

# High Frequency Ceramic Solutions

## 868MHz Impedance-Matched Balun+Filter Integrated Passive Device (IPD) for Silicon Labs EFR32 Chipset, EIA 0805.

0868BM15G0027

Detail Specification: 2/26/2018

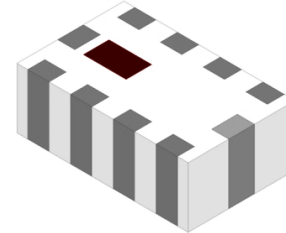
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Do you need a small sub-GHz or 2.4GHz antenna? Go to: [www.johansontechnology.com/antennas](http://www.johansontechnology.com/antennas)

### General Specifications

Part Number	0868BM15G0027	
Frequency (MHz)	865 - 870	
Unbalanced Impedance ( $\Omega$ )	50	
Balanced Impedance ( $\Omega$ )	Impedance matched to Silicon Labs EFR32	
Insertion Loss (dB)	1.7 typ. (2.0 max)	
Return Loss (dB)	14 typ. (10 min.)	
Phase Balance (deg)	180 $\pm$ 10	
Amplitude Difference (dB)	2.0 max.	
Attenuation (dB @MHz)	36 typ. (30 min.)	1730 - 1740 MHz
	28 typ. (23 min.)	2595 - 2610 MHz
Voltage Rating (V)	3.6 max.	
Power Capacity (W)	3 max. CW	
Operating Temperature	-40°C to +85°C	

The entire sub-GHz discrete L/C circuit is integrated inside this small package!



Silicon Labs Approved!

Quantity/Reel	4,000
Storage Temperature Range	-40°C to +85°C
Storage Period	18 months max
Recommended Storage Conditions for unused T&R product	+5 ~ +35 °C, Humidity 45~75%RH, 18 mos. max

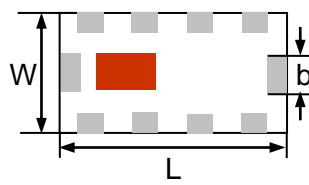
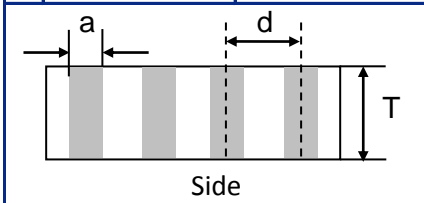
For more Silicon Labs matched balun-filters, go to: [www.johansontechnology.com/silabs](http://www.johansontechnology.com/silabs)

### Part Number Explanation

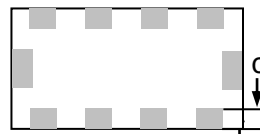
P/N Suffix	Packing Style	Bulk	Suffix = S	eg. 0868BM15G0027S
		T & R	Suffix = E	eg. 0868BM15G0027E (4k pcs/reel)

### Mechanical Dimensions

	In	mm
L	0.079 $\pm$ 0.008	2.00 $\pm$ 0.20
W	0.049 $\pm$ 0.008	1.25 $\pm$ 0.20
T	0.028 $\pm$ 0.004	0.70 $\pm$ 0.10
a	0.010 $\pm$ 0.004	0.25 $\pm$ 0.10
b	0.012 $\pm$ 0.006	0.30 $\pm$ 0.15
c	0.008 +0.004/-0.006	0.20 +0.1/-0.15
d	0.020 $\pm$ 0.004	0.50 $\pm$ 0.10



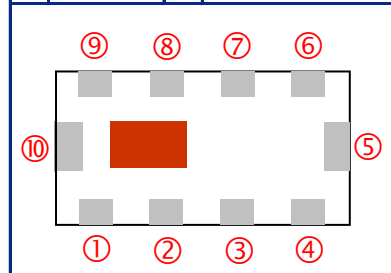
Top



Bottom

### Terminal Configuration

No.	Function	No.	Function
1	GND	6	RX_N
2	ANT	7	RX_P
3	GND	8	TX_N
4	GND	9	TX_P
5	GND	10	GND or DC Feed/GND



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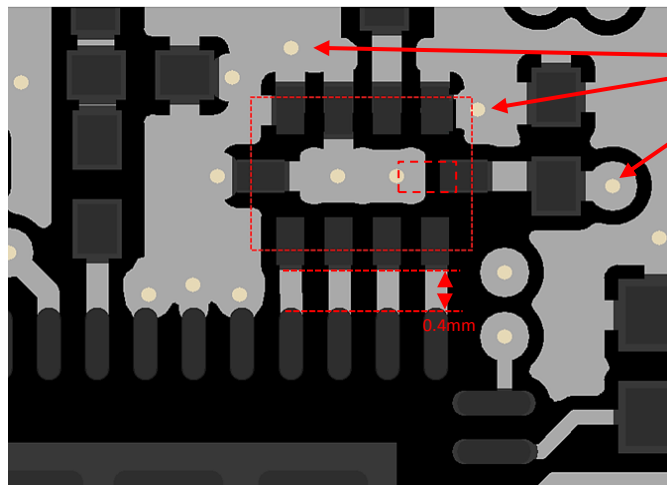
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## Pad-Soldermask Guidelines (with DC Feed)

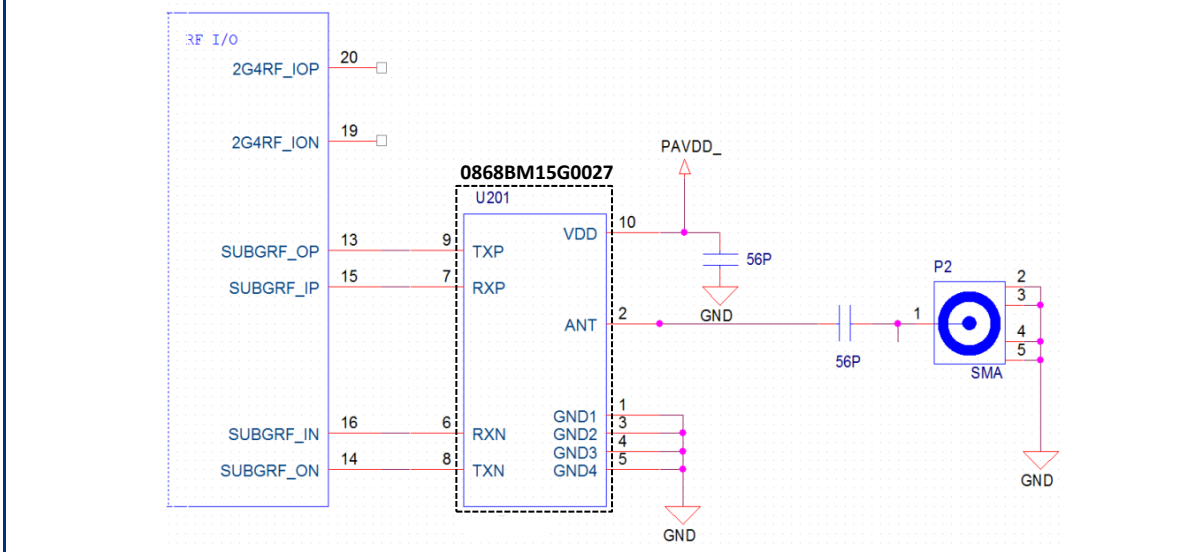


GND vias are crucial for filter harmonic attenuation

- GND
- Solder Pads
- GND via ( $\phi$  0.20)

For reference design package and PCB CAD files, please contact us at:  
[www.johansontechnology.com/ask-a-question](http://www.johansontechnology.com/ask-a-question)

## PCB Reference Design Schematic



Johanson Technology, Inc. reserves the right to make design changes without notice.  
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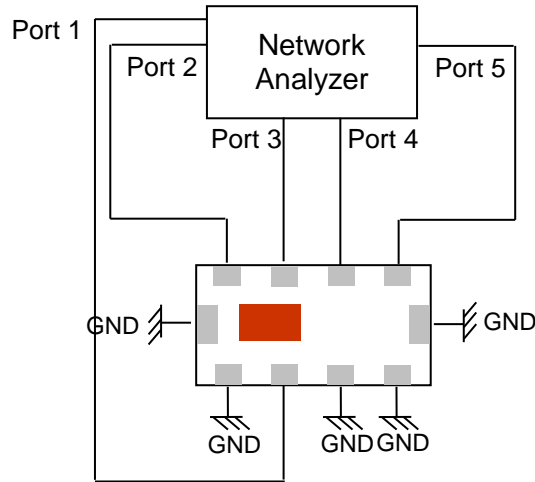
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## Measuring Diagram



### Tx mode:

Port 1 impedance: 50Ω

Port 2 and 3 impedance\*: Complex conjugate to EFR32  $Z_{IC,TX on}$

Port 4 and 5 impedance\*: Load impedance of EFR32  $Z_{IC,RX off}$

$IL=TX S_{DS21}$

$RL=TX S_{SS11} / TX S_{DD22}$

Amplitude Difference =  $dB(S(1,2)/S(1,3))$

Phase Balance =  $Phase(S(1,2)/S(1,3))$

### Rx mode:

Port 1 impedance: 50Ω

Port 4 and 5 impedance\*: Complex conjugate to EFR32  $Z_{IC,RX on}$

Port 2 and 3 impedance\*: Load impedance of EFR32  $Z_{IC,TX off}$

$IL=RX S_{DS21}$

$RL=RX S_{SS11} / RX S_{DD22}$

Amp\_balance =  $dB(S(1,4)/S(1,5))$

Phase\_balance =  $Phase(S(1,4)/S(1,5))$

\*Termination impedance included in s-parameters

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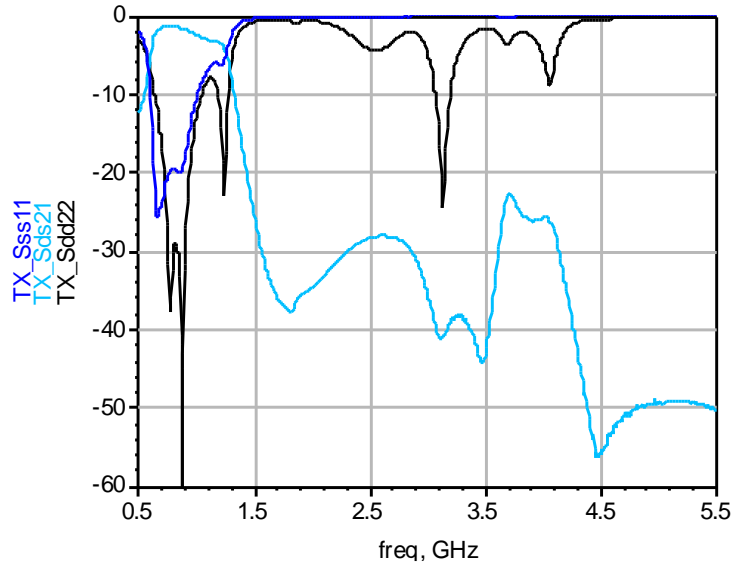
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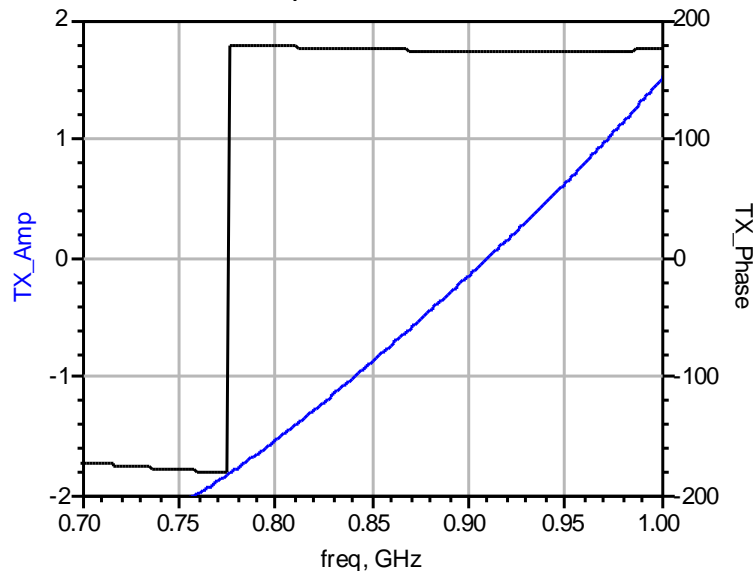
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## Typical Electrical Characteristics (T=25°C)

### Transmit Mode Insertion Loss, Return Loss, and Attenuation



### Transmit Mode Phase Balance, Amplitude Difference



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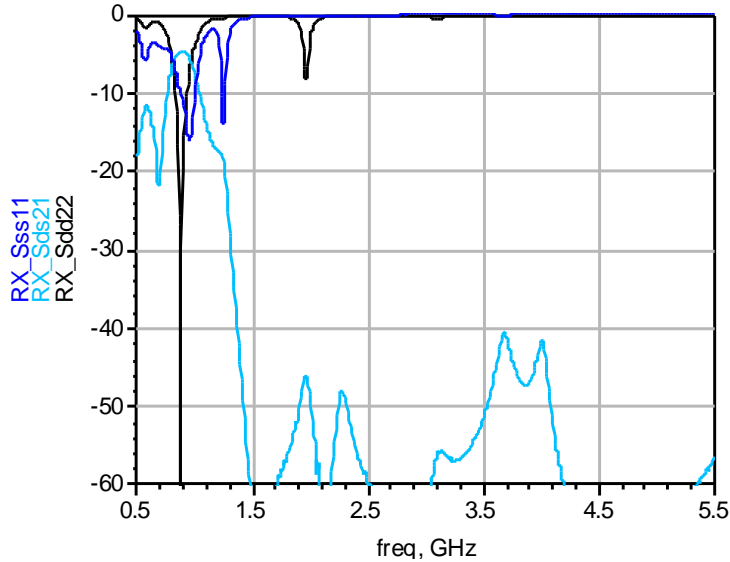
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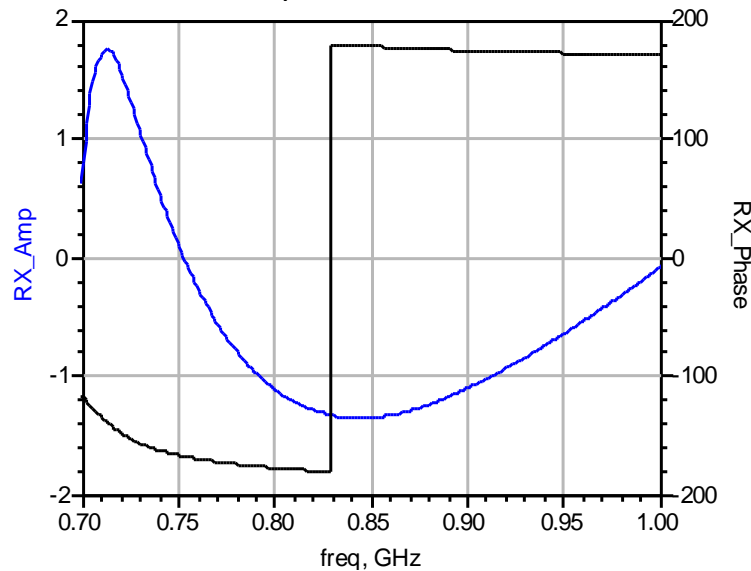
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## Typical Electrical Characteristics (T=25°C)

### Receive Mode Insertion Loss, Return Loss, and Attenuation



### Receive Mode Phase Balance, Amplitude Difference



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## Application Notes, Layout Files, and more

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

## Small SMD 868MHz (or 434M, 2.4G, 5G) antennas

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

## RoHS Compliance

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

## 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/ipc-antenna-services](http://www.johansontechnology.com/ipc-antenna-services)

## MSL Info

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

## Recommended Storage Condition and Max Shelf Life

[www.johansontechnology.com/recommended-storage-conditions](http://www.johansontechnology.com/recommended-storage-conditions)

## Packaging information

[www.johansontechnology.com/tape-reel-packaging](http://www.johansontechnology.com/tape-reel-packaging)

## Terminal Pad Composition

100% Tin (Sn)

Would you like us to review your layout for free? Need an embedded antenna recommendation for your application?

Contact us at:

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