Model 3250A Ultra-Broadband 6-Bit Digital PIN Diode Attenuator

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Applicaton Notes for Microwave Attenuators

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The Model 3250A digitally programmable attenuator provides excellent performance characteristics over the frequency range of 0.2 to 18 GHz. Attenuation levels up to 60 dB are programmable in increments of 1 dB.

The unit is an integrated assembly of a dual T-pad PIN diode attenuator and a driver consisting of a D/A and an I/V Converter. See figures 1 and 2.

The Model 3250A operates as a bilaterally-matched device at all attenuation levels. It is supplied in a compact rugged package.

- **Frequency range: 0.2 to 18 GHz**
- **Attenuation range: Up to 60 dB**
- **6 Bit Binary or BCD programming**
- **Absorptive**
- **Guaranteed Monotonicity**

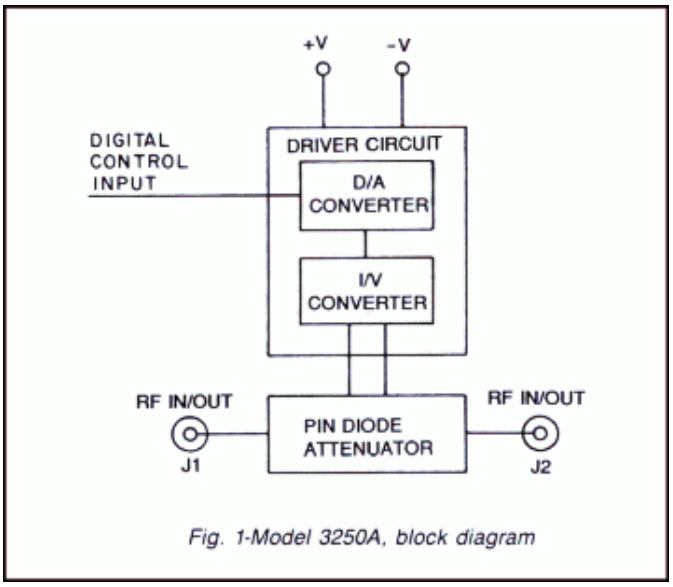
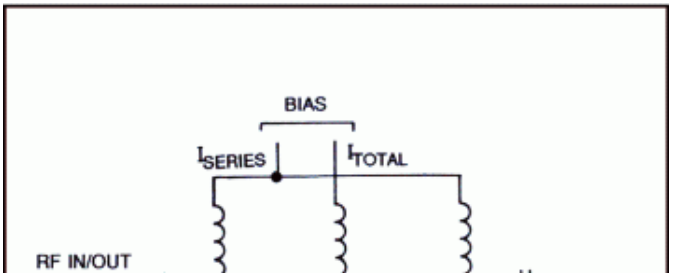


Fig. 1-Model 3250A, block diagram



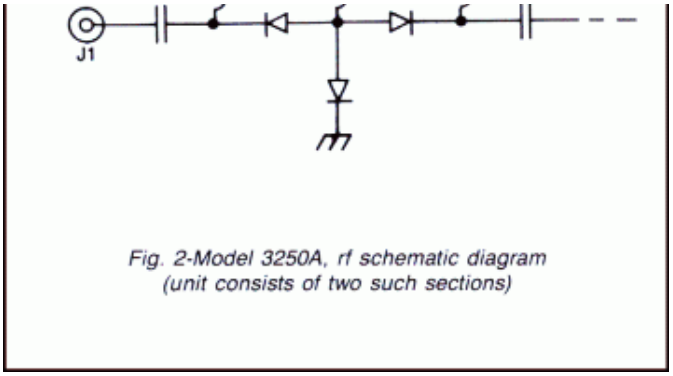


Fig. 2-Model 3250A, rf schematic diagram (unit consists of two such sections)

PERFORMANCE CHARACTERISTICS

Frequency Range.....	0.2 to 18 GHz
Mean Attenuation Range	
0.2 to 18 GHz.....	60 dB
Insertion Loss (max.)	
0.2 to 8 GHz.....	3.5 dB
>8 to 12.4 GHz.....	4.0 dB
>12.4 to 18 GHz.....	5.0 dB
VSWR (max.)	
0.2 to 8 GHz.....	1.75
>8 to 18 GHz.....	2.0
Accuracy of Attenuation	
0 to 30 dB.....	± 0.5 dB
>30 to 50 dB.....	± 0.75 dB
>50 to 60 dB.....	± 1.5 dB
Flatness of Attenuation	
0 to 30 dB.....	±1.0 dB
>30 to 40 dB.....	±1.5 dB
>40 to 50 dB.....	±2.0 dB
>50 to 60 dB.....	±3.0 dB
Temperature Coefficient	0.02 dB/°C max

Power Handling Capability	
Without Performance Degradation.....	Up to 50 mW cw or peak (see Figure 3)
Survival Power..... (from - 65 °C to + 25°C; see Figure 4 for higher temperatures)	2W average or peak
Switching Time.....	2 µsec max.
Programming.....	Positive true binary standard or BCD (Option 1). For complementary code, specify Option 2.
Minimum Attenuation Step.....	1.0 dB
Logic Input	
Logic "O" (Bit Off).....	-0.3 to +0.8 V@500 µA max
Logic "1" (Bit On).....	+2.0 to +5.0 V@100 µA max
Power Supply	
Requirements.....	+5V ±5%, 250 mA +15V ± 5%, 75 mA - 15V, ± 5%, 75 mA

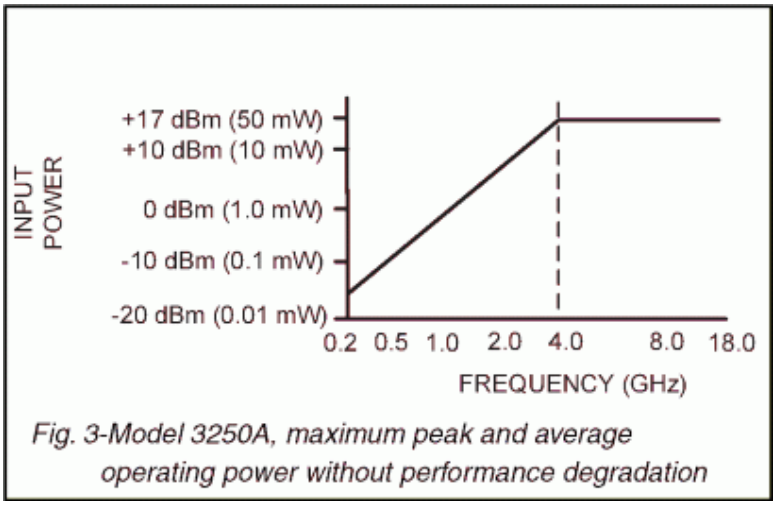


Fig. 3-Model 3250A, maximum peak and average operating power without performance degradation

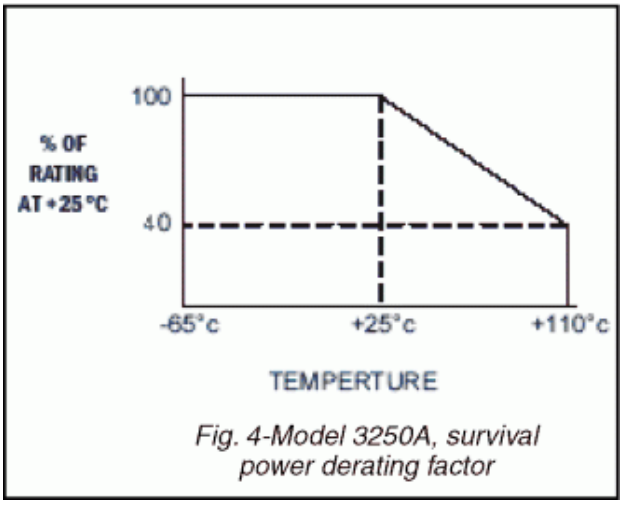


Fig. 4-Model 3250A, survival power derating factor

ENVIRONMENTAL RATINGS

Operating Temperature Range..... -54°C to 110°C

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
1	BDC programming (Binary is standard)
2	Complementary programming (positive true is standard)
7	Two SMA male rf connectors
10	One SMA male (J1) and one SMA female (J2) RF connector
5002*	8-Bit Resolution 1 µsec switching time

*Special order product. Consult factory before ordering. In addition, consult factory for impact on specifications; i.e., VSWR and insertion loss and availability.

PIN FUNCTIONS		
PIN NO.	BINARY	BCD (Opt. 1)
1	SPARE	SPARE
2	SPARE	SPARE
3	+5V	+5V
4	DIGITAL & POWER GND	DIGITAL & POWER GND
5	GND	1 dB
6	GND	2 dB
7	1 dB	4 dB
8	2 dB	8 dB
9	4 dB	10 dB
10	8 dB	20 dB
11	16 dB	40 dB
12	32 dB	OPEN (NO CONNECTION)
13	+ 15V	+ 15V
14	- 15V	- 15V
15	SPARE	SPARE

ACCESSORY FURNISHED

Mating power/logic connector

DIMENSIONS AND WEIGHT

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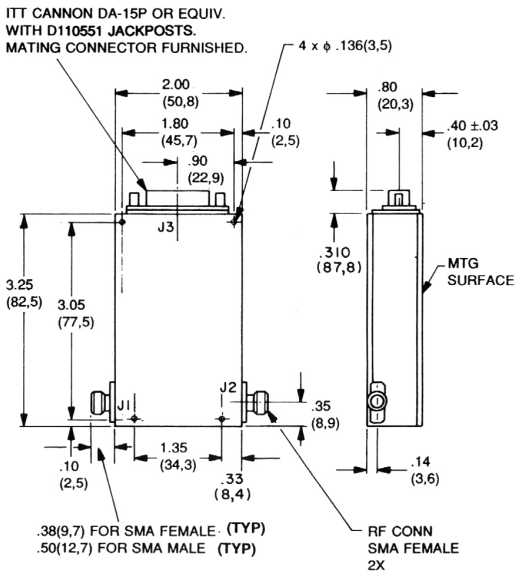

MODEL 3250A
Wt: 4 oz. (113 gr) approx.

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