

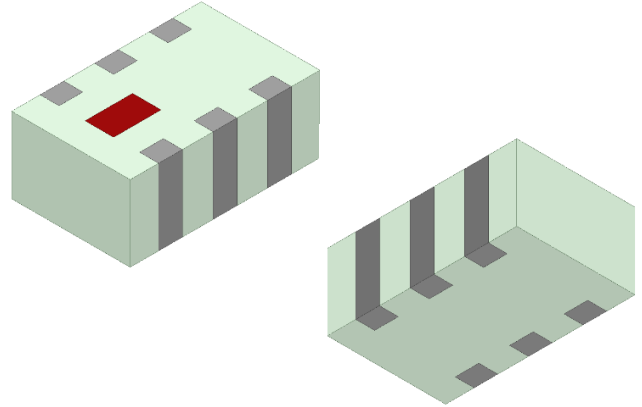


**THE DATASHEET OF
0850BM14E0016001T**



770 – 928 MHz Impedance-matched Balun-filter for Texas Instruments CC1310, 1312R, 1314R10 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
 - CC1314R10 (RGZ)



General Specifications¹

Passband Frequency (MHz)	770 - 928	
Unbalanced Impedance, Antenna-side (Ω)	50	
Balanced Impedance, Transceiver-side (Ω)	Impedance match to Texas Instruments CC1310, CC1312R, CC1314R10	
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 ± 17	180 ± 15
Amplitude Difference (dB)	3.5 Max.	2.0 Max.
Attenuation		
Frequency Range (MHz) Attenuation (dB)	1540 – 1720 8 Min.	
Frequency Range (MHz) Attenuation (dB)	1720 – 1736 15 Min.	
Frequency Range (MHz) Attenuation (dB)	1736 – 1856 15 Min.	
Frequency Range (MHz) Attenuation (dB)	2310 – 2580 30 Min.	

¹ Typical value represents average measurement at 25°C. Min./Max. values represent measurements over specified operating temperature.

General Specifications (continued)

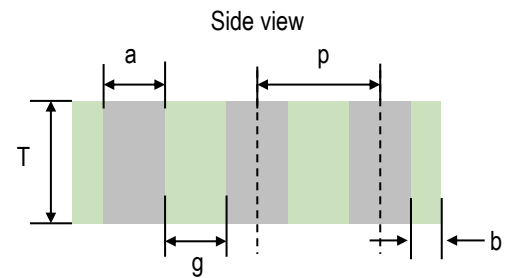
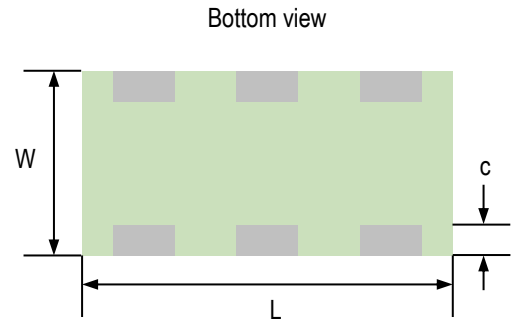
Frequency Range (MHz)	2580 – 2784
Attenuation (dB)	30 Min.
Frequency Range (MHz)	3080 – 3440
Attenuation (dB)	33 Min.
Frequency Range (MHz)	3440 – 3712
Attenuation (dB)	35 Min.

Maximum Ratings

Power Capacity (W)	2 Max. (CW)
Operating Temperature (°C)	-40 to +105
Recommended Storage Conditions post-installation (°C)	-40 to +105
Recommended Storage Conditions and Period for Unused T&R Product	45% - 75% RH +5 to +35 °C 18 Months Max.

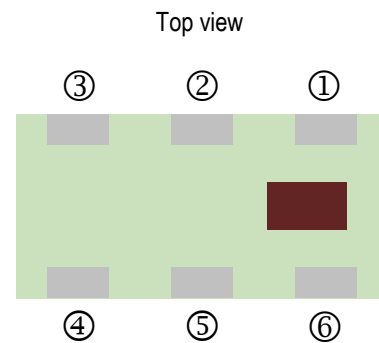
Mechanical Dimensions

	Inches			Millimeters		
L	0.063	±	0.004	1.60	±	0.10
W	0.031	±	0.004	0.80	±	0.10
T	0.024	±	0.004	0.60	±	0.10
a	0.008	±	0.004	0.20	±	0.10
b	0.008	+0.004/-0.006		0.20	+0.10/-0.15	
c	0.006	±	0.004	0.15	±	0.10
g	0.012	±	0.004	0.30	±	0.10
p	0.020	±	0.002	0.50	±	0.05



Terminal Configuration²

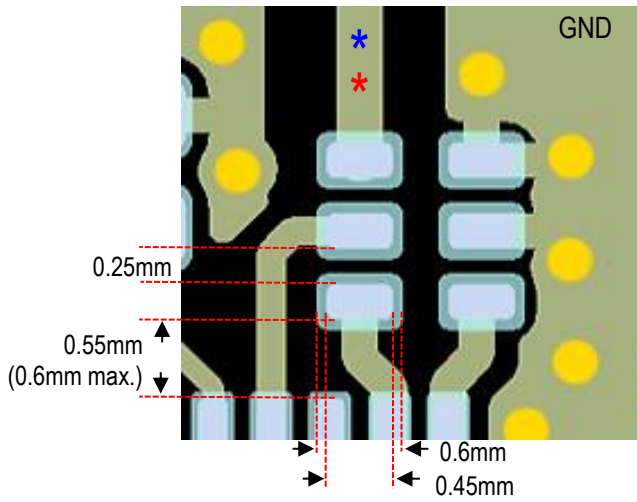
Pin Number	Function
1	Unbalanced
2	RX/TX
3	Balanced RF_N
4	Balanced RF_P
5	GND
6	GND



² The termination type is Nickel Tin. Go to: <https://www.johansontechnology.com/ipcsoldering-profile> for Typical Soldering Profile.



PCB Reference Design Layout



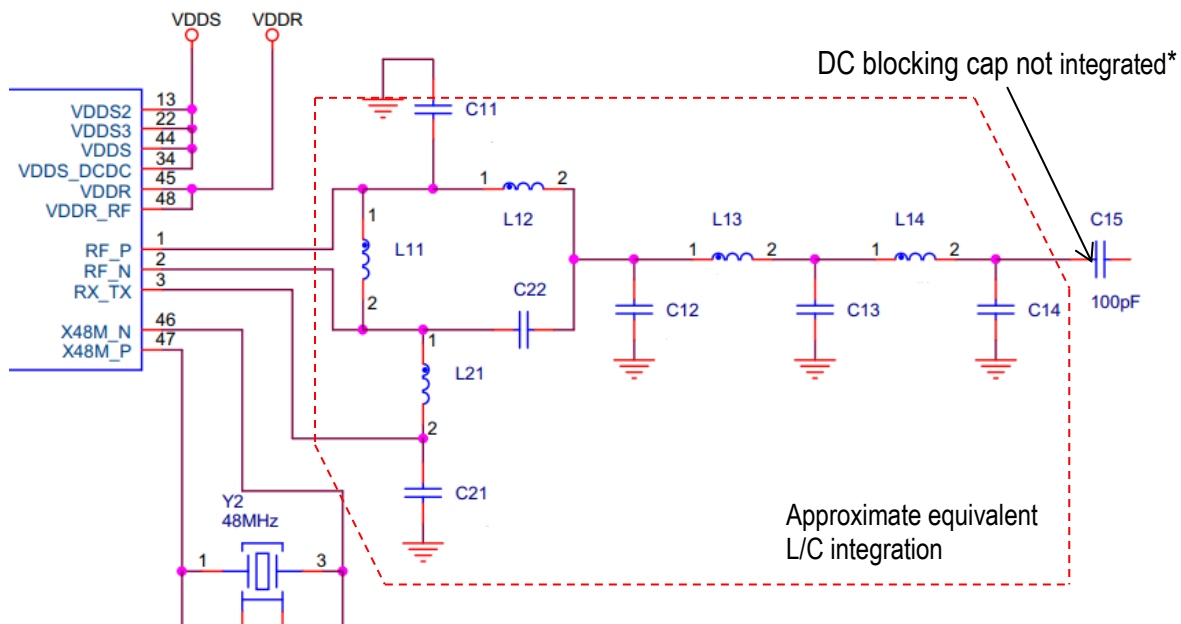
- Solder Resist
- Solder Pads
- GND Via (\varnothing 0.35mm)

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 Ω characteristic impedance, depending on PCB material and thickness.

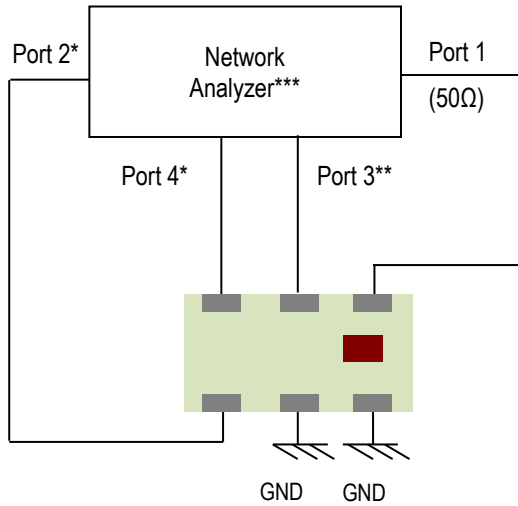
Equivalent Integrated Circuit



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

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 = S_{DS21}

Return Loss = S_{SS11}

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

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

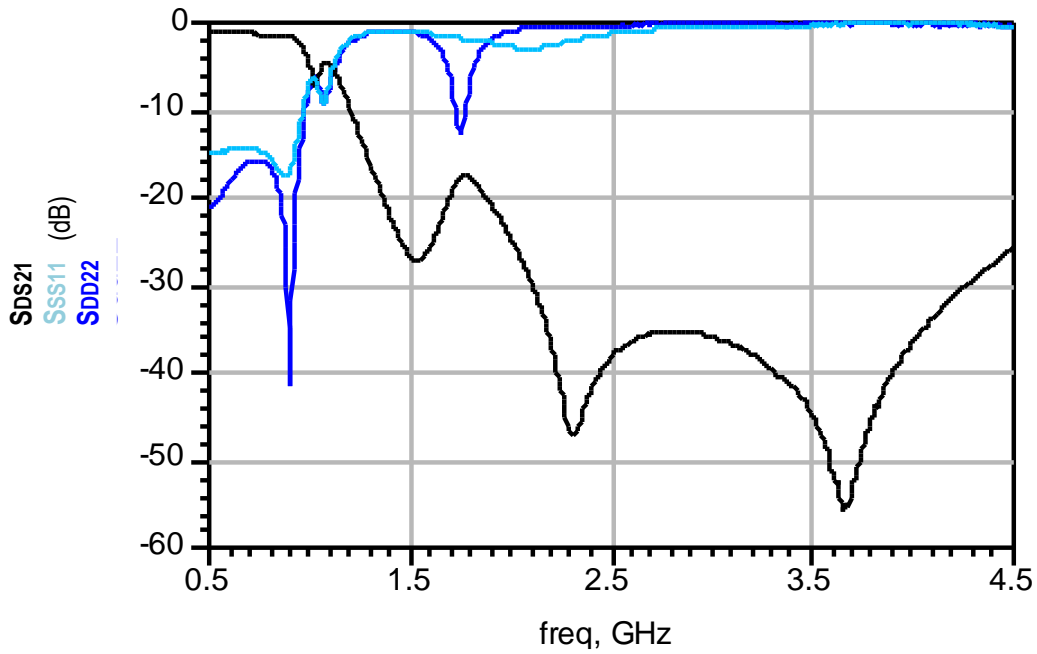
*Ports 2 and 4: Conjugate match to TI CC13XX chipset

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

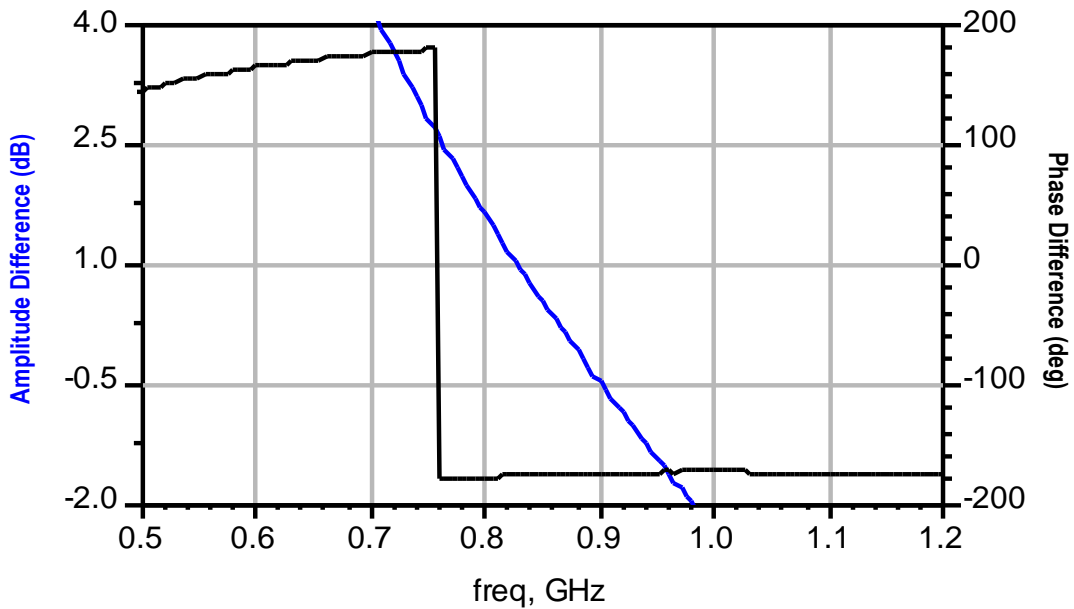
*** E5071B from Agilent

RF Measurement

Insertion Loss, Return Loss, Attenuation



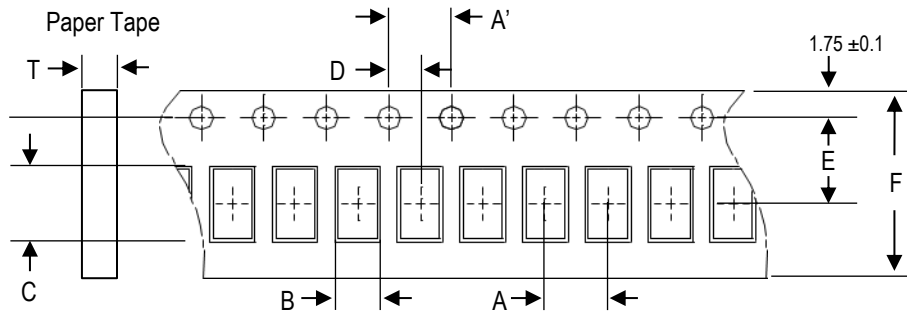
Phase Difference, Amplitude Difference



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

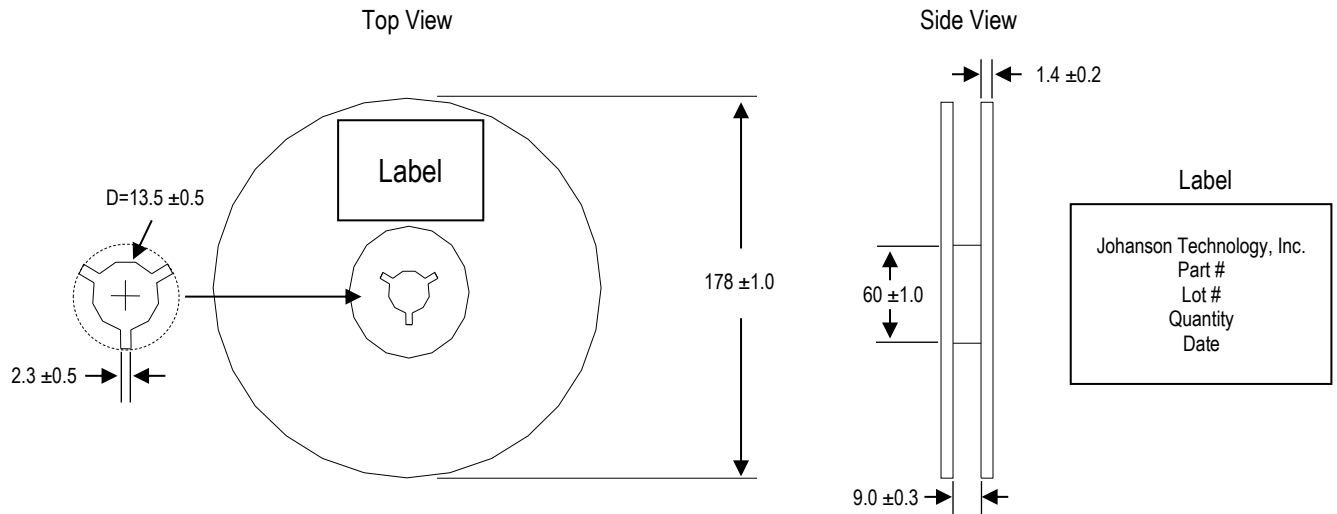
Tape and Reel Specification (Units in mm)

Tape Dimensions

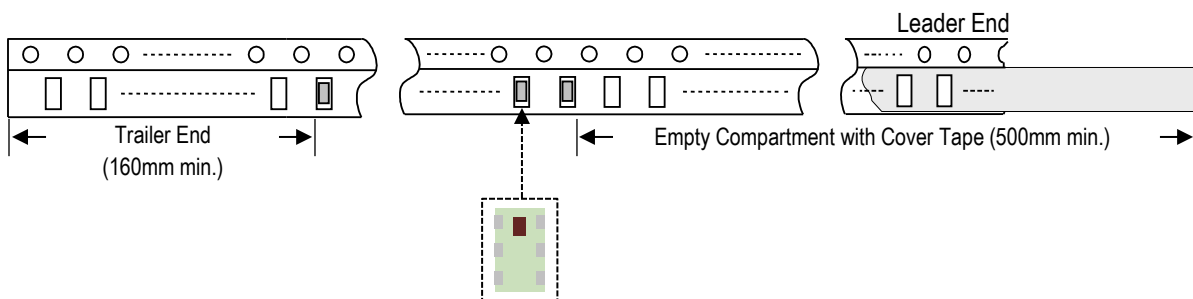


A	A'	B	C	D	E	F	T	Quantity/reel	Tape material
4.0 ±0.1	4.0 ±0.1	1.1 ±0.1	1.92 ±0.1	2.0 ±0.1	3.5 ±0.1	8.0 ±0.1	0.75 ±0.05	4,000pcs	Paper

Reel Dimensions



Leader and Trailer Dimensions



Orderable Part Number

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

Important Links

[0850BM14E0016001T Product Page](#)

[Texas Instruments Application Note SWRA524](#)

[More RF Baluns](#)

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

[Soldering Information](#)

[MSL Information](#)

[Packaging Information](#)

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

[RoHS Compliance](#)

Contact our application engineers for a PCB layout review.

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