

# Model 197

## High Stability OCXO

### Features

- 1  $\mu$ sec typical for 8 hour holdover
- -40°C to 85°C Operating Temperature Range
- Sinewave or HCMOS Output
- Industry Standard 36 x 27 mm package



36.4 x 27.4 x 13.0 mm

### Description

CTS Model 197 is a high stability double oven OCXO developed to meet stringent Long Term Evolution (LTE) performance requirements, offering 1.0 ppb (p-p) temperature stability over the industrial temperature range. It provides excellent 1  $\mu$ sec typical holdover performance with  $\pm 10^\circ\text{C}$  temperature variation. Other applications ideally suited for this OCXO include high performance instrumentation, communications systems, and rubidium replacement.

**Table 1: Ordering Information**

Model	Stability	Temp Range	Supply Voltage	EFC	Output	Frequency																						
197	J	G		N	S	10M000																						
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**Part Number Example:**

**197JGNS10M000**

Note: Not all stabilities are available for all input voltages. Please consult factory.

## Electrical Specifications

Parameter	Conditions & Remarks	Min	Typical	Max	Unit
<b>Operating Conditions</b>					
Supply Voltage (See Table 1 options)	V <sub>CC</sub>	4.75 11.4	5 12	5.25 12.6	Vdc
Turn-On Power	Nom V <sub>CC</sub>	-	-	5.0	W
Steady State Power	Nom V <sub>CC</sub> , T <sub>a</sub> = 25°C	-	1.5	2.0	W
Operating Temperature Range (See Table 1 options)	T <sub>a</sub>	-40	-	+85	°C

## Frequency Stability

Frequency	F <sub>NOM</sub> , Other frequencies available (consult factory)		10.000		MHz
Calibration	$\Delta F / F_{NOM}$	-	-	± 75	ppb
Temperature Stability (See Table 1 options)	$\Delta F / F_{NOM}$ over -40 to +85°C	-	0.5	1.0	ppb p-p
	Hysteresis	-	-	0.2	ppb
Frequency vs. Voltage	V <sub>CC</sub> ±5%	-	-	±0.3	ppb
	Per day	-	-	±0.2	ppb
Aging	Per year	-	-	±40	ppb
	10 years	-	-	±0.2	ppm
8 Hour Holdover	With ±10°C temperature variation – see Figure 1	-	<1	1.5	µsec
Warm up time	Within 20 ppb, ref to 1 hour	-	-	5	minutes

## Electronic Frequency Control (EFC) (See Table 1 options)

Voltage Range	V <sub>C</sub> , Control voltage range	0	-	4	V
Pulling Range	Positive, monotonic	±0.25	-	±0.45	ppm
Linearity		-	-	10	%

## Output Parameters

Sinewave (See Table 1 options)	50 Ω load	+5	+7	+9	dBm
Load		45	50	55	Ω
Harmonics				-30	dBc
	Load		15 pf // 10kΩ		
HCMOS (See Table 1 options)	V <sub>H</sub>	5V option 12V option	3.5 4.5	- -	- Vdc
	V <sub>L</sub>		-	-	0.5
Rise / Fall times	T <sub>R</sub> / T <sub>F</sub>		-	-	5 ns
Duty Cycle		45	50	55	%
Spurious				-70	dBc
	Offset = 10Hz	-	-	-120	
	100Hz	-	-	-135	
Phase Noise	1KHz	-	-	-145	dBc/Hz
	10KHz	-	-	-150	
	100KHz	-	-	-150	

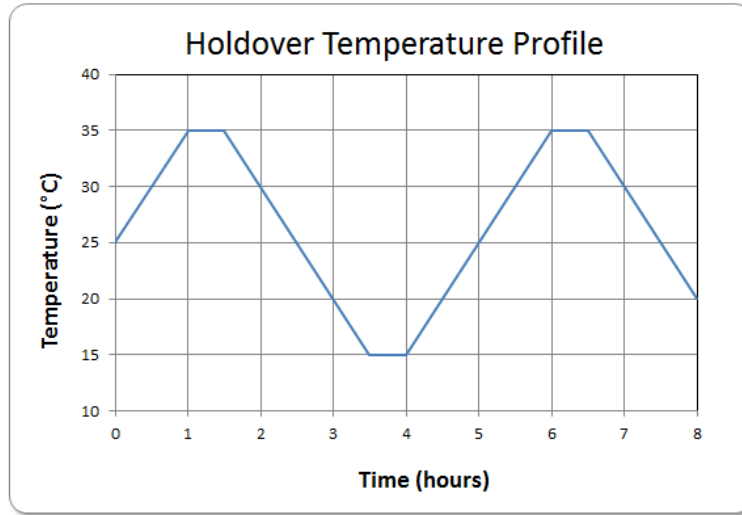


Figure 1. Holdover Temperature Profile

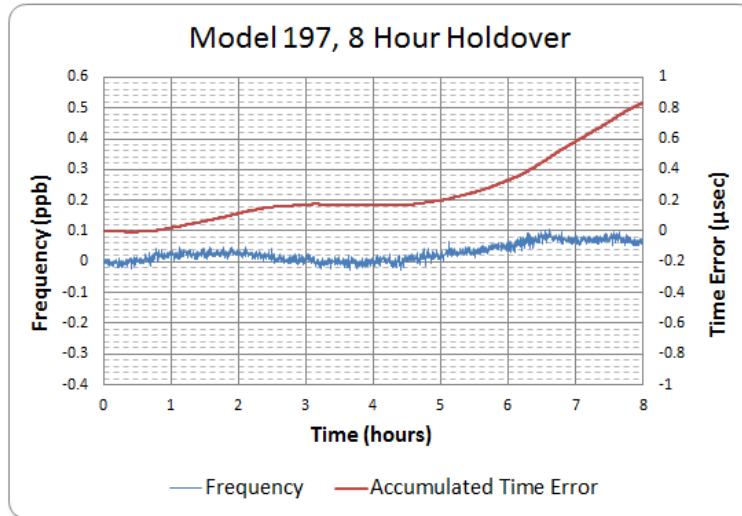
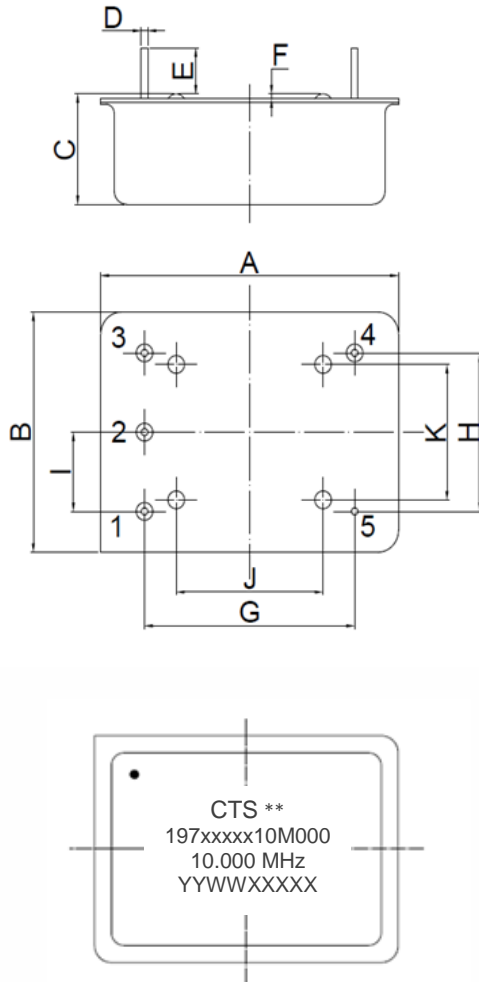


Figure 2. Typical holdover performance

## Mechanical and Environmental

Storage Temperature	-55 to +105°C
Drop Test	The test shall be carried out as the provisions of the IEC60028-2-32 test Ed. 10 cm height, 3 times on hard board with thickness of 3 cm.
Bump Test	Device are bumped in three mutually perpendicular axes at peak acceleration of 400m/s <sup>2</sup> , each 4000 ±10 times, 6ms pulse duration time.
Vibration	Frequency range: 1Hz-4Hz-100Hz-200Hz Acceleration: 0.0001g <sup>2</sup> /Hz-0.01g <sup>2</sup> /Hz-0.01g <sup>2</sup> /Hz-0.001g <sup>2</sup> /Hz Grms=1.15g Duration: 30 minutes per axis (3 axes)
Mechanical Shock	100g, 6mS duration, 1/2 sine wave, 3 shocks each direction along 3 mutually perpendicular planes.
Thermal Shock	0.5h@-40°C, 0.5h@+85°C, Note: the changing time < 30 seconds, cycling for 100 times

## Mechanical Specifications



### Pin Assignments

Pin	Function
1	V <sub>c</sub> / NC*
2	DNC**
3	V <sub>cc</sub>
4	RF Output
5	GND/Case

\* NC when EFC option "N" is selected.

\*\* DNC – Do not connect to this pin.

### Dimensions (mm)

Symbol	Min	Max
A		36.4
B		27.4
C		13.0
D	0.73	0.87
E	4.5	5.9
F	0.4	0.7
G	25.2	25.6
H	17.6	18.0
I	8.8	9.0
J	17.75 nominal	
K	15.21 nominal	

### Marking

**	Mfg Site Code
YYWWXXXXX	DC/Serial Number

This product is specified for use only in standard commercial applications. Supplier disclaims all express and implied warranties and liability in connection with any use of this product in any non-commercial applications or in any application that may expose the product to conditions that are outside of the tolerances provided in its specification.