

3CKL 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

L : Low Current Crystal Oscillator

Feature

- Miniature Ceramic surface mount with Metal Lid
- CMOS compatible logic levels
- Tri-state function available
- Low power active mode: 7.2μA max
- Supply voltage range : 1.8V ~ 3.3V
- 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 | 1.8 | | 3.3 | V | |
| Output Load | L_CMOS | | 15 | | pF | |
| Current Consumption | Icc | | | 7.2 | μA | No load condition, Vdd=3.0V |
| | | | | 6.5 | | No load condition, Vdd=1.8V |
| Duty Cycle | SYM | 45 | | 55 | % | 50 % Vdd level, L_CMOS ≤ 15 pF |
| Rise / Fall Time | T _R / T _F | | | 25 | nS | 10% Vdd to 90% Level |
| Start-up Time | T_str | | | 20 | mS | To 90% of Final Amplitude |
| High output voltage | V _{OH} | 0.9Vdd | | | V | |
| Low output voltage | V _{OL} | | | 0.1Vdd | V | |
| Enable Voltage High (Logic 1) | V _{IH} | 0.7Vdd | | | V | Output will be disable if OE is Logic 0 Output will be enable if OE is Logic 1 or open |
| Enable Voltage Low (Logic 0) | V _{IL} | | | 0.3Vdd | V | |
| Enable Voltage Low (Logic 0) | V _{PLZ} | | | 20 | mS | |
| 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.

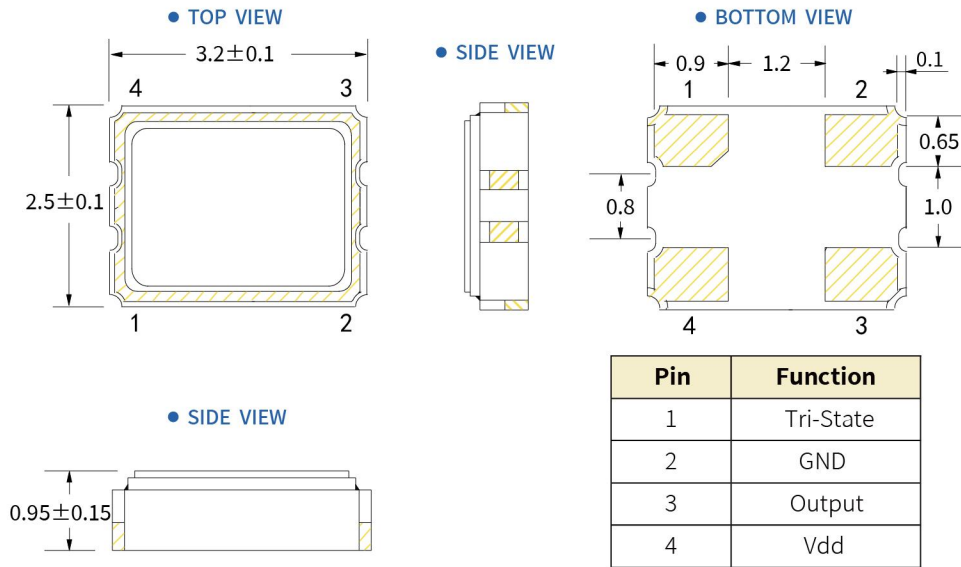
3CKL Series 3.2 x 2.5 mm SMD Crystal Oscillator

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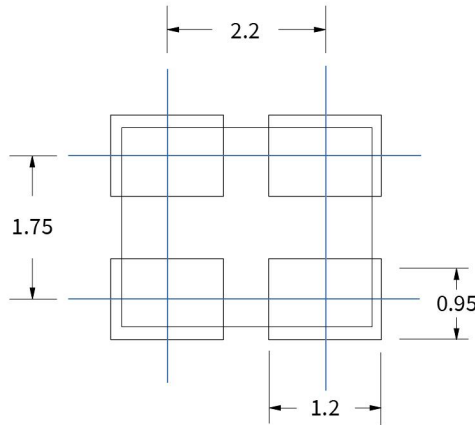
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Dimensions (UNIT:mm)



Solder pad layout (UNIT:mm)



Options and Part Identification : Example SX3M32.768KB20F30TLN

| Company | Ceramic Package | Frequency Code [KHz] | Supply Voltage | Frequency Tolerance | Operating Temperature | Frequency Drift | Output | Current Consumption | Phase Noise | |
|---|-----------------|----------------------------|--------------------------|------------------------------------|-------------------------------------|-----------------|--|---------------------|------------------|--|
| SX | 3M | 32.768K | B | 20 | F | 30 | T | L | N | |
| Code Company | | Frequency | Code Frequency Tolerance | | Code Frequency Drift | | Code Current | | Code Phase Noise | |
| SX | SCTF | 32.768 | 10 ±10ppm 20 ±20ppm | | 15 ±15ppm 20 ±20ppm 30 ±30ppm | | L 10µA M 7µA P 3µA Q 2µA U 1µA | | N Standard | |
| Code Ceramic Package | | Code Voltage | | Code Operating Temperature | | Code Output | | | | |
| 7M 7.0×5.0×1.3mm 5M 5.0×3.2×1.2mm 3M 3.2×2.5×0.95mm 2M 2.5×2.0×0.81mm 1M 2.0×1.6×0.75mm | | D 1.8V H 2.5V B 3.3V | | E -20°C ~ +70°C F -40°C ~ +85°C | | T CMOS | | | | |

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

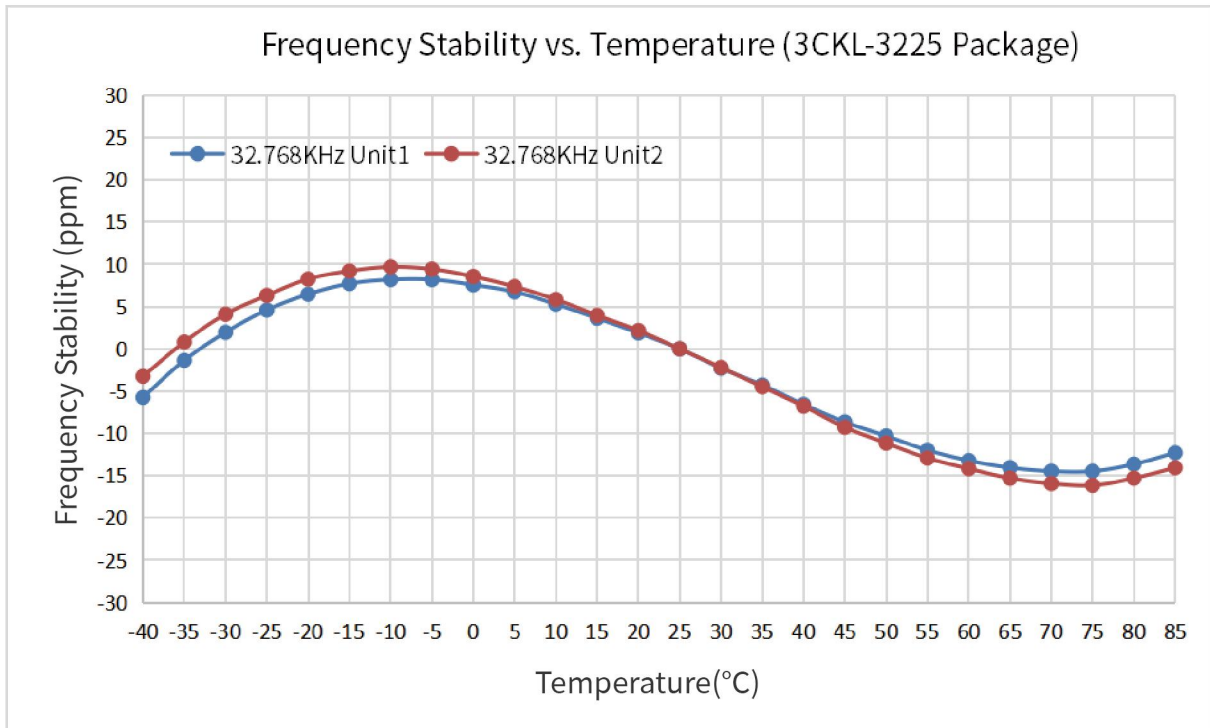
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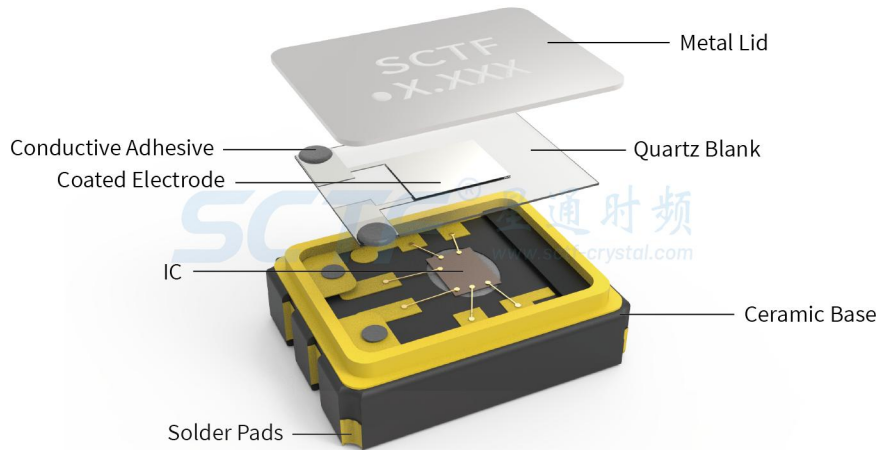
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Frequency Temperature Characteristics



Product Structure & Marking Information

Product Structure



Marking Information



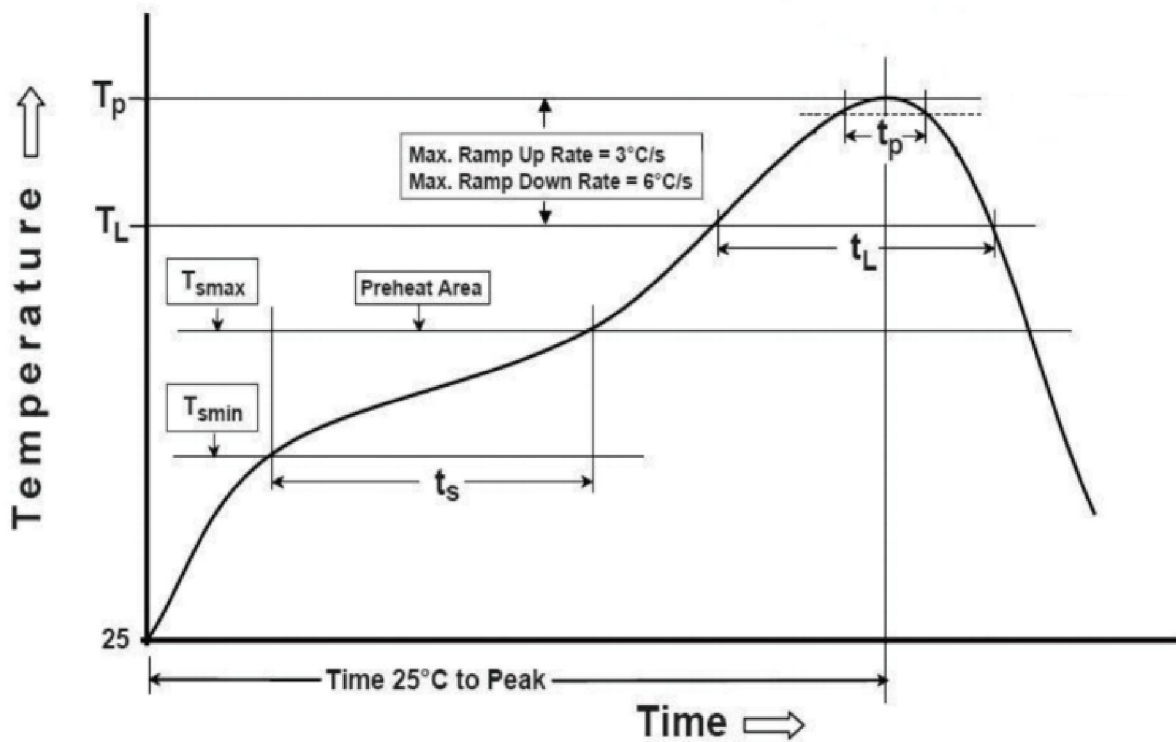
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Suggested Reflow Profile



| Profile Feature | Sn - Pb Eutectic Assembly | Preheat / Soak |
|--|----------------------------------|----------------------------------|
| Preheat / Soak <ul style="list-style-type: none"> ● Temperature Min (Ts min) ● Temperature Max (Ts max) ● Time (Ts min to Ts max) | 100°C 150°C 60-120 seconds | 150°C 200°C 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"> ● Liquidous temperature (TL) ● Time (tL) maintained above TL | 183°C 60-150 seconds | 217°C 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. |
| Suggest reflow times | 2 Times max. | |

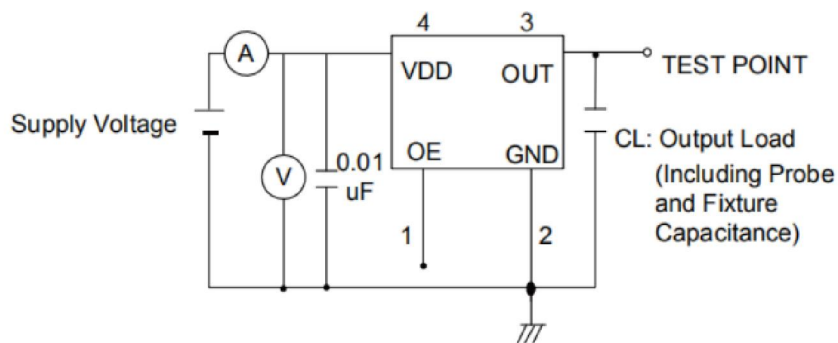
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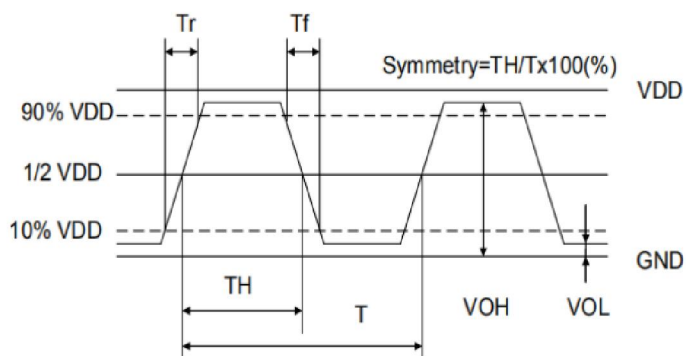
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Testing Circuit



※ 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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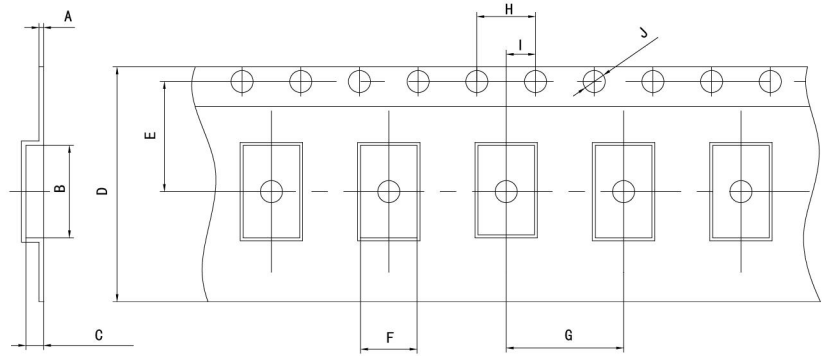
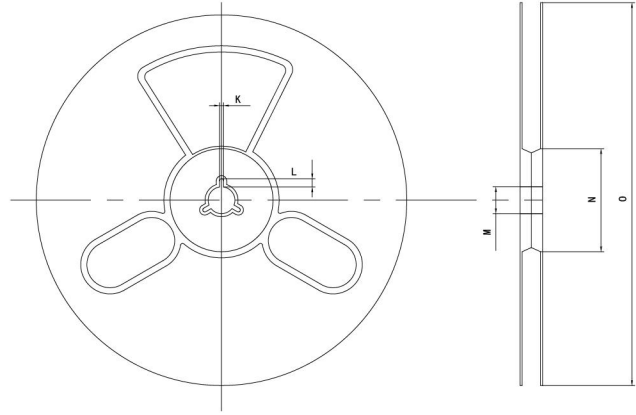
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Packaging Information

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 |
|--------|-----------|---------|---------|---------|---------|----------|---------|---------|---------|----------|---------|---------|---------|-------|--------|
| 3CKL | 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 |