



# Test Report

Report No.: CX/2017/80258

Date: 2017/11/13

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 : LOGIC ANALYZER (邏輯分析儀)  
 Style/Item No. : LAP EDUCATOR  
 Sample Receiving Date : 2017/08/18 and 2017/09/05  
 Testing Period : 2017/08/18 to 2017/09/08

**Test Result(s)** : Please refer to following pages.

**Conclusion** : Based upon the performed tests on submitted samples, the test results comply with the limits of RoHS Directive 2011/65/EU and amending Directive (EU) 2015/863 with the exempted materials below according to the declaration from applicant:

- ELECTRONIC COMPONENT (No.2.5) in Table 1: Lead (Pb)  
 ("7(a), Lead in high melting temperature type solders (i.e. lead- based alloys containing 85 % by weight or more lead)" in Directive 2011/65/EU)

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



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## Test Report



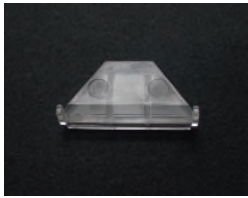



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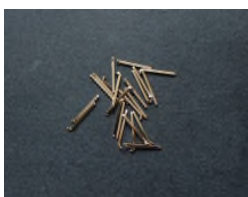
Date: 2017/11/13







### 1. Material Fraction Composition



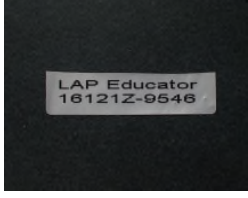



Table 1 The results of XRF screening and chemical test



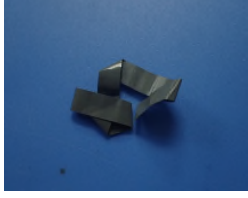



No.	Type of Components	Description	Figure	MDL Category	X-ray Screening		UV	ICP-AES	GC-MS	Other Chemical Test	Note	
					Element	Data	Cr (VI)	Pb/Cd/Hg	PBB/PBDE			
1	CASE	1.1	WHITE PLASTIC COVER		Polymers	Pb	n.d.		---		Refer to Table 3	
						Cd	n.d.		---			
						Hg	n.d.		---			
						Cr	n.d.					
						Br	n.d.					
						Cr(VI)			---			
						PBB			---			
						PBDE			---			
						CASE	1.2		WHITE LABEL WITH COLORFUL PRINT			
	Cd	n.d.	---									
	Hg	n.d.	---									
	Cr	n.d.										
	Br	n.d.										
	Cr(VI)		---									
	PBB		---									
	PBDE		---									
	CASE	1.3	SILVERY LABEL WITH BLACK PRINT		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	Other Chemical Test	Note	
						Element	Data	Cr (VI)	Pb/Cd/Hg	PBB/PBDE			
1	CASE	1.4	WHITE PLASTIC COVER		Polymers	Pb	n.d.		---				
						Cd	n.d.		---				
						Hg	n.d.		---				
						Cr	n.d.						
						Br	n.d.						
						Cr(VI)			---				
						PBB							
						PBDE							
		1.5	TRANSPARENT PLASTIC COVER		Polymers	Pb	n.d.		---			Refer to Table 3	
						Cd	n.d.		---				
						Hg	n.d.		---				
						Cr	n.d.						
						Br	n.d.						
						Cr(VI)			---				
						PBB							
						PBDE							
		1.6	BLACK PAD		Polymers	Pb	n.d.		---			Refer to Table 3	
						Cd	n.d.		---				
						Hg	n.d.		---				
						Cr	n.d.						
						Br	n.d.						
						Cr(VI)			---				
						PBB							
						PBDE							
		1.7	BLACK METALLIC SCREW		Metals	Pb	n.d.		---				
						Cd	n.d.		---				
						Hg	n.d.		---				
						Cr	354						
Br						n.d.							
Cr(VI)							---						
PBB													
PBDE													

No.	Type of Components	Description		Figure	MDL Category	X-ray Screening		UV	ICP-AES	GC-MS	Other Chemical Test	Note
						Element	Data	Cr (VI)	Pb/Cd/Hg	PBB/PBDE		
2	PCBA	2.1	PCBA		Composite Material	Pb	---	n.d.	3.34	n.d.	Refer to Table 3	Refer to Table 2
						Cd	---		n.d.			
						Hg	---		n.d.			
						Cr	---					
						Br	---					
						Cr(VI)						
						PBB						
						PBDE						
		2.2	ELECTRONIC COMPONENT		Composite Material	Pb	n.d.	---	---	---	Refer to Table 3	
						Cd	n.d.		---			
						Hg	n.d.		---			
						Cr	n.d.					
						Br	n.d.					
						Cr(VI)						
						PBB						
						PBDE						
	2.3	BLACK PLASTIC HOUSING		Polymers	Pb	n.d.	---	---	---	Refer to Table 3		
					Cd	n.d.		---				
					Hg	n.d.		---				
					Cr	n.d.						
					Br	147						
					Cr(VI)							
					PBB							
					PBDE							
	2.4	GOLDEN METALLIC PIN		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	Other Chemical Test	Note	
						Element	Data	Cr (VI)	Pb/Cd/Hg	PBB/PBDE			
2	PCBA	2.5	ELECTRONIC COMPONENT		Composite Material	Pb	89800	n.d.	Pb/Cd/Hg	*2			
						Cd	n.d.		---				
						Hg	n.d.		---				
						Cr	886						
						Br	n.d.						
						Cr(VI)							
						PBB			---				
						PBDE			---				
		2.6	SILVERY METALLIC COVER		Metals	Pb	n.d.	n.d.	Pb/Cd/Hg	---			*5
						Cd	n.d.		---				
						Hg	n.d.		---				
						Cr	100000						
						Br	n.d.						
						Cr(VI)							
						PBB			---				
						PBDE			---				
	2.7	ELECTRONIC COMPONENT		Composite Material	Pb	n.d.	---	Pb/Cd/Hg	---				
					Cd	n.d.		---					
					Hg	n.d.		---					
					Cr	n.d.							
					Br	n.d.							
					Cr(VI)								
					PBB			---					
					PBDE			---					
	2.8	GRAY CORE FRAME		Composite Material	Pb	n.d.	---	Pb/Cd/Hg	---				
					Cd	n.d.		---					
					Hg	n.d.		---					
					Cr	122							
					Br	n.d.							
					Cr(VI)								
					PBB			---					
					PBDE			---					

No.	Type of Components	Description		Figure	MDL Category	X-ray Screening		UV	ICP-AES	GC-MS	Other Chemical Test	Note	
						Element	Data	Cr (VI)	Pb/Cd/Hg	PBB/PBDE			
2	PCBA	2.9	COPPER METALLIC COIL		Metals	Pb	n.d.		---				
						Cd	n.d.		---				
						Hg	n.d.		---				
						Cr	101						
						Br	n.d.						
						Cr(VI)			---				
						PBB							
	PBDE			---									
		2.10	SILVERY LABEL WITH BLACK PRINT		Polymers	Pb	n.d.		---				
						Cd	n.d.		---				
						Hg	n.d.		---				
						Cr	n.d.						
						Br	63.3						
						Cr(VI)			---				
						PBB							
	PBDE			---									
	2.11	BROWN POLYMER JACKET WITH WHITE PRINT		Polymers	Pb	n.d.		---					
					Cd	n.d.		---					
					Hg	n.d.		---					
					Cr	n.d.							
					Br	310							
					Cr(VI)			---					
					PBB								n.d.
PBDE			n.d.										
	2.12	SILVERY METALLIC COVER		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	Other Chemical Test	Note	
						Element	Data	Cr (VI)	Pb/Cd/Hg	PBB/PBDE			
2	PCBA	2.13	BLACK PAD		Polymers	Pb	n.d.		---				
						Cd	n.d.		---				
						Hg	n.d.		---				
						Cr	n.d.						
						Br	128						
						Cr(VI)			---				
						PBB							
	PBDE			---									
		2.14	GRAY METALLIC FOIL		Metals	Pb	n.d.		---				
						Cd	n.d.		---				
						Hg	n.d.		---				
						Cr	n.d.						
						Br	n.d.						
						Cr(VI)			---				
						PBB							
	PBDE			---									
		2.15	BEIGE FILM		Polymers	Pb	n.d.		---				
						Cd	n.d.		---				
						Hg	n.d.		---				
						Cr	n.d.						
Br						n.d.							
Cr(VI)							---						
PBB									---				
PBDE			---										
	2.16	GRAY METALLIC FOIL		Metals	Pb	n.d.		---					
					Cd	n.d.		---					
					Hg	n.d.		---					
					Cr	n.d.							
					Br	n.d.							
					Cr(VI)			---					
					PBB								---
PBDE			---										








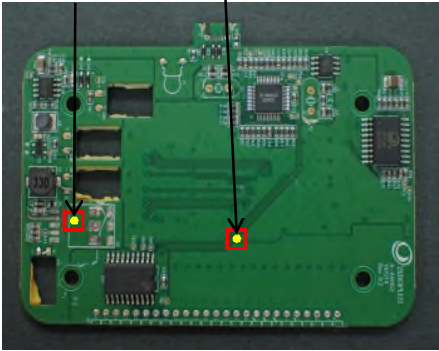
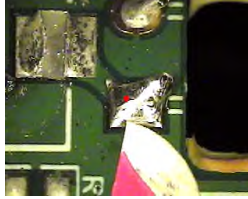
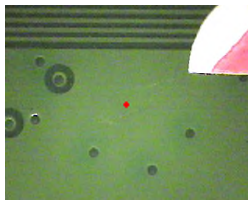
No.	Type of Components	Description		Figure	MDL Category	X-ray Screening		UV	ICP-AES	GC-MS	Other Chemical Test	Note
						Element	Data	Cr (VI)	Pb/Cd/Hg	PBB/PBDE		
2	PCBA 	2.17	SILVERY METALLIC PIN		Metals	Pb	n.d.		---			
						Cd	n.d.		---			
						Hg	n.d.		---			
						Cr	n.d.					
						Br	n.d.					
						Cr(VI)			---			
						PBB						
						PBDE						
							2.18		BLACK POLYMER JACKET WITH WHITE PRINT			
	Cd	n.d.	---									
	Hg	n.d.	---									
	Cr	n.d.										
	Br	n.d.										
	Cr(VI)		---									
	PBB											
	PBDE											
		2.19	ELECTRONIC COMPONENT		Composite Material			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/2017/80258-2.1) by point analysis (Unit: mg/kg)

Point Analysis	No.	Figure	Material	X-ray Screening		
			Type	Element	Data	Note
	1		Metals	Pb	497	
				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.	



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Table 3 The test results of Phthalates (Unit: mg/kg)

Test Item (s):	Method	MDL	Result				
			1.1	1.5	1.6	2.1	2.3
BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.	n.d.	n.d.	n.d.	n.d.
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)		50	n.d.	n.d.	n.d.	n.d.	n.d.
DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)		50	n.d.	n.d.	n.d.	n.d.	n.d.
DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)		50	n.d.	n.d.	n.d.	n.d.	n.d.



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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/cm <sup>2</sup>
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)	
<b>PBBs</b>				
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	
<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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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 $\text{cm}^2$
*6	The test item was tested by dry base.
*7	This sample follows requirement of client to conduct directly chemical tests.