

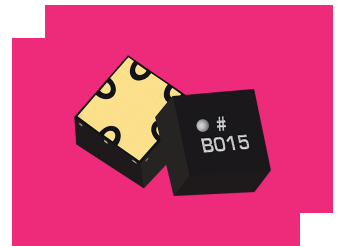
MBAL-0250CSP2

2-50 GHz Passive MMIC Chip Scale Package 1:2 Balun

DEVICE OVERVIEW

General Description

The MBAL-0250CSP2 is a GaAs passive MMIC 2:1 balun that features excellent 35 dB common mode rejection over a 2 to 50 GHz operational bandwidth. This device is an ideal solution for digital beamforming and other higher-order Nyquist sampling applications, as well as clock distribution and balanced amplifier interfaces. Available in a lead-free, RoHS compliant 2.5 x 2.5 mm CSP2 package, it is compatible with standard pick-and-place assembly processes.



[Download s-parameters here](#)

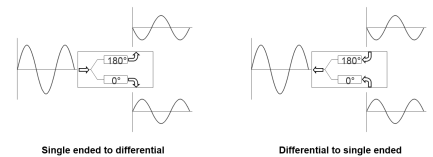
Features

- 2 GHz to 50 GHz
- 2:1 Balun (50Ω Common to 100Ω Differential)
- Optimal Phase and Amplitude Balance of 2° and 0.3 dB
- 35 dB Common Mode Rejection
- Compact 2.5mm chip scale package
- This product embodies Marki Microwave's U.S. Pat. 11,869,858.

Applications

- Balanced Receivers
- Signal Integrity
- Analog to Digital Converters
- Balanced Amplifiers
- Clock Distribution

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification
MBAL-0250CSP2	2-50 GHz Passive MMIC Chip Scale Package 1:2 Balun	CSP2	REACH RoHS	Released	EAR99
EVB-MBAL-0250	Evaluation Board, 2-50 GHz Passive MMIC Chip Scale Package 1:2 Balun	EVB	REACH RoHS	Released	EAR99

Table Of Contents

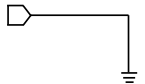
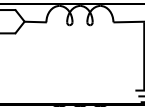
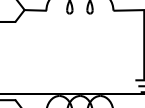
- **Device Overview**
 - General Description
 - Features
 - Applications
 - Functional Block Diagram
- **Port Configuration and Functions**
 - Port Functions
- **Revision History**
- **Specifications**
 - Absolute Maximum Ratings
 - Package Information
 - Electrical Specifications
 - Mixed Mode Scattering Parameters
 - Generated Performance Plot
 - Typical Performance Scattering Parameters
- **Mechanical Data**
 - Outline Drawing
- **Footprint Image**
- **Evaluation Board**
 - Evaluation Board - Performance Data
 - Evaluation Board Outline Drawing

Revision History

Revision Code	Revision Date	Comment
-	2025-06-04	Initial Release
A	2026-06-03	Updated Port Description

Port Configuration and Functions

Port Functions

Port	Function	Description	DC Equivalent Circuit
GND	Ground	Ground pad should be connected to RF/DC ground with low electrical and thermal resistance.	
Pin 1	Common Port / In (Unbalanced)	The common port is DC open.	
Pin 3	Out 1 / 0° Port (Balanced)	The 0° port is DC short to ground.	
Pin 4	Out 2 / 180° Port (Balanced)	The 180° port is DC short to ground.	
Pins 2,5	NC	Pins 2 and 5 are not internally connected. They can be connected to ground for normal operation.	

Specifications

Absolute Maximum Ratings

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	-	2.50 x 2.50 mm
Moisture Sensitivity Level	-	MSL 1

MBAL-0250CSP2

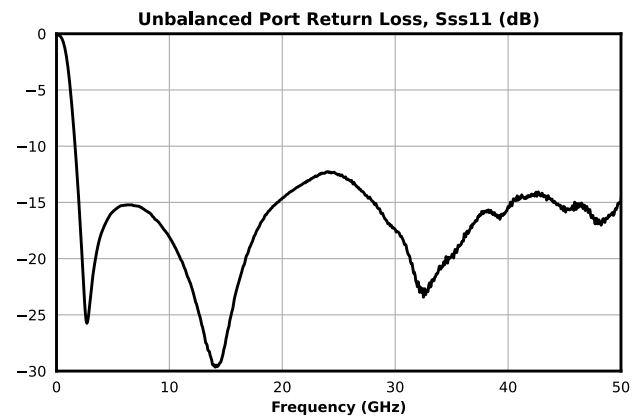
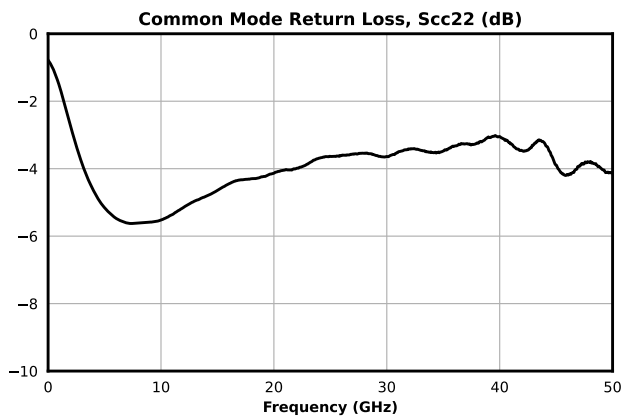
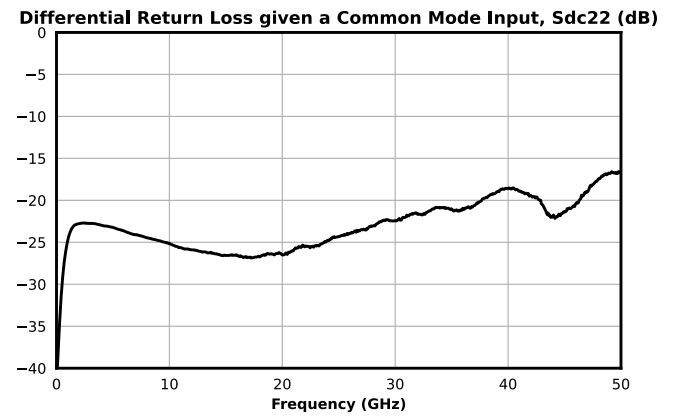
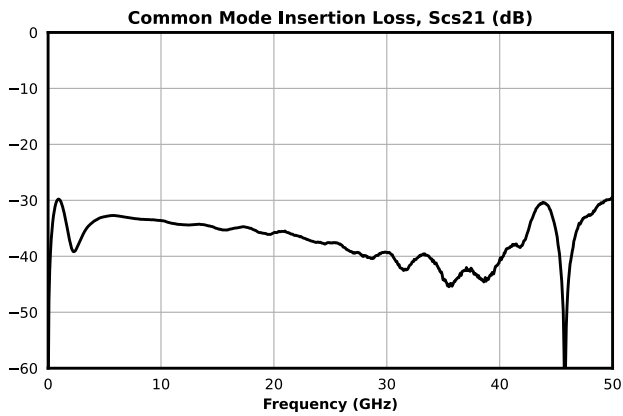
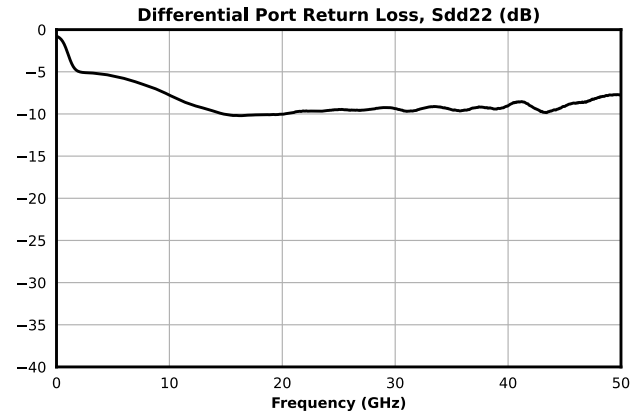
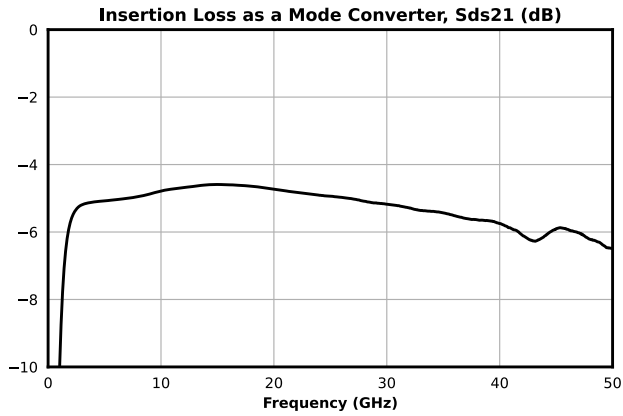
2-50 GHz Passive MMIC Chip Scale Package 1:2 Balun

Electrical Specifications

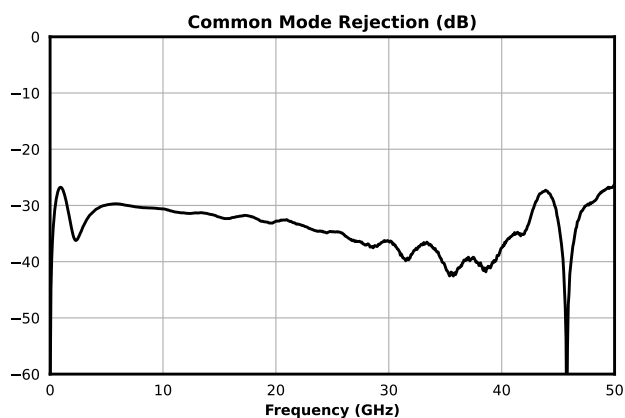
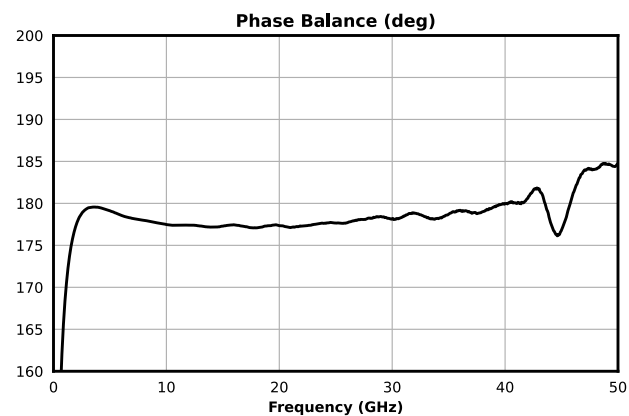
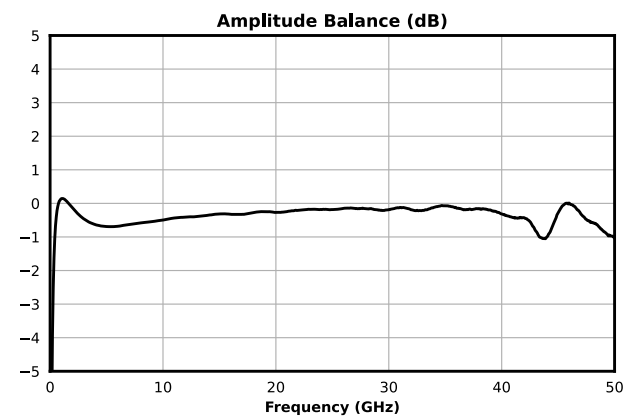
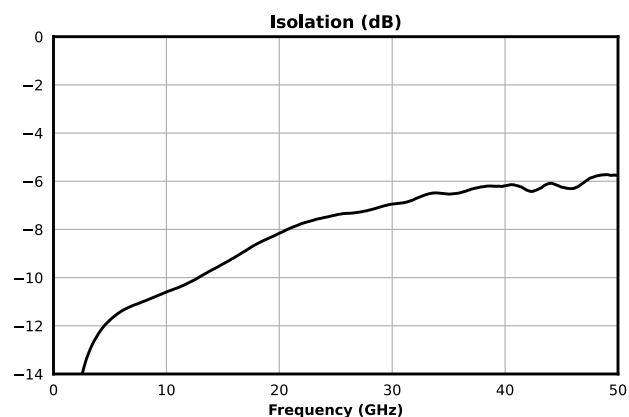
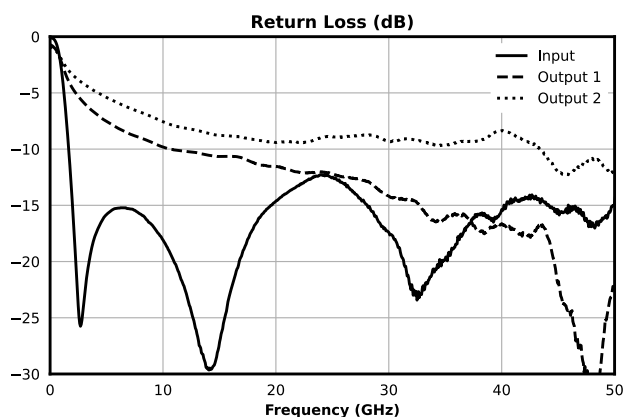
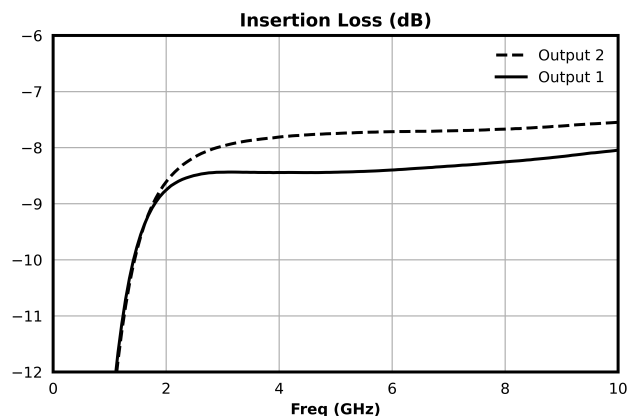
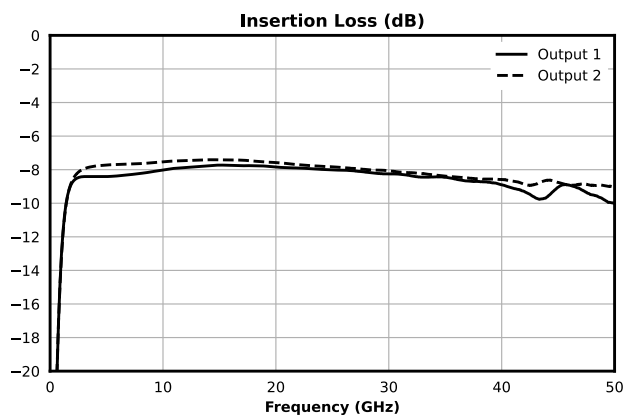
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Amplitude Balance	25°C	2	50	-	0.3	-	dB
Common Mode Rejection	25°C	2	50	-	35	-	dB
Common Port Return Loss	25°C	2	50	-	16	-	dB
Impedance	25°C	2	50	-	50	-	Ω
Insertion Loss as a Mode Converter	25°C	2	50	-	5.3	-	dB
Isolation	25°C	2	50	-	7	-	dB
Nominal Phase Shift	25°C	2	50	-	180	-	°
Output Return Loss	25°C	2	50	-	9	-	dB
Phase Balance	25°C	2	50	-	2.1	-	°
Impedance Ratio	-	-	-	-	2:1	-	-

Mixed Mode Scattering Parameters

Mixed mode scattering parameters are used to characterize differential circuits. For baluns, this means that the 0° and 180° ports become a single 100Ω differential port and the common port remains the same 50Ω common port. The two-port s-parameters of the balun are then characterized based on differential (d), common mode (c), or single-ended (s) signals. For example: Scs12 is the Common output response given a single ended input.



Typical Performance Scattering Parameters



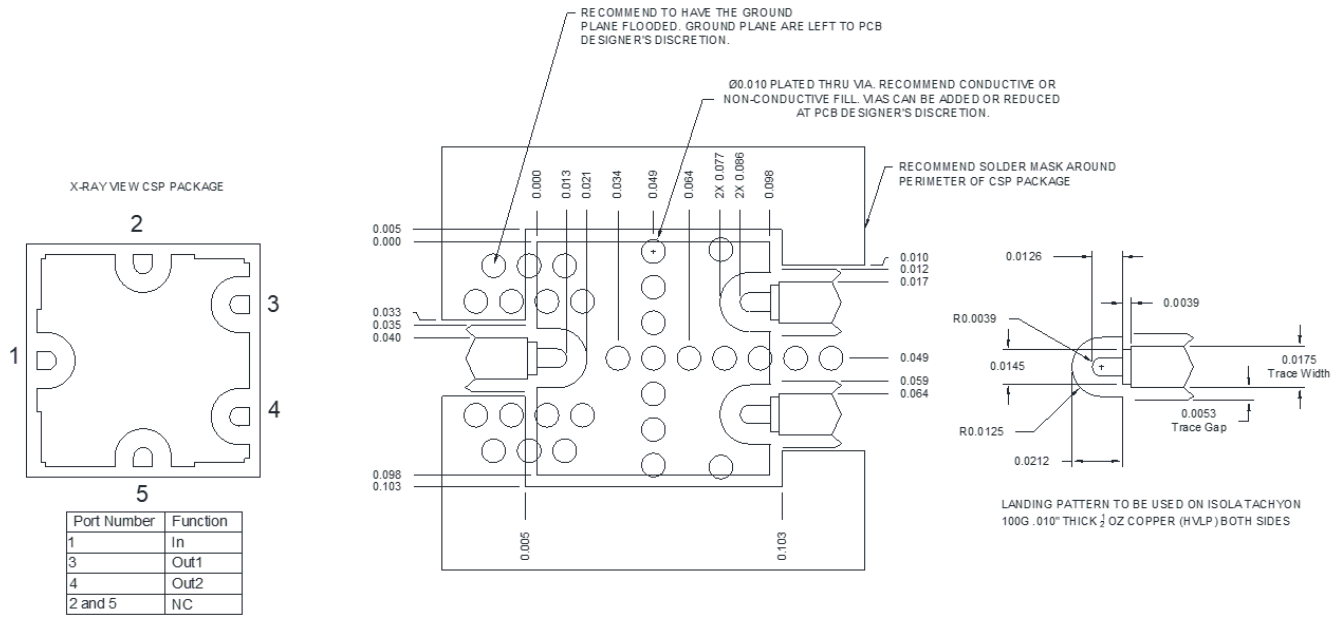
Measured data is de-embedded from fixture using AFR.

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Footprint Image

Download : [Footprint Drawing](#)



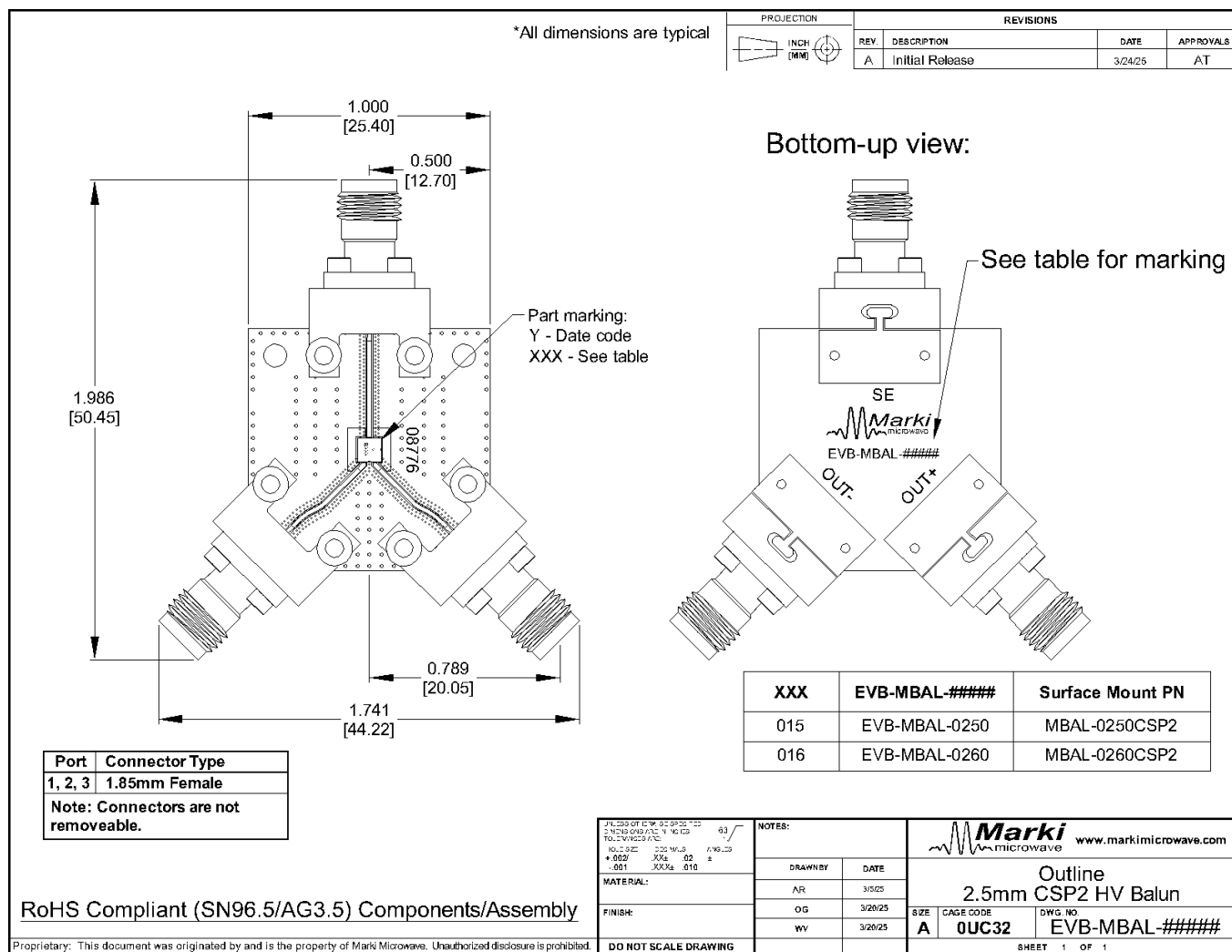
Evaluation Board - Performance Data

Parameter	Test Conditions	Frequency Range (GHz)	Min	Typ	Max	Unit
Impedance Ratio	-	-	-	2	-	-

MBAL-0250CSP2

2-50 GHz Passive MMIC Chip Scale Package 1:2
Balun

Evaluation Board - Outline Drawing



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