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## SPnT Terminated & non Terminated up to 40 GHz

SMA – SMA 2.9 – QMA - DIN 1.6 / 5.6



Radiall's R573 & R574 multithrow coaxial switches are offered in many configurations (over 40,000 possible combinations) including Terminated and non Terminated options. Radiall offers reliable products, with shorter delivery times and competitive pricing. Excellent typical RF performance make RAMSES switches (40 GHz) ideal for Automated Test Equipment (ATE) and other measurement applications.

These switches are suitable for defense, industrial, instrumentation and telecommunication applications.

Example of P/N:

R574453605 is a terminated SP6T SMA up to 18 GHz, Latching, Self Cut-Off, 28 Vdc, Indicators and male 25 pin D-Sub connector.

### PART NUMBER SELECTION

**R 57**

**Model:**

- 3: Without 50 Ω termination
- 4: With 50 Ω termination

**RF Connectors:**

- 3: SMA up to 3 GHz
- E: QMA up to 6 GHz (4) (5) (11)
- 4: SMA up to 18 GHz
- 7: SMA 2.9 up to 26.5 GHz (4) (5) (12)
- F: SMA up to 26.5 GHz (6) (10)
- 8: SMA 2.9 up to 40 GHz (4) (12)
- 9: DIN 1.6/5.6 up to 2.5 GHz (4) (5)

**Type:**

- 0: Normally open
- 1: Normally open + I.C.
- 2: Latching
- 3: Latching + I.C.
- 4: Latching + S.C.O. (1) (4)
- 5: Latching + S.C.O. + I.C. (1) (4)
- 8: Latching + S.C.O. + A.R. (1)
- 9: Latching + S.C.O. + I.C. + A.R. (1)

**Actuator Voltage:**

- 2: 12 Vdc
- 3: 28 Vdc

**Actuator Terminals:**

- 0: Solder pins
- 5: D-Sub connector

**Options: \***

- 0: Without option
- 1: Positive common (2) (7)
- 2: Compatible TTL driver (high level) (1) (9)
- 3: With suppression diodes
- 4: With suppression diodes and positive common (2) (7)
- 8: BCD TTL driver compatible (1) (3) (8) (9)

**Number of positions:**

- 3: 3 Positions
- 4: 4 Positions
- 5: 5 Positions
- 6: 6 Positions
- 7: 7 Positions
- 8: 8 Positions
- 9: 9 Positions
- 0: 10 Positions
- 1: 11 Positions
- 2: 12 Positions

I.C.: Indicator contact / S.C.O. : Self Cut-Off / A.R. : Auto Reset

- (1): These models are already equipped with suppression diodes
- (2): Standard products are equipped with negative common
- (3): Latching BCD driver enables also a global reset through driver code 0000 (see BCD logic coding page 1-11)
- (4): Available only up to 6 positions
- (5): Model "3" only
- (6): Model "4" only up to 6 positions
- (7): Option not available for type 4, 5, 8 and 9
- (8): Option available only with type 0, 1, 8 and 9
- (9): Polarity is not relevant to application for switches with TTL driver

(10): 8 and 10 positions are available only up to 22 GHz, 12 positions only up to 18 GHz



(11) : 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

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

\*For precisions see availability of options chart page 5-9

## SPnT Terminated & non Terminated up to 40 GHz

SMA – SMA 2.9 – QMA - DIN 1.6 / 5.6

### GENERAL SPECIFICATIONS

#### Type 2, 3, 4 and 5:

Latching models have a RESET pin which commands the reset of all positions. This command should be used before switching from one position to another. If not, two positions will be set at the same time.

Note: During the RESET operation the global current is: the nominal operating current multiplied by the number of positions.

#### Type 8, 9:

Latching models with AUTOMATIC RESET are available; these products have an internal SET/RESET circuit which automatically resets all the non-selected positions and sets the desired position. This option simplifies the use of latching switches by suppressing the RESET command in switching sequence.

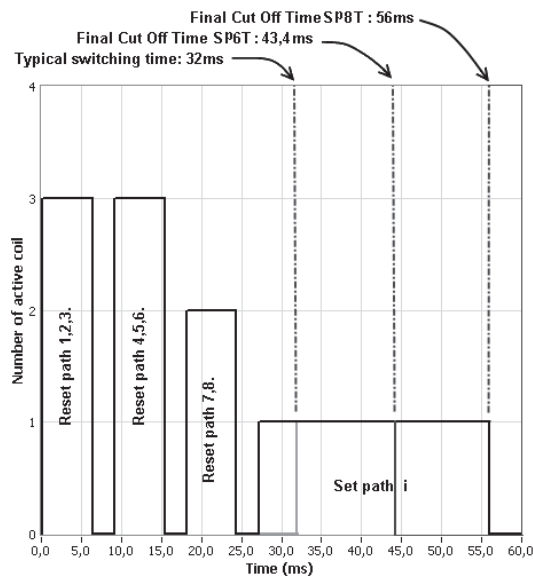
An electronic circuit supplies successively groups of 2, 3 or 4 actuators, in order to limit the maximum current.

The current with this option is the total current of 2, 3 or 4 reset coils in the same time (see table below).

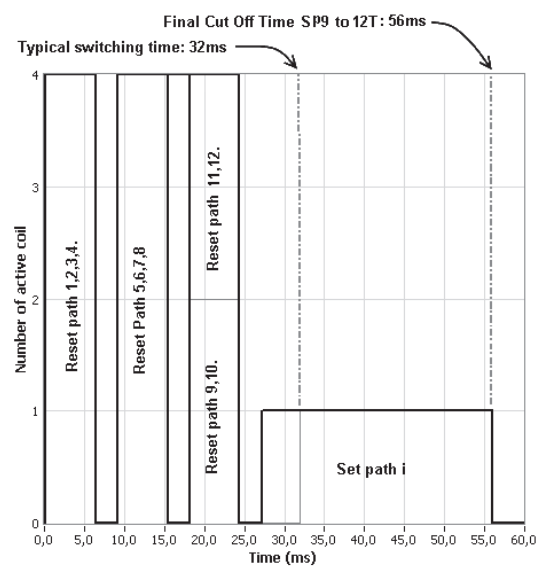
Example: During the AUTOMATIC RESET operation, at 28 Vdc, 4 position switch has a temporary consumption of only 250 mA, during 40 ms maximum.

### SWITCHING SEQUENCE

For SP6 to 8T



For SP9 to 12T



n = number of positions

Number of positions	Operating Total Current At 23 °C (mA) SPnT Latching			
	12 Volts		28 Volts	
	Manual Reset	Automatic Reset	Manual Reset	Automatic Reset
3 to 4	320 x n	640	125 x n	250
5 to 8	320 x n	960	125 x n	375
9 to 12	320 x n	1280	125 x n	500

Availability of options according to both type and number of positions

Type	Numbers of positions	Available options
0 or 1	3 to 12	0 - 1 - 2 - 3 - 4 - 8
2 or 3	3 to 6	0 - 1 - 2 - 3 - 4
	7 to 12	0 - 1 - 3 - 4
4 or 5	3 to 6	0 - 2
	7 to 12	Not available
8 or 9	3 to 12	0 - 2 - 8

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**SMA – SMA 2.9 – QMA - DIN 1.6 / 5.6**

**GENERAL SPECIFICATIONS**

Operating mode		Normally open		Latching	
Nominal operating voltage	Vdc	12 (10.2 / 13)	28 (24 / 30)	12 (10.2 / 13)	28 (24 / 30)
Coil resistance (+/-10%)	Ω	47.5	275	See table on previous page	
Nominal operating current at 23°C	mA	250	102		
Average power		See Power Rating Chart page <b>1-13</b>			
TTL input	High Level	2.2 to 5.5 V (TTL Option) / 800µA max 5.5 volts 3.5 to 5.5 V (BCD Option)			
	Low Level	0 to 0.8 V (TTL Option) / 20µA max 0.8 volts 0 to 1.5 V (BCD Option)			
Indicator rating		1 Watt / 30 Volts / 100 mA			
Switching time (Max)	ms	15 ms For automatic reset models: SP3T to SP6T => 40 ms SP7T to SP12T => 50 ms			
Life (Min)	Non terminated SP3 to 6T (R573 serie)	SMA - QMA		SMA 2.9 - 1.6/5.6	
	Terminated SP3 to 6T (R574 serie)	5 million cycles		2 million cycles	
	SP7 to 12T (all models)	2 million cycles			
Connectors		SMA - SMA2.9 - QMA - DIN 1.6/5.6			
Actuator terminals		Solder pins or male 25 pin D-sub connector			
Operating temperature range	DIN 1.6/5.6	-25°C to +70°C			
	SMA - SMA 2.9 - QMA	-40°C to +85°C			
Storage temperature range	DIN 1.6/5.6	-40°C to +85°C			
	SMA - SMA 2.9 - QMA	-55°C to +85°C			
Vibration (MIL STD 202, method 204D, cond.D)		10-2000 Hz , 20g operating for SP3 to 8T, survival for SP7 to 12T			
Shock (MIL STD 202, method 213B, cond.C)		100g / 6 ms, 1/2 sine operating for SP3 to 8T, survival for SP7 to 12T			

**RF PERFORMANCES**

SMA Connector						
Number of positions	Frequency Range GHz	V.S.W.R. (max)	Insertion Loss (max) dB	Isolation (min) dB	Impedance Ω	
3 to 6	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	60	
		12.4 - 18	1.50	0.50	60	
		18 - 26.5	1.70	0.70	50	
7 to 8	DC - 3 DC - 22	DC - 3	1.20	0.20	80	
		3 - 8	1.30	0.30	70	
		8 - 12.4	1.40	0.40	60	
		12.4 - 16	1.50	0.55	60	
		16 - 18	1.60	0.60	60	
9 to 10	DC - 3 DC - 22	18 - 22	1.70	0.70	60	
		DC - 3	1.20	0.20	80	
		3 - 8	1.30	0.30	70	
		8 - 12.4	1.40	0.40	60	
		12.4 - 15.5	1.50	0.50	60	
11 to 12	DC - 3 DC - 18	15.5 - 18	1.70	0.70	55	
		18 - 22	1.80	0.80	55	
		DC - 3	1.20	0.20	80	
		3 - 8	1.40	0.40	70	
		8 - 12.4	1.60	0.60	60	
		12.4 - 15	1.70	0.70	60	
		15 - 18	1.80	0.80	50	

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### RF PERFORMANCES

SMA2.9 Connector						
Number of positions	Frequency Range GHz		V.S.W.R. (max)	Insertion Loss (max) dB	Isolation (min) dB	Impedance $\Omega$
3 to 6	DC - 26.5 DC - 40	DC - 6	1.30	0.20	70	50
		6 - 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	50	

1.6/5.6 Connector						
Number of positions	Frequency Range GHz		V.S.W.R. (max)	Insertion Loss (max) dB	Isolation (min) dB	Impedance $\Omega$
3 to 6	DC - 2.5	DC - 1	1.30	0.20	80	75
		1 - 2.5	1.40	0.30	70	

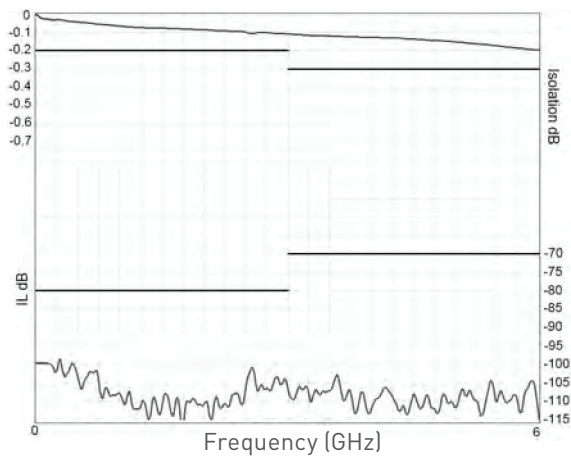
QMA Connector						
Number of positions	Frequency Range GHz		V.S.W.R. (max)	Insertion Loss (max) dB	Isolation (min) dB	Impedance $\Omega$
3 to 6	DC - 6	DC - 3	1.20	0.20	80	50
		3 - 6	1.30	0.30	70	

See page 5-12, 5-13, 5-14 and 5-15 for typical RF performances

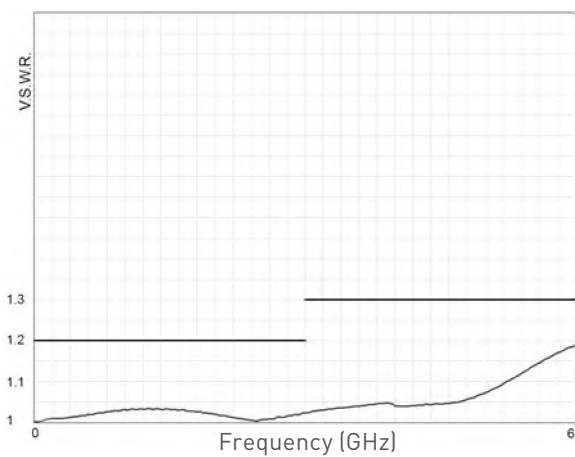
### R573 AND R574 TYPICAL RF PERFORMANCES

Example: SP6T QMA up to 6 GHz

#### Insertion Loss and Isolation



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



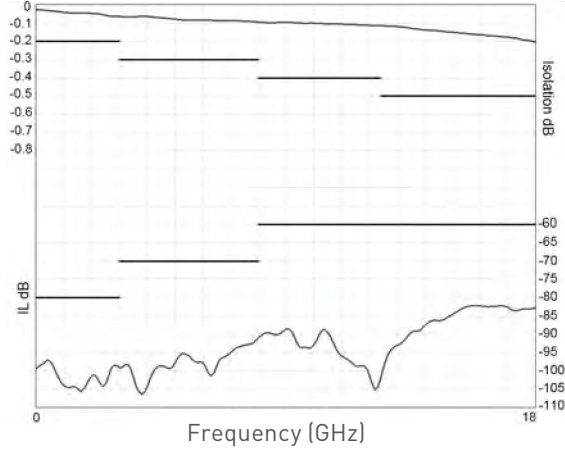
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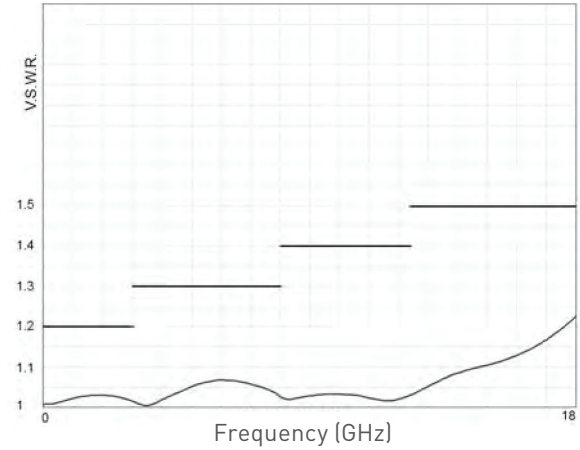
SMA – SMA 2.9 – QMA - DIN 1.6 / 5.6

Example: Non terminated SP6T SMA up to 18 GHz

**Insertion Loss and Isolation**

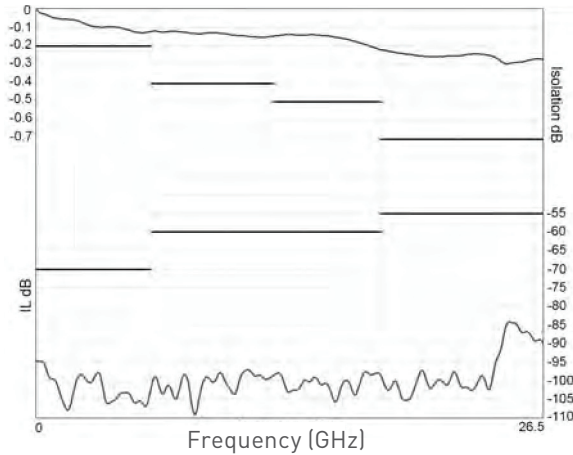


**V.S.W.R.**

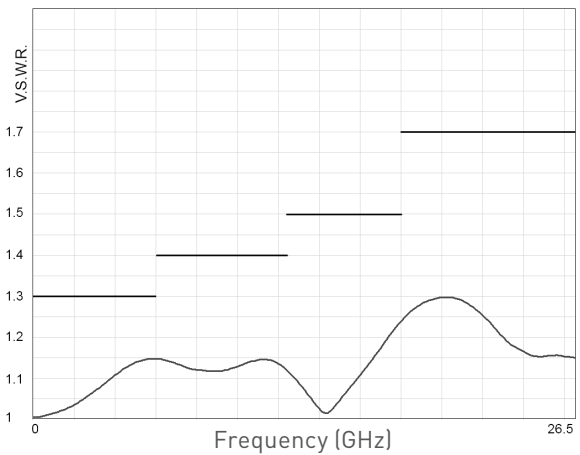


Example: Non terminated SP6T SMA 2.9 up to 26.5 GHz

**Insertion Loss and Isolation**

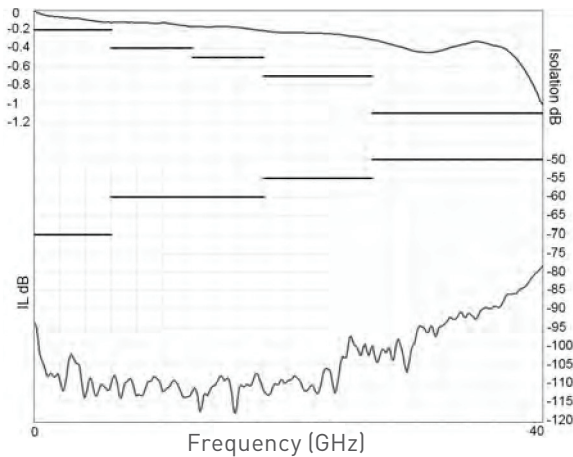


**V.S.W.R.**

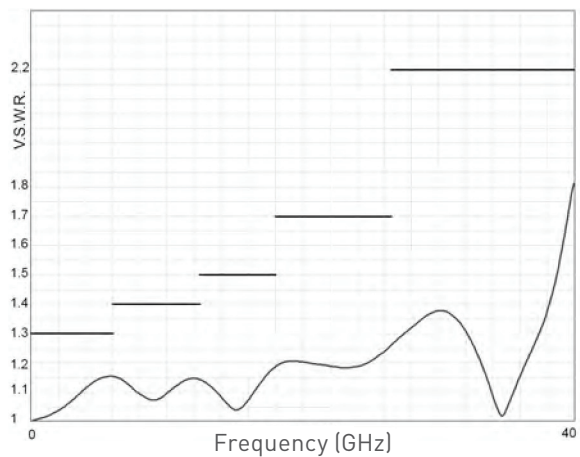


Example: Non terminated SP6T SMA 2.9 up to 40 GHz

**Insertion Loss and Isolation**



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

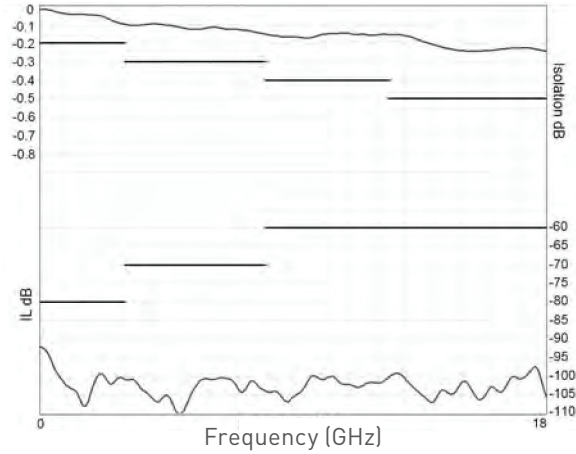


## SPnT Terminated & non Terminated up to 40 GHz

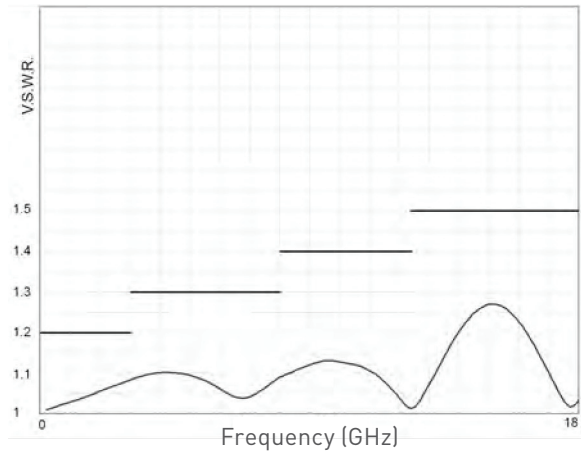
SMA – SMA 2.9 – QMA - DIN 1.6 / 5.6

Example: Terminated SP6T SMA up to 18 GHz

Insertion Loss and Isolation

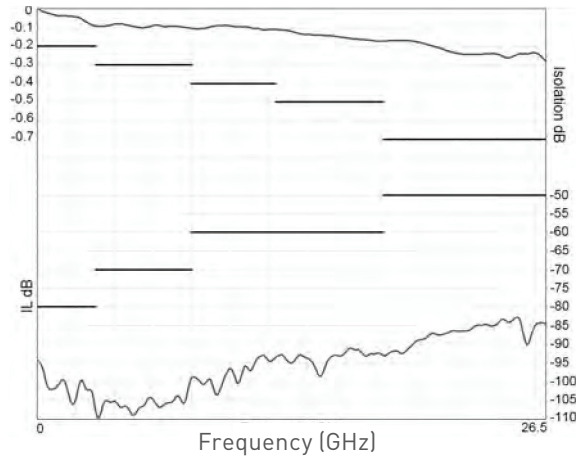


V.S.W.R.

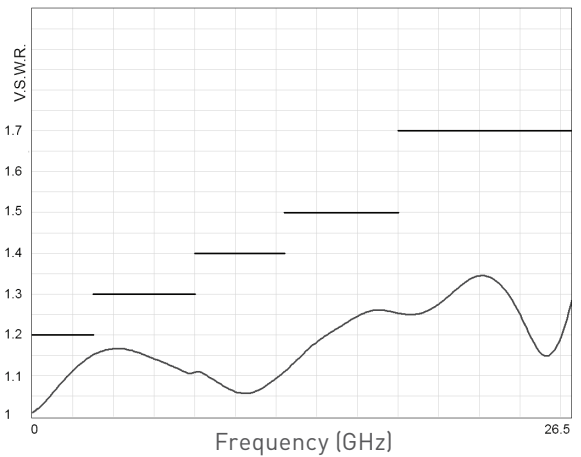


Example: Terminated SP6T SMA up to 26.5 GHz

Insertion Loss and Isolation

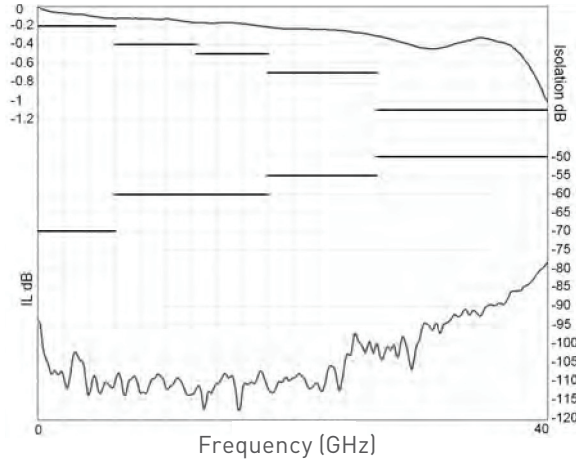


V.S.W.R.

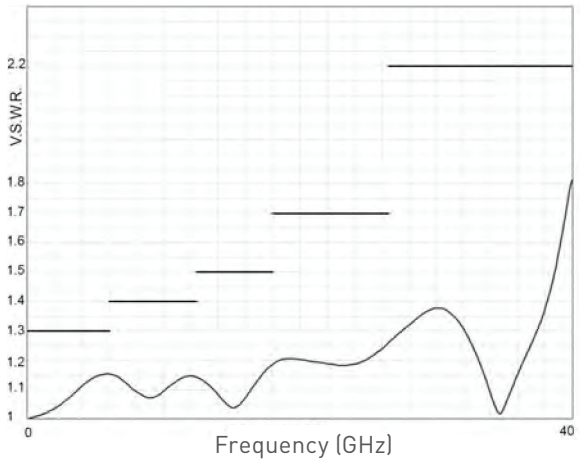


Example: Terminated SP6T SMA 2.9 up to 40 GHz

Insertion Loss and Isolation



V.S.W.R.



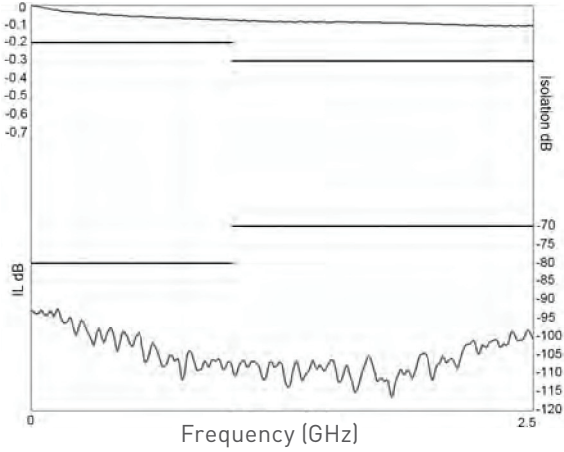
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**SPnT Terminated & non Terminated up to 40 GHz**

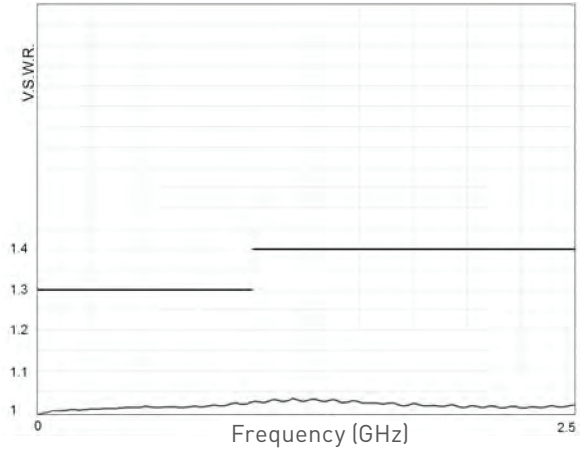
SMA - SMA 2.9 - QMA - DIN 1.6 / 5.6

Example: Non terminated SP6T 1.6/5.6 up to 2.5 GHz

**Insertion Loss and Isolation**

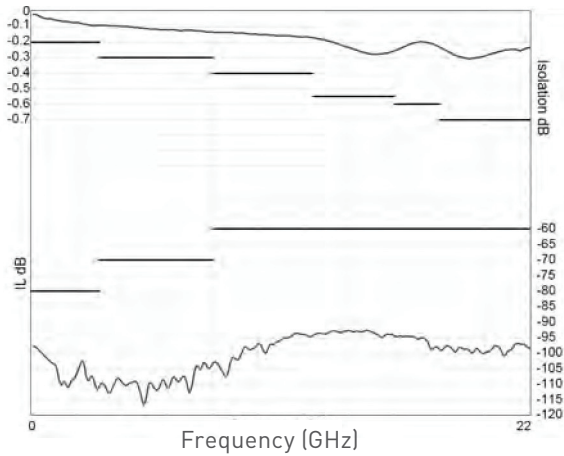


**V.S.W.R.**

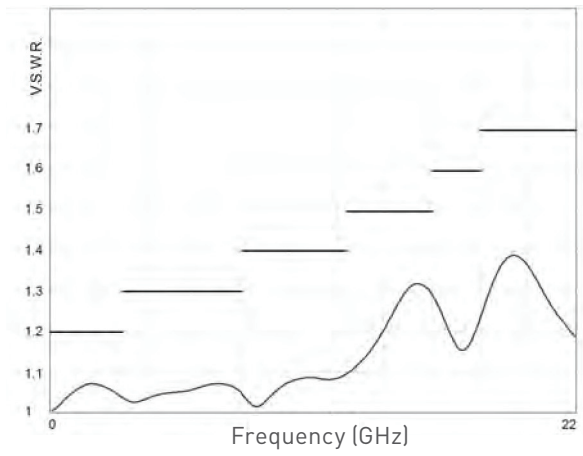


Example: SP8T SMA up to 22 GHz

**Insertion Loss and Isolation**

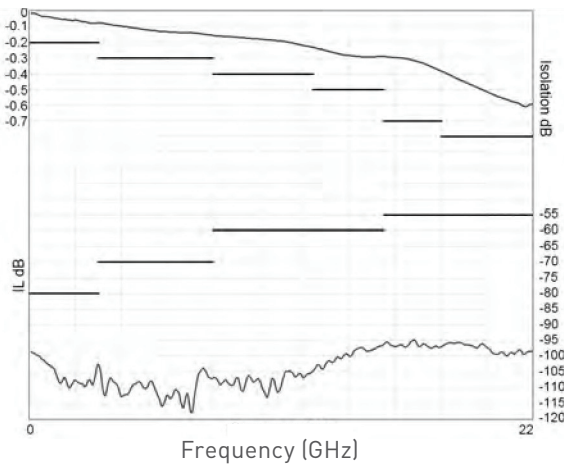


**V.S.W.R.**

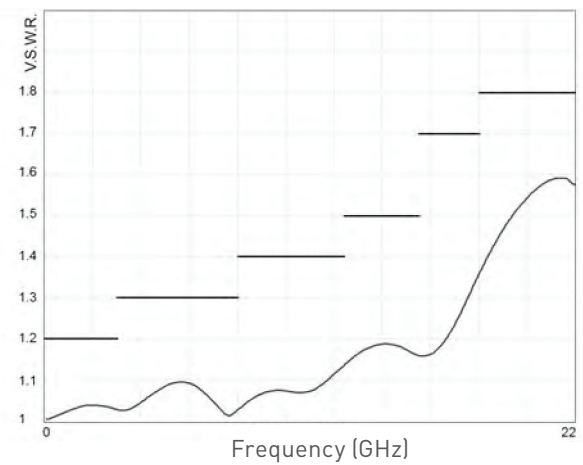


Example: SP10T SMA up to 22 GHz

**Insertion Loss and Isolation**



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

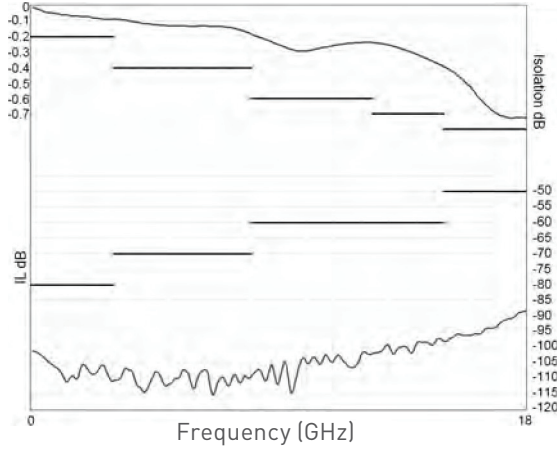


## SPnT Terminated & non Terminated up to 40 GHz

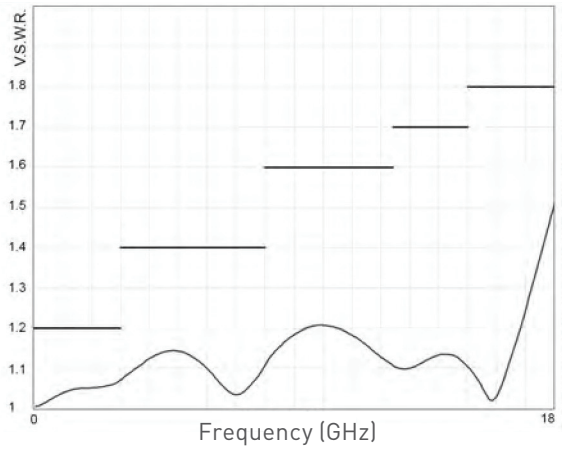
SMA – SMA 2.9 – QMA - DIN 1.6 / 5.6

Example: SP12T SMA up to 18 GHz

### Insertion Loss and Isolation



### V.S.W.R.

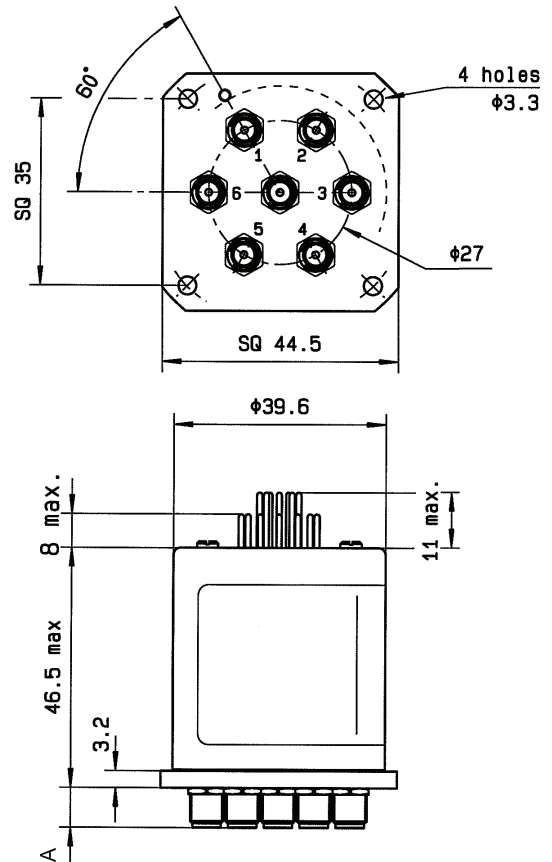


## TYPICAL OUTLINE DRAWINGS

NON TERMINATED 3 to 6 positions

Connectors	A max (mm)
SMA up to 26.5 GHz	7.4
SMA2.9 up to 40 GHz	6.3
QMA up to 6 GHz	10.8
DIN 1.6/5.6 up to 2.5 GHz	11.5

Solder pins	Type 0 or 1 with option 0 - 1 - 3 or 4
	Type 2 or 3 with option 0 or 1





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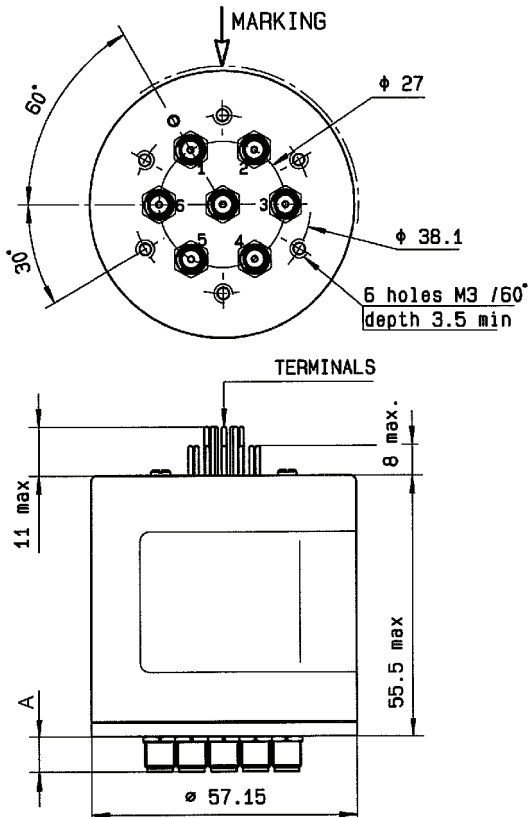
**SPnT Terminated & non Terminated up to 40 GHz**

SMA – SMA 2.9 – QMA - DIN 1.6 / 5.6

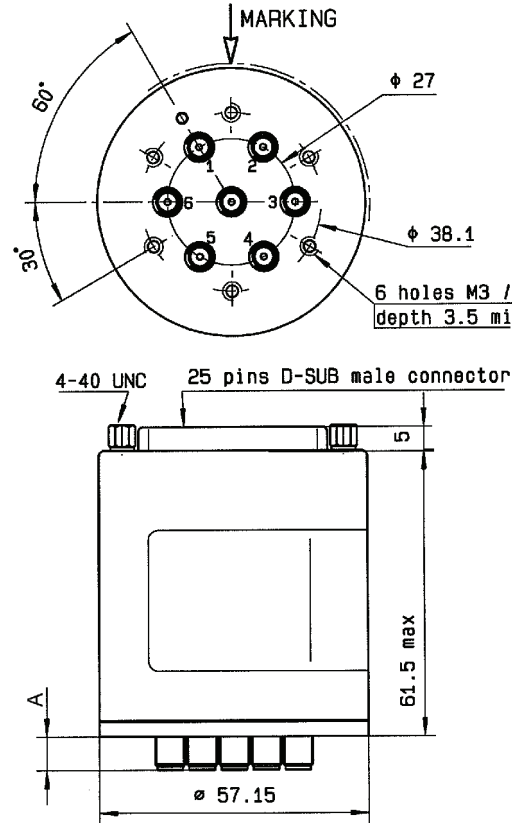
**TYPICAL OUTLINE DRAWINGS**

NON TERMINATED 3 to 6 positions (continued)

Solder pin model



D-sub model



Solder pins	Type 0 or 1 with option 2 or 8
	Type 2 or 3 with option 2 - 3 - 4 or 8
	Type 4 - 5 - 8 or 9 with option 0 - 2 or 8

D-Sub connector	All models
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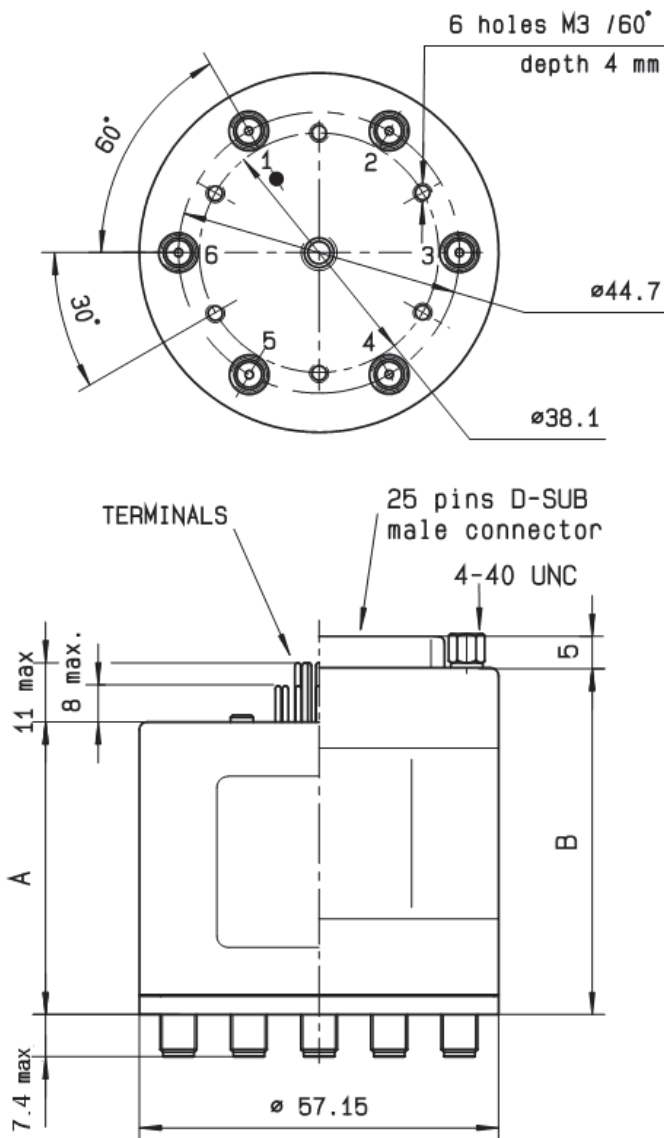
Connectors	A max (mm)
SMA up to 26.5 GHz	7.4
SMA 2.9 up to 40 GHz	6.3
QMA up to 6 GHz	10.8
DIN 1.6/5.6 up to 2.5 GHz	11.5

**SPnT Terminated & non Terminated up to 40 GHz**

SMA – SMA 2.9 – QMA - DIN 1.6 / 5.6

**TYPICAL OUTLINE DRAWINGS**

TERMINATED 3 to 6 positions



	A	B
	Solder Pins	D-Sub Connector
Type 0 - 1 - 2 or 3 with option 0 - 1 - 3 or 4	46.5	61.5
Type 0 - 1 - 2 or 3 with option 2 or 8	55.5	61.5
Type 4 - 5 - 8 or 9 with option 0 - 1 - 2 or 8	55.5	61.5

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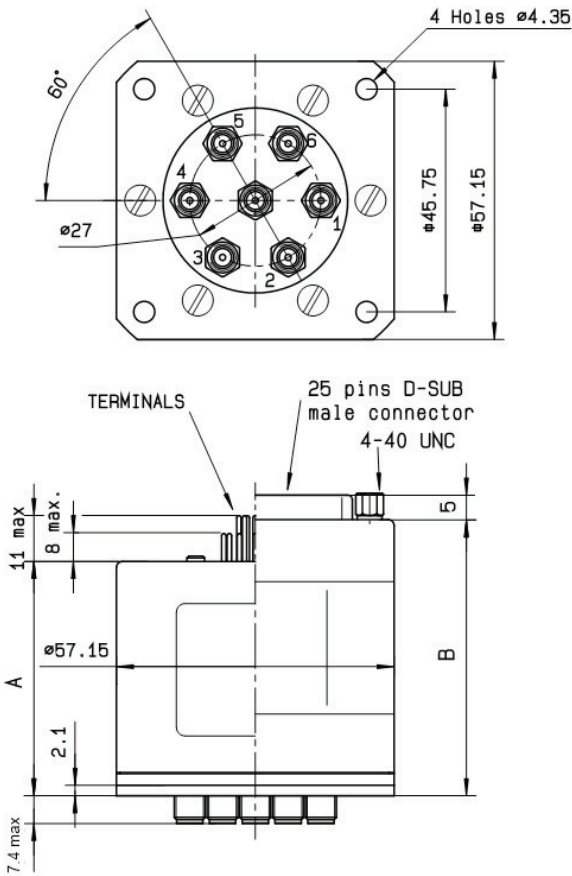
**SPnT Terminated & non Terminated up to 40 GHz**

SMA – SMA 2.9 – QMA - DIN 1.6 / 5.6

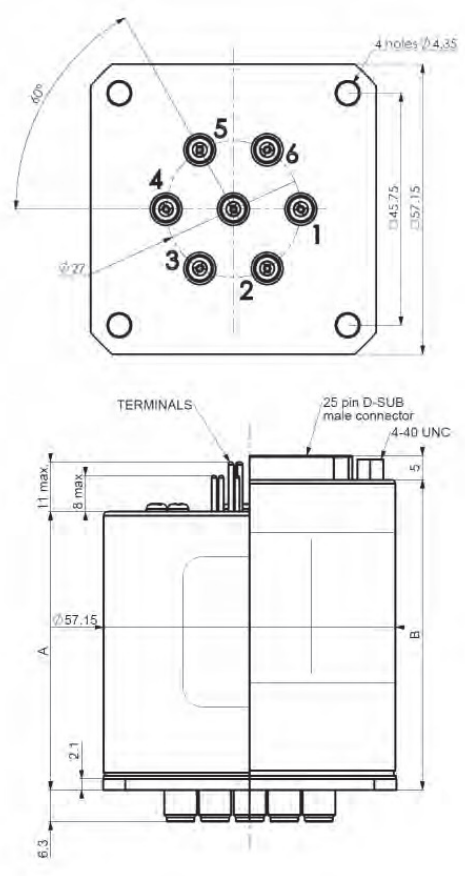
**TYPICAL OUTLINE DRAWINGS**

TERMINATED 3 to 6 positions 26.5 GHz & 40 GHz

26.5 GHz model



40 GHz model



	A	B
	Solder Pins	D-Sub Connector
Type 0 - 1 - 2 or 3 with option 0 - 1 - 3 or 4	48.5	63.5
Type 0 - 1 - 2 or 3 with option 2 or 8	57.5	63.5
Type 4 - 5 - 8 or 9 with option 0 - 1 - 2 or 8	57.5	63.5

## SPnT Terminated & non Terminated up to 40 GHz

SMA – SMA 2.9 – QMA - DIN 1.6 / 5.6

### TYPICAL OUTLINE DRAWINGS

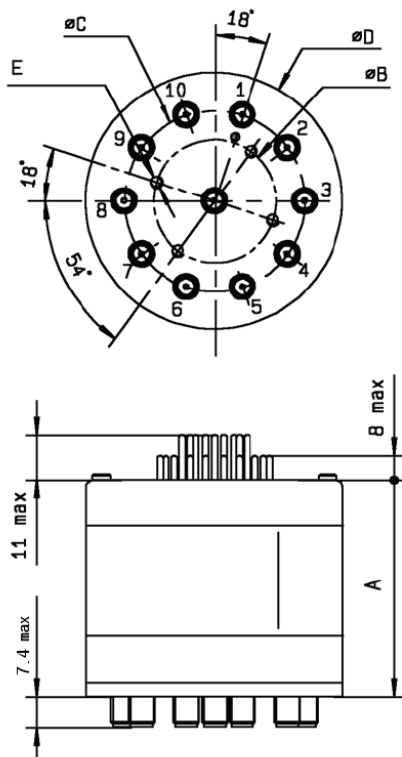
TERMINATED or NON TERMINATED 7 to 12 positions

Type	A (max) mm	
	Solder Pins	D-Sub connector
Type 0 - 1 - 2 or 3 with option 0 - 1 - 3 or 4	50	66
Type 0 - 1 - 2 or 3 with option 2 or 8 and Type 4 - 5 - 8 or 9 with option 0 - 1 - 2 or 8	61	66

Number of positions	B diameter	C diameter	D diameter	E
7 - 8	49.8	44.7	56.9	4 holes M3 depth 4mm
9 - 10	30.5	44.7	63.5	
11 - 12	40.6	55.9	68.3	

10 position model

Terminated up to 18 GHz with solder pins



12 position model

Terminated up to 12.4 GHz with D-Sub

