



# Test Report

Report No.: CX/2015/40160

Date: 2015/05/20

ZEROPLUS TECHNOLOGY CO., LTD.  
2F., NO. 123, JIAN 8TH RD., ZHONGHE DIST., NEW TAIPEI CITY 23585,  
TAIWAN

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

Sample Submitted By : ZEROPLUS TECHNOLOGY CO., LTD.  
Sample Description : BUS EXPERT  
Sample Receiving Date : 2015/04/15  
Testing Period : 2015/04/15 to 2015/04/29

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


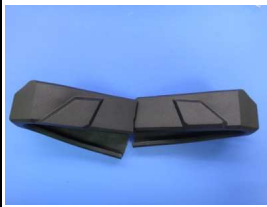


**Conclusion** : Based upon the performed tests on submitted samples, the test results comply with the limits of RoHS Directive 2011/65/EU Annex II with the exempted materials below according to the declaration from applicant:  
1. SILVER COLORED METALLIC NUT (No.1.10) in Table 1: Lead (Pb)  
("6(c), Copper alloy containing up to 4% lead by weight" in Directive 2011/65/EU)


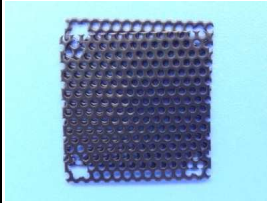


  
  
Ellis Wei, Ph.D., Supervisor  
Signed for and on behalf of  
SGS TAIWAN LTD.  
Chemical Laboratory - Taipei

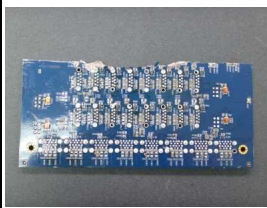
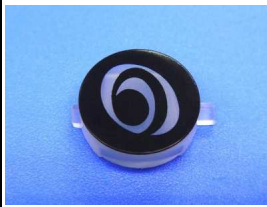

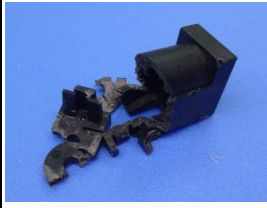
### 1. Material Fraction Composition








Table 1 The results of XRF screening and chemical test (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	CASE	1.1 BLACK/SILVER COLORED METALLIC PAD		Metals	Pb	n.d.		---		
					Cd	n.d.		---		
					Hg	n.d.		---		
					Cr	n.d.				
					Br	n.d.				
					Cr(VI)			---		
					PBB			---		
					PBDE			---		
					1.2 BLACK/SILVER COLORED METALLIC CASE			Metals		
	Cd	n.d.	---							
	Hg	n.d.	---							
	Cr	n.d.								
	Br	n.d.								
	Cr(VI)		---							
	PBB		---							
	PBDE		---							
	1.3 BLACK/SILVER COLORED METALLIC PLATE		Metals	Pb			n.d.			---
				Cd	n.d.	---				
Hg				n.d.	---					
Cr				514						
Br				n.d.						
Cr(VI)					Negative					
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	CASE	1.4	BLACK METALLIC SCREW		Metals	Pb	n.d.		---		
						Cd	n.d.		---		
						Hg	n.d.		---		
						Cr	n.d.				
						Br	n.d.				
						Cr(VI)			---		
						PBB			---		
	PBDE		---								
	CASE	1.5	BLACK POLYMER SHEET		Polymers	Pb	n.d.		---		
						Cd	n.d.		---		
						Hg	1050		570		
						Cr	n.d.				
						Br	n.d.				
						Cr(VI)			---		
						PBB			---		
	PBDE		---								
	CASE	1.6	SILVER COLORED LABEL WITH BLACK PRINT		Polymers	Pb	n.d.		---		
						Cd	n.d.		---		
						Hg	n.d.		---		
						Cr	n.d.				
						Br	n.d.				
Cr(VI)							---				
PBB							---				
PBDE		---									
CASE	1.7	LENS		Polymers	Pb	n.d.		---			
					Cd	n.d.		---			
					Hg	n.d.		---			
					Cr	n.d.					
					Br	n.d.					
					Cr(VI)			---			
					PBB			---			
PBDE		---									


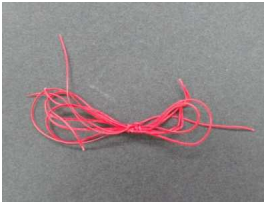






No.	Type of Components	Description		Figure	MDL Category	X-ray Screening		UV	ICP-AES	GC-MS	Note	
						Element	Data	Cr (VI)	Pb/Cd/Hg	PBB/PBDE		
1	CASE	1.8	TRANSLUCENT PLASTIC STICK		Polymers	Pb	n.d.		---			
						Cd	n.d.		---			
		Hg	n.d.			---						
		Cr	n.d.									
							Br	n.d.				
							Cr(VI)	---				
							PBB			---		
							PBDE			---		
			1.9	BLACK METALLIC MESH	Metals	Pb	n.d.		---			
	Cd					n.d.	---					
	Hg					n.d.	---					
	Cr					405						
						Br	n.d.					
						Cr(VI)	---					
						PBB			---			
						PBDE			---			
		1.10	SILVER COLORED METALLIC NUT	Metals	Pb	21700				*2		
Cd					n.d.	---						
Hg					n.d.	---						
Cr					n.d.							
						Br	n.d.					
						Cr(VI)	---					
						PBB			---			
						PBDE			---			
		1.11	BRASS METALLIC SCREW	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	
2	PCBA	2.1	PCBA		Composite Material	Pb	---	n.d.	58	n.d.	
	Cd					---	n.d.				
	Hg					---	n.d.				
	Cr					---					
	Br					---					
	Cr(VI)										
	PBB										
	PBDE										
	PCBA	2.2	TRANSLUCENT PLASTIC BUTTON WITH BLACK PRINT		Polymers	Pb	n.d.	---	---	---	
	Cd					n.d.	---				
	Hg					n.d.	---				
	Cr					n.d.					
	Br					n.d.					
	Cr(VI)										
	PBB										
	PBDE										
PCBA	2.3	BLACK PLASTIC HOUSING		Polymers	Pb	n.d.	---	---	---		
Cd					n.d.	---					
Hg					n.d.	---					
Cr					n.d.						
Br					52400						
Cr(VI)											
PBB											
PBDE											
PCBA	2.4	BLACK 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	
2	PCBA	2.5	SILVER COLORED METALLIC PIN		Metals	Pb	n.d.		---		
						Cd	n.d.		---		
						Hg	n.d.		---		
						Cr	n.d.				
						Br	n.d.				
						Cr(VI)			---		
						PBB					
	PBDE										
		2.6	BLUE PLASTIC HOUSING		Polymers	Pb	n.d.		---		
						Cd	n.d.		---		
						Hg	n.d.		---		
						Cr	n.d.				
						Br	43000				
						Cr(VI)			---		
						PBB					
	PBDE										
	2.7	WHITE PLASTIC HOUSING		Polymers	Pb	n.d.		---			
					Cd	n.d.		---			
					Hg	n.d.		---			
					Cr	n.d.					
					Br	52100					
					Cr(VI)			---			
					PBB						
PBDE											
	2.8	BLUE PLASTIC HOUSING		Polymers	Pb	n.d.		---			
					Cd	n.d.		---			
					Hg	n.d.		---			
					Cr	n.d.					
					Br	41600					
					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		
2	PCBA 	2.9	SILVER COLORED METALLIC TUBE 	Metals	Pb	n.d.		---	---			
					Cd	n.d.						
					Hg	n.d.						
					Cr	n.d.						
					Br	n.d.						
					Cr(VI)							
					PBB							
					PBDE							
3	FAN 	3.1	SILVER COLORED LABEL WITH GREEN PRINT 	Polymers	Pb	n.d.		---	---			
					Cd	n.d.						
					Hg	n.d.						
					Cr	n.d.						
					Br	n.d.						
					Cr(VI)							
	PBB											
	PBDE											
	3.2	BLACK PLASTIC FRAME 	3.2	BLACK PLASTIC FRAME	Polymers	Pb	n.d.		---	---		
						Cd	n.d.					
						Hg	n.d.					
						Cr	n.d.					
						Br	89800					
						Cr(VI)						
	PBB											
	PBDE											
	3.3	BLACK PLASTIC JACKET 	3.3	BLACK PLASTIC JACKET	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	
3	FAN 	3.4	RED PLASTIC JACKET		Polymers	Pb	n.d.		---		
	Cd					n.d.	---				
						Hg	n.d.		---		
						Cr	n.d.				
						Br	n.d.				
						Cr(VI)		---			
						PBB				---	
						PBDE				---	
		3.5	WHITE PLASTIC HOUSING		Polymers	Pb	n.d.		---		
	Cd					n.d.	---				
						Hg	n.d.		---		
						Cr	n.d.				
						Br	n.d.				
						Cr(VI)		---			
						PBB				---	
						PBDE				---	
4	ACCESSORY 	4.1	BLACK PLASTIC TUBE		Polymers	Pb	n.d.		---		
	Cd					n.d.	---				
						Hg	n.d.		---		
						Cr	n.d.				
						Br	n.d.				
						Cr(VI)		---			
						PBB				---	
						PBDE				---	
		4.2	BLACK PLASTIC JACKET		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	
4	ACCESSORY	4.3	WHITE PLASTIC JACKET		Polymers	Pb	n.d.		---		
						Cd	n.d.		---		
						Hg	n.d.		---		
						Cr	n.d.				
						Br	n.d.				
						Cr(VI)			---		
						PBB			---		
	PBDE		---								
		4.4	BLACK PLASTIC HOUSING		Polymers	Pb	n.d.		---		
						Cd	n.d.		---		
						Hg	n.d.		---		
						Cr	n.d.				
						Br	22900				
						Cr(VI)			---		
						PBB			n.d.		
	PBDE		n.d.								
		4.5	BLACK PLASTIC HOUSING		Polymers	Pb	n.d.		---		
						Cd	n.d.		---		
						Hg	n.d.		---		
						Cr	n.d.				
Br						n.d.					
Cr(VI)							---				
PBB							---				
PBDE		---									
	4.6	SILVER COLORED METALLIC CLAMP		Metals	Pb	382		---			
					Cd	n.d.		---			
					Hg	n.d.		---			
					Cr	136000					
					Br	n.d.					
					Cr(VI)			Negative			
					PBB			---			
PBDE		---									



# Test Report

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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)	
<b>PBBs</b>				
Monobromobiphenyl	mg/kg	With reference to IEC 62321: 2008. 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	
<b>PBDEs</b>				
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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## Test Report

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Mark	Description of Mark
*1	The sample weight is not enough to conduct chemical tests.
*2	The item is exempted from RoHS directive.
--*2	The item might be exempted from RoHS directive.
*3	The result was retested after regetting the same sample from client.
*4	The sample is provided separately from the client.

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 cm<sup>2</sup> 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.

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