



ZHEJIANG A-CRYSTAL
ELECTRONIC TECHNOLOGY CO., LTD.



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Rev.	1.0
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CRYSTAL UNIT SPECIFICATIONS

客户批准 Customer Approval

(请批准后回签一份 Please Return A Copy With Approval)

Customer	
Customer P/N	
Product	CRYSTAL RESONATORS
Spec	PMX405-LF/32.768K/12.5PF/±20PPM
A-Crystal P/N	AMS3276812503T6

Drawn	Checked	Approved
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FM No.: SC-GF-15-12-01



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1. ELECTRICAL SPECIFICATIONS

1.1 Hold Type: PMX405-LF

No.	Parameter	Symb	Value				Condition
			Min	Typ	Max	Units	
1	Frequency Range	F_0	32.768				KHz
2	Frequency Tolerance	$\Delta f/f_0$	-20	-	+20	PPM	REF TO 25°C
3	Temperature Coefficient	K	-0.034 ± 0.006				ppm/(°C) ²
4	Turnover Temperature	T_m	25 ± 5				°C
5	Load Capacitance	C_L	-	12.5	-	PF	
6	Operating Temperature Range	T_{OPR}	-40	-	+85	°C	
7	Storage Temperature Range	T_{STG}	-55	-	+125	°C	
8	Quality Factor	Q	20,000				Min
9	Series Resistance	R_1	-	-	50	K Ω	REF TO 25°C
10	Shunt Capacitance	C_0	-	-	2.0	PF	
11	Motional Capacitance	C_1	-	-	4.0	fF	
12	Insulator Resistance	I_R	500	-	-	M Ω	DC100V $\pm$ 15V
13	Drive Level	D_L	-	0.1	1.0	mW	
14	Capacitance ratio	C_0/C_1	-	450	-	-	
15	Aging Rate	Fa	-3.0	-	+3.0	PPM	at 25°C $\pm$ 3°C
16	Package type	10.11*3.76*3.3					

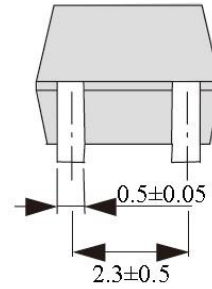
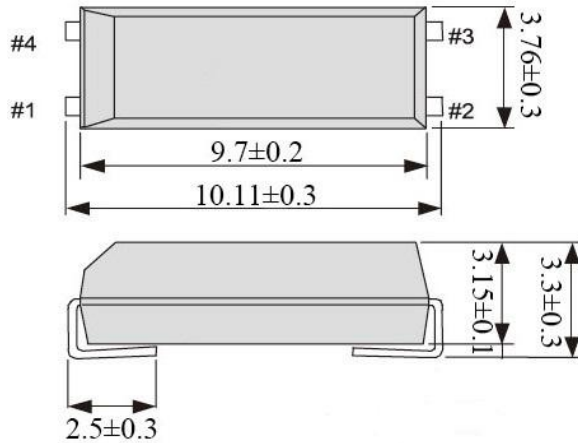


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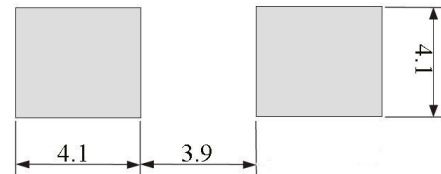
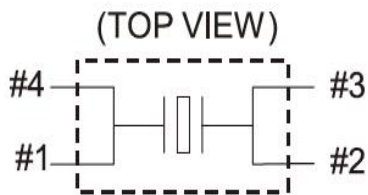


2. DIMENSIONS & MARKING

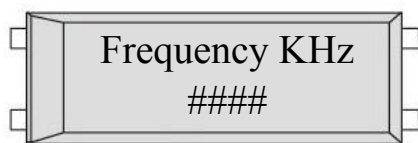
2.1 Dimension (Unit: mm)



Note: Metal may be exposed on the top or bottom of this product this will not affect any quality reliability or electrical spec



2.2 Marking:



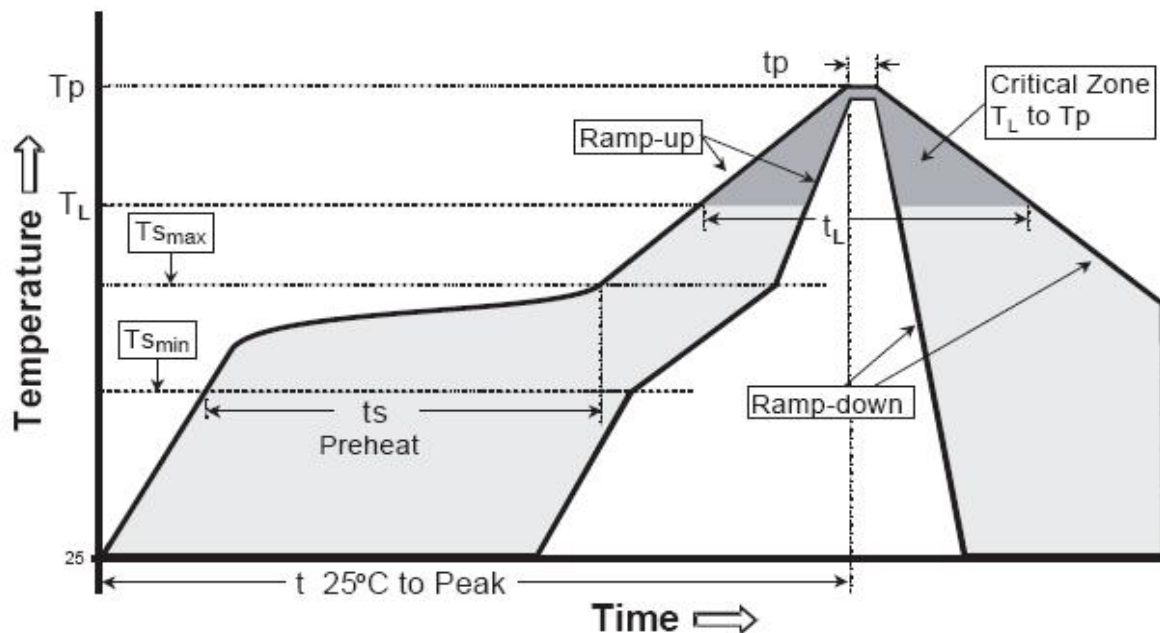
#####: Lot No



3. REFLOW PROFILES

3.1 Reflow Solder

Profiles Feature	Condition
Average Ramp-up Rate (Ts max to Tp)	3 °C/second Max.
Preheat	
■ Temperature Min (Ts min)	120 °C
■ Temperature Max (Ts max)	180 °C
■ Time (ts min to ts max)	60~120 seconds
Time maintained above	
■ Temperature (T _L)	230 °C
■ Time (t _L)	20~50 seconds
Peak/Classification Temperature(Tp)	260 °C
Time within 5 °C of actual Peak Temperature (tp)	10 seconds Max
Ramp-down rate	6 °C/second Max.
Time 25 °C to Peak Temperature	8 minutes Max.
Suggest reflow times	3 Times Max



Remark: To reference JEDEC J-STD-020C

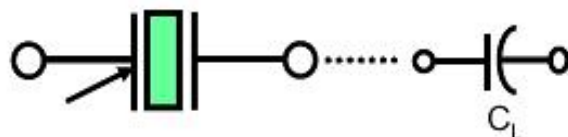


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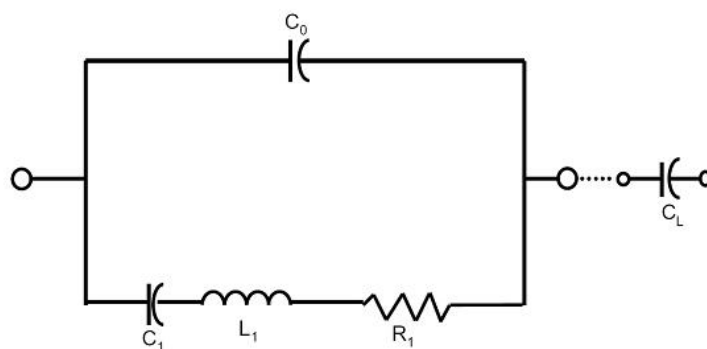


4. TEST STANDARD

4.1 Equivalent Circuits



4.2 Symbol for crystal unit





5. RELIABILITY(MECHANICAL AND ENVIRONMENTAL ENDURANCE)

No.	Test	Test Method And Condition	Value
5.1	Vibration	Vibration Frequency: 10 To 55Hz amplitude : 1.5mm Cycle Time: 1~2Min(10-55-10Hz) Direction: x. y. z; Duration: 2h/Each Direction	2*
5.2	Shock	Drop 3 times from the height of 75 cm onto hard wooden board with thickness of 3 cm.	2*
5.3	Solder ability	Dip in flux 3~5 seconds, Temperature: 260°C ± 5°C (Using rosin flux)	3*
5.4	High Temp storage	Temperature: 125°C ± 5°C for 500 H,	2*
5.5	Low Temp storage	Temperature: -40°C ± 5°C for 500 H,	2*
5.6	Humidity Storage	Temperature: 80°C ± 5°C , Relative Humidity:90-95% for 500 hours,	2*
5.7	Temp cycle	T1:-40°C ± 5°C, T2:125°C ± 5°C, T1 to T2 to T1 ,Run 5 cycles, Maintain T1 and T2 30minutes each	2*
5.8	Salt Fog	Salt density:5% at the temperature of 35°C for 96 hours.	4*
5.9	Solder Heat Resistance	Treat the Reflow 2 times by the following(Refer to 2.1)	2*
5.10	Leakage	Pressure: 0.5~0.6Ma for1 hour,	5*
5.11	Aging	Temperature:85°C ± 5°C for 500 hours,	2*
5.12	Shear Pull-off	10 N press the side for 10 s ± 1 s.	4*

Note:

1*Each test done independently.

2*Frequency Change: ±10ppm Max. Resistance Change :± 15%RR Max

3*The Dipped Part Of The Leads Should Have 90% Sn Coating

4*The appearance shall has no abnormity and soldering is good.

5*Air Leak rate<1*10⁻⁸mbar.1/s.

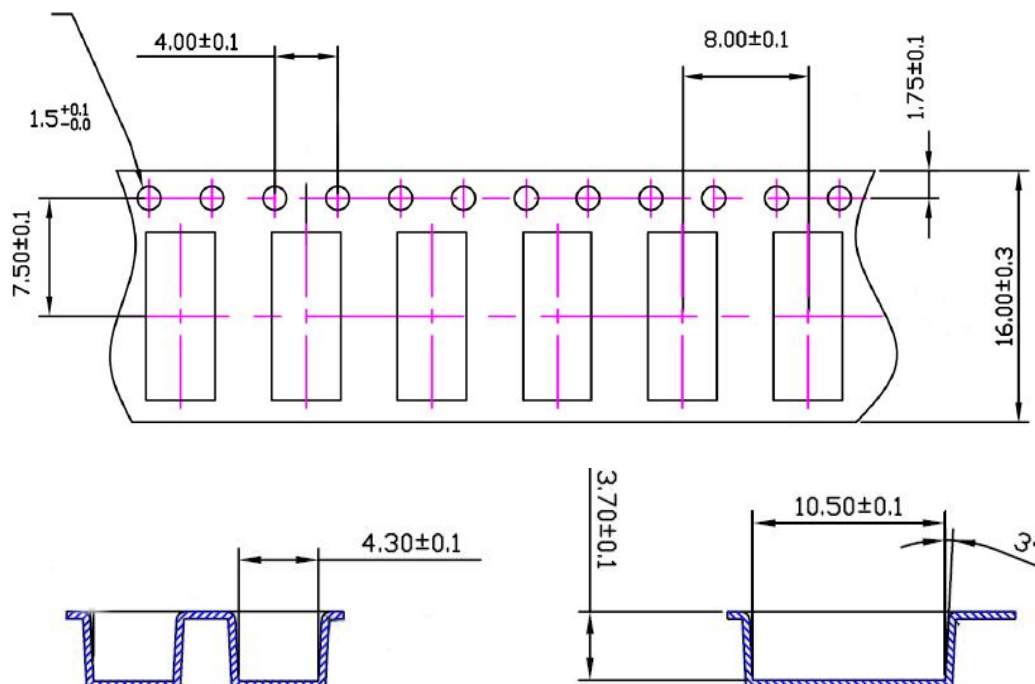


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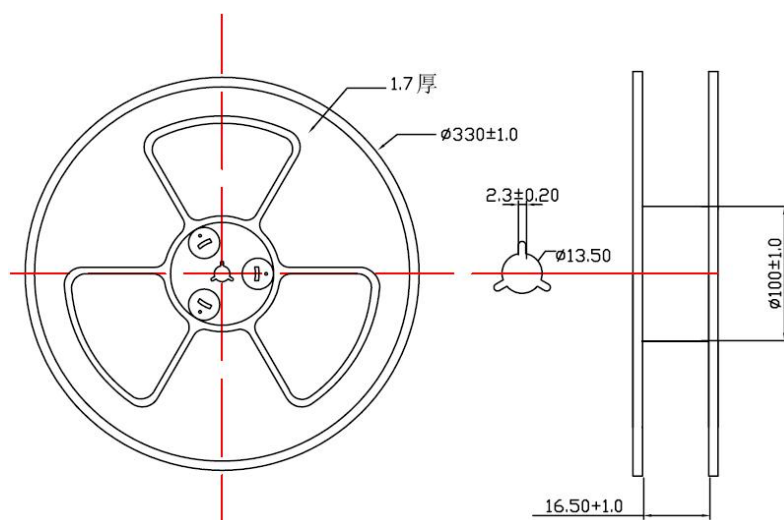


6. PACKING

6.1 Packing Method Sketch Map (Unit: mm)



6.2 Reel Dimensions (Unit: mm)



Pieces per reel: 2000/reel



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6.3 Section of package

Package is made of corrugated paper with thickness of 0.8cm. Package has 10 inner boxes, each box has 1 reel

6.3.1 Quantity of package

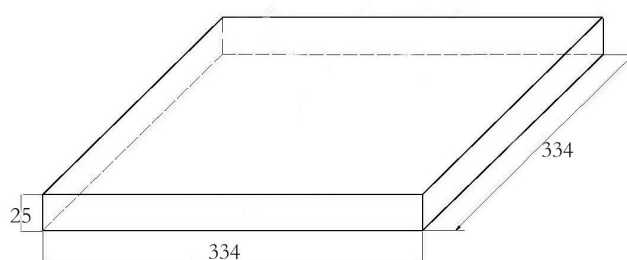
Per plastic reel 2000 pieces of Crystal Resonators

Per inner box 2k/reel

Per package 10 inner boxes & 10 inner boxes

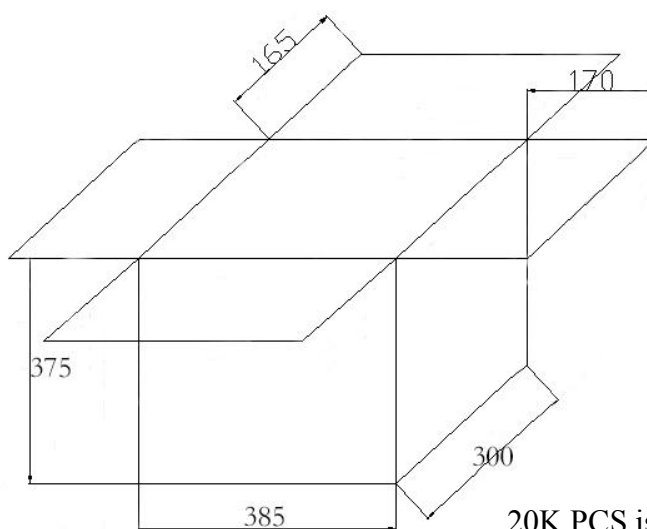
(20000 pieces of Crystal Resonators)

6.3.2 Inner Box Dimensions (Unit: mm)



2000/reel

6.3.3 Dimensions and Mark (Unit: mm)



20K PCS is 10 reel



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7. OTHER

7.1 Precautionary Statement

7.1.1 When dropped by mistake

The crystal products are designed and manufactured to resist physical shocks. However, in the event the crystal is subjected to excessive impact such as being dropped onto the floor or giving shocks during mounting. Need to make sure its satisfactory performance before using it.

7.1.2 Mounting of quartz crystal units onto circuit board

When using an automatic loading machine, test and confirm to cause on the crystal products before mounting.

Bending the circuit board in the process of cleaving boards after mounting and soldering Crystal products may cause peeling off the soldering or package cracks by mechanical stress. Please be sure that the layout of crystal products position is on the less stressed and the Cleaving process is under less stressed for crystal products.

7.1.3 Cleaning

- 1) Crystal products may be affected and destroyed at worst by ultrasonic cleaning. Please be sure to check if your cleaning process affects any damage to crystal products prior to use.
- 2) Some kind of cleaning fluid may cause any damage to crystal products .Please be sure to check suitability of the cleaning fluid in advance.

7.1.4 Storage

Storage of Crystal products under higher temperature or high humidity for a long term may affect frequency stability or solderability. Please store the Crystal products under the normal temperature and humidity without exposing to direct sunlight and dew condensation, and avoid the storage of Crystal products for more than 6 months, and mount them as soon as possible after unpacking.

7.1.5 Ozone Depleting Substance (ODS)

This Product doesn't use the class I ODS at any of production processes, and component parts.

7.1.6 Replacement

If the defect is caused by our company within one year from the delivery time, we provide the replacements with free of charge.