



6 GHz to 12 GHz, Bi-Phase Modulator, 0/180 Degrees,
TTL Control, 15nsec Speed, SMA

TECHNICAL DATA SHEET

PE86GM2005

The PE86GM2005 is a 0° to 180° Bi-Phase Modulator that operates across a broad octave frequency band from 6 GHz to 12 GHz. This modulator takes a TTL level digital bit stream and encodes it onto the RF carrier using 2 Phase Shift Keying (2PSK). 2 Phase Shift Keying utilizes 2 phases which are separated by 180°. Impressive typical performance includes low insertion loss of 2.5 dB, 15 nsec switching speed, 20 dB carrier suppression, and 0.5W CW maximum RF input power. The design is bidirectional with input and output RF ports, and employs dual bias voltages (+5/-5 Vdc) and integrated TTL processing to phase modulate the control data onto the RF, and operates across a wide temperature range of -55°C to +85°C. The rugged and compact package uses TTL, Bias, Ground pins, and field replaceable SMA Female connectors. The high reliability design meets MIL-STD-202 environmental test conditions for Humidity, Shock, Vibration, Altitude, and Temperature Cycle.

Features

- 0° to 180° Bi-Phase Modulator module
- 2 Phase Shift Keying (2PSK) Modulation
- Frequency Range: 6 GHz to 12 GHz
- Insertion Loss: 2.5 dB typ
- Switching Speed: 15 nsec typ
- Carrier Suppression: 20 dB
- Compact Package Design
- Field Replaceable SMA Connectors
- Dual Bias Voltage: +5/-5 Vdc
- Integrated TTL Driver
- -55°C to +85°C Operating Temperature
- Designed to meet MIL-STD-202 Test Conditions
- Bi-directional Operation

Applications

- Communication Systems
- Microwave Radio
- Radar
- High Data Rate Test & Measurement
- Serial Data Transmission
- Basestation Infrastructure

Electrical Specifications

Description	Minimum	Typical	Maximum	Units
Frequency Range	6		12	GHz
RF Input Power (CW)			+20	dBm
Maximum Peak RF (Survival) 1μs Pulse Width			0.5	Watts
Impedance		50		Ohms
VSWR		2:1	2.5:1	
Insertion Loss		2.5	3	dB
Carrier Suppression		20		dB
Switch Speed (Risetime)		15		ns
Phase State (Off)		0		degrees
Phase State (On)		180		degrees
Bias Voltage (+)		5		Volts
Bias Voltage (-)		-5		Volts
Bias Current @ +5 VDC		33	75	mA
Bias Current @ -5 VDC		8	20	mA

Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [6 GHz to 12 GHz, Bi-Phase Modulator, 0/180 Degrees, TTL Control, 15nsec Speed, SMA PE86GM2005](#)



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Mechanical Specifications

Size

Length	1 in	[25.4mm]
Width	1 in	[25.4 mm]
Height	0.5 in	[12.7 mm]
Weight	0.125 lbs	[56.7 g]

Configuration

Design	Bi-Phase Modulator
Connector Option	Field Replaceable
RF Connector	SMA Female

Environmental Specifications

Temperature

Operating Range	-55°C to +85°C
Storage Range	-65°C to +125°C

Humidity

Shock	MIL-STD-202F, Method 103B Cond. B
Vibration	MIL-STD-202F, Method 213B Cond. B
Altitude	MIL-STD-202F, Method 204D Cond. B
Temperature Cycle	MIL-STD-202F, Method 105C Cond. B
	MIL-STD-202F, Method 107D Cond. A

Compliance Certifications (see [product page](#) for current document)

Plotted and Other Data

Notes:

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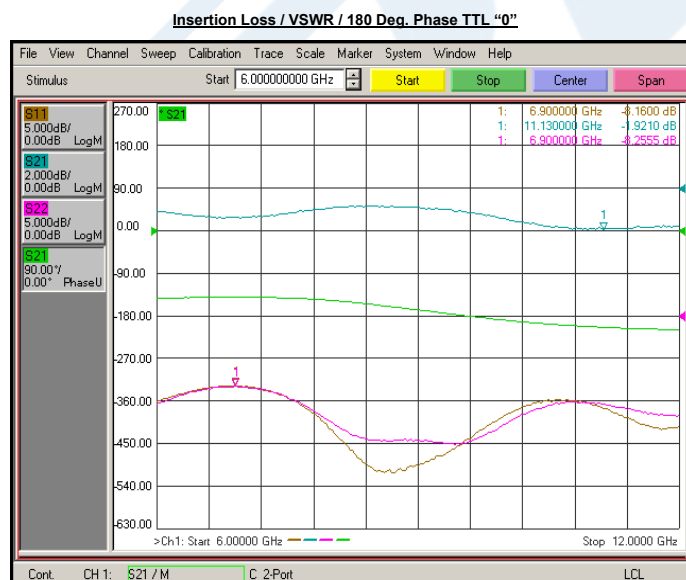
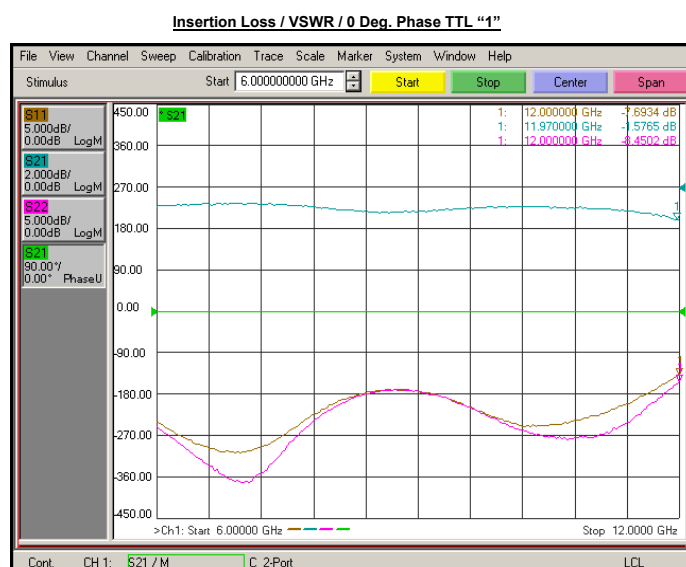


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Typical Performance Data



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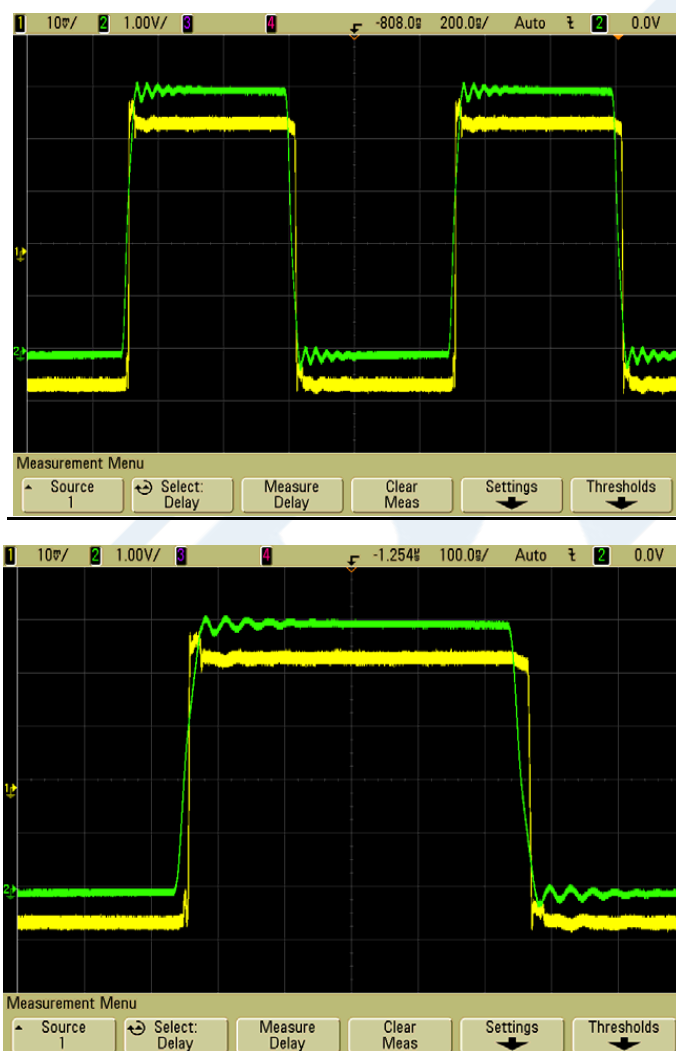


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Switching Speed Full

Pulse



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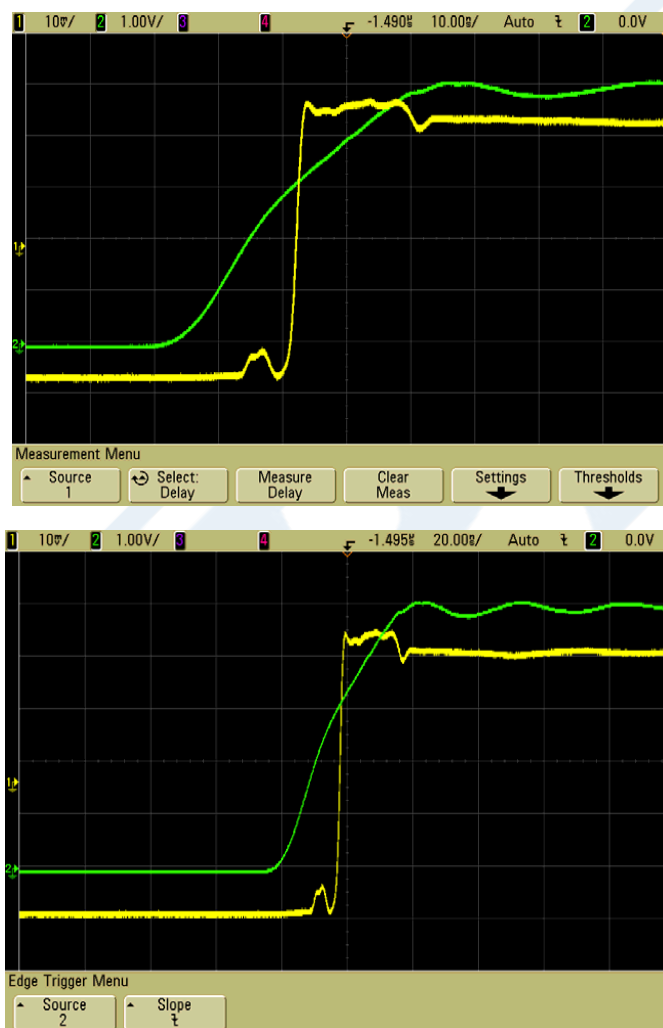
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Green Trace: TTL Signal
Yellow Trace: RF Signal

Switching Speed

Delay 0 to 180 Deg.



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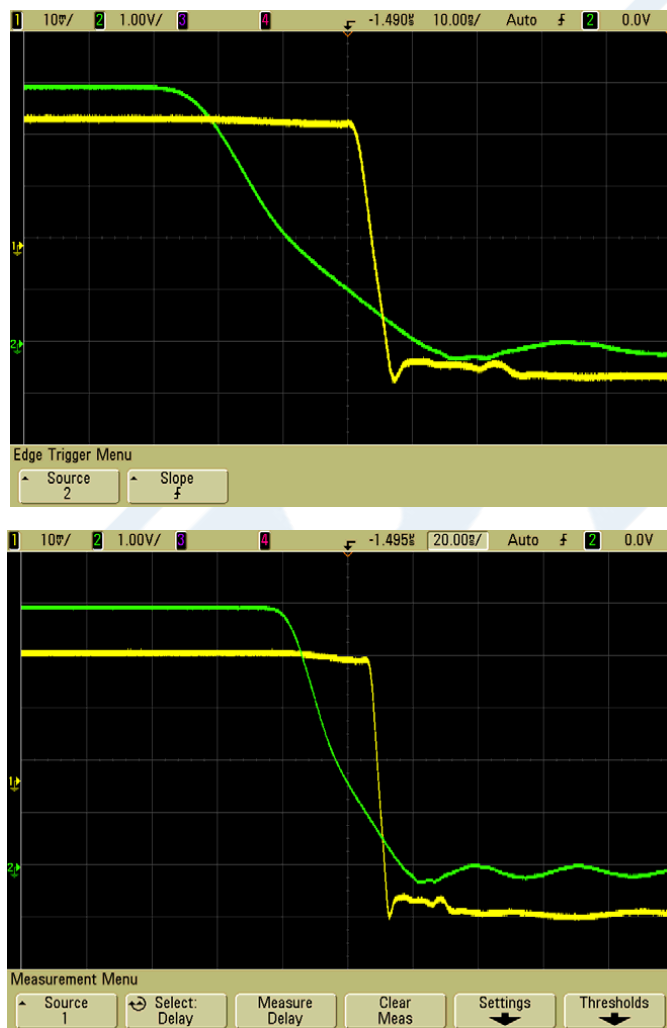
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Green Trace: TTL Signal
Yellow Trace: RF Signal

Switching Speed

Delay 180 to 0 Deg.



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PE86GM2005 CAD Drawing

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