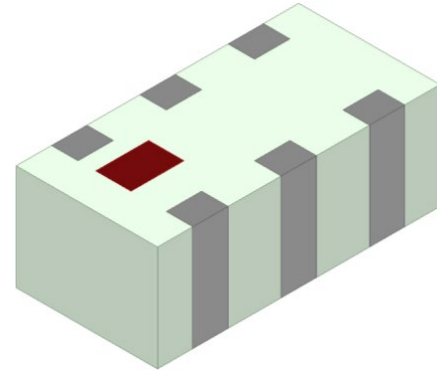


## 770 – 928 MHz Impedance-matched Balun-filter for Texas Instruments CC1310 and 1312R Wireless MCUs

- 783, 868, and 915MHz ISM bands
- SMD, EIA 0603
- Complete front-end solution
  - Integrated impedance-matching balun
  - Integrated harmonic filter for regulatory compliance
- Designed for use with Texas Instruments MCU part numbers:
  - CC1310
  - CC1312R



### General Specifications<sup>1</sup>

Passband Frequency (MHz)	770 - 928	
Unbalanced Impedance, Antenna-side ( $\Omega$ )	50	
Balanced Impedance, Transceiver-side ( $\Omega$ )	Impedance match to Texas Instruments CC1310, CC1312R	
Frequency Bands (MHz)	770 – 860	860 – 928
Insertion Loss (dB)	1.3 Typ. (1.6 Max.)	1.8 Typ. (2.2 Max.)
Return Loss (dB)	9.5 Min.	9.5 Min.
Phase Difference (Degree)	180 $\pm$ 17	180 $\pm$ 15
Amplitude Difference (dB)	3.5 Max.	2.0 Max.
Attenuation		
Frequency Range (MHz)	1540 – 1720	
Attenuation (dB)	8 Min.	
Frequency Range (MHz)	1720 – 1736	
Attenuation (dB)	15 Min.	
Frequency Range (MHz)	1736 – 1856	
Attenuation (dB)	15 Min.	
Frequency Range (MHz)	2310 – 2580	
Attenuation (dB)	30 Min.	
Frequency Range (MHz)	2580 – 2784	
Attenuation (dB)	30 Min.	

<sup>1</sup> Typical value represents average measurement at 25°C. Min./Max. values represent measurements within the operating temperature specification unless stated otherwise.

**General Specifications (continued)**

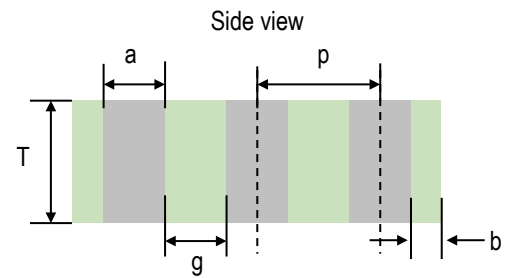
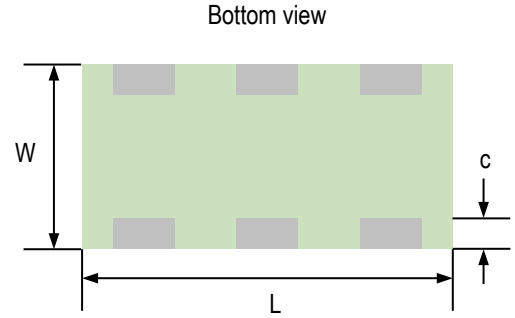
Frequency Range (MHz)	3080 – 3440
Attenuation (dB)	33 Min.
Frequency Range (MHz)	3440 – 3712
Attenuation (dB)	35 Min.

**Maximum Ratings**

Power Capacity (W)	2 Max. (CW)
Operating Temperature (°C)	-40 to +85
Recommended Storage Conditions post-installation (°C)	-40 to +85
Recommended Storage Conditions and Period for Unused T&R Product	45% - 75% RH +5 to +35 °C 18 Months Max.

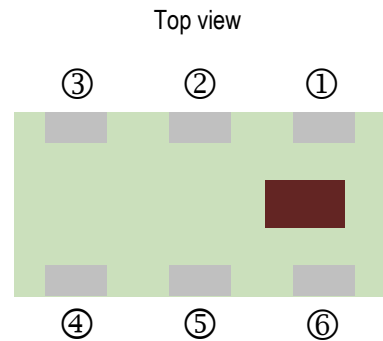
**Mechanical Dimensions**

	Inches			Millimeters		
<b>L</b>	0.079	±	0.006	2.00	±	0.15
<b>W</b>	0.049	±	0.004	1.25	±	0.10
<b>T</b>	0.031	±	0.004	0.80	±	0.10
<b>a</b>	0.010	±	0.004	0.25	±	0.10
<b>b</b>	0.012	±	0.006	0.30	±	0.15
<b>c</b>	0.008	+0.004/-0.006		0.20	+0.10/-0.15	
<b>p</b>	0.020	±	0.004	0.50	±	0.10



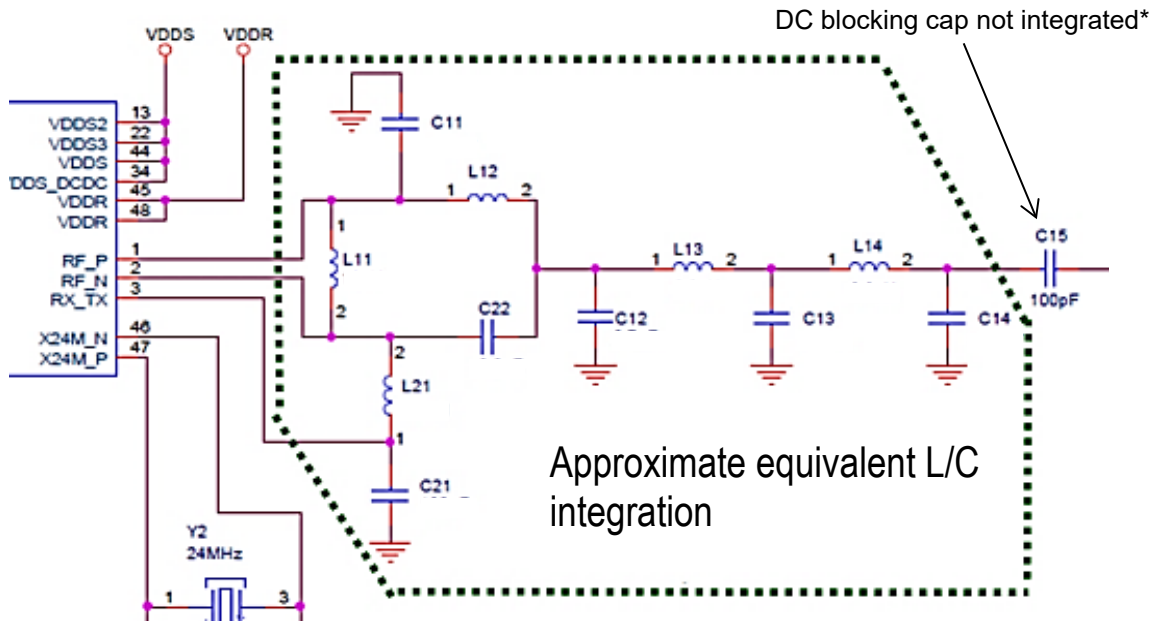
**Terminal Configuration**

Pin Number	Function
1	Unbalanced
2	RX/TX
3	Balanced RF_N
4	Balanced RF_P
5	GND
6	GND



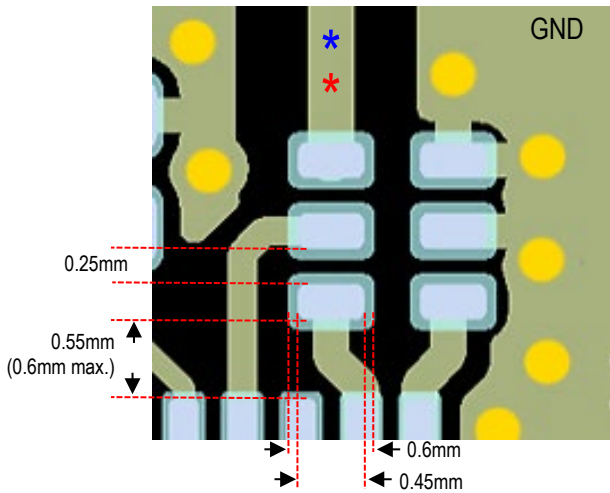


**0850BM14E0016001T Internal Equivalent Circuit**



\*We recommend the designer place a DC blocking cap (68-100pF) in series after Pin 1 (between 0850BM14E0016001T and antenna).

**PCB Reference Design Layout**



- Solder Resist
- Solder Pads
- GND Via ( $\varnothing$  0.35mm)

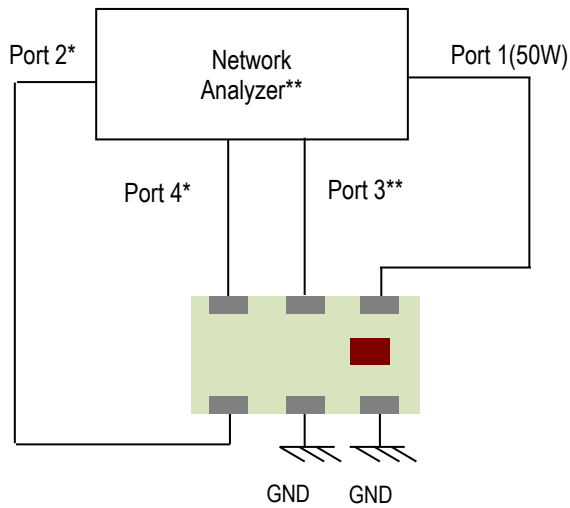
**NOTE:** GND via placement is crucial to the harmonic attenuation capability of the filter.

\* We recommend the designer place a DC blocking cap (68-100pF) in series after Pin 1 (between 0850BM14E0016001T and antenna) per page 4 of the datasheet.

\* Transmission line width should be designed to match 50 $\Omega$  characteristic impedance, depending on PCB material and thickness.

If you would like the full reference design package or have any questions, contact our application engineers at <https://www.johansontechnology.com/ask-a-question>

**Measuring Diagram**



Port 1: Unbalanced

Ports 2 and 4: Balanced

Port 3: RX\_TX

Insertion Loss=Sds21

Return Loss=Sss11

Amplitude Difference =  $\text{dB}(S(2,1)/S(4,1))$

Phase Difference =  $\text{Phase}(S(2,1)/S(4,1))$

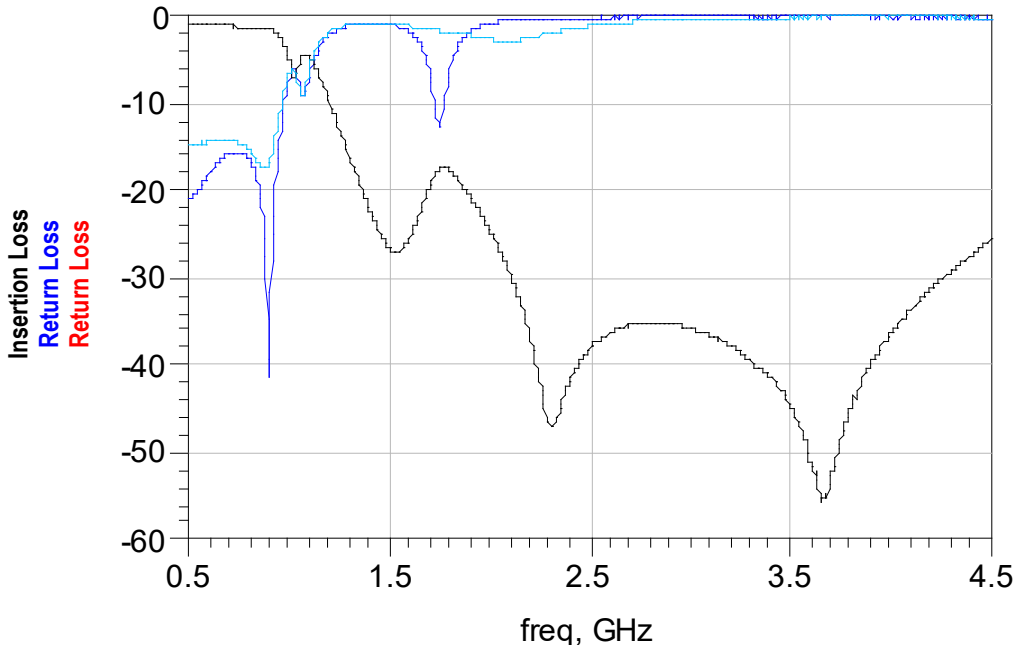
\*Ports 2 and 4: Conjugate match to TI CC13XX chipset

\*\*Port 3: Load impedance looking into RX\_TX pin of TI CC1310/1312R chipset

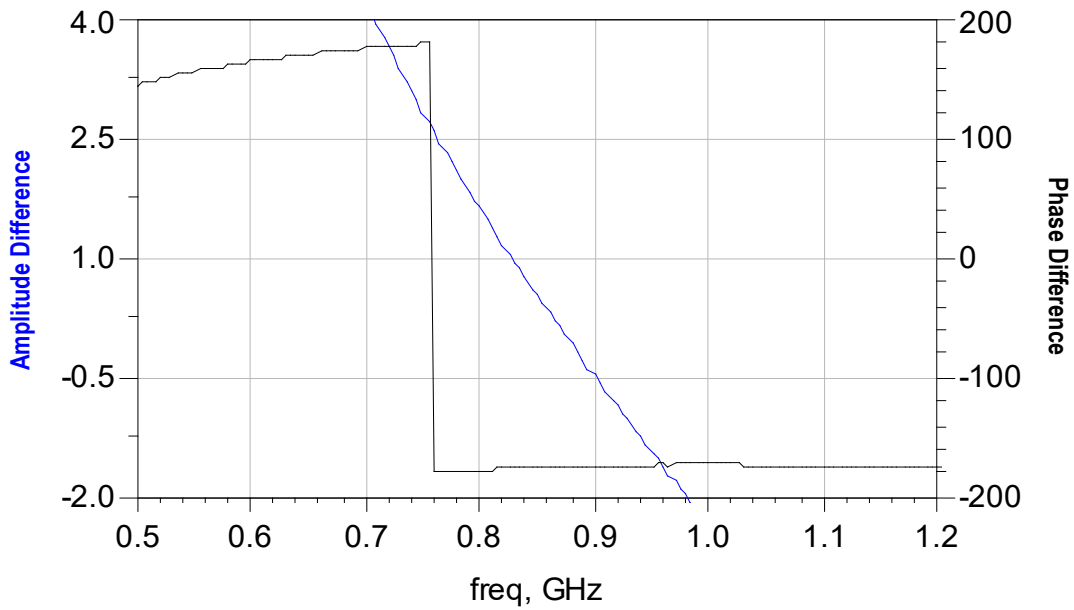


**RF Measurement**

Insertion Loss, Return Loss



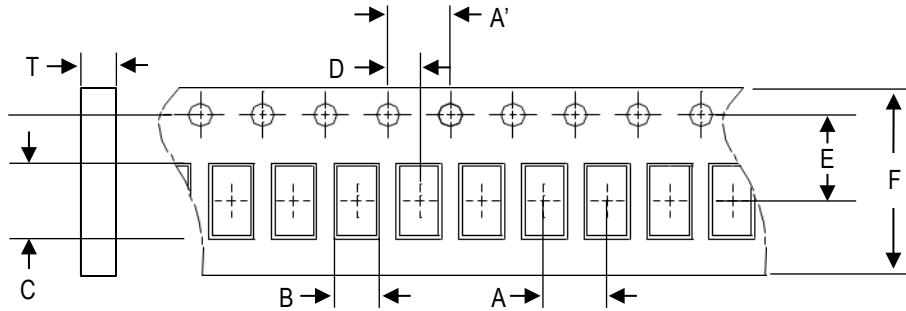
Phase Difference, Amplitude Difference



S-parameter and layout files available upon request. Please contact <https://www.johansontechnology.com/ask-a-question>

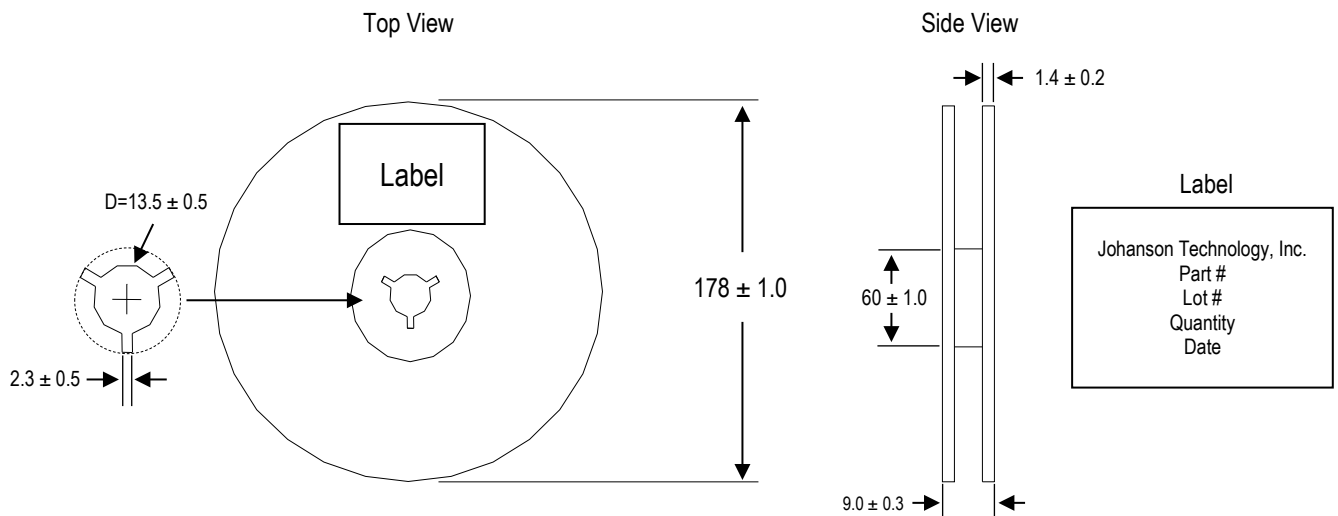
**Tape and Reel Specification (Units in mm)**

**Tape Dimensions**

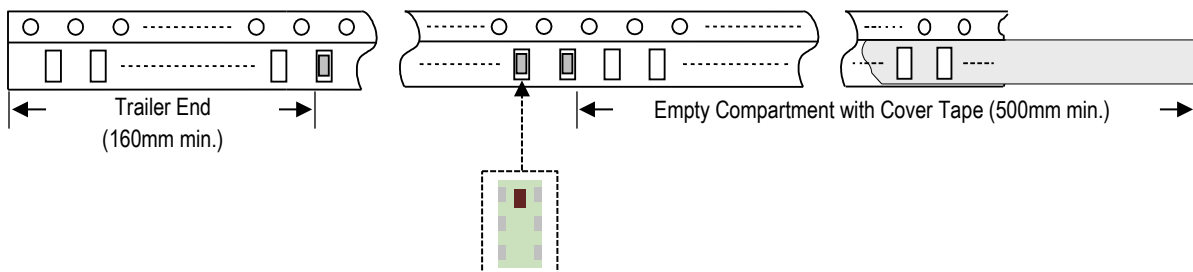


A	A'	B	C	D	E	F	T	Quantity/reel	Tape material
4.0±0.1	4.0±0.1	1.1±0.1	1.92±0.1	2.0±0.1	3.5±0.1	8.0±0.1	0.75±0.05	4,000pcs	Paper

**Reel Dimensions**



**Leader and Trailer Dimensions**





**Orderable Part Number**

Packaging Style	Part Number
Bulk (loose pcs.)	0850BM14E0016001B
T & R (7" Reel Paper Tape)	0850BM14E0016001T (Qty: 4,000 pcs./reel)

**Important Links**

[0850BM14E0016001T Product Page](#)

[Texas Instruments Application Note SWRA524](#)

[Sub-GHz Chip Antennas](#)

[Antenna Tuning, Optimization, and Validation Services](#)

[Soldering Information](#)

[MSL Information](#)

[Packaging Information](#)

[Recommended Storage Condition and Max Shelf Life](#)

[RoHS Compliance](#)