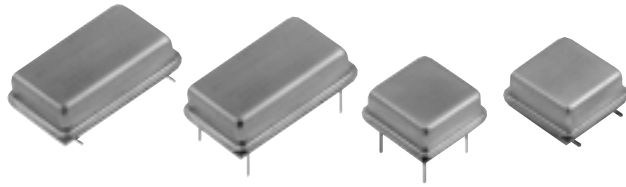




CRYSTAL OSCILLATORS HCMOS/TTL 5V



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

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

Thru-Hole / Gull Wing

Industrial: -40° to +85°C
FIXED/TRISTATE, 1 KHz to 100 MHz

FEATURES

- Industrial operating temperature range from -40°C to +85°C 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 option available
- Very low power when tristated

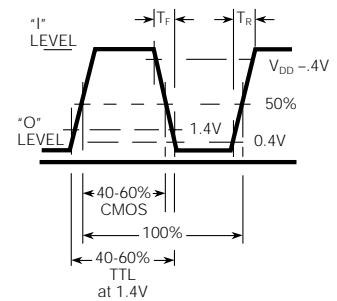
TYPICAL APPLICATIONS

- 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

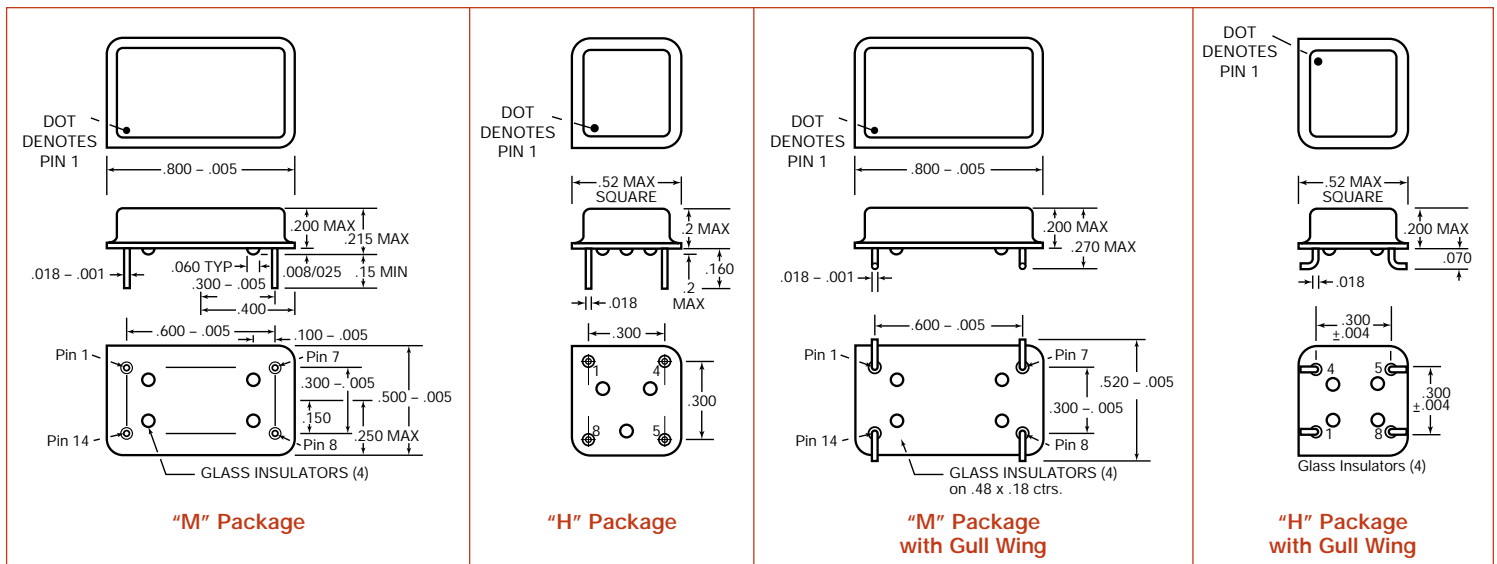
Description

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.

FIXED OUTPUT	TRISTATE	Frequency Stability
Model	Model	
1210	3210	± 100 ppm
1212	3212	± 50 ppm



WAVEFORMS





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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 volts
CMOS, sourcing 8 ma $V_{DD}-.4$ volts

Rise and Fall Times

TTL, from 0.8 to 2.4V 2.4 ns

HCMOS, 15 pf, 20 to 80% 2.5 ns

1 KHz to 75 MHz 1.5 ns

75.1 to 100 MHz 2.5 ns

HCMOS, 30 pf, 20 to 80% 4.0 ns

1 KHz to 100 MHz 6 ns

Jitter

From positive edge to positive edge 5 ps RMS

Symmetry

10 TTL, @ 1.4V 45/55 percent

HCMOS, @ 50% V_{DD} 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

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 2×10^{-8} atmos, cc/sec of helium

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

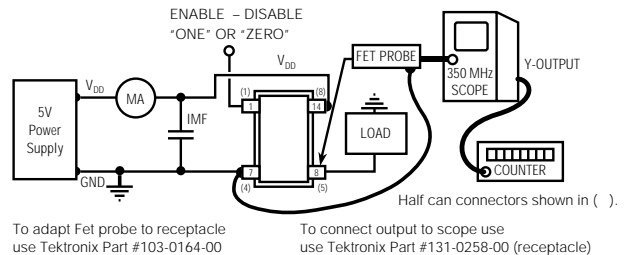
Bend Test – Will withstand two bends of 90° from reference

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

CONNECTIONS — All models

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

HOW TO ORDER

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

H 3210 - 50M

"H" 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

MF ELECTRONICS

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