



Test Report

Report No.: 161125001SZN-001

Issue date: Dec. 01, 2016

Applicant: **RADIUS INDUSTRIES**

S-57, F.I.E.E.OKHLA INDUSTRIAL AREA,PHASE-II,NEW DELHI-110020 INDIA

Sample Description:

Test item description.....: **Diode**

Model/Type reference No.....: R-1、DO-15、DO-27、R-6、A-405、SMA、SOD-123、SOD-323、SOD-523、SMB、SMC、Bridge、TO-220AB、TO-220AC、TO-252

Item No/ Lot No.....: DO-41

Trade Mark: RADCOM

Date of Sample Received.....: Nov. 23, 2016

Testing Period: Nov. 23, 2016 to Dec. 01, 2016

Tests conducted:

As requested by the applicant, refer to following page(s) for details.

Conclusion:

Tested samples	Standard	Result
Tested components of submitted sample	RoHS Directive 2011/65/EU and amendment Commission Delegated Directive (EU) 2015/863 with effective from 22 July 2019	Pass

Authorized by:
For Intertek Testing Services
Shenzhen Ltd.



Navy Wang
Engineer



Test Report

Report No.: 161125001SZN-001

Issue date: Dec. 01, 2016

◆ **RoHS Chemical Test:**

(A) Test Result Summary:

Testing Item	Result		
	(1)	(2)	(3)
Cadmium (Cd) Content (mg/kg)	ND	ND	ND
Lead (Pb) Content (mg/kg)	46	913000 #	190
Mercury (Hg) Content (mg/kg)	ND	ND	ND
Chromium (VI)(Cr ⁶⁺) Result (By Boiling Water Extraction on Metal) (µg/cm ²)	Negative	Negative	Negative

Testing Item	Result	
	(4)	(5)
Cadmium (Cd) Content (mg/kg)	ND	ND
Lead (Pb) Content (mg/kg)	ND	ND
Mercury (Hg) Content (mg/kg)	ND	ND
Chromium (VI)(Cr ⁶⁺) Content (mg/kg)	ND	ND
Polybrominated Biphenyls (PBBs)(mg/kg)		
Monobromobiphenyl (MonoBB)	ND	ND
Dibromobiphenyl (DiBB)	ND	ND
Tribromobiphenyl (TriBB)	ND	ND
Tetrabromobiphenyl (TetraBB)	ND	ND
Pentabromobiphenyl (PentaBB)	ND	ND
Hexabromobiphenyl (HexaBB)	ND	ND
Heptabromobiphenyl (HeptaBB)	ND	ND
Octabromobiphenyl (OctaBB)	ND	ND
Nonabromobiphenyl (NonaBB)	ND	ND
Decabromobiphenyl (DecaBB)	ND	ND
Polybrominated Diphenyl Ethers (PBDEs)(mg/kg)		
Monobromodiphenyl Ether (MonoBDE)	ND	ND
Dibromodiphenyl Ether (DiBDE)	ND	ND
Tribromodiphenyl Ether (TriBDE)	ND	ND
Tetrabromodiphenyl Ether (TetraBDE)	ND	ND
Pentabromodiphenyl Ether (PentaBDE)	ND	ND
Hexabromodiphenyl Ether (HexaBDE)	ND	ND
Heptabromodiphenyl Ether (HeptaBDE)	ND	ND
Octabromodiphenyl Ether (OctaBDE)	ND	ND
Nonabromodiphenyl Ether (NonaBDE)	ND	ND
Decabromodiphenyl Ether (DecaBDE)	ND	ND



Test Report

Report No.: 161125001SZN-001

Issue date: Dec. 01, 2016

Testing Item	Result	
	(4)	(5)
Dibutyl phthalate (DBP) (mg/kg)	ND	ND
Di-(2-ethyl hexyl) phthalate (DEHP) (mg/kg)	ND	ND
Benzyl butyl phthalate (BBP) (mg/kg)	ND	ND
Di-(iso-butyl) phthalate (DIBP) (mg/kg)	ND	ND
<ul style="list-style-type: none"> - ND = Not detected - NT = Not tested - Positive = A positive test result indicated the concentration of Cr(VI) is greater than threshold of 0.13µg/cm² for boiling-water-extraction procedures by visual comparison / by UV-VIS Spectrophotometer analysis. The sample coating is considered to contain Cr(VI). - Negative = A negative test result indicated the concentration of Cr(VI) is less than threshold of 0.10µg/cm² for boiling-water-extraction procedures by UV-VIS Spectrophotometer analysis. The coating is considered a non-Cr(VI) based coating. - # = As claimed by the declaration submitted from the applicant, the Lead content of the component comes from the constituent of high melting temperature type solders (i.e. Lead-based alloys containing 85% by weight or more Lead) only. According to EU RoHS Directive (2011/65/EU), Lead in high melting temperature type solders of the component can be exempted. 		

Tested Components:

- (1) Metal with silvery plating
- (2) Silver color metal plate
- (3) Silver gray color metal plate
- (4) Black plastic block
- (5) White paste

(B) RoHS Requirement:

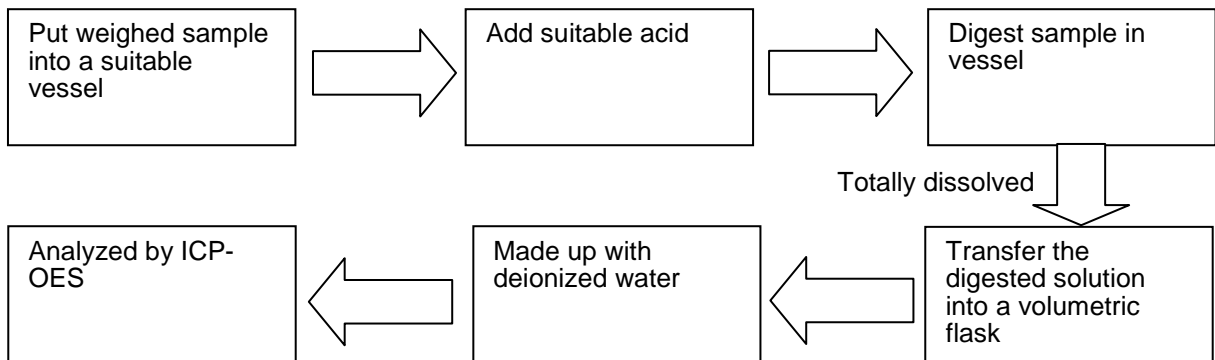
Restricted Substances	Limits
Cadmium (Cd)	0.01% (100 mg/kg)
Lead (Pb)	0.1% (1000 mg/kg)
Mercury (Hg)	0.1% (1000 mg/kg)
Chromium (VI) (Cr ⁶⁺)	0.1% (1000 mg/kg)
Polybrominated Biphenyls (PBBs)	0.1% (1000 mg/kg)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000 mg/kg)
Dibutyl phthalate (DBP) (mg/kg)	0.1% (1000 mg/kg)
Di-(2-ethyl hexyl) phthalate (DEHP) (mg/kg)	0.1% (1000 mg/kg)
Benzyl butyl phthalate (BBP) (mg/kg)	0.1% (1000 mg/kg)
Di-(iso-butyl) phthalate (DIBP) (mg/kg)	0.1% (1000 mg/kg)
<ul style="list-style-type: none"> - The above limits were quoted from Directive 2011/65/EU and amendment Commission Delegated Directive (EU) 2015/863 for homogeneous material. 	

(C) Test Method:

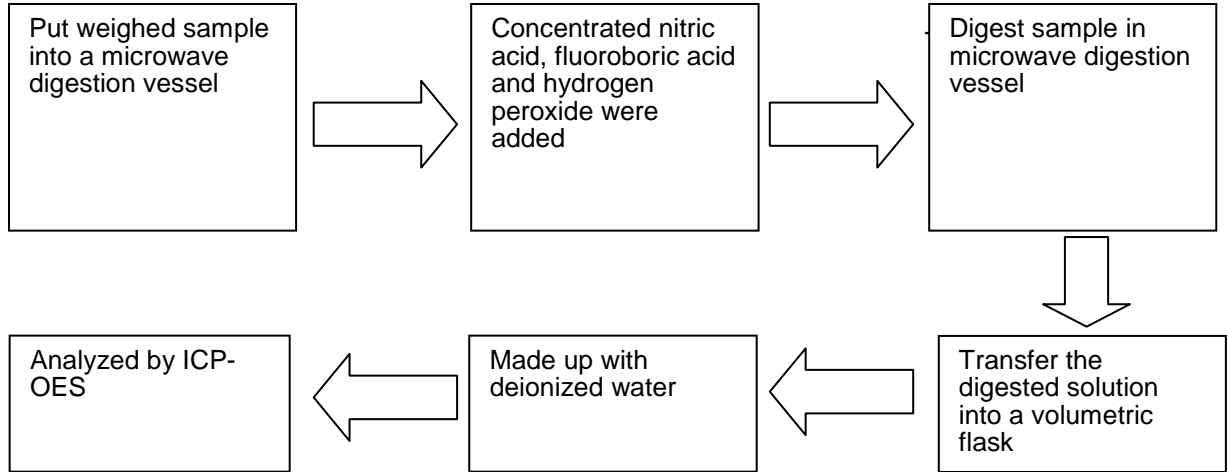
Testing Item	Testing Method	Reporting Limit
Cadmium (Cd) Content	With reference to IEC 62321-5 Edition 1.0:2013, by acid digestion and determined by ICP - OES	2 mg/kg
Lead (Pb) Content	With reference to IEC 62321-5 Edition 1.0:2013, by acid digestion and determined by ICP - OES	2 mg/kg
Mercury (Hg) Content	With reference to IEC 62321-4 Edition 1.0:2013, by acid digestion and determined by ICP - OES	2 mg/kg
Chromium (VI)(Cr ⁶⁺) Content	With reference to IEC 62321 Edition 1.0:2008, by alkaline digestion and determined by UV-VIS Spectrophotometer	1 mg/kg
Chromium (VI) (Cr ⁶⁺) Content	With reference to IEC 62321-7-1 Edition 1.0:2015, by boiling water extraction and determined by UV-VIS Spectrophotometer	0.10µg/cm ²
Polybrominated Biphenyls (PBBs) & Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321-6 Edition 1.0:2015, by solvent extraction and determined by GC/MS and further HPLC confirmation when necessary	5 mg/kg
Dibutyl phthalate (DBP) & Di-(2-ethyl hexyl) phthalate (DEHP) & Benzyl butyl phthalate (BBP) & Di-(iso-butyl) phthalate (DIBP)	With reference to EN 14372, by Gas Chromatographic-Mass Spectrometric (GC-MS) analysis	100mg/kg

(D) Measurement Flowchart:

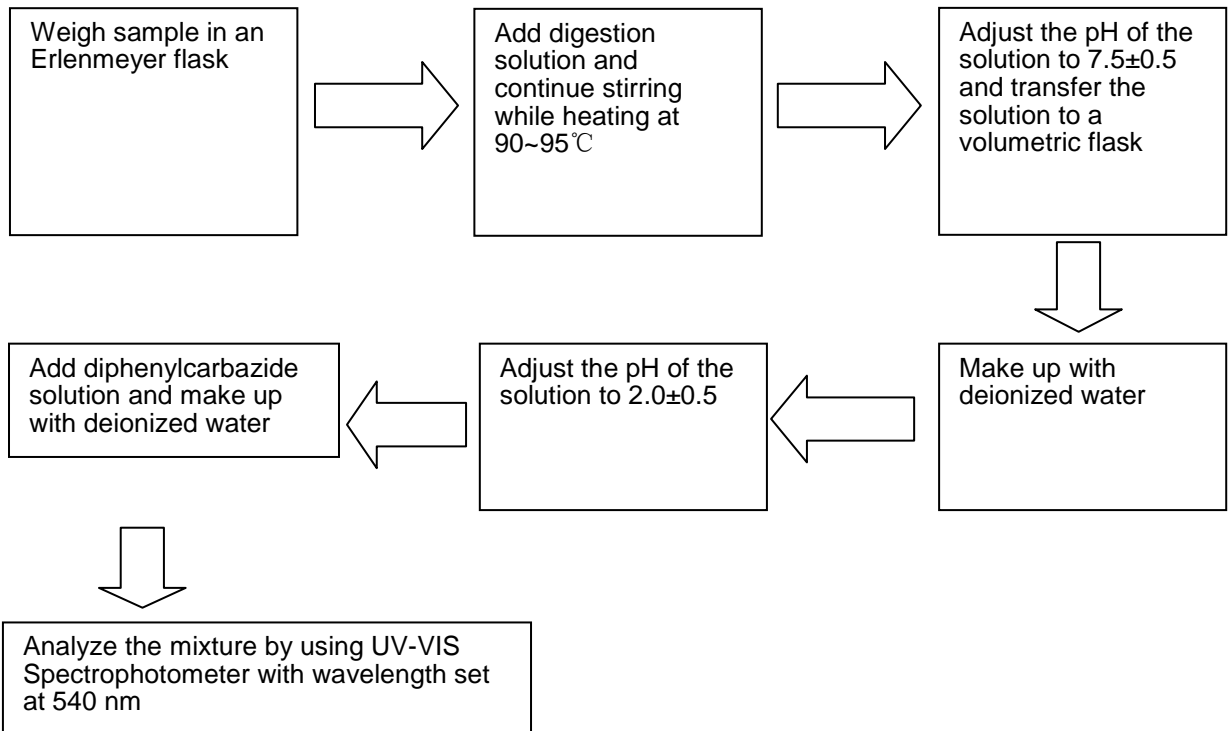
1. Test for Cd/Pb Contents



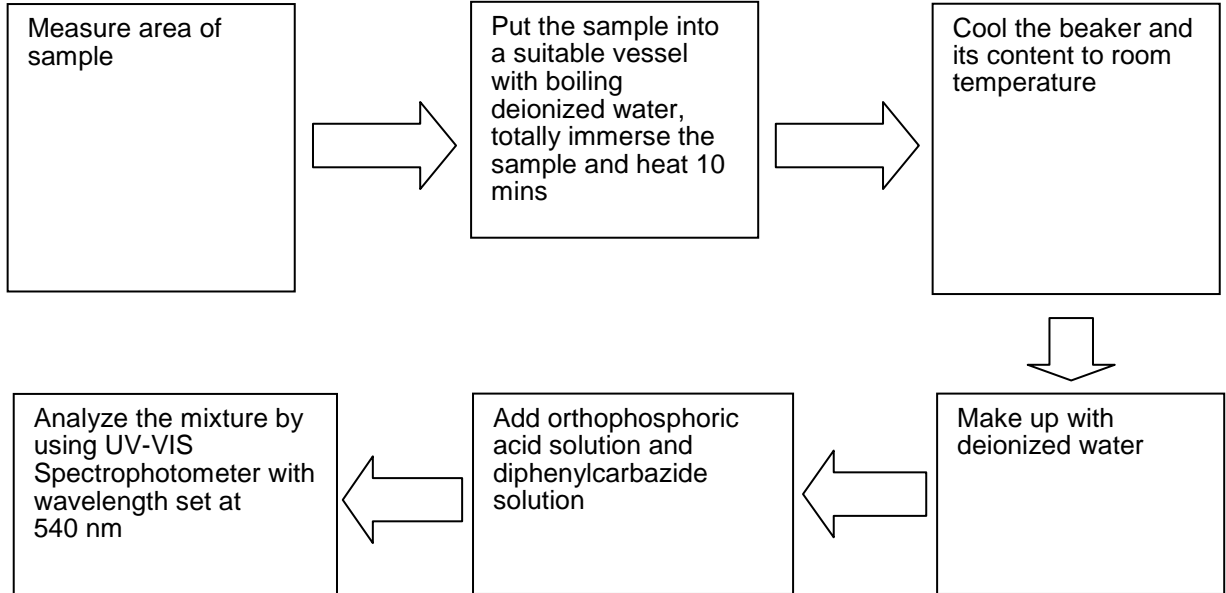
2. Test for Hg Content



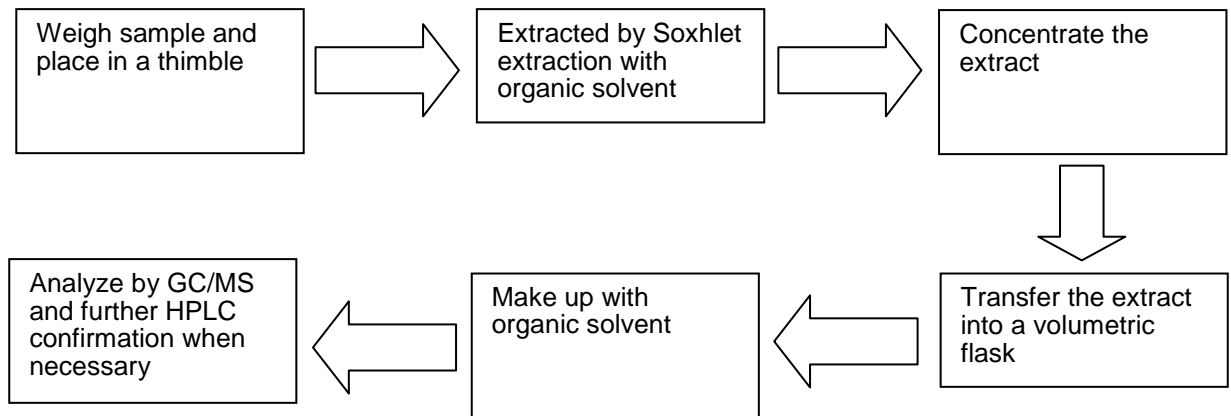
3. Test for Chromium (VI) (Cr⁶⁺) Content (Alkaline Digestion)



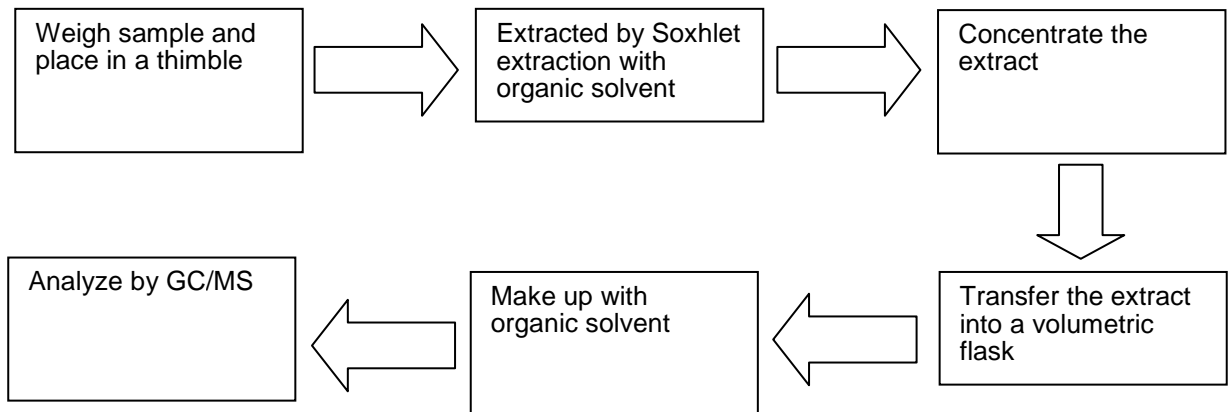
4. Test for Chromium (VI) (Cr⁶⁺) Content (Boiling Water Extraction)



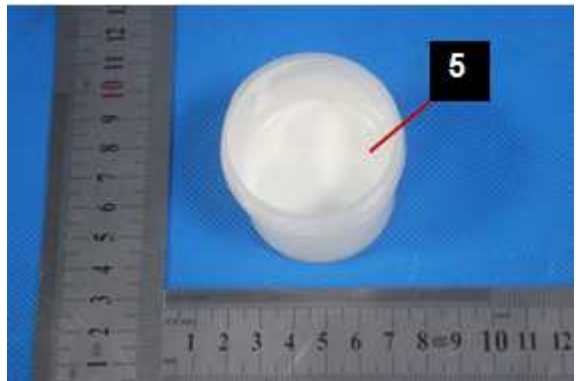
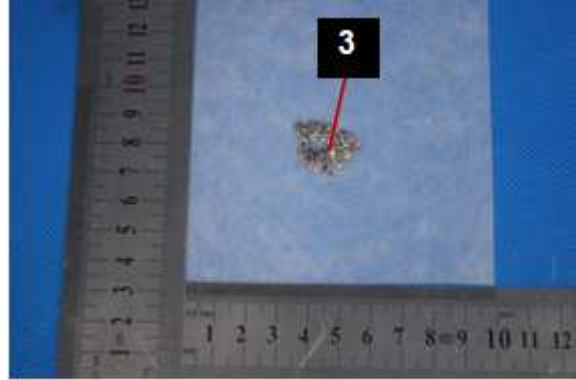
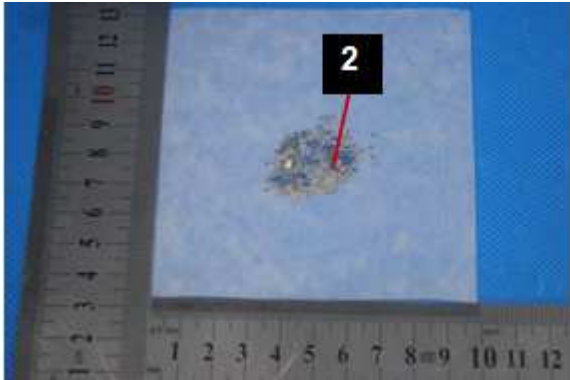
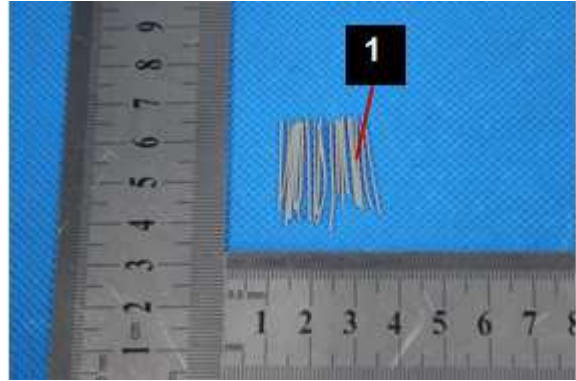
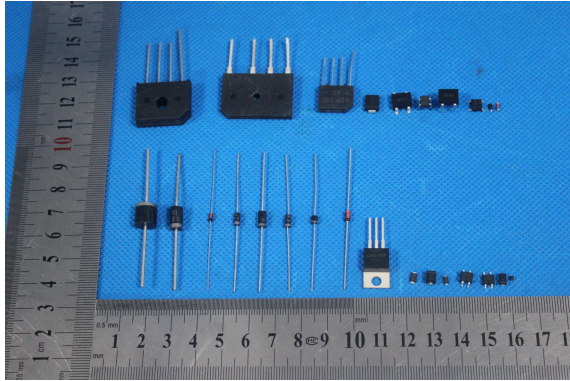
5. Test for PBBs/PBDEs Contents



6. Test for Phthalate Contents



Photos for Test Sample :



***** End of Report *****

This report is made solely on the basis of your instructions and/or information and materials supplied by you. It is not intended to be a recommendation for any particular course of action. Intertek does not accept a duty of care or any other responsibility to any person other than the Client in respect of this report and only accepts liability to the Client insofar as is expressly contained in the terms and conditions governing Intertek's provision of services to you. Intertek makes no warranties or representations either express or implied with respect to this report save as provided for in those terms and conditions. We have aimed to conduct the Review on a diligent and careful basis and we do not accept any liability to you for any loss arising out of or in connection with this report, in contract, tort, by statute or otherwise, except in the event of our gross negligence or willful misconduct.