

Specification for Approval

Date: 2012/10/11

Customer : 協裕

TAI-TECH P/N: HPC252012CF-SERIES

CUSTOMER P/N: _____

DESCRIPTION: _____

QUANTITY: _____ pcs

REMARK:		
Customer Approval Feedback		

西北臺慶科技股份有限公司
TAI-TECH Advanced Electronics Co., Ltd

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楊登欽 Peter Yang	詹志萍 Patty Chan

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APPROVED	CHECKED	DRAWN
楊祥忠 Mikey Yang	詹偉特 Jack Chan	卓秀美 Hsiu-Mei Cho

Power Inductor

HPC252012CF-SERIES

ECN HISTORY LIST

REV	DATE	DESCRIPTION	APPROVED	CHECKED	DRAWN
1.0	12/10/11	新發行	楊祥忠	詹偉特	卓秀美
備註					

Power Inductor

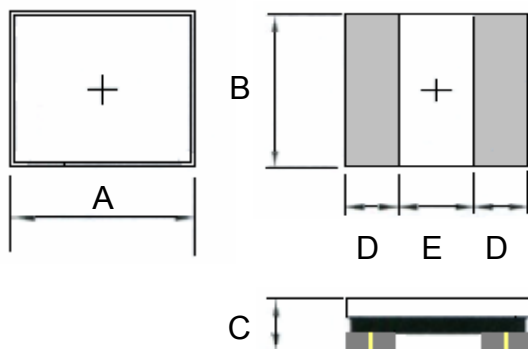
HPC252012CF-SERIES

1. Features

1. This specification applies Low Profile Power Inductors.
2. 100% Lead(Pb) & Halogen-Free and RoHS compliant.



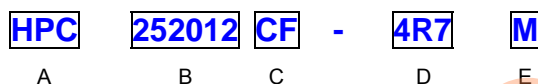
2. Dimension



Series	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)
HPC252012CF	2.5±0.2	2.0±0.2	1.2 max.	0.85 ref.	0.80 ref.

Units: mm

3. Part Numbering



- A: Series
 B: Dimension
 C: Lead Free
 D: Inductance
 E: Inductance Tolerance

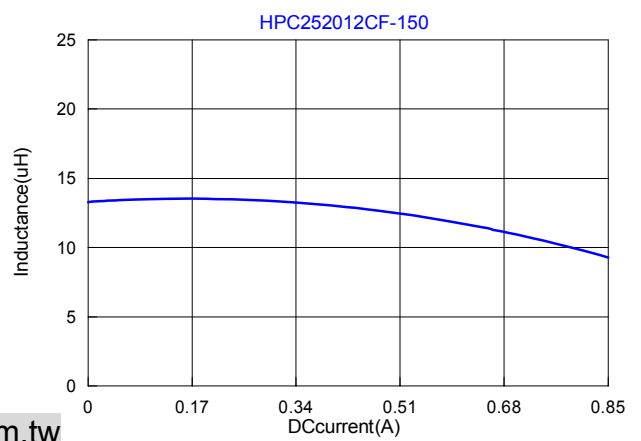
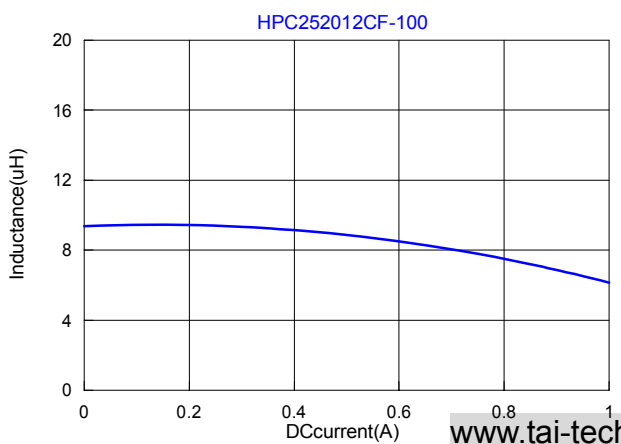
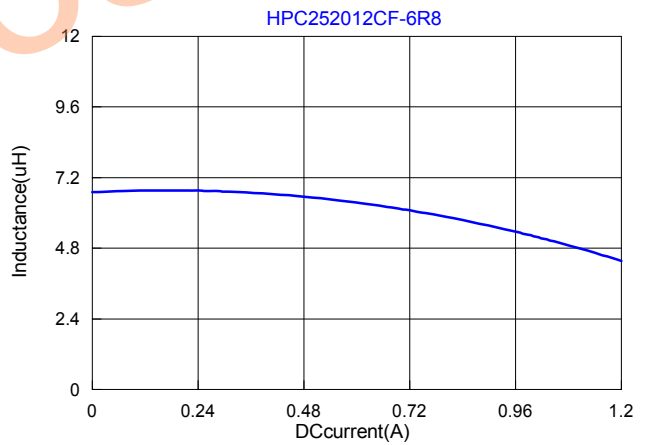
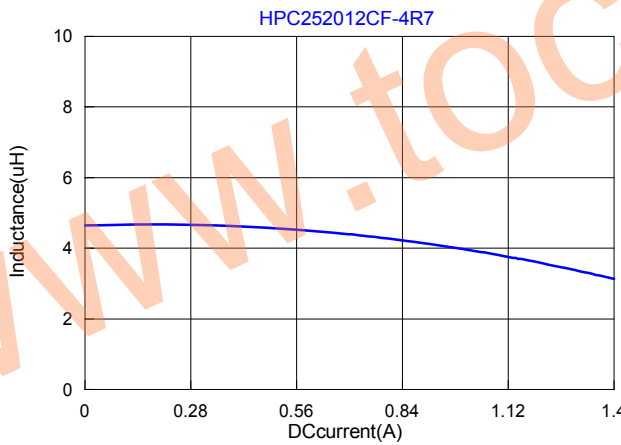
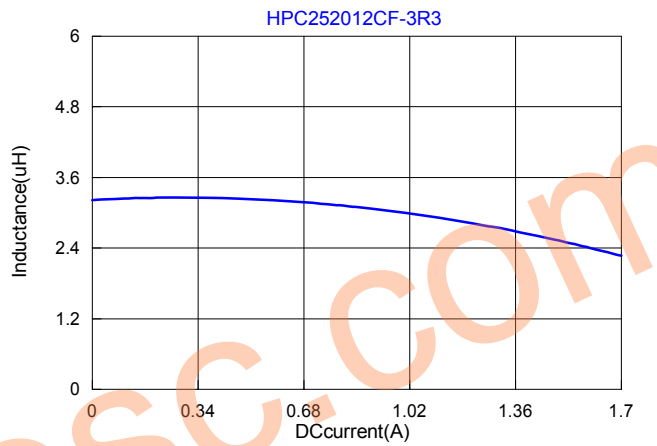
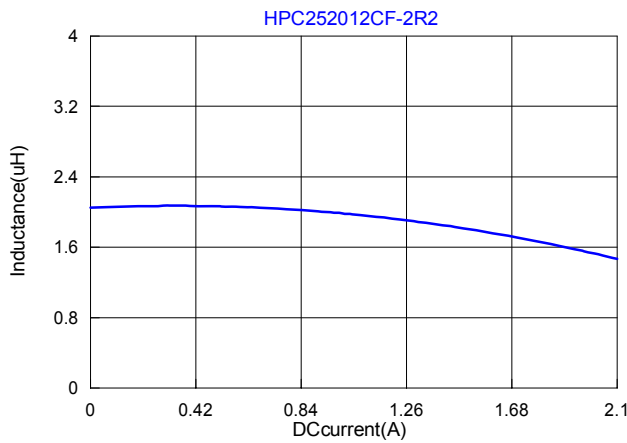
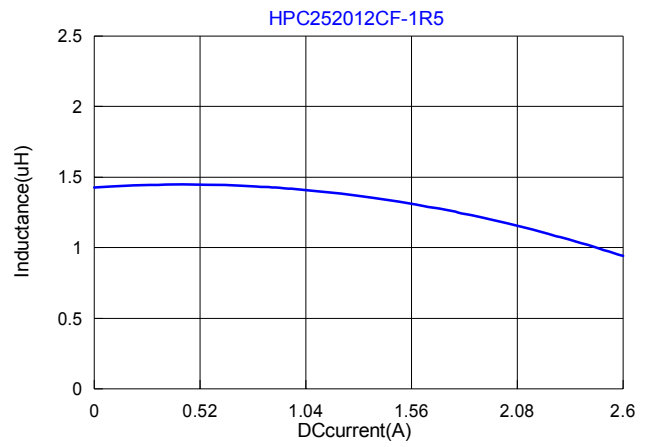
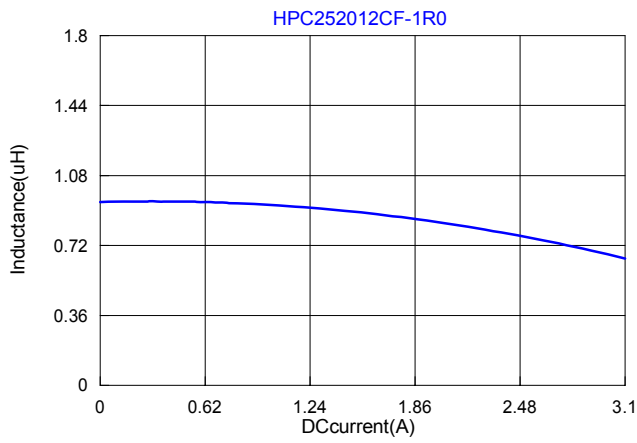
Material
 4R7=4.7uH
 M=±20% ; Y=±30%

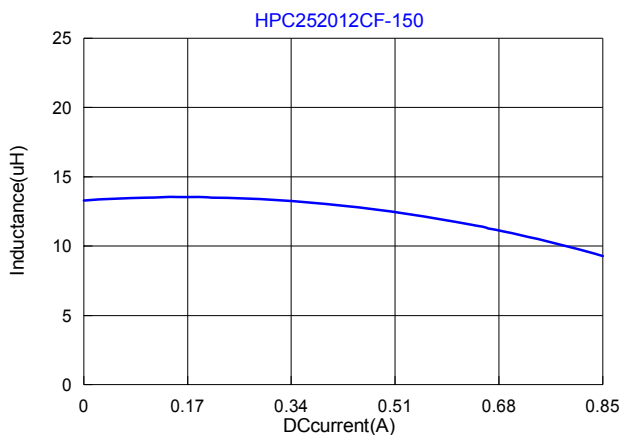
4. Specification

TAI-TECH Part Number	Inductance (uH)	Tolerance (%)	Test Frequency (Hz)	DCR (Ω) ±20%	I sat (A) typ.	I sat (A) Max.	I rms (A) typ	I rms (A) Max.
HPC252012CF-1R0Y	1.0	±30%	0.1V/1M	0.073	2.80	2.24	2.20	1.76
HPC252012CF-1R5Y	1.5	±30%	0.1V/1M	0.100	2.20	1.76	1.86	1.48
HPC252012CF-2R2M	2.2	±20%	0.1V/1M	0.129	1.80	1.44	1.70	1.36
HPC252012CF-3R3M	3.3	±20%	0.1V/1M	0.220	1.30	1.04	1.20	0.96
HPC252012CF-4R7M	4.7	±20%	0.1V/1M	0.290	1.10	0.88	1.04	0.83
HPC252012CF-6R8M	6.8	±20%	0.1V/1M	0.370	0.94	0.75	0.94	0.75
HPC252012CF-100M	10	±20%	0.1V/1M	0.570	0.82	0.65	0.84	0.60
HPC252012CF-150M	15	±20%	0.1V/1M	0.835	0.70	0.60	0.50	0.45
HPC252012CF-220M	22	±20%	0.1V/1M	1.200	0.60	0.55	0.45	0.40

Note:

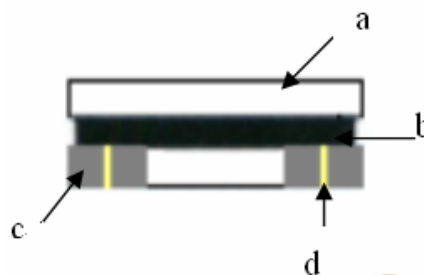
I_{sat} : Based on inductance change (ΔL/L0 : ≤-30%) @ ambient temp. 25°CI_{rms} : Based on temperature rise (ΔT : 40°C).





5. Material List

No.	Description	Specification
a.	Core	Ferrite N4 Core
b.	Coating	Epoxy
c.	Termination	Tin Pb Free
d.	Wire	Enameled Copper Wire



6. Reliability and Test Condition

Item	Performance	Test Condition
Operating Temperature	-40~+85°C (For products in unopened tape package, less than 40°C)	
Electrical Performance Test		
Inductance L	Refer to standard electrical characteristic list	Agilent-4291, Agilent-4287
Q		
SRF		
DC Resistance		Agilent-4338
Rated Current	Base on temp. rise & $\Delta L/L0 \leq 30\%$.	Saturation DC Current (Isat) will cause L0 to drop approximately $\Delta L(\%)$.
Temperature Rise Test	Rated Current < 1A ΔT 20°C Max Rated Current \geq 1A ΔT 40°C Max	Heat Rated Current (Irms) will cause the coil temperature rise approximately $\Delta T(°C)$ without core loss. 1. Applied the allowed DC current. 2. Temperature measured by digital surface thermometer
Mechanical Performance Test		
Resistance to Soldering Heat MIL-STD-202 METHOD 210	1. Inductors shall be no evidence of electrical and mechanical damage. 2. Inductance : within $\pm 0.3nH$ of initial value for $\leq 3.9nH$. 3. Inductance : within $\pm 10\%$ of initial value for $\geq 5.2nH$. 4. Q shall not change more than $\pm 20\%$.	Temp.: 260 \pm 5°C Time: 10 \pm 1.0 Sec
Solderability Test ANSI/J-STD-002	More than 95% of terminal electrode should be covered with solder.	<p>After fluxing, component shall be dipped in a melted solder bath at 235\pm5°C for 4\pm1 seconds.</p>

Item	Performance	Test Condition												
Reliability Test														
Humidity Test MIL-STD-202 METHOD 103	1. Visual examination : No mechanical damage 2. Inductance : within $\pm 10\%$ of initial value 3. Q : within $\pm 20\%$ of initial value	1. Temperature : $40 \pm 2^\circ\text{C}$ 2. Humidity : 90 ~ 95% 3. Time : 500 \pm 8hrs 4. Measured at room temperature after placing for 2 to 3 hrs												
Thermal Shock Test MIL-STD-202 METHOD 107	1. Visual examination : No mechanical damage 2. Inductance : within $\pm 10\%$ of initial value 3. Q : within $\pm 20\%$ of initial value	Conditions for 1 cycle <table border="1"> <thead> <tr> <th>Step</th> <th>Temperature($^\circ\text{C}$)</th> <th>Times(min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55 ± 2</td> <td>30 ± 3</td> </tr> <tr> <td>2</td> <td>Room Temperature</td> <td>Within 5</td> </tr> <tr> <td>2</td> <td>85 ± 5</td> <td>30 ± 3</td> </tr> </tbody> </table> Total: 100 cycles Measured at room temperature after placing for 2 to 3 hrs	Step	Temperature($^\circ\text{C}$)	Times(min.)	1	-55 ± 2	30 ± 3	2	Room Temperature	Within 5	2	85 ± 5	30 ± 3
Step	Temperature($^\circ\text{C}$)	Times(min.)												
1	-55 ± 2	30 ± 3												
2	Room Temperature	Within 5												
2	85 ± 5	30 ± 3												
High Temperature Life Test MIL-STD-202 METHOD 108	1. Visual examination : No mechanical damage 2. Inductance : within $\pm 10\%$ of initial value 3. Q : within $\pm 20\%$ of initial value	1. Temperature : $85 \pm 2^\circ\text{C}$ 2. Time : 500 \pm 8hrs 3. Measured at room temperature after placing for 2 to 3 hrs												
Humidity Resistance Test MIL-STD-202 METHOD 103		1. Temperature: $40 \pm 2^\circ\text{C}$ 2. Humidity: 90 ~ 95% 3. Time: 500 \pm 8hr. 4. Recovery: 2 to 3hrs of recovery under the standard condition after the removal from test chamber.												
Low temperature Storage Test JESD22-A119		1. Temperature : $-40 \pm 2^\circ\text{C}$ 2. Time : 500 \pm 8hrs 3. Measured at room temperature after placing for 2 to 3 hrs												
Random Vibration Test MIL-STD-202 Method 204	Appearance: Cracking, shipping and any other defects harmful to the characteristics should not be allowed. Impedance: within $\pm 30\%$	Frequency: 10-55-10Hz for 15 min. Amplitude: 1.52mm Directions and times: X, Y, Z directions for 15 min. This cycle shall be performed 12 times in each of three mutually perpendicular directions (Total 9hours).												

7. Soldering and Mounting

7-1. Soldering

Mildly activated rosin fluxes are preferred. TAI-TECH terminations are suitable for all wave and re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

7-1.1 Solder re-flow:

Recommended temperature profiles for re-flow soldering in Figure 1.

7-1.2 Soldering Iron(Figure 2):

Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended.

- Preheat circuit and products to 150°C
- Never contact the ceramic with the iron tip
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- 355°C tip temperature (max)
- 1.0mm tip diameter (max)
- Limit soldering time to 4~5 sec.

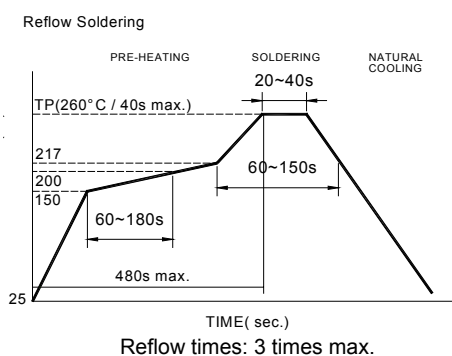


Fig.1

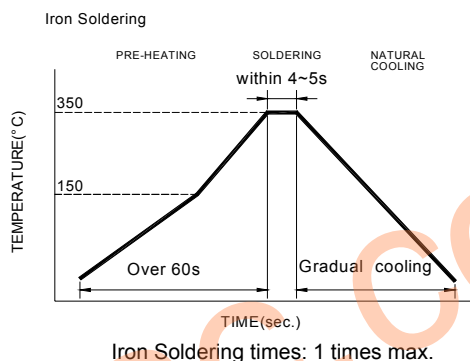
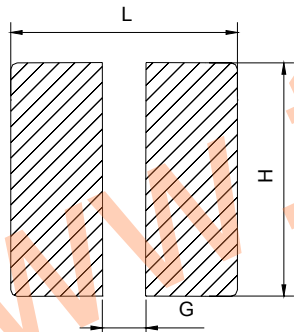


Fig.2

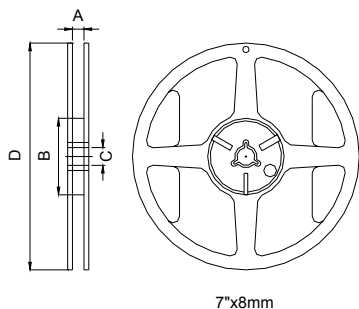
7-2. Recommended PC Board Pattern



L(mm)	G(mm)	H(mm)
2.7	0.8	2.2

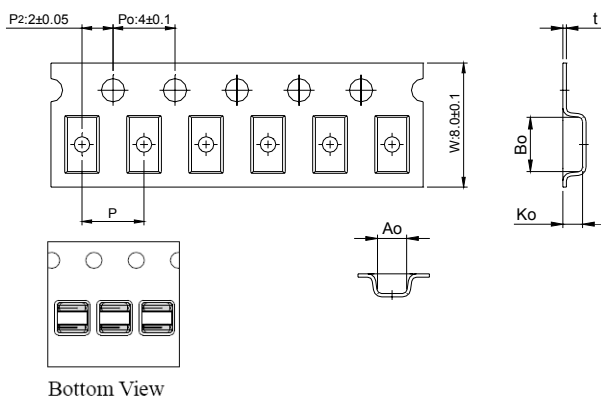
8. Packaging Information

8-1. Reel Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
7"x8mm	8.4±1.0	50 min.	13±0.8	178±2

8-2. Tape Dimension / 8mm

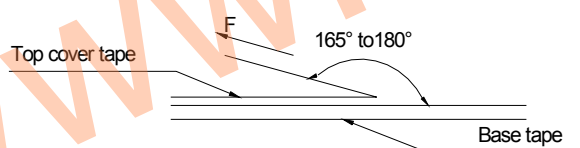


Series	Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)
HPC	252012	2.74±0.05	2.27±0.05	1.40±0.2	4.0±0.05	0.23±0.05

8-3. Packaging Quantity

Chip size	252012
Chip / Reel	2000

8-4. Tearing Off Force



The force for tearing off cover tape is 15 to 80 grams in the arrow direction under the following conditions.

Room Temp. (°C)	Room Humidity (%)	Room atm (hPa)	Tearing Speed mm/min
5~35	45~85	860~1060	300

Application Notice

- Storage Conditions

To maintain the solderability of terminal electrodes:

 1. TAI-TECH products meet IPC/JEDEC J-STD-020D standard-MSL, level 1.
 2. Temperature and humidity conditions: Less than 40°C and 60% RH.
 3. Recommended products should be used within 12 months form the time of delivery.
 4. The packaging material should be kept where no chlorine or sulfur exists in the air.
- Transportation
 1. Products should be handled with care to avoid damage or contamination from perspiration and skin oils.
 2. The use of tweezers or vacuum pick up is strongly recommended for individual components.
 3. Bulk handling should ensure that abrasion and mechanical shock are minimized.

測試報告

Test Report


號碼(No.) : CE/2012/24506 日期(Date) : 2012/02/29 頁數(Page) : 1 of 7

西北臺慶科技股份有限公司 / TAI-TECH ADVANCED ELECTRONICS CO., LTD.
(東莞臺慶精密電子有限公司 / TAI-TECH ADVANCED ELECTRONICS (DONGGUAN) CO., LTD.)
(臺慶精密電子(昆山)有限公司 / TAI-TECH ADVANCED ELECTRONICS (KUN-SHAN) CO., LTD.)
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(江蘇省昆山市筵朗昆嘉高科技工業區郭澤路 / GUO-ZE ROAD, KUNJIA HI-TECH INDUSTRIAL PARK, KUN-SHAN, JIANG-SU,
CHINA)

以下測試樣品係由客戶送樣，且由客戶聲稱並經客戶確認如下 (The following samples was/were submitted and identified by/on behalf of the client as) :

樣品名稱(Sample Description) : TLP, HPC, TLPC, SPC, TLPH, SPI SERIES
樣品型號(Style/Item No.) : TLP, HPC, TLPC, SPC, TLPH, SPI SERIES
收件日期(Sample Receiving Date) : 2012/02/21
測試期間(Testing Period) : 2012/02/21 TO 2012/02/29

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


Chenyu Kung / Operation Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory -- Taipei

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測試報告

Test Report

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 (江蘇省昆山市蓬朗昆嘉高科技工業區郭澤路 / GUO-ZE ROAD, KUNJIA HI-TECH INDUSTRIAL PARK, KUN-SHAN, JIANG-SU, CHINA)

測試結果(Test Results)

測試部位(PART NAME) No.1 : 整體混測 (6款) (MIXED ALL PARTS (6 KINDS))

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值	結果 (Result)
			(MDL)	No.1
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321: 2008方法, 以感應耦合電漿原子發射光譜儀檢測。 / With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.
鉛 / Lead (Pb)	mg/kg	參考IEC 62321: 2008方法, 以感應耦合電漿原子發射光譜儀檢測。 / With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.
汞 / Mercury (Hg)	mg/kg	參考IEC 62321: 2008方法, 以感應耦合電漿原子發射光譜儀檢測。 / With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.
六價鉻 / Hexavalent Chromium Cr(VI)	mg/kg	參考IEC 62321: 2008方法, 以UV-VIS檢測。 / With reference to IEC 62321: 2008 and performed by UV-VIS.	2	n.d.
鹵素 / Halogen				
鹵素(氟) / Halogen-Fluorine (F) (CAS No.: 14762-94-8)			50	n.d.
鹵素(氯) / Halogen-Chlorine (Cl) (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)			50	n.d.
鹵素(碘) / Halogen-Iodine (I) (CAS No.: 14362-44-8)			50	n.d.

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測試報告

Test Report

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 (臺慶精密電子(昆山)有限公司 / TAI-TECH ADVANCED ELECTRONICS (KUN-SHAN) CO., LTD.)
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 (廣東省東莞市黃江鎮黃牛埔福祥街2號 / NO. 2, FU XIANG STREET, HUANGNIU PU, HUANGJIANG TOWN, DONGGUAN, GUANGDONG)
 (江蘇省昆山市蓬朗區嘉高科技工業區郭澤路 / GUO-ZE ROAD, KUNJIA HI-TECH INDUSTRIAL PARK, KUN-SHAN, JIANG-SU, CHINA)

測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	方法偵測 極限值	結果 (Result)
			(MDL)	No. 1
多溴聯苯總和 / Sum of PBBs	mg/kg	參考IEC 62321: 2008方法, 以氣相層析儀/質譜儀檢測. / With reference to IEC 62321: 2008 and performed by GC/MS.	-	n.d.
一溴聯苯 / Monobromobiphenyl			5	n.d.
二溴聯苯 / Dibromobiphenyl			5	n.d.
三溴聯苯 / Tribromobiphenyl			5	n.d.
四溴聯苯 / Tetrabromobiphenyl			5	n.d.
五溴聯苯 / Pentabromobiphenyl			5	n.d.
六溴聯苯 / Hexabromobiphenyl			5	n.d.
七溴聯苯 / Heptabromobiphenyl			5	n.d.
八溴聯苯 / Octabromobiphenyl			5	n.d.
九溴聯苯 / Nonabromobiphenyl			5	n.d.
十溴聯苯 / Decabromobiphenyl			5	n.d.
多溴聯苯醚總和 / Sum of PBDEs			-	n.d.
一溴聯苯醚 / Monobromodiphenyl ether			5	n.d.
二溴聯苯醚 / Dibromodiphenyl ether			5	n.d.
三溴聯苯醚 / Tribromodiphenyl ether			5	n.d.
四溴聯苯醚 / Tetrabromodiphenyl ether			5	n.d.
五溴聯苯醚 / Pentabromodiphenyl ether			5	n.d.
六溴聯苯醚 / Hexabromodiphenyl ether			5	n.d.
七溴聯苯醚 / Heptabromodiphenyl ether			5	n.d.
八溴聯苯醚 / Octabromodiphenyl ether			5	n.d.
九溴聯苯醚 / Nonabromodiphenyl ether	5	n.d.		
十溴聯苯醚 / Decabromodiphenyl ether	5	n.d.		

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. 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.)

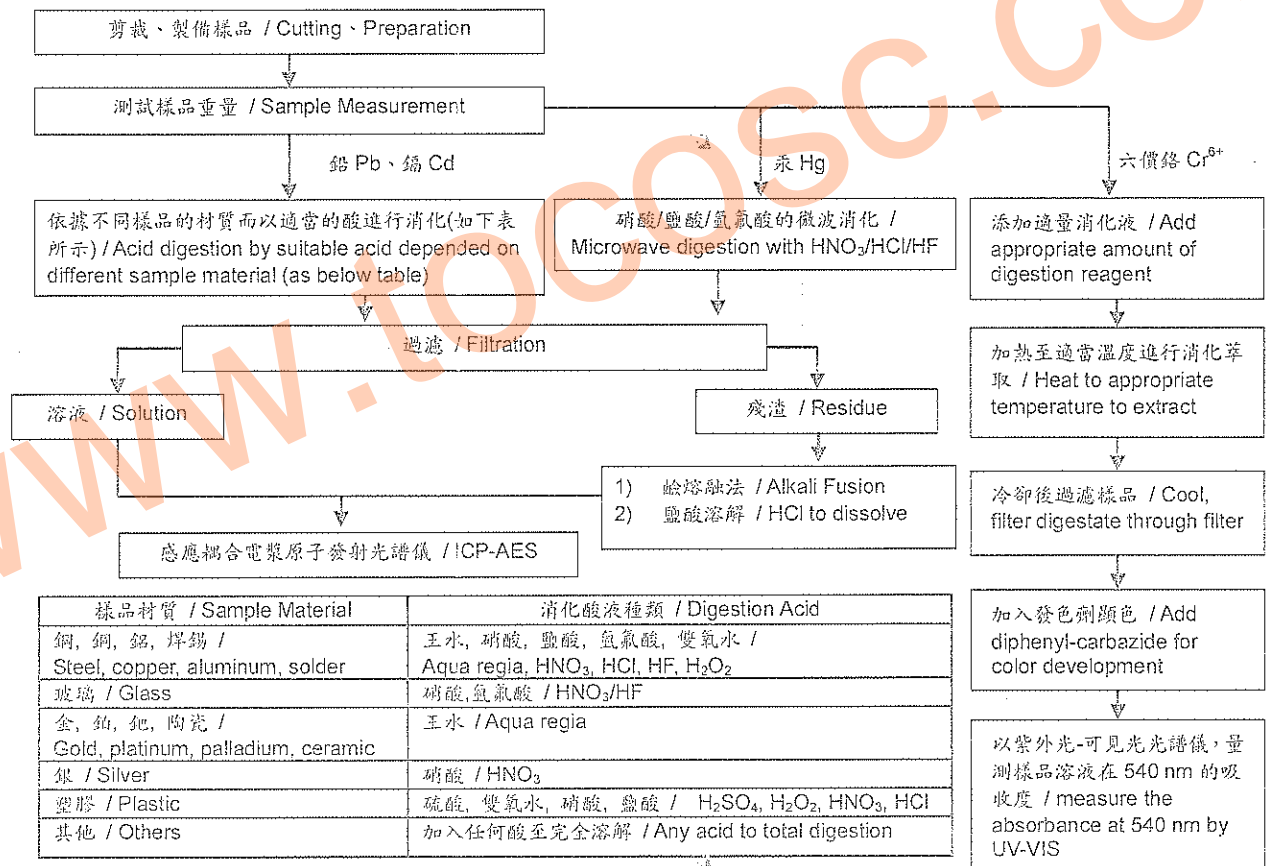
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測試報告 Test Report

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 (臺慶精密電子(昆山)有限公司 / TAI-TECH ADVANCED ELECTRONICS (KUN-SHAN) CO., LTD.)
 桃園縣楊梅市幼獅工業區幼四路1之1號 / NO. 1, YOU 4TH ROAD, YOUTH INDUSTRIAL DISTRICT, YANG-MEI CITY, TAO-YUAN HSIEN, TAIWAN, R. O. C.)
 (廣東省東莞市黃江鎮黃牛埔福祥街2號 / NO. 2, FUXIANG STREET, HUANGNIUPU, HUANGJIANG TOWN, DONGGUAN, GUANGDONG)
 (江蘇省昆山市蓬朗區嘉高科技工業區郭澤路 / GUO-ZE ROAD, KUNJIA HI-TECH INDUSTRIAL PARK, KUN-SHAN, JIANG-SU, CHINA)

- 1) 根據以下的流程图之條件，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)
- 2) 測試人員：楊登偉 / Name of the person who made measurement: Climbgreat Yang
- 3) 測試負責人：張啓興 / Name of the person in charge of measurement: Troy Chang



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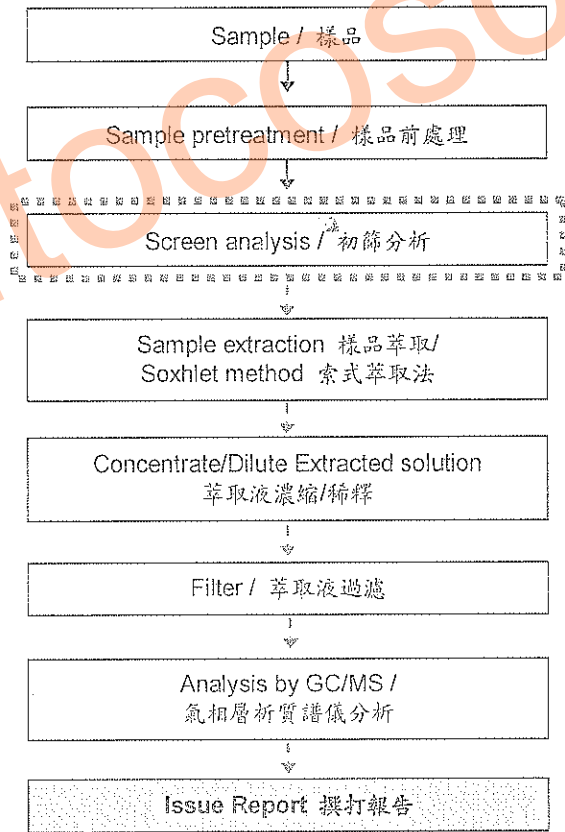
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多溴聯苯/多溴聯苯醚分析流程圖 / PBB/PBDE analytical FLOW CHART

- 圖 測試人員：翁賜彬 / Name of the person who made measurement: Roman Wong
- 圖 測試負責人：張啓興 / Name of the person in charge of measurement: 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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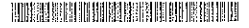
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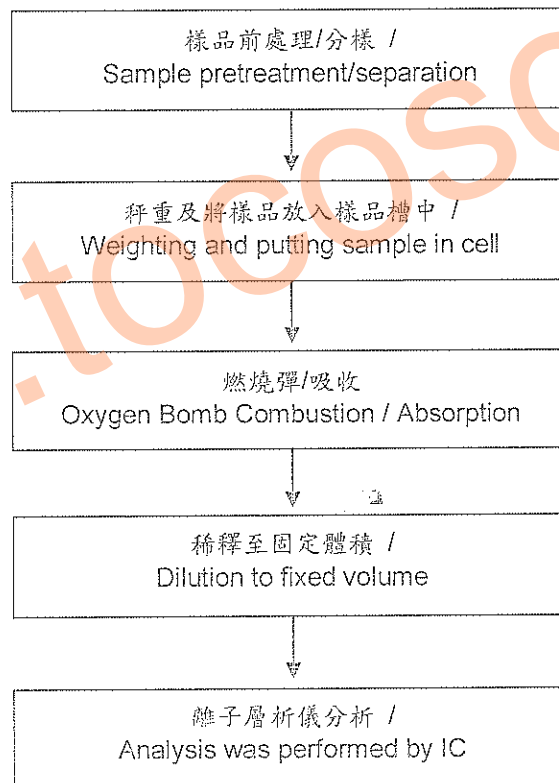
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鹵素分析流程圖 / Analytical flow chart of halogen content

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




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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.)

CE/2012/24506



** 報告結尾(End of Report) **

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