



江苏海德频率科技有限公司  
JIANGSU HD-CRYSTAL TECHNOLOGY CO., LTD

## Specifications For Product

TYPE : Quartz Crystal Resonator  
SPEC : 2016/48M/16PF  
P/N : 7D048000P01  
VER : A/1

R&D APPR. SIGNATURED			DEPT. 
ISSUE	CHECK	APPROVAL	
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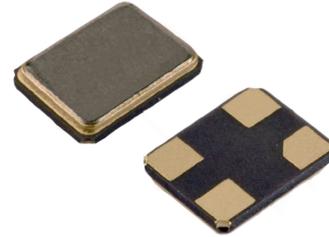
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## 7D048000P01

### 1. Scope:

- 1.1 This specification applies to the RoHS compliance quartz crystal unit with a frequency of 48.000MHz which will be used in crystal oscillator applications.



### 2. Construction:

- 2.1 Type of Quartz Resonator: SMD2016-4pads

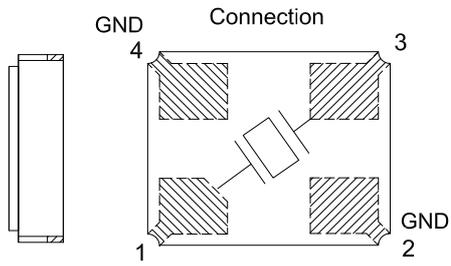
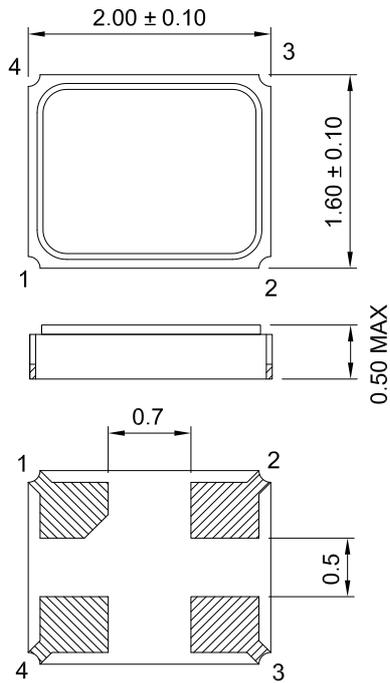
### 3. Electrical Characteristics

3.1 Nominal Frequency(f):	48.000MHz
3.2 Load Capacitance( $C_L$ ):	16pF
3.3 Frequency Tolerance( $\Delta f/f$ ):	$\pm 10$ ppm
3.4 Frequency Temperature Stability:	$\pm 20$ ppm
3.5 Resonance Resistance(ohm):	35 ohms Max
3.6 Osc mode:	Fundamental mode
3.7 Shunt Capacitance( $C_0$ ):	2pF Max
3.8 Drive Level( $D_L$ ):	100 $\mu$ W Max
3.9 Operating Temperature Range( $T_{OPR}$ ):	-20 to + 70°C
3.10 Storage Temperature Range( $T_{STG}$ ):	-55 to + 125°C
3.11 Insulation Resistance(IR):	>500M ohms
3.12 Aging( $\Delta f_A$ ):	$\pm 3$ ppm/Year Max

# Reliability Specification

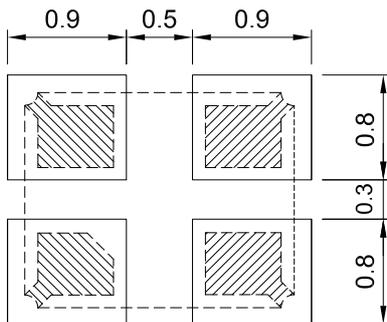
	Item	Condition	Standard
1.	Drop characteristics	Free drop from 75cm height on a hard wooden board for 3 times. (Board is thickness more than 30 mm.)	Frequency change: $\leq \pm 5\text{ppm}$ Rr as specification
2.	Mechanical shock	Device are shocked to half sine wave (1000g) three mutually perpendicular axes each 3 times	Frequency change: $\leq \pm 5\text{ppm}$ 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: $\leq \pm 5\text{ppm}$ Rr as specification
4.	Humidity characteristics	$+40 \pm 2^\circ\text{C}$ & 90%~95% R.H. 250 hours	Frequency change: $\leq \pm 5\text{ppm}$ 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: $\leq \pm 5\text{ppm}$ 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: $\leq \pm 5\text{ppm}$ Rr as specification
7.	Temperature cycling	$-30 \pm 3^\circ\text{C}/30 \pm 3 \text{ min} \sim +85 \pm 2^\circ\text{C}/30 \pm 3 \text{ min}$ , 5 cycles	Frequency change: $\leq \pm 5\text{ppm}$ Rr as specification
8.	Refluence examination	<p>1. Max 180sec 2. Max 10 sec 3. Max 80 sec 4. Max 90 sec</p>	Frequency change: $\leq \pm 5\text{ppm}$ Rr as specification

## Package Outline Dimensions



引脚	功能
#1	IN
#2	GND
#3	OUT
#4	GND

## Suggested Pad Layout



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## Packing Specification

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