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

TCXO	VCTCXO	KHz range	CMOS	Thru-Hole	SMD	15pF	3.3V	32.768 KHz
M _ T	VM _ T							

Features

- Wide frequency range : [32.768 KHz]
- 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 Ta=+25°C , CL=15pF

Output Waveform		Square wave [CMOS] . Waveform code is " T "						
Suggested Package (Size)	Type	SMD			Thru - Hold			
	Demensions	**(V)M572T** (7.0 x 5.0 x 2.3 mm)			**(V)M8T** (12.8 x 12.8 x 5.5 mm)			
Frequency Range		32.768 KHz [From KHz with divider. mA current consumption.]						
Supply Voltage V_{DD} (code)		+3.3 V ± 10% (voltage code is " 33 ")						
Output Logic Levels	Logic High " 1 "	2.97 V_{DD} (min.)						
	Logic Low " 0 "	0.33 V_{DD} (max.)						
Current Consumption. (max.) (Over operating temperature range .)		8.0 mA (max.) for 32.768 KHz at +3.3V						
Initial Calibration Tolerance		Models with mechanical trimmer : < ± 1.0 ppm. +25°C ± 2°C. Models without mechanical trimmer : < ± 2.0 ppm at +25°C ± 2°C.						

Frequency Stability (ppm)		± 0.5 ppm	± 1.0 ppm	± 1.5 ppm	± 2.0 ppm	± 2.5 ppm	± 3.0 ppm	○ : available △ : contact us X : not available
Frequency Stability vs Temperature (examples)	0°C to 50°C	○	○	○	○	○	○	
	-10°C to 60°C	△	○	○	○	○	○	
	-20°C to 70°C	X	○	○	○	○	○	
	-30°C to 75°C	X	○	○	○	○	○	
	-30°C to 85°C	X	○	○	○	○	○	
	-40°C to 85°C	X	△	○	○	○	○	

Frequency Stability				
	vs Aging at Ta = +25°C	± 1.0 ppm / year (max.)		
	vs Voltage Change	± 0.3 ppm (max.) , for a ±5% input voltage change .		
	vs Load Change	± 0.3 ppm (max.) , for a ±10% load condition change .		
	vs Reflow (SMD type)	± 1.0 ppm (max.) , 1 reflow and measured 24 hours afterwards .		
Rise and Fall Time	10.0 nsec. (max.) Measured at 20% ↔ 80% of the waveform			
Electrical Frequency Tuning (EFC) by external Control Voltage	Control Voltage Center	1.5 V ± 1.0 V (3.3V)		
	Frequency Deviation Range	± 5.0 ppm (min.)		
	Slope Polarity (Transfer Function)	Positive slope. Positive voltage for positive frequency shift.		
		Input Impedance : 1.0M Ω (min.)	Modulation Bandwidth : 3 KHz (min.)	Linearity : ± 10 % (max.)
Start-Up Time.	5.0 msec. (typ.) , 10.0 msec. (max.) (reach 90% amplitude and at+25°C±2°C)			
Duty Cycle	50 % ± 5%			
Output Load	15 pF			
Storage Temperature	-40°C to +85°C or -55°C to +125°C (package dependent)			

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

CMOS wave output code " T "

Part Number Format and Example

[1]	[2]	[3]	-	[4]	-	[5]	/	[6]
Holder Type	Output Wave	Supply Voltage		Center Frequency		Frequency Stability		Operating Temp. Range

Examples	(1)	VM8	T	3	-	32.768	-	1.5	／	-20+70
	(2)	M572	T	33	-	32.768	-	2.5	／	-30+85

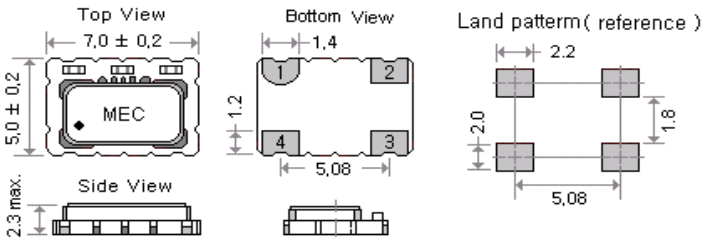
Ex (1) : VM8T3 - 10.000 - 1.5 / -20+70 [VCTCXO , VM8 type , CMOS output , 3.0V , 32.768KHz , ±1.5ppm from -20°C to 70°C]

Ex (2) : M572T33 - 20.000 - 2.5 / -30+85 [TCXO , M572 type , CMOS output , 3.3V , 32.768KHz , ±2.5ppm from -30°C to 85°C]

[1]	Holder Type
	" M " stands for TCXO , " VM " stands for VCTCXO
[2]	" T " stands for Square Wave
	ex 1 : M8T --- TCXO , M8 pcakage , CMOS output
[3]	Supply voltage , " 18 " stands for +1.8V ; " 28 " stands for +2.8V ; " 3 " stands for +3.0V ; " 33 " stands for +3.3V
[4]	Center Frequency in MHz
[5]	Frequency stability in ± _ ppm ; ex 1 : ± 2.5ppm --- 2.5 , ex 2 : ± 1.0ppm --- 1.0
[6]	Operating temperature range in °C
	ex 1 : -10 °C to 60°C ----- -10+60 ; ex 2 : -20 °C to 70°C ----- -20+70 ; ex 3 : -40 °C to 85°C ----- -40+85

Outline Dimensions (Unit : mm) , Suggested pad Layout for SMDs

[(V) M572T_ _]

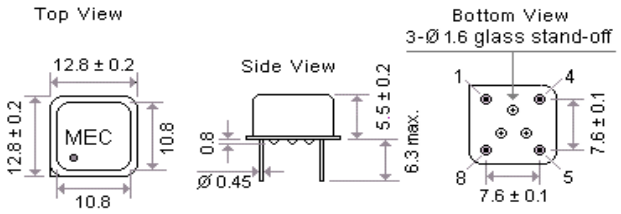


Pad Connections :

Pad 1 : NC - - - TCXO ; Vcon - - - VCTCXO

Pad 2 : Ground ; Pad 3 : Output , Pad 4 : Supply Voltage

[(V) M_8T _ _] - - - Gull - wing SMD is also available .

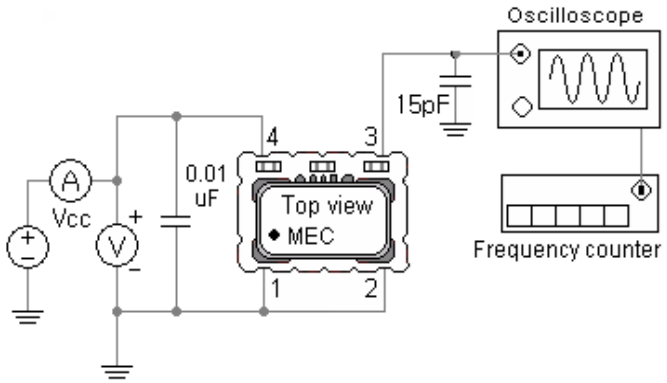


Pad Connections :

Pin 1 : Control voltage for VCTCXO , No connection for TCXO .

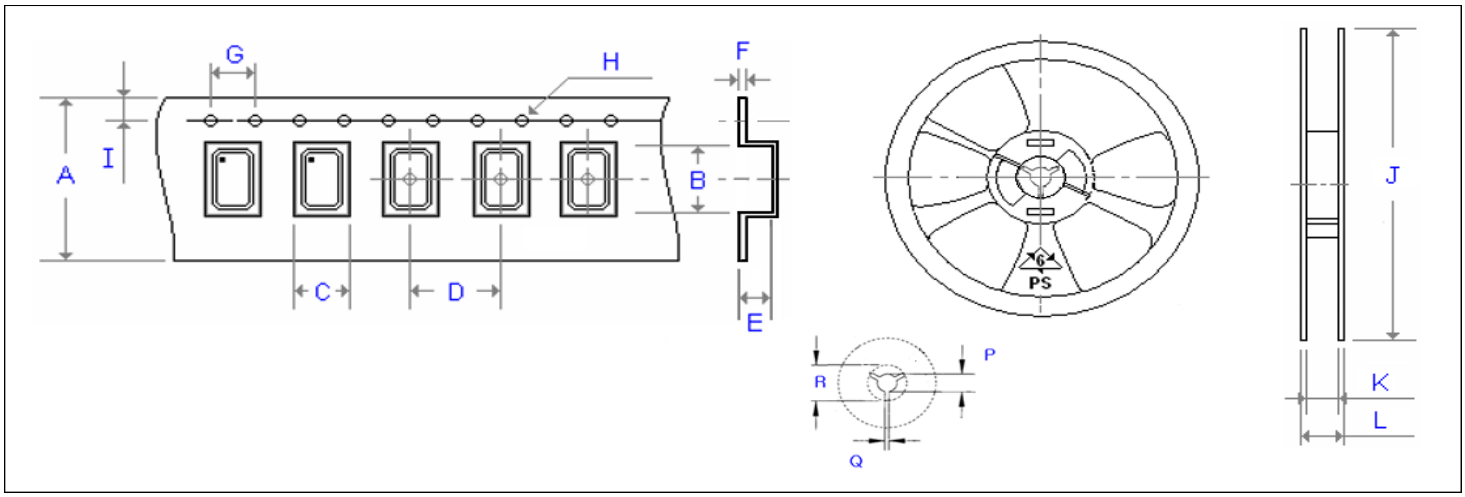
Pin 4 : Ground ; Pin 5 : Output , Pin 8 : Supply Voltage

(VC)TCXO with CMOS output wave test Circuit



Emboss Taping and Reel Specifications

[VCXO]	[(VC)TCXO]



Carrier Type Dimensions (unit : mm) ±0.3mm

	A	B	C	D	E	F	G	H	I	pcs / reel
G_226	8.00	2.80	2.25	4.00	1.10	0.30	4.00	Ø 1.50	1.75	3000
G_326	8.00	3.40	2.70	4.00	1.40	0.25	4.00	Ø 1.50	1.75	3000
G_534	12.00	5.30	3.60	8.00	1.40	0.30	4.00	Ø 1.50	1.75	1000
G_576	16.00	7.30	5.30	8.00	1.90	0.32	4.00	Ø 1.50	1.75	1000
G_43	24.00	11.80	10.00	16.00	5.00	0.30	4.00	Ø 1.50	1.75	500
G_63	24.00	11.80	10.00	16.00	5.00	0.30	4.00	Ø 1.50	1.75	500
G_JF538	12.00	5.30	3.60	8.00	1.40	0.30	4.00	Ø 1.50	1.75	1000
G_JF578	16.00	7.30	5.30	8.00	1.90	0.32	4.00	Ø 1.50	1.75	1000
(V)M21	8.00	2.30	1.90	4.00	0.90	0.25	4.00	Ø 1.50	1.75	3000
(V)ME21	8.00	2.30	1.50	4.00	1.35	0.25	4.00	Ø 1.50	1.75	3000
(V)M22	8.00	2.80	2.25	4.00	1.10	0.30	4.00	Ø 1.50	1.75	3000
(V)M_32	8.00	3.71	2.80	4.00	1.75	0.25	4.00	Ø 1.50	1.75	3000
(V)MQ_326	12.00	3.60	2.90	4.00	1.70	0.30	4.00	Ø 1.50	1.75	3000
(V)M_53	12.00	5.30	3.60	8.00	1.40	0.30	4.00	Ø 1.50	1.75	1000
(V)M_57(2)	16.00	7.40	5.50	8.00	2.80	0.35	4.00	Ø 1.50	1.75	500
(V)M_43 (63)	24.00	11.80	10.00	16.00	5.00	0.30	4.00	Ø 1.50	1.75	500

Reel Dimensions (unit : mm) ±2mm

	J	K	L	P	Q	R	pcs / reel
G_226	180.00	8.40	11.40	13.00	2.50	20.20	3000
G_326	180.00	9.00	12.00	13.00	2.50	20.20	3000
G_534	180.00	13.00	16.00	13.00	2.50	20.20	1000
G_576	180.00	17.20	19.30	13.00	2.50	20.20	1000
G_43	330.00	24.50	29.10	13.00	2.50	20.20	500
G_63	330.00	24.50	29.10	13.00	2.50	20.20	500
G_JF538	180.00	13.00	16.000	13.00	2.50	20.20	1000
G_JF578	180.00	17.20	19.300	13.00	2.50	20.20	1000
(V)M21	180.00	8.40	11.40	13.00	2.50	20.20	3000
(V)ME21	180.00	9.00	12.00	13.00	2.50	20.20	3000
(V)M22	180.00	8.40	11.40	13.00	2.50	20.20	3000
(V)M_32	180.00	9.00	11.40	13.00	2.50	20.20	3000
(V)MQ_326	180.00	13.00	16.00	13.00	2.50	20.20	3000
(V)M_53	180.00	13.00	16.00	13.00	2.50	20.20	1000
(V)M_57(2)	180.00	17.20	19.30	13.00	2.50	20.20	500
(V)M_43 (63)	330.00	24.50	29.10	13.00	2.50	20.20	500