

Wire Wound Type Common Mode Filter

WCM4532F2SF-601T15

ECN HISTORY LIST					
REV	DATE	DESCRIPTION	APPROVED	CHECKED	DRAWN
1.0	13/04/17	新發行	楊祥忠	林志鴻	林宜蒨
備 註					

Wire Wound Type Common Mode Filter

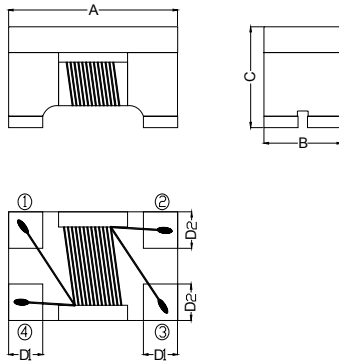
WCM4532F2SF-601T15

1. Features

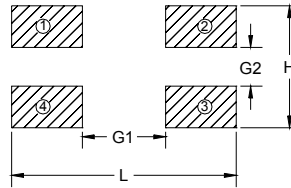
1. High common mode impedance at high frequency cause excellent noise suppression performance.
2. WCM4532F2SF series realizes small size and low profile. 4.5x3.2x2.8 mm.
3. 100% Lead(Pb) & Halogen-Free and RoHS compliant.



2. Dimension



Recommended PC Board Pattern



PC board should be designed so that products can prevent damage from mechanical stress when warping the board.
Products shall be positioned in the sideways direction against the mechanical stress to prevent failure.

Series	A(mm)	B(mm)	C(mm)	D1(mm)	D2(mm)	L(mm)	H(mm)	G1(mm)	G2(mm)
4532F2SF	4.5±0.2	3.2±0.2	2.8±0.2	1.0±0.1	1.2±0.1	4.8	3.8	2.5	0.7

Units: mm

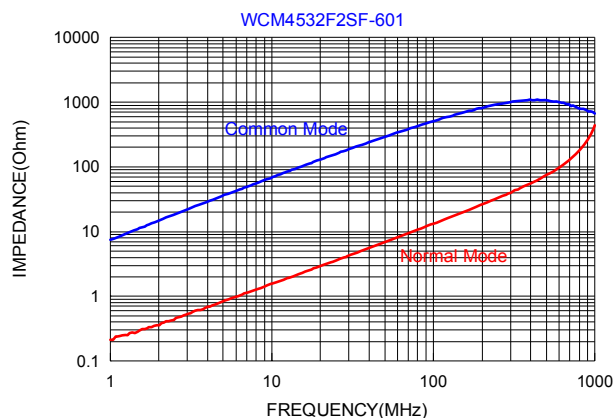
3. Part Numbering

WCM	4532	F	2	S	F	-	601	T	15
A	B	C	D	E	F		G	H	I

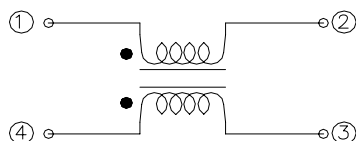
- A: Series
 B: Dimension
 C: Material Ferrite Core
 D: Number of Lines 2=2 lines
 E: Type S=Shielded , N=Unshielded
 F: Lead free
 G: Impedance 601=600Ω
 H: Packaging T=Taping and Reel
 I: Rated Current 15=1500mA

4. Specification

TAI-TECH Part Number	Common mode Impedance (Ω)	Test Frequency (MHz)	DC Resistance (Ω) max.	Rated Current (mA) max.	Rated Volt. (Vdc) max.	Withstand Volt. (Vdc) max.	IR (Ω) min.
WCM4532F2SF-601T15	600±25%	100	0.24	1500	50	125	10M

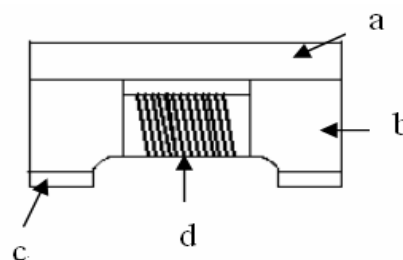


5.Schematic Diagram



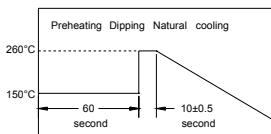
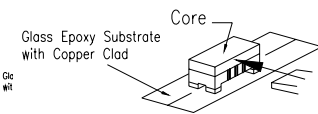
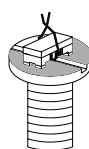
6. Materials

No.	Description	Specification
a.	Type	Shielded
b.	Core	Ferrite Core
c.	Termination	Tin Pb Free
d.	Wire	Enameled Copper Wire



7. Reliability and Test Condition

Item	Performance	Test Condition
Electrical Characteristics Test		
Z(common mode)	Refer to standard electrical characteristics list.	Agilent-4291A+ Agilent -16197A
DCR		Agilent-4338B
I.R.		Agilent4339
Operating Temperature	-40℃~+85℃	
Storage Temperature	-40℃~+85℃ (For products in unopened tape package, less than 40℃)	
Temperature Rise Test	Rated Current < 1A ΔT 20℃ Max Rated Current ≥ 1A ΔT 40℃ Max	1.Applied the allowed DC current. 2.Temperature measured by digital surface thermometer
Mechanical Performance Test		
Solderability Test ANSI /J-STD-002	More than 95% of terminal electrode should be covered with solder.	After fluxing, component shall be dipped in a melted solder bath at 235±5℃ for 4±1seconds.

Item	Performance	Test Condition															
Solder Heat Resistance MIL-STD-202 Method210	1.Components should have not evidence of electrical and mechanical damage. 2. Impedance:within ±30% of initial value.	 Preheat:150℃ 60secs. Solder:Sn-Cu0.5 Solder temperature: 260±5℃ Flux:ROL0 Dip time:10±0.5 secs.															
Component Adhesion (Pull test)	<table><tr><th>Series No.</th><th>F(Kg)</th></tr><tr><td>WCM3216F2S</td><td>0.8(min.)</td></tr><tr><td>WCM2012F2S</td><td>0.5(min.)</td></tr><tr><td>WCM3216F2N</td><td>0.8(min.)</td></tr><tr><td>WCM2012F2N</td><td>0.5(min.)</td></tr></table>	Series No.	F(Kg)	WCM3216F2S	0.8(min.)	WCM2012F2S	0.5(min.)	WCM3216F2N	0.8(min.)	WCM2012F2N	0.5(min.)	The device should be reflow soldered(255±5℃ for 10sec.)to a tinned copper substrate.A dynamometer force gauge should be applied the side of the component.The device must with-ST-F Kg without ailure of the termination attached to component.  1.Insert 10cm wire into the remaining open eye bend ,the ends of even wire lengths upward and wind together. 2.Terminal shall not be remarkably damaged. 					
Series No.	F(Kg)																
WCM3216F2S	0.8(min.)																
WCM2012F2S	0.5(min.)																
WCM3216F2N	0.8(min.)																
WCM2012F2N	0.5(min.)																
Reliability Test																	
High Temperature Life Test MIL-STD-202 METHOD 108	1. Appearance:No damage. 2. Impedance:within ±30% of initial value. No disconnection or short circuit.	Rated Current 100% Temperature:85±2℃ . Duration:500±8hrs. Measured at room temperature after placing for 2 to 3hrs.															
Low Temperature Life Test JESD22-A119		Temperature:-40±2℃ Time: 500±8hr. Recovery: 4 to 24hrs of recovery under the standard condition after the removal from test chamber.															
Thermal shock (Unload Test) MIL-STD-202 METHOD 107		<table><tr><th>Step</th><th>Temperature(℃)</th><th>Times(min.)</th></tr><tr><td>1</td><td>-55±2</td><td>30±3</td></tr><tr><td>2</td><td>Room Temp.</td><td>5</td></tr><tr><td>3</td><td>85±2</td><td>30±3</td></tr><tr><td>4</td><td>Room Temp.</td><td>5</td></tr></table> Condition for 1 cycle Step1:- 55±2℃ 30±3 min. Step2:Room temperature 5 min. Step3: 85±2℃ 30±3 min. Step4: Room temperature 5 min. Number of cycles:100	Step	Temperature(℃)	Times(min.)	1	-55±2	30±3	2	Room Temp.	5	3	85±2	30±3	4	Room Temp.	5
Step		Temperature(℃)	Times(min.)														
1		-55±2	30±3														
2	Room Temp.	5															
3	85±2	30±3															
4	Room Temp.	5															
Humidity Resistance Test MIL-STD-202 METHOD 103	Temperature:40±2℃ Humidity:90~ 95% Rated Current 100% Time:500±8hr. Recovery:4 to 24hrs of recovery under the standard condition after the removal from test chamber.																
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±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).															

8. Soldering and Mounting

8-1. 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.

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)

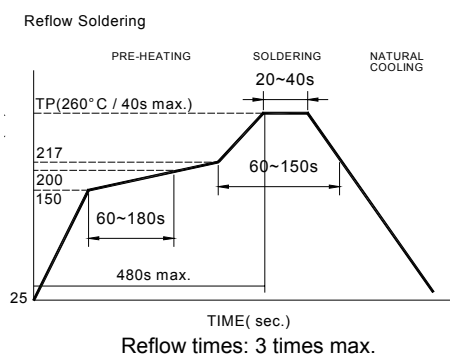


Fig.1

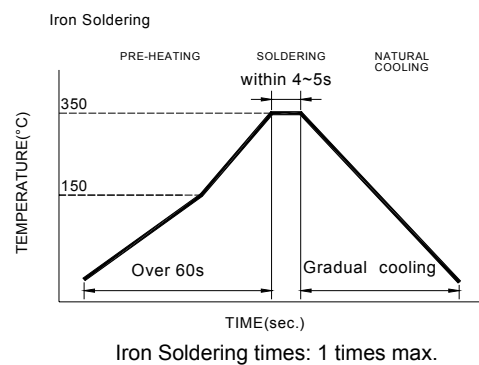
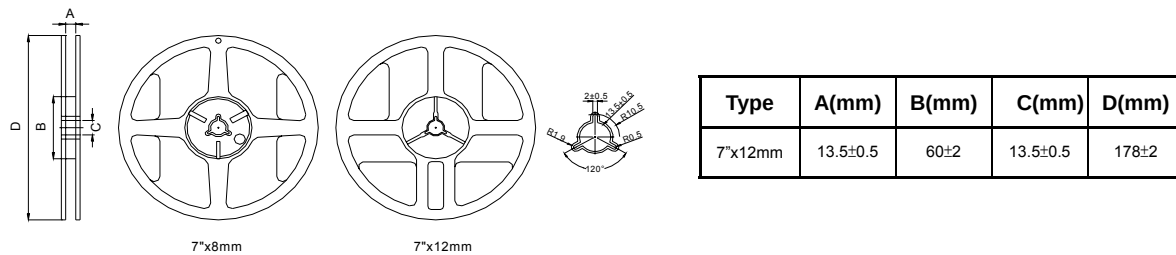


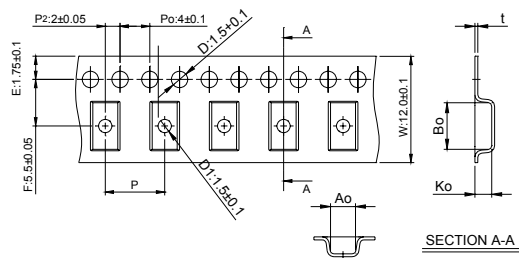
Fig.2

9. Packaging Information

9-1. Reel Dimension



9-2. Tape Dimension / 12mm

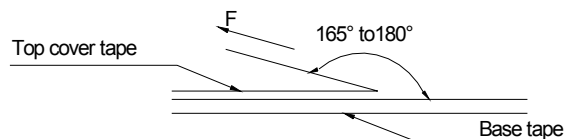


Series	size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)
WCM4532F2S	4532	4.90±0.1	3.60±0.1	3.00±0.1	8.0±0.1	0.26±0.05

9-3. Packaging Quantity

Chip size	Chip/Reel	Inner Box	Middle Box	Carton
WCM4532F2S	500	2500	12500	25000

9-4. 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 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

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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)

(江蘇省昆山市蓬朗鎮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) : WIREWOUND SERIES
樣品型號(Style/Item No.) : WCM, WCM-F2SNF, HSF, HDMI, DVI, YCM, BCM, PCM, TCM, LCM, SCM, LPF, TXF
SERIES
收件日期(Sample Receiving Date) : 2012/10/18
測試期間(Testing Period) : 2012/10/18 TO 2012/10/25

測試需求(Test Requested) : (1) 依據客戶指定，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) 依據客戶指定，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).


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 (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	27
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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CHINA)

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.

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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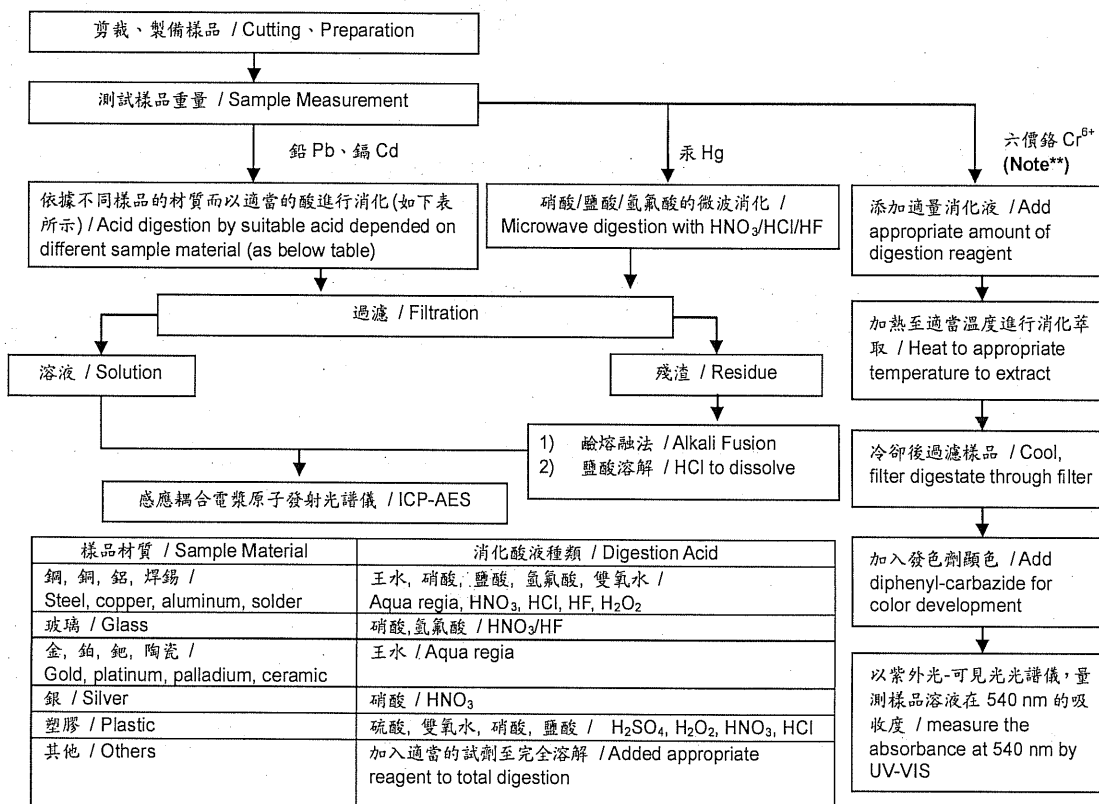
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- 1) 根據以下的流程圖之條件，樣品已完全溶解。(六價鉻測試方法除外) / These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ test method excluded)
- 2) 測試人員：楊登偉 / Name of the person who made measurement: Climbgreat Yang
- 3) 測試負責人：張啓興 / 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℃ 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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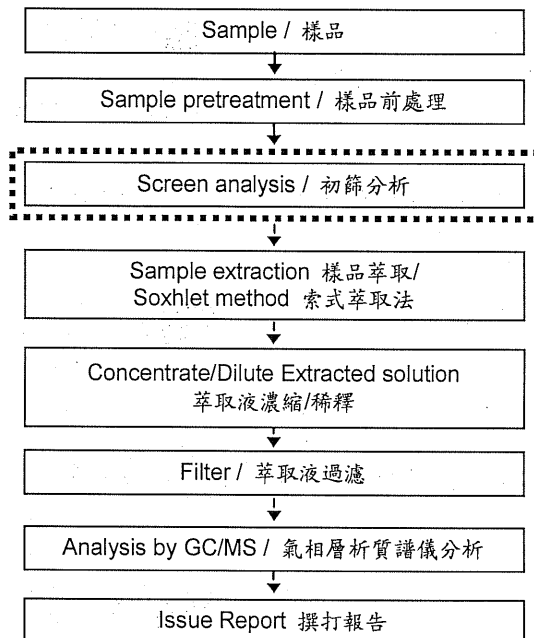
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多溴聯苯/多溴聯苯醚分析流程圖 / PBB/PBDE analytical FLOW CHART

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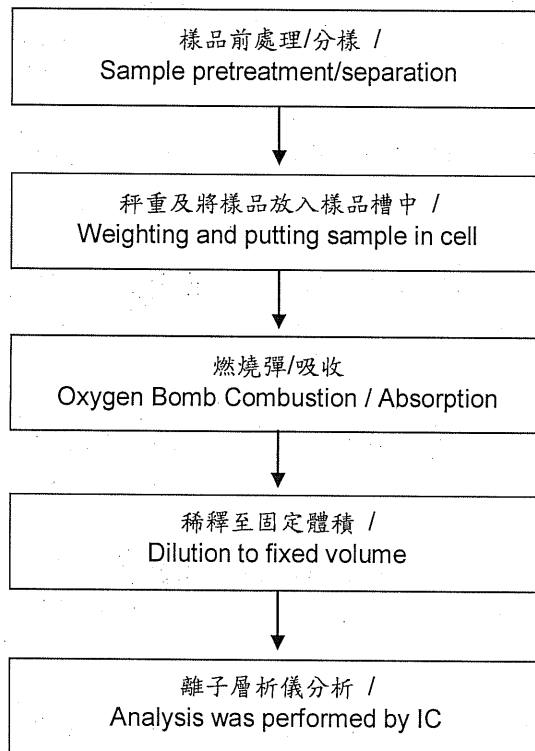
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鹵素分析流程圖 / Analytical flow chart of halogen content

- 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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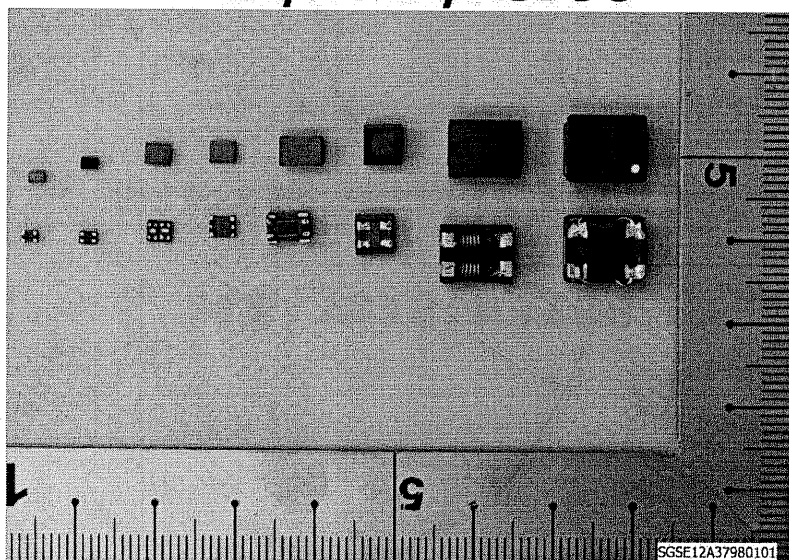
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* 照片中如有箭頭標示，則表示為實際檢測之樣品/部位。*

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

CE/2012/A3798



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