SPDT up to 50 GHz

Pc Board - SMA - SMA 2.9 - 2.4mm - QMA - SMC - SMB - mini SMB - DIN

Radiall's RAMSES SPDT switches offer excellent reliability, high performance and operating frequencies from DC to 50 GHz. Radiall's RAMSES concept (which provides for a life span of 10 million cycles) offers a variety of options to meet customer needs.

These switches are dedicated to all market applications including: military, instrumentation and telecommunications.

Example of P/N:
R570413100 is a SPDT SMA 18 GHz, failsafe, 28 Vdc, with TTL driver, without option, solder pins.

PART NUMBER SELECTION

R 570

Frequency Range:
3: SMA up to 3 GHz
B: SMB up to 3 GHz
C: SMC up to 3 GHz
E: QMA up to 6 GHz (4)
4: SMA up to 18 GHz
F: SMA up to 26.5 GHz
8: SMA 2.9 up to 40 GHz (5)
J: 2.4mm up to 50 GHz
9: DIN 1.6/5.6 up to 2.5 GHz
H: mini SMB up to 3 GHz (6)
A: Pc board mount up to 3 GHz (6)

Type:
1: Failsafe
2: Failsafe + I.C.
3: Latching
4: Latching + I.C.
5: Latching + S.C.O. (1)
6: Latching + S.C.O. + I.C. (1)

Actuator Voltage:
2: 12 Vdc
3: 28 Vdc

Actuator Terminals:
0: Solder pins

Options:
0: Without option
1: Positive common (2) (3)
3: With suppression diodes (1)
4: With suppression diodes and positive common (1) (2) (3)

TTL Option:
0: Without TTL driver
1: With TTL driver (high level) (1) (2)

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 & 6 because failsafe switches can be used with both polarities
(6): Available only upon request

(4): The QLF tradermark (Quick Lock Formula®) standard applies to QMA and QN series and guaranties the full intermateability between suppliers using this tradermark. Using QLF certified connectors also guarantees the specified level of RF performances
(5): Connector SMA 2.9 is equivalent to "K connector®", registered trademark of Anritsu

SPDT up to 50 GHz

Pc Board - SMA - SMA 2.9 - 2.4mm - QMA - SMC - SMB - mini SMB - DIN 1.6/5.6

GENERAL SPECIFICATIONS

Operating mode			Failsafe		Latching	
Nominal operating voltage (across temperature range)		Vdc	12 (10.2 to 13)	28 (24 to 30)	12 (10.2 to 13)	28 (24 to 30)
Coil resistance at 23 °C (+/-10%)		Ω	47.5	275	58	350
Operating current at 23 °C		mA	250	102	210	80
Average power			See Power Rating Chart page **1-13**			
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	
Indicator rating			1 W / 30 V / 100mA			
Switching time		ms	10			
Life	SMA - SMA 2.9 - QMA		10 million cycles			
	DIN 1.6/5.6 - Pc Board		5 million cycles			
	Mini SMB - SMB - SMC		2.5 million cycles			
	2.4mm		2 million cycles			
Connectors			SMA - SMA 2.9 - QMA - DIN 1.6/5.6 - SMB - SMC Mini SMB - Pc Board - 2.4mm			
Operating temperature range	DIN 1.6/5.6 - SMB - SMC - mini SMB - 2.4mm		-25°C to +70°C			
	SMA - SMA 2.9 - QMA - Pc Board		-40°C to +85°C			
Storage temperature range	DIN 1.6/5.6 - SMB - SMC - mini SMB - 2.4mm		-40°C to +85°C			
	SMA - SMA 2.9 - QMA - Pc Board		-55°C to +85°C			
Vibration (MIL STD 202, Method 204D, cond.D)			10-2000 Hz, 20g		Operating	
Shock (MIL STD 202, Method 213B, cond.C)			100g / 6ms, ½ sine		Operating	

RF PERFORMANCES

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 - 2.5	1.30	0.30	70	
Mini SMB	DC - 3	DC - 1	1.20	0.20	80	
		1 - 3	1.30	0.30	70	
SMB - SMC	DC - 3	DC - 3	1.20	0.20	80	50
QMA	DC - 6	DC - 3	1.20	0.20	80	
		3 - 6	1.30	0.30	70	
SMA	DC - 3 DC - 18 DC - 26.5	DC - 3	1.10	0.15	80	
		3 - 8	1.20	0.20	75	
		8 - 12.4	1.20	0.25	65	
		12.4 - 18	1.40	0.35	60	
		18 - 26.5	1.50	0.50	55	
SMA 2.9	DC - 40	DC - 6	1.30	0.30	70	
		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	1.90	0.80	50	
PC Board	DC - 3	DC - 3	1.20	0.20	80	
2.4 mm	DC - 50	DC - 6	1.30	0.30	70	
		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	1.90	0.80	50	
		40 - 50	1.90	1.10	50	

See page 2-14, 2-18 and 2-19 for typical RF performances

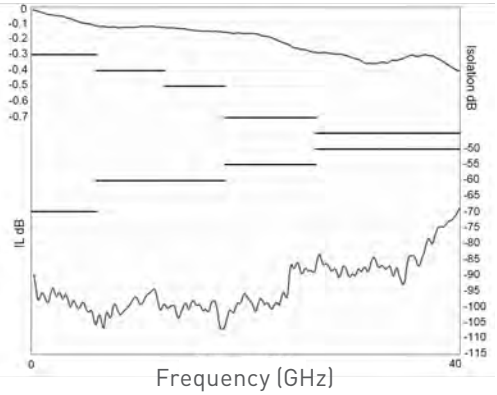
SPDT up to 50 GHz

Pc Board - SMA - SMA 2.9 - 2.4mm - QMA - SMC - SMB - mini SMB - DIN

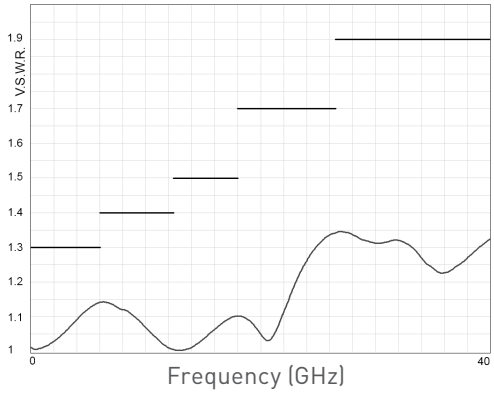
R570 AND R572 TYPICAL RF PERFORMANCE

Example: SPDT SMA 2.9 up to 40 GHz

Insertion Loss and Isolation

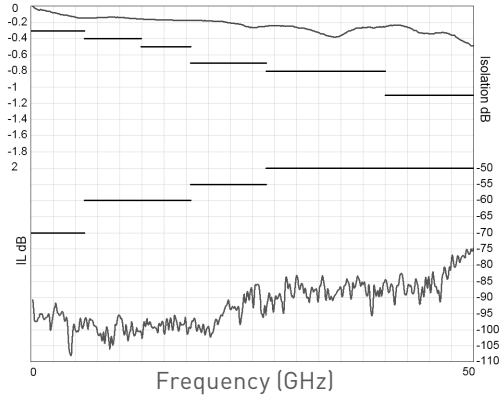


V.S.W.R.

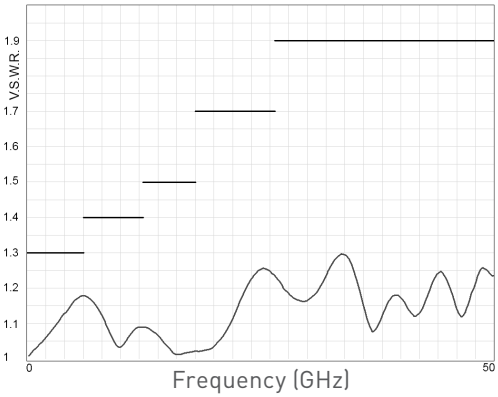


Example: SPDT 2.4mm up to 50 GHz

Insertion Loss and Isolation

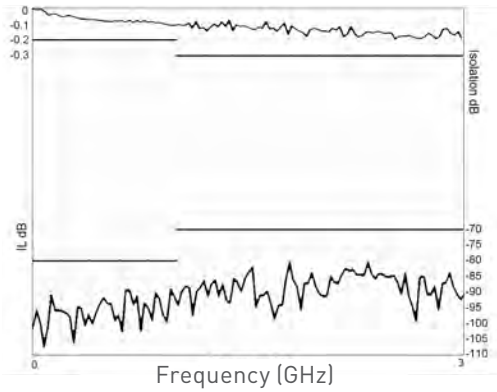


V.S.W.R.

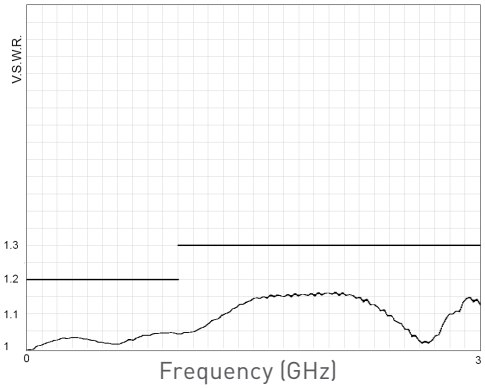


Example: SPDT mini SMB up to 3 GHz

Insertion Loss and Isolation



V.S.W.R.



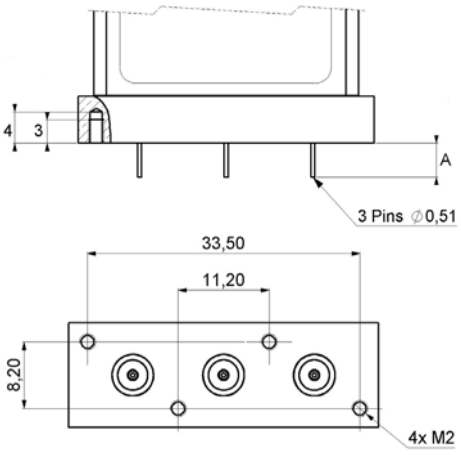
Note: see page 2-18 for other connectors

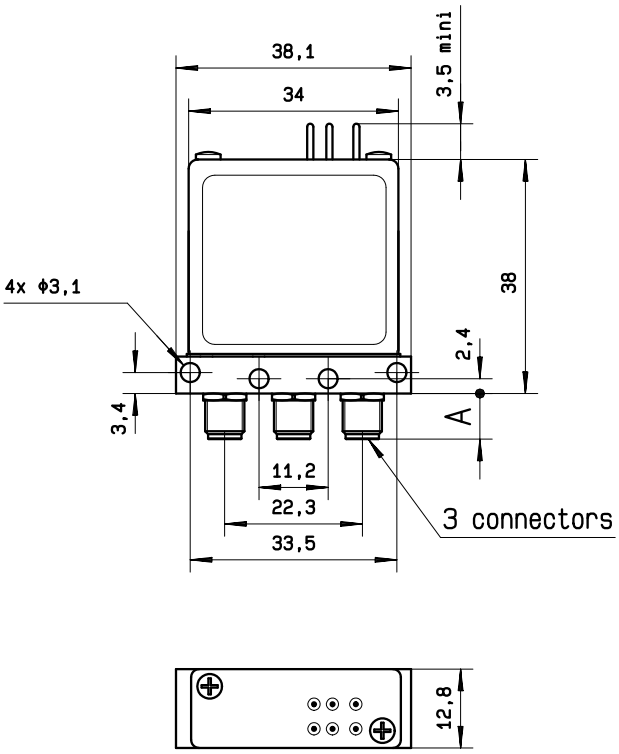
SPDT up to 50 GHz

Pc Board - SMA - SMA 2.9 - 2.4mm - QMA - SMC - SMB - mini SMB - DIN

TYPICAL OUTLINE DRAWING

Connectors	A max (mm)
SMA	7.4
SMA 2.9 & 2.4mm	6.3
SMB - SMC	9.3
QMA	10.8
Mini SMB	7.5
DIN 1.6/5.6	11.5
Pc Board	4.5

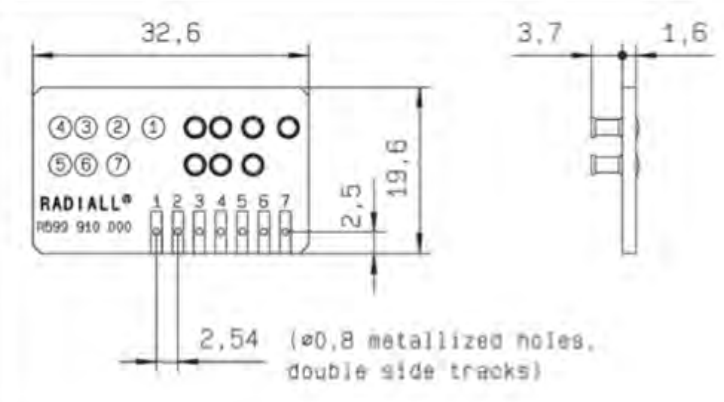




See page 2-27 for pin identification.

ACCESSORIES

A printed circuit board interface connector (ordered separately) has been designed for easy mounting on terminals.
For SPDT model R570 series => Radiall part number: **R599 910 000**



SPDT up to 50 GHz: Low Consumption & Reduced Size

SMA - SMA 2.9 - 2.4mm - QMA - SMC - SMB - mini SMB - DIN 1.6/5.6

Radiall's RAMSES R572 series are ideal for RF & microwave systems where low current consumption, reduced size, high performance and high reliability are required. Other options are also available as shown on this page.

These switches are perfect for all market applications including: industrial, instrumentation, defense and telecommunications.

Example of P/N:
R572432010 is a SPDT SMA 18 GHz, latching, 12 Vdc, positive common, solder pins.

PART NUMBER SELECTION

R 572 _ 0 _ 0

Frequency range:
3: SMA up to 3 GHz
B: SMB up to 3 GHz
C: SMC up to 3 GHz
E: QMA up to 6 GHz (3)
4: SMA up to 18 GHz
F: SMA up to 26.5 GHz
8: SMA 2.9 up to 40 GHz (4)
J: 2.4mm up to 50 GHz
9: DIN 1.6/5.6 up to 2.5 GHz
H: mini SMB up to 3 GHz (2)

Type:
1: Failsafe
3: Latching

Options:
0: Without option
1: Positive common (1)

Actuator Voltage:
2: 12 Vdc
3: 28 Vdc

(1): Positive common shall be specified only with type 3 because failsafe switches can be used with both polarities
(2): Available only upon request

(3): The QLF tradermark (Quick Lock Formula®) standard applies to QMA and QN series and guaranties the full intermateability between suppliers using this tradermark. Using QLF certified connectors also guarantees the specified level of RF performances
(4): Connector SMA2.9 is equivalent to "K connector®", registered trademark of Anritsu

SPDT up to 50 GHz: Low Consumption & Reduced Size

SMA - SMA 2.9 - 2.4mm - QMA - SMC - SMB - mini SMB - DIN 1.6/5.6

GENERAL SPECIFICATIONS

Operating mode			Failsafe		Latching	
Nominal operating voltage (across temperature range)		Vdc	12	28	12	28
			(10.2 to 13)	(24 to 30)	(10.2 to 13)	(24 to 30)
Coil resistance at 23°C (+/-10%)		Ω	75	450	58	350
Operating current at 23°C		mA	160	62	210	80
Average power			See Power Rating Chart page **1-13**			
Switching time		ms	10			
Life			2.5 million cycles			
Connectors			SMA - SMA 2.9 - QMA - DIN 1.6/5.6 - SMB - SMC Mini SMB - 2.4mm			
Operating temperature range	DIN 1.6/5.6 - SMB - SMC - mini SMB - 2.4mm		-25°C to +70°C			
	SMA - SMA 2.9 - QMA		-40°C to +85°C			
Storage temperature range	DIN 1.6/5.6 - SMB - SMC - mini SMB - 2.4mm		-40°C to +85°C			
	SMA - SMA 2.9 - QMA		-55°C to +85°C			
Vibration (MIL STD 202, Method 204D, cond.C)			10-2000 Hz, 20g		Operating	
Shock (MIL STD 202, Method 213B, cond.G)			50g, 11ms, ½ sine		Operating	

RF PERFORMANCES

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 - 2.5	1.30	0.30	70	
Mini SMB	DC - 3	DC - 1	1.20	0.20	80	
		1 - 3	1.30	0.30	70	
SMB - SMC	DC - 3	DC - 3	1.20	0.20	80	50
QMA	DC - 6	DC - 3	1.20	0.20	80	
		3 - 6	1.30	0.30	70	
SMA	DC - 3 DC - 18 DC - 26.5	DC - 3	1.10	0.15	80	
		3 - 8	1.20	0.20	75	
		8 - 12.4	1.20	0.25	65	
		12.4 - 18	1.40	0.35	60	
		18 - 26.5	1.50	0.50	55	
SMA 2.9	DC - 40	DC - 6	1.30	0.30	70	
		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	1.90	0.80	50	
2.4 mm	DC - 50	DC - 6	1.30	0.30	70	
		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	1.90	0.80	50	
		40 - 50	1.90	1.10	50	

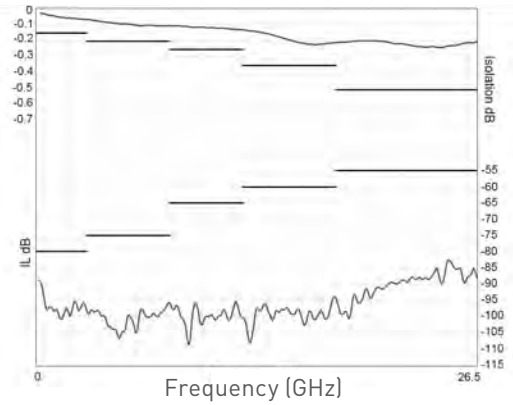
SPDT up to 50 GHz: Low Consumption & Reduced Size

SMA - SMA 2.9 - 2.4mm - QMA - SMC - SMB - mini SMB - DIN 1.6/5.6

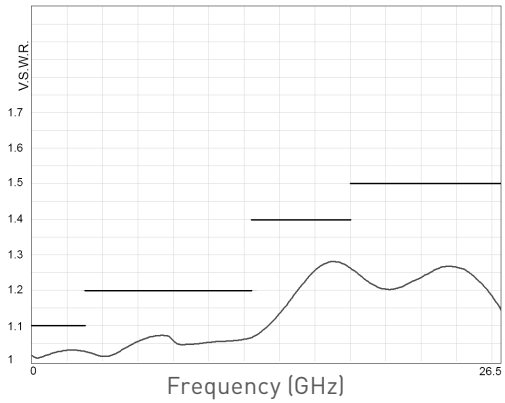
R570 AND R572 TYPICAL RF PERFORMANCES

Example: SPDT SMA up to 26.5 GHz

Insertion Loss and Isolation

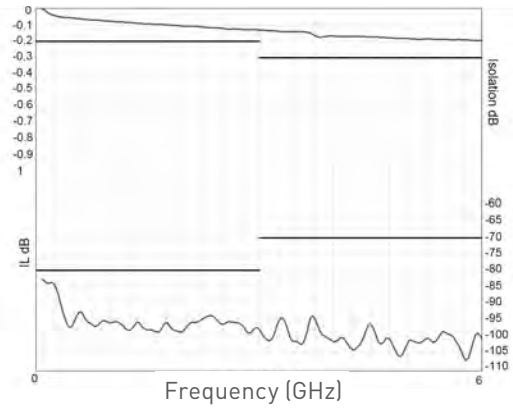


V.S.W.R.

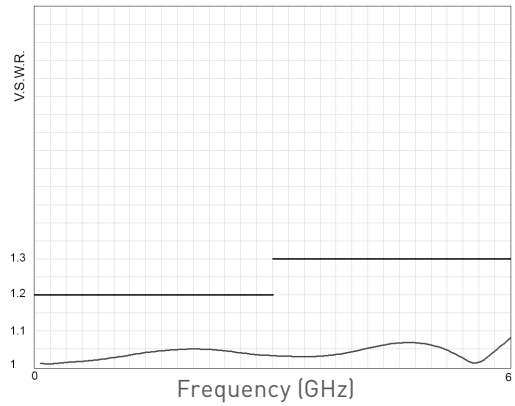


Example: SPDT QMA up to 6 GHz

Insertion Loss and Isolation



V.S.W.R.



Note: see page 2-14 for other connectors

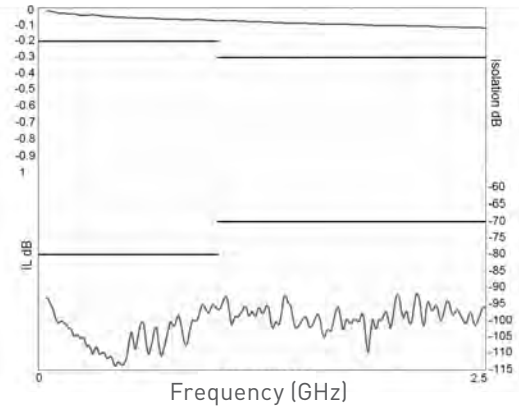
SPDT up to 50 GHz: Low Consumption & Reduced Size

SMA - SMA 2.9 - 2.4mm - QMA - SMC - SMB - mini SMB - DIN 1.6/5.6

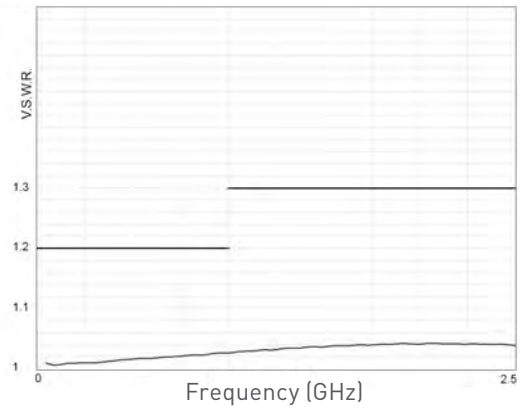
R570 AND R572 TYPICAL RF PERFORMANCES

Example: SPDT DIN 1.6/5.6 up to 2.5 GHz

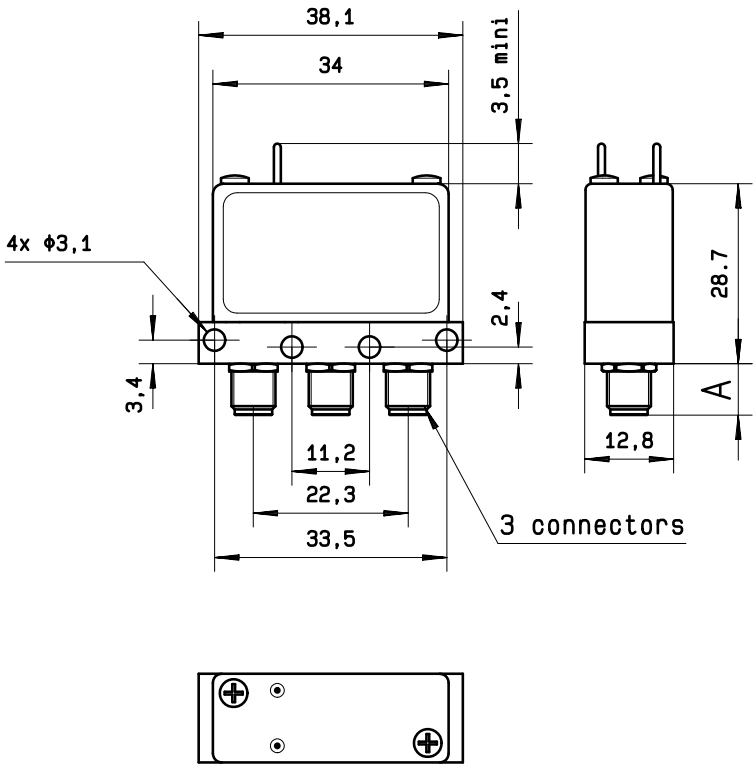
Insertion Loss and Isolation



V.S.W.R.



Connectors	A max (mm)
SMA	7.4
SMA 2.9 & 2.4mm	6.3
SMB - SMC	9.3
QMA	10.8
Mini SMB	7.5
DIN 1.6/5.6	11.5



Note: see page 2-27 for pin identification

SPDT up to 18 GHz

N - TNC - BNC

Radiall's RAMSES SPDT N, BNC & TNC switches are designed for high performance in RF & Microwave systems up to 18 GHz.

Radiall's RAMSES concept (modular concept) offers a full range of configurations. They are commonly used for applications where high power handling capability is required.

These switches are dedicated to all market applications including: defense, instrumentation and telecommunications.

Example of P/N:
R570113035 is a SPDT N 12.4 GHz, failsafe, 28 Vdc, with supression diodes, without option, D-Sub connector.

PART NUMBER SELECTION

R 570

Frequency Range:
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
D: TNC up to 18 GHz

Type:
1: Failsafe
2: Failsafe + I.C.
3: Latching
4: Latching + I.C.
5: Latching + S.C.O. (1)
6: Latching + S.C.O. + I.C. (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) (3)
3: With suppression diodes (1)
4: With suppression diodes and positive common (2) (3)

TTL Option:
0: Without TTL driver
1: With TTL driver (high level) (1) (2)

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 & 6 because failsafe switches can be used with both polarities

SPDT up to 18 GHz

N - TNC - BNC

GENERAL SPECIFICATION

Operating mode			Failsafe		Latching	
Nominal operating voltage (across temperature range)		Vdc	12	28	12	28
			(10.2 to 13)	(24 to 30)	(10.2 to 13)	(24 to 30)
Coil resistance at 23°C (+/-10%)		Ω	38	275	38	225
Operating current at 23°C		mA	320	102	320	125
Average power			See Power Rating Chart page **1-13**			
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		ms	10			
Life			2.5 million cycles			
Connectors			N - TNC - BNC			
Actuator terminals			Solders pins or 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.D)			10-2000 Hz, 20g		Operating	
Shock (MIL STD 202, Method 213B, cond.C)			100g, 6 ms, ½ sine		Non operating	

RF PERFORMANCES

Connectors	Frequency Range GHz		V.S.W.R. (max)	Insertion Loss (max) dB	Isolation (min) dB	Impedance Ω
N / TNC	DC - 3 DC - 12.4	DC - 1	1.15	0.15	85	50
		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	
TNC 18GHz	DC - 18	DC - 6	1.30	0.30	70	
		6 - 12.4	1.50	0.50	60	
		12.4 - 18	1.60	0.70	60	
BNC	DC - 3	DC - 1	1.15	0.15	85	
		1 - 2	1.20	0.20	80	
		2-3	1.25	0.25	75	

Note: see page 2-22 for typical RF performances

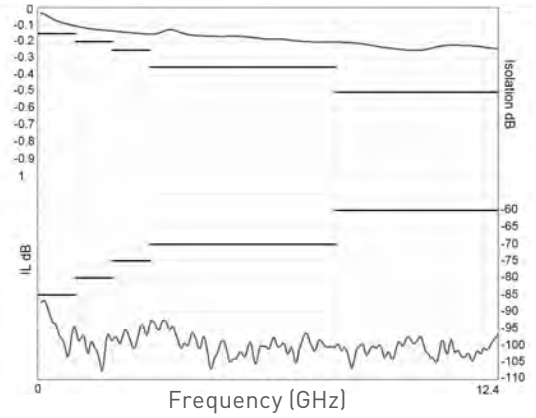
SPDT up to 18 GHz

N - TNC - BNC

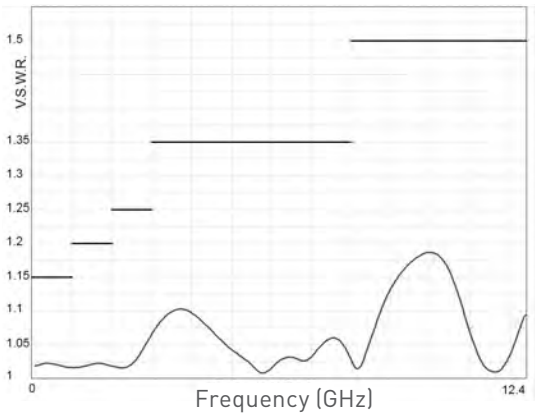
R570 TYPICAL RF PERFORMANCES

Example: SPDT N and TNC up to 12.4 GHz

Insertion Loss and Isolation

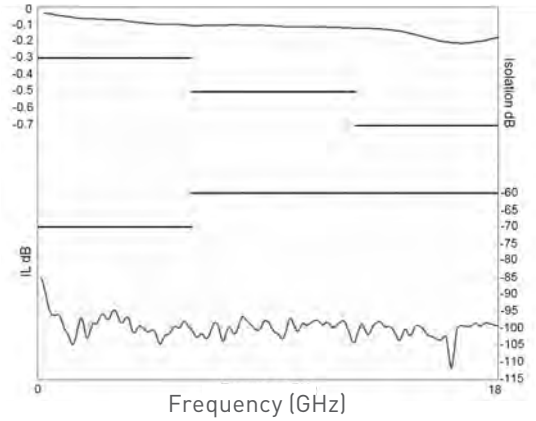


V.S.W.R.

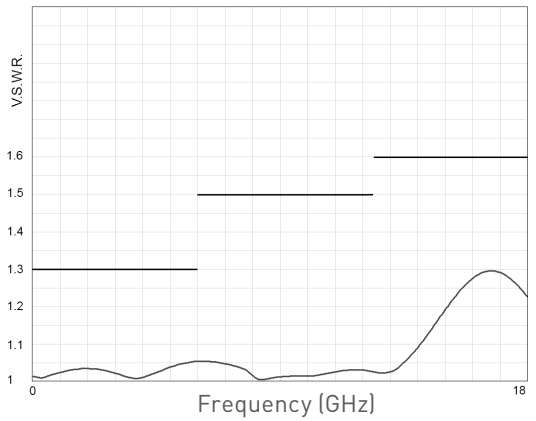


Example: SPDT TNC up to 18 GHz

Insertion Loss and Isolation



V.S.W.R.

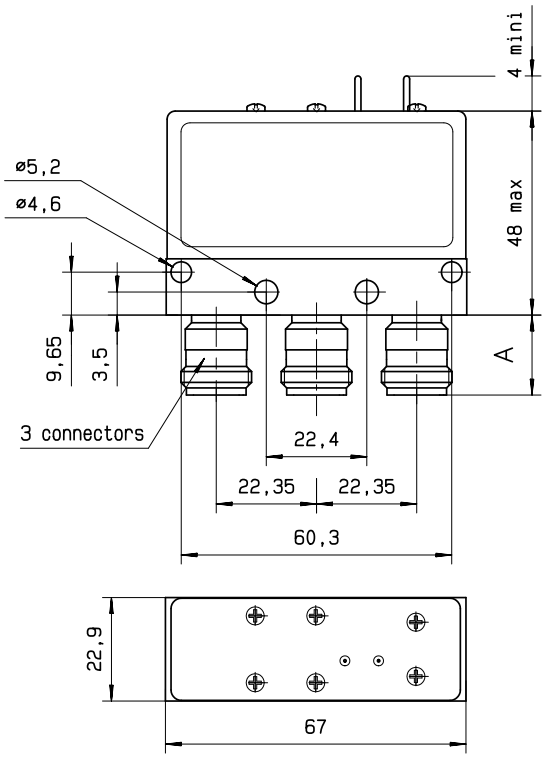


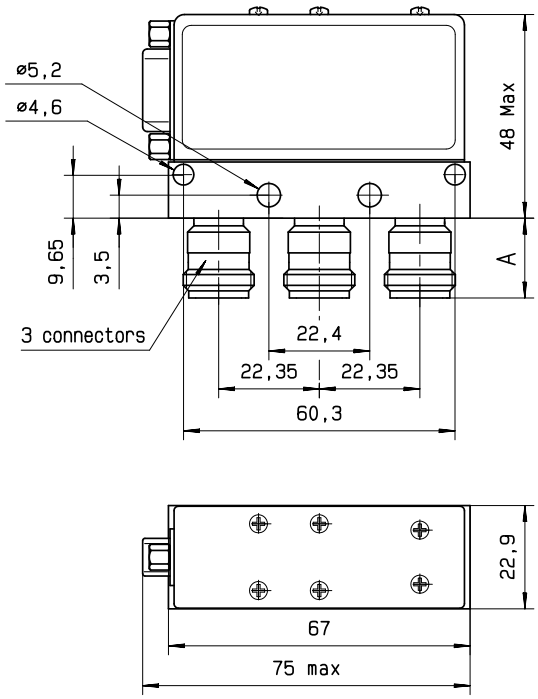
SPDT up to 18 GHz

N - TNC - BNC

TYPICAL OUTLINE DRAWING

Example: SPDT N and TNC up to 12.4 GHz





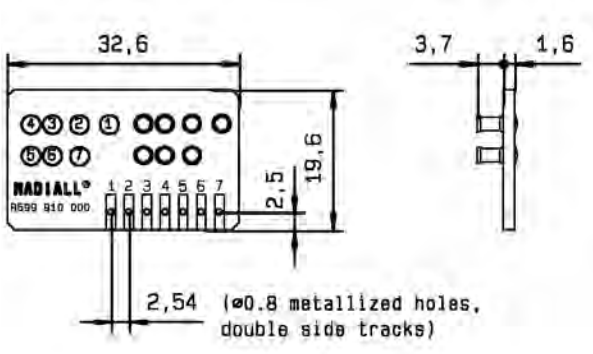
See page 2-27 for pin allocation

See page 2-27 for D-Sub pin allocation

Connectors	N	TNC	BNC
A max (mm)	18.8	11	11

ACCESSORIES

A printed circuit board interface connector (ordered separately) has been designed for easy mounting on terminals.
For SPDT model R570 series => Radiall part number: **R599 910 000**

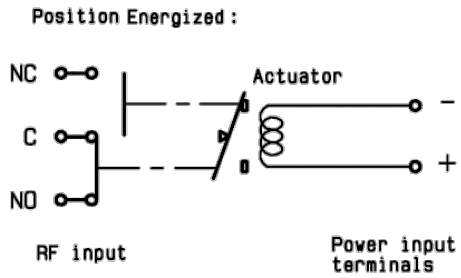


Coaxial SPDT - Electrical Schematics

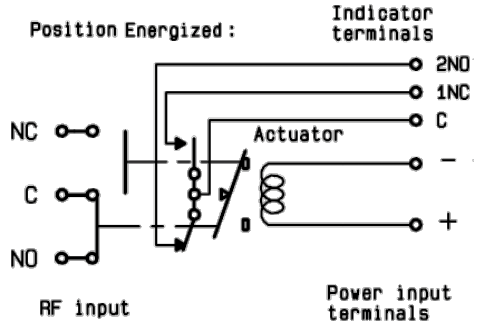
R570/R572 Series

FAILSAFE

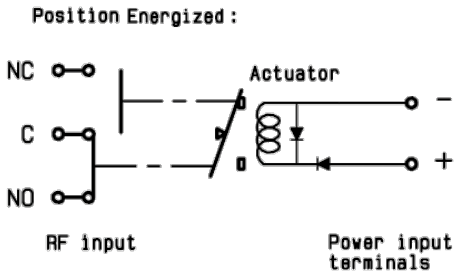
WITHOUT OPTION
R570 -1- 000 / R572 -1- 000



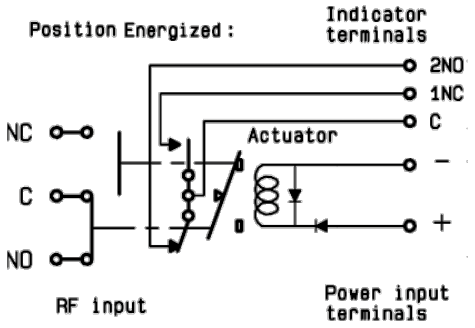
WITH INDICATOR CONTACT
R570 -2- 000



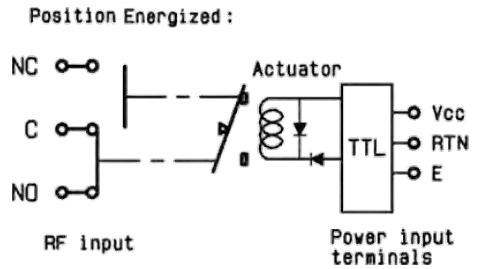
WITH SUPPRESSION DIODES
R570 -1- 030



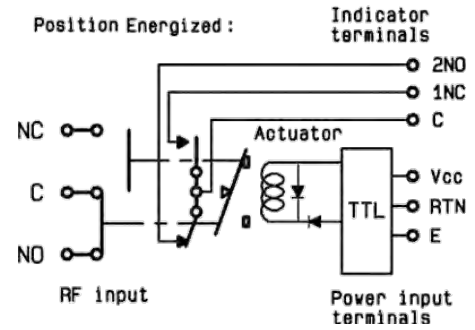
WITH SUPPRESSION DIODES AND INDICATOR CONTACT
R570 -2- 030



WITH TTL DRIVER
(supression diodes are included)
R570 -1- 100



WITH TTL DRIVER AND INDICATOR CONTACT
(supression diodes are included)
R570 -2- 100

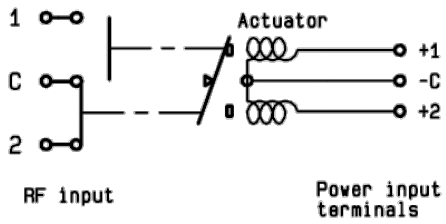


Coaxial SPDT - Electrical Schematics

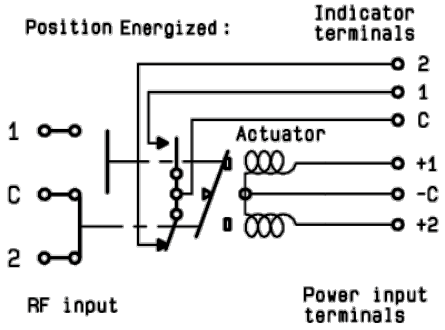
R570/R572 Series

LATCHING

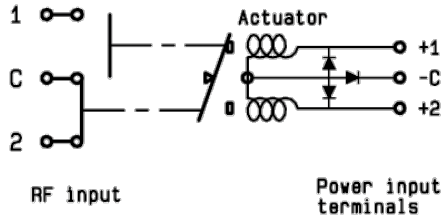
WITHOUT OPTION
R570-3- 000 AND R572 -3- 000



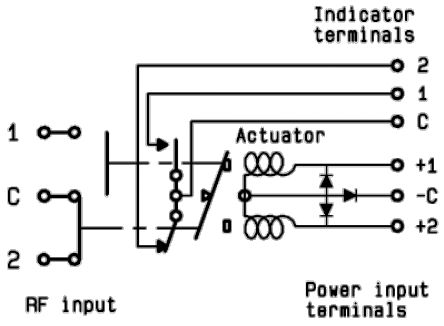
WITH INDICATOR CONTACT
R570 -4- 000



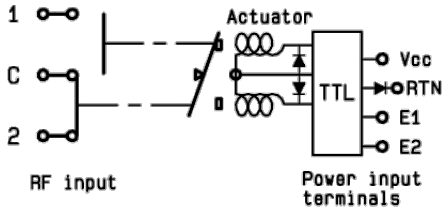
WITH SUPPRESSION DIODES
R570 -3- 030



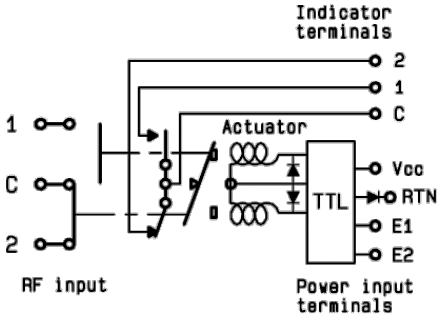
WITH SUPPRESSION DIODES AND INDICATOR CONTACT
R570 -4- 030



WITH TTL DRIVER
(supression diodes are included)
R570 -3- 100



WITH TTL DRIVER AND INDICATOR CONTACT
(supression diodes are included)
R570 -4- 100

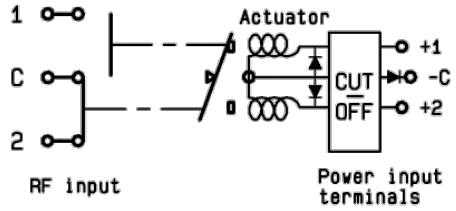


Coaxial SPDT - Electrical Schematics

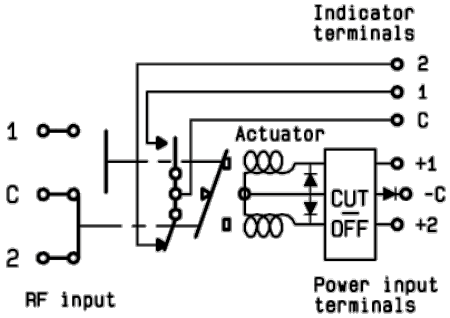
R570/R572 Series

LATCHING

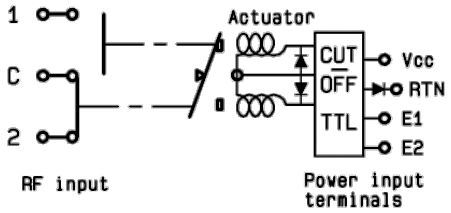
WITHOUT CUT-OFF
(supression diodes are included)
R570 -5- 000



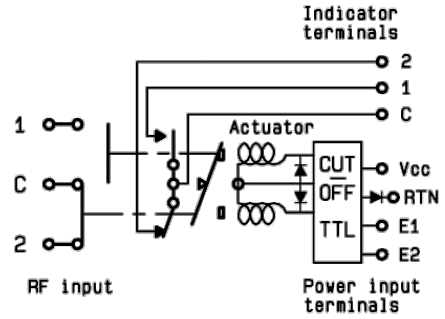
WITHOUT CUT-OFF AND INDICATOR CONTACT
(supression diodes are included)
R570 -6- 000



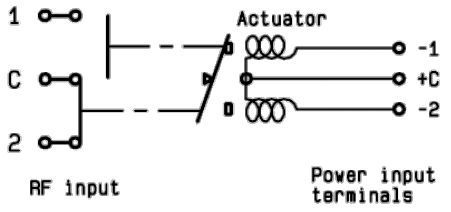
WITHOUT CUT-OFF AND TTL DRIVER
(supression diodes are included)
R570 -5- 100



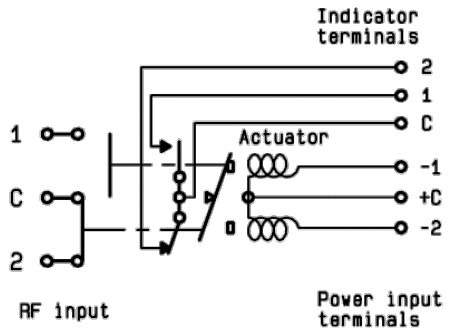
WITHOUT CUT-OFF, TTL AND INDICATOR CONTACT
(supression diodes are included)
R570 -6- 100



WITH POSTIVE COMMMON, NO OPTION
R570 -3- 010 / R572 -3- 010



WITH POSTIVE COMMMON AND INDICATOR CONTACT
R570 -4- 010

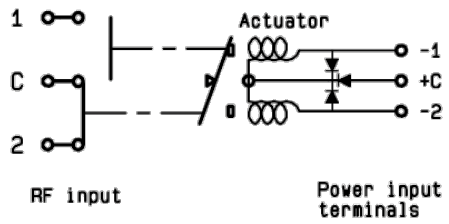


Coaxial SPDT - Electrical Schematics

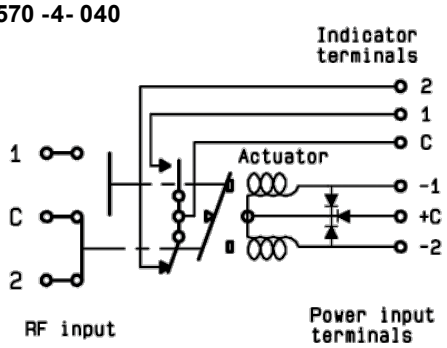
R570/R572 Series

LATCHING

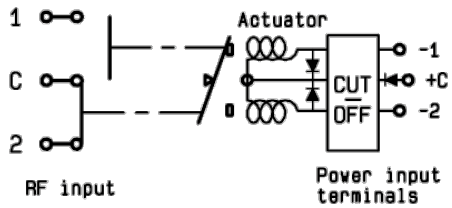
WITH POSITIVE COMMON AND SUPPRESSION DIODES
R570 -3- 040



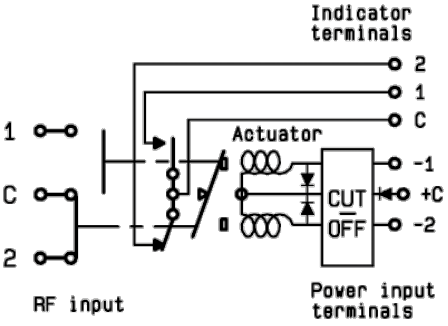
WITH POSITIVE COMMON, SUPPRESSION DIODES AND INDICATOR CONTACT
R570 -4- 040



WITH POSITIVE COMMON AND CUT-OFF (supression diodes are included)
R570 -5- 010



WITH POSITIVE COMMON, CUT-OFF AND INDICATOR CONTACT (supression diodes are included)
R570 -6- 010



PIN IDENTIFICATION

Type	PIN						
	1	2	3	4	6	7	8
Failsafe	+		-				
Failsafe + I.C.	+		-		2NO	1NC	C
Failsafe + TTL	E		RTN	VCC			
Failsafe + I.C. + TTL	E		RTN	VCC	2NO	1NC	C
Latching Latching + Cut-off	-2 or +2	-1 or +1	+C or -C				
Latching + I.C. Latching + I.C. + Cut-off	-2 or +2	-1 or +1	+C or -C		2	1	C
Latching + TTL Latching + TTL + Cut-off	E2	E1	RTN	VCC			
Latching + TTL + I.C. Latching + TTL + I.C.+ Cut-off	E2	E1	RTN	VCC	2	1	C