

# High Frequency Ceramic Solutions

## 434MHz Impedance-Matched Balun+Filter Integrated Passive Device (IPD) for Silicon Labs EFR32 Chipset, EIA 0805.

0434BM15B0027

Detail Specification: 6/9/2021

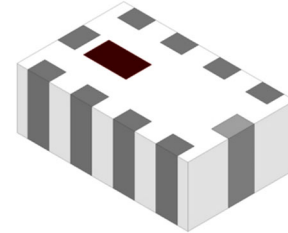
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Do you need a small sub-GHz or 2.4GHz antenna? Go to: <https://www.johansontechnology.com/antennas>

### General Specifications

Part Number	0434BM15B0027	
Frequency (MHz)	431 - 437	
Unbalanced Impedance ( $\Omega$ )	50	
Balanced Impedance ( $\Omega$ )	Impedance matched to Silicon Labs EFR32	
Insertion Loss (dB)	2.0 typ. (2.3 max)	
Return Loss (dB)	15 typ. (10 min)	
Phase Balance (deg)	$-155 \pm 15$	
Amplitude Difference (dB)	$-5.0 \pm 2.0$	
Attenuation (dB @MHz)	22 typ. (18 min.)	862 - 874 MHz
	35 typ. (30 min.)	1293 - 1311 MHz
Voltage Rating (V)	3.6 max.	
Power Capacity (W)	3 max. CW	
Operating Temperature	$-40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$	

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



Silicon Labs Approved!

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

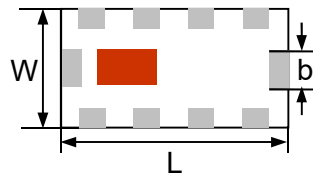
For more Silicon Labs matched balun-filters, go to: <https://www.johansontechnology.com/silabs>

### Part Number Explanation

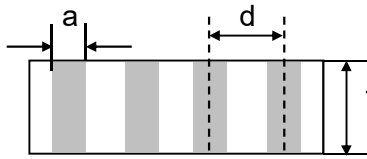
P/N Suffix	Packing Style	Bulk	Suffix = S	E.g. 0434BM15B0027S
		T & R	Suffix = E	E.g. 0434BM15B0027E

### Mechanical Dimensions

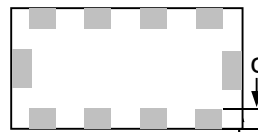
	In	mm
L	$0.079 \pm 0.008$	$2.00 \pm 0.20$
W	$0.049 \pm 0.008$	$1.25 \pm 0.20$
T	$0.035 \pm 0.004$	$0.90 \pm 0.10$
a	$0.010 \pm 0.004$	$0.25 \pm 0.10$
b	$0.012 \pm 0.006$	$0.30 \pm 0.15$
c	$0.008 + 0.004 / - 0.006$	$0.20 + 0.1 / - 0.15$
d	$0.020 \pm 0.004$	$0.50 \pm 0.10$



Top



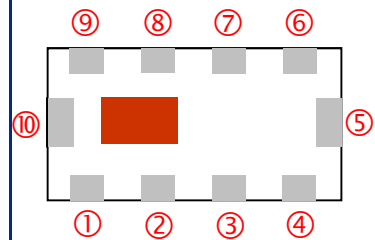
Side



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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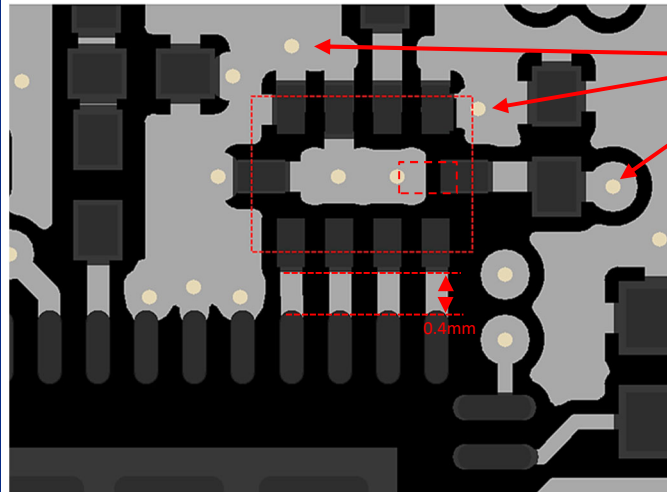
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## Pad-Soldermask Guidelines (with DC Feed)

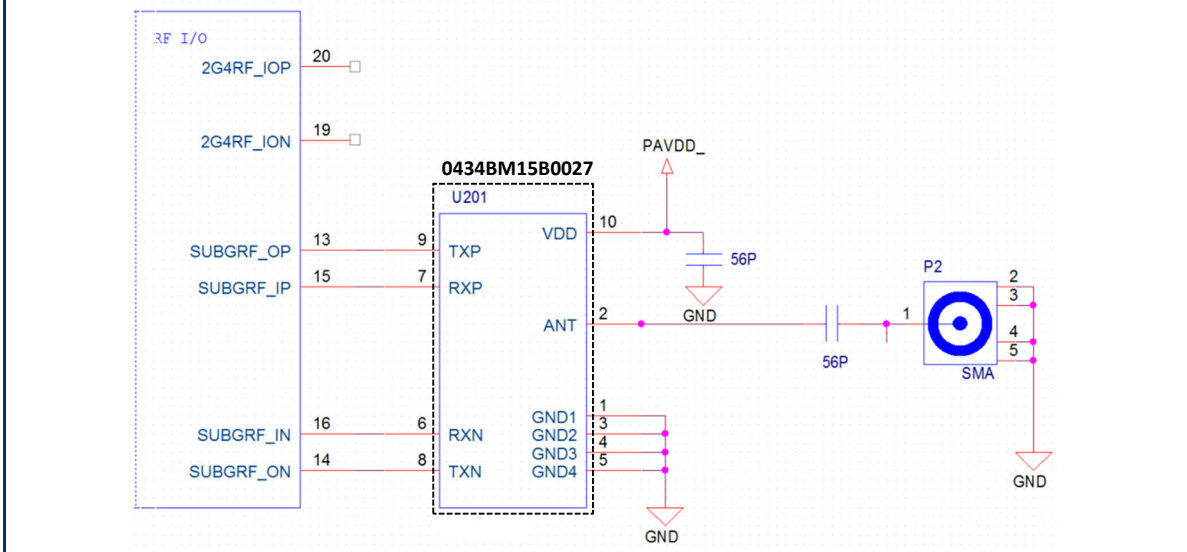


GND vias are crucial for filter harmonic attenuation

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

For reference design package and PCB CAD files, please contact us at: <https://www.johansontechnology.com/ask-a-question>

## PCB Reference Design Schematic



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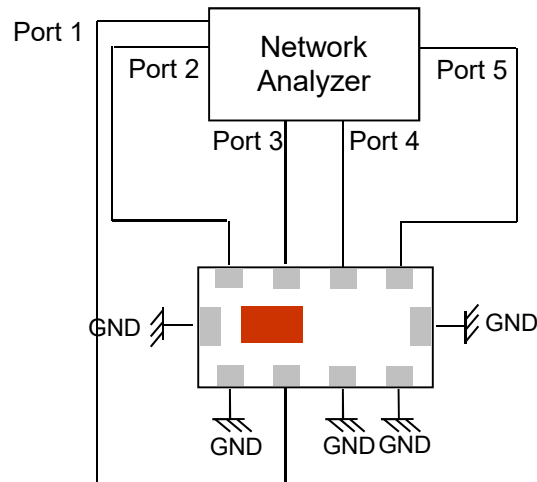
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## Measuring Diagram



### 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  $Z_{IC,RX\ off}$

$$IL=TX\ S_{DS21}$$

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

$$\text{Amplitude Difference} = dB(S(1,2)/S(1,3))$$

$$\text{Phase Balance} = \text{Phase}(S(1,2)/S(1,3))$$

### 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  $Z_{IC,TX\ off}$

$$IL=RX\ S_{DS21}$$

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

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

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

\*Termination impedance included in s-parameters

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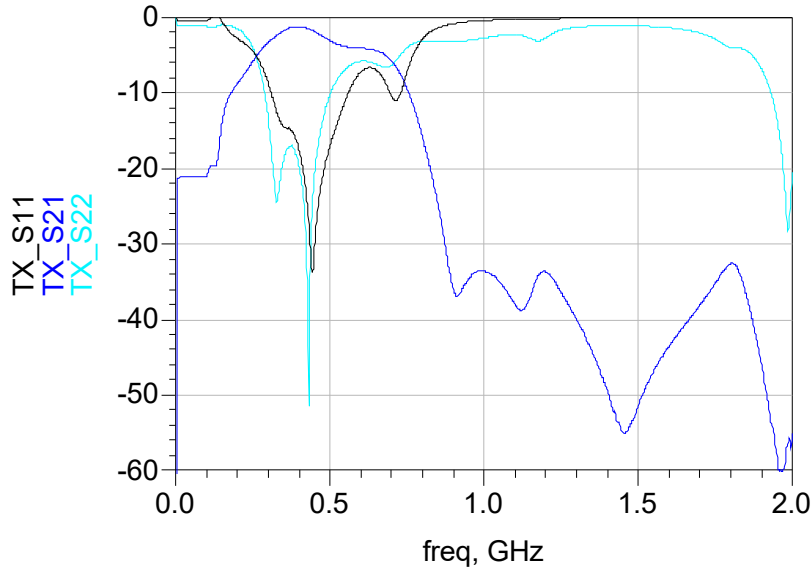
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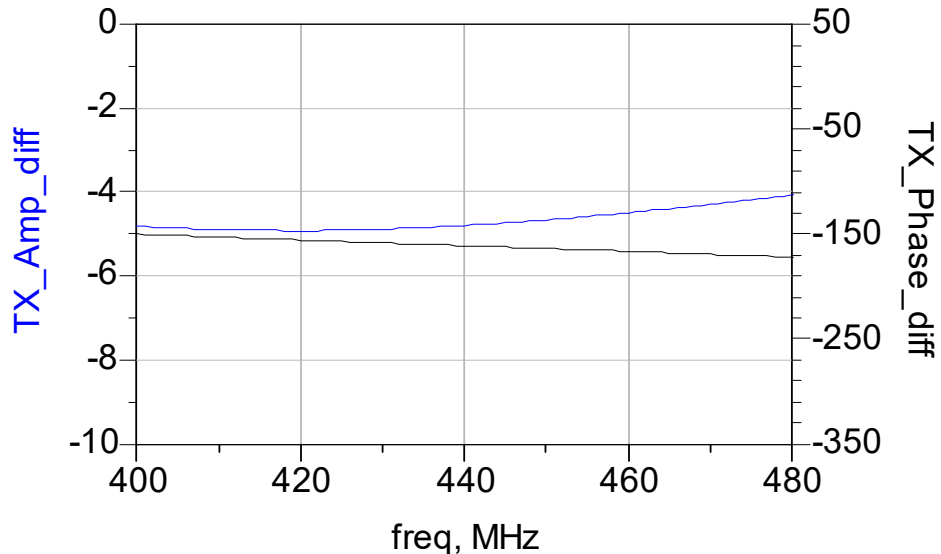
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## Typical Electrical Characteristics (T=25°C)

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



### Transmit Mode Phase Balance, Amplitude Difference



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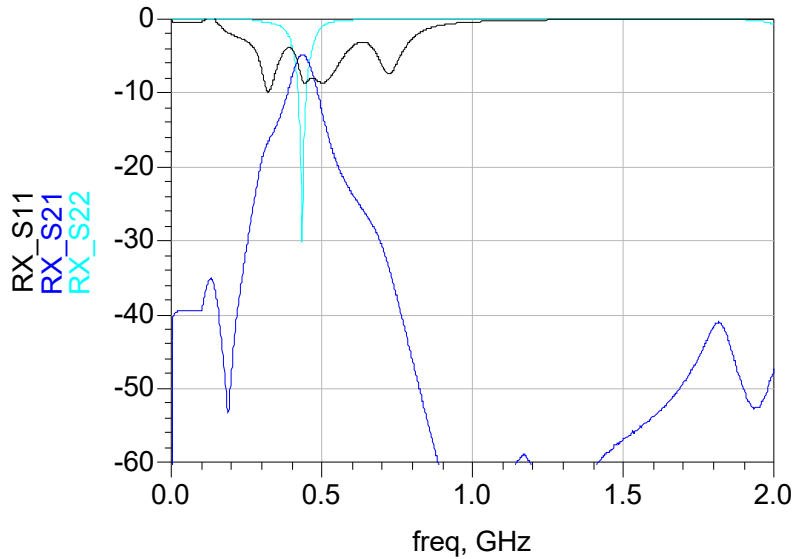
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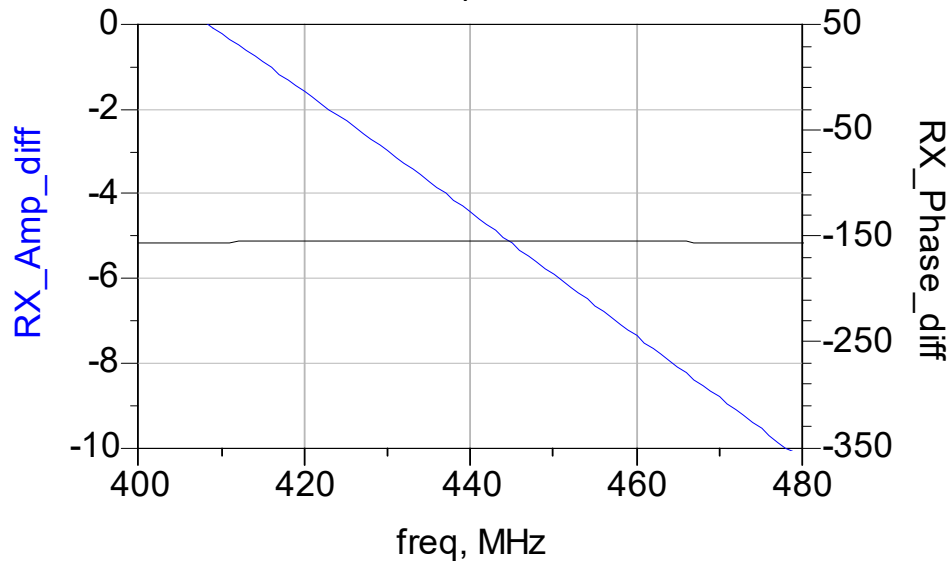
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## Typical Electrical Characteristics (T=25°C)

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



### Receive Mode Phase Balance, Amplitude Difference



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## Application Notes, Layout Files, and more

<https://www.johansontechnology.com/silabs>

## Small SMD 433MHz (or 900M, 2.4G, 5G) antennas

<https://www.johansontechnology.com/antennas>

## RoHS Compliance

<https://www.johansontechnology.com/rohs-compliance>

## Soldering Information

<https://www.johansontechnology.com/ipcsoldering-profile>

## Antenna layout and tuning techniques

<https://www.johansontechnology.com/tuning>

## Antenna layout review, tuning, and characterization services

<https://www.johansontechnology.com/ipc-antenna-services>

## MSL Info

<https://www.johansontechnology.com/msl-rating>

## Recommended Storage Condition and Max Shelf Life

<https://www.johansontechnology.com/recommended-storage-conditions>

## Packaging information

<https://www.johansontechnology.com/tape-reel-packaging>

## Terminal Pad Composition

100% Tin (Sn)

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