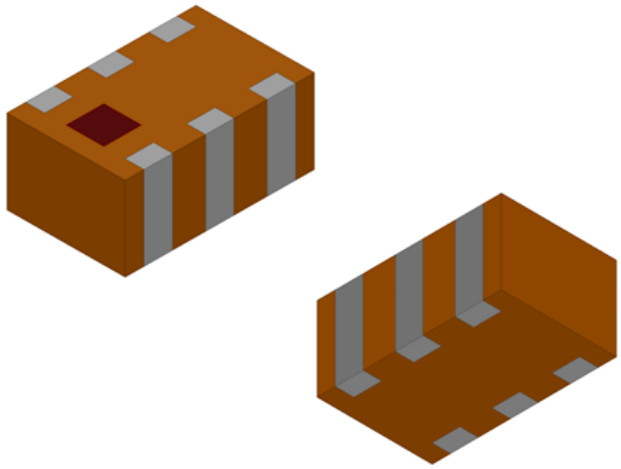
# 900 MHz RF 1:1 Balun

- 800-1000MHz, 50:50 (1:1) Impedance Ratio
- SMD, EIA 0805
- Wireless communication systems using Sub-GHz protocols for smart home, general IoT, security, metering, lighting, cellular, agriculture, city and building automation, etc.
- RoHS compliant



## General Specifications[1] [2]

| | |
|---|---|
| **Passband Frequency (MHz)** | **800 – 1000** |
| Unbalanced Impedance (Ω) | 50 |
| Balanced Impedance (Ω) | 50 |
| Insertion Loss (dB) | 1.2 Max. |
| Return Loss (dB) | 9.5 Max. |
| Phase Difference (degree) | 180 ± 10 |
| Amplitude Difference (dB) | 2 Max. |

## 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[3] | 45% - 75% RH<br>+5 to +35°C<br>18 Months Max. |

[1] Typical value represents average measurement at 25°C. Min./Max. values represent measurements over specified operating temperature.
[2] General specifications measured on Johanson's evaluation board PN 0900BL15C0050001CE1.
[3] 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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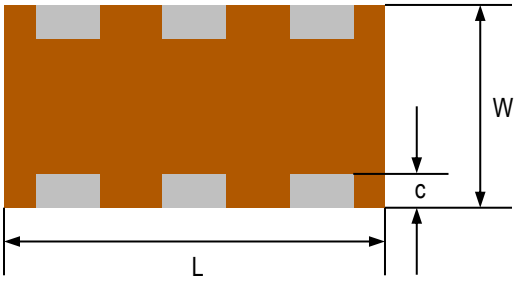
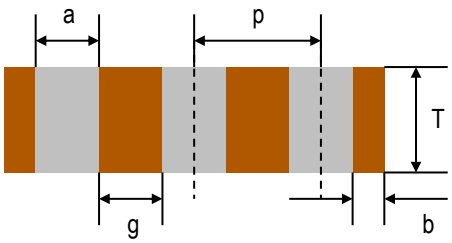
## Mechanical Dimensions

| | 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 | +0.10/-0.20 | |
| **g** | 0.014 | ± | 0.004 | 0.35 | ± | 0.10 |
| **p** | 0.026 | ± | 0.002 | 0.65 | ± | 0.05 |

Bottom view



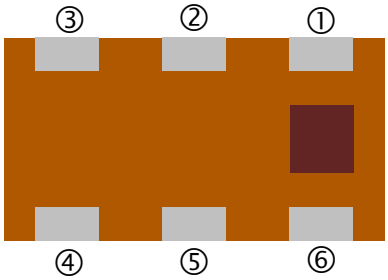

Side view




## Terminal Configuration[4]

| Pin Number | Function |
|---|---|
| **1** | Unbalanced Port (IN) |
| **2**[5] | GND *or* DC feed + RF GND |
| **3** | Balanced Port (OUT1) |
| **4** | Balanced Port (OUT2) |
| **5** | GND |
| **6** | NC |

Top view




[4] The termination type is Silver. Go to: https://www.johansontechnology.com/ipcsoldering-profile for Typical Soldering Profile.
[5] Use 56pF RF GND cap when using DC-Feed option.



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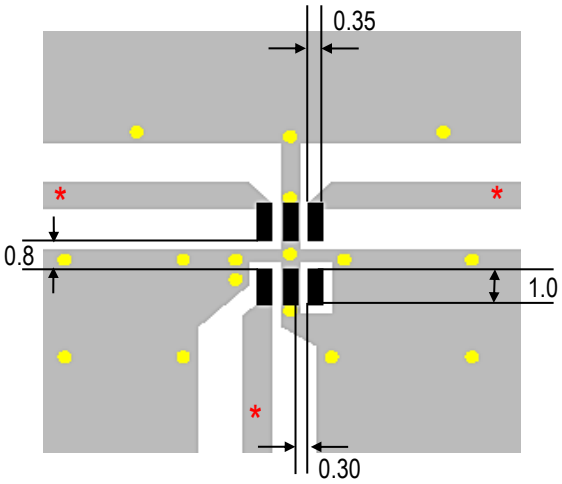
## Recommended PCB Layout (P/N 0900BL15C0050001CE1)

Note: Mount device with colored mark facing up.

**Without DC feed**



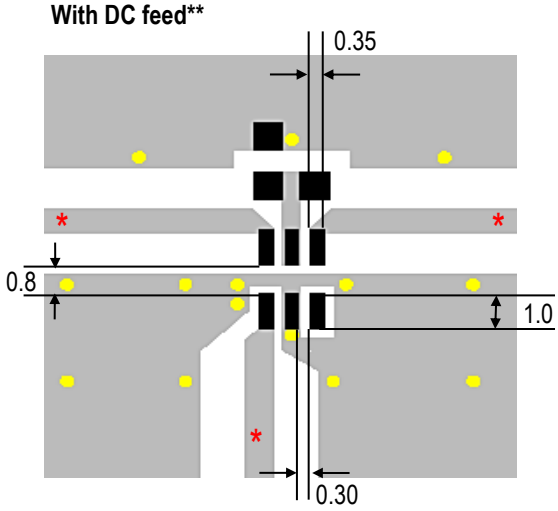

Units: mm

Solder Resist

Land

Through-hole ($\phi$0.3)

**With DC feed****




Solder Resist

Land

Through-hole ($\phi$0.3)

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

**By-pass capacitor should be connected when feeding DC power.

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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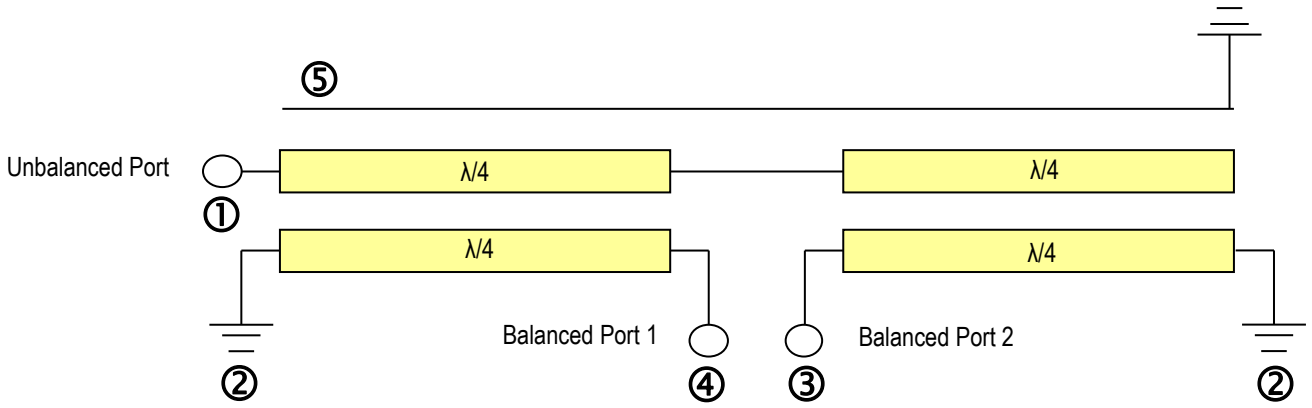
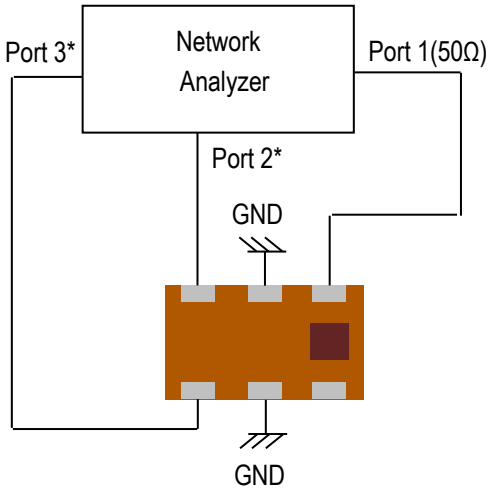
## Equivalent Internal Circuit[6] [7] [8]




## Measuring Diagram




Port 1: Unbalanced Port

Ports 2 and 3: Balanced Port

IL=$S_{ds21}$

RL=$S_{ss11}$

Amplitude Balance = dB(S(2,1)/S(3,1))

Phase Balance = Phase(S(2,1)/S(3,1))

*Impedance for ports 2 and 3 = Balanced Impedance/2

[6] Pin3 and Pin4 are DC connected to Pin2 (GND or DC feed) in the device but not DC connected to Pin5 (GND). Therefore, by-pass capacitors should be connected when feeding DC power from Pin2.
[7] Unbalanced port does not have a direct current path to GND.
[8] Use 56pF cap to RF GND when using DC-Feed option.



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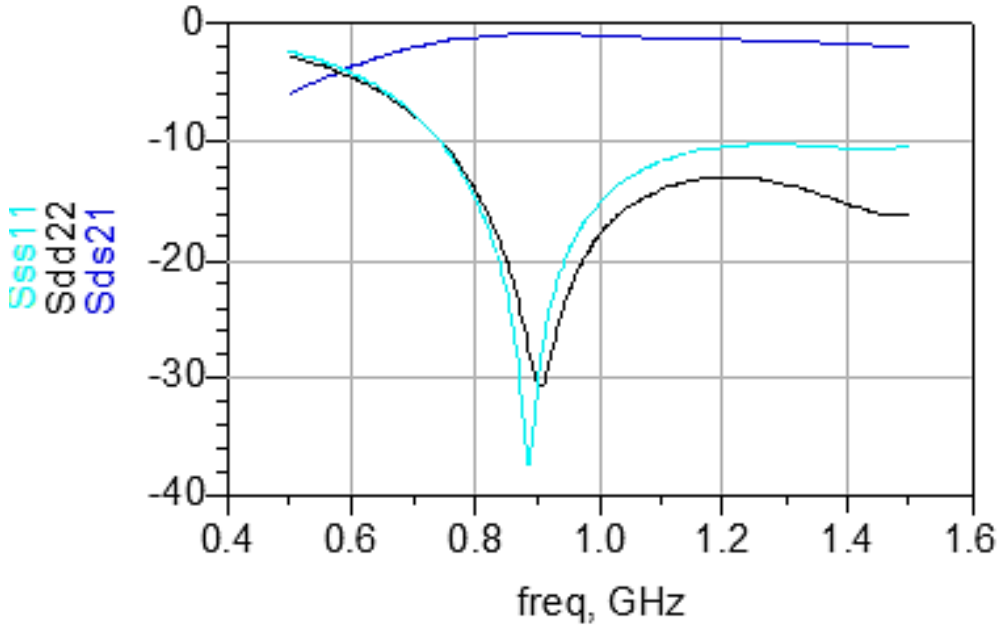
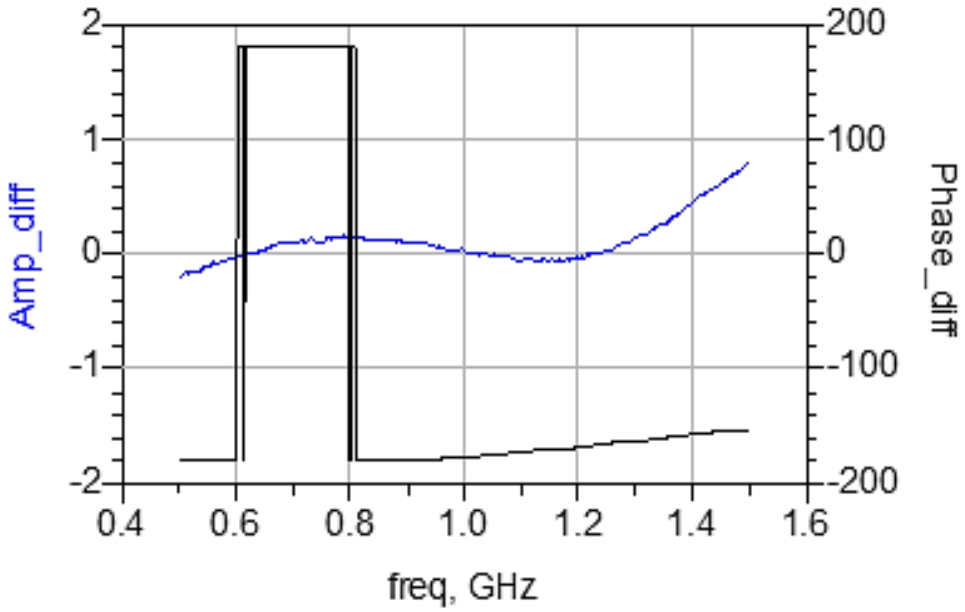
## RF Measurement

**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



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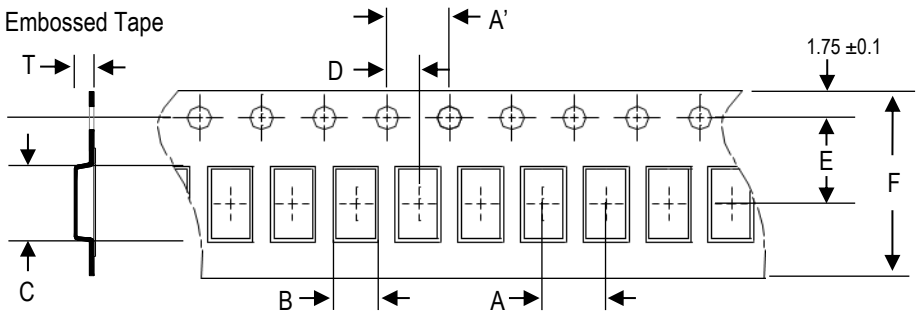
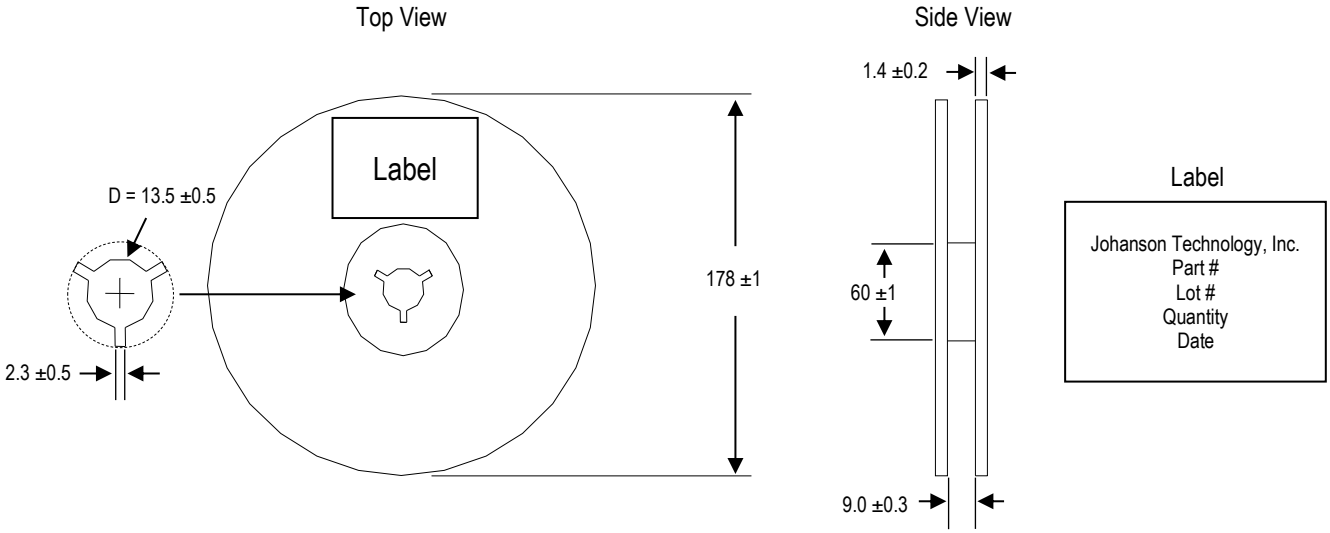
## Tape and Reel Specifications (Units in mm)

### Tape Dimensions

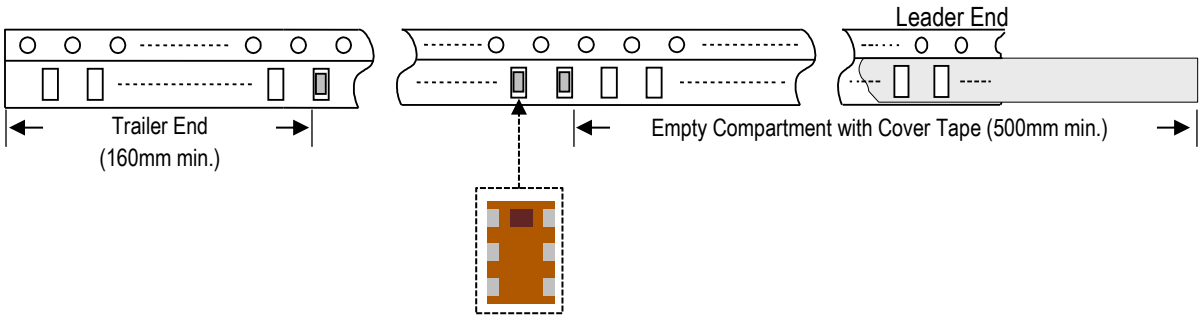



| A | A' | B | C | D | E | F | T | Quantity/reel | Tape material |
|---|---|---|---|---|---|---|---|---|---|
| 4.0 ±0.1 | 4.0 ±0.1 | 1.35 ±0.05 | 2.15 ±0.05 | 2.0 ±0.05 | 3.5 ±0.1 | 8.0 ±0.1 | 1.0 ±0.05 | 4,000pcs. | Plastic (Embossed) |

### Reel Dimensions




### Leader and Trailer Dimensions



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## Orderable Part Numbers

| Packaging Style | Part Number | Termination |
|---|---|---|
| Bulk (loose pcs.) | 0900BL15C0050001B | Silver |
| T & R (7" Reel Embossed Tape) | 0900BL15C0050001E (Qty. 4000 pcs./reel) | |
| Evaluation Board with 3 SMA connectors | 0900BL15C0050001CE1 | |

## Important Links

0900BL15C0050001E Product Page

More RF Baluns

RF Chip Antennas

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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