

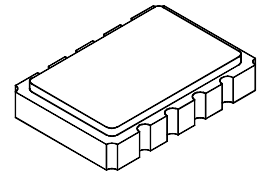


- Quartz SAW Stabilized and Filtered "Diff Sine" Technology
- Fundamental-Mode Oscillation at 672.163 MHz
- Voltage Tunable for Phase Lock Loop Operations
- Optical Timing Reference for Forward Error Correction Applications
- Complies with Directive 2002/95/EC (RoHS)



OP4009B

**672.163 MHz
Optical
Timing Clock**



SMC-08

The output of this device is generated and filtered by narrowband quartz SAW elements at 672.163 MHz. The configuration of this clock is intended to provide a pure signal for optical timing applications in noisy signal environments. The Q/Qbar differential output swing of ± 1 volt about 0 Vdc has symmetry better than $\pm 1\%$ into loads from 40 to 70 ohms; determined by customer application. The long term frequency accuracy is set by an external reference source allowing this device to complete a Phase Lock Loop design without the usual noise and jitter problems associated with PLL's.

Absolute Maximum Ratings

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

Electrical Characteristics

Characteristic		Sym	Notes	Minimum	Typical	Maximum	Units
Operating Frequency	Absolute Frequency	f _O	1, 9		672.163		MHz
	Tuning Range		2	±100			ppm
	Tuning Voltage		1	0		+3	V
	Tuning Linearity		1, 8		±3	±5	%
	Tuning Sensitivity	df/dv	2, 10	140		300	ppm/V
	Modulation Bandwidth			125	265		kHz
Q and Q̄ Output	Voltage into 50 Ω (VSWR≤1.2)	V _O	1,3	0.60		1.1	V _{P-P}
	Operating Load VSWR		1,3			2:1	
	Symmetry		3, 4, 5	49		51	%
	Harmonic Spurious		3, 4, 6			-30	dBc
	Nonharmonic Spurious		3, 4, 6, 7			-60	dBc
Phase Noise	@ 100 Hz offset				-75		dBc/Hz
	@ 1 kHz offset				-105		dBc/Hz
	@ 10 kHz offset				-125		dBc/Hz
	Noise Floor				-155		dBc/Hz
Q and Q̄ Jitter	RMS Jitter		3, 4, 6, 7		2		pS _{P-P}
	No Noise on V _{CC}		3, 4, 6, 7		12		pS _{P-P}
	200 mV _{P-P} from 1 MHz to ½ f _O on		3		12		pS _{P-P}
Input Impedance (Tuning Port)				1			KΩ
Output DC Resistance (between Q & Q̄)			1, 3	50			KΩ
DC Power Supply	Operating Voltage	V _{CC}	1, 3	3.13	3.3, 5.0	5.25	Vdc
	Operating Current	I _{CC}	1, 3			70	mA
Operating Case Temperature		T _C	1, 3	-40		+85	°C
Lid Symbolization (YY=Year, WW=Week)		RFM OP4009B YYWW					

RFM OP4009B 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.

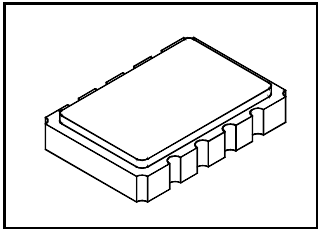
Notes:

1. Unless otherwise noted, all specifications include any combination of load VSWR, Vcc, and temperature, with Q and \bar{Q} terminated into 50 ohm loads to ground (see typical test circuit).
2. Useful tuning range is in excess of what is required over temp, aging, pushing, pulling & accuracy.
3. The design, manufacturing process, and specifications of this device are subject to change without notice.
4. Only under the nominal conditions of 50 Ω load impedance with VSWR ≤ 1.2 and nominal power supply voltage.
5. Symmetry is defined as the pulse width (in percent of total period) measured at the 50% points of Q or \bar{Q} (see timing definitions).
6. Jitter and other spurious outputs induced by externally generated electrical noise on V_{CC} or mechanical vibration are not included in this specification, except where noted. External voltage regulation and careful PCB layout are recommended for optimum performance.
7. Applies to period jitter of Q and \bar{Q} . Measurements are made with the Tektronix CSA803 signal analyzer with at least 1000 samples.
8. Linearity is a function of the percentage variation from a permitted linear deviation versus the amount of frequency tuning range (see linearity definition).
9. One or more of the following United States patents apply: 4,616,197; 4,670,681; 4,760,352.

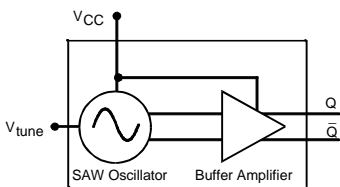
OP Performance Curves and Application Information

See the OP4005B Data Sheet for typical OP performance curves and application information.

SMC-8 8-Terminal Surface Mount Case

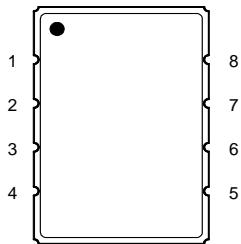


BLOCK DIAGRAM



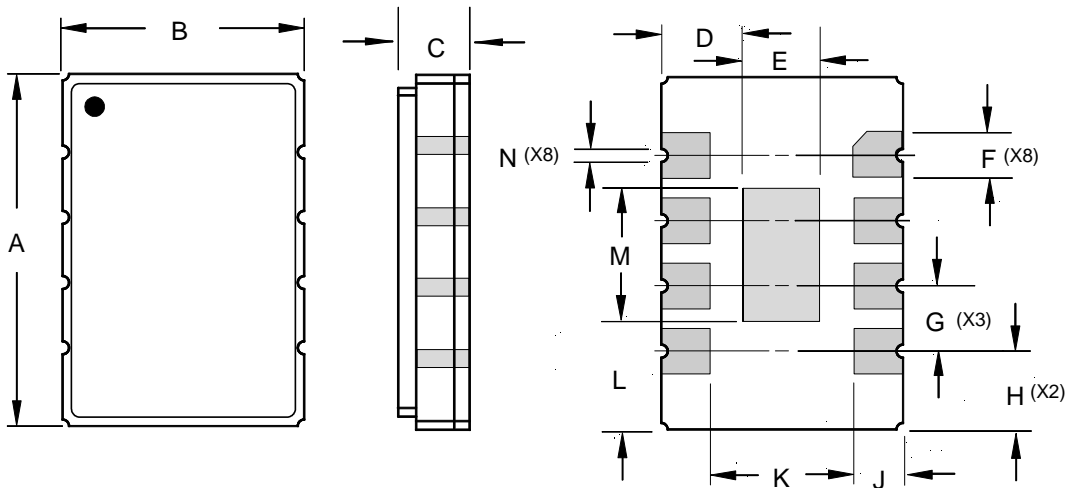
ELECTRICAL CONNECTIONS

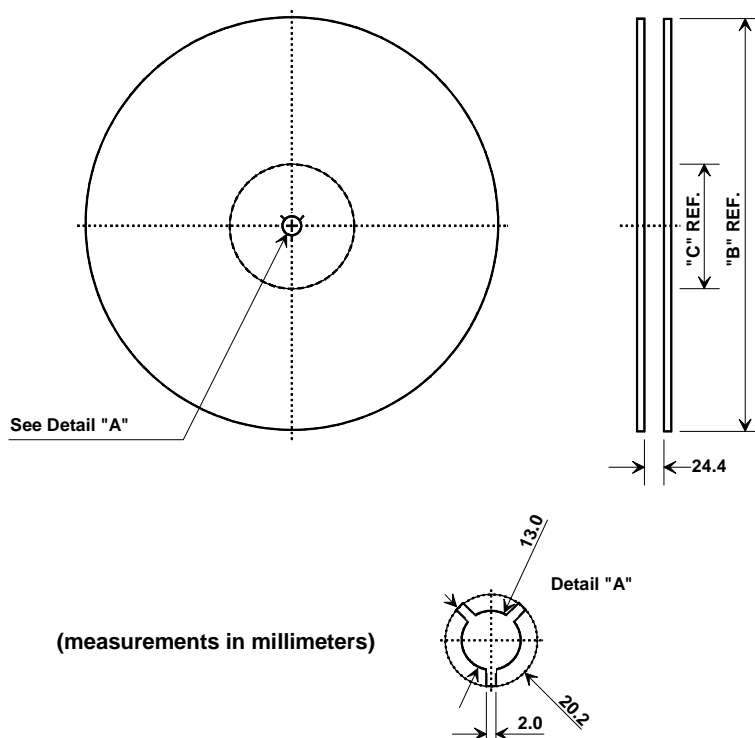
Terminal Number	Connection
1	V _{CC}
2	Ground
3	Enable/Disable
4	Q Output
5	\overline{Q} Output
6	Ground
7	
8	TUNE Input
LID	Ground



TOP VIEW

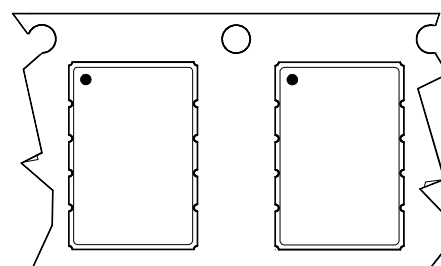
Dimension	mm		Inches	
	MIN	MAX	MIN	MAX
A	13.46	13.97	0.530	0.550
B	9.14	9.66	0.360	0.380
C	1.93 Nominal		0.076 Nominal	
D	3.56 Nominal		0.141 Nominal	
E	2.24 Nominal		0.088 Nominal	
F	1.27 Nominal		0.050 Nominal	
G	2.54 Nominal		0.100 Nominal	
H	3.05 Nominal		0.120 Nominal	
J	1.93 Nominal		0.076 Nominal	
K	5.54 Nominal		0.218 Nominal	
L	4.32 Nominal		0.170 Nominal	
M	4.83 Nominal		0.190 Nominal	
N	0.50 Nominal		0.020 Nominal	





SMC-08 Case

Reel Size			Quantity Per Reel	
"B" Nominal	"C" Nominal		Min	Max
13 Inch	330 mm	100 mm	200	1000



Orientation in Tape Carrier as Shipped

Dimensions

Carrier Tape Dimensions		Cover Tape Size
Ao	.383 ± .004 (9.7 mm)	21.3 mm
Bo	.554 ± .004 (14.1 mm)	
Ko	.130 ± .004 (3.3 mm)	
P	12 mm	
W	24 mm	
Tape Length	60 m	
Pockets/m	83	

