

## MOI-2000 CMOS Clock Oscillator

### General Description

The MOI-2000 clock oscillator is a CMOS integrated circuit that can replace ceramic resonators or crystal oscillators in microcontroller based systems that do not require precise accuracy. The patented temperature compensated oscillator can operate at  $\pm 0.5\%$  total frequency accuracy over the temperature and voltage range without using ceramic resonators, quartz crystals or other external components for frequency determination.

### Features

- No external frequency reference required
- $\pm 0.5\%$  total frequency tolerance over all conditions
- Fast and reliable oscillation startup
- Very low current consumption
- CMOS compatible square-wave output
- Shock and vibration resistant to 80kG
- Die size is 1.4mm x 1.7mm
- Available bare chip for hybrid and Chip on Board (COB)
- Industrial and automotive temperature ranges

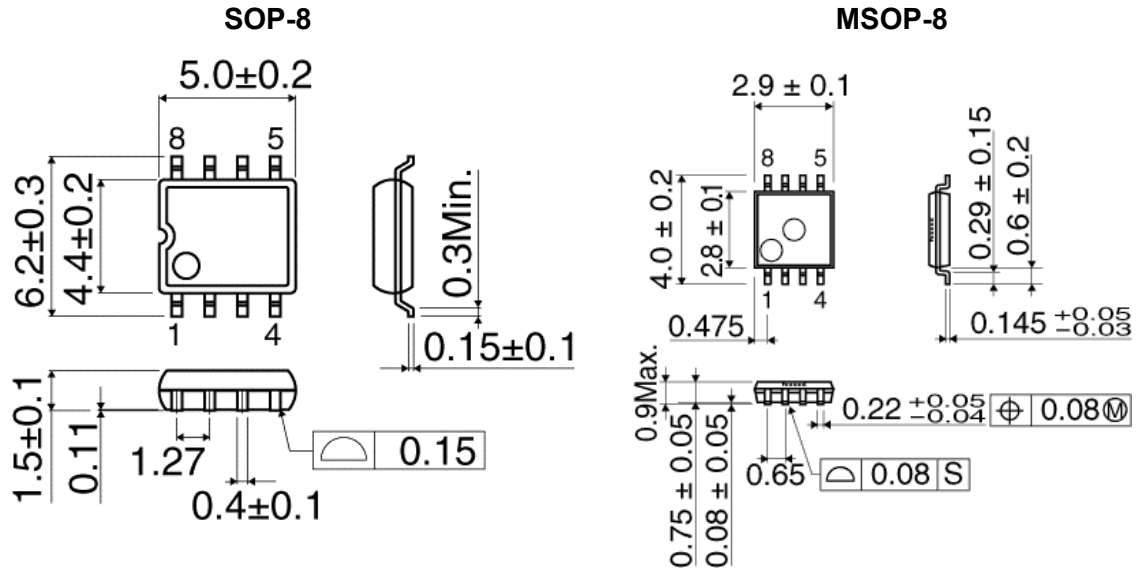
### Specification

Parameter	Symbol	MOI-2000	MOI-2000LP	Condition
Frequency Range <sup>1</sup>	$f_o$	2.000MHz ~ 20.000MHz		
		3.000MHz	2.000MHz	
		6.000MHz 12.000MHz	4.000MHz 8.000MHz	
Operating Voltage	$V_{DD}$	5V $\pm$ 5%	3.3V $\pm$ 5%	
			2.85V $\pm$ 5%	
Frequency Tolerance <sup>2</sup>	$\Delta f/f_o$	$\pm 0.5\%$ $\pm 1.0\%$ $\pm 1.0\%$ $\pm 1.5\%$		0°C ~ +70°C -40°C ~ +85°C -40°C ~ +125°C -40°C ~ +150°C
Current Consumption	$I_{OP}$	1.6mA Typ	0.7mA Typ	No load
Duty Cycle	$t_w/t$	40% ~ 60%		50% $V_{DD}$
Output Rise/Fall Time	$t_R/t_F$	14ns Max		20% ~ 80% $V_{DD}$ 12pF Load
Output Current	$I_o$	3.0mA Max		
Supply Voltage	$V_{DD}$	0V ~ 6V Max		
Oscillation Startup Time	$t_{OSC}$	50 $\mu$ s Max		

Note 1: Please contact MOI for standard frequencies.

Note 2: Includes initial frequency tolerance, tolerance over temperature, tolerance over voltage, and long-term tolerance.

### MOI 2000 Package Description

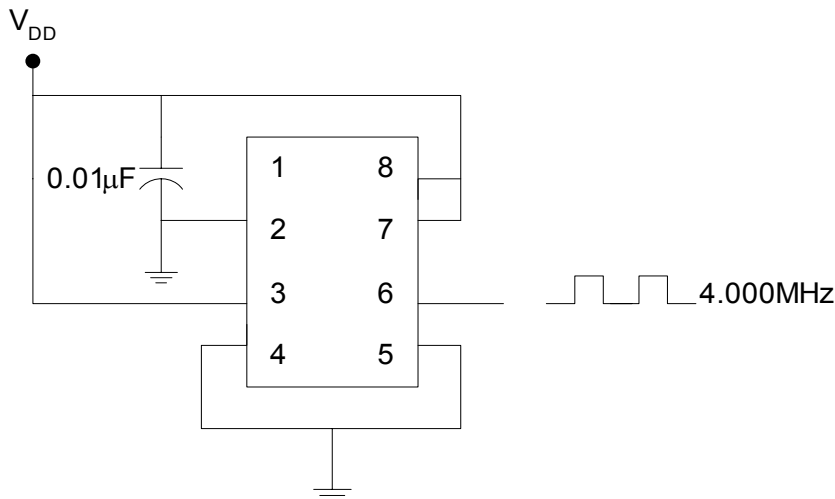


### Pin Assignment

	1	8	$V_{DD}$
GND	2	7	$V_{DD}$
S1	3	6	OUT
S2	4	5	GND

S1	S2	Out
GND	GND	8.000MHz/12.000MHz
$V_{DD}$	GND	4.000MHz/6.000MHz
GND	$V_{DD}$	2.000MHz/3.000MHz

### Application Example



## MOI 2000 Part Numbering Guide

Series	Voltage	Tolerance	Frequency	Temperature Range	Package
MOI2000	3 : 2.85V – 3.15V 33 : 3.15V – 3.45V 5 : 4.75V – 5.25V	K: $\pm 2.5\%$ L: $\pm 1.5\%$ M: $\pm 1.0\%$ P: $\pm 0.5\%$	8.00: 8.00MHz 12.00: 12.00MHz	A: $-40^{\circ}\text{C} \sim +150^{\circ}\text{C}$ C: $0^{\circ}\text{C} \sim +70^{\circ}\text{C}$ I: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$ M: $-55^{\circ}\text{C} \sim +125^{\circ}\text{C}$	D: Die M: MSOP-8 S: SOP-8

Example: MOI200033K8.00CM

### Handling Precautions

All device pins have limited ESD protection. Normal precautions should be taken to guard against ESD damage.

### Warranty

Micro Oscillator, Inc. does not assume any liability arising out of the application or use of any product or circuit described herein. Our products are not authorized for use as components in devices used for life support or other critical application where failure can cause death or bodily injury. In the case of this product being defective in manufacturing, labeling, packaging or shipping, it will be replaced with a satisfactory IC or the purchase price refunded.

### Patented

U.S.A., patent # 5,241,286.