

BAL-0020SLG

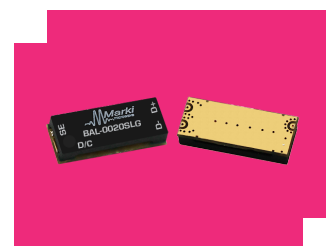
Surface-Mount Broadband Balun

DEVICE OVERVIEW

General Description

The BAL-0020SLG is a broadband surface mount balun, hand-tuned for optimal phase and amplitude balance over a 10 MHz to 20 GHz bandwidth. It serves as an excellent choice for analog to digital converters, balanced receivers, baseband digital modulations, and signal integrity enhancement.

[Download s-parameters here](#)



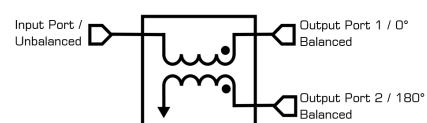
Features

- 10 MHz to 20 GHz 1:2 Balun (Balanced to Unbalanced Transformer)
- Transforms 50 Ω Input to 100 Ω Differential (50 Ohm Single) 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-0020SLG	Surface-Mount Broadband Balun	SLG	-	RoHS	Released	EAR99
<u>EVAL-BAL-0020</u>	Evaluation Board, Surface-Mount Broadband Balun	-	-	RoHS	Released	EAR99

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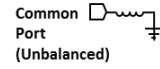
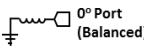
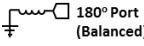
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Revision History

Revision Code	Revision Date	Comment
-	2020-09-01	Initial Release
A	2021-05-01	Temp data & insertion loss spec change
B	2021-11-01	Side vent Slot size reduced to 0.146 inch / 3.71 mm was 0.360 inches / 9.14 mm long. See Surface Mount Outline Drawing

Port Configuration and Functions

Port Functions

Port	Function	Description	Equivalent Circuit for Package
Common Port / In (Unbalanced)	RF Input	The common port is DC short to ground.	 Common Port (Unbalanced)
Out 1 / 0° Port (Balanced)	0° Port	The 0° port is DC short to ground.	 0° Port (Balanced)
Out 2 / 180° Port (Balanced)	180° Port	The 180° port is DC short to ground.	 180° Port (Balanced)

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
Dimensions	-	5.08 x 12.70 mm

Electrical Specifications

Specifications guaranteed from -55 to +100°C, measured in a 50Ω system.

Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Insertion Loss as a Mode Converter	-	10	16	-	4.5	7	dB
Insertion Loss as a Mode Converter	-	16	20	-	5	8	dB
Nominal Phase Shift	-	10	20	-	180	-	°C
Amplitude Balance	-	10	20	-	0.4	1.2	dB
Phase Balance	-	10	20	-	5	10	°
Common Mode Rejection	-	10	20	22	35	-	dB
Isolation	-	10	20	-	12	-	dB
VSWR (Common)	-	10	20	-	1.5	-	-
VSWR (Output)	-	10	20	-	1.6	-	-

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

Sdd22: differential return loss of the differential port driven with a differential signal

Sdc22: differential return loss of the differential port driven with a common signal

Sds21: insertion loss from a single ended input to a differential output

Scs22: common mode return loss of the differential port driven with a common signal

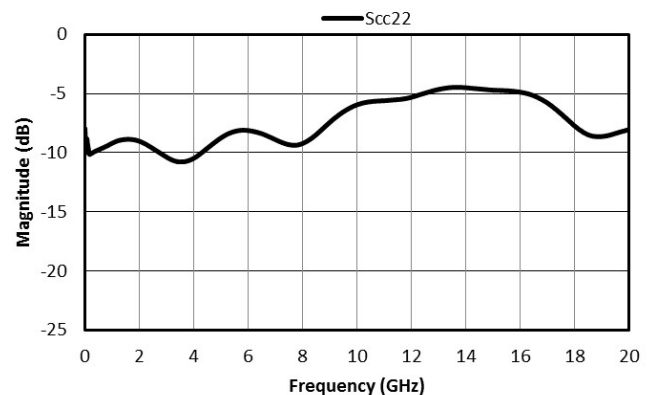
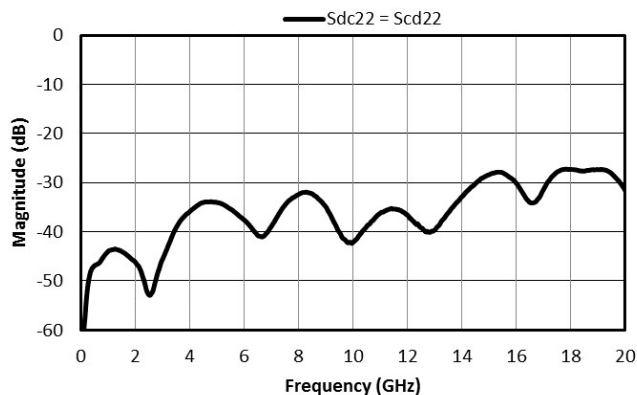
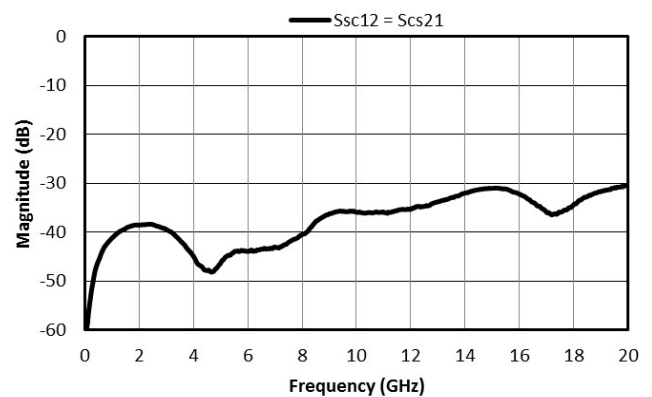
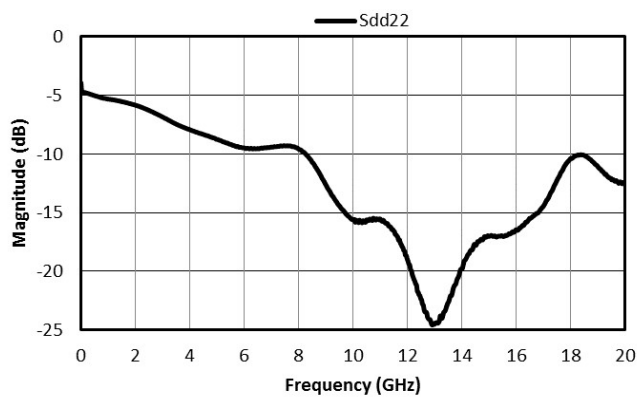
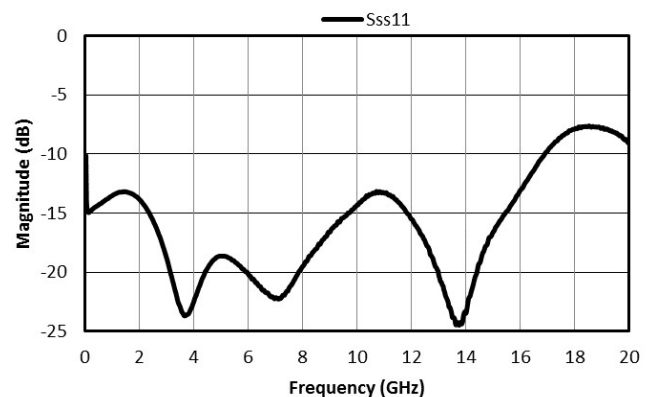
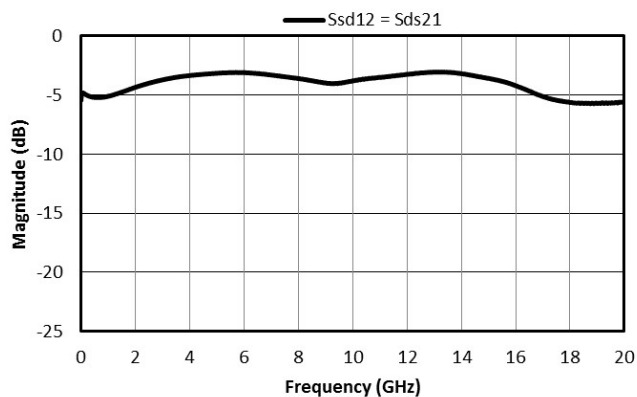
Scd22: common mode return loss of the differential port driven with a differential signal

Scs21: insertion loss from a single ended input to a common output

Sss11: single ended return loss

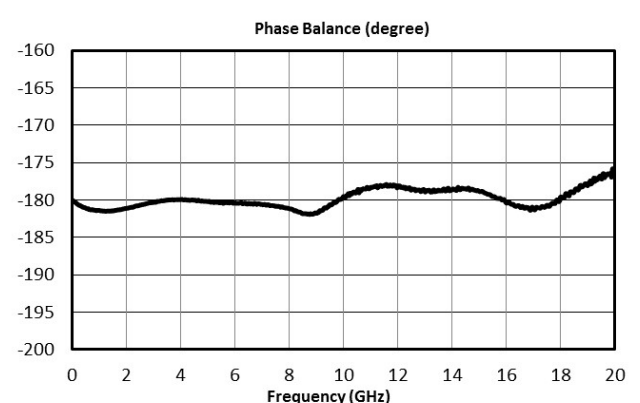
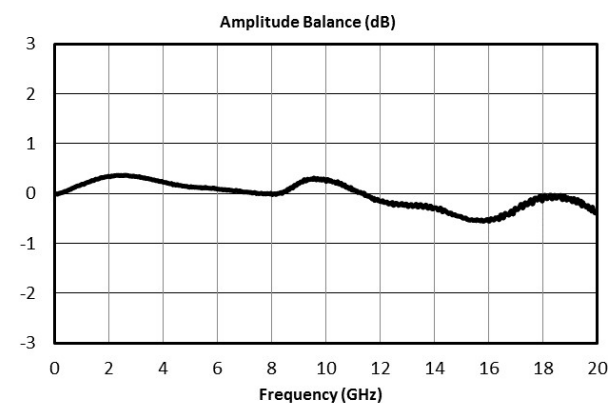
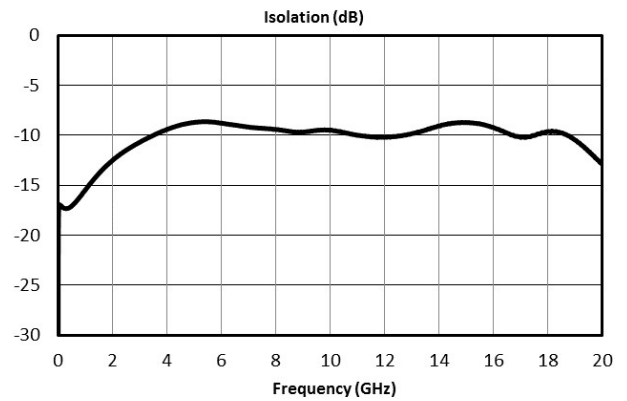
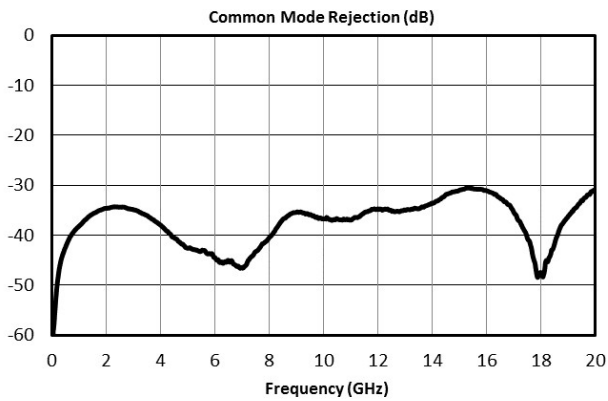
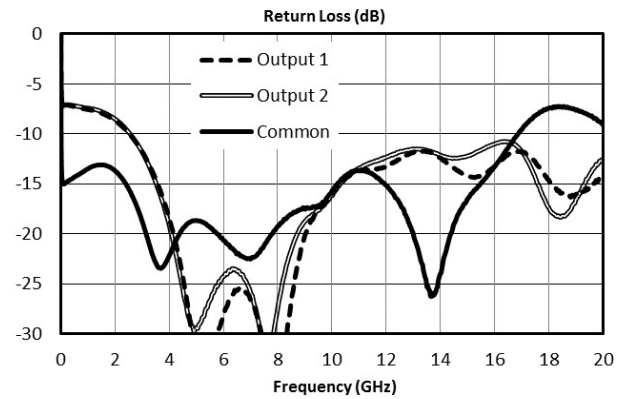
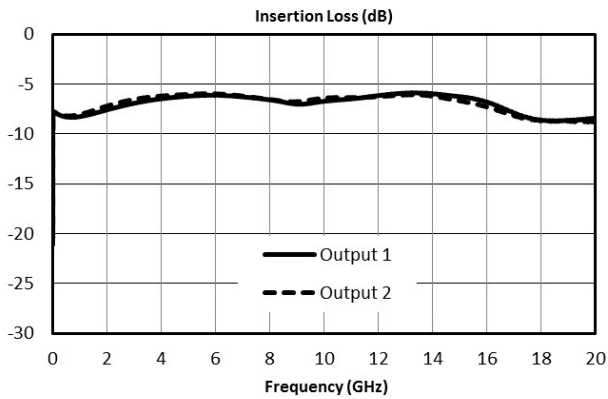
Ssd12: insertion loss from a differential signal to single ended output

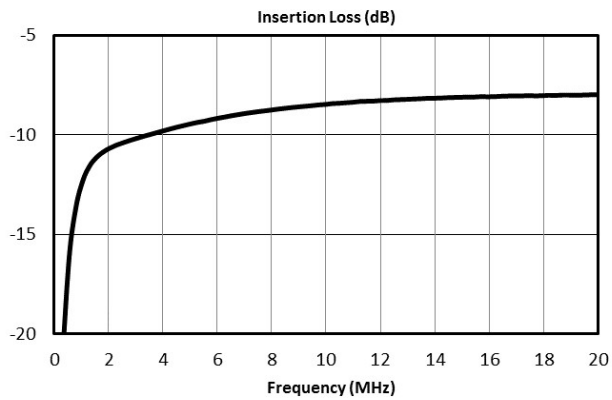
Ssc12: insertion loss from a common signal to single ended output



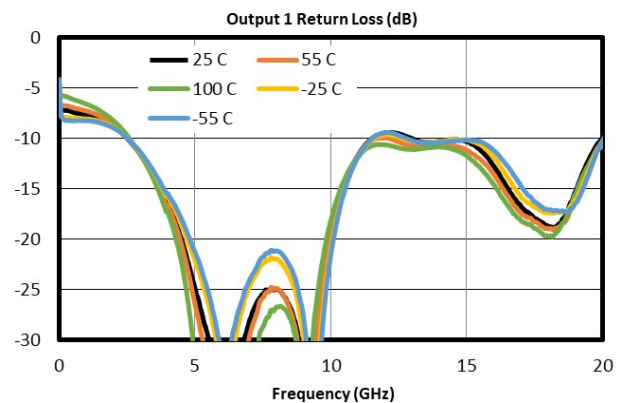
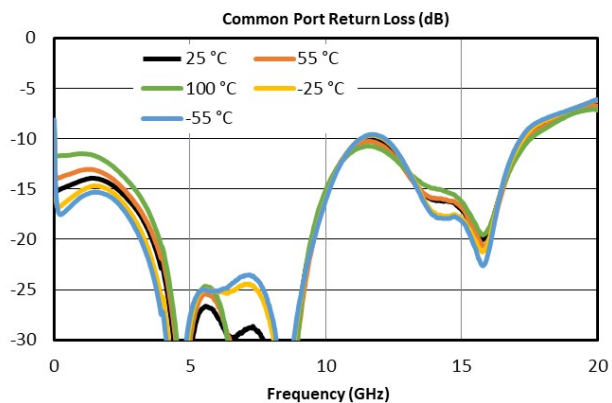
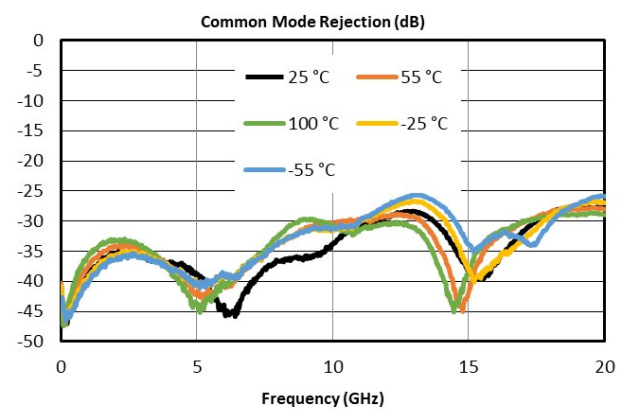
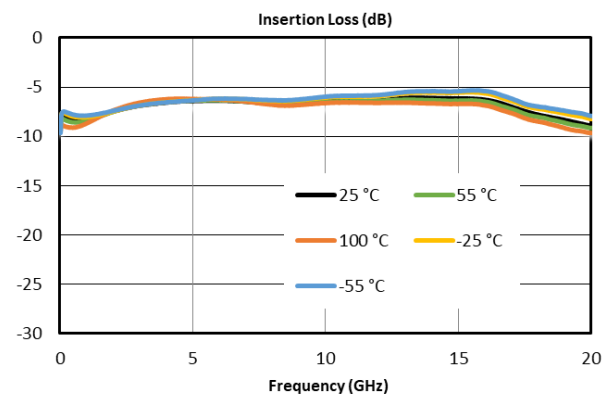
Typical Performance Scattering Parameter

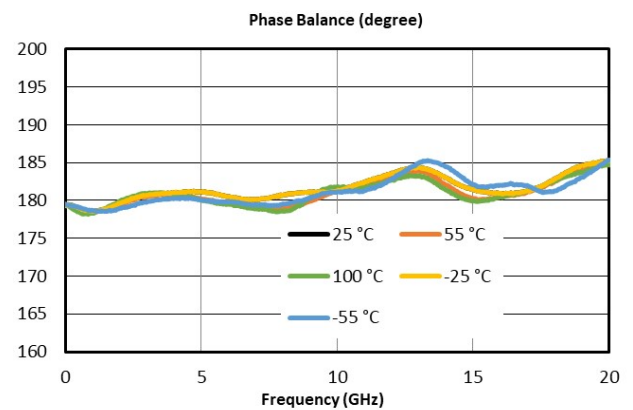
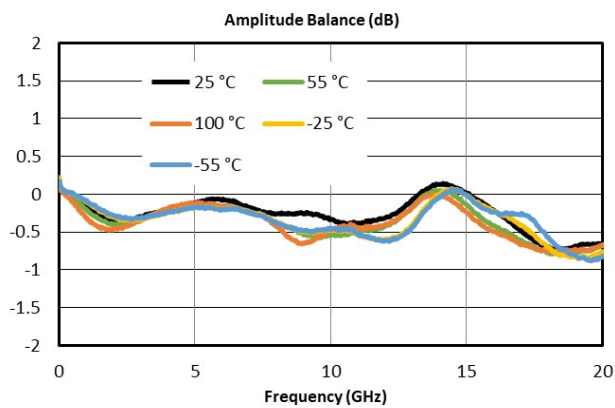
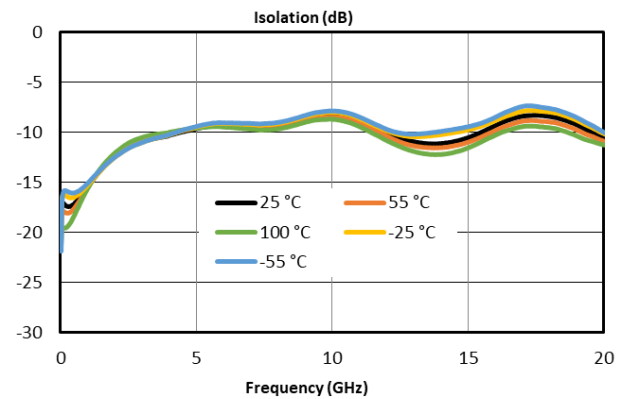
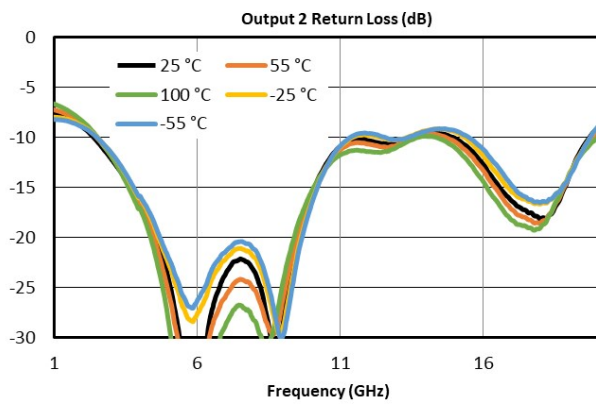
Three port scattering parameters measured as three single-ended 50Ω ports showing relationship between any two ports.





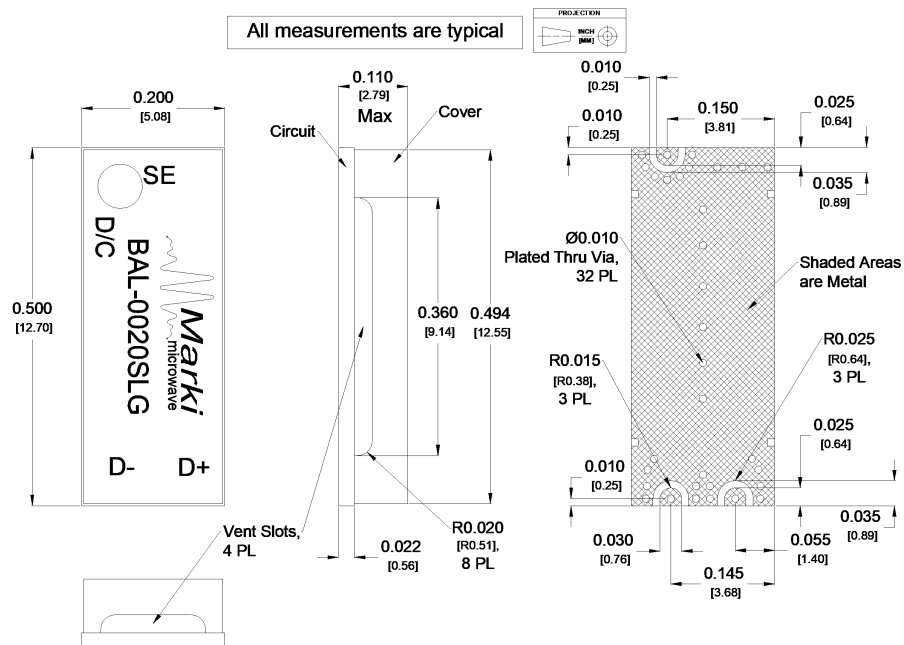
Typical Performance over Temperature

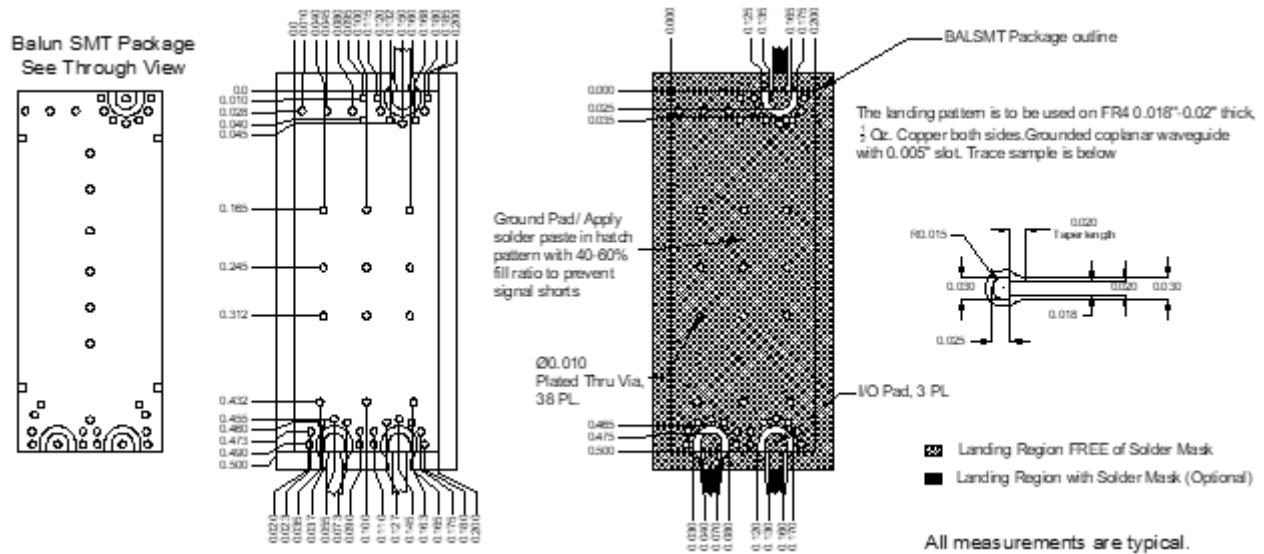




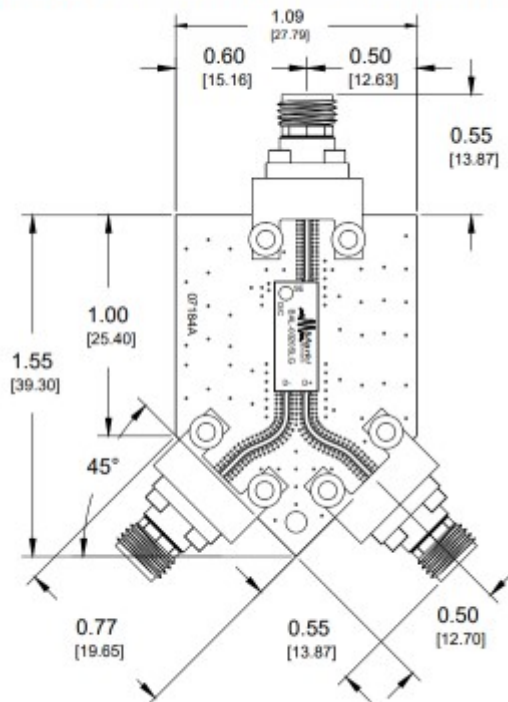
Mechanical Data

Outline Drawing

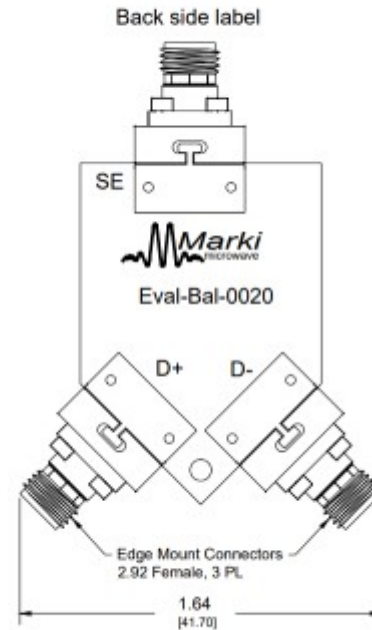


Footprint Image


RoHS Compliant (SN96.5/AG3.5) Components/Assembly



All measurements are typical



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