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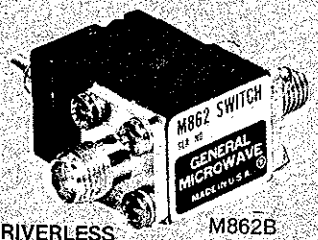
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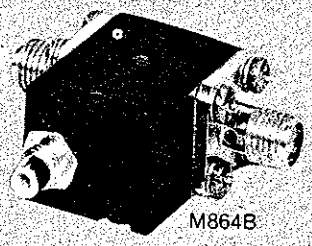
Series 86
Ultra-Broadband SPST Switches

- **Frequency range: 0.1 to 18 GHz**
- **Low VSWR and insertion loss**
- **Up to 80 dB isolation**
- **As fast as 10 nsec rise and fall times**
- **Small size, light weight**

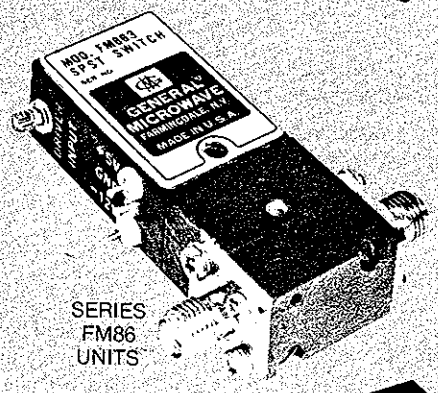


DRIVERLESS UNITS

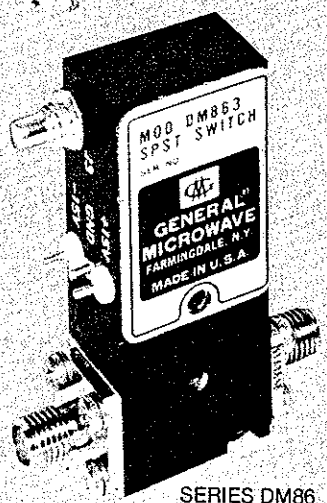
M862B



M864B



SERIES FM86 UNITS

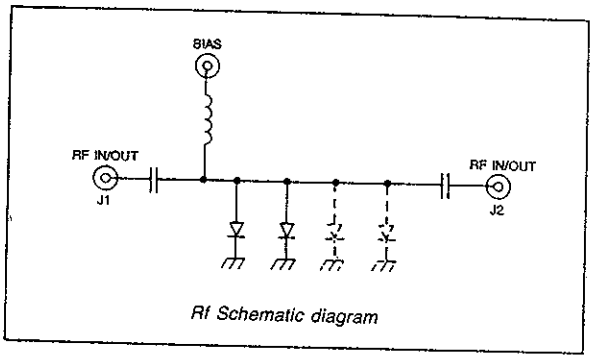


UNITS WITH INTEGRATED DRIVERS

SERIES DM86 UNITS

SERIES M86

The Series M86 is a diverse group of high performance broadband SPST switches. Included are two low insertion loss models and four high speed models, all of which operate up to 18 GHz. Each model features an integrated circuit assembly of up to four PIN diodes mounted in a microstrip transmission line as well as a resistive bias line that contributes to the broadband low-loss performance. The circuit configuration is shown below. By applying positive current to the bias terminal, the diodes are biased to low resistances and the switch is OFF. With zero or negative voltage at the bias terminal, the diodes are biased to high resistances and the switch is ON.



Rf Schematic diagram

Low Insertion Loss Models

Models M862B and M864B operate over the frequency range from 0.1 to 18 GHz. They exhibit nominal isolation characteristics of 45 and 80 dB at 18 GHz, respectively, with maximum rise and fall times of 50 nanoseconds.

High Speed Models

For higher speed requirements, Models M862BH and M864BH are available. These operate from 0.5 to 18 GHz and feature maximum rise and fall times of 10 nanoseconds. Optional Models M862BH-25 and M864BH-25 operate from 0.1 to 18 GHz with maximum rise and fall times of 20 nanoseconds.

SERIES DM86 AND FM86

The Series DM86 and FM86 switches are the same as the corresponding Series M86 models except the units are equipped with integrated drivers. DM86 switches are powered by ± 15 volt supplies; FM86 units are powered by +5 and −12 to −15 volt supplies. The proper current required to switch the unit ON or OFF is provided by the driver, which is controlled by an external logic signal.

Series 86 Specifications

MODEL NO.[3]		CHARACTERISTIC	FREQUENCY (GHz)					
			0.1 to 1.0	1.0 to 2.0	2.0 to 4.0	4.0 to 8.0	8.0 to 12.4	12.4 to 18.0
LOW INSERTION LOSS MODELS	M862B DM862C FM862C	Min Isolation (dB) Max Insertion Loss (dB) Max VSWR (ON)	30 1.0 1.3	36 1.0 1.3	40 1.0 1.3	45 1.0 1.6	45 1.5 1.75	45 2.0 1.75
	M864B DM864C FM864C	Min Isolation (dB) Max Insertion Loss (dB) Max VSWR (ON)	37 1.0 1.4	60 1.0 1.4	74 1.0 1.4	80 1.3 1.7	80 1.8 1.75	80 2.5 2.2
HIGH SPEED MODELS[1]	M862BH DM862CH FM862CH	Min Isolation (dB) Max Insertion Loss (dB) Max VSWR (ON)	30 1.0 1.3	36 1.0 1.3	40 1.0 1.5	45 1.0 1.7	45 1.5 2.0	45 2.3 2.2
	M864BH DM864CH FM864CH	Min Isolation (dB) Max Insertion Loss (dB) Max VSWR (ON)	37 1.0 1.4	60 1.0 1.4	74 1.0 1.5	80 1.3 1.7	80 1.8 2.0	80 2.8 2.2

PERFORMANCE CHARACTERISTICS

Switching Characteristics[2]

	High Speed Models	Low Loss Models
Rise Time	10 nsec max.	20 nsec max.
Fall Time	10 nsec max.	20 nsec max.
ON Time[5]	30 nsec max.	50 nsec max.
OFF Time[5]	30 nsec max.	40 nsec max.
Repetition Rate[5]	20 MHz max.	10 MHz max.

Power Handling Capability

Without Performance Degradation

Without Integrated Drivers . . . . . 1W cw or peak[4]

With Integrated Drivers . . . . . 1W cw or peak

Survival Power . . . . . 2W average, 75W peak (1 μsec max pulse width)

(1) *Models shown operate from 0.5 to 18 GHz. The addition of Option 25 to these models permits operation from 0.1 to 18 GHz, with max. rise and fall times of 20 nanoseconds.*

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

(3) *Models prefixed with "DM" or "FM" are equipped with integrated TTL-compatible drivers; models prefixed with "M" only are current-controlled units and are furnished without drivers.*

(4) *5W cw or peak with −20V back bias.*

(5) *On and Off time and repetition rate specifications are only applicable to Series DM86 and FM86 units.*

Power Supply Requirements

Driverless Units

For rated isolation: +35 mA
For rated insertion loss: −10V

Units With Integrated Drivers

All DM86 Units: +15V ±2%, 70 mA
−15V ±5%, 20 mA
All FM86 Units: +5VDC ±2%, 65 mA
−12 to −15V, 20 mA

Control Characteristics

Units With Integrated Drivers

Control Input Impedance . . . . . TTL, two-unit load. (A unit load is 1.6 mA sink current and 40 µA source current.)

Control Logic
Series DM86 . . . . . Logic "0" (-0.3 to +0.7V) for switch OFF and logic "1" (+2.5 to +5.0V) for switch ON.
Series FM86 . . . . . Logic "0" (-0.3 to +0.7V) for switch ON and logic "1" (+2.5 to +5.0V) for switch OFF.

ENVIRONMENTAL RATINGS

Operating Temperature Range:
Series M86 . . . . . −65°C to +125°C
Series DM86 . . . . . −65°C to +85°C
Series FM86 . . . . . −65°C to +110°C

ENVIRONMENTAL RATINGS (Con't)

Non-Operating Temperature Range: . . . . . −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.)

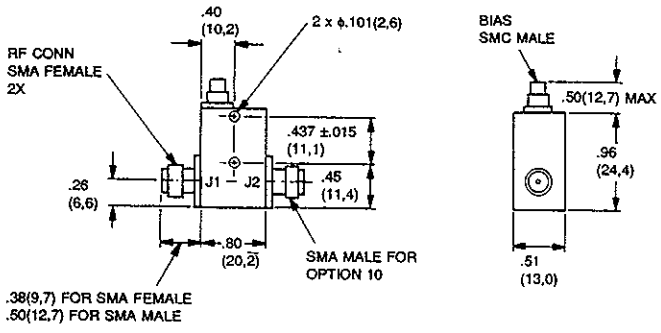
Temp. Cycling . . . . . MIL-STD-202F, Method 107D, Cond. A, 5 cycles

AVAILABLE OPTIONS

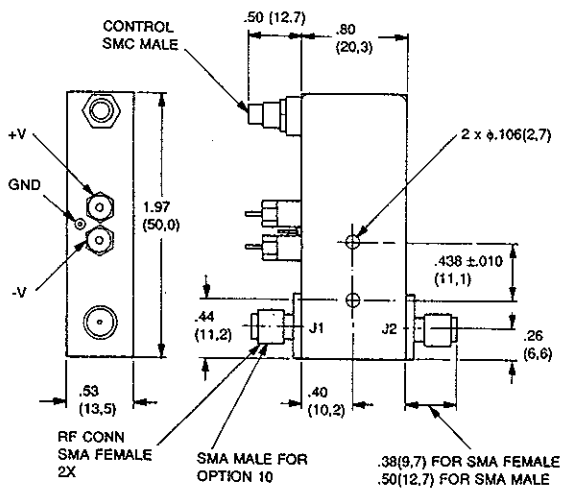
Option No.	Description
3	SMA female bias/control connector
7	Two SMA male rf connectors
9	Inverse control logic (Not applicable to Series M86)
10	One SMA male and one SMA female rf connector
20*	One unit load control input impedance
25	0.1 to 18 GHz range, 20 nsec rise and fall times (available only on high-speed models)
33	EMI filter solder-type bias/control terminal
64A	SMB male bias/control connector

**Not applicable to Series M86; standard in Series FM86 (need not be specified when ordering); all Series DM86 units are furnished with this option unless otherwise specified by customer. Other options, such as 50 ohms to ground, are available on special order.*

DIMENSIONS AND WEIGHTS



SERIES M86
Wt: 1 oz. (28 gm) approx.



SERIES DM86 AND FM86
Wt: 2 oz. (57 gm) approx.

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

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