VS9M: ANALOG MULTIPLIED LVPECL SERIES: ULTRA HF VCXO, LVPECL, +3.3 VDC

DESCRIPTION: A crystal controlled, high frequency, highly stable oscillator, adhering to Low Voltage Differential Signaling (LVPECL) 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:

- **Infiniband; Fiber Channel; SATA; 10GbE; Network Processors; SOHO Routing; Switches;**
- **Common Frequencies: 150 MHz; 156.25 MHz; 155.52 MHz; 161.1328 MHz; 212.5MHz; 312.5MHz, 622.080 MHz**
- **+3.3 VDC LVPECL**
- **Frequency Range from 750KHz to 800MHz**
- **Low Phase Noise Analog Multiplication**
- **Miniature Ceramic SMD Package Available on Tape and Reel**
- **Lead Free and ROHS Compliant**

■ ABSOLUTE MAXIMUM RATINGS:

PARAMETER	SYMBOL	VALUE	UNIT
Operating temperature range	Ta	-40…+85	°C
Storage temperature range	T(stg)	-55…+90	°C
Supply voltage	Vcc	+4.6	VDC
Maximum Input Voltage	Vi	Vss-0.5…Vcc+0.5	VDC
Maximum Output Voltage	Vo	Vss-0.5…Vcc+0.5	VDC

■ ELECTRICAL PARAMETERS:

PARAMETER	SYMBOL	TEST CONDITIONS*1		VALUE	UNIT
Nominal Frequency	fo			0.75 to 800	MHz
Supply Voltage	Vcc			+3.3 ±5%	VDC
Supply Current	Is			100.0 MAX	mA
Output Logic Type				LVPECL	
Load		Connected between each output and Vcc – 2.0 VDC		50	Ω
Output Voltage Levels	Voh Vol	min max		Vcc-1.025 Vcc-1.620	VDC VDC
Duty Cycle	DC	Measured at 50% of output voltage swing		40/60 to 60/40 or 45/55 to 55/45	%
Rise / Fall Time	tr / tf	Measured at 20/80% and 80/20% output voltage swing		0.7 TYP 1.0 MAX*2	ns
Frequency Stability		Overall conditions		±50 *(note 7)	ppm
Jitter	J	Integrated Phase tji RMS, Fj = 12 kHz…20 MHz[5]		0.3 TYP**	ps
		Integrated Phase RMS ti offset frequency 50KHz to 80MHz[5]		0.5 TYP**	ps
		Deterministic period Jitter Dj using wavecrest analyzer [4]	Fo<320MHz.	6 TYP **	ps
			Fo>320MHz.	18 TYP **	
		Random period Jitter Rj using wavecrest analyzer [4]	Fo<320MHz.	2.5 TYP **	ps
			Fo>320MHz.	2.5 TYP**	
		Acumm. Peak to Peak Jitter Tp-p using wavecrest analyzer*[4]	Fo<320MHz.	30 TYP**	ps
			Fo>320MHz.	43 TYP**	
Phase Noise,TYP	£(Δf)	typ. @212.5MHz[6]	Δf=10 Hz Δf=100 Hz Δf=1 KHz Δf=10 KHz Δf=100 KHz Δf≥1M Hz	-65 -95 -125 -140 -145 -148	dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz
Sub Harmonics, TYP	f_sub	Load, nom, Supply nom	Fo<320MHz.	-50	dBc
			Fo>320MHz.	-35	
Control Voltage Range	VC	Positive slope; 10% linearity MAX		0 to +3.3	VDC
Settability	Vfo			+1.65 ± 0.25	VDC
Absolute Pull Range	APR	Minimum guaranteed freq. pull over Δf/fc, over all conditions		See Part Numbering	ppm
Input Impedance	Zin			10 MIN	KΩ
Modulation Bandwidth	BW	-3 dB		10 MIN	KHz
Enable High Option; Pin 2 Output Enabled Output Disabled	 En Dis	 High Voltage or No Connect Ground		 0.7•Vcc MIN 0.3•Vcc MAX	 VDC VDC
Enable Low Option; Pin 2 Output Disabled Output Enabled	 Dis En	 High Voltage Ground or No Connect		 0.7•Vcc MIN 0.3•Vcc MAX	 VDC VDC

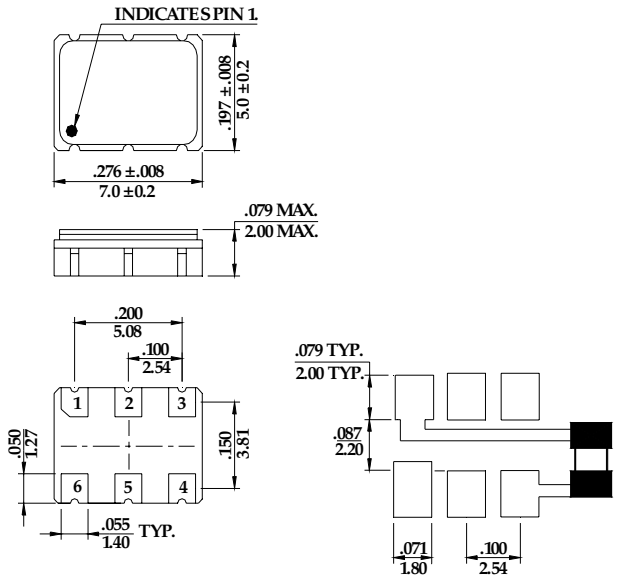
*1 Test Conditions Unless Stated Otherwise: Nominal Vcc, Nominal Load, +25 ±3°C
*2 Frequency Dependent
*3 May not be Available With All Temperature Ranges or Frequencies — Please Consult Factory
*4 Measured with Wavecrest SIA-3000A 10,000, Cycles no filtering
*5 Calculated from Agilent 5500 phase noise measurements
*6 Measured with Agilent 5500
*7 Tighter stabilities maybe available upon request – please consult factory

■ PART NUMBERING SYSTEM:

SERIES	SYMMETRY	TEMPERATURE RANGE (°C)	ABSOLUTE PULL RANGE	FREQUENCY (MHz)	Enable/Disable
VS9M: UHF +3.3Vdc VCXO with LVPECL Comp. Output	A: 40/60 to 60/40% T: 45/55 to 55/45%	R: 0…+50 S: 0…+70 U: -20…+70 V: -40…+85	K: ±20 ppm I: ±25 ppm F: ±32 ppm H: ±50 ppm G: ±80 ppm J: ±100 ppm*(note 3)	0.75…800.000	Enable High – standard (Omit Suffix) EL; Enable Low

EXAMPLE: VS9MASH -155.520
VCXO, 7x5mm Package, +3.3 VDC Supply Voltage, LVPECL Output, Standard Symmetry, 0…+70°C Operating Temperature Range, ±50 ppm APR, 25 ppm stability, 155.520 MHz

■ MECHANICAL PARAMETERS:



SOLDER PATTERN

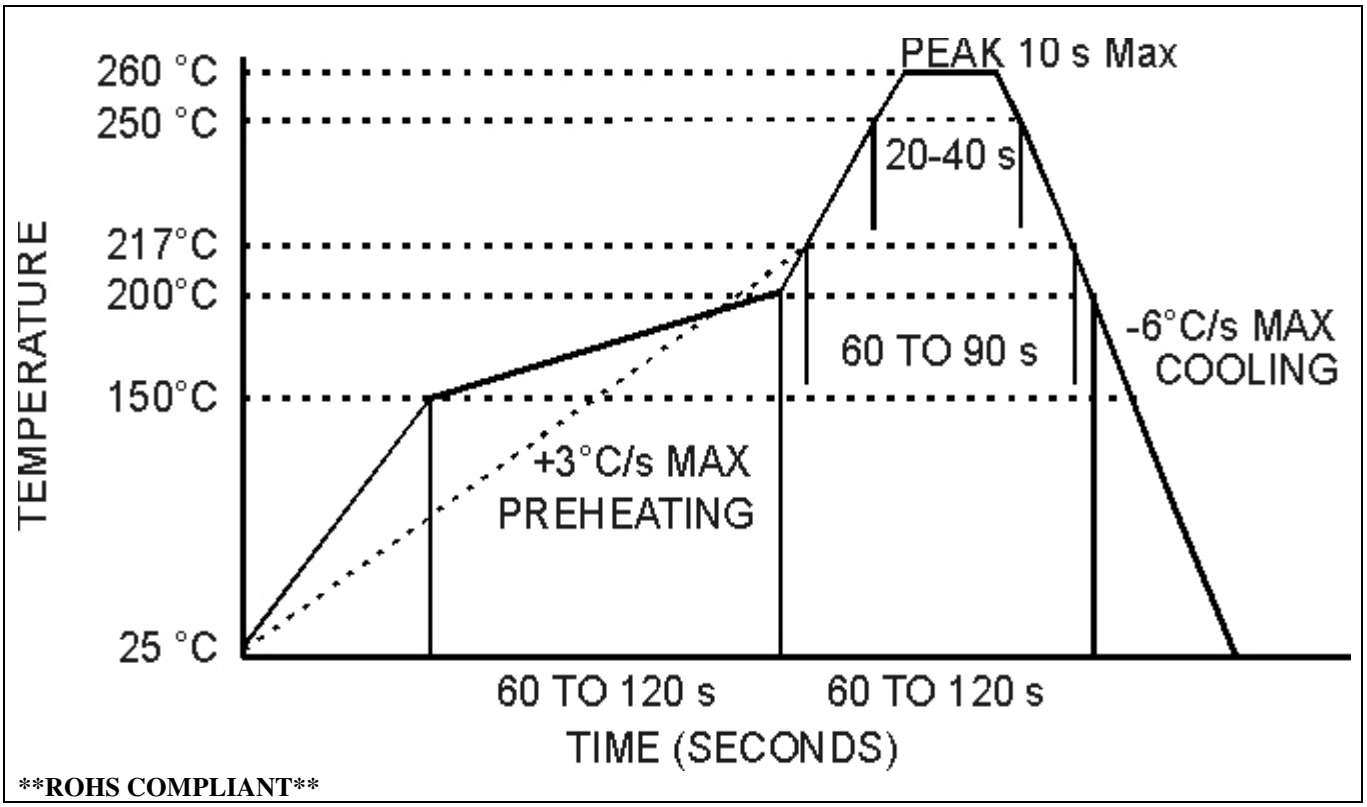
OUTLINE TOLERANCE:
±0.006" / 0.15mm
(Unless otherwise specified)

PIN FUNCTIONS:
[1] VOLTAGE CONTROL
[2] ENABLE/ DISABLE, OR NO CONNECT
[3] CASE GROUND
[4] OUTPUT
[5] COMP. OUTPUT
[6] SUPPLY VOLTAGE

MARKING:
VS9MASH
155.52
RAL D/C

***0.01µF external by-pass filter is recommended as seen on solder pattern.**

■ **REFLOW PROFILE:**



****ROHS COMPLIANT****