

PRELIMINARY SPECIFICATIONS



Customer _____

Customer Part No.: HSX531S-16.0000-16-10/10/A

Application For: _____ Products: CRYSTAL

Accepted Model: _____ Type & Freq.: HSX531S / 16.000MHz

Sample Order No: _____ Date: 2008/11/25

Approved By :

加高電子股份有限公司

加高電子股份有限公司

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Title HSX531S QUARTZ CRYSTAL SPECIFICATION				Remark TAIWAN FACTORY THAILAND FACTORY SHENZHEN FACTORY		
Date	Confirm	Check	Prepare	Spec. No.	Rev.	Page
2008/11/25	F. S. TSAI	C. L. WANG	U. F. CHEN	HSX531S-16.0000-16-10/10/A	0	1

HSX531S SPECIFICATION

INDEX

ITEM	PAGE
1. QUARTZ CRYSTAL UNIT SPECIFICATION	3
2. MARKING & DIMENSIONS	4
3. INSIDE STRUCTURE	5
4. EMBOSS CARRIER TAPE&REEL	6
a. DIMENSIONS OF CARRIER TAPE	6
b. DIMENSIONS OF REEL	6
c. STORAGE CONDITION	7
d. STANDARD PACKING QUANTITY	7
e. MATERIAL OF TAPE	7
f. LABEL CONTENTS	7
g. TAPING DIMENSION	8
h. JOINT OF TAPE	8
i. RELEASE STRENGHT OF COVER TAPE	8
5. MECHANICAL ENDURANCE	9
6. ENVIRONMENTAL ENDURANCE	9-10
7. Supplement	10-11
8. Flow Chard	12
9. Environmental Workload Chemical Substance Components List . .	13

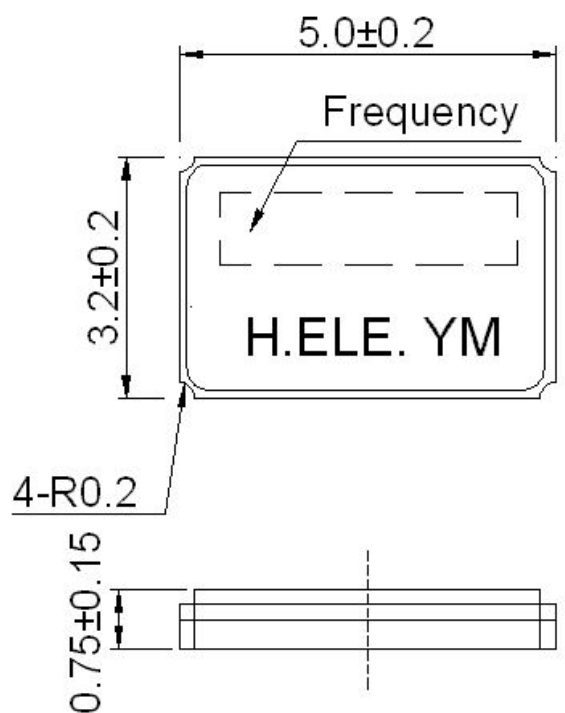
Tittle HSX531S QUARTZ CRYSTAL SPECIFICATION				Remark TAIWAN FACTORY THAILAND FACTORY SHENZHEN FACTORY		
Date	Confirm	Check	Prepare	Spec. No.	Rev.	Page
2008/11/25	F. S. TSAI	C. L. WANG	U. F. CHEN	HSX531S-16.0000-16-10/10/A	0	2

1. QUARTZ CRYSTAL UNIT SPECIFICATION

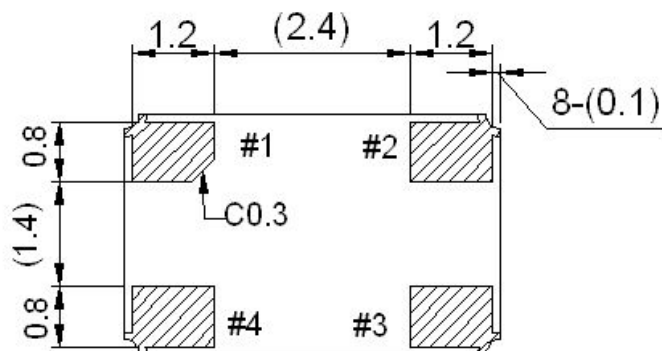
1. Frequency:	16.000000MHz
2. Holder type :	HSX531S
3. Frequency tolerance:	+/-10ppm at 25deg.C +/-3deg.C
4. Equivalent resistance:	40 ohms Max. / SERIES
5. Storage temperature range:	-40deg.C To +85deg.C
6. Operable temperature range:	-20deg.C To +70deg.C
7. Temperature drift:	+/-10ppm -20deg.C To +70deg.C
8. Loading capacitance (CL) :	16.0 pF +/-0.2pF
9. Drive level:	10uW +/- 2 uW
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 +/- 3 ppm/Year
16. Holder	HSX531S Seam type
17.Dimensions and marking	Refer to page.4
18 Emboss carrier tape & reel	Refer to page.6 and page.7
19. Note:	

Title HSX531S QUARTZ CRYSTAL SPECIFICATION				Remark TAIWAN FACTORY THAILAND FACTORY SHENZHEN FACTORY		
Date	Confirm	Check	Prepare	Spec. No.	Rev.	Page
2008/11/25	F. S. TSAI	C. L. WANG	U. F. CHEN	HSX531S-16.0000-16-10/10/A	0	3

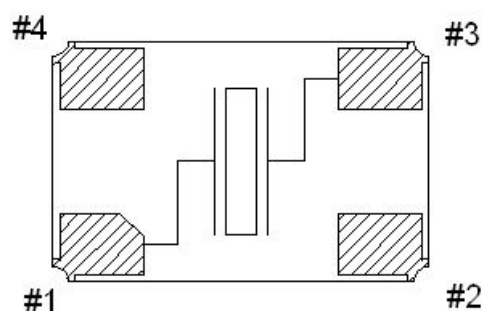
2. HSX531S MARKING & DIMENSIONS



UNIT: mm
TOLERANCE: ± 0.2



<Top View>



*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 ' (The last digit of the year)

(M: month) ex. June shall be marked as ' F ' (As shown on the Table-1).

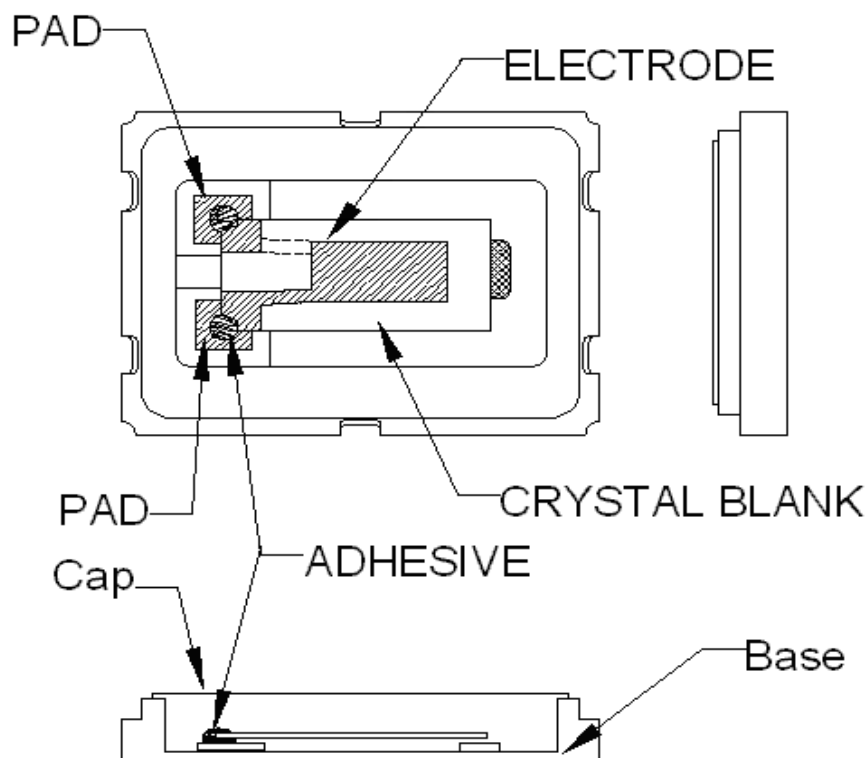
Marking : Laser marking

(Table-1)

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 HSX531S QUARTZ CRYSTAL SPECIFICATION				Remark TAIWAN FACTORY THAILAND FACTORY SHENZHEN FACTORY		
Date	Confirm	Check	Prepare	Spec. No.	Rev.	Page
2008/11/25	F. S. TSAI	C. L. WANG	U. F. CHEN	HSX531S-16.0000-16-10/10/A	0	4

3. INSIDE STRUCTURE



※Reference drawing

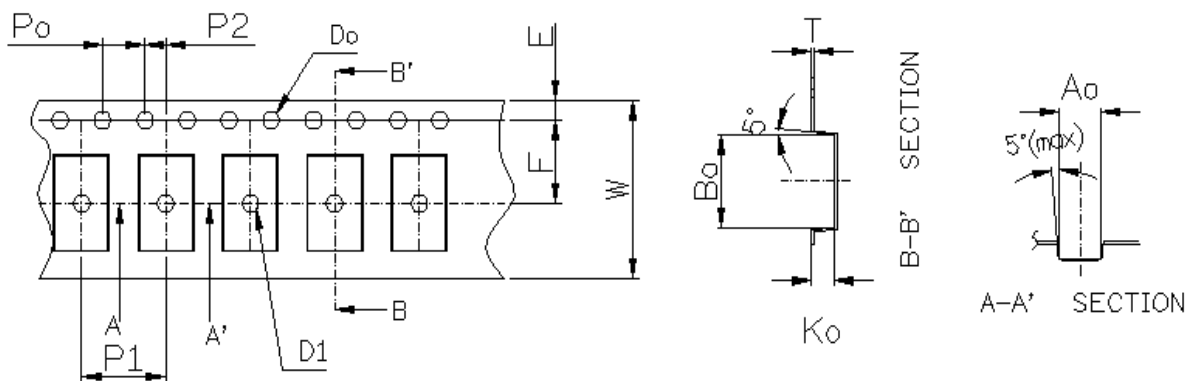
(1) Base:	Alumina Ceramic (Al_2O_3) Metallized Pad: W Ni Plating Au Plating
2) Cap:	Fe-Ni
3) Crystal Enclosure Seal:	Seal Seam
(4) Crystal Blank	Rectangular At-Cut Quartz Crystal Blank
(5) Adhesive	Silver Conductive Silicon Resin
(6) Electrode	Ag
(7) PAD	Alumina Ceramic (W. Ni. Au)

The use prohibition chemistry substance of Table 1 of DHE-0204-1 (QA-QM-08) is not included in this item.

Title HSX531S QUARTZ CRYSTAL SPECIFICATION				Remark TAIWAN FACTORY THAILAND FACTORY SHENZHEN FACTORY		
Date	Confirm	Check	Prepare	Spec. No.	Rev.	Page
2008/11/25	F. S. TSAI	C. L. WANG	U. F. CHEN	HSX531S-16.0000-16-10/10/A	0	5

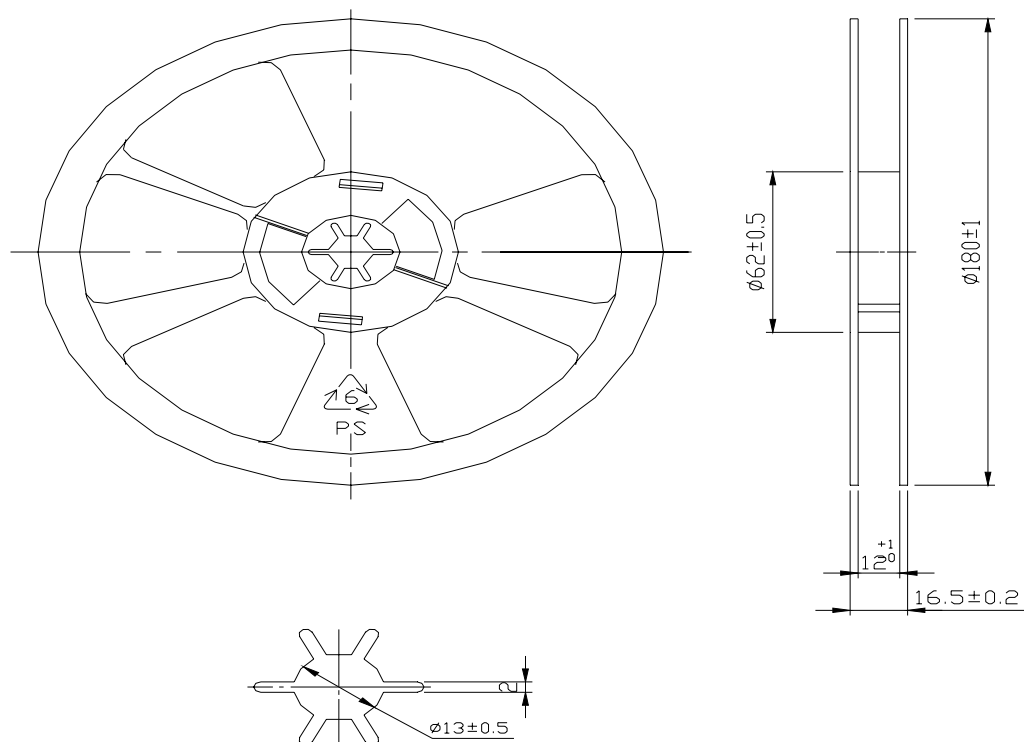
4. HSX531S EMOSS CARRIER TAPE & REEL

a.) Dimensions of Carrier Tape



Symbol	A ₀	B ₀	K ₀	P ₀	P ₁	P ₂	T
Spec	3.60±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	D ₀	D ₁	W	10P ₀	
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



Title **HSX531S**

QUARTZ CRYSTAL SPECIFICATION

Remark

TAIWAN FACTORY
THAILAND FACTORY
SHENZHEN FACTORY

Date

Confirm

Check

Prepare

Spec. No.

Rev.

Page

2008/11/25

F. S. TSAI

C. L. WANG

U. F. CHEN

HSX531S-16.0000-16-10/10/A

0

6

(Table-2)

(UNIT: mm)

ITEM			MARK	DIMENSIONS • ANGLE
FLANCE	Diameter		A	$\varphi 180+1/-1$
	Inner Width		W1	$12.0+1/-0$
	Outer Width		W	$16.5+/-0.2$
	Out Line diameter		B	$\varphi 62+0.5/-0.5$
HUB	Spindle diameter		C	$\varphi 13+/-0.5$
	Key Ditch	Width	E	$2+/-0.5$
		Deep	D	$\varphi 21+/-0.8$

c.) Storage condition

Temperature: +40deg.C Max.

Relative Humidity: 80% Max.

d.) Standard packing quantity

1,000PCS / REEL

e.) Material of the tape

Tape	Material
Carrier tape	A – PET
Top tape	Polyester

f.) Label contents

- .The type of product
- .Our specification No.
- .Your Part No.
- .Lot No.
- .Nominal Frequency
- .Quantity
- .Our Company Name

Sticks label for every reel.

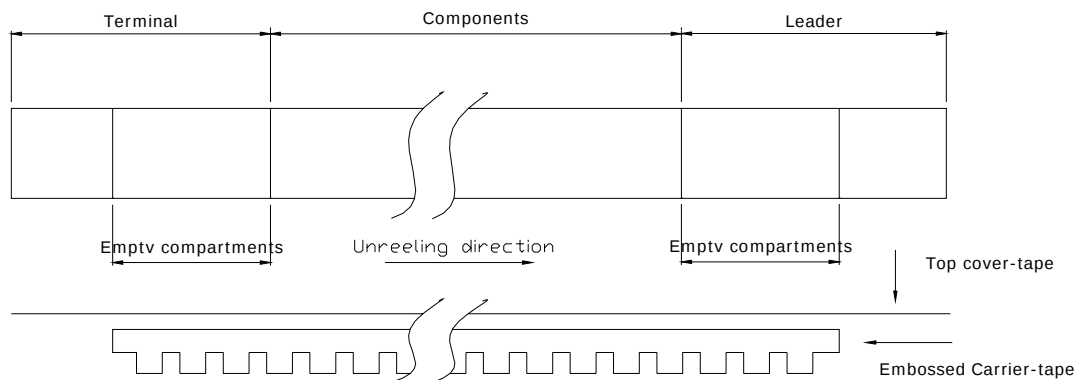
TYPE	
SPEC NO.	
Parts NO.	
Lot No.	
FREQ.	
Q'TY	
(RoHS Compliance)	
H.ELE. HARMONY ELECTRONICS CORP.	

Title **HSX531S****QUARTZ CRYSTAL SPECIFICATION**
 Remark **TAIWAN FACTORY**
THAILAND FACTORY
SHENZHEN FACTORY

Date	Confirm	Check	Prepare	Spec. No.	Rev.	Page
2008/11/25	F. S. TSAI	C. L. WANG	U. F. CHEN	HSX531S-16.0000-16-10/10/A	0	7

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.

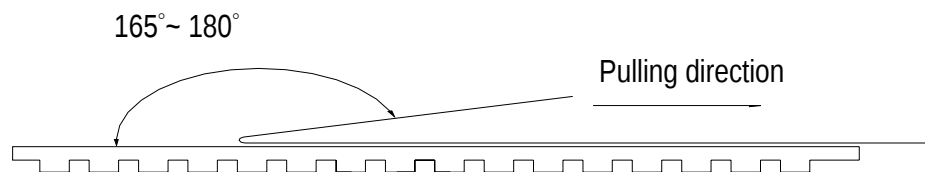
i.) Release strength of cover tape

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.

Title HSX531S QUARTZ CRYSTAL SPECIFICATION				Remark TAIWAN FACTORY THAILAND FACTORY SHENZHEN FACTORY		
Date	Confirm	Check	Prepare	Spec. No.	Rev.	Page
2008/11/25	F. S. TSAI	C. L. WANG	U. F. CHEN	HSX531S-16.0000-16-10/10/A	0	8

5. Mechanical Performance

5.1.Natural Drop

Drop 3 times from the height of 50cm onto min. 30mm thickness hard wooden board
The component shall satisfy requirement of the electrical characteristics.

5.2.Vibration

Frequency 10-55Hz, Sine Wave full amplitude of 1.5mm to X,Y and Z 3 axes,
Duration of 2 hours to each axis.

The component shall satisfy requirement of the electrical characteristics.

5.3.Sealing Tightness

Leak Rate 1.0×10^{-8} Pa-m³/sec. Max. measured by Helium leak detector.

5.4.Solderability

After applying ROSIN Flux, dipping in solder bath at 230°C +/-5°C for 5 sec.
Over 90% of terminal shall be covered by solder.

6. Environment Performance

6.1.Humidity

Temperature 60°C +/-2°C ,RH 90~95%, Duration of 240 hours

Back to room temperature first, then in 1~2 hours, the component shall be checked.

The component shall satisfy requirement of the electrical characteristics.

No physical damage

6.2.Storage in Low Temperature

-30°C +/-2°C ,Duration of 240 hours.

Back to the room temperature first, then in 1~2 hours,

The component shall be checked.

The component shall satisfy requirement of the electrical characteristics.

No physical damage

6.3.Storage in High Temperature

+85°C +/-2°C ,Duration of 240 hours.

Back to the room temperature first, then in 1~2 hours,

The component shall be checked.

The component shall satisfy requirement of the electrical characteristics.

No physical damage

Title HSX531S QUARTZ CRYSTAL SPECIFICATION				Remark TAIWAN FACTORY THAILAND FACTORY SHENZHEN FACTORY		
Date	Confirm	Check	Prepare	Spec. No.	Rev.	Page
2008/11/25	F. S. TSAI	C. L. WANG	U. F. CHEN	HSX531S-16.0000-16-10/10/A	0	9

6.4. Temperature cycles

-30°C +/-2°C (30min) ↔ +85°C +/-2°C (30min) 20 cycles

Back to the room temperature first, then in 1~2 hours,

The component shall be checked.

The component shall satisfy requirement of the electrical characteristics.

No physical damage

6.5. VPS

FC-70 (the boiling point: +215°C) Vapor for 30 sec

Back to the room temperature first, then in 1~2 hours,

The component shall be checked.

The component shall satisfy requirement of the electrical characteristics.

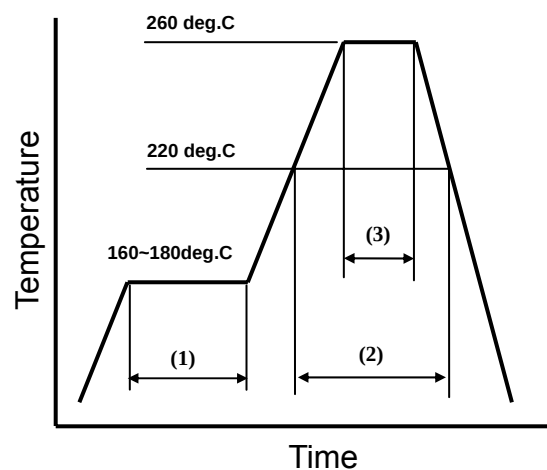
No physical damage

7. Supplement

7.1. Soldering

7.2. Please stay with our proposed reflow condition and do then soldering 2 times max.

Available for Lead Free Soldering



(1)	Preheat	160~180 deg.C	120sec.
(2)	Primary heat	220 deg.C	60sec.
(3)	Peak	260 deg.C	10sec. Max.

Title **HSX531S**

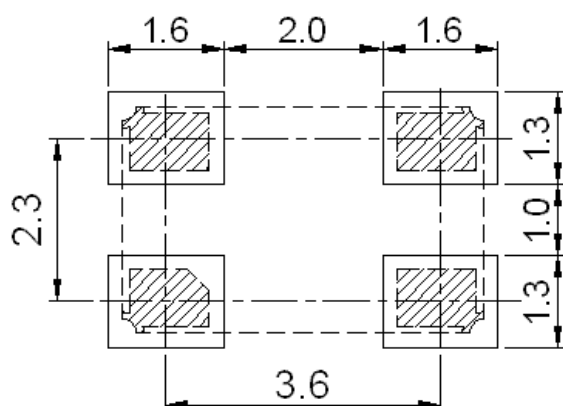
QUARTZ CRYSTAL SPECIFICATION

Remark

**TAIWAN FACTORY
THAILAND FACTORY
SHENZHEN FACTORY**

Date	Confirm	Check	Prepare	Spec. No.	Rev.	Page
2008/11/25	F. S. TSAI	C. L. WANG	U. F. CHEN	HSX531S-16.0000-16-10/10/A	0	10

7.3.Land pattern layout(Example)



7.4.Solder iron (Example)

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

7.5.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.

7.6.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.

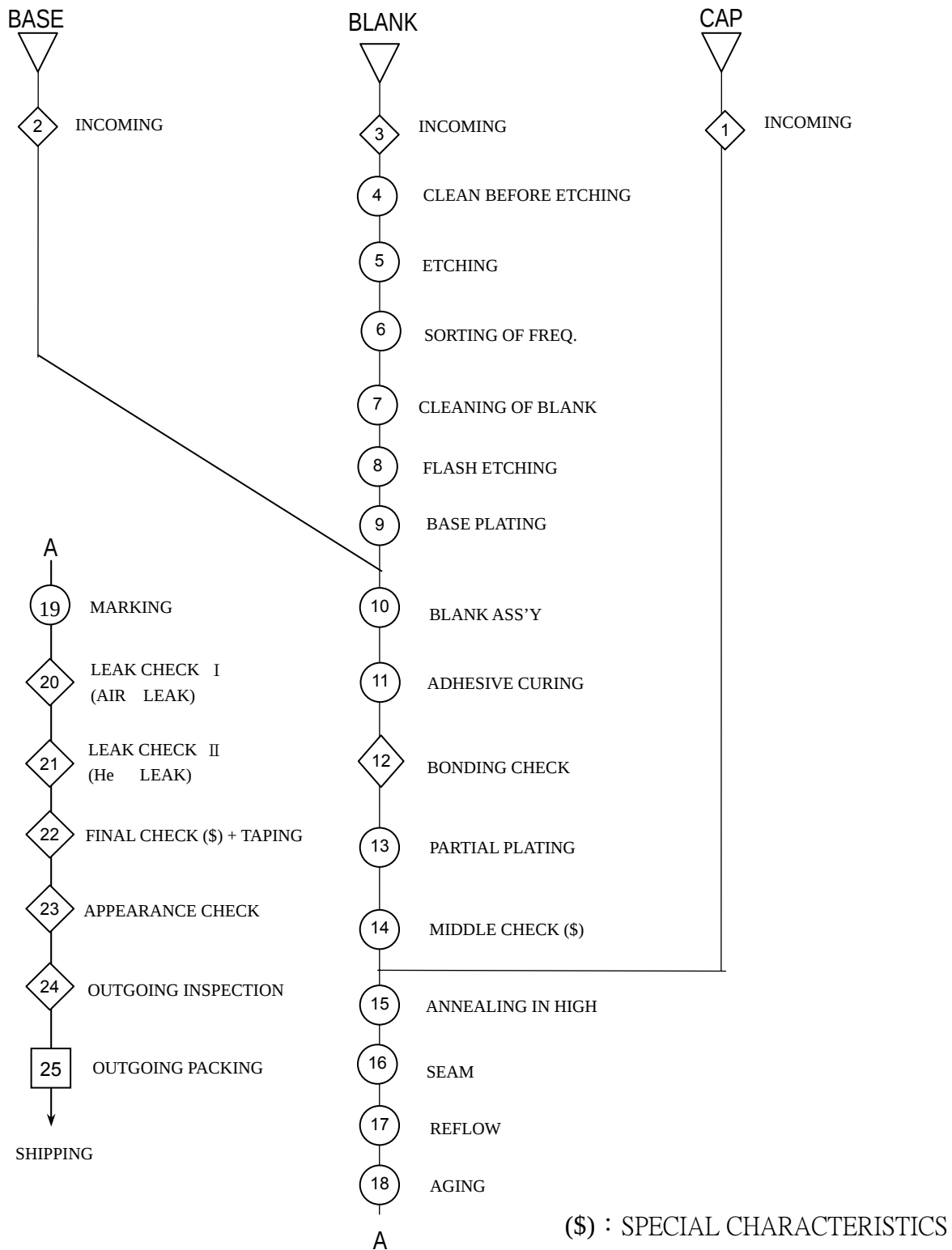
Because we only checked as single unit.

7.7.Storage

Please keep away from high temperature and high humidity ,which may cause put Solderbility. No direct Sunlight, No dew as well.

Title HSX531S QUARTZ CRYSTAL SPECIFICATION				Remark TAIWAN FACTORY THAILAND FACTORY SHENZHEN FACTORY		
Date	Confirm	Check	Prepare	Spec. No.	Rev.	Page
2008/11/25	F. S. TSAI	C. L. WANG	U. F. CHEN	HSX531S-16.0000-16-10/10/A	0	11

8. Flow Chard



Title HSX531S QUARTZ CRYSTAL SPECIFICATION				Remark TAIWAN FACTORY THAILAND FACTORY SHENZHEN FACTORY		
Date	Confirm	Check	Prepare	Spec. No.	Rev.	Page
2008/11/25	F. S. TSAI	C. L. WANG	U. F. CHEN	HSX531S-16.0000-16-10/10/A	0	12

9. Environmental Workload Chemical Substance Components List

Environmental Workload Chemical Substance Components List		
TYPE	HSX531S	
PERCENTAGE		
Chemical Substance Components	40(mg)	ppm
SILICON(Si)	0.156	3,900
GOLD(Au)	0.156	3,900
COBALT AND ITS COMPOUND(Co)	2.544	63,600
MOLYBDENUM AND ITS COMPOUND(Mo)	0.128	3,200
SILVER(Ag)	0.704	17,600
COPPER(Cu)	0.100	2,500
CHROMIUM AND ITS COMPOUND(Cr)	0.068	1,700
ALUMINIUM(Al)	11.000	275,000
MANGANESE AND ITS COMPOUND(Mn)	0.064	1,600
WOLFRAM AND ITS COMPOUND(W)	0.152	3,800
NICKEL AND ITS COMPOUND(Ni)	6.076	151,900
IRON(Fe)	9.364	234,100

Title HSX531S QUARTZ CRYSTAL SPECIFICATION				Remark TAIWAN FACTORY THAILAND FACTORY SHENZHEN FACTORY		
Date	Confirm	Check	Prepare	Spec. No.	Rev.	Page
2008/11/25	F. S. TSAI	C. L. WANG	U. F. CHEN	HSX531S-16.0000-16-10/10/A	0	13

