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IECQ-CECC range of Capacitors

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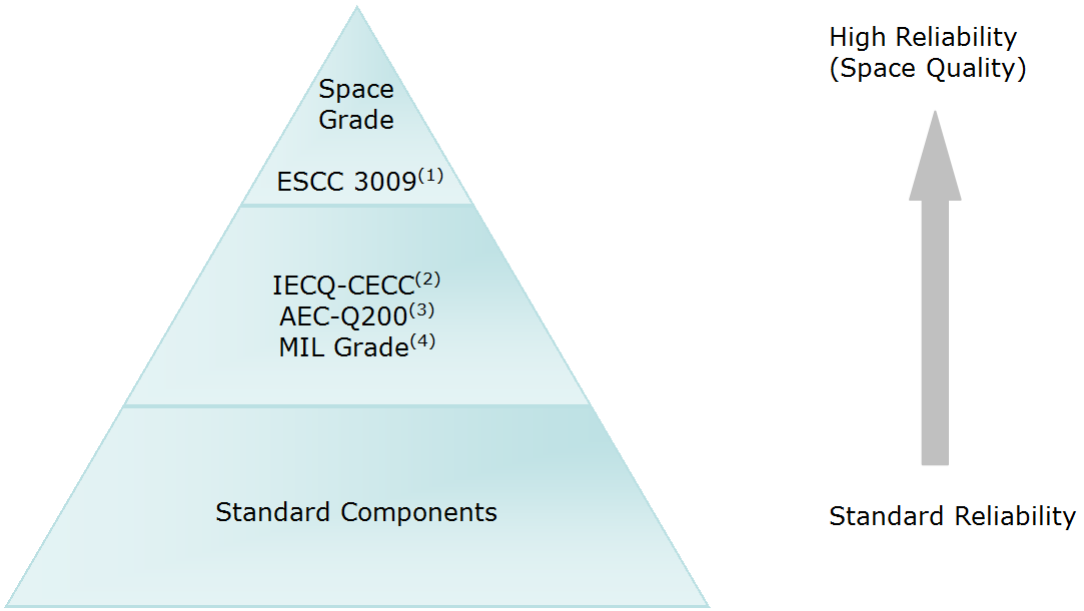
Introduction

For applications such as Mil / Aerospace where reliability is paramount, Syfer hold the IECQ-CECC internationally recognised qualification for surface mount ceramic capacitors tested in accordance with the requirements of IECQ-CECC QC32100.

IECQ-CECC is the International Electrotechnical Commission (IEC) Quality Assessment System for Electronic Components and is a product quality certification based on approval and routine periodic testing of the range approved.

The IECQ-CECC standard offers customers an intermediate level of component quality, based on, but above, commercial quality levels yet below space grade components. Component quality is checked and demonstrated by sample test results, but parts are manufactured and tested using the same processes and designs as commercial product. By comparison, space grade components usually include conditioning tests and sample quality testing to be carried out on a batch basis, resulting in much higher costs.

Syfer Product Reliability Guide



Notes:

(1) Space Grade tested in accordance with ESCC 3009. Refer to Syfer specification S02A 0100.

(2) IECQ-CECC. The International Electrotechnical Commission (IEC) Quality Assessment System for Electronic Components. This is an internationally recognised product quality certification. View Syfer's IECQ-CECC approvals at http://certificates.iecq.org-syfer or at www.syfer.com

(3) AEC-Q200. Automotive Electronics Council Stress Test Qualification For Passive Components.

(4) MIL Grade. Released in accordance with US MIL standards available on request.

Summary of Testing

IECQ-CECC approval is based on routine approval testing carried out either internally by Syfer or independently at an external test laboratory.

Samples are taken from finished stock so as to be representative of standard build quality. All components selected have been tested for

- Visual
- Dimensions
- Capacitance and Dissipation Factor
- Voltage Proof
- Insulation Resistance
- Destructive Physical analysis
- Solderability

TCC (Temperature Coefficient of Capacitance) is also tested on a ceramic lot basis.

MLCC product is sampled on a quarterly rolling test program in accordance with the tables in below, 3 to 5 tests conducted each quarter, all tests conducted within 1 calendar year.

Samples are chosen to represent all case sizes covered by the approval and the sampling plan adjusted to ensure that each test is not carried out on the same case size consecutively. The sample plan also ensures that all approved voltage ratings are covered over a rolling program.

Samples are chosen to cover all product codes (product sizes) and both dielectric types (X7R & C0G) over a rolling program

Where appropriate, the samples are tested after mounting on defined test boards. Following soldering, the parts are cleaned through either aqueous or solvent cleaning plants to ensure no contamination before testing commences.

Periodic testing Carried out for Surface Mount MLCC

Test Ref	Year 1				Year 2				Year 3				Year 4			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
P1	16							1000				50	200			
P2	16							1000				50	200			
P3	16							1000				50	200			
P4	16							1000				50	200			
P5		50					200		16					1000		
P6		50					200		16					1000		
P7/P8		50					200		16					1000		
P9		50					200		16					1000		
P10			200			50				1000					16	
P11			200			50				1000					16	
P12/P13			200			50				1000					16	
P14				1000	16						200					50
P15				1000	16						200					50
P16				1000	16						200					50

Test reference relates to below table. The figure in (brackets) is the sample size. The figures in the table (16, 50 etc.) refer to the voltage of the parts under test.

Test Ref (qty)	Test	Termination Type	Additional Requirements	Reference
P1 (77)	High Temperature Exposure (Storage)	All Types	Un-powered. 1000 hours @ T=150°C. Measurement at 24 ± 2 hours after test conclusion	MIL-STD-202 Method 108
P2 (77)	Temperature Cycling	C0G: All types X7R: Y & H only	1000 cycles -55°C to +125°C Measurement at 24 ± 2 hours after test conclusion	JESD22 Method JA-104
P3 (77)	Moisture Resistance	All Types	T = 24 hours/cycle. Note: Steps 7a & 7b not required. Un-powered. Measurement at 24 ± 2 hours after test conclusion	MIL-STD-202 Method 106
P4 (77+77)	Biased Humidity	All Types	1000 hours 85°C/85%RH. Rated voltage or 50V whichever is the less (77pcs) and 1.5V (77pcs) Measurement at 24 ± 2 hours after test conclusion	MIL-STD-202 Method 103
P5 (77)	Operational Life	All Types	Condition D Steady State T_A=125°C at full rated. Measurement at 24 ± 2 hours after test conclusion	MIL-STD-202 Method 108
P6 (5)	Resistance to Solvents	All Types	Note: Add aqueous wash chemical. Do not use banned solvents	MIL-STD-202 Method 215
P7 (30	Mechanical Shock	C0G: All types X7R: Y & H only	Figure 1 of Method 213. Condition F	MIL-STD-202 Method 213
P8 (30)	Vibration	C0G: All types X7R: Y & H only	5g's for 20 minutes, 12 cycles each of 3 orientations. Note: Use 8"X5" PCB .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 10-2000Hz	MIL-STD-202 Method 204
P9 (12)	Resistance to Soldering Heat	All Types	Condition B, no pre-heat of samples: Single Wave Solder – Procedure 2	MIL-STD-202 Method 210
P10 (30)	Thermal Shock	C0G: All types X7R: Y & H only	-55°C/+125°C. Number of cycles 300. Maximum transfer time – 20 seconds, Dwell time – 15 minutes. Air-Air	MIL-STD-202 Method 107
P11 (27)	Adhesion, Rapid Temp Change & Climatic Sequence	X7R: A, F & J only	5N force applied for 10s, -55°C/ +125°C for 5 cycles, damp heat cycles	BS EN132100 Clause 4.8, 4.12 & 4.13
P12 (30)	Board Flex	C0G: All types X7R: Y & H only	3mm deflection Class I 2mm deflection Class II	AEC-Q200-005
P13 (12)		X7R: A, F & J only	1mm deflection.	BS EN132100 Clause 4.9
P14 (30)	Terminal Strength	All Types	Force of 1.8kg for 60 seconds	AEC-Q200-006
P15 (30)	Beam Load Test	All Types	-	AEC-Q200-003
P16 (45)	Damp Heat Steady State	All Types	56 days, 40°C/93%RH. 15 × no volts, 15 × 5Vdc, 15 × R_V or 50V whichever is the less	BS EN132100 Clause 4.14

Certificate Numbers

The following certificates are authorised by the International Electrotechnical Commission Quality Assessment System for Electronic Components and can be viewed at their website www.iecq.org

- IECQ Certificate No.: Q-IECQ BSI 05.0003 / CB Certificate No.: M1043 IECQ
  - Certificate of Approval of Manufacturer
- IECQ Certificate No.: Q-IECQ BSI 07.0002 / CB Certificate No.: E1281/F
  - Fixed Multilayer ceramic Capacitors

Part Numbering

Full details of the approved ranges can be found in the latest Syfer catalogues or by reference to the Syfer website www.syfer.com.

To identify approved MLCC parts, the dielectric code in the part number is changed from X to D (X7R) and C to F (C0G) as per the example below. In addition, the controlled TCVC dielectric codes B (BX / 2X1) and R (BZ / 2C1) can also be used.

Always state on any PO that IECQ-CECC release is required

Ordering information - IECQ-CECC ranges

1210	Y	100	0103	J	D	T	_ _ _
Chip size	Termination	Voltage	Capacitance in picofarads (pF)	Capacitance tolerance	Dielectric Release codes	Packaging	Suffix code
	Y = FlexiCap™ termination base with Ni barrier (100% matte tin plating). RoHS compliant. **H** = FlexiCap™ termination base with Ni barrier (Tin/lead plating with min. 10% lead). **F** = Silver Palladium. RoHS compliant. **J** = Silver base with nickel barrier (100% matte tin plating). RoHS compliant. **A** = Silver base with nickel barrier (Tin/lead plating with min. 10% lead).	016 = 16V 025 = 25V 050 = 50V 063 = 63V 100 = 100V 200 = 200V 250 = 250V 500 = 500V 1K0 = 1kV	First digit is 0. Second and third digits are significant figures of capacitance code. The fourth digit is number of zeros following Example: 0103 = 10nF	<10pF B = ±0.1pF C = ±0.25pF D = ±0.5pF ≥ 10pF F = ±1% G = ±2% J = ±5% K = ±10% M = ±20%	**D** = X7R (2R1) with IECQ-CECC release **F** = C0G/NP0 (1B/NP0) with IECQ-CECC release **B** = 2X1/ BX released in accordance with IECQ-CECC **R** = 2C1/ BZ released in accordance with IECQ-CECC	**T** = 178mm (7") reel **R** = 330mm (13") reel **B** = Bulk pack - tubs	Used for specific customer require-ments

For further information on our AECQ-CECC approved ranges or for technical assistance please contact our Sales Department on +44 1603 723310 or by Email at sales@syfer.co.uk