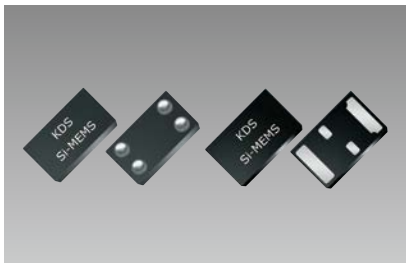
MEMS Oscillators / TC-MO - µPower

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

Pb-Free

RoHS Compliant

Model	Output Frequency (kHz)	Frequency Tolerance (×10^{-6})	Supply Voltage (V)	Current Consumption (µA Typ.)	Size (mm)	Output
MO1534	1 Hz to 32.768 kHz	±20 room; ±75,100,150 over temp	+1.2 to +3.63	+0.90	1.5×0.8×0.6 (CSP) 2.0×1.2×0.6 (QFN)	NanoDrive™ LVCMOS
MO1569	1 Hz to 462kHz	±50	+1.62 to +3.63	+2.0 (100 kHz)	1.5×0.8×0.6 (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	+1.62 to +1.98, +2.25 to +3.63	+6 to +340 (0.9 µA 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	
		+2.25	–	+3.63		Any voltage from +2.25 to +3.63V
Operating Temperature Range	T_use	-20	–	+70	℃	Extended Commercial
		-40	–	+85		Industrial
Frequency Stability	F_tol	-15	–	+15	×10^{-6}	Frequency offset at +25℃ post reflow
Frequency Tolerance	F_stab	-100	–	+100	×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	×10^{-6}	T_A = +25℃
Current Consumption [1]	Idd	–	+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 pulleddown
Duty Cycle	DC	45	–	55	%	
Output Low Voltage	V_{OL}	–	–	Vdd×0.1	V	I_{OL} = +0.5 mA
Output High Voltage	V_{OH}	Vdd×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×0.2	V	
Input High Voltage	V_{IH}	Vdd×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 (φ180) or 3000pcs./reel (φ180)					

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