# Winding Type Chip Inductor

SWF1608RF-100K

#### 1. Features

- 1. Ferrite core wire wound construction.
- 2. High Reliability due to wire wound type construction.
- 3. Small footprint as well as low profile.
- 4. 100% Lead(Pb) & Halogen-Free and RoHS compliant.
- 5. Operating temperature-40~+125°C (Including self temperature rise)
- 6. These products provide low DC resistance and high current.
- 7. Precision inductance tolerance is available.
- 8. Application for DC power line.

Digital camera and other electronic equipment

Personal computers, Hard disk drives

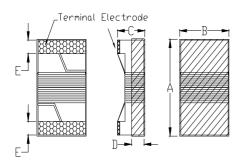
Mobile Device / Handheld Device / LowProfile Device / Panel

xDSL modem and Cable modem

# (Halogen) Halogen-free



#### 2. Dimensions



Size	Α	В	С	D	E
SWF1608	SWF1608 1.60±0.2		1.00±0.1	0.60 ref.	0.35±0.1

Unit:mm

#### 3. Part Numbering



A: Series

B: Dimension L x W

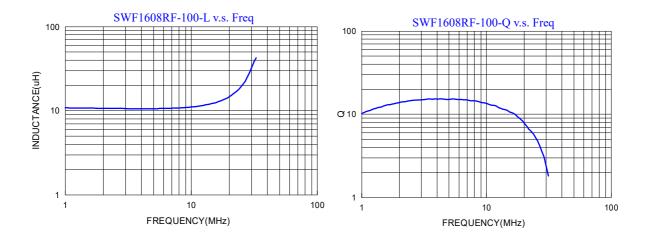
C: Control S/N

D: Lead free type

E: Inductance 100=10 uH F: Inductance Tolerance K=±10%

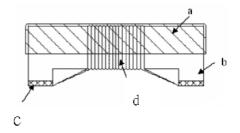
#### 4. Specification

TAI-TECH Part Number	Inductance (uH)	Tolerance	Test Frequency (Hz)	Q/MHz Typ.	SRF (MHz) Typ.	DCR (Ω) ±30%	IDC (mA) Typ.	Irms (mA) Typ.
SWF1608RF-100K	10.0	K	0.5V/2.5M	14/2.5	36	1.85	280	280



#### 5. Materials

No.	Description	Specification
a.	Upper Plate	UV Glue
b.	Core	Ferrite Core
С	Termination	Ag/Ni/Sn
d	Wire	Enameled Copper Wire



### 6. Reliability and Test Condition

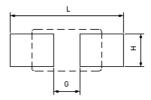
Item	Performance	Test Condition
Operating temperature	-40~+125℃ (Including self - temperature rise)	
Storage temperature	-40~+125℃ (on board)	
Electrical Performance Tes	st	
Inductance L		Agilent-4291, Agilent-4287 , Agilent-E4991A
Q		Agilent-4192, Agilent-4285
SRF	Refer to standard electrical characteristic list	Agilent-4291 , Agilent-E4991A
		Agilent-4192
DC Resistance		Agilent-34420A
IDC		Applied the current to coils, the inductance change shall be less than 20% to initial value.
Irms		Heat Rated Current (Irms) will cause the coil temperature rise $\Delta T(C)$ without core loss.  1. Applied the allowed DC current.  2. Temperature measured by digital surface thermometer
Reliability Test		
Life Test		Preconditioning: Run through IR reflow for 2 times.( IPC/JEDEC J-STD-020DClassification Reflow Profiles) Temperature: 125±2°C Applied current: rated current Duration: 1000±12hrs Measured at room temperature after placing for 24±2 hrs
Load Humidity		Preconditioning: Run through IR reflow for 2 times.( IPC/JEDEC J-STD-020DClassification Reflow Profiles Humidity: 85±2% R.H, Temperature: 85°C±2°C Duration: 1000hrs Min. with 100% rated current Measured at room temperature after placing for 24±2 hrs
Moisture Resistance	Appearance: No damage. Inductance: within±10% of initial value Q: Shall not exceed the specification value. RDC: within±15% of initial value and shall not exceed the specification value	Preconditioning: Run through IR reflow for 2 times.( IPC/JEDEC J-STD-020DClassification Reflow Profiles 1. Baked at50°C for 25hrs, measured at room temperature after placing for 4 hrs. 2. Raise temperature to $65\pm2^{\circ}C$ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to $25^{\circ}C$ in 2.5hrs. 3. Raise temperature to $65\pm2^{\circ}C$ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to $25^{\circ}C$ in 2.5hrs. 4. Skeep at $25^{\circ}C$ for 2 hrs then keep at -10°C for 3 hrs 4. Keep at $25^{\circ}C$ 80-100%RH for 15min and vibrate at the frequency of 10 to $55$ Hz to 10 Hz, measure at room temperature after placing for 1~2 hrs.
Thermal shock		Preconditioning: Run through IR reflow for 2 times.( IPC/JEDEC J-STD-020DClassification Reflow Profiles Condition for 1 cycle Step1: -40±2°C 30±5min Step2: 25±2°C ≤0.5min Step3: 125±2°C 30±5min Number of cycles: 500 Measured at room temperature after placing for 24±2 hrs
Vibration		Oscillation Frequency: 10Hz~2KHz~10Hz for 20 minute Equipment: Vibration checker Total Amplitude:10g Testing Time: 12 hours(20 minutes, 12 cycles each of 3 orientations) ∘

Item	Performance	Test Condition				
Bending		Shall be mounted on a FR4 substrate of the following dimensions: >=0805 inch(2012mm):40x100x1.2mm <0805 inch(2012mm):40x100x0.8mm Bending depth: >=0805 inch(2012mm):1.2mm <0805 inch(2012mm):0.8mm duration of 10 sec.				
Shock	Appearance: No damage. Inductance: within±10% of initial value Q: Shall not exceed the specification value. RDC: within ±15% of initial value and shall not exceed the specification value	Type (g's) (ms) Wave form Velocity change (Vi)ft/sec				
	exceed the specification value	SMD         50         11         Half-sine         11.3           Lead         50         11         Half-sine         11.3				
Solder ability	More than 95% of the terminal electrode should be covered with solder。	Preheat: 150°C,60sec.₀ Solder: Sn96.5% Ag3% Cu0.5% Temperature: 245±5°C ∘ Flux for lead free: Rosin. 9.5% ∘ Dip time: 4±1sec ∘ Depth: completely cover the termination				
Resistance to Soldering Heat		Depth: completely cover the termination  Temperature(°C) Time(s) Temperature ramp/immersion and emersion rate  260 ±5 (solder temp) 10 ±1 25mm/s ±6 mm/s 1				
	Appearance: No damage. Inductance: within±10% of initial value Q: Shall not exceed the specification value. RDC: within ±15% of initial value and shall not exceed the specification value	Preconditioning: Run through IR reflow for 2 times.( IPC/JEDEC J-STD-020DClassification Reflow Profiles With the component mounted on a PCB with the device to be tested, apply a force(>0805:1kg , <=0805:0.5kg)to the side of a device being tested. This force shall be applied for 60 +1 seconds. Also the force shall be applied gradually as not to apply a shock to the component being tested.				
Terminal Strength		DUT wide thick substrate				

#### 7. Soldering and Mounting

#### 7-1. Recommended PC Board Pattern

	Chip size							l Pattern ow Sold	
Series	Туре	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	L(mm)	G(mm)	H(mm)
SWF	1608	1.60±0.2.	1.0±0.1.	1.0±0.1	0.60 ref	0.35±0.1	1.92	0.92	1.02



#### 7-2. 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.

#### 7-2.1 Lead Free Solder re-flow:

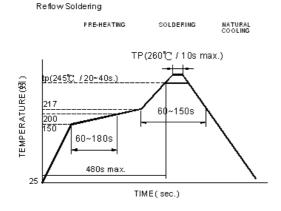
Recommended temperature profiles for lead free re-flow soldering in Figure 1.

#### 7-2.2 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.

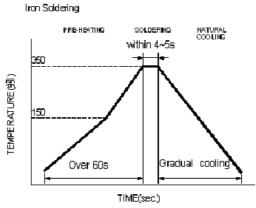
- Preheat circuit and products to 150  $\!\!\!\!\!\!^{\circ}_{\circ}$
- Never contact the ceramic with the iron tip
- Use a 20 watt soldering iron with tip diameter of 1.0mm

- 350°C tip temperature (max)
- 1.0mm tip diameter (max)
- Limit soldering time to 4~5 sec.



Reflow times: 3 times max.

Fig.1

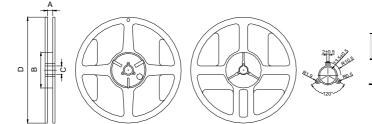


Iron Soldering times: 1 times max.

Fig.2

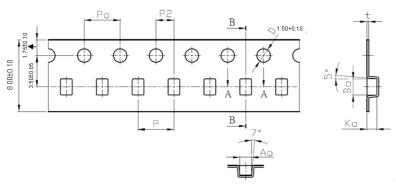
#### 8. Packaging Information

#### 8-1. Reel Dimension



Type	ype A(mm) B(mm)		C(mm)	D(mm)	
7"x8mm	9.0±0.5	60±2	13.5±0.5	178±2	

#### 8-2. Tape Dimension / 8mm(black anti-static electricity carrier tape)



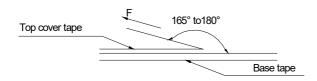
7"x12mm

Series	P(mm)	Po(mm)	P2(mm)	Bo(mm)	Ao(mm)	Ko(mm)	t(mm)
SWF1608	4.00±0.10	4.00±0.10	2.00±0.05	1.88±0.05	1.30±0.05	1.10±0.05	0.20±0.02

#### 8-3. Packaging Quantity

SWF	1608
Chip / Reel	4000
Reel Size	7"x8mm

#### 8-4. 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.	Room Humidity	Room atm	Tearing Speed	
(℃)	(%)	(hPa)	mm/min	
5~35	45~85	860~1060	300	

#### **Application Notice**

• Storage Conditions(component level)

To maintain the solderability of terminal electrodes:

- 1.TAI-TECH products meet IPC/JEDEC J-STD-020D standard-MSL, level 1.
- 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.
- ${\it 3. Bulk\ handling\ should\ ensure\ that\ abrasion\ and\ mechanical\ shock\ are\ minimized.}$



**Test Report** 

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日期(Date): 2019/09/05

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(慶邦電子元器件(泗洪) 有限公司 / TAIPAQ ELECTRONICS (SI-HONG) CO., LTD.)

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以下測試樣品係由申請廠商所提供及確認 (The following sample(s) was/were submitted and identified by/on behalf of the applicant as):

樣品名稱(Sample Description)

WIREWOUND SERIES(FILM BACKING)

樣品型號(Style/Item No.)

SWF · SWC\_F · PAS · WCM-L2NF · SWF-LF · SWFA · SWF(SWC) SERIES

收件日期(Sample Receiving Date)

2019/08/30

測試期間(Testing Period)

2019/08/30 to 2019/09/05

測試結果(Test Results) : 請參閱下一頁 (Please refer to following pages).

Troy Chang / Manager 🗣 eo Signed for and behalf of SĞS TAIWAN LTD.

Chemical Laboratory - Taipei

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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)	MDL	結果 (Result) No.1
鎬 / Cadmium (Cd)	mg/kg	參考IEC 62321-5 (2013),以感應耦合電 漿原子發射光譜儀檢測. / With	2	n. d.
鉛 / Lead (Pb)	mg/kg	reference to IEC 62321-5 (2013) and performed by ICP-AES.	2	n. d.
表 / Mercury (Hg)	mg/kg	参考IEC 62321-4:2013+ AMD1:2017,以 感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-4:2013+ AMD1:2017 and performed by ICP-AES.	2	n. d.
六價絡 / Hexavalent Chromium Cr(VI)	mg/kg	参考IEC 62321-7-2 (2017),以UV-VIS檢 測. / With reference to IEC 62321-7- 2 (2017) and performed by UV-VIS.	8	n. d.
多溴聯苯總和 / Sum of PBBs	mg/kg		_	n. đ.
一溴聯苯 / Monobromobiphenyl	mg/kg		5	n, d.
二溴聯苯 / Dibromobiphenyl	mg/kg		5	n. d.
三溴聯苯 / Tribromobiphenyl	mg/kg		5	n, d.
四溴聯苯 / Tetrabromobiphenyl	mg/kg	参考IEC 62321-6 (2015),以氣相層析/	5	n. d.
五溴聯苯 / Pentabromobipheny1	mg/kg	質譜儀檢測. / With reference to IEC	5	n. d.
六溴聯苯 / HexabromobiphenyI	mg/kg	62321-6 (2015) and performed by GC/MS.	5	n. d.
七溴聯苯 / Heptabromobiphenyl	mg/kg	00/ gg.	5	n. d.
へ溴聯苯 / Octabromobi phenyl	mg/kg	]	5	n. d.
九溴聯苯 / Nonabromobiphenyl	mg/kg	]	5	n. d.
十溴聯苯 / Decabromobiphenyl	mg/kg		5	n. d.

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測試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result) No.1
多溴聯苯醚總和 / Sum of PBDEs	mg/kg		-	n. d.
一溴聯苯醚 / Monobromodiphenyl ether	mg/kg		5	n. d.
二溴聯苯醚 / Dibromodiphenyl ether	mg/kg		5	n. d.
三溴聯苯醚 / Tribromodiphenyl ether	mg/kg	A H VIII GOOD A COMEN AND A FILE	5	n. d.
四溴聯苯醚 / Tetrabromodiphenyl ether	mg/kg	参考IEC 62321-6 (2015),以氣相層析/	5	n. d.
五溴聯苯醚 / Pentabromodiphenyl ether	mg/kg	質譜儀檢測./ With reference to IEC 62321-6 (2015) and performed by	5	n. d.
六溴聯苯醚 / Hexabromodiphenyl ether	mg/kg	GC/MS.	5	n. d.
七溴聯苯醚 / Heptabromodiphenyl ether	mg/kg	UO) MO.	5	n. d.
へ溴聯苯醚 / Octabromodiphenyl ether	mg/kg		5	n. d.
九溴聯苯醚 / Nonabromodiphenyl ether	mg/kg		5	n. d.
十溴聯苯醚 / Decabromodiphenyl ether	mg/kg		5	n. d.
鹵素 / Halogen				
鹵素(氟)/ Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg		50	81.8
鹵素(氯)/ Halogen-Chlorine (C1) (CAS No.: 22537-15-1)	mg/kg	参考BS EN 14582 (2016),以離子層析儀 分析,/ With reference to BS EN	50	n. d.
鹵素(溴)/ Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg	14582 (2016). Analysis was performed by IC.	50	n. d.
鹵素 (碘) / Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg		50	n. d.
全氟辛烷磺酸 / Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	参考US EPA 3550C (2007),以液相層析/ 質譜儀檢測. / With reference to US EPA 3550C (2007). Analysis was	10	n, d.
全氟辛酸 / PFOA (CAS No.: 335-67-1)	mg/kg	performed by LC/MS.	10	n. d.
聚氯乙烯 / PVC	**	以紅外光譜分析及焰色法檢測. / Analysis was performed by FTIR and FLAME Test.	_	Negative

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测試項目 (Test Items)	單位 (Unit)	测試方法 (Method)	MDL	結果 (Result) No.1
鄰苯二甲酸丁苯甲酯 / BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg	參考IEC 62321-8 (2017),以氣相層析/ 質譜儀檢測. / With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n. d.
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg		50	n. d.
鄰苯二甲酸二 (2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg		50	n. d.
鄰苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg		50	n. d.
鄰苯二甲酸二異癸酯 / DIDP (Di- isodecyl phthalate) (CAS No.: 26761- 40-0; 68515-49-1)	mg/kg		50	n. d.
鄰苯二甲酸二異壬酯 / DINP (Di- isononyl phthalate) (CAS No.: 28553- 12-0; 68515-48-0)	mg/kg		50	n. d.
鄰苯二甲酸二正辛酯 / DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	mg/kg		50	n. d.
鄰苯二甲酸二正己酯 / DNHP (Di-n-hexyl phthalate) (CAS No.: 84-75-3)	mg/kg		50	n. d.
鄰苯二甲酸二戊酯 / DNPP (Di-n-pentyl phthalate) (CAS No.: 131-18-0)	mg/kg		50	n, d.
六溴環十二烷及所有主要被辨別出的異構物 / Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified ( $\alpha$ - HBCDD, $\beta$ - HBCDD, $\gamma$ - HBCDD) (CAS No.: 25637-99-4 and 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	mg/kg	参考IEC 62321 (2008),以氣相層析/質 譜儀檢測,/ With reference to IEC 62321 (2008). Analysis was performed by GC/MS.	5	n. d.

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测試項目 (Test Items)	單位 (Unit)	測試方法 (Method)	MDL	結果 (Result) No.1
绨 / Antimony (Sb)	mg/kg	参考US EPA 3052 (1996),以感應耦合電 漿原子發射光譜儀檢測. / With reference to US EPA 3052 (1996). Analysis was performed by ICP-AES.	2	n. d.
鈹 / Beryllium (Be)	mg/kg	參考US EPA 3052 (1996),以威應耦合電 漿原子發射光譜儀檢測. / With reference to US EPA 3052 (1996). Analysis was performed by ICP-AES.	2	n. d.

#### 備註(Note):

- 1. mg/kg = ppm : 0.1wt% = 1000ppm
- 2. MDL = Method Detection Limit (方法偵測極限值)
- 3. n.d. = Not Detected (未檢出)
- 4. "-" = Not Regulated (無規格值)
- 5. \*\*= Qualitative analysis (No Unit) 定性分析(無單位)
- 6. Negative = Undetectable 陰性(未偵測到); Positive = Detectable 陽性(已偵測到)
- 7. 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.)

#### PFOS參考資訊(Reference Information): 持久性有機污染物 POPs - (EU) 2019/1021

PFOS濃度在物質或製備中不得超過0,001%(10ppm),在半成品、成品或零部件中不得超過0.1%(1000ppm),在紡織品或 塗層材料中不得超過1μg/m²。

(Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1µg/m<sup>2</sup>.)

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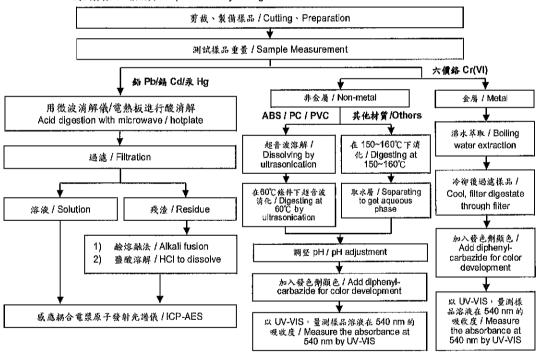
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#### 重金屬流程圖 / Analytical flow chart of Heavy Metal

根據以下的流程圖之條件,樣品已完全溶解。(六價絡測試方法除外)

These samples were dissolved totally by pre-conditioning method according to below flow chart. ( Cr<sup>6+</sup> test method excluded)

- 測試人員:陳恩臻 / Technician : Rita Chen
- 测試負責人:張啟興 / Supervisor: Troy Chang



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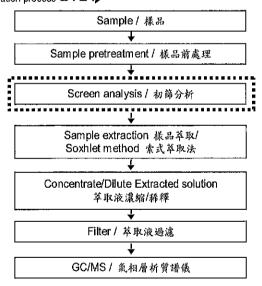
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#### 多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBB/PBDE

測試人員:涂雅苓 / Technician: Yaling Tu

測試負責人:張啟興 / Supervisor: Troy Chang

初次測試程序 / First testing process -確認程序 / Confirmation process - - - →



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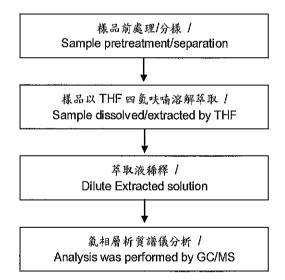
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#### 可塑劑分析流程圖 / Analytical flow chart - Phthalate

測試人員:涂雅苓 / Technician: Yaling Tu

測試負責人:張啟興 / Supervisor: Troy Chang

【测試方法/Test method: IEC 62321-8】



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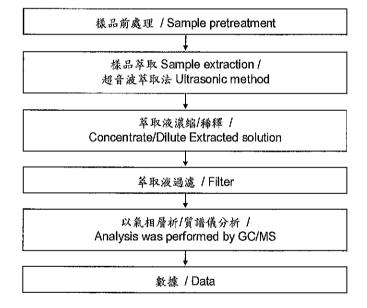
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#### 六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD

- 測試人員: 涂雅苓 / Technician: Yaling Tu
- 測試負責人:張啟興 / Supervisor: Troy Chang



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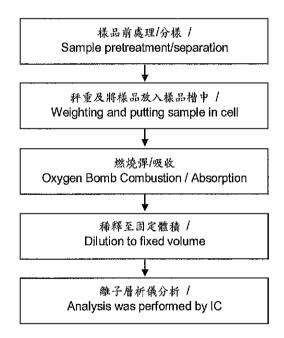
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#### 由素分析流程圖 / Analytical flow chart - Halogen

- 測試人員: 陳恩臻 / Technician: Rita Chen
- 測試負責人:張啟興 / Supervisor: Troy Chang



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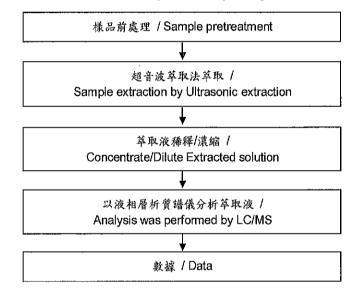
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#### 全氟辛酸/全氟辛烷磺酸分析流程圖 / Analytical flow chart - PFOA/PFOS

- 測試人員:涂雅苓 / Technician: Yaling Tu
- 測試負責人:張啟興 / Supervisor: Troy Chang



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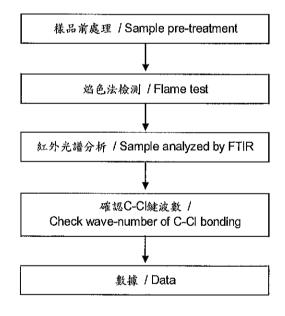
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#### 聚氯乙烯物質判定分析流程圖 / Analysis flow chart - PVC

- 測試人員:涂雅苓 / Technician: Yaling Tu
- 測試負責人:張啟興 / Supervisor: Troy Chang



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# **Test Report**

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日期(Date): 2019/09/05

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(臺慶精密電子(昆山)有限公司 / TAI-TECH ADVANCED ELECTRONICS (KUN-SHAN) CO, LTD.)

(慶邦電子元器件 (泗洪) 有限公司 / TAIPAQ ELECTRONICS (SI-HONG) CO., LTD.)

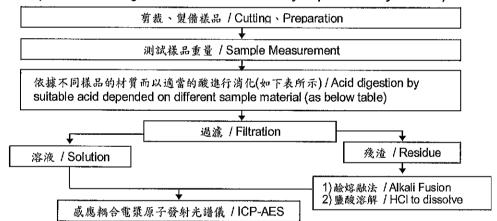
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> 根據以下的流程圖之條件,樣品已完全溶解。 / These samples were dissolved totally by pre-conditioning method according to below flow chart.

- 测試人員:陳恩臻 / Technician: Rita Chen
- 測試負責人:張啟興 / Supervisor: Troy Chang

#### 元素以 ICP-AES 分析的消化流程圖 (Flow Chart of digestion for the elements analysis performed by ICP-AES)



鋼,銅,鋁,焊錫 / Steel, copper, aluminum, solder	王水,硝酸,鹽酸,氫氟酸,雙氧水 /
	Aqua regia, HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub>
玻璃 / Glass	硝酸,氫氟酸 / HNO3/HF
金,鉑,鲍,陶瓷 / Gold, platinum, palladium, ceramic	王水 / Aqua regia
銀 / Silver	硝酸 / HNO <sub>3</sub>
塑膠 / Plastic	硫酸,雙氧水,硝酸,鹽酸 / H <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> O <sub>2</sub> , HNO <sub>3</sub> , HCl
其他 / Others	加入適當的試劑至完全溶解 / Added appropriate reagent to total digestion

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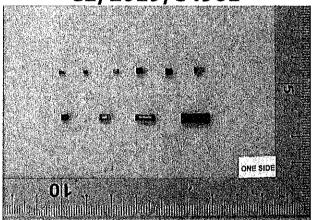
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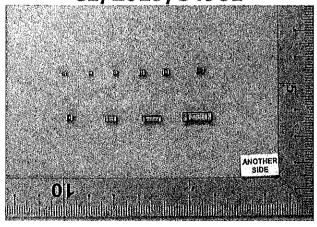
\* 照片中如有箭頭標示,則表示為實際檢測之樣品/部位、\*

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

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\*\* 報告結尾 (End of Report) \*\*

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