



Test Report

Report No: CX/2018/50198

Date: 2018/06/07



EMBEDIAN, INC.
9F-4, 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-FiMX6-XXXXXXX (where "X" may be any alphanumeric character, or "-")
 Sample Receiving Date : 2018/05/24
 Testing Period : 2018/05/24 to 2018/06/07

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

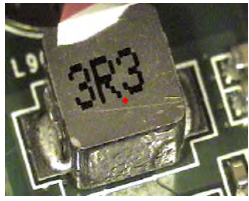

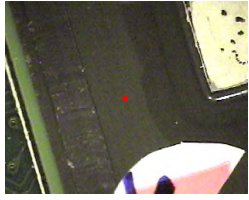
Conclusion : Based on the performed tests on submitted samples, the test results comply with the limits as set by RoHS Directive 2011/65/EU Annex II.


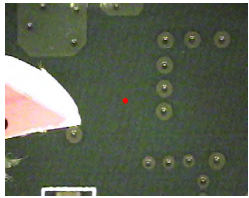
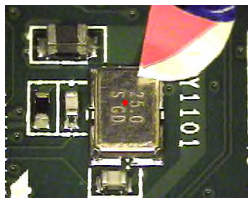



 Wendy Wei, Supervisor
 Signed for and on behalf of
 SGS TAIWAN LTD.
 Chemical Laboratory - Taipei


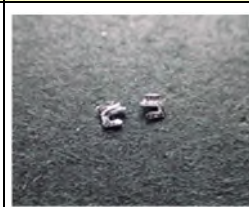


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1. Material Fraction Composition

Table 1 The results of XRF screening and chemical test

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	1.1.1 ELECTRONIC COMPONENT		Composite Material	Pb	n.d.	n.d.	---	---	
					Cd	n.d.		---		
					Hg	n.d.		---		
					Cr	1430				
					Br	n.d.				
					Cr(VI)					
					PBB			---		
					PBDE			---		
					1.1.2 ELECTRONIC COMPONENT			Composite Material		
	Cd	n.d.	---							
	Hg	n.d.	---							
	Cr	n.d.								
	Br	n.d.								
	Cr(VI)		---							
	1.1.3 ELECTRONIC COMPONENT		Composite Material	Pb	n.d.	---	---	---		
				Cd	n.d.		---			
				Hg	n.d.		---			
				Cr	n.d.					
			Br	n.d.						
			Cr(VI)		---					
			PBB			---				
			PBDE			---				

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	1.1.4	SOLDER		Metals	Pb	303		---		
						Cd	n.d.		---		
	Hg					n.d.	---				
	Cr					n.d.					
	Br					n.d.					
	Cr(VI)						---				
	PBB								---		
	PBDE			---							
	1.1.5	RAW PCB		Composite Material	Pb	n.d.		---			
					Cd	n.d.		---			
					Hg	n.d.		---			
					Cr	n.d.					
					Br	30100					
					Cr(VI)			---			
					PBB						n.d.
	PBDE			n.d.							
	1.1.6	ELECTRONIC COMPONENT		Composite Material	Pb	n.d.		---			
					Cd	n.d.		---			
					Hg	n.d.		---			
					Cr	n.d.					
					Br	418					
					Cr(VI)			---			
					PBB						n.d.
	PBDE			n.d.							
1.2	PCBA	1.2	BEIGE PLASTIC HOUSING		Polymers	Pb	n.d.		---		
						Cd	n.d.		---		
						Hg	n.d.		---		
						Cr	n.d.				
						Br	n.d.				
						Cr(VI)			---		
						PBB					
PBDE			---								

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		1.3	SILVERY METALLIC PIN		Metals	Pb	n.d.		---		
						Cd	n.d.		---		
						Hg	n.d.		---		
						Cr	n.d.				
						Br	n.d.				
						Cr(VI)			---		
		PBB			---						
		PBDE			---						
		1.4	SILVERY METALLIC PIN		Metals	Pb	n.d.		---		
						Cd	n.d.		---		
						Hg	n.d.		---		
						Cr	n.d.				
						Br	n.d.				
						Cr(VI)			---		
		PBB			---						
		PBDE			---						
		1.5	SILVERY METALLIC COVER		Metals	Pb	n.d.		---		
						Cd	n.d.		---		
Hg	n.d.					---					
Cr	n.d.										
Br	n.d.										
Cr(VI)						---					
PBB			---								
PBDE			---								



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

Test Item (s)	Test method	MDL	Unit
Cr(VI)	With reference to IEC 62321-7-2 (2017) and performed by UV-VIS. (For Polymers and Electronics)	8	mg/kg
	With reference to IEC 62321-7-1 (2015) and performed by UV-VIS. (For Coatings on Metals) (#2)	0.1	µg/cm ²
Pb/Cd	With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	mg/kg
Hg	With reference to IEC 62321-4 (2013) and performed by ICP-AES.	2	mg/kg

Test Item (s)	Unit	Method	MDL (mg/kg)	
PBBs				
Monobromobiphenyl	mg/kg	With reference to IEC 62321-6 (2015) and performed 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. MDL = Method detection limit
- 3. n.d. = not detected or lower than MDL
- 4. "---" = not conducted
- 5. n.a. = not applicable
- 6. " - " = Not Regulated
- 7. 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.
- 8. (#2):
 - a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 µg/cm².
The 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 µg/cm²).
The coating is considered a non-Cr(VI) based coating.
 - c. The result between 0.10 µg/cm² and 0.13 µg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.

- 9. 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.
- 10. If the test result by EDXRF analysis is greater than XRF screening threshold, the test sample should be further conducted by chemical test.

Mark	Description of Mark
*1	The sample weight is not enough to conduct chemical tests.
*2	The item is exempted from EU RoHS directive.
--*2	The item might be exempted from EU RoHS directive.
*3	The result was retested after regetting the same sample from client.
*4	The sample is provided separately from the client.
*5	Adopting modified IEC 62321-7-1(2015), due to the test area less than 25 cm ²
*6	The test item was tested by dry base.
*7	This sample follows requirement of client to conduct directly chemical tests.

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