

BAL-0032SSG

SURFACE-MOUNT BROADBAND BALUN

DEVICE OVERVIEW

General Description

The BAL-0032SSG is a surface-mount broadband balun, hand-tuned for optimal phase and amplitude balance over an industry leading 10 MHz to 32 GHz bandwidth. The BAL-0032SSG operates as an excellent choice for analog to digital converters, balanced receivers, baseband digital modulations, and signal integrity.

[Download s-parameters here](#)



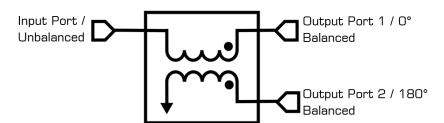
Features

- 10MHz to 32GHz 1:2 Balun (Balanced to Unbalanced Transformer)
- Transforms 50Ω to 100Ω Differential Output
- Tuned for Optimal Phase/Amplitude Balance

Applications

- Analog to Digital Converters
- Balanced Receivers
- Baseband Digital Modulation
- Signal Integrity

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Packing Size	Green Status	Product Lifecycle	Export Classification
BAL-0032SSG	SURFACE-MOUNT BROADBAND BALUN	SSG	-	RoHS	Released	EAR99
<u>EVB-BAL-0032</u>	Evaluation Board, 0.01 - 32 GHz Surface-Mount Broadband Balun	-	-	RoHS	Released	EAR99

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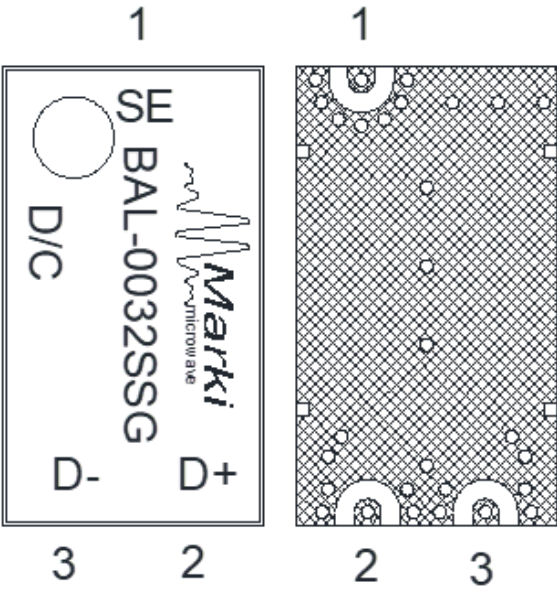
Revision History

Revision Code	Revision Date	Comment
-	2022-06-01	Datasheet Initial Release
A	2023-01-01	Unit Spread Graphs Added

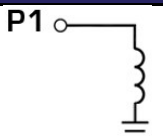
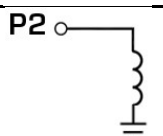
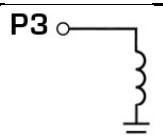
Port Configuration and Functions

Port Diagram

A top-down view of the BAL-0032SSG 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	Description	Equivalent Circuit for Package
Port 1	Common Port / SE (Unbalanced)	The common port is DC short to ground.	
Port 2	D+ / 0° Port (Balanced)	The 0° port is DC short to ground.	
Port 3	D- / 180° Port (Balanced)	The 180° port is DC short to ground.	

Specifications

Absolute Maximum Ratings

The Absolute Maximum Ratings indicate limits beyond which damage may occur to the device. Absolute Maximum Ratings are individual and should not be met in parallel. 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
Dimensions	-	5.08 x 8.89 mm

Electrical Specifications

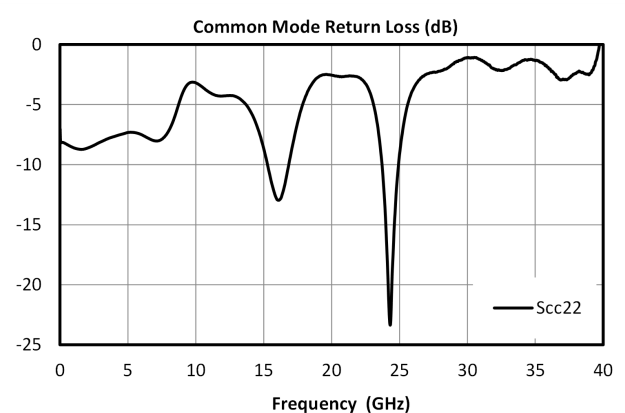
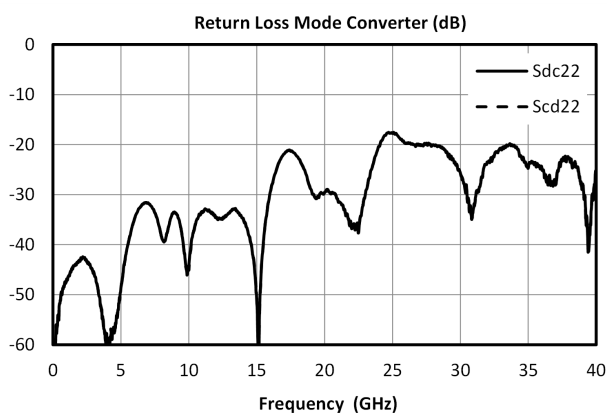
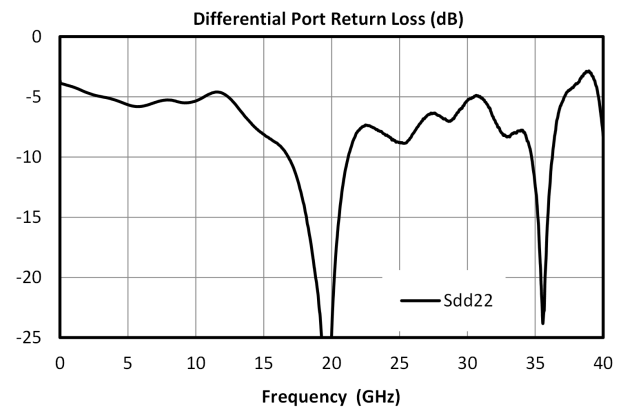
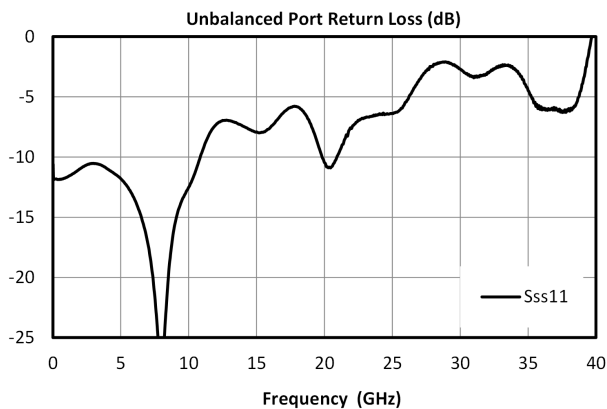
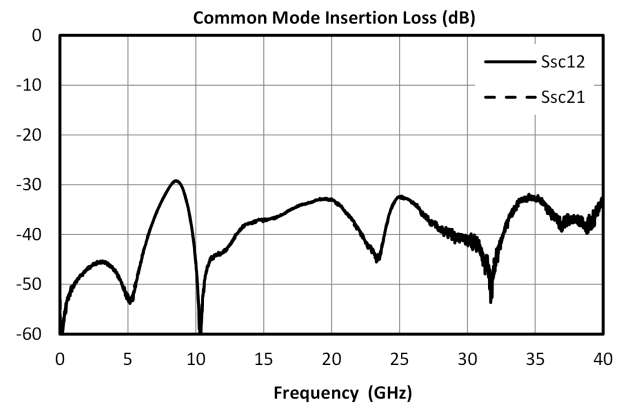
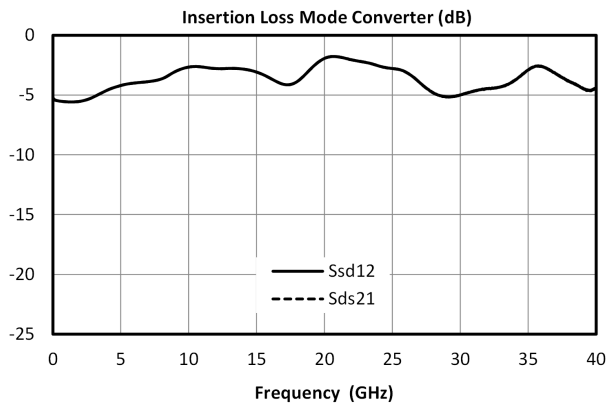
The electrical specifications apply at TA=+25°C in a 50Ω system. Min and Max limits are guaranteed at TA=+25°C.

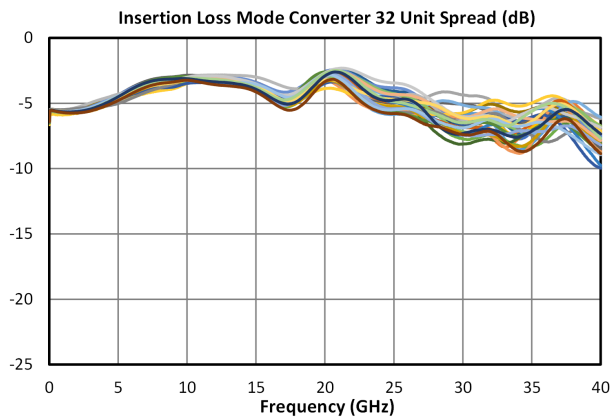
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Insertion Loss as a Mode Converter	-	0.01	32	-	5	8	dB
Nominal Phase Shift	-	0.1	32	-	180	-	°
Amplitude Balance	-	0.1	20	-	0.5	1.3	dB
Amplitude Balance	-	20	32	-	0.5	1.5	dB
Phase Balance	-	0.01	20	-	5	10	°
Phase Balance	-	20	32	-	5	13	°
Common Mode Rejection	-	0.1	20	-	25	22	dB
Common Mode Rejection	-	20	32	-	25	18	dB
Isolation	-	0.01	32	-	8	-	dB
Impedance	-	-	-	-	50	-	Ω
Return Loss (Output)	-	0.01	32	-	9	-	dB
Return Loss (Common)	-	0.1	32	-	8	-	dB

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

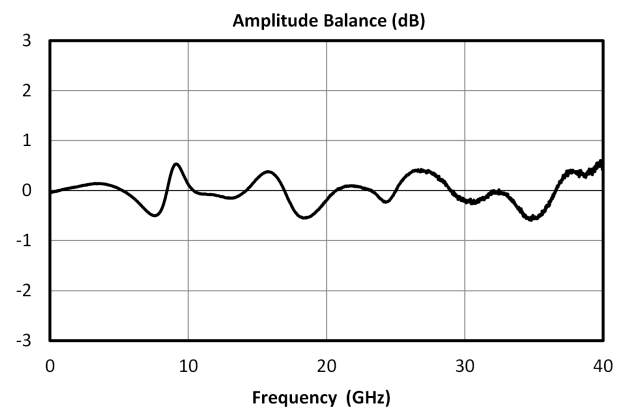
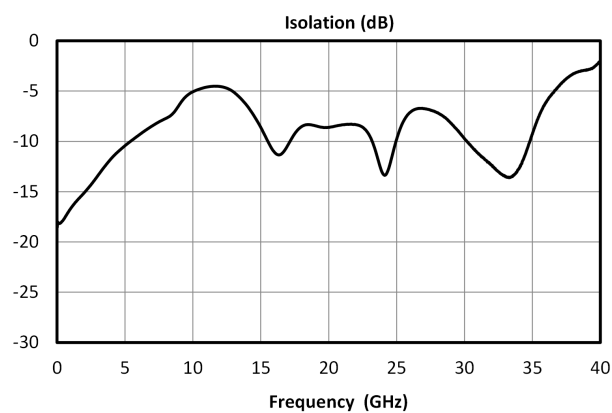
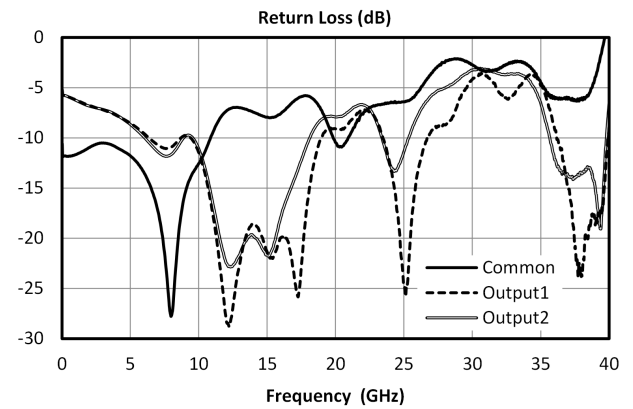
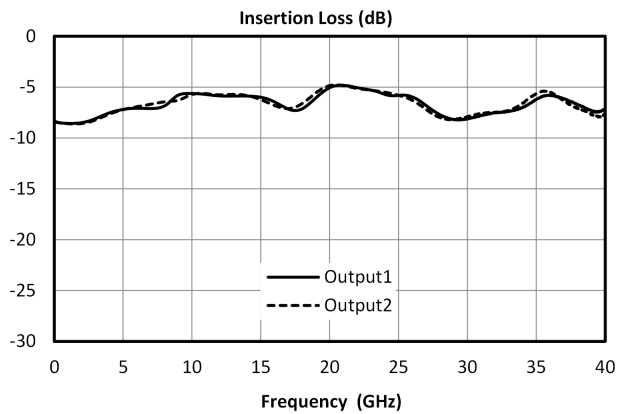
Typical performance plots are evaluation board measurements with fixturing to the device pins de-embedded

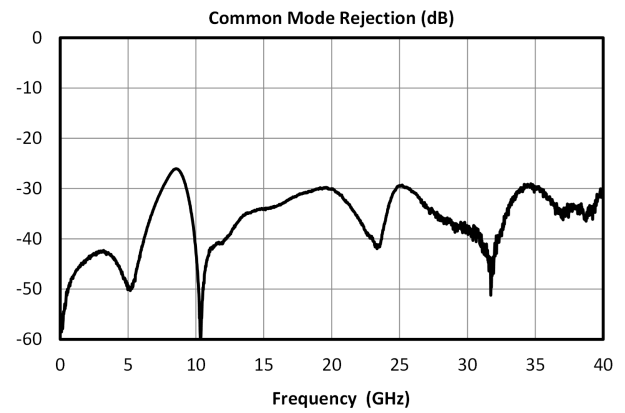
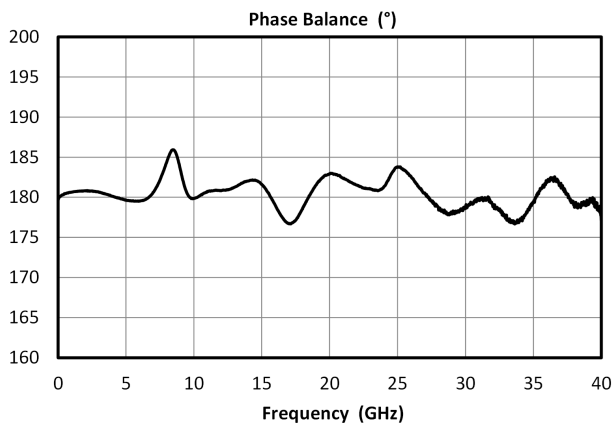




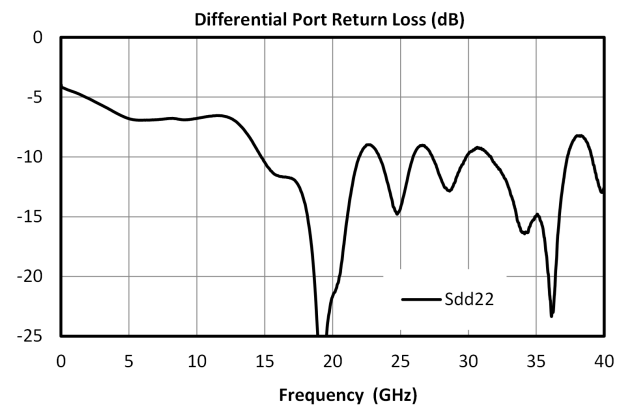
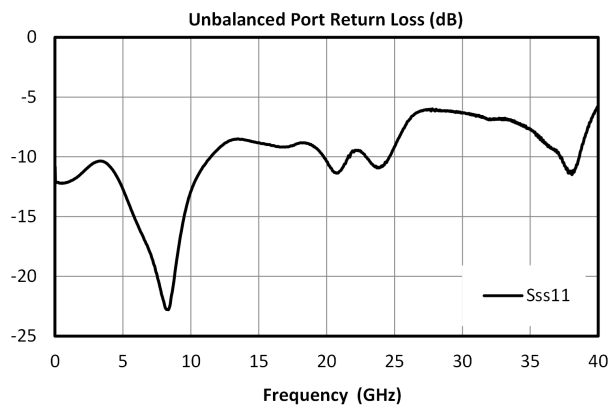
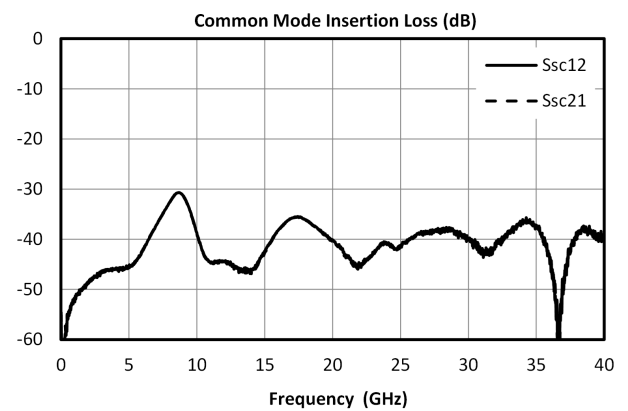
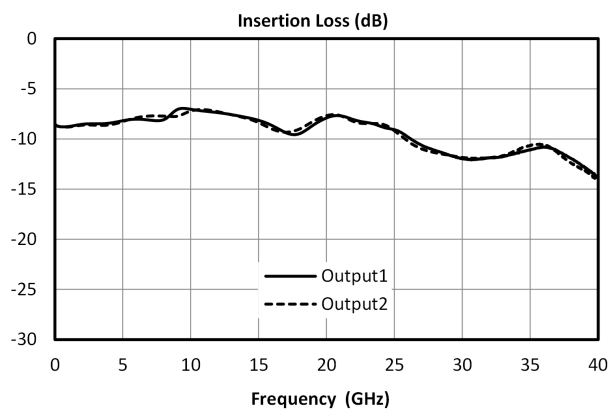
Typical Performance Plots

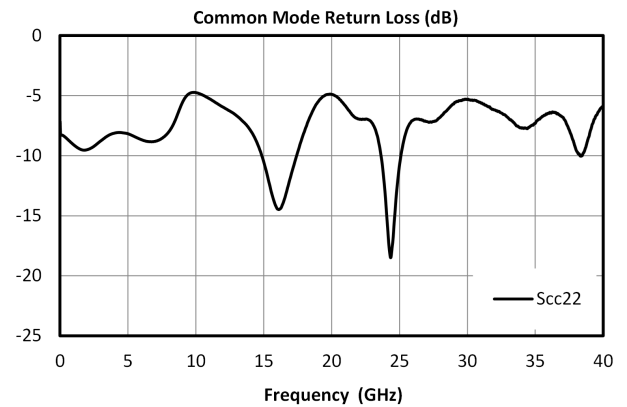
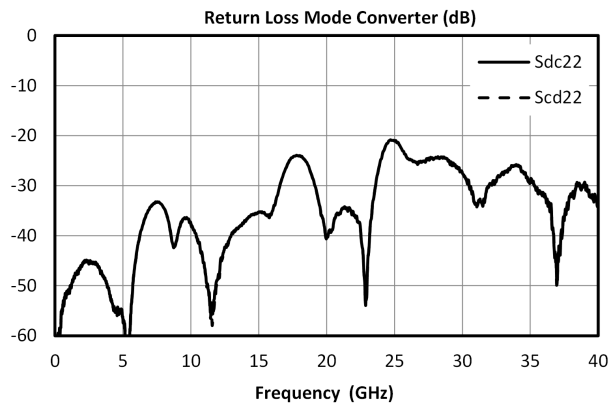
Three port scattering parameters measured as three single-ended 50Ω ports showing relationship between any two ports.



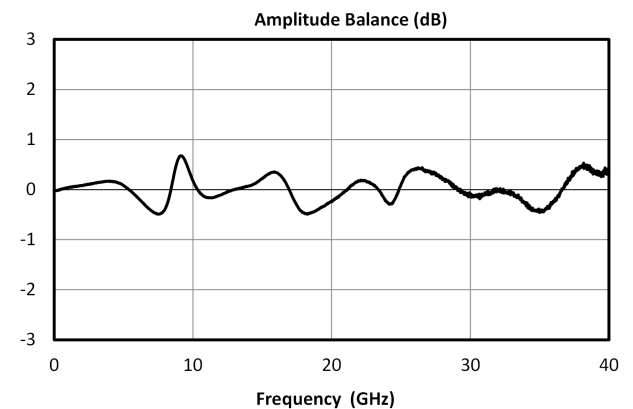
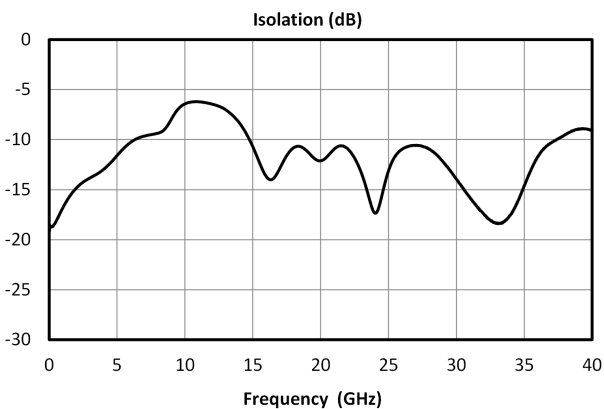
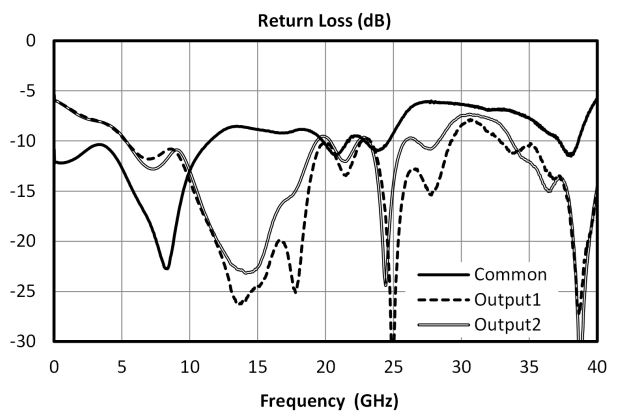
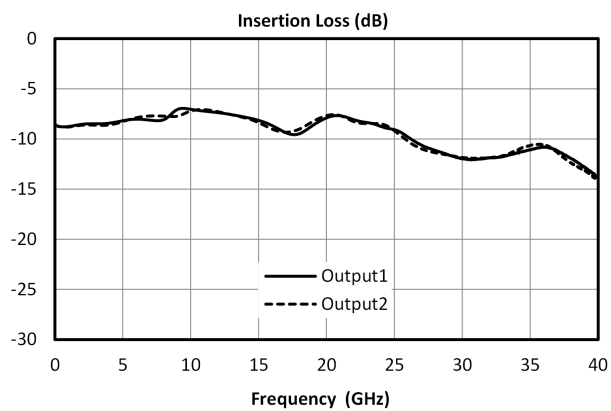


Typical EVB Mixed Mode Performance Plots

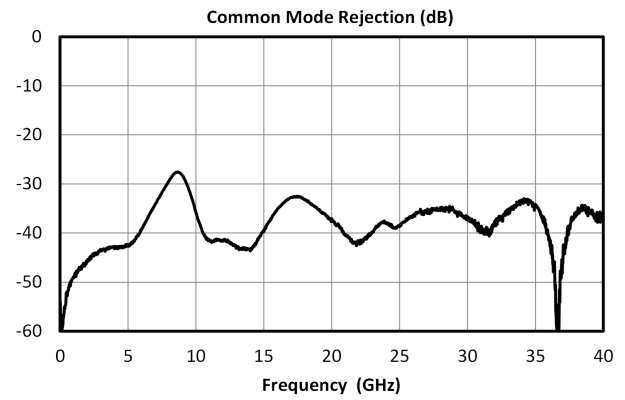
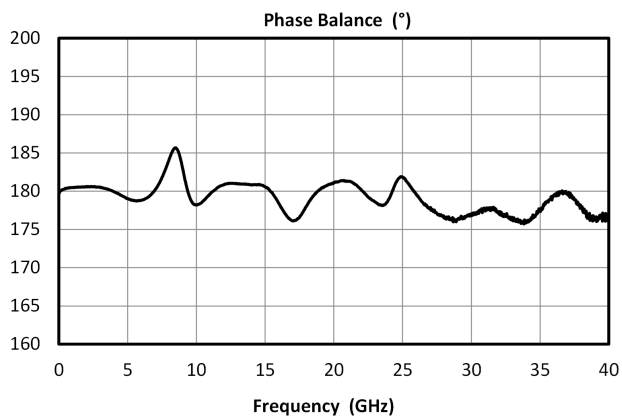




Typical EVB Performance Plots

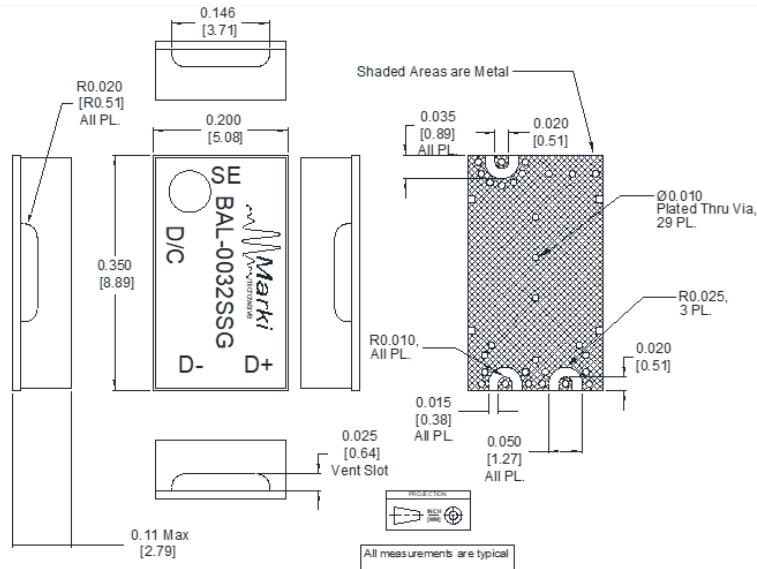


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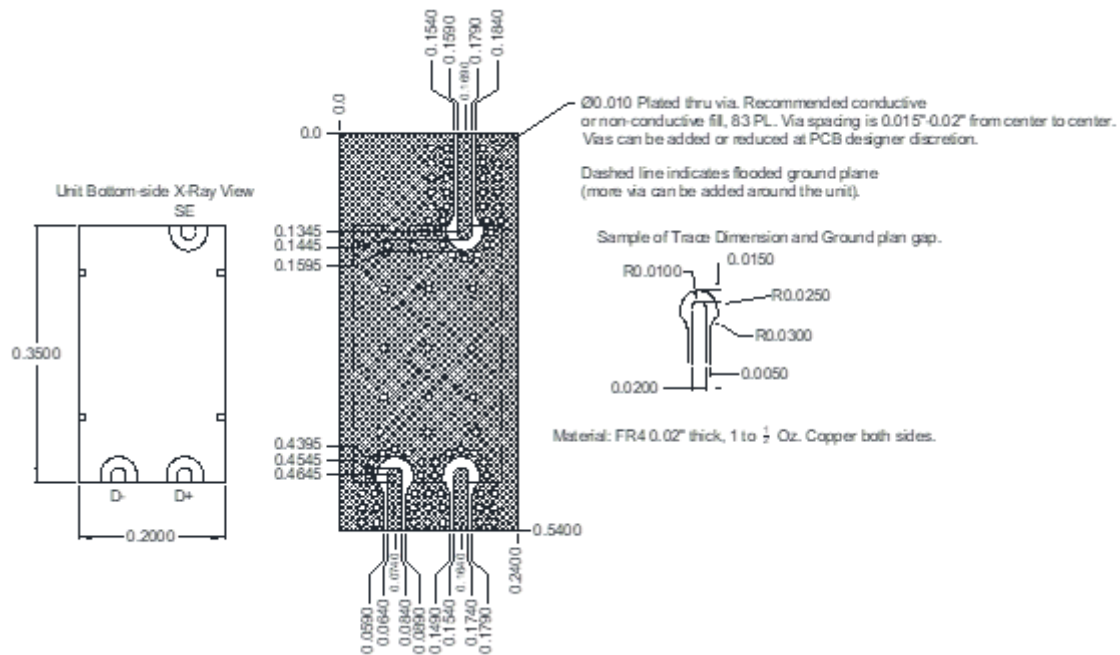
Mechanical Data

Outline Drawing



Notes:

1. Finish: 2-8 μ -inches of Gold type III Grade A
Soft Gold over 100-200 μ -inches solderable Nickel. ENIG is acceptable.
2. Material: FR4 0.01" Thick, 1/2 Oz. Copper both sides.

Footprint Image


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