

3CN Series 3.2 x 2.5 mm SMD Crystal Oscillator

3 : 3.2×2.5×0.95 mm | SMD3225-4P

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 | | dBc/Hz |
| | | | | -150 | | dBc/Hz |
| | | | | -160 | | dBc/Hz |
| Aging | f _{age} | | | 3 | ppm | 1st. Year at 25°C |

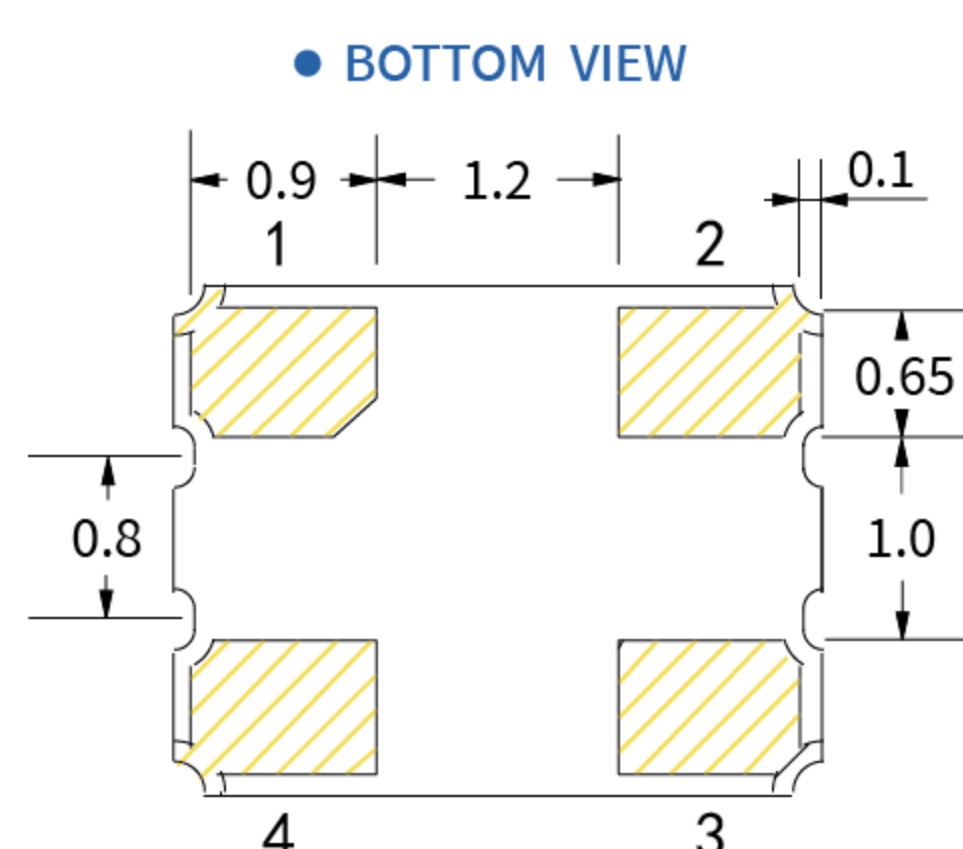
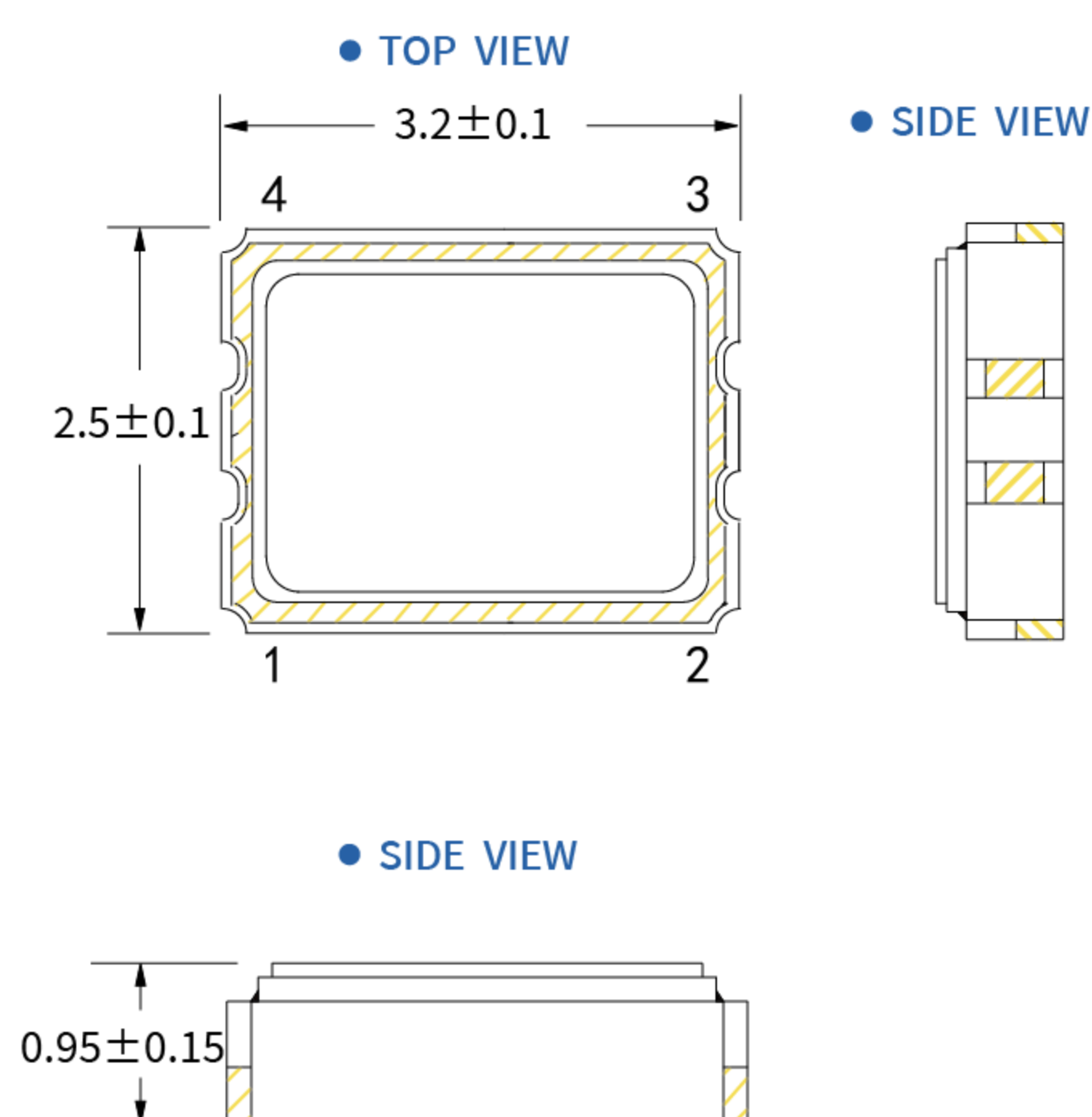
Frequency Stability & Operating Temperature Range

| Temp. | FT | ±20ppm | ±25ppm | ±30ppm | ±50ppm |
|----------------|----|--------|--------|--------|--------|
| -20°C to +70°C | | △ | ★ | ★ | ★ |
| -40°C to +85°C | | | △ | ★ | ★ |

★: Available △: Conditional

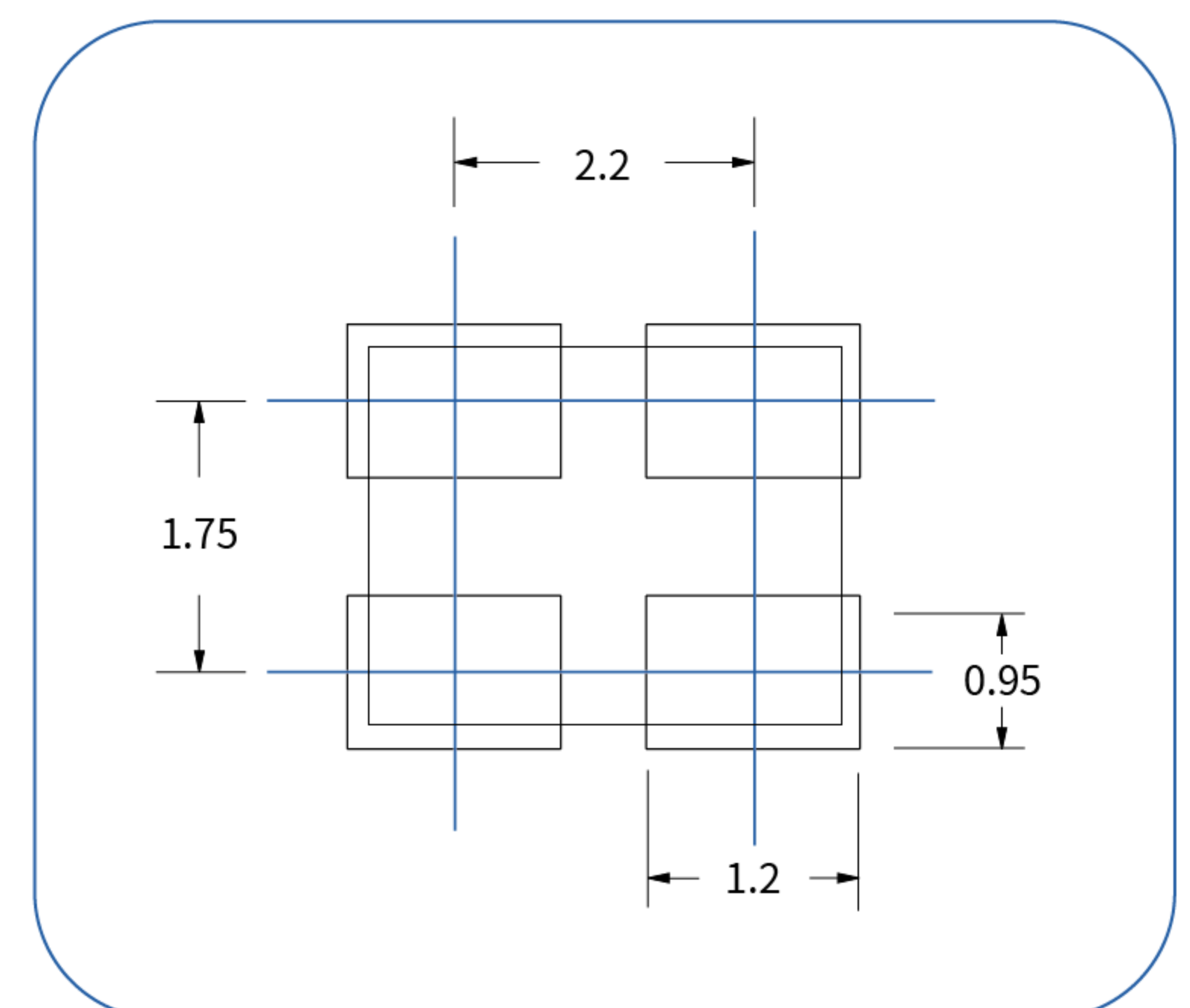
All condition: Include 25°C tolerance, operating temperature range, input voltage change, aging, load change.

Dimensions (UNIT:mm)



| Pin | Function |
|-----|-----------------|
| 1 | Tri-State |
| 2 | GND |
| 3 | Output |
| 4 | V _{dd} |

Solder pad layout (UNIT:mm)

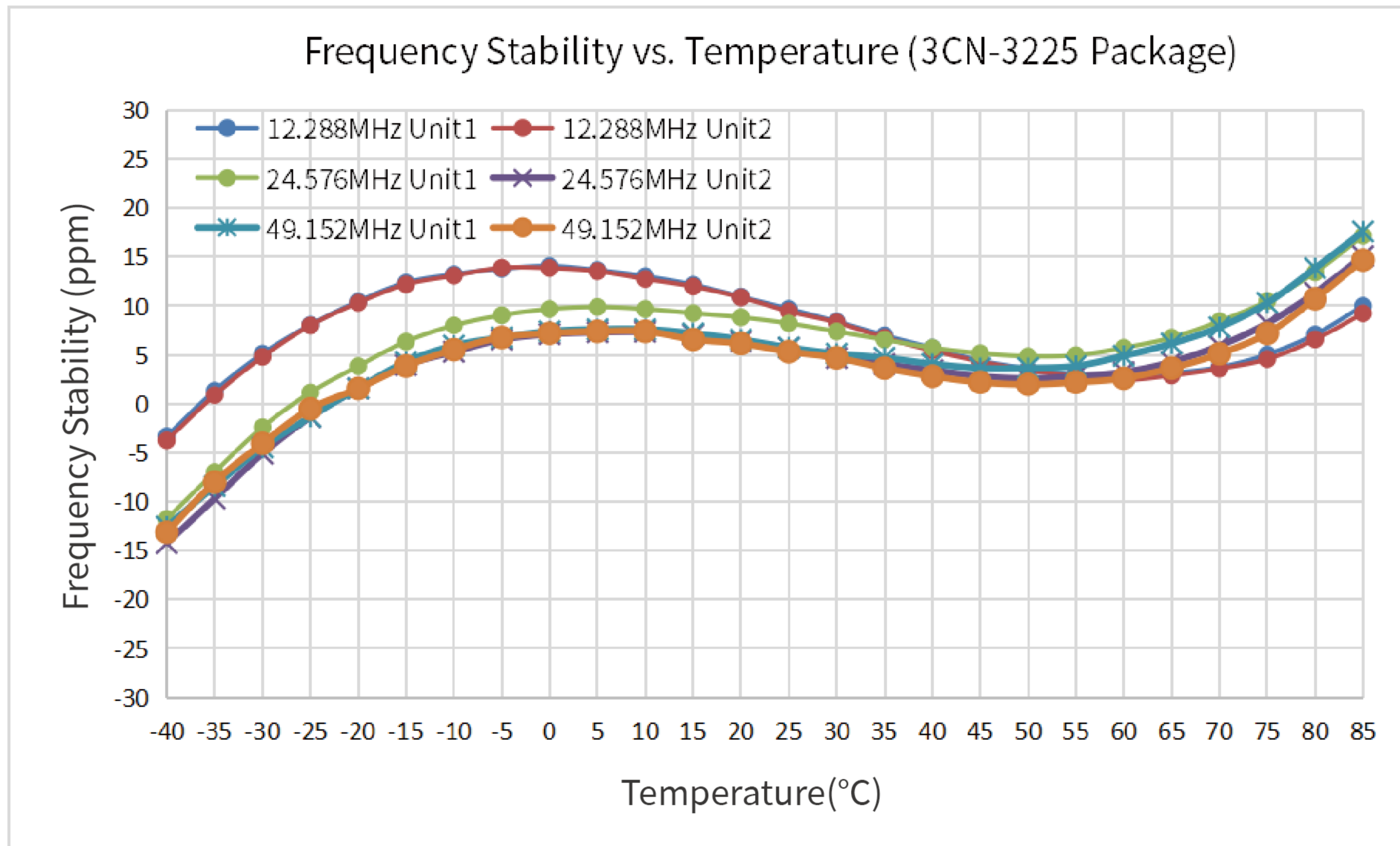


3CN Series 3.2 x 2.5 mm SMD Crystal Oscillator

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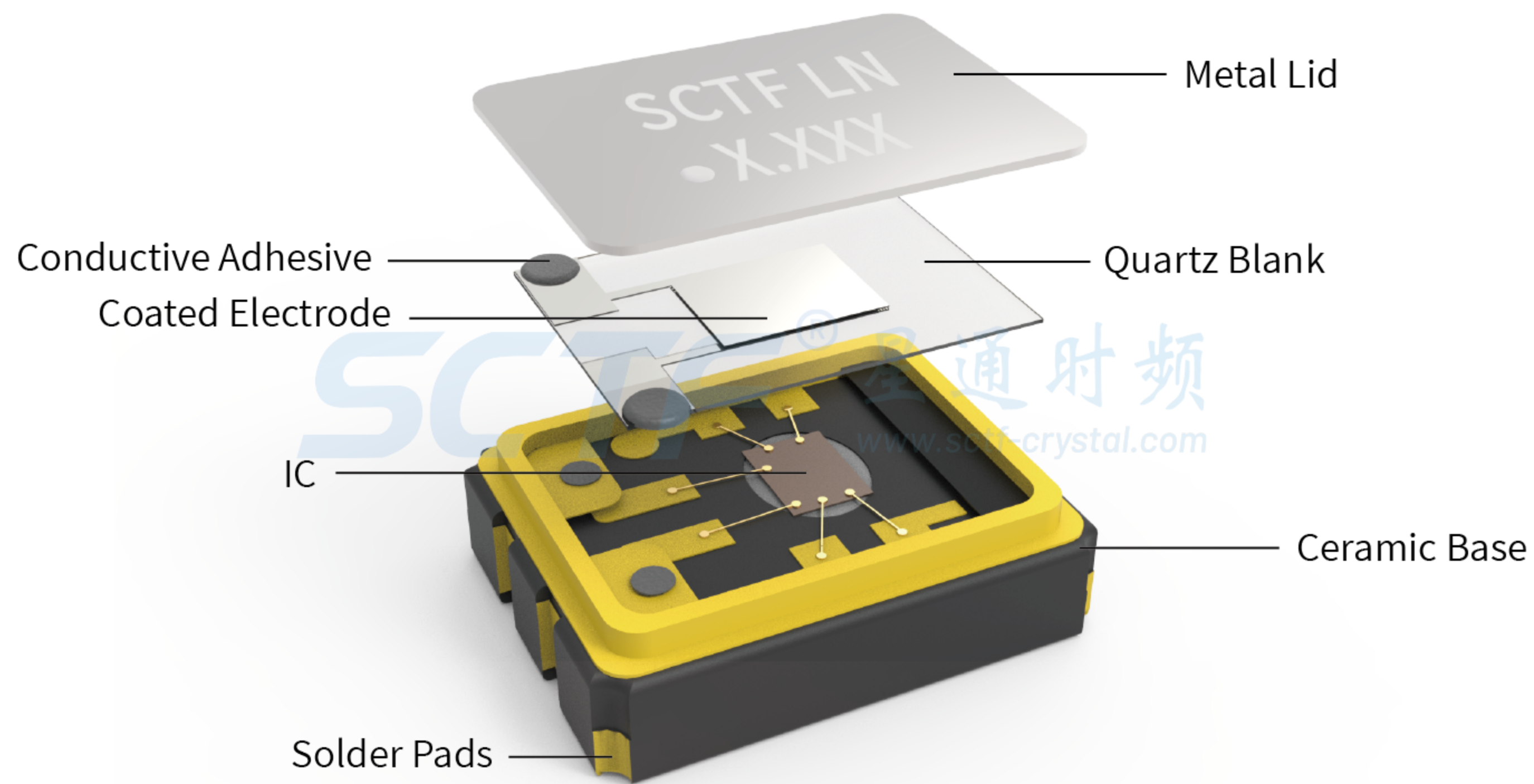
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Frequency Temperature Characteristics

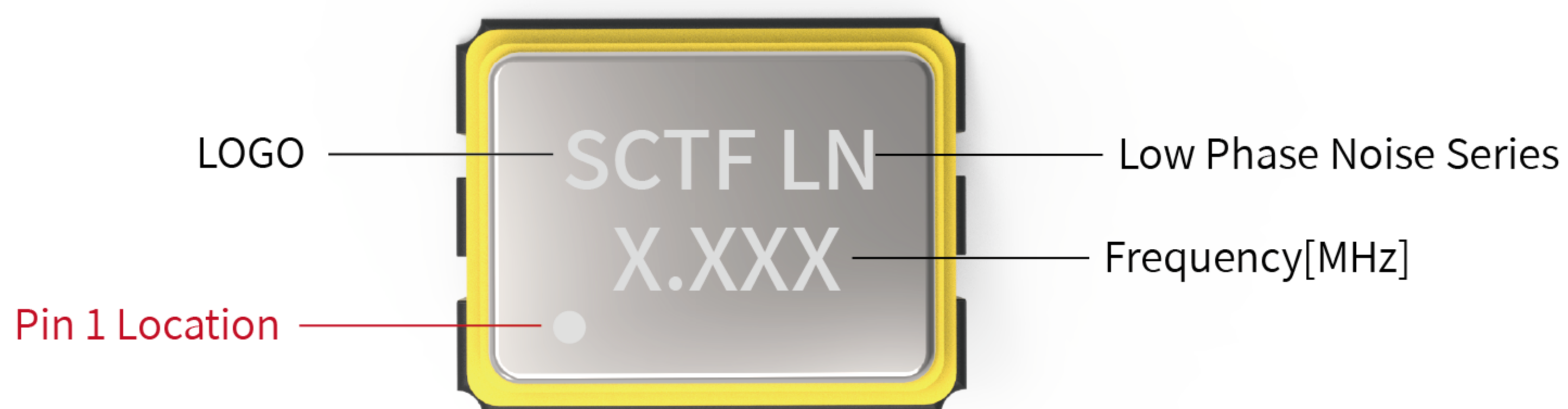


Product Structure & Marking Information

Product Structure



Marking Information

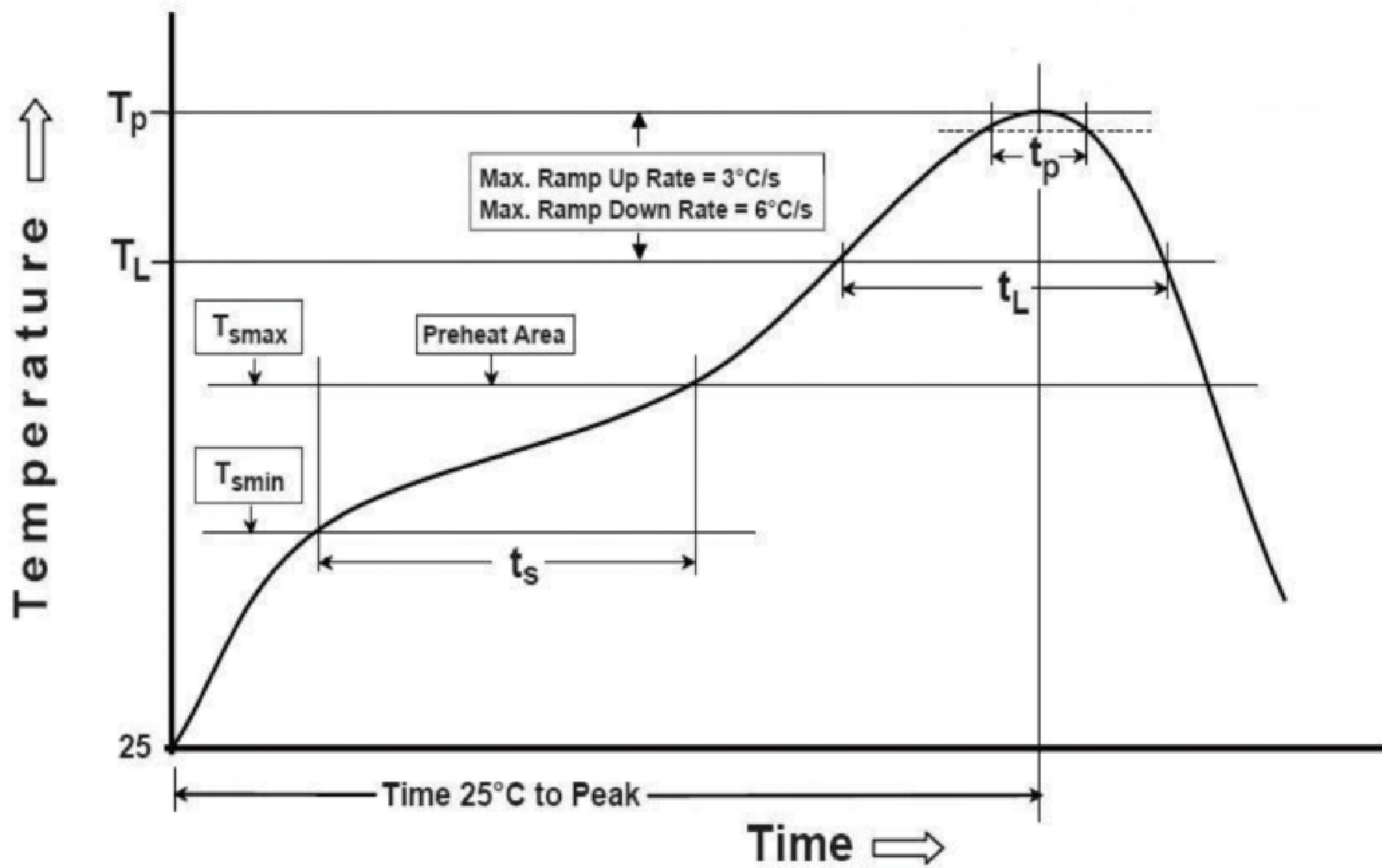


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Suggested Reflow Profile



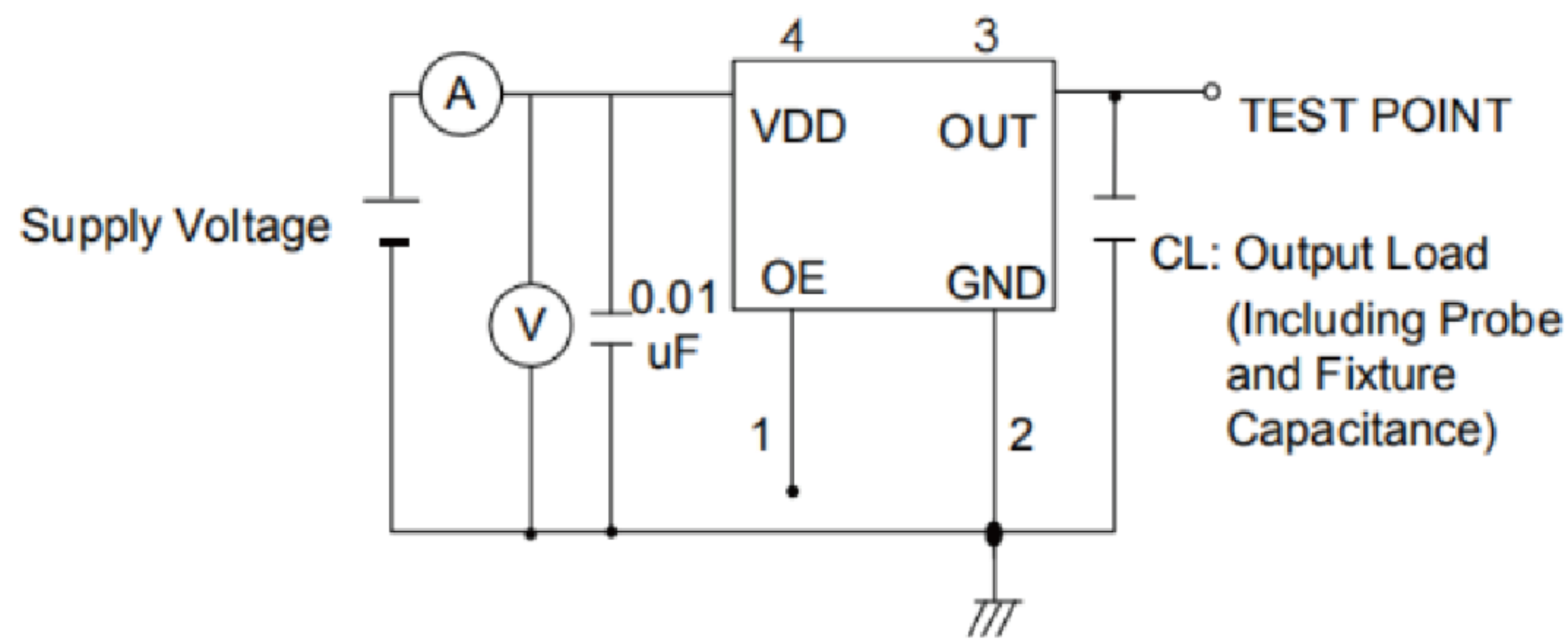
| Profile Feature | Sn - Pb Eutectic Assembly | Preheat / Soak |
|---|----------------------------------|----------------------------------|
| Preheat / Soak <ul style="list-style-type: none"> ● Temperature Min (T_s min) ● Temperature Max (T_s max) ● Time (T_s min to T_s max) | 100°C 150°C 60-120 seconds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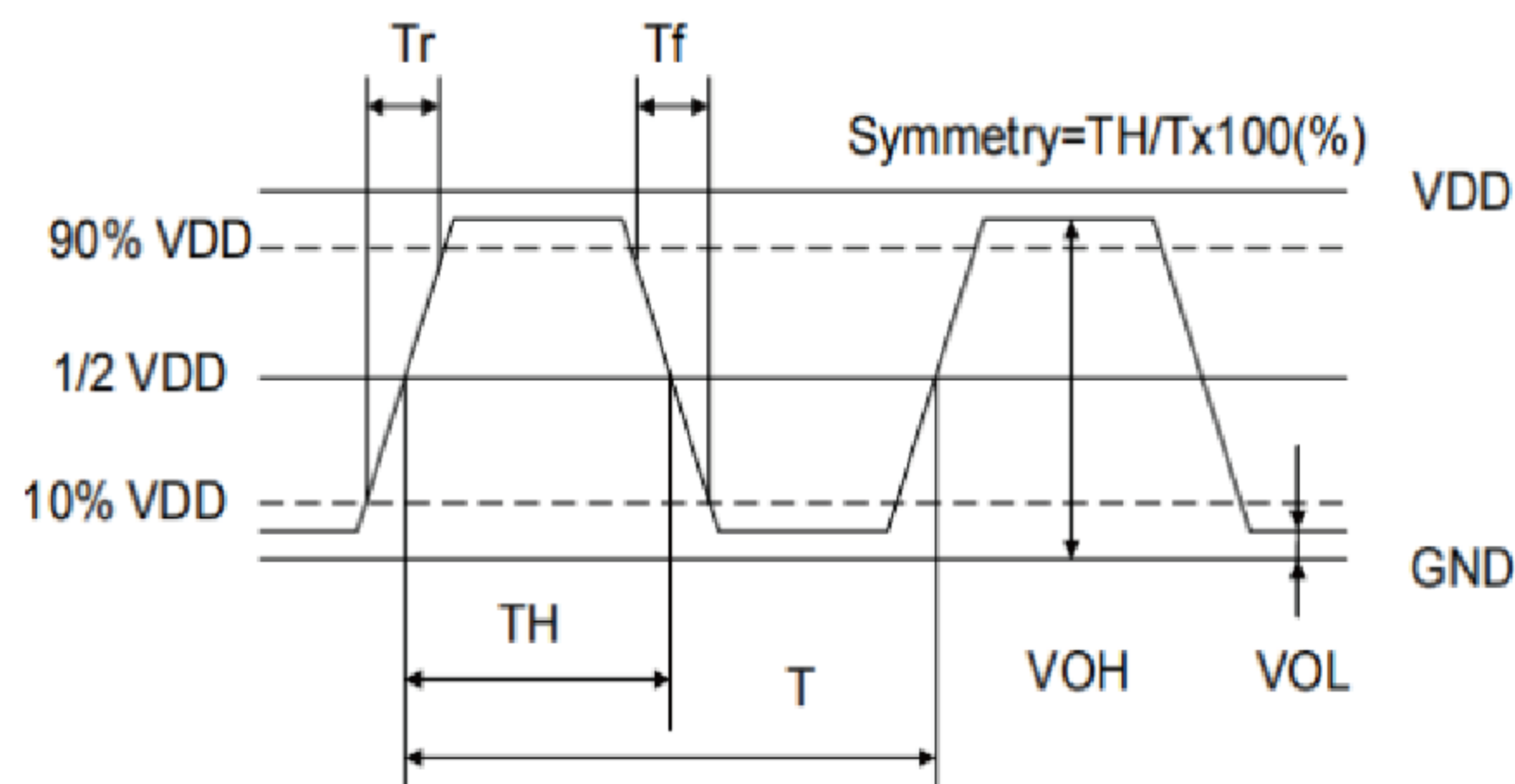
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Testing Circuit



※ 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.

Options and Part Identification : Example SX3M11.2896B20F30TNF

| 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 | F |
| Code Company | | Frequency | | Code Frequency Tolerance | | Code Frequency Drift | | Code Current | |
| SX SCTF | | 11.2896 | | 10 ±10ppm | | 15 ±15ppm | | N Standard | |
| | | 19.200 | | 20 ±20ppm | | 20 ±20ppm | | | |
| | | 25.000 | | | | 30 ±30ppm | | | |
| | | 49.152 | | | | | | | |
| Code Ceramic Package | | | Code Voltage | | Code Frequency Tolerance | | Code Output | | Code Phase Noise |
| 7M 7.0×5.0×1.3mm | | | D 1.8V | | E -20°C ~ +70°C | | T Squarewave | | F -145dBc/Hz 1KHz offset |
| 5M 5.0×3.2×1.2mm | | | H 2.5V | | F -40°C ~ +85°C | | | | G -150dBc/Hz 1KHz offset |
| 3M 3.2×2.5×0.95mm | | | B 3.3V | | | | | | H -155dBc/Hz 1KHz offset |
| 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.

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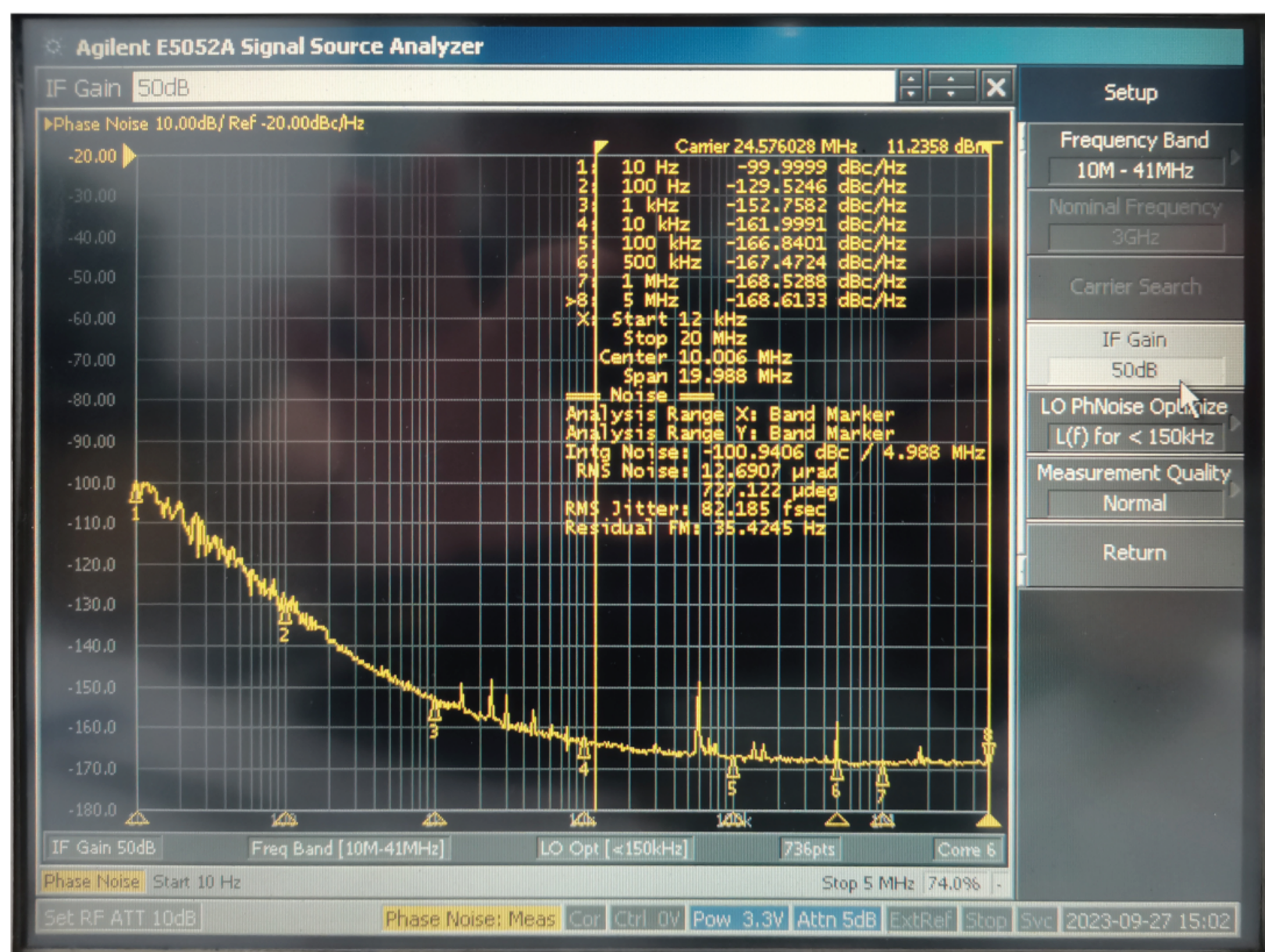
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Representative Phase Noise Plots @ +25°C

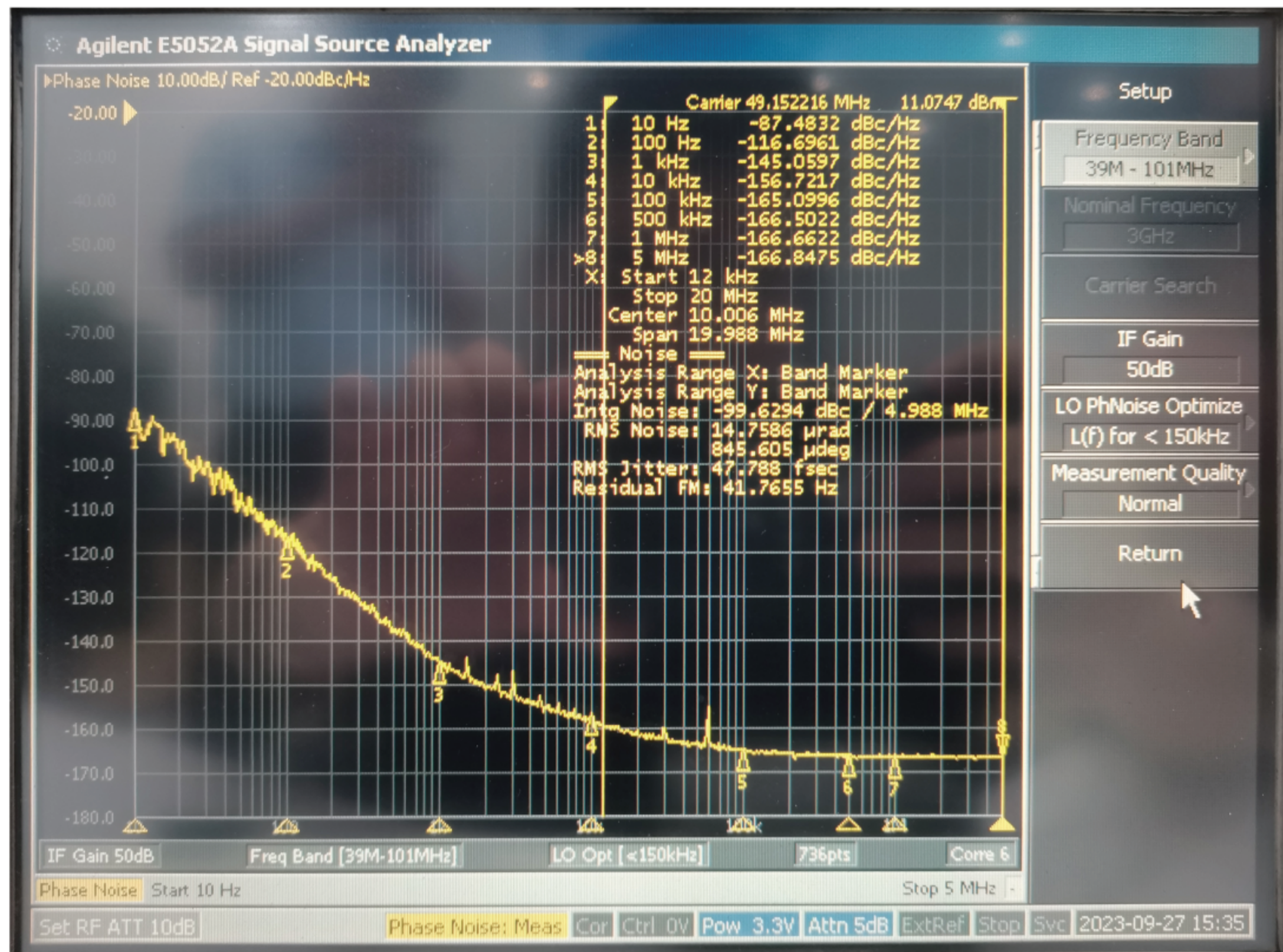
- F=12.288 MHz Vdd=3.3V CMOS Output RMS Phase Jitter=149.775 fsec



- F=24.576 MHz Vdd=3.3V CMOS Output RMS Phase Jitter=82.185 fsec



- F=49.152 MHz Vdd=3.3V CMOS Output RMS Phase Jitter=47.788 fsec



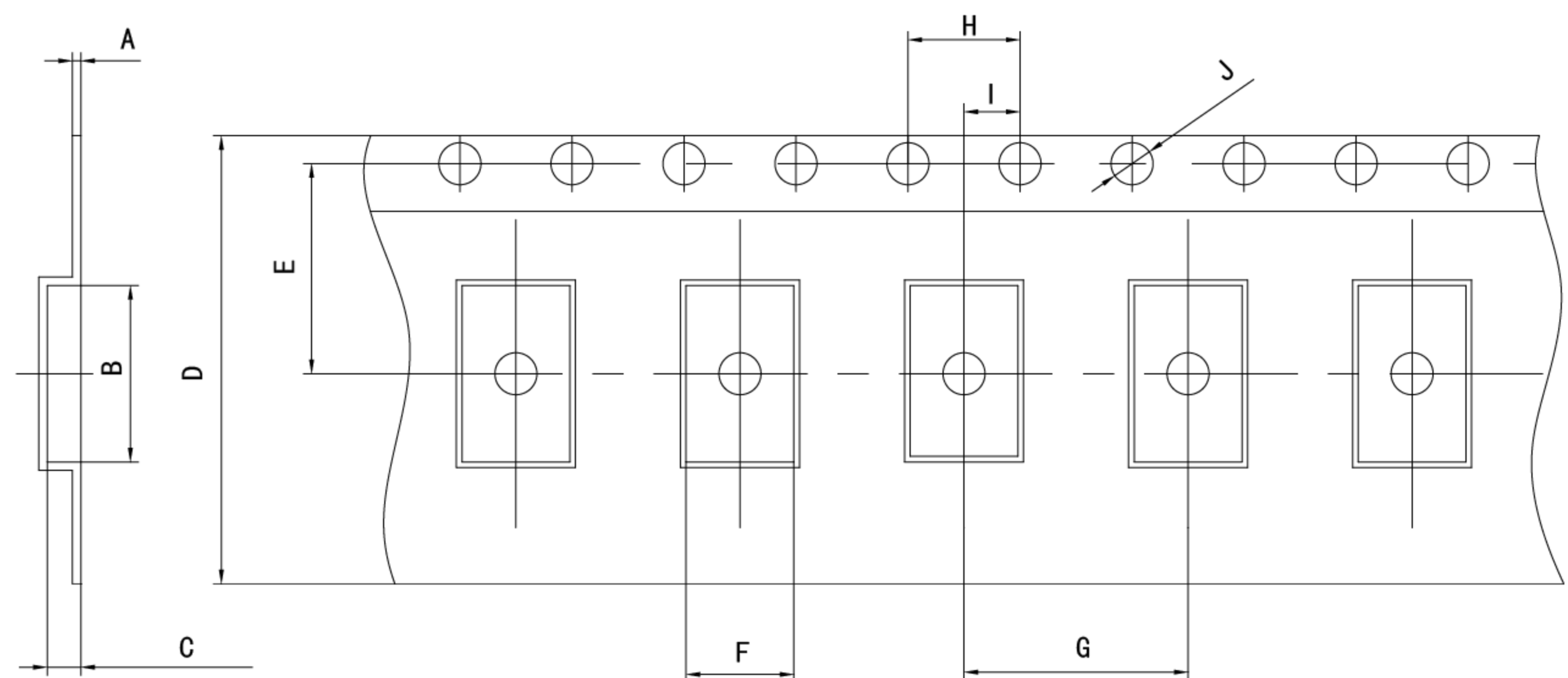
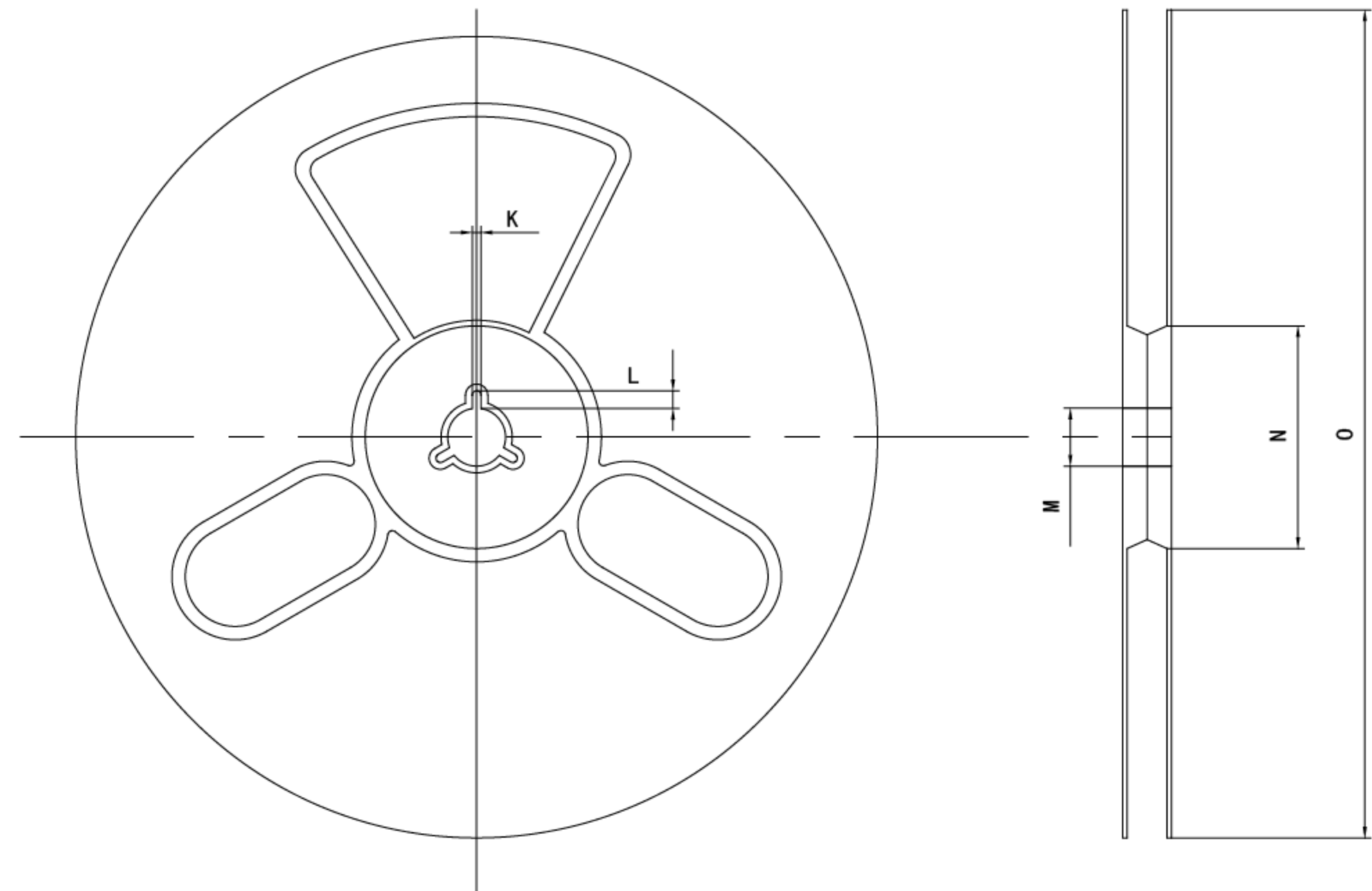
3CN Series 3.2 x 2.5 mm SMD Crystal Oscillator

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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 |
|--------|-----------|---------|---------|---------|---------|----------|---------|---------|---------|----------|---------|---------|---------|-------|--------|
| 3CN | 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

| 3CN Series | | | | |
|------------|---------|--------|---------|----------|
| 1.000 | 1.024 | 1.8432 | 2.000 | 2.048 |
| 3.6864 | 4.000 | 4.096 | 4.9152 | 6.144 |
| 7.3728 | 8.0000 | 8.192 | 10.000 | 11.0592 |
| 11.2896 | 12.000 | 12.288 | 13.000 | 14.31818 |
| 14.7456 | 16.000 | 16.384 | 18.432 | 20.000 |
| 22.5792 | 24.000 | 24.576 | 25.000 | 26.000 |
| 27.000 | 30.000 | 32.000 | 32.768 | 33.000 |
| 33.333 | 33.3333 | 40.000 | 45.1584 | 48.000 |
| 49.152 | 50.000 | | | |