SAMSUNG ELECTRO-MECHANICS

RoHS+Halogen Compliant ecoparts

Specification of Automotive MLCC

- **Supplier : Samsung electro-mechanics**
- **Product : Multi-layer Ceramic Capacitor**
- **Samsung P/N : CL10C181JB81PNC**
- **Description : CAP, 180㎊, 50V, ±5%, C0G, 0603**
- **AEC-Q 200 Specified**

A. Samsung Part Number

CL	10	C	181	J	B	8	1	P	N	C
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪

①	**Series**	Samsung Multi-layer Ceramic Capacitor			
②	**Size**	0603 (inch code)	L: 1.6 ± 0.1 mm	W: 0.8 ± 0.1 mm	
③	**Dielectric**	C0G	⑧	**Inner electrode**	Ni
④	**Capacitance**	180 ㎊		**Termination**	Cu
⑤	**Capacitance tolerance**	±5 %		**Plating**	Sn 100% (Pb Free)
			⑨	**Product**	Automotive
⑥	**Rated Voltage**	50 V	⑩	**Grade code**	Standard
⑦	**Thickness**	0.8 ± 0.1 mm	⑪	**Packaging**	Cardboard Type, 7" reel(4,000ea)

B. Reliability Test and Judgement condition

	Performance	Test condition
High Temperature Exposure	Appearance : No abnormal exterior appearance Capacitance Change : within ±2.5% or ±0.25㎊ whichever is larger Q : 1000 min IR : More than 10,000㏁ or 500㏁×㎌ Whichever is Smaller	Unpowered, 1000hrs@T=150℃ Measurement at 24±2hrs after test conclusion
Temperature Cycling	Appearance : No abnormal exterior appearance Capacitance Change : within ±2.5% or ±0.25㎊ whichever is larger Q : 1000 min IR : More than 10,000㏁ or 500㏁×㎌ Whichever is Smaller	1000Cycles Measurement at 24±2hrs after test conclusion 1 cycle condition : -55+0/-3℃(15±3min) -> Room Temp(1min.) -> 125+3/-0℃(15±3min) -> Room Temp(1min.)
Destructive Physical Analysis	No Defects or abnormalities	Per EIA 469
Moisture Resistance	Appearance : No abnormal exterior appearance Capacitance Change : within ±2.5% or ±0.25㎊ whichever is larger Q : 350 min IR : More than 10,000㏁ or 500㏁×㎌ Whichever is Smaller	10Cycles, t=24hrs/cycle Heat (25~65℃) and humidity (80~98%), Unpowered measurement at 24±2hrs after test conclusion
Humidity Bias	Appearance : No abnormal exterior appearance Capacitance Change : within ±2.5% or ±0.25㎊ whichever is larger Q : 200 min IR : More than 500㏁ or 25㏁×㎌ Whichever is Smaller	1000hrs 85℃/85%RH, Rated Voltate and 1.3~1.5V, Add 100kohm resistor Measurement at 24±2hrs after test conclusion The charge/discharge current is less than 50mA.
High Temperature Operating Life	Appearance : No abnormal exterior appearance Capacitance Change : within ±3.0% or ±0.3㎊ whichever is larger Q : 350 min IR : More than 10,000㏁ or 500㏁×㎌ Whichever is Smaller	1000hrs @ TA=125℃, 200% Rated Voltage, Measurement at 24±2hrs after test conclusion The charge/discharge current is less than 50mA.

	Performance	Test condition
External Visual	No abnormal exterior appearance	Visual inspection
Physical Dimensions	Within the specified dimensions	Using The calipers
Mechanical Shock	Appearance : No abnormal exterior appearance Capacitance Change : within ±2.5% or ±0.25pF whichever is larger Q, IR : initial spec.	Three shocks in each direction should be applied along 3 mutually perpendicular axes of the test specimen (18 shocks) Peakvalue: 1,500G; Duration: 0.5ms; Wave: Half sine; Velocity: 4.7m/sec.
Vibration	Appearance : No abnormal exterior appearance Capacitance Change : within ±2.5% or ±0.25pF whichever is larger Q, IR : initial spec.	5g's for 20min., 12cycles each of 3 orientations, Use 8"×5" PCB 0.031" Thick 7 secure points on one long side and 2 secure points at corners of opposite sides. Parts mounted within 2" from any secure point. Test from 10~2000Hz.
Resistance to Solder Heat	Appearance : No abnormal exterior appearance Capacitance Change : within ±2.5% or ±0.25pF whichever is larger Q, IR : initial spec.	Solder pot : 260±5℃, 10±1sec.
Thermal Shock	Appearance : No abnormal exterior appearance Capacitance Change : within ±2.5% or ±0.25pF whichever is larger Q, IR : initial spec.	-55℃/+125℃. Note: Number of cycles required-300, Maximum transfer time-20 sec, Dwell time-15min. Air-Air
ESD	Appearance : No abnormal exterior appearance Capacitance Change : within ±2.5% or ±0.25pF whichever is larger Q, IR : initial spec.	AEC-Q200-002
Solderability	95% of the terminations is to be soldered evenly and continuously	a) Preheat at 155℃ for 4 hours, Immerse in solder for 5s at 245±5℃ b) Steam aging for 8 hours, Immerse in solder for 5s at 245±5℃ c) Steam aging for 8 hours, Immerse in solder for 120s at 260±5℃ solder : a solution ethanol and rosin
Electrical Characterization	Capacitance : Within specified tolerance Q : 1000 max. IR(25℃) : More than 100,000MΩ or 1,000MΩ×μF IR(125℃) : More than10,000MΩ or 100MΩ×μF Whichever is Smaller Dielectric Strength	The Capacitance /Q should be measured at 25℃, 1MHz±10%, 0.5~5Vrms I.R. should be measured with a DC voltage not exceeding Rated Voltage @25℃, @125℃ for 60~120 sec. Dielectric Strength : 250% of the rated voltage for 1~5 seconds
Board Flex	Appearance : No abnormal exterior appearance Capacitance Change : within ±5.0% or ±0.5pF whichever is larger	Bending to the limit (3mm) for 5 seconds
Terminal Strength(SMD)	Appearance : No abnormal exterior appearance Capacitance Change : within ±2.5% or ±0.25pF whichever is larger	10N, for 60±1 sec.
Beam Load	Destruction value should not be exceed Chip Length < 2.5mm a) Chip Thickness > 0.5mm : 20N b) Chip Thickness ≤ 0.5mm : 8N	Beam speed 0.5±0.05mm/sec
Temperature Characteristics	C0G (From -55℃ to 125℃, Capacitance change should be within ±30PPM/℃)	

C. Recommended Soldering method :

Reflow (Reflow Peak Temperature : 260+0/-5℃, 10sec. Max)

Meet IPC/JEDEC J-STD-020 D Standard

* For the more detail Specification, Please refer to the Samsung MLCC catalogue.