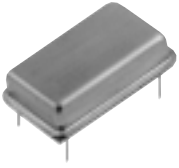




# CRYSTAL OSCILLATORS

## Harmonically Related Dual Output HCMOS

Thru-hole D.I.L.  
M package  
M1257, M1259,  
M1260



### Thru-Hole

Commercial: 0° to 70°C

FIXED FREQUENCY, 1.0 MHz to 16 MHz

#### FEATURES

- 2 times TTL frequency on M1259
- 4 times TTL frequency on M1257
- MOS output drives 200 pf
- Start up time is less than 10 ms after application of the supply voltage
- Frequency stability is +0 -0.02% (200ppm)
- All devices will drive a full 200 pf load required in driving loads over long runs

#### TYPICAL APPLICATIONS

- 4Mhz frequency drives Zilog Z80A, Zilog Z8000 and Mostek MK 3880-4
- M1260-4M will drive a 200pf load at required levels for MOS microprocessors
- M1259-4M will deliver a second, 8Mhz, output
- M1257-4M will deliver a second, 16Mhz, output

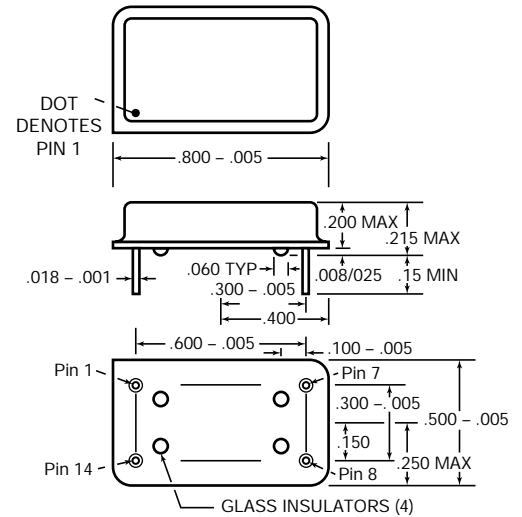
SERIES	FREQUENCY
M1260	MOS: 1 MHz - 16 MHz
M1259	MOS: 1 MHz - 8 MHz TTL: 2 times MOS frequency
M1257	MOS: 1 MHz - 8 MHz TTL: 4 times MOS frequency

#### CONNECTIONS

	M1260	M1259	M1257
Pin 1.	N.C.	2 times TTL output	4 times TTL output
Pin 7.	Ground & Case	Ground & Case	Ground & Case
Pin 8.	MOS from 1 MHz - 16 MHz	MOS from 1 MHz - 8 MHz	MOS from 1 MHz - 4 MHz
Pin 14.	+5 VDC	+5 VDC	+5 VDC

#### Description

Microprocessors and large ASICs frequently require two different but harmonically related frequencies. MF Electronics single-crystal, dual-frequency oscillators have been created for such applications. Designed to drive high capacitance (to 200 pf) MOS microprocessor loads, the dual oscillator family covers a 1 MHz to 16 MHz frequency range, and delivers frequency ratios from 2:1 to 4:1. When driving TTL loads, the upper frequency limit is increased fourfold over MOS loading frequencies.



"M" Package





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**Thru-Hole**  
**Commercial: 0° to 70°C**  
**FIXED FREQUENCY, 1.0 MHz to 16 MHz**

**Thru-hole D.I.L.**  
**M package**  
 M1257, M1259,  
 M1260

**ELECTRICAL SPECIFICATIONS**

**Frequency Range**

Fixed Output 1 MHz to 16 MHz

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

**M1260**

Output: (Pin 8.) 1 MHz - 16 MHz +0 -.02% MOS

**M1259**

Output: (Pin 8.) 1 MHz - 8 MHz +0 -.02% MOS  
 Output 2: (Pin 1.) 2 times frequency in TTL

**M1257**

Output 1: (Pin 8.) 1 MHz - 8 MHz +0 -.02% MOS  
 Output 2: (Pin 1.) 4 times frequency in TTL

	MIN	TYP	MAX	UNITS
<b>Input Voltage, V<sub>DC</sub></b>	4.5	5	5.5	volts
<b>Input Current</b>			70	mA
<b>Output Levels</b>				
<b>MOS</b>				
Load Capacitance			200	pf
Pulse Width, High	(.5 / f <sub>0</sub> ) -10			ns
Pulse Width, Low	(.5 / f <sub>0</sub> ) -10			ns
Rise Time (T <sub>r</sub> )			10	ns
Fall Time (T <sub>f</sub> )			10	ns
Zero Level (Low)			0.45	volts
One Level (High)	(V <sub>DD</sub> - 0.5V)			
<b>TTL</b>				
<b>Rise and Fall Time</b>	10 ns maximum	from 0.5 to 2.4V		
"0" level, sinking 16 mA		+0.4V		
"1" level, sourcing				
400 microAmp, min.	2.5V			
Loads	10 TTL loads			
<b>Symmetry</b>	55/45 @ 1.4 VDC (M1260, M1259)			
	60/40 @ 1.4 VDC (M1257)			
<b>Aging</b>				
First year	3		ppm	
After first year	1		ppm/yr	

**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

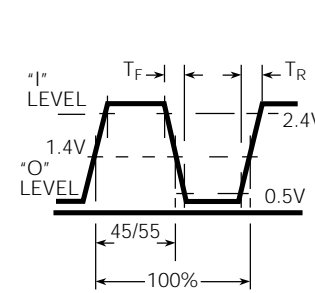
**Bend Test** - Will withstand two bends of 90° from reference

**Header** - Steel, with nickel plate

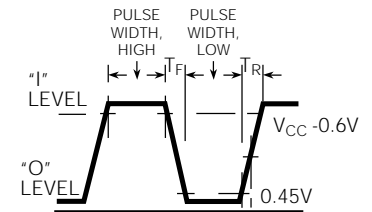
**Case** - Stainless steel, type 304

**Marking** - Epoxy ink or laser engraved

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



**TTL**



**Phase Relationship:**

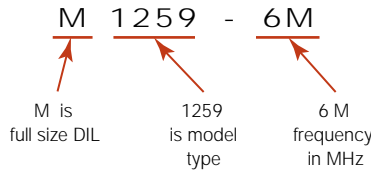
MOS positive edge follows within 15ns of TTL positive edge

MOS negative edge follows within 15ns of TTL positive edge

**MOS**

**HOW TO ORDER**

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



SS#	Rev.
M1257	A



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