

Test Report

號碼(No.): ETR21902158 日期(Date): 14-Sep-2021 頁數(Page): 1 of 13

華邦電子股份有限公司 (WINBOND ELECTRONICS CORPORATION) 台中市大雅區中部科學工業園區科雅一路8號 (NO. 8, KEYA 1ST RD., DAYA DIST., CENTRAL TAIWAN SCIENCE PARK, TAICHUNG CITY 428, 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)

華邦電子股份有限公司 (WINBOND ELECTRONICS CORPORATION)

樣品名稱(Sample Name)

CMOS ALUMINUM PROCESS WAFER

樣品型號(Style/Item No.)

300mm IC WAFER OF CENTRAL TAIWAN SCIENCE PARK SITE

收件日(Sample Receiving Date)

08-Sep-2021

測試期間(Testing Period)

08-Sep-2021 to 14-Sep-2021

測試需求(Test Requested)

- 依據客戶指定,參考RoHS 2011/65/EU Annex II及其修訂指令(EU) 2015/863測 (1)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)

論(Conclusion)

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.)







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測試部位敘述 (Test Part Description)

No.1 : 晶圓 (WAFER)

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)) (CAS No.: 7440-43-9)	參考IEC 62321-5: 2013·以感應耦合電漿 發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed	mg/kg	2	n.d.	100
	by ICP-OES.)				
鉛 (Pb) (Lead (Pb)) (CAS No.: 7439-92-1)	參考IEC 62321-5: 2013 · 以感應耦合電漿 發射光譜儀分析。(With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	n.d.	1000
汞 (Hg) (Mercury (Hg)) (CAS No.: 7439-97-6)	參考IEC 62321-4: 2013+ AMD1: 2017 · 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.)	mg/kg	2	n.d.	1000
六價鉻 Cr(VI) (Hexavalent Chromium Cr(VI)) (CAS No.: 18540-29-9)	參考IEC 62321-7-2: 2017·以紫外光-可見 光分光光度計分析。(With reference to IEC 62321-7-2: 2017, analysis was performed by UV-VIS.)	mg/kg	8	n.d.	1000
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)	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	n.d.	-
四溴聯苯 (Tetrabromobiphenyl)		mg/kg	5	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.	1000



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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)	 參考IEC 62321-6: 2015 · 以氣相層析儀/質	mg/kg	5	n.d.	-
五溴聯苯醚 (Pentabromodiphenyl ether)	iii 儀分析。(With reference to IEC 62321-	mg/kg	5	n.d.	-
六溴聯苯醚 (Hexabromodiphenyl ether)	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/1413.)	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	ı	n.d.	1000
鄰苯二甲酸丁苯甲酯 (BBP) (Butyl benzyl		mg/kg	50	n.d.	1000
phthalate (BBP)) (CAS No.: 85-68-7)					
鄰苯二甲酸二丁酯 (DBP) (Dibutyl		mg/kg	50	n.d.	1000
phthalate (DBP)) (CAS No.: 84-74-2)					
鄰苯二甲酸二(2-乙基己基)酯 (DEHP) (Di-		mg/kg	50	n.d.	1000
(2-ethylhexyl) phthalate (DEHP)) (CAS					
No.: 117-81-7)					
鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl		mg/kg	50	n.d.	1000
phthalate (DIBP)) (CAS No.: 84-69-5)	參考IEC 62321-8: 2017,以氣相層析儀/質				
鄰苯二甲酸二異癸酯 (DIDP) (Diisodecyl	譜儀分析。(With reference to IEC 62321-	mg/kg	50	n.d.	-
phthalate (DIDP)) (CAS No.: 26761-40-	8: 2017, analysis was performed by				
0, 68515-49-1)	GC/MS.)				
鄰苯二甲酸二異壬酯 (DINP) (Diisononyl		mg/kg	50	n.d.	-
phthalate (DINP)) (CAS No.: 28553-12-					
0, 68515-48-0)					
鄰苯二甲酸二正辛酯 (DNOP) (Di-n-octyl		mg/kg	50	n.d.	=
phthalate (DNOP)) (CAS No.: 117-84-0)					
鄰苯二甲酸二正戊酯 (DNPP) (Di-n-		mg/kg	50	n.d.	-
pentyl phthalate (DNPP)) (CAS No.:					
131-18-0)					



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測試項目	測試方法	單位	MDL	結果	限值
(Test Items)	(Method)	(Unit)		(Result)	(Limit)
				No.1	
六溴環十二烷及所有主要被辨別出的異構	參考IEC 62321: 2008,以氣相層析儀/質譜	mg/kg	5	n.d.	-
物(HBCDD) (α- HBCDD, β- HBCDD, γ-	儀分析。(With reference to IEC 62321:				
HBCDD) (Hexabromocyclododecane	2008, analysis was performed by				
(HBCDD) and all major	GC/MS.)				
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))					
氟 (F) (Fluorine (F)) (CAS No.: 14762-94-		mg/kg	50	n.d.	-
8)					
氯 (Cl) (Chlorine (Cl)) (CAS No.: 22537-	 参考BS EN 14582: 2016 · 以離子層析儀分	mg/kg	50	n.d.	-
15-1)	析。(With reference to BS EN 14582:				
溴 (Br) (Bromine (Br)) (CAS No.: 10097-	2016, analysis was performed by IC.)	mg/kg	50	n.d.	-
32-2)	t				
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	參考CEN/TS 15968: 2010,以液相層析串	mg/kg	0.01	n.d.	-
salts) (CAS No.: 1763-23-1 and its salts)	聯質譜儀分析。(With reference to				
全氟辛酸及其鹽類 (PFOA and its salts)	CEN/TS 15968: 2010, analysis was	mg/kg	0.01	n.d.	-
(CAS No.: 335-67-1 and its salts)	performed by LC/MS/MS.)				
砷 (As) (Arsenic (As)) (CAS No.: 7440-		mg/kg	2	n.d.	-
38-2)	參考US EPA 3052: 1996,以感應耦合電漿				
鈹 (Be) (Beryllium (Be)) (CAS No.: 7440-	發射光譜儀分析。(With reference to US	mg/kg	2	n.d.	-
41-7)	EPA 3052: 1996, analysis was performed				
銻 (Sb) (Antimony (Sb)) (CAS No.: 7440-	by ICP-OES.)	mg/kg	2	n.d.	-
36-0)					



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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. 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.
- 6. 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.
- 7. 符合性結果之判定係以測試結果與限值做比較。(The statement of compliance conformity is based on comparison of testing results and limits.)



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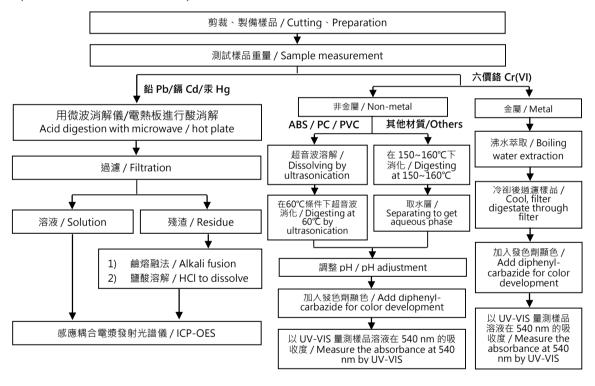
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重金屬流程圖 / Analytical flow chart of Heavy Metal

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)



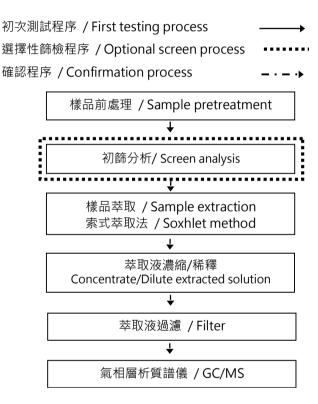


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多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBBs/PBDEs



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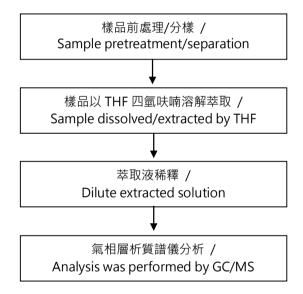
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可塑劑分析流程圖 / Analytical flow chart - Phthalate

【測試方法/Test method: IEC 62321-8】





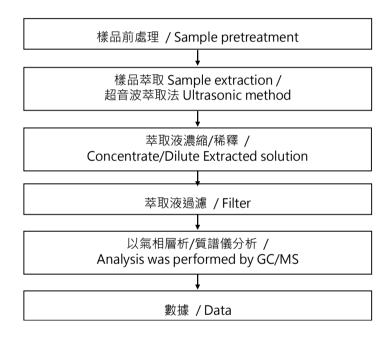
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六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD



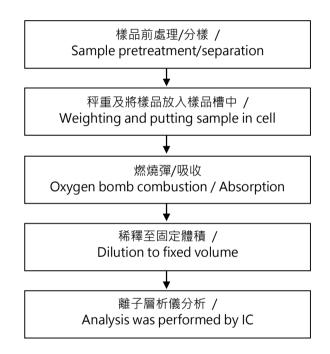


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鹵素分析流程圖 / Analytical flow chart - Halogen



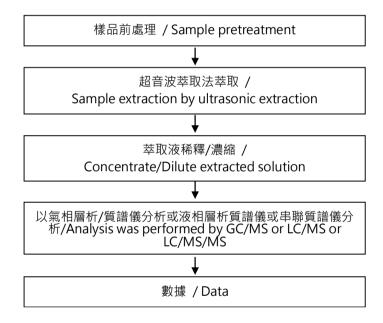


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全氟化合物(包含全氟辛酸/全氟辛烷磺酸/其相關化合物等等)分析流程圖 / Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)





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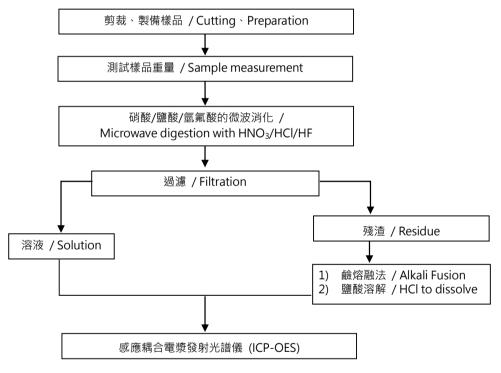
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元素(含重金屬)分析流程圖 / Analytical flow chart of Elements (Heavy metal included)

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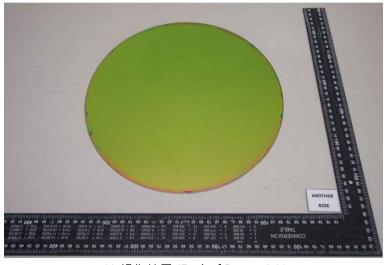
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* 照片中如有箭頭標示,則表示為實際檢測之樣品/部位. * (The tested sample / part is marked by an arrow if it's shown on the photo.)

ETR21902158



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** 報告結尾 (End of Report) **