PRELIMINARY SPECIFICATIONS

Customer 深圳市新铭诚

Customer Part No.: _____ HELE. Part No: XAT008000FK1H-O

Application For: _____ Products: CRYSTAL

Accepted Model: _____ Type & Freq.: AT-49 8.000MHz

Sample Order No: _____ Date: 2006/07/03

Approved By :

HARMONY ELECTRONICS CORP.

HARMONY ELECTRONICS (THAILAND) CO., LTD.

HARMONY ELECTRONICS (SHENZHEN) CORP., LTD.

TAIPEI OFFICE:
Company: (114)
2F., NO.409, SEC.2, TIDING BLVD., NEIHU DISTRICT, TAIPEI CITY 114, TAIWAN (R.O.C.)
TEL:886-2-2658-8883
FAX:886-2-2658-8683

TAIWAN FACTORY:
Factory: (831)
NO. 39, HWA DONG RD., TA FA IND. DIST., TA LIAO KAOHSIUNG HSIEN 831, TAIWAN, R.O.C.
TEL: 886-7-787-1555~6
FAX: 886-7-787-1557

THAILAND FACTORY:
88MOO 5, KAONGU-BEOKPRAI RD., T.BEOKPRAI, A. BANPONG, RAJCHABUREE PROVINCE 70110, THAILAND
TEL: 663-220-0740~1
FAX: 663-220-0742

SHENZHEN FACTORY:
QIAO TANG RD., TANG WEI VILLAGE, FU YOUNG SHENZHEN CITY, PEOPLE REPUBLIC OFCHINA
TEL: 86-755-2730-9262
FAX: 86-755-2730-9755

AT-49 SPECIFICATION

INDEX

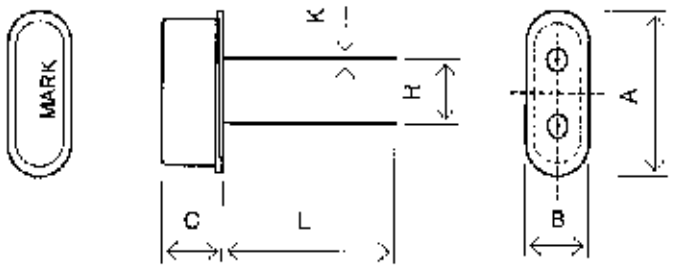
ITEM	PAGE
1. QUARTZ CRYSTAL UNIT SPECIFICATION	3
2. MARKING & DIMENSIONS	4
3. INSIDE STRUCTURE	5
4. PACKAGE	6
5. PROCESS FLOW	7
6. CHARACTERISTICS	8
6.1 Mechanical characteristics	9
6.2 Environmental characteristics	10
7. Environmental Workload Chemical Substance Components List	11
8. TEST DATA	12

1. QUARTZ CRYSTAL UNIT SPECIFICATION

1. Frequency:	8.000000 MHz
2. Holder type :	QUARTZ CRYSTAL ***AT-49***
3. Frequency tolerance:	±30 ppm at 25 deg.C ± 3 deg.C
4. Equivalent resistance:	60 ohms Max. / SERIES
5. Storage temperature range:	-40 deg.C To +85 deg.C
6. Operable temperature range:	-10 deg.C To +60 deg.C
7. Temperature drift:	±50 ppm -10 deg.C To +60 deg.C
8. Loading capacitance (CL) :	20 pF ± 0.2 pF
9. Drive level:	100± 10 μW at 60ohm
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/4195A,HP/E5100A
14. Shocking : (Vibration)	Dropping from 50 cm height 3 times on firm wood . (Frequency less than ±5 ppm Resistance less than ± 15 % or 2 ohms max.)
15. Aging:	Less than ±5 ppm / Year
16. Holder:	Metal base & cap
17.Dimensions and marking	Refer to page 4.
18. Packing:	Refer to page 6.
19. Note:	

2. MARKING & DIMENSIONS

2.1 DIMENSIONS

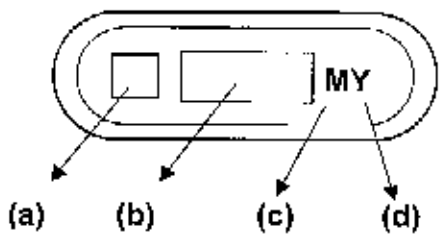


A: 11.50mm Max.
B: 5.00 Max.
C: 3.50 Max.
H: 4.88+/-0.2mm
K: Ø 0.43 +0.05 / -0.03
L: Refer to following table.

L	2.8+/-0.2	3.0+/-0.5	3.2+/-0.5	3.4+/-0.3	3.54+/-0.5	4.0+/-0.5	4.5+/-0.5	5.0+/-0.5	20.0+/-1.0	13.20+/-1.0
Selection										V

Unit: mm

2.2 MARKING



(a)Company Code: "H" for Harmony.
(b)Nominal frequency: Ex. 14.318→14.31818MHz.
(c)Month: Please refer to the Table 1.
(d)Year: Please refer to the Table 2.
Marking: Laser Marking or INK Marking.

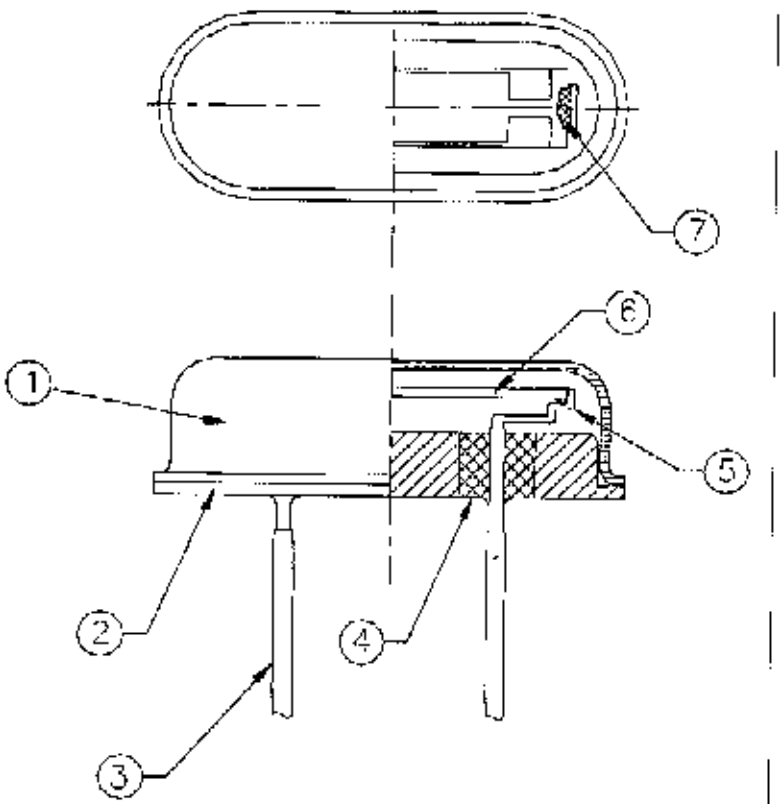
(Table-1)

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

(Table-2)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Code	0	1	2	3	4	5	6	7	8	9	0	1

3. INSIDE STRUCTURE

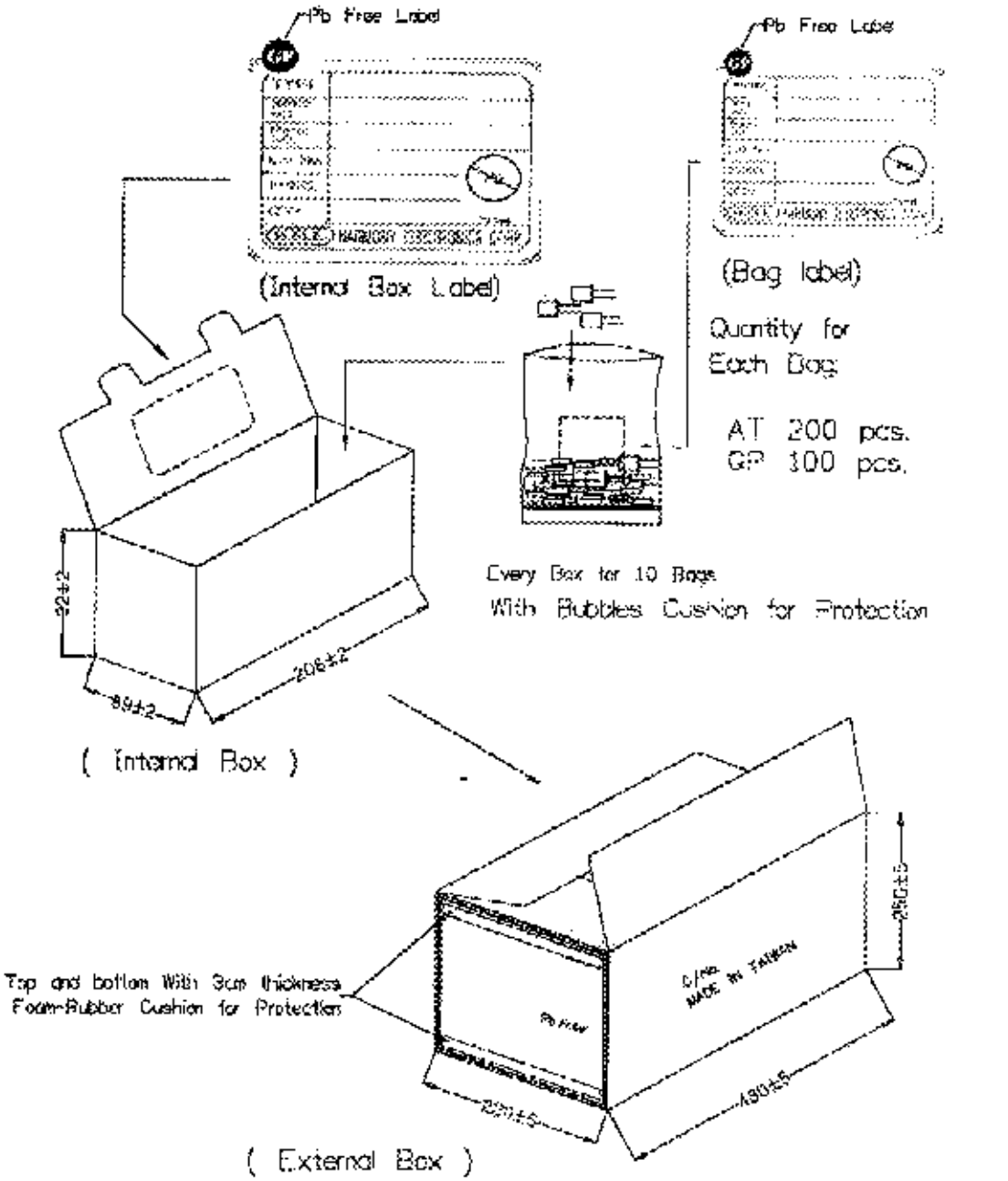


No.	NAME
1	CAN
2	BASE
3	LEAD
4	GLASS
5	SUPPORT
6	BLANK
7	Adhesive

(Pb Free)

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

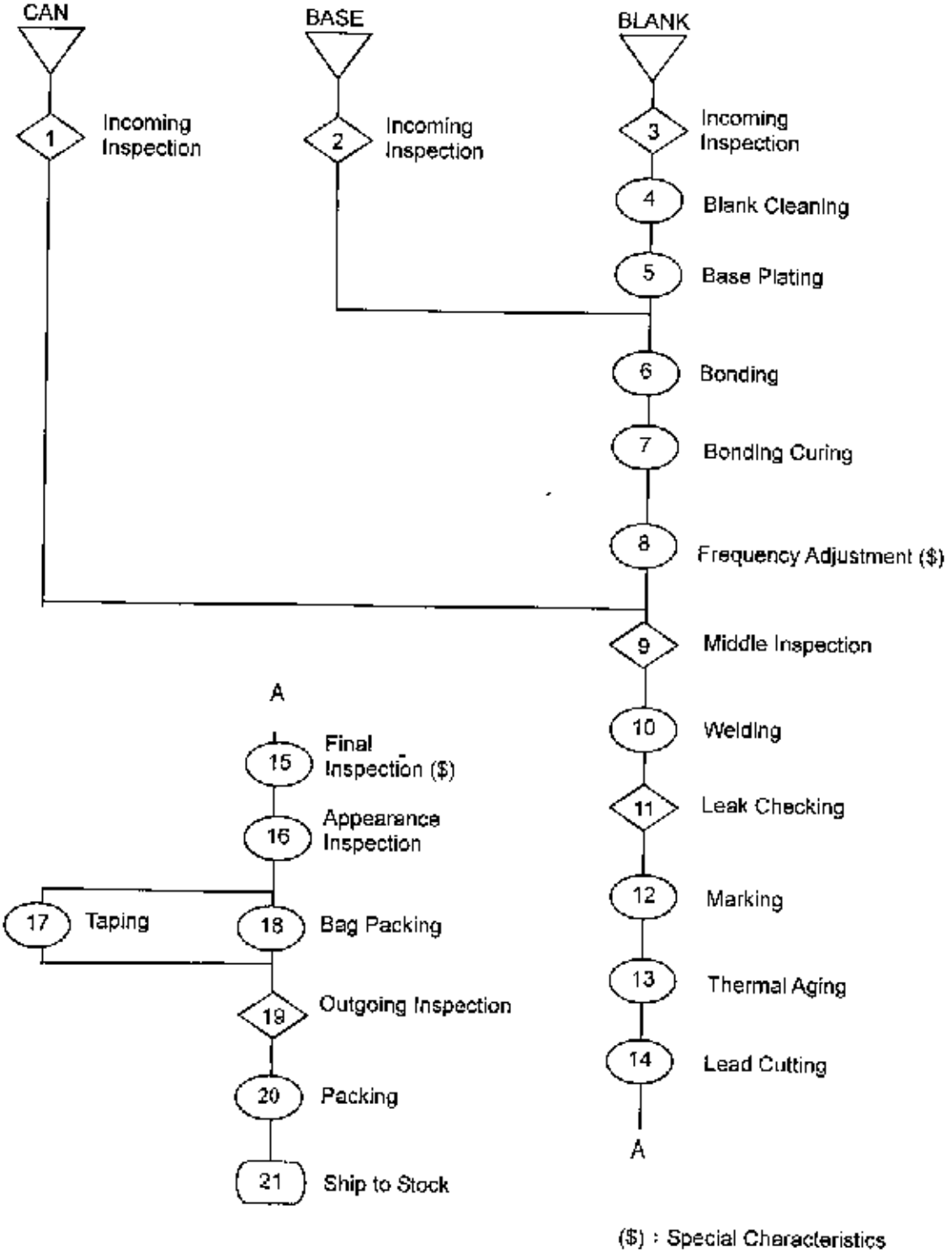
4. PACKAGE(BULK PACKAGE)



Note:Corrugated Box(Thickness:7±1mm)

Tittle AT-49 QUARTZ CRYSTAL SPECIFICATION				Remark SHENZHEN FACTORY THAILAND FACTORY		
Date	Confirm	Check	Prepare	Spec. No.	Rev.	Page
2006/07/03	F.S.Tsai	C.L.Wang	G.Y.Tsai	XAT008000FK1H-O	0	6

5. PROCESS FLOW



($) : Special Characteristics

6. CHARACTERISTICS

Units and values indicated with ( ) in this specification are the former units and the specified values.

Standard atmospheric conditions:

Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests is as follows:

Ambient temperature: 15deg.C to 35deg.C
Relative humidity : 25% to 85%
Air pressure : 86 to 106 kPa

If there is any doubt about the results, measurements shall be made within the following limits:

Ambient temperature : 20deg.C+/-1deg.C
Relative humidity : 63% to 67%
Air pressure : 86 to 106 kPa

Operating temperature range:

The operating temperature range is the range of ambient temperatures at which the quartz crystal oscillator can be stored without damage. Conditions are as specified elsewhere on these specifications.

Operating temperature range: -10 to +60deg.C

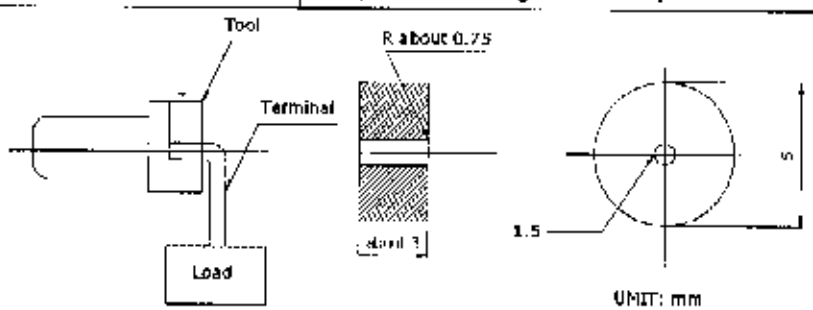
Storage temperature range:

The storage temperature range is the range of ambient temperatures at which the quartz crystal oscillator can be stored without damage. Conditions are as specified elsewhere on these specifications.

Storage temperature range: -40 to +85deg.C

6.1 Mechanical characteristics

Provided that measurement shall be carried out after letting it alone in the room temperature for 1h.

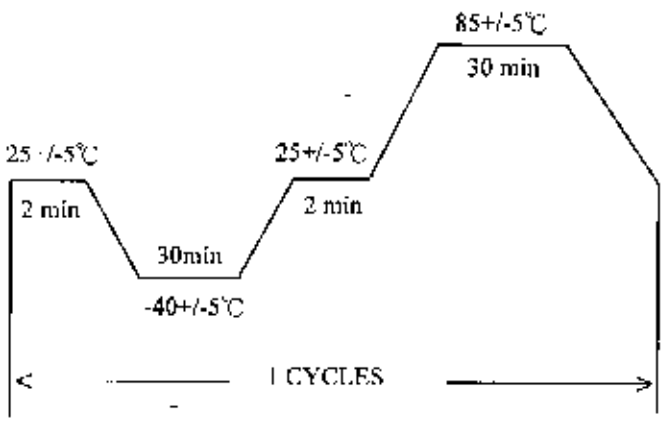
Item		Specifications	
1	Shock	Dropping three times from the height of 50cm onto hard wooden board of thickness more than 30mm.	
2	Vibration	(1)Vibration Frequency	10~55Hz
		(2)Cycle	1 to 2 min
		(3)Amplitude	0.8mm
		(4)Direction	X.Y.Z
		(5)Time	2hr for each direction
3	Terminal Strength	(1)Pulling	a) Body of specimen shall be fixed, and 8.82Nof tension weight shall be supplied gradually to axial direction of terminals/lead-wires for 30s.
			b) After above test a), there is no observation of any visual damages on the specimen.
		(2)Bending	a) Body of specimen shall be fixed, and 90degree bending shall be given, being supplied 225g tension weight. After that, terminals/lead-wires shall be straightened gradually. Then the same bending and straightening shall be supplied to the opposite direction in the same axial. (Refer to the below Fig.)
			b) After above test a), there is no observation of any visual damages on the specimen.
			
4	Sealing Tightness	There is no observation of gas bubble after specimen put into alcohol below 1atm. for 3 min.	
5	Solderability	Terminals/lead-wires of specimen shall be dipped into solder melted tank at 245+/- 5deg.C for 3+/-0.5sec. Dipping depth shall be 2mm from the bottom of specimen's body. (After applying ROSIN flux) Soldering portion shall be covered in over 80% of terminals/lead-wires dipped.	
6	Resistance to Soldering Heat	Terminals/lead-wires of specimen shall be dipped into solder melted tank at 350+/- 10deg.C for 3~4 sec. or 260+/-5deg.C for 10+/- 1sec.	

*Frequency variation shall be within +/-5ppm and equivalent resistance shall be within the specification after the test.

6.2 Environmental characteristics

Provided that measurement shall be carried out after letting it alone in the room temperature for 1h.

Item		Specifications
1	Humidity	It alone at 60deg.C+/- 2deg.C in humidity of 90~95% for 240h.
2	Storage in Low Temperature	It alone at –40deg.C+/- 2deg.C for 240h.
3	Storage in High Temperature	It alone at 85deg.C+/- 2deg.C for 240h.
4	Temperature Cycle	The following temperature cycle (10 cycles). Refer to below Fig. Temperature shift from low to high, high to low shall be done in 1deg.C/min.



*Frequency variation shall be within +/-5ppm and equivalent resistance shall be within the specification after the test.

7. Environmental Workload Chemical Substance Components List

Environmental Workload Chemical Substance Components List		
	DATE:2003/3/4	
TYPE / PERCENTAGE	AT-49	
Chemical Substance Components	0.520(g)	ppm
Pb & Pb Compound	$1.3x10^{-5}$	<25.0
Co & Co Compound	6.512^{-3}	12,523.1
Cr & Cr Compound	3.146^{-5}	60.5
Ba & Ba Compound	3.224^{-4}	620.0
Ag	7.76^{-4}	1,492.3
Cu	0.124900	240,275.0
Ni & Ni Compound	0.046709	89,825.0
P & P Compound	3.78^{-5}	72.7
Mn & Mn Compound	1.07935^{-5}	2,075.7
Zn & Zn Compound	0.039550	76,057.7
Fe	0.290400	554,861.5
B203	1.624^{-4}	312.3
C	8.2^{-5}	157.7
Si	3.24^{-5}	62.3
S	3.24^{-5}	62.3

REV. No.	DATE	REASON	CONTENTS
0	2006/07/03	NEW	-

Tittle AT-49 QUARTZ CRYSTAL SPECIFICATION				Remark SHENZHEN FACTORY THAILAND FACTORY		
Date	Confirm	Check	Prepare	Spec. No.	Rev.	Page
2006/07/03	F.S.Tsai	C.L.Wang	G.Y.Tsai	XAT008000FK1H-O	0	12