Thermal Vacuum Switches for Ground Segments

With more than 25 years of experience in the space industry, Radiall has developed a product offering that emphasizes reliability and performance. The latest addition to the range includes SPDT, DPDT and SPnT RF switches designed to operate in thermal vacuum environments. These products can be mounted on ground based test benches, used in test equipment, and space vacuum conditions.

Tvac Series switches are designed in accordance with our standard RAMSES product offering and offer identical configurations with excellent performance.

PART NUMBER SELECTION

6 standard models are available for test benches dedicated to space equipment in Thermal Vacuum environment:

- **22 GHz SPDT coaxial switch: R571 F63 121**
- **22 GHz DPDT coaxial switch: R578 F63 121**
- **22 GHz non terminated SP6T coaxial switch: R583 F33 121**
- **40GHz SPDT coaxial switch: R571 863 121**
- **40GHz DPDT coaxial switch: R578 863 121**
- **40GHz non terminated SP6T coaxial switch: R583 833 121**

Operating mode	Latching	
Nominal operating voltage (across operating temperature)	Vdc	28 (24/30)
Coil resistance (+/-10%)	Ω	DPDT and SP6T: 225 / SPDT: 350
Nominal operating current at 23°	mA	DPDT and SP6T: 125 / SPDT: 80
Average power (Thermal vacuum condition)	See Power rating chart on page 7-20	
Switching time (max)	SPDT and DPDT: 10ms / SP6T: 15ms	
SMA - SMA 2.9	SPDT	10 million cycles
SMA - SMA 2.9	DPDT	2.5 million cycles
SMA - SMA 2.9	SP6T	5 million cycles / 2 million cycles
Connectors (1)	SMA / SMA2.9	

(1) connector SMA 2.9 is equivalent to "K connector®", registered trademark of Anritsu.

Thermal Vacuum Switches

ADDITIONAL SPECIFICATION

Polarity		Positive Common
Actuator terminals	SPDT	Solder Pins
	DPDT	Male 9 pins D-Sub connector
	SP6T	Male 25 pins D-Sub connector
Operating temperature range		-40°C to 85°C
Storage temperature range		-55°C to 85°C
Construction		Thermal Vacuum compatible

SMA CONNECTOR

Switch model	Frequency range GHz		V.S.W.R. (max)	Insertion loss (max) dB	Isolation (min) dB	Impedance Ω	Average power(1) W	Repeatability
SPDT	DC – 22	DC - 3	1.20	0.20	80	50	240	0.03 dB peak change in Insertion Loss over 100 cycles
		3 - 8	1.30	0.30	70		150	
		8 - 12.4	1.40	0.40	60		120	
		12.4 - 18	1.50	0.50	60		100	
		18 - 22	1.70	0.70	55		40	
DPDT SP6T (non terminated)	DC – 22	DC - 3	1.20	0.20	80	50	240	
		3 - 8	1.30	0.30	70		150	
		8 - 12.4	1.40	0.40	60		120	
		12.4 - 18	1.50	0.50	60		100	
		18 - 22	1.70	0.70	50		40	

SMA2.9 CONNECTOR

Switch model	Frequency range GHz		V.S.W.R. (max)	Insertion loss (max) dB	Isolation (min) dB	Impedance Ω	Average power (1) W	Repeatability
SPDT DPDT	DC – 40	DC - 6	1.30	0.30	70	50	80	0.03 dB peak change in Insertion Loss over 100 cycles
		6 - 12.4	1.40	0.40	60		60	
		12.4 - 18	1.50	0.50	60		50	
		18 - 26.5	1.70	0.70	55		20	
		26.5 - 40	1.90	0.90	50		10	
SP6T (non terminated)	DC – 40	DC - 6	1.30	0.30	70	50	40	
		6 - 12.4	1.40	0.40	60		30	
		12.4 - 18	1.50	0.50	60		25	
		18 - 26.5	1.70	0.70	55		15	
		26.5 - 40	1.90	0.90	50		5	

(1): Average power at 25°C per RF path / Sea level.

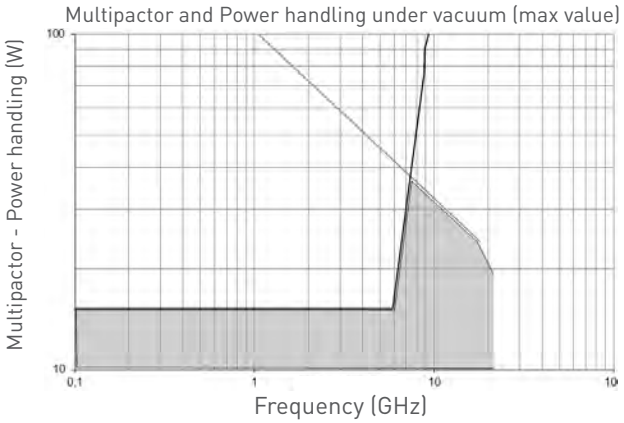
WHY A THERMAL VACUUM TEST BENCH ?

- It limits the need of hermetic adaptors and cable assemblies
- It improves RF performance
- It decreases the complexity of the Test bench

Thermal Vacuum Switches

POWER DERATING GRAPH

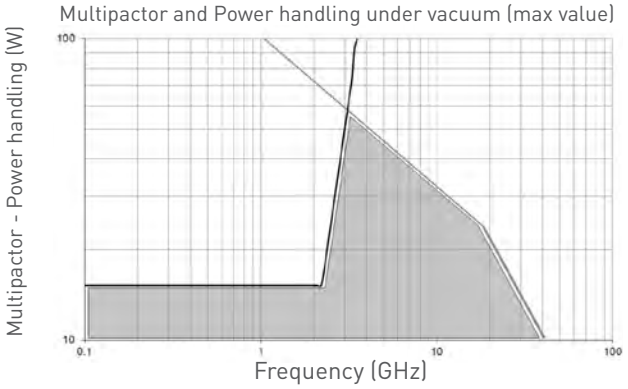
SMA22 GHz



SPDT, DPDT and SP6T products

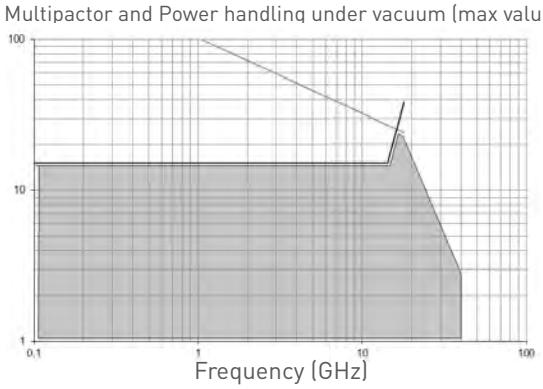
- Power Handling
- Multipactor
- Aver. Power Capability

SMA 2.9 40 GHz



SPDT and DPDT products

- Power Handling
- Multipactor
- Aver. Power Capability



SP6T products

- Power Handling
- Multipactor
- Aver. Power Capability

HERMETIC FEMALE / FEMALE ADAPTATORS

- SMA DC - 18 GHz
- TNC DC - 11 GHz
- ESA qualified
- High reliability