

Test Report

號碼(No.): ETR20C01161 日期(Date): 11-Dec-2020

頁數(Page): 1 of 13

欣興電子股份有限公司 (UNIMICRON TECHNOLOGY CORPORATION)

桃園市龜山區龜山工業區山鶯路179號 (NO. 179, SHAN YING ROAD, KWEI SHAN IND., PARK, TAOYUAN CITY TAIWAN, R.O.C.)

以下測試樣品係由申請廠商所提供及確認 (The following sample(s) was/were submitted and identified by/on behalf of the applicant as):

送樣廠商(Sample Submitted By) 欣興電子股份有限公司 (UNIMICRON TECHNOLOGY CORPORATION)

樣品名稱(Sample Name) Cu PLATING LAYER

收件日(Sample Receiving Date) 04-Dec-2020

測試期間(Testing Period) 04-Dec-2020 to 11-Dec-2020

測試需求(Test Requested) : (1) 依據客戶指定,參考RoHS 2011/65/EU Annex II及其修訂指令(EU)

2015/863測試鎘、鉛、汞、六價鉻、多溴聯苯、多溴聯苯醚, DBP, BBP,

DEHP, DIBP • (As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP,

DEHP, DIBP contents in the submitted sample(s).)

(2) 其他測試項目請見下一頁。 (Please refer to next pages for the other

測試結果(Test Results) 請參閱下一頁 (Please refer to following pages.)

Trov Chang Manager Te Signed for and on behalf SGS TAIWAN LTD. Chemical Laboratory - Taipei





Test Report

號碼(No.): ETR20C01161 日期(Date): 11-Dec-2020

頁數(Page): 2 of 13

欣興電子股份有限公司 (UNIMICRON TECHNOLOGY CORPORATION)

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測試部位敘述 (Test Part Description)

No.1 : 銅色片狀鍍層 (PLATING LAYER OF COPPER COLORED SHEET)

No.2 : 銅色片狀(含鍍層) (COPPER COLORED SHEET (INCLUDING THE PLATING LAYER))

測試結果 (Test Results)

測試項目	測試方法	單位	MDL	結果	
(Test Items)	(Method)	(Unit)		(Result)	
				No.1	No.2
鎘 (Cd) (Cadmium (Cd)) (CAS No.:	酸洗脫鍍層,參考IEC 62321-5:	mg/kg	2	n.d.	
7440-43-9)	2013 · 以感應耦合電漿發射光譜儀				
	分析。(IEC 62321-5: 2013				
鉛 (Pb) (Lead (Pb)) (CAS No.: 7439-	application of modified digestion	mg/kg	2	n.d.	
92-1)	by surface etching, analysis was				
	performed by ICP-OES.)				
汞 (Hg) (Mercury (Hg)) (CAS No.:	酸洗脫鍍層,參考IEC 62321-4:	mg/kg	2	n.d.	
7439-97-6)	2013+ AMD1: 2017,以感應耦合				
	電漿發射光譜儀分析。(IEC 62321-				
	4: 2013+AMD1: 2017 application				
	of modified digestion by surface				
	etching, analysis was performed				
	by ICP-OES.)				
六價鉻 (Hexavalent Chromium) Cr(VI)	參考IEC 62321-7-1: 2015,以紫外	μg/cm²	0.1	n.d.	
(CAS No.: 18540-29-9) (#2)	光-可見光分光光度計分析。(With				
	reference to IEC 62321-7-1:				
	2015, analysis was performed by				
ン自取4寸 (Manalayana lain langu)	UV-VIS.)	/1	-		
一溴聯苯 (Monobromobiphenyl) 二溴聯苯 (Dibromobiphenyl)		mg/kg	5		n.d.
三溴聯苯 (Tribromobiphenyl)		mg/kg	5		n.d.
1 37	- 参考IEC 62321-6: 2015,以氣相層, - 析儀/質譜儀分析。(With reference - to IEC 62321-6: 2015, analysis - was performed by GC/MS.)	mg/kg	5 5		n.d.
四溴聯苯 (Tetrabromobiphenyl)		mg/kg			n.d.
五溴聯苯 (Pentabromobiphenyl)		mg/kg	5		n.d.
六溴聯苯 (Hexabromobiphenyl)		mg/kg	5		n.d.
七溴聯苯 (Heptabromobiphenyl)		mg/kg	5		n.d.
八溴聯苯 (Octabromobiphenyl)		mg/kg	5		n.d.
九溴聯苯 (Nonabromobiphenyl)		mg/kg	5		n.d.
十溴聯苯 (Decabromobiphenyl)		mg/kg	5		n.d.
多溴聯苯總和 (Sum of PBBs)		mg/kg	-		n.d.



Test Report

號碼(No.): ETR20C01161 日期(Date): 11-Dec-2020 頁數(Page): 3 of 13

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測試項目	測試方法	單位	MDL	結果	
(Test Items)	(Method)	(Unit)		(Result)	
				No.1	No.2
一溴聯苯醚 (Monobromodiphenyl ether)		mg/kg	5		n.d.
二溴聯苯醚 (Dibromodiphenyl ether)		mg/kg	5		n.d.
三溴聯苯醚 (Tribromodiphenyl ether)		mg/kg	5		n.d.
四溴聯苯醚 (Tetrabromodiphenyl ether)	 參考IEC 62321-6: 2015 · 以氣相層	mg/kg	5		n.d.
五溴聯苯醚 (Pentabromodiphenyl ether)	新儀/質譜儀分析。(With reference	mg/kg	5		n.d.
六溴聯苯醚 (Hexabromodiphenyl ether)	to IEC 62321-6: 2015, analysis	mg/kg	5		n.d.
七溴聯苯醚 (Heptabromodiphenyl ether)	was performed by GC/MS.)	mg/kg	5		n.d.
八溴聯苯醚 (Octabromodiphenyl ether)	was performed by GC/MS.)	mg/kg	5		n.d.
九溴聯苯醚 (Nonabromodiphenyl ether)		mg/kg	5		n.d.
十溴聯苯醚 (Decabromodiphenyl ether)	1	mg/kg	5		n.d.
多溴聯苯醚總和 (Sum of PBDEs)		mg/kg	-		n.d.
鄰苯二甲酸丁苯甲酯 (BBP) (Butyl		mg/kg	50		n.d.
benzyl phthalate (BBP)) (CAS No.: 85-					
68-7)					
鄰苯二甲酸二丁酯 (DBP) (Dibutyl		mg/kg	50		n.d.
phthalate (DBP)) (CAS No.: 84-74-2)					
鄰苯二甲酸二(2-乙基己基)酯 (DEHP)		mg/kg	50		n.d.
(Di-(2-ethylhexyl) phthalate (DEHP))					
(CAS No.: 117-81-7)					
鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl	參考IEC 62321-8: 2017 · 以氣相層	mg/kg	50		n.d.
phthalate (DIBP)) (CAS No.: 84-69-5)	析儀/質譜儀分析。(With reference				
	to IEC 62321-8: 2017, analysis				
鄰苯二甲酸二異癸酯 (DIDP)	was performed by GC/MS.)	mg/kg	50		n.d.
(Diisodecyl phthalate (DIDP)) (CAS					
No.: 26761-40-0, 68515-49-1)					
鄰苯二甲酸二異壬酯 (DINP)		mg/kg	50		n.d.
(Diisononyl phthalate (DINP)) (CAS					
No.: 28553-12-0, 68515-48-0)					
鄰苯二甲酸二正辛酯 (DNOP) (Di-n-		mg/kg	50		n.d.
octyl phthalate (DNOP)) (CAS No.:					
117-84-0)					



Test Report

號碼(No.): ETR20C01161 日期(Date): 11-Dec-2020

頁數(Page): 4 of 13

欣興電子股份有限公司 (UNIMICRON TECHNOLOGY CORPORATION) 桃園市龜山區龜山工業區山鶯路179號 (NO. 179, SHAN YING ROAD, KWEI SHAN IND., PARK, TAOYUAN CITY TAIWAN, R.O.C.)

測試項目	測試方法	單位	MDL	結果	
(Test Items)	(Method)	(Unit)		(Result)	
				No.1	No.2
γ - HBCDD) (Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α - HBCDD, β - HBCDD, γ - HBCDD)) (CAS No.: 25637-99-4, 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	參考IEC 62321: 2008 · 以氣相層析儀/質譜儀分析。(With reference to IEC 62321: 2008, analysis was performed by GC/MS.)	mg/kg	5		n.d.
全氟辛烷磺酸及其鹽類 (PFOS and its salts) (CAS No.: 1763-23-1 and its salts)	參考CEN/TS 15968: 2010 · 以液相層析儀/質譜儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS.)	μg/m²	1	n.d.	
全氟辛酸及其鹽類 (PFOA and its salts) (CAS No.: 335-67-1 and its salts)		μg/m²	1	n.d.	
銻 (Sb) (Antimony (Sb)) (CAS No.: 7440-36-0)	酸洗脫鍍層,參考US EPA 3050B: 1996,以感應耦合電漿發射光譜儀 分析。(US EPA 3050B: 1996 application of modified digestion by surface etching, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	
鈹 (Be) (Beryllium (Be)) (CAS No.: 7440-41-7)		mg/kg	2	n.d.	
氟 (F) (Fluorine (F)) (CAS No.: 14762- 94-8)		mg/kg	50		457
氯 (Cl) (Chlorine (Cl)) (CAS No.: 22537-15-1)	參考BS EN 14582: 2016·以離子 層析儀分析。(With reference to	mg/kg	50		n.d.
溴 (Br) (Bromine (Br)) (CAS No.: 10097-32-2)	BS EN 14582: 2016, analysis was performed by IC.)	mg/kg	50		n.d.
碘 (I) (Iodine (I)) (CAS No.: 14362-44- 8)		mg/kg	50		n.d.



Test Report

號碼(No.): ETR20C01161 日期(Date): 11-Dec-2020 頁數(Page): 5 of 13

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備註(Note):

- 1. mg/kg = ppm; 0.1wt% = 1000ppm
- 2. MDL = Method Detection Limit (方法偵測極限值)
- 3. n.d. = Not Detected (未檢出); 小於MDL / Less than MDL
- 4. "-" = Not Regulated (無規格值)
- 5. "---" = Not Conducted (未測試項目)
- 6. 全氟辛烷磺酸及其鹽類包含 (PFOS and its salts including):
 CAS No.: 29081-56-9, 2795-39-3, 29457-72-5, 70225-14-8, 56773-42-3, 251099-16-8, 307-35-7.
- 7. 全氟辛酸及其鹽類包含 (PFOA and its salts including): CAS No.: 3825-26-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0.
- 8. (#2) =
 - a. 當六價鉻結果大於0.13 μg/cm²·表示樣品表層含有六價鉻。(The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 μg/cm². The sample coating is considered to contain Cr(VI).) b. 當六價鉻結果為n.d. (濃度小於0.10 μg/cm²)·表示表層不含六價鉻。(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. 當六價鉻結果介於 0.10 及 0.13 $\mu g/cm^2$ 時,無法確定塗層是否含有六價鉻。(The result between 0.10 $\mu g/cm^2$ and 0.13 $\mu g/cm^2$ is considered to be inconclusive unavoidable coating variations may influence the determination.)



Test Report

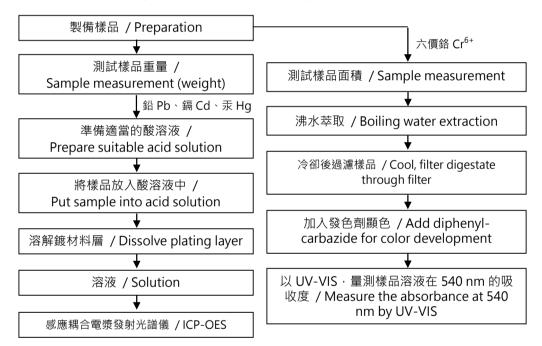
號碼(No.): ETR20C01161 日期(Date): 11-Dec-2020

頁數(Page): 6 of 13

欣興電子股份有限公司 (UNIMICRON TECHNOLOGY CORPORATION) 桃園市龜山區龜山工業區山鶯路179號 (NO. 179, SHAN YING ROAD, KWEI SHAN IND., PARK, TAOYUAN CITY TAIWAN, R.O.C.)

鍍層重金屬測試流程圖 / Flow Chart of Stripping method for metal analysis

根據以下的流程圖之條件,樣品之外部鍍層已完全溶解。(六價鉻測試方法除外) / The plating layer of samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} test method excluded)



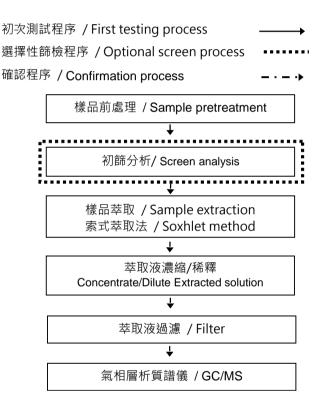


Test Report

號碼(No.): ETR20C01161 日期(Date): 11-Dec-2020

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多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBBs/PBDEs



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頁數(Page): 7 of 13



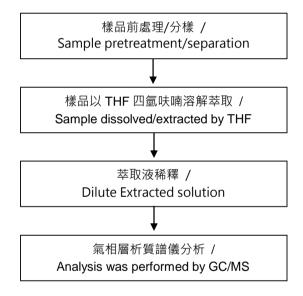
Test Report

號碼(No.): ETR20C01161 日期(Date): 11-Dec-2020 頁數(Page): 8 of 13

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可塑劑分析流程圖 / Analytical flow chart - Phthalate

【測試方法/Test method: IEC 62321-8】



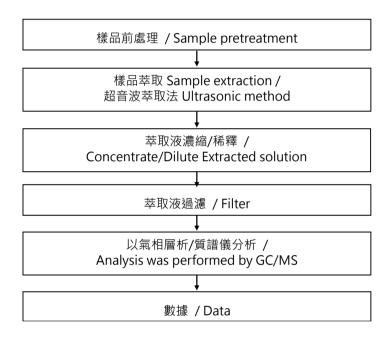


Test Report

號碼(No.): ETR20C01161 日期(Date): 11-Dec-2020

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六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD



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頁數(Page): 9 of 13

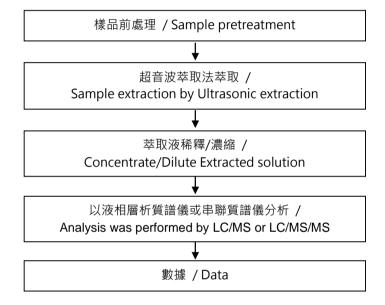


Test Report

號碼(No.): ETR20C01161 日期(Date): 11-Dec-2020 頁數(Page): 10 of 13

欣興電子股份有限公司 (UNIMICRON TECHNOLOGY CORPORATION) 桃園市龜山區龜山工業區山鶯路179號 (NO. 179, SHAN YING ROAD, KWEI SHAN IND., PARK, TAOYUAN CITY TAIWAN, R.O.C.)

全氟辛酸/全氟辛烷磺酸分析流程圖 / Analytical flow chart - PFOA/PFOS



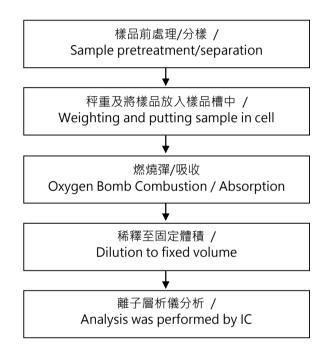


Test Report

號碼(No.): ETR20C01161 日期(Date): 11-Dec-2020 頁數(Page): 11 of 13

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鹵素分析流程圖 / Analytical flow chart - Halogen





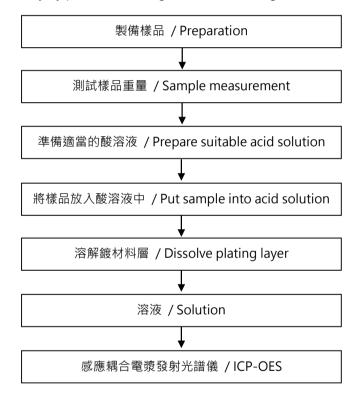
Test Report

號碼(No.): ETR20C01161 日期(Date): 11-Dec-2020 頁數(Page): 12 of 13

欣興電子股份有限公司 (UNIMICRON TECHNOLOGY CORPORATION) 桃園市龜山區龜山工業區山鶯路179號 (NO. 179, SHAN YING ROAD, KWEI SHAN IND., PARK, TAOYUAN CITY TAIWAN, R.O.C.)

鍍層重金屬測試流程圖 / Flow Chart of Stripping method for metal analysis

根據以下的流程圖之條件,樣品之外部鍍層已完全溶解。 / The plating layer of samples were dissolved totally by pre-conditioning method according to below flow chart.





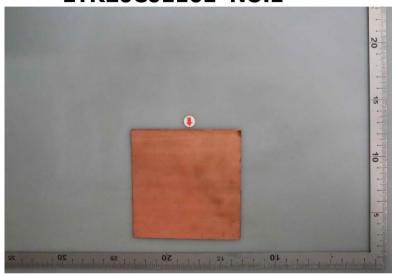
Test Report

號碼(No.): ETR20C01161 日期(Date): 11-Dec-2020 頁數(Page): 13 of 13

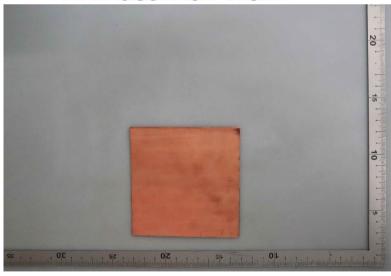
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* 照片中如有箭頭標示,則表示為實際檢測之樣品/部位. * (The tested sample / part is marked by an arrow if it's shown on the photo.)

ETR20C01161 NO.1



ETR20C01161 NO.2



** 報告結尾 (End of Report) **

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