



# SPECIFICATION

## Surface Acoustic Wave Filter

USER




USER PART No.

SEMCO PART No. **SFX836UYA02**

DOC. No. SMS-51-L-SFT D0-91

DATE Aug 07, 2014

REVISION 000

WISOL					
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## 1. REVISION HISTORY

000	Aug 07, 2014	All Page	Make specification
-----	--------------	----------	--------------------

## 2. DEFINITION

### 2-1. PART No.

**S F X 836 U Y A 0 2**

①    ②    ③    ④    ⑤    ⑥

No.	EXPLANATION	
①	SAW Filter	
②	Design Type	
③	Center Frequency:	TX 836.5MHz (824~849MHz)
④	Input/Output 50ohm/ 100ohm//8.2nH, mirror Type	
⑤	Package size: 1.8×1.4mm <sup>2</sup>	
⑥	Design Revision (02 : Molding Type)	

### 2-2. APPLICATION : UMTS B5 DPX

## 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.

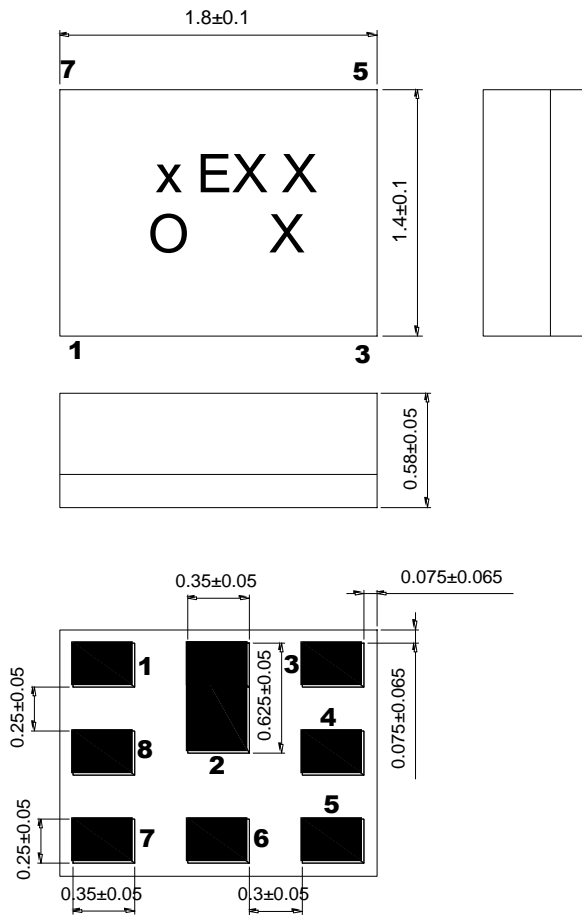
Please avoid static voltage during operation and storage.

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.

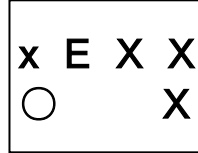
#### 4. OUTLINE DRAWING & DIMENSIONS

[Unit: mm]



No.	Function
1,8	Rx Output
3	Tx Input
6	Antenna
2, 4, 5, 7	GND

## 5. MARKING



### 5-1. x E X X X

- The 1st, 2nd character 'xE' indicates the model name of SAW Filter “SFX836UYA02” .
- The 3rd character 'X' indicates the year and the month of manufacture.

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

※ This rotates by the 3 years.

- The 4<sup>th</sup>, 5<sup>th</sup> character 'X' indicates Lot No.

### 5-2. O

- 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	0.8	W
Operating Temperature Range	- 20 ~ +85	°C
Storage Temperature Range	- 40 ~ +85	°C

### 6-2. ELECTRICAL CHARACTERISTICS

#### 6-2-1. TABLE

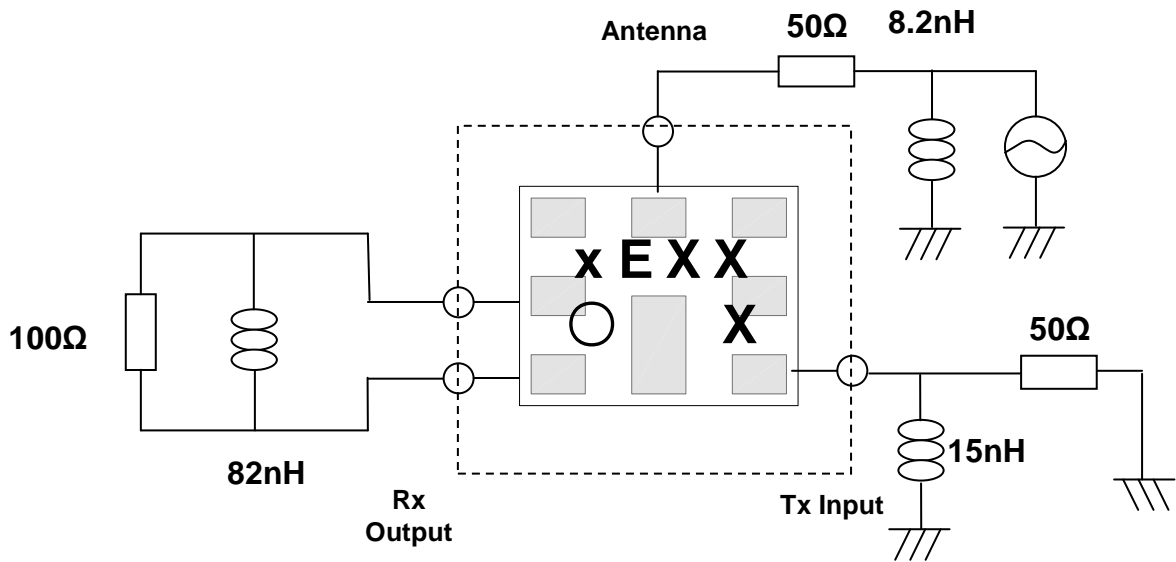
Ta = - 20 ~ +85°C

Item	CONDITION [MHz]	UNIT	RATING		
			Min.	Typ.(25°C)	Max.
<b>TX → ANTENNA</b>					
Insertion Loss	824 ~ 849	dB		1.6	2.1
Inband Ripple	824 ~ 849	dB		0.5	1.2
VSWR	824 ~ 849	-		1.5	2.0
Absolute Attenuation	0 ~ 779	dB	23	28	
	779 ~ 804	dB	28	35	
	869 ~ 894	dB	46	56	
	925 ~ 960	dB	25	31	
	1574 ~ 1577	dB	33	39	
	1638 ~ 1708	dB	33	40	
	1805 ~ 1880	dB	38	43	
	1930 ~ 1990	dB	40	45	
	2110 ~ 2170	dB	38	42	
	2400 ~ 3000	dB	25	31	
3000 ~ 6000	dB	12	17		
Termination Impedance : INPUT / ANTENNA			50Ω(//15[nH]) / 50Ω(// 8.2[nH])		
Item	CONDITION [MHz]	UNIT	RATING		
			Min.	Typ.(25°C)	Max.
<b>ANTENNA → RX</b>					
Insertion Loss	869 ~ 894	dB		1.7	2.3
Inband Ripple	869 ~ 894	dB		0.5	1.2
VSWR	869 ~ 894	-		1.6	2.0

Absolute Attenuation	0 ~ 779	dB	60	66	
	779 ~ 824	dB	60	64	
	824 ~ 849	dB	55	64	
	915 ~ 925	dB	22	26	
	925 ~ 960	dB	42	47	
	960 ~ 2000	dB	55	59	
	2000 ~ 2500	dB	53	58	
	2500 ~ 3000	dB	53	57	
	3200 ~ 6000	dB	45	55	
Termination Impedance : ANT / OUTPUT			50Ω / (// 8.2[nH]) Differential 100Ω(// 82[nH])		
TX → RX					
Isolation between Rx and Tx	824 ~ 849	dB	55	65	
	869 ~ 894	dB	53	57	



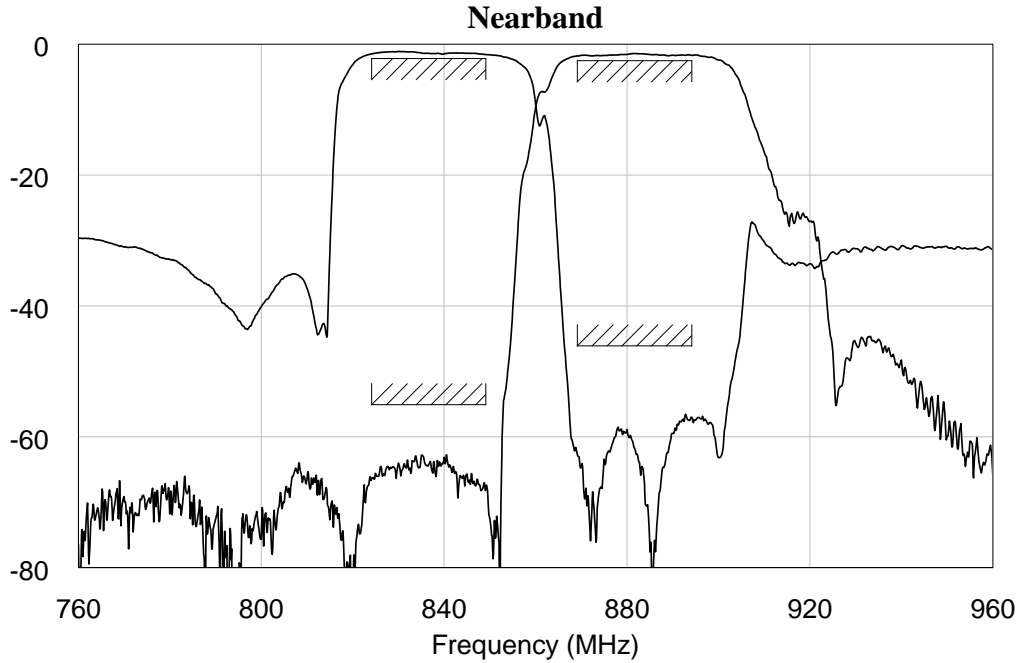
6-2-2. TEST FIXTURE



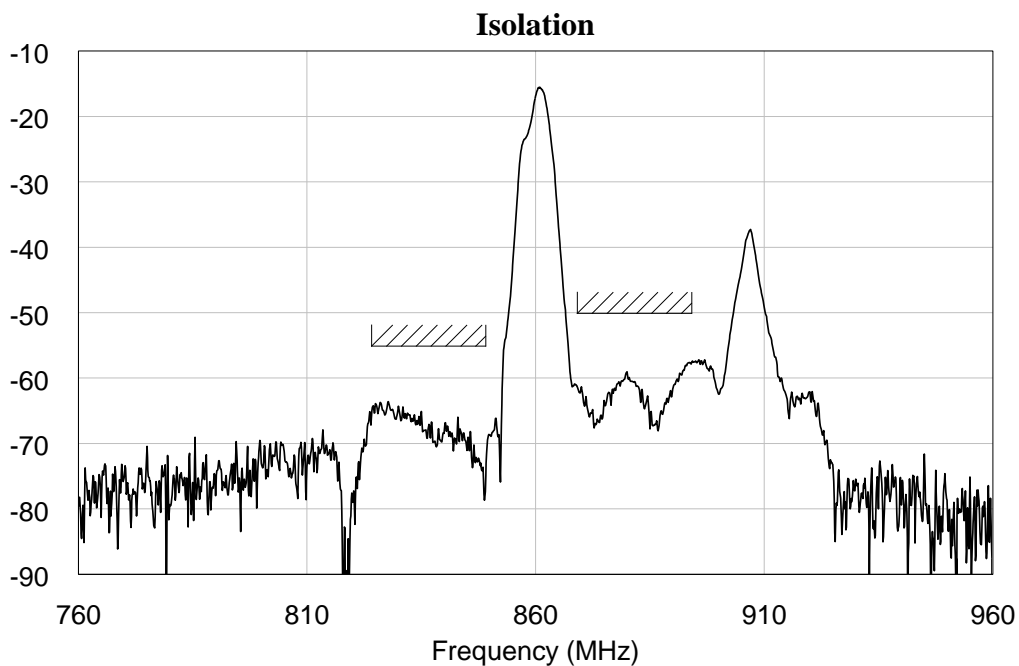
< X-ray Top View >

6-2-3. GRAPH

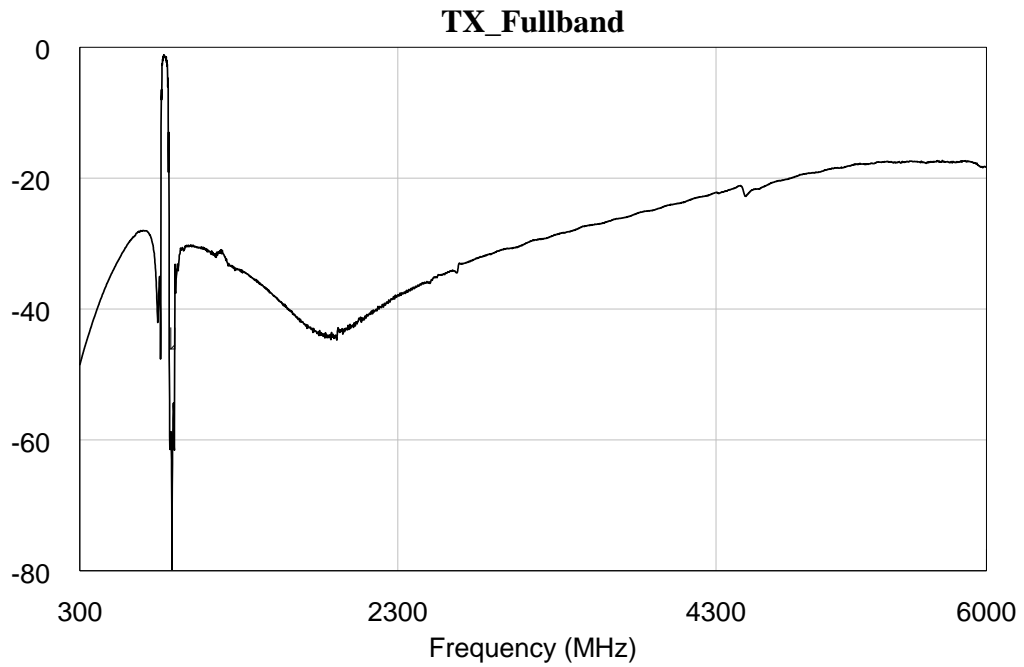
Tx→Ant, Ant→Rx Transmission Characteristics



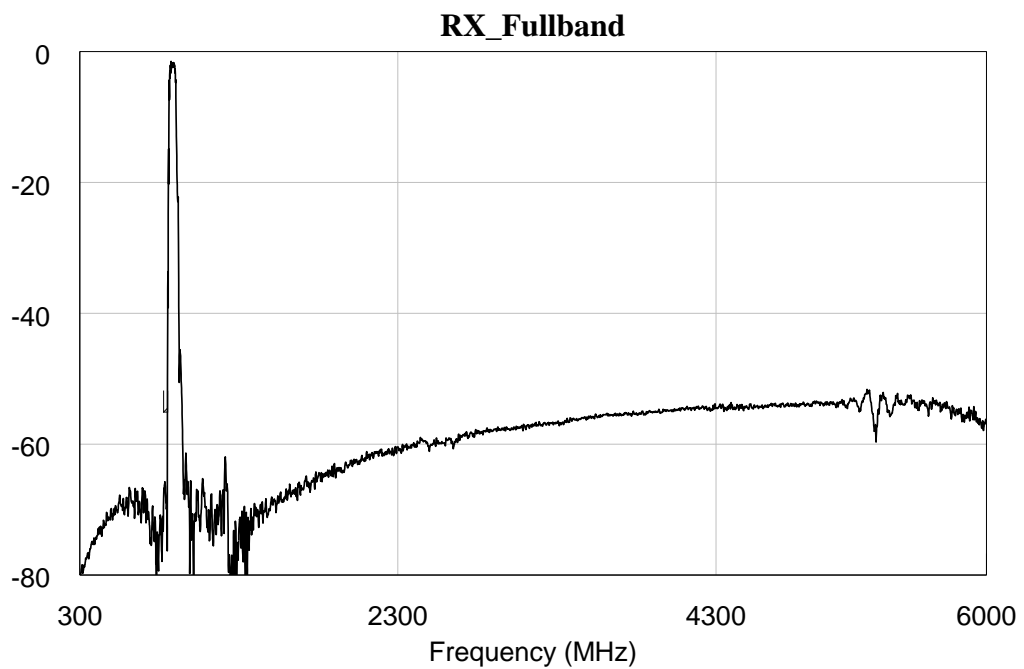
Tx → Rx Isolation Characteristics



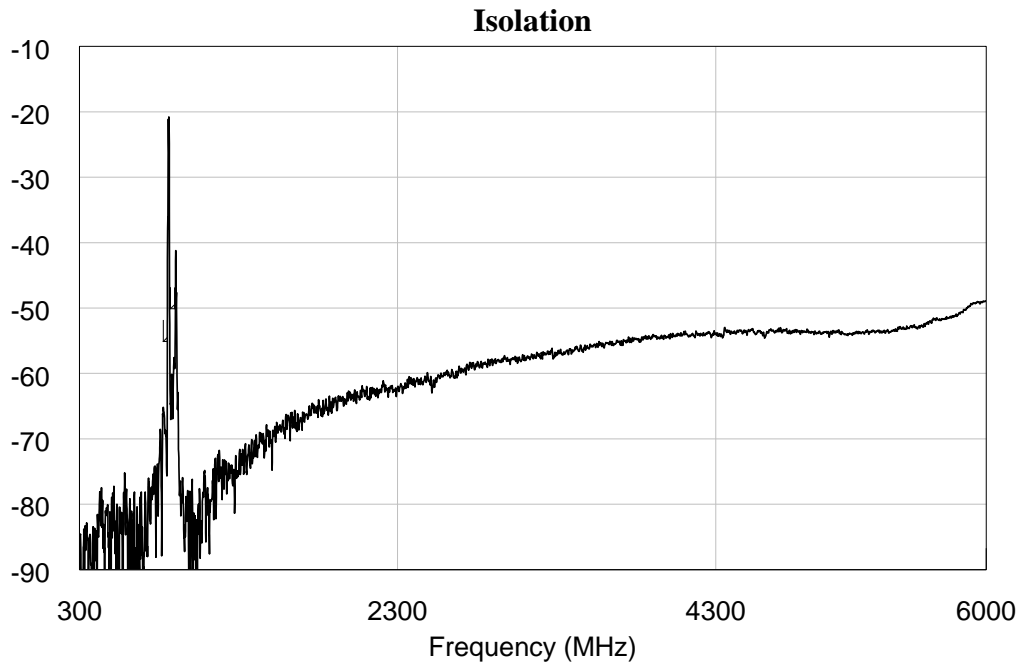
Tx → Ant Wideband Transmission Characteristics



Ant→Rx Full band Transmission Characteristics

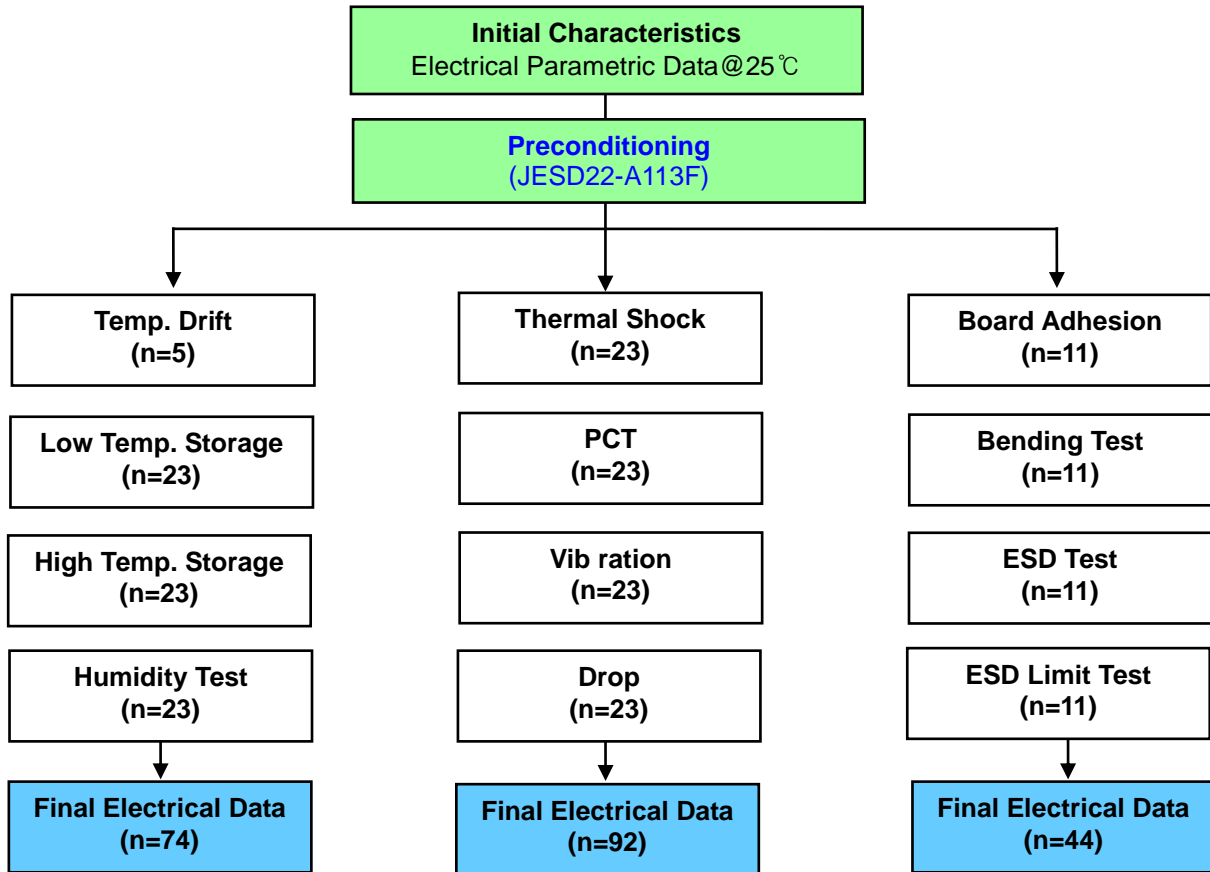


Tx→Rx Full band Isolation Characteristics



7. RELIABILITY

7-1. ENGINEERING SAMPLE FLOW CHART



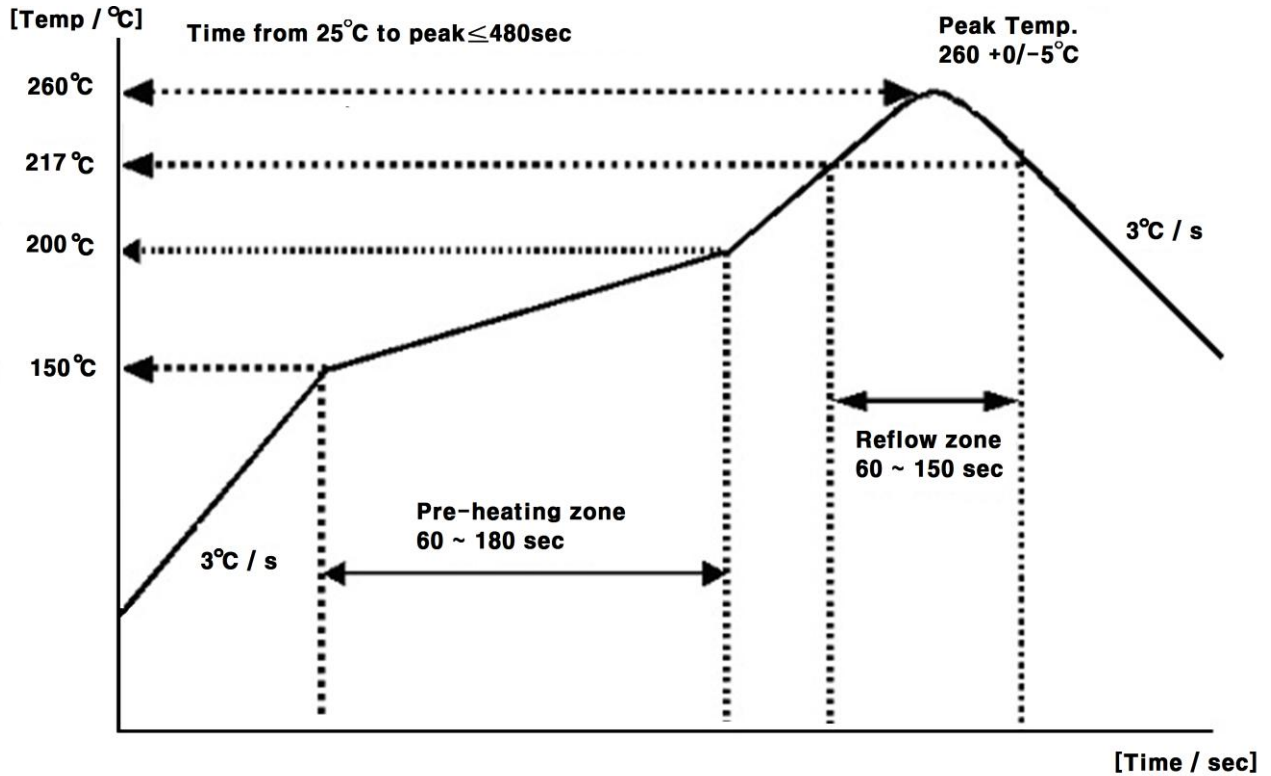
**7-2. TEST ITEM & CONDITION**

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

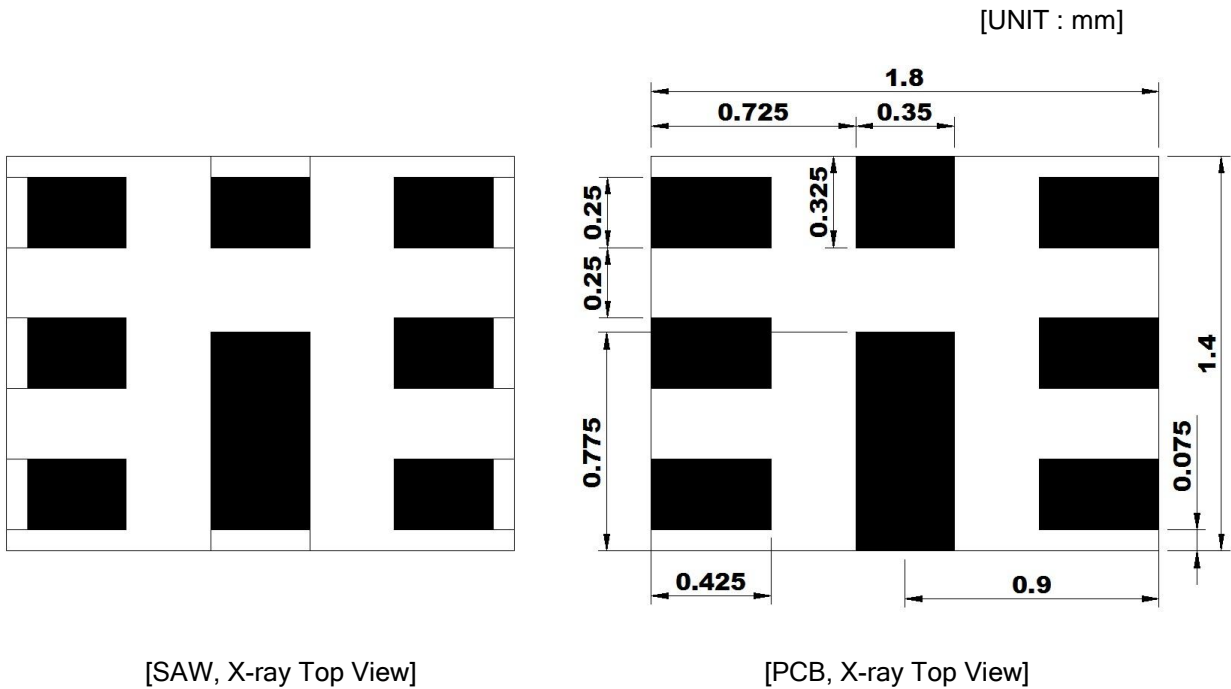


Environment Test	Temp. Drift	-20℃ → +25℃ → +85℃	description
	High Temp. Storage	+85℃ 240hr	JESD22-A103C
	Low Temp. Storage	-40℃ 240hr	JESD22-A119
	High Temp. High Humidity Storage	+85℃ 85%RH 240hr	JESD22-A106B
	Thermal Shock	-40℃/30min ⇔ +85℃/30min , 100cycle	JESD22-A106A
	High Temp. Operating	+121℃ 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



## 10. CAUTION

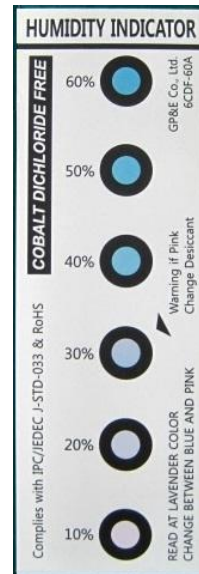
### Moisture Sensitivity Device Caution (MSL LEVEL=2a)

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)



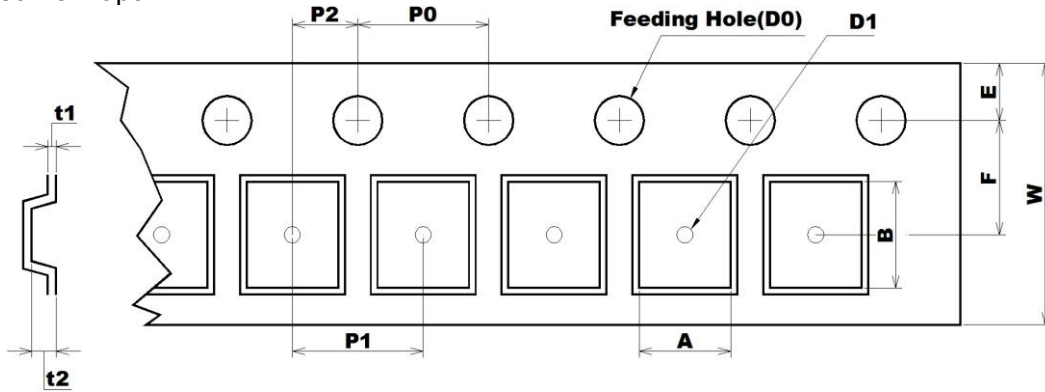
10 to 60% RH



11. PACKING

11-1. DIMENSIONS

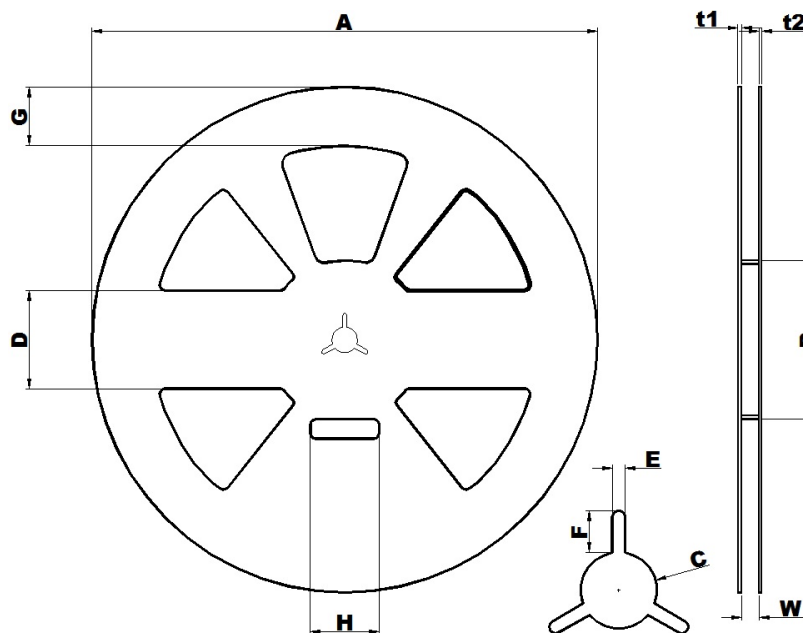
- Carrier Tape



[Unit: mm]

A	B	D0	D1	E	F	P0	P1	P2	t1	t2	W
1.70	2.1	Ø1.55	Ø1.00	1.75	3.5	4	4	2	0.25	0.70	8
+0.10	+0.10	+0.05	MIN	+0.10	+0.05	+0.10	+0.10	+0.05	+0.05	+0.10	+0.30
-0.10	-0.10	-0.05		-0.10	-0.05	-0.10	-0.10	-0.05	-0.05	-0.10	-0.30

- 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	-1.0	-0.5	-0.8	-0.3	-0.5	-0.8	-1.0	-0.5	-0.5	-0.5

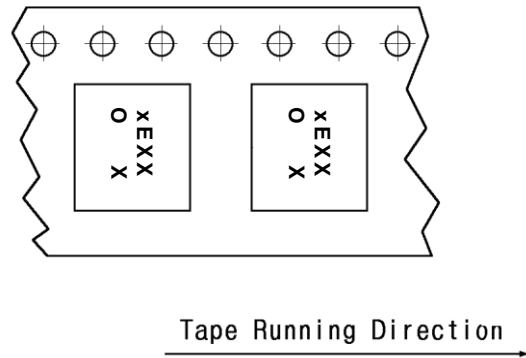
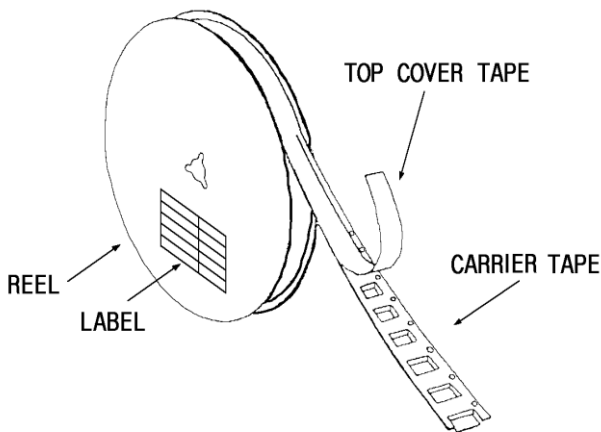
- The product shall be packed properly not to damaged during transportation and storage.

11-2. REELING QUANTITY

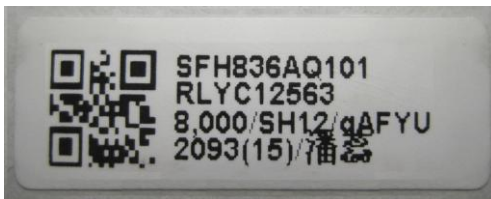
10 inch reel : 8,000 pcs/reel


11-3. TAPING STRUCTURE

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

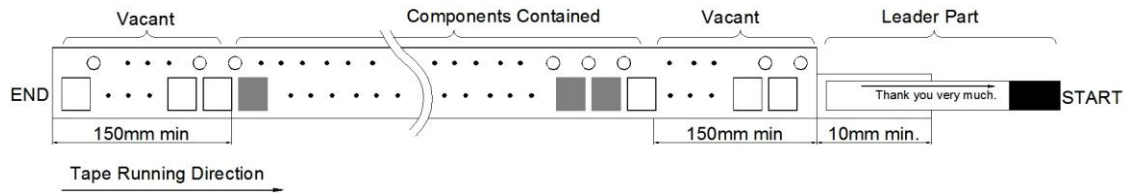


11-3-2. BAR CODE LABEL



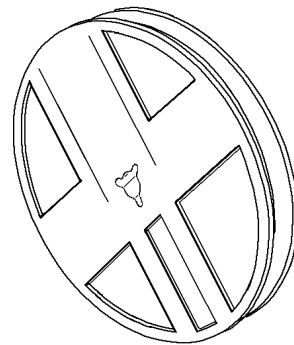
- |   |   |                    |
|---|---|--------------------|
| ① |  | MODEL NAME BARCODE |
| ② | SFH836AQ101   | Model Name         |
| ③ | RLYC12563   | Reel number        |
| ④ | 8000 / qAFYU  | Quantity / Marking |

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

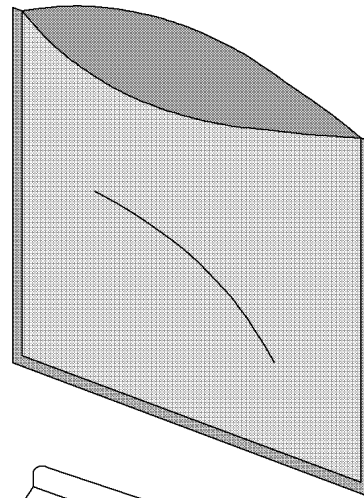


11-4. INNER BOX(Reel Packing) STRUCTURE

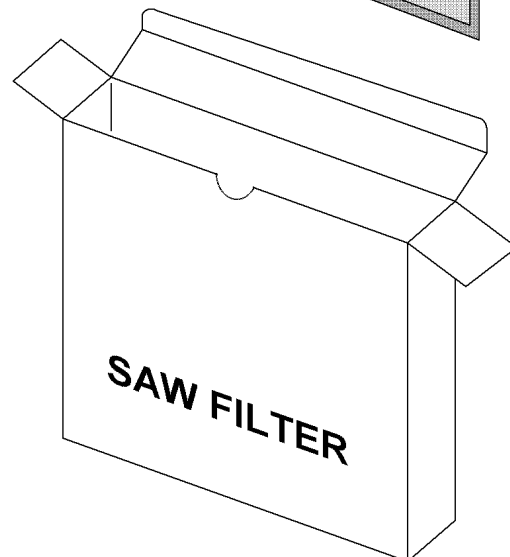
Material: Polycarbonate



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



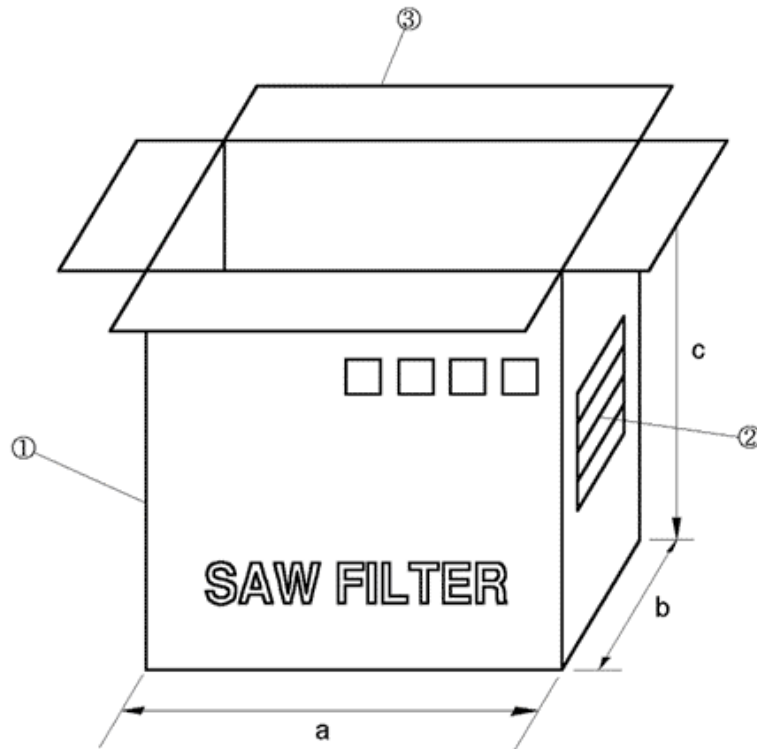
Material: Paper  
Size: (D)260×(W)37×(H)265mm<sup>3</sup>



11-5. OUTER BOX STRUCTURE

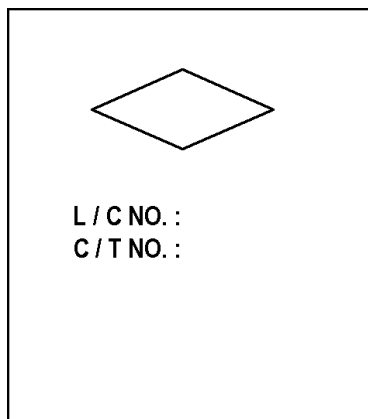
Material : Paper

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



SIDE ①

SIDE ②



MODEL	
Q'TY	EA
USER	
DATE	. .

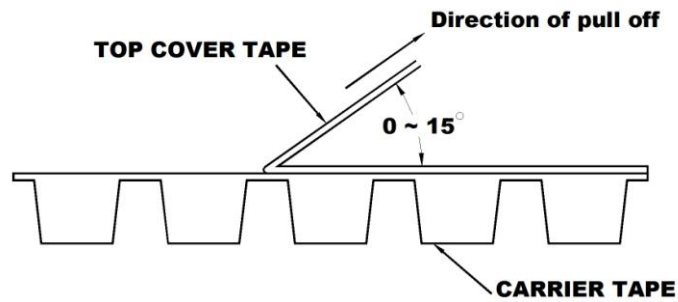
- SIDE is the same as front side.

## 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

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**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  
**Test Period** : 2013. 07. 04 to 2013. 07. 08  
**Buyer(s)** : SAMSUNG  
**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.  
**Test Comments** : By the applicant's specific request, the sampling and testing was performed only for the part indicated in the photo without disassembly.

Timothy Jeon  
Jinhee Kim  
Cindy Park  
Jerry Jung/ Testing Person

SGS Korea Co., Ltd.



Jeff Jang / Chemical Lab Mgr

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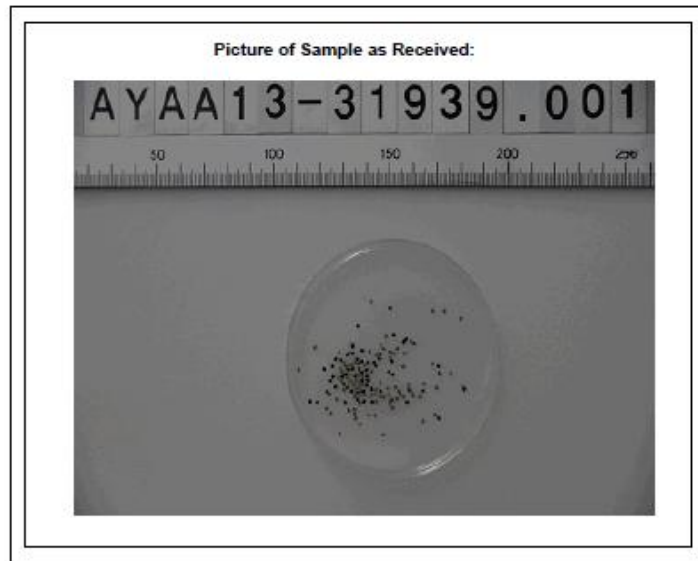
**Sample No.** : AYAA13-31939.001  
**Sample Description** : SAW FILTER  
**Item No./Part No.** : N/A  
**Materials** : N/A

**Flame Retardants-PBBs/PBDEs**

Test Items	Unit	Test Method	MDL	Results
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.

**Halogen Content**

Test Items	Unit	Test Method	MDL	Results
Bromine(Br)	mg/kg	BS EN 14582:2007 , IC	30	N.D.
Chlorine(Cl)	mg/kg	BS EN 14582:2007 , IC	30	N.D.



**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.

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SGS Korea Co., Ltd.

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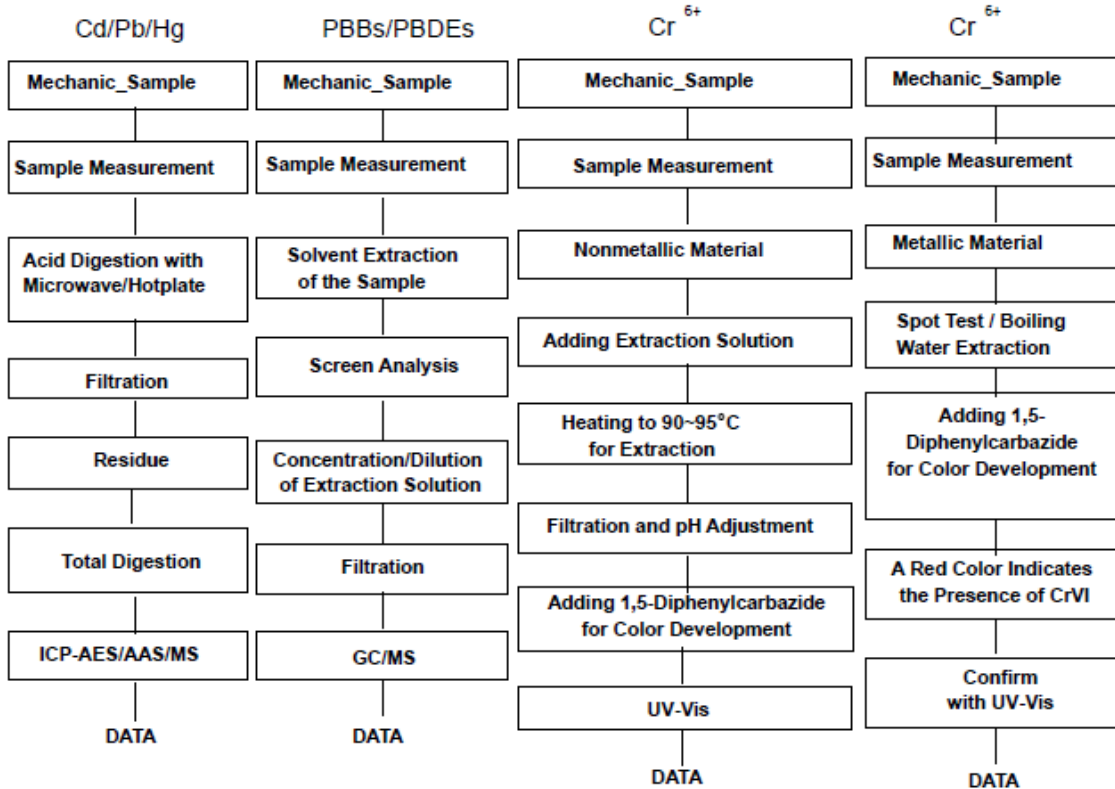




Test Report No. F690101/LF-CTSAYAA13-31939

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



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

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F052 Version5

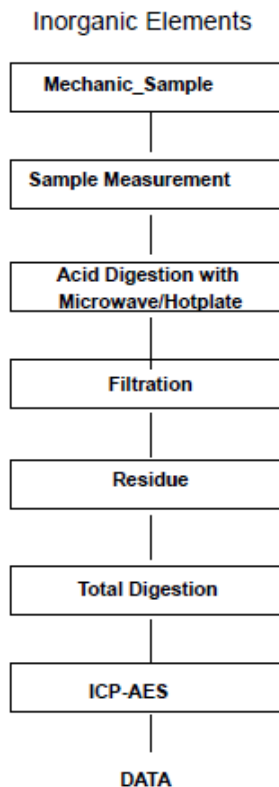
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Test Report No. F690101/LF-CTSAYAA13-31939

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**Flow Chart for Inorganic Elements Testing**



**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.

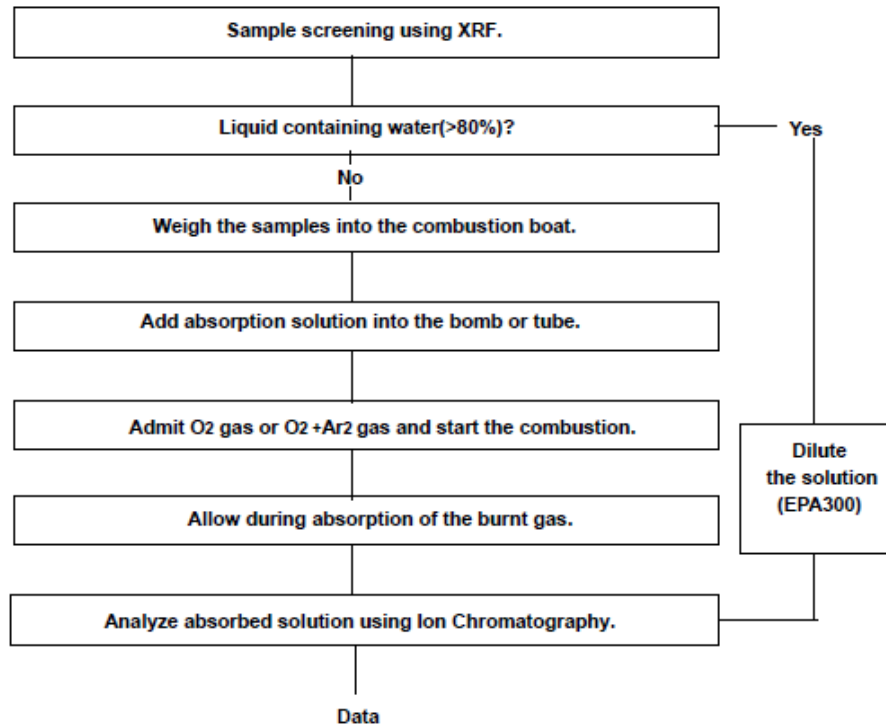
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Flow Chart for Halogen Test



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

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:  
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