

34980A RF and microwave switch modules

The 34980A offers a variety of RF and microwave switch modules—RF multiplexers, SPDT switching from DC to 26.5 GHz, or a switch/ attenuator driver module that allows you to control switches or attenuators external to the 34980A mainframe.

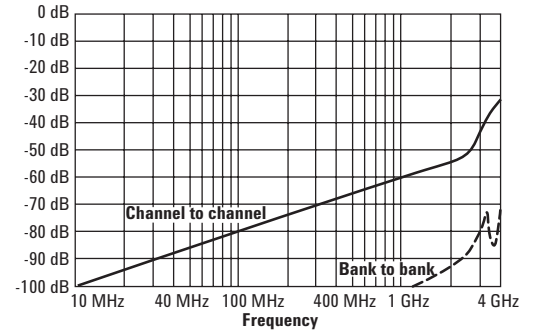
34941A/42A—from DC to 3 GHz The RF switch modules can be used to switch signals from DC to 3 GHz and above. This can be useful for switching signals between oscilloscopes, spectrum analyzers, network analyzers, and other RF test equipment.

Choose from the following features:

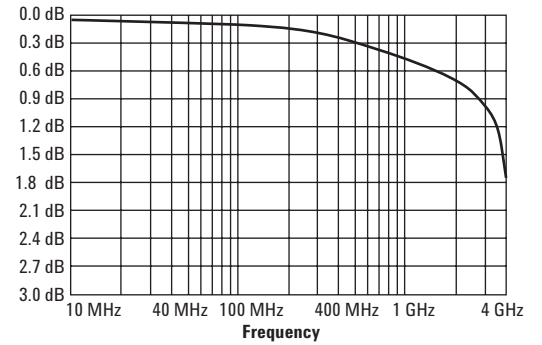
- 50- or 75-ohm Quad 4-channel multiplexers
- DC to 3 GHz
- 30 V, 0.5 A, 10 W

The 34941A and 34942A are configured as four independent 1x4 RF multiplexers on a single module. Multiple banks can be connected together to create a larger multiplexer. To prevent ground loops, individual multiplexers are isolated from each other and from the mainframe's chassis. However, the multiplexer channels can be chassis grounded with a simple change. Both 50-ohm and 75-ohm versions are available.

34941A typical initial crosstalk



34941A typical initial insertion loss



34941A typical initial VSWR

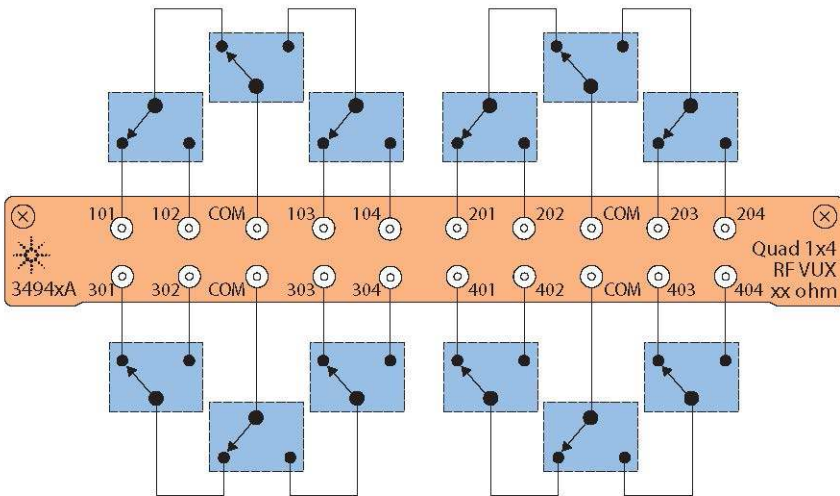
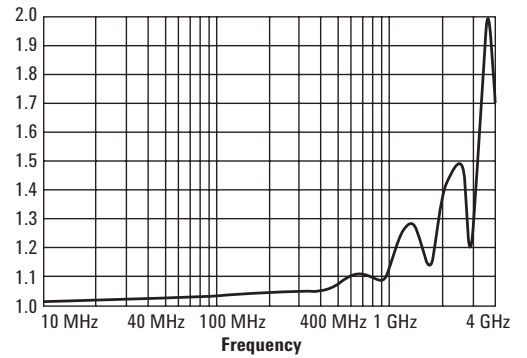


Figure 10. 34941A Quad 1x4 50 ohm 3 GHz multiplexer

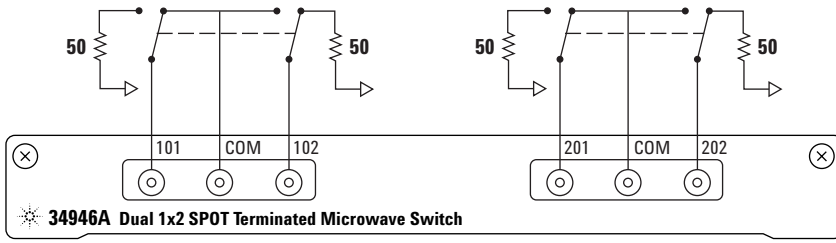


Figure 11. 34946A dual 1x2 SPDT terminated microwave switch

34946A/47A—from DC to 26.5 GHz

For applications where you need only a few high-frequency switches, the 34946A and 34947A offer single-pole, double-throw switches in either 4GHz, 20GHz or 26.5GHz options. These modules internally mount two or three independent Keysight N1810 series coaxial switches. These switches are well known for their excellent insertion loss, isolation and VSWR specifications.

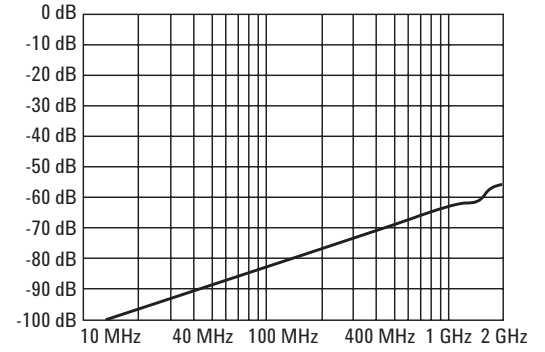
Switch read back capabilities allow you to query the position of the switch. You can choose higher density with the unterminated switches, or select the terminated switches to maintain impedance match.

34946A/47A option 001

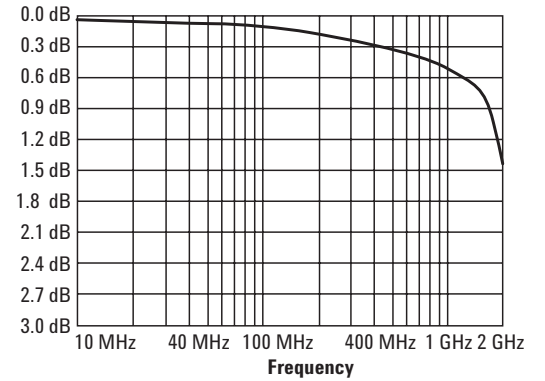
These modules can also be ordered without switches installed. This give you the capability to install your own N1810 series switches or use the module to control the N1810 Series switches outside the mainframe.

N1810 minimum required switch options		
Coil Voltage	option 124	24 Vdc coil
DC Connector	option 201	“D” subminiature 9 pin female
Drive	option 402	position indicators

34942A typical initial crosstalk



34942A typical initial insertion loss



34942A typical initial VSWR

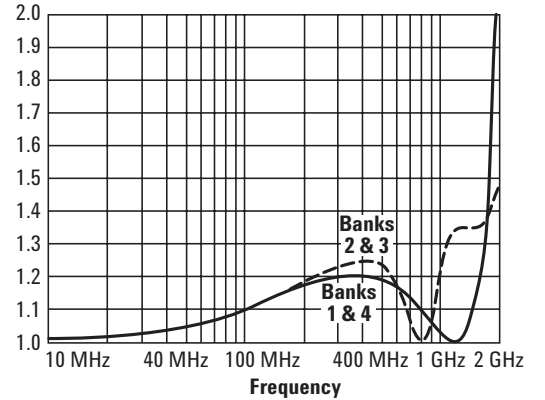


Table 6. RF and microwave selection table—specifications and characteristics

	DC to 3 GHz		DC to 26.5 GHz ^[3]	
	34941A	34942A	34946A	34947A
Channels	quad 1x4	quad 1x4	2 SPDT	3 SPDT
Switch type	50 Ω unterminated, latching relays	75 Ω unterminated, latching relays	50 Ω terminated	50 Ω unterminated
RF characteristics				
Frequency range ^[2]	DC to 3 GHz	DC to 1.5 GHz	DC to 4 GHz, 20 GHz or 26.5 GHz	DC to 4 GHz, 20 GHz or 26.5 GHz
Insertion loss ^[2] (< 40 C/ 80% RH)			DC to 4 GHz < 0.42 dB, @ 20GHz < 0.69 dB, @ 26.5GHz < 0.8 dB	DC to 4 GHz < 0.42 dB, @ 20 GHz < 0.69 dB @ 26.5GHz < 0.8 dB
100 MHz	0.15 dB	0.15 dB		
1 GHz	0.60 dB	0.60 dB		
3 GHz	1.40 dB	N/A		
VSWR			DC to 4 GHz < 1.15, @ 20 GHz < 1.30, @ 26.5GHz < 1.6	DC to 4 GHz < 1.15, @ 20 GHz < 1.30, @ 26.5GHz < 1.6
100 MHz	1.03	1.15		
1 GHz	1.25	1.35		
3 GHz	1.55	N/A		
Isolation (dB) ^[2]	Contact factory	Contact factory	DC to 4 GHz > 85 dB, @ 20 GHz > 67 dB, @ 26.5GHz > 60 dB	DC to 4 GHz > 85 dB, @ 20 GHz > 67 dB, @ 26.5GHz > 60 dB
100 MHz	80 dB	80 dB		
1 GHz	58 dB	60 dB		
3 GHz	40 dB	N/A		
Spurious noise below 1.3 GHz	-140 dBm	-140 dBm	80 dB	80 dB
Risetime	< 80 ps	< 160 ps	N/A	N/A
Signal delay	< 1 ns	< 1 ns	N/A	N/A
Capacitance	< 30 pF	< 30 pf	N/A	N/A
Switching characteristics				
Max volts ^[1]	30 V	30 V	7 VDC	7 VDC
Max current	0.5 A	0.5 A	N/A	N/A
Max power (W)	10 W ^[5]	10 W ^[5]	1 W @ 7 VDC, 50 W peak ^[4]	1 W @ 7 VDC, 50 W peak ^[4]
Offset voltage	10 μV	10 μV	N/A	N/A
Initial channel resistance	1 Ω	1 Ω	N/A	N/A
Volt-Hertz limit	2 x 10 ¹⁰	2 x 10 ¹⁰		
General characteristics				
Relay life	300,000 at 30 V/10 mA load; 100,000 at 10 W load RF SAmegas	300,000 at 30 V/10 mA load 100,000 at 10 W load RF SAmegas	> 5 M cycles, 1 M w/drive 28-32 VDC	> 5 M cycles, 1 M w/drive 28-32 VDC
Open/close time	18 ms/18 ms	18 ms/18 ms	< 15 ms/15 ms	< 15 ms/15 ms
Connector type	Female SMA	Mini 75 Ω SMB	Female SMA	Female SMA
Coil voltage	N/A	N/A	24 VDC	24 VDC
Analog bus backplane connection	No	No	No	No

[1] Channel-to-earth

[2] 50 Ω source, 50 Ω load (75 Ω for 34942A)

[3] For more detailed switch specifications, see the Keysight N1810TL, N1811TL, N1812UL for 34946A and N1810UL for the 34947A.

[4] 10 usec maximum duration

[5] Max power is 1 W between 30 MHz and 1 GHz for CISPR 11 compliance