



**CAPACITORS, FIXED CERAMIC DIELECTRIC,
TYPE II, FOR SURFACE MOUNTING,
BASED ON TYPES CNC82RE AND CNC83RE
ESCC Detail Specification No. 3001/028**

**ISSUE 1
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ESA/SCC Detail Specification No. 3001/028**



**space components
coordination group**

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SCC

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DOCUMENTATION CHANGE NOTICE

Rev. Letter	Rev. Date	Reference	CHANGE Item	Approved DCR No.
'A'	Sept. '96	P1. Cover page P2. DCN P10. Figure 2(b)	: Dimension H2 deleted from the General Dimensions Table and added to the Case Sizes Table	None None 221360

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**1. GENERAL****1.1 SCOPE**

This specification details the ratings, physical and electrical characteristics, test and inspection data for Capacitors, Fixed, Ceramic Dielectric, Type II, for Surface Mounting, based on Types CNC82RE and CNC83RE. It shall be read in conjunction with ESA/SCC Generic Specification No. 3001, the requirements of which are supplemented herein.

1.2 RANGE OF COMPONENTS

The range of capacitors covered by this specification is given in Table 1(a).

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 scheduled in Table 1(b).

1.4 PARAMETER DERATING INFORMATION (FIGURE 1)

Not applicable.

1.5 PHYSICAL DIMENSIONS

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

1.6 FUNCTIONAL DIAGRAM

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



TABLE 1(a) - RANGE OF COMPONENTS

Based on Type	Capacitance Value (µF)	Capacitance Tolerance (±%)	Rated Voltage (U _R) (Vdc)	Figure	Case Size	Weight (g)
CNC82RE	1.5	10, 20	50	2(a)	A	5.0
CNC82RE	1.8	10	50	2(a)	A	5.0
CNC82RE	2.2	10, 20	50	2(a)	A	5.0
CNC82RE	2.7	10	50	2(a)	A	5.0
CNC82RE	3.3	10, 20	50	2(a)	A	5.0
CNC82RE	3.9	10	50	2(a)	B	7.0
CNC82RE	4.7	10, 20	50	2(a)	B	7.0
CNC82RE	5.6	10	50	2(a)	B	7.0
CNC82RE	6.8	10, 20	50	2(a)	B	7.0
CNC82RE	8.2	10	50	2(a)	B	7.0
CNC82RE	10	10, 20	50	2(a)	C	9.0
CNC82RE	12	10	50	2(a)	D	12
CNC82RE	15	10, 20	50	2(a)	D	12
CNC82RE	18	10	50	2(a)	E	15
CNC82RE	22	10, 20	50	2(a)	E	15
CNC83RE	27	10	50	2(b)	H	16
CNC83RE	33	10, 20	50	2(b)	H	16
CNC83RE	39	10	50	2(b)	I	25
CNC83RE	47	10, 20	50	2(b)	I	25
CNC82RE	0.56	10	100	2(a)	A	5.0
CNC82RE	0.68	10, 20	100	2(a)	A	5.0
CNC82RE	0.82	10	100	2(a)	A	5.0
CNC82RE	1.0	10, 20	100	2(a)	A	5.0
CNC82RE	1.2	10	100	2(a)	A	5.0
CNC82RE	1.5	10, 20	100	2(a)	A	5.0
CNC82RE	1.8	10	100	2(a)	A	5.0
CNC82RE	2.2	10, 20	100	2(a)	B	7.0
CNC82RE	2.7	10	100	2(a)	B	7.0
CNC82RE	3.3	10, 20	100	2(a)	B	7.0
CNC82RE	3.9	10	100	2(a)	C	9.0
CNC82RE	4.7	10, 20	100	2(a)	C	9.0
CNC82RE	5.6	10	100	2(a)	D	12
CNC82RE	6.8	10, 20	100	2(a)	D	12
CNC82RE	8.2	10	100	2(a)	E	15
CNC82RE	10	10, 20	100	2(a)	E	15
CNC83RE	12	10	100	2(b)	H	16
CNC83RE	15	10, 20	100	2(b)	H	16
CNC83RE	18	10	100	2(b)	I	25
CNC83RE	22	10, 20	100	2(b)	I	25
CNC83RE	27	10	100	2(b)	J	30
CNC83RE	33	10, 20	100	2(b)	K	40



TABLE 1(a) - RANGE OF COMPONENTS (CONT'D)

Based on Type	Capacitance Value (μF)	Capacitance Tolerance ($\pm\%$)	Rated Voltage (U_R) (V)	Figure	Case Size	Weight (g)
CNC82RE	0.33	10, 20	250	2(a)	A	5.0
CNC82RE	0.39	10	250	2(a)	A	5.0
CNC82RE	0.47	10, 20	250	2(a)	A	5.0
CNC82RE	0.56	10	250	2(a)	B	7.0
CNC82RE	0.68	10, 20	250	2(a)	B	7.0
CNC82RE	0.82	10	250	2(a)	B	7.0
CNC82RE	1.0	10, 20	250	2(a)	B	7.0
CNC82RE	1.2	10	250	2(a)	B	7.0
CNC82RE	1.5	10, 20	250	2(a)	C	9.0
CNC82RE	1.8	10	250	2(a)	D	12
CNC82RE	2.2	10, 20	250	2(a)	D	12
CNC82RE	2.7	10	250	2(a)	E	15
CNC82RE	3.3	10, 20	250	2(a)	E	15
CNC83RE	3.9	10	250	2(b)	H	16
CNC83RE	4.7	10, 20	250	2(b)	H	16
CNC83RE	5.6	10	250	2(b)	I	25
CNC83RE	6.8	10, 20	250	2(b)	I	25
CNC83RE	8.2	10, 20	250	2(b)	J	30
CNC83RE	10	10, 20	250	2(b)	K	40
CNC82RE	0.22	10, 20	400	2(a)	A	5.0
CNC82RE	0.27	10	400	2(a)	A	5.0
CNC82RE	0.33	10, 20	400	2(a)	A	5.0
CNC82RE	0.39	10	400	2(a)	B	7.0
CNC82RE	0.47	10, 20	400	2(a)	B	7.0
CNC82RE	0.56	10	400	2(a)	B	7.0
CNC82RE	0.68	10, 20	400	2(a)	B	7.0
CNC82RE	0.82	10	400	2(a)	C	9.0
CNC82RE	1.0	10, 20	400	2(a)	C	9.0
CNC82RE	1.2	10, 20	400	2(a)	D	12
CNC82RE	1.5	10	400	2(a)	D	12
CNC82RE	1.8	10	400	2(a)	E	15
CNC82RE	2.2	10, 20	400	2(a)	E	15
CNC83RE	2.7	10, 20	400	2(b)	I	25
CNC83RE	3.3	10, 20	400	2(b)	I	25
CNC83RE	3.9	10	400	2(b)	J	25
CNC83RE	4.7	10, 20	400	2(b)	J	30
CNC83RE	5.6	10	400	2(b)	K	40
CNC83RE	6.8	10, 20	400	2(b)	K	40

TABLE 1(b) - MAXIMUM RATINGS

No.	Characteristics	Symbol	Limits		Unit	Remarks
			Min.	Max.		
1	Rated Voltage	U_R	-	50 100 250 400	Vdc	Range (See Table 1(a))
2	Temperature Characteristic	$\frac{\Delta C}{C}$	See Table 3		%	$V_T = 0$ $V_T = U_R$
3	Operating Temperature Range	T_{amb}	-55	+125	°C	Without derating. T_{amb}
4	Storage Temperature Range	T_{stg}	-55	+125	°C	
5	Soldering Temperature	T_{sol}	-	+260	°C	Note 1

NOTES

- Duration 5 seconds maximum at a distance of not less than 1.5mm from the case and the same lead shall not be resoldered until 3 minutes have elapsed.

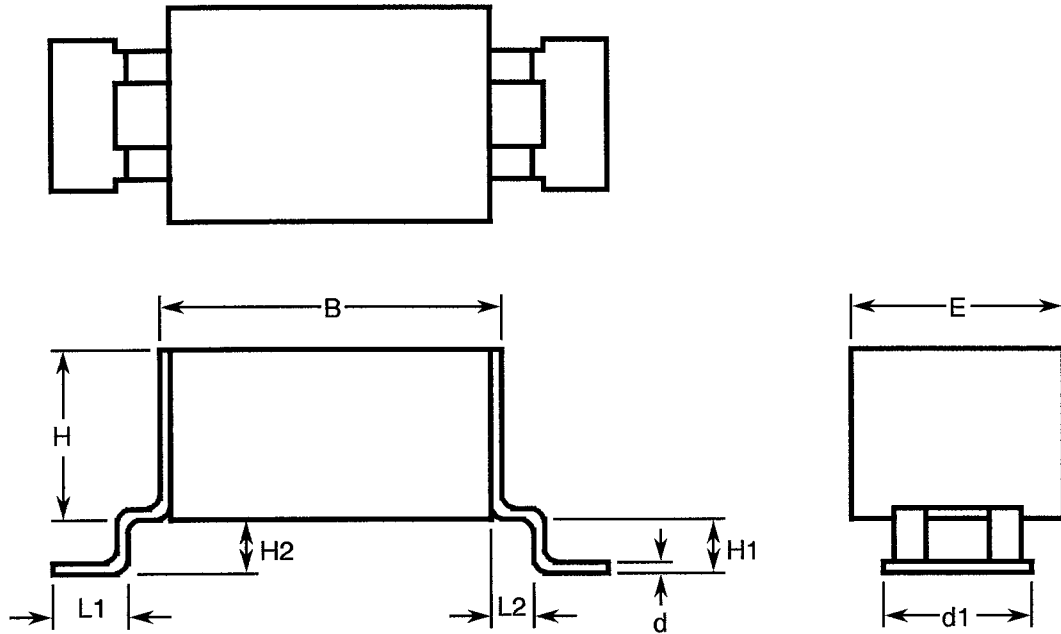
FIGURE 1 - PARAMETER DERATING INFORMATION

Not applicable.



FIGURE 2 - PHYSICAL DIMENSIONS

FIGURE 2(a) - TYPE CNC82RE



GENERAL DIMENSIONS

SYMBOL	MILLIMETRES	
	MIN	MAX
B	-	15.5
d	-	0.25
d1	7.5	8.5
E	-	11.5
H1	2.0	2.4
L1	3.3	3.7
L2	1.3	1.7

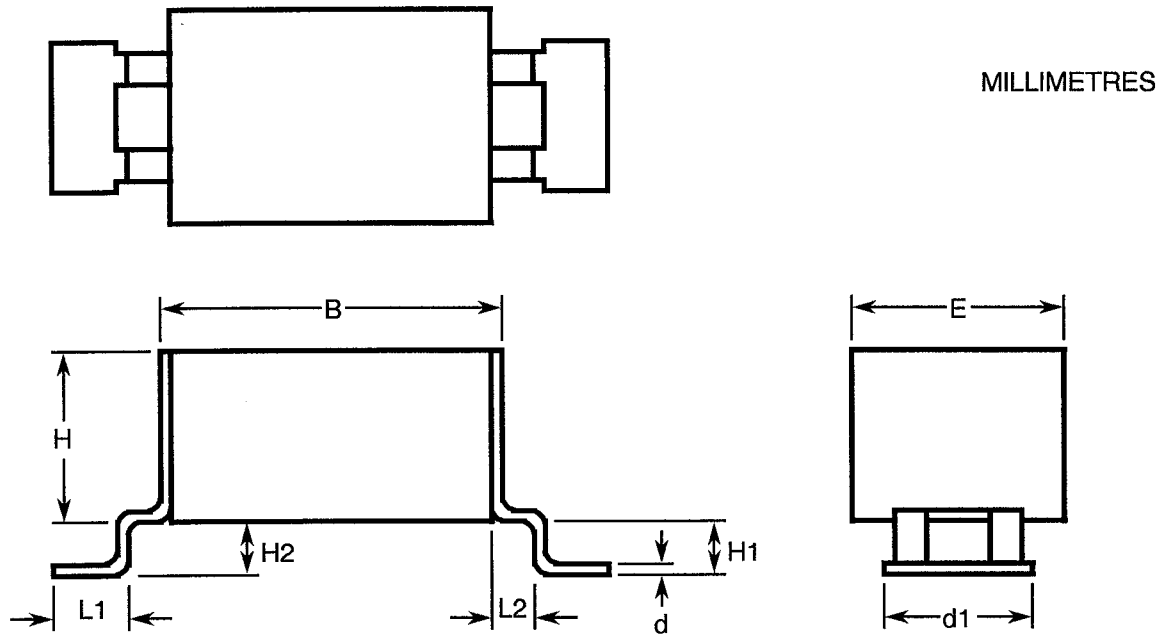
CASE SIZES

CASE SIZE	MILLIMETRES		
	H	H2	
	MAX	MIN	MAX
A	2.5	1.4	1.8
B	4.5	1.4	1.8
C	6.0	1.4	1.8
D	9.0	0.6	0.8
E	12.0	0.6	0.8



FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2(b) - TYPE CNC83RE



MILLIMETRES

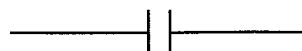
GENERAL DIMENSIONS



SYMBOL	MILLIMETRES	
	MIN	MAX
B	-	18.5
d	-	0.25
d1	14.5	15.5
E	-	17.0
H1	2.0	2.4
L1	3.3	3.7
L2	1.3	1.7

CASE SIZES

CASE SIZE	MILLIMETRES		
	H	H2	
	MAX	MIN	MAX
F	4.5	1.4	1.8
G	6.0	1.4	1.8
H	10.0	0.6	0.8
I	15.0	0.6	0.8
J	18.0	0.6	0.8
K	26.0	0.6	0.8

FIGURE 3 - FUNCTIONAL DIAGRAM



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2. APPLICABLE DOCUMENTS

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

- (a) ESA/SCC Generic Specification No. 3001 for Capacitors, Fixed, Ceramic Dielectric, Types I and II.

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 symbol is used:-

V_T = Test Voltage.

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. 3001 for Capacitors, Fixed, Chips, Ceramic Dielectric, Types I and II. 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

- (a) Para. 5.2.2, "Lead Pull Test": Not applicable.

4.2.2 Deviations from Final Production Tests (Chart II)

- (a) Para. 9.5.1.4.1(b), Voltage Proof - Body Insulation: Not applicable.

4.2.3 Deviations from Burn-in Tests (Chart III)

- (a) Para. 9.5.1.4.1(b), Voltage Proof - Body Insulation: Not applicable.
- (b) Para. 9.6, Radiographic Inspection: Not applicable.

4.2.4 Deviations from Qualification Tests (Chart IV)

- (a) Para. 9.5.1.4.1(b), Voltage Proof - Body Insulation: Not applicable.
- (b) Para. 9.7, "Robustness of Terminations":

Add to Para. 9.7.1:

"Frame termination surface mount capacitors shall be mounted on a suitable substrate. After mounting, examination shall be made for good tinning as evidenced by flowing of the solder with wetting of the terminations.

A force, as specified in Para. 4.3.3 of the Detail Specification, shall be applied normal to the line joining the terminals and in a plane parallel to the substrate, for a duration of 10 seconds."

Add to Para. 9.7.2:

"For moulded surface mount capacitors, there shall be no evidence of damage or loosening of the components from the substrate."



(c) Para. 9.8, "Resistance to Soldering Heat":

Amend the first sentence of Para. 9.8.2 to read:

"Components specially designed for printed wiring and surface mounting shall..."

Before the last sentence of Para. 9.8.2 add:

"Frame terminations of surface mount capacitors shall be completely immersed in the solder bath."

(d) Para. 9.9, "Solderability":

In the first sentence of Para. 9.9.1:

Amend "Test T" to read "Test Ta" and replace the text inside the parenthesis with "(Method 1)".

Add to the end of this paragraph:

"Only that part of the terminations which is designed to be soldered shall be tested on surface mount capacitors."

(e) Para. 9.11, "Vibration": Prior to testing, the capacitors shall be mounted and glued on a suitable substrate as specified in Para. 4.2.4(b) of this specification.

(f) Para. 9.12, "Shock or Bump": Prior to testing, the capacitors shall be mounted and glued on a suitable substrate as specified in Para. 4.2.4(b) of this specification.

4.2.5 Deviations from Lot Acceptance Tests (Chart V)

(a) Para. 9.5.1.4.1(b), Voltage Proof - Body Insulation: Not applicable.

(b) Para. 9.7, "Robustness of Terminations": As per Para. 4.2.4(b) of this specification.

(c) Para. 9.8, "Resistance to Soldering Heat": As per Para. 4.2.4(c) of this specification.

(d) Para. 9.9, "Solderability": As per Para. 4.2.4(d) of this specification.

(e) Para. 9.11, "Vibration": As per Para. 4.2.4(e) of this specification.

(f) Para. 9.12, "Shock or Bump": As per Para. 4.2.4(f) of this specification.

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. 9.4 of ESA/SCC Generic Specification No. 3001 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 scheduled in Table 1(a).

4.3.3 Robustness of Terminations

The requirements for robustness of terminations are specified in Para. 9.7 of ESA/SCC Generic Specification No. 3001 and Para. 4.2.4(a) of this specification. The test conditions shall be as follows:-

(a) **Applied Force:** 10N.

(b) **Duration:** 10s.



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

Varnished chips.

4.4.2 Terminals

The terminal material shall be Brass with Type '4' finish in accordance with the requirements of ESA/SCC Basic Specification No. 23500.

4.5 MARKING

4.5.1 General

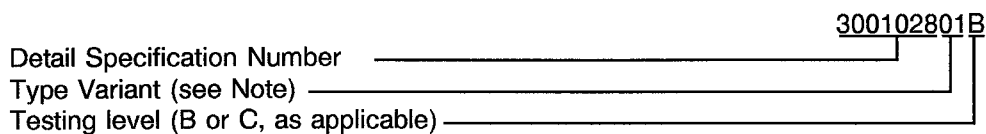
The marking of components delivered to this specification shall be in accordance with the requirements of ESA/SCC Basic Specification No. 21700 and the following paragraphs. When the component is too small to accommodate all of the marking specified, as much as space permits shall be marked and the marking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

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

- (a) The SCC Component Number.
- (b) Electrical Characteristics and Ratings.
- (c) Traceability Information.

4.5.2 The SCC Component Number

The SCC Component Number shall be constituted and marked as follows:-



N.B.

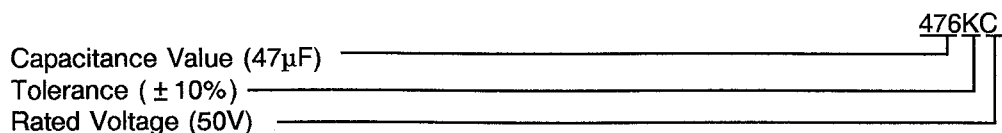
Marking of the Type Variant Number is mandatory. No further reference to type variants is made in this specification.

4.5.3 Electrical Characteristics and Ratings

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

- (a) Capacitance Value.
- (b) Tolerance.
- (d) Rated Voltage.

The information shall be constituted and marked as follows:-





4.5.3.1 Capacitance Values

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

Capacitance Value	Code
XX10 ⁴	XX4
XX10 ⁵	XX5
XX10 ⁶	XX6
XX10 ⁷	XX7
XX10 ⁸	XX8

4.5.3.2 Tolerances

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

Tolerance (%)	Code Letter
± 10	K
± 20	M

4.5.3.3 Rated Voltage

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

Rated Voltage (U _R)	Code Letter
50	C
100	E
250	H
400	K

4.5.4 Traceability Information

Traceability information shall be marked in accordance with the requirements of ESA/SCC Basic Specification No. 21700.

- (a) Manufacturing Date Code.
- (b) Serial Number.
- (c) Manufacturer's Name.



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, 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. The measurements shall be performed at $T_{amb} = +125(+0-5)$ and $-55(+5-0)$ °C.

4.6.3 Circuits for Electrical Measurements

A circuit for use in performing the electrical measurements listed in Table 2 of this specification is shown in ESA/SCC Generic Specification No. 3001.

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 parameters scheduled 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. 3001. The conditions for burn-in shall be as specified in Table 5 of this specification.

On completion of burn-in, a recovery period of 24 ± 2 hours is necessary before performance of the end-measurements.

4.7.3 Electrical Circuit for Burn-in (Figure 5)

Not applicable.

**TABLE 2 - ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE**

No.	Characteristics	Symbol	ESA/SCC 3001 Test Conditions	Limits		Unit
				Min	Max	
1	Capacitance	C	Para. 9.5.1.1	See Table 1(a)		μF
2	Tangent of Loss Angle	$\text{tg}\delta$	Para. 9.5.1.2	-	250	10^{-4}
3	Insulation Resistance	$R_i \times C$	Para. 9.5.1.3	1000	-	sec
4	Voltage Proof - Dielectric	VP	Para. 9.5.1.4	$2.5U_R$	-	Vdc

TABLE 3 - ELECTRICAL MEASUREMENTS AT HIGH AND LOW TEMPERATURES

No.	Characteristics	Symbol	ESA/SCC 3001 Test Conditions	Limits		Unit	Remarks
				Min	Max		
3	Insulation Resistance at $T_{\text{amb}} = +125 \pm 3 \text{ }^\circ\text{C}$	$R_i \times C$	Para. 9.5.1.3	100	-	sec	Note 1
6	Temperature Characteristic	$\frac{\Delta C}{C}$	Para. 9.17, $V_T = 0$	- 20	20	%	Note 2
6	Temperature Characteristic	$\frac{\Delta C}{C}$	Para. 9.17, $V_T = U_R$ For $U_R =$ 50V 100V 250V 400V	- 30 - 30 - 40 - 50	20 20 20 20	%	Notes 2 and 3

NOTES

1. Applicable to Level 'B' only. Sample test: Inspection Level S3, AQL 2.5%.
2. Sample test: 5 pieces from each dielectric lot. If 1 failure occurs, the complete lot shall be checked.
3. See Appendix '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	$\frac{\Delta C}{C}$	As per Table 2	As per Table 2	± 10	%

TABLE 5 - CONDITIONS FOR BURN-IN AND OPERATING LIFE TESTS

No.	Characteristic	Symbol	Condition	Unit
1	Ambient Temperature	T_{amb}	$+ 125(+ 0 - 5)$	$^{\circ}C$
2	Test Voltage	V_T	$2.0U_R$	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. 3001)
- 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 specified, 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 specified, 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 specified, 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. 3001. The conditions for operating life testing shall be as specified in Table 5 for the Burn-in test
- 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 SPEC.NO. 3001		MEASUREMENTS AND INSPECTIONS		SYMBOL	LIMITS		UNIT
	ENVIRONMENTAL AND ENDURANCE TESTS (1)	TEST METHOD AND CONDITIONS	IDENTIFICATION	CONDITIONS		MIN.	MAX.	
01	Robustness of Terminations	Para. 9.7 and Para. 4.3.3 of this specification	Visual Examination	-	-			
02	Resistance to Soldering Heat	Para. 9.8	Initial Measurements Capacitance	Table 2 Item 1	C	Table 2 Item 1		μF
			Final Measurements Capacitance Change Insulation Resistance	After a recovery period of 24 ± 2 hours Table 2 Item 1 Table 2 Item 3	$\Delta\text{C}/\text{C}$ $\text{Ri} \times \text{C}$	- 10 20 Table 2 Item 3	% sec	
03	Solderability	Para. 9.9	Visual Examination	-	-			
04	Rapid Change of Temperature	Para. 9.10	Initial Measurements Capacitance	Table 2 Item 1	C	Table 2 Item 1		μF
			Final Measurements Visual Examination Capacitance Change Tangent of Loss Angle	After a recovery period of 24 ± 2 hours - Table 2 Item 1 Table 2 Item 2	- $\Delta\text{C}/\text{C}$ $\text{tg}\delta$	- 10 10 Table 2 Item 2	% 10^{-4}	
05	Vibration	Para. 9.11	During Last Cycle Intermittent Contact	Open or Shorts	-			
			After Test Visual Examination	-	-			
06	Shock or Bump	Para. 9.12	Visual Examination	-	-			
07	Climatic Sequence	Para. 9.13	Initial Measurements Capacitance	Table 2 Item 1	C	Table 2 Item 1		μF
			Final Measurements External Visual Inspection Capacitance Change Tangent of Loss Angle Insulation Resistance	After a recovery period of 24 ± 2 hours Para. 9.3 of ESA/SCC3001 Table 2 Item 1 Table 2 Item 2 Table 2 Item 3	- $\Delta\text{C}/\text{C}$ $\text{tg}\delta$ $\text{Ri} \times \text{C}$	- 10 10 Table 2 Item 2 50 -	% 10^{-4} sec	

NOTES

1. The tests in this Table refer to either Chart IV or V and shall be used as applicable.



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 SPEC.NO. 3001		MEASUREMENTS AND INSPECTIONS		SYMBOL	LIMITS		UNIT
	ENVIRONMENTAL AND ENDURANCE TESTS (1)	TEST METHOD AND CONDITIONS	IDENTIFICATION	CONDITIONS		MIN.	MAX.	
08	Damp Heat, Steady State	Para. 9.14 Half of components with U_R applied, half of components without U_R applied. During 56 days at $40 \pm 2^\circ\text{C}$ and 93 (+2-0)% relative humidity	Initial Measurements Capacitance Final Measurements Visual Examination Capacitance Change Tangent of Loss Angle Insulation Resistance	Table 2 Item 1 After a recovery period of 24 ± 2 hours - Table 2 Item 1 Table 2 Item 2 Table 2 Item 3	C $\Delta C/C$ $\text{tg}\delta$ $R_i \times C$	Table 2 Item 1 - 10 10 Table 2 Item 2 50 -	μF % 10^{-4} sec	
09	Operating Life	Para. 9.15 - Temp. during test: $+125^\circ\text{C}$ - Applied voltage: $2.0U_R$ Change limits relate to initial (0- hour) measurements	Initial Measurements Capacitance Intermediate and Final Measurements Capacitance Change Tangent of Loss Angle Insulation Resistance Voltage Proof	Table 2 Item 1 Table 2 Item 1 After 1000 hrs After 2000 hrs Table 2 Item 2 Table 2 Item 3 After 1000 hrs After 2000 hrs Table 2 Item 4	C $\Delta C/C$ $\text{tg}\delta$ $R_i \times C$ VP	Table 2 Item 1 - 15 15 - 20 20 Table 2 Item 2 250 - 100 - Table 2 Item 4	μF % % 10^{-4} sec sec Vdc	
10	Temperature Characteristic	Para. 9.17	Temperature Characteristic	Table 3 Item 6	$\Delta C/C$	Table 3 Item 6	%	

NOTES

1. The tests in this Table refer to either Chart IV or V and shall be used as applicable.

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APPENDIX 'A'Page 1 of 1**AGREED DEVIATIONS FOR EUROFARAD (F)**

The measurement of Temperature Characteristic in Table 3 may be performed as follows:

No.	Characteristics	Symbol	ESA/SCC 3001 Test Conditions	Limits		Unit
				Min	Max	
6	Temperature Characteristic	$\frac{\Delta C}{C}$	Para. 9.17 For: $U_R = 50V, V_T = 50V$ $U_R = 100V, V_T = 100V$ $U_R = 250V, V_T = 200V$ $U_R = 400V, V_T = 200V$	-30 -30 -35 -30	20 20 20 20	%