

Test Report

號碼(No.): ETR24105919M01 日期(Date): 11-Mar-2024 頁數(Page): 1 of 15

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 the applicant as):

送樣廠商(Sample Submitted By)

樣品名稱(Sample Name)

: SUBSTRATE

樣品型號(Style/Item No.)

: CSP5

. 6515

收件日(Sample Receiving Date)

: 25-Jan-2024

測試期間(Testing Period)

: 25-Jan-2024 to 31-Jan-2024

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 item(s).) 請參閱下一頁 (Please refer to following pages.)

測試結果(Test Results)

結 論(Conclusion)

(1) 根據客戶所提供的樣品·其鎘、鉛、汞、六價鉻、多溴聯苯、多溴聯苯醚, DBP,

BBP, DEHP, DIBP的測試結果符合RoHS 2011/65/EU Annex II暨其修訂指令(EU) 2015/863之限值要求。 (Based on the performed tests on submitted sample(s), the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS Directive (EU) 2015/863

amending Annex II to Directive 2011/65/EU.)

Troy Chang / Department Malager Signed for and on behalf of Alwah SGS TAIWAN LTD. Chemical Laboratory - Taipei



PIN CODE: D78FBAA7



Test Report

號碼(No.): ETR24105919M01 日期(Date): 11-Mar-2024 頁數(Page): 2 of 15

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.)

測試部位敘述 (Test Part Description)

No.1 : 黑色載板 (BLACK SUBSTRATE)

測試結果 (Test Results)

測試項目	測試方法	單位	MDL	結果	限值
(Test Items)	(Method)	(Unit)		(Result)	(Limit)
				No.1	
鎘 (Cd) (Cadmium (Cd))	參考IEC 62321-5: 2013 · 以感應耦合電漿	mg/kg	2	n.d.	100
	發射光譜儀分析。(With reference to IEC				
鉛 (Pb) (Lead (Pb))	62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	2.87	1000
汞 (Hg) (Mercury (Hg))	參考IEC 62321-4: 2013+ AMD1: 2017·	mg/kg	2	n.d.	1000
	以感應耦合電漿發射光譜儀分析。(With				
	reference to IEC 62321-4: 2013+ AMD1:				
	2017, analysis was performed by ICP-				
	OES.)	41	0		1000
六價鉻 Cr(VI) (Hexavalent Chromium	参考IEC 62321-7-2: 2017・以紫外光-可見	mg/kg	8	n.d.	1000
Cr(VI))	光分光光度計分析。(With reference to IEC 62321-7-2: 2017, analysis was				
	performed by UV-VIS.)				
一溴聯苯 (Monobromobiphenyl)	,	mg/kg	5	n.d.	-
二溴聯苯 (Dibromobiphenyl)		mg/kg	5	n.d.	-
三溴聯苯 (Tribromobiphenyl)		mg/kg	5	n.d.	-
四溴聯苯 (Tetrabromobiphenyl)	4 +/150 60004 6 0045 N.F. IDE ICE (55	mg/kg	5	n.d.	-
五溴聯苯 (Pentabromobiphenyl)	參考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	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.	1000



Test Report

號碼(No.): ETR24105919M01 日期(Date): 11-Mar-2024 頁數(Page): 3 of 15

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.)

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(Test Items)	(Method)	(Unit)		(Result)	(Limit)
				No.1	
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)	# */FC C2221 C 2015 N = 1N = 17 = 1 / # / # / # / # / # / # / # / # / # /	mg/kg	5	n.d.	-
五溴聯苯醚 (Pentabromodiphenyl ether)	参考IEC 62321-6: 2015・以氣相層析儀/質	mg/kg	5	n.d.	=
六溴聯苯醚 (Hexabromodiphenyl ether)	譜儀分析。(With reference to IEC 62321-6: 2015, analysis was performed by	mg/kg	5	n.d.	=
七溴聯苯醚 (Heptabromodiphenyl ether)	GC/MS.)	mg/kg	5	n.d.	-
八溴聯苯醚 (Octabromodiphenyl ether)	GC/Wis.)	mg/kg	5	n.d.	-
九溴聯苯醚 (Nonabromodiphenyl ether)		mg/kg	5	n.d.	-
十溴聯苯醚 (Decabromodiphenyl ether)		mg/kg	5	n.d.	-
多溴聯苯醚總和 (Sum of PBDEs)		mg/kg	-	n.d.	1000
鄰苯二甲酸丁苯甲酯 (BBP) (Butyl benzyl	參考IEC 62321-8: 2017 · 以氣相層析儀/質	mg/kg	50	n.d.	1000
phthalate (BBP))	譜儀分析。(With reference to IEC 62321-				
	8: 2017, analysis was performed by				
鄰苯二甲酸二丁酯 (DBP) (Dibutyl	GC/MS.) 参考IEC 62321-8: 2017 · 以氣相層析儀/質	mg/kg	50	n.d.	1000
柳本二十酸二丁酯 (DBP) (Dibuty) phthalate (DBP))	音信C 02321-0. 2017・以報伯層が 酸/貝 譜儀分析・(With reference to IEC 62321-	тіу/ку	30	n.a.	1000
	8: 2017, analysis was performed by				
	GC/MS.)				
鄰苯二甲酸二(2-乙基己基)酯 (DEHP) (Di-	参考IEC 62321-8: 2017,以氣相層析儀/質	mg/kg	50	n.d.	1000
(2-ethylhexyl) phthalate (DEHP))	譜儀分析。(With reference to IEC 62321-	J. J			
	8: 2017, analysis was performed by				
	GC/MS.)				
鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl	參考IEC 62321-8: 2017 · 以氣相層析儀/質	mg/kg	50	n.d.	1000
phthalate (DIBP))	譜儀分析。(With reference to IEC 62321-				
	8: 2017, analysis was performed by				
	GC/MS.)				
鄰苯二甲酸二異癸酯 (DIDP) (Diisodecyl	參考IEC 62321-8: 2017 · 以氣相層析儀/質	mg/kg	50	n.d.	-
phthalate (DIDP)) (CAS No.: 26761-40-	譜儀分析。(With reference to IEC 62321-				
0, 68515-49-1)	8: 2017, analysis was performed by GC/MS.)				
	GC/IVI3.)				



Test Report

號碼(No.): ETR24105919M01

日期(Date): 11-Mar-2024

頁數(Page): 4 of 15

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 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result) No.1	限值 (Limit)
鄰苯二甲酸二異壬酯 (DINP) (Diisononyl phthalate (DINP)) (CAS No.: 28553-12-0, 68515-48-0)	參考IEC 62321-8: 2017·以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
鄰苯二甲酸二正辛酯 (DNOP) (Di-n-octyl phthalate (DNOP)) (CAS No.: 117-84-0)	參考IEC 62321-8: 2017‧以氣相層析儀/質譜儀分析。(With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.)	mg/kg	50	n.d.	-
六溴環十二烷及所有主要被辨別出的異構物 (HBCDD) (α - HBCDD, β - HBCDD, 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.	-
氟 (F) (Fluorine (F)) (CAS No.: 14762-94-8)		mg/kg	50	422	-
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 BS EN 14582:	mg/kg	50	125	-
溴 (Br) (Bromine (Br)) (CAS No.: 10097- 32-2)	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.	-
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 · 以液相層析串 聯質譜儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	n.d.	-
全氟辛酸及其鹽類 (PFOA and its salts) (CAS No.: 335-67-1 and its salts)	參考CEN/TS 15968: 2010 · 以液相層析串 聯質譜儀分析。(With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.)	mg/kg	0.01	n.d.	-



Test Report

號碼(No.): ETR24105919M01 日期(Date): 11-Mar-2024

頁數(Page): 5 of 15

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	限值
(Test Items)	(Method)	(Unit)		(Result)	(Limit)
				No.1	
鈹 (Be) (Beryllium (Be)) (CAS No.: 7440-41-7)	參考US EPA 3052: 1996.以感應耦合電漿發射光譜儀分析。(With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	-
銻 (Sb) (Antimony (Sb)) (CAS No.: 7440-36-0)	參考US EPA 3052: 1996.以感應耦合電漿發射光譜儀分析。(With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	-

備註(Note):

- 1. mg/kg = ppm; 0.1wt% = 0.1% = 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. 除非另有說明,參照ILAC-G8:09/2019,採用簡單二元(w=0)允收規則進行符合性判定;根據此規則,符合性結果之判定係以測試結果與限值做比較。(Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (w=0) stated in ILAC-G8:09/2019. According to this rule, the judgement of conformity is based on the comparing test results with limits.)
- 6. 本報告為 ETR24105919 之異動報告。(This is the additional test report of ETR24105919.)



Test Report

號碼(No.): ETR24105919M01 日期(Date): 11-Mar-2024 頁數(Page): 6 of 15

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.)

PFAS Remark:

現有PFAS定量技術是分析PFAS物質的特定結構,但同碳數族群之PFAS酸及鹽類物質,其可被辨識的特定結構相同,因此無法區別所分析的特定結構是來自酸或者鹽類,故測試結果為同碳數族群之PFAS之酸及鹽類物質的濃度總合。下表PFAS物質濃度皆已包含在測試結果中,相關資訊請參見下表:(下表列舉PFAS物質僅為範例,並不包含所有同碳數族群之PFAS鹽類。)

(The quantitative technology of PFAS is to analyze the specific structure of PFAS substances. However, PFAS acid and its salts with the same carbon number group have the same specific structure that can be identified. The tested results of the analyzed specific structure cannot be distinguished to identify the contribution from PFAS acid or its salts. Therefore, the tested results display the sum of concentrations of PFAS acids and its salts with the same carbon number group. The concentration of PFAS substances in the below table have been included in the tested results, please refer to the table for relevant information: (The listed PFAS substances are examples only, it do not include all PFAS salts with the same carbon number group.))

群組名稱 (Group Name)	物質名稱 (Substance Name)	CAS No.
(c. cap runne)	全氟辛烷磺酸 (Perfluorooctane sulfonates) (PFOS)	1763-23-1
	全氟辛基磺酸鉀 (PFOS-K) Potassium perfluorooctanesulfonate (PFOS-K)	2795-39-3
	全氟辛基磺酸鋰 (PFOS-Li) Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)	29457-72-5
	全氟辛基磺酸銨 (PFOS-NH ₄) Perfluorooctanesulfonic acid, ammonium salt (PFOS-NH ₄)	29081-56-9
PFOS, 及其鹽&衍生物 (PFOS, its salts & derivatives)	全氟辛基磺酸二乙醇銨 (PFOS-NH(OH) ₂) Perfluorooctane sulfonate diethanolamine salt (PFOS-NH(OH) ₂)	70225-14-8
	全氟辛基磺酸四乙基銨 (PFOS-N(C_2H_5) ₄) Perfluorooctanesulfonic acid,tetraethylammonium salt (PFOS-N(C_2H_5) ₄)	56773-42-3
	全氟辛基磺酸二癸二甲基銨 (PFOS-DDA) N-decyl-N,N-dimethyldecan-1-aminium 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctane-1- sulfonate (PFOS-DDA)	251099-16-8



Test Report

號碼(No.): ETR24105919M01 日期(Date): 11-Mar-2024 頁數(Page): 7 of 15

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.)

群組名稱	物質名稱	CAS No.
(Group Name)	(Substance Name)	
PFOS, 及其鹽&衍生物 (PFOS, its salts & derivatives)	全氟辛基磺醯氟 (POSF) Perfluorooctane sulfonyl fluoride (POSF)	307-35-7
	全氟辛基磺酸鎂 (PFOS-Mg) Perfluorooctanesulfonic acid, magnesium salt (PFOS-Mg)	91036-71-4
	全氟辛基磺酸鈉 (PFOS-Na) Perfluorooctanesulfonic acid, sodium salt (PFOS-Na)	4021-47-0
	全氟辛烷磺酸哌啶 Piperidine 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8- heptadecafluorooctanesulfonate	71463-74-6
PFOA, 及其鹽&衍生物 (PFOA, its salts & derivatives)	全氟辛酸 (Perfluorooctanoic acid) (PFOA)	335-67-1
	全氟辛酸鈉 (PFOA-Na) Sodium perfluorooctanoate (PFOA-Na)	335-95-5
	全氟辛酸鉀 (PFOA-K) Potassium perfluorooctanoate (PFOA-K)	2395-00-8
	全氟辛酸銀 (PFOA-Ag) Silver perfluorooctanote (PFOA-Ag)	335-93-3
	全氟辛氟 (PFOA-F) Perfluorooctanoyl fluoride (PFOA-F)	335-66-0
	全氟辛酸銨 (APFO) Ammonium pentadecafluorooctanoate (APFO)	3825-26-1
	全氟辛酸鋰 (PFOA-Li) Lithium perfluorooctanoate (PFOA-Li)	17125-58-5



Test Report

號碼(No.): ETR24105919M01 日期

日期(Date): 11-Mar-2024

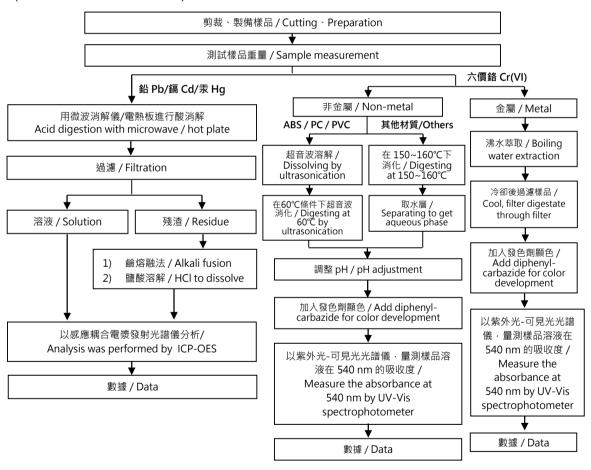
頁數(Page): 8 of 15

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.)

重金屬流程圖 / Analytical flow chart of heavy metal

根據以下的流程圖之條件,樣品已完全溶解。(六價鉻測試方法除外)

These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} test method excluded)



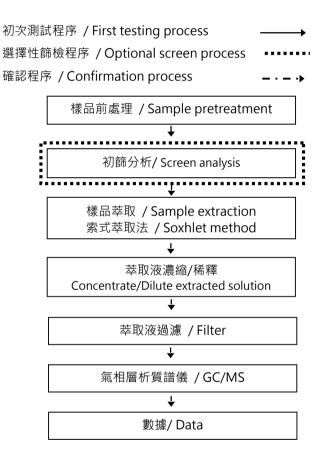


Test Report

號碼(No.): ETR24105919M01 日期(Date): 11-Mar-2024 頁數(Page): 9 of 15

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.)

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





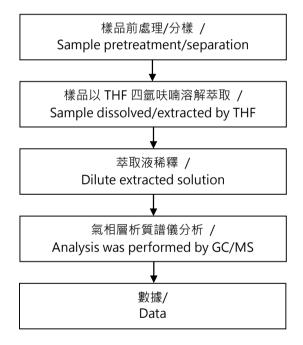
Test Report

號碼(No.): ETR24105919M01 日期(Date): 11-Mar-2024 頁數(Page): 10 of 15

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.)

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

【測試方法/Test method: IEC 62321-8】



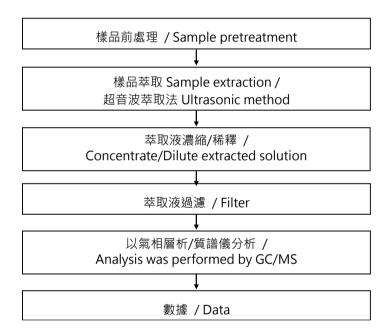


Test Report

號碼(No.): ETR24105919M01 日期(Date): 11-Mar-2024 頁數(Page): 11 of 15

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.)

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



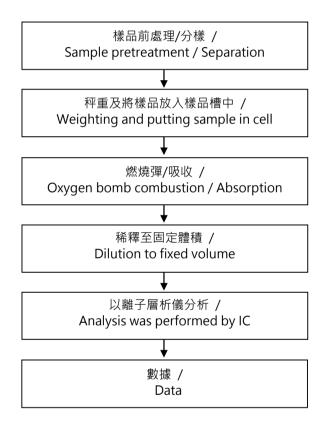


Test Report

號碼(No.): ETR24105919M01 日期(Date): 11-Mar-2024 頁數(Page): 12 of 15

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.)

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



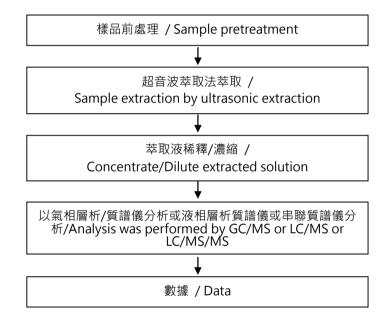


Test Report

號碼(No.): ETR24105919M01 日期(Date): 11-Mar-2024 頁數(Page): 13 of 15

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.)

全氟化合物(包含全氟辛酸/全氟辛烷磺酸/其相關化合物等等)分析流程圖 / Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)





Test Report

號碼(No.): ETR24105919M01 日期(Date): 11-Mar-2024 頁數(Page): 14 of 15

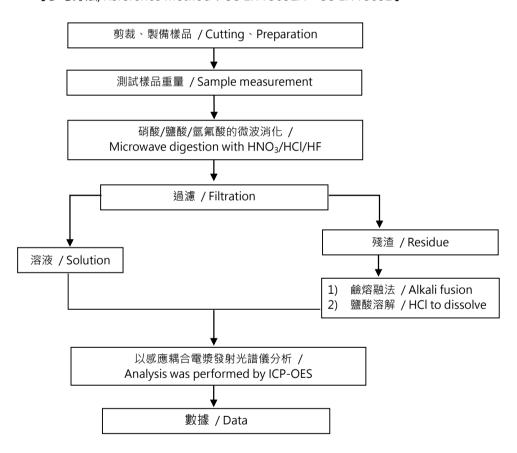
欣興電子股份有限公司 (UNIMICRON TECHNOLOGY CORPORATION) 桃園市龜山區龜山工業區山鶯路179號 (NO. 179, SHAN YING ROAD, KWEI SHAN IND., PARK, TAOYUAN CITY TAIWAN, R.O.C.)

元素(含重金屬)分析流程圖 / Analytical flow chart of elements (Heavy metal included)

根據以下的流程圖之條件,樣品已完全溶解。

These samples were dissolved totally by pre-conditioning method according to below flow chart.

【参考方法/Reference method: US EPA 3051A、US EPA 3052】



* US EPA 3051A 方法未添加氫氟酸 / US EPA 3051A method does not add HF.



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> 由申請公司要求刪除樣品照片. (The photo of sample was removed base upon the applicant's requirement.)

> > ** 報告結尾 (End of Report) **