

- 1.0pS RMS integrated 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  $\pm 1$ ppm over  $-40$  to  $+85^{\circ}\text{C}$


**DESCRIPTION**

(V)EMQF576 series TCXOs are packaged in a 7.0 x 5.0mm SMD format, available with 6 pad LVPECL or LVDS complementary outputs. With characteristic low current consumption, an integrated phase jitter performance of 1.0 pS RMS and a quick delivery time, these provide an excellent solution for both prototypes and low-cost volume production.

**GENERAL SPECIFICATION**

Output Logic Type	LVPECL	LVDS
Frequency Range	10 ~ 1500MHz	10 ~ 1500MHz
Load	50 $\Omega$ into $V_{DD}-2V$ or Thevenin equiv	100 $\Omega$
Output 'HIGH' Voltage	$V_{DD} - 1.03V$ min. $V_{DD} - 0.6V$ max.	$V_{DD} : 1.4V$ typical $V_{DD} : 1.6V$ max.
Output 'LOW' Voltage	$V_{DD} - 1.85V$ min. $V_{DD} - 1.6V$ max.	$V_{DD} : 1.1V$ typical $V_{DD} : 0.9V$ min
Rise Time ( $T_r$ )/ Fall Time ( $t_f$ )	0.2ns typ. 0.5ns max. (20% ~ 80% waveform)	0.2ns typ. 0.4ns max. (20% ~ 80% waveform)
Current Consumption $V_{DD} = +2.5V$	156MHz: 36mA typ. 600MHz: 40mA typ. 800MHz: 46mA typ. 1GHz: 50mA typ.	156MHz: 22mA typ. 600MHz: 28mA typ. 800MHz: 30mA typ. 1GHz: 34mA typ.
Current Consumption $V_{DD} = +3.3V$	156MHz: 40mA typ. 600MHz: 45mA typ. 800MHz: 48mA typ. 1GHz: 52mA typ.	156MHz: 25mA typ. 600MHz: 30mA typ. 800MHz: 32mA typ. 1GHz: 36mA typ.
Current with Output Disabled	18mA	
Initial Calibration Tolerance	$\pm 2.0$ ppm max at ambient $T = +25^{\circ}\pm 2^{\circ}\text{C}$	
Power Supply Voltage	$V_{DD} = +2.5VDC \pm 5\%$ (voltage code '25') or $+3.3VDC \pm 5\%$ (Voltage code '3')	
Start-up Time:	5ms max.	
Phase Jitter RMS: (12KHz ~ 20MHz)	1.5ps typ.	
Ageing at $T_a = +25^{\circ}\text{C}$	$\pm 2$ ppm max. At $+25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ (at shipment)	
Duty Cycle	50% $\pm 5\%$	
Frequency Stability vs. Temperature (examples)	$-30^{\circ}$ to $+85^{\circ}\text{C}$	$\pm 2.5$ ppm standard
	$-40^{\circ}$ to $+85^{\circ}\text{C}$	$\pm 1.0$ ppm available
	vs. Ageing	$\pm 1.0$ ppm max per year at $25^{\circ}\text{C}$
	vs. Voltage	$\pm 0.2$ ppm max for a 5% input voltage change
	vs. Load	$\pm 0.2$ ppm max for a 10% load condition change
	vs. Reflow	$\pm 1.0$ ppm max for 1 reflow, measured after 24 hours

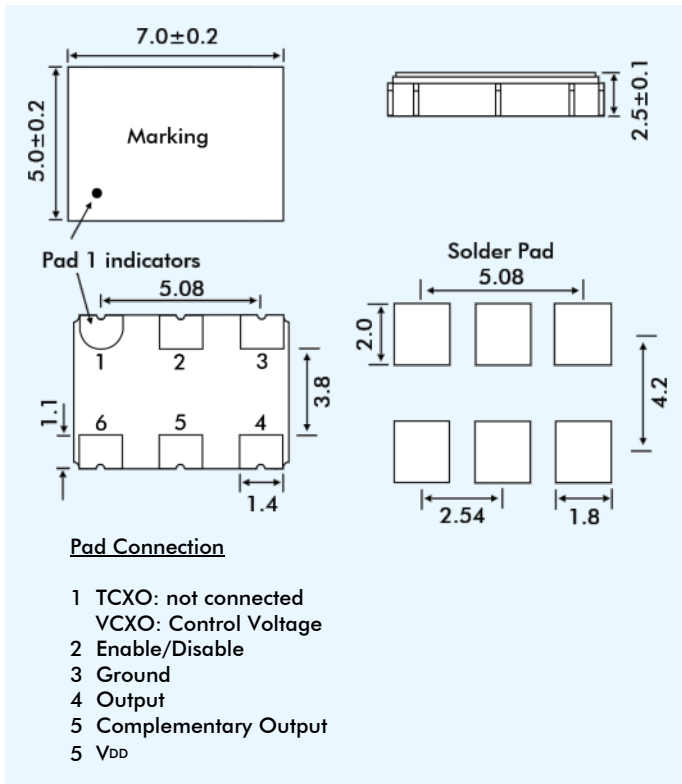
**VOLTAGE CONTROL FUNCTION**

Control Voltage Centre & Range:	$+1.5V \pm 1.0V$ for both $V_{DD}$ , 2.5V & 3.3V
Frequency Pulling Range:	$\pm 8$ ppm min.
Linearity:	$\pm 1\%$ typ, $\pm 10\%$ max.
Transfer Function:	Positive transfer
Absolute Voltage:	4.0V max.
Input Impedance:	770k $\Omega$
Harmonics:	-5.0dBc max.

**ENVIRONMENTAL PERFORMANCE SPECIFICATIONS**

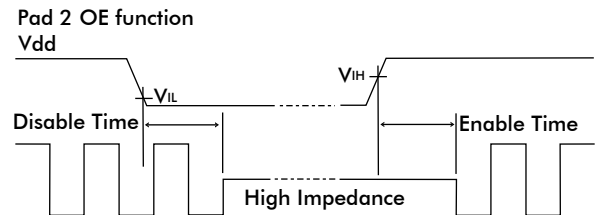
Status:	RoHS Compliant, Pb (lead) free in accordance with EU Directive 2002/95/EC 6/6(2002/95/EC) and WEEE (2002/96/EC)
Moisture Sensitivity:	Level 1 (infinite) according to IPC/JEDEC J-STD-020D.1
Second Level Interconnect:	e4
Storage Temperature Range:	-55° to +125°C
Humidity:	85%RH, 85°C, 48 hours
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 <sup>2</sup> 1/2 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

**EMQF576 - OUTLINES AND DIMENSIONS**



**Output Enable Function**

OE Control to enable/disable output:	0.9% of V <sub>DD</sub> min or no connection 0.1% of V <sub>DD</sub> max to disable
Output Enable Time:	200ns max.
Output Disable Time:	50ns max.



**PART NUMBERS**

Example:

**EMQF576P33-50.000-2.5/-30+75**

- Series Description  
TCXO = EMQF576  
VCTCXO = VEMQF576
- Output Type  
P = LVPECL  
D = LVDS
- Supply Voltage  
3.3V = 33  
2.5V = 25
- Frequency (MHz)
- Stability over OTR (±ppm)
- Operating Temperature Range (OTR) (°C)  
(Lower and upper limits.)

**SSB PHASE NOISE at 25°C**

SSB Phase Noise Data (dBc/Hz Typical)	Frequency	156.25 MHz	212.50 MHz
	10Hz Offset	-65	-61
	100Hz Offset	-92	-90
	1kHz Offset	-108	-106
	10kHz Offset	-114	-110
	100kHz Offset	-117	-112
	1MHz Offset	-139	-133
	10MHz Offset	-147	-142
Phase Jitter (12kHz ~ 20MHz, RMS)		0.9ps	1.2ps