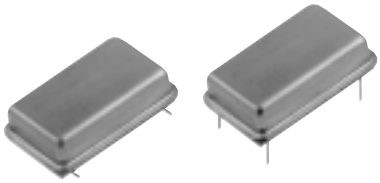
CRYSTAL OSCILLATORS
ECLPS LVPECL 3.3V

FULL SIZE D.I.L.
M package
M2980, M2984,
M2985, M2988



Thru-Hole / Gull Wing
Commercial: 0º to 70ºC
10 MHz to 410 MHz

Generates complementary 3.3V LVPECL output waveform which is optimized for low jitter for telecom applications

GUARANTEED SUPER-LOW JITTER

These oscillators use fundamental or overtone crystals to achieve jitter of less than 10 ps RMS, and 35 ps pk-pk, from positive edge to positive edge. Multiplying techniques are not used.

FEATURES

- Frequency range is 10-410 MHz
- Stability options from ±100 ppm to ±20 ppm
- Start up time less than 5 ms
- Guaranteed start-up with ramping DC Supply
- Internal bypass capacitor delivers superior waveform characteristics
- Complementary LVPECL outputs
- 5x7mm SMD version of this product is available in our R2980 models

TYPICAL APPLICATIONS

- Super-low jitter minimizes data loss and dropped packets in telecom and data networking applications

Description

These 3.3 volt thru hole LVPECL models feature jitter of 35 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 limited only by the LVPECL logic.Two outputs support differential drive at 50 ohms, assuring signal integrity even when transmitted over long paths.

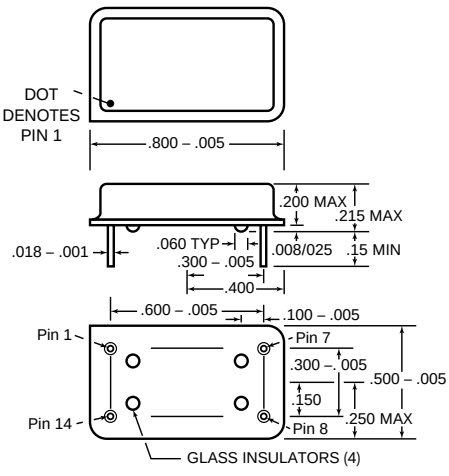


Fig. 1
"M-1" Package

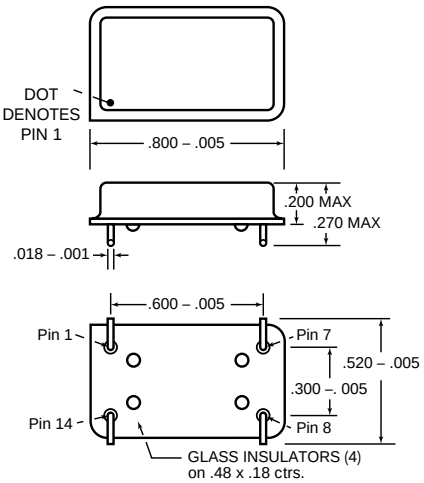


Fig. 2
"M-1" Package with Gull Wing

LVPECL 3.3 V	
Model	**Frequency Stability**
M2980	±100 ppm
M2984	±25 ppm
M2985	±50 ppm
M2988	±20 ppm

CONNECTIONS

Pin 1. LVPECL Output Complement
Pin 7. Ground, Case
Pin 8. LVPECL Output
Pin 14. V_{DD}, 3.3 V

MF ELECTRONICS

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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
Input Voltage, V_{DD}	3.0	3.3	3.6	volts
Input Current, Maximum		45	60	ma
Jitter, Positive Edge to Pos Edge,				
RMS		5	10	ps
Peak to peak		26	35	ps
Output Levels, with Output returned to (V_{DD}-2)V thru 50 Ω				
"0" Level			(V_{DD}-1.595)	volts
"1" Level	(V_{DD}-1.020)			volts
Rise and Fall Times, with Output returned to (V_{DD}-2)V thru 50 Ω		225	350	ps
(from 20 to 80%)				
Symmetry at (V_{DD}-1.3)V			45/55	percent
Aging				
First year		3		ppm
After first year		1		ppm/yr

Termination, Load

Both outputs should be terminated with 50 ohms to (V_{DD}-2) volts

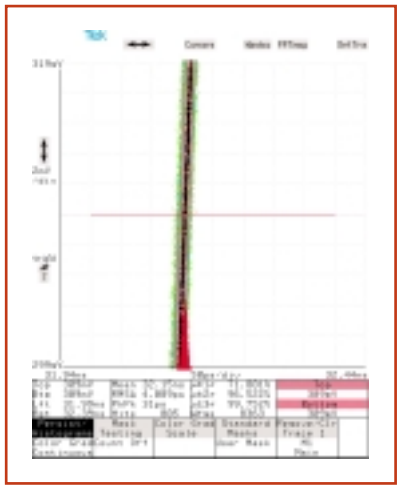


Fig. 4 Jitter for M2984-210M

Oscillogram showing jitter from leading edge taken with Tek 11801B with SD22 Sampling Head. Peak-to-peak jitter is 31 ps; RMS jitter is 4.089 ps. The distribution is unimodal, because the crystal is operating in the fundamental mode.

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

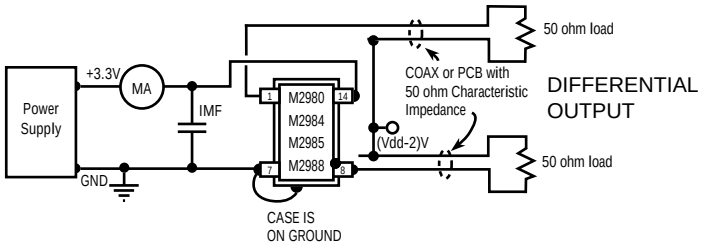
Bend Test – Will withstand two bends of 90° from reference

Header – Steel, with nickel plate

Case – Stainless steel, type 304

Marking – Printing is black epoxy ink

Resistance to Solvents – MIL STD 202, Method 215



TEST CIRCUIT FOR M2980, M2984, M2985, M2988

Fig. 3 Test Circuit

HOW TO ORDER

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

M 2984 - 410M

M	2984	410M	
M is full size DIL	2984 is model type	410M frequency in MHz	Leave blank for straight leads Add G for gullwing

SS#	Rev.
M2980	A

Unless customer-specific terms and conditions are signed by an officer of MF Electronics, the sale of this and all MF Electronics products are subject to terms and conditions set forth at www.mfelectronics.com/terms

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