

# Keysight Technologies

## M9169E

### PXI Switchable-Input Programmable Step Attenuator Module, DC to 50 GHz

#### Industries and Applications

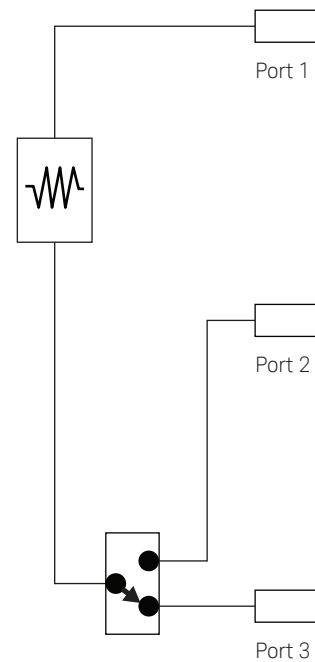
- RF signal path attenuation simulation
- Spectrum analyzer input signal conditioning
- RF receiver sensitivity test
- Adjacent channel interference

#### Product Description

In addition to connectorized standalone attenuators, Keysight Technologies, Inc. also offers PXI step attenuator modules that operate across a broad frequency range of DC to 50 GHz. The M9169E is a 3-port PXI programmable step attenuator module with a switchable path. This is ideal for switching in a calibrator signal (cal input) into the input of a signal analyzer to improve amplitude accuracy. The M9169E has a 0.03 dB insertion loss repeatability throughout the operating life of up to 5 million cycles per section. The M9169E has excellent attenuation accuracy across a wide operating temperature range ensures precise measurements.

#### Features and Benefits

Product features	Your benefit
0.03 dB insertion loss repeatability throughout the operating life	Minimize system measurement uncertainty
Long operating life of 5 million cycles	Reduce cost of test and increase reliability over test system's life expectancy
High attenuation accuracy and flatness	Superior attenuation accuracy ensures precise measurements



Schematic diagram for the M9169E



Unlocking Measurement Insights

## Hardware

Size	2 slots wide module
Frequency range	DC to 50 GHz
Attenuation range	0 to 70 dB
Attenuation resolution	2 dB, 6 dB, and 10 dB step
Repeatability	0.03 dB
Lifecycle	5 million life cycles per section
Insertion loss	DC to 40 GHz: $2.2 + 0.1 f$ (f in GHz) 40 to 50 GHz: $2.2 + 0.124 f$ (f in GHz)
Return loss (VSWR)	DC to 18 GHz: 15 dB (1.43) 18 to 26.5 GHz: 8.5 dB (2.20) 26.5 to 40 GHz: 6.5 dB (2.80) 40 to 50 GHz: 3.5 dB (5.03)
Maximum input power	1 W (+30 dBm) average 50 W peak (10 $\mu$ s max)
Maximum reverse power	1 W (+30 dBm) average 50 W peak (10 $\mu$ s max)
Switching speed	20 ms
RF connector	2.4 mm (f)
Connector compatibility	cPCI, PXI-H, PXI-1

## Attenuation Accuracy

Specified across operating frequency of 0 to 50 °C

Attenuation setting for step ranges (dB)	DC to 18 GHz	18 to 26.5 GHz	26.5 to 40 GHz	40 to 50 GHz
2	0.45	0.50	0.80	1.10
4 to 8	0.65	0.75	1.10	1.80
10 to 12	0.85	0.95	1.10	1.80
14 to 18	0.85	0.95	1.10	2.00
20 to 30	1.15	1.25	1.40	2.00
32 to 38	1.40	1.50	1.65	2.05
40 to 44	1.60	1.70	1.85	2.15
46 to 48	1.60	1.70	1.85	2.45
50 to 58	2.03	2.13	2.30	3.13
60 to 68	2.28	2.38	2.55	3.22
70	2.45	2.55	2.70	3.31

## Software

Software development platform	Microsoft Visual Studio with C/C++, Microsoft Visual Studio .NET with C# or Visual Basic, National Instruments LabVIEW, National Instruments, LabWindows CVI, The MathWorks MATLAB, Keysight VEE
Supported operating systems	Windows XP SP3, 32-bit; Windows Vista 32-bit and 64-bit; Windows 7 32-bit and 64-bit
Drivers provided	IVI-COM, IVI-C, LabVIEW, MATLAB
Included GUI	Soft front panel
Application code examples	C, C++, C#, Visual Basic, VEE, MATLAB

## Recommended Configuration

M9018A	PXIe Chassis, 18-slots, 4U, 8 GB/s
M9393A	PXIe Performance Vector Signal Analyzer: 9 kHz to 27 GHz
M9300A	PXIe Frequency Reference: 10 MHz and 100 MHz
M9037A	PXIe High Performance Embedded Controller
M9169E	PXI Switchable-Input Programmable Step Attenuator Module, DC to 50 GHz

## Related Products

M9362AD01	PXIe Quad Downconverter: 10 MHz to 50 GHz
M9352A	PXI Hybrid Amplifier/Attenuator
M9155/6/7C	PXI Switch Modules, DC to 26.5 GHz

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