

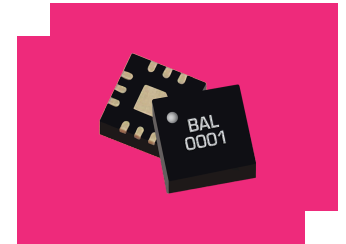
MBAL-0220PSM

2 - 20 GHz MMIC Isolation Balun

DEVICE OVERVIEW

General Description

The MBAL-0220PSM is a GaAs passive MMIC balun in a 3mm QFN surface mount package. This high isolation balun features excellent amplitude and phase balance across its 2 to 20 GHz frequency range and offers a 2:1 impedance ratio. The 3mm QFN package is a lead free, RoHS compliant package compatible with standard leaded and lead-free solder reflows. The MBAL-0220PSM is an excellent choice for balanced amplifiers, clock distribution, and higher order Nyquist sampling in analog to digital converters. The MBAL-0220PSM is a higher isolation, smaller form factor version of the MBAL-0220SM.



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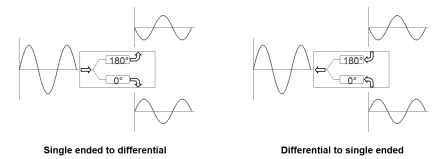
Features

- 2:1 Balun (Balanced to Unbalanced Transformer)
- High Isolation, 17dB Typical
- Broadband Operation, 2 to 20 GHz
- Insertion Loss as a Mode Converter, 2.7 dB Typical
- Common Mode Rejection, 38 dB Typical

Applications

- Electronic Warfare
- Test Equipment
- Radar and satellite communications
- High Channel Count Systems

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification
MBAL-0220PSM	2 - 20 GHz MMIC Isolation Balun	QFN	REACH RoHS	Released	EAR99
EVB-MBAL-0220P	Evaluation Board, 2-20 GHz Passive MMIC QFN Package Balun	EVB	REACH RoHS	Released	EAR99

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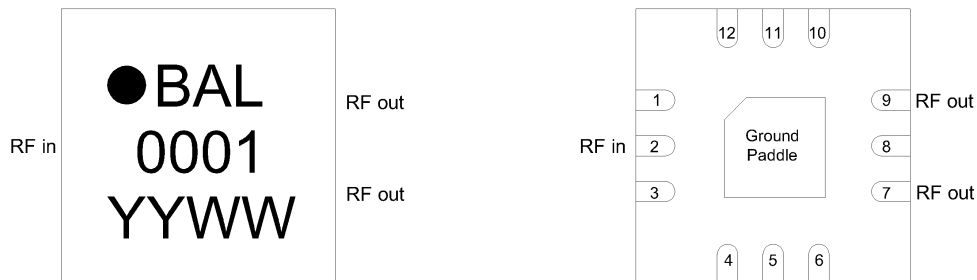
Revision History

Revision Code	Revision Date	Comment
-	2026-03-05	Initial Release
B	2026-04-23	Updated RF Power Handling

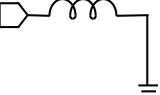
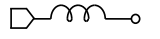
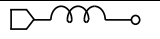
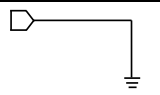
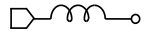
Port Configuration and Functions

Port Diagram

Below is the port diagram for the MBAL-0220PSM. The diagram is shown as an x-ray view from the top down.



Port Functions

Port	Function	Description	DC Equivalent Circuit
2	Common/Input	Pin 2 is DC short to ground.	
7	Out 1 / 0° Port (Balanced)	Pin 7 is DC open to ground.	
9	Out 2 / 180° Port (Balanced)	Pin 9 is DC open to ground.	
Paddle	Ground	Ground paddle should be connected to RF ground.	
Pins 1,3,4,5,6,8,10,11,12	Non-connect (NC)	These pins are not connected internally. Datasheet performance is tested with NC pins grounded.	

Specifications

Absolute Maximum Ratings

The Absolute Maximum Ratings indicate limits beyond which damage may occur to the device. If these limits are exceeded, the device may be inoperable or have a reduced lifetime.

Parameter	Maximum Rating	Unit
Maximum Operating Temperature	85	°C
Maximum Storage Temperature	150	°C
Minimum Operating Temperature	-40	°C
Minimum Storage Temperature	-65	°C
RF Power Handling	37	dBm

Package Information

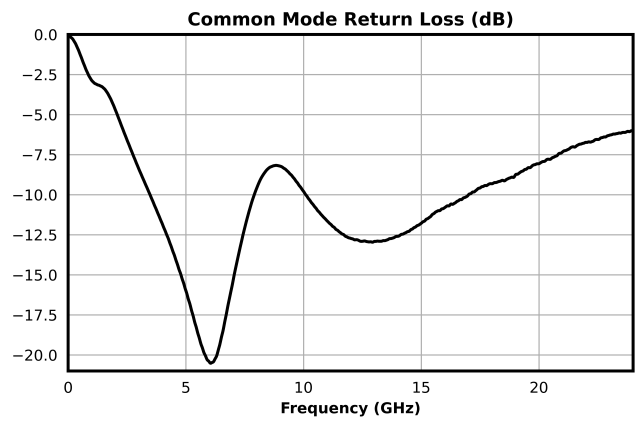
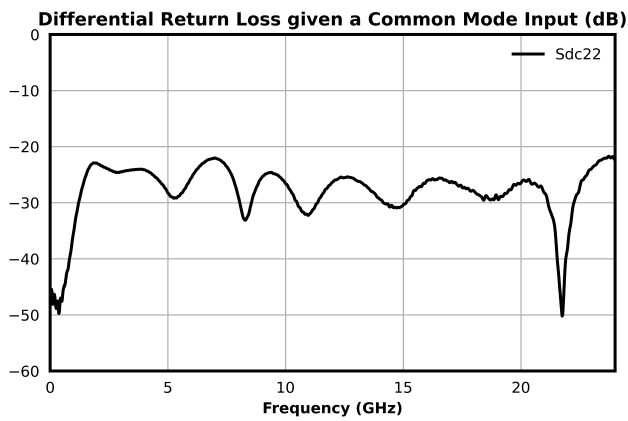
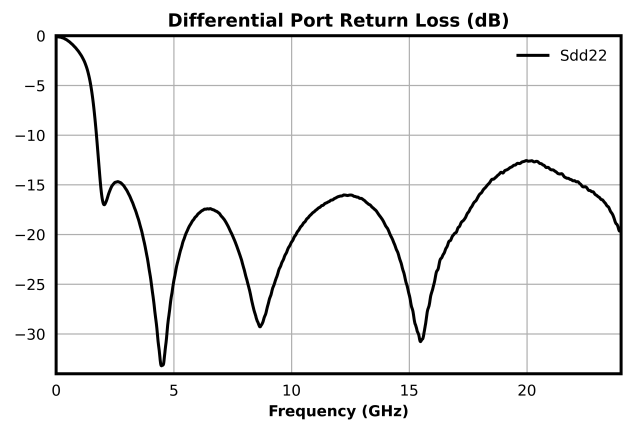
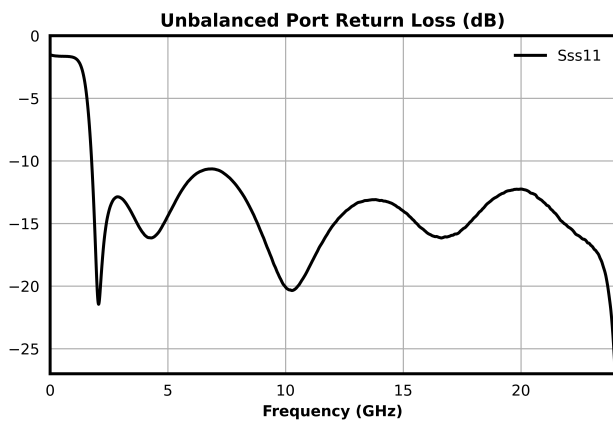
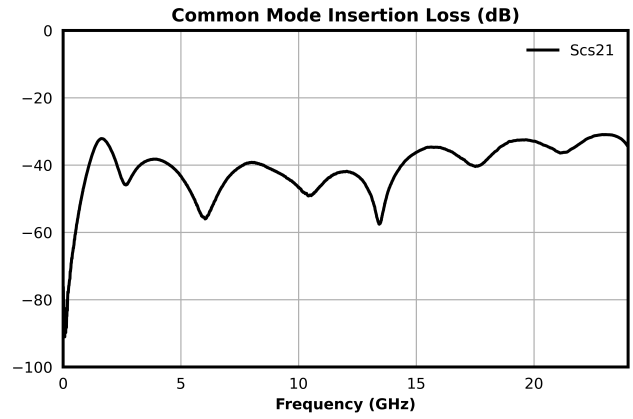
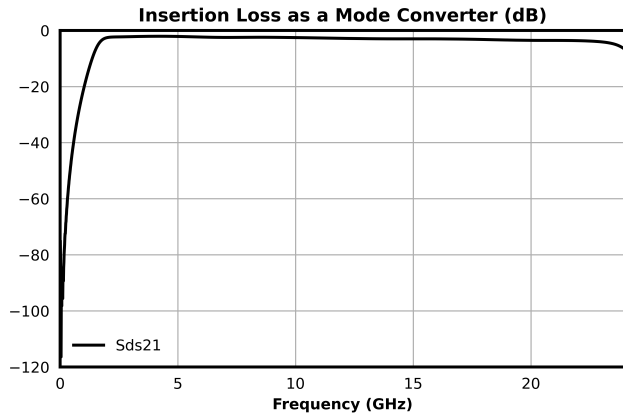
Parameter	Details	Rating
ESD	250 to < 500 Volts	HBM Class 1A
Dimensions	-	3 x 3 mm
Moisture Sensitivity Level	-	MSL 1

Electrical Specifications

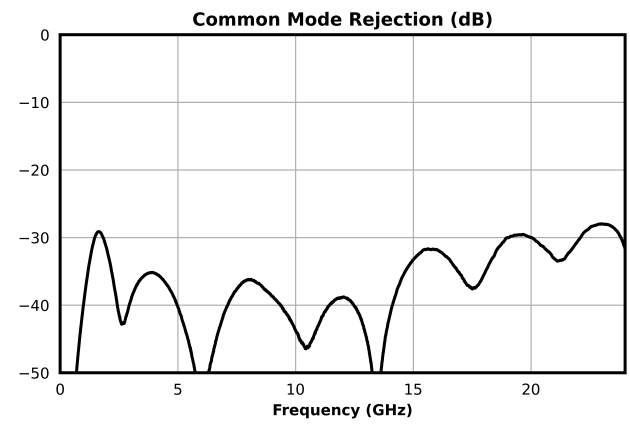
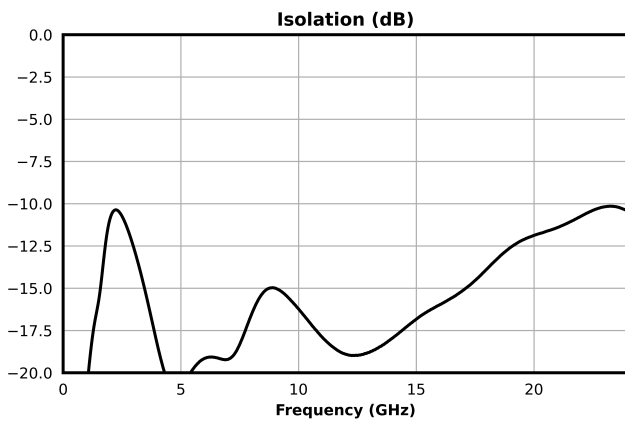
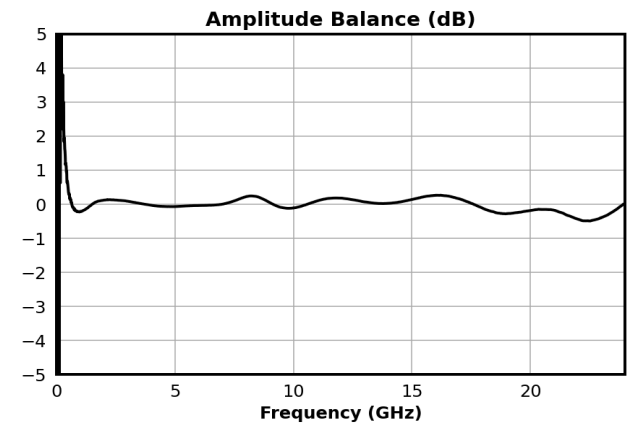
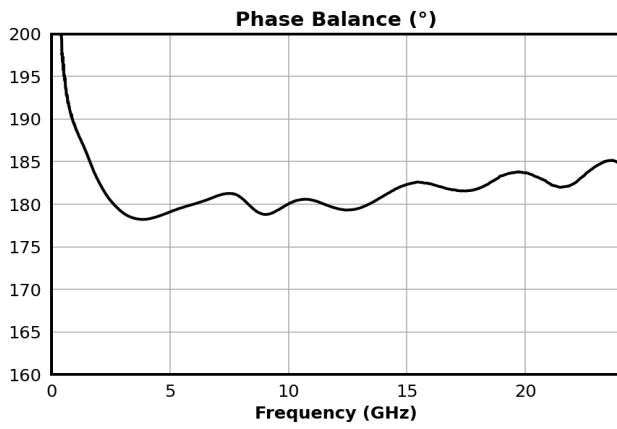
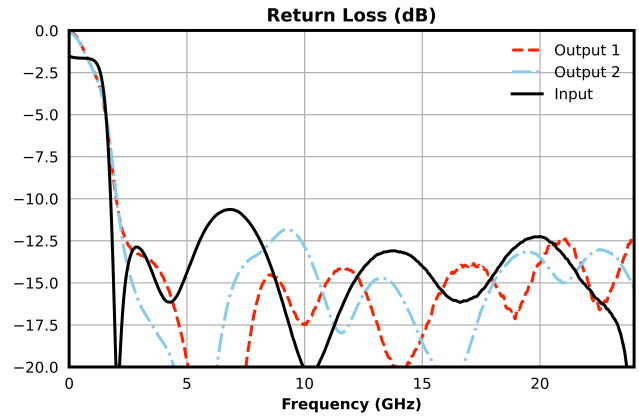
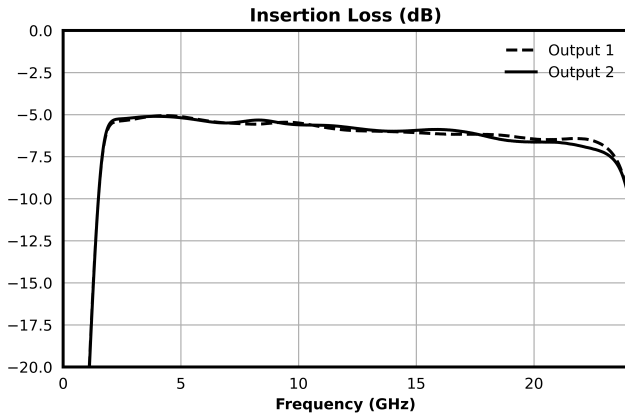
Specifications guaranteed for +25°C, measured in a 50Ω system. Measured data was taken on an evaluation board and de-embedded to surface mount launch unless otherwise noted.

Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Insertion Loss as a Mode Converter	Configuration A, Temp = 25°C	2	20	-	2.7	-	dB
Nominal Phase Shift	Configuration A, Temp = 25°C	-	-	-	180	-	°
Common Port Return Loss	Configuration A, Temp = 25°C	2	20	-	14	-	dB
Common Port Return Loss	Configuration A, Temp = 25°C	2	20	-	14.2	-	dB
Common Mode Return Loss	Configuration A, Temp = 25°C	2	20	-	11	-	dB
Output Return Loss	Configuration A, Temp = 25°C	2	20	-	16	-	dB
Isolation	Configuration A, Temp = 25°C	2	20	-	17	-	dB
Amplitude Balance	Configuration A, Temp = 25°C	2	20	-	0.1	-	dB
Phase Balance	Configuration A, Temp = 25°C	2	20	-	0.7	-	°
Common Mode Rejection	Configuration A, Temp = 25°C	2	20	-	38	-	dB
Impedance	Configuration A, Temp = 25°C	-	-	-	50	-	Ω
Impedance Ratio	-	-	-	-	2:1	-	

Mixed Mode Scattering Parameters

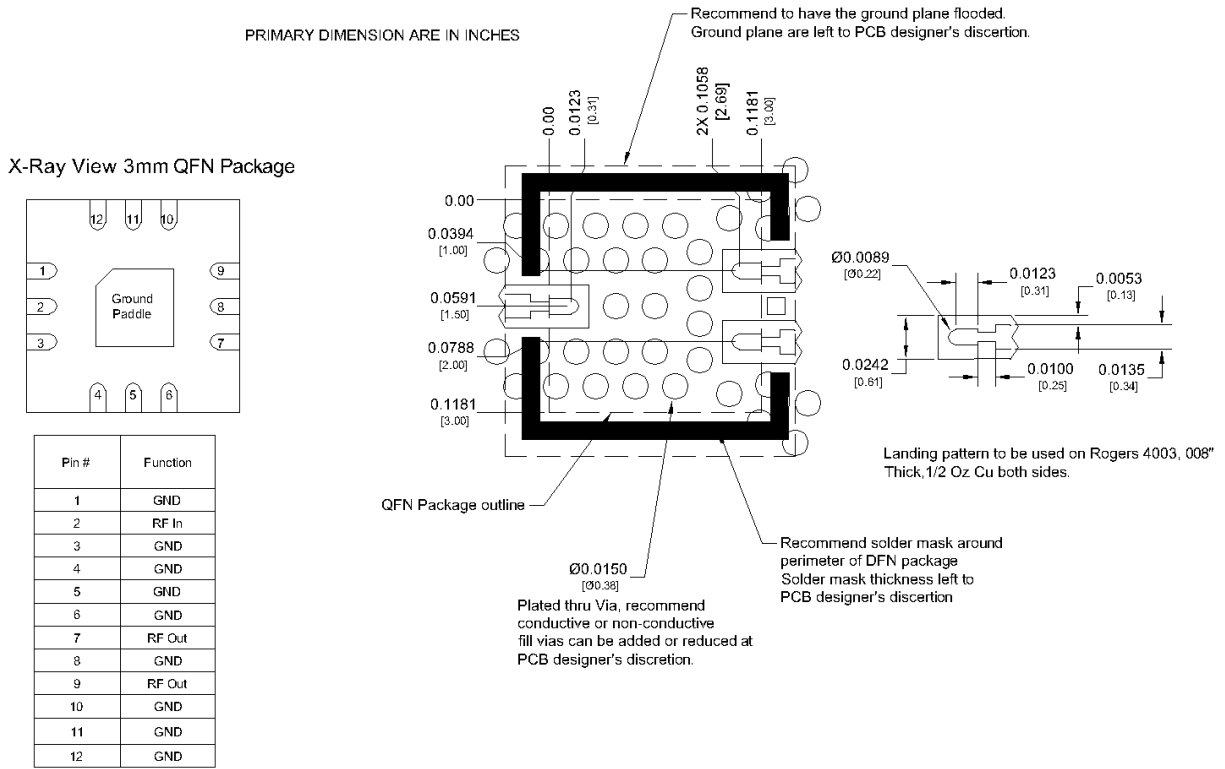


Typical Performance Scattering Parameters

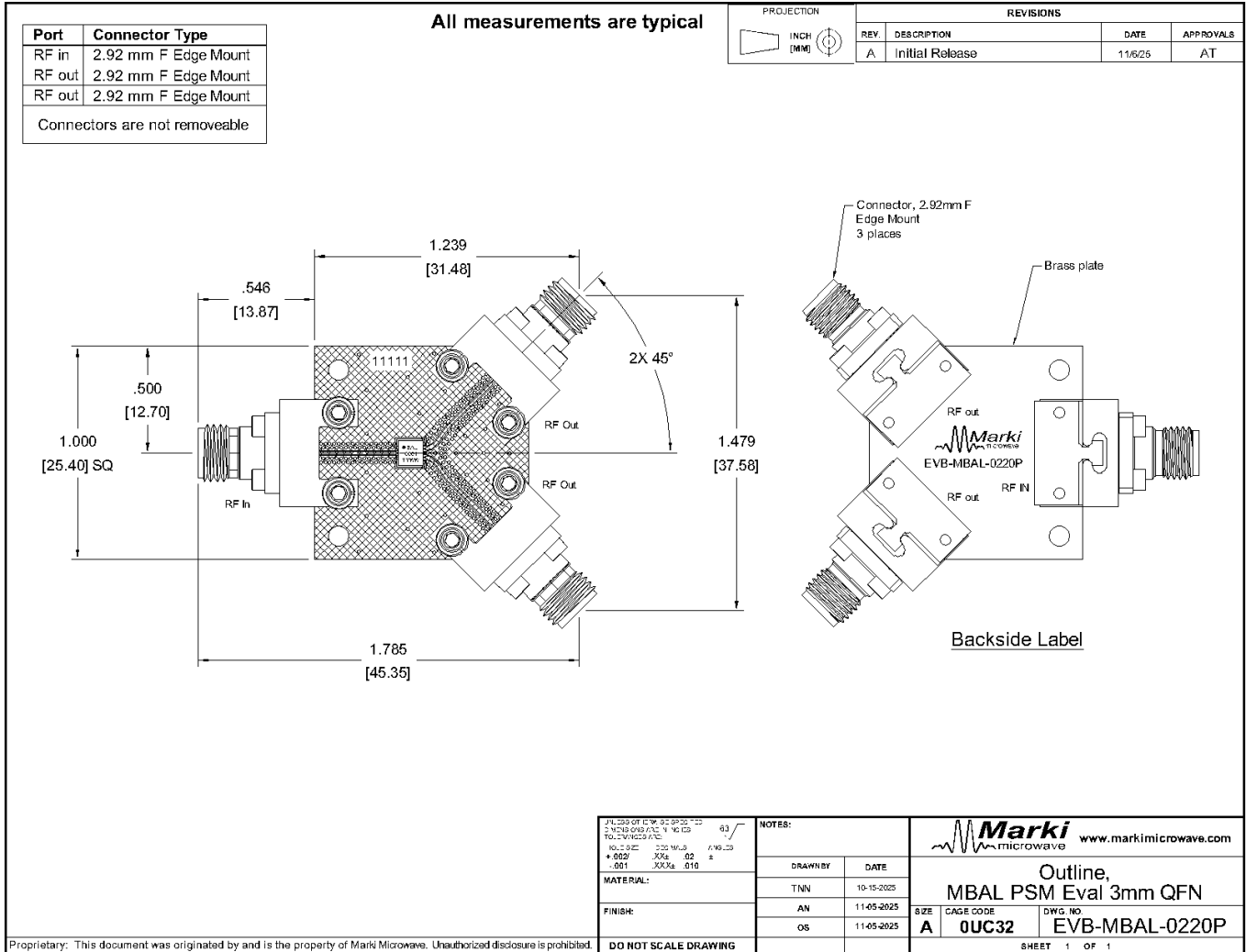


Footprint Image

Download : [Footprint Drawing](#)



Evaluation Board - Outline Drawing



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