

YANTAI HUAFENG CRYSTAL CO., LTD

APPROVAL SHEET

DATE: July 24, 2013

CUSTOMER:

PRODUCTION NAME: Tuning Fork CRYSTAL UNIT

PART NUMBER: ATLF206/12.000M/20PF/20PPM

PREPARED BY: _____ **CONFIRMED BY:** _____

MANUFACTURER: YANTAI HUAFENG CRYSTAL CO., LTD

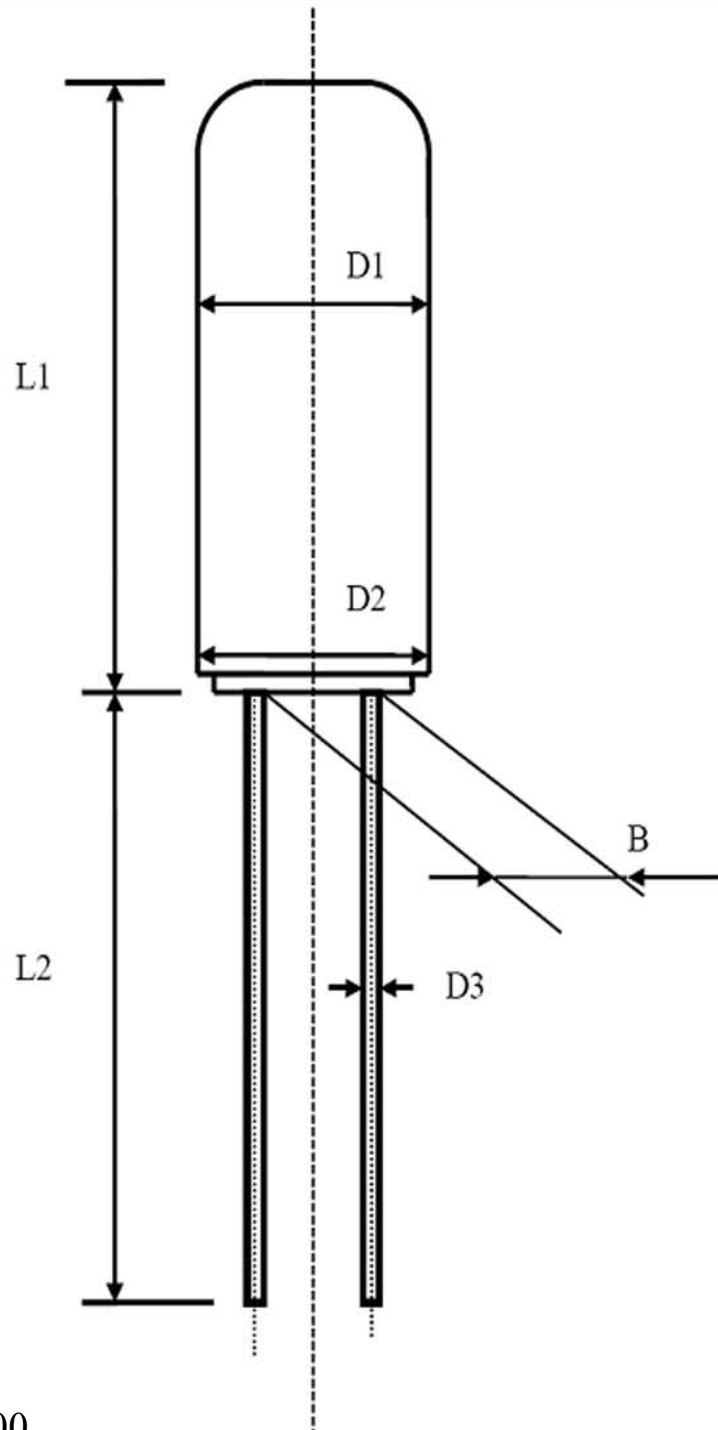
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1. QUARTZ CRYSTAL UNIT SPECIFICATION

Item	Symbol	Specifications				Remark
		Min	Type	Max	Units	
1. Production type		Quartz Crystal Resonator				
2. Holder		ATLF206				
3. Mode of oscillation		<input checked="" type="checkbox"/> Fundamental <input type="checkbox"/> 3 Overtone <input type="checkbox"/> 5 Overtone				
4. Frequency	FL	12.000		MHz		
5. Load capacitance	CL	20		pF		
6. Frequency tolerance	Tol	±20		ppm	at 25°C ± 3°C	
7. Equivalent resistance	Rs	40		Ω	Max.	
8. Working temperature range	TR	-20 ~ +70		°C		
9. Freq. Temp. Characteristics	TC	± 30		ppm	working temperature ΔF	
10. Drive level	DL	100		μW	Max.	
11. Shunt Capacitance	C0	5		pF	Max.	
12. Storage temperature range		-40 ~ 85		°C		
13. Insulation resistance		500		MΩ	Min.	
14. Measure Circuit		S&A 250B			π network	
15. Aging		5		ppm/Yr	Max.	

※ This product doesn't include harmful substance that stipulated by RoHS



L1	L2	D1	D2	D3	B
Max6.03mm	Min6.7mm	Max 2.0mm	Max 2.10mm	$\Phi 0.20 \pm 0.067\text{mm}$	0.65 ± 0.02

TYPE	C-001R	FINISH	SOLDER PLATING	UNIT	mm
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3. 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: 15°C to 35°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 : 25°C±1°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: -20°C to +70°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°C to +85°C

3.1 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 8.82N of 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 90 degree 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.
			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 $230\pm 5^{\circ}\text{C}$ for $3\pm 0.5\text{sec}$. Dipping depth shall be 2mm from the bottom of specimen's body. (After applying ROSIN flux) Soldering portion shall be covered in over 90% of terminals/lead-wires dipped.	
6	Resistance to Soldering Heat	Terminals/lead-wires of specimen shall be dipped into solder melted tank at $350\pm 10^{\circ}\text{C}$ for 3~4 sec. or $250\pm 5^{\circ}\text{C}$ for $5\pm 1\text{sec}$.	

*Frequency variation shall be within +/-5ppm and equivalent resistance less than $\pm 15\%$ max. after the test.

Note: Measuring the frequency should be done after keeping test samples at room temperature for 24 hours.

3.2 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 $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ in humidity of 90~95% for 48h.
2	Storage in Low Temperature	It alone at $-40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 240h.
3	Storage in High Temperature	It alone at $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 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 $1^{\circ}\text{C}/\text{min}$.

The diagram illustrates a temperature cycle. It starts at $25 \pm 5^{\circ}\text{C}$ for 2 minutes. The temperature then drops to $-40 \pm 5^{\circ}\text{C}$ and remains there for 30 minutes. It then rises back to $25 \pm 5^{\circ}\text{C}$ for 2 minutes. Finally, it rises to $85 \pm 5^{\circ}\text{C}$ and remains there for 30 minutes. A double-headed arrow below the diagram indicates that this entire sequence constitutes '1 Cycle'.

*Frequency variation shall be within $\pm 5\text{ppm}$ and equivalent resistance less than $\pm 15\%$ max. after the test.

Note: Measuring the frequency should be done after keeping test samples at room temperature for 24 hours.

4. Notes

1. Only the lead should be heated when soldering.

In case that the package temperature is exceeding 150°C , it may impair the crystal or may cause the crystal quartz to destroy.

2. Pulling the lead strongly may cause cracking of the hermetic glass seal bending the lead closely from the case may also cause same problem, so when the lead needs to be bent, please leave more than 05.mm of lead from the case.

3. Too much shock or vibration is not allowed. According to conditions such as machine shock during the assembly, the internal quartz crystal might be damaged.

Please check your conditions carefully when using it in advance.

4. Don't storage or use in the environment that temperature may change rapidly to avoid the condensation. And also we recommend to storage the products in the normal environment. (Temperature, humidity)

5. This product can be subjected to ultrasonic cleaning. However, since the oscillator may be affected depending on the condition, be sure to check it.

6. Applying excessive drive level to the quartz crystal may cause deterioration for characteristics or damage.

Circuit design must be such as to maintain a proper drive level.

7. Unless adequate negative resistance is allocated in the oscillation circuit, startup time of oscillation may be increased or no oscillation may occur. In order to avoid this, provide enough negative resistance in the circuitry design.