



# Model 7328H High Speed, High Dynamic Range I-Q Vector Modulator



Application Notes for [Microwave Phase Shifter](#)

The Model 7328H represents the latest advancement to General Microwave's comprehensive product line of PIN diode I-Q Vector Modulators. Its response time has been significantly reduced, resulting in an enhanced modulation rate performance of 50 MHz to better serve today's more demanding system applications.

In addition to the high speed, the Model 7328H incorporates multiple bi-phase modulator sections to provide in excess of 60 dB attenuation through 16 GHz, and is capable of a full 360 degrees of phase shift. Thus, the unit will provide high speed and simultaneous control of amplitude and phase over the full frequency range of 6 to 18 GHz. A simplified block diagram is shown in Fig. 1.

## THEORY

The Theory of Operation of the Model 7328H is the same as the Series 73 units. The RF and Driver portions of the IQ Modulator have been modified to enable modulation rates up to 50 MHz.

- High Speed - Modulation Rate of better than 50 MHz
- Wide Frequency Range - 6 to 18 GHz
- Simultaneous control of amplitude and phase over a 60dB dynamic range
- Digitally Programmable I&Q - 12 Bit ECL control
- Guaranteed monotonicity

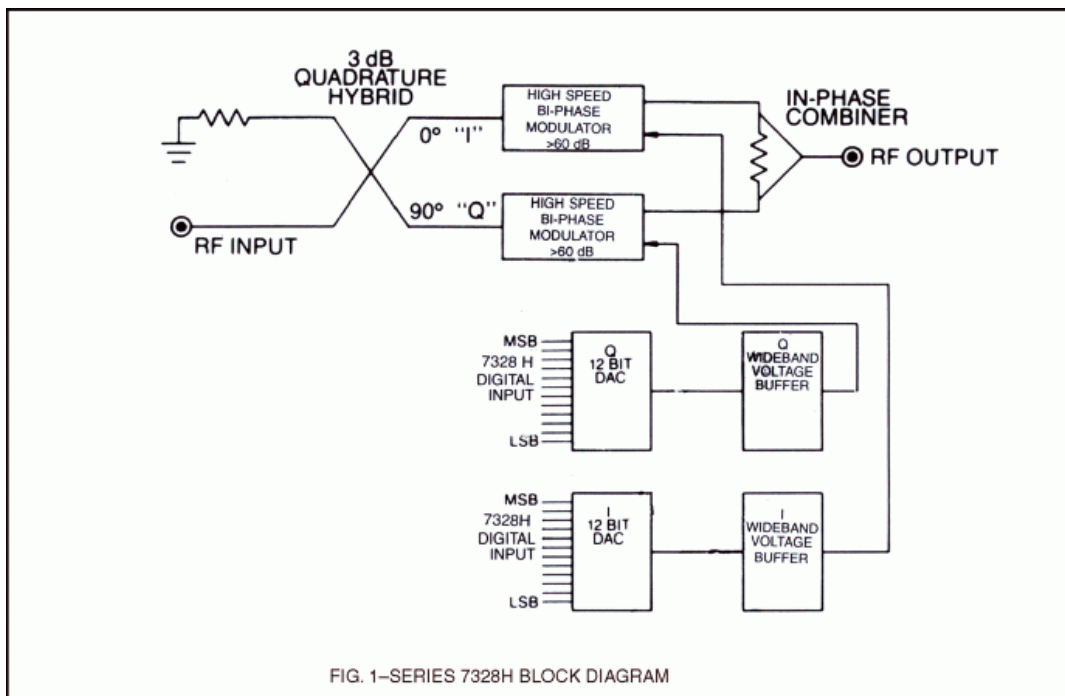


FIG. 1—SERIES 7328H BLOCK DIAGRAM

## PRELIMINARY PERFORMANCE CHARACTERISTICS

PARAMETER	SPECIFICATION
Frequency Range, min .....	6.0 to 18.0 GHz
Insertion Loss, max.....	6 to 10 GHz 15.0 dB
	10 to 12 GHz 16 dB
	12 to 18 GHz 20 dB
VSWR, max.....	6 to 10 GHz 2.0:1
	10 to 18 GHz 2.5:1
Power Handling, max	
Without Performance Degradation...	-5 dBm typical
Survival.....	+27dBm
Absolute Insertion Phase Accuracy vs Frequency.....	±15°
Variation of Phase vs Temperature, max.....	±0.2°/°C
Attenuation Range, min	
6 to 16 GHz.....	60 dB

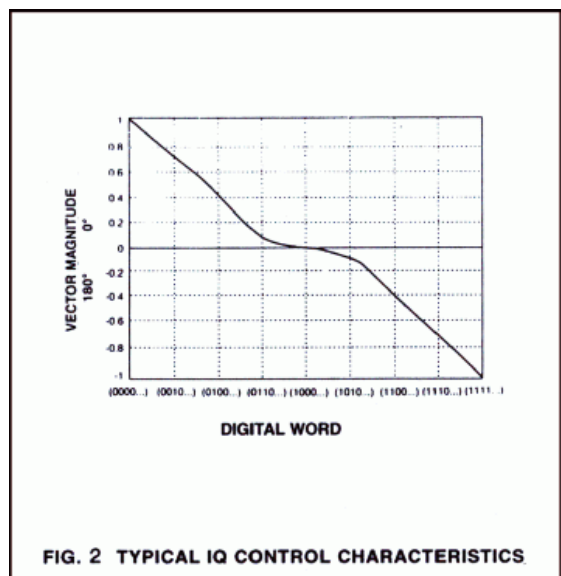
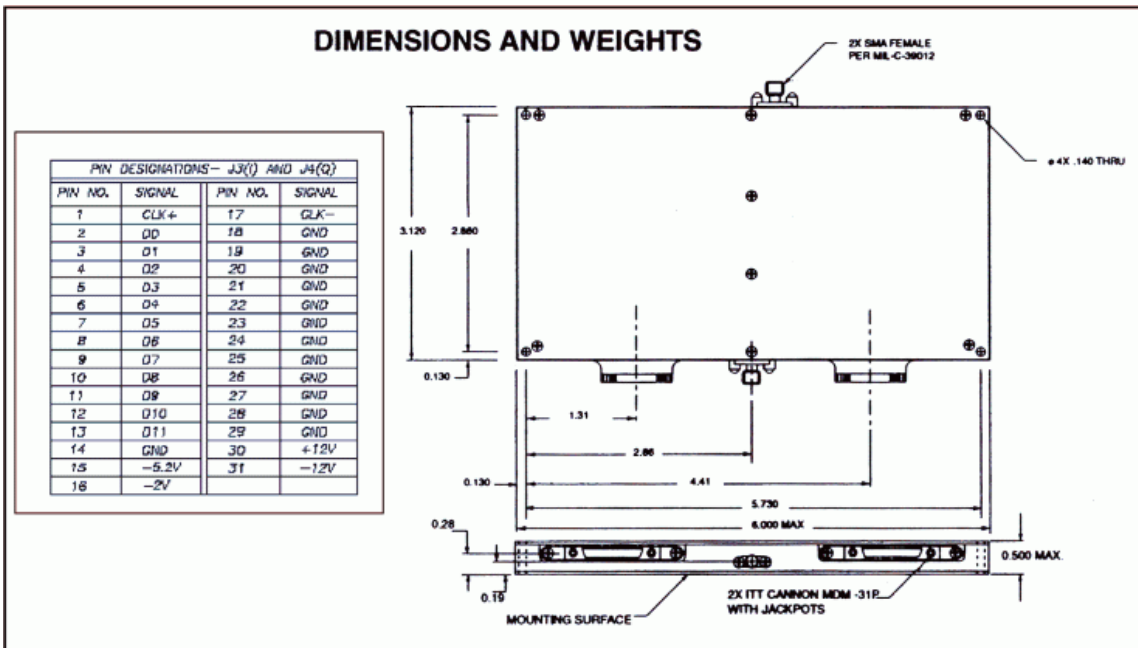


FIG. 2 TYPICAL IQ CONTROL CHARACTERISTICS

>16 to 18 GHz.....	50 dB
Variation of Amplitude vs Temperature, max.....	0.04 dB/°C
Modulation Rate, min.....	50 MHz
Control Input.....	12 Bit ECL for both I&Q
Control Characteristics, I&Q, typ.....	See Figure 2
Control Input Impedance.....	100 ohms (to-2V supply)
Power Supply.....	+12V @ 350 mA -12V @ 130 mA -5.2V @ 340 mA -2V @ 280 mA



weight 8.8oz (249gr.) approximate  
Dimensional Tolerances, unless otherwise indicated: .XX±.02; .XXX±.005

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