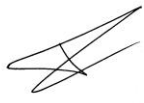





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Titre / Title


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

<b>Rédigé par / Written by</b>	<b>Responsabilité / Responsibility</b>	<b>Date</b>	<b>Signature</b>
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**DOCUMENTATION CHANGE NOTICE**

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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	
	$0 \leq F \leq 18$ GHz	$18 \leq F \leq 22$ GHz
01	1.10	1.15
02	1.10	1.15

### 4. MAXIMUM RATINGS

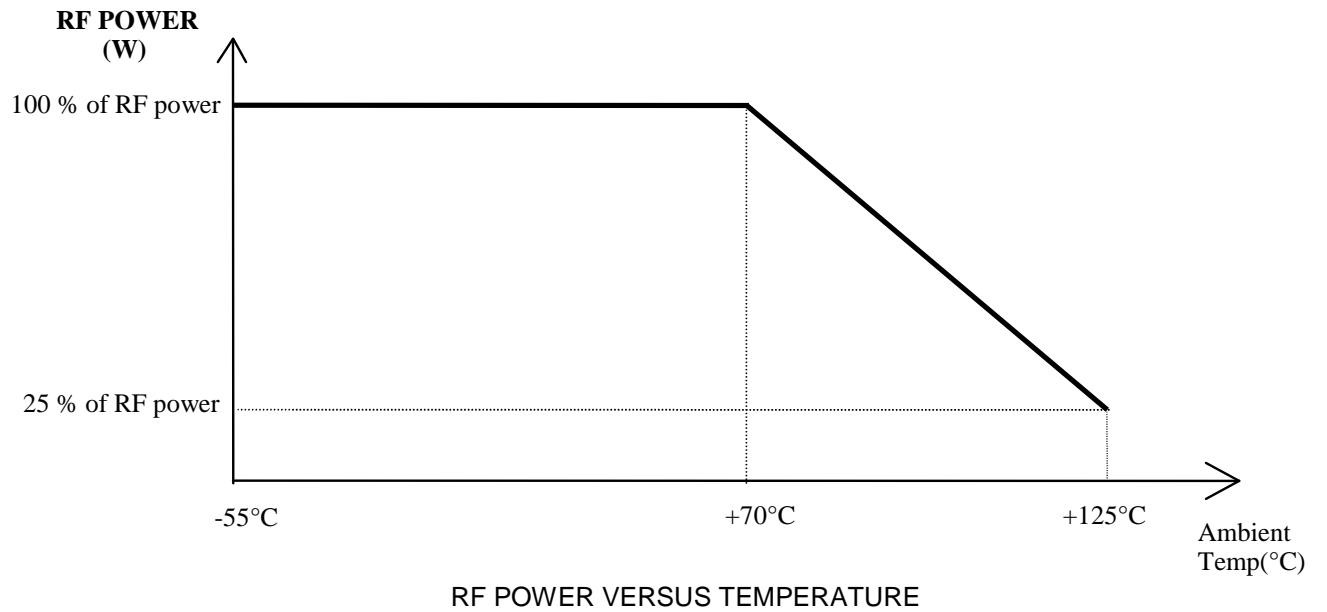
Maximum Ratings of the basic type covered by the relevant Generic Specification are given in Table 2.


**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)	P <sub>p</sub>	-	100	W
3	Operating Temperature Range	T <sub>op</sub>	-55	+125	°C
4	Storage Temperature Range	T <sub>stg</sub>	-55	+125	°C
5	Frequency Range	F	0	22	GHz
6	Impedance	Z	47.5	52.5	Ohms
7	RF Leakage	E	-90	-	dB <sub>i</sub>
8	Coupling Nut Torque	T <sub>q</sub>	80	120	N.cm

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

**FIGURE 1 – Parameter Derating Information**



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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 :  
4GHz – 8GHz – 12.4 GHz – 20GHz and 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	-	$3 \times 10^{-4}$	$\Omega/\Omega/^\circ C$

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 ( $\Delta$ ) 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**

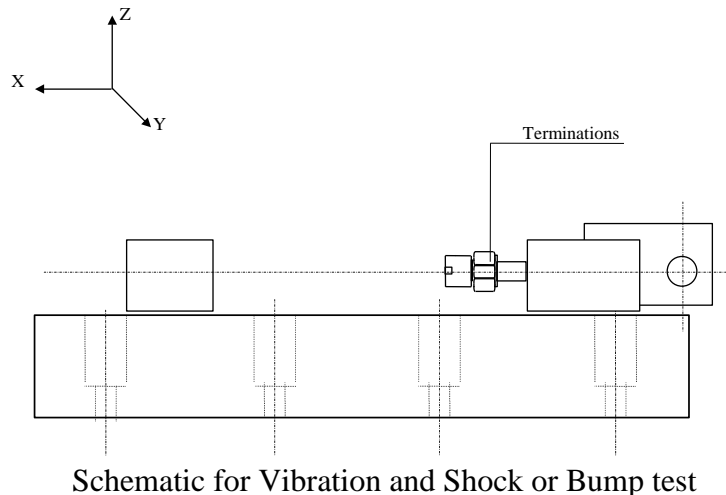
N°	Characteristics	Symbol	Test condition	Limits	Unit
1	Resistance change	$\Delta R$	As per Table 1	250	m $\Omega$
2	VSWR change	$\frac{\Delta VSWR}{VSWR}$	As per Table 1	$\pm 2$	%

**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 <sup>(1)</sup> or 10 or 18	GHz	-
3	Ambient Temperature	$T_{amb}$	+25	°C	-

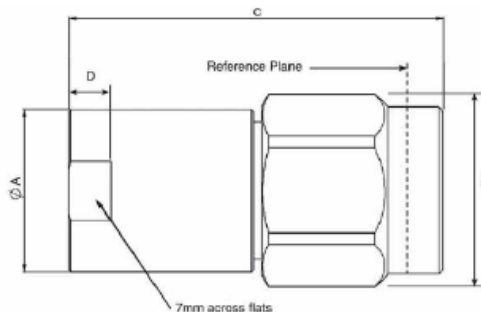
**NOTES:** (1) The dissipated power at DC or in frequency is the same.

**FIGURE 2 – Circuit for electrical measurement**



## 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

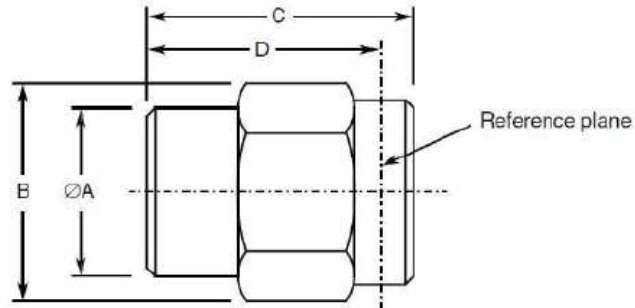
Connectors: SMA male per ESCC3402

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

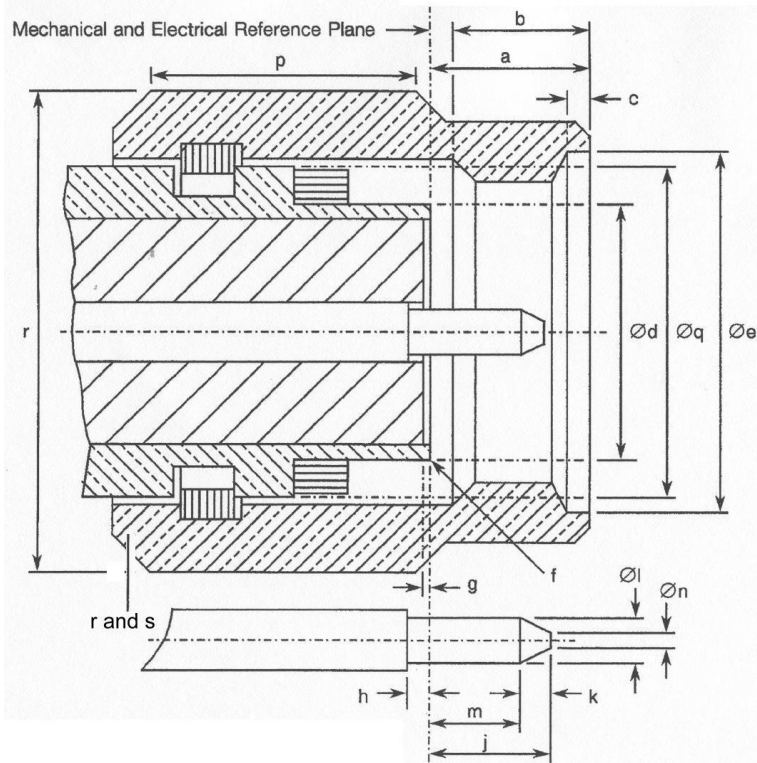
Weight: ≤ 3.5 grams

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	R4042 13 660	RF fixed load SMA DC - 22GHz -Stainless steel passivated
02	R4042 10 680	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 and figure 2 of this specification	<b>Initial measurements</b> Impedance VSWR <b>During Last Cycle</b> Intermittent contact  <b>Final measurement</b> 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 and figure 2 of this specification	<b>Initial measurements</b> Impedance VSWR  <b>Final measurement</b> 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	<b>Initial measurements</b> Impedance VSWR <b>Final measurement</b>  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 Dry heat : para 13.2.9.1  Cold heat : para 13.2.9.3	Resistance drift (2)  Resistance drift (2)  <b>Final measurement</b>  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 <sub>R</sub>  TC <sub>R</sub>  - ΔR ΔVSWR	  3.10 <sup>-4</sup>  3.10 <sup>-4</sup>  - -   250 -2   +2	Ω/Ω/°C  Ω/Ω/°C  - - mΩ %	
05	Coupling proof torque	Para 13.2.10	Interface dimensions	Para 13.2.11	-	Figure of para 13.2.11	-	
06	Mating and unmating forces	Para 13.2.11	Torque	Para 13.2.11	-	-   24	N.cm	
07	Operating Life	Para 13.2.12 and table 3 and 4 of this specification	<b>Initial measurements</b> Impedance VSWR <b>Final measurement</b> 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	<b>RF leakage</b>	Table 2	E	-   -90	dBi	
09	Peak power	Para 13.2.14 and table 2 of this specification	<b>Final measurement</b> Impedance	Table 2	Z	Table 1	-	
10	Permanence of marking	Para 13.2.16	<b>Final measurement</b> Visual Examination	No corrosion or obliteration of marking	-	-	-	

Notes :

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