

T-S42-XXYY-X –10.000 MHz Phase-Locked Clean-up ULPN TCXO with Low G-sensitivity

Product Data Sheet

Features

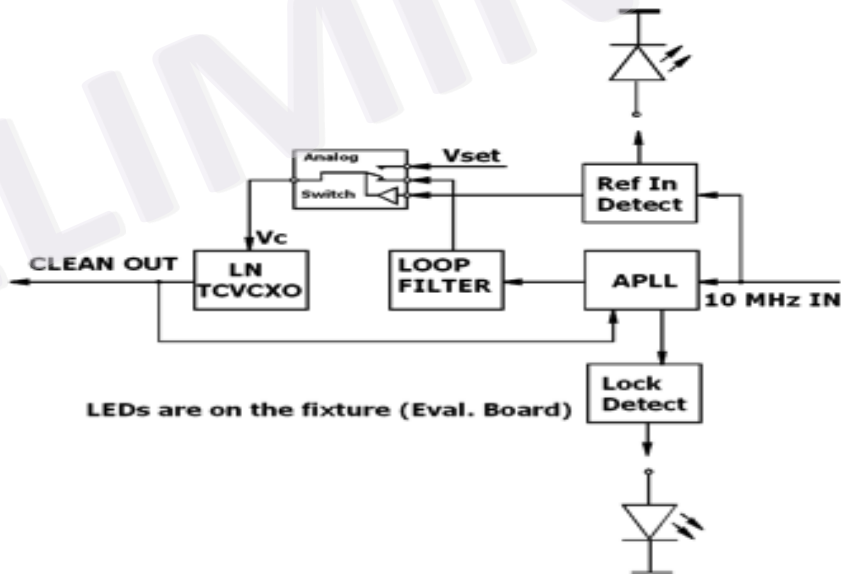
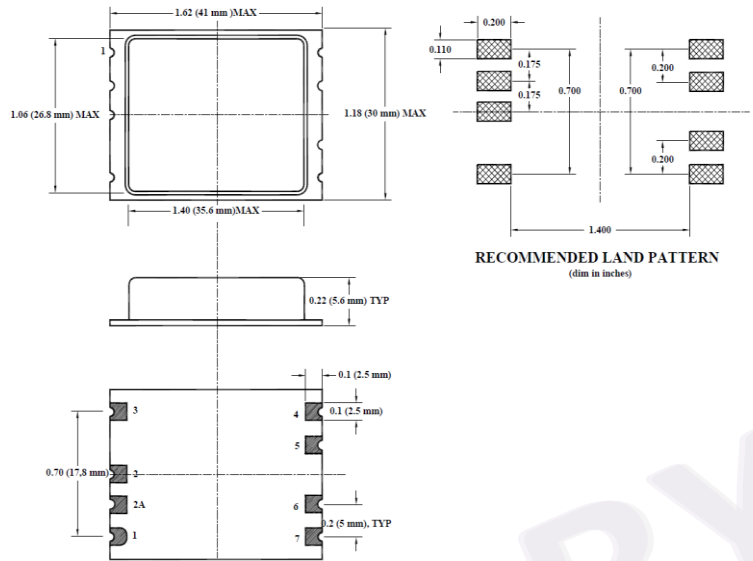
- Low G-sensitivity (0.5 ppb/G)
- Low Phase Noise Similar to OCXO
- Compact SMD Package
- In Absence of REF IN Frequency Returns to Preset Value
- Low Power Consumption Independent on Ambient Temperature and no Warm-up
- Fast Ready

Applications

- Significantly improves Phase Noise of incoming signal
- Atomic Clocks, GNSS Based Clocks
- Test and Measurement
- COTS/Dual use

Pinout

- Pad #1 - 10 MHz Input
- Pad #2 – Vref
- Pad #2A - Vset
- Pad #3 – Vcc
- Pad #4 – Lock Detect
- Pad #5 – RF OUT
- Pad #6 – Case, GND
- Pad #7 – Input Signal Detect



Specifications:

| Parameter | Symb | Condition | Min | Typ | Max | Unit | Note |
|-----------|------|-----------|-----|-----|-----|------|------|
|-----------|------|-----------|-----|-----|-----|------|------|

Absolute Maximum Ratings

| | | | | | | | |
|--------------------------|-----|--|------|--|-----|----|-----------|
| Input Break Down Voltage | Vcc | | -0.5 | | 5.5 | V | Vcc = 5 V |
| Operating Temp. | To | | -20 | | 70 | °C | |
| Operable Temp. | TO | | -40 | | 85 | °C | |
| Storage temper. | Ts | | -40 | | 85 | °C | |

Electrical

| | | | | | | | |
|------------------------------------------------------------------|---------------------------------------------------------------------|---------------------|--------------------------|--------|-------------|----------------|------------------------------------------------------------------------------------------|
| Input Frequency | Fin | | | 10.000 | | MHz | |
| Output Frequency | Fout | | | 10.000 | | MHz | *2 |
| Frequency Capture Range (APR) | ΔF/F | Over All | ±100 | | | ppb | When input signal disappears free run within 100 ppb as shipped, 1,500 ppb over 10 years |
| Allan Deviation | | .01s to 1.0s | | 1E-11 | | | |
| Frequency stability | ΔF/F | Locked | Equal to incoming signal | | | | |
| | | Free Run (Holdover) | | | ±0.28 ±5 | ppm ppb/day | Over temperature Aging |
| Recommended MAX Input SSB Phase Noise | £(Δf) | 10 Hz | | | -80 | dBc/Hz | |
| | | 100 Hz | | | -110 | | |
| | | 1 KHz | | | -130 | | |
| | | 10 KHz | | | -140 | | |
| | | 100 KHz | | | -140 | | |
| Input signal | | CMOS | 2 | | | V | Swing |
| | | Sine Wave | 0 | | 15 | dBm | |
| Output SSB Phase Noise Floor | £(Δf) | 1 Hz | | -90 | | dBc/Hz | |
| | | 10 Hz | | -120 | | | |
| | | 100 Hz | | -143 | | | |
| | | 1 KHz | | -158 | | | |
| | | 10 KHz | | -160 | | | |
| | | 100 KHz | | -160 | | | |
| Output SSB Phase Noise Improvement Compared to Input Phase Noise | £(Δf) | 1 Hz | | 20 | | dBc/Hz | Cannot improve beyond listed above noise floor |
| | | 10 Hz | | 40 | | | |
| | | 100 Hz | | 50 | | | |
| | | 1 KHz | | 50 | | | |
| | | 10 KHz | | 50 | | | |
| | | 100 KHz | | 50 | | | |
| G-sensitivity | | worst direction | | | ±0.5 | ppb/G | |
| Input Voltage | Vcc | Code 0 | 4.75 | 5.0 | 5.25 | V | By special request |
| | | Code A | 3.2 | 3.3 | 3.45 | | |
| Power consumption | P | | | 50 | | mW | Driving 50 Ohm code S |
| Spectral Purity | | Subharmonics | | none | | dBc | Output Code S |
| | | Spurious | | | -80 | | |
| | | Harmonics | | -35 | -30 | | |
| Load | Internally AC coupled 50 Ohm (Sinewave) 10K Ohm//15pf (CMOS/TTL) | | | | | | |
| Lock Time | | | | 1 | | minute | |
| Output Power | Pout | Into 50 Ohm | 9 | 11 | | | Output Code S |

All parameters for output frequency 10 MHz

| | | | | | | | |
|-----------------------|-------|--|---------|-----------|---------|----|-----------------------------------------------------------------------------------|
| Logic 1 (CMOS) | Voh | | 0.7Vref | | | V | Output Code T |
| Logic 0 (CMOS) | Vol | | | | 0.1Vref | V | Output Code T |
| Duty Cycle | | | 45/55 | | 55/45 | % | Output Code T |
| Rise/Fall Time | Tr/Tf | | | 4 | 5 | ns | Output Code T |
| Preset Voltage | Vset | | | 1.65 | | V | Can be externally adjusted by LN metal Potentiometer 10 KOhm between Vref and GND |
| Lock Detect | | | | Logic "1" | | | Can drive LED |
| Input Detect | | | | Logic "1" | | | Can drive LED |

Environmental and Mechanical

| | |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operating temp. range | -20°C to 70°C Standard, Other options – see chart below |
| Mechanical Shock | Per MIL-STD-202, 30G, 11ms , survival |
| Vibration | Per MIL-STD-202, 5G to 2000 Hz, Survival |
| 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 |

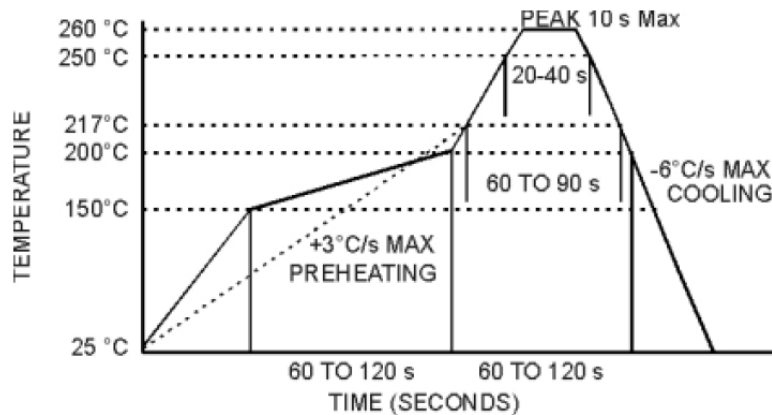
Electrical Connections

Notes:

* All parameters, unless otherwise specified, are at nominal conditions, ie: T=25°C, Nominal Vcc & Nominal

*2 Up to 20 MHz Output frequencies can be discussed with NEL. For HF range (80 to 125 MHz) please visit <https://nelfc.com/pdf/2023A.pdf>

MAX Reflow Profile



Creating a Part Number

T - **S42** - **X** **X** **YY** - **X** - 10.000 MHz
 TCXO

Package Code
 SMD 41x30x5.6, 8 pads

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 |

Supply Voltage

| Code | Specification |
|------|-------------------------|
| 0 | 5 V TYP |
| A | 3.3 V (special request) |

Output

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

Temperature Range

| Code | In 5°C steps ** |
|---------------|-----------------------------------|
| First letter | Lowest temperature from A = -40°C |
| Second letter | Highest temperature to Z = 85°C |
| 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 | | |

NOISE XT

Phase Noise Plot

