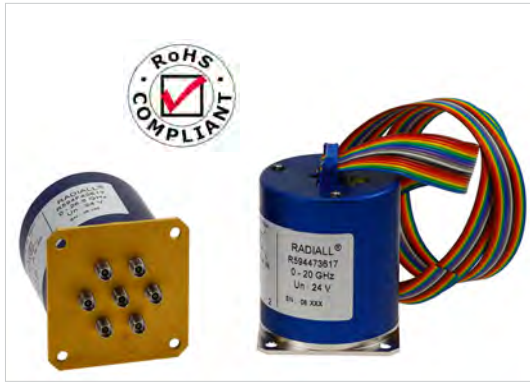


## High Performance Multiport Switches

PLATINUM Series / SPnT terminated up to 40 GHz



Radiall's PLATINUM series switches are optimized to perform at a high level over an extended life cycle. With outstanding RF performance, and a guaranteed insertion loss repeatability of 0.03 dB over a life span of 10 million switching cycles, Radiall's PLATINUM series switches are a perfect solution for automated test and measurement equipment, as well as signal monitoring devices.

Example of P/N:

R594873427 is a SPnT SMA2.9 up to 40 GHz, Latching with Indicators, Self cut-off, Auto-Reset, TTL driver and HE10 connector.

### PART NUMBER SELECTION

**R 594**

**RF Connectors:**

- 3: SMA up to 6 GHz
- 4: SMA up to 20 GHz
- F: SMA up to 26.5 GHz
- 8: SMA 2.9 up to 40 GHz (1)

**Type:**

- 4: Latching + Self cut-off without indicator
- 7: Latching + Self cut-off + Auto Reset + Indicators

**Actuator Voltage:**

- 3: 28 Vdc

**Documentation:**

- : Certificate Of Conformity
- C: Calibration certificate
- R: Calibration certificate + RF curves

**Actuator Terminal:**

- 7: HE 10 receptacle, delivered with 750 mm (30 inches) ribbon cable + HE10 connector

**Number of positions:**

- 4: 4 Positions
- 6: 6 Positions

**Options:**

- 1: Positive common (without TTL) Type "4" or "7"
- 2: TTL/5V logic with 24 Vdc supply Type "7" only

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

Ways 1 and 4 are not connected for SP4T switches.

## High Performance Multiport Switches

PLATINUM Series / SPnT terminated up to 40 GHz

PLATINUM SERIES

### GENERAL SPECIFICATIONS

Operating mode		Latching	
Nominal operating voltage (across operating temperature)	Vdc	24 (20/32)	
Coil resistance (+/-10%)	Ω	120	
Operating current at 23°C	mA	200	
Maximum stand-by current	mA	50	
Average power		RF path Cold switching: See Power page <b>5-53</b>	
		Hot switching: 1 Watt Cw	
		Internal terminations 1 Watt average into 50 Ω	
TTL input	High Level	3 to 7 V	1.4 mA max at Vcc = Max
	Low Level	0 to 0.8 Volts	-
Indicator specifications		Maximum withstanding voltage	60V
		Maximum current capacity	150 mA
		Maximum "ON" resistance	2.5 Ω
		Minimum "OFF" resistance	100MΩ
Switching time (Max)	ms	15	
Life (Min) for	SMA	10 million cycles	
	SMA 2.9	2.5 million cycles	
Connectors		SMA - SMA 2.9	
Actuator terminals		HE10 ribbon receptacle	
Weight (Max)	g	230	

### ENVIRONMENTAL SPECIFICATIONS

Operating temperature range	-25°C to +75°C
Storage temperature range	-55°C to +85°C
Temperature cycling (MIL-STD-202, Method 107D, Cond.A)	-55°C to +85°C (10 cycles)
Vibration (MIL STD 202, Method 204D, Cond.D)	10-2000 Hz, 10g operating
Shock (MIL STD 202, Method 213B, Cond.C)	50g / 6 ms, 1/2 sine operating
Moisture resistance (MIL STD 202, Method 106E, Cond.E)	65°C, 95% RH, 10 days
Altitude storage (MIL STD 202, Method 105C, Cond.B)	50,000 feet (15,240 meters)
RFI (MIL STD 1344, Method 3008 or IEC 61726)	55dB at 20GHz
Magnetic field	< 5.10-5 gauss at 1 meter

## High Performance Multiport Switches

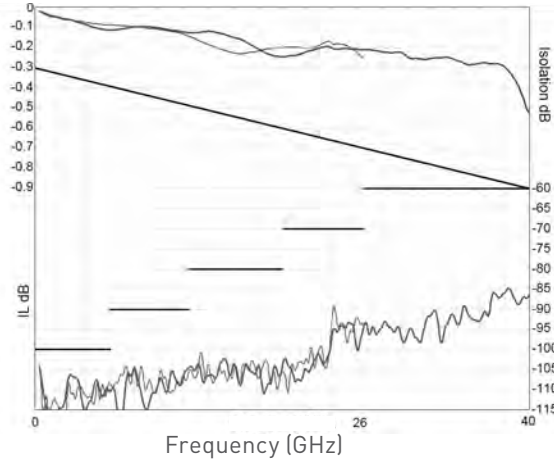
PLATINUM Series / SPnT terminated up to 40 GHz

### RF PERFORMANCES

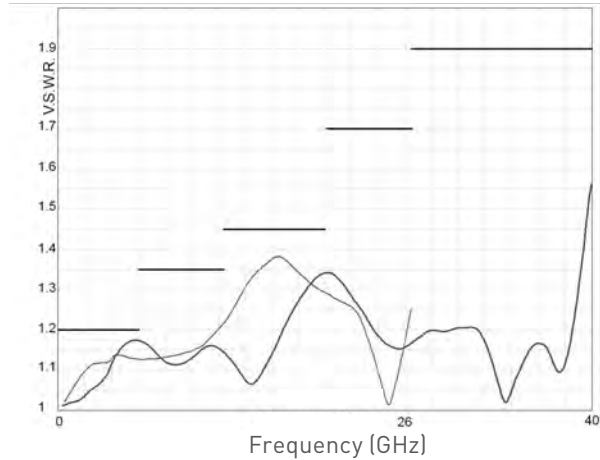
Part number		R5943-34-7	R5944-34-7 R5944-36-7	R594F-34-7 R594F-36-7	R5948-34-7 R5948-36-7			
Frequency Range	GHz	DC to 6	DC to 20	DC to 26.5	DC to 40			
Impedance	Ω	50						
Insertion Loss (Max)	dB	0.3 + 0.015 x frequency [GHz]						
Isolation (Min)	dB	100	DC to 6 GHz	100	DC to 6 GHz	100	DC to 6 GHz	100
			6 to 12.4 GHz	90	6 to 12.4 GHz	90	6 to 12.4 GHz	90
			12.4 to 20 GHz	80	12.4 to 20 GHz	80	12.4 to 18 GHz	80
					20 to 26.5 GHz	70	18 to 26.5 GHz	70
					26.5 to 40 GHz	60		
V.S.W.R. (Max)	dB	1.20	DC to 6 GHz	1.20	DC to 6 GHz	1.20	DC to 6 GHz	1.20
			6 to 12.4 GHz	1.35	6 to 12.4 GHz	1.35	6 to 12.4 GHz	1.35
			12.4 to 20 GHz	1.45	12.4 to 20 GHz	1.45	12.4 to 18 GHz	1.45
					20 to 26.5 GHz	1.70	18 to 26.5 GHz	1.70
							26.5 to 40 GHz	1.90
Repeatability (measured at 25°C)		0.03 dB			0.05 dB			

### TYPICAL RF PERFORMANCES

#### Insertion Loss and Isolation



#### V.S.W.R.



SMA — SMA 2.9 —

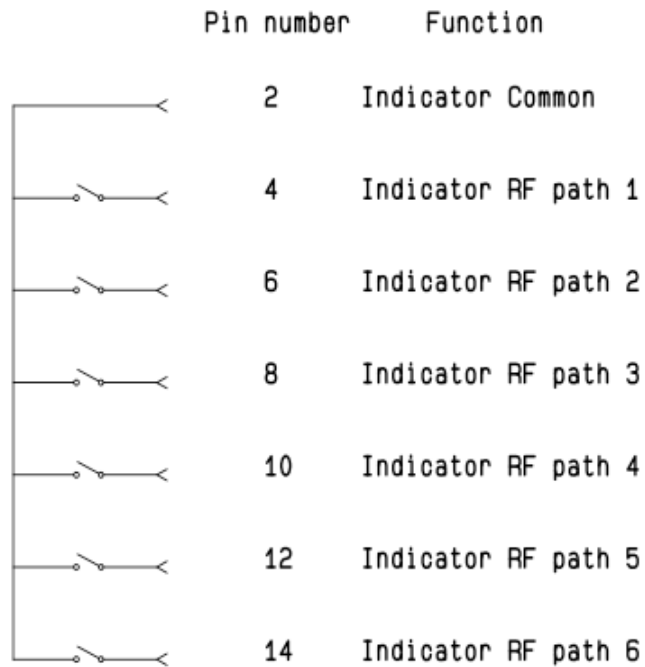
## High Performance Multiport Switches

PLATINUM Series / SPnT terminated up to 40 GHz

### ELECTRONIC POSITION INDICATORS

#### THIS OPTION IS NOT AVAILABLE WITH TYPE 4

The electronic position indicators use photo-MOS transistors which are driven by the mechanical position of the RF paths moving elements. The circuitry consists of a common which can be connected to an output corresponding to selected RF path. If one or several RF paths are closed, the corresponding indicators are connected to the common. The photo-MOS transistors are configured for AC and/or DC operation. The electronic position indicators require the supply (20 to 32 VDC) to be connected to pin 1 and ground connected to pin 15.



Ways 1 and 4 are not connected for SP4T switches.

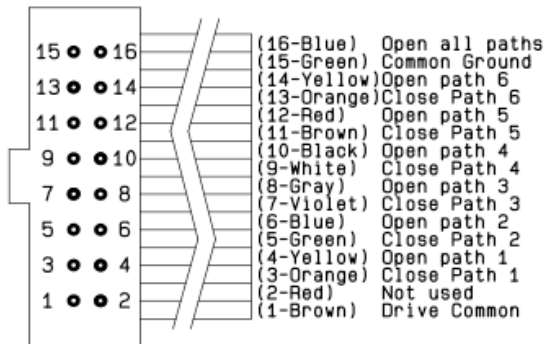
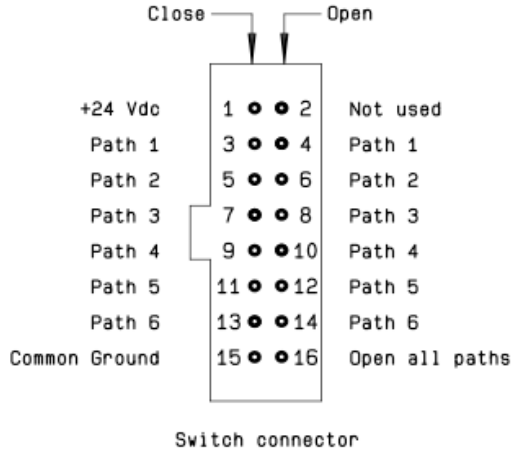
## High Performance Multiport Switches

PLATINUM Series / SPnT terminated up to 40 GHz

### DRIVING THE SWITCH

Each RF path is driven independently, and can be closed or open by applying ground to the corresponding "open" or "close" pin.

#### TYPE 4: WITHOUT TTL AND WITHOUT INDICATOR



#### Standard drive:

- Connect pin 15 to ground
- Connect pin 1 to supply (+20 VDC to +32VDC)
- Select desired RF path by applying ground to the corresponding "close" pin (Ex: ground pin 3 to close RF path 1)
- To open desired RF path connect ground to the corresponding "open" pin (Ex: ground pin 4 to open RF path 1)
- To open all RF paths, first ensure that all RF path "close" pins are disconnected from ground, then to complete the operation, connect pin 16 to ground

#### Make-Before-Break:

Make-Before-Break switching can be accomplished by closing the new RF path before opening the previously selected RF path. To complete the operation, close the new the new RF port for at least 15 minutes (minimum), then open the previously selected RF port.

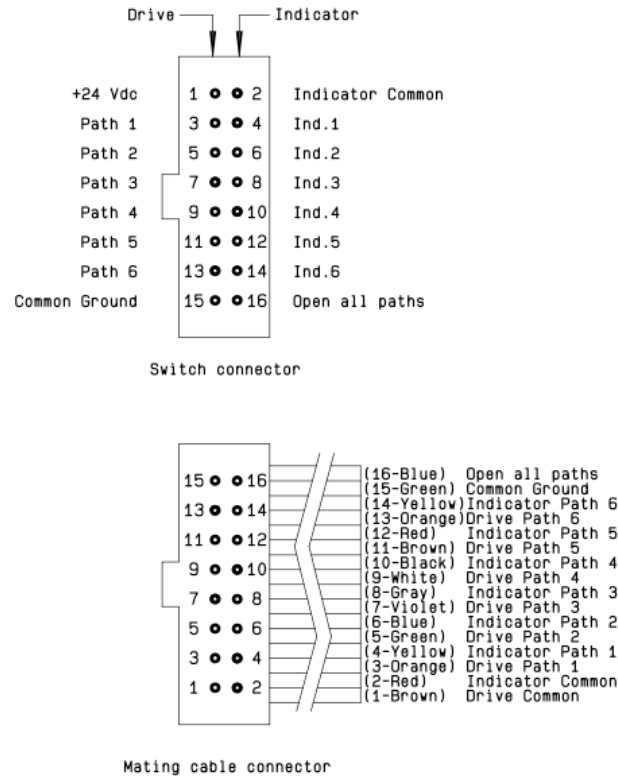
Ways 1 and 4 are not connected for SP4T switches.

## High Performance Multiport Switches

PLATINUM Series / SPnT terminated up to 40 GHz

### TYPE 7: WITH TTL (OPTION "2") / WITHOUT TTL (OPTION "1") AND INDICATORS

Each RF path can be closed by applying Ground or TTL "High" for option 2 to the corresponding "drive" pin. In general, except for Make-Before-Break drive, all other RF paths are simultaneously opened by internal logic.



#### Standard drive option "1":

- Connect pin 15 to ground
- Connect pin 1 to supply (+20 VDC to +32 VDC)
- Select (close) desired RF path by applying ground to the corresponding "drive" pin (Ex: apply ground to pin 3 to close RF path 1)
- To select another path, ensure that all unwanted RF path "drive" pins are disconnected from ground (to prevent multiple RF path engagement), then apply ground to the "drive" pin which corresponds to the desired RF path
- To open all RF paths, ensure that all RF path "drive" pins are disconnected from ground, then complete the operation by applying ground to pin 16

#### TTL drive option "2":

- Connect pin 15 to ground
- Connect pin 1 to supply (+20 VDC to +32 VDC)
- Select (close) desired RF path by applying TTL "High" to the corresponding "drive" pin (Ex: apply TTL "High" to pin 3 to close RF path 1)
- To select another path, ensure that all unwanted RF path "drive" pins are in TTL "Low" position (to prevent multiple RF path engagement), then apply TTL "High" to the "drive" pin which corresponds to the desired RF path
- To open all RF paths, ensure that all RF path "drive" pins are in TTL "Low" position, then to complete the operation by applying TTL "High" to pin 16

#### Break-Before-Make:

Open the undesired RF path after 15 minutes (minimum), then close the new RF path.

#### Make-Before-Break:

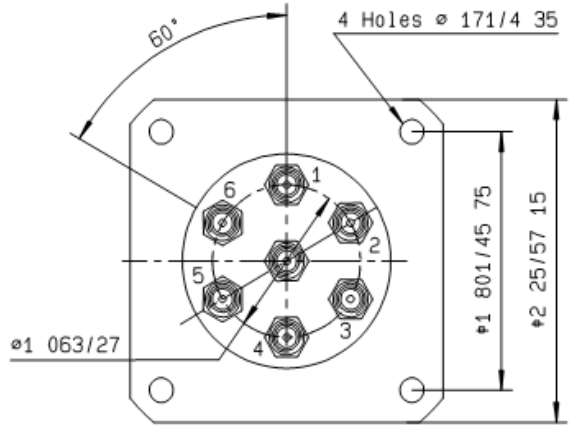
Ensure that the previously selected RF path "drive" is connected to ground (or TTL "High" for option "2"), then close the new RF path.

Ways 1 and 4 are not connected for SP4T switches.

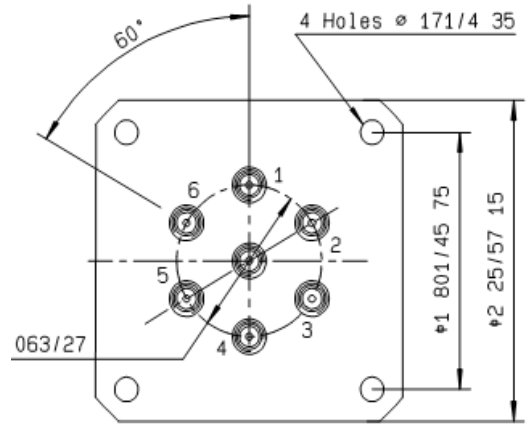
## High Performance Multiport Switches

### TYPICAL OUTLINE DRAWING

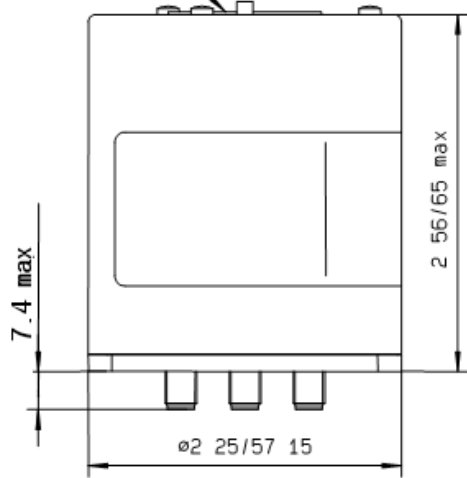
#### SMA connectors



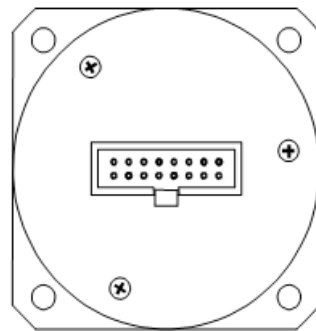
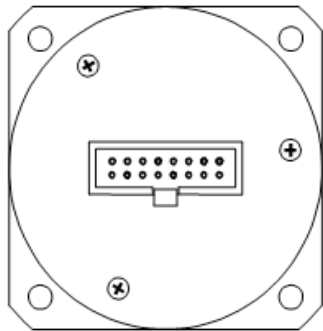
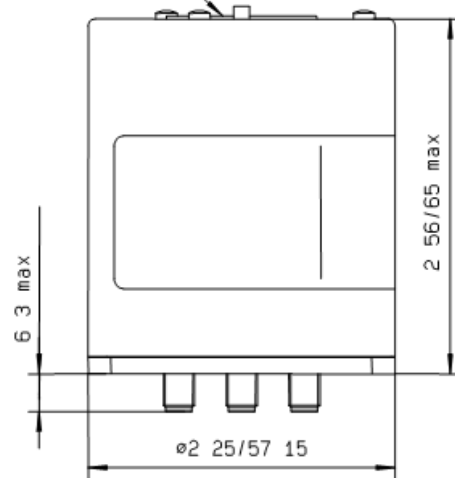
#### SMA 2.9 connectors



#### 16 pin HB10 male connector



#### 16 pin HB10 male connector



Ways 1 and 4 are not connected for SP4T switches.

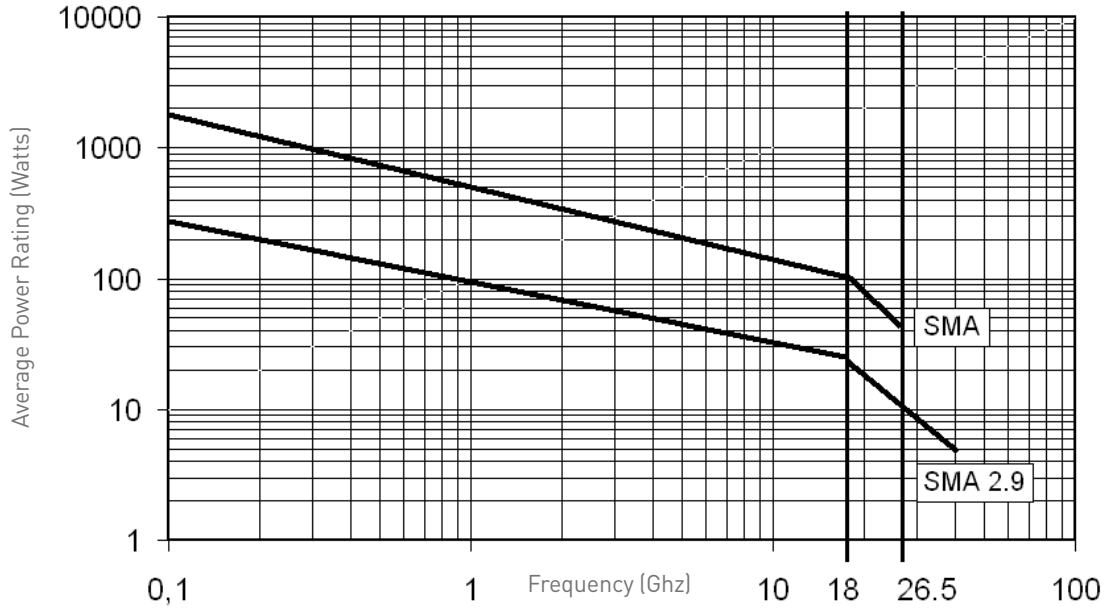
## High Performance Multiport Switches

PLATINUM Series / SPnT terminated up to 40 GHz

### POWER RATING CHART

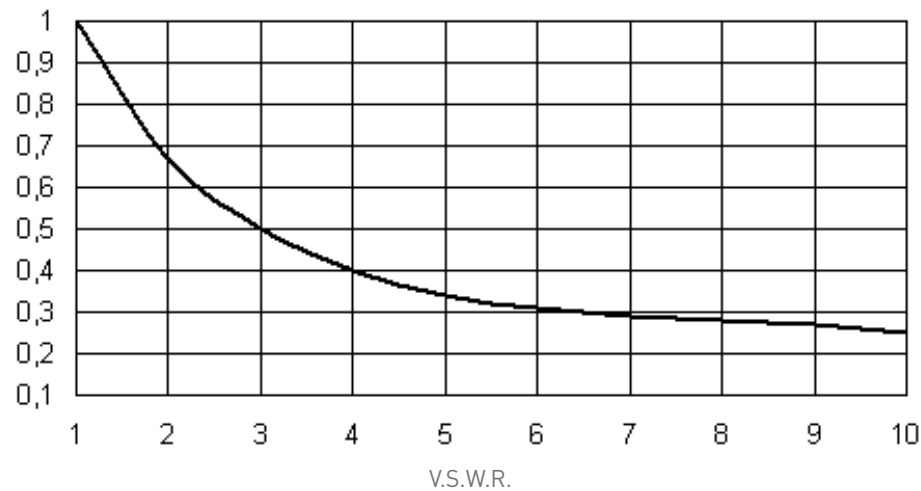
This graph is based on the following conditions:

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



### DERATING FACTOR VERSUS VSWR

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





### Optional Features For SPnT

#### EXAMPLES OF DEDICATED APPLICATION OPTIONS



SPnT with flat ribbon cable for easy installation with limited space.



Thermal vacuum SPnT designed based on our expertise in Space. For more detailed information, see page 7-6 to 7-8.



SPnT with special mounting bracket for easy mounting in Automatic Test Equipment.



Subminiature SP6T with a micro D connector instead of solder pins.



SP3T used for a military application with sequential access and severe environmental characteristics.



Subminiature SP6T developed for test bench applications requiring low RF leakage.