

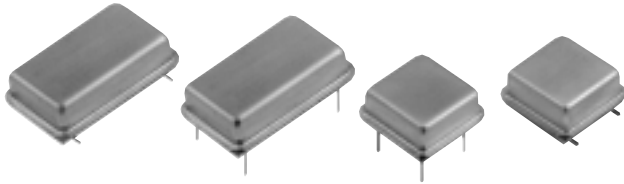


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VOLTAGE CONTROLLED CRYSTAL OSCILLATORS HCMOS/TTL 5V

FULL SIZE D.I.L.
M package
M3261 thru M3263
M3271 thru M3273
M3281 thru M3283

HALF SIZE D.I.L.
H package
H3261 thru H3263
H3271 thru H3273
H3281 thru H3283



Thru-Hole / Gull Wing

Commercial: 0° to 70°C
TRISTATE, 3 MHz to 105 MHz

GUARANTEED CAPTURE RANGE/ABSOLUTE PULL RANGE

Guaranteed Capture Range (GCR) and Absolute Pull Range (APR) are terms often used interchangeably. MF's Guaranteed Capture Range (GCR) is defined as the minimum guaranteed frequency deviation or "pull" (in ppm) around the nominal frequency, with all effects of temperature, variations in V_{DD} and load taken into account. This amount of absolute frequency deviation is available under all operating conditions for modulation or capturing other signals. No additional frequency capture allowances are necessary.

FEATURES

- Super low jitter of 20 ps peak to peak maximum limits loss of data packets in digital data recovery
- Various guaranteed capture ranges available from ± 75 ppm to ± 150 ppm
- Guaranteed Capture Range of ± 50 ppm
- Excellent incremental and best-straight-line linearity
- Start-up time is less than 5ms
- Each unit is ATE-tested to guarantee full compliance with all electrical specifications

TYPICAL APPLICATIONS

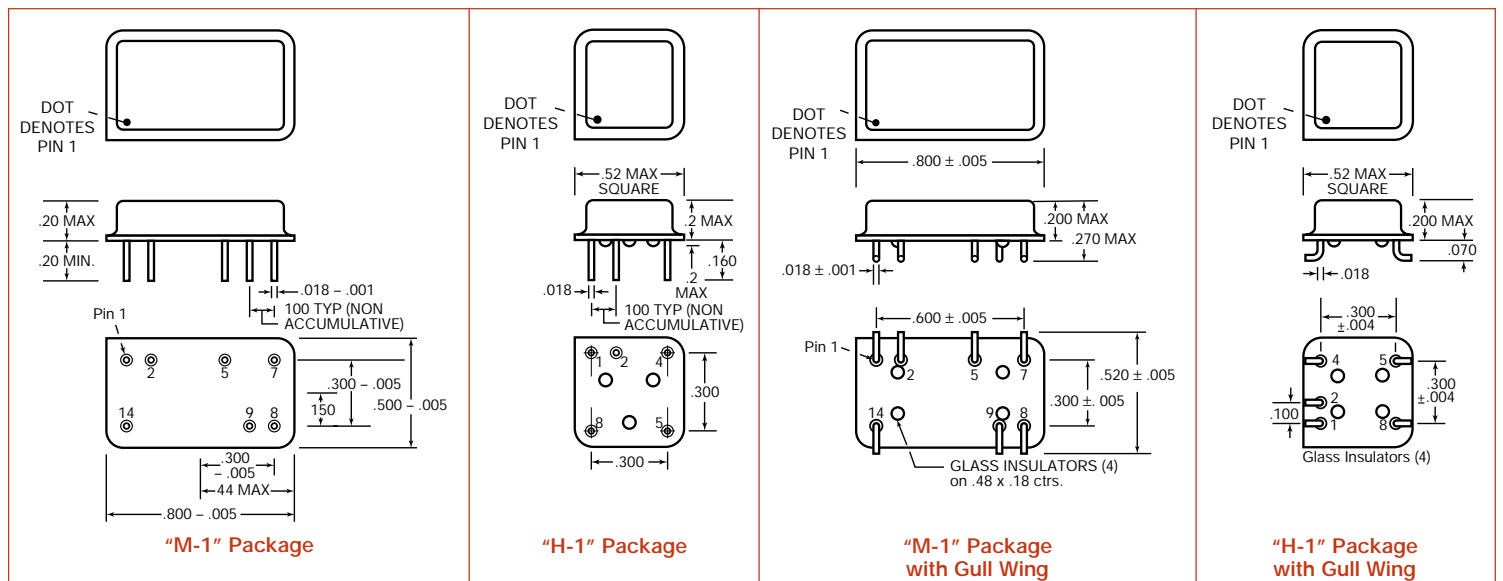
- Phase locked loops and data acquisition projects, including:
 - xDSL customer premise equipment
 - Cable modems
 - ATM/SONET/SDH

Description

These thru-hole VCXOs generate a 5 volt HCMOS/TTL frequency output which is controlled ("pulled") by an input voltage. MF Electronics' VCXO specification defines not only the end-point frequency/voltage parameters, but also the center voltage at which the nominal frequency is achieved.

CONNECTIONS

	Full Size	Half Size
Pin 1.	Not used	Control Voltage, V_C
Pin 2.	Control Voltage, V_C	Tristate
Pin 4.		Ground & Case
Pin 5.	Tristate	Output
Pin 7.	Ground & Case	
Pin 8.	Output	+5V, V_{DD}
Pin 9.	Not used	
Pin14.	+5V, V_{DD}	





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Center Frequency is at 2.5V with ±50 ppm stability

MODEL	Control Voltage (Volts)	Frequency Deviation (ppm)	Guaranteed Capture Range (ppm)	Control Voltage at Center Frequency	Center Frequency Stability (ppm)
3261	0.5 to 4.5	± 75 to 150	± 75	2.5	± 30, typ ± 50, max
3262	0.5 to 4.5	± 100 to 200	± 100	2.5	
3263	0.5 to 4.5	± 150 to 300	± 150	2.5	

Center Frequency is at 2.5V with ±25 ppm stability

MODEL	Control Voltage (Volts)	Frequency Deviation (ppm)	Guaranteed Capture Range (ppm)	Control Voltage at Center Frequency	Center Frequency Stability (ppm)
3271	0.5 to 4.5	± 75 to 150	± 75	2.5	± 20, typ ± 25, max
3272	0.5 to 4.5	± 100 to 200	± 100	2.5	
3273	0.5 to 4.5	± 150 to 300	± 150	2.5	

Center Frequency is at 2.5V with ±20 ppm stability

MODEL	Control Voltage (Volts)	Frequency Deviation (ppm)	Guaranteed Capture Range (ppm)	Control Voltage at Center Frequency	Center Frequency Stability (ppm)
3281	0.5 to 4.5	± 75 to 150	± 75	2.5	± 15, typ ± 20, max
3282	0.5 to 4.5	± 100 to 200	± 100	2.5	
3283	0.5 to 4.5	± 150 to 300	± 150	2.5	

DESCRIPTIONS

M3261, H3261,	±75 ppm capture when using using 0.5 to 4.5V control-voltage and 2.5V center with ±50 ppm stability
M3262, H3262,	±100 ppm capture when using using 0.5 to 4.5V control-voltage and 2.5V center with ±50 ppm stability
M3263, H3263,	±150 ppm capture when using using 0.5 to 4.5V control-voltage and 2.5V center with ±50 ppm stability
M3271, H3271,	±75 ppm capture when using using 0.5 to 4.5V control-voltage and 2.5V center with ±25 ppm stability
M3232, H3232,	±100 ppm capture when using using 0.5 to 4.5V control-voltage and 2.5V center with ±25 ppm stability
M3273, H3273,	±150 ppm capture when using using 0.5 to 4.5V control-voltage and 2.5V center with ±25 ppm stability
M3281, H3281,	±75 ppm capture when using using 0.5 to 4.5V control-voltage and 2.5V center with ±20 ppm stability
M3282, H3282,	±100 ppm capture when using using 0.5 to 4.5V control-voltage and 2.5V center with ±20 ppm stability
M3283, H3283,	±150 ppm capture when using using 0.5 to 4.5V control-voltage and 2.5V center with ±20 ppm stability

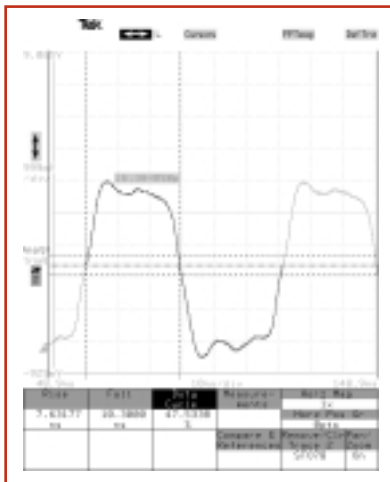


Fig. 1 H3263-16.384M with 50pf load

FREQUENCY VS. CONTROL VOLTAGE FOR TYPICAL DEVICE

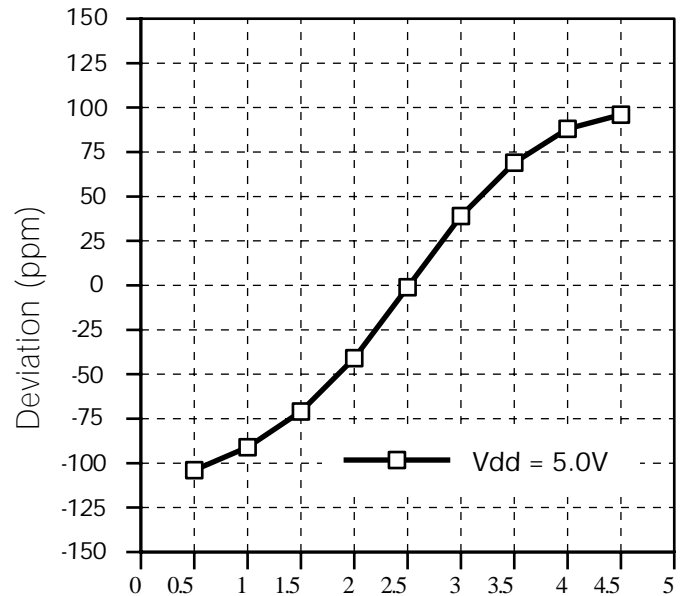


Fig. 2 Deviation from Nominal for M3282-77.76 M





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ELECTRICAL SPECIFICATIONS

Frequency Range 20 KHz to 150 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	4.5	5.0	5.5	volts
Input Current		30	45	ma
Output Levels (HCMOS)			0.4	volts
"0" Level, sinking 16 ma.				volts
"1" Level, sourcing 10 ma.	V _{DD} -4			
Rise and Fall Times, HCMOS		2.5	4	ns
From 0.4 to (V _{DD} -4) V			2	ns
(Above 35 MHz)				
Symmetry			45/55	percent
At V _{DD} /2				
Aging				
First year		3		ppm
After first year		1		ppm/yr
Input Impedance,				
Pin 2., Control Voltage	15	1000		Kohms
Control Voltage Bandwidth	15	20		KHz
Control Voltage	Maximum and minimum as specified for each model.			

Jitter
Jitter is less than 20 ps peak-peak, when measured by Tektronix 11801B Digital Storage Oscilloscope with SD-22 Sampling head in Color Statistics mode.

Tristate
"1" Output is On – Pin 5 may float or 2.4V min, sourcing 400µa
"0" Output is disabled, tristate, high impedance – Pin 5 requires 0.4V, sinking 400µa

JITTER FOR TYPICAL DEVICE

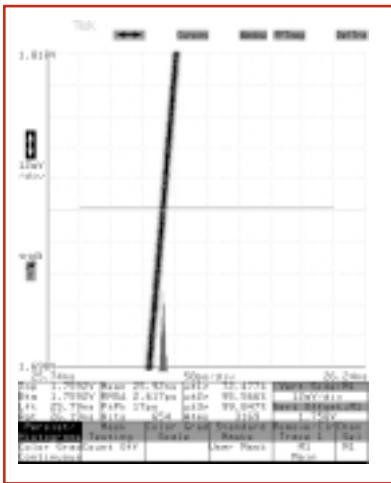


Fig. 3 Jitter for M3282-77.76 M

ENVIRONMENTAL SPECIFICATIONS

Temperature
 Operating 0 to 70°C
 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, or 7 microinch gold over nickel

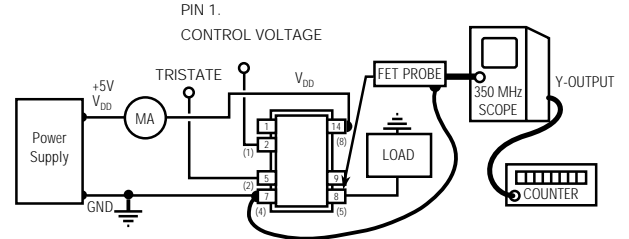
Bend Test – Will withstand two bends of 90° from reference

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



Half Size connections shown in ()

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

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

ALL OSCILLATORS HAVE INTERNAL BYPASS CAPACITORS

TEST CIRCUIT

HOW TO ORDER

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

H 3282 - 77.76M

"M" is full size DIL
"H" is half size DIL

"3210" is model type

"50 M" frequency in MHz

Leave blank for straight leads
Add "G" for gullwing

SS#	Rev.
M3261	A



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