EI1106220

S3225A-024000-F12AAUAC

YOKE®

APPROVAL SHEET

Cidev Agencies(1973)LTD.

Item : S3225A Crystal

Spec. no : S3225A-024000-F12AAUAC

Freq : 24.000 MHz

Customer Approved	Checked By	Issued By
	陳慧美	

友桂電子股份有限公司

YOKETAN CORPORATION

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RoHS Compliant

YOKE®

REVISION HISTORY

Rev	Revise page	Revise Contents	Date	Ref.No.	Reviser
A	N/A	INITIAL ISSUE	2015/3/9	N/A	Aki Hsieh
A	Page.3	50uW revised to 100uW	2015/4/13	2-3	Aki Hsieh

SPECIFICATION OF CRYSTAL UNITS YOKETAN CORP.

Customer : Cidev

SPEC NO : S3225A-024000-F12AAUAC

Date : 9-Mar-15

1 General

1-1 Enclosure:	S3225A (Lead Free Parts)
1-2 Application:	
1-3 Overtone Order :	Fundamental
1-4 Crystal unit Frequency :	24.000 MHz
1-5 Frequency Deviation :	
1-5-1 At Reference Temperature :	±10ppm at 25 ± 3℃
1-5-2 At Operating Temperature :	±10ppm in 1-6(Refer to 25℃)
1-6 Operating Temperature Range :	-15℃ to +70℃
1-7 Storage Temperature Range :	-40℃ to +85℃

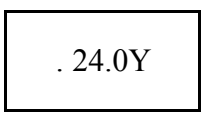
2 Circuit

2-1 Circuit :	250B
2-2 Load Capacitance :	12pF±0.3pF
2-3 Level of Drive :	100uW

3 Electrical Performance

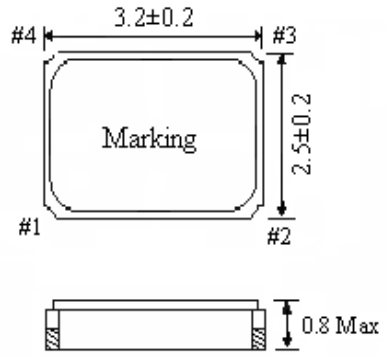
3-1 Equivalent Series Resistance:	Less than 60 ohms
3-2 Electrostatic Capacitance :	3.5pF Max.
3-3 Insulation Resistance :	More than 500Mohms at DC100V
3-4 Aging:	±2ppm/year Max.

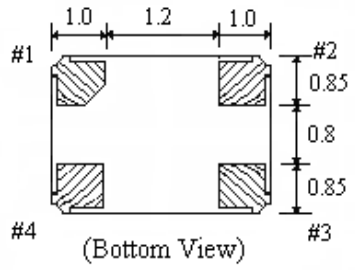
4 Marking

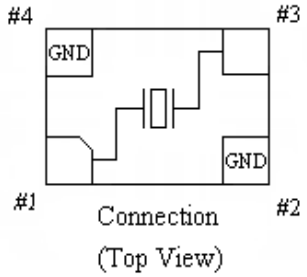


SPECIFICATION OF CRYSTAL UNITS YOKETAN CORP.

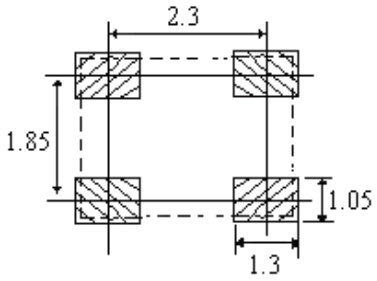
Dimensions





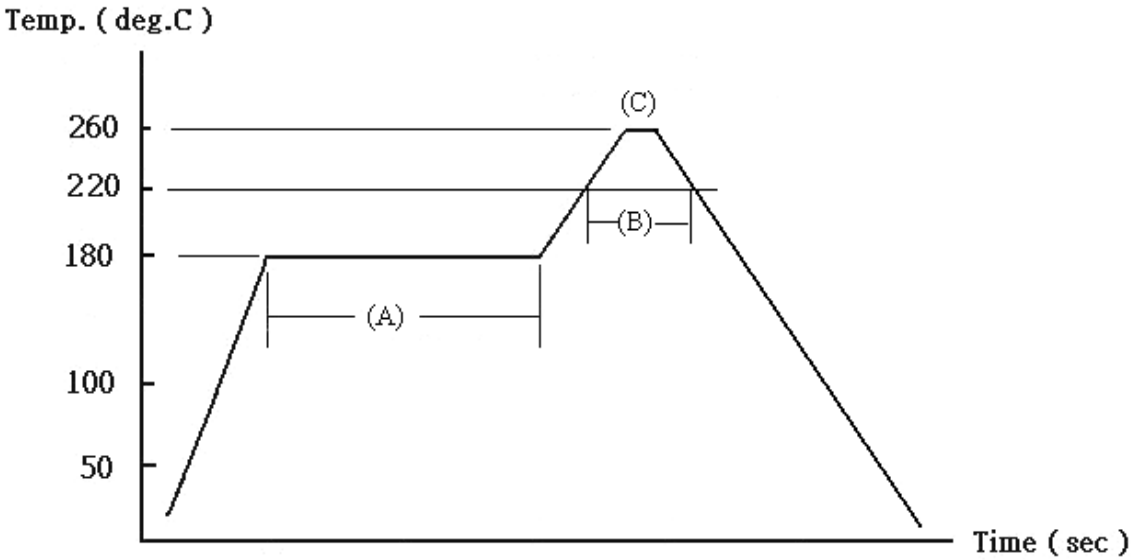


Recommended Soldering Pattern



	Date	Name	Unit : mm	
Drawn	15.Aug.2014	Leo	Title	Drawing No.
Checked	15.Aug.2014	Iris	Dimension of External	PKX-322508-0815
Approved	15.Aug.2014	Wan		

Soldering Reflow



(A)→Preheating area : 180±10°C, 90±30sec.
(B)→Heating area : 220±10°C, 30sec. Max.
(C)→Peak temperature : 260°C, 10sec. Max.
Ramp rate : 3°C/sec. Max.

Note:
The crystal characteristics may be affected and destroyed at worst by additional production process as ultrasonic welding or molding encapsulation…. Please be sure to check if this process affects any damage to crystal products prior to use.

SPECIFICATION OF CRYSTAL & OSC UNITS YOKETAN CORP.

Reliability Test (applicable to SMD type OSC and X'tal)

Condition B.

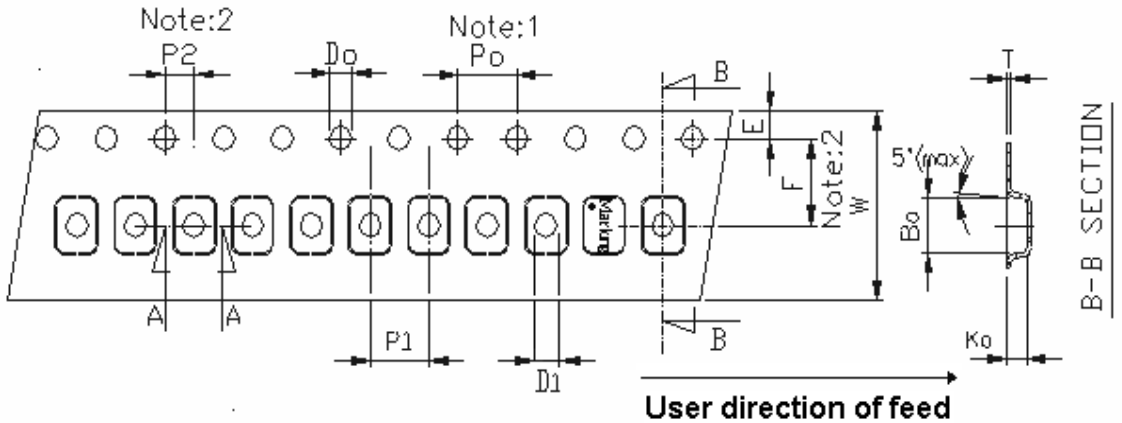
Test Items	Test Condition	Specification	
		General OSC (Note:1)	General X'tal (Note:2)
1. Gross Leak Test	FC-40 125℃/30sec	No continuous bubble	
2. Fine Leak Test	Bombing of He 4.5kg/cm^2 for 1.5 hours	Less than 1*10^-8atm.c.c./sec, Helium	
3. Drop Test	a ~19.999MHz(Fund.) →75 cm height b. 20~29.999MHz(Fund.) →50 cm height c. 30~ MHz(Fund.) →20 cm height on hard wooden surface / 3 times (thickness more than 30 mm)	△F≦± 10PPM , Duty within spec.	△F≦±10PPM , △C.I.≦±10ohms
4. Vibration Test	Freq. range: 10~55Hz Peak to peak amplitude:1.5mm 3 direction(X,Y,Z)，each 60min.	△F≦± 10PPM , Duty within spec.	△F≦±10PPM , △C.I.≦±10ohms
5. Shearing Test	Weight : 5N, Test duration : 10±1 sec	△F≦±5PPM , Duty within spec.	△F≦±10PPM , △C.I.≦±10ohms
6. Substrate Bending Test	Test duration : 5±1 sec Amount of substrate : 3mm	△F≦± 10PPM , Duty within spec.	△F≦±10PPM , △C.I.≦±10ohms
7. Resistance to Soldering Test	IR Reflow furnace with the condition 2 times. Peak temp.260±3℃，10sec(Min.)	△F≦± 10PPM , Duty within spec.	△F≦±10PPM , △C.I.≦±10ohms
8. Low Temp. Exposure Test	-40±3℃, 240±12 hrs	△F≦± 10PPM , Duty within spec.	△F≦±10PPM , △C.I.≦±10ohms
9. Aging Test	125±3℃, 240±12hrs	△F≦± 10PPM , Duty within spec.	△F≦±10PPM , △C.I.≦±10ohms
10. High Temp. & Humidity Test	+85℃±5℃& 85%±5% R.H. , 240±12 hrs	△F≦± 10PPM , Duty within spec.	△F≦±10PPM , △C.I.≦±10ohms
11. Temperature Cycling Test	-40±3℃/15±3min ~ +85±3℃/15±3min 15cycles	△F≦± 10PPM , Duty within spec.	△F≦±10PPM , △C.I.≦±10ohms

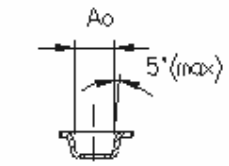
Note:1 → For communication application the spec. demanded **"△F≦±5 PPM, Duty within spec."**。

Note:2 → For communication application the spec. demanded **"△F≦±5 PPM, △C.I.≦±5 ohms "**。

SPECIFICATION OF TAPE & REEL YOKETAN CORP.

Taping





A–A SECTION

Ao= 2.70±0.10 mm

Bo= 3.40±0.10 mm

Ko= 1.0±0.10 mm

Unit: mm

Symbol	Spec.
K1	–
Po	4.0±0.10
P1	4.0±0.10
P2	2.0±0.10
Do	1.55±0.05
D1	1.0(MIN)
E	1.75±0.10
F	3.50±0.10
10Po	40.0±0.10
W	8.0±0.20
T	0.25±0.05

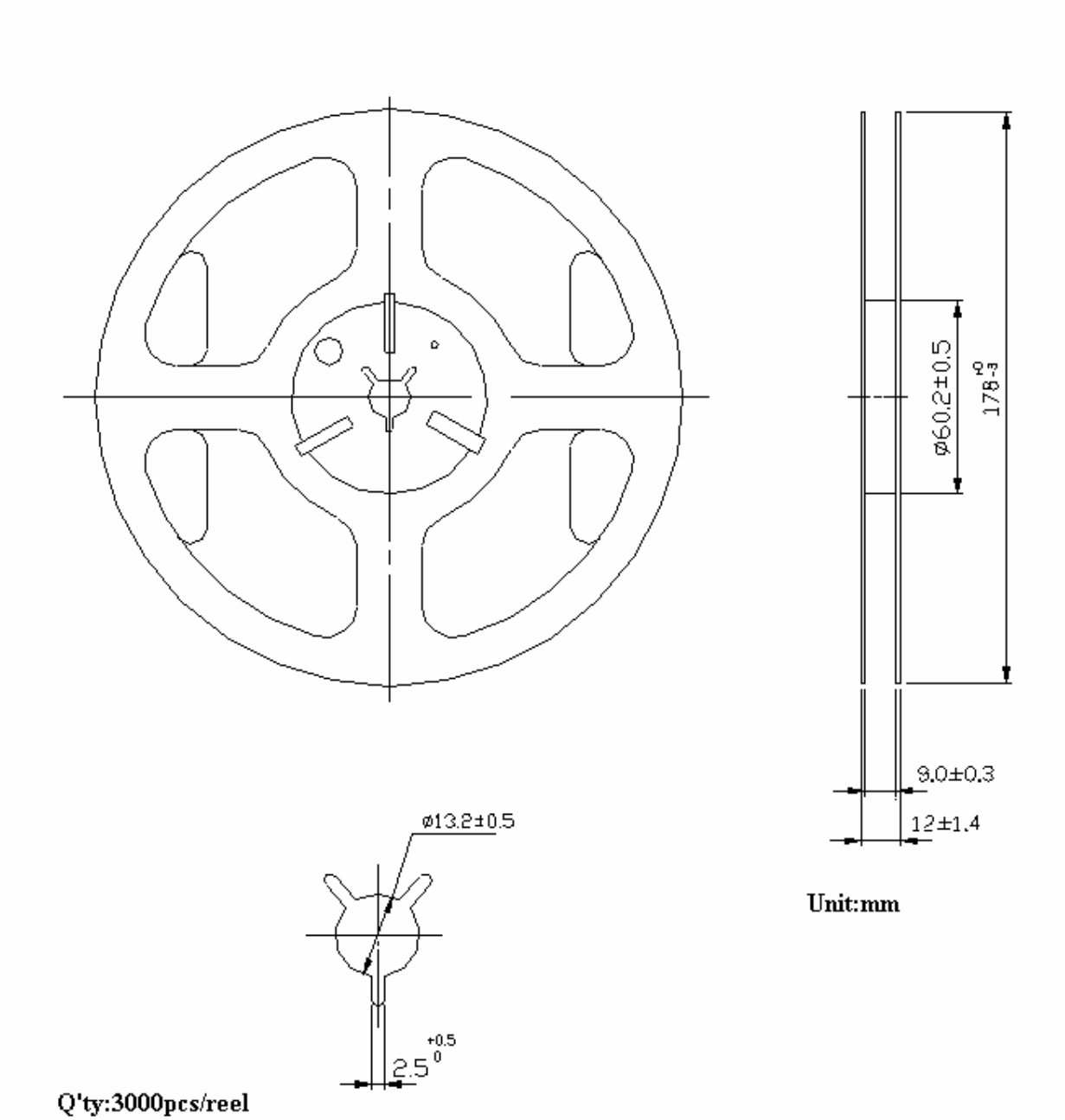
Notice:

1. 10 Sprocket hole pitch cumulative tolerance is ±0.1mm
2. Pocket position relative to sprocket hole measured as true position of pocket not pocket hole.
3. Ao & Bo measured on a place 0.3mm above the bottom of the pocket to top surface of the carrier.
4. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
5. Carrier camber shall be not than 1mm per 100mm through a length of 250mm.

	Date	Name	Unit : mm	
Drawn	**4.Jun.2013**	Leo	Title	Drawing No.
Checked	**4.Jun.2013**	Iris	**Tape & Reel Dimension**	**C009-020310-X-1106**
Approved	**4.Jun.2013**	Wan		

SPECIFICATION OF TAPE & REEL YOKETAN CORP.

Reel



Unit:mm

Q'ty:3000pcs/reel

	Date	Name	Unit : mm	
Drawn	**22.Jan.2007**	Leo	Title	Drawing No.
Checked	**22.Jan.2007**	Iris	**Tape & Reel Dimension**	**C009-0709-A-1001**
Approved	**22.Jan.2007**	Wan		

簽名有效
For Question, Please Contact with SGS
www.tw.sgs.com

測試報告
Test Report

號碼(No.) : CE/2015/10115　　日期(Date) : 2015/01/12　　頁數(Page): 1 of 12

友桂電子股份有限公司
YOKETAN CORPORATION
台中市潭子區台中加工出口區南二路28號之2
28-2, NAN 2ND ROAD, T.E.P.Z, TANTZU DISTRICT, TAICHUNG CITY (427), TAIWAN

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)：

送樣廠商(Sample Submitted By)	:	友桂電子股份有限公司 (YOKETAN CORPORATION)
樣品名稱(Sample Description)	:	CERAMIC SMD SERIES
收件日期(Sample Receiving Date)	:	2015/01/05
測試期間(Testing Period)	:	2015/01/05 TO 2015/01/12

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測試結果(Test Results) : 請見下一頁 (Please refer to next pages).

Troy Chang / Manager – Tech
Signed for and on behalf of
SGS 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)	方法偵測極限值 (MDL)	結果 (Result)
				No.1
鎘 / Cadmium (Cd)	mg/kg	參考IEC 62321-5: 2013方法，以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-5: 2013 and performed by ICP-AES.	2	n.d.
鉛 / Lead (Pb)	mg/kg	參考IEC 62321-5: 2013方法，以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-5: 2013 and performed by ICP-AES.	2	n.d.
汞 / Mercury (Hg)	mg/kg	參考IEC 62321-4: 2013方法，以感應耦合電漿原子發射光譜儀檢測. / With reference to IEC 62321-4: 2013 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.
鈹 / Beryllium (Be)	mg/kg	參考US EPA 3052方法，以感應耦合電漿原子發射光譜儀檢測. / With reference to US EPA Method 3052. Analysis was performed by ICP-AES.	2	n.d.
全氟辛烷磺酸 / Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	參考US EPA 3550C: 2007方法，以液相層析/質譜儀檢測. / With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.

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28-2, NAN 2ND ROAD, T.E.P.Z, TANTZU DISTRICT, TAICHUNG CITY (427), TAIWAN

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
全氟辛酸 / PFOA (CAS No.: 335-67-1)	mg/kg	參考US EPA 3550C: 2007方法，以液相層析/質譜儀檢測. / With reference to US EPA 3550C: 2007. Analysis was performed by LC/MS.	10	n.d.
鄰苯二甲酸丁苯甲酯 / BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	%	參考EN 14372，以氣相層析/質譜儀檢測. / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.
鄰苯二甲酸二丁酯 / DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	%	參考EN 14372，以氣相層析/質譜儀檢測. / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.
鄰苯二甲酸二 (2-乙基己基)酯 / DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	%	參考EN 14372，以氣相層析/質譜儀檢測. / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	n.d.
鄰苯二甲酸二異丁酯 / DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	%	參考EN 14372，以氣相層析/質譜儀檢測. / With reference to EN 14372. Analysis was performed by GC/MS.	0.003	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)	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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號碼(No.) : CE/2015/10115　　日期(Date) : 2015/01/12　　頁數(Page): 4 of 12

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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 (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	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.
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		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.

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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.)

PFOS參考資訊(Reference Information) : 持久性有機污染物 POPs - (EU) 757/2010

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/m^2。

(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^2.)

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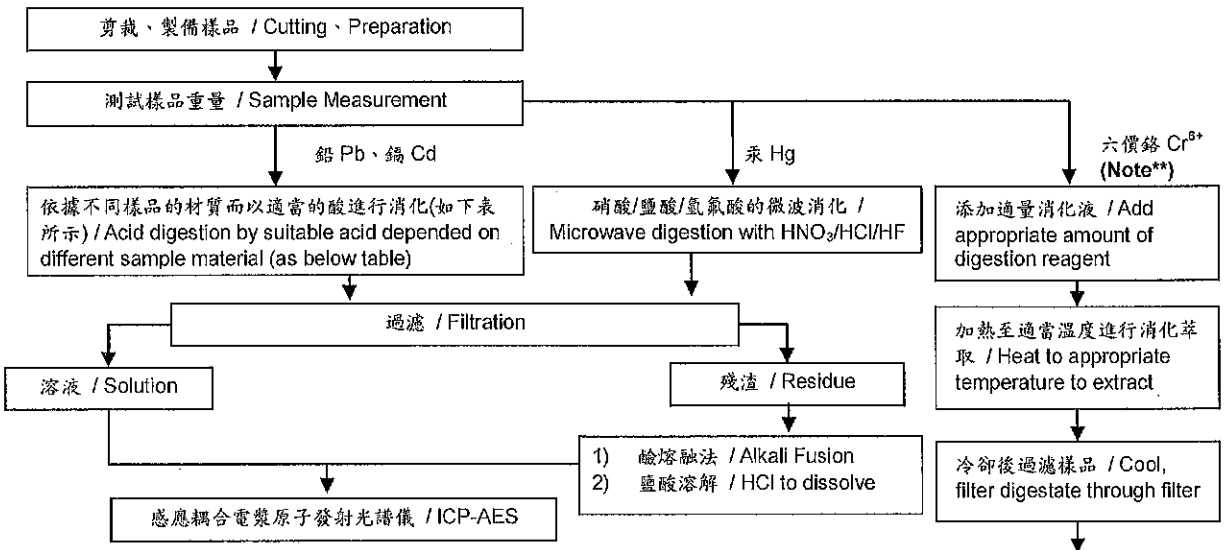
測試報告
Test Report

友桂電子股份有限公司
YOKETAN CORPORATION
台中市潭子區台中加工出口區南二路28號之2
28-2, NAN 2ND ROAD, T.E.P.Z, TANTZU DISTRICT, TAICHUNG CITY (427), TAIWAN

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^{6+} 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



樣品材質 / Sample Material	消化酸液種類 / Digestion Acid
鋼, 銅, 鋁, 焊錫 / Steel, copper, aluminum, solder	王水, 硝酸, 鹽酸, 氫氟酸, 雙氧水 / Aqua regia, HNO_3, HCl, HF, H_2O_2
玻璃 / Glass	硝酸,氫氟酸 / HNO_3/HF
金, 鉑, 鈀, 陶瓷 / Gold, platinum, palladium, ceramic	王水 / Aqua regia
銀 / Silver	硝酸 / HNO_3
塑膠 / Plastic	硫酸, 雙氧水, 硝酸, 鹽酸 / H_2SO_4, H_2O_2, HNO_3, HCl
其他 / Others	加入適當的試劑至完全溶解 / Added appropriate reagent to total digestion

Note**: (For IEC 62321)
(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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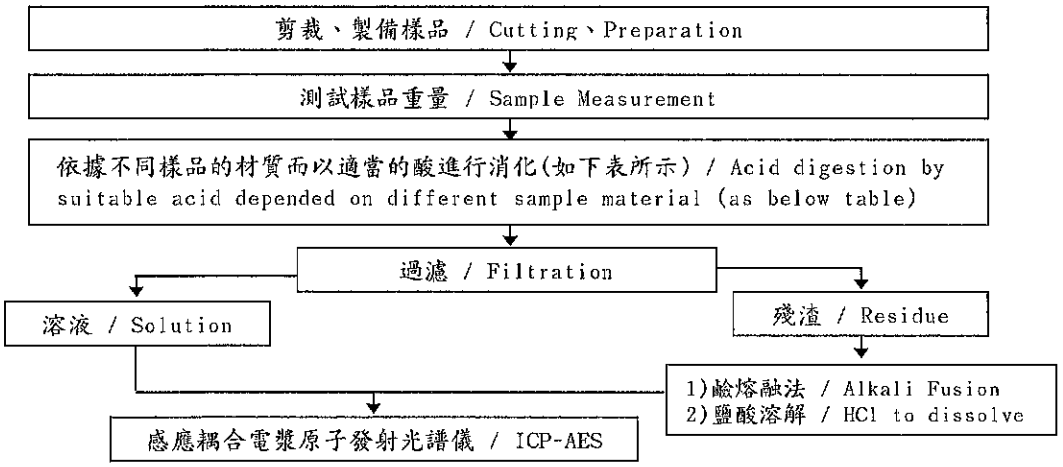
3) 測試負責人：張啓興 / Name of the person in charge of measurement: Troy Chang

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_3, HCl, HF, H_2O_2
玻璃 / Glass	硝酸,氫氟酸 / HNO_3/HF
金,鉑,鈀,陶瓷 / Gold, platinum, palladium, ceramic	王水 / Aqua regia
銀 / Silver	硝酸 / HNO_3
塑膠 / Plastic	硫酸,雙氧水,硝酸,鹽酸 / H_2SO_4, H_2O_2, HNO_3, 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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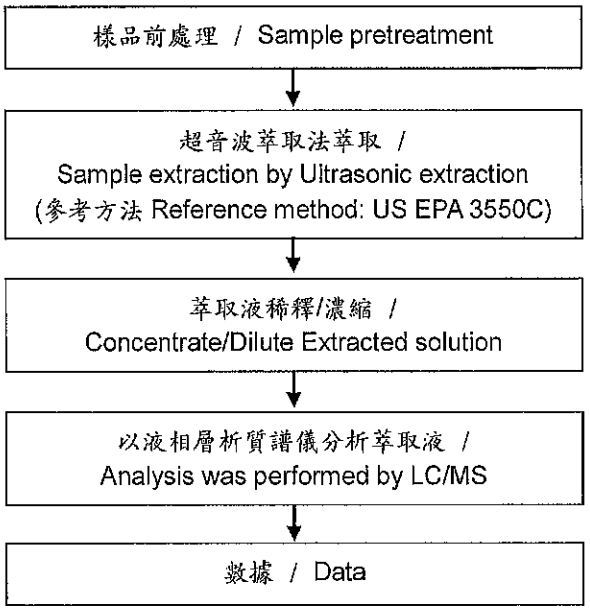
全氟辛酸/全氟辛烷磺酸分析流程圖 / PFOA/PFOS analytical flow chart

- 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



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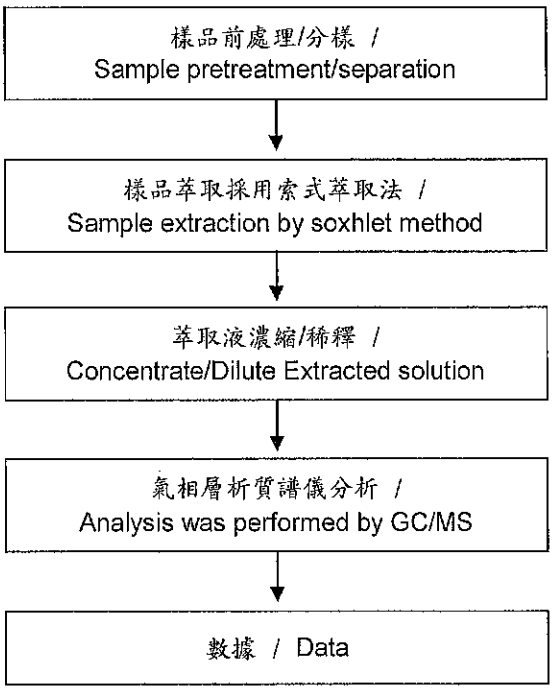
可塑劑分析流程圖 / Analytical flow chart of phthalate content

- 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



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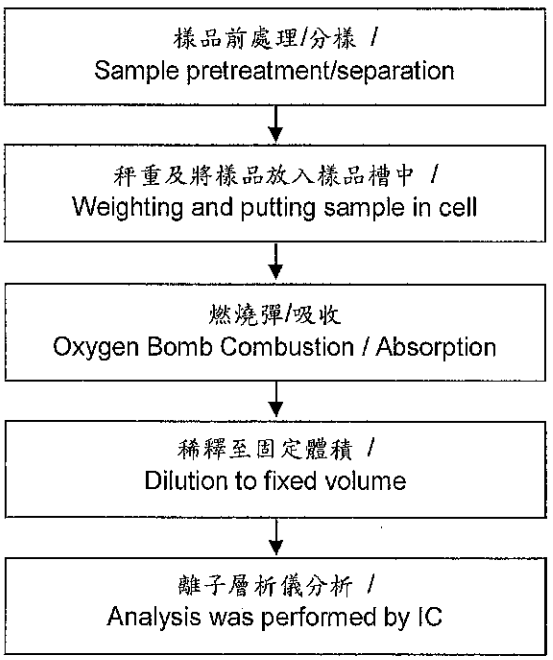
鹵素分析流程圖 / Analytical flow chart of halogen content

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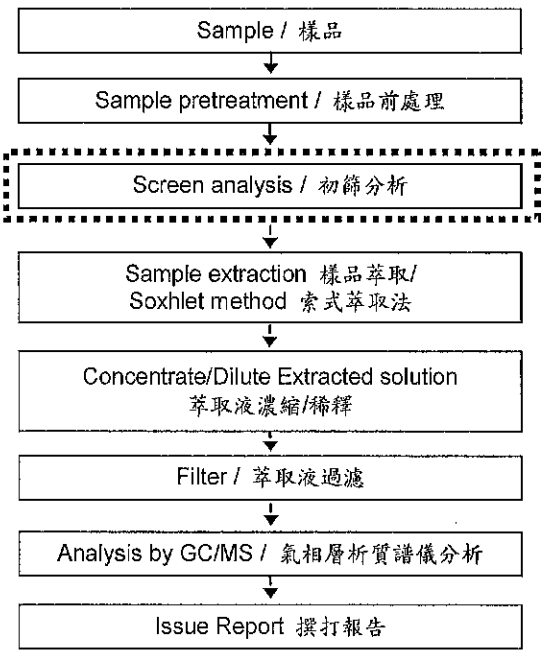
多溴聯苯/多溴聯苯醚分析流程圖 / PBB/PBDE analytical FLOW CHART

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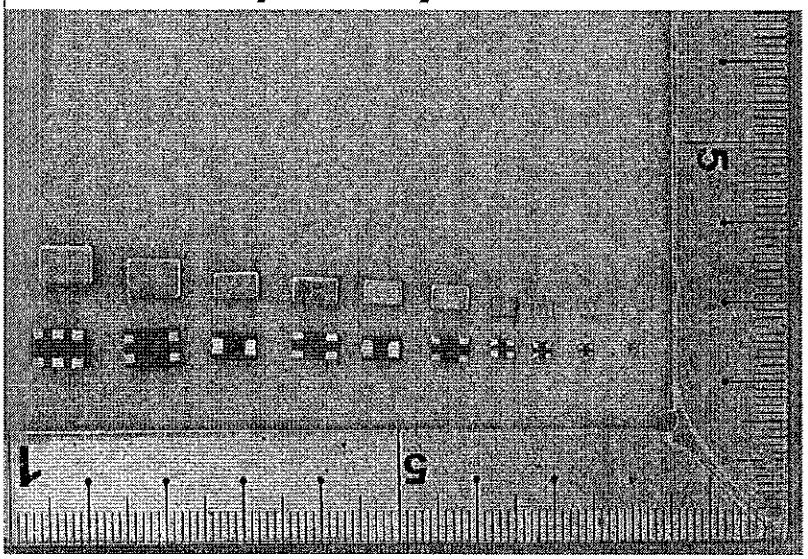
* 照片中如有箭頭標示，則表示爲實際檢測之樣品/部位. *
(The tested sample / part is marked by an arrow if it's shown on the photo.)

CE/2015/10115



** 報告結尾 (End of Report) **

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