

测試報告

	逓	: CE/2016/56431A	日期(Date) : 2016/06/07	頁數(Page): 1 of 16
Test Report	》近 ^本 句(NO.)	. CE/2010/J0431A	日朝(Date). 2010/00/01	其數(rage): 1 01 10
美麗微半導體股份有限公司 FORMOSA MICROSEMI CO., L 新北市土城區中央路三段20	TD. 8號5樓			
5F., NO. 208, SEC. 3, ZH	ONGYANG RD.,	TUCHENG DIST., NEW	V TAIPEI CITY 23680, TAIWAN	
以下測試樣品係由申請廠商 behalf of the applicant		(The following s	ample(s) was/were submitte	d and identified by/on
送樣廠商(Sample Submitte	d By) :	美麗微半導體股份有	f限公司(FORMOSA MICROSEMI(CO., LTD.)
樣品名稱(Sample Descript	ion) :	BRIDGE RECTIFIERS	PRODUCTS(各項橋式整流產品))/ MOLDED TYPE(成型類)
樣品型號(Style/Item No.)	:		/ MDB / MDS (TO-269AA) / MI MDLS (MBF) / KBP / KBL / KBU	

		4GBJ / QFNB
其他(Other Info.)	:	測試部位(PART NAME)No.3:鉛含量適用ROHS排外條款(1) 7A 高熔點銲錫中的鉛(例 如鉛含量≧85 %合金中的鉛),使用於產品中的高溫焊錫膏及焊片 SN5 PB92.5
		AG2.5;(2)7(C)-I 含鉛之玻璃或陶瓷的電器和電子元件,介電陶瓷電容器除外例
		如高壓電子裝置,或玻璃或陶瓷基複合材料,使用於產品中的GLASS
		PASSIVATED(GPP)晶粒。
		PART NAME NO.3 : LEAD CONTENTS IS ROHS EXEMPTION (1) 7(A) LEAD IN HIGH
		MELTING TEMPERATURE TYPE SOLDERS (I.E. LEAD-BASED ALLOYS CONTAINING 85%
		BY WEIGHT OR MORE LEAD.); (2) 7(C)-I LEAD IN GLASS OF CATHODE RAY TUBES,
		ELECTRONIC COMPONENTS AND FLUORESCENT TUBES.
收件日期(Sample Receiving Date)	:	2016/05/31
測試期間(Testing Period)	:	2016/05/31 TO 2016/06/06

测試結果(Test Results) : 請見下一頁 (Please refer to next pages).



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<u>测試結果(Test Results)</u>

測試部位(PART NAME)No.1 : 銀色金屬腳鍍層 (PLATING LAYER OF SILVER COLORED METAL PIN) 測試部位(PART NAME)No.2 銀色金屬腳底材 (BASE MATERIAL OF SILVER COLORED METAL PIN) : 測試部位(PART NAME)No.3 : 整體混測 (MIXED ALL PARTS)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值 (MDL)	結果(Result)		
				No. 1	No. 2	No. 3
鐍 / Cadmium (Cd)	mg/kg	酸洗脫鍍層,參考IEC 62321-5 (2013) ,以感應耦合電漿原子發射光譜儀檢 測. / IEC 62321-5 (2013) application of modified digestion by surface etching and performed by ICP-AES.	2	n. d.		
	mg/kg	参考IEC 62321-5 (2013),以感應耦合 電漿原子發射光譜儀檢測. / With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2		n. d.	n. d.
鉛 / Lead (Pb)	mg/kg	酸洗脫鍍層,參考IEC 62321-5 (2013) ,以感應耦合電漿原子發射光譜儀檢 測. / IEC 62321-5 (2013) application of modified digestion by surface etching and performed by ICP-AES.	2	80. 4		
	mg/kg	參考IEC 62321-5 (2013),以感應耦合 電漿原子發射光譜儀檢測. / With reference to IEC 62321-5 (2013) and performed by ICP-AES.	2		23.2	4740



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测試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值 (MDL)	結果 (Result)		
				No. 1	No. 2	No. 3
汞 / Mercury (Hg)	mg/kg	酸洗脫鍍層,參考IEC 62321-4 (2013) ,以感應耦合電漿原子發射光譜儀檢 測. / IEC 62321-4 (2013) application of modified digestion by surface etching and performed by ICP-AES.	2	n. d.		
	mg/kg	参考IEC 62321-4 (2013),以感應耦合 電漿原子發射光譜儀檢測. / With reference to IEC 62321-4 (2013) and performed by ICP-AES.	2		n. d.	n. d.
六價鉻 / Hexavalent Chromium Cr(VI)(#2)	µg/cm²	参考IEC 62321-7-1 (2015),以UV-VIS 檢測. / With reference to IEC 62321-7-1 (2015) and performed by UV-VIS.	0.10	n. d.	n. d.	
六價鉻 / Hexavalent Chromium Cr(VI)	mg/kg	参考IEC 62321 (2008),以UV-VIS檢 測. / With reference to IEC 62321 (2008) and performed by UV-VIS.	2			n. d.
鎳 / Nickel (Ni)	mg/kg	參考US EPA 3050B(1996),以感應耦 合電漿原子發射光譜儀檢測. / With reference to US EPA 3050B(1996). Analysis was performed by ICP-AES.	2	13.4		
鈹 / Beryllium (Be)	mg/kg	参考US EPA 3052 (1996),以感應耦合 電漿原子發射光譜儀檢測. / With reference to US EPA 3052 (1996). Analysis was performed by ICP-AES.	2			n. d.



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美麗微半導體股份有限公司

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5F., NO. 208, SEC. 3, ZHONGYANG RD., TUCHENG DIST., NEW TAIPEI CITY 23680, TAIWAN

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值 (MDL)	結果 (Result)		
(Test Ttems)				No. 1	No. 2	No. 3
砷 / Arsenic (As)	mg/kg	参考US EPA 3052 (1996),以感應耦合 電漿原子發射光譜儀檢測. / With reference to US EPA 3052 (1996). Analysis was performed by ICP-AES.	2			n. d.
全氟辛烷磺酸 / Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	$\mu{ m g/m^2}$	參考US EPA 3550C (2007),以液相層 析/質譜儀檢測. / With reference to US EPA 3550C (2007). Analysis was performed by LC/MS.	1	n. d.		
全氟辛酸 / PFOA(CAS No.: 335-67-1)	$\mu { m g/m^2}$	参考US EPA 3550C (2007),以液相層 析/質譜儀檢測. / With reference to US EPA 3550C (2007). Analysis was performed by LC/MS.	1	n. d.		
鄰苯二甲酸丁苯甲酯 / BBP(Butyl Benzyl phthalate)(CAS No.: 85-68-7)	mg/kg		50			n. d.
鄰苯二甲酸二丁酯 / DBP(Dibutyl phthalate)(CAS No.: 84-74-2)	mg/kg		50			n. d.
鄰苯二甲酸二 (2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg	4 + IFC (20201 0/CD (2012)	50			n. d.
鄰苯二甲酸二異丁酯 / DIBP (Di- isobutyl phthalate) (CAS No.: 84-69- 5)	mg/kg	參考IEC 62321-8/CD (2013),以氣相 層析儀/質譜儀檢測. / With reference to IEC 62321-8/CD	50			n. d.
鄰苯二甲酸二異癸酯 / DIDP (Di- isodecyl phthalate) (CAS No.: 26761- 40-0; 68515-49-1)	mg/kg	(2013). Analysis was performed by GC/MS.	50			n. d.
鄰苯二甲酸二異壬酯 / DINP (Di- isononyl phthalate) (CAS No.: 28553- 12-0; 68515-48-0)	mg/kg		50			n. d.
鄰苯二甲酸二正辛酯 / DNOP (Di-n- octyl phthalate) (CAS No.: 117-84-0)	mg/kg		50			n. d.



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美麗微半導體股份有限公司

FORMOSA MICROSEMI CO., LTD. 新北市土城區中央路三段208號5樓 5F., NO. 208, SEC. 3, ZHONGYANG RD., TUCHENG DIST., NEW TAIPEI CITY 23680, TAIWAN

测試項目 (Test Items)	單位 测試方法 (Unit) (Method)	方法偵測 極限值	結果(Result)			
(lest lieus)		(Method)	(MDL)	No. 1	No. 2	No. 3
六溴環十二烷及所有主要被辨別出的異構 物 / Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α - HBCDD, β - HBCDD, γ - HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	mg/kg	参考IEC 62321 (2008),以氣相層析/ 質譜儀檢測. / With reference to IEC 62321 (2008). Analysis was performed by GC/MS.	5			n. d.
多溴聯苯總和 / Sum of PBBs	mg/kg		-			n. d.
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	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	参考IEC 62321-6 (2015),以氣相層析	5			n. d.
十溴聯苯 / Decabromobiphenyl	mg/kg	/質譜儀檢測. / With reference to	5			n. d.
多溴聯苯醚總和 / Sum of PBDEs	mg/kg	IEC 62321-6 (2015) and performed	-			n. d.
一溴聯苯醚 / Monobromodiphenyl ether	mg/kg	by GC/MS.	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	mg/kg	1	5			n. d.
五溴聯苯醚 / Pentabromodiphenyl ether	mg/kg		5			n. d.
六溴聯苯醚 / Hexabromodiphenyl ether	mg/kg]	5			n. d.
七溴聯苯醚 / Heptabromodiphenyl ether	mg/kg]	5			n.d.
八溴聯苯醚 / Octabromodiphenyl ether	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.



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備註(Note):

- 1. mg/kg = ppm; 0.1wt% = 1000ppm
- 2. n.d. = Not Detected (未檢出)
- 3. MDL = Method Detection Limit (方法偵測極限值)
- 4. "-" = Not Regulated (無規格值)
- 5. "---" = Not Conducted (未測項目)
- 6. (#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 μ g/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 $\mu g/cm^2$). The coating is considered a non-Cr(VI) based coating c. 當六價鉻結果介於 0.10 及 0.13 μg/cm² 時,無法確定塗層是否含有六價鉻. / The result between 0.10 μg/cm² and 0.13 μ g/cm² is considered to be inconclusive – unavoidable coating variations may influence the determination.

7. For No.3: 樣品的測試是基於申請人要求混合測試,報告中的混合測試結果不代表其中個別單一材質的含量. (The samples was/were analyzed on behalf of the applicant as mixing sample in one testing. The above results was/were only given as the informality value.)



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PFOS参考資訊(Reference Information): 持久性有機污染物 POPs - (EU) 757/2010

PFOS濃度在物質或製備中不得超過0.001%(10ppm),在半成品、成品或零部件中不得超過0.1%(1000ppm),在紡織品或塗層 材料中不得超過1 μ g/m²。

(Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above $l\mu g/m^2$.)

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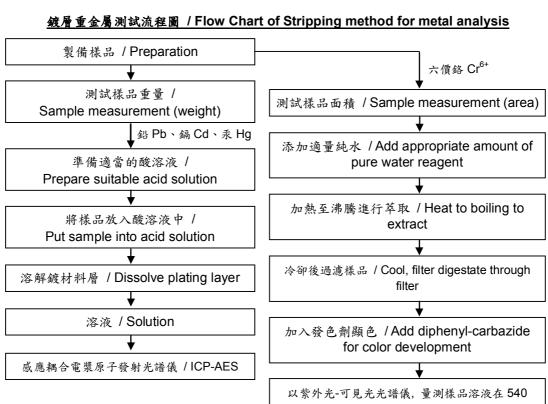
美麗微半導體股份有限公司 FORMOSA MICROSEMI CO., LTD. 新北市土城區中央路三段208號5樓 5F., NO. 208, SEC. 3, ZHONGYANG RD., TUCHENG DIST., NEW TAIPEI CITY 23680, TAIWAN

測試部位(PART NAME)No.1

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)

測試人員:王志瑋 / Technician: JR Wang

測試負責人:張啟興 / Supervisor: Troy Chang



nm 的吸收度 / measure the absorbance at 540 nm by UV-VIS



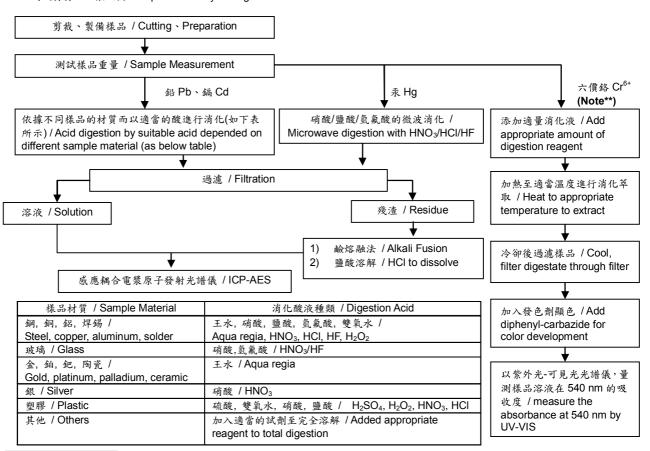
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美麗微半導體股份有限公司 FORMOSA MICROSEMI CO., LTD. 新北市土城區中央路三段208號5樓 5F., NO. 208, SEC. 3, ZHONGYANG RD., TUCHENG DIST., NEW TAIPEI CITY 23680, TAIWAN

測試部位(PART NAME)No. 2,3

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. (Cr⁶⁺ test method excluded) ■ 測試人員:王志瑋 / Technician: JR Wang

■ 測試負責人:張啟興 / Supervisor: Troy Chang



Note** (For IEC 62321)

(1) 針對非金屬材料加入鹼性消化液,加熱至 90~95℃萃取. / For non-metallic material, add alkaline digestion reagent and heat to 90~95℃.

(2) 針對金屬材料加入純水,加熱至沸腾萃取. / For metallic material, add pure water and heat to boiling.



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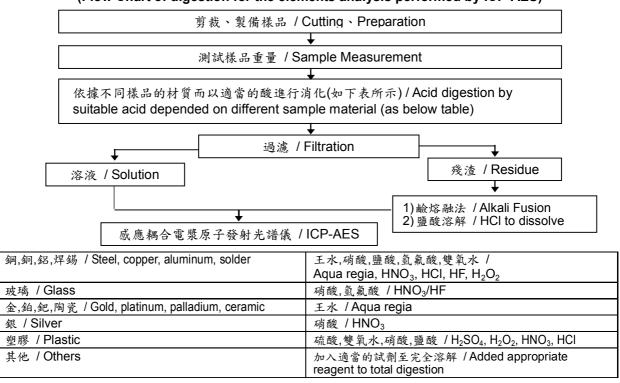
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> 根據以下的流程圖之條件,樣品已完全溶解。 / These samples were dissolved totally by pre-conditioning method according to below flow chart.

- 測試人員:王志瑋 / Technician: JR Wang
- 測試負責人:張啟興 / Supervisor: Troy Chang

元素以 ICP-AES 分析的消化流程圖 (Flow Chart of digestion for the elements analysis performed by ICP-AES)





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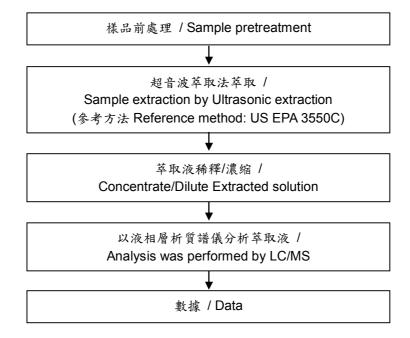
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5F., NO. 208, SEC. 3, ZHONGYANG RD., TUCHENG DIST., NEW TAIPEI CITY 23680, TAIWAN

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

- 測試人員:涂雅苓 / Technician: Yaling Tu
- 測試負責人:張啟興 / Supervisor: Troy Chang



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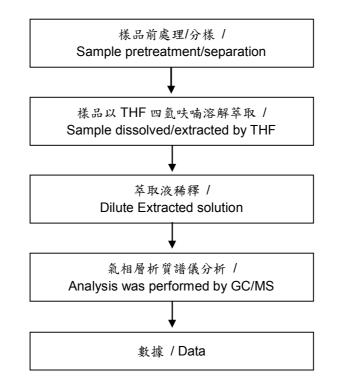
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<u>可塑劑分析流程圖 / Analytical flow chart - Phthalate</u>

- 測試人員:徐毓明 / Technician: Andy Shu
- 測試負責人:張啟興 / Supervisor nt: Troy Chang

【测試方法/Test method: IEC 62321-8】





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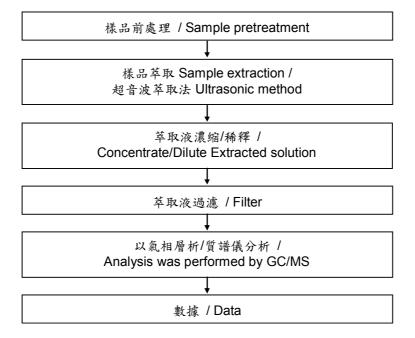
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六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD

- 測試人員:涂雅苓 / Technician: Yaling Tu
- 測試負責人:張啟興 / Supervisor: Troy Chang



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美麗微半導體股份有限公司 FORMOSA MICROSEMI CO., LTD. 新北市土城區中央路三段208號5樓 5F., NO. 208, SEC. 3, ZHONGYANG RD., TUCHENG DIST., NEW TAIPEI CITY 23680, TAIWAN

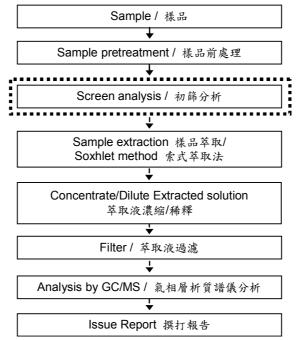
多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBB/PBDE

■ 測試人員: 涂雅苓 / Technician: Yaling Tu

■ 測試負責人:張啟興 / Supervisor: Troy Chang

初次測試程序 / First testing process _

選擇性篩檢程序 / Optional screen process 確認程序 / Confirmation process _ . _ . ▶



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測試報告 Test Report ^{號碼(No.)}: CE/2016/56431A

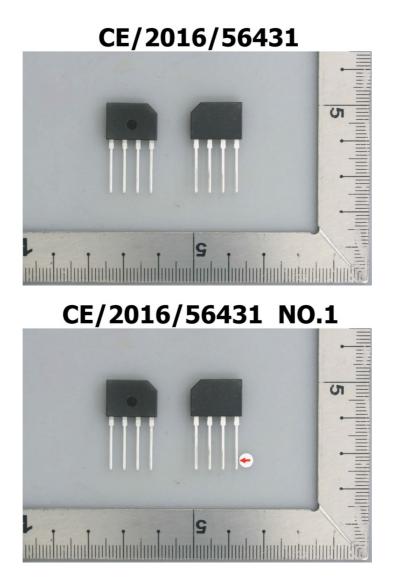
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* 照片中如有箭頭標示,則表示為實際檢測之樣品/部位. * (The tested sample / part is marked by an arrow if it's shown on the photo.)





Test Report

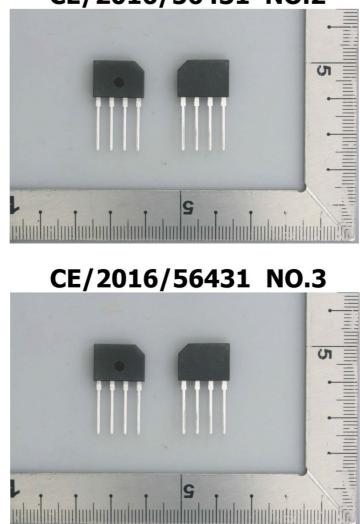
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