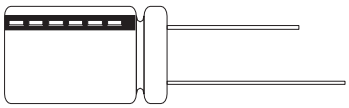
CADE SERIES: Low ESR Type



FEATURES

- Long life, 105℃, 4,000 ~ 7,000 hours assured
- Low ESR, suitable for switching power supplies
- Smaller size with large permissible ripple current

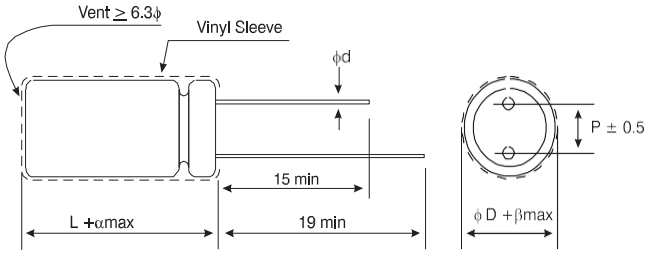
SPECIFICATIONS

Item	Performance							
Operating Temp	-55°C ~ +105°C							
Capacitance Toloerance	± 20% (120Hz, 20°C)							
Leakage Current (at 20°C)	I = 0.01CV or 3 (μA) whichever is greater (after 2 minutes) Where, C= rated capacitance in μF. V= rated DC working voltage in V.							
Dissipation Factor Tan δ at 120Hz, 20°C	Rated Voltage	6.3	10	16	25	35	50	63	100
	Tan δ(max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08
	When the capacitance exceeds 1000μF, 0.02 shall be added every 1000μF increase.							
Low Temperature Characteristics (at 120Hz)	Rated Voltage	6.3	10	16	25	35	50	63	100
	Z(-25°C)/Z(+20°C)	3	3	3	3	3	3	3	3
	Impedance ratio shall not exceed the values given in the table.								
Load Life Test	Test Time	4,000 hours for φD≤6.3mm 5,000 hours for φD=8mm 6,000 hours for φD=10mm 7,000 hours for φD≥12.5mm							
	Capacitance Change	Within ±25% of initial value							
	Dissipation Factor	Less than 200% of specified value							
	Leakage Current	Within specified value							
	The above specifications hall be satisfied when the capacitors are restored to 20° C after the rated ripple current for 4,000 ~ 7,000 hrs at 105° C.								
Shelf Life Test	Test Time	1,000 hours							
	Capacitance Change	Within ±25% of initial value							
	Dissipation Factor	Less than 200% of specified value							
	Leakage Current	Within specified value							
	The above specifications shall be satisfied when the capacitors are restored to 20° C after exposing them for 1,000 hours at 105° C without voltage applied.								
Ripple Current & Frequency Multipliers	Freq. (Hz) / Cap. (μF)	120	1K	10K	100K up				
	Under ~ 33	0.42	0.70	0.90	1.0				
	39 ~ 270	0.50	0.73	0.92	1.0				
	330 ~ 680	0.55	0.77	0.94	1.0				
	820 ~ 1,800	0.60	0.80	0.96	1.0				
	2,200 ~ 15,000	0.70	0.85	0.98	1.0				
Standards	Satisfies Characteristic JIS C 5101-4								

DIMENSIONS

Unit: mm

φD	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
φd	0.5		0.6			0.8	
α	1.0			1.5			
β	0.5						



CADE SERIES: Low ESR Type

DIMENSIONS & PERMISSIBLE RIPPLE CURRENT

Dimension: φDx L(mm) Ripple Current: mA/rms at 100Hz, 105°C

VDC / Item / μF	6.3V (0J)				10V (1A)				16V (1C)				25V (1E)			
	φDx L	Impedance (Ω, Max/100KHz)		Ripple Current (mA/rms, 105°C)	φDx L	Impedance (Ω, Max/100KHz)		Ripple Current (mA/rms, 105°C)	φDx L	Impedance (Ω, Max/100KHz)		Ripple Current (mA/rms, 105°C)	φDx L	Impedance (Ω, Max/100KHz)		Ripple Current (mA/rms, 105°C)
		20°C	-10°C	100kHz		20°C	-10°C	100kHz		20°C	-10°C	100kHz		20°C	-10°C	100kHz
4.7													5 x 11	0.6	1.2	180
10									5 x 11	0.6	1.2	180	5 x 11	0.6	1.2	180
22	5 x 11	0.6	1.2	180	5 x 11	0.6	1.2	180	5 x 11	0.6	1.2	180	5 x 11	0.6	1.2	180
33	5 x 11	0.6	1.2	180	5 x 11	0.6	1.2	180	5 x 11	0.6	1.2	180	5 x 11	0.6	1.2	180
39													5 x 11	0.6	1.2	180
47	5 x 11	0.6	1.2	180	5 x 11	0.6	1.2	180	5 x 11	0.6	1.2	180	5 x 11	0.6	1.2	180
56									5 x 11	0.6	1.2	180				
82					5 x 11	0.6	1.2	180					6.3 x 11	0.25	0.5	290
100	5 x 11	0.6	1.2	180	5 x 11	0.6	1.2	180	6.3 x 11	0.25	0.5	290	6.3 x 11	0.25	0.5	290
120									6.3 x 11	0.25	0.5	290	6.3 x 15	0.23	0.46	430
150	6.3 x 11	0.25	0.5	290	6.3 x 11	0.25	0.5	290	6.3 x 11	0.29	0.5	290	8 x 11.5	0.117	0.234	555
180					6.3 x 11	0.25	0.5	290	6.3 x 15	0.23	0.46	430				
220	6.3 x 11	0.25	0.5	290	6.3 x 11	0.25	0.5	290	8 x 11.5	0.117	0.234	555	8 x 11.5	0.117	0.234	555
					6.3 x 15	0.23	0.46	430								
330	6.3 x 11	0.25	0.500	290	8 x 11.5	0.117	0.234	555	8 x 11.5	0.117	0.234	555	10 x 12.5	0.090	0.18	755
	6.3 x 15	0.23	0.46	430									8 x 15	0.085	0.17	730
470	8 x 11.5	0.117	0.234	555	8 x 11.5	0.117	0.234	555	10 x 12.5	0.090	0.18	755	10 x 16	0.068	0.136	1,050
									8 x 15	0.085	0.17	730	8 x 20	0.065	0.130	995
560	8 x 11.5	0.117	0.234	555									10 x 20	0.052	0.104	1,220
680	10 x 12.5	0.090	0.180	755	10 x 12.5	0.090	0.180	755	10 x 16	0.068	0.136	1,050	10 x 20	0.052	0.104	1,220
					8 x 15	0.085	0.170	730	8 x 20	0.065	0.130	995				
820	8 x 15	0.085	0.170	730					10 x 20	0.052	0.104	1,220	10 x 25	0.045	0.090	1,440
	10 x 12.5	0.090	0.180	755												
1,000	10 x 12.5	0.090	0.180	755	10 x 16	0.068	0.136	1,050	10 x 20	0.052	0.104	1,220	12.5 x 20	0.038	0.076	1,655
					8 x 20	0.065	0.130	995					10 x 30	0.035	0.070	1,815
1,200	8 x 20	0.065	0.130	955	10 x 20	0.052	0.104	1,220	10 x 25	0.045	0.090	1,440				
	10 x 16	0.068	0.136	1,050												
1,500	10 x 20	0.052	0.104	1,220	10 x 20	0.052	0.104	1,220	12.5 x 20	0.038	0.076	1,655	16 x 25	0.022	0.044	2,555
					10 x 25	0.045	0.090	1,440	10 x 30	0.035	0.070	1,815	12.5 x 25	0.030	0.060	1,945
1,800													12.5 x 30	0.025	0.050	2,310
													16 x 20	0.029	0.058	2,205
2,200	10 x 25	0.045	0.090	1,440	12.5 x 20	0.038	0.076	1,655	12.5 x 25	0.030	0.060	1,945	16 x 25	0.022	0.044	2,555
	12.5 x 20	0.038	0.076	1,815	10 x 30	0.035	0.070	1,815					18 x 20	0.028	0.056	2,490
													12.5 x 35	0.022	0.044	2,510
2,700	10 x 30	0.035	0.070	1,815	12.5 x 25	0.030	0.060	1,945	12.5 x 30	0.025	0.050	2,310	16 x 25	0.022	0.044	2,555
									16 x 20	0.029	0.058	2,205				
3,300	12.5 x 20	0.038	0.076	1,655	12.5 x 25	0.030	0.060	1,945	16 x 25	0.022	0.044	2,555	16 x 31.5	0.018	0.036	3,010
					12.5 x 30	0.025	0.050	2,310	12.5 x 35	0.022	0.044	2,510	18 x 25	0.020	0.040	2,740
3,900	12.5 x 25	0.030	0.060	1,945	12.5 x 35	0.022	0.044	2,510	16 x 25	0.022	0.044	2,555	16 x 35.5	0.016	0.032	3,150
					16 x 20	0.029	0.058	2,205	18 x 20	0.028	0.056	2,490	18 x 31.5	0.016	0.032	3,635
4,700	16 x 25	0.022	0.044	2,555	16 x 25	0.022	0.044	2,555	16 x 31.5	0.018	0.036	3,010	18 x 35.5	0.015	0.030	3,680
	12.5 x 30	0.025	0.050	2,310					18 x 25	0.020	0.040	2,740				
5,600	12.5 x 35	0.022	0.044	2,510	16 x 25	0.022	0.044	2,555	18 x 35.5	0.016	0.032	3,150				
	16 x 20	0.029	0.058	2,205	18 x 20	0.028	0.056	2,490	18 x 31.5	0.016	0.032	3,635				
6,800	16 x 25	0.022	0.044	2,555	16 x 31.5	0.018	0.036	3,010	18 x 35.5	0.015	0.030	3,680	18 x 40	0.014	0.028	3,800
	18 x 20	0.028	0.056	2,490	18 x 25	0.020	0.040	2,740								
8,200	16 x 31.5	0.018	0.036	3,010	16 x 35.5	0.016	0.032	3,150	18 x 35.5	0.015	0.030	3,680				
					18 x 31.5	0.016	0.032	3,635								
10,000	16 x 31.5	0.016	0.032	3,150	18 x 35.5	0.015	0.030	3,680	18 x 40	0.014	0.028	3,800				
	18 x 25	0.020	0.040	2,740												
12,000	18 x 31.5	0.016	0.032	3,635												
15,000	18 x 35.5	0.015	0.030	3,680	18 x 40	0.014	0.028	3,800								

PART NUMBER EXAMPLE

CADE 108 M 1C B 100 200

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

CADE SERIES: Low ESR Type

DIMENSIONS & PERMISSIBLE RIPPLE CURRENT

Dimension: φDx L(mm) Ripple Current: mA/rms at 100Hz, 105°C

VDC / Item / μF	35V (1V)				50V (1H)				63V (1J)				100V (2A)			
	φDx L	Impedance (Ω,Max/100KHz)		Ripple Current (mA/rms, 105°C)	φDx L	Impedance (Ω, Max/100KHz)		Ripple Current (mA/rms, 105°C)	φDx L	Impedance (Ω, Max/100KHz)		Ripple Current (mA/rms, 105°C)	φDx L	Impedance (Ω, Max/100KHz)		Ripple Current (mA/rms, 105°C)
		20°C	-10°C	100kHz		20°C	-10°C	100kHz		20°C	-10°C	100kHz		20°C	-10°C	100kHz
0.47													5 x 11	43	86	20
1													5 x 11	20	40	30
2.2													5 x 11	9.8	19.6	44
3.3													5 x 11	6.6	13.2	58
4.7	5 x 11	0.6	1.2	180	5 x 11	2.3	4.6	90	5 x 11	4.7	9.4	68	5 x 11	4.6	9.2	74
6.8					5 x 11	1.4	2.8	120	5 x 11	2.5	5.0	95	5 x 11	3.5	7.0	95
10	5 x 11	0.6	1.2	180					5 x 11	2.1	4.2	110	6.3 x 11	1.8	3.6	130
12									5 x 11	2	4.0	145				
15									6.3 x 11	1.2	2.4	160	8 x 11.5	0.83	1.66	180
18					5 x 11	1.3	2.6	155					6.3 x 15	0.80	1.60	200
22	5 x 11	0.6	1.2	180	5 x 11	1.2	2.4	170	6.3 x 11	0.71	1.42	250	8 x 11.5	0.68	1.36	230
27	5 x 11	0.6	1.2	180												
33	5 x 11	0.6	1.2	180	6.3 x 11	0.43	0.86	300	6.3 x 11	0.71	1.42	250	10 x 12.5	0.46	0.92	320
													8 x 15	0.45	0.90	360
39									6.3 x 15	0.70	1.40	330				
47	6.3 x 11	0.25	0.5	290	6.3 x 11	0.43	0.86	300	8 x 11.5	0.342	0.684	405	10 x 16	0.37	0.74	420
													8 x 20	0.37	0.74	420
56	6.3 x 11	0.25	0.5	290	6.3 x 15	0.4	0.80	360			0.234					
68									8 x 11.5	0.342	0.684	405	10 x 20	0.30	0.60	490
82	6.3 x 11	0.25	0.500	290	8 x 11.5	0.234	0.468	485					10 x 25	0.25	0.50	540
100	8 x 11.5	0.117	0.234	555	8 x 11.5	0.234	0.468	485	10 x 12.5	0.256	0.512	535	12.5 x 20	0.18	0.36	580
									8 x 15	0.230	0.460	535				
120					8 x 15.0	0.155	0.31	635	10 x 16	0.194	0.388	600				
					10 x 12.5	0.162	0.324	615								
150	8 x 11.5	0.117	0.234	555	10 x 12.5	0.162	0.324	615	10 x 16	0.194	0.388	660	12.5 x 25	0.13	0.26	710
180					8 x 20	0.12	0.240	860	10 x 20	0.147	0.294	885	12.5 x 30	0.12	0.24	790
					10 x 16	0.119	0.238	850	12.5 x 16	0.150	0.300	1,020	16 x 20	0.13	0.26	750
220	10 x 12.5	0.090	0.180	755	10 x 16	0.119	0.238	850	10.0 x 20	0.147	0.294	885	16 x 25	0.10	0.20	890
	8 x 15	0.085	0.170	730	10 x 20	0.090	0.180	1,030	10 x 25	0.130	0.260	1,050	18 x 20	0.11	0.22	850
270					10.0 x 25	0.082	0.164	1,200	16 x 16	0.090	0.180	1,410				
330	10 x 16	0.068	0.136	1050	10 x 20	0.09	0.180	1,030	12.5 x 20	0.085	0.170	1,285	16 x 25	0.090	0.180	1,080
	8 x 20	0.065	0.130	995	10 x 30	0.060	0.120	1,610								
390	10 x 20	0.052	0.104	1,220	12.5 x 20	0.063	0.126	1,480	12.5 x 25	0.070	0.140	1,720	18 x 25	0.083	0.166	1,260
									18 x 16	0.086	0.172	1,690				
470	10 x 20	0.052	0.104	1,220	12.5 x 20	0.06	0.120	1,500	12.5 x 25	0.070	0.140	1,720	16 x 31.5	0.076	0.152	1,310
									12.5 x 30	0.055	0.110	2,090				
									16 x 20	0.059	0.118	1,765				
560	10 x 25	0.045	0.090	1,440	12.5 x 25	0.05	0.100	1,832	16 x 25.0	0.050	0.100	2,160	18 x 31.5	0.068	0.136	1,370
													18 x 35.5	0.064	0.128	1,410
680	12.5 x 20	0.038	0.076	1,655	12.5 x 25	0.05	0.100	1,832	12.5 x 35	0.047	0.094	2,265				
	10 x 30	0.035	0.070	1,815	16 x 20	0.048	0.096	1,835	18 x 20.0	0.055	0.110	2,290				
820					12.5 x 35	0.035	0.068	2,285	16 x 31.5	0.043	0.086	2,670	18 x 40	0.047	0.094	1,520
					18 x 20	0.042	0.084	2,420	18 x 25	0.043	0.086	2,585				
1,000	12.5 x 25	0.030	0.060	1,945	16 x 25.0	0.034	0.068	2,235	16 x 31.5	0.043	0.086	2,670				
									16 x 35.5	0.036	0.072	2,770				
1,200	12.5 x 30	0.025	0.050	2,310	16 x 31.5	0.028	0.056	2,700	18 x 31.5	0.032	0.064	2,950				
	16 x 20	0.029	0.058	2,205	18 x 25	0.029	0.058	2,610								
1,500	16 x 25	0.022	0.044	2,555	16 x 31.5	0.028	0.056	2,700	18 x 35.5	0.030	0.060	3,095				
	12.5 x 35	0.022	0.044	2,510	16 x 35.5	0.025	0.05	2,790								
1,800	16 x 25.0	0.022	0.044	2,555	18 x 31.5	0.025	0.05	3,000								
	18 x 20	0.028	0.056	2,490												
2,200	16 x 31.5	0.018	0.036	3,010	18 x 35.5	0.023	0.046	3,100	18 x 40	0.028	0.056	3,200				
	18 x 25.0	0.02	0.040	2,740												
2,700	16 x 35.5	0.016	0.032	3,150												
	18 x 31.5	0.016	0.032	3,635												
3300	18 x 35.5	0.015	0.030	3,680												
4700	18 x 40	0.014	0.028	3,800												