



# TEST REPORT

REPORT No.: CTB211105020CX

Date: Nov 9, 2021

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**Applicant:** Shenzhen Ai-Thinker Technology Co., Ltd

**Address:** 410, Block C, Huafeng Smart Innovation Port, Gushu 2nd Road, Gushu Community, Xixiang Street, Baoan District, Shenzhen, China

**Manufacturer:** Shenzhen Ai-Thinker Technology Co., Ltd

**Address:** 410, Block C, Huafeng Smart Innovation Port, Gushu 2nd Road, Gushu Community, Xixiang Street, Baoan District, Shenzhen, China

The following samples were submitted and identified on behalf of the clients as:

**Sample name:** Wi-Fi module

**Brands:**   安信可科技  
Ai-Thinker

**Model(s):** Hi-12F, Hi-12FL, Hi-07S, Hi-07SL

**Sample received date:** Nov 05, 2021





**Testing period:** Nov 05, 2021 to Nov 9, 2021

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

**Test Result:** Please refer to next page(s).

\*\*\*\*\*  
**Result Summary :**

Test Requested	Conclusion
European Directive 2011/65/EU and amendment (EU) 2015/863 on the restriction of the use of certain hazardous substances in electrical and electronic equipment	PASS

<b>Tested By:</b> 	<b>Check By:</b> 	<b>Approve By:</b>  
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**Date:** Nov 9, 2021

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**Shenzhen CTB Testing Technology Co., Ltd**

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## Test Method:

### A. Screening test by XRF spectroscopy

XRF screening limits for regulated elements according to IEC 62321-3-1:2013

Element	Screening limit / mg/kg		MDL	
	Polymers and metals	Composite material	Polymers	Other material
Pb	$BL \leq (700-3\sigma) < X < (1300+3\sigma)$ $\leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma)$ $\leq OL$	10mg/kg	50mg/kg
Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma)$ $\leq OL$	$LOD \leq (50-3\sigma) < X < (150+3\sigma)$ $\leq OL$	10mg/kg	50mg/kg
Hg	$BL \leq (700-3\sigma) < X < (1300+3\sigma)$ $\leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma)$ $\leq OL$	10mg/kg	50mg/kg
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$	10mg/kg	50mg/kg
Br	$BL \leq (300-3\sigma) < X$ (non-metal only)	$BL \leq (250-3\sigma) < X$	10mg/kg	50mg/kg

### B. Chemical Test

Test Item(s)	Test Method	Analysis Equipment(s)	MDL	Limit
Lead (Pb)	IEC 62321-5:2013	ICP-OES	10mg/kg	1000mg/kg
Cadmium (Cd)	IEC 62321-5:2013	ICP-OES	10mg/kg	100mg/kg
Mercury (Hg)	IEC 62321-4:2013+AMD1:2017	ICP-OES	10mg/kg	1000mg/kg
Hexavalent Chromium Cr(VI)	IEC 62321-7-1:2015 & IEC 62321-7-2:2017	UV-VIS	10mg/kg	1000mg/kg
Polybrominated Biphenyls (PBBs)	IEC 62321-6:2015	GC-MS	10mg/kg	1000mg/kg
Polybrominated Diphenyl Ethers (PBDEs)	IEC 62321-6:2015	GC-MS	10mg/kg	1000mg/kg
Dibutyl Phthalate	IEC 62321-8:2017	GC-MS	30mg/kg	1000mg/kg
Benzylbutyl Phthalate	IEC 62321-8:2017	GC-MS	30mg/kg	1000mg/kg
Bis-(2-ethylhexyl)Phthalate	IEC 62321-8:2017	GC-MS	30mg/kg	1000mg/kg
Diisobutyl phthalate	IEC 62321-8:2017	GC-MS	30mg/kg	1000mg/kg

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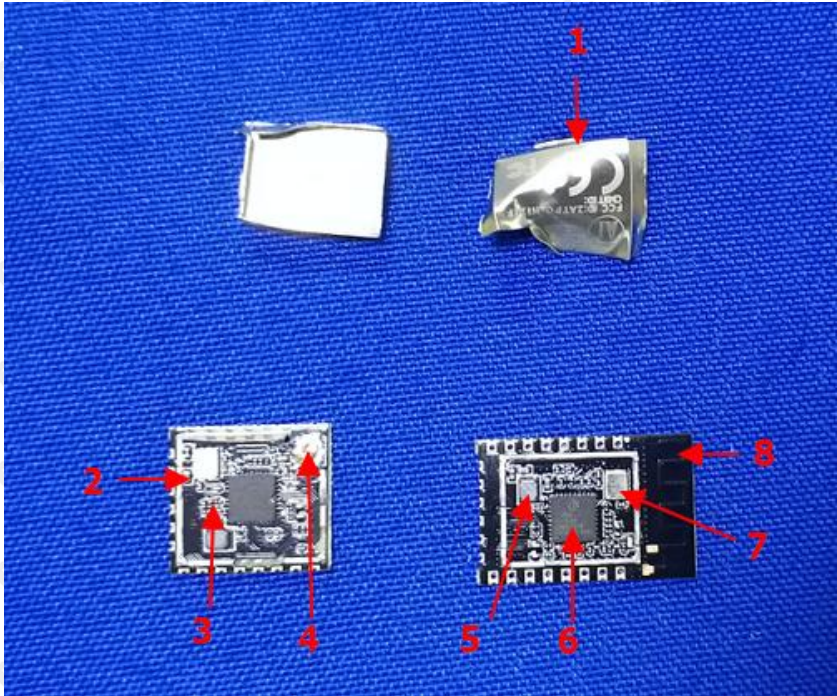
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## Tested material list

No.	Description	Photo(s)
1	Silver metal	
2	Solder	
3	SMD on PCB	
4	Socket	
5	Electronics	
6	IC	
7	Electronics	
8	PCB	



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## Test Result(s):

No.	XRF screening Result					Chemical confirm Result (mg/kg)	Remark	Conclusion
	Pb	Cd	Hg	Cr	Br			
1	BL	BL	BL	BL	N/A	---	---	PASS
2	BL	BL	BL	BL	N/A	---	---	PASS
3	BL	BL	BL	BL	BL	---	---	PASS
4	BL	BL	BL	BL	BL	---	---	PASS
5	BL	BL	BL	BL	BL	---	---	PASS
6	BL	BL	BL	BL	BL	---	---	PASS
7	BL	BL	BL	BL	BL	---	---	PASS
8	BL	BL	BL	BL	X	PBB&PBDE: N.D	---	PASS

Test Item(s)	Dibutyl Phthalate (DBP) ( mg/kg)	Benzylbutyl Phthalate (BBP) ( mg/kg)	Bis-(2-ethylhexyl) Phthalate (DEHP) ( mg/kg)	Diisobutyl phthalate (DIBP) ( mg/kg)	Conclusion
CAS No.	84-74-2	85-68-7	117-81-7	84-69-5	
Limit	1000	1000	1000	1000	
No.	Result (mg/kg)				
8	N.D	N.D	N.D	N.D	PASS

## Remark:

1. BL = below the limit
2. OL = over the limit
3. X = inconclusive, chemical confirm test is needed
4. NA = not applicable
5. mg/kg = milligram per kilogram = ppm
6. N.D = not detected
7. Negative = The Cr<sup>6+</sup> concentration is below the limit of quantification. The coating is considered a non- Cr<sup>6+</sup> based coating.

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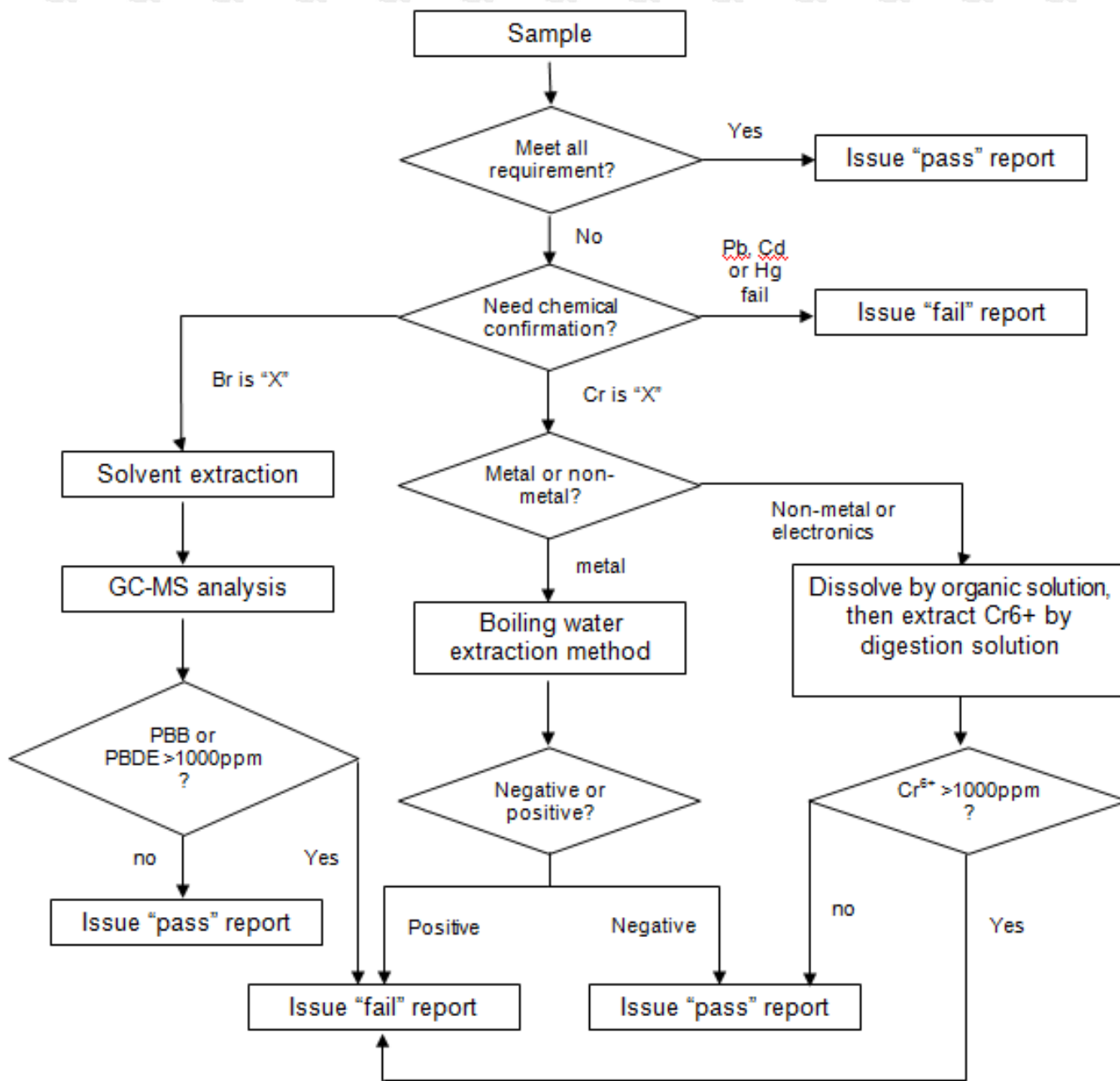
8. Positive = The  $\text{Cr}^{6+}$  concentration is above the limit of quantification and the statistical margin of error, The sample coating is considered to contain  $\text{Cr}^{6+}$ .
9. The limit for composite test should be divided by the mixed number.

Note:

1. When perform screening tests, it is the result on total Br while test item on restricted substances is PBBs/PBDEs, it is the result on total Cr while test item on restricted substances is  $\text{Cr}^{6+}$ .
2. Pb, Cd, Hg, Cr and Br results are obtained by EDXRF for primary screening, and further chemical testing by ICP-OES (for Cd, Pb, Hg), UV-VIS (for  $\text{Cr}^{6+}$ ) and GC-MS (for PBBs, PBDEs) is needed to be performed, if the concentration falls into the inconclusive area according to IEC 62321-3-1:2013.
3. For the XRF screening test for RoHS elements, the reading may be different to the actual content in the sample be of non-uniformity composition.

## Test flow chart

### 1. Pb/Cd/Hg/Cr<sup>6+</sup>/PBBs/PBDEs





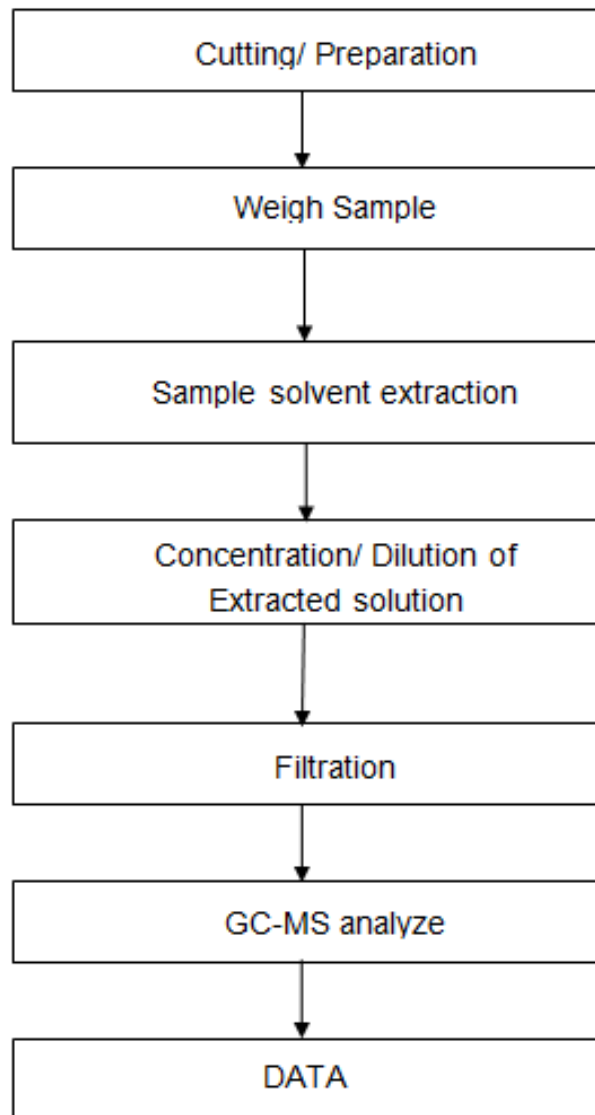
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## 2. Phthalate test flow chart







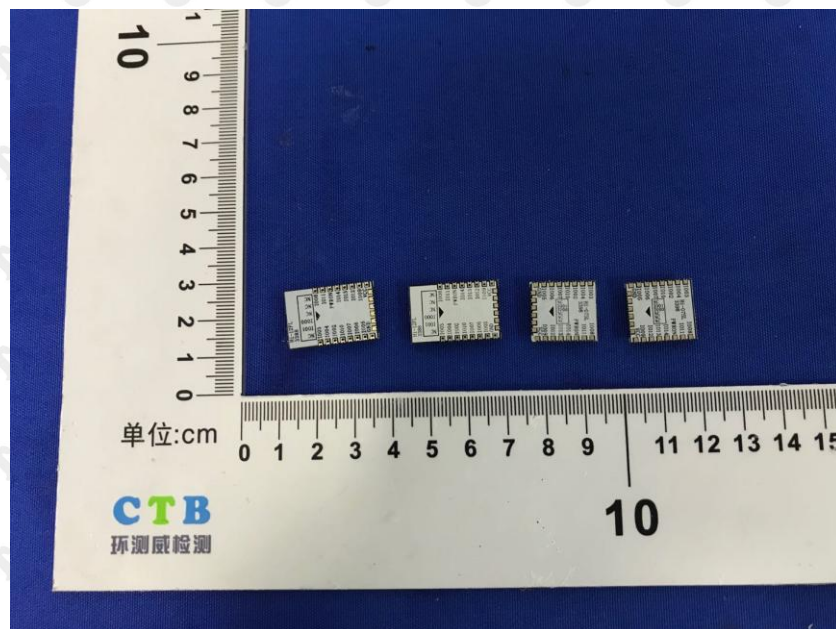
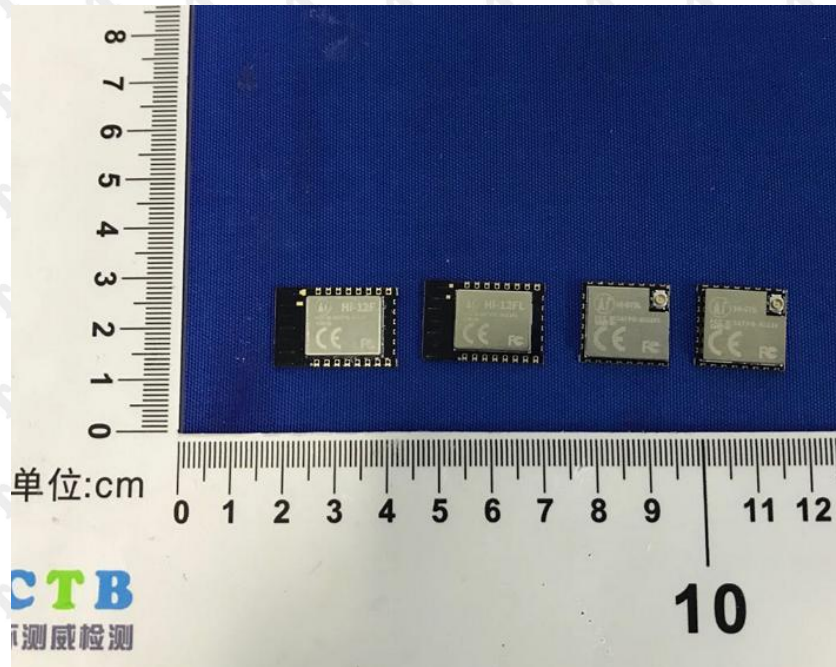
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## Photo documentation



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

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