

# 3CM Series 3.2 x 2.5 mm SMD Crystal Oscillator

3 : 3.2×2.5×0.95 mm | SMD3225-4P

C : SPXO Crystal Oscillator

M : Multi Voltage

## Feature

- Miniature Ceramic surface mount with Metal Lid
- CMOS compatible logic levels
- Tri-state function available
- Supply voltage range : 1.62V ~ 3.63V(Compatible with 1.8V, 2.5V, 3.3V)
- 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              |      | 54.000             | MHz  |                                                                                           |
| Operating Temperature         | T <sub>use</sub>                | -20                |      | 70                 | °C   |                                                                                           |
|                               |                                 | -40                |      | 85                 | °C   |                                                                                           |
| Storage Temperature Range     | T <sub>stg</sub>                | -55                |      | 125                | °C   |                                                                                           |
| Supply Voltage                | V <sub>dd</sub>                 | 1.62               |      | 3.63               | V    |                                                                                           |
| Output Load                   | L <sub>CMOS</sub>               |                    | 15   |                    | pF   |                                                                                           |
| Current Consumption           | I <sub>cc</sub>                 |                    |      | 10                 | mA   | 1MHz ≤ Freq. < 40MHz                                                                      |
|                               |                                 |                    |      | 20                 |      | 40MHz ≤ Freq. ≤ 54MHz                                                                     |
| Duty Cycle                    | SYM                             | 45                 |      | 55                 | %    | 50 % V <sub>dd</sub> level, L <sub>CMOS</sub> ≤ 15 pF                                     |
| Rise / Fall Time              | T <sub>R</sub> / T <sub>F</sub> |                    |      | 5                  | nS   | 10% V <sub>dd</sub> to 90% Level                                                          |
| Start-up Time                 | T <sub>str</sub>                |                    |      | 5                  | mS   | To 90% of Final Amplitude                                                                 |
| High output voltage           | V <sub>OH</sub>                 | 0.9V <sub>dd</sub> |      |                    | V    |                                                                                           |
| Low output voltage            | V <sub>OL</sub>                 |                    |      | 0.1V <sub>dd</sub> | V    |                                                                                           |
| Enable Voltage High (Logic 1) | V <sub>IH</sub>                 | 0.7V <sub>dd</sub> |      |                    | 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>                 |                    |      | 0.3V <sub>dd</sub> | V    |                                                                                           |
| Aging                         | f <sub>age</sub>                |                    |      | 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 |        | △      | ★      | ★      |

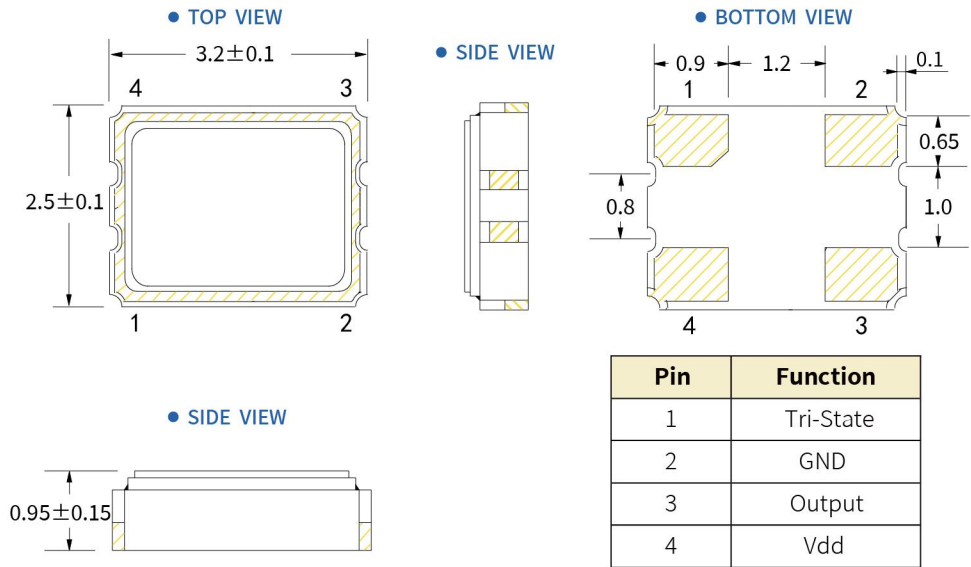
★: Available    △: Conditional

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

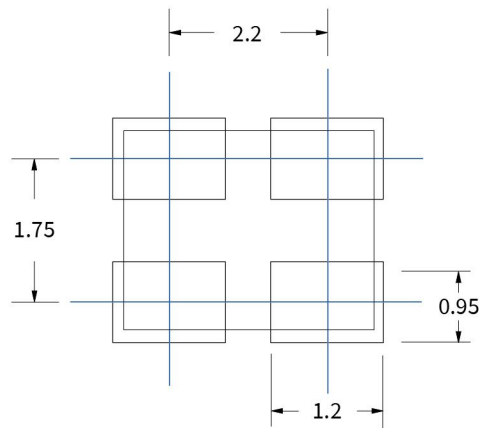
# 3CM Series 3.2 x 2.5 mm SMD Crystal Oscillator

3 : 3.2×2.5×0.95 mm | SMD3225-4P      C : SPXO Crystal Oscillator      M : Multi Voltage

## Dimensions (UNIT:mm)



## Solder pad layout (UNIT:mm)



## Options and Part Identification : Example SX3M1.000M20F30TNN

| Company      | Ceramic Package      | Frequency Code [MHz] | Supply Voltage | Frequency Tolerance      | Operating Temperature      | Frequency Drift      | Output      | Current Consumption | Phase Noise      |
|--------------|----------------------|----------------------|----------------|--------------------------|----------------------------|----------------------|-------------|---------------------|------------------|
| SX           | 3M                   | X.XXX                | M              | 20                       | F                          | 30                   | T           | N                   | N                |
| Code Company |                      | Frequency            |                | Code Frequency Tolerance |                            | Code Frequency Drift |             | Code Current        |                  |
| SX SCTF      |                      | 1.000                |                | 10 ±10ppm                |                            | 15 ±15ppm            |             | N Standard          |                  |
|              |                      | 13.560               |                | 20 ±20ppm                |                            | 20 ±20ppm            |             |                     |                  |
|              |                      | 19.200               |                |                          |                            | 30 ±30ppm            |             |                     |                  |
|              |                      | 37.125               |                |                          |                            |                      |             |                     |                  |
|              | Code Ceramic Package |                      | Code Voltage   |                          | Code Operating Temperature |                      | Code Output |                     | Code Phase Noise |
|              | 7M 7.0×5.0×1.3mm     |                      | M 1.62V~3.63V  |                          | E -20°C ~ +70°C            |                      | T CMOS      |                     | N Standard       |
|              | 5M 5.0×3.2×1.2mm     |                      |                |                          | F -40°C ~ +85°C            |                      |             |                     |                  |
|              | 3M 3.2×2.5×0.95mm    |                      |                |                          |                            |                      |             |                     |                  |
|              | 2M 2.5×2.0×0.81mm    |                      |                |                          |                            |                      |             |                     |                  |
|              | 1M 2.0×1.6×0.75mm    |                      |                |                          |                            |                      |             |                     |                  |

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

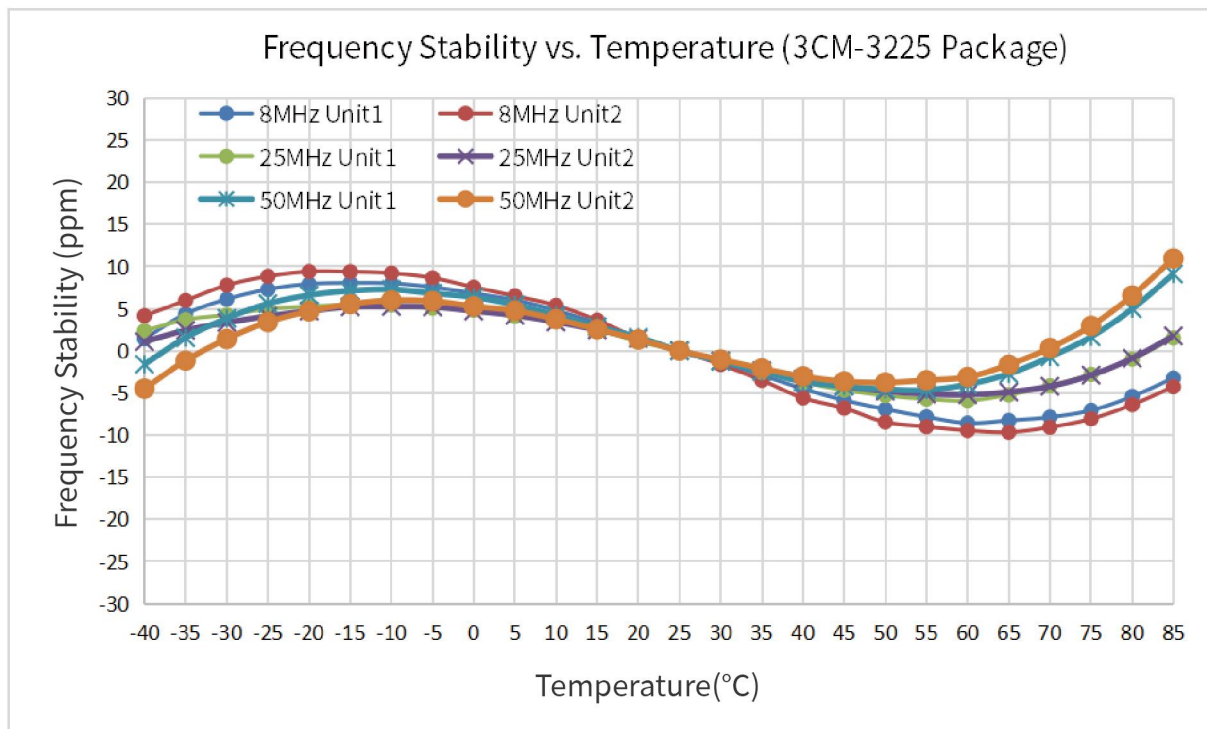
# 3CM Series 3.2 x 2.5 mm SMD Crystal Oscillator

3 : 3.2×2.5×0.95 mm | SMD3225-4P

C : SPXO Crystal Oscillator

M : Multi Voltage

## Frequency Temperature Characteristics

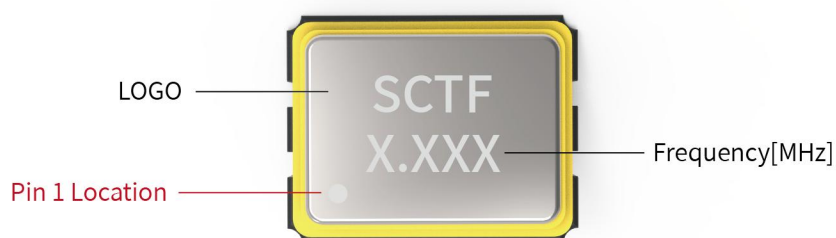


## Product Structure&Marking Information

### • Product Structure



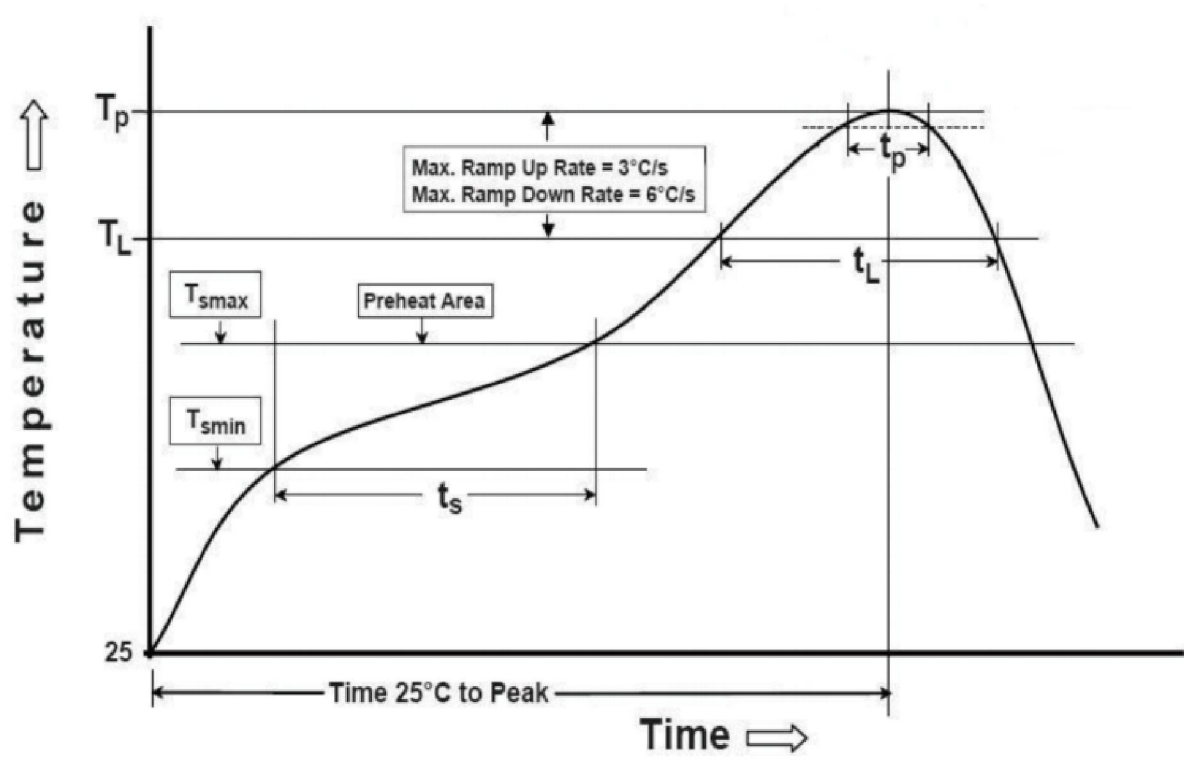
### • Marking Information



# 3CM Series 3.2 x 2.5 mm SMD Crystal Oscillator

3 : 3.2×2.5×0.95 mm | SMD3225-4P      C : SPXO Crystal Oscillator      M : Multi Voltage

## Suggested Reflow Profile



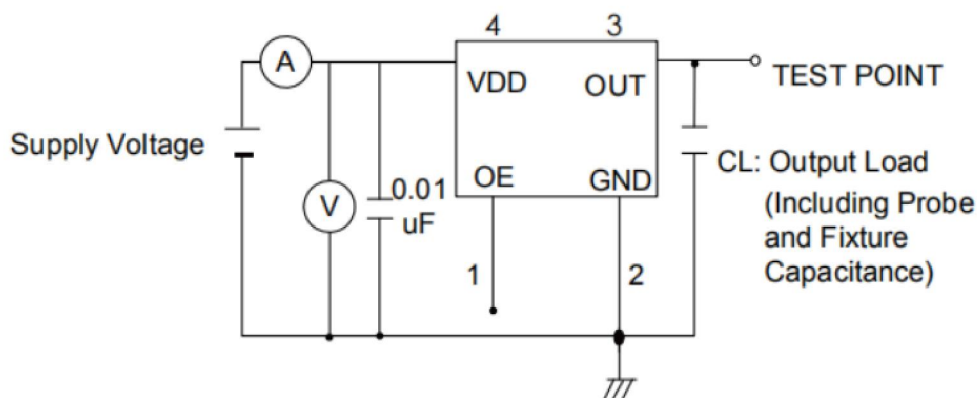
| Profile Feature                                                                                                                                                                                                                  | Sn - Pb Eutectic Assembly        | Preheat / Soak                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------|
| Preheat / Soak <ul style="list-style-type: none"><li>● Temperature Min ( <math>T_{smin}</math> )</li><li>● Temperature Max ( <math>T_{smax}</math> )</li><li>● Time ( <math>T_{smin}</math> to <math>T_{smax}</math> )</li></ul> | 100°C<br>150°C<br>60-120 seconds | 150°C<br>200°C<br>60-120 seconds |
| Ramp - up rate ( $T_L$ to $T_p$ )                                                                                                                                                                                                | 3°C/ second max.                 | 3°C/ second max.                 |
| Time maintained above <ul style="list-style-type: none"><li>● Liquidous temperature ( <math>T_L</math> )</li><li>● Time ( <math>t_L</math> ) maintained above <math>T_L</math></li></ul>                                         | 183°C<br>60-150 seconds          | 217°C<br>60-150 seconds          |
| Peak package body temperature ( $T_p$ )                                                                                                                                                                                          | 235°C                            | 260°C                            |
| Time within 5° C of the specified classification temperature ( $T_p$ )                                                                                                                                                           | 20 seconds                       | 30 seconds                       |
| Ramp - down rate ( $T_p$ to $T_L$ )                                                                                                                                                                                              | 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.                     |                                  |

# 3C Series 3.2 x 2.5 mm SMD Crystal Oscillator

3 : 3.2×2.5×0.95 mm | SMD3225-4P

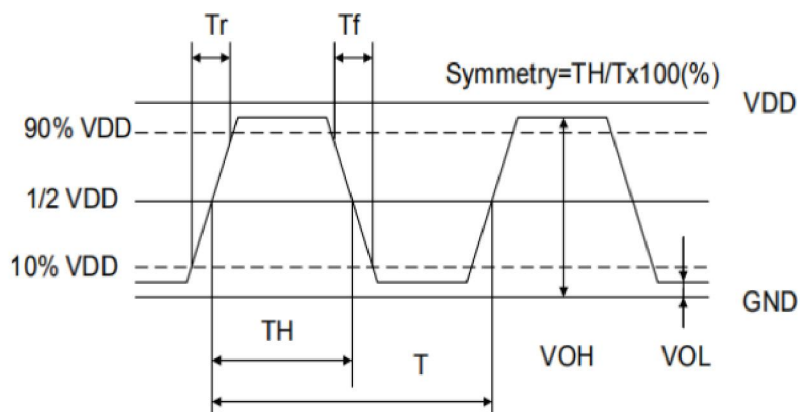
C : SPXO Crystal Oscillator

## Testing Circuit



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

## Waveform Conditions



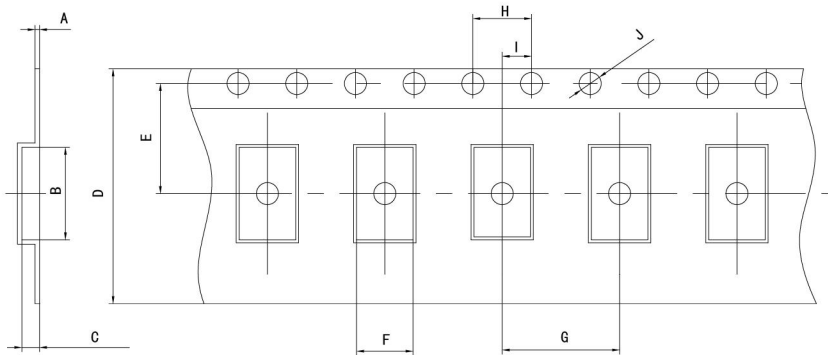
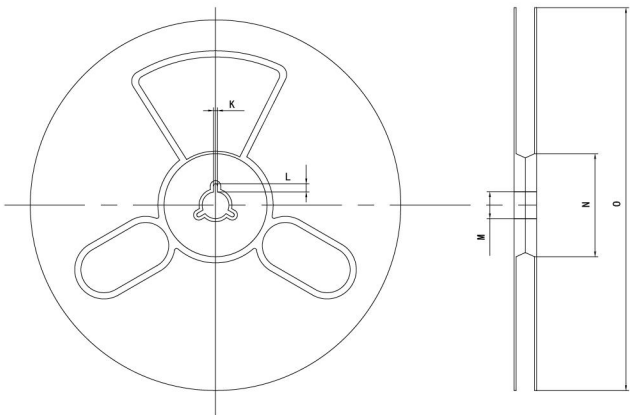
Waveform measurement system should have a min. bandwidth of 5 times the frequency being tested.

# 3CM Series 3.2 x 2.5 mm SMD Crystal Oscillator

3 : 3.2×2.5×0.95 mm | SMD3225-4P      C : SPXO Crystal Oscillator      M : Multi Voltage

## 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      |
|--------|-----------|---------|---------|---------|---------|----------|---------|---------|---------|----------|---------|---------|---------|-------|--------|
| 3CM    | 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 |

# 3CM Series 3.2 x 2.5 mm SMD Crystal Oscillator

3 : 3.2×2.5×0.95 mm | SMD3225-4P      C : SPXO Crystal Oscillator      M : Multi Voltage

## Common Frequencies – MHz

| 3CM 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     |         |         |          |          |

单击下面可查看定价，库存，交付和生命周期等信息

[>>SCTF\(星通时频\)](#)