# O-CS8-0XXXXXXX-X
# Ultra Low Phase Noise, Precision SC-cut HF OCXO in 14x21x7.5 mm SMD Package

Rev. M

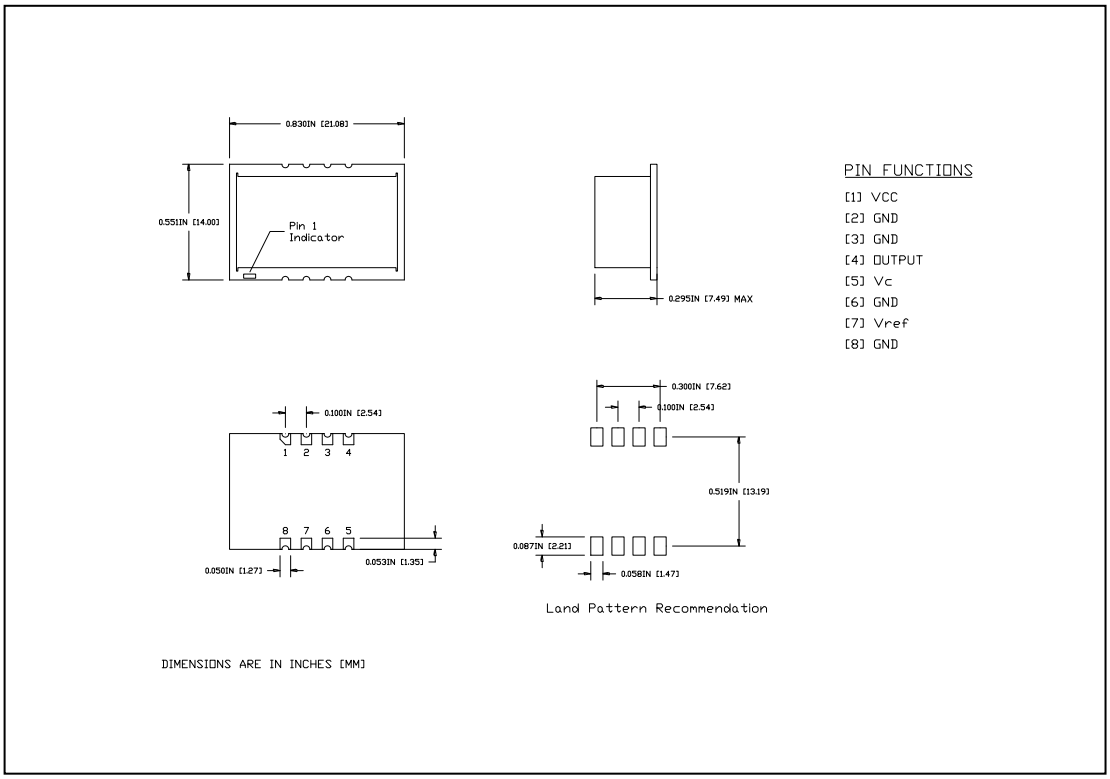
## Product Data Sheet

## Features

- **SC-cut crystal**
- **Ultra Low Phase Noise**
- **Sine Wave +15 dBm output**
- **Extremely Small, Slim Package**

## Applications

- **Instrumentation**
- **Radar**
- **High End Synthesizers**
- **Telecommunication Systems**
- **Data Communications**

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# OVEN CONTROLLED CRYSTAL OSCILLATORS

**Data Sheet 1319A**

O-CS8-0XXXXXXX-X Rev. M

| Parameter | Symb | Condition | Min | Typ | Max | Unit | Note |
|---|---|---|---|---|---|---|---|
| ***Absolute Maximum Ratings*** | | | | | | | |
| **Input Break Down Voltage** | Vcc | | -0.5 | | 6.5 | V | Vcc option 0 |
| **Storage temper.** | Ts | | -55 | | 85 | °C | |
| **Control Voltage** | Vc | | -1 | | 10.5 | V | |
| ***Electrical (1)*** | | | | | | | |
| **Frequency** | F | | 80 | | 120 | MHz | |
| **Frequency stability** | ΔF/F | vs. Temp. | | ±50 | | ppb | See table below Note 2 |
| | | vs. Supply | | | 2 | ppb/5% change | |
| | | Vs. load | | | 2 | ppb/5% change | |
| **Aging** | | per day<br>per first year<br>10 years | | 5E-9<br>5E-7 | <br><br>2.0 | <br><br>ppm | After 30 days of continuous operation |
| **Allan Deviation** | | .01s to 1s | | 5E-11 | | | |
| **SSB Phase Noise at 100.000 MHz** | £(Δf) | 10 Hz<br>100 Hz<br>1 KHz<br>10 KHz<br>100 KHz | | -95 | <br>-125<br>-158<br>-170<br>-178 | dBc/Hz | Grade "L" |
| | | 10 Hz<br>100 Hz<br>1 KHz<br>10 KHz<br>100 KHz | | -100 | <br>-130<br>-160<br>-172<br>-178 | | Grade "P" |
| | | 10 Hz<br>100 Hz<br>1 KHz<br>10 KHz<br>100 KHz | | -105 | <br>-135<br>-162<br>-175<br>-180 | | Grade "U", Available with slope option "L" |
| **Retrace** | | After 30 minutes | | ±20 | | ppb | |
| **G-sensitivity** | | worst direction | | | ±0.5 | ppb/G | |
| **Supply Voltage** | | 5V±5% | 4.75 | 5.0 | 5.25 | V | Option "0" |
| **Power consumption** | P | steady state, 25°C<br>steady state, -40°C<br>start-up | | 1.0<br>2.5<br>3.0 | 1.2<br><br>3.5 | W | Still air |
| **Spectral Purity** | | Output power<br>Subharmonics<br>Spurious<br>Harmonics | 12 | 15<br>none<br><br>-35 | <br><br>-80<br>-30 | dBm<br>dBc | Non-supply related |
| **Load** | 50 Ohm (Internally AC-coupled) | | | | | | |
| **Warm-up time** | τ | to 0.1ppm accuracy | | 3 | 5 | minutes | |
| **Output Waveform** | | Sine-wave | | | | | |
| **Control voltage** | Vc | | 0<br>0 | | 10.0<br>4.5 | V | Slope option "L"<br>Slope option "P" |
| **Input Impedance** | Zin | At Vc Pin | 10 | | | K ohm | |
| **Pull range** | | from nominal F | | ±3.0 | | ppm | |
| **Absolute pull range** | APR | | ±0.5 | | | ppm | |
| **Deviation slope** | | Monotonic, posit | | 0.7<br>1.3 | | ppm/V | Slope option "L"<br>Slope option "P" |
| **Linearity** | | | ±10% | | | | |
| **Reference Voltage** | Vref | | | N/A<br>4.5 | | <br>V | Slope option "L"<br>Slope option "P" |
| **Setability** | Vc0 | @25°C, Fnom. | 4.0<br>1.75 | 5.0<br>2.25 | 6.0<br>2.75 | V | Slope option "L", no bias<br>Slope option "P" *5 |
| **Modulation Bandwidth** | Fm | | DC | | 1 | KHz | |

All parameters for 100.000 MHz

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***Environmental and Mechanical***

| | |
|---|---|
| **Operating temp. range** | 0 to 70°C Standard, Other options – see Chart below |
| **Mechanical Shock** | Per MIL-STD-202, 30G, 11ms |
| **Thermal Shock** | Per MIL-STD-883, Method 1011, Condition A |
| **Vibration** | Per MIL-STD-202, 5G to 2000 Hz |
| **Operational vibration** | Phase noise under vibration to be verified by the customer |
| **Seal** | Only crystal resonator is hermetically sealed |
| **Soldering Conditions** | See MAX reflow profile below; The device may be reflowed once. Reflowing upside down is not allowed. Hand soldering is highly encouraged. NO CLEAN assembly is recommended |
| **Moisture Sensitivity** | Class 1 |

***Electrical Connections***

| | |
|---|---|
| **Pin Out** | Pin #1-- Vcc; Pins ##2,3,6,8 – GND; Pin #4 – OUTPUT; Pin #5– Vc; Pin #7 - Vref |

## Creating a Part Number

**O - C S8 - 0 X X XX XX X - X** - Frequency, MHz

O = OCXO

C = Conventional Power

**Package Code**

S8 14x21x7.5 mm SMD

**Supply Voltage**

| Code | Specification |
|---|---|
| 0 | 5.0V ±5% |

**Control Voltage**

| Code | Specification |
|---|---|
| L | 0 to 10 V |
| P | 0 to 4.5 V |

**Output**

| Code | Specification |
|---|---|
| S | Sinewave |
| T | CMOS/TTL |

**Temperature Stability**

| Code | Specification |
|---|---|
| 17 | $1x10^{-7}$ |
| 58 | $5x10^{-8}$ |
| YZ | $Yx10^{-Z}$ |

**Environmental**

| Code | Specification |
|---|---|
| L | Contains a level of lead that is in excess of RoHS directive and is not designed for reflow |
| R | RoHS compliant |

**Phase Noise Grade (see table)**

| Code | Specification |
|---|---|
| L | Standard |
| P | Premium |
| U | Ultimate |

**Temperature Range**

| Code | In 5ºC steps ** |
|---|---|
| First letter | Lowest temperature from A = -40ºC |
| Second letter | Highest temperature to Z = 85ºC |
| Examples | |
| IS | 0°C to 50°C |
| GU | -10°C to 60°C |
| EW | -20°C to 70°C |

****Temperature Code Table**

| Letter | Temp °C | Letter | Temp °C | Letter | Temp °C | Letter | Temp °C | Letter | Temp °C | Letter | Temp °C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **A** | -40 | **F** | -15 | **K** | 10 | **P** | 35 | **U** | 60 | **Z** | 85 |
| **B** | -35 | **G** | -10 | **L** | 15 | **Q** | 40 | **V** | 65 | | |
| **C** | -30 | **H** | -5 | **M** | 20 | **R** | 45 | **W** | 70 | | |
| **D** | -25 | **I** | 0 | **N** | 25 | **S** | 50 | **X** | 75 | | |
| **E** | -20 | **J** | 5 | **O** | 30 | **T** | 55 | **Y** | 80 | | |

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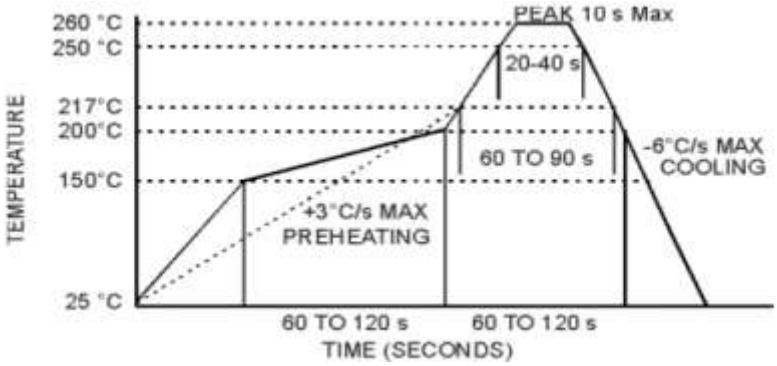
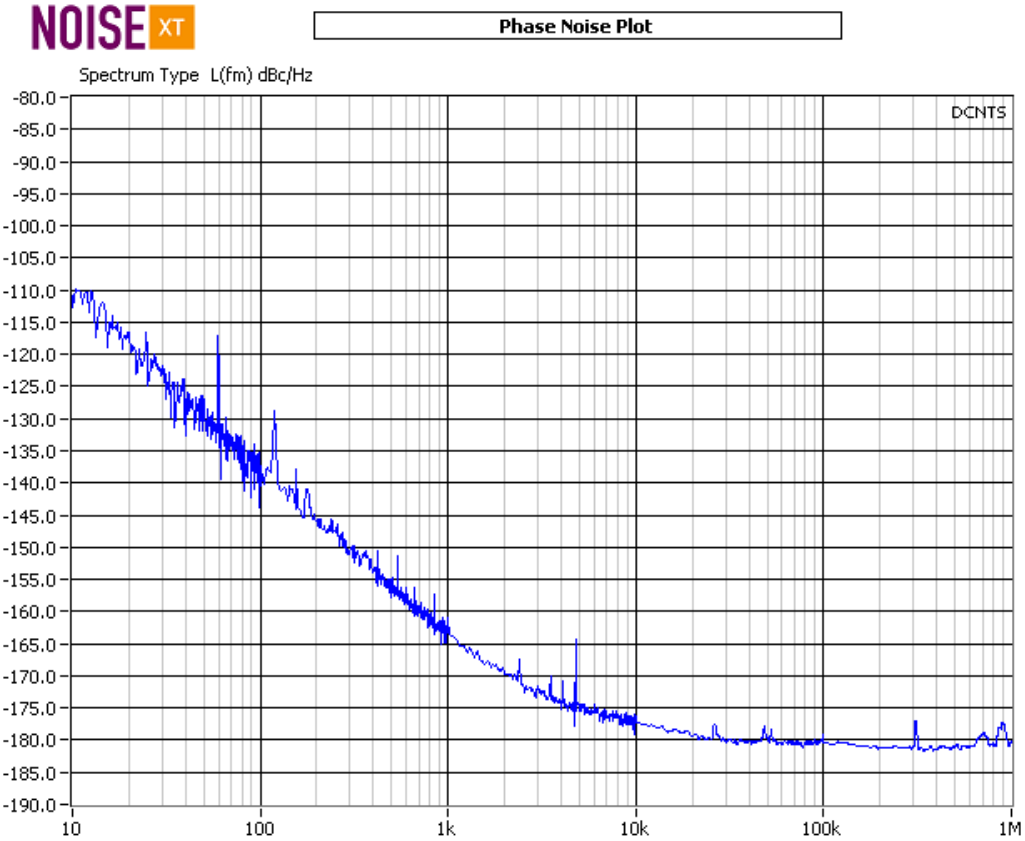
Notes:
1. Not all combinations are available – consult factory
2. It's not recommended to over-specify stability over temperature performance: it significantly affects the cost.
3. Unless absolutely necessary do not specify highest operating temperature above 70°C
4. All parameters, unless otherwise specified, are at nominal conditions, ie: T=25°C, Nominal Vcc & Nominal Load.
5. No internal bias for all slope options. Older units with the date code prior to 2042 may have internal bias at Vc port.

## MAX Reflow Profile

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