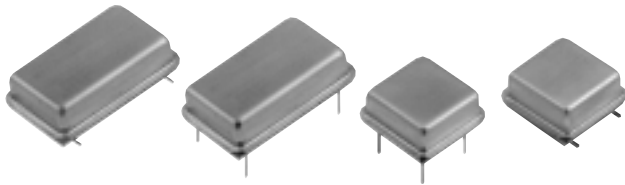




CRYSTAL OSCILLATORS HCMOS/TTL 5V



Thru-Hole / Gull Wing

Commercial: 0° to 70°C

FIXED FREQUENCY, 1 KHz to 175 MHz

TRISTATE, 32.768 KHz to 175 MHz

"HARD ZERO", 62.5 KHz to 125 MHz

FEATURES

- Frequency from 1 KHz to 175 MHz
- Choice of thru-hole packages
 - DIL Full Size ("M")
 - Half Size DIL ("H")
 - Gull Wing SMD
- Tristate and "Hard Zero" options accommodate ATE
- 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 available
- Internal bypass capacitor delivers superior waveform characteristics
- Jitter from positive edge to positive edge is 50 ps RMS max

TYPICAL APPLICATIONS

- Any thru-hole PCB that requires a standard HCMOS/TTL 5V clock, including microprocessors and microcontrollers.

FULL SIZE D.I.L. M package

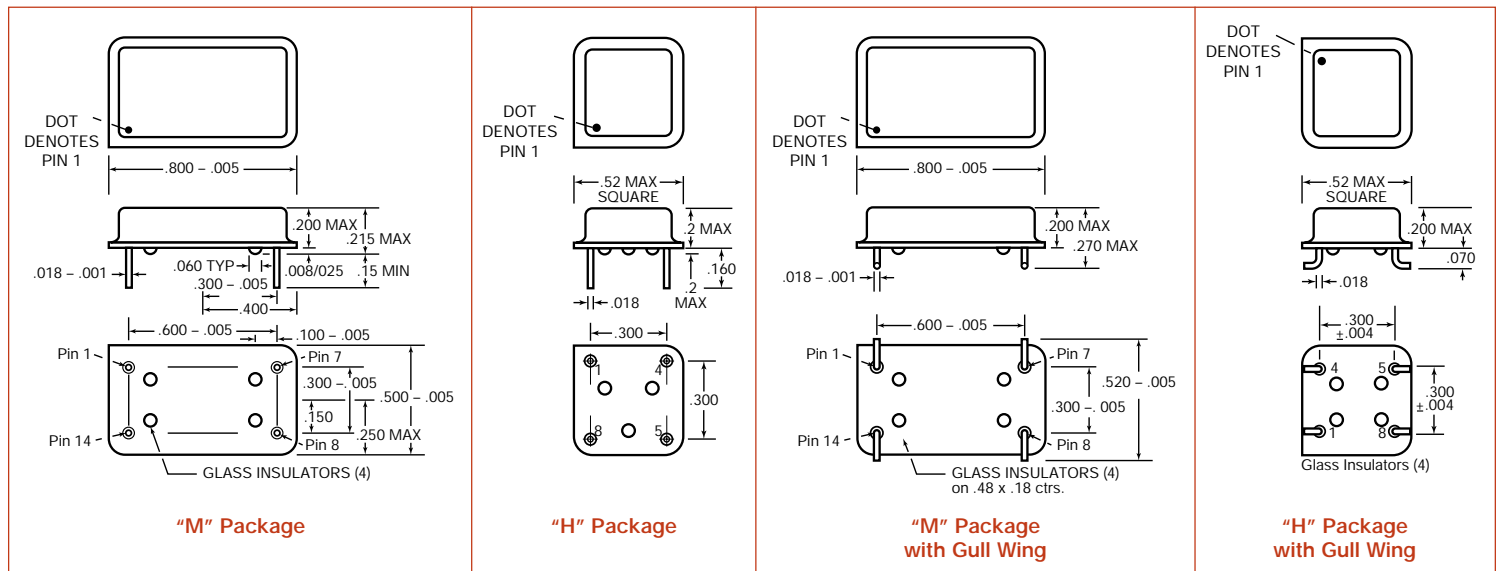
M1280, M1281,
M1282, M1286,
M1288, M1289,
M1290, M1291,
M1292, M1298,
M1299
M1991, M1992,
M1998, M1999
M3290, M3291,
M3292, M3296,
M3298, M3299
M3991, M3992,
M3998, M3999

HALF SIZE D.I.L. H package

H1280, H1281,
H1282, H1286,
H1288, H1289,
H1290, H1291,
H1292, H1298,
H1299
H1991, H1992,
H1998, H1999
H3290, H3291,
H3292, H3296,
H3298, H3299
H3991, H3992,
H3998, H3999

Description

MF Electronics thru-hole oscillators embody 25 years of design and manufacturing know-how. They are available in full-size and half size packages, all hermetically sealed with welded stainless steel cover. These 5V thru-hole oscillators are designed for everyday stresses of 0°C to 70°C operation and extended frequency selection of 1 KHz to 175 MHz. Higher (5V) operation ensures superior output loading and faster rise/fall times characteristics.





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"HARD ZERO", 62.5 KHz to 125 MHz

**FULL SIZE D.I.L.
M package**

M1280, M1281,
M1282, M1286,
M1288, M1289,
M1290, M1291,
M1292, M1298,
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M1991, M1992,
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H3998, H3999

ELECTRICAL SPECIFICATIONS

Frequency Range

| | |
|--------------|---------------------|
| Fixed Output | 1 KHz to 175 MHz |
| Tristate | 32.768 to 175 MHz |
| "Hard Zero" | 62.5 KHz to 125 MHz |

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

| | MIN | TYP | MAX | UNITS |
|---|------|-----|------|-------|
| Input Voltage, V_{DD} | 4.50 | 5.0 | 5.50 | volts |
| Input Current | | | | |
| 1 KHz to 10 MHz | | 10 | 20 | mA |
| 10.1 to 25 MHz | | 20 | 35 | mA |
| 25.1 to 50 MHz | | 25 | 45 | mA |
| 50.1 to 75 MHz | | 40 | 55 | mA |
| 75.1 to 125 MHz | | 50 | 60 | mA |
| 100.1 to 175 MHz | | 55 | 65 | mA |

Output Levels

| | | | | |
|--------------------------|---------------|-----|-----|-------|
| "0" Level, sinking 16 mA | | | 0.4 | volts |
| "1" Level, TTL | 2.4 | 4.6 | | volts |
| CMOS, sourcing 8 mA | $V_{DD} - .4$ | | | volts |

Rise and Fall Times

| | | | |
|-------------------------|-----|---|----|
| TTL, from 0.8 to 2.4V | 2.4 | 4 | ns |
| HCMOS, 15 pf, 20 to 80% | | | |
| 1 KHz to 75 MHz | 2.5 | 4 | ns |
| 75.1 to 175 MHz | 1.5 | 2 | ns |
| HCMOS, 30 pf, 20 to 80% | | | |
| 1 KHz to 125MHz | 4.0 | 6 | ns |
| HCMOS, 50 pf, 20 to 80% | | | |
| 1KHz to 75 MHz | 4.0 | 6 | ns |

Jitter

| | | |
|-------------------------------------|----|--------|
| From positive edge to positive edge | 50 | ps RMS |
|-------------------------------------|----|--------|

Symmetry

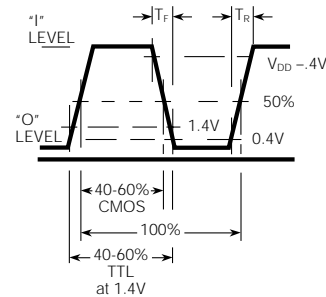
| | | | |
|-----------------------|-------|----------|---------|
| 10 TTL, @ 1.4V | 45/55 | 40/60 | percent |
| Depending on model | | or 45/55 | percent |
| HCMOS, @ 50% V_{DD} | 45/55 | 40/60 | percent |
| Depending on model | | or 45/55 | percent |

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": Disable or Tristate – Pin 1 requires 0.4V, sinking 400 microAmp



WAVEFORMS

CONNECTIONS — All models

| | FULL SIZE | HALF SIZE | M1280's H1280's | M1290's, "Hard-Zero" M3290's, H3290's Tristate |
|--------|-----------|-----------|--------------------|---|
| PIN 1 | 1 | 1 | NOT USED | Floating or "1": Oscillator runs Ground or "0": Hard "0" for M1290's or Tristate for 3290's |
| PIN 7 | 7 | 4 | Ground and Case | |
| PIN 8 | 8 | 5 | Output | |
| PIN 14 | 14 | 8 | 5V, V_{DD} | |

| FIXED OUTPUT | | TRISTATE | | HARD ZERO | Frequency Stability |
|----------------|----------------|----------------|----------------|----------------|---------------------|
| 40/60 Symmetry | 45/55 Symmetry | 40/60 Symmetry | 45/55 Symmetry | 40/60 Symmetry | |
| 1280 | 1286 | 3290 | 3296 | M1290 | ±100 ppm |
| 1281 | 1991 | 3291 | 3991 | M1291 | ±25 ppm |
| 1282 | 1992 | 3292 | 3992 | M1292 | ±50 ppm |
| 1288 | 1998 | 3298 | 3998 | M1298 | ±20 ppm |
| 1289 | 1999 | 3299 | 3999 | M1299 | ±32 ppm |



