RADIALL	TECHNICAL DATA SHEET	R 593 - - - - - -
HIGH PERFORMANCE TRANSFER SWITCHES		Issue : July-07-2007

DPDT Coaxial Switches DC to 6 GHz, DC to 20 GHz, DC to 26.5 GHz, DC to 40 GHz

Radiall's PLATINUM SERIES switches are optimised to perform at a high level over an extended life span. With outstanding RF performances, 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.

PART NUMBER SELECTION

NEW

R 593 . 7 3 1 4 . .

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 (2)

Type :
7 : Latching + Self cut-off + Indicators

Actuator Voltage :
3 : 24 Vdc

TTL Option :
1 : With TTL driver (high level)

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

Actuator Terminals and Fixing :
8 : HE 10 receptacle with bracket (1)
9 : HE 10 receptacle without bracket (1)

Options :
4 : With suppression diodes and positive common

(1) : Delivered with 750 mm (30 inches) ribbon cable + HE10 connector

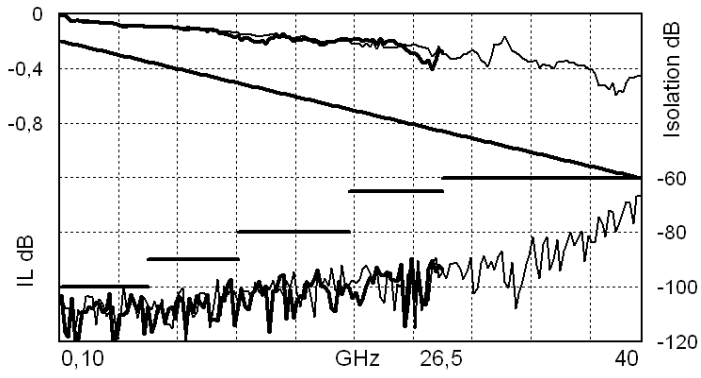
PICTURE

Note (2) :Connector SMA 2.9 is equivalent too "K connector®"
® : Registered trademark of Anritsu

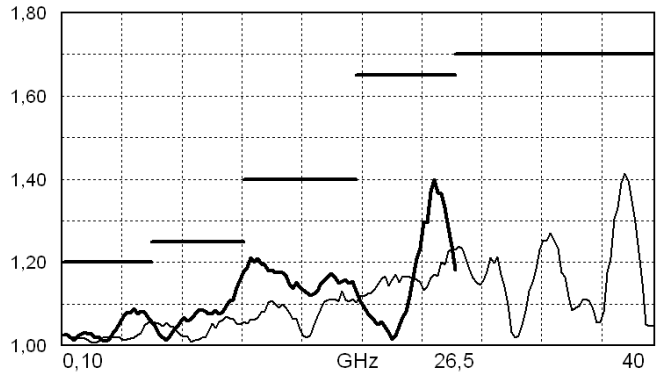
RF PERFORMANCES

PART NUMBER	R59337314-	R59347314-	R593F7314-	R59387314-
Frequency Range GHz	DC to 6	DC to 20	DC to 26.5	DC to 40
Impedance Ohms	50			
Insertion Loss dB (Maximum)	0.2 + 0.025 x frequency (GHz)			
Isolation dB (Minimum)	100	DC to 6 GHz : 100 6 to 12.4 GHz : 90 12.4 to 20 GHz : 80	DC to 6 GHz : 100 6 to 12.4 GHz : 90 12.4 to 20 GHz : 80 20 to 26.5 GHz : 65	DC to 6 GHz : 100 6 to 12.4 GHz : 90 12.4 to 20 GHz : 80 20 to 26.5 GHz : 65 26.5 to 40 GHz : 60
V.S.W.R. (Maximum)	1.20	DC to 6 GHz : 1.20 6 to 12.4 GHz : 1.25 12.4 to 18 GHz : 1.40 18 to 20 GHz : 1.65	DC to 6 GHz : 1.20 6 to 12.4 GHz : 1.25 12.4 to 18 GHz : 1.40 18 to 26.5 GHz : 1.65	DC to 6 GHz : 1.20 6 to 12.4 GHz : 1.25 12.4 to 18 GHz : 1.40 18 to 26.5 GHz : 1.65 26.5 to 40 GHz : 1.70
Repeatability (measured at 25°C)	0.03 dB			0.05 dB

TYPICAL RF PERFORMANCES



Insertion Loss and Isolation



V.S.W.R.

——— : 26.5 GHz model with SMA / —— : 40 GHz

ADDITIONAL SPECIFICATIONS

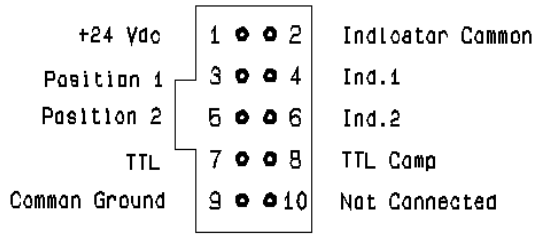
Operating mode		**Latching**	
Nominal operating voltage (across operating temperature) Vdc		**24** (20 / 32)	
Coil resistance (+/-10%) Ohms		120	
Nominal operating current at 23°C mA		200	
Maximum stand-by current mA		50	
Average power		RF path Cold switching : see Power Rating Chart on page 6 Hot switching : 1 Watt CW	
TTL input	High Level	3 to 7 V	1.4 mA max at 7 V
	Low Level	0 to 0.8 V	
Indicator specifications		Maximum withstanding voltage : 60V Maximum current capacity : 150 mA Maximum « ON » resistance : 2.5 Ω Minimum « OFF » resistance : 100 MΩ	
Switching time (max) ms		15	
Life (min**) for**	SMA	10 million cycles	
	SMA 2.9	5 million cycles	
Connectors		SMA – SMA 2.9	
Actuator terminal		HE10 ribbon receptacle	
Weight (max) g		110	

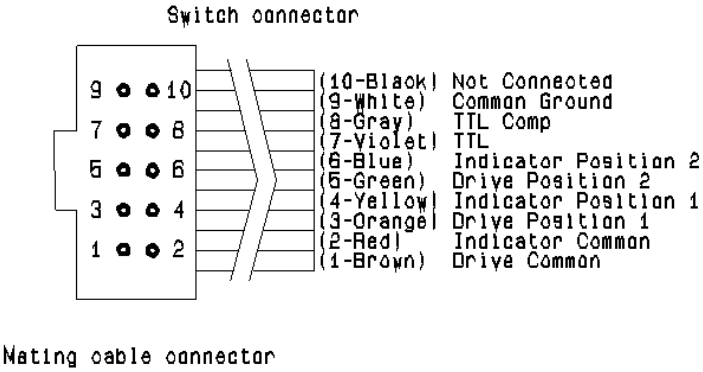
ENVIRONMENTAL SPECIFICATIONS

Operating temperature range °C	-25 to +75	
Storage temperature range °C	-55 to +85	
Temperature cycling (MIL-STD-202 , Method 107D , Cond.A) °C	-55 to +85 (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 , ½ 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)	40dB at 20GHz	

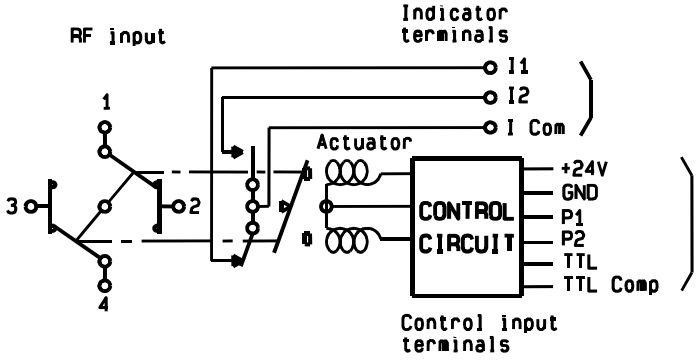
DRIVING THE SWITCH

There is two positions for a transfer switch. Each RF path can be closed by applying Ground or TTL "High" to the corresponding "drive" pin.





SCHEMATIC DIAGRAM



	RF continuity	Indicator
Position 1	1-2 / 3-4	ICom – I1
Position 2	1-3 / 2-4	ICom – I2

Standard drive

- Connect pin 9 to ground (See note 1).
- 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 unwanted RF path "drive" pin are 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 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).

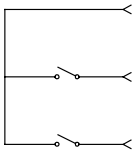
TTL drive (Single line)

- 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).

Note 1

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 has applied. Therefore, if a pulse drive is used and continuous indicator operation is required, pin 9 must be grounded.

ELECTRONIC POSITION INDICATORS

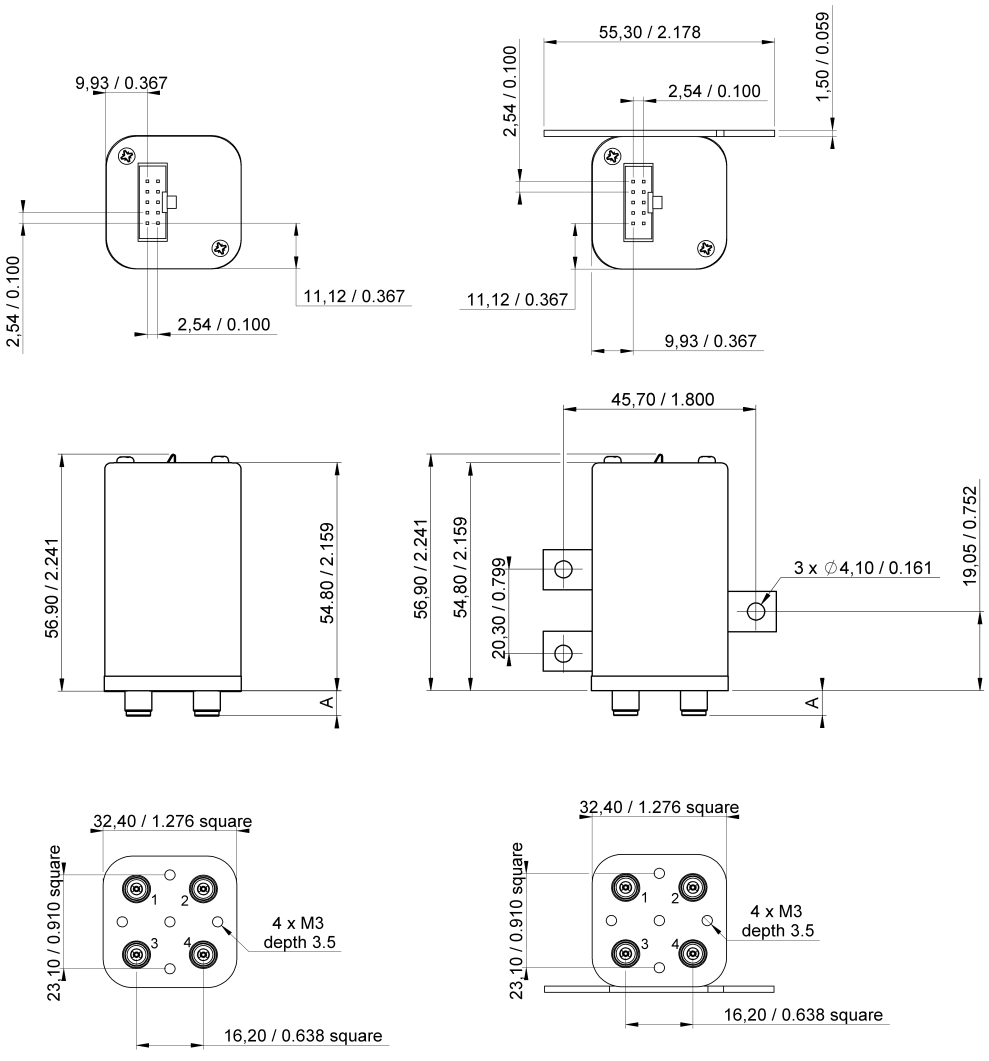


Pin number	Function
2	Indicator Common
4	Indicator Position "1"
6	Indicator Position "2"

The electronic position indicators utilise 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

All dimensions are in millimetres/ inches.

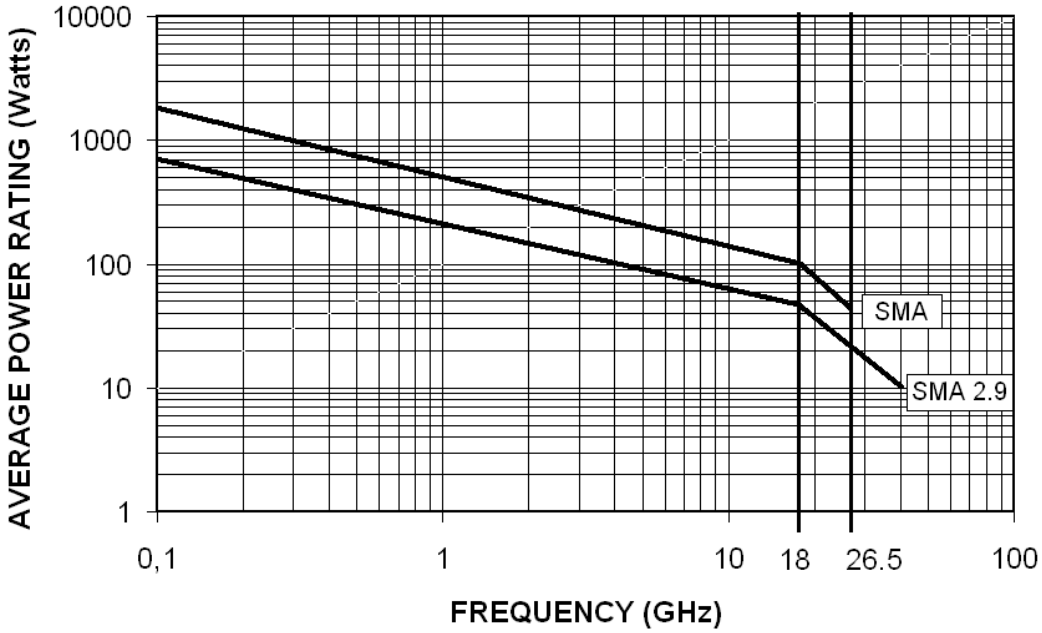


Connectors	SMA	SMA 2.9
A max (mm)	7.4	6.3

POWER RATING CHART

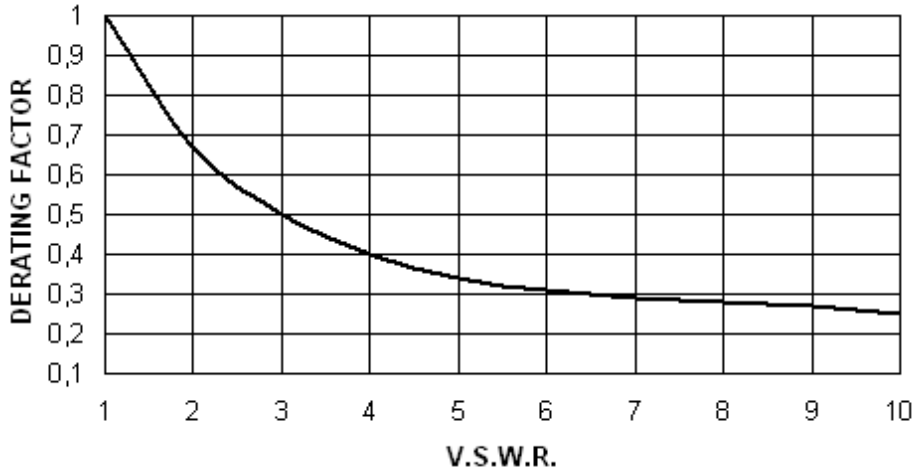
This graph is based on the following conditions :

- 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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FORSTAR®

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