

D.I.L. FULL SIZE 46E D ■ 5649501 0000297 T ■ MFE  
 M1600, M1610, M1636, M1644, M1645 M1800, M1810, M1836, M1844, M1845  
 M2600, M2610, M2636, M2644, M2645 M2800, M2810, M2836, M2844, M2845  
 M1700, M1710, M1736, M1744, M1745 M1900, M1910, M1936, M1944, M1945  
 M2700, M2710, M2736, M2744, M2745  
 M F ELECTRONICS CORP

Guaranteed

Crystal Clock Oscillators 10 MHz to 410 MHz

T-50-23

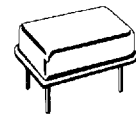
# ECL Oscillators in 10 KH and 10E Logic

M F ECL oscillators, in 10 KH logic, with complementary outputs, and in the three most accepted pin-outs – all are made in the full size and half size DIL package in frequencies from 10 MHz to 396 MHz. Frequency tolerances from .02% to 25 ppm include all effects of voltage, load and aging.

The Series M1600, M1700, M1800 and M1900 have single outputs and the M2600, M2700, M2800 have dual-complementary outputs. These oscillators all have case tied to electrical ground.

Above 210 MHz, 10E logic is used.

- Three pin-outs for versatile compatibility
- Fixed single and complementary frequency to 410 MHz
- M1900 has Enable/Disable, reducing noise of unwanted frequency and allowing wired OR (to 210 MHz)
- DIL - full size or half size
- 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 internally factory-supplied



"M" Package



"H" Package

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

- 5 VOLT POWER ON PIN 14		+ 5 VOLT POWER ON PIN 14			-5 VOLT POWER ON PIN 7		Frequency Stability
Single Output Series	Complementary Output Series	Single Output Series	Complementary Output Series	Enable/Disable Output Series	Single Output Series	Complementary Output Series	
M1600	M2600	M1700	M2700	M1900	M1800	M2800	±.01%
M1610	M2610	M1710	M2710	M1910	M1810	M2810	±.02%
M1636*	M2636*	M1736*	M2736*	M1936*	M1836*	M2836*	±.01%
M1644	M2644	M1744	M2744	M1944	M1844	M2844	±.0025%
M1645	M2645	M1745	M2745	M1945	M1845	M2845	±.005%

\*Superior Symmetry 45/55

Note: For Half-Size, please consult factory for availability.

**MFELECTRONICS CORP.**

10 Commerce Drive, New Rochelle, NY 10801  
 914-576-6570 Fax: 914-576-6204

H1600, H1610, H1636, H1644, H1645	H2700, H2710, H2736, H2744, H2745
H2600, H2610, H2636, H2644, H2645	H1800, H1810, H1836, H1844, H1845
H1700, H1710, H1736, H1744, H1745	H2800, H2810, H2836, H2844, H2845

T-50-23

## Guaranteed Crystal Clock Oscillators ECL Oscillators in 10KH and 10E Logic

### SPECIFICATIONS

#### Temperature

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

#### Frequency Range

DIL Package	10 MHz to 410 MHz
DIL Half Size	10 MHz to 210 MHz

	MIN.	TYP.	MAX.	UNITS
<b>Input Voltage</b>				
M1600's, M2600's, M1800's and M2800's	-4.75	-5.2	-5.45	volts
M1700's, M2700's, M1900's	4.75	5.0	5.25	volts

<b>Input Current (max.)</b>	45	60	ma.
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#### Output Levels,

M1600's, M2600's, M1800's, M2800's

"0" Level			
25 deg. C	-1.95	-1.63	volts
75 deg. C	-1.95	-1.60	volts
"1" Level			
25 deg. C	-0.98	-0.81	volts
75 deg. C	-0.92	-0.735	volts

#### Output Levels,

M1700's, M2700's, M1900's

"0" Level			
25 deg. C	(Vc -1.95)	(Vc -1.63)	volts
75 deg. C	(Vc -1.95)	(Vc -1.60)	volts
"1" Level			
25 deg. C	(Vc -0.98)	(Vc -0.81)	volts
75 deg. C	(Vc -0.92)	(Vc -0.735)	volts

#### Rise and Fall Times

(20 to 80%)	1.0	2.0	ns.
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#### Symmetry

All units, except as noted	45/55	40/60	percent
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M1636, M1736, M1836, M1936	48/52	45/55	percent
M2636, M2736, M2836			

### TERMINATIONS

All ECL oscillators must be terminated. If required, internal terminating resistors of any specified value may be factory-supplied.

### ENABLE/DISABLE

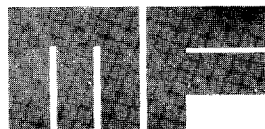
The Series M1900 has an Enable-Disable feature, which allows several oscillators to be wire-OR'd, so that one frequency of several may be selected. If Pin 1. is "0", the output is normal. However, when Pin 1. is "1" the oscillator shuts-down, and the output goes to logic "0". The logic "0" may be wire-OR'd.

### AUTOMATED TESTING (ATE)

Automated testing can effectively be performed using the M1900, since this model may be turned-off and "0" 'd, allowing a test frequency to be inserted on the output node.

### CONNECTIONS

Pin	M1600,M2600 SERIES Connections	M1700,M2700,M1900 SERIES Connections	M1800,M2800 SERIES Connections
1.	Not used in Single Output or Used for Complementary Output (same termination as Pin 8.) Used for M1900. Float or "0" for normal operation "1" for "0" output		
7.	Electrical Ground and Case	Electrical Ground and Case	-5.2 V (Vee)
8.	Output (requires termination of 270 ohms to Pin 14 or 50 ohms to -2V)	Output (requires termination of 270 ohms to Pin 7 or 50 ohms to +3V)	Output (requires termination of 270 ohms to Pin 7 or 50 ohms to -2V)
14.	-5.2 Volts	+5 Volts	Electrical Ground and Case
CASE	Tied to Pin 7.	Tied to Pin 7.	Tied to Pin 14.

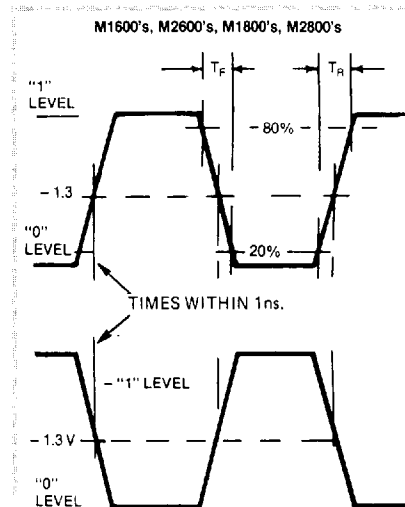
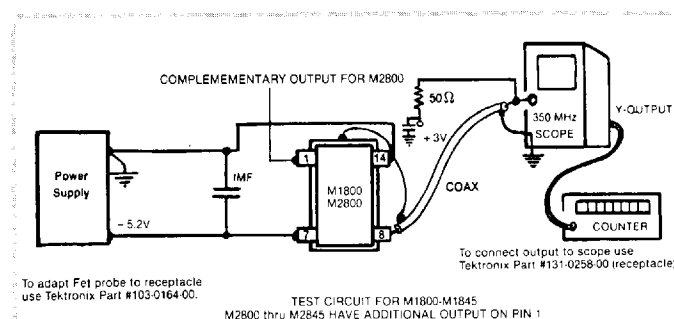
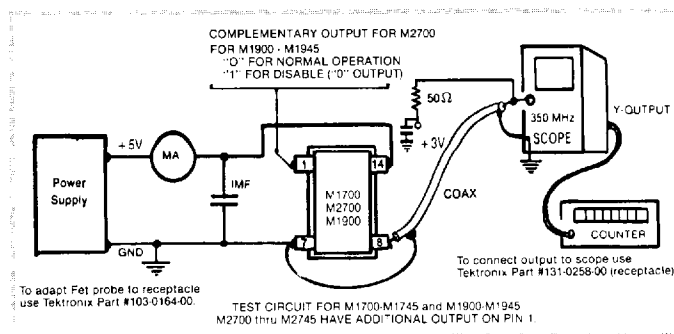
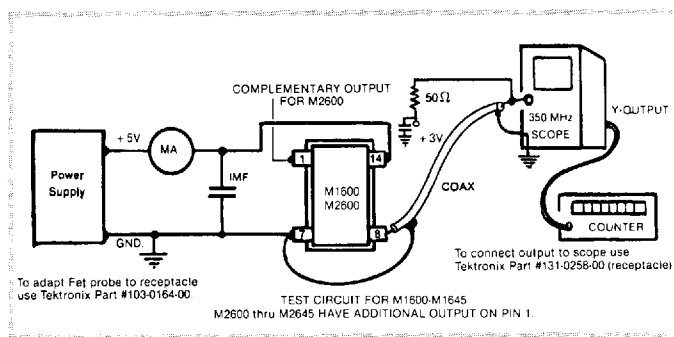


## D.I.L. FULL SIZE

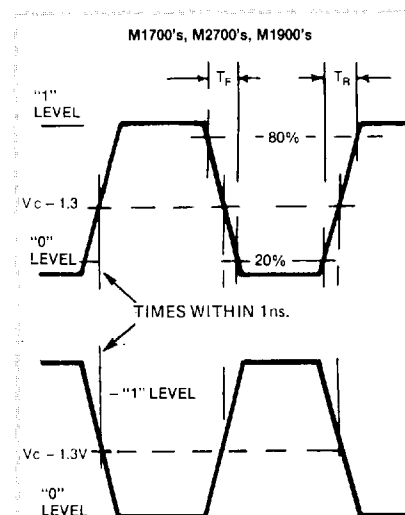
M1600, M1610, M1636, M1644, M1645  
M2600, M2610, M2636, M2644, M2645  
M1700, M1710, M1736, M1744, M1745  
M2700, M2710, M2736, M2744, M2745

M1800, M1810, M1836, M1844, M1845  
M2800, M2810, M2836, M2844, M2845  
M1900, M1910, M1936, M1944, M1945

# Guaranteed Crystal Clock Oscillators ECL Oscillators in 10 KH Logic



One waveform on series M1600-M1645 & M1800-M1845  
Both waveforms on series M2600-M2645 & M2800-M2845  
Outputs must be loaded with 50 ohms to -2V or  
170 ohms to -5.2V.



One waveform on series M1700-M1745 & M1900-M1945  
Both waveforms on series M2700-M2745  
Outputs must be loaded with 50 ohms to (Vc - 2V)  
270 ohms to gnd.

**D.I.L. HALF SIZE**

H1600, H1610, H1636, H1644, H1645	H2700, H2710, H2736, H2744, H2745
H2600, H2610, H2636, H2644, H2645	H1800, H1810, H1836, H1844, H1845
H1700, H1710, H1736, H1744, H1745	H2800, H2810, H2836, H2844, H2845

Guaranteed

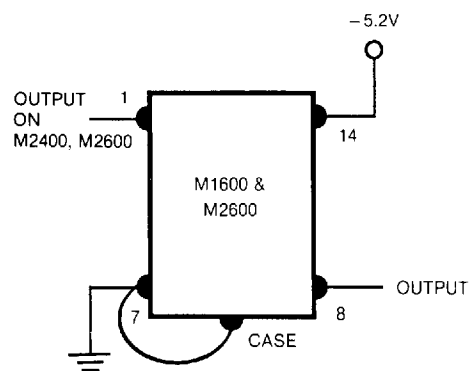
**Crystal Clock Oscillators ECL Oscillators in 10 KH Logic**

Fig. 1

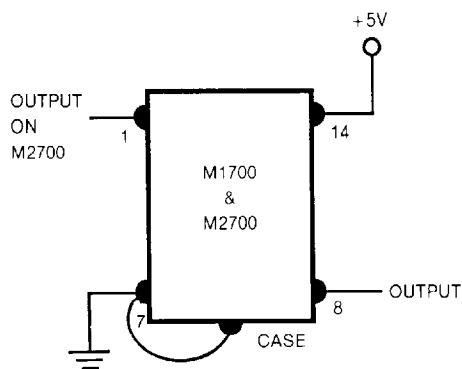


Fig. 3

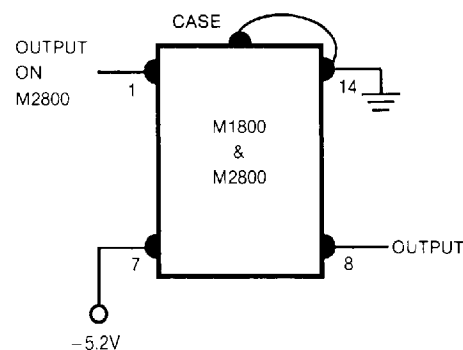


Fig. 4

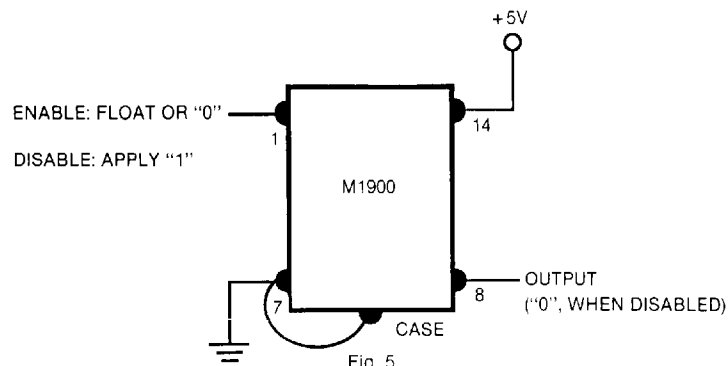
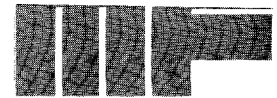


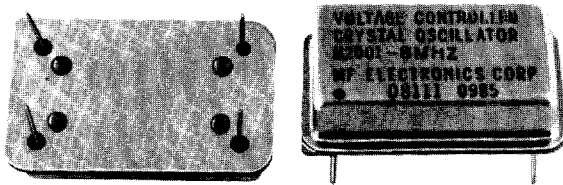
Fig. 5

**Note: Outputs must be properly terminated**



T-90-20

# Packaging and Environmental Information



## DIL Package ("M" oscillators)

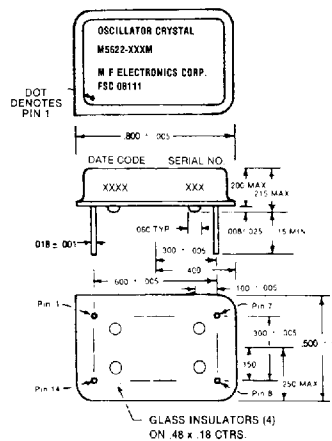
The most widely used package, this fits into the standard pin locations for a DIL 14 pin IC. Pin 1 is used in oscillators which have an additional output (duals and complementaries), or additional inputs (enable/disables, tristates and VCXO's).

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.

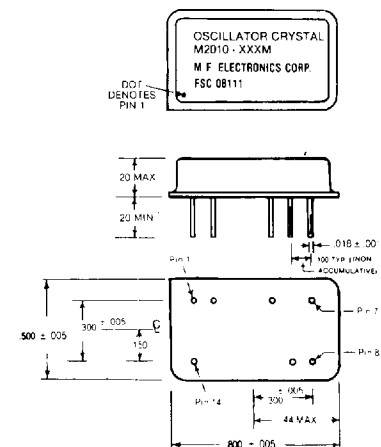
The HI-REL M5500 and M5516 use all 14 pins for additional mechanical strength in the connection to the PC board.

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.

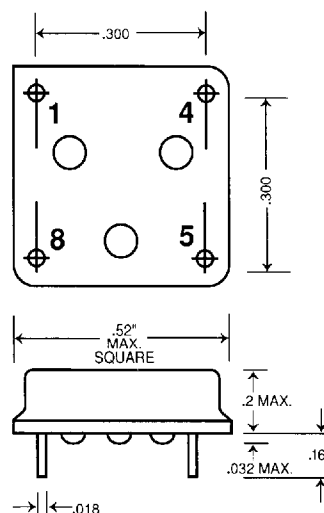
## "M" Package



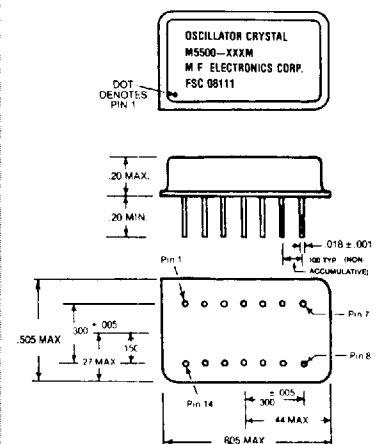
## "M-1" Package M2010, M2015

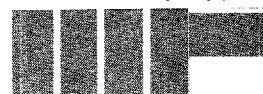


## "H" Package

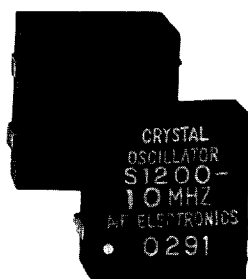


## "M-2" Package M5500, M5516





## 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.

