



2 GHz to 6 GHz, Bi-Phase Modulator, 0/180 Degrees,
TTL Control, 50nsec Speed, SMA

TECHNICAL DATA SHEET

PE86GM2003

The PE86GM2003 is a 0° to 180° Bi-Phase Modulator that operates across a broadband frequency range from 2 GHz to 6 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 < 1.7 dB and switching speed of < 50 nsec. The design is bidirectional with input and output RF ports, and employs dual bias voltages (+5/-15 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: 2 GHz to 6 GHz
- Insertion Loss: < 1.7 dB typ
- Switching Speed < 50 nsec
- Compact Package Design
- Field Replaceable SMA Connectors
- Dual Bias Voltage: +5/-15 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	2		6	GHz
RF Input Power (CW)			+27	dBm
Impedance		50		Ohms
VSWR			1.8:1	
Phase Error			8	Degrees
Insertion Loss		1.7	2.5	dB
Amplitude Balance		±0.3	±1	dB
Switching Speed			50	ns
Phase State (Off)		0		degrees
Phase State (On)		180		degrees
Bias Voltage (+)		5		Volts
Bias Voltage (-)		-15		Volts
Bias Current @ +5 VDC		32	50	mA
Bias Current @ -15 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: [2 GHz to 6 GHz, Bi-Phase Modulator, 0/180 Degrees, TTL Control, 50nsec Speed, SMA PE86GM2003](#)



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Mechanical Specifications

Size

Length	1.5 in	[38.1mm]
Width	1.5 in	[38.1 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	-40°C to +85°C
Storage Range	-65°C to +125°C

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

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

Plotted and Other Data

Notes:

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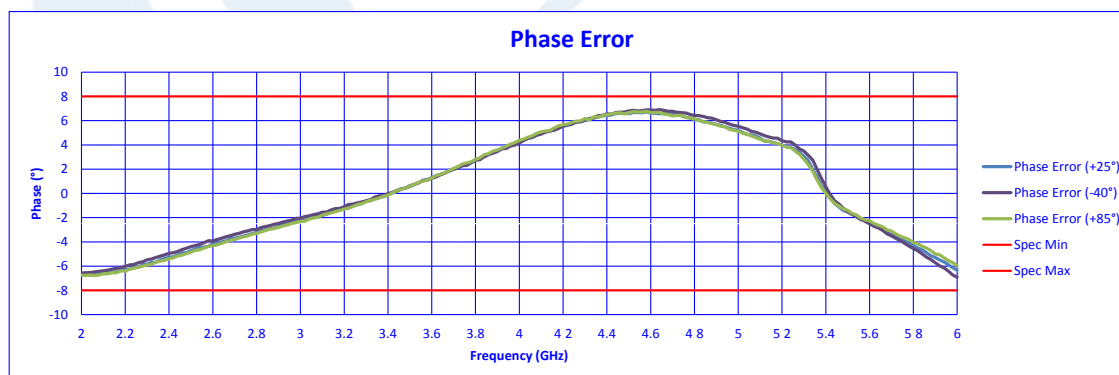
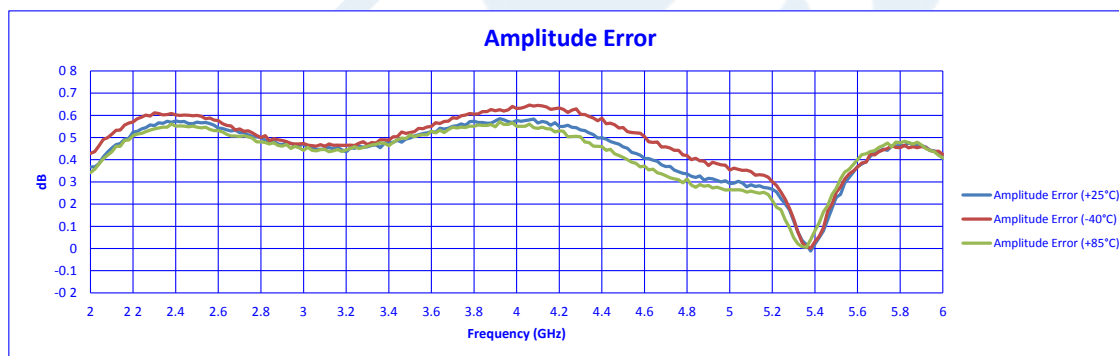
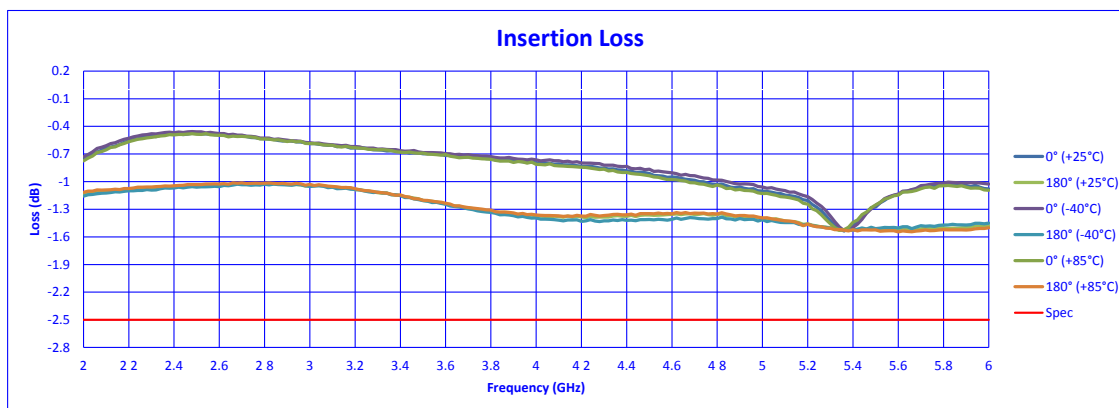


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Typical Performance Data



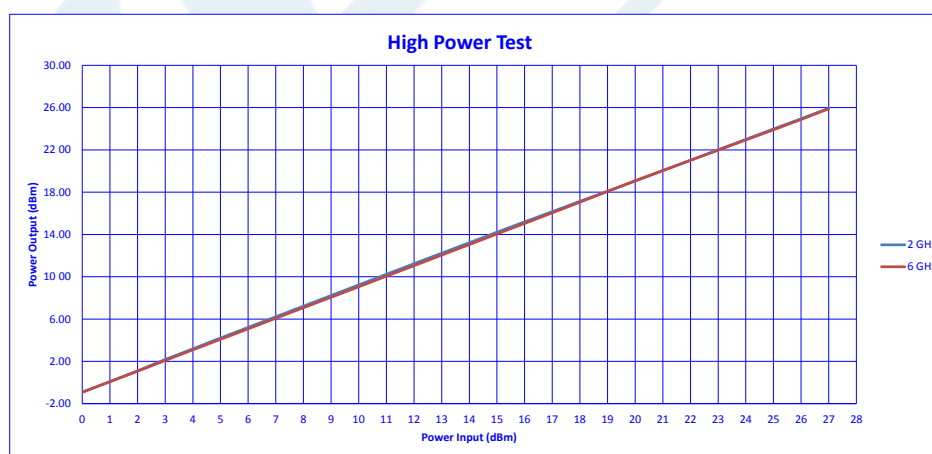
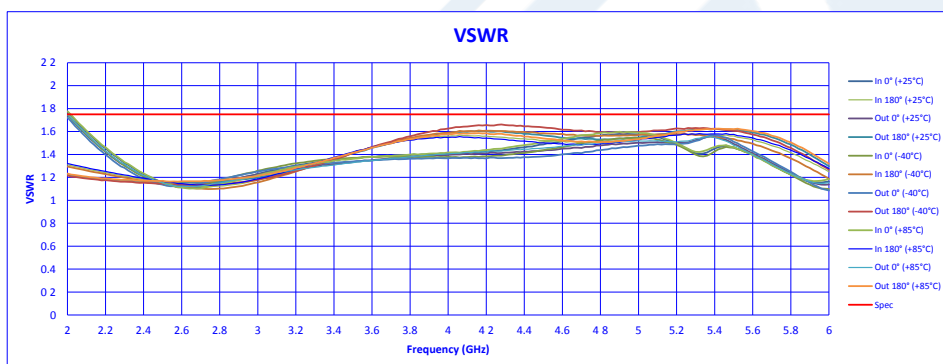
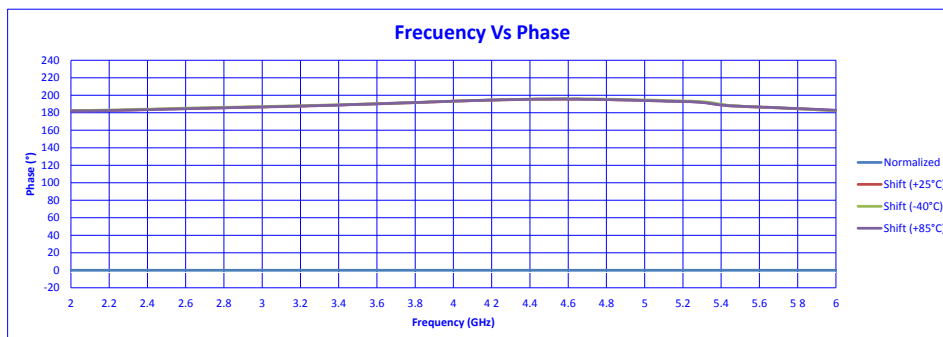
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Switching Speed
10 ns Per Div (17.78 ns)



Switching Speed
10 ns Per Div (17.33 ns)



TTL Signal = Green RF
Signal = Yellow

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Full Pulse

Rise Time (6 ns)

Fall Time (5.8 ns)

2 us Per Div



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RF Signal = Yellow

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PE86GM2003 CAD Drawing

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