



D.I.L.

M1400, M1410, M1436, M1444, M1445
 M2400, M2410, M2436, M2444, M2445
 M1500, M1510, M1536, M1544, M1545
 M2500, M2510, M2536, M2544, M2545

Guaranteed

Crystal Clock Oscillators

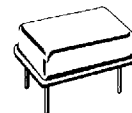
T-50-23

ECL Oscillators in 10K Logic 10 MHz to 125 MHz

The M F ECL oscillators Series M1400 and M1500 are in 10 K logic, with and without complementary outputs in the full size DIL package in frequencies from 10 MHz to 125 MHz. Frequency tolerances from .02% to 25 ppm include all effects of voltage, load and aging.

The series M1400, M1500 have single outputs and the M2400, M2500 have dual-complementary outputs. All ECL oscillators must be properly terminated, or an internal factory-supplied terminating resistor may be specified.

- Two pin-outs for versatile compatibility
- Single or dual complementary outputs
- Frequency from 10 MHz to 125 MHz in 10K logic
- Start up time less than 5 ms.
- Stability options from .02% to .0025% (25 ppm)
- Guaranteed start-up with ramping DC Supply
- Specified for extended temperature to 85 deg. C, to allow for additional heat rise in confined space
- Terminating resistor may be internal - consult factory



"M" Package

See Page 35 for
 Package Outlines
 and Page 38 for
 How To Order

-5 VOLT POWER		+5 VOLT POWER		Frequency Stability
Single Output Series	Complementary Output Series	Single Output Series	Complementary Output Series	
M1400	M2400	M1500	M2500	±.01%
M1410	M2410	M1510	M2510	±.02%
M1436*	M2436*	M1536*	M2536*	±.01%
M1444	M2444	M1544	M2544	±.0025%
M1445	M2445	M1545	M2545	±.005%

*Superior Symmetry, 45/55

SPECIFICATIONS

Temperature

Operating
 Storage

0 to 85 deg. C, case temperature
 -55 to +125 deg. C

Frequency Range

10 MHz to 125 MHz



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Guaranteed Crystal Clock Oscillators ECL Oscillators in 10K Logic

	MIN.	TYP.	MAX	UNITS
Input Voltage				
M1400's and M2400's	-4.75	-5.2	-5.45	volts
M1500's and M2500's	4.75	5.0	5.25	volts

Input Current (max.)	45	60	ma.
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Output Levels, M1400's, M2400's

"0" Level

25 deg. C	-1.85	-1.65	volts
85 deg. C	-1.825	-1.65	volts

"1" Level

25 deg. C	-0.96	-0.81	volts
85 deg. C	-0.89	-0.70	volts

Output Levels, M1500's, M2500's

"0" Level

25 deg. C	(Vc -1.85)	(Vc -1.65)	volts
85 deg. C	(Vc -1.825)	(Vc -1.65)	volts

"1" Level

25 deg. C	(Vc -0.96)	(Vc -0.81)	volts
85 deg. C	(Vc -0.89)	(Vc -0.7)	volts

Rise and Fall Times

(20 to 80%)	2.0	3.0	ns.
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Symmetry

All units, except as noted	45/55	40/60	percent
M1436, M1536, M2436, M2536	48/52	45/55	percent

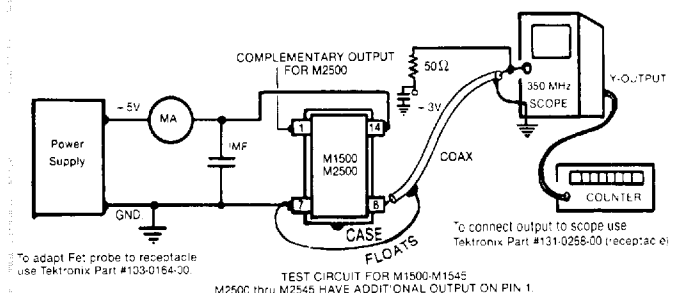
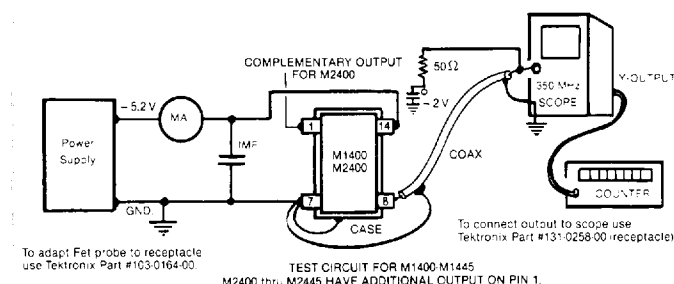
Environmental Data

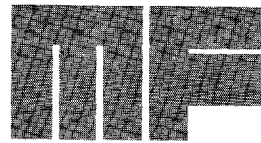
See specifications page 37.

CONNECTIONS

	M1400, M2400	M1500, M2500
PIN 1.	Not used in Single Output or Used for Complementary Output (Same termination as Pin 8.)	
PIN 7.	Electrical Ground & Case	Electrical Ground
PIN 8.	Output (requires termination of 270 ohms to Pin 14, or 50 ohms to -2 V)*	Output requires termination of 270 ohms to Pin 7, or 50 ohms to +3 V)*
Pin 14.	-5.2 Volts	+5 Volts
CASE	Tied to Pin 7.	Floating

*Terminating resistor may be internally supplied if requested





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Guaranteed Crystal Clock Oscillators ECL Oscillators in 10K Logic

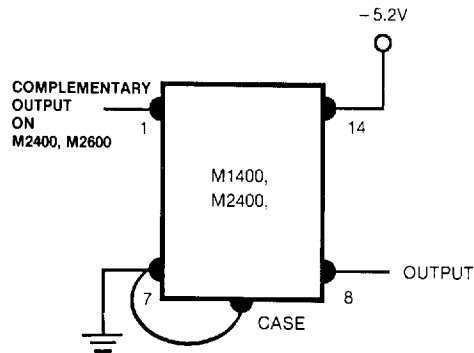


Fig. 1

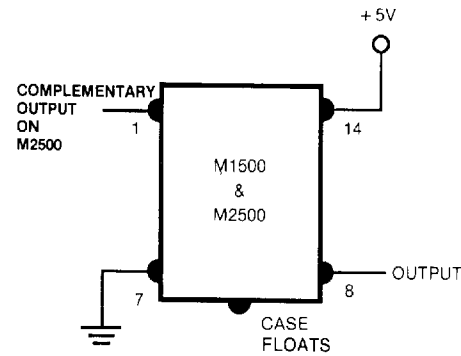
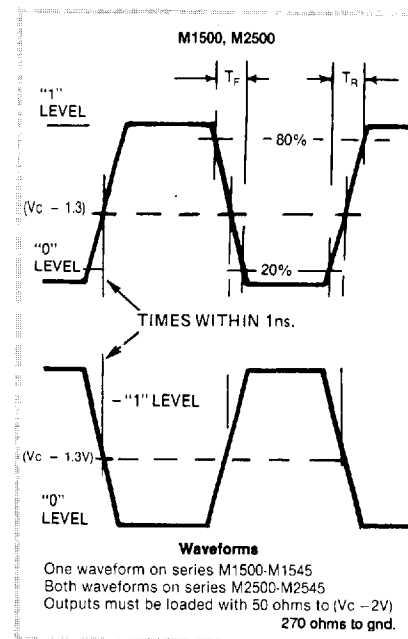
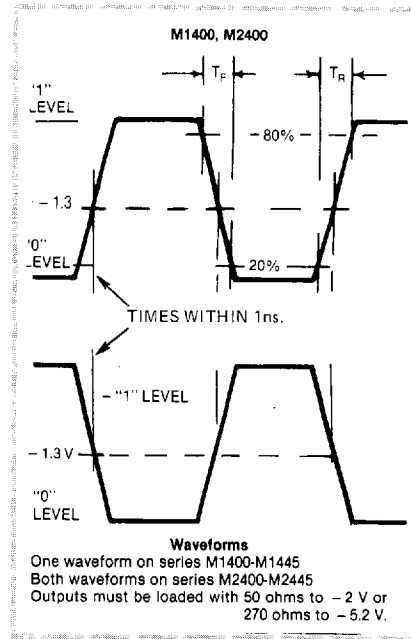


Fig. 2

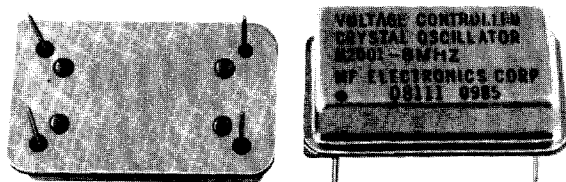
Note: Outputs must be properly terminated





T-90-20

Packaging and Environmental Information



DIL Package ("M" oscillators)

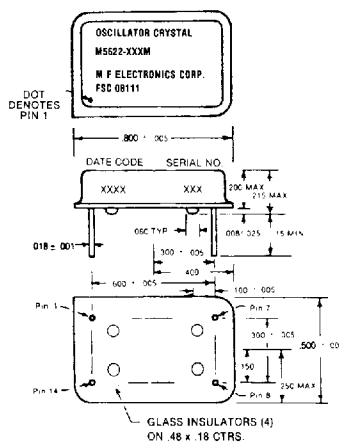
The most widely used package, this fits into the standard pin locations for a DIL 14 pin IC. Pin 1 is used in oscillators which have an additional output (duals and complementaries), or additional inputs (enable/disables, tristates and VCXO's).

Phase-Locked Loop VCXO (M2010 and M2015) package has a total of 7 pins, which are allow for 2 inputs and an additional B+ pin.

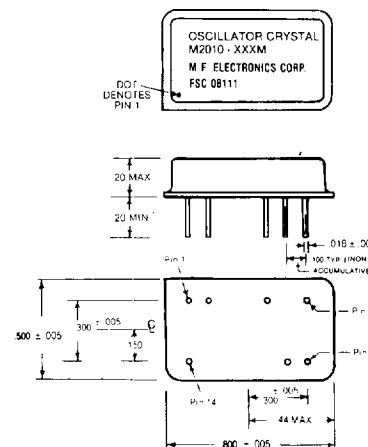
The HI-REL M5500 and M5516 use all 14 pins for additional mechanical strength in the connection to the PC board.

All cases are of stainless steel to prevent rust, and the platforms are corrosion-resistant nickel, or gold over nickel (ECL). The pins are solder plated, or gold over active nickel.

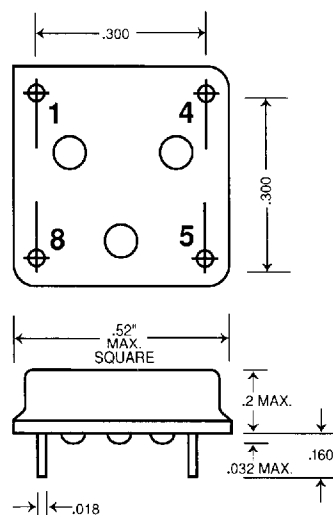
"M" Package



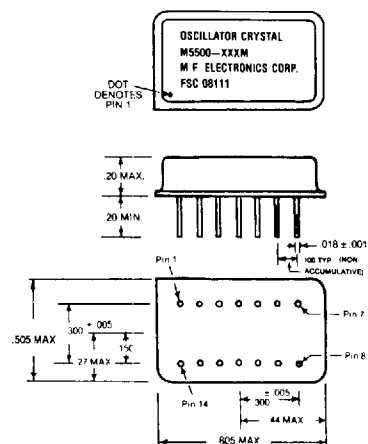
"M-1" Package M2010, M2015

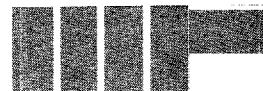


"H" Package

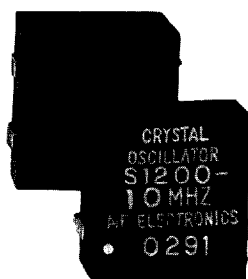


"M-2" Package M5500, M5516





Packaging and Environmental Information



Surface-Mount Package ("S" oscillators)

The "S" package provides a surface-mount version of the most common TTL/HCMOS oscillators, including enable/disable and tristate. Similar to the PLCC 28, the package is a true J-lead with molded plastic on the outside and a true hermetic-seal inside.

The maximum overall size is .490 inches sq. and the height is 0.200 inch with lead location on .4 X .2 inch (5 X 10 mm) centers. The leads are alloy 42, with a nickel barrier and solder coat.

Unlike the "C" leads which cannot tolerate normal movement and flexing of the PC board, the MF package with J-leads effectively allows the part to float, when there are mechanical or thermal stresses in the PC board.

The "S" package is also superior to the half-can with gull-wings, because it designed from inside-out and can be easily handled by pick-and-place machines, either from tubes or tape-and-reel.

