CTS Reeves
FREQUENCY PRODUCTS

Model 196
Universal OCXO

High Performance, low-profile universal ovenized crystal oscillator

Features:

- Low-profile European package
- SC Crystal for High Stability or AT Crystal for Lower Cost
- Wide (2 to 26 MHz) frequency range
- Electrical Tuning
- 5.0 or 12 Volt operation
- HCMOS Compatible or Sinewave Output
- IR Reflow Compatible
- Hermetic sealed

Applications:

- Telecommunications Switching
- Telecommunications Transmission
- Cellular Base Stations
- Wireless and PCS Base Stations
- Test and Measurement

Benefits:

- Low Cost - High Performance
- Low Profile - Fits Most Base Station Card Slots
- 5V Operation for Systems with Limited Supply
- Platform Design for Shorter Lead Time
- Standard Product with Variety of Choices

Frequency Stability	**SC Cut (Option B)**	**AT Cut (Option A)**
Daily Aging ppm/day (see Notes 1 & 3, page 3)	±0.001 ppm	±0.005 ppm
First Year Aging (ppm/year)	±0.100 ppm	±0.300 ppm
10 Years Aging Life	±0.300 ppm	±0.900 ppm
Temperature Stability -30°C to 70°C	±0.020 ppm	±0.100 ppm
Voltage Stability	±0.005 ppm	±0.010 ppm
Load Stability: ±10% Variation	±0.003 ppm	±0.003 ppm
Warm up @ -30°C within 10 minutes (see Note 2, page 3)	±0.050 ppm	± 0.100 ppm

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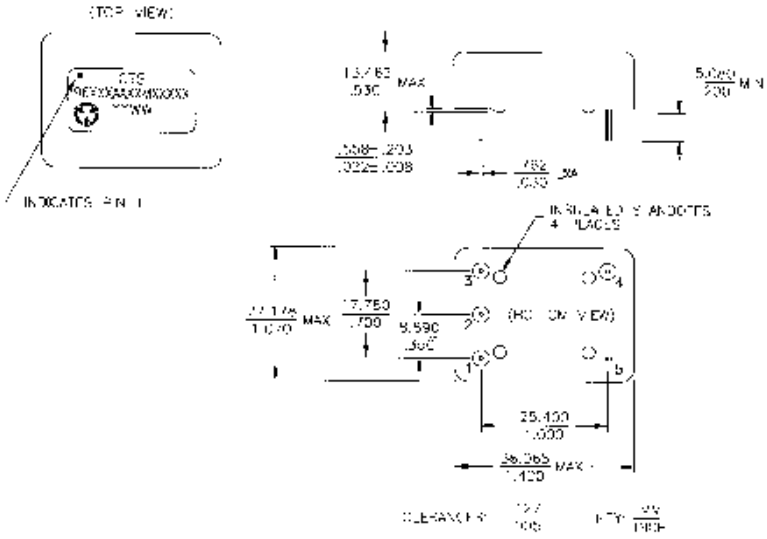


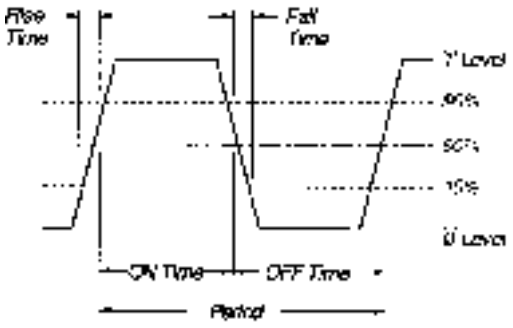
Pin Description:

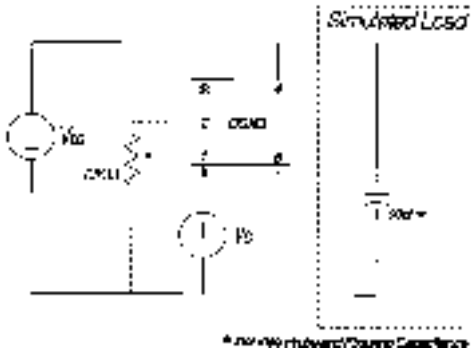
Pin	Symbol	Functional Description
1	VC	Control Voltage
2	Vref	Reference Voltage
3	VDD	Supply Voltage
4	Output	RF Output
5	GND	Circuit and Package Ground

Phase Noise:

For 10 MHz output, SC crystal stability, squarewave signal, and 5 volt supply.

Offset Frequency	Typical dBc/Hz Level
1 Hz	-75
10 Hz	-105
100 Hz	-130
1 kHz	-145
10 kHz	-150





9	6				A	A			M					

Stability
A = AT Stability
B = SC Stability

Supply
D = +5V
E = +12V

Frequency
MHz
Example:
05 (5 MHz)
10 (10 MHz)

Frequency
5 digits

Output Signal
C = HCMOS
S = Sinewave

Factory Use
A = Standard

M = Decimal Point

Consult factory for additional versions

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Specifications:

Parameter	Symbol	Minimum	Nominal	Maximum	Unit
Nominal Frequency (See How to Order)	fo	2		26	MHz
Supply Voltage (Option D) 5 Volt Supply	VDD	4.75	5.00	5.25	Volts
Supply Voltage (Option E) 12 Volt Supply	VDD	11.4	12.00	12.6	Volts
Input Power @ Warm-up	P		3.2	3.5	W
Input Power @ Steady State 25°C	P		1.0	1.2	W
Operational Temperature Range	Ta	-30		70	°C
Squarewave Output (Option C) (see Figures 1 & 2, page 4)					
Symmetry or Duty Cycle	SYM	45	50	55	%
Output Voltage Levels					
Logic "1" Level:	VOH	4.2			V
Logic "0" Level:	VOL			0.4	V
Rise and Fall Time	tr, tf		2	5	n sec
Sinewave Output (Option S)					
Output Level into 50 ohms	Vout	3	7		dBm
Harmonic Content	Hc		-35	-30	dBc
Output Reference Voltage with 5 Volt Supply (see Note 6)					
Reference Voltage Accuracy	Vref	3.85	4.00	4.15	Volts
Reference Voltage Stability	Svref		±3	±9	mV
Load Current	Ic			1	mA
Output Reference Voltage with 12 Volt Supply (see Note 6)					
Reference Voltage Accuracy	Vref	4.85	5.00	5.15	Volts
Reference Voltage Stability	Svref		±4	±10	mV
Load Current	Ic			1	mA

Voltage Control Specifications:

Parameter	Symbol	Minimum	Nominal	Maximum	Unit
Control Voltage	Vc	0	2.5	5	Volts
Deviation Range (Option A, see Notes 4&5)		±3	±5		ppm
Deviation Range (Option B, see Notes 4&5)		±0.7	±1		ppm
Transfer Function			Positive		
Input Impedance		50			KOhms
Sink Current		200			uA

Absolute Maximum Ratings:

Parameter	Symbol	Minimum	Maximum	Unit
Supply Voltage Option D	VDD	-0.5	7	Volts
Supply Voltage Option E	VDD	-0.5	15	Volts
Voltage Control	Vc	-0.5	12	Volts
Storage Temperature Range	Tstg	-55	105	°C

Notes

1. Aging stability after 14 days of continuous operation.
   Aging stability from 48 to 72 hours lees than ± 0.003 ppm/day rate.
2. Warm-up referenced to stabilized frequency 1 hour after turn-on.
3. Aging Stability after 14 days of continuous operation.
   Aging stability from 48 to 72 hours less than ±0.01 ppm/day rate.
4. Referenced from Nominal Frequency at time of shipment.
5. The Control Voltage can be left fixed to its internal nominal bias with a 10 year lifetime accuracy of 1.6 ppm for AT Stability (Option A) and ±0.7 ppm for SC Stability (Option B).
6. Output reference voltage is for customer use (see Fig. 2 for suggested options)

Environmental Performance Specifications:

Test	Test Description
Shock	500 G's 1 mS, Halfsine, # shocks per direction, Per MIL-STD-202F, Method 213B, Test Condition D
Sinusoidal Vibration	0.06" D.A. or 10G's Peak, 10 to 500 Hz Per MIL-STD-202F, Method 204D, Test Condition A
Random Vibration	5.35 G's rms. 20 to 2000 Hz, Per MIL-STD-202F Method 214 Test Condition 1A, 15 minutes each axis
Moisture	10 cycles, 95% RH, per MIL-STD-202F, Method 106F
Seal	Condition D Bath @ 90°C ±5°C MIL-STD-202F Method 112
Marking Permanency	Per MIL-STD-202F, Method 215J
Attachment Method	PCB Through Hole Mounted
Resistance to Solder Heat	Per MIL-STD-202F Method 210, Condition E
IR reflow	Consult Factory