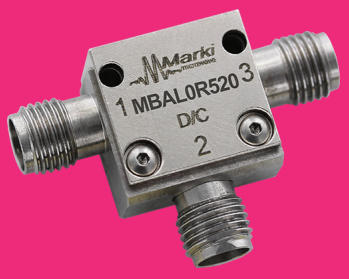
Sales: 408-778-9952 | General: 408-778-4200 | Fax: 408-778-4300
Sales & Customer Support: sales@markimicrowave.com
Tech Support: support@markimicrowave.com

MBAL-0R520BH

General Description

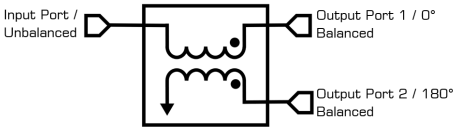
The MBAL-0R520BH is a GaAs passive MMIC 2:1 balun (unbalanced to balanced transformer) that features excellent 28 dB common mode rejection and low 4 dB insertion loss as a mode converter over a 0.5 to 20 GHz operational bandwidth. The MBAL-0R520BH can be used for performing measurements on high frequency 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 MBAL-0R520BH is packaged in a small form-factor, high-performance connectorized housing for easy integration into test setups and system signal paths.



Features

- 2:1 Impedance Ratio (50Ω Common to 100Ω Differential)
- Broadband, 0.5 GHz to 20 GHz
- Amplitude Balance, 0.5 dB Typical
- Phase Balance, 3.6° Typical
- Common Mode Rejection, 28 dB Typical
- Compact 1.1 x 0.8 Inch, 3-Port Connectorized Package

Functional Block Diagram



Electrical Performance Summary

Parameter	Typ	Unit
Frequency Range	0.5 to 20	GHz
Insertion Loss as a Mode Converter	4	dB
Phase Balance	3.6	°
Amplitude Balance	0.5	dB
Impedance Ratio	2:1	-
Common Mode Rejection	28	dB

Summary only – refer to the Electrical Specifications, Absolute Maximum Ratings, and Recommended Operating Range tables for complete details.

Part Ordering Options

Part Number	Description	Package	Connectors	Green Status	Product Lifecycle	Export Classification
MBAL-0R520BH	0.5 - 20 GHz Passive MMIC 2:1 Balun	BH	-	REACH RoHS	Released	EAR99

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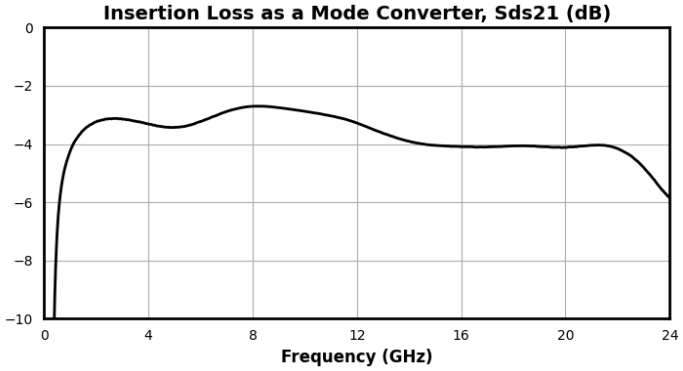
Table Of Contents

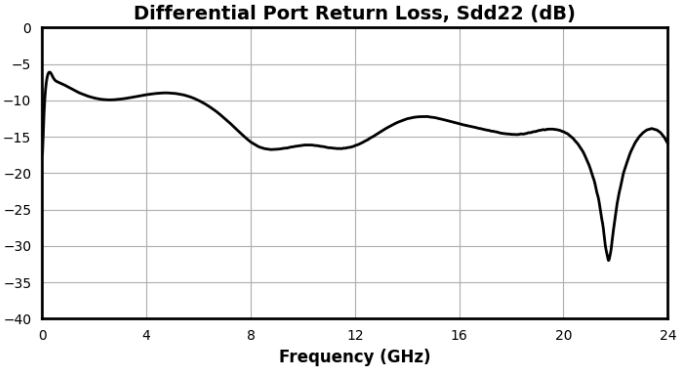
- **Device Overview**
  - General Description
  - Features
  - Functional Block Diagram
  - Electrical Performance Summary
  - Part Ordering Options
- **Specifications**
  - Mixed Mode Scattering Parameters
  - Typical Performance Scattering Parameters
  - Electrical Specifications
  - Absolute Maximum Ratings
  - Package Information
- **Port Configuration and Functions**
  - Port Diagram
  - Port Functions
- **Mechanical Data**
  - Outline Drawing
- **Revision History**

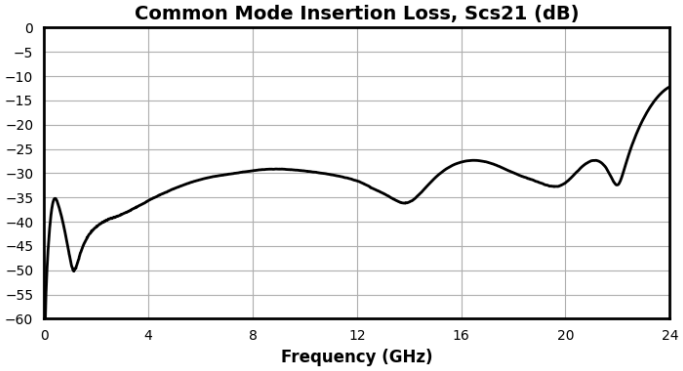
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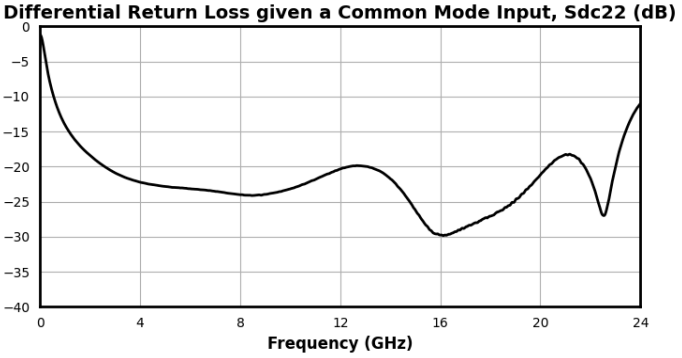
Mixed Mode Scattering Parameters

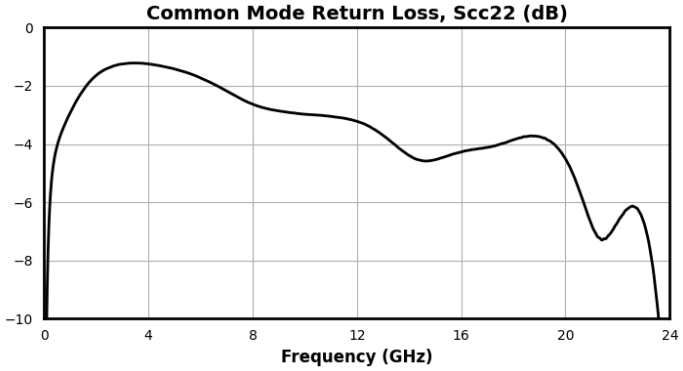
Mixed mode scattering parameters are used to characterize differential circuits. For baluns, this means that the 0° and 180° ports become a single 100Ω differential port and the common port remains the same 50Ω common port. The two-port s-parameters of the balun are then characterized based on differential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

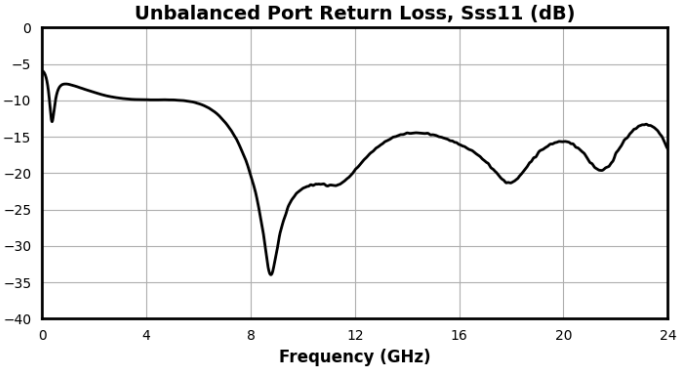




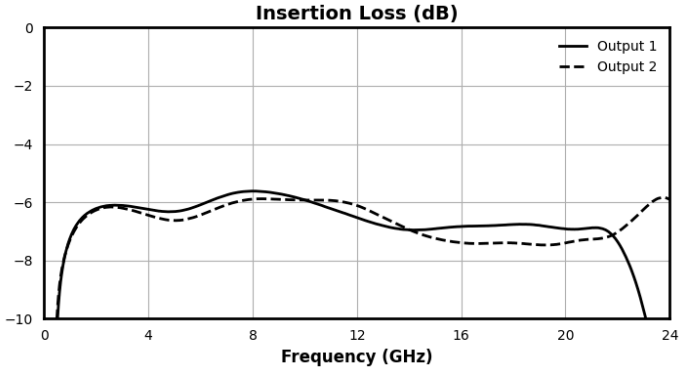


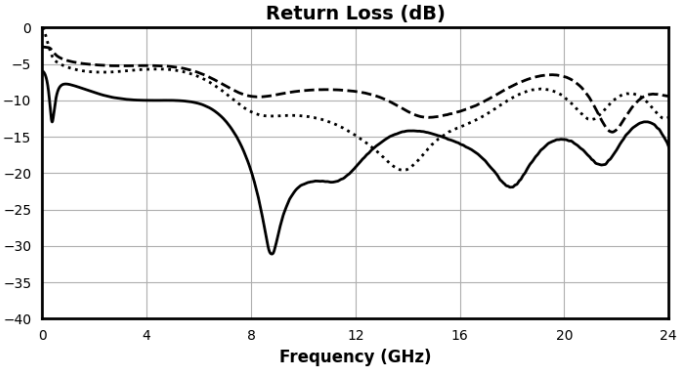




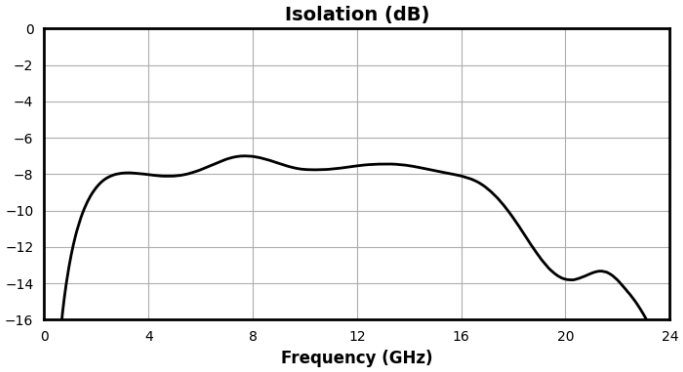


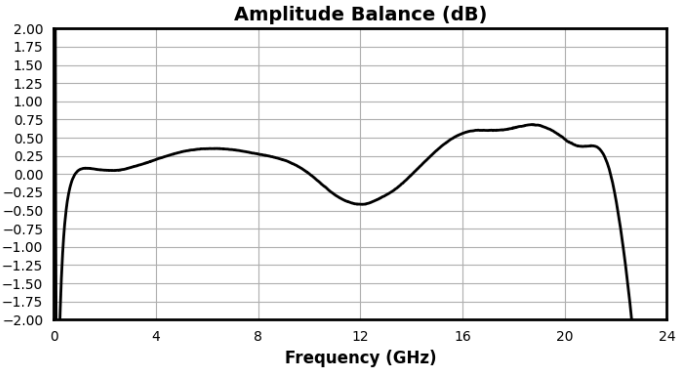
Typical Performance Scattering Parameters

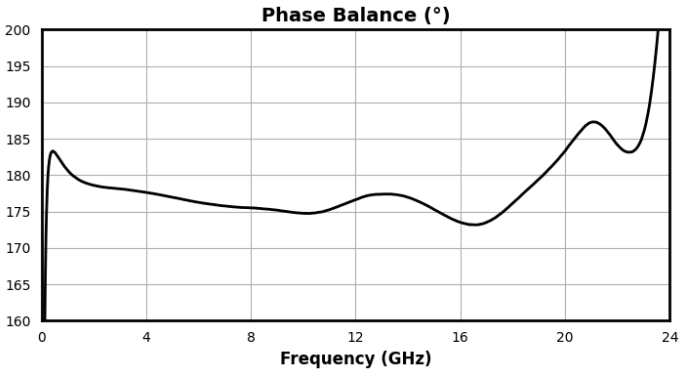


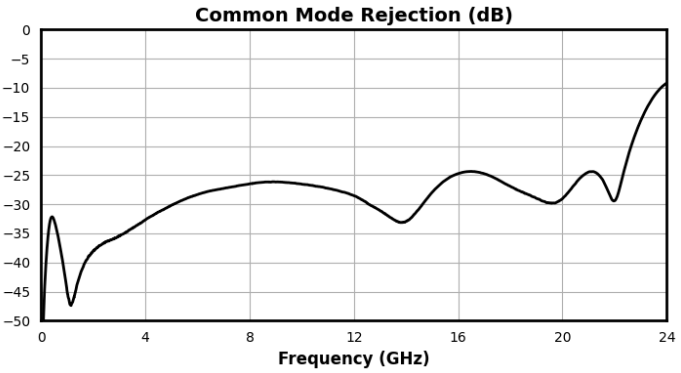


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SPECIFICATIONS

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
Frequency Range	-	0.5	20	-	-	-	GHz
Insertion Loss as a Mode Converter	-	0.5	20	-	4	-	dB
Impedance Ratio	-	-	-	-	2:1	-	-
Amplitude Balance	-	0.5	20	-	0.5	-	dB
Phase Balance	-	0.5	20	-	3.6	-	°
Nominal Phase Shift	-	0.5	20	-	180	-	°
Common Mode Rejection	-	0.5	20	-	28	-	dB
Isolation	-	0.5	20	-	8	-	dB
Common Port Return Loss	-	0.5	20	-	16	-	dB
Output Return Loss	-	0.5	20	-	11	-	dB
Impedance	-	0.5	20	-	50	-	Ω

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
RF Power Handling	37	dBm

Package Information

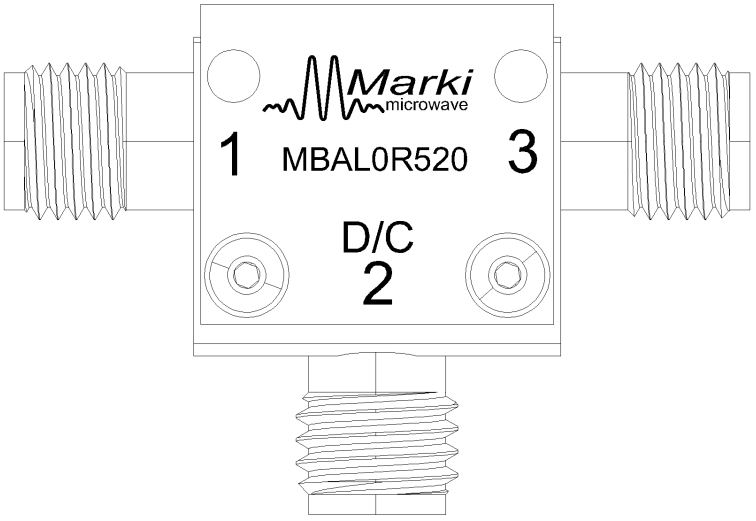
Parameter	Details	Rating
ESD	250 to < 500 Volts	HBM Class 1A
Weight	Package name: BH	12.2g
Dimensions	-	29.01 x 19.84 mm

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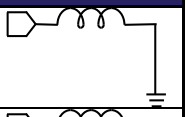
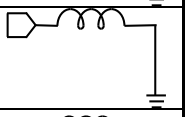
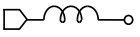
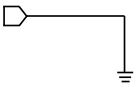
PORT CONFIGURATION AND FUNCTIONS

Port Diagram

A top-down view of the MBAL-0R520BH 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

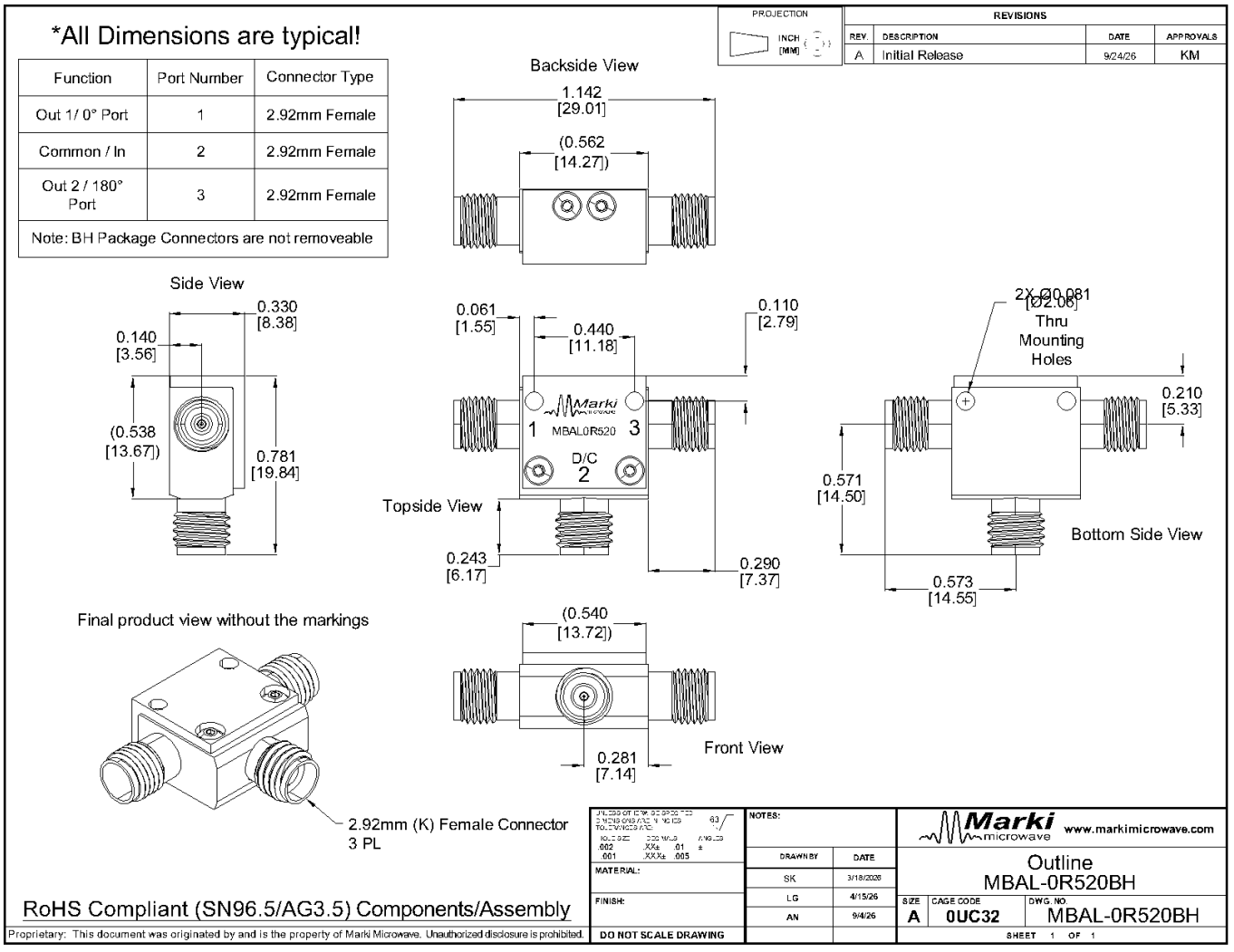
Port	Function	Connector Type	Description	DC Equivalent Circuit
Port 2	Common Port / In (Unbalanced)	2.92F	The common port is DC short to ground.	
Port 1	Out 1 / 0° Port (Balanced)	2.92F	The 0° port is DC short to ground.	
Port 3	Out 2 / 180° Port (Balanced)	2.92F	The 180° port is DC open.	
GND	Ground	-	BH package ground provided through metal housing and outer coax conductor.	

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MECHANICAL DATA

Outline Drawing

Download : Outline 2D Drawing



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REVISION HISTORY

Revision Code	Revision Date	Comment
-	2026-11-19	Initial Release

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