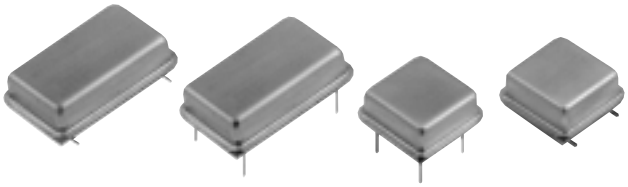
CRYSTAL OSCILLATORS
HCMOS/TTL 5V



FULL SIZE D.I.L.
M package
M1210 thru M1212,
M3210 thru M3212,

HALF SIZE D.I.L.
H package
H1210 thru H1212,
H3210 thru H3212

Thru-Hole / Gull Wing
Industrial: -40º to +85ºC
FIXED/TRISTATE,1 KHz to 100 MHz

Description

MF Electronics industrial temperature range thru-hole oscillators provide low jitter clock waveforms needed to clock standard HCMOS or TTL circuits in PCBs mounted in rugged environments.

FEATURES

- Industrial operating temperature range from -40ºC to +85ºC accommodates rugged environments
- Low jitter from positive edge to positive edge of 5 ps RMS max ensures stable data transmission
- Internal bypass capacitor delivers superior waveform characteristics
- Stability options of ±100 ppm and ±50 ppm
- 45/55 symmetry is standard
- Guaranteed start-up with ramping DC Supply
- Start up time less than 5 ms
- Tristate is standard
- Very low power when tristated

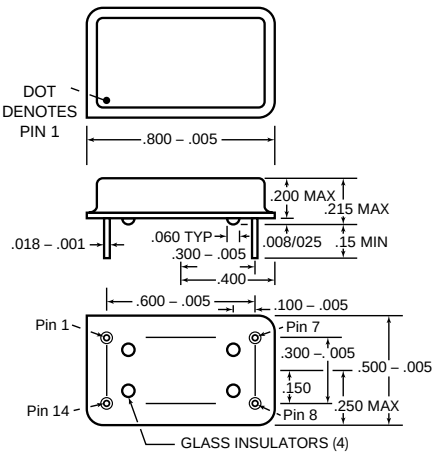
TYPICAL APPLICATIONS

- Telecom and data networking applications that require low jitter and are subjected to rugged environmental conditions, including:
  - ATM
  - Frame relay
  - DSL
  - Gigabit ethernet
  - Fibre channel
  - VoIP

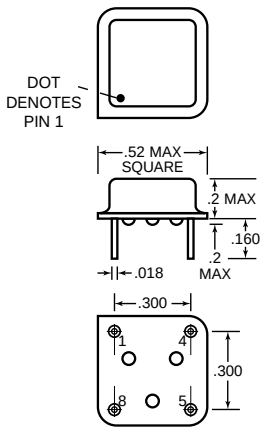
TRISTATE	FIXED OUTPUT	
Model	**Model**	**Frequency Stability**
3210	1210	±100 ppm
3212	1212	±50 ppm
3211	1211	±25 ppm

CONNECTIONS — All models

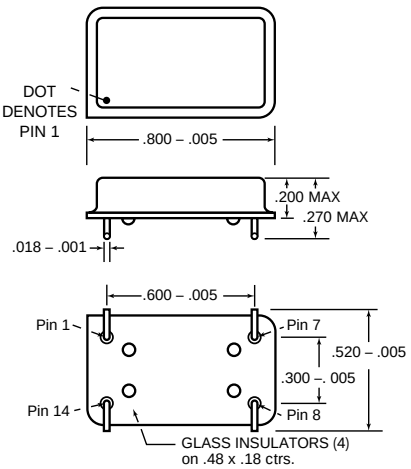
	FULL SIZE	HALF SIZE	M1210's H3210's	M3210's, H3212's Tristate
PIN	1	1	NOT USED	Floating or "1": Oscillator runs Ground or "0": Disable or Tristate
PIN	7	4	Ground and Case	
PIN	8	5	Output	
PIN	14	8	+5V, V_{DD}	



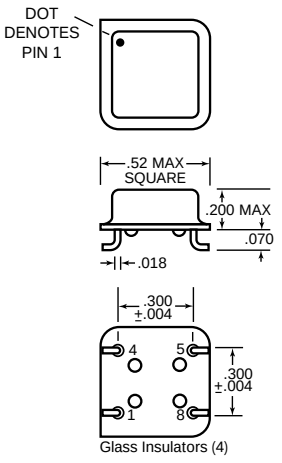
"M" Package



"H" Package



"M" Package with Gull Wing



"H" Package with Gull Wing

MF ELECTRONICS

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Thru-Hole /Gull Wing
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FIXED/TRISTATE, 1 KHz to 100 MHz

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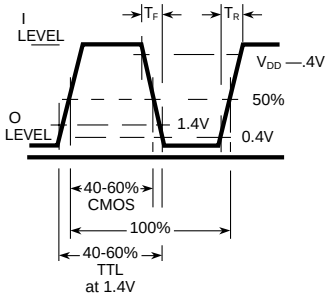
ELECTRICAL SPECIFICATIONS

Frequency Range 1 KHz to 100 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	50	ma
75.1 to 100 MHz		50	60	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 100 MHz		1.5	2.5	ns
HCMOS, 30 pf, 20 to 80%				
1 KHz to 100 MHz		4.0	6	ns
Jitter				
From positive edge to positive edge			5	ps RMS
Symmetry				
10 TTL, @ 1.4V		45/55	40/60	percent
HCMOS, @ 50% V_{DD}		45/55	40/60	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

ENVIRONMENTAL SPECIFICATIONS

Temperature

Operating	-40° to +85°C
Storage	-55° to +125°C

Temperature Cycle – Not to exceed ±5 ppm change when exposed to 2 hours maximum at each temperature from 0 to 120°C, with 25°C reference

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

Gross Leak – Each unit checked in 125°C fluorocarbon

Fine Leak – Mass spectrometer leak rate less than 2 X 10^{-8} atmos, cc/sec of helium

Pins – Kovar, nickel plated with 60/40 solder coat

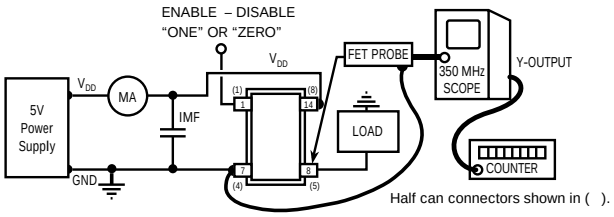
Bend Test – Will withstand two bends of 90° from reference

Header – Steel, with nickel plate

Case – Stainless steel, type 304

Marking – Printing is black epoxy ink

Resistance to Solvents – MIL STD 202, Method 215



ALL OSCILLATORS HAVE INTERNAL BYPASS CAPACITORS

TEST CIRCUIT

HOW TO ORDER

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

H 3210 - 50M

"M" is full size DIL "H" is half size DIL	"3210" is model type	"50 M" frequency in MHz	Leave blank for straight leads Add "G" for gullwing

SS#	Rev.
M1210	A

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