

Test Report

鈞寶電子工業股份有限公司 KING CORE ELECTRONICS INC. 桃園市平鎮區南豐路269號(平鎮工業區)

NO. 269, NANFONG RD., PINGJHEN DISTRICT, TAOYUAN CITY 324, 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/on behalf of the applicant as):

號碼(No.): CE/2015/61751 日期(Date): 2015/06/12

送樣廠商(Sample Submitted By) : 鈞寶電子工業股份有限公司(KING CORE ELECTRONICS INC.)

樣品名稱(Sample Description) : MULTILAYER CHIP (FINAL PRODUCT, LEAD FREE)(CHEMICAL-PLATING SOLUTION)

樣品型號(Style/Item No.) : TERMINAL-Sn 收件日期(Sample Receiving Date) : 2015/06/09

測試期間(Testing Period) : 2015/06/09 TO 2015/06/12

測試需求(Test Requested):

- (1) 依據客戶要求,參考ROHS 2011/65/EU Annex II 指令測試鎘、鉛、汞、六價鉻、多溴聯苯醚. (As specified by client, with reference to RoHS Directive 2011/65/EU Annex II to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs contents in the submitted sample.)
- (2) 依據客戶要求,參考 WTO/TBT 通報 G/TBT/N/EU/256,檢測 DBP, BBP, DEHP. (As specified by client, with reference to G/TBT/N/EU/256 of WTO/TBT to test DBP, BBP, DEHP.)
- (3) 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) : 請見下一頁 (Please refer to next pages).

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、多溴聯苯醚的測試結果符合 RoHS 指令 2011/65/EU Annex II 之限值要求 (Based on the performed tests on submitted samples, the test result(s) of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs comply with the limits as set by RoHS Directive 2011/65/EU Annex II.)
- (2) 根據客戶所提供的樣品,其 DBP, BBP, DEHP 之測試結果符合 WTO/TBT 通報 G/TBT/N/EU/256 之限 值要求 (Based on the performed tests on submitted samples, the test results of DBP, BBP, DEHP comply with the limits as set by G/TBT/N/EU/256 of WTO/TBT.)

Troy Changy Manager - Tech Signed for and on behalf of SGS TAIWAN LTD: Chemical Laboratory - Taipei

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測試結果(Test Results)

測試部位(PART NAME)No.1 : 透明液體 (TRANSPARENT LIQUID)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限値 (MDL)	結果 (Result) No.1	限值 (Limit)
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321-5: 2013方法, 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.	100
鉛 / Lead (Pb)	mg/kg	参考IEC 62321-5: 2013方法, 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.	1000
汞 / Mercury (Hg)	mg/kg	參考IEC 62321-4: 2013方法, 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.	1000
六價鉻 / Hexavalent Chromium Cr(VI)	mg/kg	参考IEC 62321: 2008方法,以UV-VIS 檢測. / With reference to IEC 62321: 2008 and performed by UV- VIS.	2	n. d.	1000
神 / Arsenic (As)	mg/kg	参考US EPA 3052方法,以感應耦合電 漿原子發射光譜儀檢測. / With reference to US EPA Method 3052. Analysis was performed by ICP-AES.	2	n. d.	-

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限値 (MDL)	結果 (Result) No.1	限值 (Limit)
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	參考IEC 62321: 2008方法, 以氣相層析/質譜儀檢測. / With reference to IEC 62321: 2008 method. Analysis was performed by GC/MS.	5	n. d.	-
全氟辛烷磺酸 / Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	参考US EPA 3550C: 2007方法, 以液相層析/質譜儀檢測. / With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n. d.	-
全氟辛酸 / PFOA (CAS No.: 335-67-1)	mg/kg	参考US EPA 3550C: 2007方法, 以液相層析/質譜儀檢測. / With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n. d.	-
鄰苯二甲酸丁苯甲酯 / BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg	参考IEC 62321-8 (111/321/CD),以氣相層析儀/質譜儀檢測之. / With reference to IEC 62321-8 (111/321/CD). Analysis was performed by GC/MS.	50	n. d.	1000
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg	參考IEC 62321-8 (111/321/CD),以氣相層析儀/質譜儀檢測之. / With reference to IEC 62321-8 (111/321/CD). Analysis was performed by GC/MS.	50	n. d.	1000
鄰苯二甲酸二 (2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg	参考IEC 62321-8 (111/321/CD),以氣相層析儀/質譜儀檢測之. / With reference to IEC 62321-8 (111/321/CD). Analysis was performed by GC/MS.	50	n. d.	1000

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號碼(No.): CE/2015/61751

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測極限値	結果 (Result)	限值 (Limit)
(Test Ttems)	(onit)	(me thod)	(MDL)	No. 1	(LIMIU)
多溴聯苯總和 / Sum of PBBs	mg/kg		_	n. d.	1000
一溴聯苯 / Monobromobiphenyl	mg/kg		5	n. d.	1
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	 參考IEC 62321: 2008方法,以氣相層	5	n. d.	_
十溴聯苯 / Decabromobiphenyl	mg/kg	析/質譜儀檢測. / With reference to IEC 62321: 2008 and performed by GC/MS.	5	n. d.	_
多溴聯苯醚總和 / Sum of PBDEs	mg/kg		-	n. d.	1000
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	mg/kg		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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號碼(No.): CE/2015/61751

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NO. 269, NANFONG RD., PINGJHEN DISTRICT, TAOYUAN CITY 324, TAIWAN



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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	限值 (Limit)
鹵素 / Halogen					
鹵素(氟)/ Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg		50	n. d.	-
鹵素(氣)/ Halogen-Chlorine (C1) (CAS No.: 22537-15-1)	mg/kg	參考BS EN 14582:2007,以離子層析儀 分析. / With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n. d.	-
鹵素(溴)/ Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg		50	n. d.	-
鹵素(碘)/ Halogen-Iodine(I)(CAS No.: 14362-44-8)	mg/kg		50	n. d.	ı

日期(Date): 2015/06/12

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)

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1µg/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 $1\mu g/m^2$.)



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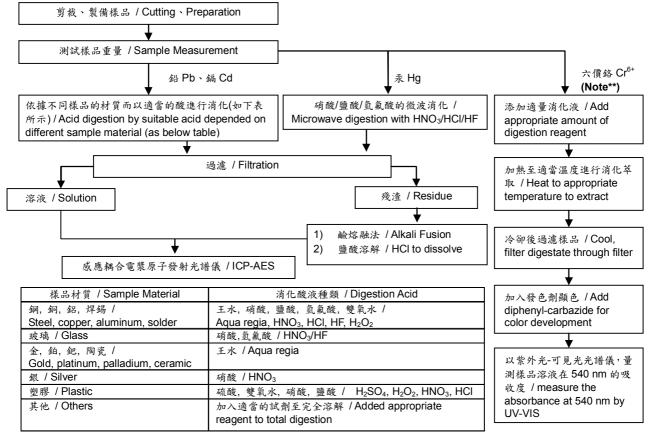
頁數(Page): 6 of 13

鈞寶電子工業股份有限公司 KING CORE ELECTRONICS INC.

桃園市平鎮區南豐路269號(平鎮工業區)

NO. 269, NANFONG RD., PINGJHEN DISTRICT, TAOYUAN CITY 324, TAIWAN

- 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)
- 測試人員:楊登偉 / Name of the person who made measurement: Climbgreat Yang
- 測試負責人:張啟興 / Name of the person in charge of measurement: 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°C
- (2) 針對金屬材料加入純水,加熱至沸騰萃取. / For metallic material, add pure water and heat to boiling.



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鈞寶電子工業股份有限公司

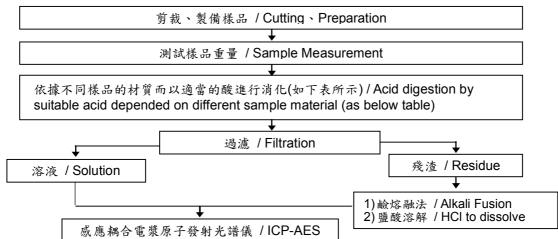
KING CORE ELECTRONICS INC.

桃園市平鎮區南豐路269號(平鎮工業區)

NO. 269, NANFONG RD., PINGJHEN DISTRICT, TAOYUAN CITY 324, TAIWAN

- 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:楊登偉 / Name of the person who made measurement: Climbgreat Yang
- 測試負責人:張啟興 / Name of the person in charge of measurement: 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)



鋼,銅,鋁,焊錫 / Steel, copper, aluminum, solder	王水,硝酸,鹽酸,氫氟酸,雙氧水 /
	Aqua regia, HNO ₃ , HCl, HF, H ₂ O ₂
玻璃 / Glass	硝酸,氫氟酸 / HNO ₃ /HF
金,鉑,鈀,陶瓷 / Gold, platinum, palladium, ceramic	王水 / Aqua regia
銀 / Silver	硝酸 / HNO ₃
塑膠 / Plastic	硫酸,雙氧水,硝酸,鹽酸 / H ₂ SO ₄ , H ₂ O ₂ , HNO ₃ , HCI
其他 / Others	加入適當的試劑至完全溶解 / Added appropriate reagent to total digestion



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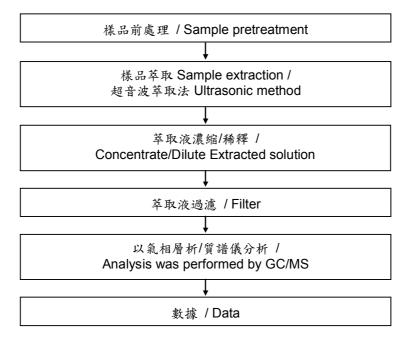


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六溴環十二烷分析流程圖 / HBCDD analytical flow chart

日期(Date): 2015/06/12

- 測試人員: 翁賜彬 / Name of the person who made measurement: Roman Wong
- 測試負責人:張啟興 / Name of the person in charge of measurement: Troy Chang





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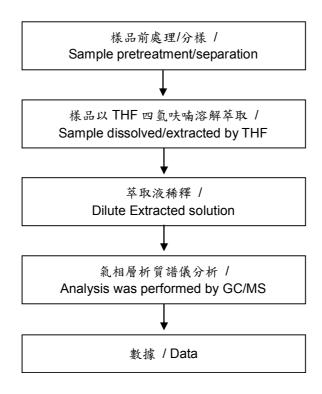
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可塑劑分析流程圖 / Analytical flow chart of phthalate content

日期(Date): 2015/06/12

- 測試人員:徐毓明 / Name of the person who made measurement: Andy Shu
- 測試負責人:張啟興 / Name of the person in charge of measurement: Troy Chang

【測試方法/Test method: IEC 62321-8】





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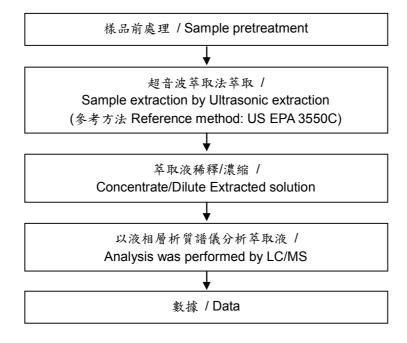
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全氟辛酸/全氟辛烷磺酸分析流程圖 / PFOA/PFOS analytical flow chart

日期(Date): 2015/06/12

- 測試人員:翁賜彬 / Name of the person who made measurement: Roman Wong
- 測試負責人:張啟興 / Name of the person in charge of measurement: Troy Chang





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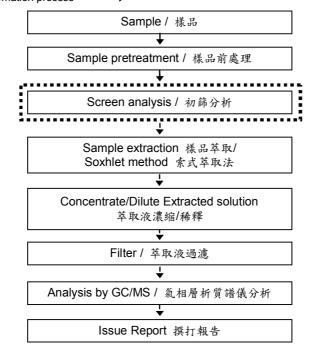
多溴聯苯/多溴聯苯醚分析流程圖 / PBB/PBDE analytical FLOW CHART

日期(Date): 2015/06/12

- 測試人員: 翁賜彬 / Name of the person who made measurement: Roman Wong
- 測試負責人:張啟興 / Name of the person in charge of measurement: Troy Chang

號碼(No.): CE/2015/61751

確認程序 / Confirmation process - - - - ▶





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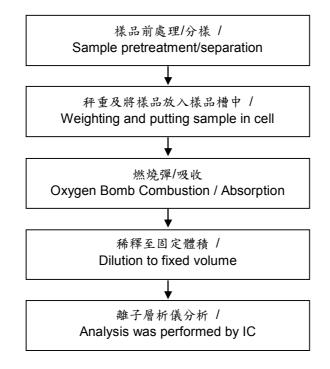


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鹵素分析流程圖 / Analytical flow chart of halogen content

日期(Date): 2015/06/12

- 測試人員: 陳恩臻 / Name of the person who made measurement: Rita Chen
- 測試負責人:張啟興 / Name of the person in charge of measurement: Troy Chang





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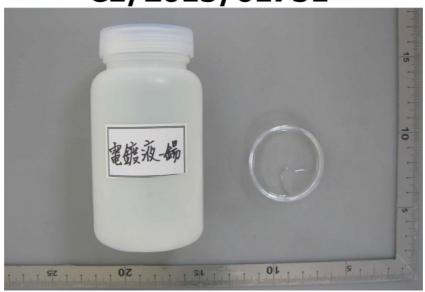
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* 照片中如有箭頭標示,則表示為實際檢測之樣品/部位. * (The tested sample / part is marked by an arrow if it's shown on the photo.)

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** 報告結尾 (End of Report) **