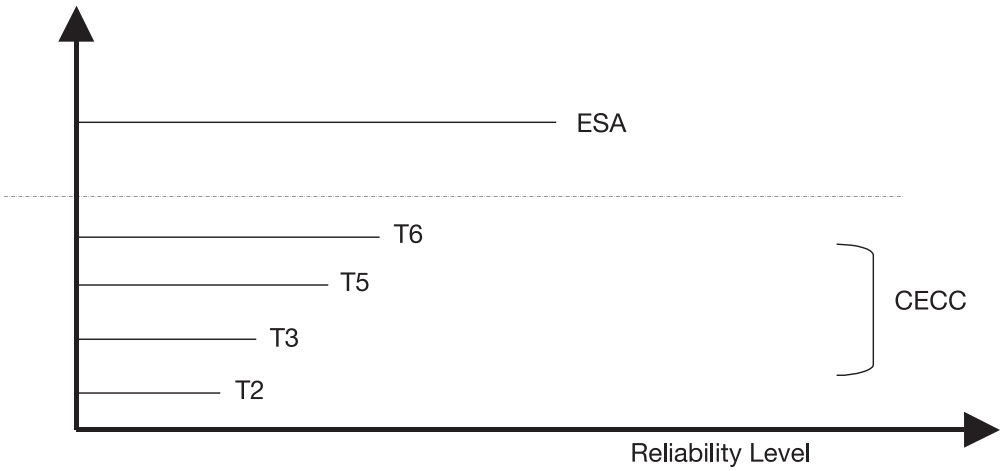
QPL ESCC 3009 and CECC Surface Mount MLCC, Type I & II

AVAILABLE TYPES

MLC CHIPS vs ESA ESCC & vs CECC 32101-002, 003 (established reliability) from 25V up to 500V.

AVAILABLE RELIABILITY LEVELS

ESA QUALIFIED		with or without LVT 1,2a,2b,3
CECC + 100% Burn in /168H + Thermal shock + 85/85 humidity test + on 40 samples per batch + DPA	T6	
CECC + 100% Burn in /168H + DPA	T5	
CECC + 100% Burn in /48H + DPA	T3	
CECC + DPA	T2	



- Level T5 & T6: Reliability Level = MIL S
- Level T3: Reliability Level = MIL R

AVAILABLE RELIABILITY LEVELS SUMMARY/TYPES

Types	Products		Reliability Level	
			T6 to T2	ESA
MLC Chips	AN, AC & AD 12, 13, 14, 15, 20 (NP0, X7R)	**CECC**	X	
MLC Chips ESA Qualified/3009	A...C NP0 A...Z X7R A...G 2C1	**ESA ESCC**		X

RELEVANT STANDARDS

Type of Component	Reliability Level	
	T2 / T3 / T5 / T6	ESA Level
MLC Chips	CECC 32101-002 32101-003 32101-801 IEC 60384-21/22	ESA ESCC 3009

QPL ESCC 3009 and CECC Surface Mount MLCC, Type I & II

DIELECTRIC TYPES USED

Type I

- ▶NP0 ▶ Code: C

Type II

- ▶ X7R ▶ Code: Z
- ▶ 2C1 ▶ Code: G

ELECTRICAL MEASUREMENT CONDITIONS FOR CECC CHIPS: T2 / T3 / T5 / T6

Type		1	2
code		C	Z
Classification	IEC/CECC EIA DIN MIL	1B C0G NP0 CG	2R1 X7R
Capacitance change With temperature & :	Ubias = 0 Ubias = UR	±30ppm/°C	± 15% N.A.
Typical ageing (%/dec.)		0	1.5
Reference temperature		22°C ±3°C	22°C ±3°C
Capacitance and D.F. measurement	Frequency Voltage	C ≤ 1000 pF F = 1MHz C > 1000 pF F = 1 kHz Um ≤ 5 Vrms	C ≤ 100 pF F = 1MHz C > 100 pF F = 1 kHz Um ≤ 0.3 Vrms ± 0.2
Dissipation Factor (DF)		C ≤ 50 pF DF < 1.5 (150/C + 7).10^{-4} C>50 pF DF < 15.10^{-4}	DF < 250 .10^{-4}
Insulation Resistance under UR /1 mn		For C ≤ 10nF: Ri > 100 GΩ or For C > 10nF: Ri x Cr > 1000s	For C ≤ 10nF: Ri > 100 GΩ or For C > 10nF: Ri x C > 1000s
Proof voltage		For UR ≤ 100V : 2.5 x UR For UR > 100V : 1.5 UR + 100V	For UR ≤ 100V: 2.5 x UR For UR >100V: 1.5 x UR + 100V

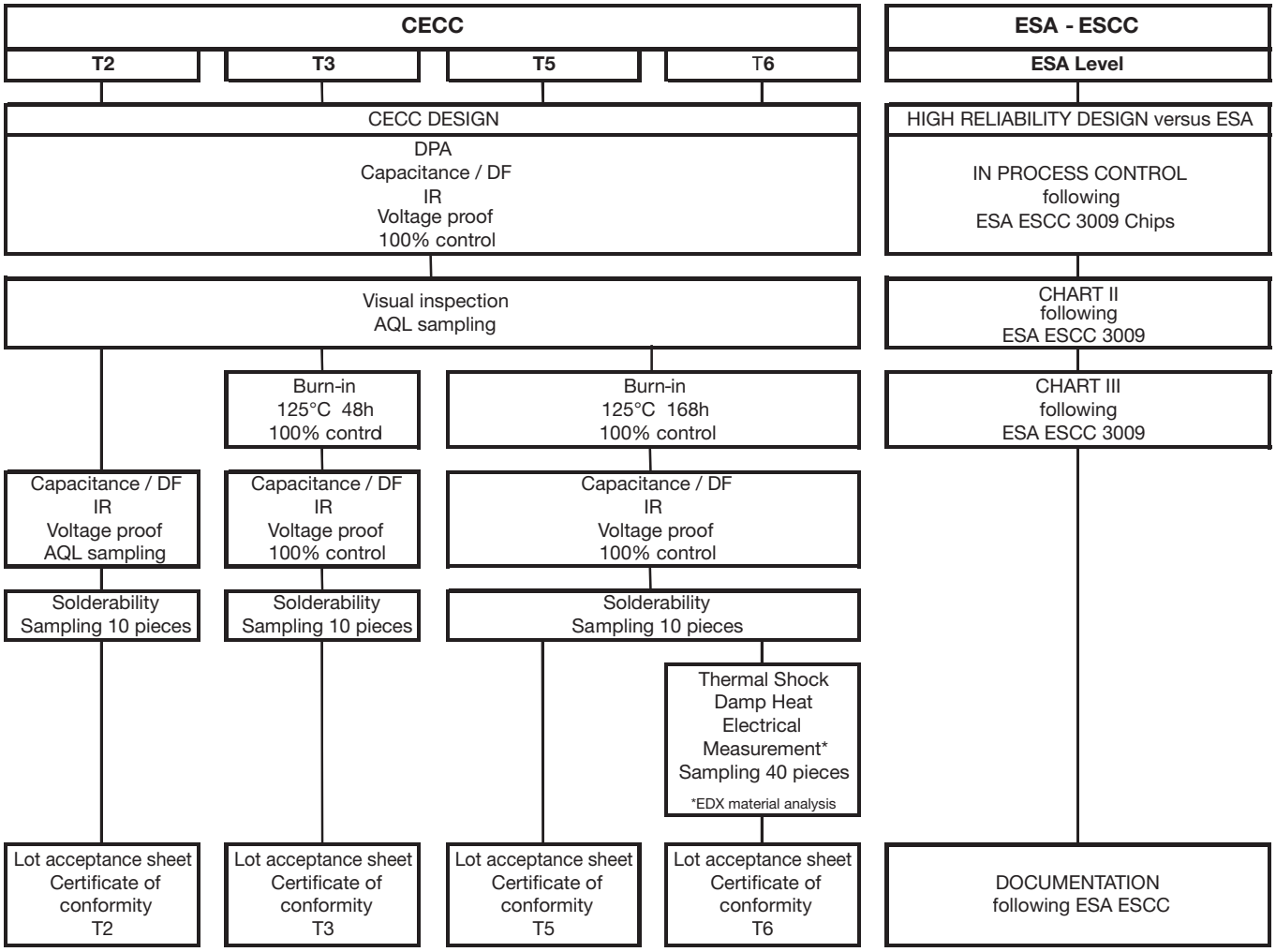
Note: ESA Chips are strictly measured vs ESA spec. 3009 + detail spec.

ELECTRICAL MEASUREMENT CONDITIONS FOR ESA CHIPS

Type		1	2	
code		C	Z	G
Classification	IEC/CECC EIA DIN MIL	1B C0G NP0 CG	2R1 X7R	2C1 BX
Capacitance change With temperature & :	Ubias = 0 Ubias = UR	±30ppm/°C	± 20% *-60/+20%	± 20% -30/+20%
Typical ageing (%/dec.)		0	1.5	1.5
Reference temperature		22°C ±3°C	22°C ±3°C	22°C ±3°C
Capacitance and D.F. measurement	Frequency Voltage	C ≤ 1000 pF F = 1MHz C > 1000 pF F = 1 kHz Um ≤ 5 Vrms	C ≤ 100 pF F = 1MHz C > 100 pF F = 1 kHz Um ≤ 1 Vrms	
Dissipation Factor (DF)		C ≤ 50 pF DF < 1.5 (150/C + 7).10^{-4} C>50 pF DF < 15.10^{-4}	DF < 250 .10^{-4}	
Insulation Resistance under UR /1 mn		Ri > 100 GΩ	For C ≤ 10nF: Ri > 100 GΩ or For C > 10nF: Ri x C > 1000s	
Proof voltage		For UR < 500V : 2.5 x UR	For UR < 500V: 2.5 x UR For UR = 500V: 2 x UR	

*Typical value for this dielectric class
Note: ESA Chips are strictly measured vs ESA spec. 3009 + detail spec.

RELIABILITY LEVELS DESCRIPTION



AVAILABLE TERMINATIONS

Summary

Type	CECC Level T2/T3/T5/T6	ESA Level	Remark
Ag - Pd - Pt	AC	A3..	–
Nickel Barrier + Tin Lead Finish(1)	AN	A6...	Preferred Version
Nickel Barrier + Tin Finish(2)	AD		

(1) "No Pure Tin" terminations.
(2) Lead Free terminations.

TERMINATION CODES FOR ESA MLC PARTS

Code	ESA Version	
e.g. A.12	Code	Termination
A312C... A312G...	03	Silver Palladium Platinium
A312Z...	10	X7R Dielectric + Silver Palladium Platinium
A612C... A612G...	06	ESA Preferred Termination Nickel Barrier + Tin Lead Finish
A612Z....	07	X7R Dielctric + ESA Preferred Termination Nickel Barrier + Tin Lead Finish

PACKAGING

- Plastic Tape – Minimum Order Quantity: 1000p for CECC and ESA products*
  *Note for smaller quantities contact plant
- Waffle Pack – Anti-static material only ESA Products – Minimum Order Quantity: 50p for ESA products
- Vacuum Pack only CECC Products – Minimum Order Quantity: 1Kp for CECC products

MARKING

Chips:

CECC	T6/T5/T3/T2	On packaging label only - versus code
ESA Level		On packaging label only - versus ESA code

AVAILABLE CLIMATIC AND ELECTRIC TESTS

Test P/N	Test Description	Qty. of Parts	Average Lead Time
XX00--5028---	DPA versus EIA RS469	25/X + 25/Y	1 to 2 weeks
MX00--5056---	85/85 Humidity test / ESA 3009 / 5.2.2 85°C / 85% HR / 1.5Vdc / 240h	50	3 weeks
MX00--5059---	85/85 Humidity test / MIL STD 202 Method 103 40°C / 95 HR / 100Vdc / 240h	50	3 weeks
MX00--5060---	85°C/85° HR / 240h Humidity test	12	3 weeks
XX00--5080-00	100% burn in (same as "5079" but limited to 48H)	100%	1 week
XX00--5079-00	100% burn in versus ESA 3009 (168H / 2x Ur)	100%	3 weeks
XX00--5090-00	Halt test (accelerated burn-in 140°C / 3Ur)	100pc	4 weeks
XX00--5100-00	Life test 1000 or 2000H versus ESA 3009/9.10	100pc	7 or 14 weeks
XX00--5082-00	Solderability test (bath method vs. ESA or CECC)	20pc	2 weeks
XX00--5091-00	Electric test (Cr; DF; IR) 100%	100%	Tbd
XX00--5092-00	Rapid change of temperature (-55° to 125°C)	50pc	Tbd
XX00--5093-00	Climatic test sequence	50pc	Tbd
XX00--5094-00	Visual insp. Versus ESA or customer spec.	100%	Tbd

QPL ESCC 3009 and CECC Surface Mount MLCC, Type I & II

ESA QUALIFIED CHIPS TYPE I - NP0

Case Sizes		0805		1206		1210		1812		2220	
Cap Tolerance		1,2,5,10 % , +/- 0.5pf for C < 10pf									
ESA QPL		3009003..		3009022..		3009004..		3009005..		3009006..	
CODE		A_12C..		A_20C..		A_13C..		A_14C..		A_15C..	
Value	Code	50v	100v	50v	100v	50v	100v	50v	100v	50v	100v
4.7pf	479	■	■								
5.6pf	569	■	■								
6.8pf	689	■	■								
8.2pf	829	■	■								
10pf	100	■	■	■	■						
12pf	120	■	■	■	■						
15pf	150	■	■	■	■						
18pf	180	■	■	■	■						
22pf	220	■	■	■	■	■	■				
27pf	270	■	■	■	■	■	■				
33pf	330	■	■	■	■	■	■				
39pf	390	■	■	■	■	■	■				
47pf	470	■	■	■	■	■	■				
56pf	560	■	■	■	■	■	■				
68pf	680	■	■	■	■	■	■				
82pf	820	■	■	■	■	■	■				
100pf	101	■	■	■	■	■	■	■	■		
120pf	121	■	■	■	■	■	■	■	■		
150pf	151	■	■	■	■	■	■	■	■		
180pf	181	■	■	■	■	■	■	■	■		
220pf	221	■	■	■	■	■	■	■	■		
270pf	271	■	■	■	■	■	■	■	■		
330pf	331	■	■	■	■	■	■	■	■		
390pf	391	■	■	■	■	■	■	■	■		
470pf	471	■	■	■	■	■	■	■	■	■	■
560pf	561	■	■	■	■	■	■	■	■	■	■
680pf	681	■	■	■	■	■	■	■	■	■	■
820pf	821	■	■	■	■	■	■	■	■	■	■
1.0 nf	102	■	■	■	■	■	■	■	■	■	■
1.2nf	122	■	■	■	■	■	■	■	■	■	■
1.5nf	152	■	■	■	■	■	■	■	■	■	■
1.8 nf	182	■		■	■	■	■	■	■	■	■
2.2nf	222	■		■	■	■	■	■	■	■	■
2.7nf	272			■	■	■	■	■	■	■	■
3.3nf	332			■	■	■	■	■	■	■	■
3.9nf	392			■	■	■	■	■	■	■	■
4.7nf	472			■		■	■	■	■	■	■
5.6nf	562					■	■	■	■	■	■
6.8nf	682					■	■	■	■	■	■
8.2nf	822					■		■	■	■	■
10nf	103					■		■	■	■	■
12nf	123							■	■	■	■
15nf	153							■	■	■	■
18nf	183									■	■
22nf	223									■	■
27 nf	273									■	■
33 nf	333									■	■

Available Terminations:

A3.. Silver Palladium Platinum (ESA variant 03) and

A6.. Nickel Barrier with Tin Lead Finish (ESA variant 06)

ESA QUALIFIED CHIPS TYPE II - 2C1

Case Sizes		0805			1206			1210			1812			2220		
Cap Tolerance		5, 10 , 20 %														
ESA QPL		3009008..			3009023..			3009009..			3009010..			3009011..		
CODE		A_12G..			A_20G..			A_13G..			A_14G..			A_15G..		
Value	Code	25 v	50v	100v	25v	50v	100v	25v	50v	100v	25v	50v	100v	25v	50v	100v
820 pf	821	■	■	■												
1.0nf	102	■	■	■												
1.2nf	122	■	■	■												
1.5nf	152	■	■	■												
1.8 nf	182	■	■	■												
2.2nf	222	■	■	■												
2.2nf	222	■	■	■	■	■	■									
2.7nf	272	■	■	■	■	■	■									
3.3nf	332	■	■	■	■	■	■									
3.9nf	392	■	■	■	■	■	■	■	■	■						
4.7nf	472	■	■	■	■	■	■	■	■	■						
5.6nf	562	■	■	■	■	■	■	■	■	■						
6.8nf	682	■	■	■	■	■	■	■	■	■	■	■	■			
8.2nf	822	■	■	■	■	■	■	■	■	■	■	■	■			
10nf	103	■	■	■	■	■	■	■	■	■	■	■	■			
12nf	123	■	■		■	■	■	■	■	■	■	■	■			
15nf	153	■	■		■	■	■	■	■	■	■	■	■			
18nf	183	■	■		■	■	■	■	■	■	■	■	■	■	■	■
22nf	223	■	■		■	■	■	■	■	■	■	■	■	■	■	■
27nf	273	■	■		■	■		■	■	■	■	■	■	■	■	■
33nf	333	■			■	■		■	■	■	■	■	■	■	■	■
39nf	393	■			■	■		■	■	■	■	■	■	■	■	■
47nf	473	■			■	■		■	■	■	■	■	■	■	■	■
56nf	563				■	■		■	■		■	■	■	■	■	■
68nf	683				■	■		■	■		■	■	■	■	■	■
82nf	823				■			■	■		■	■	■	■	■	■
100nf	104				■			■	■		■	■		■	■	■
120nf	124							■	■		■	■		■	■	■
150nf	154							■	■		■	■		■	■	■
180nf	184							■			■	■		■	■	■
220nf	224							■			■	■		■	■	
270nf	274										■	■		■	■	
330nf	334										■			■	■	
390nf	394										■			■	■	
470nf	474										■			■	■	
560nf	564													■	■	
680nf	684													■	■	
820nf	824													■		
1uf	105													■		
1.2uf	125															
1.5uf	155															
1.8uf	185															
2.2uf	225															
2.7uf	275															
3.3uf	335															
3.9uf	395															
4.7uf	475															
5.6uf	565															
6.8uf	685															
8.2uf	825															
10uf	106															
22 uf	226															

Available Terminations:

A3.. Silver Palladium Platinum (ESA variant 03) and

A6.. Nickel Barrier with Tin Lead Finish (ESA variant 06)

ESA QUALIFIED CHIPS TYPE II - X7R ESA VARIANT 07

Case Sizes		0805				1206					1210					1812					2220				
Cap Tolerance		5, 10 , 20 %																							
ESA QPL		3009008..				3009023..					3009009..					3009010..					3009011..				
CODE		A_12Z..				A_20Z..					A_13Z..					A_14Z..					A_15Z..				
Value	Code	25v	50v	100v	200v	25v	50v	100v	200v	400v	25v	50v	100v	200v	400v	25v	50v	100v	200v	400v	25v	50v	100v	200v	400v
270 pf	271									■															
330 pf	331				■					■															
390 pf	391				■					■															
470 pf	471				■				■	■															
560 pf	561				■				■	■															
680 pf	681				■				■	■				■	■										
820 pf	821				■				■	■				■	■										
1.0 nf	102				■				■	■				■	■										
1.2nf	122				■				■	■				■	■										
1.5nf	152				■				■	■				■	■										
1.8 nf	182				■				■	■				■	■										
2.2nf	222				■				■	■				■	■										
2.7nf	272	■	■	■	■				■	■				■	■										
3.3nf	332	■	■	■	■	■	■	■	■	■				■	■				■	■					
3.9nf	392	■	■	■	■	■	■	■	■	■	■	■	■	■	■				■	■					
4.7nf	472	■	■	■	■	■	■	■	■	■	■	■	■	■	■				■	■					
5.6nf	562	■	■	■	■	■	■	■	■		■	■	■	■	■				■	■					
6.8nf	682	■	■	■	■	■	■	■	■		■	■	■	■	■				■	■				■	■
8.2nf	822	■	■	■	■	■	■	■	■		■	■	■	■	■				■	■				■	■
10nf	103	■	■	■	■	■	■	■	■		■	■	■	■	■				■	■				■	■
12nf	123	■	■	■	■	■	■	■	■		■	■	■	■					■	■				■	■
15nf	153	■	■	■	■	■	■	■	■		■	■	■	■					■	■				■	■
18nf	183	■	■	■		■	■	■	■		■	■	■	■					■	■				■	■
22nf	223	■	■	■		■	■	■	■		■	■	■	■		■	■	■	■	■				■	■
27nf	273	■	■	■		■	■	■	■		■	■	■	■		■	■	■	■	■				■	■
33nf	333	■	■	■		■	■	■	■		■	■	■	■		■	■	■	■	■				■	■
39nf	393	■	■	■		■	■	■	■		■	■	■	■		■	■	■	■	■				■	■
47nf	473	■	■	■		■	■	■	■		■	■	■	■		■	■	■	■	■				■	■
56nf	563	■	■			■	■	■			■	■	■	■		■	■	■	■					■	■
68nf	683	■	■			■	■	■			■	■	■	■		■	■	■	■					■	■
82nf	823	■	■			■	■	■			■	■	■			■	■	■	■					■	
100nf	104	■	■			■	■	■			■	■	■			■	■	■	■		■	■	■	■	
120nf	124	■				■	■				■	■	■			■	■	■	■		■	■	■	■	
150nf	154	■				■	■				■	■	■			■	■	■	■		■	■	■	■	
180nf	184					■					■	■	■			■	■	■			■	■	■	■	
220nf	224					■					■	■	■			■	■	■			■	■	■	■	
270nf	274										■	■				■	■	■			■	■	■	■	
330nf	334										■	■				■	■	■			■	■	■	■	
390nf	394										■					■	■	■			■	■	■		
470nf	474										■					■	■	■			■	■	■		
560nf	564															■	■				■	■	■		
680nf	684															■	■				■	■	■		
820nf	824															■					■	■	■		
1uf	105															■					■	■	■		
1.2uf	125																				■	■			
1.5uf	155																				■	■			
1.8uf	185																				■				
2.2uf	225																				■				

Key	■	Supplied “in accordance with “

QPL ESCC 3009 and CECC Surface Mount MLCC, Type I & II

CECC CHIPS TYPE I – NP0 (AVAILABLE RELIABILITY LEVEL: T6 TO T2) CECC UPGRADED

IEC 60384-21/22, CECC 32100-32101/801

Case Sizes		0805			1206				1210				1812				2220			
Cap Tolerance		1,2,5,10 % , +/- 0.5pf for C < 10pf																		
CODE		A_12C..			A_20C..				A_13C..				A_14C..				A_15C..			
Value	Code	25/50v	100v	200v	25/50v	100v	200v	500v	25/50v	100v	200v	500v	25/50v	100v	200v	500v	25/50v	100v	200v	500v
4.7pf	479																			
5.6pf	569																			
6.8pf	689																			
8.2pf	829																			
10pf	100																			
12pf	120																			
15pf	150																			
18pf	180																			
22pf	220																			
27pf	270																			
33pf	330																			
39pf	390																			
47pf	470																			
56pf	560																			
68pf	680																			
82pf	820																			
100pf	101																			
120pf	121																			
150pf	151																			
180pf	181																			
220pf	221																			
270pf	271																			
330pf	331																			
390pf	391																			
470pf	471																			
560pf	561																			
680pf	681																			
820pf	821																			
1.0 nf	102																			
1.2nf	122																			
1.5nf	152																			
1.8 nf	182																			
2.2nf	222																			
2.7nf	272																			
3.3nf	332																			
3.9nf	392																			
4.7nf	472																			
5.6nf	562																			
6.8nf	682																			
8.2nf	822																			
10nf	103																			
12nf	123																			
15nf	153																			
18nf	183																			
22nf	223																			
27 nf	273																			
33 nf	333																			
39 nf	**393**																			

Note: 3 terminations available: Ag Pd Pt ▶ AC, Nickel Barrier with Tin Lead finish ▶ AN, Nickel Barrier with Tin finish ▶ AD

Key		Supplied “in accordance with “

QPL ESCC 3009 and CECC Surface Mount MLCC, Type I & II

CECC CHIPS TYPE II – X7R (AVAILABLE RELIABILITY LEVEL: T6 TO T2) CECC UPGRADED

IEC 60384-21/22, CECC 32100-32101/801

Case Sizes		0805			1206					1210					1812					2220				
Cap Tolerance		5, 10 , 20 %																						
CODE		A_12Z..			A_20Z..					A_13Z..					A_14Z..					A_15Z..				
Value	Code	25/50v	100v	200v	25v	50v	100v	200v	500v	25v	50v	100v	200v	500v	25v	50v	100v	200v	500v	25v	50v	100v	200v	500v
330 pf	331																							
390 pf	391																							
470 pf	471																							
560 pf	561																							
680 pf	681																							
820 pf	821																							
1000 pf	102																							
1.2nf	122																							
1.5nf	152																							
1.8 nf	182																							
2.2nf	222																							
2.7nf	272																							
3.3nf	332																							
3.9nf	392																							
4.7nf	472																							
5.6nf	562																							
6.8nf	682																							
8.2nf	822																							
10nf	103																							
12nf	123																							
15nf	153																							
18nf	183																							
22nf	223																							
27nf	273																							
33nf	333																							
39nf	393																							
47nf	473																							
56nf	563																							
68nf	683																							
82nf	823																							
100nf	104																							
120nf	124																							
150nf	154																							
180nf	184																							
220nf	224																							
270nf	274																							
330nf	334																							
390nf	394																							
470nf	474																							
560nf	564																							
680nf	684																							
820nf	824																							
1uf	105																							
1.2uf	125																							
1.5uf	155																							
1.8uf	185																							
2.2uf	225																							

Note: 3 terminations available: Ag Pd Pt ▶ AC, Nickel Barrier with Tin Lead finish ▶ AN, Nickel Barrier with Tin finish ▶ AD

Key		Supplied “in accordance with “

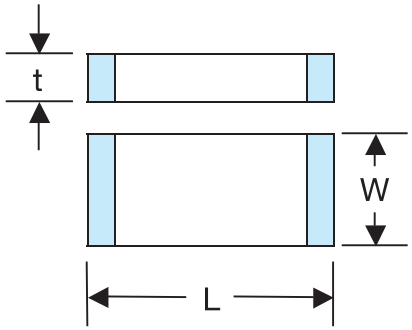
DIMENSIONS

I - Chips T2/T3/T5/T6 (vs CECC)
AN... AC... & AD...

mm (inches)

Size	L	W	t max.
0805	2.0 ± 0.3 (0.079 ± 0.012)	1.25 ± 0.3 (0.049 ± 0.012)	1.3 (0.051)
1206	3.2 ± 0.3 (0.126 ± 0.012)	1.6 ± 0.3 (0.063 ± 0.012)	1.6 (0.063)
1210	3.2 ± 0.3 (0.126 ± 0.012)	2.5 ± 0.3 (0.098 ± 0.012)	1.8 (0.071)
1812	4.5 ± 0.3 (0.177 ± 0.012)	3.2 ± 0.3 (0.126 ± 0.012)	1.8 (0.071)
2220	5.7 ± 0.4 (0.224 ± 0.016)	5.0 ± 0.4 (0.197 ± 0.016)	1.8 (0.071)

Part thickness manufactured "according to CECC" exceed above limits.



II - ESA Level 3009
A3... & A6...

mm (inches)

Size	L		W		Thickness max. (t)		
	min.	max.	min.	max	NP0 Class	2C1 Class	X7R Class
0805	1.7 (0.067)	2.3 (0.091)	1.05 (0.041)	1.45 (0.057)	1.8(0.071)	1.8(0.071)	1.8(0.071)
1206	2.8 (0.110)	3.6 (0.142)	1.3 (0.051)	1.9(0.075)	2.3(0.091)	2.3(0.091)	2.3(0.091)
1210	2.8 (0.110)	3.6 (0.142)	2.2 (0.087)	2.8(0.110)	2.3(0.091)	2.3(0.091)	2.3(0.091)
1812	4.0 (0.157)	5.0 (0.197)	2.8 (0.110)	3.6(0.142)	2.8(0.110)	2.8(0.110)	2.8(0.110)
2220	5.2 (0.205)	6.2 (0.244)	4.5 (0.177)	5.5(0.217)	2.8(0.110)	2.8(0.110)	2.8(0.110)

Part thickness manufactured "according to ESA" exceed above limits.

QPL ESCC 3009 and CECC Surface Mount MLCC, Type I & II

HOW TO ORDER ESA NP0 WITH 3009 SPEC

3009	003	06	1002	J	C
Spec 3009	**Component Variant** 003 = 0805 022 = 1206 004 = 1210 005 = 1812 006 = 2220	**Term Type** 03 = Ag Pd Pt 06 = Ni/SnPb	**Capacitance Code** 3 significant digits + number of zeros e.g. 1002 = 10nF 1001 = 1nF	**Capacitance Tolerance** F = 1% G = 2% J = 5% K = 10%	**Voltage** C = 50V E = 100V

HOW TO ORDER ESA 2C1 & X7R WITH 3009 SPEC

3009	008	07	1003	K	C
Spec 3009	**Component Variant** 008 = 0805 023 = 1206 009 = 1210 010 = 1812 011 = 2220	**Term Type** 03 = Ag Pd Pt 06 = Ni/SnPb 07 = Ni/SnPb (X7R)	**Capacitance Code** 2 significant digits + number of zeros e.g. 103 = 10nF 105 = 1µF	**Capacitance Tolerance** J = 5% K = 10% M = 20%	**Voltage** A = 25 C = 50V E = 100V G = 200V K = 400V

QPL ESCC 3009 and CECC Surface Mount MLCC, Type I & II

HOW TO ORDER ESA MLCC

A6	14	C	E	0222	K	NC
Termination	Size	Class	Voltage	Capacitance	Tolerance	Suffix

Termination
A3 = AgPdPt Terminations
A6 = Nickel Barrier Terminations with Tin Lead Finish

Size
12 = 0805
13 = 1210
14 = 1812
15 = 2220
20 = 1206
43 = 2225

Class
Z = X7R
C = NP0
G = 2C1

Voltage
C = 25V
D = 50/63V
E = 100V
F = 200V
G = 250V
I = 400V
J = 500V

Capacitance

Capacitance expressed by 2 significant figures **7th digit:** 0 (zero)
8th and 9th digits: the 2 significant figures of the capacitance value.
10th digit:
- for values ▶ 10 pF and ▶ 990 µF: the number of ZEROS to be added to the capacitance value
- for values ▶ 1 pF and ▶ 9.9 pF: the figure 9 signifying that the capacitance value is to be multiplied by 0.1
- for values <1 pF: the figure 8 signifying that the capacitance value is to be multiplied by 0.01.

Examples: 1000 pF: 0102
8.2 pF: 0829
0.47 pF: 0478

Capacitance expressed by 3 significant figures **7th, 8th and 9th digits:** the 3 significant figures of the capacitance value
10th digit:
- for values >100 pF and ▶ 990 µF: the number of ZEROS to be added to the capacitance value
- for values >10 pF and <100 pF: the figure 9 signifying that the capacitance value is to be multiplied by 0.1
- for values >1 pF and <10 pF: the figure 8 signifying that the capacitance value is to be multiplied by 0.01.

Examples: 196 pF: 1960
47.2 pF: 4729
8.28 pF: 8288

Tolerance

C < 10 pF	Code
± 0.5pF	D

C ▶ 10 pF	Code
± 1%	F
± 2%	G
± 5%	J
± 10%	K
± 20%	M

Suffix
suffix / ESCC
NC = See Note 1
2J = See Note 2
NB = See Note 3

Not RoHS Compliant

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

For RoHS compliant products, please select correct termination style.

Note 1: NC suffix is for testing level of ESCC 3009 Issue 2 or C testing level of ESCC 3009 Issue 1, waffle-pack packing.
Note 2: 2J suffix is for testing level of ESCC 3009 Issue 2 or C testing level of ESCC 3009 Issue 1, tape & reel packing.
Note 3: NB suffix is for serialised B testing level of ESCC 3009 issue 1, waffle-pack packing.

HOW TO ORDER CECC MLCC

AN	14	C	E	0222	K	T6
Termination	Size	Class	Voltage	Capacitance	Tolerance	CECC Suffix

Termination
AC = AgPdPt Terminations
AN = Nickel Barrier Terminations with Tin Lead Finish
AD = Nickel Barrier Terminations with Tin Finish

Size
12 = 0805
13 = 1210
14 = 1812
15 = 2220
20 = 1206
43 = 2225

Class
Z = X7R
C = NP0

Voltage
C = 25V
D = 50/63V
E = 100V
F = 200V
G = 250V
I = 400V
J = 500V

Capacitance

Capacitance expressed by 2 significant figures **7th digit:** 0 (zero)
8th and 9th digits: the 2 significant figures of the capacitance value.
10th digit:
- for values ▶ 10 pF and ▶ 990 µF: the number of ZEROS to be added to the capacitance value
- for values ▶ 1 pF and ▶ 9.9 pF: the figure 9 signifying that the capacitance value is to be multiplied by 0.1
- for values <1 pF: the figure 8 signifying that the capacitance value is to be multiplied by 0.01.

Examples: 1000 pF: 0102
8.2 pF: 0829
0.47 pF: 0478

Capacitance expressed by 3 significant figures **7th, 8th and 9th digits:** the 3 significant figures of the capacitance value
10th digit:
- for values >100 pF and ▶ 990 µF: the number of ZEROS to be added to the capacitance value
- for values >10 pF and <100 pF: the figure 9 signifying that the capacitance value is to be multiplied by 0.1
- for values >1 pF and <10 pF: the figure 8 signifying that the capacitance value is to be multiplied by 0.01.

Examples: 196 pF: 1960
47.2 pF: 4729
8.28 pF: 8288

Tolerance

C < 10 pF	Code
± 0.5pF	D

C ▶ 10 pF	Code
± 1%	F
± 2%	G
± 5%	J
± 10%	K
± 20%	M

CECC Suffix

Burn-in 100% 168H +TS +HR	T6
Burn-in 100% 168H	T5
Burn-in 100% 48H	T3
No Burn-in	T2
T5 + Tape	2K
T3 + Tape	2L
T2 + Tape	2Y
T6 + Tape	24
T5 + Waffle Pack	9Y

Not RoHS Compliant

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

For RoHS compliant products, please select correct termination style.