

## SUBMINIATURE SPnT up to 40 GHz

SMA – SMA 2.9 – QMA

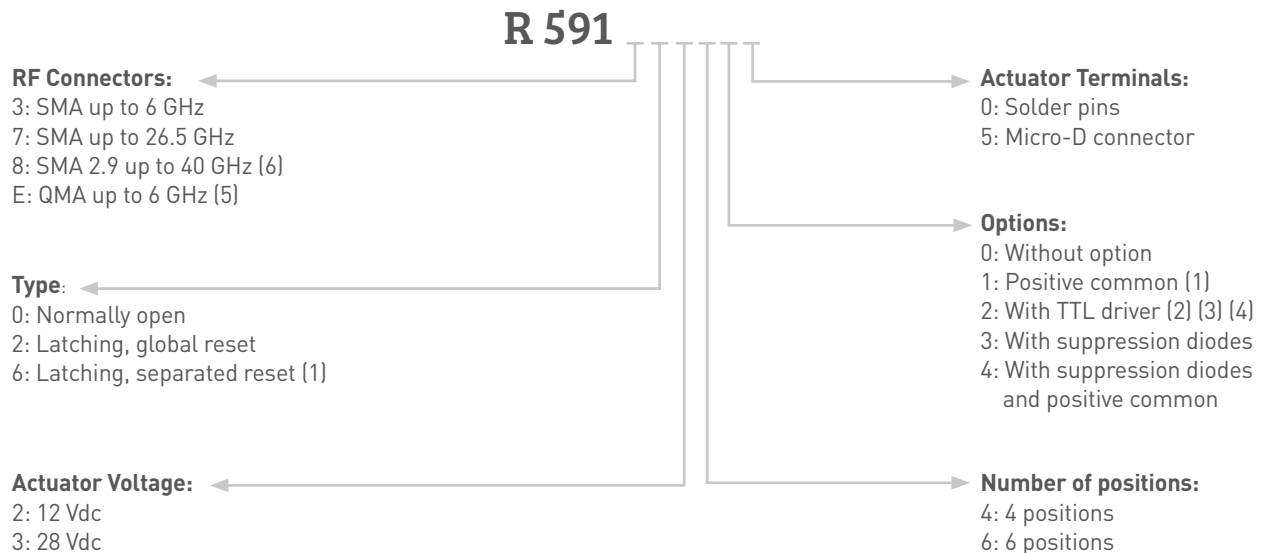


Radiall's R591 coaxial subminiature switches have a typical operating life exceeding 25 million cycles. Providing excellent RF performance, repeatability, and a guaranteed life of 10 million cycles make these switches ideal for Automated Test Equipment (ATE) and other measurement applications. These subminiature switches are also an excellent choice for Mil/Aero applications due to their small size, light weight, and outstanding shock and vibration handling capabilities.

Example of P/N:

R591302420 is a SP4T SMA up to 6 GHz, Normally open, 12 Vdc with TTL driver and solder pins.

### PART NUMBER SELECTION



(1): Available with "solder pins" models only

(2): Polarity is not relevant to application for switches with TTL driver

(3): Suppression diodes are already included with TTL option

(4): Available with "normally open" models only

(5): The QLF trademark (Quick Lock Formula®) standard applies to QMA and QN series and guarantees the full intermateability between suppliers using this trademark.

Using QLF certified connectors also guarantees the specified level of RF performances.

(6): Connector SMA2.9 is equivalent to "K connector®", registered trademark of Anritsu



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### GENERAL SPECIFICATIONS

Operating mode		Normally open		Latching	
Nominal operating voltage (across operating temperature)	Vdc	12 (10.2 / 13)	28 (21 / 30)	12 (10.2 / 13)	28 (21 / 30)
Coil resistance (+/-10%)	Ω	48	250	60	285
Operating current at 23°C	mA	250	110	200	98
Average power		See RF Power Rating Chart page <b>1-13</b>			
TTL input	High Level	2.2 to 5.5 Volts		800µA max 5.5 Volts	
	Low Level	0 to 0.8 Volts		20µA max 0.8 Volts	
Switching time (Max)	ms	10			
Life		10 million cycles (SMA, QMA) / 2 million cycles (SMA2.9)			
Connectors		SMA - QMA - SMA 2.9			
Actuator terminals		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 receptacle M83513/07-A according to MIL-C-85513.			
Operating temperature range		-40°C to +85°C			
Storage temperature range		-55°C to +85°C			
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, 20.71g		operating	
Shock (According to MIL STD 202, Method 213B, Cond. C)		100g / 6 ms, 1/2 sine		operating	

### RF PERFORMANCES

Connectors	Frequency range GHz		V.S.W.R. (max)	Insertion loss (max) dB	Isolation (min) dB	Impedance Ω
QMA / SMA	DC - 6	DC - 3	1.20	0.20	80	50
		3 - 6	1.30	0.30	70	
SMA	DC - 26-5	DC - 3	1.20	0.20	80	
		3 - 8	1.30	0.30	70	
		8 - 12.4	1.40	0.40	60	
		12.4 - 18	1.50	0.50	60	
		18 - 26.5	1.60	0.60	55	
SMA 2.9	DC - 40	DC - 3	1.20	0.20	80	
		3 - 8	1.30	0.30	70	
		8 - 12.4	1.40	0.40	60	
		12.4 - 18	1.50	0.50	60	
		18 - 26.5	1.70	0.70	55	
		26.5 - 40	2.20	1.10	45	

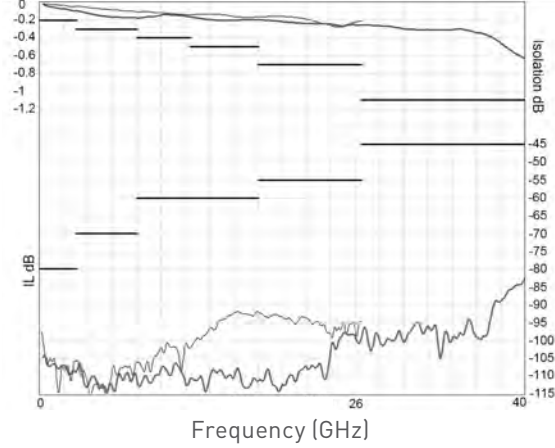
See page 5-4 for typical RF performances

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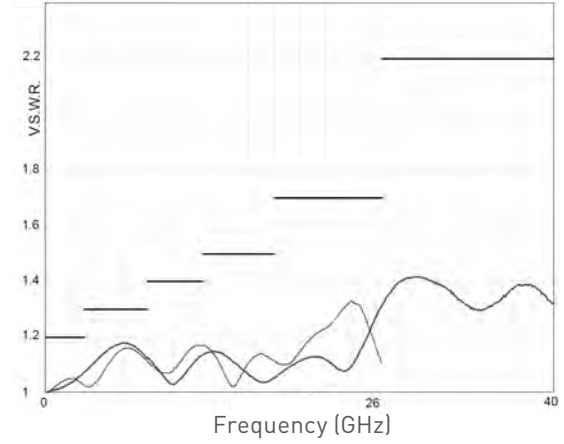
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**TYPICAL RF PERFORMANCES**

Insertion Loss and Isolation

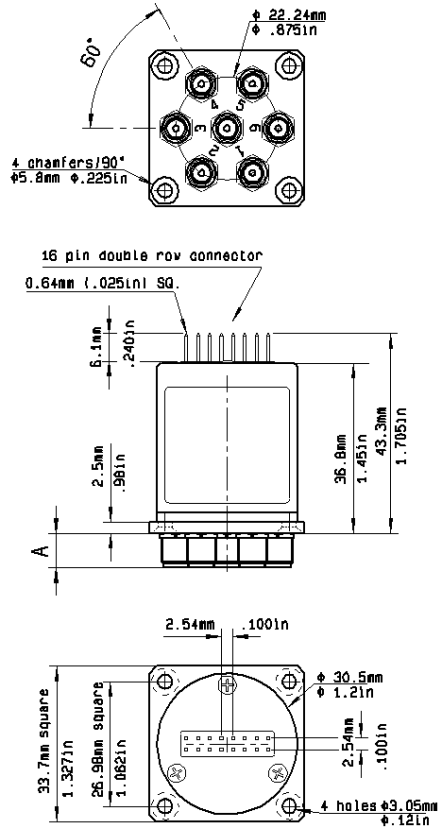


V.S.W.R.

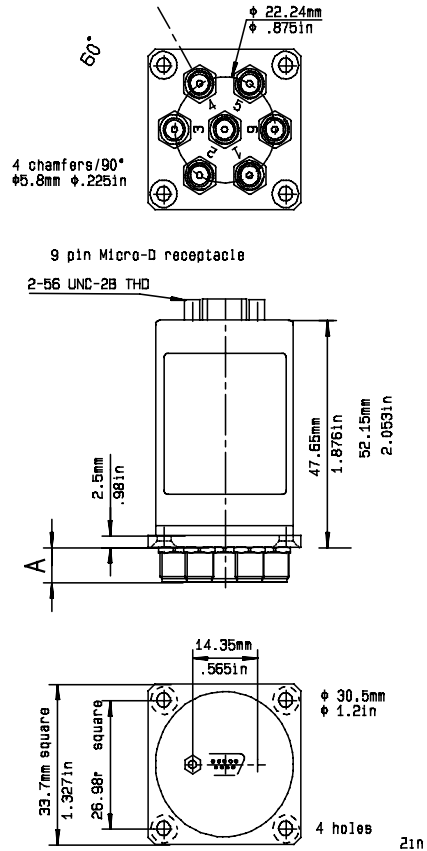


**TYPICAL OUTLINE DRAWING (1)**

Solder pin Model



Micro-D Model



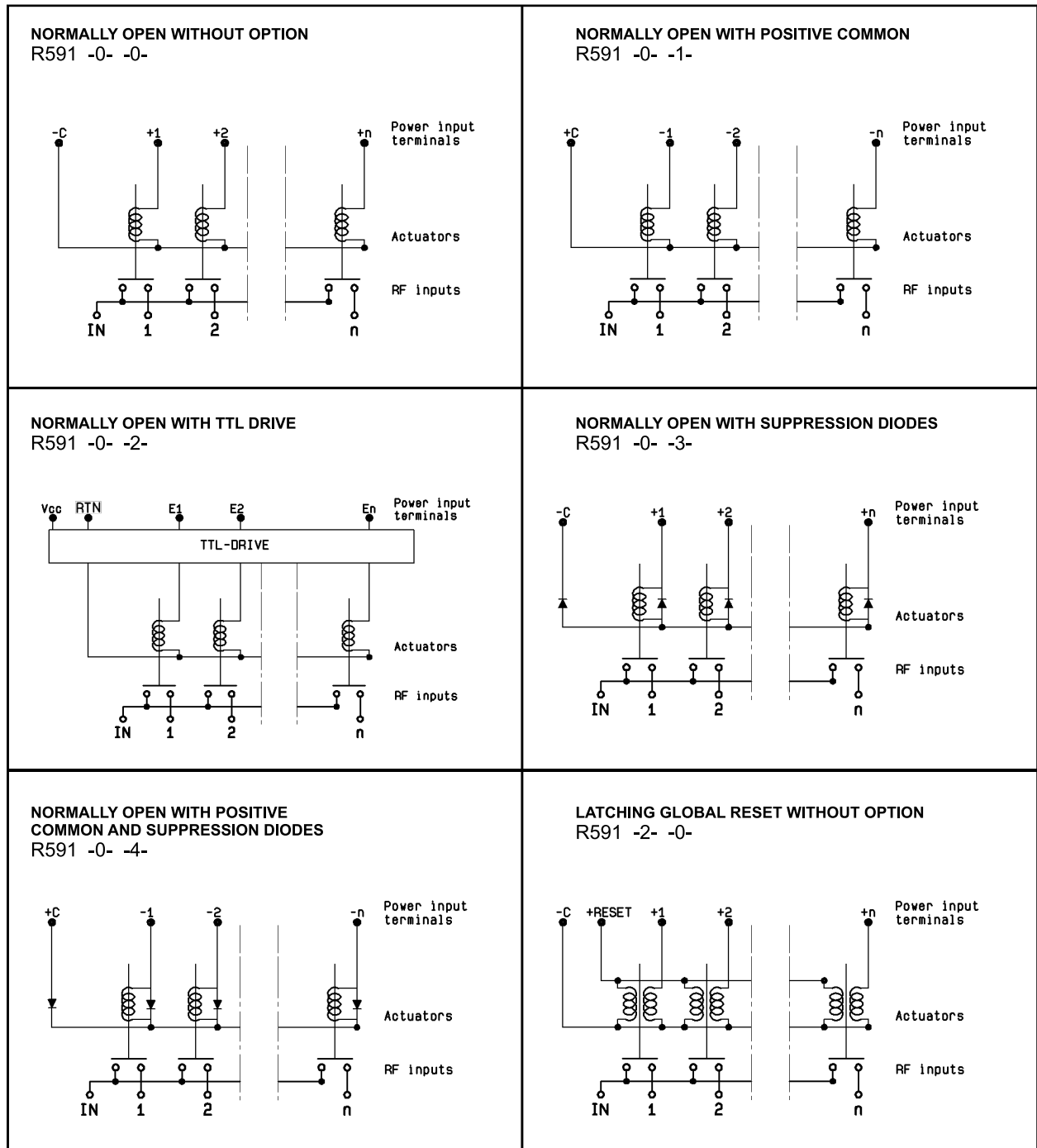
(1) : For SP4T, ways 3 and 6 not connected  
All dimensions are in mm/inches

Connectors	SMA	SMA 2.9	QMA
A max (mm/in.)	7.4/0.291	6.3/0.248	10.8/0.425

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**R591 SERIES ELECTRICAL SCHEMATICS**

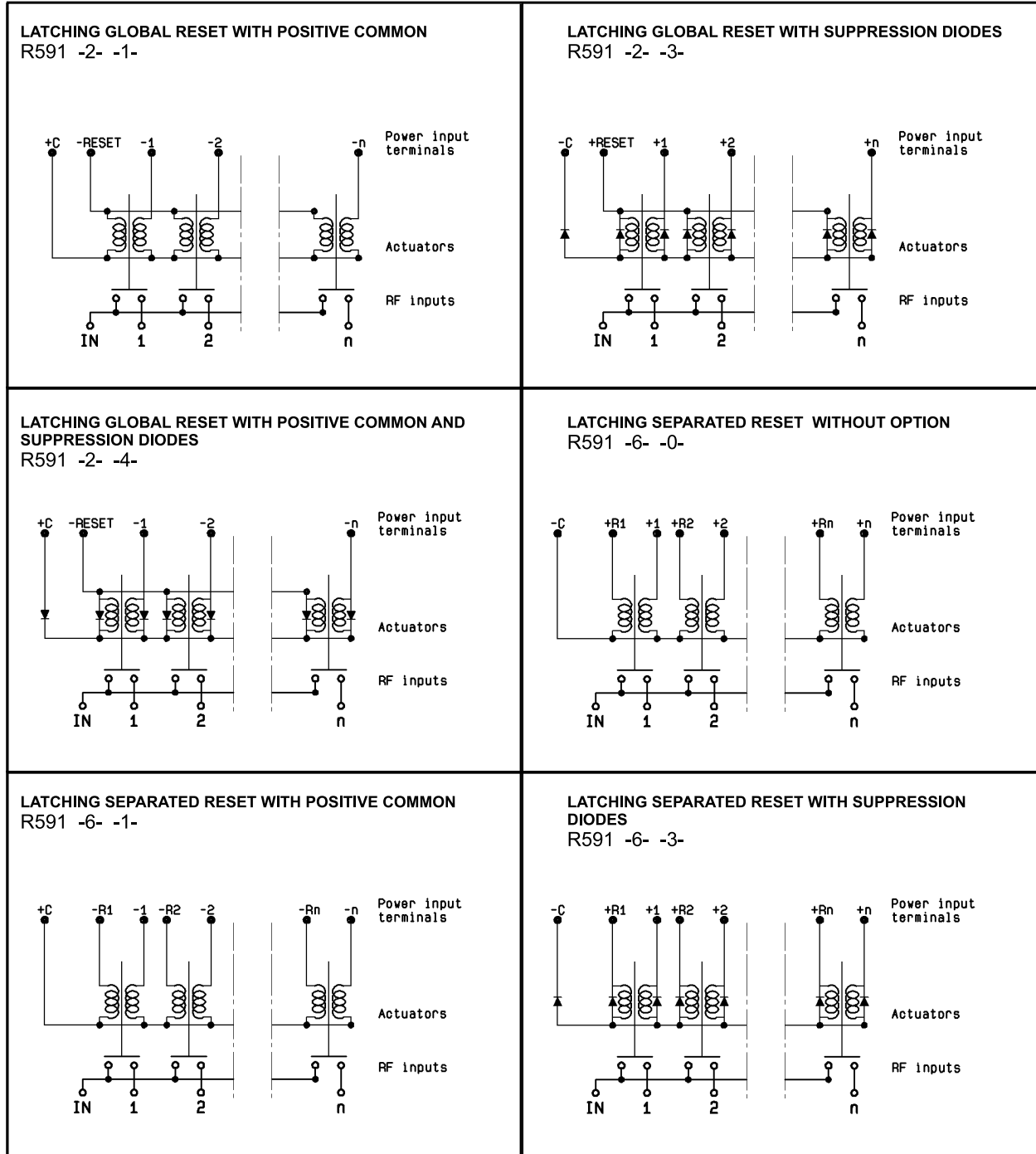


SUBMINIATURE SERIES

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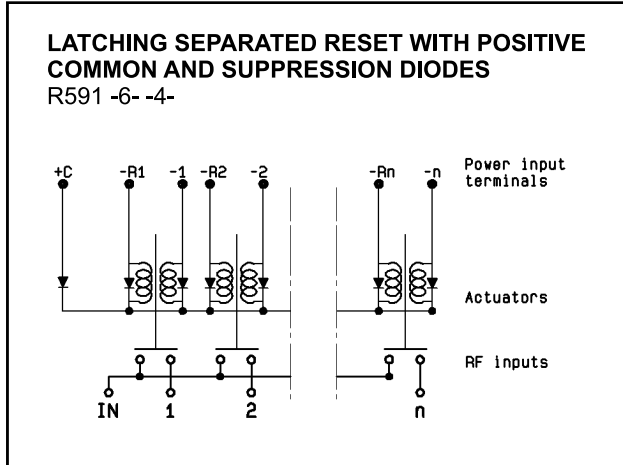
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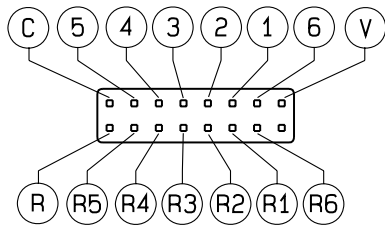
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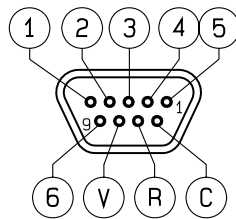


**PIN IDENTIFICATION**

Solder pins (top view)\*



9 pin Micro-D (top view)



\*Compatible with 2.54 mm pitch double row

16 contact female connector

NC: not connected

For SP4T, ways 3 and 6 not connected

Pin R = reset of all paths



Type		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 global reset	Negative common	-C	NC	+1	+2	+3	+4	+5	+6	+reset	NC	NC	NC	NC	NC	NC
	Positive common	+C	NC	-1	-2	-3	-4	-5	-6	-reset	NC	NC	NC	NC	NC	NC
Latching individual reset*	Negative common	-C	NC	+1	+2	+3	+4	+5	+6	NC	+res.1	+res.2	+res.3	+res.4	+res.5	+res.6
	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

\*Available with "solder pins" models only.