General Multilayer Ceramic Capacitor(SAMSUNG)

Multilayer Ceramic Capacitor(MLCC) is an electronic part that temporarily stores an electrinical charge and the most prevalent type of capacitor today.New technologies have enabled the MLCC manufacturers to follow the trend dictated by smaller and smaller electronic devices such as Cellular telephone,Computers,DSC,DVC,GPS

General Features

*Miniature Size
*Wide Capacitance and Voltage Range
*Tape a & Reel for Surface Mount Assembly
*Low ESR

Applications

*General Electronic circuit

Part Numbering

CL	10	B	104	K	B	8	N	N	N	C
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)

(1)Samsung Multilayer Ceramic Capacitor
(2)Size(mm)
(3)Temperature Charateristic
(4)Nominal Capacitance
(5)Capacitance Tolerance
(6)Rated Voltage
(7)Thickness option
(8)Product and Plating Method
(9)Samsung Control Code
(10)Reserved For Future Use
(11)Packaging Style

(1)Samsung Multilayer Ceramic Capacitor

(2)Size(mm)

Code	EIA code	Size(mm)
03	0201	0.6×0.3
05	0402	1.0×0.5
10	0603	1.6×0.8
21	0805	2.0×1.25
31	1206	3.2×1.6
32	1210	3.2×2.5
43	1812	4.5×3.2
55	2220	5.7×5.0

(3)CAPACITANCE TEMPERATURE CHARATERISTIC

Code	Temperature Charateristic				Temperature Range
C	CLASS 1	C0G	C△	0±30(ppm/℃)	-55~+125℃
P		P2H	P△	-150±60	
R		R2H	R△	-220±60	
S		S2H	S△	-330±60	
T		T2H	T△	-470±60	
U		U2J	U△	-750±60	
L		S2L	S△	+350~-1000	
A	CLASS 2	X5R	X5R	±15%	-55~+85℃
B		X7R	X7R	±15%	-55~+125℃
X		X6S	X6S	±22%	-55~+105℃
F		Y5V	Y5V	+22~-82%	-30~+85℃

※Temperature Charateristic

Temp Characteristic	Below 2.0pF	2.2~3.9pF	Above 4.0pF	Above 10pF
C△	C0G	C0G	C0G	C0G
P△	~	P2J	P2J	P2J
R△	~	R2J	R2J	R2J
S△	~	S2J	S2J	S2J
T△	~	T2J	T2J	T2J
U△	~	U2J	U2J	U2J

J:±120ppm/℃, H:±60ppm/℃, G:±30ppm/℃

(4)NOMINAL CAPACITANCE

Nominal capacitance is identified by three digits;
The first and second digits identify the first and second significant figures of the capacitance
The third digit identifies the multiplier.
R identifies a decimal point

※For example

Code	Nominal capacitance
1R5	1.5pF
103	10000pF,10nF,0.01uF
104	100000pF,100nF,0.1uF

(5)CAPACITANCE TOLERANCE

Code	Tolerance	Nominal Capacitance
A	±0.05pF	Less than 10pF (Including 10pF)
B	±0.1pF	
C	±0.25pF	
D	±0.5pF	
F	±1pF	
F	±1%	More than 10pF
G	±2%	
J	±5%	
K	±10%	
M	±20%	
Z	+80,-20%	

(6)RATED VOLTAGE

Code	Rate Voltage
R	4.0V
Q	6.3V
P	10V
O	16V
A	25V
L	35V
B	50V
C	100V
D	200V
E	250V
G	500V
H	630V
I	1000V
J	2000V
K	3000V

(7)THICKNESS OPTION

Size	Code	Thickness(T)(In mm)
0201(0603)	3	0.3±0.03
0402(1005)	5	0.5±0.05
0603(1608)	8	0.8±0.1
0805(2012)	A	0.65±0.1
	C	0.85±0.1
	F	1.25±0.1
	Q	1.25±0.15
1206(3216)	C	0.85±0.1
	F	1.25±0.1
	H	1.60±0.20
1210(3225)	F	1.25±0.20
	H	1.60±0.20
	I	2.0±0.20
	J	2.5±0.20
	V	2.5±0.30
1812(4532)	F	1.25±0.20
	H	1.60±0.20
	I	2.0±0.20
	J	2.5±0.20
	L	3.2±0.30
2220(5750)	F	1.25±0.20
	H	1.60±0.20
	I	2.0±0.20
	J	2.5±0.20
	L	3.2±0.30

(8)PRODUCT & PLATING METHOD

Code	Electrode	Temination	Plating Type
A	Pd	Ag	Sn_100%
N	Ni	Cu	Sn_100%
G	Cu	Cu	Sn_100%

(9)Samsung Control Code

Code	Description of the Code
A	Array (2-Element)
B	Array (4-Element)
C	High-Q
N	Normal
L	Automotive
P	LICC

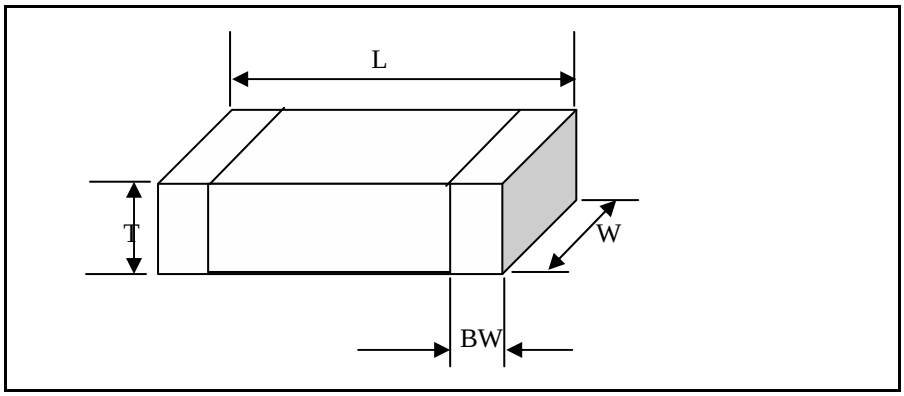
(10)RESERVED FOR FUTURE USE

Code	Description of the Code
N	Reserved for future use

(11)PACKAGING STYLE

Code	Packaging Style
B	Bulk
P	Bulk Case
C	Paper 7″
D	Paper 13″ (10,000EA)
E	Embossing 7″
F	Embossing 13″ (10,000EA)
L	Paper 13″ (15,000EA)
O	Paper 10″
S	Embossing 10″

Appearance and Dimensions



Code	EIA Code	Dimensions (in mm)			
		L	W	T(MAX)	BW
03	0201	0.6±0.03	0.3±0.03	0.33	0.15±0.05
05	0402	1.0±0.05	0.5±0.05	0.55	0.2+0.15/-0.1
10	0603	1.6±0.1	0.8±0.1	0.9	0.3±0.2
21	0805	2.0±0.1	1.25±0.1	1.35	0.5+0.2/-0.3
31	1206	3.2±0.15	1.6±0.15	1.4	0.5+0.2/-0.3
31	1206	3.2±0.20	1.6±0.2	1.8	0.5+0.2/-0.3
32	1210	3.2±0.30	2.5±0.2	2.7	0.6±0.3
32	1210	3.2±0.30	2.5±0.3	2.8	0.6±0.3
43	1812	4.5±0.40	3.2±0.3	3.5	0.8±0.3
55	2220	5.7±0.40	5.0±0.3	3.5	1.0±0.3

●Storage Condition

◆Storage Environment

The electrical charateristic of MLCCs were degraded by the environment of high temperature or humidity. Therefore,the MLCCs shall be stored in the ambient temperature and the relative humidity of less than 40℃ and 70%,respectively.

Guarantee storage period is wihtin 6 months from the outgoing date of delivery.

◆Corrosive Gases

Since the solderability of the end termination in MLCC was degraded by chemical atmosphere such as chlorine,acid and sulfide gases,MLCCs must be avoided from these gases.

◆Temperature Fluctuations

Since dew condension may occur by the differences in temperature when the MLCCs are taken out of

storage,it is important to maintain the temperature-controlled environment.

●Design of land pattern

When designing printed circuit boards,the shape and size of the lands must allow for the proper amount of solder on the capacitor.
The amount of solder at the end terminations has a direct effect on the crack.
The crack in MLCC will be easily occurred by the tensile stress which was due to too much amount of solder.In contrast,if too little solder is applied,the termination strength will be insufficiently.

※All specification are subject to change without notice.
※Conformity to RoHS Directive:This means that,in conformity with EU directive 2002/95/EC,lead,cadmium,mercury, hexavalent chromium,and specific bromine-based flame retardants,PBB and PBDE,have not been used,except for exempted applications.