

Helping Customers Innovate, Improve & Grow


LT-400

The LT-400 is a temperature compensated oscillator that achieves a temperature stability of ± 1 ppm over the temperature range of -40°C to $+85^{\circ}\text{C}$. The LT-400 has low long term drift over time with the aging achieving ± 1.5 ppm and a total stability budget of ± 6.8 ppm. Designed for Low Earth Orbit applications that demand low noise sources and the stability of a TCXO.

Features

- Radiation Tolerant
- Hermetic Seal
- Frequency Range: 20 MHz to 160 MHz

Applications

- Low Earth Orbit
- Nuclear Hardened Environments

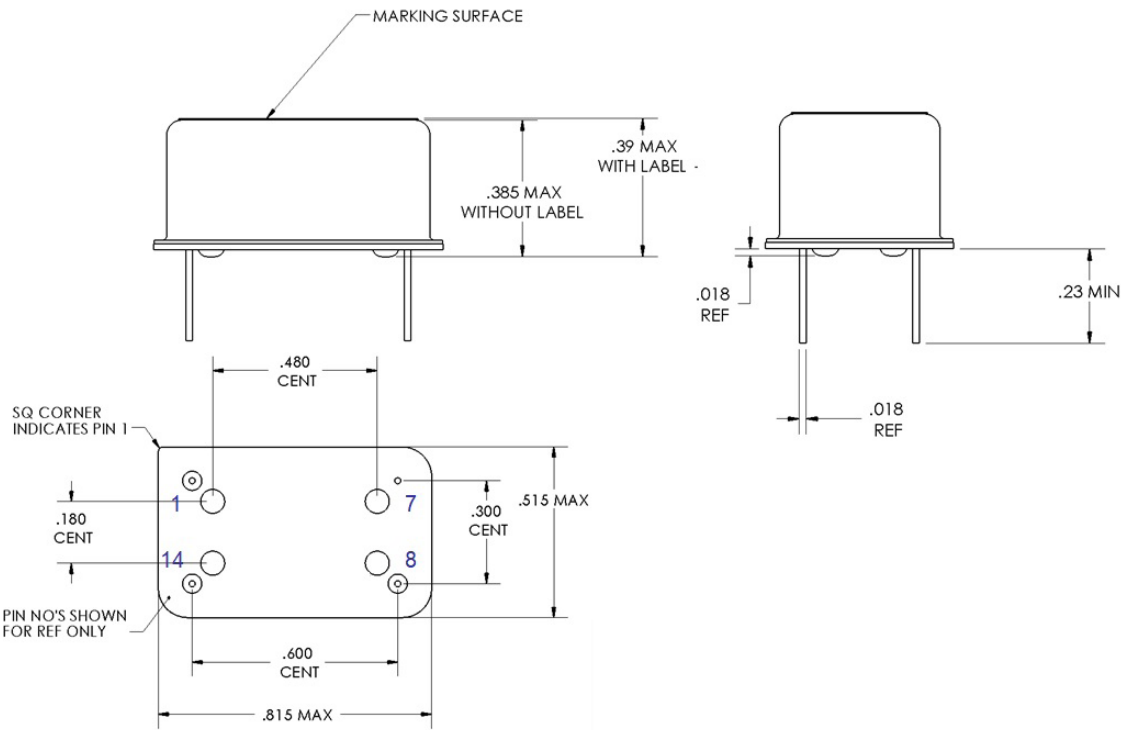
Performance Specifications

Parameter	Min	Typ	Max	Units	Condition
Frequency Stabilities at 100 MHz ¹					
vs. operating temperature range (referenced to $+25^{\circ}\text{C}$)	-1.0		+1.0	ppm	$-40 \dots +85^{\circ}\text{C}$
Initial Tolerance	-1.0		+1.0	ppm	at time of shipment
vs. supply voltage change	-0.2		+0.2	ppm	$V_s \pm 5\%$
vs. load change	-0.1		+0.1	ppm	Load $\pm 5\%$
vs. aging / 5 year	-1.5		+1.5	ppm	@ $+40^{\circ}\text{C}$
vs. acceleration	-4.0		+4.0	ppb/g	10 to 2000 Hz, any axis
Total stability budget	-6.8		+6.8	ppm	for 5 years
Supply Voltage (Vs)					
Supply voltage	4.75	5.0	5.25	VDC	
Current consumption			25	mA	@ $+25^{\circ}\text{C}$
Warm-up Time			10	seconds	to 1 ppm of final frequency @ $+25^{\circ}\text{C}$
RF Output					
Signal	Sinewave				
Resistance Load		50		Ω	
Output Power	0	+3.0	+6.0	dBm	
Harmonics / Sub-Harmonics			-25	dBc	

Performance Specifications

Parameter	Min	Typ	Max	Units	Condition
Frequency Tuning (EFC)					
Tuning Range	Fixed Frequency (No Tuning)				Initial Accuracy ± 1.0 ppm @ +25°C
Tuning Range	± 14.0		± 30.0	ppm	
Linearity			20	%	
Tuning Slope	Positive				
Control Voltage Range	0.0		3.3	VDC	
Phase Noise ²					
Phase Noise (@ 50 MHz)			-80	dBc/Hz	10 Hz
			-110	dBc/Hz	100 Hz
			-135	dBc/Hz	1 kHz
			-151	dBc/Hz	10 kHz
Phase Noise (@ 100 MHz)			-70	dBc/Hz	10 Hz
			-100	dBc/Hz	100 Hz
			-125	dBc/Hz	1 kHz
			-145	dBc/Hz	10 kHz
Additional Parameters					
Weight			6.0	g	
Absolute Maximum Ratings					
Supply voltage (Vs)			6.0	V	
No damage driving low impedance load	17	50		Ω	
Power Dissipation			200	mW	
Maximum Internal Controlled Temperature			+108	°C	
Maximum Junction Temperature Rating			+150	°C	
Maximum Junction to Case Temp Rise			$\leq +18$	°C	
Operable temperature range	-40		+90	°C	
Storage temperature range	-55		+125	°C	
Environmental and Product Classification					
Radiation (TID)	50 krad Total Ionizing Dose				
Radiation (Single Event)	40MeV-cm ² /mg fluence 1e7 particles/cm ²				
Crystal	AT Cut with Swept Quartz				
Components	Commercial grade / Packaged / SMT				
PCB Material	FR4				
Random Vibration	per MIL-STD-202, Method 214, Test Condition II, 3 min/axis, Test condition letter "K", 53.79 Grms				
Mechanical Shock	per MIL-STD-202, Method 213, Test Condition F (1500G, 0.5 msec half-sine pulse)				
Solderability	per MIL-STD-202, Method 208				

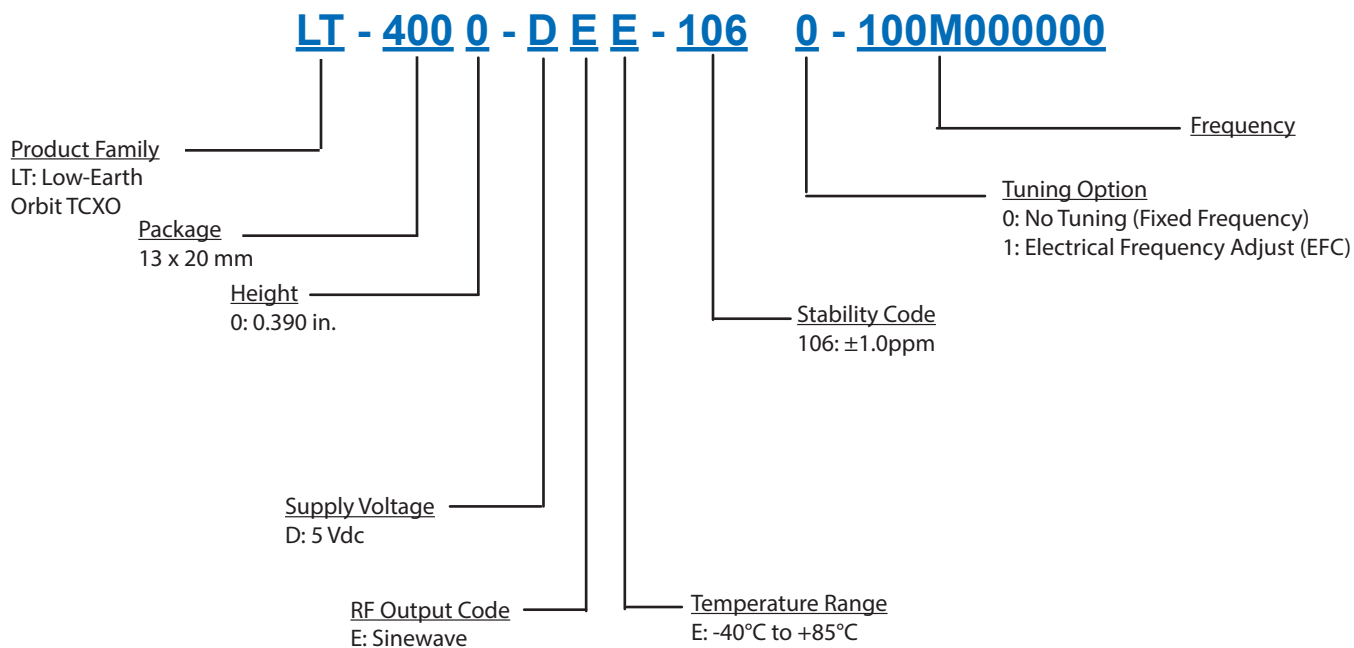
Outline Drawing / Enclosure



Dimensions in inches

Pin Connections	
1	Vc (control voltage) or No Connect
7	Ground (Case)
8	RF Output
14	Supply Voltage Input

Ordering Information



Notes:

1. Unless otherwise stated, all values are valid after warm-up time and refer to typical conditions for supply voltage, frequency control voltage, load, and temperature (25°C).
2. Frequency range from 20 MHz to 80 MHz, no multiplication; Frequency range from 80 MHz to 160 MHz, x2 multiplication.

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