

Temperature Compensated Crystal Oscillators [TCXO " M "]

CMOS Output

TCXO	VCTCXO	Quick - Turn Clock Oscillators	CMOS	1.8 V	2.5 V	3.3 V	Min.	Max.
MTF_T	VMTF_T						1 MHz	200 MHz

Features

1.2 pS Phase Jitter (typical)

- Programmable low cost CMOS TCXO
- High frequency range : [1 MHz ~ 200 MHz]
- Frequency stability as tight as ± 2.0 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 Waveform		Square wave [CMOS] . Waveform code is “ T ”					
Type		MTF326 , VMTF326			MTF538 , VMTF538		
Package Size		3.2 x 2.5 x 1.6 mm			5.0 x 3.2 x 1.4 mm		
Supply Voltage (V _{DD})		+ 1.8 V (code is " 18 ")		+ 2.5 V (code is " 25 ")		+ 3.3 V (code is " 33 ")	
Available Frequency Range		1 ~ 125 MHz		1 ~ 200 MHz		1 ~ 200 MHz	
Current Consumption		30 mA (max.)		35 mA (max.)		40 mA (max.)	
Initial Calibration Tolerance		± 2.0 ppm at +25°C ± 2°C. (Default for Quick - Turn)					
Frequency Stability	vs Temperature	± 2.0 ppm (max.) at -40°C to 85°C (Default for Quick - Turn)					
	vs Aging at Ta= + 25 °C	± 1.0 ppm (max.) , per year					
	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	± 1.0 ppm (max.) , 1 reflow and measured 24 hours afterwards .					
Output Logic High " 1 "		V _{DD} - 0.4 V (min.)					
Output Logic Low " 0 "		0.4 V (max.)					
Rise Time and Fall Time		10.0 nsec (max.) ; 10% ↔ 90% of the waveform					
Duty Cycle		1 ~ 150MHz : 50 % ± 5 %					
		150 ~ 200MHz : 50 % ± 10 %					
Start-Up Time		5.0 msec. (typ.) , 10.0 msec. (max.)					
Output Load		15 pF					
Electrical Frequency Tuning (EFC) by external	Control Voltage Center	1.8 V		2.5 V		3.3 V	
		0.9 V ± 0.6 V		1.4 V ± 1.0 V		1.5 V ± 1.0 V	
Control Voltage	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.)	
Output Enable / Disable Function		70% of V _{DD} (min.) to enable.					
		30% of V _{DD} (max.) to disable.					
		Disable Current : 0.2 mA (typ.) , 1.0 mA (max.)					
RMS Jitter (12KHz ~ 20MHz)		100MHz as example	1.2 psec (typ.)				
Phase Noise			10 Hz	100 Hz	1 KHz	10 KHz	100 KHz
Offset / dBc / Hz (typ.)			-72 dBc / Hz	-101 dBc / Hz	-115 dBc / Hz	-121 dBc / Hz	-119 dBc / Hz
Storage Temperature		-55°C to +150°C					

Temperature Compensated Crystal Oscillators [TCXO " M "]

CMOS Wave Output Code " T "

Part Number Format and Exmple

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

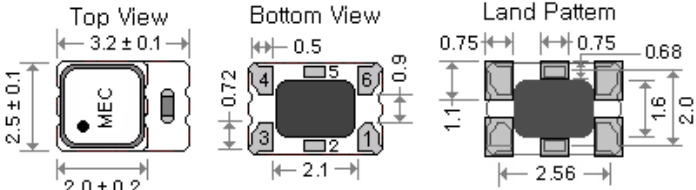
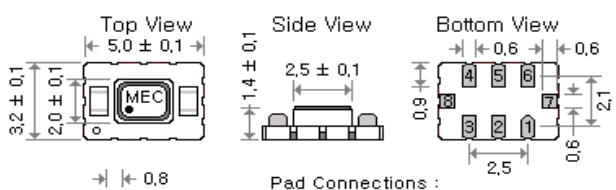
Examples	(1)	MTF538	T	33	-	133.330	-	1.0	/	-40+85
	(2)	VMTF326	T	18	-	100.000	-	2.0	/	-10+60

Ex (1) : MTF538T33 - 133.330 - 1.0 / -40+85 [TCXO , 5032 SMD package , CMOS , 3.3V , 133.330MHz , $\pm 1.0\text{ppm}$ from -40°C to 85°C]

Ex (2) : VMTF326T18 - 100.000 - 2.0 / -10+60 [VCTCXO , 3225 SMD package , CMOS , 1.8V , 100.000 MHz , $\pm 2.0\text{ppm}$ from -10°C to 60°C]

[1]	Holder Type " MTF " stands for TCXO ; " VMTF " stands for VCTCXO
[2]	" T " stands for Square Wave
[3]	Supply voltage : " 18 " stands for +1.8V ; " 25 " stands for +2.5V ; " 33 " stands for +3.3V
[4]	Center Frequency in MHz
[5]	Frequency stability in $\pm$ _ ppm ; ex 1 : $\pm 1.0\text{ppm}$ --- 1.0 , ex 2 : $\pm 2.0\text{ppm}$ --- 2.0
[6]	Operating temperature range in $^{\circ}\text{C}$ ex 1 : -40°C to 85°C ----- -40+85 ; ex 2 : -10°C to 60°C ----- -10+60

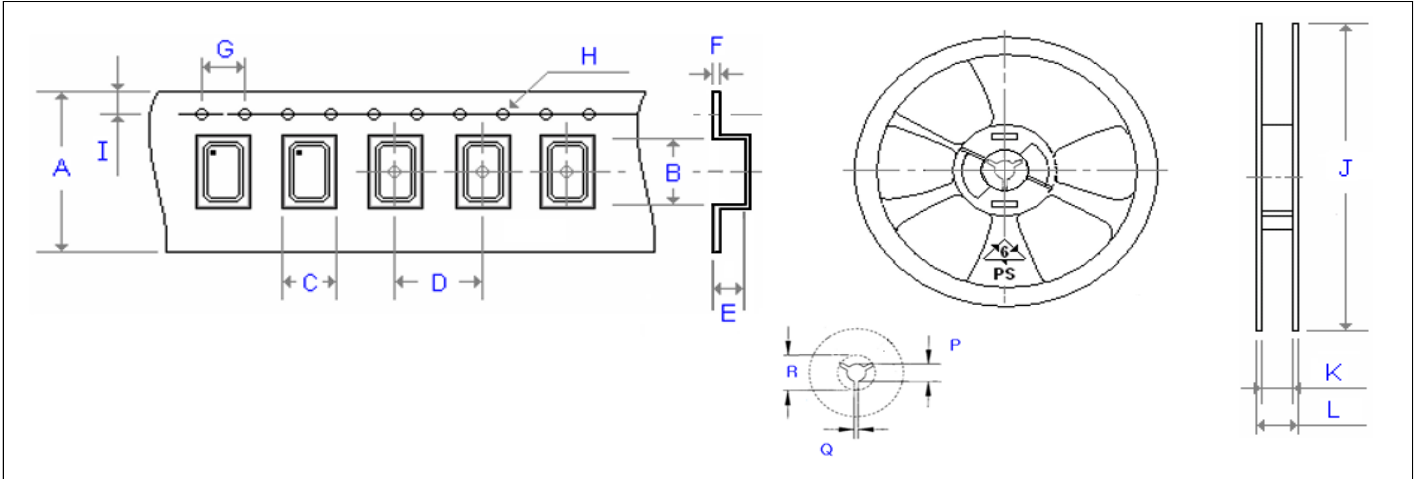
Outline Dimensions (Unit : mm) , Suggested pad Layout for SMDs

[(V) MTF326T]	[(V) MTF538T]
 Top View Bottom View Land Pattern Side View Pad Connections : Pad 1: No Connection for TCXO Voltage Control for VCTCXO Pad 2: Output Enable Pad 3: Ground Pad 4: Output Pad 5: No Connection Pad 6: Supply Voltage	 Top View Side View Bottom View Land Pattern Pad Connections : Pad1 : No Connection For TCXO Voltage Control For VCTCXO Pad2 : Output Enable Pad3 : Ground Pad4 : Output Pad5 : No Connection Pad6 : Supply Voltage Pad7 : No Connection Pad8 : No Connection

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_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 / -0.0mm

	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