

# Specification for Approval

**Date:** 2020/12/23

**Customer :** \_\_\_\_\_

**TAI-TECH P/N:** SLS493850F2-334-R10

**CUSTOMER P/N:** \_\_\_\_\_

**DESCRIPTION:** \_\_\_\_\_

**QUANTITY:** \_\_\_\_\_ pcs

<b>REMARK:</b>		
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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APPROVED	CHECKED
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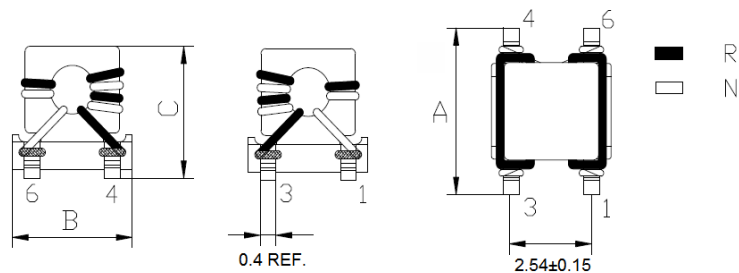
R&D Center

APPROVED	CHECKED	DRAWN
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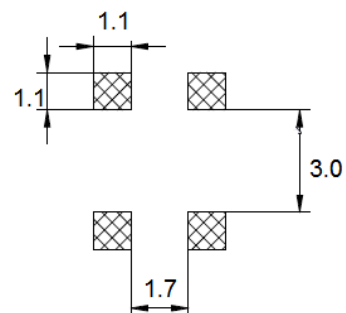


**COMMON MODE CHOKE** **SLS493850F2-334-R10**

**1. Dimension**

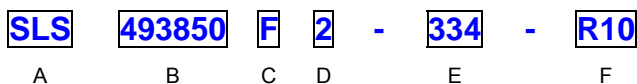


**PAD Layout(mm)**



Series	A(mm)	B(mm)	C(mm)
SLS493850	4.90±0.15	3.80±0.15	4.18±0.50

**2. Part Numbering**



- A: Series
- B: Dimension                      A x B x C
- C: Material                          Ferrite Core
- D: Number Of Lines              2=2 lines
- E: Impedance                      334=334 Ω
- F: RDC                                R10=0.1 Ω

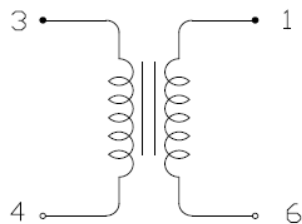
**3. Specification**

TAI-TECH Part Number	Impedance (Ω)	DCR(Ω)	Rated Current(A) max
SLS493850F2-334-R10	334Min	0.1 Max	3.0

Note:

- 1. Test frequency: 100MHz
- 2. I<sub>rms</sub> : Based on temperature rise (ΔT : 40°C typ.)

**4. Schematic Diagram**

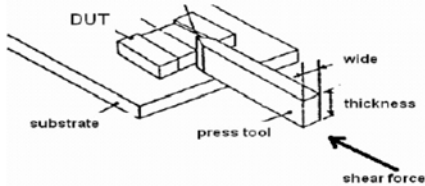


## 5. Material List

No.	Item	Material
1	Core	Ferrite Core
2	Wire	Enamelled Copper wire
3	BASE	Plastic Base
4	Adhesive	Epoxy resin
5	Terminal	Sn/Cu

## 6. Reliability and Test Condition

Item	Performance	Test Condition
Operating temperature	-40~+105°C (Including self - temperature rise)	
Storage temperature	-40~+105°C (on board)	
<b>Electrical Performance Test</b>		
Inductance	Refer to standard electrical characteristics list.	HP4284A,CH11025,CH3302,CH1320,CH1320S LCR Meter.
DCR		CH16502,Agilent33420A Micro-Ohm Meter.
Heat Rated Current (I <sub>rms</sub> )	$\Delta T \leq 40^\circ\text{C}$	Heat Rated Current (I <sub>rms</sub> ) will cause the coil temperature rise $\Delta T(^\circ\text{C})$ . 1.Applied the allowed DC current 2.Temperature measured by digital surface thermometer
<b>Reliability Test</b>		
Life Test	Appearance : No damage. Impedance : within±15% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	Preconditioning: Run through IR reflow for 3 times. ( IPC/JEDEC J-STD-020E Classification Reflow Profiles) Temperature : 105±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 3 times. ( IPC/JEDEC J-STD-020E Classification Reflow Profiles) Humidity : 85±2% R.H, Temperature : 85°C±2°C Duration : 1000hrs Min. Bead: with 100% rated current. Inductance: with 10% rated current. Measured at room temperature after placing for 24±2 hrs.
Moisture Resistance		Preconditioning: Run through IR reflow for 3 times. ( IPC/JEDEC J-STD-020E Classification Reflow Profiles) 1. Baked at 50°C for 25hrs, measured at room temperature after placing for 4 hrs. 2. Raise temperature to 65±2°C 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25°C in 2.5hrs. 3. Raise temperature to 65±2°C 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25°C in 2.5hrs,keep at 25°C for 2 hrs then keep at -10°C for 3 hrs 4. Keep at 25°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 3 times. ( IPC/JEDEC J-STD-020E Classification Reflow Profiles) Condition for 1 cycle Step1 : -40±2°C 30±5min Step2 : 25±2°C ≤0.5min Step3 : 105±2°C 30±5min Number of cycles : 500 Measured at room temperature after placing for 24±2 hrs.
Vibration		Preconditioning: Run through IR reflow for 3 times. ( IPC/JEDEC J-STD-020E Classification Reflow Profiles) Oscillation Frequency: 10Hz~2KHz~10Hz for 20 minutes Equipment : Vibration checker Total Amplitude:10g Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations)

Item	Performance	Test Condition															
Bending	Appearance : No damage. Impedance : within±15% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	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. Impedance : within±15% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	Test condition: <table border="1"> <thead> <tr> <th>Type</th> <th>Peak value (g's)</th> <th>Normal duration (D) (ms)</th> <th>Wave form</th> <th>Velocity change (Vi)ft/sec</th> </tr> </thead> <tbody> <tr> <td>SMD</td> <td>50</td> <td>11</td> <td>Half-sine</td> <td>11.3</td> </tr> <tr> <td>Lead</td> <td>50</td> <td>11</td> <td>Half-sine</td> <td>11.3</td> </tr> </tbody> </table>	Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec	SMD	50	11	Half-sine	11.3	Lead	50	11	Half-sine	11.3
Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec													
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	a. Method B, 4 hrs @155°C dry heat @235°C±5°C Test time:5 +/-0.5 seconds. b. Method D category 3. (steam aging 8hours ± 15 min)@ 260°C±5°C															
Resistance to Soldering Heat		Depth: completely cover the termination <table border="1"> <thead> <tr> <th>Temperature(°C)</th> <th>Time(s)</th> <th>Temperature ramp/immersion and emersion rate</th> <th>Number of heat cycles</th> </tr> </thead> <tbody> <tr> <td>260 ±5 (solder temp)</td> <td>10 ±1</td> <td>25mm/s ±6 mm/s</td> <td>1</td> </tr> </tbody> </table>	Temperature(°C)	Time(s)	Temperature ramp/immersion and emersion rate	Number of heat cycles	260 ±5 (solder temp)	10 ±1	25mm/s ±6 mm/s	1							
Temperature(°C)	Time(s)	Temperature ramp/immersion and emersion rate	Number of heat cycles														
260 ±5 (solder temp)	10 ±1	25mm/s ±6 mm/s	1														
Terminal Strength	Appearance : No damage. Impedance : within±15% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	Preconditioning: Run through IR reflow for 3 times. ( IPC/JEDEC J-STD-020E Classification Reflow Profiles) With the component mounted on a PCB with the device to be tested, apply a force (>0805inch(2012mm):1kg , <=0805 inch(2012mm):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. 															

## 7. Soldering and Mounting

### 7-1. Soldering

Mildly activated rosin fluxes are preferred. TAI-TECH terminations are suitable for re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

#### 7-1.1 IR Soldering Reflow:

Recommended temperature profiles for lead free re-flow soldering in Figure 1. Table 1.1&1.2 (J-STD-020E)

#### 7-1.2 Soldering Iron:

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. (Figure 2.)

- Preheat circuit and products to 150°C
- 350°C tip temperature (max)
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- 1.0mm tip diameter (max)
- Limit soldering time to 4~5 sec.

Fig.1 IR Soldering Reflow

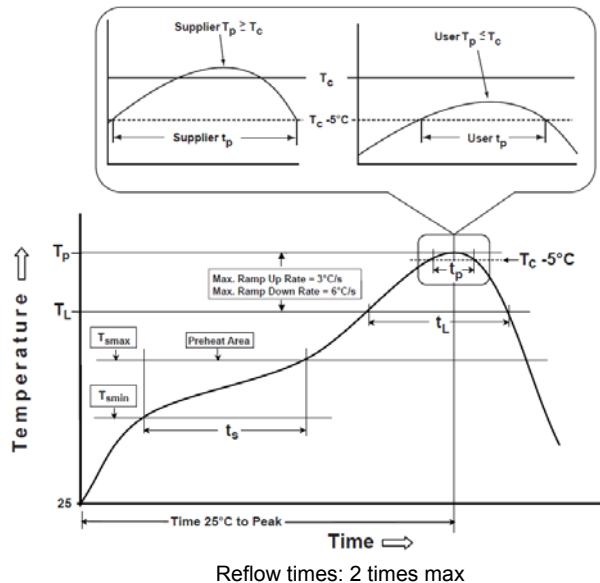


Fig.2 Iron soldering temperature profiles

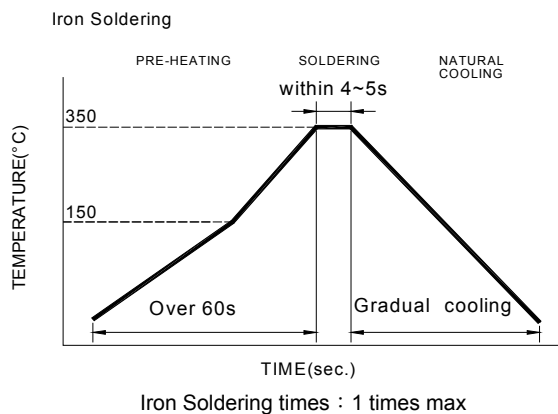


Table (1.1): Reflow Profiles

Profile Type:	Pb-Free Assembly
Preheat	
-Temperature Min( $T_{smin}$ )	150°C
-Temperature Max( $T_{smax}$ )	200°C
-Time( $t_s$ )from( $T_{smin}$ to $T_{smax}$ )	60-120seconds
Ramp-up rate( $T_L$ to $T_p$ )	3°C/second max.
Liquidus temperature( $T_L$ )	217°C
Time( $t_L$ )maintained above $T_L$	60-150 seconds
Classification temperature( $T_c$ )	See Table (1.2)
Time( $t_p$ ) at $T_c - 5^\circ\text{C}$ ( $T_p$ should be equal to or less than $T_c$ .)	< 30 seconds
Ramp-down rate( $T_p$ to $T_L$ )	6°C /second max.
Time 25°C to peak temperature	8 minutes max.

**Tp**: maximum peak package body temperature, **Tc**: the classification temperature.  
For user (customer) **Tp** should be equal to or less than **Tc**.

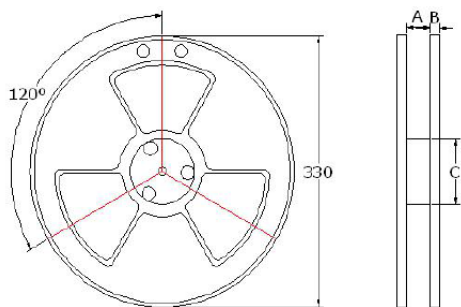
Table (1.2) Package Thickness/Volume and Classification Temperature ( $T_c$ )

	Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> >2000
PB-Free Assembly	<1.6mm	260°C	260°C	260°C
	1.6-2.5mm	260°C	250°C	245°C
	≥2.5mm	250°C	245°C	245°C

Reflow is referred to standard IPC/JEDEC J-STD-020E ◦

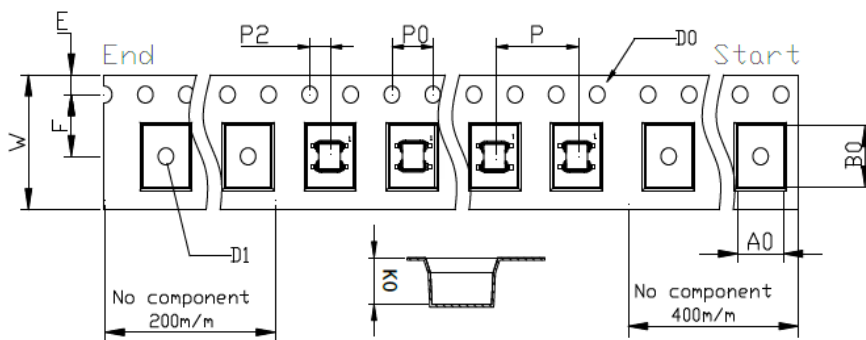
### 8. Packaging Information

(1) Reel Dimension



A(mm)	B(mm)	C(mm)
16.5	2.3	100

(2) Tape Dimension



Series	Size	W(mm)	A0(mm)	B0(mm)	K0(mm)	P(mm)	P0(mm)	P2(mm)	F(mm)	E(mm)	D0(mm)	D1(mm)
SLS	493850	16.0	5.1	4.2	4.35	12.0	4.0	2.0	7.5	1.75	1.5	1.5

(3)Packaging Quantity

SLS	493850
REEL	1000

**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.
    2. Temperature and humidity conditions: Less than 40°C 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/2020/61759

日期(Date) : 2020/06/17

頁數(Page): 1 of 11

西北臺慶科技股份有限公司 / TAI-TECH ADVANCED ELECTRONICS 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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桃園市楊梅區幼獅工業區幼四路1號 / NO. 1, YOU 4TH ROAD, YOUTH INDUSTRIAL DISTRICT, YANG-MEI, TAO-YUAN CITY, TAIWAN, R. O. C.

(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)

(中國, 江蘇省, 宿遷市, 泗洪縣, 經濟開發區杭州路南側, 建設北路東側 / THE SOUTH HANGZHOU ROAD AND THE EAST JIANSHE ROAD, ECONOMIC DEVELOPMENT ZONE, SIHONG COUNTY, SUQIANCITY, JIANGSU PROVINCE, P, R, CHINA)

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) : BASE TYPE CHOKE COIL/INDUCTOR  
樣品型號(Style/Item No.) : CHTPW、CHTPR、TEP、T5W、SLS SERIES  
收件日期(Sample Receiving Date) : 2020/06/10  
測試期間(Testing Period) : 2020/06/10 to 2020/06/17

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

*Troy Chang*  
Troy Chang / Manager - Tech  
Signed for and behalf of  
SGS TAIWAN LTD.  
Chemical Laboratory - Taipei



PIN CODE: D90A80B4

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# 測試報告

## Test Report

號碼(No.) : CE/2020/61759

日期(Date) : 2020/06/17

頁數(Page): 2 of 11

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

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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
鎘 / Cadmium (Cd)	mg/kg	參考 IEC 62321-5: 2013, 以感應耦合電漿發射光譜儀檢測. / With reference to IEC 62321-5: 2013 and performed by ICP-OES.	2	n. d.
鉛 / Lead (Pb)	mg/kg		2	n. d.
汞 / Mercury (Hg)	mg/kg	參考 IEC 62321-4:2013+ AMD1:2017, 以感應耦合電漿發射光譜儀檢測. / With reference to IEC 62321-4:2013+ AMD1:2017 and performed by ICP-OES.	2	n. d.
六價鉻 / Hexavalent Chromium Cr(VI)	mg/kg	參考 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	參考 IEC 62321-6: 2015, 以氣相層析/質譜儀檢測. / With reference to IEC 62321-6: 2015 and performed by GC/MS.	-	n. d.
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		5	n. d.
五溴聯苯 / Pentabromobiphenyl	mg/kg		5	n. d.
六溴聯苯 / Hexabromobiphenyl	mg/kg		5	n. d.
七溴聯苯 / Heptabromobiphenyl	mg/kg		5	n. d.
八溴聯苯 / Octabromobiphenyl	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	參考 IEC 62321-6: 2015, 以氣相層析/質譜儀檢測。 / With reference to IEC 62321-6: 2015 and performed by GC/MS.	-	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		5	n. d.
四溴聯苯醚 / Tetrabromodiphenyl ether	mg/kg		5	n. d.
五溴聯苯醚 / Pentabromodiphenyl ether	mg/kg		5	n. d.
六溴聯苯醚 / Hexabromodiphenyl ether	mg/kg		5	n. d.
七溴聯苯醚 / Heptabromodiphenyl ether	mg/kg		5	n. d.
八溴聯苯醚 / 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.	
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	參考 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.
<b>鹵素 / Halogen</b>				
鹵素 (氟) / Halogen-Fluorine (F) (CAS No. : 14762-94-8)	mg/kg	參考 BS EN 14582: 2016, 以離子層析儀分析。 / With reference to BS EN 14582: 2016. Analysis was performed by IC.	50	74.3
鹵素 (氯) / Halogen-Chlorine (Cl) (CAS No. : 22537-15-1)	mg/kg		50	n. d.
鹵素 (溴) / Halogen-Bromine (Br) (CAS No. : 10097-32-2)	mg/kg		50	n. d.
鹵素 (碘) / Halogen-Iodine (I) (CAS No. : 14362-44-8)	mg/kg		50	n. d.

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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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測試項目 (Test Items)	單位 (Unit)	測試方法 (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.

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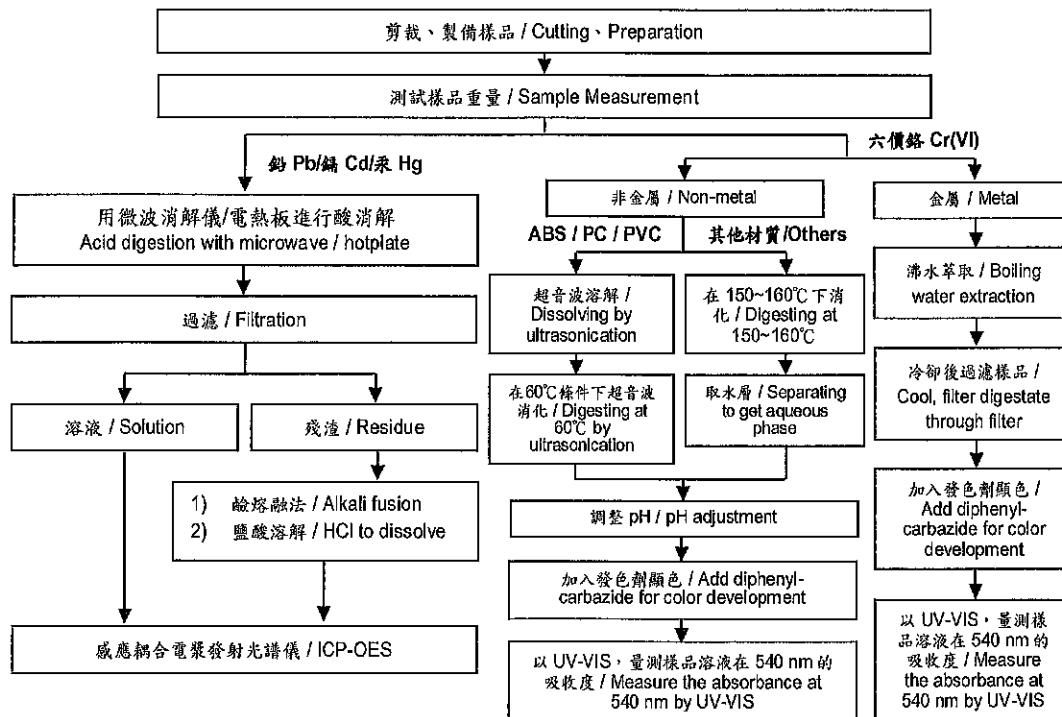
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### 重金屬流程圖 / Analytical flow chart of Heavy Metal

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)



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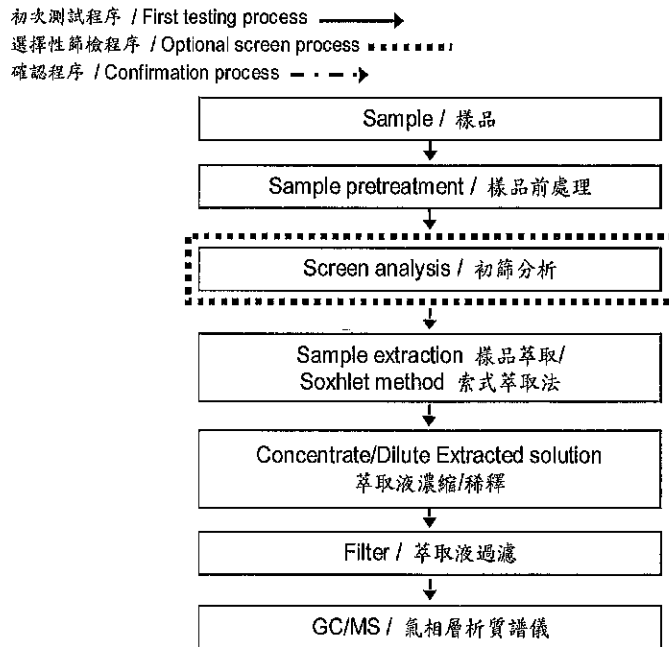
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### 多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBB/PBDE



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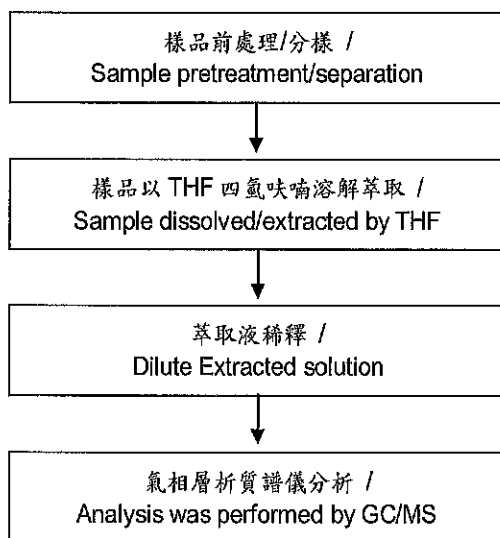
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### 可塑劑分析流程圖 / Analytical flow chart - Phthalate

【測試方法/Test method: IEC 62321-8】



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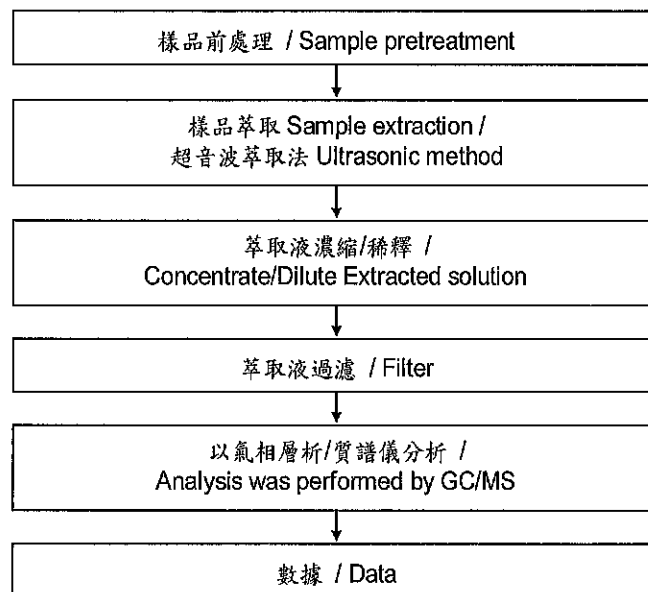
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### 六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD



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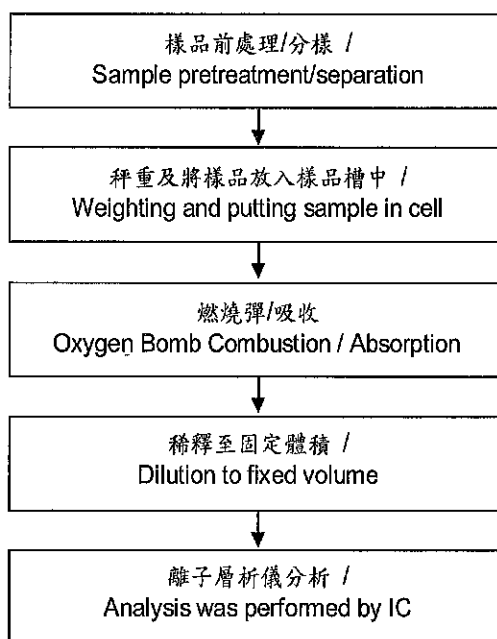
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### 鹵素分析流程圖 / Analytical flow chart - Halogen



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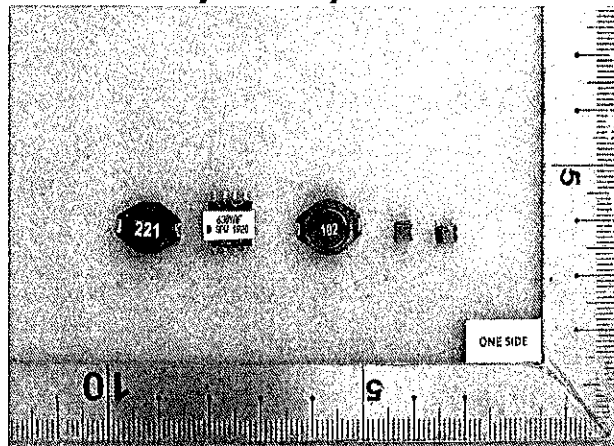
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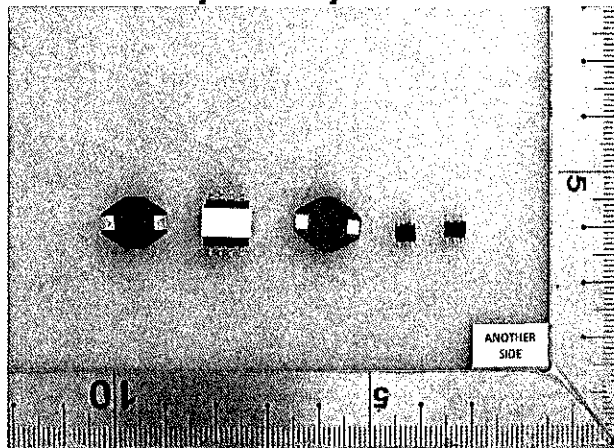
\* 照片中如有箭頭標示, 則表示為實際檢測之樣品/部位。\*

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

### CE/2020/61759



### CE/2020/61759



\*\* 報告結尾 (End of Report) \*\*

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