EMQN576P

LVPECL TCXO 7 x 5mm SMD — 10MHz to 1450MHz

- **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 ±1ppm over -40 to +85°C**

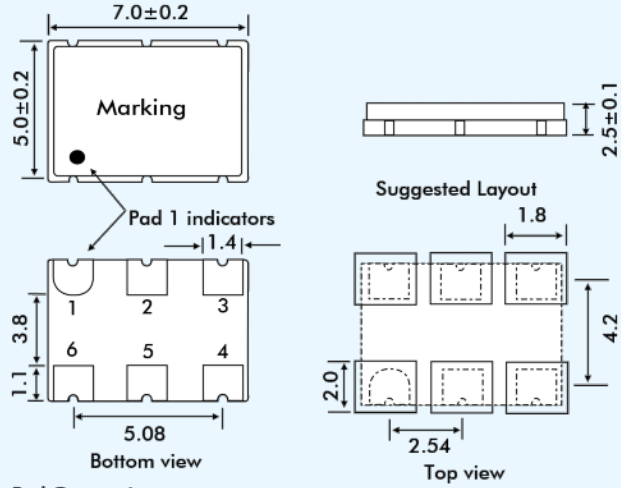
DESCRIPTION

(V)EMQN576P series TCXOs are packaged in a standard, 7 x 5 x 2.5mm outline, ceramic SMD package. With LVPECL output, tolerances are available from ±1.0ppm over -40° to +85°C. The part exhibits low supply current, 25mA typ. at 50MHz.

SPECIFICATION

Product Series Code	
TCXO:	EMQN576P
VCTCXO:	VEMQN57P
Frequency Range:	10.0MHz to 1450MHz
Output Load:	50Ω into Vcc-2V or Thevenin equivalent
Output Waveform:	LVPECL
Supply Voltage:	+2.5VDC±5% or +3.3Volts ±5%
Output High Voltage V_{OH}:	V_{DD} -1.03V min. V_{DD} -0.6V max.
Output Low Voltage V_{OL}:	V_{DD} -1.85V min. V_{DD} -1.6V max.
Initial Calibration Tolerance:	<±2.0ppm at +25°±2°C
Operating Temperature Range:	from 0°~50° to -40°~+85°C
Frequency Stability	
vs. Temperature:	
-30° to +85°C:	±2.5ppm standard ±1.0ppm available
-40° to +85°C:	±2.5ppm standard ±1.0ppm available
vs. Ageing:	±1.0 ppm max. per year 25°C
vs. Voltage Change:	±0.2 ppm max. ±5% change
vs. Load Change:	±0.2 ppm max. ±10% change
vs. Reflow (SMD type):	±1.0ppm max. for one reflow *(measured after 24 hours)*
Duty Cycle:	50%±5% standard
Rise/Fall Times:	0.2ns typ. 0.5ns max. (20% to 80% waveform)
Current Consumption V_{DD} +2.5V	
at 156MHz:	36mA typical
at 600MHz:	40mA typical
at 800MHz:	46mA typical
at 1GHz:	50mA typical
Current Consumption V_{DD} +3.3V	
at 156MHz:	40mA typical
at 600MHz:	45mA typical
at 800MHz:	48mA typical
at 1GHz:	52mA typical
Current when disabled:	18mA typical
Start-up Time:	5ms max.

EMQN576P - OUTLINES AND DIMENSIONS



Pad Connections
1 Not connected for TCXO
Voltage Control for VCTCXO
2 Tri-state
3 Ground
4 PECL Output
5 Complimentary PECL Output
6 Supply Voltage

VEMQN576P VOLTAGE CONTROL SPECIFICATION

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

PART NUMBERS

Example: **_EMQN576P33-50.000-2.5/-30+85**

Series Description
TCXO = EMQN576P
VCTCXO = VEMQN576P

Supply Voltage
3.3V = 33
2.5V = 25

Frequency (MHz)

Stability over OTR (±ppm)

Operating Temperature Range (OTR) (°C)
(*Lower and upper limits.*)

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OUTPUT ENABLE FUNCTION

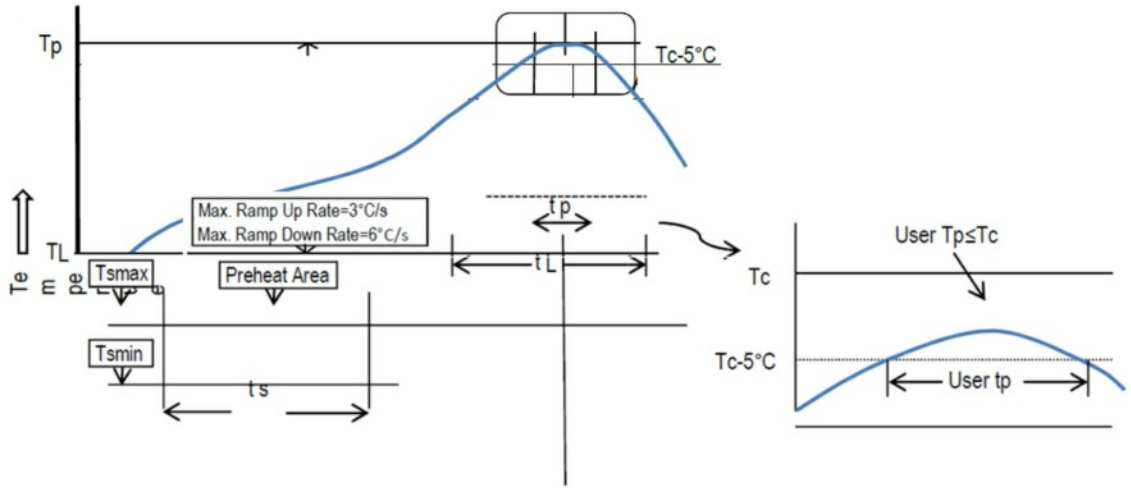
OE Control	Enable:	0.9% Vdd minimum or no connection to enable output
	Disable:	0.1%Vdd maximum to disable output (high impedance)
Output Enable Time:		200ns max.
Output Disable Time:		50ns max.

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, 1000g² 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.

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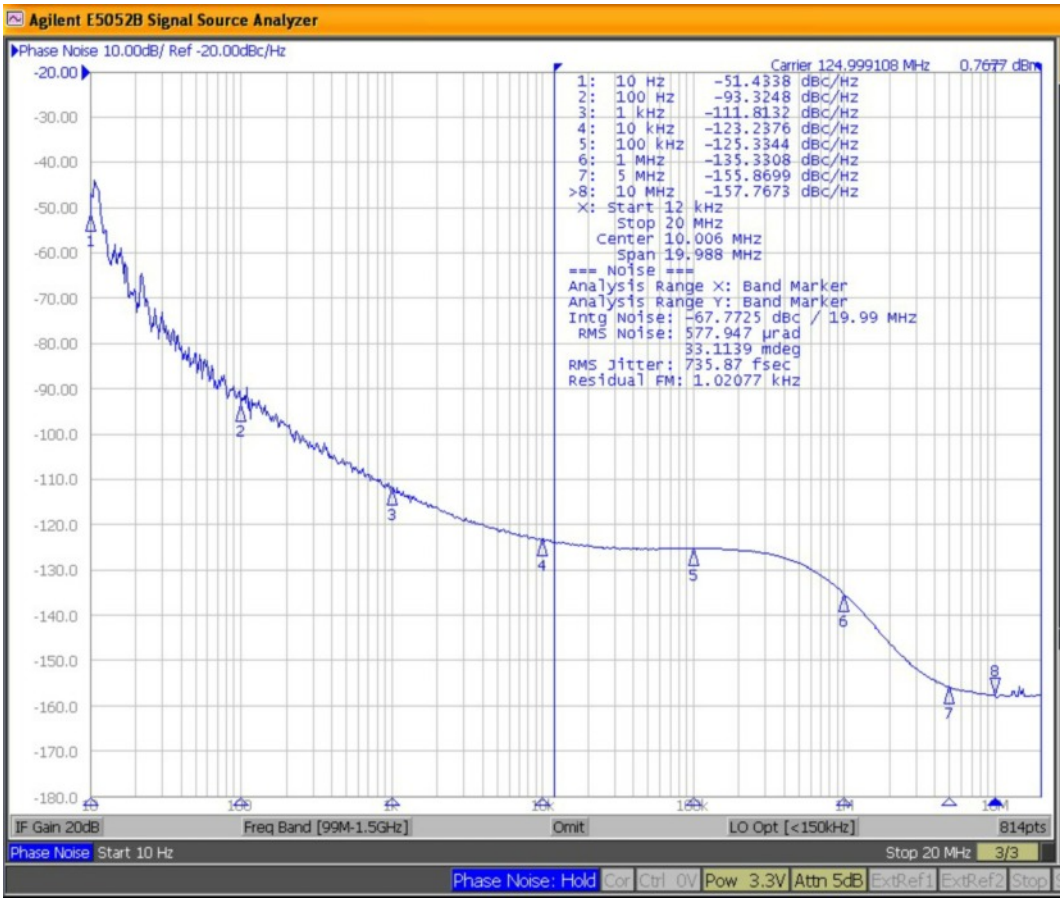
SSB PHASE NOISE at 25°C

	Frequency (MHz)	96.000	192.000	800.000	1200.000
SSB Phase Noise Data (dBc/Hz Typical)	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



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