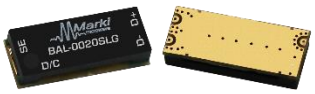
LEAD-FREE / RoHS-COMPLIANT

SURFACE-MOUNT BROADBAND BALUN BAL-0020SLG



SMT

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
- BAL-0020SLG.s3p

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

Parameter	Frequency Range	Min	Typ	Max
Insertion Loss as a mode converter (dB)	10 MHz to 20 GHz		4.5	7
Nominal Phase Shift (Degrees)			180	
Amplitude Balance (dB)			0.4	1.2
Phase Balance (Degrees)			5	10
Common Mode Rejection (dB)		22	35	
Isolation (dB)			12	
VSWR (Common)			1.5	
VSWR (Output)			1.6	
Total Input Power (W)				TBD

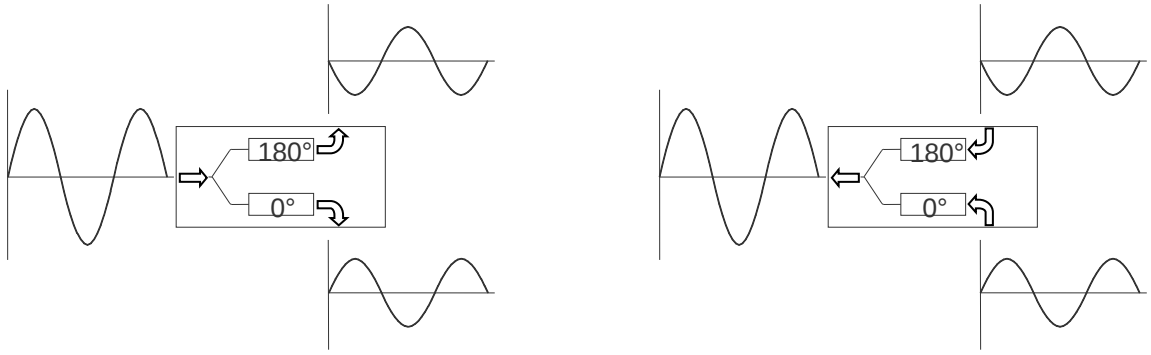
Model Number	Description
BAL-0020SLG	10 MHz to 20 GHz Balun, Surface Mount, LEAD-FREE/RoHS COMPLIANT
EVAL-BAL-0020	Connectorized Evaluation Fixture, LEAD-FREE/RoHS COMPLIANT

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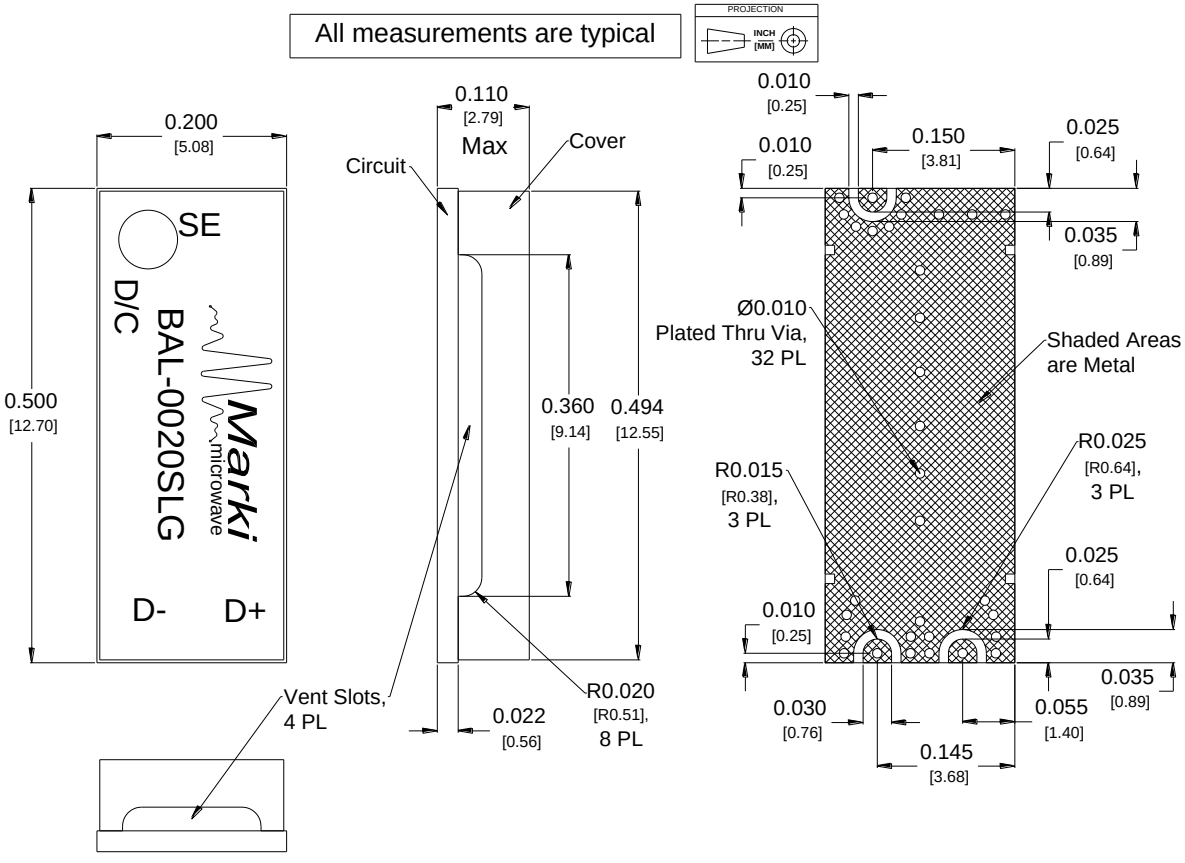
SURFACE-MOUNT BROADBAND BALUN BAL-0020SLG

Block Diagram



Single ended to differential **Differential to single ended**

Outline Drawing



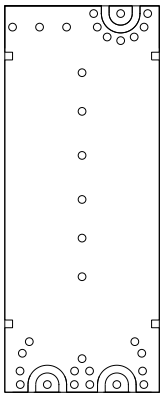
Material is FR4 ,Finish is 2-8µ-inches of Gold type III Grade A, Soft Gold over 100-200 µ-inches solderable Nickel.

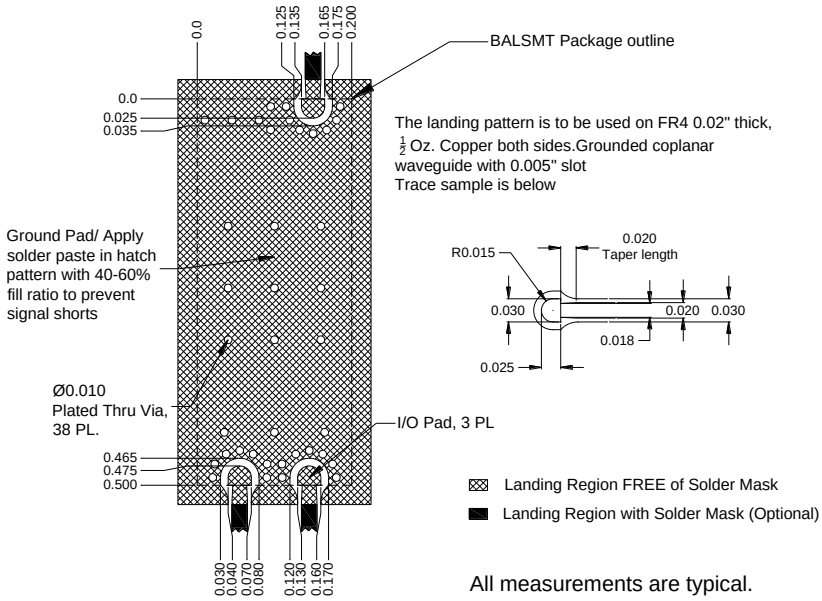
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SURFACE-MOUNT BROADBAND BALUN BAL-0020SLG

PCB Footprint Drawing

Balun SMT Package
See Through View



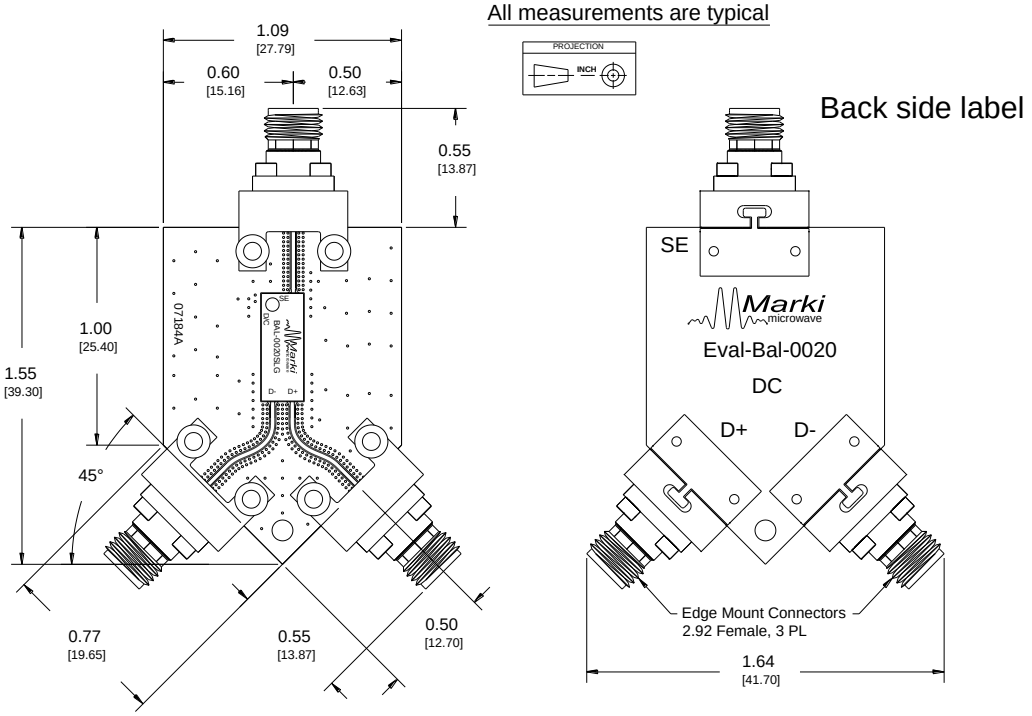


All measurements are typical.

Click here for a DXF of the above layout.

Eval Package Outline Drawing

All measurements are typical



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Mixed Mode Scattering Parameters[1]

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.

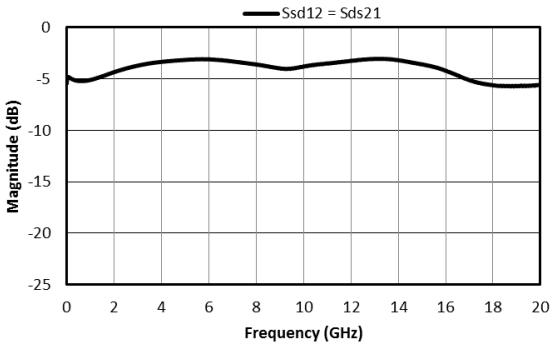


Fig. 1. Insertion loss as a mode converter

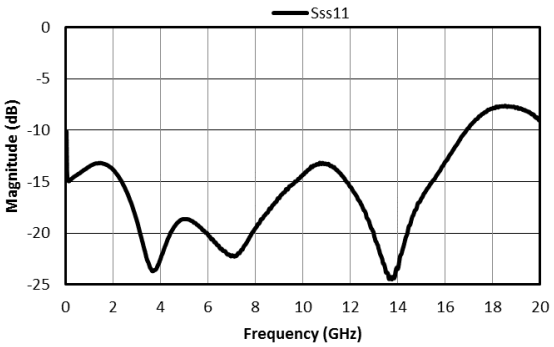


Fig. 2. Unbalanced port return loss

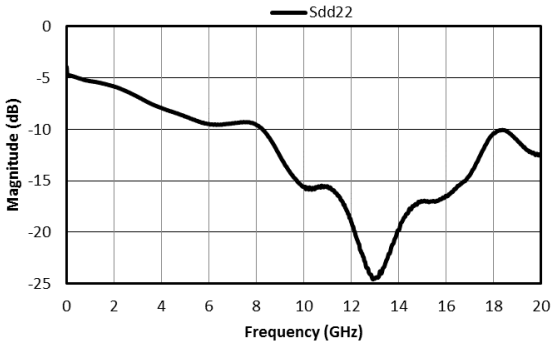


Fig. 3. Differential port return loss

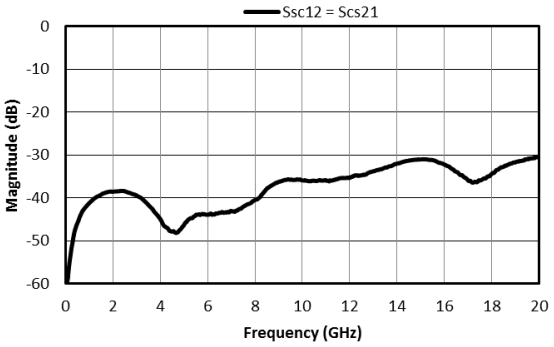


Fig. 4. Insertion loss of a common mode signal

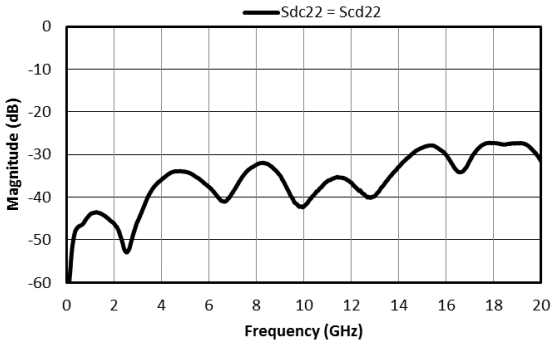


Fig. 5. Reflection converted between differential and common modes

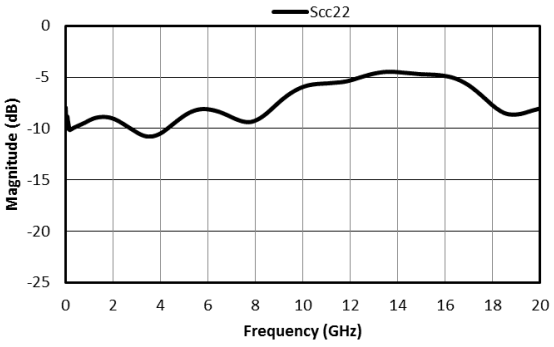


Fig. 6. Return loss of a common mode signal

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Typical Performance Scattering Parameter

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

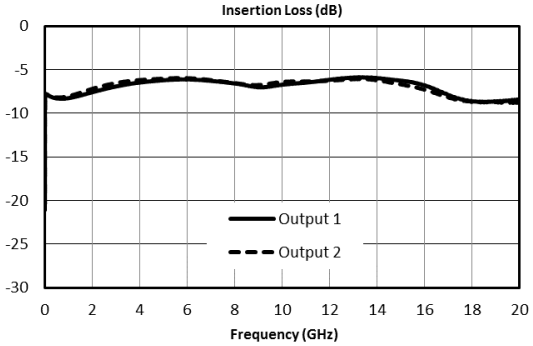


Fig. 7. Common to output port insertion loss

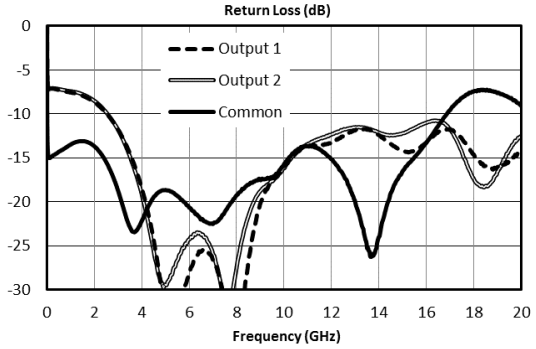


Fig. 8. Return loss for common port and output ports.

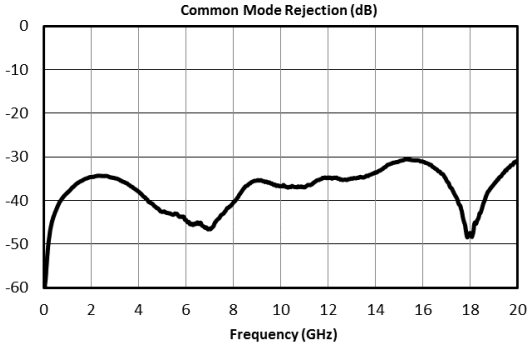


Fig. 9. Common mode rejection.

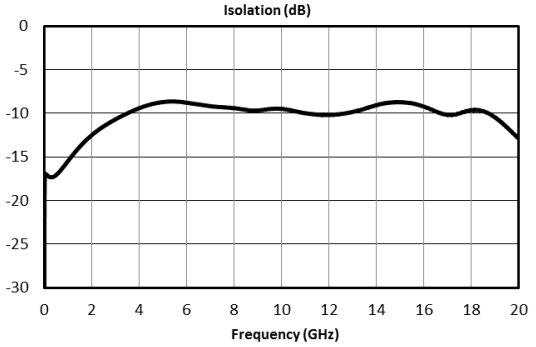


Fig. 10. Isolation between output ports

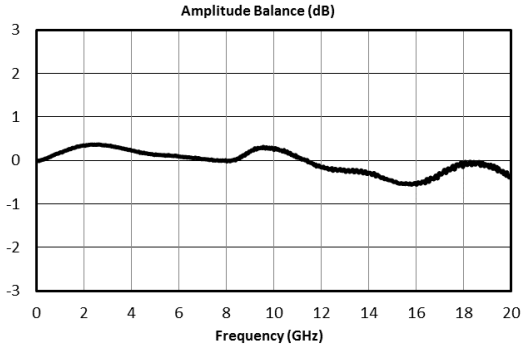


Fig. 11. Amplitude balance between output ports.

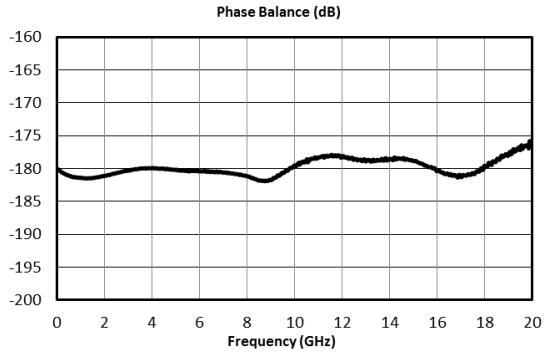


Fig. 12. Phase balance between output ports.

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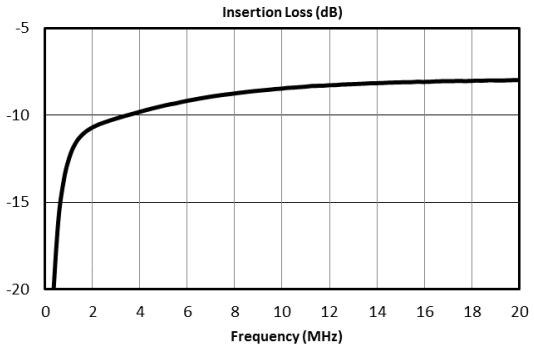
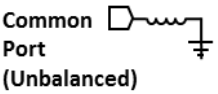
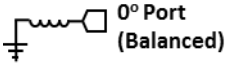
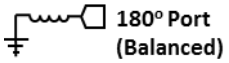


Fig. 13. Low Frequency Insertion Loss

DC Interface

Port	Description	DC Interface Schematic
Common Port / In (Unbalanced)	The common port is DC short to ground.	
Out 1 / 0º Port (Balanced)	The 0º port is DC short to ground.	
Out 2 / 180º Port (Balanced)	The 180º port is DC short to ground.	

Absolute Maximum Ratings	
Parameter	**Maximum Rating**
DC Current	TBD
RF Power Handling	TBD
Operating Temperature	-55ºC to +100ºC
Storage Temperature	-65ºC to +125ºC

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DATASHEET NOTES:

1. 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
   Scc22: 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

Revision History

Revision code	Revision Date	Comment
-	August 2020	Draft

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