



# TEST REPORT

**APPLICANT** : NiceRF Wireless Technology Co., Ltd.  
**PRODUCT NAME** : Wireless Module  
**MODEL NAME** : RF2401F20 /RF2401F27/RF2401PRO/RF2401  
**BRAND NAME** : **G-NiceRF**<sup>®</sup>  
**TEST REQUEST** : As required by client , based on the RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU to determine the Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis (2-ethylhexyl) phthalate (DEHP), Dibutyl phthalate (DBP), Butyl benzyl Phthalate (BBP), Diisobutyl phthalate (DIBP) content in the submitted samples  
**RECEIPT DATE** : 2019-07-02  
**TEST DATE** : 2019-07-04 to 2019-07-09  
**ISSUE DATE** : 2019-07-12  
**CONCLUSION** : Based on the performed tests on submitted sample(s), the results comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

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Xiaoshan Ni (Supervisor)

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# DIRECTORY

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<b>Change History</b>		
<b>Version</b>	<b>Date</b>	<b>Reason for change</b>
1.0	2019-07-12	First edition

# 1. Technical Information

Note: Provided by applicant

## 1.1 Applicant Information

<b>Applicant</b>	NiceRF Wireless Technology Co., Ltd.
<b>Applicant Address</b>	309-314, 3/F, Bldg A, Hongdu business building, Zone 43, Baoan Dist, Shenzhen, China
<b>Manufacturer</b>	NiceRF Wireless Technology Co., Ltd.
<b>Manufacturer Address</b>	309-314, 3/F, Bldg A, Hongdu business building, Zone 43, Baoan Dist, Shenzhen, China

# 2. Test Methods

## 2.1. Screening test by XRF spectroscopy

XRF screening limits in mg/kg for regulated elements according to IEC 62321-3-1:2013

Element	Polymer	Metal	Composite Materials
Cd	$P \leq 70 - 3\sigma < D < 130 + 3\sigma \leq F$	$P \leq 70 - 3\sigma < D < 130 + 3\sigma \leq F$	$P \leq 50 - 3\sigma < D < 150 + 3\sigma \leq F$
Pb	$P \leq 700 - 3\sigma < D < 1300 + 3\sigma \leq F$	$P \leq 700 - 3\sigma < D < 1300 + 3\sigma \leq F$	$P \leq 500 - 3\sigma < D < 1500 + 3\sigma \leq F$
Hg	$P \leq 700 - 3\sigma < D < 1300 + 3\sigma \leq F$	$P \leq 700 - 3\sigma < D < 1300 + 3\sigma \leq F$	$P \leq 500 - 3\sigma < D < 1500 + 3\sigma \leq F$
Br	$P \leq 300 - 3\sigma < D$	----	$P \leq 250 - 3\sigma < D$
Cr	$P \leq 700 - 3\sigma < D$	$P \leq 700 - 3\sigma < D$	$P \leq 500 - 3\sigma < D$

Note: P = PASS

F = FAIL

The symbol "D" marks the region where further investigation is necessary.

XRF testing results are only used for reference.

## 2.2. Chemical Test

Test item	Procedure	Apparatus	MDL(mg/kg)
Hg	With reference to IEC 62321-4-2013	ICP-OES	2
Cd & Pb	With reference to IEC 62321-5-2013	AAS or ICP-OES	2
Cr <sup>6+</sup>	With reference to IEC 62321-7-2:2017 (For Polymer and Electronics)	UV-VIS	2
	With reference to IEC 62321-7-1:2015 <sup>▲</sup> (For Plating on Metals)		0.1ug/cm <sup>2</sup>
PBBs & PBDEs	With reference to IEC 62321-6:2015	GC-MS	5
Phthalates (DBP,BBP,DEHP,DIBP)	With reference to IEC 62321-8:2017	GC-MS	10

### 3. Test Results and Sample Description

The results of XRF screening and chemical test (Unit: mg/kg)

No.	Sample No.	SAMPLE DESCRIPTION	SAMPLE MATERIAL	X-ray Screening		chemical test			Conclusion
				Element	Data	UV-Vis	ICP-OES	GC-MS	
1	A-1	METAL SHIELDING COVER	METAL	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	/				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
				DIBP					
2	A-2	IC	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	P				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
				DIBP					
		N.D.							
		N.D.							
		N.D.							
		N.D.							
3	A-3	IC	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	P				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
				DIBP					
		N.D.							
		N.D.							
		N.D.							
		N.D.							
4	A-4	CRYSTAL OSCILLATOR	METAL	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	/				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
				DIBP					



No.	Sample No.	SAMPLE DESCRIPTION	SAMPLE MATERIAL	X-ray Screening		chemical test			Conclusion
				Element	Data	UV-Vis	ICP-OES	GC-MS	
5	A-5	CAPACITOR	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	P				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
								N.D.	
								N.D.	
								N.D.	
								N.D.	
6	A-6	RESISTOR	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	P				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
								N.D.	
								N.D.	
								N.D.	
								N.D.	
7	A-7	SOLDERING TIN	METAL	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	/				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
8	A-8	PCB	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	D				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
								N.D.	
								N.D.	
								N.D.	
								N.D.	
								N.D.	
								N.D.	



No.	Sample No.	SAMPLE DESCRIPTION	SAMPLE MATERIAL	X-ray Screening		chemical test			Conclusion
				Element	Data	UV-Vis	ICP-OES	GC-MS	
9	A-9	METAL SHIELDING COVER	METAL	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	/				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
10	A-10	IC	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	P				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
			N.D.						
			N.D.						
			N.D.						
			N.D.						
11	A-11	IC	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	P				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
			N.D.						
			N.D.						
			N.D.						
			N.D.						
12	A-12	IC	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	P				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
			N.D.						
			N.D.						
			N.D.						
			N.D.						



No.	Sample No.	SAMPLE DESCRIPTION	SAMPLE MATERIAL	X-ray Screening		chemical test			Conclusion
				Element	Data	UV-Vis	ICP-OES	GC-MS	
13	A-13	CRYSTAL OSCILLATOR	METAL	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	/				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
14	A-14	AUDION	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	P				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
		N.D.							
		N.D.							
		N.D.							
		N.D.							
15	A-15	CAPACITOR	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	P				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
		N.D.							
		N.D.							
		N.D.							
		N.D.							
16	A-16	CAPACITOR	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	P				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
		N.D.							
		N.D.							
		N.D.							
		N.D.							



No.	Sample No.	SAMPLE DESCRIPTION	SAMPLE MATERIAL	X-ray Screening		chemical test			Conclusion
				Element	Data	UV-Vis	ICP-OES	GC-MS	
17	A-17	RESISTOR	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	P				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
								N.D.	
								N.D.	
								N.D.	
								N.D.	
18	A-18	RESISTOR	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	P				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
								N.D.	
								N.D.	
								N.D.	
								N.D.	
19	A-19	SOLDERING TIN	METAL	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	/				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
20	A-20	PCB	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	P				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
								N.D.	
								N.D.	
								N.D.	
								N.D.	





No.	Sample No.	SAMPLE DESCRIPTION	SAMPLE MATERIAL	X-ray Screening		chemical test			Conclusion
				Element	Data	UV-Vis	ICP-OES	GC-MS	
21	A-21	METAL SHIELDEING COVER	METAL	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	/				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
22	A-22	IC	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	P				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
			N.D.						
			N.D.						
			N.D.						
			N.D.						
23	A-23	CRYSTAL OSCILLATOR	METAL	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	/				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
24	A-24	CAPACITOR	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	P				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
			N.D.						
			N.D.						
			N.D.						
			N.D.						



No.	Sample No.	SAMPLE DESCRIPTION	SAMPLE MATERIAL	X-ray Screening		chemical test			Conclusion
				Element	Data	UV-Vis	ICP-OES	GC-MS	
25	A-25	RESISTOR	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	P				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
								N.D.	
								N.D.	
								N.D.	
								N.D.	
26	A-26	SOLDERING TIN	METAL	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	/				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
27	A-27	PCB	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	D				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
								N.D.	
								N.D.	
								N.D.	
								N.D.	
								N.D.	
								N.D.	
28	A-28	IC	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	P				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
DIBP									
								N.D.	
								N.D.	
								N.D.	
								N.D.	
								N.D.	



No.	Sample No.	SAMPLE DESCRIPTION	SAMPLE MATERIAL	X-ray Screening		chemical test			Conclusion	
				Element	Data	UV-Vis	ICP-OES	GC-MS		
29	A-29	CRYSTAL OSCILLATOR	METAL	Pb	P	/	/	/	Pass	
				Cd	P					
				Hg	P					
				Cr	P					
				Br	/					
				Cr <sup>6+</sup>						
				PBBs						
				PBDEs						
				DBP						
				BBP						
				DEHP						
				DIBP						
30	A-30	CAPACITOR	COMPOSITE	Pb	P	/	/	/	Pass	
				Cd	P					
				Hg	P					
				Cr	D					
				Br	P					
				Cr <sup>6+</sup>		N.D.				
				PBBs						
				PBDEs						
				DBP		N.D.				
				BBP		N.D.				
				DEHP		N.D.				
				DIBP		N.D.				
31	A-31	RESISTOR	COMPOSITE	Pb	P	/	/	/	Pass	
				Cd	P					
				Hg	P					
				Cr	P					
				Br	P					
				Cr <sup>6+</sup>						
				PBBs						
				PBDEs						
				DBP						N.D.
				BBP						N.D.
				DEHP						N.D.
				DIBP						N.D.
32	A-32	SOLDERING TIN	METAL	Pb	P	/	/	/	Pass	
				Cd	P					
				Hg	P					
				Cr	P					
				Br	/					
				Cr <sup>6+</sup>						
				PBBs						
				PBDEs						
				DBP						
				BBP						
				DEHP						
				DIBP						

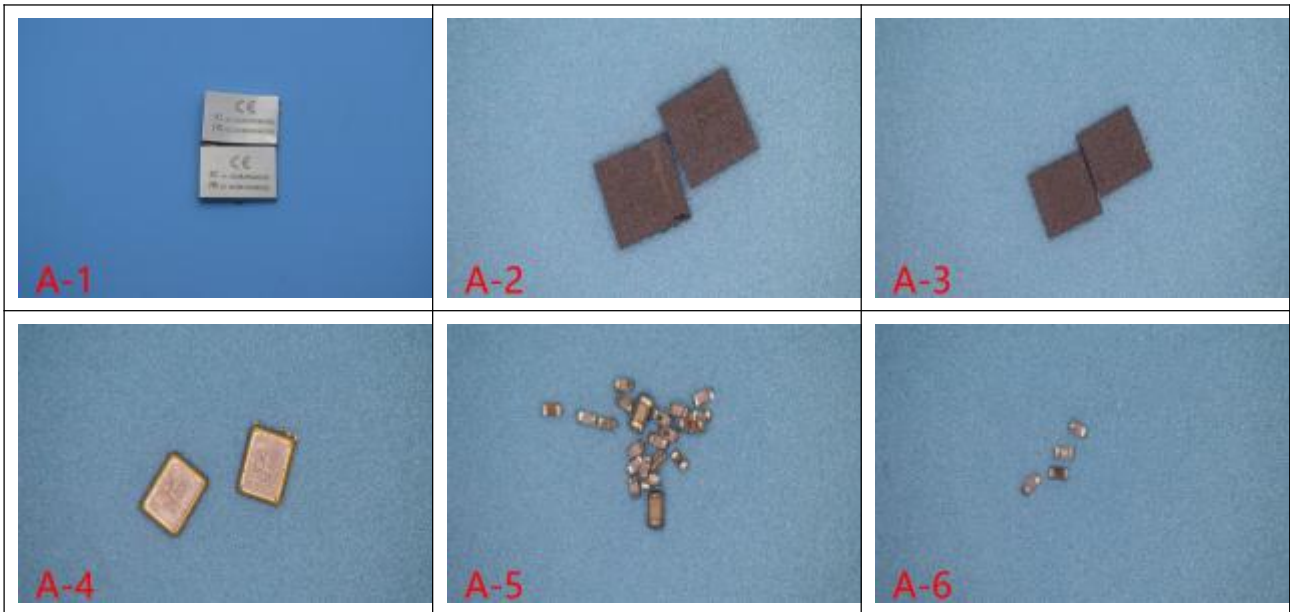
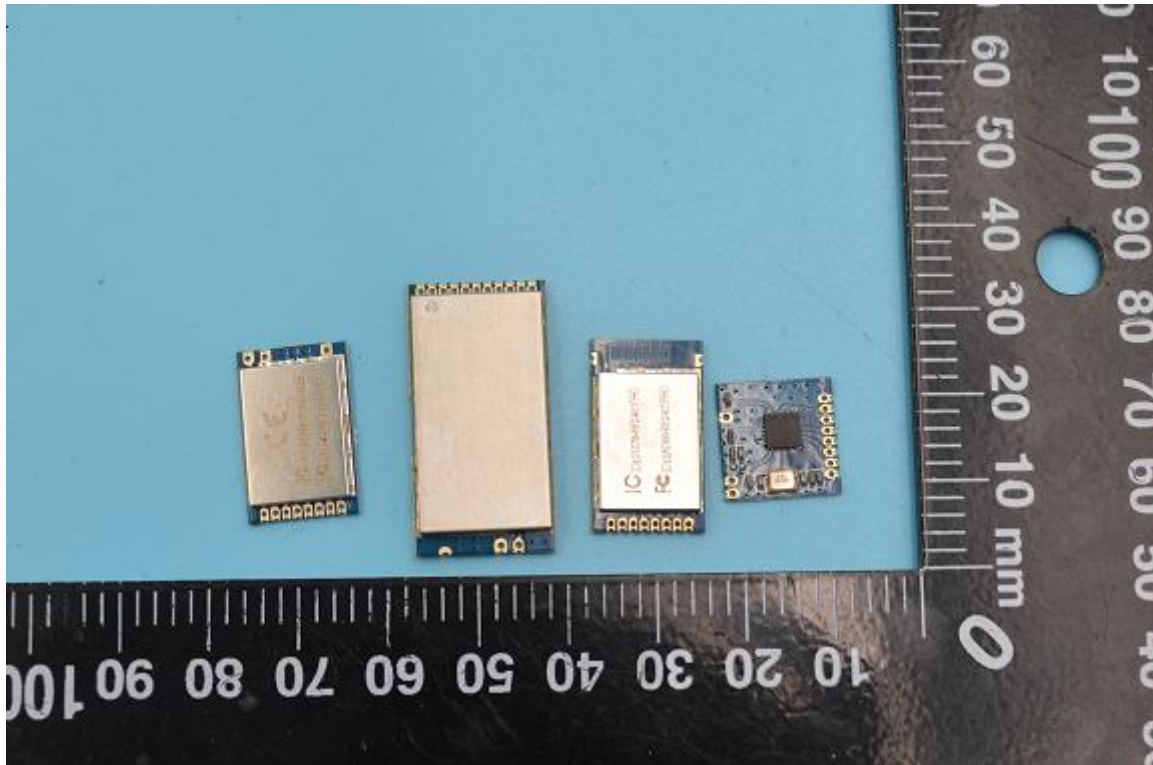


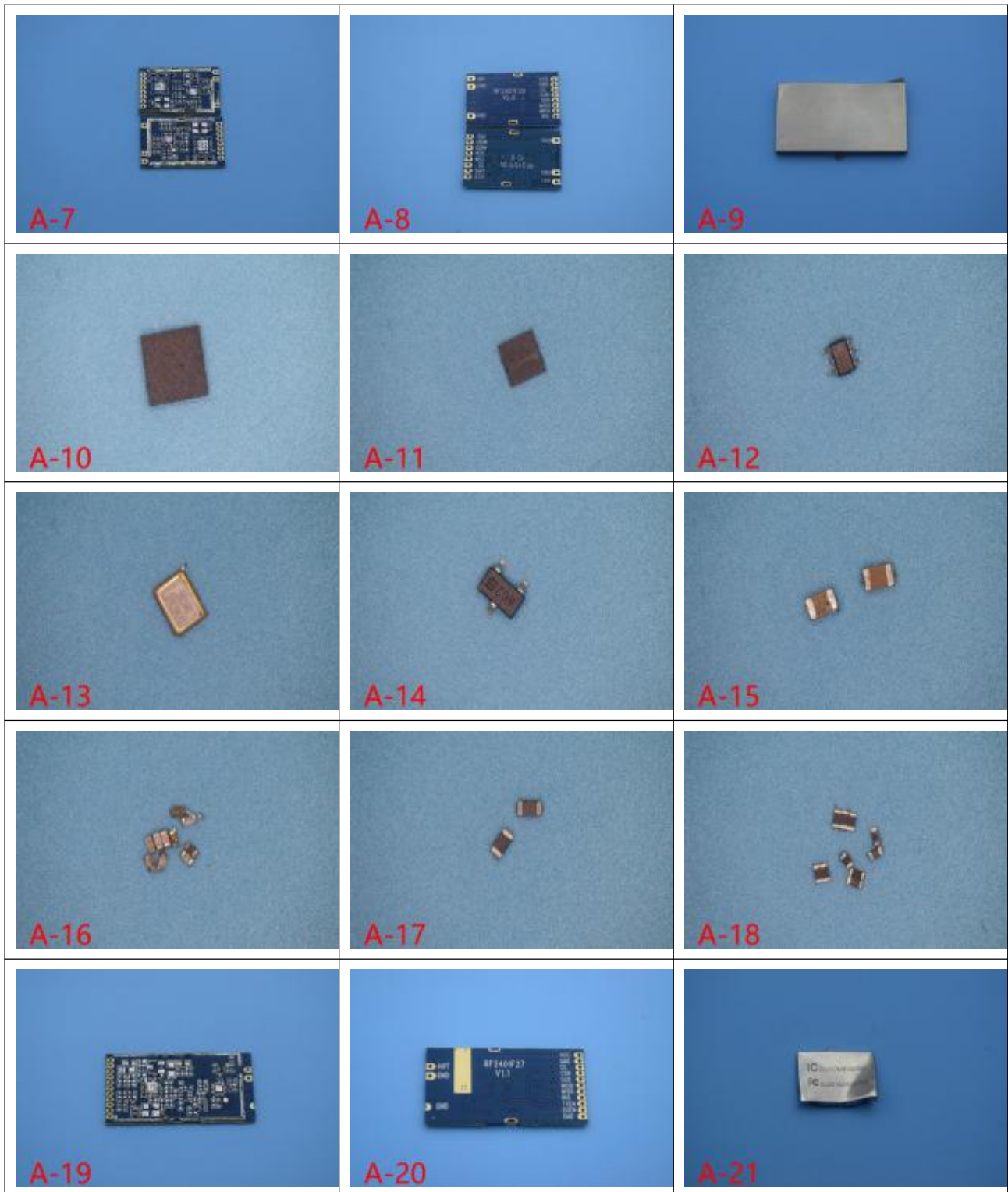
No.	Sample No.	SAMPLE DESCRIPTION	SAMPLE MATERIAL	X-ray Screening		chemical test			Conclusion
				Element	Data	UV-Vis	ICP-OES	GC-MS	
33	A-33	PCB	COMPOSITE	Pb	P	/	/	/	Pass
				Cd	P				
				Hg	P				
				Cr	P				
				Br	P				
				Cr <sup>6+</sup>					
				PBBs					
				PBDEs					
				DBP					
				BBP					
				DEHP					
				DIBP					

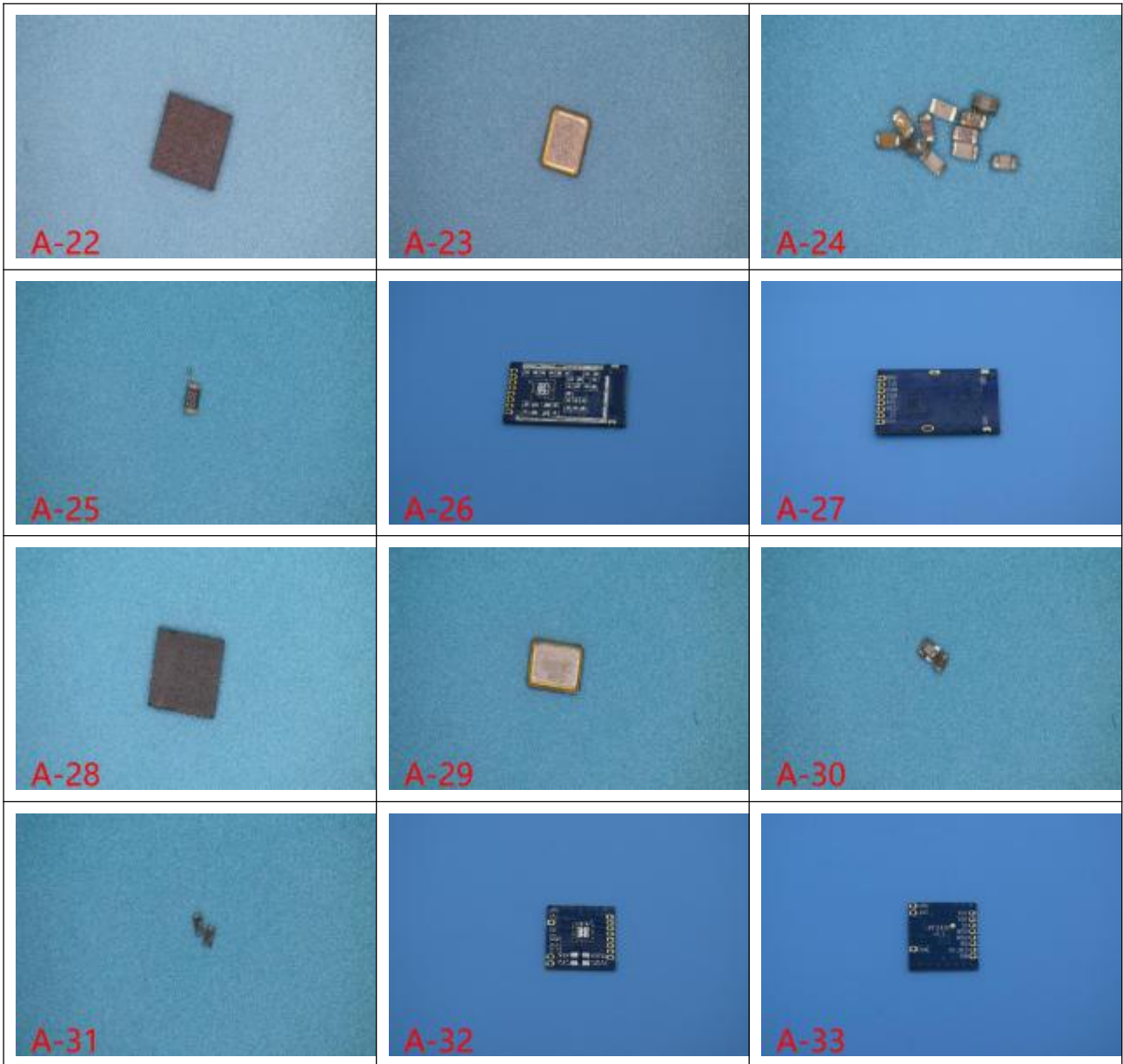
**Remark:**

- (1) mg/kg=ppm
- (2) N.D. = Not Detected (< MDL);
- (3)"/"= Not Conducted
- (4)MDL = Method Detection Limit
- (5) ^ = a. The sample is negative for Cr<sup>6+</sup> - the Cr<sup>6+</sup> concentration is below the limit 0.10ug/cm<sup>2</sup>. The coating is considered a non-Cr<sup>6+</sup> based coating.  
 b. The sample positive for Cr<sup>6+</sup> if the Cr<sup>6+</sup> concentration is greater than 0.13ug/cm<sup>2</sup>. The sample coating is considered to contain Cr<sup>6+</sup>.  
 c. The result between 0.10ug/cm<sup>2</sup> and 0.13ug/cm<sup>2</sup> is considered to be inconclusive unavoidable coating variations may influence the determination.

# Annex A Photographs of the EUT









## Annex B General Information

### 1.1 Identification of the Responsible Testing Laboratory

<b>Laboratory Name:</b>	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
<b>Laboratory Address:</b>	FL1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China
<b>Telephone:</b>	+86 755 36698555
<b>Facsimile:</b>	+86 755 36698525

### 1.2 Identification of the Responsible Testing Location

<b>Name:</b>	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
<b>Address:</b>	FL1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China

### 1.3 Test Equipments Utilized

No.	Equipment Name	Serial No.	Type	Manufacturer	Cal.Date	Cal.Due Date
1	X-Ray Fluorescence Spectroscopy(XRF)	0102	EDX-1800B	Skyray	2019.04.10	2020.04.09
2	gas chromatograph-mass spectrometer (GC-MS)	CN10617090	6890-5975I	Agilent	2019.04.10	2020.04.09
3	Visible Spectrophotometer	723S18011	DP-733S	Delp	2018.09.06	2019.09.05
4	IPC-OES	842320072001	iCAP7200	Thermo	2019.04.10	2020.04.09

\*\*\*\*\* END OF REPORT \*\*\*\*\*