SAMSUNG ELECTRO-MECHANICS

RoHS+Halogen Compliant

Specification of Automotive MLCC (Reference sheet)

- **Supplier : Samsung electro-mechanics**
- **Product : Multi-layer Ceramic Capacitor**
- **Samsung P/N : CL10B334KA8VPNC**
- **Description : CAP, 330㎋, 25V, ±10%, X7R, 0603**
- **AEC-Q 200 Specified**

A. Samsung Part Number

CL	10	B	334	K	A	8	V	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**	X7R	⑧	**Inner electrode**	Ni
④	**Capacitance**	330 ㎋		**Termination**	Soft termination
⑤	**Capacitance tolerance**	±10 %		**Plating**	Sn 100% (Pb Free)
			⑨	**Product**	Automotive
⑥	**Rated Voltage**	25 V	⑩	**Grade code**	Standard
⑦	**Thickness**	0.8 ± 0.1 mm	⑪	**Packaging**	Cardboard Type, 7" reel

B. Reliability Test and Judgement condition

	Performance	Test condition
High Temperature Exposure	Appearance : No abnormal exterior appearance Capacitance Change : Within ±10% Tan δ : 0.075 max 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 ±10% Tan δ : 0.075 max 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 ±12.5% Tan δ : 0.075max 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 ±12.5% Tan δ : 0.075 max 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 ±12.5% Tan δ : 0.075 max IR : More than 1000㏁ or 50㏁×㎌ 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	Microscope (´10)
Physical Dimensions	Within the specified dimensions	Using The calipers
Mechanical Shock	Appearance : No abnormal exterior appearance Capacitance Change : Within ±10% Tan δ, IR : initial spec.	Three shocks in each direction should be applied along 3 mutually perpendicular axes of the test specimen (18 shocks) Peakvalue | Duration | Wave | Velocity 1,500G | 0.5ms | Half sine | 4.7m/sec.
Vibration	Appearance : No abnormal exterior appearance Capacitance Change : Within ±10% Tan δ, 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 ±10% Tan δ, IR : initial spec.	Solder pot : 260±5℃, 10±1sec.
Thermal Shock	Appearance : No abnormal exterior appearance Capacitance Change : Within ±10% Tan δ, 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 ±10% Tan δ, 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 Tan δ (DF) : 0.05max. IR(25℃) : More than 10,000MΩ or 500MΩ×μF IR(125℃) : More than1,000MΩ or 10MΩ×μF Whichever is Smaller Dielectric Strength	The Capacitance /D.F. should be measured at 25℃, 1kHz±10%, 1.0±0.2Vrms 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 ±10%	Bending to the limit (2mm) for 5 seconds
Terminal Strength(SMD)	Appearance : No abnormal exterior appearance Capacitance Change : Within ±10%	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 characteristic	X7R (From -55℃ to 125℃, Capacitance change should be within ±15%)	

C. Recommended Soldering method :

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

⚠ Product specifications included in the specifications are effective as of March 1, 2013.
Please be advised that they are standard product specifications for reference only.
We may change, modify or discontinue the product specifications without notice at any time.
So, you need to approve the product specifications before placing an order.
Should you have any question regarding the product specifications,
please contact our sales personnel or application engineers.