



PRODUCT INFORMATION LETTER

PIL IPG-DIS/14/8368
Dated 23 Apr 2014

**NEW STMicroelectronics BALUN version for
NRF51822-QFAA/AB and NRF51422-QFAA**

Sales Type/product family label	BAL-NRF01D3
Type of change	Product marking change
Reason for change	to be compatible with new IC versions from Nordic Semiconductor
Description	see attached
Forecasted date of implementation	16-Apr-2014
Forecasted date of samples for customer	16-Apr-2014
Forecasted date for STMicroelectronics change Qualification Plan results availability	16-Apr-2014
Involved ST facilities	ST France and China plants

DOCUMENT APPROVAL

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PIL

Product/Process Information Letter

NEW STMicroelectronics BALUN version for NRF51822-QFAA/AB and NRF51422-QFAA

Notification number:	IPG-DIS/14/8368	Issue Date	16/04/2014
Issued by	Aline AUGIS		
Product series affected by the change		BAL-NRF01D3	

Reason for change

New IC versions of **NRF51822-QFAA/QFAB** and **NRF51422-QFAA** from Nordic Semiconductor require new version of STM Balun.

New STM Balun : BALF-NRF01D3

Effects of change

New part number BALF-NRF01D3 balun is pin compatible with former BAL-NRF01D3 version.

Product identification and traceability

Device Marking		STM Balun variant	
Packet/Variant	Build Code		
QF AA	CA	BAL-NRF01D3 + 0.8pF	N/A
	C0	BAL-NRF01D3 + 0.8pF	
	FA	BALF-NRF01D3	
	GC	BALF-NRF01D3	
	G0	BALF-NRF01D3	
QF AB	AA	BAL-NRF01D3 + 0.8pF	N/A
	A0	BAL-NRF01D3 + 0.8pF	
	B0	BALF-NRF01D3	

Qualification complete date	Week 12-2014
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(1) IPG: Industrial & Power Group - ASD: Application Specific Device - IPAD: Integrated Passive and Active Devices

Forecasted sample availability

Product family	Sub-family	Commercial part Number	Availability date
EMI filtering and Signal conditioning	IPD for RF front-end	BALF-NRF01D3	Now

Change implementation schedule

Estimated production start	Estimated first shipments
Week 12-2014	Week 17-2014

Qualification:

Comments:

Qualification Report

Qualification of new product BALF-NRF01D3

General Information

Product Line	IPAD
Product Description	Balun
P/N	BALF-NRF01D3
Product Group	IPG
Product division	ASD&IPAD
Package	CSPG
Maturity level step	Qualified

Locations

Wafer fab	ST TOURS (FRANCE)
Assembly plant	ST TOURS (FRANCE) and ST CHINA
Reliability Lab	ST TOURS (FRANCE)

DOCUMENT INFORMATION

Version	Date	Pages	Prepared by	Approved by	Comment
1.0	20/03/2014	8	J.MICHELON	J.P. REBRASSE	

Note: This report is a summary of the reliability trials performed in good faith by STMicroelectronics in order to evaluate the potential reliability risks during the product life using a set of defined test methods.
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1 APPLICABLE AND REFERENCE DOCUMENTS

Document reference	Short description
JESD47	Stress-Test-Driven Qualification of Integrated Circuits
SOP 2614	Reliability requirements for product qualification
0061692	Reliability tests and criteria for qualifications
SOP 2610	general product qualification procedure
JESD 22	Reliability test methods for packaged devices

2 GLOSSARY

SS	Sample Size
TC	Temperature Cycling
THS	Temperature Humidity Storage
PCB	Printed Circuit Board
HTOL	High temperature Operation Life
DT	Drop Test

3 RELIABILITY EVALUATION OVERVIEW

The objective is to qualify the new product BALF-NRF01D3, which is a product in flip chip package with 5 bumps.

4 CONCLUSION

Qualification Plan requirements have been fulfilled without exception. Reliability tests have shown that the devices behave correctly against environmental tests (no failure). Moreover, the stability of electrical parameters during the accelerated tests demonstrates the robustness of the products and safe operation, which is consequently expected during their lifetime.

5 DEVICE CHARACTERISTICS

5.1 Device description

STMicroelectronics BALF-NRF01D3 is an ultra-miniature balun.

The BALF-NRF01D3 integrates matching network in a monolithic glass substrate. Matching impedance has been customized for the nRF51422- QFAAG0, nRF51822-QFABB0 and nRF51422-QFAAE0 RF transceivers.

The BAL-NRF01D3 uses STMicroelectronics IPD technology on nonconductive glass substrate which optimizes RF performances.

5.2 Construction note

6 TESTS RESULTS SUMMARY

6.1 Test vehicle

For package qualification: daisy chain 7x7 bumps with pitch 400 μm and RLC06A technology.

For technology qualification: TCV at wafer level and in SO20 package.

Lot #	Part Number	Package	Comments
1	Daisy chain 7x7	Flip Chip pitch 400	Test vehicle of the technology of the BALF-NFR01D3
2	Daisy chain 7x7	Flip Chip pitch 400	
3	Daisy chain 7x7	Flip Chip pitch 400	

6.2 Test plan and results summary

Test	PC	Std ref.	Conditions	SS	Steps	Failure/SS	Note
						Lot 1	
Drop Test	N	DTS04169-EN	1500G 1 ms	108	1000 drops	Beta = 5.1 Eta = 1129 @5% = 520 First failed = 575 drops	Passed

Test	PC	Std ref.	Conditions	SS	Steps	Failure/SS	Note
						Lot 2	
Drop Test	N	DTS04169-EN	1500G 1 ms	108	1000 drops	Beta = 8.1 Eta = 1209 @5% = 734 First failed = 719 drops	Passed

Test	PC	Std ref.	Conditions	SS	Steps	Failure/SS	Note
						Lot 3	
Drop Test	N	DTS04169-EN	1500G 1 ms	108	1000 drops	Beta = 5.8 Eta = 1114 @5% = 552 First failed = 588 drops	Passed

Test	PC	Std ref.	Conditions	SS	Steps	Failure/SS	Note
						Lot 1	
Thermal Cycling	N	DTS04193-EN	-40/+125°C 2cycles/h	36	1000c	First failed = 995 cycles	Passed

Test	PC	Std ref.	Conditions	SS	Steps	Failure/SS	Note
						Lot 2	
Thermal Cycling	N	DTS04193-EN	-40/+125°C 2cycles/h	36	1000c	Beta = 19 Eta = 1135 @5% = 920 First failed = 945 cycles	Passed

Test	PC	Std ref.	Conditions	SS	Steps	Failure/SS	Note
						Lot 3	
Thermal Cycling	N	DTS04193-EN	-40/+125°C 2cycles/h	36	1000c	Beta = 6.2 Eta = 1489 @5% = 775 First failed = 779 cycles	Passed

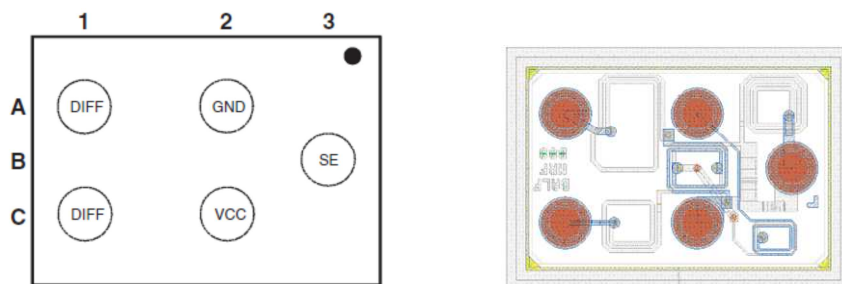
Test	PC	Std ref.	Conditions	SS	Steps	Failure/SS	Note
						Lot 1	
THS	N	JESD22 A-101	T=85°C/ RH=85%	36	168h	0/36	No corrosion is observed
					504h	0/36	
					1000h	0/36	

Test	PC	Std ref.	Conditions	SS	Steps	Failure/SS	Note
						Lot 3	
THS	N	JESD22 A-101	T=85°C/ RH=85%	36	168h	0/36	No corrosion is observed
					504h	0/36	
					1000h	0/36	

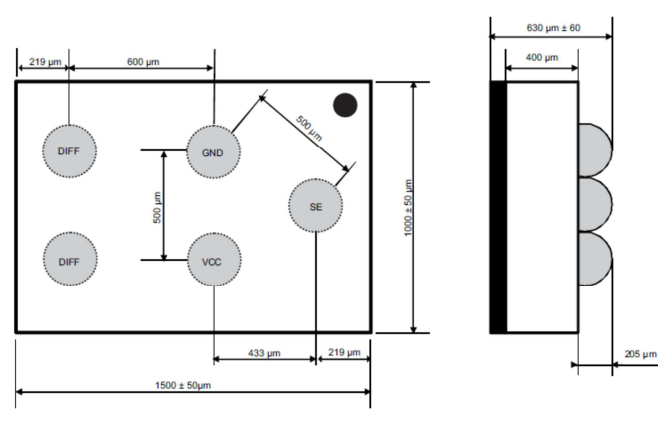
7 ANNEXES

7.1 Device details

7.1.1 Pin connection



7.1.2 Package outline



7.2 Tests Description

Test name	Description	Purpose
Package Oriented		
THS Temperature Humidity Storage	The device is stored at controlled conditions of ambient temperature and relative humidity.	To evaluate the package moisture resistance. Corrosion is put in evidence.
DT Drop Test	Test conditions are Peak acceleration of 1500g and pulse duration of 1ms.	This test is performed to simulate the drop of a device in mobile application (like mobile phone, PDA, etc.).
TC Temperature Cycling	The device is submitted to cycled temperature excursions, between a hot and a cold chamber in air atmosphere.	To investigate failure modes related to the thermo-mechanical stress induced by the different thermal expansion of the materials interacting in the die-package system. Typical failure modes are linked to metal displacement, dielectric cracking, molding compound delamination, wire-bonds failure, die-attach layer degradation.



Public Products List

PIL Title : NEW STMicroelectronics BALUN version for NRF51822-QFAA/AB and NRF51422-QFAA

PIL Reference : IPG-DIS/14/8368

PIL Created on : 18-APR-2014

Subject : Public Products List

Dear Customer,

Please find below the Standard Public Products List impacted by the change:

ST COMMERCIAL PRODUCT

BAL-NRF01D3

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