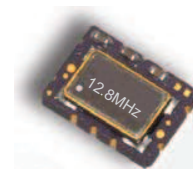


TCXO3186
5x7mm Surface Mount High Precision TCXO

Description

DEI's TCXO3186 Series are 5x7mm surface mount Temperature Compensated Crystal Controlled Oscillators (TCXO) with a Tri-state LVCMOS output. Through the use of analog temperature compensation, the TCXO3186 Series are capable of holding sub 1-ppm stabilities over the 0 to 70 °C temperature range.



Features

Model TCXO3186

TCXO	Low Jitter <1pS RMS
3.3V Operation	Tri-State Enable/Disable Function
LVCMOS Output Logic	5x7mm Surface Mount Package
Frequency Stability: ±0.28ppm	Tape and Reel Packaging
Temperature Range : 0 to 70°C	RoHS Compliant / Lead Free ✓ RoHS

Absolute Maximum Ratings

Parameter	Minimum	Nominal	Maximum	Units	Note
Storage Temperature	-55	-	85	°C	
Supply Voltage (Vcc)	-0.5	-	6.0	Vdc	
Input Voltage	-0.5	-	Vcc+0.5	Vdc	

Operating Specifications

Parameter	Minimum	Nominal	Maximum	Units	Note
Frequencies Available (Fo)		10.0, 12.8, 19.2, 20.0		MHz	
Frequency Calibration @ 25 C	-1.00	-	1.00	ppm	1
Frequency Stability [$\pm(F_{max} - F_{min})/2.F_o$]	-0.28	-	0.28	ppm	2
Holdover Stability (Over 24 Hours)	-0.32	-	0.32	ppm	3
Supply Voltage Variation (Vcc ±5%)	-0.20	-	0.20	ppm	
Load Coefficient (±5%)	-0.20	-	0.20	ppm	
Static Temperature Hysteresis	-	-	0.40	ppm	Absolute, 4
Total Frequency Tolerance	-4.60	-	4.60	ppm	5
Temperature Range	0	-	70	C	
Supply Voltage (Vcc)	3.135	3.3	3.465	Vdc	
Supply Current (Icc)	-	-	6	mA	
Period Jitter	-	3	5	ps rms	
Phase Jitter (BW=12kHz to 20MHz)	-	0.5	1	ps rms	
SSB Phase Noise at 10Hz offset	-	-80		dBc/Hz	
SSB Phase Noise at 100Hz offset	-	-110		dBc/Hz	
SSB Phase Noise at 1KHz offset	-	-135		dBc/Hz	
SSB Phase Noise at 10KHz offset	-	-150		dBc/Hz	
SSB Phase Noise at >100KHz offset	-	-150		dBc/Hz	

Input Characteristics For Enable / Disable Function (Pin 8)

Parameter		Minimum	Nominal	Maximum	Units	Note
Enable Voltage (High) or open circuit	(Vih)	70%Vcc	-	-	Vdc	6
Disable Voltage (Low) Output Tri-stated	(Vil)	-	-	30%Vcc	Vdc	

LVC MOS Output Characteristics

Parameter		Minimum	Nominal	Maximum	Units	Note
LOAD		-	15	-	pF	7
Voltage (High)	(Voh)	90%Vcc	-	-	Vdc	
Voltage (Low)	(Vol)	-	-	10%Vcc	Vdc	
Current (High)	(Ioh)	-4	-	-	mA	
Current (Low)	(Iol)	-	-	4	mA	
Duty Cycle at 50% of Vcc		45	50	55	%	
Rise / Fall Time 10% to 90%		-	-	8	ns	

- 1) Initial calibration @ 25 C. Specifications at time of shipment after 48 hours of operation
- 2) Frequency stability vs. change in temperature.
- 3) Inclusive of frequency stability, supply voltage change (±1%), load change, aging, for 24 hours
- 4) Frequency change after reciprocal temperature ramped over the operating range. Frequency measured before and after at 25°C.
- 5) Inclusive of calibration @ 25 C, frequency vs. change in temperature, change in supply voltage (±5%), load change (±5%), reflow soldering process and 20 years aging, referenced to Fo.
- 6) Leave Pad 8 unconnected if enable / disable function is not required. When tri-stated, the output stage is disabled but the oscillator and compensation circuit are still active (current consumption < 1 mA).
- 7) For best performance it is recommended that the circuit connected to this output should have an equivalent input capacitance of 15pF.

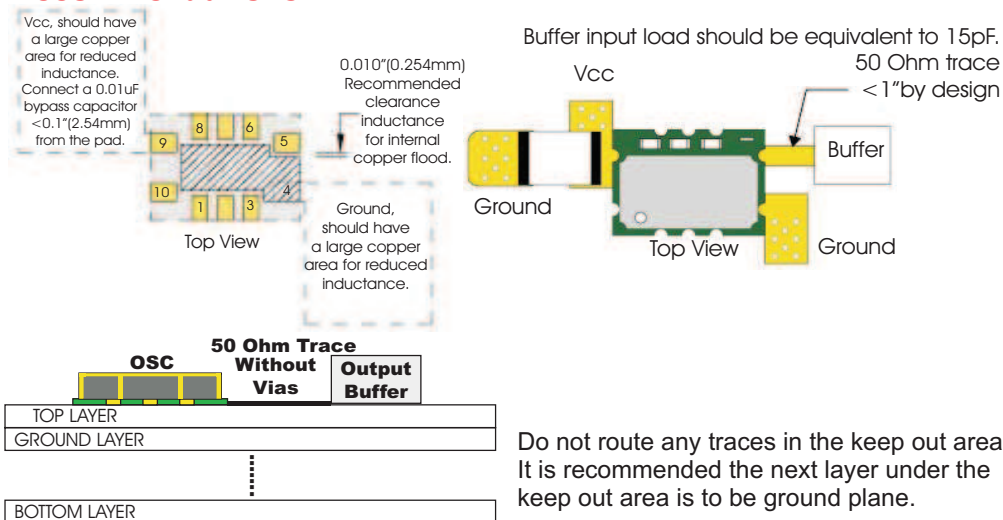
Package Characteristics

Package	Ceramic Surface Mount Package.
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Environmental Characteristics

Vibration:	Vibration per Mil Std 883E Method 2007.3 Test Condition A
Shock:	Mechanical Shock per Mil Std 883E Method 2002.4 Test Condition B.
Soldering:	SMD product suitable for Convection Reflow soldering. Peak temperature 260 C. Maximum time above 220 C, 60 seconds.
Solderability	Solderability per Mil Std 883E Method 2003

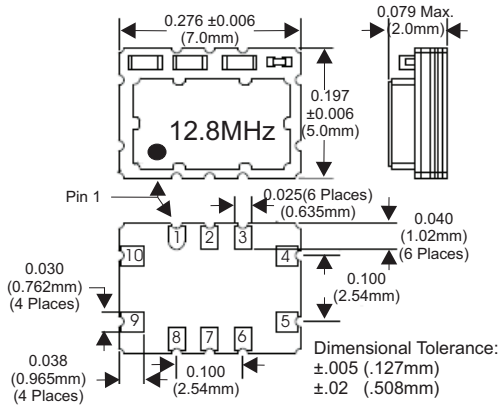
Design Recommendations



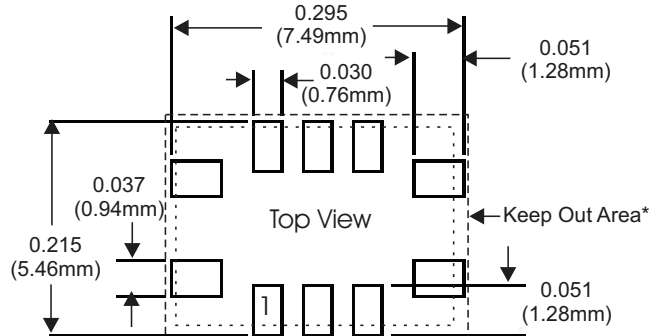
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Package Layout



Suggested Pad Layout

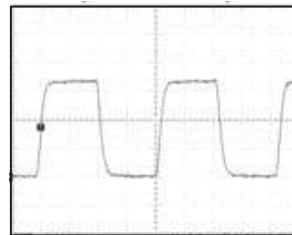


* Do not route any traces in the keep out area. It is recommended the next layer under the keep out area is to be ground plane.

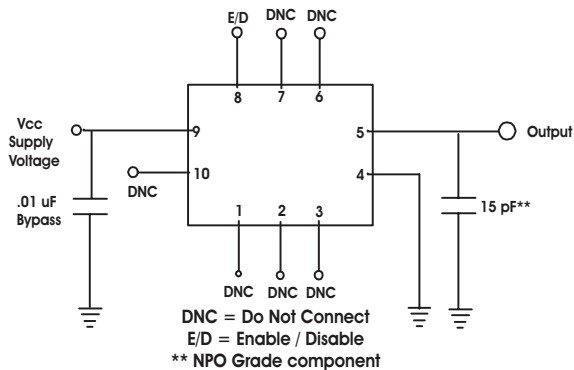
Pad Connections

Pad	Connection
1	Do not connect
2	Do not connect
3	Do not connect
4	Ground
5	Output
6	Do not connect
7	Do not connect
8	Tri-state Enable / Disable
9	Supply, Vcc
10	Do not connect

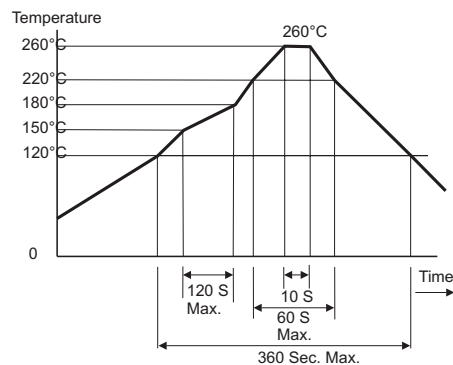
Output Waveform



Test Circuit



Solder Profile



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Tape and Reel Information

