



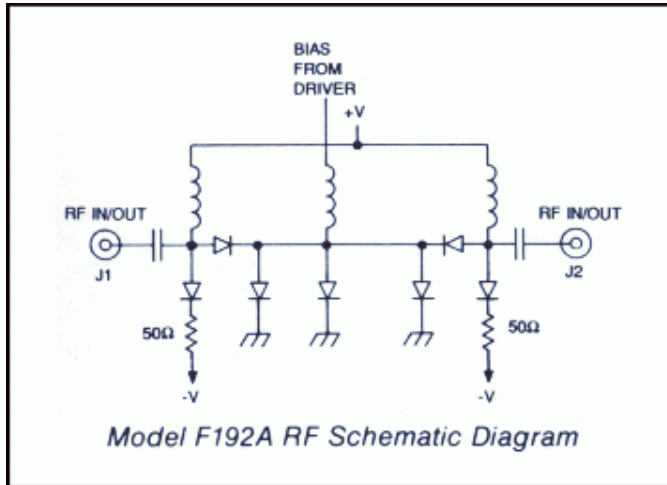
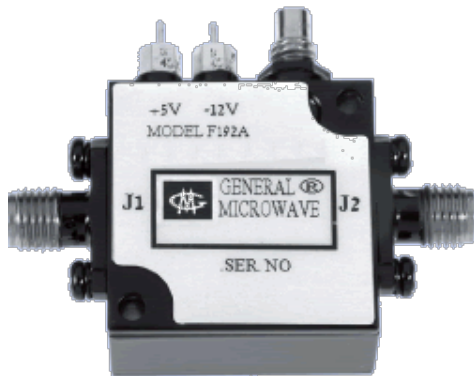
# Model F192A Non-Reflective Ultra-Broadband High-Speed Pulse Modulator

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Applicaton Notes for [Microwave Attenuators](#)

- High speed
- 0.2 to 18 GHz frequency range
- 80 dB isolation
- Low VSWR and insertion loss
- Small size, light weight

The Model F192A is a high-speed non-relective PIN diode pulse modulator with integrated driver. Operating over the instantaneous frequency range from 0.2 to 18 GHz, it provides a minimum isolation of 80 dB from 0.5 to 18 GHz, and 70 dB below 0.5 GHz. The RF design consists of an arrangement of shunt and series diodes in a microstrip integrated circuit transmission line as shown in the schematic diagram below.



The currents required to switch the unit ON or OFF and simultaneously maintain a bilateral 50-ohm impedance match in both states are provided by the integrated driver, which is controlled by an external logic signal.

## PERFORMANCE CHARACTERISTICS

| CHARACTERISTIC          | FREQUENCY (GHz) |            |            |             |              |
|-------------------------|-----------------|------------|------------|-------------|--------------|
|                         | 0.2 to 0.5      | 0.5 to 2.0 | 2.0 to 8.0 | 8.0 to 12.4 | 12.4 to 18.0 |
| Min Isolation (dB)      | 70              | 80         | 80         | 80          | 80           |
| Max Insertion Loss (dB) | 2.0             | 2.0        | 2.5        | 3.0         | 3.5          |
| VSWR (ON and OFF)       | 1.5             | 1.5        | 1.75       | 2.0         | 2.0          |

### Switching Speed

|                |               |
|----------------|---------------|
| Rise Time..... | 10 nsec. max. |
| Fall Time..... | 10 nsec. max. |
| ON Time.....   | 30 nsec. max. |
| OFF Time.....  | 15 nsec max.  |

### Power Handling Capability

|                                      |  |
|--------------------------------------|--|
| Without Performance Degradation..... | 500 mW cw or peak                              |
| Survival Power.....                  | 1W average, 10W peak (1 µsec max. pulse width) |

### Power Supply Requirements

|                  |
|------------------|
| +5V ± 5%, 90 mA  |
| -12V ± 5%, 75 mA |

### Control Characteristics

|                              |  |
|------------------------------|--|
| Control Input Impedance..... | TTL, advanced Schottky, one-unit load. (A unit load is 0.6 mA sink current and 20µA source current). |
| Control Logic.....           | Logic "0" (-0.3 to +0.8V) for switch ON and logic "1" (+2.0 to +5.0V) for switch OFF                 |

## ENVIRONMENTAL RATINGS

### Operating Temperature

|            |                  |
|------------|------------------|
| Range..... | -65°C to + 110°C |
|------------|------------------|

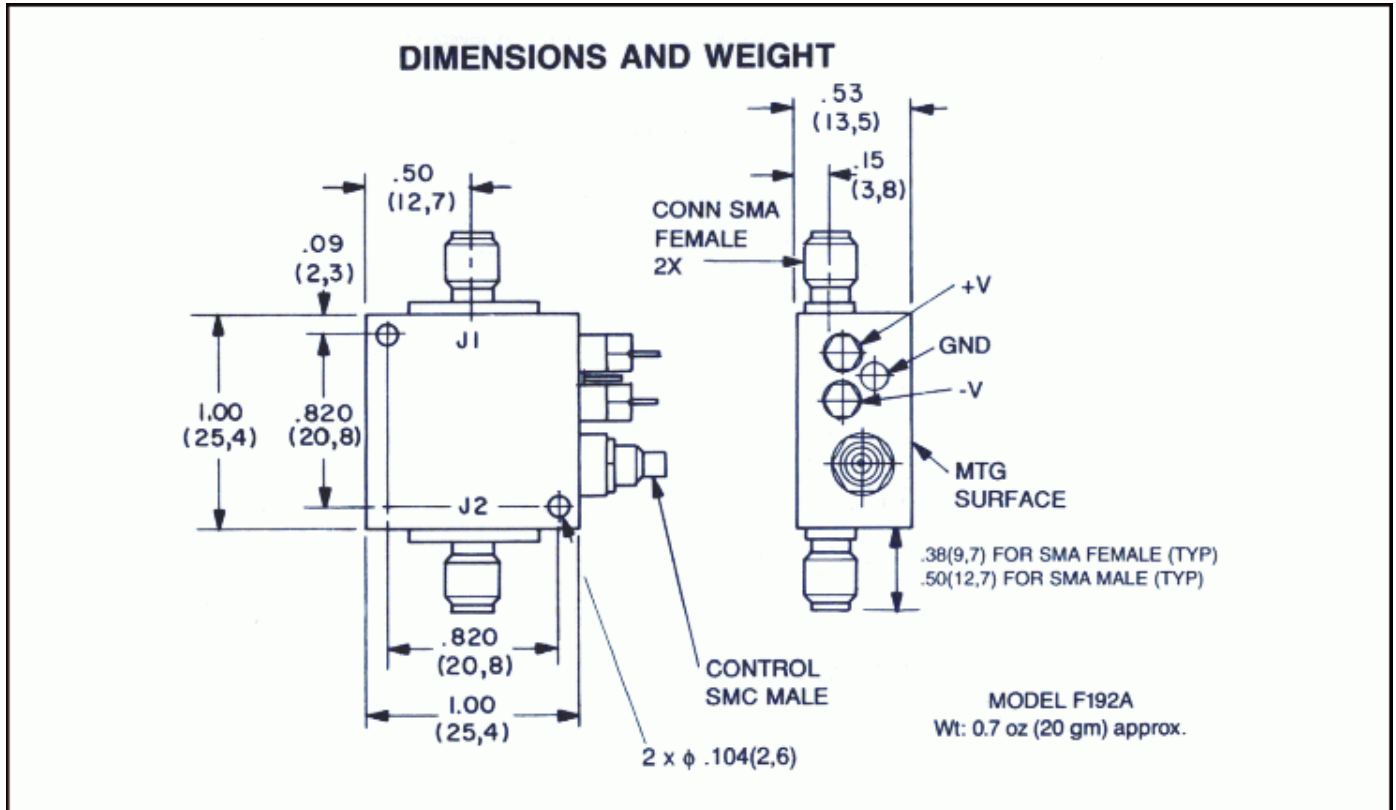
### Non-Operating Temperature

## AVAILABLE OPTIONS

[See Application Notes](#)

| Option No. | Description                  |
|------------|------------------------------|
| 3          | SMA female control connector |

|                            |  |            |   |
|----------------------------|--|------------|---|
| <b>Range</b> .....         | -65°C to + 125°C   | <b>7</b>   | Two SMA male rf connectors  |
| <b>Humidity</b> .....      | MIL-STD-202F, Method 103B,<br>Cond. B (96 hrs. at 95%)                                     | <b>9</b>   | Inverse control logic; logic "1" for<br>switch ON and logic "0" for switch<br>OFF |
| <b>Shock</b> .....         | MIL-STD-202F, Method 213B,<br>Cond. B (75G, 6 msec)  | <b>10</b>  | One SMA male (J1) and one SMA<br>female (J2) rf connector                         |
| <b>Vibration</b> .....     | MIL-STD-202F, Method 204D,<br>Cond. B (.06" double amplitude or<br>15G, whichever is less) | <b>33</b>  | EMI filter solder-type control<br>terminal  |
| <b>Altitude</b> .....      | MIL-STD-202F, Method 105C,<br>Cond. B (50,000 ft.)   | <b>48</b>  | +5, -15V operation  |
| <b>Temp. Cycling</b> ..... | MIL-STD-202F, Method 107D,<br>Cond. A, 5 cycles  | <b>64A</b> | SMB male control connector  |



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



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