



BROADBAND BALUN (200 kHz to 3 GHz)

BAL-0003

Features

- 200 kHz to 3 GHz Balun (Balanced to Unbalanced Transformer)
- Matched 50 Ohm Impedance on Input and Output Ports
- Tuned for Optimal Phase/Amplitude Balance
- Applications: Analog to Digital Converters, Balanced Receivers, Baseband Digital Modulation, Signal Integrity
- [BAL-0003.s3p](#)



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

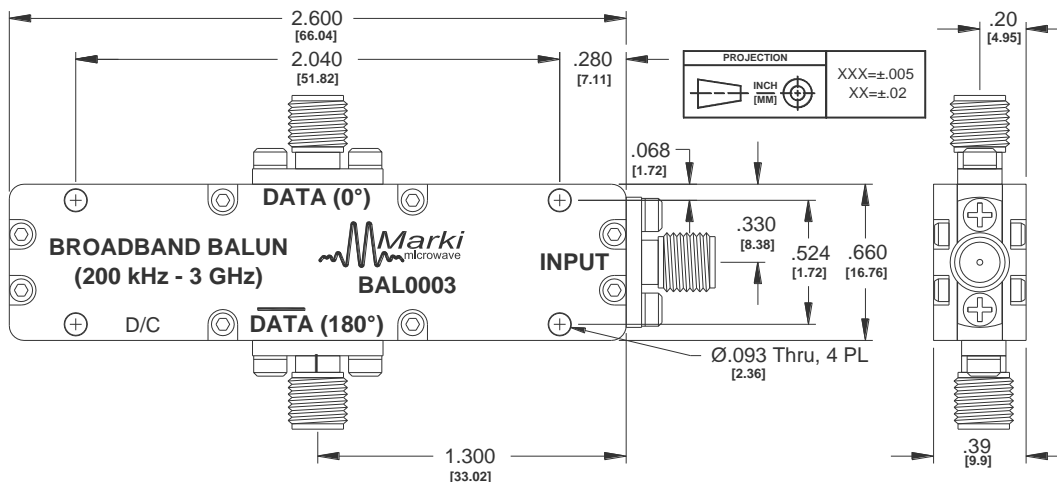
Parameter	Frequency Range	Min	Typ	Max	
Nominal Insertion Loss (dB)	200 kHz to 3 GHz		6		
Nominal Phase Shift (Degrees)			180		
Amplitude Balance (dB)			±0.05	±0.5	
Phase Balance (Degrees)			±1	±5	
Common Mode Rejection (dB)			35	45	
Excess Insertion Loss (dB) ¹				1	2
Isolation (dB)				8	
VSWR (Input)				1.35	
VSWR (Output)				1.7	
Risetime /Falltime (ps) ²				48	
Total Input Power (W)					1
Weight (g)				27	

¹Excess Insertion Loss = (Common Port to Output Port Insertion Loss) – 6 dB.

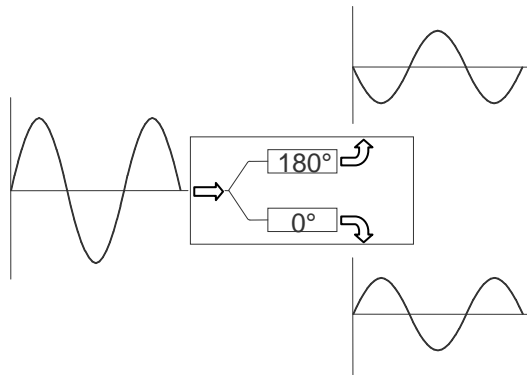
²Specified as 90%/10%. Calculated from $\tau_{balun}^2 = (\tau_{out}^2 - \tau_{in}^2)$

Model Number	Description
BAL-0003	200 kHz to 3 GHz Balun with SMA connectors ¹

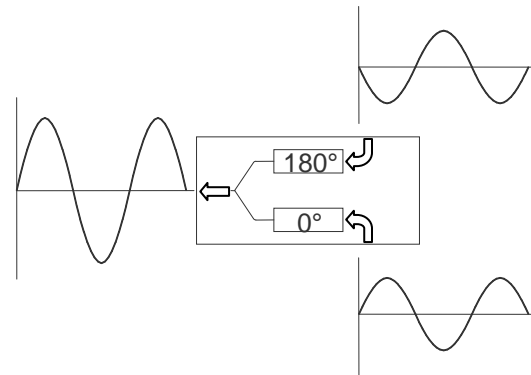
¹Default is SMA female connectors. Consult factory for other connector options.



Block Diagram



Single ended to differential



Differential to single ended

Typical Performance

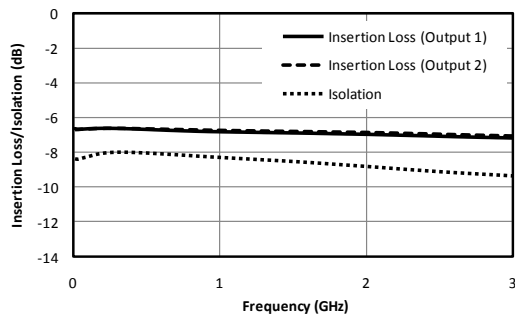


Fig. 1. Common to output port insertion loss and output to output port Isolation.

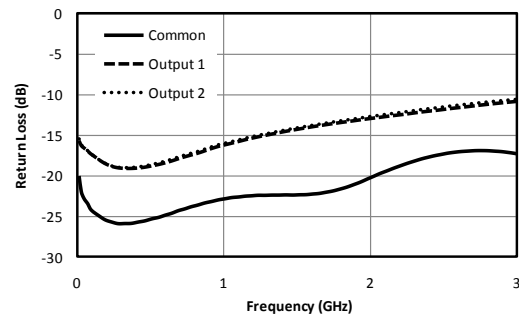


Fig. 2. Return loss for common port and output ports.

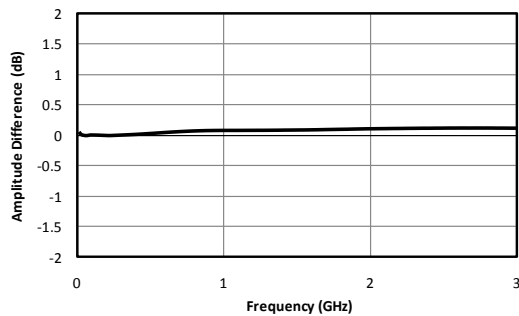


Fig. 3. Amplitude balance between output ports.

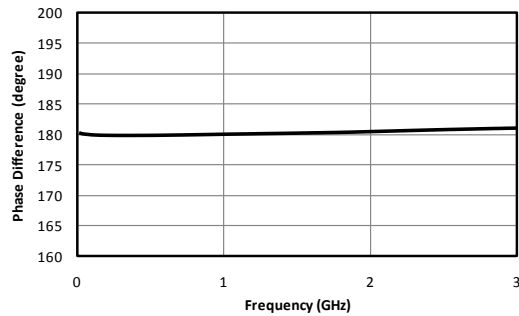


Fig. 4. Phase balance between output ports.

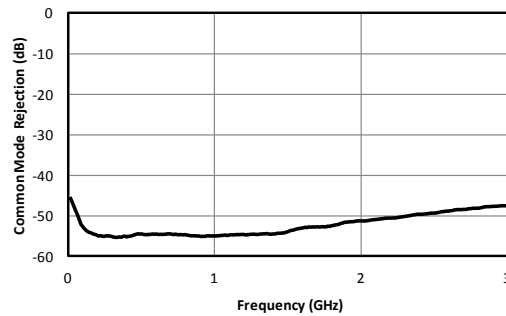


Fig. 5. Common mode rejection.

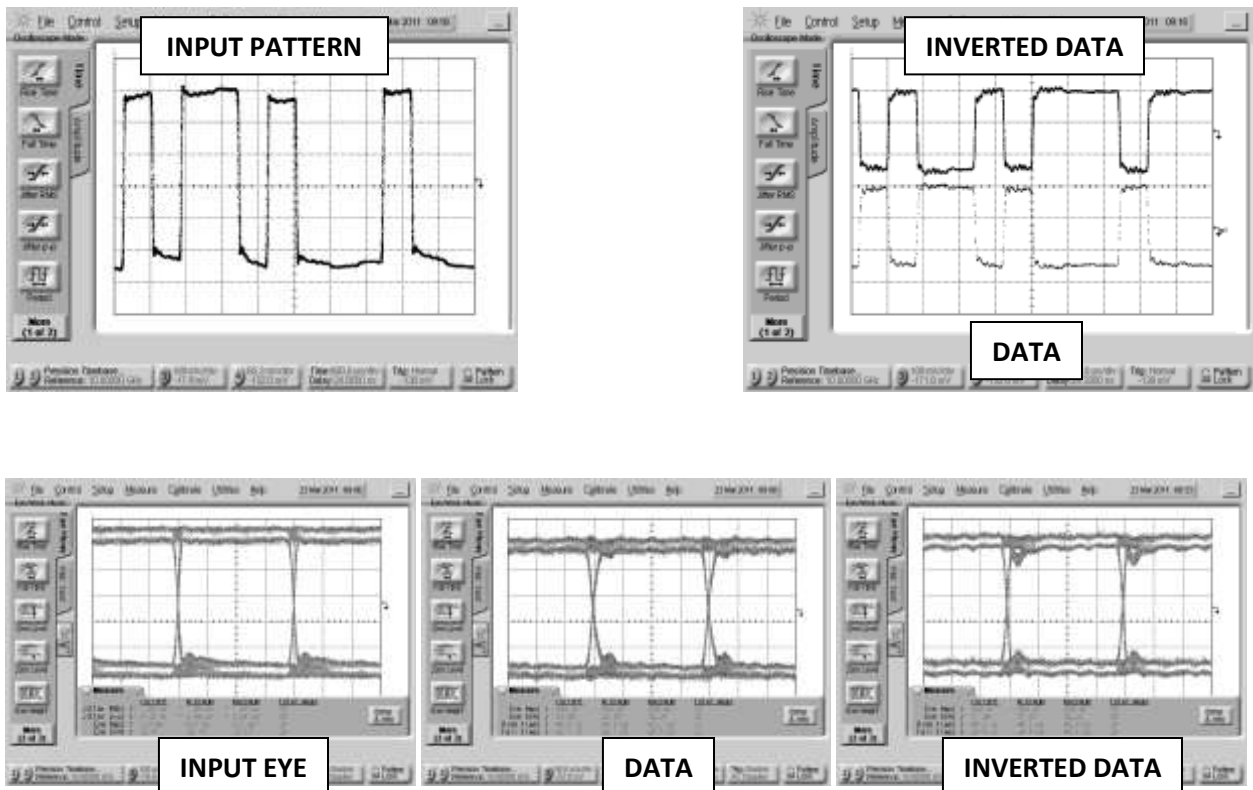


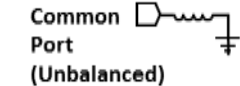
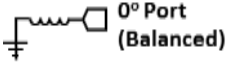
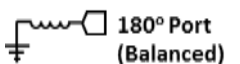
Fig. 6. Oscilloscope measurements of the BAL-0003 with a 2.5 Gb/s PRBS pattern. Bit pattern is measured with a 2^7-1 PRBS input demonstrating extremely good pulse fidelity for both inverted and non-inverted output. Eye diagrams are taken with a $2^{31}-1$ PRBS input demonstrating minimal eye distortion/closure afforded by the extremely low frequency operation of the balun (<200 kHz).

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DC Interface

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

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