

# 3CK Series 3.2 x 2.5 mm SMD Crystal Oscillator

3 : 3.2×2.5×0.95 mm | SMD3225-4P

CK : 32.768KHz Crystal Oscillator

## Feature

- Miniature Ceramic surface mount with Metal Lid
- CMOS compatible logic levels
- Tri-state function available
- Supply voltage range : 1.62V ~ 5.5V(Compatible with 1.8V, 2.5V, 3.3V,5.0V)
- RoHS Compliant / Pb Free

## Applications

- Real Time Clock Reference
- Internet of Things (IoT) devices
- Smart meters
- Audio, Video, Gaming products
- Portable Electronics



## Electrical Specifications

| Item                          | Symb.                           | Min.   | Typ.            | Max.   | Unit | Notes   |
|-------------------------------|---------------------------------|--------|-----------------|--------|------|---|
| Frequency Range               | Freq.                           |        | 32.768          |        | KHz  |   |
| Operating Temperature         | T_use                           | -20    |                 | 70     | °C   |   |
|                               |                                 | -40    |                 | 85     | °C   |   |
| Storage Temperature Range     | T_stg                           | -55    |                 | 125    | °C   |   |
| Supply Voltage                | Vdd                             | 1.62   | 1.8/2.5/3.3/5.0 | 5.5    | V    |   |
| Output Load                   | L_CMOS                          |        | 15              |        | pF   |   |
| Current Consumption           | Icc                             |        |                 | 90     | μA   | No load condition, Vdd=3.0V   |
| Duty Cycle                    | SYM                             | 45     |                 | 55     | %    | 50% Vdd level, L_CMOS ≤ 15 pF   |
| Rise / Fall Time              | T <sub>R</sub> / T <sub>F</sub> |        |                 | 25     | nS   | 10% Vdd to 90% Level  |
| Start-up Time                 | T_str                           |        |                 | 5      | mS   | To 90% of Final Amplitude   |
| High output voltage           | V <sub>OH</sub>                 | 0.9Vdd |                 |        | V    |   |
| Low output voltage            | V <sub>OL</sub>                 |        |                 | 0.1Vdd | V    |   |
| Enable Voltage High (Logic 1) | V <sub>IH</sub>                 | 0.7Vdd |                 |        | V    | Output will be disable if OE is Logic 0<br>Output will be enable if OE is Logic 1 or open |
| Enable Voltage Low (Logic 0)  | V <sub>IL</sub>                 |        |                 | 0.3Vdd | V    |   |
| Aging                         | f_age                           |        |                 | 3      | ppm  | 1st. Year at 25°C   |

## Frequency Stability & Operating Temperature Range

| Temp. \ FT     | ±20ppm | ±25ppm | ±30ppm | ±50ppm |
|----------------|--------|--------|--------|--------|
| -20°C to +70°C | △      | ★      | ★      | ★      |
| -40°C to +85°C |        | △      | ★      | ★      |

★: Available    △: Conditional

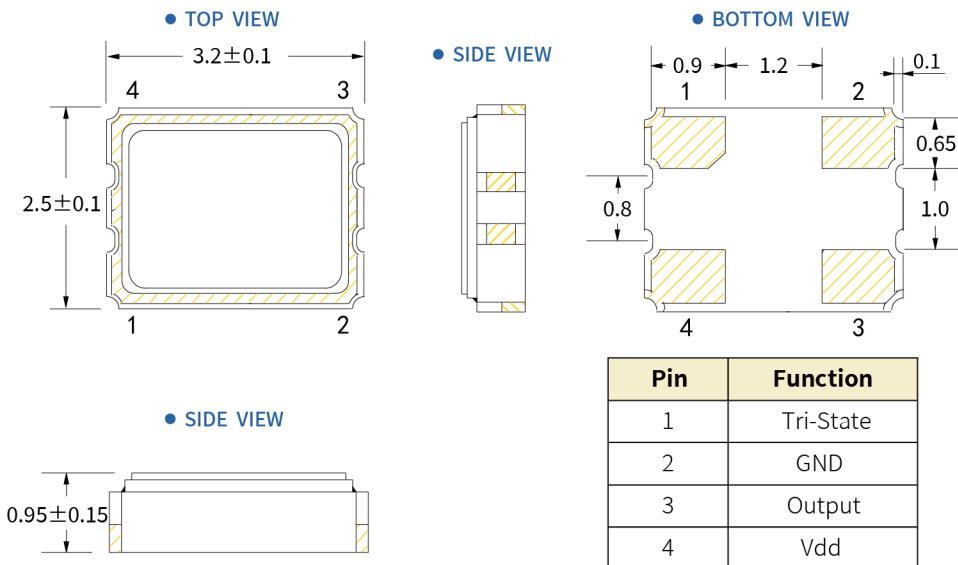
All condition: Include 25°C tolerance, operating temperature range, input voltage change, aging, load change.

# 3CK Series 3.2 x 2.5 mm SMD Crystal Oscillator

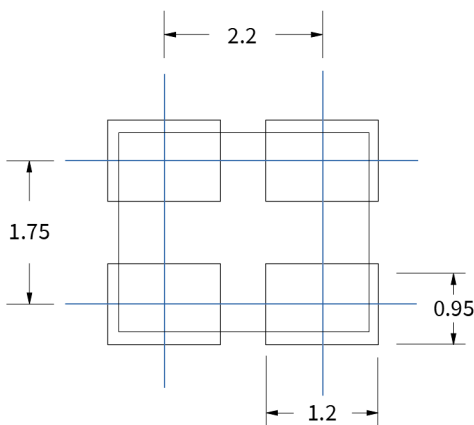
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## Dimensions (UNIT:mm)



## Solder pad layout (UNIT:mm)



## Options and Part Identification : Example SX3M32.768KB20F30TNN

| Company      | Ceramic Package   | Frequency Code [KHz] | Supply Voltage                       | Frequency Tolerance      | Operating Temperature              | Frequency Drift                     | Output       | Current Consumption | Phase Noise      |
|--------------|---|----------------------|--------------------------------------|--------------------------|------------------------------------|-------------------------------------|--------------|---------------------|------------------|
| <b>SX</b>    | <b>3M</b>   | <b>32.768K</b>       | <b>B</b>                             | <b>20</b>                | <b>F</b>                           | <b>30</b>                           | <b>T</b>     | <b>N</b>            | <b>N</b>         |
| Code Company |   | Frequency            |                                      | Code Frequency Tolerance |                                    | Code Frequency Drift                |              | Code Current        |                  |
| SX SCTF      |   | 32.768               |                                      | 10 ±10ppm<br>20 ±20ppm   |                                    | 15 ±15ppm<br>20 ±20ppm<br>30 ±30ppm |              | N Standard          |                  |
|              | Code Ceramic Package  |                      | Code Voltage                         |                          | Code Operating Temperature         |                                     | Code Output  |                     | Code Phase Noise |
|              | 7M 7.0x5.0x1.3mm<br>5M 5.0x3.2x1.2mm<br>3M 3.2x2.5x0.95mm<br>2M 2.5x2.0x0.81mm<br>1M 2.0x1.6x0.75mm |                      | D 1.8V<br>H 2.5V<br>B 3.3V<br>A 5.0V |                          | E -20°C ~ +70°C<br>F -40°C ~ +85°C |                                     | T Squarewave |                     | N Standard       |

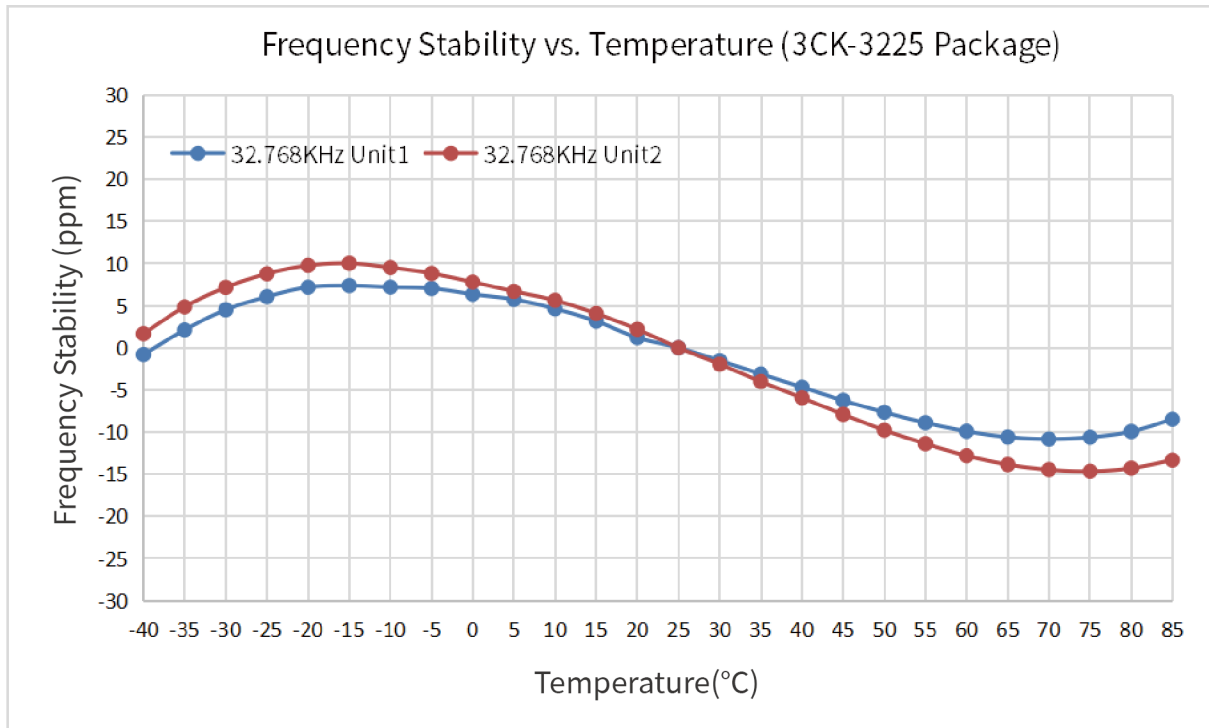
If you have other parameter requirements, you can contact **SCTF** at any time.

# 3CK Series 3.2 x 2.5 mm SMD Crystal Oscillator

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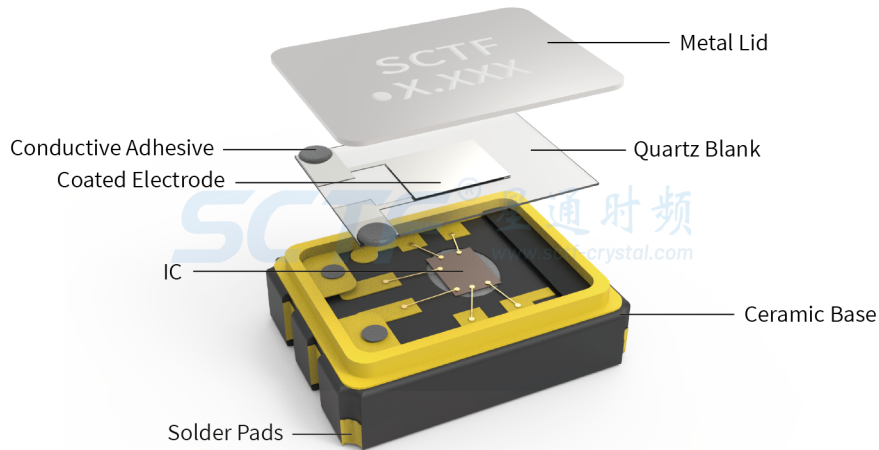
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## Frequency Temperature Characteristics

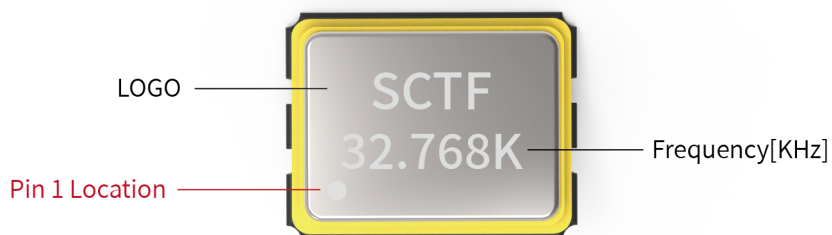


## Product Structure & Marking Information

### Product Structure



### Marking Information

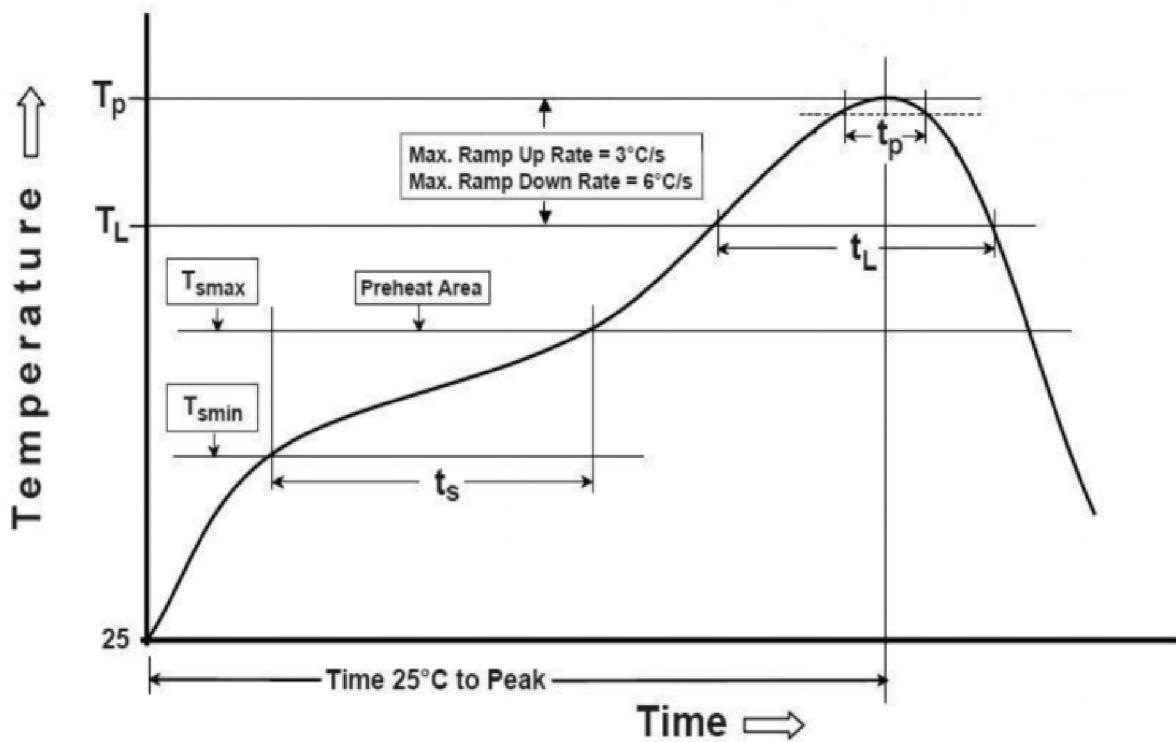


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## Suggested Reflow Profile



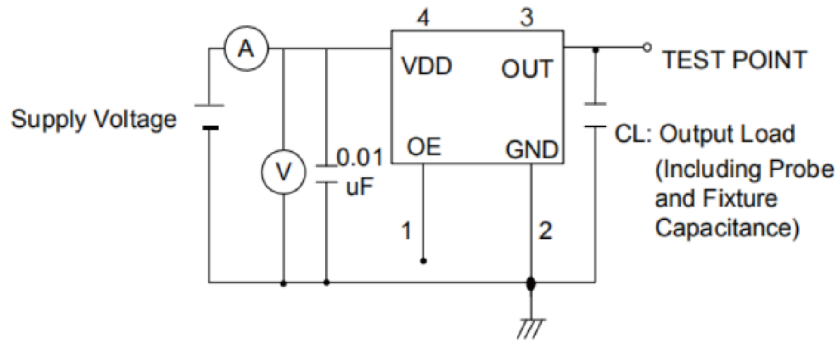
| Profile Feature  | Sn - Pb Eutectic Assembly        | Preheat / Soak                   |
|--|----------------------------------|----------------------------------|
| Preheat / Soak <ul style="list-style-type: none"> <li>● Temperature Min ( Ts min )</li> <li>● Temperature Max ( Ts max )</li> <li>● Time ( Ts min to Ts max )</li> </ul> | 100°C<br>150°C<br>60-120 seconds | 150°C<br>200°C<br>60-120 seconds |
| Ramp - up rate ( TL to Tp )  | 3°C/ second max.                 | 3°C/ second max.                 |
| Time maintained above <ul style="list-style-type: none"> <li>● Liquidous temperature ( TL )</li> <li>● Time ( tL ) maintained above TL</li> </ul>                        | 183°C<br>60-150 seconds          | 217°C<br>60-150 seconds          |
| Peak package body temperature ( Tp )   | 235°C                            | 260°C                            |
| Time within 5° C of the specified classification temperature ( Tp )  | 20 seconds                       | 30 seconds                       |
| Ramp - down rate ( Tp to TL )  | 6°C/ second max.                 | 6°C/ second max.                 |
| Time 25° C to peak temperature   | 6 minutes max.                   | 8 minutes max.                   |
| <b>Suggest reflow times</b>  | <b>2 Times max.</b>              |                                  |

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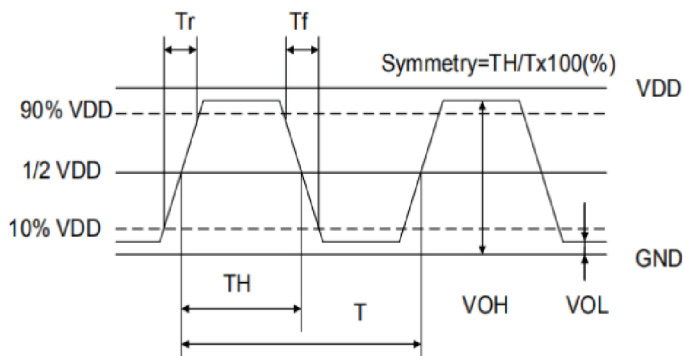
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## Testing Circuit



※ Notes: PIN 1 connected to Vdd or floating, the product is working properly; connected to GND, stops working.

## Waveform Conditions



Waveform measurement system should have a min. bandwidth of 5 times the frequency being tested.

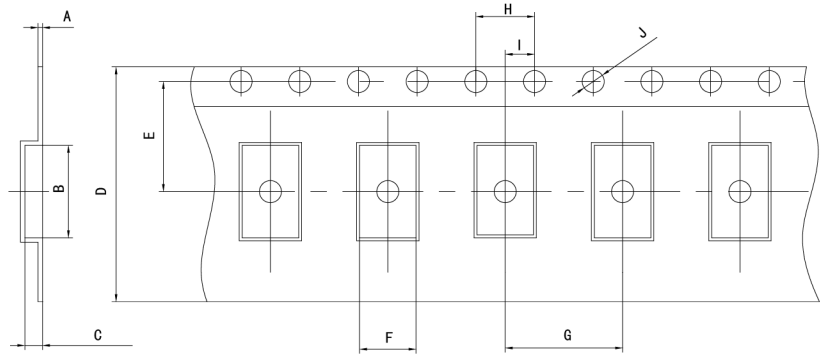
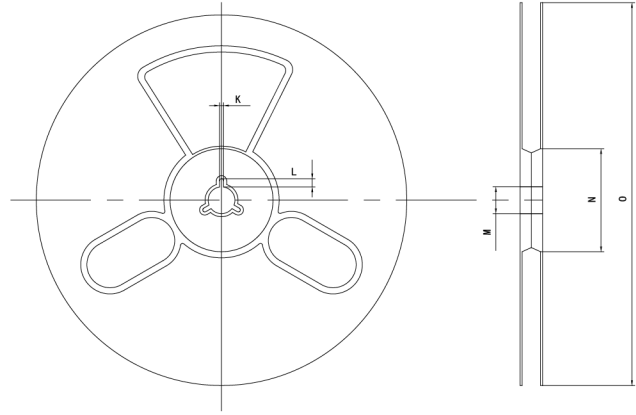
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## Packaging Information

T=Tape and reel (3,000pcs/reel)



### Pocket Tape Dimensions(mm)

| Series | A         | B       | C       | D       | E       | F        | G       | H       | I       | J        | K       | L       | M       | N     | O      |
|--------|-----------|---------|---------|---------|---------|----------|---------|---------|---------|----------|---------|---------|---------|-------|--------|
| 3CK    | 0.25±0.05 | 3.5±0.1 | 1.4±0.1 | 8.0±0.1 | 3.5±0.1 | 2.70±0.1 | 4.0±0.1 | 4.0±0.1 | 2.0±0.1 | φ1.5±0.1 | 2.0±0.2 | 4.0±1.0 | φ13±0.5 | φ60±1 | φ180±1 |