

- Micro-miniature SMD package 5 x 3.2mm
- Stability from  $\pm 1$ ppm over  $-30^{\circ}$  to  $+75^{\circ}$ C
- Supply Voltage from 2.3 Volts to 5.5 Volts
- Produced as TCXO or VCTCXO with EFC
- Readily customized



### DESCRIPTION

EM53 series TCXOs are ceramic SMD TCXOs packaged in an industry-standard, micro-miniature 5 x 3.2mm package. This TCXO can be run from a supply voltage of 2.3 to 5.5 Volts. Close tolerances from  $\pm 1$ ppm over  $-30^{\circ}$  to  $+75^{\circ}$ C are available. The part can be produced as either a standard TCXO or a voltage-controlled TCXO (VCTCXO).

### SPECIFICATION

Product Series Code	TCXO: EM53S VCTCXO: VEM53S
Frequency Range:	6.4MHz to 40.0MHz
Output Waveform:	Clipped Sinewave
Initial Calibration Tolerance*:	$< \pm 1$ ppm at $25^{\circ}$ C
Standard Frequencies:	10.0, 12.80, 13.0, 14.40, 15.36, 16.384, 19.2, 19.440, and 19.68MHz (Partial list)
Operating Temperature Range:	See table
Frequency Stability	
vs. Ageing:	$\pm 1.0$ ppm max. first year
vs. Voltage Change:	$\pm 0.3$ ppm max. $\pm 5\%$ change
vs. Load Change:	$\pm 0.3$ ppm max. $\pm 10\%$ change
vs. Reflow:	$\pm 1$ ppm max. for one reflow (Measured after 24 hours)
Supply Voltage:	+2.8, +3.0, 3.3 or +5.0Volts (Specify when ordering)
Output Voltage Level:	0.8V p-p minimum
Start-up Time:	2ms typical, 5ms max.
Current Consumption:	See table below
Output Load:	10k $\Omega$ /10pF $\pm 10\%$
Harmonic Distortion:	-10dB typical, -7dB max.
SSB Phase Noise:	See table
Output Format:	DC coupled. Requires an external AC coupling capacitor at pin 3. 1000 pF recommended
Storage Temperature:	$-50^{\circ}$ to $+100^{\circ}$ C

\* Stability over temperature is measured from this initial frequency.

### FREQUENCY STABILITY

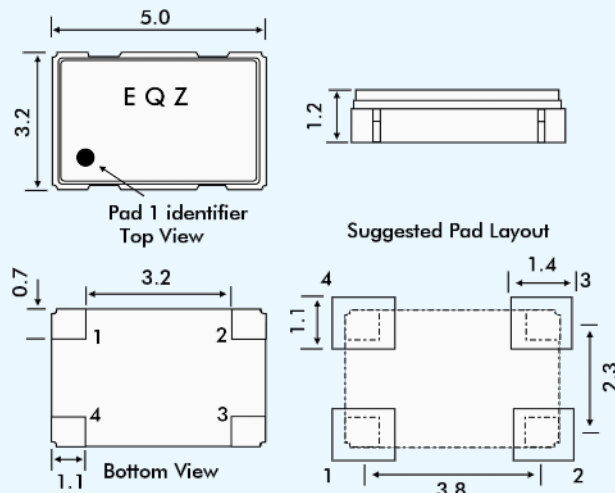
Frequency Stability (ppm)		$\pm 0.5$	$\pm 1.0$	$\pm 1.5$	$\pm 2.0$	$\pm 2.5$
Temperature Range ( $^{\circ}$ C)	0 ~ +50	✓	✓	✓	✓	✓
	-10 ~ +60	ASK	✓	✓	✓	✓
	-20 ~ +70	x	✓	✓	✓	✓
	-30 ~ +75	x	✓	✓	✓	✓
	-40 ~ +85	x	✓	✓	✓	✓

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

### CURRENT CONSUMPTION

Supply Voltage		Max Current
Frequency Range	10.0 to 15MHz	1.5mA
	15.01 to 26MHz	2.0mA
	26.01 to 40MHz	2.5mA

### EM53S - OUTLINES AND DIMENSIONS



#### Pad Connections

- 1 Not connected or Voltage Control for VCTCXO
- 2 Ground
- 3 Output
- 4 Supply Voltage

### VEM53S VOLTAGE CONTROL SPECIFICATION

Control Voltage:	Standard = $+1.5 \pm 1.0$ Volts for all input voltages. (Contact technical sales if $+2.5 \pm 2.0$ Volts is required.)
Frequency Deviation:	$\pm 6.0$ ppm min.
Slope Polarity:	Positive (increase of control voltage increases output frequency.)
Input Impedance:	1.0M $\Omega$ min.
Modulation Bandwidth:	3.0kHz min. measured at -3dB

### PHASE NOISE

SSB Phase Noise at $25^{\circ}$ C	Offset (Hz)	10	100	1k	10k	100k
	EM53S 13MHz (dBc/Hz)		-80	-115	-135	-148

### PART NUMBERING PROCEDURE

Example: **EM53S 3 - 19.44 - 2.5/-30+75**

Series Description: EM53S  
 TCXO = EM53S  
 VCTCXO = VEM53S

Supply Voltage:  
 28 = 2.8 VDC  
 3 = 3.0 VDC  
 33 = 3.3 VDC  
 5 = 5.0 VDC

Frequency (MHz): 19.44  
 Stability over OTR ( $\pm$ ppm): 2.5  
 Operating Temperature Range (OTR) ( $^{\circ}$ C): -30 to +75  
 Lower and upper limits.