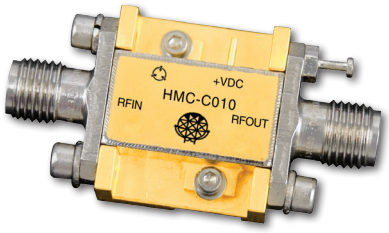
HMC-C010

v02.1007

600° ANALOG PHASE SHIFTER MODULE, 6 - 15 GHz



Features

Wide Bandwidth: 6 - 15 GHz

>600° Phase Shift

Single Positive Voltage Control

Hermetically Sealed Module

Field Replaceable SMA Connectors

-55 to +85 °C Operating Temperature

Typical Applications

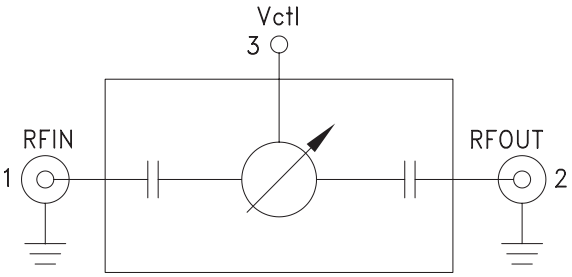
The HMC-C010 is ideal for:

- Fiber Optics
- Military
- Test Equipment

General Description

The HMC-C010 is an Analog Phase Shifter which is controlled via an analog control voltage from 0 to +5V. The HMC-C010 provides a continuously variable phase shift of 0 to 800 degrees at 6 GHz, and 0 to 450 degrees at 16 GHz, with consistent insertion loss versus phase shift. The phase shift is monotonic with respect to control voltage. The control port has a modulation bandwidth of 50 MHz. The low insertion loss and extremely robust packaging enable this part to be used in a wide range of applications including the phase adjustment of clocks in fiber optic systems and test equipment. The HMC-C010 is housed in a miniature hermetic module with replaceable SMA connectors.

Functional Diagram



Electrical Specifications, T_A = +25° C, 50 Ohm System

Parameter	Frequency (GHz)	Min.	Typ.	Max.	Units
Phase Shift Range:	6 - 10 GHz 10 - 15 GHz	600 360	800 600		degrees degrees
Insertion Loss	6 - 15 GHz		7	10	dB
Return Loss (Input and Output)	6 - 15 GHz		7		dB
Control Voltage Range	6 - 15 GHz		0 - 5		Volt
Modulation Bandwidth	6 - 15 GHz		50		MHz
Phase Voltage Sensitivity	6 - 15 GHz		120		deg /Volt
Insertion Phase Temperature Sensitivity	6 - 15 GHz		0.5		deg /°C

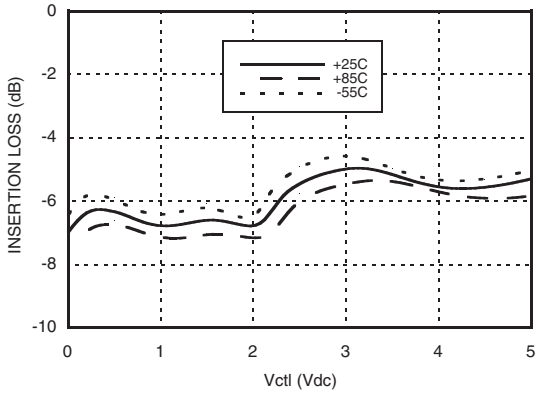
Information furnished by Analog Devices is believed to be accurate and reliable. However, no responsibility is assumed by Analog Devices for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Specifications subject to change without notice. No license is granted by implication or otherwise under any patent or patent rights of Analog Devices. Trademarks and registered trademarks are the property of their respective owners.

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

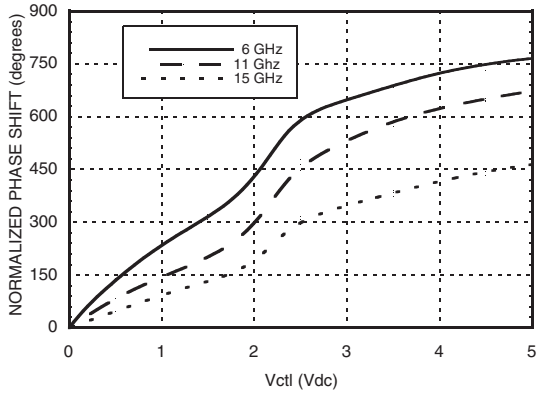
RoHS✓ EARTH FRIENDLY

600° ANALOG PHASE SHIFTER MODULE, 6 - 15 GHz

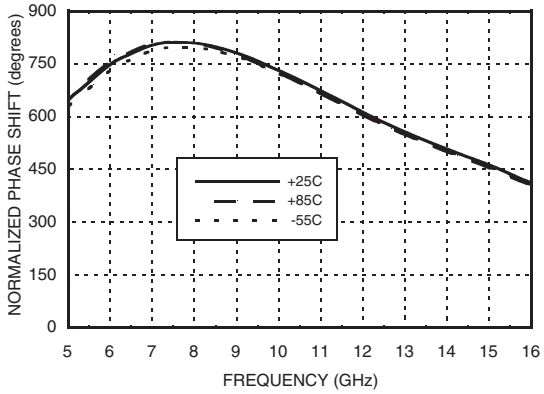
Insertion Loss vs. Control Voltage



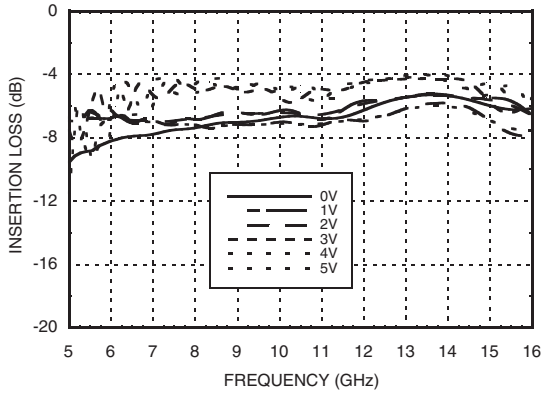
Phase Shift vs. Control Voltage



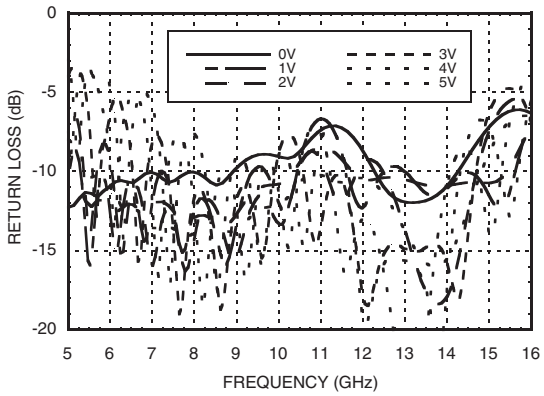
Phase Shift vs. Frequency @ Vctl = 5V (Relative to Vctl = 0V)



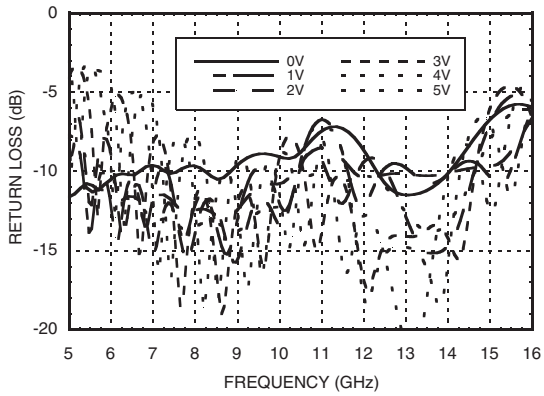
Insertion Loss vs. Frequency



Input Return Loss vs. Frequency, Vctl = 0 to +5V



Output Return Loss vs. Frequency, Vctl = 0 to +5V



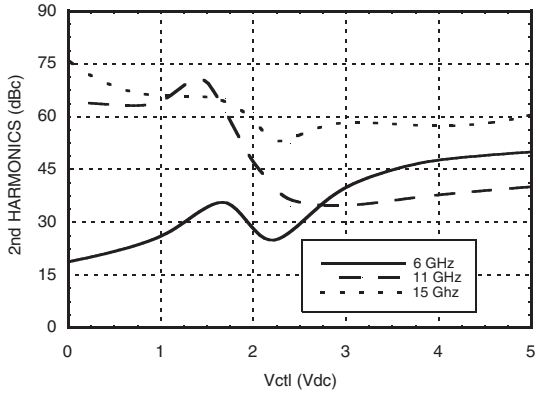
Information furnished by Analog Devices is believed to be accurate and reliable. However, no responsibility is assumed by Analog Devices for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Specifications subject to change without notice. No license is granted by implication or otherwise under any patent or patent rights of Analog Devices. Trademarks and registered trademarks are the property of their respective owners.

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

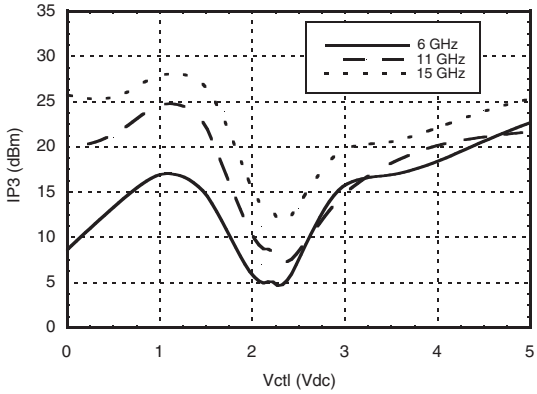
RoHS✓ EARTH FRIENDLY

600° ANALOG PHASE SHIFTER MODULE, 6 - 15 GHz

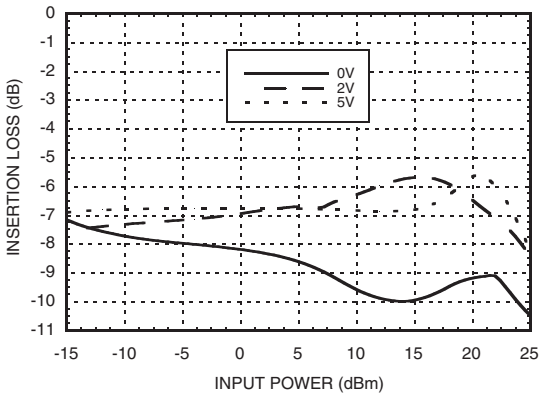
Second Harmonics vs. Control Voltage, Pin = -10 dBm



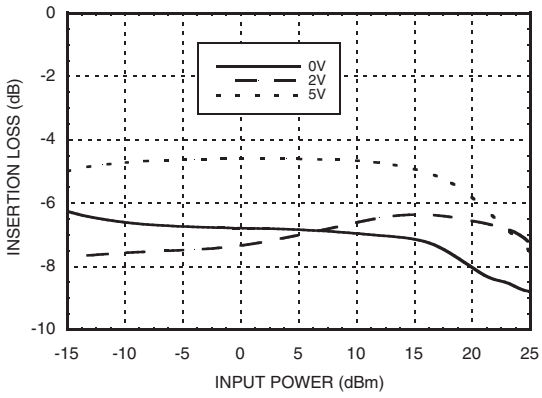
Input IP3 vs. Control Voltage



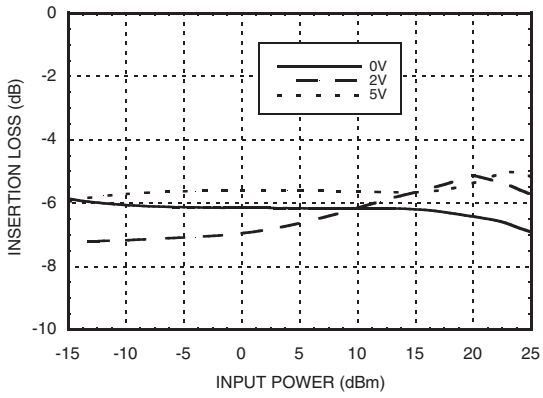
Insertion Loss vs. Pin @ 7 GHz



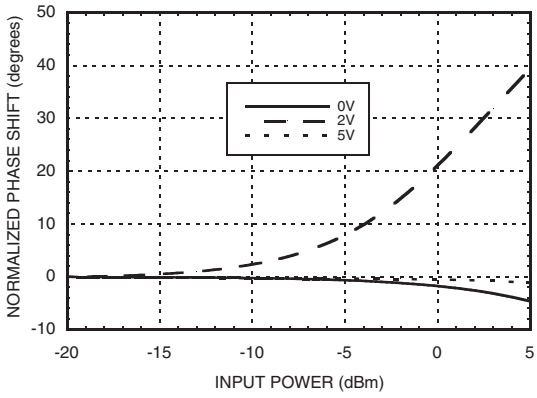
Insertion Loss vs. Pin @ 11 GHz



Insertion Loss vs. Pin @ 15 GHz



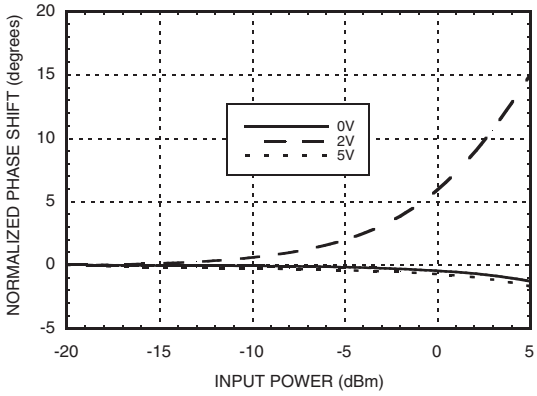
Phase Shift vs. Pin @ 7 GHz



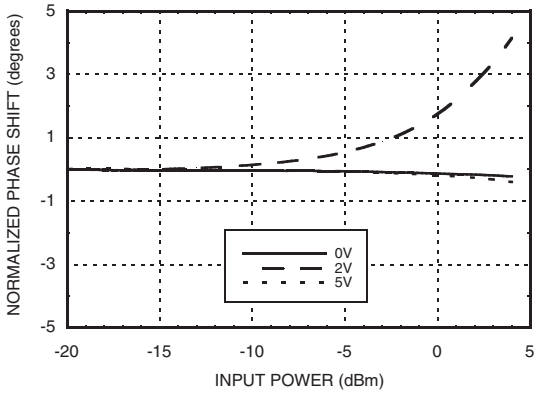
Information furnished by Analog Devices is believed to be accurate and reliable. However, no responsibility is assumed by Analog Devices for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Specifications subject to change without notice. No license is granted by implication or otherwise under any patent or patent rights of Analog Devices. Trademarks and registered trademarks are the property of their respective owners.

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

Phase Shift vs. Pin @ 11 GHz



Phase Shift vs. Pin @ 15 GHz



Absolute Maximum Ratings

Control Voltage (Vctl)	-1 Vdc to +8 Vdc
Input Power (RFIN)	+25 dBm
Channel Temperature (Tc)	150 °C
Continuous Pdiss (T = 85 °C) (derate 21 mW/°C above 85 °C)	1.36 W
Thermal Resistance (junction to ground paddle)	48 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C
ESD Sensitivity (HBM)	Class 1B

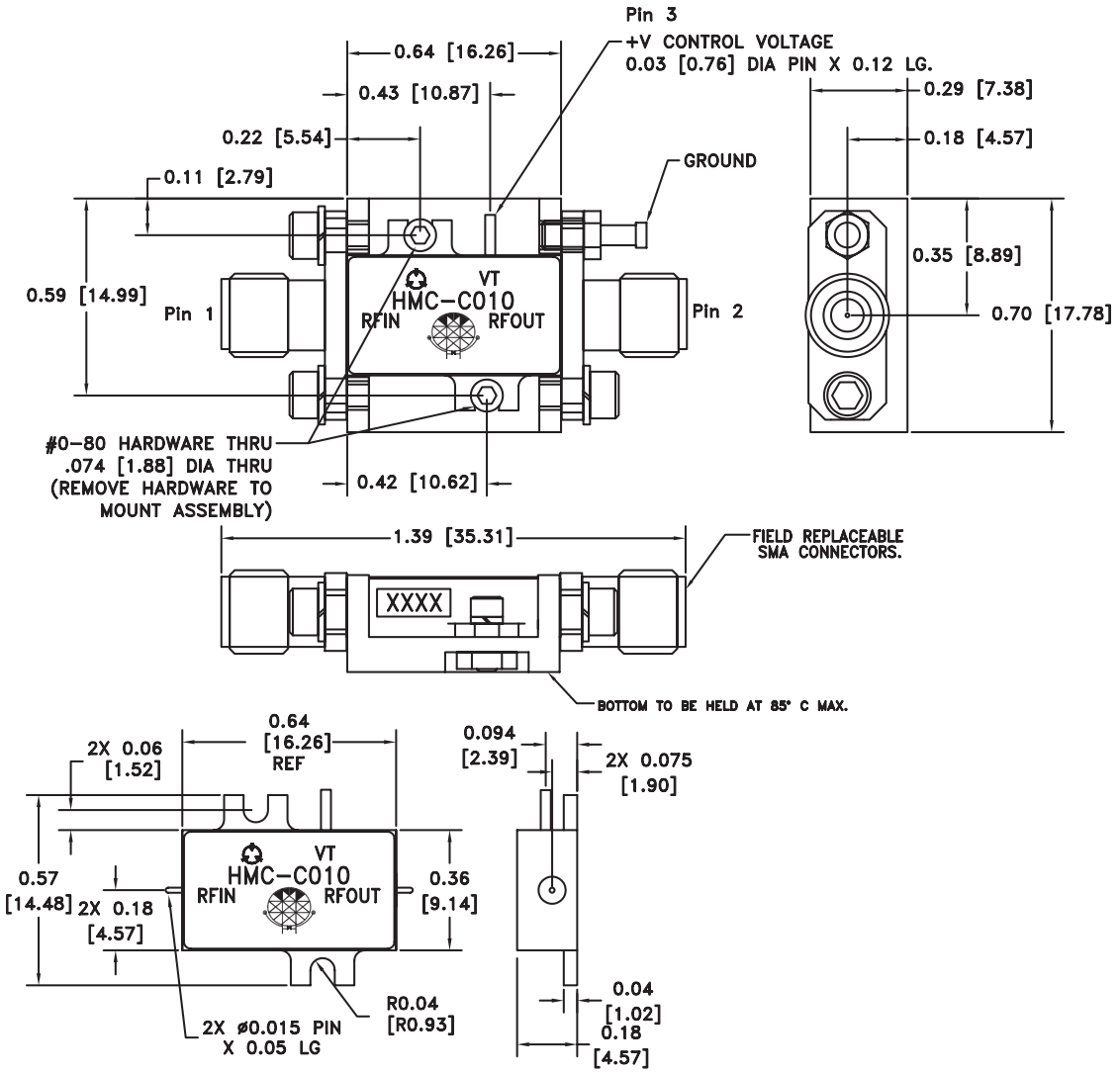
Information furnished by Analog Devices is believed to be accurate and reliable. However, no responsibility is assumed by Analog Devices for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Specifications subject to change without notice. No license is granted by implication or otherwise under any patent or patent rights of Analog Devices. Trademarks and registered trademarks are the property of their respective owners.

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

RoHS✓ EARTH FRIENDLY

600° ANALOG PHASE SHIFTER MODULE, 6 - 15 GHz

Outline Drawing



Package Information

Package Type	C-1
Package Weight [1]	10.2 gms [2]
Spacer Weight	N/A

[1] Includes the connectors

[2] ±1 gms Tolerance

NOTES:

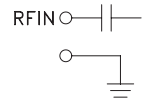
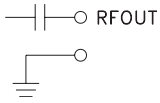
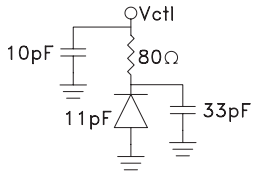
1. PACKAGE, LEADS, COVER MATERIAL: KOVAR™
2. BRACKET MATERIAL: ALUMINUM
3. PLATING: ELECTROLYTIC GOLD 50 MICROINCHES MIN., OVER ELECTROLYTIC NICKEL 75 MICROINCHES MIN.
4. ALL DIMENSIONS ARE IN INCHES [MILLIMETERS].
5. TOLERANCES ±.005 [0.13] UNLESS OTHERWISE SPECIFIED.
6. FIELD REPLACEABLE SMA CONNECTORS. TENSOLITE 5602 - 5CCSF OR EQUIVALENT.

⚠7 TO MOUNT MODULE TO SYSTEM PLATFORM REPLACE 0 -80 HARDWARE WITH DESIRED MOUNTING SCREWS.

Information furnished by Analog Devices is believed to be accurate and reliable. However, no responsibility is assumed by Analog Devices for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Specifications subject to change without notice. No license is granted by implication or otherwise under any patent or patent rights of Analog Devices. Trademarks and registered trademarks are the property of their respective owners.

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1	RFIN & RF Ground	RF input connector, SMA female, field replaceable. This pin is DC blocked and matched to 50 Ohms.	
2	RFOUT & RF Ground	RF output connector, SMA female, field replaceable. This pin is DC blocked and matched to 50 Ohms.	
3	Vctl	Phase shift control pin. Application of a voltage between 0 and 5 volts causes the transmission phase to change. The DC equivalent circuit is a series connected diode and resistor.	
	GND	Power supply ground.	

Information furnished by Analog Devices is believed to be accurate and reliable. However, no responsibility is assumed by Analog Devices for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Specifications subject to change without notice. No license is granted by implication or otherwise under any patent or patent rights of Analog Devices. Trademarks and registered trademarks are the property of their respective owners.

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Analog Devices Inc.:

HMC-C010