



- **Quartz SAW Stabilized Differential Output Technology**
- **Very Low Jitter Fundamental-Mode Operation at 622.08 MHz**
- **Voltage Tunable for Phase Locked Loop Applications**
- **Timing Reference for Optical Data Communications Systems**

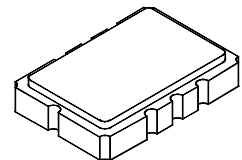
The OP4005B1 is a voltage-controlled SAW clock (VCSC) designed for phase-locked loop (PLL) applications in optical data communications systems. The differential outputs of the OP4005B1 are generated by high-Q, fundamental mode quartz surface acoustic wave (SAW) technology. This technique provides very low output jitter and phase noise, plus excellent immunity to power supply noise. The OP4005B1 differential outputs feature $\pm 1\%$ symmetry, and can be DC-configured to drive a wide range of high-speed logic families. The OP4005B1 is packaged in a hermetic metal-ceramic LCC.

Absolute Maximum Ratings

Rating	Value	Units
DC Supply Voltage	0 to 5.5	Vdc
Tune Voltage	0 to 5.5	Vdc
Case Temperature	-55 to 100	°C

OP4005B1

**622.08 MHz
Optical
Timing Clock**



SMC-08A

Electrical Characteristics

Characteristic	Sym	Notes	Minimum	Typical	Maximum	Units
Operating Frequency	f_0	Absolute Frequency	1	622.08		MHz
		Tuning Range	2	± 100		ppm
		Tuning Voltage	1	0	3.3	Vdc
		Tuning Linearity	1	± 5		%
		Modulation Bandwidth		200		kHz
Q and Q Output	V_O	Voltage into 50 Ω (VSWR ≤ 1.2)	1,3	0.60	1.1	V_{P-P}
		Operating Load VSWR	1,3		2:1	
		Symmetry	3, 4, 5	45	55	%
		Harmonic Spurious	3, 4, 6		-15	dBc
		Nonharmonic Spurious	3, 4, 6, 7		-60	dBc
Phase Noise		@ 100 Hz offset	3, 6	-70		dBc/Hz
		@ 1 kHz offset	3, 6	-100		dBc/Hz
		@ 10 kHz offset	3, 6	-125		dBc/Hz
		Noise Floor	3, 6	-150		dBc/Hz
Q and Q Jitter		RMS Jitter (10kHz to 80MHz)	3, 4, 6, 7	0.1		ps
		No Noise on V_{CC}	3, 4, 6, 7	12		ps _{P-P}
		200 mV _{P-P} Noise, from 1 MHz to $\frac{1}{2} f_0$ on V_{CC}	3	12		ps _{P-P}
Input Impedance (Tuning Port)			8	10		K Ω
Output DC Resistance (between Q & Q)		1, 3	50			K Ω
DC Power Supply	V_{CC}	Operating Voltage	1, 3	3.13	3.3 or 5.0	Vdc
		Operating Current	I_{CC}	1, 3	70	mA
Operating Case Temperature	T_C	1, 3	-40°C		+85°C	°C
Lid Symbolization (YY=Year, WW=Week)			RFM OP4005B1 YYWW			

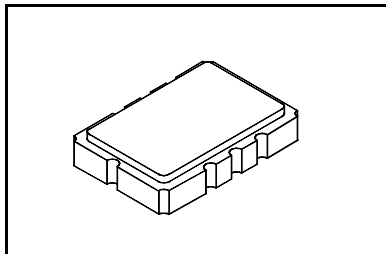
CAUTION: Electrostatic Sensitive Device. Observe precautions for handling. **COCOM CAUTION:** Approval by the U.S. Department of Commerce is required prior to export of this device.

Notes:

1. Unless otherwise noted, all specifications include the combined effects of load VSWR, V_{CC} and T_C .
2. Net tuning range after tuning out the effects of initial manufacturing tolerances, VSWR pushing/pulling, V_{CC} , T_C and aging.
3. The internal design, manufacturing processes, and specifications of this device are subject to change without notice.
4. Specified only for a balanced load with a VSWR < 1.2 (50 ohms each side), and a $V_{CC} = 3.0$ Vdc.
5. Symmetry is defined as the width in (% of total period) measure at 50% of the peak-to-peak voltage of either output.
6. Jitter and other noise outputs due to power supply noise or mechanical vibration are not included in this specification except where noted.
7. Applies to period jitter of either differential output. Measured with a Tektronix CSA803 signal analyzer with at least 1000 samples.
8. One or more of the following United States patents apply: 4, 616,197; 4,670,681; 4,760,352.

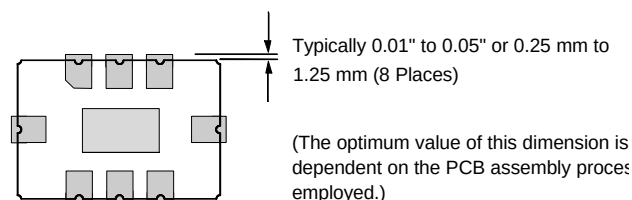
SMC-8A

8-Terminal Surface Mount Case



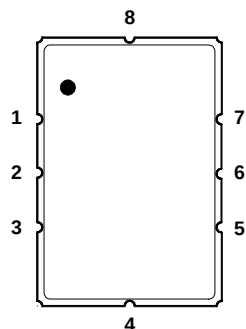
Typical Printed Circuit Board Land Pattern

A typical land pattern for a circuit board is shown below. Grounding of the metallic center pad is optional.



Electrical Connections

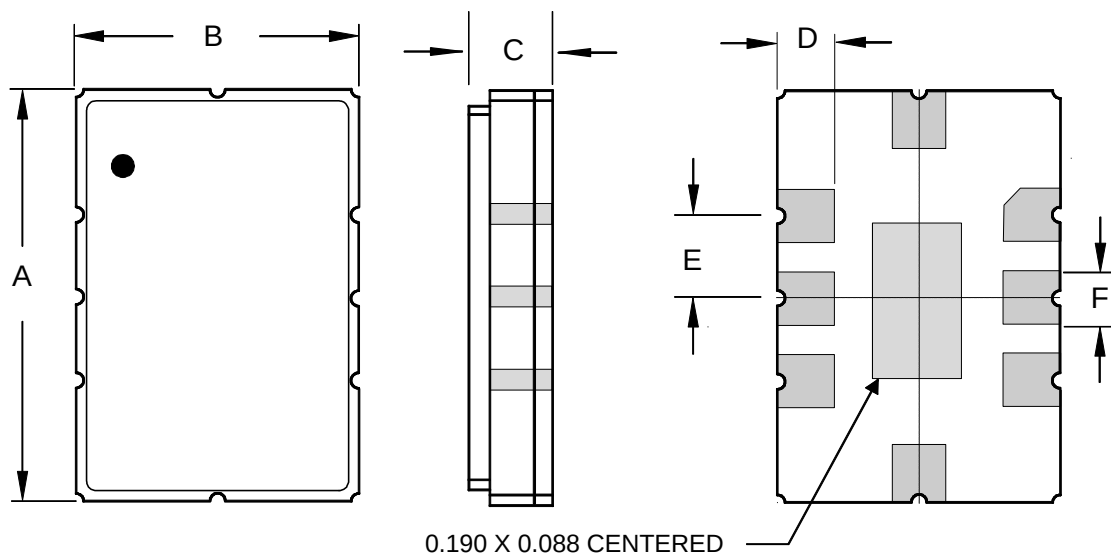
Terminal Number	Connection
1	Tune
2	*Enable
3	Ground
4	Ground
5	Q Output
6	$\bar{Q}$ Output
7	V_{CC}
8	Ground
LID	Ground



*Enable Sense: Pin 2 Ground-Clock Off

Dimensions

Dimension	mm		Inches	
	MIN	MAX	MIN	MAX
A	13.46	13.97	0.530	0.550
B	9.14	9.66	0.360	0.380
C	1.93 Nominal		0.076 Nominal	
D	1.93 Nominal		0.076 Nominal	
E	2.54 Nominal		0.100 Nominal	
F	1.27 Nominal		0.050 Nominal	



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