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**RF COAXIAL CONNECTORS, TNC,  
VERY HIGH POWER, 50 OHMS,  
ADAPTORS**

**BASED ON TYPE TNC-VHP**

**ESCC Detail Specification No. 3402/028**

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DCR No.	CHANGE DESCRIPTION
<a href="#">1581</a>	Specification upissued to incorporate changes per DCR.

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## 1 GENERAL

### 1.1 SCOPE

This specification details the ratings, physical and electrical characteristics, test and inspection data for RF Coaxial Connectors, Type TNC-VHP, 50 Ohms, Adaptors. 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, specific electrical, mechanical and other relevant 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

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 Figure 2.

### 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 2.

**TABLE 1(a) – TYPE VARIANTS**

Variant Number	Description (1)
01	Straight Adaptor, Male-to-Male
02	Straight Adaptor, Male-to-Female
03	Straight Adaptor, Female-to-Female
04	Right Angle Adaptor, Male-to-Male
05	Right Angle Adaptor, Male-to-Female
06	Right Angle Adaptor, Female-to-Female

**NOTES:**

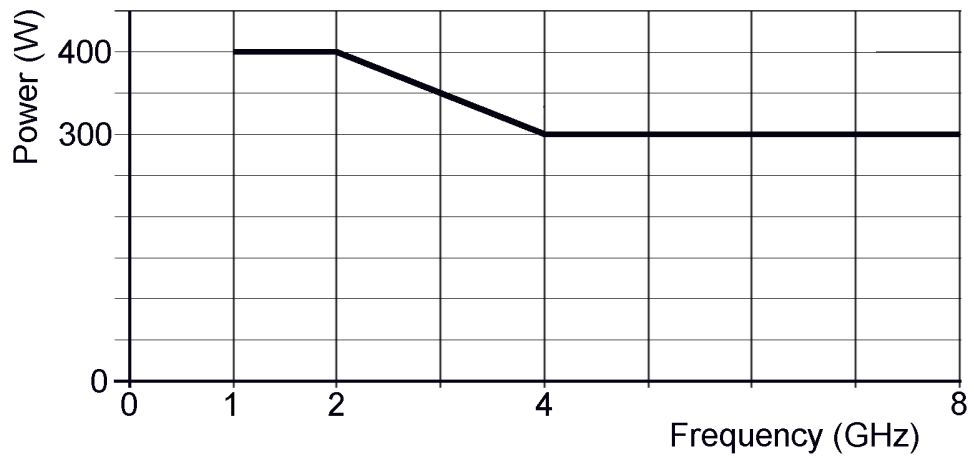
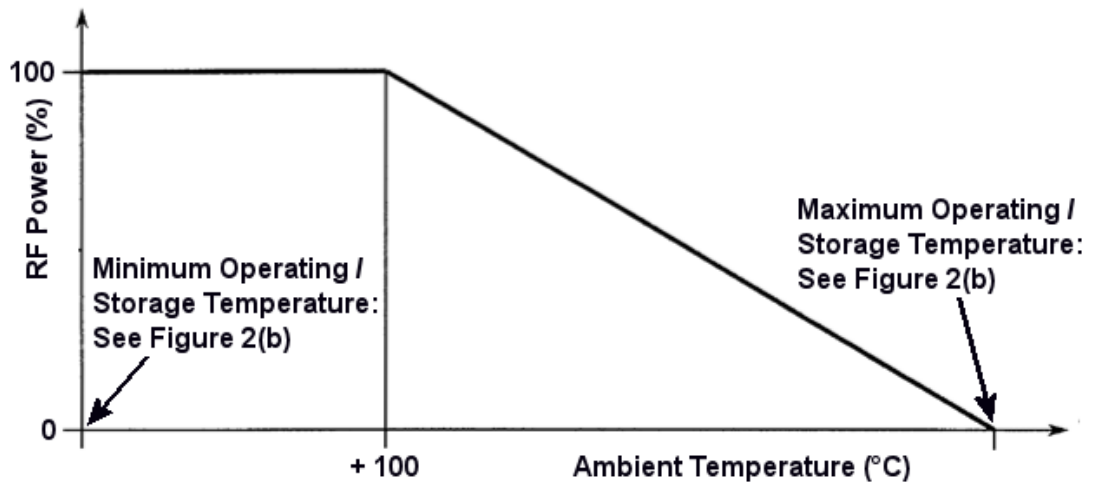
1. The Variants are described in Figure 2(b).

**TABLE 1(b) - MAXIMUM RATINGS**

Characteristics	Symbols	Maximum Ratings	Units	Remarks
RF Power (Continuous)	$P_{rf}$	400	W	Notes 1, 2, 3
Nominal Impedance	Z	50	$\Omega$	-
Operating Frequency Range	f	DC to 8	GHz	-
Operating Voltage	$V_{op}$	500	Vrms	-
Corona Level	$P_{co}$	120	W	RF power level without corona breakdown
Operating Temperature Range	$T_{op}$	See Figure 2(b)	$^{\circ}C$	$T_{amb}$
Storage Temperature Range	$T_{stg}$	As per Operating Temperature Range	$^{\circ}C$	-

**NOTES:**

1. Derating with pressure is not required for  $\leq 1.5mPa$ .
2. At  $f = 2GHz$ . For  $f > 2GHz$ , derate as shown in Figure 1(a). Load VSWR is better than 1.3.
3. At  $T_{amb} = +100^{\circ}C$ . For  $T_{amb} > +100^{\circ}C$ , derate as shown in Figure 1(b). For operation under vacuum,  $T_{amb}$  shall be the temperature of the equipment the component is mounted on.

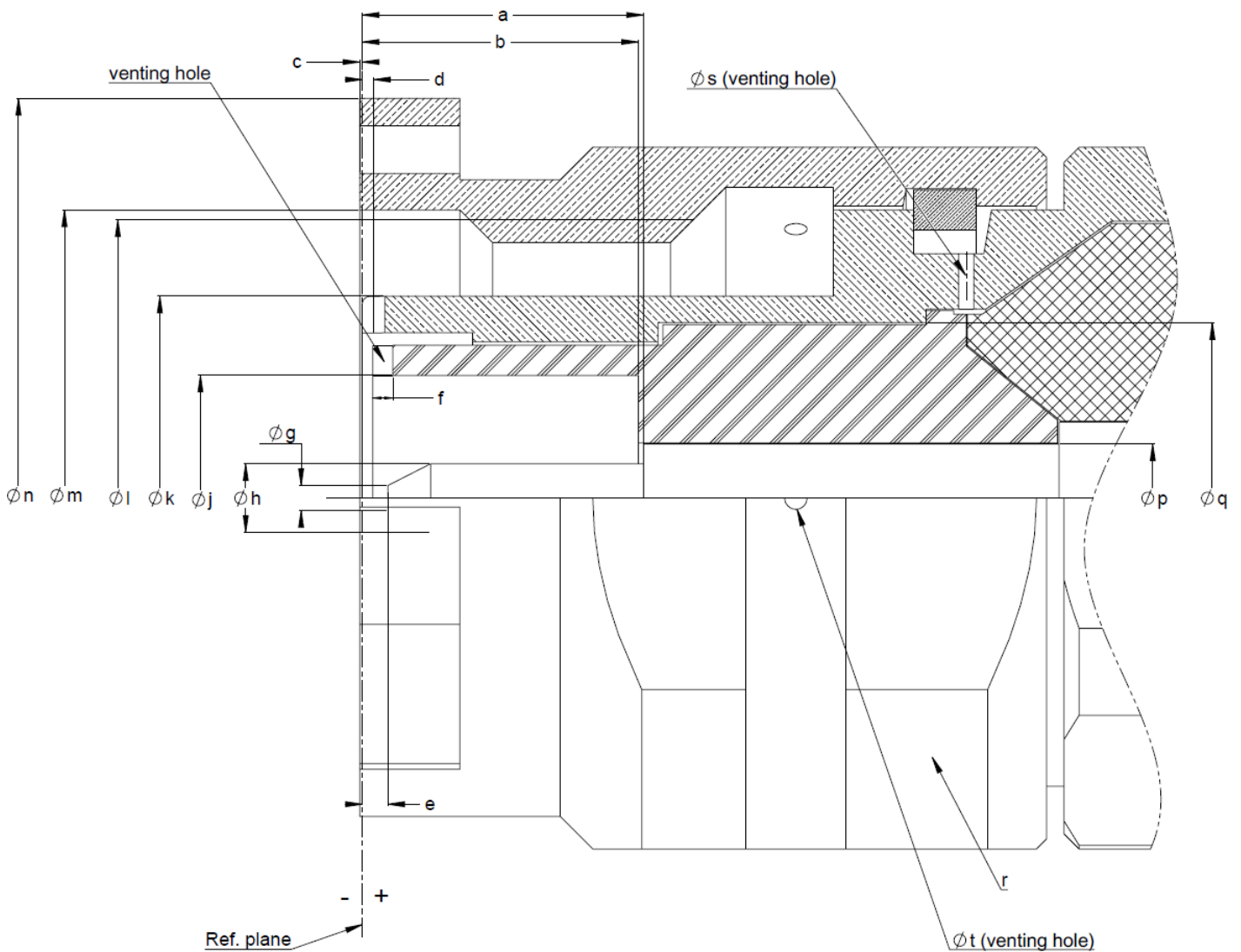
**FIGURE 1 - PARAMETER DERATING INFORMATION****FIGURE 1(a) - POWER VERSUS FREQUENCY****FIGURE 1(b) - RF POWER VERSUS AMBIENT TEMPERATURE**



**FIGURE 2 – PHYSICAL DIMENSIONS**

**FIGURE 2(a) – INTERFACE AND MATING GAUGE DIMENSIONS**

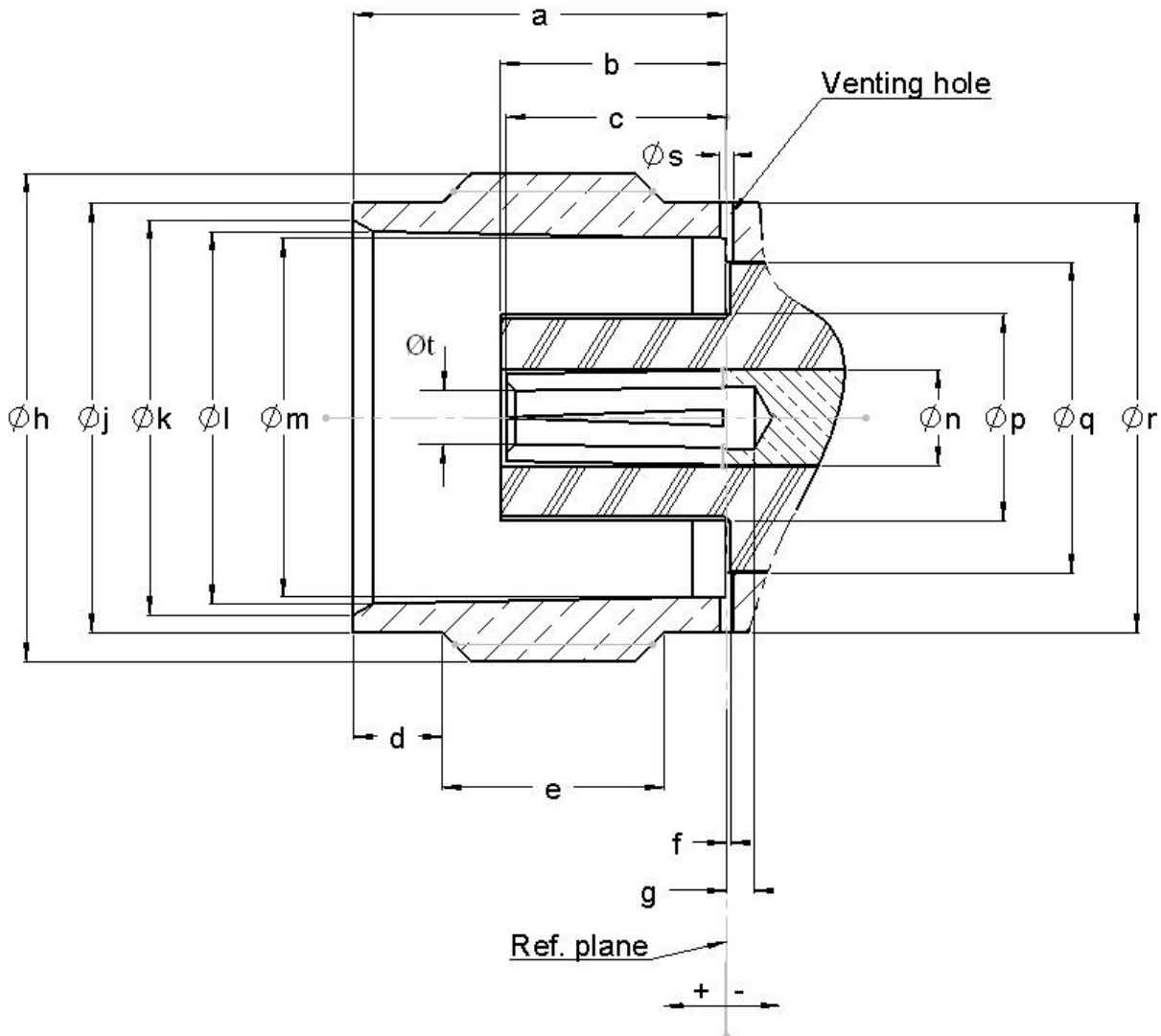
**TNC MALE INTERFACE**



Symbols	Dimensions (mm)		Remarks
	Min	Max	
a	5.35	5.85	
b	5.42	5.78	
c	+0.3	-0.55	
d	0.15	0.45	
e	0.1	0.9	
f	0.35 x 0.35	0.45 x 0.45	Venting hole
Øg	0.35	0.65	
Øh	1.32	1.37	
Øj	4.88	4.92	

Symbols	Dimensions (mm)		Remarks
	Min	Max	
Øk	8.03	8.09	
Øl	7/16-28 UNEF-2B		
Øm	11.4	11.6	
Øn	-	16	
Øp	2.14	2.18	
Øq	6.975	7.025	
r	-	14	Square
Øs	0.25	0.35	Venting hole
Øt	0.4	0.5	Venting hole

TNC FEMALE INTERFACE



Symbols	Dimensions (mm)		Remarks
	Min	Max	
a	8.36	8.46	
b	4.97	5.23	
c	4.72	5.22	
d	1.8	2.2	
e	4.75	5.25	
f	-0.1	+0.05	
g	0.08	1.18	
Øh	7/16-28 UNEF-2A		
Øj	9.61	9.68	

Symbols	Dimensions (mm)		Remarks
	Min	Max	
Øk	8.8	9	
Øl	8.32	8.46	
Øm	8.1	8.15	
Øn	2.14	2.18	
Øp	4.62	4.72	
Øq	6.975	7.025	
Ør	9.61	9.68	
Øs	0.25	0.35	Venting hole
Øt	1.4	1.45	

## 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) ESCC Generic Specification No. [3408](#) for RF Cable Assemblies.

## 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 I-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 Tests (Chart III)**

Not applicable.

#### 4.2.4 **Deviations from Qualification Tests (Chart IV)**

- (a) The following additional subgroup test sequence shall be performed on a mated pair of connectors during Qualification Tests; no failures are allowed:
  - i. Multipaction: Para. 4.3.9
  - ii. RF Power Handling: Para. 4.3.10.
  - iii. Corona: Para. 4.3.11.
  - iv. External Visual Inspection: Para. 9.8 of the Generic Specification.
- (b) Para. 9.17, Corona Level: shall not be performed.

#### 4.2.5 Deviations from Lot Acceptance Tests (Chart V)

The following additional subgroup test sequence shall be performed on a mated pair of connectors during Lot Acceptance Tests as part of the Environmental/Mechanical Subgroup; no failures are allowed:

- (a) Multipaction: Para. 4.3.9.
- (b) RF Power Handling: Para. 4.3.10.
- (c) Corona: Para. 4.3.11.
- (d) External Visual Inspection: Section 9 of the Generic Specification.

**NOTE:**

Testing per this additional subgroup is not required to be performed on ESCC qualified components if there is no change in the material, process and design of the component since initial qualification, subject to technical justification being provided by the Manufacturer and agreed by the ESCC Executive.

### 4.3 ENVIRONMENTAL, MECHANICAL AND ENDURANCE REQUIREMENTS

#### 4.3.1 Dimension Check

The applicable test requirements are specified in Section 9 of ESCC Generic Specification No. [3402](#). The dimensions of the connectors specified herein shall conform to those shown in Figures 2(a) and 2(b) of this specification.

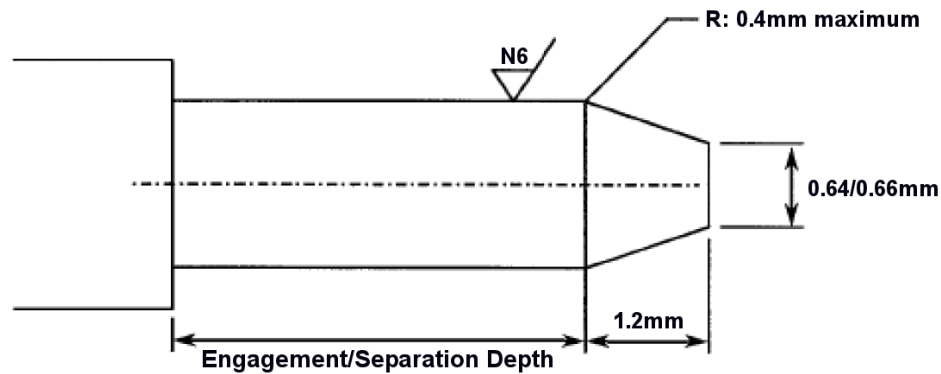
#### 4.3.2 Weight

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

#### 4.3.3 Contact Engagement and Separation Forces

The applicable test requirements are specified in Section 9 of ESCC Generic Specification No. [3402](#). For female contacts, the following details shall apply:

- (a) Oversize Test Pin (See Figure 3):
  - Steel test pin diameter: 1.384/1.388mm
  - Insertion depth: 2/2.5mm
  - Number of insertions: 3
- (b) Maximum Diameter Test Pin (See Figure 3):
  - Steel test pin diameter: 1.372/1.376mm
  - Engagement depth: 3/3.5mm
  - Engagement force:  $\leq 9\text{N}$
- (c) Minimum Diameter Test Pin (See Figure 3):
  - Steel test pin diameter: 1.308/1.321mm
  - Separation depth: 3/3.5mm
  - Separation force:  $\geq 0.56\text{N}$

**FIGURE 3 – TEST PINS CONFIGURATION****4.3.4 Coupling Proof Torque**

The applicable test requirements are specified in Section 9 of ESCC Generic Specification No. 3402. The applied torque shall be 339N.cm.

**4.3.5 Mating and Unmating Forces**

The applicable test requirements are specified in Section 9 of ESCC Generic Specification No. 3402. The maximum torque during mating and unmating shall not exceed 22.6N.cm.

Whenever a test is performed on mated pairs of connectors, the pairs shall be torqued at 265N.cm.

**4.3.6 Centre 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).

**4.3.7 Endurance**

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

- Number of cycles: 500 for Qualification Tests (Chart IV); 100 for Lot Acceptance Tests (Chart V).
- Rate: 12 cycles/minute maximum.

**4.3.8 Residual Magnetism**

The applicable test requirements are specified in Section 9 of ESCC Generic Specification No. 3402. The residual magnetism shall not exceed 20 gamma.

**4.3.9 Multipaction**

Multipaction shall be performed as specified in Section 8 of ESCC Generic Specification No. 3408. The multipaction classification applicable to these components is type 2. The test requirements are specified in Figure 2(b) herein.

**4.3.10 RF Power Handling**

RF Power Handling shall be performed as specified in Section 8 of ESCC Generic Specification No. 3408. The following test conditions shall apply:

- (a) Test temperature:  $T_{amb} = +100^{\circ}\text{C}$ .

**4.3.11 Corona**

Corona shall be performed as specified in Section 8 of ESCC Generic Specification No. 3408. The test requirements are specified in Figure 2(b) herein.

#### 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 Material and Plating

- (a) Shell:
  - Material: Beryllium copper
  - Plating: Gold 2.5µm, over copper 2.5µm
- (b) Centre Contact:
  - Material: Brass (Male Contacts); beryllium copper (Female Contacts)
  - Plating: Gold 2.5µm, over copper 2.5µm
- (c) Coupling nut:
  - Material: Beryllium copper
  - Plating: Silver 5µm
- (d) Insert:
  - Material: PTFE and Fluoroloy H

#### 4.5 MARKING

##### 4.5.1 General

The marking of all components delivered to this specification shall be in accordance with the requirements of ESCC Basic Specification No. [21700](#) and the following paragraphs. Each component shall be marked in respect of:

- (a) The ESCC qualified components symbol (for ESCC qualified components only).
- (b) The ESCC Component Number.
- (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: 340202801B

- Detail Specification Number: 3402028
- Type Variant (see Table 1(a)): 01 (as required)
- Testing Level: B

##### 4.5.3 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  $T_{amb} = +22 \pm 3^{\circ}C$ .

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

Characteristics	Symbols	Test Method and Conditions	Limits		Units
			Min.	Max.	
Insulation Resistance	R <sub>I</sub>	ESCC No. 3402 500Vdc	5000	-	MΩ
Voltage Proof (Dielectric Withstanding Voltage)	V <sub>P</sub>	ESCC No. 3402	Figure 2(b)	-	V
Voltage Proof Leakage Current	I <sub>VPL</sub>	ESCC No. 3402 Note 1	-	2	mA

**NOTES:**

1. Measured during Voltage Proof.

**TABLES 3, 4 AND 5**

Not applicable.

4.7 ENVIRONMENTAL, MECHANICAL AND ENDURANCE TESTS

4.7.1 Measurements and Inspections on Completion of Environmental, Mechanical and Endurance Tests

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

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

ESCC Generic Spec. No. 3402		Measurements and Inspections		Symbols	Limits		Units
Environmental, Mechanical and Endurance Test (1)	Test Method and Conditions	Identification	Conditions		Min.	Max.	
Contact Resistance	Para. 9.9	Contact Resistance	Centre Contact (20mV 10mA)	-	-	1.5	mΩ
			Shell (20mV 10mA)	-	-	0.7	mΩ
Vibration During last cycles	Para 9.10	Monitor Contacts	-	-	No intermittent contact, open or short circuit		-
Final Measurements		Contact Resistance Visual Examination	Centre Contact (20mV 10mA)	-	-	1.5	mΩ
			-	-	-	-	-
Shock or Bump	Para. 9.11	Contact Resistance Visual Examination	Centre Contact (20mV 10mA)	-	-	1.5	mΩ
			-	-	-	-	-
Rapid Change of Temperature	Para. 9.12	After recovery					
		Contact Resistance	Centre Contact (20mV 10mA)	-	-	1.5	mΩ
		Voltage Proof	Table 2	V <sub>P</sub>	Table 2	-	-
		Voltage Proof Leakage Current	Table 2	I <sub>VPL</sub>	-	Table 2	-
Visual Examination		-	-	-	-	-	

ESCC Generic Spec. No. 3402		Measurements and Inspections		Symbols	Limits		Units	
Environmental, Mechanical and Endurance Test (1)	Test Method and Conditions	Identification	Conditions		Min.	Max.		
Climatic Sequence Low Air Pressure	Para. 9.13	Voltage Proof	150Vrms at 44mbar		No Breakdown or flashover		-	
Final Measurements		After recovery						
		Insulation Resistance	Table 2		R <sub>i</sub>	Table 2	-	-
		Voltage Proof	Table 2		V <sub>P</sub>	Table 2	-	-
		Voltage Proof Leakage Current	Table 2		I <sub>VPL</sub>	-	Table 2	-
	External Visual Inspection		ESCC No. 3402	-	-	-	-	
Coupling Proof Torque	Para. 9.4 and Para. 4.3.4 of this spec.	Interface Dimensions	-	-	Figure 2(a)		-	
		Visual Examination	-	-	-	-	-	
Mating/Unmating Forces	Para. 9.5	Torque	Para. 4.3.5	-	-	Para. 4.3.5	-	
Seal Test	Para. 9.7	Not applicable	Not applicable	-	-	-	-	
External Visual Inspection	Para. 9.8	External Visual Inspection	ESCC No. 3402	-	-	-	-	
VSWR or Reflection Coefficient	Para. 9.16	VSWR	-	-	Figure 2(b)		-	
RF Insertion Loss	Para. 9.19	Insertion Loss	-	-	Figure 2(b)		-	
Endurance	Para 9.18 and Para. 4.3.7 of this spec.	Mating/Unmating Forces	Para. 4.3.5	-	-	Para. 4.3.5	-	
		Contact Resistance	Centre Contact (20mV 10mA)	-	-	2	mΩ	
			Shell (20mV 10mA)	-	-	2	mΩ	
	Visual Examination	-	-	-	-	-		
Corrosion	Para. 9.20	Visual Examination	-	-	No exposure of base metal		-	
Residual Magnetism	Para. 9.21	Magnetism	-	-	-	Para. 4.3.8	-	
RF Leakage	Para. 9.23	RF Leakage	-	-	Figure 2(b)		-	
High Temperature Storage	Para. 9.24	After 1 to 2 hours						
		Mating/Unmating Forces	Para. 4.3.5	-	-	Para. 4.3.5	-	
		Insulation Resistance	Table 2		R <sub>i</sub>	Table 2	-	MΩ
		Voltage Proof	Table 2		V <sub>P</sub>	Table 2		-
		Voltage Proof Leakage Current	Table 2		I <sub>VPL</sub>	-	Table 2	-
		Centre Contact Retention	Para. 4.3.6		-	-	-	-
		Interface Dimensions	-		-	Figure 2(a)		-
		Contact Resistance	Centre Contact (20mV 10mA)	-	-	-	3	mΩ
	Shell (20mV 10mA)	-	-	-	3	mΩ		
	External Visual Inspection		ESCC No. 3402	-	-	-	-	
Permanence of Marking	Para. 9.27	-	-	-	-	-	-	
Multipaction	Para. 4.3.9 of this spec.	-	-	-	-	-	-	
RF Power Handling	Para. 4.3.10 of this spec.							
During Testing		VSWR	ESCC No. 3402	-	Figure 2(b)		-	
		Insertion Loss	ESCC No. 3402		-	Figure 2(b)		-
Final Measurement		Insulation Resistance	Table 2		R <sub>i</sub>	Table 2	-	-
		Voltage Proof	Table 2		V <sub>P</sub>	Table 2	-	-
		Voltage Proof Leakage Current	Table 2		I <sub>VPL</sub>	-	Table 2	-
		VSWR	ESCC No. 3402		-	Figure 2(b)		-
	Insertion Loss	ESCC No. 3402		-	Figure 2(b)		-	

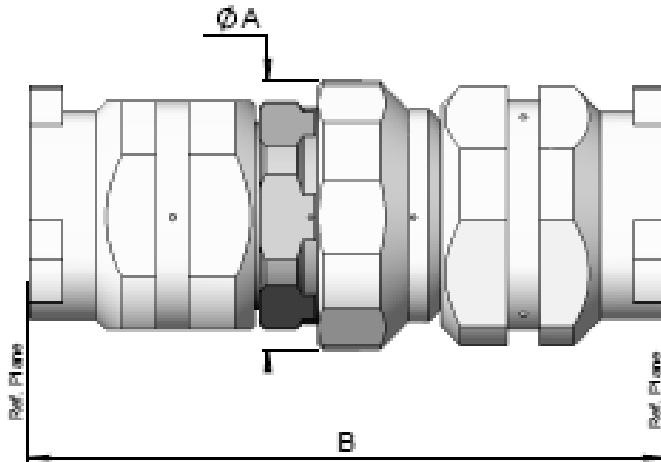


ESCC Generic Spec. No. <a href="#">3402</a>		Measurements and Inspections		Symbols	Limits		Units	
Environmental, Mechanical and Endurance Test (1)	Test Method and Conditions	Identification	Conditions		Min.	Max.		
Corona	Para. 4.3.11 of this spec.	VSWR	ESCC No. <a href="#">3402</a>	-	Figure 2(b)		-	
During Testing			Insertion Loss	ESCC No. <a href="#">3402</a>	-	Figure 2(b)		-
Final Measurement		Insulation Resistance	Table 2	$R_i$	Table 2	-	-	
		Voltage Proof	Table 2	$V_P$	Table 2	-	-	
		Voltage Proof Leakage Current	Table 2	$I_{VPL}$	-	Table 2		-
		VSWR	ESCC No. <a href="#">3402</a>	-	Figure 2(b)		-	
		Insertion Loss	ESCC No. <a href="#">3402</a>	-	Figure 2(b)		-	
External Visual Inspection	Para. 9.8	External Visual Inspection	ESCC No. <a href="#">3402</a>	-	-	-	-	

**NOTES**

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

**FIGURE 2(b) – TYPE VARIANTS CHARACTERISTICS**  
**VARIANT 01 - STRAIGHT ADAPTOR, MALE-TO-MALE**



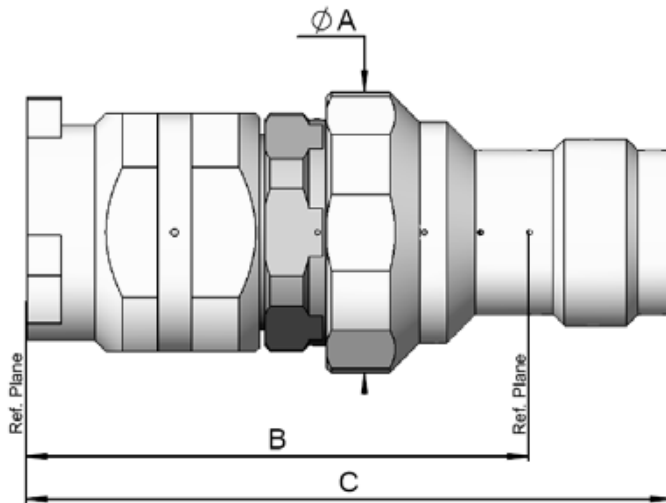
Symbols	Dimensions (mm)	
	Min	Max
ØA	16.4	16.6
B	-	39

Electrical Characteristics	Values	Units
Voltage Standing Wave Ratio (VSWR)	$\leq 1.1 + 0.01 \times f$ (GHz)	-
RF Insertion loss	$\leq 0.04 \times \sqrt{f}$ (GHz)	dB
RF Leakage	$\leq -115 + f$ (GHz)	dBi
Voltage Proof	$\geq 1500$	Vrms
Corona	$\geq P_{\infty}$ at 1GHz (see Table 1(b))	W
Multipaction Threshold (pulse width 20µs; PRF: 1kHz)	$\geq 2000$ at 1GHz	Wpp

Mechanical Characteristics	Values	Units
Centre Contact Retention Force (Axial)	$\geq 27.2$	N
Centre Contact Retention Torque (Rotational)	Not applicable	N.cm
Cable Retention Force (Axial)	Not applicable	N
Cable Retention Torque (Rotational)	Not applicable	N.cm
Weight	$\leq 35$	g

Other Characteristics	Values	Units
Operating Temperature Range	-65 to +165	°C
Leakage Rate (Panel-sealed Connectors)	Not applicable	-
Leakage Rate (Hermetic Sealed Connector)	Not applicable	-
Solderability	Not applicable	-

VARIANT 02 - STRAIGHT ADAPTOR, MALE-TO-FEMALE



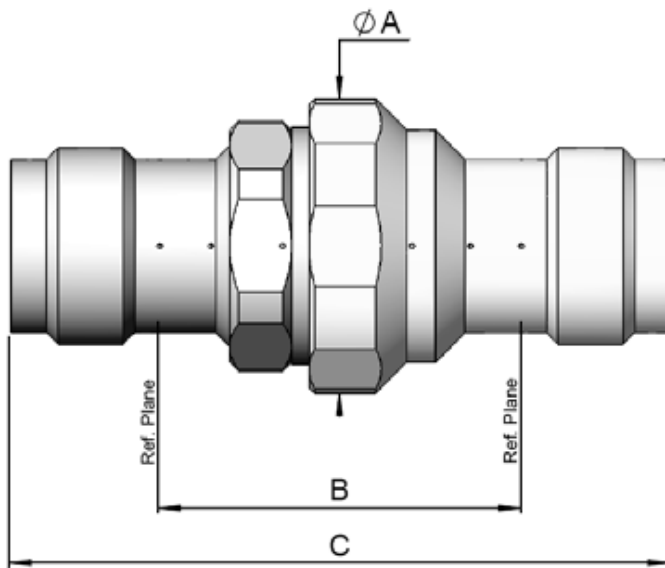
Symbols	Dimensions (mm)	
	Min	Max
ØA	16.4	16.6
B	-	30
C	-	39

Electrical Characteristics	Values	Units
Voltage Standing Wave Ratio (VSWR)	$\leq 1.1 + 0.01 \times f \text{ (GHz)}$	-
RF Insertion loss	$\leq 0.04 \times \sqrt{f \text{ (GHz)}}$	dB
RF Leakage	$\leq -115 + f \text{ (GHz)}$	dBi
Voltage Proof	$\geq 1500$	Vrms
Corona	$\geq P_{\infty}$ at 1GHz (see Table 1(b))	W
Multipaction Threshold (pulse width 20µs; PRF: 1kHz)	$\geq 2000$ at 1GHz	Wpp

Mechanical Characteristics	Values	Units
Centre Contact Retention Force (Axial)	$\geq 27.2$	N
Centre Contact Retention Torque (Rotational)	Not applicable	N.cm
Cable Retention Force (Axial)	Not applicable	N
Cable Retention Torque (Rotational)	Not applicable	N.cm
Weight	$\leq 28$	g

Other Characteristics	Values	Units
Operating Temperature Range	-65 to +165	°C
Leakage Rate (Panel-sealed Connectors)	Not applicable	-
Leakage Rate (Hermetic Sealed Connector)	Not applicable	-
Solderability	Not applicable	-

VARIANT 03 – STRAIGHT ADAPTOR, FEMALE-TO-FEMALE



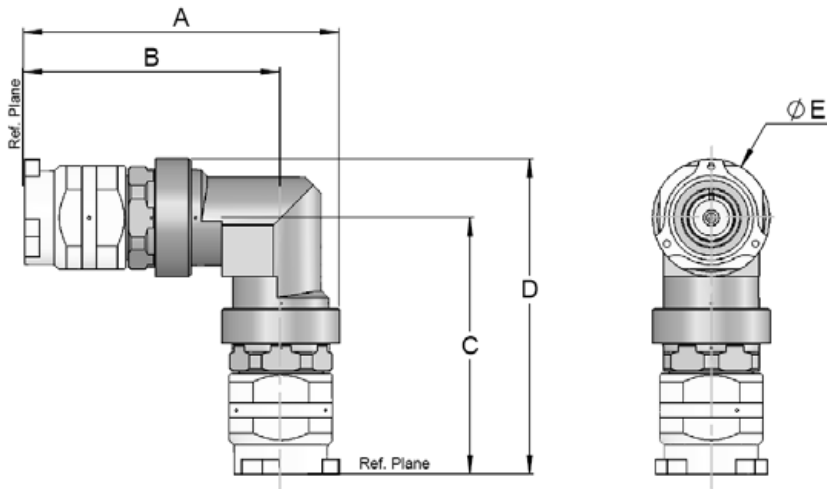
Symbols	Dimensions (mm)	
	Min	Max
ØA	16.4	16.6
B	-	21
C	-	38

Electrical Characteristics	Values	Units
Voltage Standing Wave Ratio (VSWR)	$\leq 1.1 + 0.01 \times f \text{ (GHz)}$	-
RF Insertion loss	$\leq 0.04 \times \sqrt{f \text{ (GHz)}}$	dB
RF Leakage	$\leq -115 + f \text{ (GHz)}$	dBi
Voltage Proof	$\geq 1500$	Vrms
Corona	$\geq P_{\infty}$ at 1GHz (see Table 1(b))	W
Multipaction Threshold (pulse width 20µs; PRF: 1kHz)	$\geq 2000$ at 1GHz	Wpp

Mechanical Characteristics	Values	Units
Centre Contact Retention Force (Axial)	$\geq 27.2$	N
Centre Contact Retention Torque (Rotational)	Not applicable	N.cm
Cable Retention Force (Axial)	Not applicable	N
Cable Retention Torque (Rotational)	Not applicable	N.cm
Weight	$\leq 21$	g

Other Characteristics	Values	Units
Operating Temperature Range	-65 to +165	°C
Leakage Rate (Panel-sealed Connectors)	Not applicable	-
Leakage Rate (Hermetic Sealed Connector)	Not applicable	-
Solderability	Not applicable	-

VARIANT 04 – RIGHT ANGLE ADAPTOR, MALE-TO-MALE



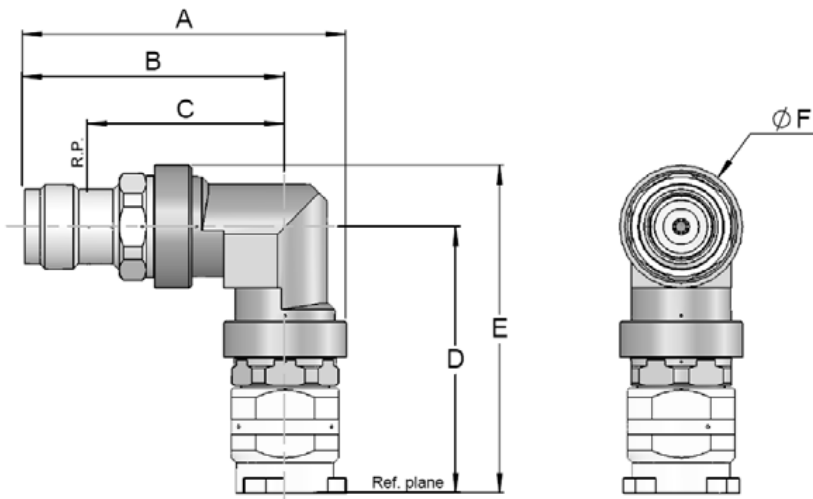
Symbols	Dimensions (mm)	
	Min	Max
A	-	43
B	-	35
C	-	35
D	-	43
ØE	15.9	16.1

Electrical Characteristics	Values	Units
Voltage Standing Wave Ratio (VSWR)	$\leq 1.13 + 0.01 \times f \text{ (GHz)}$	-
RF Insertion loss	$\leq 0.05 \times \sqrt{f \text{ (GHz)}}$	dB
RF Leakage	$\leq -115 + f \text{ (GHz)}$	dBi
Voltage Proof	$\geq 1500$	Vrms
Corona	$\geq P_{\infty}$ at 1GHz (see Table 1(b))	W
Multipaction Threshold (pulse width 20µs; PRF: 1kHz)	$\geq 2000$ at 1GHz	Wpp

Mechanical Characteristics	Values	Units
Centre Contact Retention Force (Axial)	$\geq 27.2$	N
Centre Contact Retention Torque (Rotational)	Not applicable	N.cm
Cable Retention Force (Axial)	Not applicable	N
Cable Retention Torque (Rotational)	Not applicable	N.cm
Weight	$\leq 62$	g

Other Characteristics	Values	Units
Operating Temperature Range	-65 to +165	°C
Leakage Rate (Panel-sealed Connectors)	Not applicable	-
Leakage Rate (Hermetic Sealed Connector)	Not applicable	-
Solderability	Not applicable	-

VARIANT 05 – RIGHT ANGLE ADAPTOR, MALE-TO-FEMALE



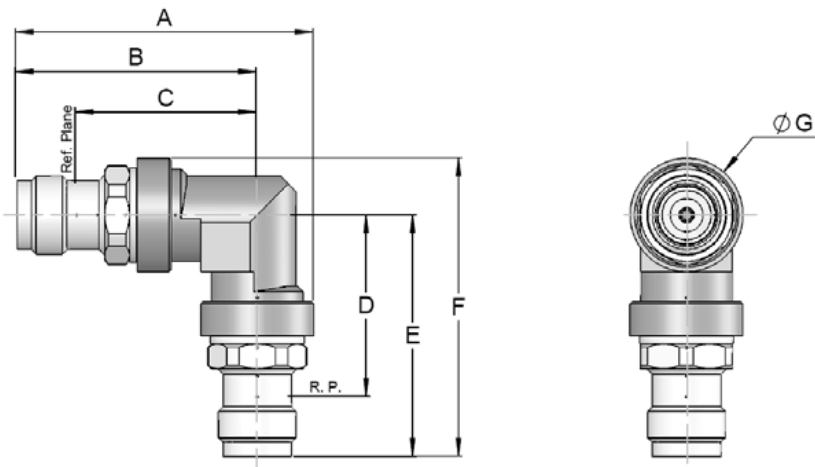
Symbols	Dimensions (mm)	
	Min	Max
A	-	43
B	-	35
C	-	26
D	-	35
E	-	43
ØF	15.9	16.1

Electrical Characteristics	Values	Units
Voltage Standing Wave Ratio (VSWR)	$\leq 1.13 + 0.01 \times f$ (GHz)	-
RF Insertion loss	$\leq 0.05 \times \sqrt{f}$ (GHz)	dB
RF Leakage	$\leq -115 + f$ (GHz)	dBi
Voltage Proof	$\geq 1500$	Vrms
Corona	$\geq P_{\infty}$ at 1GHz (see Table 1(b))	W
Multipaction Threshold (pulse width 20µs; PRF: 1kHz)	$\geq 2000$ at 1GHz	Wpp

Mechanical Characteristics	Values	Units
Centre Contact Retention Force (Axial)	$\geq 27.2$	N
Centre Contact Retention Torque (Rotational)	Not applicable	N.cm
Cable Retention Force (Axial)	Not applicable	N
Cable Retention Torque (Rotational)	Not applicable	N.cm
Weight	$\leq 55$	g

Other Characteristics	Values	Units
Operating Temperature Range	-65 to +165	°C
Leakage Rate (Panel-sealed Connectors)	Not applicable	-
Leakage Rate (Hermetic Sealed Connector)	Not applicable	-
Solderability	Not applicable	-

VARIANT 06 – RIGHT ANGLE ADAPTOR, FEMALE-TO-FEMALE



Symbols	Dimensions (mm)	
	Min	Max
A	-	43
B	-	35
C	-	26
D	-	43
E	-	35
F	-	26
ØG	15.9	16.1

Electrical Characteristics	Values	Units
Voltage Standing Wave Ratio (VSWR)	$\leq 1.13 + 0.01 \times f$ (GHz)	-
RF Insertion loss	$\leq 0.05 \times \sqrt{f}$ (GHz)	dB
RF Leakage	$\leq -115 + f$ (GHz)	dBi
Voltage Proof	$\geq 1500$	Vrms
Corona	$\geq P_{\infty}$ at 1GHz (see Table 1(b))	W
Multipaction Threshold (pulse width 20µs; PRF: 1kHz)	$\geq 2000$ at 1GHz	Wpp

Mechanical Characteristics	Values	Units
Centre Contact Retention Force (Axial)	$\geq 27.2$	N
Centre Contact Retention Torque (Rotational)	Not applicable	N.cm
Cable Retention Force (Axial)	Not applicable	N
Cable Retention Torque (Rotational)	Not applicable	N.cm
Weight	$\leq 48$	g

Other Characteristics	Values	Units
Operating Temperature Range	-65 to +165	°C
Leakage Rate (Panel-sealed Connectors)	Not applicable	-
Leakage Rate (Hermetic Sealed Connector)	Not applicable	-
Solderability	Not applicable	-

**APPENDIX A**  
**AGREED DEVIATIONS FOR RADIALL (F)**

Items Affected	Description of Deviations
Deviations from Qualification Tests (Chart IV)	<p>Para. 8.1 and Chart IV: The test requirements applicable to Qualification Testing may be replaced by testing in accordance with Radiall test specification RAD-GEN-CONN-004 as specified in the PID and indicated in Chart F4 below. For each subgroup, the sample size is given in Chart F4. No failures are allowed.</p>
Deviations from Lot Acceptance Tests (Chart V)	<p>Para. 8.2 and Chart V: The test requirements applicable to Lot Acceptance Level 1 Testing (LA1) performed for the purposes of maintenance of qualification may be replaced by testing in accordance with Radiall test specification RAD-GEN-CONN-004 as specified in the PID and indicated in Chart F4 below. For each subgroup, the sample size and the period between successive subgroup testing are given in Chart F4. No failures are allowed.</p> <p>Note: The test methods and requirements for each test in Chart F4 are as specified in the PID. Unless otherwise specified, the measurements and inspections required (as applicable) to the tests of Chart F4 shall be as specified in Table 6 of the Detail Specification.</p> <p><b>CHART F4 – QUALIFICATION AND MAINTENANCE OF QUALIFICATION</b> (total 20 connectors representative of the connector range)</p> <ul style="list-style-type: none"> <li>• <b>Subgroup I</b> (8 connectors; 24 month period) <ul style="list-style-type: none"> <li>○ Endurance: 50 mating/unmating cycles</li> <li>○ Vibration: sine and random (Table 6 requirements are not applicable)</li> <li>○ Mechanical Shock (Table 6 requirements are not applicable)</li> <li>○ Rapid Change of Temperature</li> <li>○ Endurance: 450 mating/unmating cycles</li> <li>○ Permanence of Marking</li> <li>○ External Visual Inspection</li> <li>○ DPA (on 2 connectors)</li> </ul> </li> <li>• <b>Subgroup II</b> (6 connectors; 12 month period) <ul style="list-style-type: none"> <li>○ RF Insertion Loss</li> <li>○ VSWR</li> <li>○ Coupling Proof Torque</li> <li>○ Mating/Unmating Forces</li> <li>○ Contact Resistance</li> <li>○ External Visual Inspection</li> </ul> </li> <li>• <b>Subgroup III</b> (4 connectors per type; 24 month period) <ul style="list-style-type: none"> <li>○ Residual Magnetism</li> <li>○ Soldering Proof</li> <li>○ RF Leakage</li> <li>○ High Temperature Storage</li> <li>○ External Visual Inspection</li> </ul> </li> <li>• <b>Subgroup IV</b> (2 connectors; 24 month period) (Note 1) <ul style="list-style-type: none"> <li>○ Multipactor</li> <li>○ Power Handling</li> <li>○ Corona</li> <li>○ External Visual Inspection</li> </ul> </li> </ul> <p><b>NOTES:</b></p> <p>1. Applicable only during maintenance of qualification if there is a change of design or a change of sub-contractor since qualification, or if ordered by the Orderer.</p>



Items Affected	Description of Deviations
Para. 4.3.10 RF Power Handling	<p data-bbox="354 295 1489 358">Due to test equipment limitations, RF Power Handling may be performed at a reduced RF Power of 355W at 2GHz (instead of at the specified rated RF Power of 400W at 2GHz).</p> <p data-bbox="354 376 1489 510">Note: The required performance of the components specified herein up to the specified rated RF Power: 400W at 2GHz, was confirmed during the initial ESCC Qualification in 2018 by the use of simulation techniques. The simulated results correlate with the real qualification test results at 355W at 2GHz.</p> <p data-bbox="354 528 1489 591">There have been no changes in the material, process and design of the components since the initial qualification.</p>