# Precision SMD TCXO/VCTCXO

7.0 x 5.0 x 1.9mm

## AST3TQ-28

ESD Sensitive

RoHS/RoHS II Compliant

**Moisture Sensitivity Level (MSL) – 3**

## FEATURES:

- Standard available frequencies: 10.00, 12.80, 15.36, 16.32, 16.384, 19.20, 19.44, 20.00, 25.00, 26.00, 30.72 & 40.00 MHz
- Standard LVCMOS Output
- Frequency stability of ±280 ppb (±0.28 ppm) over -40°C to +85°C
- Excellent Phase Noise, Harmonics & Spurious content
- Typical rms jitter of 400fs @ 40MHz carrier & 1.0ps @ 10MHz carrier over 12kHz to 20MHz BW

## APPLICATIONS:

- COTS Military Radios & other Communication Hardware
- WiMax,
- LTE, BTS
- CATV, LAN, LMDS
- GPS Tracking with Hold-Over accuracy
- Test & Measurement Equipment
- Point-to-Point communication networks

## STANDARD SPECIFICATIONS:

| Parameters | Rating |
|---|---|
| Storage Temperature Range | -55 to +125℃ |
| Supply Voltage | -0.5 to 6V |
| ESD, HBM/CDM/MM | 4kV/2kV/200V |

| Parameters | Minimum | Typical | Maximum | Units | Notes |
|---|---|---|---|---|---|
| Frequency Range | 10 | | 40 | MHz | |
| Standard Frequencies: | 10.00, 12.80, 15.36, 16.32, 16.384, 19.20, 19.44, 20.00, 25.00, 26.00, 30.72 and 40.00 | | | MHz | |
| Initial Frequency Tolerance (@+25℃) at shipping | | | ±0.3 | ppm | Relative to carrier |
| **Frequency Stability Options** | | | | | |
| -40℃ to +85℃ | | | ±280 | ppb | |
| Frequency Stability vs. Supply Voltage Change (Vdd±5%): | | | ±100 | ppb | |
| Frequency Stability vs. Load Change (Load±5%): | | | ±200 | ppb | |
| Supply Voltage (Vdd): | +3.135 | +3.3 | +3.465 | V | |
| Aging (first year @+25℃): | | | ±1.0 | ppm | |
| Aging (20 years @+25℃): | | ±3.0 | ±4.6 | ppm | |
| Supply Current (Icc) (into 15pF load): | | 3.0 | 4.0 | mA | @10MHz carrier |
| | | 5.5 | 7.0 | | @40MHz carrier |
| **LVCMOS Output (Square wave)** | | | | | |
| $V_{OH}$: | 2.4 | | | V | Load=15pF |
| $V_{OL}$: | | | 0.4 | V | Load=15pF |
| Load: | | | 15 | pF | |
| Duty Cycle: | 45 | | 55 | % | @( $V_{OH}$ - $V_{OL}$)/2 |
| Rise/Fall Time: | | | 6 | ns | Load=15pF |
| RMS Jitter (12kHz to 20MHz BW) | 0.4 | | 1.3 | ps | Carrier dependent |
| Control Port | | | | | ***Applicable for VCTCXO only*** |
| Voltage Range (Vc) | 0.50 | | +2.50 | V | |
| Frequency Pull | ±7.00 | ±10.00 | ±12.00 | ppm | (Vc = 1.5V±1.0V) |
| Center Control Voltage (Vc) | | +1.50 | | | To be with-in ±500 ppb of Fc @ 25°C |
| Port Impedance | 100 | | | kΩ | |
| Phase Noise (10MHz carrier frequency @25℃): | | | -95 | dBc/Hz | Offset @10Hz |
| | | | -120 | | Offset @100Hz |
| | | | -140 | | Offset @1kHz |
| | | | -145 | | Offset @10kHz |
| | | | -150 | | Offset @100kHz |



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RoHS/RoHS II Compliant

7.0 x 5.0 x 1.9mm

## OPTIONS & PART IDENTIFICATION: (left blank if standard)

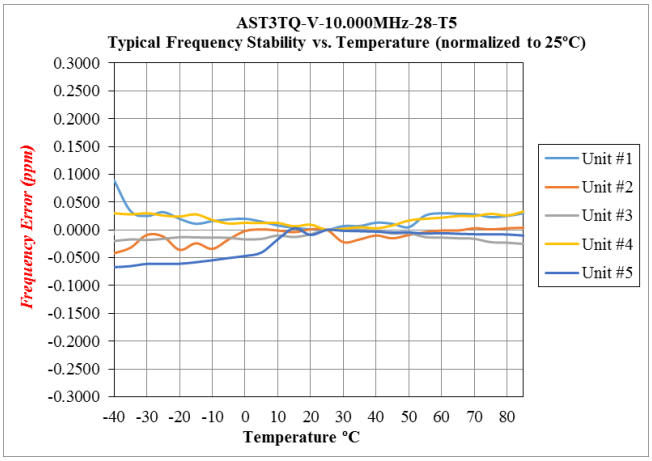
AST3TQ-[ ]-[ ] MHz - 28 -[ ]

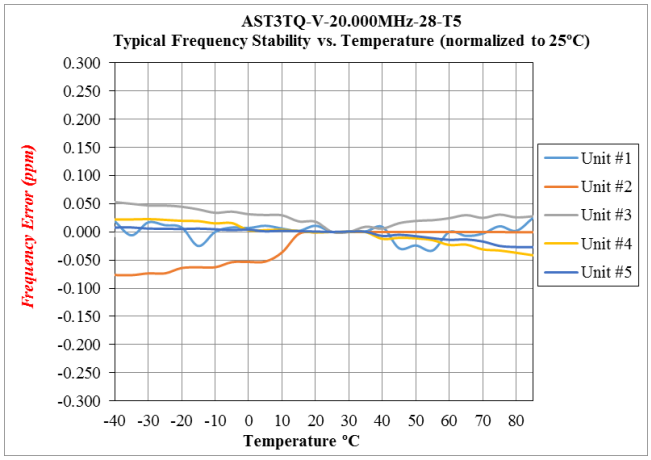
**Pull-Ability**
T = TCXO
V = VCTCXO

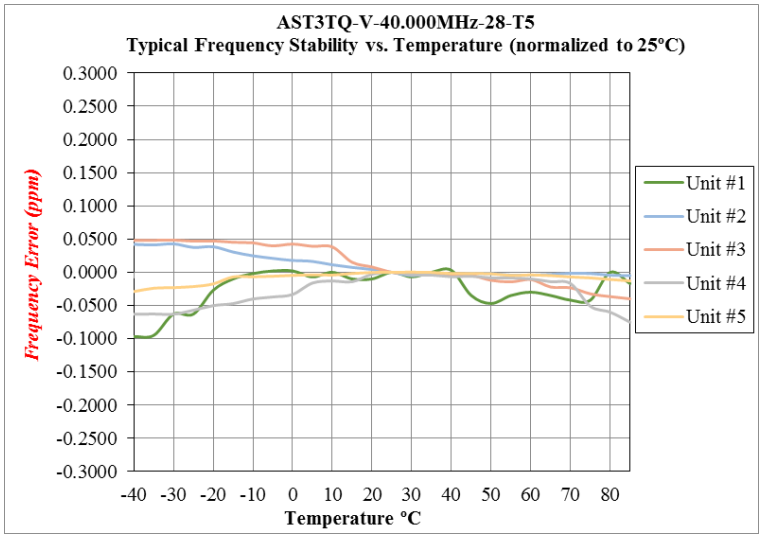
**Frequency in MHz**
Please specify the frequency in MHz
e.g. 19.200MHz

**Packaging**
Blank: Bulk
T5: 500pcs/reel
T2: 2000pcs/reel

## FREQUENCY STABILITY VS. TEMPERATURE



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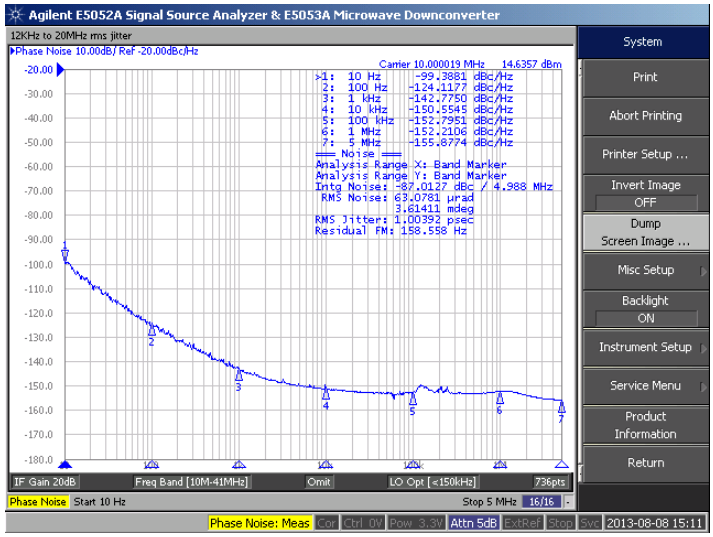
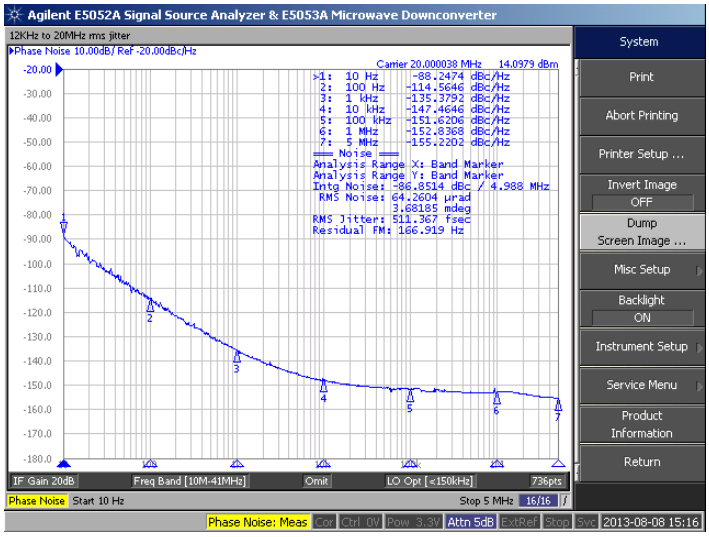
## TYPICAL PHASE NOISE

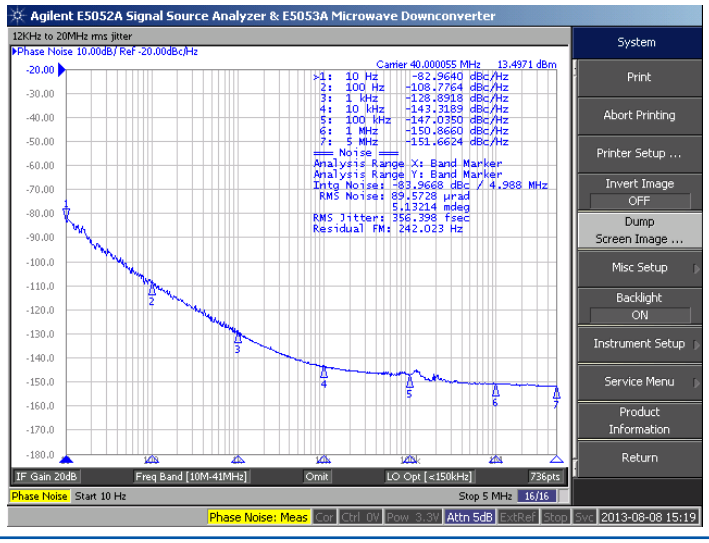
### 10.00 MHz Carrier




### 20.00 MHz Carrier




### 40.00 MHz Carrier







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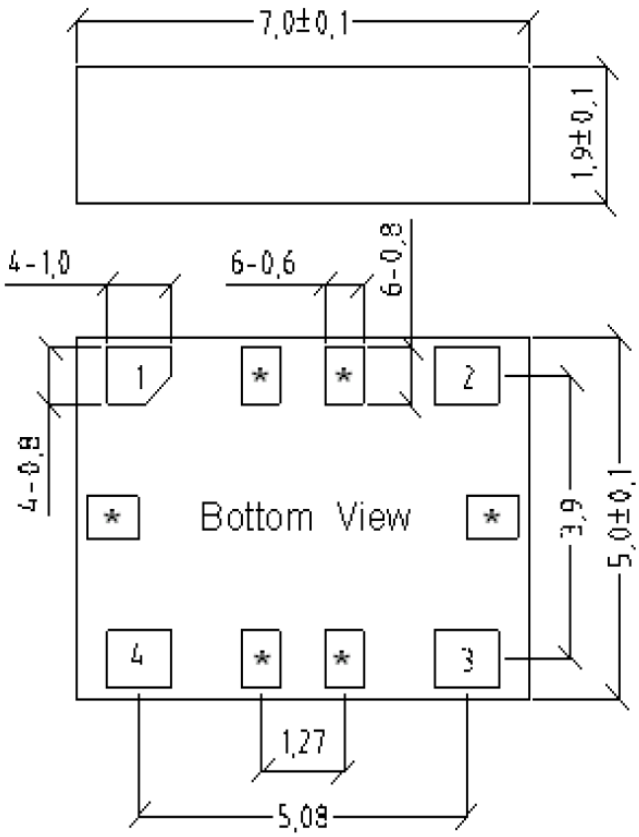
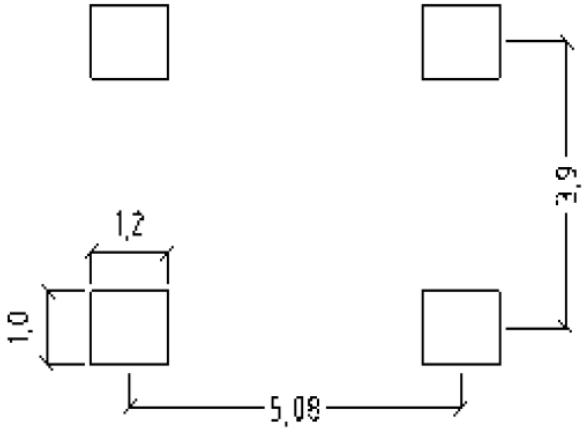
## OUTLINE DIMENSION:



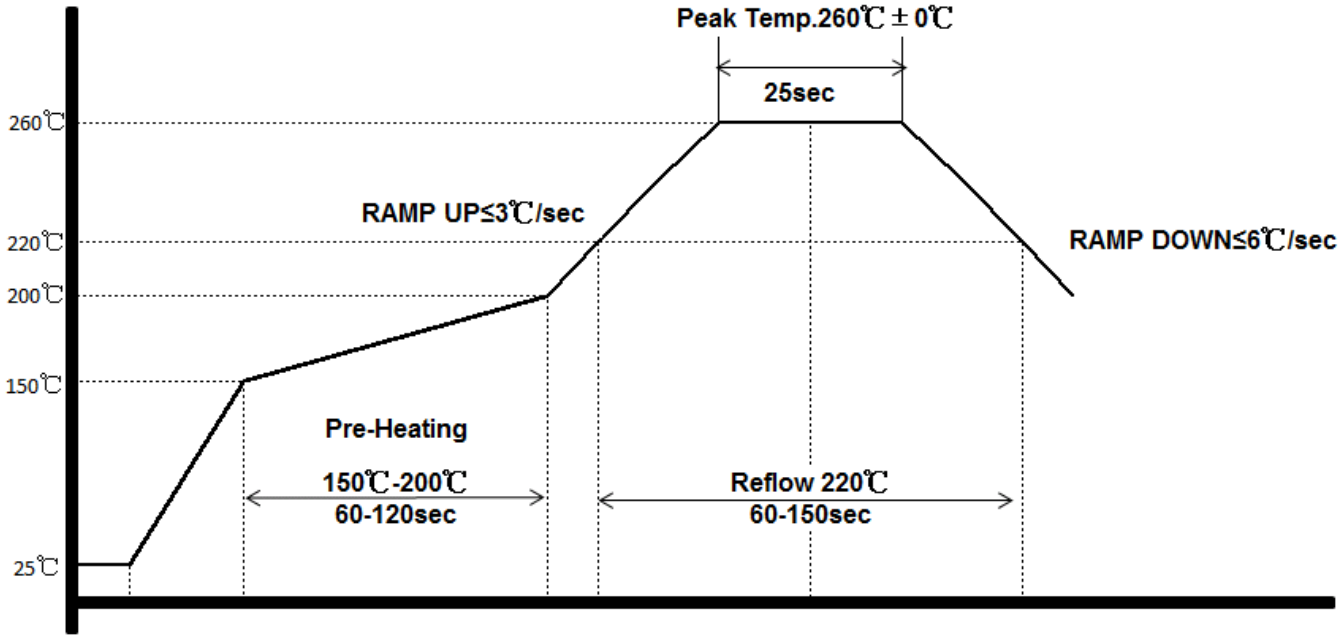

Recommended Land Pattern




| Pin | Function |
|---|---|
| 1 | NC *(for TCXO)*<br>Vc (*for VCTCXO*) |
| 2 | GND |
| 3 | Output |
| 4 | Vdd |
| * | For factory test only |

Dimensions: mm

## REFLOW PROFILE:



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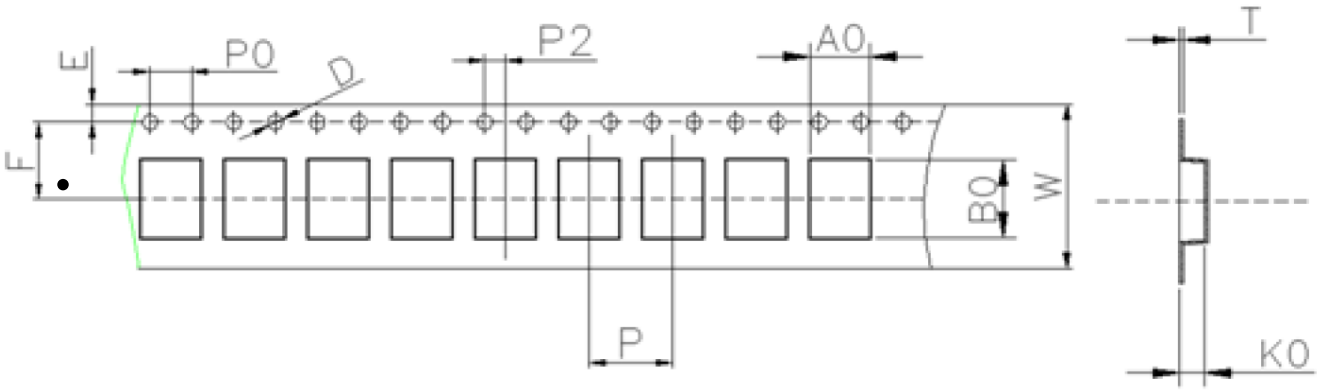
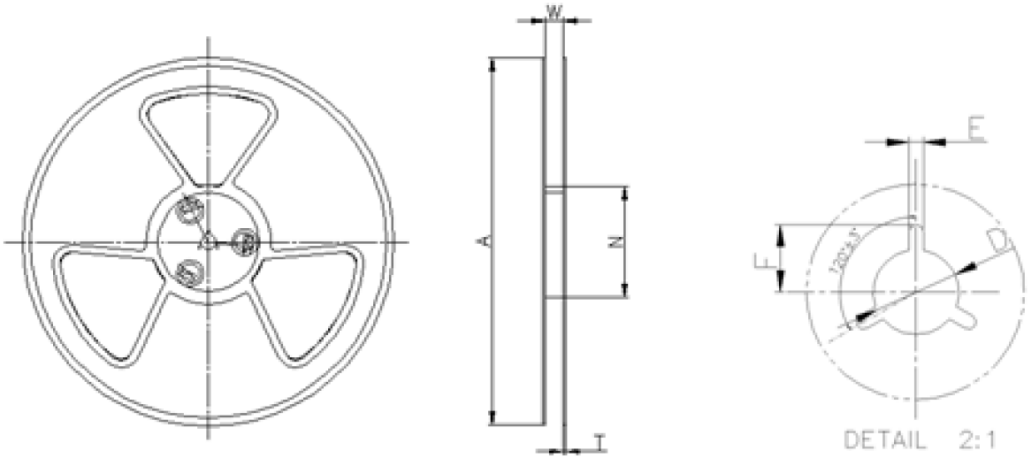
## TAPE & REEL:

**Packaging:**
**T5: 500pcs/reel**
**T2: 2,000pcs/reel**
**MSL-3 packaging applies to MOQ=50 units (cut tape) & T5 and T2.**




| W | A0 | B0 | K0 | P | F |
|---|---|---|---|---|---|
| 16.0±0.3 | 5.7±0.15 | 7.6±0.15 | 2.4±0.15 | 8.0±0.1 | 7.5±0.1 |
| **E** | **D** | **P0** | **P2** | **T** | |
| 1.75±0.1 | 1.5+0.1/-0.0 | 4.0±0.1 | 2.0±0.1 | 0.3±0.05 | |




| W | A | N | T | E | F | D |
|---|---|---|---|---|---|---|
| 16.5±0.4 | 330±0.5 | 100±0.3 | 1.8±0.2 | 2.1±0.3 | 10.75±0.3 | 13.5+0.5/-0.2 |

**Dimensions: mm**

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