



Crystal Clock Oscillator — CMOS/HCMOS

by SaRonix

Technical Data

Ref. No. **Series M**

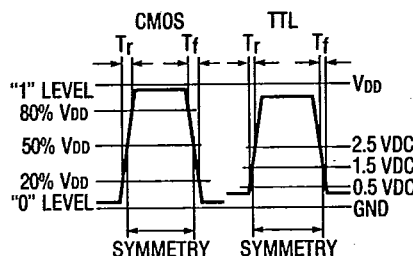
Date **May 1988**

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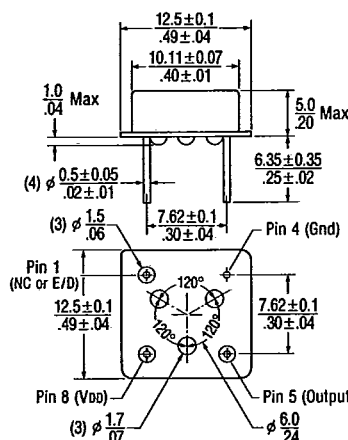
Description

A crystal controlled, low current hybrid oscillator circuit providing precise rise and fall times to drive CMOS, NMOS and TTL. The HCMOS version (1.8432 MHz to 50.0000 MHz) can drive up to 10 TTL loads. The CMOS version (250 kHz to 24.00 MHz) has a very low power consumption of less than 4 mA typically. Device is packaged in a $\frac{1}{2}'' \times \frac{1}{2}''$ resistance welded, all metal case to conserve board space.

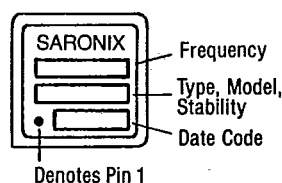
Output Waveform



Package



Standard Marking Format



Scale: None (Dimensions in mm inches)

Frequency Range: CMOS: 250 kHz to 24.000000 MHz
HCMOS: 1.8432 MHz to 50.000000 MHz

Frequency Stability: 0.0025% to 0.05% maximum over all conditions: calibration tolerance, operating temperature, input voltage change, load change, aging, shock and vibration.

Temperature Range: Operating: 0°C to +70°C
Storage: -55°C to +125°C

Input Voltage: Rated: +5 VDC $\pm 10\%$
Operating: +4 VDC min., +7 VDC max.

Input Current: CMOS: 4mA typical, 8mA max.
HCMOS: 10mA typical, 15mA max.

Output: Symmetry: CMOS: 50% $\pm 10\%$ max.
HCMOS: 50% $\pm 5\%$ max.
Rise & Fall Times: CMOS (1 TTL): 20% to 80% V_{DD} = 12ns max.
0.5V to 2.5V = 8ns max.
HCMOS (10 TTL): 20% to 80% V_{DD} = 4ns max.
0.5V to 2.5V = 6ns max.
"0" Level: $V_{SS} + 0.5V$ max.
"1" Level: $V_{DD} - 0.5V$ min.

Mechanical: Shock: MIL-STD-883C, Method 2002.3, Condition B
Solderability: MIL-STD-883C, Method 2003.5
Terminal Strength: MIL-STD-202F, Method 211A, Conditions A and C
Vibration: MIL-STD-883C, Method 2007.1, Condition A
Solvent Resistance: MIL-STD-202F, Method 215C
Resistance to Soldering Heat: MIL-STD-202F, Method 210A, Condition B

Environmental: Gross Leak Test: MIL-STD-883C, Method 1014.8, Condition C1
Fine Leak Test: MIL-STD-883C, Method 1014.8, Condition A2, $< 5 \times 10^{-8}$ ATM cc/sec.
Thermal Test: MIL-STD-883C, Method 1011.7, Condition A
Moisture Resistance: MIL-STD-883C, Method 1004.6

Part Numbering Guide

Type NCC 039 C* - 4.000000 Frequency
NCC-CMOS Model 039 (CMOS from 250 kHz to 3.9999 MHz) A = ± 25 ppm (0.0025%)
NCH-HCMOS Model 069 (CMOS from 4.0000 to 24.0000 MHz) B = ± 50 ppm (0.005%)
039 (HCMOS from 1.8432 to 5.9999 MHz) C = ± 100 ppm (0.010%)
069 (HCMOS from 6.0000 to 24.0000 MHz) D = ± 500 ppm (0.050%)
089 (HCMOS from 24.0000+ to 50.0000 MHz)

*For Enable/Disable function on pin #1, add "E" suffix after the tolerance.
Example: NCC039CE - 4.0000



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Standard Frequencies*

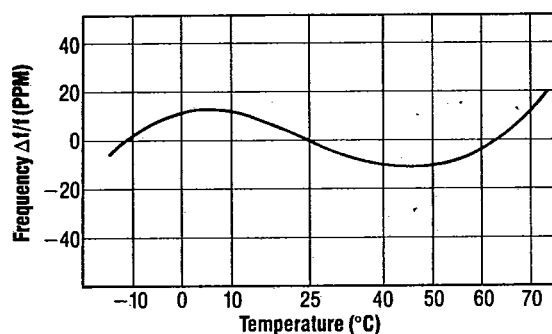
1.843200 MHz
3.686400 MHz
4.000000 MHz
7.372800 MHz
8.000000 MHz
10.000000 MHz
12.000000 MHz
16.000000 MHz
16.257000 MHz
18.432000 MHz
19.660800 MHz
20.000000 MHz
22.118400 MHz
24.000000 MHz

Note:

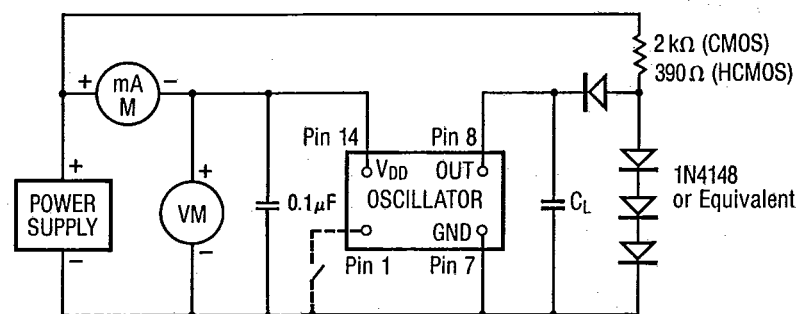
These frequencies are available as standards only with a "C" tolerance.

*Special frequencies available upon request.

Typical Frequency Characteristics vs. Temperature



Test Circuit



Note:

Pin 1 = No connection or Enable/Disable function optional (Enable = "1" level, Disable = "0" level).
CL = Total fixture and probe capacitance = 15 pF max.

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