

## Clipped Sinewave, 4 Pad FR4 substrate SMD

- Industry-standard SMD package 11.4 x 9.6 x 2.5mm
- Close tolerance stabilities from  $\pm 0.5\text{ppm}$  over  $0^\circ$  to  $+50^\circ\text{C}$
- $\pm 1\text{ppm}$  over  $-40$  to  $+85^\circ\text{C}$
- Low power consumption

### DESCRIPTION

EM42S series TCXOs are packaged in the industry-standard 11.4 x 9.6 x 2.5mm SMD package. With clipped sinewave output, close tolerances are available from  $\pm 0.5\text{ppm}$  over  $0^\circ$  to  $50^\circ\text{C}$  or  $\pm 1\text{ppm}$  over  $-40^\circ$  to  $+85^\circ\text{C}$ . The part has low power consumption.

### SPECIFICATION

|                                  |                                                                                    |
|----------------------------------|------------------------------------------------------------------------------------|
| Product Series Code              | TCXO: EM42S<br>VCTCXO: VEM42S                                                      |
| Frequency Range:                 | 10.0MHz to 27.0MHz                                                                 |
| Output Waveform:                 | Clipped Sinewave                                                                   |
| Initial Calibration Tolerance**: | $\leq \pm 1\text{ppm}$ at $25^\circ\text{C}$                                       |
| 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:                      | $\pm 1.0\text{ ppm max. first year}$                                               |
| vs. Voltage Change:              | $\pm 0.3\text{ ppm max. } \pm 5\% \text{ change}$                                  |
| vs. Load Change:                 | $\pm 0.3\text{ ppm max. } \pm 10\% \text{ change}$                                 |
| vs. Reflow:                      | $\pm 1\text{ppm max. for one reflow (Measured after 24 hours)}$                    |
| Supply Voltage:                  | $+2.8, +3.0$ or $+5.0\text{Volts}$<br>(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:                     | 10kOhm//10pF $\pm 10\%$                                                            |
| Harmonic Distortion:             | -10dB typical, -7dB max.                                                           |
| SSB Phase Noise:                 | See table                                                                          |
| Output Format:                   | DC block, AC coupled                                                               |
| Storage Temperature:             | $-50^\circ$ to $+100^\circ\text{C}$                                                |

### FREQUENCY STABILITY

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

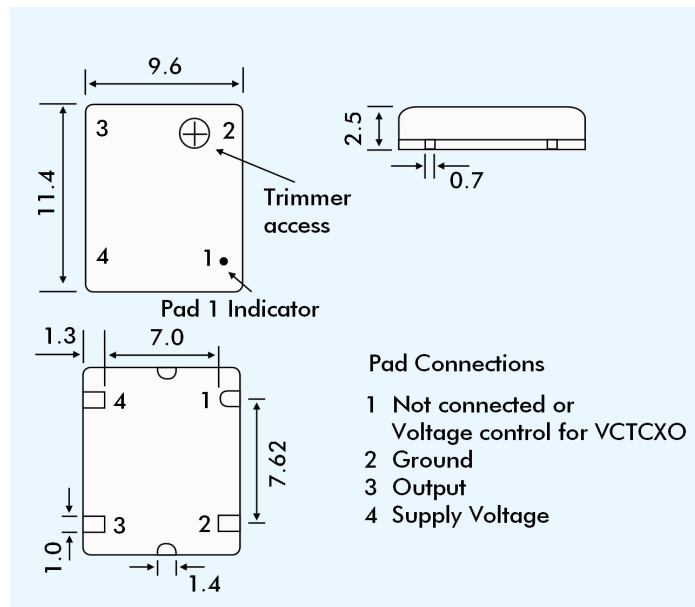
✓ = available, x = not available, ASK = call Technical Sales

### CURRENT CONSUMPTION

| Frequency Range  | +3.0 V | +5.0 V |
|------------------|--------|--------|
| 10.0MHz to 13MHz | 1.3mA  | 2.0mA  |
| 13.1MHz to 20MHz | 1.5mA  | 2.2mA  |
| 20.1MHz to 27MHz | 2.0mA  | 2.5mA  |



### EM42S - OUTLINES AND DIMENSIONS



### VEM42S VOLTAGE CONTROL SPECIFICATION

|                       |                                                                                                                                     |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Control Voltage:      | Standard = $+1.5 \pm 1.0\text{Volts}$ for all input voltages. (Contact technical sales if $+2.5 \pm 2.0\text{ Volts}$ is required.) |
| Frequency Deviation:  | $\pm 6.0\text{ ppm min.}$                                                                                                           |
| Slope Polarity:       | Positive (increase of control voltage increases output frequency.)                                                                  |
| Input Impedance:      | 1.0M $\Omega$ min.                                                                                                                  |
| Modulation Bandwidth: | 3.0kHz min. measured at -3dB                                                                                                        |
| Linearity:            | 10% max.                                                                                                                            |

### PHASE NOISE

| SSB Phase Noise at $25^\circ\text{C}$ | Offset (Hz)          | 10  | 100  | 1k   | 10k  | 100k |
|---------------------------------------|----------------------|-----|------|------|------|------|
|                                       | EM42S 13MHz (dBc/Hz) | -80 | -115 | -135 | -148 | -150 |

### PART NUMBERING PROCEDURE

Example: **EM42S3-19.44-2.5/-30+75**

Series Description  
 TCXO = EM42S  
 VCTCXO = VEM42S

Supply Voltage  
 28 = 2.8 VDC  
 3 = 3.0 VDC  
 5 = 5.0 VDC

Frequency (MHz)  
 Stability over OTR ( $\pm\text{ppm}$ )  
 Operating Temperature Range (OTR) ( $^\circ\text{C}$ )  
 Lower and upper limits.