

<b>SMD Type Power Inductor</b>	<b>FPI0403F-SERIES</b>
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<b>ECN HISTORY LIST</b>					
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

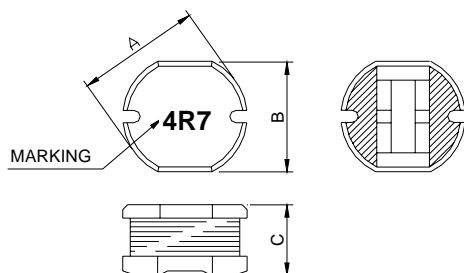
**FPI0403F-SERIES**

## 1. Features

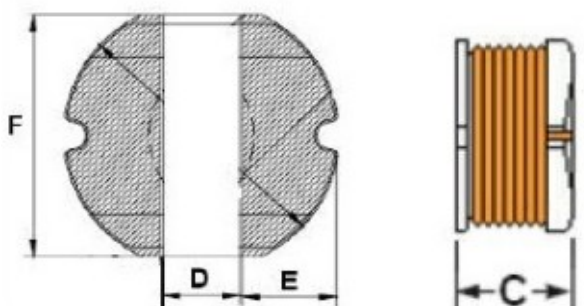
1. Excellent solderability and high heat resistance.
2. Excellent terminal strength construction.
3. Packed in embossed carrier tape and can be used by automatic mounting machine.
4. 100% Lead(Pb) & Halogen-Free and RoHS compliant.



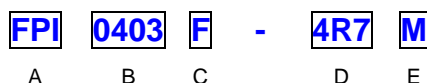
## 2. Dimension



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 ( $\Omega$ ) 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

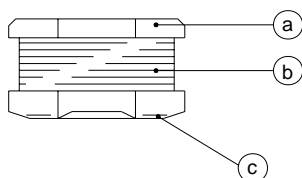
\* IDC Test

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%.

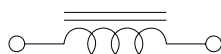
For all FPI series ,when a IDC current is applied, the temperature rised of the parts is less than 40 degree C

## 5. Material List



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

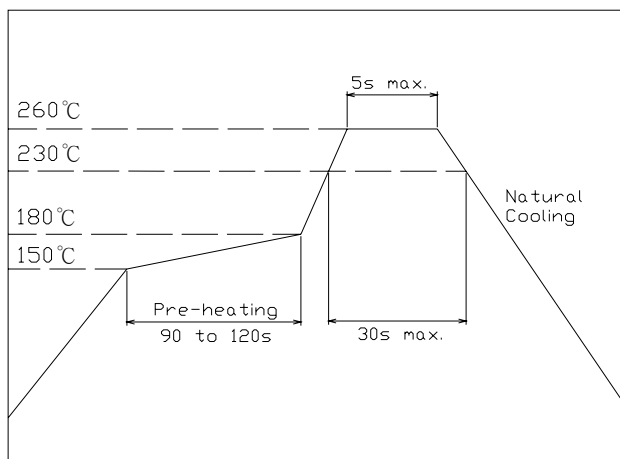
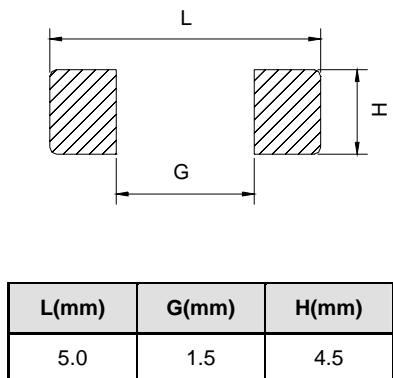
## 6. Schematic Diagram



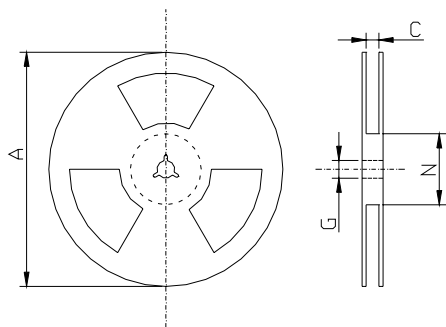
### 7. Reliability and Test Condition

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. ( $\Delta t$ )	
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).

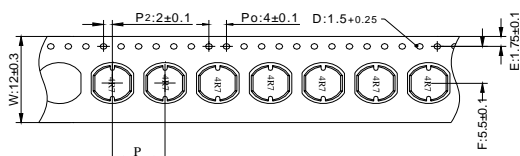
### 8. Recommended PC Board Pattern



### 9. Packaging Information



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



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.

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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, 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)



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

## Test Report

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### 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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# 測試報告

## Test Report

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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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# 測試報告 Test Report

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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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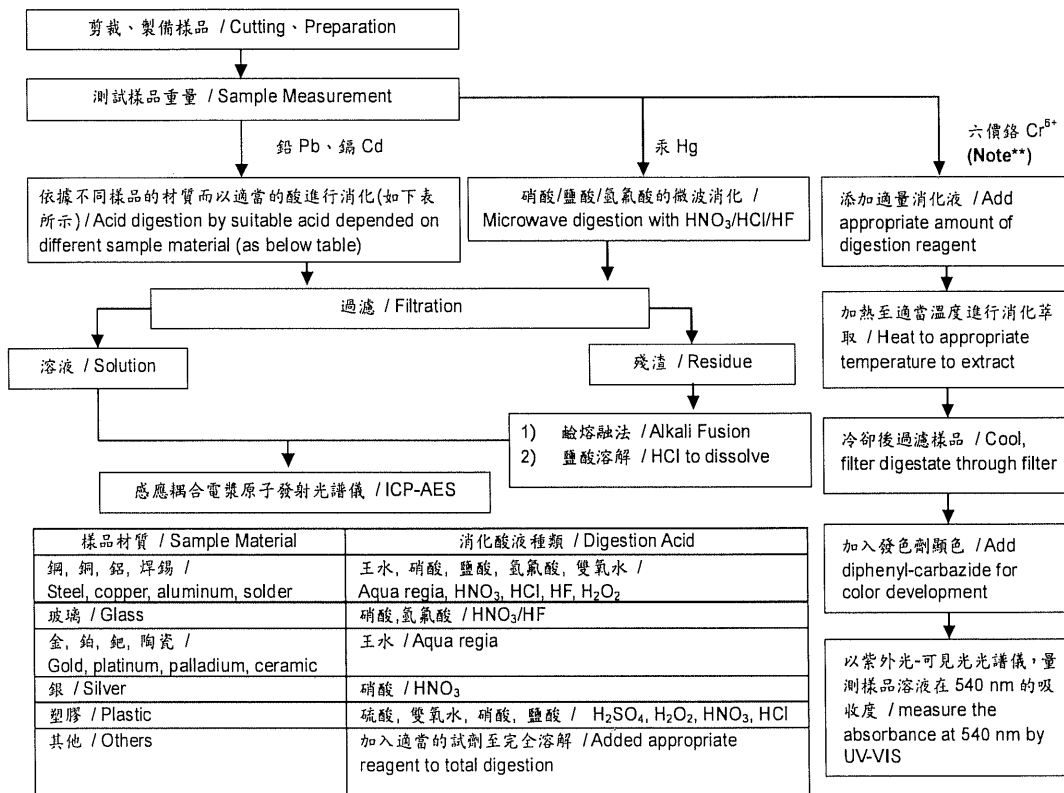
## 測試報告 Test Report

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



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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# 測試報告

## Test Report

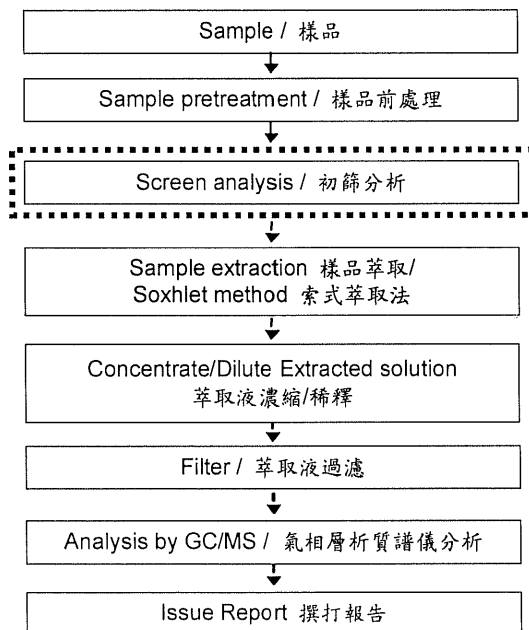
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### 多溴聯苯/多溴聯苯醚分析流程圖 / PBB/PBDE analytical FLOW CHART

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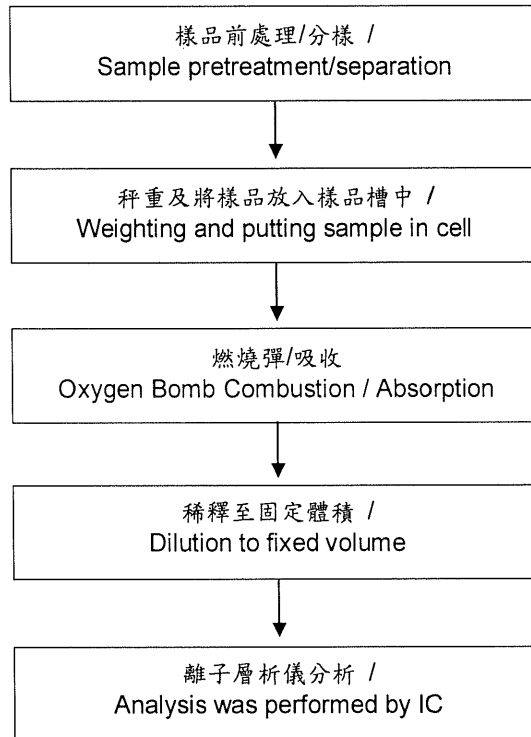
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### 鹵素分析流程圖 / Analytical flow chart of halogen content

- 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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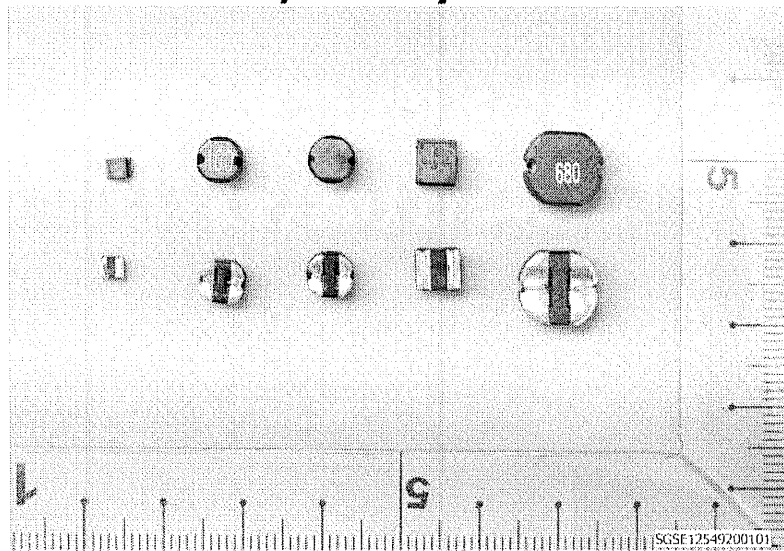
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\* 照片中如有箭頭標示，則表示為實際檢測之樣品/部位。\*

(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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