

Specification for Approval

Date: 2014/01/03

Customer : 東莞臺慶

TAI-TECH P/N: FPI0403F-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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Sales Dep.

APPROVED	CHECKED
曾詩涵 Angela Tseng	曾詩涵 Angela Tseng

R&D Center

APPROVED	CHECKED	DRAWN
楊祥忠 Mike Yang	羅培君 Peijun Lo	徐允珮 Shelly Hsu

SMD Type Power Inductor

FPI0403F-SERIES

ECN HISTORY LIST

REV	DATE	DESCRIPTION	APPROVED	CHECKED	DRAWN
1.0	13/01/26	新發行	楊祥忠	羅培君	徐允珮
備註					

SMD Type Power Inductor

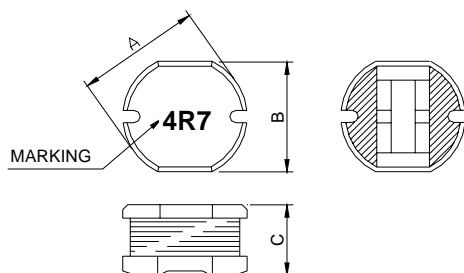
FPI0403F-SERIES

1. Features

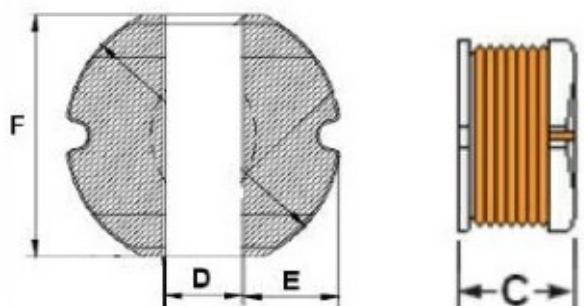
- 1.Excellent solderability and high heat resistance.
- 2.Excellent terminal strength construction.
- 3.Packed in embossed carrier tape and can be used by automatic mounting machine.
- 4.100% Lead(Pb) & Halogen-Free and RoHS compliant.



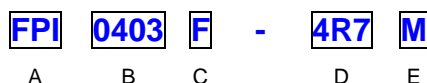
2. Dimension



Size	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)
FPI 0403	4.50±0.3	4.00±0.3	3.20±0.3	1.20±0.3	1.90±0.3	4.50±0.3



3. Part Numbering



A: Series

B: Dimension

C: Lead free type

D: Inductance

4R7=4.7uH, 470=47uH, 471=470uH

E: Inductance Tolerance

M=±20%

4. Specification

Customer Part Number	TAI-TECH Part Number	Inductance (uH)	Tolerance (%)	Test Frequency (Hz)	DCR (Ω) max.	IDC (A) max.
	FPI 0403F-1R0M	1.0	± 20%	1V/7.96M	0.03	4.00
	FPI 0403F-1R4M	1.4	± 20%	1V/7.96M	0.04	3.50
	FPI 0403F-1R8M	1.8	± 20%	1V/7.96M	0.05	3.00
	FPI 0403F-2R2M	2.2	± 20%	1V/7.96M	0.06	2.60
	FPI 0403F-2R7M	2.7	± 20%	1V/7.96M	0.06	2.20
	FPI 0403F-3R3M	3.3	± 20%	1V/7.96M	0.07	2.00
	FPI 0403F-3R9M	3.9	± 20%	1V/7.96M	0.07	2.00
	FPI 0403F-4R7M	4.7	± 20%	1V/7.96M	0.08	1.90
	FPI 0403F-5R6M	5.6	± 20%	1V/7.96M	0.12	1.80
	FPI 0403F-6R8M	6.8	± 20%	1V/7.96M	0.14	1.60
	FPI 0403F-8R2M	8.2	± 20%	1V/7.96M	0.15	1.40
	FPI 0403F-100M	10	± 20%	1V/2.52M	0.19	1.10
	FPI 0403F-120M	12	± 20%	1V/2.52M	0.21	1.10

Customer Part Number	TAI-TECH Part Number	Inductance (uH)	Tolerance (%)	Test Frequency (Hz)	DCR (Ω) max.	IDC (A) max.
	FPI 0403F-150M	15	$\pm 20\%$	1V/2.52M	0.25	1.00
	FPI 0403F-180M	18	$\pm 20\%$	1V/2.52M	0.30	1.00
	FPI 0403F-220M	22	$\pm 20\%$	1V/2.52M	0.35	1.00
	FPI 0403F-270M	27	$\pm 20\%$	1V/2.52M	0.45	0.75
	FPI 0403F-330M	33	$\pm 20\%$	1V/2.52M	0.60	0.70
	FPI 0403F-390M	39	$\pm 20\%$	1V/2.52M	0.70	0.65
	FPI 0403F-470M	47	$\pm 20\%$	1V/2.52M	0.80	0.60
	FPI 0403F-560M	56	$\pm 20\%$	1V/2.52M	0.85	0.55
	FPI 0403F-680M	68	$\pm 20\%$	1V/2.52M	1.00	0.50
	FPI 0403F-820M	82	$\pm 20\%$	1V/2.52M	1.10	0.46
	FPI 0403F-101M	100	$\pm 20\%$	1V/1K	1.20	0.22
	FPI 0403F-121M	120	$\pm 20\%$	1V/1K	1.60	0.20
	FPI 0403F-151M	150	$\pm 20\%$	1V/1K	2.00	0.20
	FPI 0403F-181M	180	$\pm 20\%$	1V/1K	3.00	0.20
	FPI 0403F-221M	220	$\pm 20\%$	1V/1K	3.00	0.20
	FPI 0403F-271M	270	$\pm 20\%$	1V/1K	4.00	0.16
	FPI 0403F-331M	330	$\pm 20\%$	1V/1K	4.00	0.14
	FPI 0403F-391M	390	$\pm 20\%$	1V/1K	5.00	0.12
	FPI 0403F-471M	470	$\pm 20\%$	1V/1K	6.00	0.12
	FPI 0403F-561M	560	$\pm 20\%$	1V/1K	7.00	0.10

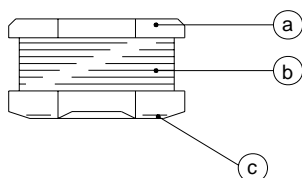
* IDC Test

For the parts with inductance under 82 uH , the L is measured at 1MHz then when a IDC current is applied, the L should drop less than 35%.

For the parts with inductance over 100 uH , the L is measured at 1KHz then when a IDC current is applied, the L should drop less than 35%.

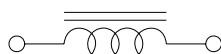
For all FPI series ,when a IDC current is applied, the temperature rised of the parts is less than 40 degree C

5. Material List



No.	Item	Material
1	Core	Ferrite DR Core
2	Wire	Enamelled Copper wire(180°C Class)
3	Terminal	Ag+Ni+Sn

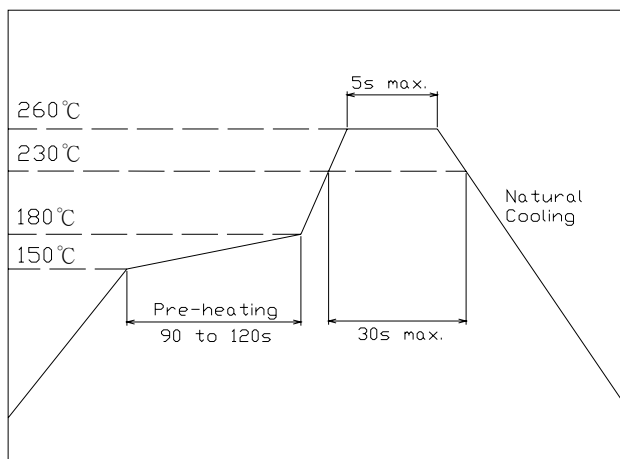
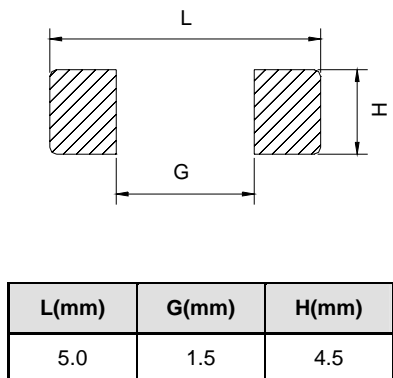
6. Schematic Diagram



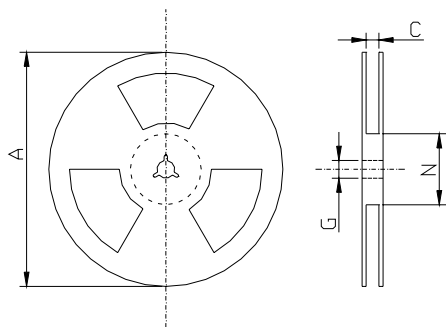
7. Reliability and Test Condition

Item	Performance	Test Condition
Operating Temperature	-25~+85°C	
Storage temperature	-25~+85°C (For products in unopened tape package, less than 40°C)	
Rated Current	Base on temp. rise & $\Delta L/LOA \leq 35\%$	
Temperature Rise Test	40°C typ. (Δt)	
Solderability	More than 90% of the terminal electrode shall be covered with fresh solder.	Preheat : 150±25°C for 60 secs Solder : Sn-Ag3.0-Cu0.5 Solder Temp.:245±5°C Flux : Rosin Dip Time : 4±1 secs
Thermal Shock Test (Temp. Cycle)	Inductance shall not change more than ±20%	ROOM TEMP. → -25±2°C 15 MINUTES → 30 MINUTES ROOM TEMP. → 85±2°C 15 MINUTES → 30 MINUTES
Humidity Resistance Test	Inductance shall not change more than ±20%	Temperature : 40±2°C Humidity : 90~95% Applied Current : per spec. Time : 500 hrs
High Temperature Resistance Test	Inductance shall not change more than ±20%	Temperature : 85±2°C Applied Current : per spec. Time : 500 hrs
Random Vibration Test	Appearance: Cracking, shipping and any other defects harmful to the characteristics should not be allowed. Inductance: within±30%	Frequency: 10-55-10Hz for 1 min. Amplitude: 1.52mm Directions and times: X, Y, Z directions for 2 hours. A period of 2 hours in each of 3 mutually perpendicular directions (Total 6 hours).

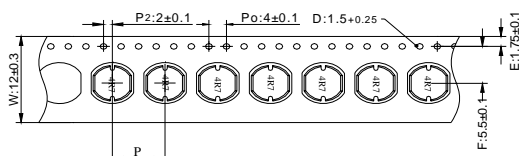
8. Recommended PC Board Pattern



9. Packaging Information



Style	A(mm)	C(mm)	G(mm)	N(mm)
13"X12mm	330	14 ⁺⁰	13.5±0.5	50 ⁰



Style	W(mm)	P(mm)	D(mm)	Packaging Qty(pcs)
12 mm	12±0.3	8±0.1	1.5±0.25	2000

Application Notice

• Storage Conditions

To maintain the solderability of terminal electrodes:

1. Temperature and humidity conditions: Less than 40°C and 60% RH.
2. Recommended products should be used within 12 months form the time of delivery.
3. 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/2012/54920 日期(Date) : 2012/05/31 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. LTD.)

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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)	:	WINDING POWER INDUCTOR, SMD POWER INDUCTOR
樣品型號(Style/Item No.)	:	LQC, LQN, FPI, FPIP, FPIG SERIES
收件日期(Sample Receiving Date)	:	2012/05/24
測試期間(Testing Period)	:	2012/05/24 TO 2012/05/31

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

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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(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.

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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	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/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.)

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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.)

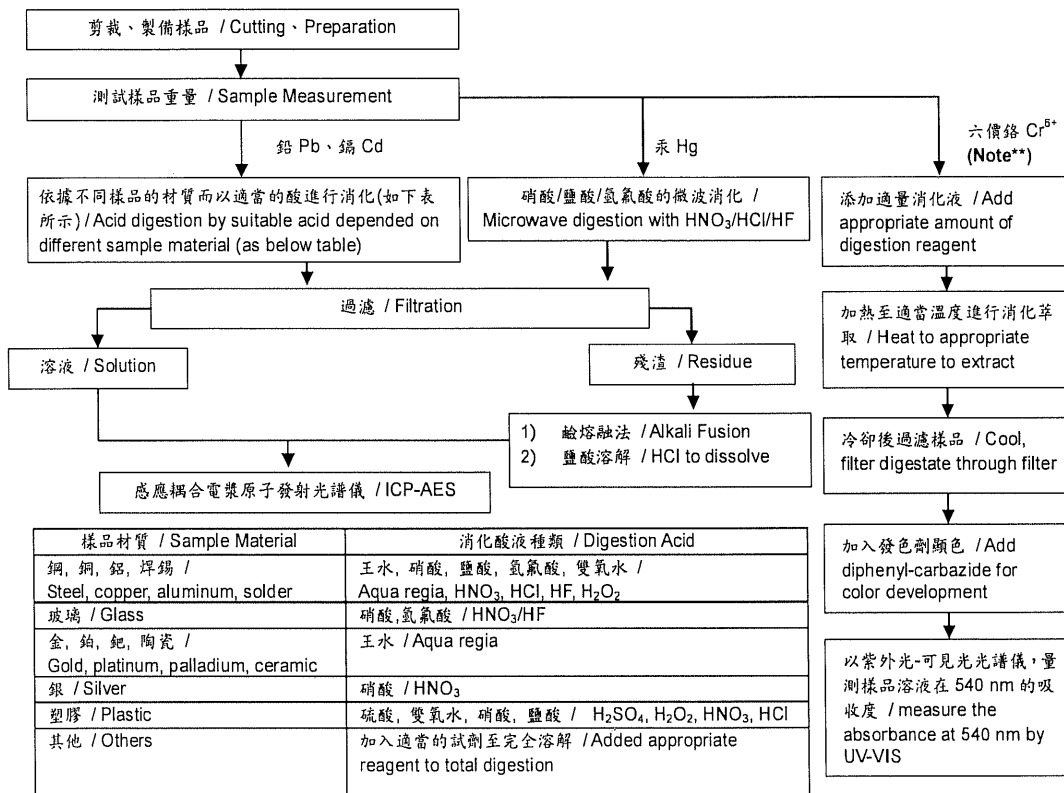
桃園縣楊梅市幼獅工業區幼四路1之1號 / NO. 1, YOU 4TH ROAD, YOUTH INDUSTRIAL DISTRICT, YANG-MEI CITY, TAO-YUAN HSIEN, TAIWAN R. O. C.)

(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)

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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. (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



Note**: (1) 針對非金屬材料加入鹼性消化液, 加熱至 90~95°C 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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Test Report

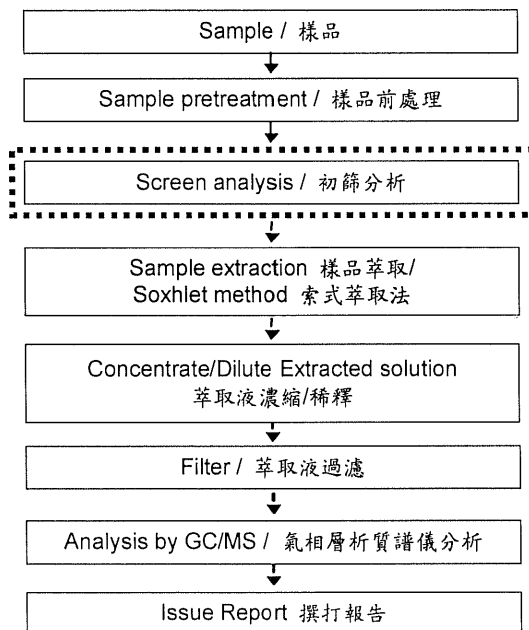
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多溴聯苯/多溴聯苯醚分析流程圖 / PBB/PBDE analytical FLOW CHART

- 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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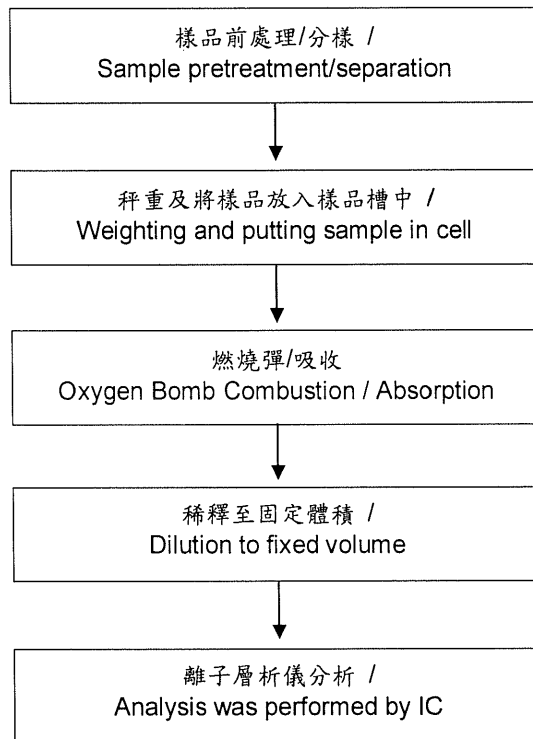
號碼(No.) : CE/2012/54920 日期(Date) : 2012/05/31 頁數(Page) : 7 of 8

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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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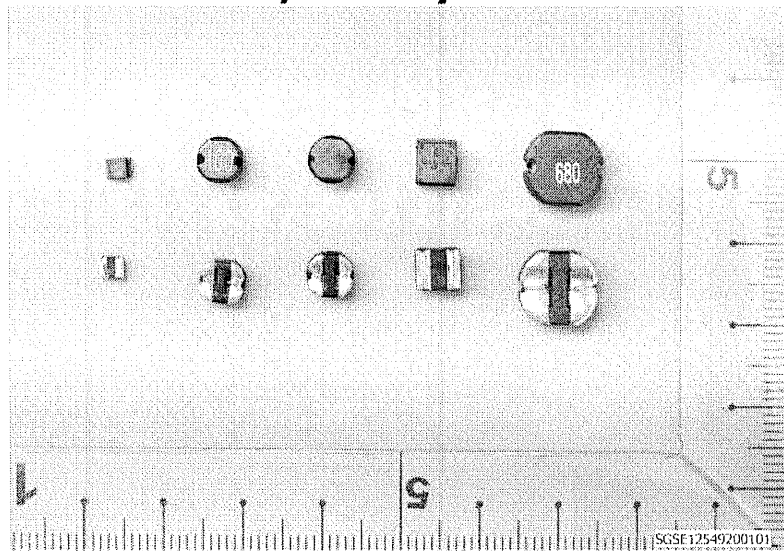
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* 照片中如有箭頭標示，則表示為實際檢測之樣品/部位。*

(The tested sample / part is marked by an arrow if it's shown on the photo.)

CE/2012/54920



** 報告結尾(End of Report) **

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