SAMSUNG ELECTRO-MECHANICS

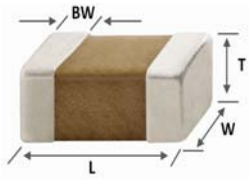
Specification of Automotive MLCC (Reference sheet)

RoHS+Halogen Compliant ecoparts

- Supplier : Samsung electro-mechanics
- Product : Multi-layer Ceramic Capacitor
- Samsung P/N : CL10C220JB81PNC
- Description : CAP, 22pF, 50V, ± 5%, C0G, 0603
- AEC-Q200 Qualified

A. Dimension

- Dimension



Size	0603 inch
L	1.60±0.10 mm
W	0.80±0.10 mm
T	0.80±0.10 mm
BW	0.30±0.20 mm

B. Samsung Part Number

CL	10	C	220	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: 1.60±0.10 mm	W: 0.80±0.10 mm
③ **Dielectric**	C0G	⑧ **Inner electrode**	Ni
④ **Capacitance**	22 pF	**Termination**	Cu
⑤ **Capacitance tolerance**	± 5%	**Plating**	Sn 100% (Pb Free)
		⑨ **Product**	Automotive
⑥ **Rated Voltage**	50 V	⑩ **Special code**	Normal
⑦ **Thickness**	0.80±0.10 mm	⑪ **Packaging**	Cardboard Type, 7" Reel

C. Reliability Test and Judgement condition

	Performance	Test condition
High Temperature Exposure	Appearance : No abnormal exterior appearance Capacitance Change : Within ±2.5% or 0.25pF whichever is larger Q : 840 min. IR : More than 10,000 MΩ or 500 MΩ×μF Whichever is smaller	Unpowered, 1,000hrs @ Max. temperature Measurement at 24±2hrs after test conclusion
Temperature Cycling	Appearance : No abnormal exterior appearance Capacitance Change : Within ±2.5% or 0.25pF whichever is larger Q : 840 min. IR : More than 10,000 MΩ or 500 MΩ×μF Whichever is smaller	1,000Cycles Measurement at 24±2hrs after test conclusion 1 cycle condition : -55+0/-3℃(30±3min) → Room Temp. (1min) → 125+3/-0℃(30±3min) → Room Temp. (1min)
Destructive Physical Analysis	No Defects or abnormalities	Per EIA 469
Humidity Bias	Appearance : No abnormal exterior appearance Capacitance Change : Within ±2.5% or 0.25pF whichever is larger Q : 173.26 min. IR : More than 500 MΩ or 25 MΩ×μF Whichever is smaller	1,000hrs 85℃/85%RH, Rated Voltage and 1.3~1.5V, Add 100kohm resistor The charge/discharge current is less than 50mA.
High Temperature Operating Life	Appearance : No abnormal exterior appearance Capacitance Change : Within ±3% or 0.3pF whichever is larger Q : 330 min. IR : More than 1,000 MΩ or 50 MΩ×μF Whichever is smaller	1,000hrs @ 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 ±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) Peak value: 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 10~2,000Hz.
Resistance to Solder Heat	Appearance : No abnormal exterior appearance Capacitance Change : Within ±2.5% or 0.25pF whichever is larger Q, IR : Initial spec.	preheating : 150℃ for 60~120 sec. Solder pot : 260±5℃, 10±1sec.
ESD	Appearance : No abnormal exterior appearance Capacitance Change : Within ±2.5% or 0.25pF whichever is larger Q, IR : Initial spec.	AEC-Q200-002 or ISO/DIS10605
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 : 840 min. IR(25℃) : More than 100,000 MΩ or 1,000 MΩ×μF Whichever is smaller IR(125℃) : More than 10,000 MΩ or 100 MΩ×μF Whichever is smaller Dielectric Strength	The Capacitance / D.F. should be measured at 25℃, 1 MHz ± 10%, 0.5~5 Vrms I.R. should be measured with a DC voltage not exceeding Rated Voltage @25℃, @125℃ for 60~120 sec. Dielectric Strength : 300% of the rated voltage for 1~5 seconds
Board Flex	Appearance : No abnormal exterior appearance Capacitance Change : Within ±5% or 0.5pF whichever is larger	Bending to the limit, 3 mm for 60 seconds
Terminal Strength(SMD)	Appearance : No abnormal exterior appearance Capacitance Change : Within ±2.5% or 0.25pF whichever is larger	10 N, for 60 sec.
Beam Load	Destruction value should be exceed 20 N	Beam speed : 0.5±0.05 mm/sec
Temperature Characteristics	C0G From -55 ℃ to 125 ℃, Capacitance change should be within 0±30ppm/℃	

D. Recommended Soldering method :

Reflow (Reflow Peak Temperature : 260 +0/-5℃, 30sec.), Meet IPC/JEDEC J-STD-020 D Standard

⚠ 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.