



TEST REPORT

REPORT No.: **DTI201901257786E**

Date: 2019-01-30

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Applicant Company Name: SHENZHEN AOYUDA ELECTRONIC CO.,LTD

Applicant Company Address: 3rd floor,buiding H3,hongfa science park,
shiyuan street,baonan district,shezhen.

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

Sample Name : Semiconductor vibration
 Model No : 5032(2P、4P)
 Series models : 2016 (4P) /8*4.5 (4P) /7015 (4P) /3225(2P、4P)/
 7050(2P、4P)/3215 (2P) /2520 (4P) /1612 (4P)
 Sample Receiving Date : Jan.25,2019
 Testing Period : From Jan.25,2019 to Jan.29,2019
 Results : Please refer to next page(s).

Summary of Test Results:


TEST REQUEST

A As specified by client,to determine Lead, Cadmium, Mercury, Hexavalent Chromium, Polybrominated Biphenyls (PBBs), Polybrominated Diphenyl ethers (PBDEs), Bis-(2-ethylhexyl) Phthalate (DEHP), Benzylbutyl Phthalate (BBP), Dibutyl Phthalate (DBP) & Di-iso-butyl ortho-phthalate (DIBP) contents in the submitted sample in accordance with Directive 2011/65/EU and its amendment directives 2015/863/EU (RoHS 2.0) .

CONCLUSION

Pass

Signed for and on behalf of
DTI

Approved by: 
lab manager



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Results:

Description for specimen:

- (1) Crystal oscillator metal shell
- (2) Internal silver sheet metal
- (3) Black crystal

A. EU RoHS Directive 2011/65/EU and its amendment directives (RoHS 2.0)

Test method:

Lead ,Mercury & Cadmium Content:

With reference to IEC 62321-4:2013 and IEC62321-5:2013, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-AES)

Hexavalent Chromium Content (For metal material):

With reference to IEC 62321-7-1:2015, by boiling-water-extraction and analysis was performed by UV-visible spectrophotometer (UV-Vis)

Hexavalent Chromium Content (For non-metal material):

With reference to IEC 62321-7-2:2017, by alkaline digestion and analysis was performed by UV-visible spectrophotometer (UV-Vis)

PBBs & PBDEs Content:

With reference to IEC 62321-6:2015, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)

DEHP, BBP, DBP&DIBP content:

With reference to CPSC-CH-C1001-09.3 by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)



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Shenzhen Deesev Testing International Corp.
深圳市德泽威技术检测有限公司

9th Flr., Building B, Feiyang Science & Technology Park, Longchang Rd.No.8, Bao'an, Shenzhen, Guangdong, China
中国广东省深圳市宝安区隆昌路8号飞扬科技园8座9楼
Tel: +86-755-32936716 Fax: +86-755-66683099



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1) The test results of Pb、Cd、Hg and Cr (VI)

Item	Unit	MDL	Results			Limit
			(1)	(2)	(3)	
Lead Content (Pb)	mg/kg	2	N.D.	N.D.	N.D.	≤1000
Cadmium Content (Cd)	mg/kg	2	N.D.	N.D.	N.D.	≤100
Mercury Content (Hg)	mg/kg	2	N.D.	N.D.	N.D.	≤1000
Hexavalent Chromium (Cr (VI)) (Metal material)	µg/cm ²	0.05	Negative	Negative	/	#
Hexavalent Chromium (Cr (VI)) (Non-metal material)	mg/kg	2	/	/	N.D.	≤1000
Conclusion	/	/	Pass	Pass	Pass	/

Note:

- N.D. = Not Detected or less than MDL
- MDL = Method Detection Limit
- Negative= Sample Cr(VI) concentration is less than 0.10 µg/cm²
- Positive = Sample Cr(VI) concentration is greater than 0.13 µg/cm²
- # =
Positive indicates the presence of Cr(VI) on the tested areas and the test results are considered to be incompatible with Directive 2011/65/EU and its amendment directives 2015/863/EU (RoHS 2.0) requirement.
- Negative indicates the absence of Cr(VI) on the tested areas and the test results are considered to be consistent with Directive 2011/65/EU and its amendment directives 2015/863/EU (RoHS 2.0) requirement.
- mg/kg = ppm



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 中国 广东省 深圳市 宝安区 隆昌路 8号 飞扬科技园 8座9楼
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2) The test results of PBBs & PBDEs

Item	Unit	MDL	Results	Limit
			(3)	
Polybrominated Biphenyls (PBBs)				
Monobromobiphenyl	mg/kg	5	N.D.	/
Dibromobiphenyl	mg/kg	5	N.D.	/
Tribromobiphenyl	mg/kg	5	N.D.	/
Tetrabromobiphenyl	mg/kg	5	N.D.	/
Pentabromobiphenyl	mg/kg	5	N.D.	/
Hexabromobiphenyl	mg/kg	5	N.D.	/
Heptabromobiphenyl	mg/kg	5	N.D.	/
Octabromobiphenyl	mg/kg	5	N.D.	/
Nonabromodiphenyl	mg/kg	5	N.D.	/
Decabromodiphenyl	mg/kg	5	N.D.	/
Total content	mg/kg	/	N.D.	≤1000
Polybrominated Diphenylethers (PBDEs)(Mon-Deca)				
Monobromodiphenyl ether	mg/kg	5	N.D.	/
Dibromodiphenyl ether	mg/kg	5	N.D.	/
Tribromodiphenyl ether	mg/kg	5	N.D.	/
Tetrabromodiphenyl ether	mg/kg	5	N.D.	/
Pentabromodiphenyl ether	mg/kg	5	N.D.	/
Hexabromodiphenyl ether	mg/kg	5	N.D.	/
Heptabromodiphenyl ether	mg/kg	5	N.D.	/
Octabromodiphenyl ether	mg/kg	5	N.D.	/
Nonabromodiphenyl ether	mg/kg	5	N.D.	/
Decabromodiphenyl ether	mg/kg	5	N.D.	/
Total content	mg/kg	/	N.D.	≤1000
Conclusion	/	/	Pass	/

Note:

- N.D. = Not Detected or less than MDL
- mg/kg = ppm
- MDL = Method Detection Limit



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3) The test results of DEHP, BBP, DBP & DIBP

Item	Unit	MDL	Results	Limit
			(3)	
Di-2-ethylhexyl phthalate(DEHP)	mg/kg	30	N.D.	≤1000
Benzyl-n-butyl phthalate (BBP)	mg/kg	30	N.D.	≤1000
Di-n-butyl phthalate (DBP)	mg/kg	30	N.D.	≤1000
Di-iso-butyl phthalate (DIBP)	mg/kg	30	N.D.	≤1000
Conclusion	/	/	Pass	/

Note:

- N.D. = Not Detected or less than MDL
- mg/kg = ppm
- MDL = Method Detection Limit
- Flow chart appendix is included.
- Photo appendix is included.



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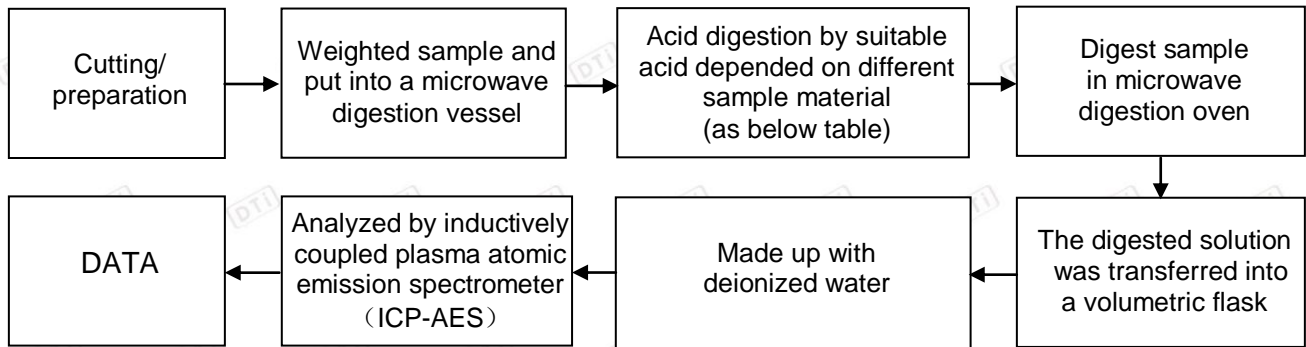
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Appendix I

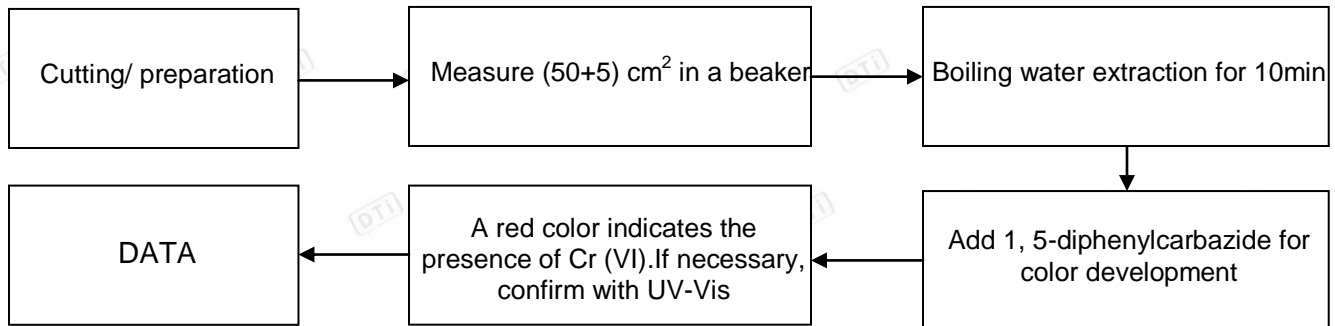
Test Flow chart

1. Test Flowchart for Cd / Pb /Hg content

These samples were dissolved totally by pre-conditioning method according to below flow chart.



2. Test Flowchart for Cr⁶⁺ content (Metal material)





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Tel: +86-755-32936716 Fax: +86-755-66683099



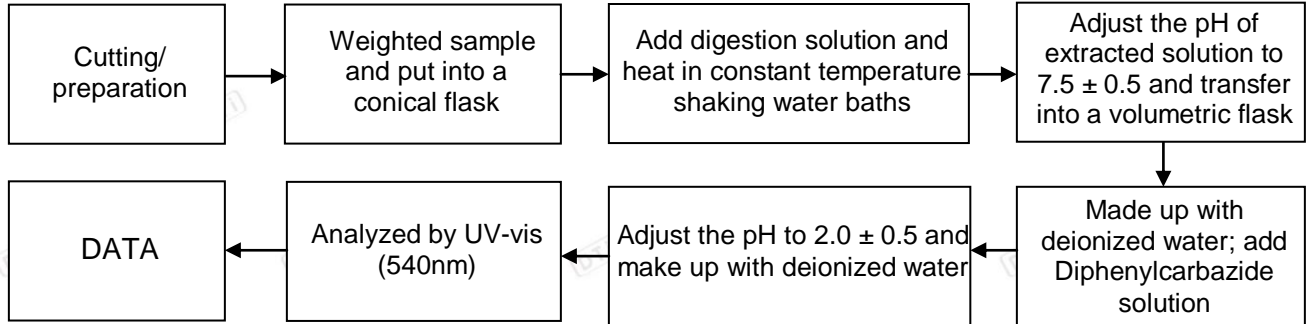
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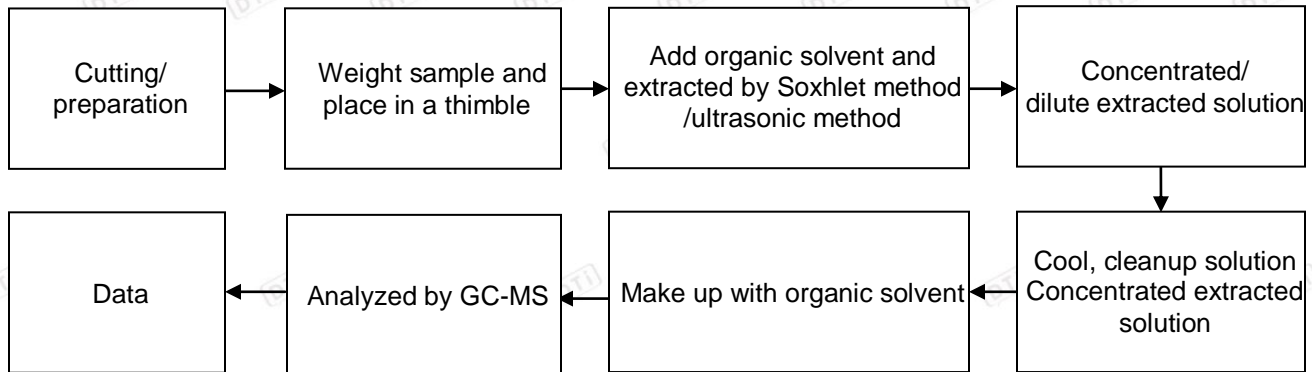
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3. Test Flowchart for Cr⁶⁺ content (Non-metal material)



4. Test Flowchart for PBBs & PBDEs content





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中国广东省深圳市宝安区隆昌路8号飞扬科技园8座9楼
Tel: +86-755-32936716 Fax: +86-755-66683099



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5. Test Flowchart for DEHP, BBP, DBP & DIBP content

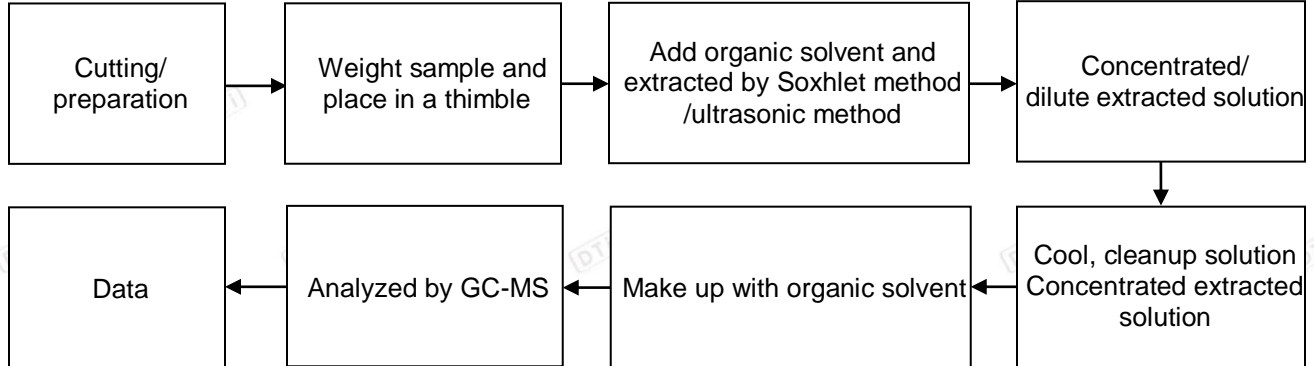


Table:

Sample material	Digestion Acid
Steel, copper, aluminum, solder	Aqua regia, HNO ₃ , HCl, HF, H ₂ O ₂
Glass	HNO ₃ /HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO ₃
Plastic	H ₂ SO ₄ , H ₂ O ₂ , HNO ₃ , HCl
Others	Any acid to total digestion



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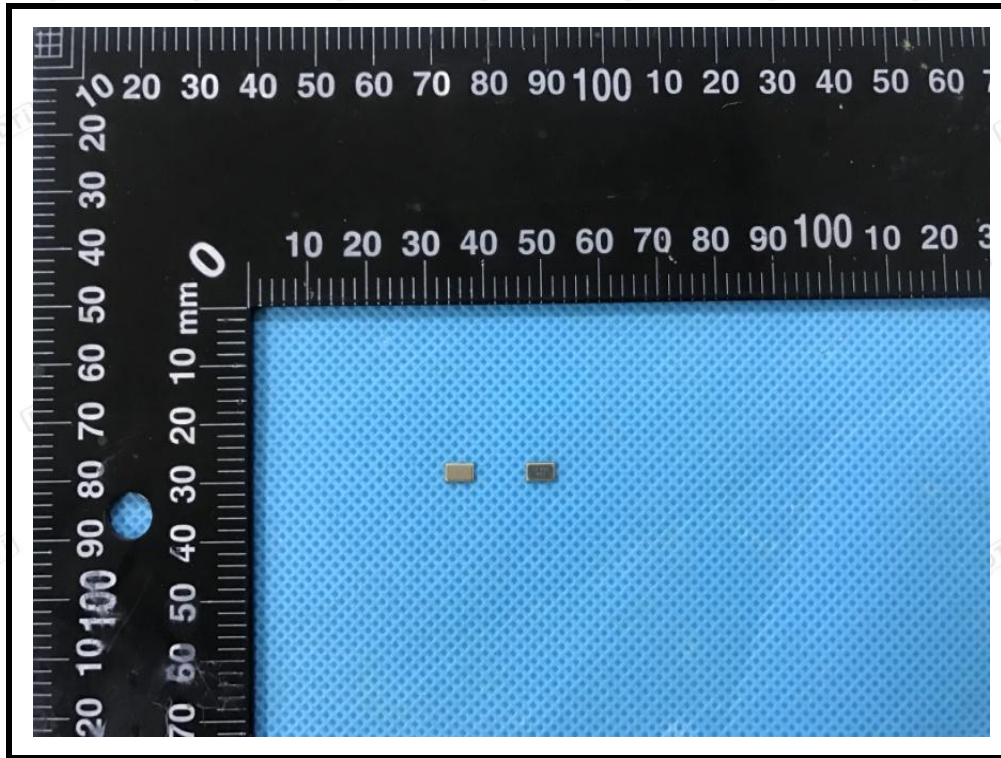
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Appendix II

Photograph of Sample





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Tel: +86-755-32936716 Fax: +86-755-66683099

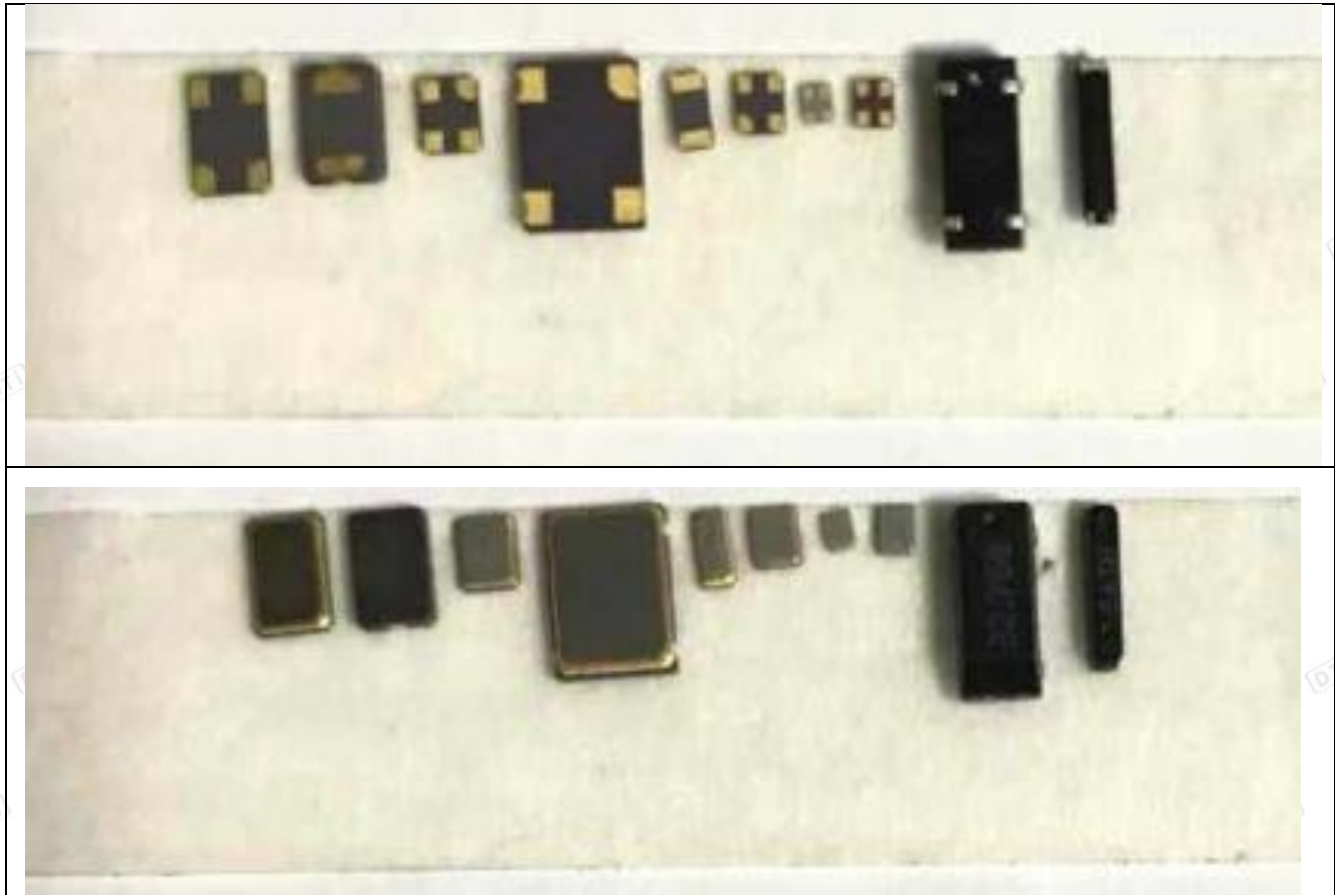


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DTI authenticate the photo on original report only

*** End of Report ***



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