Voltage Controlled Temperature Compensated Crystal Oscillators VCTCXO, VMW57D Series, +3.3V "W" Family LVDS Outputs	MERCURY Since 1973

Features:
- ♦ 5x7x2.8 mm ceramic SMD VCTCXOs with LVDS differential output
- ♦ 0.01 uF decoupling capacitor built-in
- ♦ Wide frequency range: 12.0 MHz to 800 MHz
- ♦ Low cost. Moderate jitter. Ideal for SONET, xDSL.

RoHS Compliant Product by Mercury

General Specifications (at+25°C and specified input voltage)

Product Series			**VMW57D. 'W"** family characteristics.
Frequency Range			12.0 MHz ~ 800.0 MHz
Output Wave From			**Differential LVDS Square wave**. Wave form code is "**D**"
Initial Calibration Tolerance			±2 ppm at +25°C±2°c and Vcon = +1.65 V D.C.
Frequency Stability **vs operating temperature** **vs Aging** **vs Voltage Change** **vs Load Change** **vs Reflow**			±2.5 ppm over -30 to +80°C (Custom spec. are available) ±1.0 ppm max. first year at +25°C ±0.3 ppm max. for a ±5% input voltage change ±0.3 ppm max. for a ±10% loading condition change ±1 ppm max. 1 reflow and measured 24 hours afterwards
Current Consumption			24 MHz < Fout: 33 mA max. 24 MHz ≤ fout ≤96 MHz: 50 mA max; 96 MHz <fout <700 MHz: 85 mA max. (Measured with load).
Supply Voltage (V_{DD})			**+3.3 V** ±5% (voltage code is "**33**")
Supply Voltage magnitude Change (ΔV_{DD})			-50 m V min.; +50 m V max.
Output Voltage Levels	**Logic High**		**V_{OH}:** 1.4 V typical; 1.6 V max. Condition: 100 Ω differential load.
	Logic Low		**V_{OL}:** 0.9 V min.; 1.1 V typical. Condition: 100 Ω differential load.
Offset Voltage (V_{OS})			1.125 V min.; 1.20 V typical; 1.375 V max.
Offset Magnitude Change (ΔV_{OS})			0.0 mV min.; 3 mV typical; 25 mV max.
Output Differential Voltage (V_{OD})			247 mV min.; 355 mV typical; 454 mV max.
Rise Time and Fall Time (Tr ; Tf)			1 nano. sec. max. 20% ↔ 80% of waveform; 100 ohm differential load.
Duty Cycle (Symmetry)			50%±5% measured at 50% of waveform.
Start-up Time			5 m. sec. max.
Pad 1: **Electronic Frequency Tuning.** **(VCTCXO only)**	Control Voltage Center and Range		Control Voltage Center Vcon= +1.5 V.; Range: ±1.0 V.
	Frequency Deviation Range		±10 ppm typical
	Slope Polarity		Positive: Positive voltage for positive frequency shift
	Linearity		10 % max.
Pad 2: **Tri-state Function**	No Connection	Differential LVDS and complimentary LVDS outputs.	
	Disable	Both outputs are disabled (high impedance) when pad No. 2 is taken below 0.45∗Vcc referenced to ground (threshold). Oscillator is always ON. Only buffer stage is disabled. Disable current: 50 uA max. (at 0.0 V). Disable time: 10 ns max.	

MERCURY www.mercury-crystal.com

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	Enable	At disabled mode, both outputs are enabled when pad No. 2 is taken above 0.45 * Vcc referenced to ground (threshold). Enable time: 10ns+one period of the output frequency max.
Output Load		100 Ω differential load.
Aging		±1 ppm per year max.

SSB Phase Noise (dBc/Hz)	Offset	10 Hz	100 Hz	1 kHz	10 kHz	100 kHz	1 MHz	10 MHz
	VMW57D33-19.440	-80	-108	-132	-142	-150	-150	-152
	VMW57D33-77.760	-72	-103	-122	-130	-125	-125	-143
	VMW57D33-155.520	-65	-95	-120	-125	-121	-120	-140
	VMW57D33-311.020	-59	-86	-116	-129	-124	-140	-148
	VMW57D33-622.080	-55	-85	-109	-115	-110	-110	-128

Jitter		Period Jitter (RMS)	Period Jitter (peak-to-peak)	Integrated Jitter RMS (12 KHz ~20 MHz)
	VMW57D33-19.440	2.2 ps typ; 4.0 ps max	17 ps typ.; 20 ps max.	2.0 ps typ; 3.0 ps max.
	VMW57D33-77.760	3.5 ps typ; 5.3 ps max	25 ps typ.; 28 ps max	2.7 ps typ; 4.0 ps max.
	VMW57D33-155.520	4.3 ps typ; 6.1 ps max	27 ps typ.; 30 ps max	2.6 ps typ; 4.0 ps max.
	VMW57P33-311.020	4.5 ps typ. 6.3 ps max	22 ps typ.; 25 ps max	2.6 ps typ; 4.0 ps max.
	VMW57P33-622.080	5.0 ps typ.;6.8 ps max	32 ps typ.; 35 ps max	2.5 ps typ; 4.0 ps max.

Packaging	179 mm reel, 16 mm tape, 8.0 mm pitch, 1000 pcs per reel.
Contact Pad Surface Finish	Gold over nickel on ceramic substrate

Environment Performance Specifications

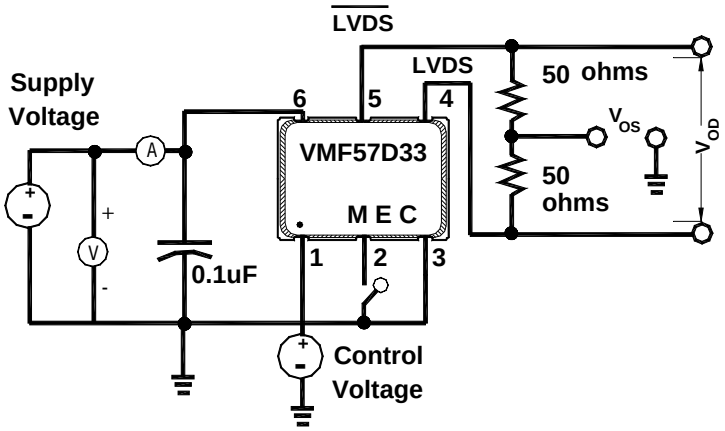
Green Requirement	RoHS compliant, Pb (lead) free
Humidity	85% RH, 85°C, 48 hours
Hermeticity	Leak rate $2x10^{-8}$ ATM-cm^3/sec max. Crystal part only.
Solderability	MIL-STD-202F method 208E
Vibration	MIL-STD-202F method 204, 35G, 50 to 2000 Hz
Shock	MIL-STD-202F method 213B, test condi. E, 1000GG ½ sine wave
Storage temp. range	-55 to +125°C

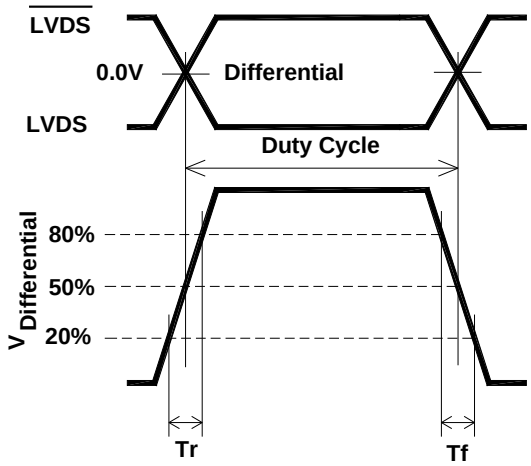
Part Number Format and Example:

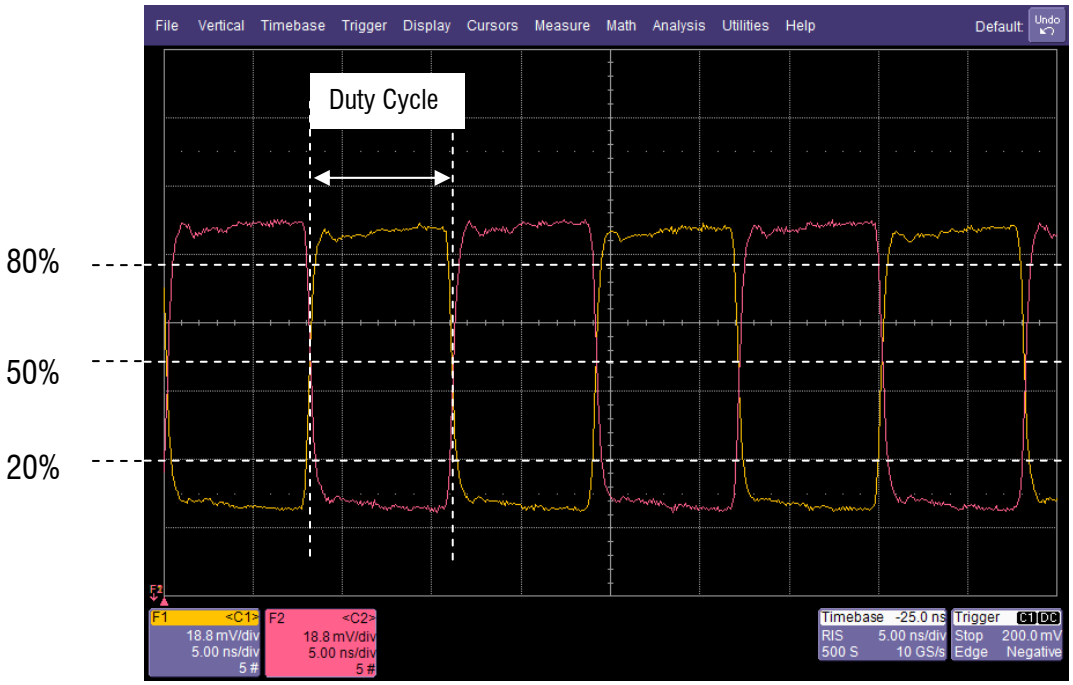
Part number example:				VMW57D33-80.000-2.5/-30+75						✍= Please specify		
						✍		✍		✍		
VM	**W**	**57**	**D**	**33**	—	**80.000**	—	**2.5**	/	**-30+75**		
❶	❷	❸	❹	❺		❻		❼		❽		

❶: **"VM"** for VCTCXO; **"M"** for TCXO
❷**"W"**: W family performance
❸**"57"**: 5x7 mm SMD;
❹: **"D"** for LVDS output;
❺ **"33"**: for +3.3 V;
❻: Frequency in MHz
❼: Frequency stability in ppm;
❽: Operating Temperature range in °C

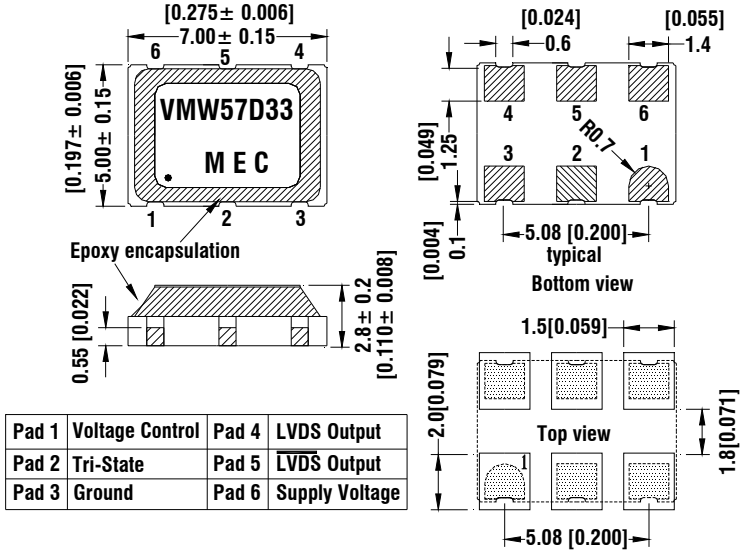
VMW57D33 VCTCXO Test Circuit and Waveform:







Package Dimensions and Suggested Land Pattern: Unit: mm



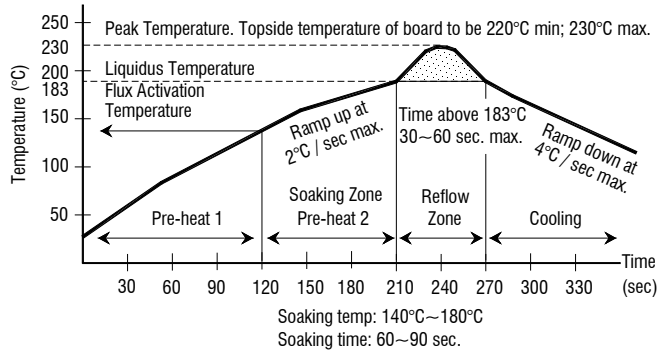
Pad 1	Voltage Control	Pad 4	LVDS Output
Pad 2	Tri-State	Pad 5	$\overline{\text{LVDS}}$ Output
Pad 3	Ground	Pad 6	Supply Voltage

Rounded pad is pad No. 1. Count counter-clockwise when looking at top view.
Count clockwise when looking at bottom view. 0.01 uF decoupling capacitor is built-in.

Recommended Solder Reflow Profiles

245°C liquidus 221°C solidus solder alloy is used in the assembly of VMW57D products.
Do not exceed the reflow conditions given below.

Profile A (low temperature solder reflow): For Sn62 Pb36 Ag2 and Sn63 Pb37 alloy.



Profile B (high temperature solder reflow): For Sn96.5% Ag 3.5% Cu 0.5% alloy.