



Test Report

Report No: CX/2018/50097

Date: 2018/05/29

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 : SINGLE BOARD COMPUTER
 Style/Item No. : SMART-BEE
 Sample Receiving Date : 2018/05/15
 Testing Period : 2018/05/15 to 2018/05/29

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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 with the exemption of Annex III according to the declaration from client:
 1. SILVERY METALLIC NUT (No.1.8) in Table 1: Lead (Pb)
 6(c), Copper alloy containing up to 4 % lead by weight" in Directive 2011/65/EU

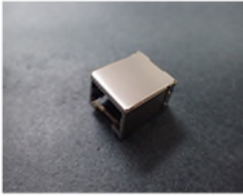
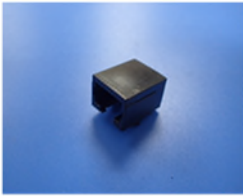


 Wendy Wei, Supervisor
 Signed for and on behalf of
 SGS TAIWAN LTD.
 Chemical Laboratory - Taipei










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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 SILVERY METALLIC FRAME		Metals	Pb	n.d.	---	---	---	
					Cd	n.d.				
					Hg	n.d.				
					Cr	n.d.				
					Br	n.d.				
					Cr(VI)					
					PBB					
					PBDE					
					1.2 BLACK PLASTIC HOUSING					
	Cd	n.d.								
	Hg	n.d.								
	Cr	n.d.								
	Br	46300								
	Cr(VI)									
	1.3 SILVERY METALLIC FRAME		Metals	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	1.4 BLACK PLASTIC HOUSING		Polymers	Pb	n.d.		---				
					Cd	n.d.						
	Hg				n.d.							
	Cr				n.d.							
	Br				37800							
	Cr(VI)					---						
	PBB										n.d.	
	PBDE										n.d.	
	1.5 SILVERY METALLIC FRAME		Metals	Pb	213					*5		
				Cd	n.d.							
				Hg	n.d.							
				Cr	184000							
				Br	n.d.							
				Cr(VI)							n.d.	
				PBB								---
				PBDE								---
	1.6 SILVERY METALLIC FRAME		Metals	Pb	n.d.					*5		
				Cd	n.d.							
				Hg	n.d.							
				Cr	179000							
Br				n.d.								
Cr(VI)					n.d.							
PBB											---	
PBDE											---	
1.7 BLACK PLASTIC HOUSING		Polymers	Pb	n.d.								
			Cd	n.d.								
			Hg	n.d.								
			Cr	155								
			Br	142000								
			Cr(VI)							---		
			PBB								n.d.	
			PBDE								n.d.	

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	1.8	SILVERY METALLIC NUT		Metals	Pb	17300		*2			
						Cd	n.d.					
	Hg					n.d.						
	Cr					n.d.						
	Br					n.d.						
	Cr(VI)						---					
	PBB											
	PBDE			---								
	1.9	BEIGE PLASTIC HOUSING		Polymers	Pb	n.d.		---				
					Cd	n.d.						
					Hg	n.d.						
					Cr	n.d.						
					Br	n.d.						
					Cr(VI)							---
					PBB							
	PBDE			---								
	1.10	BLACK PLASTIC HOUSING		Polymers	Pb	n.d.		---				
					Cd	n.d.						
					Hg	n.d.						
					Cr	n.d.						
					Br	55.8						
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 $\mu\text{g}/\text{cm}^2$.
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 $\mu\text{g}/\text{cm}^2$).
The coating is considered a non-Cr(VI) based coating.
 - c. The result between 0.10 $\mu\text{g}/\text{cm}^2$ and 0.13 $\mu\text{g}/\text{cm}^2$ 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.