

# "High Frequency Ceramic Solutions"

2.45GHz Impedance Matched Balun-Filter for Atmel Chipset AT86RF232 and AT86RF233. Platforms:  
 ATmega256/128/64RFR2, Zigbit 256RFR2, Zigbit RF233, ZigBit RF233+FEM, Extension RF233, USB RF233, SAM R21,  
 ATMEGA256RFR2 Xplained Pro.

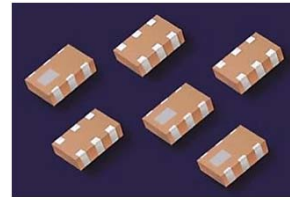
P/N 2450BM15A0015

Detail Specification: 12/5/2016

Page 1 of 4

Impedance matching network, balun, and harmonic filter all in one EIA 0805 package!

General Specifications	
Part Number	2450BM15A0015
Frequency (MHz)	2400~2500
Unbalanced Impedance	50 $\Omega$
Differential Balanced Impedance	Impedance match to: Atmel AT86RF232, AT86RF233, ATmega256/128/64RFR2, Zigbit 256RFR2, Zigbit RF233, ZigBit RF233+FEM, Extension RF233, USB RF233, SAM R21
Insertion Loss (-40C to +85C)	1.1dB Typ, 1.5 dB max.
Insertion Loss (-40C to +125C)	1.3dB Typ, 1.9 dB max.
Return Loss	9.5 min.
Phase Difference	180 $\pm$ 10 (deg)
Amplitude Difference	2.0 dB max.
Power Capacity	2 Watt max. (CW)
Differential Mode Attenuation	20dB min. @2Fo 20dB min. @3Fo
Common Mode Rejection	20dB min. @2Fo



Solder Paste	SAC 305 type is recommended
Operating Temp.	-40 to +125°C
Storage Temp	-40 to +85°C
Recommended Storage Conditions for unused product on T&R*	+5C to +35C, Humidity 45~75%RH
Reel Quantity	4,000
Storage Period	18 months max.*

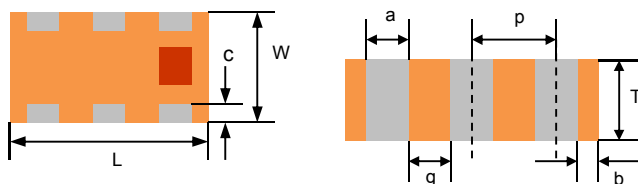
\*18 months in vacuum sealed bag and 1 week cumulative after opened. For more info and proper handling go to: [www.johansontechnology.com/silverleads](http://www.johansontechnology.com/silverleads)

## Part Number Explanation

P/N Suffix	Packing Style	Bulk (Loose)	Suffix = S	eg. 2450BM15A0015S
		T & R	Suffix = E	eg. 2450BM15A0015E
	Termination style	AgPt	Suffix = None	eg. 2450BM15A0015 (E or S)
	Evaluation Board	2450BM15A0015-EBSMA		

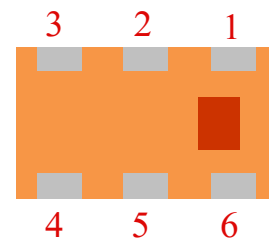
## Mechanical Dimensions

	In	mm
L	0.079 $\pm$ 0.004	2.00 $\pm$ 0.10
W	0.049 $\pm$ 0.004	1.25 $\pm$ 0.10
T	0.031 $\pm$ 0.004	0.80 $\pm$ 0.10
a	0.012 $\pm$ 0.004	0.30 $\pm$ 0.10
b	0.008 $\pm$ 0.004	0.20 $\pm$ 0.10
c	0.012 +.004/-0.008	0.30 +0.1/-0.2
g	0.014 $\pm$ 0.004	0.35 $\pm$ 0.10
p	0.026 $\pm$ 0.002	0.65 $\pm$ 0.05



## Terminal Configuration

No.	Function
1	Unbalanced Port (50 $\Omega$ )
2	GND
3	Balanced Differential Port
4	Balanced Differential Port
5	GND
6	GND



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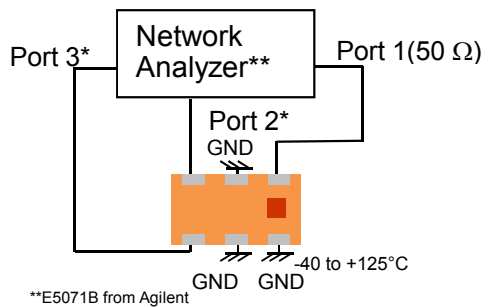
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Detail Specification: 12/5/2016

Page 2 of 4

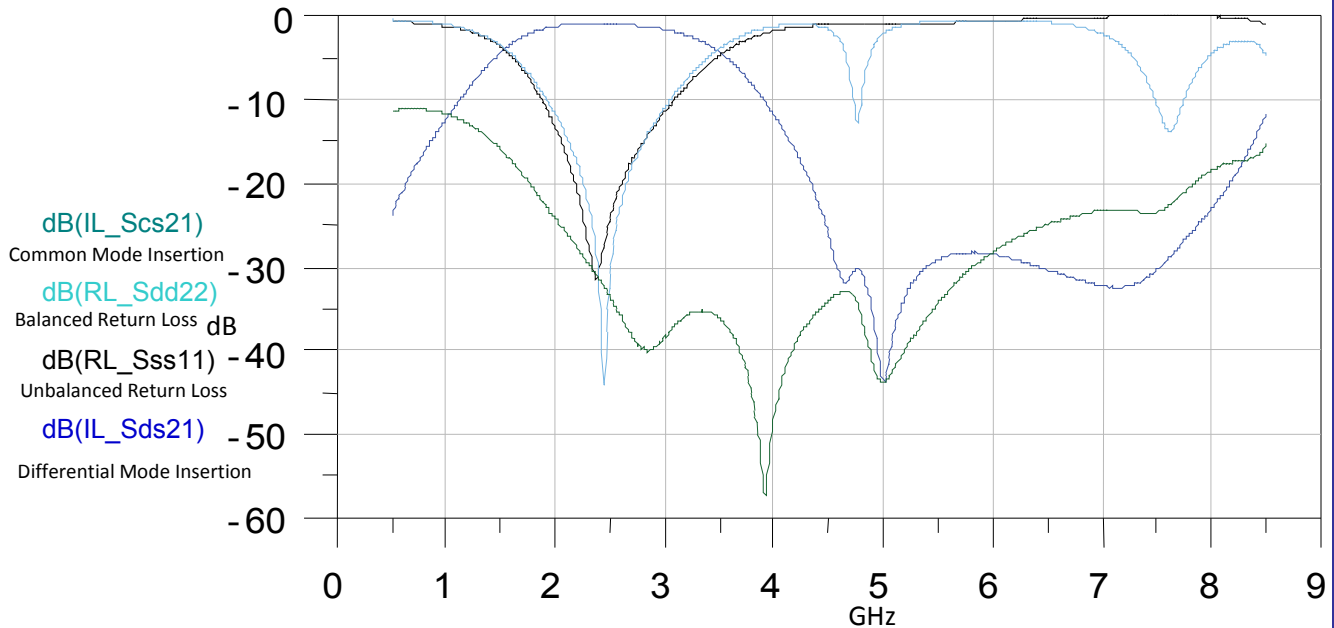
## Measuring Diagram



Port 1: Unbalanced Port  
 Ports 2 and 3: Balanced Port  
 IL=Sds21  
 RL=Sss11  
 Amp\_balance = dB(S(2,1)/S(3,1))  
 Phase\_balance = Phase(S(2,1)/S(3,1))  
 \*Impedance for ports 2 and 3  
 = Conjugate to Balanced Impedance/2

## Typical Electrical Performance (T=25°C)

### Insertion and Return Loss



Impedance matching network, balun, and harmonic filter all in one EIA 0805 package!

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Ver 6.3

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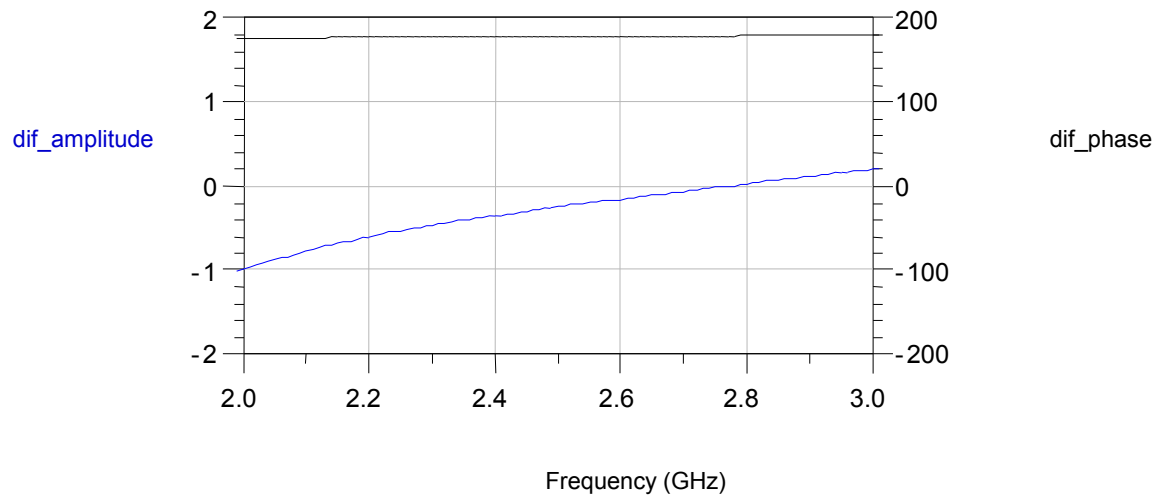
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Detail Specification: 12/5/2016

Page 3 of 4

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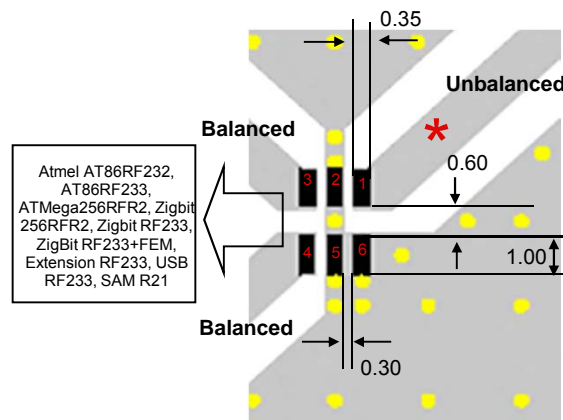
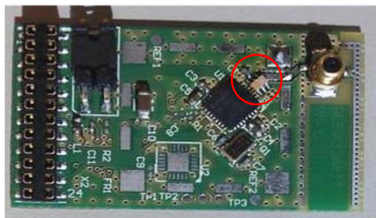
### Amplitude and Phase Balance



## Mounting Considerations

Mount these devices with brown mark facing up.

\* Line width should be designed to match 50Ω characteristic impedance, depending on PCB material and thickness.



### LEGEND

- Solder Resist
- Land
- Through-hole (φ0.3)

Units : mm

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For layout/gerber files for this and other Atmel reference designs, go to: [www.johansontechnology.com/atmel](http://www.johansontechnology.com/atmel)

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Page 4 of 4

## Component Handling

[www.johansontechnology.com/silverleads](http://www.johansontechnology.com/silverleads)

## Packaging information

[www.johansontechnology.com/ipcpackaging.html](http://www.johansontechnology.com/ipcpackaging.html)

## Soldering Information

[www.johansontechnology.com/ipcsoldering-profile](http://www.johansontechnology.com/ipcsoldering-profile)

## Antenna layout and tuning techniques

[www.johansontechnology.com/tuning](http://www.johansontechnology.com/tuning)

## Antenna layout review, tuning, and characterization services

[www.johansontechnology.com/ipcantennaservices](http://www.johansontechnology.com/ipcantennaservices)

## Pad metalization information

[www.johansontechnology.com/silverleads](http://www.johansontechnology.com/silverleads)

## MSL Info

[www.johansontechnology.com/technical-notes/msl-rating.html](http://www.johansontechnology.com/technical-notes/msl-rating.html)

## Recommended Storage Condition and Max Shelf Life

[www.johansontechnology.com/ipcstorage-shelflife](http://www.johansontechnology.com/ipcstorage-shelflife)

## Application Notes, Layout Files, and more

[www.johansontechnology.com/atmel](http://www.johansontechnology.com/atmel)

## RoHS Compliance

[www.johansontechnology.com/technical-notes/rohs-compliance.html](http://www.johansontechnology.com/technical-notes/rohs-compliance.html)

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