# "High Frequency Ceramic Solutions"

**2.45GHz Impedance Matched Balun-Filter for Atmel Chipset AT86RF232 and AT86RF233. Platforms: ATMega256RFR2, Zigbit 256RFR2, Zigbit RF233, ZigBit RF233+FEM, Extension RF233, USB RF233**

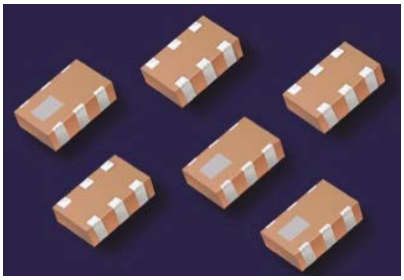
**P/N 2450BM15A0015**

Detail Specification: 1/21/2013



## General Specifications

| | |
|---|---|
| **Part Number** | 2450BM15A0015 |
| **Frequency (MHz)** | 2400~2500 |
| **Unbalanced Impedance** | 50 Ω |
| **Differential Balanced Impedance** | **Impedance match to:** Atmel AT86RF232, AT86RF233, ATMega256RFR2, Zigbit 256RFR2, Zigbit RF233, ZigBit RF233+FEM, Extension RF233, USB RF233 |
| **Insertion Loss (-40C to +85C)** | 1.1dB Typ, 1.5 dB max. |
| **Insertion Loss (-40C to +125C)** | 1.3dB Typ, 1.9 dB max. |
| **Return Loss** | 9.5 min. |
| **Phase Difference** | 180 ± 10 (deg) |
| **Amplitude Difference** | 2.0 dB max. |
| **Power Capacity** | 1 Watt max. |
| **Differential Mode Attenuation** | 20dB min. @2Fo<br>20dB min. @3Fo |
| **Common Mode Rejection** | 20dB min. @2Fo |



| | |
|---|---|
| **Operating Temp.** | -40 to +125°C |
| **Solder Paste** | SAC 305 type is recommended |
| **Recommended Storage Conditions*** | +5 to +35 oC, Humidity 45~75%RH |
| **Reel Quanity** | 4,000 |
| **Storage Period** | 18 months max. |

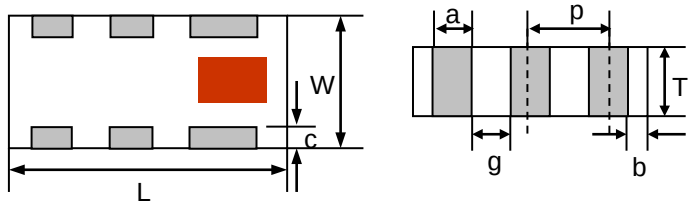
*18 months in vacuum sealed bag and 1 week cumulative after opened.
For more info go to www.johansontechnology.com/silverleads

## Part Number Explanation

| | | | | |
|---|---|---|---|---|
| **P/N Suffix** | **Packing Style** | Bulk (Loose) | Suffix = S | eg. 2450BM15A0015S |
| | | T & R | Suffix = E | eg. 2450BM15A0015E |
| | Termination style | 100% Tin | Suffix = None | eg. 2450BM15A0015 (E or S) |
| | **Evaluation Board** | 2450BM15A0015-EBSMA | | |

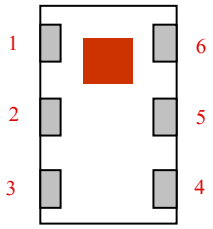
## Mechanical Dimensions

| | In | mm |
|---|---|---|
| **L** | 0.079 ± 0.004 | 2.00 ± 0.10 |
| **W** | 0.049 ± 0.004 | 1.25 ± 0.10 |
| **T** | 0.031 ± 0.004 | 0.80 ± 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 /-0.2 | 0.30 ± 0.10 |
| **g** | 0.014 ± 0.004 | 0.35 ± 0.10 |
| **p** | 0.026 ± 0.002 | 0.65 ± 0.05 |




## Terminal Configuration

| No. | Function |
|---|---|
| **1** | Unbalanced Port (50 Ω) |
| **2** | GND |
| **3** | Balanced Differential Port |
| **4** | Balanced Differential Port |
| **5** | GND |
| **6** | GND |

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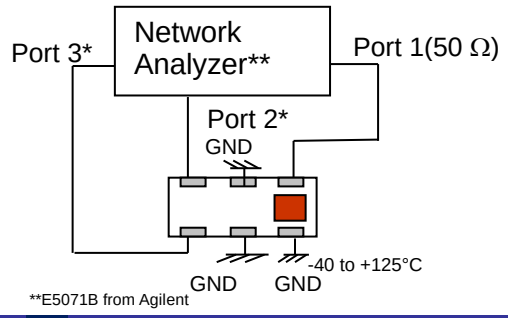
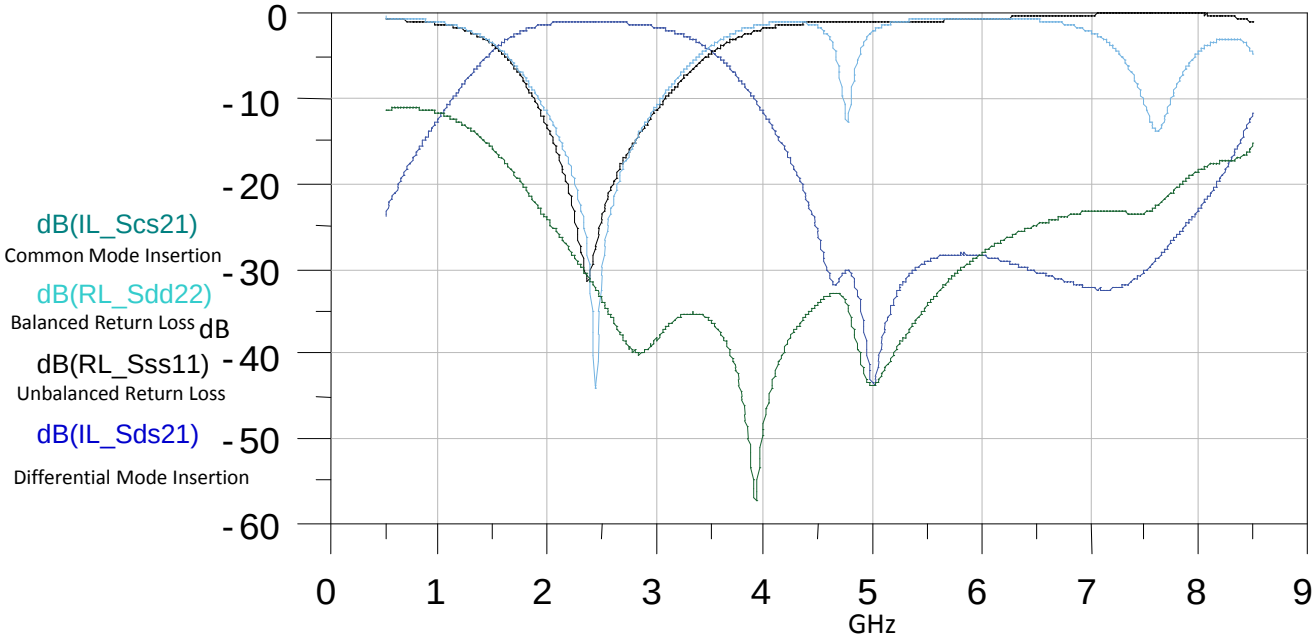
## Measuring Diagram




Port 1:Unbalanced Port
Ports 2 and 3: Balanced Port
IL=Sds21
RL=Sss11
Amp_balance = dB(S(2,1)/S(3,1))
Phase_balance = Phase(S(2,1)/S(3,1))
*Impedance for ports 2 and 3
= Conjugate to Balanced Impedance/2

## Typical Electrical Performance (T=25°C)

### Insertion and Return Loss




*Impedance matching network, balun and harmonic filter all in one EIA 0805 package!*

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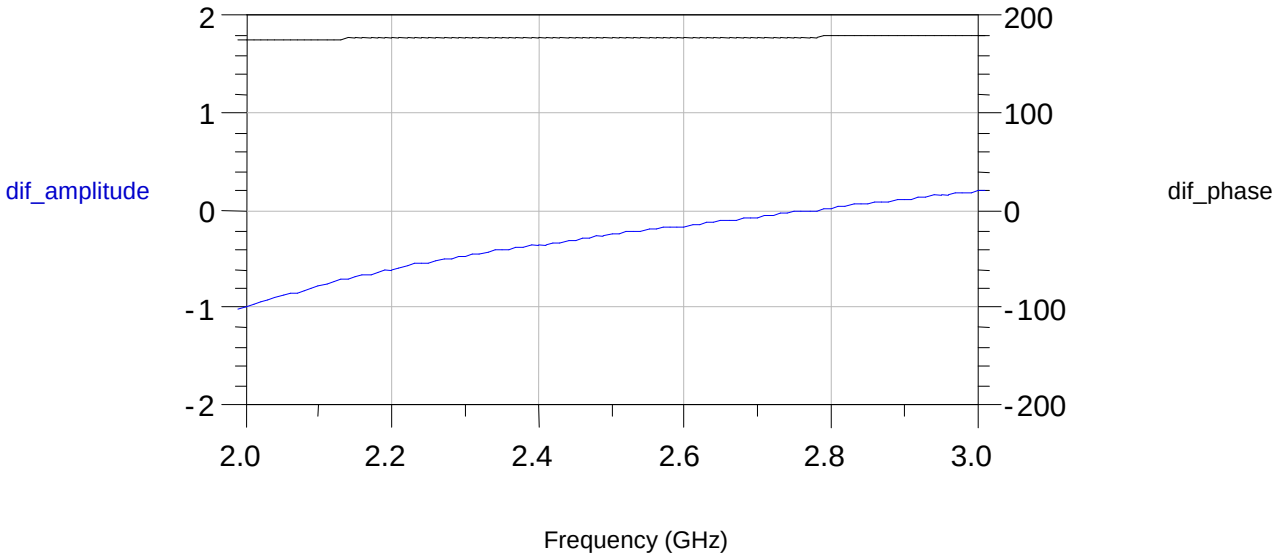
## Typical Electrical Performance (T=25°C)

### Amplitude and Phase Balance

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## Mounting Considerations

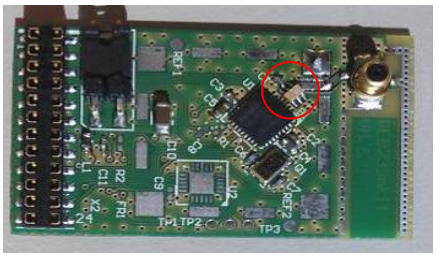
Mount these devices with brown mark facing up.

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

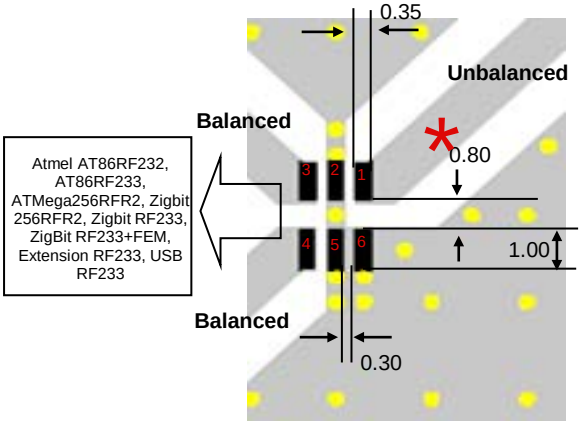
**LEGEND**

- Solder Resist
- Land
- Through-hole (ϕ0.3)

Units : mm



REB233mkII V8.6.1 EVB Example

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