

# PRELIMINARY SPECIFICATIONS



Customer Part No.: \_\_\_\_\_ HELE. Part No: X5H012000FC1H-X

Application For: \_\_\_\_\_ Products: QUARTZ CRYSTAL

Accepted Model: \_\_\_\_\_ Type & Freq.: HSX530G 12.000MHz

Sample Order No: \_\_\_\_\_ Date: 2012/10/15

Approved By :

## 加高電子股份有限公司

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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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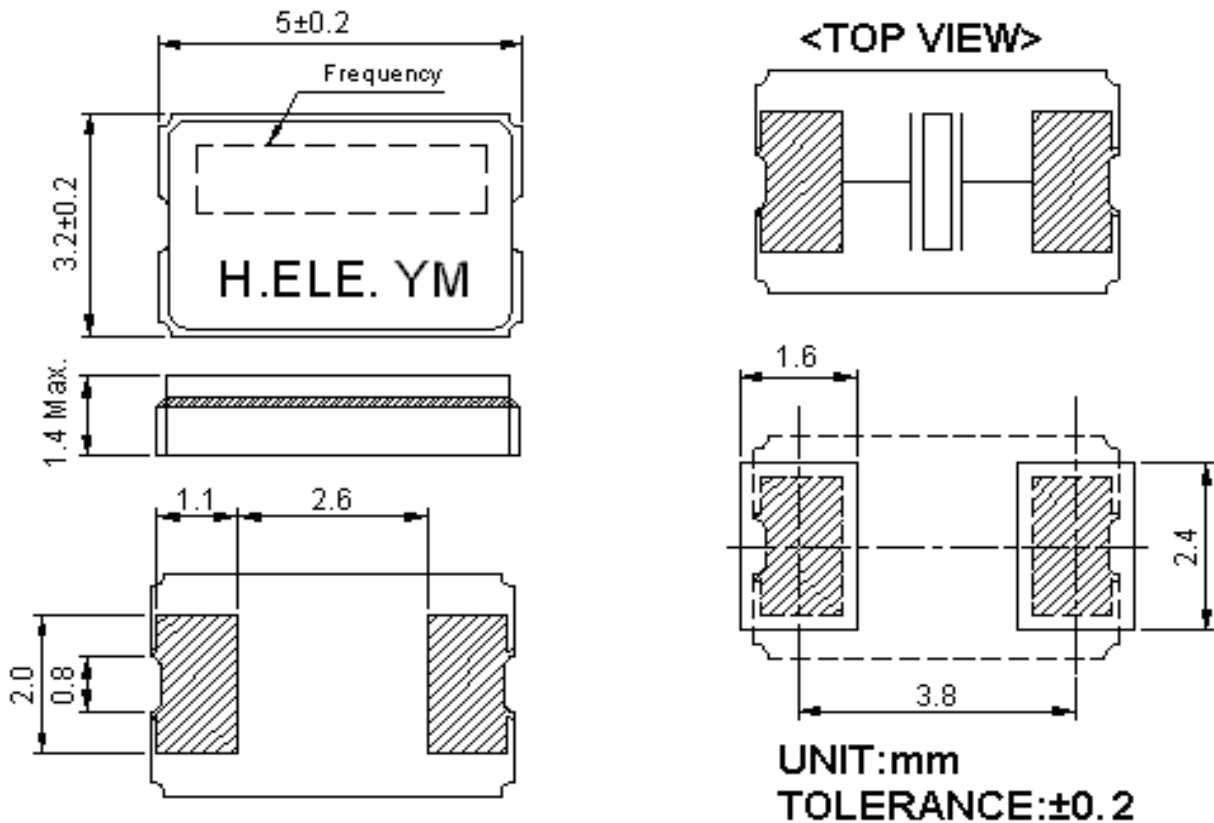
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# 1. QUARTZ CRYSTAL UNIT SPECIFICATION

1. Frequency:	12.000000MHz
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:	-40deg.C To +85deg.C
7. Temperature drift:	+/-50ppm                      -40deg.C To +85deg.C
8. Loading capacitance (CL) :	12.0pF
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 50 cm height 3 times on firm wood
Variation :	Frequency less than +/-5 ppm 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  $\rightarrow$  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)

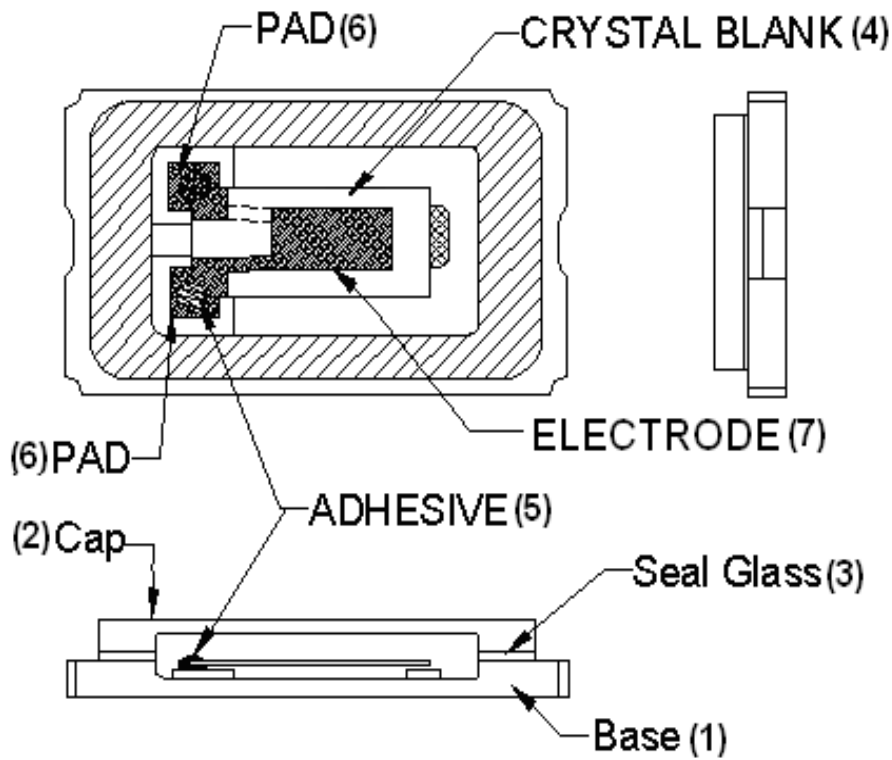
Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
A	B	C	D	E	F	G	H	J	K	L	M

Title **HSX530G**  
**QUARTZ CRYSTAL SPECIFICATION**

Country of origin **TAIWAN FACTORY**  
**THAILAND FACTORY**  
**CHINA FACTORY**

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### 3. INSIDE STRUCTURE



※Reference drawing

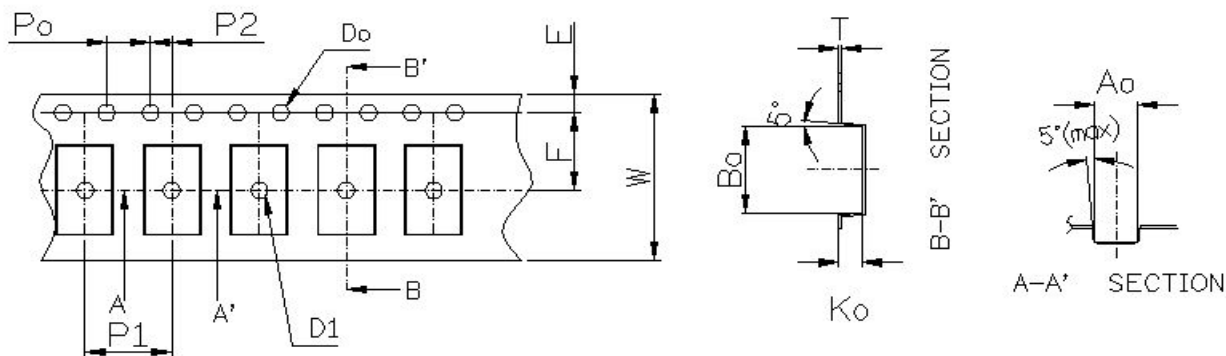
(1) Base: Alumina Ceramic ( $Al_2O_3$ ) Metallized Pad: Ni Plating Au Plating
(2) Cap: Alumina Ceramic ( $Al_2O_3$ )
(3) Crystal Enclosure Seal: Seal Glass
(4) Crystal Blank Rectangular At-Cut Quartz Crystal Blank
(5) Adhesive Silver Conductive Silicon Resin
(6) PAD Alumina Ceramic (Ni. Au)
(7) Electrode

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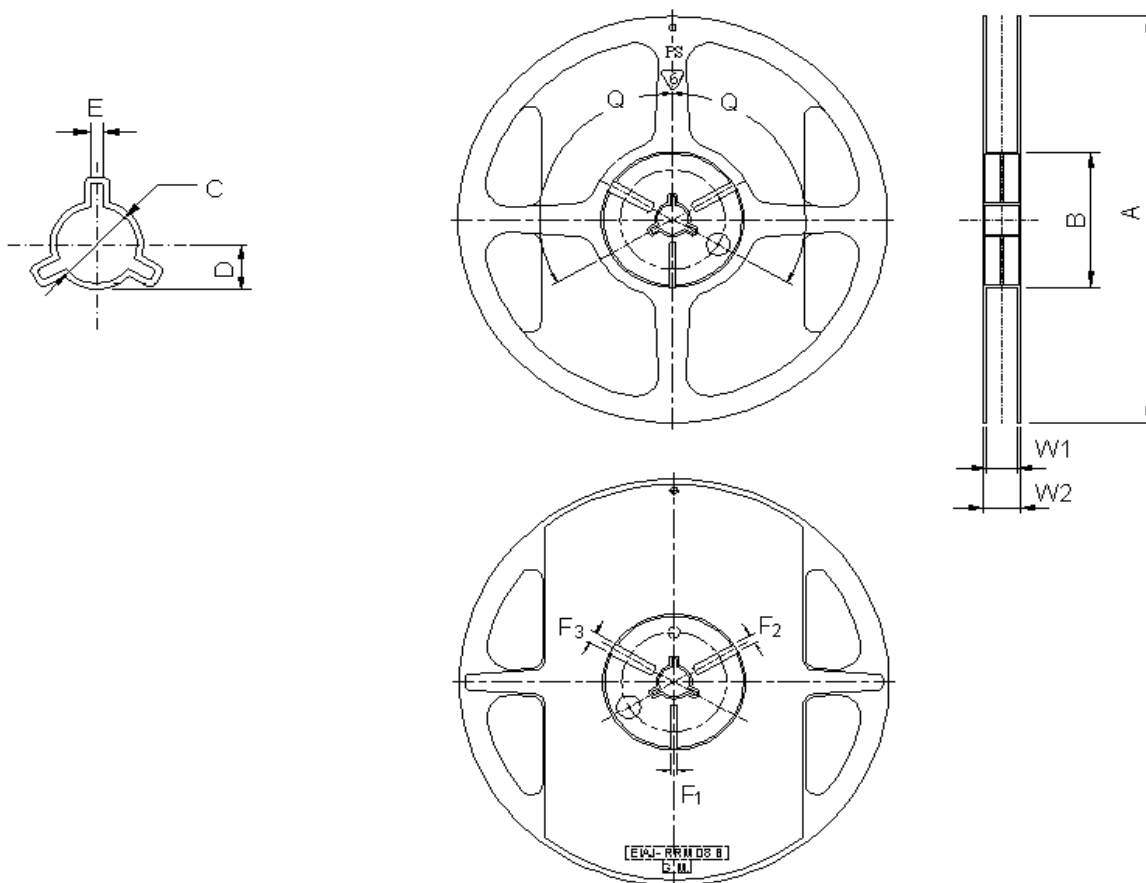
#### 4. HSX530G EMOSS CARRIER TAPE & REEL

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



Symbol	<b>Ao</b>	<b>Bo</b>	<b>Ko</b>	<b>Po</b>	<b>P1</b>	<b>P2</b>	<b>T</b>
Spec	3.60±0.1	5.40±0.1	1.40±0.1	4.0±0.1	8.0±0.1	2.0±0.05	0.30±0.05
Symbol	<b>E</b>	<b>F</b>	<b>Do</b>	<b>D1</b>	<b>W</b>	<b>10Po</b>	
Spec	1.75±0.1	5.50±0.05	1.55±0.05	1.50(min)	12.0±0.2	40.0±0.1	

##### b.) Dimensions of Reel



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(Table-2)

(UNIT: mm)

ITEM		MARK	DIMENSIONS · ANGLE	
FLANCE	Diameter	A	$\phi$ 180+0/-3	
	Inner Width	W1	12.8+/-0.3	
	Outer Width	W2	15.5+/-1.0	
HUB	Out Line diameter	B	$\phi$ 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	$\phi$ 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

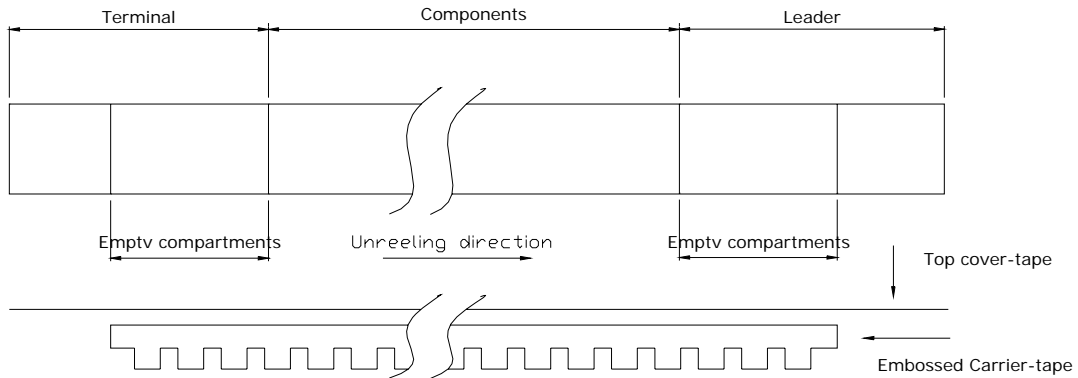
	
TYPE:	
SPEC.No.:	
Parts No.:	
Lot No.:	
FREQ.:	MHz
Q'TY:	PCS
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Sticks label for every reel.

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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.

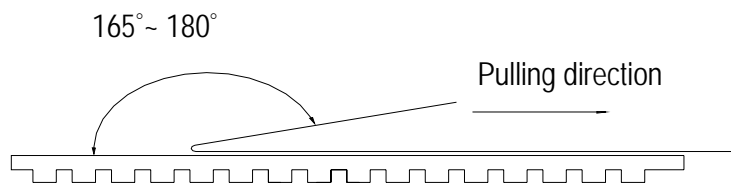
i.) Release strength of cover tape

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

Pulling direction 165° to 180°

Speed 300mm/min.

Otherwise unless specified.



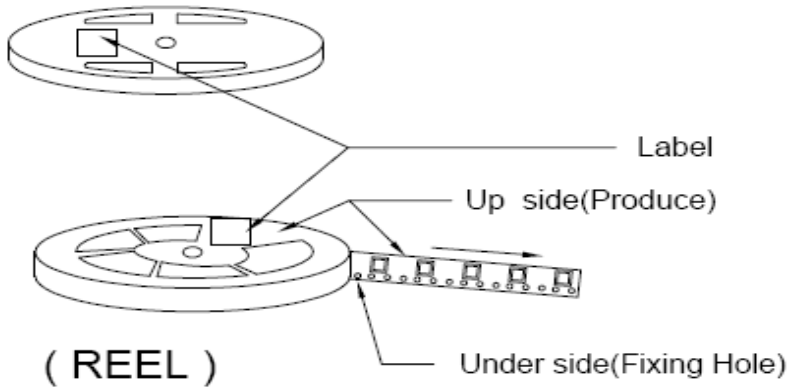
Other standards shall be based on JIS C 0806-1990.


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j.) Package

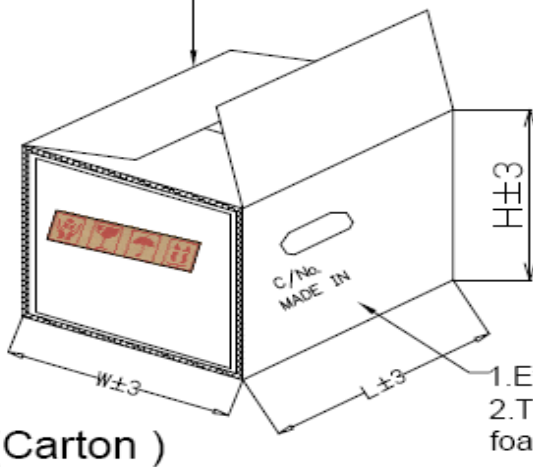
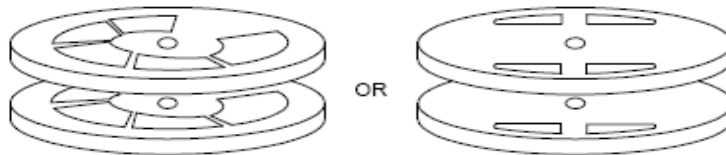
1. Reel :  $\varnothing 180$



	
TYPE:	
SPEC.No.:	
Parts No.:	
LotNo.:	
FREQ.:	MHz
Q'TY:	PCS
HARMONY ELECTRONICS CORP.  ROHS	

## 2. Carton 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.



Carton Type	A	B	C	D
Produce Type	840/751	630/531/ 421	321/21	OTHER
Reel	15	15	15	1~7
L±3	200	200	200	195
W±3	200	200	200	195
H±3	230	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 50 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	

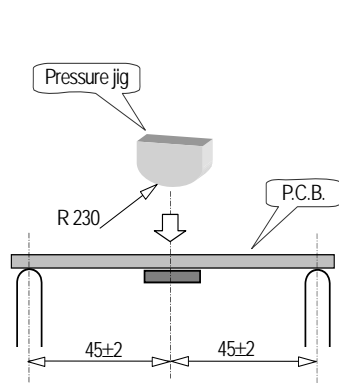


Fig-1

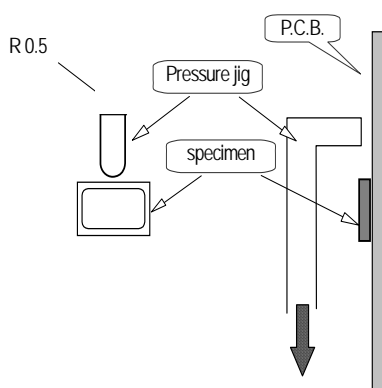


Fig-2

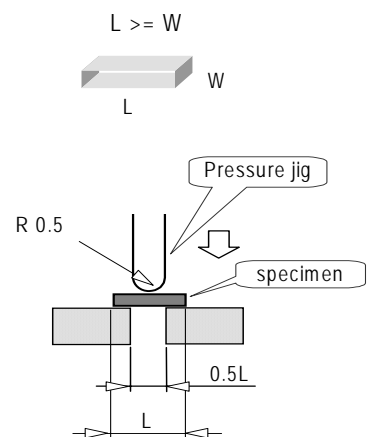
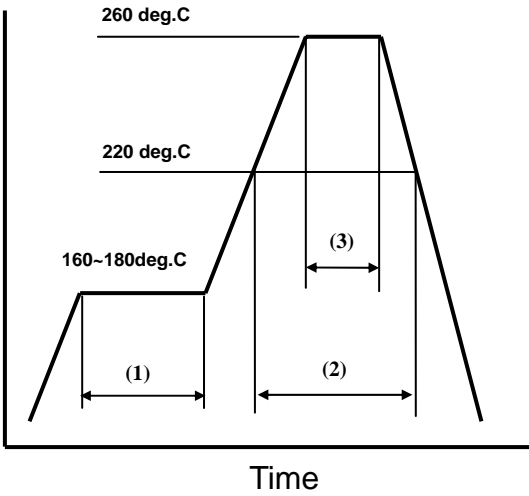


Fig-3

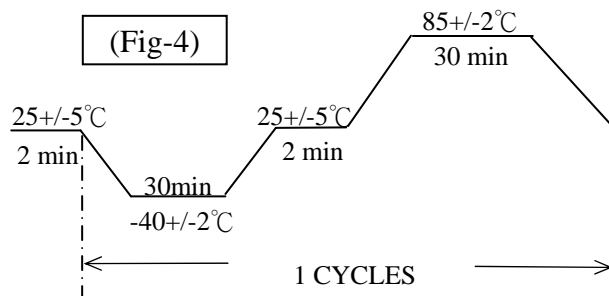
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6	Seal	Less than $1.0 \times 10^{-8}$ Pa.m <sup>3</sup> /sec by Helium leak detector. Also, no serial bubble is observed by Fluorinate tests.	---												
7	Solder ability	3sec +/-0.5sec. Dip in 245deg.C +/-5deg.C solder. (Use ROSIN type flux for solder.)	B												
8	Resistance to Soldering Heat	<p>Run in reflow Reflow soldering shall be allowed Only two (2) time.</p> <p><i>Available for Lead Free Soldering</i></p>  <table border="1" data-bbox="534 1086 1093 1189"> <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.**

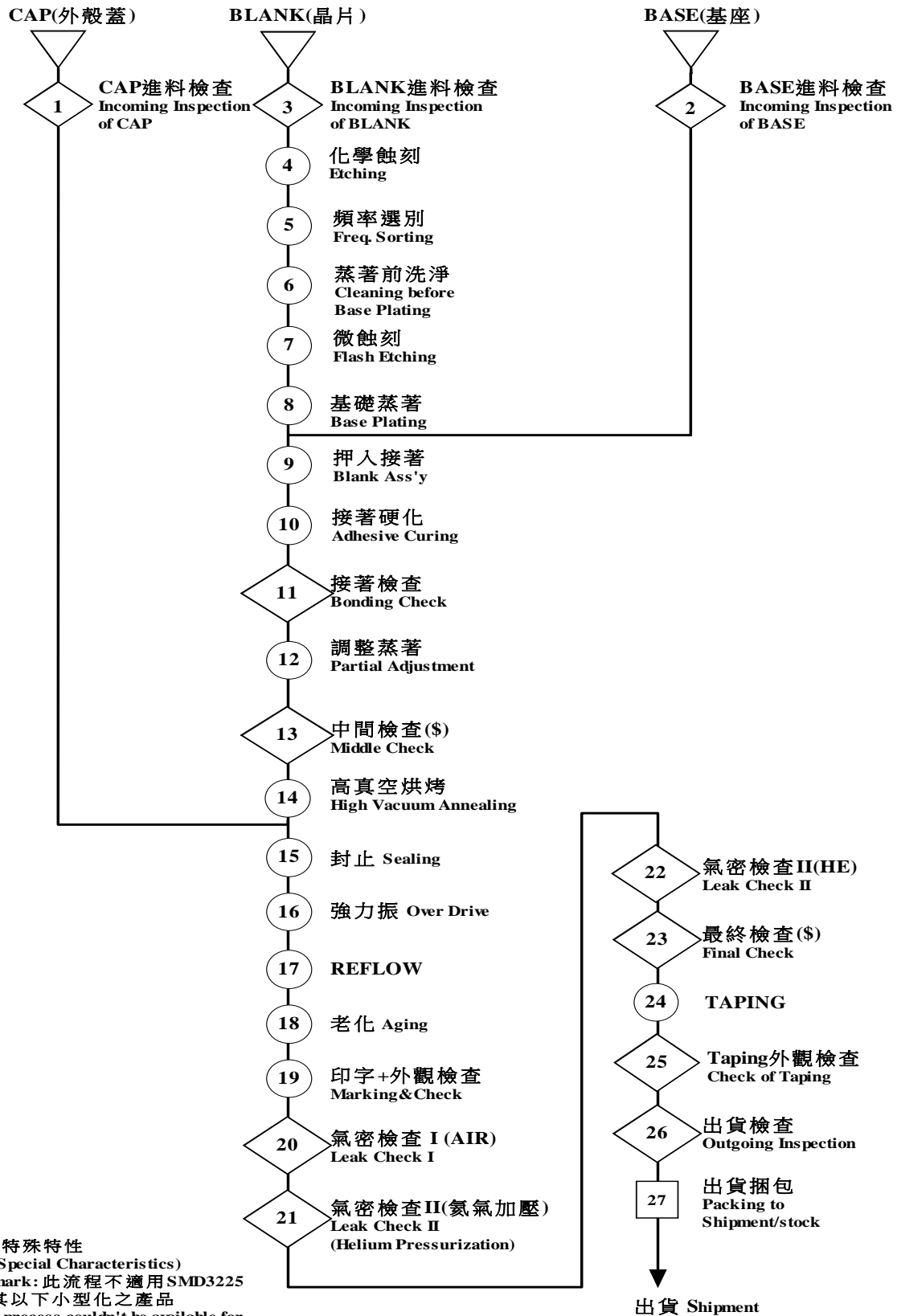
	Item	Test Methods	Specifications Code
1	Humidity	Should be satisfied after letting it alone at +60deg.C+/-2deg.C in humidity of 90% ~ 95% for 240 hours.	A
2	Storage in Low Temperature	Should be satisfied after letting it alone at -40deg.C+/-2deg.C for 240 hours.	A
3	Storage in High Temperature	Should 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). (Refer to Fig-4). 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. Flow Chart



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**8. Environmental Workload Chemical Substance Components List**

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

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