

# 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

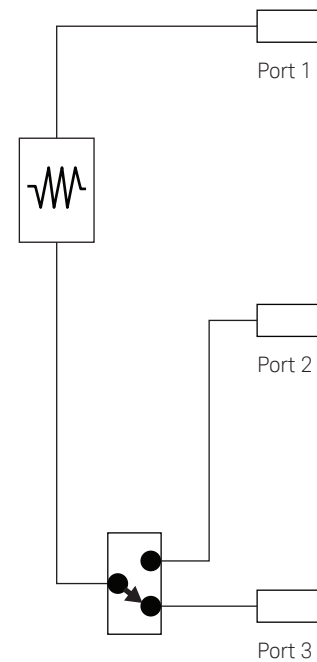
### Product Description

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

## 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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