Titre / Title

RF COAXIAL FIXED LOADS
DC – 50 GHz

DETAIL SPECIFICATION

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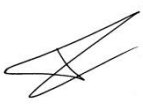
S. POIZAT	Space Project Manager	16/04/2020	
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DOCUMENTATION CHANGE NOTICE

REVISION OR ISSUE	DATE	CHANGE
1 -	16/04/2020	Initial edition

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LIST OF TABLES AND FIGURES

1. SCOPE

This Detailed Technical Sheet details the ratings and electrical characteristics for RF Fixed Load, 0 -50 GHz, 2.4mm series.

2. APPLICABLE DOCUMENT

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

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

3. TYPE VARIANT

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

Table 1: *Type variants*

	VARIANT	VSWR
		0 ≤ F ≤ 50 GHz
Male	801	1.3

4. MAXIMUM RATINGS

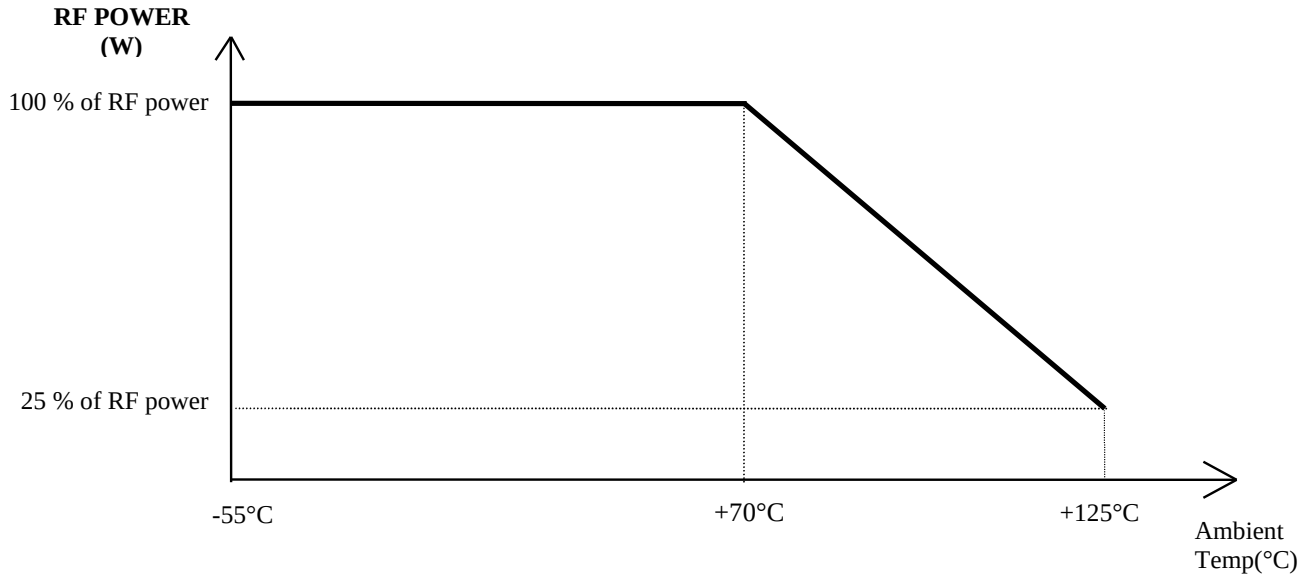
Maximum Ratings of the basic type covered by the relevant Generic Specification are given Table 2.

Table 2: *Maximum ratings*

N°	Characteristics	Symbol	Maximum Rating		Unit
			Min	Max	
1	RF Power	P	-	0.5	W (1)
2	Peak Power (at 25°C) (2)	Pp	-	50	W
3	Operating Temperature Range	T_{op}	-55	+125	°C
4	Storage Temperature Range	T_{stg}	-55	+125	°C
5	Frequency Range	F	0	50	GHz
6	Impedance	Z	47.5	52.5	Ohms
7	RF Leakage (3)	E	-85	-	dBi
8	Coupling Nut Torque	Tq	80	120	N.cm

NOTES:
(1) See Figure 1.
(2) Duration 1µs, cyclic rate 1ms
(3) Between DC to 31.5GHz only.

FIGURE 1 – *Parameter Derating Information*



RF POWER VERSUS TEMPERATURE

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 ± 3 °C.
The measurement shall be performed with six points of frequency:
10GHz – 20GHz – 30GHz – 40GHz and 50GHz

5.1. HIGH AND LOW TEMPERATURE ELECTRICAL MEASUREMENTS

Characteristics	Symbol	Test Method and Conditions	Maximum Rating		Unit
		(Note 1)	Min	Max	
Temperature coefficient of Resistance	TC_R	DC test reference temperature	-	3×10^{-4}	Ω/Ω/°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 ± 3 °C. The parameter drift value (Δ) applicable to the parameters scheduled, shall not be exceeded. In additional 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 have 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	mΩ
2	VSWR change	$\frac{\Delta VSWR}{VSWR}$	As per Table 1	±2	%

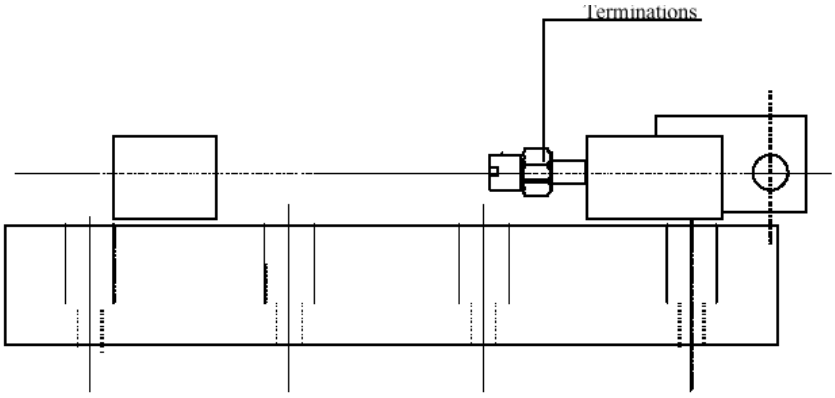
Table 4: *Conditions for Operating Life testing*

N°	Characteristics	Symbol	Limits	Unit	Note
1	RF Power	P_{in}	0.5	W	-
2	Frequency	F	DC(1) or 10 or 18	GHz	-
3	Ambient Temperature	T_{amb}	+70	°C	-

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

Test mounting for Operating life: The DUT (load under test) shall be mounted directly on the Hybrid coupler without SR cable between the coupler and the DUT.

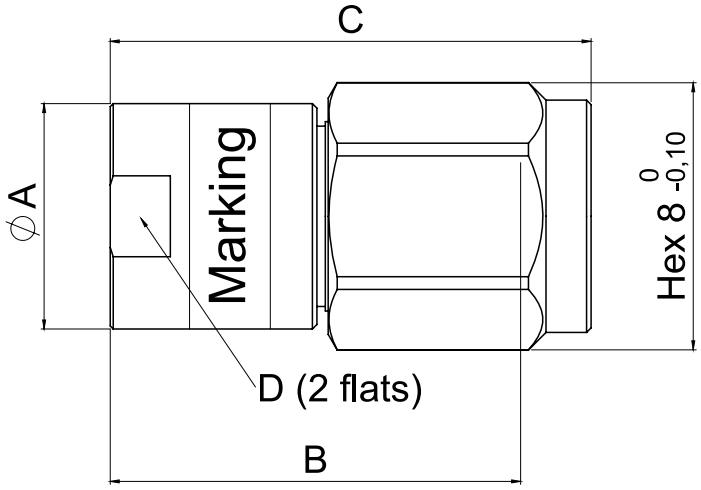
FIGURE 2 – *Circuit for electrical measurement*



Schematic for Vibration and Shock or Bump test

8. MECHANICAL DIMENSION

8.1. DIMENSION FOR VARIANT 801

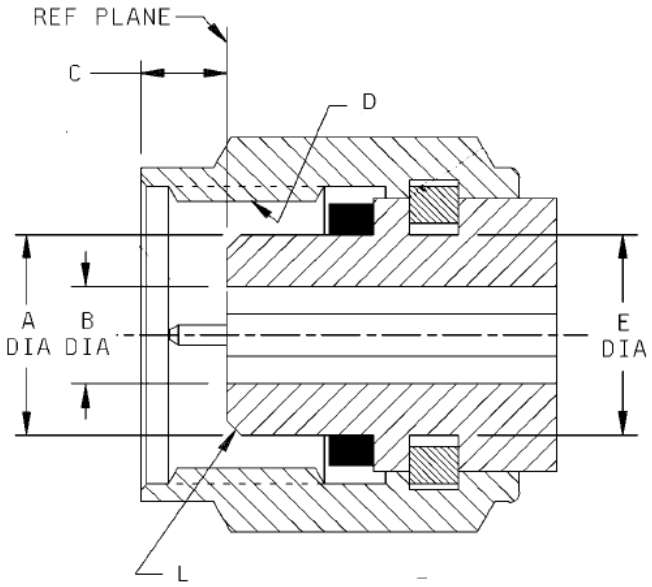


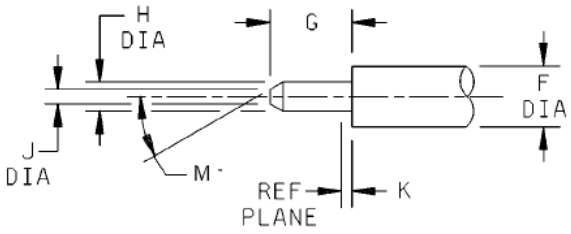
SYMBOL / CHARACTERISTICS	PHYSICAL DIMENSION (mm)	
	Min	**Max**
∅ A	-	7.7
B	13.5	14
C	-	16.5
D	6.5	7.5

General Tolerance: ± 0.5 mm
Connectors: 2.4mm per MIL STD 348A
Weight: ≤ 5 grams

8.2. INTERCHANGEABILITY FOR 2.4MM SERIES

8.2.1. 2.4mm plug





Symbols	Dimension (mm)		Comment
	Min	Max	
ØA	4.725	4.75	
ØB	2.387	2.413	
C	1.85	2.45	
D	M7 x 0.75-6g		
ØE	4.75	4.85	
ØF	1.029	1.054	
G	1.34	1.45	
ØH	0.506	0.523	
ØJ	0.2	0.25	
K	0	0.08	
L	0.25 x 45°±2	0.35 x 45°±2	Chamfer
M	28	32	°

Table 5: *Radiall Part Number*

Variant	Radiall Reference	Designation
801	R4042N0660	RF fixed load 2.4mm DC - 50GHz - Male

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

N°	Radiall 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	**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 - - - –2	 250 +2	 Ω - - - mΩ %
02	Shock	Para 13.2.7 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 - - –2	 250 +2	 Ω - - mΩ %
03	Rapid Change of Temperature	Para 13.2.8	**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 - - –2	 250 +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) **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	 - -2	 3.10^{-4} 3.10^{-4} 250 +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	**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 - - –2	 250 +2	 Ω - - mΩ %
08	RF leakage	Para 13.2.13	**RF leakage**	Table 2	E	-	-85	dBi
09	Peak power	Para 13.2.14 and table 2 of this specification	**Final measurement** Impedance	 Table 2	 Z	Table 1		
10	Permanence of marking	Para 13.2.16	**Final measurement** Visual Examination	 No corrosion or obliteration of marking	-	-		-

Notes:

(1) The tests in this table refer to either para 11 or 12 of RAD-GEN-ATCH-002 specification and shall be used as applicable

(2) Measurement to be made on only 2 samples.