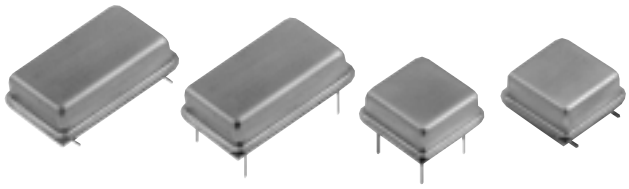
CRYSTAL OSCILLATORS
HCMOS/TTL 3.3V



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

Thru-Hole / Gull Wing
Commercial: 0º to 70ºC
FIXED FREQUENCY, 1 KHz to 125 MHz
TRISTATE, 32.768 KHz to 125 MHz

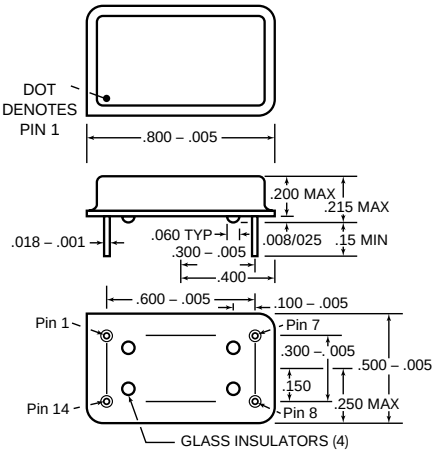
FEATURES
- Frequency from 1 KHz to 125 MHz
- Choice of Thru-hole packages
  - DIL Full Size (“M”)
  - Half Size DIL (“H”)
  - Gull Wing SMD
- Tristate option available
- Very low power when tristated
- Start up time less than 5 ms
- Stability options from ±100 ppm to ±20 ppm
- Guaranteed start-up with 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.

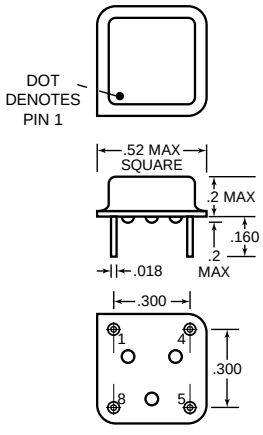
Description
Our thru-hole fixed frequency 3.3 volt oscillators embody 25 years of design and manufacturing know-how. They are available in full size and half size package, all hermetically sealed with welded stainless steel cover. These 3.3V oscillators are intended for new designs that take advantage 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

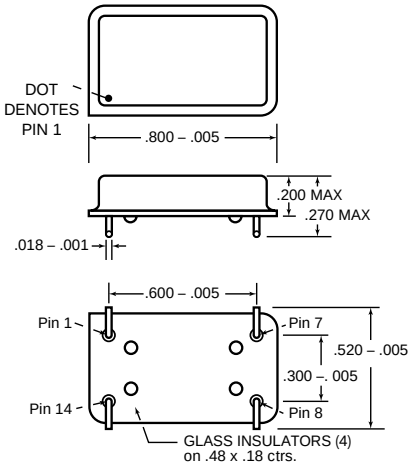
	FULL SIZE	HALF SIZE	M1380 s H1380 s	M3390 s, H3390 s Tristate
PIN	1	1	NOT USED	Floating or 1 : Oscillator runs Ground or 0 : Disable or Tristate
PIN	7	4	Ground and Case	
PIN	8	5	Output	
PIN	14	8	+3.3V, V_{DD}	



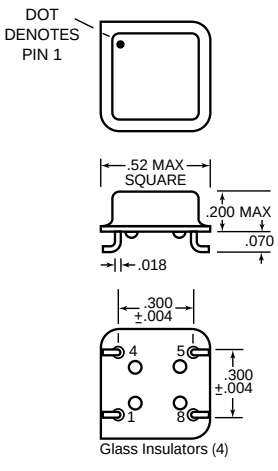
“M” Package



“H” Package



“M” Package with Gull Wing



“H” Package with Gull Wing

MF ELECTRONICS

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ELECTRICAL SPECIFICATIONS

Frequency Range

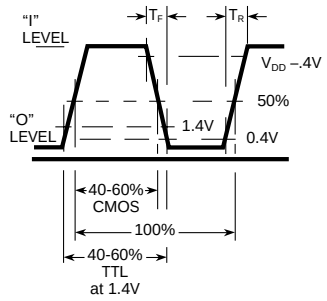
Fixed Output	1KHz to 125 MHz
Tristate	32.768 KHz to 125 MHz

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

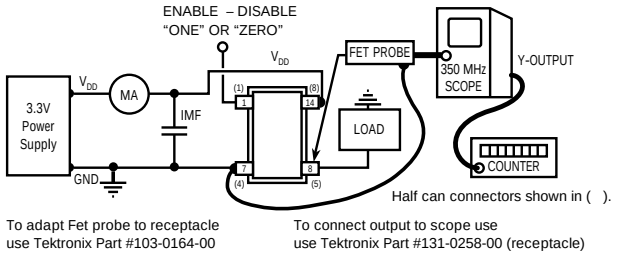
	MIN	TYP	MAX	UNITS
Input Voltage, V_{DD}	3.0	3.3	3.6	volts
Input Current				
1 KHz to 10 MHz		8	14	mA
10.1 to 25 MHz		15	20	mA
25.1 to 50 MHz		20	30	mA
50.1 to 75 MHz		25	35	mA
75.1 to 125 MHz		30	40	mA
Output Levels				
"0" Level, sinking 16 mA			0.4	volts
"1" Level, sourcing 8 mA	V_{DD}-.4		0.5	volts
Rise and Fall Times				
CMOS, 15 pf, 20 to 80% (<60 MHz)		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_{DD}		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



ALL OSCILLATORS HAVE INTERNAL BYPASS CAPACITORS

TEST CIRCUIT

ENVIRONMENTAL SPECIFICATIONS

Temperature

Operating	0º to 70°C
Storage	-55º 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

MF ELECTRONICS

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