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

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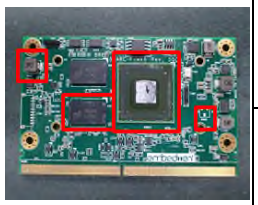
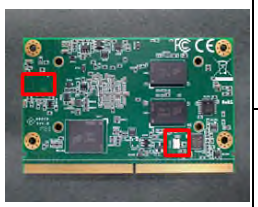
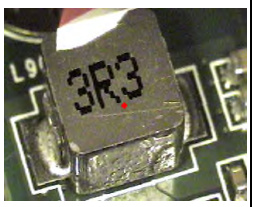
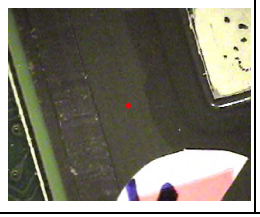
Test Result(s) : Please refer to next page(s).

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

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

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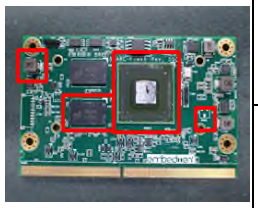
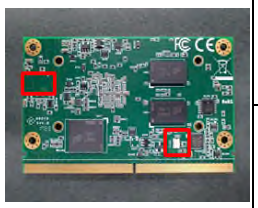
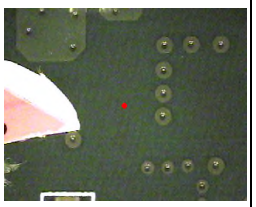
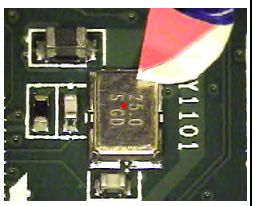
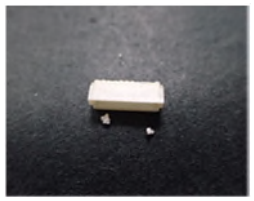
						Element	Data	Cr (VI)	Pb/Cd/Hg	PBB/PBDE	
1	PCBA  	1.1.4	SOLDER		Metals	Pb	303		---		
						Cd	n.d.		---		
						Hg	n.d.		---		
						Cr	n.d.				
						Br	n.d.				
						Cr(VI)		---			
						PBB				---	
						PBDE				---	
		1.1.5	RAW PCB		Composite Material	Pb	n.d.		---		
						Cd	n.d.		---		
						Hg	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.	
	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				---	

SGS Taiwan Ltd. 台灣檢驗科技股份有限公司 | 25, Wu Chyuan 7th Road, New Taipei Industrial Park, Wu Ku District, New Taipei City, Taiwan /新北市五股區新北產業園區五權七路25號 t+886 (02)2299 3939 f+886 (02)2299 3237 www.sgs.tw

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						Element	Data	Cr (VI)	Pb/Cd/Hg	PBB/PBDE	
1	PCBA  	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	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	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/cm²
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		With reference to IEC 62321-6 (2015) and performed by GC/MS.	
Monobromobiphenyl	mg/kg		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 cm²
*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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