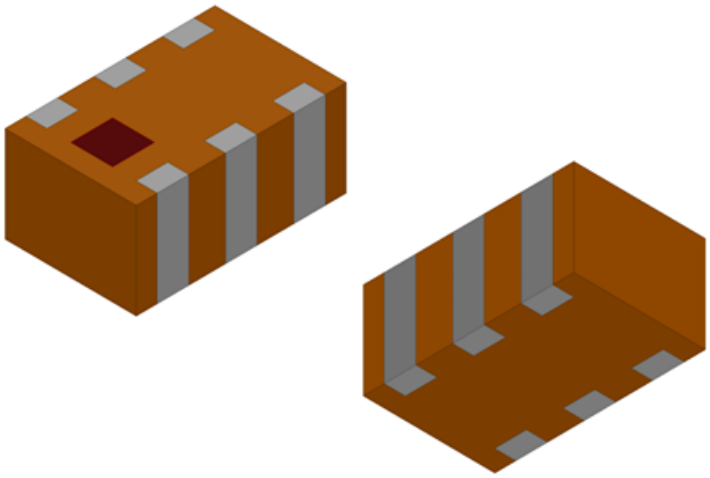
402 – 405 MHz, 430 – 435 MHz Integrated Balun-filter for Texas Instruments Chipsets

- 402 – 405 MHz, 430 – 435 MHz ISM bands
- SMD, EIA 0805
- Complete front-end RF solution
  - Integrated impedance-matching balun and filter
  - Integrated harmonic filter for regulatory compliance
- Designed for use with Texas Instruments MCU chipsets and series:
  - CC110X, CC111X, CC113X, CC115X
  - CC110L, CC113L, CC115L
  - CC430, RF430



General Specifications[1]

Passband Frequency (MHz)	**402 – 405, 430 – 435**	
Unbalanced Impedance, Antenna-side (Ω)	50	
Balanced Impedance, Transceiver-side (Ω)	Impedance-Matched to T.I. CC110X, CC111X, CC113X and CC115X; CC110L, CC113L and CC115L; CC430 and RF430 Chipsets	
Frequency Bands (MHz)	**402 – 405**	**430 – 435**
Insertion Loss (dB)	1.9 Max.	1.9 Max.
Return Loss (dB)	9.5 Min.	9.5 Min.
Phase Difference (Degree)	180 ± 10	180 ± 10
Amplitude Difference (dB)	3.0 Max.	1.5 Max.
Attenuation		
Frequency Range (MHz) Attenuation (dB)	804 – 810 25 Min.	860 – 870 34 Min.
Frequency Range (MHz) Attenuation (dB)	1206 – 1215 35 Min.	1290 – 1305 35 Min.
Frequency Range (MHz) Attenuation (dB)	1608 – 1620 35 Min.	1720 – 1740 35 Min.
Frequency Range (MHz) Attenuation (dB)	2010 – 2025 35 Min.	2150 – 2175 35 Min.

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

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Maximum Ratings

Power Capacity (W)	1 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[2]	45% - 75% RH +5 to +35 °C 18 Months Max.

[2] 18 months max. in vacuum sealed bag and 1 week after opened. Please keep unused parts in vacuum sealed bags. For more info go to https://www.johansontechnology.com/silverleads-profile.

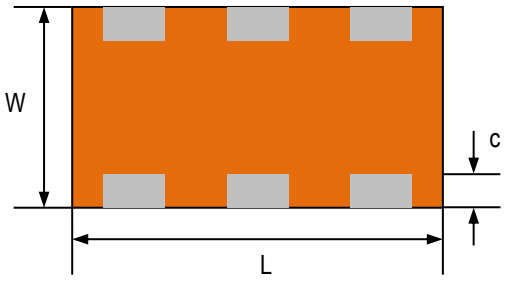
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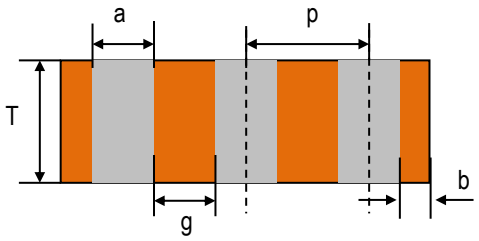
Mechanical Dimensions

	Inches			Millimeters		
L	0.079	±	0.004	2.00	±	0.10
W	0.049	±	0.004	1.25	±	0.10
T	0.028	±	0.004	0.70	±	0.10
a	0.012	±	0.004	0.30	±	0.10
b	0.008	±	0.004	0.20	±	0.10
c	0.012	+0.004/-0.008		0.30	+0.1/-0.2	
g	0.014	±	0.004	0.35	±	0.10
p	0.026	±	0.002	0.65	±	0.05

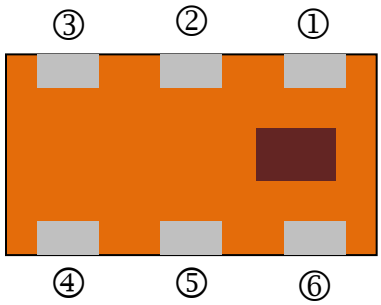
Bottom view



Side view



Top view



Terminal Configuration[3]

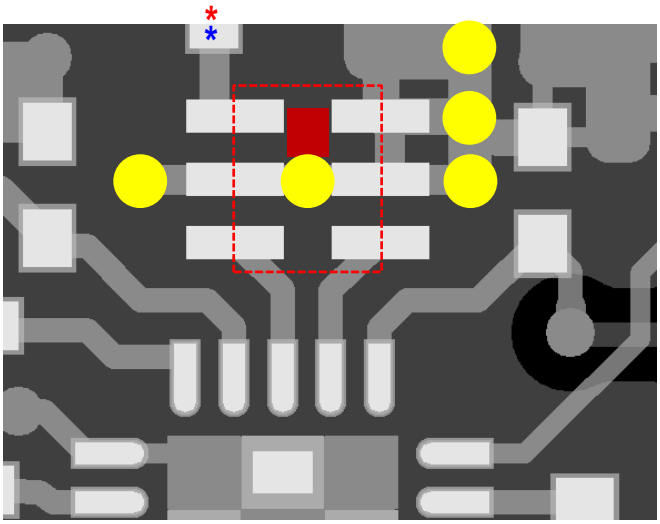
Pin Number	Function
1	Unbalanced
2	GND
3	Balanced Port
4	Balanced Port
5	GND
6	GND

[3] The termination type is Silver. Go to: https://www.johansontechnology.com/ipcsoldering-profile for Typical Soldering Profile.

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PCB Reference Design Layout



Solder Resist

Solder Pads

GND Via

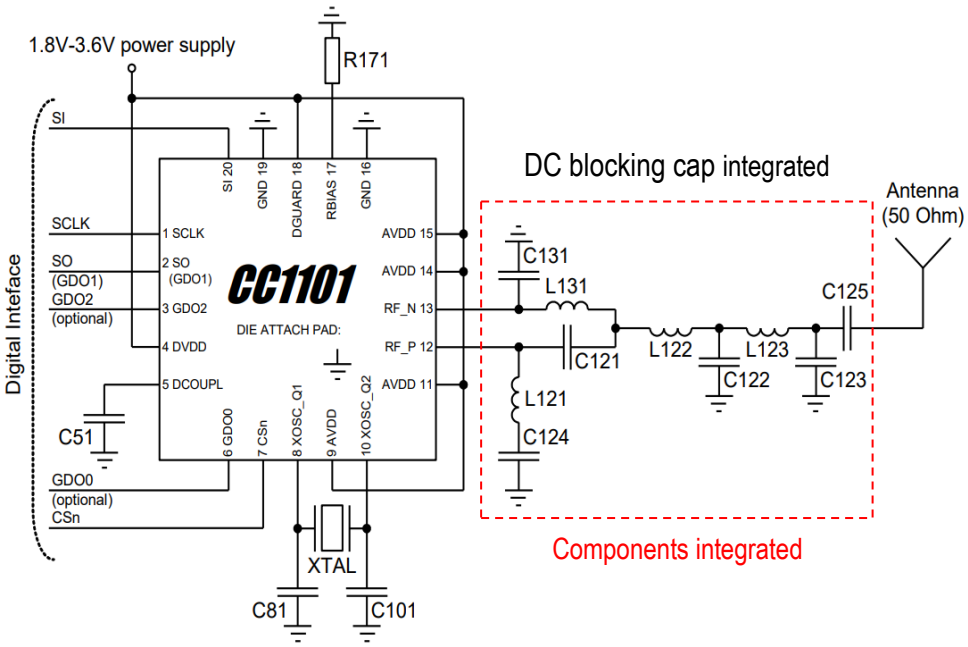
NOTE: GND via placement is crucial to the harmonic attenuation capability of the filter.

* DC-blocking capacitor embedded. External DC-blocking cap not necessary.

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

We recommend designers to follow the official reference design in Texas Instruments Design Note DN025.

Equivalent Integrated Circuit

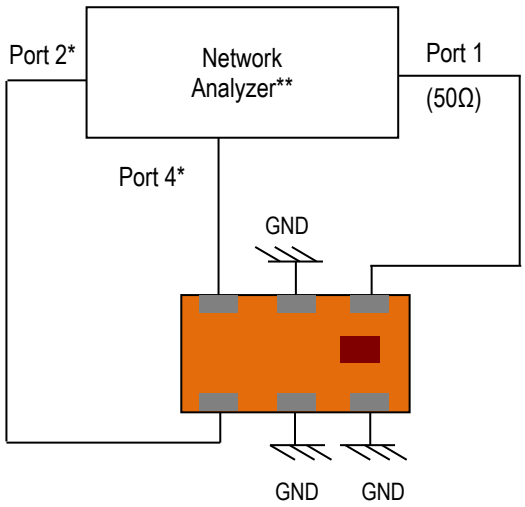


If you would like the full reference design package or have any questions,
contact our application engineers at https://www.johansontechnology.com/ask-a-question

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Measuring Diagram



Port 1: Unbalanced

Ports 2 and 4: Balanced

Insertion Loss= S_{DS21}

Return Loss=S_{SS11}

Amplitude Difference = dB(S(2,1)/S(4,1))

Phase Difference = Phase(S(2,1)/S(4,1))

*Ports 2 and 4: Conjugate match to TI chipsets (Page 1)

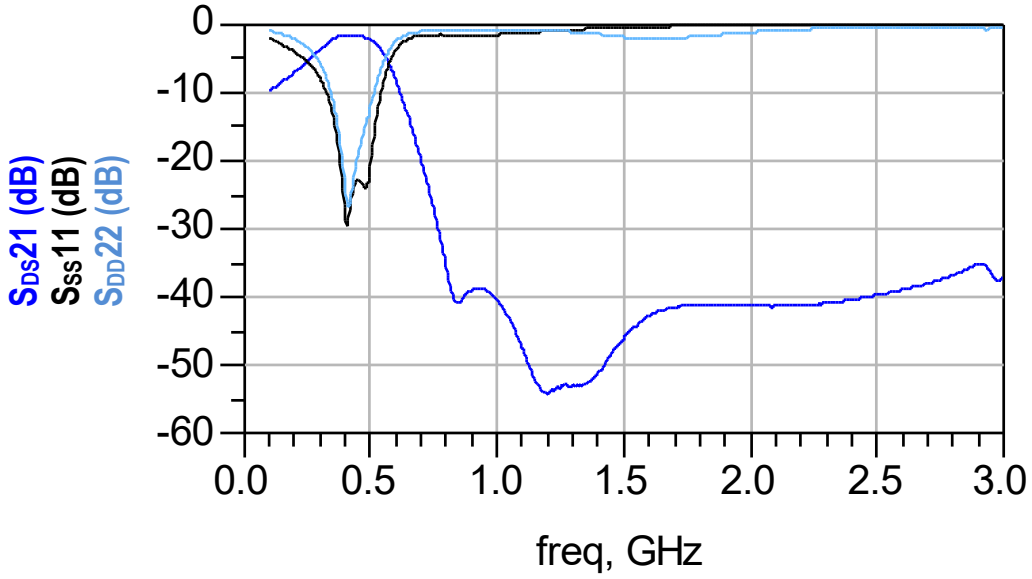
** E5071B from Agilent

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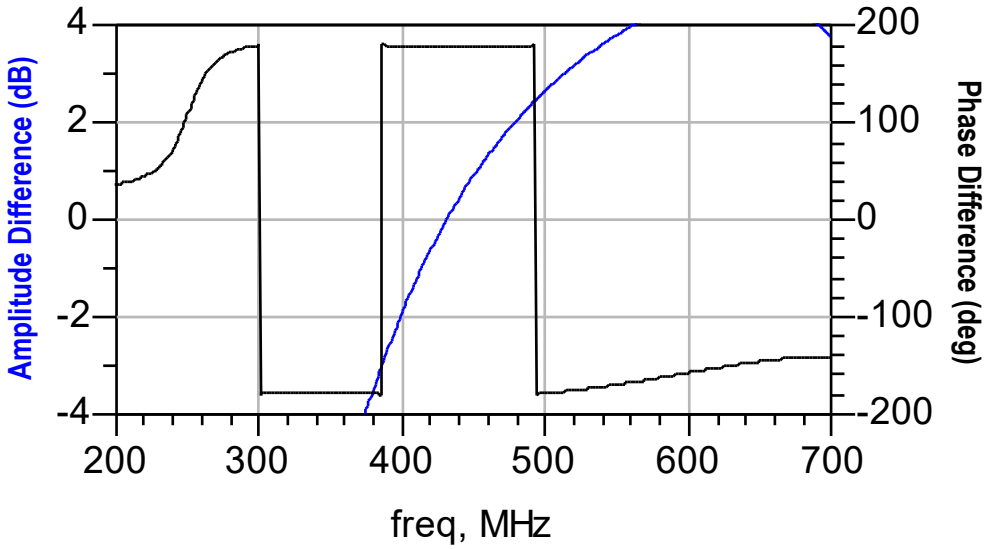
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RF Measurement

Insertion Loss, Return Loss, Attenuation



Phase Difference, Amplitude Difference



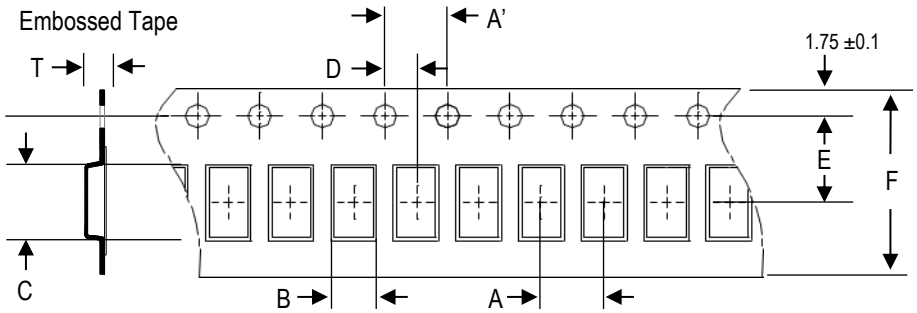
S-parameter and layout files available upon request. Please contact us at: https://www.johansontechnology.com/ask-a-question

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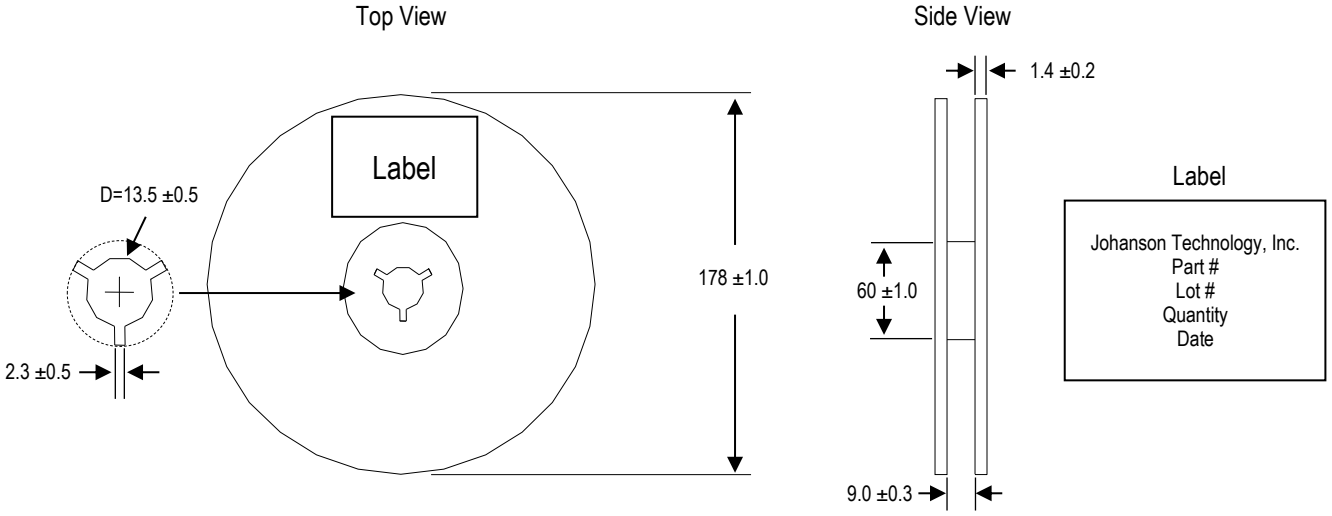
Tape and Reel Specification (Units in mm)

Tape Dimensions

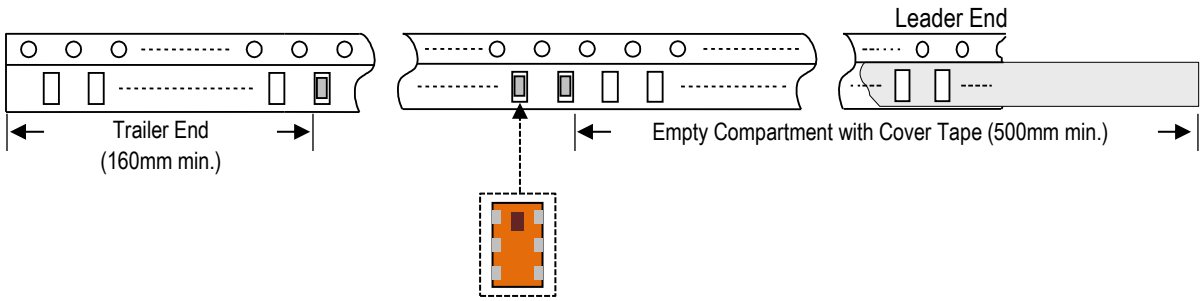


A	A'	B	C	D	E	F	T	Quantity/reel	Tape material
4.0 ± 0.1	4.0 ± 0.1	1.35 ± 0.05	2.15 ± 0.05	2.0 ± 0.05	3.5 ± 0.1	8.0 ± 0.1	1.00 ± 0.05	4,000 pcs	Plastic (Embossed)

Reel Dimensions



Leader and Trailer Dimensions



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Orderable Part Number

Packaging Style	Part Number	Termination
Bulk (loose pcs.)	0433BM15A0001001B	Silver
T & R (7" Reel Embossed Tape)	0433BM15A0001001E (Qty: 4,000 pcs/reel)	

Important Links

0433BM15A0001001E Product Page

Texas Instruments Design Note DN025

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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