測試報告
Test Report

光顧科技股份有限公司
VIKING TECH CORPORATION
新竹縣湖口鄉新竹工業區光復北路70號
NO. 70, KUANFU N. ROAD, HSIN CHU INDUSTRIAL PARK, HUKOU, HSIN CHU HSIEH 303, TAIWAN

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) : 光顧科技股份有限公司 (VIKING TECH CORPORATION)
樣品名稱 (Sample Description) : THIN FILM CHIP INDUCTOR
樣品型號 (Style/Item No.) : AL SERIES
收件日期 (Sample Receiving Date) : 2019/05/21
測試期間 (Testing Period) : 2019/05/21 to 2019/05/27

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頁。 (Please refer to next pages for the other item(s).)

測試結果 (Test Results) : 請參閱下頁 (Please refer to following 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, DBP, BBP, DEHP, DIBP的測試結果符合RoHS 2011/65/EU Annex II及其修訂指令(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.)
測試報告
Test Report

光緯科技股份有限公司
VIKING TECH CORPORATION
新竹縣湖口鄉新竹工業區光復北路70號
NO. 70, KUANFU N. ROAD, HSIN CHU INDUSTRIAL PARK, HUKOU, HSIN CHU HSIENT 303, TAIWAN

測試結果(Test Results)

測試部位(PART NAME)No. 1: THIN FILM CHIP INDUCTOR (MULTILAYER CHIP INDUCTOR)

<table>
<thead>
<tr>
<th>測試項目 (Test Items)</th>
<th>單位 (Unit)</th>
<th>測試方法 (Method)</th>
<th>MDL</th>
<th>結果 (Result)</th>
<th>限值 (Limit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>鎘 / Cadmium (Cd)</td>
<td>mg/kg</td>
<td>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.</td>
<td>2</td>
<td>n.d.</td>
<td>100</td>
</tr>
<tr>
<td>鋅 / Lead (Pb)</td>
<td>mg/kg</td>
<td>參考 IEC 62321-4:2013+ AMD1:2017，以感應耦合電漿原子發射光譜儀檢測 / With reference to IEC 62321-4:2013+ AMD1:2017 and performed by ICP-AES.</td>
<td>2</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>水銀 / Mercury (Hg)</td>
<td>mg/kg</td>
<td>參考 IEC 62321-7-2 (2017)，以UV-VIS檢測 / With reference to IEC 62321-7-2 (2017) and performed by UV-VIS.</td>
<td>8</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>六價鉻 / Hexavalent Chromium Cr(VI)</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6 (2015)，以氣相層析儀 / 質譜儀檢測 / With reference to IEC 62321-6 (2015) and performed by GC/MS.</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
</tbody>
</table>

多溴聯苯總和 / Sum of PBBs
- 一溴聯苯 / Monobromobiphenyl
- 二溴聯苯 / Dibromobiphenyl
- 三溴聯苯 / Tribromobiphenyl
- 四溴聯苯 / Tetrabromobiphenyl
- 五溴聯苯 / Pentabromobiphenyl
- 六溴聯苯 / Hexabromobiphenyl
- 七溴聯苯 / Heptabromobiphenyl
- 八溴聯苯 / Octabromobiphenyl
- 九溴聯苯 / Nonabromobiphenyl
- 十溴聯苯 / Decabromobiphenyl

<table>
<thead>
<tr>
<th>测試项目 (Test Items)</th>
<th>单位 (Unit)</th>
<th>测试方法 (Method)</th>
<th>MDL</th>
<th>结果 (Result)</th>
<th>限值 (Limit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>多溴联苯总和 / Sum of PBBs</td>
<td>mg/kg</td>
<td>参考 IEC 62321-6 (2015)，以气相层析仪 / 质谱仪检测 / With reference to IEC 62321-6 (2015) and performed by GC/MS.</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
</tbody>
</table>
### 測試項目 (Test Items)

<table>
<thead>
<tr>
<th>測試項目 (Test Items)</th>
<th>單位 (Unit)</th>
<th>測試方法 (Method)</th>
<th>MDL (Result)</th>
<th>限值 (Limit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>多溴聯苯醚總和 / Sum of PBDEs</td>
<td>mg/kg</td>
<td>參考 IEC 62321-6 (2015), 以氣相層析儀/質譜儀檢測. / With reference to IEC 62321-6 (2015) and performed by GC/MS.</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>一溴聯苯醚 / Monobromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>二溴聯苯醚 / Dibromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>三溴聯苯醚 / Tribromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>四溴聯苯醚 / Tetrabromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>五溴聯苯醚 / Pentabromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>六溴聯苯醚 / Hexabromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>七溴聯苯醚 / Heptabromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>八溴聯苯醚 / Octabromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>九溴聯苯醚 / Nonabromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>十溴聯苯醚 / Decabromodiphenyl ether</td>
<td>mg/kg</td>
<td></td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>邻苯二甲酸二(2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)</td>
<td>mg/kg</td>
<td>50</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>邻苯二甲酸二甲酯 / BBP (Butyl benzyl phthalate) (CAS No.: 85-68-7)</td>
<td>mg/kg</td>
<td>50</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>邻苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)</td>
<td>mg/kg</td>
<td>50</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>邻苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)</td>
<td>mg/kg</td>
<td>50</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>邻苯二甲酸二異壬酯 / DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0; 68515-49-1)</td>
<td>mg/kg</td>
<td>50</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>邻苯二甲酸二異壬酯 / DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0; 68515-48-0)</td>
<td>mg/kg</td>
<td>50</td>
<td>n.d.</td>
<td>1000</td>
</tr>
<tr>
<td>邻苯二甲酸二正辛酯 / DNOP (Di-n- octyl phthalate) (CAS No.: 117-84-0)</td>
<td>mg/kg</td>
<td>50</td>
<td>n.d.</td>
<td>1000</td>
</tr>
</tbody>
</table>
## Test Items

<table>
<thead>
<tr>
<th>测试项目 (Test Items)</th>
<th>单位 (Unit)</th>
<th>测试方法 (Method)</th>
<th>MDL</th>
<th>结果 (Result) No. 1</th>
<th>限值 (Limit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>六溴环十二烷及所有主要被辨析出的異構物 / 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))</td>
<td>mg/kg</td>
<td>参考 IEC 62321 (2008), 以氣相層析儀/Hash 62321 (2008). Analysis was performed by GC/MS.</td>
<td>5</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>頭素 / Halogen</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>頭素 (氟) / Halogen-Fluorine (F) (CAS No.: 14762-94-8)</td>
<td>mg/kg</td>
<td>参考 IEC 62321 (2008), 以氣相層析儀/Hash 62321 (2008). Analysis was performed by GC/MS.</td>
<td>50</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>頭素 (氟) / Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)</td>
<td>mg/kg</td>
<td>参考 BS EN 14582 (2016), 以離子層析儀分析 / With reference to BS EN 14582 (2016). Analysis was performed by IC.</td>
<td>50</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>頭素 (溴) / Halogen-Bromine (Br) (CAS No.: 10097-32-2)</td>
<td>mg/kg</td>
<td>参考 BS EN 14582 (2016), 以離子層析儀分析 / With reference to BS EN 14582 (2016). Analysis was performed by IC.</td>
<td>50</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>頭素 (碘) / Halogen-Iodine (I) (CAS No.: 14362-44-8)</td>
<td>mg/kg</td>
<td>参考 BS EN 14582 (2016), 以離子層析儀分析 / With reference to BS EN 14582 (2016). Analysis was performed by IC.</td>
<td>50</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>茂全氧烷磺酸 / Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)</td>
<td>mg/kg</td>
<td>参考 BS EN 14582 (2016), 以離子層析儀分析 / With reference to BS EN 14582 (2016). Analysis was performed by IC.</td>
<td>10</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>茂全氧酸 / PFOA (CAS No.: 335-67-1)</td>
<td>mg/kg</td>
<td>参考 BS EN 14582 (2016), 以離子層析儀分析 / With reference to BS EN 14582 (2016). Analysis was performed by IC.</td>
<td>10</td>
<td>n.d.</td>
<td>-</td>
</tr>
<tr>
<td>穒 / Antimony (Sb)</td>
<td>mg/kg</td>
<td>参考 BS EN 14582 (2016), 以離子層析儀分析 / With reference to BS EN 14582 (2016). Analysis was performed by IC.</td>
<td>2</td>
<td>n.d.</td>
<td>-</td>
</tr>
</tbody>
</table>

**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 (未検出)
4. "-" = Not Regulated (無规格值)
PFOS参考資訊 (Reference Information)：持久性有機污染物 POPs - (EU) 757/2010

PFOS濃度在物資或製備中不得超過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 1µg/m².)
These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ test method excluded)

- Treatment: 酸浸法 / Acid digestion
- 用微波消解仪 / Acid digestion with microwave
- 热板消解 / Hotplate digestion
- 超音波消解 / Ultrasonication
- 在150~160℃下消化 / Digesting at 150~160℃
- 快速水萃取 / Boiling water extraction
- 冷却后过滤样品 / Cool, filter digestate through filter
- 加入发色剂显色 / Add diphenyl-carbazide for color development
- 以UV-VIS-量测样品溶液在540nm的吸光度 / Measure the absorbance at 540 nm by UV-VIS
- 金属性 / Metal
- 非金属性 / Non-metal
- 其他物质 / Others

测试样品重量 / Sample Measurement

测试样品重量 / Sample Measurement

剪裁、製备样品 / Cutting, Preparation

剪裁、製备样品 / Cutting, Preparation

1) 酸溶融法 / Alkal fusion
2) 盐酸溶解 / HCl to disslove

540 nm


test method excluded)
Sample pretreatment / 樣品前處理

Screen analysis / 初篩分析

Sample extraction / 樣品萃取

Concentrate/Dilute Extracted solution / 萃取液濃縮/稀釋

Filter / 精細濾過

GC/MS / 氣相層析質譜儀

Test Report

Technician: Yaling Tu
Supervisor: Troy Chang

Initial testing process / First testing process
Optional screen process
Confirmation process

Sample / 樣品

Analysis flow chart - PBB/PBDE

M'ao Sheng and Chonghao analyses

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at https://www.sgs.com/en/terms-and-conditions/terms-e-document. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein reflects the Company’s findings at the time of its intervention only and within the limits of client’s instruction, if any. The Company’s sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced, except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the samples tested.

SGS Taiwan Ltd. 台灣檢驗科技股份有限公司

25, W. Chien 1st Road, New Taipei Industrial Park, Wu Ku District, New Taipei City, Taiwan
Tel: +886 (02) 2299 3939 Fax: +886 (02) 2299 3237
www.sgs.com.tw

Member of the SGS Group
測試報告
Test Report

四氫呋喃溶解萃取 / Test method: IEC 62321-8

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

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

1. 樣品前處理/分樣 / Sample pretreatment/separation
2. 樣品以 THF 四氫呋喃溶解萃取 / Sample dissolved/extracted by THF
3. 萃取液稀釋 / Dilute Extracted solution
4. 氣相層析質譜儀分析 / Analysis was performed by GC/MS
六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD

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

1. 樣品前處理 / Sample pretreatment
2. 樣品萃取 / Sample extraction / 超音波萃取法 Ultrasonic method
3. 萃取液濃縮/稀釋 / Concentrate/Dilute Extracted solution
4. 萃取液過濾 / Filter
5. 以氣相層析/質譜儀分析 / Analysis was performed by GC/MS
6. 數據 / Data
測試報告
Test Report

光顒科技股份有限公司
VIKING TECH CORPORATION

新竹縣湖口鄉新竹工業區光復北路70號
NO. 70, KUANFU N. ROAD, HSIN CHU INDUSTRIAL PARK, HUKOU, HSIN CHU HSIENT 303, TAIWAN

號碼(No.) : CE/2019/54070 日期(Date) : 2019/05/27 頁數(Page): 10 of 13

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

- 测试人员：陈思纬 / Technician: Rita Chen
- 测试负责人：张敏兴 / Supervisor: Troy Chang

1. 样品前处理/分样
   Sample pretreatment/separation

2. 称重及将样品放入样品槽中
   Weighing and putting sample in cell

3. 燃烧弹/吸收
   Oxygen Bomb Combustion / Absorption

4. 稀释至固定体积
   Dilution to fixed volume

5. 离子层析仪分析
   Analysis was performed by IC
**Test Report**

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

---

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

1. 樣品前處理 / Sample pretreatment
2. 超音波萃取法萃取 / Sample extraction by Ultrasonic extraction
3. 萃取液稀釋/濃縮 / Concentrate/Dilute Extracted solution
4. 以液相層析質譜儀分析萃取液 / Analysis was performed by LC/MS
5. 數據 / Data
These samples were dissolved totally by pre-conditioning method according to below flow chart.

- 测试人员：陈恩臻 / Technician: Rita Chen
- 测试负责人：张敏兴 / Supervisor: Troy Chang

元素以 ICP-AES 分析的消化流程图

(Flow Chart of digestion for the elements analysis performed by ICP-AES)

剪裁，製備樣品 / Cutting，Preparation

測試樣品重量 / Sample Measurement

依據不同樣品的材質而以適當的酸進行消化（如下表所示）/ Acid digestion by suitable acid depended on different sample material (as below table)

溶液 / Solution

過濾 / Filtration

濁液 / Residue

1) 碱熔融法 / Alkali Fusion
2) 酸溶法 / HCl to dissolve

鋼,銅,錳,鎳 / Steel, copper, aluminum, solder

金,銀,銅,陶瓷 / Gold, platinum, palladium, ceramic

鍶 / Silver

塑料 / Plastic

其他 / Others

王水,硝酸,鹽酸,氫氟酸,雙氧水 / Aqua regia, HNO₃, HCl, HF, H₂O₂

硝酸,硝酸銅 / HNO₃/HF

王水 / Aqua regia

硝酸 / HNO₃

硝酸,雙氧水,硝酸,鹽酸 / H₂SO₄, H₂O₂, HNO₃, HCl

加入適當的試劑至完全溶解 / Added appropriate reagent to total digestion
## 測試報告
### Test Report

光韻科技股份有限公司  
VIKING TECH CORPORATION

新竹縣湖口鄉新竹工業區光復北路70號
NO. 70, KUANFU N. ROAD, HSIN CHU INDUSTRIAL PARK, HUKOU, HSIN CHU HSIEN 303, TAIWAN

* 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.)

** 貨號 (No.) : CE/2019/54070  日期 (Date) : 2019/05/27  页數 (Page) : 13 of 13**