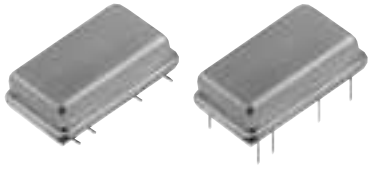




# CRYSTAL OSCILLATORS

## ECLPS PECL 5V

FULL SIZE D.I.L.  
M package  
M2910, M2954,  
M2955, M2958



### Thru-Hole/ Gull Wing

Commercial: 0° to 70°C  
10 MHz to 410 MHz

Generates complementary 5V ECLPS PECL output waveform optimized for low jitter for telecom applications.

#### FEATURES

- Super low jitter output – 2 ps RMS typical
- Frequency range is 10-410 MHz
- Four stability choices to 20 ppm
- Start up time less than 5 ms
- Guaranteed start-up with ramping DC Supply

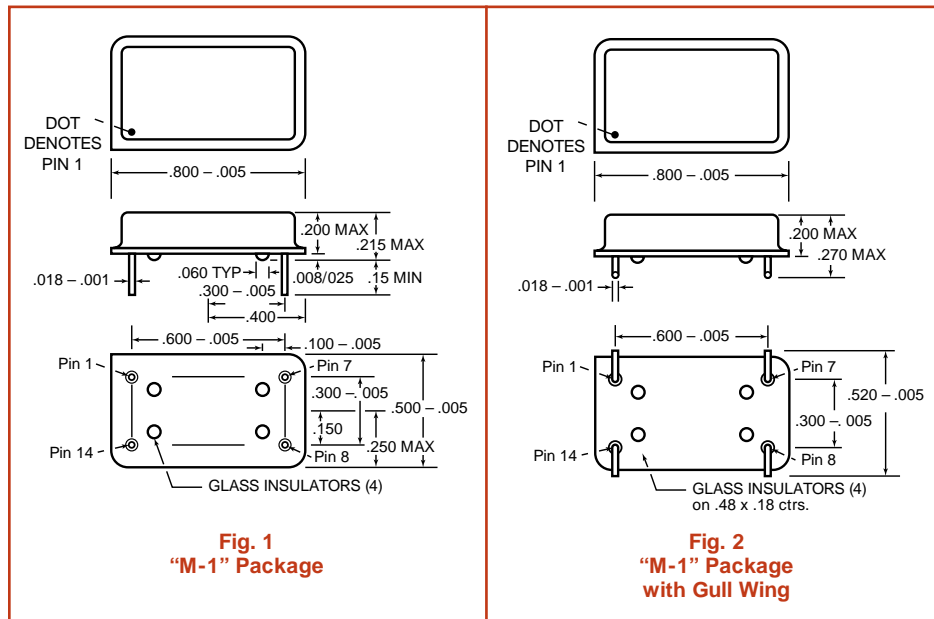
#### TYPICAL APPLICATIONS

- High-speed data communications

#### Description

These 5 volt thru hole ECLPS PECL models feature jitter of 20 ps, peak-to-peak from positive edge to positive edge. This is accomplished by using AT-cut crystals operating in their fundamental or overtone modes. No frequency doubling, tripling or phase-lock-loop multipliers are used, ensuring the very lowest jitter supported by the ECLPS PECL logic. Two outputs support differential drive at 50 ohms each, assuring signal integrity even when transmitted over long paths. They are compatible, and produce the same waveshapes as our M2911 VCXOs.

They are available in the full size (M) package with or without gull wing. Four stability options are available from ±100 ppm thru ±20 ppm.



#### ECLPS PECL 5V

Model	Frequency Stability
M2910	±100 ppm
M2954	±25 ppm
M2955	±50 ppm
M2958	±20 ppm

#### CONNECTIONS

- Pin 1. ECLPS PECL Output
- Pin 7. Ground, Case
- Pin 8. ECLPS PECL Output Complement
- Pin 14. V<sub>DD</sub>, 5 V





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**ELECTRICAL SPECIFICATIONS**

**Frequency Range** 10 MHz to 410 MHz

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

	MIN	TYP	MAX	UNITS
<b>Input Voltage, V<sub>DD</sub></b>	4.75	5.0	5.25	volts
<b>Input Current, Maximum</b>			70	ma
<b>Output Levels, with Output returned to (V<sub>DD</sub>-2)V thru 50 Ω</b>				
"0" Level			(V <sub>DD</sub> -1.63)	volts
"1" Level	(V <sub>DD</sub> -0.98)			volts
<b>Rise and Fall Times, with Output returned to (V<sub>DD</sub>-2)V thru 50 Ω (from 20 to 80%)</b>		225	350	ps
<b>Jitter, Positive Edge to Pos Edge, RMS</b>		2	3.5	ps
Peak to peak		14	20	ps
<b>Symmetry at (V<sub>DD</sub>-1.3)V</b>			45/55	percent
<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

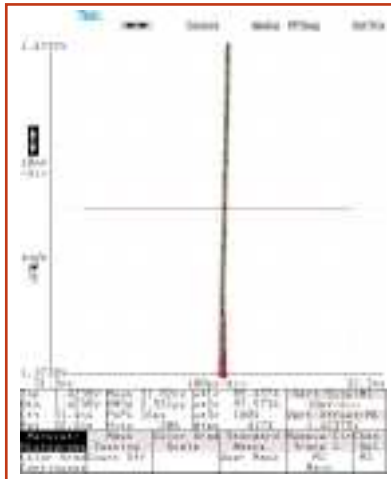
**Case** – Stainless steel, type 304

**Marking** – Epoxy ink or laser engraved

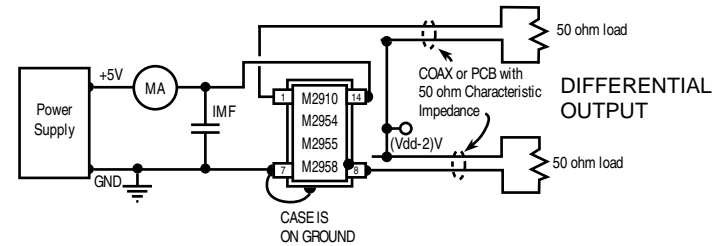
**Resistance to Solvents** – MIL STD 202, Method 215

**Termination, Load**

Both outputs should be terminated with 50 ohms to (V<sub>DD</sub>-2) volts



**Fig. 3 Jitter for M2954-155.52 M**  
 Oscillogram showing jitter from leading edge taken with Tek 11801B with SD22 Sampling Head. Peak-to-peak jitter is 16 ps; RMS jitter is 2.551 ps.



**TEST CIRCUIT FOR M2910, M2954, M2955, M2958**

**Fig. 4 Test Circuit**

**HOW TO ORDER**

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

**M 2958 - 250M**

"M" is full size DIL

"2958" is model type

"250 M" frequency in MHz

Leave blank for straight leads  
 Add "G" for gullwing

SS#	Rev.
M2910	A



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