

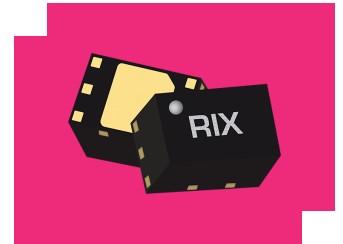
ATD20-0040PSM

20dB DC - 40GHz MMIC Differential Attenuator

DEVICE OVERVIEW

General Description

The ATD20-0040PSM is a surface mount GaAs MMIC 20dB differential attenuator housed in a DFN package. This attenuator is an ideal solution for attenuating differential signals and can be used in a wide range of applications. The compact DFN package allows for extreme miniaturization of SMT footprints. GaAs MMIC technology provides consistent unit-to-unit performance in a small, low-cost form factor. A 50-ohm match is maintained over the entire operating frequency range.



[Download s-parameters here](#)

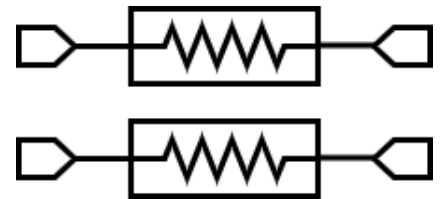
Features

- Small 1.3 x 2.0 mm Package Size
- 20dB Attenuation From DC to 40 GHz
- 23dB Typical Return Loss Over Operating Band

Applications

- Test Equipment
- Electronic Warfare
- Radar and satellite communications
- High Channel Count Systems

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification
ATD20-0040PSM	20dB DC - 40GHz MMIC Differential Attenuator	DFN	REACH RoHS	Pre-release	EAR99

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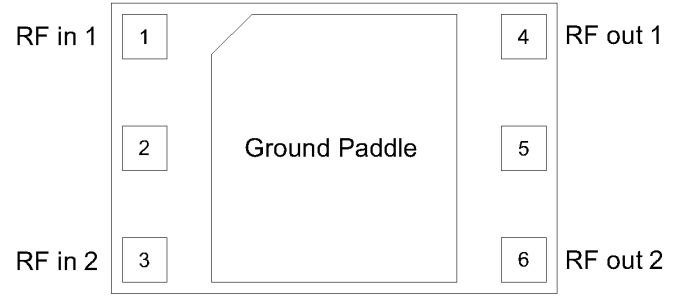
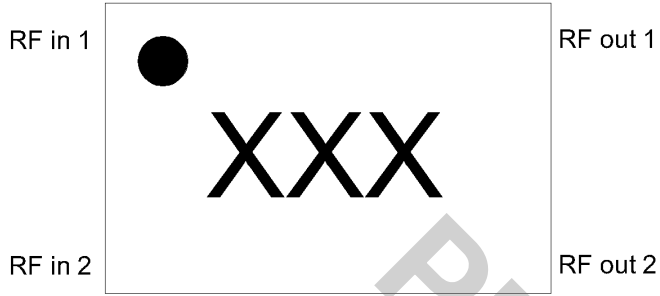
Revision History

Revision Code	Revision Date	Comment
G0	2025-10-17	Pre-release

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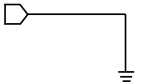
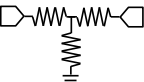

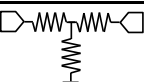
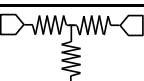
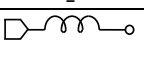
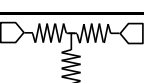
Port Configuration and Functions

Port Diagram



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Port Functions

Port	Function	Description	DC Equivalent Circuit
Ground Paddle	Gnd	Ground paddle should be connected to RF ground	
Pin 1	Input/Output 1	Pin 1 and Pin 4 are DC connected to each other and ground through a T-network of resistors.	
Pin 2	Non-connect (NC)	Pin 2 is not connected internally and should be tied to RF ground.	
Pin 3	Input/Output 2	Pin 3 and Pin 6 are DC connected to each other and ground through a T-network of resistors.	
Pin 4	Input/Output 1	Pin 4 and Pin 1 are DC connected to each other and ground through a T-network of resistors.	
Pin 5	Non-connect (NC)	Pin 5 is not connected internally and should be tied to RF ground.	
Pin 6	Input/Output 2	Pin 6 and Pin 3 are DC connected to each other and ground through a T-network of resistors.	

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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
Maximum Operating Temperature	100	°C
Maximum Storage Temperature	125	°C
Minimum Operating Temperature	-55	°C
Minimum Storage Temperature	-65	°C
DC Current	48	mA
RF Power Handling	1.5	W

Power handling tested with a continuous wave at 18GHz.

Package Information

Parameter	Details	Rating
ESD	250 to < 500 Volts	HBM Class 1A
Dimensions	-	2.0 x 1.3 mm
Moisture Sensitivity Level	-	MSL 1

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Electrical Specifications

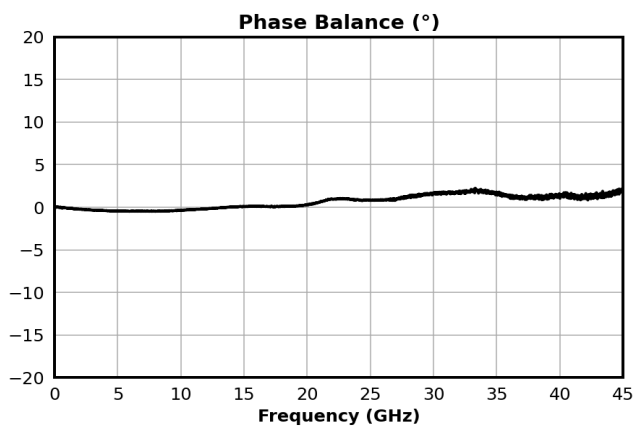
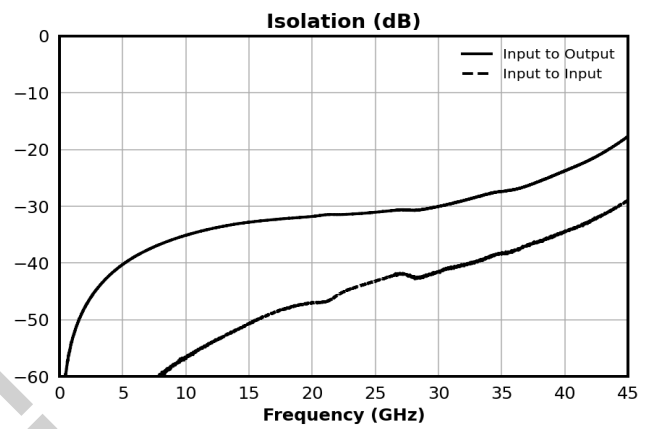
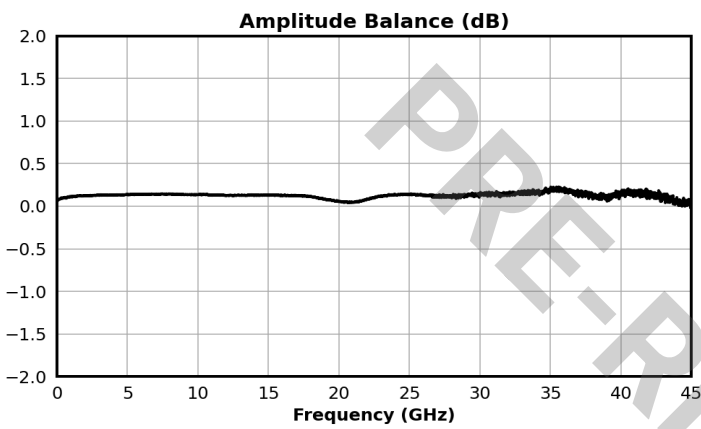
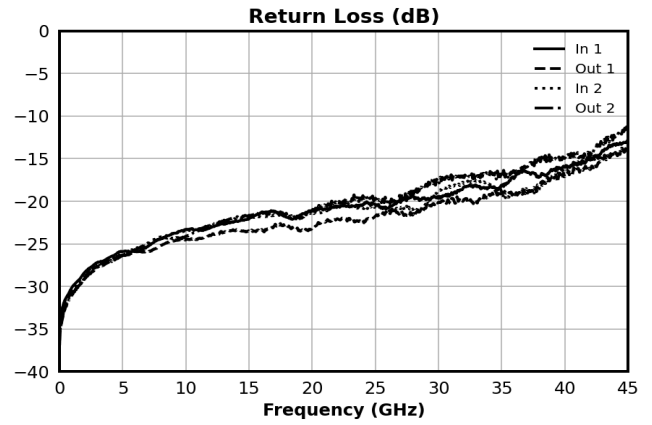
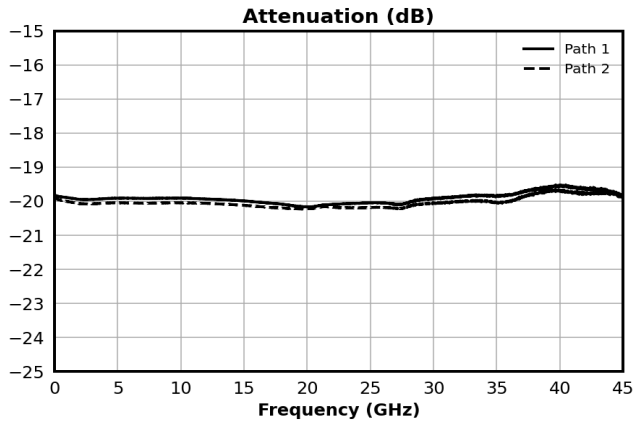
The electrical specifications apply at TA=+25°C in a 50Ω system. Min and Max limits are guaranteed at TA=+25°C. Attenuation paths 1 and 2 are symmetrical and have the same typical performance.

Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Attenuation	Configuration A, Temp = 25°C	0	40	-	19.9	-	dB
Return Loss	Configuration A, Temp = 25°C	0	40	-	23	-	dB
Attenuation Flatness ¹	Configuration A, Temp = 25°C	0	40	-	0.7	-	dB
Phase Balance	-	0	40	-	0.7	-	°
Amplitude Balance	-	0	40	-	0.1	-	dB

^[1] Attenuation Flatness = Max(Insertion Loss) - Min(Insertion Loss)

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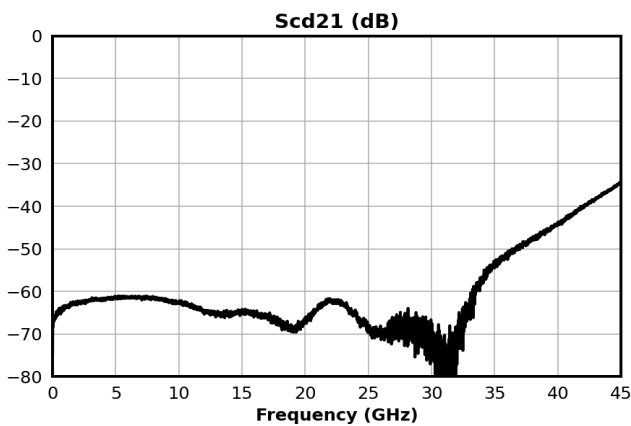
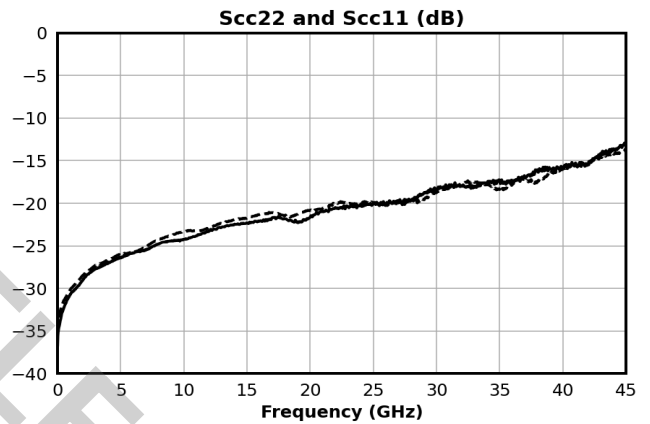
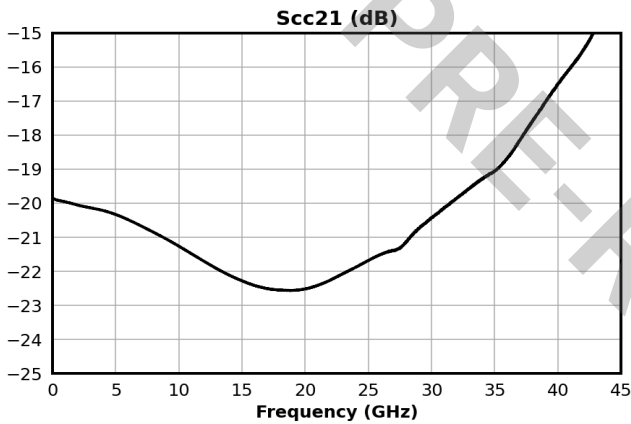
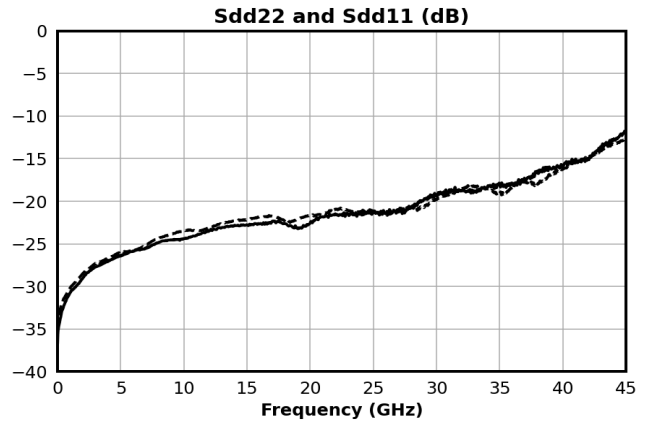
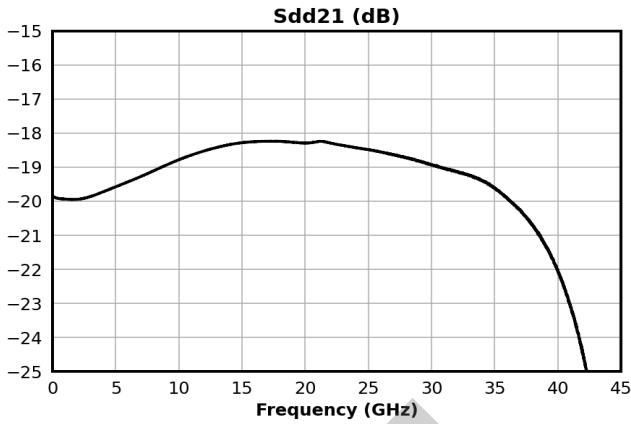
Typical Performance Plot



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Typical Mixed Mode Performance Plots

Mixed mode scattering parameters are used to characterize differential circuits. For differential attenuators this means that the 2 input ports become a single 100Ω differential port and the 2 output ports become a single 100Ω differential port. The two-port s-parameters of the differential attenuators are then characterized based on differential (d) signals.

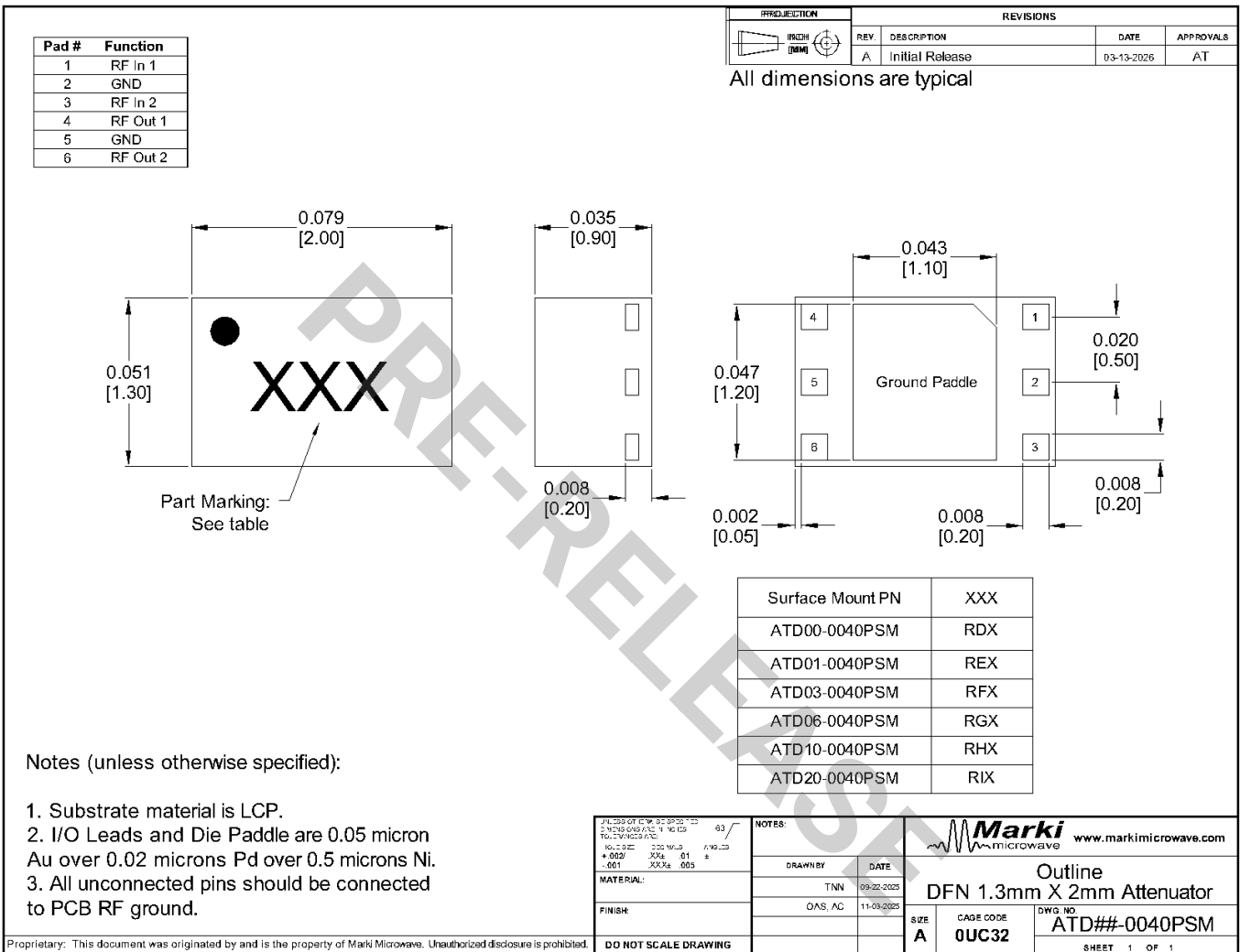


Measured data is de-embedded from fixture using AFR.

Mechanical Data

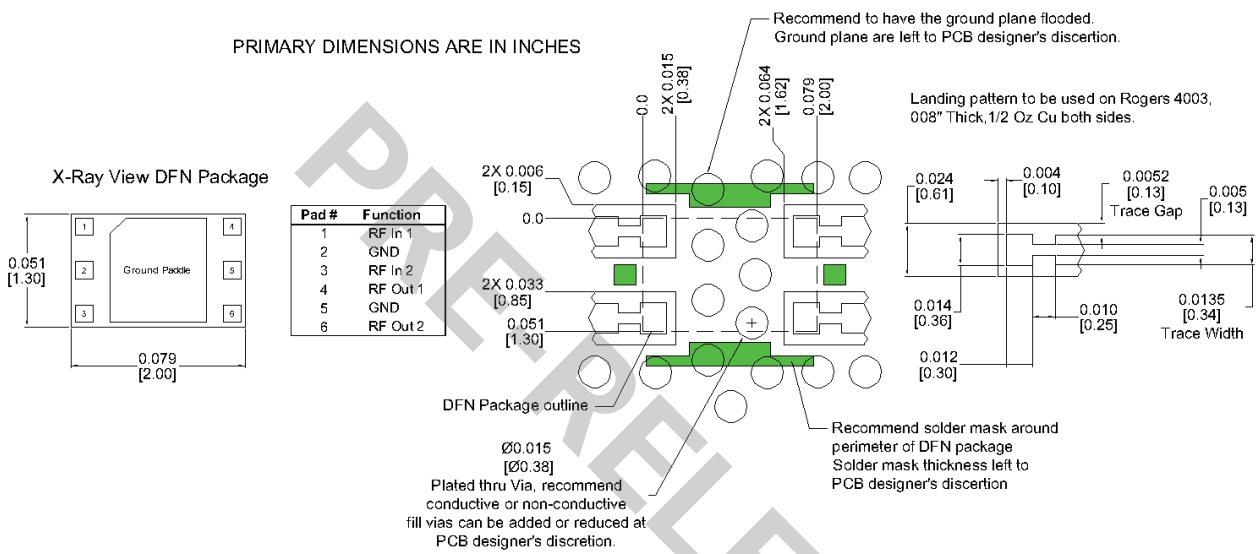
Outline Drawing

Download : [Outline 2D Drawing](#) | [Outline 3D Drawing](#) | [Outline 3D STP](#)

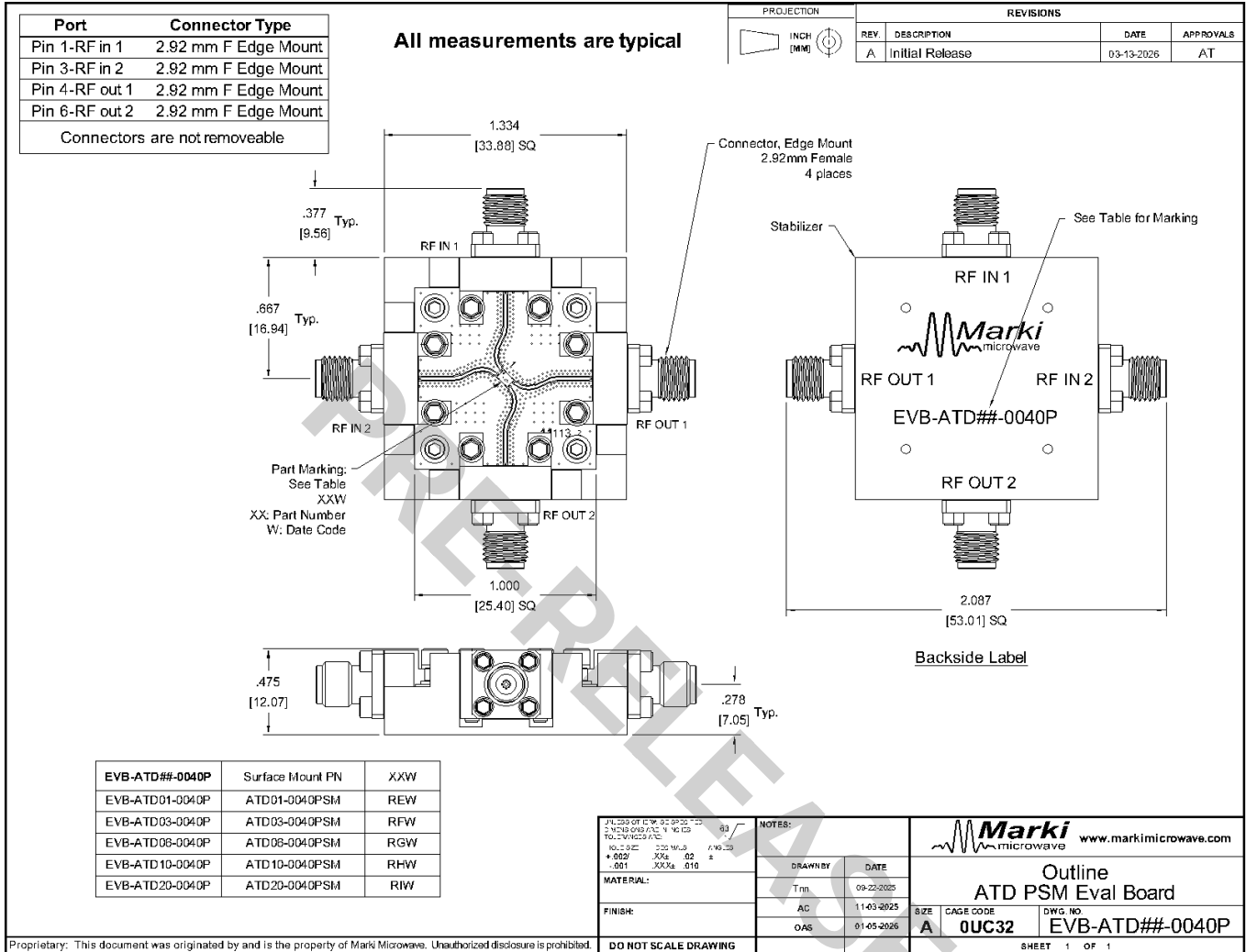


Footprint Image

Download : [Footprint Drawing](#)



Evaluation Board - Outline Drawing



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