

# High Frequency Ceramic Solutions

2.45GHz Impedance Matched Balun + Band Pass Filter: Optimized for Nordic's Chipsets: nRF51822-QFAA, P/N 2450BM14E0003  
 nRF51422-QFAA, nRF51822-QFAB, nRF51422-QFAB, nRF51822-QFAC, nRF51422-QFAC, nRF51802-QFAA

Detail Specification: 6/29/2016

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For the Full App Note and Layout Files, go to: [www.johansontechnology.com/nordic](http://www.johansontechnology.com/nordic)

## General Specifications

|  |   |
|--|---|
| <b>Part Number</b>   | 2450BM14E0003   |
| <b>Frequency (MHz)</b>   | 2400 - 2500   |
| <b>Unbalanced Impedance</b>  | 50 $\Omega$ (single ended)  |
| <b>Differential Balanced Impedance</b>   | Impedance matched to Nordic Semi nRF51822-QFAx, nRF51422-QFAx, and nRF51802-QFAA chipsets |
| <b>Average Insertion Loss when connected to the nRF51XX chipset (Active OP)</b>  | 0.9dB Typ. @25C,<br>1.5dB max. (-40 to +85C),<br>2.0dB (+85 to +105C)                     |
| <b>Insertion Loss when component measured by itself (passive insertion loss)</b> | 2.1dB typ. @25C, 2.5dB max. (-40 to +85C), 3.0dB (+85 to 105C)                            |



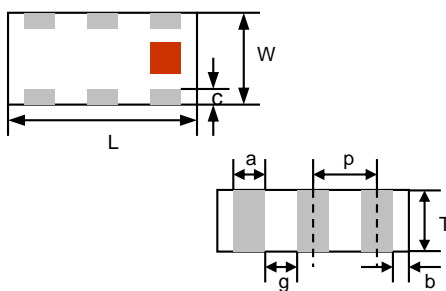
|   |  |
|---|--|
| <b>Return Loss (dB)</b>   | 15 typ. 9.5 min.                             |
| <b>Amplitude Difference</b>   | 150 $\pm$ 15deg                              |
| <b>Reel Quantity</b>  | 4,000 pcs                                    |
| <b>Operating Temperature</b>  | -40 to +105°C                                |
| <b>Storage Temperature</b>  | -40 to +85°C                                 |
| <b>Recommended Storage Conditions for unused product on T&amp;R</b> | +5 to +35°C, Humidity: 45-75%RH, 18 mos. Max |
| <b>Power Capacity</b>   | 1W max.(CW)                                  |

## Part Number Explanation

|                   |                          |          |               |                             |
|-------------------|--------------------------|----------|---------------|-----------------------------|
| <b>P/N Suffix</b> | <b>Packaging Style</b>   | Bulk     | Suffix = S    | E.g.. 2450BM14E0003S        |
|                   | <b>Termination Style</b> | T & R    | Suffix = T    | E.g.. 2450BM14E0003T        |
|                   |                          | 100% Tin | Suffix = None | E.g.. 2450BM14E0003(T or S) |

## Mechanical Dimensions

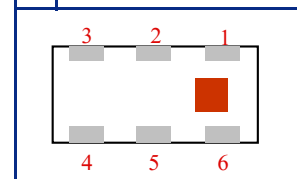
|          | In                 | mm              |
|----------|--------------------|-----------------|
| <b>L</b> | 0.063 $\pm$ 0.004  | 1.60 $\pm$ 0.10 |
| <b>W</b> | 0.031 $\pm$ 0.004  | 0.80 $\pm$ 0.10 |
| <b>T</b> | 0.024 $\pm$ 0.004  | 0.60 $\pm$ 0.10 |
| <b>a</b> | 0.008 $\pm$ 0.004  | 0.20 $\pm$ 0.10 |
| <b>b</b> | 0.008 +.004/-0.006 | 0.20 +0.1/-0.15 |
| <b>c</b> | 0.006 $\pm$ 0.004  | 0.15 $\pm$ 0.10 |
| <b>g</b> | 0.012 $\pm$ 0.004  | 0.30 $\pm$ 0.10 |
| <b>p</b> | 0.020 $\pm$ 0.002  | 0.50 $\pm$ 0.05 |



You can download layout files, schematics, output power measured results (App Note AN020), and s-parameters at: <http://johansontechnology.com/nordic>

## Terminal Configuration

| No. | Function        |
|-----|-----------------|
| 1   | Unbalanced Port |
| 2   | GND             |
| 3   | Balanced Port   |
| 4   | Balanced Port   |
| 5   | DC Feed         |
| 6   | GND             |



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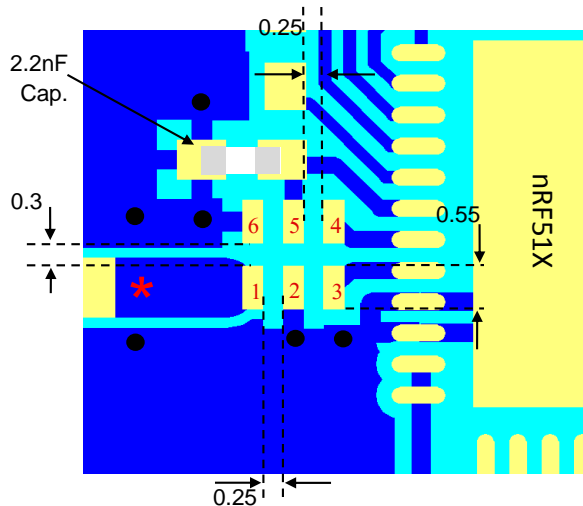
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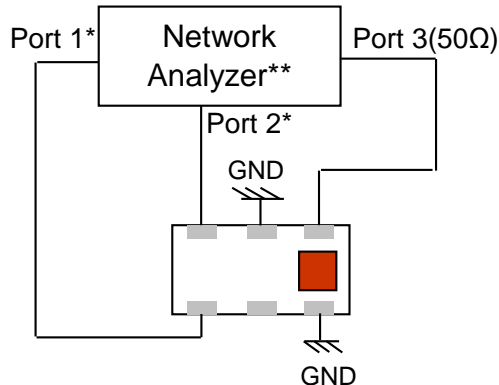
## Mounting Considerations



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

Do you need the layout/gerber files of the above? Go to: [www.johansontechnology.com/nordic](http://www.johansontechnology.com/nordic) or send us a message to review your layout at: [www.johansontechnology.com/component/ask-a-question](http://www.johansontechnology.com/component/ask-a-question)

## Solo-Component Characterization Scheme



Port 3: Unbalanced Port  
 Ports 1 and 2: Balanced Port  
 $IL = S_{ds21}$ ,  $Att_{DM} = S_{ds21}$ ,  $Att_{CM} = S_{cs21}$   
 $RL = S_{ss11}$   
 $Amp\_balance = dB(S(1,3)/S(2,3))$   
 $Phase\_balance = Phase(S(1,3)/S(2,3))$

\*Impedance for ports 1 and 2  
 = Conjugate to Balanced Impedance/2  
 \*\*E5071B from Agilent

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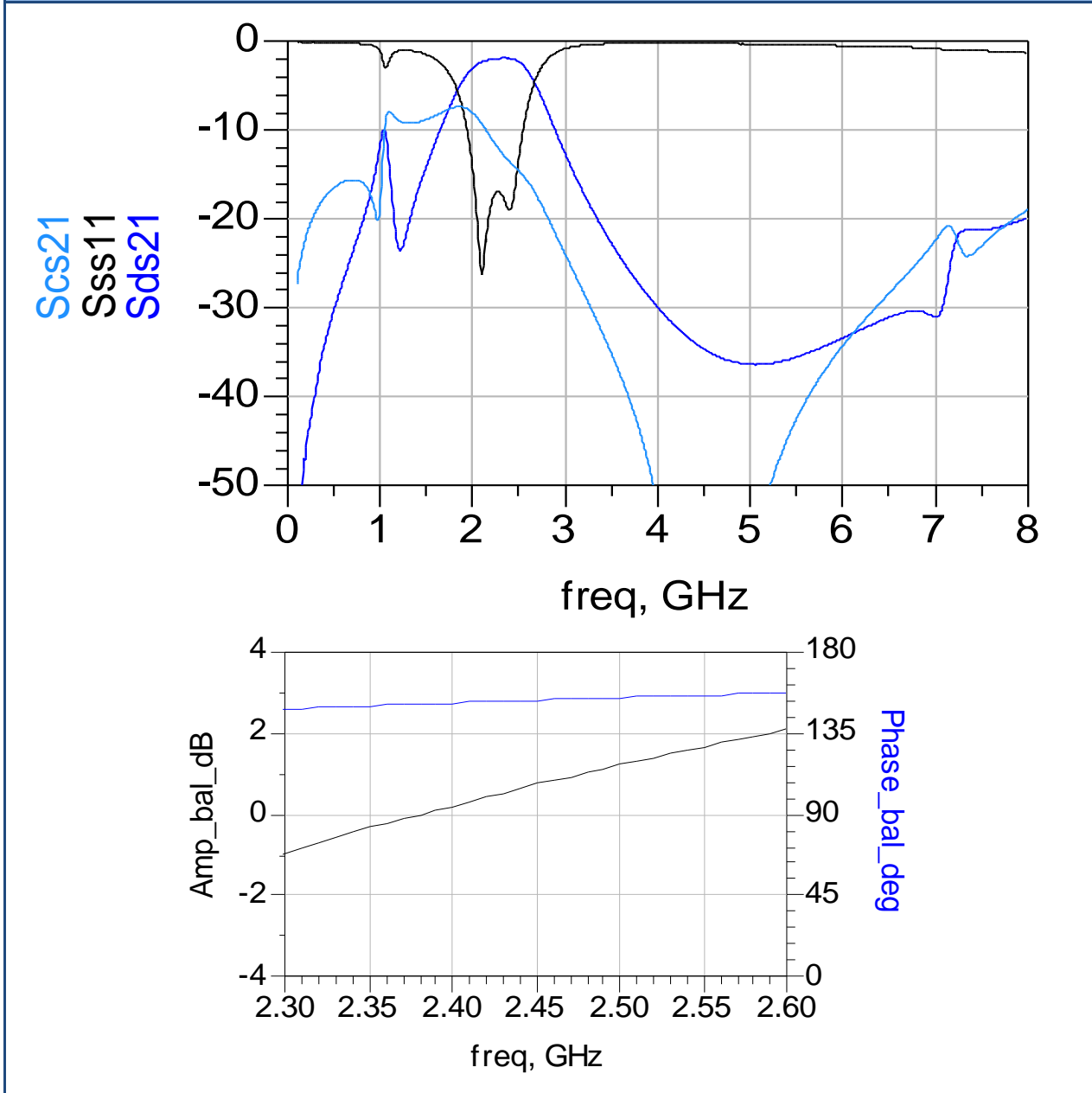
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## Typical Electrical Characteristics (T=25°C)



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## Application Notes, Layout Files, and more

[www.johansontechnology.com/nordic](http://www.johansontechnology.com/nordic)

## Packaging information

<http://www.johansontechnology.com/tape-reel-packaging>

## Soldering Information

[www.johansontechnology.com/ipcsoldering-profile](http://www.johansontechnology.com/ipcsoldering-profile)

## MSL Info

<http://www.johansontechnology.com/msl-rating>

## Recommended Storage Condition and Max Shelf Life

<http://www.johansontechnology.com/recommended-storage-conditions>

## RoHS Compliance

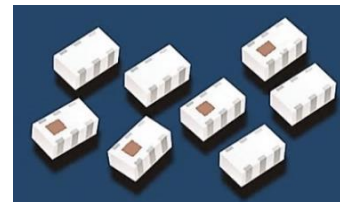
<http://www.johansontechnology.com/rohs-compliance>

## Antenna layout and tuning techniques

[www.johansontechnology.com/tuning](http://www.johansontechnology.com/tuning)

## Antenna layout review, tuning, and characterization services

<http://www.johansontechnology.com/ipc-antenna-services>



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