



# SPECIFICATION

## Surface Acoustic Wave Filter

USER


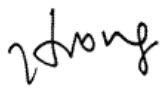

USER PART No.

SEMCO PART No. **SFHG60YA002**

DOC. No. SMS-51-L-SFT FX-34

DATE July 23, 2013

REVISION Preliminary

WISOL					
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## 1. REVISION HISTORY

Preliminary	July 23, 2013	All Page	Make specification
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## 2. DEFINITION

2-1. PART No.

**SFHG60YA002**

①      ②      ③      ④      ⑤      ⑥

No.	EXPLANATION
①	SAW Filter
②	Design Type
③	Center Frequency :1960.0MHz(1930 ~ 1990)
④	Input:50ohm,Output:100ohm
⑤	Package size: 1.1×0.9mm <sup>2</sup>
⑥	Design Revision (02 : Molding Type)

2-2. APPLICATION : Band-Pass Filter for CDMA Rx etc (UMTS Band II)

## 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.

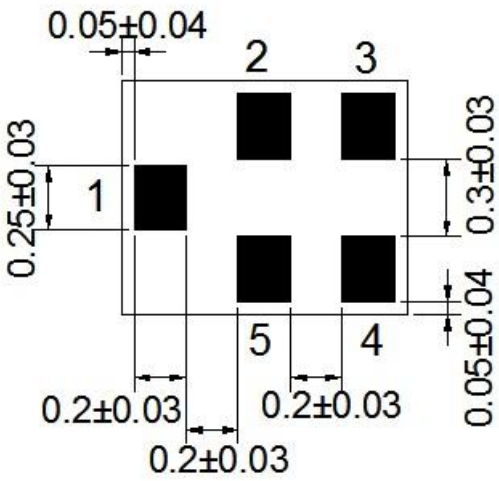
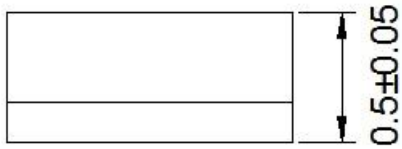
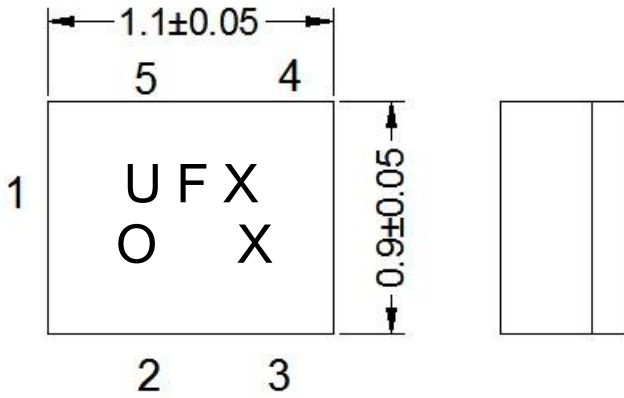
Please avoid static voltage during operation and storage.

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, 5	Ground
1	Unbalanced Input
3,4	Balanced Output

## 5. MARKING



### 5-1. U F X X

- The 1<sup>st</sup> 2<sup>nd</sup> character 'UF' indicates the model name of SAW Filter SFHG60YA002.
- The 3<sup>rd</sup> character 'X' indicates the year and the month of manufacture.

Year	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
<b>2013</b>	P	Q	R	S	T	U	V	W	X	Y	Z	a
<b>2014</b>	1	2	3	4	5	6	7	8	9	A	B	C
<b>2015</b>	D	E	F	G	H	I	J	K	L	M	N	O
<b>2016</b>	P	Q	R	S	T	U	V	W	X	Y	Z	a

※ This rotates by the 3 years.

- The 4<sup>th</sup> character 'X' indicates Lot No.

### 5-2. ○

- This symbol indicates input pin 1.
- This indicates the producing center
  - : China,

### 5-3. Marking : Laser Marking

## 6. PERFORMANCE

### 6-1. MAXIMUM RATINGS

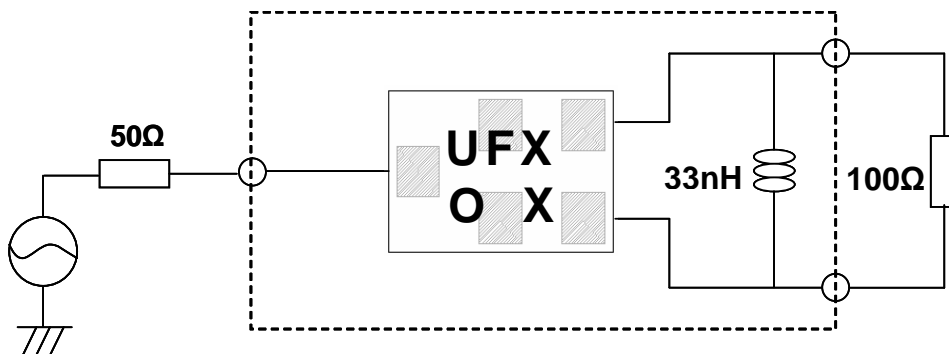
CHARACTERISTICS	RATINGS	UNITS
DC Permissive Voltage	5	V
Maximum Input Power	15	dBm
Operating Temperature Range	- 30 ~ +85	°C
Storage Temperature Range	- 40 ~ +85	°C

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	1930 ~ 1990	dB	-	2.8	4.2
Inband Ripple	1930 ~ 1990	dB	-	0.8	2.3
Input VSWR	1930 ~ 1990	-	-	1.7	2.3
Output VSWR	1930 ~ 1990	-	-	1.9	2.3
Amplitude Imbalance	1930 ~ 1990	dB	-2.0.	-	+2.0
Phase Imbalance	1930 ~ 1990	degree	-20	-	+20
Absolute Attenuation	DC ~ 1850	dB	50	58	-
	1850 ~ 1910	dB	20	48	-
	2400 ~ 2484	dB	50	67	-
	3860 ~ 3980	dB	40	62	-
	3980 ~ 6000	dB	30	43	-
Termination Impedance		Input: Unbalanced 50 ohm Output: Balanced 100 ohm // 33nH			

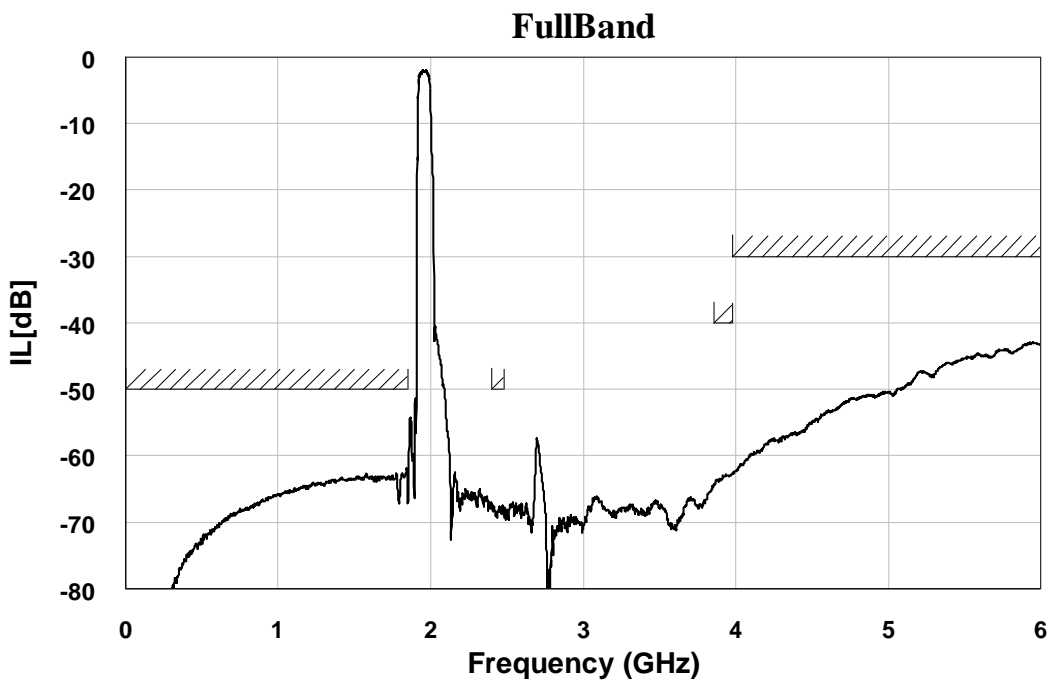
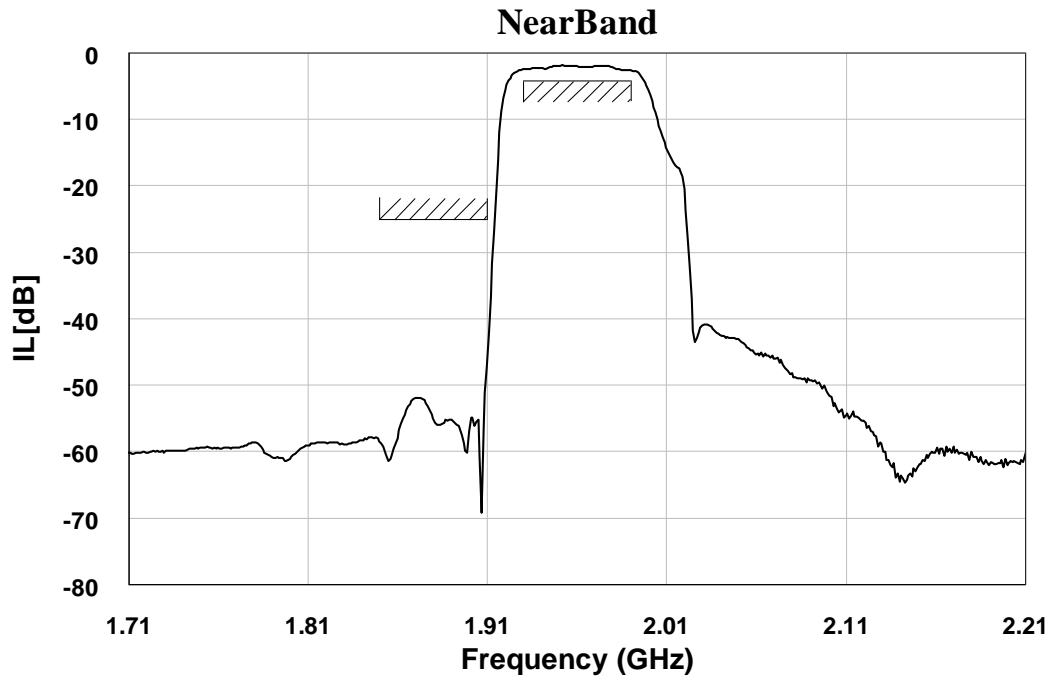
6-2-2. TEST FIXTURE



[X-Ray Top View]

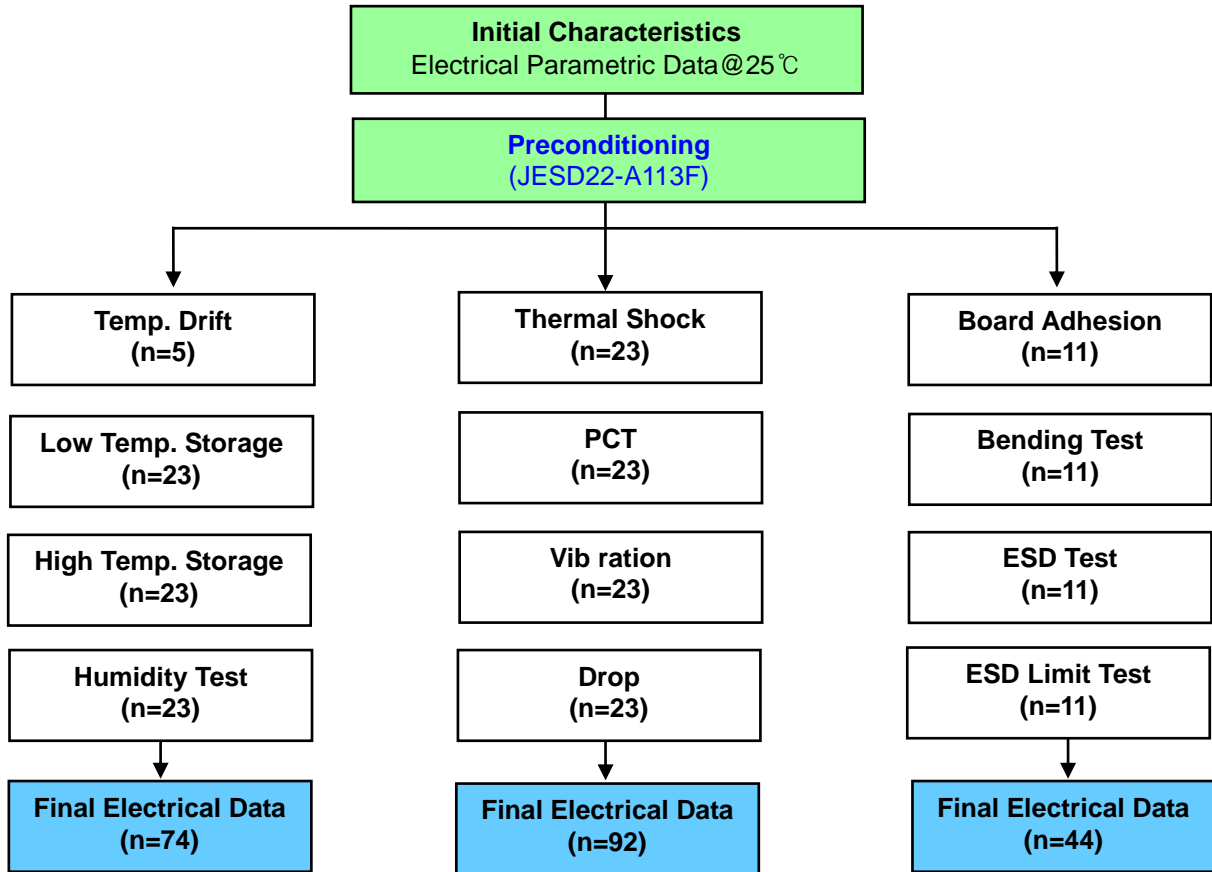


6-2-3. GRAPH



7. RELIABILITY

7-1. ENGINEERING SAMPLE FLOW CHART



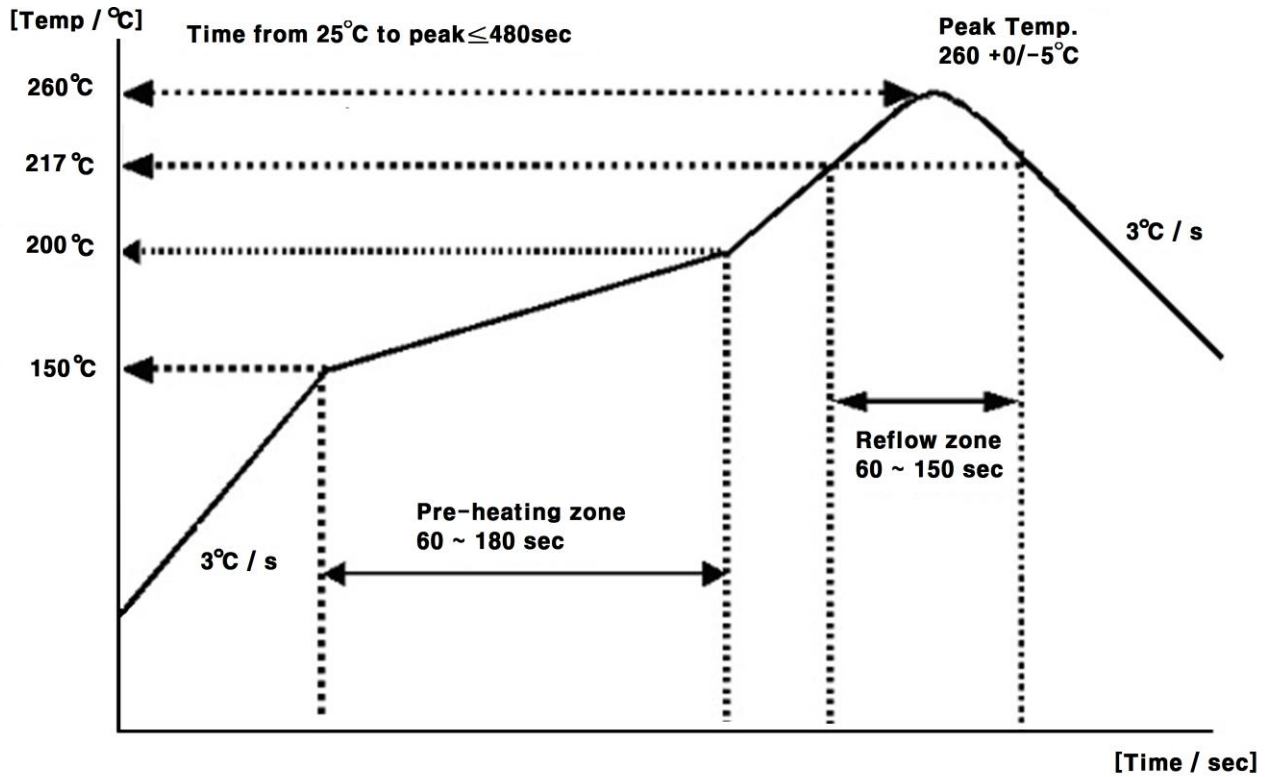
**7-2. TEST ITEM & CONDITION**

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

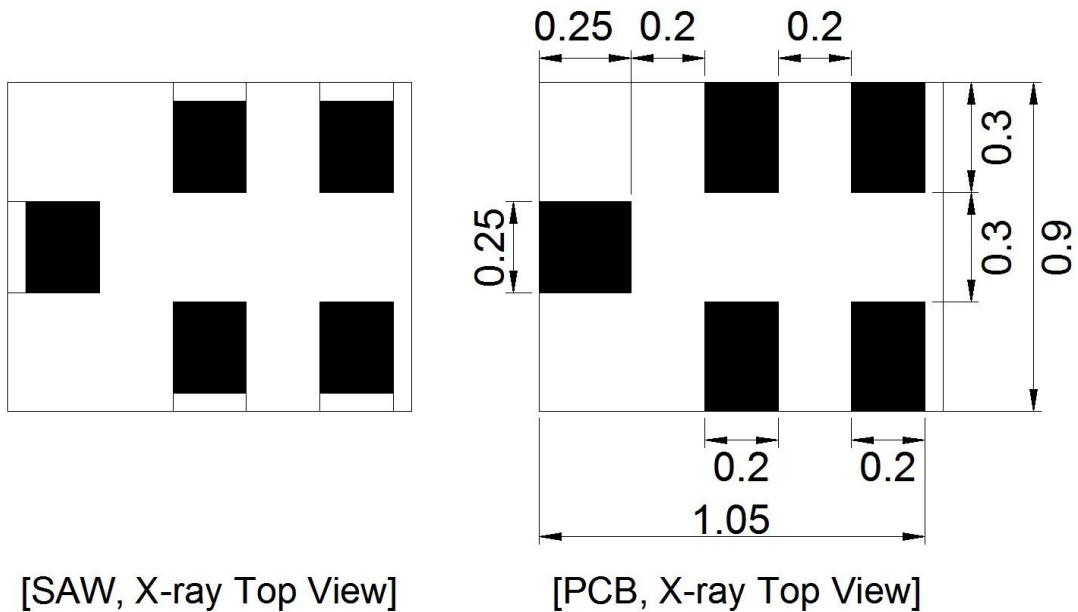


Environment Test	Temp. Drift	-30℃ → +25℃ → +85℃	description
	High Temp. Storage	+85℃ 240hr	JESD22-A103C
	Low Temp. Storage	-40℃ 240hr	JESD22-A119
	High Temp. High Humidity Storage	+85℃ 85%RH 240hr	JESD22-A106B
	Thermal Shock	-40℃/30min ⇔ +85℃/30min , 100cycle	JESD22-A106A
	High Temp. Operating	+121℃ 100%RH 96hr	JESD22-A102C
Mechanical Test	Vibration Test (Random)	20 Hz~2000 Hz,0.053G <sup>2</sup> /Hz or 8g's 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



## 10. CAUTION

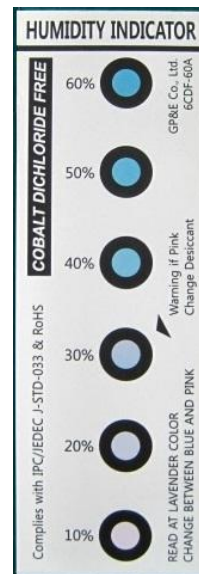
### Moisture Sensitivity Device Caution (MSL LEVEL=2a)

1. Calculated shelf life in sealed bag : 12 month at < 40°C and < 90% relative Humidity(RH)
  2. Peak package body temperature : **260°C**
  3. After bag is opened, devices that will be subjected to reflow solder or other high temperature process must be
    - (a) Mounted within : 672 hours of factory conditions ≤30 °C/60% RH, or
    - (b) Stored per J-STD-033
  4. Device require bake, before mounting, if :
    - (a) Humidity Indicator Card reads > 60% when read at 23±5 °C
    - (b) 3(a) or 3(b) are not met
  5. If baking is required, refer to IPC/JEDEC J-STD-033 for bake procedure
- Note : Level and body temperature defined by IPC/JEDEC J-STD-020

Aluminum Pack (310mmX370mm)



HIC(Humidity Indication Card)

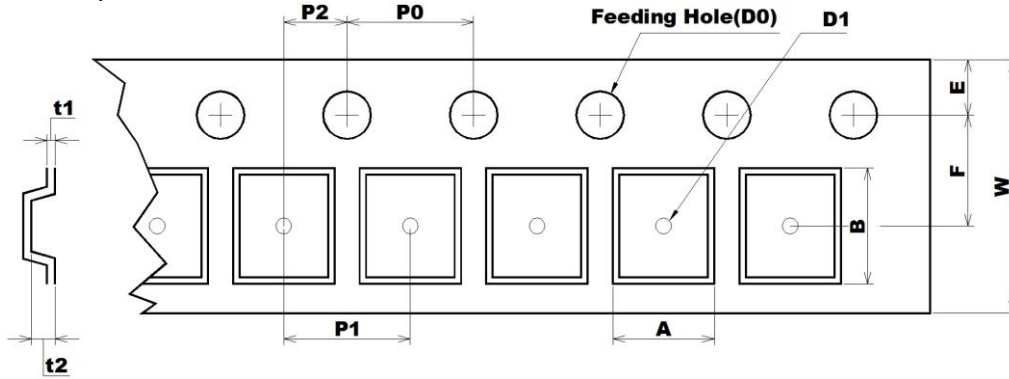


10 to 60% RH

11. PACKING

11-1. DIMENSIONS

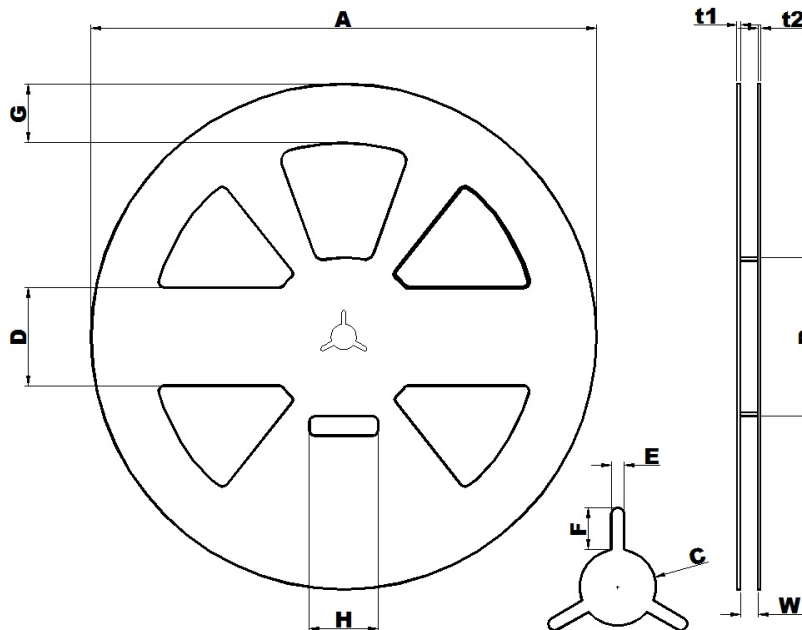
- Carrier Tape



[Unit: mm]

A	B	D0	D1	E	F	P0	P1	P2	t1	t2	W
1.1	1.35	Ø1.50	Ø0.50	1.75	3.5	4	4	2	0.25	0.7	8
0.05	0.05	+0.10	0.05	0.10	0.05	0.10	0.10	0.05	0.02	0.07	+0.30
		-0.00									-0.10

- Reel



[Unit: mm]

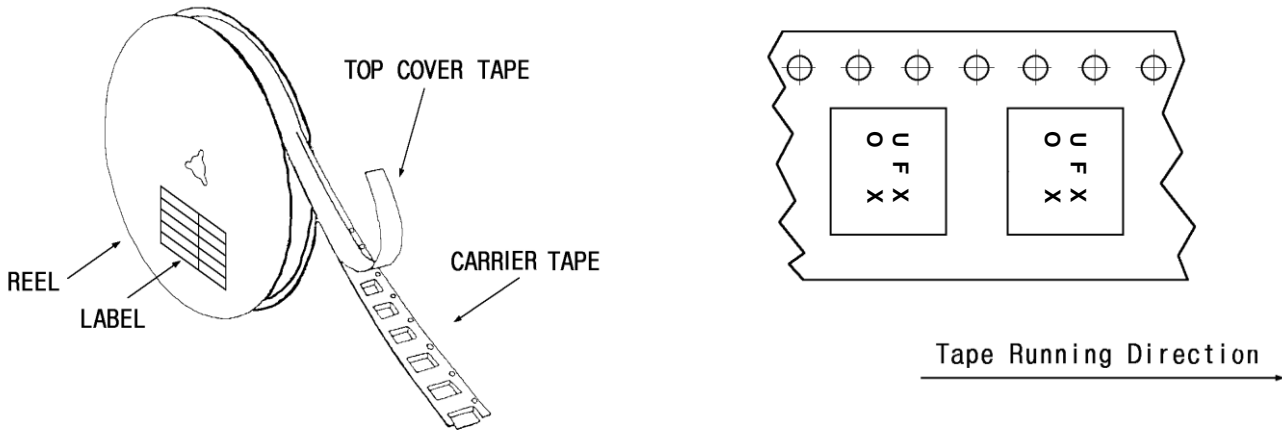
A	B	C	D	E	F	G	H	t1	t2	W
Ø258.0	Ø81.0	Ø13.0	50.0	2.2	7.0	30.0	35.0	1.8	1.5	9.0
+1.0	1.0	0.5	0.8	0.3	0.5	0.8	1.0	0.5	0.5	+1.0
-0.5										-0.5

- The product shall be packed properly not to damaged during transportation and storage.

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.

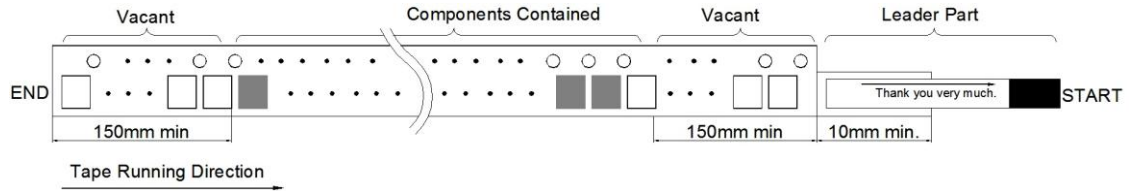


11-3-2. BAR CODE LABEL



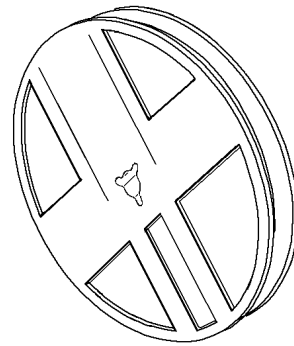
- |   |   |                    |
|---|---|--------------------|
| ① |  | MODEL NAME BARCODE |
| ② | SFH836AQ101   | Model Name         |
| ③ | RLYC12563   | Reel number        |
| ④ | 8000 / qAFYU  | Quantity / Marking |

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

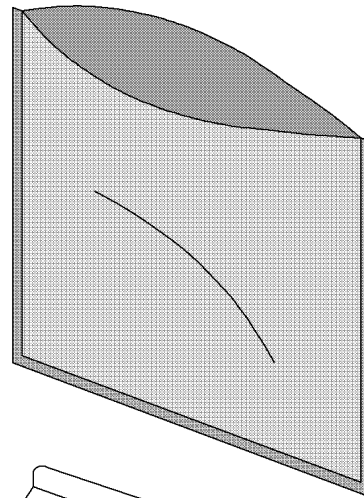


11-4. INNER BOX(Reel Packing) STRUCTURE

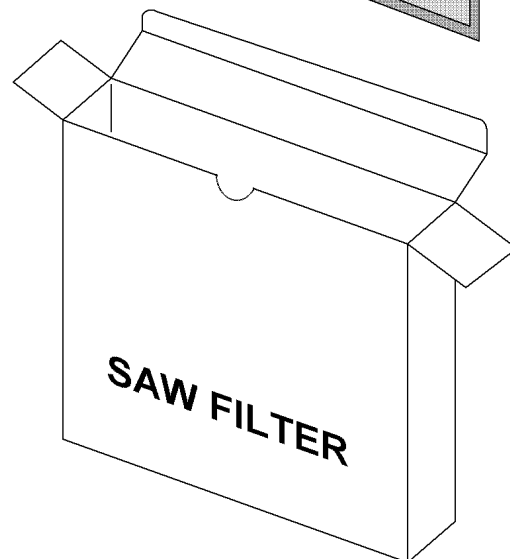
Material: Polycarbonate



Material: Polyethylene + Aluminium  
 Size: 310×370mm<sup>2</sup>



Material: Paper  
 Size: (D)260×(W)37×(H)265mm<sup>3</sup>

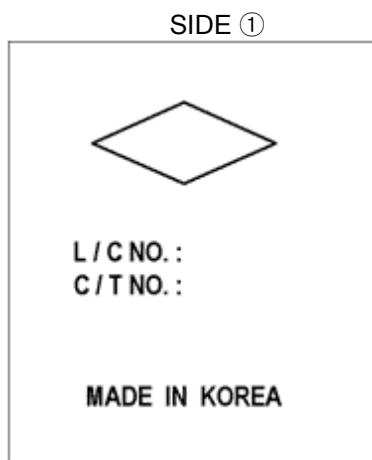
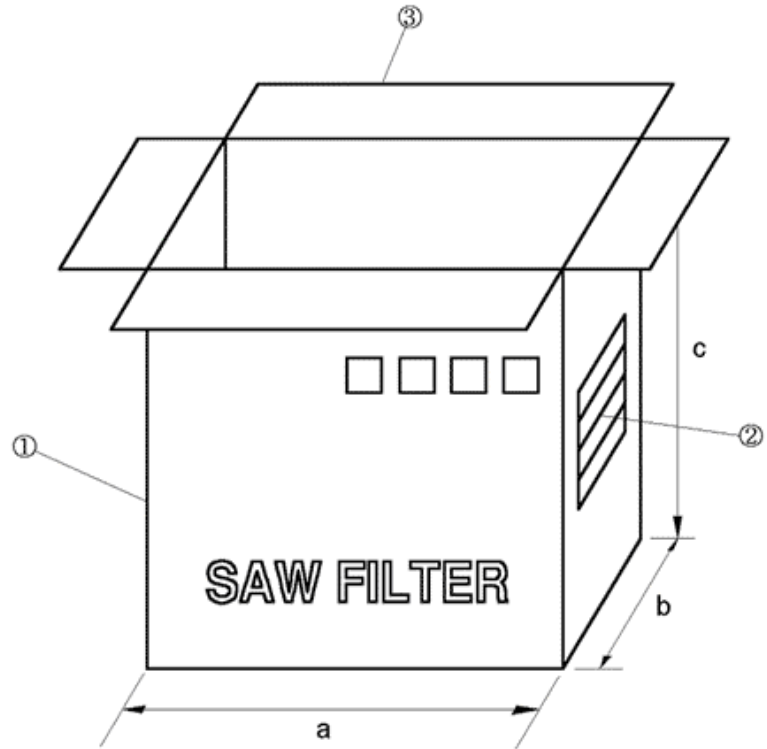




11-5. OUTER BOX STRUCTURE

Material : Paper

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



SIDE ②

MODEL	
Q'TY	EA
USER	
DATE	

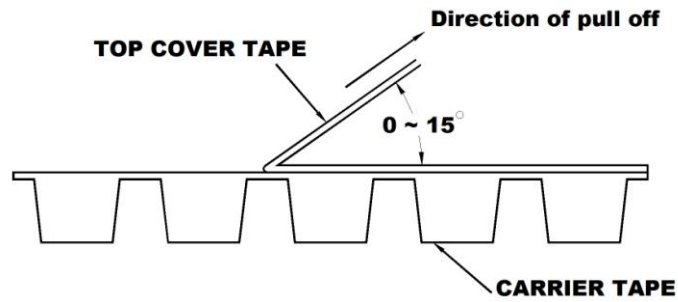
- SIDE is the same as front side.

## 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-CTSAYAA11-28285

Issued Date: 2011. 09. 06 Page 1 of 2

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

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

<b>SGS File No.</b>	: AYAA11-28285
<b>Product Name</b>	: SAW FILTER
<b>Item No./Part No.</b>	: N/A
<b>Received Date</b>	: 2011. 08. 31
<b>Test Period</b>	: 2011. 09. 01 to 2011. 09. 06
<b>Test Results</b>	: For further details, please refer to following page(s)
<b>Test Performed</b>	: SGS Korea tested the sample(s) selected by applicant with following results.
<b>Test Comments</b>	: By the applicant's specific request, the sampling and testing was performed only for the part indicated in the photo without disassembly.

SGS Korea Co. Ltd.



Jeff Jang / Chemical Lab Mgr

Timothy Jeon  
Jinhee Kim  
Cindy Park  
Jerry Jung/ Testing Person

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F052 Version4

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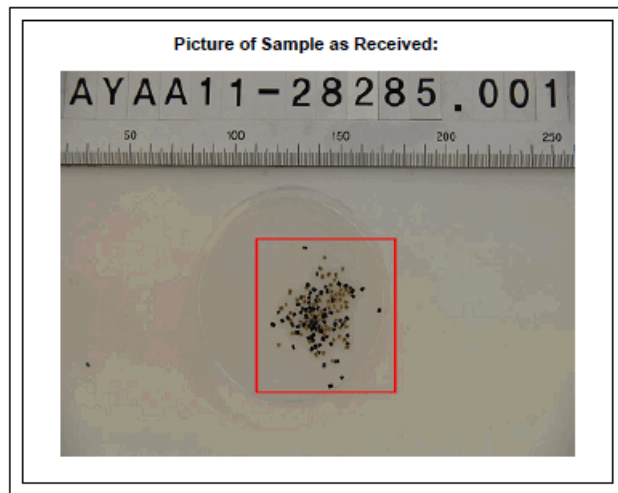
**Test Report No.** F690101/LF-CTSAYAA11-28285

Issued Date: 2011. 09. 06 Page 2 of 2

**Sample No.** : AYAA11-28285.001  
**Sample Description** : SAW FILTER  
**Item No./Part No.** : N/A  
**Materials** : N/A

**Heavy Metals**

Test Items	Unit	Test Method	MDL	Results
Antimony (Sb)	mg/kg	With reference to EPA 3052(1996), US EPA 6010B(1996), ICP	10	N.D.



\*\*\* End \*\*\*

- NOTE: (1) N.D. = Not detected. (<MDL)  
 (2) mg/kg = ppm  
 (3) MDL = Method Detection Limit  
 (4) - = No regulation  
 (5) \*\* = Qualitative analysis (No Unit)  
 (6) \* = 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.

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