

High Frequency Winding Type Chip Inductor SWI0805UF-SERIES

ECN HISTORY LIST					
REV	DATE	DESCRIPTION	APPROVED	CHECKED	DRAWN
1.0	20/04/28	新發行	楊祥忠	徐鋒強	何玉蓮
備 註					

High Frequency Winding Type Chip Inductor

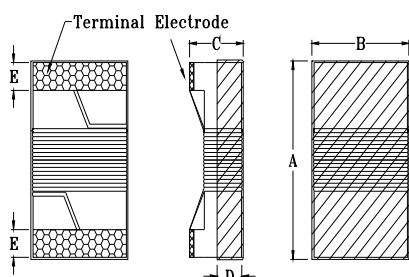
SWI0805UF-SERIES

1. Features

1. Ceramic core wire wound construction.
2. No batch to batch variations in inductance
3. High Reliability due to ceramic wire wound construction.
4. High frequency application.
5. Small footprint as well as low profile.
6. 100% Lead(Pb) & Halogen-Free and RoHS compliant.
7. Operating temperature-40~+125°C (Including self - temperature rise)



2. Dimensions



Size	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)
SWI0805	2.29 max.	1.73 max.	1.52 max.	0.51 ref.	0.44±0.1

Unit:mm

3. Part Numbering

SWI	0805	UF	-	2N8	S
A	B	C		D	E

A: Series

B: Dimension

LxW

C: Material

D: Inductance

2N8=2.8nH

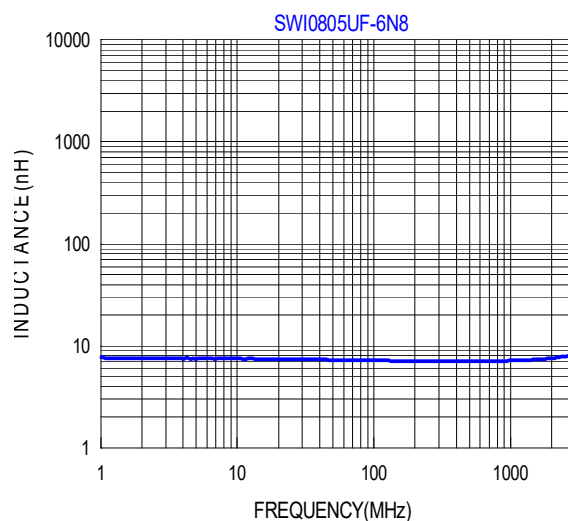
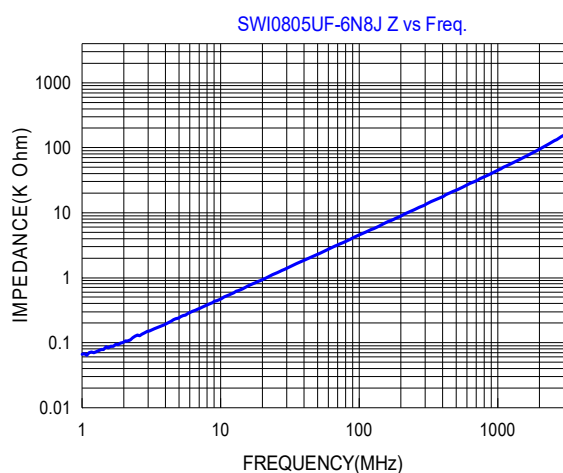
E: Inductance Tolerance

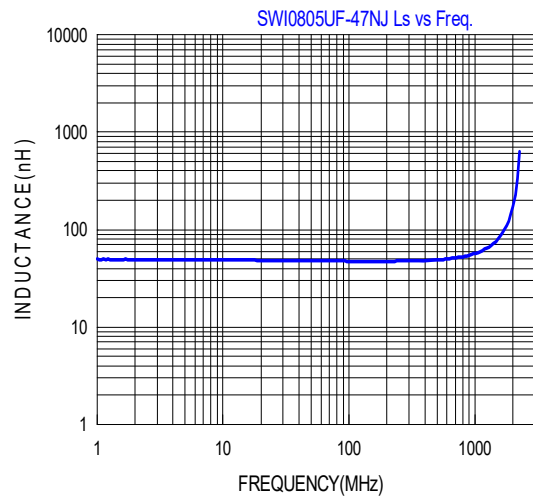
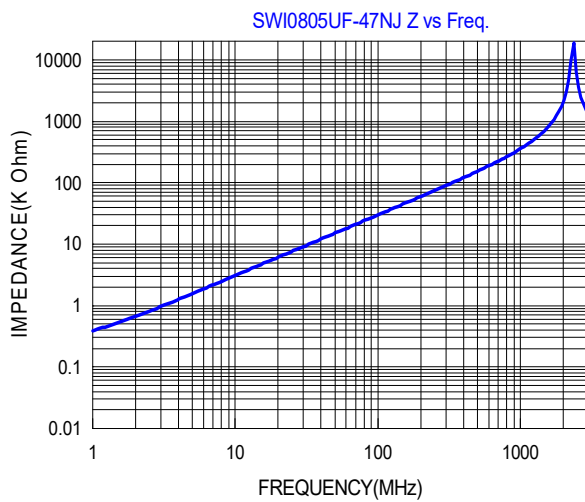
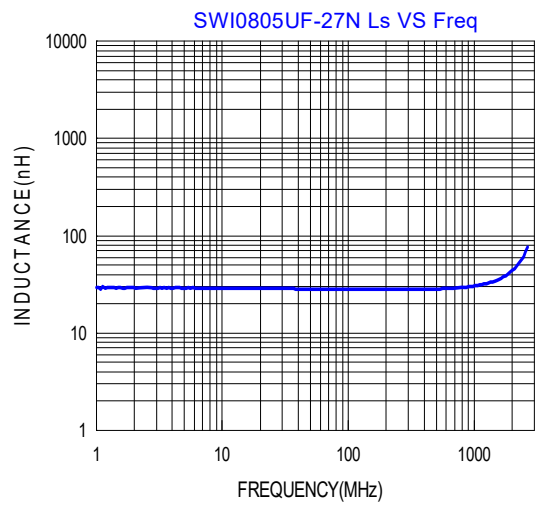
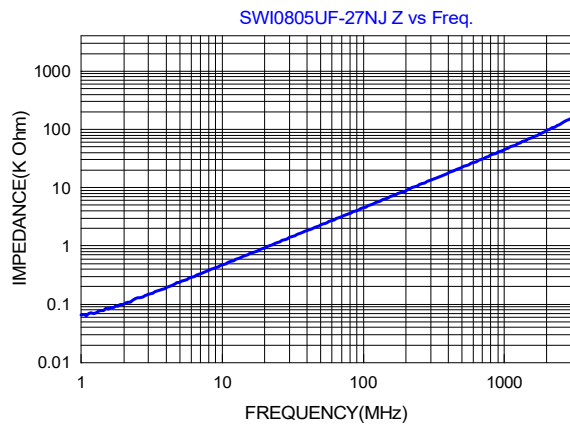
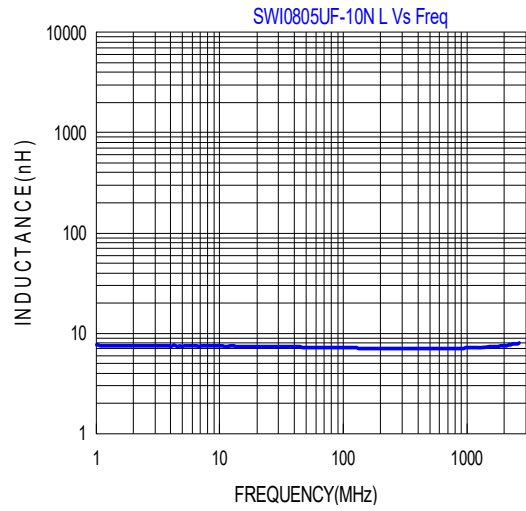
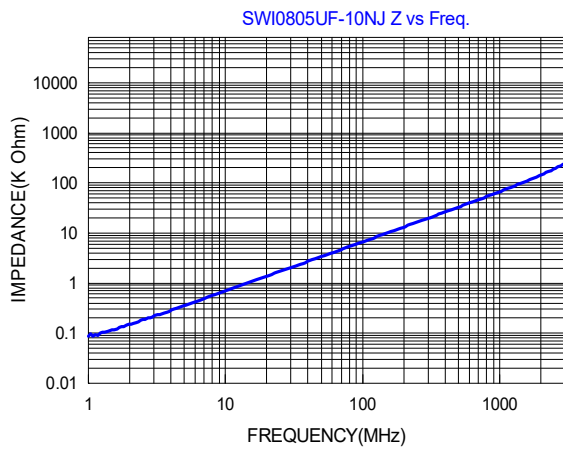
C=±0.2nH, S=±0.3nH, G=±2%, J=±5%

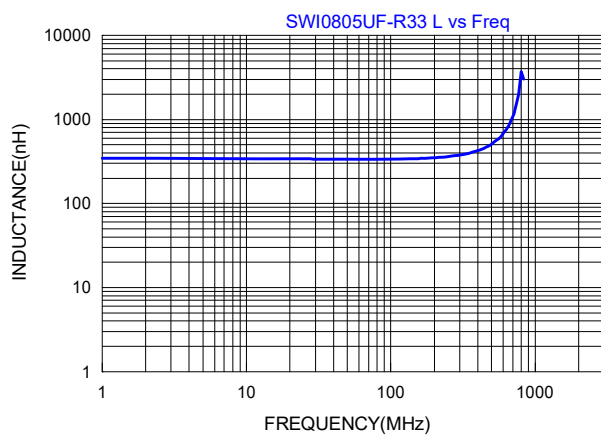
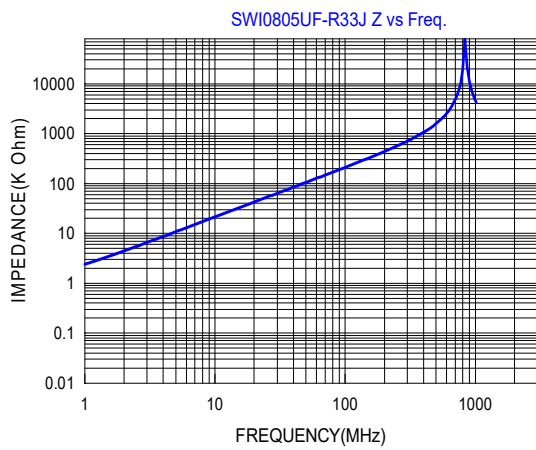
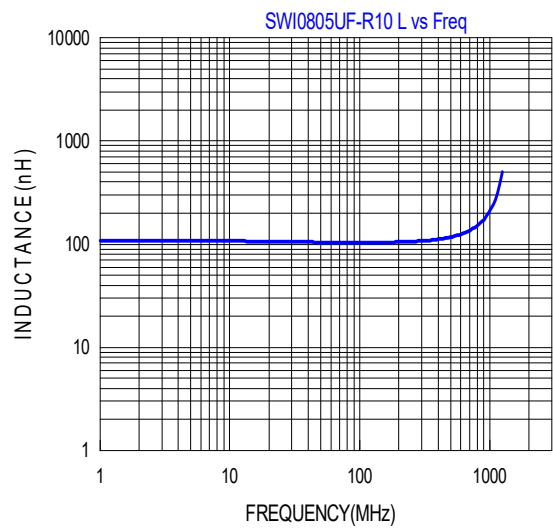
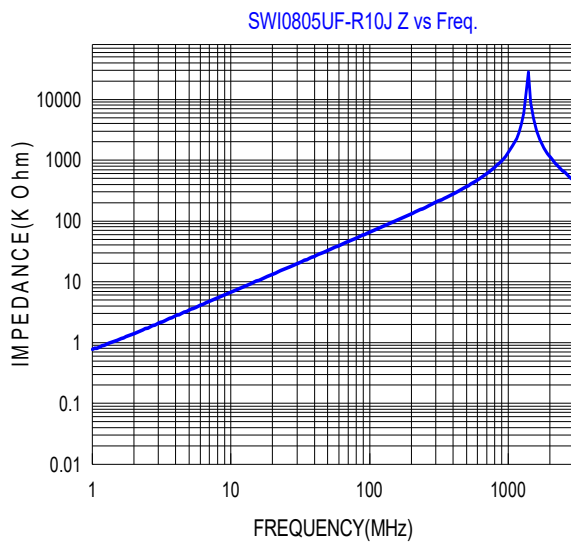
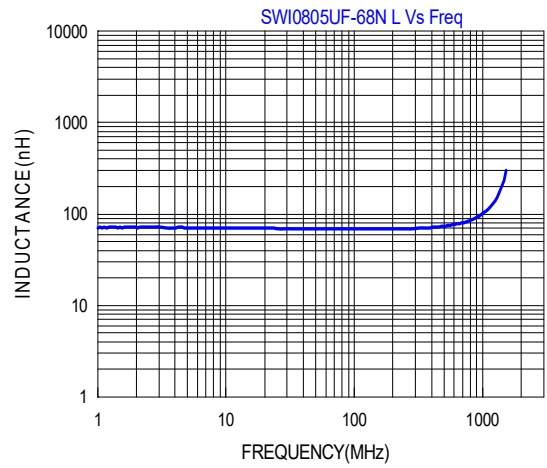
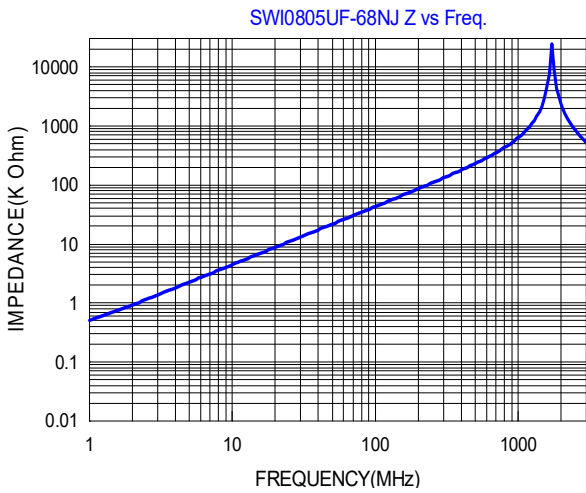
4. Specification

Part Number	Inductance (nH)	Tolerance	Test Frequency (Hz)	Q @ Test Freq. min.	Rated Current (mA) max.	DCR (Ω) max.	SRF (MHz) min.
SWI0805UF-2N8□	2.8	C,S	0.1V/250M	80/1500	800	0.06	7900
SWI0805UF-3N0□	3.0	C,S	0.1V/250M	65/1500	800	0.06	7900
SWI0805UF-3N3□	3.3	C,S	0.1V/250M	50/1500	600	0.08	7900
SWI0805UF-5N6□	5.6	C,S	0.1V/250M	65/1000	600	0.08	5500
SWI0805UF-6N8□	6.8	C,J	0.1V/250M	50/1000	600	0.11	5500
SWI0805UF-7N5□	7.5	C,J	0.1V/250M	50/1000	600	0.14	4500
SWI0805UF-8N2□	8.2	C,J	0.1V/250M	50/1000	600	0.12	4700
SWI0805UF-10N□	10	G,J	0.1V/250M	60/500	600	0.10	4200
SWI0805UF-12N□	12	G,J	0.1V/250M	50/500	600	0.15	4000
SWI0805UF-15N□	15	G,J	0.1V/250M	50/500	600	0.17	3400
SWI0805UF-18N□	18	G,J	0.1V/250M	50/500	600	0.20	3300
SWI0805UF-22N□	22	G,J	0.1V/250M	55/500	500	0.22	2600
SWI0805UF-24N□	24	G,J	0.1V/250M	50/500	500	0.22	2000
SWI0805UF-27N□	27	G,J	0.1V/250M	55/500	500	0.25	2500
SWI0805UF-33N□	33	G,J	0.1V/250M	60/500	500	0.27	2050

Part Number	Inductance (nH)	Tolerance	Test Frequency (Hz)	Q @ Test Freq. min.	Rated Current (mA) max.	DCR (Ω) max.	SRF (MHz) min.
SWI0805UF-36N□	36	G,J	0.1V/250M	55/500	500	0.27	1700
SWI0805UF-39N□	39	G,J	0.1V/250M	60/500	500	0.29	2000
SWI0805UF-43N□	43	G,J	0.1V/200M	60/500	500	0.34	1650
SWI0805UF-47N□	47	G,J	0.1V/200M	60/500	500	0.31	1650
SWI0805UF-56N□	56	G,J	0.1V/200M	60/500	500	0.34	1550
SWI0805UF-68N□	68	G,J	0.1V/200M	60/500	500	0.38	1450
SWI0805UF-82N□	82	G,J	0.1V/150M	65/500	400	0.42	1300
SWI0805UF-91N□	91	G,J	0.1V/150M	65/500	400	0.48	1200
SWI0805UF-R10□	100	G,J	0.1V/150M	65/500	400	0.46	1200
SWI0805UF-R11□	110	G,J	0.1V/150M	50/250	400	0.48	1000
SWI0805UF-R12□	120	G,J	0.1V/150M	50/250	400	0.51	1100
SWI0805UF-R15□	150	G,J	0.1V/100M	50/250	400	0.56	920
SWI0805UF-R18□	180	G,J	0.1V/100M	50/250	400	0.64	870
SWI0805UF-R20□	200	G,J	0.1V/100M	50/250	400	0.68	860
SWI0805UF-R22□	220	G,J	0.1V/100M	50/250	400	0.70	850
SWI0805UF-R24□	240	G,J	0.1V/100M	44/250	350	1.00	690
SWI0805UF-R25□	250	G,J	0.1V/100M	45/250	350	1.20	660
SWI0805UF-R27□	270	G,J	0.1V/100M	48/250	350	1.00	650
SWI0805UF-R33□	330	G,J	0.1V/100M	48/250	310	1.40	600
SWI0805UF-R39□	390	G,J	0.1V/100M	48/250	290	1.50	560
SWI0805UF-R47□	470	G,J	0.1V/50M	33/100	250	1.70	375
SWI0805UF-R56□	560	G,J	0.1V/25M	23/50	230	1.90	340
SWI0805UF-R62□	620	G,J	0.1V/25M	23/50	210	2.20	220
SWI0805UF-R68□	680	G,J	0.1V/25M	23/50	190	2.20	188
SWI0805UF-R82□	820	G,J	0.1V/25M	23/50	180	2.35	215
SWI0805UF-1R0□	1000	G,J	0.1V/25M	15/50	170	2.5	100
SWI0805UF-1R2□	1200	G,J	0.1V/7.9M	18/25	170	2.5	100

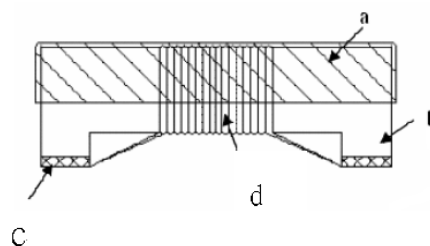






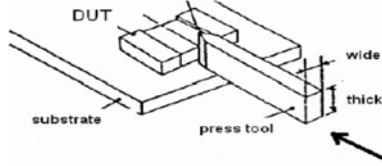
5. Materials

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



6. Reliability and Test Condition

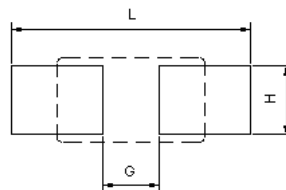
Item	Performance	Test Condition
Operating temperature	-40~+125°C (Including self - temperature rise)	
Storage temperature	-40~+125°C (on board)	
Electrical Performance Test		
Inductance L	Refer to standard electrical characteristic list	Agilent-4291, Agilent-4287
Q		Agilent-4192, Agilent-4285
SRF		Agilent-4291
DC Resistance		Agilent-4192
Rated Current		Agilent-34420A
Reliability Test		Applied the current to coils, the inductance change shall be less than 20% to initial value.
Life Test	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/JEDECJ-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/JEDECJ-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		Preconditioning: Run through IR reflow for 2 times.(IPC/JEDECJ-STD-020DClassification Reflow Profiles) 1. Baked at50°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 2 times.(IPC/JEDECJ-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 fempraturc 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	Appearance : No damage. Inductance : within±10% of initial 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	Q : Shall not exceed the specification value. RDC : within ±15% of initial value and shall not exceed the specification value	<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 (V)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 (V)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 (V)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.	Preheat: 150°C ,60sec. 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 Depth: completely cover the termination															
Resistance to Soldering Heat		<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. 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 e	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. 															

7. Soldering and Mounting

7-1. Recommended PC Board Pattern

Chip size							Land Patterns For Reflow Soldering		
Series	Type	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	L(mm)	G(mm)	H(mm)
SWI	0805	2.29max.	1.73max.	1.52max	0.51 ref	0.44±0.1	2.80	1.25	1.78



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.

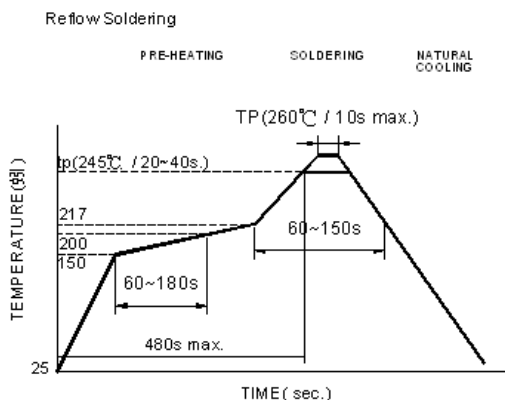
7-2.1 Solder re-flow:

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

7-2.2 Soldering Iron(Figure 2):

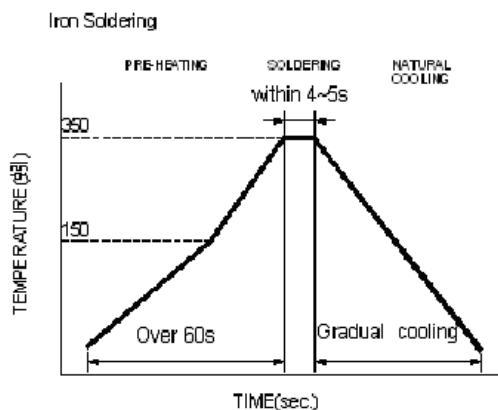
Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended.

- Preheat circuit and products to 150°C
- 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

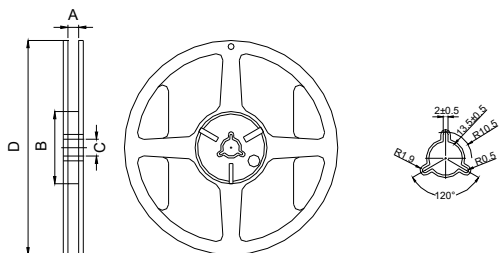


Iron Soldering times: 1 times max.

Fig.2

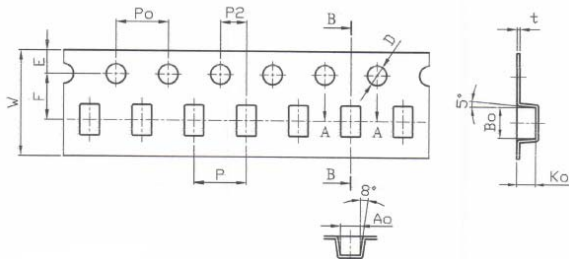
8. Packaging Information

8-1. Reel Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
7"x8mm	8.4±0.5	60±2	13.5±0.5	178±2

8-2. Tape Dimension / 8mm

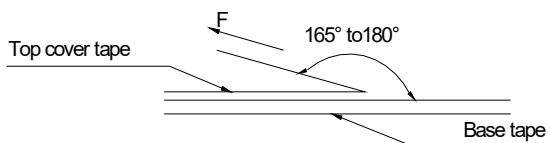


Series	W(mm)	P(mm)	E(mm)	F(mm)	P2(mm)	D(mm)	P0(mm)	A0(mm)	B0(mm)	K0(mm)	t(mm)
SWI0805UF	8.00±0.10	4.00±0.10	1.75±0.10	3.50±0.05	2.00±0.05	1.50+0.10/-0.00	4.00±0.10	1.80±0.10	2.30±0.10	1.60±0.10	0.23±0.05

8-3. Packaging Quantity

Chip size	0805
Reel	2000
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. (°C)	Room Humidity (%)	Room atm (hPa)	Tearing Speed 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.
 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/2020/34939

日期(Date) : 2020/03/27

頁數(Page): 1 of 11

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

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.

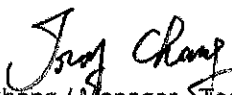
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(中國, 江蘇省, 宿遷市, 泗洪縣, 經濟開發區杭州路南側, 建設北路東側 / THE SOUTH HANGZHOU ROAD AND THE EAST JIANSHE ROAD, ECONOMIC DEVELOPMENT ZONE, SIHONG COUNTY, SUQIANCITY, JIANGSU PROVINCE, P, R, CHINA)

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) : CERAMIC SERIES
樣品型號(Style/Item No.) : SWI(SWC)、SWC_I SERIES
收件日期(Sample Receiving Date) : 2020/03/20
測試期間(Testing Period) : 2020/03/20 to 2020/03/27

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


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



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測試報告

Test Report

號碼(No.) : CE/2020/34939

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頁數(Page): 2 of 11

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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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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		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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測試報告

Test Report

號碼(No.) : CE/2020/34939

日期(Date) : 2020/03/27

頁數(Page): 3 of 11

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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 (α -HBCDD, β -HBCDD, γ -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.
鹵素 / Halogen				
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	n. d.
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

號碼(No.) : CE/2020/34939

日期(Date) : 2020/03/27

頁數(Page): 4 of 11

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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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測試報告

Test Report

號碼(No.) : CE/2020/34939

日期(Date) : 2020/03/27

頁數(Page): 5 of 11

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

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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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測試報告

Test Report

號碼(No.) : CE/2020/34939

日期(Date) : 2020/03/27

頁數(Page): 6 of 11

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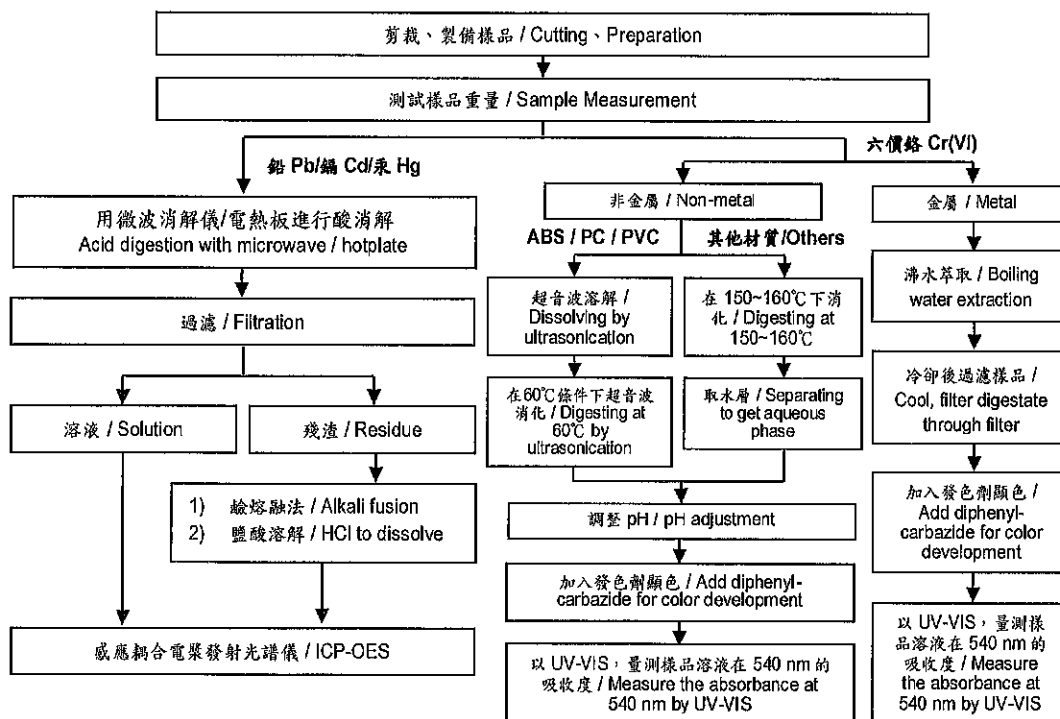
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重金屬流程圖 / Analytical flow chart of Heavy Metal

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. (Cr⁶⁺ test method excluded)



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測試報告

Test Report

號碼(No.) : CE/2020/34939

日期(Date) : 2020/03/27

頁數(Page): 7 of 11

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

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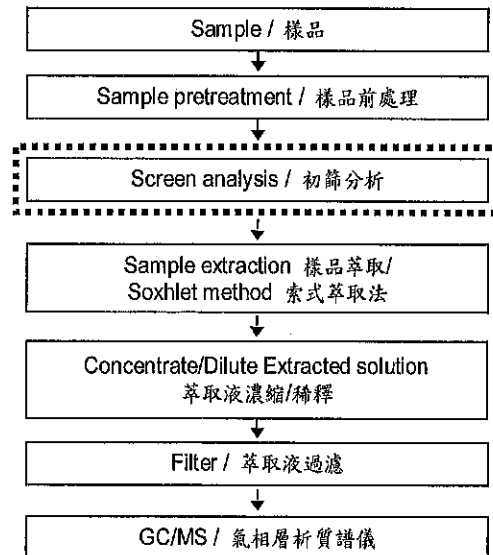
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多溴聯苯/多溴聯苯醚分析流程圖 / Analytical flow chart - PBB/PBDE

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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測試報告

Test Report

號碼(No.) : CE/2020/34939

日期(Date) : 2020/03/27

頁數(Page): 8 of 11

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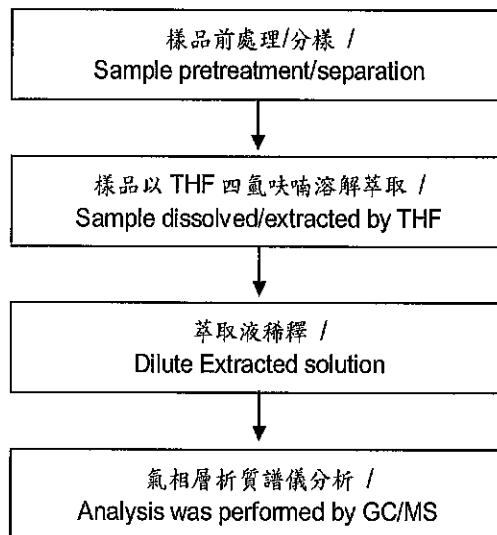
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可塑劑分析流程圖 / Analytical flow chart - Phthalate

【測試方法/Test method: IEC 62321-8】



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測試報告

Test Report

號碼(No.) : CE/2020/34939

日期(Date) : 2020/03/27

頁數(Page): 9 of 11

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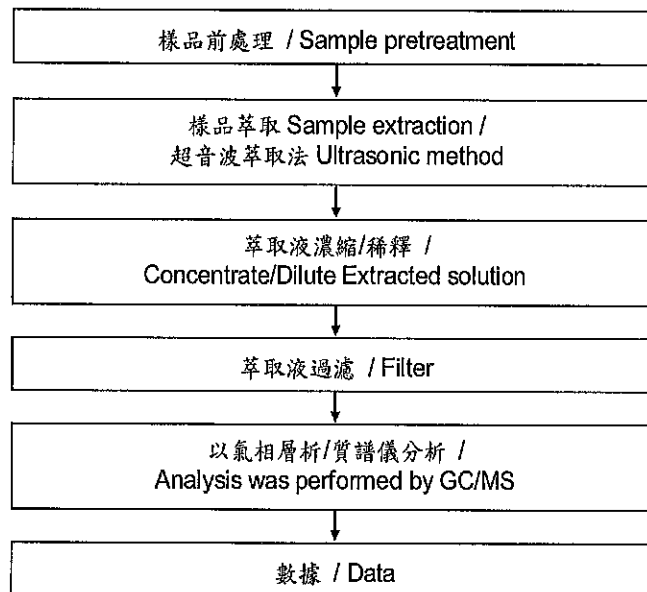
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六溴環十二烷分析流程圖 / Analytical flow chart - HBCDD



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測試報告

Test Report

號碼(No.) : CE/2020/34939

日期(Date) : 2020/03/27

頁數(Page): 10 of 11

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

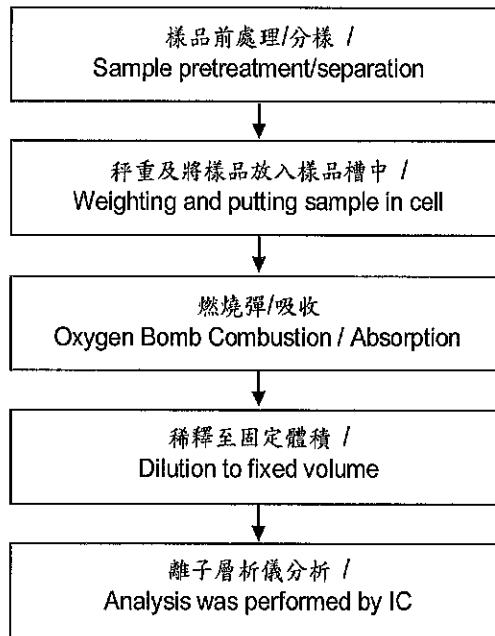
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鹵素分析流程圖 / Analytical flow chart - Halogen



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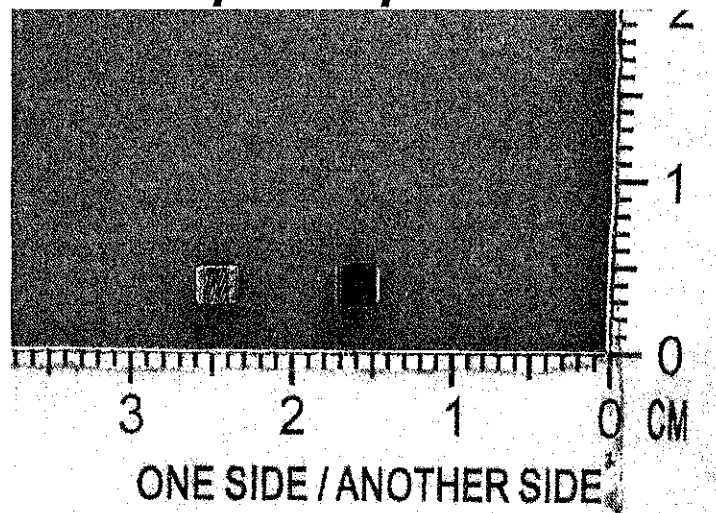
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* 照片中如有箭頭標示, 則表示為實際檢測之樣品/部位。*
(The tested sample / part is marked by an arrow if it's shown on the photo.)

CE/2020/34939



** 報告結尾 (End of Report) **

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