



FIXED OSCILLATORS ECL and PECL 0° to 70°C

FULL SIZE D.I.L
M2900, M2936
M2944, M2945
M2948

HALF SIZE D.I.L
H2900, H2936
H2944, H2945
H2948



Thru-Hole/Gull Wing

10 MHz to 410 MHz

ECLPS, HIGH SPEED, LOW JITTER

ECLPS Logic

These ECLPS logic oscillators are our most advanced fixed frequency types. These fixed frequency devices use the same output logic as ECLPS VCXO models 2901 thru 2903, and exhibit identical waveform characteristics.

The high speed ECLPS clock oscillators are available in full size (M) and half size (H) thru-hole packages. All models have dual complementary outputs and are available at frequencies through 410 MHz. Frequency stability extends from ± 20 ppm to ± 100 ppm. All feature 250 ps typical rise/fall times and provide superior jitter and transition speeds. Their low output impedance and dual complementary outputs preserve waveform symmetry when sending the timing waveforms over appreciable distance. Output symmetry of 45/55 is available.

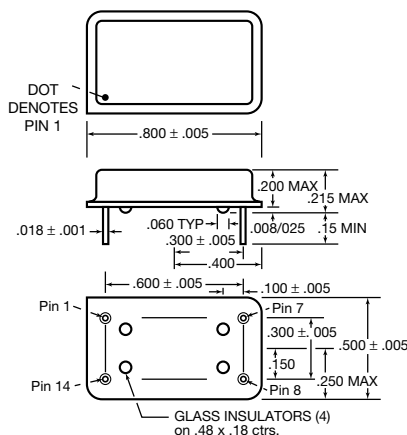
The MF Models 2900 are the fastest PECL oscillators available. The fastest ECLPS logic ensures low jitter and fast transition and match VCXO Models M2901, M2902 and M2903 in speed and waveform. All 2900 models provide positive ECL (PECL) and have complementary outputs.

Frequency tolerances from ± 100 ppm to ± 20 ppm include all effects of voltage, load and aging.

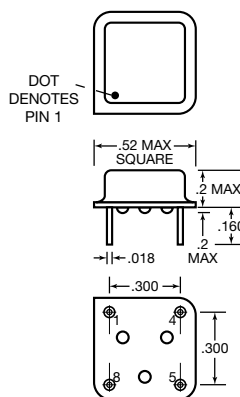
PECL OSCILLATORS		
ECLPS Lite Logic 10 MHz thru 410 MHz		
+5 Volt Power on Pin 14 (PECL)		
Complementary Output	Frequency Stability	
M2900 H2900	± 100 ppm	
M2936*, H2936	± 100 ppm	
M2944, H2944	± 25 ppm	
M2945, H2945	± 50 ppm	
M2948, H2948	± 20 ppm	

*Guaranteed Superior Symmetry 45/55

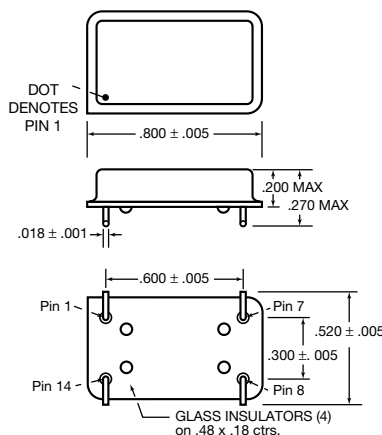
- DIL - full size or half size
- Complementary outputs
- Typical jitter is 12 ps RMS
- Start up time less than 5 ms.
- Stability options from .01% (100 ppm) to .002% (20 ppm)
- Guaranteed start-up with ramping DC Supply
- Specified for extended temperature to 85°C, to allow for additional heat rise in confined space
- Terminating resistor may be internal - consult factory



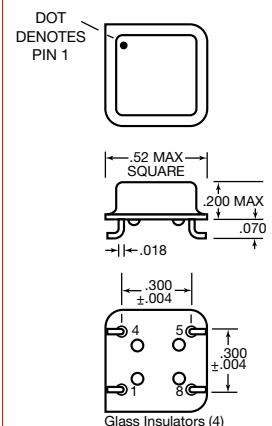
**"M" Package - "L" Package
is same as "M"
but seated height is 0.190**



"H" Package



**"M" Package
with Gull Wing**



**"H" Package
with Gull Wing**

MF ELECTRONICS

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FIXED OSCILLATORS — ECL and PECL, 0° to 70° C

Thru-Hole / Gull Wing

10 MHz to 410 MHz – ECLPS, HIGH SPEED, LOW JITTER

SPECIFICATIONS

Temperature

Operating	0 to 70°C, case temperature
Storage	-55 to +125°C

Frequency Range 10 MHz to 410 MHz

	MIN.	TYP	MAX	UNITS
Input Voltage, V_{DD}	4.75	5.0	5.25	volts
Input Current		45	60	ma
Output Levels,				
“0” Level				
25°C	($V_{DD}-1.85$)	($V_{DD}-1.65$)	($V_{DD}-1.95$)	($V_{DD}-1.63$) volts
70°C	($V_{DD}-1.825$)	($V_{DD}-1.65$)	($V_{DD}-1.95$)	($V_{DD}-1.60$) volts
“1” Level				
25°C	($V_{DD}-0.96$)	($V_{DD}-0.81$)	($V_{DD}-0.98$)	($V_{DD}-0.81$) volts
70°C	($V_{DD}-0.89$)	($V_{DD}-0.7$)	($V_{DD}-0.92$)	($V_{DD}-0.735$) volts
Jitter,		80	100	picosec, peak-to-peak
Rise and Fall Times (20 to 80%)		225	350	ps
Symmetry				
All units, except 2936 Models		45/55	40/60	percent
M2936, H2936		48/52	45/55	percent

TERMINATIONS

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

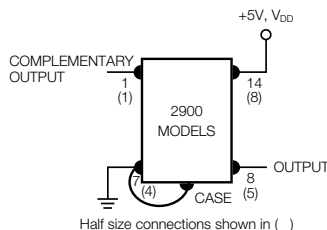


Fig. 1

Note: Outputs must be properly terminated

ENVIRONMENTAL SPECIFICATIONS

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 G's, 0.35 ms, 1/2 sine wave, 3 shocks in each plane

Vibration – 10-2000 Hz of .06" d.a. or 20 G's, whichever is less

Humidity – Resistant to 85° R.H. at 85°C

MECHANICAL SPECIFICATIONS

Gross Leak – Each unit checked in 125°C fluoro-carbon

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, or 7 microinch gold over nickel

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

Header – Steel, with nickel plate, or 7 microinch gold over nickel

Case – Stainless steel, type 304

Marking – Printing is black epoxy ink

Resistance to Solvents – MIL STD 202, Method 215

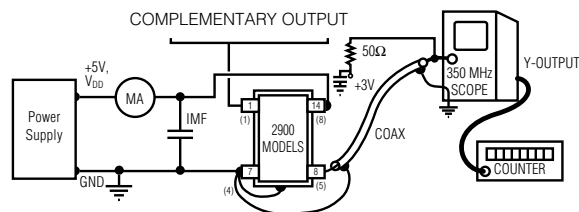
AGING

3 to 5 ppm, first year, typ.

1 ppm per year thereafter, typ.

CONNECTIONS

PINS		2900 Models
Full Size	Half Size	
1.	1.	Output requires termination of 270 ohms to Pin 7 (4) or 50 ohms to +3V
7.	4.	Electrical Ground and Case
8.	5.	Output requires termination of 270 ohms to Pin 7 (4) or 50 ohms to +3V
14.	8.	+5V, V_{DD}
CASE		Tied to Pin 7 (4)



To adapt Fet probe to receptacle use Tektronix Part #103-0164-00

To connect output to scope use Tektronix Part #131-0258-00 (receptacle)

TEST CIRCUIT FOR 2900's

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Figure 2: 155.52 MHz PECL oscillator, showing steep rise and fall times and excellent duty cycle. Levels have 900 mv difference between "1" and "0". Overshoots are caused by inductance of socket.

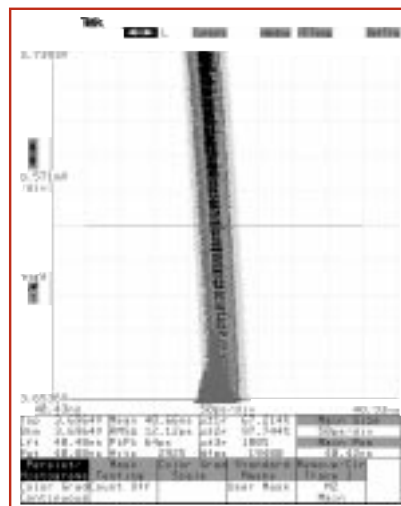


Figure 3: 155.52 MHz oscillator with expansion of transition at 3.7 volts. Jitter is shown by the histogram, slicing the waveform at 3.7 volts. Distribution is unimodal, with peak-peak jitter of 57 ps.

HOW TO ORDER

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

M 2948-155.52M G

"M" is full size DIL
"H" is half size DIL
"L" is low height, full size DIL

"2948" is model type

"155.52 M" frequency in MHz

Add "G" for gullwing

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