

2CN Series 2.5 x 2.0 mm SMD Crystal Oscillator

2 : 2.5×2.0×0.81 mm | SMD2520-4P

CN : Low Phase Noise Crystal Oscillator

Feature

- Ceramic surface mount with Metal Lid
- CMOS compatible logic levels
- Tri-state function available
- RMS Phase Jitter: 0.3pSec max.
- RoHS Compliant / Pb Free

Applications

- Wireless Devices
- Internet of Things (IoT) devices
- Fibre Channel
- Ethernet/Gigabit Ethernet
- Portable Electronics



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 | V _{dd} | 1.8 | | 3.3 | V | |
| Output Load | L _{CMOS} | | 15 | | pF | |
| Current Consumption | I _{cc} | | | 10 | mA | 1MHz ≤ Freq. < 40MHz |
| | | | | 20 | | 40MHz ≤ Freq. ≤ 54MHz |
| Duty Cycle | SYM | 45 | | 55 | % | 50 % V _{dd} level, L _{CMOS} ≤ 15 pF |
| Rise / Fall Time | T _R / T _F | | | 5 | nS | 10% V _{dd} to 90% Level |
| Start-up Time | T _{str} | | | 5 | mS | To 90% of Final Amplitude |
| High output voltage | V _{OH} | 0.9V _{dd} | | | V | |
| Low output voltage | V _{OL} | | | 0.1V _{dd} | V | |
| Enable Voltage High(Logic 1) | V _{IH} | 0.7V _{dd} | | | 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} | | | 0.3V _{dd} | V | |
| Enable Time | T _{PLZ} | | | 150 | uS | |
| RMS Phase Jitter | T _{RPJ} | | | 0.3 | pSec | Integrated 12KHz to 20MHz |
| Phase Noise @27MHz 3.3V | 10 Hz | T _{PN} | -100 | | dBc/Hz | |
| | | | -125 | | | |
| | | | -150 | | | |
| | | | -160 | | | |
| 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

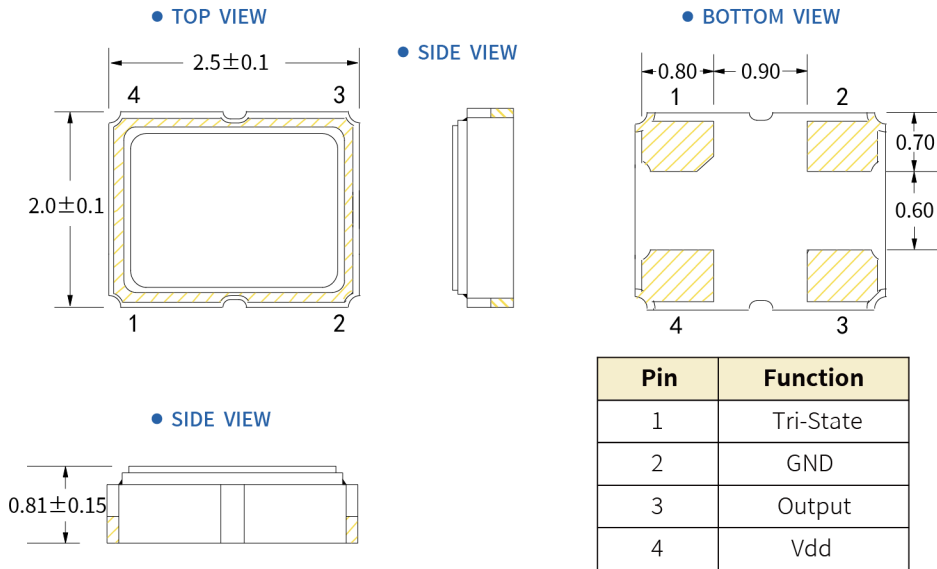
All condition: Include 25°C tolerance, operating temperature range, input voltage change, aging, load change.

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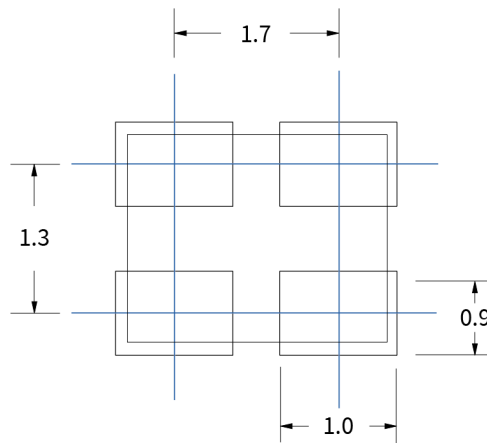
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Dimensions (UNIT:mm)



Solder pad layout (UNIT:mm)



Options and Part Identification : Example SX2M11.2896B20F30TNF

| Company | Ceramic Package | Frequency Code [MHz] | Supply Voltage | Frequency Tolerance | Operating Temperature | Frequency Drift | Output | Current Consumption | Phase Noise |
|--------------|---|---------------------------------------|----------------------------|--------------------------|------------------------------------|-------------------------------------|--------------|---------------------|--|
| SX | 2M | X.XXX | B | 20 | F | 30 | T | N | F |
| Code Company | Code Ceramic Package | Frequency | Code Voltage | Code Frequency Tolerance | Code Frequency Tolerance | Code Frequency Drift | Code Output | Code Current | Code Phase Noise |
| SX SCTF | 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 | 11.2896 19.200 25.000 49.152 | D 1.8V H 2.5V B 3.3V | 10 ±10ppm 20 ±20ppm | E -20°C ~ +70°C F -40°C ~ +85°C | 15 ±15ppm 20 ±20ppm 30 ±30ppm | T Squarewave | N Standard | F -145dBc/Hz 1KHz offset G -150dBc/Hz 1KHz offset H -155dBc/Hz 1KHz offset |

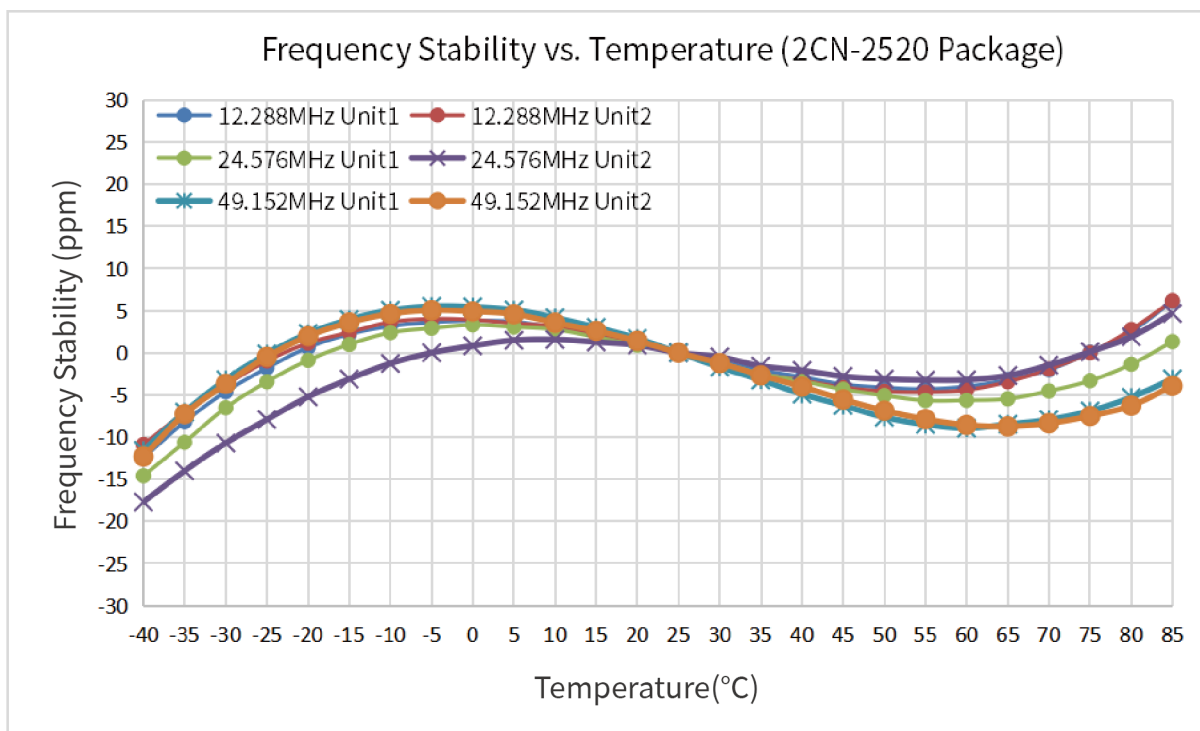
If you have other parameter requirements, you can contact **SCTF** at any time.

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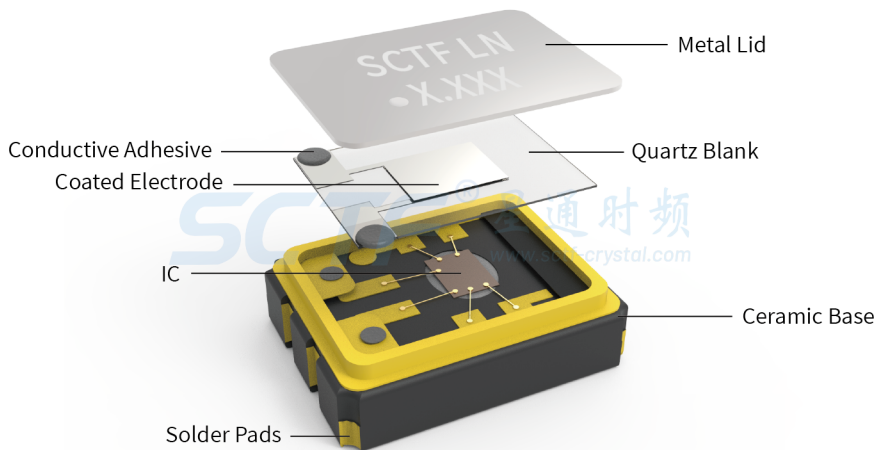
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Frequency Temperature Characteristics

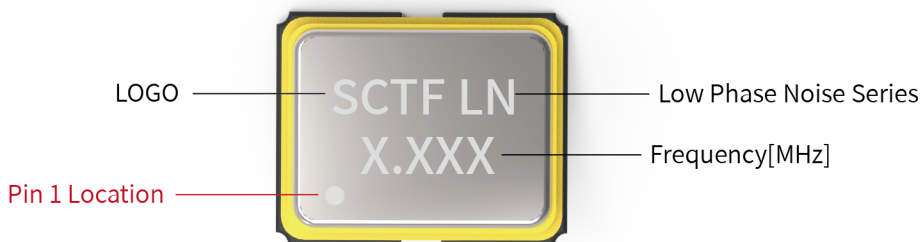


Product Structure & Marking Information

Product Structure



Marking Information



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Suggested Reflow Profile



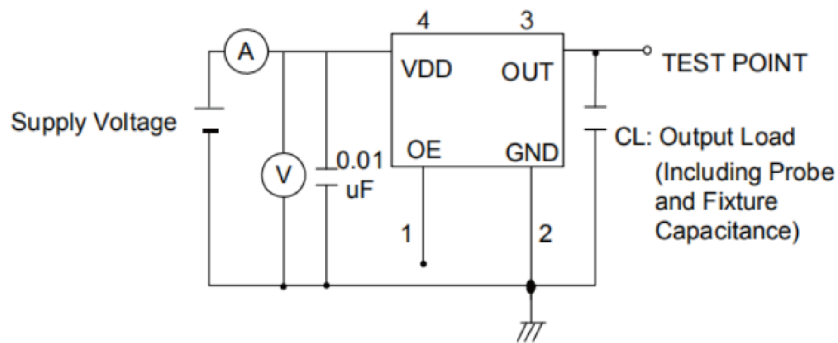
| Profile Feature | Sn - Pb Eutectic Assembly | Preheat / Soak |
|--|----------------------------------|----------------------------------|
| Preheat / Soak <ul style="list-style-type: none"> ● Temperature Min (Ts min) ● Temperature Max (Ts max) ● Time (Ts min to Ts max) | 100°C 150°C 60-120 seconds | 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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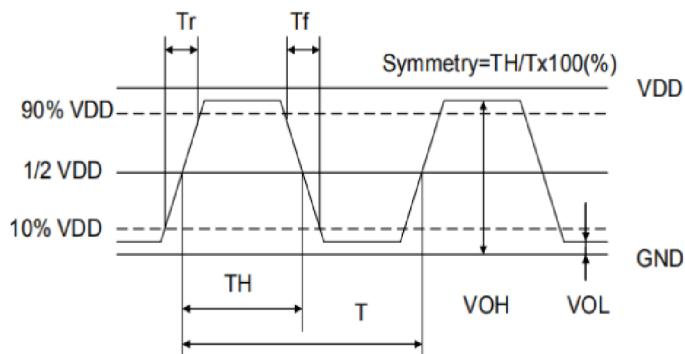
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Testing Circuit



※ 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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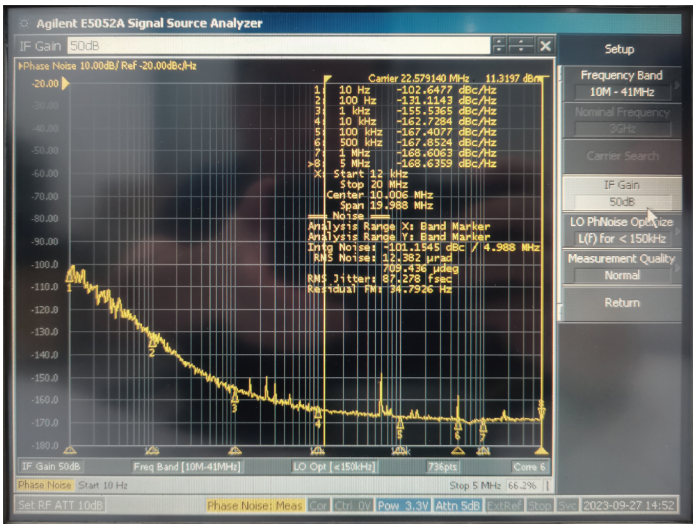
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Representative Phase Noise Plots @ +25°C

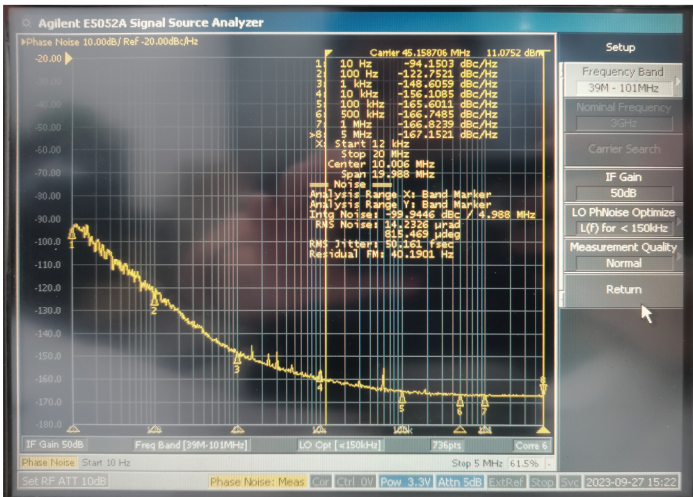
- F=11.2896 MHz Vdd=3.3V CMOS Output RMS Phase Jitter=167.514 fsec



- F=22.5792 MHz Vdd=3.3V CMOS Output RMS Phase Jitter=87.278 fsec



- F=45.1584 MHz Vdd=3.3V CMOS Output RMS Phase Jitter=50.161 fsec



更新日期: 2024年4月9日

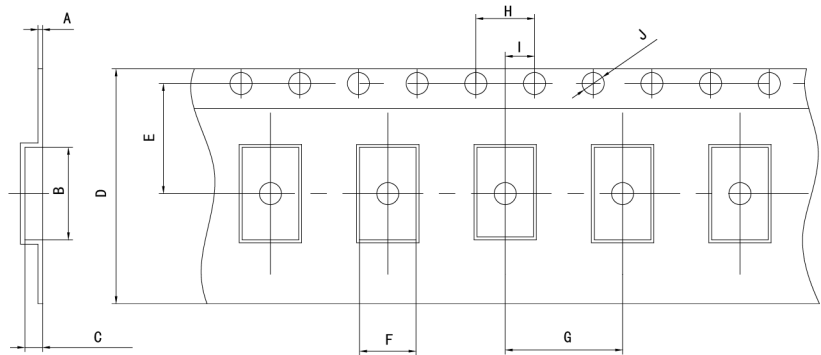
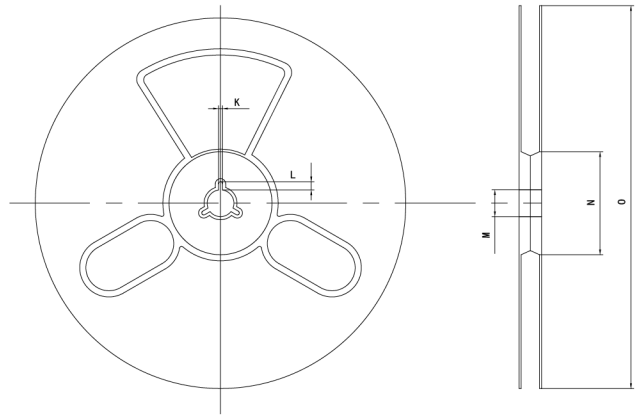
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Packaging Information

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 |
|--------|-----------|---------|---------|---------|---------|----------|---------|---------|---------|----------|---------|---------|---------|-------|--------|
| 2CN | 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

| 2CN Series | | | | |
|------------|----------|---------|--------|---------|
| 1.000 | 1.024 | 1.8432 | 2.000 | 2.048 |
| 3.579545 | 3.6864 | 4.000 | 4.096 | 4.9152 |
| 6.0000 | 6.144 | 7.3728 | 8.0000 | 8.192 |
| 10.000 | 11.2896 | 12.000 | 12.288 | 13.000 |
| 13.560 | 14.31818 | 14.7456 | 16.000 | 16.384 |
| 16.9344 | 18.432 | 19.200 | 20.000 | 22.5792 |
| 24.000 | 24.576 | 25.000 | 26.000 | 27.000 |
| 27.120 | 30.000 | 30.720 | 32.000 | 32.768 |
| 33.000 | 33.333 | 33.3333 | 38.400 | 40.000 |
| 45.1584 | 48.000 | 49.152 | 50.000 | |

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[S2D8.000000D20F30T](#) [S3B13.560000F1210F30](#) [S3B13.560000F1610F30](#) [S3B14.318180F1010F30](#) [S3B16.000000F1210F30](#)
[S3B16.000000F2010F30](#) [S3B18.432000F2010F30](#) [S3B20.000000F1510F30](#) [S3B20.000000F2010F30](#) [S3B24.000000F1010F30](#)
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