

- Highly stable CMOS TCXO with ultra-low supply current
- Industry-standard package
- Consumes less than 4mA at 20.0MHz with 3.3V supply
- Low phase noise
- RoHS compliant



DESCRIPTION

EM38K TCXOs and VCTCXOs are packaged in a 14 pin DIL compatible package. The part offers the stability of a TCXO and the design convenience of HCMOS output with ultra-low current consumption.

SPECIFICATION

Product Code	TCXO:	EM38K
	VCTCXO:	VEM38K
Frequency Range:	12.8MHz to 26.0MHz	
Output Waveform:	HCMOS	
Initial Calibration Tolerance:	± 2.0 ppm at $+25^{\circ}\pm 2^{\circ}\text{C}$	
Standard Frequencies:	12.8, 13.0, 14.4, 15.36, 16.0, 16.384, 16.8, 19.2, 19.44, 19.68, 20.0 and 26.0MHz (Partial list.)	
Operating Temperature Range:	See table	
Frequency Stability	See table	
vs. Temperature	± 1.0 ppm max. first year	
vs. Ageing:	± 1.0 ppm max. $\pm 10\%$ change	
vs. Voltage Change:	± 0.3 ppm max. $\pm 10\%$ change	
vs. Load Change:	± 1.0 ppm max. for one reflow (Measured after 24 hours)	
vs. Reflow (SMD type):	$\pm 2.8, 3.0$ or 3.3 Volts	
Supply Voltage:	See table	
Current Consumption:	See table	
Output Logic Levels:	See table	
Rise and Fall Times:	4ns typical with 15pF load	
Duty Cycle:	$50\% \pm 5\%$	
Start-up Time:	5ms typical, 10ms max.	
Output Load:	15pF	
Fanout (drive capability):	12mA typical, 17mA max. (at TTL level)	
RMS Period Jitter:	3ps max. (1 Sigma, 1000 samples; capacitive coupling between Vdd and Ground).	
RoHS Status:	RoHS compliant and pB free	
Packaging:	16mm tape, 8mm pitch	
	1000 pieces per reel.	

CURRENT CONSUMPTION

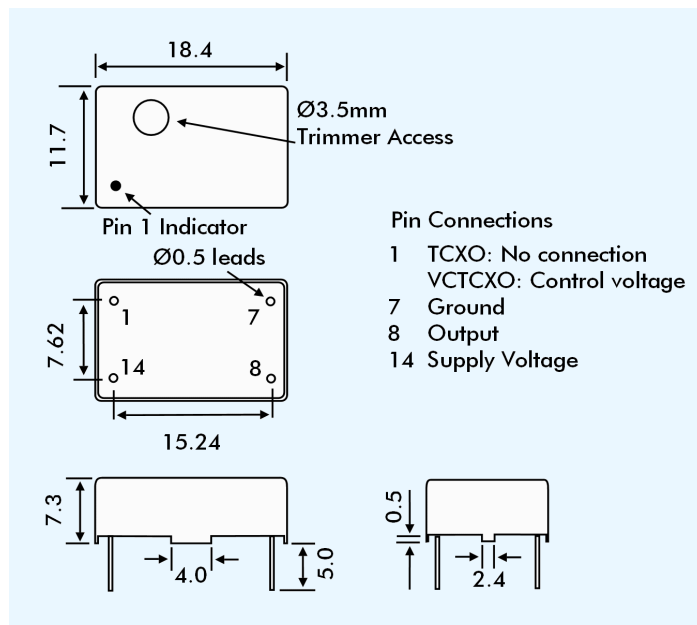
Frequency	Input Voltage		
	+2.8V	+3.0V	+3.3V
12.800MHz	2.3mA typ.	2.4mA typ.	2.6mA typ.
13.000MHz	2.5mA typ.	2.6mA typ.	2.8mA typ.
14.400MHz	2.6mA typ.	2.8mA typ.	3.1mA typ.
16.384MHz	2.8mA typ.	3.0mA typ.	3.2mA typ.
19.200MHz	3.2mA typ.	3.3mA typ.	3.6mA typ.
19.440MHz	3.2mA typ.	3.4mA typ.	3.7mA typ.
20.000MHz	3.2mA typ.	3.4mA typ.	3.7mA typ.
26.000MHz	3.6mA typ.	3.8mA typ.	4.1mA typ.

FREQUENCY STABILITY OVER TEMPERATURE

Stability (ppm)		± 1.0	± 2.0	± 2.5	± 3.0	± 4.0	± 5.0
Temp. Range ($^{\circ}\text{C}$)	0 ~ +50	✓	✓	✓	✓	✓	✓
	-10 ~ +60	ASK	✓	✓	✓	✓	✓
	-20 ~ +70	X	✓	✓	✓	✓	✓
	-30 ~ +75	X	✓	✓	✓	✓	✓
	-40 ~ +85	X	X	X	ASK	ASK	✓

✓ = available, x = not available, ASK = call Technical Sales

OUTLINES AND DIMENSIONS



VEM38K VOLTAGE CONTROL SPECIFICATION

Control Voltage:	± 5 to ± 12 ppm for $+1.5 \pm 1.5$ Volts
Slope Polarity:	Positive (increase of control voltage increases output frequency.)
Linearity:	6% typical, 10% maximum

SSB PHASE NOISE at 25°C

Offset	100Hz	1kHz	10kHz	100kHz	1MHz
Part = VEM38K30 at 13.000MHz (dBc/Hz)	-80	-110	-130	-135	-142

PART NUMBER FORMAT

Example:

Series Description
TCXO = EM38K
VCTCXO = VEM38K

Supply Voltage

28=2.8V, 30=3.0V, 33=3.3VDC

Frequency (MHz)

Stability over OTR ($\pm$ ppm)

Operating Temperature Range (OTR)

Lower and upper limits ($^{\circ}\text{C}$)

EM38K33-20.000-2.5/-30+75