

Features

- Programmable low cost CMOS TCXO
- High frequency range : [1 MHz ~ 200 MHz]
- Frequency stability as tight as ± 2.0 ppm over -40°C to 85°C

General specifications of all available packages , at $T_a = +25^{\circ}\text{C}$, $C_L = 15\text{pF}$

| Output Waveform | | Square wave [CMOS] . Waveform code is " T " | | | | |
|---|--|--|---------------------------------------|---------------------------------|---------------|---------------|
| Type | | MTF326 , VMTF326 | MTF538 , VMTF538 | MTF572 , VMTF572 | | |
| Package Size | | 3.2 x 2.5 x 1.6 mm | 5.0 x 3.2 x 1.4 mm | 7.0 x 5.0 x 2.3 mm | | |
| Supply Voltage (V_{DD}) | | + 1.8 V (code is " 18 ") | + 2.5 V (code is " 25 ") | + 3.3 V (code is " 33 ") | | |
| Available Frequency Range | | 1 ~ 125 MHz | 1 ~ 200 MHz | 1 ~ 200 MHz | | |
| Current Consumption | | 30 mA (max.) | 35 mA (max.) | 40 mA (max.) | | |
| Initial Calibration Tolerance | | ± 2.0 ppm at $+25^{\circ}\text{C} \pm 2^{\circ}\text{C}$. (Default for Quick - Turn) | | | | |
| Frequency Stability | vs Temperature | ± 2.0 ppm (max.) at -40°C to 85°C (Default for Quick - Turn) | | | | |
| | vs Aging at $T_a = + 25^{\circ}\text{C}$ | ± 1.0 ppm (max.) , per year | | | | |
| | vs Voltage Change | ± 0.3 ppm (max.) , for a $\pm 5\%$ input voltage change . | | | | |
| | vs Load Change | ± 0.3 ppm (max.) , for a $\pm 10\%$ load condition change . | | | | |
| | vs Reflow | ± 1.0 ppm (max.) , 1 reflow and measured 24 hours afterwards . | | | | |
| Output Logic High " 1 " | | $V_{DD} - 0.4$ V (min.) | | | | |
| Output Logic Low " 0 " | | 0.4 V (max.) | | | | |
| Rise Time and Fall Time | | 10.0 nsec (max.) ; 10% \rightarrow 90% of the waveform | | | | |
| Duty Cycle | | 1 ~ 150MHz : 50 % \pm 5 % | | | | |
| | | 150 ~ 200MHz : 50 % \pm 10 % | | | | |
| Start-Up Time | | 5.0 msec. (typ.) , 10.0 msec. (max.) | | | | |
| Output Load | | 15 pF | | | | |
| Electrical Frequency Tuning (EFC) by external Control Voltage | Control Voltage Center | 1.8 V | 2.5 V | 3.3 V | | |
| | Frequency Deviation Range | 0.9 V \pm 0.6 V | 1.4 V \pm 1.0 V | 1.5 V \pm 1.0 V | | |
| Control Voltage | Slope Polarity (Transfer Function) | Positive slope. Positive voltage for positive frequency shift. | | | | |
| | | Input Impedance : 1.0M Ω (min.) | Modulation Bandwidth : 3 KHz (min.) | Linearity : ± 10 % (max.) | | |
| Output Enable / Disable Function [OE not available for (V)MTF572] | | 70% of V_{DD} (min.) to enable. | | | | |
| | | 30% of V_{DD} (max.) to disable. | | | | |
| | | Disable Current : 0.2 mA (typ.) , 1.0 mA (max.) | | | | |
| RMS Jitter (12KHz ~ 20MHz) | | 1.2 psec (typ.) | | | | |
| Phase Noise Offset / dBc / Hz (typ.) | 100MHz as example | 10 Hz | 100 Hz | 1 KHz | 10 KHz | 100 KHz |
| | | -72 dBc / Hz | -101 dBc / Hz | -155 dBc / Hz | -121 dBc / Hz | -119 dBc / Hz |
| Storage Temperature | | -55°C to $+150^{\circ}\text{C}$ | | | | |

Temperature Compensated Crystal Oscillators [TCXO " M "]

CMOS wave output code " T "

Part Number Format and Exmple

| | | | | | | | | | |
|--|-------------|-------------|----------------|---|------------------|---|---------------------|---|-----------------------|
| | [1] | [2] | [3] | - | [4] | - | [5] | / | [6] |
| | Holder Type | Output Wave | Supply Voltage | | Center Frequency | | Frequency Stability | | Operating Temp. Range |

| | | | | | | | | | | |
|----------|-----|---------|---|----|---|---------|---|-----|---|--------|
| Examples | (1) | MTF572 | T | 33 | - | 133.330 | - | 2.0 | / | -40+85 |
| | (2) | VMTF326 | T | 18 | - | 100.000 | - | 1.0 | / | -10+60 |

Ex (1) : MTF572T33 - 133.330 - 2.0 / -40+85 [TCXO , 7050 SMD package , CMOS , 3.3V , 133.330MHz , ±2.0ppm from -40°C to 85°C]

Ex (2) : VMTF326T18 - 100.000 - 1.0 / -10+60 [VCTCXO , 3225 SMD package , CMOS , 1.8V , 100.000 MHz , ±1.0ppm from -10°C to 60°C]

| | |
|-------|--|
| [1] | Holder Type " MTF " stands for TCXO ; " VMTF " stands for VCTCXO |
| [2] | " T " stands for Square Wave |
| [3] | Supply voltage : " 18 " stands for +1.8V ; " 25 " stands for +2.5V ; " 33 " stands for +3.3V |
| [4] | Center Frequency in MHz |
| [5] | Frequency stability in ± _ ppm ; ex 1 : ± 1.5ppm --- 1.5 , ex 2 : ± 2.0ppm --- 2.0 |
| [6] | Operating temperature range in °C ex 1 : -10 °C to 60°C ----- -10+60 ; ex 2 : -30 °C to 75°C ----- -30+75 |

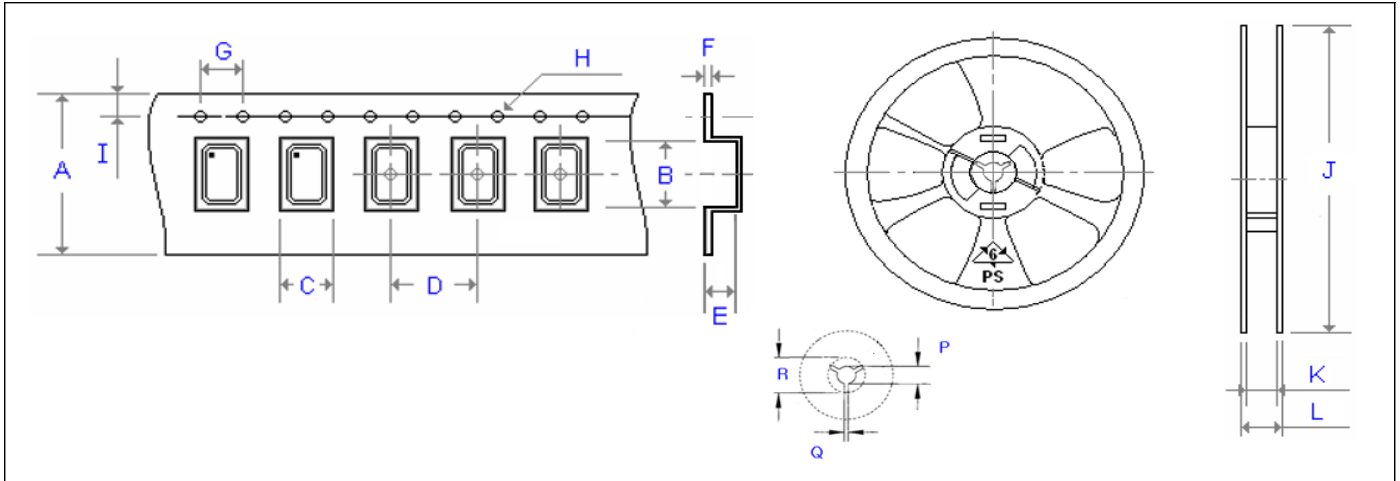
Outline Dimensions (Unit : mm) , Suggested pad Layout for SMDs

| | |
|--|---|
| <p style="text-align: center;">[(V) MTF326T]</p> <p>Pad Connections : Pad 1: No Connection for TCXO Voltage Control for VCTCXO Pad 2: Output Enable Pad 3: Ground Pad 4: Output Pad 5: No Connection Pad 6: Supply Voltage</p> | <p style="text-align: center;">[(V) MTF538T]</p> <p>Pad Connections : Pad1 : No Connection For TCXO Voltage Control For VCTCXO Pad2: Output Enable Pad3: Ground Pad4: Output Pad5: No Connection Pad6: Supply Voltage Pad7: No Connection Pad8: No Connection</p> |
| <p style="text-align: center;">[(V) MTF572T]</p> <p>Pad Connections : Pad1 : No Connection For TCXO Voltage Control For VCTCXO Pad2: Ground Pad3: Output Pad4: Supply Voltage</p> | |

Emboss Taping and Reel Specifications

[VCXO]

[(VC)TCXO]



Carrier Type Dimensions (unit : mm) ±0.3mm

| | A | B | C | D | E | F | G | H | I | pcs / reel |
|--------------|-------|-------|-------|-------|------|------|------|--------|------|------------|
| G_226 | 8.00 | 2.80 | 2.25 | 4.00 | 1.10 | 0.30 | 4.00 | ∅ 1.50 | 1.75 | 3000 |
| G_326 | 8.00 | 3.40 | 2.70 | 4.00 | 1.40 | 0.25 | 4.00 | ∅ 1.50 | 1.75 | 3000 |
| G_536 | 12.00 | 5.30 | 3.60 | 8.00 | 1.40 | 0.30 | 4.00 | ∅ 1.50 | 1.75 | 1000 |
| G_576 | 16.00 | 7.30 | 5.30 | 8.00 | 1.90 | 0.32 | 4.00 | ∅ 1.50 | 1.75 | 1000 |
| G_538 | 12.00 | 5.40 | 3.60 | 8.00 | 1.70 | 0.30 | 4.00 | ∅ 1.50 | 1.75 | 1000 |
| G_578 | 16.00 | 7.30 | 5.30 | 8.00 | 1.90 | 0.32 | 4.00 | ∅ 1.50 | 1.75 | 1000 |
| (V)M21 | 8.00 | 2.30 | 1.90 | 4.00 | 0.90 | 0.25 | 4.00 | ∅ 1.50 | 1.75 | 3000 |
| ME21 | 8.00 | 2.30 | 1.50 | 4.00 | 1.35 | 0.25 | 4.00 | ∅ 1.50 | 1.75 | 3000 |
| (V)M22 | 8.00 | 2.80 | 2.25 | 4.00 | 1.10 | 0.30 | 4.00 | ∅ 1.50 | 1.75 | 3000 |
| (V)M_32 | 8.00 | 3.71 | 2.80 | 4.00 | 1.75 | 0.25 | 4.00 | ∅ 1.50 | 1.75 | 3000 |
| (V)M_326 | 12.00 | 3.60 | 2.90 | 4.00 | 1.70 | 0.30 | 4.00 | ∅ 1.50 | 1.75 | 1000 |
| (V)M_53 | 12.00 | 5.30 | 3.60 | 8.00 | 1.40 | 0.30 | 4.00 | ∅ 1.50 | 1.75 | 1000 |
| (V)M_538 | 12.00 | 5.40 | 3.60 | 8.00 | 1.70 | 0.30 | 4.00 | ∅ 1.50 | 1.75 | 1000 |
| (V)M_57(2) | 16.00 | 7.40 | 5.50 | 8.00 | 2.80 | 0.35 | 4.00 | ∅ 1.50 | 1.75 | 500 |
| (V)M_43 (63) | 24.00 | 11.80 | 10.00 | 16.00 | 5.00 | 0.30 | 4.00 | ∅ 1.50 | 1.75 | 500 |

Reel Dimensions (unit : mm) ±2mm

| | J | K | L | P | Q | R | pcs / reel |
|--------------|--------|-------|-------|-------|------|-------|------------|
| G_226 | 180.00 | 8.40 | 11.40 | 13.00 | 2.50 | 20.20 | 3000 |
| G_326 | 180.00 | 9.00 | 12.00 | 13.00 | 2.50 | 20.20 | 3000 |
| G_536 | 180.00 | 13.00 | 16.00 | 13.00 | 2.50 | 20.20 | 1000 |
| G_576 | 180.00 | 17.20 | 19.30 | 13.00 | 2.50 | 20.20 | 1000 |
| G_538 | 180.00 | 13.00 | 16.00 | 13.00 | 2.50 | 20.20 | 1000 |
| G_578 | 180.00 | 17.20 | 19.30 | 13.00 | 2.50 | 20.20 | 1000 |
| (V)M21 | 180.00 | 8.40 | 11.40 | 13.00 | 2.50 | 20.20 | 3000 |
| ME21 | 180.00 | 9.00 | 12.00 | 13.00 | 2.50 | 20.20 | 3000 |
| (V)M22 | 180.00 | 8.40 | 11.40 | 13.00 | 2.50 | 20.20 | 3000 |
| (V)M_32 | 180.00 | 9.00 | 11.40 | 13.00 | 2.50 | 20.20 | 3000 |
| (V)M_326 | 180.00 | 13.00 | 16.00 | 13.00 | 2.50 | 20.20 | 1000 |
| (V)M_53 | 180.00 | 13.00 | 16.00 | 13.00 | 2.50 | 20.20 | 1000 |
| (V)M_538 | 180.00 | 13.00 | 16.00 | 13.00 | 2.50 | 20.20 | 1000 |
| (V)M_57(2) | 180.00 | 17.20 | 19.30 | 13.00 | 2.50 | 20.20 | 500 |
| (V)M_43 (63) | 330.00 | 24.50 | 29.10 | 13.00 | 2.50 | 20.20 | 500 |