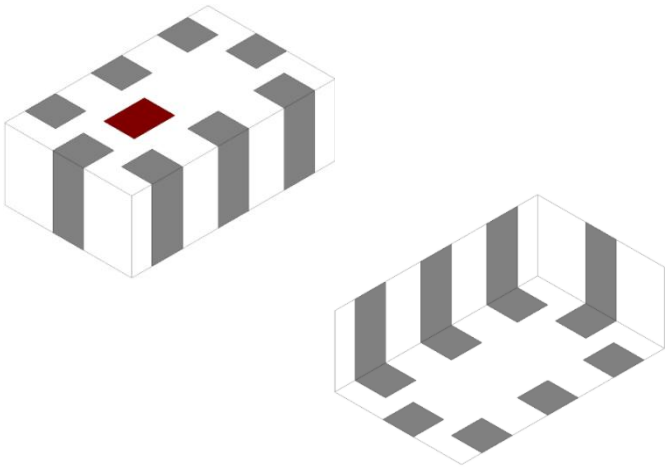
868 – 928 MHz Integrated Balun-filter for Texas Instruments Chipsets

- 868 - 928 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:
  - CC112X, CC117X, CC12XX



General Specifications[1]

Passband Frequency (MHz)	**868 - 928**	
Unbalanced Impedance, Antenna-side (Ω)	50	
Balanced Impedance, Transceiver-side (Ω)	Impedance match to Texas Instruments CC112X, CC117X, CC12XX	
Communication Mode	**TX-ANT**	**RX-ANT**
Insertion Loss (dB)	2.0 Max.	2.5 Max.
Return Loss (dB)	9.5 Min.	9.5 Min.
Phase Difference (Degree)	n/a	180 ± 15
Amplitude Difference (dB)	n/a	2.0 Max.
Attenuation		
Frequency Range (MHz) Attenuation (dB)	1736 - 1856 35 Min.	n/a
Frequency Range (MHz) Attenuation (dB)	2604 – 2784 35 Min.	n/a
Frequency Range (MHz) Attenuation (dB)	3472 – 3712 35 Min.	n/a
Frequency Range (MHz) Attenuation (dB)	4340 – 4640 35 Min.	n/a

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

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Maximum Ratings

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.

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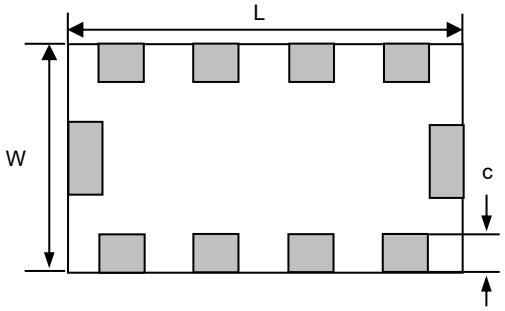
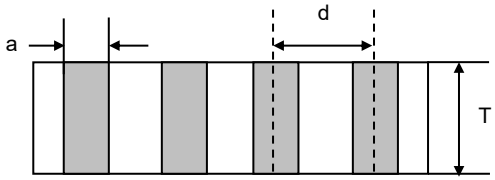
Mechanical Dimensions

	Inches			Millimeters		
L	0.079	±	0.008	2.00	±	0.2
W	0.049	±	0.008	1.25	±	0.2
T	0.039		Max.	1.00		Max.
a	0.010	±	0.004	0.25	±	0.1
b	0.012	±	0.004	0.30	±	0.1
c	0.008		+0.004/-0.006	0.20		+0.1/-0.15
p	0.020	±	0.004	0.50	±	0.1

Bottom view



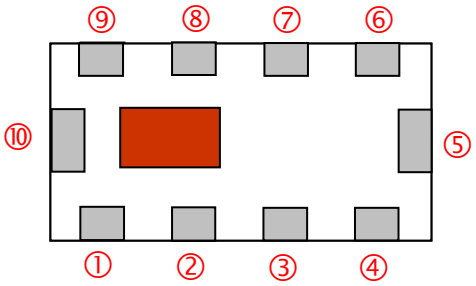
Side view



Terminal Configuration[2]

Pin Number	Function
1	LNA_N
2	LNA_P
3	TRX
4	PA
5	GND
6	GND
7	ANT
8	GND
9	GND
10	GND

Top view



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

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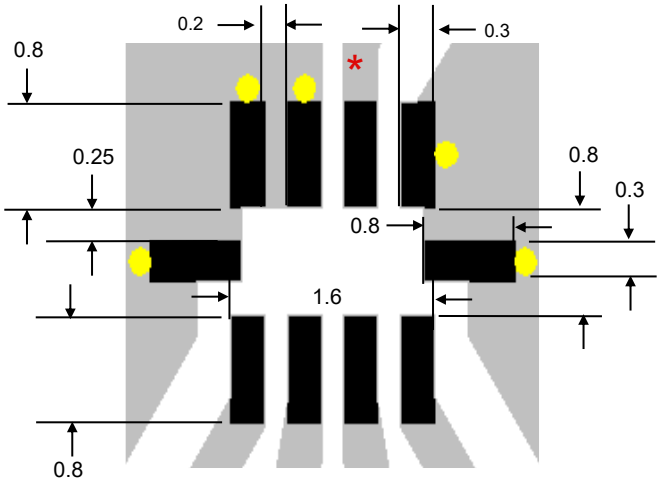
PCB Reference Design Layout



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

* 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 DN039.

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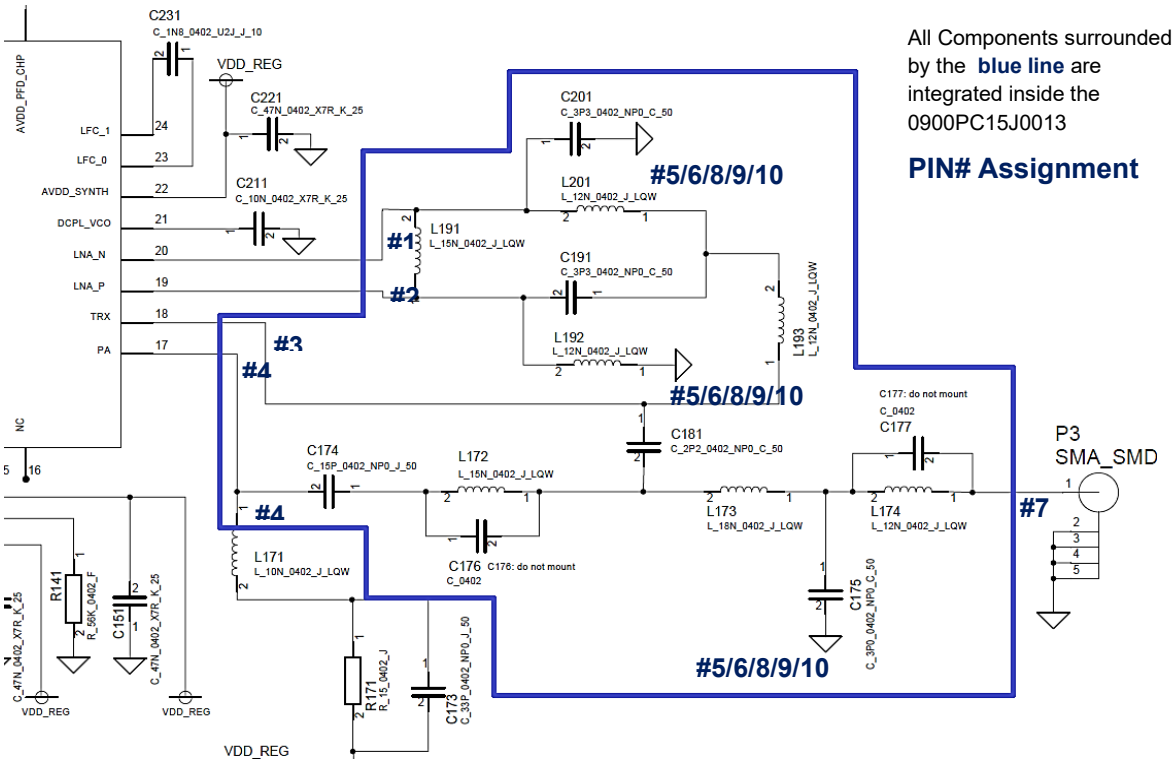
Equivalent Integrated Circuit



All Components surrounded by the **blue line** are integrated inside the 0900PC15J0013

PIN# Assignment

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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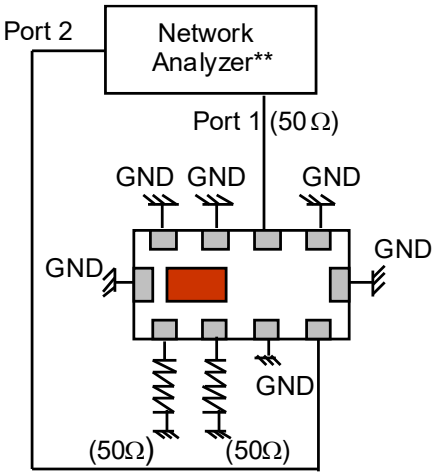
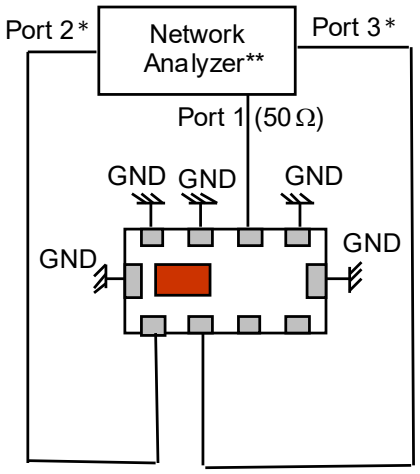
Measuring Diagram



Tx :
Port1: Antenna Port
Port1 Terminate impedance: 50ohm
Port2: PA Port
Port2 Terminate impedance:
Complex conjugate to impedance of TI CC112X PA pin
IL = S21
RL = S11 / S22
**E5071B / C from Agilent



RX:
Port 1: Antenna Port
Port1 Terminate impedance: 50ohm
Ports 2 and 3: Rx Balanced Port
*Port 2 and 3 Terminate impedance : Complex conjugate to 1/2 x (Balance impedance of TI CC112X LNA_N / LNA_P pins)
IL=Sds21
RL=Sss11 / Sdd22
Amp_balance = dB(S(3,1)/S(2,1))
Phase_balance = Phase(S(3,1)/S(2,1))

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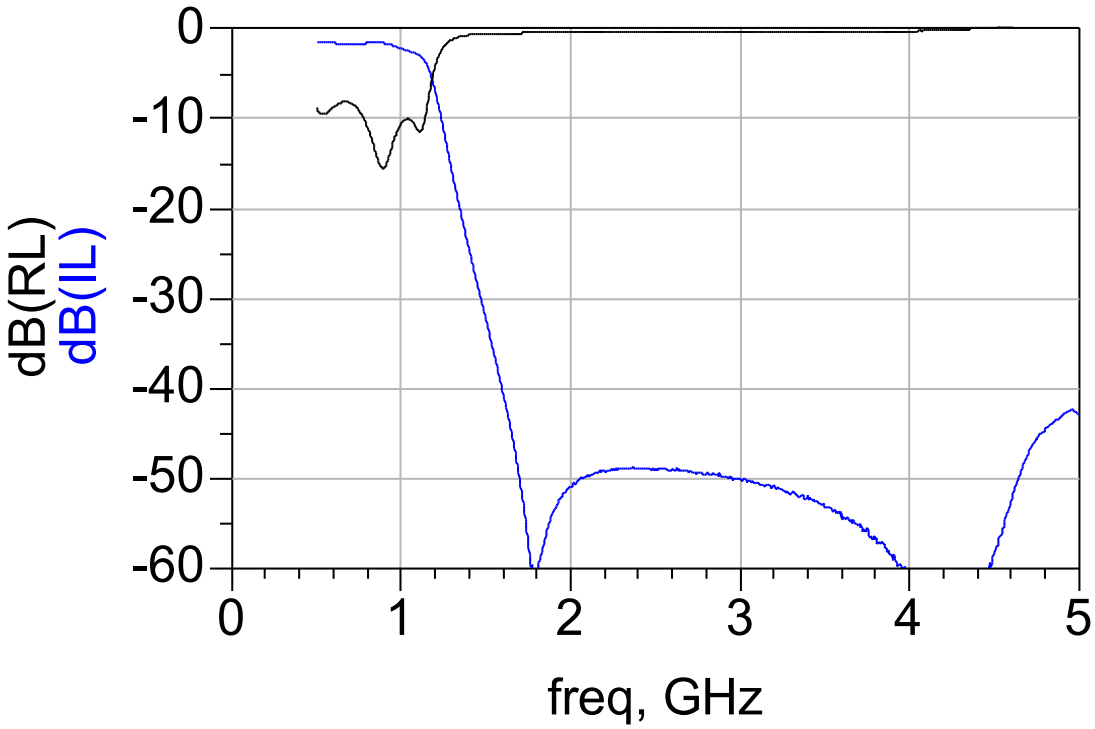
RF Measurement

TX Mode Insertion Loss, Return Loss, Attenuation



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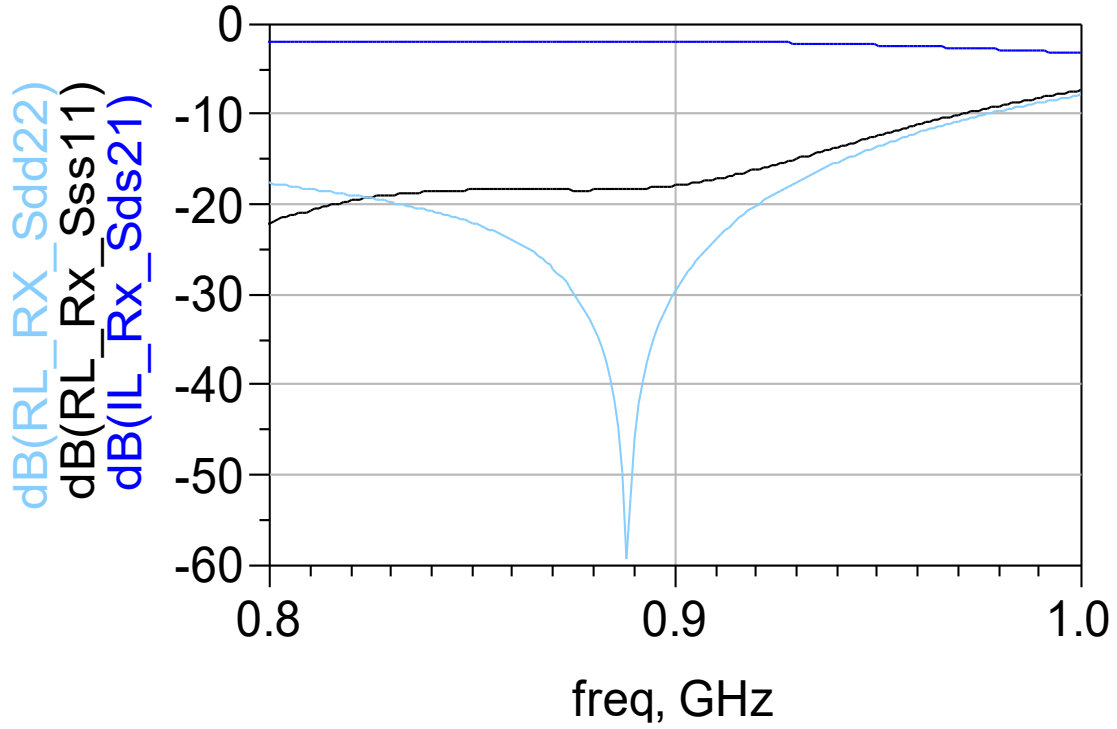
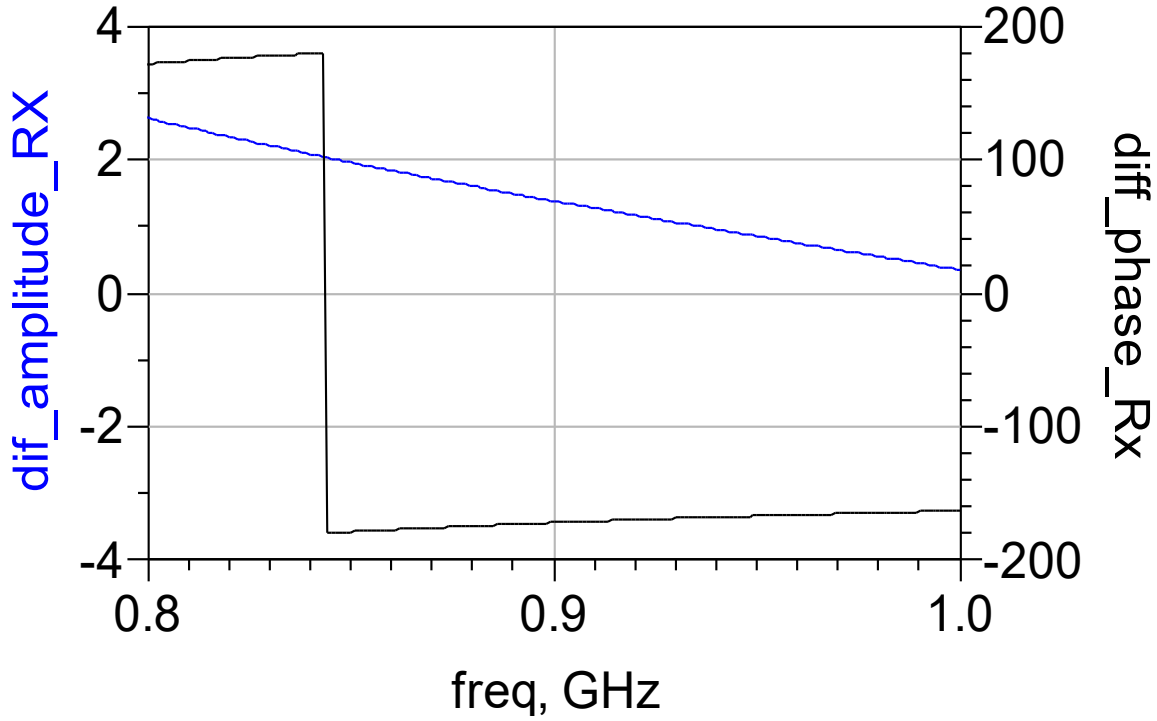
RX Mode Insertion Loss, Return Loss, Attenuation



RX Mode Phase Difference and 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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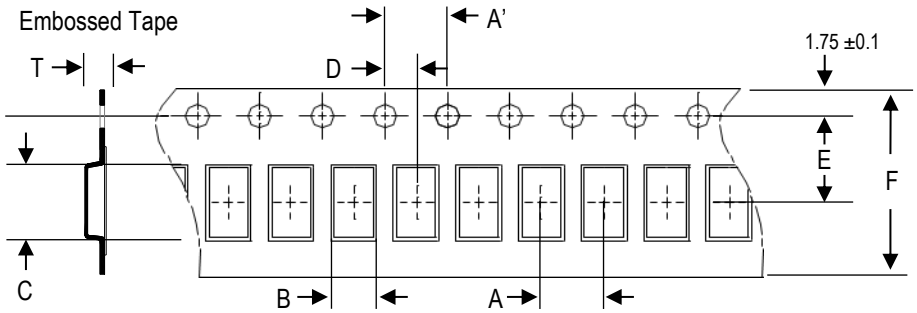
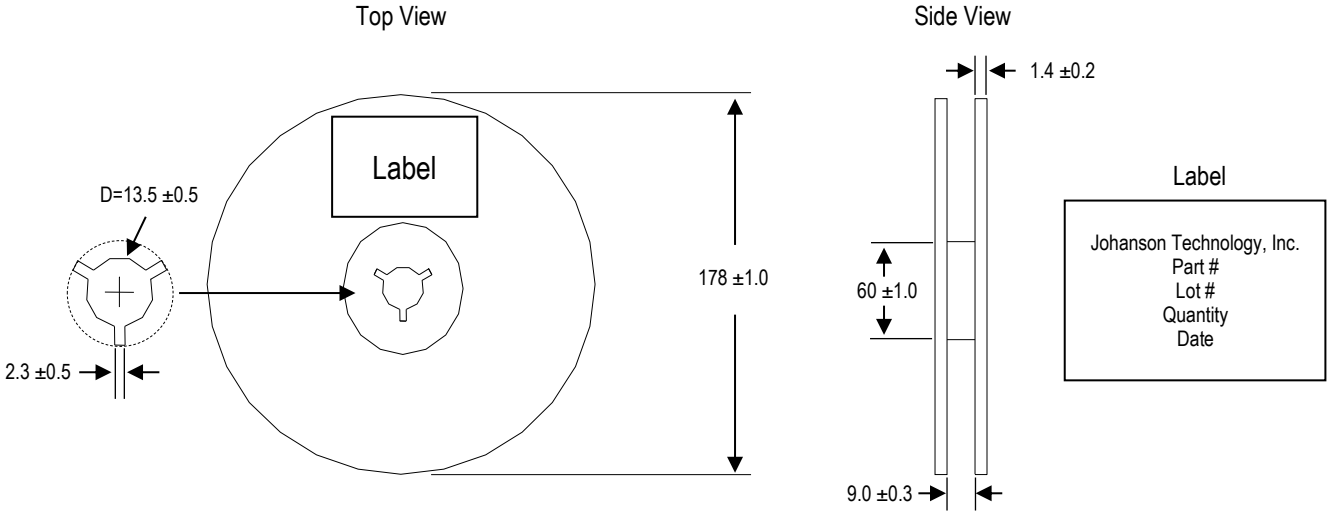
Tape and Reel Specification (Units in mm)

Tape Dimensions

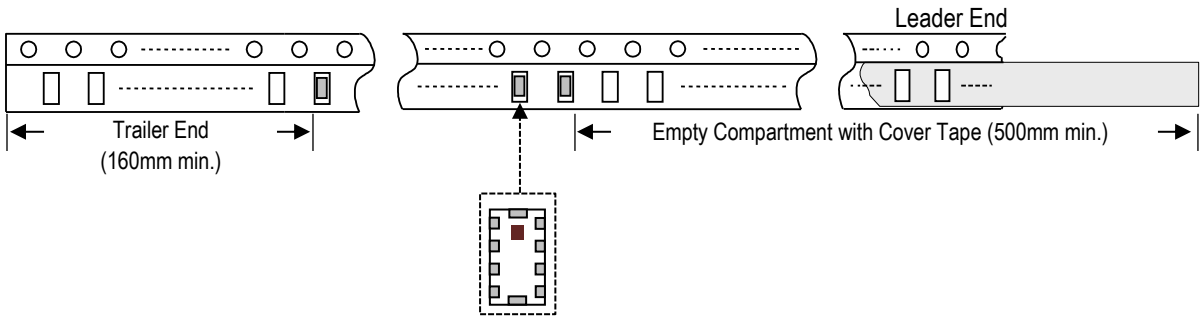


A	A'	B	C	D	E	F	T	Quantity/reel	Tape material
4.0 ± 0.1	4.0 ± 0.1	1.35 ± 0.05	2.15 ± 0.05	2.0 ± 0.05	3.5 ± 0.1	8.0 ± 0.1	1.08 ± 0.05	4,000 pcs	Plastic (Embossed)

Reel Dimensions



Leader and Trailer Dimensions



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Orderable Part Number

Packaging Style	Part Number	Termination
Bulk (loose pcs.)	0900PC15J0013001B	Nickel Tin
T & R (7" Reel Embossed Tape)	0900PC15J0013001E (Qty: 4,000 pcs/reel)	

Important Links

0900PC15J0013001E Product Page

Texas Instruments Design Note DN039

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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