



Test Report

Report No.: CX/2015/80136

Date: 2015/09/04

EMBEDIAN, INC.
4F-7, 432 KEELUNG RD., SEC.1, TAIPEI 11051, TAIWAN.

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

Sample Submitted By : EMBEDIAN, INC.
 Sample Description : SMARC COMPUTER ON MODULE
 Style/Item No. : SMARC-T335X-XXXXX(WHERE "X" MAY BE ANY ALPHANUMERIC CHARACTER, "I", "G" OR "-")
 Sample Receiving Date : 2015/08/21 and 2015/08/31
 Testing Period : 2015/08/21 to 2015/08/28 and 2015/08/31 to 2015/09/04

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

Conclusion : Based upon the performed tests on submitted samples, the test results comply with the limits of RoHS Directive 2011/65/EU.



Ellis Wei, Ph.D. Supervisor
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei

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1. Material Fraction Composition

Table 1 The results of XRF screening and chemical test (Unit: mg/kg)


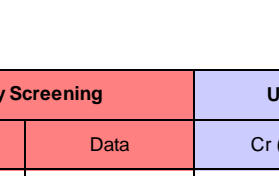
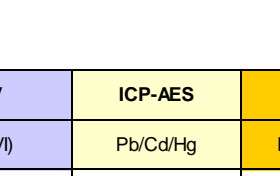
No.	Type of Components	Description	Figure	MDL Category	X-ray Screening		UV	ICP-AES	GC-MS	Note
					Element	Data	Cr (VI)	Pb/Cd/Hg	PBB/PBDE	
1	PCBA	1.1		Composite Material	Pb	---	---	---	---	Refer to Table 2
					Cd	---		---		
					Hg	---		---		
					Cr	---		---		
					Br	---		---		
					Cr(VI)	---		---		
					PBB	---		---		
					PBDE	---		---		
					BEIGE PLASTIC HOUSING	1.2				
	Cd	n.d.	---							
	Hg	n.d.	---							
	Cr	n.d.	---							
	Br	n.d.	---							
	Cr(VI)	---	---							
	SILVER COLORED METALLIC PIN	1.3		Metals	Pb	n.d.	---	---	---	
					Cd	n.d.		---		
					Hg	n.d.		---		
	Cr	n.d.	---							
Br	n.d.	---								
Cr(VI)	---	---								
PBB	---	---								
PBDE	---	---								

Table 2 The test results on the PCBA (CX/2015/80136-1.1, Top side and Bottom side) by point analysis (Unit: mg/kg)

Point Analysis	No.	Figure	Material Type	X-ray Screening		
				Element	Data	Note
	1		Composite Material	Pb	n.d.	
				Cd	n.d.	
				Hg	n.d.	
				Cr	n.d.	
				Br	n.d.	
	2		Composite Material	Pb	n.d.	
				Cd	n.d.	
				Hg	n.d.	
				Cr	n.d.	
				Br	n.d.	
	3		Composite Material	Pb	n.d.	
				Cd	n.d.	
			Hg	n.d.		
			Cr	n.d.		
			Br	n.d.		
4		Metals	Pb	n.d.		
			Cd	n.d.		
			Hg	n.d.		
			Cr	n.d.		
			Br	n.d.		

Point Analysis	No.	Figure	Material Type	X-ray Screening		
				Element	Data	Note
	5		Composite Material	Pb	n.d.	Refer to No.1 in Table 3
				Cd	n.d.	
				Hg	n.d.	
				Cr	n.d.	
				Br	310	
	6		Composite Material	Pb	n.d.	Refer to No.2 in Table 3
				Cd	n.d.	
				Hg	n.d.	
			Cr	n.d.		
			Br	152		
7		Composite Material	Pb	n.d.	Refer to No.2 in Table 3	
			Cd	n.d.		
			Hg	n.d.		
			Cr	n.d.		
			Br	270		
8		Composite Material	Pb	n.d.	Refer to No.2 in Table 3	
			Cd	n.d.		
			Hg	n.d.		
			Cr	n.d.		
			Br	n.d.		

Point Analysis	No.	Figure	Material Type	X-ray Screening		
				Element	Data	Note
	9		Composite Material	Pb	n.d.	
				Cd	n.d.	
				Hg	n.d.	
				Cr	n.d.	
	10		Composite Material	Pb	n.d.	
				Cd	n.d.	
				Hg	n.d.	
				Cr	176	
	11		Composite Material	Pb	n.d.	
				Cd	n.d.	
				Hg	n.d.	
				Cr	n.d.	
12		Composite Material	Pb	n.d.		
			Cd	n.d.		
			Hg	n.d.		
			Cr	n.d.		

Point Analysis	No.	Figure	Material Type	X-ray Screening		
				Element	Data	Note
	13		Composite Material	Pb	n.d.	Refer to No.3 in Table 3
				Cd	n.d.	
				Hg	n.d.	
				Cr	n.d.	
				Br	5670	
	14		Composite Material	Pb	n.d.	Refer to No.4 in Table 3
				Cd	n.d.	
				Hg	n.d.	
				Cr	n.d.	
				Br	282	
	15		Composite Material	Pb	n.d.	
				Cd	n.d.	
				Hg	n.d.	
				Cr	n.d.	
				Br	n.d.	
	16		Composite Material	Pb	n.d.	
			Cd	n.d.		
			Hg	n.d.		
			Cr	n.d.		
			Br	n.d.		


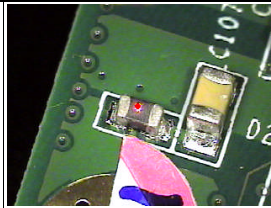
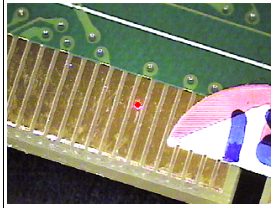
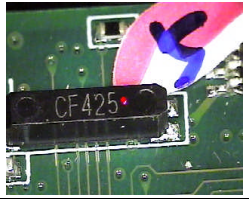
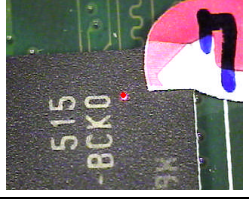
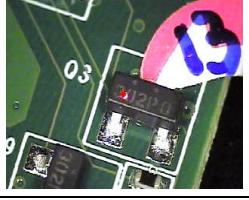
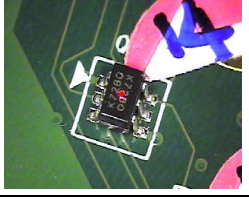
Point Analysis	No.	Figure	Material Type	X-ray Screening		
				Element	Data	Note
	17		Composite Material	Pb	n.d.	
				Cd	n.d.	
				Hg	n.d.	
				Cr	339	
				Br	n.d.	
	18		Composite Material	Pb	n.d.	
				Cd	n.d.	
				Hg	n.d.	
				Cr	n.d.	
				Br	n.d.	

Table 3 The confirming test results for point analysis on PCBA (Unit: mg/kg)

Type of Components	Description		Figure	MDL Category	Substance	UV	ICP-AES	GC-MS	Note
						Cr (VI)	Pb/Cd/Hg	PBB/PBDE	
	1	ELECTRONIC COMPONENT	Component Material	Pb		---	---		
				Cd					
				Hg					
				Cr					
				Br					
				Cr(VI)		---			n.d.
				PBB					n.d.
				PBDE					
	2	ELECTRONIC COMPONENT	Component Material	Pb			---		
				Cd					
				Hg					
				Cr					
				Br					
				Cr(VI)		---			n.d.
				PBB					n.d.
				PBDE					
	3	ELECTRONIC COMPONENT	Component Material	Pb			---		
				Cd					
				Hg					
				Cr					
				Br					
				Cr(VI)		---			n.d.
				PBB					n.d.
				PBDE					
	4	ELECTRONIC COMPONENT	Component Material	Pb			---		
				Cd					
				Hg					
				Cr					
				Br					
				Cr(VI)		---			n.d.
				PBB					n.d.
				PBDE					



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Test Item :	MDL (mg/kg)				XRF screening threshold (mg/kg)	Test method
	Category Element	Polymers	Composite Material	Metals		
XRF (X-ray fluorescence)	Pb	50	100	100	500	With reference to IEC 62321-3-1: 2013
	Cd	50	50	50	50	
	Hg	50	100	100	500	
	Cr	50	100	100	500	
	Br	50	100	n.a.	250	

Test Item (s):	Test method	MDL (mg/kg)	Facilities
Cr(VI)	With reference to IEC 62321: 2008 (For Polymers and Electronics)	2	UV
	With reference to IEC 62321: 2008 (For Coatings on Metals)	-*	-
Pb/Cd	With reference to IEC 62321-5: 2013	2	ICP-AES
Hg	With reference to IEC 62321-4: 2013	2	ICP-AES

Test Item (s):	Unit	Method	MDL (mg/kg)	
PBBs				
Monobromobiphenyl	mg/kg	With reference to IEC 62321-6: 2015. Determination of PBB and PBDE by GC/MS.	5	
Dibromobiphenyl	mg/kg		5	
Tribromobiphenyl	mg/kg		5	
Tetrabromobiphenyl	mg/kg		5	
Pentabromobiphenyl	mg/kg		5	
Hexabromobiphenyl	mg/kg		5	
Heptabromobiphenyl	mg/kg		5	
Octabromobiphenyl	mg/kg		5	
Nonabromobiphenyl	mg/kg		5	
Decabromobiphenyl	mg/kg		5	
PBDEs				
Monobromodiphenyl ether	mg/kg		5	
Dibromodiphenyl ether	mg/kg		5	
Tribromodiphenyl ether	mg/kg		5	
Tetrabromodiphenyl ether	mg/kg		5	
Pentabromodiphenyl ether	mg/kg		5	
Hexabromodiphenyl ether	mg/kg	5		
Heptabromodiphenyl ether	mg/kg	5		
Octabromodiphenyl ether	mg/kg	5		
Nonabromodiphenyl ether	mg/kg	5		
Decabromodiphenyl ether	mg/kg	5		

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1. mg/kg = ppm
2. n.d. = not detected or lower than MDL
3. MDL = Method detection limit
4. "---" = not conducted
5. n.a. = not applicable

The XRF result of Br for metal sample is conducted from semi-quantitative method of polymer. If the Br result is shown as n.d., the reading will be less than 100ppm.

6. " - " = Not Regulated
7. _*:

Spot-test:

Negative = Absence of Cr(VI) coating,

Positive = Presence of Cr(VI) coating;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result cannot be confirmed.)

Boiling-water-extraction:

Negative = Absence of Cr(VI) coating

Positive = Presence of Cr(VI) coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.

8. Magnetic samples can not be located on test position and there are breakdown risks on XRF equipment. Therefore, this kind of sample will be conducted chemical test directly.
9. If the test result by EDXRF analysis is greater than XRF screening threshold, the test sample should be further conducted by chemical test.

10/10

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