

## Verification Report

No. SZXEC1800976301

Date: 16 Jan 2019

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FIBOCOM WIRELESS INC.

5F, TOWER A, TECHNOLOGY BUILDING II, 1057 NANHAI AVENUE, SHENZHEN, CHINA

Sample Name : Wireless LTE Module  
 SGS Job No. : RP18-009648 - SZ  
 Tested Basic Model No. NL668-EAU  
 (P.O. No.) :  
 Tested Extended Model No. NL668-EU  
 (P.O. No.) :  
 Date of Sample Received : 25 Jun 2018  
 Verification Period : 25 Jun 2018 - 19 Dec 2018  
 Verification Requested : With reference to RoHS Directive (EU) 2015/863 amending 2011/65/EU.  
 Verification Method : Please refer to next page(s).  
 Verification Result : Please refer to next page(s).  
 Verification Conclusion : Based on the verification results of the submitted samples, the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP), and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.  
 Note : The test results are related only to the tested items. The report shall not be reproduced except in full without the written approval of the testing laboratory.

Signed for and on behalf of  
 SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

*Tina*

Tina Fan  
 Approved Signatory



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### Verification Method :

1. With reference to IEC 62321-2:2013, review was performed for the samples disjointed from the submitted articles.
2. With reference to IEC 62321-1:2013, tests were performed for the samples indicated by the photos in this report
  - (1) With reference to IEC 62321-3-1:2013, screening by EDXRF spectroscopy
  - (2) Wet chemical test method
    - a. With reference to IEC 62321-5:2013, determination of Cadmium by ICP-OES
    - b. With reference to IEC 62321-5:2013, determination of Lead by ICP-OES
    - c. With reference to IEC 62321-4:2013+A1:2017, determination of Mercury by ICP-OES
    - d. With reference to IEC 62321-7-1:2015, IEC 62321-7-2:2017 & ISO 17075-1:2017, determination of Hexavalent chromium by Colorimetric method using UV-Vis.
    - e. With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS
3. With reference to IEC 62321-8:2017, determination of phthalates by GC-MS.



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In accordance with the result of material risk assessment, the following disjointed parts in the submitted sample have been verified.

Part No.	Part Description	Restricted Substances	Results of EDXRF(1)	Screening Result of PHTH(2)	Result of Wet Chemical Testing(3) (mg/kg)	Conclusion on EU RoHS	Sample Submitted / Resubmitted Date
1	NL668-EAU-Silvery metal shell	Pb Cd Hg Cr(VI)▼ PBBs PBDEs DBP BBP DEHP DIBP	BL BL BL IN --- --- --- --- --- ---	--- --- --- --- --- --- --- --- --- ---	--- --- --- ND --- --- --- --- --- ---	Comply Comply Comply Comply --- --- --- --- --- ---	25 Jun 2018
2	NL668-EAU-White plastic label w/ black surface	Pb Cd Hg Cr(VI)▼ PBBs PBDEs DBP BBP DEHP DIBP	BL BL BL BL BL BL --- --- --- ---	--- --- --- --- --- --- --- --- --- ---	--- --- --- --- --- --- ND ND ND ND	Comply Comply Comply Comply Comply Comply Comply Comply Comply Comply	25 Jun 2018
3	NL668-EAU-Silvery metal frame	Pb Cd Hg Cr(VI)▼ PBBs PBDEs DBP	BL BL BL BL --- --- ---	--- --- --- --- --- --- ---	--- --- --- --- --- --- ---	Comply Comply Comply Comply --- --- ---	25 Jun 2018



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Part No.	Part Description	Restricted Substances	Results of EDXRF(1)	Screening Result of PHTH(2)	Result of Wet Chemical Testing(3) (mg/kg)	Conclusion on EU RoHS	Sample Submitted / Resubmitted Date
		BBP DEHP DIBP	--- --- ---	--- --- ---	--- --- ---	--- --- ---	
4 -C	NL668-EAU-Black chip "IC"	Pb Cd Hg Cr(VI)▼ PBBs PBDEs DBP BBP DEHP DIBP	BL BL BL BL IN IN --- --- --- ---	--- --- --- --- --- --- --- --- --- ---	--- --- --- --- ND ND ND ND ND ND	Comply Comply Comply Comply Comply Comply Comply Comply Comply Comply	25 Jun 2018 11 Jul 2018
5	NL668-EAU-Black chip "IC"	Pb Cd Hg Cr(VI)▼ PBBs PBDEs DBP BBP DEHP DIBP	BL BL BL BL BL BL --- --- --- ---	--- --- --- --- --- --- --- --- --- ---	--- --- --- --- --- --- ND ND ND ND	Comply Comply Comply Comply Comply Comply Comply Comply Comply Comply	25 Jun 2018

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Part No.	Part Description	Restricted Substances	Results of EDXRF(1)	Screening Result of PHTH(2)	Result of Wet Chemical Testing(3) (mg/kg)	Conclusion on EU RoHS	Sample Submitted / Resubmitted Date
6	NL668-EAU-Black chip "IC"	Pb Cd Hg Cr(VI)▼ PBBs PBDEs DBP BBP DEHP DIBP	BL BL BL BL BL BL --- --- --- ---	--- --- --- --- --- --- --- --- --- ---	--- --- --- --- --- --- ND ND ND ND	Comply Comply Comply Comply Comply Comply Comply Comply Comply Comply	25 Jun 2018
7 -C	NL668-EAU-Black chip "IC"	Pb Cd Hg Cr(VI)▼ PBBs PBDEs DBP BBP DEHP DIBP	BL BL BL BL IN IN --- --- --- ---	--- --- --- --- --- --- --- --- --- ---	--- --- --- --- ND ND ND ND ND ND	Comply Comply Comply Comply Comply Comply Comply Comply Comply Comply	25 Jun 2018 11 Jul 2018
8	NL668-EAU-Black chip "IC"	Pb Cd Hg Cr(VI)▼ PBBs PBDEs DBP	BL BL BL BL BL BL ---	--- --- --- --- --- --- ---	--- --- --- --- --- --- ND	Comply Comply Comply Comply Comply Comply Comply	25 Jun 2018



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Part No.	Part Description	Restricted Substances	Results of EDXRF(1)	Screening Result of PHTH(2)	Result of Wet Chemical Testing(3) (mg/kg)	Conclusion on EU RoHS	Sample Submitted / Resubmitted Date
		BBP	---	---	ND	Comply	
		DEHP	---	---	ND	Comply	
		DIBP	---	---	ND	Comply	
9	NL668-EAU-Black chip "IC"	Pb	BL	---	---	Comply	25 Jun 2018
		Cd	BL	---	---	Comply	
		Hg	BL	---	---	Comply	
		Cr(VI)▼	BL	---	---	Comply	
		PBBs	BL	---	---	Comply	
		PBDEs	BL	---	---	Comply	
		DBP	---	---	ND	Comply	
		BBP	---	---	ND	Comply	
		DEHP	---	---	ND	Comply	
		DIBP	---	---	ND	Comply	
10	NL668-EAU-Green "PCB"	Pb	BL	---	---	Comply	25 Jun 2018
		Cd	BL	---	---	Comply	
		Hg	BL	---	---	Comply	
		Cr(VI)▼	BL	---	---	Comply	
		PBBs	IN	---	ND	Comply	
		PBDEs	IN	---	ND	Comply	
		DBP	---	---	ND	Comply	
		BBP	---	---	ND	Comply	
		DEHP	---	---	ND	Comply	
		DIBP	---	---	ND	Comply	

Part No.	Part Description	Restricted Substances	Results of EDXRF(1)	Screening Result of PHTH(2)	Result of Wet Chemical Testing(3) (mg/kg)	Conclusion on EU RoHS	Sample Submitted / Resubmitted Date
11	NL668-EAU-Silvery metal solder	Pb Cd Hg Cr(VI)▼ PBBs PBDEs DBP BBP DEHP DIBP	BL BL BL BL --- --- --- --- --- ---	--- --- --- --- --- --- --- --- --- ---	--- --- --- --- --- --- --- --- --- ---	Comply Comply Comply Comply --- --- --- --- --- ---	25 Jun 2018
12	NL668-EU-Silvery metal shell	Pb Cd Hg Cr(VI)▼ PBBs PBDEs DBP BBP DEHP DIBP	BL BL BL IN --- --- --- --- --- ---	--- --- --- --- --- --- --- --- --- ---	--- --- --- ND --- --- --- --- --- ---	Comply Comply Comply Comply --- --- --- --- --- ---	12 Dec 2018

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### Remark :

(1) (a) There are the results on total Br while test items on restricted substances are PBBs and PBDEs. There is the result on total Cr while test item on restricted substances is Cr(VI).

(b) Results are obtained by EDXRF for primary screening, and further chemical testing by ICP-OES (for Cd, Pb, Hg), UV-Vis (for Cr(VI)) and GC-MS (for PBBs, PBDEs) is recommended to be performed, if the concentration exceeds the below warning value according to IEC62321-3-1:2013 (unit: mg/kg).

Element	Polymer	Metal	Composite Materials
Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (150+3\sigma) \leq OL$
Pb	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Hg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Br	$BL \leq (300-3\sigma) < X$	--	$BL \leq (250-3\sigma) < X$
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$

(c) BL = Below Limit, OL = Over Limit, IN = Inconclusive, LOD = Limit of Detection, -- = Not regulated.

(d) The XRF screening test for RoHS elements - The reading may be different to the actual content in the sample be of non-uniformity composition.

(2) Screening results of PHTH are for primary screening, and further chemical testing by GC-MS (for DBP, BBP, DEHP and DIBP) are recommended to be performed if the concentration exceeds the below warning value (unit: mg/kg)

Compound	Polymer
DBP	$BL \leq 600 < X$
BBP	$BL \leq 600 < X$
DEHP	$BL \leq 600 < X$
DIBP	$BL \leq 600 < X$

(3) (a) mg/kg = 0.0001%, MDL=Method detection Limit, ND = Not Detected (<MDL), --- = Not conducted, - = Without BOM.

(b) Unit and MDL in wet chemical test

Test Item	Pb	Cd	Hg	DBP	BBP	DEHP	DIBP
Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MDL	10	10	10	100	100	100	100



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The MDL for single compound of PBBs and PBDEs is 100 mg/kg,  
MDL of Cr(VI) for polymer, composite and leather sample is 10 mg/kg,  
MDL of Cr(VI) for metal sample is 0.10µg/cm<sup>2</sup>.

(c) ▼ =Metal sample

- a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm<sup>2</sup>.  
The sample coating is considered to contain CrVI
- b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 µg/cm<sup>2</sup>).  
The coating is considered a non-CrVI based coating
- c. The result between 0.10 µg/cm<sup>2</sup> and 0.13 µg/cm<sup>2</sup> is considered to be inconclusive  
- unavoidable coating variations may influence the determination

Information on storage conditions and production date of the tested sample is unavailable  
and thus Cr(VI) results represent status of the sample at the time of testing.

IEC 62321 series is equivalent to EN 62321 series

[http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP\\_ORG\\_ID,FSP\\_LANG\\_ID:1258637,25](http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25)

(4) According to the declaration from applicant, the materials of other parts in Model "NL668-EU" are the same as those in Model "NL668-EAU", and the results of Model "NL668-EAU" for support the results of other parts in Model "NL668-EU". The applicant will take the responsibility of all discrepancy and risk.



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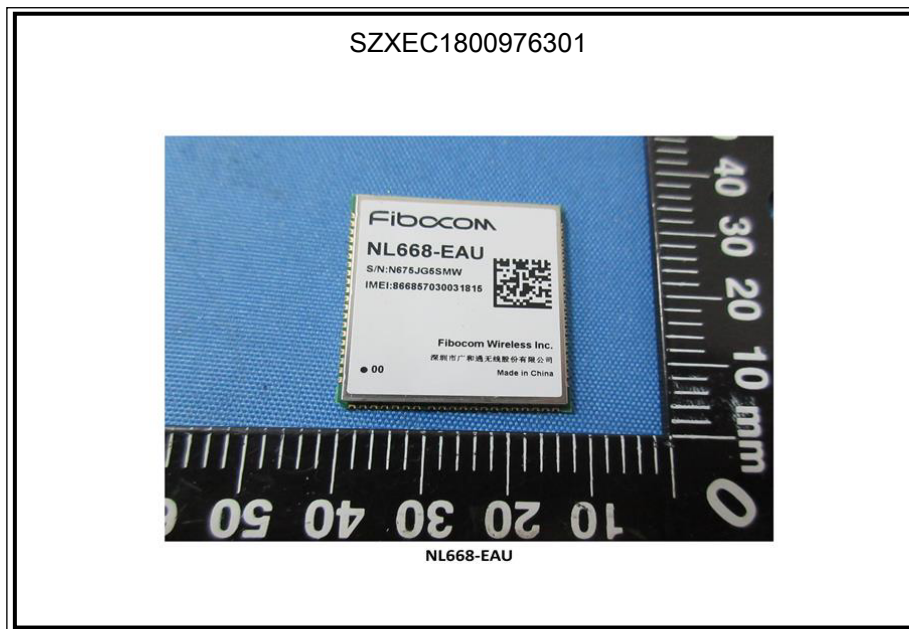
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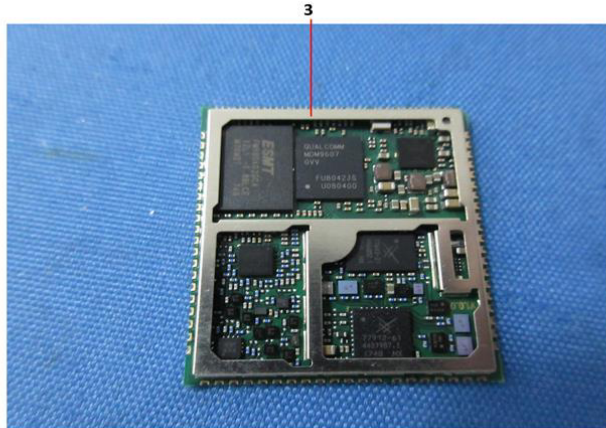
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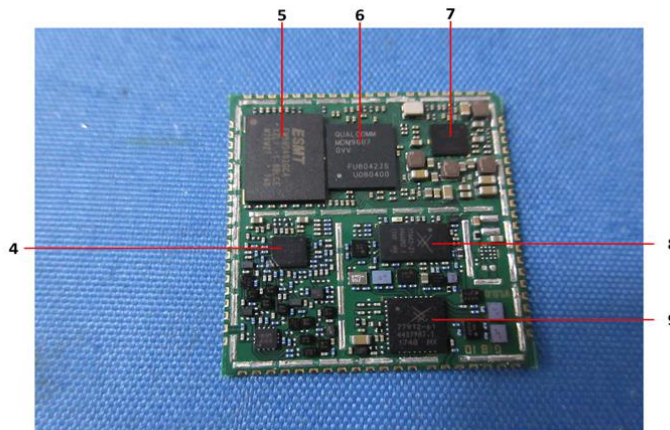


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NL668-EAU

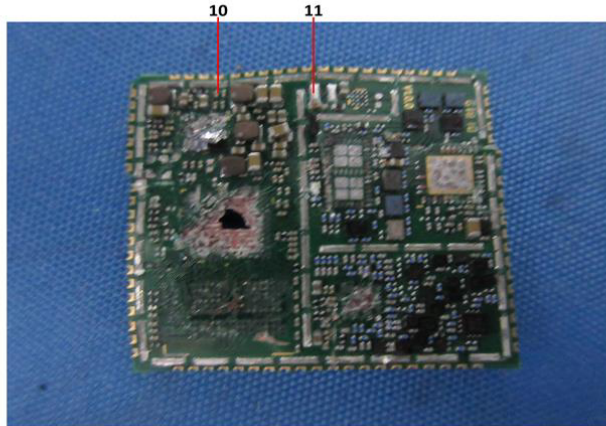
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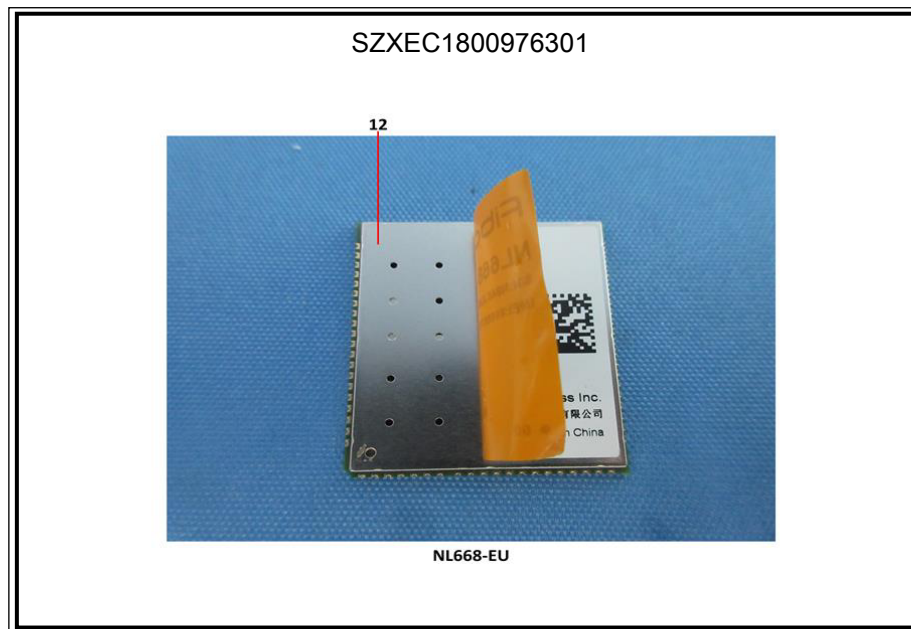


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