



Test Report

Report No: CX/2016/C0215

Date: 2017/01/05

HIWIN MIKROSYSTEM CORP.
NO. 6, JINGKE CENTRAL RD., PRECISION MACHINERY PARK, TAICHUNG
40852, TAIWAN

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

Sample Submitted By : HIWIN MIKROSYSTEM CORP.
Sample Description : DRIVE
Style/Item No. : D2T-01XX-X-XX-X 、 D2T-04XX-X-XX-X 、 D2T-10XX-X-XX-X
Sample Receiving Date : 2016/12/20
Testing Period : 2016/12/20 to 2017/01/05

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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 and amending Directive (EU) 2015/863 with the exempted materials below according to the declaration from applicant:

1. ELECTRONIC COMPONENT (No.1.2.2) in Table 1: Lead (Pb)
("7(c)- I , Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound" 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 (Unit: mg/kg)

																						
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	1KW_PCBA	1.1.1	ELECTRONIC COMPONENT		Composite Material	Pb	n.d.		---		Refer to Table 2											
						Cd	n.d.															
		Hg	n.d.																			
		Cr	792																			
		1	1KW_PCBA	1.1.1	ELECTRONIC COMPONENT		Composite Material	Br	n.d.	n.d.												
								Cr(VI)														
				PBB			---															
				PBDE																		
				1	1KW_PCBA	1.1.2	BLACK PLASTIC HOUSING		Polymers	Pb	n.d.		---		Refer to Table 2							
										Cd	n.d.											
						Hg	n.d.															
						Cr	n.d.															
						1	1KW_PCBA	1.1.2	BLACK PLASTIC HOUSING		Polymers	Br	n.d.	---								
												Cr(VI)										
								PBB			---											
								PBDE														
								1	1KW_PCBA	1.1.3	ELECTRONIC COMPONENT		Composite Material	Pb	n.d.		---		Refer to Table 2			
														Cd	n.d.							
										Hg	n.d.											
										Cr	n.d.											
										1	1KW_PCBA	1.1.3	ELECTRONIC COMPONENT		Composite Material	Br	83300	---				
																Cr(VI)						
												PBB			---							
												PBDE										

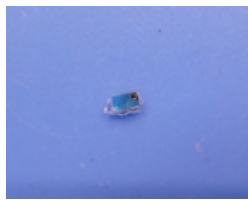


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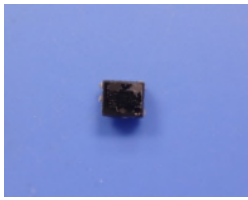



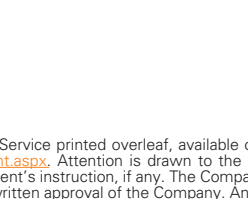

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No.	Type of Components	Description		Figure	MDL Category	X-ray Screening		UV	ICP-AES	GC-MS	Other	Note
						Element	Data	Cr (VI)	Pb/Cd/Hg	PBB/PBDE	Chemical Test	
1	1KW_PCBA	1.1.4	ELECTRONIC COMPONENT		Composite Material	Pb	n.d.		---		Refer to Table 2	
						Cd	n.d.		---			
						Hg	n.d.		---			
						Cr	n.d.					
						Br	n.d.					
						Cr(VI)						
						PBB						
						PBDE						
		Pb	n.d.		---	Refer to Table 2						
		Cd	n.d.		---							
		Hg	n.d.		---							
		Cr	265									
		Br	n.d.									
		Cr(VI)										
		PBB										
		PBDE										
	1KW_PCBA	1.2.1		BLACK PLASTIC COVER		Polymers	Pb	n.d.		---		Refer to Table 2
			Cd				n.d.	---				
			Hg				n.d.	---				
			Cr				n.d.					
			Br				62300					
			Cr(VI)									
			PBB									
			PBDE									
		1.2.2	ELECTRONIC COMPONENT		Composite Material	Pb		532		3580		Refer to Table 2
						Cd	n.d.	---				
						Hg	n.d.	---				
						Cr	1400	n.d.				
						Br	n.d.					
						Cr(VI)						
						PBB						
						PBDE						

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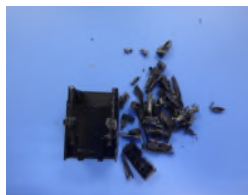



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No.	Type of Components	Description		Figure	MDL Category	X-ray Screening		UV	ICP-AES	GC-MS	Other Chemical Test	Note
						Element	Data	Cr (VI)	Pb/Cd/Hg	PBB/PBDE		
1	1KW_PCBA	1.2.3	ELECTRONIC COMPONENT		Composite Material	Pb	n.d.		---		Refer to Table 2	
						Cd	n.d.		---			
						Hg	n.d.		---			
	1.2.4	ELECTRONIC COMPONENT	ELECTRONIC COMPONENT		Composite Material	Cr	271				Refer to Table 2	
						Br	147000					
						Cr(VI)						
	1.2.5	BLACK PLASTIC HOUSING	BLACK PLASTIC HOUSING		Polymers	PBB					Refer to Table 2	
						PBDE						
	1.3.1	SILVERY METALLIC FRAME	SILVERY METALLIC FRAME		Composite Material	Pb	n.d.					
						Cd	n.d.					
	1KW_PCBA	1.2.3	ELECTRONIC COMPONENT		Composite Material	Hg	n.d.				Refer to Table 2	
						Cr	n.d.					
						Br	n.d.					
	1.2.4	ELECTRONIC COMPONENT	ELECTRONIC COMPONENT		Composite Material	Cr(VI)					Refer to Table 2	
						PBB						
						PBDE						
	1.2.5	BLACK PLASTIC HOUSING	BLACK PLASTIC HOUSING		Polymers	Pb	n.d.				Refer to Table 2	
						Cd	n.d.					
						Hg	n.d.					
	1.3.1	SILVERY METALLIC FRAME	SILVERY METALLIC FRAME		Composite Material	Cr	n.d.				Refer to Table 2	
						Br	n.d.					
						Cr(VI)						
	1KW_PCBA	1.2.3	ELECTRONIC COMPONENT		Composite Material	PBB					Refer to Table 2	
						PBDE						
	1.2.4	ELECTRONIC COMPONENT	ELECTRONIC COMPONENT		Composite Material	Pb	n.d.					
						Cd	n.d.					
	1.2.5	BLACK PLASTIC HOUSING	BLACK PLASTIC HOUSING		Polymers	Hg	n.d.				Refer to Table 2	
						Cr	n.d.					
						Br	n.d.					
	1.3.1	SILVERY METALLIC FRAME	SILVERY METALLIC FRAME		Composite Material	Cr(VI)					Refer to Table 2	
						PBB						
						PBDE						

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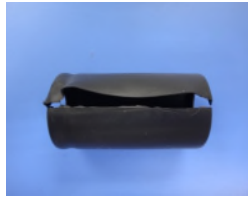
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No.	Type of Components	Description		Figure	MDL Category	X-ray Screening		UV	ICP-AES	GC-MS	Other Chemical Test	Note
						Element	Data	Cr (VI)	Pb/Cd/Hg	PBB/PBDE		
1	1KW_PCBA	1.3.2	BLACK PLASTIC HOUSING		Polymers	Pb	n.d.		---		Refer to Table 2	
						Cd	n.d.		---			
						Hg	n.d.		---			
						Cr	n.d.					
						Br	44400					
						Cr(VI)		---				
						PBB			n.d.			
						PBDE			n.d.			
						1.3.3	GOLDEN METALLIC PIN		Metals	Pb		
		Cd	n.d.	---								
		Hg	n.d.	---								
		Cr	n.d.									
		Br	n.d.									
		Cr(VI)			---							
		PBB			---							
		PBDE			---							
		1.3.4	LED		Composite Material					Pb	n.d.	
						Cd	n.d.	---				
						Hg	n.d.	---				
						Cr	n.d.					
						Br	n.d.					
						Cr(VI)			---			
						PBB			---			
						PBDE			---			
						1.3.5	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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No.	Type of Components	Description		Figure	MDL Category	X-ray Screening		UV	ICP-AES	GC-MS	Other	Note			
						Element	Data	Cr (VI)	Pb/Cd/Hg	PBB/PBDE	Chemical Test				
1		1.3.6	BLACK PLASTIC HOUSING		Polymers	Pb	n.d.		---		Refer to Table 2				
						Cd	n.d.		---						
						Hg	n.d.		---						
						Cr	n.d.								
						Br	n.d.		---						
						Cr(VI)									
						PBB									
						PBDE									
		1.3.7	GOLDEN METALLIC PIN		Metals	Pb	n.d.		---		Refer to Table 2				
						Cd	n.d.		---						
						Hg	n.d.		---						
						Cr	n.d.								
						Br	n.d.		---						
						Cr(VI)									
						PBB									
						PBDE									
2		2.1	ELECTRONIC COMPONENT		Composite Material	Pb	n.d.		---		Refer to Table 2				
						Cd	n.d.		---						
						Hg	n.d.		---						
						Cr	n.d.								
						Br	136000		---						
						Cr(VI)									
						PBB									
						PBDE									
		3		3.1	BLACK PLASTIC JACKET		Polymers	Pb	n.d.		---		Refer to Table 2		
								Cd	n.d.		---				
								Hg	n.d.		---				
								Cr	n.d.						
								Br	n.d.		---				
								Cr(VI)							
								PBB							
								PBDE							

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No.	Type of Components	Description		Figure	MDL Category	X-ray Screening		UV	ICP-AES	GC-MS	Other	Note
						Element	Data	Cr (VI)	Pb/Cd/Hg	PBB/PBDE	Chemical Test	
3	400W_PCBA	3.2	ELECTRONIC COMPONENT		Composite Material	Pb	n.d.		---		Refer to Table 2	
						Cd	n.d.		---			
						Hg	n.d.		---			
						Cr	n.d.					
						Br	n.d.					
						Cr(VI)		---		---		
						PBB			---			
						PBDE			---			
		3.3	ELECTRONIC COMPONENT		Composite Material	Pb	n.d.		---		Refer to Table 2	
						Cd	n.d.		---			
						Hg	n.d.		---			
						Cr	n.d.					
						Br	11100					
						Cr(VI)		---		n.d.		
						PBB			n.d.			
						PBDE			n.d.			



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Table 2 The test results of Phthalates (Unit: mg/kg)

Test Item (s):	Method	MDL	Result						
			1.1.1	1.1.2	1.1.3	1.1.4	1.1.5	1.2.1	1.2.2
BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	With reference to IEC 62321-8/CD (2013). Analysis was performed by GC/MS.	50	n.d.	n.d.	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.	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.	n.d.	n.d.
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)		50	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.

Test Item (s):	Method	MDL	Result						
			1.2.3	1.2.4	1.2.5	1.3.1	1.3.2	1.3.3	1.3.4
BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	With reference to IEC 62321-8/CD (2013). Analysis was performed by GC/MS.	50	n.d.	n.d.	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.	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.	n.d.	n.d.
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)		50	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.



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Test Item (s):	Method	MDL	Result						
			1.3.5	1.3.6	1.3.7	2.1	3.1	3.2	3.3
BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	With reference to IEC 62321-8/CD (2013). Analysis was performed by GC/MS.	50	n.d.	n.d.	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.	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.	n.d.	n.d.
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)		50	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.

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Test Item :	MDL (mg/kg)				XRF screening threshold (mg/kg)	Test method
XRF (X-ray fluorescence)	Category	Polymers	Composite Material	Metals	500	With reference to IEC 62321-3-1: 2013
	Element					
	Pb	50	100	100		
	Cd	50	50	50		
	Hg	50	100	100		
	Cr	50	100	100		
	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
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):	Test method	MDL (µg/cm²)	Facilities
Cr(VI)(#2)	With reference to IEC 62321-7-1:2015 (For Coatings on Metals)	0.1	UV

Test Item (s):	Unit	Method	MDL (mg/kg)
PBBs			
Monobromobiphenyl	mg/kg	With reference to IEC 62321-6: 2015. 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
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. 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. (#2):

- a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 mg/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 mg/cm²).
The coating is considered a non-Cr(VI) based coating.
- c. The result between 0.10 mg/cm² and 0.13 mg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.

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.

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.
*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.