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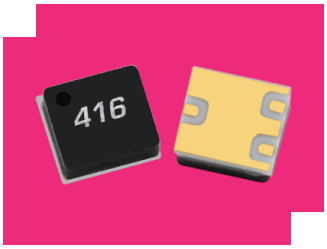
BAL-0416SMG

Surface-Mount Broadband Balun

DEVICE OVERVIEW

General Description

The BAL-0416SMG is a Surface Mount Microlithic™ balun. As with all Microlithic™ baluns, it features excellent amplitude balance, phase balance, and common mode rejection across a broad bandwidth and in a miniaturized form factor. It has significant isolation, reducing the reflection of unwanted common mode signals. The BAL-0416SMG is a lead free, RoHS compliant package compatible with standard leaded and lead-free solder reflows. SMA connectorized evaluation packages are available. The BAL-0416SMG is an excellent choice for balanced amplifiers, clock distribution, and higher order Nyquist sampling in analog to digital converters.



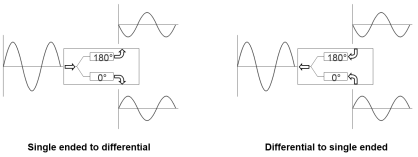
Features

- 2:1 Impedance Ratio
- 4 GHz to 16 GHz 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
- Balanced Amplifiers
- Mixers
- Clock Distribution
- Signal Integrity

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification	Recommended Replacement
BAL-0416SMG	Surface-Mount Broadband Balun	SMG	REACH RoHS	End of Life	EAR99	MBAL-0220CSP2

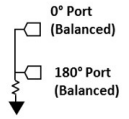
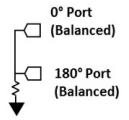
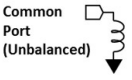
Table Of Contents

Revision History

Revision Code	Revision Date	Comment
-	2014-01-01	Datasheet initial Release
A	2016-01-01	Typical Performance Plots Updated
B	2019-10-01	Mixed Mode Scattering Parameters added
C	2020-07-01	Specs table update
D	2020-10-01	Specs table update
E	2021-10-01	Plating spec update
F	2024-07-31	Product Lifecycle Update to EOL

Port Configuration and Functions

Port Functions

Port	Function	Description	DC Equivalent Circuit
0° Port (Balanced)	0° Port	The 0° port is DC short to the 180o port and passes through a resistor to ground.	
180° Port (Balanced)	180° Port	The 180° port is DC short to the 0o port and passes through a resistor to ground.	
Common Port (Unbalanced)	RF Input	The common port is DC short to ground.	

Specifications

Absolute Maximum Ratings

Parameter	Maximum Rating	Unit
RF Power Handling	1	W

Package Information

Parameter	Details	Rating
Dimensions	-	2.79 x 2.54 mm
Moisture Sensitivity Level	-	MSL 1

Electrical Specifications

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

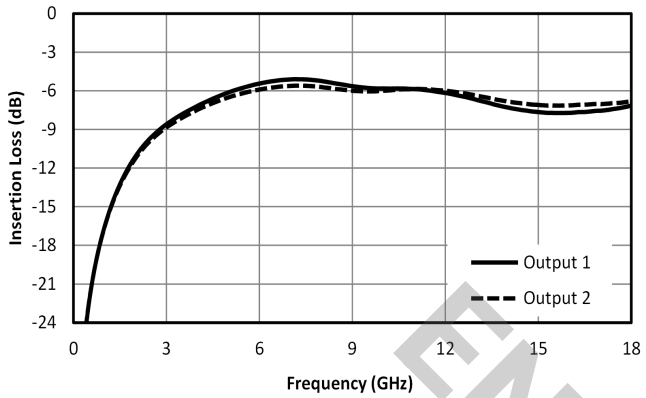
Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Impedance Ratio	-	4	16	-	2:1	-	
Amplitude Balance	-	4	16	-	0.4	1	dB
Common Mode Rejection	-	4	12	25	35	-	dB
Common Mode Rejection	-	12	16	15	26	-	dB
Insertion Loss as a Mode Converter [1]	-	4	16	-	3.3	5.5	dB
Isolation	-	-	-	-	15	-	dB
Nominal Phase Shift	-	4	16	-	180	-	°
Phase Balance	-	12	16	-	6	15	°
Phase Balance	-	4	12	-	1	5	°
VSWR	-	-	-	-	2.5	-	

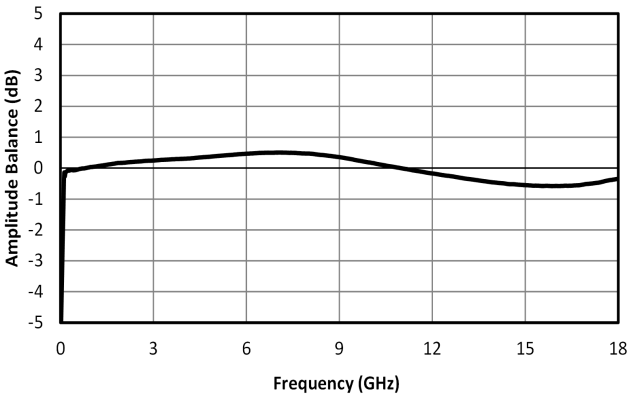
[1] Includes fixture losses

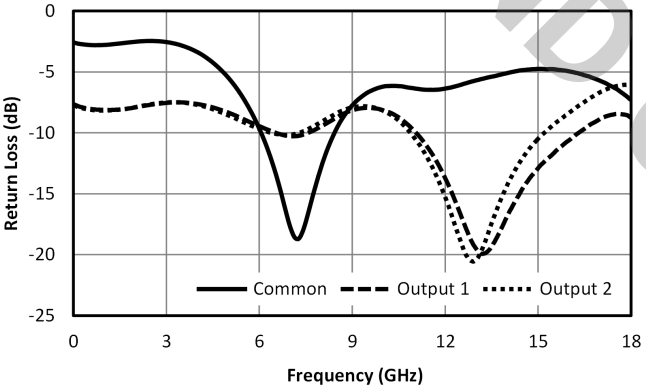
Typical Performance Scattering Parameters

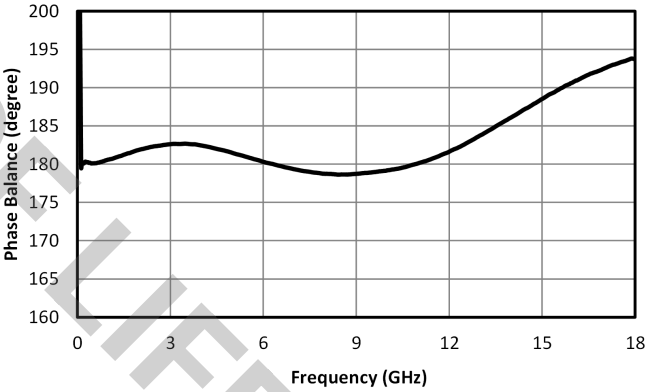
Three port scattering parameters measured as three single-ended 50Ω ports showing relationship between any two ports. For example: S21 and S31, often referred to as insertion loss of a balun, is the output response on ports 2 and 3 with an input stimulus on port 1.

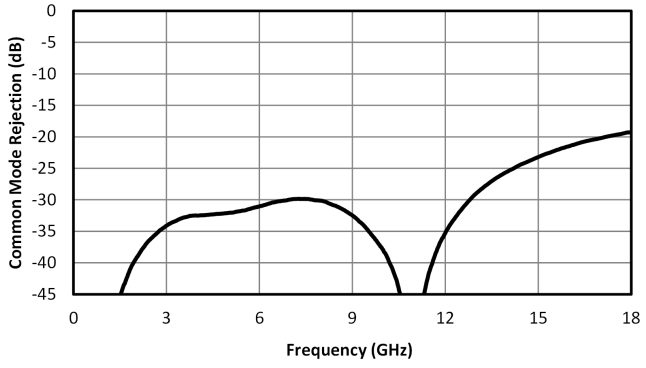
[1]Includes test fixture loss. Results are not de-embedded.

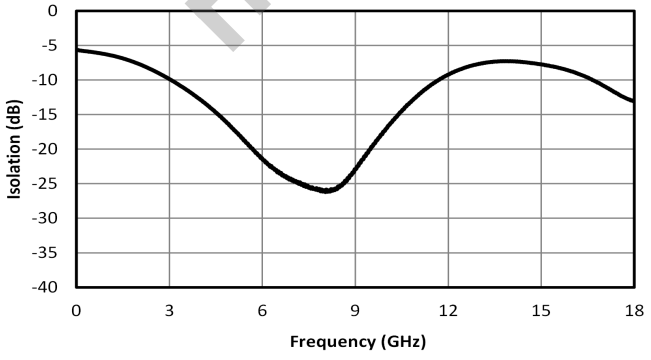






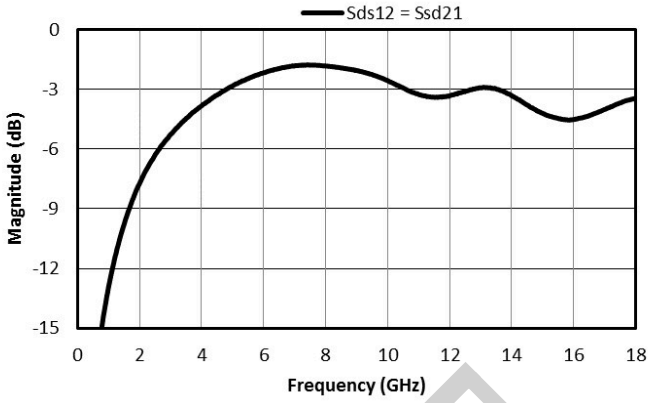


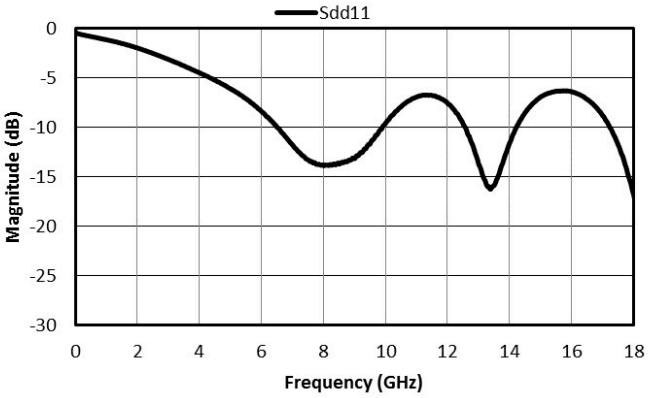


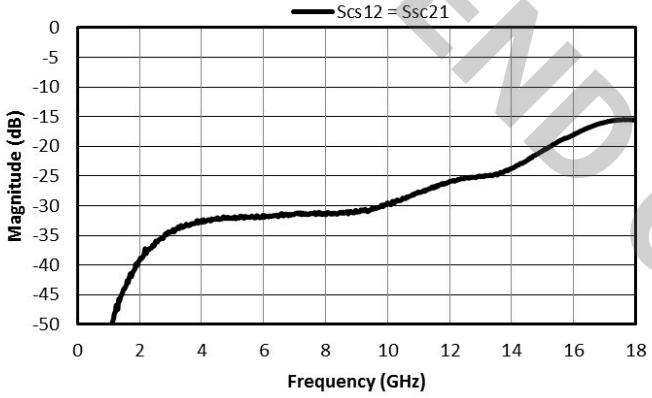


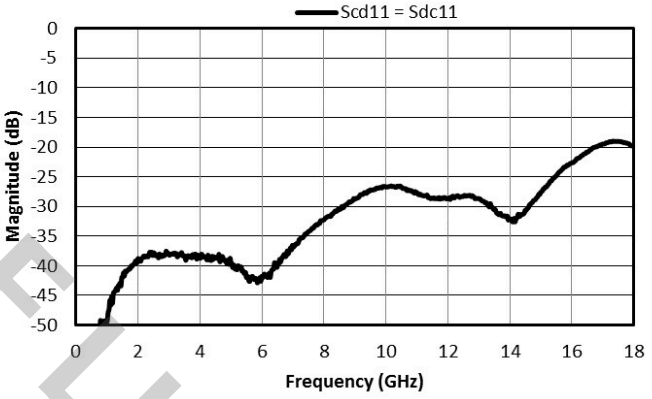
Mixed Mode Scattering Parameters

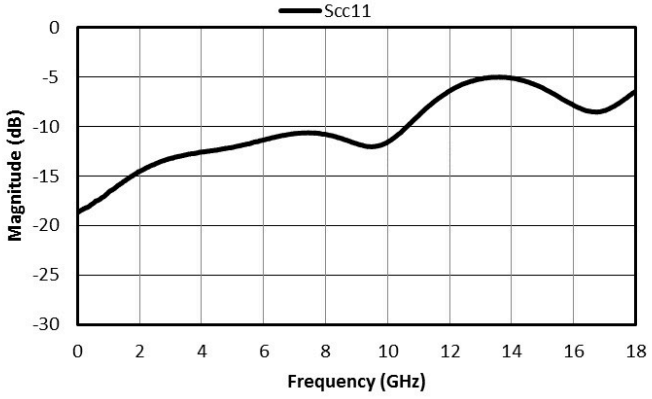
Mixed mode scattering parameters are used to characterize differential circuits. For baluns, this means that the 0° and 180° ports become a single 100Ω differential port and the common port remains the same 50Ω common port. The two-port s-parameters of the balun are then characterized based on differential (d), common mode (c), or single-ended (s) signals. For example: Scs12 is the Common output response given a single ended input.

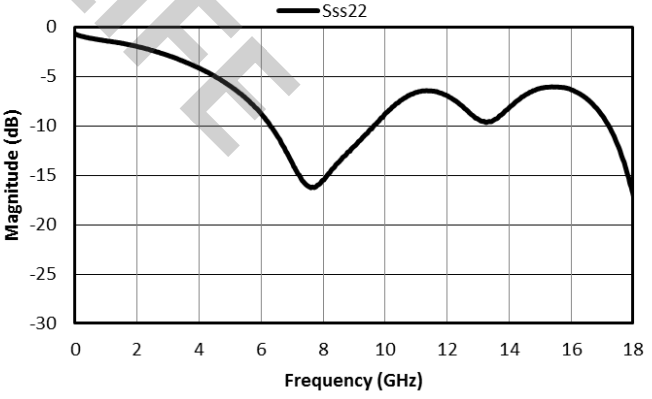








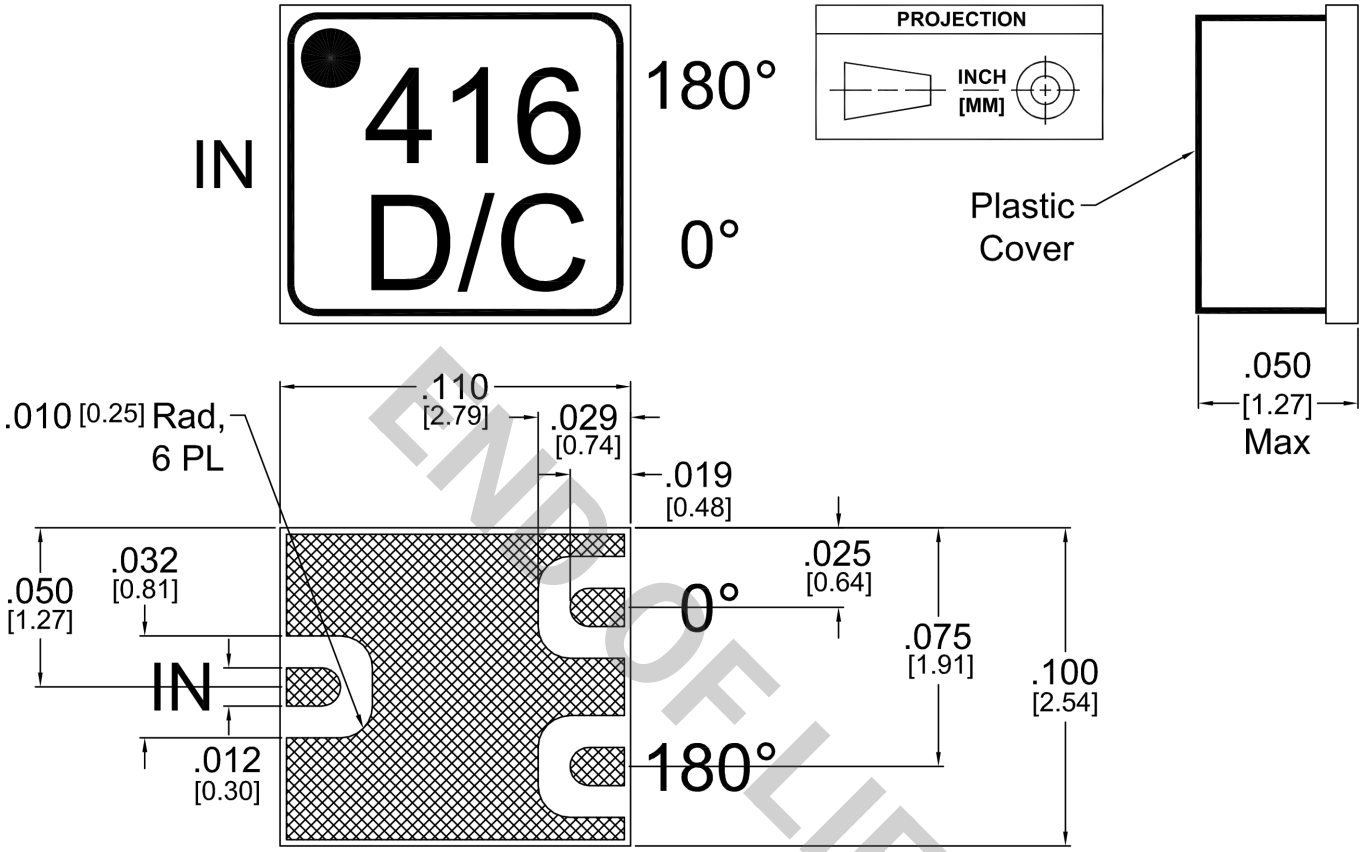




Mechanical Data

Outline Drawing

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



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