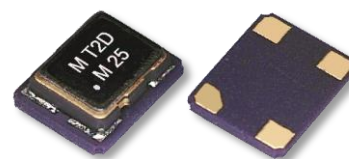


TCXO	Output Enable / Disable	-40 to +105 °C	CMOS	SMD	15pF	1.8 V	2.5 V	3.3 V	Min.	Max.
M_1T									9.5 MHz	60 MHz

Features

- Wide frequency range : [9.5 MHz ~ 60.0 MHz]
- Frequency stability as tight as ± 2.5 ppm over -40°C to 85°C
- Frequency stability as tight as ± 5.0 ppm over -40°C to 105°C (available)



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

Output Waveform		Square wave [CMOS] . Waveform code is " T "				
Type		M211T	M221T	M321T		
Package (Size)		2.0 x 1.6 x 0.7 mm	2.5 x 2.0 x 0.8 mm	3.2 x 2.5 x 1.2 mm		
Frequency Range		10.0 ~ 52.0 MHz	9.5 ~ 60.0 MHz	9.5 ~ 60.0 MHz		
Supply Voltage Range		+ 1.8 V (code is " 18 ")	+ 2.5 V (code is " 25 ")	+ 3.3 V (code is " 33 ")		
Current Consumption		6 mA (max.)	7 mA (max.)	8 mA (max.)		
Standard Frequency [MHz]		12.000 , 20.000 , 24.000 , 25.000 , 26.000 , 40.000 , 50.000 , 60.000				
Initial Calibration Tolerance		± 2.0 ppm (max.) at +25°C $\pm 2^\circ\text{C}$. after reflow				
Frequency Stability		± 2.5 ppm	± 5.0 ppm	± 10.0 ppm	X : not available	
Frequency Stability vs Temperature	- 40°C to + 85°C	○	○	○	△ : please contact us	
	- 40°C to + 105°C	△	△	○	○ : available	
Frequency Stability	vs Aging at Ta= + 25°C	± 1.0 ppm (max.) , per year				
	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 .				
Output Logic High " 1 "		V _{DD} of 90% (min.)				
Output Logic Low " 0 "		V _{DD} of 10% (max.)				
Rise Time and fall time		10.0 nsec. (max.) ; 10% \leftrightarrow 90% of the waveform				
Duty Cycle		50 % \pm 5 %				
Start-Up Time.		5.0 msec. (max.)				
Output Load		15 pF				
Output Enable / Disable Function on Pad1 (Don't use in the OPEN condition)		V _{DD} of 70% (min.) to enable output				
		V _{DD} of 30% (max.) to disable output				
RMS Jitter (12KHz ~ 20MHz)		0.3 psec (typ.) , 1.0 psec (max.)				
Phase Noise		50MHz as example				
Offset / dBc / Hz [typ.]		10 Hz	100 Hz	1 KHz	10 KHz	100 KHz
		-85 dBc / Hz	-111 dBc / Hz	-133 dBc / Hz	-149 dBc / Hz	-154 dBc / Hz
Storage Temperature		-55°C to +125°C				

Temperature Compensated Crystal Oscillators [TCXO " M "]

CMOS wave output code " T "

Part Number Format and Exmple

	[1]	[2]	[3]	[4]	-	[5]	-	[6]	/	[7]	
	Holder Type	Enable/Disable Function	Output Wave	Supply Voltage		Center Frequency		Frequency Stability		Operating Temp. Range	
Examples	(1)	M32	1	T	33	-	40.000	-	5.0	/	-40+105
	(2)	M22	1	T	18	-	38.400	-	2.5	/	-40+85

Ex (1) : M321T33 - 40.000 - 5.0 / -40+105 [TCXO , 3225 SMD package , OE on pad1 , CMOS output , 3.3V , 40.000MHz , ±5.0ppm from -40°C to 105°C]

Ex (2) : M221T18 - 38.400 - 2.5 / -40+85 [TCXO , 2520 SMD package , OE on pad1 , CMOS output , 1.8V , 38.400MHz , ±2.5ppm from -40°C to 85°C]

[1]	Holder Type " M " stands for TCXO
[2]	Enable / Disable Function on pad1 , ex M321 --- OE on pad1
[3]	" T " stands for Square Wave ex : M321T --- TCXO , 3225 SMD package , CMOS output
[4]	Supply voltage , " 18 " stands for +1.8V ; " 25 " stands for +2.5V ; " 33 " stands for +3.3V
[5]	Center Frequency in MHz
[6]	Frequency stability in ± ppm ; ex 1 : ± 2.5ppm --- 2.5 , ex 2 : ± 5.0ppm --- 5.0
[7]	Operating temperature range in °C ex 1 : -40 °C to 85°C ----- -40+85 ; ex 2 : -40 °C to 105°C ----- -40+105

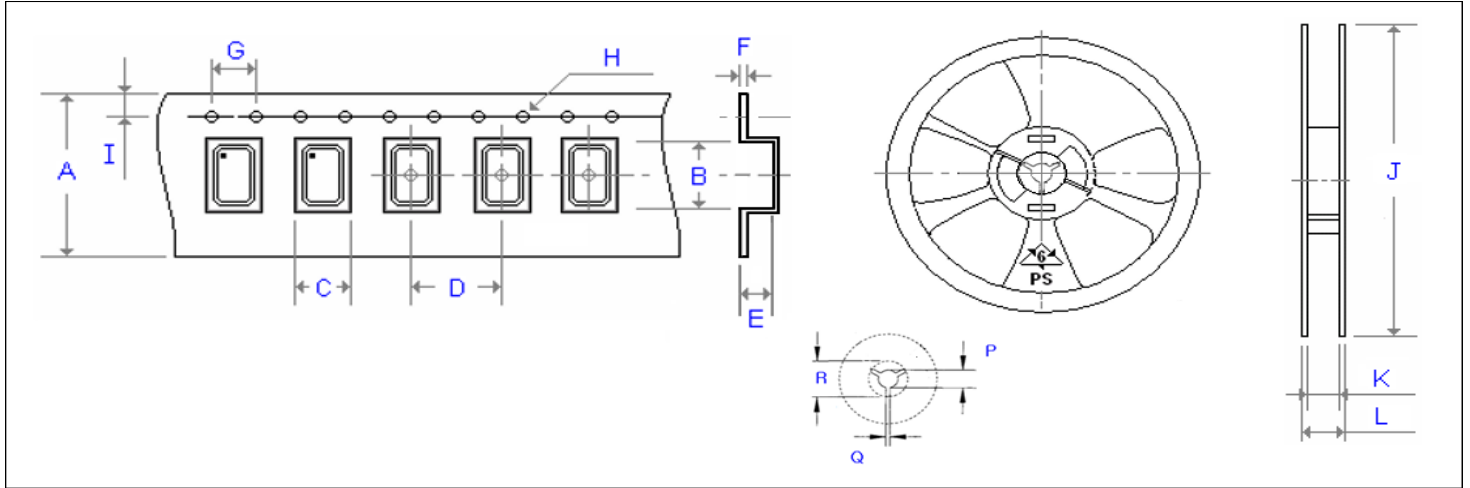
Outline Dimensions (Unit : mm) , Suggested pad Layout for SMDs

[M211T]	[M221T]
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Top View 2.0 ± 0.1 1.6 ± 0.1 MEC</p> </div> <div style="text-align: center;"> <p>Bottom View 1.2 0.4 0.6 0.3</p> </div> <div style="text-align: center;"> <p>Land Pattern 0.6 0.4 0.8 1.2</p> </div> </div> <p style="margin-top: 10px;">Side View 0.7 ± 0.1</p> <p>Pad Connections : Pad 1 : OE Pad 4 : Supply Voltage Pad 2 : Ground Pad 5 : No Connection Pad 3 : Output Pad 6 : No Connection</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Top View 2.5 ± 0.2 2.0 ± 0.2 MEC</p> </div> <div style="text-align: center;"> <p>Bottom View 0.5 0.6 1.9</p> </div> <div style="text-align: center;"> <p>Land Pattern 0.6 0.8 1.9 1.3</p> </div> </div> <p style="margin-top: 10px;">Side View 0.8 ± 0.1</p> <p>Pad Connections : Pad 1 : OE Pad 3 : Output Pad 2 : Ground Pad 4 : Supply Voltage</p>
[M321T]	
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Top View 3.2 ± 0.1 2.5 ± 0.1 MEC</p> </div> <div style="text-align: center;"> <p>Bottom View 0.6 0.7 1.8</p> </div> <div style="text-align: center;"> <p>Land Pattern 1.0 1.1 2.6 1.9</p> </div> </div> <p style="margin-top: 10px;">Side View 1.2 ± 0.1 0.4 typ</p> <p>Pad Connections : Pad 1 : OE Pad 3 : Output Pad 2 : Ground Pad 4 : Supply Voltage</p>	

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	∅ 1.50	1.75	3000
G_326	8.00	3.40	2.70	4.00	1.40	0.25	4.00	∅ 1.50	1.75	3000
G_534	12.00	5.30	3.60	8.00	1.40	0.30	4.00	∅ 1.50	1.75	1000
G_576	16.00	7.30	5.30	8.00	1.90	0.32	4.00	∅ 1.50	1.75	1000
G_43	24.00	11.80	10.00	16.00	5.00	0.30	4.00	∅ 1.50	1.75	500
G_63	24.00	11.80	10.00	16.00	5.00	0.30	4.00	∅ 1.50	1.75	500
G_JF538	12.00	5.30	3.60	8.00	1.40	0.30	4.00	∅ 1.50	1.75	1000
G_JF578	16.00	7.30	5.30	8.00	1.90	0.32	4.00	∅ 1.50	1.75	1000
(V)M21	8.00	2.30	1.90	4.00	0.90	0.25	4.00	∅ 1.50	1.75	3000
(V)ME21	8.00	2.30	1.50	4.00	1.35	0.25	4.00	∅ 1.50	1.75	3000
(V)M22	8.00	2.80	2.25	4.00	1.10	0.30	4.00	∅ 1.50	1.75	3000
(V)M_32	8.00	3.71	2.80	4.00	1.75	0.25	4.00	∅ 1.50	1.75	3000
(V)MQ_326	12.00	3.60	2.90	4.00	1.70	0.30	4.00	∅ 1.50	1.75	3000
(V)M_53	12.00	5.30	3.60	8.00	1.40	0.30	4.00	∅ 1.50	1.75	1000
(V)M_57(2)	16.00	7.40	5.50	8.00	2.80	0.35	4.00	∅ 1.50	1.75	500
(V)M_43 (63)	24.00	11.80	10.00	16.00	5.00	0.30	4.00	∅ 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	16.00	13.00	2.50	20.20	1000
G_JF578	180.00	17.20	19.30	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

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