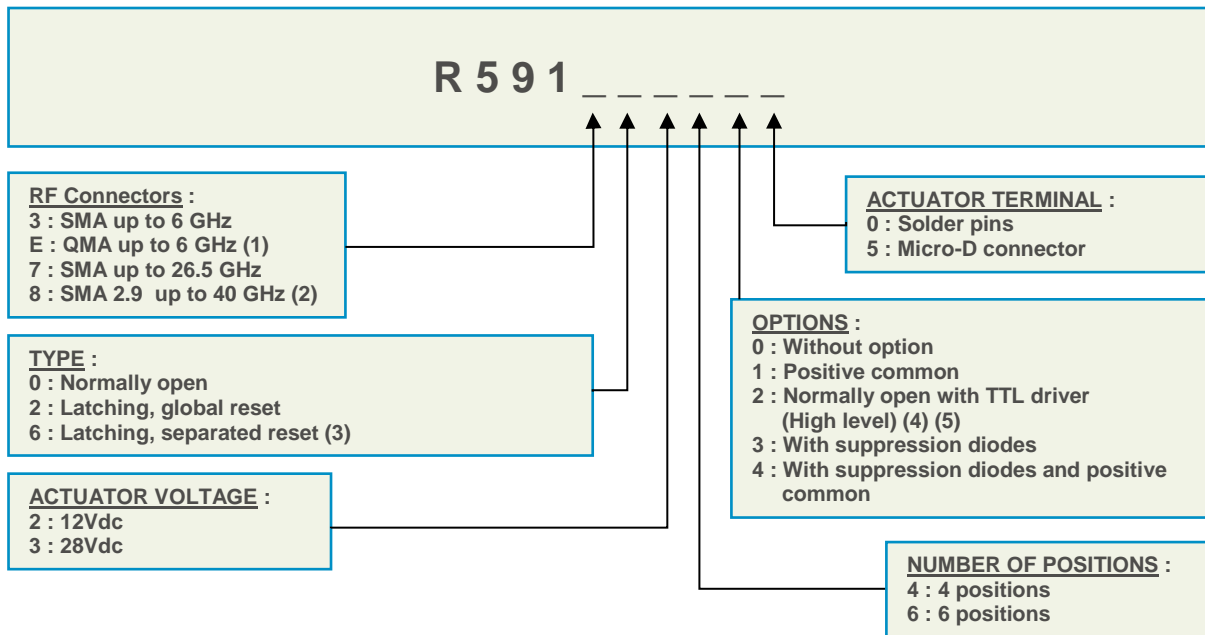


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### SPnT Coaxial Subminiature Switches DC to 6 GHz, DC to 26.5 GHz, DC to 40 GHz

R591 RADIALL coaxial subminiature switches have a typical operating life exceeding 25 million cycles. Excellent RF & repeatability characteristics along with a guaranteed life of 10 million cycles make these switches ideal for Automated Test Equipment (ATE) and other measurement applications. These miniature switches are also an excellent choice for Mil/Aero applications due to their small size, light weight, as well as outstanding shock and vibration handling capabilities.

PART NUMBER SELECTION



- (1) The "QLF" trademark (quick lock formula®) standard applies to QMA and QN series and guarantees the full interchangeability between suppliers using this trademark. Using QLF certified connectors also guarantees the specified level of RF performances.
- (2) Connector SMA2.9 is equivalent to "K Connector®", registered trademark of Anritsu
- (3) Available with "solder pins" models only
- (4) Polarity is not relevant to application for switches with TTL driver
- (5) Suppression diodes are already included with TTL option



PICTURE



GENERAL SPECIFICATIONS



Operating mode		Normally open		Latching	
Nominal operating voltage (Vdc) (across operating temperature range)		12 (10.2 / 13)	28 (21 / 30)	12 (10.2 / 13)	28 (21 / 30)
Coil resistance (+/-10%) (Ohms)		48	250	60	285
Nominal operating current at 23°C (mA)		250	110	200	98
Average power		See Power Rating Chart on final page			
TTL input	High Level	2.2 to 5.5 Volts			
	Low Level	0 to 0.8 V			
Switching time max (ms)		10			
Life min for	SMA / QMA	10 million cycles			
	SMA 2.9	2 million cycles			
Connectors		SMA – QMA – SMA 2.9			
Actuator terminals	Solder Pins	Solder pins double row connector for wrapping, soldering (250°C max / 30 sec), or connecting to 2.54 mm pitch female connector.			
	9 pin micro-D	9 pin micro-D receptacle M83513/07-A according to MIL-C-85513.			
Operating temperature range (°C)		-40 to +85			
Storage temperature range (°C)		-55 to +85			
Sine vibration (According to MIL STD 202, Method 204D, Cond. D)		10-2000 Hz, 20g	operating		
Random vibration (According to MIL STD 202, Method 214A, Profile I, Cond. F)		50-2000 Hz, 20.71grms	operating		
Shock (According to MIL STD 202, Method 213B, Cond. C)		100g / 6 ms, ½ sine	operating		

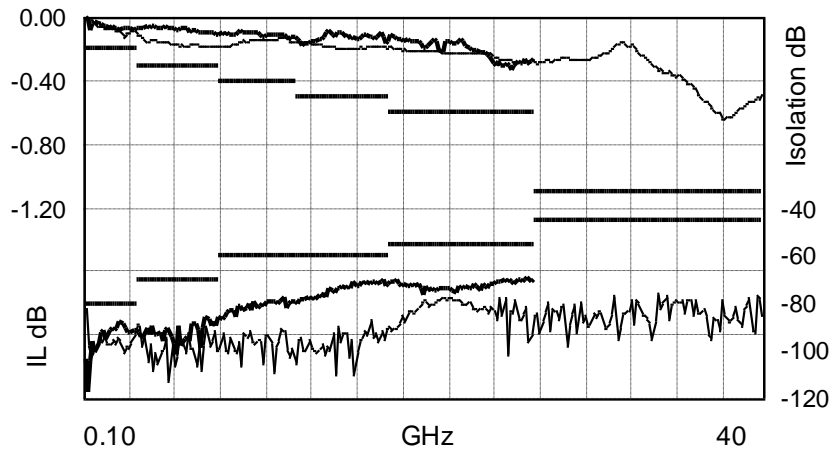
RF PERFORMANCES

Connectors	Frequency Range GHz	V.S.W.R. (max)	Insertion Loss (max) dB	Isolation (min) dB	Max. average power (W) (1)	Impedance Ohms	
SMA / QMA	DC – 6	DC – 3	1.20	0.20	80	250	50
		3 – 6	1.30	0.30	70	170	
SMA	DC – 26.5	DC – 3	1.20	0.20	80	250	50
		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 – 26.5	1.60	0.60	55	40	
SMA2.9	DC – 40	DC – 3	1.20	0.20	80	60	50
		3 – 8	1.30	0.30	70	35	
		8 – 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	2.20	1.10	45	5	

TYPICAL RF PERFORMANCES

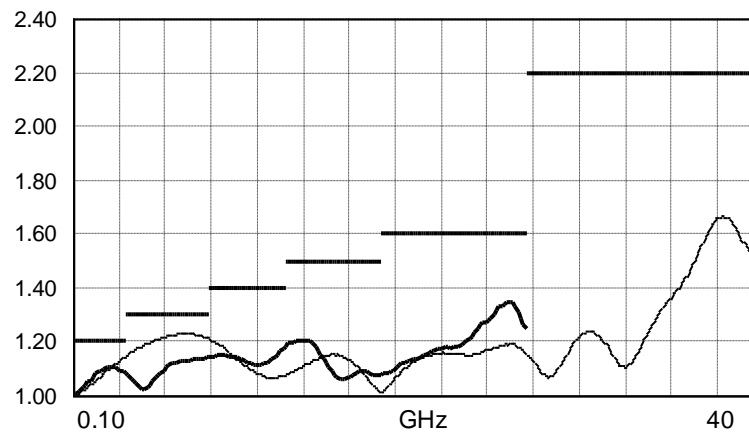
**Insertion Loss and Isolation :**

-  26.5GHz model with SMA connector
-  40GHz model with SMA2.9 connector

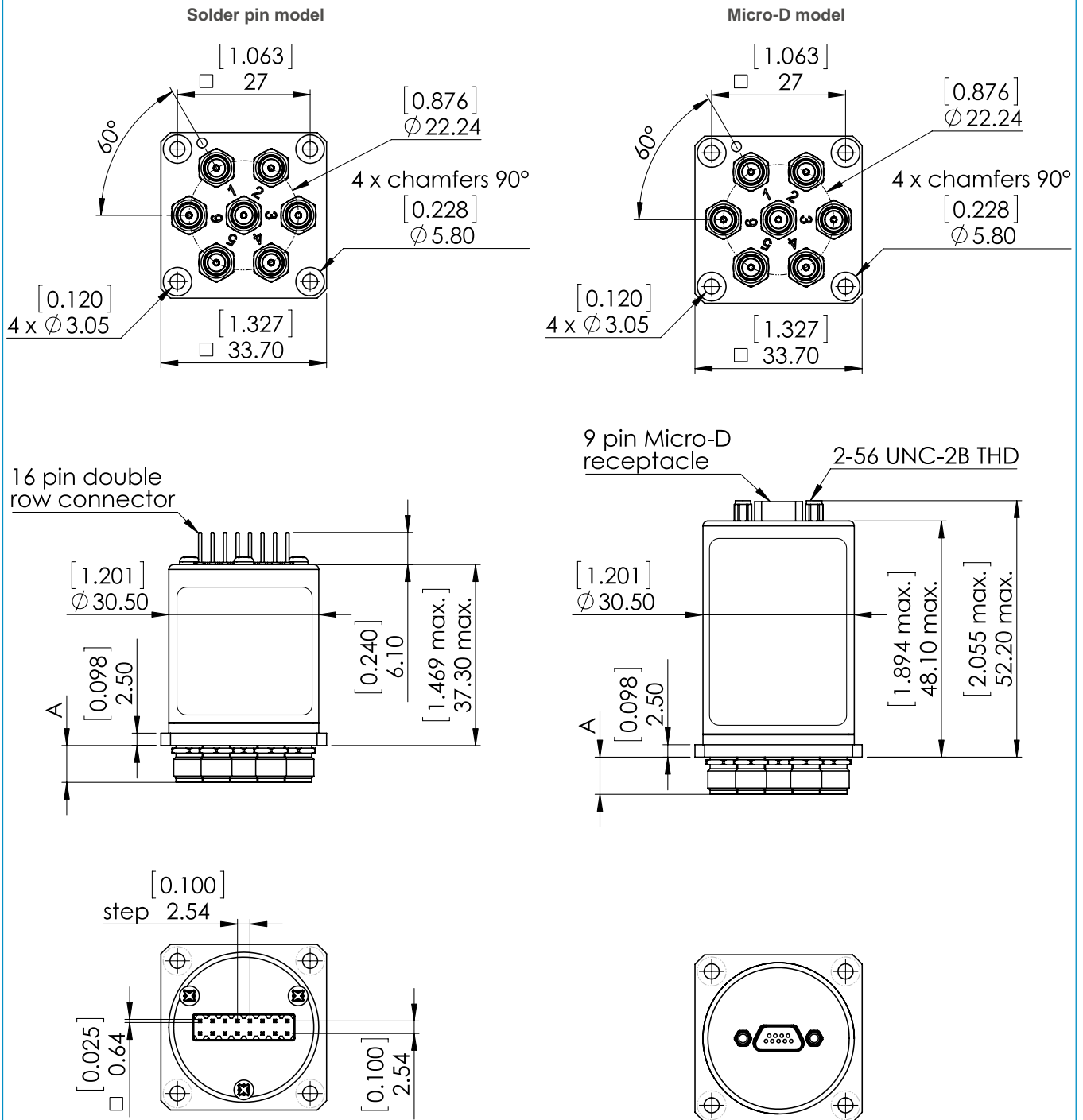


**V.S.W.R :**

-  26.5GHz model with SMA connector
-  40GHz model with SMA2.9 connector



TYPICAL OUTLINE DRAWING

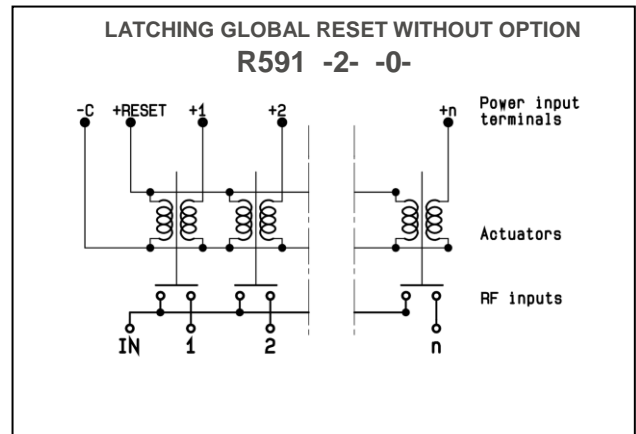
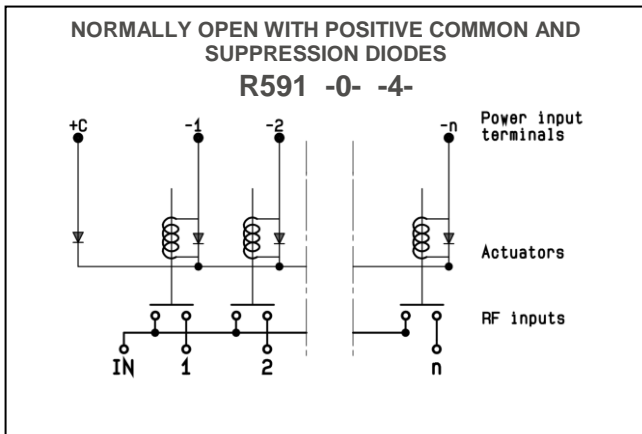
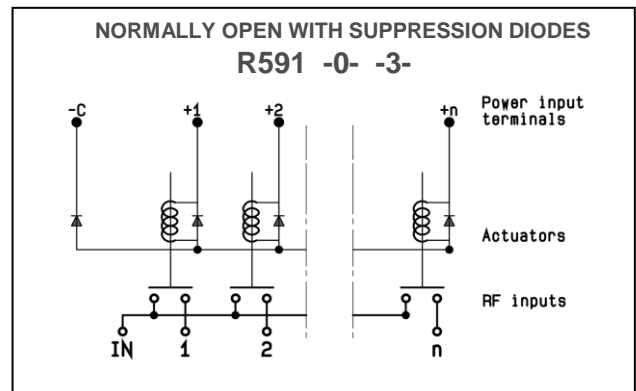
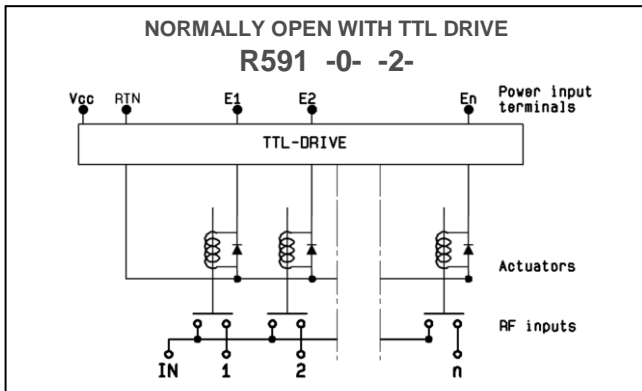
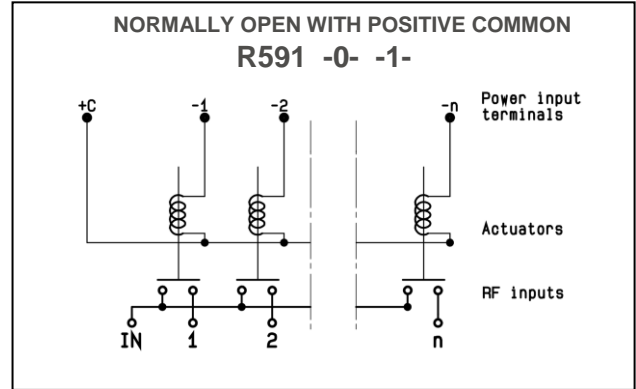
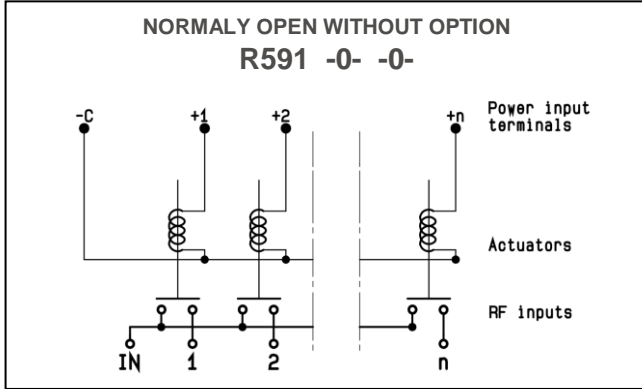


All dimensions are in millimetres.[inches]  
General tolerances: ±0.5 mm [0.02 in]

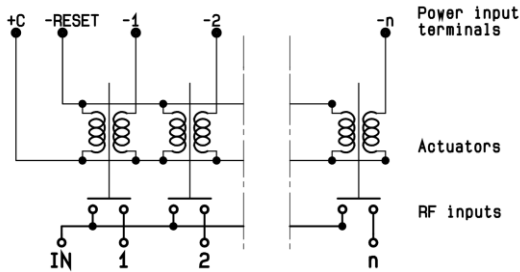
Connectors	SMA	SMA2.9	QMA
A max (mm / inches)	7.7 / 0.303	6.7 / 0.264	10.8 / 0.425

Ways 3 and 6 are not connected for SP4T

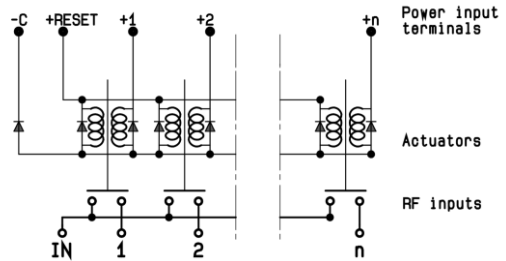
R591 SERIES ELECTRICAL SCHEMATICS



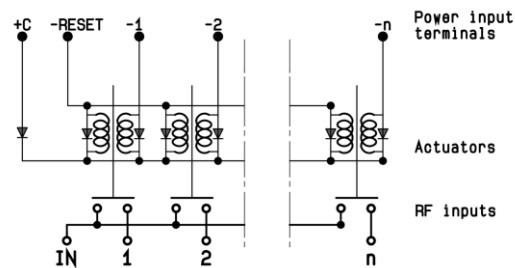
**LATCHING GLOBAL RESET WITH POSITIVE COMMON**  
**R591 -2- -1-**



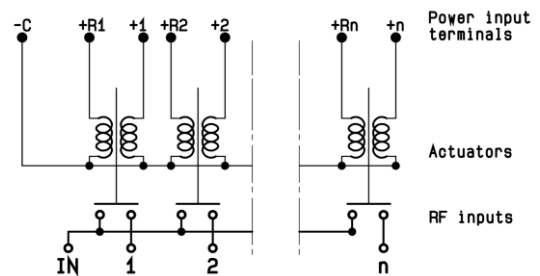
**LATCHING GLOBAL RESET WITH SUPPRESSION DIODES**  
**R591 -2- -3-**



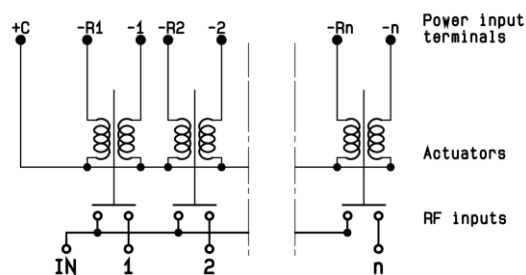
**LATCHING GLOBAL RESET WITH POSITIVE COMMON AND SUPPRESSION DIODES**  
**R591 -2- -4-**



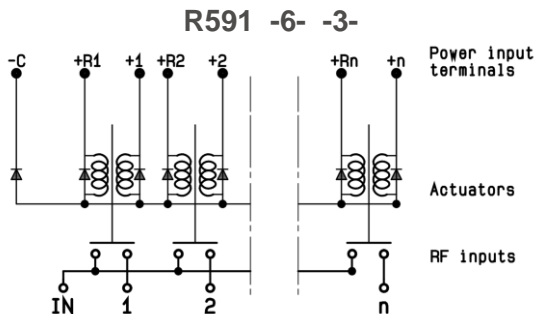
**LATCHING SEPARATED RESET WITHOUT OPTION**  
**R591 -6- -0-**



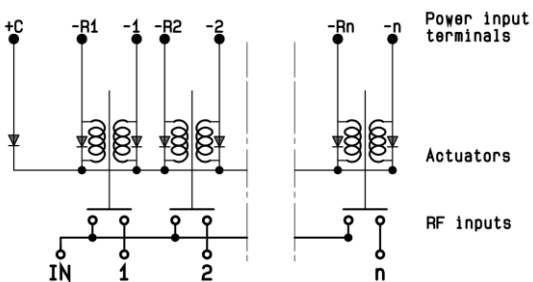
**LATCHING SEPARATED RESET WITH POSITIVE COMMON**  
**R591 -6- -1-**



**LATCHING SEPARATED RESET WITH SUPPRESSION DIODES**  
**R591 -6- -3-**

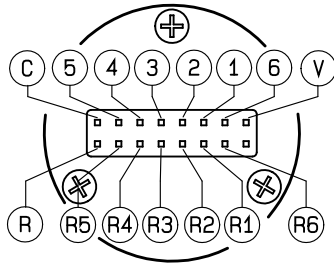


**LATCHING SEPARATED RESET WITH POSITIVE COMMON AND SUPPRESSION DIODES**  
**R591 -6- -4-**

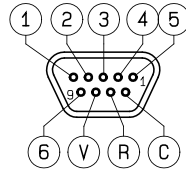


Pin identification

**Solder pins (Top view) \***



**9 pin Micro-D (Top view)**



\* : Compatible with 2.54 pitch double row 16 contacts female connector

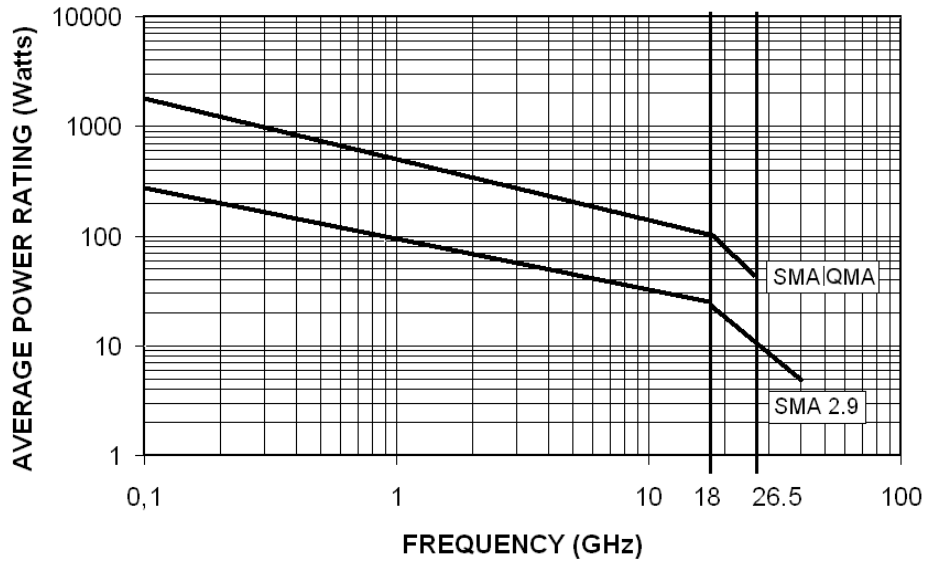
Type		PIN														
		C	V	1	2	3	4	5	6	R	R1	R2	R3	R4	R5	R6
Normally open	Negative common	-C	NC	+1	+2	+3	+4	+5	+6	NC	NC	NC	NC	NC	NC	NC
	Positive common	+C	NC	-1	-2	-3	-4	-5	-6	NC	NC	NC	NC	NC	NC	NC
Latching	Negative common	-C	NC	+1	+2	+3	+4	+5	+6	+reset	NC	NC	NC	NC	NC	NC
global reset	Positive common	+C	NC	-1	-2	-3	-4	-5	-6	-reset	NC	NC	NC	NC	NC	NC
Latching	Negative common	-C	NC	+1	+2	+3	+4	+5	+6	NC	+res.1	+res.2	+res.3	+res.4	+res.5	+res.6
individual reset	Positive common	+C	NC	-1	-2	-3	-4	-5	-6	NC	-res.1	-res.2	-res.3	-res.4	-res.5	-res.6
Normally open with TTL drive		RTN	Vcc	E1	E2	E3	E4	E5	E6	NC	NC	NC	NC	NC	NC	NC

**NC stand for "Not Connected"**  
**Pin R : Reset all paths**  
**Ways 3 and 6 are not connected for SP4T**

POWER RATING CHART

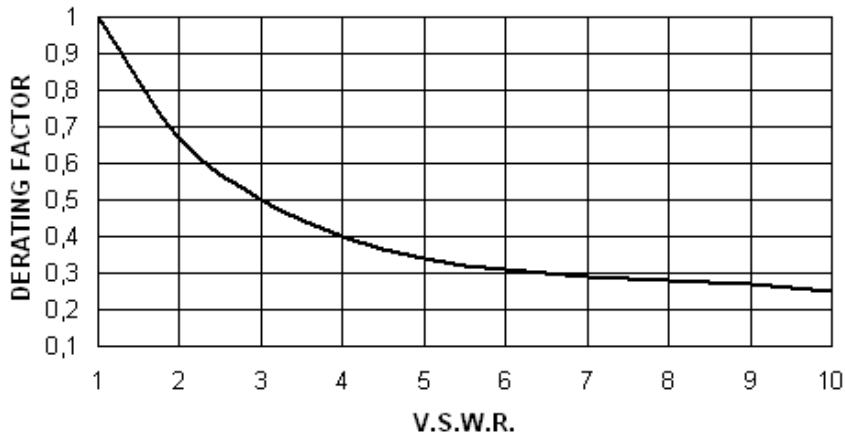
This graph is based on the following conditions :

- Ambient temperature : + 25°C
- Sea level
- V.S.W.R. : 1 and cold switching



DERATING FACTOR VERSUS V.S.W.R.

The average power input must be reduced for load V.S.W.R. above 1.





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[R514F73417](#) [R595333210](#) [R595F53225](#) [R591363400](#) [R595433410](#) [R595333215](#) [R595337220](#) [R595343115](#) [R595343125](#) [R591362440](#)  
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[R570413030](#) [R570452000](#)