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CAPACITORS, LEADLESS SURFACE MOUNTED,

TANTALUM, SOLID ELECTROLYTE,

BASED ON TYPE CTC21E

ESA/SCC Detail Specification No. 3012/003

space components
coordination group

Issue/Rev.	Date	Approved by	
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DOCUMENTATION CHANGE NOTICE

Rev. Letter	Rev. Date	Reference	CHANGE Item	Approved DCR No.

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1. GENERAL

1.1 SCOPE

This specification details the ratings, physical and electrical characteristics, test and inspection data for Capacitors, Leadless Surface Mounted, Tantalum, Solid Electrolyte, based on Type CTC21E. It shall be read in conjunction with ESA/SCC Generic Specification No. 3012, the requirements of which are supplemented herein.

1.2 RANGE OF COMPONENTS AND TYPE VARIANTS

The range of capacitors covered by this specification is given in Table 1(a) and the Type Variants are given in Para. 4.4.2.

1.3 MAXIMUM RATINGS

The maximum ratings, which shall not be exceeded at any time during use or storage, applicable to the capacitors specified herein, are as scheduled in Table 1(b).

1.4 PARAMETER DERATING INFORMATION

The parameter derating information applicable to the capacitors specified herein is shown in Figure 1.

1.5 PHYSICAL DIMENSIONS

The physical dimensions of the capacitors specified herein are shown in Figure 2.

1.6 FUNCTIONAL DIAGRAM

The functional diagram of the capacitors specified herein is shown in Figure 3.

2. APPLICABLE DOCUMENTS

The following documents form part of this specification and shall be read in conjunction with it:-

(a) ESA/SCC Generic Specification No. 3012 for Capacitors, Leadless Surface Mounted, Tantalum, Solid Electrolyte, Enclosed Anode Connection.

3. TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS

For the purpose of this specification, the terms, definitions, abbreviations, symbols and units specified in ESA/SCC Basic Specification No. 21300 shall apply. In addition, the following symbols are used:-

V_T = Test Voltage.

TABLE 1(a) - RANGE OF COMPONENTS

(1) Rated Voltage (U_R) (V)	(2) Capacitance Value (C) (µF)	(3) Tolerance (±%)	D.C. Leakage Current (I_L)			Dissipation Factor (DF)			(10) ESR max 500kHz +25°C (mΩ)	(11) Ripple Current 500kHz +25°C (max) (1) (A)	(12) Ripple Current 1.0kHz +25°C (max) (1) (A)	(13) Case Size	(14) Max. Weight (g)
			(4) +25°C (µA)	(5) +85°C (µA)	(6) +125°C (µA)	(7) −55°C (%)	(8) +25°C (%)	(9) +85°C and +125°C (%)					
6.3	270	10, 20	17	170	212	32	16	24	45	2.9	2.0	C	2.0
6.3	330	10, 20	20.8	208	260	40	20	30	45	2.9	2.0	C	2.0
6.3	560	10, 20	35.3	353	441	48	24	36	35	3.6	2.5	D	3.6
6.3	680	10, 20	42.8	428	535	60	30	45	35	3.6	2.5	D	3.6
10	180	10, 20	18	180	225	24	12	18	50	2.7	1.9	C	2.0
10	220	10, 20	22	220	275	24	12	18	45	2.9	2.0	C	2.0
10	390	10, 20	39	390	487	40	20	30	35	3.6	2.5	D	3.6
10	470	10, 20	47	470	587	44	22	33	35	3.6	2.5	D	3.6
16	120	10, 20	19.2	192	240	20	10	15	55	2.6	1.8	C	2.0
16	150	10, 20	24	240	300	24	12	18	50	2.9	2.0	C	2.0
16	270	10, 20	43.2	432	540	32	16	24	45	3.5	2.3	D	3.6
16	330	10, 20	52.8	528	660	40	20	30	45	3.6	2.5	D	3.6
20	82	10, 20	16.4	164	205	12	6	9	65	2.4	1.7	C	2.0
20	100	10, 20	20	200	250	16	8	12	60	2.5	1.7	C	2.0
20	180	10, 20	36	360	450	24	12	18	50	3.0	2.1	D	3.6
20	220	10, 20	44	440	550	24	12	18	45	3.1	2.2	D	3.6

NOTES

1. At $T_{amb} \leq +25°C$. For derating at $T_{amb} > +25°C$, see Figure 1(a).

TABLE 1(a) - RANGE OF COMPONENTS

(1) Rated Voltage (U_R) (V)	(2) Capacitance Value (C) (µF)	(3) Tolerance (±%)	D.C. Leakage Current (I_L) (4) +25°C (µA)	(5) +85°C (µA)	(6) +125°C (µA)	Dissipation Factor (DF) (7) −55°C (%)	(8) +25°C (%)	(9) +85°C and +125°C (%)	(10) ESR max 500kHz +25°C (mΩ)	(11) Ripple Current 500kHz +25°C (max) (1) (A)	(12) Ripple Current 1.0kHz +25°C (max) (1) (A)	(13) Case Size	(14) Max. Weight (g)
25	39	10, 20	9.7	97	121	10	5.0	7.5	95	2.0	1.4	C	2.0
25	47	10, 20	11.7	117	146	12	6.0	9.0	85	2.1	1.5	C	2.0
25	82	10, 20	20.5	205	256	12	6.0	9.0	65	2.6	1.8	D	3.6
25	100	10, 20	25	250	312	16	8.0	12	60	2.7	1.9	D	3.6
40	33	10, 20	13.2	132	165	10	5.0	7.5	100	1.9	1.3	C	2.0
40	56	10, 20	22.4	224	280	12	6.0	9.0	80	2.3	1.6	D	3.6
40	68	10, 20	27.2	272	340	12	6.0	9.0	75	2.4	1.7	D	3.6
50	22	10, 20	11	110	137	10	5.0	7.5	125	1.7	1.2	C	2.0
50	47	10, 20	23.5	235	293	12	6.0	9.0	85	2.3	1.6	D	3.6
63	12	10, 20	7.5	75	93	10	5.0	7.5	160	1.5	1.1	C	2.0
63	15	10, 20	9.4	94	118	10	5.0	7.5	145	1.6	1.1	C	2.0
63	33	10, 20	20.8	208	260	10	5.0	7.5	100	2.1	1.5	D	3.6

NOTES: See Page 6.

TABLE 1(b) - MAXIMUM RATINGS

No.	CHARACTERISTICS	SYMBOL	MAXIMUM RATINGS	UNITS	REMARKS
1	Rated Voltage	U_R	See Table 1(a), Column 1	Vdc	Note 1
2	Surge Voltage	U_S	$1.3 \times U_R$	Vdc	≤85°C
3	Category Voltage	U_C	$0.66 \times U_R$	Vdc	
4	Operating Temperature Range	T_{op}	−55 to +125	°C	T_{amb}
5	Rated Temperature	T_r	+85	°C	
6	Category Temperature	T_c	+125	°C	
7	Storage Temperature Range	T_{stg}	−55 to +125	°C	
8	Soldering Temperature	T_{sol}	+260	°C	Note 2

NOTES

1. At $T_{amb} \leq +25°C$. For derating at $T_{amb} > +25°C$, see Figure 1(b).
2. Soldering time 10 seconds maximum for reflow soldering.

FIGURE 1 - PARAMETER DERATING INFORMATION

FIGURE 1(a) - RIPPLE CURRENT VERSUS TEMPERATURE

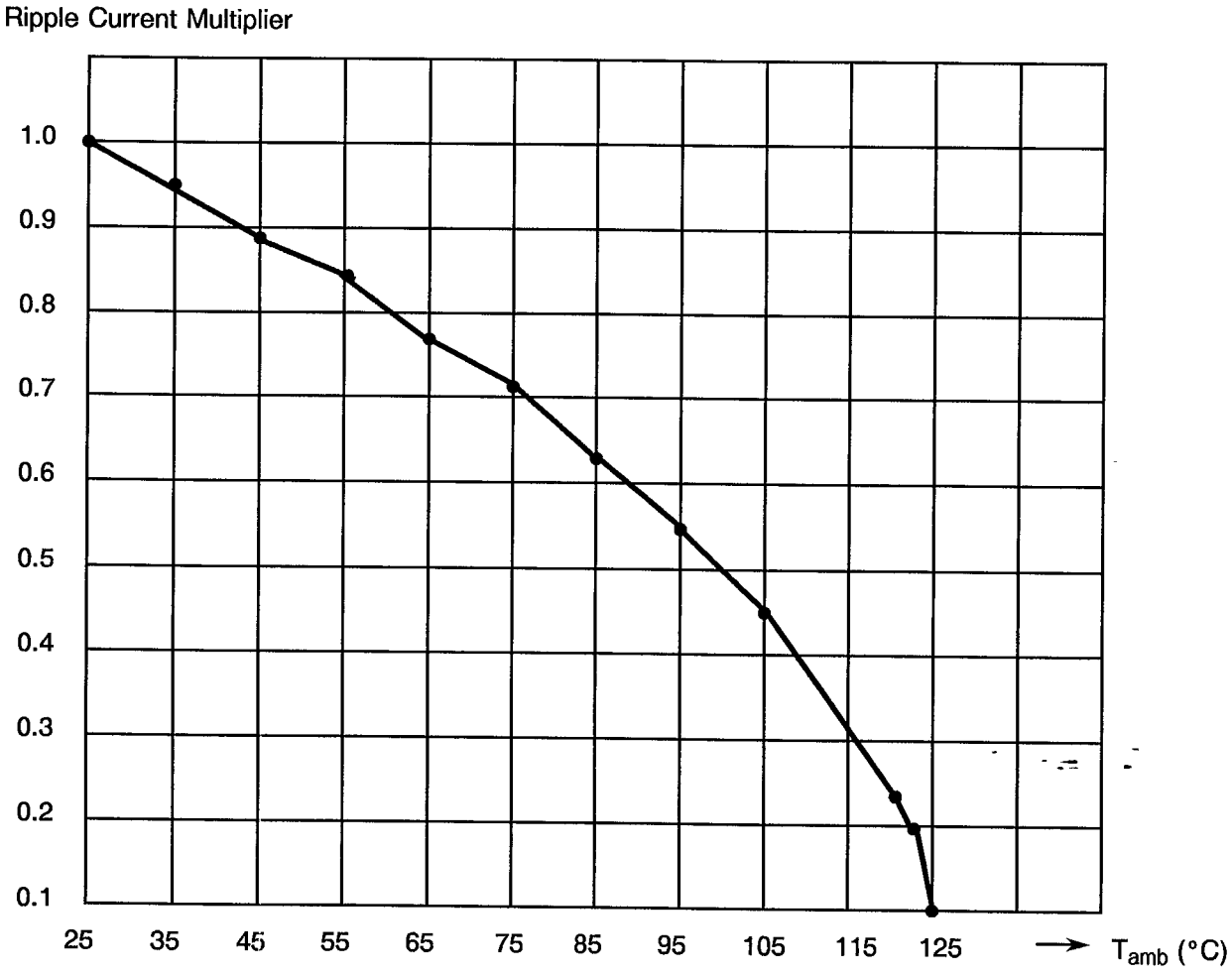


FIGURE 1 - PARAMETER DERATING INFORMATION (CONTINUED)

FIGURE 1(b) - RATED VOLTAGE VERSUS TEMPERATURE

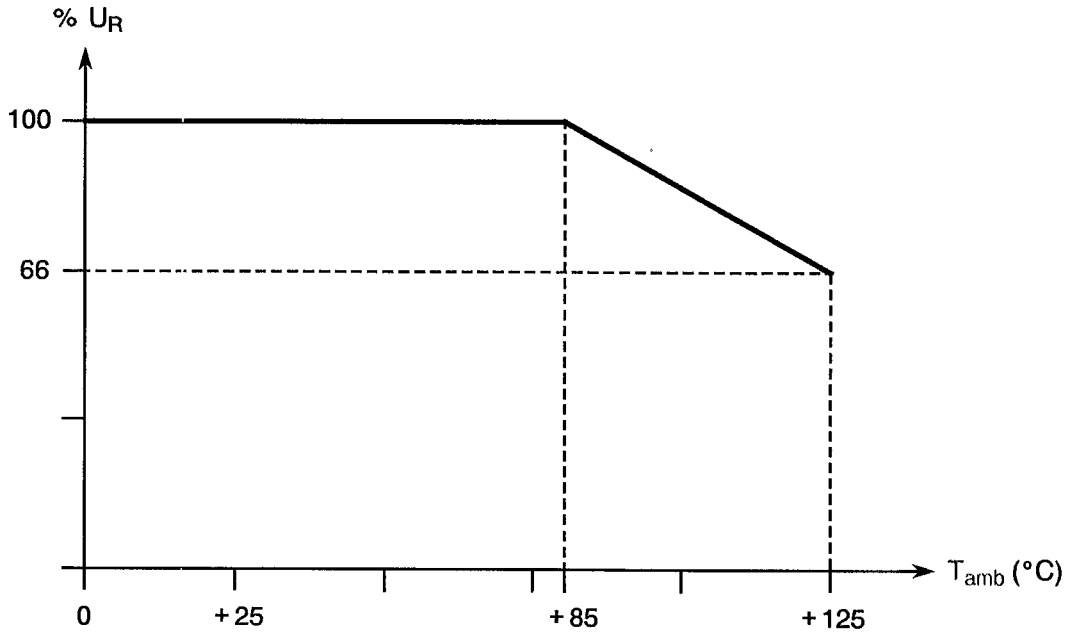
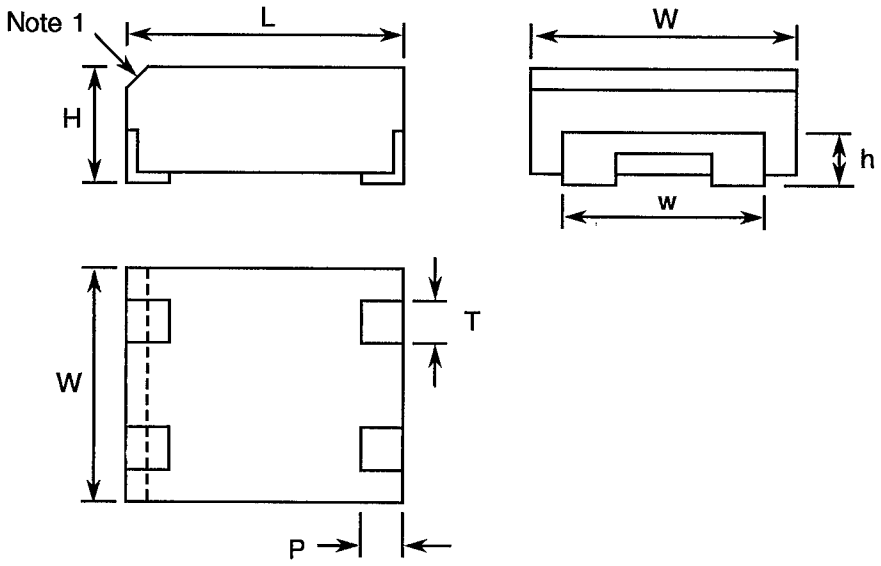


FIGURE 2 - PHYSICAL DIMENSIONS

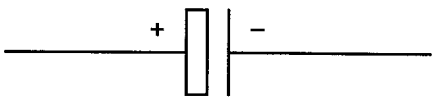


CASE SIZE	DIMENSIONS (mm)												
	L		W		H		w		P		T		h
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
C	10.9	11.9	8.9	9.5	4.4	5.4	6.7	7.3	1.2	1.8	1.7	2.3	2.0
D	10.9	11.9	12.4	13	5.4	6.4	10.2	10.8	1.2	1.8	2.7	3.3	2.0

NOTES

1. Chamfer is 0.8mm at 45° and indicates the positive end.

FIGURE 3 - FUNCTIONAL DIAGRAM



4. REQUIREMENTS

4.1 GENERAL

The complete requirements for procurement of the capacitors specified herein are stated in this specification and ESA/SCC Generic Specification No. 3012 for Capacitors, Leadless Surface Mounted, Tantalum, Solid Electrolyte, Enclosed Anode Connection. Deviations from the Generic Specification, applicable to this specification only, are listed in Para. 4.2.

Deviations from the applicable Generic Specification and this Detail Specification, formally agreed with specific Manufacturers on the basis that the alternative requirements are equivalent to the ESA/SCC requirements and do not affect the components' reliability, are listed in the appendices attached to this specification.

4.2 DEVIATIONS FROM GENERIC SPECIFICATION

4.2.1 Deviations from Special In-process Controls

None.

4.2.2 Deviations from Final Production Tests (Chart II)

(a) Para. 9.4.4, Electrical Measurements at Room Temperature:

- Capacitance and Dissipation factor shall be measured at 1.0kHz ± 50Hz.
- ESR shall be measured as specified in Table 2.

4.2.3 Deviations from Burn-in and Electrical Measurements (Chart III)

(a) Para. 9.4.4, Electrical Measurements at Room Temperature:

- Capacitance and Dissipation factor shall be measured at 1.0kHz ± 50Hz.
- ESR shall be measured as specified in Table 2.

4.2.4 Deviations from Qualification Tests (Chart IV)

(a) An additional subgroup of 12 components shall be added to Chart IV (total 104 components). This subgroup shall be submitted to a ripple current test as follows:

- The capacitors shall be mounted and placed in a still air enclosure at room temperature. A sinusoidal a.c. voltage (100kHz ± 2.0kHz) shall be superimposed on 50% of rated d.c. voltage so that the peak voltages do not exceed the value of the rated d.c. voltage of the capacitor. Rated ripple current (see Column 11 of Table 1(a)) shall be applied continuously, except for measurement periods, for a duration of 240 hours.

- The d.c. voltage shall be supplied by a regulated power supply, free from surges, having a low internal resistance, and shall be applied to each capacitor through a separate resistor. D.C. power supply regulation shall remain within ± 2.0% or less. A.C. power supply shall be within ± 5.0% of current with less than 10% distortion.

- After testing, the capacitors shall be examined for evidence of mechanical damage and shall be measured in accordance with Table 2 of this specification.

- 1 failure is allowed for this subgroup.

(b) Para. 9.19, Solderability: The solderable area is the termination 'pad' and up to 1/3 the height of the tab.

4.2.5 Deviations from Lot Acceptance Tests (Chart V)

(a) An additional subgroup of 12 components shall be added to Level 1 (total of 34 components). This subgroup shall be submitted to a ripple current test as specified in Para. 4.2.4.

(b) Para. 9.19, Solderability: The solderable area is the termination 'pad' and up to 1/3 the height of the tab.

4.3 MECHANICAL REQUIREMENTS

4.3.1 Dimension Check

The dimensions of the capacitors specified herein shall be verified in accordance with the requirements set out in Para. 9.6 of ESA/SCC Generic Specification No. 3012 and they shall conform to those shown in Figure 2 of this specification.

4.3.2 Weight

The maximum weight of the capacitors specified herein shall be as specified in Table 1(a) - Range of Components

4.3.3 Adhesion

The requirements for adhesion are specified in Para. 9.10 of ESA/SCC Generic Specification No. 3012.

4.4 MATERIALS AND FINISHES

The materials and finishes shall be as specified herein. Where a definite material is not specified, a material which will enable the capacitors specified herein to meet the performance requirements of this specification shall be used. Acceptance or approval of any constituent material does not guarantee acceptance of the finished product.

4.4.1 Case

The case shall be epoxy moulding.

4.4.2 Termination Material and Finish

The terminations shall be brass.

The termination finishes shall be Type '9' (Variant 01), Type 3 (Variant 02) and Type 10 (Variant 03), in accordance with the requirements of ESA/SCC Basic Specification No. 23500.

4.5 MARKING

4.5.1 General

The marking of all components delivered to this specification shall be in accordance with the requirements of ESA/SCC Basic Specification No. 21700 and the following paragraphs. When the component is too small to accommodate all of the marking specified, as much as space permits shall be marked and the marking information, in full, shall accompany each component in its primary package.

The information to be marked and the order of precedence, shall be as follows:-

(a) Polarity.

(b) The SCC Component Number.

(c) Electrical Characteristics and Ratings.

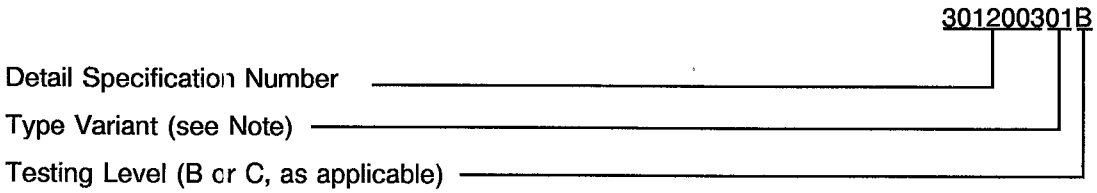
(d) Traceability Information.

4.5.2 Polarity

Polarity shall be defined by a chamfer on the positive end of the body of the capacitor.

4.5.3 The SCC Component Number

Each component shall bear the SCC Component Number which shall be constituted and marked as follows:



N.B.
For Type Variants see Para. 4.4.2.

4.5.4 Electrical Characteristics and Ratings

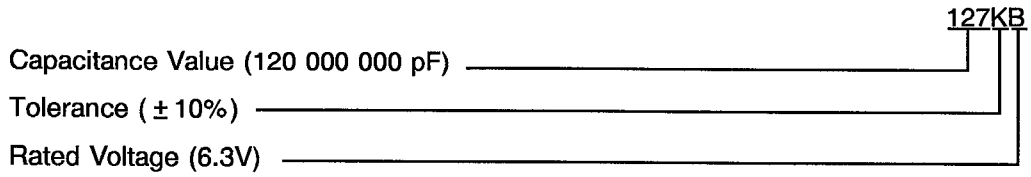
The electrical characteristics and ratings to be marked, in the following order of precedence, are:-

(a) Capacitance value.

(b) Tolerance.

(c) Rated voltage.

The information shall be constituted and marked as follows:-



4.5.4.1 Capacitance Values

The capacitance values shall be expressed by means of the following codes. The unit quantity for marking shall be picofarads (pF).

Capacitance Value (pF)	Code
XX10^5	XX5
XX10^6	XX6
XX10^7	XX7

4.5.4.2 Tolerance

The tolerance on capacitance values shall be indicated by the code letters specified hereafter.

Tolerance (±%)	Code Letter
10	K
20	M

4.5.4.3 Rated Voltage
The rated voltage shall be indicated by the code letters specified hereafter.

Rated Voltage (U_R) (V)	Code Letter
6.3	B
10	D
16	E
20	F
25	G
40	K
50	L
63	N

4.5.5 Traceability Information
Each component shall be marked in respect of traceability information in accordance with the requirements of ESA/SCC Basic Specification No. 21700.

4.6 ELECTRICAL MEASUREMENTS

4.6.1 Electrical Measurements at Room Temperature

The parameters to be measured at room temperature are scheduled in Table 2. Unless otherwise specified, the measurements shall be performed at $T_{amb} = +22 \pm 3$ °C.

4.6.2 Electrical Measurements at High and Low Temperatures

The parameters to be measured at high and low temperatures are scheduled in Table 3.

4.6.3 Circuits for Electrical Measurements (Figure 4)

Not applicable.

4.7 BURN-IN TESTS

4.7.1 Parameter Drift Values

The parameter drift values applicable to burn-in are specified in Table 4 of this specification. Unless otherwise stated, measurements shall be performed at $T_{amb} = +22 \pm 3$ °C. The parameter drift values (Δ) applicable to the scheduled parameters shall not be exceeded. In addition to these drift value requirements for a given parameter, the appropriate limit value specified in Table 2 shall not be exceeded.

4.7.2 Conditions for Burn-in

The requirements for burn-in are specified in Section 7 of ESA/SCC Generic Specification No. 3012. The conditions for burn-in shall be as specified in Table 5(a) of this specification.

4.7.3 Electrical Circuit for Burn-in (Figure 5)

Not applicable.

TABLE 2 - ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE

No.	Characteristics	Symbol	ESA/SCC 3012 Test Method	Test Conditions	Limits		Unit
					Min.	Max.	
1	Capacitance	C	Para. 9.4.1.1	$f = 1000 \pm 50$ Hz $V_p \leq 2.2V$ $V_m \leq 1.0$Vrms	Note 1		µF
2	d.c. Leakage Current	I_L	Para. 9.4.1.2	$V_m = U_R \pm 2.0\%$ $R_s = 1.0k\Omega$	-	Note 2	µA
3	Dissipation Factor	DF	Para. 9.4.1.3	$f = 1000 \pm 50$ Hz	-	Note 3	%
4	Equivalent Series Resistance	ESR	-	$f = 500 \pm 5.0$ kHz $V_p \leq 2.2V$ Vac_{max}: 0.5Vrms	-	Note 4	mΩ

NOTES
1. See Columns 2 and 3 of Table 1(a).
2. See Column 4 of Table 1(a).
3. See Column 8 of Table 1(a).
4. See Column 10 of Table 1(a).

TABLE 3 - ELECTRICAL MEASUREMENTS AT HIGH AND LOW TEMPERATURES

No.	Characteristics	Symbol	ESA/SCC 3012 Test Method	Test Conditions (Note 1)	Limits		Unit
					Min.	Max.	
1	Capacitance Change	$\frac{\Delta C}{C}$	Para. 9.4.1.1	$f = 1000 \pm 50$ Hz $V_p \leq 2.2V$ $V_m \leq 1.0$Vrms $T_{amb} = -55°C$ $T_{amb} = +85°C$ $T_{amb} = +125°C$	 −10 −8.0 −12	 +10 +8.0 +12	% (2)
2	d.c. Leakage Current	I_L	Para. 9.4.1.2	$R_s = 1.0k\Omega$ $T_{amb} = +85°C$ $V_m = U_R \pm 2.0\%$ $T_{amb} = +125°C$ $V_m = 0.67U_R$	 - -	 Note 3 Note 4	µA
3	Dissipation Factor	DF	Para. 9.4.1.3	$f = 1000 \pm 50$ Hz $T_{amb} = -55°C$ $T_{amb} = +85°C$ $T_{amb} = +125°C$	 - - -	 Note 5 Note 6 Note 6	%

NOTES
1. Inspection Level II, Single Sampling, AQL 0.65% of IEC Publication No. 410 for each capacitance value. Each capacitance value shall be considered as constituting a complete lot.
2. With respect to the values measured in Table 2.
3. See Column 5 of Table 1(a).
4. See Column 6 of Table 1(a).
5. See Column 7 of Table 1(a).
6. See Column 9 of Table 1(a).

FIGURE 4 - CIRCUITS FOR ELECTRICAL MEASUREMENTS

Not applicable.

TABLE 4 - PARAMETER DRIFT VALUES

No.	CHARACTERISTICS	SYMBOL	SPEC. AND/OR TEST METHOD	TEST CONDITIONS	CHANGE LIMITS (Δ)	UNIT
1	Capacitance Change	ΔC/C	As per Table 2	As per Table 2	±5.0	%
2	d.c. Leakage Current Change	$\Delta I_L/I_L$	As per Table 2	As per Table 2	Notes 1 and 2	μA

NOTES

1. Leakage currents $<0.1\mu A$ are considered as a $0.1\mu A$ value.
2. 2.0 × initial value measured or (0.25 × Table 2 Item 2 + $0.05\mu A$), whichever is smaller.

TABLE 5(a) - CONDITIONS FOR BURN-IN

No.	Characteristic	Symbol	Condition	Unit
1	Ambient Temperature	T_{amb}	+85 (+0−3)	°C
2	Test Voltage	V_T	U_R	V

TABLE 5(b) - CONDITIONS FOR OPERATING LIFE TESTS

No.	CHARACTERISTICS	SYMBOL	CONDITION	UNIT
1	Ambient Temperature 1	T_{amb1}	+85 (+0−3)	°C
2	Test Voltage 1	V_{T1}	U_R	V
3	Ambient Temperature 2	T_{amb2}	+125 (+0−3)	°C
4	Test Voltage 2	V_{T2}	U_C	V

FIGURE 5 - ELECTRICAL CIRCUIT FOR BURN-IN AND OPERATING LIFE TESTS

Not applicable.

4.8 ENVIRONMENTAL AND ENDURANCE TESTS (CHARTS IV AND V OF ESA/SCC GENERIC SPECIFICATION No. 3012)

4.8.1 Measurements and Inspections on Completion of Environmental Tests

The parameters to be measured and inspections to be performed on completion of environmental tests are scheduled in Table 6. Unless otherwise stated, the measurements shall be performed at $T_{amb} = +22 \pm 3$ °C.

4.8.2 Measurements and Inspections at Intermediate Points during Endurance Tests

The parameters to be measured and inspections to be performed at intermediate points during endurance tests are scheduled in Table 6. Unless otherwise stated, the measurements shall be performed at $T_{amb} = +22 \pm 3$ °C.

4.8.3 Measurements and Inspections on Completion of Endurance Tests

The parameters to be measured and inspections to be performed on completion of endurance tests are scheduled in Table 6. Unless otherwise stated, the measurements shall be performed at $T_{amb} = +22 \pm 3$ °C.

4.8.4 Conditions for Operating Life Tests (Part of Endurance Testing)

The requirements for operating life testing are specified in Section 9 of ESA/SCC Generic Specification No. 3012. The conditions for operating life testing shall be as specified in Table 5(b) of this specification.

4.8.5 Electrical Circuit for Operating Life Tests (Figure 5)

Not applicable.

TABLE 6 - MEASUREMENTS AND INSPECTIONS ON COMPLETION OF ENVIRONMENTAL TESTS AND AT INTERMEDIATE POINTS AND ON COMPLETION OF ENDURANCE TESTING

No.	ESA/SCC GENERIC SPECIFICATION NO. 3012		MEASUREMENTS AND INSPECTIONS		SYMBOL	LIMITS		UNIT
	ENVIRONMENTAL AND ENDURANCE TESTS (1)	TEST METHOD AND CONDITIONS	IDENTIFICATION	CONDITIONS		MIN.	MAX.	
01	Mounting	Para. 9.9	**Final Examination**					
			Terminals	Good Timing	-	-	-	
			Final Measurements					
			Capacitance	Table 2 Item 1	C	Record Values		
			d.c. Leakage Current	Table 2 Item 2	I_L	-	Table 2	
			Dissipation Factor	Table 2 Item 3	DF	-	Table 2	
02	Rapid Change of Temperature	Para. 9.3.2	**Initial Measurements**					
			Capacitance	Value recorded in 01	C	Table 2 Item 1		
			Final Measurements	Recovery period of 4 hours min.				
			Visual Examination	-	-	-	-	
			Capacitance Change	Table 2 Item 1	ΔC/C	−5.0	+5.0	%
			d.c. Leakage Current	Table 2 Item 2	I_L	-	Table 2	
			Dissipation Factor	Table 2 Item 3	DF	-	Table 2	
03	External Visual Inspection	Para. 9.5	**Final Inspection**					
			Visual Inspection	ESA/SCC No. 20500	-	-	-	
04	Adhesion	Para. 9.10 and Para. 4.3.3 of this spec.	**Initial Measurements**					
			Capacitance	Value recorded in 01	C	Table 2 Item 1		
			Final Measurements					
			Visual Examination	No damage or loosening from the substrate	-	-	-	
			Capacitance Change	Table 2 Item 1	ΔC/C	−5.0	+5.0	%
05	Vibration	Para. 9.11	**Measurements during test**	During Last Cycle No Intermittent Contact >0.5ms, arcing or open or shorts	-	-	-	
			Final Examination					
			Visual Examination	No damage	-	-	-	
06	Shock or Bump	Para. 9.12	**Final Examination**					
			Visual Examination	-	-	-	-	
07	Climatic Sequence	Para. 9.13	**Initial Measurements**					
			Capacitance	Value recorded in 01 After Dry Heat (2)	C	Table 2 Item 1		
			d.c. Leakage Current	Table 3 Item 2	I_L	-	Table 3	
			Final Measurements	After recovery of 1 to 24 hours				
			Visual Inspection	ESA/SCC No. 20500	-	-	-	
			Capacitance Change	Table 2 Item 1	ΔC/C	−10	+10	%
			d.c. Leakage Current	Table 2 Item 2	I_L	-	Table 2	
			Dissipation Factor	Table 2 Item 3	DF	-	(3)	
08	High and Low Temperature Stability	Para. 9.14	**Measurements during test**					
			Electrical Measurements	Tables 2 & 3	-	Tables 2 & 3		

NOTES

1. The tests in this Table refer to either Chart IV or V and shall be used as applicable.
2. While still at the high temperature.
3. 1.2× the value specified in Table 2 of this specification.
4. Compared to the values measured in Table 2 of this specification.
5. 1.25× the value specified in Table 3 of this specification.
6. 2.0× the value specified in Table 2 of this specification.
7. 1.5× the value specified in Table 2 of this specification.

TABLE 6 - MEASUREMENTS AND INSPECTIONS ON COMPLETION OF ENVIRONMENTAL TESTS AND AT INTERMEDIATE POINTS AND ON COMPLETION OF ENDURANCE TESTING (CONT'D)

No.	ESA/SCC GENERIC SPECIFICATION No. 3012		MEASUREMENTS AND INSPECTIONS		SYMBOL	LIMITS		UNIT
	ENVIRONMENTAL AND ENDURANCE TESTS (1)	TEST METHOD AND CONDITIONS	IDENTIFICATION	CONDITIONS		MIN.	MAX.	
09	Surge Voltage	Para. 9.15	**Final Measurements**					
			Capacitance Change	Table 2 Item 1	ΔC/C	−10	+10	% (4)
			d.c. Leakage Current	Table 2 Item 2	I_L	-	Table 2	
			Dissipation Factor	Table 2 Item 3	DF	-	Table 2	
10	Damp Heat Steady State	Para. 9.16	**Initial Measurements**					
			Capacitance	Table 2 Item 1	C	Table 2		
			Final Measurements	After recovery of 1 to 2 hours				
			Visual Examination	-	-	-	-	
			Capacitance Change	Table 2 Item 1	ΔC/C	−10	+10	%
			d.c. Leakage Current	Table 2 Item 2	I_L	-	Table 2	
			Dissipation Factor	Table 2 Item 3	DF	-	(3)	
11	Operating Life	Para. 9.17	**Initial Measurements**					
			Capacitance	Value recorded in 01	C	Table 2 Item 1		
			Intermediate Measurements at 250 and 1000 hours					
			d.c. Leakage Current (2)	Table 3 Item 2	I_L	-	(5)	
			Final Measurements at 1000 and 2000 hours	After recovery of 1 to 2 hours				
			Capacitance Change	Table 2 Item 1	ΔC/C	−10	+10	%
			d.c. Leakage Current	Table 2 Item 2	I_L	-	(6)	
			Dissipation Factor	Table 2 Item 3	DF	-	(7)	
			Visual Examination	No damage	-	-	-	
12	Permanence of Marking	Para. 9.18	**Final Examination**					
			Visual Examination	No corrosion or obliteration of marking	-	-	-	
13	Solderability	Para. 9.19 and Para. 4.2.4 of this spec.	**Final Examination**					
			Visual Examination	No damage	-	-	-	

NOTES: See Page 18.