RESISTORS, FIXED, SURFACE MOUNT, WIREWOUND

BASED ON TYPE MSP B HR

ESCC Detail Specification No. 4002/009

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ESA/SCC Detail Specification No. 4002/009

space components
coordination group

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1. GENERAL

1.1 SCOPE

This specification details the ratings, physical and electrical characteristics, test and inspection data for Resistors, Fixed, Surface Mount, Wirewound, based on Type MSP HR B. It shall be read in conjunction with ESA/SCC Generic Specification No. 4002, the requirements of which are supplemented herein.

1.2 TYPE VARIANTS AND RANGE OF COMPONENTS

Variants of the basic type resistors and the range of components covered by this specification are 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 resistors specified herein, are as scheduled in Table 1(b).

1.4 PARAMETER DERATING INFORMATION

The applicable derating information for the resistors specified herein is shown in Figure 1.

1.5 PHYSICAL DIMENSIONS

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

1.6 FUNCTIONAL DIAGRAM

The functional diagram for the resistors 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. 4002, Resistors, Fixed, Wirewound.

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:

I_T = Test Current.

R_A = Resistance value measured at $T_{amb} = +22 \pm 3$ °C.

Ri = Insulation Resistance.

TCC = Temperature Characteristic of Resistance.

V_T = Test Voltage.

TABLE 1(a) - TYPE VARIANTS AND RANGE OF COMPONENTS

Variant	Type	Inductive	Non-Inductive	Weight (Max.) (g)
01	MSP 1 B	X	-	0.4
02	MSP 2 B	X	-	1.0
03	MSP 3 B	X	-	1.7
04	MSP 1 B	-	X	0.4
05	MSP 2 B	-	X	1.0
06	MSP 3 B	-	X	1.7

Tolerance (±%)	Inductively Wound Resistance Range (1) Rn (Ω)			Non-Inductively Wound Resistance Range (1) Rn (Ω)		
	Var. 01	Var. 02	Var. 03	Var. 04	Var. 05	Var. 06
0.1	1.0 to 1 000	1.0 to 2 200	1.0 to 4 120	10 to 1 000	10 to 1 000	10 to 1 000
0.5	0.5 to 1 000	0.5 to 2 200	1.0 to 4 120	10 to 1 000	10 to 1 000	10 to 1 000
1.0 2.0 5.0	0.5 to 1 000	0.5 to 2 200	0.1 to 4 120	10 to 1 000	10 to 1 000	10 to 1 000
Temperature Characteristic of Resistance ($\pm 10^{-6}/°C$)	Resistance Value (ohm) (Note 2)					
30	$Rn \geq 10$					
50	$1.0 < Rn < 10$					
100	$0.5 \leq Rn \leq 1.0$					

NOTES

1. The critical value is outside the resistance range.
2. For information only for values less than 5.0Ω.

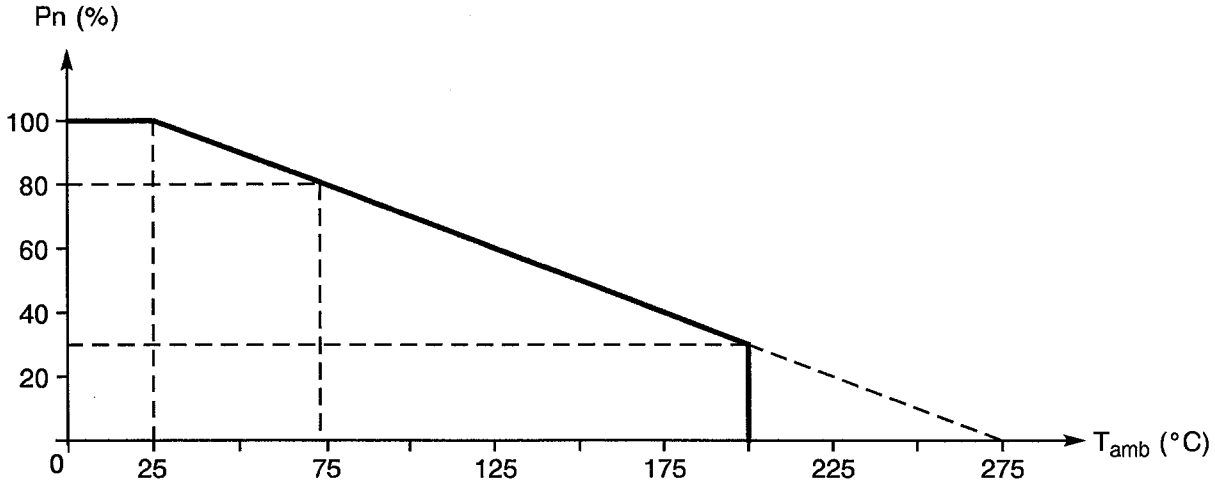
TABLE 1(b) - MAXIMUM RATINGS

No.	Characteristics	Symbol	Maximum Rating			Unit	Remarks
			Var. 01 & 04	Var. 02 & 05	Var. 03 & 06		
1	Rated Dissipation	Pn	1.0	2.0	2.5	W	Note 1
2	Limiting Element Voltage	U_L	50	120	200	V	Critical resistance outside maximum ohmic value
3	Rated Voltage	U_R	$\sqrt{Pn\ Rn}$ or (2) U_L			V	Rn is the rated resistance (Note 3)
4	Operating Temperature Range	T_{op}	−55 to +200			°C	T_{amb}
5	Storage Temperature Range	T_{stg}	−55 to +200			°C	
6	Soldering Temperature	T_{sol}	+235			°C	Note 4
7	Maximum Time Constant (For Non-Inductive Resistors)	L/R	20 7.4			ns	For values <50Ω For values ≥50Ω

NOTES

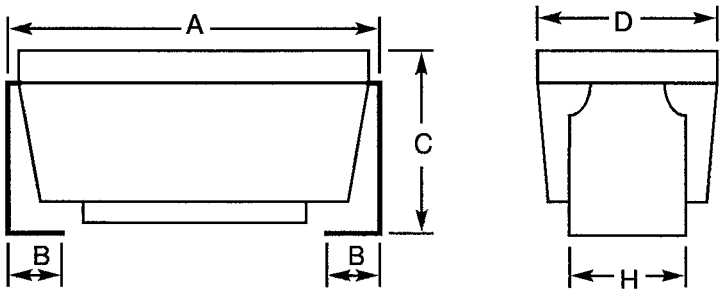
1. At $T_{amb} \leq +25°C$. For derating at $T_{amb} > +25°C$, see Figure 1.
2. Whichever is smaller.
3. Shall never exceed the Limiting Element Voltage.
4. Duration 10 seconds maximum.

FIGURE 1 - PARAMETER DERATING INFORMATION



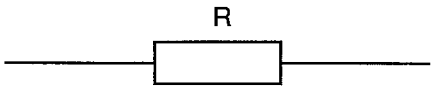
Rated Power versus Temperature

FIGURE 2 - PHYSICAL DIMENSIONS



SYMBOL	VARIANTS 01 AND 04		VARIANTS 02 AND 05		VARIANTS 03 AND 06	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
A	6.45	7.25	11.00	11.80	14.30	15.10
B	1.00	1.80	2.00	2.80	2.00	2.80
C	3.35	4.15	4.65	5.45	6.40	7.20
D	3.35	4.15	6.60	7.40	6.60	7.40
H	1.95	2.75	4.65	5.45	4.65	5.45

FIGURE 3 - FUNCTIONAL DIAGRAM



4. REQUIREMENTS

4.1 GENERAL

The complete requirements for procurement of the resistors specified herein shall be as stated in this specification and ESA/SCC Generic Specification No. 4002. 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. 9.1, Overload: The conditions shall be as follows:-

Voltage: $\sqrt{5PnRn}$ or $2U_L$, whichever is less.

Duration: 5.0 seconds.

If better than 0.1%, use the Figure 1 curve.

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

None.

4.2.4 Deviations from Qualification Tests (Chart IV)

(a) Para. 9.1, Overload: Test Conditions as Para. 4.2.2(a).

(b) Para. 9.10, Robustness of Terminations: Bond Strength of the end face plating: Not applicable.

(c) Para. 9.18, Maximum Time Constant: Not applicable to inductive resistors.

4.2.5 Deviations from Lot Acceptance Tests (Chart V)

(a) Para. 9.10, Robustness of Terminations: Bond Strength of the end face plating: Not applicable.

(b) Para. 9.18, Maximum Time Constant: Not applicable to inductive resistors.

4.3 MECHANICAL REQUIREMENTS

4.3.1 Dimension Check

The dimensions of the resistors specified herein shall be verified in accordance with the requirements set out in Para. 9.4 of ESA/SCC Generic Specification No. 4002 and shall conform to those shown in Figure 2 of this specification.

4.3.2 Weight

The maximum weight of the resistors specified herein shall be as specified in Table 1(a) of this specification.

4.3.3 Robustness of Terminations

The requirements for robustness of termination testing are specified in Para. 9.10.2 of ESA/SCC Generic Specification No. 4002.

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 components 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

Resistor assemblies shall be protected by a coating or enclosure of moisture-resistant insulating material which shall completely cover the outside of the resistor element, including the connections from the wire to the end-cap and the end-cap to the terminations. The coating shall not crack, craze, drip, run or form globules at any temperature up to and including +200°C, regardless of the mounting position of the resistor.

The protective coating or enclosure shall be such that it minimises the establishment of leakage paths between the terminals resulting from collection of moisture film on the outside surface of the resistor.

4.4.2 Terminations

The termination material shall be nickel/copper/zinc alloy, nickel plated with tin-lead plated finish (minimum 10% lead).

4.4.3 Wire

Each resistor shall be wound with a conductor having no joints, welds or bands within each terminated resistance element. In no case shall the nominal diameter be less than 20µm.

4.5 MARKING

4.5.1 General

The marking of all components delivered to this specification shall be in accordance with 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:-

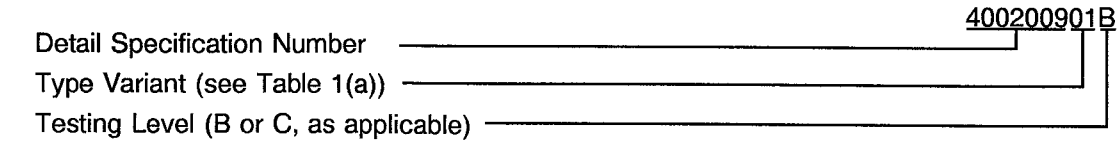
(a) The SCC Component Number.

(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:



4.5.3 Electrical Characteristics and Ratings

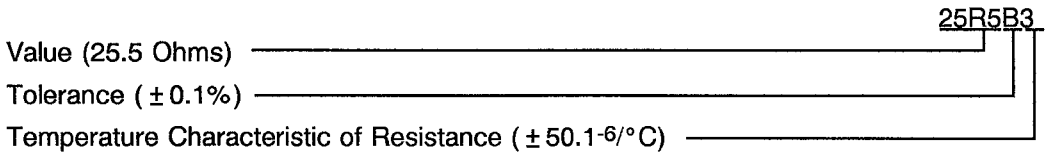
The electrical characteristics and ratings to be marked in the following order of precedence are:-

(a) Resistance Value.

(b) Tolerance.

(c) Temperature Characteristic of Resistance.

The information shall be constituted and marked as follows:



4.5.3.1 Resistance Values

Resistance values shall be expressed by means of the following codes. The unit quantity for marking shall be ohms (Ω).

Resistance Value	Code
0.XXX	RXXX
X.XX	XRXX
XX.X	XXRX
XXX	XXX0
XXX 10^1	XXX1

For values of 100Ω and above, the first 3 digits (X) represent significant figures and the last digit specifies the number of zeros to follow.

When values of less than 100Ω are required, the letter 'R' is used to indicate the decimal point. When the letter is used, all successive digits represent significant figures.

4.5.3.2 Tolerance

The tolerance on resistance values shall be indicated by the letter codes specified hereafter.

Tolerance (±%)	Code Letter
0.1	B
0.5	D
1.0	F
2.0	G
5.0	J

4.5.3.3 Temperature Characteristic of Resistance

The temperature characteristic of resistance shall be indicated by the numerical codes specified hereafter.

Digit	Temperature Characteristic of Resistance (±10-6/°C)
9	30
3	50
4	100

4.5.4 Traceability Information

Traceability information shall be marked 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 stated, 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 on a sample basis at high and low temperatures are scheduled in Table 3.

The distribution of the sample shall be as follows:

- 1/3 with the lowest resistance value.
- 1/3 with the highest resistance value.
- 1/3 with the median resistance value.

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 parameters scheduled, shall not be exceeded. In addition to these drift value requirements, the appropriate limit value specified in Table 2 for a given parameter 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. 4002. The conditions for burn-in shall be as specified in Table 5 of this specification.

After 168(+24 − 0) hours, the resistors shall be removed from the chamber and allowed to cool under normal atmospheric conditions for a minimum of 4 hours.

4.7.3 Electrical Circuits for Burn-in

Alternative circuits for use in performing the burn-in tests are shown in Figures 5(a) and 5(b) of this specification.

TABLE 2 - ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE

No.	Characteristics	Symbol	ESA/SCC 4002 Test Method	Test Conditions	Tolerance (±%)	Limits		Unit
						Min.	Max.	
1	Resistance	R_A	Para. 9.5.1.1	Para. 9.5.1.1	0.1	0.999 Rn	1.001 Rn	Ω
					0.5	0.995 Rn	1.005 Rn	
					1.0	0.990 Rn	1.010 Rn	
					2.0	0.980 Rn	1.020 Rn	
					5.0	0.950 Rn	1.050 Rn	
2	Insulation Resistance	Ri	Para. 9.5.1.2	Para. 9.5.1.2.2 (Note 1)	All	1 000	-	MΩ
3	Voltage Proof	VP	Para. 9.5.1.3	Para. 9.5.1.3.2 (Note 1)	All	500	-	Vrms

NOTES

1. The measurements shall be performed on a sample basis in accordance with General Inpection Level II, Table IIA, AQL = 0.65% of IEC Publication No. 410 on the total production lot.

TABLE 3 - ELECTRICAL MEASUREMENTS AT HIGH AND LOW TEMPERATURES

No.	Characteristics	Symbol	ESA/SCC 4002 Test Method	Test Conditions (Note 1)	Resistance Range	Limits		Unit
						Min.	Max.	
4	Resistance Change between −55(+3−0) °C and +22±3 °C	$\frac{\Delta R}{R}$	Para. 9.5.1.1	Para. 9.5.1.1	Rn ≤ 1.0	−0.8	+0.8	%
					1.0 < Rn < 10	−0.4	+0.4	
					Rn ≥ 10	−0.25	+0.25	
5	Resistance Change between +200±3 °C and +22±3 °C	$\frac{\Delta R}{R}$	Para. 9.5.1.1	Para. 9.5.1.1	Rn ≤ 1.0	−1.5	+1.5	%
					1.0 < Rn < 10	−0.75	+0.75	
					Rn ≥ 10	−0.45	+0.45	

NOTES

1. The measurements shall be performed on a sample basis in accordance with General Inpection Level II, Table IIA, AQL = 0.65% of IEC Publication No. 410 on the total production lot. In addition, see Para. 4.6.2 for distribution of the sample.

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	Resistance Change	$\frac{\Delta R_A}{R_A}$	As per Table 2	As per Table 2	0.2 (1)	%

NOTES

1. Or $\Delta R_A = 0.05\Omega$, whichever is greater.

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

No.	Characteristics	Symbol	Condition	Unit
1	Ambient Temperature	T_{amb}	$+25 \pm 3$	°C
2	Test Voltage or Test Current	V_T or I_T	Note 1 to Figure 5	V or I

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

FIGURE 5(a) - PARALLEL CIRCUIT

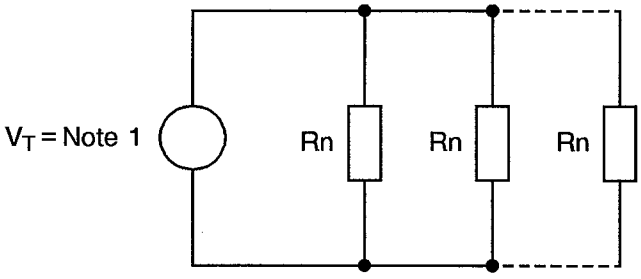
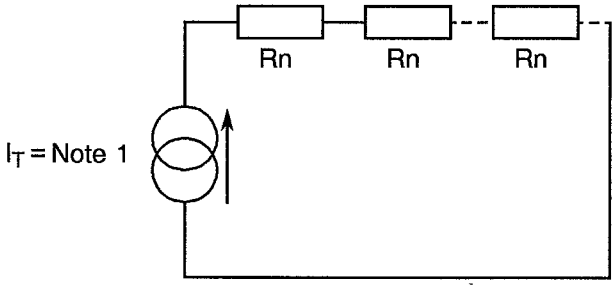


FIGURE 5(b) - SERIES CIRCUIT



NOTES

1. $V_T = U_L$ or $\sqrt{0.6\ PnRn}$

$I_T = \frac{U_L}{Rn}$ or $\sqrt{\frac{Pn \times 0.6}{Rn}}$

Whichever is smaller, with the Pn value according to tolerance (see Table 1(a)).

4.8 ENVIRONMENTAL AND ENDURANCE TESTS (CHARTS IV AND V OF ESA/SCC GENERIC SPECIFICATION No. 4002)

4.8.1 General

The resistors shall be mounted as described in ESA/SCC Generic Specification No. 4002, Para. 9.20. The substrate material shall be Alumina.

4.8.2 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.

4.8.3 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 as scheduled in Table 6 of this specification. Unless otherwise stated, the measurements shall be performed at $T_{amb} = +22 \pm 3$ °C.

4.8.4 Measurements and Inspections on Completion of Endurance Tests

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

4.8.5 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. 4002. The conditions for operating life testing shall be as specified in Table 5 of this specification.

4.8.6 Electrical Circuits for Operating Life Tests

Circuits for use in performing the operating life tests are shown in Figure 5 of this specification.

4.8.7 Conditions for High Temperature Storage Test (Part of Endurance Testing)

The requirements for the high temperature storage test are specified in Section 9 of ESA/SCC Generic Specification No. 4002. The conditions for high temperature storage shall be $T_{amb} = +200(+0-5)$ °C.

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. 4002		MEASUREMENTS AND INSPECTIONS		SYMBOL	LIMITS		UNIT
	ENVIRONMENTAL AND ENDURANCE TESTS (1)	TEST METHOD AND CONDITIONS	IDENTIFICATION	CONDITIONS		MIN.	MAX.	
01	Overload	Para. 9.1 and Paras. 4.2.2 and 4.2.4 of this spec.	**Initial Measurements** Chart IV Resistance **Final Measurements** Visual Examination Chart II Resistance Chart IV Resistance Change	 Table 2 Item 1 After a recovery period of 1to 2 hrs No evidence of damage and marking legible Table 2 Item 1 Table 2 Item 1	 R_A - R_A $\Delta R_A/R_A$	 Record Values - Table 2 Item 1 $\pm(0.25+\frac{0.05}{Rn}\times 100)$	 - 	 - %
02	Permanence of Marking	Para. 9.6	**Final Measurements** Visual Examination	 No corrosion or obliteration of marking	 -	 -	 -	 -
03	Temperature Characteristic of Resistance	Para. 9.7 Procedure II	**During Test** Temperature Characteristic of Resistance	 Para. 9.7.3 of ESA/SCC No. 4002	 TCC	 Table 1(a)		 10^{-6}/°C
04	Voltage Proof (Altitude)	Para. 9.8	**During Test** Visual Examination	100Vrms for 5.0 seconds No breakdown or flashover	 -	 -	 -	 -
05	Solderability	Para. 9.9 Procedure II	**Final Measurements** Visual Examination	After Drying No evidence of damage and marking legible	 -	 -	 -	 -
06	Robustness of Terminations	Para 9.10 Adhesion Paras. 4.2.4 and 4.2.5 of this spec. Bond Strength of End Face Plating	Mounting **Initial Measurements** Resistance **Final Measurements** Resistance Change Visual Examination Not applicable	Para. 9.20 of ESA/SCC No. 4002 Table 2 Item 1 Table 2 Item 1 No evidence of damage, cracking, lifting or dry solder joints	 R_A $\Delta R_A/R_A$ -	 Record Values $\pm(0.25+\frac{0.05}{Rn}\times 100)$ -	 - 	 % -
07	Resistance to Soldering Heat	Para. 9.11 Procedure I	 **Initial Measurements** Resistance **Final Measurements** Visual Examination Resistance Change	After Drying Table 2 Item 1 After 24 ± 4 hours recovery No evidence of damage and marking legible Table 2 Item 1	 R_A - $\Delta R_A/R_A$	 Record Values - $\pm(0.25+\frac{0.01}{Rn}\times 100)$	 - 	 - %

NOTES: See Page 18.

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. 4002		MEASUREMENTS AND INSPECTIONS		SYMBOL	LIMITS		UNIT
	ENVIRONMENTAL AND ENDURANCE TESTS (1)	TEST METHOD AND CONDITIONS	IDENTIFICATION	CONDITIONS		MIN.	MAX.	
08	Rapid Change of Temperature	Para. 9.12 and Table 1(b) of this spec.	**Initial Measurements** Resistance **Final Measurements** Visual Examination Resistance Change	 Table 2 Item 1 After 1 to 2 hrs recovery No evidence of damage Table 2 Item 1	 R_A - $\Delta R_A/R_A$	 Record Values - $\pm(0.25+\frac{0.05}{Rn}\times 100)$	 - 	 - %
09	Vibration	Para. 9.13	**Initial Measurements** Resistance **During Test** Electrical Discontinuity **Final Measurements** Visual Examination Resistance Change	 Table 2 Item 1 $\leq$0.1 msec. No evidence of damage Table 2 Item 1	 R_A - $\Delta R_A/R_A$	 Record Values - $\pm(0.25+\frac{0.05}{Rn}\times 100)$	 - 	 - %
10	Climatic Sequence	Para. 9.14 Procedure I	**Initial Measurements** Resistance **Final Measurements** Visual Examination Resistance Change Insulation Resistance	After Drying Table 2 Item 1 After 1 to 2 hrs recovery No evidence of damage and marking legible Table 2 Item 1 Table 2 Item 2	 R_A $\Delta R_A/R_A$ Ri	 Record Values $\pm(1.0+\frac{0.05}{Rn}\times 100)$ 100	 -	 % MΩ
11	Operating Life	Para. 9.15 Chart IV	**Initial Measurements** Resistance **Intermediate Measurements** (1000 ± 48 hrs) Resistance Change **Final Measurements** (2000 ± 48 hrs) Resistance Change Visual Examination	 Table 2 Item 1 After 1 to 2 hrs recovery Table 2 Item 1 After 1 to 2 hrs recovery Table 2 Item 1 No evidence of damage	 R_A $\Delta R_A/R_A$ $\Delta R_A/R_A$ -	 Record Values $\pm(0.35+\frac{0.05}{Rn}\times 100)$ $\pm(0.5+\frac{0.05}{Rn}\times 100)$ -	 -	 % % -
		Para. 9.15 Chart V	**Initial Measurements** Resistance **Final Measurements** (1000 ± 48 hrs) Resistance Change Visual Examination	 Table 2 Item 1 After 1 to 2 hrs recovery Table 2 Item 1 No evidence of damage	 R_A $\Delta R_A/R_A$ -	 Record Values $\pm(0.35+\frac{0.05}{Rn}\times 100)$ -	 -	 % -

NOTES: See Page 18.

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. 4002		MEASUREMENTS AND INSPECTIONS		SYMBOL	LIMITS		UNIT
	ENVIRONMENTAL AND ENDURANCE TESTS (1)	TEST METHOD AND CONDITIONS	IDENTIFICATION	CONDITIONS		MIN.	MAX.	
12	High Temperature Storage	Para. 9.16	**Initial Measurements** Resistance **Intermediate Measurements** (1000 ± 48 hrs) Resistance Change **Final Measurements** (2000 ± 48 hrs) Resistance Change	 Table 2 Item 1 Table 2 Item 1 Table 2 Item 1	 R_A $\Delta R_A/R_A$ $\Delta R_A/R_A$	 Record Values $\pm(1.0+\frac{0.05}{Rn}\times 100)$ $\pm(1.0+\frac{0.05}{Rn}\times 100)$		 % %
13	External Visual Inspection	Para. 9.17	Visual Inspection	ESA/SCC No. 20500	-	-	-	-
14	Maximum Time Constant (Not applicable to inductive resistors)	Para. 9.18 and Paras. 4.2.4 and 4.2.5 of this spec.	Time Constant	Para. 9.18 of ESA/SCC No. 4002	L/R	Table 1(b)		ns

NOTES

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

APPENDIX 'A'

AGREED DEVIATIONS FOR VISHAY - SFERNICE (F)

ITEMS AFFECTED	DESCRIPTION OF DEVIATIONS
Para. 4.2.1	(a) Para. 9.1, Overload: May be performed 100%. (b) Para. 9.2, Third Harmonic Control or Current Noise: May be performed 100%.
Para. 4.2.2	If the tests specified for Para. 4.2.1 above are performed, the same tests may be performed on a sample basis with Level II AQL = 1.5%. If there is 1 failure, 100% testing shall be performed.
Para. 4.2.3	(a) Para. 9.5.3, Electrical Measurements at High and Low Temperatures: May be omitted for Level 'C'