RF COAXIAL CONNECTORS, TYPE SSMA, (FEMALE CONTACT)

ESCC Detail Specification No. 3402/005

Issue 3	March 2018

Document Custodian: European Space Agency – see https://escies.org

LEGAL DISCLAIMER AND COPYRIGHT

European Space Agency, Copyright © 2018. All rights reserved.

The European Space Agency disclaims any liability or responsibility, to any person or entity, with respect to any loss or damage caused, or alleged to be caused, directly or indirectly by the use and application of this ESCC publication.

This publication, without the prior permission of the European Space Agency and provided that it is not used for a commercial purpose, may be:

- copied in whole, in any medium, without alteration or modification.
- copied in part, in any medium, provided that the ESCC document identification, comprising the ESCC symbol, document number and document issue, is removed.

DOCUMENTATION CHANGE NOTICE

(Refer to https://escies.org for ESCC DCR content)

DCR No.	CHANGE DESCRIPTION
1100	Specification upissued to incorporate changes per DCR.

TABLE OF CONTENTS

1	GENERAL	6
1.1	SCOPE	6
1.2	TYPE VARIANTS	6
1.3	MAXIMUM RATINGS	6
1.4	PARAMETER DERATING INFORMATION (FIGURE 1)	6
1.5	PHYSICAL DIMENSIONS	6
1.6	STANDARD TEST CONNECTOR INTERFACE	6
2	APPLICABLE DOCUMENTS	12
3	TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS	12
4	REQUIREMENTS	12
4.1	GENERAL	12
4.2	DEVIATIONS FROM GENERIC SPECIFICATION	12
4.2.1	Deviations from Special In-process Controls	12
4.2.2	Deviations from Final Production Tests (Chart II)	12
4.2.3	Deviations from Burn-in and Electrical Measurements (Chart III)	12
4.2.4	Deviations from Qualification Tests (Chart IV)	12
4.2.5	Deviations from Lot Acceptance Tests (Chart V)	12
4.3	MECHANICAL REQUIREMENTS	12
4.3.1	Dimension Check	12
4.3.2	Weight	13
4.3.3	Coupling Proof Torque	13
4.3.4	Cable Retention Force	13
4.3.4.1	Flexible Cables	13
4.3.4.2	Semi-rigid Cables	13
4.3.5	Mating and Unmating Forces	13
4.3.6	Endurance	13
4.3.7	Residual Magnetism	13
4.3.7.1	Beryllium copper, copper underplate, gold-plated connectors	13
4.3.7.2	Beryllium copper, nickel underplate, gold-plated connectors	13
4.3.7.3	Stainless steel connectors	13
4.3.8	Contact Engagement and Separation Forces	14
4.3.9	Contact Retention	14
4.4	MATERIALS AND FINISHES	14
4.4.1	Gold Plated Versions	14
4.4.1.1	Normal Types	14
4.4.1.2	Hermetic Types	15
4.4.2	Stainless Steel Versions	15

4.5	MARKING	16
4.5.1	General	16
4.5.2	The ESCC Component Number	16
4.5.3	Characteristics	16
4.5.3.1	Type of Plating/Material	16
4.5.3.2	Subvariants	16
4.5.4	Traceability Information	16
4.6	ELECTRICAL MEASUREMENTS	17
4.6.1	Electrical Measurements at Room Temperature	17
4.6.2	Electrical Measurements at High and Low Temperatures (Table 3)	17
4.6.3	Circuits for Electrical Measurements	17
4.7	BURN-IN TESTS (TABLES 4 AND 5)	17
4.8	ENVIRONMENTAL AND ENDURANCE TESTS (CHARTS IV AND V OF ESCC GENERIC SPECIFICATION NO. 3402)	18
4.8.1	Measurements and Inspections on Completion of Environmental Tests	18
4.8.2	Measurements and Inspections at Intermediate Points during Endurance Tests	18
4.8.3	Measurements and Inspections on Completion of Endurance Tests	18
4.8.4	Conditions for Operating Life Tests (Part of Endurance Testing)	18
4.8.5	Electrical Circuits for Operating Life Tests	18
4.8.6	Conditions for High Temperature Storage Test (Part of Endurance Testing)	18

1 GENERAL

1.1 SCOPE

This specification details the ratings, physical and electrical characteristics, test and inspection data for RF Coaxial Connectors, Type SSMA (Female Contact). It shall be read in conjunction with ESCC Generic Specification No. 3402, the requirements of which are supplemented herein.

1.2 TYPE VARIANTS

A list of the type variants of the connectors specified herein, which are also covered by this specification, is given in Table 1(a).

For each type variant, the full electrical and physical characteristics are given in individual Figures 2(b) at the end of this specification.

1.3 MAXIMUM RATINGS

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

1.4 PARAMETER DERATING INFORMATION (FIGURE 1)

The derating information applicable to the connectors specified herein is shown in Figure 1

1.5 PHYSICAL DIMENSIONS

The physical dimensions of the connectors specified herein are shown in Figures 2(a) and 2(b).

1.6 STANDARD TEST CONNECTOR INTERFACE

Whenever gauges are required for mating with the connectors under test, their physical dimensions shall be in accordance with those specified in Figure 3.

TABLE 1(a) – TYPE VARIANTS

Variant	Description
01	Straight Jack, Solder Type, for Semi-Rigid Cable Ø 2.2mm (0.085”)
06	Straight Jack, Crimp Type
09	Straight Jack, Solder Type, Flange-Mounted, for Semi-Rigid Cable Ø2.2mm (0.085”)
15	Square Flange Receptacle, Front Mounting
17	2-Hole Flange Receptacle, Front Mounting
27	Elbow Receptacle, Square Flange
29	Square Flange Receptacle
30	2-Hole Flange Receptacle
31	Square Flange Receptacle
58	Bulkhead Receptacle
59	Bulkhead Receptacle for Semi-Rigid Cable Ø2.2mm (0.085”)
60	Hermetic Receptacle, Solder Type

NOTES
1. The Variants are described in Figure 2(b).
2. For finishes, see Para. 4.4.

TABLE 1(b) - MAXIMUM RATINGS

No.	Characteristics	Symbol	Maximum Ratings	Unit	Remarks
1	Peak Power at +25°C	Pmax	1	kW	1µs max
2	Power	P	0.8	kW	See Figures 1(a) and 1(b)
3	Nominal Impedance	Z	50	Ω	-
4	Frequency Range	f	See Figure 2(b)	GHz	-
5	Voltage Rating	U_R	See Figure 2(b) (Voltage Proof)	Vrms	See Figure 1(c)
6	Operating Temperature Range	T_{op}	See Figure 2(b)	°C	-
7	Storage Temperature Range	T_{stg}	As per Operating Temperature Range	°C	-

FIGURE 1 - PARAMETER DERATING INFORMATION

FIGURE 1(a) - POWER VERSUS TEMPERATURE

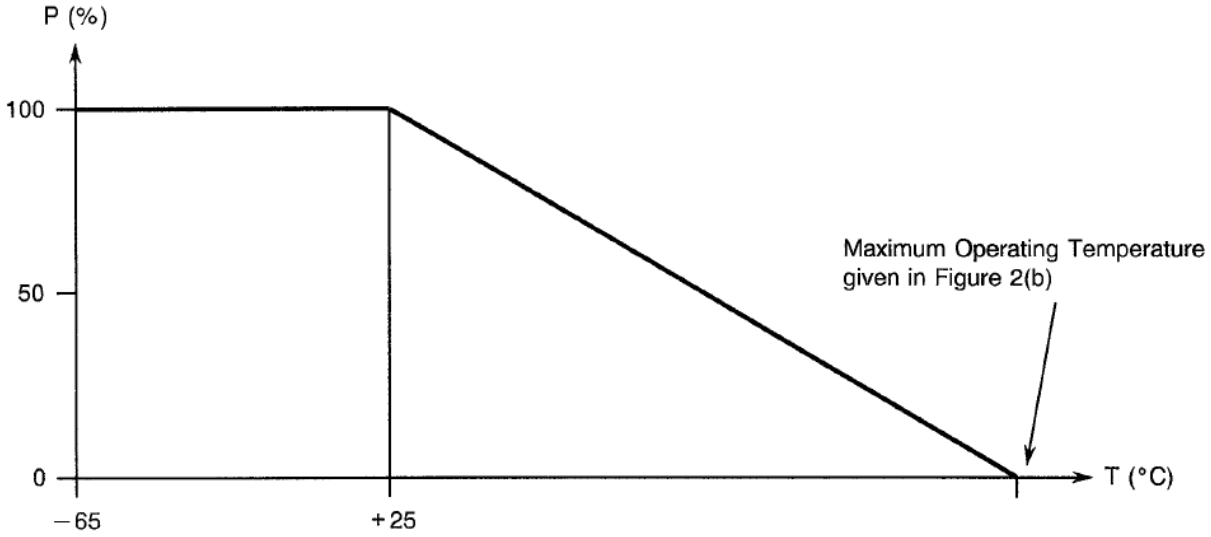
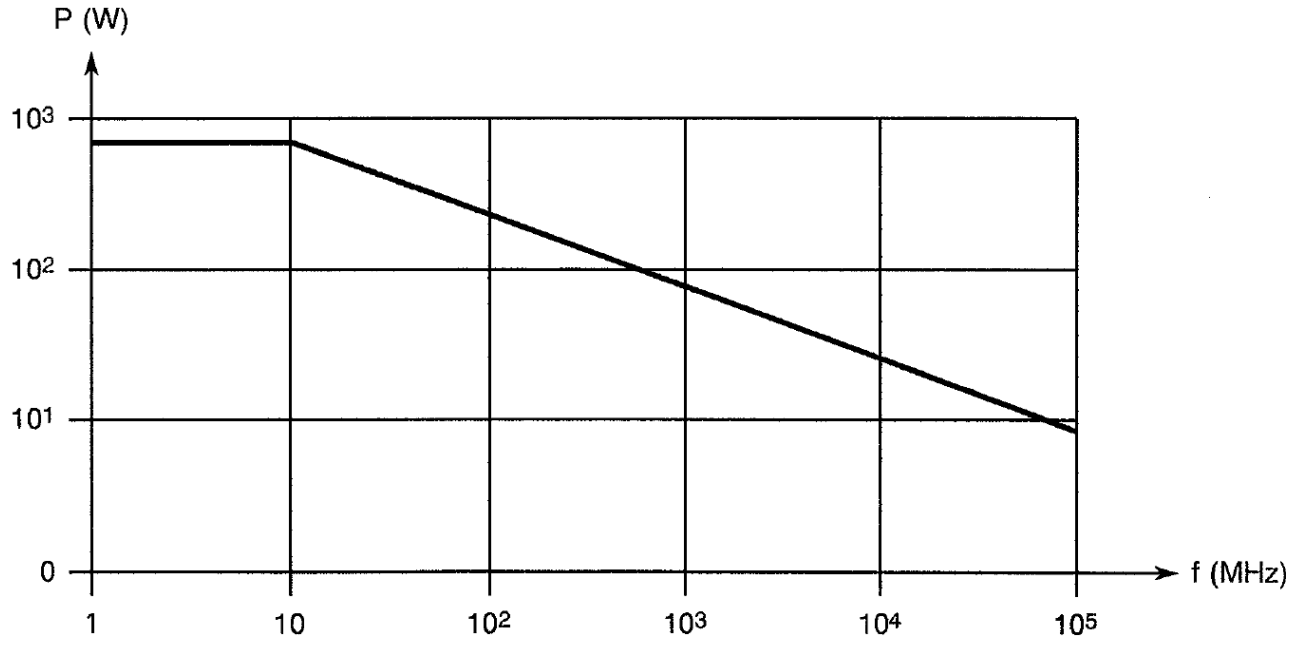


FIGURE 1(b) - POWER VERSUS FREQUENCY



POWER (VSWR in line 1) at T_{amb} = +40°C.

FIGURE 1 – PARAMETER DERATING INFORMATION (CONTINUED)

FIGURE 1(c) – VOLTAGE DERATING AT LOW AIR PRESSURE

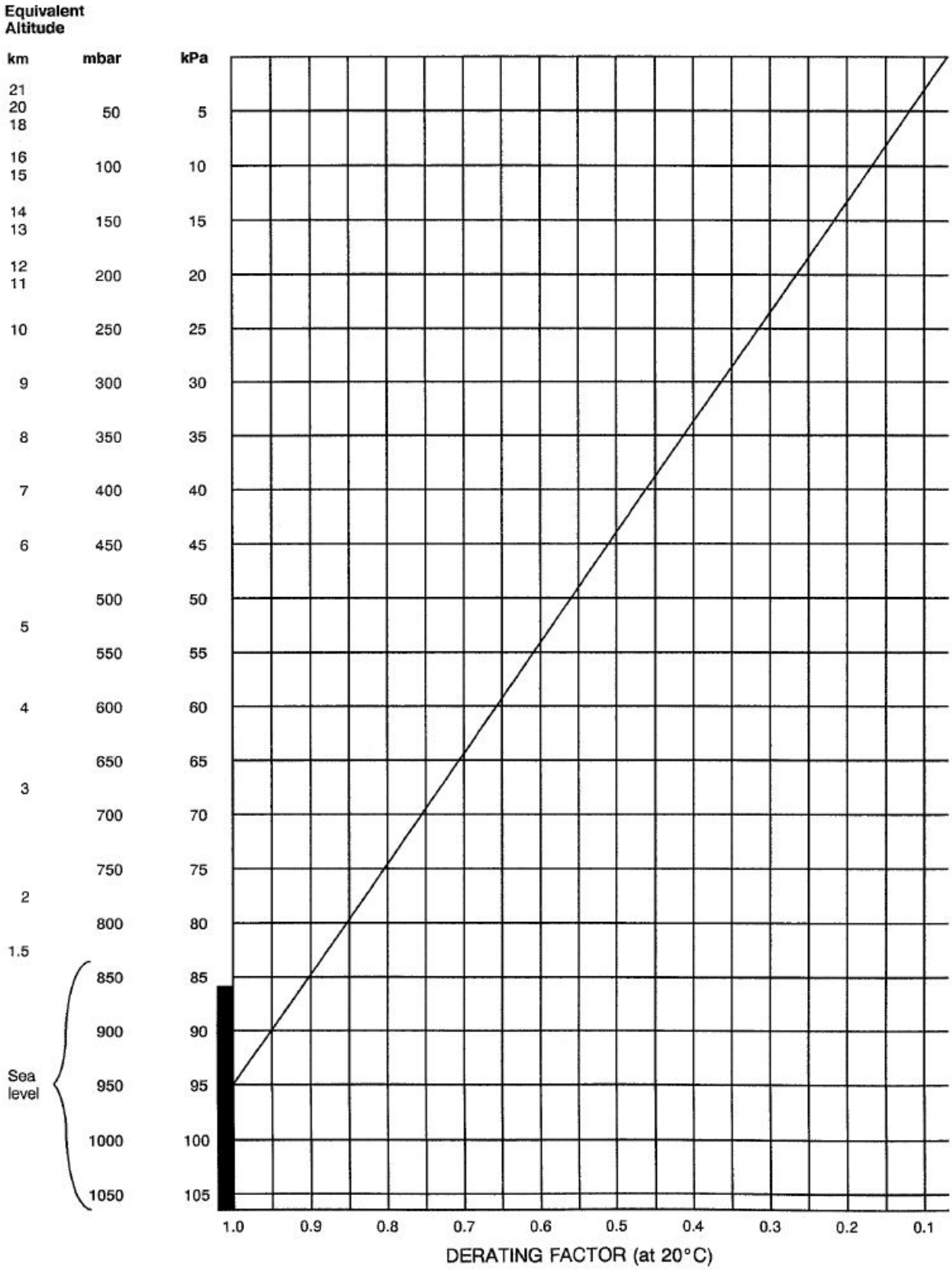
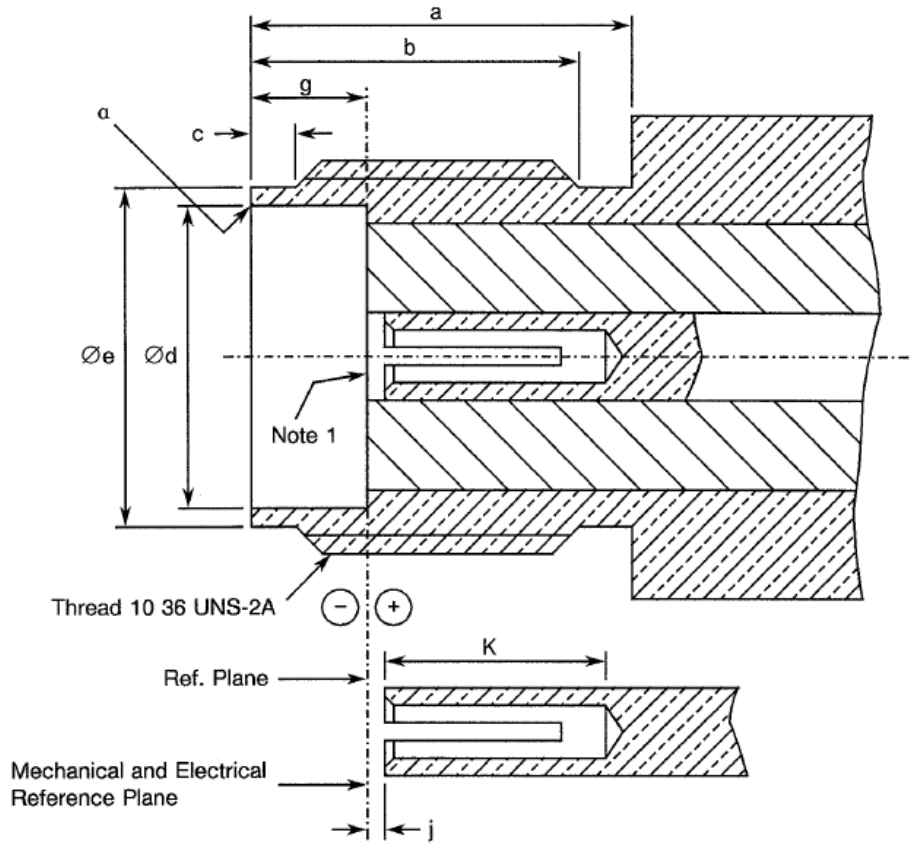


FIGURE 2 - PHYSICAL DIMENSIONS

FIGURE 2(a) - CONNECTOR INTERFACE, FEMALE CONTACT

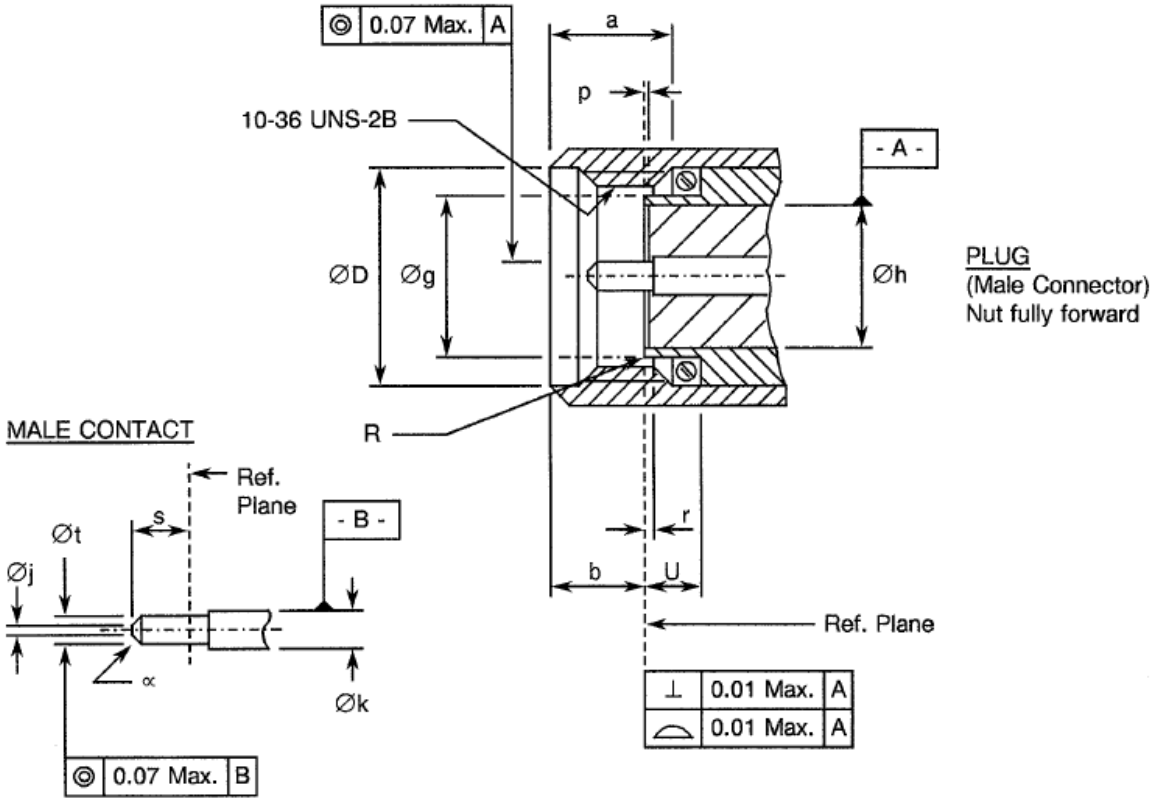


Symbol	Millimetres		Notes
	Min.	Max.	
a	3.56	-	
b	4.32	-	
c	0.38	1.14	
Ød	3.23	3.3	
Øe	3.89	4.06	
g	1.88	1.98	
j	0	0.41	
K	2.92	-	
α	-	0.13	45º Chamfer, no sharp edge

NOTES

1. Face position relative to reference plane shall be within the limits of +0 to -0.18mm.

FIGURE 3 - STANDARD TEST CONNECTOR INTERFACE, MALE CONTACT



Symbol	Millimetres		Notes
	Min	Max	
a	2.54	4.32	
b	2.59	3.35	
ØD	5.05	5.21	
Øg	3.17	3.22	
Øh	2.79 NOM.		
Øj	-	0.25	Flat
Øk		-	Note 1
p	0	0.05	Insert recess
r	0	0.076	Contact recessed
R	-	0.08	Radius or chamfer
s	1.4	1.65	
Øt	0.498	0.518	
U	2.03	-	
α	-	-	45 ±3° Chamfer

NOTES

1. Choose to give required performance.

2 APPLICABLE DOCUMENTS

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

(a) ESCC Generic Specification No. 3402 for RF Coaxial Connectors.
(b) MIL-G-45204, Gold Plating, Electrodeposited.
(c) MIL-C-17/133, Cables, Radio Frequency, Coaxial, 0.0865 inch (2.2mm) Diameter, Semirigid, 50 Ohms.

3 TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS

For the purpose of this specification, the terms, definitions, abbreviations, symbols and units specified in ESCC Basic Specification No. 21300 shall apply.

4 REQUIREMENTS

4.1 GENERAL

The complete requirements for procurement of the connectors specified herein are stated in this specification and ESCC Generic Specification No. 3402. 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 ESCC 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, Coupling Proof Torque: shall not be performed on connectors with a female contact (only during Chart II).

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

(a) Chart III is not applicable.

4.2.4 Deviations from Qualification Tests (Chart IV)

None

4.2.5 Deviations from Lot Acceptance Tests (Chart V)

None.

4.3 MECHANICAL REQUIREMENTS

4.3.1 Dimension Check

The dimensions of the connectors specified herein shall be verified in accordance with the requirements set out in Para. 9.25 of ESCC Generic Specification No. 3402 and shall conform to those shown in Figures 2(a) and 2(b) of this specification.

4.3.2 Weight
The maximum weight of the connectors specified herein shall be as specified in Figure 2(b).

4.3.3 Coupling Proof Torque
The requirements for testing of the coupling proof torque are specified in Section 9 of ESCC Generic Specification No. 3402. The applied torque shall be 110N.cm.

4.3.4 Cable Retention Force
The requirements for testing of the cable retention force are specified in Section 9 of ESCC Generic Specification No. 3402. Figure 2(b) specifies the values for axial loads. Torque shall be applied as follows:

4.3.4.1 Flexible Cables
Flexible cables shall be rotated 180° in both directions.
Rotational movement shall be applied at 15cm from the connector.

4.3.4.2 Semi-rigid Cables
The torque value shall be as follows:

M17/133-RG 405/U (MIL-C-17/133): 11.28N.cm.

4.3.5 Mating and Unmating Forces
The applicable measurement requirements are specified in Section 9 of ESCC Generic Specification No. 3402. The maximum torque during mating and unmating shall not exceed 12N.cm.

Whenever a test is performed on mated pairs of connectors, the pairs shall be torqued at 60-80N.cm.

4.3.6 Endurance
The applicable test requirements are specified in Section 9 of ESCC Generic Specification No. 3402. The test conditions shall be as follows:

(a) Number of cycles: 500 for qualification; 100 for lot acceptance.
(b) Rate: 12 cycles maximum/minute.

4.3.7 Residual Magnetism
The applicable measurement requirements are specified in Section 9 of ESCC Generic Specification No. 3402.

4.3.7.1 Beryllium copper, copper underplate, gold-plated connectors
The maximum allowable value shall not exceed 20 gammas.

4.3.7.2 Beryllium copper, nickel underplate, gold-plated connectors
There are no requirements in respect of residual magnetism. This version is made such that the residual magnetism does not exceed 2000 gammas.

4.3.7.3 Stainless steel connectors
Residual magnetism is not applicable to stainless steel versions.

4.3.8 Contact Engagement and Separation Forces

The requirements for these measurements are specified in Section 9 of ESCC Generic Specification No. 3402 and apply to female contacts only.

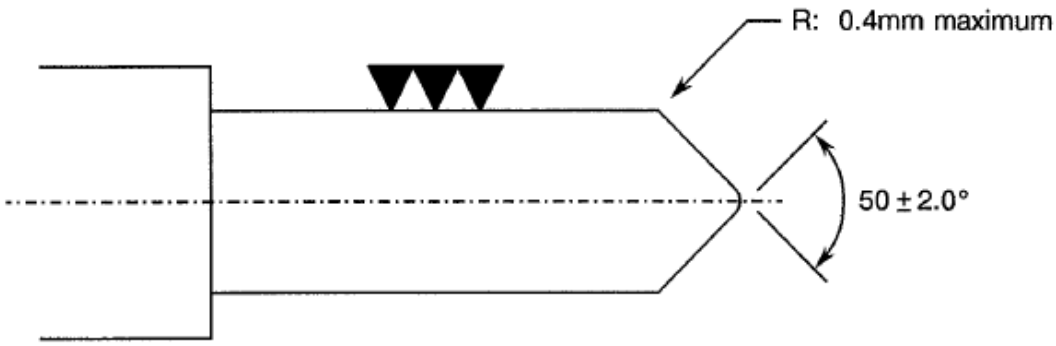
(a) Oversize Pin

Steel test pin diameter	:	0.528/0.583 mm.
Insertion depth	:	1.35 mm max.
Number of insertions	:	3

(b) Withdrawal Force Test (Minimum Diameter Test Pin)

Steel test pin diameter	:	0.492/0.495 mm.
Insertion depth	:	1.25 mm max.
Number of insertions	:	25g min.

FIGURE 4 – TEST PIN CONFIGURATION



4.3.9 Contact Retention

The requirements for this test are specified in Section 9 of ESCC Generic Specification No. 3402. The test conditions are given in Figure 2(b). After testing, the connector interface dimensions shall be within the limits of Figure 2(a).

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 connectors 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 Gold Plated Versions

4.4.1.1 Normal Types

(a) Shell, Coupling Nut, Centre Contact

Material	:	Beryllium copper.
Underplate	:	Nickel, 2µm minimum, or copper, 2.5µm minimum.
Plating	:	Gold, 2.5µm minimum, Class 2, Type 2 of MIL-G-45204.

(b) Inserts

Material	:	PTFE.
Baking conditions	:	10 cycles (-10, +55 °C). 1 cycle = 15 minutes minimum at each temperature with 5 minutes maximum transfer time.

(c) Gaskets
Material : Silicone rubber.

(d) Accessories (ferrule, crimping sleeve and nut)
Material : Brass.
Underplate : Nickel, 2µm minimum, or copper, 2.5µm minimum.
Plating : Gold, 2.5µm minimum, Class 2, Type 2 of MIL-G-45204.

4.4.1.2 Hermetic Types

(a) Shell
Material : FN 42.
Underplate : Nickel, 2µm minimum.
Plating : Gold, 2.5µm minimum, Class 2, Type 2 of MIL-G-45204.

(b) Insert
Material : Glass, Sovirel 747-01.

(c) Centre Contact
Material : Steel, Silver P.
Underplate : Nickel, 2µm minimum.
Plating : Gold, 2.5µm minimum, Class 2, Type 2 of MIL-G-45204.

4.4.2 Stainless Steel Versions

(a) Shell, Coupling Nut
Material : Amagnetic stainless steel, electro-passivated.
For solder-type connectors: rear part of shell shall be protected by an adequate coating for solderability.

(b) Centre Contact
Material : Beryllium copper.
Underplate : Nickel, 2µm minimum.
Plating : Gold, 2.5µm minimum, Class 2, Type 2 of MIL-G-45204.

(c) Inserts
Material : PTFE.
Baking conditions : 10 cycles (-10, +55 °C). 1 cycle = 15 minutes minimum at each temperature with 5 minutes maximum transfer time.

(d) Gaskets
Material : Silicone.

(e) Accessories
- Crimping elements:
  Material : Brass.
  Underplate : Nickel, 2µm minimum.
  Plating : Adequate for good solderability.
- Nut:
  Material : Amagnetic stainless steel, electro-passivated.
- Washers:
  Material : Beryllium copper.
  Plating : Nickel, 2µm minimum

4.5 MARKING

4.5.1 General

The marking of components delivered to this specification shall be in accordance with the requirements of ESCC 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 ESCC Component Number.
(b) Electrical Characteristics and Ratings.
(c) Traceability Information.

4.5.2 The ESCC Component Number

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

Example: 340200529B

- Detail Specification Number: 3402005
- Type Variant (see Table 1(a)): 29
- Testing Level (B or C, as applicable): B

4.5.3 Characteristics

Each component shall be marked in respect of:

(a) Type of plating/material.
(b) Subvariant.

The information shall be constituted and marked as follows:

Example: 102

- Plating/Material Type: 1
- Subvariant: 02

4.5.3.1 Type of Plating/Material

The type of plating/material shall be identified by means of the following codes:

Code	Type of Plating/Material	Para.
1	Gold plate, copper underplate	4.4.1
2	Gold plate, nickel underplate	4.4.1
3	Amagnetic stainless steel	4.4.2

For hermetic types (see Para. 4.4.1.2), only plating code 2 is available.

4.5.3.2 Subvariants

Subvariants are identified by 2 digits and are specified where applicable in Figure 2(b). When no subvariant is shown, the 2 digits shall be '01'.

4.5.4 Traceability Information

Each component shall be marked in respect of traceability information in accordance with the requirements of ESCC Basic Specification No. 21700.

4.6 ELECTRICAL MEASUREMENTS

4.6.1 Electrical Measurements at Room Temperature

The parameters to be measured in respect of electrical characteristics are scheduled in Table 2. Unless otherwise specified, the measurements shall be performed at T_{amb} = +22 ±3°C.

4.6.2 Electrical Measurements at High and Low Temperatures (Table 3)

Not applicable.

4.6.3 Circuits for Electrical Measurements

Not applicable.

4.7 BURN-IN TESTS (TABLES 4 AND 5)

Not applicable.

TABLE 2 - ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE

No.	Characteristics	Symbol	Spec. and/or test Method	Test Conditions	Limits		Unit
					Min.	Max.	
1	Insulation Resistance	Ri	ESCC 3402, Para. 9.1	500 Vdc	5000	-	MΩ
2	Voltage Proof	Vp	ESCC 3402, Para. 9.2	-	See Figure 2(b)		

TABLES 3, 4 AND 5

Not applicable.

4.8 ENVIRONMENTAL AND ENDURANCE TESTS (CHARTS IV AND V OF ESCC GENERIC SPECIFICATION NO. 3402)

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 of this specification. Unless otherwise stated, the measurements shall be performed at T_{amb} = +22 ±3°C.

4.8.2 Measurements and Inspections at Intermediate Points during Endurance Tests
Not applicable.

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 of this specification. Unless otherwise stated, the measurements shall be performed at T_{amb} = +22 ±3°C.

4.8.4 Conditions for Operating Life Tests (Part of Endurance Testing)
Not applicable.

4.8.5 Electrical Circuits for Operating Life Tests
Not applicable.

4.8.6 Conditions for High Temperature Storage Test (Part of Endurance Testing)
The requirements for the high temperature storage test are specified in Section 9 of ESCC Generic Specification No. 3402. The conditions for high temperature storage shall be the maximum operating temperature as specified in Figure 2(b).

TABLE 6 - MEASUREMENTS AND INSPECTIONS ON COMPLETION OF ENVIRONMENTAL AND ENDURANCE TESTS

No.	ESCC Generic Spec. No. 3402		Measurements and Inspections		Symbol	Limits		Units
	Environmental and Endurance Tests (1)	Test Method and Conditions	Identification	Conditions		Min.	Max.	
01	Coupling Proof Torque	Para. 9.4	**Final Measurements**					
			Interface Dimensions	-	-	Figure 2(a)		-
			Visual Examination	Para 9.4 of ESCC 3402	-	-		-
02	Mating and Unmating Forces	Para. 9.5	**During Test**					
			Torque	Para. 4.3.5	-	-	12	N.cm
03	Seal Test	Para. 9.7	Hermeticity	If applicable	-	-	1.10^{-8}	cm^3/s
			Leakage	As applicable	-	No Bubbles		-
04	Contact Resistance	Para. 9.9 6V 10mA	**During Test**					
			Contact Resistance	Centre Contact	-	-	6.5	mΩ
				Shell	-	-	2	mΩ
				Hermetic Centre Contact	-	-	22	mΩ
05	Vibration	Para. 9.10 Full Engagement	**During Test**	**Last Cycle in each direction**				
			Electrical Measurements	No open or short circuits	-	-	-	-
			Final Measurements					
			Contact Resistance	Centre Contact (6V 10mA)	-	-	6.5	mΩ
			Visual Examination	No evidence of damage	-	-	-	-
06	Shock or Bump	Para. 9.11 Full Engagement	**Final Measurements**					
			Contact Resistance	Centre Contact (6V 10mA)	-	-	6.5	mΩ
			Visual Examination	No evidence of damage	-	-	-	-
07	Rapid Change of Temperature	Para. 9.12	**Final Measurements**	**After a recovery period of 24 ±2hrs**				
			Contact Resistance	Centre Contact (6V 10mA)	-	-	6.5	mΩ
			Voltage Proof	Table 2 Item 2	Vp	Figure 2(b)		-
			Visual Examination	-	-	-	-	-
08	Climatic Sequence	Para. 9.13	**During Test**	**At Low Air Pressure**				
			Voltage Proof	No flashover or breakdown				
			Final Measurements	**After Final Damp Heat cycle (within 1 to 24 hrs recovery)**				
			Insulation Resistance	Table 2 Item 1	Ri	200	-	MΩ
			Voltage Proof	Table 2 item 2	Vp	Figure 2(b)		
			External Visual Inspection	Para. 9.8 of ESCC 3402	-	-	-	-
09	Cable Retention Force	Para. 9.14 and Para. 4.3.4 of this spec.	**During Test**					
			Continuity	-	-	-	-	-
10	Cabling and Crimping Capability	Para. 9.15	Visual Examination	Para 9.15 of ESCC 3402	-			-
			Dimensions	Para 9.15 of ESCC 3402	-	Fig 2(a) & 2(b)		-
			Insulation Resistance	Table 2 Item 1	Ri	5000	-	MΩ
			Voltage Proof	Table 2 Item 2	Vp	Figure 2(b)		-
11	VSWR or Reflection Coefficient	Para. 9.16	VSWR	Para. 9.16 of ESCC 3402	-	Figure 2(b)		-

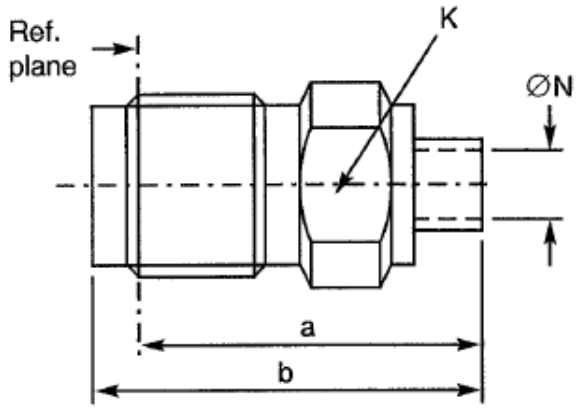
No.	ESCC Generic Spec. No. 3402		Measurements and Inspections		Symbol	Limits		Units
	Environmental and Endurance Tests (1)	Test Method and Conditions	Identification	Conditions		Min.	Max.	
12	Corona Level	Para. 9.17	Corona	Para. 9.17 of ESCC 3402	-	Figure 2(b)		-
13	Endurance	Para. 9.18 and Para. 4.3.6 of this spec.	**Final Measurements**					
			Mating/Unmating Forces	Para. 4.3.5	-	-	12	N.cm
			Contact Resistance	Centre Contact (6V 10mA)	-	-	9	mΩ
				Shell (6V 10mA)	-	-	3	mΩ
				Hermetic Centre Contact	-	-	27	-
			Visual Examination	Para. 9.18 of ESCC 3402		-	-	-
14	RF Insertion Loss	Para. 9.19	Insertion Loss	Para. 9.19 of ESCC 3402	-	Figure 2(b)		-
15	Corrosion	Para. 9.20	Visual Examination	Para. 9.20 of ESCC 3402 No exposure of base metal	-	-	-	-
16	Residual Magnetism	Para. 9.21	Magnetism	-	-	Para. 4.3.7		-
17	Soldering Proof	Para. 9.22	**Final Measurements**					
			Interface Dimensions	-	-	Figure 2(b)		-
			Mating/Unmating Forces	Para. 4.3.5	-	-	12	N.cm
			Insulation Resistance	Table 2 Item 1	Ri	5000	-	MΩ
			Voltage Proof	Table 2 Item 2	Vp	Figure 2(b)		-
			Contact Resistance	Centre Contact	-	-	6.5	mΩ
				Shell	-	-	2	mΩ
				Hermetic Centre Contact	-	-	22	-
			External Visual Inspection	Para. 9.8 of ESCC 3402	-	-	-	-
18	RF Leakage	Para. 9.23	Leakage	-	-	Figure 2(b)		-
19	High Temperature Storage	Para. 9.24 and Para. 4.8.6 of this spec.	**Final Measurements**					
			Mating/Unmating Forces	Para. 4.3.5	-	-	12	N.cm
			Insulation Resistance	Table 2 Item 1	Ri	5000	-	MΩ
			Voltage Proof	Table 2 item 2	Vp	Figure 2(b)		-
			Contact Retention	Para. 4.3.9	-	Para. 4.3.9		-
			Visual Examination	-	-	-	-	-
			Contact Resistance	Centre Contact	-	-	18	mΩ
				Shell	-	-	7.5	mΩ
				Hermetic Centre Contact	-	-	34	mΩ
			External Visual Inspection	Para. 9.8 of ESCC 3402	-	-	-	-

NOTES

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

FIGURE 2(b) – VARIANTS

VARIANT 01 – STRAIGHT JACK, SOLDER TYPE, FOR SEMI-RIGID CABLE Ø2.2mm (0.085")



Symbol	Millimetres		Notes
	Min.	Max.	
a	10.5 NOM.		
b	12.5 NOM.		
K	6.35 NOM.		Flats
ØN	2.25 NOM.		

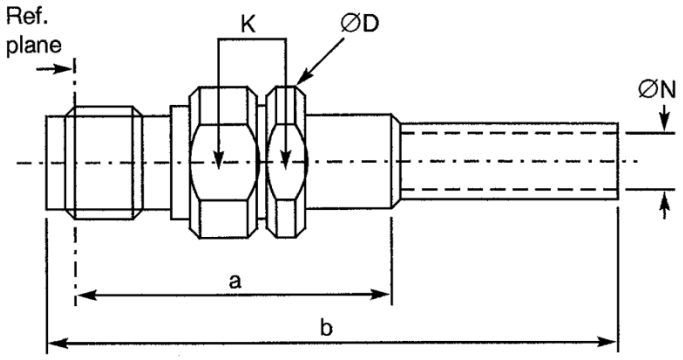
ELECTRICAL CHARACTERISTICS	VALUES	UNITS
Frequency range	0 to 18	GHz
Maximum voltage standing wave ratio (VSWR)	1.05 + 0.015 f (GHz)	
Maximum reflection coefficient	0.024 + 0.0063 f (GHz)	
Maximum insertion loss	0.03 √f (GHz)	dB
RF leakage	-[100 - f (GHz)]	dB
Voltage proof	750	Vrms
Corona level	190	Vrms

MECHANICAL CHARACTERISTICS	VALUES	UNITS
Mini centre contact retention force (axial)	Not applicable	N
Mini centre contact retention torque	Not applicable	N.cm
Mini cable retention force	200	N
Mini cable retention torque value	11.5	N.cm
Maximum weight	1.3	g

OTHER CHARACTERISTICS	VALUES	UNITS
Rapid change of temperature - peak value	+115	°C
Operating temperature range	-55 to +105	°C
Maxi leakage (panel sealed connectors)	Not applicable	
Maxi leakage (hermetic sealed connector)	Not applicable	
Solderability	Applicable	
Soldering proof	Not applicable	
Cables used	KS 1, RG 405/U, (Ø2.2mm)	

FIGURE 2(b) – VARIANTS (CONTINUED)

VARIANT 06 – STRAIGHT JACK, CRIMP-TYPE



Symbol	Millimetres		Notes
	Min.	Max.	
a	22.5 NOM.		
b	36.4 NOM.		
ØD	7 NOM.		
K	6.35 NOM		2 flats
ØN			Note 1

NOTES

1. Shall accept cables specified in the table below.

ELECTRICAL CHARACTERISTICS	VALUES	UNITS
Frequency range	0 to 12.4	GHz
Maximum voltage standing wave ratio (VSWR)	1.2 + 0.025 f (GHz)	
Maximum reflection coefficient	0.09 + 0.01 f (GHz)	
Maximum insertion loss	0.03 $\sqrt{f}$ (GHz)	dB
RF leakage	-[95 - f (GHz)]	dB
Voltage proof	750	Vrms
Corona level	190	Vrms

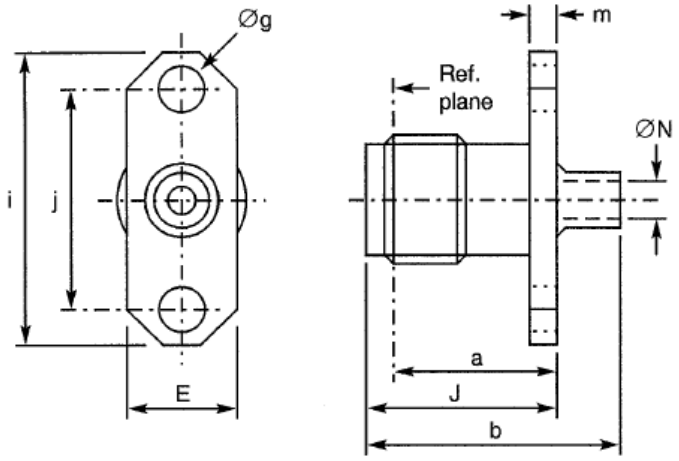
MECHANICAL CHARACTERISTICS	VALUES	UNITS
Mini centre contact retention force (axial)	22	N
Mini centre contact retention torque	0.5	N.cm
Mini cable retention force	(1) 80; (2) 110	N
Mini cable retention torque value	2 x 180° applic. point 50 x ØN	
Maximum weight	2.3	g

OTHER CHARACTERISTICS		VALUES	UNITS
Rapid change of temperature - peak value		+200 (see cables used)	°C
Operating temperature range		-55 to +155	°C
Maxi leakage (panel sealed connectors)		Not applicable	
Maxi leakage (hermetic sealed connector)		Not applicable	
Solderability		Applicable	
Soldering proof		Not applicable	
Cables used	(1) Filotex 50 CIS (2) KX 3B – KX 22A RG 174/U – RG 316/U	ØN = 2.1 ±0.1 ØN = 3.25 ±0.1	mm

FIGURE 2(b) – VARIANTS (CONTINUED)

VARIANT 09 - STRAIGHT JACK, SOLDER TYPE, FLANGE-MOUNTED, FOR SEMI-RIGID CABLE Ø2.2mm (0.085")

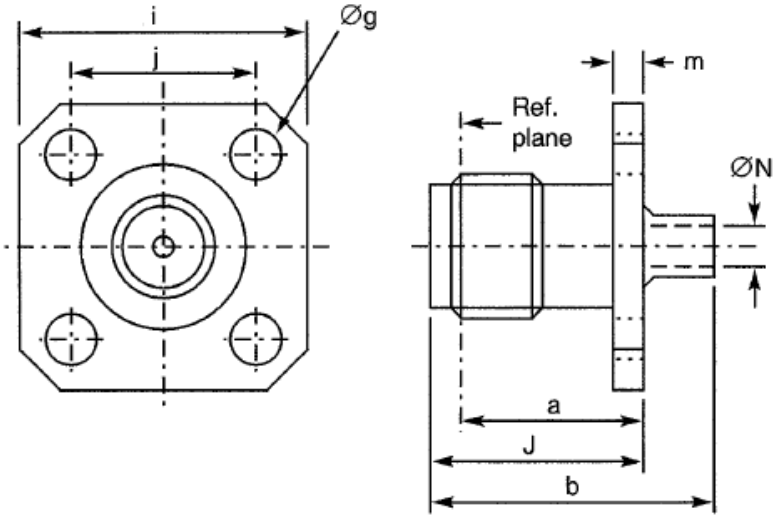
Subvariant 01 – 2-Hole Flange Version



Symbol	Millimetres		Notes
	Min.	Max.	
a	7.6 NOM.		
b	12.5 NOM.		
E	4.7 NOM		
Øg	2.4 NOM.		2 holes
i	12 NOM.		
j	8.34 NOM.		
J	9.5 NOM.		
m	1.7 NOM.		
ØN	2.25 NOM.		

NOTES
1. Maximum panel thickness: 2.3 mm.

Subvariant 02 – Square Flange Version



Symbol	Millimetres		Notes
	Min.	Max.	
a	7.6 NOM.		
b	12.5 NOM.		
Øg	2.4 NOM.		4 holes
i	9.5 NOM.		Square
j	5.9 NOM.		Square
J	9.5 NOM.		
m	1.7 NOM.		
ØN	2.25 NOM.		

FIGURE 2(b) – VARIANTS (CONTINUED)

VARIANT 09 - STRAIGHT JACK, SOLDER TYPE, FLANGE-MOUNTED, FOR SEMI-RIGID CABLE Ø2.2mm (0.085") (CONTINUED)

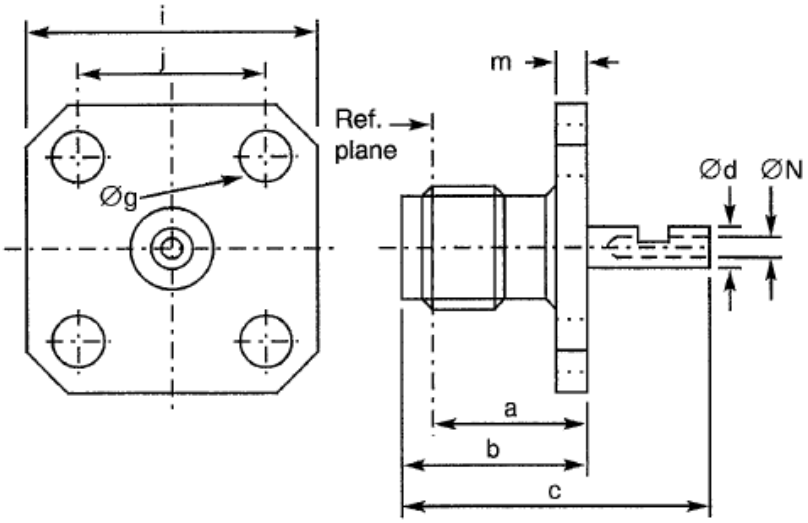
ELECTRICAL CHARACTERISTICS	VALUES	UNITS
Frequency range	0 to 18	GHz
Maximum voltage standing wave ratio (VSWR)	1.05 + 0.015 f (GHz)	
Maximum reflection coefficient	0.024 + 0.0063 f (GHz)	
Maximum insertion loss	0.03 $\sqrt{f}$ (GHz)	dB
RF leakage	- [100 - f (GHz)]	dB
Voltage proof	750	Vrms
Corona level	190	Vrms

MECHANICAL CHARACTERISTICS		VALUES		UNITS
Mini centre contact retention force (axial)		Not applicable		N
Mini centre contact retention torque		Not applicable		N.cm
Mini cable retention force		200		N
Mini cable retention torque value		11.5		N.cm
Maximum weight	Subvariant	01: 2.5	02: 3	g

OTHER CHARACTERISTICS	VALUES	UNITS
Rapid change of temperature - peak value	+115	°C
Operating temperature range	-55 to +105	°C
Maxi leakage (panel sealed connectors)	Not applicable	
Maxi leakage (hermetic sealed connector)	Not applicable	
Solderability	Applicable	
Soldering proof	Not applicable	
Cables used	KS 1, RG 405/U, (Ø2.2mm)	

FIGURE 2(b) – VARIANTS (CONTINUED)

VARIANT 15 – SQUARE FLANGE RECEPTACLE



Symbol	Millimetres		Notes
	Min.	Max.	
a	7.6 NOM.		
b	9.5 NOM.		
c	12.5 NOM.		
Ød	0.85 NOM.		
Øg	2.4 NOM.		4 holes
i	9.5 NOM.		Square
j	5.9 NOM.		Square
m	1.7 NOM.		
ØN	0.6 NOM.		

ELECTRICAL CHARACTERISTICS		VALUES	UNITS
Frequency range		0 to 18	GHz
Maximum voltage standing wave ratio (VSWR)	(1)	1.07 + 0.01 f (GHz)	
Maximum reflection coefficient	(1)	0.034 + 0.004 f (GHz)	
Maximum insertion loss	(1)	0.03 √f (GHz)	dB
RF leakage	(1)	- [95 - f (GHz)]	dB
Voltage proof		750	Vrms
Corona level		Not applicable	Vrms

NOTES

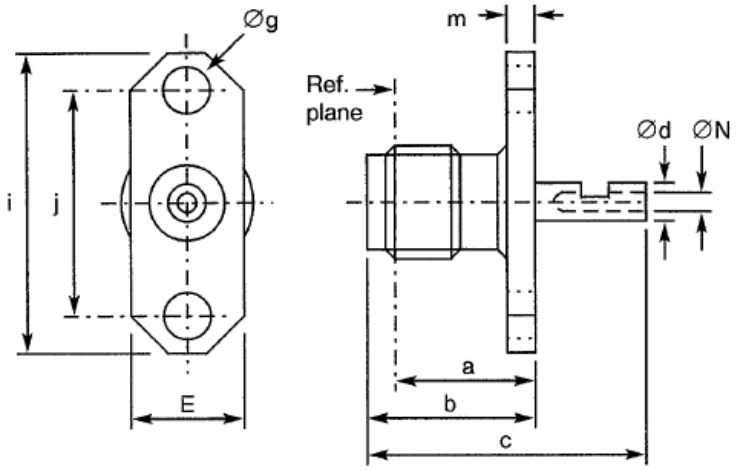
1. For information only.

MECHANICAL CHARACTERISTICS	VALUES	UNITS
Mini centre contact retention force (axial)	22	N
Mini centre contact retention torque	1.8	N.cm
Mini cable retention force	Not applicable	N
Mini cable retention torque value	Not applicable	N.cm
Maximum weight	1.3	g

OTHER CHARACTERISTICS	VALUES	UNITS
Rapid change of temperature - peak value	+115	°C
Operating temperature range	-65 to +105	°C
Maxi leakage (panel sealed connectors)	Not applicable	
Maxi leakage (hermetic sealed connector)	Not applicable	
Solderability	On centre contact only	
Soldering proof	Applicable	
Cables used	Not applicable	

FIGURE 2(b) – VARIANTS (CONTINUED)

VARIANT 17 – 2-HOLE FLANGE RECEPTACLE



Symbol	Millimetres		Notes
	Min.	Max.	
a	7.6 NOM.		
b	9.5 NOM.		
c	12.5 NOM.		
Ød	0.85 NOM.		
E	4.7 NOM.		
Øg	2.4 NOM.		2 holes
i	12 NOM.		
j	8.34 NOM.		
m	1.7 NOM.		
ØN	0.6 NOM.		

ELECTRICAL CHARACTERISTICS		VALUES	UNITS
Frequency range		0 to 18	GHz
Maximum voltage standing wave ratio (VSWR)	(1)	1.07 + 0.01 f (GHz)	
Maximum reflection coefficient	(1)	0.034 + 0.004 f (GHz)	
Maximum insertion loss	(1)	0.03 √f (GHz)	dB
RF leakage	(1)	- [95 - f (GHz)]	dB
Voltage proof		750	Vrms
Corona level		Not applicable	Vrms

NOTES

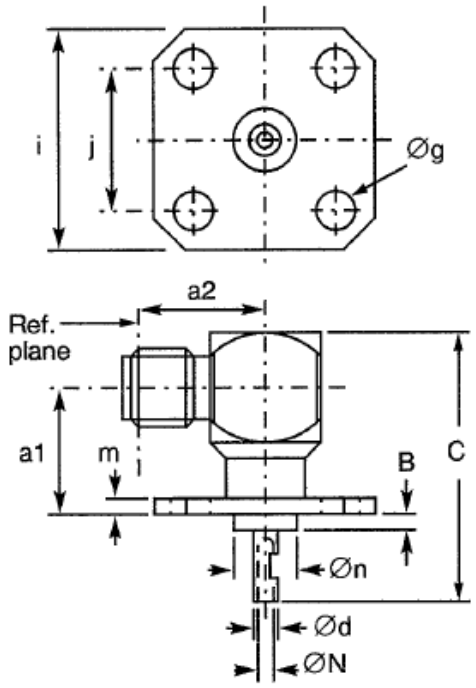
1. For information only.

MECHANICAL CHARACTERISTICS	VALUES	UNITS
Mini centre contact retention force (axial)	22	N
Mini centre contact retention torque	1.8	N.cm
Mini cable retention force	Not applicable	N
Mini cable retention torque value	Not applicable	N.cm
Maximum weight	1.1	g

OTHER CHARACTERISTICS	VALUES	UNITS
Rapid change of temperature - peak value	+115	°C
Operating temperature range	-65 to +105	°C
Maxi leakage (panel sealed connectors)	Not applicable	
Maxi leakage (hermetic sealed connector)	Not applicable	
Solderability	On centre contact only	
Soldering proof	Applicable	
Cables used	Not applicable	

FIGURE 2(b) – VARIANTS (CONTINUED)

VARIANT 27 – ELBOW RECEPTACLE, SQUARE FLANGE



Symbol	Millimetres		Notes
	Min.	Max.	
a1	7.4 NOM.		
a2	8.3 NOM.		
B	1.6 NOM.		
C	14.5 NOM.		
Ød	0.85 NOM.		
Øg	2.4 NOM.		4 holes
i	9.5 NOM.		Square
j	5.9 NOM.		Square
m	1.7 NOM.		
Øn	2.7 NOM.		
ØN	0.6 NOM.		

ELECTRICAL CHARACTERISTICS		VALUES	UNITS
Frequency range		0 to 18	GHz
Maximum voltage standing wave ratio (VSWR)	(1)	1.1 + 0.025 f (GHz)	
Maximum reflection coefficient	(1)	0.047 + 0.01 f (GHz)	
Maximum insertion loss	(1)	0.03 √f (GHz)	dB
RF leakage	(1)	- [95 - f (GHz)]	dB
Voltage proof		750	Vrms
Corona level		Not applicable	Vrms

NOTES

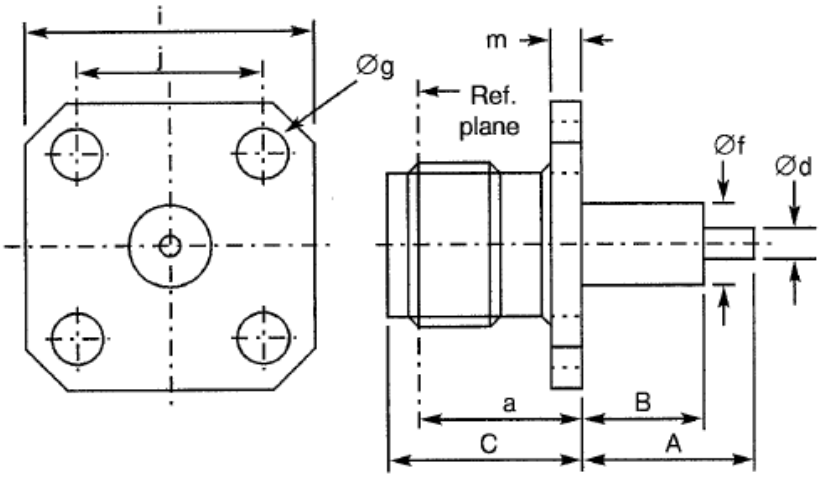
1. For information only.

MECHANICAL CHARACTERISTICS	VALUES	UNITS
Mini centre contact retention force (axial)	22	N
Mini centre contact retention torque	1.8	N.cm
Mini cable retention force	Not applicable	N
Mini cable retention torque value	Not applicable	N.cm
Maximum weight	2.5	g

OTHER CHARACTERISTICS	VALUES	UNITS
Rapid change of temperature - peak value	+200	°C
Operating temperature range	-55 to +155	°C
Maxi leakage (panel sealed connectors)	Not applicable	
Maxi leakage (hermetic sealed connector)	Not applicable	
Solderability	On centre contact only	
Soldering proof	Applicable	
Cables used	Not applicable	

FIGURE 2(b) – VARIANTS (CONTINUED)

VARIANT 29 – SQUARE FLANGE RECEPTACLE



Symbol	Millimetres		Notes
	Min.	Max.	
a	7.6 NOM.		
A	See next page		
B	See next page		
C	9.5 NOM.		
Ød	0.85 NOM.		
Øf	2.7 NOM.		
Øg	2.4 NOM.		4 holes
i	9.5 NOM.		Square
j	5.9 NOM.		Square
m	1.7 NOM.		

ELECTRICAL CHARACTERISTICS		VALUES	UNITS
Frequency range		0 to 18	GHz
Maximum voltage standing wave ratio (VSWR)		1.07 + 0.01 f (GHz)	
Maximum reflection coefficient		0.034 + 0.004 f (GHz)	
Maximum insertion loss	(1)	0.03 √f (GHz)	dB
RF leakage	(1)	- [95 - f (GHz)]	dB
Voltage proof		750	Vrms
Corona level		Not applicable	Vrms

NOTES

1. For information only.

MECHANICAL CHARACTERISTICS	VALUES	UNITS
Mini centre contact retention force (axial)	22	N
Mini centre contact retention torque	1.8	N.cm
Mini cable retention force	Not applicable	N
Mini cable retention torque value	Not applicable	N.cm
Maximum weight	2	g

OTHER CHARACTERISTICS	VALUES	UNITS
Rapid change of temperature - peak value	+115	°C
Operating temperature range	-65 to +105	°C
Maxi leakage (panel sealed connectors)	Not applicable	
Maxi leakage (hermetic sealed connector)	Not applicable	
Solderability	On centre contact only	
Soldering proof	Applicable	
Cables used	Not applicable	

FIGURE 2(b) – VARIANTS (CONTINUED)

VARIANT 29 – SQUARE FLANGE RECEPTACLE (CONTINUED)

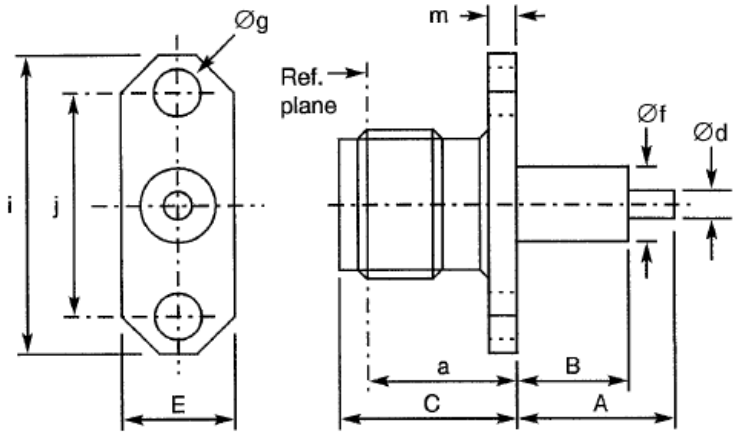
Subvariant No.	A (Contact)		B (Insert)	
	Min.	Max.	Min.	Max.
01	11.83	11.87	5.9	6.1
02	26.4	26.6	-0.05	+0.05
03	15.8	16.6	12.6	12.8
04	3.1	3.2	1.55	1.75
05	2.5	2.7	0.25	0.3
06	9.2	9.3	4	4.2
07	20.4	20.6	4	4.2
08	8.9	9.1	2.9	3.1
09	9.9	10.1	4.8	4.9
10	12.78	12.88	-0.05	+0.05
11	5.9	6.1	1.9	2.1
12	7.6	7.8	2.85	3.05
13	15.9	16.1	2.85	3.05
14	4.1	4.3	-0.05	+0.05
15	10.9	11	7.9	8
16	4.55	4.65	3.25	3.35
17	5.9	6.1	2.45	2.55
18	8.3	8.5	1.27	1.37
19	4.05	4.15	1.24	1.3
20	-	-	-	-
21	20.4	20.6	17.9	18.1
22	14.8	15.2	11.8	12.2
23	8.4	8.45	-0.05	+0.05
24	17.8	18	14.9	15.1
25	13.95	14.05	3.9	3.95
26	10	10.1	5.76	5.81
27	2.5	2.7	2.4	2.6
28	4	4.2	3.9	4.1
29	8.4	8.6	8.3	8.5
30	6.985	7.035	3.92	4.08
31	39.9	40.1	-0.05	+0.05
32	-	-	-	-
33	-	-	-	-
34	9.9	10.1	3.02	3.1

NOTES

1. All dimensions in millimetres.

FIGURE 2(b) – VARIANTS (CONTINUED)

VARIANT 30 – 2-HOLE FLANGE RECEPTACLE



Symbol	Millimetres		Notes
	Min.	Max.	
a	7.6 NOM.		
A	See next page		
B	See next page		
C	9.5 NOM.		
Ød	0.85 NOM.		
E	4.7 NOM.		
Øf	2.7 NOM.		
Øg	2.4 NOM.		2 holes
i	12 NOM.		
j	8.34 NOM.		
m	1.7 NOM.		

ELECTRICAL CHARACTERISTICS		VALUES	UNITS
Frequency range		0 to 18	GHz
Maximum voltage standing wave ratio (VSWR)		1.07 + 0.01 f (GHz)	For B = 0
Maximum reflection coefficient		0.034 + 0.004 f (GHz)	For B = 0
Maximum insertion loss	(1)	0.03 √f (GHz)	dB
RF leakage	(1)	- [95 - f (GHz)]	dB
Voltage proof		750	Vrms
Corona level		Not applicable	Vrms

NOTES

1. For information only.

MECHANICAL CHARACTERISTICS	VALUES	UNITS
Mini centre contact retention force (axial)	22	N
Mini centre contact retention torque	1.8	N.cm
Mini cable retention force	Not applicable	N
Mini cable retention torque value	Not applicable	N.cm
Maximum weight	1.5	g

OTHER CHARACTERISTICS	VALUES	UNITS
Rapid change of temperature - peak value	+115	°C
Operating temperature range	-65 to +105	°C
Maxi leakage (panel sealed connectors)	Not applicable	
Maxi leakage (hermetic sealed connector)	Not applicable	
Solderability	On centre contact only	
Soldering proof	Applicable	
Cables used	Not applicable	

FIGURE 2(b) – VARIANTS (CONTINUED)

VARIANT 30 – 2-HOLE FLANGE RECEPTACLE (CONTINUED)

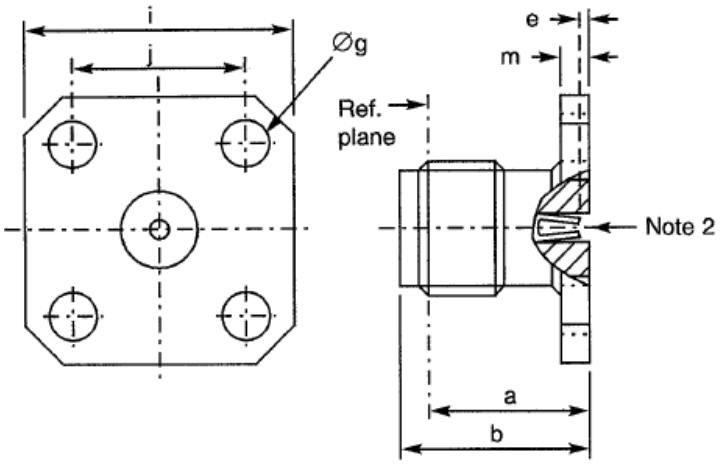
Subvariant No.	A (Contact)		B (Insert)	
	Min.	Max.	Min.	Max.
01	12.3	12.7	4.8	4.9
02	15.8	16	0.4	0.6
03	10.9	11	0.9	1
04	11.9	12.1	2.9	3.1
05	17.8	18	14.9	15.1
06	2.2	2.4	-0.05	+0.05
07	4.2	4.6	-0.05	+0.05
08	-	-	-	-
09	4.7	5.3	2.3	2.5
10	6.9	7.1	6.8	7
11	3	3.2	1	1.1
12	-	-	-	-
13	6.9	7.1	3.1	3.3
14	7.4	7.6	4.9	5.1

NOTES

1. All dimensions in millimetres.

FIGURE 2(b) – VARIANTS (CONTINUED)

VARIANT 31 – SQUARE FLANGE RECEPTACLE



Symbol	Millimetres		Notes
	Min.	Max.	
a	7.6 NOM.		
b	9.5 NOM.		
e	0.18	0.41	
Øg	2.55	2.7	4 holes
i	9.5 NOM.		Square
j	5.9 NOM.		Square
m	1.7 NOM.		

ELECTRICAL CHARACTERISTICS	VALUES	UNITS
Frequency range	0 to 18	GHz
Maximum voltage standing wave ratio (VSWR)	1.05 + 0.03 f (GHz)	For B = 0
Maximum reflection coefficient	0.024 + 0.013 f (GHz)	For B = 0
Maximum insertion loss (1)	0.03 √f (GHz)	dB
RF leakage (1)	- [95 - f (GHz)]	dB
Voltage proof	750	Vrms
Corona level	Not applicable	Vrms

NOTES

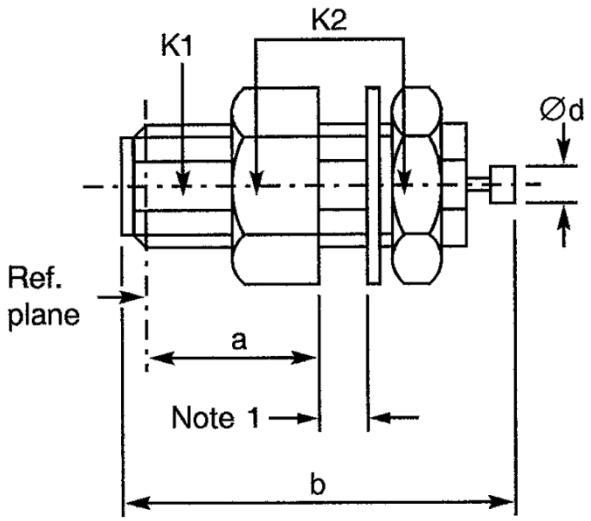
1. For information only.
2. Contact insertion and withdrawal forces shall be measured on the rear contact (see Para. 4.3.8).

MECHANICAL CHARACTERISTICS	VALUES	UNITS
Mini centre contact retention force (axial)	22	N
Mini centre contact retention torque	Not applicable	N.cm
Mini cable retention force	Not applicable	N
Mini cable retention torque value	Not applicable	N.cm
Maximum weight	1.3	g

OTHER CHARACTERISTICS	VALUES	UNITS
Rapid change of temperature - peak value	+115	°C
Operating temperature range	-65 to +105	°C
Maxi leakage (panel sealed connectors)	Not applicable	
Maxi leakage (hermetic sealed connector)	Not applicable	
Solderability	Not applicable	
Soldering proof	Not applicable	
Cables used	Not applicable	

FIGURE 2(b) – VARIANTS (CONTINUED)

VARIANT 58 – BULKHEAD RECEPTACLE



Symbol	Millimetres		Notes
	Min.	Max.	
a	6.1 NOM.		
b	15.2 NOM.		
Ød	1.3 NOM.		
K1	-	-	2 flats
K2	6.35 NOM.		Hex flats

NOTES

1. Maximum panel thickness: 1.6mm.

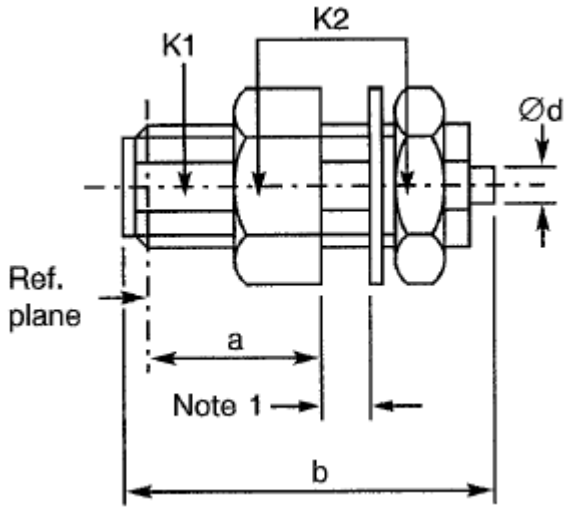
ELECTRICAL CHARACTERISTICS	VALUES	UNITS
Frequency range	0 to 18	GHz
Maximum voltage standing wave ratio (VSWR)	Not applicable	
Maximum reflection coefficient	Not applicable	
Maximum insertion loss	Not applicable	dB
RF leakage	Not applicable	dB
Voltage proof	750	Vrms
Corona level	Not applicable	Vrms

MECHANICAL CHARACTERISTICS	VALUES	UNITS
Mini centre contact retention force (axial)	22	N
Mini centre contact retention torque	1.8	N.cm
Mini cable retention force	Not applicable	N
Mini cable retention torque value	Not applicable	N.cm
Maximum weight	2	g

OTHER CHARACTERISTICS	VALUES	UNITS
Rapid change of temperature - peak value	+115	^{o}C
Operating temperature range	-65 to +105	^{o}C
Maxi leakage (panel sealed connectors)	Not applicable	
Maxi leakage (hermetic sealed connector)	Not applicable	
Solderability	On centre contact only	
Soldering proof	Applicable	
Cables used	Not applicable	

FIGURE 2(b) – VARIANTS (CONTINUED)

VARIANT 59 – BULKHEAD RECEPTACLE FOR SEMI-RIGID CABLE, Ø2.2mm (0.085")



Symbol	Millimetres		Notes
	Min.	Max.	
a	6.1 NOM.		
b	15 NOM.		
Ød	2.25 NOM.		
K1	-	-	2 flats
K2	6.35 NOM.		Hex flats

NOTES

1. Maximum panel thickness: 2mm.

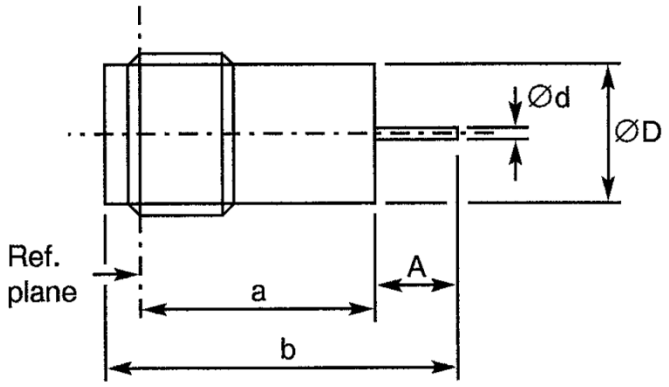
ELECTRICAL CHARACTERISTICS	VALUES	UNITS
Frequency range	0 to 18	GHz
Maximum voltage standing wave ratio (VSWR)	1.05 + 0.015 f (GHz)	
Maximum reflection coefficient	0.024 + 0.0063 f (GHz)	
Maximum insertion loss	0.03 √f (GHz)	dB
RF leakage	- [100 - f (GHz)]	dB
Voltage proof	750	Vrms
Corona level	190	Vrms

MECHANICAL CHARACTERISTICS	VALUES	UNITS
Mini centre contact retention force (axial)	Not applicable	N
Mini centre contact retention torque	Not applicable	N.cm
Mini cable retention force	200	N
Mini cable retention torque value	11.5	N.cm
Maximum weight	2	g

OTHER CHARACTERISTICS	VALUES	UNITS
Rapid change of temperature - peak value	+115	°C
Operating temperature range	-55 to +105	°C
Maxi leakage (panel sealed connectors)	Not applicable	
Maxi leakage (hermetic sealed connector)	Not applicable	
Solderability	Applicable	
Soldering proof	Not applicable	
Cables used	KS 1, RG 405/U	

FIGURE 2(b) – VARIANTS (CONTINUED)

VARIANT 60 – HERMETIC RECEPTACLE, SOLDER TYPE



Symbol	Millimetres	
	Min.	Max.
a	8.3 NOM.	
A	2.9 NOM.	
b	13.1 NOM.	
Ød	0.4 NOM.	
ØD	3.7 NOM.	

ELECTRICAL CHARACTERISTICS	VALUES	UNITS
Frequency range	0 to 12.4	GHz
Maximum voltage standing wave ratio (VSWR)	1.1 + 0.05 f (GHz)	
Maximum reflection coefficient	0.047 + 0.023 f (GHz)	
Maximum insertion loss	0.03 √f (GHz)	dB
RF leakage	- [95 - f (GHz)]	dB
Voltage proof	750	Vrms
Corona level	Not applicable	Vrms

NOTES

1. For information only.

MECHANICAL CHARACTERISTICS	VALUES	UNITS
Mini centre contact retention force (axial)	Not applicable	N
Mini centre contact retention torque	Not applicable	N.cm
Mini cable retention force	Not applicable	N
Mini cable retention torque value	Not applicable	N.cm
Maximum weight	1	g

OTHER CHARACTERISTICS	VALUES	UNITS
Rapid change of temperature - peak value	+125	°C
Operating temperature range	-40 to +100	°C
Maxi leakage (panel sealed connectors)	Not applicable	
Maxi leakage (hermetic sealed connector)	Applicable	
Solderability	Not applicable	
Soldering proof	Applicable	
Cables used	Not applicable	