



Test Report

No. 3595412-CH02

Date: October 10, 2014

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ON Semiconductor
970 Fraser Drive
Burlington, Ontario
Canada

The following sample(s) was/were submitted and identified by/on behalf of the client as:

Hearing Aid Amplifier
Model/Part No.: R3110 (lamine based)

Sample Received Date:

10/7/2014

Testing Period:

10/8/2014 – 10/9/2014

Test Requested : Please refer to the result summary.

Test Method & Results : Please refer to next page(s).

Result Summary :

Test Requested	Comment
European Directive 2011/65/EU Annex II (RoHS); recasting 2002/95/EC	PASS

Signed for and on behalf of SGS North America, Inc.

Manoj Aluri
Chemist, Chemistry Laboratory

Prepared By:

Veronica Marrero
Laboratory Operations Lead, Chemistry Laboratory

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European Directive 2011/65/EU Annex II (RoHS); recasting 2002/95/EC

1. Lead, Cadmium, Mercury, Chromium and Bromine content by XRF Screening

Method : With reference to IEC 62321-5:2013. Analysis was performed by XRF Spectroscopy.

Test item	Sample Description	Result					Comment
		Cd	Pb	Hg	Cr	Br	
1	Hearing Aid Amplifier – Model/Part No.: R3110 (laminated based) – Side with metal contacts	X	BL	BL	BL	BL	Refer to chemical result
2	Hearing Aid Amplifier – Model/Part No.: R3110 (laminated based) – Top	X	BL	BL	BL	BL	Refer to chemical result

Note :

1. BL = Below Limit by XRF analysis
2. OL = Over Limit by XRF analysis
3. X = Inconclusive (means questionable, need further chemical analysis)
4. # = Insufficient sample for screening test
5. NA = Not Applicable
6. † = With reference to RoHS Annex III Exemption 7(c)-I Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound.

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 GCMS (for PBBs, PBDEs) are recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-5:2013.

Element	Unit	Non-metal	Metal	Composite Material
Cd	mg/kg	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (150+3\sigma) \leq OL$
Pb	mg/kg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Hg	mg/kg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Cr	mg/kg	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$
Br	mg/kg	$BL \leq (300-3\sigma) < X$	--	$BL \leq (250-3\sigma) < X$

BL = Below Limit
 OL = Over Limit
 X = Inconclusive
 LOD = Limit of Detection

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- 2. The XRF screening test for RoHS elements – The reading may be different to the actual content in the sample due to non-uniformity composition.

- 3. Maximum permissible limit:

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

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2. Cadmium content and Polybromobiphenyl (PBB) and Polybromodiphenyl ether (PBDE) by chemical method

Method : With reference to IEC 62321:2013 and 62321:2008. Cadmium was analyzed by Inductively Coupled Argon Plasma Spectrometry and PBB, PBDE were analyzed by Gas Chromatography – Mass Spectrometry (GC-MS).

Test Item	Result (mg/kg)	Detection Limit (mg/kg)	Permissible Limit (mg/kg)
	1		
Cadmium (Cd)	ND	2	100
Comment	PASS	--	--

Sample Description:

1. **Hearing Aid Amplifier – Model/Part No.: R3110 (laminated based)– Whole***

Note : 1. mg/kg = milligram per kilogram
2. ND = Not Detected

Remark: * = Sample was tested as a whole because physical separation was not possible

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Test Item	Result (mg/kg)	Detection Limit (mg/kg)	Permissible Limit (mg/kg)
	1		
Sum of PBBs	ND	--	1000
Monobromobiphenyl	ND	5	--
Dibromobiphenyl	ND	5	--
Tribromobiphenyl	ND	5	--
Tetrabromobiphenyl	ND	5	--
Pentabromobiphenyl	ND	5	--
Hexabromobiphenyl	ND	5	--
Heptabromobiphenyl	ND	5	--
Octabromobiphenyl	ND	5	--
Nonabromobiphenyl	ND	5	--
Decabromobiphenyl	ND	5	--
Sum of PBDEs	ND	--	1000
Monobromodiphenyl ether	ND	5	--
Dibromodiphenyl ether	ND	5	--
Tribromodiphenyl ether	ND	5	--
Tetrabromodiphenyl ether	ND	5	--
Pentabromodiphenyl ether	ND	5	--
Hexabromodiphenyl ether	ND	5	--
Heptabromodiphenyl ether	ND	5	--
Octabromodiphenyl ether	ND	5	--
Nonabromodiphenyl ether	ND	5	--
Decabromodiphenyl ether	ND	5	--
Comment	PASS	--	--

Sample Description:

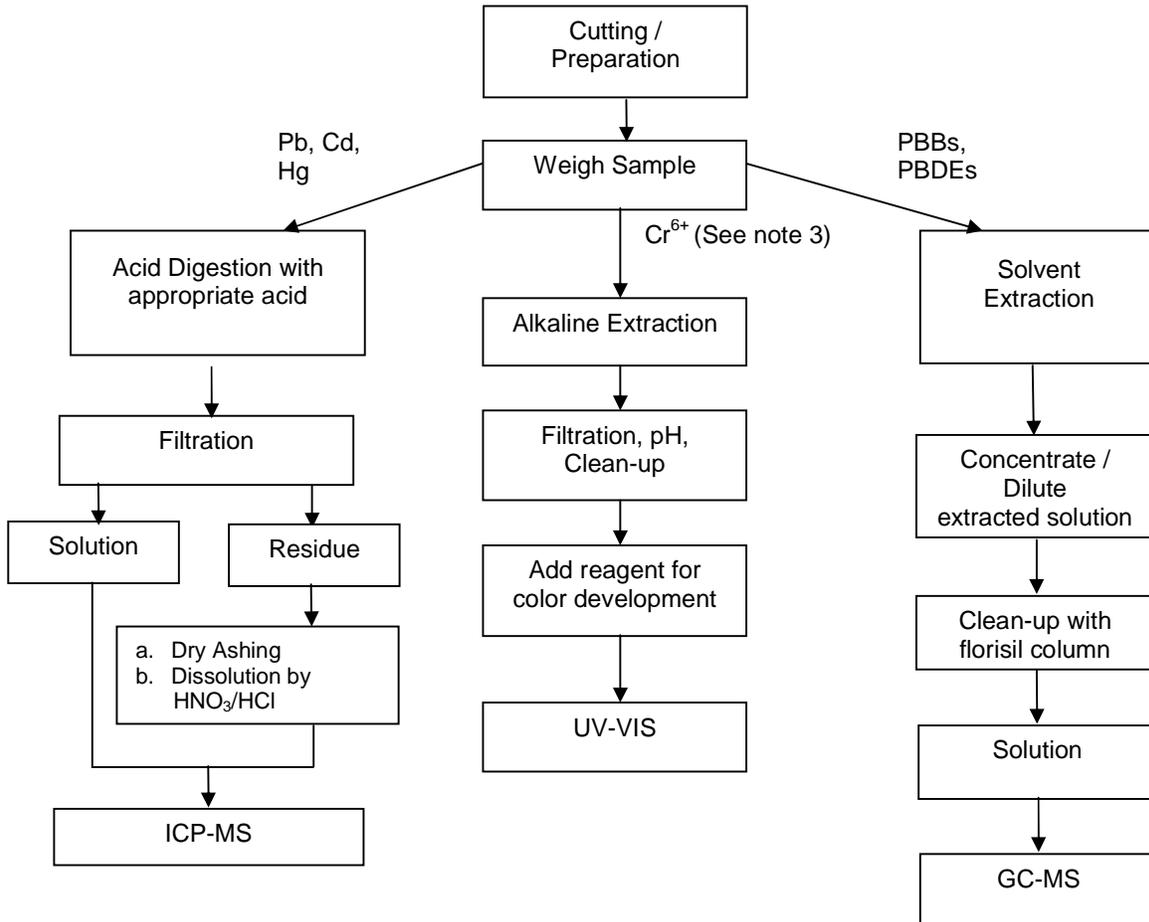
1. **Hearing Aid Amplifier – Model/Part No.: R3110 (laminated based)– Whole***

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Flowchart for RoHS:



- Note :
1. For Cr(VI), spot test is adopted for metal sample.
 2. The Cd, Pb and Hg contents test on polymeric samples were dissolved totally by pre-conditioning method according to above flow chart.
 3. Cr⁶⁺ is performed only when total Cr is detected

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Sample Photo:



SGS authenticates the photo on the original report only

*** End of Report ***

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