

Test Report

號碼(No.): ETR23504781M04 日期(Date): 05-Jan-2024

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美麗微半導體股份有限公司 (FORMOSA MICROSEMI CO., LTD.)

杭州美麗微電子有限公司 (HANGZHOU FORMOSA MICRO-ELECTRONIC CO., LTD.)

宜蘭縣宜蘭市梅洲里梅洲二路38號 (NO. 38, MEIZHOU 2ND RD., MEIZHOU VIL., YILAN CITY, YILAN COUNTY 26053, TAIWAN)

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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):

樣品名稱(Sample Name) : HIGH TEMPERATURE SOLDER PROCESSED PLASTIC MOLDED PRODUCTS

(INCLUDED SURFACE MOUNT AND AXIAL PACKAGE PRODUCTS) (各項高溫焊

錫製程塑封裝產品(包含貼片與軸式封裝產品))

樣品型號(Style/Item No.) : 請參考第二頁 (PLEASE REFER TO PAGE 2)

收件日(Sample Receiving Date)

26-May-2023

測試期間(Testing Period)

: 26-May-2023 to 05-Jun-2023

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).)

測試結果(Test Results)

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

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



PIN CODE: F22E045



TAIWAN)

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杭州市濱江區明德路6號 (NO. 6, MINGDE RD., BINJIANG DIST., HANGZHOU, CHINA)

樣品型號(Style/Item No.):

4GBJ / A-405 / ASM-10A / ASM-10A-L / ASM-10C / BCT / BJ / BL / BU / DB / DBF / DBL / DBLS / DBS / DF / DFS / DFS-1 / DO-14 / DO-15 / DO-27 / DO-201AD / DO-201AE / DO-218 / DO-34 / DO-405 / DO-41 / DPAK(TO-252) / DPAK-1(TO-252-1) / DPAK-2(TO-252-2) / D2PAK(TO-263) / D2PAK-1(TO-263-1) / D2PAK-7(TO-263-7) / D3K / FH / FHV / FV5M / FV5M-1 / FV5M-2 / FH10M / GBL / GBJ / GBP / GBPC-W / GBPC-T / GBU / GBU-1/ GH / GT / HV / HV03 / HV05 / HV07 / ITO-220AB / ITO-220AB-W / ITO-220AC / KBL / KBJ / KBP / KBP-1/ KBPC-3 / KBPC-6 / KBPC-8 / KBPC-MT / KBPC-MW / KBPC-PS / KBPC-PT / KBPC-PW / KBU / LDBS / LMBS / LMDS(TBS) / LMDS-1/ MBF / MBLS / MBLS-1 / MBLS-7 / MD / MDB / MDLS / MDS(TO-269AA) / MDS-1 / MDS-6 / MINI-MELF(DO-213AA/GL34) / MINI-SMA(SOD-123) / MP / MT-35/ P0600M / P6 / P600 / QFNB / R-1 / R-3 / R-6 / R6 / RB-15 / RS / SMA / MELF(DO-213AB) / SMA-F / SMA-FL / SMA-HFL / SMA-HS / SMA-HS1 / SMA-HS2 / SMA-HSFL / SMA-HSFL1 / SMA-HSFL2 / SMA-HST / SMA-L / SMA-N/ SMA-NT / SMA-W / SMA-S / SMA-SF / SMB(DO-214AA) / SMB-F(DO-214AA) / SMB-FL / SMB-HS / SMB-HSFL / SMB-S / SMC (DO-214AB) / SMC-F(DO-214AB) / SMC-T1 / SMC-T2 / SMC-T3 / SMC-T4 /SOD-123H / SOD-123H1 / SOD-123HT / SOD-123HT1 / SOD-123MFL / SOD-123NT/ SOD-123T / SOD-123S / SOD-123S1/ SOD-123S-1 / SOD-123S-2/ SOD-123ST2 / SOD-123S-3 / SOD-123S-4 / SOD-123S-5 / SOD-123S7 / SOD-123S8 / SOD-123SA1/ SOD-123SA3 / SOD-123ST / SOD-123ST-1/ SOD-123ST-2/ SOD-323 / SOD-323HE / SOD-323S / SOD-323ST1 / SOD-323ST2 / SOD-323FLT / sTOLL-5L(MO-319A) / T4532 / T5454 / TO-92(TO-226AA) / TO-92S / TO-126 / TO-220 / TO-220AB / TO-220AC / TO-247AC / TO-247S / TO-251 / TO-251AA / TO-251AB / TO-251S / TO-252AA / TO-252-4L / TO-256 / TO-262(I2PAK) / TO-277 / TO-277A / TO-277B / TO-3P(TO-247) / TO-3PN / UDLS / W / WOB / DFN3333-8(T3333P8) / DFN5060-8(T5060P8) / DFN5060 Dual(T5060P8 Dual) / DFN3030-8(T3030P8) / DFN5X6 (DFN5060) / PPAK5X6/ DFN8080-3(T8080P3) / DFN8080-8(T8080P8) / TOLL-8L (MO-299A) / T5060P8 Thin (DFN5060-8 Thin) / SOP8 (SOP-08)



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測試部位敘述 (Test Part Description)

No.1 : 各項高溫焊錫製程塑封裝產品(包含貼片與軸式封裝產品) (HIGH TEMPERATURE SOLDER PROCESSED

PLASTIC MOLDED PRODUCTS (INCLUDED SURFACE MOUNT AND AXIAL PACKAGE PRODUCTS))

測試結果 (Test Results)

測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)
鎘 (Cd) (Cadmium (Cd))	參考IEC 62321-5: 2013,以感應耦合電漿 發射光譜儀分析。(With reference to IEC	mg/kg	2	No.1 n.d.
鉛 (Pb) (Lead (Pb))	62321-5: 2013, analysis was performed by ICP-OES.)	mg/kg	2	24400
汞 (Hg) (Mercury (Hg))	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.
六價鉻 Cr(VI) (Hexavalent Chromium Cr(VI))	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.
一溴聯苯 (Monobromobiphenyl)		mg/kg	5	n.d.
二溴聯苯 (Dibromobiphenyl)	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.
三溴聯苯 (Tribromobiphenyl)		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.



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測試項目 (Test Items)	測試方法 (Method)	單位 (Unit)	MDL	結果 (Result)
(Test items)	(Method)	(OIIII)		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)	☆ 孝(C C C 2 2 2 1 C C 2 0 1 E 以	mg/kg	5	n.d.
五溴聯苯醚 (Pentabromodiphenyl ether)	參考IEC 62321-6: 2015,以氣相層析儀/質譜儀分析。(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	-	n.d.
鄰苯二甲酸丁苯甲酯 (BBP) (Butyl benzyl		mg/kg	50	n.d.
phthalate (BBP))				
鄰苯二甲酸二丁酯 (DBP) (Dibutyl	參考IEC 62321-8: 2017 · 以氣相層析儀/質	mg/kg	50	n.d.
phthalate (DBP))	譜儀分析。(With reference to IEC 62321-			
鄰苯二甲酸二(2-乙基己基)酯 (DEHP) (Di-	8: 2017, analysis was performed by	mg/kg	50	n.d.
(2-ethylhexyl) phthalate (DEHP))	GC/MS.)			
鄰苯二甲酸二異丁酯 (DIBP) (Diisobutyl		mg/kg	50	n.d.
phthalate (DIBP))				
六溴環十二烷及所有主要被辨別出的異構	參考IEC 62321-9: 2021 · 以氣相層析儀/質	mg/kg	20	n.d.
物(HBCDD) (α- HBCDD, β- HBCDD, γ-	譜儀分析。(With reference to IEC 62321-			
HBCDD) (Hexabromocyclododecane	9: 2021, 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))				



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測試項目	測試方法	單位	MDL	結果
(Test Items)	(Method)	(Unit)		(Result)
				No.1
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.)			
中鏈氯化石蠟(C14-C17) (MCCP)	參考ISO 18219-2: 2021 · 以氣相層析儀/	mg/kg	50	n.d.
(Medium Chain Chlorinated	質譜儀分析。(With reference to ISO			
Paraffins(C14-C17) (MCCP)) (CAS No.:	18219-2: 2021, analysis was performed			
85535-85-9)	by GC/MS.)			
四溴雙酚-A (TBBP-A)	參考RSTS-E&E-121,以液相層析儀/質譜	mg/kg	10	n.d.
(Tetrabromobisphenol A (TBBP-A))	儀分析。(With reference to RSTS-E&E-			
(CAS No.: 79-94-7)	121, analysis was performed by LC/MS.)			

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. 全氟辛烷磺酸及其鹽類包含等物質 (PFOS and its salts including): CAS No.: 1763-23-1, 2795-39-3, 29457-72-5, 29081-56-9, 70225-14-8, 56773-42-3, 251099-16-8, 307-35-7, 91036-71-4, 4021-47-0 and others.
- 6. 全氟辛酸及其鹽類包含等物質 (PFOA and its salts including): CAS No.: 335-67-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0, 3825-26-1 and others.
- 7. 本報告為 ETR23504781 之異動報告。(This is the additional test report of ETR23504781.)



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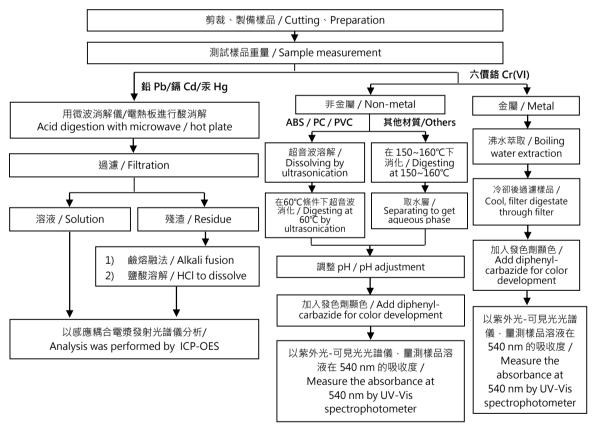
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重金屬流程圖 / Analytical flow chart of heavy metal

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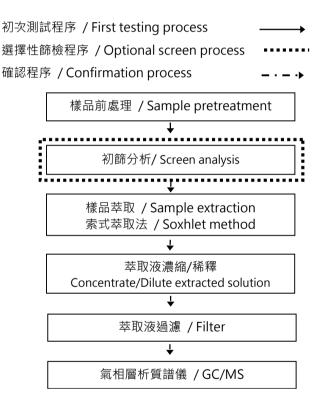
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多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBBs/PBDEs





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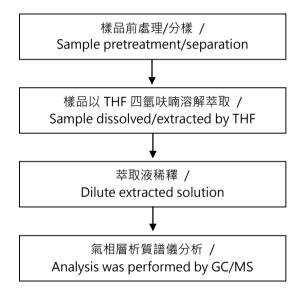
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可塑劑分析流程圖 / Analytical flow chart - Phthalate

【測試方法/Test method: IEC 62321-8】





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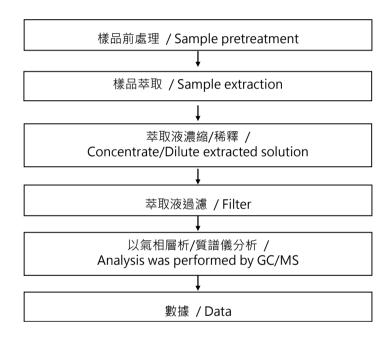
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六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD





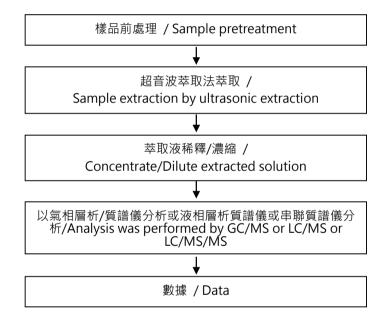
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全氟化合物(包含全氟辛酸/全氟辛烷磺酸/其相關化合物等等)分析流程圖 / Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)





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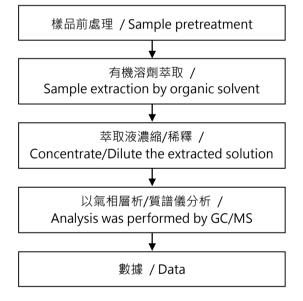
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分析流程圖 / Analytical flow chart

【適用於:多氯聯苯、多氯奈、多氯三聯苯、滅蟻靈、氯化石蠟、DBBT】

*Apply to: PCBs, PCNs, PCTs, Mirex, Chlorinated Paraffins, DBBT





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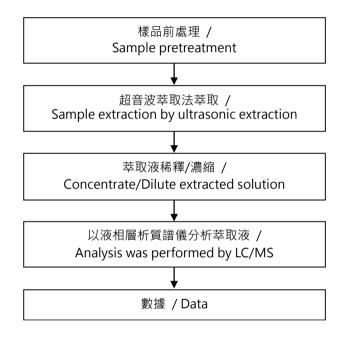
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四溴雙酚-A 分析流程圖 / Analytical flow chart - TBBP-A





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美麗微半導體股份有限公司 (FORMOSA MICROSEMI CO., LTD.)

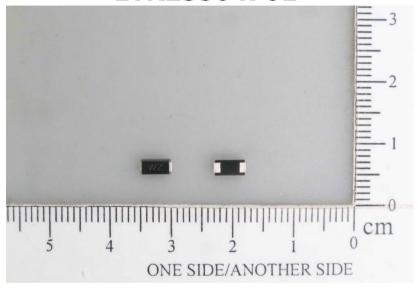
杭州美麗微電子有限公司 (HANGZHOU FORMOSA MICRO-ELECTRONIC CO., LTD.)

宜蘭縣宜蘭市梅洲里梅洲二路38號 (NO. 38, MEIZHOU 2ND RD., MEIZHOU VIL., YILAN CITY, YILAN COUNTY 26053, TAIWAN)

杭州市濱江區明德路6號 (NO. 6, MINGDE RD., BINJIANG DIST., HANGZHOU, CHINA)

* 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.)

ETR23504781



** 報告結尾 (End of Report) **