



# TEST REPORT

REPORT No.: R2JS150429F0149E

Date: July 6, 2015

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Shanghai SIMCom Wireless Solutions Ltd  
SIM Technology Building, No.633, Jinzhong Road, Changning District, Shanghai, P.R. China

Report on the submitted samples said to be:

Sample Name : GPS/GNSS Module  
Style/ Item No. : SIM68V/SIM28  
Sample Receiving Date : April 30, 2015  
Testing Period : From April 30, 2015 to July 6, 2015  
Results : Please refer to next page(s).

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### Summary of Test Results:

### TEST REQUEST CONCLUSION

A EU RoHS Directive 2011/65/EU and its amendment directives -XRF and Chemical test(Lead, Cadmium, Mercury, Hexavalent Chromium, PBBs & PBDEs content) Pass

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Signed for and on behalf of  
BACL

Checked by: \_\_\_\_\_  
Jane Xu  
Technical Supervisor

Approved by: \_\_\_\_\_  
William Wei  
Laboratory Manager

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**Results:**

**A. EU RoHS Directive 2011/65/EU and its amendment directives on XRF**

Test method: With reference to IEC62321-3-1:2013 screening by X-ray Fluorescence Spectroscopy (XRF)

Seq. No.	Tested Part(s)	Results				
		Pb	Cd	Hg	Cr	Br
1	Brown body(capacitor, C0402C0G2R2C500NTB)	BL	BL	BL	BL	BL
2	Grey body(capacitor, C0402C0G120J500NTB)	BL	BL	BL	BL	BL
3	Gray body(capacitor, C0402C0G120J500NTB)	BL	BL	BL	BL	BL
4	Grey body(capacitor, C0402C0G180J500NTB)	BL	BL	BL	BL	BL
5	Grey body(capacitor, C0402C0G220J500NTB)	BL	BL	BL	BL	BL
6	Brown body(capacitor, C0402X7R103K160NTB)	BL	BL	BL	BL	BL
7	Brown body(capacitor, C0402X7R333K160NTB)	BL	BL	BL	BL	BL
8	Grey body(capacitor, CL05A105KQ5NNNC)	BL	BL	BL	BL	BL
9	Grey body(capacitor, LMK105 BJ105KV-F)	BL	BL	BL	BL	BL
10	Brown body(capacitor, C0402X5R105K100NTB)	BL	BL	BL	BL	BL
11	Brown body(capacitor, CL10A225KQ8NNNC)	BL	BL	BL	BL	BL
12	Grey body(capacitor, GRM188R60J475KE19D)	BL	BL	BL	BL	BL
13	Brown body(capacitor, CL10A475KQ8NNNC)	BL	BL	BL	BL	BL
14	Black/white body(SMD resistor,LL1005-FHL6N8J)	BL	BL	BL	BL	BL
15	Blue body(inductor,SDWL1005C8N2JSTF)	BL	BL	BL	BL	BL
16	Black body(diode,RB520S-30FJTE61)	BL	BL	BL	BL	BL
17	Black body(IC,MT3333AV/B )	BL	BL	BL	BL	BL
18	Black body(IC,BGU7005 )	BL	BL	BL	BL	BL
19	Black body(IC,SAFEA1G58KA0F00R15 )	BL	BL	BL	BL	BL
20	Black/white body(SMD resistor,GZ1005U121TFB03)	BL	BL	BL	BL	BL
21	Black body(EC,BLM15AG121SN1 )	BL	BL	BL	BL	BL
22	Silvery body(crystal,CM7V-T1A-32.768KHz-12.5PF-20PPM)	BL	BL	BL	BL	BL

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Seq. No.	Tested Part(s)	Results				
		Pb	Cd	Hg	Cr	Br
23* <sup>1</sup>	Chocolate body with white printing(crystal,Q13FC1350000400)	OL	BL	BL	BL	BL
24	Silvery body(crystal,ENG3090B)	BL	BL	BL	BL	BL
25*	Green PCB(8BAA10-SIM68V _ V1.02 _ PCB)	BL	BL	BL	BL	IN
26	Silvery metal(shield, SIM28 _ SHIELD _ 100320)	BL	BL	BL	BL	---
27	Grey body(capacitor, C0402X5R224K6R3NTN)	BL	BL	BL	BL	BL
28	Brown body(capacitor, C0402X5R224K6R3NTN)	BL	BL	BL	BL	BL
29*	Green PCB(SIM28 _ V1.01)	BL	BL	BL	BL	IN

-- = Not Conducted

\* = Screening by XRF and detected by chemical method. The test results of chemical method please refer to next pages.

\*<sup>1</sup> = As claimed by the material declaration submitted by the client, the materials of the sample No.53 is ceramic. And according to RoHS directive 2011/65/EU and its amendments, Lead is exempted in electronic ceramic parts (e.g. piezoelectronic devices).

Remark:

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

Element	Unit	Polymers	Metal	Composite Material
Cd	mg/kg	BL≤70-3σ<X <130+3σ≤OL	BL≤70-3σ<X <130+3σ≤OL	LOD<X <150+3σ≤OL
Pb	mg/kg	BL≤700-3σ<X <1300+3σ≤OL	BL≤700-3σ<X <1300+3σ≤OL	BL≤500-3σ<X <1500+3σ≤OL
Hg	mg/kg	BL≤700-3σ<X <1300+3σ≤OL	BL≤700-3σ<X <1300+3σ≤OL	BL≤500-3σ<X <1500+3σ≤OL
Cr	mg/kg	BL≤700-3σ<X	BL≤700-3σ<X	BL≤500-3σ<X
Br	mg/kg	BL≤300-3σ<X	--	BL≤250-3σ<X

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Note:

- BL = Below Limit
- OL = Over Limit
- IN = Inconclusive (questionable, need further chemical analysis)
- LOD = Limit of Detection

- (2) The XRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.
- (3) The maximum permissible limit is quoted from the RoHS directive 2011/65/EU:

RoHS Restricted Substances	Maximum Concentration Value (mg/kg) (by weight in homogenous materials)
Cadmium (Cd)	100
Lead (Pb)	1000
Mercury (Hg)	1000
Hexavalent Chromium (Cr(VI))	1000
Polybrominated biphenyls (PBBs)	1000
Polybrominated diphenylethers (PBDEs)	1000

Remark :

- (4) As requested by applicant, only components shown in this report were screened by XRF spectroscopy for 2011/65/EU and its amendment directives, other components were not screened included in this report.
- (5) Photo appendix is included.

Disclaimers:

This XRF Screening report is for reference purposes only. The applicant shall make its/his/her own judgment as to whether the information provided in this XRF screening report is sufficient for its/his/her purposes.

The result shown in this XRF screening report will differ based on various factors, including but not limited to, the sample size, thickness, area, surface flatness, equipment parameters and matrix effect (e.g. plastic, rubber, metal, glass, ceramic etc.). Further wet chemical pre-treatment with relevant chemical equipment analysis are required to obtain quantitative data.

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**The Test Results of Chemical Method:**

Test method:

PBBs & PBDEs Content:

With reference to IEC 62321 Ed 1.0:2008 Annex A, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)

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FINAL

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1) The test results of PBBs & PBDEs

Item	Unit	MDL	Results		Limit
			25	29	
<b>Polybrominated Biphenyls (PBBs)</b>					
Monobromobiphenyl	mg/kg	5	N.D.	N.D.	
Dibromobiphenyl	mg/kg	5	N.D.	N.D.	
Tribromobiphenyl	mg/kg	5	N.D.	N.D.	
Tetrabromobiphenyl	mg/kg	5	N.D.	N.D.	
Pentabromobiphenyl	mg/kg	5	N.D.	N.D.	
Hexabromobiphenyl	mg/kg	5	N.D.	N.D.	
Heptabromobiphenyl	mg/kg	5	N.D.	N.D.	
Octabromobiphenyl	mg/kg	5	N.D.	N.D.	
Nonabromodiphenyl	mg/kg	5	N.D.	N.D.	
Decabromodiphenyl	mg/kg	5	N.D.	N.D.	
Total content	mg/kg	/	N.D.	N.D.	1000 mg/kg
<b>Polybrominated Diphenylethers (PBDEs)(Mon-Deca)</b>					
Monobromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Dibromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Tribromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Tetrabromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Pentabromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Hexabromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Heptabromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Octabromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Nonabromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Decabromodiphenyl ether	mg/kg	5	N.D.	N.D.	
Total content	mg/kg	/	N.D.	N.D.	1000 mg/kg
<b>Conclusion</b>	<b>/</b>	<b>/</b>	<b>Pass</b>	<b>Pass</b>	

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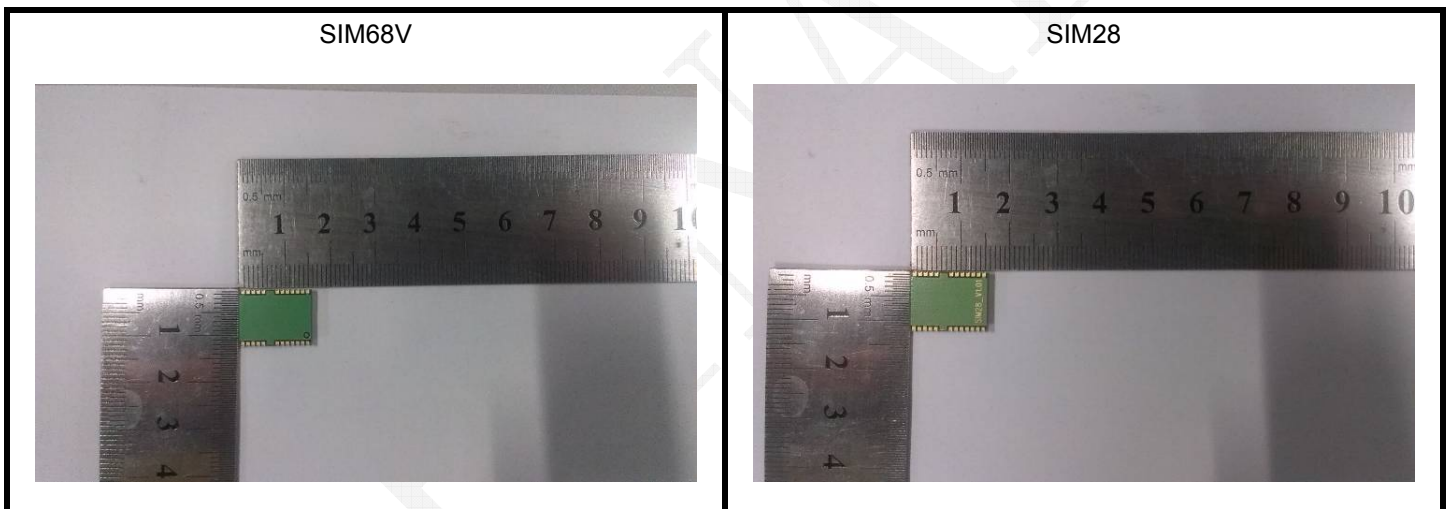
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Note:

- N.D. = Not Detected or less than MDL
- mg/kg = ppm
- MDL = Method Detection Limit
- The results less than MDL are not taken into account while calculating the sum contents.
- Photo appendix is included.

## Appendix

Photograph of Sample



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Test part No. 1	Test part No. 2	Test part No. 3
		
Test part No. 4	Test part No. 5	Test part No. 6
		
Test part No. 7	Test part No. 8	Test part No. 9
		
Test part No. 10	Test part No. 11	Test part No. 12
		
Test part No. 13	Test part No. 14	Test part No. 15

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Test part No. 16	Test part No. 17	Test part No. 18
		
Test part No. 19	Test part No. 20	Test part No. 21
		
Test part No. 22	Test part No. 23	Test part No. 24
		
Test part No. 25	Test part No. 26	Test part No. 27
		
Test part No. 28	Test part No. 29	

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