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

CMOS Output

TCXO	nA Current	± 5 ppm	CMOS	SMD	15 pF	1.8 V	2.5 V	3.0 V
ME32T	32.768 KHz	-40 to 85 °C				3.3 V	5.0 V	

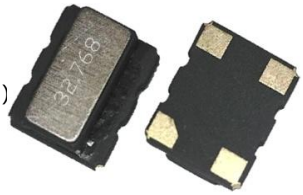
Features

- CMOS 32.768 KHz TCXO with a maximum frequency stability of ± 5 ppm (±2.62 minutes / year) over -40 to +85°C, providing a much better timekeeping accuracy than the competition
- A proprietary temp. compensation technique is applied to the built-in 32.768 KHz tuning fork crystal & temp. sensor
- A 1.5 µA typical current consumption makes it ideal for battery-operated devices
- 3.28 x 2.5 x 1.3 mm ceramic SMD package, ideal for new miniaturizing applications

RoHS Compliance

Applications:

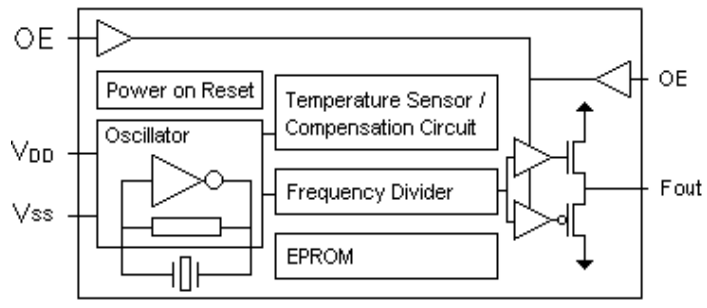
- Frequency reference for real time clocks (RTCs)
- Portable instruments
- Smart metering, data loggers
- GPS receivers. Telematics.
- Timing synchronization for networks, servers, hubs, routers and switches
- If ±1.0 ~ ±2.5 ppm frequency stability is required , please use Mercury's M572T series (mA current consumption)
- If temperature compensation is not required , please use Mercury's " HG57 " series (nA current consumption) or " HA " series (mA current consumption)



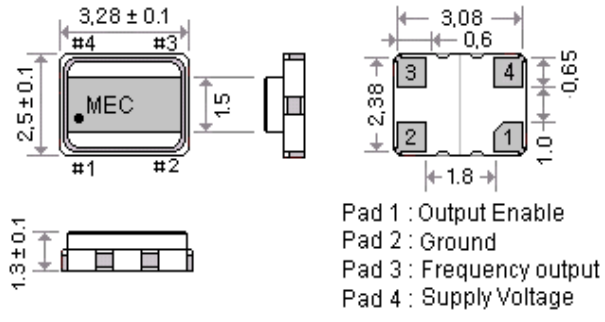
General specifications of all available packages , at Ta=+25°C , CL=15pF

Output Wave Form		Square wave [LVCMOS]				
Nominal Frequency		32.768 KHz				
Standard Supply Voltages (Custom V_{DD} is also available)	V_{DD}	1.8 ± 5 %	2.5 ± 5 %	3.0 ± 5 %	3.3 ± 5 %	5.0 ± 10 %
	Voltage code	18	25	3	33	5
Power Supply Current (Icc) (typical)		0.79 uA	1.05 uA	1.25 uA	1.37 uA	2.05 uA
Initial Calibration Tolerance		± 1.5 ppm (max.) at T_{amb} = +25° C ± 3° C				
Frequency Stability over Temperature (max.)		± 5 ppm (-40°C to +85°C)				
Timing error over time [± 5 ppm (-40°C to +85°C)]		± 0.432 sec/day ; ± 12.960 sec/month ; ± 2.628 minutes / year , w.r.t fo at +25°C.				
Frequency Stability	vs Aging	± 3.0 ppm / year (max.) first year at +25° C				
	vs V_{DD} Tolerance Change	± 0.2 ppm (max.) for a ± 5 % input voltage change				
	vs Load Change	± 0.2 ppm (max.) for a ± 10 % loading condition change				
	vs Reflow	± 1.0 ppm (max.) 1 reflow and measured 24 hours afterwards				
	vs all range of V_{DD} (△f / V)	± 1.0 ppm / volt (max.) V_{DD} = 1.7 V to 5.5 V .				
Output Logic / Output Load		CMOS / 15 pF				
Supply Voltage Variation ($\triangle V_{DD}$)		0.25 V (max.) Condition : △V / △t = 1 V / us				
Output Voltage Level	V_{OH}	V_{DD} - 0.4 V (min.) ; I_{OH} = 0.1 mA , all V_{DD} range				
Output Voltage Level	V_{OL}	0.4 V (max.) ; I_{OL} = - 0.1 mA , all V_{DD} range				
Start - up Time		1 sec. (max.) at +25°C ; 3 sec. (max .) over -40°C to +85°C				
Rise Time and Fall Time		100 nano. sec. max. Measured at 20% ⟷ 80% of the waveform , 15 pF load.				
Duty Cycle (Symmetry)		50% ±10% typical (Measured at 50% of V_{DD} Over -40°C to +85°C.)				
Pad 1 OE Thresholds		Vih = 0.8 * V_{DD} , Vil = 0.2 * V_{DD} ; Open connection prohibit				

Block Diagram



Package Dimensions and Suggested Land Pattern



Part Number Format and Example

[1]	[2]		[3]		[4]		[5]
ME32T	Supply Voltage	-	32.768 K	-	Frequency Stability	/	Operating Temp. Range

Examples	(1)	ME32T	5	-	32.768 K	-	5.0	/	-40+85

ME32T5 - 32.768K - 5.0 / -40+85 [ME32T type , CMOS , 5.0V , 32.768 KHz , ± 5.0 ppm from -40°C to 85°C]