



TEST REPORT

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Applicant : Shenzhen Hi-Link Electronic CO., Ltd
Address : 1705, 1706, 1709A, Building E, Xinghe WORLD, Minle Community, Minzhi Street, Longhua District, Shenzhen Guangdong China
Manufacturer's name : Shenzhen Hi-Link Electronic CO., Ltd
Address : 1705, 1706, 1709A, Building E, Xinghe WORLD, Minle Community, Minzhi Street, Longhua District, Shenzhen Guangdong China

Report on the submitted samples said to be:

Sample Name : Radar Module
Trade Mark : N/A
Tested Style No. : HLK-LD2450-P
Series models : HLK-LD2450, HLK-LD2450A-P, HLK-LD2450A, HLK-JC2480
Sample reception time : December 27, 2024
Testing Period : December 27, 2024 ~ January 03, 2025
Test request : According to RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.
Test method : Please refer to next page(s).
Results : Please refer to next page(s).

Test Requirement

Conclusion

- A. EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU- Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs), Bis(2-ethylhexyl)phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)

Pass

Redact By

Tina

Reviewed By

Eric

Approval By

Sophia

Date of issue January 03, 2025



Shenzhen Alliance Testing Technology Co., LTD.

Tel: 0755-23224560; E-mail: ant@ant-alliance.net;
<http://www.ant-alliance.cn>

202, building B, jinfengzhihuigu, No.45, Yonghe Road, Heping community, Fuhai street, Bao'an District, Shenzhen, Guangdong, China



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Results:

A. EU RoHS Directive 2011/65/EU

Part No.	Sample Description	Test item	XRF Result	Chemical Test (mg/kg)	Conclusion
1	Beige plastic (Blue PCB)	Pb	BL	/	Pass
		Cd	BL	/	
		Hg	BL	/	
		Cr(Cr(VI))▼	BL	/	
		Br(PBBs&PBDEs)▼	BL	/	
		DBP	/	N.D.	
		BBP	/	N.D.	
		DEHP	/	N.D.	
		DIBP	/	N.D.	
2	Gold metal (Blue PCB)	Pb	BL	/	Pass
		Cd	BL	/	
		Hg	BL	/	
		Cr(Cr(VI))▼	BL	/	
		Br(PBBs&PBDEs)▼	/	/	
		DBP	/	/	
		BBP	/	/	
		DEHP	/	/	
		DIBP	/	/	
3	Crystal oscillator (Blue PCB)	Pb	BL	/	Pass
		Cd	BL	/	
		Hg	BL	/	
		Cr(Cr(VI))▼	BL	/	
		Br(PBBs&PBDEs)▼	/	/	
		DBP	/	/	
		BBP	/	/	
		DEHP	/	/	
		DIBP	/	/	
4	Inductance (Blue PCB)	Pb	BL	/	Pass
		Cd	BL	/	
		Hg	BL	/	
		Cr(Cr(VI))▼	BL	/	
		Br(PBBs&PBDEs)▼	BL	/	
		DBP	/	N.D.	
		BBP	/	N.D.	
		DEHP	/	N.D.	
		DIBP	/	N.D.	



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Part No.	Sample Description	Test item	XRF Result	Chemical Test (mg/kg)	Conclusion
5	Black plastic (Blue PCB)	Pb	BL	/	Pass
		Cd	BL	/	
		Hg	BL	/	
		Cr(Cr(VI))▼	BL	/	
		Br(PBBs&PBDEs)▼	X	N.D.	
		DBP	/	N.D.	
		BBP	/	N.D.	
		DEHP	/	N.D.	
		DIBP	/	N.D.	
6	Silver metal pin (Blue PCB)	Pb	BL	/	Pass
		Cd	BL	/	
		Hg	BL	/	
		Cr(Cr(VI))▼	BL	/	
		Br(PBBs&PBDEs)▼	/	/	
		DBP	/	/	
		BBP	/	/	
		DEHP	/	/	
		DIBP	/	/	
7	Diode (Blue PCB)	Pb	BL	/	Pass
		Cd	BL	/	
		Hg	BL	/	
		Cr(Cr(VI))▼	BL	/	
		Br(PBBs&PBDEs)▼	BL	/	
		DBP	/	N.D.	
		BBP	/	N.D.	
		DEHP	/	N.D.	
		DIBP	/	N.D.	
8	Chip capacitor (Blue PCB)	Pb	BL	/	Pass
		Cd	BL	/	
		Hg	BL	/	
		Cr(Cr(VI))▼	BL	/	
		Br(PBBs&PBDEs)▼	BL	/	
		DBP	/	N.D.	
		BBP	/	N.D.	
		DEHP	/	N.D.	
		DIBP	/	N.D.	



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Part No.	Sample Description	Test item	XRF Result	Chemical Test (mg/kg)	Conclusion
9	Triode (Blue PCB)	Pb	BL	/	Pass
		Cd	BL	/	
		Hg	BL	/	
		Cr(Cr(VI))▼	BL	/	
		Br(PBBs&PBDEs)▼	BL	/	
		DBP	/	N.D.	
		BBP	/	N.D.	
		DEHP	/	N.D.	
		DIBP	/	N.D.	
10	Black IC (Blue PCB)	Pb	BL	/	Pass
		Cd	BL	/	
		Hg	BL	/	
		Cr(Cr(VI))▼	BL	/	
		Br(PBBs&PBDEs)▼	X	N.D.	
		DBP	/	N.D.	
		BBP	/	N.D.	
		DEHP	/	N.D.	
		DIBP	/	N.D.	
11	Triode (Blue PCB)	Pb	BL	/	Pass
		Cd	BL	/	
		Hg	BL	/	
		Cr(Cr(VI))▼	BL	/	
		Br(PBBs&PBDEs)▼	BL	/	
		DBP	/	N.D.	
		BBP	/	N.D.	
		DEHP	/	N.D.	
		DIBP	/	N.D.	
12	Black IC (Blue PCB)	Pb	BL	/	Pass
		Cd	BL	/	
		Hg	BL	/	
		Cr(Cr(VI))▼	BL	/	
		Br(PBBs&PBDEs)▼	BL	/	
		DBP	/	N.D.	
		BBP	/	N.D.	
		DEHP	/	N.D.	
		DIBP	/	N.D.	



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Part No.	Sample Description	Test item	XRF Result	Chemical Test (mg/kg)	Conclusion
13	Blue PCB	Pb	BL	/	Pass
		Cd	BL	/	
		Hg	BL	/	
		Cr(Cr(VI))▼	BL	/	
		Br(PBBs&PBDEs)▼	X	N.D.	
		DBP	/	N.D.	
		BBP	/	N.D.	
		DEHP	/	N.D.	
		DIBP	/	N.D.	



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Note:

- (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 IEC 62321-3-1:2013.

Element	Unit	Non-metal	Metal	Composite Material
Cd	mg/kg	$BL \leq 70-3\sigma < X < 130+3\sigma \leq OL$	$BL \leq 70-3\sigma < X < 130+3\sigma \leq OL$	$BL \leq 50-3\sigma < X < 150+3\sigma \leq OL$
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

- (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 document 2015/863/EC amending RoHS directive 2011/65/EU.
- (4) ▼=For restricted substances PBBs and PBDEs, the results show the total Br content; The restricted substance was Cr (VI), and the results showed the total Cr content.

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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(5) Test method:

Lead (Pb) & Cadmium (Cd) Content:

According to IEC 62321-5:2013, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES)

Mercury (Hg) Content:

According to IEC 62321-4:2013+AMD1:2017 CSV, by acid digestion and analysis was performed by inductively coupled plasma atomic emission spectrometer (ICP-OES)

Hexavalent Chromium (Cr⁶⁺) Content:

According to IEC 62321-7-1:2015 or IEC 62321-7-2:2017, by alkaline digestion and analysis was performed by UV-visible spectrophotometer (UV-Vis)

PBBs & PBDEs Content:

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

DBP, BBP, DEHP, DIBP Content:

According to IEC 62321-8:2017, by solvent extraction and analysis was performed by gas chromatographic-mass spectrometer (GC-MS)

RoHS Restricted Substances	Unit	MDL	Maximum Concentration Value (mg/kg) (by weight in homogenous materials)
Cadmium (Cd)	mg/kg	2	100
Lead (Pb)	mg/kg	2	1000
Mercury (Hg)	mg/kg	2	1000
Hexavalent Chromium (Cr(VI))	ug/cm ² (Metal); mg/kg (Nonmetal)	0.1ug/cm ² (Metal); 8mg/kg (Nonmetal)	See below (Metal); 1000mg/kg (Nonmetal)
Polybrominated biphenyls (PBBs)	mg/kg	5	1000
Polybrominated diphenyl ethers (PBDEs)	mg/kg	5	1000
Dibutyl Phthalate (DBP)	mg/kg	50	1000
Benzyl butyl Phthalate (BBP)	mg/kg	50	1000
Bis(2-ethylhexyl) Phthalate (DEHP)	mg/kg	50	1000
Diisobutyl Phthalate (DIBP)	mg/kg	50	1000



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- MDL = Method Detection Limit
- /= Not apply
- LOQ = Limit of Quantification, The LOQ of Hexavalent chromium is 0.10 $\mu\text{g}/\text{cm}^2$
- $\text{mg}/\text{kg} = \text{ppm} = \text{parts per million}$
- N.D.=Not Detected (<MDL or LOQ)
- - a. The sample is positive for Cr (VI) if the Cr (VI) concentration is greater than 0.13 $\mu\text{g}/\text{cm}^2$. The sample coating is considered to contain Cr (VI)
 - b. The sample is negative for Cr (VI) if Cr (VI) is N.D. (concentration less than 0.10 $\mu\text{g}/\text{cm}^2$). The sample coating is considered a non- Cr (VI) based coating
 - c. The result between 0.10 $\mu\text{g}/\text{cm}^2$ and 0.13 $\mu\text{g}/\text{cm}^2$ is considered to be inconclusive, unavoidable coating variations may influence the determination
- #1 According to the statement provided by the customer, RoHS Directive 2011/65/EU based on ANNEX III 5(a), Lead is exempted in glass of cathode ray tubes, electronic components and fluorescent tubes.
- #2 According to the statement provided by the customer, RoHS Directive 2011/65/EU based on ANNEX III 7(c)-I, Lead is exempted in electronic ceramic or glass parts (e.g. piezo electronic devices).
- #3 According to the statement provided by the customer, RoHS directive 2011/65/EU based on ANNEX III 6(c), Lead is exempted as an alloying element in Copper containing up to 4% (40000ppm) by weight.
- #4 According to the statement provided by the customer, RoHS Directive 2011/65/EU based on ANNEX III 7(a), Lead is exempted in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead).
- #5 According to the statement provided by the customer, RoHS Directive 2011/65/EU based on ANNEX III 6(b), Lead is exempted as an alloying element in Aluminum containing up to 0.4% (4000ppm) by weight.
- #6 According to the statement provided by the customer, RoHS Directive 2011/65/EU based on ANNEX III 8(b), Cadmium and its compounds in electrical contact is exempted.
- #7 According to the statement provided by the customer, RoHS Directive 2011/65/EU based on ANNEX III 6(a), Lead is exempted in steel for machining purposes and in galvanized steel containing up to 0.35% (3500ppm) by weight.
- Photo appendix is included.

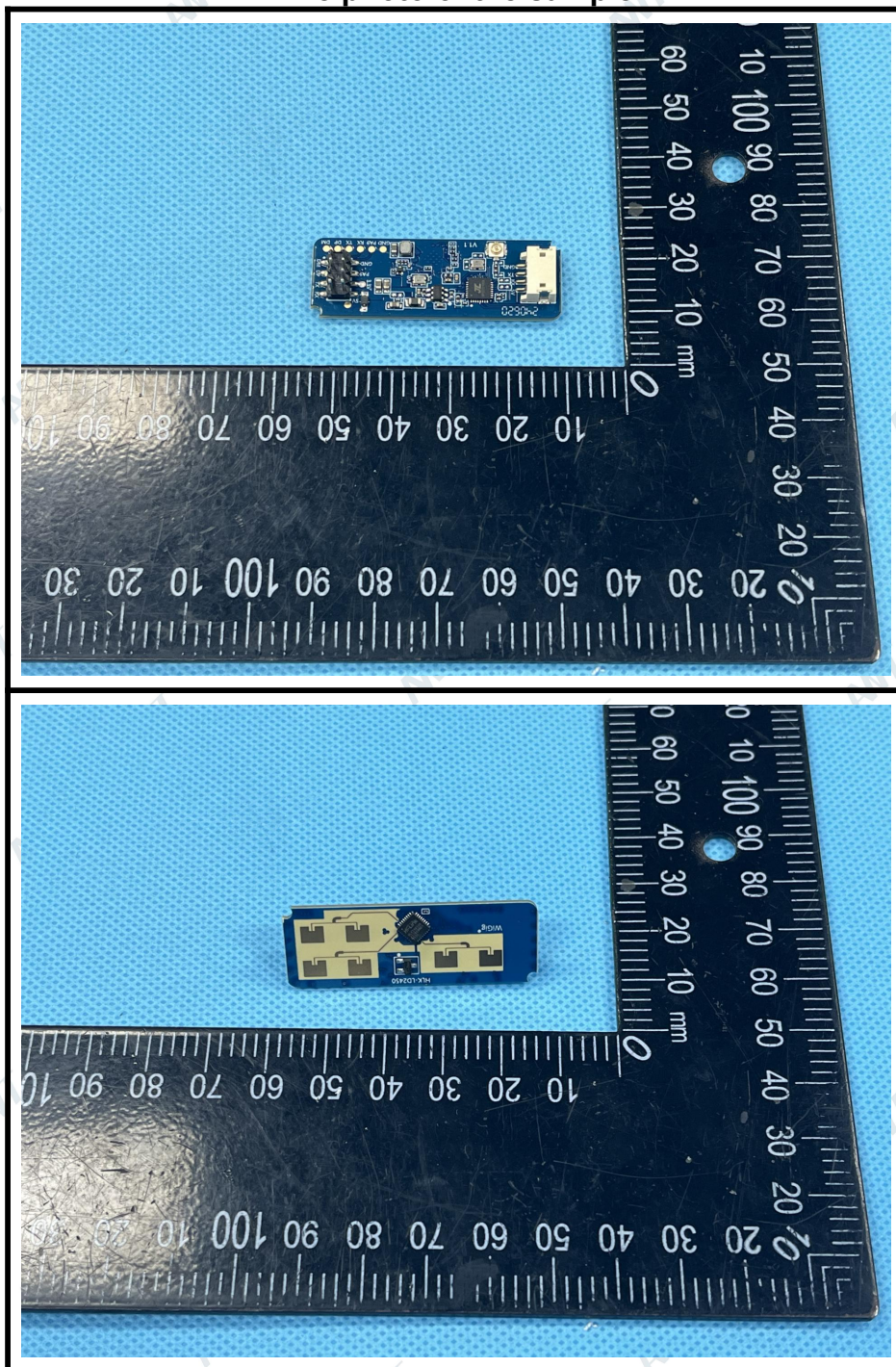


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The photo of the sample

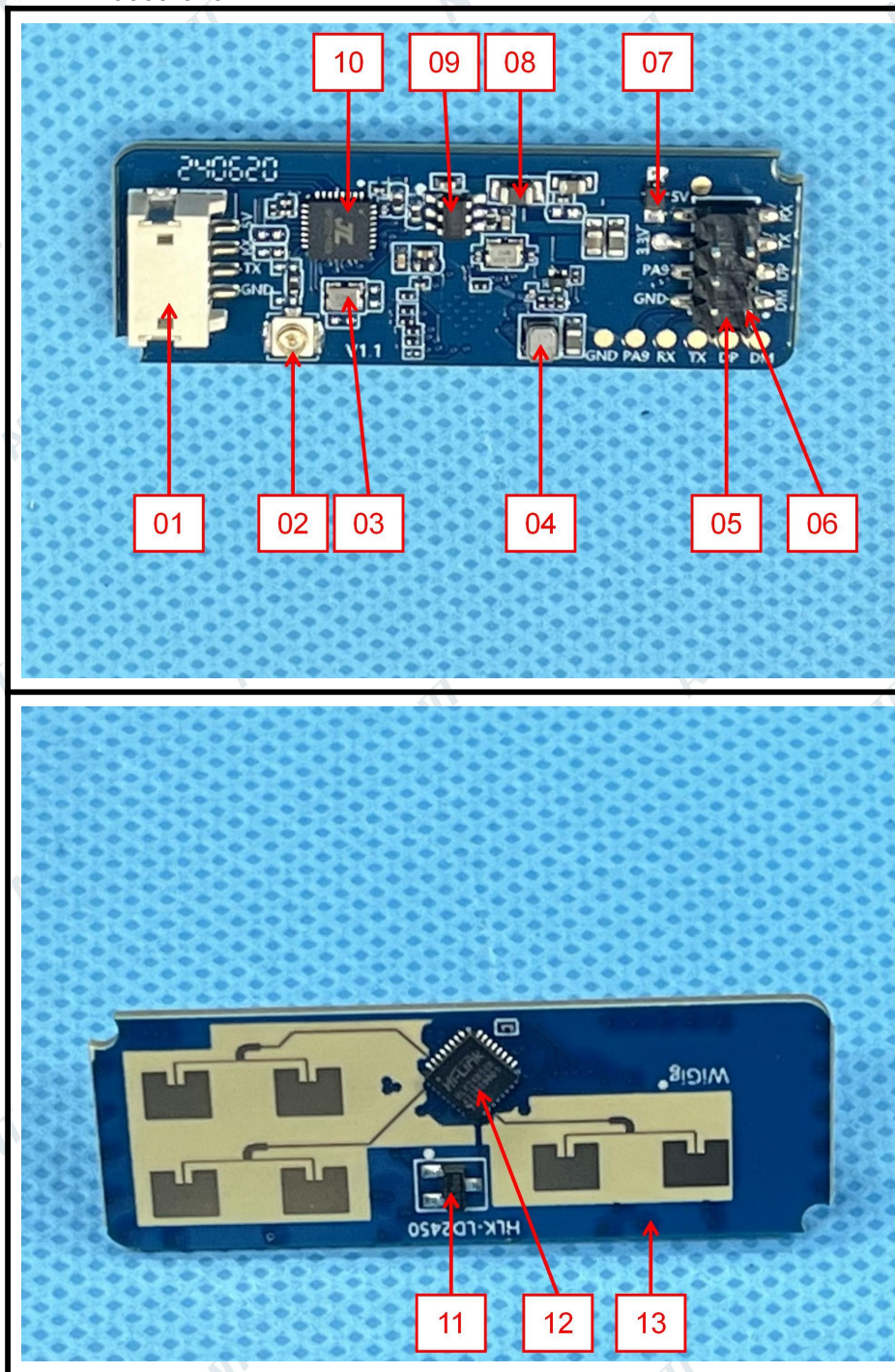




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ANT authenticate the photo on original report only



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Statement:

1. The test report is considered invalidated without approval signature, special seal on the perforation.
2. The result(s) shown in this report refer only to the sample(s) tested.
3. Without written approval of ANT, this report can't be reproduced except in full.
4. The sample(s) and sample information was/were provided by the client who should be responsible for the authenticity which ANT hasn't verified.
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*** End of Report ***