

**REV B.**
**VS2 SERIES: VCXO OSCILLATOR, HCMOS, +5.0 VDC, 7x5mm Package**

**DESCRIPTION:** A crystal controlled, high frequency, highly stable, voltage controlled oscillator, adhering to HCMOS Standards. The output can be Tri-stated to facilitate testing or combined multiple clocks. The device is contained in a sub-miniature, very low profile, leadless ceramic SMD package with 6 gold contact pads. This miniature oscillator is ideal for today's automated assembly environments.

**APPLICATIONS AND FEATURES:**

- **Common Frequencies:** 16.384 MHz; 19.44 MHz; 27 MHz; 38.88 MHz; 51.84 MHz;
- **+5.0 VDC HCMOS**
- **Frequency Range from 1 to 51.84 MHz**
- **Miniature Ceramic SMD Package Available on Tape and Reel**
- **Lead Free**

**ELECTRICAL PARAMETERS:**

| PARAMETER                                  | SYMBOL     | TEST CONDITIONS <sup>*1</sup>                      | VALUE                            | UNIT       |
|--------------------------------------------|------------|----------------------------------------------------|----------------------------------|------------|
| Nominal Frequency                          | fo         |                                                    | 1.000 ~ 51.840                   | MHz        |
| Supply Voltage                             | Vcc        |                                                    | +5.0 ±10%                        | VDC        |
| Supply Current MAX                         | Is         |                                                    | 35.0                             | mA         |
| Output Logic Type                          |            |                                                    | HCMOS                            |            |
| Load                                       |            | Connected from output to ground                    | 15                               | pF         |
| Output Voltage Levels                      | Voh<br>Vol |                                                    | 0.9•Vcc MIN<br>0.1•Vcc MAX       | VDC<br>VDC |
| Duty Cycle                                 | DC         | Measured at 50% of Vcc                             | 40/60 to 60/40 or 45/55 to 55/45 | %          |
| Rise / Fall Time                           | tr / tf    | Measured at 20/80% and 80/20% Vcc Levels           | 6.0 MAX <sup>*2</sup>            | ns         |
| Jitter                                     | J          | RMS, Fj = 12 kHz...20 MHz                          | 1 TYP                            | ps         |
| Overall Frequency Stability                | Δf/fc      | Op. Temp., Aging, Load, Supply and Cal. Variations | ±50 <sup>*4</sup>                | ppm        |
| Control Voltage Range                      | VC         | Positive slope; 10% linearity MAX                  | 0 to +5.0                        | VDC        |
| Settability                                | Vfo        |                                                    | +2.5 ± 0.5                       | VDC        |
| Absolute Pull Range                        | APR        | Minimum guaranteed freq. pull over Δf/fc           | See Part Numbering <sup>*3</sup> | ppm        |
| Input Impedance                            | Zin        |                                                    | 10 MIN                           | kΩ         |
| Modulation Bandwidth                       | BW         | -3 dB                                              | 10 MIN                           | kHz        |
| Pin 2    Output Enabled<br>Output Disabled | En<br>Dis  | High Voltage or No Connect<br>Ground               | 0.7•Vcc MIN<br>0.3•Vcc MAX       | VDC<br>VDC |
| Absolute voltage range                     | Vcc(abs)   | Non-Destructive                                    | -0.5...+7.0                      | VDC        |

\*1 Test Conditions Unless Stated Otherwise: Nominal Vcc, Nominal Load, +25 ±3°C

\*2 Frequency Dependent

\*3 Not All APR's Available With All Temperature Ranges—Consult Factory For Availability

\*4 Tighter stabilities available at narrow temperature ranges—Consult Factory For Availability

**ENVIRONMENTAL PARAMETERS:**

| PARAMETER                   | SYMBOL | TEST CONDITIONS <sup>*1</sup> | VALUE                 | UNIT |
|-----------------------------|--------|-------------------------------|-----------------------|------|
| Operating temperature range | Ta     |                               | SEE PART NUMBER TABLE | °C   |
| Storage temperature range   | T(stg) |                               | -55...+90             | °C   |

**PART NUMBERING SYSTEM:**

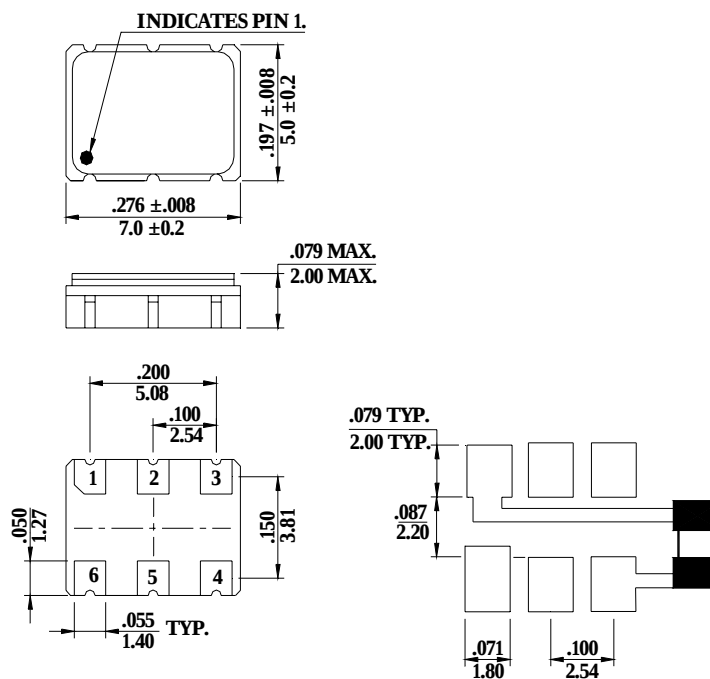
| SERIES                      | SYMMETRY                                 | TEMPERATURE RANGE (°C)                                   | APR (ppm)                                             | FREQUENCY (MHz) |
|-----------------------------|------------------------------------------|----------------------------------------------------------|-------------------------------------------------------|-----------------|
| VS2: VCXO with HCMOS Output | A: 40/60 to 60/40%<br>T: 45/55 to 55/45% | R: 0...+50<br>S: 0...+70<br>U: -20...+70<br>V: -40...+85 | F: ±32 ppm<br>H: ±50 ppm<br>G: ±80 ppm<br>J: ±100 ppm | 1.000...51.840  |

**EXAMPLE: VS2ASH-38.880**

VCXO Oscillator, 7x5mm Package, +5.0 VDC Supply Voltage, HCMOS Output, 40/60% Symmetry, 0...+70°C Operating Temperature Range, ±50 ppm APR, 38.880 MHz

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Consult the factory for any custom requirements.

**MECHANICAL PARAMETERS:**

**SOLDER PATTERN**

**\*0.01 $\mu$ F external by-pass filter is recommended as shown on solder pattern.**

**OUTLINE TOLERANCE:**

$\pm 0.006''$  / 0.15mm  
(Unless otherwise specified)

**PIN FUNCTIONS:**

- [1] VOLTAGE CONTROL
- [2] ENABLE/DISABLE
- [3] CASE GROUND
- [4] OUTPUT
- [5] NO CONNECT
- [6] SUPPLY VOLTAGE

**TYP. MARKING:**

VS2ASH  
38.88  
RAL D/C