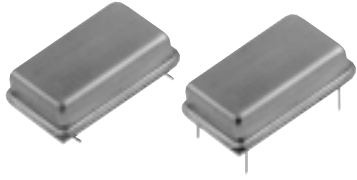




CRYSTAL OSCILLATORS ECL and PECL



**FULL SIZE D.I.L
M package**
M1400, M1436,
M1444, M1445,
M1500, M1536,
M1544, M1545,
M2400, M2436,
M2444, M2445,
M2500, M2536,
M2544, M2545

Thru-Hole / Gull Wing Commercial: 0° to 70°C 10 MHz to 125 MHz 1400 and 2400 – 10K ECL, -5.2V 1500 and 2500 – 10K PECL, +5V

FEATURES

- Single or dual complementary outputs
- Start up time less than 5 ms
- Stability options from ±100 ppm to ±25 ppm
- Guaranteed start-up with ramping DC Supply
- Specified for extended temperature to 85°C, to allow for additional heat rise in confined space
- Terminating resistor may be internal – consult factory

These models which use 10K ECL logic are not recommended for new designs. Suggested models are M1600s and M1700s which use 10KH ECL logic, or low jitter models shown on M2910 data sheet which are available thru 410MHz.

| ECL OSCILLATORS | | |
|-------------------------------|----------------------|---------------------|
| 10K Logic 10 MHz thru 125 MHz | | |
| -5 Volt Power on Pin 14 | | |
| Single Output | Complementary Output | Frequency Stability |
| M1400 | M2400 | ±100 ppm |
| M1436* | M2436* | ±100 ppm |
| M1444 | M2444 | ±25 ppm |
| M1445 | M2445 | ±50 ppm |

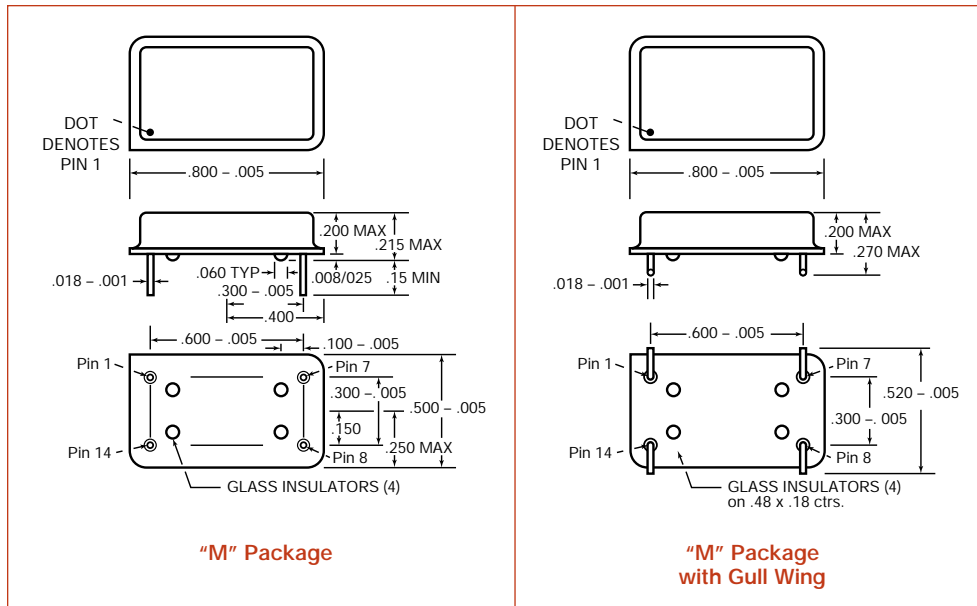
| PECL OSCILLATORS | | |
|-------------------------------|----------------------|---------------------|
| 10K Logic 10 MHz thru 125 MHz | | |
| +5 Volt Power on Pin 14 | | |
| Single Output | Complementary Output | Frequency Stability |
| M1500 | M2500 | ±100 ppm |
| M1536* | M2536* | ±100 ppm |
| M1544 | M2544 | ±25 ppm |
| M1545 | M2545 | ±50 ppm |

Description

MF Electronics' high speed clock oscillators for digital and communications applications are based on 5V ECL logic and are available in full size (M) and half size (H) thru-hole packages. Designed in ECL 10K logic, the oscillators deliver 10 MHz to 125 MHz output.

All models are available in complementary output, and a choice of either negative (ECL) or positive (PECL) operating voltage. These models are intended for designs which interface with 10K logic. For superior performance, see our models using 10KH or ECLPS.

*Guaranteed Superior Symmetry 45/55





FIXED OSCILLATORS
ECL and PECL, 10 MHz to 125 MHz
Thru-Hole /Gull Wing
Commercial: 0° to 70°C
10 MHz to 125 MHz
1400 and 2400 – 10K ECL, -5.2V
1500 and 2500 – 10K PECL, +5V

FULL SIZE D.I.L M package
 M1400, M1436, M1444, M1445, M1500, M1536, M1544, M1545, M2400, M2436, M2444, M2445, M2500, M2536, M2544, M2545

ELECTRICAL SPECIFICATIONS

Frequency Range 10 MHz to 125 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 | | | | |
| Negative Input Units | -4.75 | -5.2 | -5.45 | volts |
| Positive Input Units | 4.75 | 5.0 | 5.25 | volts |
| Input Current | | 45 | 60 | mA |
| Output Levels, Negative Input Units | | | | |
| "0" Level | | | | |
| 25°C | -1.85 | | -1.65 | volts |
| 70°C | -1.825 | | -1.65 | volts |
| "1" Level | | | | |
| 25°C | -0.96 | | -0.81 | volts |
| 70°C | -0.89 | | -0.70 | volts |
| Positive Input Units | | | | |
| "0" Level | | | | |
| 25°C | (Vc-1.85) | | (Vc-1.65) | volts |
| 70°C | (Vc-1.825) | | (Vc-1.65) | volts |
| "1" Level | | | | |
| 25°C | (Vc-0.96) | | (Vc-0.81) | volts |
| 70°C | (Vc-0.89) | | (Vc-0.7) | volts |

Rise and Fall Times (20 to 80%) 2.0 3.0 ns

Symmetry
 All units, except '36 Models 45/55 40/60 percent
 M1436, M1536, M2436, M2536 48/52 45/55 percent

Aging
 First year 3-5 ppm
 After first year 1 ppm/yr

ENVIRONMENTAL SPECIFICATIONS

Temperature
 Operating 0° to 70°C, case temperature
 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 – Permanent black epoxy ink or laser marked

Resistance to Solvents – MIL STD 202, Method 215

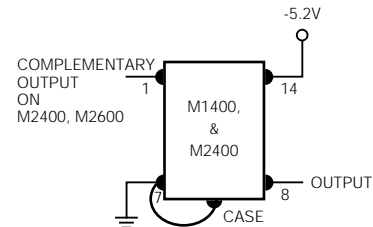


Fig. 1

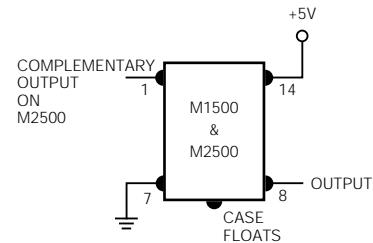


Fig. 2

Note: Outputs must be properly terminated



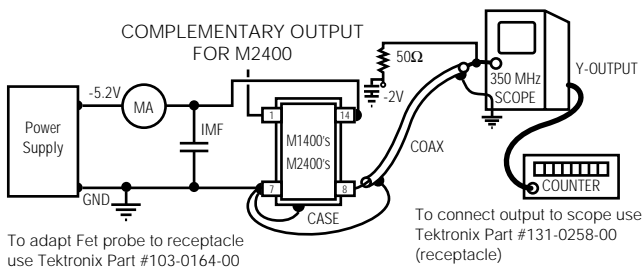


FIXED OSCILLATORS
ECL and PECL, 10 MHz to 125 MHz
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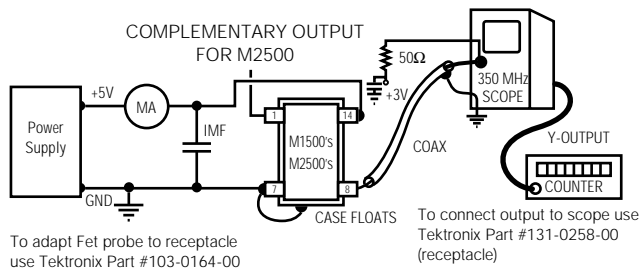
FULL SIZE D.I.L M package
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CONNECTIONS

| PINS | M1400, M2400 Models | M1500, M2500 Models |
|------|---|---|
| 1. | Not used in Single Output or Used for Complementary Output (same termination as Pin 8.) | |
| 7. | Electrical Ground and Case | Electrical Ground |
| 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 |
| 14. | -5.2 volts | +5 Volts |
| CASE | Tied to Pin 7. | Floating |



TEST CIRCUIT FOR M1400's
M2400's HAVE ADDITIONAL OUTPUT ON PIN 1.



TEST CIRCUIT FOR M1500's
M2500's HAVE ADDITIONAL OUTPUT ON PIN 1.

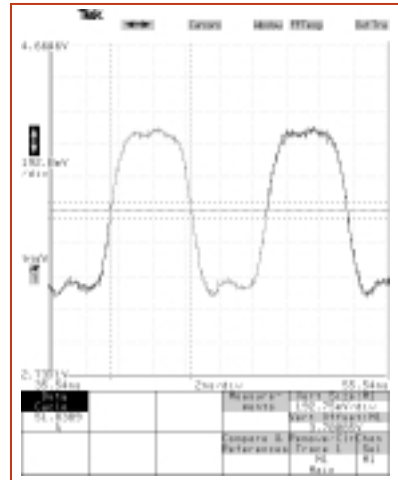
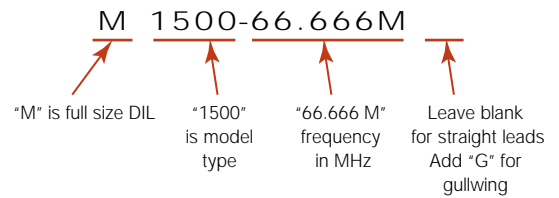


Fig. 3 M2545-107M, 10K logic

HOW TO ORDER

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



| SS# | Rev. |
|-------|------|
| M1400 | A |



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