

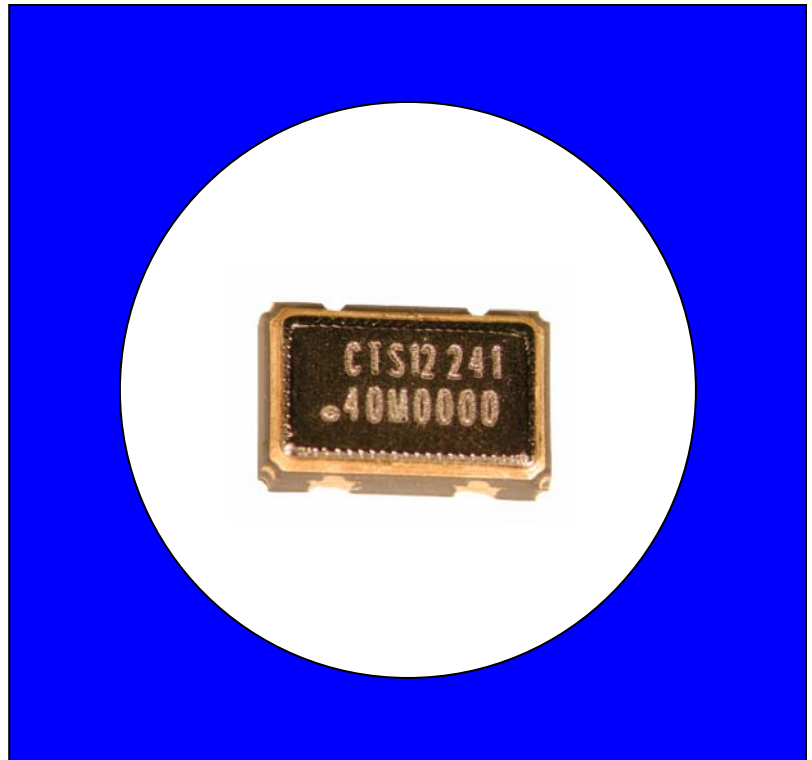


FEATURES

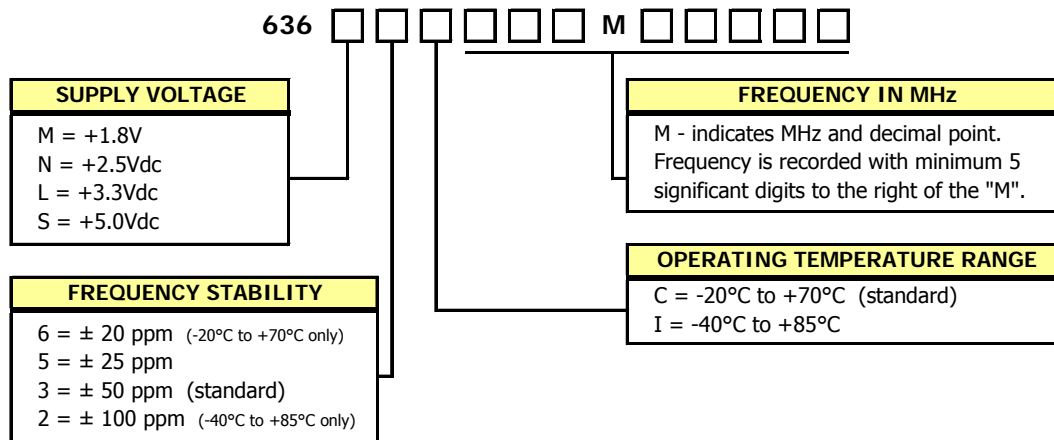
- Standard 5.0x3.2mm Surface Mount Footprint
- HCMOS/TTL Compatible
- Fundamental and 3rd Overtone Crystals
- Frequency Range 1.0 – 125 MHz
- Frequency Stability, ±50 ppm Standard (±25 ppm and ±20 ppm available)
- +1.8Vdc, +2.5Vdc, +3.3Vdc or +5.0Vdc Operation
- Operating Temperature to -40°C to +85°C
- Output Enable Standard
- Tape & Reel Packaging
- **RoHS/Green Compliant (6/6)**

DESCRIPTION

The Model 636 is a ceramic packaged Clock oscillator offering reduced size and enhanced stability. The small size means it is perfect for any application. The enhanced stability means it is the perfect choice for today's communications applications that require tight frequency control.



ORDERING INFORMATION



Example Part Number: 636L3C032M76800



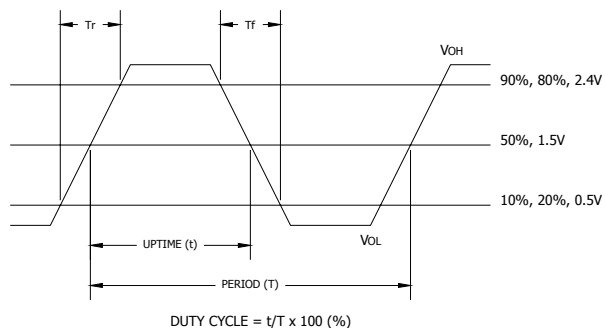
ELECTRICAL CHARACTERISTICS

| | PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNIT | |
|---|--|-------------------------------------|--|------------------------------|--------------------------|--|----------|----|
| Absolute Maximums | Maximum Supply Voltage | V_{CC} | - | -0.5 | - | 7.0 | V | |
| | Storage Temperature | T_{STG} | - | -55 | - | 125 | °C | |
| | Frequency Range | f_0 | - | 1.0 | - | 125 | MHz | |
| | Frequency Stability (See Note 1 and Ordering Information) | $\Delta f/f_0$ | - | - | - | 20,25,50 or 100 | ± ppm | |
| | Aging | $\Delta f/f_0$ | - | - | - | 3 | ± ppm/yr | |
| | Operating Temperature Commercial Industrial | T_A | - | -20 -40 | 25 | 70 85 | °C | |
| Electrical and Waveform Parameters | Supply Voltage Model 636M Model 636N Model 636L Model 636S | V_{CC} | ± 10 % | 1.62 2.25 2.97 4.50 | 1.8 2.5 3.3 5.0 | 1.98 2.75 3.63 5.50 | V | |
| | Supply Current Model 636M | I_{CC} | 1.0 MHz to 20 MHz $C_L = 15pF$ | - | - | 5 | mA | |
| | | | 20.1 MHz to 50 MHz $C_L = 15pF$ | - | - | 15 | | |
| | | | 50.1 MHz to 125 MHz $C_L = 15pF$ | - | - | 20 | | |
| | Model 636N | | 1.0 MHz to 20 MHz $C_L = 15pF$ | - | - | 7 | | |
| | | | 20.1 MHz to 50 MHz $C_L = 15pF$ | - | - | 15 | | |
| | | | 50.1 MHz to 125 MHz $C_L = 15pF$ | - | - | 25 | | |
| | Model 636L | C_L | 1.0 MHz to 20 MHz $C_L = 15pF$ | - | - | 7 | pF | |
| | | | 20.1 MHz to 50 MHz $C_L = 15pF$ | - | - | 20 | | |
| | | | 50.1 MHz to 125 MHz $C_L = 15pF$ | - | - | 30 | | |
| | Model 636S | C_L | 1.0 MHz to 20 MHz $C_L = 15pF$ | - | - | 10 | pF | |
| | | | 20.1 MHz to 50 MHz $C_L = 15pF$ | - | - | 30 | | |
| | | | 50.1 MHz to 80 MHz $C_L = 15pF$ | - | - | 40 | | |
| | Output Load Model 636M Model 636N & 636L Model 636S | C_L | 1.0 MHz to 125 MHz | - | - | 15 | pF | |
| | | | 1.0 MHz to 50 MHz | - | - | 30 | | |
| | | | 50.1 MHz to 125 MHz | - | - | 15 | | |
| | | | 1.0 MHz to 50 MHz | - | - | 50 | | |
| | | | | 50.1 MHz to 80 MHz | - | - | 30 | |
| | | | | 80.1 MHz to 125 MHz | - | - | 15 | |
| | Output Voltage Levels Logic '1' Level Logic '0' Level | V_{OH} V_{OL} | CMOS Load CMOS Load | 90% V_{CC} - | - - | - 10% V_{CC} | - - | V |
| | Output Current Logic '1' Level (M,N,L,S) Logic '0' Level (M,N,L,S) | I_{OH} I_{OL} | $V_{OH} = 90\%V_{CC}$ $V_{OL} = 10\%V_{CC}$ | - - | - - | -2, -4, -8, -16 +2, +4, +8, +16 | - - | mA |
| | Output Duty Cycle | SYM | @ 50% Level | 45 | - | 55 | - | % |
| Rise and Fall Time Model 636M, 636N & 636L | T_R, T_F | @ 10% - 90% Levels | - | - | - | - | ns | |
| | | 1.0 MHz to 20 MHz $C_L = 15pF$ | - | 8 | 10 | - | | |
| | | 20.1 MHz to 50 MHz $C_L = 15pF$ | - | 4 | 6 | - | | |
| | | 50.1 MHz to 125 MHz $C_L = 15pF$ | - | 2.5 | 3 | - | | |
| Model 636S | T_R, T_F | 1.0 MHz to 20 MHz $C_L = 15pF$ | - | 6 | 8 | - | ns | |
| | | 20.1 MHz to 50 MHz $C_L = 15pF$ | - | 3 | 5 | - | | |
| | | 50.1 MHz to 125 MHz $C_L = 15pF$ | - | 15 | 2 | - | | |
| Start Up Time | T_S | Application of V_{CC} | - | - | 10 | - | ms | |
| Enable Function Enable Input Voltage Model 636M Model 636N Model 636L Model 636S | V_{IH} | Pin 1 Logic '1', Output Enabled | 1.26 | - | - | - | V | |
| | | Pin 1 Logic '1', Output Enabled | 1.75 | - | - | - | | |
| | | Pin 1 Logic '1', Output Enabled | 2.0 | - | - | - | | |
| | | Pin 1 Logic '1', Output Enabled | 4.0 | - | - | - | | |
| Disable Input Voltage Model 636M,N,L Model 636S | V_{IL} | Pin 1 Logic '0', Output Disabled | - | - | 0.5 | - | V | |
| | | Pin 1 Logic '0', Output Disabled | - | - | 0.8 | - | | |
| Enable Time (M,N,L,S) | T_{PLZ} | Pin 1 Logic '1' | - | - | 10 | - | ms | |
| Standby Current | I_{ST} | Pin 1 Logic '0', Output Disabled | - | - | 10 | - | uA | |
| Period Jitter, Pk-Pk | - | - | - | - | 100 | - | ps | |
| Period Jitter, RMS | - | - | - | - | 25 | - | ps | |
| Phase Jitter, RMS | - | Bandwidth 12 kHz - 20 MHz | - | < 2 | - | - | ps | |

Notes:

1. Inclusive of initial tolerance at time of shipment, changes in supply voltage, load, temperature and aging.

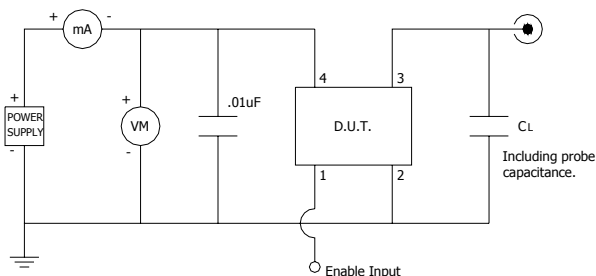
CMOS/TTL OUTPUT WAVEFORM



ENABLE TRUTH TABLE

| PIN 1 | PIN 3 |
|-----------|-----------|
| Logic '1' | Output |
| Open | Output |
| Logic '0' | High Imp. |

TEST CIRCUIT, CMOS LOAD

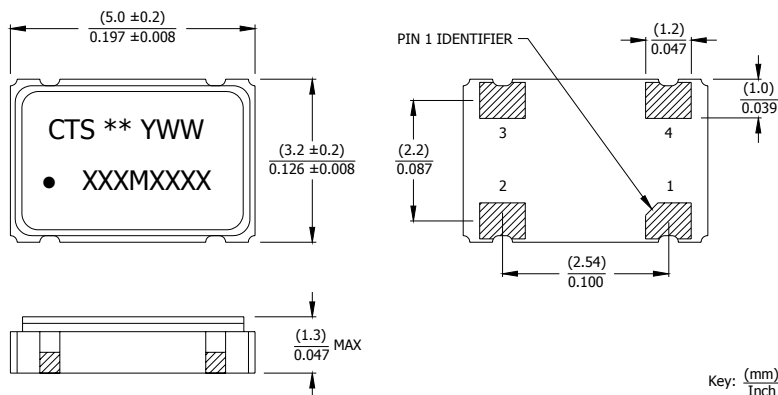


D.U.T. PIN ASSIGNMENTS

| PIN | SYMBOL | DESCRIPTION |
|-----|-----------------|--------------------------|
| 1 | EOH | Enable Input |
| 2 | GND | Circuit & Package Ground |
| 3 | Output | RF Output |
| 4 | V _{CC} | Supply Voltage |

MECHANICAL SPECIFICATIONS

PACKAGE DRAWING



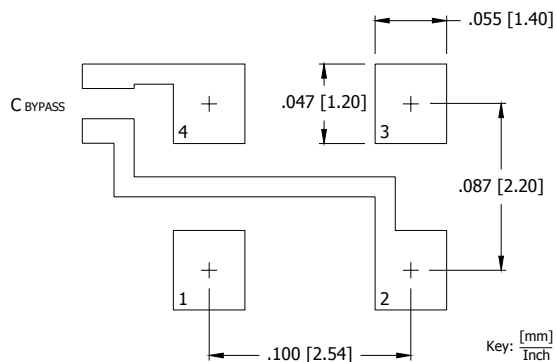
MARKING INFORMATION

- ** - Manufacturing Site Code.
- YWW - Date code, Y - year, WW - week.
- XXXMXXXX - Frequency marked with 4 significant digits after the 'M'.

NOTES

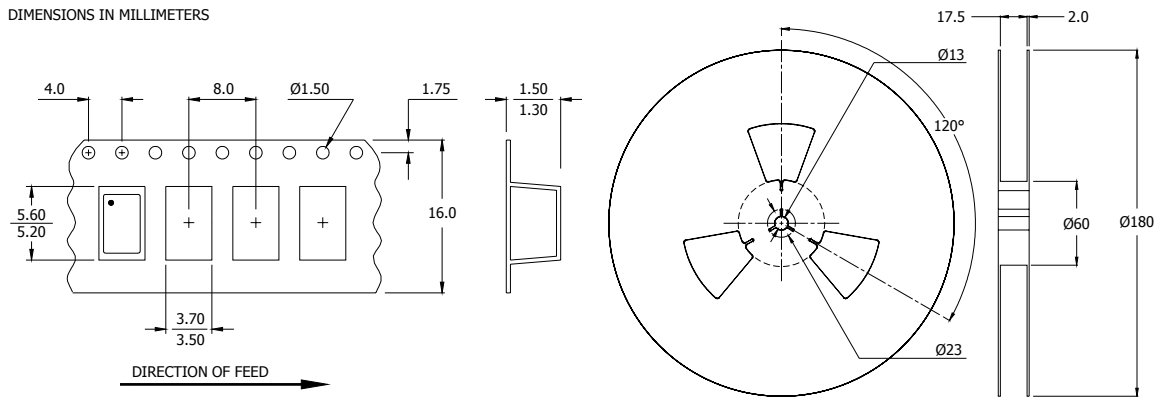
- Termination pads (e4), barrier-plating is nickel (Ni) with gold (Au) flash plate.
- Reflow conditions per JEDEC J-STD-020.

SUGGESTED SOLDER PAD GEOMETRY



C_{BYPASS} should be ≥ 0.01 uF.

TAPE AND REEL INFORMATION



Device quantity is 3,000 pieces per 180mm reel.

ENVIRONMENTAL SPECIFICATIONS

| | |
|----------------------------------|---|
| Temperature Cycle: | 400 cycles from -55°C to $+125^{\circ}\text{C}$, 10 minute dwell at each temperature, 1 minute transfer time between temperatures. |
| Mechanical Shock: | 1,500g's, 0.5mS duration, $\frac{1}{2}$ sinewave, 3 shocks each direction along 3 mutually perpendicular planes (18 total shocks). |
| Sinusoidal Vibration: | 0.06 inches double amplitude, 10 to 55 Hz and 20g's, 55 to 2,000 Hz, 3 cycles each in 3 mutually perpendicular planes (9 times total). |
| Gross Leak: | No leak shall appear while immersed in an FC40 or equivalent liquid at $+125^{\circ}\text{C}$ for 20 seconds. |
| Fine Leak: | Mass spectrometer leak rates less than 2×10^{-8} ATM cc/sec air equivalent. |
| Resistance to Solder Heat: | Product must survive 3 reflows of $+260^{\circ}\text{C}$ peak, 10 seconds maximum. |
| High Temperature Operating Bias: | 2,000 hours at $+125^{\circ}\text{C}$, maximum bias, disregarding frequency shift. |
| Frequency Aging: | 1,000 hours at $+85^{\circ}\text{C}$, full bias, less than ± 5 ppm shift. |
| Moisture Sensitivity Level: | Level 1 per JEDEC J-STD-020. |

QUALITY AND RELIABILITY

Quality systems meet or exceed the requirements of ISO 9000:2000 standards.