

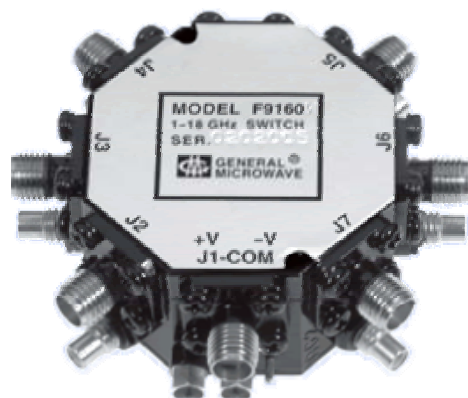


Series 91 and 92 Miniature Broadband SP6T Switches

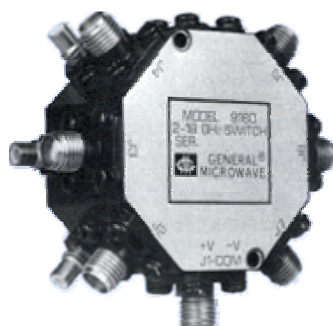
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Application Notes for [RF Switches](#)

- Frequency range (Series 91): 1 to 18 GHz
- Frequency range (Series 92): 0.2 to 4 GHz
- Reflective and Non-reflective models
- Low VSWR and insertion loss
- Isolation: up to 60 dB
- Miniature size, light weight



F9160
(WITH INTEGRATED DRIVER)



9160-500
(DRIVERLESS)

MODELS 9160-500 AND 9260-500

These switches provide high-performance characteristics over a multi-octave frequency range. The Model 9160-500 covers the 1 to 18 GHz frequency range while the Model 9260-500 covers the 0.2 to 4 GHz range. Their description and operation are the same as that for the Models 9120-500 and 9220-500 SP2T switches.

MODELS 9160T-500, 9160W-500, AND 9260T-500

These switches are non-reflective versions of the switches described above.

SERIES F91 AND F92

The Series F91 and F92 switches are the same as the corresponding Series 91 and 92 models, except the units are equipped with integrated drivers.

SERIES G91 AND G92

These switches are the same as the Series G91 and G92 SP2T switches except for the number of ports.

MODEL NO. ⁽¹⁾	CHARACTERISTIC	FREQUENCY (GHz)					
		0.2-1	1-2	2-4	4-8	8-12.4	12.4-18
9160-500* F9160	Min. Isolation (dB)	-	60	60	55	50	50
	Max. Insertion Loss (dB)	-	1.6	1.6	1.8	2.2	3.4
	Max. VSWR (ON)	-	1.6	1.6	1.9	2.0	2.2
G9160*	Min. Isolation (dB)	-	60	60	60	60	50
	Max. Insertion Loss (dB)	-	2.2	2.2	2.6	3.2	3.5
	Max. VSWR (ON)	-	1.6	1.6	2.0	2.2	2.3
9260-500* F9260*	Min. Isolation (dB)	60	60	60	-	-	-
	Max. Insertion Loss (dB)	1.5	1.5	1.5	-	-	-
	Max. VSWR (ON)	1.6	1.6	1.6	-	-	-
G9260*	Min. Isolation (dB)	60	60	60	-	-	-
	Max. Insertion Loss (dB)	2.2	2.2	2.2	-	-	-
	Max. VSWR (ON)	1.6	1.6	1.6	-	-	-
9160T-500* F9160T* G9160T*	Min. Isolation (dB)	-	50	50	45	40	40
	Max. Insertion Loss (dB)	-	1.5	1.5	2.2	2.7	3.2
	Max. VSWR (ON or OFF)	-	1.6	1.6	1.8	2.0	2.2
9260T-500* F9260T* G9260T*	Min. Isolation (dB)	60	60	50	-	-	-
	Max. Insertion Loss (dB)	1.5	1.5	1.5	-	-	-
	Max. VSWR (ON or OFF)	1.5	1.5	1.6	-	-	-

9160W-500*	Min. Isolation (dB)	-	60	60	60	60	55
F9160W	Max. Insertion Loss (dB)	-	2.2	2.2	2.6	3.2	3.5
G9160W*	Max. VSWR (ON or OFF)	-	1.7	1.7	2.0	2.2	2.3

*Special-order product. Consult factory before ordering.

PERFORMANCE CHARACTERISTICS

Power Handling Capability

Without Performance Degradation

Units without "T" or "W" suffix: 1W cw or peak

Units with "T" or "W" suffix

Input to any "OFF" port: 100 mW cw or peak

Input to any "ON" port: 1W cw or peak

Input to common port: 1W cw or peak

Survival Power

Units without "T" or "W" suffix: 1W average, 75W peak (1µsec max. pulse width)

Units with "T" or "W" suffix:

Input to any "OFF" port: 1W average, 10W peak (1µsec max. pulse width)

Input to any "ON" port: 1W average, 75W peak (1µsec max. pulse width)

Input to common port: 1W average, 75W peak (1µsec max. pulse width)

Switching Time⁽²⁾

SERIES 91/F91/G91

ON time..... 250 nsec max.

OFF time..... 250 nsec max.

With Option C37..... 100 nsec max.

SERIES 91/F91/G91

ON time..... 500 nsec max.

OFF time..... 500 nsec max.

Power Supply Requirements

SERIES 91/92/F91/F92

Driverless Units

Bias current required at each port for rated isolation and insertion loss.

Port OFF..... +50 mA

Port ON..... -50 mA

Units With Integrated Drivers

(For one port ON)..... +5V ±5%, 315 mA
-12 to -15V, 100 mA

SERIES G91/G92

(For one port ON)..... +5V ±5%, 150 mA
+15V ±5%, 70 mA

Control Characteristics

SERIES 91/92/F91/F92

Units With Integrated Drivers

Control Logic..... Logic "0" (-0.3 to +0.8V) for port ON and logic "1" (+2.0 to +5.0V) for port OFF.

Control Input

Impedance..... TTL, low power Schottky, one unit load. (A unit load is 0.8 mA sink current and 40 µA source current.)

SERIES G91/G92

Control

Logic..... Logic "0" (-0.3 to +0.8V) for port ON and logic "1" (+2.0 to +5.0V) for port OFF.

Control Input

Impedance..... Schottky TTL, one unit load. (A unit load is 2.0 mA sink current and 50 µA source current.)

ENVIRONMENTAL RATINGS

Temperature Range

Units With Integrated Drivers

Operating..... -54°C to +110°C

Non-Operating..... -65°C to +125°C

Driverless Units Operating and

Non-Operating..... -65°C to +125°C

Humidity..... MIL-STD-202F, Method 103B, Cond. B (96 hrs. at 95%)

Shock..... MIL-STD-202F, Method 213B, Cond. B (75G, 6 msec)

Vibration..... MIL-STD-202F, Method 204D, Cond. B (.06" double amplitude or 15G, whichever is less)

Altitude..... MIL-STD-202F, Method 105C, Cond. B (50,000 ft.)

Temp. Cycling..... MIL-STD-202F, Method 107D, Cond. A, 5 cycles

AVAILABLE OPTIONS

Option No.	Description
3	SMA female bias/control connectors
7	SMA male RF connectors
9	Inverse control logic; logic "0" for port OFF and logic "1" for port ON (Not applicable to Series 91/92)
33	EMI filter solder-type bias/control terminals
41*	Internal video filter, common port only
42*	Internal video filter, output ports only
43*	Internal video filter, all ports
64A	SMB male bias/control connectors
C37**	100 nsec. switching time

*Not applicable to Series 92/F92/G92. [See Video Filter Options on Switches](#)

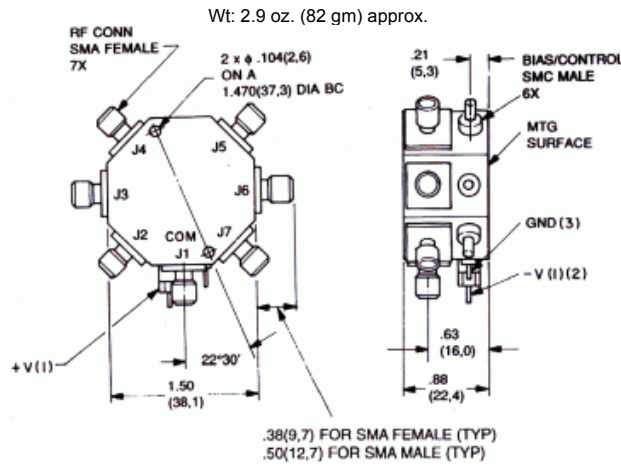
**Not applicable to series 92/F92/C92. Minimum order buy of 100 switches

(1) Models prefixed with "F" or "G" are equipped with integrated TTL-compatible drivers; models without the "F" or "G" prefix are current-controlled units and are furnished without drivers; models suffixed with "T" or "W" are non-reflective except a high VSWR will be present at the common port if all other ports are OFF.

(2) For driverless units, shaped current pulses must be provided by the user.

DIMENSIONS AND WEIGHTS

MODELS 91/92/F91/F92/G91/G92



- (1) Used only on units with integrated drivers
- (2) +15V for G91/G92
- (3) Not used on driverless units except with option 33

Dimensional Tolerances, unless otherwise indicated: .XX ±.02; .XXX ±.005

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