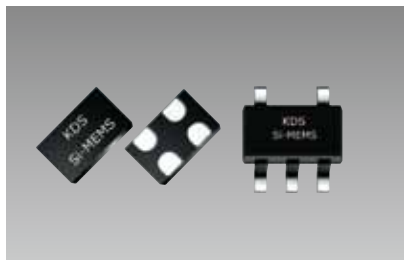


High Temperature MEMS Oscillators

MO1618/MO8918/MO8919/MO2018/MO2019/MO8920/MO8921/MO2020/MO2021



■ Features

- Low power consumption of +3.5 mA typical (20 MHz, +1.8 V)
- Excellent total frequency tolerance as low as $\pm 20 \times 10^{-6}$

■ Applications

- High temp industrial equipment such as industrial control systems and industrial sensors
- Servo motor, PLC & High-temp networking gears
- Outdoor systems (medical and health monitoring)
- Asset tracking systems



Model	Output Frequency (MHz)	Frequency Tolerance ($\times 10^{-6}$)	Supply Voltage (V)	Current Consumption (mA Typ.)	Size (mm)	Output			
MO1618	33 standard frequencies	$\pm 20, \pm 25, \pm 30, \pm 50$ (-40 to +125°C)	+1.62 to +1.98, +2.25 to +3.63	+3.6 to +5.4 (+1.0 μ A stby)	2.0 \times 1.6 \times 0.8, 2.5 \times 2.0 \times 0.8, 3.2 \times 2.5 \times 0.8, 5.0 \times 3.2 \times 0.8, 7.0 \times 5.0 \times 1.0 (QFN)	LVCMOS			
MO8918	1 to 110								
MO8919	115 to 137								
MO2018	1 to 110								
MO2019	115 to 137								
MO8920	1 to 110	$\pm 20, \pm 25, \pm 30, \pm 50$ (-55 to +125°C)			2.9 \times 2.8 \times 1.3 (SOT23-5)	LVCMOS			
MO8921	119 to 137								
MO2020	1 to 110								
MO2021	119 to 137								2.0 \times 1.6 \times 0.8, 2.5 \times 2.0 \times 0.8, 3.2 \times 2.5 \times 0.8, 5.0 \times 3.2 \times 0.8, 7.0 \times 5.0 \times 1.0 (QFN)
									2.9 \times 2.8 \times 1.3 (SOT23-5)

■ Standard Specification (MO8918)

Item	Legend	Min.	Typ.	Max.	Unit	Condition
Output Frequency Range	f	1	-	110	MHz	Refer to datasheet for exact list of supported frequencies
Supply Voltage	V _{dd}	+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}	-40	-	+105	°C	Extended Industrial
		-40	-	+125		Automotive
Frequency Tolerance	F _{stab}	-20	-	+20	$\times 10^{-6}$	Inclusive of Initial tolerance at +25° C, 1st year aging at +25° C, and variations over operating temperature, rated power supply voltage and load (15 pF \pm 10%).
		-25	-	+25		
		-30	-	+30		
		-50	-	+50		
Current Consumption	I _{dd}	-	+3.8	+4.7	mA	No load condition, f = 20 MHz, V _{dd} = +2.8V, +3.0V or +3.3V
		-	+3.6	+4.5		No load condition, f = 20 MHz, V _{dd} = +2.5V
		-	+3.5	+4.5		No load condition, f = 20 MHz, V _{dd} = +1.8V
OE Disable Current	I _{od}	-	-	+4.5	mA	V _{dd} = +2.5V to +3.3V, OE = Low, Output in high Z state
		-	-	+4.3		V _{dd} = +1.8V, OE = Low, Output in high Z state
Standby Current	I _{std}	-	+2.6	+8.5	μ A	V _{dd} = +2.8V to +3.3V, \overline{ST} = Low, Output is weakly pulled down
		-	+1.4	+5.5		V _{dd} = +2.5V, \overline{ST} = Low, Output is weakly pulled down
		-	+0.6	+4.0		V _{dd} = +1.8V, \overline{ST} = Low, Output is weakly pulled down
Duty Cycle	DC	45	-	55	%	All V _{dds}
Output Low Voltage	V _{OL}	-	-	V _{dd} \times 0.1	V	I _{OL} = +4.0 mA (V _{dd} = +3.0V or +3.3V)
		-	-	V _{dd} \times 0.1		I _{OL} = +3.0 mA (V _{dd} = +2.8V or +2.5V)
		-	-	V _{dd} \times 0.1		I _{OL} = +2.0 mA (V _{dd} = +1.8V)
Output High Voltage	V _{OH}	V _{dd} \times 0.9	-	-	V	I _{OH} = -4.0 mA (V _{dd} = +3.0V or +3.3V)
		V _{dd} \times 0.9	-	-		I _{OH} = -3.0 mA (V _{dd} = +2.8V or +2.5V)
		V _{dd} \times 0.9	-	-		I _{OH} = -2.0 mA (V _{dd} = +1.8V)
Rise and Fall Time	Tr, Tf	-	1.0	2.0	ns	V _{dd} = +2.5V, +2.8V, +3.0V or +3.3V, 20% to 80%
		-	1.3	2.5		V _{dd} = +1.8V, 20% to 80%
		-	1.0	3.0		V _{dd} = +2.25V to +3.63V, 20% to 80%
Input Low Voltage	V _{IL}	-	-	V _{dd} \times 0.3	V	Pin 1, OE or \overline{ST}
Input High Voltage	V _{IH}	V _{dd} \times 0.7	-	-	V	Pin 1, OE or \overline{ST}
Start-up Time	T _{start}	-	-	5.0	ms	Measured from the time V _{dd} reaches its rated minimum value.
Enable and Disable Time	T _{oe}	-	-	130	ns	f = 110 MHz. For other frequencies, T _{oe} = 100 ns + 3 \times cycles
Resume Time	T _{resume}	-	-	5.0	ms	Measured from the time \overline{ST} pin crosses 50% threshold
RMS Period Jitter	T _{jitt}	-	1.6	2.5	ps	f = 75 MHz, V _{dd} = +2.5V, +2.8V, +3.0V or +3.3V
		-	1.9	3.0		f = 75 MHz, V _{dd} = +1.8V
Peak-to-peak Period Jitter	T _{pk}	-	12	20	ps	f = 75 MHz, V _{dd} = +2.5V, +2.8V, +3.0V or +3.3V
		-	14	25		f = 75 MHz, V _{dd} = +1.8V
RMS Phase Jitter (random)	T _{phj}	-	0.5	0.8	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 (ϕ 180) or 3000pcs./reel (ϕ 180: 2016, 2520, 3225 package)				