



1 GHz to 20 GHz Digital Control Attenuator, 63.5 dB, 7 Bits, 0.5 dB Step Size, Field Replaceable SMA

TECHNICAL DATA SHEET

PE70A5017

The PE70A5017 is an Absorptive 7 Bit Digitally Controlled Programmable Attenuator that operates across a broadband frequency from 1 GHz to 20 GHz. The 50 Ohm design supports TTL control logic and has an attenuation range that covers 0 to 63.5 dB in 0.5 dB steps. Attenuation steps are 0.5, 1, 2, 4, 8, 16, and 32 dB. Insertion loss is 5.5 dB typical with a maximum RF input power of +27 dBm. Additional typical performance includes attenuation flatness of +/- 1.3 dB, Input P0.1dB compression power of +27 dBm, input IP3 of 43 dBm, and switching speed of 150 nsec. The unit requires a dual bias supply of +5V/-5V with DC current of 120mA/70 mA max. The low profile pin package is aluminum with Gold plating and supports field replaceable SMA RF connectors and a Micro-D15 female connector for DC Bias and Command Control functions. The module has an operational temperature range from -40°C to +85°C and is guaranteed to meet a series of environmental test conditions for Altitude, Vibration, Humidity, and Shock.

Features

- Absorptive Programmable Voltage Controlled Attenuator
- 1 GHz to 20 GHz
- Attenuation Range 0 to 63.5 dB typ
- 0.5 dB Step Size
- 7 Bits
- Digital TTL Logic Control
- Insertion Loss 6 dB typ
- Attenuation Flatness +/- 1.25 dB typ
- Input P0.1 dB Compression Power +27 dBm
- Input IP3 43 dBm
- Max RF input Power (CW) +27 dBm
- Switching Speed 150 nsec
- Dual DC Supply +5V/-5V @ 120mA/70mA
- 50 Ohm Design
- Field Replaceable SMA Female RF Connectors
- Micro-D15 Female connector for DC Bias and Command Control
- Operational Temperature Range -40°C to +85°C
- Rugged and Compact Aluminum Gold Plated Package Design
- Guaranteed Environmental Test Conditions Altitude, Vibration, Humidity, Shock
- Single Positive Control Line Per Bit

Applications

- Test & Measurement
- Military and Commercial Communications
- Military Electronic Systems
- Research & Development

Electrical Specifications (Values at +25°C, sea level)

Description	Minimum	Typical	Maximum	Units
Frequency Range	1		20	GHz
Impedance		50		Ohms
Attenuation Range		63.5		dB
Insertion Loss		6	9	dB
VSWR		1.8:1	2:1	
Input at 0.1 dB Compression Point		+27		dB
Input IP3		+40		dBm
DC Voltage		5		Vdc
Attenuation Flatness*		1.25		dB
TTL Low for Thru Path		0 to 0.8V		Vdc

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TTL High for Attenuation	2-5V	Vdc
Step Size	0.5	dB
Switching Speed	150	ns
RF Input Power	27	dBm
Control Bits	5	Bits
Bias Current	120/70	mA
IL Temperature Coefficient	0.03	dB/deg C

*Referenced to Insertion Loss

Absolute Maximum Rating

Parameter	Rating
Biasing	+5V±10%/-5V±10%
RF Input power	+27dBm

Mechanical Specifications

Size

Length	1.89 in [48.01 mm]
Width	0.39 in [9.91 mm]
Height	1.18 in [29.97 mm]
Weight	0.05 lbs [22.68 g]
Connector 1	Field Replaceable SMA Female
Connector 2	Field Replaceable SMA Female

Environmental Specifications

Temperature

Operating Range	-40 to +85 deg C
Storage Range	-50 to +105 deg C
Humidity	100% RH at 35°C, 95% RH at 40°C
Shock	20G for 11 msec half sine wave, 3 axis both directions
Vibration	25g RMS (15 degrees 2KHz) endurance, 1 hour per axis
Altitude	30,000 Feet

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

Plotted and Other Data

Notes:

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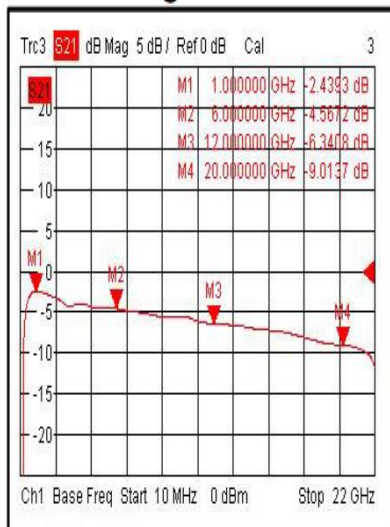
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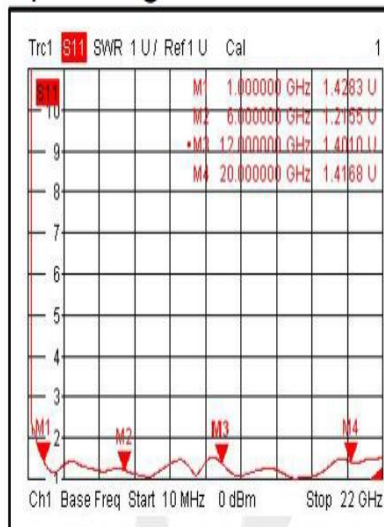
PE70A5017

Performance Data

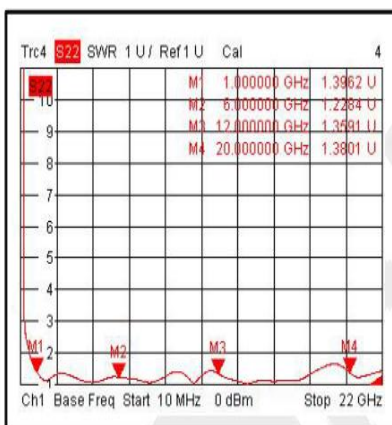
Insertion Loss @+25°C



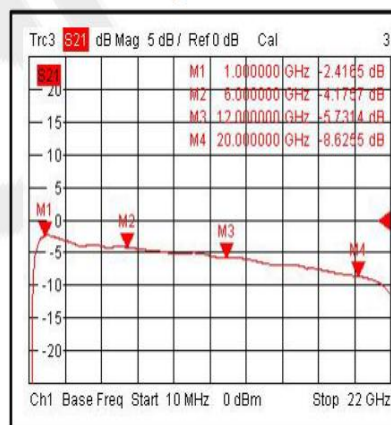
Input VSWR @+25°C



Output VSWR @+25°C



Insertion Loss @-40°C



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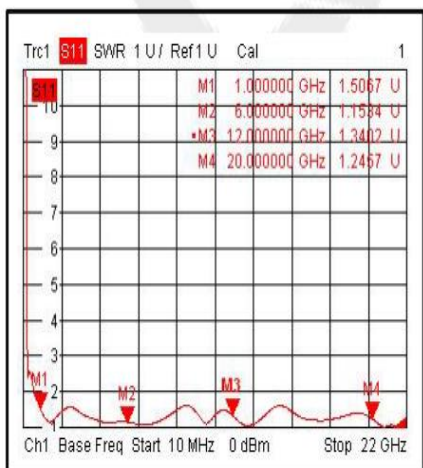


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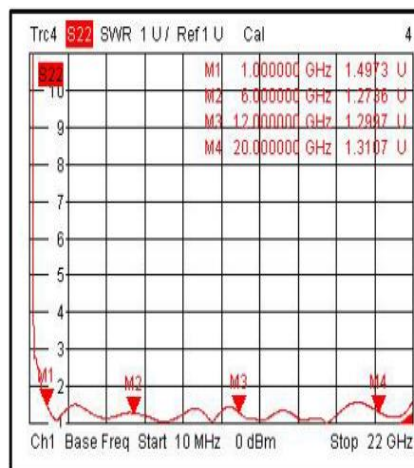
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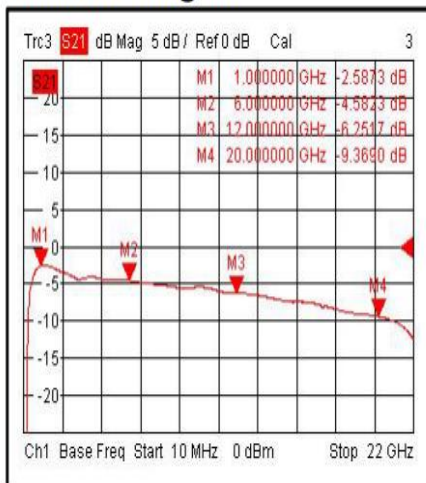
Input VSWR @-40°C



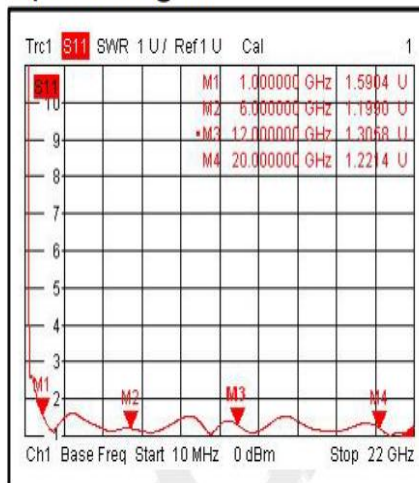
Output VSWR @-40°C



Insertion Loss @+85°C



Input VSWR @+85°C



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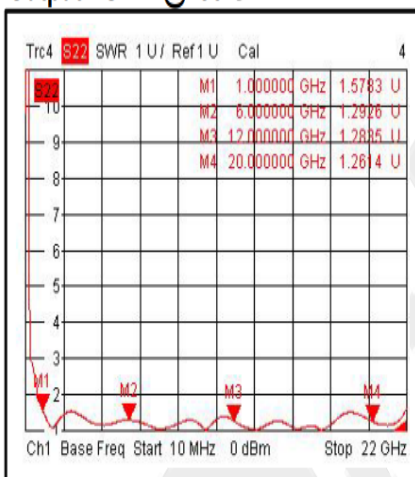


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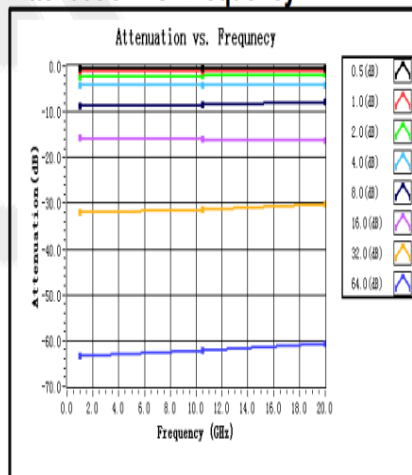
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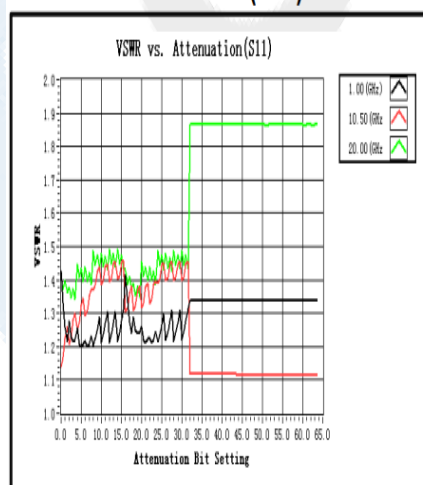
Output VSWR @+85°C



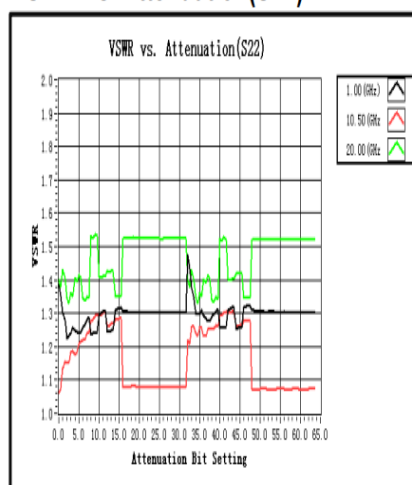
Attenuation vs. Frequency



VSWR vs. Attenuation(S11)



VSWR vs. Attenuation(S22)



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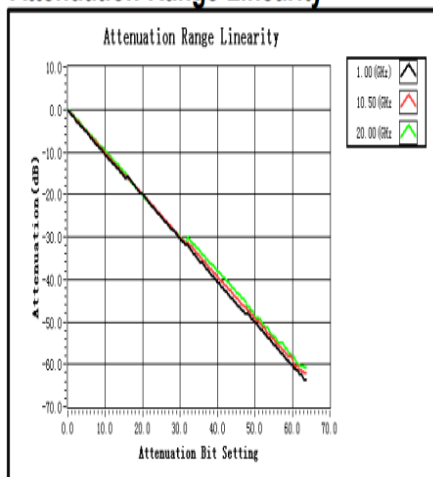


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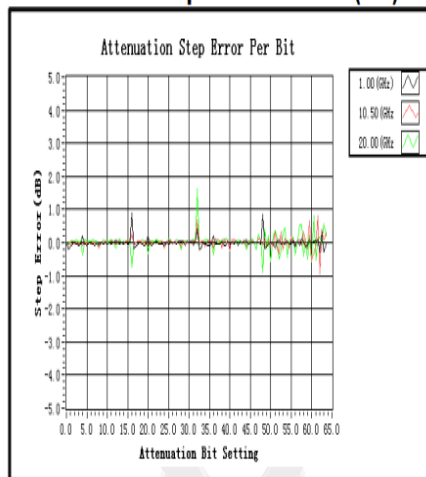
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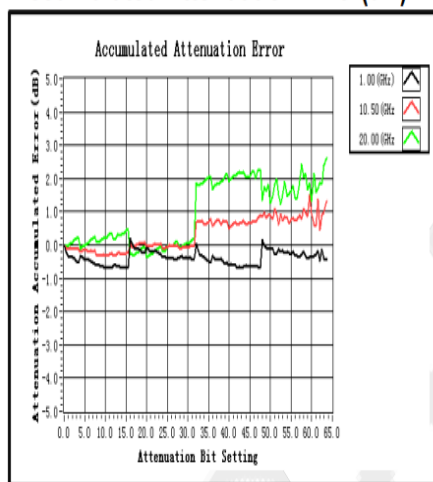
Attenuation Range Linearity



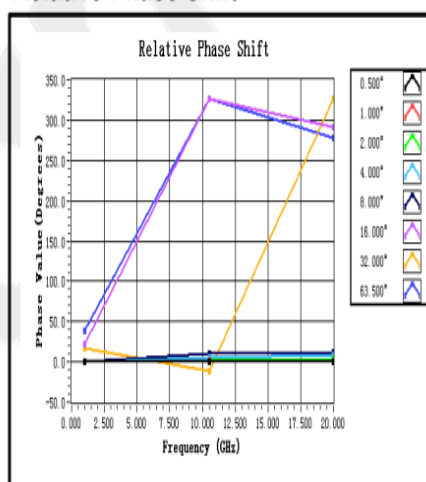
Attenuation Step Error Per Bit (dB)



Accumulated Attenuation Error (dB)



Relative Phase Shift



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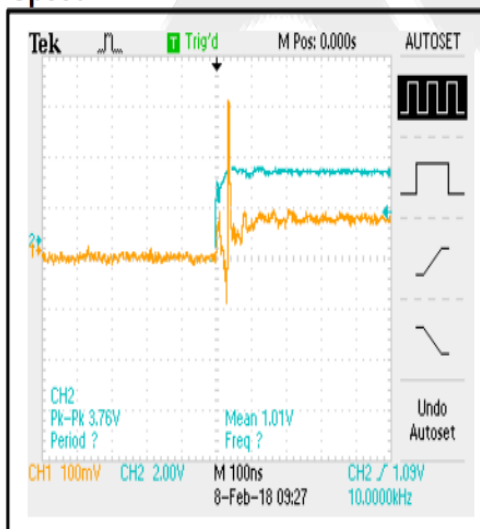


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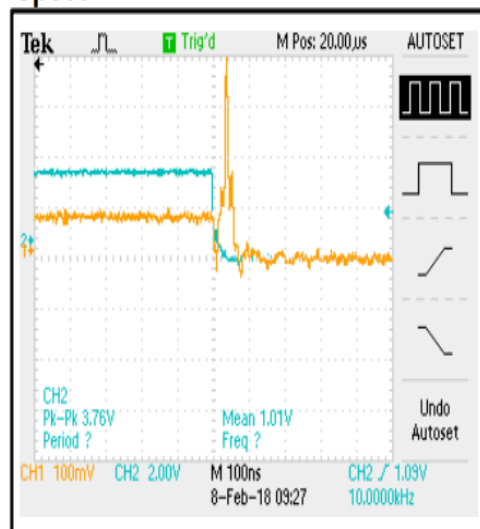
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Speed



Speed



1 GHz to 20 GHz Digital Control Attenuator, 63.5 dB, 7 Bits, 0.5 dB Step Size, Field Replaceable SMA from Pasternack Enterprises has same day shipment for domestic and International orders. Our RF, microwave and millimeter wave products maintain a 99.4% availability and are part of the broadest selection in the industry.

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URL: <https://www.pasternack.com/bench-top-70db-ttl-controlled-sma-female-sma-female-0-watts-attenuator-pe70a5017-p.aspx>

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MICRO-D15(Female)

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UNLESS OTHERWISE SPECIFIED DRAWING DIMENSIONS ARE INCHES DIMENSIONS IN [] ARE MILLIMETERS	TOLERANCES:		
	$X = \pm .2$	[.5]	FRACTIONS
	$XY = .02$	[.5]	$\pm 1/32$
	$XXX = \pm .005$	[.13]	ANGLES $\pm 1^\circ$
	CABLE LENGTH TOLERANCES:		
		>12 [305]	$= +1$ [25] / -0
		>12 [305]	≤ 60 [1524]
		>60 [1524]	≤ 60 [1524]
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		>56700 [1440180]	≤ 57000 [1447800]
		>57000 [1447800]	≤ 57300 [1455420]
		>57300 [1455420]	≤ 57600 [1463040]
		>57600 [1463040]	≤ 57900 [1470660]
		>57900 [1470660]	≤ 58200 [1478280]
		>58200 [1478280]	≤ 58500 [1485900]
		$>$	

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an INFINITI® brand

Website: www.Pasternack.com
Phone: 1.866.727.8376 | 1.949.261.1920

DESCRIPTION

7 Bit TTL Controlled Programmable Attenuator, 63.5 dB, 1 GHz to 20 GHz, 7 Bits, 0.5 dB Step Size, SMA

SIZE A	CAGE CODE 53919	DRAWN BY HBAKKE	ITEM NO. PE70A5017	REV A
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ZONE	REV.	DESCRIPTION	DATE	CHANGED BY	APPROVED BY
	A	INITIAL RELEASE	02/02/2023	HBAKKE	TGALLA

REVISION

PROVED BY
TGALLA

