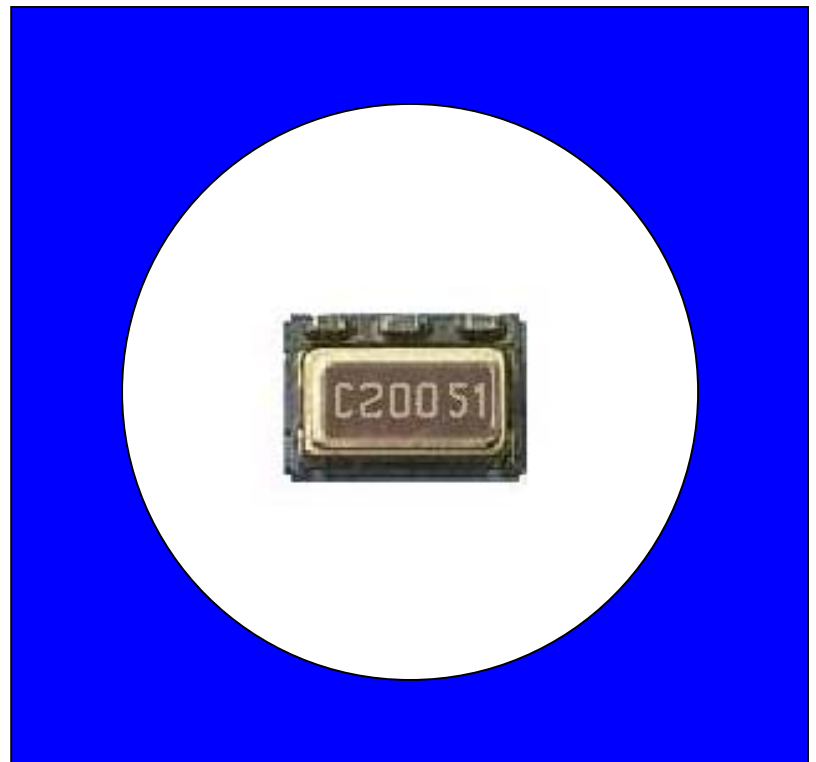


### FEATURES

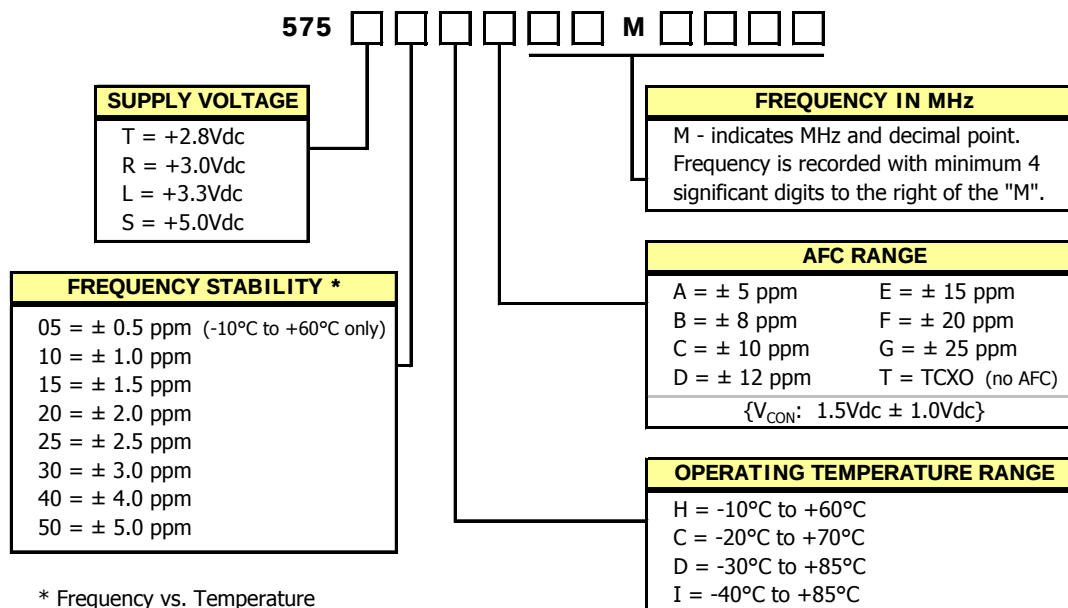
- 7x5mm Surface Mount Footprint
- Clipped Sinewave Output
- Frequency Range 10 – 36 MHz
- Frequency Stability, several options to choose from,  $\pm 0.5$  ppm to  $\pm 5$  ppm
- +2.8Vdc, +3.0Vdc, +3.3Vdc, +5.0Vdc Operation
- Voltage Control for Frequency Tuning
- Operating Temperature to  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Tape & Reel Packaging
- **RoHS/Green Compliant**

### DESCRIPTION

The Model 575 is a Voltage Controlled Temperature Compensated Crystal Oscillator (VCTCXO) offering reduced size, low power consumption and enhanced frequency stability. The M575 is the perfect choice for today's compact or portable wireless communications applications that require tight frequency control.



### ORDERING INFORMATION

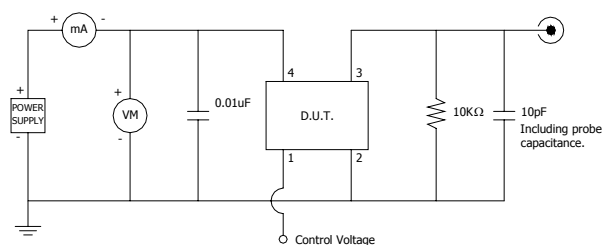


Example Part Number: 575L20DA19M4400

## ELECTRICAL CHARACTERISTICS

|                                    | PARAMETER                                                                                     | SYMBOL         | CONDITIONS                                                              | MIN                           | TYP                      | MAX                          | UNIT   |
|------------------------------------|-----------------------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------|-------------------------------|--------------------------|------------------------------|--------|
| Absolute Maximums                  | Maximum Supply Voltage                                                                        | $V_{CC}$       | -                                                                       | -0.5                          | -                        | 7.0                          | V      |
|                                    | Maximum Control Voltage                                                                       | $V_C$          | -                                                                       | -0.5                          | -                        | $V_{CC}$                     | V      |
|                                    | Storage Temperature                                                                           | $T_{STG}$      | -                                                                       | -55                           | -                        | 125                          | °C     |
|                                    | Frequency Range                                                                               | $f_O$          | -                                                                       | 10                            | -                        | 36                           | MHz    |
|                                    | Frequency Stability                                                                           | $\Delta f/f_O$ | Frequency vs. Temperature                                               | Refer to Ordering Information |                          |                              | ± ppm  |
|                                    | Frequency Stability vs. Supply Voltage                                                        | -              | 5% change                                                               | -                             | -                        | 0.2                          | ± ppm  |
|                                    | vs. Load                                                                                      | -              | 10% change                                                              | -                             | -                        | 0.2                          |        |
|                                    | vs. Aging                                                                                     | -              | 1st year                                                                | -                             | -                        | 1.0                          |        |
|                                    | Pulling Range                                                                                 | -              | $V_C = 1.5V \pm 1.0V$                                                   | Refer to Ordering Information |                          |                              | ± ppm  |
|                                    | Operating Temperature<br>Order Code 'H'<br>Order Code 'C'<br>Order Code 'D'<br>Order Code 'I' | $T_A$          | -                                                                       | -10<br>-20<br>-30<br>-40      | 25                       | 60<br>70<br>85<br>85         | °C     |
| Electrical and Waveform Parameters | Supply Voltage<br>Order Code 'T'<br>Order Code 'R'<br>Order Code 'L'<br>Order Code 'S'        | $V_{CC}$       | -                                                                       | 2.66<br>2.85<br>3.14<br>4.75  | 2.8<br>3.0<br>3.3<br>5.0 | 2.94<br>3.15<br>3.47<br>5.25 | V      |
|                                    | Supply Current                                                                                | $I_{CC}$       | 10.00 MHz - 15.00 MHz<br>15.10 MHz - 25.00 MHz<br>25.10 MHz - 36.00 MHz | -<br>-<br>-                   | -<br>-<br>-              | 1.5<br>2.0<br>2.5            | mA     |
|                                    | Output Load                                                                                   | $R_L // C_L$   | -                                                                       | 10 kOhm // 10 pF              |                          |                              |        |
|                                    | Control Voltage                                                                               | $V_C$          | -                                                                       | 0.5                           | 1.5                      | 2.5                          | V      |
|                                    | Output Voltage Levels                                                                         | $V_O$          | Clipped Sinewave                                                        | 0.8                           | -                        | -                            | Vp-p   |
|                                    | $V_C$ Input Impedance                                                                         | $Z_C$          | -                                                                       | 1.0                           | -                        | -                            | MOhm   |
|                                    | Start Up Time                                                                                 | $T_S$          | -                                                                       | -                             | -                        | 2                            | ms     |
|                                    | Phase Noise                                                                                   | -              | @100 Hz<br>@1 kHz<br>@10 kHz                                            | -<br>-<br>-                   | -110<br>-130<br>-140     | -<br>-<br>-                  | dBc/Hz |
|                                    |                                                                                               |                |                                                                         |                               |                          |                              |        |

# TEST CIRCUIT, $R_L // C_L$ LOAD



## D.U.T. PIN ASSIGNMENTS

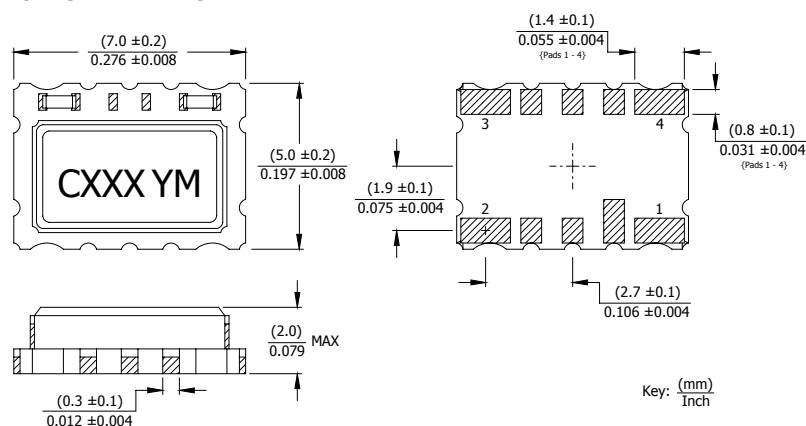
| PIN | SYMBOL   | DESCRIPTION              |
|-----|----------|--------------------------|
| 1   | $V_C$    | Control Voltage (Note 1) |
| 2   | GND      | Circuit & Package Ground |
| 3   | Output   | Clipped Sine Wave Output |
| 4   | $V_{CC}$ | Supply Voltage           |

### Note:

1. Connect to ground for TCXO (no AFC) option.

## MECHANICAL SPECIFICATIONS

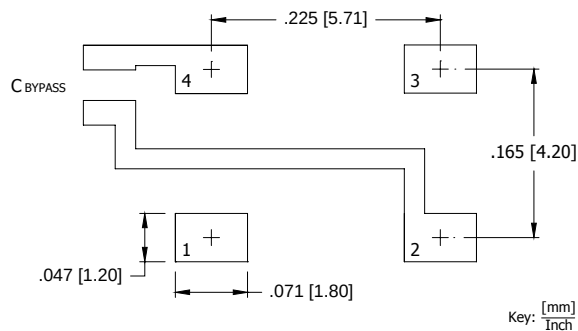
### PACKAGE DRAWING



### NOTES

1. DO NOT make connections to non-labeled pins. Castellated pins may have internal connections used in the manufacturing process.
2. Termination pads (e4), barrier-plating is nickel (Ni) with gold (Au) flash plate.
3. Reflow conditions per JEDEC J-STD-020.

### SUGGESTED SOLDER PAD GEOMETRY



$C_{BYPASS}$  should be  $\geq 0.01 \mu F$ .

### MARKING INFORMATION

1. C – CTS and Pin 1 identifier.
2. XXX – Frequency. See Table I for codes.
3. YM – Date code, Y – year, M – month, see Table II for codes.

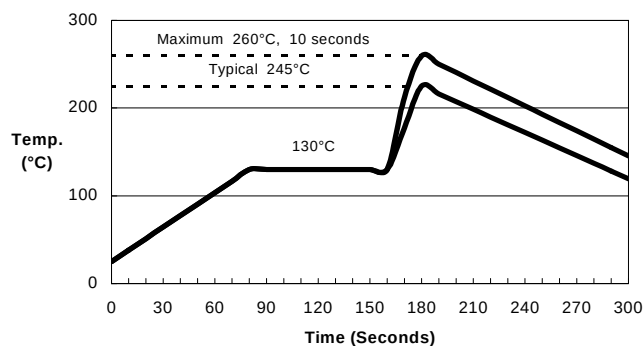
TABLE I - FREQUENCY CODING

| Frequency | Marking Code | Frequency | Marking Code |
|-----------|--------------|-----------|--------------|
| 10.0 MHz  | 100          | 19.2 MHz  | 192          |
| 12.8 MHz  | 128          | 19.44 MHz | 194          |
| 13.0 MHz  | 130          | 19.68 MHz | 196          |
| 14.4 MHz  | 144          | 19.8 MHz  | 198          |
| 15.36 MHz | 153          | 20.0 MHz  | 200          |
| 16.8 MHz  | 168          | 26.0 MHz  | 260          |

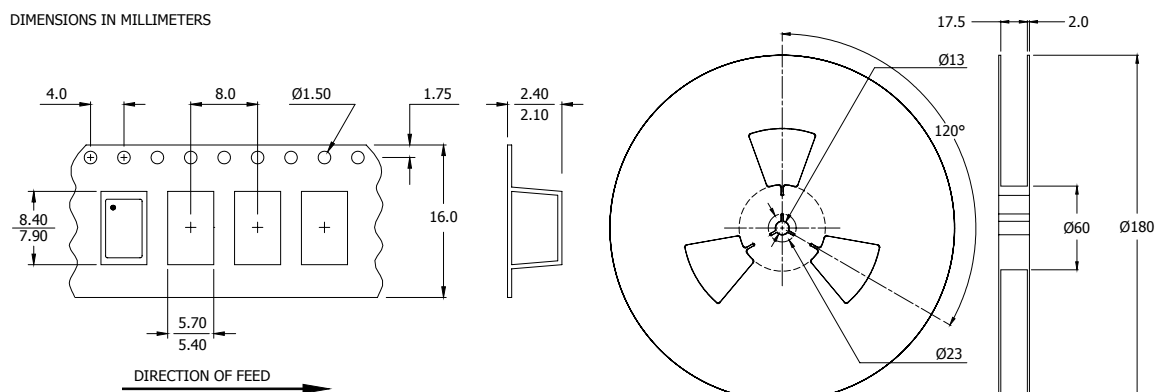
TABLE II - DATE CODE

| Year     | Month        |               |
|----------|--------------|---------------|
| 4 = 2004 | 1 = January  | 7 = July      |
| 5 = 2005 | 2 = February | 8 = August    |
| 6 = 2006 | 3 = March    | 9 = September |
| 7 = 2007 | 4 = April    | 10 = October  |
| 8 = 2008 | 5 = May      | 11 = November |
| 9 = 2009 | 6 = June     | 12 = December |

### SUGGESTED REFLOW PROFILE



## TAPE AND REEL INFORMATION



Device quantity is 1,000 pieces per 180mm reel.

## ENVIRONMENTAL SPECIFICATIONS

|                                  |                                                                                                                                        |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Temperature Cycle:               | 200 cycles from -55°C to +125°C, 10 minute dwell at each temperature, 1 minute transfer time between temperatures.                     |
| Mechanical Shock:                | 1,500g's, 0.5mS duration, ½ 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°C for 20 seconds.                                          |
| Fine Leak:                       | Mass spectrometer leak rates less than $2 \times 10^{-8}$ ATM cc/sec air equivalent.                                                   |
| Resistance to Solder Heat:       | Product must survive 3 reflows of +260°C peak, 10 seconds maximum.                                                                     |
| Temperature and Humidity:        | 85°C, 85% R.H., full bias, 500 hours.                                                                                                  |
| High Temperature Operating Bias: | 2,000 hours at +125°C, maximum bias, disregarding frequency shift.                                                                     |
| Frequency Aging:                 | 1,000 hours at +85°C, full bias, less than $\pm 1$ 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.