



**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 : QMEMS7050/148.500M/3.3V/±30PPM  
P/N : 8P148500301  
VER : A/1

R&D APPR. SIGNATURED			DEPT. 
ISSUE	CHECK	APPROVAL	
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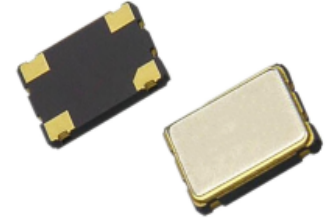
## Product Description

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### 8P148500301

#### 1. Scope:

- 1.1 This specification applies to the RoHS crystal oscillator with a frequency of 148.500MHz which will be used in electronic equipment.



#### 2. Construction:

- 2.1 Oscillators series: QMEMS7050 8P series  
2.2 Package: SMD 7.0×5.0

#### 3. Electrical Characteristics

- |      |   |   |
|------|---|---|
| 3.1  | Nominal Frequency:  | 148.500MHz                              |
| 3.2  | Frequency Stability:<br>(incl. 25°C tolerance, tolerance over<br>operating temperature range, input voltage<br>change, load change, 1 year aging) | ±30ppm                                  |
| 3.3  | Aging:  | ±3ppm/year Max                          |
| 3.4  | Operating Temperature Range:  | -40 to + 85°C                           |
| 3.5  | Storage Temperature Range:  | -55 to +125°C                           |
| 3.6  | Input Voltage ( $V_{DD}$ ):   | +3.3Vdc±10%                             |
| 3.7  | Input Current ( $I_{DD}$ ):   | 36mA max                                |
| 3.8  | Output Waveform:  | CMOS                                    |
| 3.9  | Output Symmetry:  | 45%~55%                                 |
| 3.10 | Rise/Fall Time:   | 5ns max                                 |
| 3.11 | Output Voltage $V_{OL}$ :<br>$V_{OH}$ :   | 10%VDD<br>90%VDD                        |
| 3.12 | Output Load:  | 15pF                                    |
| 3.13 | Output State Control:   | Enable/disable                          |
| 3.14 | Start-up Time:  | 5ms max                                 |
| 3.15 | Standby current:  | 10µA max                                |
| 3.16 | Phase Jitter (rms):   | 1ps rms max 12kHz to 20MHz max          |
| 3.17 | Oscillation mode:   | Fundamental                             |
| 3.18 | Others:   | Not recommended for safety applications |

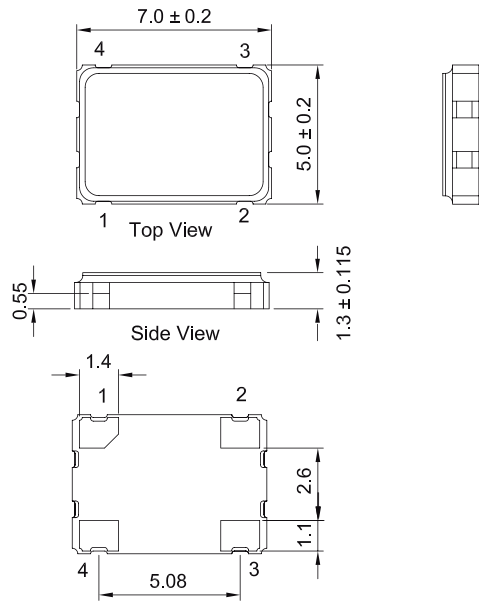
## Reliability Specification

NO.	ITEM	SPECIFICATION	TEST METHOD
4.1	Temperature Cycle (GB/T 2423.22-2002, Method Nb)	Frequency change after test $\leq\pm$ 5ppm.	10 cycles from -55°C to 125°C. Measurement taken after DUT being left at room temperature for 24 $\pm$ 2 hours.
4.2	Low Temperature Storage (GB/T 2423.1-2001, Method Aa)	Frequency change after test $\leq\pm$ 5ppm.	Spending 72 hrs at -55°C $\pm$ 3°C constant temperature. Measurement taken after DUT being left at room temperature for 24 $\pm$ 2 hours.
4.3	High Temperature Storage (GB/T 2423.2-2001, Method Ba)	Frequency change after test $\leq\pm$ 5ppm.	Spending 72 hrs at 125°C $\pm$ 3°C constant temperature. Measurement taken after DUT being left at room temperature for 24 $\pm$ 2 hours.
4.4	Humidity (GB/T 2423.3-2006, Method Cab)	Frequency change after test $\leq\pm$ 5ppm.	Spending 96 hrs at 40 °C $\pm$ 3 °C, with 90 $\pm$ 3% R.H. Measurement taken after DUT being left at room temperature for 24 $\pm$ 2 hours.
4.5	Vibration (GB/T 2423.10-1995, Method Fc)	Frequency change after test $\leq\pm$ 5ppm.	Apply 0.75mm vibration at sweep frequency 10~500 Hz, for 2h. 10 cycles in each direction of 3 axis. Measurement taken after 1 hour.
4.6	Shock (GB/T 2423.5-1995, Method Ea)	Frequency change after test $\leq\pm$ 5ppm. No visible damages.	Peak 1000m/s <sup>2</sup> , normal width 6ms half sine wave form, 3.7m/s, 3 perpendicular axis of samples, 3 cycles / direction, total 18 cycles. Measurement taken after 1 hour.
4.7	Drop (GB/T 2423.8-1995, Method Ed)	Frequency change after test $\leq\pm$ 5ppm. No visible damages.	Free drop to the wooden plate from 1.0 m heights for 3 times.
4.8	Solderability (GB/T 2423.28-2005, Method Tc)	Terminals shall be covered more than 95% with solder.	In 245 $\pm$ 5°C solder bath for 2 $\pm$ 0.5 seconds. There is no need to do functioned test. 8-12X magnifier.
4.9	Terminal Strength (JIS-C-6429 Method 1 & 2 )	No visible damage	Mount on a glass-epoxy board (100x50x1.6mm), then bend to 2mm displacement (velocity 1mm/sec) and keep for 5 seconds. or pulling force 0.5 kg for at least 60 seconds.
4.10	Resistance to Soldering Heat (GB/T 2423.28-2005, Test Tb Method 1B)	Frequency change after test $\leq\pm$ 5ppm.	Passed through the re-flow oven under the following condition. Preheat to 150°C $\pm$ 5°C for 60 to 120sec, and peak 265°C $\pm$ 5°C for 10s $\pm$ 3sec. Measurement taken after DUT being left at room temperature for at 24 $\pm$ 2 hours.
4.11	OTHERS		

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## Package Outline Dimensions

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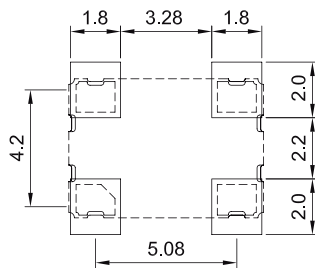


PAD FUNCTION:  
1: ENABLE CONTROL  
2: GND  
3: OUT  
4: VDD

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## Suggested Pad Layout

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## Packing Specification

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