

# Specification for Approval

**Date:** 2012/10/31

**Customer :** 天河

**TAI-TECH P/N:** CHTPW3316F-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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**SMD Type Power Inductor**

CHTPW3316F-Series

<b>ECN HISTORY LIST</b>					
REV	DATE	DESCRIPTION	APPROVED	CHECKED	DRAWN
1.0	12/10/31	新發行	許智良	張榮泉	徐允珮
備 註					

# SMD Type Power Inductor

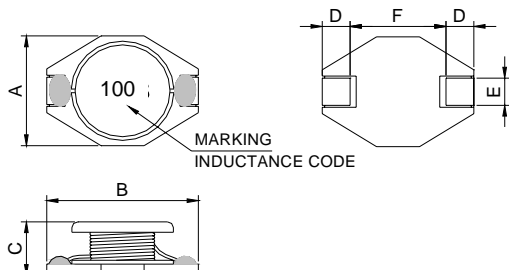
CHTPW3316F-Series

## 1. Features

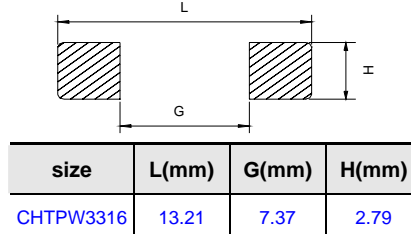
- 1.Low profile very effective in space-conscious applications.
- 2.Low resistance and high energy storage.
- 3.100% Lead(Pb) & Halogen-Free and RoHS compliant.



## 2. Dimension



### Recommended PC Board Pattern

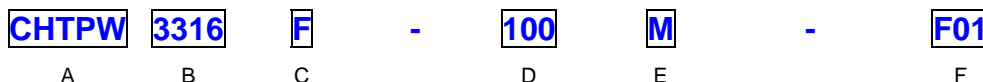


Units: mm

Series	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)
CHTPW3316	9.30±0.20	12.80±0.20	5.00±0.30	2.40±0.20	2.50±0.20	7.60±0.30

Units: mm

## 3. Part Numbering



- A: Series
- B: Dimension
- C: Lead free
- D: Inductance 100=10.0uH
- E: Inductance Tolerance M=±20%, N=±25% , Y=±30
- F: Control S/N

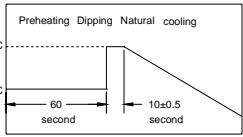
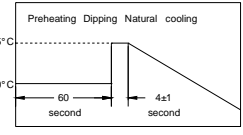
## 4. Specification

Part Number	Inductance (uH)	Test Frequency (Hz)	SRF (MHz) typ.	DCR (Ω) max.	I rms (A)	I sat (A)
CHTPW3316F-1R0M	1.0±20%	0.1V/100K	150	0.009	6.8	9.0
CHTPW3316F-1R5M	1.5±20%	0.1V/100K	100	0.010	6.4	8.0
CHTPW3316F-2R2M	2.2±20%	0.1V/100K	85	0.012	6.1	7.0
CHTPW3316F-3R3M	3.3±20%	0.1V/100K	60	0.015	5.4	5.8
CHTPW3316F-4R7M	4.7±20%	0.1V/100K	45	0.018	4.8	5.2
CHTPW3316F-6R8M	6.8±20%	0.1V/100K	35	0.027	4.4	4.3
CHTPW3316F-100M	10±20%	0.1V/100K	25	0.038	3.9	3.4
CHTPW3316F-150M	15±20%	0.1V/100K	20	0.046	3.1	3.0
CHTPW3316F-220M	22±20%	0.1V/100K	18	0.085	2.7	2.5
CHTPW3316F-330M	33±20%	0.1V/100K	14	0.10	2.1	2.0
CHTPW3316F-470M	47±20%	0.1V/100K	11	0.14	1.8	1.8
CHTPW3316F-680M	68±20%	0.1V/100K	10	0.20	1.5	1.4
CHTPW3316F-101M	100±20%	0.1V/100K	7.0	0.28	1.3	1.1
CHTPW3316F-151M	150±20%	0.1V/100K	6.5	0.40	1.0	0.9
CHTPW3316F-221M	220±20%	0.1V/100K	5.0	0.61	0.8	0.8
CHTPW3316F-331M	330±20%	0.1V/100K	4.0	1.02	0.6	0.6
CHTPW3316F-471M	470±20%	0.1V/100K	3.0	1.27	0.5	0.5
CHTPW3316F-681M	680±20%	0.1V/100K	2.5	2.02	0.4	0.4
CHTPW3316F-102M	1000±20%	0.1V/100K	2.0	3.00	0.3	0.3

### 5. Schematic Diagram



### 6. Reliability and Test Condition

Item	Performance	Test Condition															
Operating Temperature	-40~+85°C																
Storage temperature	-40~+85°C (For products in unopened tape package, less than 40°C) 50~60%RH (Product without taping)																
Rated Current	Base on temp. rise & $\Delta L/LOA \leq 30\%$ typ.	Saturation DC Current (Isat) will cause L0 to drop approximately $\Delta L(\%)$ .															
Temperature Rise Test	40°C max. ( $\Delta t$ )	Heat Rated Current (Irms) will cause the coil temperature rise approximately $\Delta T(^{\circ}C)$ without core loss. 1. Applied the allowed DC current. 2. Temperature measured by digital surface thermometer															
Solder heat Resistance MIL-STD-202 Method 210F Condition B	Appearance: No significant abnormality. Inductance change: Within $\pm 20\%$ .	 <p>Preheat: 150±5°C, 60sec. Solder : Sn-Cu0.5% Solder temperature: 260±5°C Flux: rosin Dip time: 10±0.5sec.</p>															
Solderability ANSI /J-STD-002C Method B	More than 90% of the terminal electrode should be covered with solder.	 <p>Preheat: 150±5°C, 60sec. Solder : Sn-Cu0.5% Solder temperature: 235±5°C Flux: rosin Dip time: 4±1sec..</p>															
Thermal shock (Unload Test) MIL-STD-202G METHOD 107G Test condition A-3	Appearance: no damage. Inductance: within $\pm 20\%$ of initial value.	<table border="1" data-bbox="734 1164 1029 1422"> <thead> <tr> <th>Phase</th> <th>Temperature(°C)</th> <th>Time(min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55+0/-2°C</td> <td>15±1</td> </tr> <tr> <td>2</td> <td>Room Temp.</td> <td>5</td> </tr> <tr> <td>3</td> <td>+85+2/-0°C</td> <td>15±1</td> </tr> <tr> <td>4</td> <td>Room Temp.</td> <td>5</td> </tr> </tbody> </table> <p>Measured: 100 times</p> <p>For CHTPW Condition for 1 cycle Step1:- 55+0/-2°C 15±1 min. Step2: Room temperature 5 min. Step3: +85+2/-0°C 15±1 min. Step4: Room temperature 5 min. Number of cycles: 100</p>	Phase	Temperature(°C)	Time(min)	1	-55+0/-2°C	15±1	2	Room Temp.	5	3	+85+2/-0°C	15±1	4	Room Temp.	5
Phase	Temperature(°C)	Time(min)															
1	-55+0/-2°C	15±1															
2	Room Temp.	5															
3	+85+2/-0°C	15±1															
4	Room Temp.	5															
Humidity Resistance Test (Unload Test) MIL-STD-202G METHOD 103B Test condition C	Appearance: no damage. Inductance: within $\pm 20\%$ of initial value.	Temperature: 40±2°C. Duration: 500 hrs. Humidity: 90~95%															
High Temperature Resistance Test (Unload Test) MIL-STD-202G METHOD 108A Test condition C	Appearance: no damage. Inductance: within $\pm 20\%$ of initial value.	Temperature: 85±2°C. Duration: 500 hrs.															
Low Temperature Life Test	Appearance: no damage. Inductance: within $\pm 20\%$ of initial value.	Temperature: -40±2°C. Applied current: rated current. Duration: 500 hrs.															
Random Vibration Test (Unload Test) MIL-STD-202 Method 204 D Test condition A	Appearance: Cracking, shipping and any other defects harmful to the characteristics should not be allowed. Inductance: within $\pm 20\%$ of initial value.	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).															

## 8. Soldering and Mounting

### 8-1. Soldering

Mildly activated rosin fluxes are preferred. The minimum amount of solder can lead to damage from the stresses caused by the difference in coefficients of expansion between solder, chip and substrate. TAI-TECH terminations are suitable for re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

#### 8-1.1 Solder re-flow:

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

#### 8-1.2 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.

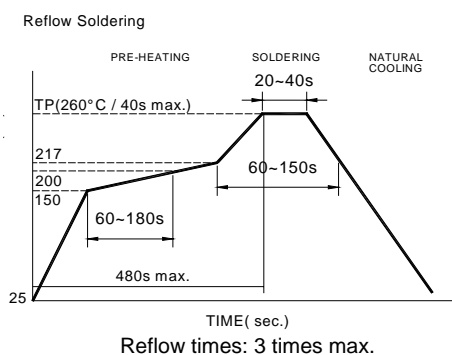


Fig.1

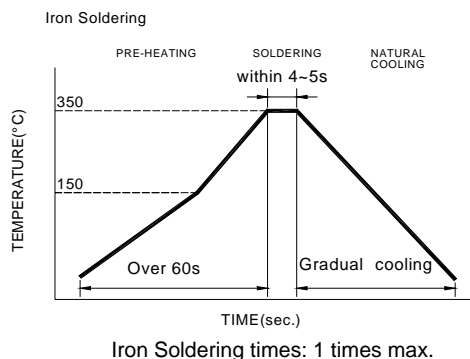
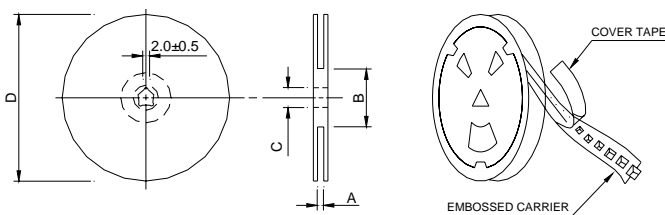


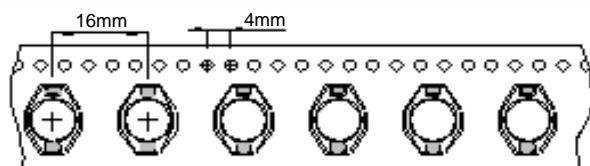
Fig.2

## 9. Packaging Information

### 9-1. Reel Dimension & Tape Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
13"x24mm	24.5	100	13.5±0.5	330

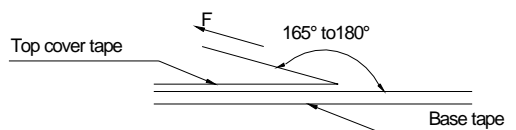


### 9-2. Packaging Quantity

CHTP W	3316F
Chip / Reel	500
Reel Style	13"x24mm

## 9-3. Tearing Off Force

The force for tearing off cover tape is 10 to 130 grams in the arrow direction under the following conditions (referenced ANSI/EIA-481-C-2003 of 4.11 standard).



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 from 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/2012/37274 日期(Date) : 2012/04/03 頁數(Page) : 1 of 7

西北臺慶科技股份有限公司 / TAI-TECH ADVANCED ELECTRONICS CO., LTD.

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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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(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)

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) : SMD POWER INDUCTOR、COMMON MODE CHOKE COIL  
樣品型號(Style/Item No.) : CHTPW, CHTPR, TP, CHCPW, T4W, T5W SERIES  
收件日期(Sample Receiving Date) : 2012/03/28  
測試期間(Testing Period) : 2012/03/28 TO 2012/04/03

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

號碼(No.) : CE/2012/37274 日期(Date) : 2012/04/03 頁數(Page) : 2 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.)  
 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 (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
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.
<b>鹵素 / Halogen</b>				
鹵素 (氟) / Halogen-Fluorine (F) (CAS No.: 14762-94-8)	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 (氯) / Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)			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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西北臺慶科技股份有限公司 / TAI-TECH ADVANCED ELECTRONICS CO., LTD.  
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 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.)

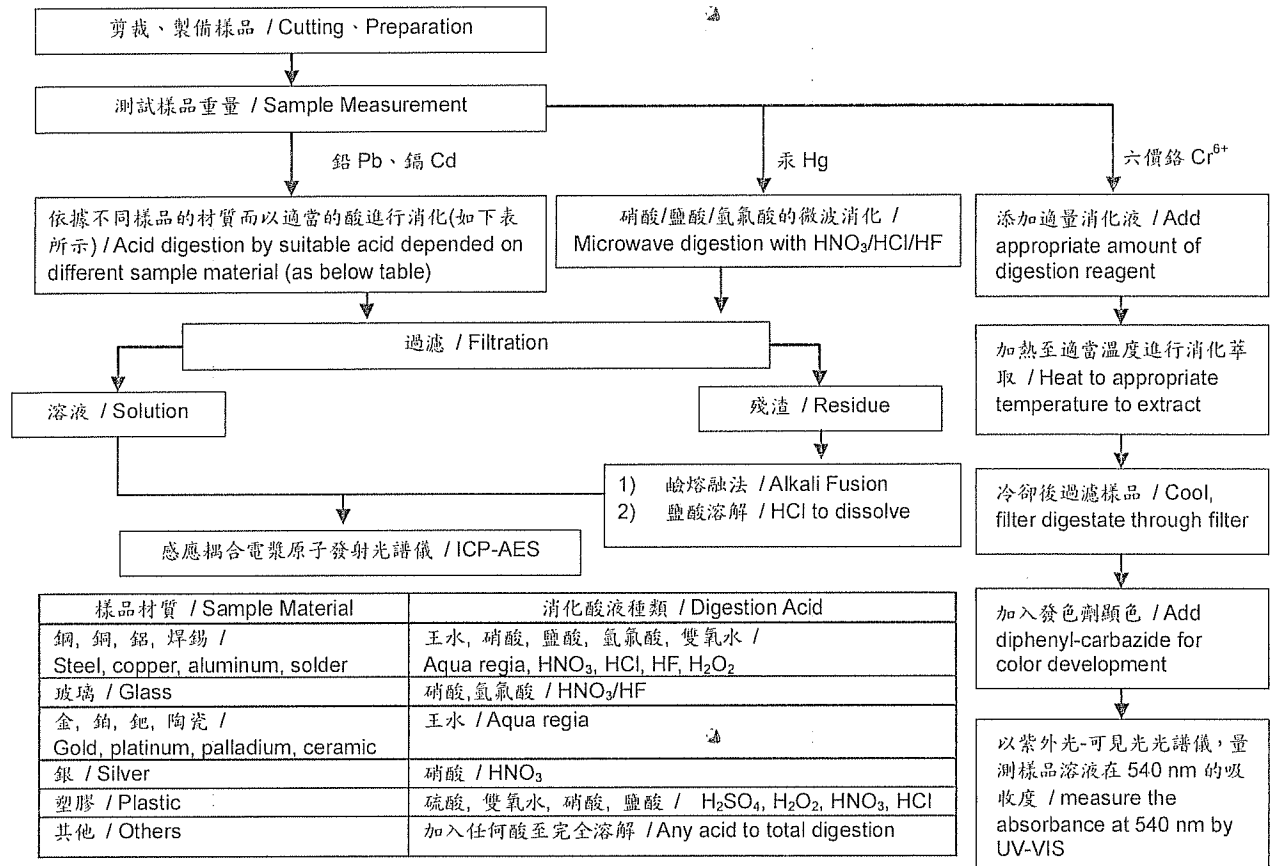
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## 測試報告 Test Report

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 (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.)  
 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)  
 (江蘇省昆山市蓬朗昆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<sup>6+</sup> 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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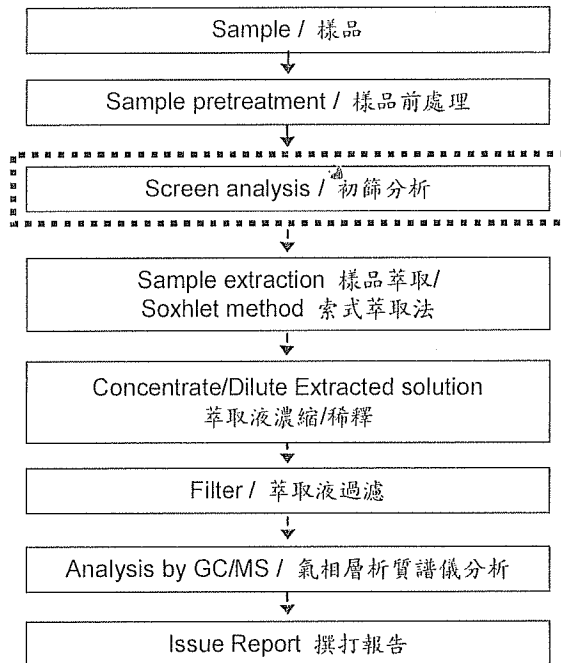
## 測試報告 Test Report

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 CHINA)

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


- 測試人員：翁賜彬 / Name of the person who made measurement: Roman Wong
- 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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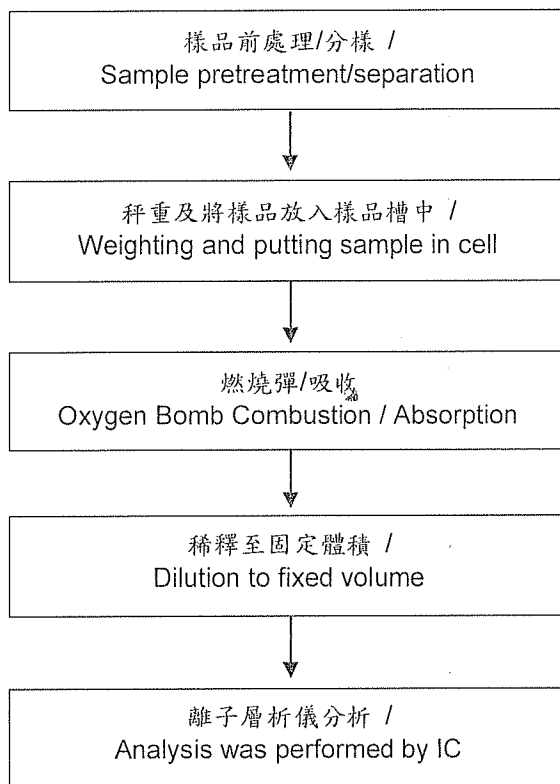
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 CHINA)

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

- 1) 測試人員：陳立倫 / Name of the person who made measurement: Alan Chen
- 2) 測試負責人：張啓興 / Name of the person in charge of measurement: Troy Chang



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## 測試報告 Test Report

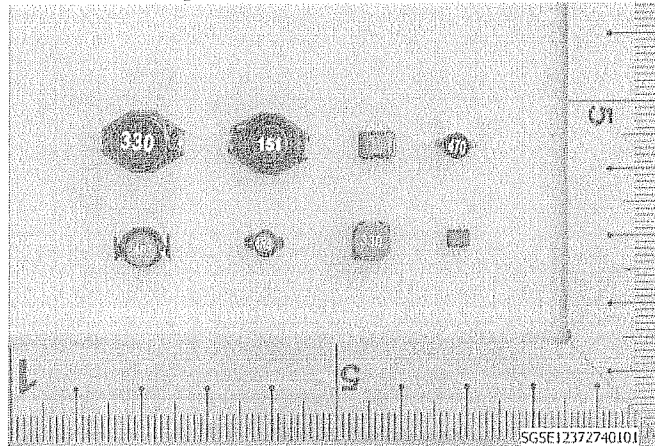
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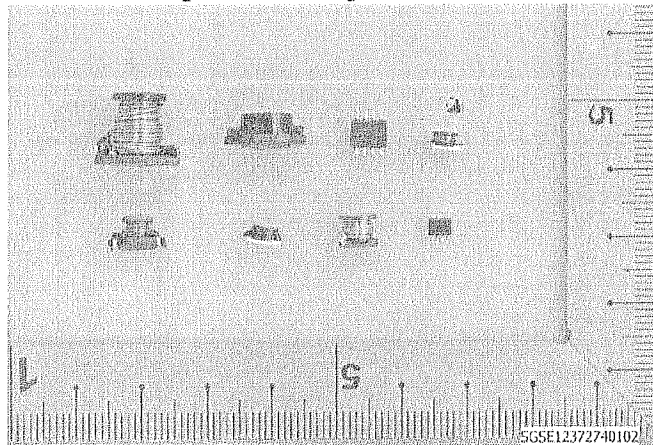


\* 照片中如有箭頭標示，則表示為實際檢測之樣品/部位。\*  
(The tested sample / part is marked by an arrow if it's shown on the photo.)

### CE/2012/37274



### CE/2012/37274



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