# 3C Series 3.2 x 2.5 mm SMD Crystal Oscillator

3 : 3.2×2.5×0.95 mm | SMD3225-4P  C : SPXO 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

- Wireless Devices
- Internet of Things (IoT) devices
- Ethernet/Gigabit Ethernet
- Audio, Video, Gaming products
- Micro base station

## Electrical Specifications

| Item | Symb. | Min. | Typ. | Max. | Unit | Notes |
|---|---|---|---|---|---|---|
| Frequency Range | Freq. | 1.000 | | 160.000 | MHz | |
| Operating Temperature | T_use | -20 | | 70 | °C | |
| | | -40 | | 85 | °C | |
| StorageTemperature 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 | | | 10 | mA | 1MHz ⩽ Freq. < 40MHz |
| | | | | 20 | | 40MHz ⩽ Freq. < 80MHz |
| | | | | 40 | | 80MHz ⩽ Freq. < 160MHz |
| Duty Cycle | SYM | 45 | | 55 | % | 50 % Vdd level, L_CMOS ⩽ 15 pF |
| Rise / Fall Time | $T_R$ / $T_F$ | | | 5 | nS | 10% Vdd to 90% Level |
| Start-up Time | T_str | | | 5 | 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<br>Output will be enable if OE is Logic 1 or open |
| Enable Voltage Low (Logic 0) | $V_{IL}$ | | | 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.

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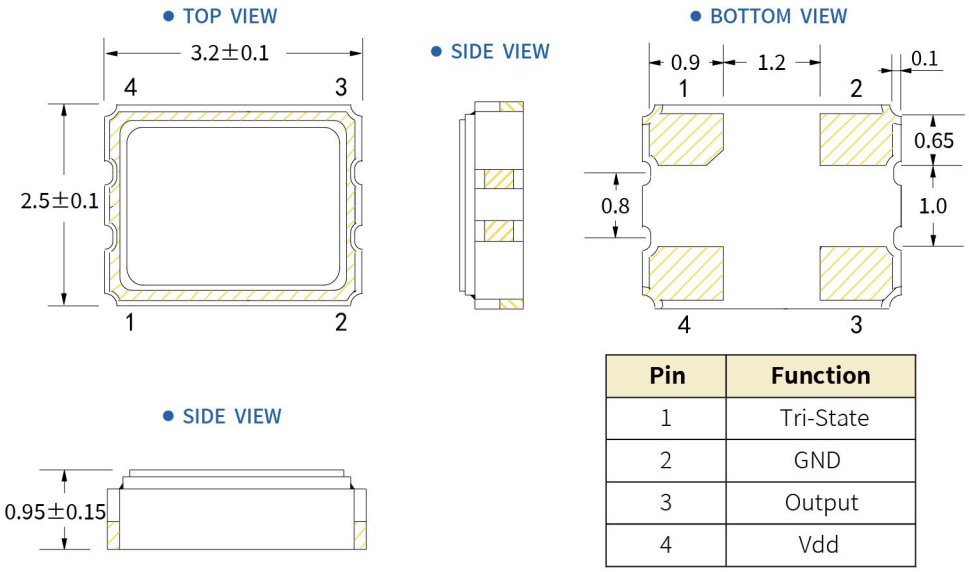
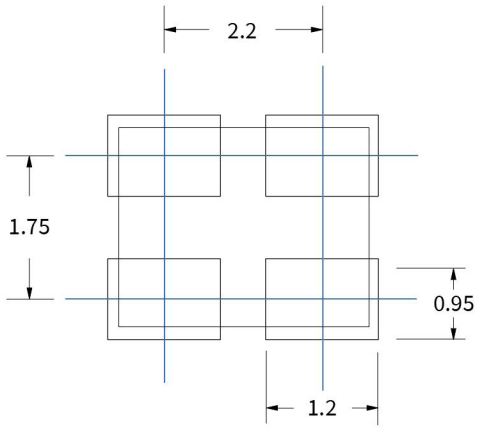
## Dimensions (UNIT:mm)




| Pin | Function |
|---|---|
| 1 | Tri-State |
| 2 | GND |
| 3 | Output |
| 4 | Vdd |

## Solder pad layout (UNIT:mm)




## Options and Part Identification : Example SX3M1.000B20F30TNN

| Company | Ceramic Package | Frequency Code [MHz] | Supply Voltage | Frequency Tolerance | Operating Temperature | Frequency Drift | Output | Current Consumption | Phase Noise |
|---|---|---|---|---|---|---|---|---|---|
| SX | 3M | X.XXX | B | 20 | F | 30 | T | N | N |

| Code | Company |
|---|---|
| SX | SCTF |

| Frequency |
|---|
| 1.000 |
| 13.560 |
| 19.200 |
| 37.125 |

| Code | Frequency Tolerance |
|---|---|
| 10 | ±10ppm |
| 20 | ±20ppm |

| Code | Frequency Drift |
|---|---|
| 15 | ±15ppm |
| 20 | ±20ppm |
| 30 | ±30ppm |

| Code | Current |
|---|---|
| N | Standard |

| Code | Ceramic Package |
|---|---|
| 1M | 2.0×1.6×0.75mm |
| 2M | 2.5×2.0×0.81mm |
| 3M | 3.2×2.5×0.95mm |
| 5M | 5.0×3.2×1.2mm |
| 7M | 7.0×5.0×1.3mm |
| OA | 12.7×12.7×5.4 mm[PXO-8] |
| OB | 20.4×12.8×4.9 mm [PXO-14] |

| Code | Voltage |
|---|---|
| D | 1.8V |
| H | 2.5V |
| B | 3.3V |
| A | 5.0V |

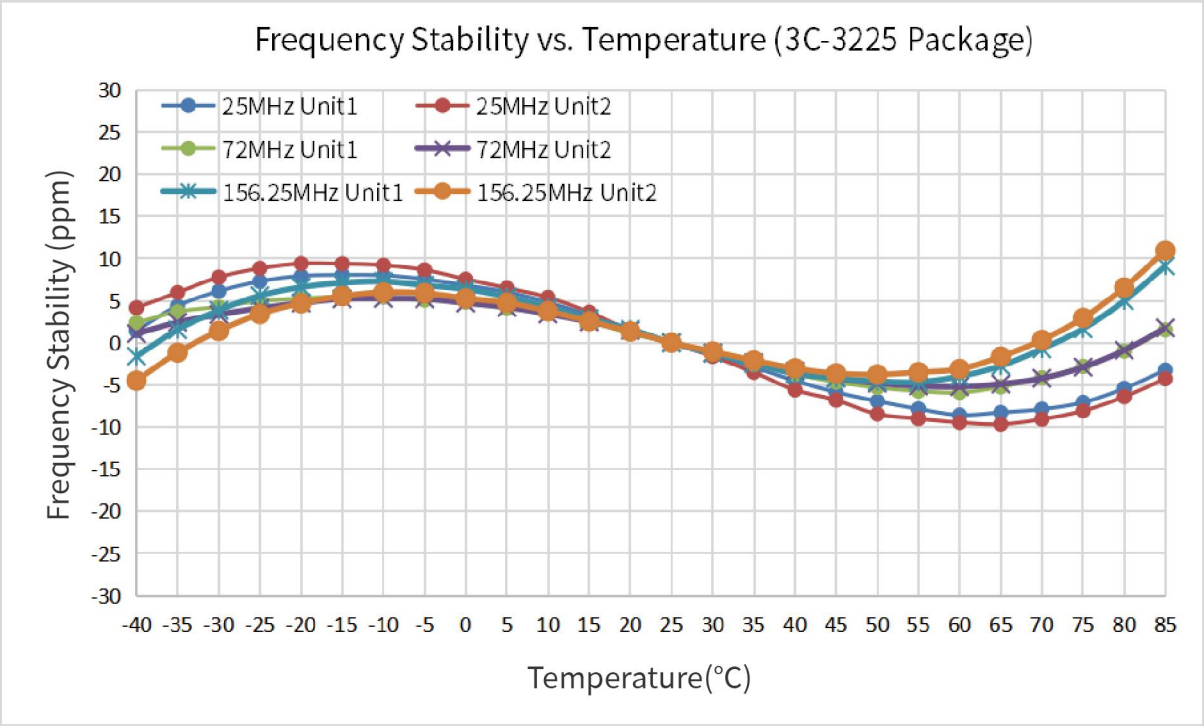
| Code | Operating Temperature |
|---|---|
| E | -20°C ~ +70°C |
| F | -40°C ~ +85°C |

| Code | Output |
|---|---|
| T | CMOS 15pF |
| H | CMOS 30pF |
| G | CMOS 50pF |

| Code | Phase Noise |
|---|---|
| N | Standard |

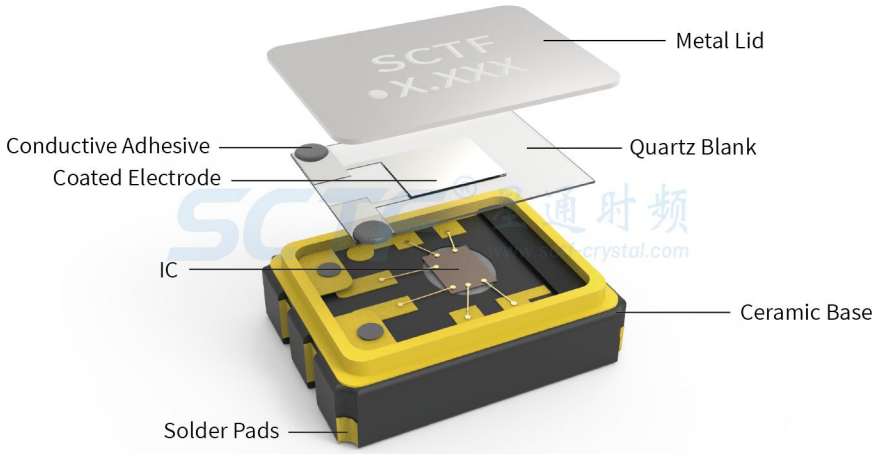
If you have other parameter requirements, you can contact **SCTF** at any time.

## Frequency Temperature Characteristics

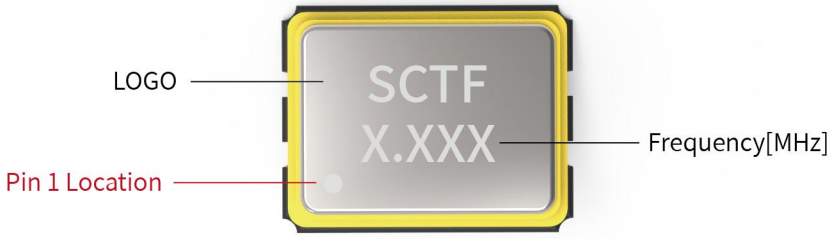



## Product Structure&Marking Information

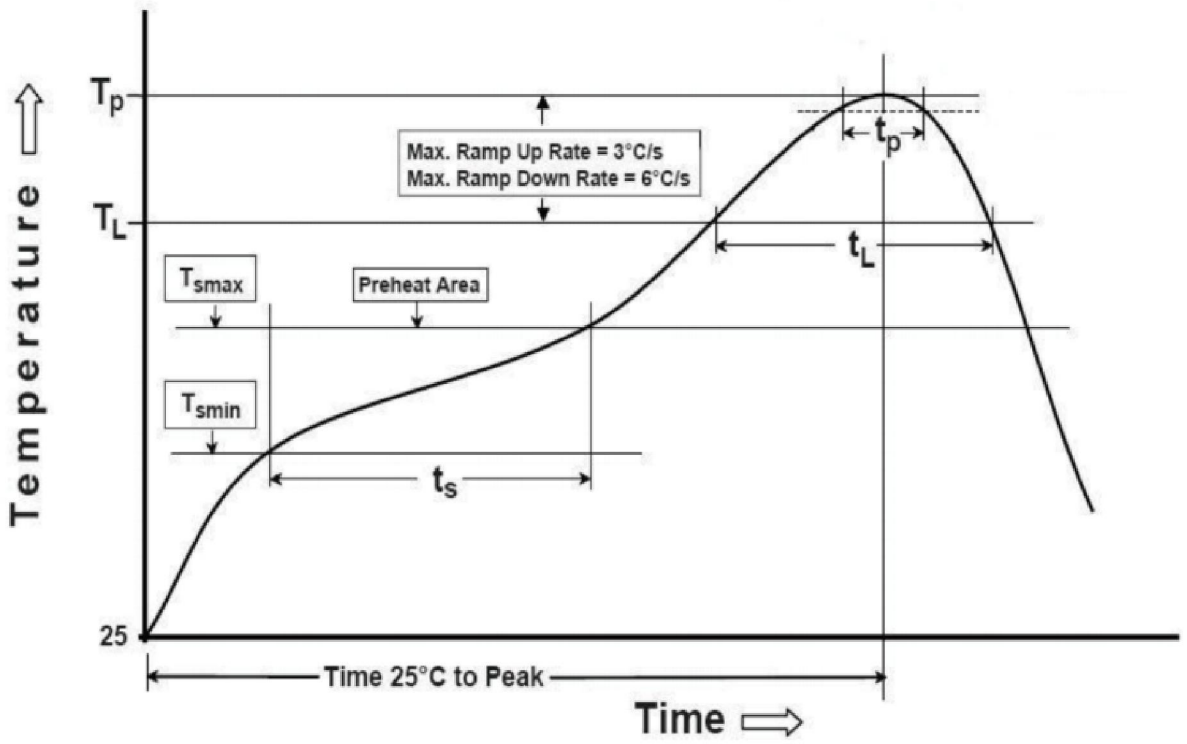
- Product Structure




- Marking Information

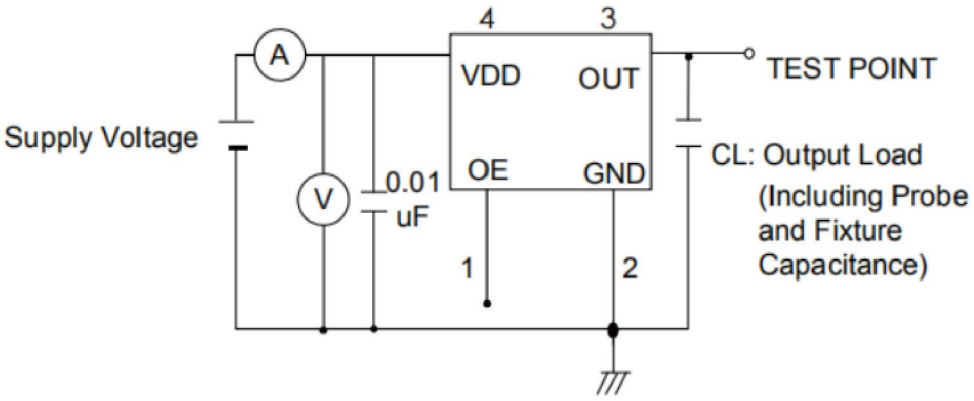


## Suggested Reflow Profile



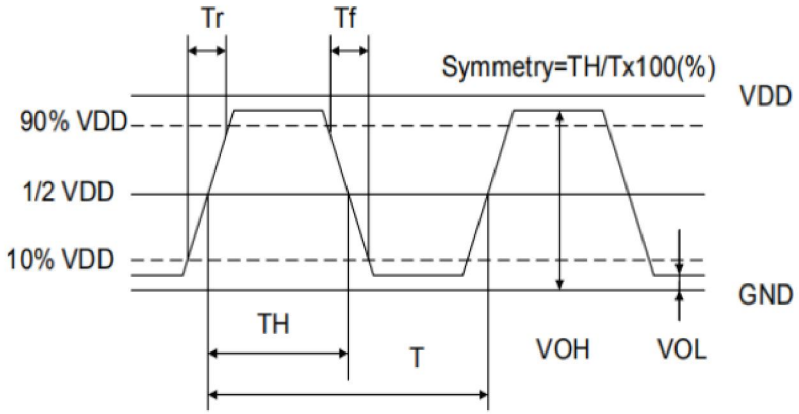

| Profile Feature | Sn - Pb Eutectic Assembly | Preheat / Soak |
|---|---|---|
| Preheat / Soak<br>● Temperature Min ( Ts min )<br>● Temperature Max ( Ts max )<br>● Time ( Ts min to Ts max ) | 100°C<br>150°C<br>60-120 seconds | 150°C<br>200°C<br>60-120 seconds |
| Ramp - up rate ( TL to Tp ) | 3°C/ second max. | 3°C/ second max. |
| Time maintained above<br>● Liquidous temperature ( TL )<br>● Time ( tL ) maintained above TL | 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. |
| **Suggust reflow times** | **2 Times max.** | |

## Testing Circuit




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

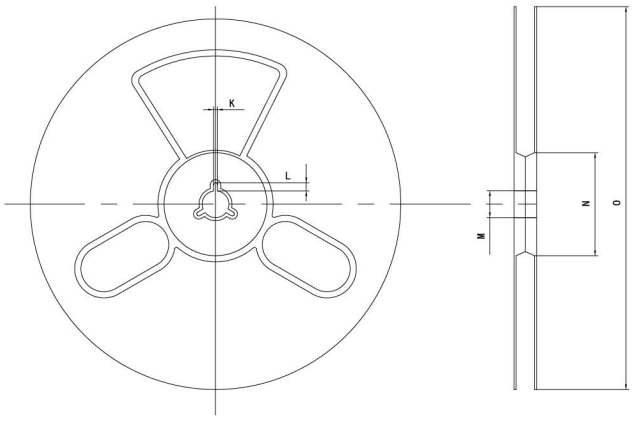
## Waveform Conditions

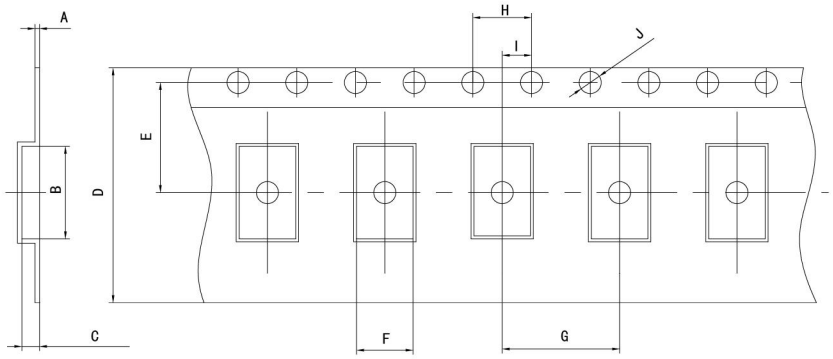



Waveform measurement system should have a min. bandwidth of 5 times the frequency being tested.

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3C | 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 |

## Common Frequencies – MHz

| 3C Series | | | | |
|---|---|---|---|---|
| 1.000 | 1.024 | 1.8432 | 2.000 | 2.048 |
| 2.176 | 2.4576 | 2.500 | 3.072 | 3.579545 |
| 3.6864 | 4.000 | 4.096 | 4.9152 | 5.000 |
| 5.5296 | 6.000 | 6.144 | 6.7458 | 6.780 |
| 7.200 | 7.3728 | 7.680 | 8.000 | 8.192 |
| 10.000 | 11.0592 | 11.2896 | 12.000 | 12.288 |
| 12.500 | 13.000 | 13.560 | 14.31818 | 14.7456 |
| 16.000 | 16.384 | 18.432 | 19.200 | 19.6608 |
| 20.000 | 22.1184 | 22.5792 | 24.000 | 24.576 |
| 25.000 | 26.000 | 27.000 | 27.120 | 28.63636 |
| 29.4912 | 30.000 | 32.000 | 32.768 | 33.000 |
| 33.330 | 33.333 | 33.3333 | 36.000 | 37.125 |
| 37.400 | 38.400 | 38.880 | 40.000 | 40.680 |
| 45.000 | 45.1584 | 48.000 | 49.152 | 50.000 |
| 54.000 | 60.000 | 64.000 | 65.536 | 66.000 |
| 66.666 | 72.000 | 75.000 | 80.000 | 96.000 |
| 100.000 | 125.000 | 133.000 | 148.500 | 156.250 |

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