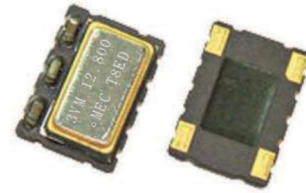


Temperature Compensated Crystal Oscillators [TCXO " M " and VCTCXO " VM "] CMOS Output

TCXO	VCTCXO	MHz range	CMOS	SMD	15pF	2.5 V	3.0 V	Min.	Max.
M _ T	VM _ T					3.3 V	5.0 V	1.25 MHz	40.0 MHz



Features

- Wide frequency range : [1.25 MHz ~ 38.4 MHz]
- Frequency stability as tight as ± 0.5 ppm over 0°C to 50°C
- Frequency stability as tight as ± 1.0 ppm over -40°C to 85°C

General specifications of all available packages , at $T_a=+25^{\circ}\text{C}$, $CL=15\text{pF}$

Output Wave Form		Square wave [LVCMOS] . Wave form code is " T "					
Type		M32T , VM32T		(V)M53T , VM53T		M572T , VM572T	
Package (Size)		(3.2 x 2.5 x 1.0 mm)		(5.0 x 3.2 x 1.3 mm)		(7.0 x 5.0 x 2.3 mm)	
Frequency Range		8.192 ~ 40.0 MHz		6.4 ~ 40.0 MHz		1.25 ~ 40.0 MHz	
Input Voltage Range	Standard	+2.5 V (code is " 25 ")	+3.0 V (code is " 3 ")	+3.3 V (code is " 33 ")	+5.0 V (code is " 5 ")		
Current Consumption. (max.) (Over operating temperature range .)	Package	M32T	6 mA	6 mA	6 mA	-----	
		M53T	6 mA	6 mA	6 mA	-----	
		M572T	10 mA	13 mA	13 mA	27 mA	
Output Logic Levels	Logic High " 1 " (min.)	2.25 V	2.7 V	2.97 V	4.5 V		
	Logic Low " 0 " (max.)	0.25 V	0.3 V	0.33 V	0.5 V		
Standard Frequency (Partial list) [MHz]		10.000	12.800	13.000	14.7456	16.000	16.384
		19.200	19.440	19.680	20.000	25.000	27.000
Initial Calibration Tolerance		Models with mechanical trimmer : $< \pm 1.0$ ppm. $+25^{\circ}\text{C} \pm 2^{\circ}\text{C}$. Models without mechanical trimmer : ± 2.0 ppm at $+25^{\circ}\text{C} \pm 2^{\circ}\text{C}$.					
Frequency Stability (ppm)		± 0.5 ppm	± 1.0 ppm	± 1.5 ppm	± 2.0 ppm	± 2.5 ppm	± 3.0 ppm
Frequency Stability vs Temperature (examples)	0 $^{\circ}\text{C}$ to 50 $^{\circ}\text{C}$	○	○	○	○	○	○
	-10 $^{\circ}\text{C}$ to 60 $^{\circ}\text{C}$	△	○	○	○	○	○
	-20 $^{\circ}\text{C}$ to 70 $^{\circ}\text{C}$	X	○	○	○	○	○
	-30 $^{\circ}\text{C}$ to 75 $^{\circ}\text{C}$	X	○	○	○	○	○
	-30 $^{\circ}\text{C}$ to 85 $^{\circ}\text{C}$	X	○	○	○	○	○
	-40 $^{\circ}\text{C}$ to 85 $^{\circ}\text{C}$	X	△	○	○	○	○
Frequency Stability	vs Aging	± 1.0 ppm max., per year at 25°C .					
	vs Voltage Change	± 0.3 ppm max. , for a $\pm 5\%$ input voltage change .					
	vs Load Change	± 0.3 ppm max. , for a $\pm 10\%$ load condition change .					
	vs Reflow (SMD type)	± 1.0 ppm max., 1 reflow and measured 24 hours afterwards .					
Output Voltage Level (peak to peak)		T T L / CMOS					
Mechanical Frequency Tuning	Standard	± 3.0 ppm (min.) tuning Note: VM57 has no mechanical trimmer built-in.					
	Option	No mechanical trimmer built-in (for aqueous washing cycles). To order please add " 1 " after the regular model prefix . Example: M381T.					
Output Logic Levels	Logic High " 1 " "	90% of V_{DD} min.					
	Logic Low " 0 " "	10% of V_{DD} max.					
Electrical Frequency Tuning (EFC) by external control voltage	Control Voltage Center	Standard: $+1.5\text{ V} \pm 1.0\text{ V}$ for all input voltages.					
	Frequency Deviation Range	± 5.0 ppm. (min.) with $V_{con} = +1.5\text{ V} \pm 1.0\text{ V}$					
	Slope Polarity (Transfer Function)	Positive slope. Positive voltage for positive frequency shift.					
		Input Impedance : 50M Ω min.	Modulation Bandwidth : 20 KHz min.		Linearity : $\pm 10\%$ max.		
Rise Time and fall time		10.0 n sec. max. ; 20% \leftrightarrow 80% of the wave form.					
Duty Cycle		Standard: 50 % \pm 10 % ; Option: 50 % \pm 5 %					
Start-Up Time.		5.0 m sec. (typ.) , 10.0 m sec. (max.) (reach 90% amplitude and at $+25^{\circ}\text{C} \pm 2^{\circ}\text{C}$)					
Output Load		15 pF					
SSB Phase Noise at 25°C , 15pF	Offset / dBc / Hz [typical]	10 Hz	100 Hz	1 KHz	10 KHz	100 KHz	
	M572T33 - 10.000	-96 dBc / Hz	-122 dBc / Hz	-138 dBc / Hz	-145 dBc / Hz	-150 dBc / Hz	
Storage Temperature		-40°C to $+85^{\circ}\text{C}$ or -55°C to $+125^{\circ}\text{C}$ (package dependent)					

TCXOs

○ : available
△ : please contact us
X : not available