

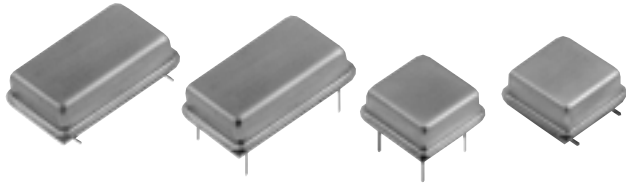


# CRYSTAL OSCILLATORS

## HCMOS/TTL 3.3V

**FULL SIZE D.I.L. package**  
M1380, M1381, M1382, M1388, M1389, M3390, M3391, M3392, M3398, M3399

**HALF SIZE D.I.L. package**  
H1380, H1381, H1382, H1388, H1389, H3390, H3391, H3392, H3398, H3399



## Thru-Hole / Gull Wing

**Commercial: 0° to 70°C**  
**FIXED FREQUENCY, 1 KHz to 125 MHz**  
**TRISTATE, 32.768 KHz to 125 MHz**

### FEATURES

- Frequency from 1 KHz to 125 MHz
- Choice of Thru-hole packages
  - DIL Full Size ("M")
  - Half Size DIL ("H")
  - Gull Wing SMD
- Tristate option available
- Very low power when tristated
- Start up time less than 5 ms
- Stability options from ±100 ppm to ±20 ppm
- Guaranteed start-up with ramping DC Supply
- 45/55 symmetry is standard
- Internal bypass capacitor delivers superior waveform characteristics
- Output jitter from positive edge to positive edge is 50 ps RMS max

### TYPICAL APPLICATIONS

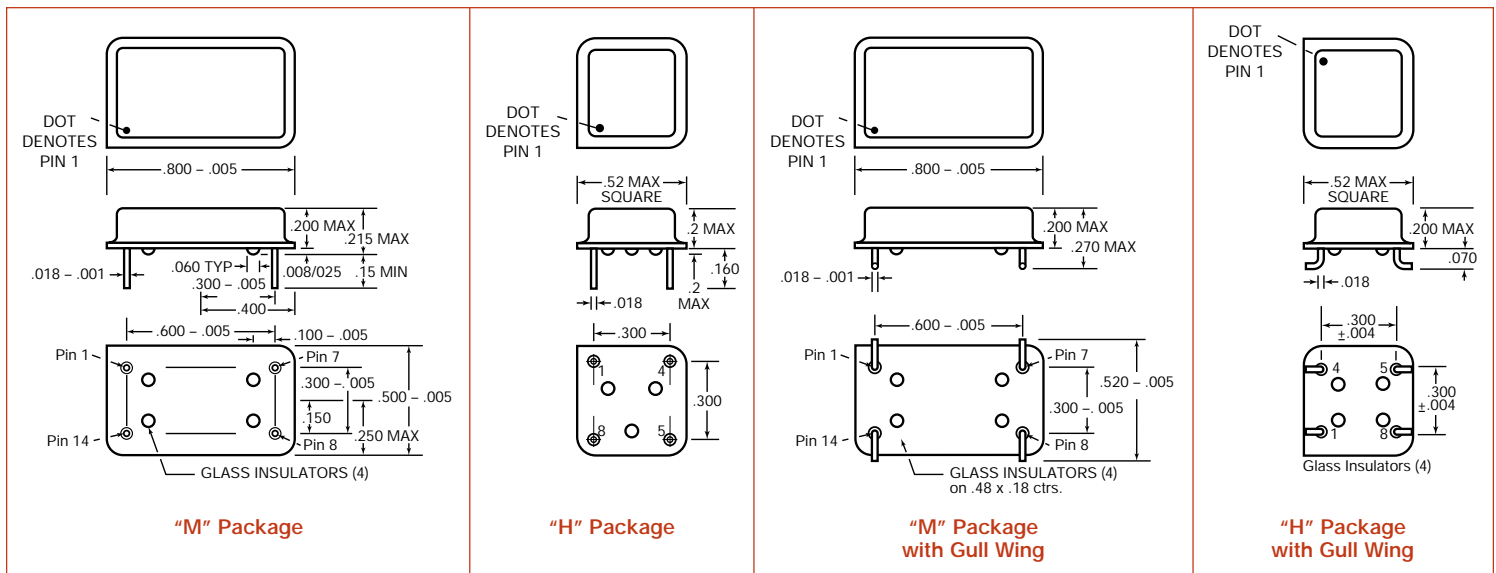
- Any thru-hole PCB that requires a standard HCMOS/TTL 3.3V clock, including microprocessors and microcontrollers.

### Description

Our thru-hole fixed frequency 3.3 volt oscillators embody 25 years of design and manufacturing know-how. They are available in full size and half size package, all hermetically sealed with welded stainless steel cover. These 3.3V oscillators are intended for new designs that take advantage of their low dissipation and reduced temperature rise. They cover 0°C to 70°C operation and provide frequency selection from 1 KHz to 125 MHz and have excellent long-term reliability, plus superior startup, loading and waveshape characteristics.

### CONNECTIONS — All models

|     | FULL SIZE | HALF SIZE | M1380 s<br>H1380 s     | M3390 s, H3390 s Tristate  |
|-----|-----------|-----------|------------------------|--|
| PIN | 1         | 1         | NOT USED               | Floating or 1 : Oscillator runs<br>Ground or 0 : Disable or Tristate |
| PIN | 7         | 4         | Ground and Case        |  |
| PIN | 8         | 5         | Output                 |  |
| PIN | 14        | 8         | +3.3V, V <sub>DD</sub> |  |





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**Commercial: 0° to 70°C**  
**FIXED FREQUENCY, 1 KHz to 125 MHz**  
**TRISTATE, 32.768 KHz to 125 MHz**

**FULL SIZE D.I.L. M package**  
M1380, M1381, M1382, M1388, M1389, M3390, M3391, M3392, M3398, M3399

**HALF SIZE D.I.L. H package**  
H1380, H1381, H1382, H1388, H1389, H3390, H3391, H3392, H3398, H3399

**ELECTRICAL SPECIFICATIONS**

**Frequency Range**

Fixed Output 1KHz to 125 MHz  
Tristate 32.768 KHz to 125 MHz

**Frequency Stability**

Includes calibration at 25°C, operating temperature, change of input voltage, change of load, shock and vibration.

| Input Voltage, V <sub>DD</sub> | MIN | TYP | MAX | UNITS |
|--------------------------------|-----|-----|-----|-------|
|                                | 3.0 | 3.3 | 3.6 | volts |
| <b>Input Current</b>           |     |     |     |       |
| 1 KHz to 10 MHz                |     | 8   | 14  | mA    |
| 10.1 to 25 MHz                 |     | 15  | 20  | mA    |
| 25.1 to 50 MHz                 |     | 20  | 30  | mA    |
| 50.1 to 75 MHz                 |     | 25  | 35  | mA    |
| 75.1 to 125 MHz                |     | 30  | 40  | mA    |

**Output Levels**

"0" Level, sinking 16 mA  
"1" Level, sourcing 8 mA

| V <sub>DD</sub>      | MIN | TYP | MAX | UNITS |
|----------------------|-----|-----|-----|-------|
| V <sub>DD</sub> -0.4 |     |     | 0.4 | volts |
|                      |     |     | 0.5 | volts |

**Rise and Fall Times**

| CMOS, 15 pf, 20 to 80% (<60 MHz) | MIN | TYP | MAX | UNITS |
|----------------------------------|-----|-----|-----|-------|
|                                  |     | 3.0 | 4   | ns    |
| CMOS, 30 pf, 20 to 80% (<60 MHz) |     | 4.0 | 5   | ns    |
| CMOS, 50 pf, 20 to 80% (<60 MHz) |     | 6.0 | 8   | ns    |
| CMOS, 15 pf, 20 to 80% (>60 MHz) |     | 2.0 | 2.5 | ns    |
| CMOS, 30 pf, 20 to 80% (>60 MHz) |     | 3.0 | 4.5 | ns    |

**Symmetry**

CMOS, @ 50% V<sub>DD</sub> 48/52 45/55 percent

**Jitter**

from positive edge to positive edge 50 ps RMS

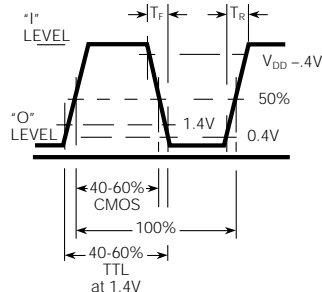
**Aging**

First year 3 ppm  
After first year 1 ppm/yr

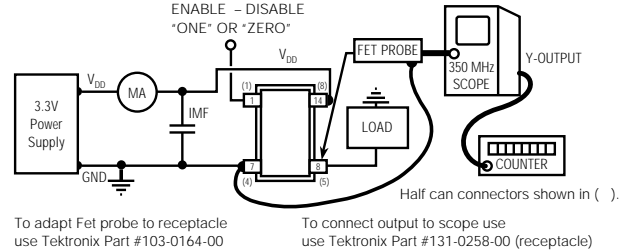
**Input Requirements for Pin 1.:**

"1": On - Pin 1 may float or 2.4V min., sourcing 400 microAmp  
"0": Tristate - Pin 1 requires 0.4V, sinking 400 microAmp

| Fixed Output | Tristate | Frequency Stability |
|--------------|----------|---------------------|
| 1380         | 3390     | ±100 ppm            |
| 1381         | 3391     | ±25 ppm             |
| 1382         | 3392     | ±50 ppm             |
| 1388         | 3398     | ±20 ppm             |
| 1389         | 3399     | ±32 ppm             |



**WAVEFORMS**



To adapt Fet probe to receptacle use Tektronix Part #103-0164-00  
To connect output to scope use Tektronix Part #131-0258-00 (receptacle)

**ALL OSCILLATORS HAVE INTERNAL BYPASS CAPACITORS**

**TEST CIRCUIT**

**ENVIRONMENTAL SPECIFICATIONS**

**Temperature**

Operating 0° to 70°C  
Storage -55° to +125°C

**Shock** - 1000 Gs, 0.35 ms, 1/2 sine wave, 3 shocks in each plane

**Vibration** - 10-2000 Hz of .06" d.a. or 20 Gs, whichever is less

**Humidity** - Resistant to 85° R.H. at 85°C

**MECHANICAL SPECIFICATIONS**

**Leak** - MIL STD 883, Method 1014, condition A1

**Pins** - Kovar, nickel plated with 60/40 solder coat

**Bend Test** - Will withstand two bends of 90° from reference

**Header** - Steel, with nickel plate

**Case** - Stainless steel, type 304

**Marking** - Epoxy ink or laser engraved

**Resistance to Solvents** - MIL STD 202, Method 215

**HOW TO ORDER**

For Part Number, put package type before model number, and add frequency in MHz, for example:

**M 1387-44.736M**

"M" is full size DIL  
"H" is half size DIL  
"1387" is model type  
"44.736 M" frequency in MHz  
Leave blank for straight leads  
Add "G" for gullwing

| SS#   | Rev. |
|-------|------|
| M1380 | A    |



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