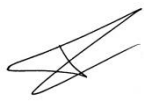





Titre / Title

**RF LOADS FIXED COAXIAL
DC – 22 GHz**

DETAIL SPECIFICATION

Rédigé par / Written by	Responsabilité / Responsibility	Date	Signature
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DOCUMENTATION CHANGE NOTICE

REVISION OR ISSUE	DATE	CHANGE
1/-	21/11/2016	Initial edition
1/A	19/09/2018	Table 1 VSWR limits updated to 18GHz instead of 18.4, points of frequency updated for Electrical measurement and Connector repeatability



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1. SCOPE

This Detail Technical Sheet details the ratings and electrical characteristics for RF Load Fixed, 0 -22 GHz

2. APPLICABLE DOCUMENT

The following documents shall be read in conjunction with this specification:

RAD-GEN-ATCH-002: General Specification: Attenuators and Loads RF Fixed Coaxial

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3. TYPE VARIANT

Variants of the basic type covered by the relevant Generic Specification are given in Table 1.

Table 1: Type variants

VARIANT	VSWR	
	$0 \leq F \leq 18 \text{ GHz}$	$18 \leq F \leq 22 \text{ GHz}$
01	1.10	1.15
02	1.10	1.15

4. MAXIMUM RATINGS

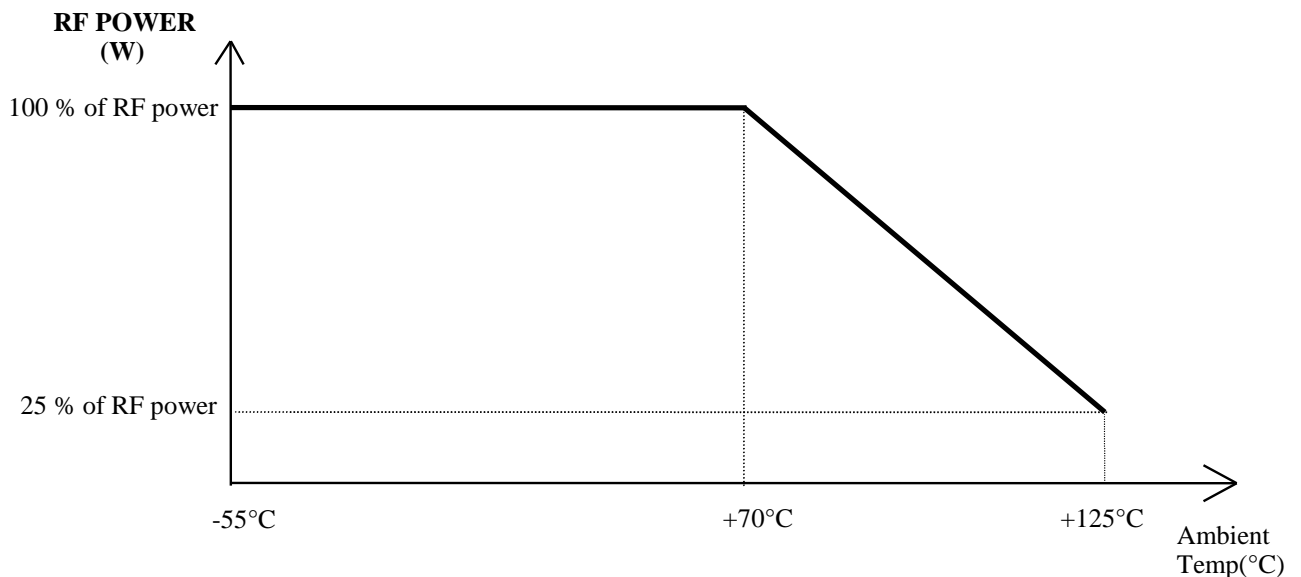
Maximum Ratings of the basic type covered by the relevant Generic Specification are given in Table 2.

Table 2: Maximum ratings


N°	Characteristics	Symbol	Maximum Rating		Unit
			Min	Max	
1	RF Power				
	Variant 01	P	-	2	W (1)
	Variant 02	P	-	1	W (1)
2	Peak Power (at 25°) (2)	Pp	-	100	W
3	Operating Temperature Range	T _{op}	-55	+125	°C
4	Storage Temperature Range	T _{stg}	-55	+125	°C
5	Frequency Range	F	0	22	GHz
6	Impedance	Z	47.5	52.5	Ohms
7	RF Leakage	E	-90	-	dB
8	Coupling Nut Torque	Tq	80	120	N.cm

NOTES:
 (1) See Figure 1.
 (2) Duration 1µs, cyclic rate 1ms

FIGURE 1 – Parameter Derating Information



RF POWER VERSUS TEMPERATURE

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5. ELECTRICAL MEASUREMENTS

The parameters to be measured at room temperature are scheduled in Table 1. Unless otherwise specified, the measurements shall be performed at $T_{amb} = +22 \pm 3$ °C.

The measurement shall be performed with five points of frequency:

2GHz – 8GHz – 12.4 GHz – 18GHz - 22 GHz.

5.1. HIGH AND LOW TEMPERATURE ELECTRICAL MEASUREMENTS

Characteristics	Symbol	Test Method and Conditions (Note 1)	Maximum Rating		Unit
			Min	Max	
Temperature coefficient of Resistance	TC_R	DC test reference temperature	-	3×10^{-4}	$\Omega/\Omega/^\circ C$

Note 1: Measurements shall be performed during LAT or Qualification test

6. CONNECTORS REPEATABILITY:

Not applicable for loads.

7. OPERATING LIFE

7.1. PARAMETER DRIFT VALUES

The parameter drift values applicable to burn-in are specified in Table 3 of this specification. Unless otherwise stated, measurements shall be performed at $T_{amb} = +22 \pm 3$ °C. The parameter drift value (Δ) applicable to the parameters scheduled, shall not be exceeded. In addition to these drift value requirements for a given parameter, the appropriate limit value specified in Table 1 shall not be exceeded.

7.2. CONDITIONS FOR OPERATING LIFE

The condition for Operating life are given in Table 4. After test, a visual inspection shall be performed and no damage shall be appeared.

Table 3: Parameter drift values for Operating Life

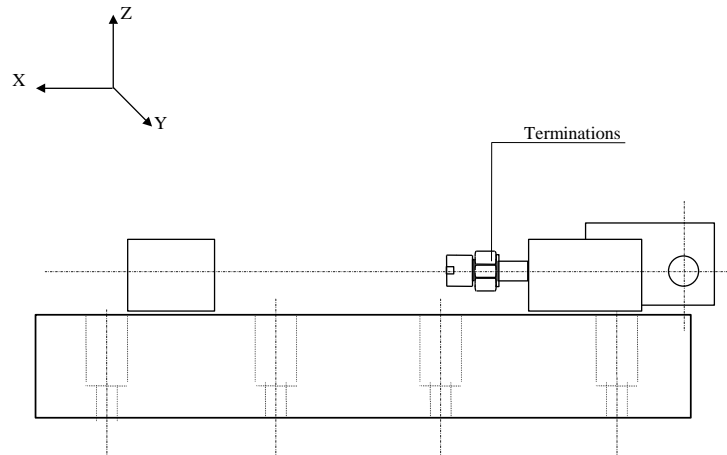
N°	Characteristics	Symbol	Test condition	Limits	Unit
1	Resistance change	ΔR	As per Table 1	250	m Ω
2	VSWR change	$\frac{\Delta VSWR}{VSWR}$	As per Table 1	± 2	%

Table 4: Conditions for Operating Life testing

N°	Characteristics	Symbol	Limits	Unit	Note
1	RF Power	P_{in}	2	W	For Variant 01
			1	W	For Variant 02
2	Frequency	F	DC ⁽¹⁾ or 10 or 18	GHz	-
3	Ambient Temperature	T_{amb}	+25	°C	-

NOTES: (1) The dissipated power at DC or in frequency is the same.

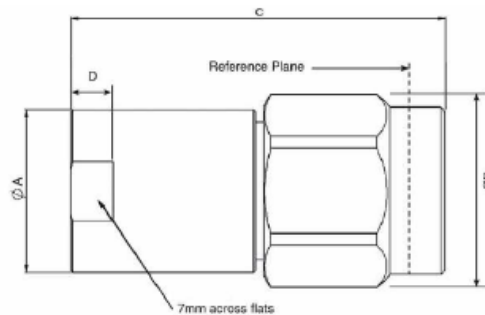
FIGURE 2 – Circuit for electrical measurement



Schematic for Vibration and Shock or Bump test

8. MECHANICAL DIMENSION

8.1. DIMENSION FOR VARIANT 01: Stainless steel passivated



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

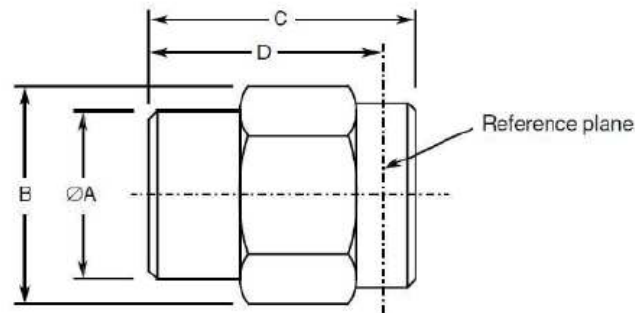
Connectors: SMA male per ESCC3402

Weight: ≤ 5 grams

Material and Finishes:

- Shell: Amagnetic Stainless Steel, electro-passivated
- Coupling Nut: Amagnetic Stainless Steel, electro-passivated
- Centre Contact: Beryllium Copper, with nickel underplate (2µm minimum) and gold plating (1.3µm minimum). Measurements of plating thickness shall be performed inside the female centre contact at a maximum distance of 0.4mm from the end and on the male centre contact on pin diameter Øt (see Interface Dimensions).
- Inserts: PTFE

8.2. DIMENSION FOR VARIANT 02: Gold plated with nickel underplate



Symbols	Dimensions mm	
	Min	Max
ØA	6.2	6.4
B	7.8	8
C	-	12
D	-	10.5

Connectors: SMA male per ESCC3402

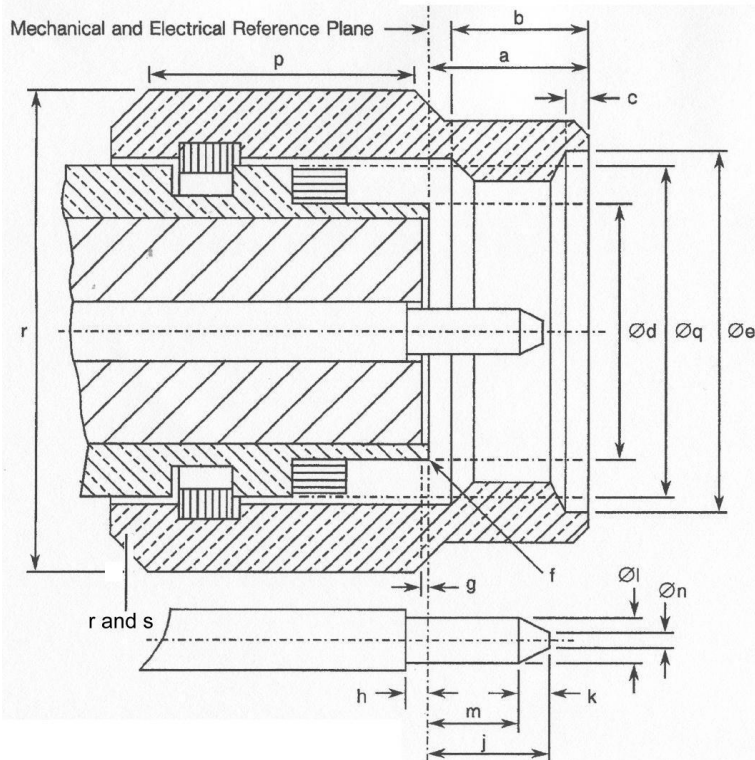
Weight: ≤ 3.5 grams

Material and Finishes:

- Shell, Coupling Nut, Centre Contact: Beryllium copper, with nickel underplate (2µm minimum) and gold plating (2.5µm minimum). Measurements of plating thickness on the centre contact shall be performed on pin diameter ØI (see Interface Dimensions).
- Inserts: PTFE
- Gaskets: Silicone rubber

8.3. INTERCHANGEABILITY FOR SMA

8.3.1. SMA plug



Symbol	Millimetres		notes
	min	max	
a		3.43	
b	2.54		
c	0.38	1.14	
Ød		0.4592	
Øe	6.35		
f		008	Radius or 45° Chamfer
g	0.00	0.20	
h	0.00	0.25	
j		2.54	
k	0.38		
Øl	0.90	9.94	
m	1.27		
Øn		0.38	
p	3.17		
Øq			N/A
r	7.84	8.00	Hexagonal on flat
s		9.20	


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Table 5: Radiall Part Number

Variant	Radiall Reference	Designation
01	R404213660	RF fixed load SMA DC - 22GHz - Stainless steel passivated
02	R404210680	RF fixed load SMA DC - 22GHz - Reduced size - Gold plated with nickel underplate

Table 6: Measurements and inspections on completion of environment and endurance tests

N°	Radial Generic Spec. RAD-GEN-ATCH-002		Measurements and Inspections		Symbol	Limits		Unit
	Environmental and Endurance Test (1)	Test Method and Conditions	Identification	Conditions		Min	Max	
01	Vibration	Para. 13.2.6 of Generic specification and figure 2 of this specification	Initial measurements Impedance VSWR During Last Cycle Intermittent contact Final measurement Visual Examination Resistance change VSWR change	Table 2 Table 1 >0.5ms No open or short circuits No damage Table 3 Table 3	Z VSWR - ΔR ΔVSWR	Record values Record values - - 250 -2 +2	Ω - - mΩ %	
02	Shock	Para 13.2.7 of Generic specification and figure 2 of this specification	Initial measurements Impedance VSWR Final measurement Visual Examination Resistance change VSWR change	Table 2 Table 1 No damage Table 3 Table 3	Z VSWR - ΔR ΔVSWR	Record values Record values - - 250 -2 +2	Ω - - mΩ %	
03	Rapid Change of Temperature	Para 13.2.8 of Generic specification	Initial measurements Impedance VSWR Final measurement Visual Examination Resistance change VSWR change	Table 2 Table 1 After recovery time of 24±2hrs No damage Table 3 Table 3	Z VSWR - ΔR ΔVSWR	Record values Record values - - 250 -2 +2	Ω - - mΩ %	
04	Climatic sequence	Para 13.2.9 of Generic specification Dry heat: para 13.2.9.1 of Generic specification Cold heat: para 13.2.9.3 of Generic specification	Resistance drift (2) Resistance drift (2) Final measurement Visual Examination Resistance change VSWR change	At +125°C, At -55°C, After recovery time between 1 hr and 24 hrs No damage Table 3 Table 3	TC _R TC _R - ΔR ΔVSWR	 3.10 ⁻⁴ 3.10 ⁻⁴ - - 250 -2 +2	Ω/Ω/°C Ω/Ω/°C - mΩ %	
05	Coupling proof torque	Para 13.2.10 of Generic specification	Interface dimensions	Para 13.2.11	-	Figure of para 13.2.11	-	
06	Mating and unmating forces	Para 13.2.11 of Generic specification	Torque	Para 13.2.11	-	- 24	N.cm	
07	Operating Life	Para 13.2.12 of Generic specification and table 3 and 4 of this specification	Initial measurements Impedance VSWR Final measurement Visual Examination Resistance change VSWR change	Table 2 Table 1 No damage Table 3 Table 3	Z VSWR - ΔR ΔVSWR	Record values Record values - - 250 -2 +2	Ω - - mΩ %	
08	RF leakage	Para 13.2.13 of Generic specification	RF leakage	Table 2	E	- -90	dBi	
09	Peak power	Para 13.2.14 of Generic specification and table 2 of this specification	Final measurement Impedance	Table 2	Z	Table 1		
10	Permanence of marking	Para 13.2.16 of Generic specification	Final measurement Visual Examination	No corrosion or obliteration of marking	-	-	-	

Notes:

- (1) The tests in this table refer to either paragraph 11 and 12 of Generic specification and shall be used as applicable
- (2) Measurement to be made on 2 samples only.