



V8F / V8M

DESCRIPTION

- *LVPECL Voltage controlled crystal oscillator*
- *Supply voltage :3.3 V ±5%*
- *Frequency range 50 to 800MHz*
- *Frequency pulling up to ± 150 ppm*

APPLICATIONS

- *SONET / SDH*
- *Fiber Channel*
- *Ethernet*
- *VCXO for PLL Application*
- *Test and Measurement*
- *Networking*

FEATURES

- *Fundamental mode oscillation (50 MHz to 250MHz)*
- *Analog frequency multiplication (100MHz to 800MHz)*
- *Low phase noise and jitter characteristics*
- *High performance and reliability (over 20 years aging)*
- *High frequency fundamental crystal (including inverted-mesa technology)*

ELECTRICAL SPECIFICATIONS

| PARAMETER | SYMBOL | CONDITION | SERIES | | | | | | UNIT |
|-----------------------------|----------------------|---|-------------|------|------|------|------|------|-------|
| | | | V8F | | | V8M | | | |
| | | | Min. | Typ. | Max. | Min. | Typ. | Max. | |
| Frequency range | F ₀ | 3.3 volts ±5% | 50 | | 250 | 100 | | 800 | MHz |
| Supply Voltage | V _{CC} | ±5%, 25°C | | 3.3 | | | 3.3 | | V |
| Sub-Harmonics | sH | Delta Ref. to carrier | - | - | - | -70 | -60 | -40 | dBm |
| Spurs | sp | Delta Ref. to carrier | -85 | | -75 | -75 | | -60 | dBm |
| Duty Cycle | DC | Output termination 50Ω / V _{CC} -2.0V | 40 to 60 | | | | | | % |
| RMS Phase Jitter | J | 12 kHz – 20 MHz Bandwidth | | 0.4 | 0.7 | | 0.6 | 1.0 | ps |
| Frequency Stability | st | -40°C to +85°C, ref. to 25°C | ±30 | | | | | | ppm |
| Voltage Control Input Range | V _c | | 0 to 3.3 | | | | | | V |
| Modulation Bandwidth | Bw | -3db | | 25 | | | 20 | | KHz |
| VC Input Impedance, min. | Z _{in} | V _{CC} = 3.3, 0 ≤ V _c ≤ V _{CC} | 100 | | | | | | kΩ |
| Pull Range ¹ | Pr | 0 ≤ V _c ≤ V _{CC} | 100 | | 150 | 40 | | 150 | ppm |
| VC Transfer Function | K _{VCC} | | 30.3 | | 60.6 | 12.1 | | 45.5 | ppm/V |
| VC Linearity | L _{in} | Positive slope | 10 | | | | | | % |
| Voltage Control Center | V _c | Freq. tolerance ±10ppm max. | 1.65 | | | | | | V |
| Start-Up Time | t _{start} | T _a =25°C | 10 | | | | | | ms |
| Aging | F-ag | Over 20 years life time | 15 | | | | | | ppm |
| Operating Temperature | T _a | | -40 to +85 | | | | | | °C |
| Storage Temperature | T _(stg) | Absolute max | -65 to +150 | | | | | | °C |
| Maximum Voltage | V _{CC(abs)} | | 4.6 | | | | | | V |
| Moisture Sensitivity Level | MSL | JEDEC J-STD-020 | 1 | | | | | | |
| Termination Finish | | | Au | | | | | | |
| ESD Sensitivity | HBM | Human body model JESD22-A114 | 3 | | | | | | kV |

Note:
1.0-100 ppm pull range is not available for all frequencies in the V8M Series

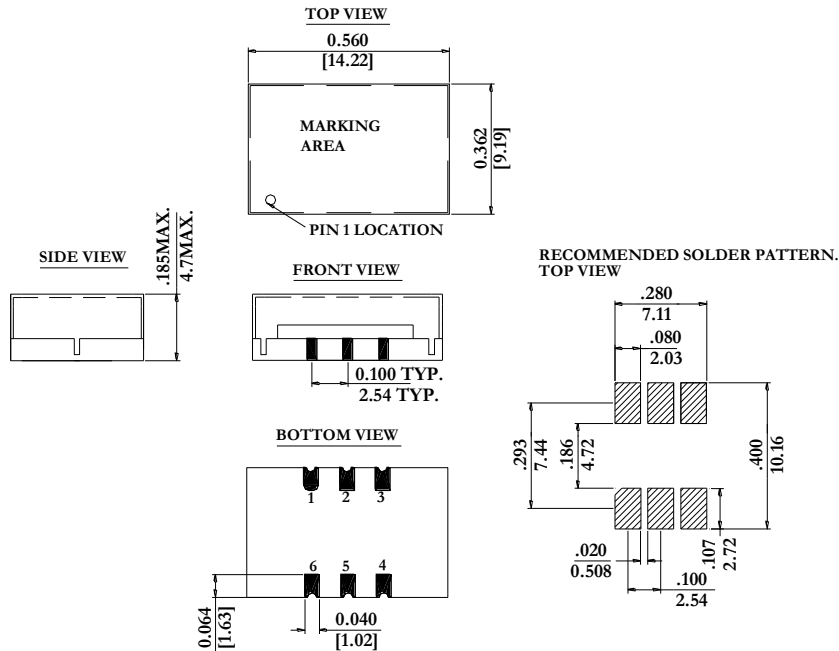
OUTPUT CHARACTERISTICS

| | PARAMETER | SYMBOL | CONDITION | VALUE | | | UNIT |
|--------|----------------------|-----------|---|---------------|---------------|--------------|------|
| | | | | Min | Typ. | Max | |
| LVPECL | Output Levels | V_{OH} | Load 50Ω to $V_{CC}-2V$ | $V_{CC}-1.35$ | $V_{CC}-1.01$ | $V_{CC}-0.8$ | V |
| | | V_{OL} | | $V_{CC}-2.00$ | $V_{CC}-1.78$ | $V_{CC}-1.6$ | V |
| | Rise/Fall Time | T_r/T_f | frequency-dependent | 0.3 | 0.5 | 1.2 | ns |
| | Output Voltage Swing | V_{pp} | Output termination 50Ω / $V_{CC} -2.0V$ | 0.65 | 0.77 | 0.95 | V |
| | Supply Current | I_s | 3.3V ±5% | | | 65 | mA |
| | Output Load | O_{CL} | Output termination 50Ω / $V_{CC} -2.0V$ | | | 50 | Ω |

TYPICAL FREQUENCIES

| | | | | |
|-----------|-----------|-----------|------------|-----------|
| 61.440MHz | 76.800MHz | 77.760MHz | 78.6432MHz | 81.920MHz |
| 92.160MHz | 103.68MHz | 104.00MHz | 122.880MHz | 125.00MHz |
| 153.60MHz | 155.52MHz | 156.25MHz | 207.360MHz | 208.00MHz |
| 245.76MHz | 307.20MHz | 312.50MHz | 320.000MHz | 327.68MHz |
| 368.64MHz | 400.00MHz | 491.52MHz | 614.400MHz | 622.08MHz |

MECHANICAL DIMENSIONS AND PIN FUNCTIONING



Dimension: inches/ [mm]
Tolerances: 0.004"/ [0.1mm]

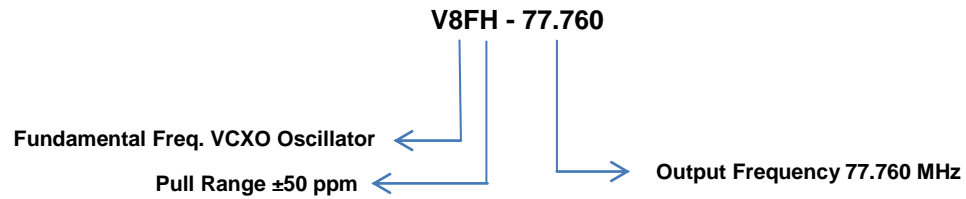
| PIN | SYMBOL | FUNCTION |
|-----|-----------------|----------------------------|
| 1 | V _c | Voltage Control |
| 2 | N/C | N/C |
| 3 | GND | Case and Electrical Ground |
| 4 | Q | Output |
| 5 | /Q | Complementary output |
| 6 | V _{cc} | Power Supply Voltage |

PART NUMBERING

| SERIES | Pull Range (ppm) | - | OUTPUT FREQUENCY (MHz) |
|--------|--------------------------------|---|------------------------|
| V8F | H: ±50 J: ±100 L: ±150 | - | F ₀ |
| V8M | S: ±40 J: ±100 ¹ | - | |

Note: 1.0-100 ppm pull range is not available for all frequencies in the V8M Series

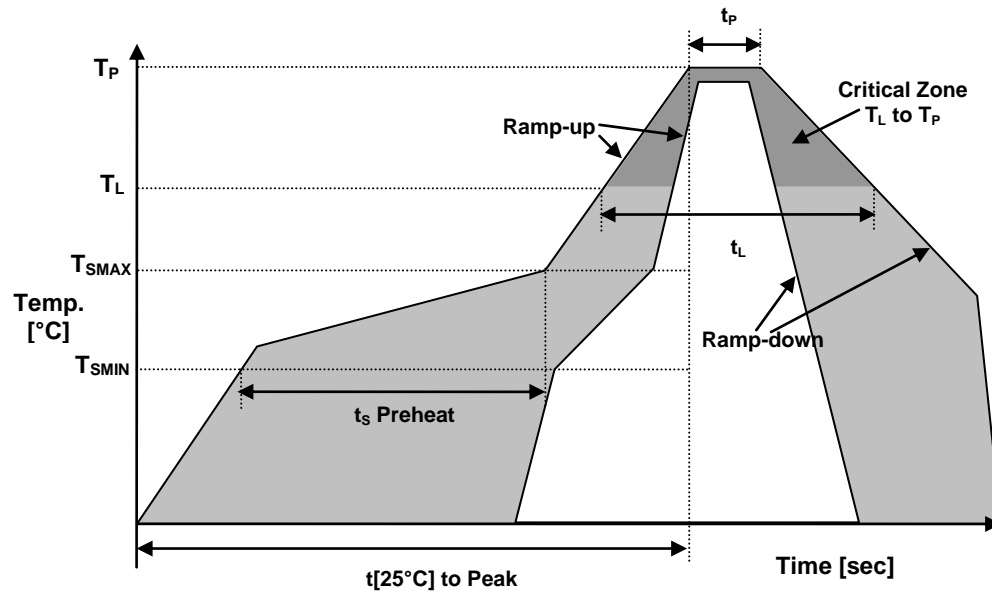
EXAMPLE:



MARKING

- A marking code will be issued by the sales department at order confirmation.

REFLOW PROFILE



| Recommended Solder Reflow Profile | | |
|--|-------------------------------|--------------|
| Temperature Min Preheat | T_{SMIN} | 150°C |
| Temperature Max Preheat | T_{SMAX} | 175°C |
| Time (T_{SMIN} to T_{SMAX}) | t_s | 60-180 sec. |
| Temperature | T_L | 217°C |
| Peak Temperature | T_P | 260°C |
| Ramp-up rate | R_{UP} | 3°C/sec max. |
| Ramp-down rate | R_{DOWN} | 6°C/sec max. |
| Time within 5°C of Peak Temperature | t_p | 10 sec max. |
| Time $t[25^\circ\text{C}]$ to Peak Temperature | $t[25^\circ\text{C}]$ to Peak | 480 sec. |
| Time | t_L | 60-150 sec. |