

# SPECIFICATIONS FOR APPROVAL



Customer Part No.: \_\_\_\_\_ HELE. Part No: **X5H013560FC1H-X**  
Application For: \_\_\_\_\_ Products: **QUARTZ CRYSTAL**  
Accepted Model: \_\_\_\_\_ Type & Freq.: **HSX530G/ 13.560MHz**  
Sample Order No: **EOS-EA0212-2** Date: **2014/10/22**

Approved By :

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Title <b>HSX530G</b> <b>QUARTZ CRYSTAL SPECIFICATION</b>				Country of origin <b>TAIWAN FACTORY</b> <b>THAILAND FACTORY</b> <b>CHINA FACTORY</b>		
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**HARMONY ELECTRONICS CORP.**

# HSX530G SPECIFICATION

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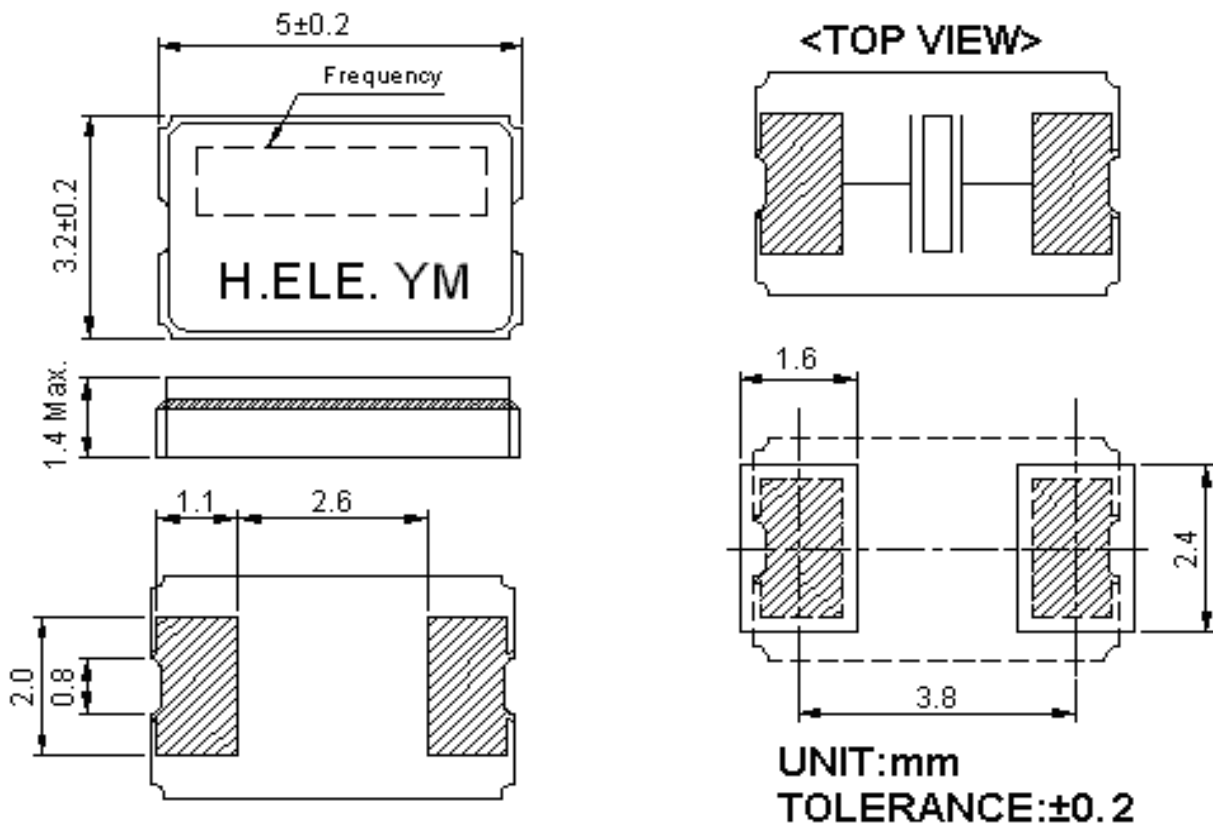
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# 1. QUARTZ CRYSTAL UNIT SPECIFICATION

- |                                |   |
|--------------------------------|---|
| 1. Frequency:                  | 13.560000MHz  |
| 2. Holder type :               | <b>HSX530G</b>  |
| 3. Frequency tolerance:        | +/-30ppm at 25deg.C+/- 3deg.C   |
| 4. Equivalent resistance:      | 100 ohms Max. / SERIES  |
| 5. Storage temperature range:  | -40deg.C To +85deg.C  |
| 6. Operable temperature range: | -20deg.C To +70deg.C  |
| 7. Temperature drift:          | +/- 30ppm          -20deg.C To +70deg.C                                     |
| 8. Loading capacitance (CL) :  | 12.0 pF   |
| 9. Drive level:                | 10 uW    (300uW Max)  |
| 10. Shunt Capacitance:         | 7.0 pF Max.   |
| 11. Insulation resistance :    | More than 500M ohms at DC 100V  |
| 12. Mode of oscillation:       | Fundamental   |
| 13. Circuit:                   | Measured in HP/E5100A,S&A 250B  |
| 14. Shocking :                 | Dropping from 75 cm height 3 times on firm wood                             |
| Variation :                    | Frequency less than +/-5 ppm<br>Resistance less than +/- 15 % or 2ohms max. |
| 15. Aging:                     | Less than +/-5 ppm/Year   |
| 16. Holder                     | HSX530G Ceramic Base  |
| 17. Dimensions and marking     | Refer to page.4   |
| 18 Emboss carrier tape & reel  | Refer to page.6 and page.7  |
| 19. Moisture Sensitivity Level | Level 1   |
| 20. Note:                      |   |

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## 2. HSX530G MARKING & DIMENSIONS



\*Marking should be printed as following:

Nominal Frequency, Logo, Manufactured year & month

\*Nominal frequency (□)= 3 number after decimal point MAX.

(ex. 12.000 MHz → 12.000)

\*Manufacturing Lot No.

(Y: year) ex. 2000 shall be marked as ' 0 ' (As shown on the Table-1)

(M: month) ex. June shall be marked as ' F ' (As shown on the Table-2).

**Marking : Laser marking.**

(Table-1)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Code	0	1	2	3	4	5	6	7	8	9

(Table-2)

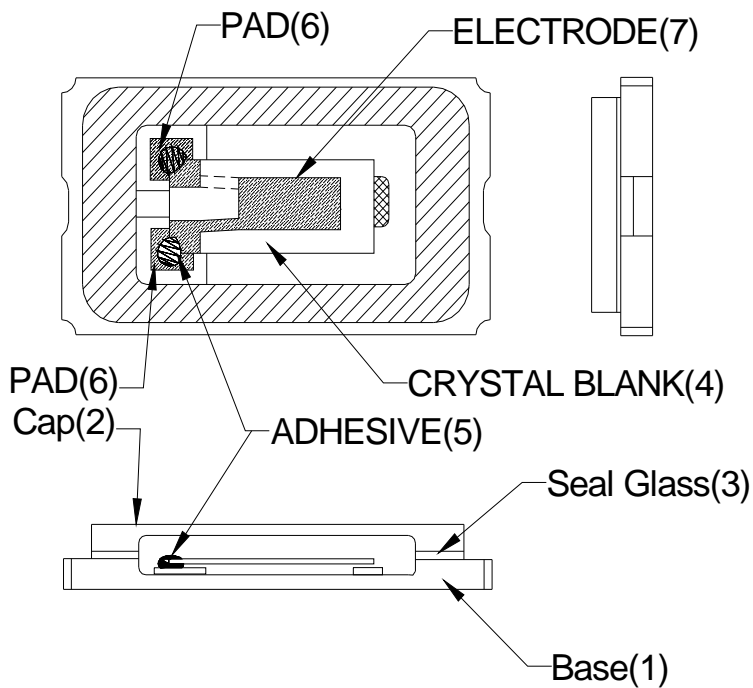
Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
A	B	C	D	E	F	G	H	J	K	L	M

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**QUARTZ CRYSTAL SPECIFICATION**

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### 3. INSIDE STRUCTURE



※Reference drawing

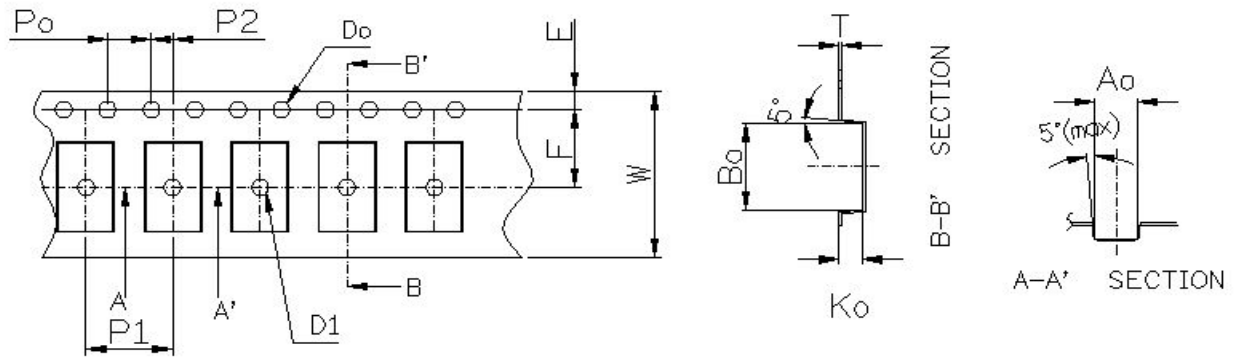
(1) Base: Alumina Ceramic (Al <sub>2</sub> O <sub>3</sub> )
(6) Metallized Pad: W Ni Plating Au Plating
(2) Cap: Alumina Ceramic (Al <sub>2</sub> O <sub>3</sub> )
(3) Crystal Enclosure Seal: Seal Glass
(4) Crystal Blank Rectangular At-Cut Quartz Crystal Blank
(5) Adhesive Silver Conductive Silicon Resin
(7) Electrode

The use prohibition chemistry substance of Table 1 of DHE-0204-1 (HE-QA-24) is not included in this item.

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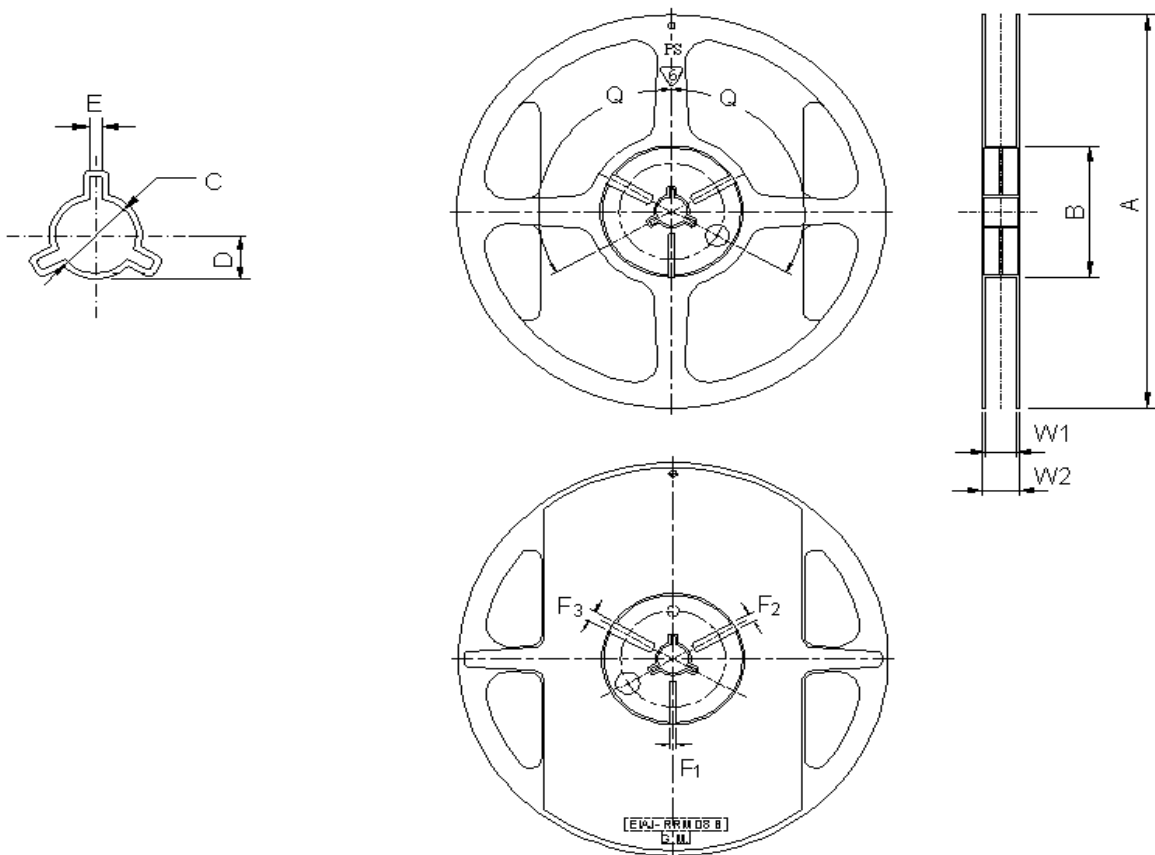
#### 4. HSX530G EMBOSS CARRIER TAPE & REEL

##### a.) Dimensions of Carrier Tape



Symbol	$A_0$	$B_0$	$K_0$	$P_0$	$P_1$	$P_2$	$T$
Spec	$3.60 \pm 0.1$	$5.40 \pm 0.1$	$1.40 \pm 0.1$	$4.0 \pm 0.1$	$8.0 \pm 0.1$	$2.0 \pm 0.05$	$0.30 \pm 0.05$
Symbol	$E$	$F$	$D_0$	$D_1$	$W$	$10P_0$	
Spec	$1.75 \pm 0.1$	$5.50 \pm 0.05$	$1.55 \pm 0.05$	1.50 (min)	$12.0 \pm 0.2$	$40.0 \pm 0.1$	

##### b.) Dimensions of Reel



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(Table-2)

(UNIT: mm)

ITEM		MARK	DIMENSIONS • ANGLE	
FLANCE	Diameter	A	$\psi 180+0/-3$	
	Inner Width	W1	12.8+/-0.3	
	Outer Width	W2	15.5+/-1.0	
HUB	Out Line diameter		B	$\psi 60.5+/-0.5$
	Center Core slit	Width	F1	3.0+0.5/-0
			F2	4.0+0.5/-0
			F3	5.0+0.5/-0
	Position		Q	120deg
	Spindle diameter		C	$\psi 13.2+/-0.5$
Key Ditch	Width	E	3.0+/-0.2	

## c.) Storage condition

Temperature: +40°C Max.

Relative Humidity: 80% Max.



## d.) Standard packing quantity

1,000 PCS / REEL

## e.) Material of the tape

Tape	Material
Carrier tape	PS
Top tape	PET

## f.) Label contents

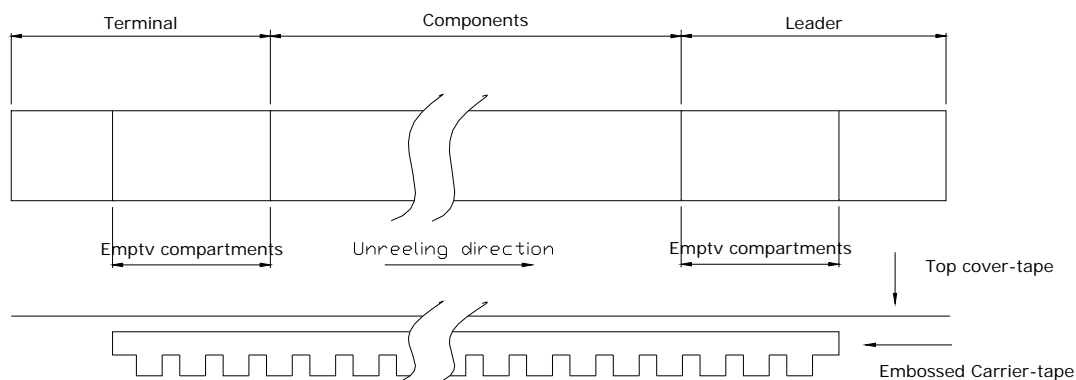
	
TYPE:	
SPEC.No.:	
Parts No.:	
Lot No.:	
FREQ.:	MHZ
Q'TY:	PCS
HARMONY ELECTRONICS CORP.  ROHS	

Sticks label for every reel.

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g.) Taping dimension

Leader	Cover-tape	The length of cover-tape in the leader is more than 400 mm including empty embossed area.
	Carrier-tape	After all products were packaged, must remain more than twenty pieces or 400 mm empty area, which should be sealed by cover-tape.
Terminal	Cover-tape	The tip of cover-tape shall be fixed temporary by paper tape and roll around the core of reel one round.
	Carrier-tape	The empty embossed area which are sealed by top cover-tape must remain more the 40 mm.



h.) Joint of tape

The carrier-tape and top cover-tape should not be jointed.

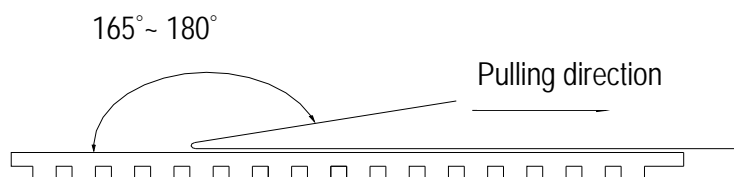
i.) Release strength of cover tape

It has to between 0.1N to 0.7N under following condition.

Pulling direction 165° to 180°

Speed 300mm/min.

Otherwise unless specified.

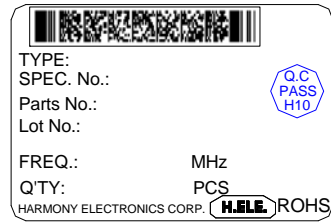
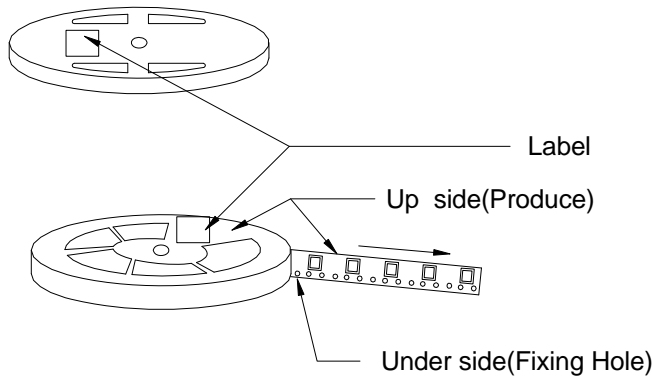


Other standards shall be based on JIS C 0806-1990.

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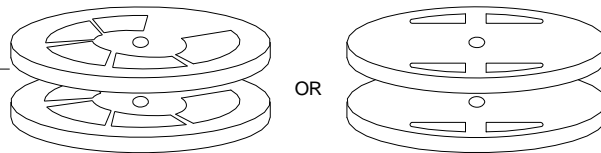
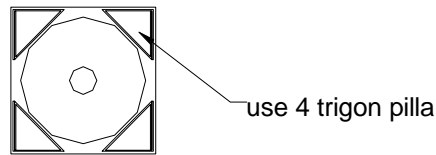


j.) Package

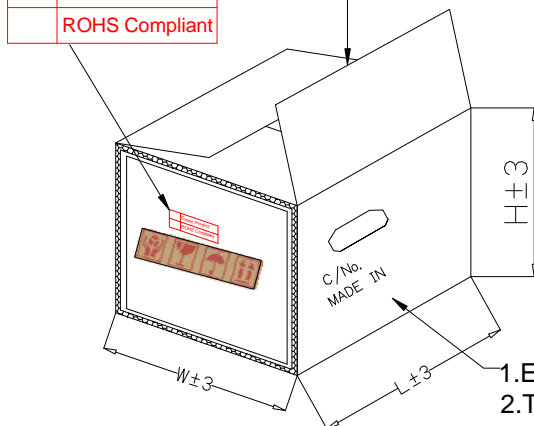


One reel quantity: [1000pcs]&[3000pcs]

- ① Top and bottom with 2.3cm thickness foam-rubber cushion for protection.
- ② Carton's Q'TY:1~15 pcs.
- ③ Carton Type=A,B,C use 4 trigon pillar to fasten the Reel.
- ④ Need to add 3 pages dry agent in each outer box.



Green Product  
ROHS Compliant



Carton Type	A	B	C	D
Produce Type	840/751	630/531/ 421	321/221 211/111	OTHER
Reel	15	15	15	1~7
L±3	200	200	200	195
W±3	200	200	200	195
H±3	230/260	230	230	150

- 1. Every Carton with 3 desiccant.
- 2. Top and bottom with 2.3cm thickness foam-rubber cushion for protection

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**5. Mechanical Endurance: Provided that measurement shall be carried out after it alone in the room temperature for 1 hour.**

	Item	Test Methods	Specifications Code
1	Drop	Should be satisfied after dropping three times from the height of 75 cm onto hard wooden board of thickness more than 30mm.	A
2	Vibration	Should be satisfied after supplying following vibration. (1)Vibration Frequency: 10~55Hz (2)Cycle: 1 to 2 Min. (3)Amplitude: 0.8mm (4)Direction: X.Y.Z (5)Time: 2 Hours / Each Direction	A
3	Substrate Bending	Mount the specimen on substrate. Apply the following pressure Direction: see Fig -1 Speed: 0.5 mm/sec Hours: 5 ± 1 sec Amount of substrate: 3 mm Max.	C
4	Adhesion	Mount the specimen on substrate. Apply the following pressure Direction: see Fig -2 Weight: 5N Hours: 10 ± 1 sec	
5	Body strength	Mount the specimen on substrate. Apply the following pressure Direction: see Fig -3 Weight: 10N Hours: 10 ± 1 sec	

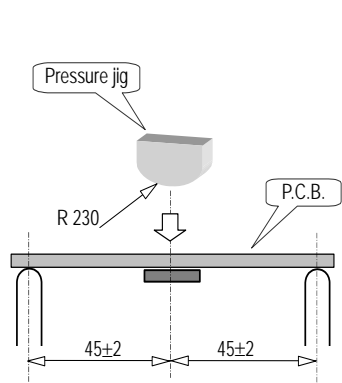


Fig-1

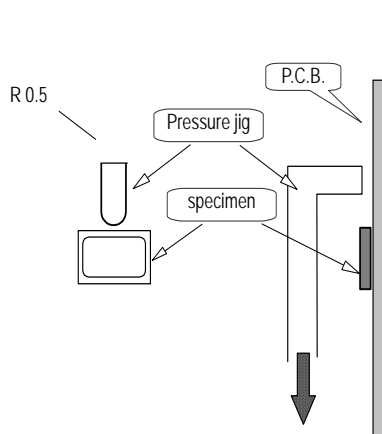


Fig-2

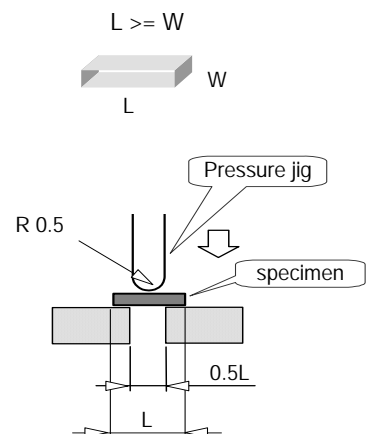
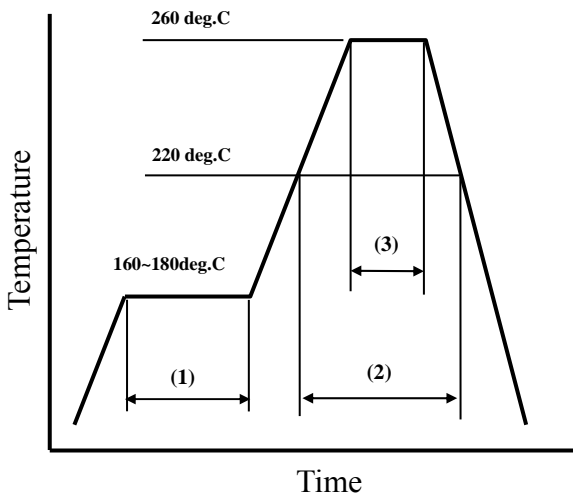


Fig-3

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**QUARTZ CRYSTAL SPECIFICATION**

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6	Seal	Less than $1.0 \times 10^{-8}$ Pa.m <sup>3</sup> /sec by Helium leak detector. Also, no serial bubble is observed by Fluorinate tests.	---												
7	Solder ability	3sec +/-0.5sec. Dip in 245deg.C +/-5deg.C solder. (Use ROSIN type flux for solder.)	B												
8	Resistance to Soldering Heat	<p>Run in reflow Reflow soldering shall be allowed Only two (2) time.</p> <p><b>Available for Lead Free Soldering</b></p>  <table border="1" data-bbox="534 1064 1093 1176"> <tr> <td>(1)</td> <td>Preheat</td> <td>160~180 deg.C</td> <td>120sec.</td> </tr> <tr> <td>(2)</td> <td>Primary heat</td> <td>220 deg.C</td> <td>60sec.</td> </tr> <tr> <td>(3)</td> <td>Peak</td> <td>260 deg.C</td> <td>10sec. Max.</td> </tr> </table>	(1)	Preheat	160~180 deg.C	120sec.	(2)	Primary heat	220 deg.C	60sec.	(3)	Peak	260 deg.C	10sec. Max.	A
(1)	Preheat	160~180 deg.C	120sec.												
(2)	Primary heat	220 deg.C	60sec.												
(3)	Peak	260 deg.C	10sec. Max.												

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**6. Environmental Endurance: Provided that measurement shall be carried out after letting it alone in the room temperature for 1 hour.**

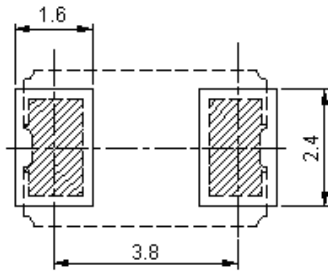
	Item	Test Methods	Specifications Code
1	Humidity	Should be satisfied after letting it alone at +60deg.C+/-2deg.C in humidity of 90% ~ 95% for 240 hours.	A
2	Storage in Low Temperature	Should be satisfied after letting it alone at -40deg.C+/-2deg.C for 240 hours.	A
3	Storage in High Temperature	Should be satisfied after letting it alone at +85deg.C+/-2deg.C for 240 hours.	A
4	Thermal Shock	Should be satisfied after supplying the following temperature cycle (25 cycles). Temperature increasing or reducing time within 3 minutes. 	A

Specifications code	Specifications
<b>A</b>	Frequency variation shall be within +/-5ppm and equivalent resistance shall be within the specification after the test
<b>B</b>	More than 90% of lead shall be covered by new solder.
<b>C</b>	Without mechanical damage such as breaks. Without electrode peeling. Electrical characteristics shall be satisfied.

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## 7. Supplement

### 7.1.Land pattern layout(Example)



### 7.2.Solder iron (Example)

Bit temp.: 350°C max., Time:3sec max. , Each terminal solder a 1 time max.

### 7.3.Mounting

This component is designed for automatic insertion.

However, you are requested to do the trial with your insertion machine in order to be Sure of proper operation and no damage of component.

Please pay attention to board warp which may damage the component and cause Soldering Process.

Avoid mounting and processing by Ultrasonic welding because this method has a Possibility of an excessive vibration spreading inside the crystal products and Becoming the cause of characteristic deterioration and not oscillating.

### 7.4.Cleaning

Cleaning liquid which corrodes Nickel shall not be used

It may cause the problem on the surface, color, marking etc.

Ultra-sonic cleaning is possible, however, you are requested to check on your board.

Because we only checked as single unit.

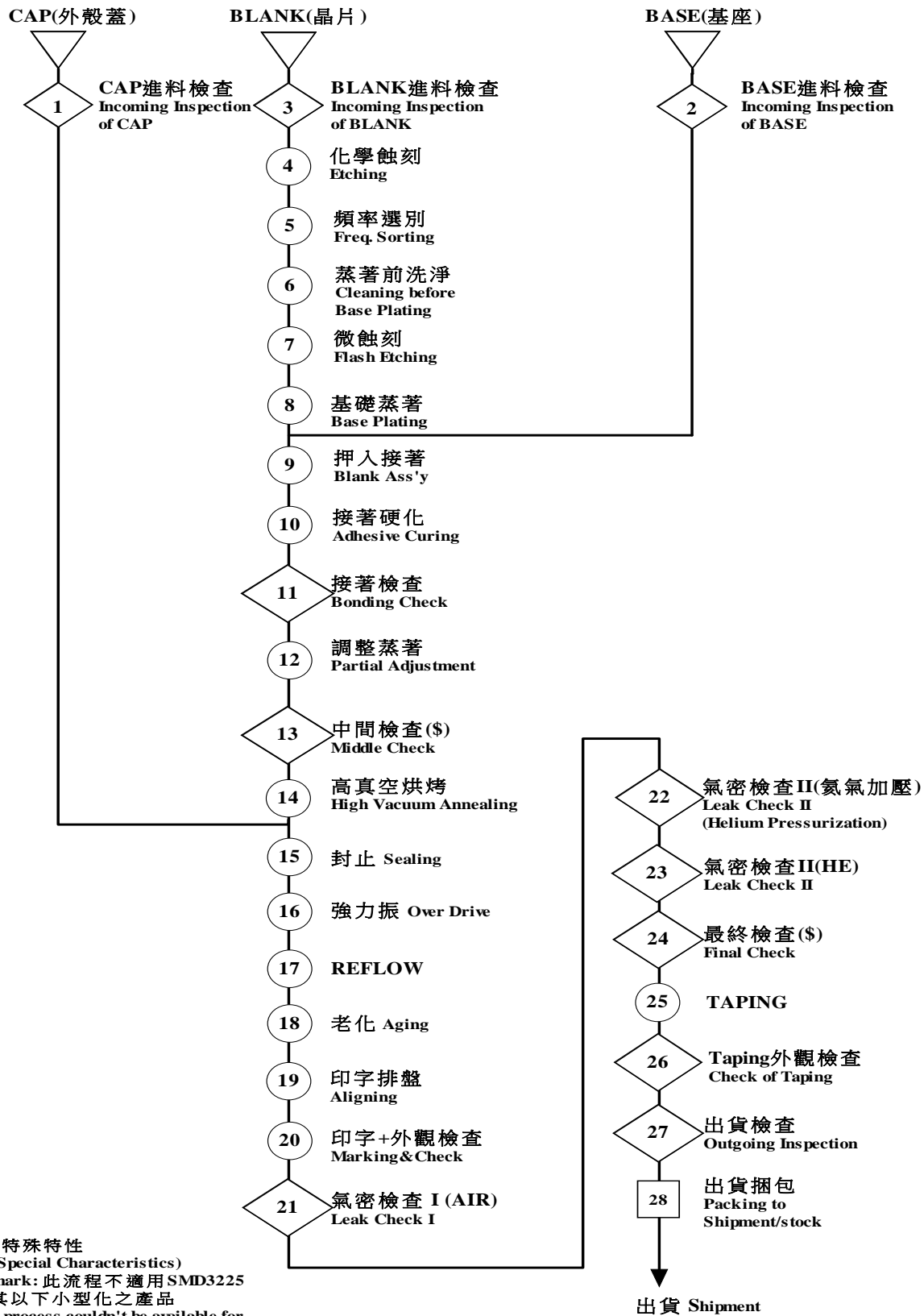
### 7.5.Storage

Please keep away from high temperature and high humidity, which may cause put solderability.

No direct Sunlight, No dew as well.

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### 8. Flow Chart



(\$): 特殊特性  
 (For Special Characteristics)  
 \*Remark: 此流程不適用SMD3225  
 及其以下小型化之產品  
 (The process couldn't be available for  
 SMD3225 and the smaller PKG.)

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## 9. Environmental Workload Chemical Substance Components List

Environmental Workload Chemical Substance Components List		
Chemical Substance Components	TYPE	H(D)SX530G
	PERCENTAGE	47(mg) ppm
Silicon(Si)		0.21150 99.4050
Gold(Au)		0.06110 28.7170
Fluorinre(F)		0.98700 463.8900
Titanium(Ti)		0.22560 106.0320
Boron(B)		0.06110 28.7170
Cobalt and its compound(Co)		0.04042 18.9974
Lead(Pb)		3.40280 1599.3160
Bismuth(Bi)		0.23500 110.4500
Silver(Ag)		0.08930 41.9710
Chromium and its compound(Cr)		0.07520 35.3440
Zinc(Zn)		0.68620 322.5140
Aluminum(Al)		21.14530 9938.2910
Manganese and its compound(Mn)		0.22090 103.8230
Wolfram and its compound(W)		0.24910 117.0770
Nickel and its compound(Ni)		0.17390 81.7330
Iron(Fe)		1.82830 859.3010

Title <b>HSX530G</b> <b>QUARTZ CRYSTAL SPECIFICATION</b>				Country of origin <b>TAIWAN FACTORY</b> <b>THAILAND FACTORY</b> <b>CHINA FACTORY</b>		
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