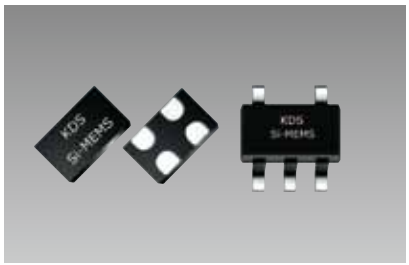
MEMS Oscillators - Low Power

MO8008/MO8009/MO2001/MO2002



■Features

- Excellent total frequency tolerance as low as ±20×10^{-6}
- Low power consumption of +3.5 mA typical (f = 20 MHz, Vdd = +1.8V)

■ Applications

- Ideal for DSC, DVC, DVR, IP CAM, Tablets, e-Books, SSD, GPON, EPON, etc.
- Ideal for high-speed serial protocols such as: USB, SATA, SAS, Firewire, 100M/1G/10G Ethernet, etc.

Pb-Free

RoHS Compliant

Model	Output Frequency (MHz)	Frequency Tolerance (×10^{-6})	Supply Voltage (V)	Current Consumption (mA Typ.)	Size (mm)	Output
MO8008	1 to 110	±20, ±25, ±50	+1.62 to +1.98, +2.25 to +3.63	+3.1 to +5.4 (+0.6 to +1.0 µA stby)	2.0×1.6×0.8, 2.5×2.0×0.8, 3.2×2.5×0.8, 5.0×3.2×0.8, 7.0×5.0×1.0 (QFN)	LVCMOS
MO8009	115 to 137					
MO2001	1 to 110				2.9×2.8×1.3 (SOT23-5)	
MO2002	115 to 137					

■ Standard Specification (MO8008)

Item	Legend	Min.	Typ.	Max.	Unit	Condition
Output Frequency Range	f	1	-	110	MHz	
Supply Voltage	Vdd	+1.62	+1.8	+1.98	V	
		+2.25	+2.5	+2.75		
		+2.52	+2.8	+3.08		
		+2.7	+3.0	+3.3		
		+2.97	+3.3	+3.63		
		+2.25	-	+3.63		
Operating Temperature Range	T_use	-20	-	+70	℃	Extended Commercial
		-40	-	+85		Industrial
Frequency Stability	F_stab	-20	-	+20	×10^{-6}	Inclusive of initial tolerance at +25° C, 1st year aging at +25° C, and variations over operating temperature, rated power supply voltage and load.
		-25	-	+25		
		-50	-	+50		
Current Consumption	Idd	-	+3.8	+4.5	mA	No load condition, f = 20 MHz, Vdd = +2.8V to +3.3V
		-	+3.7	+4.2		No load condition, f = 20 MHz, Vdd = +2.5V
		-	+3.5	+4.1		No load condition, f = 20 MHz, Vdd = +1.8V
OE Disable Current	I_od	-	-	+4.2	mA	Vdd = +2.5V to +3.3V, OE = GND, Output in high-Z state
		-	-	+4.0		Vdd = +1.8V, OE = GND, Output in high-Z state
Standby Current	I_std	-	+2.1	+4.3	µA	$\overline{ST}$ = GND, Vdd = +2.8V to +3.3V, Output is weakly pulled down
		-	+1.1	+2.5		ST = GND, Vdd = +2.5V , Output, Output is weakly pulled down
		-	+0.2	+1.3		ST = GND, Vdd = +1.8V, Output i, Output is weakly pulled down
Duty Cycle	DC	45	-	55	%	All Vdds
Output Low Voltage	V_{OL}	-	-	Vdd×0.1	V	I_{OL} = +4.0 mA (Vdd = +3.0V or +3.3V) I_{OL} = +3.0 mA (Vdd = +2.8V and Vdd = +2.5V) I_{OL} = +2.0 mA (Vdd = +1.8V)
Output High Voltage	V_{OH}	Vdd×0.9	-	-	V	I_{OH} = -4.0 mA (Vdd = +3.0V or +3.3V) I_{OH} = -3.0 mA (Vdd = +2.8V and Vdd = +2.5V) I_{OH} = -2.0 mA (Vdd = +1.8V)
Rise and Fall Time	Tr, Tf	-	1.0	2.0	ns	Vdd = +2.5V, +2.8V, +3.0V or +3.3V, 20% to 80%
		-	1.3	2.5		Vdd =+1.8V, 20% to 80%
		-	-	2.0		Vdd = +2.25V to +3.63V, 20% to 80%
Input Low Voltage	V_{IL}	-	-	Vdd×0.3	V	Pin 1, OE or $\overline{ST}$
Input High Voltage	V_{IH}	Vdd×0.7	-	-	V	Pin 1, OE or $\overline{ST}$
Start-up Time	T_start	-	-	5.0	ms	Measured from the time Vdd reaches its rated minimum value
Enable and Disable Time	T_oe	-	-	130	ns	f = 110 MHz. For other frequencies, T_oe = 100 ns + 3×cycles
Resume Time	T_resume	-	-	5.0	ms	Measured from the time $\overline{ST}$ pin crosses 50% threshold
RMS Period Jitter	T_jitt	-	1.8	3.0	ps	f = 75 MHz, Vdd = +2.5V, +2.8V, +3.0V or +3.3V
		-	1.8	3.0		f = 75 MHz, Vdd = +1.8V
Peak-to-peak Period Jitter	T_pk	-	12	25	ps	f = 75 MHz, Vdd = +2.5V, +2.8V, +3.0V or +3.3V
		-	14	30		f = 75 MHz, Vdd = +1.8V
RMS Phase Jitter (random)	T_phj	-	0.5	0.9	ps	f = 75 MHz, Integration bandwidth = 900 kHz to 7.5 MHz
		-	1.3	2.0		f = 75 MHz, Integration bandwidth = 12 kHz to 20 MHz
Packing Unit	1000pcs./reel (φ180) or 3000pcs./reel (φ180: 2016, 2520, 3225 package)					