

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

HARMONY ELECTRONICS CORP.

HARMONY ELECTRONICS (THAILAND) CO., LTD.

HARMONY ELECTRONICS (SHENZHEN) CORP., LTD.

HARMONY ELECTRONICS (SUZHOU) CO.,LTD

TAIPEI OFFICE:

公司:(114)
台北市內湖區堤頂大道 2 段 409
號 2 樓
2F., NO.409, SEC.2, TIDING
BLVD., NEIHU DISTRICT,
TAIPEI CITY 114, TAIWAN
TEL:886-2-26588883
FAX:886-2-26588683

TAIWAN FACTORY:

工廠:(831)
高雄市大寮區大發工業區華東路
39 號
No.39, HWA DONG RD.,
DALLIAO DIST.,DAFA
INDUSTRIAL PARK.,
KAOHSIUNG CITY 831,
TAIWAN
TEL: (07)787-1555-6
FAX: (07)787-1557

THAILAND FACTORY:

66MOO 5,
KAONGU-BEOKPRAI RD.,
T.BEOKPRAI, A. BANPONG,
RAJCHABUREE PROVINCE
70110, THAILAND
TEL: (032)221994-6,
200740-1
FAX: (032)200742

SHENZHEN FACTORY:

深圳市福永鎮塘尾村塘橋路聚源
工業區
QIAO TANG RD., TANGWEI
VILLAGE FU YONG TOWN
SHENZHEN CITY CHINA
TEL: 0755-27309272 /
27309262
FAX: 0755-27309755

SUZHOU FACTORY:

蘇州市相城區黃埭鎮安民路 5 號
NO.5 ANMING ROAD,
HUANGDAI TOWN,
XIANGCHENG DISTRICT,
SUZHOU CITY, JIANGSU
PROVINCE
TEL:86-512-67592373
FAX:86-512-67592363

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HARMONY ELECTRONICS CORP.

HSX530G SPECIFICATION

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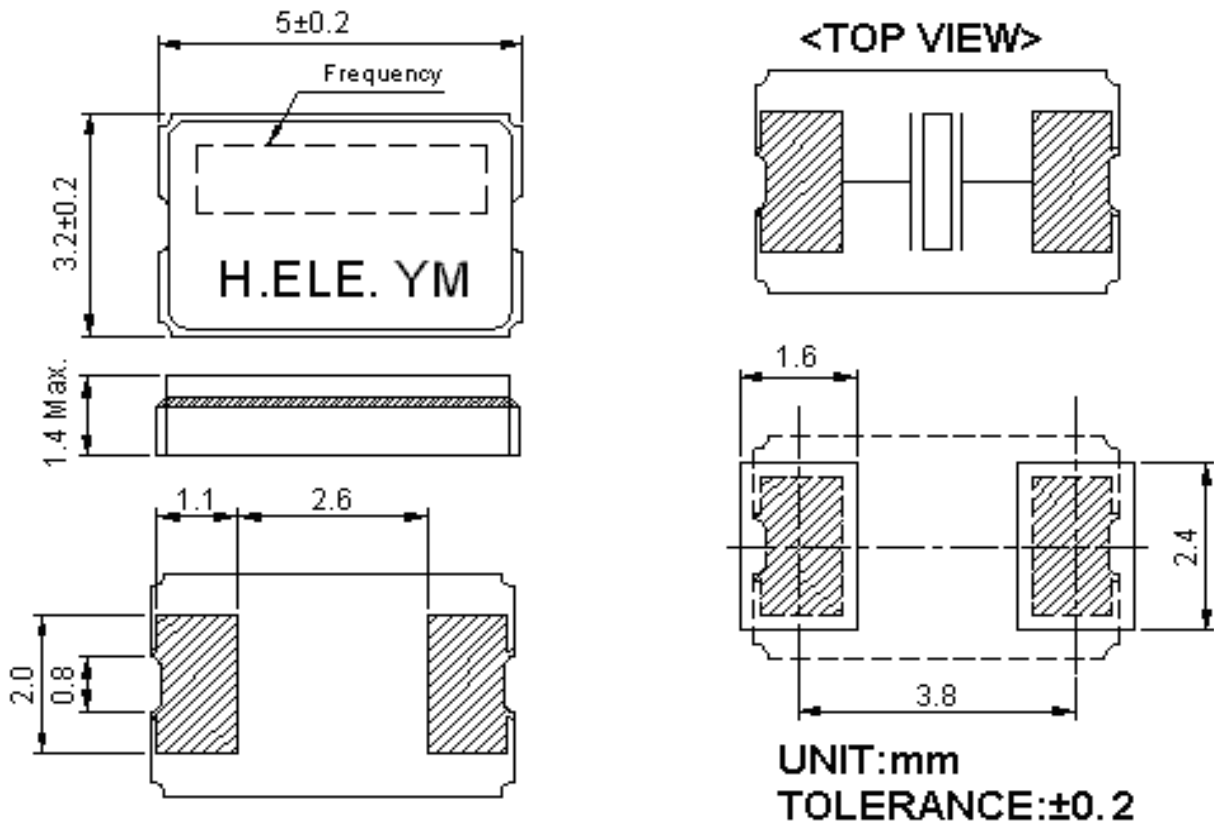
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1. QUARTZ CRYSTAL UNIT SPECIFICATION

- | | |
|--------------------------------|---|
| 1. Frequency: | 12.000000MHz |
| 2. Holder type : | HSX530G |
| 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)

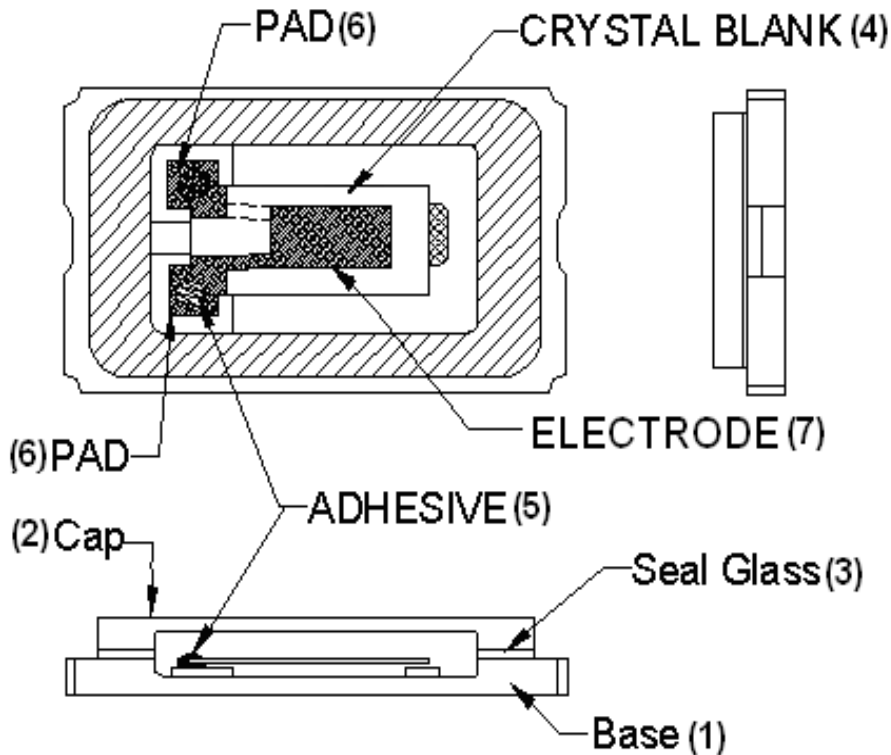
Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
A	B	C	D	E	F	G	H	J	K	L	M

Title **HSX530G**
QUARTZ CRYSTAL SPECIFICATION

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

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3. INSIDE STRUCTURE



※Reference drawing

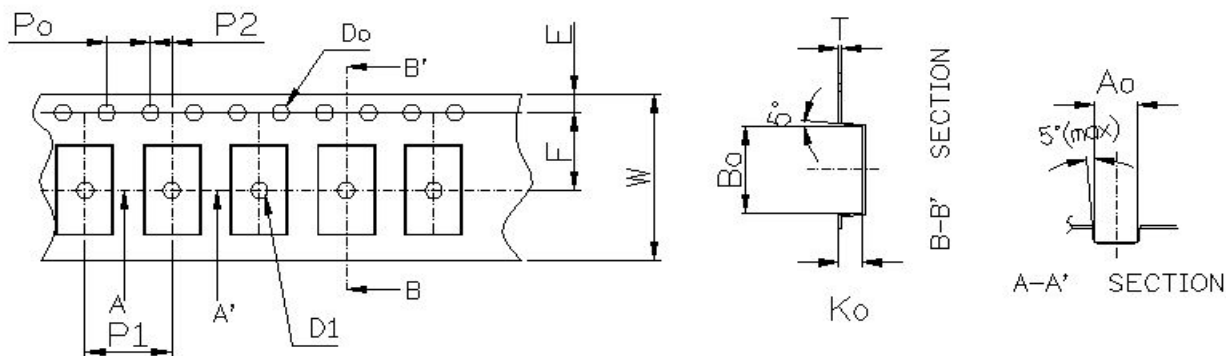
(1) Base: Alumina Ceramic (Al_2O_3) Metallized Pad: Ni Plating Au Plating
(2) Cap: Alumina Ceramic (Al_2O_3)
(3) Crystal Enclosure Seal: Seal Glass
(4) Crystal Blank Rectangular At-Cut Quartz Crystal Blank
(5) Adhesive Silver Conductive Silicon Resin
(6) PAD Alumina Ceramic (Ni. Au)
(7) Electrode

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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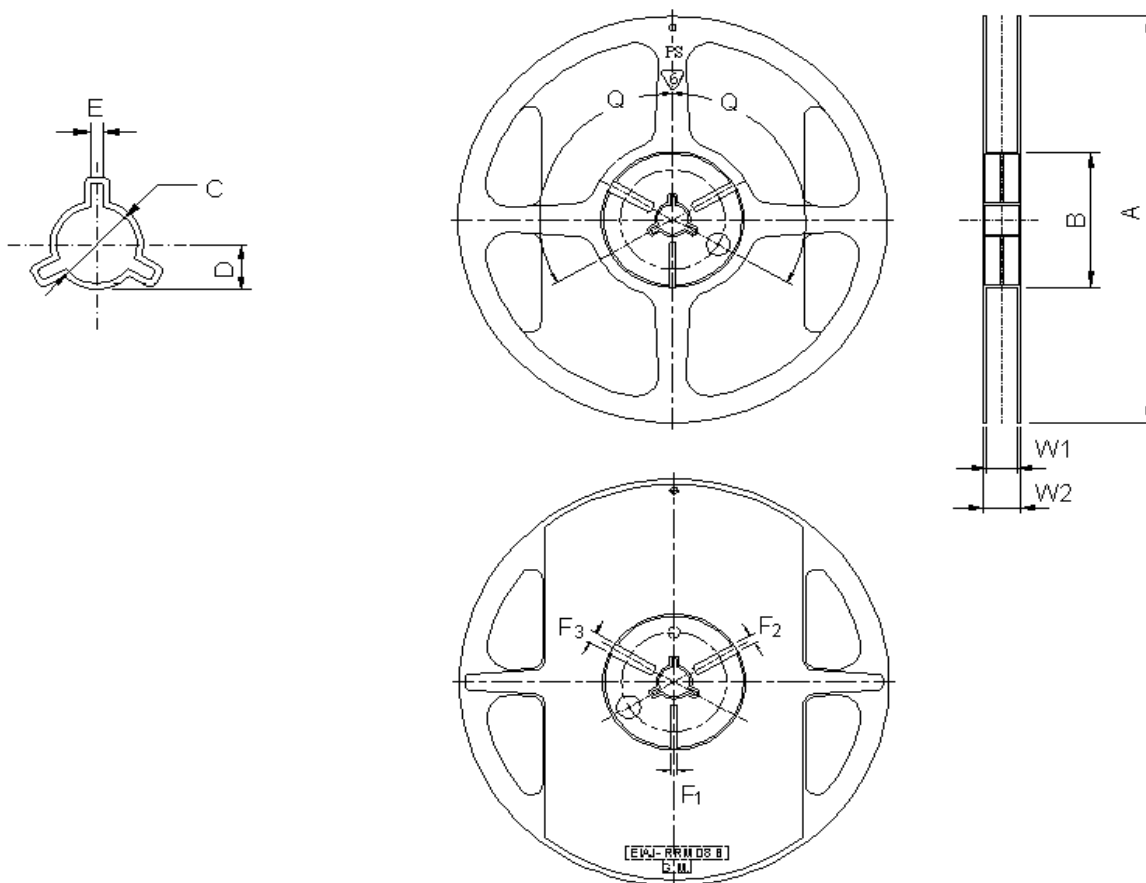
4. HSX530G EMOSS CARRIER TAPE & REEL

a.) Dimensions of Carrier Tape



Symbol	Ao	Bo	Ko	Po	P1	P2	T
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	E	F	Do	D1	W	10Po	
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	ϕ 180+0/-3	
	Inner Width	W1	12.8+/-0.3	
	Outer Width	W2	15.5+/-1.0	
HUB	Out Line diameter	B	ϕ 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	ϕ 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

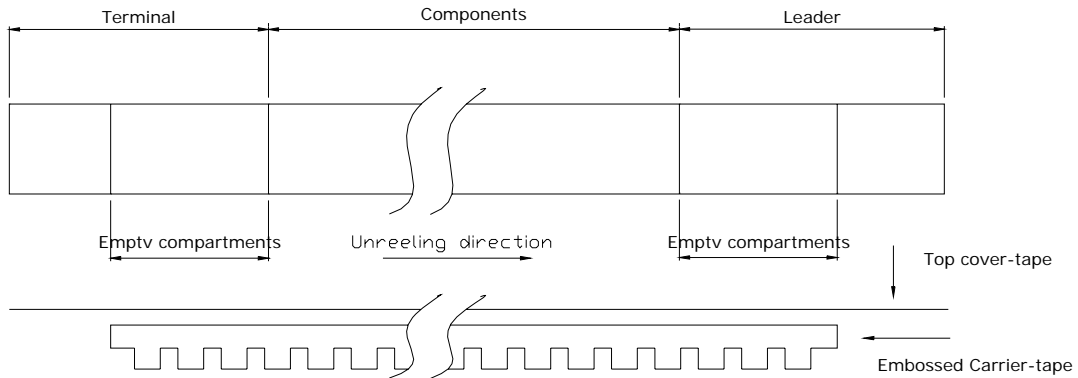
	
TYPE:	
SPEC.No.:	
Parts No.:	
Lot No.:	
FREQ.:	MHZ
Q'TY:	PCS
HARMONY ELECTRONICS CORP.  ROHS	

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.

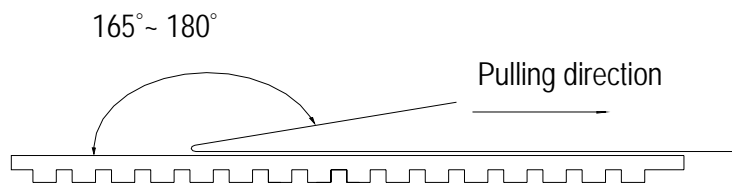
i.) Release strength of cover tape

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

Pulling direction 165° to 180°

Speed 300mm/min.

Otherwise unless specified.

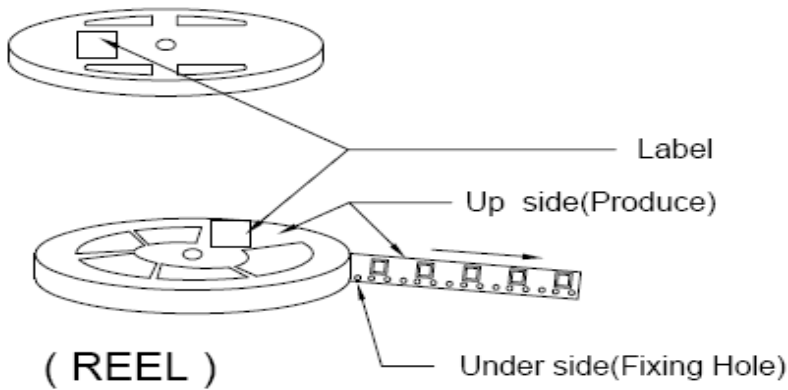


Other standards shall be based on JIS C 0806-1990.

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j.) Package

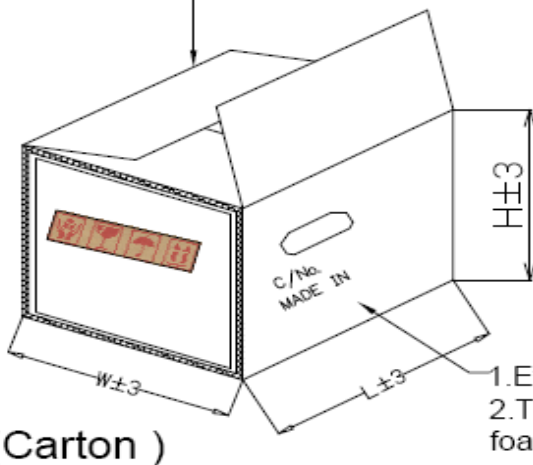
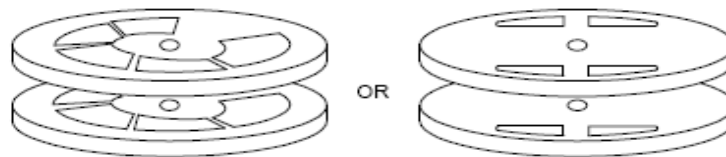
1. Reel : $\varnothing 180$



TYPE:	
SPEC.No.:	
Parts No.:	
LotNo.:	
FREQ.:	MHz
Q'TY:	PCS
HARMONY ELECTRONICS CORP. (H.ELE.) 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	

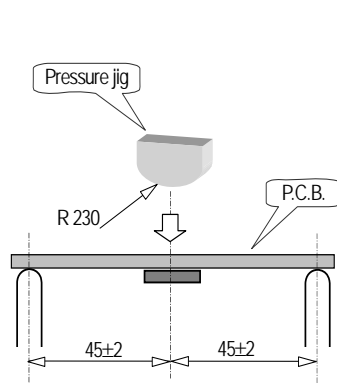


Fig-1

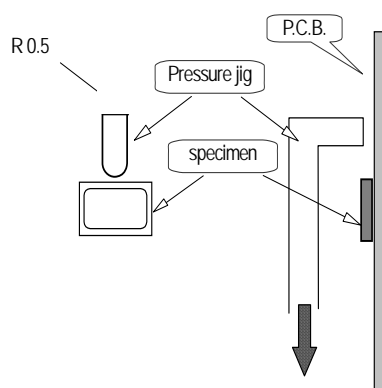


Fig-2

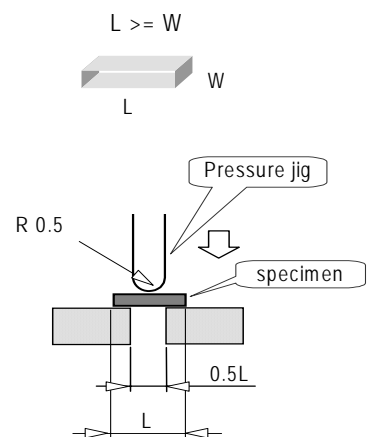
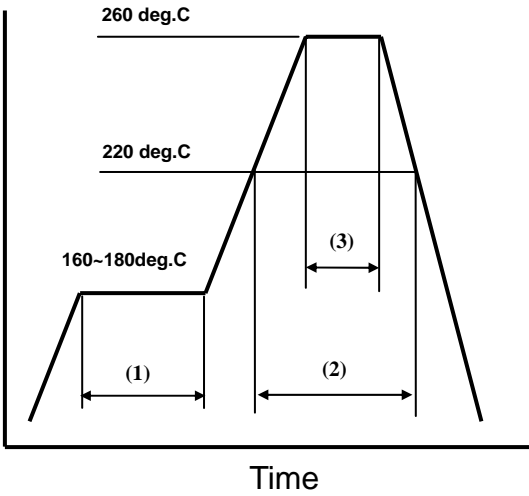


Fig-3

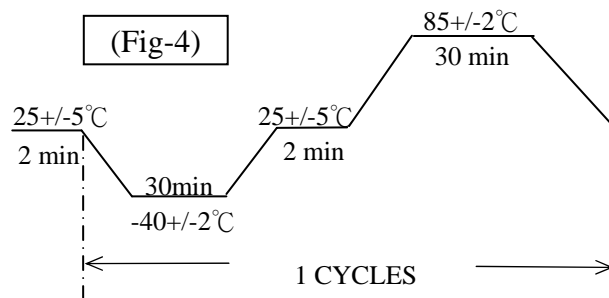
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6	Seal	Less than 1.0×10^{-8} Pa.m ³ /sec by Helium leak detector. Also, no serial bubble is observed by Fluorinate tests.	---												
7	Solder ability	3sec +/-0.5sec. Dip in 245deg.C +/-5deg.C solder. (Use ROSIN type flux for solder.)	B												
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.												
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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.

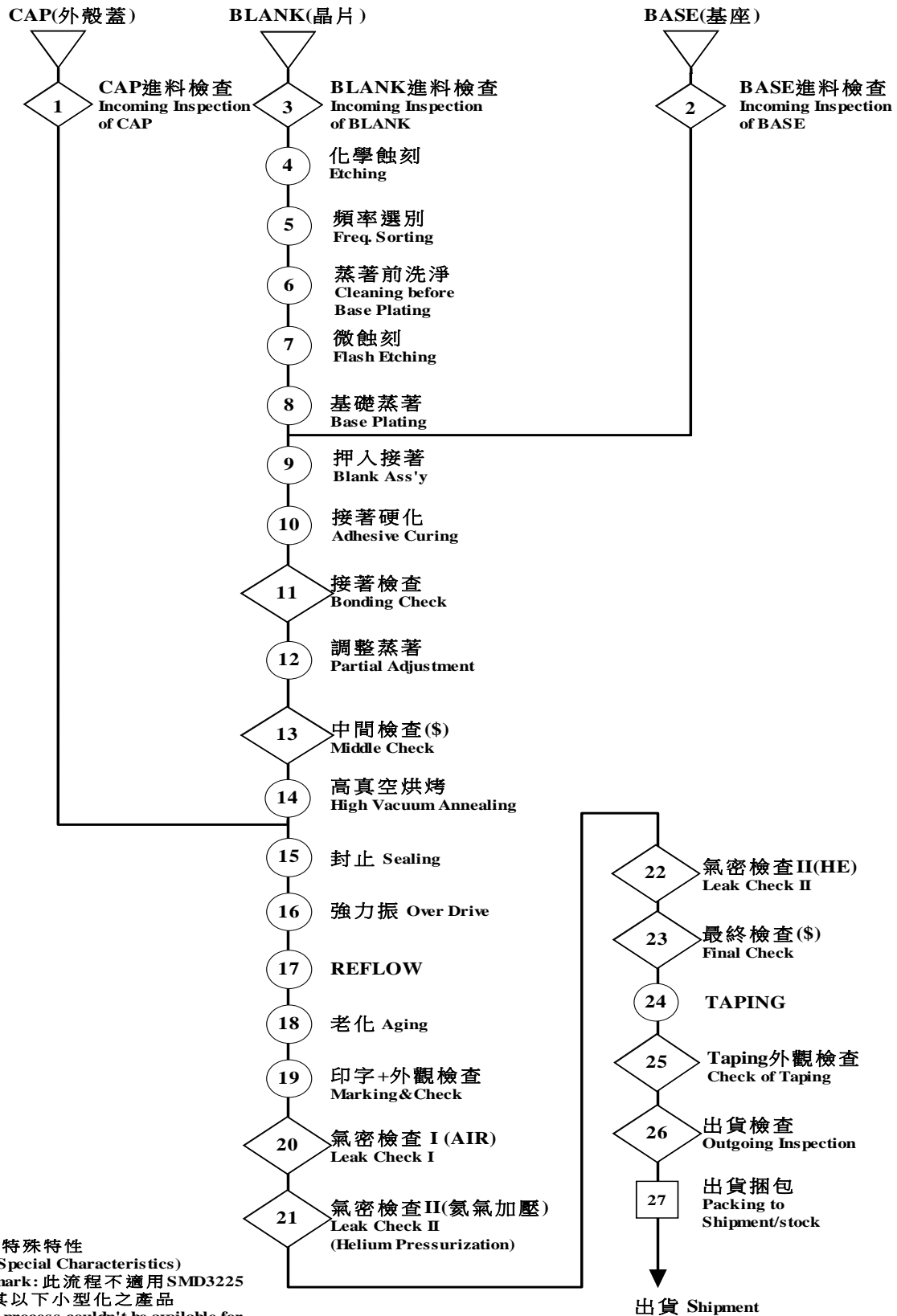
	Item	Test Methods	Specifications Code
1	Humidity	Should be satisfied after letting it alone at +60deg.C+/-2deg.C in humidity of 90% ~ 95% for 240 hours.	A
2	Storage in Low Temperature	Should be satisfied after letting it alone at -40deg.C+/-2deg.C for 240 hours.	A
3	Storage in High Temperature	Should 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
A	Frequency variation shall be within +/-5ppm and equivalent resistance shall be within the specification after the test
B	More than 90% of lead shall be covered by new solder.
C	Without mechanical damage such as breaks. Without electrode peeling. Electrical characteristics shall be satisfied.

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7. 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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8. Environmental Workload Chemical Substance Components List

Environmental Workload Chemical Substance Components List		
<div style="text-align: center;"> TYPE PERCENTAGE Chemical Substance Components </div>	H(D)SX530G	
	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

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