



**IEC QUALITY ASSESSMENT SYSTEM (IECQ)**  
 covering Electronic Components,  
 Assemblies, Related Materials and Processes  
 For rules and details of the IECQ visit [www.iecq.org](http://www.iecq.org)

## Schedule of Scope to Certificate of Conformity

### Approved Component

IECQ Certificate No.: IECQ-C ULTW 16.0002

CB Certificate No.: 20002429AQP-1

Schedule Number: IECQ-C ULTW 16.0002-S

Rev No.: 1 Revision Date: 2016-01-04 Page 1 of 5

#### Approval Scope

Map Range and Thickness Code --- 200~250V

Dielectric & Series		X7R – Soft termination					
Cap. (pF)	EIA Size	0603	0805	1206	1210	1808	1812
	Rated Voltage	200~250V					
	Cap. Thick. rule code code						
100	101						
150	151						
180	181						
220	221	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	
270	271	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
330	331	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
390	391	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
470	471	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
560	561	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
680	681	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
820	821	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
1000	102	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
1200	122	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
1500	152	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
1800	182	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
2200	222	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
2700	272	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
3300	332	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
3900	392	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
4700	472	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
5600	562	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
6800	682	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
8200	822	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
10000	103	B	XBMJC	XBMJCIDEP	EPFG	CIDEPF	EPFGH
12000	123		XBMJC	XBMJCIDEP	EPFG	EPF	EPFGH
15000	153		XBMJC	XBMJCIDEP	EPFG	EPF	EPFGH
18000	183		XBMJC	XBMJCIDEP	EPFG	EPF	EPFGH
22000	223		XBMJC	XBMJCIDEP	EPFG	EPF	EPFGH
27000	273		MJC	XBMJCIDEP	EPFG	EPF	EPFGH

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Dielectric & Series		X7R – Soft termination					
Cap. (pF)	EIA Size	0603	0805	1206	1210	1808	1812
	Rated Voltage	200~250V					
	Cap. Thick. rule code code						
33000	333		C	XBMJCIDEP	EPFG	EPF	EPFGH
39000	393			XBMJCIDEP	EPFG	EPF	EPFGH
47000	473			XBMJCIDEP	EPFG	EPF	EPFGH
56000	563			MJCIDEP	EPFG	EPF	EPFGH
68000	683			CIDEP	EPFG	EPF	EPFGH
82000	823			CIDEP	EPFG	EPF	EPFGH
100000	104			EP	EPFG	EPF	EPFGH
120000	124				EPFG	EPF	EPFGH
150000	154				EPFG	EPF	EPFGH
180000	184				EPFG		EPFGH
220000	224				EPFG		EPFGH
270000	274				EPFG		EPFGH
330000	334				EPFG		EPFGH
390000	394						FGH
470000	474						
560000	564						
680000	684						
820000	824						
1000000	105						
1200000	125						
1500000	155						
1800000	185						

**Table 1 Sample Part Number**

No.	Size	Cap. Range	Thickness Code & Range	
1	0603	220pF ~ 10nF	B	0.70~0.95mm
2	0805	220pF ~ 33nF	X, B, M, J, C	0.70~1.35mm
3	1206	220pF ~ 100nF	X, B, M, J, C, I, D, E, P	0.70~1.90mm
4	1210	220pF ~ 330nF	M, J, C, I, D, E, P, F, G	0.85~2.80mm
5	1808	220pF ~ 150nF	C, I, D, E, P, F	1.15~2.20mm
6	1812	270pF ~ 390nF	C, I, D, E, P, F, G, H	1.15~3.10mm

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**P/N Explanation:**

MT	18	X	221	J	500	X	S	E
Remark 1	Remark 2	Remark 3	Remark 4	Remark 5	Remark 6	Remark 7	Remark 8	Remark 9

Remark 1	PDC family
Code	Description
MT	AEC-Q200 --- Automotive safe concern

Remark 2	EIA size		
Code	Description	Code	Description
18	0603 (1608)	32	1210 (3225)
21	0805 (2012)	42	1808 (4520)
31	1206 (3216)	43	1812 (4532)

Remark 3	Dielectric Material Characteristics
Code	Description
X	X7R

Remark 4	Capacitance Rule Code				
Code	Description	Code	Description	Code	Description
221	221=22x10 <sup>1</sup> =220pF	333	333=33x10 <sup>3</sup> =33nF	334	334=33x10 <sup>4</sup> =330nF
271	271=27x10 <sup>1</sup> =270pF	104	104=10x10 <sup>4</sup> =100nF	394	394=39x10 <sup>4</sup> =390nF
103	103=10x10 <sup>3</sup> =10nF	154	154=15x10 <sup>4</sup> =150nF	---	---

Remark 5	Tolerance				
Code	Description	Code	Description	Code	Description
J	±5%	I	-10%~0%	N	-5%~+10%
K	±10%	L	0%~+10%	M	±20%

Remark 6	Rated voltage		
Code	Description	Code	Description
201	200VDC	251	250VDC

Remark 7	Packaging Type			
Code	Description	Code	Description	
X	Bulk	B	Tray package	
P	Tape and 7" Reel, Embossed Tape	T	Tape and 7" Reel, Paper Tape	
K	Tape and 10" Reel, Embossed Tape	Q	Tape and 10" Reel, Paper Tape	
L	Tape and 13" Reel, Embossed Tape	G	Tape and 13" Reel, Paper Tape	

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IECQ-C Schedule of Scope Rev. 01



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Remark 8		Thickness Description			
Code	Description	Code	Description	Code	Description
S	0.80±0.07 mm	C	1.25±0.10 mm	F	2.00±0.20 mm
X	0.80±0.10 mm	I	1.25±0.20 mm	G	2.50±0.30 mm
B	0.8 +0.15/-0.10mm	D	1.40±0.15 mm	H	2.80±0.30 mm
M	0.95±0.10 mm	E	1.60±0.20 mm	---	---
J	1.15±0.15 mm	P	1.60 +0.3/-0.10mm	---	---

Remark 9		Series - Special Control Code			
Code	Description				
E	Soft Termination [Anti-Bend termination base with Ni barrier (100% Tin plating)]				

### Outline Drawing and Dimension

Outline Drawing	Size	Dimension			
		L (mm)	W (mm)	T (mm)	MB (mm)
	0603	1.60±0.20	0.80±0.20	0.95 max.	0.20 min.
	0805	2.10±0.20	1.25±0.20	1.35 max.	0.30 min.
	1206	3.30±0.30	1.60 +0.30/-0.10	1.90 max.	0.30 min.
	1210	3.30±0.40	2.50±0.30	2.80 max.	0.30 min.
	1808	4.60±0.50	2.00±0.25	2.20 max.	0.30 min.
	1812	4.60±0.50	3.20±0.40	3.10 max.	0.30 min.

### Electrical Characteristics

<i>Dielectric</i>	<b>X7R</b>
<b>Size</b>	<b>0603, 0805, 1206, 1210, 1808, 1812</b>
<b>Capacitance range</b>	<b>220pF to 390nF</b>
<b>Capacitance tolerance**</b>	<b>J, K, L, N, M</b>
<b>Dissipation Factor</b>	<b>≤2.5%</b>
<b>Rated voltage (WVDC)</b>	<b>200V, 250V</b>
<b>Insulation resistance at Ur</b>	<b>≥10GΩ or RxC≥500ΩxF whichever is smaller</b>
<b>Operating temperature</b>	<b>-55 to +125°C</b>
<b>Temperature Characteristic of Capacitance</b>	<b>±15%</b>

\*\* Preconditioning for MLCC : Perform a heat treatment at 150±10°C for 1hour, then leave in ambient condition for 24±4hours before measurement.

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### **Standards and Specifications**

AEC-Q200 Rev.D, *Stress Test Qualification for Passive Components*

MIL-STD-105E, *Sampling Procedure and Tables for Inspection by Attributes*

MIL-STD-202G, *Test Method Standard, Electronic and Electrical Component Part*

MIL-STD-883, *Test Method Standard, Microcircuits*

EIA-469, *Standard Test Method for Destructive Physical Analysis (Dpa) of Ceramic Monolithic CAPA*

JESD22-A104E, *Temperature Cycling*

JESD22-B100B, *Physical Dimension*

J-STD-020D, *Moisture/Reflow Sensitivity Classification for Nonhermetic Solid State Surface Mount Devices*

J-STD-002, *Solderability Tests for Component Leads, Terminations, Lugs, Terminals and Wires*

IEC 60384-22, *Sectional specification: Fixed surface mount multilayer capacitors of ceramic dielectric, Class 2*

EIA-198, *Ceramic Dielectric Capacitors Classes I, II, III and IV*

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