

## 产 品 规 格 书

### SPECIFICATIONS FOR PRODUCT

产品类型 TYPE : SMD3225

产品规格 SPEC : 27.12MHz/3225/12PF/10PPM

产品型号 P/N : CJ13-271201210B20

日期 DATE : 2021/05/06

|                      |                     |                   |           |
|----------------------|---------------------|-------------------|-----------|
| <b>核准及签名</b>         |                     |                   | <b>部门</b> |
| R&D APPR. SIGNATURED |                     |                   | DEPT.     |
| <b>拟制</b>            | <b>审核</b>           | <b>批准</b>         | 频率器件事业部   |
| ISSUE                | CHECK               | APPROVAL          |           |
| Ivan<br>2021/05/06   | Abbey<br>2021/05/06 | Ken<br>2021/05/06 |           |



**SMCE3225 4 pads Crystal Resonator**

**CJ13-271201210B20**

1. Scope:

- 1.1 This specification applies to the RoHS/SONY compliance quartz crystal unit with a frequency of 27.12MHz which will be used in crystal oscillator applications.

2. Construction:

- 2.1 Type of Quartz Resonator: SMCE3225 4pads

3. Electrical Characteristics

- 3.1 Nominal Frequency(f): 27.12MHz
- 3.2 Load Capacitance( $C_L$ ): 12pF
- 3.3 Frequency Tolerance( $\Delta f/f$ ):  $\pm 10$ ppm
- 3.4 Frequency Temperature Stability:  $\pm 20$ ppm
- 3.5 Resonance Resistance(ohm): 40ohms Max
- 3.6 Osc mode: Fundamental mode
- 3.7 Shunt Capacitance( $C_0$ ):  $< 2$ pF
- 3.8 Drive Level( $D_L$ ):  $< 100$  $\mu$ W
- 3.9 Operating Temperature Range( $T_{OPR}$ ): -40 to + 85
- 3.10 Storage Temperature Range( $T_{STG}$ ): -55 to + 125°C
- 3.11 Insulation Resistance(IR):  $> 500$  M ohms
- 3.12 Aging( $\Delta f_A$ ):  $\pm 3$ ppm per Year

## 4. Reliability Specifications

This is the quality control and quality assurance and reliability tests performance data for the RoHS/

SONY compliance 27.12MHz SMCE3225 4pads crystal resonators

related to the specification and approval sheet provided by JSCJ .

Standard test condition (TEMP.: 20±5°C. Relative humidity: 65±20%)

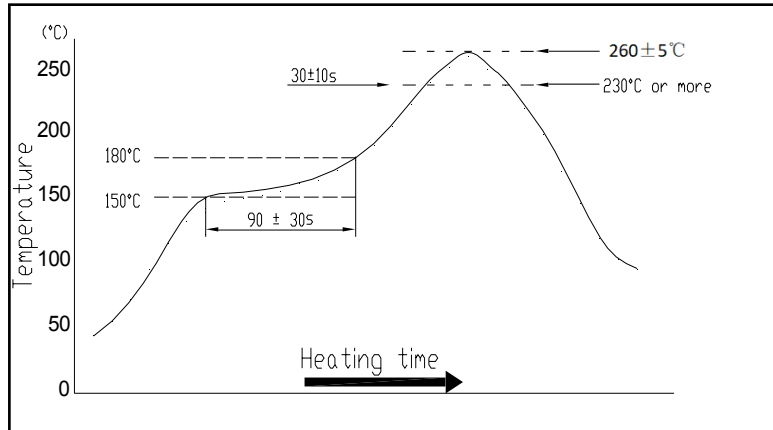
For any discrepancy in GO/NG, test will be done at TEMP.25±2°C, R.H. 65±5%.

| NO.  | PROCESS  | SPECIFICATION  | TEST METHOD   |
|------|--|--|---|
| 4.1  | Temperature Cycle (GB/T 2423.22-2002, Method Nb)               | Frequency change after test $\pm$ 5ppm. Resonance resistance change after test $\leq$ 10ohms.                                | 10 cycles from -55°C to 125°C. Measurement taken after DUT being left at room temperature for 24±2 hours.   |
| 4.2  | Low Temperature Storage (GB/T 2423.1-2001, Method Aa)          | Frequency change after test $\pm$ 5ppm. Resonance resistance change after test $\leq$ 10ohms.                                | Spending 72 hrs at -55°C±3°C constant temperature. Measurement taken after DUT being left at room temperature for 24±2 hours.   |
| 4.3  | High Temperature Storage (GB/T 2423.2-2001, Method Ba)         | Frequency change after test $\pm$ 5ppm. Resonance resistance change after test $\leq$ 10ohms.                                | Spending 72 hrs at 125°C±3°C constant temperature. Measurement taken after DUT being left at room temperature for 24±2 hours.   |
| 4.4  | Humidity (GB/T 2423.3-2006, Method Cab)                        | Frequency change after test $\pm$ 5ppm. Resonance resistance change after test $\leq$ 10ohms.                                | Spending 96 hrs at 40 °C $\pm$ 3 °C, with 93 %R.H. Then keep the DUT in dry oven at 40 $\pm$ 5 °C for 24 hour. Measurement taken after DUT being left at room temperature for 1 to 2 hours.   |
| 4.5  | Vibration (GB/T 2423.10-1995, Method Fc)                       | Frequency change after test $\pm$ 5ppm. Resonance resistance change after test $\leq$ 10ohms.                                | Apply 0.75mm vibration at sweep frequency 10~500 Hz, 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 $\pm$ 5ppm. Resonance resistance change after test $\leq$ 10ohms. and exhibit no visible damage. | 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 $\pm$ 5ppm. Resonance resistance change after test $\leq$ 10ohms. and exhibit no visible damage. | Free drop to the steel plate with thickness of 3 mm from 1.00 m heights for 3 times.  |
| 4.8  | Solderability ( IEC60068-2-58, Test Td:)                       | Terminals shall be covered more then 95% with solder.  | Passed through the re-flow oven under the following condition. Preheat 150 to 180°C for 60 to 120sec, and soldering time for 20s $\pm$ 5s at 235°C, peak soldering time for 10s $\pm$ 1s between 240 and 250°C. There is no need to do functional 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 1.8kg for at least 60 seconds.   |
| 4.10 | Resistance to Soldering Heat (IEC60068-2-58, Test Td: Table 4) | Frequency change after test $\pm$ 5ppm. Resonance resistance change after test $\leq$ 10ohms.                                | Passed through the re-flow oven under the following condition. Preheat 150 to 180°C for 60 to 120sec, and soldering time for 60s max at 235°C, peak soldering time for 20s max at 265°C max. Measurement taken after DUT being left at room temperature for at least 2 hours. |
| 4.11 | OTHERS   |  |   |

5. Recommended Reflow soldering condition (SMD)

Solder profile

Peak:  $260 \pm 5^\circ\text{C}$  Soldering zone:  $230^\circ\text{C}$  or more,  $30 \pm 10\text{s}$ . Pre-heating zone 1:  $150 \sim 180^\circ\text{C}$ ,  $90 \pm 30\text{s}$

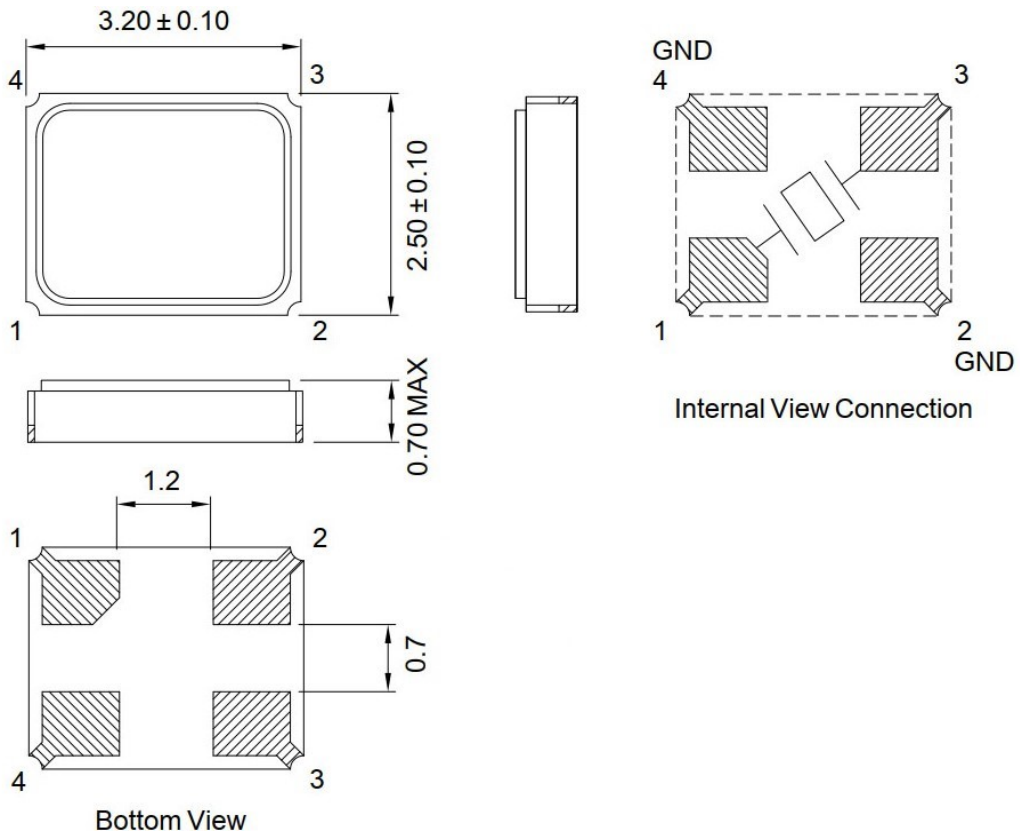


Temperature profile for reflow soldering

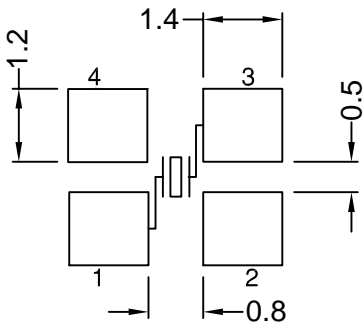
6. Soldering iron method

Bit temperature:  $350 \pm 10^\circ\text{C}$  Application time of soldering iron:  $3+1\text{ s}$ . For other procedures, refer to IEC 60068-2-20.

## Package Outline Dimensions



## Suggested Pad Layout



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## Inside Structure

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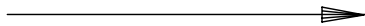
| No. | Components    | Materials                                   |
|-----|---------------|---|
| 1   | Package       | Ceramic( $\text{Al}_2\text{O}_3$ )          |
| 2   | Lid           | KV(Fe/Ni/Co)                                |
| 3   | Crystal blank | $\text{SiO}_2$                              |
| 4   | Electrode     | Ag, Cr                                      |
| 5   | Silver glue   | Ag, $\text{CH}_3\text{OH}$ , $\text{SiO}_2$ |



EMBOSSED TYPE DIMENSIONS



USER FEED DIRECTION

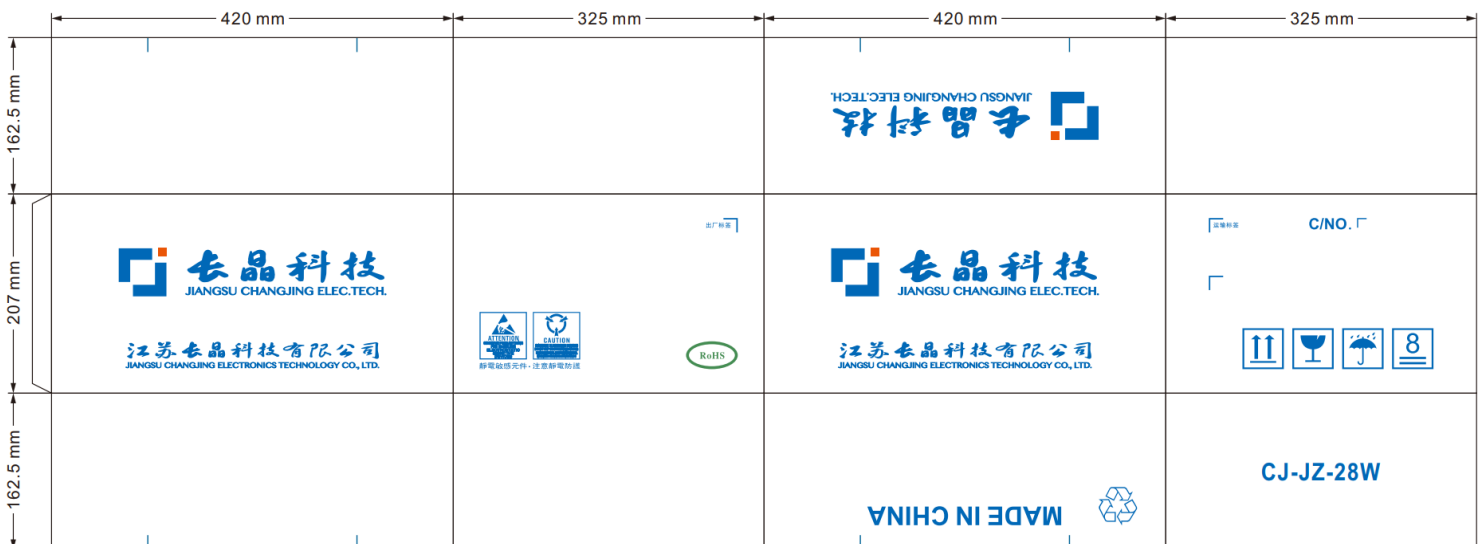


# Package

## Inside package



## Outside package



### NOTICE

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