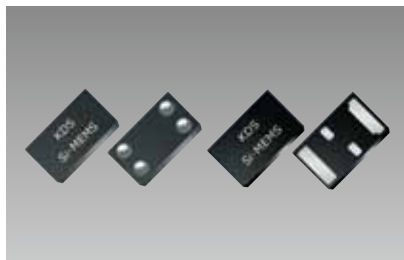


MEMS Oscillators / TC-MO -μPower

MO1534/MO1569/MO1576/MO8021



■ Features

- Ultra-low power
- Internal filtering eliminates external Vdd bypass cap

■ Applications

- Tablets, Wearable, Portable audio
- Health and wellness monitors, Fitness bands
- IoT devices
- Input devices



Model	Output Frequency (kHz)	Frequency Tolerance ($\times 10^{-6}$)	Supply Voltage (V)	Current Consumption ($\mu\text{A Typ.}$)	Size (mm)	Output
MO1534	1 Hz to 32.768 kHz	± 20 room; $\pm 75, 100, 150$ over temp	+1.2 to +3.63	+0.90	1.5 \times 0.8 \times 0.6 (CSP) 2.0 \times 1.2 \times 0.6 (QFN)	NanoDrive™ LVCMOS
MO1569	1 Hz to 462kHz	± 50	+1.62 to +3.63	+2.0 (100 kHz)	1.5 \times 0.8 \times 0.6 (CSP)	LVCMOS
MO1576 Super TC-MO	1 Hz to 2 MHz	± 5 all inclusive		+8.0 (100 kHz)		
MO8021	1 Hz to 26 MHz	± 100	+1.71 to +1.89	+6 to +340 (0.9 $\mu\text{A stby}$)		

■ Standard Specification (MO8021)

Item	Legend	Min.	Typ.	Max.	Unit	Condition
Output Frequency Range	f	1	-	26	MHz	
Operating Supply Voltage	Vdd	+1.62	+1.8	+1.98	V	Any voltage from +2.25 to +3.63V
		+2.25	-	+3.63		
Operating Temperature Range	T _{use}	-20	-	+70	°C	Extended Commercial Industrial
		-40	-	+85		
Frequency Stability	F _{tol}	-15	-	+15	$\times 10^{-6}$	Frequency offset at +25°C post reflow
Frequency Tolerance	F _{stab}	-100	-	+100	$\times 10^{-6}$	Inclusive of initial tolerance, and variations over operating temperature, rated power supply voltage and output load.
First Year Aging	F _{aging1}	-3.0	-	+3.0	$\times 10^{-6}$	T _A = +25°C
Current Consumption [1]	I _{dd}	-	+60	-	μA	f = 3.072 MHz, Vdd = +1.8V, no load
		-	+110	+130		f = 6.144 MHz, Vdd = +1.8V, no load
		-	+230	+270		f = 6.144 MHz, Vdd = +1.8V, 10 pF load
		-	+160	-		f = 12 MHz, Vdd = +1.8V, no load
		-	-	+160		f = 6.144 MHz, Vdd = +2.25V to +3.63V, no load
Standby Current	I _{std}	-	+0.7	+1.3	μA	Vdd = +1.8V, ST pin = HIGH, output is weakly pulled down
		-	-	+1.5		Vdd = +2.25V to +3.63V, ST pin = HIGH, output is weakly pulled down
Duty Cycle	DC	45	-	55	%	
Output Low Voltage	V _{OL}	-	-	Vdd \times 0.1	V	I _{OL} = +0.5 mA
Output High Voltage	V _{OH}	Vdd \times 0.9	-	-	V	I _{OH} = -0.5 mA
Rise and Fall Time	Tr, Tf	-	+4.0	+8.0	ns	20% to 80%
Input Low Voltage	V _{IL}	-	-	Vdd \times 0.2	V	
Input High Voltage	V _{IH}	Vdd \times 0.8	-	-	V	
Start-up Time	T _{start}	-	75	150	ms	Measured from the time Vdd reaches 90% of its final value
Standby Time	T _{stdby}	-	-	20	μs	Measured from the time ST pin crosses 50% threshold
Resume Time	T _{resume}	-	2.0	3.0	ms	Measured from the time ST pin crosses 50% threshold
RMS Period Jitter	T _{jitt}	-	75	110	ps	f = 6.144 MHz, Vdd = +1.8V
		-	-	110		f = 6.144 MHz, Vdd = +2.25V to +3.63V
RMS Phase Jitter (random)	T _{phj}	-	0.8	2.5	ns	f = 6.144 MHz, Integration bandwidth = 100 Hz to 40 kHz Vdd = +1.8V, Note [2]
		-	-	2.5		f = 6.144 MHz, Integration bandwidth = 100 Hz ~ 40 kHz Vdd = +2.25V to +3.63V, Note [2]
Packing Unit		1000pcs./reel (ϕ 180) or 3000pcs./reel (ϕ 180)				

[1]. Supply current with load is a function of the output frequency and output load.

For any given output frequency, the capacitive loading will increase supply current equal to C_{load} \times Vdd \times f(MHz).

[2]. Max spec inclusive of +25 mV peak-to-peak sinusoidal noise on Vdd. Noise frequency 100 Hz to 20 MHz.