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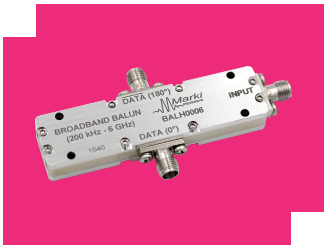
BALH-0006

HIGH POWER BALUN (200 kHz to 6 GHz)

DEVICE OVERVIEW

General Description

The BALH-0006 is a broadband balun, hand-tuned for optimal phase and amplitude balance over a 200 kHz to 6 GHz bandwidth. It serves as an excellent choice for analog to digital converters, balanced receivers, baseband digital modulations, and signal integrity enhancement.



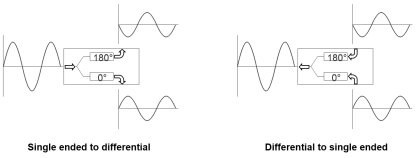
Features

- 1:1 Impedance Ratio
- 200 kHz to 6 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

Functional Block Diagram



Single ended to differential

Differential to single ended

Part Ordering Options

Part Number	Description	Connectors	Green Status	Product Lifecycle	Export Classification
BALH-0006	HIGH POWER BALUN (200 kHz to 6 GHz)	Standard	REACH RoHS	Released	EAR99

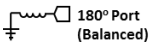
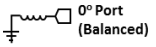
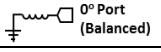
Table Of Contents

Revision History

Revision Code	Revision Date	Comment
-	2014-01-01	Initial Datasheet Release
A	2019-10-01	Mixed Mode Scattering Parameters Added
B	2019-11-01	RoHS Compliant Assembly
C	2020-07-01	Spec Table Update
D	2020-10-01	Spec Table Update

Port Configuration and Functions

Port Functions

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

Specifications

Package Information

Parameter	Details	Rating
Weight	-	27g
Dimensions	-	66.04 x 16.76 mm

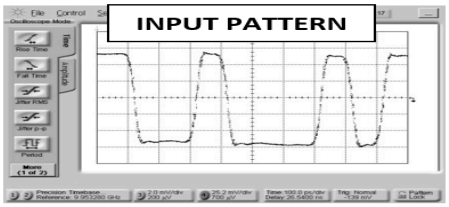
Electrical Specifications

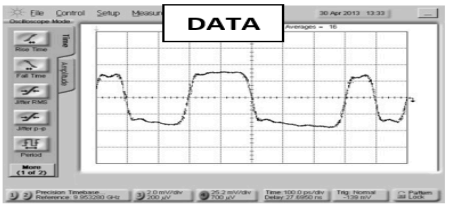
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Input P1dB [1]	-	0.0002	6	37	-	-	dBm
Insertion Loss as a Mode Converter	-	0.0002	6	-	2.5	4	dB
Nominal Phase Shift	-	0.0002	6	-	180	-	°
Amplitude Balance	-	0.0002	6	-	0.1	0.5	dB
Common Mode Rejection	-	0.0002	6	30	40	-	dB
Impedance Ratio	-	-	-	-	1:1	-	
Isolation	-	0.0002	6	-	8	-	dB
Phase Balance	-	0.0002	6	-	1	5	°
Risetime/Falltime [2]	-	0.0002	6	-	11.5	-	ps
VSWR (Input)	-	0.0002	6	-	1.5	-	
VSWR (Output)	-	0.0002	6	-	1.7	-	

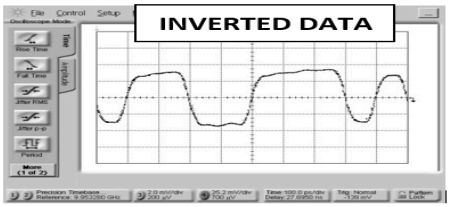
[1] Measured in a well heat-sinked environment.
[2] Specified as 90%/10%. Calculated from Tau(balun)^2=(Tau(out)^2 - Tau(in)^2).

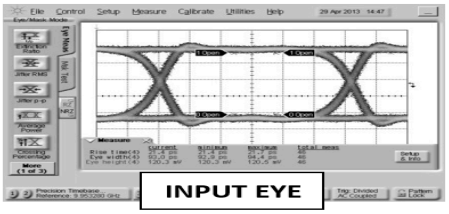
Time Domain Performance Plots

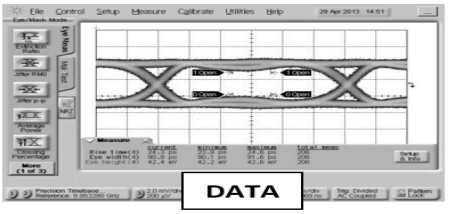
Oscilloscope measurements of the BALH-0006 with a 10 Gb/s PRBS pattern. Bit pattern is measured with a 2^7-1 PRBS input demonstrating extremely good pulse fidelity for both inverted and non-inverted output. Eye diagrams are taken with a 2^{31}-1 PRBS input demonstrating minimal eye distortion/closure afforded by the extremely low frequency operation of the balun (<200 kHz).

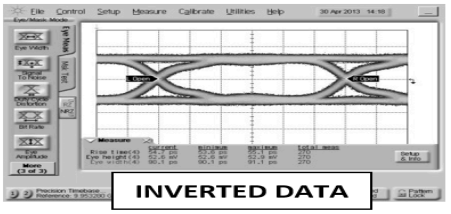






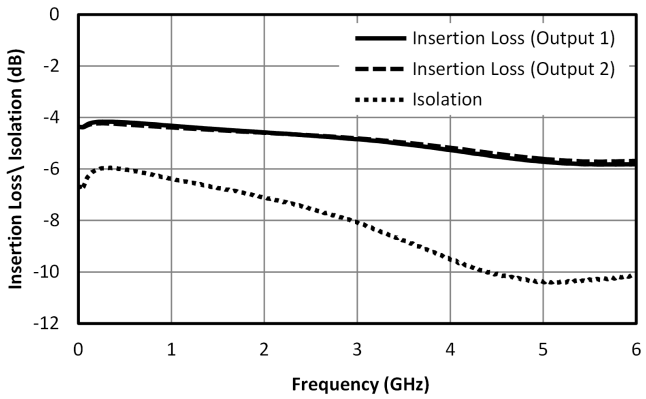


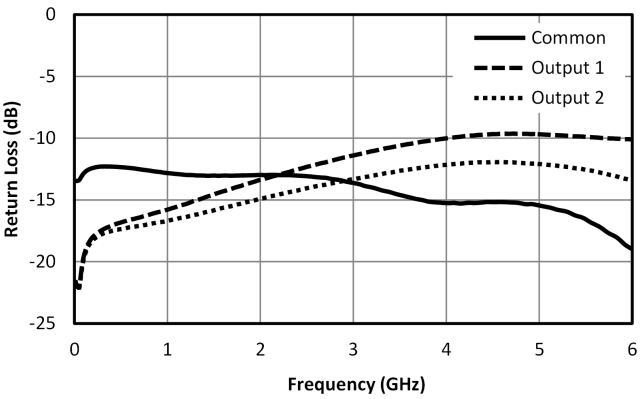


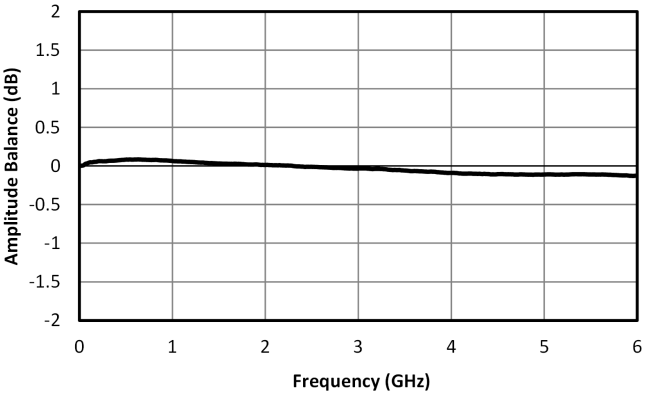


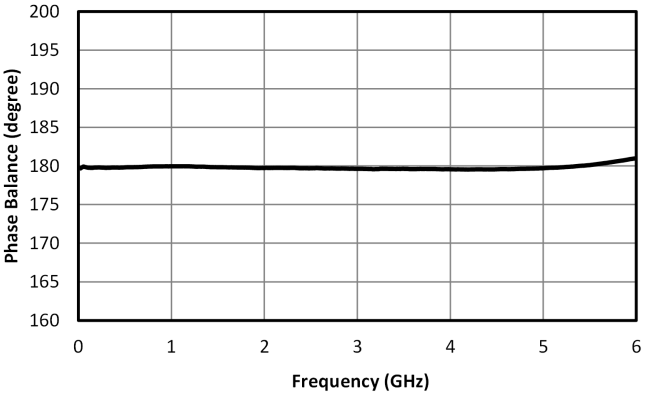
Typical Performance Scattering Parameters

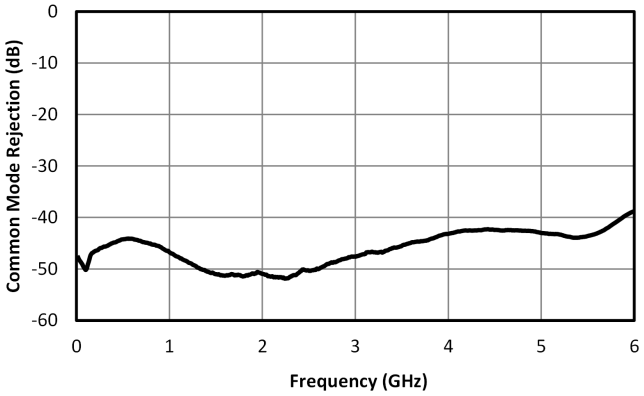
Three port scattering parameters measured as three single-ended 50Ω ports showing relationship between any two ports. For example: S21 and S31, often referred to as insertion loss of a balun, is the output response on ports 2 and 3 with an input stimulus on port 1.





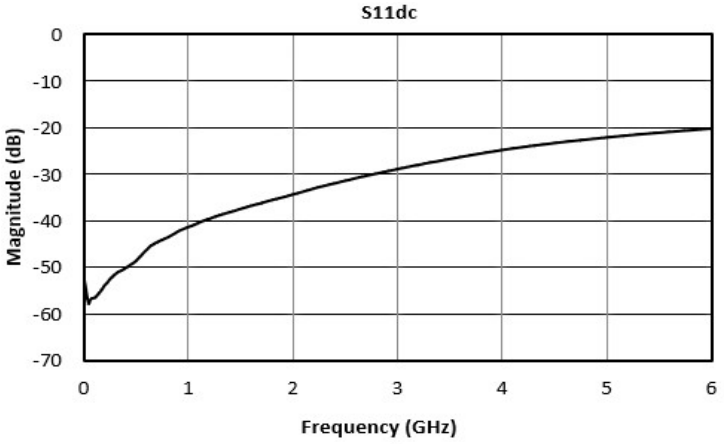


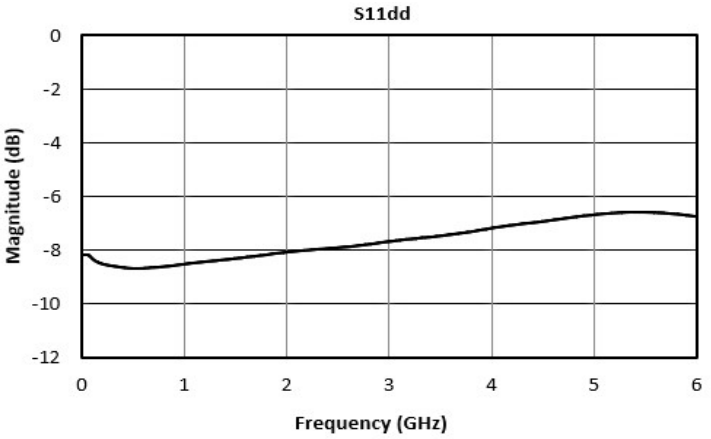


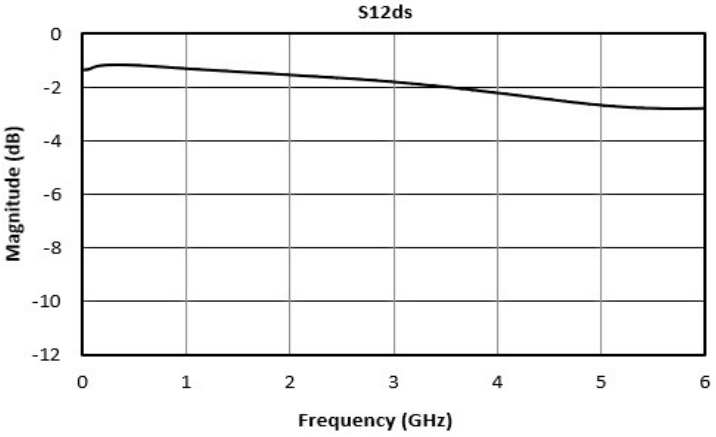


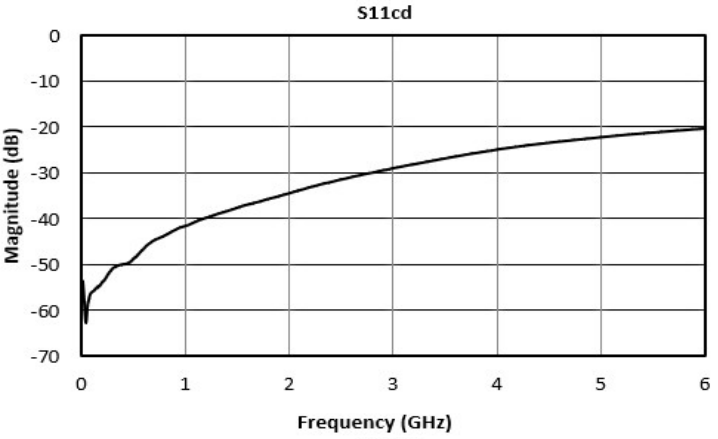
Mixed Mode Scattering Parameters

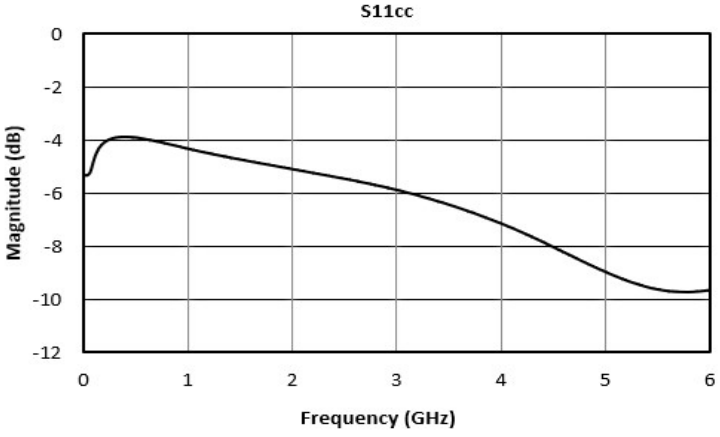
Mixed mode scattering parameters are used to characterize differential circuits. For baluns, this means that the 0° and 180° ports become a single 100Ω differential port and the common port remains the same 50Ω common port. The two-port s-parameters of the balun are then characterized based on differential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

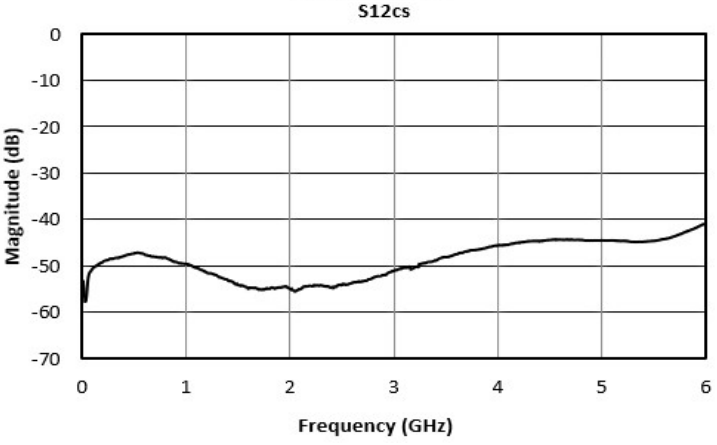












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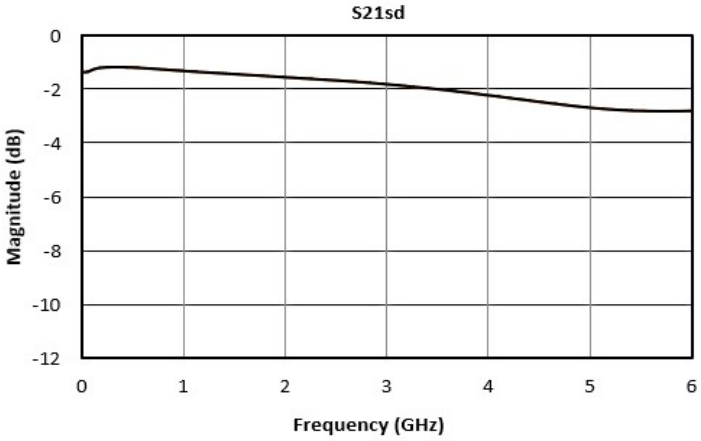
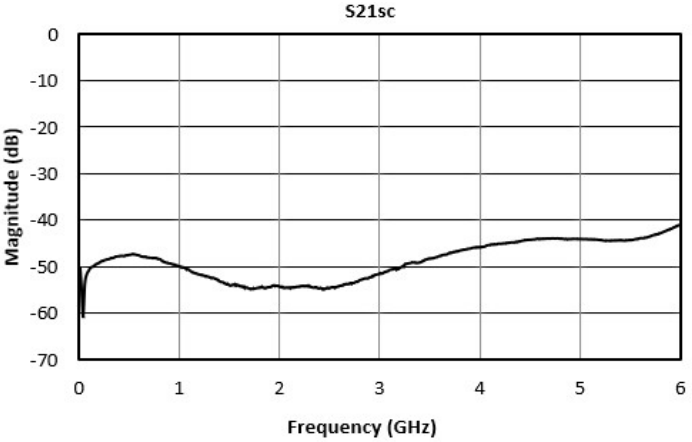
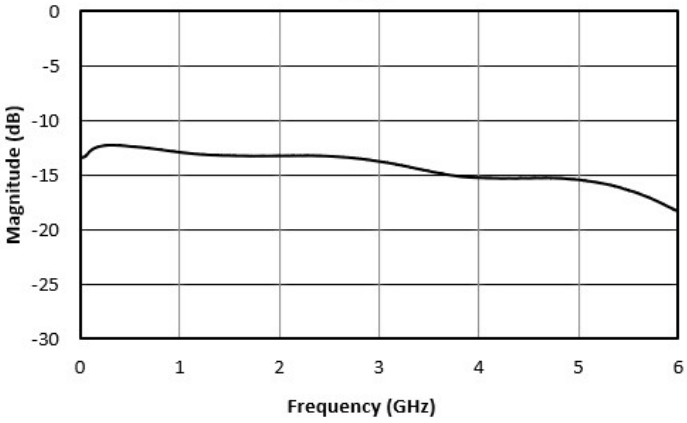


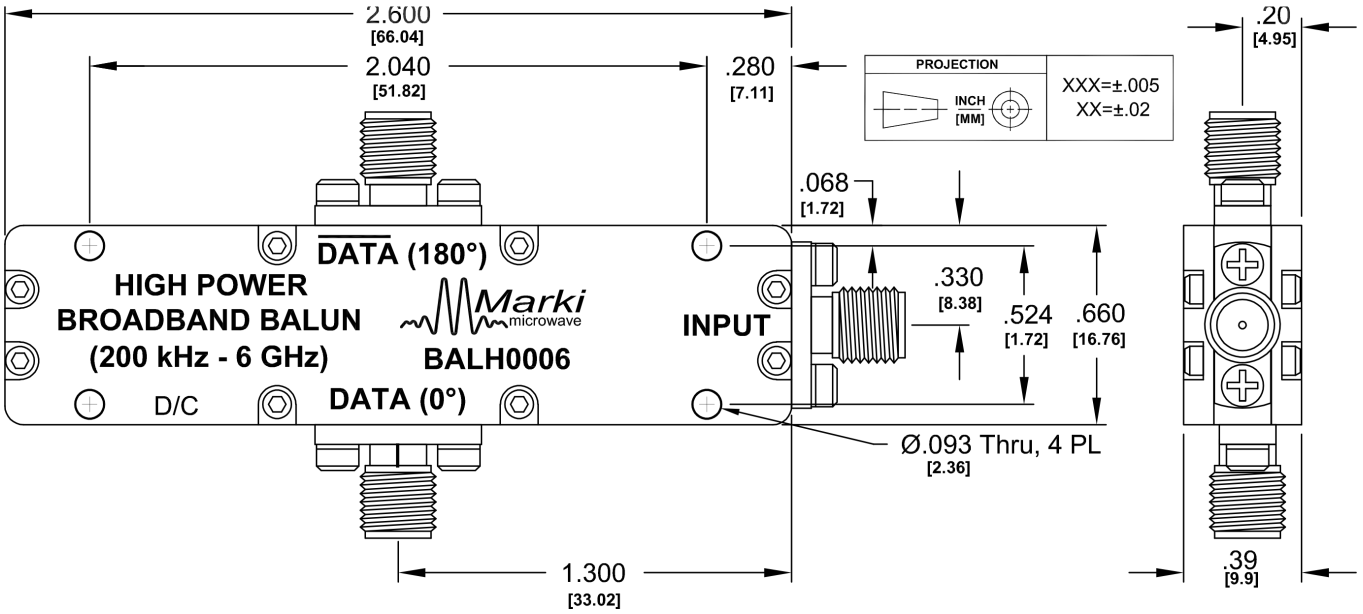




Mechanical Data

Outline Drawing

Download : Outline 2D Drawing | Outline 3D Drawing | Outline 3D STP



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

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