KEMET Ceramic MLCC Surface Mount Capacitors

High Temperature Product Qualification Test Plan and Results Summary

High Temperature 200ºC 1210 100nF 100V

			KEMET Part Number ==>	**C1210H104K1GAC**	
			KEMET Lot Number ==>	7212207407	
			Piece Counts ==>	SS	#Fail
RELIABILITY/ ENVIRONMENTAL TESTS					
High Temperature Life	MIL-STD-202, Mthd 108	200°C, Rated Voltage, 2000 Hours		77	0
Load Humidity	MIL-STD-202, Mthd 103	85°C /85%RH, Rated Voltage, 1000 Hours		77	0
Low Voltage Humidity	MIL-STD-202, Mthd 103	85°C /85%RH, 1.5V, 1000 Hours		77	0
Temperature Cycling	JESD22 Method JA-104	-55°C to +200°C, 50 Cycles		77	0
Thermal Shock	MIL-STD-202, Mthd 107	-55°C to +150°C, 20s transfer, 15 min dwell, 300 Cycles		30	0
Moisture Resistance	MIL-STD-202, Mthd 106	Cycled Temp / RH. 0V, 10 cycles @ 24 Hrs each		77	0
PHYSICAL, MECHANICAL & PROCESS TESTS					
External Visual	MIL-STD-883, Mthd 2009	Evaluate physical external characteristics of all parts submitted for test		All pieces tested	0
Physical Dimensions	JESD22 Method JB-100	Length, width, and thickness		30	0
Resistance to Solvents	MIL-STD-202, Method 215	Include Aqueous wash chemical - OKEM Clean or equivalent		5	0
Solderability	ANSI / J-STD-002	a) Method B, 4 hrs @ 155°C dry heat @ 235°C		15	0
		b) Method B, category 3, 8 hr steam age @ 220 / 260°C dips		30	0
		c) Method D, category 3, Leaching @260°C dip		15	0
Mechanical Shock and Vibration	MIL-STD-202 Mthd 213/214	Method 213: Figure 1, Condition F Method 204: 5 gs for 20 min, 12 cycles		30	0
Restistance to Soldering Heat	MIL-STD-202, Mthd 210	Condition B, no pre-heat of samples, Single Wave Solder		30	0
Terminal Strength	JIS-C-6429	Force of 1.8 kg for 60 seconds		30	0
Board Flex	JIS-C-6429	2mm minimum for all except 3 mm min for Class I			
Electrical Characterization	KEMET Custom Test	Parametrically test, show statistics at room as well as min and max operating temperatures		30	0
QUALIFICATION STATUS				**APPROVED**	
				660	**0**

KEMET Ceramic SMD Product

High Temperature 200ºC C0G 1210 100nF 100 Volt Product

High Temperature Qualification Test Results

Lot Number	Results	Test Point	Capacitance, nF				Delta Cap, %				DF, 1 KHz, %				IR, 25°C, Gohm			
			AVG	STD	Max	Min	AVG	STD	Max	Min	AVG	STD	Max	Min	AVG	STD	Max	Min
High Temperature Life, 200°C, Rated Voltage, 2000 Hours																		
		Pre Test Limits			110.0	90			N/A	N/A			0.1	N/A			N/A	10.0
C1210H104K1GAC		Post Test Limits			---	---			0.3	-0.3			0.5	N/A			N/A	1.00
7198197108	0/77	0 hours	92.34	1.05	94.08	89.68	-	-	-	-	0.006	0.001	0.007	0.005	70	1.12	82	56
	0/77	1000 hours	92.34	1.05	94.06	89.67	0.019	0.003	0.026	0.015	0.013	0.009	0.045	0.007	69	1.12	80	53
Storage Life, 150°C, 0 Volts, 1000 Hours																		
		Pre Test Limits			110.0	90			N/A	N/A			0.1	N/A			N/A	10.0
C1210H104K1GAC		Post Test Limits			---	---			0.3	-0.3			0.5	N/A			N/A	1.00
7212207407	0/77	0 hours	99.90	1.23	102.40	97.30	-	-	-	-	0.003	0.000	0.003	0.002	2450	1.740	9070	1080
	0/77	1000 hours	99.90	1.23	102.40	97.30	-0.021	0.036	0.000	-0.102	0.003	0.000	0.004	0.002	1400	1.270	2590	621

Lot Number	Results	Test Point	Capacitance, nF				Delta Cap, %				DF, 1 KHz, %				IR, 25°C, Gohm			
			AVG	STD	Max	Min	AVG	STD	Max	Min	AVG	STD	Max	Min	AVG	STD	Max	Min
Load Humidity, 85°C, Rated Voltage, 1000 Hours																		
		Pre Test Limits			110.0	90			N/A	N/A			0.1	N/A			N/A	10.0
C1210H104K1GAC		Post Test Limits			---	---			0.3	-0.3			0.5	N/A			N/A	1.00
7212207407	0/77	0 hours	99.80	1.30	103.00	97.00	-	-	-	-	0.003	0.000	0.003	0.003	2380	2.180	48100	612
	0/77	1000 hours	99.80	1.30	103.00	96.90	-0.009	0.028	0.000	-0.103	0.003	0.000	0.003	0.002	691	1.560	3670	267
Low Volt Humidity, 85°C, 1.5 Volts, 1000 Hours																		
		Pre Test Limits			110.0	90			N/A	N/A			0.1	N/A			N/A	10.0
C1210H104K1GAC		Post Test Limits			---	---			0.3	-0.3			0.5	N/A			N/A	1.00
7212207407	0/77	0 hours	99.90	1.18	102.00	97.30	-	-	-	-	0.003	0.000	0.003	0.003	1430	1.340	2630	351
	0/77	1000 hours	99.90	1.20	102.00	97.30	-0.004	0.020	0.000	-0.102	0.003	0.000	0.004	0.002	389	2.310	1500	74

Lot Number	Results	Test Point	Capacitance, nF				Delta Cap, %				DF, 1 KHz, %				IR, 25°C, Gohm			
			AVG	STD	Max	Min	AVG	STD	Max	Min	AVG	STD	Max	Min	AVG	STD	Max	Min
Temperature Cycle, 50 Cycles																		
		Pre Test Limits			110.0	90			N/A	N/A			0.1	N/A			N/A	10.0
C1210H104K1GAC		Post Test Limits			---	---			0.3	-0.3			0.5	N/A			N/A	10.00
7292276310	0/77	Initial	99.31	1.25	102.30	96.30	---	---	---	---	0.009	0.008	0.052	0.004	58	1.19	76	46
	0/77	50 Cycles	99.31	1.25	102.30	96.30	-0.002	0.002	0.002	-0.011	0.007	0.000	0.008	0.006	44	2.43	274	18
Thermal Shock, 300 Cycles																		
		Pre Test Limits			110.0	90			N/A	N/A			0.1	N/A			N/A	10.0
C1210H104K1GAC		Post Test Limits			---	---			0.3	-0.3			0.5	N/A			N/A	10.00
7237150W07	0/30	Initial	98.06	0.90	100.80	95.90	---	---	---	---	0.003	0.000	0.004	0.001	878	1.320	1490	477
	0/30	300 Cycles	98.05	0.90	100.80	95.80	-0.003	0.017	0.010	-0.104	0.003	0.000	0.003	0.002	666	1.530	1300	90
Moisture Resistance, 0 V DC, 10 Cycles																		
		Pre Test Limits			110.0	90			N/A	N/A			0.1	N/A			N/A	10.0
C1210H104K1GAC		Post Test Limits			---	---			0.3	-0.3			0.5	N/A			N/A	1.00
7212207407	0/77	Initial	100.00	1.22	102.80	97.50	---	---	---	---	0.003	0.000	0.003	0.003	2580	1.830	9790	927
	0/77	300 Cycles	100.00	1.22	102.80	97.50	0.002	0.014	0.100	0.000	0.003	0.000	0.004	0.002	180	3.980	1260	2

KEMET Ceramic SMD Product

High Temperature 200ºC C0G 1210 100nF 100 Volt Product

High Temperature Qualification Test Results

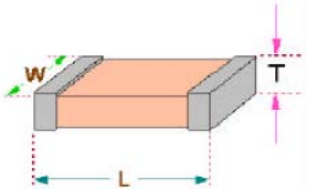
Lot Number	Results	Test Point	Capacitance, nF				Delta Cap, %				DF, 1 KHz, %				IR, 25°C, Gohm			
			AVG	STD	Max	Min	AVG	STD	Max	Min	AVG	STD	Max	Min	AVG	STD	Max	Min
Mechanical Shock and Vibration																		
		Pre Test Limits			110.0	90			N/A	N/A			0.1	N/A			N/A	10.0
C1210H104K1GAC		Post Test Limits			---	---			0.3	-0.3			0.5	N/A			N/A	10.00
7212207407	0/30	Initial	99.7	1.24	102.4	97.5	---	---	---	---	0.002	0.000	0.003	0.002	1765.0	1.055	3825	802
	0/30	Post	100	1.24	102.4	97.5	-0.003	0.017	0.000	-0.101	0.003	0.000	0.003	0.002	1203.0	1.020	1802	405
Resistance to Soldering Heat																		
		Pre Test Limits			110.0	90			N/A	N/A			0.1	N/A			N/A	10.0
C1210H104K1GAC		Post Test Limits			---	---			0.3	-0.3			0.5	N/A			N/A	10.00
7122207407	0/30	Initial	99.40	1.03	101.40	97.00	---	---	---	---	0.006	0.000	0.007	0.006	1140.0	1.49	204	562
	0/30	Post	99.50	1.03	101.40	97.00	0.003	0.002	0.010	0.001	0.006	0.000	0.007	0.005	1230.0	1.36	1910	704

Electrical Characterization

			-55°C Delta Cap, PPM/°C				Reference Capacitance @ 25°C, nF				+ 200°C Delta Cap, PPM/°C				IR, 200°C, Gohm			
		Post Test Limits	AVG	STD	Max	Min	AVG	STD	Max	Min	AVG	STD	Max	Min	AVG	STD	Max	Min
C1210H104K1GAC																		
9267073B00	0/30	± 30 PPM/°C	-5.40	3.81	-8.67	-1.22	97.47	2.70	102.24	95.79	18.04	1.02	20.45	16.57	10.18	1.03	13.60	8.20

Physical Dimension

Dimension	*Results*	*Limits, mm*	AVG	STD	Max	Min
Length (L)	0/30	3.0 - 3.4	3.25	0.038	3.30	3.15
Thickness (T)	0/30	1.5 - 1.9	1.76	0.010	1.78	1.74
Width (T)	0/30	2.3 - 2.7	2.45	0.009	2.46	2.44



Other Mechanical / Performance Results

		C1210H104K1GAC			
	Limits Reference	AVG	STD	Max	Min
ESD	per AEC-Q200-002	Classification 6			
Beam Load	per AEC-Q200-003	394	49	475	293