SPnT Coaxial Subminiature Switches DC to 6 GHz, DC to 26.5 GHz, DC to 40 GHz

R591 RADIALL coaxial subminiature switches have a typical operating life exceeding 25 million cycles. Excellent RF & repeatability characteristics along with a guaranteed life of 10 million cycles make these switches ideal for Automated Test Equipment (ATE) and other measurement applications. These miniature switches are also an excellent choice for Mil/Aero applications due to their small size, light weight, as well as outstanding shock and vibration handling capabilities.

PART NUMBER SELECTION

R 5 9 1 _ _ _ _ _ _

RF Connectors :
3 : SMA up to 6 GHz
E : QMA up to 6 GHz (1)
7 : SMA up to 26.5 GHz
8 : SMA 2.9 up to 40 GHz (2)

TYPE :
0 : Normally open
2 : Latching, global reset
6 : Latching, separated reset (3)

ACTUATOR VOLTAGE :
2 : 12Vdc
3 : 28Vdc

ACTUATOR TERMINAL :
0 : Solder pins
5 : Micro-D connector

OPTIONS :
0 : Without option
1 : Positive common
2 : Normally open with TTL driver (High level) (4) (5)
3 : With suppression diodes
4 : With suppression diodes and positive common

NUMBER OF POSITIONS :
4 : 4 positions
6 : 6 positions

(1) The “QLF” tradermark (quick lock formula®) standard applies to QMA and QN series and guarantees the full intermateability between suppliers using this tradermark.Using QLF certified connectors also guarantees the specified level of RF performances.
(2) Connector SMA2.9 is equivalent to “K Connector®”, registered trademark of Anritsu
(3) Available with “solder pins “ models only
(4) Polarity is not relevant to application for switches with TTL driver
(5) Suppression diodes are already included with TTL option

PICTURE

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GENERAL SPECIFICATIONS

Operating mode		**Normally open**		**Latching**	
Nominal operating voltage (Vdc) (across operating temperature range)		**12** (10.2 / 13)	**28** (21 / 30)	**12** (10.2 / 13)	**28** (21 / 30)
Coil resistance (+/-10%) (Ohms)		48	250	60	285
Nominal operating current at 23°C (mA)		250	110	200	98
Average power		See Power Rating Chart on final page			
TTL input	High Level	2.2 to 5.5 Volts			
	Low Level	0 to 0.8 V			
Switching time max (ms)		10			
Life min for	SMA / QMA	10 million cycles			
	SMA 2.9	2 million cycles			
Connectors		SMA – QMA – SMA 2.9			
Actuator terminals	**Solder Pins**	Solder pins double row connector for wrapping, soldering (250°C max / 30 sec), or connecting to 2.54 mm pitch female connector.			
	9 pin micro-D	9 pin micro-D receptacle M83513/07-A according to MIL-C-85513.			
Operating temperature range (°C)		-40 to +85			
Storage temperature range (°C)		-55 to +85			
Sine vibration (According to MIL STD 202, Method 204D, Cond. D)		10-2000 Hz, 20g operating			
Random vibration (According to MIL STD 202, Method 214A, Profile I, Cond. F)		50-2000 Hz, 20.71grms operating			
Shock (According to MIL STD 202, Method 213B, Cond. C)		100g / 6 ms, ½ sine operating			

RF PERFORMANCES

Connectors	**Frequency Range GHz**		**V.S.W.R. (max)**	**Insertion Loss (max) dB**	**Isolation (min) dB**	**Max. average power (W) (1)**	**Impedance Ohms**
SMA / QMA	DC – 6	DC – 3	1.20	0.20	80	250	50
		3 – 6	1.30	0.30	70	170	
SMA	DC – 26.5	DC – 3	1.20	0.20	80	250	50
		3 – 8	1.30	0.30	70	150	
		8 – 12.4	1.40	0.40	60	120	
		12.4 – 18	1.50	0.50	60	100	
		18 – 26.5	1.60	0.60	55	40	
SMA2.9	DC – 40	DC – 3	1.20	0.20	80	60	50
		3 – 8	1.30	0.30	70	35	
		8 – 12.4	1.40	0.40	60	30	
		12.4 – 18	1.50	0.50	60	25	
		18 – 26.5	1.70	0.70	55	15	
		26.5 – 40	2.20	1.10	45	5	

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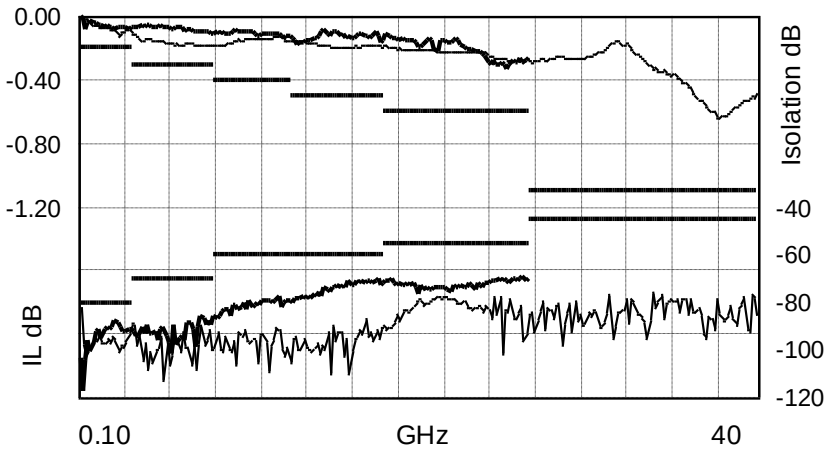
TYPICAL RF PERFORMANCES

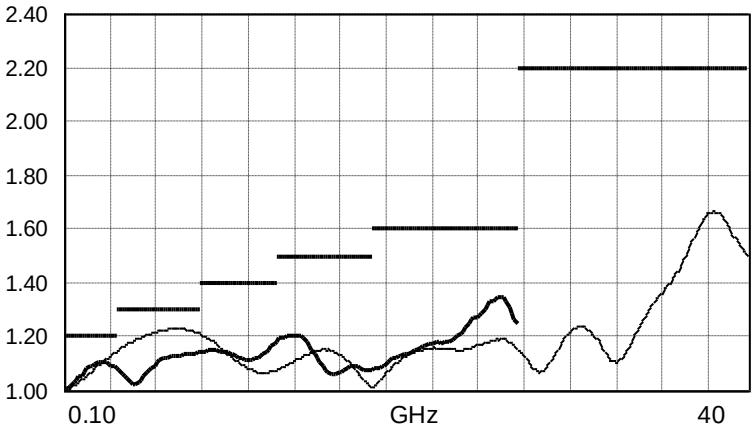
Insertion Loss and Isolation :

26.5GHz model with SMA connector
40GHz model with SMA2.9 connector



V.S.W.R :

26.5GHz model with SMA connector
40GHz model with SMA2.9 connector



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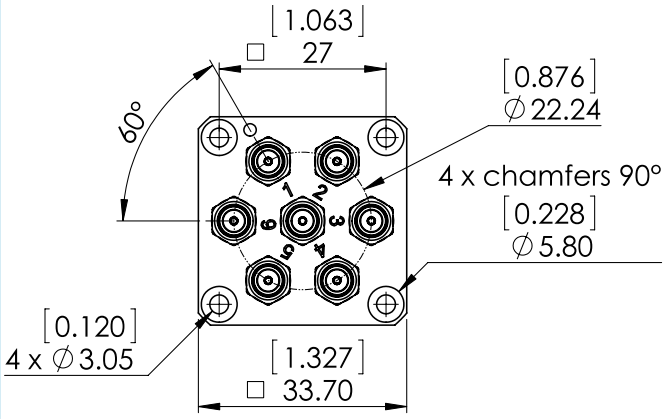
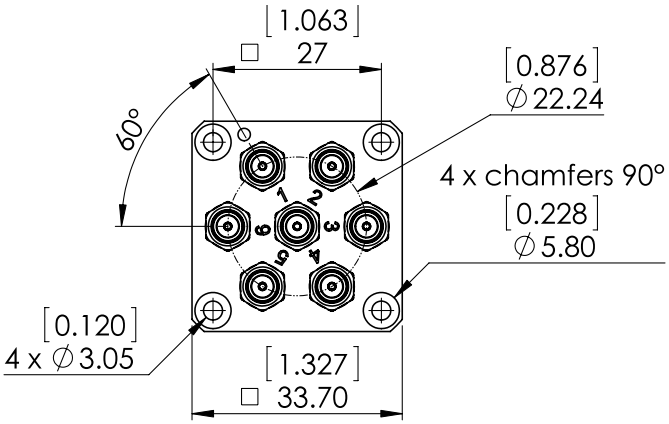
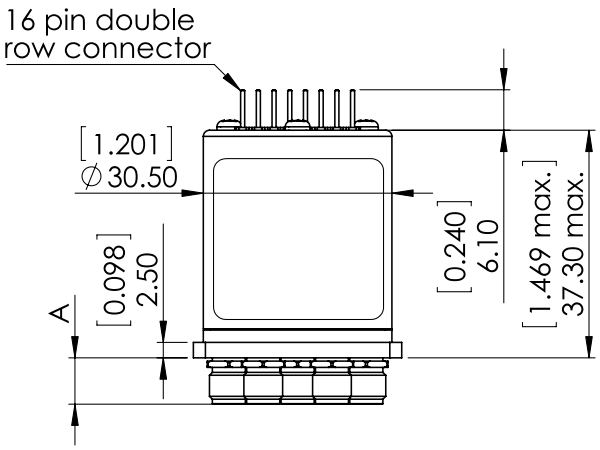
TYPICAL OUTLINE DRAWING

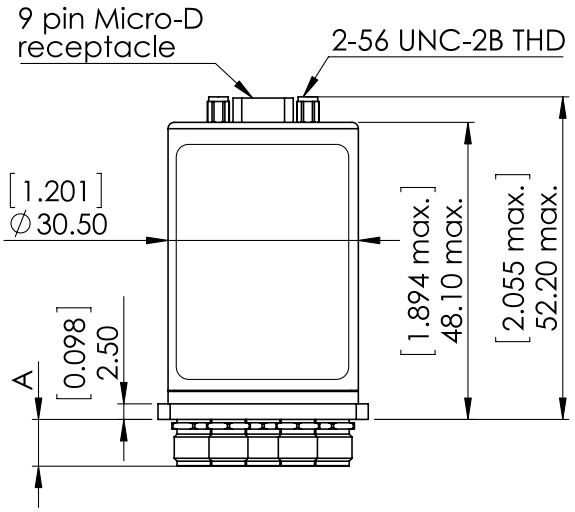
Solder pin model

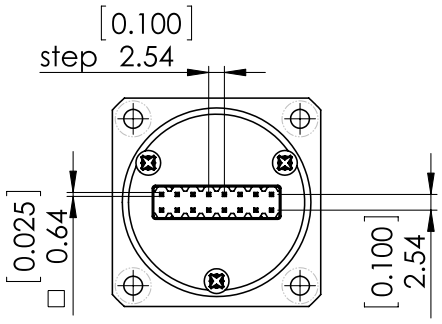


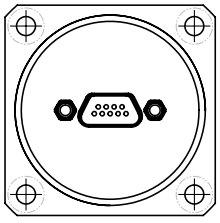
Micro-D model











All dimensions are in millimetres.[inches]
General tolerances: ±0.5 mm [0.02 in]

Connectors	SMA	SMA2.9	QMA
A max (mm / inches)	7.7 / 0.303	6.7 / 0.264	10.8 / 0.425

Ways 3 and 6 are not connected for SP4T

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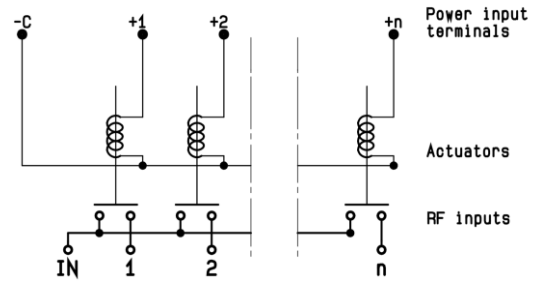
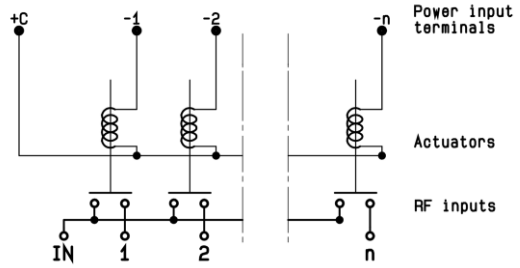
R591 SERIES ELECTRICAL SCHEMATICS

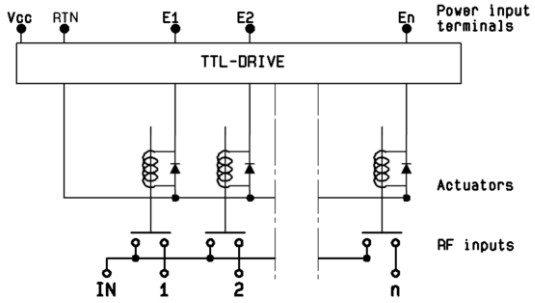
NORMALY OPEN WITHOUT OPTION
R591 -0- -0-



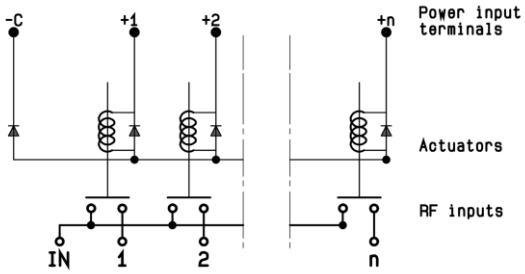
NORMALLY OPEN WITH POSITIVE COMMON
R591 -0- -1-



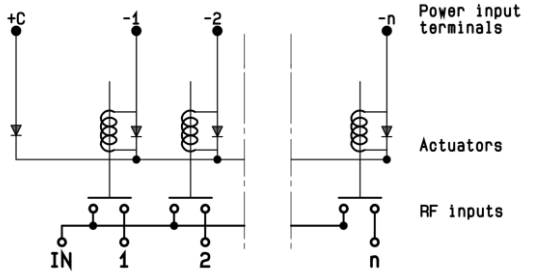
NORMALLY OPEN WITH TTL DRIVE
R591 -0- -2-



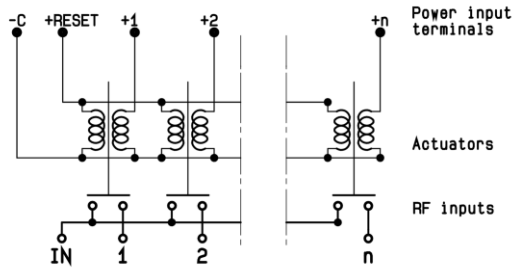
NORMALLY OPEN WITH SUPPRESSION DIODES
R591 -0- -3-



NORMALLY OPEN WITH POSITIVE COMMON AND SUPPRESSION DIODES
R591 -0- -4-



LATCHING GLOBAL RESET WITHOUT OPTION
R591 -2- -0-



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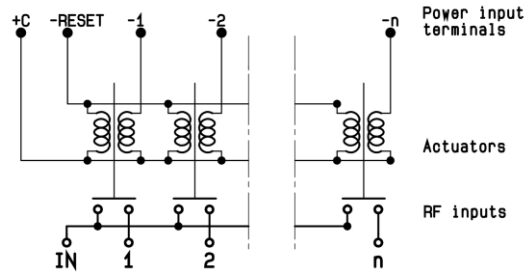
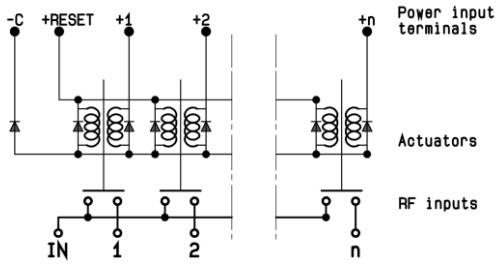
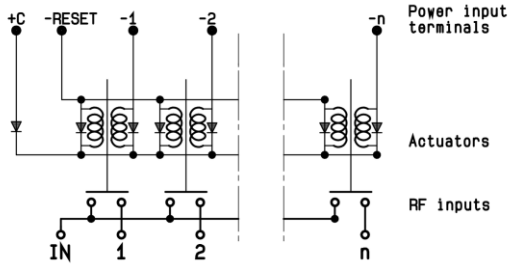
LATCHING GLOBAL RESET WITH POSITIVE COMMON
R591 -2- -1-



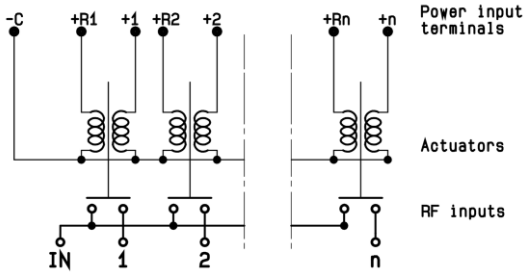
LATCHING GLOBAL RESET WITH SUPPRESSION DIODES
R591 -2- -3-



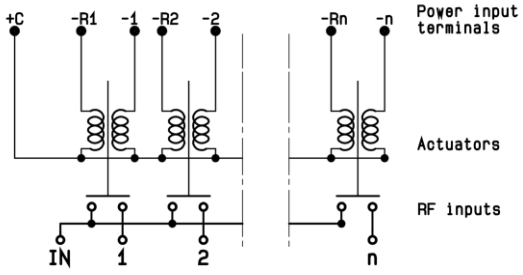
LATCHING GLOBAL RESET WITH POSITIVE COMMON AND SUPPRESSION DIODES
R591 -2- -4-



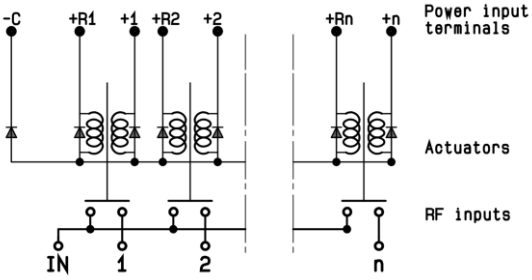
LATCHING SEPARATED RESET WITHOUT OPTION
R591 -6- -0-



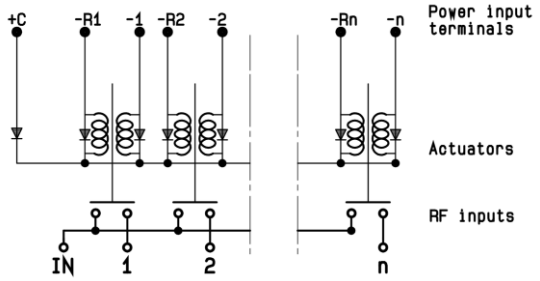
LATCHING SEPARATED RESET WITH POSITIVE COMMON
R591 -6- -1-



LATCHING SEPARATED RESET WITH SUPPRESSION DIODES
R591 -6- -3-



LATCHING SEPARATED RESET WITH POSITIVE COMMON AND SUPPRESSION DIODES
R591 -6- -4-



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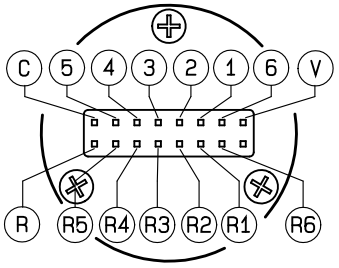
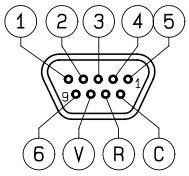
Pin identification

Solder pins (Top view) *



9 pin Micro-D (Top view)



*** : Compatible with 2.54 pitch double row 16 contacts female connector**

		PIN														
Type		**C**	**V**	**1**	**2**	**3**	**4**	**5**	**6**	**R**	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**
Normally open	**Negative common**	-C	NC	+1	+2	+3	+4	+5	+6	NC	NC	NC	NC	NC	NC	NC
	Positive common	+C	NC	-1	-2	-3	-4	-5	-6	NC	NC	NC	NC	NC	NC	NC
Latching	**Negative common**	-C	NC	+1	+2	+3	+4	+5	+6	+reset	NC	NC	NC	NC	NC	NC
global reset	**Positive common**	+C	NC	-1	-2	-3	-4	-5	-6	-reset	NC	NC	NC	NC	NC	NC
Latching	**Negative common**	-C	NC	+1	+2	+3	+4	+5	+6	NC	+res.1	+res.2	+res.3	+res.4	+res.5	+res.6
individual reset	**Positive common**	+C	NC	-1	-2	-3	-4	-5	-6	NC	-res.1	-res.2	-res.3	-res.4	-res.5	-res.6
Normally open with TTL drive		RTN	Vcc	E1	E2	E3	E4	E5	E6	NC	NC	NC	NC	NC	NC	NC

NC stand for "Not Connected"
Pin R : Reset all paths
Ways 3 and 6 are not connected for SP4T

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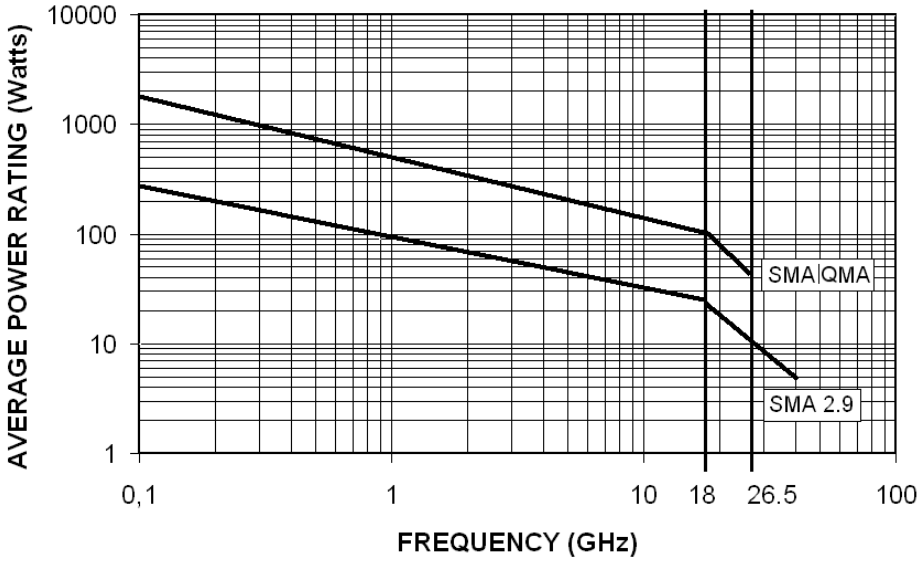
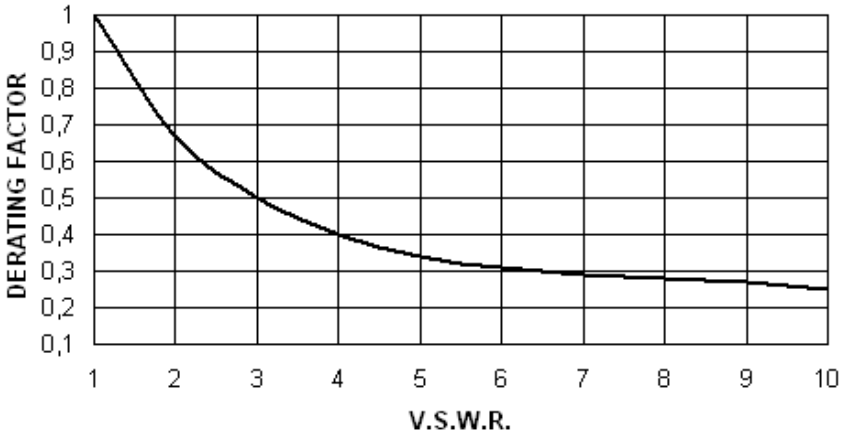
POWER RATING CHART

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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