



## DPDT

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**DPDT PART NUMBER SELECTION GUIDE<sup>[1]</sup>**

PLATINUM		TITANIUM		RAMSES		DIGITAL POSITION	
DPDT	R593	DPDT	R513	DPDT	R577	DPDT	R 1-3
-	-	-	-	-	-	-	-
3	3	3	3	-	3	3	SMA 3 GHz
-	-	-	-	-	-	-	SMA 6 GHz
4	4	4	4	-	4	4	SMA 18 GHz
F	F	F	F	-	F	F	SMA 20 GHz
8	8	8	8	-	8	8	SMA 26.5 GHz
-	-	-	-	-	-	-	SMA 2.9 40 GHz
-	-	-	-	-	-	-	2.4 mm up to 50 GHz
-	-	-	-	-	-	-	QMA 6 GHz
-	-	-	-	-	-	-	DIN 1.6/5.6, 2.5 GHz
-	-	-	-	0	0	0	N 3 GHz
-	-	-	-	1	1	1	N 12.4 GHz
-	-	-	-	2	2	2	BNC 3 GHz
-	-	-	-	5	5	5	TNC 3 GHz
-	-	-	-	6	6	6	TNC 12.4 GHz
-	-	-	-	1/2	1/2	1/2	Failsafe
7	7	7	7	3/4/5/6	3/4/5/6	3/4/5/6	Latching
-	-	-	-	2	2	2	12 V
3	3	3	3	-	-	-	24 V
-	-	-	-	3	3	3	28 V
-	-	-	-	0	0	0	Without
1	1	1	1	1	1	1	With option
-	-	-	-	0	0	0	Without option
-	-	-	-	1	1	1	Positive common
-	-	-	-	3	3	3	Suppression diodes
4	4	4	4	4	4	4	Suppression diodes and positive common
-	-	-	-	0	0	0	Solder pins with bracket
-	-	-	-	2	2	2	Solder pins without bracket
-	-	-	-	5	5	5	D-Sub connector with bracket
-	-	-	-	7	7	7	D-Sub connector without bracket
8	8	8	8	-	-	-	HE 10 with bracket
9	9	9	9	-	-	-	HE 10 without bracket

**Notes**

Example of P/N: R577412020 is a DPDT SMA 18 GHz failsafe, 12 Vdc, without TTL driver, solder pins with bracket.

1. For part number creation and available options, see detailed part number selection for each series.

## DPDT UP TO 50 GHz

SMA - SMA 2.9 - 2.4 MM - QMA - DIN 1.6/5.6



Radiall's DPDT switches offer excellent reliability, high performance and operating frequencies from DC to 50 GHz. Radiall's RAMSES concept guarantees a life span of 2.5 million cycles and provides a full array of options to respond to the needs of our customers.

These relays are well suited for applications across all markets including: Defense, Instrumentation, and Telecom.

*Example of P/N: R577F63105 is a DPDT SMA 26.5 GHz latching with Indicators, Self Cut-Off, 28 Vdc, TTL driver, D-Sub connector.*

### PART NUMBER SELECTION

# R577

#### SERIES PREFIX

#### 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 <sup>[5]</sup>
- 9: DIN 1.6/5.6 up to 2.5 GHz
- J: 2.4 mm up to 50 GHz

#### TYPE

- 1: Failsafe
- 2: Failsafe + I.C.
- 3: Latching
- 4: Latching + I.C.
- 5: Latching + S.C.O. <sup>[1]</sup>
- 6: Latching + S.C.O. + I.C. <sup>[1]</sup>

#### ACTUATOR VOLTAGE

- 2: 12 Vdc
- 3: 28 Vdc

#### ACTUATOR TERMINALS & FIXING

- 0: Solder pins with bracket
- 2: Solder pins without bracket
- 5: D-Sub connector with bracket
- 7: D-Sub connector without bracket

#### OPTIONS

- 0: Without option
- 1: Positive common <sup>[2 & 3]</sup>
- 3: With suppression diodes <sup>[1]</sup>
- 4: With suppression diodes and positive common <sup>[2 & 3]</sup>

#### TTL OPTION

- 0: Without TTL driver
- 1: With TTL driver <sup>[1 & 2]</sup>

### Notes

I.C.: Indicator contact/S.C.O.: Self Cut-Off.

1. Suppression diodes are already included in self cut-off & TTL option.

2. Polarity is not relevant to application for switches with TTL driver.

3. Positive common shall be specified only with type 3,4,5 and 6 because failsafe switches can be used with both polarities.

4. 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 performance.

5. Connector SMA 2.9 is equivalent to "K connector®", registered trademark of Anritsu.

## RAMSES Series

## GENERAL SPECIFICATIONS

OPERATING MODE		FAILSAFE		LATCHING	
Nominal operating voltage (across operating temperature)	Vdc	12 (10.2 / 13)	28 (24 / 30)	12 (10.2 / 13)	28 (24 / 30)
Coil resistance (+/-10%)	Ω	35	200	38	225
Nominal operating current at 23 °C	mA	340	140	320	125
Average power		See Power Rating Chart page 1-13			
TTL input	High Level	2.2 to 5.5 Volts - 800 μA max 5.5 Volts			
	Low Level	0 to 0.8 Volts - 20 μA max 0.8 Volts			
Indicator rating		1 W/30 V/100 mA			
Switching time (max)	ms	15			
Life	SMA - SMA 2.9 - QMA - DIN 1.6/5.6	2.5 million cycles			
	2.4 mm	2 million cycles			
Connectors		SMA - SMA 2.9 - QMA - DIN 1.6/5.6 - 2.4 mm			
Actuator terminals		Solder pins or male 9 pin D-Sub connector			
Operating temperature range	DIN 1.6/5.6 - 2.4 mm	-25°C to +70°C			
	SMA - SMA 2.9 - QMA	-40°C to +85°C			
Storage temperature range	DIN 1.6/5.6 - 2.4 mm	-40°C to +85°C			
	SMA - SMA 2.9 - QMA	-55°C to +85°C			
Vibration (MIL STD 202, Method 204D, Cond. C)		10-2,000 Hz, 10g		operating	
Shock (MIL STD 202, Method 213B, Cond. G)		50 g/11 ms, ½ sine		operating	

## RF PERFORMANCE

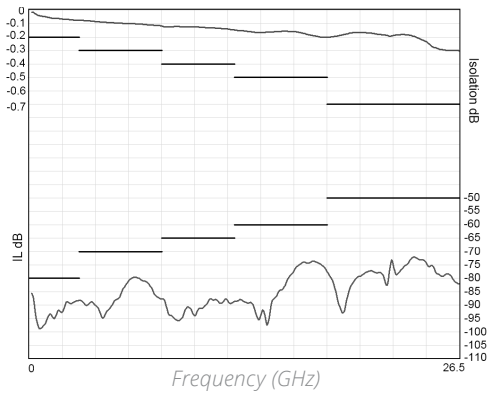
CONNECTORS	FREQUENCY RANGE GHz		V.S.W.R. (MAX)	INSERTION LOSS (MAX) dB	ISOLATION (MIN) dB	IMPEDANCE Ω
DIN 1.6/5/6	DC - 2.5	DC - 1	1.20	0.20	80	75
		1 - 25	1.30	0.30	70	
QMA	DC - 6	DC - 3	1.20	0.20	80	50
		3 - 6	1.20	0.30	70	
SMA	DC - 3 DC - 18 DC - 26.5	DC - 3	1.20	0.20	80	50
		3 - 8	1.30	0.30	70	
		8 - 12.4	1.40	0.40	65	
		12.4 - 18	1.50	0.50	60	
SMA 2.9	DC - 40	18 - 26.5	1.70	0.70	50	50
		DC - 6	1.30	0.30	70	
		6 - 12.4	1.40	0.40	60	
		12.4 - 18	1.50	0.50	60	
2.4 mm	DC - 50	18 - 26.5	1.70	0.70	55	50
		26.5 - 40	1.90	0.80	50	
		DC - 6	1.30	0.30	70	
		6 - 12.4	1.40	0.40	60	
		12.4 - 18	1.50	0.50	60	
		40 - 50	2.00	1.10	50	

See page 4-4 for typical RF performance.

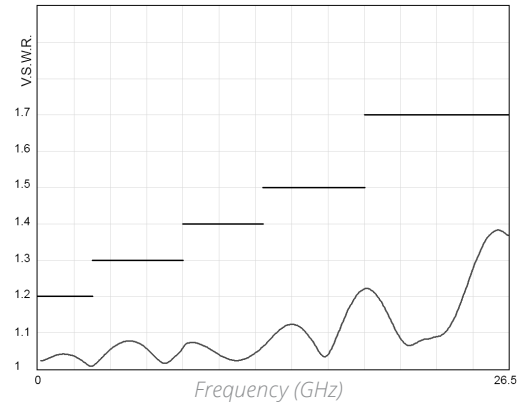
**R577 TYPICAL RF PERFORMANCE**

*Example: DPDT SMA up to 26.5 GHz*

**INSERTION LOSS & ISOLATION**

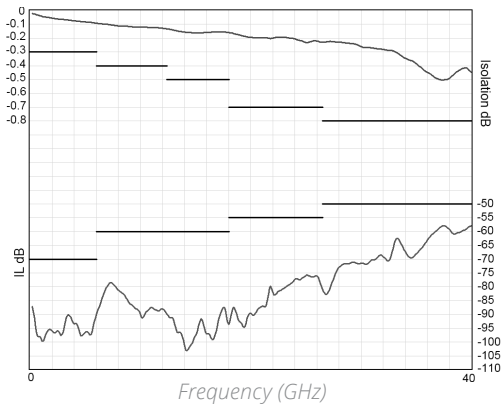


**V.S.W.R**

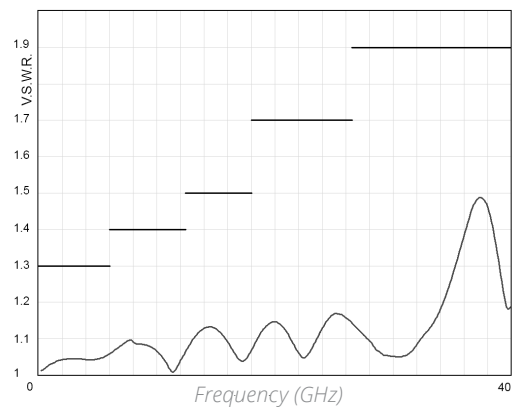


*Example: DPDT SMA 2.9 up to 40 GHz*

**INSERTION LOSS & ISOLATION**

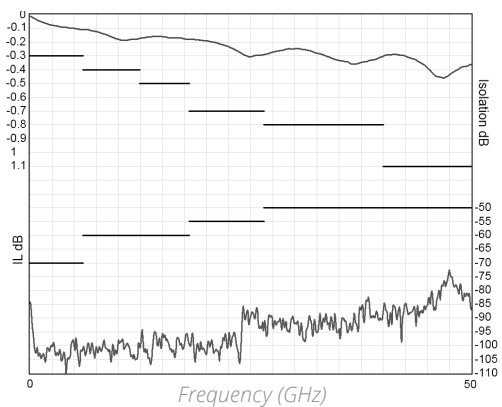


**V.S.W.R**

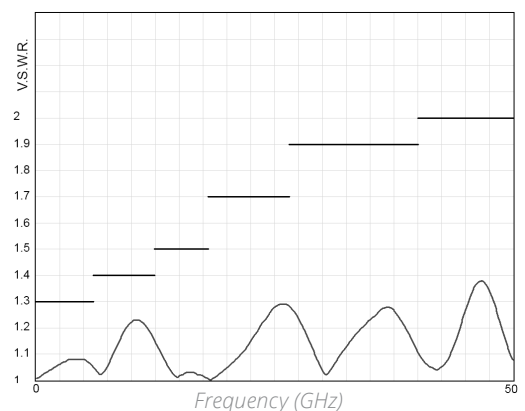


*Example: DPDT 2.4 mm up to 50 GHz*

**INSERTION LOSS & ISOLATION**



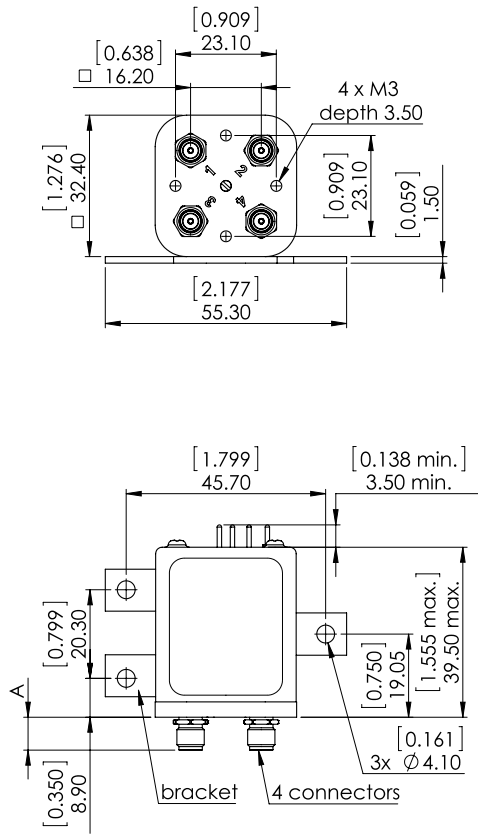
**V.S.W.R**



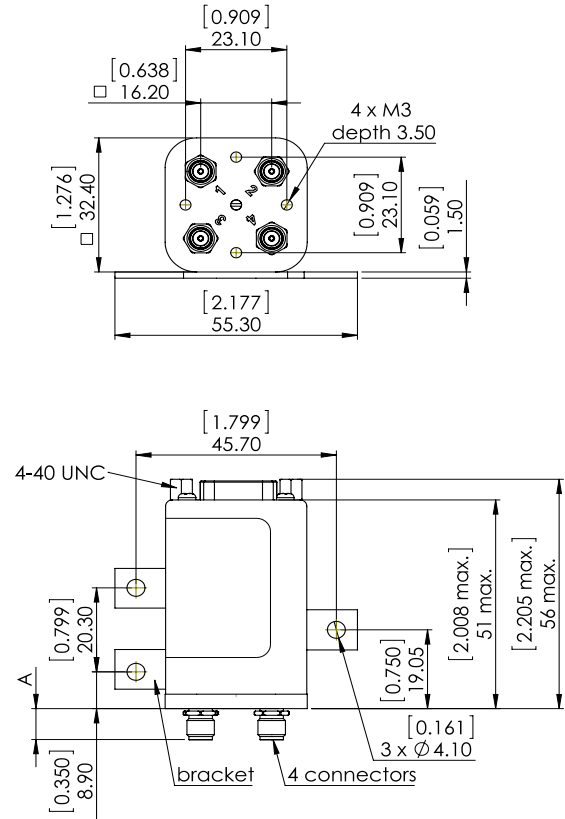
RAMSES Series

TYPICAL OUTLINE DRAWING

WITH SOLDER PINS & BRACKET



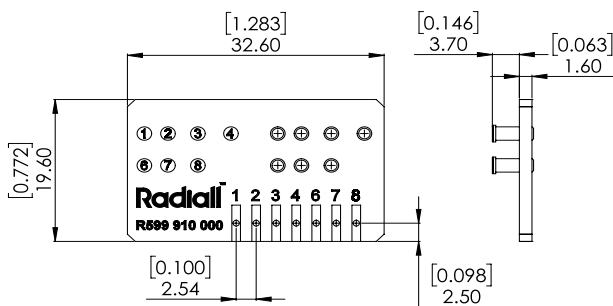
WITH D-SUB CONNECTOR & BRACKET



CONNECTORS	SMA	SMA 2.9 & 2.4 MM	QMA	DIN 1.6/5.6
A max (mm [inches])	7.7 [0.303]	6.7 [0.264]	10.8 [0.394]	11.5 [0.433]

ACCESSORIES

A printed circuit board interface connector (ordered separately) has been designed for easy mounting on terminals. For DPDT model R577 series = Radiall part number: R599 910 000



(Ø0.8 [0.031] metallized holes, double side tracks)



Notes

All dimensions are in millimeters [inches]. PCB accessory pin number assignment is independant from the pin identification table of the switch.

**DPDT UP TO 12.4 GHz - RAMSES Concept**  
**N - BNC - TNC**



Radiall's DPDT switches offer excellent reliability, high performance and operating frequencies from DC to 12.4 GHz. Radiall's RAMSES concept guarantees a life span of 2.5 million cycles and provides a full array of options to respond to the needs of our customers.

These relays are well suited for applications across all markets including: Defense, Instrumentation, and Telecom.

*Example of P/N: R577122030 is a DPDT N 12.4 GHz, failsafe with Indicators, 12 Vdc, suppression diodes, solder pins with bracket.*

**PART NUMBER SELECTION**

**R577**

**SERIES PREFIX**

**RF CONNECTORS**

- 0: N up to 3 GHz
- 1: N up to 12.4 GHz
- 2: BNC up to 3 GHz
- 5: TNC up to 3 GHz
- 6: TNC up to 12.4 GHz

**TYPE**

- 1: Failsafe
- 2: Failsafe + I.C.
- 3: Latching
- 4: Latching + I.C.
- 5: Latching + S.C.O. <sup>[1]</sup>
- 6: Latching + S.C.O. + I.C. <sup>[1]</sup>

**ACTUATOR VOLTAGE**

- 2: 12 Vdc
- 3: 28 Vdc

**TTL OPTION**

- 0: Without TTL driver
- 1: With TTL driver <sup>[1 & 2]</sup>

**OPTIONS**

- 0: Without option
- 1: Positive common <sup>[2 & 3]</sup>
- 3: With suppression diodes <sup>[1]</sup>
- 4: With suppression diodes and positive common <sup>[2 & 3]</sup>

**ACTUATOR TERMINALS & FIXING**

- 0: Solder pins with bracket
- 2: Solder pins without bracket
- 5: D-Sub connector with bracket
- 7: D-Sub connector without bracket

**Notes**

- I.C.: Indicator contact/S.C.O.: Self Cut-Off.*
- 1. Suppression diodes are already included in self cut-off & TTL option.*
- 2. Polarity is not relevant to application for switches with TTL driver.*
- 3. Positive common shall be specified only with type 3,4,5 and 6 because failsafe switches can be used with both polarities.*



## RAMSES Series

## GENERAL SPECIFICATIONS

OPERATING MODE		FAILSAFE		LATCHING	
Nominal operating voltage (across operating temperature)	Vdc	12 (10.2 / 13)	28 (24 / 30)	12 (10.2 / 13)	28 (24 / 30)
Coil resistance (+/-10%)	$\Omega$	35	200	38	225
Nominal operating current at 23°C	mA	340	140	320	125
Average power		See Power Rating Chart page 1-13			
TTL input	High Level	2.2 to 5.5 Volts			
	Low Level	0 to 0.8 Volts			
Indicator rating		1 W / 30 V / 100 mA			
Switching time (max)	ms	15			
Life		2.5 million cycles			
Connectors		N - BNC - TNC			
Actuator terminals		Solder pins or male 9 pin D-Sub connector			
Operating temperature range		-40°C to +85°C			
Storage temperature range		-55°C to +85°C			
Vibration (MIL STD 202, Method 204D, cond. C)		10 - 2,000 Hz, 10g		operating	
Shock (MIL STD 202, Method 213B, cond. G)		50 g / 11 ms, ½ sine		operating	

## RF PERFORMANCE

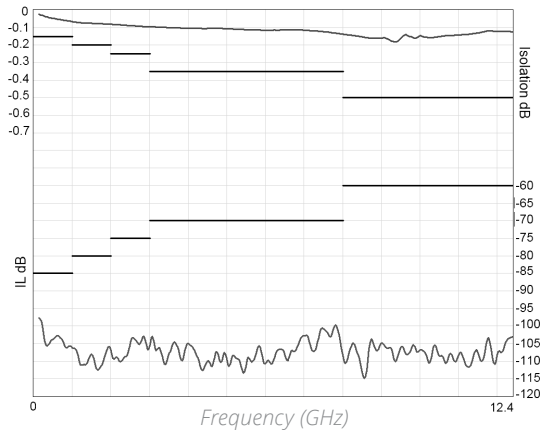
CONNECTORS	FREQUENCY RANGE GHz	V.S.W.R. (MAX)	INSERTION LOSS (MAX) dB	ISOLATION (MIN) dB	IMPEDANCE $\Omega$	
BNC	DC - 3	DC - 1	1.15	0.15	85	50
		1 - 2	1.20	0.20	80	
		2 - 3	1.25	0.25	75	
N - TNC	DC - 3 DC - 12.4	DC - 1	1.15	0.15	85	
		1 - 2	1.20	0.20	80	
		2 - 3	1.25	0.25	75	
		3 - 8	1.35	0.35	70	
		8 - 12.4	1.50	0.50	60	

See page 4-8 for typical RF performance.

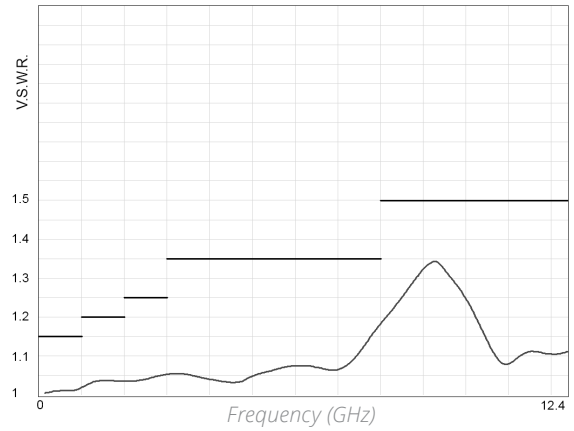
**R577 TYPICAL RF PERFORMANCE**

*Example: DPDT N/TNC up to 12.4 GHz*

**INSERTION LOSS & ISOLATION**

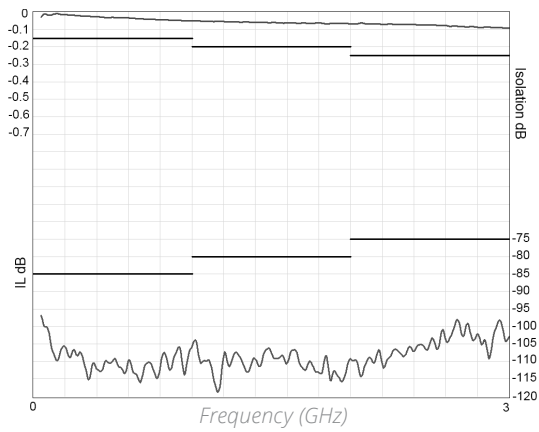


**V.S.W.R.**

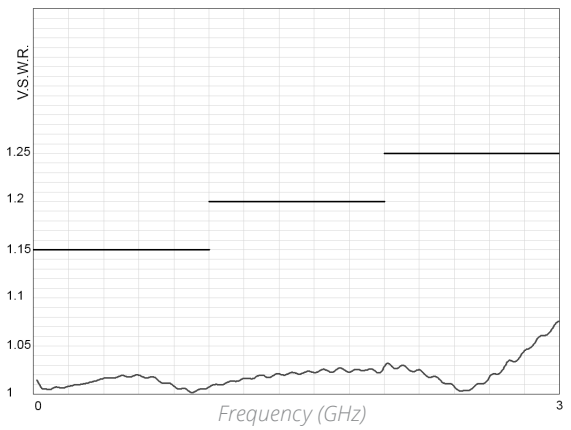


*Example: DPDT BNC up to 3 GHz*

**INSERTION LOSS & ISOLATION**



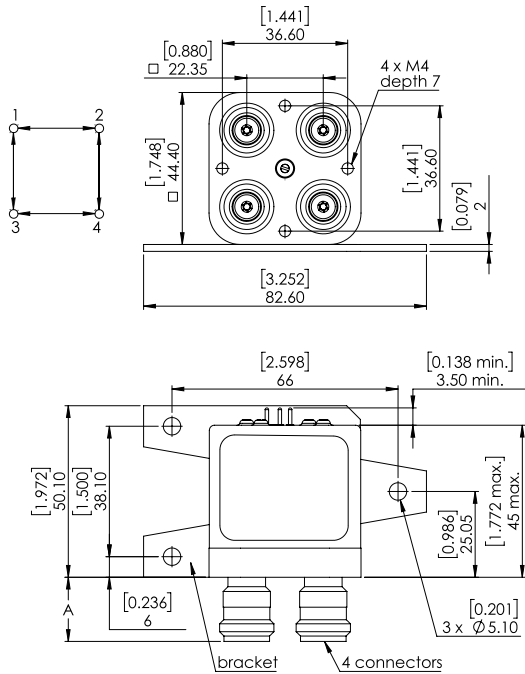
**V.S.W.R.**



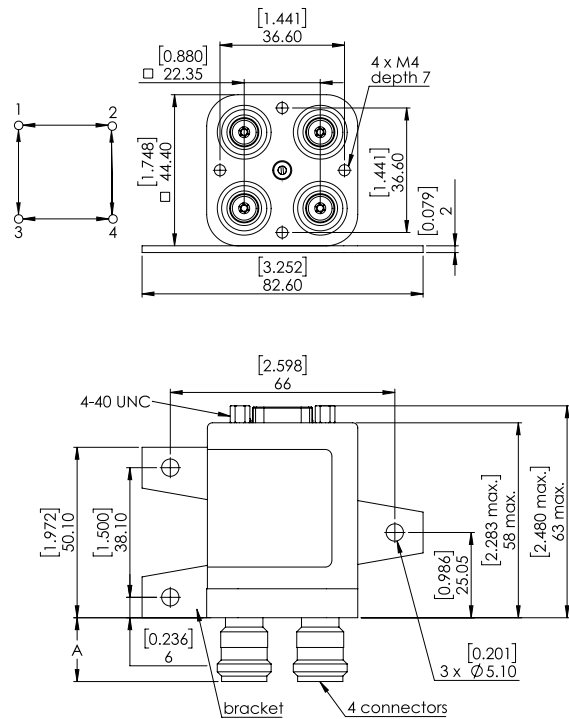
RAMSES Series

TYPICAL OUTLINE DRAWING

WITH SOLDER PINS & BRACKET



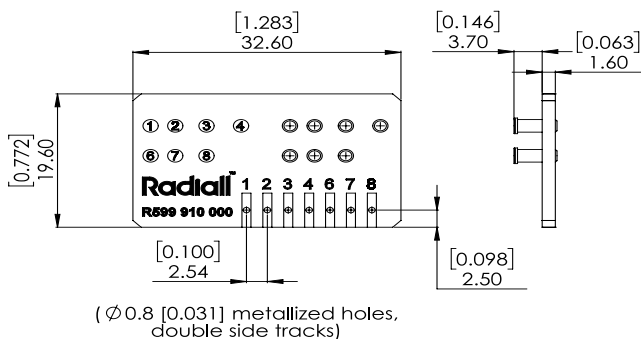
WITH D-SUB CONNECTOR & BRACKET



CONNECTORS	N	BNC	TNC
A max (mm [inches])	19.5 [0.748]	12.5 [0.472]	12.5 [0.472]

ACCESSORIES

A printed circuit board interface connector (ordered separately) has been designed for easy mounting on terminals. For DPDT model R577 series = Radiall part number: R599 910 000



Notes

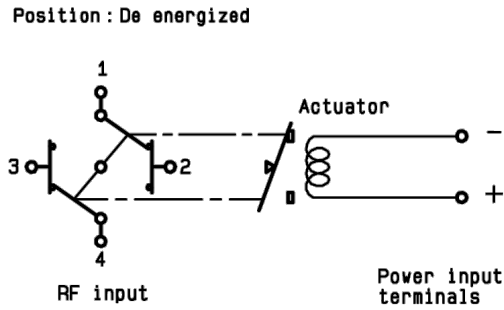
All dimensions are in millimeters [inches].  
See page 4-13 for pin allocation.

## COAXIAL DPDT

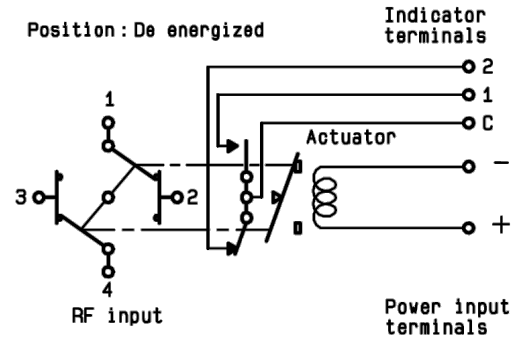
### R577 SERIES

#### FAILSAFE

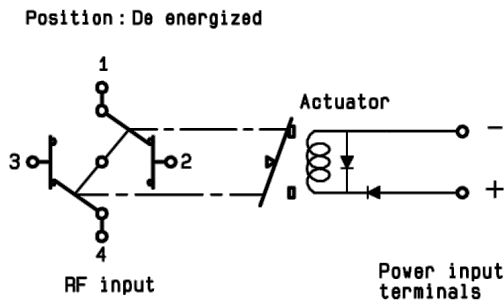
WITHOUT OPTION  
R577-1-000



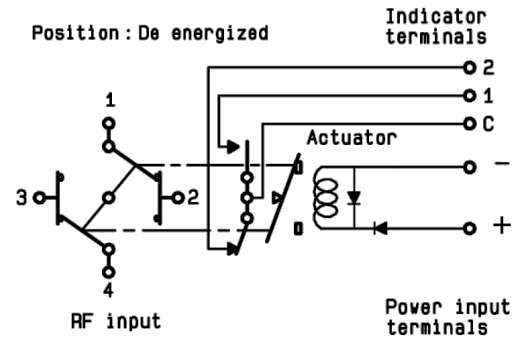
WITH INDICATOR CONTACT  
R577-2-000



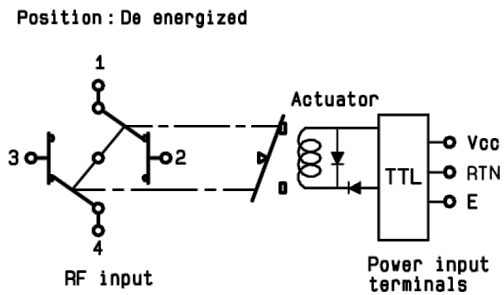
WITH SUPPRESSION DIODES  
R577-1-030



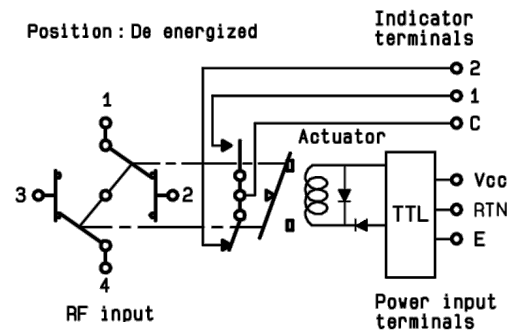
WITH SUPPRESSION DIODES & INDICATOR CONTACT  
R577-2-030



WITH TTL DRIVER (SUPPRESSION DIODES ARE INCLUDED)  
R577-1-100



WITH TTL DRIVER & INDICATOR CONTACT  
(SUPPRESSION DIODES ARE INCLUDED)  
R577-2-100



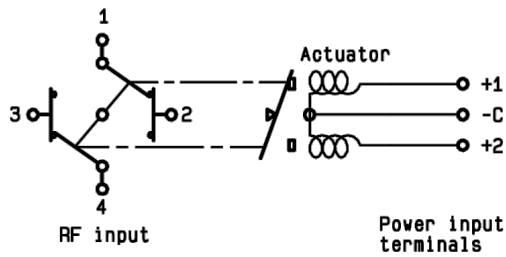
## COAXIAL DPDT

### R577 SERIES

#### LATCHING

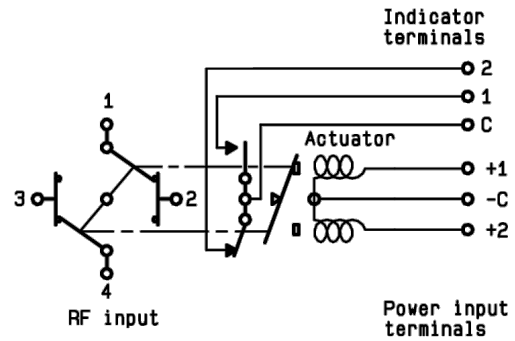
#### WITHOUT OPTION

R577-3-000



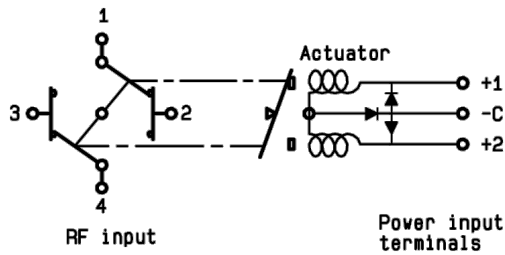
#### WITH INDICATOR CONTACT

R577-4-000



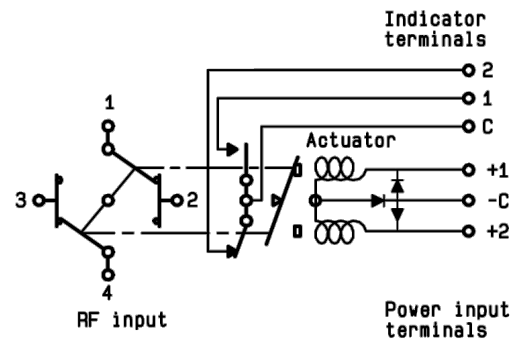
#### WITH SUPPRESSION DIODES

R577-3-030



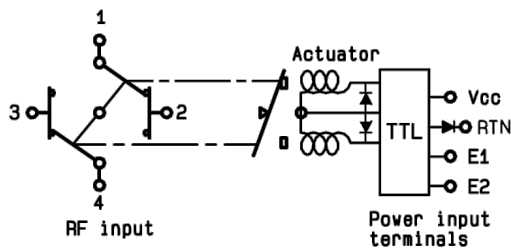
#### WITH SUPPRESSION DIODES & INDICATOR CONTACT

R577-4-030



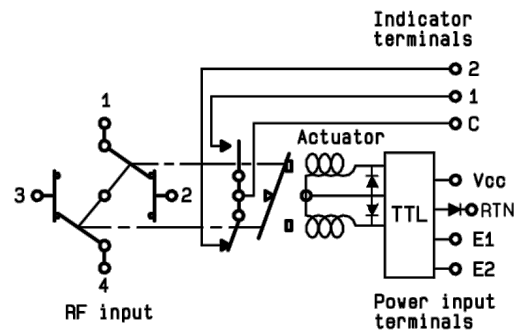
#### WITH TTL DRIVER (SUPPRESSION DIODES ARE INCLUDED)

R577-3-100



#### WITH TTL DRIVER & INDICATOR CONTACT (SUPPRESSION DIODES ARE INCLUDED)

R577-4-100

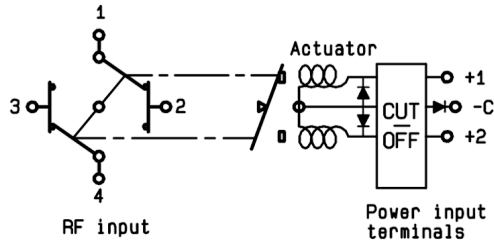


### COAXIAL DPDT (CONTINUED)

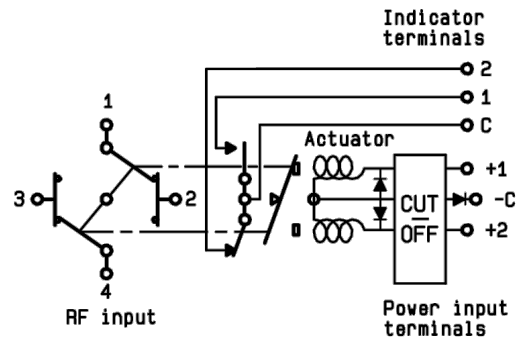
#### R577 SERIES

#### LATCHING

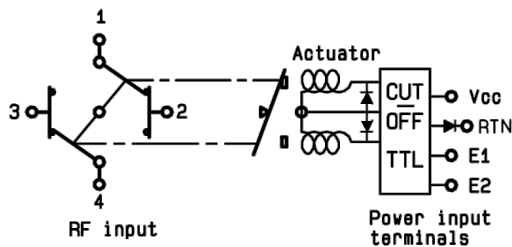
WITH CUT-OFF (SUPPRESSION DIODES ARE INCLUDED)  
R577-5-000



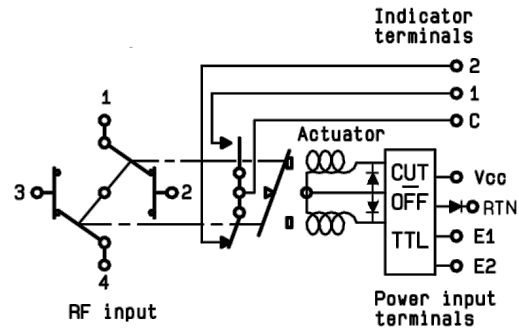
WITH CUT-OFF & INDICATOR CONTACT  
(SUPPRESSION DIODES ARE INCLUDED)  
R577-6-000



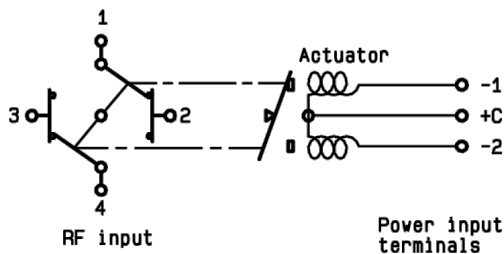
WITH CUT-OFF & TTL DRIVER  
R577-5-100



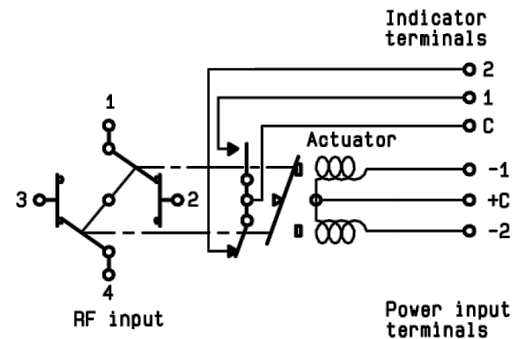
WITH CUT-OFF & INDICATOR CONTACT  
(SUPPRESSION DIODES ARE INCLUDED)  
R577-6-100



WITH POSITIVE COMMON, NO OPTION  
R577-3-010



WITH POSITIVE COMMON & INDICATOR CONTACT  
R577-4-010

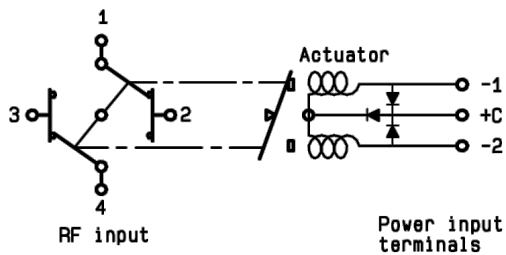


## COAXIAL DPDT (CONTINUED)

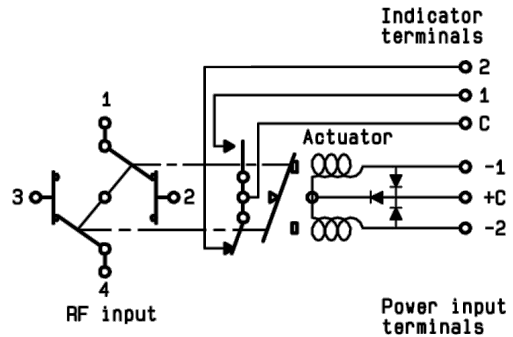
### R577 SERIES

#### LATCHING

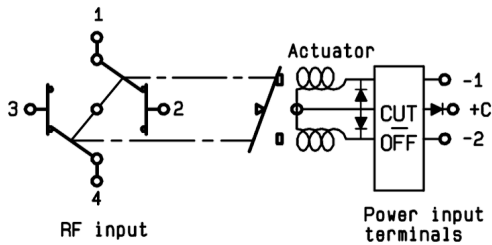
WITH POSITIVE COMMON & SUPPRESSION DIODES  
R577-3-040



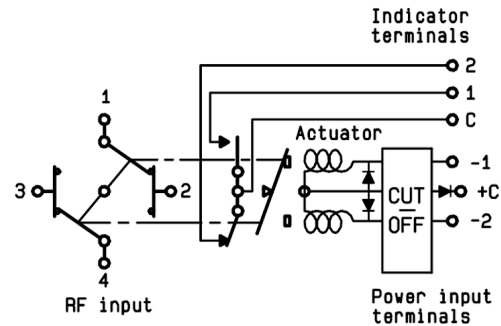
WITH POSITIVE COMMON, SUPPRESSION DIODES & INDICATOR CONTACT  
R577-4-040



WITH POSITIVE COMMON & CUT-OFF  
(SUPPRESSION DIODES ARE INCLUDED)  
R577-5-010

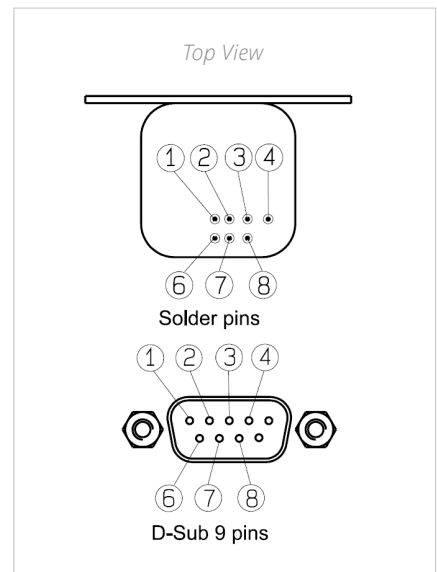


WITH POSITIVE COMMON, CUT-OFF & INDICATOR CONTACT  
(SUPPRESSION DIODES ARE INCLUDED)  
R577-6-010



#### PIN IDENTIFICATION

TYPE	PIN						
	1	2	3	4	6	7	8
Failsafe	+		-				
Failsafe + I.C.	+		-		1	2	C
Failsafe + TTL	E		RTN	VCC			
Failsafe + I.C. + TTL	E		RTN	VCC	1	2	C
Latching	-1 or +1	-2 or +2	+C or -C				
Latching + I.C.	-1 or +1	-2 or +2	+C or -C		1	2	C
Latching + Cut-off	-1 or +1	-2 or +2	+C or -C				
Latching + I.C. + Cut-off	-1 or +1	-2 or +2	+C or -C		1	2	C
Latching + Cut-off + I.C.	E2	E1	RTN	VCC			
Latching + TTL + I.C.	E2	E1	RTN	VCC	1	2	C



Titanium Series

**HIGH PERFORMANCE DPDT**

**DPDT UP TO 40 GHz**



Radiall's TITANIUM 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 2.5 million switching cycles. Radiall's TITANIUM switches are perfect for automated test and measurement equipment, as well as signal monitoring devices.

*Example of P/N: R513473148 is a DPDT SMA 20 GHz, latching, Self Cut-Off, diodes, positive common, TTL driver, Indicators, HE10 receptacle with bracket.*

**PART NUMBER SELECTION**

**R513**

**SERIES PREFIX**

**RF CONNECTORS**

- 3: SMA up to 6 GHz
- 4: SMA up to 20 GHz
- F: SMA up to 26.5 GHz
- 8: SMA2.9 up to 40 GHz <sup>[2]</sup>

**TYPE**

- 7: Latching + Self cut-off + Indicators

**ACTUATOR VOLTAGE**

- 3: 24 Vdc

**TTL OPTION**

- 1: With TTL driver

**OPTIONS**

- 4: With suppression diodes and positive common

**ACTUATOR TERMINALS & FIXING**

- 8: HE 10 receptacle with bracket <sup>[1]</sup>
- 9: HE 10 receptacle without bracket <sup>[1]</sup>

**DOCUMENTATION**

- : Certificate of conformity
- C: Calibration certificate
- R: Calibration certificate + RF curves

**Notes**

1. Delivered with 750 mm (30 inches) ribbon cable + HE10 connector.
2. Connector SMA2.9 is equivalent to "K connector<sup>®</sup>" registered trademark of Anritsu.



## Titanium Series

## GENERAL SPECIFICATIONS

OPERATING MODE		LATCHING	
Nominal operating voltage (across operating temperature)	Vdc	24 (20/32)	
Coil resistance (+/-10%)	$\Omega$	120	
Nominal operating current at 23 °C	mA	200	
Maximum stand-by current	mA	50	
Average power		RF path Cold switching: see RF Power Rating Chart on page 4-19 Hot switching: 1 Watt CW	
TTL input	High Level	3 to 7 V	1.4 mA max at 7 V
	Low Level	0 to 0.8 Volts	-
Indicator specifications		Maximum withstanding voltage	60 V
		Maximum current capacity	150 mA
		Maximum "ON" resistance	2.5 $\Omega$
		Minimum "OFF" resistance	100 M $\Omega$
Switching time (max)	ms	15	
Life (min)		2.5 million cycles	
Connectors		SMA - SMA 2.9	
Actuator terminals		HE10 ribbon receptacle	
Weight (Max)	g	110	

## 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) operating	10 - 2,000 Hz, 10 g
Shock (MIL STD 202, Method 213B, Cond.C) operating	50 g / 6 ms, 1/2 sine
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 ft (15,240 meters)
RFI (MIL STD 1344, Method 3008 or IEC 61726)	40 dB at 20 GHz

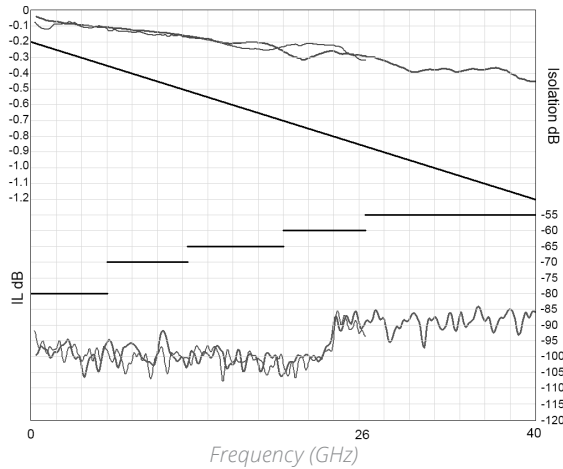
Titanium Series

RF PERFORMANCE

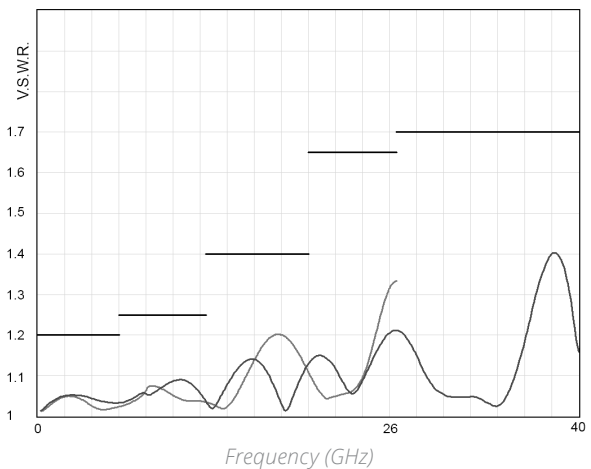
PART NUMBER		R51337314-	R51347314-		R513F7314-		R51387314-		
Frequency Range	GHz	DC to 6	DC to 20		DC to 26.5		DC to 40		
Impedance	Ω	50							
Insertion Loss (max)	dB	0.2 + 0.025 × frequency (GHz)							
Isolation (min)	dB	80	DC to 6 GHz 6 to 12.4 GHz 12.4 to 20 GHz	80 70 65	DC to 6 GHz 6 to 12.4 GHz 12.4 to 20 GHz 20 to 26.5 GHz	80 70 65 60	DC to 6 GHz 6 to 12.4 GHz 12.4 to 20 GHz 20 to 26.5 GHz 26.5 to 40 GHz	80 70 65 60 55	
V.S.W.R. (max)		1.20	DC to 6 GHz 6 to 12.4 GHz 12.4 to 20 GHz	1.20 1.25 1.40	DC to 6 GHz 6 to 12.4 GHz 12.4 to 20 GHz 20 to 26.5 GHz	1.20 1.25 1.40 1.65	DC to 6 GHz 6 to 12.4 GHz 12.4 to 20 GHz 20 to 26.5 GHz 26.5 to 40 GHz	1.20 1.25 1.40 1.65 1.70	
Repeatability (at 25 °C)		0.03 dB					0.05 dB		

TYPICAL RF PERFORMANCE

INSERTION LOSS & ISOLATION



V.S.W.R.

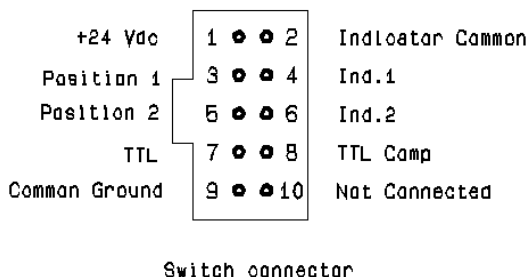


SMA — SMA 2.9 —

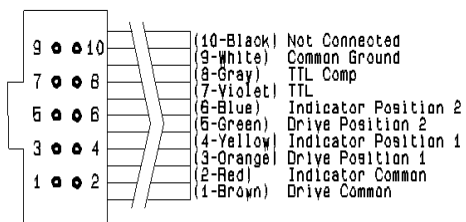
Titanium Series

**DRIVING THE SWITCH**

Transfer switches are configured with two positions. Each RF path can be closed by applying ground or TTL "High" to the corresponding "driver " pin.



Switch connector



Mating cable connector

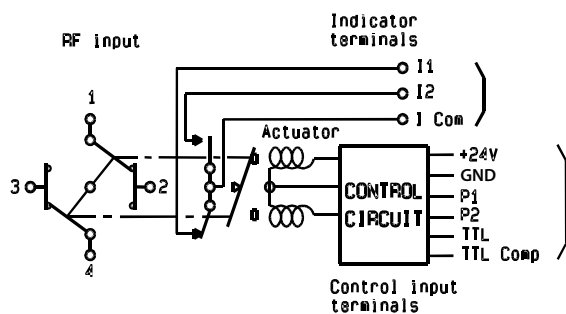
**Standard Drive**

- Connect pin 9 to ground (See note)
- Connect pin 1 to supply (+20 VDC to +32 VDC)
- Select (close) desired RF paths by applying ground to the corresponding "drive" pin (Ex: apply ground to pin 3 to close RF path 1-2 and 3-4)
- To select the second path, ensure that the unwanted RF path "drive" pin is disconnected from ground. Apply ground to the "drive" pin which corresponds to the desired RF paths (Ex: apply ground to pin 5 to close RF path 1-3 and 2-4)

**TTL Drive (Dual line)**

- Connect pin 9 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 7 and TTL "Low" to pin 8 to close RF paths position 1)
- To select the second path, ensure that the unwanted RF path "drive" pins are in TTL "Low" position. Apply TTL "High" to the "drive" pin which correspond to the desired RF path and TTL "low" to the undesired. (Ex: apply TTL "High" to pin 8 and TTL "Low" to pin 7 to close RF paths position 2)

**RF SCHEMATIC DIAGRAM**



**TTL Drive (Single line)**

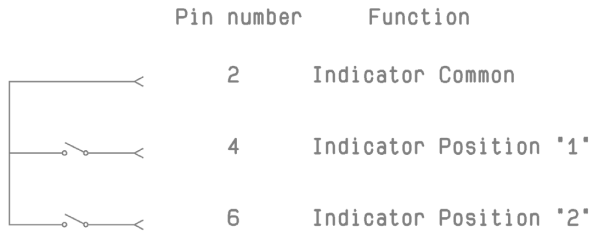
- Connect pin 9 to ground
- Connect pin 1 to supply (+20 VDC to +32 VDC)
- Connect pin 8 to TTL "High"
- Select (close) position 1 by applying TTL "High" to pin 7 (Ex: apply TTL "High" to pin 7 to close RF paths 1-2 and 3-4)
- Select position 2 by applying TTL "Low" to pin 7 (Ex: apply TTL "Low" to pin 7 to close RF paths 1-3 and 2-4)

	RF CONTINUITY	INDICATOR
Position 1	1-2 / 3-4	ICom - I1
Position 2	1-3 / 2-4	ICom - I2

**Notes**

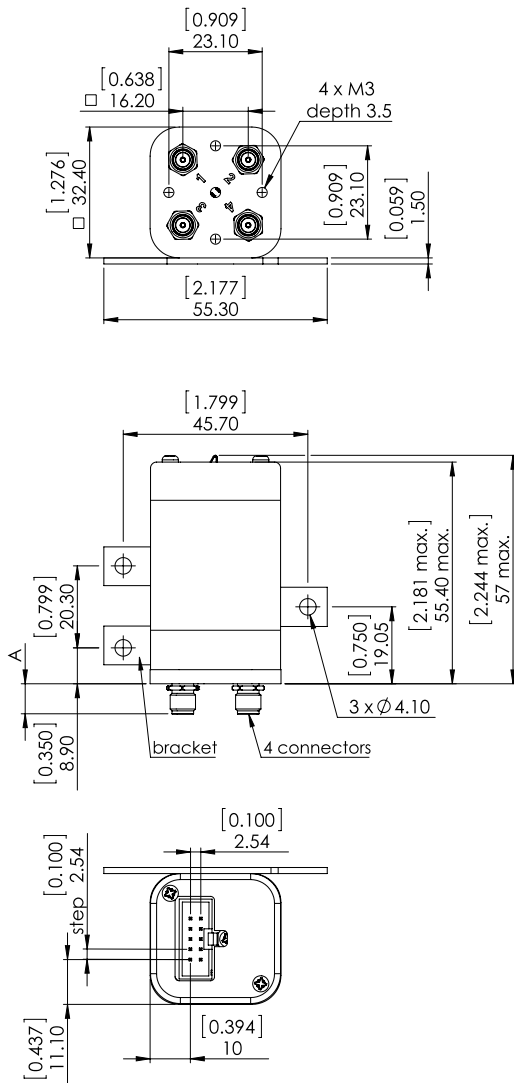
Pin 9 does not need to be grounded for the switch to operate in standard drive. If pin 9 is not grounded, the position indicators will only function while the appropriate drive is applied. Therefore, if a pulse drive is used and continuous indicator operation is required, pin 9 must be grounded.

RF PERFORMANCE



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. 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 9.

TYPICAL OUTLINE DRAWING



CONNECTORS	SMA	SMA 2.9
A max (mm [inches])	7.7 [0.303]	6.7 [0.264]

Notes

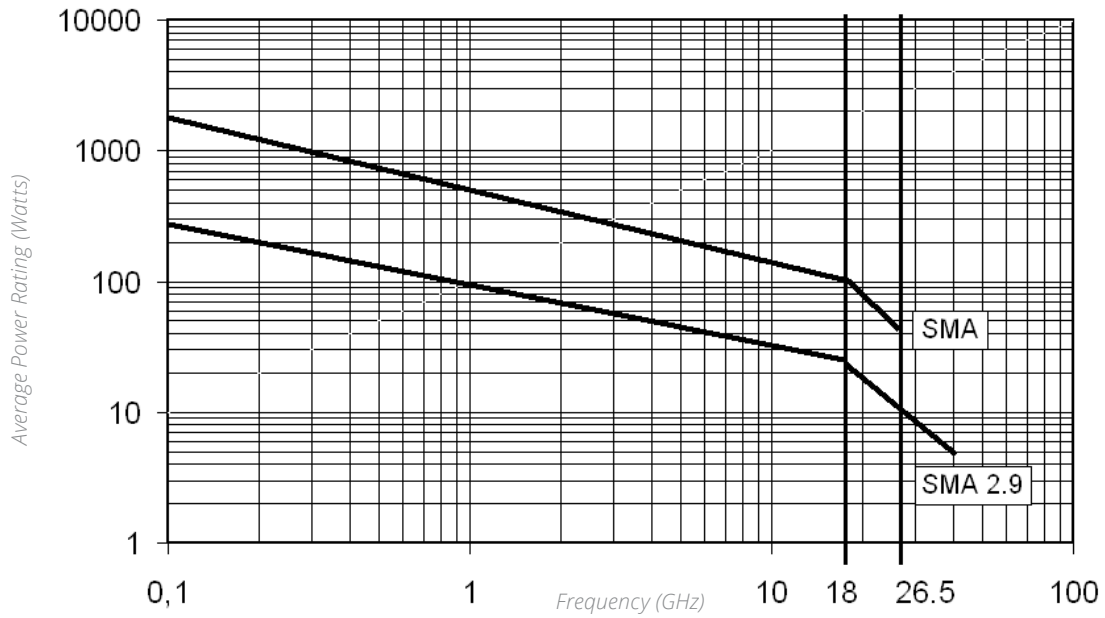
All dimensions are in millimeters [inches].

Titanium Series

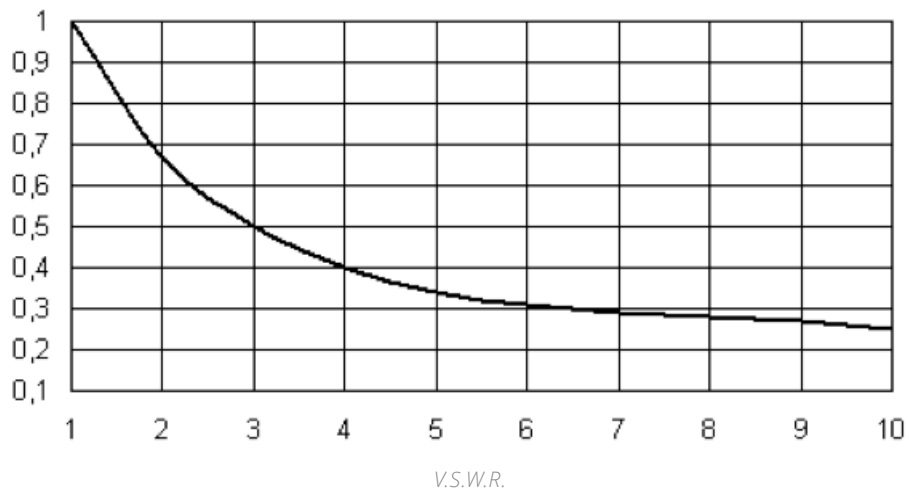
**POWER RATING CHART**

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.**



Platinum Series

**HIGH PERFORMANCE DPDT**

**DPDT 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. PLATINUM series switches are perfect for automated test and measurement equipment, as well as signal monitoring devices.

*Example of P/N: R593F73148 is a DPDT SMA 26.5 GHz, latching, Self Cut-Off, diodes, positive common, TTL driver, Indicators, HE10 receptacle with bracket.*

**PART NUMBER SELECTION**

**R593**

**SERIES PREFIX**

**RF CONNECTORS**

- 3: SMA up to 6 GHz
- 4: SMA up to 20 GHz
- F: SMA up to 26.5 GHz
- 8: SMA2.9 up to 40 GHz <sup>[2]</sup>

**TYPE**

- 7: Latching + Self cut-off + Indicators

**ACTUATOR VOLTAGE**

- 3: 24 Vdc

**TTL OPTION**

- 1: With TTL driver

**OPTIONS**

- 4: With suppression diodes and positive common

**ACTUATOR TERMINALS AND FIXING**

- 8: HE 10 receptacle with bracket <sup>[1]</sup>
- 9: HE 10 receptacle without bracket <sup>[1]</sup>

**DOCUMENTATION**

- : Certificate of conformity
- C: Calibration certificate
- R: Calibration certificate + RF curves

**Notes**

1. Delivered with 750 mm (30 inches) ribbon cable + HE10 connector.
2. Connector SMA2.9 is equivalent to "K connector" registered trademark of Anritsu.

## Platinum Series

## GENERAL SPECIFICATIONS

OPERATING MODE		LATCHING	
Nominal operating voltage (across operating temperature)	Vdc	24 (20/32)	
Coil resistance (+/-10%)	$\Omega$	120	
Nominal operating current at 23 °C	mA	200	
Maximum stand-by current	mA	50	
Average power		RF path Cold switching: see RF Power Rating Chart on page 4-25 Hot switching: 1 Watt CW	
TTL input	High Level	3 to 7 V	1.4 mA max at 7 V
	Low Level	0 to 0.8 Volts	-
Indicator specifications		Maximum withstanding voltage	60 V
		Maximum current capacity	150 mA
		Maximum "ON" resistance	2.5 $\Omega$
		Minimum "OFF" resistance	100 M $\Omega$
Switching time (max)	ms	15	
life (min)	SMA	10 million cycles	
	SMA 2.9	5 million cycles	
Connectors		SMA - SMA 2.9	
Actuator terminals		HE10 ribbon receptacle	
Weight (Max)	g	110	

## 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) operating	10 - 2,000 Hz, 10 g
Shock (MIL STD 202, Method 213B, Cond.C) operating	50 g / 6 ms, 1/2 sine
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 ft (15,240 meters)
RFI (MIL STD 1344, Method 3008 or IEC 61726)	40 dB at 20 GHz

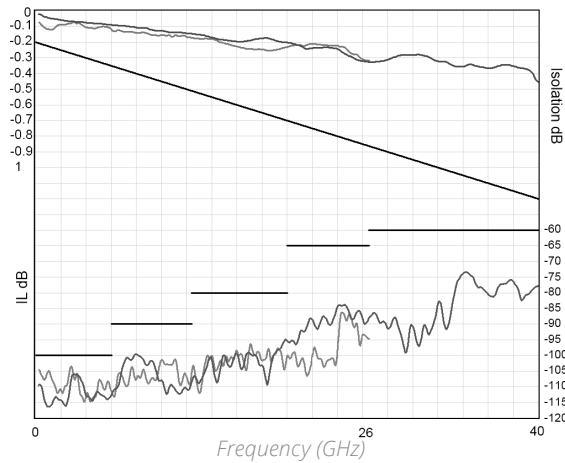
Platinum Series

RF PERFORMANCE

PART NUMBER		R59337314-	R59347314-	R593F7314-		R59387314-	R51387314-		
Frequency Range	GHz	DC to 6	DC to 20		DC to 26.5		DC to 40		
Impedance	Ω	50							
Insertion Loss (max)	dB	0.2 + 0.025 × frequency (GHz)							
Isolation (min)	dB	100	DC to 6 GHz 6 to 12.4 GHz 12.4 to 20 GHz	100 90 80	DC to 6 GHz 6 to 12.4 GHz 12.4 to 20 GHz 20 to 26.5 GHz	100 90 80 65	DC to 6 GHz 6 to 12.4 GHz 12.4 to 20 GHz 20 to 26.5 GHz 26.5 to 40 GHz	100 90 80 65 60	
V.S.W.R. (max)		1.20	DC to 6 GHz 6 to 12.4 GHz 12.4 to 20 GHz	1.20 1.25 1.40	DC to 6 GHz 6 to 12.4 GHz 12.4 to 20 GHz 20 to 26.5 GHz	1.20 1.25 1.40 1.65	DC to 6 GHz 6 to 12.4 GHz 12.4 to 20 GHz 20 to 26.5 GHz 26.5 to 40 GHz	1.20 1.25 1.40 1.65 1.70	
Repeatability (at 25 °C)		0.03 dB					0.05 dB		

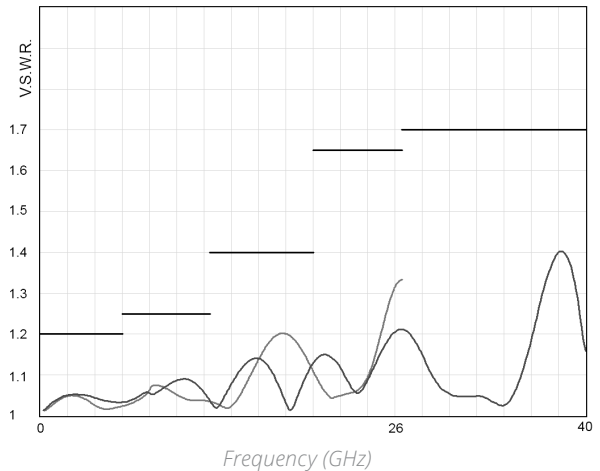
TYPICAL RF PERFORMANCE

INSERTION LOSS & ISOLATION



SMA — SMA 2.9 —

V.S.W.R.

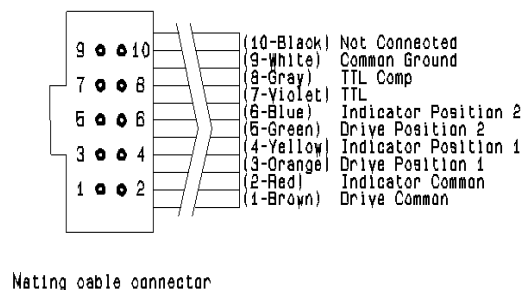
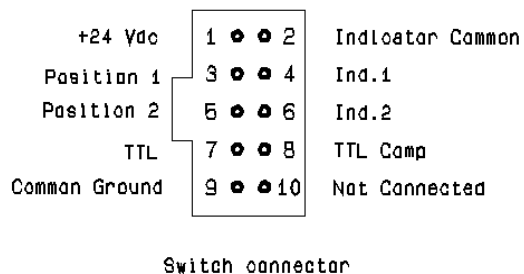




Platinum Series

**DRIVING THE SWITCH**

Transfer switches are configured with two positions. Each RF path can be closed by applying Ground or TTL "High" to the corresponding "driver " pin.



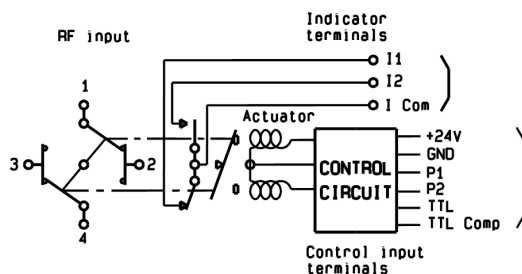
**Standard Drive**

- Connect pin 9 to ground (See note)
- Connect pin 1 to supply (+20 VDC to +32 VDC)
- Select (close) desired RF paths by applying ground to the corresponding "drive" pin (Ex: apply ground to pin 3 to close RF path 1-2 and 3-4)
- To select the second path, ensure that the unwanted RF path "drive" pin is disconnected from ground. Apply ground to the "drive" pin which corresponds to the desired RF paths (Ex: apply ground to pin 5 to close RF path 1-3 and 2-4)

**TTL Drive (Dual line)**

- Connect pin 9 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 7 and TTL "Low" to pin 8 to close RF paths position 1)
- To select the second path, ensure that the unwanted RF path "drive" pins are in TTL "Low" position. Apply TTL "High" to the "drive" pin which corresponds to the desired RF path and TTL "low" to the undesired (Ex: apply TTL "High" to pin 8 and TTL "Low" to pin 7 to close RF paths position 2)

**RF SCHEMATIC DIAGRAM**



**TTL Drive (Single line)**

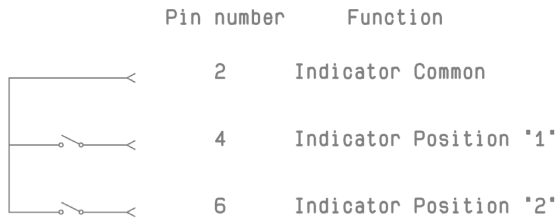
- Connect pin 9 to ground
- Connect pin 1 to supply (+20 VDC to +32 VDC)
- Connect pin 8 to TTL "High"
- Select (close) position 1 by applying TTL "High" to pin 7 (Ex: apply TTL "High" to pin 7 to close RF paths 1-2 and 3-4)
- Select position 2 by applying TTL "Low" to pin 7 (Ex: apply TTL "Low" to pin 7 to close RF paths 1-3 and 2-4)

	RF CONTINUITY	INDICATOR
Position 1	1-2 / 3-4	ICom - I1
Position 2	1-3 / 2-4	ICom - I2

**Notes**

Pin 9 does not need to be grounded for the switch to operate in standard drive. If pin 9 is not grounded, the position indicators will only function while the appropriate drive is applied. Therefore, if a pulse drive is used and continuous indicator operation is required, pin 9 must be grounded.

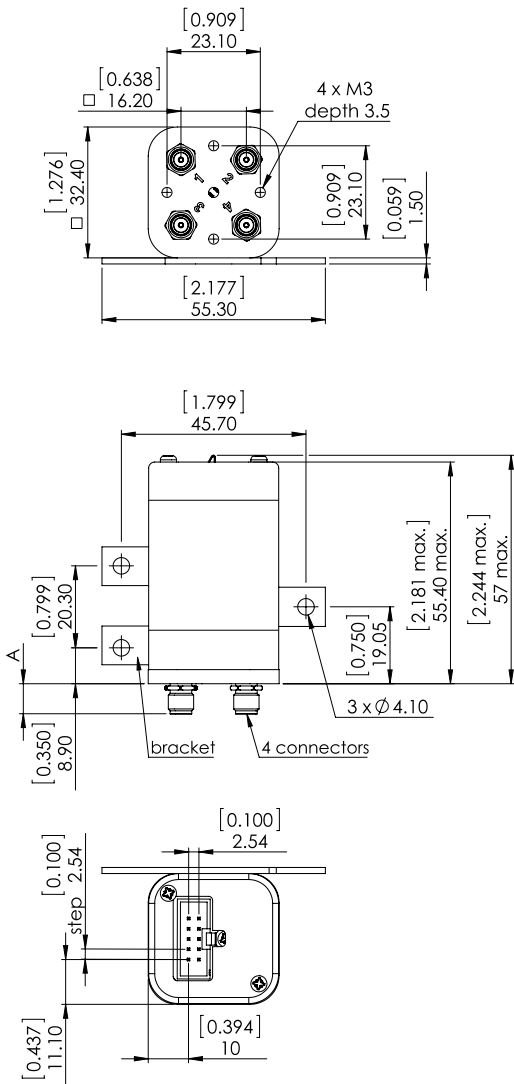
RF PERFORMANCE



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. 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 9.

TYPICAL OUTLINE DRAWING



CONNECTORS	SMA	SMA2.9
A max (mm [inches])	7.7 [0.303]	6.7 [0.264]

Notes

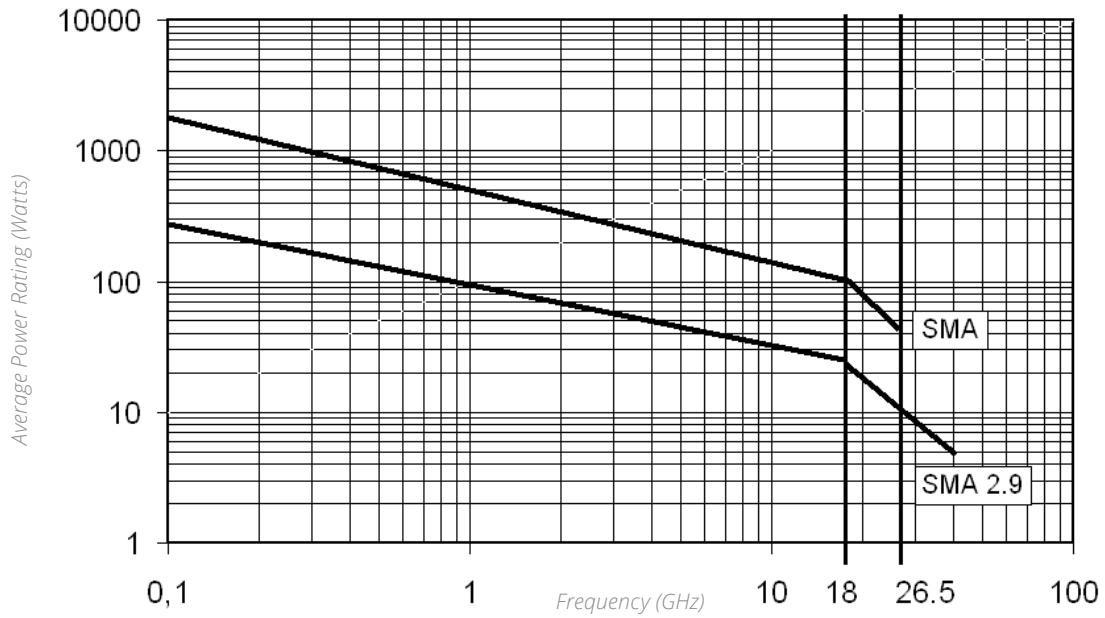
All dimensions are in millimeters [inches].

Platinum Series

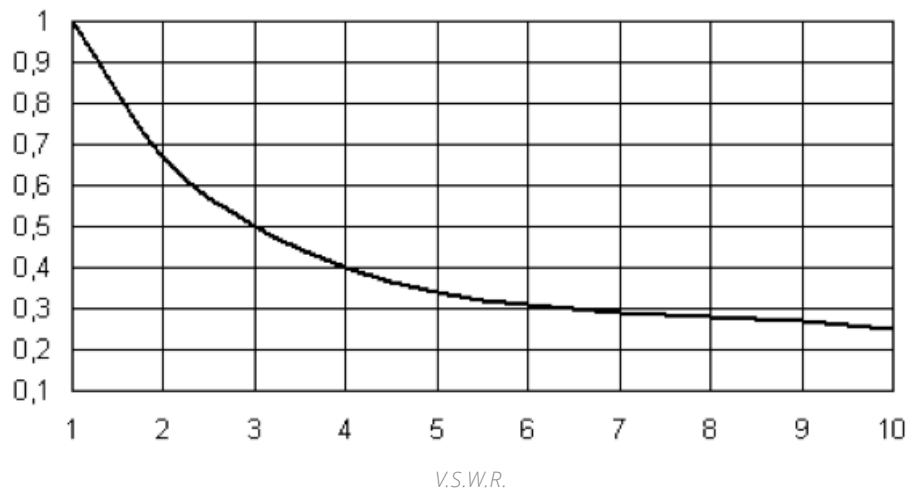
**POWER RATING CHART**

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.**

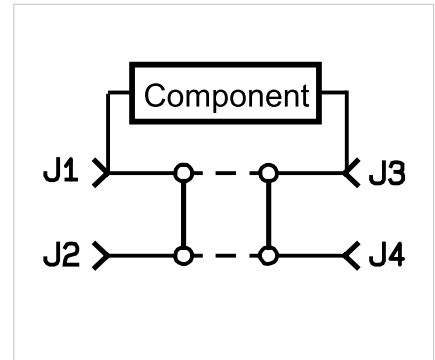


Optional Features

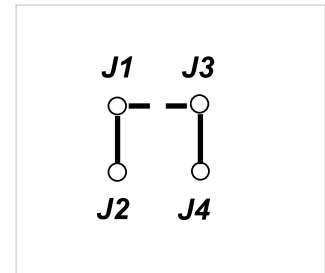
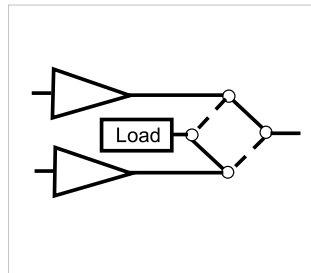
**OPTIONAL FEATURES FOR DPDT SWITCHES**

**GENERAL**

A microwave circuit or component can be inserted into a transmission line by using a DPDT switch as a bypass product. In event that the short-circuit of the microwave circuit or component is undesirable, the J1/J3 path can be left out (see application option below).



**EXAMPLES OF DEDICATED APPLICATION OPTIONS**



This DPDT with a cable load is used for redundancy purposes for 2 amplifiers, one working, the other one in stand-by.

This true Bypass Switch is based on a DPDT with only 3 RF ways instead of 4.

- Component inserted in J2/J4
- POS 1: J1 to J3: Direct line
- POS 2: J1 to J3: Component line



This DPDT has been fitted with a specific bracket to fulfill a specific customer request.



This DPDT was designed with a specific flat cable for an easy integration.

# Mouser Electronics

Authorized Distributor

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