

## HIGH POWER BALUN (200 kHz to 3 GHz)

**BALH-0003**

### Features

- 200 kHz to 3 GHz Balun (Balanced to Unbalanced Transformer)
- Better than 37 dBm 1-dB compression point
- Tuned for Optimal Phase/Amplitude Balance
- Applications: Analog to Digital Converters, Balanced Receivers, Baseband Digital Modulation, Signal Integrity
- [BALH-0003.s3p](#)



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

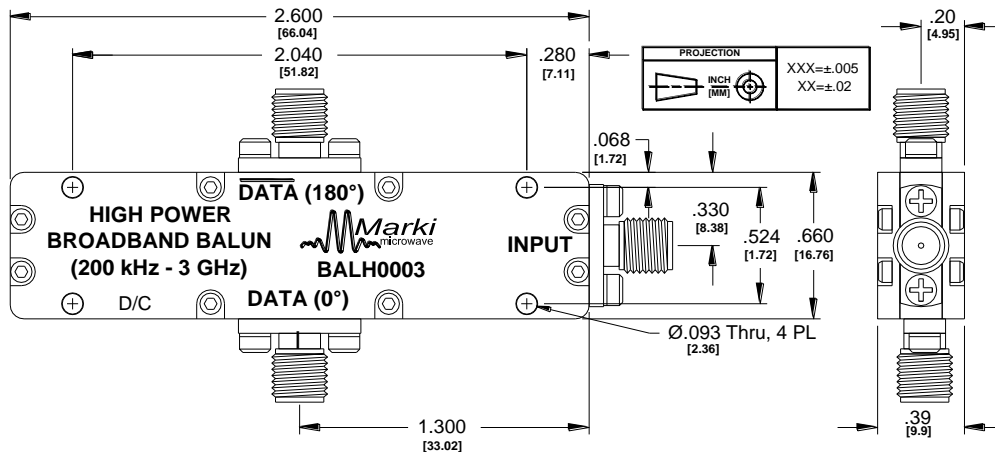
| Parameter                                 | Frequency Range  | Min | Typ  | Max  |  |
|---|------------------|-----|------|------|--|
| Insertion Loss (dB)                       | 200 kHz to 3 GHz |     | 4.5  | 5.5  |  |
| Input 1 dB Compression (dBm) <sup>1</sup> |                  | 37  |      |      |  |
| Nominal Phase Shift (Degrees)             |                  |     | 180  |      |  |
| Amplitude Balance (dB)                    |                  |     | ±0.1 | ±0.5 |  |
| Phase Balance (Degrees)                   |                  |     | ±1   | ±5   |  |
| Common Mode Rejection (dB)                |                  |     | 35   | 45   |  |
| Isolation (dB)                            |                  |     |      | 7    |  |
| VSWR (Input)                              |                  |     |      | 1.6  |  |
| VSWR (Output)                             |                  |     |      | 1.6  |  |
| Risetime /Falltime (ps) <sup>2</sup>      |                  |     |      | 13   |  |
| Weight (g)                                |                  |     |      | 27   |  |

<sup>1</sup>Measured in a well-heat sunk environment.

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

| Model Number | Description  |
|--------------|--|
| BALH-0003    | 200 kHz to 3 GHz High Power Balun with SMA connectors <sup>1</sup> |

<sup>1</sup>Default is SMA female connectors. Consult factory for other connector options.

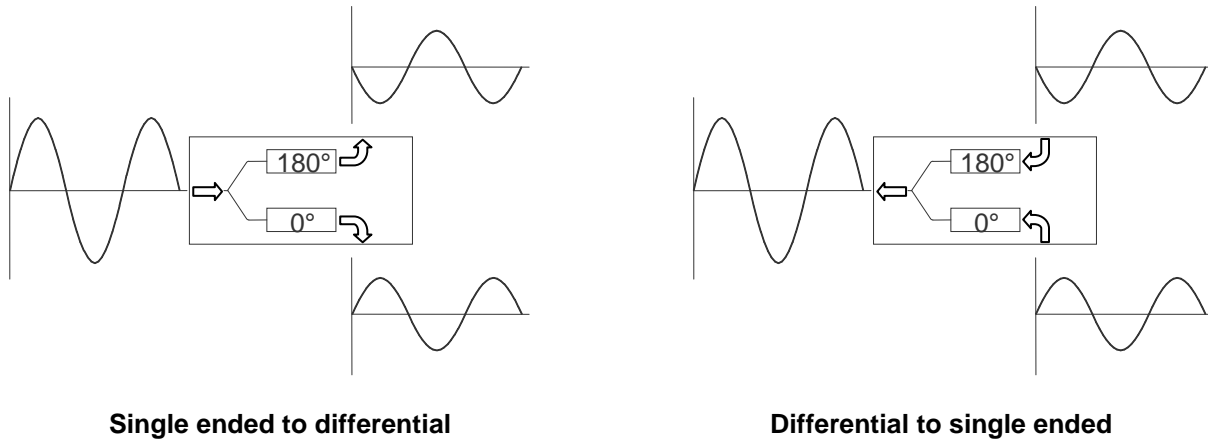


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## Block Diagram



## Typical Performance

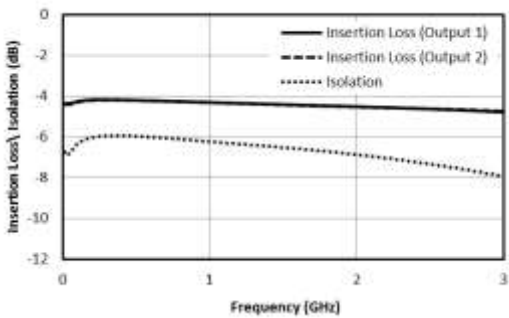


Fig. 1. Common to output port insertion loss and output to output port Isolation.

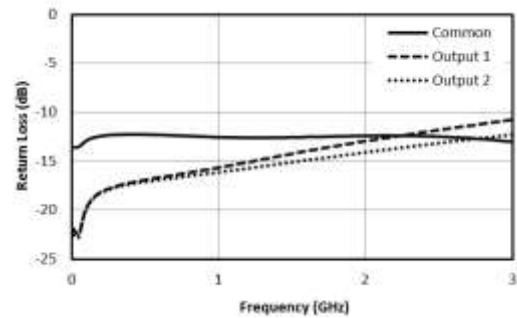


Fig. 2. Return loss for common port and output ports.

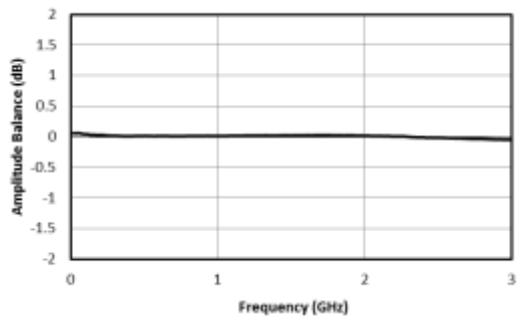


Fig. 3. Amplitude balance between output ports.

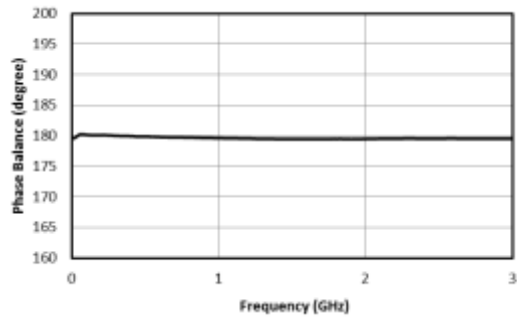


Fig. 4. Phase balance between output ports.

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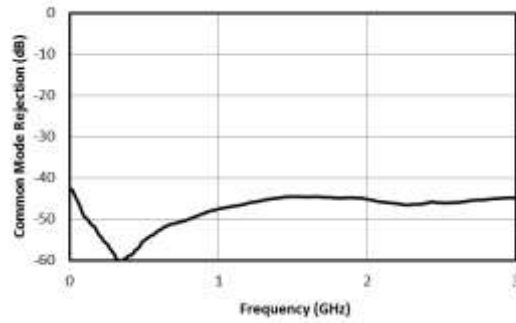


Fig. 5. Common mode rejection.

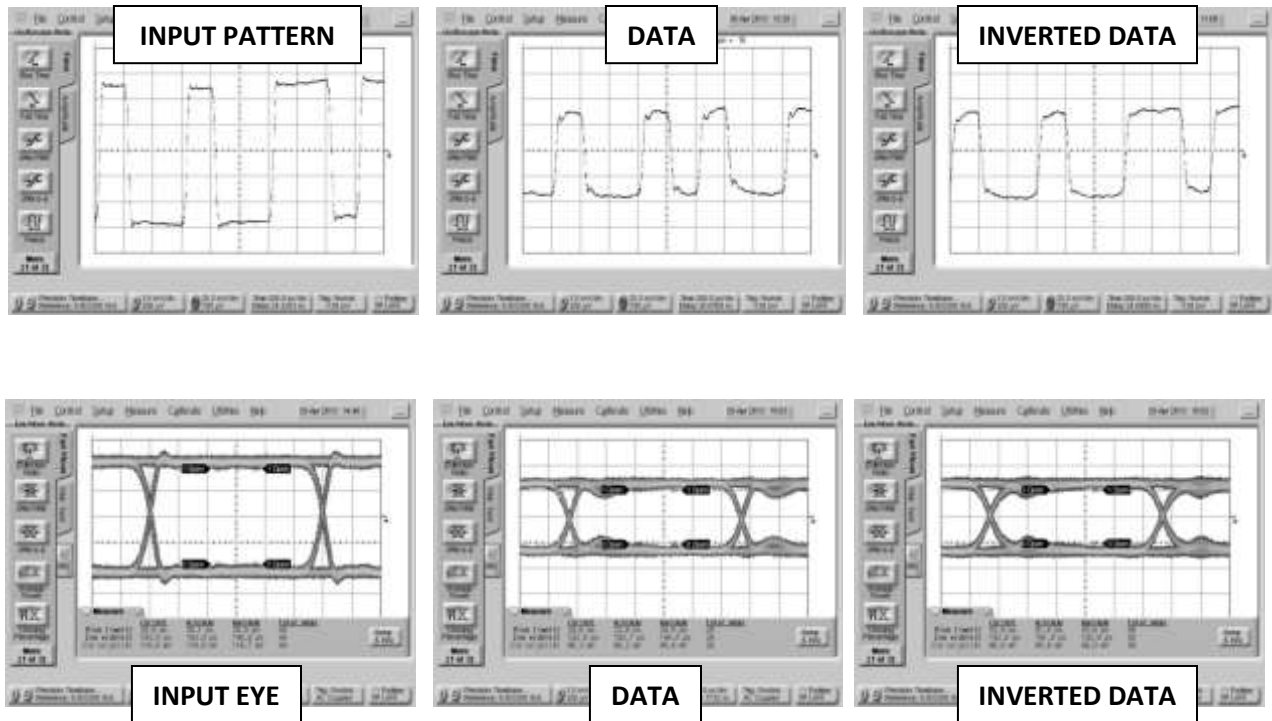


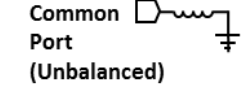
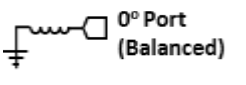
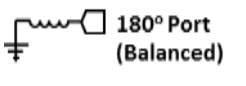
Fig. 6. Oscilloscope measurements of the BALH-0003 with a 5 Gb/s PRBS pattern. Bit pattern is measured with a  $2^7-1$  PRBS input demonstrating extremely good pulse fidelity for both inverted and non-inverted output. Eye diagrams are taken with a  $2^{31}-1$  PRBS input demonstrating minimal eye distortion/closure 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<br>(Unbalanced) | The common port is DC short to ground. |  <p>Common Port<br/>(Unbalanced)</p> |
| Out 1 / 0° Port<br>(Balanced)    | The 0° port is DC short to ground.     |  <p>0° Port<br/>(Balanced)</p>       |
| Out 2 / 180° Port<br>(Balanced)  | The 180° port is DC short to ground.   |  <p>180° Port<br/>(Balanced)</p>     |

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