

**UP-RISING STAR- Manufacturer OF / MLCC | Plate-type multilayer porcelain dielectric capacitor-Native rookie**



**Local enterprises, Japan and Taiwan background**

The entrepreneurial team comes from Taiwan Guoji, Huake, Housheng, Dafang and other well-known enterprises in the same industry. The product manager has been in Guoji for 7 years and Dafang for 12 years, and the founder is from the senior management of Housheng



**Top management team in the industry-fast response to rapidly changing market demand**



**Efficient operation-high degree of cooperation of the factory, timely formulate the rectification plan and effectively implement the suggestions made by the factory and customers in the cooperation**



**Japan and Taiwan technical background-key equipment from Japan, powder core technology independent research and development, technical indicators higher than domestic counterparts, slightly higher than or close to the Japanese**



**Strict and scientific quality control-zero defect strategy + special line management**



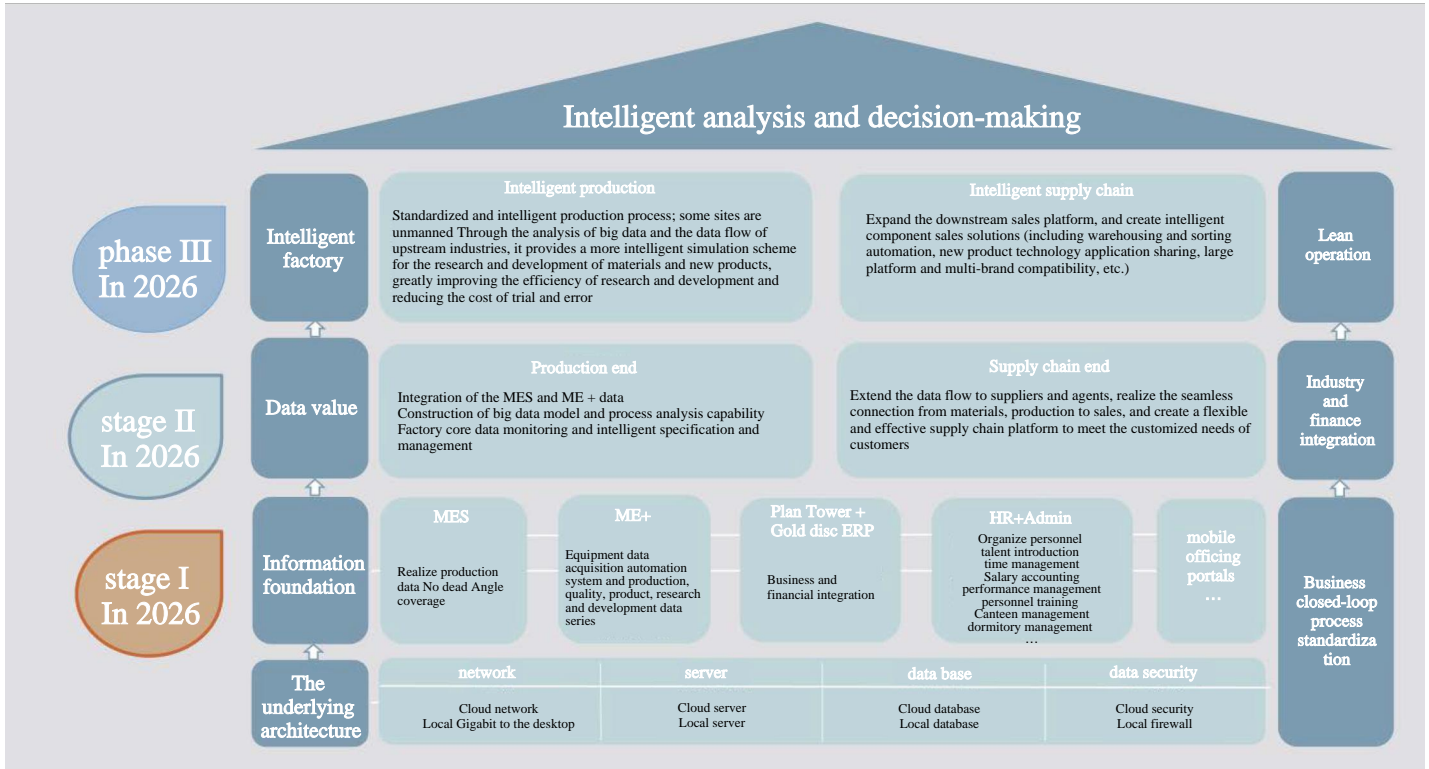
**Perfect after-sales service-2-4-8-5 response principle**



**Capacity planning-increasing year by year to ensure a stable delivery period**



Smart factory planning



technical competence

The main production of main equipment supply, mainly Japanese, American and Taiwan suppliers, high stability, high efficiency, high precision, low fault, high manufacturing process, leading the industry.

Coating film thickness and electrode printing technology leading domestic counterparts

<p>Japanese-high order machine Minimum coating film thickness: 1 μ m The industry's first choice</p>		<p>Japanese-higher-order RHK Industry's scope of use: high-capacity products The industry's first choice</p>	
<p>Japanese-advanced printing press process capability MaxR&lt;math&gt;\leq 2N&lt;/math&gt; Low sheet for product printing and overlapping layer Accuracy has a key factor</p>		<p>Taiwan system-high-order silver-dip machine Fully automatic series</p>	
<p>Japanese-High-order stack machine Process capacity is above 500 layers Foil stripping capacity &lt;math&gt;&lt; 1\text{um}&lt;/math&gt; The overlapping layer precision is <math>\pm 10 \mu \text{m}</math></p>		<p>American-burning furnace High temperature stability and durability</p>	
<p>Japanese-high-order hydraulic press Maximum pressure of 28,445 psi The industry's first choice</p>		<p>Japanese-high-order test machine, high-order 6-side appearance machine, high-order test charter plane Industry use scope: medium and high capacity products, the industry's fastest detection speed and production speed</p>	



Main material system

序号 (No.)	名称 (Item)	材质 (Material)
1	介电层 (Dielectric Layer)	陶瓷 (Ceramic)
2	电极层 (Electrode Layer)	镍 (Ni)
3	铜层 (Copper Layer)	铜 (Cu)
4	镍层 (Nickel Layer)	镍 (Ni)
5	锡层 (Tin Layer)	锡 (Sn)

Ceramic powder

KCM Corporation

CeramMetal slurry

Key materials-high-capacity material development

The K value is higher than that of its domestic counterparts

We have the ability to develop X5R, X7R and medium and high pressure Dopant formula

Barium titanate (Class II porcelain)

dopant

Low K

**K3800** Commercial formula powder

Class II porcelain (TC curve)

Temperature (°C)

high K

**K6200** Develop powder independently

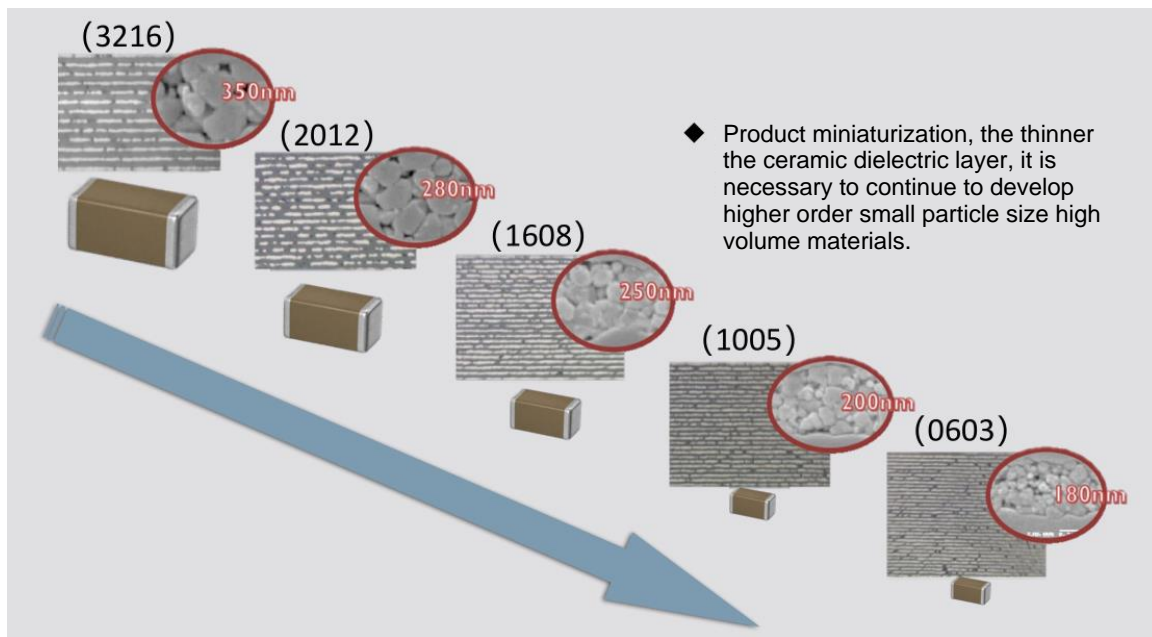
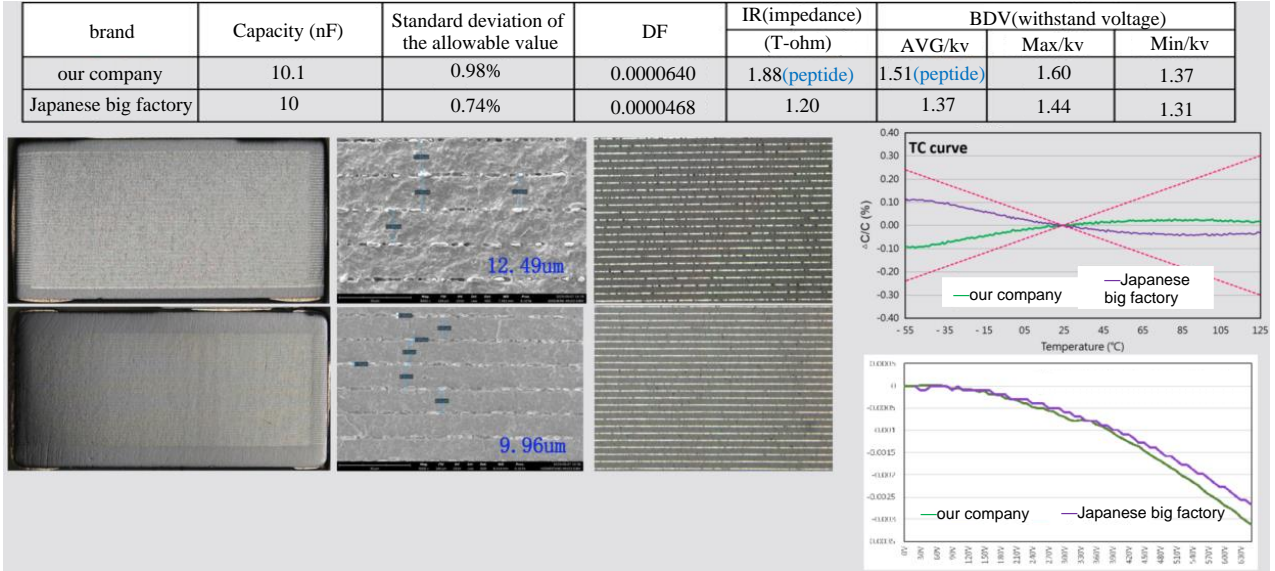
Self-developed formula can meet the requirements of X5R and X7R, etc. Meet the EIA specifications.

Various modifying agents (rare earth oxides)

Comparison of product design capabilities

Compare specifications 1206 NPO 103 630V

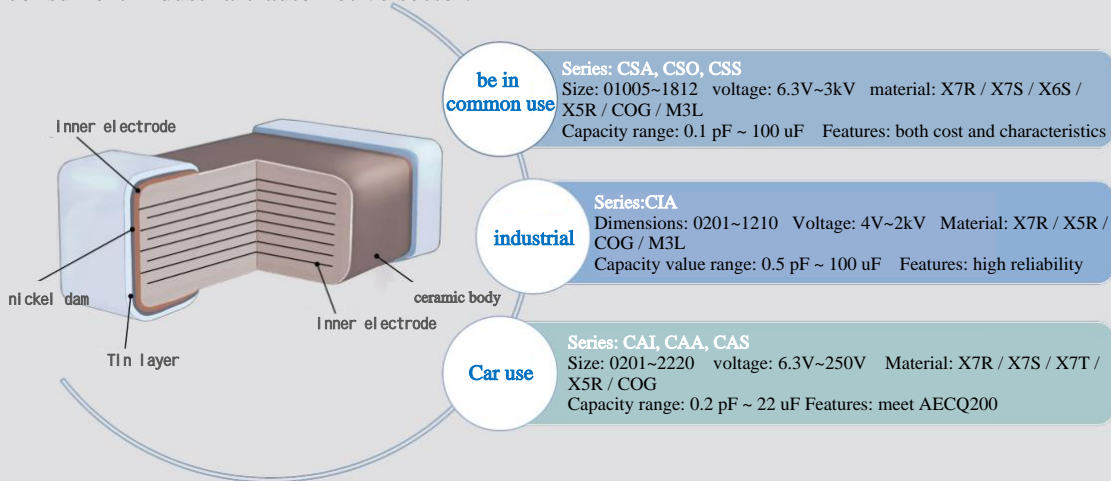
Product IR & BDV is better than Japanese, and DCbias is close to Japanese



structure		same as	open a way	high-handed	Soft end	high frequency	Soft end series
material	dielectric layer	X7R/X6S/X5R/COG/M3L	X7R	X7R/COG	X7R/COG	COG	X7R
	The electrode layer	Ni	Ni	Ni	Ni	Cu	Ni
	End electrode	Cu/Ni/Sn	Cu/Ni/Sn	Cu/Ni/Sn	Cu/Ni/Ag(Cu)/Sn	Cu/Ni/Sn	Cu/Ni/Ag(Cu)/Sn
Plate bending ability		General-purpose: ≥1mm Vehicle (X7R): ≥2mm Vehicle (COG): ≥3mm	General-purpose: ≥1mm	General-purpose: ≥1mm Vehicle (X7R): ≥2mm Vehicle (COG): ≥3mm	General-purpose: ≥3mm Vehicle: ≥5mm	General-purpose: ≥1mm Vehicle: ≥3mm	General-purpose: ≥3mm Vehicle: ≥5mm
characteristic	merit	The range of capacity is wide	Prevent short circuit	High pressure resistance (>=1kV)	Anti-plate bending strong The range of capacity is wide	High frequency features are good High Q value	Anti-plate bending strong Prevent short circuit
	shortcoming		The range of capacity is narrow	The range of capacity is narrow	The range of capacity is narrow		The range of capacity is narrow
apply		general service	Power supply, socket	high-tension line	source Car / industry	high frequency line	Connecner, interface end

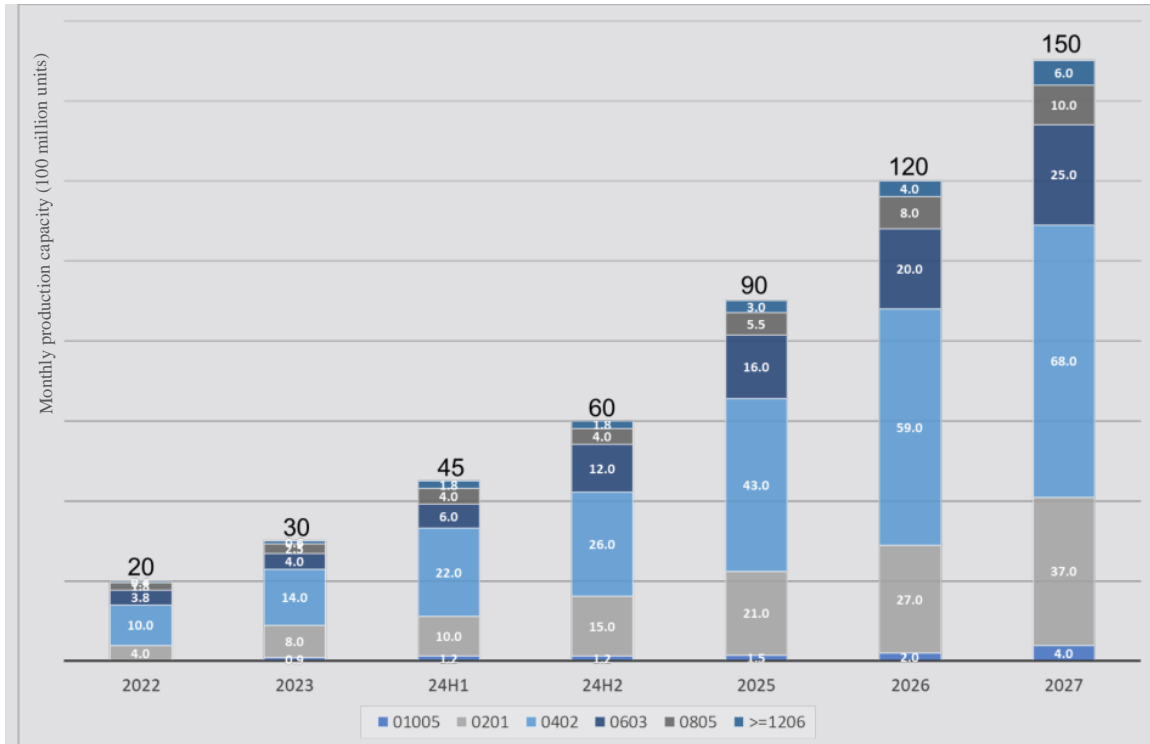
### Piticular ceramic capacitor MLCC

Capacitance size covers 01005~2220, and product types span the consumer / industrial / automotive sector.

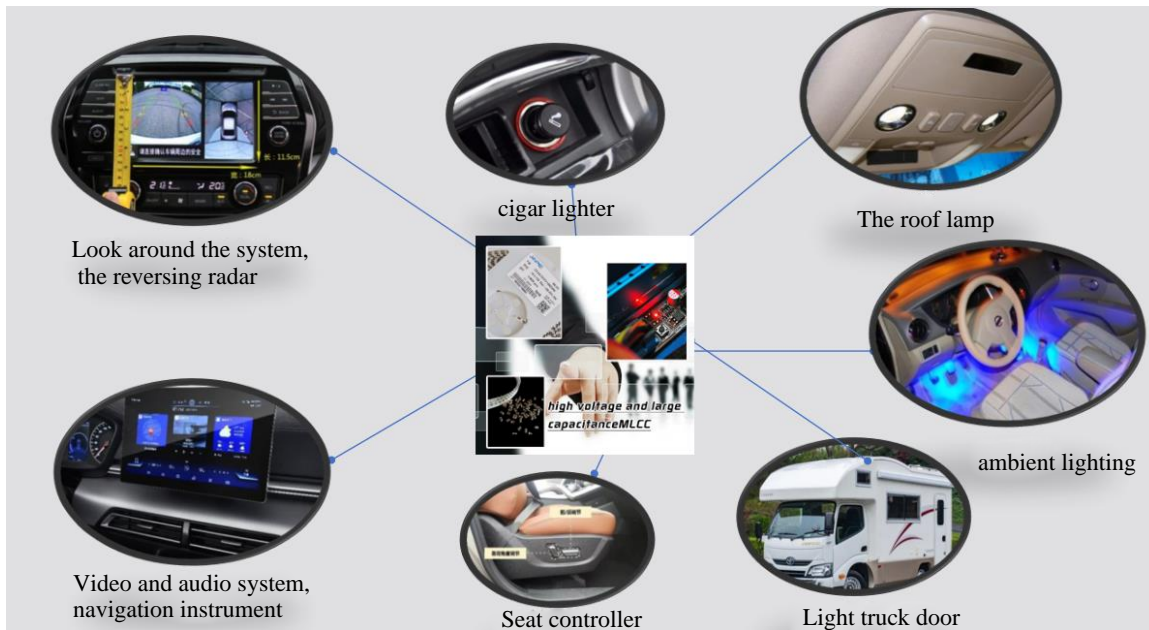




Production capacity planning

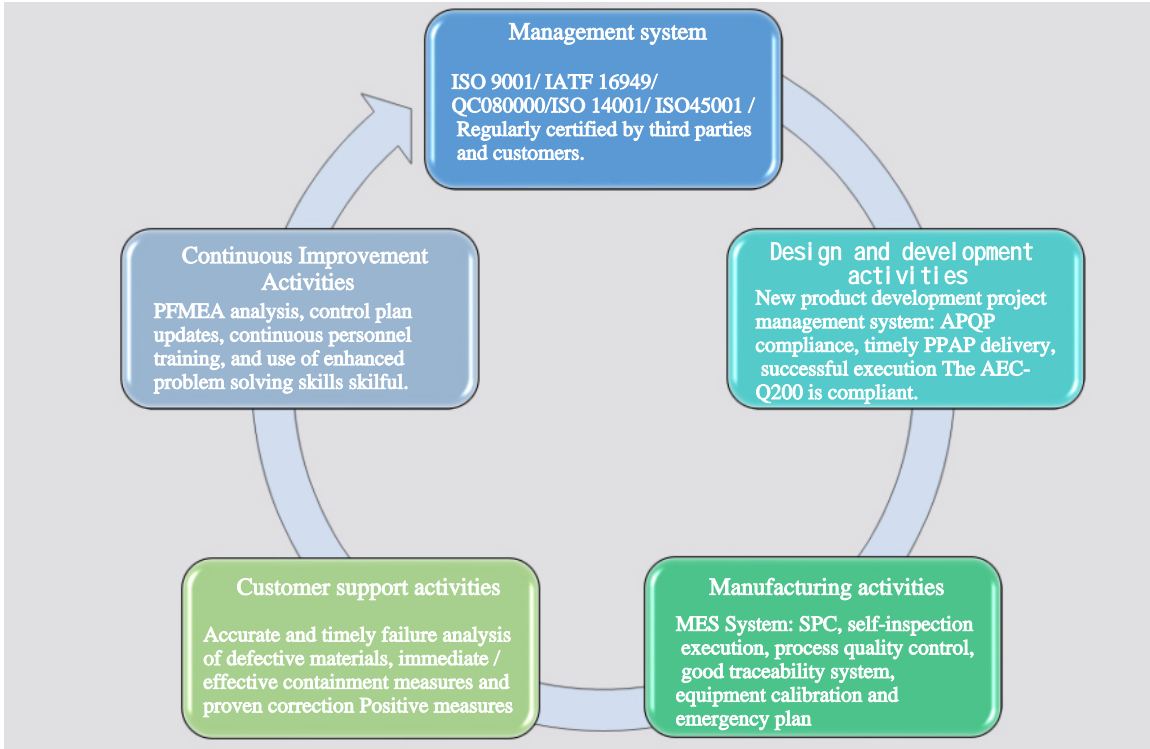


Part of the case





### Zero defect strategy



### Customer complaint feedback process

The customer complaint handling process follows the principle of 2-4-8-5. The process is as follows,

treatment flowchart	customer feedback	→	Factory Analysis & Improvement, Effect confirmation	→	result of handling
treatment flowchart	Customer feedback of abnormal information collection: <b>5W2H:</b> when/where/who/what/whyhow& how much Bad samples or bad pictures		<p><b>According to the 2-4-8-5 principle</b></p> <p>2: The first response is <b>within 2 hours</b></p> <p>4: Emergency measures &amp; second response <b>within 24 hours</b>.</p> <p>8: The third response provides a preliminary cause, corrective action report <b>within 48 hours</b> of receiving the defective sample.</p> <p>5: The fourth response replies to the final analysis report within 5 working days after receipt of the defective product, Root cause / preventive measures &amp; effectiveness verification</p>		The Sales shall provide the report and inform the customer of the processing result: (1) Abnormal products, local scrap, return or replacement processing. (2) Whether we can communicate with customers to use it specially
illustrate	<p>when:2022/05/23 Where: xxx company warehouse Who: xxx customer SQE What: Outer box label CSA0402X7R222K500GT) Not with side mark and physical label (Physical label: CSA0402NP0101J500GT) Why: The label is wrong how: cause the customer cannot how much: 1 box.</p>		<p>Occurrence Source 5Why Analysis: Why1: Why is there a label discrepancy? - Personnel posted in error; Why2: Why is it misplaced? - Take the wrong outer box to lead to the wrong paste; Why3: Why did you get the wrong box? - Two different outer boxes together Why4: Why is the outer box put together? - Multiple material numbers working in the same area; Why5: Why do multiple material numbers work in the same area? - No fixed area was delineated.</p> <p>Outflow source: 1. After putting the wrong label in the warehouse, make up the label by itself, and there is no OQC confirmation; 2. There is no cross-scanning label (reel / small box / outer box) after the labeling.</p>		<p>improvement strategy: 1. Delimit the fixed area, and only one material number product can be operated at the same time in the fixed area.</p> <p>2. The permission to fill the label is set to OQC, and there is no filling permission to play in the warehouse. OQC will record, recover and retain the damaged label, and the system will also keep the replacement record.</p> <p>1. Effect verification: The improvement was completed on May 26, 2022 until the end of March 2023, and no abnormal labeling occurred again The event. 2. Warehouse and QA formulated the operation process of label breakage and formulate documents and issue them. (C-OL-004)</p>



labware AEC-Q200

<p><b>surface:</b> The visual microscope will visually inspect the product for defects</p>		<p><b>Welding heat resistance:</b> Tin furnace 1 to test the electrical tolerance of capacitance components under high temperature tin immersion conditions ability</p>		<p><b>Life test:</b> 1. Life-time testing machine 2. The DC power supply device 1 determines the product under the specified conditions of use and maintenance The service life</p>	
<p><b>size:</b> Specification for the physical dimensions of the test capacitor components</p>		<p><b>Plate bending test, thrust test:</b> universal material testing machine</p>		<p><b>mechanical shock:</b> Mechanical impact test machine 1 determines the materials of the capacitive components in the collision process The ability to absorb the energy</p>	
<p><b>Damstruction physical test:</b> A pair of components samples were dissected, as well as back and backward The whole process of a series of tests and analysis.</p>		<p><b>Solubility:</b> 1. Solvent reagent 2. stereatic microscope 3. Digital bridge 4. Impedance tester 5. The withstand pressure tester</p>		<p><b>mechanical vibration:</b> Mechanical vibration test machine 1 the vibration load of the product in the specified severity Under the ability to maintain its working characteristics and integrity</p>	
<p><b>Electrical test:</b> 1. Digital electric bridge 2. Impedance tester 3. The withstand pressure tester</p>		<p><b>Hot and cold impact:</b> Three boxes of cold and hot shock box and a test product in the surrounding atmospheric temperature changes sharply Of the quality and reliability of the same</p>		<p><b>Electrostatic test:</b> Electrostatic tester a test whether the static electricity generated in the actual use will produce Product damage or cause a decline in product performance</p>	
<p><b>solderability:</b> Tin furnace-Determine whether the material is suitable for welding and during the welding process There will be welding difficulties or welding defects</p>		<p><b>Constant temperature and humidity (temperature change), constant temperature and humidity (load):</b> Used to test products to ensure reliability, ensure and improve product quality Improve credibility</p>		<p><b>Characteristics of tolerance value changing with temperature:</b> The purpose of the test is to determine that the product is stored in a climate Adaptability of storage, transportation and use</p>	



Car rules application

**Power-related and safety-related**

**function requirement**

- High Reliability
- Fail-Safe
- Anti-Bending
- High-Temp.

**apply**

- Motor
- ABS
- EPS
- TPMS
- ESC/ESP
- Fuel Injection System
- Pump
- Airbag

**Specification requirements**

- size:0603~1812
- material quality:X7R,COG,X8R,X8G
- Capacity value:2.2pF~10uF
- withstand voltage: 16V~1KV

**Body electronics**

**function requirement**

- High Reliability
- Space Saving
- Anti-Bending
- Fail-Safe

**apply**

- Lamp
- Wipers
- Parking Assistant
- Dashboard Systems
- ECU
- Car Alarm
- Light Sensor
- Air Control
- Heating

**Specification requirements**

- size:0402~1812,0612
- material quality:X7R,COG
- Capacity value:2.2pF~22uF
- voltage:6.3V~630V

**Comfort and vehicle information**

**Specification requirements**

- Space Saving
- Decoupling
- ESD Protection
- High Frequency

**apply**

- HUD
- Navigation
- GPS
- Electric Mirror Control
- Remote Keyless
- Cruise Control
- A/V Entertainment
- Electric Seat Control

**Specification requirements**

- size:0201~1210
- material quality:X7R,COG,X6S,X5R
- Capacity value:0.1pF~22uF
- withstand voltage:6.3V~50V

**Power management**

**function requirement**

- Hash Environment
- High Voltage
- High Reliability
- Anti-Bending

**apply**

- BMS
- Charger
- Electric Pump
- Inverter
- DC/DC Converters
- On Board Charger

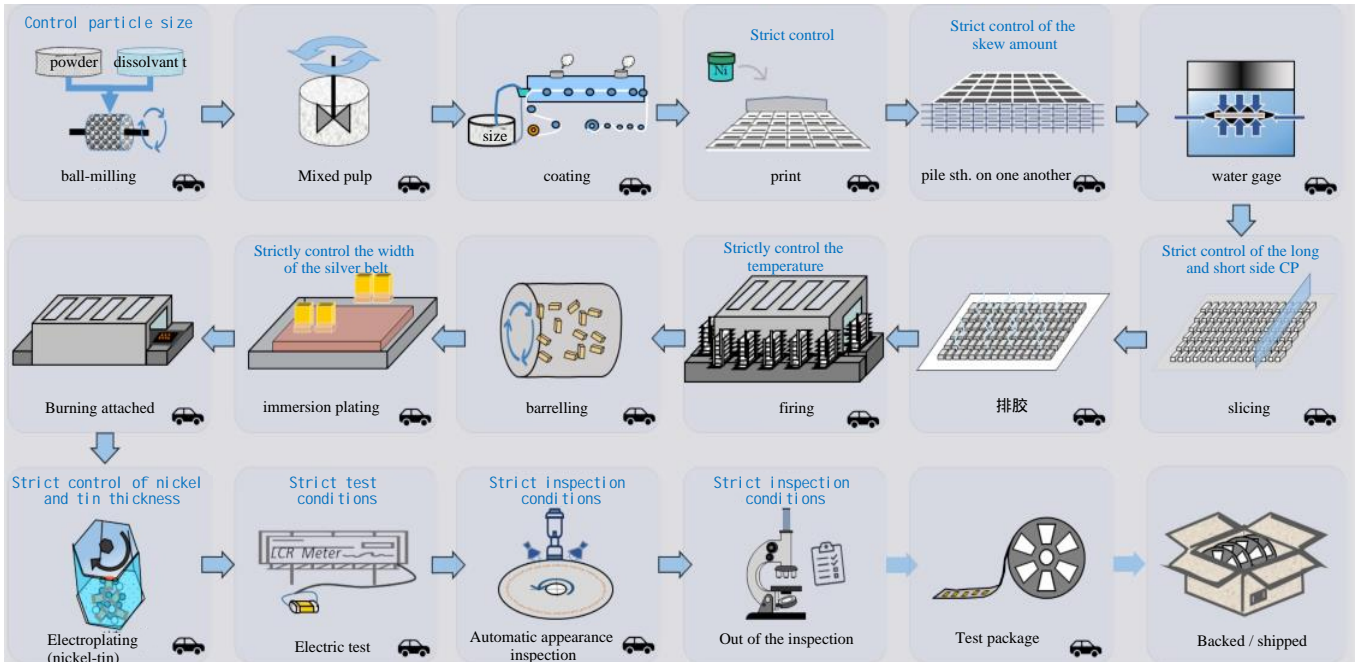
**Specification requirements**

- size:0402~1812,0612
- material quality:X7R,COG
- Capacity value:2.2pF~22uF
- voltage:6.3V~630V

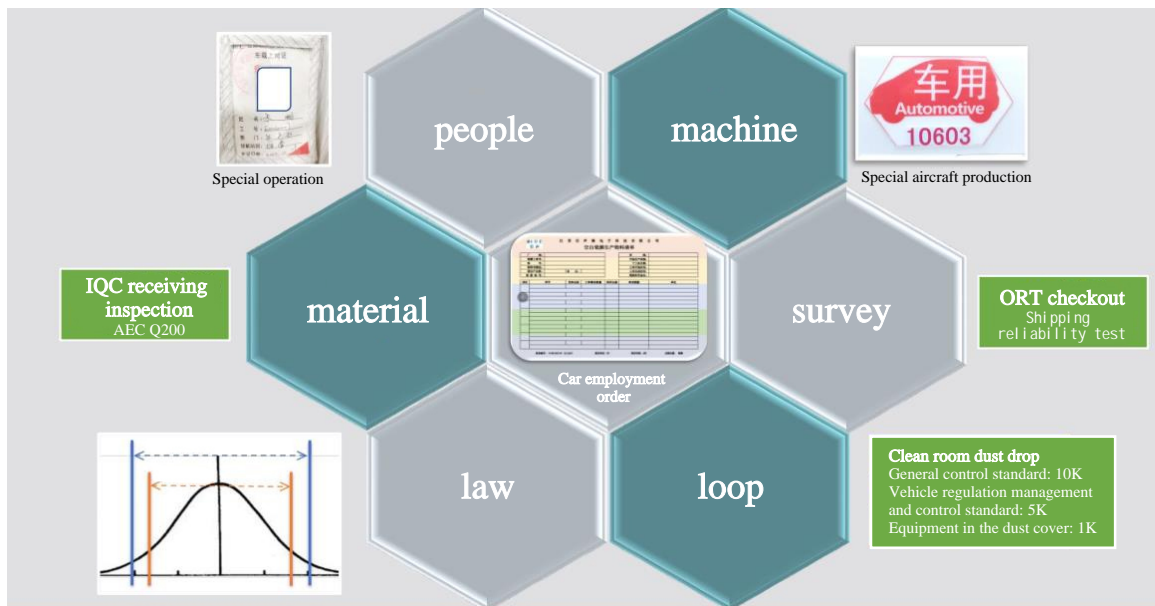




production flow



Special line management





## Material analysis for the experimental equipment

### Scanning electron microscopy (SEM / EDS)

#### 1. Principle:

Scanning electron microscope (Scanning Electron Microscope, SEM), sweeps over the surface of a sample using a fine focused electron beam. Various physical signals arise to modulate imaging in a commonly used instrument for microscopic analysis.

#### 2. Application:

- ① Nāi mǐ grade raw material analysis Such as: ceramic original powder, nickel pulp, copper pulp, rare earth mixture and so on
- ② Surface quality analysis: Such as: coating uniformity, printing quality, end electrode combustion, electroplating layer analysis
- ③ Product metallographic analysis: Such as: ceramic powder sintering condition, capture density, electrode layer sintering condition, end electrode burning condition, electroplating layer density and other microscopic detection
- ④ elemental analysis Such as: rare earth mixture analysis, ceramic powder composition analysis, foreign body element analysis and so on
- ⑤ Product failure analysis



### Specific Surface Area Analyzer (BET)

#### 1. Principle

With nitrogen as the adsorbent substance and nitrogen as the carrier gas, the two gases are mixed in a certain proportion to reach the specified relative pressure, and then flow through the solid material. When the sample tube is put into the liquid nitrogen for heat preservation, the sample is physically adsorbed to the nitrogen in the mixed gas, while the carrier gas is not adsorbed. At this time, the adsorption peak appears on the screen. When the liquid nitrogen is removed, the sample tube is back at room temperature, the adsorbed nitrogen is detached out, and the desorption peak appears on the screen. Finally, a known volume of pure nitrogen was injected in the mixture to obtain a corrected peak. Based on the peak area of the corrected and deattached peaks, the adsorption amount of the sample at this relative pressure is calculated. Changing the mixing ratio of nitrogen and carrier gas can measure the adsorption amount under the relative pressure of several nitrogen, so that the specific surface can be calculated according to the BET formula

#### 2. Application

The specific surface area and porosity of nano-ceramic powder affect the strength, appearance and density of ceramic body sintering curing and finished product. The specific surface area of the addition also affects the contraction of the ceramic body and the ceramic sintering situation



## Certified resume

