

- 0.8ps phase jitter
- Quick turnaround, low-cost TCXO
- Standard 7.0 x 5.0 x 2.5mm SMD package
- Supply voltage 2.5V or 3.3 VDC
- Frequency stability from $\pm 1\text{ppm}$ over -40 to $+85^\circ\text{C}$



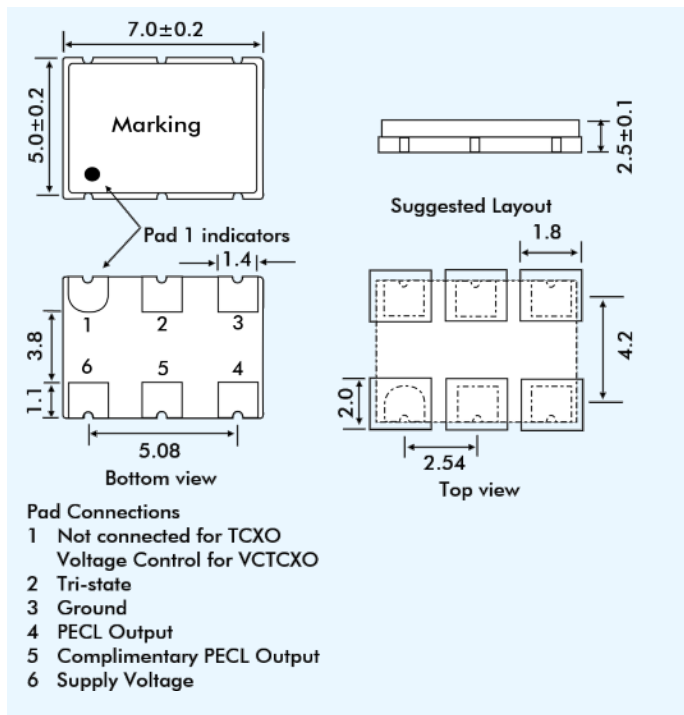
DESCRIPTION

(V)EMQN576D series TCXOs are packaged in a standard, 7 x 5 x 2.5mm outline, ceramic SMD package. With LVDS output, tolerances are available from $\pm 1.0\text{ppm}$ over -40° to $+85^\circ\text{C}$. The part exhibits low supply current, 25mA typ. at 50MHz.

SPECIFICATION

Product Series Code	TCXO: EMQN576D VCTCXO: VEMQN576D
Frequency Range:	10.0MHz to 1450MHz
Output Load:	100 Ω
Output Waveform:	LVPECL
Supply Voltage:	+2.5VDC $\pm 5\%$ or +3.3Volts $\pm 5\%$
Output High Voltage V_{OH} :	V_{DD} 1.4V typical V_{DD} 1.6V maximum
Output Low Voltage V_{OL} :	V_{DD} 1.1V typical V_{DD} 0.9V minimum
Initial Calibration Tolerance:	$< \pm 2.0\text{ppm}$ at $+25^\circ \pm 2^\circ\text{C}$
Operating Temperature Range:	from $0^\circ \sim 50^\circ$ to $-40^\circ \sim +85^\circ\text{C}$
Frequency Stability vs. Temperature:	-30° to $+85^\circ\text{C}$: $\pm 2.5\text{ppm}$ standard $\pm 1.0\text{ppm}$ available -40° to $+85^\circ\text{C}$: $\pm 2.5\text{ppm}$ standard $\pm 1.0\text{ppm}$ available
vs. Ageing:	$\pm 1.0\text{ppm}$ max. per year 25°C
vs. Voltage Change:	$\pm 0.2\text{ppm}$ max. $\pm 5\%$ change
vs. Load Change:	$\pm 0.2\text{ppm}$ max. $\pm 10\%$ change
vs. Reflow (SMD type):	$\pm 1.0\text{ppm}$ max. for one reflow (measured after 24 hours)
Duty Cycle:	50% $\pm 5\%$ standard
Rise/Fall Times:	0.2ns typ. 0.5ns max. (20% to 80% waveform)
Current Consumption $V_{DD} + 2.5V$	
at 156MHz:	22mA typical
at 600MHz:	28mA typical
at 800MHz:	30mA typical
at 1GHz:	34mA typical
Current Consumption $V_{DD} + 3.3V$	
at 156MHz:	25mA typical
at 600MHz:	30mA typical
at 800MHz:	32mA typical
at 1GHz:	36mA typical
Current when disabled:	18mA typical
Start-up Time:	5ms max.

EMQN576D - OUTLINES AND DIMENSIONS



VEMQN576D VOLTAGE CONTROL SPECIFICATION

Control Voltage Centre & Range:	$\pm 1.5V \pm 1.0V$ for both 2.5V and 3.3V operation
Frequency Pulling Range:	$\pm 8\text{ppm}$ min.
Linearity:	$\pm 1\%$ typical $\pm 10\%$ max.
Slope Polarity:	Positive transfer
Absolute Voltage:	4.0V max.
Input Impedance:	770k Ω typical
Harmonics:	-5.0dBc max.

PART NUMBERS

Example: **EMQN576D33-50.000-2.5/-30+85**

Series Description
TCXO = EMQN576P
VCTCXO = VEMQN576P

Supply Voltage
3.3V = 33
2.5V = 25

Frequency (MHz)

Stability over OTR ($\pm\text{ppm}$)

Operating Temperature Range (OTR) ($^\circ\text{C}$)
(Lower and upper limits.)

OUTPUT ENABLE FUNCTION

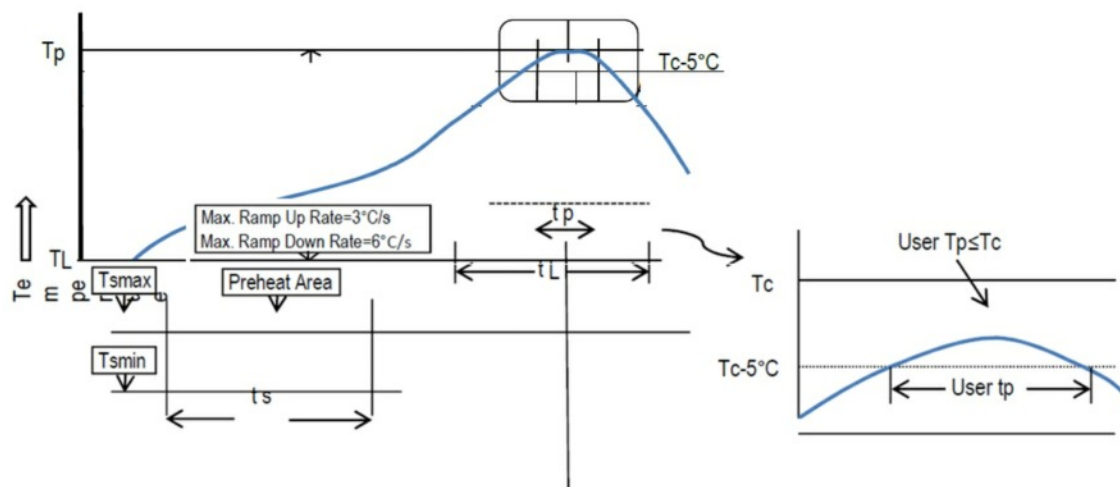
OE Control	Enable:	0.9% Vdd minimum or no connection to enable output
	Disable:	0.1%Vdd maximum to disable output (high impedance)
Output Enable Time:		200ns max.
Output Disable Time:		50ns max.

ENVIRONMENTAL PERFORMANCE SPECIFICATIONS

Status:	RoHS Compliant, Pb (lead) free in accordance with EU Directive 2002/95/EC 6/6(2002/95/EC) and WEEE (2002/96/EC)
Moisture Sensitivity:	Level 1 (infinite) according to IPC/JEDEC J-STD-020D.1
Second Level Interconnect:	e4
Storage Temperature Range:	-55° to +125°C
Humidity:	85%RH, 85°C, 48 hours
Fine Leak / Gross Leak:	MIL-STD-202F method 1014, condition A / MIL-STD-883, method 1014, condition C
Solderability:	MIL-STD-202F method 208E
Reflow:	260°C for 10s, x2
Vibration:	MIL-STD-202F method 204, 35g, 50 to 2000Hz
Shock:	MIL-STD-202F method 2133B, test condition E, 1000g ² ½ sinewave
Resistant to Solvents:	MIL-STD-202F method 215
Temperature Cycling:	MIL-STD-883 method 1010
ESD Rating:	Human Body Model (HBM): 1500V min.
Pad Surface Finish:	Gold (Au) 0.3µm to 1.0µm over nickel (N) 1.27µm to 8.89µm
Weight of device:	0.045gm typical

RECOMMENDED SOLDER REFLOW PROFILE

Per IPC/JEDEC J-STD-020D.1



Profile Feature	SN-Pb Eutectic Assembly	PB-Free Assembly
Preheat/Soak - Temperature min. (Ts min.) - Temperature max. (Ts max.) - Time (Ts (Ts min. to Tz max.))	100°C 150°C 60 to 120 seconds	150° 200° 60 to 120 seconds
Ramp-up Rate (TL to Tp)	3°C/sec. max.	3°C/sec. max.
Liquidous Temperature (TL) Time (TL) maintained above TL	183°C 60 to 150 seconds	217°C 60 to 150 seconds
Peak package body temperature (Tp)	235°C	260°C
Time (Tp) within 5°C of the classification temperature Tc	10 to 30 seconds	20 to 40 seconds
Ramp-down rate (Tp to TL)	6°/second max.	6°/second max.
Time 25°C to peak temperature	6 minutes max.	8 minutes max.

All temperatures refer to topside of the package, measured on the package body surface.

SSB PHASE NOISE at 25°C

SSB Phase Noise Data (dBc/Hz Typical)	Frequency (MHz)	96.000	192.000	800.000	1200.000
	10Hz offset	-71	-93	-47	-51
	100Hz offset	-96	-91	-80	-76
	1kHz offset	-114	-108	-96	-92
	10kHz offset	-124	-119	-105	-100
	100kHz offset	-127	-122	-108	-103
	1MHz offset	-134	-128	-116	-111
	5MHz offset	-153	-151	-139	-133
	10MHz offset	-154	-153	-143	-138
	20MHz offset	-156	-152	-146	-144
Phase Jitter ps (12kHz - 20MHz, rms)		0.85	0.77	0.81	0.96

PHASE NOISE PLOT OF VMQF576P33-125.00MHz

VDD = +3.3V, Vcontrol = 0.0V

