

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

TCXO	VCTCXO								
M _ T	VM _ T	MHz range	CMOS	SMD	15pF	1.8 V 3.0 V	2.5 V 3.3 V	Min. 6.4 MHz	Max. 52.0 MHz

Features

- Wide frequency range : [6.4 MHz ~ 52.0 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 Ta=+25°C , CL=15pF

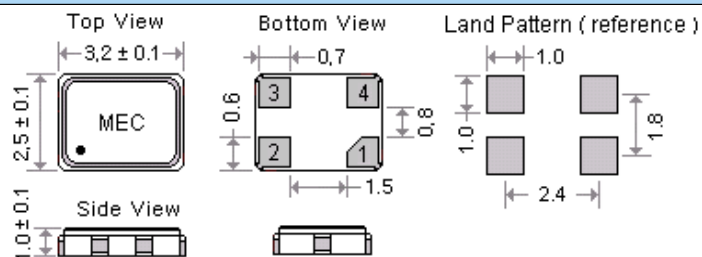
Output Waveform			Square wave [CMOS] . Waveform code is “ T ”														
Type			M32T , VM32T		M53T , VM53T			M572T , VM572T									
Package size (mm)			3.2 x 2.5 x 1.0		5.0 x 3.2 x 1.3			7.0 x 5.0 x 2.3									
Frequency Range			8.192 ~ 40.0 MHz		6.4 ~ 40.0 MHz			6.4 ~ 52.0 MHz									
Supply Voltage V _{DD} (code)					+1.8 V ± 5% (code is “ 18 ”)		+2.5 V ± 5% (code is “ 25 ”)		+3.0 V ± 5% (code is “ 3 ”)		+3.3 V ± 5% (code is “ 33 ”)						
Current Consumption. (max.) (Over operating temperature range .)			Package	M32T	6 mA		6 mA		6 mA		6 mA						
				M53T	6 mA		6 mA		6 mA		6 mA						
				M572T	10 mA		10 mA		13 mA		13 mA						
Output Logic Levels		Logic High " 1 " (min.)		1.62 V		2.25 V		2.7 V		2.97 V							
		Logic Low " 0 " (max.)		0.25 V		0.25 V		0.3 V		0.33 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 : < ± 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 .												
Electrical Frequency Tuning (EFC) by external		Control Voltage Center			0.9 V ± 0.6 V (1.8 V) ; 1.4 V ± 1.0 V (2.5V) ; 1.5 V ± 1.0 V (3.0V / 3.3V)												
		Frequency Deviation Range			± 5.0 ppm (min.)												
		Slope Polarity (Transfer Function			Positive slope. Positive voltage for positive frequency shift.												
Control Voltage					Input Impedance : 1.0M Ω (min.)			Modulation Bandwidth : 20 KHz (min.)			Linearity : ± 10 % (max.)						
Output Load			15 pF														
Duty Cycle			Standard: 50 % ± 10 % ; Option: 50 % ± 5 %														
Storage Temperature			-40°C to +85°C or -55°C to +125°C (package dependent)														
Phase Noise [dBc / Hz (typ.)]		Offset		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					

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

CMOS Wave Output Code " T "

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

[(V) M32T__]

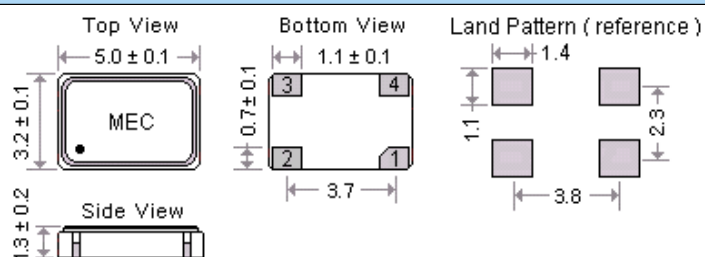


Pad Connections :

Pad 1 : Control voltage for VCTCXO ; Ground for TCXO .

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

[(V) M53T__]

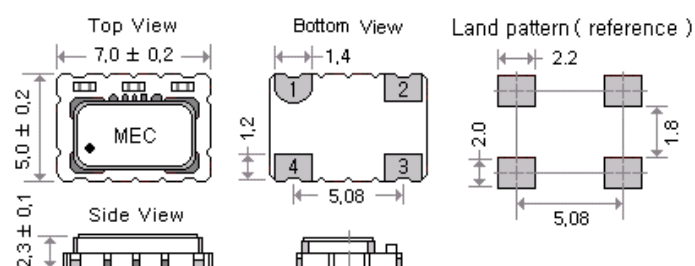


Pad Connections :

Pad 1 : Control voltage for VCTCXO ; Ground for TCXO .

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

[(V) M572T__]



Pad Connections :

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

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

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

CMOS Wave Output Code " T "

Part Number Format and Example

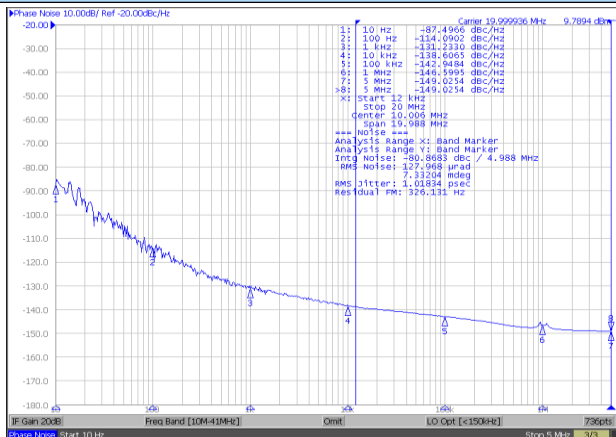
	[1]	[2]	[3]	-	[4]	-	[5]	/	[6]
	Holder Type	Output Wave	Supply Voltage		Center Frequency		Frequency Stability		Operating Temp. Range
Examples	(1) VM32	T	3	-	10.000	-	1.5	/	-20+70
	(2) M572	T	3	-	20.000	-	2.5	/	-30+85

Ex (1) : VM32T3 - 10.000 - 1.5 / -20+70 [VCTCXO , VM32 type , CMOS output , 3.0V , 10.000MHz , ± 1.5 ppm from -20°C to 70°C]

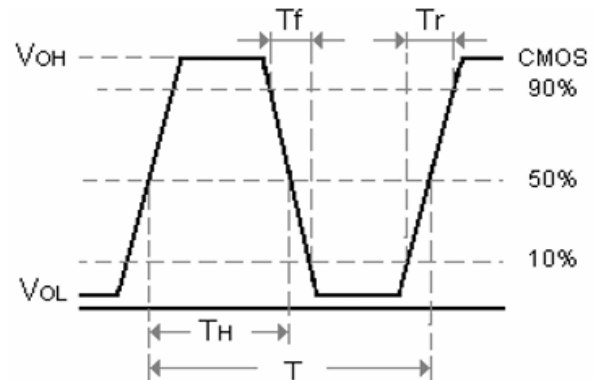
Ex (2) : M572T3 - 20.000 - 2.5 / -30+85 [TCXO , M572 type , CMOS output , 3.0V , 20.000MHz , ± 2.5 ppm from -30°C to 85°C]

[1]	Holder Type " M " stands for TCXO , " VM " stands for VCTCXO
[2]	" T " stands for Square Wave ex 1 : VM32T --- VCTCXO , VM32 package , CMOS Output ; ex 2 : M572T --- TCXO , M572 package , CMOS Output
[3]	Supply voltage , " 18 " stands for +1.8V ; " 25 " stands for +2.5V ; " 3 " stands for +3.0V ; " 33 " stands for +3.3V
[4]	Center Frequency in MHz
[5]	Frequency stability in $\pm$ ppm ; ex 1 : ± 1.5 ppm --- 1.5 , ex 2 : ± 2.5 ppm --- 2.5
[6]	Operating temperature range in °C ex 1 : -20 °C to 70°C ----- -20+70 ; ex 2 : -30 °C to 85°C ----- -30+85

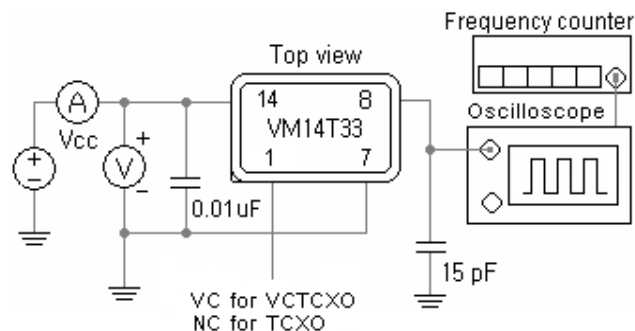
CMOS Typical Phase Noise (M572T33-20.000)



CMOS Output Wave , " T " series



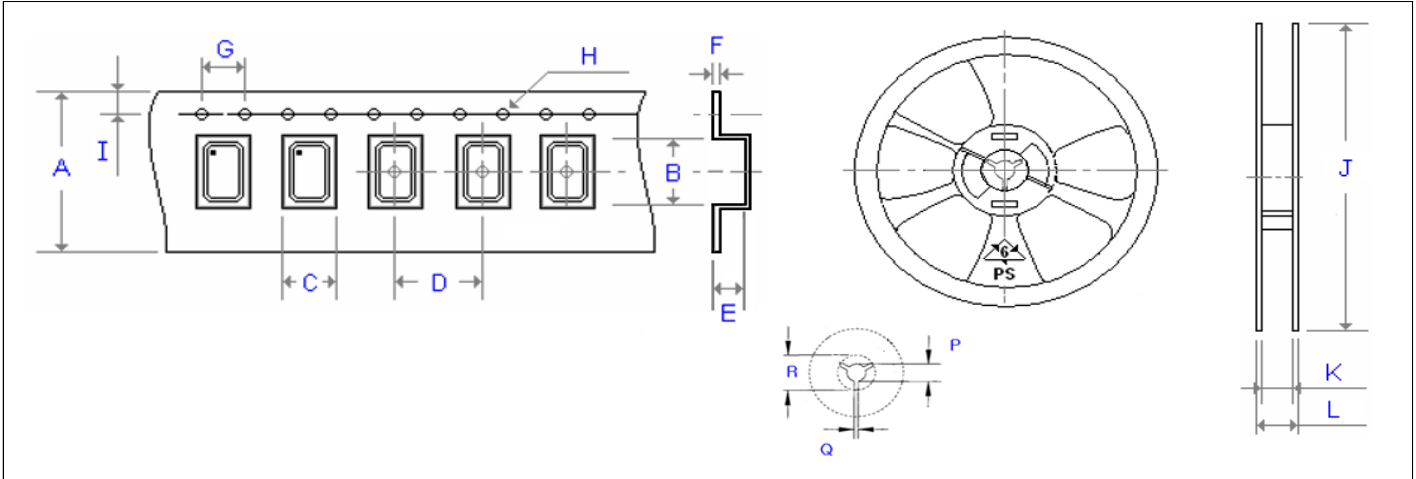
(VC) TCXO with CMOS square wave: Ex. VM14T33



Emboss Taping and Reel Specifications

[VCXO]

[(VC)TCXO]



Carrier Type Dimensions (unit : mm) $\pm 0.3\text{mm}$

	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_536	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	0.30	4.00	Ø 1.50	1.75	1000
G_538	12.00	5.40	3.60	8.00	1.70	0.30	4.00	Ø 1.50	1.75	1000
G_578	16.00	7.30	5.30	8.00	1.90	0.30	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
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)M_326	12.00	3.60	2.90	4.00	1.70	0.30	4.00	Ø 1.50	1.75	1000
(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_538	12.00	5.40	3.60	8.00	1.70	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) $+2.0 / -0.0\text{mm}$

	J	K	L	P	Q	R	pcs / reel
G_226	180.00	9.00	12.00	13.20	2.10	-	3000
G_326	180.00	9.00	12.00	13.20	2.10	-	3000
G_536	180.00	13.00	16.00	13.20	2.50	-	1000
G_576	180.00	17.20	19.30	13.30	2.20	22.00	1000
G_538	180.00	13.00	16.00	13.20	2.50	-	1000
G_578	180.00	17.20	19.30	13.30	2.20	22.00	1000
(V)M21	180.00	9.00	12.00	13.20	2.10	-	3000
ME21	180.00	9.00	12.00	13.20	2.10	-	3000
(V)M22	180.00	9.00	12.00	13.20	2.10	-	3000
(V)M_32	180.00	9.00	12.00	13.20	2.10	-	3000
(V)M_326	180.00	13.00	16.00	13.20	2.50	-	1000
(V)M_53	180.00	13.00	16.00	13.20	2.50	-	1000
(V)M_538	180.00	13.00	16.00	13.20	2.50	-	1000
(V)M_57(2)	180.00	17.20	19.30	13.30	2.20	22.00	500
(V)M_43 (63)	330.00	24.50	29.10	13.00	2.20	17.30	500