





HIGH RELIABILITY ELECTROLYTE CAPACITOR & MLCCs

JINPEI

MILITARY
QUALITY TRUST
JINPEI

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version: BWDI03

JINPEI since 2005

WHO WE ARE

Specialzing in powder metallurgy, new materials and electronic components. Our core team members have years of experience in research and development at defense enterprises and were previously visiting scholars at the Debye Laboratory.
mastering cutting-edge industry technologies and a deep understanding of **capacitor** application scenarios.



Had been being highly recognized of meeting the demanding from high reliability and extreme harshness in the fields of national defense and military,commercial aerospace, oil drilling, healthcare, and communication.(comparing with MIL NASA).
Since 2005, Jinpei had been striving to become a long-term contract contractor of enterprises who own tens of thousands of employees.

CERTIFICATE



Mission

Making our customers no related problems from capacitor application .

Vision

Become the most trusted partner of customers

Value

Honesty | Positive | Inclusion | Achievement for others

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CABAF 150℃

SMD



- 150°C series, high heat resistance.
- Low ESR, high frequency and low impedance.
- Military products meet environmental requirements such as vibration and low air pressure. It can be supplied according to the "seven specialty" level, and can also be supplied according to the "general military" level.
- It is suitable for energy storage, filtering and bypass in electronic circuits in aerospace, aviation, cold, high altitude and ocean.

Main technical indicators

item	character
Operating temperature range	-55℃～+150℃
Rated operating voltage range	16V～63V
Nominal capacitance range	27μF～1000μF
Allowable deviation of nominal capacitance	M（±20%） （25℃，120Hz）
DC leakage current*1	1≤0.01$C_R U_R$（μA） （25℃，2min） C_R：Nominal capacitance（μF）；U_R：Rated voltage（V）
Loss tangent tgδ (max)	Comment on "List of Product Specifications and Technical Parameters"（25℃，120Hz）
ESR (Max)*2	For details, please refer to the "List of Product Specifications and Technical Parameters"（25℃，100KHz）
Durability High Temperature Test	The rated voltage is applied at 150°C for 2000h, and after recovery for 24h, it is often suitable (25°C±5°C) test, and its electrical performance is in line with it：
Store at high temperatures	It was stored at 150 °C for 500 hours, recovered for 24 hours, and tested at room temperature (20 °C±5 °C), and its electrical properties were in line with it：

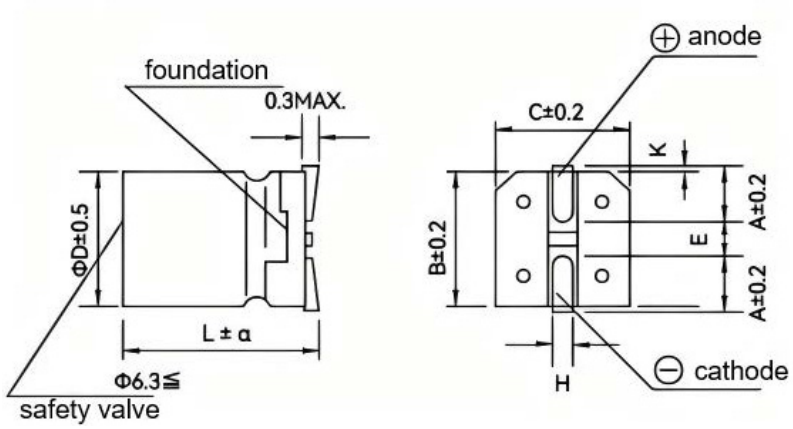
Durability High Temperature Test	
Rate of change in capacitance	≤± 20% of the initial measurement
DC leakage current	≤ initial prescriptive value
The loss angle is tangent	≤ 200% of the initial measurement
ESR	≤ 200% of the initial measurement

Store at high temperatures	
Rate of change in capacitance	≤± 10% of the initial measurement
DC leakage current	≤ 200% of the initial specified value
The loss angle is tangent	≤ initial measurements
ESR：	≤ 200% of the initial measurement

Executive standard number: Q/MN60031-2023 Seventh special standard number: QZJ840634
Note: '1 1KΩ protection resistor in series during testing and charging; The '2 test location is the root of the capacitor lead terminal.

Outline drawing and size table (mm)

D×L	D	L	A	**B**	C	E	H
8×8	8	8	2.9	**8.3**	8.3	3.2	0.8～1.1
8×10	8	10	2.9	**8.3**	8.3	3.2	0.8～1.1
8×11.7	8	11.7	2.9	**8.3**	8.3	3.2	0.8～1.1
10×10	10	10	3.2	**10.3**	10.3	4.6	0.8～1.1
10×12.3	10	12.3	3.2	**10.3**	10.3	4.6	0.8～1.1



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Parameters sheet

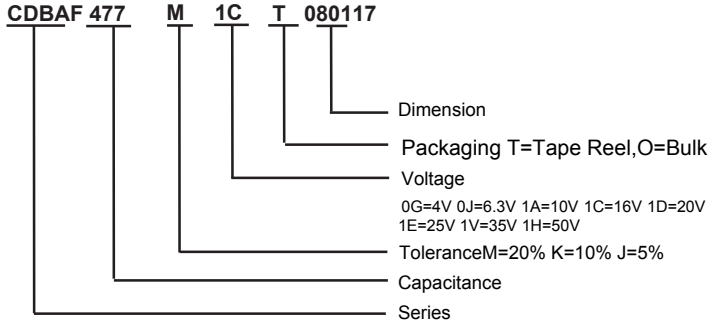
rated voltage/V	Cap μF	Dimension D×L (mm)	tgō 120Hz	ESR mΩ,25℃ 100kHz	Ripple current mA,rms 100KH, 150℃
16	270	8×8	0.08	30	800
	330	8×10	0.08	17	1900
	390	8×10	0.08	17	1900
	470	8×11.7	0.08	16	2000
	560	10×10	0.08	16	2000
	680	10×10	0.08	16	2000
	820	10×12.3	0.08	13	220
	1000	10×12.3	0.08	13	2200
20	180	8×8	0.08	39	600
	220	8×8	0.08	39	600
	270	8×10	0.08	20	1800
	330	8×11.7	0.08	18	1900
	390	10×10	0.08	18	1900
	470	10×10	0.08	18	1900
	560	10×12.3	0.08	15	2100
25	100	8×8	0.08	41	600
	120	8×8	0.08	41	600
	150	8×10	0.08	20	1800
	180	8×11.7	0.08	19	1900
	220	8×11.7	0.08	19	1900
	220	10×10	0.08	19	1900

rated voltage/V	Cap μF	Dimension D×L (mm)	tgō 120Hz	ESR (mΩ,25℃ 100kHz	Ripple current mA,rms 100KH, 150℃
25	270	10×10	0.08	19	1900
	330	10×12.3	0.08	15	2100
35	82	8×8	0.08	44	600
	100	8×10	0.08	22	1700
	120	8×11.7	0.08	21	1800
	150	8×11.7	0.08	21	1800
	180	0×10	0.08	21	1800
	220	10×12.3	0.08	16	2000
50	47	8×8	0.08	40	600
	56	8×10	0.08	35	1500
	68	8×11.7	0.08	30	1500
	82	10×10	0.08	25	1500
	100	10×12.3	0.08	22	1600
	120	10×12.3	0.08	22	1600
63	27	8×8	0.08	52	400
	33	8×10	0.08	38	1300
	39	8×10	0.08	38	1300
	47	8×11.7	0.08	35	1300
	56	10×10	0.08	28	1400
	68	10×12.3	0.08	25	1500

Ripple current frequency coefficient

Frequency (f)	1KHz≤f<1KHz	1KHz≤f<10KHz	10KHz≤f<100KHz	100KHz≤f<300KHz
coefficient	0.05	0.3	0.7	1.0

PART NUMBER EXAMPLE



SMD

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- Suitable for reflow soldering, high-density installation for small, low-profile equipment.
- Super interference absorption ability, excellent temperature and frequency characteristics.
- Military products meet environmental requirements such as vibration and low air pressure. It can be supplied according to the "seven specialty" level, and can also be supplied according to the "general military" level.
- It is suitable for energy storage, filtering and bypass in electronic circuits in aerospace, aviation, cold, high altitude and ocean.

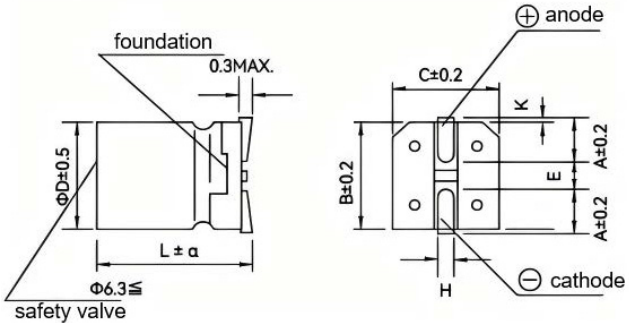
■ Main technical indicators

Item	characteristic
Operating temperature range	-55℃~+105℃
Rated operating voltage range	6.3V~25V
Nominal capacitance (25°C, 120Hz)	10μF~15000μF
Allowable deviation of nominal capacitance (25°C, 120Hz)	M（±20%）
DC leakage current（25℃，2min）*1	I≤0.02 $C_R U_R$ (μA) or 300 μA (whichever is greater) C_R: Nominal capacitance (μF); U_R: Rated voltage (V)
Loss tangent (max) (25°C, 120Hz)	For details, please refer to the "List of Product Specifications and Technical Parameters"
ESR（max）（25℃，100KHz）*2	For details, please refer to the "List of Product Specifications and Technical Parameters"
High and low temperature characteristics (impedance ratio, 100KHz)	-55°C:$Z_{-55°C}/Z_{+25°C}$≤1.25;105°C:$Z_{105°C}/Z_{+25°C}$≤1.25
Durability (High Temperature Test)	The rated voltage is applied at 105°C for 2000h, and after recovery for 24h, the electrical performance of the rated voltage (25°C±5°C) is tested at room temperature Rate of change in capacitance: ≤± 20% of the initial measurement The loss angle is tangent: ≤ 200% of the initial measurement DC leakage current: ≤ initial prescriptive value ESR: ≤ 200% of the initial measurement
Steady-state damp heat	60 °C, 90~95%RH storage for 1000h, recovery for 24h, room temperature (25±5 °C) test, its electrical performance conforms: Rate of change in capacitance: ≤± 20% of the initial measurement The loss angle is tangent: ≤ 150% of the initial specified value DC leakage current: ≤ initial prescriptive value ESR: ≤ 150% of the initial specified value

Executive standard number: Q/MN60006-2017 Seven special standard number: QZJ840634

*1 1KΩ protection resistor in series during testing and charging; *2 The test position is the root of the capacitor lead segment.

■ Outline drawing and size table (mm)



D×L	D	L	A	B	C	E	H
5×5.4	5	5.4±0.3	2.2	5.3	5.3	1.4	0.5~0.8
6.3×5.4	6.3	5.4±0.3	2.6	6.6	6.6	2.1	0.5~0.8
6.3×7.7	6.3	7.7±0.3	2.6	6.6	6.6	2.1	0.5~0.8
6.3×9.7	6.3	9.7±0.3	2.6	6.6	6.6	2.1	0.5~0.8
8×6.2	8	6.2±0.3	2.9	8.3	8.3	3.2	0.8~1.1
8×10	8	10±1.0	2.9	8.3	8.3	3.2	0.8~1.1
8×11.7	8	11.7±1.0	2.9	8.3	8.3	3.2	0.8~1.1
10×7.5	10	7.5±1.0	3.2	10.3	10.3	4.6	0.8~1.1
10×10	10	10±1.0	3.2	10.3	10.3	4.6	0.8~1.1
10×10.5	10	10.5±1.0	3.2	10.3	10.3	4.6	0.8~1.1
10×12.3	10	12.3±1.0	3.2	10.3	10.3	4.6	0.8~1.1
10×16	10	16±1.0	3.2	10.3	10.3	4.6	0.8~1.1
12×13.5	12	13.5±1.0	4.7	12.8	12.8	4.4	0.8~1.2
12.5×16	12.5	16±1.0	4.7	12.8	12.8	4.4	1.0~1.3
16×16.5	16	16.5±1.0	5.7	17.0	17.0	6.5	1.0~1.3
16×21.5	16	21.5±1.0	5.7	17.0	17.0	6.5	1.0~1.3
18×16.5	18	16.5±1.0	6.7	19.0	19.0	6.5	1.0~1.3
18×2	18	21.5±1.0	6.7	19.0	19.0	6.5	1.0~

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■ List of product specifications and technical parameters

rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ) (100kHz)	Ripple current mA.rms (100kHz)
6.3 1J	47	5×5.4	0.12	45	1670
	56	5×5.4	0.12	45	1670
	68	5×5.4	0.12	45	1670
	82	5×5.4	0.12	45	1670
	100	6.3×5.4	0.12	27	2400
	120	6.3×5.4	0.12	27	2400
	150	6.3×5.4	0.12	19	2700
	180	6.3×5.4	0.12	17	3100
	180	6.3×7.7	0.12	15	3150
	220	6.3×7.7	0.12	15	3150
	270	6.3×7.7	0.12	15	3150
	330	6.3×7.7	0.12	15	3150
	330	10×7.5	0.12	15	3200
	390	6.3×9.7	0.12	12	3400
	470	6.3×9.7	0.12	10	4300
	560	8×10	0.12	10	5400
	680	8×10	0.12	10	5400
	820	8×11.7	0.12	9	5600
	1000	8×11.7	0.12	9	5600
	1000	10×10	0.12	8	5900
	1200	10×10	0.13	8	5900
	1500	10×12.3	0.13	8	6100
	1800	10×12.3	0.13	8	6100
	2200	10×16	0.13	8	6300
	2700	10×16	0.13	8	6300
	3300	12.5×13.5	0.14	8	6600
	3900	12.5×13.5	0.14	8	6600
	3900	12.5×16	0.14	8	6800
	4700	12.5×16	0.15	8	6800
	5600	16×16.5	0.15	8	7000
	6800	16×16.5	0.16	8	7000
	8200	18×16.5	0.16	8	7200
	10000	16×21.5	0.17	8	7100
	10000	18×16.5	0.17	8	7200
	12000	16×21.5	0.18	8	7100
	15000	18×21.5	0.18	8	7500
10 1A	10	5×5.4	0.12	45	1670
	12	5×5.4	0.12	45	1670
	15	5×5.4	0.12	45	1670
	18	5×5.4	0.12	45	1670
	22	5×5.4	0.12	45	1670
	27	5×5.4	0.12	45	1670
	33	5×5.4	0.12	45	1670

rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ) (100kHz)	Ripple current mA.rms (100kHz)
10 1A	33	6.3×5.4	0.12	30	2200
	39	5×5.4	0.12	45	1670
	39	6.3×5.4	0.12	30	2200
	47	5×5.4	0.12	30	2200
	47	6.3×5.4	0.12	30	2200
	56	5×5.4	0.12	30	2200
	56	6.3×5.4	0.12	30	2200
	68	5×5.4	0.12	30	2200
	68	6.3×5.4	0.12	30	2200
	82	6.3×5.4	0.12	30	2200
	100	6.3×5.4	0.12	30	2200
	100	6.3×7.7	0.12	20	2690
	120	6.3×5.4	0.12	30	2200
	120	6.3×7.7	0.12	20	2690
	150	6.3×7.7	0.12	20	2690
	180	6.3×7.7	0.12	20	2690
	220	6.3×7.7	0.12	20	2690
	220	6.3×9.7	0.12	15	3100
	270	6.3×9.7	0.12	15	3100
	330	8×10	0.12	15	3950
	330	8×11.7	0.12	15	3950
	390	8×10	0.12	11	4800
	470	8×10	0.12	8	5400
	560	8×11.7	0.12	8	5600
	680	10×10	0.12	8	5900
	820	10×10	0.12	8	5900
	1000	10×10	0.12	8	5900
	1200	10×12.3	0.13	8	6100
	1500	10×12.3	0.13	8	6100
	1800	10×16	0.13	8	6300
	2200	10×16	0.13	8	6300
	2200	12.5×13.5	0.13	8	6600
	2700	12.5×13.5	0.13	8	6600
	2700	12.5×16	0.13	8	6800
	3300	12.5×16	0.14	8	6800
	3900	16×16.5	0.14	8	7000
	4700	16×16.5	0.15	8	7000
	5600	16×16.5	0.15	8	7000
	5600	18×16.5	0.15	8	7200
	6800	16×21.5	0.16	8	7100
	8200	18×16.5	0.16	8	7200
	10000	18×21.5	0.17	8	7500
	12000	18×21.5	0.18	8	7500

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■ List of product specifications and technical parameters

rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ) (100kHz)	Ripple current mA.rms (100kHz)
16 1C	10	5×5.4	0.12	45	1670
	10	6.3×5.4	0.12	30	2200
	12	5×5.4	0.12	45	1670
	12	6.3×5.4	0.12	30	2200
	15	5×5.4	0.12	45	1670
	15	6.3×5.4	0.12	30	2200
	18	5×5.4	0.12	45	1670
	18	6.3×5.4	0.12	30	2200
	22	5×5.4	0.12	45	1670
	22	6.3×5.4	0.12	30	2200
	27	5×5.4	0.12	45	1670
	27	6.3×5.4	0.12	30	2200
	33	5×5.4	0.12	45	1670
	33	6.3×5.4	0.12	30	2200
	39	5×5.4	0.12	45	1670
	39	6.3×5.4	0.12	30	2200
	47	5×5.4	0.12	45	1670
	47	6.3×5.4	0.12	30	2200
	56	6.3×5.4	0.12	30	2200
	68	6.3×5.4	0.12	30	2200
	82	6.3×5.4	0.12	30	2200
	82	6.3×7.7	0.12	20	2690
	82	8×6.2	0.12	20	2690
	100	6.3×7.7	0.12	20	2690
	120	6.3×7.7	0.12	20	2690
	120	8×6.2	0.12	20	2690
	150	8×6.2	0.12	20	2690
	150	10×7.5	0.12	20	2890
	180	6.3×9.7	0.12	18	3500
	220	8×10	0.12	18	3890
	270	8×10	0.12	16	3970
	270	8×11.7	0.12	16	4070
	330	8×10	0.12	16	4070
	390	8×11.7	0.12	16	4070
	470	10×10	0.12	12	5900
	470	10×12.3	0.12	10	6100
	560	10×10	0.12	10	5900
	680	10×12.3	0.12	10	6100
	820	10×12.3	0.12	10	6100
	1000	10×16	0.12	8	6300
	1200	10×16	0.13	8	6300

rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ) (100kHz)	Ripple current mA.rms (100kHz)
16	1200	12.5×13.5	0.13	8	6600
	1500	12.5×13.5	0.13	8	6600
	1500	12.5×16	0.13	8	6800
	1800	12.5×16	0.13	8	6800
	2200	16×16.5	0.13	8	7000
	2700	16×16.5	0.13	8	7000
	3300	16×16.5	0.14	8	7000
	3900	16×21.5	0.14	8	7100
	3900	18×16.5	0.14	8	7200
	4700	16×21.5	0.15	8	7100
	4700	18×21.5	0.15	8	7500
	5600	18×21.5	0.15	8	7500
20 1D	10	5×5.4	0.12	45	1670
	10	6.3×5.4	0.12	30	2200
	10	6.3×7.7	0.12	25	2670
	12	5×5.4	0.12	45	1670
	12	6.3×5.4	0.12	30	2200
	12	6.3×7.7	0.12	25	2670
	15	5×5.4	0.12	45	1670
	15	6.3×5.4	0.12	30	2200
	15	6.3×7.7	0.12	25	2670
	18	5×5.4	0.12	45	1670
	18	6.3×5.4	0.12	30	2200
	18	6.3×7.7	0.12	25	2670
	22	5×5.4	0.12	45	1670
	22	6.3×5.4	0.12	30	2200
	22	6.3×7.7	0.12	25	2670
	27	5×5.4	0.12	45	1670
	27	6.3×5.4	0.12	30	2200
	27	6.3×7.7	0.12	25	2670
	33	5×5.4	0.12	45	1670
	33	6.3×5.4	0.12	30	2200
	33	6.3×7.7	0.12	25	2670
	39	6.3×5.4	0.12	30	2200
	39	6.3×7.7	0.12	25	2670
	47	6.3×7.7	0.12	25	2670
	47	8×6.2	0.12	25	2670
	56	6.3×7.7	0.12	25	2670
	56	8×6.2	0.12	25	2670
	68	6.3×7.7	0.12	25	2670
	82	6.3×7.7	0.12	25	2670

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■ List of product specifications and technical parameters

rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ) (100kHz)	Ripple current mA,rms (100kHz)
20 1D	100	6.3×7.7	0.12	25	2670
	120	6.3×9.7	0.12	20	2950
	120	8×10	0.12	18	3600
	150	8×10	0.12	18	3600
	180	8×10	0.12	18	3600
	220	10×10	0.12	15	4880
	270	10×10	0.12	15	4880
	330	10×10	0.12	15	4880
	390	10×12.3	0.12	15	5500
	470	10×12.3	0.12	12	5800
	560	10×16	0.12	12	6300
	680	10×16	0.12	12	6300
	820	10×16	0.12	12	6300
	820	12.5×13.5	0.12	12	6600
	1000	12.5×16	0.12	12	6800
	1200	12.5×16	0.13	12	6800
	1500	16×16.5	0.13	12	7000
	1800	16×16.5	0.13	12	7000
	2200	16×21.5	0.13	12	7100
	2200	18×16.5	0.13	12	7200
	2700	16×21.5	0.13	12	7100
	2700	18×16.5	0.13	12	7200
	3300	18×21.5	0.14	12	7500
	3900	18×21.5	0.14	12	7500
	4700	18×21.5	0.15	12	7500
25 1E	10	6.3×5.4	0.12	45	2100
	10	6.3×7.7	0.12	25	2670
	12	6.3×5.4	0.12	45	2100
	12	6.3×7.7	0.12	25	2670
	15	6.3×5.4	0.12	45	2100
	15	6.3×7.7	0.12	25	2670
	18	6.3×5.4	0.12	45	2100
	18	6.3×7.7	0.12	25	2670
	22	6.3×5.4	0.12	45	2100
	22	6.3×7.7	0.12	25	2670

rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ) (100kHz)	Ripple current mA,rms (100kHz)
25 1E	27	6.3×5.4	0.12	45	2100
	27	6.3×7.7	0.12	25	2670
	33	6.3×5.4	0.12	45	2100
	33	6.3×7.7	0.12	25	2670
	39	6.3×5.4	0.12	45	2100
	39	6.3×7.7	0.12	25	2670
	47	6.3×5.4	0.12	30	2200
	47	6.3×7.7	0.12	25	2670
	56	6.3×7.7	0.12	25	2670
	68	6.3×7.7	0.12	25	2670
	82	8×10	0.12	20	3000
	100	8×10	0.12	18	3600
	120	8×10	0.12	18	3600
	150	8×10	0.12	18	3600
	180	8×10	0.12	18	3600
	220	10×10	0.12	15	4880
	270	10×10	0.12	15	4880
	330	10×12.3	0.12	15	5500
	390	10×12.3	0.12	12	5800
	470	10×16	0.12	12	6300
	560	12.5×13.5	0.12	12	6600
	680	12.5×13.5	0.12	12	6600
	680	12.5×16	0.12	12	6800
	820	12.5×16	0.12	12	6800
	1000	12.5×16	0.12	12	6800
	1200	16×16.5	0.13	12	7000
	1500	16×16.5	0.13	12	7000
	1500	18×16.5	0.13	12	7200
	1800	16×21.5	0.13	12	7100
	2200	16×21.5	0.13	12	7100
	2200	18×16.5	0.13	12	7200
	2200	18×21.5	0.13	12	7500
	2700	18×21.5	0.13	12	7500
	3300	18×21.5	0.14	12	7500
	3900	18×21.5	0.14	12	7500

PART NUMBER EXAMPLE

CDBAG 106 M 1C T 063054

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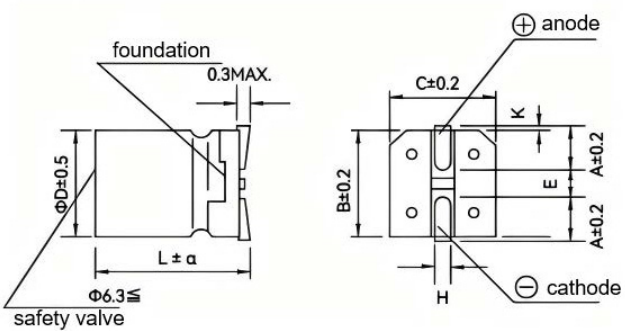
- Suitable for reflow soldering, high-pressure resistant series.
- Low ESR, high frequency and low impedance.
- Military products meet environmental requirements such as vibration and low air pressure. It can be supplied according to the "seven specialty" level, and can also be supplied according to the "general military" level.
- It is suitable for energy storage, filtering and bypass in electronic circuits in aerospace, aviation, cold, high altitude and ocean.

■ Main technical indicators

Item	characteristic
Operating temperature range	-55℃~+105℃
Rated operating voltage range	35V~100V
Nominal capacitance (25°C, 120Hz)	4.7μF~2200μF
Allowable deviation of nominal capacitance (25°C, 120Hz)	M（±20%）
DC leakage current（25℃，2min）*1	I≤0.02$C_R U_R$（μA） C_R: Nominal capacitance (μF); U_R: Rated voltage (V)
Loss tangent (max) (25°C, 120Hz)	For details, please refer to the "List of Product Specifications and Technical Parameters"
ESR（max）（25℃，100KHz）*2	For details, please refer to the "List of Product Specifications and Technical Parameters"
High and low temperature characteristics (impedance ratio, 100KHz)	-55°C:$Z_{-55°C}/Z$+25°C≤1.25;105°C:Z105°C/Z+25°C≤1.25
Durability (High Temperature Test)	The rated voltage is applied at 105°C for 2000h, and after recovery for 24h, the electrical performance of the rated voltage (25°C±5°C) is tested at room temperature Rate of change in capacitance: ≤± 20% of the initial measurement The loss angle is tangent: ≤ 150% of the initial measurement DC leakage current: ≤ initial prescriptive value ESR: ≤ 150% of the initial measurement
Steady-state damp heat	60 °C, 90~95%RH storage for 1000h, recovery for 24h, room temperature (25±5 °C) test, its electrical performance conforms: Rate of change in capacitance: ≤± 20% of the initial measurement The loss angle is tangent: ≤ 150% of the initial specified value DC leakage current: ≤ initial prescriptive value ESR: ≤ 150% of the initial specified value

Executive standard number: Q/MN60006-2017 Seven special standard number: QZJ840634
*1 1KΩ protection resistor in series during testing and charging; *2 The test position is the root of the capacitor lead segment.

■ Outline drawing and size table (mm)



D×L	D	L	A	B	C	E	H
5×5.4	5	5.4±0.3	2.2	5.3	5.3	1.4	0.5~0.8
6.3×5.4	6.3	5.4±0.3	2.6	6.6	6.6	2.1	0.5~0.8
6.3×7.7	6.3	7.7±0.3	2.6	6.6	6.6	2.1	0.5~0.8
6.3×9.7	6.3	9.7±0.3	2.6	6.6	6.6	2.1	0.5~0.8
8×6.2	8	6.2±0.3	2.9	8.3	8.3	3.2	0.8~1.1
8×10	8	10±1.0	2.9	8.3	8.3	3.2	0.8~1.1
8×11.7	8	11.7±1.0	2.9	8.3	8.3	3.2	0.8~1.1
10×7.5	10	7.5±1.0	3.2	10.3	10.3	4.6	0.8~1.1
10×10	10	10±1.0	3.2	10.3	10.3	4.6	0.8~1.1
10×10.5	10	10.5±1.0	3.2	10.3	10.3	4.6	0.8~1.1
10×12.3	10	12.3±1.0	3.2	10.3	10.3	4.6	0.8~1.1
10×16	10	16±1.0	3.2	10.3	10.3	4.6	0.8~1.1
12×13.5	12	13.5±1.0	4.7	12.8	12.8	4.4	0.8~1.2
12.5×16	12.5	16±1.0	4.7	12.8	12.8	4.4	1.0~1.3
16×16.5	16	16.5±1.0	5.7	17.0	17.0	6.5	1.0~1.3
16×21.5	16	21.5±1.0	5.7	17.0	17.0	6.5	1.0~1.3
18×16.5	18	16.5±1.0	6.7	19.0	19.0	6.5	1.0~1.3
18×21.5	18	21.5±1.0	6.7	19.0	19.0	6.5	1.0~1.3

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■ List of product specifications and technical parameters

rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ) (100kHz)	Ripple current mA,ms (100kHz)
35	4.7	6.3×5.4	0.12	50	1900
	5.6	6.3×5.4	0.12	50	1900
	6.8	6.3×5.4	0.12	50	1900
	8.2	6.3×5.4	0.12	50	1900
	10	6.3×5.4	0.12	50	1900
	12	6.3×5.4	0.12	50	1900
	15	6.3×5.4	0.12	50	1900
	18	6.3×5.4	0.12	50	1900
	22	6.3×5.4	0.12	50	1900
	27	6.3×7.7	0.12	45	2700
	33	6.3×7.7	0.12	45	2700
	39	6.3×7.7	0.12	45	2700
	47	6.3×7.7	0.12	45	2700
	56	8×10	0.12	35	2900
	68	8×10	0.12	35	2900
	82	8×10	0.12	35	2900
	100	8×11.7	0.12	24	3100
	120	8×11.7	0.12	24	3100
	150	10×10	0.12	22	3300
	180	10×10	0.12	22	3300
	220	10×12.3	0.12	20	3400
	270	10×12.3	0.12	20	3400
	330	10×16	0.12	20	3800
	390	10×16	0.12	20	3800
	470	10×16	0.12	20	3800
	470	12.5×13.5	0.12	20	4200
	560	12.5×16	0.12	20	4400
	680	12.5×16	0.12	20	4400
	820	16×16.5	0.12	18	4800
	1000	16×16.5	0.12	18	4800
	1200	18×16.5	0.13	18	5300
	1500	16×21.5	0.13	18	5300
	1500	18×16.5	0.13	18	6000
	1800	18×21.5	0.13	18	6200
	2200	18×21.5	0.13	18	6200
40	6.8	6.3*5.4	0.12	50	1900
	8.2	6.3*5.4	0.12	50	1900
	10	6.3*5.4	0.12	50	1900
	12	6.3*5.4	0.12	50	1900
	15	6.3*5.4	0.12	50	1900
	18	6.3*5.4	0.12	50	1900
	22	6.3*7.7	0.12	45	2700

rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ) (100kHz)	Ripple current mA,rms (100kHz)
40	27	6.3*7.7	0.12	45	2700
	33	6.3*7.7	0.12	45	2700
	39	6.3*7.7	0.12	45	2700
	47	8*10	0.12	35	2900
	56	8*10	0.12	35	2900
	68	8*10	0.12	35	2900
	82	8*11.7	0.12	24	3100
	100	8*11.7	0.12	24	3100
	120	10*10	0.12	22	3300
	150	10*10	0.12	22	3300
	180	10*12.3	0.12	20	3400
	220	10*12.3	0.12	20	3400
	270	10×16	0.12	20	3800
	330	10×16	0.12	20	3800
	390	10×16	0.12	20	3800
	390	12.5×13.5	0.12	20	4200
	470	12.5×13.5	0.12	20	4200
	470	12.5×16	0.12	20	4400
	560	12.5×16	0.12	20	4400
	680	16×16.5	0.12	20	4800
	820	16×16.5	0.12	20	4800
	1000	16×16.5	0.12	20	4800
	1200	16×21.5	0.13	18	5300
	1200	18×16.5	0.13	18	5300
	1500	16×21.5	0.13	18	6200
	1500	18×21.5	0.13	18	6200
	1800	18×21.5	0.13	18	6200
50	4.7	6.3×5.4	0.12	50	1900
	5.6	6.3×5.4	0.12	50	1900
	6.8	6.3×5.4	0.12	50	1900
	8.2	6.3×5.4	0.12	50	1900
	10	6.3×5.4	0.12	50	1900
	12	6.3×5.4	0.12	50	1900
	15	6.3×7.7	0.12	45	2700
	18	6.3×7.7	0.12	45	2700
	22	6.3×7.7	0.12	45	2700
	27	8×10	0.12	35	2900
	33	8×10	0.12	35	2900
	39	8×11.7	0.12	24	3100
	47	8×11.7	0.12	24	3100
	56	8×11.7	0.12	24	3100
	68	8×11.7	0.12	24	3100

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■ List of product specifications and technical parameters

rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ) (100kHz)	Ripple current mA,rms (100kHz)
50	82	10×10	0.12	22	3300
	100	10×10	0.12	22	3300
	100	10×12.3	0.12	20	3400
	120	10×12.3	0.12	20	3400
	150	10×12.3	0.12	20	3400
	180	10×16	0.12	20	3500
	220	10×16	0.12	20	3500
	220	12.5×13.5	0.12	20	3800
	270	12.5×13.5	0.12	20	3800
	270	12.5×16	0.12	20	4000
	330	12.5×16	0.12	20	4000
	470	16×16.5	0.12	18	4500
	560	16×16.5	0.12	18	4500
	560	18×16.5	0.12	18	4500
	680	16×21.5	0.12	18	5100
	680	18×16.5	0.12	18	5500
	1000	18×21.5	0.12	18	5700
63	4.7	6.3×5.4	0.12	50	1900
	5.6	6.3×5.4	0.12	50	1900
	6.8	6.3×5.4	0.12	50	1900
	8.2	6.3×5.4	0.12	50	1900
	10	6.3×7.7	0.12	45	2700
	12	6.3×7.7	0.12	45	2700
	15	6.3×7.7	0.12	45	2700
	18	8×10	0.12	35	2900
	22	8×10	0.12	35	2900
	27	8×10	0.12	35	2900
	33	8×11.7	0.12	24	3100
	39	8×11.7	0.12	24	3100
	47	8×11.7	0.12	24	3100
	56	8×11.7	0.12	24	3100
	68	10×10	0.12	22	3300
	82	10×12.3	0.12	20	3400
	100	10×12.3	0.12	20	3400
	120	10×16	0.12	20	3500
	150	10×16	0.12	20	3500
	150	12.5×13.5	0.12	20	3500
	180	12.5×16	0.12	20	3800
	270	16×16.5	0.12	18	4500
	330	16×16.5	0.12	18	4500

rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ) (100kHz)	Ripple current mA,rms (100kHz)
63	390	16×21.5	0.12	20	4700
	390	18×16.5	0.12	20	4700
	470	16×21.5	0.12	18	4700
	470	18×16.5	0.12	18	4700
	560	18×21.5	0.12	18	5000
	680	18×21.5	0.12	18	5000
80	10	8×10	0.12	60	1700
	12	8×10	0.12	60	1700
	15	8×10	0.12	60	1700
	18	8×11.7	0.12	50	1900
	22	8×11.7	0.12	50	1900
	27	8×11.7	0.12	50	1900
	33	10×10	0.12	45	2700
	39	10×10	0.12	45	2700
	47	10×12.3	0.12	35	2900
	56	10×12.3	0.12	35	2900
	68	10×16	0.12	35	2900
	82	10×16	0.12	35	2900
	100	10×16	0.12	35	2900
	100	12.5×13.5	0.12	30	3300
	120	12.5×16	0.12	30	3500
	150	12.5×16	0.12	30	3500
	180	16×16.5	0.12	28	3700
	220	16×16.5	0.12	28	3700
	270	16×21.5	0.12	28	4500
	270	18×16.5	0.12	28	4500
	330	16×21.5	0.12	28	4500
	330	18×16.5	0.12	28	5000
	390	18×21.5	0.12	26	5600
	470	18×21.5	0.12	26	5600
	560	18×21.5	0.12	26	5600
100	8.2	8×10	0.12	60	1700
	10	8×10	0.12	60	1700
	12	8×11.7	0.12	50	1900
	15	8×11.7	0.12	50	1900
	18	8×11.7	0.12	50	1900
	22	10×10	0.12	45	2700
	27	10×10	0.12	45	2700
	33	10×12.3	0.12	35	2900
	39	10×12.3	0.12	35	2900

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- List of product specifications and technical parameters

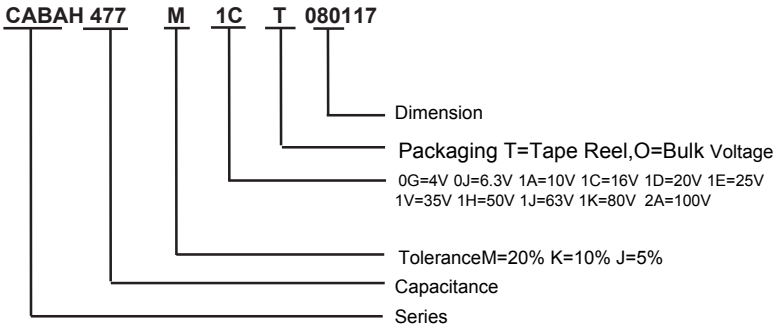
rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ) (100kHz)	Ripple current mA,rms (100kHz)
100	47	10×16	0.12	35	2900
	56	10×16	0.12	35	2900
	56	12.5×13.5	0.12	30	3100
	68	12.5×16	0.12	30	3100
	100	16×16.5	0.12	30	3900

rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ) (100kHz)	Ripple current mA,rms (100kHz)
100	47	10×16	0.12	35	2900
	56	10×16	0.12	35	2900
	56	12.5×13.5	0.12	30	3100
	68	12.5×16	0.12	30	3100
	100	16×16.5	0.12	30	3900

- Ripple current frequency coefficient

Frequency (f)	<1KHz	1KHz≤f<10KHz	10KHz≤f<100KHz	100KHz≤f<300KHz
coefficient	0.05	0.3	0.7	1.0

PART NUMBER EXAMPLE



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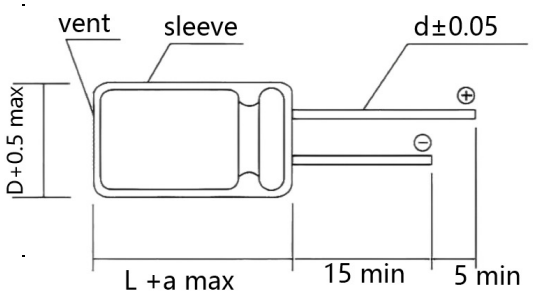
- High pressure resistant series.
- Low ESR with high frequency and low impedance.
- Military products meet the environmental requirements such as vibration and low pressure, and can be supplied according to the "seven specialty" level or the "general army" level.
- It is suitable for filtering, energy storage and bypass in electronic circuits in aerospace, aviation, alpine, high altitude and ocean.

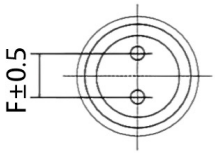
■ Main technical parameters:

Item	characteristic
Operating temperature range	-55℃~+105℃
Rated voltage range	35V~250V
Nominal capacitance range	4.7μF~150μF
Allowable deviation of nominal capacitance (25°C, 120Hz)	M（±20%）
DC leakage current（25℃，2min）*1	I≤0.02$C_R U_R$（μA） C_R: Nominal capacitance (μF); U_R: Rated voltage (V)
The loss angle is tangent tgδ(max)(25℃，120Hz）	For details, please refer to the "List of Product Specifications and Technical Parameters"
ESR max（25℃，100KHz）*2	For details, please refer to the "List of Product Specifications and Technical Parameters"
High and low temperature characteristics (impedance ratio, 100KHz)	55℃：$Z_{-55℃}/Z_{25℃}$≤1.25 105℃：$Z_{105℃}/Z_{25℃}$≤1.25
Durability (High Temperature Test)	The rated voltage is applied at 105°C for 2000h, and after recovery for 24h, the electrical performance of the rated voltage (25°C±5°C) is tested at room temperature . Rate of change in capacitance: ≤± 20% of the initial measurement Loss tangent tgδ: ≤ 150% of the initial specified value DC leakage current: ≤ initial prescriptive value ESR: ≤ 150% of the initial specified value
Steady-state damp heat	60 °C, 90~95%RH storage for 1000h, recovery for 24h, room temperature (25 °C±5 °C) test, its electrical performance conforms: Rate of change in capacitance: ≤± 20% of the initial measurement Loss tangent tgδ: ≤ 150% of the initial specified value DC leakage current: ≤ initial prescriptive value ESR: ≤ 150% of the initial specified value

Executive standard number: Q/MN60001-2008 Seven special standard number: QZJ840634
*1 When testing and charging, a 1KΩ protection resistor is connected in series. *2 The test position is the bottom of the lead terminal.

■ Outline drawing and size table (mm)





D×L	F±0.5	d±0.05	a
6.3×8	2.5	0.6	1
6.3×11	2.5	0.6	1
8×8	3.5	0.6	1
8×12	3.5	0.6	1
10×12.5	5	0.6	1

■ Ripple current frequency coefficient

Frequency (f)	<1KHz	1KHz≤f<10KHz	10KHz≤f<100KHz	100KHz≤f<300KHz
coefficient	0.05	0.3	0.7	1.0

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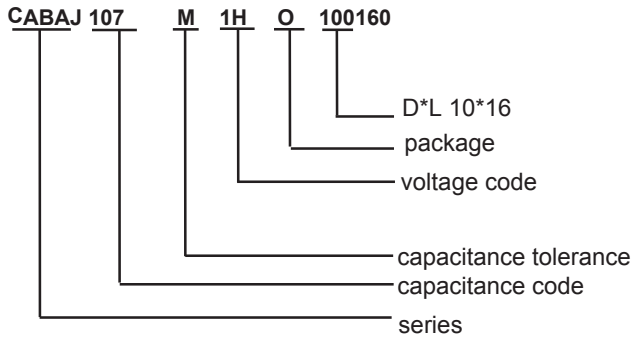
■ List of product specifications and technical parameters

rated voltage (V)	capacity (μF)	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ, 100KHz)	Ripple current (mA.rms 100KHz)	weight (typical). (g)
35	4.7	6.3×8	0.12	50	1650	0.50
	10	6.3×8	0.12	45	1980	0.50
	15	6.3×8	0.12	45	1980	0.50
	22	6.3×8	0.12	50	1980	0.50
	22	6.3×11	0.12	45	2050	0.55
	22	8×8	0.12	35	2500	0.68
	33	6.3×11	0.12	35	2050	0.55
	33	8×8	0.12	35	2500	0.68
	39	6.3×11	0.12	35	2050	0.55
	39	8×8	0.12	35	2500	0.68
	47	6.3×11	0.12	30	2050	0.55
	47	8×8	0.12	35	2500	0.68
	47	8×12	0.12	30	2920	0.85
	56	8×8	0.12	35	2500	0.68
	56	8×12	0.12	30	2920	0.85
	56	10×12.5	0.12	28	3720	1.6
	68	8×12	0.12	28	2920	0.85
	68	10×12.5	0.12	28	3720	1.60
	82	8×12	0.12	28	2920	0.85
	82	10×12.5	0.12	28	3720	1.6
	100	10×12.5	0.12	24	3720	1.6
	150	10×12.5	0.12	22	3720	1.6
50	4.7	6.3×8	0.12	50	1750	0.50
	10	6.3×8	0.12	45	1980	0.50
	10	6.3×11	0.12	35	2050	0.55
	10	8×8	0.12	35	2500	0.68
	15	6.3×8	0.12	45	1980	0.50
	15	8×8	0.12	35	2500	0.68
	22	6.3×8	0.12	45	1980	0.50
	22	8×8	0.12	35	2500	0.68
	22	8×12	0.12	35	2720	0.85
	33	6.3×11	0.12	45	1980	0.55
	33	8×8	0.12	35	2500	0.68
	33	8×12	0.12	35	2720	0.85
	39	8×12	0.12	35	2720	0.85
	39	10×12.5	0.12	30	2850	1.6
	47	8×12	0.12	32	2720	0.85
	47	10×12.5	0.12	30	2850	1.6
	56	8×12	0.12	32	2720	0.85
	56	10×12.5	0.12	30	2850	1.6
	68	10×12.5	0.12	30	2850	1.6
	82	10×12.5	0.12	30	2850	1.6

rated voltage (V)	capacity (μF)	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ, 100KHz)	Ripple current (mA,rms 100KHz)	weight (typical). (g)
63	4.7	8×8	0.12	50	1900	0.68
	10	6.3×11	0.12	55	1980	0.55
	10	8×8	0.12	45	2500	0.68
	10	8×12	0.12	35	2720	0.85
	15	8×8	0.12	45	2500	0.68
	15	8×12	0.12	35	2720	0.85
	22	8×8	0.12	45	2500	0.68
	22	8×12	0.12	35	2720	0.85
	22	10×12.5	0.12	30	2850	1.6
	33	8×8	0.12	45	2500	0.68
	33	8×12	0.12	35	2720	0.85
	33	10×12.5	0.12	30	2850	1.6
	39	8×12	0.12	35	2720	0.85
	39	10×12.5	0.12	30	2850	1.6
	47	8×12	0.12	35	2720	0.85
	47	10×12.5	0.12	25	2850	1.6
	56	10×12.5	0.12	25	2850	1.6
80	4.7	8×8	0.12	50	1900	0.68
	10	8×8	0.12	45	2500	0.68
	10	8×12	0.12	35	2720	0.85
	15	8×8	0.12	45	2500	0.68
	15	8×12	0.12	35	2720	0.85
	22	8×12	0.12	35	2720	0.85
	22	10×12.5	0.12	30	2850	1.6
	33	8×12	0.12	35	2720	0.85
	33	10×12.5	0.12	30	2850	1.6
	39	10×12.5	0.12	30	2850	1.6
	47	10×12.5	0.12	30	2850	1.6
100	10	8×12	0.12	120	1250	0.85
	22	10×12.5	0.12	90	1740	1.6
160	10	8×12	0.12	180	1000	0.85
	15	10×12.5	0.12	150	1350	1.6
200	6.8	8×12	0.12	180	1000	0.85
	10	10×12.5	0.12	150	1350	1.6
250	4.7	8×12	0.12	250	840	0.85
	6.8	10×12.5	0.12	180	1140	1.6
	10	10×12.5	0.12	150	1350	1.6

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HOW TO MAKE A PART NUMBER



Code	Lead Forming Type
O	Bulk
T	5mm Chip tape
A	(Φ4~Φ6.3)2.5mm tape
F	(Φ4~Φ8)5mm tape
P	Φ≥Φ8mm original(vertical)tape
M	5mm Lead forming
C	C Lead forming
B	B Lead forming
D	(Φ4~Φ8)2.5mm Lead forming

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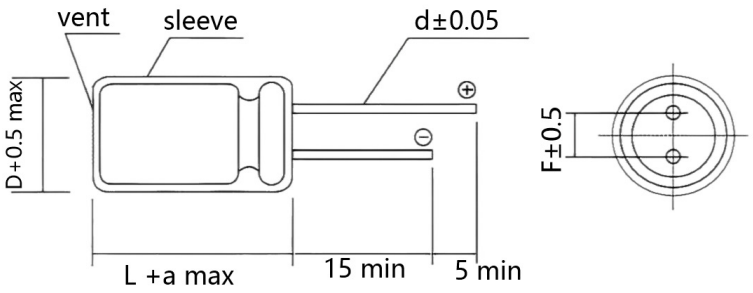
- Conductive polymer solid-state electrolyte is used to achieve **ultra-low ESR**.
- Super interference absorption ability, excellent temperature and frequency characteristics.
- Military products meet the environmental requirements such as vibration and low pressure, and can be supplied according to the "seven specialty" level or the "general army" level.
- It is suitable for filtering, energy storage and bypass in electronic circuits in aerospace, aviation, alpine, high altitude and ocean.

■ Main technical parameters:

Item	characteristic
Operating temperature range	-55℃~+105℃
Rated voltage range	2.5V~25V
Nominal capacitance range	10μF~3500μF
Allowable deviation of nominal capacitance (25°C, 120Hz)	M（±20%）
DC leakage current（25℃，2min）*1	I≤0.2CRUR or 300 (μA) whichever is greater CR: Nominal capacitance (μF); UR: Rated voltage (V)
The loss angle tangent tgδ（max）（25℃，120Hz）	For details, please refer to the "List of Product Specifications and Technical Parameters"
ESR（max）（25℃，100KHz）*2	For details, please refer to the "List of Product Specifications and Technical Parameters"
High and low temperature characteristics (impedance ratio, 100KHz)	-55℃：$Z_{-55℃}/Z_{25℃}$≤1.25 105℃：$Z_{105℃}/Z_{25℃}$≤1.25
Durability (High Temperature Test)	The rated voltage is applied at 105°C for 2000h, and after recovery for 24h, the electrical performance of the rated voltage (25°C±5°C) is tested at room temperature Rate of change in capacitance: ≤± 20% of the initial measurement Loss tangent tgδ: ≤ 150% of the initial specified value DC leakage current: ≤ initial prescriptive value ESR: ≤ 150% of the initial specified value
Steady-state damp heat	60 °C, 90~95%RH storage for 1000h, recovery for 24h, room temperature [25 °C±5 °C] test, its electrical properties conform: Rate of change in capacitance: ≤± 20% of the initial measurement Loss tangent tgδ: ≤ 150% of the initial specified value DC leakage current: ≤ initial prescriptive value ESR: ≤ 150% of the initial specified value

Executive standard number: Q/MN60000-2008 Seven special standard number: QZJ840634
*1 When testing and charging, a 1KΩ protection resistor is connected in series.
*2 The test position is the bottom of the lead terminal.

■ Outline drawing and size table (mm)



D×L	F±0.5	d±0.05	a
6.3×8	2.5	0.6	1
6.3×11	2.5	0.6	1
8×8	3.5	0.6	1
8×12	3.5	0.6	1
10×12.5	5	0.6	1

■ Ripple current frequency coefficient

Frequency (f)	<1KHz	1KHz≤f<10KHz	10KHz≤f<100KHz	100KHz≤f<300KHz
coefficient	0.05	0.3	0.7	1.0

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■ List of product specifications and technical parameters

rated voltage (V)	capacity (μF)	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ, 100KHz)	Ripple current (mA,rms 100KHz)	weight (typical) (g)
2.5 0E	560	6.3×8	0.08	11	4460	0.50
	680	6.3×8	0.08	11	4460	0.50
	820	6.3×8	0.08	11	4460	0.50
	820	8×8	0.08	9	5220	0.68
	1000	8×8	0.08	9	5220	0.68
	1000	8×12	0.08	9	5220	0.85
	1200	8×8	0.08	9	5220	0.68
	1200	8×12	0.08	9	5220	0.85
	1500	8×12	0.08	9	5220	0.85
	2000	10×12.5	0.08	9	5550	1.60
	2500	10×12.5	0.08	9	5550	1.6
	2700	10×12.5	0.08	9	5550	1.6
	3000	10×12.5	0.08	9	5550	1.6
	3300	10×12.5	0.08	9	5550	1.6
	3500	10×12.5	0.08	9	5550	1.6
4 0G	560	6.3×8	0.08	11	4460	0.50
	560	8×8	0.08	9	5220	0.68
	680	8×8	0.08	9	5220	0.68
	680	8×12	0.08	9	5220	0.85
	820	8×8	0.08	9	5220	0.68
	820	8×12	0.08	9	5220	0.85
	1000	8×12	0.08	9	5220	0.85
	1200	8×12	0.08	9	5220	0.85
	1200	10×12.5	0.08	9	5550	1.60
	1500	10×12.5	0.08	9	5550	1.60
	2000	10×12.5	0.08	9	5550	1.60
	2500	10×12.5	0.08	9	5550	1.60
6.3 0J	470	6.3×8	0.08	11	4460	0.50
	470	8×8	0.08	9	5220	0.68
	560	6.3×8	0.08	11	4460	0.50
	560	8×8	0.08	9	5220	0.68
	680	8×8	0.08	9	5220	0.68
	680	8×12	0.08	9	5220	0.85
	820	8×12	0.08	9	5220	0.85
	820	10×12.5	0.08	9	5550	1.60
	1000	8×12	0.08	9	5220	0.85
	1000	10×12.5	0.08	9	5550	1.60
	1200	8×12	0.08	9	5220	0.85
	1200	10×12.5	0.08	9	5550	1.6
	1500	10×12.5	0.08	9	5550	1.6
	2000	10×12.5	0.08	9	5550	1.6

rated voltage (V)	capacity (μF)	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ, 100KHz)	Ripple current (mA,rms 100KHz)	weight (typical) (g)
10 1A	820	8×12	0.10	9	5220	0.85
	820	10×12.5	0.10	9	5550	1.6
	1000	10×12.5	0.10	9	5550	1.6
	1200	10×12.5	0.10	9	5550	1.6
	1500	10×12.5	0.10	9	5550	1.6
16 1C	10	6.3×8	0.10	25	2080	0.50
	22	6.3×8	0.10	25	2080	0.50
	33	6.3×8	0.10	25	2080	0.50
	39	6.3×8	0.10	25	2080	0.50
	47	6.3×8	0.10	25	2080	0.50
	68	6.3×8	0.10	20	2520	0.50
	82	6.3×8	0.10	20	2520	0.50
	100	6.3×8	0.10	18	2880	0.50
	100	6.3×11	0.10	15	3500	0.55
	180	8×8	0.12	12	4460	0.68
	180	8×12	0.12	11	4800	0.85
	220	8×8	0.12	12	4460	0.68
	220	8×12	0.12	11	4800	0.85
	270	8×8	0.12	12	4460	0.68
	270	8×12	0.12	11	4800	0.85
	330	8×12	0.12	11	4800	0.85
	330	10×12.5	0.12	11	5080	1.6
	470	10×12.5	0.12	11	5080	1.6
	560	10×12.5	0.12	11	5080	1.6
	680	10×12.5	0.12	11	5080	1.6
	820	10×12.5	0.12	11	5080	1.6
20 1D	10	6.3×8	0.10	25	2080	0.50
	22	6.3×8	0.10	25	2080	0.50
	33	6.3×8	0.10	25	2080	0.50
	39	6.3×8	0.10	25	2080	0.50
	47	6.3×8	0.10	25	2080	0.50
	68	6.3×11	0.10	20	2520	0.55
	68	8×8	0.10	18	3500	0.68
	82	8×8	0.12	18	3500	0.68
	82	8×12	0.12	15	4460	0.85
	100	8×12	0.12	15	4460	0.85
	100	10×12.5	0.12	15	4880	1.6
	180	10×12.5	0.12	15	4880	1.6
	220	10×12.5	0.12	15	4880	1.6
	270	10×12.5	0.12	15	4880	1.6
	330	10×12.5	0.12	15	4880	1.6

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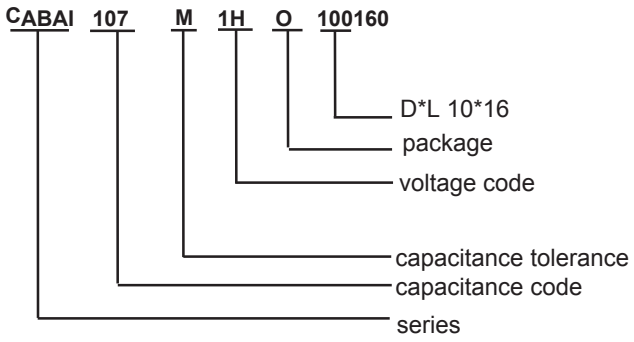
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■ List of product specifications and technical parameters

rated voltage (V)	capacity (μF)	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ, 100KHz)	Ripple current (mA,rms 100KHz)	weight (typical) (g)
10 1A	220	6.3×8	0.08	11	4460	0.50
	220	8×8	0.08	9	5220	0.68
	270	6.3×8	0.08	11	4460	0.50
	270	8×8	0.08	9	5220	0.68
	330	6.3×8	0.08	11	4460	0.50
	330	8×8	0.08	9	5220	0.68
	390	8×8	0.08	9	5220	0.68
	390	8×12	0.08	9	5220	0.85
	470	8×8	0.08	9	5220	0.68
	470	8×12	0.08	9	5220	0.85
	560	8×12	0.10	9	5220	0.85
	680	8×12	0.10	9	5220	0.85
	680	10×12.5	0.10	9	5550	1.6

rated voltage (V)	capacity (μF)	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ, 100KHz)	Ripple current (mA,rms 100KHz)	weight (typical) (g)
25 1E	10	6.3×8	0.10	25	2080	0.50
	22	6.3×8	0.10	25	2080	0.50
	33	6.3×8	0.10	25	2080	0.50
	39	6.3×8	0.10	25	2080	0.50
	47	6.3×11	0.10	20	2880	0.55
	47	8×8	0.10	18	3500	0.68
	68	8×8	0.12	18	3500	0.68
	68	8×12	0.12	15	4460	0.85
	82	8×12	0.12	15	4460	0.85
	100	8×12	0.12	15	4460	0.85
	100	10×12.5	0.12	15	4880	1.6
	180	10×12.5	0.12	15	4880	1.6
	220	10×12.5	0.12	15	4880	1.6

HOW TO MAKE A PART NUMBER



Code	Lead Forming Type
O	Bulk
T	5mm Chip tape
A	(Φ4~Φ6.3)2.5mm tape
F	(Φ4~Φ8)5mm tape
P	Φ≥Φ8mm original(vertical)tape
M	5mm Lead forming
C	C Lead forming
B	B Lead forming
D	(Φ4~Φ8)2.5mm Lead forming

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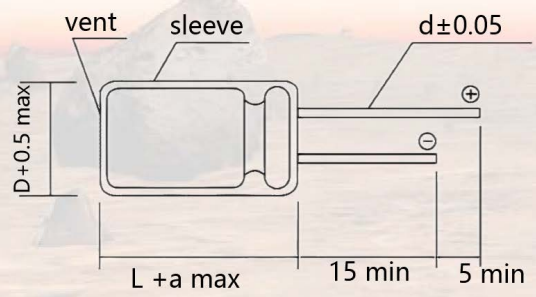
- 150°C series, high heat resistance, lead type.
- Low ESR, high frequency and low impedance.
- Military products meet environmental requirements such as vibration and low air pressure. It can be supplied according to the "seven specialty" level, and can also be supplied according to the "general military" level.
- It is suitable for energy storage, filtering and bypass in electronic circuits in aerospace, aviation, cold, high altitude and ocean.

Main technical indicators

Item	characteristic
Operating temperature range	-55℃~+150℃
Rated operating voltage range	16V~63V
Nominal capacitance range	27μF~1000μF
Allowable deviation of nominal capacitance	M（±20%） （25℃，120Hz）
DC leakage current*1	I≤0.01$C_R U_R$（μA） （25℃，2min） C_R: Nominal capacitance (μF); U_R: Rated voltage (V)
The tangent of the loss angle tgδ（max）	For details, please refer to the "List of Product Specifications and Technical Parameters"（25℃，120Hz）
ESR (maximum)*2	For details, please refer to the "List of Product Specifications and Technical Parameters"（25℃，100KHz）
Durability (High Temperature Test)	The rated voltage is applied at 105°C for 2000h, and after recovery for 24h, the electrical performance of the rated voltage (25°C±5°C) is tested at room temperature. Rate of change in capacitance: ≤± 10% of the initial measurement DC leakage current: ≤ initial prescriptive value The loss angle is tangent: ≤ 200% of the initial measurement ESR: ≤ 200% of the initial measurement
Store at high temperatures	After storage at 105 °C for 500 hours, recovery for 24 hours, and test at room temperature (25 °C±5 °C), its electrical properties meet the following requirements: Rate of change in capacitance: ≤± 10% of the initial measurement DC leakage current: ≤ 200% of the initial specified value The loss angle is tangent: ≤ initial measurements ESR: ≤ 200% of the initial measurement

Executive standard number: Q/MN60032-2023 Seventh special standard number: QZJ840634
Note: *1 1KΩ protection resistor in series during testing and charging; *2 The test location is the root of the capacitor lead terminal.

Outline drawing and size table (mm)



D×L	F±0.5	d±0.05	a
8×8	3.5	0.6	1.0
8×10	3.5	0.6	1.0
8×12	3.5	0.6	1.0
10×10	5	0.6	2.0
10×12.5	5	0.6	2.0

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■ List of product specifications and technical parameters

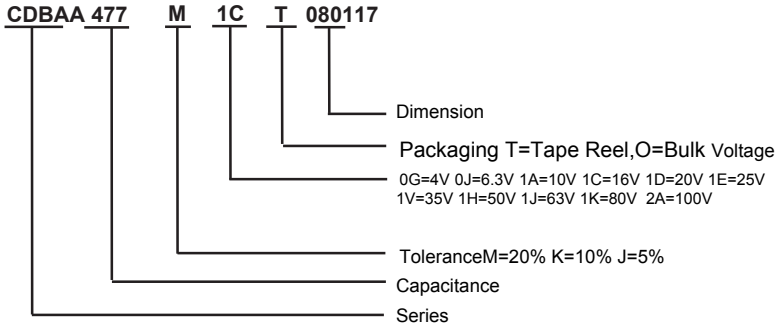
rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KH, 150℃)
16	270	8×8	0.08	30	800
	330	8×10	0.08	17	1900
	390	8×10	0.08	17	1900
	470	8×12	0.08	16	2000
	560	10×10	0.08	16	2000
	680	10×10	0.08	16	2000
	820	10×12.5	0.08	13	2200
	1000	10×12.5	0.08	13	2200
20	180	8×8	0.08	39	600
	220	8×8	0.08	39	600
	270	8×10	0.08	20	1800
	330	8×12	0.08	18	1900
	390	10×10	0.08	18	1900
	470	10×10	0.08	18	1900
	560	10×12.5	0.08	15	2100
25	100	8×8	0.08	41	600
	120	8×8	0.08	41	600
	150	8×10	0.08	20	1800
	180	8×12	0.08	19	1900
	220	10×10	0.08	19	1900

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KHz, 150℃)
25	270	10×10	0.08	19	1900
	330	10×12.5	0.08	15	2100
35	82	8×8	0.08	44	600
	100	8×10	0.08	22	1700
	120	8×12	0.08	21	1800
	150	8×12	0.08	21	1800
	180	10×10	0.08	21	1800
	220	10×12.5	0.08	16	2000
50	47	8×8	0.08	40	600
	56	8×10	0.08	35	1500
	68	8×12	0.08	30	1500
	82	10×10	0.08	25	1500
	100	10×12.5	0.08	22	1600
	120	10×12.5	0.08	22	1600
63	27	8×8	0.08	52	400
	33	8×10	0.08	38	1300
	39	8×10	0.08	38	1300
	47	8×12	0.08	35	1300
	56	10×10	0.08	28	1400
	68	10×12.5	0.08	25	1500

■ Ripple current frequency coefficient

Frequency (f)	1KHz≤f<1KHz	1KHz≤f<10KHz	10KHz≤f<100KHz	100KHz≤f<300KHz
coefficient	0.05	0.3	0.7	1.0

PART NUMBER EXAMPLE



CABAC



- 125°C series, high heat resistance, leaded type.
- Low ESR, high frequency and low impedance.
- The national military standard level meets the environmental requirements of vibration and low pressure.
- It is suitable for energy storage, filtering and bypass in electronic circuits in aerospace, aviation, cold, high altitude and ocean.

■ Main technical indicators

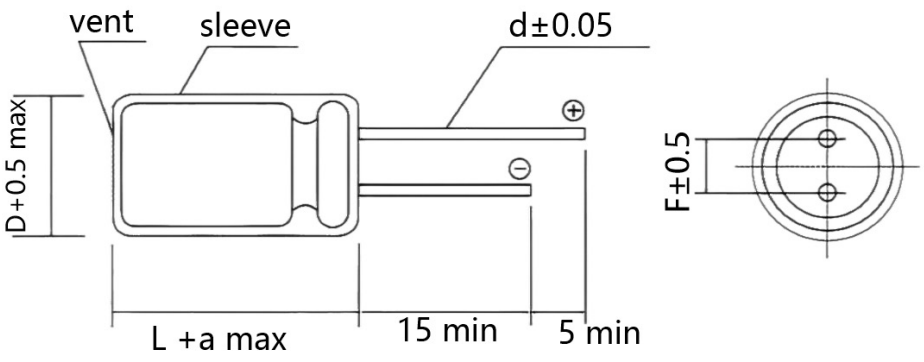
item	characteristic
Operating temperature range	-55℃~+125℃
Rated operating voltage range	10V~100V
Nominal capacitance range	8.2μF~22000μF
Allowable deviation of nominal capacitance	M（±20%） （25℃，120Hz）
DC leakage current*1	I≤0.01CRUR（μA） （25℃，2min） C_R: Nominal capacitance (μF); U_R: Rated voltage (V)
Loss tangent tgδ (max)	For details, please refer to the "List of Product Specifications and Technical Parameters" （25℃，120Hz）
ESR (maximum)*2	For details, please refer to the "List of Product Specifications and Technical Parameters" （25℃，100KHz）
Low temperature characteristics (capacitance rate of change)	($C_{25℃}$-$C_{-55℃}$）/$C_{25℃}$≤35% （25℃，120Hz）
Durability (High Temperature Test)	The rated voltage is applied at 125°C for 2000h, and after recovery for 24h, the test is at room temperature (25°C±5°C), and its electrical performance conforms to: Rate of change in capacitance: ≤± 15% of initial measurements DC leakage current: ≤ initial prescriptive value The loss angle is tangent: ≤ initial measurements ESR: ≤ 200% of the initial measurement
Store at high temperatures	After storage at 125 °C for 1000h, recovery for 24 h, and test at room temperature (25 °C±5 °C), its electrical performance conforms to: Rate of change in capacitance: ≤± 15% of initial measurements DC leakage current: ≤ initial prescriptive value The loss angle is tangent: ≤ initial measurements ESR: ≤ 200% of the initial measurement

Execution standard number：Q/MN21002－2020 GJB10175－2021 Note:

1） 1KΩ protection resistor in series during testing and charging;

2） The test location is the root of the capacitor lead terminal.

■ Outline drawing and size table (mm)



Ø	6.3	8	10	12.5	16	18
F	2.5	3.5	5.0		7.5	
d	0.6				0.8	
a	1.0		2.0			
B	0.5		1.0			

CABAC

■ List of product specifications and technical parameters

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KHz, 125℃)
10 1A	270	6.3×8	0.12	28	880
	330	6.3×11	0.12	25	1040
	390	6.3×11	0.12	25	1040
	470	8×8	0.12	25	1040
	560	8×8	0.12	25	1040
	680	8×11.5	0.12	20	1200
	820	8×11.5	0.12	20	1200
	1000	10×10	0.12	18	1200
	1200	10×12.5	0.13	18	1360
	1500	10×12.5	0.13	18	1360
	1800	10×16	0.13	18	1520
	2200	10×20	0.13	18	1600
	2700	12.5×16	0.13	15	1760
	3300	12.5×20	0.14	15	1920
	3900	12.5×20	0.14	15	1920
	4700	12.5×25	0.15	15	2000
	5600	12.5×25	0.15	15	2000
	6800	16×25	0.16	15	2120
	8200	16×25	0.16	15	2120
	10000	16×30	0.17	15	2320
	12000	16×35	0.18	15	2400
	15000	18×30	0.18	15	2400
	18000	18×35	0.18	15	2520
	22000	18×40	0.19	15	2680
16 1C	180	6.3×8	0.12	28	880
	220	6.3×8	0.12	28	880
	270	6.3×11	0.12	25	1040
	330	8×8	0.12	25	1040
	390	8×8	0.12	25	1040
	470	8×11.5	0.12	20	1200
	560	8×11.5	0.12	20	1200
	680	10×10	0.12	18	1200
	820	10×12.5	0.12	18	1360
	1000	10×12.5	0.12	18	1360
	1200	10×16	0.12	18	1520
	1500	12.5×16	0.13	15	1760
	1800	12.5×16	0.13	15	1760
	2200	12.5×20	0.13	15	1920
	2700	12.5×20	0.14	15	1920
	3300	12.5×25	0.14	15	2000

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KHz, 125℃)
16 1C	3900	12.5×25	0.15	15	2000
	4700	16×25	0.15	15	2120
	5600	16×30	0.16	15	2320
	6800	16×35	0.16	15	2360
	8200	16×35	0.16	15	2360
	10000	18×30	0.17	15	2400
	12000	18×35	0.18	15	2520
	15000	18×40	0.18	15	2680
20 1D	100	6.3×8	0.12	28	960
	120	6.3×8	0.12	28	960
	150	6.3×11	0.12	25	1120
	180	6.3×11	0.12	25	1120
	220	8×8	0.12	25	1120
	270	8×11.5	0.12	20	1280
	330	8×11.5	0.12	20	1280
	390	10×10	0.12	18	1280
	470	10×12.5	0.12	18	1440
	560	10×12.5	0.12	18	1440
	680	10×16	0.12	18	1600
	820	10×16	0.12	18	1600
	1000	12.5×16	0.13	18	1880
	1200	12.5×16	0.13	18	1880
	1500	12.5×20	0.13	18	2080
	1800	12.5×20	0.14	18	2080
	2200	12.5×25	0.14	15	2120
	2700	12.5×25	0.14	15	2120
	3300	16×25	0.14	15	2240
	3900	16×30	0.15	15	2320
	4700	16×35	0.15	15	2480
	5600	16×35	0.15	15	2480
	6800	18×35	0.16	15	2560
	8200	18×40	0.16	15	2640
	10000	18×40	0.16	15	2640
25 1E	100	6.3×8	0.12	28	800
	120	6.3×11	0.12	25	960
	150	6.3×11	0.12	25	960
	180	8×8	0.12	25	1120
	220	8×11.5	0.12	20	1280
	270	8×11.5	0.12	20	1280
	330	10×10	012	18	1280

CABAC

■ List of specifications and technical parameters

rated voltage v	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KHz, 125℃)
25 1E	390	10×10	0.12	18	1280
	470	10×12.5	0.12	18	1440
	560	10×12.5	0.12	18	1440
	680	10×16	0.12	18	1600
	820	12.5×16	0.12	16	1880
	1000	12.5×16	0.12	16	1880
	1200	12.5×20	0.13	16	2080
	1500	12.5×20	0.13	16	2080
	1800	12.5×25	0.14	15	2120
	2200	16×25	0.14	15	2240
	2700	16×25	0.14	15	2240
	3300	16×30	0.14	15	2360
	3900	16×35	0.14	15	2480
	4700	18×30	0.14	15	2560
	5600	18×30	0.15	15	2560
	6800	18×35	0.15	15	2600
	8200	18×40	0.16	15	2640
35 1V	68	6.3×8	0.12	28	880
	82	6.3×11	0.12	25	1040
	100	8×8	0.12	25	1040
	120	8×8	0.12	25	1040
	150	8×11.5	0.12	22	1200
	180	8×11.5	0.12	22	1200
	220	10×10	0.12	20	1200
	270	10×12.5	0.12	20	1360
	330	10×16	0.12	20	1520
	390	12.5×16	0.12	20	1760
	470	12.5×16	0.12	20	1760
	560	12.5×20	0.12	17	1920
	680	12.5×25	0.12	17	2120
	820	12.5×25	0.12	17	2120
	1000	16×25	0.12	17	2400
	1200	16×25	0.13	17	2400
	1500	16×30	0.13	17	2480
	1800	16×35	0.13	17	2480
	2200	18×30	0.13	17	2480
	2700	18×30	0.13	17	2480
	3300	18×35	0.13	17	2640
	3900	18×35	0.13	17	2640
	4700	18×40	0.13	17	2800

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KHz, 125℃)
40 1G	47	6.3×8	0.12	35	880
	56	6.3×11	0.12	32	1040
	68	6.3×11	0.12	32	1040
	82	8×8	0.12	32	1040
	100	8×11.5	0.12	30	1200
	120	8×11.5	0.12	30	1200
	150	10×10	0.12	28	1200
	180	10×10	0.12	28	1200
	220	10×12.5	0.12	25	1360
	270	10×16	0.12	22	1520
	330	10×16	0.12	22	1520
	390	12.5×16	0.12	20	1760
	470	12.5×16	0.12	20	1760
	560	12.5×20	0.12	20	1920
	680	12.5×20	0.12	20	1920
	820	12.5×25	0.12	20	2120
	1000	12.5×25	0.12	20	2120
	1200	16×25	0.12	17	2400
	1500	16×30	0.12	16	2440
	1800	16×35	0.12	16	2480
	2200	16×35	0.12	16	2480
	2700	18×35	0.12	16	2640
	3300	18×40	0.12	16	2800
50 1H	27	6.3×8	0.12	35	640
	33	6.3×11	0.12	32	800
	39	6.3×11	0.12	32	800
	47	8×8	0.12	32	800
	56	8×8	0.12	32	800
	68	8×11.5	0.12	30	960
	82	10×10	0.12	28	960
	100	10×10	0.12	28	960
	120	10×12.5	0.12	25	1120
	150	10×16	0.12	21	1280
	180	10×16	0.12	21	1280
	220	12.5×16	0.12	18	1600
	270	12.5×16	0.12	18	1600
	330	12.5×20	0.12	18	1720
	390	12.5×20	0.12	18	1720
	470	12.5×25	0.12	17	1800
	560	12.5×25	0.12	17	1800

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■ List of specifications and technical parameters

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KHz, 125℃)
50 1H	680	16×25	0.12	16	2040
	820	16×30	0.12	16	2200
	1000	16×35	0.12	16	2280
	1200	16×35	0.12	16	2280
	1500	18×30	0.12	16	2400
	1800	18×35	0.12	16	2520
	2200	18×40	0.12	16	2680
63 1J	18	6.3×8	0.10	45	640
	22	6.3×11	0.10	40	800
	27	8×8	0.10	40	800
	33	8×8	0.10	40	800
	39	8×11.5	0.10	35	960
	47	8×11.5	0.10	35	960
	56	10×10	0.10	30	960
	68	10×12.5	0.10	25	1120
	82	10×12.5	0.10	25	1120
	100	10×16	0.10	22	1280
	120	10×16	0.10	22	1280
	150	12.5×16	0.10	18	1520
	180	12.5×16	0.10	18	1520
	220	12.5×20	0.10	17	1800
	270	12.5×25	0.10	17	2000
	330	12.5×25	0.10	17	2000
	390	16×25	0.10	16	2240
	470	16×25	0.10	16	2240
	560	16×30	0.10	16	2320
	680	16×35	0.10	16	2360
	820	18×30	0.10	16	2360
	1000	18×35	0.10	16	2400
	1200	18×40	0.10	16	2680
80 1K	8.2	6.3×8	0.10	50	520
	10	6.3×11	0.10	45	680
	12	6.3×11	0.10	45	680
	15	8×8	0.10	45	680
	18	8×11.5	0.10	40	840
	22	8×11.5	0.10	40	840

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KHz, 125℃)
80 1K	27	8×11.5	0.10	40	840
	33	10×10	0.10	35	840
	39	10×12.5	0.10	30	1000
	47	10×12.5	0.10	30	1000
	56	10×16	0.10	25	1160
	68	10×20	0.10	24	1320
	82	12.5×16	0.10	22	1400
	100	12.5×20	0.10	20	1480
	120	12.5×20	0.10	20	1480
	150	12.5×25	0.10	18	1800
	180	12.5×25	0.10	18	1800
	220	16×25	0.10	18	2000
	270	16×30	0.10	18	2160
	330	16×35	0.10	18	2320
	390	18×30	0.10	17	2320
	470	18×35	0.10	17	2360
	560	18×40	0.10	17	2480
	680	18×40	0.10	17	2480
100 2A	27	10×10	0.12	40	480
	33	10×12.5	0.12	35	640
	39	10×12.5	0.12	35	640
	47	10×16	0.12	30	784
	56	10×20	0.12	26	1040
	68	12.5×16	0.12	24	1160
	82	12.5×20	0.12	22	1280
	100	12.5×20	0.12	22	1280
	120	12.5×25	0.12	22	1560
	150	12.5×25	0.12	22	1560
	180	16×25	0.12	20	1760
	220	16×25	0.12	20	1760
	270	16×30	0.12	20	1880
	330	16×35	0.12	20	2040
	390	18×30	0.12	19	2040
	470	18×35	0.12	19	2160
	560	18×40	0.12	18	2280

■ Ripple current frequency coefficient

Frequency (f)	1KHz≤f<1KHz	1KHz≤f<10KHz	10KHz≤f<100KHz	100KHz≤f<300KHz
coefficient	0.05	0.3	0.7	1.0

CABAD



- 125°C series, high heat resistance, leaded type.
- Low ESR, high frequency and low impedance.
- The national military standard level meets the environmental requirements of vibration and low pressure.
- It is suitable for energy storage, filtering and bypass in electronic circuits in aerospace, aviation, cold, high altitude and ocean.

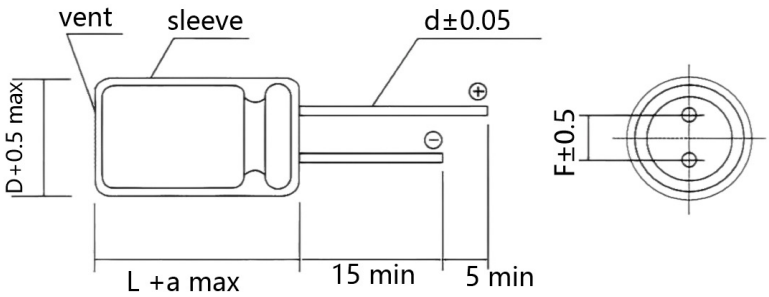
Main technical indicators

Item	characteristic
Operating temperature range	-55℃~+125℃
Rated operating voltage range	10V~100V
Nominal capacitance range	8.2μF~22000μF
Allowable deviation of nominal capacitance	M（±20%） （25℃，120Hz）
DC leakage current*1	I≤0.01$C_R U_R$（μA） （25℃，2min） C_R: Nominal capacitance (μF); U_R: Rated voltage (V)
Loss tangent tgδ (max)	For details, please refer to the "List of Product Specifications and Technical Parameters"（25℃，120Hz）
ESR (maximum)*2	For details, please refer to the "List of Product Specifications and Technical Parameters"（25℃，100KHz）
Low temperature characteristics (capacitance rate of change)	($C_{25℃}$/$C_{-55℃}$) /$C_{25℃}$≤35% （25℃，120Hz）
Durability (High Temperature Test)	The rated voltage is applied at 125°C for 2000h, and after recovery for 24h, the test is at room temperature (25°C±5°C), and its electrical performance conforms to: Rate of change in capacitance: ≤± 15% of initial measurements DC leakage current: ≤ initial prescriptive value The loss angle is tangent: ≤ initial measurements ESR: ≤ 200% of the initial measurement
Store at high temperatures	After storage at 125 °C for 1000h, recovery for 24 h, and test at room temperature (25 °C±5 °C), its electrical performance conforms to: Rate of change in capacitance: ≤± 15% of initial measurements DC leakage current: ≤ initial prescriptive value The loss angle is tangent: ≤ initial measurements ESR: ≤ 200% of the initial measurement

Execution standard number：Q/MN21002—2020 GJB10175—2021

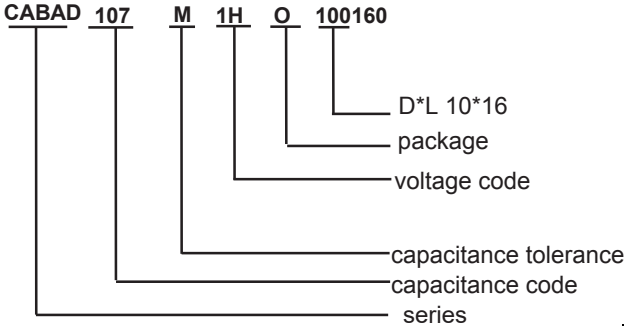
Note: *1 1KΩ protection resistor in series during testing and charging; *2 The test location is the root of the capacitor lead terminal.

Outline drawing and size table (mm)



Ø	6.3	8	10	12.5	16	18
F	2.5	3.5	5.0		7.5	
d	0.6				0.8	
a	1.0		2.0			
B	0.5			1.0		

PART NUMBER



Code	Lead Forming Type
O	Bulk
T	5mm Chip tape
A	(Φ4~Φ6.3)2.5mm tape
F	(Φ4~Φ8)5mm tape
P	Φ≥Φ8mm original(vertical)tape
M	5mm Lead forming
C	C Lead forming
B	B Lead forming
D	(Φ4~Φ8)2.5mm Lead forming

CABAD

■ List of product specifications and technical parameters

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KHz, 125℃)
10	270	6.3×8	0.12	28	880
	330	6.3×11	0.12	25	1040
	390	6.3×11	0.12	25	1040
	470	8×8	0.12	25	1040
	560	8×8	0.12	25	1040
	680	8×11.5	0.12	20	1200
	820	8×11.5	0.12	20	1200
	1000	10×10	0.12	18	1200
	1200	10×12.5	0.13	18	1360
	1500	10×12.5	0.13	18	1360
	1800	10×16	0.13	18	1520
	2200	10×20	0.13	18	1600
	2700	12.5×16	0.13	15	1760
	3300	12.5×20	0.14	15	1920
	3900	12.5×20	0.14	15	1920
	4700	12.5×25	0.15	15	2000
	5600	12.5×25	0.15	15	2000
	6800	16×25	0.16	15	2120
	8200	16×25	0.16	15	2120
	10000	16×30	0.17	15	2320
	12000	16×35	0.18	15	2400
	15000	18×30	0.18	15	2400
	18000	18×35	0.18	15	2520
	22000	18×40	0.19	15	2680
16	180	6.3×8	0.12	28	880
	220	6.3×8	0.12	28	880
	270	6.3×11	0.12	25	1040
	330	8×8	0.12	25	1040
	390	8×8	0.12	25	1040
	470	8×11.5	0.12	20	1200
	560	8×11.5	0.12	20	1200
	680	10×10	0.12	18	1200
	820	10×12.5	0.12	18	1360
	1000	10×12.5	0.12	18	1360
	1200	10×16	0.12	18	1520
	1500	12.5×16	0.13	15	1760
	1800	12.5×16	0.13	15	1760
	2200	12.5×20	0.13	15	1920
	2700	12.5×20	0.14	15	1920
	3300	12.5×25	0.14	15	2000

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KHz, 125℃)
16	3900	12.5×25	0.15	15	2000
	4700	16×25	0.15	15	2120
	5600	16×30	0.16	15	2320
	6800	16×35	0.16	15	2360
	8200	16×35	0.16	15	2360
	10000	18×30	0.17	15	2400
	12000	18×35	0.18	15	2520
	15000	18×40	0.18	15	2680
20	100	6.3×8	0.12	28	960
	120	6.3×8	0.12	28	960
	150	6.3×11	0.12	25	1120
	180	6.3×11	0.12	25	1120
	220	8×8	0.12	25	1120
	270	8×11.5	0.12	20	1280
	330	8×11.5	0.12	20	1280
	390	10×10	0.12	18	1280
	470	10×12.5	0.12	18	1440
	560	10×12.5	0.12	18	1440
	680	10×16	0.12	18	1600
	820	10×16	0.12	18	1600
	1000	12.5×16	0.13	18	1880
	1200	12.5×16	0.13	18	1880
	1500	12.5×20	0.13	18	2080
	1800	12.5×20	0.14	18	2080
	2200	12.5×25	0.14	15	2120
	2700	12.5×25	0.14	15	2120
	3300	16×25	0.14	15	2240
	3900	16×30	0.15	15	2320
	4700	16×35	0.15	15	2480
	5600	16×35	0.15	15	2480
	6800	18×35	0.16	15	2560
	8200	18×40	0.16	15	2640
	10000	18×40	0.16	15	2640
25	100	6.3×8	0.12	28	800
	120	6.3×11	0.12	25	960
	150	6.3×11	0.12	25	960
	180	8×8	0.12	25	1120
	220	8×11.5	0.12	20	1280
	270	8×11.5	0.12	20	1280
	330	10×10	012	18	1280

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■ List of product specifications and technical parameters

rated voltage v	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KHz, 125℃)
25	390	10×10	0.12	18	1280
	470	10×12.5	0.12	18	1440
	560	10×12.5	0.12	18	1440
	680	10×16	0.12	18	1600
	820	12.5×16	0.12	16	1880
	1000	12.5×16	0.12	16	1880
	1200	12.5×20	0.13	16	2080
	1500	12.5×20	0.13	16	2080
	1800	12.5×25	0.14	15	2120
	2200	16×25	0.14	15	2240
	2700	16×25	0.14	15	2240
	3300	16×30	0.14	15	2360
	3900	16×35	0.14	15	2480
	4700	18×30	0.14	15	2560
	5600	18×30	0.15	15	2560
	6800	18×35	0.15	15	2600
	8200	18×40	0.16	15	2640
35	68	6.3×8	0.12	28	880
	82	6.3×11	0.12	25	1040
	100	8×8	0.12	25	1040
	120	8×8	0.12	25	1040
	150	8×11.5	0.12	22	1200
	180	8×11.5	0.12	22	1200
	220	10×10	0.12	20	1200
	270	10×12.5	0.12	20	1360
	330	10×16	0.12	20	1520
	390	12.5×16	0.12	20	1760
	470	12.5×16	0.12	20	1760
	560	12.5×20	0.12	17	1920
	680	12.5×25	0.12	17	2120
	820	12.5×25	0.12	17	2120
	1000	16×25	0.12	17	2400
	1200	16×25	0.13	17	2400
	1500	16×30	0.13	17	2480
	1800	16×35	0.13	17	2480
	2200	18×30	0.13	17	2480
	2700	18×30	0.13	17	2480
	3300	18×35	0.13	17	2640
	3900	18×35	0.13	17	2640
	4700	18×40	0.13	17	2800

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KHz, 125℃)
40	47	6.3×8	0.12	35	880
	56	6.3×11	0.12	32	1040
	68	6.3×11	0.12	32	1040
	82	8×8	0.12	32	1040
	100	8×11.5	0.12	30	1200
	120	8×11.5	0.12	30	1200
	150	10×10	0.12	28	1200
	180	10×10	0.12	28	1200
	220	10×12.5	0.12	25	1360
	270	10×16	0.12	22	1520
	330	10×16	0.12	22	1520
	390	12.5×16	0.12	20	1760
	470	12.5×16	0.12	20	1760
	560	12.5×20	0.12	20	1920
	680	12.5×20	0.12	20	1920
	820	12.5×25	0.12	20	2120
	1000	12.5×25	0.12	20	2120
	1200	16×25	0.12	17	2400
	1500	16×30	0.12	16	2440
	1800	16×35	0.12	16	2480
	2200	16×35	0.12	16	2480
	2700	18×35	0.12	16	2640
	3300	18×40	0.12	16	2800
50	27	6.3×8	0.12	35	640
	33	6.3×11	0.12	32	800
	39	6.3×11	0.12	32	800
	47	8×8	0.12	32	800
	56	8×8	0.12	32	800
	68	8×11.5	0.12	30	960
	82	10×10	0.12	28	960
	100	10×10	0.12	28	960
	120	10×12.5	0.12	25	1120
	150	10×16	0.12	21	1280
	180	10×16	0.12	21	1280
	220	12.5×16	0.12	18	1600
	270	12.5×16	0.12	18	1600
	330	12.5×20	0.12	18	1720
	390	12.5×20	0.12	18	1720
	470	12.5×25	0.12	17	1800
	560	12.5×25	0.12	17	1800

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■ List of product specifications and technical parameters

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KHz, 125℃)
50	680	16×25	0.12	16	2040
	820	16×30	0.12	16	2200
	1000	16×35	0.12	16	2280
	1200	16×35	0.12	16	2280
	1500	18×30	0.12	16	2400
	1800	18×35	0.12	16	2520
	2200	18×40	0.12	16	2680
63	18	6.3×8	0.10	45	640
	22	6.3×11	0.10	40	800
	27	8×8	0.10	40	800
	33	8×8	0.10	40	800
	39	8×11.5	0.10	35	960
	47	8×11.5	0.10	35	960
	56	10×10	0.10	30	960
	68	10×12.5	0.10	25	1120
	82	10×12.5	0.10	25	1120
	100	10×16	0.10	22	1280
	120	10×16	0.10	22	1280
	150	12.5×16	0.10	18	1520
	180	12.5×16	0.10	18	1520
	220	12.5×20	0.10	17	1800
	270	12.5×25	0.10	17	2000
	330	12.5×25	0.10	17	2000
	390	16×25	0.10	16	2240
	470	16×25	0.10	16	2240
	560	16×30	0.10	16	2320
	680	16×35	0.10	16	2360
	820	18×30	0.10	16	2360
	1000	18×35	0.10	16	2400
	1200	18×40	0.10	16	2680
80	8.2	6.3×8	0.10	50	520
	10	6.3×11	0.10	45	680
	12	6.3×11	0.10	45	680
	15	8×8	0.10	45	680
	18	8×11.5	0.10	40	840
	22	8×11.5	0.10	40	840

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KHz, 125℃)
80	27	8×11.5	0.10	40	840
	33	10×10	0.10	35	840
	39	10×12.5	0.10	30	1000
	47	10×12.5	0.10	30	1000
	56	10×16	0.10	25	1160
	68	10×20	0.10	24	1320
	82	12.5×16	0.10	22	1400
	100	12.5×20	0.10	20	1480
	120	12.5×20	0.10	20	1480
	150	12.5×25	0.10	18	1800
	180	12.5×25	0.10	18	1800
	220	16×25	0.10	18	2000
	270	16×30	0.10	18	2160
	330	16×35	0.10	18	2320
	390	18×30	0.10	17	2320
	470	18×35	0.10	17	2360
	560	18×40	0.10	17	2480
	680	18×40	0.10	17	2480
100	27	10×10	0.12	40	480
	33	10×12.5	0.12	35	640
	39	10×12.5	0.12	35	640
	47	10×16	0.12	30	784
	56	10×20	0.12	26	1040
	68	12.5×16	0.12	24	1160
	82	12.5×20	0.12	22	1280
	100	12.5×20	0.12	22	1280
	120	12.5×25	0.12	22	1560
	150	12.5×25	0.12	22	1560
	180	16×25	0.12	20	1760
	220	16×25	0.12	20	1760
	270	16×30	0.12	20	1880
	330	16×35	0.12	20	2040
	390	18×30	0.12	19	2040
	470	18×35	0.12	19	2160
	560	18×40	0.12	18	2280

■ Ripple current frequency coefficient

Frequency (f)	1KHz≤f<1KHz	1KHz≤f<10KHz	10KHz≤f<100KHz	100KHz≤f<300KHz
coefficient	0.05	0.3	0.7	1.0

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- Conductive polymers are used to achieve ultra-low ESR.
- Super interference absorption ability, excellent temperature and frequency characteristics.
- The national military standard level meets the environmental requirements of vibration and low pressure.
- It is suitable for energy storage, filtering and bypass in electronic circuits in aerospace, aviation, cold, high altitude and ocean.

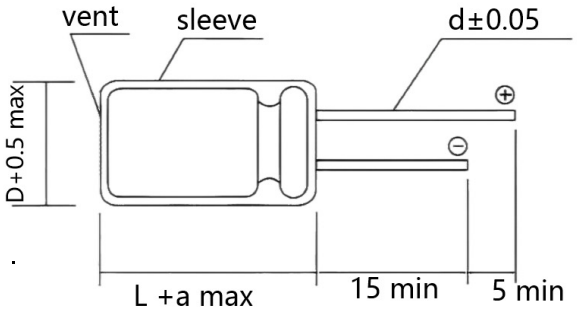
Main technical indicators

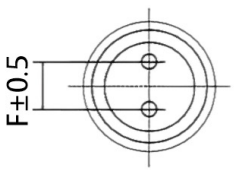
Item	characteristic
Operating temperature range	-55℃~+105℃
Rated operating voltage range	6.3V~100V
Nominal capacitance range	12μF~15000μF
Allowable deviation of nominal capacitance	M（±20%） （25℃，120Hz）
DC leakage current*1	I≤0.02$C_R U_R$ （25℃，2min） C_R: Nominal capacitance (μF); U_R: Rated voltage (V)
Loss tangent tgδ (max)	For details, please refer to the "List of Product Specifications and Technical Parameters" （25℃，120Hz）
ESR (maximum)*2	For details, please refer to the "List of Product Specifications and Technical Parameters" （25℃，100KHz）
Low temperature characteristics (capacitance rate of change)	$C_{25℃}$- ~$C_{-55℃}$ $C_{25℃}$≤35% （25℃，120Hz）
Durability (High Temperature Test)	The rated voltage is applied at 105°C for 2000h, and after recovery for 24h, the electrical performance of the rated voltage (25°C±5°C) is tested at room temperature
	Rate of change in capacitance: ≤± 10% of the initial measurement
	DC leakage current: ≤ initial prescriptive value
	The loss angle is tangent: ≤ initial measurements
	ESR: ≤ 200% of the initial measurement
Store at high temperatures	After storage at 105°C for 1000h, recovery for 24h, and test at room temperature (25°C±5°C), its electrical properties meet the following requirements:
	Rate of change in capacitance: ≤± 10% of the initial measurement
	DC leakage current: ≤ 200% initial provisions
	The loss angle is tangent: ≤ initial measurements
	ESR: ≤ 200% of the initial measurement

Execution standard number：Q/MN21003—2021 GJB10175—2021

Note: *1 1KΩ protection resistor in series during testing and charging; *2 The test location is the root of the capacitor lead terminal.

Outline drawing and size table (mm)





Ø	6.3	8	10	12.5	16	18
F	2.5	3.5	5.0		7.5	
d	0.6				0.8	
a	1.0		2.0			
B	0.5			1.0		

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■ List of product specifications and technical parameters

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KH, 105℃)
6.3	390	6.3×8	0.08	15	2700
	470	6.3×8	0.08	15	2700
	560	6.3×8	0.08	15	2700
	560	6.3×11	0.08	13	3100
	680	6.3×11	0.08	13	3100
	680	8×8	0.08	13	3100
	820	6.3×11	0.08	13	3100
	820	8×12	0.08	13	3600
	1000	8×12	0.08	13	3600
	1200	8×12	0.08	13	3600
	1500	10×10	0.08	12	4100
	1800	10×10	0.08	12	4100
	1800	10×12.5	0.08	11	4500
	2200	10×12.5	0.08	11	4500
10	270	6.3×8	0.08	20	2200
	330	6.3×8	0.08	20	2200
	390	6.3×8	0.08	20	2200
	390	6.3×11	0.08	17	2600
	470	6.3×11	0.08	17	2600
	560	6.3×11	0.08	17	2600
	560	8×8	0.08	17	3000
	680	8×12	0.08	15	3400
	820	8×12	0.08	15	3400
	1000	8×12	0.08	15	3400
	1000	10×10	0.08	15	3800
	1200	10×10	0.08	15	3800
	1500	10×12.5	0.08	13	4200
	1800	10×12.5	0.08	13	4200
16	150	6.3×8	0.08	28	2200
	180	6.3×8	0.08	28	2200
	220	6.3×8	0.08	28	2200
	270	6.3×11	0.08	25	2600
	330	8×8	0.08	25	2600
	390	8×12	0.08	20	3000
	470	8×12	0.08	20	3000
	560	8×12	0.08	20	3000
	680	10×10	0.08	18	3000
	820	10×12.5	0.08	18	3400
	1000	10×12.5	0.08	18	3400

rated voltage v	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KHz, 105℃)
16	1200	10×16	0.08	18	3800
	1500	10×20	0.08	15	4000
	1800	12.5×16	0.08	15	4400
	2200	12.5×20	0.08	15	4800
	2700	12.5×20	0.08	15	4800
	3300	12.5×25	0.08	15	5000
	3900	12.5×25	0.08	15	5000
	4700	16×25	0.08	15	5300
	5600	16×25	0.08	15	5300
	6800	16×30	0.08	15	5500
	8200	16×35	0.08	15	5900
	10000	18×30	0.10	15	6000
	12000	18×35	0.12	15	6300
	15000	18×40	0.15	15	6700
20	120	6.3×8	0.08	28	2400
	150	6.3×8	0.08	28	2400
	180	6.3×11	0.08	25	2800
	220	6.3×11	0.08	25	2800
	270	8×8	0.08	25	2800
	330	8×12	0.08	20	3200
	390	8×12	0.08	20	3200
	470	8×12	0.08	20	3200
	560	10×10	0.08	18	3200
	680	10×12.5	0.08	18	3600
	820	10×12.5	0.08	18	3600
	1000	10×16	0.08	18	4000
	1200	10×20	0.08	18	4400
	1500	10×20	0.08	18	4400
	1500	12.5×16	0.08	18	4700
	1800	12.5×20	0.08	18	5200
	2200	12.5×20	0.08	18	5200
	2700	12.5×25	0.08	15	5300
	3300	16×25	0.08	15	5600
	3900	16×25	0.09	15	5600
	4700	16×30	0.09	15	5800
	5600	16×30	0.10	15	5800
	6800	16×35	0.11	15	6200
	8200	18×30	0.12	15	6200
	10000	18×35	0.13	15	6400

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■ List of product specifications and technical parameters

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KH, 105℃)
20	12000	18×40	0.15	15	6600
25	100	6.3×8	0.08	28	2000
	120	6.3×8	0.08	28	2000
	150	6.3×11	0.08	25	2400
	180	6.3×11	0.08	25	2400
	220	8×8	0.08	25	2800
	270	8×12	0.08	20	3200
	330	8×12	0.08	20	3200
	390	10×10	0.08	18	3200
	470	10×12.5	0.08	18	3200
	560	10×12.5	0.08	18	3200
	680	10×12.5	0.08	18	3200
	820	10×16	0.08	18	4000
	1000	10×20	0.08	18	4400
	1200	10×20	0.08	18	4400
	1200	12.5×16	0.08	16	4700
	1500	12.5×20	0.08	16	5200
	1800	12.5×25	0.08	15	5300
	2200	12.5×25	0.08	15	5300
	2700	16×25	0.08	15	5600
	3300	16×25	0.09	15	5600
	3900	16×30	0.09	15	5900
	4700	16×30	0.10	15	5900
	5600	16×35	0.11	15	6200
	6800	18×35	0.12	15	6500
	8200	18×40	0.13	15	6600
	10000	18×40	0.13	15	6600
35	56	6.3×8	0.08	28	2200
	68	6.3×8	0.08	28	2200
	82	6.3×11	0.08	25	2600
	100	6.3×11	0.08	25	2600
	120	8×8	0.08	25	2600
	150	8×12	0.08	22	3000
	180	8×12	0.08	22	3000
	220	10×10	0.08	20	3000
	270	10×12.5	0.08	20	3400
	330	10×12.5	0.08	20	3400
	390	10×16	0.08	20	3800
	470	10×16	0.08	20	3800

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KHz, 105℃)
35	560	10×20	0.08	20	4000
	680	10×20	0.08	20	4000
	680	12.5×16	0.08	20	4400
	820	12.5×20	0.08	17	4800
	1000	12.5×20	0.08	17	4800
	1200	12.5×25	0.08	17	5300
	1500	16×25	0.08	17	6000
	1800	16×25	0.08	17	6000
	2200	16×30	0.08	17	6200
	2700	16×35	0.08	17	6200
	3300	18×30	0.09	17	6200
	3900	18×35	0.09	17	6600
	4700	18×40	0.10	17	7000
	5600	18×40	0.10	17	7000
40	56	6.3×8	0.08	35	2200
	68	6.3×8	0.08	35	2200
	82	6.3×11	0.08	32	2600
	100	6.3×11	0.08	32	2600
	120	8×12	0.08	30	3000
	150	8×12	0.08	30	3000
	180	8×12	0.08	30	3000
	220	10×10	0.08	28	3000
	270	10×12.5	0.08	25	3400
	330	10×12.5	0.08	25	3400
	390	10×16	0.08	22	3800
	470	10×20	0.08	20	4000
	560	10×20	0.08	20	4000
	560	12.5×16	0.08	20	4400
	680	12.5×20	0.08	20	4800
	820	12.5×20	0.08	20	4800
	1000	12.5×25	0.08	20	5300
	1200	12.5×25	0.08	20	5300
	1500	16×25	0.08	17	6000
	1800	16×30	0.08	16	6100
	2200	16×30	0.08	16	6100
	2700	16×35	0.08	16	6200
	3300	18×35	0.09	16	6600
	3900	18×40	0.10	16	7000
	4700	18×40	0.10	16	7000

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■ List of product specifications and technical parameters

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KH, 105℃)
50	27	6.3×8	0.08	35	1600
	33	6.3×8	0.08	35	1600
	39	6.3×11	0.08	32	2000
	47	6.3×11	0.08	32	2000
	56	6.3×11	0.08	32	2000
	68	8×12	0.08	30	2400
	82	8×12	0.08	30	2400
	100	8×12	0.08	30	2400
	120	10×10	0.08	28	2400
	150	10×12.5	0.08	25	2800
	180	10×12.5	0.08	25	2800
	220	10×16	0.08	21	3200
	270	10×20	0.08	18	3600
	330	10×20	0.08	18	3600
	330	12.5×16	0.08	18	4000
	390	12.5×20	0.08	18	4300
	470	12.5×20	0.08	18	4300
	560	12.5×25	0.08	17	4500
	680	12.5×25	0.08	17	4500
	820	16×25	0.08	16	5100
	1000	16×25	0.08	16	5100
	1200	16×30	0.08	16	5500
	1500	16×35	0.08	16	5700
	1800	18×30	0.08	16	6000
	2200	18×35	0.08	16	6300
	2700	18×40	0.08	16	6700
63	18	6.3×8	0.08	45	1600
	22	6.3×8	0.08	45	1600
	27	6.3×11	0.08	40	2000
	33	6.3×11	0.08	40	2000
	39	8×8	0.08	40	2000
	47	8×12	0.08	35	2400
	56	8×12	0.08	35	2400
	68	8×12	0.08	35	2400
	82	10×10	0.08	30	2400
	100	10×12.5	0.08	25	2800

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KHz, 105℃)
63	120	10×16	0.08	22	3200
	150	10×16	0.08	22	3200
	180	10×20	0.08	18	3400
	220	10×20	0.08	18	3400
	220	12.5×16	0.08	18	3800
	270	12.5×20	0.08	17	4500
	330	12.5×25	0.08	17	5000
	390	12.5×25	0.08	17	5000
	470	16×25	0.08	16	5600
	560	16×25	0.08	16	5600
	680	16×25	0.08	16	5600
	820	16×30	0.08	16	5800
	1000	16×35	0.08	16	5900
	1200	18×35	0.08	16	6000
	1500	18×40	0.08	16	6700
	1800	18×40	0.08	16	6700
80	12	6.3×8	0.09	50	1300
	15	6.3×8	0.09	50	1300
	18	6.3×11	0.09	45	1700
	22	6.3×11	0.09	45	1700
	27	8×8	0.09	45	1700
	33	8×12	0.09	40	2100
	39	8×12	0.09	40	2100
	47	8×12	0.09	40	2100
	56	10×10	0.09	35	2100
	68	10×12.5	0.09	30	2500
	82	10×16	0.09	25	2900
	100	10×16	0.09	25	2900
	120	10×20	0.09	24	3300
	150	10×20	0.09	24	3300
	180	10×20	0.09	24	3300
	180	12.5×16	0.09	22	3500
	220	12.5×20	0.09	20	3700
	270	12.5×25	0.09	18	4500
	330	12.5×25	0.09	18	4500
	390	16×25	0.09	18	5000

CABAE

■ List of product specifications and technical parameters

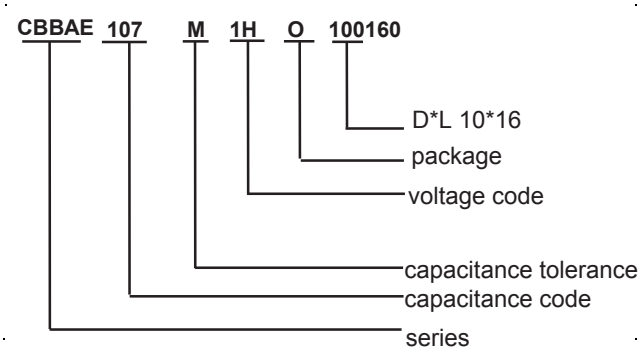
rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KH, 105℃)
80	470	16×25	0.09	18	5000
	560	16×30	0.09	18	5400
	680	16×35	0.09	18	5800
	820	16×35	0.09	18	5800
	1000	18×35	0.09	17	5900
	1200	18×40	0.09	17	6200
100	27	10×10	0.09	40	1200
	33	10×10	0.09	40	1200
	39	10×12.5	0.09	35	1600
	47	10×16	0.09	30	1960
	56	10×16	0.09	30	1960
	68	10×20	0.09	26	2600
	82	10×20	0.09	26	2600

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KHz, 105℃)
100	82	12.5×16	0.09	24	2900
	100	12.5×20	0.09	22	3200
	120	12.5×20	0.09	22	3200
	150	12.5×25	0.09	22	3900
	180	12.5×25	0.09	22	3900
	220	16×25	0.09	20	4400
	270	16×25	0.09	20	4400
	330	16×30	0.09	20	4700
	390	16×35	0.09	19	5100
	470	18×30	0.09	19	5100
	560	18×35	0.09	19	5400
	680	18×40	0.09	18	5700

■ Ripple current frequency coefficient

Frequency (f)	1KHz≤f<1KHz	1KHz≤f<10KHz	10KHz≤f<100KHz	100KHz≤f<300KHz
coefficient	0.05	0.3	0.7	1.0

HOW TO MAKE A PART NUMBER



Code	Lead Forming Type
O	Bulk
T	5mm Chip tape
A	(Φ4~Φ6.3)2.5mm tape
F	(Φ4~Φ8)5mm tape
P	Φ≥Φ8mm original(vertical)tape
M	5mm Lead forming
C	C Lead forming
B	B Lead forming
D	(Φ4~Φ8)2.5mm Lead forming

CABAB



- Conductive polymer solid-state electrolyte is used to achieve **ultra-low ESR**.
- Superior interference absorption. Excellent temperature and frequency characteristics.
- The national military standard level meets the environmental requirements of vibration and low pressure.
- It is suitable for energy storage, filtering and bypass in electronic circuits in aerospace, aviation, cold, high altitude and ocean

■ Main technical indicators

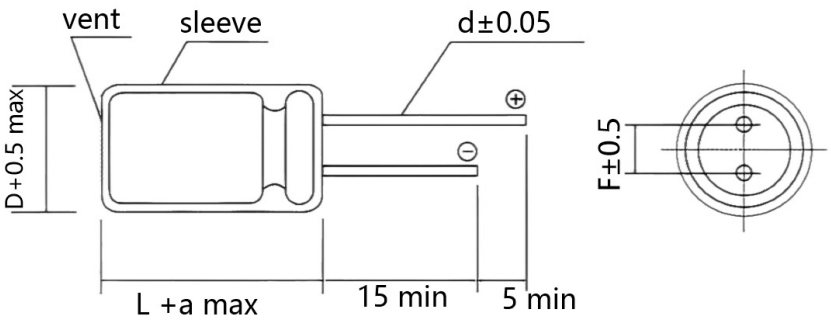
item	characteristic
Operating temperature range	-55℃~+105℃
Rated operating voltage range	40V~80V
Nominal capacitance range	68μF~2200μF
Allowable deviation of nominal capacitance	M（±20%） （25℃，120Hz）
DC leakage current*1	I≤0.01$C_R U_R$ （25℃，2min） C_R: Nominal capacitance (μF); UR: Rated voltage (V)
Loss tangent tg δ (max)	For details, please refer to the "List of Product Specifications and Technical Parameters"（25℃，120Hz）
ESR（max）*2	For details, please refer to the "List of Product Specifications and Technical Parameters"（25℃，100KHz）
Low temperature characteristics (capacitance rate of change)	$C_{25℃}$-$C_{-55℃}$/$C_{25℃}$≤25% （25℃，120Hz）
Durability (High Temperature Test)	The rated voltage is applied at 105° C for 2000h, and after recovery for 24h, the electrical performance is tested at room temperature (25° C±5° C).： Rate of change in capacitance: ≤±10%Initial measurements DC leakage current: ≤Initial prescriptive value The loss angle is tangent: ≤Initial measurements ESR: ≤200%Initial measurements
Store at high temperatures	It was stored at 105 ° C for 1000h, recovered for 24 h, and tested at room temperature (25 ° C±5 ° C).： Rate of change in capacitance: ≤±10%Initial measurements DC leakage current: ≤Initial prescriptive value The loss angle is tangent: ≤Initial measurements ESR: ≤200%Initial measurements

Executive standard number：ZZR－Q/MN21001－2020 GJB10175－2021 Note:

1） 1KΩ protection resistor in series during testing and charging;

2） The test position is the bottom of the capacitor lead terminal.

■ Outline drawings and size charts（mm）



ϕ	10	13	16	18
F	5		7.5	
d	0.6		0.8	
α	2.0			
β	1.0			

CABAB

List specifications and technical parameters

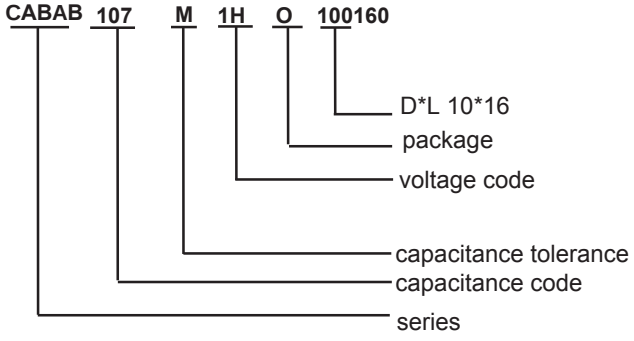
rated voltage V	capacity μ F	Dimension sD×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KH, 105℃)
40 1G	180	10×16	0.08	22	3400
	220	10×20	0.08	22	3800
	330	13×16	0.08	20	4100
	470	13×20	0.08	20	4600
	680	13×25	0.08	20	5000
	1200	16×20	0.08	18	5600
	2200	16×30	0.09	16	5900
50 1H	100	10×16	0.08	21	3200
	120	10×16	0.08	21	3200
	150	10×20	0.08	18	3500
	220	13×16	0.08	18	4000
	330	13×20	0.08	18	4300
	470	13×25	0.08	17	4500
	680	16×25	0.08	16	5100
	820	16×30	0.08	16	5500
	1000	16×35	0.08	16	5700
	1500	18×35	0.08	16	6300
63 1J	68	10×16	0.08	22	3200

rated voltage V	capacity μ F	Dimension sD×L (mm)	tgδ (120Hz)	ESR (mΩ,25℃) (100kHz)	Ripple current mA,rms (100KH, 105℃)
63 1J	100	10×20	0.08	18	3500
	150	13×16	0.08	18	3800
	220	13×20	0.08	17	4500
	330	13×25	0.08	17	5000
	470	16×25	0.08	16	5600
	680	18×25	0.08	16	6000
	820	18×35	0.08	16	6500
	1000	18×40	0.08	16	6700
80 1K	68	10×16	0.09	25	2900
	100	10×20	0.09	24	3300
	150	13×16	0.09	22	3500
	180	10×20	0.09	22	3300
	220	13×20	0.09	20	3700
	330	13×25	0.09	18	4500
	470	16×25	0.09	18	5000
	680	18×25	0.09	17	5600
	820	16×35	0.09	17	5800
	1000	18×40	0.09	16	6000

■ Ripple current frequency coefficient

Frequency (f)	1KHz≤f<1KHz	1KHz≤f<10KHz	10KHz≤f<100KHz	100KHz≤f<300KHz
coefficient	0.05	0.3	0.7	1.0

HOW TO MAKE A PART NUMBER



Code	Lead Forming Type
O	Bulk
T	5mm Chip tape
A	(Φ4~Φ6.3)2.5mm tape
F	(Φ4~Φ8)5mm tape
P	Φ≥Φ8mm original(vertical)tape
M	5mm Lead forming
C	C Lead forming
B	B Lead forming
D	(Φ4~Φ8)2.5mm Lead forming

CAFAA

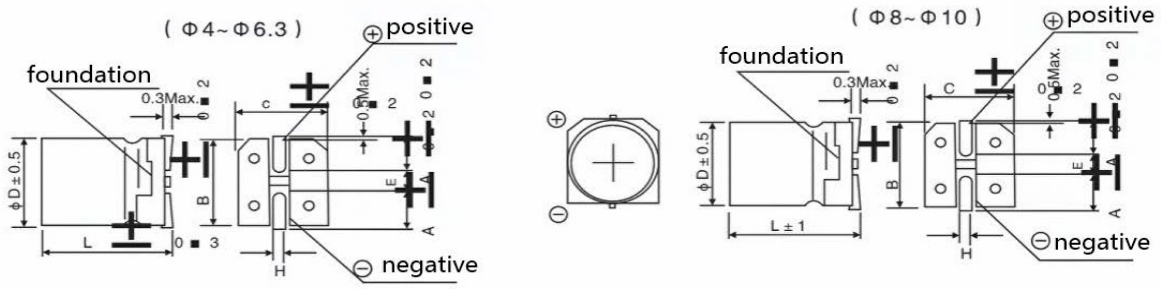


- There are reliability indicators, and the five-level failure rate ($\lambda \leq 1\times10^{-5}$).
- Suitable for reflow soldering and high-density installations of small, low-profile equipment
- It meets the environmental requirements of vibration, low pressure, humidity resistance and other environmental requirements of the national military standard GJB603-88
- It is suitable for filtering, coupling and bypassing in electronic circuits in aerospace, aviation, alpine, high altitude and ocean

■ Main technical parameters:

<table>
<tr><th>Item</th><th>characteristic</th></tr>
<tr><td>Operating temperature range</td><td>-55℃~+105℃</td></tr>
<tr><td>Rated voltage range</td><td>6.3V~50V</td></tr>
<tr><td>Nominal capacitance range</td><td>0.1μF~1500μF</td></tr>
<tr><td>Allowable deviation of nominal capacitance (25°C, 120Hz)</td><td>M（±20%）</td></tr>
<tr><td>DC leakage current（25℃，5min）</td><td>I≤0.01CRUR or 3 μ A (whichever is greater)
CR：Nominal capacitance（μF）；UR：Rated voltage（V）</td></tr>
<tr><td>DF tgδ（25℃，120Hz）</td><td>
<table>
<tr><td>Rated Voltage (V)</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td></tr>
<tr><td>tgδ（≤）</td><td>0.30</td><td>0.24</td><td>0.20</td><td>0.16</td><td>0.14</td><td>0.14</td></tr>
</table>
</td></tr>
<tr><td>Temperature characteristics (capacitance rate of change, 120 Hz)</td><td>（$C_{+25℃}$－$C_{-55℃}$）/$C_{+25℃}$≤40%</td></tr>
<tr><td>Durability (High Temperature Test)</td><td>The rated voltage with ripple current is applied at 105°C for 2000h, and after recovery for 24h, the test is carried out at room temperature (25°C±5°C), and its electrical performance conforms to:
<table>
<tr><td>Rate of change in capacitance</td><td>≤± 30% of the initial measurement</td></tr>
<tr><td>DF tgδ</td><td>≤ 200% of the initial specified value</td></tr>
<tr><td>DC leakage current</td><td>≤ initial prescriptive value</td></tr>
</table>
</td></tr>
<tr><td>Store at high temperatures</td><td>After storage at 105°C for 500 hours, recovery for 24 hours, return to room temperature (25 °C±5 °C) test, its electrical performance conforms to:
<table>
<tr><td>Rate of change in capacitance</td><td>≤± 20% of the initial measurement</td></tr>
<tr><td>DF tgδ</td><td>≤ 200% of the initial specified value</td></tr>
<tr><td>DC leakage current</td><td>≤ 200% of the initial specified value</td></tr>
</table>
</td></tr>
<tr><td colspan="2">Execution standard number：Q/MN30000-2007　　GJB603-88</td></tr>
</table>

■ Outline drawing and size table (mm)



D×L	4×5.8	6.3×5.8	6.3×7.7	8×10	10×10
D	4.0	6.3	6.3	8.0	10.0
A	1.8	2.4	2.4	2.9	3.2
B	4.3	6.6	6.6	8.3	10.3
C	4.3	6.6	6.6	8.3	10.3
E	1.0	2.2	2.2	3.1	4.5
L	5.8	5.8	7.7	10.0	10.0
H	0.5~0.8			0.8~1.1	

CAFAA

■ List of product specifications and technical parameters

Rated voltage(UR)V	6.3 0J	10 1A	16 1C	25 1E	35 1V	50 1H
Nominal capacitance (Cn) μF	D×L(mm)					
0.1						4×5.8
0.22						4×5.8
0.33						4×5.8
0.47						4×5.8
1.0						4×5.8
2.2					4×5.8	4×5.8
3.3					4×5.8	4×5.8
4.7					4×5.8	6.3×5.8
10					6.3×5.8	6.3×5.8
22				6.3×5.8	6.3×5.8	6.3×7.7
33			6.3×5.8	6.3×5.8	6.3×7.7	6.3×7.7
47		6.3×5.8	6.3×5.8	6.3×7.7	6.3×7.7	6.3×7.7
100	6.3×5.8	6.3×5.8	6.3×5.8	6.3×7.7	6.3×7.7	8×10
150	6.3×7.7	6.3×7.7	6.3×7.7	6.3×7.7	8×10	10×10
220	6.3×7.7	6.3×7.7	6.3×7.7	8×10	8×10	10×10
330	6.3×7.7	8×10	8×10	8×10	10×10	
470	8×10	8×10	8×10	10×10		
680	8×10	10×10	10×10			
1000	8×10	10×10				
1500	10×10					

Part number examples

CAFAA | 158 | M | 0J | T | 100100
series | capacitance | tolerance | voltage | package | dimension

CAFAB



- Wide operating temperature range, 105°C2000h life
- Suitable for reflow soldering and high-density installations of small, low-profile equipment.
- Military products meet environmental requirements such as vibration and low air pressure
- Military products can be supplied according to the "seven specialized" level, and can also be supplied according to the "general army" level
- It is suitable for filtering and coupling in electronic circuits in aerospace, aviation, cold, high altitude and ocean

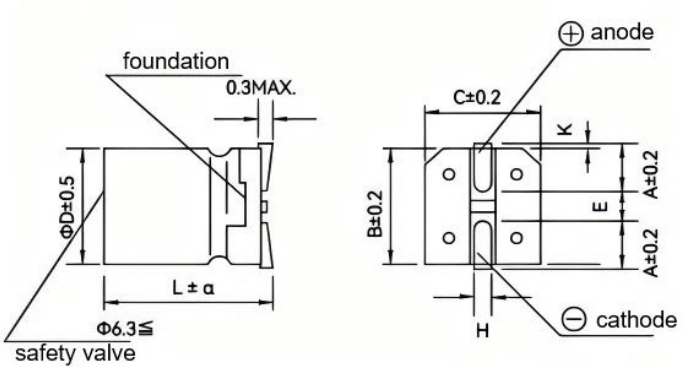
■ Main technical parameters:

item	characteristic
Operating temperature range	-55℃~+105℃
Rated operating voltage range	4V~100V
Nominal capacitance range	0.1μF~10000μF
Allowable deviation of nominal capacitance	M（±20%）
DC leakage current*1（25℃，5min）	I≤0.01CRUR or 3 μ A (whichever is greater) CR：Nominal capacitance（μF）；UR：Rated voltage（V）
DF tgδ	For details, please refer to the "List of Product Specifications and Technical Parameters" （25℃，120Hz）
Temperature Characteristics (Impedance Ratio, 120KHz)	UR(V) 4 6.3 10 16 25 35 50 63 80 100 Z-25℃/Z+25℃ ≤7 ≤4 ≤3 ≤2 ≤2 ≤2 ≤2 ≤3 ≤3 ≤3 Z-55℃/Z+25℃ ≤15 ≤8 ≤8 ≤4 ≤4 ≤3 ≤3 ≤4 ≤4 ≤4
durability	The rated voltage is applied at 105°C for 2000h, and after recovery for 24h, the electrical performance of the rated voltage (25°C±5°C) is tested at room temperature (25°C5°C). Rate of change in capacitance: ≤± 20% of initial measured value (≤4V: within 25% of ± initial measured value) DC leakage current: ≤ 200% of the initial measurement The DF: ≤ initial prescriptive value
Store at high temperatures	It was stored at 105°C for 1000h, recovered for 24h, and tested at room temperature (25°C±5°C), and its electrical performance met the durability requirements.

Execution standard number：Q/MN10002—2003

■ Outline drawing and size table (mm)

Standard product: (Size: φ4×5.4~φ18×21.5)



D×L	D	L	A	B	C	E	H
4×5.4	4	5.4021	1.8	4.3	4.3	1.0	0.5~0.8
5×5.4	5	5.4.02¹	2.1	5.3	5.3	1.3	0.5~0.8
6.3×5.4	6.3	5.4±0.3	2.4	6.6	6.6	2.2	0.5~0.8
6.3×7.7	6.3	7.7±0.3	2.4	6.6	6.6	2.2	0.5~0.8
6.3×9.7	6.3	9.7±0.3	2.4	6.6	6.6	2.2	0.5~0.8
8×10	8	10±1.0	2.9	8.3	8.3	3.1	0.8~1.1
8×11.7	8	11.7±1.0	2.9	8.3	8.3	3.1	0.8~1.1
10×10	10	10±1.0	3.2	10.3	10.3	4.5	0.8~1.1
10×10.5	10	10.5±1.0	3.2	10.3	10.3	4.5	0.8~1.1
10×12.3	10	12.3±1.0	3.2	10.3	10.3	4.5	0.8~1.1
10×16	10	16±1.0	3.2	10.3	10.3	4.5	0.8~1.1
12.5×13.5	12.5	13.5±1.0	4.7	12.8	12.8	4.5	0.8~1.2
12.5×16	12.5	16±1.0	4.7	12.8	12.8	4.5	0.8~1.2
16×16.5	16	16.5±1.0	5.7	17.0	17.0	6.5	1.0~1.3
16×21.5	16	21.5±1.0	5.7	17.0	17.0	6.5	1.0~1.3
18×16.5	18	16.5±1.0	6.7	19.0	19.0	6.5	1.0~1.3
18×21.5	18	21.5±1.0	6.7	19.0	19.0	6.5	1.0~1.3

CAFAB

■ List of product specifications and technical parameters

Rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	Ripple current mA.rms (105℃/ 120Hz)
4 0G	22	4×5.4	0.4	22
	33	5×5.4	0.4	30
	47	5×5.4	0.4	36
	56	5×5.4	0.4	37
	68	5×5.4	0.4	40
	82	5×5.4	0.4	50
	100	6.3×5.4	0.4	60
	120	6.3×5.4	0.4	70
	150	6.3×5.4	0.4	86
	180	6.3×5.4	0.4	90
	220	6.3×5.4	0.4	102
	330	6.3×7.7	0.4	105
	390	6.3×7.7	0.4	150
	470	6.3×7.7	0.4	210
	560	8×10	0.4	210
	680	8×10	0.4	210
	820	8×10	0.4	220
	1000	8×10	0.4	230
	1200	10×10	0.4	270
	1500	10×10	0.4	310
	1800	10×12.3	0.4	350
	2200	10×16	0.4	400
	2200	12.5×13.5	0.4	438
	2700	12.5×13.5	0.4	500
	3300	12.5×16	0.4	530
	3900	16×16.5	0.42	600
	4700	16×16.5	0.42	650
	5600	16×21.5	0.44	700
	6800	18×16.5	0.44	750
	8200	18×21.5	0.46	800
	10000	18×21.5	0.46	850
6.3 0J	22	4×5.4	0.3	22
	33	5×5.4	0.3	30
	47	5×5.4	0.3	36
	56	5×5.4	0.3	39
	68	5×5.4	0.3	42
	82	5×5.4	0.3	56
	100	6.3×5.4	0.3	60
	120	6.3×5.4	0.3	72
	150	6.3×5.4	0.3	86

Rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	Ripple current mA.ms (105℃/ 120Hz)
6.3 0J	180	6.3×5.4	0.3	95
	220	6.3×5.4	0.3	102
	270	6.3×7.7	0.3	103
	330	6.3×7.7	0.3	105
	390	6.3×7.7	0.3	135
	470	6.3×7.7	0.3	210
	560	8×10	0.3	210
	680	8×10	0.3	210
	820	8×10	0.3	220
	1000	8×10	0.3	230
	1200	10×10	0.3	260
	1500	10×10	0.3	310
	1800	10×12.3	0.3	350
	2200	10×16	0.3	400
	2200	12.5×13.5	0.3	438
	2700	12.5×13.5	0.3	460
	3300	12.5×13.5	0.3	480
	3300	12.5×16	0.3	530
	3900	12.5×16	0.32	570
	4700	16×16.5	0.32	620
	5600	16×16.5	0.34	680
	6800	16×21.5	0.34	740
	6800	18×16.5	0.34	820
	8200	18×21.5	0.34	880
10 1A	22	5×5.4	0.24	27
	33	5×5.4	0.24	35
	47	5×5.4	0.24	40
	47	6.3×5.4	0.24	46
	56	6.3×5.4	0.24	48
	68	6.3×5.4	0.24	50
	82	6.3×5.4	0.24	55
	100	6.3×5.4	0.24	60
	120	6.3×5.4	0.24	70
	150	6.3×5.4	0.24	86
	180	6.3×7.7	0.24	96
	220	6.3×7.7	0.24	105
	270	6.3×9.7	0.24	140
	330	8×10	0.24	195
	390	8×10	0.24	200
	470	8×10	0.24	210

CAFAB

■ List of product specifications and technical parameters

Rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	Ripple current mA.rms (105℃/ 120Hz)
10 1A	560	8×10	0.24	260
	680	10×10	0.24	310
	820	10×10	0.24	310
	1000	10×10	0.24	310
	1000	10×12.3	0.24	330
	1200	10×12.3	0.24	360
	1500	10×16	0.24	390
	1500	12.5×13.5	0.24	440
	1800	12.5×13.5	0.24	470
	2200	12.5×13.5	0.24	500
	2200	12.5×16	0.24	530
	2700	12.5×16	0.26	580
	3300	16×16.5	0.26	600
	3900	16×16.5	0.28	650
	4700	16×16.5	0.28	700
	5600	16×21.5	0.3	730
	5600	18×16.5	0.3	800
	6800	18×21.5	0.3	850
16 1C	10	4×5.4	0.2	18
	22	4×5.4	0.2	26
	22	5×5.4	0.2	30
	33	6.3×5.4	0.2	40
	47	6.3×5.4	0.2	50
	56	6.3×5.4	0.2	52
	68	6.3×5.4	0.2	54
	82	6.3×5.4	0.2	58
	100	6.3×5.4	0.2	60
	120	6.3×5.4	0.2	65
	120	6.3×7.7	0.2	90
	150	6.3×7.7	0.2	95
	180	6.3×7.7	0.2	100
	220	6.3×7.7	0.2	105
	220	6.3×9.7	0.2	110
	270	6.3×9.7	0.2	120
	270	8×10	0.2	190
	330	8×10	0.2	195
	390	8×10	0.2	200
	470	8×10	0.2	230
	560	10×10	0.2	280
	680	10×10	0.2	310
	820	10×10	0.2	360

Rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	Ripple current mA.ms (105℃/ 120Hz)
16 1C	1000	10×10	0.2	360
	1000	10×12.3	0.2	380
	1000	10×16	0.2	400
	1000	12.5×13.5	0.2	440
	1200	12.5×13.5	0.2	440
	1500	12.5×13.5	0.2	440
	1800	12.5×13.5	0.2	440
	2200	12.5×16	0.22	530
	2700	16×16.5	0.22	640
	3300	16×16.5	0.24	680
	3900	16×16.5	0.24	750
	4700	16×21.5	0.26	800
	4700	18×16.5	0.26	830
	5600	18×21.5	0.26	880
25	4.7	4×5.4	0.16	13
	10	4×5.4	0.16	18
	10	5×5.4	0.16	23
	22	6.3×5.4	0.16	38
	33	6.3×5.4	0.16	48
	47	6.3×5.4	0.16	66
	47	6.3×7.7	0.16	70
	56	6.3×7.7	0.16	75
	68	6.3×7.7	0.16	80
	82	6.3×7.7	0.16	85
	100	6.3×7.7	0.16	91
	120	6.3×7.7	0.16	120
	150	6.3×7.7	0.16	140
	180	8×10	0.16	150
	220	8×10	0.16	155
	330	8×10	0.16	190
	330	10×10	0.16	210
	470.0	10×10.5	0.16	300
	560.0	10×12.3	0.16	330
	560	10×16	0.16	420
	680	12.5×13.5	0.16	420
	820	12.5×13.5	0.16	500
	1000	12.5×16	0.16	540
	1000	16×16.5	0.16	640
	1200	16×16.5	0.16	640
	1500	16×16.5	0.16	650
	1800	16×21.5	0.18	700

CAFAB

■ List of product specifications and technical parameters

Rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	Ripple current mA.rms (105℃/ 120Hz)
25 1E	2200	16×21.5	0.18	750
	2200	18×16.5	0.18	780
	2700	18×21.5	0.18	820
35 1V	2.2	4×5.4	0.14	7.5
	3.3	4×5.4	0.14	9
	4.7	4×5.4	0.14	15
	10	5×5.4	0.14	25
	22	6.3×5.4	0.14	42
	33	6.3×5.4	0.14	46
	33	6.3×7.7	0.14	59
	47	6.3×5.4	0.14	52
	47	6.3×7.7	0.14	63
	56	6.3×7.7	0.14	65
	68	6.3×7.7	0.14	70
	82	6.3×7.7	0.14	80
	100	6.3×7.7	0.14	84
	120	8×10	0.14	130
	150	8×10	0.14	155
	180	8×10	0.14	160
	220	8×10	0.14	190
	330	10×10	0.14	300
	470	10×10.5	0.14	340
	470	10×12.3	0.14	380
	470	10×16	0.14	400
	470	12.5×13.5	0.14	415
	560	12.5×13.5	0.14	415
	680	12.5×16	0.14	500
	820	12.5×16	0.14	500
	1000	16×16.5	0.14	530
	1000	16×21.5	0.14	580
	1200	16×21.5	0.14	620
	1200	18×16.5	0.14	700
	1500	18×16.5	0.14	750
	1500	18×21.5	0.14	800
	2200	18×21.5	0.16	820
50 1H	0.10	4×5.4	0.14	1.0
	0.22	4×5.4	0.14	2.6
	0.33	4×5.4	0.14	3.2
	0.47	4×5.4	0.14	3.8
	1.00	4×5.4	0.14	6.3

Rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	Ripple current mA.rms (105℃/ 120Hz)
50 1H	2.2	4×5.4	0.14	11
	3.3	4×5.4	0.14	14
	4.7	5×5.4	0.14	19
	10.0	5×5.4	0.14	22
	10.0	6.3×5.4	0.14	30
	22	6.3×5.4	0.14	42
	22	6.3×7.7	0.14	51
	33	6.3×7.7	0.14	60
	47	6.3×7.7	0.14	63
	56	8×10	0.14	70
	68	8×10	0.14	80
	82	8×10	0.14	120
	100	8×10	0.14	140
	120	10×10	0.14	150
	150	10×10	0.14	180
	180	10×10	0.14	200
	220	10×10	0.14	220
	220	10×12.3	0.14	260
	330	10×16	0.14	280
	330	12.5×13.5	0.14	310
	330	12.5×16	0.14	360
	470	12.5×16	0.14	410
	560	16×16.5	0.14	640
	680	16×16.5	0.14	640
	820	16×21.5	0.14	720
	820	18×16.5	0.14	750
	820	18×21.5	0.14	780
	1000	18×21.5	0.14	800
63 1J	10	6.3×7.7	0.18	39
	22	6.3×7.7	0.18	49
	33	8×10	0.18	112
	47	8×10	0.18	119
	56	8×10	0.18	120
	56	10×10	0.18	124
	68	10×10	0.18	128
	82	10×10	0.18	132
	100	10×10	0.18	135
	120	10×10	0.18	150
	150	10×10	0.18	196
	180	10×12.3	0.18	210

CAFAB

■ List of product specifications and technical parameters

Rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	Ripple current mA.rms (105℃/ 120Hz)
63 1J	180	10×16	0.18	300
	220	12.5×13.5	0.18	360
	220	12.5×16	0.18	400
	330	12.5×16	0.18	450
	330	16×16.5	0.18	500
	470	16×16.5	0.18	550
	470	16×21.5	0.18	600
	560	16×21.5	0.18	650
	560	18×16.5	0.18	700
	680	18×21.5	0.18	720
	820	18×21.5	0.18	750
80 1K	10	6.3×7.7	0.18	50
	22	6.3×7.7	0.18	60
	33	8×10	0.18	90
	47	8×10	0.18	120
	56	10×10	0.18	150
	68	10×10	0.18	160
	82	10×10	0.18	170
	100	10×12.3	0.18	280
	100	10×16	0.18	300
	100	12.5×13.5	0.18	475
	120	12.5×13.5	0.18	500
	150	12.5×13.5	0.18	600
	180	12.5×16	0.18	640
	220	12.5×16	0.18	650

Rated voltage (V)	Capacitance (μF)	Dimensions D×L (mm)	tgδ (120Hz)	Ripple current mA.rms (105℃/ 120Hz)
80 1K	330	16×16.5	0.18	680
	470	16×21.5	0.18	700
	470	18×16.5	0.18	720
	560	18×21.5	0.18	740
100 2A	4.7	6.3×7.7	0.18	35
	10	6.3×7.7	0.18	50
	10	8×10	0.18	77
	22	10×10	0.18	126
	33	10×10	0.18	133
	47	10×12.3	0.18	135
	47	10×16	0.18	138
	47	12.5×13.5	0.18	140
	56	12.5×13.5	0.18	220
	68	12.5×13.5	0.18	240
	82	12.5×13.5	0.18	300
	100	12.5×13.5	0.18	405
	100	12.5×16	0.18	440
	120	12.5×16	0.18	480
	150	16×16.5	0.18	500
	180	16×16.5	0.18	530
	220	16×16.5	0.18	560
	220	16×21.5	0.18	600
	220	18×16.5	0.18	630
	330	18×21.5	0.18	680

■ Ripple current frequency coefficient

Frequency (f)	50Hz	120Hz	300Hz	1kHz
coefficient	0.70	1.00	1.17	1.36

Part number exampls

CAFAB series | 158 capacitance | M tolerance | 0J voltage | T package | 100100 dimension

CAAAA



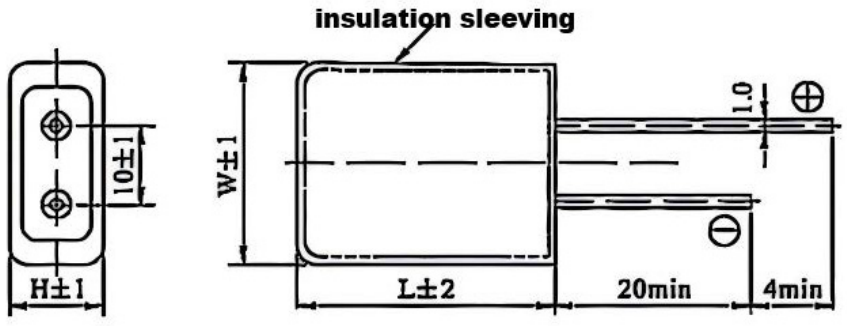
- Wide temperature products, ultra-long service life of 50 years.
- Military products meet the environmental requirements of vibration and low pressure, and military products can be supplied according to the "seven specialty" level or the "general army" level.
- It is suitable for filtering, coupling and bypass in electronic circuits in aerospace, aviation, alpine, high altitude and ocean.

※Main technical parameters:

project		characteristic				
Operating temperature range		-55℃-+105℃				
Rated voltage range		16V-450V				
Nominal capacitance range		82μF-22000μF				
Allowable deviation of nominal capacitance（25℃，120Hz）		M（±20%）				
DC leakage current（25℃，5min）		I≤0.01$C_R U_R$（μA）；C_R：Nominal capacitance（μF）；U_R：Rated voltage（V）				
Loss tangent tgδ (max)（25℃，120Hz）		For details, please refer to the "List of Product Specifications and Technical Parameters"				
Temperature characteristics (120 Hz.)	Impedance ratio	U_R（V）	16	25-100	160-250	350-450
		$Z_{-55℃}/Z_{+25℃}$	≤5	≤3	≤7	≤12
	Rate of change in capacitance	（$C_{+25℃}$-C-55℃）/$C_{+25℃}$≤20%				
Durability		The rated voltage with ripple current is applied at 105°C for 5000h, and after recovery for 24h, the electrical performance is tested at room temperature (25°C±5°C), and its electrical performance conforms to:				
		Rate of change in capacitance	≤± 20% of the initial value			
		The loss angle tangent tgδ	≤ 200% of the initial specified value			
		DC leakage current	≤ initial prescriptive value			
Store at high temperatures		After storage at 105°C for 1000h, recovery for 24h, and test at room temperature (25°C±5°C), its electrical performance conforms to:				
		Rate of change in capacitance	≤± 20% of the initial value			
		The loss angle tangent tgδ	≤ 200% of the initial specified value			
		DC leakage current	≤ 200% of the initial specified value			

Executive standard number: Q/MN118-2016 Seven special standard number: QZJ840634

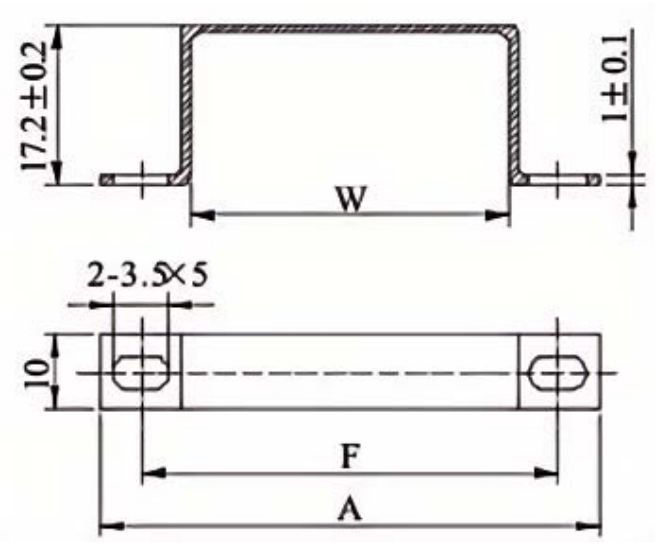
※Outline drawing and size table (mm)



W×H×L	code	weight（g）
35×16×35	A	33
35×16×50	B	48

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※ Outline drawing and size table of mounting ring(mm)



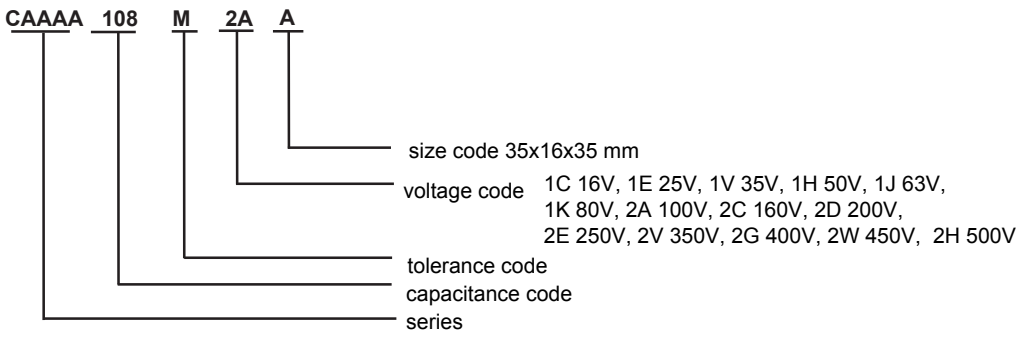
W×H×L	A ±0.5	F ±0.5	W ±0.2
35×16×35	57.5	47.5	35.5
35×16×50			

※ parameters of sheet

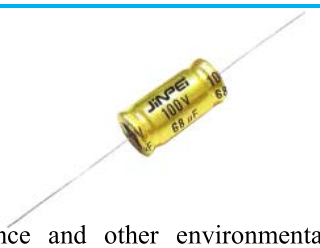
Rated Voltage/V	Cap (μF)	W×H×L (mm)	tg δ (120Hz)	Ripple curren Arms, 120Hz
16	15000	35×16×35	0.47	4.2
	22000	35×16×50	0.61	4.5
25	8200	35×16×35	0.31	3.0
	15000	35×16×50	0.45	4.8
35	5000	35×16×35	0.22	2.3
	6800	35×16×50	0.25	2.6
	8200	35×16×50	0.28	3.1
50	3300	35×16×35	0.15	2.5
	4700	35×16×35	0.18	2.5
	5000	35×16×50	0.19	3.3
	6800	35×16×50	0.22	3.5
63	2700	35×16×35	0.14	2.2
	3300	35×16×50	0.15	2.7
80	1500	35×16×35	0.12	2.0
	2200	35×16×50	0.13	2.7

Rated Voltage/V	Cap (μF)	W×H×L (mm)	tg δ (120Hz)	Ripple current Arms, 120Hz
100	1000	35×16×35	0. 12	1. 9
	1500	35×16×50	0. 12	2. 7
160	560	35×16×35	0. 20	1. 4
	680	35×16×50	0. 20	1. 8
200	330	35×16×35	0. 20	1. 1
	470	35×16×50	0. 20	1. 2
	560	35×16×50	0. 20	1. 4
250	270	35×16×35	0. 20	0. 8
	330	35×16×50	0. 20	1. 4
	470	35×16×50	0. 20	1. 6
350	150	35×16×35	0. 20	0. 7
	220	35×16×50	0. 20	1. 3
400	100	35×16×35	0. 20	0. 5
	150	35×16×50	0. 20	1. 1
450	82	35×16×35	0. 20	0. 3
	100	35×16×50	0. 20	0. 7

Part number sample



CAOD



- There are reliability indicators, and there are five levels of failure rate（ $\lambda \leqslant 1\times10^{-5}$ ）。
- Axial structure, wide temperature product。
- It meets the environmental requirements of vibration, low pressure, humidity resistance and other environmental requirements of the national military standard GJB603-88。
- It is suitable for filtering, coupling and bypass in high-voltage electronic circuits in aerospace, aviation, cold, high altitude and ocean。

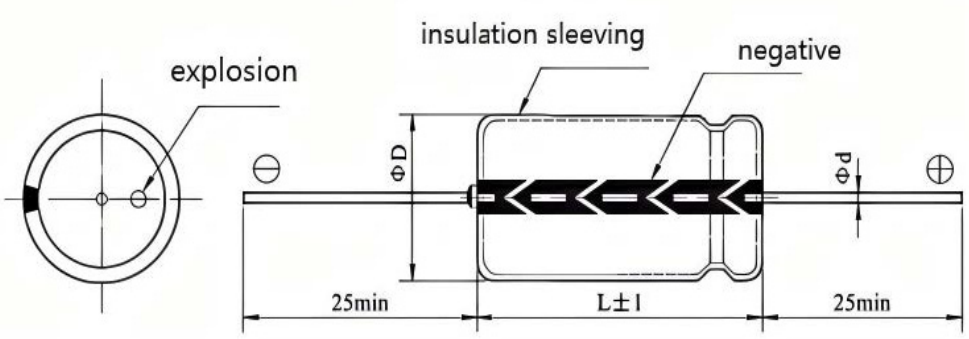
■ Main technical parameters

Item	characteristic
Operating temperature range	-55℃~+105℃
Rated operating voltage range	25V－100V、400V、450V
Nominal capacitance range	3.3μF~1000μF
Allowable deviation of nominal capacitance	M（±20%） （25℃，100Hz）
DC leakage current（25℃，2min）	$I \leqslant 0.02C_RU_R$ C_R：Nominal capacitance (μF); UR: Rated voltage (V)
DF tg δ (max)	For details, please refer to the "List of Product Specifications and Technical Parameters" （25℃，100Hz）
Rated ripple current	For details, please refer to the "List of Product Specifications and Technical Parameters" （105℃，100Hz）
Temperature characteristics (120Hz) impedance ratio	25V~100V：$Z_{-55℃}/Z_{+25℃} \leqslant 7$ 400V、450V：$Z_{-55℃}/Z_{+25℃} \leqslant 12$
Durability (High Temperature Test)	The rated voltage is applied at 105℃ for 2000h, and after recovery for 24h, the electrical performance is tested at room temperature (25℃±5℃).： Rate of change in capacitance: ≤± 20% of the initial measurement DC leakage current: ≤Initial prescriptive value The DF: ≤200% of the initial specified value
Store at high temperatures	It was stored at 105℃ for 500 hours, recovered for 24 hours, and tested at room temperature (25℃±5℃), and its electrical properties were in line with it： Rate of change in capacitance: ≤±20%Initial measurements DC leakage current: ≤200%Initial prescriptive value The DF: ≤200%Initial prescriptive value

Execution standard number：Q/MN20051－2003 GJB603－88

■ Outline drawings and size charts（mm）

D±1.0	8	10	13	16	18
d±0.1	0.6		0.8		



CAOD

■ List of product specifications and technical parameters

Rated voltage (V)	capacity (μF)	Dimensions D×L (mm)	Tgδ (100Hz)	Ripple current (mA，rms) (105℃，100Hz)
25 1E	100	8×16	0.15	157
	100	8×20	0.15	175
	220	8×16	0.15	220
	220	10×30	0.15	330
	330	13×20	0.15	380
35 1V	470	13×25	0.15	511
50 1H	33	8×16	0.15	85
	330	13×25	0.15	627
	470	13×30	0.15	820
63 1J	10	8×16	0.10	64
	22	8×16	0.10	95
	47	8×16	0.10	150
	47	10×16	0.10	170
	100	10×20	0.10	250
	220	13×25	0.10	450
	330	13×30	0.10	620
	470	16×30	0.10	840
	680	18×30	0.10	920
	1000	18×40	0.10	1050
100 2A	220	13×30	0.10	510
	470	16×30	0.10	780
	680	18×40	0.10	950
	10	8×16	0.10	57
	22	8×16	0.10	95
	22	10×16	0.10	110
	33	10×20	0.10	170
	47	10×25	0.10	205
	68	13×25	0.10	240
	100	13×30	0.10	310
	220	16×40	0.10	560
	330	18×35	0.10	720
400 2G	3.3	13×30	0.20	50
	6.8	10×25	0.20	70
450 2W	10	13×25	0.20	97

Part number examples

CAOD series | 107 capacitance | M tolerance | 1J voltage | T package | 100100 dimension

CABBA



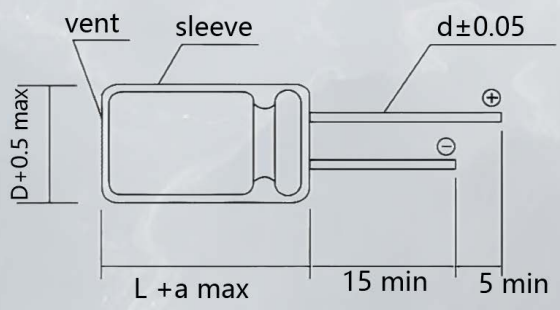
- **7mm** height and small model, suitable for high-density assembly of electronic circuits.
- Military products meet environmental requirements such as vibration and low air pressure.
- Military products can be supplied according to the "seven specialized" level, and can also be supplied according to the "general military" level.
- It is suitable for filtering, energy storage and bypass in electronic circuits in aerospace, aviation, alpine, high altitude and ocean.

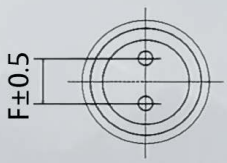
■ Main technical parameters:

Itme	characteristic
Operating temperature range	-40℃~+85℃
Rated voltage range	6.3V~63V
Nominal capacitance range	0.1μF~330μF
Allowable deviation of nominal capacitance (25°C, 120Hz)	M（±20%）
DC leakage current（25℃，5min）	I≤0.01CRUR or 3 (whichever is greater) CR: Nominal Capacitance (F); UR: Rated voltage (V)
The loss angle tangent tgδ（25℃，120Hz）	UR(V) 6.3 10 16 25 35 50 63 tgδ（≤） 0.24 0.20 0.16 0.14 0.12 0.10 0.10
Temperature characteristics (impedance ratio, 120Hz)	UR(V) 6.3 10~16 25~63 Z-40°C/Z+25°C ≤7 ≤5 ≤4
durability	The rated voltage with ripple current is applied at 85°C for 1000h, and after recovery for 24h, it is tested at room temperature (25°C±5°C), and its electrical performance conforms to: Rate of change in capacitance: ≤± 20% of the initial measurement Loss tangent tgδ: ≤ 200% of the initial specified value DC leakage current: ≤ initial prescriptive value
Store at high temperatures	After storage at 85°C for 500h and recovery for 24h, it was tested at room temperature (25°C±5°C), and its electrical properties conformed to: Rate of change in capacitance: ≤± 20% of the initial measurement Loss tangent tgδ: ≤ 200% of the initial specified value DC leakage current: ≤ 200% of the initial specified value

Executive standard number: Q/MN000119-91 Seven special standard number: QZJ840634

■ Outline drawing and size table (mm)





D±0.5	4	5	6.3	8
F±0.5	1.5	2.0	2.5	3.5
d±0.1	0.45			0.5

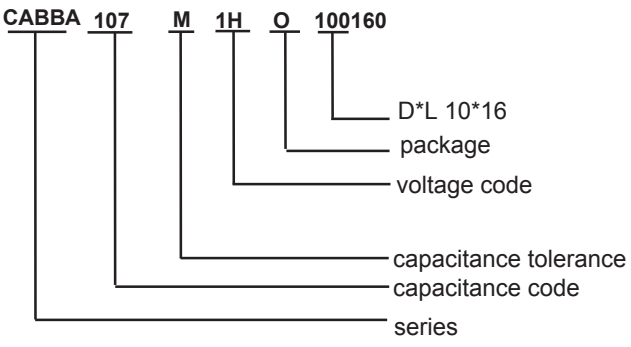
CABBA

■ List of product specifications and technical parameters

CR/μF \ UR/V	6.3 0J		10 1A		16 1C		25 1E		35 1V		50 1H		63 1J	
	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)
0.1											4×7	1	4×7	1.0
0.15											4×7	1.5	4×7	1.5
0.22											4×7	2.3	4×7	2.3
0.33											4×7	3.5	4×7	3.5
0.47											4×7	5.0	4×7	5.0
0.68											4×7	8	4×7	8
1.0									4×7	8	4×7	10	4×7	10
1.5									4×7	10	4×7	13	4×7	13
2.2									4×7	13	4×7	16	4×7	16
3.3							4×7	15	4×7	16	4×7	22	5×7	23
4.7					4×7	20	4×7	20	4×7	22	4×7	26	5×7	30
6.8					4×7	25	4×7	25	4×7	26	5×7	30	6.3×7	35
10					4×7	30	4×7	29	5×7	31	5×7	38	6.3×7	40
15			4×7	28	4×7	35	5×7	35	5×7	40	6.3×7	44		
22	4×7	35	4×7	35	4×7	40	5×7	49	6.3×7	52	8×7	60		
33	4×7	40	4×7	45	5×7	55	6.3×7	60	6.3×7	70	8×7	90		
47	5×7	50	5×7	60	6.3×7	68	6.3×7	80	8×7	95				
68	5×7	60	6.3×7	75	6.3×7	80	8×7	100						
100	6.3×7	80	6.3×7	90	8×7	100	8×7	125						
220	8×7	130	8×7	160	8×7	160								
330	8×7	190												

Rated ripple current
(85℃, 120Hz)
Dimensions

HOW TO MAKE A PART NUMBER



Code	Lead Forming Type
O	Bulk
T	5mm Chip tape
A	(Φ4~Φ6.3)2.5mm tape
F	(Φ4~Φ8)5mm tape
P	Φ≥Φ8mm original(vertical)tape
M	5mm Lead forming
C	C Lead forming
B	B Lead forming
D	(Φ4~Φ8)2.5mm Lead forming

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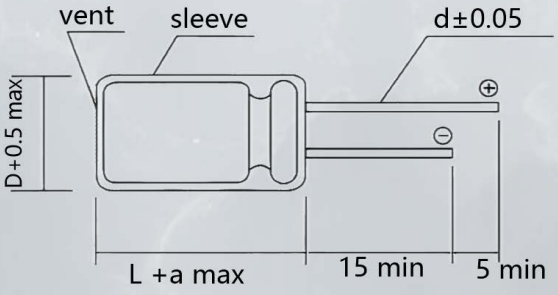
- 105°C **ultra-mini** for high-density assembly of electronic circuits.
- Military products meet environmental requirements such as vibration and low air pressure.
- Military products can be supplied according to the "seven specialized" level, and can also be supplied according to the "general military" level.
- It is suitable for filtering, coupling and bypassing in electronic circuits in aerospace, aviation, alpine, high altitude and ocean.

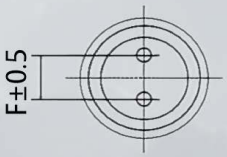
Main technical parameters:

Item	characteristic
Operating temperature range	-40℃~+105℃
Rated voltage range	6.3V~63V
Nominal capacitance range	0.1μF~220μF
Allowable deviation of nominal capacitance (25°C, 120Hz)	M（±20%）
DC leakage current（25℃，5min）	I≤0.01$C_R U_R$ or 3 (μA) (whichever is greater) C_R: Nominal Capacitance (F); U_R: Rated voltage (V)
The loss angle tangent tgδ（25℃，120Hz）	U_R(V) 6.3 10 16 25 35 50 63 tgδ（≤） 0.24 0.20 0.16 0.14 0.12 0.10 0.08
Temperature characteristics (impedance ratio, 120Hz)	U_R(V) 6.3 10~16 25~63 $Z_{-40℃}/Z_{+25℃}$ ≤7 ≤5 ≤4
durability	The rated voltage with ripple current is applied at 105°C for 1000h, and after recovery for 24h, the electrical performance is tested at room temperature (25°C±5°C), and its electrical performance conforms to: Rate of change in capacitance: ≤± 20% of the initial measurement Loss tangent tgδ: ≤ 200% of the initial specified value DC leakage current: ≤ initial prescriptive value
Store at high temperatures	After storing at 105 °C for 500 hours and recovering for 24 hours, the electrical properties of the two temperatures (25 °C±5 °C) were tested, and the electrical properties conformed to: Rate of change in capacitance: ≤± 20% of the initial measurement Loss tangent tgδ: ≤ 200% of the initial specified value DC leakage current: ≤ 200% of the initial specified value

Executive standard number: Q/MN71-2000 Seven special standard number: QZJ840634

Outline drawing and size table (mm)





D±0.5	4	5	6.3	8
F±0.5	1.5	2.0	2.5	3.5
d±0.1	0.45			0.5

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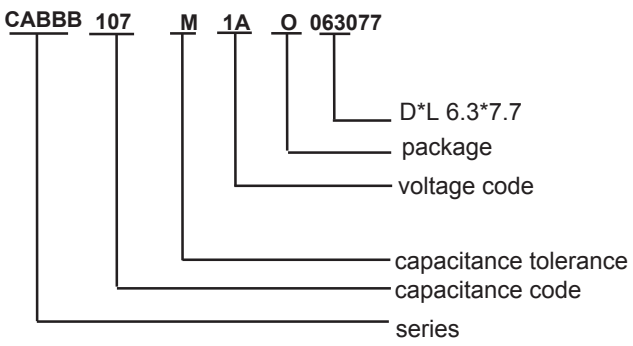
■ List of product specifications and technical parameters

UR(V) / CR(μF)	6.3 0J		10 1A		16 1C		25 1E		35 1V		50 1H		63 1J	
	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)
0.1											4×7	1.0	4×7	1.3
0.15											4×7	1.2	4×7	1.5
0.22											4×7	2.3	4×7	2.5
0.33											4×7	4.7	4×7	5.0
0.47											4×7	5.0	4×7	5.5
0.68											4×7	8.2	4×7	9.0
1.0									4×7	11	4×7	10	4×7	11
1.5									4×7	13	4×7	12	4×7	14
2.2									4×7	16	4×7	19	4×7	20
3.3							4×7	16	4×7	20	4×7	24	5×7	25
4.7					4×7	20	4×7	19	4×7	24	5×7	29	6.3×7	32
6.8					4×7	24	5×7	25	4×7	29	6.3×7	36		
10					4×7	29	5×7	33	5×7	36	6.3×7	44		
15			4×7	28	4×7	35	6.3×7	42	6.3×7	47				
22	4×7	34	5×7	28	5×7	44	6.3×7	51	6.3×7	57				
33	5×7	42	5×7	47	6.3×7	57	6.3×7	63	6.3×7	72				
47	5×7	50	6.3×7	59	6.3×7	68	6.3×7	78						
68	6.3×7	70	6.3×7	77	6.3×7	81	8×7	92						
100	6.3×7	77	6.3×7	96	8×7	117	8×7	111						
220	8×7	130	8×7	155	8×7	173								

Rated ripple current (105℃, 120Hz)

Dimensions

HOW TO MAKE A PART NUMBER



Code	Lead Forming Type
O	Bulk
T	5mm Chip tape
A	(Φ4~Φ6.3)2.5mm tape
F	(Φ4~Φ8)5mm tape
P	Φ≥Φ8mm original(vertical)tape
M	5mm Lead forming
C	C Lead forming
B	B Lead forming
D	(Φ4~Φ8)2.5mm Lead forming

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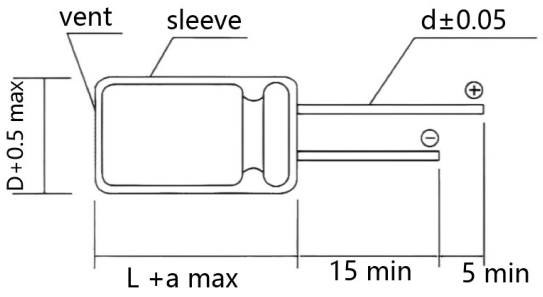
- There are reliability indicators, and the five-level failure rate ($\lambda \leq 1\times10^{-5}$).
- Very low leakage current, ultra-low impedance, ultra-long life
- It meets the environmental requirements of vibration, low pressure, humidity resistance and other environmental requirements of the national military standard GJB603-88
- It is suitable for filtering, coupling and bypassing in electronic circuits in aerospace, aviation, alpine, high altitude and ocean

■ Main technical parameters:

item	characteristic
Operating temperature range	-55℃~+105℃
Rated voltage range	10V~100V
Nominal capacitance range	22μF~1000μF
Allowable deviation of nominal capacitance (25°C, 120Hz)	T（-10%~+50%）
DC leakage current（25℃，5min）	I≤0.006$C_R U_R$ or 1 (whichever is greater) C_R: Nominal Capacitance (F); U_R: Rated voltage (V)
The loss angle tangent tgδ（25℃，120Hz）	U_R(V) 10~25 32~63 100 tgδ（≤） 0.13 0.08 0.07
Temperature characteristics (impedance ratio, 120Hz)	U_R(V) 10~25 32~50 63~100 $Z_{-55°C}/Z_{+25°C}$ 15 10 21
durability	The rated voltage is applied at 105℃ for 2000h, and after recovery for 24h, the electrical performance of the rated voltage (25℃±5℃) is tested at room temperature Rate of change in capacitance: ≤± 20% of the initial measurement The loss angle tangent tgδ: ≤ 150% of the initial specified value DC leakage current: ≤ initial prescriptive value
Store at high temperatures	After storing at 105 °C for 500 hours and recovering for 24 hours, the electrical properties of the two temperatures (25 °C±5 °C) were tested, and the electrical properties conformed to: Rate of change in capacitance: ≤± 10% of the initial measurement The loss angle tangent tgδ: ≤ 115% of the initial specified value DC leakage current: ≤ 200% of the initial specified value

Executive standard number: SJ20205-92 and GJB603-88

■ Outline drawing and size table (mm)



D±1.0	12	16		
L±1.0	25	25	30	35
F±0.5	5.0	7.5		
d±0.1	0.6	0.8		

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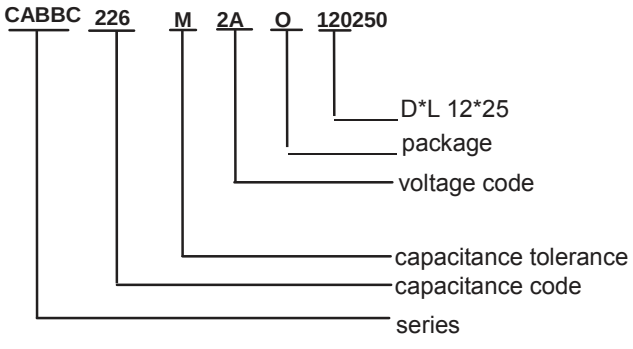
■ List of product specifications and technical parameters

$U_{R(V)}$ / $C_{R(\mu F)}$	10 1A			16 1C			25 1E			35 1V		
	DxL (mm)	Z Ω	I~ (mA)	DxL (mm)	Z Ω	I~ (mA)	DxL (mm)	Z Ω	I~ (mA)	DxL (mm)	Z Ω	I~ (mA)
150										12x25	0.25	470
220							12x25	0.27	450	16x25	0.17	660
330				12x25	0.21	550	16x25	0.18	630	16x35	0.12	950
470	12x25	0.15	650	16x25	0.15	760	16x30	0.13	830			
680	16x25	0.10	910	16x30	0.10	990						
1000				16x35	0.07	1300						

$U_{R(V)}$ / $C_{R(\mu F)}$	50 1H			63 1J			100 2A		
	DxL (mm)	Z Ω	1~ (mA)	DxL (mm)	Z Ω	I~ (mA)	DxL (mm)	Z Ω	1~ (mA)
22							12x25	0.64	190
33							16x25	0.42	270
47				12x25	0.51	260	16x30	0.30	360
68	12x25	0.56	320	16x25	0.35	370	16x35	0.21	460
100	16x25	0.38	440	16x35	0.24	530			
150	16x30	0.25	600						
220	16x35	0.17	790						

Rated ripple current (105°C, 120Hz) impedance（25℃，100kHz）

HOW TO MAKE A PART NUMBER



Code	Lead Forming Type
O	Bulk
T	5mm Chip tape
A	(Φ4~Φ6.3)2.5mm tape
F	(Φ4~Φ8)5mm tape
P	Φ≥Φ8mm original(vertical)tape
M	5mm Lead forming
C	C Lead forming
B	B Lead forming
D	(Φ4~Φ8)2.5mm Lead forming

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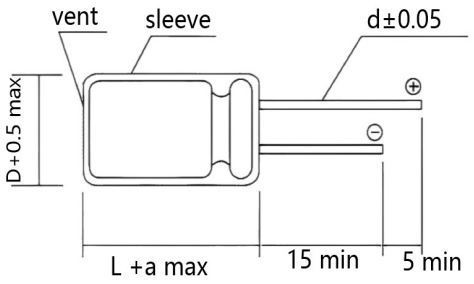
- There are reliability indicators, and the five-level failure rate ($\lambda \leq 1\times10^{-5}$).
- 6.3V~450V full voltage series wide operating temperature
- It meets the environmental requirements of vibration, low pressure, humidity resistance and other environmental requirements of the national military standard GJB603-88
- It is suitable for filtering, energy storage and bypass in electronic circuits in aerospace, aviation, alpine, high altitude and ocean

■ Main technical parameters:

<table>
<tr><th colspan="2">Item</th><th>characteristic</th></tr>
<tr><td colspan="2">Operating temperature range</td><td>-55℃~+105℃</td></tr>
<tr><td colspan="2">Rated voltage range</td><td>6.3V~500V</td></tr>
<tr><td colspan="2">Nominal capacitance range</td><td>1μF~15000μF</td></tr>
<tr><td colspan="2">Allowable deviation of nominal capacitance (25°C, 120Hz)</td><td>M（±20%）</td></tr>
<tr><td colspan="2">DC leakage current（25℃，5min）</td><td>I≤0.02$C_R U_R$ or 3μA (whichever is greater)
C_R: Nominal capacitance (μF); U_R: Rated voltage (V)</td></tr>
<tr><td colspan="2">The loss angle tangent tgδ（25℃，120Hz）</td><td><table><tr><td>U_R(V)</td><td>6.3</td><td>16~100</td><td>160~250</td><td>400~500</td></tr><tr><td>tgδ（≤）</td><td>0.20</td><td>0.15</td><td>0.20</td><td>0.20</td></tr></table>For products with a capacity greater than 1000 μF, the loss tangent increases by 0.02 for each additional 1000 μF.</td></tr>
<tr><td rowspan="2">Temperature Characteristics (100Hz)</td><td>Impedance ratio</td><td><table><tr><td>U_R(V)</td><td>6.3~10</td><td>16~35</td><td>50~80</td><td>100</td><td>160~250</td><td>400~500</td></tr><tr><td>$Z_{-55℃}/Z_{+25℃}$</td><td>≤4</td><td>≤3</td><td>≤6</td><td>≤5</td><td>≤7</td><td>≤15</td></tr></table></td></tr>
<tr><td>Rate of change in capacitance</td><td>（$C_{+25℃}$－$C_{-55℃}$）/$C_{+25℃}$≤20%</td></tr>
<tr><td colspan="2">Durability (High Temperature Test)</td><td>The rated voltage is applied at 105℃ for 2000h, and afte r recovery for 24h, the electrical performance of the rated voltage (25℃±5℃) is test ed at room temperature .<table><tr><td>Rate of change in capacitance</td><td>≤± 20% of the initial measurement</td></tr><tr><td>Loss tangent tgδ</td><td>≤ 130% of the initial specified value</td></tr><tr><td>DC leakage current</td><td>≤ initial prescriptive value</td></tr></table></td></tr>
<tr><td colspan="2">Store at high temperatures</td><td>After storing at 105 °C for 500 hours and recovering for 24 hours, the electrical properties of the two temperatures (25 °C±5 °C) were tested, and the electrical properties conformed to:<table><tr><td>Rate of change in capacitance</td><td>≤± 10% of the initial measurement</td></tr><tr><td>Loss tangent tgδ</td><td>≤ 115% of the initial specified value</td></tr><tr><td>DC leakage current</td><td>≤ 200% of the initial specified value</td></tr></table></td></tr>
</table>

Execution standard number：Q/MN20003－1995　　GJB603－88

■ Outline drawing and size table (mm)



D	±0.5			±1.0					
	5	6.3	8	10	12.5	16	18	22	25
F±0.5	2.0	2.5	3.5	5		7.5		10	12.8
d±0.1	0.5		0.5			0.8			

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■ List of product specifications and technical parameters

UR(V) / CR(μF)	6.3 0J		10 1A		16 1C		25 1E		35 1V		50 1H		63 1J	
	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	1~ (mA)	DxL (mm)	1~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)
10													5×11	26
15											5×11	29	6.3×11	36
22									5×11	32	6.3×11	39	6.3×11	43
33							5×11	36	6.3×11	43	6.3×11	47	8×12	61
47					5×11	42	6.3×11	48	6.3×11	52	8×12	66	8×12	73
68			5×11	44	6.3×11	54	6.3×11	58	8×12	72	8×12	79	10×12.5	99
100	5×11	49	6.3×11	58	6.3×11	66	8×12	81	8×12	87	10×16	120	10×20	155
150	6.3×11	66	6.3×11	72	8×12	93	8×12	99	10×12.5	120	10×20	170	10×25	212
220	6.3×11	88	8×12	101	8×12	112	10×12.5	134	10×16	162	12.5×25	230	10×30	252
330	8×12	112	8×12	123	10×12.5	154	10×16	184	10×20	230	12.5×30	309	12.5×30	345
470	10×12.5	150	10×12.5	165	10×16	206	10×20	254	10×30	336	12.5×35	368	12.5×35	488
680	10×16	202	10×16	221	10×20	286	10×30	375	12.5×25	405	12.5×35	525	16×30	627
1000	10×20	283	10×20	310	10×30	425	12.5×25	454	12.5×30	538	16×30	680	16×40	878
1500	10×25	388	10×30	466	12.5×25	521	12.5×30	610	16×35	760	16×40	962	18×40	1050
2200	10×30	494	12.5×25	538	12.5×30	651	16×35	798	16×40	921	18×40	1128		
3300	12.5×25	584	12.5×35	746	16×35	874	16×40	995	18×40	1197				
4700	12.5×35	796	16×30	915	16×40	1074	18×40	1277	22×40	2714				
6800	16×30	962	16×40	1106	18×40	1261	22×40	2586						
10000	16×40	1212	18×40	1352										
15000	18×40	1430												

Rated ripple current
（105℃，100Hz）

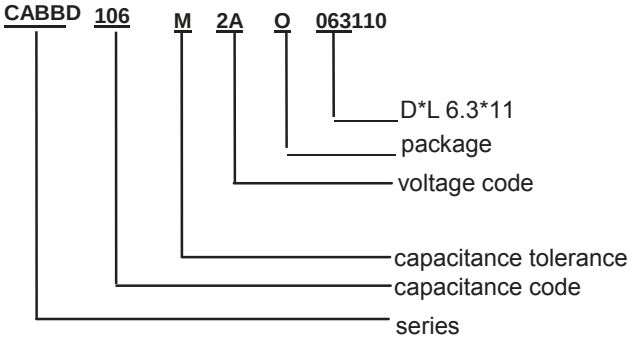
UR(V) / CR(μF)	100 2A		160 2C		250 2E	
	DxL(mm)	I~(mA)	DxL(mm)	|~(mA)	DxL(mm)	I~(mA)
4.7					8×12	50
6.8	5×11	41	8×12	52	8×16	62
10	6.3×11	48	8×12	72	10×16	92
15	8×12	60	10×12.5	98	10×20	115
22	10×12.5	70	10×16	135	10×25	150
33	10×16	130	10×20	180	12.5×20	200
47	10×20	145	12.5×20	240	12.5×25	269
68	12.5×20	180	12.5×25	275	16×25	340
100	12.5×25	219	12.5×30	380	16×30	460
150	12.5×30	310	16×25	490	18×30	530
220	12.5×35	365	16×36	700	18×40	760
330	16×30	580	18×35	851	22×50	1010
470	16×40	765	18×4 5	1080		
680	18×40	955	22×50	1300		
1000	22×50	1150				

Rated ripple current
（105℃，100Hz）

UR(V) / CR(μF)	400 2G		450 2W		500 2H	
	DxL(mm)	I~(mA)	DxL(mm)	|~(mA)	DxL(mm)	I~(mA)
1	8×12	20	8×12	20	10×12	22
1.5	8×12	28	10×12.5	23	10×16	25
2.2	10×12.5	34	10×16	29	10×20	32
3.3	10×16	48	10×16	35	10×25	40
4.7	10×20	57	10×20	45	12.5×20	48
5.6	10×20	68	12.5×20	56	12.5×25	61
6.8	12.5×20	80	12.5×20	65	12.5×25	68
8.2	12.5×20	87	12.5×25	68	12.5×30	72
10	12.5×2 5	100	12.5×30	77	16×30	78
15	16×25	124	16×25	110	16×35	90
22	16×30	170	16×30	138	16×40	115
33	16×35	239	16×40	190	18×40	140
47	18×35	310	18×40	245	18×45	182
56	18×40	350	18×45	288		
68	22×35	425	22×45	330		
82	22×40	494	25×40	398		
100	25×45	580	25×50	450		

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HOW TO MAKE A PART NUMBER



Code	Lead Forming Type
O	Bulk
T	5mm Chip tape
A	(Φ4~Φ6.3)2.5mm tape
F	(Φ4~Φ8)5mm tape
P	Φ≥Φ8mm original(vertical)tape
M	5mm Lead forming
C	C Lead forming
B	B Lead forming
D	(Φ4~Φ8)2.5mm Lead forming

CABBE



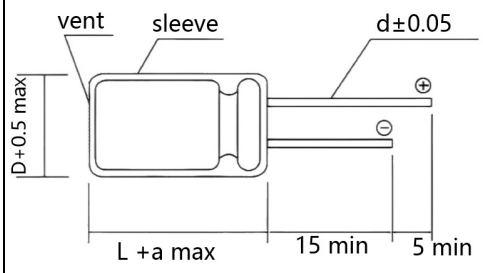
- There are reliability indicators, and the five-level failure rate ($\lambda \leq 1\times10^{-5}$).
- It meets the environmental requirements of vibration, low pressure, humidity resistance and other environmental requirements of the national military standard GJB603-88
- It is suitable for filtering, coupling and bypass in the electronic unified circuit of aerospace, aviation, alpine, high altitude and ocean.

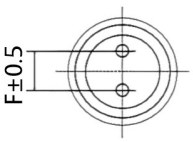
■ Main technical indicators

<table>
<tr><th>Item</th><th>characteristic</th></tr>
<tr><td>Operating temperature range</td><td>-55℃~+105℃（≤100V）；-40℃~+105℃（>100V）</td></tr>
<tr><td>Rated operating voltage range</td><td>6.3V~450V</td></tr>
<tr><td>Nominal capacitance range</td><td>1.0~10000μF</td></tr>
<tr><td>Allowable deviation of nominal capacitance</td><td>M（-20%~+20%） （25℃，100Hz）</td></tr>
<tr><td>DC leakage current（25℃，5min）</td><td>I≤0.02CRUR or 4（μA） C_R：Nominal capacitance（μF）；U_R：Rated voltage（V）</td></tr>
<tr><td>Loss tangent tgδ (max)</td><td>For details, please refer to the "List of Product Specifications and Technical Parameters"（25℃，100Hz）</td></tr>
<tr><td>Impedance Z (max)</td><td>For details, please refer to the "List of Product Specifications and Technical Parameters"（25℃，100KHz）</td></tr>
<tr><td>Temperature characteristics (100Hz, impedance ratio)</td><td>
<table>
<tr><td>U_R(V)</td><td>6.3~16</td><td>25~100</td><td>160~250</td><td>350~450</td></tr>
<tr><td>Z（-55℃）/Z（+25℃）</td><td>≤4</td><td>≤3</td><td>—</td><td>—</td></tr>
<tr><td>Z（-40℃）/Z（+25℃）</td><td>—</td><td>—</td><td>≤8</td><td>≤12</td></tr>
</table>
</td></tr>
<tr><td>Durability (High Temperature Test)</td><td>The rated voltage with ripple current is applied at 105°C for 2000h, and after recovery for 24h, the test is carried out at room temperature (25°C±5°C), and its electrical performance conforms to:
<table>
<tr><td>Rate of change in capacitance</td><td>≤± 20% of the initial measurement</td></tr>
<tr><td>DC leakage current</td><td>≤ initial prescriptive value</td></tr>
<tr><td>The loss angle is tangent</td><td>≤ 200% of the initial measurement</td></tr>
</table>
</td></tr>
<tr><td>Store at high temperatures</td><td>Left at 105°C for 1000h, after the test, the normal temperature (25°C±5°C) was restored to the test, and its electrical properties conformed to:
<table>
<tr><td>Rate of change in capacitance</td><td>≤± 20% of the initial measurement</td></tr>
<tr><td>DC leakage current</td><td>≤ initial prescriptive value</td></tr>
<tr><td>The loss angle is tangent</td><td>≤ 200% of the initial measurement</td></tr>
</table>
</td></tr>
</table>

Execution standard number：Q/MN20077—2010 GJB603—88

■ Outline drawing and size table (mm)





D	+0.5				+1.0		
	5	6.3	8	10	12.5	16	18
F±0.5	2.0	2.5	3.5	5		7.5	
d±0.1	0.5		0.6			0.8	

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■ List of product specifications and technical parameters

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (100Hz)	With (mΩ,25℃) (100kHz)	Ripple current mA,rms (100Hz,105℃)
6.3 0J	220	8×12	0.24	0.60	67
	330	10×12.5	0.24	0.40	94
	470	10×16	0.24	0.28	127
	680	10×20	0.24	0.20	170
	1000	10×25	0.24	0.15	231
	1500	12.5×20	0.24	0.11	283
	2200	12.5×25	0.26	0.087	383
	3300	12.5×35	0.28	0.068	555
	4700	16×30	0.30	0.056	694
	6800	16×40	0.34	0.048	964
	10000	18×40	0.42	0.041	1240
10 1A	150	8×12	0.20	0.68	60
	220	8×12	0.20	0.48	73
	330	10×12.5	0.20	0.33	102
	470	10×16	0.20	0.24	137
	680	10×20	0.20	0.17	184
	1000	10×30	0.20	0.12	250
	1500	12.5×25	0.20	0.09	342
	2200	12.5×35	0.22	0.068	469
	3300	16×30	0.24	0.063	629
	4700	16×35	0.26	0.046	860
	6800	18×40	0.30	0.04	1106
16 1C	100	8×12	0.16	0.68	61
	150	8×12	0.16	0.47	75
	220	10×12.5	0.16	0.33	104
	330	10×16	0.16	0.23	144
	470	10×20	0.16	0.18	192
	680	10×30	0.16	0.13	283
	1000	12.5×25	0.16	0.095	351
	1500	12.5×30	0.16	0.072	471
	2200	12.5×40	0.18	0.057	658
	3300	16×35	0.20	0.047	853
	4700	18×35	0.22	0.041	1080
	5600	18×40	0.26	0.038	1260
25V	68	6.3×11	0.14	0.75	44

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (100Hz)	With (mΩ,25℃) (100kHz)	Ripple current mA,rms (100Hz,105℃)
25 1E	100	8×12	0.14	0.52	63
	150	8×12	0.14	0.45	77
	220	10×12	0.14	0.39	107
	330	10×16	0.14	0.23	148
	470	10×20	0.14	0.18	198
	680	12.5×20	0.14	0.15	266
	1000	12.5×25	0.14	0.09	361
	1500	12.5×40	0.14	0.058	559
	2200	16×35	0.16	0.048	716
	3300	16×40	0.18	0.045	938
	4700	18×40	0.20	0.040	1187
35 1V	47	8×12	0.12	0.69	49
	68	8×12	0.12	0.48	59
	100	10×12.5	0.12	0.32	82
	150	10×16	0.12	0.23	113
	220	10×20	0.12	0.17	153
	330	10×30	0.12	0.12	230
	470	12.5×25	0.12	0.093	280
	680	12.5×30	0.12	0.072	369
	1000	12.5×40	0.12	0.048	517
	1500	16×35	0.12	0.048	670
	2200	16×40	0.14	0.042	868
	3300	18×40	0.16	0.032	1127
50V 1H	33	8×12	0.10	0.65	50
	47	8×12	0.10	0.45	59
	68	10×16	0.10	0.31	92
	100	10×20	0.10	0.22	125
	150	12.5×25	0.10	0.15	192
	220	12.5×30	0.10	0.11	254
	330	12.5×35	0.10	0.084	336
	470	12.5×35	0.10	0.066	401
	680	16×30	0.10	0.054	505
	1000	16×40	0.10	0.046	708
	1500	18×35	0.10	0.040	860
	2200	18×40	0.12	0.035	1110

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■ List of product specifications and technical parameters

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (100Hz)	With (mΩ,25℃) (100kHz)	Ripple current mA,rms (100Hz,105℃)
63 1J	22	8×12	0.09	1.20	47
	33	8×12	0.09	0.52	58
	47	10×12.5	0.09	0.37	79
	68	10×20	0.09	0.26	120
	100	10×25	0.09	0.18	162
	150	10×30	0.09	0.13	218
	220	12.5×30	0.09	0.094	294
	330	12.5×35	0.09	0.073	390
	470	16×30	0.09	0.058	487
	680	16×40	0.09	0.048	676
	1000	18×40	0.09	0.041	870
80 1K	15	8×12	0.09	1.20	36
	22	8×12	0.09	0.77	44
	33	10×12.5	0.09	0.53	61
	47	10×20	0.09	0.39	92
	68	10×25	0.09	0.28	124
	100	10×30	0.09	0.21	165
	150	12.5×30	0.09	0.15	225
	220	12.5×35	0.09	0.12	295
	330	16×30	0.09	0.088	378
	470	16×40	0.09	0.069	521
	680	18×40	0.09	0.055	663
100 2A	10	8×12	0.08	3.1	51
	15	10×12.5	0.08	2.5	71
	22	10×16	0.08	1.25	98
	33	10×20	0.08	0.9	134
	47	12.5×20	0.08	0.65	179
	68	12.5×25	0.08	0.38	241
	100	12.5×35	0.08	0.26	345
	150	16×30	0.08	0.22	443
	220	16×35	0.08	0.16	579
	330	16×40	0.08	0.13	758
	470	18×40	0.08	0.11	960

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (100Hz)	Ripple current mA,rms (100Hz,105℃)
160 2C	4.7	6.3×11	0.15	50
	6.8	8×12	0.15	72
	10	8×12	0.15	98
	15	10×12.5	0.15	135
	22	10×16	0.15	180
	33	10×20	0.15	240
	47	12.5×20	0.15	275
	68	12.5×25	0.15	380
	82	12.5×25	0.15	490
	100	16×25	0.15	700
	150	16×30	0.15	851
	220	18×30	0.15	1080
	330	18×35	0.15	1300
	470	18×40	0.15	1650
200 2D	3.3	6.3×11	0.15	50
	4.7	8×12	0.15	60
	6.8	8×12	0.15	85
	10	10×12.5	0.15	108
	15	10×16	0.15	140
	22	10×20	0.15	195
	33	12.5×20	0.15	250
	47	12.5×25	0.15	300
	68	12.5×25	0.15	420
	82	16×25	0.15	500
	100	16×25	0.15	725
	150	16×30	0.15	990
	220	18×30	0.15	1120
	330	18×40	0.15	1400
250 2E	4.7	8×12	0.15	50
	6.8	10×12.5	0.15	62
	10	10×16	0.15	92
	15	10×20	0.15	115
	22	12.5×20	0.15	150

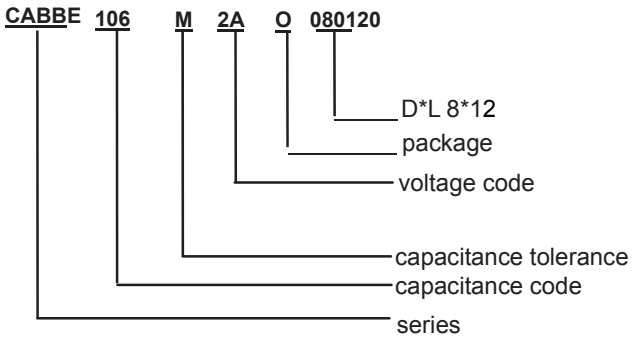
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■ List of product specifications and technical parameters

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (100Hz)	Ripple current mA,rms (100Hz,105℃)
250 2E	33	12.5×20	0.15	200
	47	12.5×25	0.15	269
	68	16×25	0.15	340
	82	16×25	0.15	373
	100	16×30	0.15	460
	150	18×30	0.15	530
	220	18×40	0.15	760
350 2V	1.5	6.3×11	0.20	24
	2.2	8×12	0.20	39
	3.3	8×12	0.20	49
	4.7	10×12.5	0.20	59
	6.8	10×12.5	0.20	85
	10	10×16	0.20	104
	15	10×20	0.20	137
	22	12.5×20	0.20	167
	33	12.5×25	0.20	248
	47	16×25	0.20	301
	68	16×30	0.20	356
	82	18×30	0.20	459
	100	18×35	0.20	612
	150	18×40	0.20	743
400 2G	1.0	6.3×11	0.20	21
	1.5	8×12	0.20	29
	2.2	8×12	0.20	36
	3.3	8×12	0.20	50

rated voltage V	capacity μF	Dimensions D×L (mm)	tgδ (100Hz)	Ripple current mA,rms (100Hz,105℃)
400 2G	4.7	10×12.5	0.20	60
	6.8	10×16	0.20	87
	10	10×20	0.20	106
	15	12.5×20	0.20	131
	22	12.5×25	0.20	180
	33	16×25	0.20	252
	47	16×25	0.20	326
	68	16×30	0.20	450
	82	18×30	0.20	612
	100	18×35	0.20	828
	120	18×40	0.20	950
450 2W	2.2	8×12	0.20	32
	3.3	10×12.5	0.20	40
	4.7	10×16	0.20	50
	6.8	10×20	0.20	70
	10	12.5×20	0.20	86
	15	12.5×25	0.20	126
	22	12.5×25	0.20	153
	33	16×25	0.20	212
	47	16×30	0.20	272
	47	18×25	0.20	272
	68	18×30	0.20	369
	82	18×30	0.20	504
	82	18×35	0.20	504
	100	18×40	0.20	640

HOW TO MAKE A PART NUMBER



Code	Lead Forming Type
O	Bulk
T	5mm Chip tape
A	(Φ4~Φ6.3)2.5mm tape
F	(Φ4~Φ8)5mm tape
P	Φ≥Φ8mm original(vertical)tape
M	5mm Lead forming
C	C Lead forming
B	B Lead forming
D	(Φ4~Φ8)2.5mm Lead forming

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※It meets the environmental requirements of the national military standard GJB3516-99 such as vibration, low pressure and humidity resistance.

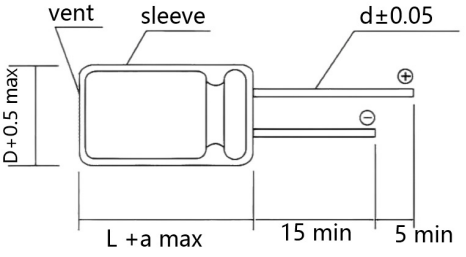
※It is suitable for filtering, coupling and bypassing in electronic circuits in aerospace, aviation, alpine, high altitude and ocean

■ Main technical parameters:

item	characteristic
Operating temperature range	-55℃~+85℃
Rated voltage range	6.3V~160V
Nominal capacitance range	15μF~10000μF
Allowable deviation of nominal capacitance (25°C, 100Hz)	T（-10%~+50%）
DC leakage current（25℃，5min）	I≤0.03CRU$_R$（μA） C_R: Nominal capacitance (μF); U_R: Rated voltage (V)
The loss angle tangent tgδ（25℃，100Hz）	U$_R$(V) 6.3 10 16 25/32 50 63 100 160 tgδ（≤） 0.4~0.6 0.35~0.5 0.30~0.5 0.2~0.4 0.2~0.3 0.2~0.3 0.2~0.3 0.2
Temperature characteristics (impedance ratio, 100Hz)	U$_R$(V) 6.3 10~16 25~160 $Z_{-55℃}/Z_{+25℃}$ ≤7 ≤5 ≤4
durability	The rated voltage is applied at 85°C for 2000h, and after recovery for 24h, the electrical performance is tested at room temperature (25°C±5°C), and its electrical performance conforms to: Rate of change in capacitance: ≤± 20% of initial measurement (U$_R$≤100V); ≤± 15% of initial measured value (U$_R$>100V) Loss tangent tgδ: ≤ 200% of the initial specified value DC leakage current: ≤ initial prescriptive value
Store at high temperatures	After storage at 85 °C for 1000h, recovery for 24 h, and test at room temperature (25 °C±5°C), its electrical properties meet the following requirements: Rate of change in capacitance: ≤± 20% of initial measurement (U$_R$≤100V); ≤± 15% of initial measured value (U$_R$>100V) Loss tangent tgδ: ≤ 200% of the initial specified value DC leakage current: ≤ 200% of the initial specified value
Shelving life	After being left at +85°C for 100h and recovered for 24h, the electrical properties of the room temperature (25°C±5°C) were tested, and the electrical properties were in line with: Structural coefficients: ≤4.0; Shelving factor: ≤3.0 Rate of change in capacitance: ≤± 10% of the initial measurement Loss tangent tgδ: ≤ 175% of the initial specified value DC leakage current: ≤ 200% of the initial specified value

Implementation standard number: Q/MN20009-97 and GJB3516-99

■ Outline drawing and size table (mm)



D±1.0	12	14	16			19		22	26	
F±0.5	5	7.5	7.5			10			12.5	
d±0.1	0.5		0.8							
L±1.0	20	20	25	30	35	35	40	45	45	60

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■ List of product specifications and technical parameters

UR(V) / CR(μF)	6.3 0J				10 1A				16 1C			
	DxL (mm)	I~ (μA)	Z(Ω)		DxL (mm)	I~ (μA)	Z(Ω)		DxL (mm)	I~ (μA)	Z(Ω)	
			1kHz	10kHz			1kHz	10kHz			1kHz	10kHz
470									12x20	240		0.22
680					12×20	260		0.27	14×20	300		0.22
1000	12×20	300		0.24	14x20	340		0.18	16x25	440		0.15
1500	14×20	390	0.32		16×25	500	0.23		16×35	640	0.20	
2200	16×25	570	0.22		16×30	660	0.16		19x35	840	0.14	
3300	16×35	730	0.15		16×35	820	0.11		19×40	960	0.10	
4700	19x35	950	0.10		19x40	1020	0.07		22x45	1300	0.07	
6800	19x40	1050	0.07		22x45	1400	0.06		26x45	1520	0.06	
10000	22x45	1350	0.06		26x45	1840	0.06		26x60	2130	0.06	

UR(V) / CR(μF)	25 1E				35 1V				50 1H			
	DxL (mm)	I~ (μA)	Z(Ω)		DxL (mm)	I~ (μA)	Z(Ω)		DxL (mm)	I~ (μA)	Z(Ω)	
			1kHz	10kHz			1kHz	10kHz			1kHz	10kHz
100									12x20	140		0.90
150									14×20	180		0.60
220					12×20	200		0.30	16x25	260		0.41
330	12×20	240		0.37	14×20	260		0.34	16×35	370		0.28
470	14×20	316		0.28	16×25	370		0.24	19×35	460		0.20
680	16×25	440		0.18	16×35	530		0.16	19x40	620		0.14
1000	16×35	520		0.12	19×35	570		0.11	22x45	700		0.90
1500	19×35	700	0.18		19×40	750	0.15		26x45	930	0.12	
2200	19×40	900	0.11		22x45	1030	0.10		26x60	1300	0.08	
3300	22x45	1260	0.07		26x60	1370	0.07					
4700	26x60	1420	0.06		26x60	1650	0.60					
6800	26x60	2000	0.06									

Impedance (25°C, 1kHz, or 10kHz)

Rated ripple current (85°C, 100Hz)

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■ List of product specifications and technical parameters

$U_{R(V)}$ / $C_{R(\mu F)}$	63 1J				100 2A				160 2C			
	DxL (mm)	I~ (μA)	Z(Ω)		DxL (mm)	I~ (μA)	Z(Ω)		DxL (mm)	I~ (μA)	Z(Ω)	
			1kHz	10kHz			1kHz	10kHz			1kHz	10kHz
15									12x20	50		6.67
22									14x20	60		4.55
33					12x20	80		2.12	16x25	90		3.30
47					14x20	100		1.49	16x30	120		2.13
68	12x20	110		1.13	16x25	140		1.03	16x35	150		1.47
100	14x20	150		0.80	16x30	190		0.70	19x35	210		1.60
150	16x25	210		0.54	16x35	250		0.47	19x40	270		0.67
220	16x35	300		0.37	19x35	330		0.52	22x45	380		0.46
330	19x35	400		0.25	19x40	430		0.22	26x45	500		0.31
470	19x40	510		0.17	22x45	590		0.15	26x60	620		0.22
680	22x45	700		0.12	26x60	760		0.11				
1000	26x45	760		0.08	26x60	870		0.07				
1500	26x60	1070	0.12									

→ Impedance (25°C, 1kHz, or 10kHz)

→ Rated ripple current (85°C, 100Hz)

HOW TO MAKE A PART NUMBER

CABBF 477 M 0J O 120200

- 120200 — D*L 12*20
- O — package
- 0J — voltage code
- M — capacitance tolerance
- 477 — capacitance code
- CABBF — series

Code	Lead Forming Type
O	Bulk
T	5mm Chip tape
A	(Φ4~Φ6.3)2.5mm tape
F	(Φ4~Φ8)5mm tape
P	Φ≥Φ8mm original(vertical)tape
M	5mm Lead forming
C	C Lead forming
B	B Lead forming
D	(Φ4~Φ8)2.5mm Lead forming

CADAA



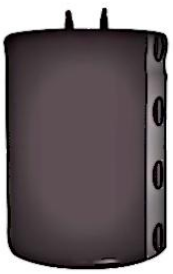
- There are reliability indicators, and there are five levels of failure rate（$\lambda \leq 1\times10^{-5}$）
- It meets the environmental requirements of vibration, low pressure, humidity resistance and other environmental requirements of the national military standard GJB603-88
- It is suitable for filtering, coupling and bypassing in electronic circuits in aerospace, aviation, alpine, high altitude and ocean

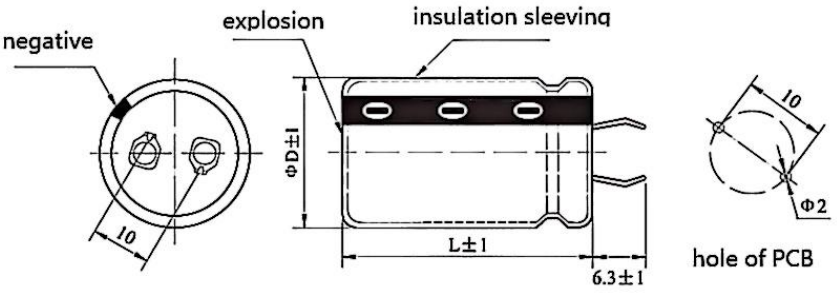
Main technical parameters:

<table>
<tr><td>Item</td><td colspan="2">characteristic</td></tr>
<tr><td>Operating temperature range</td><td colspan="2">-55℃~+105℃</td></tr>
<tr><td>Rated voltage range</td><td colspan="2">10V~500V</td></tr>
<tr><td>Nominal capacitance range</td><td colspan="2">47μF~68000μF</td></tr>
<tr><td>Allowable deviation of nominal capacitance（25℃，100Hz）</td><td colspan="2">M（±20%）</td></tr>
<tr><td>DC leakage current（25℃，5min）</td><td colspan="2">$I \leq 0.02C_RU_R$（μA）
C_R：Nominal capacitance（μF）；U_R：Rated voltage（V）</td></tr>
<tr><td>Dissipation factor tgδ（25℃，100Hz）</td><td colspan="2"><table><tr><td>U_R（V）</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>80</td><td>100</td><td>160~450</td><td>500</td></tr><tr><td>tgδ（≤）</td><td>0.20</td><td>0.18</td><td>0.15</td><td>0.12</td><td>0.10</td><td>0.10</td><td>0.10</td><td>0.10</td><td>0.15</td><td>0.20</td></tr></table>Products with capacities greater than 1500μF，Each increase1000μF，The dissipation factor increases0.02。</td></tr>
<tr><td rowspan="2">Temperature Characteristics (100Hz)</td><td>Impedance ratio</td><td>$Z_{-55℃}/Z_{+25℃} \leq 15$</td></tr>
<tr><td>Rate of change in capacitance</td><td>（$C_{+25℃}-C_{-55℃}$）/$C_{+25℃} \leq 20\%$（≤40%（500V））
（$C_{+25℃}-C_{-40℃}$）/$C_{+25℃} \leq 10\%$（≤20%（500V））</td></tr>
<tr><td>durability</td><td colspan="2">The rated voltage with ripple current is applied at 105°C for 2000h, and after recovery for 24h, the rated voltage with ripple current is tested at room temperature (25°C±5°C), and its electrical performance is in accordance with the test ：<table><tr><td>Rate of change in capacitance</td><td>≤±15% Initial measurements</td></tr><tr><td>The dissipation factor tgδ</td><td>≤150% Initial prescriptive value</td></tr><tr><td>DC leakage current</td><td>≤Initial prescriptive value</td></tr></table></td></tr>
<tr><td>Store at high temperatures</td><td colspan="2">After being left at 105 °C for 500h and recovered for 24 hours, the electrical performance was tested at room temperature (25 °C±5 °C). ：<table><tr><td>Rate of change in capacitance</td><td>≤±15% Initial measurements</td></tr><tr><td>The loss angle tangent tgδ</td><td>≤200% Initial prescriptive value</td></tr><tr><td>DC leakage current</td><td>≤200% Initial prescriptive value</td></tr></table></td></tr>
</table>

Execution standard number：ZZR—Q/MN20085—2015 and GJB603A—2011

Outline drawings and size charts（mm）





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List of product specifications and technical parameters

$U_{R(V)}$ / $C_{R(\mu F)}$	10 1A		16 1C		25 1E		35 1V		50 1H	
	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)
1200									22×35	800
									25×25	800
1500							22×35	850	22×40	1120
									25×30	1120
2200					22×30	950	22×40	970	22×45	1360
					25×25	950	25×25	970	25×35	1360
3300					25×30	1250	22×45	1380	22×50	1850
							25×30	1380	25×40	1850
									30×30	1850
4700	22×30	750	22×25	1300	30×25	1550	22×50	1850	25×45	2400
	25×25	750					25×35	1850	30×35	2400
									35×25	2400
5600			22×30	1420	30×30	1710	25×40	2140	30×40	2780
					35×25	1710	30×30	2140	35×35	2780
							35×25	2140		
6800	22×40	1120	22×35	1680	30×35	1850	25×45	2320	30×45	3240
	25×35	1120	25×25	1680	35×30	1850	30×35	2320	35×40	3240
							35×30	2320		
8200	22×45	1320			30×40	2100	30×40	2670	30×50	3570
	25×40	1320	22×40	1850	35×35	2100	35×35	2670	35×45	3570
			25×30	1850						
10000	22×50	1450	25×35	1920	30×45	2540	30×45	2850	35×50	3850
	25×45	1450	30×30	1920	35×40	2540	35×40	2850		
12000	30×40	1670	25×45	2180	30×50	2750	35×45	3210	35×60	4210
	35×25	1670	30×35	2180	35×45	2750				
			35×30	2180						
15000	30×35	1950	25×50	2430	35×50	2950	35×50	3500		
	35×30	1950	30×40	2430						
			35×35	2430						
18000							35×60	4350		
22000	30×40	2480	30×45	3220	35×60	3900				
	35×35	2480	35×40	3220						
27000			30×50	3650						
			35×45	3650						
33000	30×45	3300	35×50	4100						
	35×40	3300								
47000	30×50	3800	35×60	4800						
	35×45	3800								
56000	35×50	4400								
68000	35×60	4800								

→ Rated ripple current（105℃，100Hz）

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■ List of product specifications and technical parameters

$C_R(\mu F)$ / $U_R(V)$	63 1J		80 1K		100 2A		160 2C		200 2D	
	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)
150									22×25	480
220							22×25	610	22×30	740
330							22×35	740	25×35	930
470					22×25	770	25×35	860	25×40	1140
560			22×25	520	22×30	900	30×35	1100	30×40	1350
680	22×25	520	25×25	750	22×35	970	30×40	1270	30×45	1510
820	22×30	720	25×30	890	22×40	1180	30×45	1440	30×50	1640
					25×30	1180	35×35	1440	35×40	1640
1000	22×35	810	25×35	1050	22×45	1340	30×50	1720	35×45	1710
					25×35	1340	35×40	1720		
1200			25×40	1300	25×40	1600	35×45	1850		
			30×35	1300	30×35	1600				
1500	25×45	1200	30×40	1520	30×40	2100	35×50	2140	35×50	2300
	30×30	1200	35×30	1520	35×35	2100				
1800									35×60	2440
2200	25×50	1550	30×45	1880	30×50	2550	35×60	2400	35×70	2770
	30×35	1550	35×35	1880	35×40	2550				
	35×25	1550								
3300	30×40	2150	35×40	2450	35×45	3200				
	35×30	2150								
3900					35×50	3600				
4700	30×45	2800	30×50	3300	35×60	3900				
	35×35	2800	35×45	3300						
5600	30×50	2980	35×50	3700						
	35×40	2980								
6800	35×45	3250	35×60	4100						
8200	35×50	3650								
10000	35×60	4120								

→ Rated ripple current（105℃，100Hz）

CADAA

List of product specifications and technical parameters

$C_R(\mu F)$ / $U_R(V)$	250 2E		350 2V		400 2G		450 2W		500 2H	
	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)
47					25×25	210	22×30	270	25×35	240
									30×30	240
56					25×25	280	25×30	310	25×40	280
									30×35	280
68					25×30	340	25×35	380	25×45	340
									30×40	340
82					25×35	390	25×40	450	25×50	410
					30×30	390	30×30	450	30×45	410
100					25×40	420	25×45	540	30×50	460
					30×30	420	30×35	540	35×40	460
150	22×35	410	22×40	630	25×45	550	25×50	710	35×45	550
	25×30	410	25×35	630	30×35	550	30×40	710		
							35×35	710		
220	22×40	640	22×45	750	30×45	620	30×50	950	35×50	650
	25×35	640	25×40	750	35×40	620	35×40	950		
	30×30	640	30×35	750						
270									35×60	820
330	25×40	710	25×45	820			35×50	1280		
	30×35	710	30×40	820						
			35×35	820						
470	25×50	850	30×50	1040			35×60	1640		
	30×40	850	35×40	1040						
	35×35	850								
560	30×45	1150	35×45	1210						
	35×40	1150								
680	30×50	1370	35×50	1460						
	35×45	1370								
820	35×50	1520	35×60	1550						
1000	35×60	1740								
1500	35×70	1850								

Rated ripple current（105℃，100Hz）

Part number example

CADAA	478	M	2A	350600
series	capacitance	tolerance	voltage	dimesion

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- 10V~500V full voltage series wide operating temperature
- It meets the environmental requirements of the national military standard GJB3516-99 such as vibration, low pressure and humidity resistance
- It is suitable for filtering, coupling and bypassing in electronic circuits in aerospace, aviation, alpine, high altitude and ocean

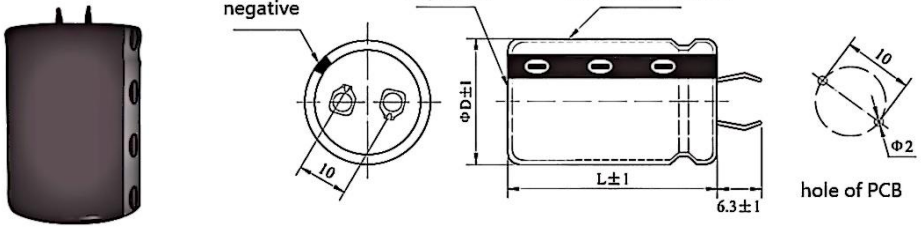
■ Main technical parameters:



item		characteristic
Operating temperature range		-55℃~+105℃
Rated voltage range		10V~500V
Nominal capacitance range		47μF~82000μF
Allowable deviation of nominal capacitance（25℃，100Hz）		M（±20%）
DC leakage current（25℃，5min）		I≤0.02$C_R U_R$（μA） C_R: Nominal capacitance (μF); U_R: Rated voltage (V)
DF tgδ（25℃，100Hz）		U_R（V） 10 16 25 35 50 63 80 100 160~450 500 tgδ（≤） 0.20 0.18 0.15 0.12 0.10 0.10 0.10 0.10 0.15 0.20 Products with capacities greater than 1500μF，Each increase1000μF，The DF increases 0.02。
Temperature characteristics（100Hz）	Impedance ratio	$Z_{-55℃}/Z_{+25℃}$≤15
	Rate of change in capacitance	（$C_{+25℃}$－$C_{-55℃}$）/$C_{+25℃}$≤20%（≤40%（500V）） （$C_{+25℃}$－$C_{-40℃}$）/$C_{+25℃}$≤10%（≤20%（500V））
durability		The rated voltage with ripple current is applied at 105℃ for 2000h, and after recovery for 24h, the rated voltage with ripple current is tested at room temperature (25° C±5℃), and its electrical performance is in accordance with the test： Rate of change in capacitance ≤± 15% of initial measurements The loss angle is tangent tgδ ≤150% of the initial specified value DC leakage current ≤Initial prescriptive value
Store at high temperatures		After being left at 105 ℃ for 500h and recovered for 24 hours, the electrical performance was tested at room temperature： Rate of change in capacitance ≤± 15% of initial measurements The loss angle is tangent tgδ ≤200% of the initial specified value DC leakage current ≤200% of the initial specified value
Shelving life		After being left at 85℃ for 100 hours and recovered for 24 hours, the electrical properties were tested at room temperature： Structural coefficients ≤4.0 Shelving factor ≤3.0 Rate of change in capacitance ≤±6%Initial measurements The loss angle tangent tg δ ≤175%Initial prescriptive value DC leakage current ≤150%Initial prescriptive value

Execution standard number：ZZR－Q/MN20078－2010 and GJB3516－1999

■ Outline drawings and size charts（mm）



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■ List of product specifications and technical parameters

$C_R(\mu F)$ / $U_R(V)$	10 1A		16 1C		25 1E		35 1V		50 1H	
	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)
1500									22×35	1100
									25×25	1100
2200							22×35	950	22×40	1300
									25×30	1300
3300					25×25	1250	22×40	1350	22×45	1800
							25×25	1350	25×35	1800
4700					25×30	1500	22×45	1800	22×50	2350
							25×30	1800	25×40	2350
									30×30	2350
5600			22×25	1430	25×35	1650	22×50	2100	25×45	2700
					30×30	1650	25×35	2100	30×35	2700
									35×25	2700
6800	22×30	1220	22×30	1650	30×30	1800	25×40	2300	30×40	3200
					35×25	1800	30×30	2300	35×35	3200
							35×25	2300		
8200	22×35	1420	22×35	1830	30×35	1950	25×45	2600	30×45	3500
	25×25	1420	25×25	1830	35×30	1950	30×35	2600	35×40	3500
							35×30	2600		
10000	22×40	1650	22×40	1950	30×40	2500	30×40	2800	30×50	3800
	25×30	1650	25×30	1950	35×35	2500	35×35	2800	35×45	3800
12000	22×45	1940	22×45	2150	30×45	2720	30×45	3100	35×50	4200
	25×35	1940	25×35	2150	35×40	2720	35×40	3100		
			30×30	2150						
15000	25×40	2200	22×50	2400	30×50	2900	35×45	3450	35×60	4500
	30×35	2200	25×40	2400	35×45	2900				
			30×35	2400						
18000							35×50	4300		
22000	25×45	2460	25×50	3200	35×50	3900	35×60	4800		
	30×40	2460	30×40	3200						
	35×30	2460	35×35	3200						
27000			30×45	3600						
			35×40	3600						
33000	25×50	3200	30×50	4100	35×60	5200				
	30×45	3200	35×45	4100						
	35×35	3200								
47000	30×50	4100	35×50	5200						
	35×40	4100								
56000	35×45	4600	35×60	5600						
68000	35×50	5000								
82000	35×60	5600								

Rated ripple current
（105℃，100Hz）

CADAB

■ List of product specifications and technical parameters

$C_R(\mu F)$ / $U_R(V)$	63 1J		80 1K		100 2A		160 2C		200 2D	
	DxL (mm)	I~ (mA)	DxL (mm)	I|~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I|~ (mA)	DxL (mm)	I~ (mA)
150									22×25	600
220							22×25	740	22×30	870
330							22×35	830	25×35	1110
470							25×35	980	25×40	1220
560					22×25	870	30×35	1200	30×40	1450
680			22×25	720	22×30	1100	30×40	1370	30×45	1630
820	22×25	620	25×25	850	22×35	1250	30×45	1560	30×50	1740
							35×35	1560	35×40	1740
1000	22×30	750	25×30	1290	22×40	1380	30×50	1810		
					25×30	1380	35×40	1810	35×45	1820
1200			25×35	1440	22×45	1540	35×45	1980		
					25×35	1540				
1500	22×35	1200	25×40	1400	25×40	1800	35×50	2340	35×50	2400
			30×35	1400	30×35	1800				
1800									35×60	2590
2200	25×45	1500	30×40	1860	30×40	2400	35×60	2600	35×70	2976
	30×30	1500	35×30	1860	35×35	2400				
3300	25×50	2100	30×45	2430	30×50	3150				
	30×35	2100	35×35	2430	35×40	3150				
	35×25	2100								
3900					35×45	3500				
4700	30×40	2750	35×40	3250	35×50	3800				
	35×30	2750	30×50	3250						
5600	35×35	2900	35×45	3600	35×60	4100				
	30×45	2900								
6800	30×50	3200	35×50	4000						
	35×40	3200								
8200	35×45	3600	35×60	4300						
10000	35×50	4000								
12000	35×60	4300								

↳ Rated ripple current（105℃， 100Hz）

CADAB

■ List of product specifications and technical parameters

U_R(V) \ C_R(μF)	250 2E		350 2V		400 2G		450 2W		500 2H	
	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)	DxL (mm)	I~ (mA)
47					25×25	260	22×30	350	25×35	270
									30×30	270
56					25×25	380	25×30	410	25×40	320
									30×35	320
68					25×30	440	25×35	470	25×45	360
									30×40	360
82					25×35	490	25×40	550	25×50	450
					30×30	490	30×30	550	30×45	450
100					25×40	620	25×45	610	30×50	510
					30×30	620	30×35	610	35×40	510
150	22×35	510	22×40	680	25×45	710	25×50	810	35×45	640
	25×30	510	25×35	680	30×35	710	30×40	810		
							35×35	810		
220	22×40	670	22×45	820	30×45	780	30×50	1050	35×50	750
	25×35	670	25×40	820	35×40	780	35×40	1050		
	30×30	670	30×35	820						
270									35×60	880
330	25×40	830	25×45	950	30×50	910	35×50	1380		
	30×35	830	30×40	950	35×45	910				
			35×35	950						
470	25×50	950	30×50	1160	35×50	1360	35×60	1740		
	30×40	950	35×40	1160						
	35×35	950								
560	30×45	1250	35×45	1350	35×60	1500				
	35×40	1250								
680	30×50	1450	35×50	1580						
	35×45	1450								
820	35×50	1630	35×60	1650						
1000	35×60	1890								
1500	35×70	2100								

↳ Rated ripple current（105℃，100Hz）

Part number example

CADAB 478 M 2A 350500

series capacitance tolerance voltage dimesion

CADAC



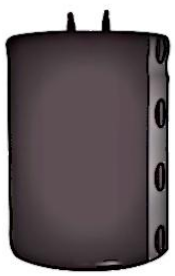
- Solder pin structure, high pressure product, small volume。
- There are reliability indicators, and there are five levels of failure rate（ $\lambda \leqslant 1\times10^{-5}$）
- It meets the environmental requirements of the national military standard GJB603A-2021
- such as vibration, low pressure, and humidity resistance
- It is suitable for filtering and energy storage in the electronic unified circuit of aerospace, aviation, alpine, high altitude and ocean.

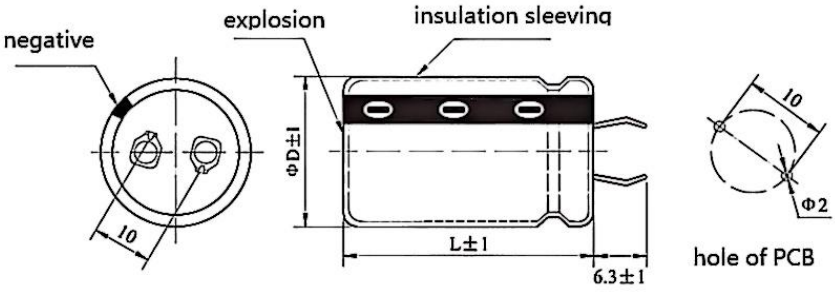
■ Main technical parameters:

Item	characteristic
Operating temperature range	-40℃~+105℃
Rated operating voltage range	400V~450V
Nominal capacitance range	82~1000μF
Allowable deviation of nominal capacitance	M（±20%） （25℃，100Hz）
DC leakage current（25℃，5min）	I≤0.01$C_R U_R$（μA） C_R：Nominal capacitance (μF); U_R: Rated voltage (V)
DF δ (max)	For details, please refer to the "List of Product Specifications and Technical Parameters" （25℃，100Hz）
Temperature characteristics (100Hz, impedance ratio)	$Z_{-40℃}/Z_{+25℃}\leqslant12$
Rated ripple current	For details, please refer to the "List of Product Specifications and Technical Parameters" （105℃，100Hz）
Durability (High Temperature Test)	The rated voltage with ripple current is applied at 105℃ for 2000h, and after recovery for 24h, the rated voltage with ripple current is tested at room temperature (25℃±5℃), and its electrical performance is in accordance with the test：
	Rate of change in capacitance: ≤±20% Initial measurements
	DC leakage current: ≤Initial prescriptive value
	The DF: ≤200% Initial measurements
Store at high temperatures	Left at 105℃ for 1000h, after the test, the normal temperature (25℃±5℃) was restored to the test, and its electrical properties were in line with：
	Rate of change in capacitance: ≤±15% Initial measurements
	DC leakage current: ≤200% Initial prescriptive value
	The DF: ≤200% Initial measurements

Execution standard number：Q/MN20088—2023 GJB603A—2011

■ Outline drawings and size charts（mm）





CADAC

■ List of product specifications and technical parameters

Rated voltage (V)	capacity (μF)	Dimensions D×L (mm)	tgδ (100Hz)	Ripple current (mA,rms)
400 2G	100	22×25	0.20	494
	120	22×30	0.20	577
	120	25×25	0.20	577
	150	22×35	0.20	707
	150	25×30	0.20	707
	220	22×45	0.20	924
	220	25×35	0.20	924
	270	25×40	0.20	1038
	270	30×30	0.20	1038
	330	25×45	0.20	1240
	330	30×35	0.20	1240
	390	35×30	0.20	1180
	390	30×40	0.20	1180
	470	30×45	0.20	1400
	470	35×35	0.20	1400
	560	35×40	0.20	1638
	680	35×50	0.20	2017
	820	35×55	0.20	2324
	1000	35×60	0.20	2680

Rated voltage (V)	capacity (μF)	Dimensions D×L (mm)	tgδ (100Hz)	Ripple current (mA,rms)
450 2W	82	22×30	0.20	472
	100	25×25	0.20	507
	100	22×35	0.20	507
	120	25×30	0.20	610
	120	22×40	0.20	610
	150	25×35	0.20	735
	180	30×25	0.20	745
	180	22×45	0.20	745
	220	25×40	0.20	900
	220	30×30	0.20	900
	270	25×45	0.20	1080
	270	35×30	0.20	1080
	270	25×45	0.20	1080
	270	30×35	0.20	1080
	330	35×30	0.20	1260
	330	30×40	0.20	1146
	330	35×35	0.20	1158
	470	30×50	0.20	1470
	470	35×40	0.20	1470
	560	35×50	0.20	1800
	680	35×55	0.20	2080
	820	35×60	0.20	2390

Part number example

CADAC	108	M	2G	350600
series	capacitance	tolerance	voltage	dimesion

CAEAA



- Wide operating temperature range, 105°C2000h life
- Military products meet environmental requirements such as vibration and low air pressure
- A and B type fixing methods are available, and the size can be customized according to needs
- Military products can be supplied according to the "seven specialized" level, and can also be supplied according to the "general army" level
- It is suitable for filtering and energy storage in electronic circuits in aerospace, aviation, cold, high altitude and ocean

■ Main technical parameters:

Item	characteristic
Operating temperature range	-55℃~+105℃
Rated voltage range	10V~450V
Nominal capacitance range	220μF~2200000μF
Allowable deviation of nominal capacitance (25°C, 120Hz)	M（±20%）
DC leakage current（25℃，5min）	I≤0.01CRUR (μ A) or 15mA (whichever is less) C_R: Nominal capacitance (μF); U_R: Rated voltage (V)

Loss tangent tgδ (max)（25℃，120Hz）

UR(V) / φD	10	16	25	35	50	63	100	160~450
35	0.8	0.6	0.5	0.4	0.3	0.25	0.25	0.25
51	1.5	1	0.8	0.6	0.5	0.4	0.25	0.25
63.5	2	1.5	1	0.8	0.6	0.5	0.35	0.25
76,90,100	3	25	2	1	0.6	0.5	0.35	0.25

Temperature characteristics (impedance ratio, 120Hz)

UR(V)	10~16	25~100	160	250~450
$Z_{-40℃}/Z_{+25℃}$	≤3	≤2	≤4	≤7
$Z_{-55℃}/Z_{+25℃}$	≤5	≤4	≤7	≤15

durability

The rated voltage with ripple current is applied at 105°C for 2000h, and after recovery for 24h, the test is carried out at room temperature (25°C±5°C), and its electrical performance conforms to:

Rate of change in capacitance	≤± 20% of the initial measurement
The loss angle tangent tgδ	≤ 200% of the initial specified value
DC leakage current	≤ initial prescriptive value

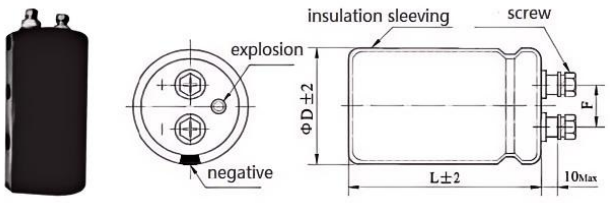
Store at high temperatures

After storing at 105 °C for 500 hours and recovering for 24 hours, the electrical properties of the two temperatures (25 °C±5°C) were tested, and the electrical properties conformed to:

Rate of change in capacitance	≤± 20% of the initial measurement
The loss angle tangent tgδ	≤ 200% of the initial specified value
DC leakage current	≤ 200% of the initial specified value

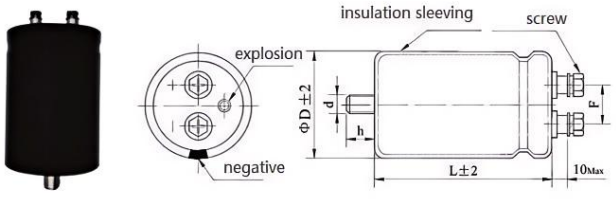
Executive standard number: Q/MN102-2008 Seven special standard number: QZJ840634

■ Outline drawing and size table (mm)



Type A (Basic type, fixed mounting ring)

D	F±1.0	Hexagon screws	The maximum torque is N.m	remark
35	13	M5×10	2	Military
				Ordinary products
51	20	M5×10	2	Military
	22			Ordinary products
63.5	25	M5×10	2	Military
	28.6			Ordinary products



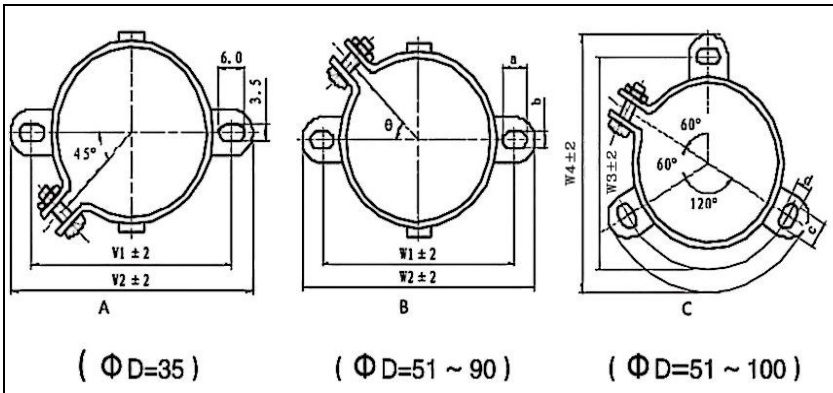
Type B (bottom screw fixed, please specify when ordering)

D	F±1.0	Hexagon dart nails	The maximum torque is N.m	remark
76	30	M5×10	2	Military
	32			Ordinary products
90	32	M5×10	2	Military
	32			Ordinary products
100	41.5	M8×16	3	Military
	41.5			Ordinary products

D	d	h	The maximum torque is N.m
35	M8	12	4
≥51	M12	16	10

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■ Outline drawing and size table of mounting ring(mm)



D	a	b	I
51~76	6	4.5	45°
90	7	5	30°

D	c	d
51~90	7	4.5
100	8	5.5

D	A/B		C	
	W1	W2	W3	W4
35	48.0	58.0	—	—
51	(68.0)	(80.0)	63.5	73.0
63.5	(81.0)	(93.0)	76.2	85.1
76	(93.5)	(106.0)	88.9	98.4
90	(108.0)	(120.5)	101.6	111.1

■ List of product specifications and technical parameters

UR(V) / CR(μF)	10 1A		16 1C		25 1E		35 1V		50 1H		63 1J	
	DxL (mm)	I~ (A)	DxL (mm)	I~ (A)	DxL (mm)	I~ (A)	DxL (mm)	I~ (A)	DxL (mm)	I~ (A)	DxL (mm)	I~ (A)
3300											35×50	2.9
4700							35×50	3.1	35×50	3.8	35×50	3.4
6800					35×50	3.0	35×50	3.5	35×50	4.2	35×50	4.1
10000			35×50	3.3	35×50	3.6	35×50	4.7	35×50	4.9	35×60	5.0
15000	35×50	3.4	35×50	3.7	35×50	4.1	35×50	5.1	35×60	5.5	35×90	5.9
22000	35×50	4.1	35×50	4.2	35×50	4.9	35×80	5.6	35×90	6.3	51×65	6.9
33000	35×50	4.8	35×50	5.2	35×60	6.2	51×60	7.4	51×65	8.0	51×80	9.4
47000	35×50	6.2	35×60	6.8	35×80	8.3	51×80	8.4	51×80	9.9	63.5×80	11.2
68000	35×60	6.8	35×80	7.1	51×60	10.2	51×100	12.3	51×100	12.8	63.5×100	13.5
100000	35×80	8.6	51×60	9.6	51×80	11.5	63.5×100	13.6	63.5×100	16.8	76×120	17.8
150000	51×60	10.8	51×80	11.0	63.5×80	13.8	63.5×120	15.1	76×120	19.5	76×140	21.0
220000	51×80	13.2	51×100	14.1	63.5×100	17.0	76×120	17.4	76×140	22.0	90×150	23.7
330000	51×100	15.8	63.5×100	20.6	76×120	20.8	76×170	21.3	90×150	24.3	90×200	26.1
470000	63.5×100	17.0	63.5×120	22.1	76×140	22.4	90×150	25.4	90×200	26.1	100×25	28.1
680000	63.5×120	18.4	76×120	24.0	90×150	24.2	90×200	27.5	100×250	27.8		
1000000	76×140	20.1	76×180	26.1	90×200	26.4	100×250	29.7				
1500000	90×150	22.1	90×200	28.8	100×250	29.2						
2200000	90×200	24.3	100×250	30.1								

Rated ripple current (105℃, 120Hz)

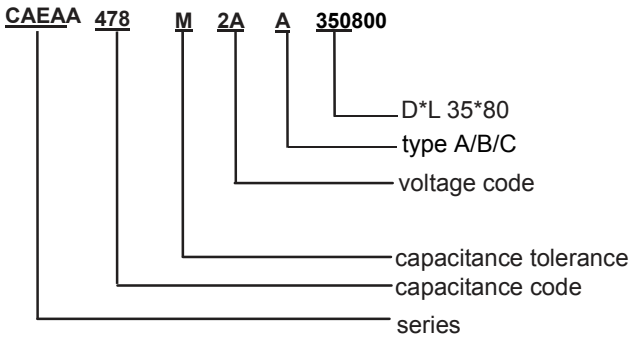
■ List of product specifications and technical parameters

UR(V) / CR(μF)	100 2A		160 2C		250 2E		350 2V		400 2G		450 2W	
	DxL (mm)	I~ (A)	DxL (mm)	I~ (A)	DxL (mm)	I~ (A)	DxL (mm)	I~ (A)	DxL (mm)	I~ (A)	DxL (mm)	I~ (A)
220											35×60	1.9
330									35×60	2.1	35×80	2.5
470							35×50	2.5	35×80	2.7	35×100	3.2
680					35×50	1.4	35×80	3.2	35×100	4.1	51×80	3.9
1000			35×50	1.6	35×80	1.9	35×100	4.8	51×80	5.0	51×100	5.2
1500	35×50	1.9	35×60	2.1	35×100	2.4	51×80	6.5	51×100	6.8	51×120	6.4
2200	35×50	2.4	35×80	2.7	51×65	3.2	51×100	8.2	63.5×100	8.9	63.5×100	9.0
3300	35×60	3.3	51×60	3.8	51×100	4.3	63.5×80	11.8	63.5×120	11.8	76×120	12.1
4700	35×80	3.8	51×80	4.5	51×120	5.9	63.5×120	13.8	76×120	14.8	76×150	15.1
6800	35×100	5.2	51×100	6.8	63.5×100	7.1	76×120	19.2	76×160	19.2	90×150	20.0
10000	51×80	6.7	63.5×100	7.8	76×120	9.6	76×180	25.1	90×160	24.2	90×200	24.8
15000	51×100	7.8	63.5×120	9.8	76×140	12.7	90×140	30.4	90×250	28.5	100×250	29.7
22000	63.5×100	9.9	76×120	12.5	90×150	15.4	90×200	34.7	100×250	34.8		
33000	63.5×120	12.7	76×160	13.4	90×200	17.0	100×250	37.9				
47000	76×120	17.0	90×160	17.2	100×250	18.2						
68000	76×160	18.2	90×220	19.2								
100000	90×150	20.6	100×250	21.2								
150000	100×250	23.4										

Rated ripple current (105℃, 120Hz)

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HOW TO MAKE A PART NUMBER



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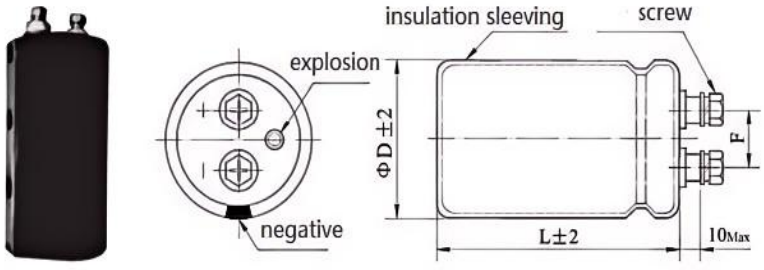
- There are reliability indicators, and the five-level failure rate ($\lambda \leq 1\times10^{-5}$).
- It meets the environmental requirements of GJB603A-2011 such as vibration, low air pressure and humidity resistance.
- It is suitable for energy storage and filtering in electronic circuits in aerospace, aviation, alpine, high altitude and ocean.

■ Main technical parameters:

item	characteristic
Operating temperature range	-55℃~+105℃
Rated voltage range	10V~450V
Nominal capacitance range	470μF-2200000μF
Allowable deviation of nominal capacitance (25°C, 100Hz)	M（±20%）
DC leakage current（25℃，5min）	≤0.01$C_R U_R$ (μA) or 15mA (whichever is less) C_R: Nominal capacitance (μF); U_R: Rated voltage (V)
Loss tangent tgδ (max)（25℃，100Hz）	For details, please refer to the "List of Product Specifications and Technical Parameters"
Temperature Characteristics (100Hz) (Impedance Ratio)	U_R(V) | 10~16 | 25~100 | 160~250 | 350~450 $Z_{-55℃}/Z_{+25℃}$ | ≤5 | ≤4 | ≤10 | ≤12
Rated ripple current (100Hz, 105°C)	For details, please refer to the "List of Product Specifications and Technical Parameters"
durability	The rated voltage with ripple current is applied at 105°C for 2000h, and after recovery for 24h, the test is carried out at room temperature (25°C±5°C), and its electrical performance conforms to: Rate of change in capacitance: ≤± 20% of the initial measurement Loss tangent tgδ: ≤ 200% of the initial specified value DC leakage current: ≤ initial prescriptive value
Store at high temperatures	After being left at 105°C for 500h and recovered for 24h, the electrical performance of the electrical performance is tested at room temperature (25±5°C). Rate of change in capacitance: ≤± 20% of the initial measurement Loss tangent tgδ: ≤ 200% of the initial specified value DC leakage current: ≤ 200% of the initial specified value

Execution standard number：Q/MN20087—2017 and GJB603A—2011

■ Outline drawing and size table (mm)



D	F±1.0	Hexagon screws	The maximum torque is N.m
35	13	M5×10	1.13
51	20		
63.5	25		
76	30		
90	32		

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■ List of product specifications and technical parameters

Rated voltage (V)	capacity (μF)	Dimensions D×L (mm)	tgδ (120Hz)	Ripple current (A,rms)
10 1A	100000	35×80	0.8	7.5
	150000	50×60	1	9.8
	220000	50×80	1.2	12.2
	330000	50×100	1.4	14.8
	470000	63.5×100	1.8	16
	680000	63.5×120	1.8	17.4
	1000000	75×140	2.1	19.5
	1500000	90×150	2.5	21.1
	2200000	90×200	2.8	22.4
16 1C	47000	35×60	0.6	5.7
	68000	35×80	0.6	6.1
	100000	50×60	0.8	8.7
	150000	50×80	0.8	10.2
	220000	50×100	1.2	13
	330000	63.5×100	1.5	19.5
	470000	63.5×120	1.8	20.4
	680000	75×120	2	22
	1000000	75×180	2.2	25.1
	1500000	90×200	2.2	27.8
25 1E	33000	35×60	0.5	5.4
	47000	35×80	0.5	7.7
	68000	50×60	0.6	9.4
	100000	50×80	0.6	10.5
	150000	63.5×80	0.8	12.8
	220000	63.5×100	0.8	16
	330000	75×120	1.2	18.8
	470000	75×140	1.2	19.4
	680000	90×150	1.5	21
	1000000	90×200	1.8	24.2
35 1V	15000	35×60	0.4	4.1
	22000	35×80	0.4	5.2
	33000	50×60	0.5	6.8
	47000	50×80	0.5	7.4
	68000	50×100	0.6	12.1
	100000	63.5×100	0.7	12.6

Rated voltage (V)	capacity (μF)	Dimensions D×L (mm)	tgδ (120Hz)	Ripple current (A,rms)
35 1V	150000	63.5×120	0.7	14.1
	220000	75×120	0.8	16.4
	330000	75×170	0.8	20.2
	470000	90×150	1	23.4
	680000	90×200	1.2	26.5
50 1H	15000	35×80	0.3	5.2
	22000	35×100	0.35	6.1
	33000	50×80	0.4	7.4
	47000	50×90	0.4	9.5
	68000	50×100	0.5	11.7
	100000	63.5×100	0.5	15.8
	150000	75×120	0.5	17.5
	220000	75×140	0.6	21
	330000	90×150	0.6	23.3
	470000	90×200	0.6	25.1
63 1J	10000	35×80	0.25	4.6
	15000	35×100	0.3	5.5
	22000	50×80	0.4	6.7
	33000	50×100	0.4	9.1
	47000	63.5×80	0.5	11.2
	68000	63.5×100	0.5	12.5
	100000	75×120	0.5	16.8
	150000	75×140	0.5	20.1
	220000	90×150	0.5	22.7
	330000	90×200	0.5	24.1
100 2A	3300	35×60	0.2	3.2
	4700	35×80	0.2	3.5
	6800	35×100	0.25	5.1
	10000	50×80	0.25	6.5
	15000	50×100	0.3	7.5
	22000	63.5×100	0.35	9.6
	33000	63.5×120	0.35	11.7
	47000	75×120	0.4	16
	68000	75×160	0.4	17.2
	100000	90×150	0.5	19.6

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■ List of product specifications and technical parameters

Rated voltage (V)	capacity (μF)	Dimensions D×L (mm)	tgδ (120Hz)	Ripple current (A,rms)
160 2C	1500	35×60	0.2	2.1
	2200	35×80	0.2	2.7
	3300	50×80	0.2	3.8
	4700	50×100	0.2	4.5
	6800	50×120	0.25	6.8
	10000	63.5×100	0.25	7.8
	15000	63.5×120	0.3	9.8
	22000	75×120	0.3	12.5
	33000	75×160	0.3	13.4
	47000	90×170	0.3	17.2
	68000	90×220	0.3	19.2
200 2D	1500	35×80	0.2	2.2
	2200	35×100	0.2	2.9
	3300	50×80	0.2	4.1
	4700	50×100	0.2	5.8
	6800	63.5×110	0.2	6.8
	10000	63.5×120	0.25	9.2
	15000	75×120	0.25	11.5
	22000	75×160	0.25	13.7
	33000	90×170	0.25	16.5
	47000	90×220	0.25	18.2
250 2E	1000	35×80	0.2	2.1
	1500	35×100	0.2	2.5
	2200	50×80	0.2	3.2
	3300	50×100	0.2	4.3
	4700	50×120	0.2	5.9
	6800	63.5×100	0.2	7.1
	10000	75×120	0.25	9.6
	15000	75×140	0.25	12.7
	22000	90×150	0.25	15.4
	33000	90×200	0.25	17

Rated voltage (V)	capacity (μF)	Dimensions D×L (mm)	tgδ (120Hz)	Ripple current (A,rms)
350 2V	680	35×80	0.2	3.2
	1000	35×100	0.2	4.8
	1500	50×80	0.2	6.5
	2200	50×100	0.2	8.2
	3300	63.5×100	0.2	11.8
	4700	63.5×120	0.25	13.8
	6800	75×120	0.25	19.2
	10000	75×180	0.3	25.1
	15000	90×140	0.3	30.4
	22000	90×200	0.3	34.7
400 2G	470	35×60	0.2	2.5
	680	35×80	0.2	3.5
	1000	50×80	0.2	4.6
	1500	50×100	0.2	6.4
	2200	63.5×100	0.2	8.7
	3300	63.5×120	0.2	11.6
	4700	75×120	0.2	13.8
	6800	75×160	0.25	18.4
	10000	90×170	0.25	23.2
	15000	90×250	0.25	26.5
450 2W	470	35×80	0.2	3.2
	680	50×80	0.2	3.6
	1000	50×100	0.2	4.8
	1500	50×120	0.2	5.9
	2200	63.5×120	0.2	8.7
	3300	75×120	0.2	11.5
	4700	75×150	0.25	14.1
	6800	90×170	0.25	19.5
	10000	90×200	0.25	22.7

Part number example

CAAAB 478 M 2A 350800

series capacitance tolerance voltage dimesion

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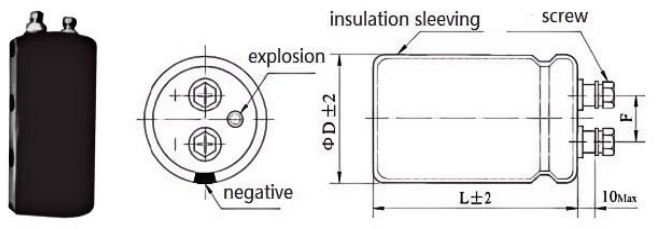
- Long-life product, with reliability index, five-level failure rate ($\lambda \leq 1\times10^{-5}$).
- Screw construction, full range, available for type A and type B fixing, the size can also be customized according to needs.
- It meets the environmental requirements of the national military standard GJB603A-2021 such as vibration, low pressure, and humidity resistance
- It is suitable for energy storage and filtering in the electronic unified circuit of aerospace, aviation, cold, high altitude and ocean.

■ Main technical parameters:

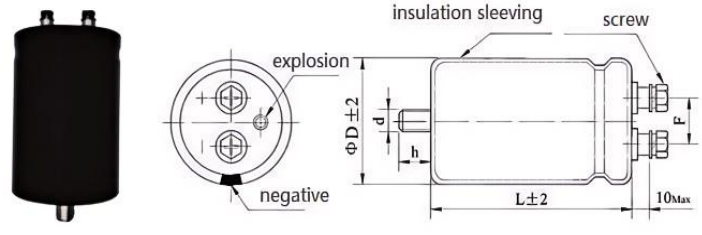
Item	characteristic
Operating temperature range	-40℃~+105℃
Rated operating voltage range	10V~450V
Nominal capacitance range	470~820000μF
Allowable deviation of nominal capacitance	M（-20%~+20%） （25℃，100Hz）
DC leakage current（25℃，5min）	I≤0.01$C_R U_R$ (μA) or 15mA (whichever is less) C_R: Nominal capacitance (μF); U_R: Rated voltage (V)
Loss tangent tgδ (max)	For details, please refer to the "List of Product Specifications and Technical Parameters"（25℃，100Hz）
Temperature characteristics (100Hz, impedance ratio)	U_R(V) 10~35 25~100 160~250 350~450 $Z_{-40℃}/Z_{+25℃}$ ≤10 ≤8 ≤12 ≤15
Rated ripple current	For details, please refer to the "List of Product Specifications and Technical Parameters"（105℃，100Hz）
Durability (High Temperature Test)	The rated voltage with ripple current is applied at 105°C for 5000h, and after recovery for 24h, the electrical performance is tested at room temperature (25°C±5°C), and its electrical performance conforms to: Rate of change in capacitance: ≤± 20% of the initial measurement DC leakage current: ≤ initial prescriptive value The loss angle is tangent: ≤ 200% of the initial measurement
Store at high temperatures	Left at 105°C for 1000h, after the test, the normal temperature (25°C±5°C) was restored to the test, and its electrical properties conformed to: Rate of change in capacitance: ≤± 20% of the initial measurement DC leakage current: ≤ 200% of the initial specified value The loss angle is tangent: ≤ 200% of the initial measurement

Execution standard number：Q/MN20089－2023 GJB603A－2011

■ Outline drawing and size table (mm)



Type A (Basic type, fixed mounting ring)



Type B (bottom screw fixed, please specify when ordering)

D	F±1.0	Hexagon screws	The maximum torque is N.m
35	13	M5×10	1.13
50	20		
63.5	25		
76	30		
90	32		

D	d	h	The maximum torque is N.m
35	MB	12	4
≥51	M12	16	10

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■ List of product specifications and technical parameters

Rated voltage (V)	capacity (μF)	Dimensions D×L (mm)	tgδ (100Hz)	Ripple current (mA,ms)
10 1A	56000	35×60	0.80	6.2
	68000	35×80	0.80	6.8
	100000	50×80	1.20	7.5
	150000	50×100	1.20	10.2
	220000	63.5×100	1.60	12.8
	330000	63.5×120	1.60	14.0
	470000	63.5×130	2.00	15.4
	560000	75×140	2.50	16.2
	680000	75×150	2.50	17.5
	820000	90×150	2.80	19.0
16 1C	47000	35×60	0.60	5.7
	56000	35×80	0.60	6.1
	68000	50×80	0.80	6.9
	100000	50×100	0.80	9.2
	150000	50×120	1.00	12.0
	220000	63.5×120	1.50	14.1
	330000	63.5×130	1.50	18.4
	470000	75×150	1.80	20.0
	560000	90×150	2.20	21.1
	680000	90×170	2.40	23.8
25 1E	33000	35×60	0.50	5.7
	47000	35×80	0.50	7.6
	56000	50×80	0.60	8.1
	68000	50×100	0.60	9.5
	100000	50×120	0.80	10.8
	150000	63.5×100	0.80	12.1
	220000	63.5×120	0.80	15.8
	330000	75×130	1.20	17.4
	470000	90×150	1.60	21.5
	560000	90×170	1.80	22.2
35 1V	15000	35×60	0.40	4.1
	22000	35×80	0.40	5.2
	33000	50×60	0.50	6.3
	47000	50×80	0.50	7.4
	56000	50×100	0.60	9.0
	68000	50×120	0.60	11.1
	100000	63.5×120	0.70	12.7
	150000	25×40	0.70	14.5

Rated voltage (V)	capacity (μF)	Dimensions D×L (mm)	tgδ (100Hz)	Ripple current (mA,rms)
35 1V	220000	30×30	0.80	15.8
	330000	25×45	1.20	19.2
	470000	30×35	1.50	22.4
50 1H	10000	35×80	0.30	4.6
	15000	50×60	0.30	5.1
	22000	50×80	0.40	6.4
	33000	50×100	0.40	7.5
	47000	50×120	0.50	9.7
	56000	63.5×120	0.50	11.2
	68000	75×120	0.50	12.4
	82000	75×130	0.60	14.5
	100000	75×150	0.60	16.0
	150000	90×140	0.80	18.3
	220000	90×170	0.80	21.1
	330000	90×220	1.00	23.2
63 1J	10000	35×80	0.30	4.2
	15000	50×80	0.35	5.5
	22000	50×100	0.40	6.7
	33000	50×120	0.45	9.1
	47000	63.5×120	0.50	10.2
	68000	75×120	0.60	12.5
	82000	75×130	0.60	14.5
	100000	75×150	0.60	16.8
	150000	90×140	0.80	19.1
	220000	90×170	0.80	21.7
	330000	90×220	0.80	23.5
100 2A	3300	35×80	0.25	3.2
	4700	35×100	0.25	3.8
	6800	50×80	0.25	5.1
	8200	50×100	0.25	5.4
	10000	63.5×100	0.30	6.5
	15000	63.5×120	0.30	7.5
	22000	75×100	0.35	9.6
	33000	75×120	0.35	11.7
	47000	75×150	0.40	14.0
	68000	90×120	0.50	16.2
	82000	90×150	0.50	17.4
	100000	90×170	0.60	19.5

CAEAC

- List of product specifications and technical parameters

Rated voltage (V)	capacity (μF)	Dimensions D×L (mm)	tgδ (100Hz)	Ripple current (mA,rms)
160 2C	1500	35×80	0.20	2.1
	2200	35×100	0.20	2.7
	3300	50×80	0.20	3.8
	4700	50×100	0.20	4.2
	6800	50×120	0.20	5.6
	8200	63.5×100	0.25	6.1
	10000	63.5×120	0.25	7.5
	15000	75×120	0.30	8.9
	22000	75×120	0.30	11.4
	33000	90×150	0.35	12.7
	47000	90×200	0.35	16.3
	68000	90×250	0.40	18.2
200 2D	1500	35×80	0.20	1.8
	2200	50×80	0.20	2.6
	3300	50×100	0.20	3.7
	4700	50×120	0.20	4.8
	6800	63.5×110	0.20	6.3
	8200	63.5×120	0.20	8.0
	10000	75×120	0.25	9.2
	15000	75×130	0.25	10.5
	22000	90×150	0.30	12.7
	33000	90×170	0.30	14.5
	47000	90×220	0.30	17.2
250 2E	1000	35×80	0.20	1.9
	1500	50×80	0.20	2.4
	2200	50×100	0.20	3.2
	3300	50×120	0.20	4.3
	4700	63.5×100	0.20	5.4
	6800	75×120	0.20	7.1
	8200	75×130	0.25	8.4
	10000	75×150	0.25	9.6
	15000	90×150	0.30	12.2
	22000	90×170	0.30	15.5
	33000	90×220	0.30	17.1

Rated voltage (V)	capacity (μF)	Dimensions D×L (mm)	tgδ (100Hz)	Ripple current (mA,rms)
350 2V	680	35×80	0.20	3.2
	1000	50×80	0.20	4.1
	1500	50×100	0.20	5.5
	2200	50×120	0.20	7.2
	3300	63.5×120	0.20	9.4
	4700	63.5×130	0.20	13.8
	6800	75×130	0.25	15.5
	8200	90×140	0.25	18.2
	10000	90×160	0.30	25.1
	15000	90×200	0.30	27.4
	22000	90×220	0.30	31.7
400 2G	470	35×60	0.20	2.7
	680	35×80	0.20	3.2
	1000	50×80	0.20	4.1
	1500	50×100	0.20	6.0
	2200	63.5×100	0.20	7.5
	3300	63.5×120	0.20	9.2
	4700	75×120	0.25	12.8
	6800	75×160	0.25	15.4
	8200	90×150	0.25	18.2
	10000	90×170	0.25	20.2
	15000	90×250	0.25	23.5
450 2W	470	35×80	0.20	2.7
	680	50×80	0.20	3.2
	1000	50×100	0.20	3.8
	1500	50×120	0.20	5.5
	2200	63.5×120	0.20	6.9
	3300	75×120	0.20	9.6
	4700	75×150	0.25	13.4
	6800	90×170	0.25	16.5
	10000	90×220	0.25	22.7

Part number example

CAEAC	478	M	2A	A	350800
series	capacitance	tolerance	voltage	typeA/B	dimesion



CCAJ

■ Characteristics and Applications

- ◆ Square, without outer sealing layer, suitable for surface mounting;
- ◆ The medium is Class I ceramic, with good frequency characteristics and high capacitance stability;
- ◆ Each batch of products undergoes 100% temperature shock screening and high-temperature electrical load screening;
- ◆ Suitable for resonant circuits, coupling circuits, and circuits that require low loss, high capacitance stability, and high insulation resistance in various military electronic devices.

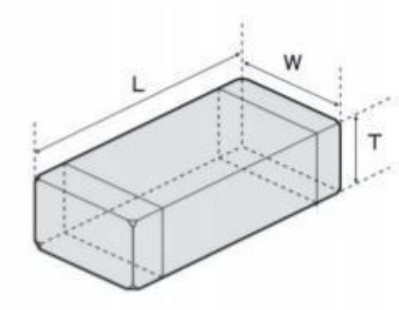
■ Ordering Example

CCAJ	0805	CG	101	J	1H	M	J
Series	**External dimensions**	**Temperature coefficient**	**capacitance**	**Tolerance**	**Rated voltage**	**Termination**	**Quality Grade**
SMD MLCC	According to the table below	CG:0±30ppm/℃ CH:0±60ppm/℃ -55~+125℃	Numerical method, 101 is 100pF	According to the table below	standard method 50V	M = silver palladium Z = Ni barrier with tin / lead plate min. 4 % lead	According to the table below

■ Comparison Table of Quality Levels and Execution Standards

Quality Grade	Quality grade code	Implement detailed specifications	Refer to the general standard for execution
Seven specialties plus	G+	QJ/PWV411-2012	QZJ840624 Ceramic Capacitor "Seven Specialized" Technical Conditions
Seven specialties	G	QJ/PWV415-2012	QZJ840624 Ceramic Capacitor "Seven Specialized" Technical Conditions
Military screening	S	QJ/PWV401-2010	GJB192A–1998
General military	J	QJ/PWV419-2012	GJB192A–1998

Size Code	Dimensions mm		
	L	W	Tmax
0402	1.00±0.15	0.50±0.05	0.55
0603	1.60±0.15	0.80±0.15	0.95
0805	2.00±0.20	1.25±0.20	1.40
1206	3.20±0.20	1.60±0.20	1.90
1210	3.20±0.40	2.50±0.30	2.80
1812	4.50±0.50	3.20±0.40	3.50
2220	5.70±0.50	5.00±0.50	5.20
2225	5.70±0.50	6.30±0.50	6.20



■ Temperature coefficient

Temperature coefficient code	Nominal temperature coefficient	Working temperature range
CG	0±30 ppm/℃	-55℃~+125℃
CH	0 ± 60 ppm/℃	

■ Allowabledeviationof capacitance

Nominal capacitance range	Allowable deviation range	code
0.1 pF~0.9 pF	±0.10pF、±0.25pF、±0.50pF	B、C、D
1.0 pF~8.2 pF	±0.10pF、±0.25Pf ±0.50pF、±1%	B、C、D、F
C_R≥10pF	±1%	F
	±2%	G
	±5%	J
	±10%	K

Item	Test conditions	performance index
Capacity C_R	Test frequency: C_R ≤1000pF, 1MHz ± 10%; C_R > 1000pF, 1KHz ± 10% Test voltage:1.0V ± 0.2Vrms	When C_R ≥ 50pF, tg δ≤ 15×10^{-4} When C_R < 50pF, tg δ≤$1.5x(150/C_R+7)x10^{-4}$
Tangent of the loss Angle Tg δ		
Insulation resistance IR	Test voltage: rated voltage U_R; Test time:1min±5s	IR ≥ $1x10^5$ MΩ or 1000 · μ F, whichever is smaller
Voltage endurance	Test voltage: 2.5U_R; Test time: 5s±1s	No breakdown, arcing or visible damage

CG、CH capacitance sheet

size		0402	0603			0805			1206			1210			1812			2220		2225	
Ce	U_R (V)	50	50	100	200	50	100	200	50	100	200	50	100	200	50	100	200	50	100	50	100
CAP(pF)	code																				
0.5	0R5	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
1.0	1R0	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
1.2	1R2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
1.5	1R5	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
1.8	1R8	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
2.2	2R2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
2.7	2R7	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
3.3	3R3	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
3.9	3R9	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
4.7	4R7	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
5.6	5R6	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
6.8	6R8	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
8.2	8R2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
10	100	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
12	120	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
15	150	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
18	180	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
22	220	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
27	270	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
33	330	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
39	390	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
47	470	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
56	560	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
68	680	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
82	820	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
100	101	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
110	111	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
120	121	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
130	131	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
150	151	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
180	181	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
200	201	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
220	221	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
270	271	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
330	331	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
390	391	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
470	471	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
560	561	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
680	681	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
820	821	■	■	■	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
910	911	■	■	■	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
1000	102	■	■	■	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
1200	122	□	■	■	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
1500	152	□	■	■	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
1800	182	□	■	□	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2200	222	□	■	□	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2700	272	□	■	□	□	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3300	332	□	■	□	□	■	■	□	■	■	■	■	■	■	■	■	■	■	■	■	■
3900	392	□	■	□	□	■	■	□	■	■	■	■	■	■	■	■	■	■	■	■	■
4700	472	□	■	□	□	■	■	□	■	■	■	■	■	■	■	■	■	■	■	■	■
5600	562	□	■	□	□	■	□	□	■	■	■	■	■	■	■	■	■	■	■	■	■
6800	682	□	■	□	□	■	□	□	■	■	■	■	■	■	■	■	■	■	■	■	■
8200	822	□	■	□	□	■	□	□	■	■	□	■	■	■	■	■	■	■	■	■	■
10000	103	□	■	□	□	■	□	□	■	■	□	■	■	■	■	■	■	■	■	■	■
12000	123	□	□	□	□	■	□	□	■	■	□	■	■	■	■	■	■	■	■	■	■
15000	153	□	□	□	□	■	□	□	■	■	□	■	■	□	■	■	□	■	■	■	■
18000	183	□	□	□	□	■	□	□	■	■	□	■	■	□	■	■	□	■	■	■	■
22000	223	□	□	□	□	■	□	□	■	■	□	■	■	□	■	■	□	■	■	■	■
27000	273	□	□	□	□	□	□	□	■	■	□	■	■	□	■	■	□	■	■	■	■
33000	333	□	□	□	□	□	□	□	■	■	□	■	■	□	■	■	□	■	■	■	■
39000	393	□	□	□	□	□	□	□	■	■	□	■	■	□	■	■	□	■	■	■	■
47000	473	□	□	□	□	□	□	□	■	■	□	■	■	□	■	■	□	■	■	■	■
56000	563	□	□	□	□	□	□	□	■	■	□	■	■	□	■	■	□	■	■	■	■
68000	683	□	□	□	□	□	□	□	■	■	□	■	■	□	■	■	□	■	■	■	■
82000	823	□	□	□	□	□	□	□	■	■	□	■	■	□	■	■	□	■	■	■	■
100000	104	□	□	□	□	□	□	□	■	■	□	■	■	□	■	■	□	■	■	■	■
120000	124	□	□	□	□	□	□	□	□	□	□	■	■	□	■	■	□	■	■	■	■
150000	154	□	□	□	□	□	□	□	□	□	□	■	■	□	■	■	□	■	□	■	□
180000	184	□	□	□	□	□	□	□	□	□	□	□	□	□	■	■	□	■	□	■	□
220000	224	□	□	□	□	□	□	□	□	□	□	□	□	□	■	■	□	■	□	■	□

CCDA Equal MIL-PRF-55681/4/5



1. Capacitor characteristics and applications

1.1 FEATURES

- Size specification serial, suitable for surface mounting elements of hybrid integrated circuit or printed circuit;
- It has the characteristics of low loss, high electrical capacity stability and high reliability;
- Suitable for all kinds of equipment in the high frequency circuit, amplification circuit;

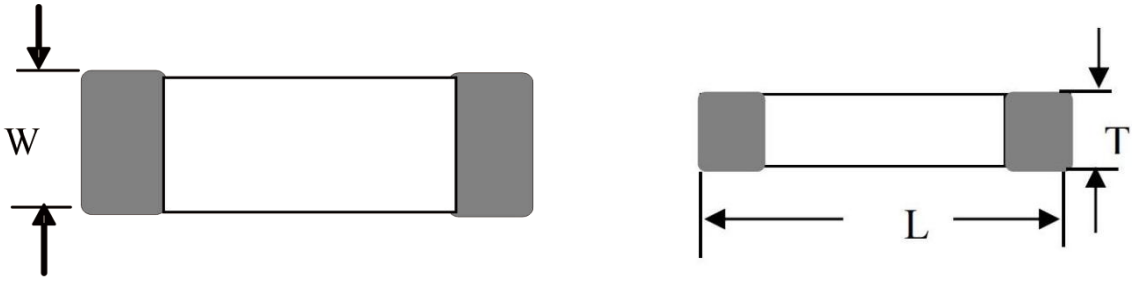
1.2 Main performance indicators

- Temperature coefficient: NPO: 0 ± 30ppm /℃
- Capacitance drift: no more than ± 0.2% or ± 0.05 pF, take the larger
- Loss angle tangent: not exceeding 0. 15% at a frequency of 1 MHz / 1 KHz
- Insulation resistance (25℃): 100000M Ω
- Medium voltage resistance (test surge current does not exceed 50mA): 2.5 UR
- Operating temperature: -55~125℃

2. Product model naming Specification

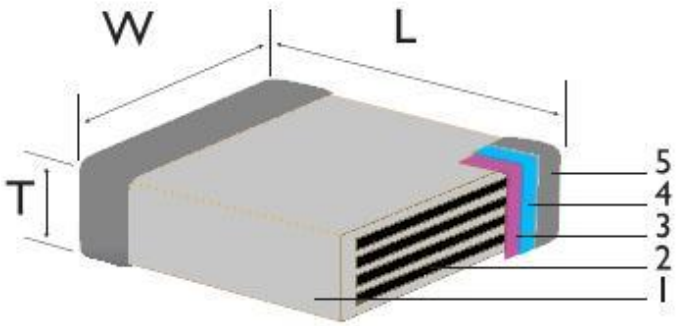
CCDA	0505	N	4R7	B	1H	Z	M
model	dimensions	characteristic	rated capacitance	Allowable deviation of the electrical capacitance	rated voltage	exit	failure rate level
CCDA: Class 1 porcelain dielectric capacitor	0505 1111 1812	N:0± 30ppm /C	The first and second digits represent significant numbers, and the last digit is the number of zeros that follow	B：±0.1pF C：±0.25pF D：±0.50pF J：±5% K：±10%	1H：50V 2A：100V 2R：150V 2D：200V	Base metal shield tin (tin / lead alloy with at least 3% lead)	≤ 1.0%/ 1000h

3. Product dimensions



model		Dimensions (mm)		
The British system said	Metric representation	L	W	T_{max}
0505	1212	$1.40^{+0.38}_{-0.25}$	1.40±0.38	1.45
1111	2828	$2.79^{+0.51}_{-0.25}$	2.79±0.38	2.59
1812	4532	4.50±0.40	3.20±0.30	3.10

Note: Products that meet customer requirements can be designed according to the special requirements of customers.



order number	name
1	ceramic dielectric
2	inner electrode
3	External electrode
4	nickel dam
5	Lead tin layer

4. Capacity range

4.1 0505 Specification capacity value table

0505 specification and value table

Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Capacity value code	Capacity value (pF)	accuracy	Maximum direct current operating voltage (V)
0R2	0.2	B ,C	200	1R9	1.9	B,C, D	200	9R1	9.1	B,C	200	510	51	F,G, J,K, M	150
0R3	0.3			2R0	2			100	10	F,G, J,K, M		560	56		
0R4	0.4			2R1	2.1			110	11			620	62		
0R5	0.5	B,C, D		2R2	2.2			120	12			680	68		
0R6	0.6			2R4	2.4			130	13			750	75		
0R7	0.7			2R7	2.7			150	15			820	82		
0R8	0.8			3R0	3			160	16			910	91		
0R9	0.9			3R3	3.3			180	18			101	100		
1R0	1			3R6	3.6			200	20			111	110		50
1R1	1.1			3R9	3.9			220	22			121	120		
1R2	1.2			4R3	4.3			240	24						
1R3	1.3			4R7	4.7			270	27						
1R4	1.4			5R1	5.1			300	30						
1R5	1.5			5R6	5.6			330	33						
1R6	1.6			6R2	6.2			360	36						
1R7	1.7			6R8	6.8			390	39						
1R8	1.8			7R5	7.5			430	43						
				8R2	8.2			470	47						

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4.2 1111 Specification capacity value table

1111 Specification capacity value table

Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Capacity value code	Capacity value (pF)	accuracy	Maximum direct current operating voltage (V)
0R2	0.2	B ,C	200	2R4	2.4	B,C, D	200	200	20	F,G, J,K, M	200	151	150	F,G ,J,K, M	200
0R3	0.3			2R7	2.7			220	22			161	160		
0R4	0.4			3R0	3			240	24			181	180		
0R5	0.5	B,C, D		3R3	3.3			270	27			201	200		
0R6	0.6			3R6	3.6			300	30			221	220		
0R7	0.7			3R9	3.9			330	33			241	240		
0R8	0.8			4R3	4.3			360	36			271	270		
0R9	0.9			4R7	4.7			390	39			301	300		150
1R0	1			5R1	5.1			430	43			331	330		100
1R1	1.1			5R6	5.6			470	47			361	360		
1R2	1.2			6R2	6.2			510	51			391	390		
1R3	1.3			6R8	6.8			560	56			431	430		50
1R4	1.4			7R5	7.5			620	62			471	470		
1R5	1.5			8R2	8.2			680	68						
1R6	1.6			9R1	9.1			750	75						
1R7	1.7			100	10	F,G, J,K, M		820	82						
1R8	1.8			110	11			910	91						
1R9	1.9			120	12			101	100						
2R0	2			130	13			111	110						
2R1	2.1			150	15			121	120						
2R2	2.2			160	16			131	130						
				180	18										

4.3 1812 Specification capacity value table

1812 Specification value table

Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Capacity value code	Capacity value (pF)	accuracy	Maximum direct current operating voltage (V)
0R5	0.5	B,C,D	200	4R3	4.3	B,C,D	200	330	33	F,G, J,K, M	200	241	240	F,G ,J, K, M	200
0R6	0.6			4R7	4.7			360	36			271	270		
0R7	0.7			5R1	5.1			390	39			301	300		
0R8	0.8			5R6	5.6			430	43			331	330		
0R9	0.9			6R2	6.2			470	47			361	360		
1R0	1			6R8	6.8			510	51			391	390		
1R1	1.1			7R5	7.5			560	56			431	430		
1R2	1.2			8R2	8.2			620	62			471	470		
1R3	1.3			9R1	9.1			680	68			511	510		150
1R5	1.5			100	10	F,G, J,K, M		750	75			561	560		
1R6	1.6			110	11			820	82			621	620		100
1R8	1.8			120	12			910	91			681	680		
2R0	2			130	13			101	100			751	750		
2R1	2.1			150	15			111	110			821	820		
2R2	2.2			160	16			121	120			911	910		50
2R4	2.4			180	18			131	130			102	1000		
2R7	2.7			200	20			151	150			112	1100		
3R0	3			220	22			161	160			122	1200		
3R3	3.3			240	24			181	180						
3R6	3.6			270	27			201	200						
3R9	3.9			300	30			221	220						

5. Technical requirements and test conditions

5.1 Conventional electrical performance

<table>
<tr><th>project</th><th>technical specifications</th><th colspan="6">test method</th></tr>
<tr><td>operating temperature range</td><td>(-55 ~ +125)℃</td><td colspan="6"></td></tr>
<tr><td>surface</td><td>no significant defect</td><td colspan="6">eyeballing</td></tr>
<tr><td rowspan="3">Electrostatic capacity of Capacitance</td><td rowspan="3">Within the specification error range</td><td>nominal capacity</td><td>Test frequency</td><td>test voltage</td><td colspan="2">ambient temperature</td></tr>
<tr><td>≤1000pF</td><td>1MHz (±10%)</td><td rowspan="2">(1.0±0.2)Vrms</td><td colspan="2" rowspan="2">(25±2)℃</td></tr>
<tr><td>>1000pF</td><td>1KHz (±10%)</td></tr>
<tr><td>loss tangent (DF)</td><td>The frequency is Not at 1 MHz / 1 KHz Over 0. 15%</td><td colspan="6">Test method: the same as the "static electricity capacity"</td></tr>
<tr><td rowspan="3">insulation resistance (I .R). Insulation Resistance</td><td rowspan="3">≥100000M Ω</td><td>rated voltage</td><td>test voltage</td><td>testing time</td><td>Charge and discharge current</td><td>environment</td></tr>
<tr><td>Ur <1000V</td><td>U r</td><td>(60±5) sec</td><td>≤50mA</td><td rowspan="2">temperature (25±2)℃ Humidity was <75%</td></tr>
<tr><td>Ur ≥1000V</td><td>1000V</td><td>(60±5) sec</td><td>≤50mA</td></tr>
<tr><td rowspan="2">Electric resistance strength of the medium (D .W .V).</td><td rowspan="2">Media should not be broken down or damaged</td><td>rated voltage</td><td>test voltage</td><td>duration</td><td colspan="2">Charge and discharge current</td></tr>
<tr><td>All voltage</td><td>2.5Ur</td><td>5 Seconds</td><td colspan="2">≤50mA</td></tr>
<tr><td rowspan="8">Capacity temperature coefficient or temperature characteristics</td><td rowspan="8">C 0G : (0±30) ppm /℃</td><td colspan="6">The following temperature order, 30min after temperature stability (△ C to T 3)</td></tr>
<tr><td>step</td><td colspan="5">temperature (℃)</td></tr>
<tr><td>T 1</td><td colspan="5">25±2</td></tr>
<tr><td>T 2</td><td colspan="5">Lower limit Category temperature (-55 ± 3)</td></tr>
<tr><td>T 3</td><td colspan="5">25±2</td></tr>
<tr><td>T 4</td><td colspan="5">Upper limit Category temperature (125 ± 2)</td></tr>
<tr><td>T 1</td><td colspan="5">25±2</td></tr>
<tr><td rowspan="3">Solder ability</td><td rowspan="3">surface</td><td rowspan="3">No visible damage, injury, on tin rate of 95%</td><td colspan="5">Absolve the capacitor in ethanol and rosin (25% weight) solution, remove the temperature at (80~120) ℃ (10-30) seconds, and soak the solder solution.</td></tr>
<tr><td colspan="5">Tin immersion temperature: (245 ± 2) ℃; tin immersion speed: (25 ± 0.25) mm / sec</td></tr>
<tr><td colspan="5">Tin immersion time: (5 ± 0.5) sec</td></tr>
<tr><td colspan="7">remarks:
When testing the dielectric power resistance strength of the capacitor, in order to eliminate the influence of the external environment, when the test voltage exceeds 2000 Vdc, then the capacitor should be soaked in insulating oil for testing.</td></tr>
</table>

5.2 Quality consistency test

Quality consistency test is A group A test, consisting of the following table and performed in the order shown. Equal MIL-PRF-55681/4/5

divide into groups	inspecting item	Requires the chapter number	Test method chapter number	sampling plan
A divide into groups	Voltage treatment	3.8 in ZZR-Q / CT 20003-2018	4.5.3 in GJB 192B-2011	100%
A divide into groups	Insulation resistance (125℃)	3.11 in ZZR-Q / CT 20003-2018	4.5.6 in GJB 192B-2011	In accordance with GJB 192B-2011 Table 6
A divide into groups	Visual and mechanical inspection	3.3 in ZZR-Q / CT 20003-2018, .4.1 3，3.28 ， 3.29	4.5.2 in GJB 192B-2011	In accordance with GJB 192B-2011 Table 6
A divide into groups	solder ability	3.15 in ZZR-Q / CT 20003-2018	4.4.2 in GJB 192B-2011	13 samples, and 0 failed

6.2.1 A1 group ——, voltage treatment

100% test, requirements: when appropriate, can select voltage processing screening.
Test temperature:125_{0}^{+4}℃；
Test time:96_{0}^{+4}hour;
Applied voltage: $2U_R$

6.2.2 A2 block —— Insulation Resistance (125℃)

Sampling test according to the requirements in Table 6 in GJB 192B-2011,

Test temperature: 125_{0}^{+4}℃；
test voltage U_C： $U_C = U_R$ (U_R<1000V)；
Applied voltage time: (60 ± 5) seconds.

6.2.3 A3 group —— appearance and mechanical inspection

Sampling test according to the requirements in Table 6 in GJB 192B-2011, The size suitable for the gauge inspection shall be inspected;
Visual inspection of the sheet capacitor under a microscope (10 times magnification): No cracks and cracks, layering, and electrode exposure are allowed on the surface of the capacitor.

6.2.4 A4 grouping —— soldability

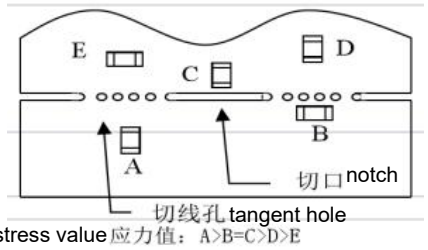
Draw 5 products from each batch;

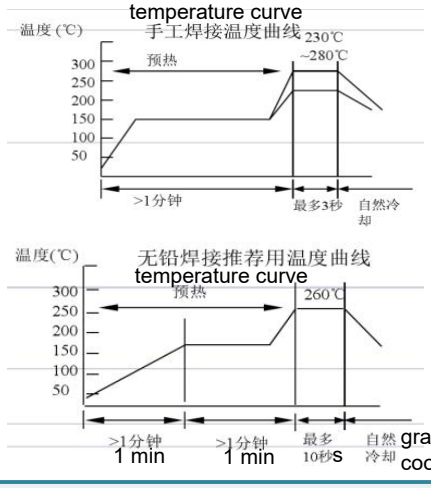
Test conditions: the lead end of the capacitor continues in the welding tin groove of (245 ± 2) ℃ (5 ± 0.5) S;

Requirements: After testing, perform a visual inspection with a 10 x magnification lens. The surface of the lead end should be 95% evenly stained with tin, tin layer continuous. The remaining 5% allows only very small pinholes and no defects with solder immersion, but should not be concentrated in one area.

6. Notes for use

Notes for MLCC
1. Notes before use:
The MLCC chip may be damaged under the harsh working environment or the external mechanical overpressure described in the relevant instructions in this admission letter, so first considering the relevant conditions in this admission letter.
2. The recommended layout **of the PC board design**
2.1 The amount of solder used will affect the ability of the chip to resist mechanical stress, which may lead to the breakage or cracking of MLCC. Therefore, when designing the substrate, we must carefully consider the size and configuration of the welding pad, which has a decisive role in the amount of the solder composed of the substrate.
2.2 When designing the position of the pad and SMD MLCC, the stress shall be reduced to the lowest point, and the MLCC shall be installed in the least affected position on the PC plate.
3. Automatic installation should consider the problems
If the suction tube drops beyond the minimum limit, it will produce excessive pressure on the MLCC, which will cause the MLCC rupture. When lowering the tube, pay attention to the following points:
3.1 After correcting the deviation of the PC plate, the low limit of the suction tube should be adjusted to the surface horizontal position of the PC plate.
3.2 The suction pressure shall be adjusted between 1 and 3N.
3.3 In order to reduce the deformation degree of the PC plate caused by the impact force of the suction, the support nail shall be placed under the PC plate.
4. Welding
4.1 MLCC is a combination of ceramic and metal. As a ceramic body, especially the large size ceramic body, its thermoplasticity is poor, the response to heat is relatively slow, by the cold and hot, the ceramic body is easy to crack. It is recommended to conduct continuous preheating for more than 1 minute before welding.
The interior of the 4.2 MLCC is a metal electrode, which is very thermoplastic and responds responsive to heat. Therefore, in the case of heat, the metal part and the ceramic part must have a certain degree of inconsistent expansion, resulting in internal stress, easy to cause porcelain cracking. It is recommended to conduct continuous preheating for more than 1 minute before welding.
4.3 For manual welding, the maximum diameter of the tip with constant temperature iron is 1.0mm and the maximum power is 25 watts; the iron cannot directly touch the MLCC element.
5. Cleaning
5.1 The temperature difference between the components and the cleaning process shall not be greater than 100℃.
5.2 In the case of ultrasonic cleaning, if the output power is too large, the PC plate will withstand excessive vibration, which will cause the MLCC or welding point to crack, or reduce the strength of the end electrode. Therefore, special attention should be paid to the following points:
Ultrasonic output: less than 20W / L; ultrasonic frequency: less than 40 KHz; ultrasonic cleaning time: 5 minutes or less
6. Cut the PC plate
6.1 After installing the MLCC and other components, note that any force should be applied to the PC board. MLCC cannot tolerate excess
6.2 The segmentation of the board cannot be divided by hand, and appropriate equipment should be used.
7. Storage method
To maintain the weldability of the end electrodes and to keep the packaging materials in good condition, the recommended storage conditions are as follows:
Storage temperature: (5-40) ℃; storage relative humidity: (20-70)% RH
The MLCC end weldability decreases over time even when stored under ideal storage conditions, so the MLCC should be used within 6 months from the date of shipment.





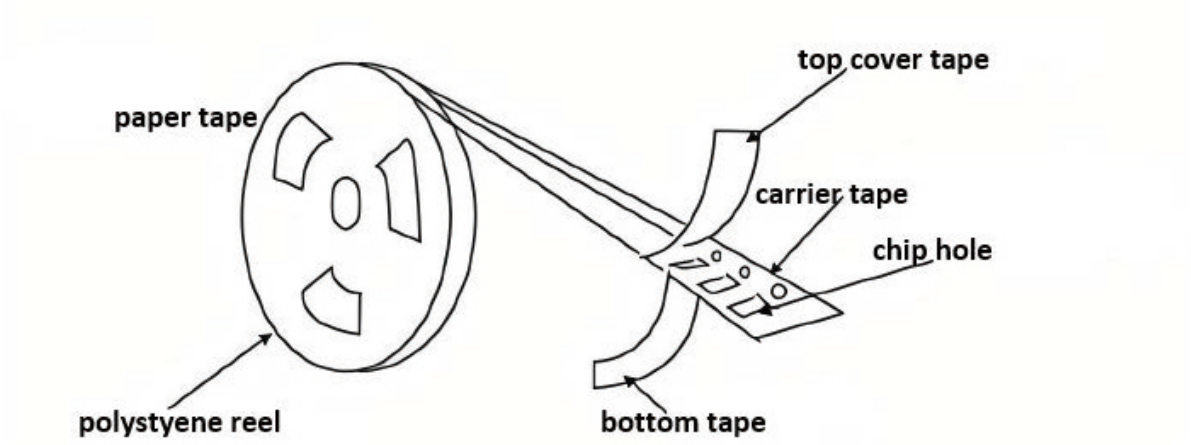
7. Product packaging

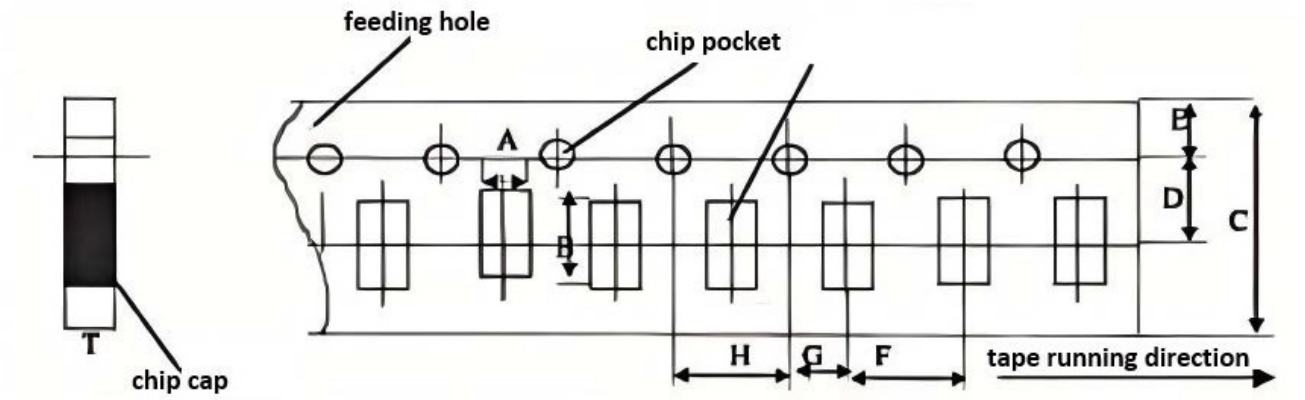
7.1 bags in bulk

specifications	bulk	remarks
0505	5000	Packaging form and quantity can be determined according to the customer's requirements
1111	2000	
1812	50	

7.2 Paper tape packaging

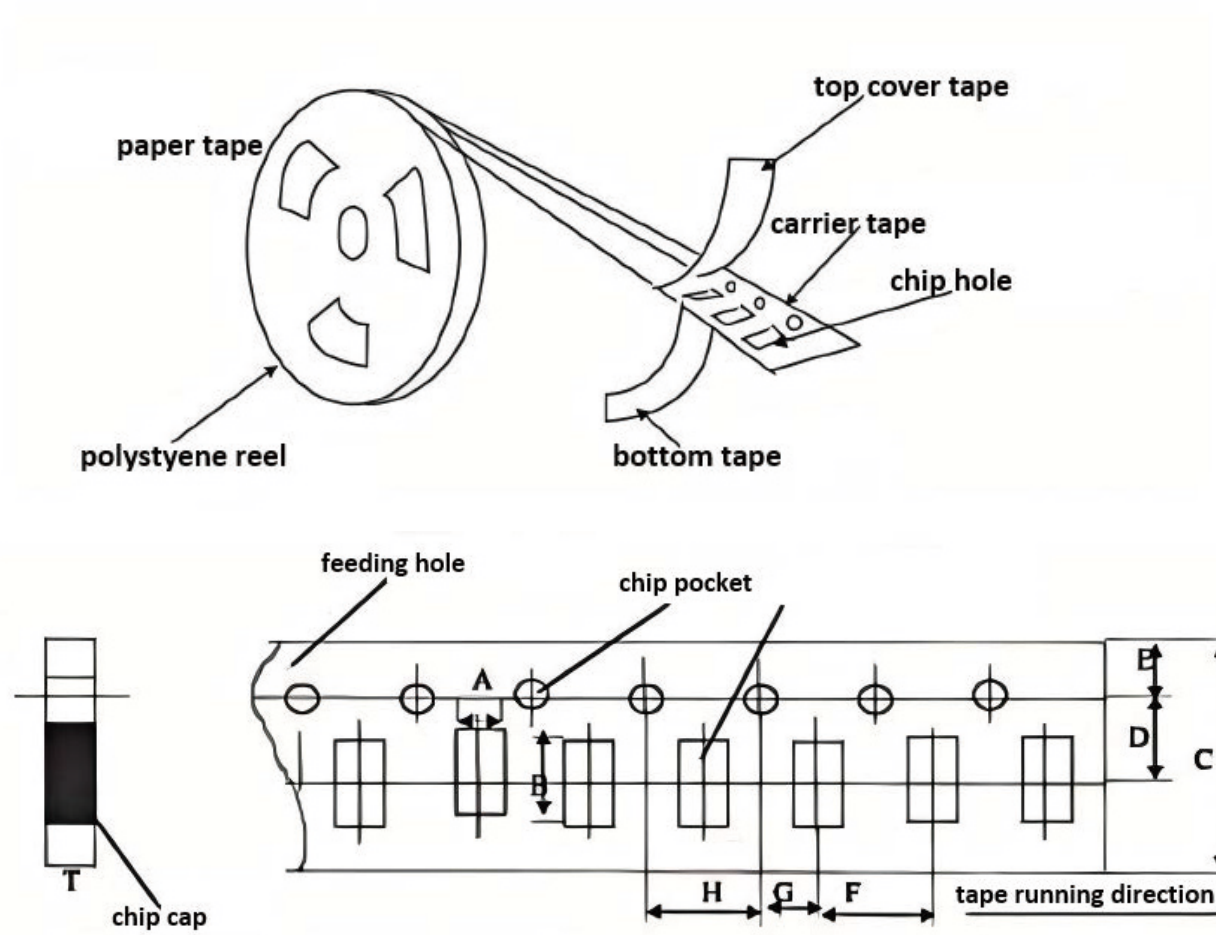
7.2.1Paper tape coil structure





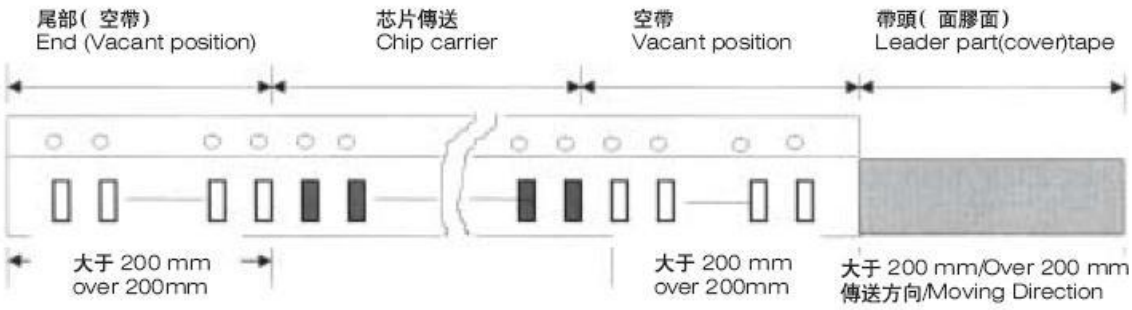
7.3 Plastic tape packaging

7.3.1 Plastic tape coil structure



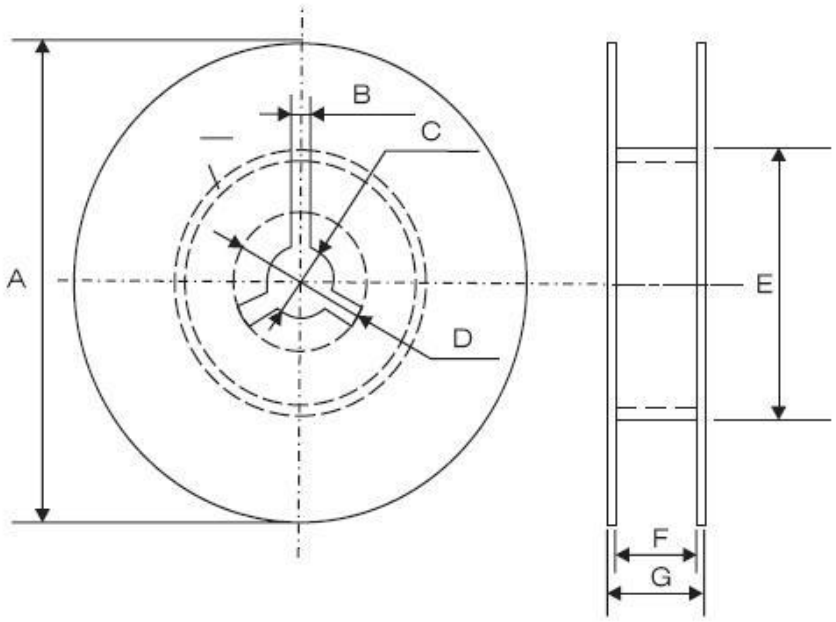
7.4 Front and rear structure of the conveyor belt

*傳送帶的前后結構
Structure of leader part and end part of the carrier paper



7.5 Reel dimensions

*卷盘尺寸 Reel Dimensions (unit:mm)



A	B	C	D	E	F	G
Φ 178.00±2.00	3.00	Φ13.00±0.50	Φ21.00±0.80	Φ 50.00 or greater	10.00±1.50	12Max
Φ 330.00±2.00	3.00	Φ13.00±0.50	Φ21.00±0.80	Φ 50.00 or greater	10.00±1.50	12Max

7.6 Ribbon preparation method

8.6.1 The belt of the packaging capacitor is wound clockwise. When the belt is pulled from the top to the down direction, the transfer hole is on the right side of the belt.

8.6.2 For the front end of the strip, leave at least 5 spaced strips.

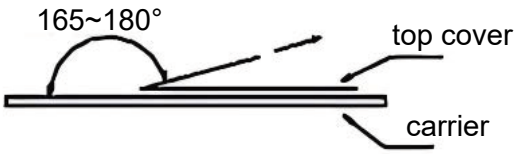
.38.6 When compiling the belt, the lead belt part or blank part must be reserved according to the figure below.

8.6.4 The number of product errors in the installation of the disk must be less than 0. 1% of the number or 1 per disk, discontinuous errors.

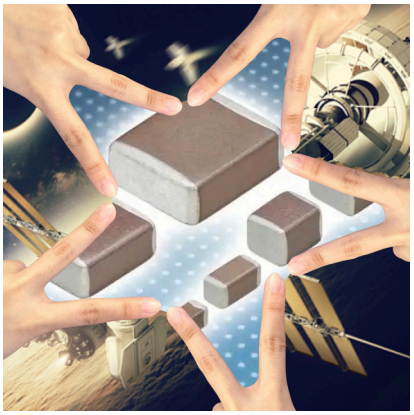
8.6.5 The upper and lower tape shall not exceed the edge of the tape and shall not block the transfer hole.

8.6.6 The cumulative error of the transmission hole is 10 spacing: ± 0.3 mm.

8.6.7 The stripping moment of the upper tape shall be within 0.1 to 0.7 Newton as shown in the following below.



CCAE



■ Characteristics and Applications

- ◆ Square, without outer sealing layer, suitable for surface mounting;
- ◆ The medium is Class I ceramic, with good frequency characteristics and high capacitance stability;
- ◆ Each batch of products undergoes 100% temperature shock screening and high-temperature electrical load screening;
- ◆ Suitable for resonant circuits, coupling circuits, and circuits that require low loss, high capacitance stability, and high insulation resistance in various military electronic devices.

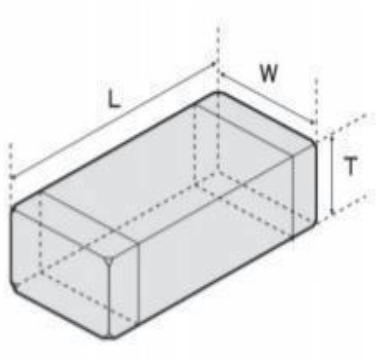
■ Part number Example

CCAE	0805	CG	101	J	1H	J
Series	**External dimensions**	**Temperature coefficient**	**capacitance**	**Tolerance**	**Rated voltage**	**Quality Grade**
SMD MLCC	Size code	CG:0±30ppm/℃ H:0±60ppm/℃ -55~+125℃	Numerical method, 101 is 100pF	According to the table below	0J 6.3V 1A 10V 1C 16V 1D 20V 1E 25V 1H 50V 1J 63V 2A 100V	According to the table below

■ Comparison Table of Quality Levels and Execution Standards

Quality Grade	Quality grade code	Implement detailed specifications	Refer to the general standard for execution
Seven specialties plus	G+	QJ/PWV411-2012 I dielectric QJ/PWV412-2012 II dielectric	QZJ840624 Ceramic Capacitor "Seven Specialized" Technical Conditions
Seven specialties	G	QJ/PWV415-2012 I dielectric QJ/PWV416-2012 II dielectric	QZJ840624 Ceramic Capacitor "Seven Specialized" Technical Conditions
Military screening	S	QJ/PWV401-2010 I dielectric QJ/PWV402-2010 II dielectric	GJB192A-1998
General military	J	QJ/PWV419-2012 I dielectric QJ/PWV420-2012 II dielectric	GJB192A-1998

Size Code	Dimensions mm		
	L	W	Tmax
0402	1.00±0.15	0.50±0.05	0.55
0603	1.60±0.15	0.80±0.15	0.95
0805	2.00±0.20	1.25±0.20	1.40
1206	3.20±0.20	1.60±0.20	1.90
1210	3.20±0.40	2.50±0.30	2.80
1812	4.50±0.50	3.20±0.40	3.50
2220	5.70±0.50	5.00±0.50	5.20
2225	5.70±0.50	6.30±0.50	6.20
3035	7.60±0.60	6.30±0.60	6.20



■ Temperature coefficient

Temperature coefficient	Nominal temperature coefficient	Working temperature range
COG/NPO / CG / N	0±30 ppm/℃	-55℃~+125℃
COH / H	0± 60 ppm/℃	-55℃~+125℃
X7R / B	±15%	-55℃~+125℃
X7S / K	±22%	-55℃~+125℃
X7T / C	+22% ~ -33%	-55℃~+125℃
X6S / Q	±22%	-55℃~+105℃
X6T / D	+22% ~ -33%	-55℃~+105℃
X5R / X	±15%	-55℃~+85℃
2R1 / E	±15%	-55℃~+125℃
2R2 / G	±15%	55℃~+85℃
2C1 / P	±20%	-55℃~+125℃
2C2 / V	±20%	-55℃~+85℃
2X1 / W	±15%	-55℃~+125℃

■ Allowabledeviationof capacitance

Capacitance range	Allowable deviation range	code
0.1 pF~0.9 pF	±0.10pF、±0.25pF、±0.50pF	B、C、D
1.0 pF~8.2 pF	±0.10pF、±0.25Pf ±0.50pF、±1%	B、C、D、F
C_R≥10pF	±1%	F
	±2%	G
	±5%	J
	±10%	K
	±20%	M

I dielectric	Test conditions	performance index
Capacitance C_R	Test frequency: C_R≤1000pF, 1MHz ± 10%; C_R > 1000pF, 1KHz ± 10% Test voltage:1.0V ± 0.2Vrms	When C_R≥ 50pF, tg δ≤ 15×10^{-4} When C_R< 50pF, tgδ≤$1.5x(150/C_R+7)x10^{-4}$
Tangent of the loss Angle Tgδ		
Insulation resistance IR	Test voltage: ratedvoltage U_R; Test time:1min±5s	IR ≥ $1x10^5$ MΩ or 1000 · μ F, whichever is smaller
Voltage endurance	Test voltage: 2.5U_R; Test time: 5s±1s	No breakdown, arcing or visible damage

II dielectric	Test conditions	performance index
Capacitance C_R	C_R ≤10uF1KHz ± 10%;1.0V ± 0.2Vrms; 10uF< C_R< 470uF 120Hz ± 10% 0.5V ± 0.2Vrms; 470uF≤ C_R＜2000uF 50Hz ± 10% 0.5V±0.1Vrms; 2000uF≤ C_R≤4700uF 25Hz±10% 0.25V±0.1Vrms;	1,size ≤ 0603 or CR≥1uFtgδ≤$1200x10^{-4}$ 2, U_R ≤16V tgδ≤$1000x10^{-4}$ 16V < U_R ≤50V tgδ ≤ $500x10^{-4}$ 50V < U_R ≤200V tgδ ≤ $250x10^{-4}$ 3, C_R ≥ 100uF tgδ ≤ $1500x10^{-4}$
Insulation resistance IR	Test voltage: ratedvoltage U_R; Test time:1min±5s	C_R<0.47uF IR≥$1x10^4$MΩ or 500 MΩ · μF, the lesser C_R ≥0.47uF IR≥100 MΩ · μF,
Voltage endurance	Test voltage: 2.5U_R; Test time: 5s±1s	No breakdown, arcing or visible damage

I dielectric CG、CH capacitance sheet

size		0402	0603			0805			1206			1210			1812			2220		2225	
CR	UR(V)	50	50	100	200	50	100	200	50	100	200	50	100	200	50	100	200	50	100	50	100
CAP(pF)	code																				
0.5	OR5	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
1.0	1RO	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
1.2	1R2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
1.5	1R5	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
1.8	1R8	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
2.2	2R2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
2.7	2R7	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
3.3	3R3	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
3.9	3R9	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
4.7	4R7	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
5.6	5R6	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
6.8	6R8	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
8.2	8R2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
10	100	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
12	120	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
15	150	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
18	180	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
22	220	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
27	270	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
33	330	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
39	390	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
47	470	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
56	560	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
68	680	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
82	820	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
100	101	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
110	111	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
120	121	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
130	131	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
150	151	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
180	181	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
200	201	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
220	221	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
270	271	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
330	331	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
390	391	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
470	471	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
560	561	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
680	681	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
820	821	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
910	911	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
1000	102	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
1200	122		■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
1500	152		■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
1800	182		■			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2200	222		■			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2700	272		■			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3300	332		■			■	■		■	■	■	■	■	■	■	■	■	■	■	■	■
3900	392		■			■	■		■	■	■	■	■	■	■	■	■	■	■	■	■
4700	472		■			■	■		■	■	■	■	■	■	■	■	■	■	■	■	■
5600	562		■			■			■	■	■	■	■	■	■	■	■	■	■	■	■
6800	682		■			■			■	■	■	■	■	■	■	■	■	■	■	■	■
8200	822		■			■			■	■		■	■	■	■	■	■	■	■	■	■
10000	103		■			■			■	■		■	■	■	■	■	■	■	■	■	■
12000	123					■			■	■		■	■	■	■	■	■	■	■	■	■
15000	153					■			■	■		■	■		■	■		■	■	■	■
18000	183					■			■	■		■	■		■	■		■	■	■	■
22000	223					■			■	■		■	■		■	■		■	■	■	■
27000	273								■	■		■	■		■	■		■	■	■	■
33000	333								■	■		■	■		■	■		■	■	■	■
39000	393								■	■		■	■		■	■		■	■	■	■
47000	473								■	■		■	■		■	■		■	■	■	■
56000	563								■	■		■	■		■	■		■	■	■	■
68000	683								■	■		■	■		■	■		■	■	■	■
82000	823								■	■		■	■		■	■		■	■	■	■
100000	104								■	■		■	■		■	■		■	■	■	■
120000	124											■	■		■	■		■	■	■	■
150000	154											■	■		■	■		■		■	
180000	184											■	■		■	■		■		■	
220000	224											■	■		■	■		■		■	

II dielectric capacitance sheet

Size		0402							0603								0805								1206							
C_R \ U_R(V)		6.3	10	16	25	35	50	100	6.3	10	16	25	35	50	100	200	6.3	10	16	25	35	50	100	200	6.3	10	16	25	35	50	100	200
Cap(pF)	Code																															
220	221																															
270	271																															
330	331																															
390	391																															
470	471																															
560	561																															
680	681																															
820	821																															
1000	102																															
1200	122																															
1500	152																															
1800	182																															
2200	222																															
2700	272																															
3300	332																															
3900	392																															
4700	472																															
5600	562																															
6800	682																															
8200	822																															
10000	103																															
12000	123																															
15000	153																															
18000	183																															
22000	223																															
27000	273																															
33000	333																															
39000	393																															
47000	473																															
56000	563																															
68000	683																															
82000	823																															
100000	104			M	M		M																									
150000	154		M	M	M		M																									
220000	224	M	M	M	M		M																									X7T
270000	274	M	M	M	M																											
330000	334	M	M	M	M	M																										
470000	474	M	M	M	M	M	M		M	M	M	M	M	M																		
680000	684	M	M	M	M	M			M	M	M	M	M	M																		
1000000	105	M	M	M	M	M	M		M	M	M	M	M	M																		
1500000	155	M	M	M	M	M			M	M																					M	
2200000	225	M	M	M	M	M			M	M	M	M	M	M																	M	
3300000	335	M	M						M	M	M	M										M									M	
4700000	475	M	M						M	M	M	M	M				M	M	M	M		M			M							
6800000	685	M							M	M	M	M					M	M	M	M												
10000000	106	M							M	M	M	M	M				M	M	M	M	M				M	M	M	M	M	M		
15000000	156								M	M							M	M	M	M	M				M	M	M	M	M			
22000000	226								M	M							M	M	M	M	M				M	M	M	M	M			
33000000	336																M	M							M	M	M	M				
47000000	476								M								M	M							M	M	M	M				
68000000	686																								M	M						
100000000	107																M								M	M						
150000000	157																								M							
220000000	227																								M							
330000000	337																															
470000000	477																															

X7R X5R X6S X7T X7S M , tolerance ±20%

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II dielectric capacitance sheet

Size		1210									1812									2220						2225		3025		
C_R \ U_R(V)		4	6.3	10	16	25	35	50	100	200	4	6.3	10	16	25	35	50	100	200	16	25	35	50	100	200	50	100	16	25	50
Cap (pF)	Code																													
2200	222																													
2700	272																													
3300	332																													
3900	392																													
4700	472																													
5600	562																													
6800	682																													
8200	822																													
10000	103																													
12000	123																													
15000	153																													
18000	183																													
22000	223																													
27000	273																													
33000	333																													
39000	393																													
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150000	154																													
220000	224																													
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330000	334																													
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680000	684																													
1000000	105																													
1500000	155																													
2200000	225																													
3300000	335																													
4700000	475											M	M	M	M		M	M												
6800000	685											M	M	M	M		M						M	M						
10000000	106		M	M	M	M	M	M				M	M	M	M	M	M					M	M	M						
15000000	156		M	M	M	M		M				M	M	M	M							M	M	M						
22000000	226		M	M	M	M	M					M	M	M	M							M	M							M
33000000	336		M	M		M						M	M	M						M										
47000000	476		M	M	M	M					M	M	M	M						M	M	M								
68000000	686		M								M	M	M								M									
100000000	107	M	M	M	M						M	M	M								M							M		
150000000	157	M	M																											
220000000	227	M	M																											
330000000	337	M	M																											
470000000	477										M																			

X7R X5R X6S X7T X7S

M, tolerance ±20% only

CCAF



1， Feature

◆Chip structure, suitable for surface mount；
◆National military standard；
◆Each batch is DPA, and 100% of the products are screened for temperature shock and high temperature load。

2， Application

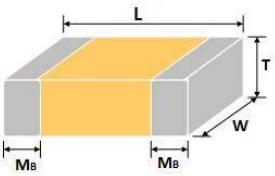
I dielectric： Resonant circuits, coupling circuits and circuits requiring low loss, high capacitance stability and high insulation resistance
II dielectric: Circuits with bypass, filter, low frequency coupling or low requirements for loss and capacitance stability

3, Part number sample

CCAF	0805	CG	101	J	1H	6
series	size code	temperature coefficient	Capacitance code	tolerance code	voltage code	failure rate class

6 failure rate class 6 / **5** failure rate class 5 aerospace technology

size code（unit：mm）

outline	size	0402	0603	0805	1210	1812
 unit：mm	L	1.00±0.10	1.60±0.15	2.00±0.30	3.20±0.40	4.50±0.50
	W	0.50±0.10	0.80±0.15	1.25±0.20	2.50±0.30	3.20±0.40
	T max	0.60	1.00	1.50	2.80	3.50
	size	2220	2225	3025	/	/
	L	5.70±0.50	5.70±0.50	7.50±0.50	/	/
	W	5.00±0.50	6.50±0.50	6.30±0.50	/	/
	T max	5.10	5.10	5.00	/	/
	M_B	0.95±0.30	0.95±0.30	0.50±0.50	/	/

temperature coeffient

series	temperature coeffient/code	Allow capacitance change without U_R	Allow capacitance change with U_R	temperature range
CCAF	COG/ CG BC/Z BP/L	0±30ppm/℃	/	-55℃~125℃
	BX / O	±15%	+15/-25%	-55℃~125℃
	BR / Y	±15%	+15/-40%	-55℃~125℃
	BY / M	±15%	/	-55℃~125℃

rated voltage

0J 6.3V, 1A 10V, 1C 16V, 1D 20V, 1E 25V, 1H 50V, 1J 63V, 2A 100V, 3A 1000V……

termination

Nickel Barrier

capacitance markmethod

It is marked with three digits，The first two digits mark the effective value of the electrical capacity，The third digit mark the number of zeros after the valid value，unit pF，for exmaple：101=100pF(0.1nF) 103=10000pF(10nF)

Capacitance tolerance

I dielectric	C_R＜10pF	B:±10pF	C:±0.25pF
		D： ±0.5pF	/
	C_R≥10pF	F:±1%	G:±2%
		J:±5%	K:±10%
II dielectric		K:±10%	M:±20%

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dielectric capacitance sheet

size	0402			0603			0805			1210			1812			2220			2225		
Cr \ Ur(V)	25	50	100	25	50	100	25	50	100	25	50	100	25	50	100	25	50	100	25	50	100
0R5																					
1R0																					
1R2																					
1R5																					
1R8																					
2R2																					
2R7																					
3R3																					
4R7																					
5R6																					
6R8																					
8R2																					
100																					
120																					
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333																					
473																					
563																					
683																					
823																					
104																					

BC

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II dielectric capacitance sheet

size	0402		0603			0805			1210			1812			2220			2225			3025	
Cr \ Ur(v)	25	50	25	50	100	25	50	100	25	50	100	25	50	100	25	50	100	25	50	100	50	100
101																						
121																						
151																						
181																						
221																						
271																						
331																						
391																						
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124																						
154																						
184																						
224																						
274																						
334																						
474																						
568																						
684																						
824																						

BX BY BR

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II dielectric capacitance sheet

size	0805		1210					1812					2220				
Cr \ Ur(V)	25	50	250	500	630	1000	2000	250	500	630	1000	2000	250	500	630	1000	2000
100	■	■	■	■	■	■	■	■	■				■	■			
120	■	■	■	■	■	■	■	■	■				■	■			
150	■	■	■	■	■	■	■	■	■				■	■			
180	■	■	■	■	■	■	■	■	■				■	■			
220	■	■	■	■	■	■	■	■	■				■	■			
270	■	■	■	■	■	■	■	■	■				■	■			
330	■	■	■	■	■	■	■	■	■				■	■			
390	■	■	■	■	■	■	■	■	■				■	■			
470	■	■	■	■	■	■	■	■	■				■	■			
560	■	■	■	■	■	■	■	■	■				■	■			
680	■	■	■	■	■	■	■	■	■				■	■			
820	■	■	■	■	■	■	■	■	■				■	■			
101	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
121	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
151	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
181	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
221	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
271	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
331	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
391	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
471	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
561	■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■
681	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
821	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
102	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
122	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
152	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
182	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
222	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
272	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
332	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
392	■	■	■	■	■	■	■	■	■				■	■			
472	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
562	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
682	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
822	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■
103													■	■			

■ BC/BP/CG

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II dielectric capacitance sheet

size	0805			1210						1812							2220						
Cr \ Ur (V)	250	500	630	200	250	500	630	1000	2000	200	250	500	630	1000	2000	3000	200	250	500	630	1000	2000	3000
101																							
121																							
151																							
181																							
221																							
271																							
331																							
391																							
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334																							
474																							
564																							
684																							
824																							
105																							

2R1　　BY、2R1

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CCHQ



1. Capacitor characteristics and applications

1.1 FEATURES

- Size specification serial, suitable for surface mounting elements of hybrid integrated circuit or printed circuit;
- With high Q value, low ESR and high reliability characteristics;
- Low loss, high capacitance stability, the maximum working frequency up to 3GHz;
- Suitable for high frequency circuit, VHF-microwave section, radio frequency and amplifier circuit in all kinds of equipment;

1.2 Main performance indicators

- Temperature coefficient: NPO: 0 ± 30ppm /℃
- Capacitance drift: no more than ± 0.2% or ± 0.05 pF, take the larger one.
- Quality factor (Q value): greater than 2,000 when the frequency is 1 MHz / 1 KHz
- Insulation resistance: at 20℃: 100000M Ω
- Operating temperature: -55~125℃

2. Product model name

2.1 Specifications

CCHQ	2525	NPO	3RO	B	2D	N	T
Product appearance	size specifications	Media types	Nominal capacity (in pF)	Error level	rated voltage	tip type	pack form
CCHQ: High Q RF capacitor	0603 0708 0709 0805 0505 1111 2525 3838	NPO : 0 ±30ppm/℃	The first two digits are valid numbers, and the latter digit is 10 The power number of;	A :±0.05pF B :±0.10pF C :±0.25pF D :±0.50pF F :±1.0% G :±2.0% J :±5.0%	0J=6.3V 1A=10V 1C=16V 1D=20V 1E=25V 1V=35V 1H=50V 2H=500V 3H=5000V...	N: three-layer plating; S: all silver terminal	T: tape packaging; Bor vacancy:, loose packaging

2.2 Corresponding relationship between Jinpei product series and ATC product series

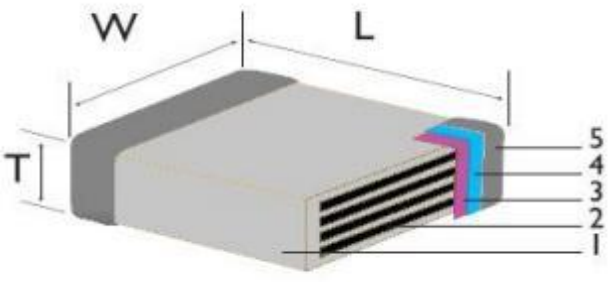
Jinpe i Series of specifications	Corresponding to the ATC series specifications
CCHQ-0603	ATC 600S
CCHQ-0805	ATC 600F
CCHQ-0505	ATC 100A /ATC 700A
CCHQ - 1111	ATC 100B
CCHQ-2525	ATC 100C
CCHQ-3838	ATC 100E

3. Product dimensions



model		Dimensions (mm)		
The British system said	Metric representation	L	W	T_{max}
0603	1608	1.52±0.25	0.76±0.25	1.01
0708	1821	1.78±0.15	2.03±0.25	3.04
0709	1823	1.78±0.25	2.29±0.25	2.92
0805	2012	2.00±0.25	1.25±0.25	1.45
0505	1212	$1.40^{+0.38}_{-0.25}$	1.40±0.38	1.45
1111	2828	$2.79^{+0.51}_{-0.25}$	2.79±0.38	2.59
2525	6363	$5.84^{+0.51}_{-0.25}$	6.35±0.38	3.68
3838	9696	$9.65^{+0.38}_{-0.25}$	9.65±0.25	4.50

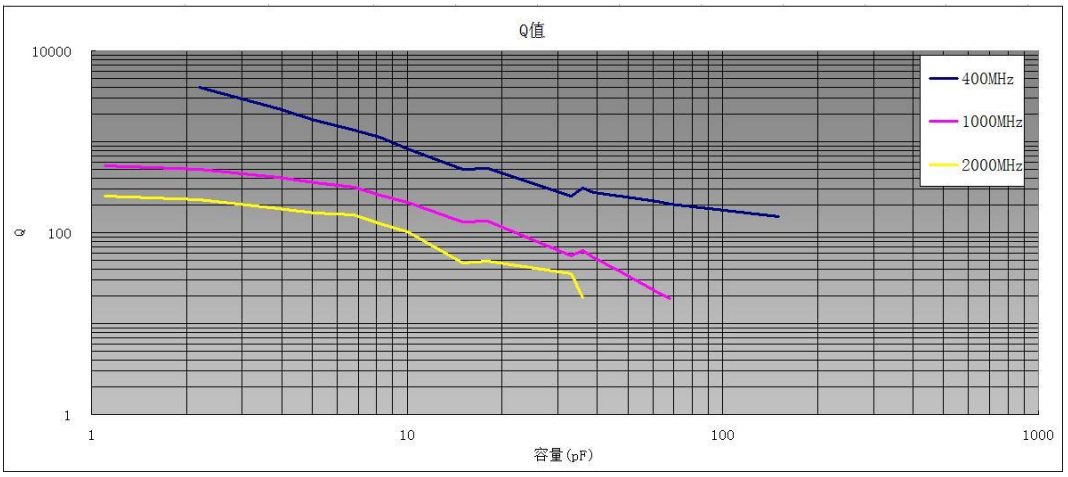
Note: Products that meet customer requirements can be designed according to the special requirements of customers.



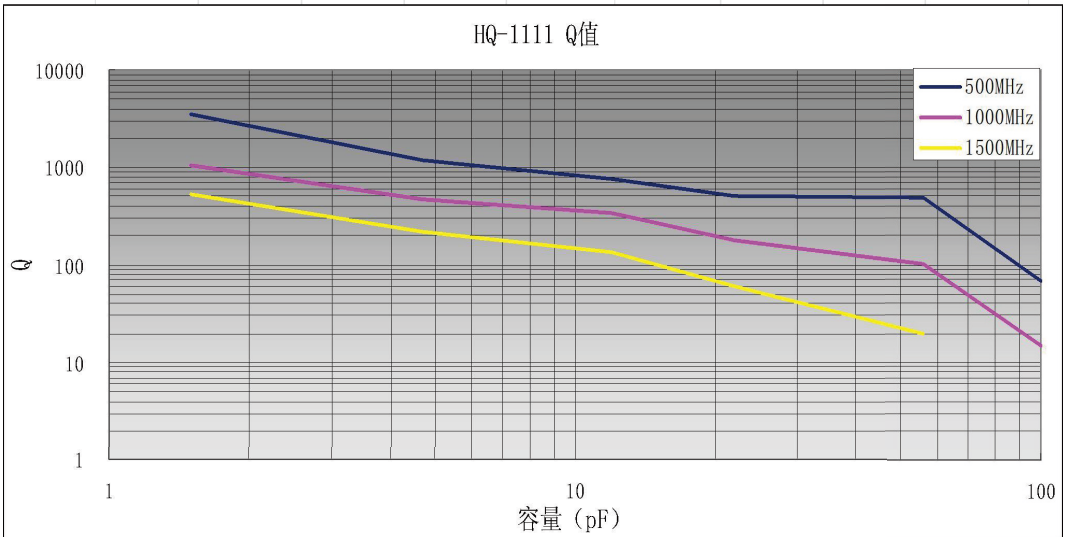
order number	name
1	ceramic dielectric
2	inner electrode
3	External electrode
4	nickel dam
5	Tin layer

4. Characteristic curve

CCHQ-0505 Q value



CCHQ-1111 Q value pair tolerance value



Note: The above chart is obtained using Agilent 4287A test for reference only and does not represent on-site inspection.

5. Capacity range

5. Technical requirements and test conditions

CCH Q-0603, specification and value table

Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)
0R1	0.1	B,C	250	1R7	1.7	B,C, D	250	6R2	6.2	B,C, D	250	300	30	F,G, J,K, M	250
0R2	0.2			1R8	1.8			6R8	6.8			330	33		
0R3	0.3			1R9	1.9			7R5	7.5			360	36		
0R4	0.4			2R0	2			8R2	8.2			390	39		
0R5	0.5	B,C, D		2R1	2.1			9R1	9.1			430	43		
0R6	0.6			2R2	2.2			100	10	F,G, J,K, M		470	47		
0R7	0.7			2R4	2.4			110	11			510	51		
0R8	0.8			2R7	2.7			120	12			560	56		
0R9	0.9			3R0	3			130	13			620	62		
1R0	1			3R3	3.3			150	15			680	68		
1R1	1.1			3R6	3.6			160	16			750	75		
1R2	1.2			3R9	3.9			180	18			820	82		
1R3	1.3			4R3	4.3			200	20			910	91		150
1R4	1.4			4R7	4.7			220	22			101	100		
1R5	1.5			5R1	5.1			240	24						
1R6	1.6			5R6	5.6			270	27						

5.2 0708 Specification capacity value table

CCH Q-0708, specification capacity table

Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)
1R0	1	B,C,D	500	3R9	3.9	B,C,D	500	220	22	F,G,J, K	500
1R1	1.1			4R3	4.3			240	24		
1R2	1.2			4R7	4.7			270	27		
1R3	1.3			5R1	5.1			300	30		
1R4	1.4			5R6	5.6			330	33		
1R5	1.5			6R2	6.2			360	36		
1R6	1.6			6R8	6.8			390	39		
1R7	1.7			7R5	7.5			430	43		
1R8	1.8			8R2	8.2			470	47		
1R9	1.9			9R1	9.1			510	51		
2R0	2			100	10	F,G,J,K		560	56		
2R1	2.1			110	11			620	62		
2R2	2.2			120	12			680	68		
2R4	2.4			130	13			750	75		
2R7	2.7			150	15			820	82		
3R0	3			160	16			910	91		
3R3	3.3			180	18			101	100		
3R6	3.6			200	20						

5.3 0709 Specification value table

CCH Q-0709, specification and value table

Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)
1R0	1	B,C,D	500	3R9	3.9	B,C,D	500	220	22	F,G,J, K	500
1R1	1.1			4R3	4.3			240	24		
1R2	1.2			4R7	4.7			270	27		
1R3	1.3			5R1	5.1			300	30		
1R4	1.4			5R6	5.6			330	33		
1R5	1.5			6R2	6.2			360	36		
1R6	1.6			6R8	6.8			390	39		
1R7	1.7			7R5	7.5			430	43		
1R8	1.8			8R2	8.2			470	47		
1R9	1.9			9R1	9.1			510	51		
2R0	2			100	10	F,G,J,K		560	56		
2R1	2.1			110	11			620	62		
2R2	2.2			120	12			680	68		
2R4	2.4			130	13			750	75		
2R7	2.7			150	15			820	82		
3R0	3			160	16			910	91		
3R3	3.3			180	18			101	100		
3R6	3.6			200	20						

5.4 0805 Specification capacity value table

Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)
0R2	0.2	B,C	250	1R9	1.9	B,C, D	250	9R1	9.1	B,C	250	510	51	F,G, J,K, M	250
0R3	0.3			2R0	2			100	10	F,G, J,K, M		560	56		
0R4	0.4			2R1	2.1			110	11			620	62		
0R5	0.5	B,C, D		2R2	2.2			120	12			680	68		
0R6	0.6			2R4	2.4			130	13			750	75		
0R7	0.7			2R7	2.7			150	15			820	82		
0R8	0.8			3R0	3			160	16			910	91		
0R9	0.9			3R3	3.3			180	18			101	100		
1R0	1			3R6	3.6			200	20			111	110		
1R1	1.1			3R9	3.9			220	22			121	120		
1R2	1.2			4R3	4.3			240	24			131	130		
1R3	1.3			4R7	4.7			270	27			151	150		
1R4	1.4			5R1	5.1			300	30			161	160		150
1R5	1.5			5R6	5.6			330	33			181	180		
1R6	1.6			6R2	6.2			360	36			201	200		
1R7	1.7			6R8	6.8			390	39			221	220		100
1R8	1.8			7R5	7.5			430	43			241	240		
				8R2	8.2			470	47						

CCHQ-0805, specification and value table

5.5 0505 Specification capacity value table

CCH Q-0505, specification and value table

Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)
0R2	0.2	B,C	250	1R9	1.9	B,C,D	250	9R1	9.1	B,C	250	510	51	F,G,J,K,M	250
0R3	0.3			2R0	2			100	10	F,G,J,K,M		560	56		
0R4	0.4			2R1	2.1			110	11			620	62		
0R5	0.5	B,C,D		2R2	2.2			120	12			680	68		
0R6	0.6			2R4	2.4			130	13			750	75		
0R7	0.7			2R7	2.7			150	15			820	82		
0R8	0.8			3R0	3			160	16			910	91		
0R9	0.9			3R3	3.3			180	18			101	100		
1R0	1			3R6	3.6			200	20			111	110		
1R1	1.1			3R9	3.9			220	22			121	120		
1R2	1.2			4R3	4.3			240	24			131	130		
1R3	1.3			4R7	4.7			270	27			151	150		150
1R4	1.4			5R1	5.1			300	30			161	160		
1R5	1.5			5R6	5.6			330	33			181	180		
1R6	1.6			6R2	6.2			360	36			201	200		100
1R7	1.7			6R8	6.8			390	39			221	220		
1R8	1.8			7R5	7.5			430	43						
				8R2	8.2			470	47						

5.6 1111 Specification capacity value table

CCH Q-1111, specification capacity table

Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)
0R2	0.2	B,C	1500	2R4	2.4	B,C, D	1500	200	20	F,G, J,K, M	1500	151	150	F,G ,J, K, M	500
0R3	0.3			2R7	2.7			220	22			161	160		
0R4	0.4			3R0	3			240	24			181	180		
0R5	0.5	B,C, D		3R3	3.3			270	27			201	200		
0R6	0.6			3R6	3.6			300	30			221	220		
0R7	0.7			3R9	3.9			330	33			241	240		
0R8	0.8			4R3	4.3			360	36			271	270		
0R9	0.9			4R7	4.7			390	39			301	300		
1R0	1			5R1	5.1			430	43			331	330		
1R1	1.1			5R6	5.6			470	47			361	360		
1R2	1.2			6R2	6.2			510	51			391	390		
1R3	1.3			6R8	6.8			560	56						
1R4	1.4			7R5	7.5							431	430		250
1R5	1.5			8R2	8.2			620	62		1000	471	470		
1R6	1.6			9R1	9.1			680	68			511	510		
1R7	1.7			100	10	F,G, J,K, M		750	75			561	560		
1R8	1.8			110	11			820	82			621	620		
1R9	1.9			120	12			910	91			681	680		
2R0	2			130	13			101	100		500	751	750		
2R1	2.1			150	15			111	110			821	820		
2R2	2.2			160	16			121	120			911	910		100
				180	18			131	130			102	1000		
												112	1100		

5.7 2525 Specification capacity value table

CCH Q-2525, specification capacity table

Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)
1R0	1	B ,C	3600	5R 1	5.1	B,C,D	3600	360	36	F,G, J,K, M	3600	241	240	F,G ,J, K , M	2000
1R1	1.1			5R 6	5.6			390	39			271	270		
1R2	1.2			6R 2	6.2			430	43			301	300		
1R3	1.3			6R 8	6.8			470	47			331	330		
				7R 5	7.5			510	51			361	360		
1R4	1.4	B,C, D		8R 2	8.2			560	56			391	390		1000
1R5	1.5			9R 1	9.1			620	62			431	430		
1R6	1.6			100	10	F,G, J,K, M		680	68			471	470		
1R7	1.7			110	11			750	75			511	510		
1R8	1.8			120	12			820	82			561	560		
1R9	1.9			130	13			910	91			621	620		
2R 0	2			150	15			101	100			681	680		500
2R 1	2.1			160	16			111	110			751	750		
2R 2	2.2			180	18			121	120			821	820		
2R 4	2.4			200	20							911	910		
2R 7	2.7			220	22			131	130		2000	102	1000		
3R 0	3			240	24			151	150			112	1100		
3R 3	3.3			270	27			161	160			122	1200		
3R 6	3.6			300	30			181	180			152	1500		
3R 9	3.9			330	33			201	200			182	1800		
4R 3	4.3							221	220						
4R 7	4.7														

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5.8 3838 Specification capacity value table

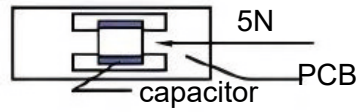
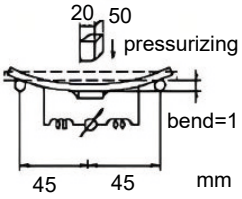
CCH Q-3838, specification and value table

Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)	Tolerance code	Tolerance (pF)	accuracy	Maximum direct current operating voltage (V)
1R0	1	B ,C	7200	8R2	8.2	B,C, D	7200	910	91	F,G, J,K, M	3600	112	1100	F,G ,J, K, M	1000
1R1	1.1			9R1	9.1			101	100			122	1200		
1R2	1.2			100	10	F,G, J,K, M		111	110			152	1500		
1R3	1.3			110	11			121	120			182	1800		500
1R4	1.4	B,C, D		120	12			131	130			202	2000		
1R5	1.5			130	13			151	150			222	2200		
1R6	1.6			150	15			161	160			242	2400		
1R7	1.7			160	16			181	180			272	2700		
1R8	1.8			180	18			201	200			302	3000		
1R9	1.9			200	20			221	220			332	3300		
2R0	2			220	22			241	240			362	3600	G,J ,K, M	250
2R1	2.1			240	24			271	270			392	3900		
2R2	2.2			270	27			301	300			432	4300		
2R4	2.4			300	30			331	330			472	4700		
2R7	2.7			330	33			361	360			512	5100		
3R0	3			360	36			391	390			562	5600		
3R3	3.3			390	39			431	430	F,G, J,K, M	1500	622	6200		
3R6	3.6			430	43			471	470			682	6800		
3R9	3.9			470	47			511	510						
4R3	4.3			510	51			561	560						
4R7	4.7			560	56			621	620						
5R1	5.1			620	62			681	680						
5R6	5.6			680	68			751	750						
6R2	6.2			750	75			821	820						
6R8	6.8			820	82			911	910						
7R5	7.5							102	1000						

6. Technical requirements and test conditions

<table>
<tr><th>project</th><th colspan="2">technical specifications</th><th colspan="5">test method</th></tr>
<tr><td>operating temperature range</td><td colspan="2">(-55 ~ +125)℃</td><td colspan="5"></td></tr>
<tr><td>surface</td><td colspan="2">no significant defect</td><td colspan="5">eyeballing</td></tr>
<tr><td rowspan="2">Electrostatic capacity of Cap acitance</td><td colspan="2" rowspan="2">Within the specification error range</td><td>Test frequency</td><td colspan="2">test voltage</td><td>ambient temperature</td></tr>
<tr><td>1MHz (±10%)</td><td colspan="2">(1.0±0.2)Vrms</td><td>(25±2)℃</td></tr>
<tr><td>figure of merit (Q price)</td><td colspan="2">Greater than 2,000 at a frequency of 1 MHz</td><td colspan="5">Test method: the same as the "static electricity capacity"</td></tr>
<tr><td rowspan="2">insulation resistance (I.R.) Insulation Resistance</td><td colspan="2" rowspan="2">≥100000M Ω</td><td>test voltage</td><td>testing time</td><td>Charge and discharge current</td><td>environment</td></tr>
<tr><td>UR</td><td>(60±5) sec</td><td>≤50mA</td><td>Temperature (25 ± 2)℃ humidity <75%</td></tr>
<tr><td rowspan="2">Electric resistance strength of the medium (D.W.V.) D ielectric W ithstanding Voltag e</td><td colspan="2" rowspan="2">Media should not be broken down or damaged</td><td colspan="2">test voltage</td><td>time</td><td>Charge and discharge current</td></tr>
<tr><td colspan="2">UR<200V 2.5UR200V
≤UR≤1000V 1.5URUR＞1000V
1.2UR</td><td>(1~5) sec</td><td>≤50mA</td></tr>
<tr><td rowspan="7">Capacity temperature coefficient or temperature characteristics</td><td colspan="2" rowspan="7">NPO : (0±30) ppm /℃</td><td colspan="4">In the following temperature order (△ C to T 3)</td></tr>
<tr><td>step</td><td colspan="3">temperature (℃)</td></tr>
<tr><td>T 1</td><td colspan="3">20±2</td></tr>
<tr><td>T 2</td><td colspan="3">-55±3</td></tr>
<tr><td>T 3</td><td colspan="3">20±2</td></tr>
<tr><td>T 4</td><td colspan="3">125±2</td></tr>
<tr><td>T 1</td><td colspan="3">20±2</td></tr>
<tr><td>sold erability</td><td>surface</td><td>No visible damage occurred,
The upper tin rate is 95%</td><td colspan="5">Soak the capacitor in ethanol and rosin (25% by weight) solution and remove in
(80~120) sec (10~30) at ℃ temperature and then dip in the solder solution. Tin immersion temperature: (235 ± 5) ℃; tin immersion speed: (25 ± 0.25) mm / sec tin immersion time: (2 ± 0.5) sec</td></tr>
</table>

6. Technical requirements and test conditions

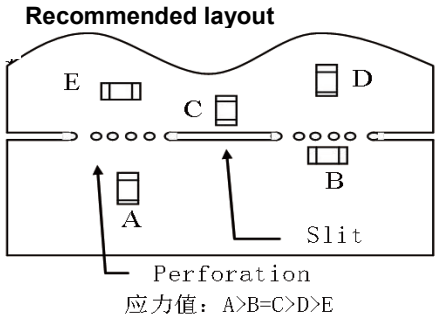
<table>
<tr><td rowspan="4">Welding heat resistance</td><td>surface</td><td>No visible damage, with a tin loading rate of 95%</td><td rowspan="4">Absolve the capacitor in ethanol and rosin (25% weight) solution, remove and preheat at 100~200℃ for 10 ± 2min, and then dip in the solder solution. Tin immersion temperature: 260 ± 5℃; tin immersion speed: 25±0.25mm/s
Tin immersion time: 5 ± 1 sec
After removal, it was cleaned with solvent and observed under a microscope at 10 times more.
24 ± 2 hrs before measurement.</td></tr>
<tr><td>△C/C</td><td>± 0.5% or ± 0.5 pF, taking the larger ones</td></tr>
<tr><td>D.F.</td><td>The same as the initial standard</td></tr>
<tr><td>I.R.</td><td>The same as the initial standard</td></tr>
<tr><td>End electrode adhesive strength</td><td colspan="2">The end electrode is not stripped, and there is no visible damage in appearance</td><td>Applied thrust: 5N
Time: 10 + 1 sec
Speed: 1 mm/sec
</td></tr>
<tr><td rowspan="2">Anti-bending strength</td><td>surface</td><td>No visible damage</td><td rowspan="2">Test substrate: PCB
Bending depth: 1mm
Pressure speed: 1 mm/sec.
The measurement shall be made in the bent state.
</td></tr>
<tr><td>△C/C</td><td>≤+5%</td></tr>
<tr><td rowspan="4">temperature cycle</td><td>surface</td><td>No visible damage</td><td rowspan="3">Cyops: 5 times, one cycle in 4 steps:
<table><tr><th>stage</th><th>temperature</th><th>Time</th></tr><tr><td>Step 1</td><td>-55±3</td><td>30</td></tr><tr><td>Step 2</td><td>20±2</td><td>3</td></tr><tr><td>Step 3</td><td>-125±3</td><td>30</td></tr><tr><td>Step 4</td><td>20±2</td><td>3</td></tr></table></td></tr>
<tr><td>△C/C</td><td>± 1% or ± 1 pF
Take more of the two</td></tr>
<tr><td>D.F.</td><td>The same as the initial standard</td></tr>
<tr><td>I.R.</td><td>The same as the initial standard</td><td>24,24 + 2 hrs before measurement.</td></tr>
<tr><td rowspan="4">Steady state wet test</td><td>surface</td><td>No visible damage</td><td rowspan="4">temperature:40±2℃
Humidity: 90 ~ 95% RH
Time: 500 + 24 / -0 hours
Placing conditions: room temperature
Hold time: 24 hours</td></tr>
<tr><td>△C/C</td><td>± 2% or ± 1 pF
Take more of the two</td></tr>
<tr><td>D.F.</td><td>≤Two times the initial standard</td></tr>
<tr><td>I.R.</td><td>Ri≥2500 MΩ or Ri * CR> 25S</td></tr>
<tr><td rowspan="4">life test</td><td>surface</td><td>No visible damage</td><td></td></tr>
<tr><td>△C/C</td><td>± 2% or ± 1 pF
Take more of the two</td><td><table><tr><th>rated voltage</th><th>Apply voltage</th></tr><tr><td>Ur<500V</td><td>2Ur</td></tr><tr><td>500V ≤Ur ≤1000V</td><td>1.5Ur</td></tr><tr><td>Ur >1000V</td><td>1.2Ur</td></tr></table></td></tr>
<tr><td>D.F.</td><td>≤Two times the initial standard</td><td rowspan="2">Charge and discharge current:≤50mA
temperature:(125±3)℃
Time: 96 ± 4 hours
Placing conditions: room temperature
Hold time: 24 hours</td></tr>
<tr><td>I.R.</td><td>Ri≥4000 MΩ or Ri * CR> 40S</td></tr>
<tr><td colspan="4">Note: When testing the electric resistance strength of the capacitor, in order to exclude the influence of the external environment, when the test voltage exceeds 1000 Vdc, the capacitor should be soaked in insulating oil for testing.</td></tr>
</table>

7. Precautions for use

7.1 Notes before use:

The RF-HQ-MLCC chip may be damaged under the harsh working conditions that go beyond the relevant statement, so first consider applying the relevant instructions in this statement.

7.2 Design of the PC board



7.2.1 The amount of solder used will affect the ability of the chip to resist mechanical stress, which may cause the breakage or cracking of RF-HQ-MLCC. Therefore, when designing the substrate, we must carefully consider the size and configuration of the welding pad, which has a decisive role in the amount of the solder composed of the substrate.

7.2.2 When designing the position of the pad and SMD RF-HQ-MLCC, the stress shall be reduced to the lowest point and the MLCC shall be installed in the least affected position on the PC plate.

7.3 Automatic installation should consider the problems

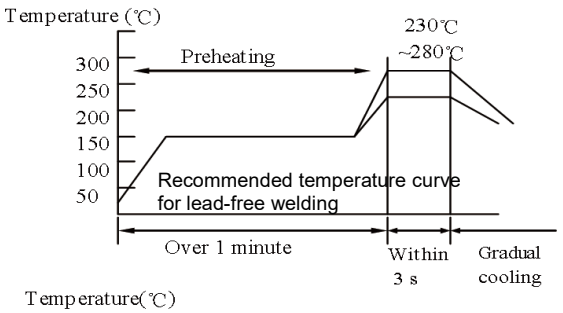
If the tube drops beyond the lowest limit, it will too excessive pressure on RF-HQ-MLCC, which leads cause RF-HQ-MLCC rupture. When lowering the tube, pay attention to the following points:

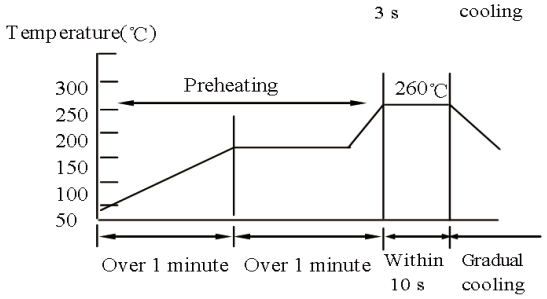
7.3.1 After correcting the deviation of the PC plate, the low limit of the suction tube should be adjusted to the surface horizontal position of the PC plate.

7.3.2 The suction pressure shall be adjusted between 1 and 3N.

7.3.3 In order to reduce the deformation degree of the PC plate caused by the impact force of the suction, the support nail shall be placed under the PC plate.

7.4 Welding





7.4.1 RF-HQ-MLCC is a combination of ceramic and metal. As a ceramic body, especially the large size ceramic body, its own thermoplasticity is poor, the response to heat is relatively slow, by the cold and hot situation, the ceramic body is easy to crack. It is recommended to conduct continuous preheating for more than 1 minute before welding.

7.4.2 The interior of the RF-HQ-MLCC is a metal electrode, which is thermoplastic and responds responsive to heat. Therefore, in the case of heat, the metal part and the ceramic part must have a certain degree of inconsistent expansion, resulting in internal stress, easy to cause porcelain cracking. It is recommended to conduct continuous preheating for more than 1 minute before welding.

7.4.3 For manual welding, the maximum diameter of the tip using constant temperature iron is 1.0mm and the maximum power is 25 watts; the iron shall not directly touch the MLCC element.

7.4.4 Avoid crest welding for specifications 1111 and above.

7.5 Cleaning

7.5.1 The temperature difference between the components and the cleaning process should not be greater than 100℃.

7.5.2 In the case of ultrasonic cleaning, the output power will make the PC plate withstand excessive vibration, which will cause the MLCC or welding point cracking, or reduce the strength of the end electrode. Therefore, special attention should be paid to the following points:

Ultrasonic output: less than 20W / L; ultrasonic frequency: less than 40 KHz; ultrasonic cleaning time: 5 minutes or less

7.6 Cut the PC plate

7.6.1 After installing MLCC and other components, note that not any force should be applied to the PC board. The RF-HQ-MLCC cannot be subjected to excessive mechanical impact.

7.6.2 The segmentation of the board cannot be divided by hand, and appropriate equipment should be used.

7.7 Storage method

To maintain the weldability of the end electrodes and to keep the packaging materials in good condition, the recommended storage conditions are as follows:

Storage temperature: 5-40℃; storage relative humidity: 20-70% RH

RF-HQ-MLCC end welds will decrease over time, so RF-HQ-MLCC should be used within 6 months from the date of shipment.

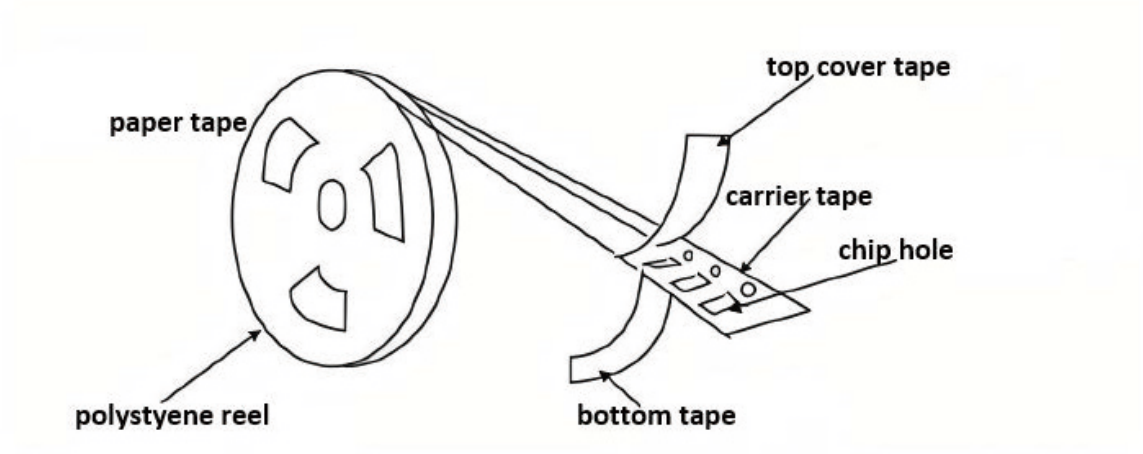
8. Product packaging

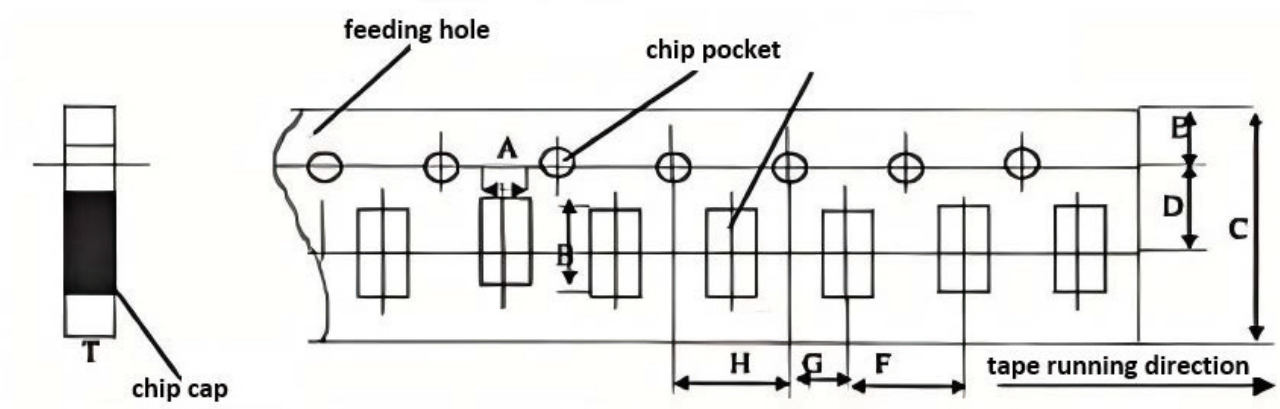
8.1 bag bulk

specifications	bulk	remarks
0603	5000	Packaging form and quantity can be determined according to the customer's requirements
0709	2000	
0805	5000	
0505	5000	
1111	2000	
2525	100	
3838	50	

8.2 Paper tape packaging

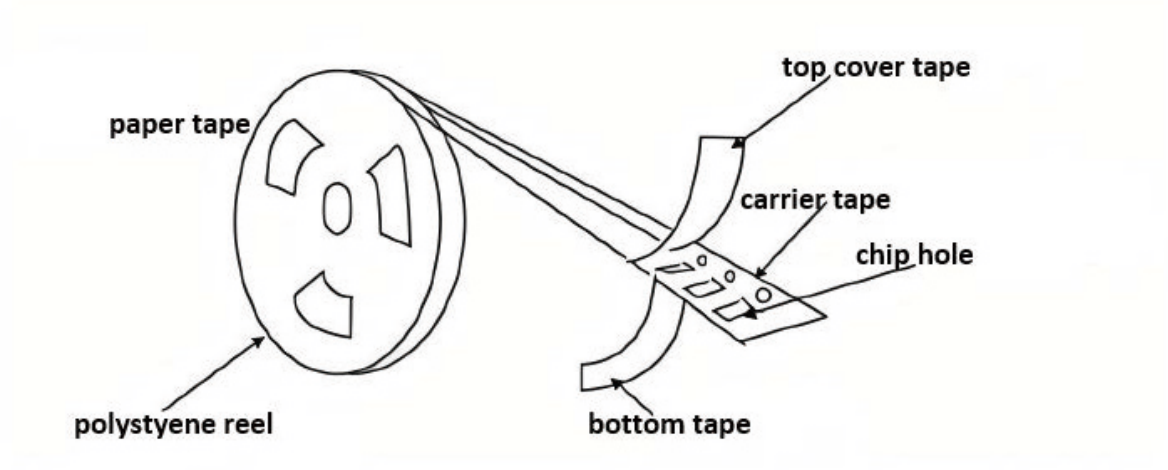
8.2.1 Paper tape coil structure

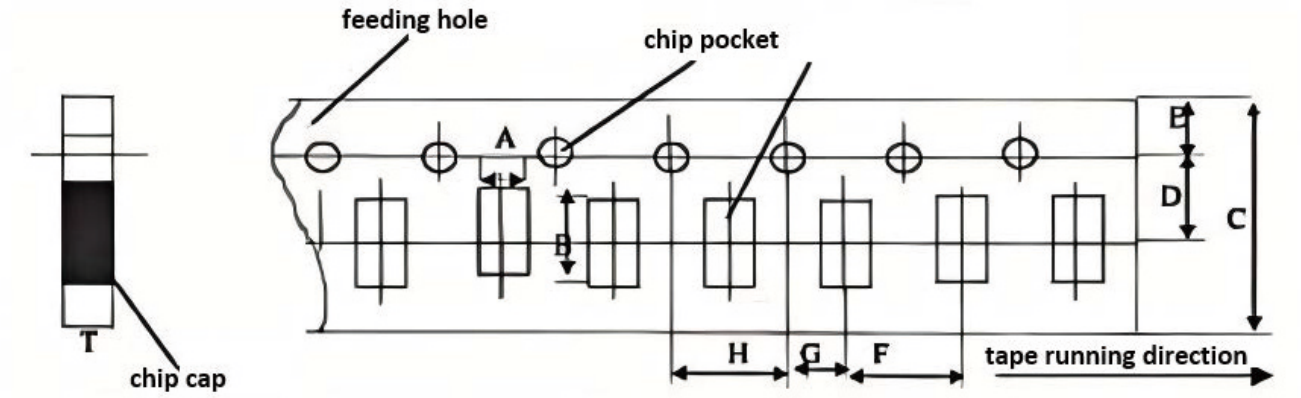




8.3 Plastic tape packaging

8.3.1 Plastic tape coil structure

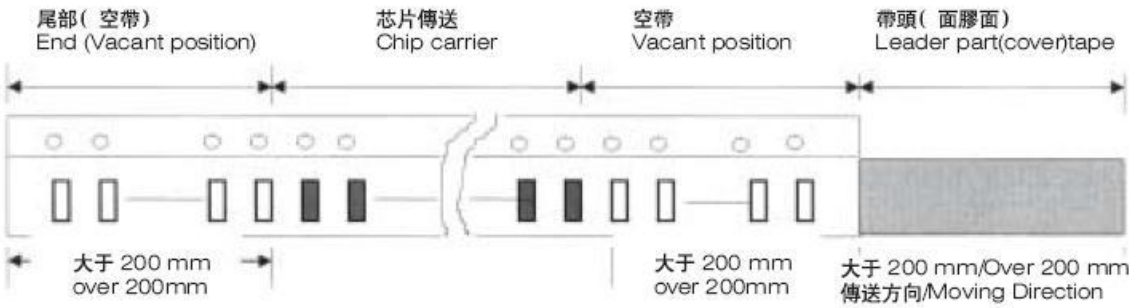




8.4 Front and rear structure of the conveyor belt

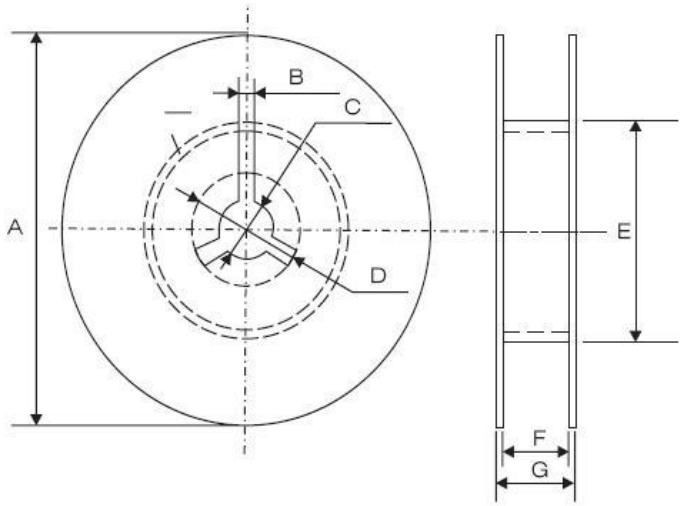
＊傳送帶的前后結構

Structure of leader part and end part of the carrier paper



8.5 Reel dimensions

*卷盘尺寸 Reel Dimensions (unit:mm)



A	B	C	D	E	F	G
Φ 178.00±2.00	3.00	Φ13.00±0.50	Φ21.00±0.80	Φ 50.00 or greater	10.00±1.50	12Max
Φ 330.00±2.00	3.00	Φ13.00±0.50	Φ21.00±0.80	Φ 50.00 or greater	10.00±1.50	12Max

8.6 Ribbon preparation method

8.6.1 The belt of the packaging capacitor is wound clockwise. When the belt is pulled from the top to the down direction, the transfer hole is on the right side of the belt.

8.6.2 For the front end of the strip, leave at least 5 spaced strips.

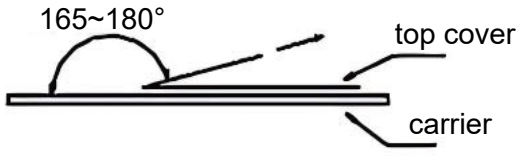
8.6.3 When compiling the tape, the lead tape part or blank part must be reserved according to the figure below.

8.6.4 The number of product errors in the installation of the disk must be less than 0. 1% of the number or 1 per disk, discontinuous errors.

8.6.5 The upper tape and the lower tape shall not exceed the edge of the tape and shall not block the transfer hole.

8.6.6 The cumulative error of the transmission hole is within 10 spacing: ± 0.3 mm.

8.6.7 The stripping moment of the upper tape shall be within 0.1 to 0.7 Newton as shown in the following below.



9. Test results of product prohibited substances About RoHS

All products comply with the RoHS directive:

- Lead (pb) (＜1000ppm)
- Mercury (Hg) (＜1000ppm)
- Cadmium (cd) (＜100ppm)
- Hexavalent Chromium Content (Cr 6+) (＜1000ppm)
- Polybrominated Biphenyls (PBBs) (＜1000ppm)
- Polybrominated diphenyl ethers (PBDE) (＜1000ppm)

Mark the “RoHS” logo or “GP” mark on the product label if necessary





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