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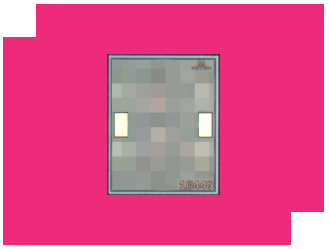
ATN06-0040CH

Passive GaAs MMIC DC - 40 GHz 6dB Attenuator

DEVICE OVERVIEW

General Description

The ATN06-0040CH is part of a family of precision GaAs MMIC fixed attenuators. The ATN06-0040CH provides a nominal 6dB attenuation over a DC-40GHz operating range. These attenuators are an ideal solution for attenuating a signal and they can be used in a wide range of applications. They are ideal for test equipment's protection and signal overload prevention in various RF systems. A 50-ohm match is maintained over the entire operating frequency range.



Download s-parameters here

Features

- 6dB Attenuation
- Additional Attenuation Values Available: 3dB, 10dB, 15dB, 20dB
- Excellent Return Loss

Applications

- Test Equipment
- Precision Characterization
- High Channel Count Systems
- Amplitude Matching
- 5G transceivers

Functional Block Diagram

Part Ordering Options

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification
ATN06-0040CH	Passive GaAs MMIC DC - 40 GHz 6dB Attenuator	CH	RoHS REACH	Released	EAR99

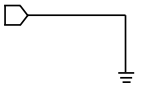
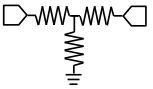
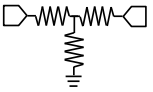
Table Of Contents

Revision History

Revision Code	Revision Date	Comment
-	2026-02-26	Initial Release

Port Configuration and Functions

Port Functions

Port	Function	Description	DC Equivalent Circuit
Pad	Ground	CH package ground path is provided through the substrate and ground bond pads.	
Port 1	Input/Output	Port 1 and port 2 are DC connected to each other and ground through a T-network of resistors.	
Port 2	Input/Output	Port 1 and port 2 are DC connected to each other and ground through a T-network of resistors.	

Specifications

Absolute Maximum Ratings

The Absolute Maximum Ratings indicate limits beyond which damage may occur to the device. If these limits are exceeded, the device may be inoperable or have a reduced lifetime.

Parameter	Maximum Rating	Unit
DC Current at any Port	100	mA
Maximum Operating Temperature	100	°C
Maximum Storage Temperature	125	°C
Minimum Operating Temperature	-55	°C
Minimum Storage Temperature	-65	°C
RF Power Handling	2	W

Package Information

Parameter	Details	Rating
Dimensions	-	0.60 x 0.75 mm

Electrical Specifications

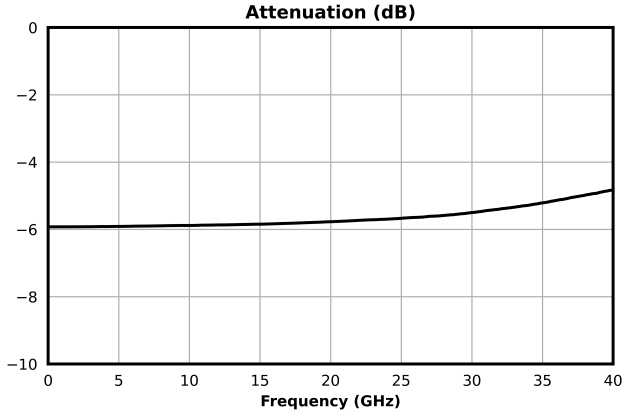
The electrical specifications apply at TA=+25°C in a 50Ω system. Min and Max limits are guaranteed at TA=+25°C. All bare die are 100% visually inspected and RF performance is guaranteed by sample testing.

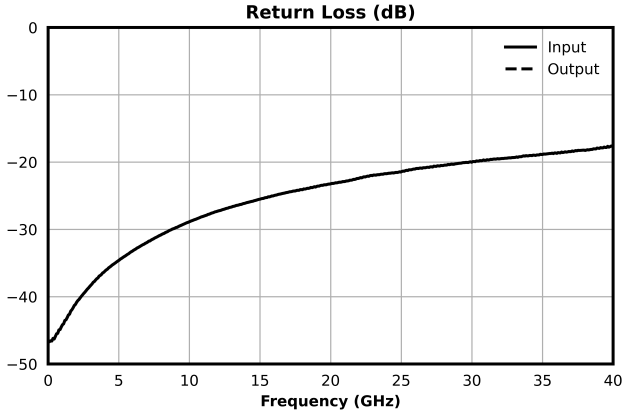
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Attenuation	Configuration A, Temp = 25°C	0	40	-	5.8	-	dB
Attenuation [1]	Configuration A, Temp = 25°C	0	40	-	5.9	-	dB
Return Loss [2]	Configuration A, Temp = 25°C	0	40	-	24	-	dB
Return Loss	Configuration A, Temp = 25°C	0	40	-	23	-	dB
Attenuation Flatness [3]	Configuration A, Temp = 25°C	0	40	-	1.1	-	dB
Attenuation Flatness [4]	Configuration A, Temp = 25°C	0	40	-	1.1	-	dB

[1][2] Includes wirebonds and TL

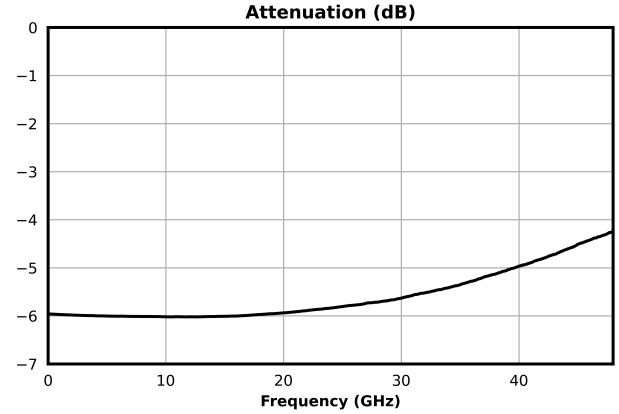
[3][4] Attenuation Flatness = Max(Insertion Loss) - Min(Insertion Loss)

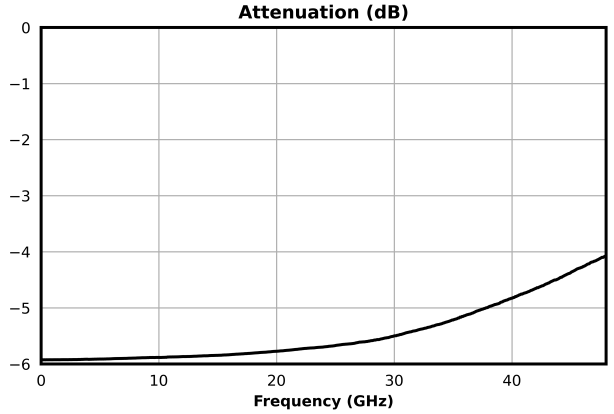
Typical Performance Plot-Bare Die

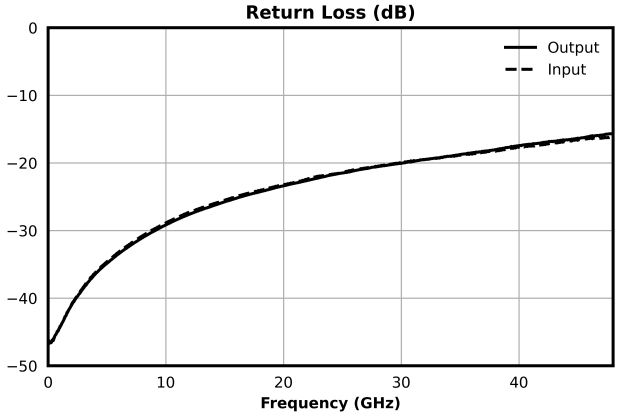


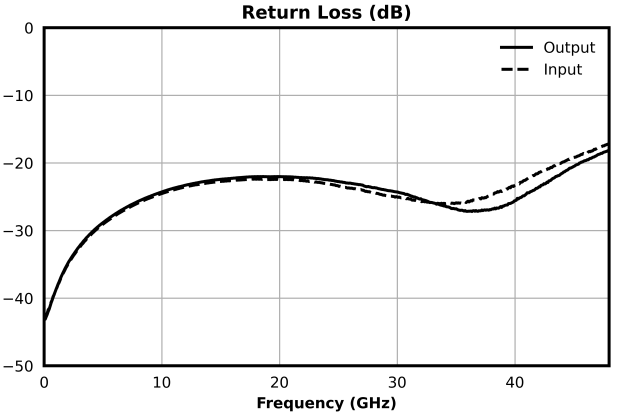


Typical Performance Plot



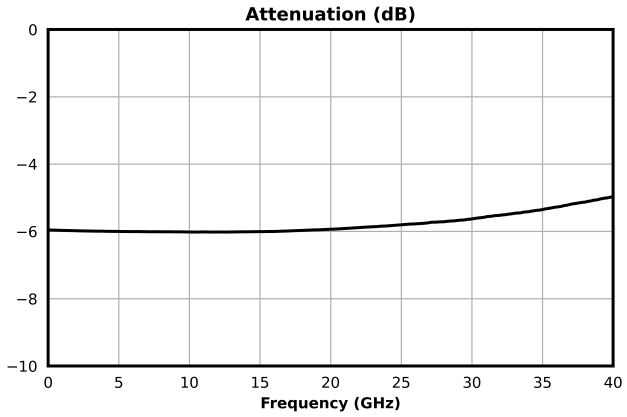


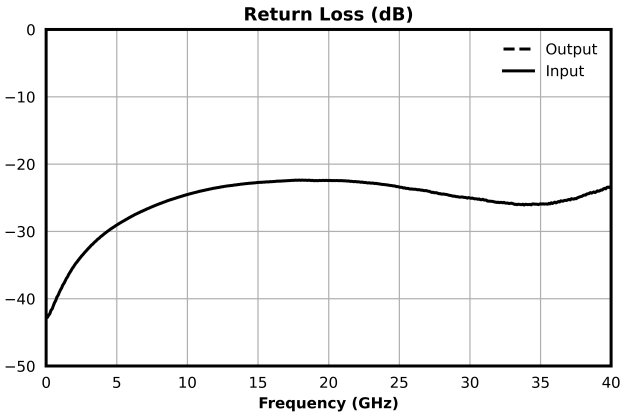




Typical Performance Plot- Transmission Line and Bondwire Effect

The die is connected to Transmission lines with bond wires on both sides.





Die Mounting Recommendations

Mounting and Bonding Recommendations

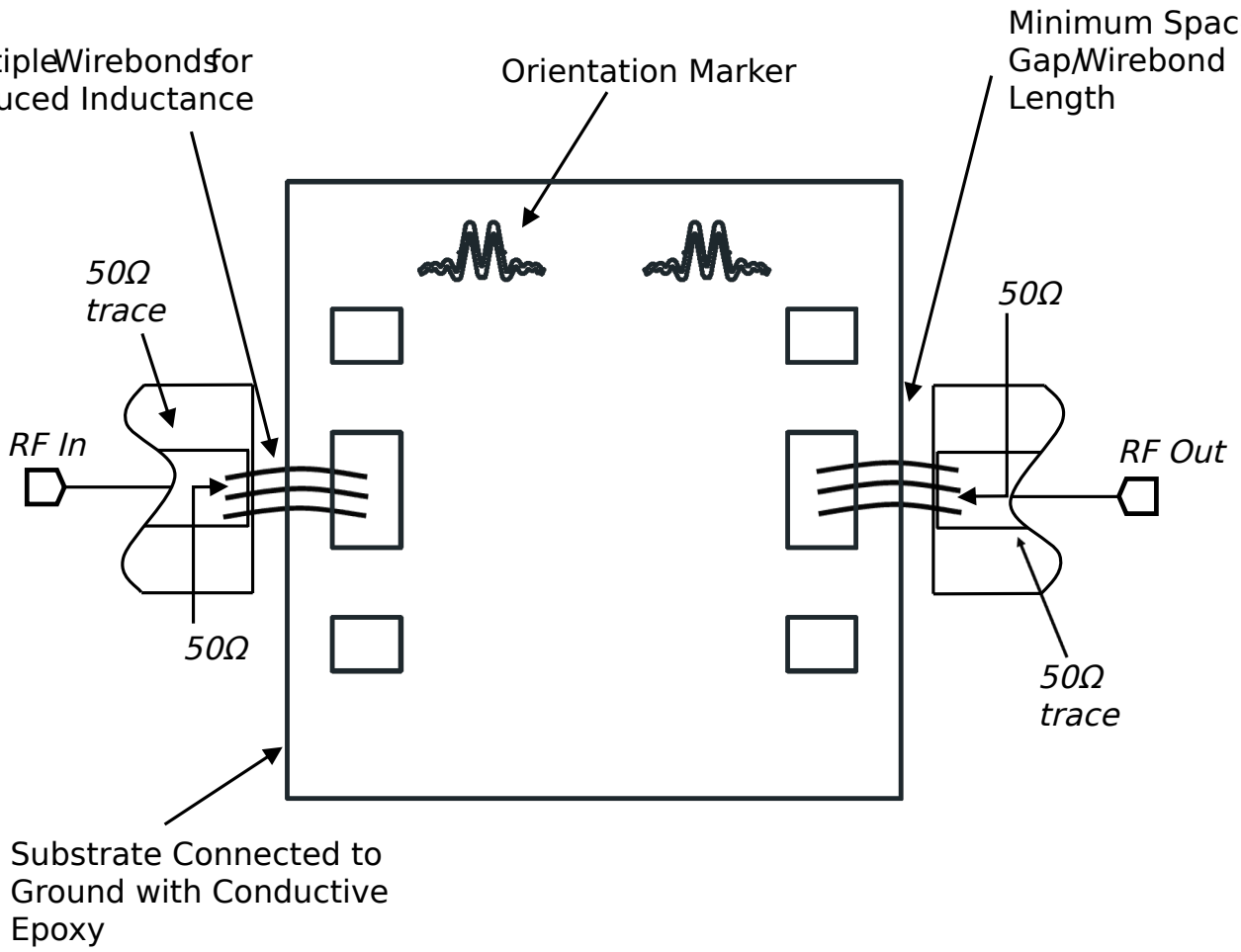
Marki MMICs should be attached directly to a ground plane with conductive epoxy. The ground plane electrical impedance should be as low as practically possible. This will prevent resonances and permit the best possible electrical performance. Datasheet performance is only guaranteed in an environment with a low electrical impedance ground.

Mounting - To epoxy the chip, apply a minimum amount of conductive epoxy to the mounting surface so that a thin epoxy fillet is observed around the perimeter of the chip. Cure epoxy according to manufacturer instructions.

Wire Bonding - Ball or wedge bond with 0.025 mm (1 mil) diameter pure gold wire. Thermosonic wirebonding with a nominal stage temperature of 150 °C and a ball bonding force of 40 to 50 grams or wedge bonding force of 18 to 22 grams is recommended. Use the minimum level of ultrasonic energy to achieve reliable wirebonds. Wirebonds should be started on the chip and terminated on the package or substrate. Bond wire inductance will improve return loss. Bondwire inductance in the range of 30pH to 200pH will improve performance.

Circuit Considerations – 50 Ω transmission lines should be used for all high frequency connections in and out of the chip. Wirebonds should be kept as short as possible, with multiple wirebonds recommended for higher frequency connections to reduce parasitic inductance. In circumstances where the chip more than .001” thinner than the substrate, a heat spreading spacer tab is optional to further reduce bondwire length and parasitic inductance.

Bonding Diagram



Handling Precautions

General Handling
Chips should be handled with care using tweezers or a vacuum collet. Users should take precautions to protect chips from direct human contact that can deposit contaminants, like perspiration and skin oils on any of the chip's surfaces.

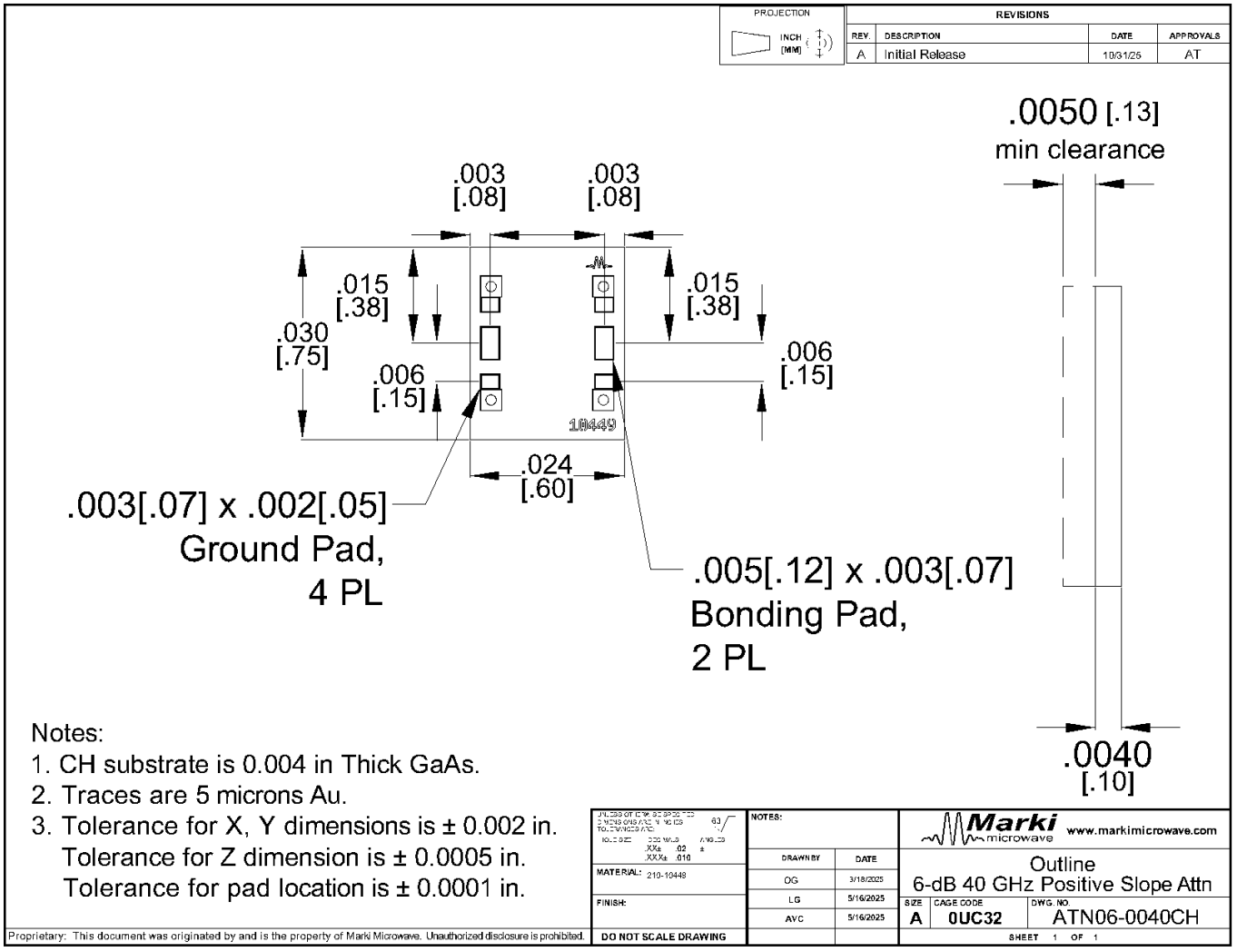
Static Sensitivity
GaAs MMIC devices are sensitive to ESD and should be handled, assembled, tested, and transported only in static protected environments.

Cleaning and Storage: Do not attempt to clean the chip with a liquid cleaning system or expose the bare chips to liquid. Once the ESD sensitive bags the chips are stored in are opened, chips should be stored in a dry nitrogen atmosphere.

Mechanical Data

Outline Drawing

Download : Outline 2D Drawing



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