



VOLTAGE CONTROLLED OSCILLATORS

HCMOS, 0° TO 70°C

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

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

Tristate VCXOs Thru-Hole, 5V, Jitter is 20 ps Pk-Pk

These 5 volt thru hole VCXO models feature jitter of 20 ps, peak-to-peak, using fundamental crystals without multipliers. They are available for the first time in a variety of off-the-shelf models, in full size (M) and half size (H) packages, with and without gull wing. Users have a choice of many off-the-shelf 5V thru-hole models. Diverse combinations of pull, control voltage and frequency deviation are available, accommodating a wide variety of filtering and driving circuitry. The tristate function facilitates diagnostic ATE testing, or facilitates choice of clock speed under software control. All VCXOs are tested and guaranteed.



Tristate, 5V Thru-Hole/Gull Wing 3 MHz to 175 MHz SUPER-LOW JITTER 20 ps PEAK-PEAK

These 5V VCXOs generate an HCMOS/TTL frequency output which is controlled by an input control voltage. The end-point voltage/frequency parameters are defined, as is the center frequency.

CAPTURE RANGE

The Frequency-Capture range is equal to the (Center-Frequency \pm the Frequency Deviation), because every MF VCXO is ATE-tested to meet the Frequency-Deviation over the temperature range. **Frequency Capture specification includes all effects of temperature and supply voltage. It is not necessary to make additional capture allowances.**

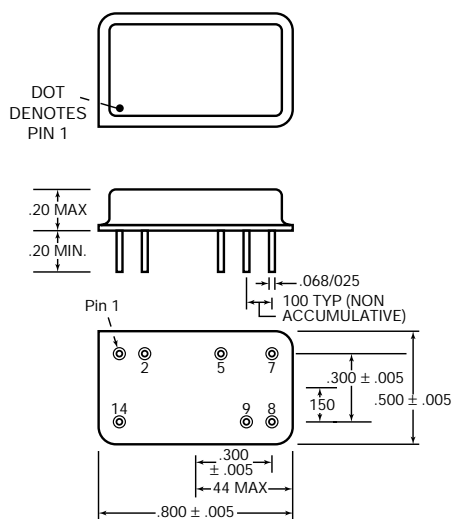
CONNECTIONS

Full Size	
Pin 1.	Not used
Pin 2.	Control Voltage, V_C
Pin 5.	Tristate
Pin 7.	Ground & Case
Pin 8.	Output
Pin 9.	Not used
Pin 14.	+5V, V_{DD}

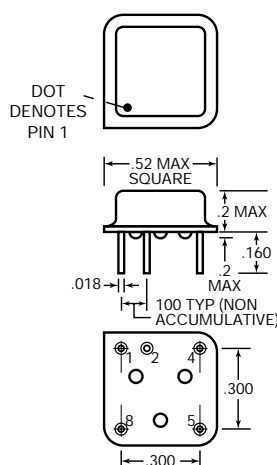
Half Size	
Pin 1.	Control Voltage, V_C
Pin 2.	Tristate
Pin 4.	Ground & Case
Pin 5.	Output
Pin 8.	+5V, V_{DD}

FEATURES

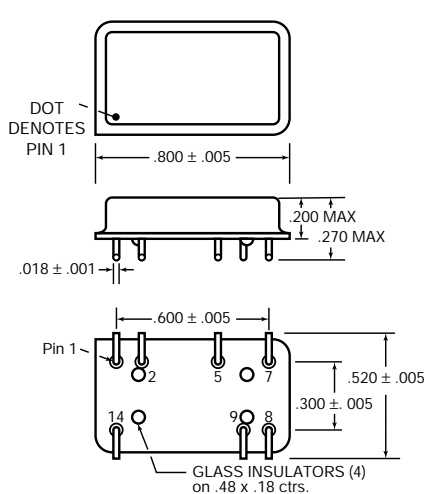
- Tristate is standard
- Jitter is specified
- Frequency from 3 MHz to 175 MHz
- Capture-range is fully defined, under all conditions
- Start-up time less than 5 ms.
- Half size or full size DIL package
- Choice of thru-hole or gull wing



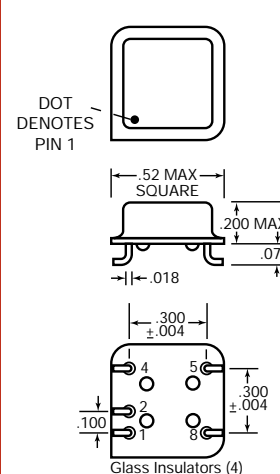
"M-1" Package



"H-1" Package



**"M-1" Package
with Gull Wing**



**"H-1" Package
with Gull Wing**



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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

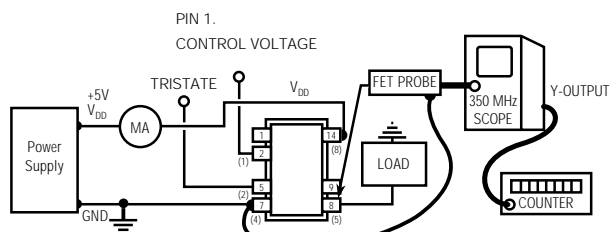
MODEL	Control Voltage (Volts)	Frequency Deviation (ppm)	Guaranteed Capture Range (ppm)	Control Voltage at Center Frequency	Center Frequency Stability (ppm)
3271	0.5 to 4.5	± 75 to 150	± 75	2.5	± 20, typ ± 25, max
3272	0.5 to 4.5	± 100 to 200	± 100	2.5	
3273	0.5 to 4.5	± 150 to 300	± 150	2.5	

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, 1	±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



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

MF ELECTRONICS

VOLTAGE CONTROLLED OSCILLATORS
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Tristate, 5V
Thru-Hole /Gull Wing
3 MHz to 175 MHz
Super-Low Jitter 20 ps Peak-to-Peak

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SPECIFICATIONS

Temperature

Operating	0 to 70°C
Storage	-55 to +125°C

Frequency Stability

$V_C = 2.5V$	$\pm 20, \pm 25$ or ± 50 ppm, max. as shown in model specification
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	MIN.	TYP	MAX	UNITS
Input Voltage	4.5	5.0	5.5	volts
Input Current		30	45	ma
Output Levels (HCMOS)				
"0" Level, sinking 16 ma.			0.4	volts
"1" Level, sourcing 10 ma.	$V_{DD} - .4$			volts
Rise and Fall Times, HCMOS				
From 0.4 to $(V_{DD} - .4)$ V		2.5	4	ns
(Above 35 MHz)			2	ns
Symmetry				
At $V_{DD}/2$.		45/55	percent
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 400 μ a
"0" Output is disabled, tristate, high impedance -
Pin 5 requires 0.4V, sinking 400 μ a

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.

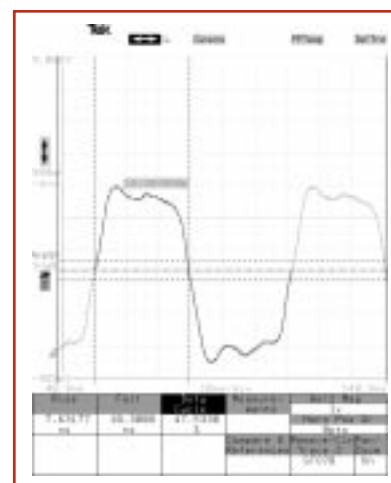


Fig. 1 H3263-16.384M
with 50pf load

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FREQUENCY VS. CONTROL VOLTAGE
 FOR TYPICAL DEVICE

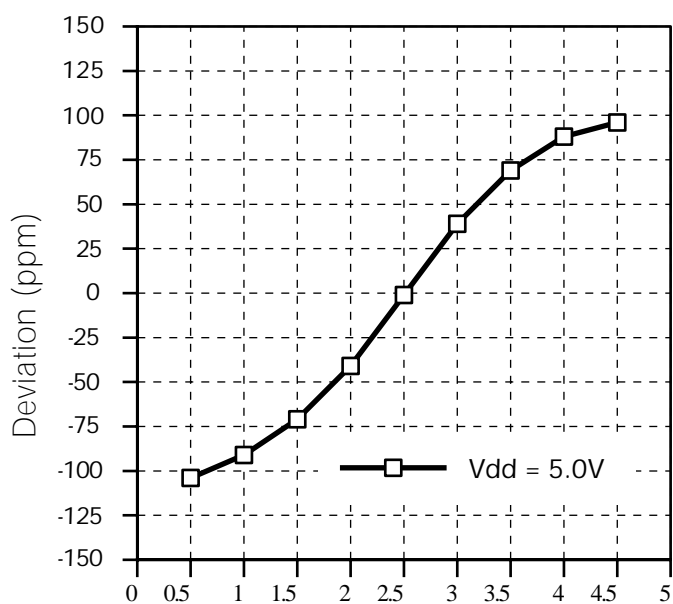


Fig. 2 Deviation from Nominal for
 M3282-77.76 M

JITTER FOR TYPICAL DEVICE

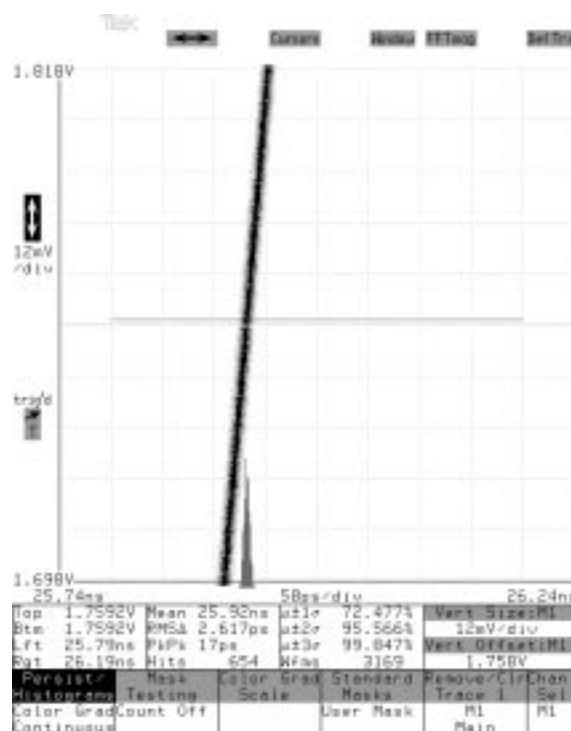


Fig. 3 Jitter for M3282-77.76 M

HOW TO ORDER

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

H 3282 - 77.76 M G

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

"3282"
 is model
 type

"77.76 M"
 frequency in MHz

Add
 "G"
 for
 gullwing

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