

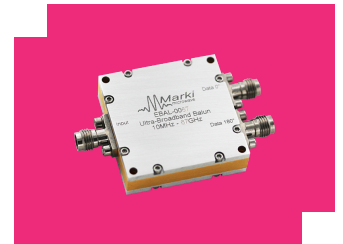
EBAL-0067

10 MHz to 67 GHz Broadband Balun

DEVICE OVERVIEW

General Description

The EBAL-0067 is an ultra-broadband 2:1 balun (unbalanced to balanced transformer), hand-tuned for optimal amplitude and phase balance. The EBAL-0067 transforms between a 50Ω common input and a 100Ω differential output. It operates over a 10 MHz to 67 GHz bandwidth, with typical 0.25 dB amplitude and 2° phase balance, low 4 dB insertion loss as a mode converter. The EBAL-0067 can be used for performing measurements on high frequency differential devices, including cables, microchips, and communication systems. It is an excellent choice for test & measurement benches, high speed analog-to-digital converters, balanced receivers, baseband digital modulations, and signal integrity. For accurate simulations, use the provided S3P file taken from measured production units. The EBAL-0067 is in a 1.5 x 1.5 inch connectorized package and features 1.85 mm Female connectors on the common input and differential output ports.



[Download s-parameters here](#)

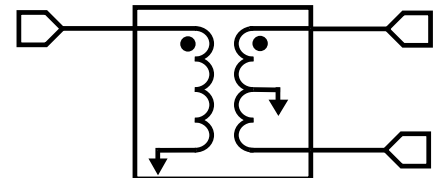
Features

- 2:1 Impedance Ratio
- 10MHz to 67GHz Balun (Unbalanced to Balanced Transformer)
- Transforms 50Ω to 100Ω Differential Output
- Designed for Optimal Phase/Amplitude Balance

Applications

N/A

Functional Block Diagram



Part Ordering Options

Part Number	Description	Connectors	Green Status	Product Lifecycle	Export Classification
EBAL-0067	10 MHz to 67 GHz Broadband Balun	<u>Standard</u>	REACH RoHS	Released	EAR99

Table Of Contents

- **Device Overview**
 - General Description
 - Features
 - Applications
 - Functional Block Diagram
- **Port Configuration and Functions**
 - Port Diagram
 - Port Functions
- **Revision History**
- **Specifications**
 - Absolute Maximum Ratings
 - Package Information
 - Electrical Specifications
 - Typical Mixed Mode Performance Plots
 - Typical Performance Plots
- **Mechanical Data**
 - Outline Drawing

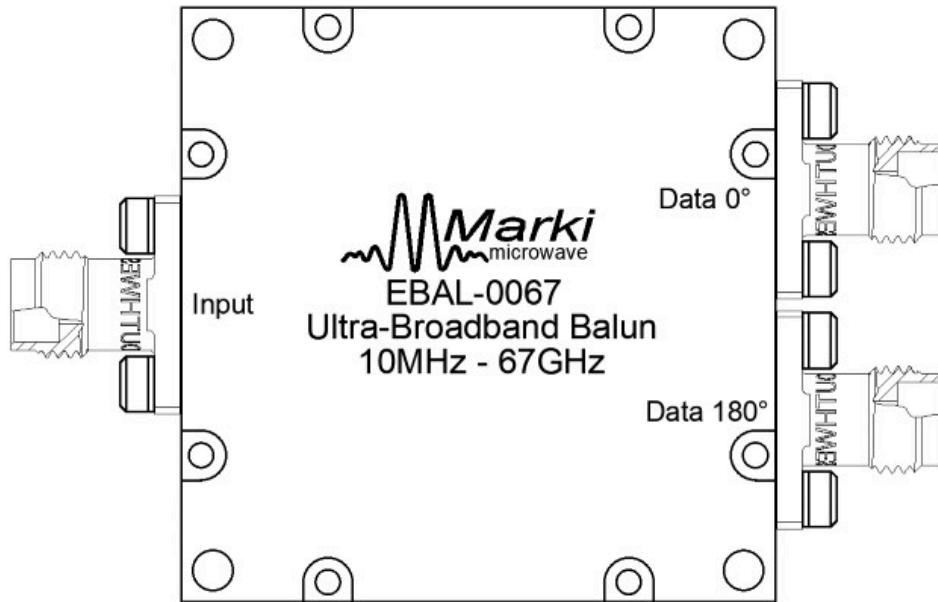
Revision History

Revision Code	Revision Date	Comment
-	2023-06-01	Datasheet Initial Release



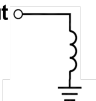
Port Configuration and Functions

Port Diagram

A top-down view of the EBAL-0067 package outline drawing is shown below. Marki baluns are passive reciprocal devices allowing either single ended to differential or differential to single ended conversion.



Port Functions

Port	Function	Connector Type	Description	DC Equivalent Circuit
Data 0°	D+ / 0° Port (Balanced)	-	The 0° port is DC short to the 180° port and DC open to ground and common.	
Data 180°	D- / 180° Port (Balanced)	-	The 180° port is DC short to the 0° port and DC open to ground and common.	
Input	Common Port / SE (Unbalanced)	-	The common port is DC short 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	-	38.10x38.10 mm

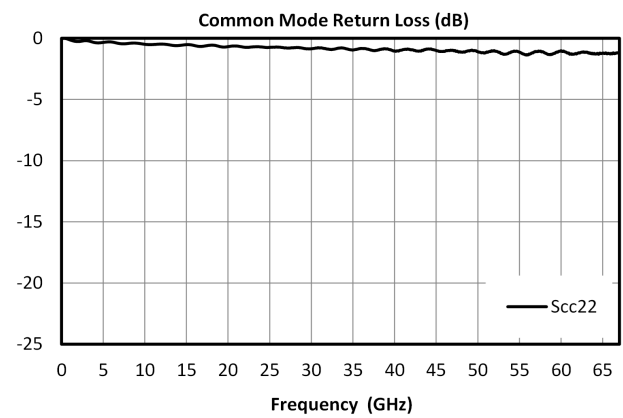
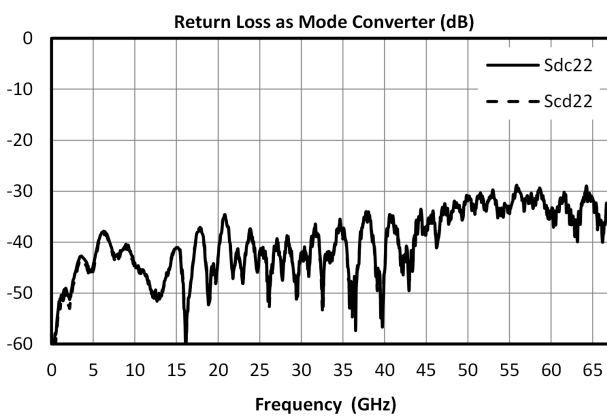
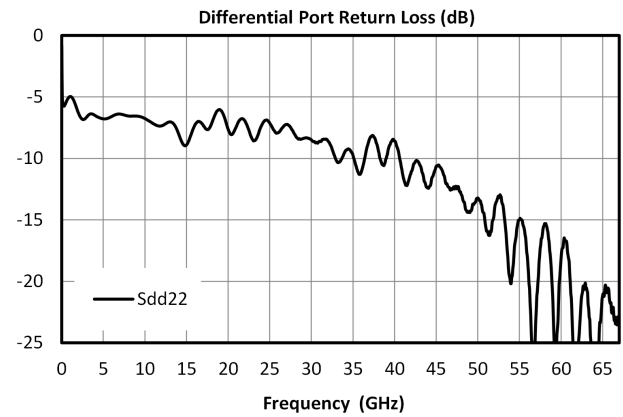
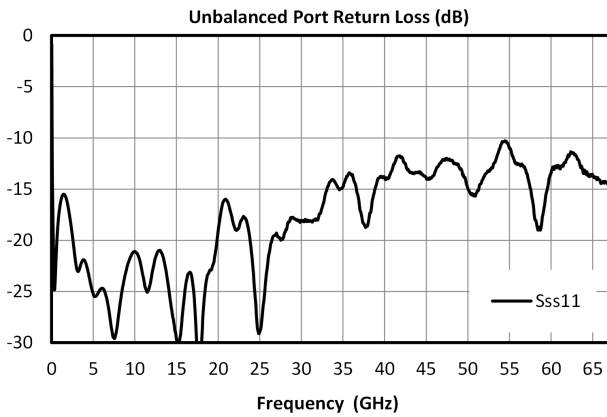
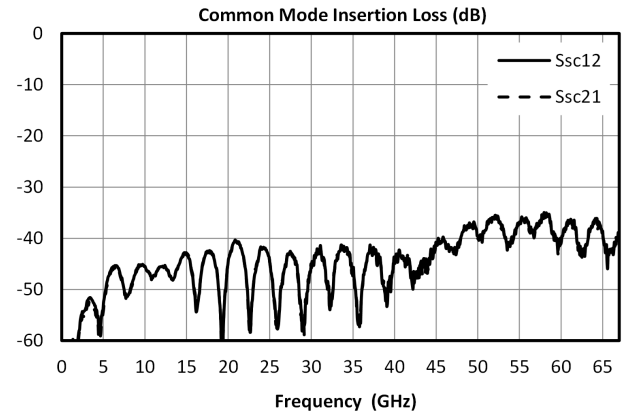
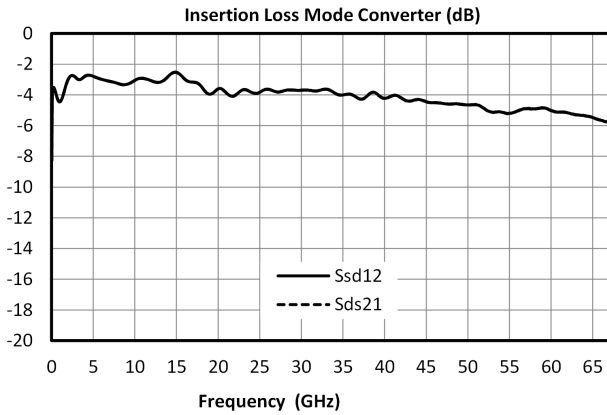
Electrical Specifications

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

Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Amplitude Balance	-	0.01	40	-	0.25	1	dB
Amplitude Balance	-	40	67	-	0.5	1.5	dB
Common Mode Rejection	-	40	67	20	35	-	dB
Common Mode Rejection	-	0.01	40	25	42	-	dB
Impedance	-	-	-	-	50	-	Ω
Insertion Loss as a Mode Converter	-	0.01	67	-	4	8	dB
Isolation	-	0.01	67	-	5	-	dB
Nominal Phase Shift	-	0.01	67	-	180	-	°
Phase Balance	-	40	67	-	5	15	°
Phase Balance	-	0.01	40	-	2	10	°
Return Loss (Common)	-	0.01	67	-	17	-	dB
Return Loss (Output)	-	0.01	67	-	9	-	dB
Impedance Ratio	-	-	-	-	2:1	-	

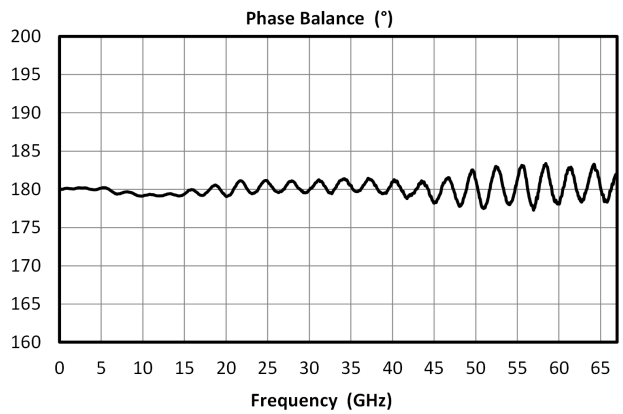
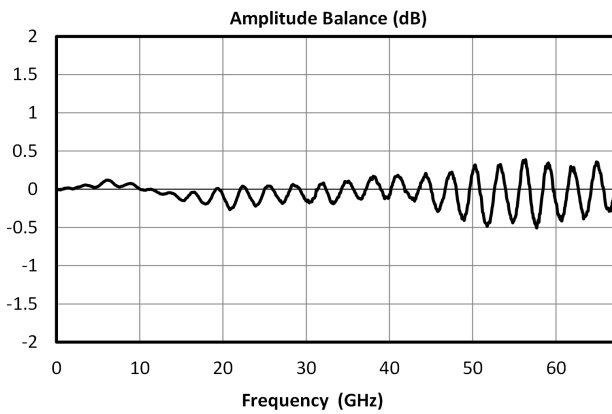
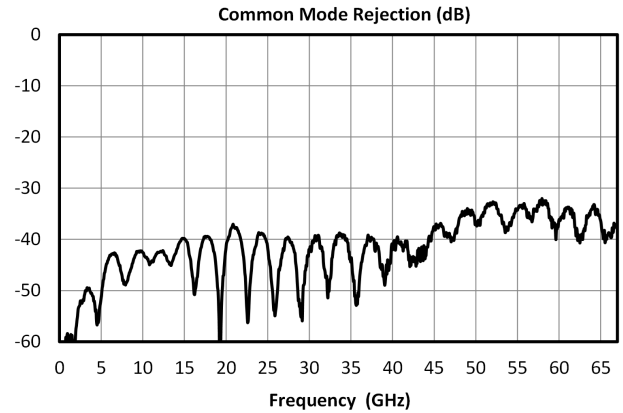
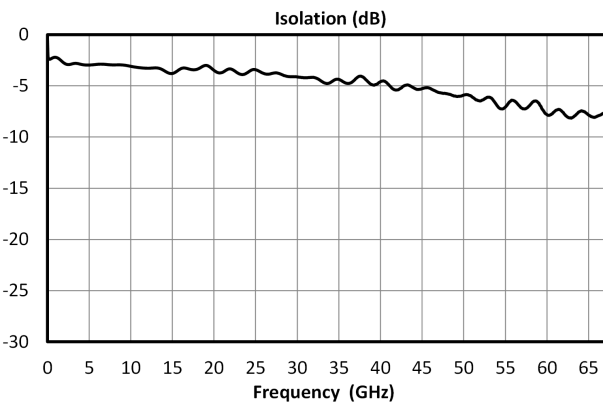
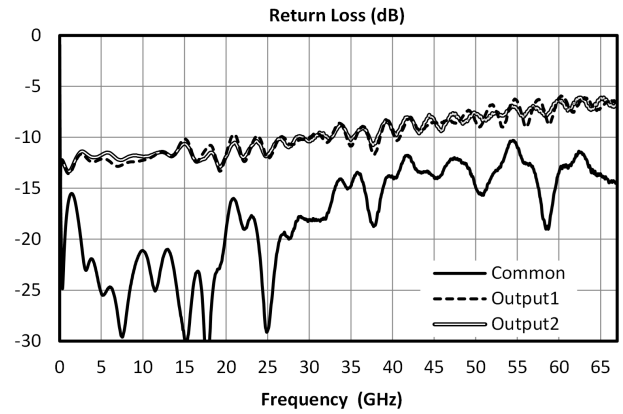
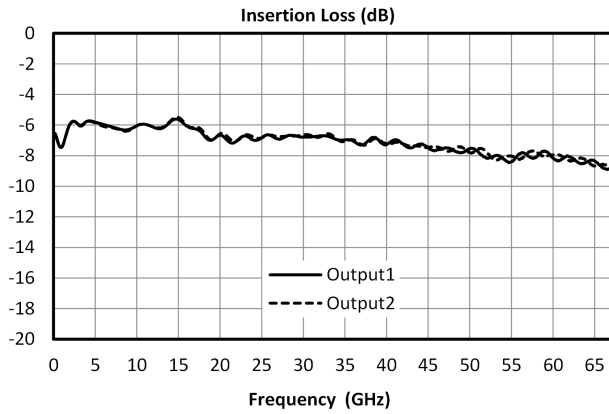
Typical Mixed Mode Performance Plots

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: Sds21 is the differential output response given a single ended input.



Typical Performance Plots

Three port scattering parameters measured as three single-ended 50Ω ports showing relationship between any two ports.

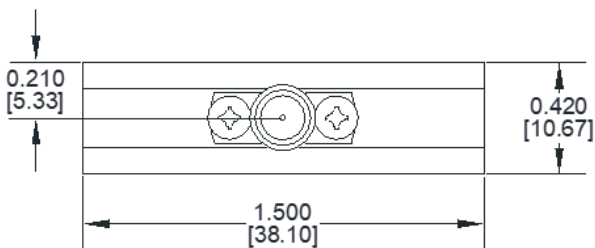
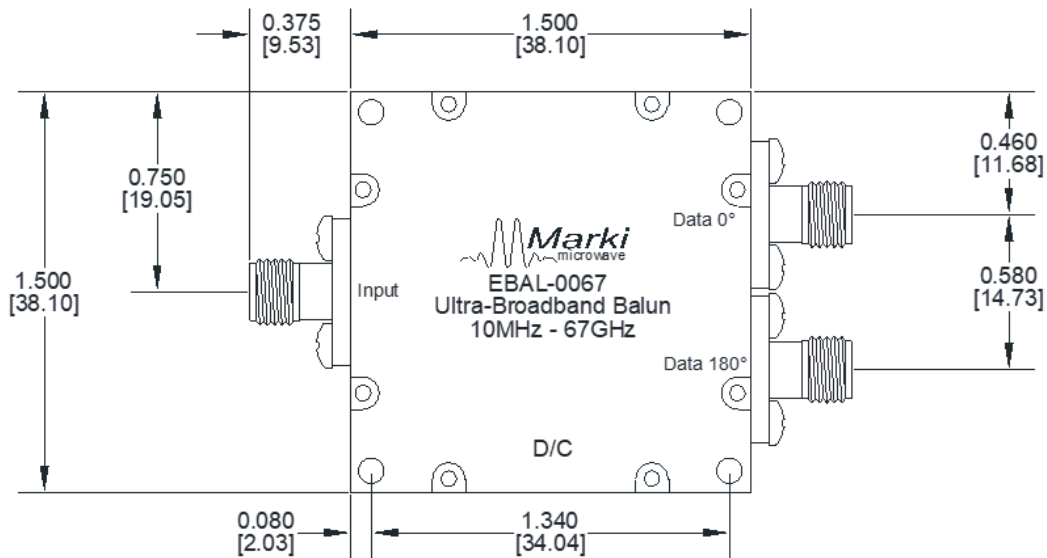


Mechanical Data

Outline Drawing

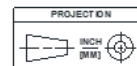
Download : [Outline 2D Drawing](#) | [Outline 3D Drawing](#) | [Outline 3D STP](#)

All measurements are typical



Note: Connectors are not removable. Do not attempt replacing.

Port	Connector Type
1,2,3	1.85 mm Female



DISCLAIMER

MARKI MICROWAVE, LLC., ("MARKI") PROVIDES TECHNICAL SPECIFICATIONS AND DATA (INCLUDING DATASHEETS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, AND OTHER INFORMATION AND RESOURCES "AS IS" AND WITH ALL FAULTS. MARKI DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT.

These resources are intended for developers skilled in the art designing with Marki products. You are solely responsible for (1) selecting the appropriate products for your application, (2) designing, validating, and testing your application, and (3) ensuring your application meets applicable standards and other requirements. Marki makes no guarantee regarding the suitability of its products for any particular purpose, nor does Marki assume any liability whatsoever arising out of your use or application of any Marki product.

Marki grants you permission to use these resources only for development of an application that uses Marki products. Other reproduction or use of these resources is strictly prohibited. No license is granted to any other Marki intellectual property or to any third-party intellectual property. Marki reserves the right to make changes to the product(s) or information contained herein without notice.

MARKI MICROWAVE and T3 MIXER are trademarks or registered trademarks of Marki Microwave, LLC. All other trademarks used are the property of their respective owners.

© 2023, Marki Microwave, LLC