Specification for Approval

Date: 2013/04/22

Customer : 東莞台慶

TAI-TECH P/N: HPC3015F-SERIES

CUSTOMER P/N:

DESCRIPTION:

QUANTITY: 100 pcs

REMARK:		
Customer Approval Feedback		

西 北 臺 慶 科 技 股 份 有 限 公 司
TAI-TECH Advanced Electronics Co., Ltd

■ 西北臺慶科技股份有限公司
TAI-TECH Advanced Electronics Co., Ltd
Headquarter:
NO.1 YOU 4TH ROAD, YOUTH INDUSTRIAL DISTRICT, YANG-MEI, TAO-YUAN HSIEN, TAIWAN, R.O.C.
TEL: +886-3-4641148 FAX: +886-3-4643565
http://www.tai-tech.com.tw
E-mail: sales@tai-tech.com.tw

□ 東莞臺慶精密電子有限公司
DONGGUAN TAI-TECH ADVANCED ELECTRONICS CO., LTD
JITIGANG MANAGEMENT DISTRICT, HUANGJIANG, DONGGUAN, GUANGDONG, CHINA
TEL: +86-769-3365488 FAX: +86-769-3366896
E-mail: sales@tai-tech.net

Office:
金亨國際有限公司
KAMHENG INTERNATIONAL LIMITED
TEL: +86-852-25772033 FAX: +86-852-28817778

□ 臺慶精密電子(昆山)有限公司
TAI-TECH ADVANCED ELECTRONICS(KUNSHAN) CO., LTD
SHINWHA ROAD, KUNJIA HI-TECH INDUSTRIAL PARK, KUN-SHAN, JIANG-SU, CHINA
TEL: +86-512-57619396 FAX: +86-512-57619688
E-mail: sales@tai-tech.cn

Office:
北欣國際有限公司
NORTH STAR INTERNATIONAL LIMITED
TEL: +86-512-57619396 FAX: +86-512-57619688

Sales Dep.

APPROVED	CHECKED
管哲頎 Eric Kuan	姜佩蓉 Pei-Rong Chiang

R&D Center

APPROVED	CHECKED	DRAWN
楊祥忠 Mikey Yang	詹偉特 Jack Chan	林宜薀 Beryl Lin

Power Inductor

HPC3015F-SERIES

ECN HISTORY LIST

REV	DATE	DESCRIPTION	APPROVED	CHECKED	DRAWN
1.0	13/04/22	新 發 行	楊祥忠	詹偉特	林宜薀
備註					

Power Inductor

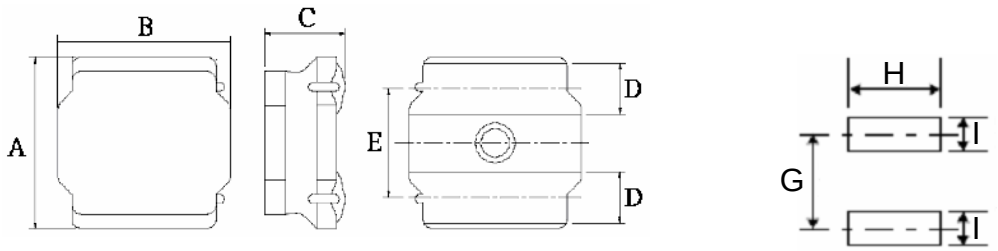
HPC3015F-SERIES

1. Features

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

Halogen-free Pb-free

2. Dimension



Series	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	G(mm)	H(mm)	I(mm)
HPC3015F	3.0±0.1	3.0±0.1	1.5 max.	0.9±0.2	1.9±0.2	2.2 ref.	2.7 ref.	0.8 ref.

Units: mm

3. Part Numbering

HPC	3015	F	-	2R2	M
A	B	C		D	E

A: Series
B: Dimension
C: Control S/N
D: Inductance 2R2=2.2uH
E: Inductance Tolerance M=±20%；Y=±30%

4. Specification

TAI-TECH Part Number	Inductance (uH)	Tolerance (%)	Test Frequency (Hz)	SRF (MHz) min.	DCR (Ω) ±20%	I sat (A)	I rms (A)
HPC3015F-1R0Y	1.0	±30%	1V100K	100	0.030	2.10	2.10
HPC3015F-1R5Y	1.5	±30%	1V100K	87	0.040	1.80	1.82
HPC3015F-2R2M	2.2	±20%	1V100K	64	0.060	1.48	1.50
HPC3015F-3R3M	3.3	±20%	1V100K	49	0.080	1.21	1.23
HPC3015F-4R7M	4.7	±20%	1V100K	40	0.120	1.02	1.04
HPC3015F-6R8M	6.8	±20%	1V100K	36	0.160	0.87	0.88
HPC3015F-100M	10	±20%	1V100K	28	0.230	0.70	0.71
HPC3015F-150M	15	±20%	1V100K	23	0.360	0.56	0.56
HPC3015F-220M	22	±20%	1V100K	20	0.520	0.47	0.47

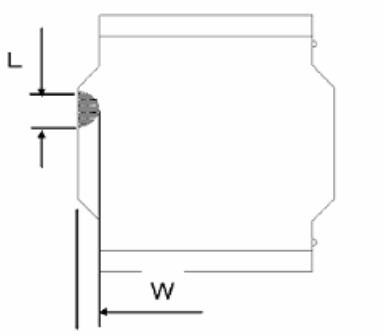
Note:

Isat：Based on inductance change （△L/L0：≦-30%）@ ambient temp. 25℃

Irms：Based on temperature rise （△T：40℃ typ.）

Core chipping

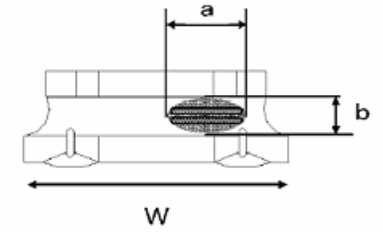
The appearance standard of the chipping size on top side, and bottom side ferrite core is listed below.



Type	L	W
HPC3015F	0.6mm Max.	0.6mm Max.

Void appearance tolerance Limit

Size of voids occurring to coating resin is specified below.



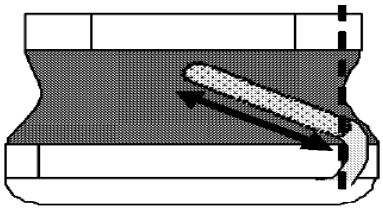
Exposed wire tolerance limit of coating resin part on product side.

Size of exposed wire occurring to coating resin is specified below.

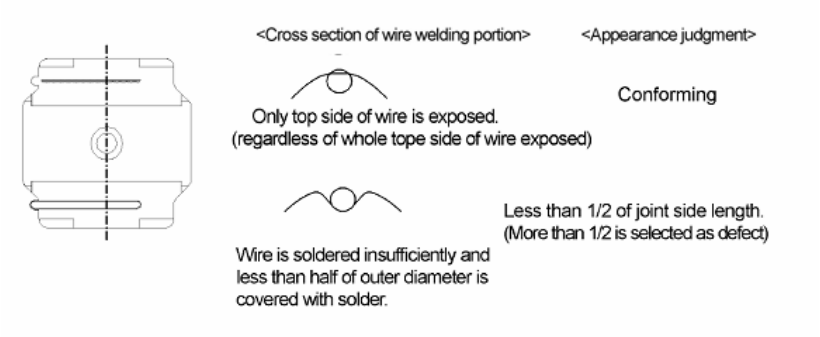
1. Width direction（dimension a）: Acceptable when a≦w/2
   Nonconforming when a＞w/2
2. Length direction（dimension b）: Dimension b is not specified.
3. The total area of exposed wire occurring to each sides is not greater than 50% of coating resin area, and is acceptable.

External appearance criterion for exposed wire

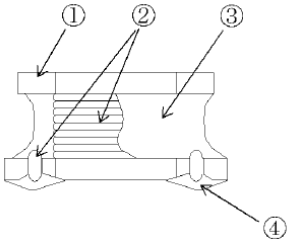
Exposed end of the winding wire at the secondary side should be 2mm and below.



5 Exectrde appearance criterion for exposed wire

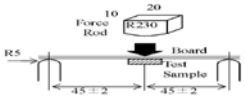
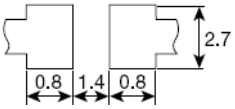
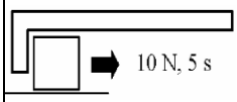


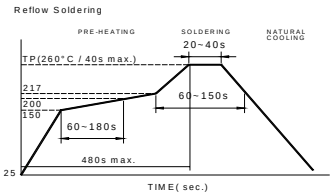
6. Material List



No.	Item	Material
1	Core	Ni-Zn ferrite
2	Wire	Copper Wire
3	Coating	Epoxy with magnetic
4	Solder	Lead free

7. Reliability and Test Condition

Item	Performance	Test Method and Remarks
Operating Temperature	- 25 ~ +120℃.	Including self-generated heat
Storage Temperature	-40 ~ +85℃. - 5 to 40℃ for the product with taping.	
Rated current	Within the specified tolerance	
Inductance (L)		LCR Meter: HP 4285A or equivalent, 100kHz, 1V
DC Resistance		DC Ohmmeter: HIOKI3227 or equivalent
Temperature characteristics	Inductance change：Within±20%	Measurement of inductance shall be taken at temperature rang within–25℃ to +85℃. With reference to inductance value at+20 ℃,change rate shall be calculated. Measurement of inductance shall be taken at temperature rang within–40℃ to +125℃. With reference to inductance value at+20 ℃,change rate shall be calculated.
Resistance to flexure substrate	No damage.	The test samples shall be soldered to the testing board by the reflow. As illustrated below, apply force in the direction of the arrow indicating until deflection of the test board reaches to 2mm.  Substrate size：100x40x1.0 Substrate material：glass epoxy-resin Solder cream thickness：0.10 
Adhesion of Terminal electrode	Shall not come off PC board.	The test samples shall be soldered to the testing board and by the reflow.  Applied force：10 N to X and Y directions. Duration：5s Solder cream thickness：0.15
Resistance to Vibration	Inductance change：Within±10% No abnormality observed in appearance.	The test samples shall be soldered to the test board by the reflow. Then it shall be submitted to below test conditions. Frequency: 10-55Hz Total Amplitude: 1.5mm (May not exceed acceleration 196m/S2) Sweeping Method:10Hz to 55Hz to 10Hz for 1min. Time：2 hours each in X,Y, and Z Direction. Recovery: At least 2hrs of recovery under the standard condition after the test, followed by the measurement within 48hrs.
Solderability	At least 90% of surface of terminal electrode is covered by new solder.	The test samples shall be dipped in flux, and then immersed in molten solder as shown in below. Flux：methanol solution containing rosin 25% Solder temperature: 245±5℃ Time: 5±1.0 sec. Immersion depth: All sides of mounting terminal shall be immersed.

Item	Performance	Test Method and Remarks
Resistance to soldering	Inductance change：Within±10% No abnormality observed in appearance.	Test board thickness:1.0mm Test board material:glass epoxy resin THE Chip shall be stabilized normal condition for1~2hours befor measuring 
Thermal shock	Inductance change：Within±10% No abnormality observed in appearance.	The test samples shall be soldered to the test board by the reflow. The test samples shall be placed at specified temperature for specified time by step 1 to step 4 as shown below in sequence. The temperature cycles shall be repeated 100 cycles . Phase / Temperature(℃) / Time(min.) 1 / -55 ±2℃ / 30±3 2 / Room Temp / Within 3 3 / 85±2℃ / 30±3 4 / Room Temp / Within 3
Damp heat life test		Test Method and Remarks The test samples shall be soldered to the test board by the reflow. The test samples shall be placed in thermostatic oven set at specified temperature and humidity as shown in below. Temperature: 40±2℃ Humidity: 90~95%RH Time: 504±8 hrs.
Loading under damp heat life test		The test samples shall be soldered to the test board by the reflow. The test samples shall be placed in thermostatic oven set at specified temperature and humidity and applied the rated current continuously as shown in below. Temperature: 60±2℃ Humidity: 90~95%RH Applied current: Rated current Time: 500+24/-0 hrs
Low temperature life test		The test samples shall be soldered to the test board by the reflow. After that, the test samples shall be placed at test conditions as shown in below. Temperature:-40±2℃ Time: 500±8 hrs.
Loading at high temperature life test		The test samples shall be soldered to the test board by the reflow. Temperature: 40±2℃. Applied current: Rated current Time: 500±8 hrs.

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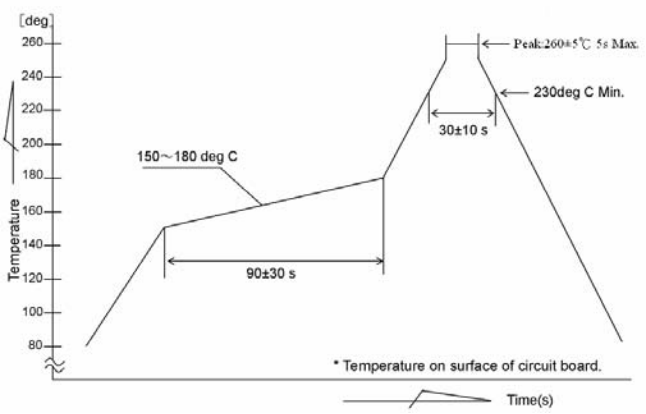
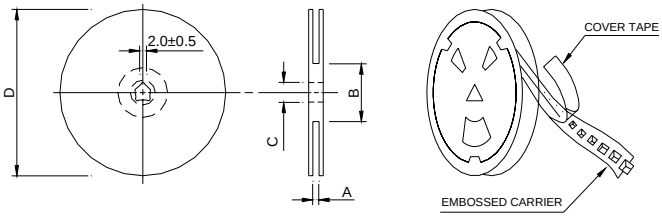
8. Soldering



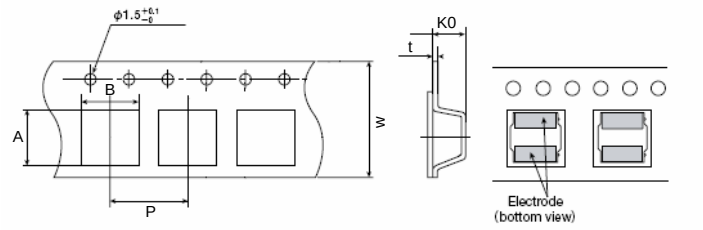
9. Packaging Information

(1) Reel Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
HPC3015F	10±1.5	60±1.0	13±0.5	180±0.5

(2) Tape Dimension



Type	A(mm)	B(mm)	Ko(mm)	P(mm)	W(mm)	t(mm)
HPC3015F	3.2±0.1	3.2±0.1	1.9±0.1	4.0±0.1	8.0±0.2	0.30±0.05

(3) Packaging Quantity

Type	Chip / Reel
HPC3015F	2000

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℃ 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/2013/23406 日期(Date) : 2013/03/01 頁數(Page) : 1 of 8

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.
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)
(江蘇省昆山市篷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户送樣，且由客户聲稱並經客户確認如下 (The following samples was/were submitted and identified by/on behalf of the client as)：

樣品名稱(Sample Description)	:	SMD POWER INDUCTOR
樣品型號(Style/Item No.)	:	HPC, SPC, UHP, SPC, TLPC, TLPH, SPI SERIES
收件日期(Sample Receiving Date)	:	2013/02/22
測試期間(Testing Period)	:	2013/02/22 TO 2013/03/01

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測試需求(Test Requested) : (1) 依據客户指定，進行鎘，鉛，汞，六價鉻，多溴聯苯，多溴聯苯醚測試. (As specified by client, to test Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs contents in the submitted sample.)

(2) 依據客户指定，進行鹵素-氟、氯、溴、碘測試. (As specified by client, to test Halogen-Fluorine, Chlorine, Bromine, Iodine contents in the submitted sample.)

測試方法(Test Method) : 請見下一頁 (Please refer to next pages).

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

SGS TAIWAN LTD

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

測試報告
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(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(5款) (MIXED ALL PARTS(5 TYPES))

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.
鹵素 / Halogen				
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.

測試報告
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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
多溴聯苯總和 / Sum of PBBs	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 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.

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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. 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.)

測試報告
Test Report

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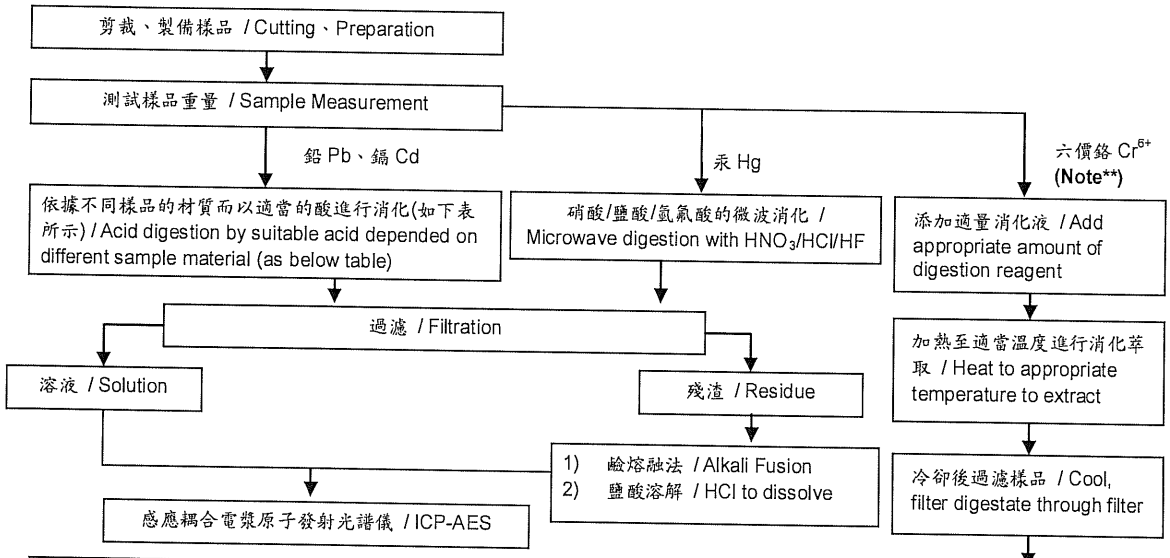
1) 根據以下的流程圖之條件，樣品已完全溶解。(六價鉻測試方法除外) / These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} test method excluded)
2) 測試人員：楊登偉 / Name of the person who made measurement: Climbgreat Yang
3) 測試負責人：張啓興 / Name of the person in charge of measurement: Troy Chang



樣品材質 / Sample Material	消化酸液種類 / Digestion Acid
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_2O_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_2SO_4, H_2O_2, HNO_3, HCl
其他 / Others	加入適當的試劑至完全溶解 / Added appropriate reagent to total digestion

Note**: (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，加熱至沸騰萃取. / For metallic material, add pure water and heat to boiling.

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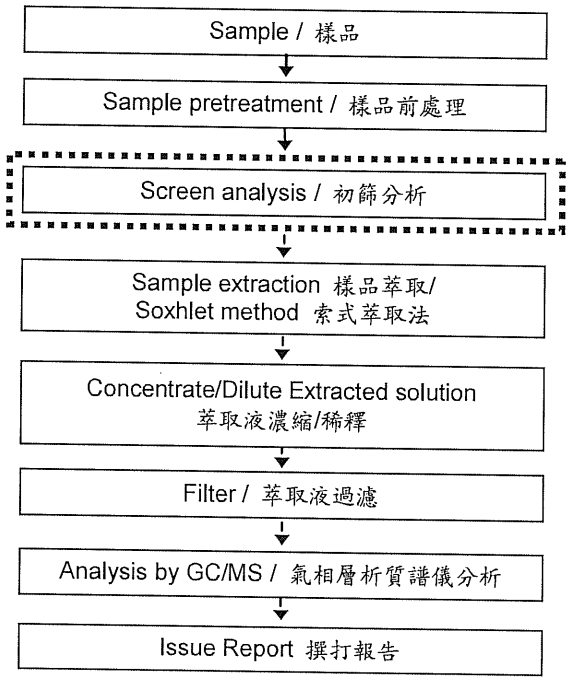
多溴聯苯/多溴聯苯醚分析流程圖 / PBB/PBDE analytical FLOW CHART

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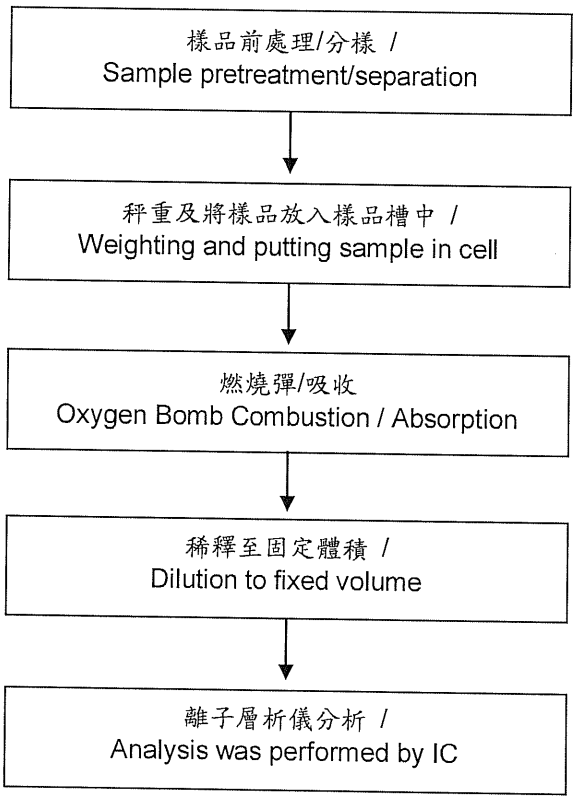
鹵素分析流程圖 / Analytical flow chart of halogen content

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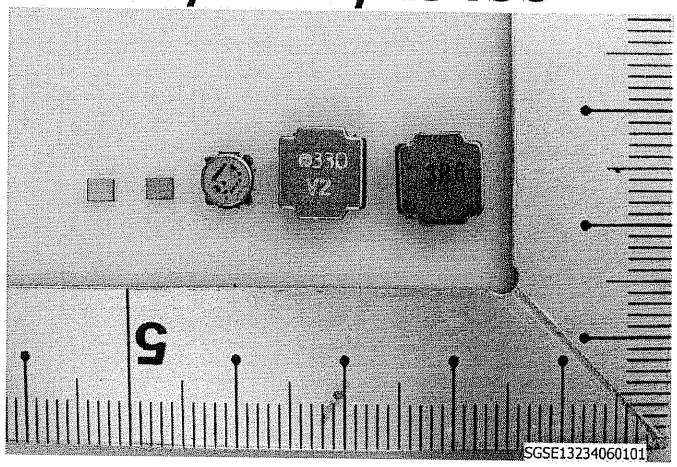
* 照片中如有箭頭標示，則表示爲實際檢測之樣品/部位. *
(The tested sample / part is marked by an arrow if it's shown on the photo.)

CE/2013/23406



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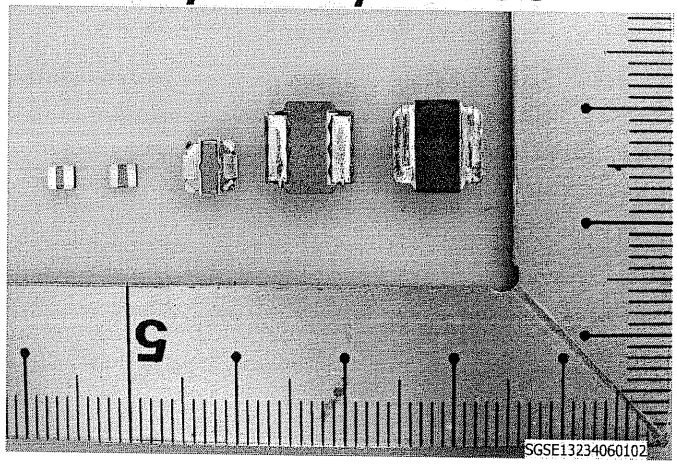

** 報告結尾(End of Report) **

单击下面可查看定价，库存，交付和生命周期等信息

>>TAI-TECH(台庆)