

# 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

Page 1 of 4

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, 1.5dB max. (-40 to +85C), 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)



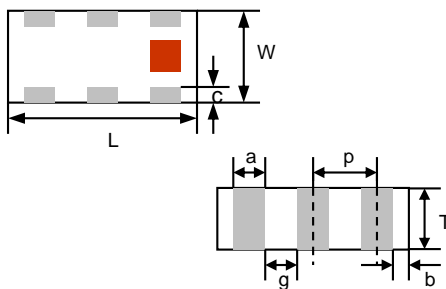
<b>Return Loss (dB)</b>	15 typ. 9.5 min.	<b>Amplitude Difference</b>	150 $\pm$ 15deg
<b>Attenuation Differential mode (dB):</b>		<b>Reel Quantity</b>	4,000 pcs
800-928 MHz	15 typ. @25°C 10 min.	<b>Operating Temperature</b>	-40 to +105°C
1200-1500 MHz	14 typ. @25°C 10 min.	<b>Storage Temperature</b>	-40 to +85°C
4800~5000MHz	35 typ. @25°C 20 min.	<b>Recommended Storage Conditions for unused product on T&amp;R</b>	+5 to +35°C, Humidity: 45-75%RH, 18 mos. Max
7200~7500MHz	21 typ. @25°C 18 min.	<b>Power Capacity</b>	1W max.(CW)
<b>Attenuation Common mode (dB):</b>			
4800~5000MHz	44 typ. @25°C 20 min.		

## 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

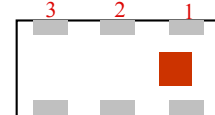
	In	mm
<b>L</b>	0.063 $\pm$ 0.004	1.60 $\pm$ 0.10
<b>W</b>	0.031 $\pm$ 0.004	0.80 $\pm$ 0.10
<b>T</b>	0.024 $\pm$ 0.004	0.60 $\pm$ 0.10
<b>a</b>	0.008 $\pm$ 0.004	0.20 $\pm$ 0.10
<b>b</b>	0.008 +.004/-0.006	0.20 +0.1/-0.15
<b>c</b>	0.006 $\pm$ 0.004	0.15 $\pm$ 0.10
<b>g</b>	0.012 $\pm$ 0.004	0.30 $\pm$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



Johanson Technology, Inc. reserves the right to make design changes without notice.  
 All sales are subject to Johanson Technology, Inc. terms and conditions.



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

4001 Calle Tecate • Camarillo, CA 93012, USA • TEL +1.805.389.1166

Ver. 3.0

2016 Johanson Technology, Inc. All Rights Reserved

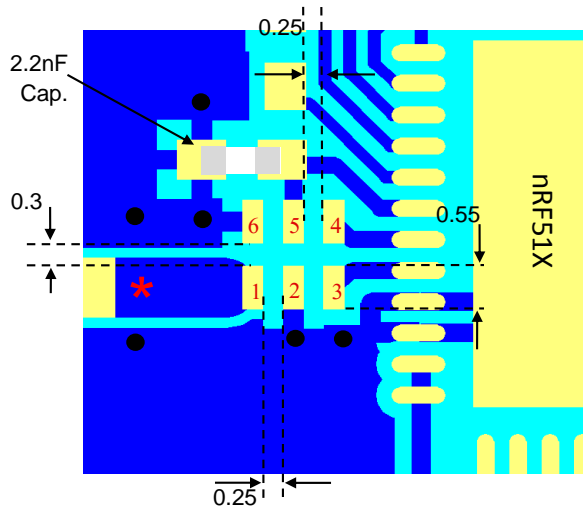
# High Frequency Ceramic Solutions

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

Page 2 of 4

## Mounting Considerations

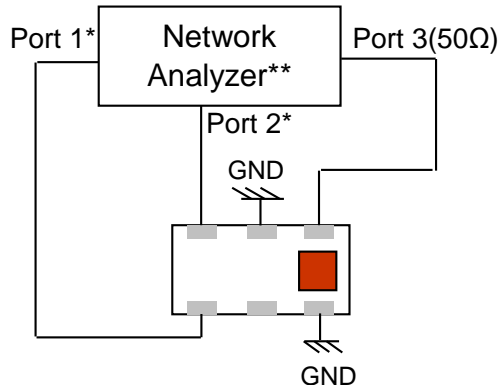


- Land
- Via Through

\*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

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

Johanson Technology, Inc. reserves the right to make design changes without notice.  
 All sales are subject to Johanson Technology, Inc. terms and conditions.



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

4001 Calle Tecate • Camarillo, CA 93012, USA • TEL +1.805.389.1166

Ver. 3.0

2016 Johanson Technology, Inc. All Rights Reserved

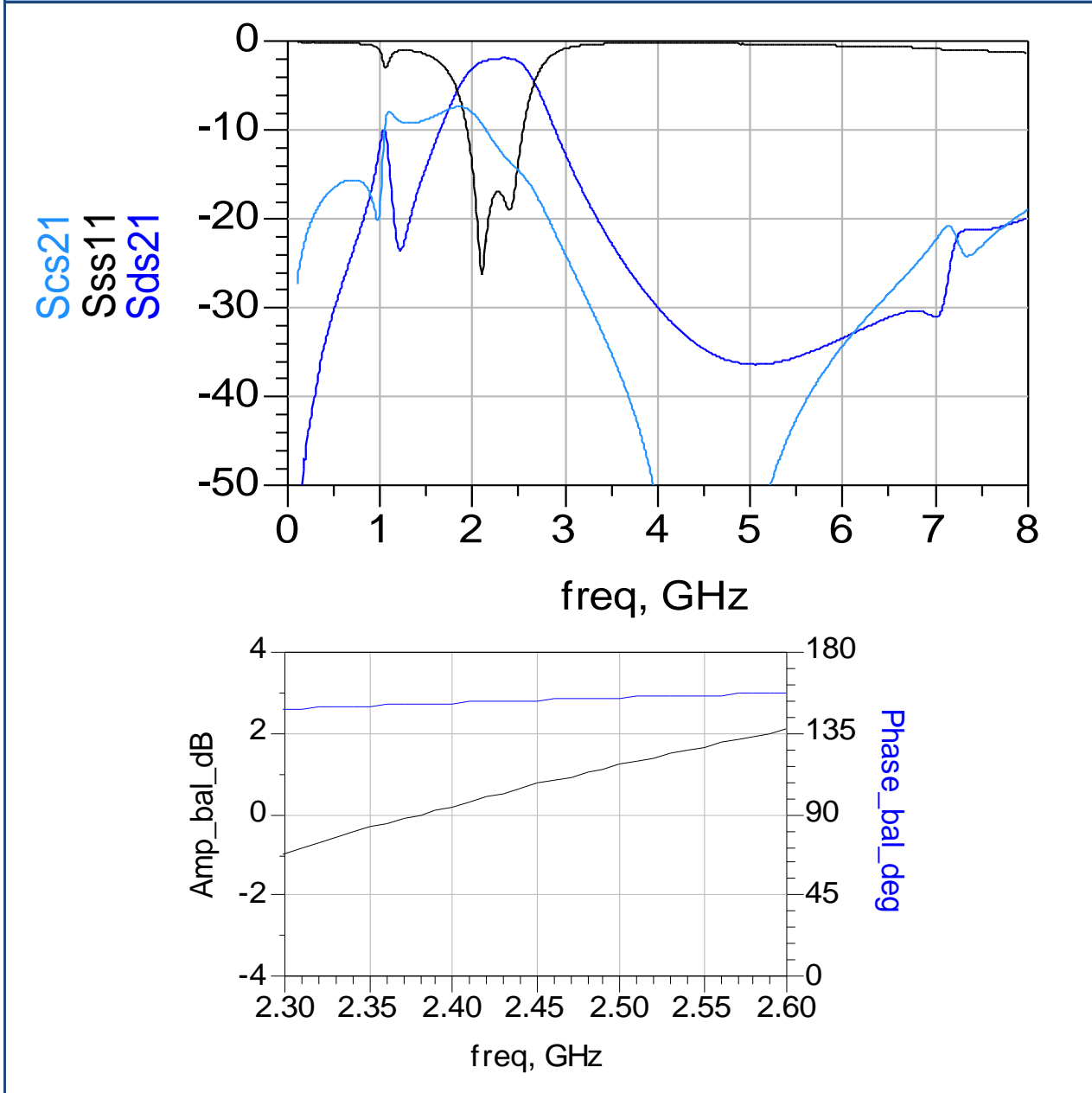
# High Frequency Ceramic Solutions

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

Page 3 of 4

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



Johanson Technology, Inc. reserves the right to make design changes without notice.  
All sales are subject to Johanson Technology, Inc. terms and conditions.



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

4001 Calle Tecate • Camarillo, CA 93012, USA • TEL +1.805.389.1166

Ver. 3.0

2016 Johanson Technology, Inc. All Rights Reserved

# 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

Page 4 of 4

## 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

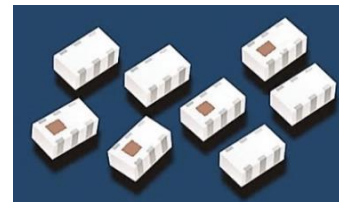
<http://www.johansontechnology.com/rohs-compliance>

## 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>



Johanson Technology, Inc. reserves the right to make design changes without notice.  
All sales are subject to Johanson Technology, Inc. terms and conditions.



Ver. 3.0

[www.johansontechnology.com](http://www.johansontechnology.com)  
4001 Calle Tecate • Camarillo, CA 93012, USA • TEL +1.805.389.1166

2016 Johanson Technology, Inc. All Rights Reserved