



**江苏浩都频率科技有限公司**  
JIANGSU HD CRYSTAL TECHNOLOGY CO., LTD

**Specifications For Product**

TYPE : Quartz Crystal Oscillator  
SPEC : LVPECL/LVDS/HCSL  
P/N : 8X Series  
VER : A/0

|                     |       |          |                                                                                               |
|---------------------|-------|----------|-----------------------------------------------------------------------------------------------|
| R&D APPR.SIGNATURED |       |          | DEPT.<br> |
| ISSUE               | CHECK | APPROVAL |                                                                                               |
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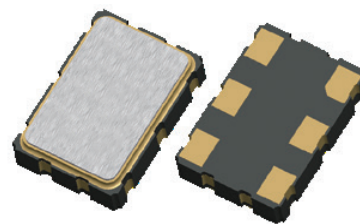
## Specification Revision Record Sheet

[illegible]

## Product Description

### 1. Scope:

- 1.1 This specification applies to the RoHS crystal oscillator with a frequency which will be used in electronic equipment.



### 2. Construction:

- 2.1 Oscillators series: LVPECL/LVDS/HCSL Crystal Oscillator  
2.2 Package: SMD3.2×2.5

### 3. Electrical Characteristics

| Parameter                                    | LVPECL              |                     |                     |                     | LVDS                |                     |                     |                     | unit   |
|----------------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|--------|
|                                              | 3.3V                |                     | 2.5V                |                     | 3.3V                |                     | 2.5V                |                     |        |
|                                              | Min                 | Max                 | Min                 | Max                 | Min                 | Max                 | Min                 | Max                 |        |
| Supply Voltage Variation(V <sub>DD</sub> )   | V <sub>DD</sub> -5% | V <sub>DD</sub> +5% | V <sub>DD</sub> -5% | V <sub>DD</sub> +5% | V <sub>DD</sub> -5% | V <sub>DD</sub> +5% | V <sub>DD</sub> -5% | V <sub>DD</sub> +5% | V      |
| Frequencu Range                              | 10                  | 250                 | 10                  | 250                 | 10                  | 250                 | 10                  | 250                 | MHz    |
| Supply Current                               |                     |                     |                     |                     |                     |                     |                     |                     |        |
| 10MHz ≤ Fo < 160MHz                          | -                   | 70                  | -                   | 70                  | -                   | 50                  | -                   | 50                  | mA     |
| Output Level    Output High                  | 2.275               | -                   | 1.475               | -                   | -                   | 1.6                 | -                   | 1.6                 | V      |
| Output Low                                   | -                   | 1.68                | -                   | 0.88                | 0.9                 | -                   | 0.9                 | -                   |        |
| Transition Time: Rise/Fall Time <sup>+</sup> | -                   | 1.0                 | -                   | 1.0                 | -                   | 1.0                 | -                   | 1.0                 | nSec   |
| Start Time                                   | -                   | 10                  | -                   | 10                  | -                   | 10                  | -                   | 10                  | mSec   |
| Tri-Start(Input to Pin 2 or Pin 1)           |                     |                     |                     |                     |                     |                     |                     |                     |        |
| Enable (High voltage or floating)            | 2.31                | -                   | 1.75                | -                   | 2.31                | -                   | 1.75                | -                   | V      |
| Disable (Low voltage or GND)                 | -                   | 0.99                | -                   | 0.75                | -                   | 0.99                | -                   | 0.75                |        |
| RMS Phase Jitter                             |                     |                     |                     |                     |                     |                     |                     |                     |        |
| (Integrated 12KHz-20MHz)                     |                     |                     |                     |                     |                     |                     |                     |                     |        |
| Fo < 80MHz                                   | -                   | 1                   | -                   | 1                   | -                   | 1                   | -                   | 1                   | pSec   |
| 80MHz ≤ Fo < 125MHz                          | -                   | 0.5                 | -                   | 0.5                 | -                   | 0.5                 | -                   | 0.5                 |        |
| 125MHz ≤ Fo < 160MHz                         | -                   | 0.3                 | -                   | 0.3                 | -                   | 0.3                 | -                   | 0.3                 |        |
| Phase Noise@ 156.25MHz    100Hz              | -95                 |                     | -90                 |                     | -90                 |                     | -90                 |                     | dBc/Hz |
| 1KHz                                         | -125                |                     | -125                |                     | -120                |                     | -120                |                     |        |
| 10KHz                                        | -140                |                     | -140                |                     | -140                |                     | -140                |                     |        |
| Aging(@25 °C 1 st year)                      | -                   | ±3                  | -                   | ±3                  | -                   | ±3                  | -                   | ±3                  | ppm    |
| Storage Temp. Range                          | -55                 | 125                 | -55                 | 125                 | -55                 | 125                 | -55                 | 125                 | °C     |

## Product Description

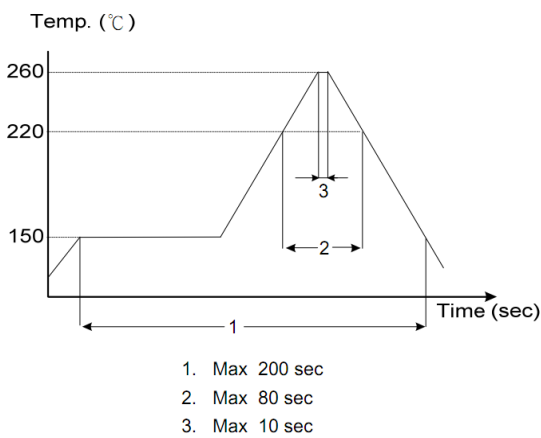
| Parameter                                    | HCSL                |                     |                     |                     | unit |
|----------------------------------------------|---------------------|---------------------|---------------------|---------------------|------|
|                                              | 3.3V                |                     | 2.5V                |                     |      |
|                                              | Min                 | Max                 | Min                 | Max                 |      |
| Supply Voltage Variation(V <sub>DD</sub> )   | V <sub>DD</sub> -5% | V <sub>DD</sub> +5% | V <sub>DD</sub> -5% | V <sub>DD</sub> +5% | V    |
| Frequencu Range                              | 25                  | 175                 | 25                  | 175                 | MHz  |
| Supply Current                               |                     |                     |                     |                     | mA   |
| 25MHz ≤ Fo < 160MHz                          | -                   | 50                  | -                   | 50                  |      |
| Output Level Output High                     | 0.6                 | -                   | 0.58                | -                   | V    |
| Output Low                                   | -                   | 0.15                | -                   | 0.15                |      |
| Transition Time: Rise/Fall Time <sup>+</sup> | -                   | 0.5                 | -                   | 0.5                 | nSec |
| Start Time                                   | -                   | 10                  | -                   | 10                  | mSec |
| Tri-Start(Input to Pin 2 or Pin 1)           |                     |                     |                     |                     |      |
| Enable                                       | 0.7V <sub>DD</sub>  | -                   | 0.7V <sub>DD</sub>  | -                   | V    |
| Disable                                      | -                   | 0.3V <sub>DD</sub>  | -                   | 0.3V <sub>DD</sub>  |      |
| RMS Phase Jitter                             |                     |                     |                     |                     |      |
| (Integrated 12KHz-20MHz)                     |                     |                     |                     |                     |      |
| 125MHz ≤ Fo < 160MHz                         | -                   | 0.5                 | -                   | 0.5                 | pSec |
| Aging(@25 °C 1 st year)                      | -                   | ±3                  | -                   | ±3                  | ppm  |
| Storage Temp. Range                          | -55                 | 125                 | -55                 | 125                 | °C   |

Standard frequencies are frequencies which the crystal has been designed and does not imply a stock position.

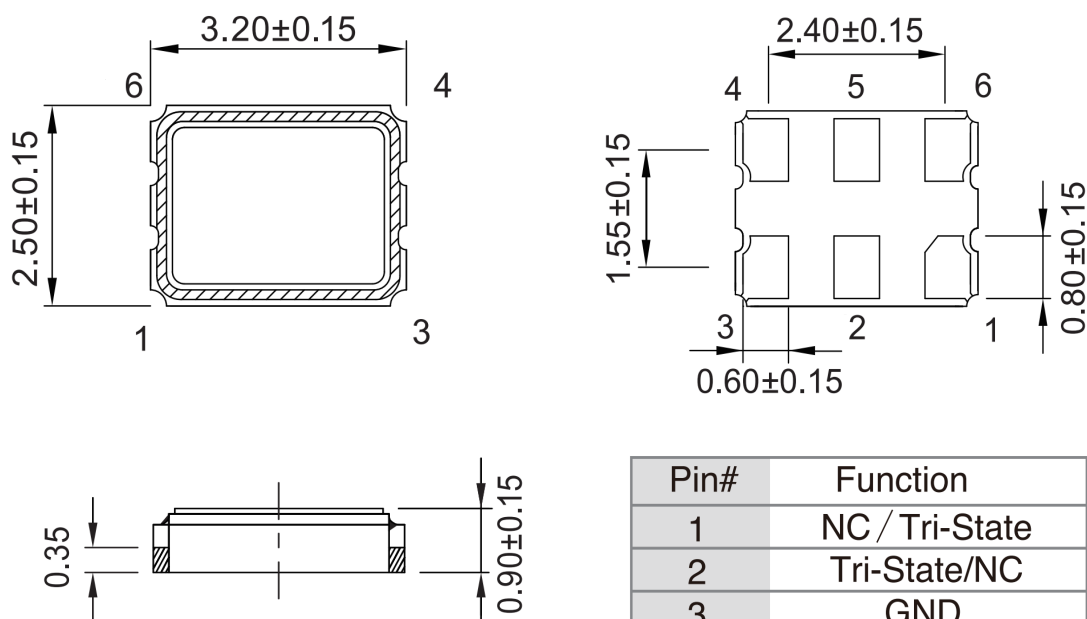
+ Transition times are measured between 20% and 80% of  $V_{DD}$ .



## Reliability Specification

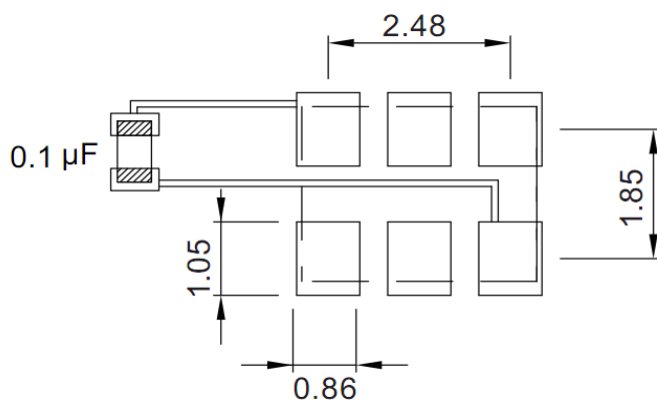
|    | Item                             | Condition                                                                                                                                                                                                                                                                 | Standard                                                        |
|----|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| 1. | Drop characteristics             | Free drop from 75cm height on a hard wooden board for 3 times. (Board is thickness more than 30 mm.)                                                                                                                                                                      | Frequency change: $\leq \pm 5\text{ppm}$<br>Rr as specification |
| 2  | Mechanical shock                 | Device are shocked to half sine wave (1000g) three mutually perpendicular axes each 3 times                                                                                                                                                                               | Frequency change: $\leq \pm 5\text{ppm}$<br>Rr as specification |
| 3. | Shake characteristics            | Shake frequency 10~55Hz, cyc1~2 minutes, swing 1.5mm, direction x/y/z, all 30 minutes, test after 1 hours.                                                                                                                                                                | Frequency change: $\leq \pm 5\text{ppm}$<br>Rr as specification |
| 4. | Humidity characteristics         | +40 $\pm$ 2 $^{\circ}\text{C}$ & 90%~95% R.H. 250 hours                                                                                                                                                                                                                   | Frequency change: $\leq \pm 5\text{ppm}$<br>Rr as specification |
| 5. | Low temperature characteristics  | -40 $\pm$ 2 $^{\circ}\text{C}$ , 250 hours, put in room temperature, test after 1 hours.                                                                                                                                                                                  | Frequency change: $\leq \pm 5\text{ppm}$<br>Rr as specification |
| 6. | High temperature characteristics | +85 $\pm$ 2 $^{\circ}\text{C}$ , 250 hours, put in room temperature, test after 1 hours.                                                                                                                                                                                  | Frequency change: $\leq \pm 5\text{ppm}$<br>Rr as specification |
| 7. | Temperature cycling              | -40 $\pm$ 2 $^{\circ}\text{C}$ /30 $\pm$ 3 min~+85 $\pm$ 2 $^{\circ}\text{C}$ /30 $\pm$ 3min, 5 cycles                                                                                                                                                                    | Frequency change: $\leq \pm 5\text{ppm}$<br>Rr as specification |
| 8. | Refluence examination            |  <p>Temp. (<math>^{\circ}\text{C}</math>)</p> <p>260</p> <p>220</p> <p>150</p> <p>Time (sec)</p> <p>1</p> <p>2</p> <p>3</p> <p>1. Max 200 sec<br/>2. Max 80 sec<br/>3. Max 10 sec</p> | Frequency change: $\leq \pm 5\text{ppm}$<br>Rr as specification |
| 9. | Others                           |                                                                                                                                                                                                                                                                           |                                                                 |

## Package Outline Dimensions



Units:mm

## Suggested Pad Layout



To ensure optimal oscillator performance, place a by-pass capacitor of 0.1µF as close to the part as possible between Vdd and GND pads.

**Packing Specification**

