

Product Description

ATEK350C4 is a voltage variable attenuator housed in 4x4 mm surface mount package. Attenuator operation range covers 0.1 - 35 GHz. Usable band high frequency goes up to 40 GHz.

Evaluation Board, bare die, custom package, and module options are available upon request.

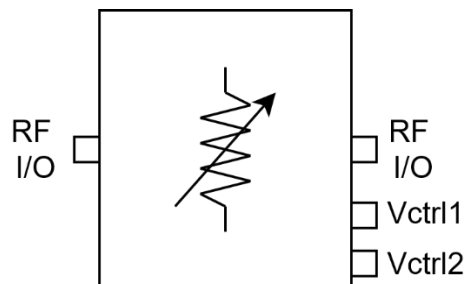
Product Features

- Frequency Range: 0.1 - 35 GHz
- Insertion Loss: 1.5 dB
- Attenuation Range: 30 dB
- IIP3: 30 dBm
- 4x4 mm SMD Package

Applications

- Test Equipment
- Mobile Infrastructure
- 5G
- SATCOM
- General Purpose Wireless
- Electronic Warfare

Functional Block Diagram



Electrical Specifications

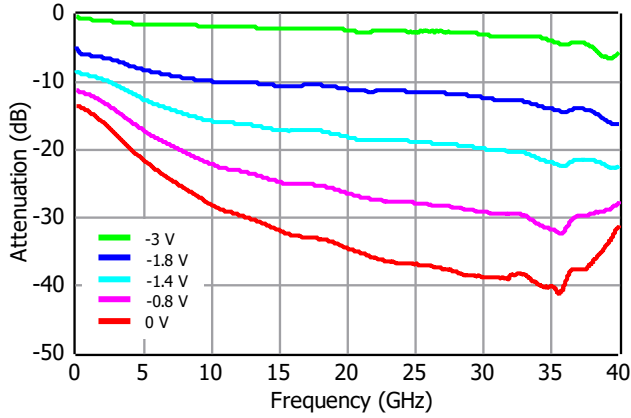
Conditions unless otherwise noted: $V_{ctrl1} = V_{ctrl2}$, 25 °C.

Parameter		Min	Typ	Max	Units
Operational Frequency Range		0.1		35	GHz
Insertion Loss	0.1 GHz		0.4		dB
	5 GHz		1.4		
	15 GHz		2		
	25 GHz		2.5		
	35 GHz		4		
Attenuation Range	0.1 GHz		13.5		dB
	5 GHz		20.5		
	15 GHz		30		
	25 GHz		35		
	35 GHz		36		
Input Return Loss			10		dB
Output Return Loss			10		dB
Input IP3			30		dBm
DC Control Voltage		-3		0	V
DC Control Current ($I_{ctrl1} + I_{ctrl2}$)			0.5		mA
Operating Temperature		-40		85	°C

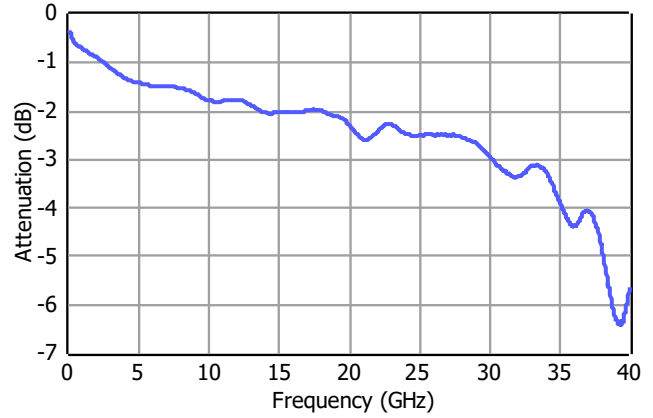
Typical Performance Plots

Conditions unless otherwise specified: $V_{ctrl1}=V_{ctrl2}$, $T=25\text{ C}$.

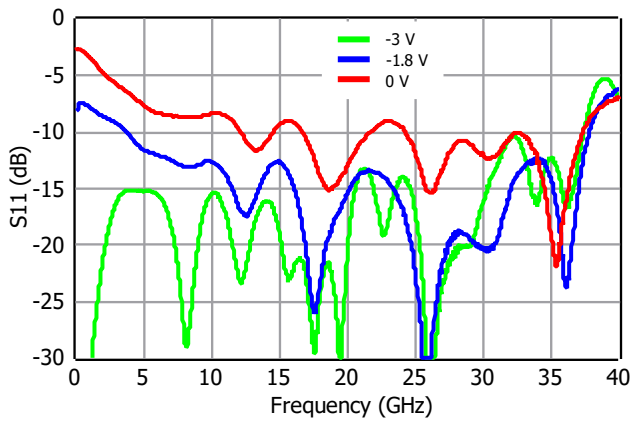
Attenuation vs. V_{ctrl1}



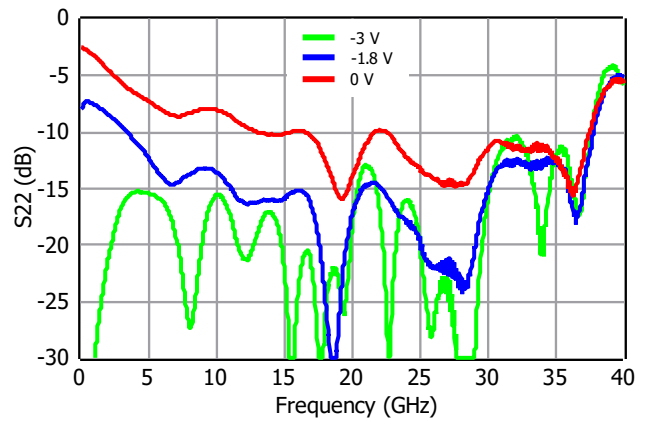
Insertion Loss vs. V_{ctrl1}



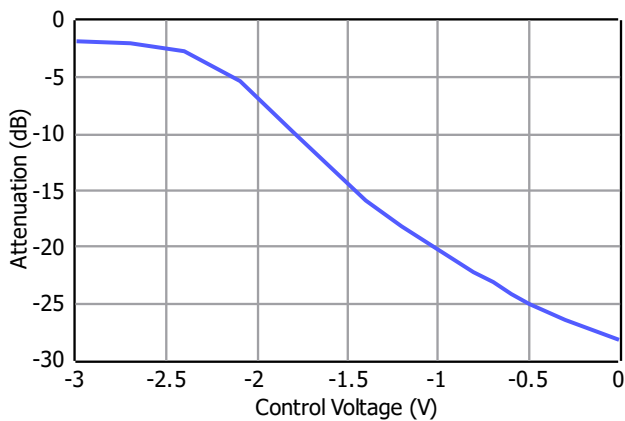
Input Return Loss vs. V_{ctrl1}



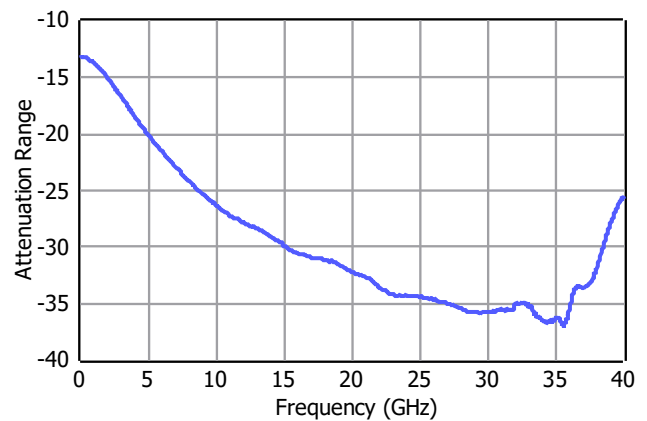
Output Return Loss vs. V_{ctrl1}



Attenuation vs. V_{ctrl1} at 10 GHz



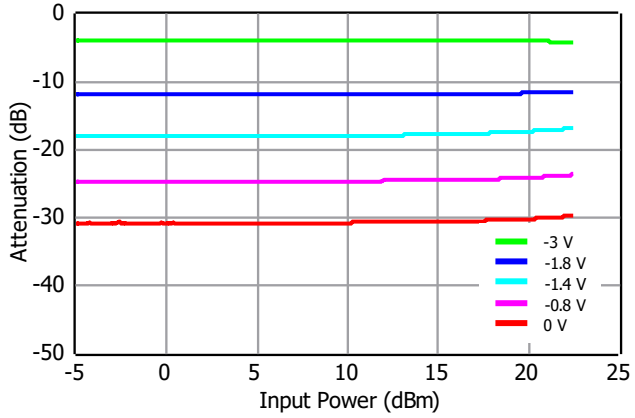
Attenuation Range vs. Frequency



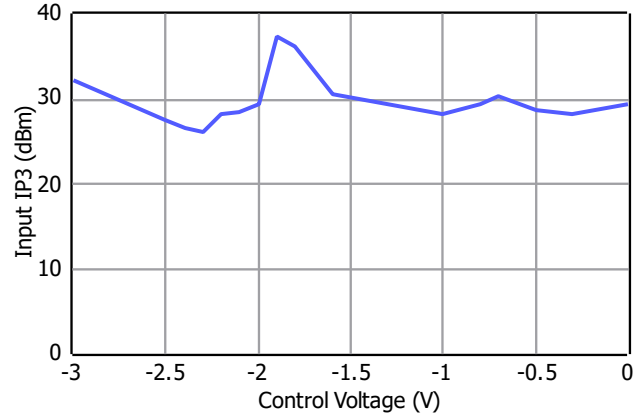
Typical Performance Plots

Conditions unless otherwise specified: $V_{ctrl1}=V_{ctrl2}$, $T=25$ C.

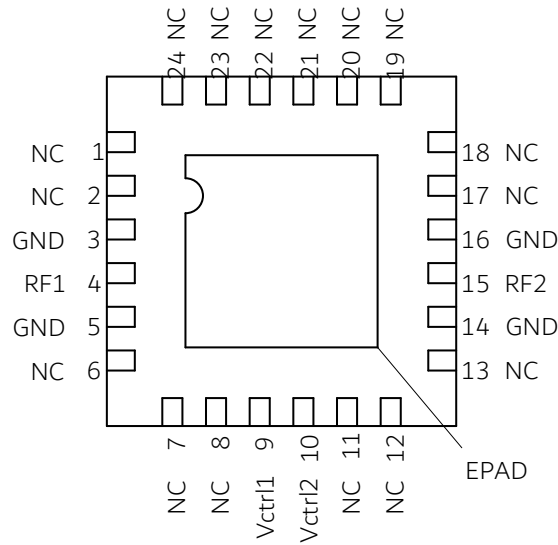
Attenuation vs. Input Power over V_{ctrl} at 12 GHz



Input IP3 vs. V_{ctrl1} at 12 GHz



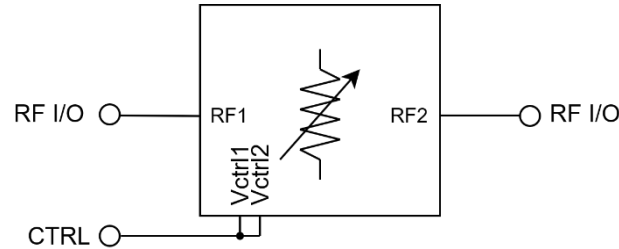
Pin Description



Pin Number	Pin Name	Description
4	RF1	RF input/output pin. If the DC voltage level on RF lines is not equal to 0 V, an external DC block capacitor is required.
15	RF2	RF input/output pin. If the DC voltage level on RF lines is not equal to 0 V, an external DC block capacitor is required.
9	Vctrl1	Control voltage pin.
10	Vctrl2	Control voltage pin.
1-2, 6-8, 11-13, 17-24	NC	These pins are not internally connected. Can be grounded.
3, 5, 14, 16	GND	Ground.
25	EPAD	Exposed Pad on the bottom of the package should be connected to ground with multiple number of vias to reduce the inductance to the GND.

Applications Information

Signal entering from RF1 goes to RF2 with an attenuation level controlled by external control (CTRL) voltage. Typical application schematic to operate the attenuator is given below.



The attenuation level of the voltage variable attenuator is controlled through Vctrl1 and Vctrl2 pins. A voltage level in between -3 V to 0 V can be applied to those pins to set the attenuation level. For ease of use, Vctrl1 and Vctrl2 pins can be shorted, and single CTRL voltage can be applied.

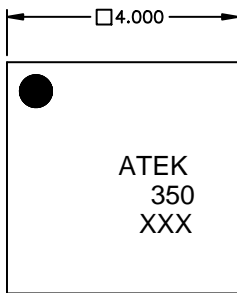
To filter out the ripples and unwanted signals on the external CTRL signal, a low pass filter in series R, shunt C configuration can be implemented on the Vctrl1 and Vctrl2 lines. Note that external RC filtering limits the attenuation switching speed of the attenuator. If filtering the external CTRL signal is of no concern, then the attenuator can be operated without any additional external components.

Absolute Maximum Ratings

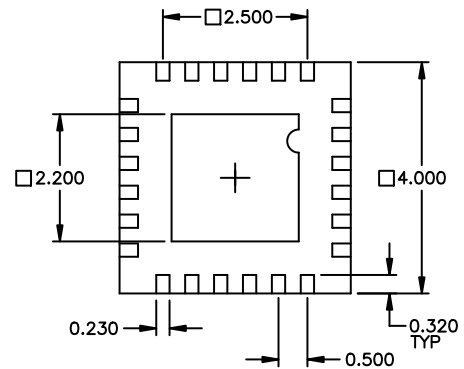
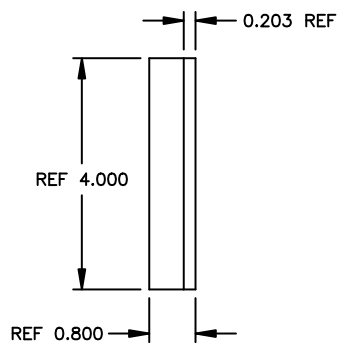
Parameter	Value/Range
Control Voltages (Vctrl1, Vctrl2)	TBD
Supply Current Ictrl1, Ictrl2	TBD
RF Input Power (RF1, RF2)	TBD
Storage Temperature	-55 to +125°C

Operation of this device outside the parameter ranges given above may cause damage. These parameters should not be applied simultaneously.

Mechanical and Marking Information



TOP VIEW



BOTTOM VIEW

NOTES

- MATERIALS:
LEAD FRAME: COPPER
BODY: SEMICONDUCTOR MOLDING EPOXY
- FINISH:
LEAD FRAME: NICKEL GOLD PLATED
- UNLESS OTHERWISE SPECIFIED, RADIUS ON ALL EDGES AND CORNERS = 0.25mm MAX.
- PACKAGE CONFORMS TO JEDEC MO-220.
- DIMENSIONS ARE IN MILLIMETER
- TOLERANCES ARE:
X.XX ±0.15 ANGLES: 1°
X.XXX ±0.050

Handling Precautions



Caution!
ESD-Sensitive Device
Handle Accordingly

Contact Information

For the latest specifications, additional product information, support, and sales.

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Revisions

Revision No	Revision Date	Revision Reason	Section / Page No
1.0	29.01.2021	Initial Version	
1.1	11.07.2021	Drawing Update	3/8, 4/8, 7/8