

1CM Series 2.0 x 1.6 mm SMD Crystal Oscillator

1 : 2.0×1.6×0.75 mm | SMD2016-4P

C : SPXO Crystal Oscillator

M : Multi Voltage

Feature

- Ultra 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_use | -20 | | 70 | °C | |
| | | -40 | | 85 | °C | |
| Storage Temperature Range | T_stg | -55 | | 125 | °C | |
| Supply Voltage | Vdd | 1.62 | | 3.63 | V | |
| Output Load | L_CMOS | | 15 | | pF | |
| Current Consumption | Icc | | | 10 | mA | 1MHz ≤ Freq. < 40MHz |
| | | | | 20 | | 40MHz ≤ Freq. ≤ 54MHz |
| 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 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.

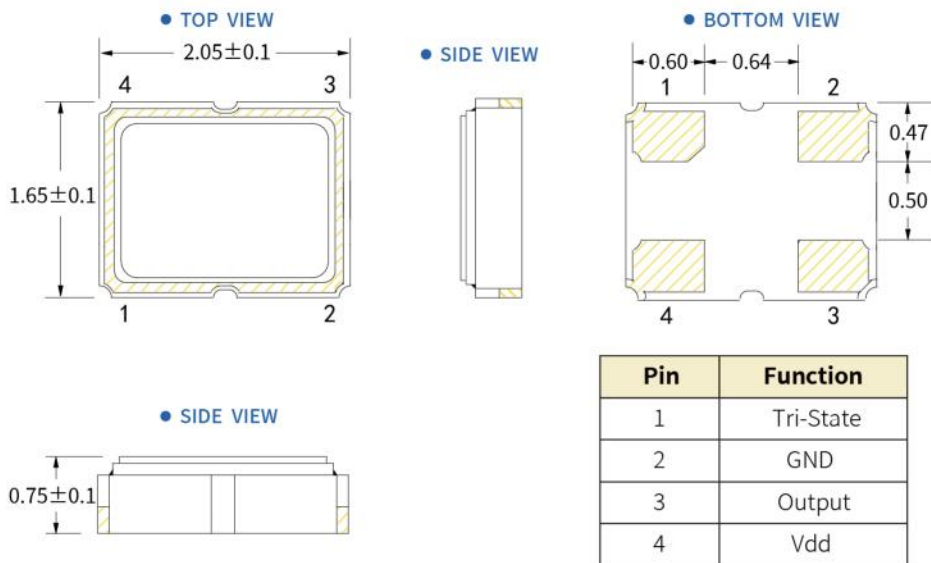
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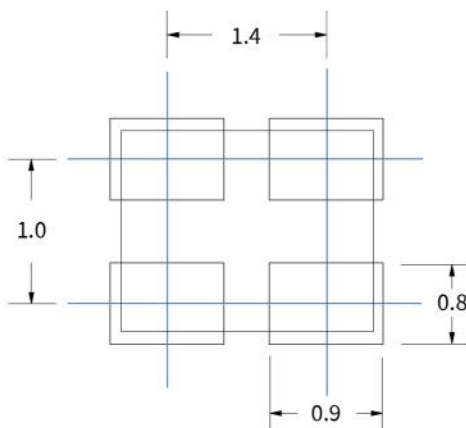
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Dimensions (UNIT:mm)



Solder pad layout (UNIT:mm)



Options and Part Identification : Example SX1M1.000M20F30TNN

| Company | Ceramic Package | Frequency Code [MHz] | Supply Voltage | Frequency Tolerance | Operating Temperature | Frequency Drift | Output | Current Consumption | Phase Noise |
|--------------|---|-------------------------------------|----------------|--------------------------|------------------------------------|-------------------------------------|-------------|---------------------|------------------|
| SX | 1M | X.XXX | M | 20 | F | 30 | T | N | N |
| Code Company | | Frequency | | Code Frequency Tolerance | | Code Frequency Drift | | Code Current | |
| SX SCTF | | 1.000 13.560 19.200 37.125 | | 10 ±10ppm 20 ±20ppm | | 15 ±15ppm 20 ±20ppm 30 ±30ppm | | N Standard | |
| | Code Ceramic Package | | Code Voltage | | Code Operating Temperature | | Code Output | | Code Phase Noise |
| | 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 | | M 1.62V-3.63V | | E -20°C ~ +70°C F -40°C ~ +85°C | | T CMOS | | N Standard |

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

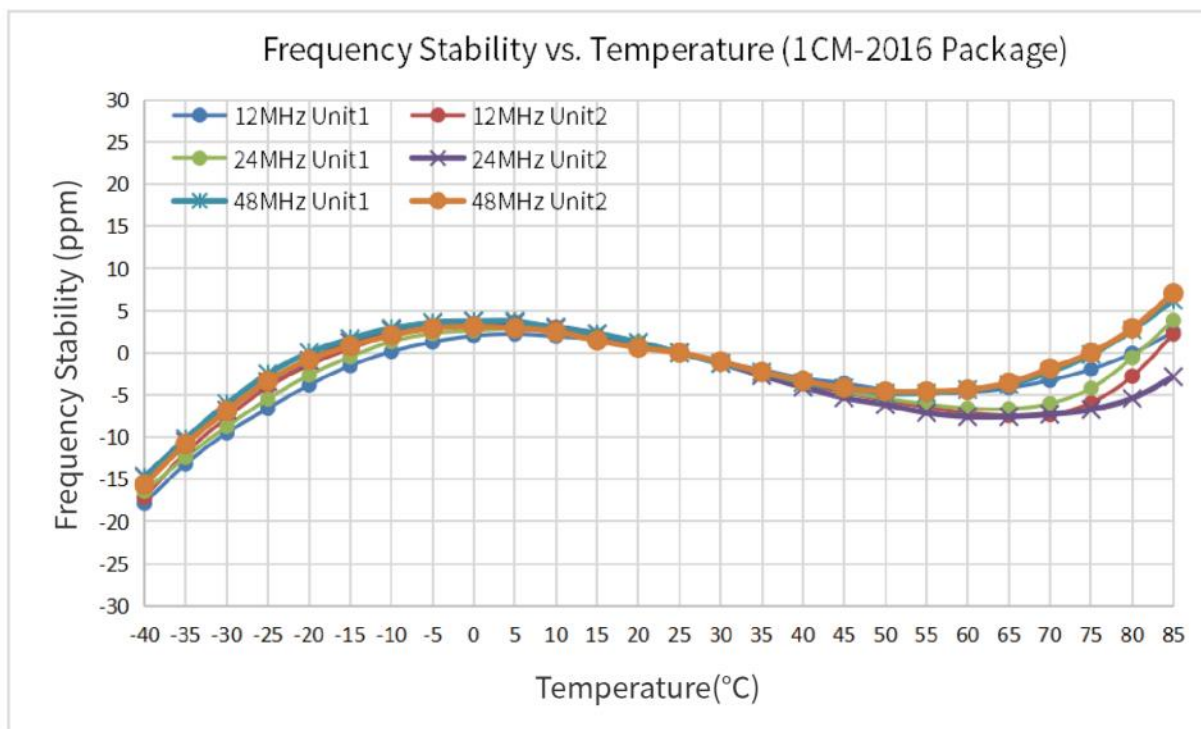
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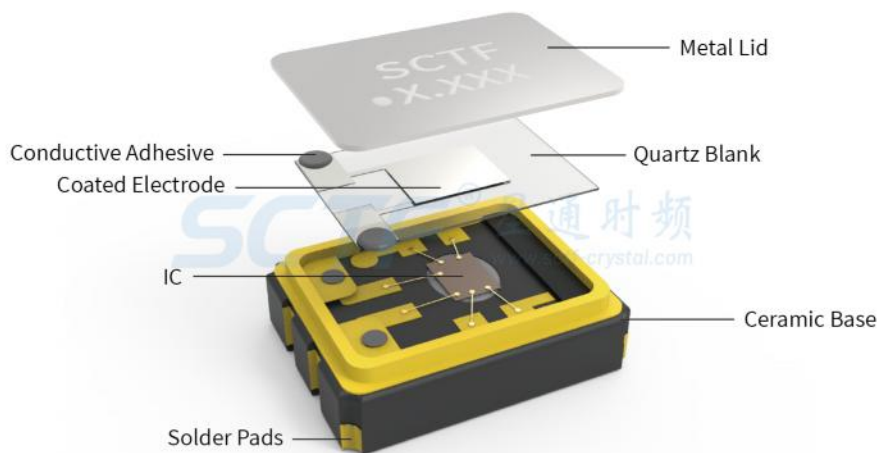
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Frequency Temperature Characteristics



Product Structure & Marking Information

Product Structure



Marking Information



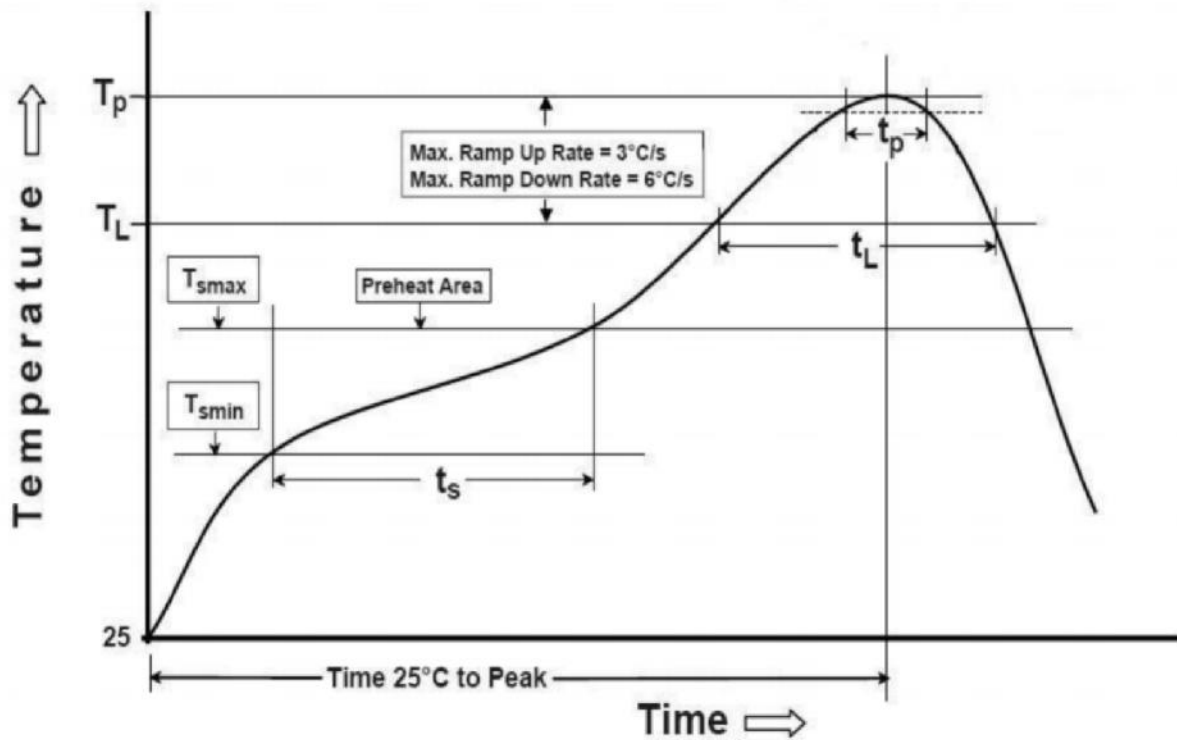
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Suggested Reflow Profile



| Profile Feature | Sn - Pb Eutectic Assembly | Preheat / Soak |
|--|----------------------------------|----------------------------------|
| Preheat / Soak <ul style="list-style-type: none"> ● Temperature Min (T_{smin}) ● Temperature Max (T_{smax}) ● Time (T_{smin} to T_{smax}) | 100°C 150°C 60-120 seconds | 150°C 200°C 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"> ● Liquidous temperature (T_L) ● Time (t_L) maintained above T_L | 183°C 60-150 seconds | 217°C 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. | |

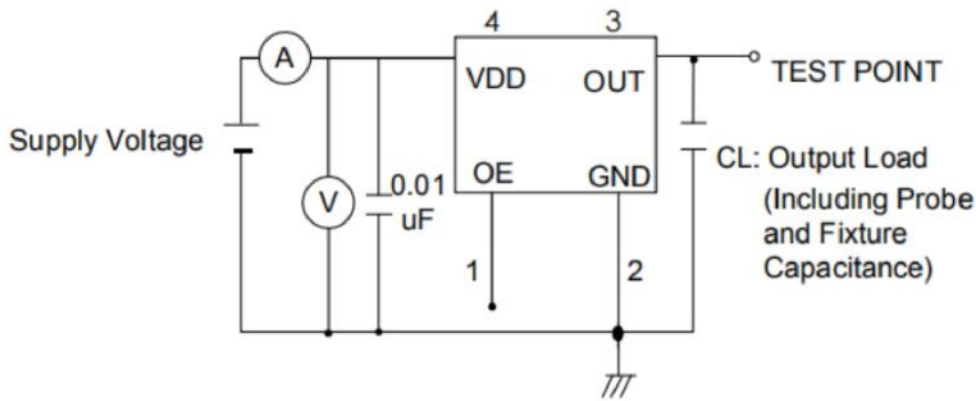
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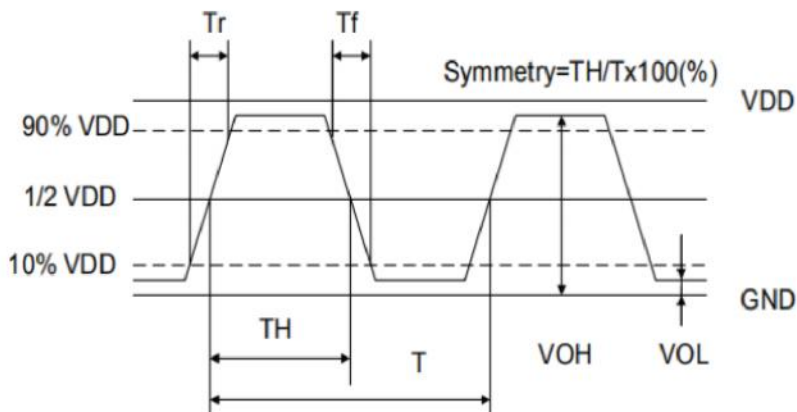
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Testing Circuit



※ 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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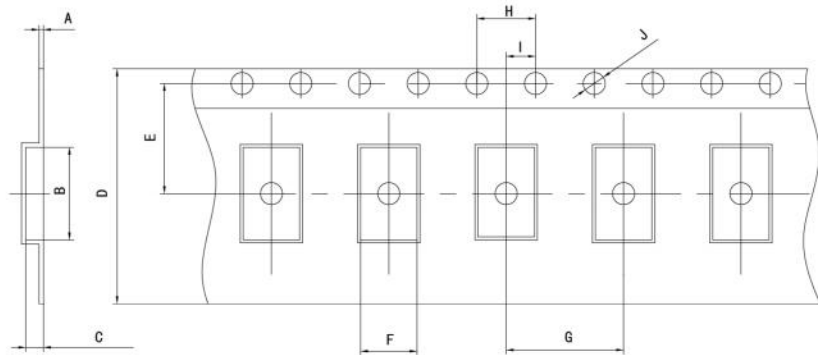
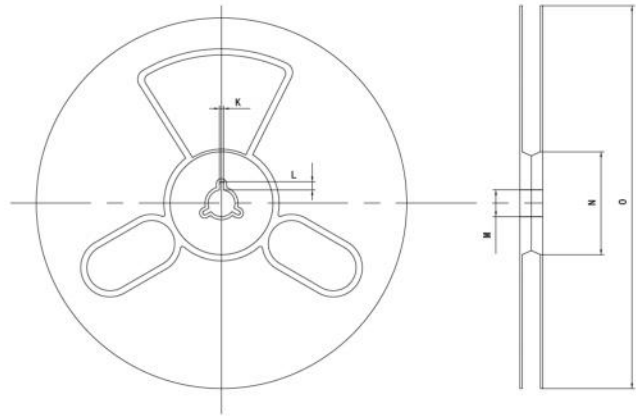
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Packaging Information

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 |
|--------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|----------|---------|---------|---------|-------|--------|
| 1CM | 0.25±0.05 | 2.3±0.1 | 1.0±0.1 | 8.0±0.1 | 3.5±0.1 | 1.9±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 |

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Common Frequencies – MHz

| 1CM Series | | | | |
|------------|----------|----------|---------|---------|
| 1.000 | 1.8432 | 2.000 | 2.048 | 3.6864 |
| 4.000 | 4.9152 | 6.000 | 7.3728 | 8.000 |
| 8.192 | 10.000 | 11.2896 | 12.000 | 12.288 |
| 13.000 | 13.560 | 14.31818 | 14.7456 | 16.000 |
| 16.384 | 18.432 | 19.200 | 20.000 | 22.1184 |
| 22.5792 | 24.000 | 24.576 | 25.000 | 26.000 |
| 27.000 | 28.63636 | 30.000 | 32.000 | 32.768 |
| 33.000 | 33.330 | 33.333 | 33.3333 | 38.400 |
| 40.000 | 45.000 | 45.1584 | 48.000 | 49.152 |
| 50.000 | 54.000 | | | |