

# Surface Acoustic Wave Filter

USER


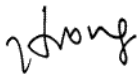

USER PART No.

SEMCO PART No. **SFHG52AA002**

DOC. No. SMS-51-L-SFT FX-44

DATE Jan 14, 2014

REVISION Preliminary

WISOL					
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ISSUED BY		CHECKED BY		APPROVED BY	

WISOL CO., LTD.  
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G

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## 1. REVISION HISTORY

Preliminary	Jan 14, 2014	All Page	Make specification
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## 2. DEFINITION

2-1. PART No.

**S F H G 5 2 A A 0 0 2**

①      ②      ③      ④      ⑤      ⑥

No.	EXPLANATION
①	SAW Filter
②	Design Type
③	Center Frequency :2350.0MHz(2300 ~ 2400)
④	Input:50ohm,Output:50ohm
⑤	Package size: 1.1×0.9mm
⑥	Design Revision (02 : Molding Type)

2-2. APPLICATION : Band-Pass Filter for LTE Band40 Rx etc

## 3. PRECAUTIONS

3-1. This device should not be used in any type of fluid such as water, oil, organic solvent, etc.

3-2. This is a hermetic device.

MSL(Moisture Sensitive Level) is the '2a' level.

3-3. Ultrasonic cleaning shall be avoided.

3-4. Isopropyl Alcohol and Ethyl Alcohol can be used for cleaning. Contact us before using other cleaning solvents than above

3-5. This is an electrostatic sensitive device.

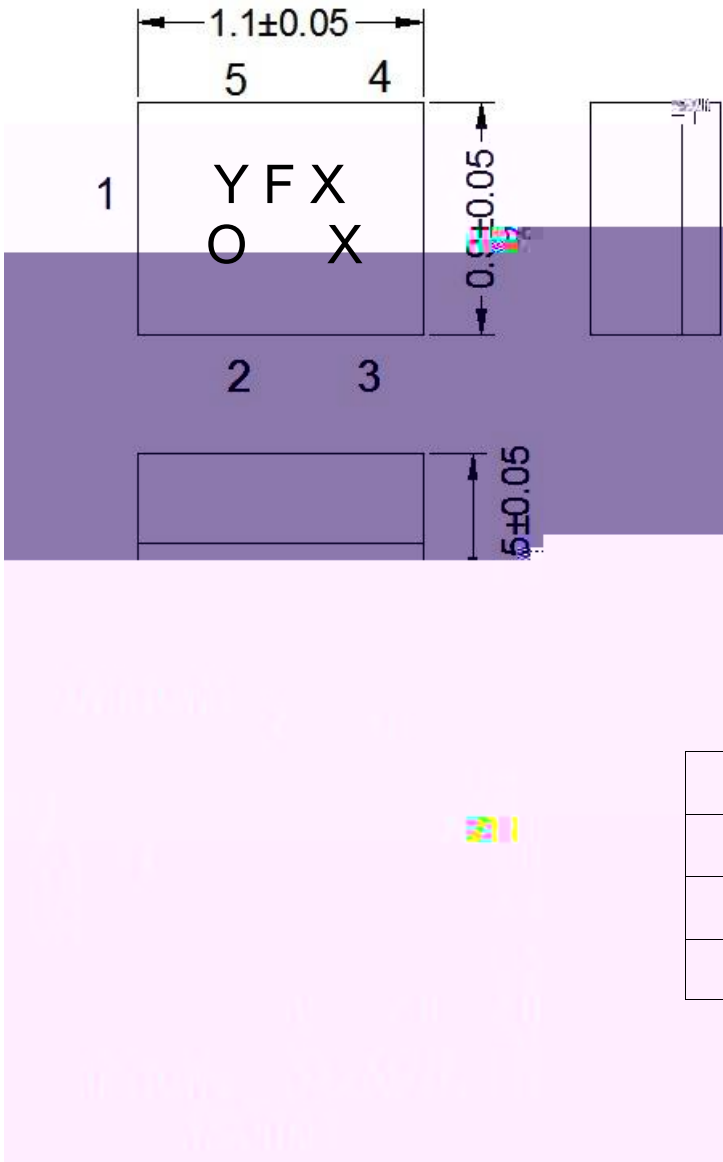
Please avoid static voltage during operation and storage.

3-6. Sudden change of temperature shall be avoided, deterioration of the characteristics can occur.

3-7. If any malfunction due to designing or manufacturing which is out of specification occurs within one year after the products have been delivered, the maker should exchange the defective products.

4. OUTLINE DRAWING & DIMENSIONS

[Unit: mm]

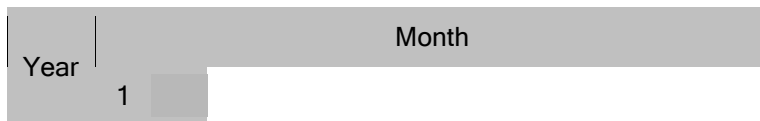


No.	Function
2, 3, 5	Ground
1	Unbalanced Input
4	Unbalanced Output

## 5. MARKING

### 5-1. Y F X X

- The 1<sup>st</sup> 2<sup>nd</sup> character 'YF' indicates the model name of SAW Filter SFHG52AA002.
- The 3<sup>rd</sup> character 'X' indicates the year and the month of manufacture.



## 6. PERFORMANCE

### 6-1. MAXIMUM RATINGS

CHARACTERISTICS	RATINGS	UNITS
DC Permissive Voltage	5	V
Maximum Input Power	15	dBm
Operating Temperature Range	30 ~ +85	°C
Storage Temperature Range		

**6-2. ELECTRICAL CHARACTERISTICS**
**6-2-1. TABLE**

Ta = 30 ~ +85°C

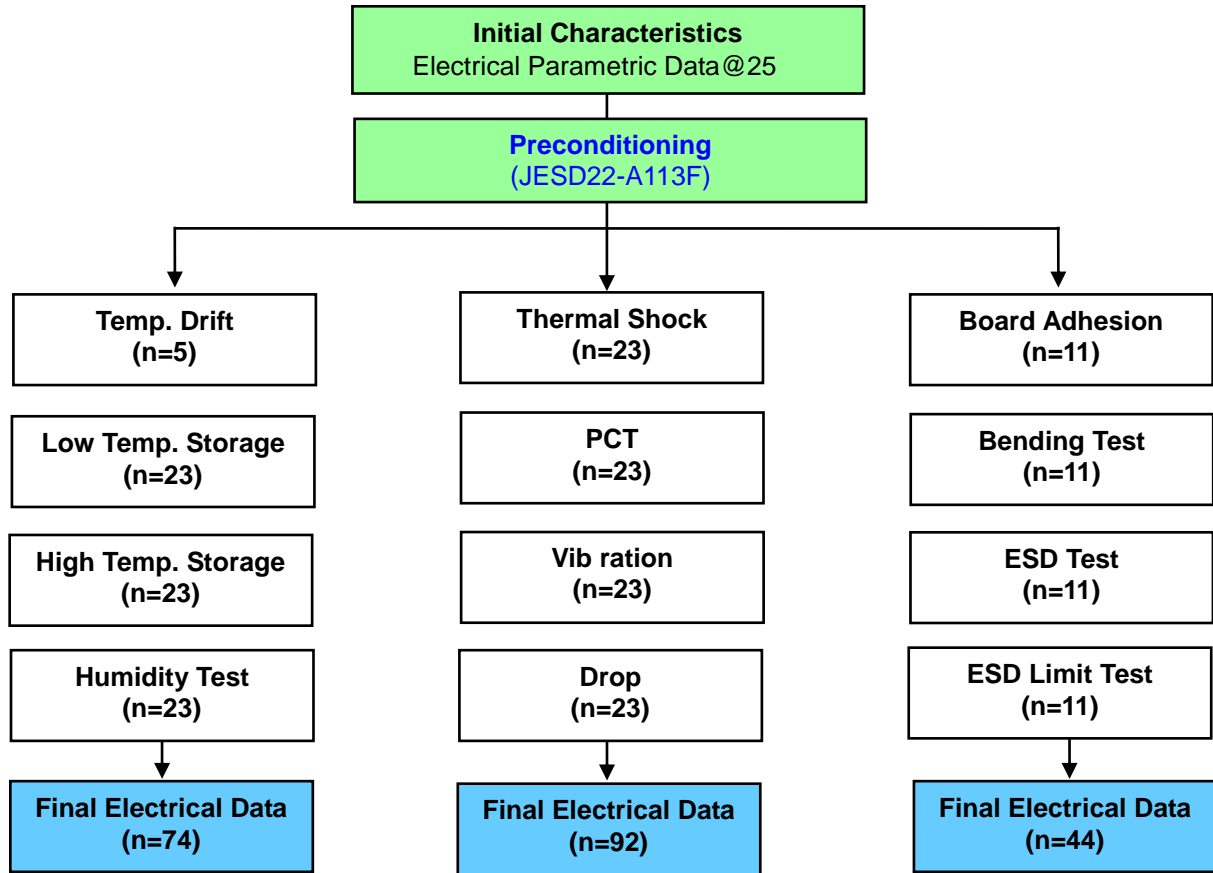
Item	FREQUENCY RANGE [MHz]	UNIT	SPECIFICATION		
			Min.	Typ. (25°C)	Max.
Insertion Loss	2300 ~ 2400	dB	-	1.8	2.8
Inband Ripple	2300 ~ 2400	dB	-	0.7	1.8
Input VSWR	2300 ~ 2400	-	-	1.7	2.2
Output VSWR	2300 ~ 2400	-	-	1.5	2.2
Absolute Attenuation	0 ~ 1577	dB	24	29	-
	1577 ~ 1680	dB	23	28	-
	1845 ~ 1880	dB	21	26	-
	2110 ~ 2170	dB	21	26	-
	2460 ~ 2485	dB	20	33	-
	2485 ~ 2500	dB	29	35	-
	4600 ~ 4800	dB			





## 7. RELIABILITY

### 7-1. ENGINEERING SAMPLE FLOW CHART



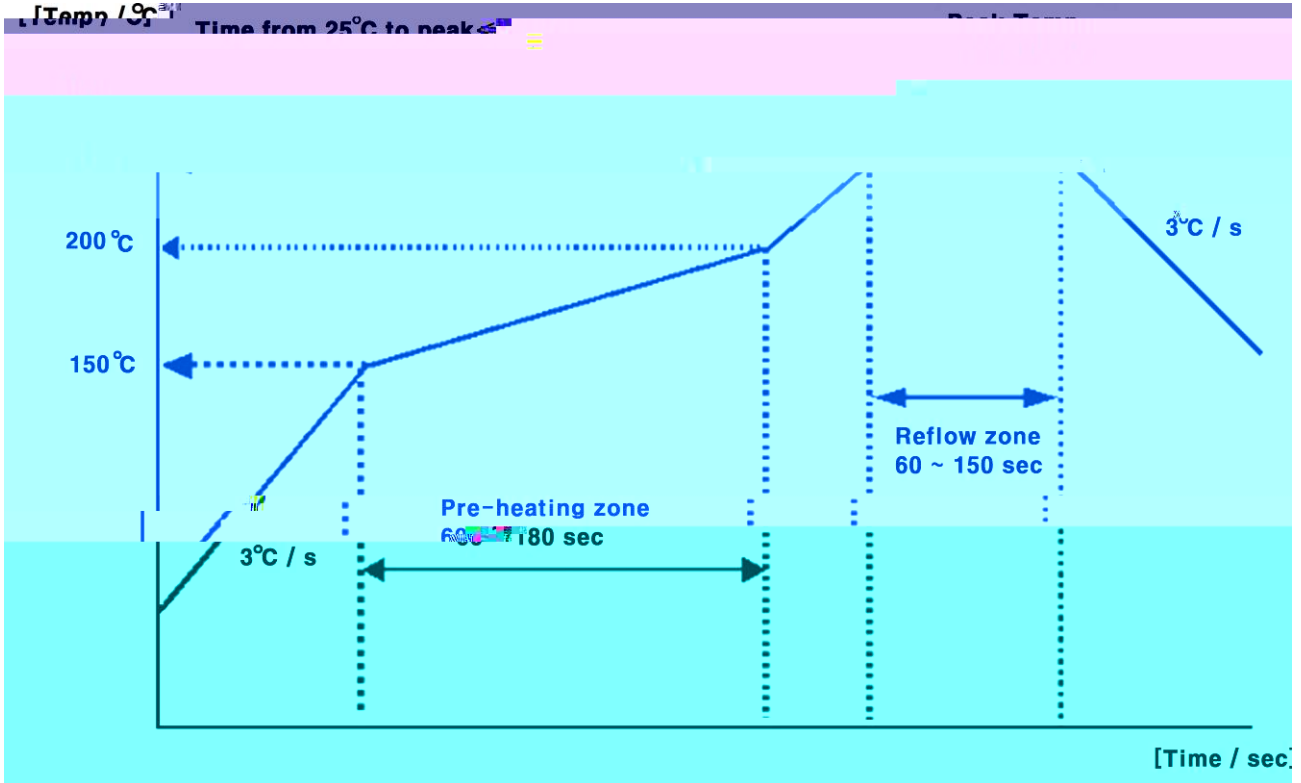
**7-2. TEST ITEM & CONDITION**

CATEGORY	TEST ITEM	TEST CONDITION	REMARK
	Preconditioning	+125℃ 24hr Baking → +60℃ 60%RH 120hr → Reflow Test(3times)	JESD22A113F

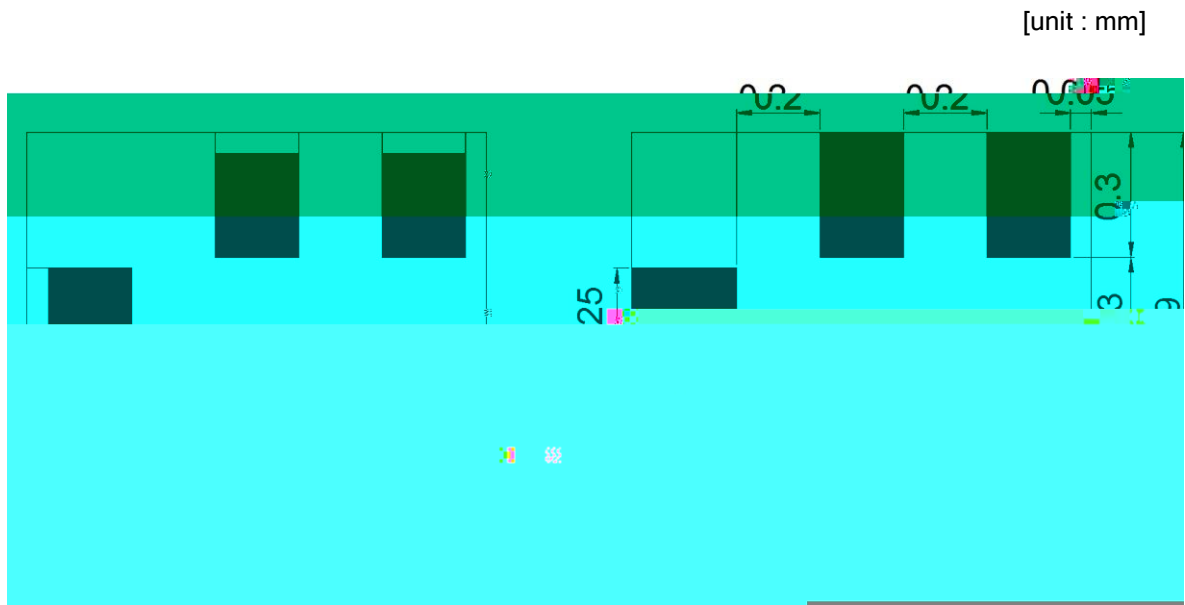


Environment Test	Temp. Drift	-30℃ → +25℃ → +85℃	description
	High Temp. Storage	+85℃ 240hr	JESD22-A103C
	Low Temp. Storage	-40℃ 240hr	JESD22-A119
	High Temp. High Humidity Storage	+85℃ 85%RH 240hr	JESD22-A106B
	Thermal Shock	-40℃/30min ⇔ +85℃/30min , 100cycle	JESD22-A106A
	High Temp. Operating	+121℃ 100%RH 96hr	JESD22-A102C
Mechanical Test	Vibration Test (Random)	20 Hz~2000 Hz,0.053G <sup>2</sup> /Hz or 8gs RMS,15min/plane	IEC 68-2-36 Fdb
	Drop Test	152 cm 12times Steel floor JIG(110g~150g)	IEC 1178-1.4.8.9
	Board Adhesion	0.5 mm/sec 1point push	IEC 68-2-21 Ue3
	Bending Test	0.5 mm/sec 3times -PCB : FR4 , PCB SIZE : 100*40 mm	IEC 68-2-21 Ue3
Physical Test	Solder Heat Resistance	±250V,C=100pF,R=1.5 kΩ, 1times	IEC 68-2-21 Ue3
	static marginal test	C=100pF,R=1.5 kΩ, 1times(demand of customer)	JESD22-A114F

### 8. REFLOW CONDITION



### 9. RECOMMENDED PCB DIMENSIONS



[SAW, X-ray Top view]

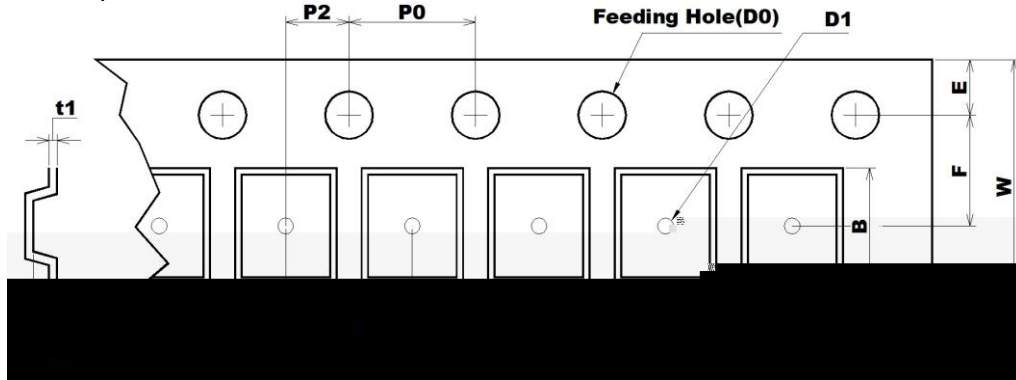
[PCB, X-ray Top view]



## 11. PACKING

### 11-1. DIMENSIONS

- Carrier Tape



[Unit: mm]

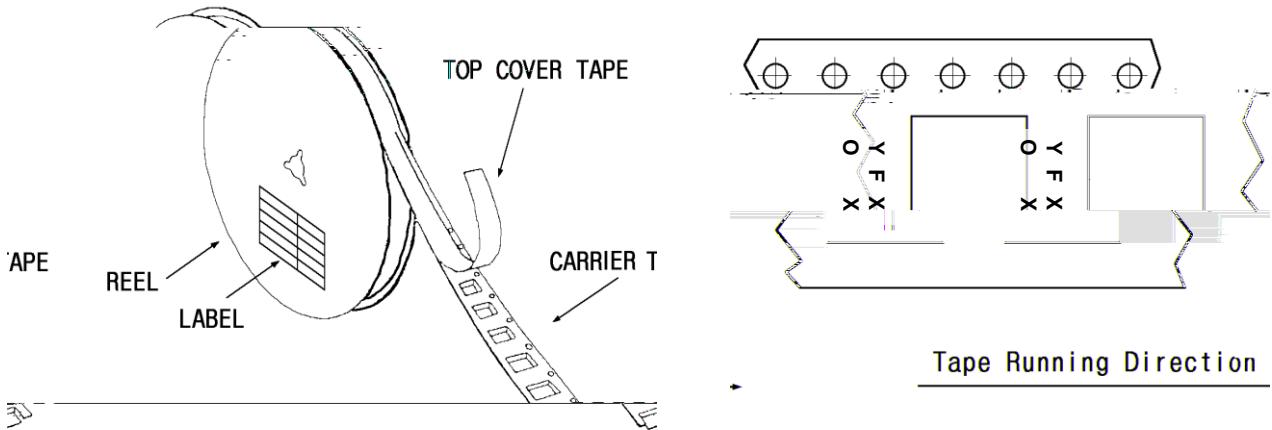
A	B	D0	D1
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**11-2. REELING QUANTITY**

10 inch reel : 10,000 pcs/reel

**11-3. TAPING STRUCTURE**

11-3-1. The tape shall be wound around the reel in direction shown below.


**11-3-2. BAR CODE LABEL**

**MODEL NAME BARCODE**

SFH836AQ101

Model Name

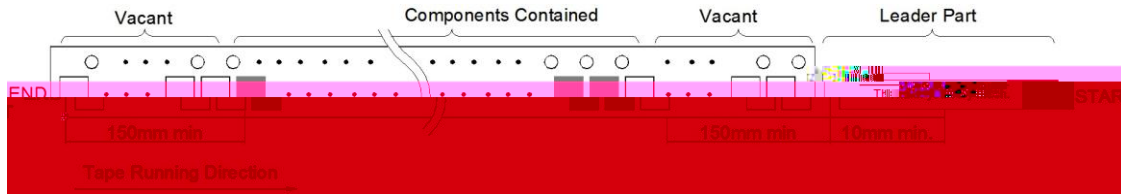
RLYC12563

Reel number

8,000 / qAFYU

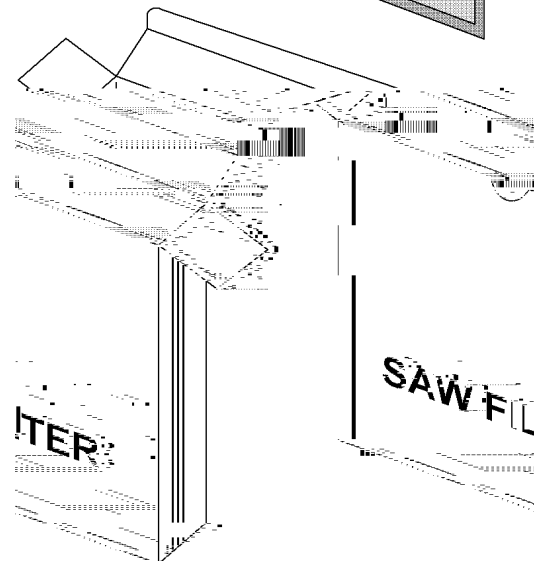
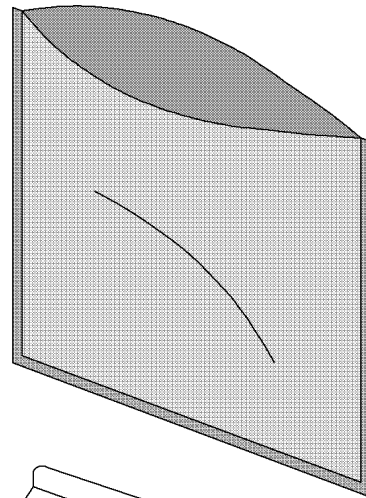
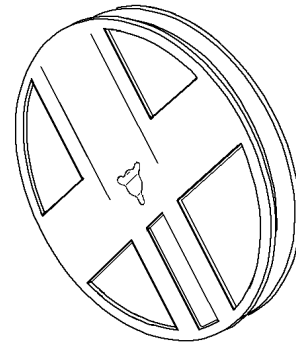
Quantity / Marking

1-3-3. Leader part and vacant position specifications.



11-4. INNER BOX(Reel Packing) STRUCTURE

Material:

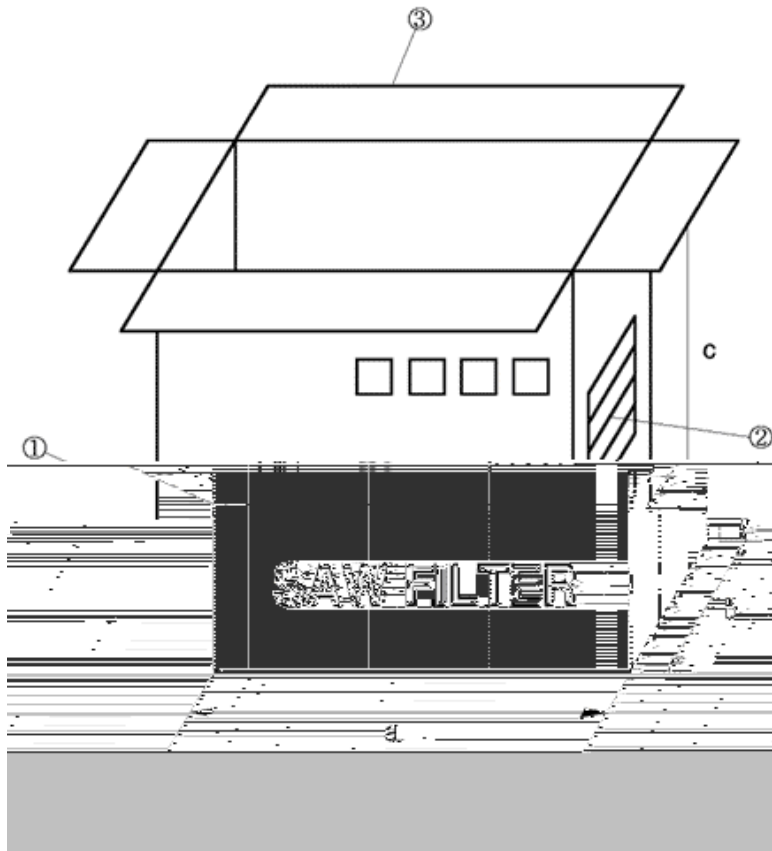




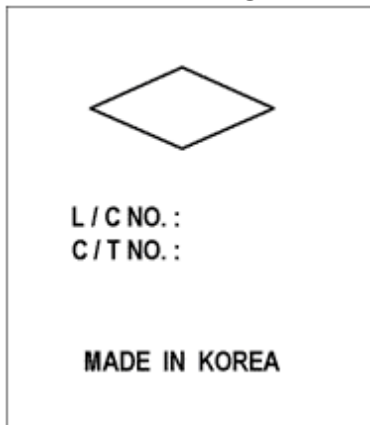
11-5. OUTER BOX STRUCTURE

Material : Paper

TYPE	SIZE(mm)			Inner Box #
	a	b	c	
A	270	240	275	6 boxes



SIDE ①



SIDE ②

MODEL	
Q'TY	EA
USER	
DATE	

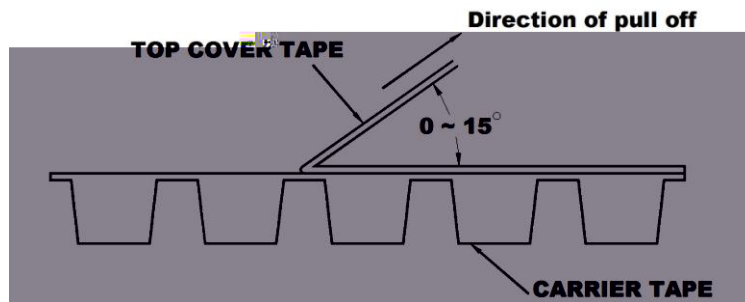
- SIDE is the same as front side.

## 12. TAPE SPECIFICATIONS

12-1. Tensile Strength of Carrier Tape: 4.4N/mm width

12-2. Top Cover Tape Adhesion (See the below figure)

- pull of angle: 0~15 degree
- speed: 300mm/min.
- force: 20~70g



### 13. RoHS DATA


**Test Report No.** F690101/LF-CTSAYAA13-31939

Issued Date: 2013. 07. 08 Page 1 of 6

**To:** WISOL CO., LTD.  
 373-7  
 Gajang-dong  
 Osan-si  
 Gyeonggi-do  
 Korea

The following merchandise was submitted and identified by the client as :

**SGS File No.** : AYAA13-31939  
**Product Name** : SAW FILTER  
**Item No./Part No.** : N/A  
**Received Date** : 2013. 07. 03

TESTED (Sample) : 2013.07.03 by : 2013.07.03

Buyers) : SAMHUNG

**Test Results** : For further details, please refer to following page(s)

**Test Performed** : SGS Korea tested the sample(s) selected by applicant with following results.

nry for the part

**Test Comments** : By the applicant's specific request, the sampling and testing was performed on indicated in the photo without disassembly.

iS Korea Co., Ltd.

SG



f Jang / Chemical Lab Mgr

 Timothy Jeon  
 Jinhee Kim  
 Cindy Park  
 Jerry Jung/ Testing Person



Jef

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 an otherwise stated the results shown in this test report refer only to the sample(s) tested and each sample(s) are retained for 30 days only.

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052 Version5

Member of th


**Test Report No. F690101/LF-CTSAYAA13-31939**

Issued Date: 2013. 07. 08 Page 2 of 8

**Sample No.** : AYAA13-31939.001  
**Sample Description** : SAW FILTER  
**Item No./Part No.** : N/A  
**Materials** : N/A

**Heavy Metals**

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321:2008, ICP	0.5	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321:2008, ICP	5	N.D.
Mercury (Hg)	mg/kg	With reference to IEC 62321:2008, ICP	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	With reference to IEC 62321:2008, UV-VIS	1	N.D.
Antimony (Sb)	mg/kg	With reference to EPA 3052(1996), US EPA 6010B(1996), ICP	10	N.D.

**Flame Retardants-PBBs/PBDEs**

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Dibromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tribromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Pentabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Hexabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Heptabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Octabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Nonabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Decabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Pentabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Hexabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Heptabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Nonabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.

**NOTE:**

- (1) N.D. : Not detected.(<MDL)
- (2) mg/kg : ppm
- (3) MDL : Method Detection Limit
- (4) - : No regulation
- (b) Negative : Undetectable / Positive : Detectable
- (0) \*\* : Qualitative analysis (No Unit)
- (7) \* : Boiling water extraction:

Negative : Absence of CrVI coating

Positive : Presence of CrVI coating, the detected concentration in boiling water extraction

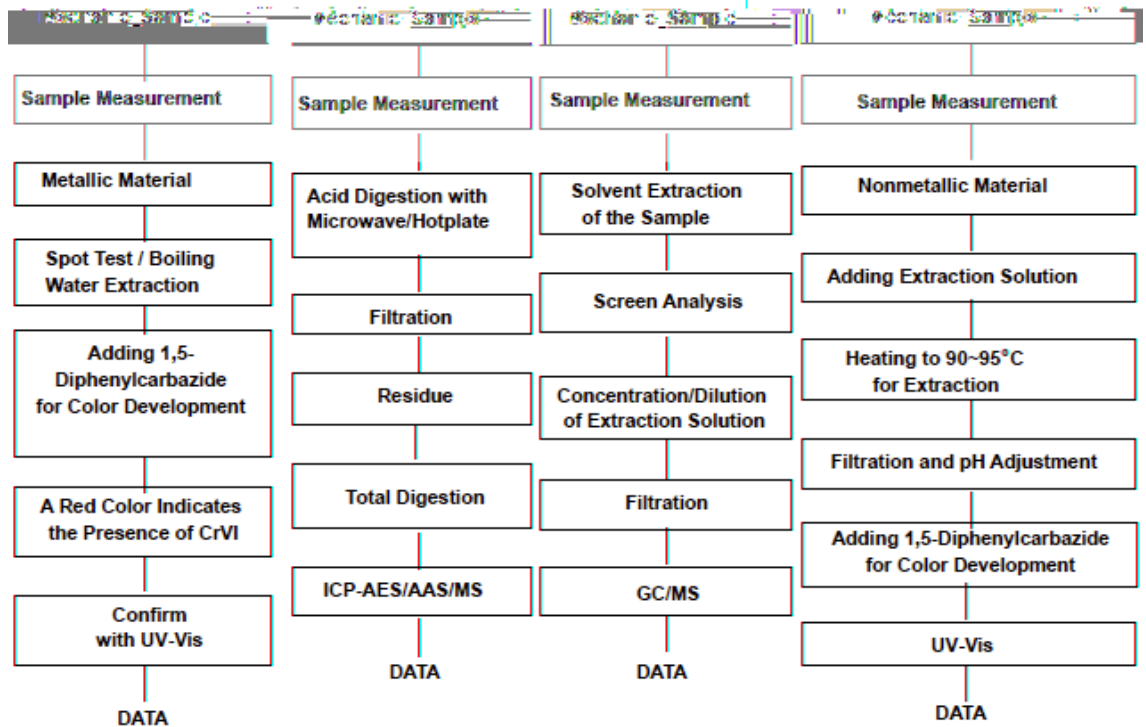
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Page 4 of 8 **Test Report No. F690101/LF-CTSAYAA13-31939** Issued Date: 2013. 07. 08

**Testing Flow Chart for RoHS: Cd/Pb/Hg/Cr<sup>6+</sup> /PBBs&PBDEs Testir**



Cd,Pb,Hg. The samples were dissolved totally by pre-conditioning method according to above flow chart for Section Chief : Gilsae Yi

- NOTE:
- (1) N.D. = Not detected.(<MDL)
  - (2) mg/kg = ppm
  - (3) MDL = Method Detection Limit
  - (4) - = No regulation
  - (5) Negative = Undetectable / Positive = Detectable
  - (6) \*\* = Qualitative analysis (No Unit)
  - (7) \* = Boiling-water-extraction:  
 Negative = Absence of CrVI coating  
 Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.

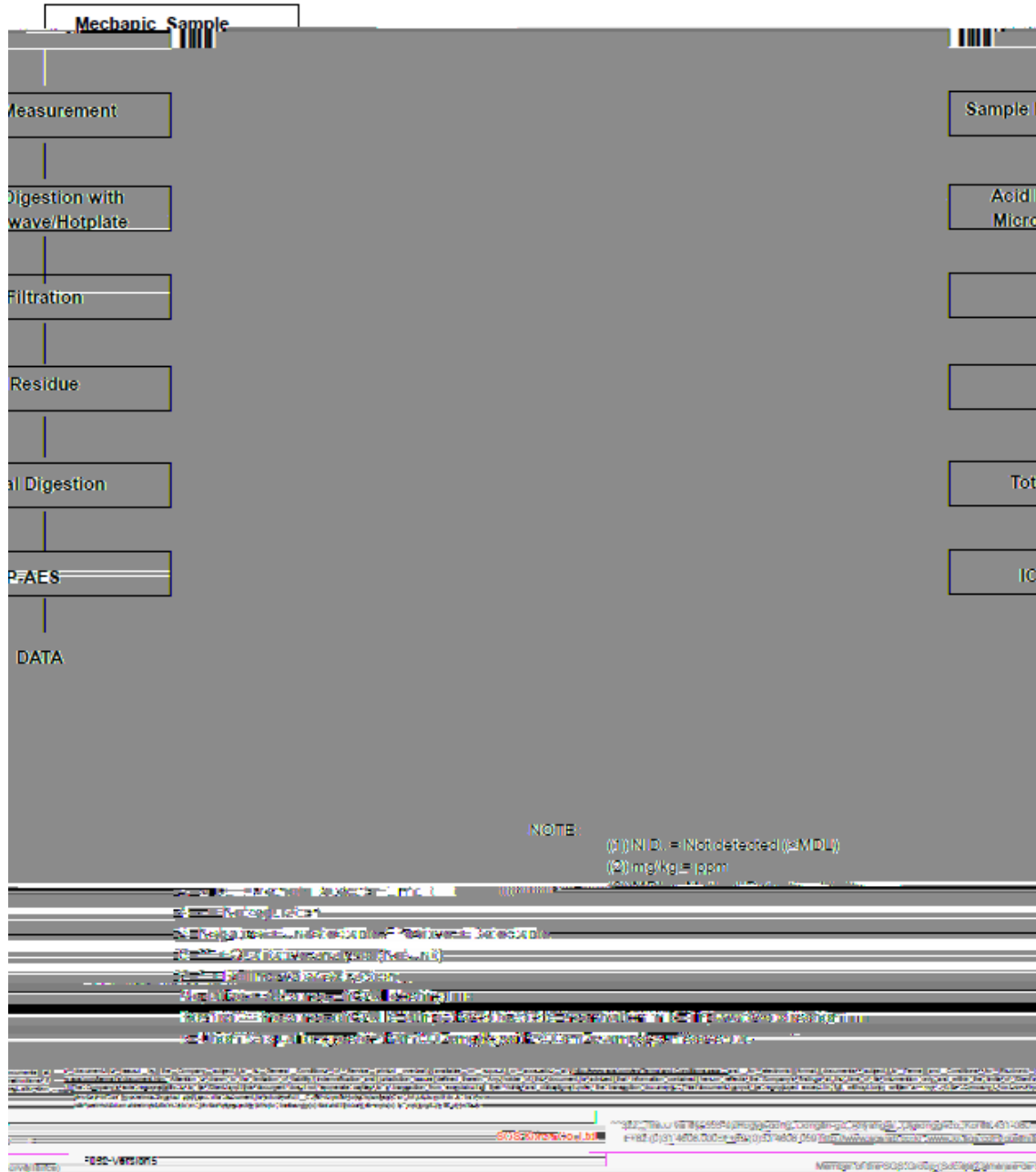


Test Report No. 20130115-030440-MC-01000

Chart for Inorganic Elements Testing

Flow

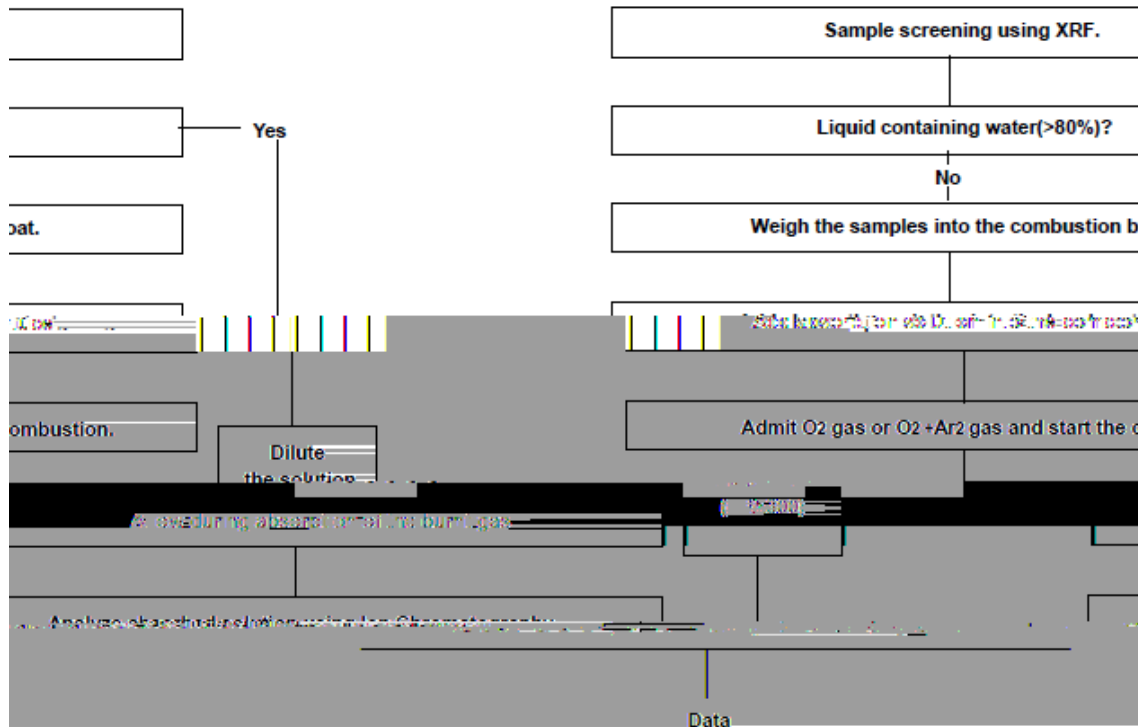
Inorganic Elements





Test Report No. 50001010 E-GT02AA002 81000

Flow Chart for Halogen Test



(1) N.D. = Not detected (<MDL)

NOTE:

- 1. mg/kg (mass)
- 2. M.L. = Method Detection Limit
- 3. N/A = Not available
- 4. Negative = Undetectable / Positive = Detectable
- 5. \*\* = Qualitative analysis (N/A unit)
- 6. \* = Being water extraction
- 7. Negative = Absence of DMF residue
- 8. Positive = Presence of DMF residue, the calculated concentration is equal or greater than 0.02 mg/kg with 0.01

enclosures in being water extraction on 2 sample surface area

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