DOCUMENT CHANGE REQUEST

DCR number 233	Changes required for: N/A	Originator: S Thacker
Date: 2006/02/08	Date sent: 2006/02/08	Organisation: ESA/ESTEC
Status: IMPLEMENTED		

Title:	Load RF Coaxial Type SMA, DC-22GHz		
Number:	3403/006	Issue:	1

Other documents affected:

Page:

Total re-write (for variants 01 & 02) plus new specification generated (for Variant 03)

Paragraph:

Total re-write (for variants 01 & 02) plus new specification generated (for Variant 03)

Original wording:

Proposed wording:

Total reformat of this Detail Specification as part of the ongoing conversion of specifications to the ESCC format (applies to SMA Loads: Variants 01 & 02). For variant 03 (TNC Load) a separate specification (No.58) has been raised (based on 3403/006).

See as follows for a summary of the changes. See also attached 3403/006 Issue 2 Draft C and No.58 issue 1 Draft B.

note: known support for active procurement against this specification (all 3 variants) includes the following Manufacturer: RADIALL / F

Summary of changes to the current format, layout and content is as follows:

1. Rewording and restructure of various sections and paragraphs of the specification plus other editorial changes based on the layout and editorial content of other Detail Specifications for similar components already converted to ESCC format plus the converted Generic 3403.

2. Deletion of any redundant paragraphs.

3. Para 2: Applicable Documents is amended to delete the references to 3402/003 & 3402/008 and MIL-G-45204 specifications.
(see 12 & 17 below).

4. Table 1(a): Variant 03 (TNC Male Load), plus all Variant 03 specific requirements in the spec, are deleted (and transferred to new spec No.58).

DCR number 233	Changes required for: N/A	Originator: S Thacker
Date: 2006/02/08	Date sent: 2006/02/08	Organisation: ESA/ESTEC
Status: IMPLEMENTED		

(To separate the SMA and TNC families into individual specs)

5. Table 1(b): DC Power rating is added to the Maximum Ratings table.
(to be consistent with Generic 3403).

6. Table 1(b), 2, 6: Maximum Ratings Table, Room Temperature Electrical Measurements Table, Intermediate and End-point Electrical Measurements Table: change impedance (& resistance) values to be 47.5 ohm minimum to 52.5 ohm maximum.
(This is due a standardisation by the manufacturer (Radiall/F) to a +/-5% tolerance on impedance (& resistance) for 50ohm coaxial components (for Space/Mil/Commercial product)).

7. Table 1(b): Coupling Proof torque is added to the Maximum Ratings table.
(to be consistent with Generic 3403).

8. Table 1(b): Maximum Ratings table (and also Table 6) unit for RF leakage corrected to be "dBi" (was "dB")
(clarification/correction of error)

9. Table 1(b): Frequency range for Variant 03 is corrected to be DC to 18GHz (was to 22GHz).
(clarification)

10. Figure 1: Parameter Derating Requirements are moved to be a note to the Maximum Ratings table.

11. Figure 2: Variant 01 dim B corrected to be 8.5mm to 9.5mm (was 7.8mm to 8mm)
(technical error).

12. Figure 2: Physical dimensions:
The drawings are amended to only include critical dimensions (Variant 01: Dim's D E F are deleted, Variant 02: Dim F is deleted).
References to 3402/001,& 3402/002 & 3402/008 are deleted and the applicable Interface Dimension drawings are added (female and/or male).
In addition the applicable Mating Gauge Dimensions (Female and/or Male Interfaces) are added from 3402/001, 3402/002 & 3402/008 with the thread definition for variant 01 & 02 corrected to be "0.250-36 UNS-2A" (was "0.260-36 UNS-2A").
(to be consistent with Generic 3403 and for consistency/clarification).

13. Para 4.2: Deviations from Generic spec is amended; i.e. Residual Magnetism deviation is added; the existing deviations are deleted.
(to be consistent with the updated Generic specification ESCC 3403)

14. Para 4.3.2: Weight requirements are moved to the Component Type Variants table.

15. Para 4.3.5: Contact Engagement and Separation Forces: Details from 3402/003 are included in this para (applicable to Variant 02 only)

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16. Para 4.3.5: Residual Magnetism is deleted to match the generic spec requirements. The "information only" limits for Variants 02 & 03 are deleted.
("information only" requirements are considered redundant).

17. Para 4.4: Materials: the gold plate reference to MIL spec is deleted. Gaskets are added to list of included materials.
(For consistency with other ESCC detail specs for similar components)

18. Para 4.5: Marking: Delete requirement for marking of the testing level letter from the ESCC Component Number.
(as per latest ESCC No. 21700).

19. Para 4.7.2: Conditions for Burn-in: Delete the recovery period requirement of 24 +/-2 hours for after burn-in.
(the generic spec allows the test to be performed within 24h; this is considered sufficient).

20. Table 3: "Resistance Drift" is renamed as "Temperature coefficient of Resistance" with symbol "TCR".

21. Table 3: Measurement of Resistance is changed to be a DC test (not an RF test at 2, 12.4 & 22 GHz)
(Resistance is specified at DC condition).

22. Figure 4: mechanical test schematic is deleted (the requirements for mounting in the generic spec are considered sufficient).

23 . Figure 5(b): operating life test set-up is deleted.
(the requirements for operating life in the generic spec are considered sufficient).

24. Table 6 is amended to include all applicable test requirements (Bump, Coupling Proof Torque, Mating and Unmating Forces, Connector Repeatability, Residual Magnetism, Power Sensitivity, Corrosion, Permanence of Marking are deleted).
(to be consistent with the updated Generic specification ESCC 3403).

Justification:

(see also change details for each item above):

A. Part of the ongoing activity of conversion of cover-sheeted ESA/SCC specifications to the ESCC format.

B. To make the format, presentation and content editorially and technically consistent with the various other ESCC Detail Specifications already converted to ESCC format.

C. To make the content consistent with the proposed ESCC format Generic Specification No.3403 issue 2.

D. To maintain the component family structure of individual detail specifications (by extracting the TNC Load (leaving SMA loads remaining) from 3403/006)

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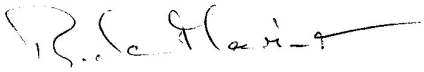
Attachments:

58.pdf, 3403006.pdf, null

Modifications:

The following additional changes are included in this DCR:
Page 6 Table 1(b) Peak Power for Variant 03 (TNC variant) in new ESCC spec No.58:
Amend rating to be Peak Power = 200W max (was 100W).
Justification: The 200W Rating is consistent with the Radiall device's actual capability.

Approval signature:



Date signed:

2006-02-08

LOAD,

RF, COAXIAL, TYPE TNC, DC - 18GHz

ESCC Detail Specification No. 58

Issue 1 - DRAFT B	January 2006

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

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DCR No.	CHANGE DESCRIPTION

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1. GENERAL

1.1 SCOPE

This specification details the ratings, physical and electrical characteristics and test and inspection data for the component type variants and/or the range of components specified below. It supplements the requirements of, and shall be read in conjunction with, the ESCC Generic Specification listed under Applicable Documents.

1.2 APPLICABLE DOCUMENTS

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

(a) ESCC Generic Specification No. 3403.

1.3 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.

1.4 THE ESCC COMPONENT NUMBER AND COMPONENT TYPE VARIANTS

1.4.1 The ESCC Component Number

The ESCC Component Number shall be constituted as follows:

Example: 3403xxx01

- Detail Specification Reference: 3403xxx
- Component Type Variant Number: 01 (as required)

1.4.2 Component Type Variants and Range of Components

The component type variants and range of components applicable to this specification are as follows:

Variant Number	Connector Type	VSWR	Weight max (g)
01	TNC Male	DC < f ≤ 4GHz ≤1.08 4 < f ≤ 8GHz ≤1.1 8 < f ≤ 12.4GHz ≤1.15 12.4 < f ≤18GHz ≤1.2	23

1.5 MAXIMUM RATINGS

The maximum ratings shall not be exceeded at any time during use or storage.

Maximum ratings shall only be exceeded during testing to the extent specified in this specification and when stipulated in Test Methods and Procedures of the ESCC Generic Specification.

Characteristics	Symbols	Maximum Ratings	Units	Remarks
RF Power	P_{RF}	2	W	Note 1
Peak Power	P_P	100	W	duration 1µs 1% duty cycle
DC Power	P_{DC}	2	W	T_{amb}=+25˚C
Impedance	Z	47.5 to 52.5	Ω	-
Frequency Range	f_{op}	DC to 18	GHz	-
RF Leakage	E	-[80dB - f(GHz)]	dBi	-
Operating Temperature Range	T_{op}	-55 to +125	˚C	T_{amb}
Storage Temperature Range	T_{stg}	-55 to +125	˚C	-
Coupling Nut Torque	Tq	265	N.cm	Note 2

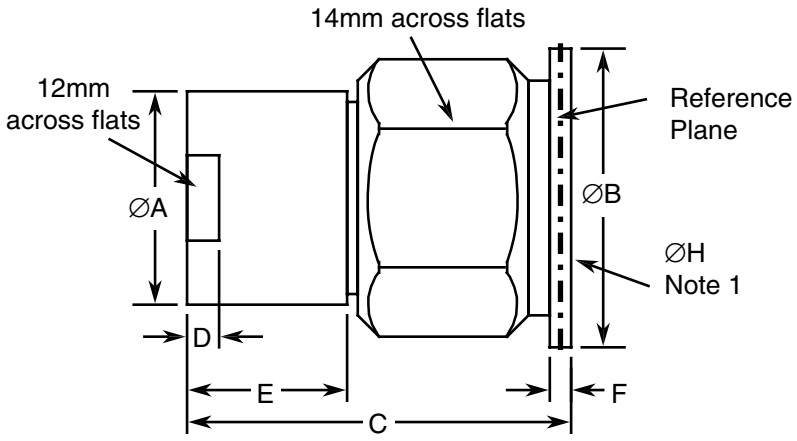
NOTES:

1. RF Power shall be derated against operating temperature as follows:

   P_{RF} at $T_{op} \leq +25$˚C. Derate linearly to 0W at $T_{op} = +125$˚C.

2. Coupling Proof Torque: 339N.cm

1.6 PHYSICAL DIMENSIONS

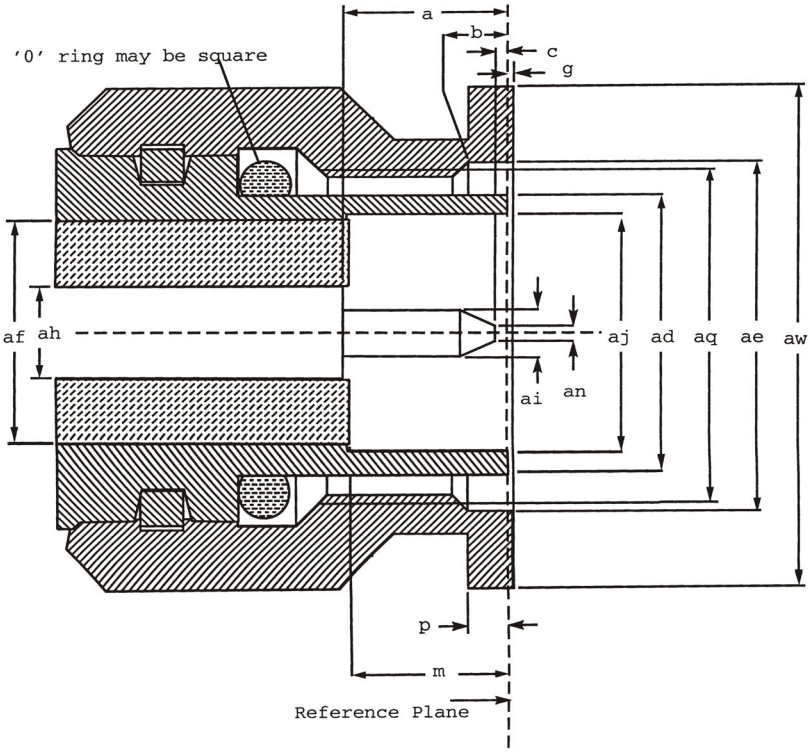


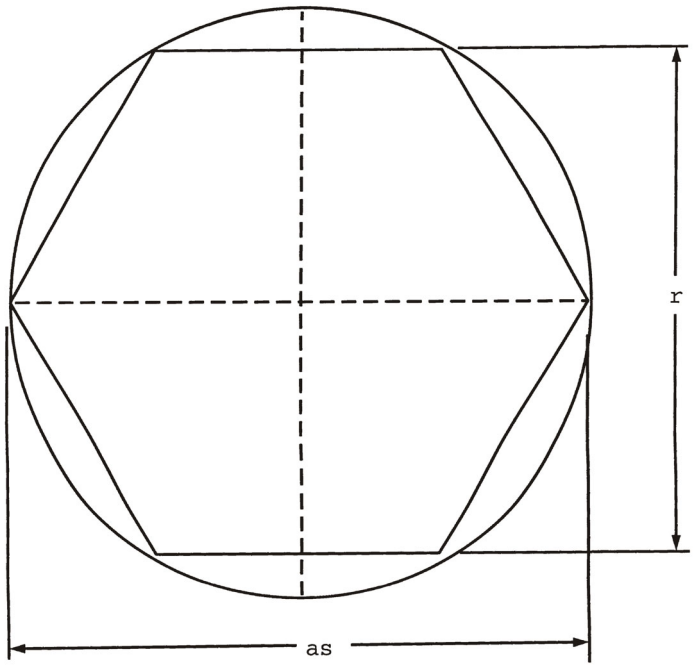
Symbols	Dimensions mm	
	Min	Max
ØA	12.95	13.05
ØB	15.9	16
C	-	25
D	2.5	3
E	9.15	9.45
F	1.8	2.2
ØH	0.9	1

NOTES:
1. 3 holes 120° apart on Ø13.8(+0.2 -0)mm

1.6.1 Interface Dimensions

Male Interface

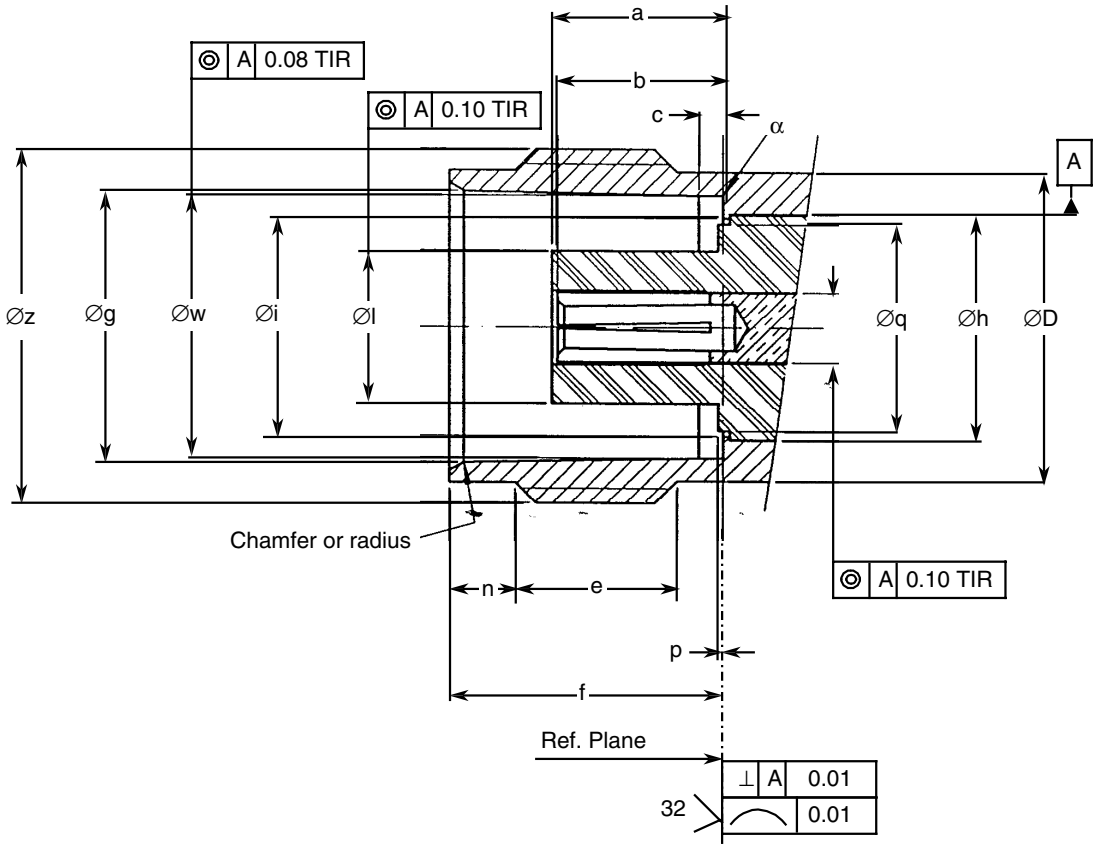




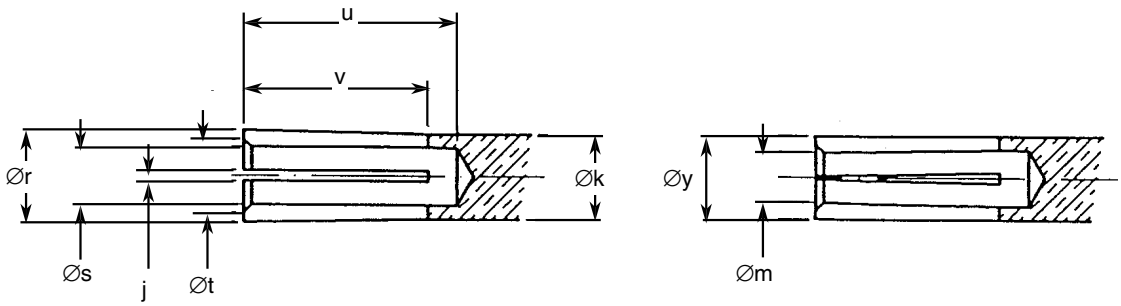
Symbols	Dimensions mm		Notes
	Min	Max	
a	5.35	5.5	
b	1.5	2.4	
c	0.35	0.9	
Ød	8.03	8.09	
Øe	11.4	11.6	
Øf	5.28	5.32	
g	-0.3	+0.55	
Øh	1.62	1.66	
Øj	6.18	6.22	
Øl	1.34	1.36	
m	5.28	5.38	
Øn	0.35	0.65	
p	1.5	2.4	
Øq	7/16-28UNEF-2B		
r	-	14	hexagon
Øs	-	16	
Øw	-	16	

1.6.2 Mating Gauge Dimensions

Female Interface



Detailed view of centre contact



Symbols	Dimensions mm		Notes
	Min	Max	
a	5.21	5.28	Contact recess
b	5.08	5.28	Insert recess
c	0.51	1.02	
∅D	9.6	9.68	
e	4.75	-	
f	8.36	8.46	
∅g	8.31	8.46	
∅h	6.99	7.01	
∅i	6.71	6.76	
j	0.26	0.34	4 slots /90° apart
∅k	2.16	2.18	
∅l	4.67	4.72	
∅m	1.21	1.3	After heat treatment
n	1.73	2.24	
p	0	0.15	
∅q	-	6.5	
∅r	2.45	2.48	
∅s	1.52	1.58	
∅t	1.68	1.88	90°
u	5.21	-	
v	4.75 typical		
∅w	8.1	8.15	
∅y	2.23	2.31	Mated with Ø1.36 pin, gauge over slotted portion only
∅z	7/16 - 28 UNEF - 2A		
α	-	0.1	Radius

1.7 MATERIALS AND FINISHES

Materials and finishes shall be as follows:

a. Shell: Amagnetic Stainless Steel, electro-passivated
b. Coupling Nut: Amagnetic Stainless Steel, electro-passivated
c. Centre Contact: Beryllium Copper, with nickel underplate (2µm minimum) and Gold plating (1.3µm minimum)
d. Inserts: PTFE
e. Gaskets: Silicone rubber

2. REQUIREMENTS

2.1 GENERAL

The complete requirements for procurement of the components specified herein are as stated in this specification and the ESCC Generic Specification. Permitted deviations from the Generic Specification, applicable to this specification only, are listed below.

Permitted deviations from the Generic Specification and this Detail Specification, formally agreed with specific Manufacturers on the basis that the alternative requirements are equivalent to the ESCC requirement and do not affect the component's reliability, are listed in the appendices attached to this specification.

2.1.1 Deviations from the Generic Specification

2.1.1.1 Deviations from Qualification and Periodic Tests - Chart F4

(a) Residual Magnetism: is not applicable

2.2 MARKING

The marking shall be in accordance with the requirements of ESCC Basic Specification No. 21700 and as follows.

The information to be marked on the component shall be:

(a) The ESCC qualified components symbol (for ESCC qualified components only).
(b) The ESCC Component Number.
(c) Traceability information.

2.3 COUPLING PROOF TORQUE TEST

Ref. Coupling Proof Torque in the ESCC Generic Specification.
Coupling Proof Torque: 339N.cm.

2.4 MATING AND UNMATING FORCES TEST

Ref. Mating and Unmating Forces in the ESCC Generic Specification.
Maximum Torque during mating or unmating: 22.6N.cm.

2.5 ELECTRICAL MEASUREMENTS AT ROOM, HIGH AND LOW TEMPERATURES

The measurements shall be performed at room, high and low temperatures.

2.5.1 Room Temperature Electrical Measurements

The measurements shall be performed at T_{amb}=+22 ±3°C.

Characteristics	Symbols	Test Method and Conditions	Limits		Units
			Min	Max	
Voltage Standing Wave Ratio	VSWR	ESCC No. 3403 f = 0 to 18GHz	-	Note 1	-
Resistance	R	DC test	47.5	52.5	Ω

NOTES:
1. The limits for VSWR are as specified in Component Type Variants and Range of Components.

2.5.2 High and Low Temperatures Electrical Measurements

The measurements shall be performed at T_{amb}=+125 (+0 -3) ˚C and T_{amb}=-55 (+3 -0) ˚C.

Characteristics	Symbols	Test Method and Conditions (Note 1)	Limits		Units
			Min	Max	
Temperature Coefficient of Resistance	TC_R	DC test Reference Temperature: 25˚C	-	3 x 10^{-4}	Ω/Ω/˚C

NOTES:
1. Measurements shall be performed during Screening Tests on a sample of 2 components. In the event of any failure a 100% inspection shall be performed.

2.6 PARAMETER DRIFT VALUES

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

The test methods and test conditions shall be as per the corresponding test defined in Room Temperature Electrical Measurements.

The drift values (Δ) shall not be exceeded for each characteristic where specified. The corresponding absolute limit values for each characteristic shall not be exceeded.

Characteristics	Symbols	Drift Value Δ	Units
Voltage Standing Wave Ratio	$\frac{\Delta VSWR}{VSWR}$	± 2	%
Resistance	Δ R	±250	mΩ

2.7 INTERMEDIATE AND END-POINT ELECTRICAL MEASUREMENTS

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

The test methods and test conditions shall be as per the corresponding test defined in Room Temperature Electrical Measurements.

The drift values (Δ) shall not be exceeded for each characteristic where specified. The corresponding

absolute limit values for each characteristic shall not be exceeded.

Test Reference per ESCC No. 3403	Characteristics	Symbols	Limits		Units
			Min	Max	
Vibration Initial Measurements	Resistance Voltage Standing Wave Ratio	R VSWR	47.5 Note 1	52.5 Note 1	Ω -
Measurements during last cycle	Intermittent contact	-	No discontinuity > 0.5ms No open or short circuit		-
Final Measurements	Resistance	R	47.5	52.5	Ω
	Resistance Drift (from initial measurement)	ΔR	-	±250	mΩ
	Voltage Standing Wave Ratio	VSWR	Note 1	Note 1	-
	VSWR Drift (from Initial measurement)	$\frac{\Delta VSWR}{VSWR}$	-	±2	%
Shock Initial Measurements	Resistance (Note 2) Voltage Standing Wave Ratio (Note 2)	R VSWR	47.5 Note 1	52.5 Note 1	Ω -
Final Measurements	Resistance	R	47.5	52.5	Ω
	Resistance Drift (from initial measurement)	ΔR	-	±250	mΩ
	Voltage Standing Wave Ratio	VSWR	Note 1	Note 1	-
	VSWR Drift (from Initial measurement)	$\frac{\Delta VSWR}{VSWR}$	-	±2	%
Rapid Change of Temperature Initial Measurements	Resistance Voltage Standing Wave Ratio	R VSWR	47.5 Note 1	52.5 Note 1	Ω -
Final Measurements	Resistance	R	47.5	52.5	Ω
	Resistance Drift (from initial measurement)	ΔR	-	±250	mΩ
	Voltage Standing Wave Ratio	VSWR	Note 1	Note 1	-
	VSWR Drift (from Initial measurement)	$\frac{\Delta VSWR}{VSWR}$	-	±2	%
Climatic Sequence Initial Measurements	Resistance (Note 2) Voltage Standing Wave Ratio (Note 2)	R VSWR	47.5 Note 1	52.5 Note 1	Ω -
Measurements during Dry Heat	Temperature Coefficient of Resistance	TC_R	-	3×10^{-4}	Ω/Ω/°C

Test Reference per ESCC No. 3403	Characteristics	Symbols	Limits		Units
			Min	Max	
Measurements during Cold	Temperature Coefficient of Resistance	TC_R	-	3×10^{-4}	Ω/Ω/°C
Final Measurements	Resistance	R	47.5	52.5	Ω
	Resistance Drift (from initial measurement)	ΔR	-	±250	mΩ
	Voltage Standing Wave Ratio	VSWR	Note 1	Note 1	-
	VSWR Drift (from Initial measurement)	$\frac{\Delta VSWR}{VSWR}$	-	±2	%
Operating Life Initial Measurements	Resistance (Note 2)	R	47.5	52.5	Ω
	Voltage Standing Wave Ratio (Note 2)	VSWR	Note 1	Note 1	-
Final Measurements	Resistance	R	47.5	52.5	Ω
	Resistance Drift (from initial measurement)	ΔR	-	±250	mΩ
	Voltage Standing Wave Ratio	VSWR	Note 1	Note 1	-
	VSWR Drift (from Initial measurement)	$\frac{\Delta VSWR}{VSWR}$	-	±2	%
RF Leakage	RF leakage f = 0 to 18GHz	E	-62	-	dBi
Peak Power					
Final Measurements	Resistance Voltage Standing Wave Ratio	R VSWR	47.5 Note 1	52.5 Note 1	Ω -

NOTES:

1. The limits for VSWR are as specified in Component Type Variants and Range of Component:
2. This test need not be repeated. The most recent result from the previous test may be used instead.

2.8 BURN-IN CONDITIONS

Characteristics	Symbols	Test Conditions	Units
Ambient Temperature	T_{amb}	+125	°C
Power	P_{in}	0	W

2.9 OPERATING LIFE CONDITIONS

Characteristics	Symbols	Test Conditions	Units
Ambient Temperature	T_{amb}	+25	^{o}C
Power	P_{in}	Note 1	W
Frequency	f_{in}	18	GHz

NOTES:

1. Rated RF Power as specified in Maximum Ratings.

LOAD,

RF, COAXIAL, TYPE SMA, DC - 22GHz

ESCC Detail Specification No. 3403/006

Issue 2 - DRAFT C	January 2006

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

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DCR No.	CHANGE DESCRIPTION
TBD	Specification upissued to incorporate editorial and technical changes per DCR

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1. GENERAL

1.1 SCOPE

This specification details the ratings, physical and electrical characteristics and test and inspection data for the component type variants and/or the range of components specified below. It supplements the requirements of, and shall be read in conjunction with, the ESCC Generic Specification listed under Applicable Documents.

1.2 APPLICABLE DOCUMENTS

The following documents form part of this specification and shall be read in conjunction with it:
(a) ESCC Generic Specification No. 3403.

1.3 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.

1.4 THE ESCC COMPONENT NUMBER AND COMPONENT TYPE VARIANTS

1.4.1 The ESCC Component Number

The ESCC Component Number shall be constituted as follows:
Example: 340300601

- Detail Specification Reference: 3403006
- Component Type Variant Number: 01 (as required)

1.4.2 Component Type Variants and Range of Components

The component type variants and range of components applicable to this specification are as follows:

Variant Number	Connector Type	VSWR	Weight max (g)
01	SMA Male	DC < f ≤ 4GHz ≤1.05 4 < f ≤ 12.4GHz ≤1.15 12.4 < f ≤ 18GHz ≤1.2 18 < f ≤22GHz ≤1.3	5

Variant Number	Connector Type	VSWR	Weight max (g)
02	SMA Female	DC < f ≤ 4GHz ≤1.05 4 < f ≤ 12.4GHz ≤1.15 12.4 < f ≤ 18GHz ≤1.2 18 < f ≤22GHz ≤1.25	5

1.5 MAXIMUM RATINGS

The maximum ratings shall not be exceeded at any time during use or storage.
Maximum ratings shall only be exceeded during testing to the extent specified in this specification and when stipulated in Test Methods and Procedures of the ESCC Generic Specification.

Characteristics	Symbols	Maximum Ratings	Units	Remarks
RF Power	P_{RF}	1	W	Note 1
Peak Power	P_P	100	W	duration 1µs 1% duty cycle
DC Power	P_{DC}	1	W	T_{amb}=+25˚C
Impedance	Z	47.5 to 52.5	Ω	-
Frequency Range	f_{op}	DC to 22	GHz	-
RF Leakage	E	-85	dBi	-
Operating Temperature Range	T_{op}	-55 to +125	˚C	T_{amb}
Storage Temperature Range	T_{stg}	-55 to +125	˚C	-
Coupling Nut Torque	Tq	120	N.cm	Note 2

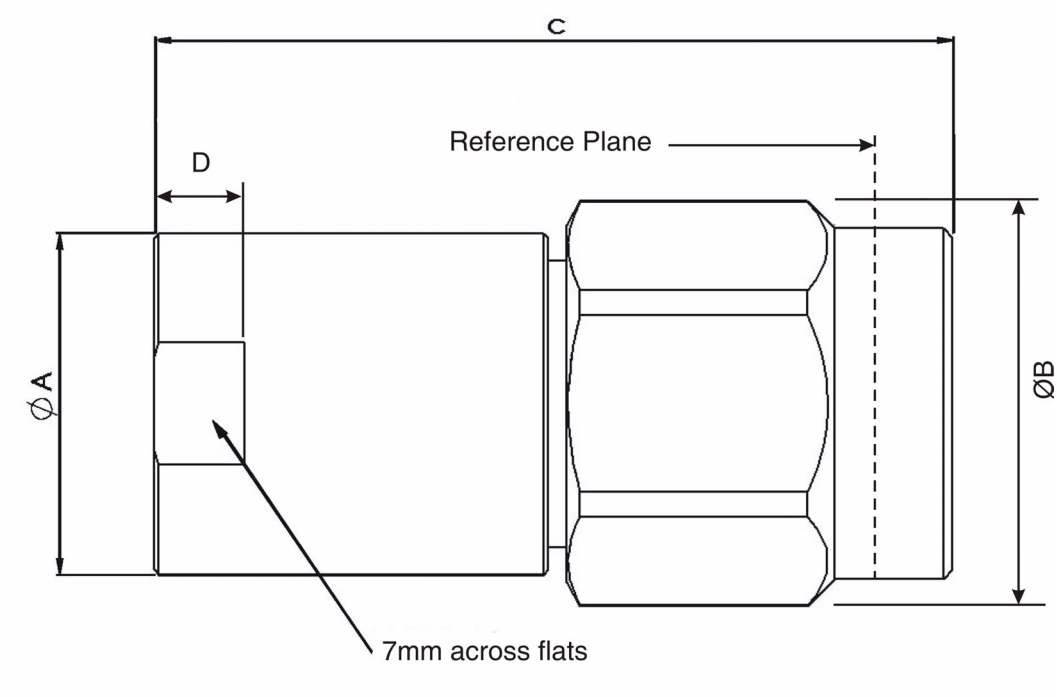
NOTES:

1. RF Power shall be derated against operating temperature as follows:
   P_{RF} at T_{op} ≤ +25˚C. Derate linearly to 500mW at T_{op} = +125˚C.

2. Coupling Proof Torque: 170N.cm

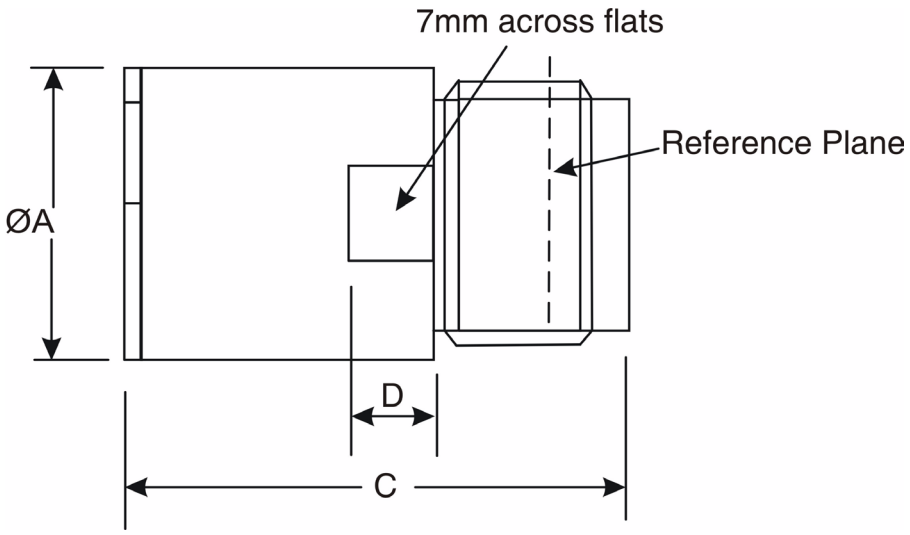
1.6 PHYSICAL DIMENSIONS

1.6.1 SMA Male Load



Symbols	Dimensions mm	
	Min	Max
ØA	-	7.7
ØB	8.5	9.5
C	-	16.5
D	1.9	2.3

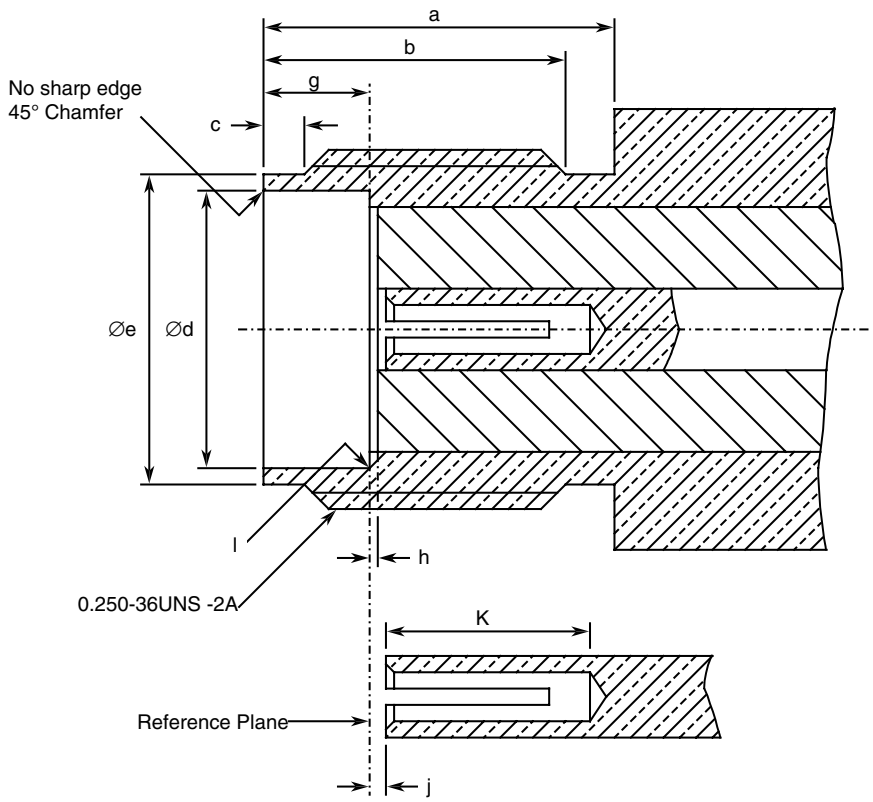
1.6.2 SMA Female Load



Symbols	Dimensions mm	
	Min	Max
ØA	-	7.7
C	-	14.3
D	1.9	2.3

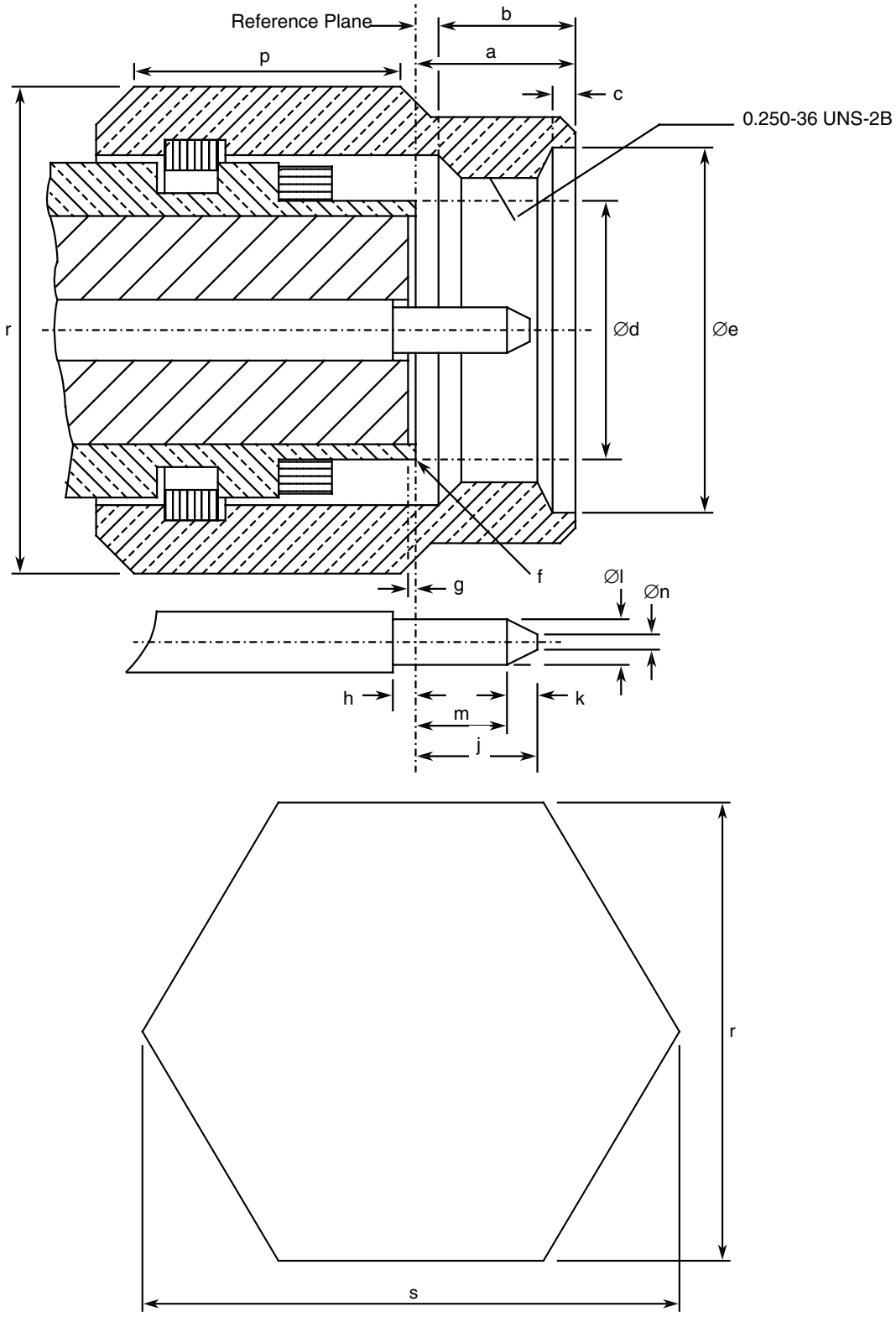
1.6.3 Interface Dimensions

Female Interface



Symbols	Dimensions mm		Notes
	Min	Max	
a	5.54	-	
b	4.32	-	
c	0.38	1.14	
Ød	4.597	4.67	
Øe	5.28	5.49	
g	1.88	1.98	
h	0	0.2	
j	0	0.25	
k	2.92	-	
l	-	0.04	Radius

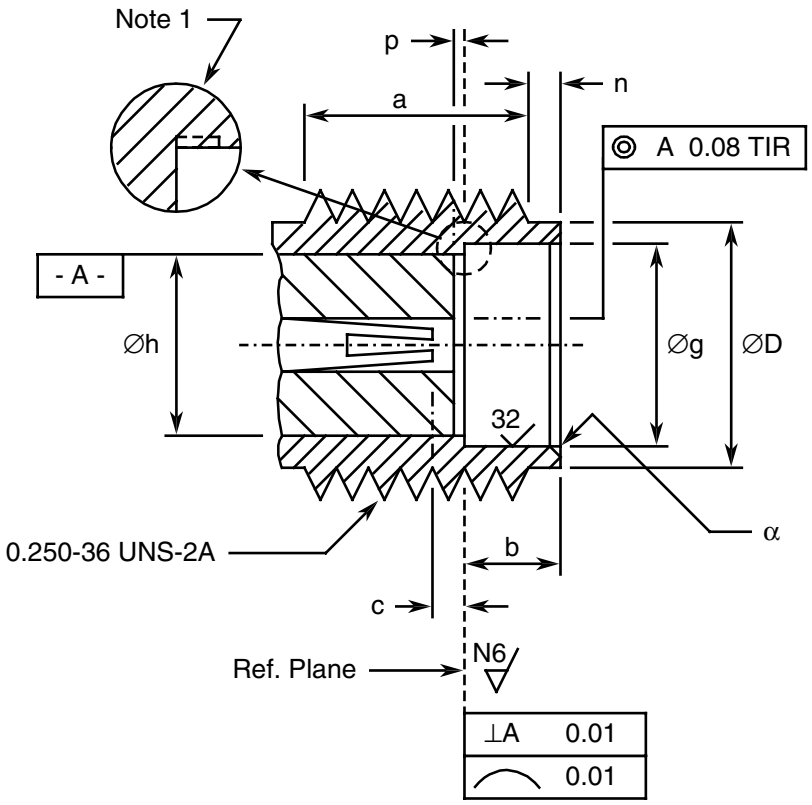
Male Interface



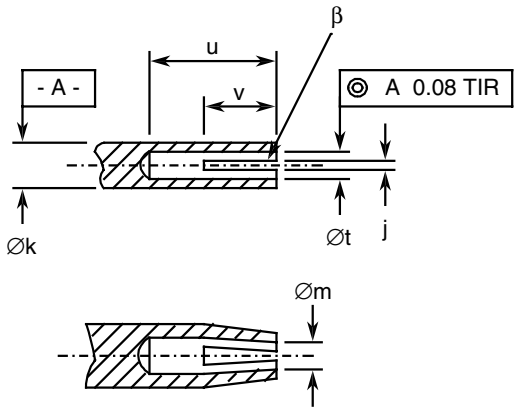
Symbols	Dimensions mm		Notes
	Min	Max	
a	-	3.43	
b	2.54	-	
c	0.38	1.14	
∅d	-	4.592	
∅e	6.35	-	
f	-	0.08	Radius or 45° chamfer
g	0	0.2	
h	0	0.25	
j	-	2.54	
k	0.38	-	
∅l	0.9	0.94	
m	1.27	-	
∅n	-	0.38	
p	3.17	-	
r	7.84	8	Hexagon
s	-	9.2	

1.6.4 Mating Gauge Dimensions

Female Interface



Detailed view of centre contact

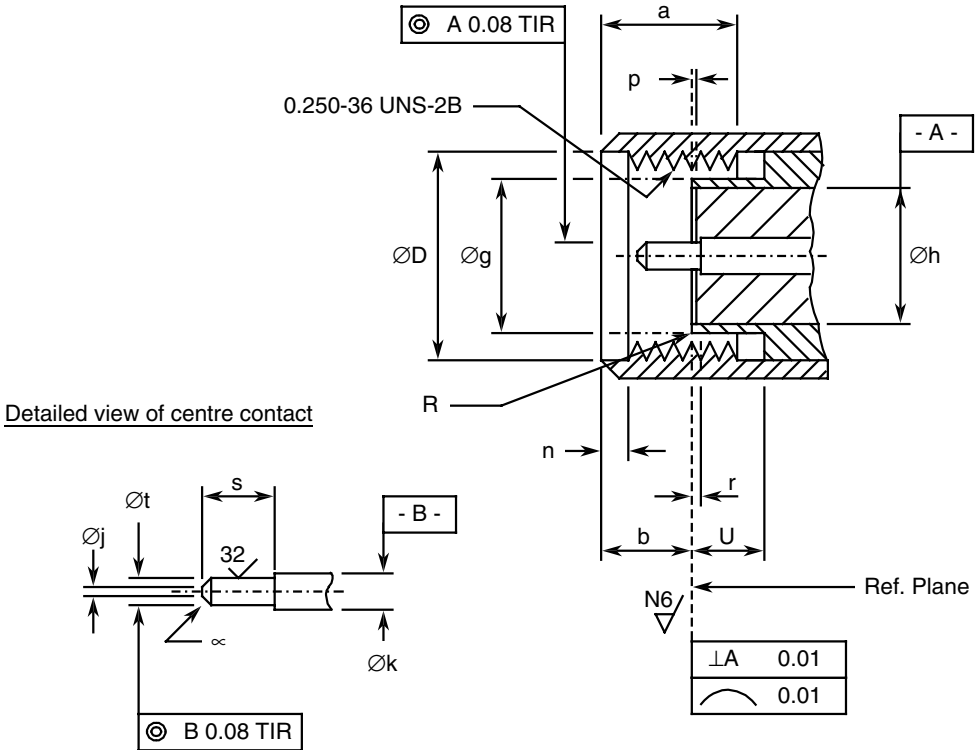


Symbols	Dimensions mm		Notes
	Min	Max	
a	3.81	-	
b	1.88	1.98	
c	0	0.08	Contact recess
∅D	5.28	5.49	
∅g	4.6	4.67	
∅h	4.1	4.13	
j	0.13	0.23	2 or more slots
∅k	1.27	1.29	
∅m	0.72	0.84	After closing
n	0.38	1.14	
p	0	0.05	Insert recess
u	2.54	-	
∅t	0.94	0.99	
v	1.91	2.41	
α	-	0.25	45° Chamfer
β	0.99	1.19	45° Chamfer

NOTES:

1. No fillet permitted. Radial undercut 0.2mm maximum deep x 0.89mm maximum long permitted.

Male Interface



Symbols	Dimensions mm		Notes
	Min	Max	
a	3.71	4.32	
b	2.59	3.35	
ØD	6.48	6.73	
Øg	4.34	4.59	
Øh	4.1	4.13	
Øj	-	0.38	Flat
Øk	1.27	1.29	
n	0.64	1.14	
p	0	0.05	Insert recess
r	0	0.08	Contact recessed
R	-	0.08	Radius
s	2.03	2.29	
Øt	0.9	0.93	
U	2.03	-	
α	-	-	45 ± 3° Chamfer

1.7 MATERIALS AND FINISHES

Materials and finishes shall be as follows:

a. Shell: Amagnetic Stainless Steel, electro-passivated
b. Coupling Nut: Amagnetic Stainless Steel, electro-passivated
c. Centre Contact: Beryllium Copper, with nickel underplate (2µm minimum) and Gold plating (1.3µm minimum)
d. Inserts: PTFE
e. Gaskets: Silicone rubber.

2. REQUIREMENTS

2.1 GENERAL

The complete requirements for procurement of the components specified herein are as stated in this specification and the ESCC Generic Specification. Permitted deviations from the Generic Specification, applicable to this specification only, are listed below.

Permitted deviations from the Generic Specification and this Detail Specification, formally agreed with specific Manufacturers on the basis that the alternative requirements are equivalent to the ESCC requirement and do not affect the component's reliability, are listed in the appendices attached to this specification.

2.1.1 Deviations from the Generic Specification

2.1.1.1 Deviations from Qualification and Periodic Tests - Chart F4

(a) Residual Magnetism: is not applicable

2.2 MARKING

The marking shall be in accordance with the requirements of ESCC Basic Specification No. 21700 and as follows.

The information to be marked on the component shall be:

(a) The ESCC qualified components symbol (for ESCC qualified components only).
(b) The ESCC Component Number.
(c) Traceability information.

2.3 CONTACT ENGAGEMENT AND SEPARATION FORCES TEST

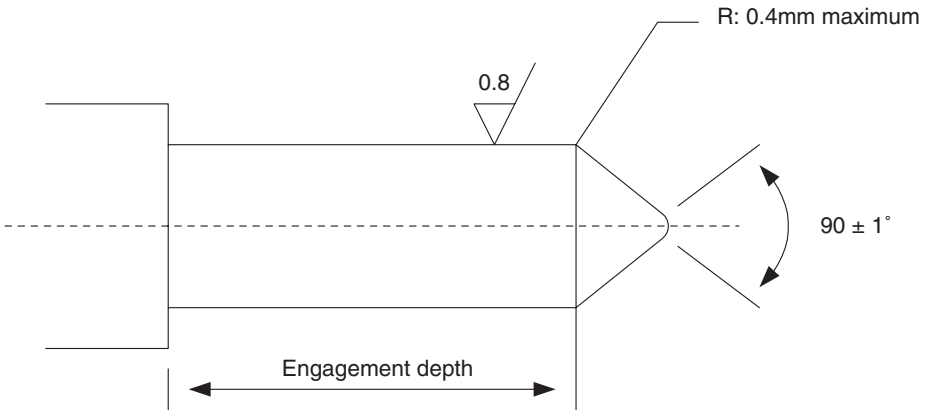
Ref. Contact Engagement and Separation Forces in the ESCC Generic Specification.

a) Oversize Test Pin
Pin diameter : 0.9525/0.955mm
Insertion depth : 0.76/1.14mm

b) Maximum Diameter Test Pin
Pin diameter : 0.94/0.942mm
Engagement depth : 1.27/1.91mm
Engagement force: 1360g maximum.

c) Minimum Diameter Test Pin
Pin diameter : 0.902/0.904mm

Seperation depth: 1.27/1.91mm
Separation force: 28.4g minimum.



2.4 COUPLING PROOF TORQUE TEST
Ref. Coupling Proof Torque in the ESCC Generic Specification.
Coupling Proof Torque: 170N.cm.

2.5 MATING AND UNMATING FORCES TEST
Ref. Mating and Unmating Forces in the ESCC Generic Specification.
Maximum Torque during mating or unmating: 24N.cm.

2.6 ELECTRICAL MEASUREMENTS AT ROOM, HIGH AND LOW TEMPERATURES
The measurements shall be performed at room, high and low temperatures.

2.6.1 Room Temperature Electrical Measurements
The measurements shall be performed at T_{amb}=+22 ±3°C.

Characteristics	Symbols	Test Method and Conditions	Limits		Units
			Min	Max	
Voltage Standing Wave Ratio	VSWR	ESCC No. 3403 f = 0 to 22GHz	-	Note 1	-
Resistance	R	DC test	47.5	52.5	Ω

NOTES:
1. The limits for VSWR are as specified in Component Type Variants and Range of Components.

2.6.2 High and Low Temperatures Electrical Measurements
The measurements shall be performed at T_{amb}=+125 (+0 -3) ˚C and T_{amb}=-55 (+3 -0) ˚C.

Characteristics	Symbols	Test Method and Conditions (Note 1)	Limits		Units
			Min	Max	
Temperature Coefficient of Resistance	TC_R	DC test Reference Temperature: 25˚C	-	3×10^{-4}	Ω/Ω/˚C

NOTES:

1. Measurements shall be performed during Screening Tests on a sample of 2 components. In the event of any failure a 100% inspection shall be performed.

2.7 PARAMETER DRIFT VALUES

Unless otherwise specified, the measurements shall be performed at T_{amb}=+22 ±3°C.
The test methods and test conditions shall be as per the corresponding test defined in Room Temperature Electrical Measurements.
The drift values (Δ) shall not be exceeded for each characteristic where specified. The corresponding absolute limit values for each characteristic shall not be exceeded.

Characteristics	Symbols	Drift Value Δ	Units
Voltage Standing Wave Ratio	$\frac{\Delta VSWR}{VSWR}$	± 2	%
Resistance	Δ R	±250	mΩ

2.8 INTERMEDIATE AND END-POINT ELECTRICAL MEASUREMENTS

Unless otherwise specified, the measurements shall be performed at T_{amb}=+22 ±3°C.
The test methods and test conditions shall be as per the corresponding test defined in Room Temperature Electrical Measurements.
The drift values (Δ) shall not be exceeded for each characteristic where specified. The corresponding absolute limit values for each characteristic shall not be exceeded.

Test Reference per ESCC No. 3403	Characteristics	Symbols	Limits		Units
			Min	Max	
Vibration Initial Measurements	Resistance Voltage Standing Wave Ratio	R VSWR	47.5 Note 1	52.5 Note 1	Ω -
Measurements during last cycle	Intermittent contact	-	No discontinuity > 0.5ms No open or short circuit		-
Final Measurements	Resistance	R	47.5	52.5	Ω
	Resistance Drift (from initial measurement)	ΔR	-	±250	mΩ
	Voltage Standing Wave Ratio	VSWR	Note 1	Note 1	-
	VSWR Drift (from Initial measurement)	$\frac{\Delta VSWR}{VSWR}$	-	±2	%

Test Reference per ESCC No. 3403	Characteristics	Symbols	Limits		Units
			Min	Max	
Shock Initial Measurements	Resistance (Note 2) Voltage Standing Wave Ratio (Note 2)	R VSWR	47.5 Note 1	52.5 Note 1	Ω -
Final Measurements	Resistance	R	47.5	52.5	Ω
	Resistance Drift (from initial measurement)	ΔR	-	±250	mΩ
	Voltage Standing Wave Ratio	VSWR	Note 1	Note 1	-
	VSWR Drift (from Initial measurement)	$\frac{\Delta VSWR}{VSWR}$	-	±2	%
Rapid Change of Temperature Initial Measurements	 Resistance Voltage Standing Wave Ratio	 R VSWR	 47.5 Note 1	 52.5 Note 1	 Ω -
Final Measurements	Resistance	R	47.5	52.5	Ω
	Resistance Drift (from initial measurement)	ΔR	-	±250	mΩ
	Voltage Standing Wave Ratio	VSWR	Note 1	Note 1	-
	VSWR Drift (from Initial measurement)	$\frac{\Delta VSWR}{VSWR}$	-	±2	%
Climatic Sequence Initial Measurements	 Resistance (Note 2) Voltage Standing Wave Ratio (Note 2)	 R VSWR	 47.5 Note 1	 52.5 Note 1	 Ω -
Measurements during Dry Heat	Temperature Coefficient of Resistance	TC_R	-	3×10^{-4}	Ω/Ω/°C
Measurements during Cold	Temperature Coefficient of Resistance	TC_R	-	3×10^{-4}	Ω/Ω/°C
Final Measurements	Resistance	R	47.5	52.5	Ω
	Resistance Drift (from initial measurement)	ΔR	-	±250	mΩ
	Voltage Standing Wave Ratio	VSWR	Note 1	Note 1	-
	VSWR Drift (from Initial measurement)	$\frac{\Delta VSWR}{VSWR}$	-	±2	%
Operating Life Initial Measurements	Resistance (Note 2) Voltage Standing Wave Ratio (Note 2)	R VSWR	47.5 Note 1	52.5 Note 1	Ω -
Final Measurements	Resistance	R	47.5	52.5	Ω

Test Reference per ESCC No. 3403	Characteristics	Symbols	Limits		Units
			Min	Max	
	Resistance Drift (from initial measurement)	ΔR	-	±250	mΩ
	Voltage Standing Wave Ratio	VSWR	Note 1	Note 1	-
	VSWR Drift (from Initial measurement)	$\frac{\Delta VSWR}{VSWR}$	-	±2	%
RF Leakage	RF leakage f = 0 to 22GHz	E	-85	-	dBi
Peak Power Final Measurements	 Resistance Voltage Standing Wave Ratio	 R VSWR	 47.5 Note 1	 52.5 Note 1	 Ω -

NOTES:
1. The limits for VSWR are as specified in Component Type Variants and Range of Component:
2. This test need not be repeated. The most recent result from the previous test may be used instead.

2.9 BURN-IN CONDITIONS

Characteristics	Symbols	Test Conditions	Units
Ambient Temperature	T_{amb}	+125	°C
Power	P_{in}	0	W

2.10 OPERATING LIFE CONDITIONS

Characteristics	Symbols	Test Conditions	Units
Ambient Temperature	T_{amb}	+25	°C
Power	P_{in}	Note 1	W
Frequency	f_{in}	18	GHz

NOTES:
1. Rated RF Power as specified in Maximum Ratings.