

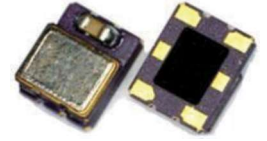
# Temperature Compensated Crystal Oscillators [ TCXO " M " and VCTCXO " VM " ]

TCXO			VCTCXO			N series	SMD	2.5 V 3.3 V	Min. 10 MHz	Max. 1,500 MHz	
MQN_T	MQN_P	MQN_D	VMQN_T	VMQN_P	VMQN_D						CMOS

### Features

**0.8 pS Phase Jitter ( typical )**

The (V)MQN326T, (V)MQN326P and (V)MQN326D Series are members of Mercury's Q-Family Temperature Compensated oscillators that can be delivered within days. With low current consumption (44 mA for LVPECL 212.500 MHz at 3.3V) and an integrated phase jitter performance of 0.8 pS RMS, they have gained its precision frequency control market position by providing engineers with few-day samples for prototypes and low cost, fast delivery for volume production.

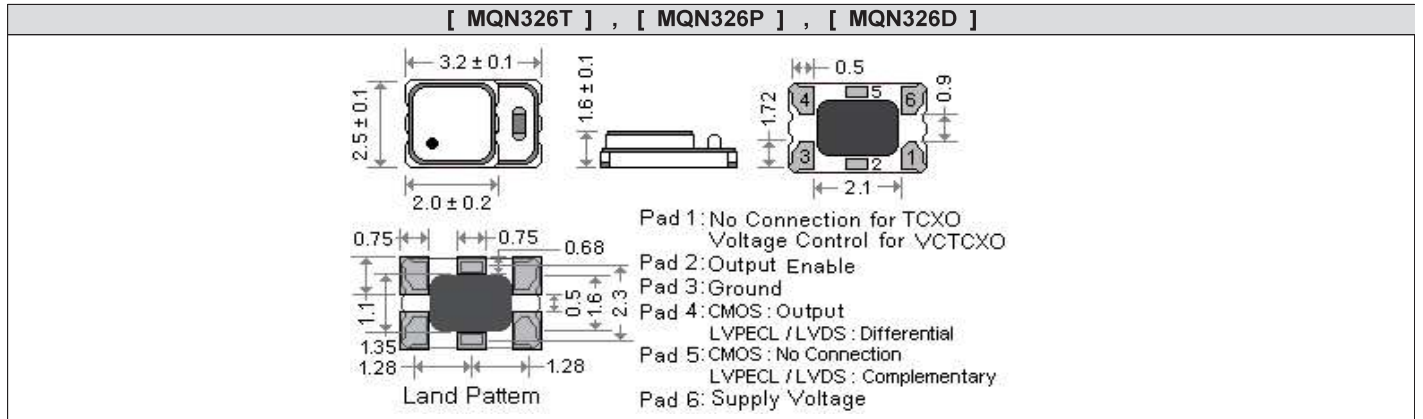


General specifications, at Ta=+25°C, CL=15pF

Model	(V)MQN326T	(V)MQN326P	(V)MQN326D						
Output Logic	LVCMOS / LVTTTL	LVPECL	LVDS						
Supply Voltage V <sub>DD</sub> ( code )	+ 2.5 V <sub>DD</sub> ± 5% ( voltage code " 25 " ) + 3.3 V <sub>DD</sub> ± 5% ( voltage code " 33 " )	+ 2.5 V <sub>DD</sub> ± 5% ( voltage code " 25 " ) + 3.3 V <sub>DD</sub> ± 5% ( voltage code " 33 " )	+ 2.5 V <sub>DD</sub> ± 5% ( voltage code " 25 " ) + 3.3 V <sub>DD</sub> ± 5% ( voltage code " 33 " )						
Available Frequency Range	10 ~ 250 MHz	10 ~ 1,500 MHz	10 ~ 1,500 MHz						
Load	15 pF	50 Ω into V <sub>cc</sub> - 2V or Thevenin equivalent	100 Ω						
Output Logic " High " , " 1 "	90 % V <sub>DD</sub>	V <sub>DD</sub> - 1.03 ( min. ) , V <sub>DD</sub> - 0.6 ( max. )	1.4 V Typical , 1.6 V max.						
Output Logic " Low " , " 0 "	10 % V <sub>DD</sub>	V <sub>DD</sub> - 1.85 ( min. ) , V <sub>DD</sub> - 1.6 ( max. )	1.1 V Typical , 0.9 V min.						
( V <sub>DD</sub> = + 2.5V )	50 MHz : 24 mA	156 MHz : 36 mA	156 MHz : 22 mA						
Current Consumption	125 MHz : 28 mA	600 MHz : 40 mA	600 MHz : 28 mA						
All values are typical and over the operating temperatures.	200 MHz : 30 mA	800 MHz : 46 mA	800 MHz : 30 mA						
( V <sub>DD</sub> = + 3.3V )	50 MHz : 26 mA	156 MHz : 40 mA	156 MHz : 25 mA						
Current Consumption	125 MHz : 30mA	600 MHz : 45 mA	600 MHz : 30 mA						
All values are typical and over the operating temperatures.	200 MHz : 34 mA	800 MHz : 48 mA	800 MHz : 32 mA						
Current with Output Disabled	18 mA ( typical )	18 mA ( typical )	18 mA ( typical )						
Rise Time / Fall Time	1.5 nS. ( Typical ) , 3.0 nS. ( max. ) Tr / Tf : 10% ↔ 90% waveform	0.2 nS. ( Typical ) , 0.5 nS. ( max. ) Tr / Tf : 20% ↔ 80% waveform	0.2 nS. ( Typical ) , 0.4 nS. ( max. ) Tr / Tf : 20% ↔ 80% waveform						
Initial Calibration Tolerance	±1.0 ppm. max. at +25°C±2°C. ( upon shipment )								
Frequency Stability Codes	Temperature (ref to +25°C) : ± 2.5 ppm over -30°C to +85°C ( default ) ± 1.0 ppm over -40°C to +85°C ( available ) Aging : ± 1.0 ppm max. , per year at 25°C Voltage Change : ± 0.2 ppm max. , for a ±5% input voltage change. Load Change : ± 0.2 ppm max. , for a ±10% load condition change. Reflow : ± 1.0 ppm max. , 1 reflow and measured 24 hours afterwards.								
Duty Cycle	50 % ± 5%								
Start-up Time	5 m sec. ( max. )								
Aging at Ta = +25°C	± 2 ppm max. first year at 25°C ; ± 10 ppm max. over 10 years								
Storage Temperature	-55°C to + 150°C								
SSB Phase Noise [ dBc / Hz ( typical ) ]	Offset	10 Hz	100 Hz	1K Hz	10K Hz	100K Hz	1M Hz	10M Hz	Phase Jitter ( 12KHz ~ 20 MHz )
	125 MHz	-51	-93	-111	-123	-125	-135	-155	0.73 pS
	212.5 MHz	-42	-87	-105	-115	-118	-130	-151	0.85 pS
	312.5 MHz	-49	-88	-107	-111	-114	-124	-147	0.88 pS

Control Voltage Function on Pad 1	Output Enable Function on pad 2
Control Voltage Center and Range	70% of V <sub>DD</sub> (min.) to enable output. (Open connection prohibit.)
Frequency Pulling Range	
Linearity	30% of V <sub>DD</sub> (max.) to disable output (high impedance).
Transfer Function	
Absolute Voltage	Output Enable Time / Disable Time
Input Impedance	Integrated Phase Jitter
Harmonics	200 nS. Max. / 50 nS. Max. 0.8 pS typical ( 12 KHz to 20 MHz ) < 150 fS ( 1.875 KHz to 20 MHz )

Outline Dimensions ( Unit : mm ) , Suggested pad Layout for SMDs



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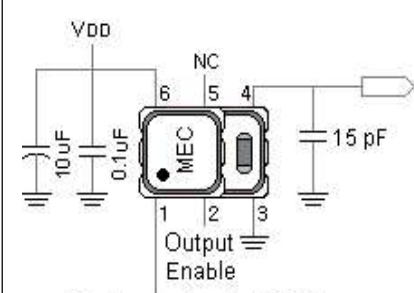
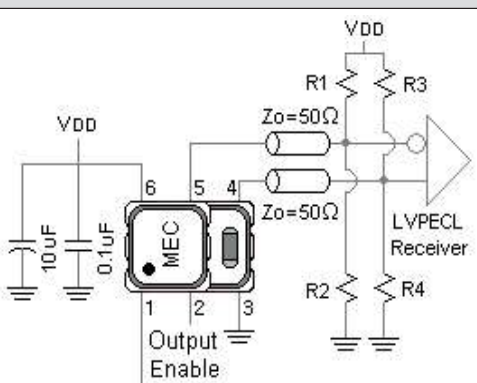
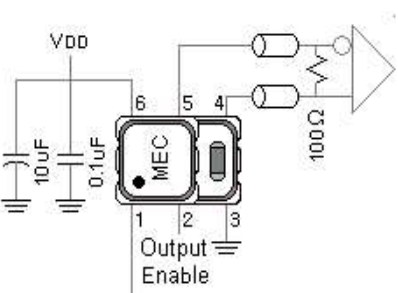
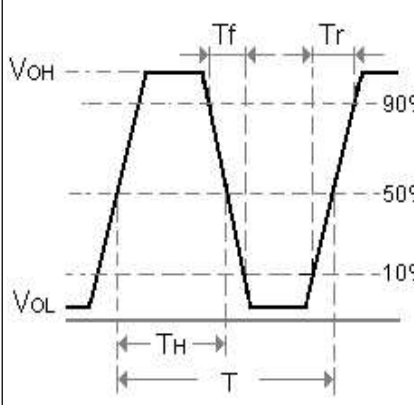
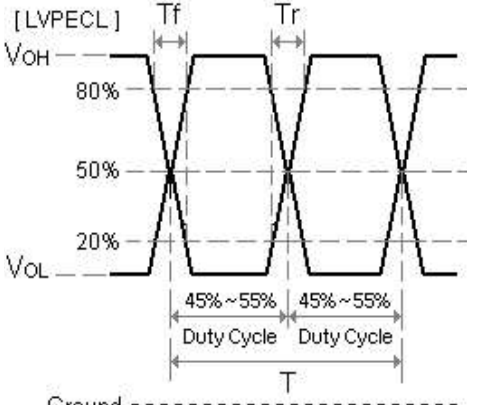
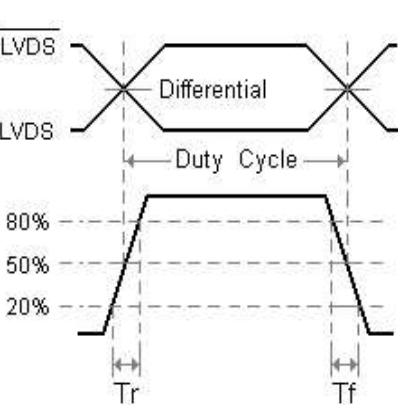
TCXO			VCTCXO			N series	SMD	2.5 V 3.3 V	Min. 10 MHz	Max. 1,500 MHz
MQN_T	MQN_P	MQN_D	VMQN_T	VMQN_P	VMQN_D					
CMOS	LVPECL	LVDS	CMOS	LVPECL	LVDS					

## Part Number Format and Example

Example : VMQN326D33 - 622.080 - 2.0 / -40+85

VMQN	326	D	33	-	622.080	-	2.0	/	-40+85
Hold Type	Package	T : CMOS	Supply Voltage		Center Freq. ( MHz )		Freq. Stability		Operating Temperature Range
" MQN " : TCXO	" 326 "	P : LVPECL	" 33 " for 3.3V						
" VMQN " : VCTCXO	( 3.2 * 2.5 mm )	D : LVDS	" 25 " for 2.5V						

## Test Circuits and Output Waveforms

CMOS	LVPECL	LVDS
 <p style="text-align: center;">No Connection for TCXO Voltage Control for VCTCXO</p>	 <p style="text-align: center;">No Connection for TCXO Voltage Control for VCTCXO</p> <p style="text-align: center;">VDD = 3.3 V : R1 = R3 = 127Ω ; R2 = R4 = 82.5 Ω VDD = 2.5 V : R1 = R3 = 250 Ω ; R2 = R4 = 62.5 Ω</p>	 <p style="text-align: center;">No Connection for TCXO Voltage Control for VCTCXO</p>
	 <p style="text-align: center;">Ground .....</p>	

### Output OE Function on pad 2

