2.25 Volt Voltage Variable Absorptive Attenuator - 40 dB, 1.8—2.5 GHz

AT-119

Features

- Single Positive Voltage Control 0 to +2.25 Volts
- >50 dB Attenuation Range at 2.1 GHz
- Low DC Power Consumption
- Low Cost SOT-25 Plastic Package
- Tape and Reel Packaging Available

Description

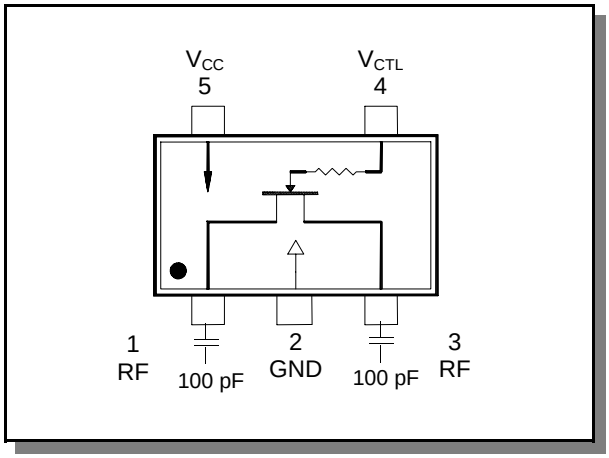
M/A-COM's AT-119 is a GaAs MMIC voltage variable absorptive attenuator in a low cost, SOT-25 five-lead, surface mount plastic package. M/A-COM fabricates the AT-119 with a proven monolithic GaAs self-aligned gate process that features full chip passivation for performance and reliability

Applications

The AT-119 is ideally suited for applications that require fine tuning, linear attenuation with voltage, and very low power consumption.

Typical applications for the AT-119 include automatic gain control circuits in satellite radio receivers and other wireless receivers.

Functional Schematic



1. V_{CC} = +3.3 V_{DC} @ 50 µA max.
2. V_{CTL} = 0 V_{DC} to +3.3 VDC @ 50 µA max.
3. External DC blocking capacitors are required on all RF ports.

Absolute Maximum Ratings[1]

@ T_A = +25 °C (unless otherwise specified)

Parameter	Absolute Maximum
Maximum Input Power	+21 dBm
Supply Voltage V_{CC}	-1 V, + 8 V
ControlVoltage V_{CTL}	-1 V, V_{CC} +0.5 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

1. Exceeding any one or a combination of these limits may cause permanent damage.

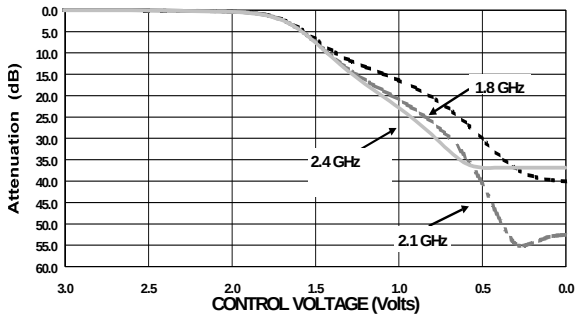
Electrical Specifications @ T_A = +25 °C, Frequency = 2.4 GHz, V_{CC} = 3.3 V_{DC}[1]

Parameters	Test Conditions	Units	Min	Typ	Max
Minimum Insertions Loss	V_{CTL} = 2.25 V_{DC}	dB		3.0	3.2
Maximum Attenuation	V_{CTL} = 0.5 V_{DC}	dB	37		
Attenuation Slope	0.75 V_{DC} < V_{CTL} < 1.75 V_{DC}	dB/V	24		
Return Loss	0.6 V_{DC} < V_{CTL} < 1.75 V_{DC}	dB		>12	
Input Power for 1 dB Change in Attenuation	0 V_{DC} < V_{CTL} < 3.0 V_{DC}	dBm		>10	
Input 3rd Order Intercept Point	0 V_{DC} < V_{CTL} < 3.0 V_{DC}	dBm		>20	
Switching Speed	50% V_{CTL} to 10% / 90% RF	nSec		180	
Transients	V_{CTL} = 3 V_{DC}, In-Band	mV		10	

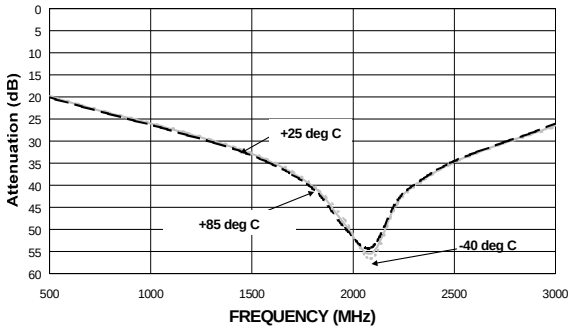
1. All measurements in a 50-Ω system unless otherwise specified. The RF ports must be blocked outside of the package from ground or any other voltage.

Typical Performance Curves

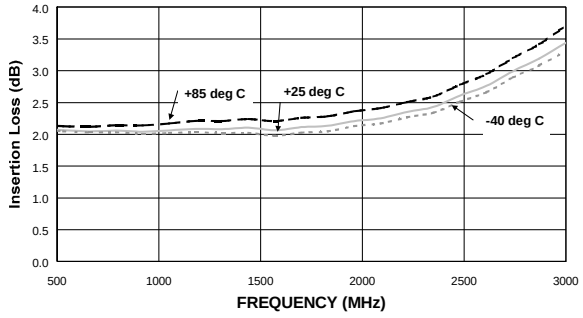
Attenuation vs. Control Voltage, +25 °C



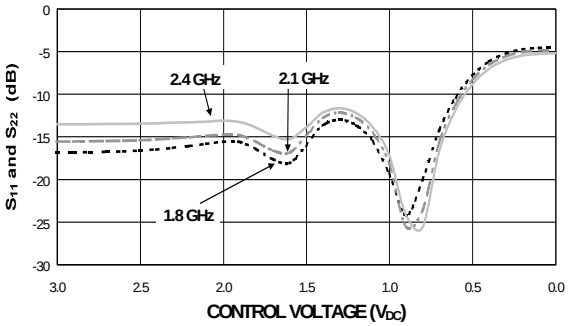
Attenuation vs. Frequency @ 0.0 V_{DC} for Control Voltage



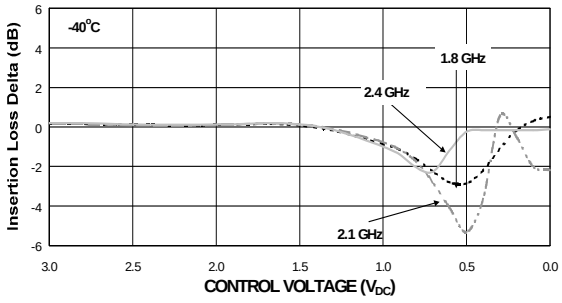
Insertion Loss vs. Frequency @ 2.25 V_{DC} for Control Voltage



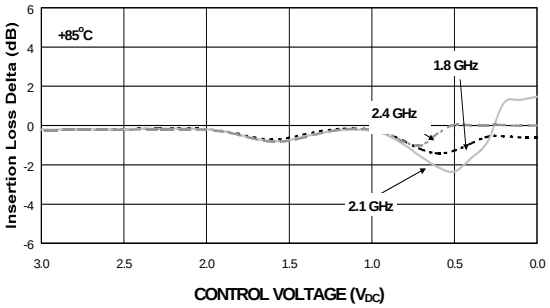
Return Loss vs. Control Voltage @ +25 °C



Insertion Loss Delta Normalized to +25 °C



Insertion Loss Delta Normalized to +25 °C



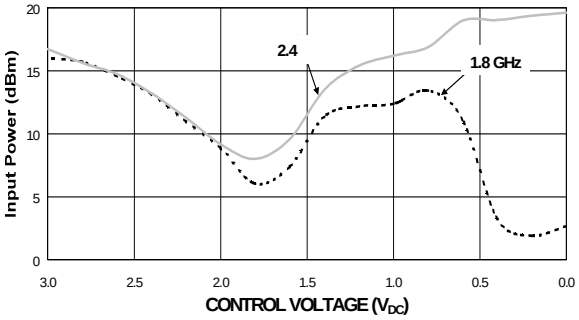
Specifications subject to change without notice.

- **North America:** Tel. (800) 366-2266
- **Asia/Pacific:** Tel.+81-44-844-8296, Fax +81-44-844-8298
- **Europe:** Tel. +44 (1344) 869 595, Fax+44 (1344) 300 020

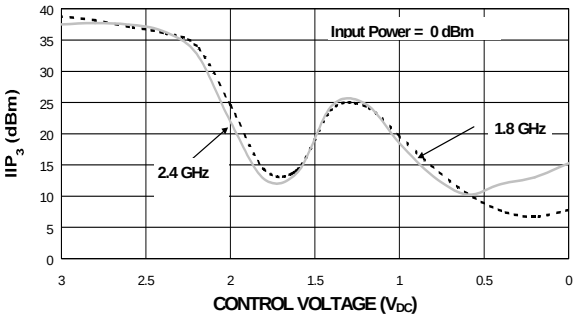
Visit www.macom.com for additional data sheets and product information.

Typical Performance Curves (Cont'd)

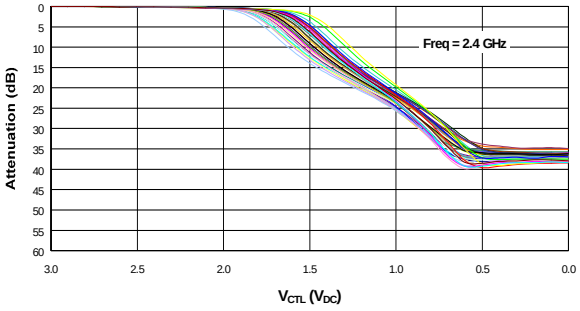
Input Power for 1 dB Change in Attenuation: +25 °C



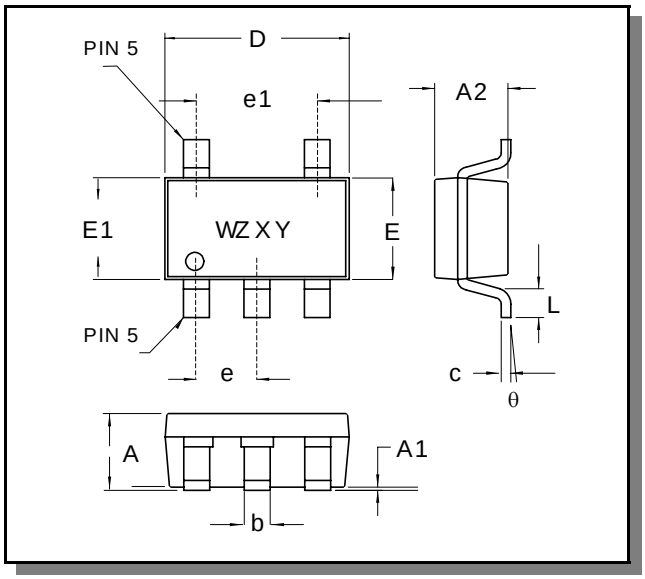
Input IP_3 vs. Control Voltage: +25 °C



Typical Device Variation, Attenuation vs. V_{CTL}



SOT-25 [1]



1. See JEDEC MO-178 VAR AA for additional dimensions and tolerances

SOT-25 [1] Dimensions

DIM	Measurement (mm)		
	MIN	NOM	MAX
A			1.45
A1			0.15
A2	0.90	1.15	1.30
b	0.30		0.50
c	0.08		0.22
D		2.90 basic	
e		0.95 basic	
e1		1.90 basic	
E		2.80 basic	
E1		1.60 basic	
L	0.30	0.60	0.45
θ	0°	4°	8°

Ordering Information

Part Number	Package
AT-119TR	Tape and Reel[1]
AT-119TR-3000	3000 Piece Tape and Reel
AT-119SMB	Sample Board

1. If specific reel size is required, consult factory for part number assignment.

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