

# APPROVAL SHEET

Qi Hardware Inc

**Item :** 49US(SMD) Crystal

**Spec. no :** R49SSA-028636-F20-YYY-YQA

**Freq :** 28.63636 MHz

Customer Approved	Checked By	Issued By
		

友桂電子股份有限公司

**YOKETAN CORPORATION**

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Tel: 027-320-2889 Fax: 027-320-2890



**RoHS Compliant**



005

[illegible]

# SPECIFICATION OF CRYSTAL UNITS

YOKETAN CORP.

Customer : Qi

SPEC NO : R49SSA-028636-F20-YYY-YQA

Date : 20-Dec-10

## 1 General

1-1 Enclosure:	HC-49SMD (Lead Free Parts)
1-2 Application:	
1-3 Overtone Order :	Fundamental
1-4 Crystal unit Frequency :	28.63636 MHz
1-5 Frequency Deviation :	
1-5-1 At Reference Temperature :	$\pm 30\text{ppm at } 25 \pm 3$
1-5-2 At Operating Temperature :	$\pm 30\text{ppm in 1-6}$
1-6 Operating Temperature Range :	-10 to +60
1-7 Storage Temperature Range :	-40 to +85

## 2 Circuit

2-1 Circuit :	250B
2-2 Load Capacitance :	20pF $\pm$ 0.3pF
2-3 Level of Drive :	100uW

## 3 Electrical Performance

3-1 Equivalent Series Resistance:	Less than 50 ohms
3-2 Electrostatic Capacitance :	5.0pF Max.
3-3 Insulation Resistance :	More than 500Mohms at DC100V
3-4 Aging:	$\pm 5\text{ppm/year Max}$

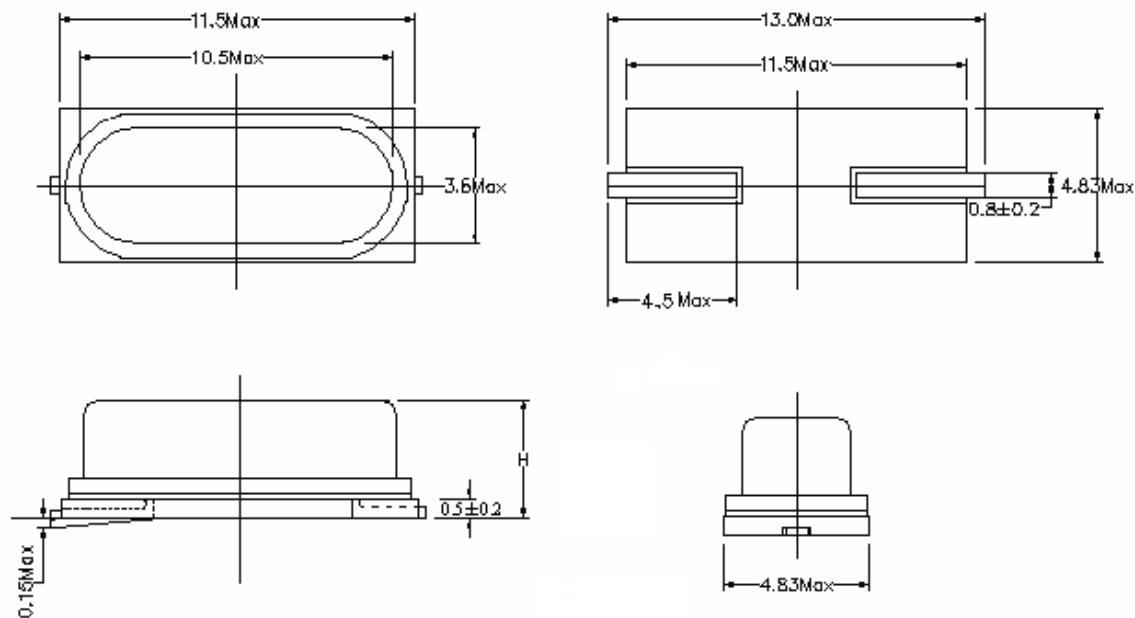
## 4 Marking

28.63636 Y
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# SPECIFICATION OF CRYSTAL UNITS

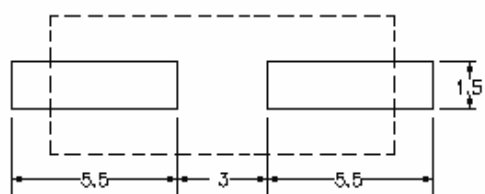
YOKETAN CORP.

## Dimension



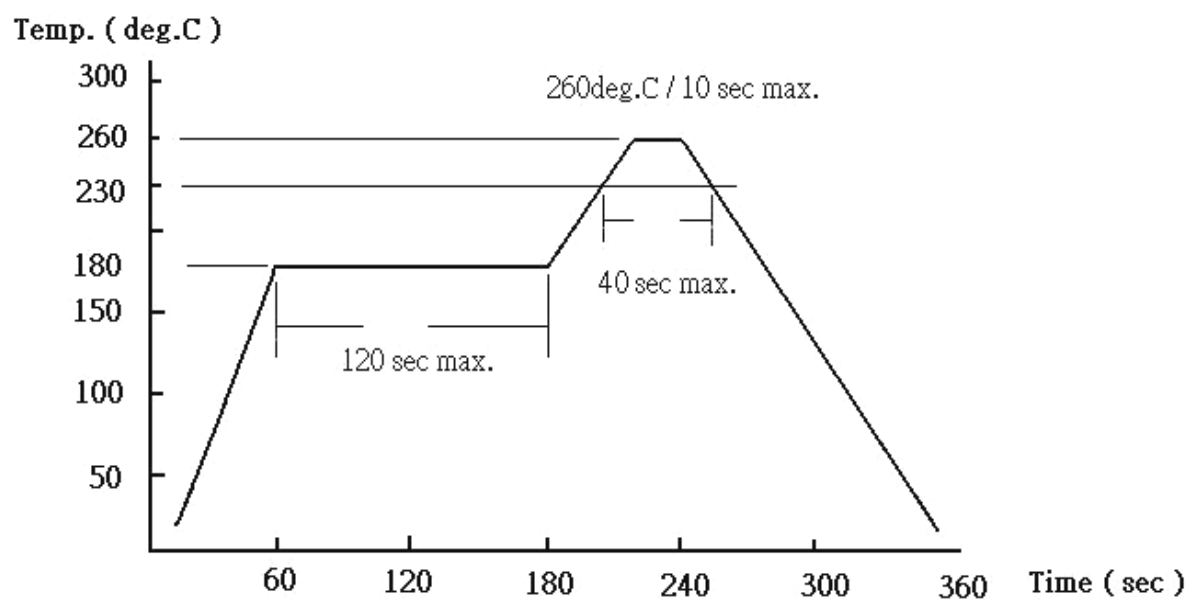
H : 4.5 mm Max.

## Recommended Soldering Pattern



	Date	Name	Unit : mm	
Drawn	6.Jun.2009	Leo	Title	Drawing No.
Checked	6.Jun.2009	Iris	Dimension of External	PKX-1304845-112
Approved	6.Jun.2009	Wan		

## Soldering reflow



# SPECIFICATION OF CRYSTAL UNITS

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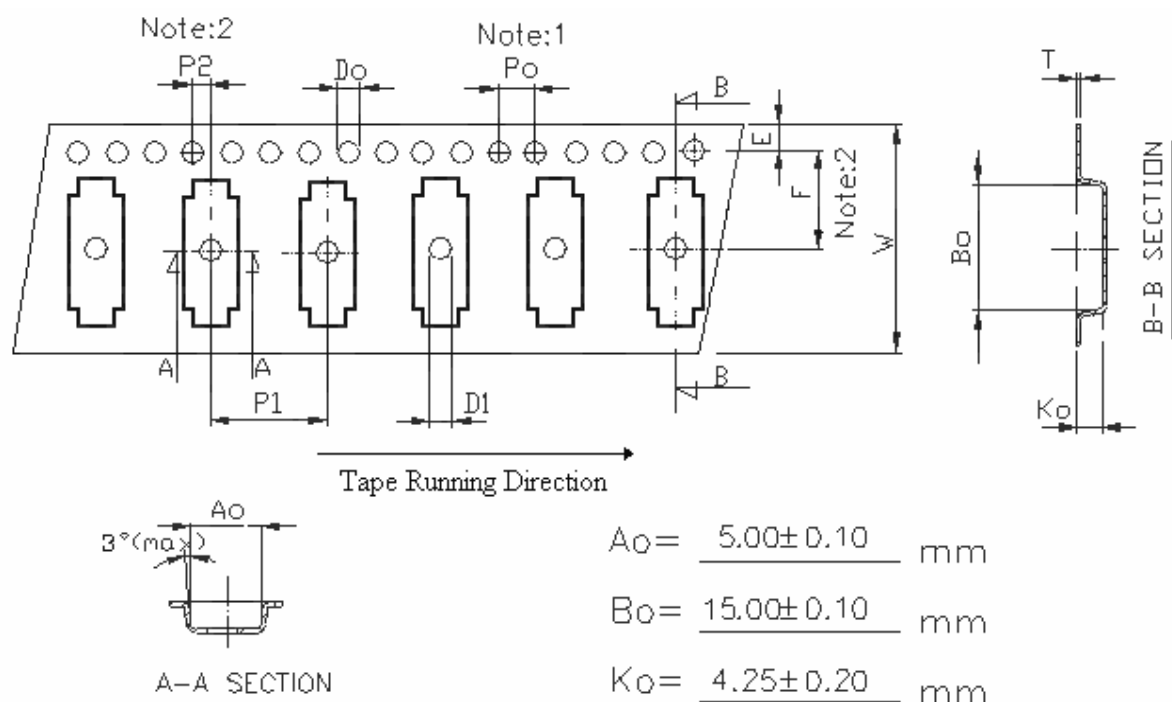
## Reliability Test ( applicable to 49(50) type .U type and Tuning Fork X'tal )

Test Items	Test Condition	Specification	
		Dip	SMD
1. Gross Leak Test	FC-40 125 /30sec	No continuous bubble	
2. Fine Leak Test	Bombing of He 4kg/cm <sup>2</sup> for 2 hours	Less than 5*10 <sup>-8</sup> atm.c.c./sec, Helium	
3. Drop Test	a. ~19.999MHz(Fund.) 100 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 , C.I within spec.	F ±10PPM , C.I within spec.
4. Vibration Test	Freq. range: 10~55Hz Peak to peak amplitude:1.5mm 3 direction(X,Y,Z) , each 60min.	F ± 10PPM , C.I within spec.	F ±10PPM , C.I within spec.
5. Resistance to Soldering Test	a. IR Reflow furnace with the condition 2 times. Peak temp.260±3 , 10±1 sec.	NA	F ±10PPM , C.I within spec. For SMD type only.
	b. Dip terminals in a 245±5 solder station(pool) Dipping depth 0.5mm(Min) Dipping time 5±0.5 sec.	At least 90% by 30X magnification of each dipped area shall be covered by fresh solder. For DIP type only.	NA
6. Bending Test	Bending cycle : 1 cycle 0° - > 45° -> 0° -> 45° - > 0°	F ±5PPM , C.I within spec. For DIP type only.	NA
7. Shearing Test	Weight : 5N, Test duration : 10±1 sec	NA	F ±10PPM , C.I within spec. For SMD type only.
8. Low Temp. Exposure Test	-40±3 , 240±12 hrs	F ± 10PPM , C.I within spec.	F ±10PPM , C.I within spec.
9. Aging Test	85±3 , 240±12hrs	F ± 10PPM , C.I within spec.	F ±10PPM , C.I within spec.
10. High Temp. & Humidity Test	+85 ±5 & 85%±5% R.H. , 240±12 hrs	F ± 10PPM , C.I within spec.	F ±10PPM , C.I within spec.
11. Temperature Cycling Test	-25±3 /15±3min ~ +85±3 /15±3min 15cycles	F ± 10PPM , C.I within spec.	F ±10PPM , C.I within spec.

# SPECIFICATION OF TAPE & REEL

YOKETAN CORP.

## Taping



Unit: mm

Symbol	Spec.
K1	-
Po	$4.0 \pm 0.10$
P1	$8.0 \pm 0.10$ or $12.0 \pm 0.10$
P2	$2.00 \pm 0.10$
Do	$1.50 \pm 0.10$
D1	1.50(MIN)
E	$1.75 \pm 0.10$
F	$11.50 \pm 0.10$
10Po	$40.0 \pm 0.20$
W	$24.0 \pm 0.30$
T	$0.40 \pm 0.05$

Notice:

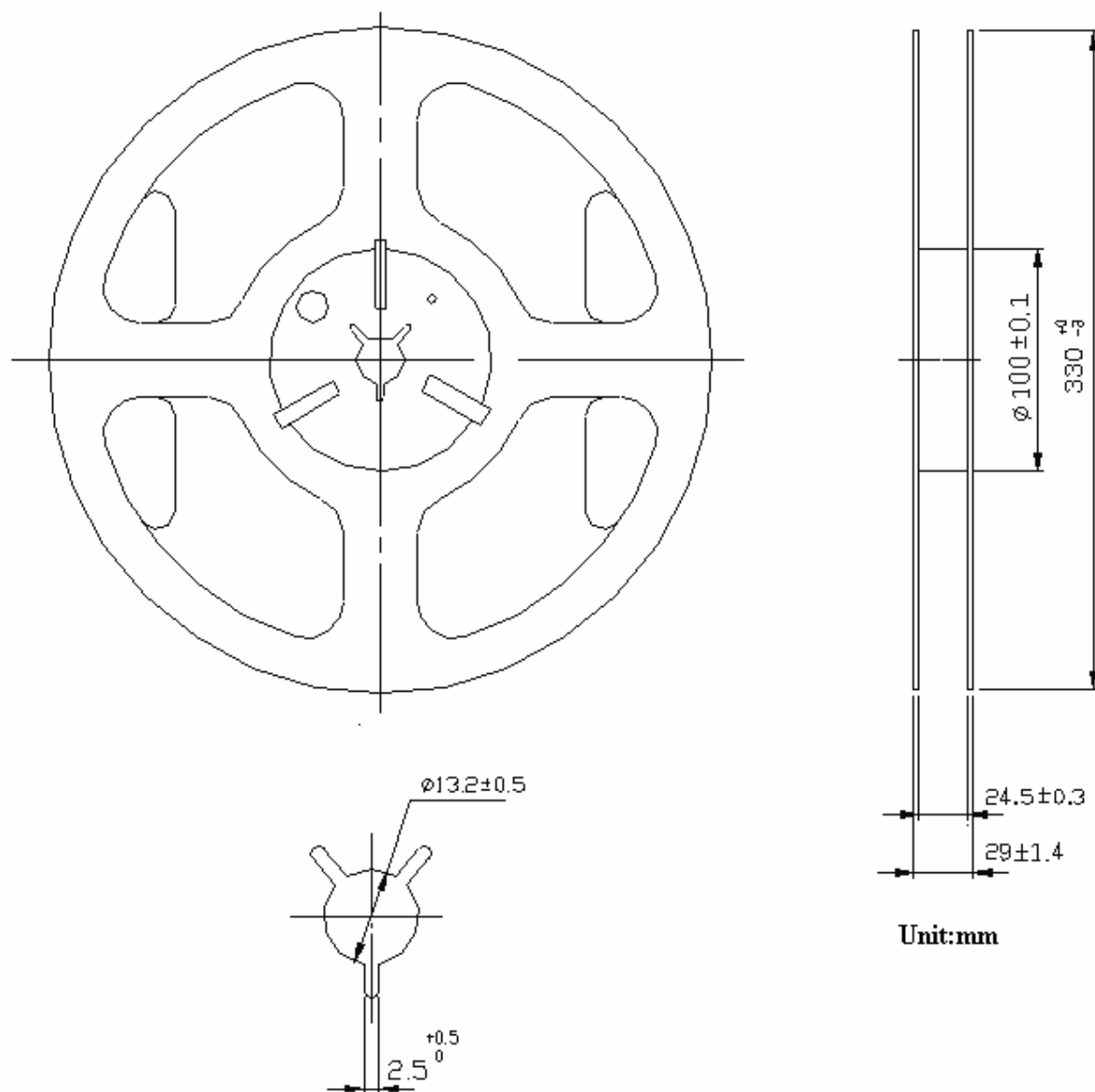
1. 10 Sprocket hole pitch cumulative tolerance is  $\pm 0.2\text{mm}$
2. Pocket position relative to sprocket hole measured as true position of pocket not pocket hole.
3.  $A_o$  &  $B_o$  measured on a place 0.3mm above the bottom of the pocket to top surface of the carrier.
4.  $K_o$  measured from 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	27.Oct.2008	Leo	Title	Drawing No.
Checked	27.Oct.2008	Iris	Tape & Reel Dimension	C009-051542-X-1003
Approved	27.Oct.2008	Wan		

# SPECIFICATION OF TAPE & REEL

YOKETAN CORP.

## Reel



Unit:mm

Q'ty:1000pcs/reel  
(2000pcs/reel)

	Date	Name	Unit : mm	
Drawn	27.Oct.2008	Leo	Title	Drawing No.
Checked	27.Oct.2008	Iris	Tape & Reel Dimension	C009-1324-X-1002
Approved	27.Oct.2008	Wan		



## Test Report

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YOKETAN CORPORATION  
28-2, NAN 2ND ROAD, T. E. P. Z, TAICHUNG, TAIWAN



The following sample(s) was/were submitted and identified by/on behalf of the client as :

Sample Description	:	CRYSTAL UNIT
Style/Item No.	:	50U(T)(T3), 49U(T)(T3), 49US, 49SMD SERIES/ATXX SERIES
Sample Receiving Date	:	2009/12/31
Testing Period	:	2009/12/31 TO 2010/01/08

Test Result(s) : Please refer to next page(s).

  
Chenyu Kung / Operation Manager  
Signed for and on behalf of  
SGS TAIWAN LTD.  
Chemical Laboratory – Taipei

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28-2, NAN 2ND ROAD, T. E. P. Z, TAICHUNG, TAIWAN



## Test Result(s)

PART NAME NO.1 : MIXED ALL PARTS (9 TYPES)

Test Item (s):	Unit	Method	MDL	Result
				No.1
Cadmium (Cd)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.
Lead (Pb)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.
Mercury (Hg)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.
Hexavalent Chromium Cr(VI) by alkaline extraction	mg/kg	With reference to IEC 62321: 2008 and performed by UV-VIS.	2	n.d.
Perfluorooctane sulfonates (PFOS) PFOS – Acid PFOS – Metal Salt PFOS – Amide	mg/kg	With reference to US EPA 3540C: 1996 method for PFOS Content. Analysis was performed by LC/MS.	10	n.d.
PFOA (CAS No.: 000335-67-1)	mg/kg	With reference to US EPA 3540C: 1996 method for PFOA Content. Analysis was performed by LC/MS.	10	n.d.
<b>Halogen</b>				
Halogen-Fluorine (F) (CAS No.: 014762-94-8)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.
Halogen-Chlorine (Cl) (CAS No.: 022537-15-1)			50	n.d.
Halogen-Bromine (Br) (CAS No.: 010097-32-2)			50	n.d.
Halogen-Iodine (I) (CAS No.: 014362-44-8)			50	n.d.

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YOKETAN CORPORATION  
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Test Item (s):	Unit	Method	MDL	Result
				No.1
<b>Sum of PBBs</b>	mg/kg	With reference to IEC 62321: 2008 and performed by GC/MS.	-	n.d.
Monobromobiphenyl			5	n.d.
Dibromobiphenyl			5	n.d.
Tribromobiphenyl			5	n.d.
Tetrabromobiphenyl			5	n.d.
Pentabromobiphenyl			5	n.d.
Hexabromobiphenyl			5	n.d.
Heptabromobiphenyl			5	n.d.
Octabromobiphenyl			5	n.d.
Nonabromobiphenyl			5	n.d.
Decabromobiphenyl			5	n.d.
<b>Sum of PBDEs</b>			-	n.d.
Monobromodiphenyl ether			5	n.d.
Dibromodiphenyl ether			5	n.d.
Tribromodiphenyl ether			5	n.d.
Tetrabromodiphenyl ether			5	n.d.
Pentabromodiphenyl ether			5	n.d.
Hexabromodiphenyl ether			5	n.d.
Heptabromodiphenyl ether			5	n.d.
Octabromodiphenyl ether			5	n.d.
Nonabromodiphenyl ether			5	n.d.
Decabromodiphenyl ether			5	n.d.

- Note : 1. mg/kg = ppm; 0.1wt% = 1000ppm  
 2. n.d. = Not Detected  
 3. MDL = Method Detection Limit  
 4. " - " = Not Regulated  
 5. The sample(s) was/were analyzed on behalf of the applicant as mixing sample in one testing.  
 The above result(s) was/were only given as the informality value.

## PFOS Reference Information : Directive 2006/122/EC

- (1) May not be placed on the market or used as a substance or constituent of preparations in a concentration equal to or higher than 0.005 % by mass.
- (2) May not be placed on the market in semi-finished products or articles, or parts thereof, if the concentration of PFOS is equal to or higher than 0.1 % by mass calculated with reference to the mass of structurally or microstructurally distinct parts that contain PFOS or, for textiles or other coated materials, if the amount of PFOS is equal to or higher than 1µg/m<sup>2</sup> of the coated material.

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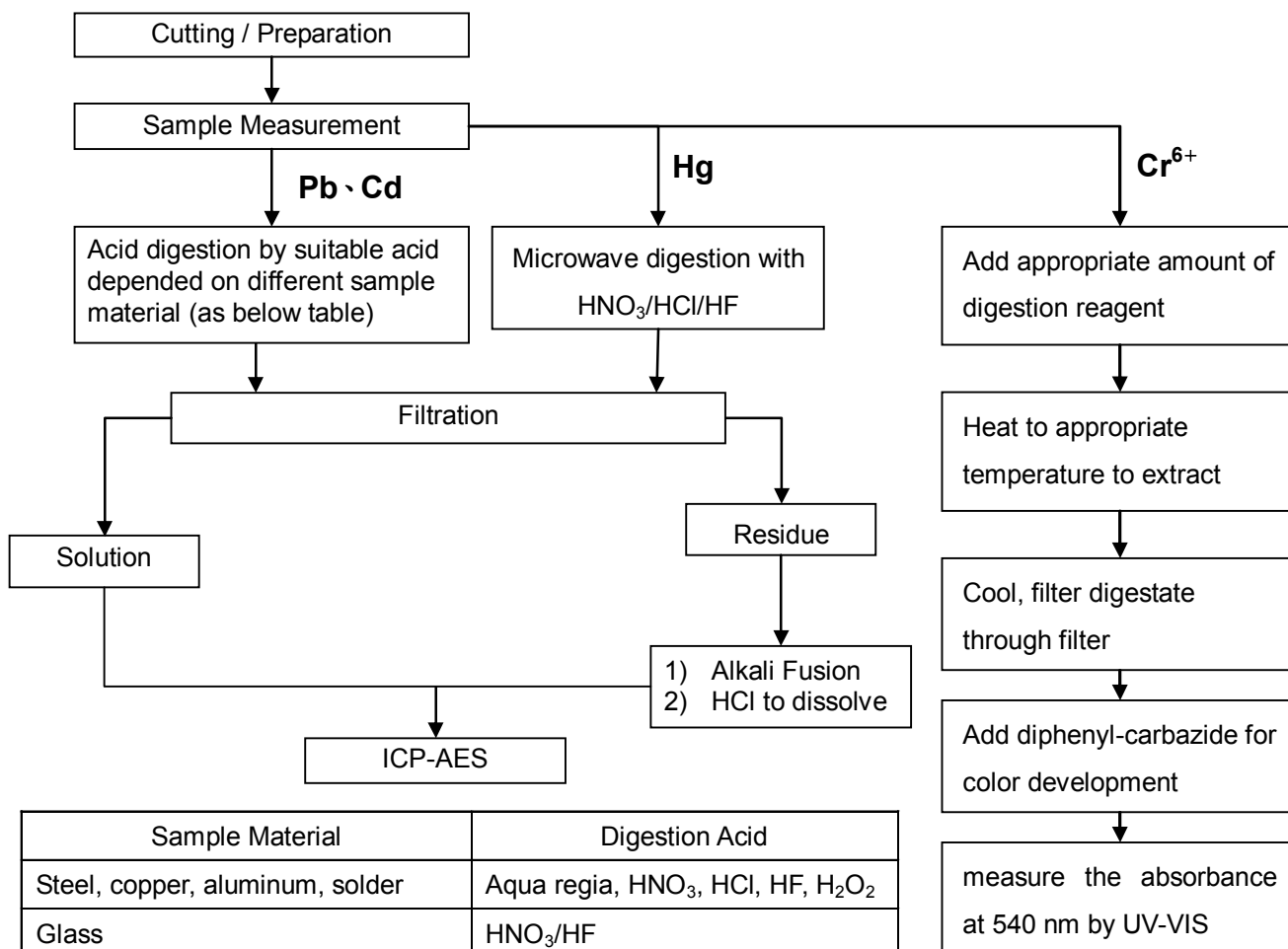
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YOKETAN CORPORATION  
28-2, NAN 2ND ROAD, T. E. P. Z, TAICHUNG, TAIWAN

- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart.  
(Cr<sup>6+</sup> test method excluded)
- 2) Name of the person who made measurement: Climbgreat Yang
- 3) Name of the person in charge of measurement: Troy Chang



Sample Material	Digestion Acid
Steel, copper, aluminum, solder	Aqua regia, HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub>
Glass	HNO <sub>3</sub> /HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO <sub>3</sub>
Plastic	H <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> O <sub>2</sub> , HNO <sub>3</sub> , HCl
Others	Any acid to total digestion

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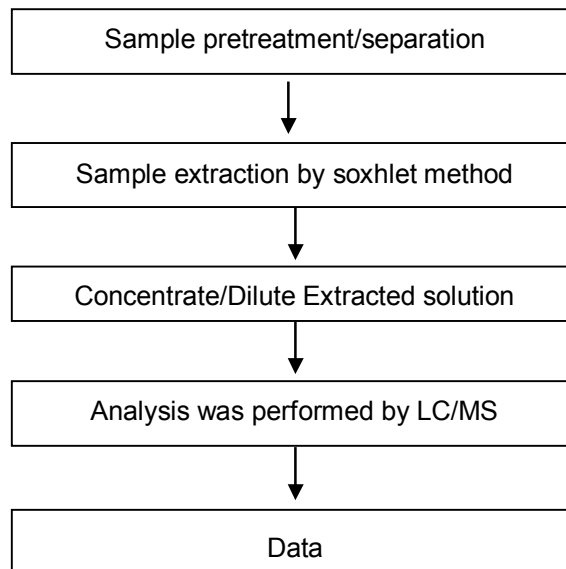
YOKETAN CORPORATION  
28-2, NAN 2ND ROAD, T. E. P. Z, TAICHUNG, TAIWAN



### Analytical flow chart of Soxhlet extraction (LC/MS) procedure

- 1) Name of the person who made measurement: Lydia Fu
- 2) Name of the person in charge of measurement: Shinjyh Chen

#### ■ Test Items: PFOS/PFOA 、Benzotriazole



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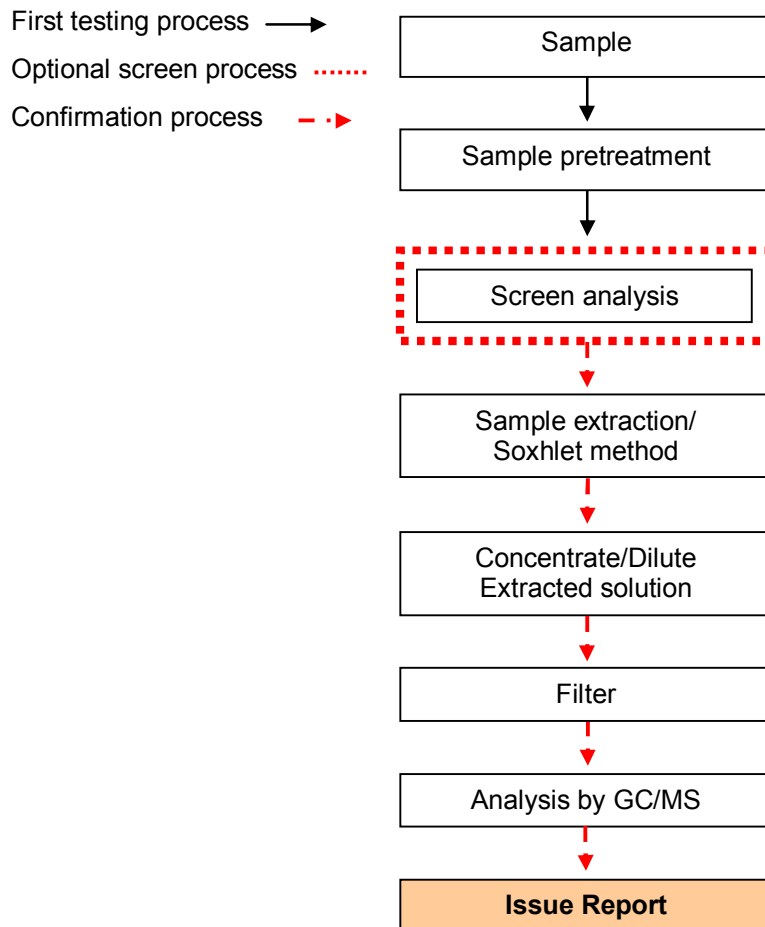
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### PBB/PBDE analytical FLOW CHART

- 1) Name of the person who made measurement: Roman Wong
- 2) Name of the person in charge of measurement: Shinjyh Chen



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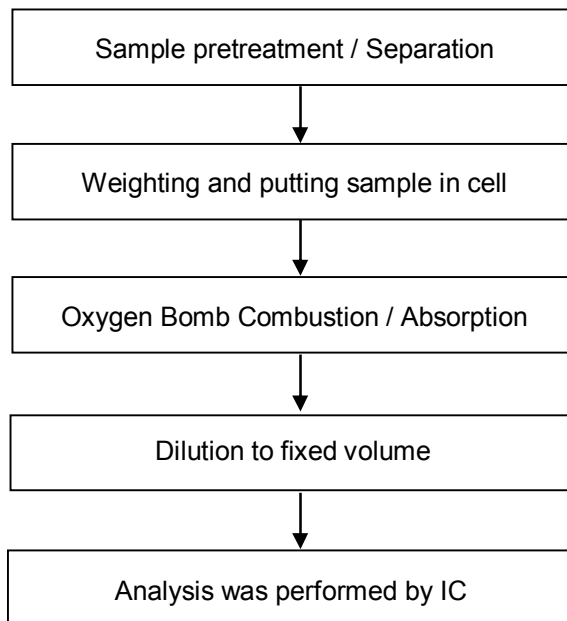
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28-2, NAN 2ND ROAD, T. E. P. Z, TAICHUNG, TAIWAN



### Analytical flow chart of halogen content

- 1) Name of the person who made measurement: Alan Chen
- 2) Name of the person in charge of measurement: Troy Chang



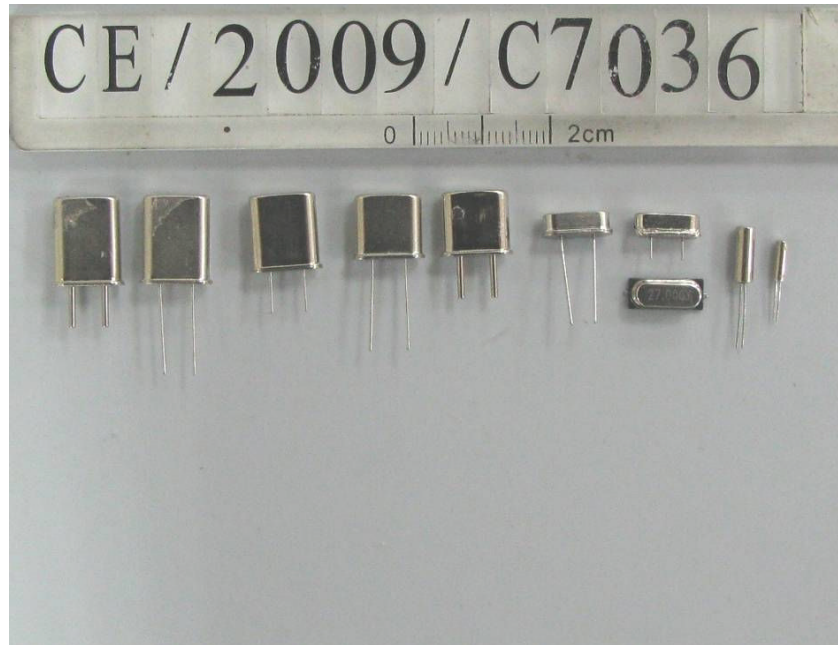
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\*\* End of Report \*\*

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