BALUN BAL-0106

Features

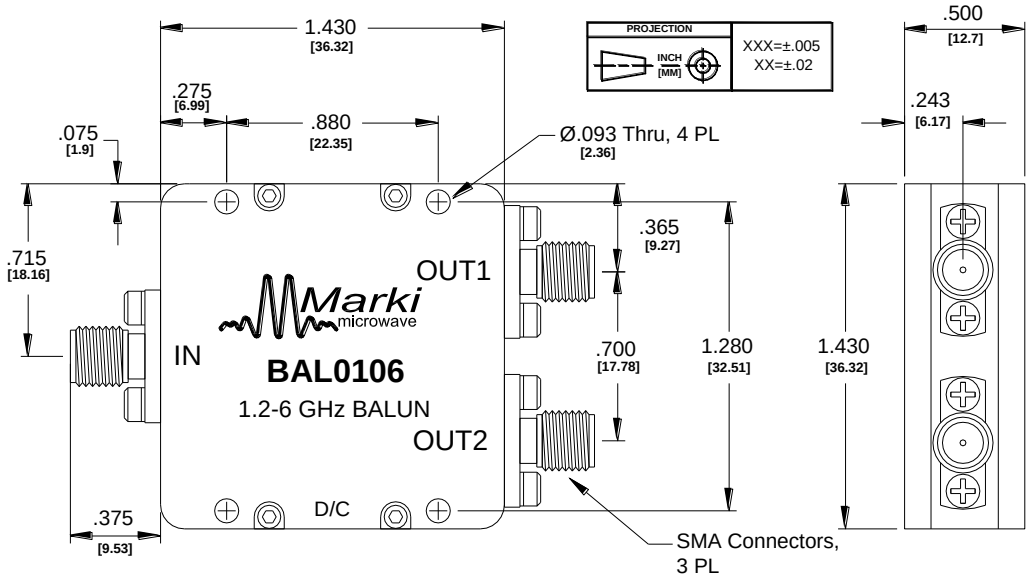
- 1.2 to 6 GHz Balun (Balanced to Unbalanced Transformer)
- Tuned for Optimal Phase/Amplitude Balance
- Provides 50 Ω to 100 Ω Differential Transformation
- Applications: Antenna Feeds, Device Testing, General Lab Use
- BAL-0106.s3p

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)	1.2 to 6 GHz		0.6	1.8
Nominal Phase Shift (Degrees)			180	
Amplitude Balance (dB)			0.1	0.5
Phase Balance (Degrees)			2	5
Common Mode Rejection (dB)		28	38	
Isolation (dB)			6	
VSWR (Input) VSWR (Output)			1.2 2.6	
Total Input Power (W)				5
Weight (g)			38	

Model Number	Description
BAL-0106	1.2 to 6 GHz Balun with SMA connectors[1]

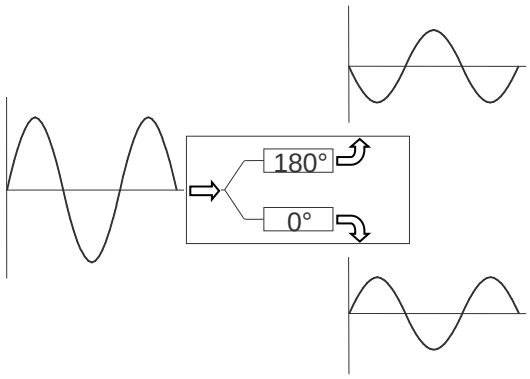
[1]Default is SMA female connectors. Consult factory for other connector options.



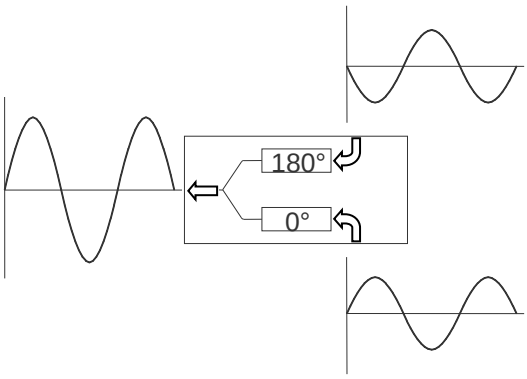
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Block Diagram



Single ended to differential



Differential to single ended

Typical Performance Scattering Parameters

Three port scattering parameters measured as three single-ended 50Ω ports showing relationship between any two ports. For example: S21 and S31, often referred to as insertion loss of a balun, is the output response on ports 2 and 3 with an input stimulus on port 1.

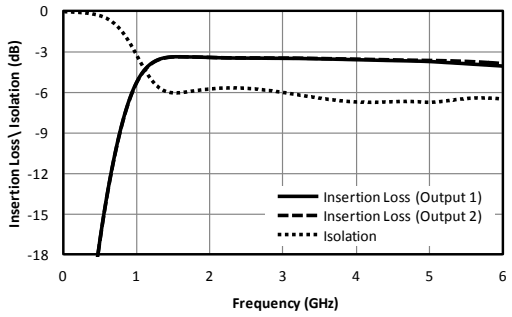


Fig. 1. Common to output port insertion loss and output to output port Isolation.

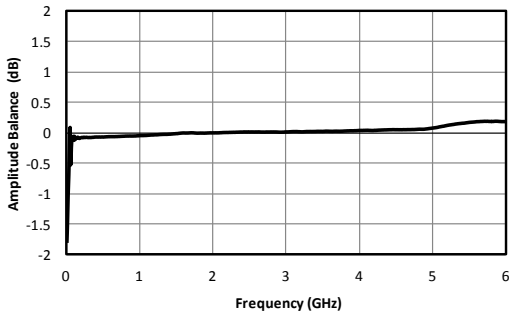


Fig. 3. Amplitude balance between output ports.

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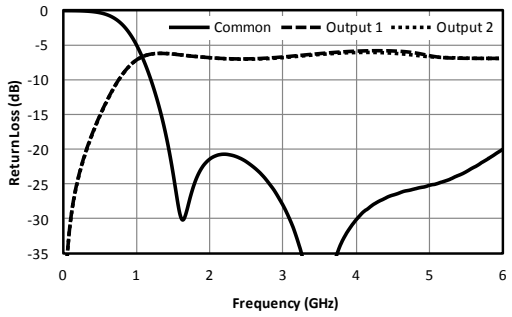


Fig. 2. Return loss for common port and output ports.

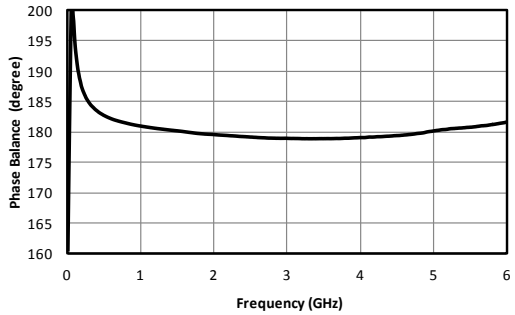


Fig. 4. Phase balance between output ports.

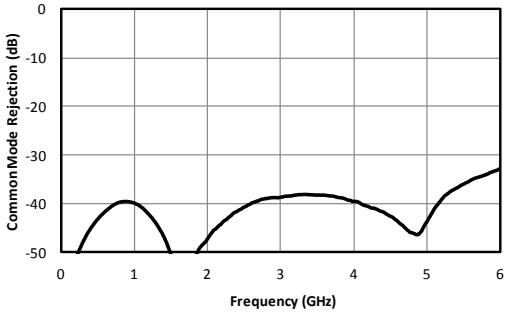


Fig. 5. Common mode rejection

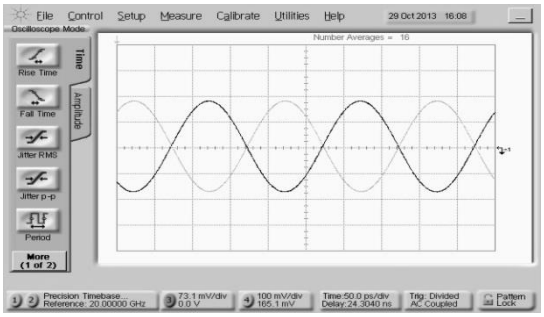
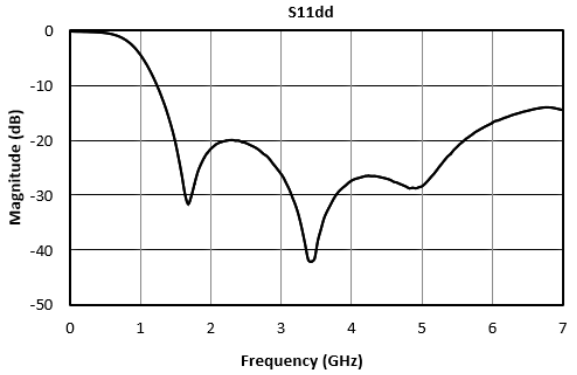


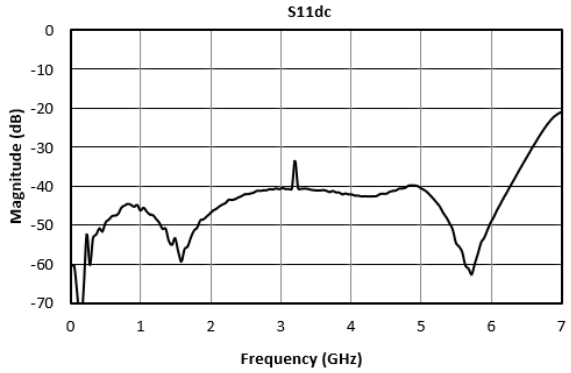
Fig. 6. Oscilloscope measurements with 5 GHz sine wave input. Excellent amplitude and phase balance are apparent. Note that BAL-0106 is not suitable for baseband data, as any data input will be high pass filtered, particularly on the inverted side.

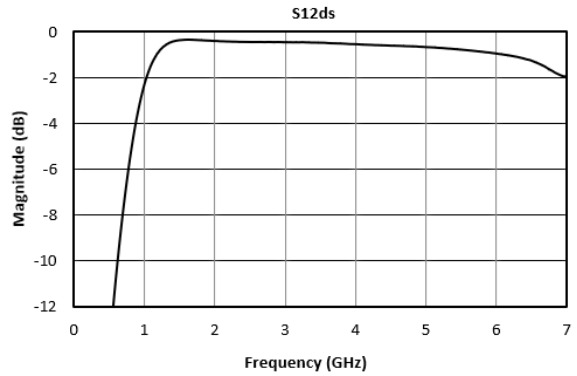
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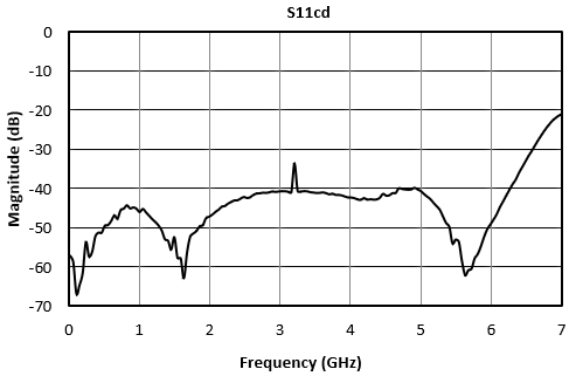
Mixed Mode Scattering Parameters

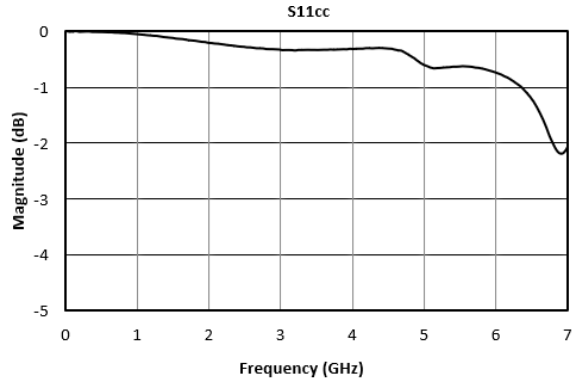
Mixed mode scattering parameters are used to characterize differential circuits. For baluns, this means that the 0° and 180° ports become a single 100Ω differential port and the common port remains the same 50Ω common port. The two-port s-parameters of the balun are then characterized based on differential (d), common mode (c), or single-ended (s) signals. For example: S12ds is the differential output response given a single ended input.

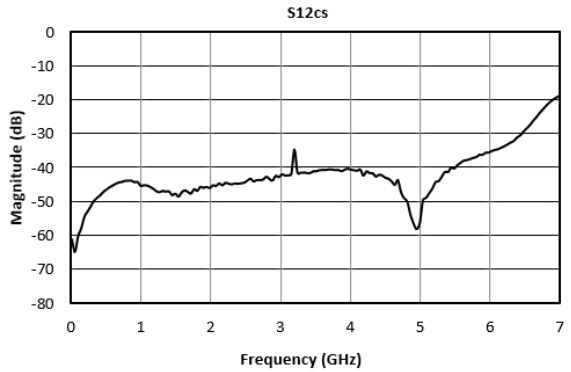




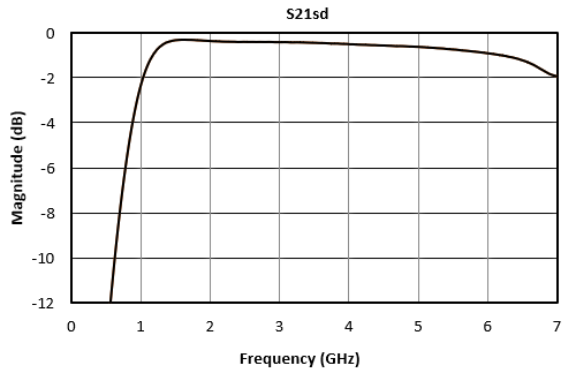


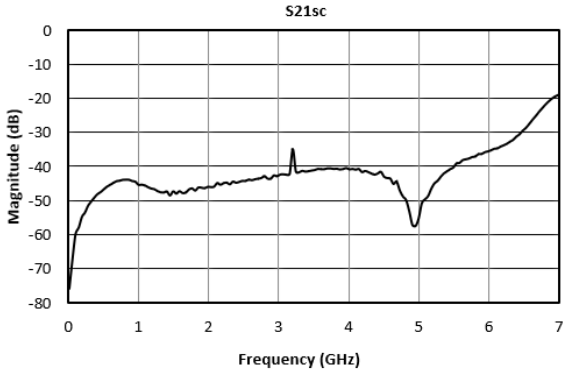


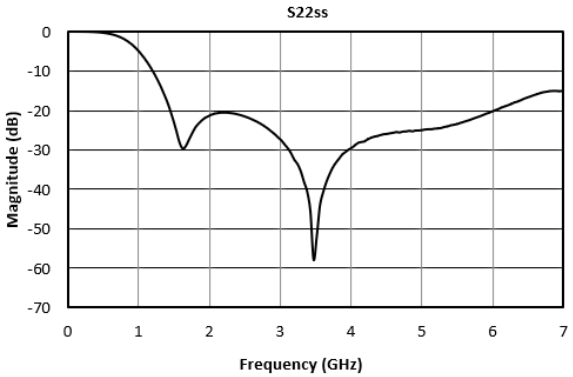




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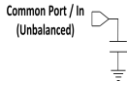
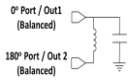
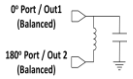






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DC Interface

Port	Description	DC Interface Schematic
Common Port / In (Unbalanced)	The common port is DC open.	
Out 1 / 0° Port (Balanced)	The 0° port is DC shorted to the 180° port and DC open to ground.	
Out 2 / 180° Port (Balanced)	The 180° port is DC shorted to the 0° port and DC open to ground.	

Revision History

Revision code	Revision Date	Comment
-	2013	Datasheet initial Release
A	2014	DC Interface Added
B	October 2019	Mixed Mode Scattering Parameters added
C	July 2020	Specs Table Update
D	October 2020	Specs Table Update

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