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Sales & Customer Support: sales@markimicrowave.com
Tech Support: support@markimicrowave.com

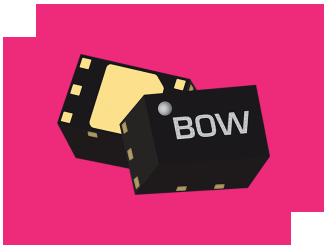
MBAL-0214PSM

2 - 14 GHz MMIC Isolation Balun

DEVICE OVERVIEW

General Description

The MBAL-0214PSM is a GaAs passive MMIC balun in a DFN surface mount package. This high isolation balun features excellent amplitude and phase balance across its 2 to 14 GHz frequency range and offers a 2:1 impedance ratio. The compact DFN package allows for extreme miniaturization of SMT footprints. The MBAL-0214PSM is an excellent choice for balanced amplifiers, clock distribution, and higher order Nyquist sampling in analog to digital converters.



Download s-parameters here

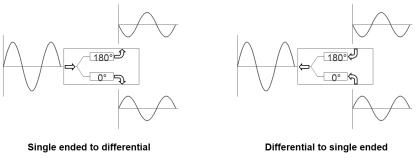
Features

- 2:1 Impedance Ratio
- 2 to 14 GHz Balun (Balanced to Unbalanced Transformer)
- Insertion Loss as a Mode Converter, 2.1 dB Typical
- Common Mode Rejection, 32 dB Typical

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
MBAL-0214PSM	2 - 14 GHz MMIC Isolation Balun	DFN	REACH RoHS	Released	EAR99
EVB-MBAL-0214P	Evaluation Board, 2-14 GHz Passive MMIC DFN Package Balun	EVB	REACH RoHS	Released	EAR99

Table Of Contents

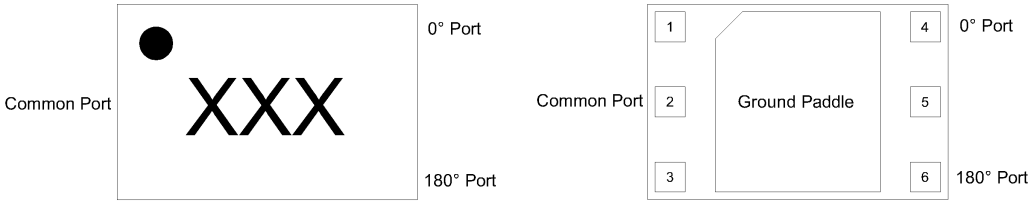
Revision History

Revision Code	Revision Date	Comment
-	2026-02-24	Initial Release

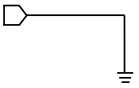
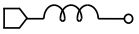
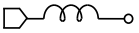
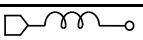
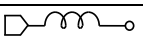
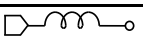
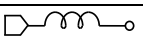
Port Configuration and Functions

Port Diagram

An X-ray top-down view of the MBAL-0214PSM package outline drawing is shown below. The MMIC Baluns are passive reciprocal devices allowing either signal splitting or combining.



Port Functions

Port	Function	Description	DC Equivalent Circuit
Ground Paddle	Gnd	Ground paddle should be connected to RF ground	
Pin 1	Non-connect (NC)	Pin 1 is not connected internally and should be tied to RF ground.	
Pin 2	Common	Pin 2 is the common input/output port. It is DC open to ground.	
Pin 3	Non-connect (NC)	Pin 3 is not connected internally and should be tied to RF ground.	
Pin 4	Input/Output 1	Pin 4 is an input/output port. It is DC open to ground.	
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 is an input/output port. It is DC open to ground.	

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

Package Information

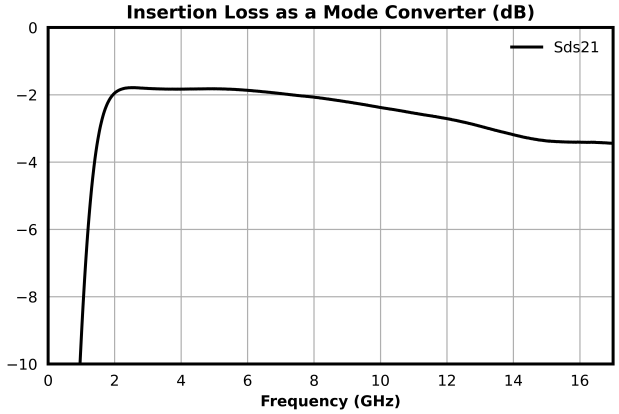
Parameter	Details	Rating
ESD	250 to < 500 Volts	HBM Class 1A
Dimensions	-	2.0 x 1.3 mm
Moisture Sensitivity Level	-	MSL 1

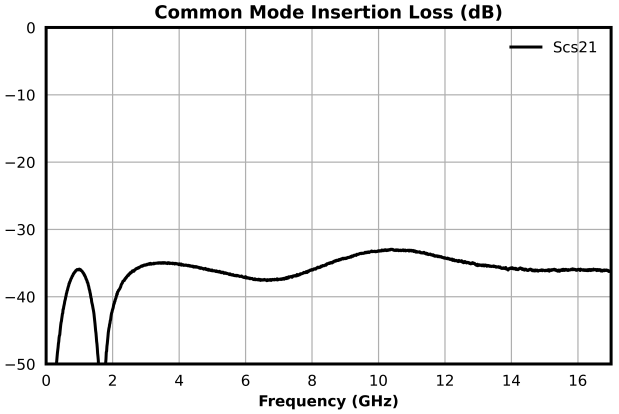
Electrical Specifications

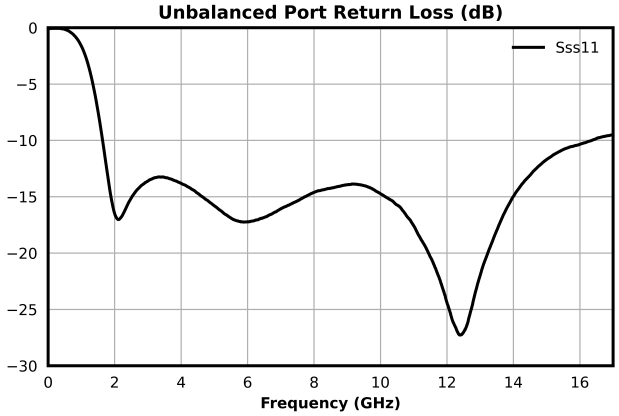
The electrical specifications apply at TA=+25°C in a 50Ω system. Min and Max limits are guaranteed at TA=+25°C.

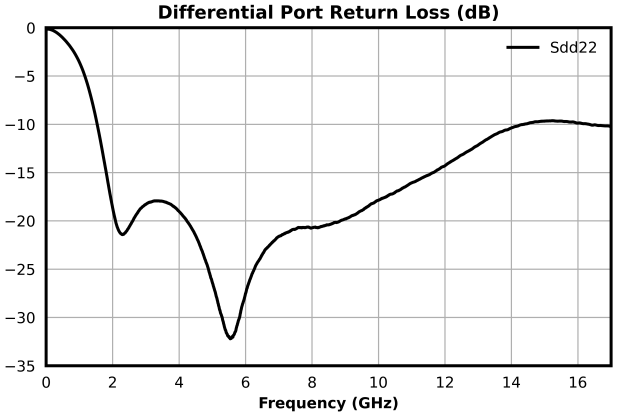
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Insertion Loss as a Mode Converter	Configuration A, Temp = 25°C	2	14	-	2.1	-	dB
Nominal Phase Shift	Configuration A, Temp = 25°C	-	-	-	180	-	°
Common Port Return Loss	Configuration A, Temp = 25°C	2	14	-	16	-	dB
Common Mode Return Loss	Configuration A, Temp = 25°C	2	14	-	6	-	dB
Output Return Loss	Configuration A, Temp = 25°C	2	14	-	13	-	dB
Isolation	Configuration A, Temp = 25°C	2	14	-	11	-	dB
Amplitude Balance	Configuration A, Temp = 25°C	2	14	-	0.3	-	dB
Phase Balance	Configuration A, Temp = 25°C	2	14	-	1.9	-	°
Common Mode Rejection	Configuration A, Temp = 25°C	2	14	-	32	-	dB
Impedance	Configuration A, Temp = 25°C	-	-	-	50	-	Ω
Impedance Ratio	-	2	14	-	2:1	-	

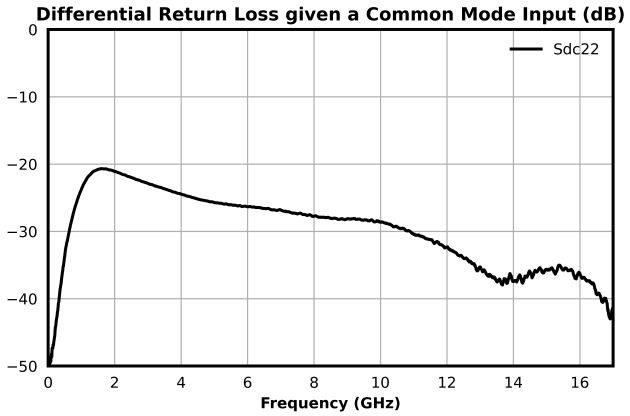
Mixed Mode Scattering Parameters

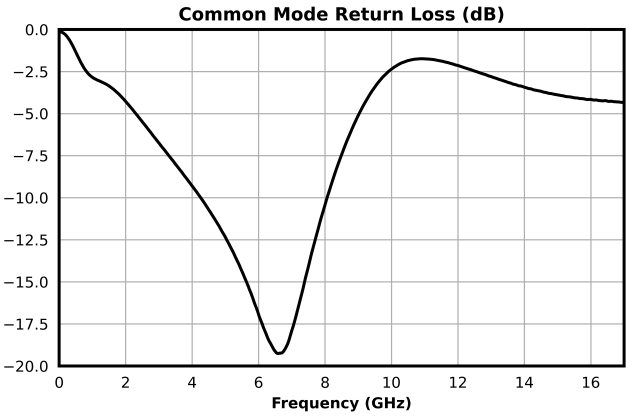




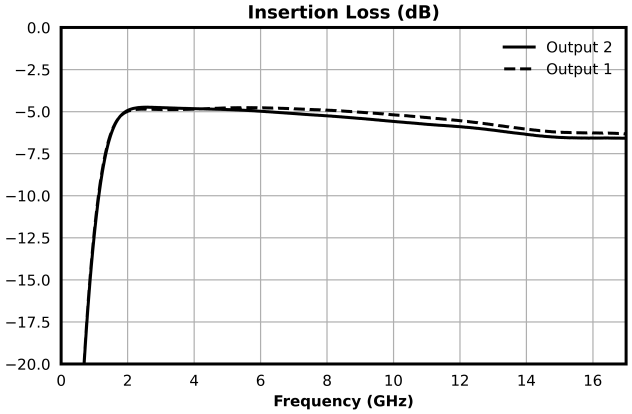


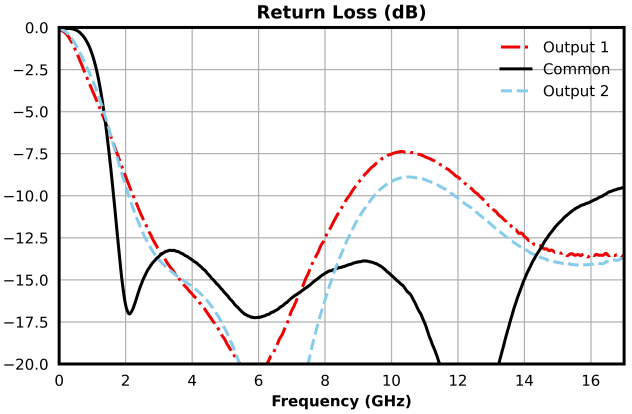


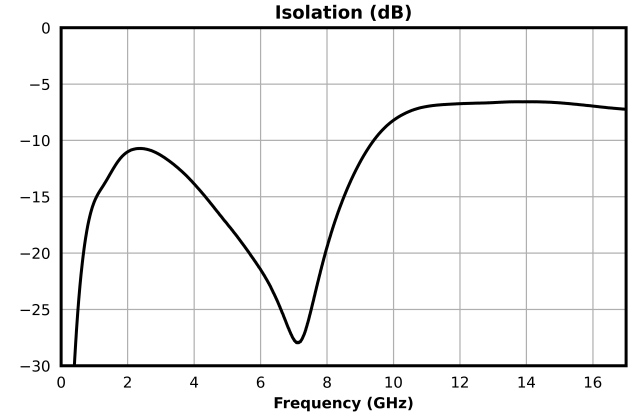


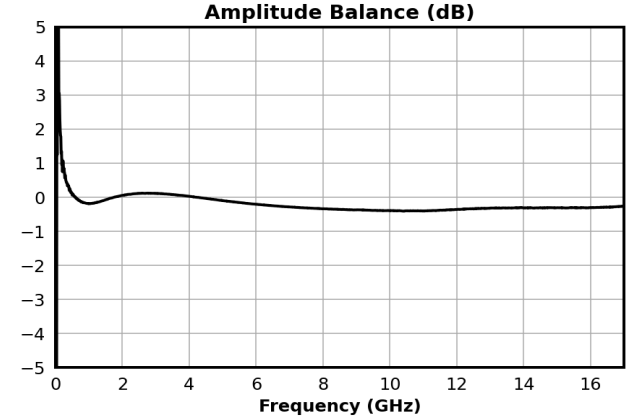


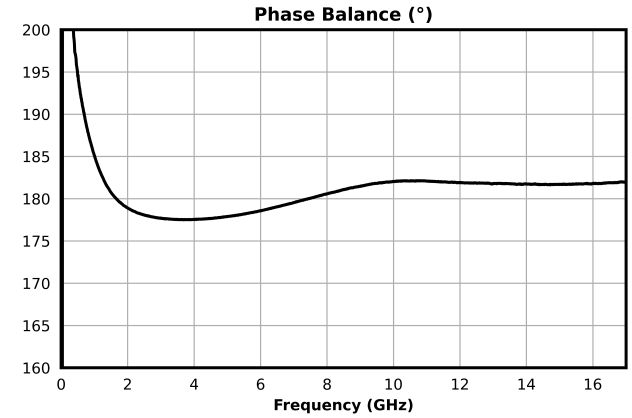
Typical Performance Scattering Parameters

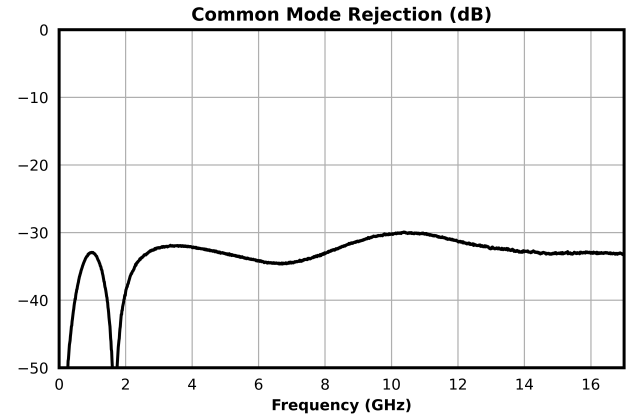










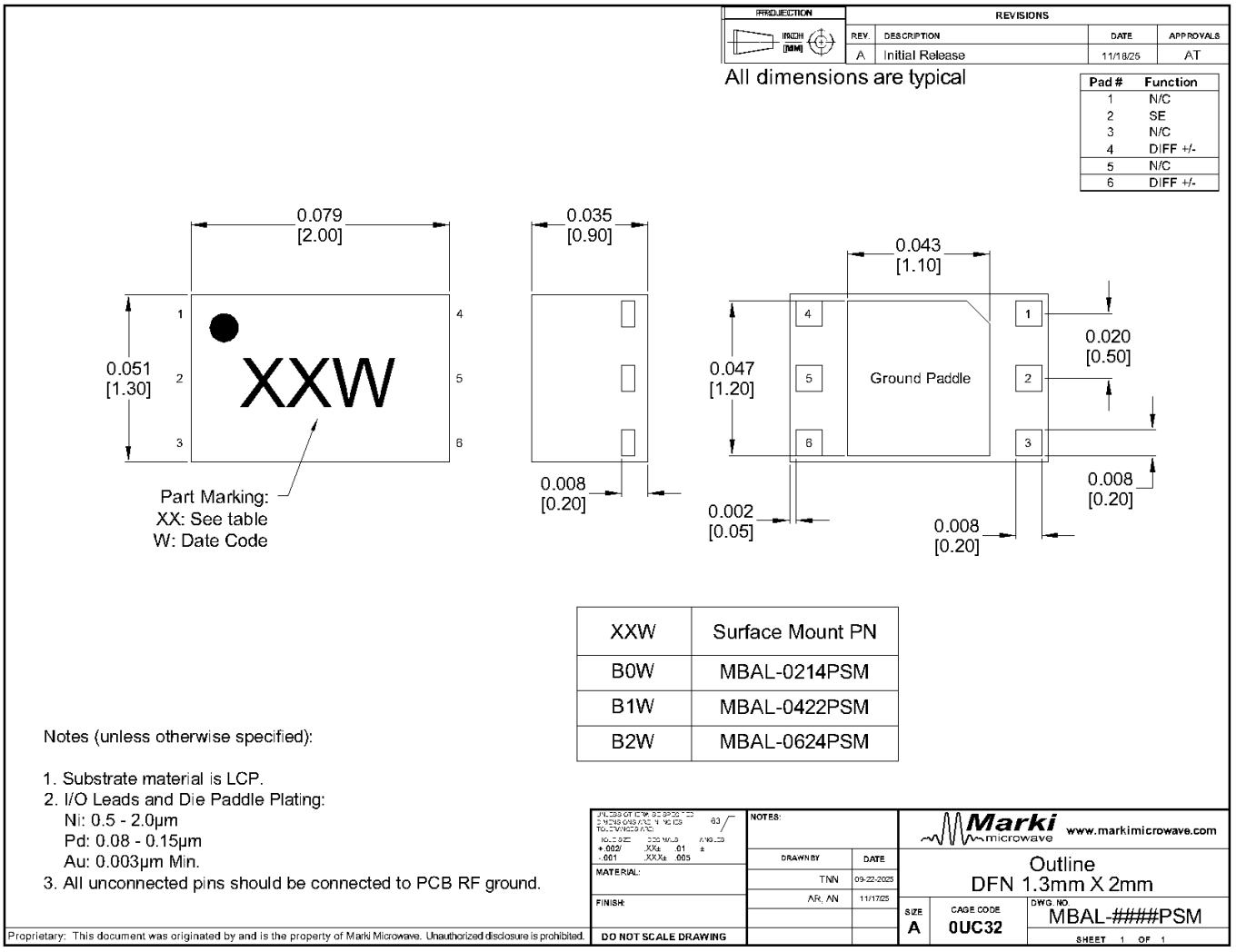


Measured data is de-embedded from fixture using AFR.

Mechanical Data

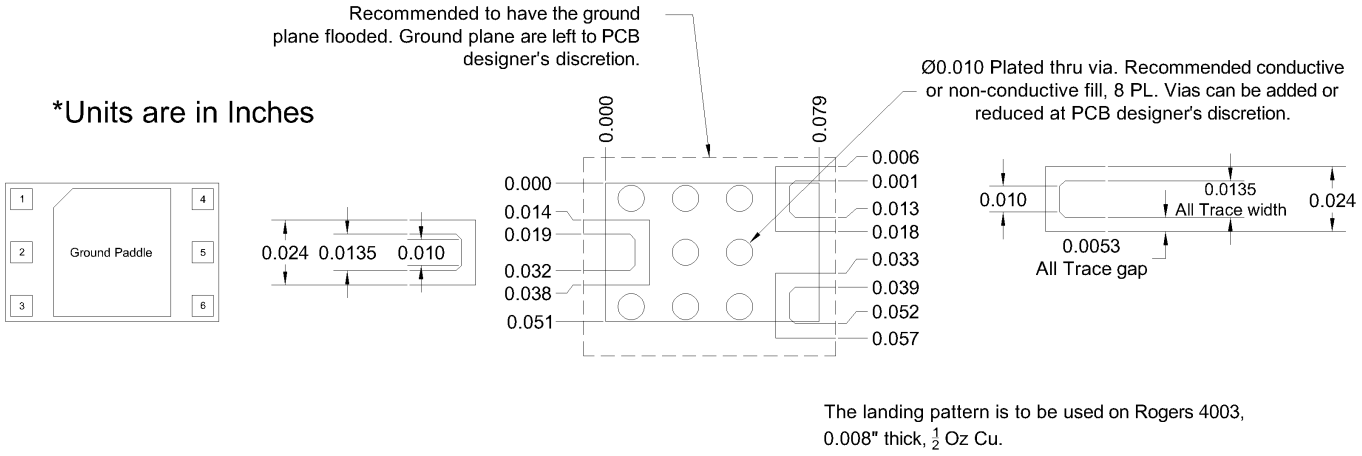
Outline Drawing

Download : Outline 2D Drawing | Outline 3D Drawing | Outline 3D STP



Footprint Image

Download : Footprint Drawing



The landing pattern is to be used on Rogers 4003, 0.008" thick, $\frac{1}{2}$ Oz Cu.

Evaluation Board - Outline Drawing

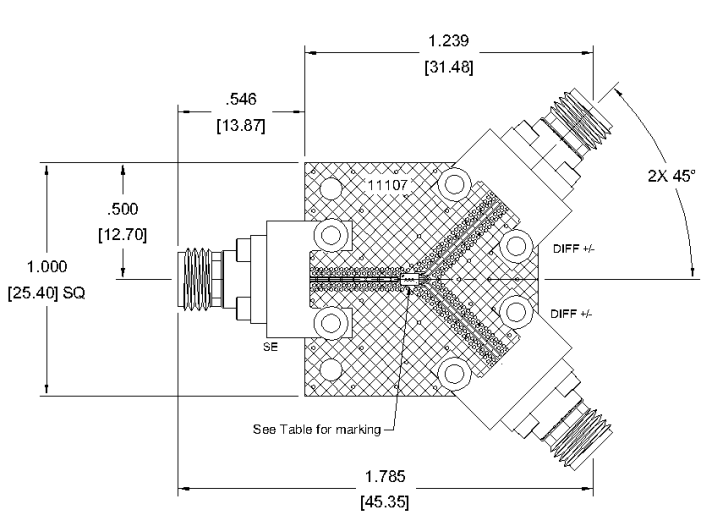
Port	Connector Type
RF in	2.92 mm F Edge Mount
RF out	2.92 mm F Edge Mount
RF out	2.92 mm F Edge Mount

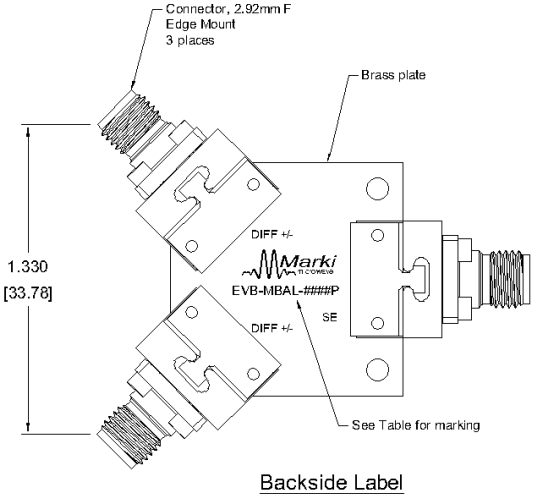
Connectors are not removeable

All measurements are typical

PROJECTION: INCH [MM]

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVALS
A	Initial Release	11/18/25	AT





Backside Label

EVB-MBAL-####P	Surface Mount PN	XXX
EVB-MBAL-0214P	MBAL-0214PSM	B0X
EVB-MBAL-0422P	MBAL-0422PSM	B1X
EVB-MBAL-0624P	MBAL-0624PSM	B2X

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACTIONS ±1/64, .XX ±.02, .XXX ±.010, ANGLES ±1°

MATERIAL:

FINISH:

DO NOT SCALE DRAWING

NOTES:

DRAWN BY	DATE
Tnn	09/22/2025
AR	11/17/25
AN	11/17/25

Marki microwave www.markimicrowave.com

Outline,
MBAL PSM Eval Board

SIZE	CAGE CODE	DWG. NO.
A	0UC32	EVB-MBAL-####P

SHEET 1 OF 1

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