

Temperature Compensated Crystal Oscillators [15pF CMOS Square Wave Output]

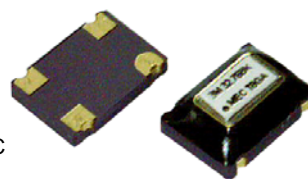
TCXO : M__T series , VCTCXO : VM__T series

KHz Range Output with mA Current Consumption



Features :

- Wide frequency range : [32.768 KHz] , [20.0 KHz ~ 50.0 KHz]
- 5.0 * 7.0 * 2.5 mm ceramic SMD (VC)TCXOs with CMOS square wave output .
- 0.01 uF decoupling capacitor built-in .
- Frequency stability as tight as ± 0.5 ppm over 0°C to 50°C or ± 1.0 ppm over -30°C to 75°C



General Specifications (at+25°C and specified input voltage)

Frequency Range			20.0 KHz ~ 50.0 KHz ; 32.768 KHz						
Output Wave From			Square wave. Wave form code is “ T ”						
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.						
Standard Frequency (Partial list)			32.768 KHz						
Frequency Stability (ppm)			± 0.5 ppm	± 1.0 ppm	± 1.5 ppm	± 2.0 ppm	± 2.5 ppm	± 3.0 ppm	○ : available △ : please 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 -30°C to 75°C -40°C to 85°C	○	○	○	○	○	○		
		△	○	○	○	○	○		
		X	○	○	○	○	○		
		X	○	○	○	○	○		
		X	○	○	○	○	○		
Frequency Stability	vs Aging	≒ ±1.0 ppm , first year at 25°C .							
	vs Voltage Change	≒ ±0.3 ppm , for a ±5% input voltage change .							
	vs Load Change	≒ ±0.3 ppm , for a ±10% load condition change .							
	vs Reflow (SMD type)	≒ ±1.0 ppm , 1 reflow and measured 24 hours afterwards .							
Output Logic			CMOS						
Mechanical Frequency Tuning		Standard	± 3.0 ppm (min.) tuning Note: (V)M57 has no mechanical trimmer built -in.						
		Option	No mechanical trimmer built-in (for aqueous washing cycles). To order please add “ 1 ” after the regular model prefix . Example: M381						
Input Voltage Range		Standard	+3.3 V (voltage code is “ 33 ”)			+5.0 V (voltage code is “ 5 ”)			
Output Logic Levels		Logic High “ 1 ”	90% of V _{DD} min.						
		Logic Low “ 0 ”	10% of V _{DD} max.						
Rise and Fall Time			10.0 n sec. max. Measured at 20% ↔ 80% of the wave form						
Current Consumption. (max.) (Over operating temperature range .)			8.0 mA (max.) for 32.768 KHz at +3.3V 12.0 mA (max.) for 50.0 KHz at +3.3V						
Rise and Fall Time			10.0 n sec. max. Measured at 20% ↔ 80% of the wave form						
Pin 1 Options VCTCXO only	Control Voltage Range		Standard: +1.5 V ± 1.0 V for all input voltages. Contact Mercury if +2.5 V ± 2.0 V is required.						
	Frequency Deviation Range		± 6.0 ppm. (min..) with Vcon = +1.5 V±1.0 V						
	Slope Polarity (Transfer Function)		Positive slope. Positive voltage for positive frequency shift.						
	Input Impedance		10 KΩ min.						
	Modulation Bandwidth		3 KHz min. Measured at -3 dB, Vcontrol=+1.5 V _{DC} .						
	Linearity		10 % max.						
Duty Cycle			50 % ± 5 %						
Start-Up Time.			2.0m sec. (typ.) , 5.0m sec. (max.) (reach 90% amplitude and at+25°C±2°C)						
Output Load			15 pF						
Storage Temperature			-40°C to +85°C or -55°C to +125°C (package dependent)						

Note 1: Some specifications are package dependent. Please refer to the spec. sheet of individual packages once a package is selected .

Note 2: TCXO products ordered without mechanical and electrical frequency tuning should have a frequency tolerance of ± 2 ppm (at +25°C) and the frequency stability over temperature will be from that measured value.

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Temperature Compensated Crystal Oscillators [15pF CMOS Square Wave Output]

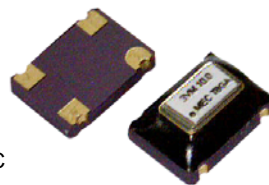
TCXO : M__T series , VCTCXO : VM__T series

MHz Range Output



Features :

- Wide frequency range : [1.25 MHz ~ 156.0 MHz]
- 7.0 * 5.0 * 2.5 mm ceramic SMD (VC)TCXOs with CMOS square wave output .
- 0.01 uF decoupling capacitor built-in .
- Frequency stability as tight as ± 0.5 ppm over 0°C to 50°C or ± 1.0 ppm over -30°C to 75°C



RoHS Compliance

General Specifications (at+25°C and specified input voltage)

Frequency Range			1.25 MHz ~ 156.0 MHz						
Output Wave Form			Square wave. Wave form code is "T "						
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.						
Standard Frequency (Partial list)			10.0 , 12.8 , 13.0 , 14.4 , 15.36 , 16.384 , 19.2 , 19.440 , 19.68 , 25.0 , 20.0 , 27.0 , 38.880 , 40.0 , 77.760 , 125.0 , 155.520 MHz						
Frequency Stability (ppm)			± 0.5 ppm	± 1.0 ppm	± 1.5 ppm	± 2.0 ppm	± 2.5 ppm	± 3.0 ppm	○ : available △ : please 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	○	○	○	○	○		
	-40°C to 85°C	X	○	○	○	○	○		
Frequency Stability	vs Aging	≤ ±1.0 ppm , first year at 25°C .							
	vs Voltage Change	≤ ±0.3 ppm , for a ±5% input voltage change .							
	vs Load Change	≤ ±0.3 ppm , for a ±10% load condition change .							
	vs Reflow (SMD type)	≤ ±1.0 ppm , 1 reflow and measured 24 hours afterwards .							
Output Voltage Level (peak to peak)			T T L / CMOS						
Mechanical Frequency Tuning		Standard	± 3.0ppm (min.) tuning Note: VM57 has no mechanical trimmer built-in.						
		Option	No mechanical trimmer built-in (for aqueous washing cycles). To order please add " 1 " after the regular model prefix . Example: M381T.						
Input Voltage Range		Standard	+2.8 V (voltage code is " 28 ")	+3.0 V (voltage code is " 3 ")	+3.3 V (voltage code is " 33 ")	+5.0 V (voltage code is " 5 ")			
Current Consumption. (max.) (Over operating temperature range .)			2 mA @ 8.192 MHz	2 mA @ 8.192 MHz		5 mA @ 8.192 MHz			
			3 mA @ 10.0 MHz	4 mA @ 10.0 MHz		7 mA @ 10.0 MHz			
			14 mA @ 77.760 MHz	17 mA @ 77.760 MHz		32 mA @ 77.760 MHz			
			26 mA @ 155.520 MHz	35 mA @ 155.520 MHz		50 mA @ 155.520 MHz			
Output Logic Levels		Logic High " 1 "	90% of V _{DD} min.						
		Logic Low " 0 "	10% of V _{DD} max.						
Pin 1 Options VCTCXO only	Control Voltage		Standard: +1.5 V ± 1.0 V for all input voltagesContact Mercury if +2.5 V ± 2.0 V is required.						
	Frequency Deviation Range		± 6.0 ppm. (min.) with Vcon = +1.5 V±1.0 V						
	Slope Polarity		Positive slope. Positive voltage for positive frequency shift.						
	Input Impedance		50K Ω min.						
	Modulation Bandwidth (at -3 dB)		20 KHz min.						
	Linearity		±10 % max.						
Rise Time (0.1 V _{DD} → 0.9 V _{DD})			10.0 n sec. max.. ; 20%↔ 80% of the wave form.						
Duty Cycle			Standard: 50 % ± 10 % ; Option: 50 % ± 5 % ; Measured at 50% V _D .						
Start-Up Time.			5.0 m sec. (typ.) , 10.0 m sec. (max.) (reach 90% amplitude and at+25°C ± 2°C)						
Output Load			15 pF						
SSB Phase Noise at 25°C	Offset		10 Hz	100 Hz	1 KHz	10 KHz	100 KHz		
	M57T33 - 10.000		-115 dBc / Hz	-135 dBc / Hz	-148 dBc / Hz	-152 dBc / Hz	-155 dBc / Hz		
	M57T33 - 155.520		-72 dBc / Hz	-110 dBc / Hz	-125 dBc / Hz	-132 dBc / Hz	-125 dBc / Hz		
Storage Temperature			-40°C to +85°C or -55°C to +125°C (package dependent)						

Note 1: Some specifications are package dependent. Please refer to the spec. sheet of individual packages once a package is selected .

Note 2: TCXO products ordered without mechanical and electrical frequency tuning should have a frequency tolerance of ± 2 ppm (at +25°C) and the frequency stability over temperature will be from that measured value.

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Temperature Compensated Crystal Oscillators [15pF CMOS Square Wave Output]

TCXO : MV__T series

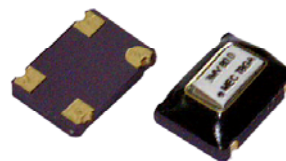
VCTCXO : VMV__T series

[" V " Group Characteristics]



Features :

- Wide frequency range : [27.0 MHz ~ 200.0 MHz]
- 7.0 * 5.0 * 2.5 mm ceramic SMD (VC)TCXOs with CMOS square wave output .
- 0.01 uF decoupling capacitor built-in .
- Frequency stability as tight as ± 0.5 ppm over 0°C to 50°C or ± 1.0 ppm over -30°C to 75°C



General Specifications (at+25°C and specified input voltage)

Frequency Range		27.0 MHz ~ 200.0 MHz						○ : available △ : please contact us X : not available
Output Wave From		Square wave. Wave form code is “ T ”						
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.						
Standard Frequency (Partial list)		30.0 , 32.768 , 38.880 , 40.0 , 50.0 , 54.0 , 64.0 , 65.536 , 77.760 , 80.0 , 100.0 , 128.0 , 155.520 , 160.0 , 200.0 MHz						
Frequency Stability (ppm)		± 0.5 ppm	± 1.0 ppm	± 1.5 ppm	± 2.0 ppm	± 2.5 ppm	± 3.0 ppm	
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	○	○	○	○	○	
	-40°C to 85°C	X	X	X	△	△	○	
Frequency Stability	vs Aging	≒ ± 1.0 ppm , first year at 25°C .						
	vs Voltage Change	≒ ± 0.3 ppm , for a ±5% input voltage change .						
	vs Load Change	≒ ± 0.3 ppm , for a ±10% load condition change .						
	vs Reflow (SMD type)	≒ ± 1.0 ppm , 1 reflow and measured 24 hours afterwards .						
Mechanical Frequency Tuning		Standard	± 3.0 ppm (min.) tuning Note: VMV57 have no mechanical trimmer built -in.					
		Options	No mechanical trimmer built -in (for aqueous washing cycles). To order please add “ 1 ” after the regular model prefix . Example: MV381T3.					
Input Voltage Range		+3.3 V (voltage code is “ 33 ”)						
Output Logic Levels	Logic High “ 1 ”	90% of V _{DD} min.						
	Logic Low “ 0 ”	10% of V _{DD} max..						
Rise Time and Fall Time		10 n sec. typical (0.3 V ↔ 3.0 V, 15 pF load)						
Pin 1 Options VCTCXO only	Control Voltage	+1.5 V ± 1.0 V (default) Note : +3.0 V , +3.3V units all have Vcon = +1.5 V±1.0 V						
	Frequency Deviation Range	± 6.0 ppm. (min.) with Vcon = +1.5 V±1.0 V						
	Slope Polarity (Transfer Function)	Positive slope : Increasing control voltage (Vcon) increases output frequency .						
	Input Impedance	2 MΩ min.						
	Modulation Bandwidth (at -3 dB)	25 KHz min.						
	Linearity	10 % max.						
Current Consumption. (max.)		40 mA (max.) , Frequency dependent .						
Duty Cycle		50% ± 5% measured at 50% V _{DD}						
Start-Up Time.		5.0m sec. (typ.) , 10.0m sec. (max.) (reach 90% amplitude and at+25°C±2°C)						
Output Load		15 pF						
SSB Phase Noise at 25°C	Offset	100 Hz	1 KHz	10 KHz	100 KHz	1 MHz		
	MV57T33 - 77.760	-80 dBc / Hz	-110 dBc / Hz	-135 dBc / Hz	-130 dBc / Hz	-132 dBc / Hz		
	MV57T33 - 155.520	-80 dBc / Hz	-110 dBc / Hz	-125 dBc / Hz	-120 dBc / Hz	-125 dBc / Hz		
Storage Temperature		-55°C to +125°C						

Note 1: Some specifications are package dependent. Please refer to the spec. sheet of individual packages once a package is selected .

Note 2: TCXO products ordered without mechanical and electrical frequency tuning should have a frequency tolerance of ± 2 ppm (at +25°C) and the frequency stability over temperature will be from that measured value.

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Temperaturer Compensated Crystal Oscillators [15pF CMOS Square Wave Output]

TCXO : MW__T series

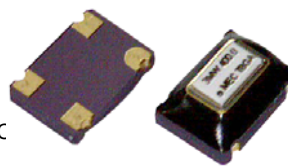
[" W " Group Characteristics]

VCTCXO : VMW__T series



Features :

- Wide frequency range : [200.0 MHz ~ 800.0 MHz]
- 7.0 * 5.0 * 2.8 mm ceramic SMD (VC)TCXOs with CMOS square wave output .
- 0.01 uF decoupling capacitor built-in .
- Frequency stability as tight as ± 0.5 ppm over 0°C to 50°C or ± 1.0 ppm over -30°C to 75°C



RoHS Compliance

General Specifications (at+25°C and specified input voltage)

Frequency Range			200.01 MHz ~ 800.0 MHz						
Output Wave From			Square wave. Wave form code is " T "						
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.						
Standard Frequency (Partial list)			200.0 , 204.8 , 311.04 , 320.0 , 400.0 , 409.6 , 622.08 ,						
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	○	○	○	○	○	
	-40°C to 85°C		X	X	X	△	△	○	
Frequency Stability	vs Aging		≧ ± 1.0 ppm , first year at 25°C .						
	vs Voltage Change		≧ ± 0.3 ppm , for a ±5% input voltage change .						
	vs Load Change		≧ ± 0.3 ppm , for a ±10% load condition change .						
	vs Reflow (SMD type)		≧ ± 1.0 ppm , 1 reflow and measured 24 hours afterwards .						
Mechanical Frequency Tuning		Standard	± 3.0 ppm (min.) tuning Note: (V)MW57T has no mechanical trimmer built -in .						
		Options	No mechanical trimmer built-in (for aqueous washing cycles). To order please add "1 " after the regular model prefix . Example: MW381T.						
Input Voltage Range			+3.3 V (voltage code is " 33 ")						
Output Logic Levels		Logic High " 1 "	90% of V _{DD} min.						
		Logic Low " 0 "	10% of V _{DD} max..						
Rise Time and Fall Time			1.2 n sec. typical (0.3 V↔ 3.0 V, 15 pF load)						
Pin 1 Options VCTCXO only	Control Voltage		+1.5 V ± 1.0 V						
	Frequency Deviation Range		± 6.0 ppm. (min.) with Vcon = +1.5 V±1.0 V						
	Slope Polarity		Positive slope : Increasing control voltage (Vcon) increases output frequency .						
	Input Impedance		2 MΩ min.						
	Modulation Bandwidth (at -3 dB)		25 KHz min.						
	Linearity		10 % max.						
Current Consumption. (max.)			65 mA (max.) , Frequency dependent .						
Duty Cycle			50% ± 5% measured at 50% V _{DD}						
Start-Up Time.			5.0m sec. (typ.) , 10.0m sec. (max.) (reach 90% amplitude and at+25°C±2°C)						
Output Load			15 pF						
SSB Phase Noise at 25°C	Offset		10 Hz	100 Hz	1 KHz	10 KHz	100 KHz		
	MW57T33 - 622.080		-50 dBc / Hz	-77 dBc / Hz	-102 dBc / Hz	-115 dBc / Hz	-108 dBc / Hz		
Storage Temperature			-55°C to +125°C						

Note 1: Some specifications are package dependent. Please refer to the spec. sheet of individual packages once a package is selected .

Note 2: TCXO products ordered without mechanical and electrical frequency tuning should have a frequency tolerance of ± 2 ppm (at +25°C) and the frequency stability over temperature will be from that measured value.

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Temperature Compensated Crystal Oscillators [LVDS Differential Square Wave Output]

TCXO : MF__ D series

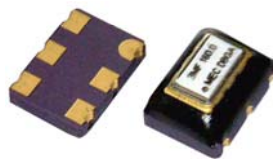
VCTCXO : VMF__ D series

[" F " Group Characteristics]



Features :

- Wide frequency range : [38.880 MHz ~ 432.0 MHz]
- 7.0 * 5.0 * 2.8 mm ceramic SMD (VC)TCXOs with LVDS wave output .
- 0.01 uF decoupling capacitor built-in .
- Less than 1ps phase jitter. Ideal for SONET , xDSL.



RoHS Compliance

General Specifications (at+25°C and specified input voltage)

Frequency Range		38.880 MHz ~ 432.0 MHz						
Output Wave From		Differential LVDS square wave . Wave code is " D "						
Initial Calibration Tolerance		Models with mechanical trimmer: < ±2.0 ppm (+25°C ±2°C) .						
Standard Frequency (Partial list)		10.0 , 12.8 , 16 , 19.44 , 20.0 , 25.0 , 27.0 , 30.0 , 32.0 , 32.768 , 38.880 , 40.0 , 50.0 , 54.0 , 64.0 , 65.536 , 77.76 , 80.0 , 100.0 , 128.0 , 155.520 , 160.0 , 200.0 , 204.8 , 311.04 , 320.0 , 409.6 , 622.08 , 800.0 MHz						
Frequency Stability (ppm)		± 1.0 ppm	± 2.0 ppm	± 2.5 ppm	± 3.0 ppm	± 4.0 ppm	± 5.0 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	○	○	○	○	○	
-40°C to 85°C		X	X	X	△	△	○	
Frequency Stability	vs Aging	≤ ± 1.0 ppm , first year at 25°C .						
	vs Voltage Change	≤ ± 0.3 ppm , for a ±5% input voltage change .						
	vs Load Change	≤ ± 0.3 ppm , for a ±10% load condition change .						
	vs Reflow (SMD type)	≤ ± 1.0 ppm , 1 reflow and measured 24 hours afterwards .						
Mechanical Frequency Tuning		Standard	± 3.0 ppm (min.) tuning Note: VMW57D have no mechanical trimmer built-in .					
		Option	No mechanical trimmer built -in (for aqueous washing cycles). To order please add " 1 " after the regular model prefix . Example: MW381D					
Input Voltage Range		+3.3 V (voltage code is " 33 ")						
Output Logic Levels	Logic High " 1 "	1.4 V typical ; 1.6 V max.						
	Logic Low " 0 "	0.9 V min. ; 1.1 V max.						
Differential Output Voltage, V _{OD}		247 mV min.; 355 mV typical ; 454 mV max. Output 1 - output 2						
Differential Output Error, dV _{OD}		-50 mV min ; 50 mV max.						
Output Offset Voltage, Vos		1.125 V min. ; 1.200 V typical ; 1.375 V max.						
Offset Magnitude Error, dVos		0 mV min. ; 3 mV typical ; 25 m V max.						
Rise Time and Fall Time		1.5 n sec. (max.) ; 20% ↔ 80% of waveform .						
Current Consumption. (Measured with load)		38.880 MHz≤f _{out} ≤ 100 MHz : 50 mA (max.) ; 100 MHz≤f _{out} ≤320 MHz : 65 mA (max.) 320 MHz≤f _{out} ≤432 MHz : 75 mA (max.)						
Duty Cycle		50% ± 5% measured at 1.25V						
Start-Up Time.		5.0m sec. (typ.) , 10.0m sec. (max.) (reach 90% amplitude and at+25°C±2°C)						
Output Load		50 Ω from each load						
Drive Capability		100 Ω between LVDS and complimentary LVDS output						
Pad 1. Option VCTCXO only	Control Voltage Center , Range	+ 1.5 V ; Range ±1.0V						
	Frequency Deviation Range	± 6.0 ppm (min.) with Vcon = +1.5 V±1.0 V						
	Linearity	6% typical ; 10% max.						
	Slope Polarity	Positive : Positive voltage for positive frequency shift						
Tri - State Function. on pad No. 2	No Connection	Differential LVDS and complimentary LVDS outputs .						
	Disable	Both outputs are disabled (high impedance) when pad No.2 is taken below 0.45*Vcc referenced to ground (threshold) Oscillator is always On . Only buffer stage is disabled . Disable current : 50 uA max. (at 0.0V) , Disable time : 10 ns (max.)						
	Enable	At disabled mode , both outputs are enabled when Tri-state pad is taken above 0.45*Vcc referenced toground (threshold) ;Enable time : 10ns + one period of the output frequency (max.)						
SSB Phase Noise at 25°C	Offset	10 Hz	100 Hz	1 KHz	10 KHz	100 KHz		
	MF57D33 - 155.520	-62 dBc / Hz	-92 dBc / Hz	-120 dBc / Hz	-132 dBc / Hz	-128 dBc / Hz		
	MF57D33 - 311.020	-59 dBc / Hz	-86 dBc / Hz	-116 dBc / Hz	-129 dBc / Hz	-124 dBc / Hz		
Phase Jitter (RMS) (12 KHz to 20 MHz)		0.4 ps (typ.) 0.5 ps (max.) for 155.520 MHz						
Period Jitter (RMS) (typical)		38.880 MHz	77.760 MHz	155.520 MHz	311.020 MHz			
		2.5 ps	2.5 ps	3.0 ps	3.0 ps			
Period Jitter (Peak to peak) (typical)		18.0 ps	18.0 ps	20.0 ps	25.0 ps			
Storage Temperature		-55°C to +125°C						

Note 1: Some specifications are package dependent. Please refer to the spec. sheet of individual packages once a package is selected .

Note 2: TCXO products ordered without mechanical and electrical frequency tuning should have a frequency tolerance of ±2 ppm (at +25°C) and the frequency stability over temperature will be from that measured value.

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" TCXO " and " VCTCXO "

Clipped Sine Wave " S " series ; CMOS Output Wave " T " series

PECL Output Wave " P " series ; LVDS Output Wave " D " series

Part Number Format and Examples :

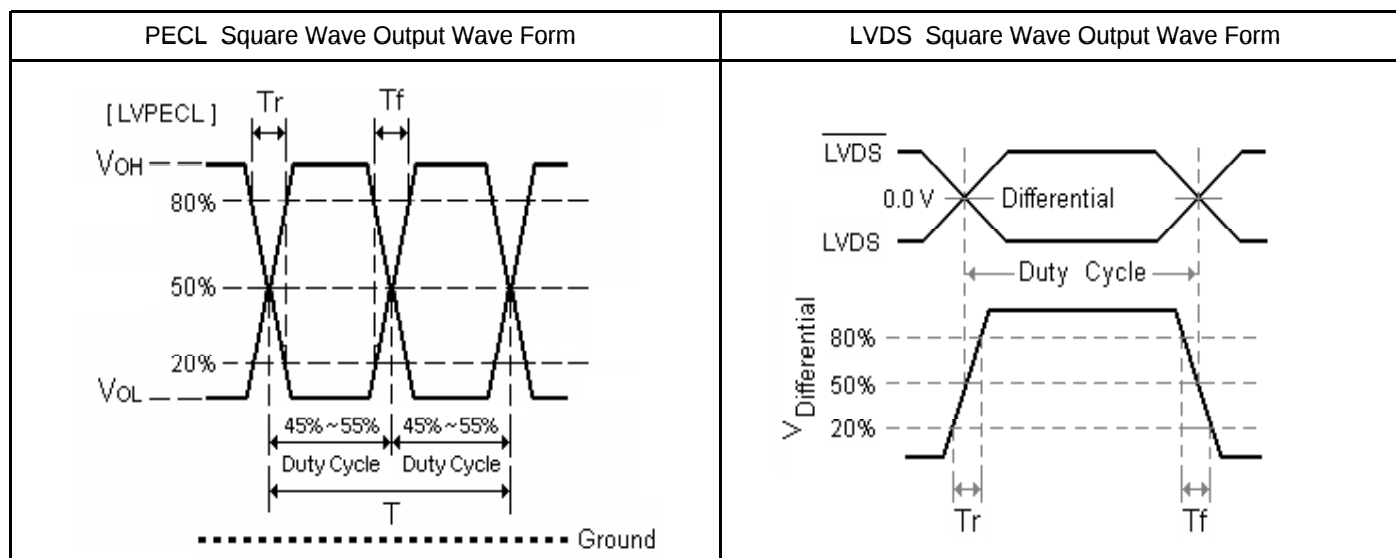
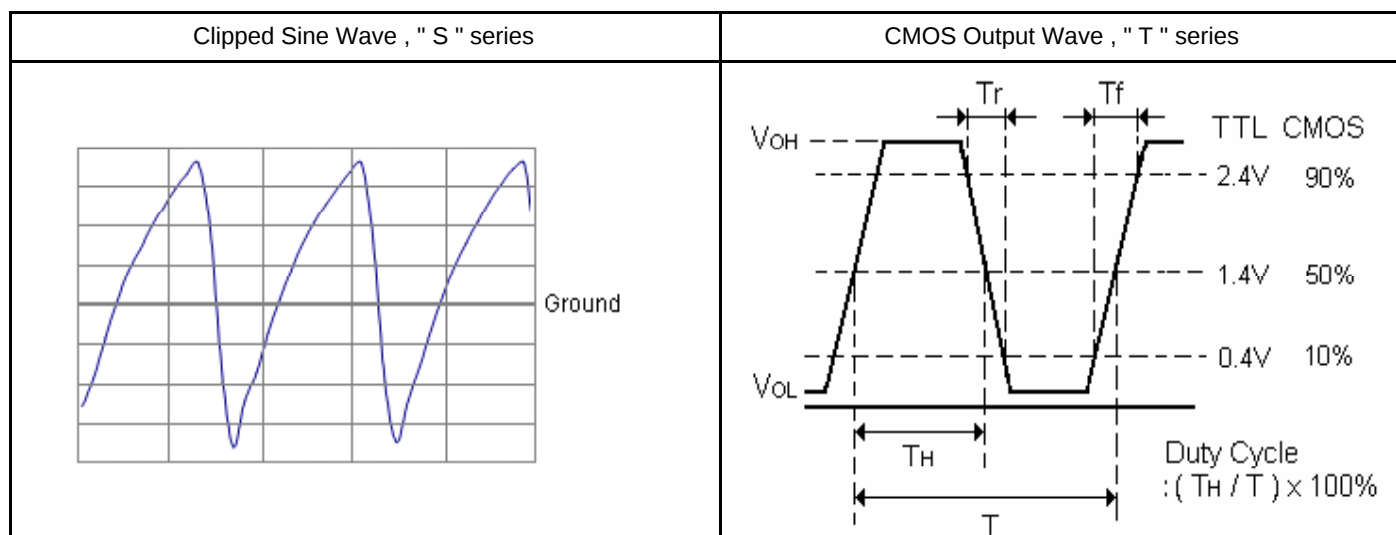
[1] (V) M _ _ G	[2] S _ ---	[3] Frequency ---	[4] Freq. Stability /	[5] Temp. Range
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[1]	" M " : For TCXO , " VM " : For VCTCXO Please add " G " after the " type code " for RoHS compliance [(V) M53 , (V) M57 series are not included] .
[2]	" S " : Clipped Sine Wave , " T " : CMOS Output Wave , " P " : LVPECL Output Wave , " D " : LVDS Output Wave
[3]	Frequency in MHz
[4]	Frequency stability in $\pm$ _ ppm ; ex 1 : ± 2.5 ppm --- 2.5 , ex 2 : ± 1.0 ppm --- 1.0
[5]	Operating temperature range in $^{\circ}$ C

Ex (1) : VM38GS5-10.000 -1.5/-20+70 VCTCXO , package type : VM38 , 10.000MHz , 5.0 V supply voltage, Clipped Sine wave , Lead Free ,
 ± 1.5 ppm from -20° C to 70° C

Ex (2) : M57T33-20.000 -2.5/-30+70 TCXO , package type : M57 , 20.000MHz , 3.3 V , Square wave , ± 2.5 ppm from -20° C to 70° C

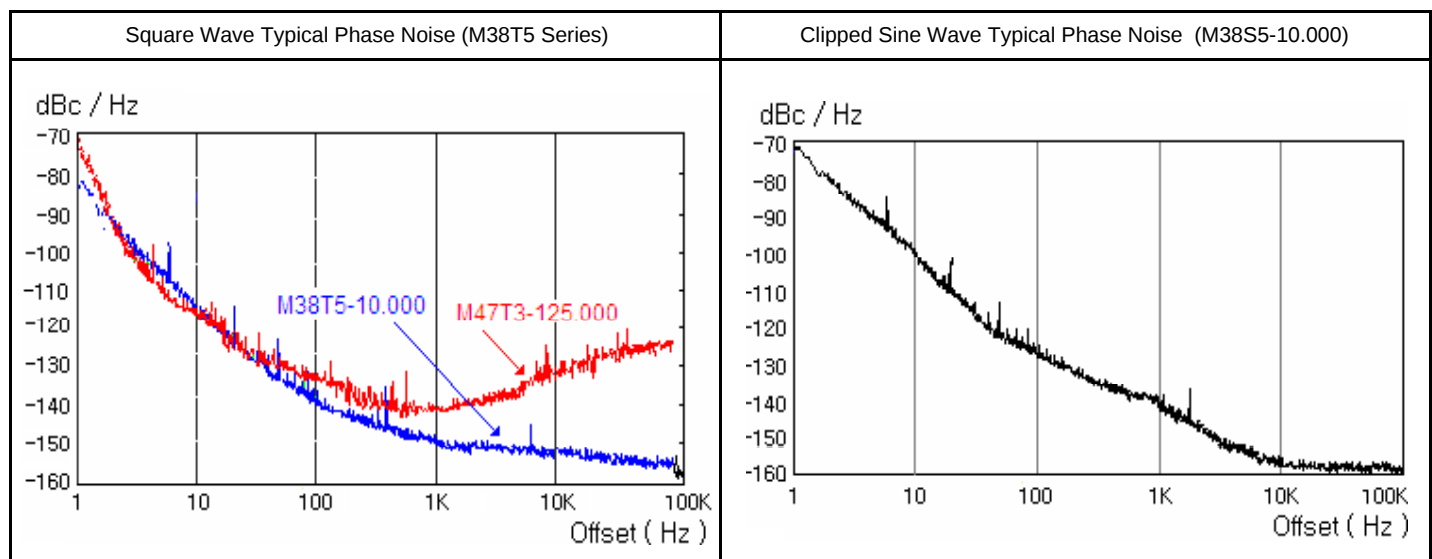
Note : M57T, VM57T, M53T and VM53T are RoHS compliant and lead free products.



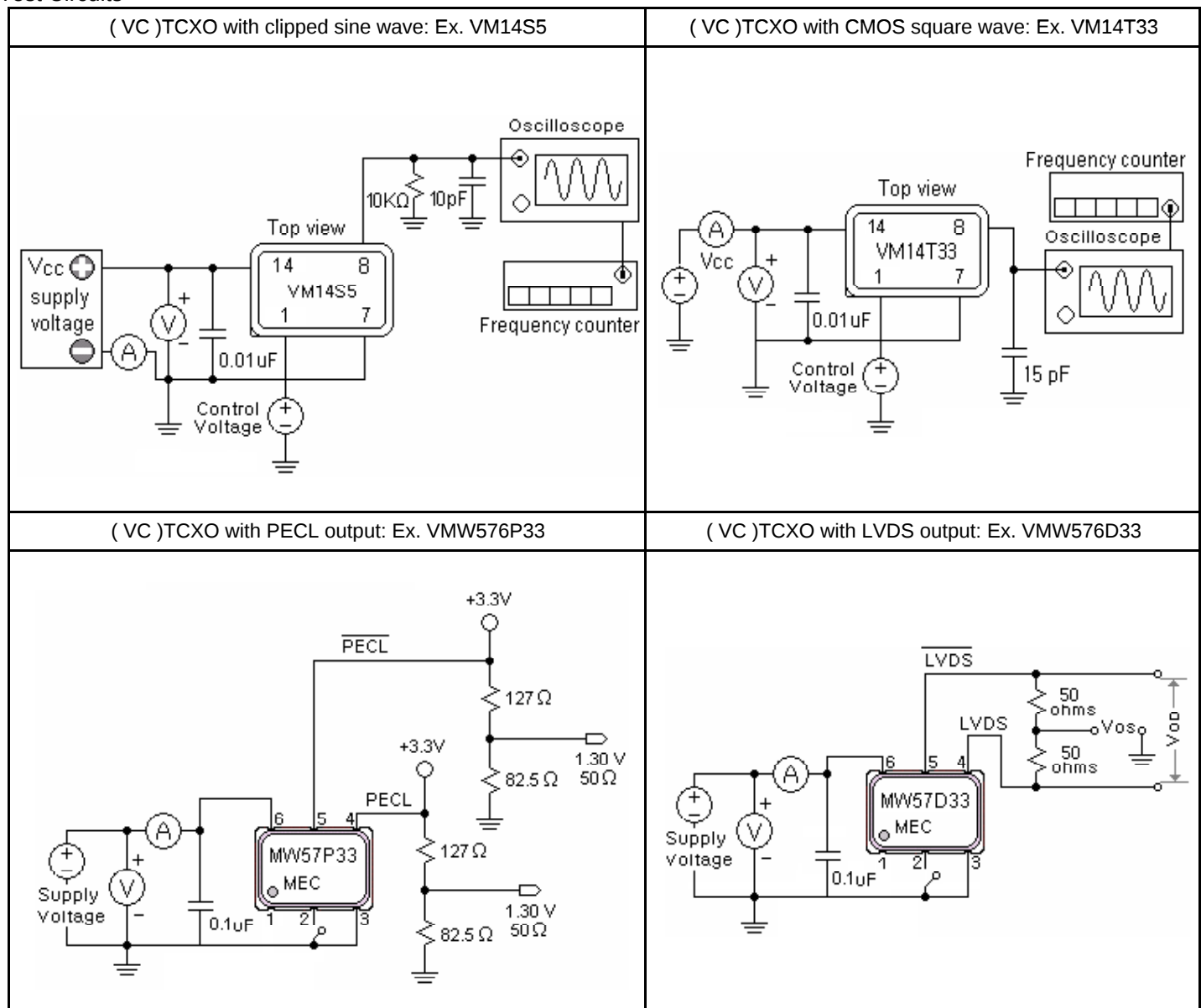
" TCXO " and " VCTCXO "

Clipped Sine Wave " S " series ; CMOS Output Wave " T " series

PECL Output Wave " P " series ; LVDS Output Wave " D " series



Test Circuits



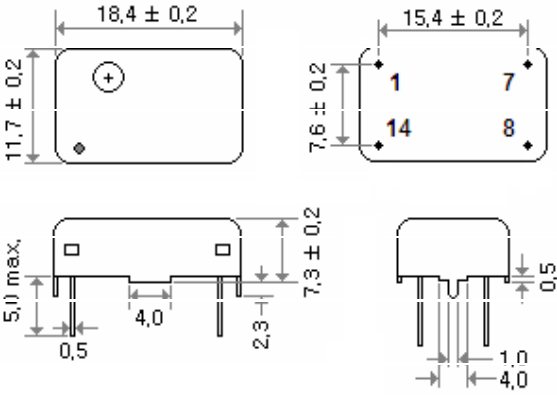
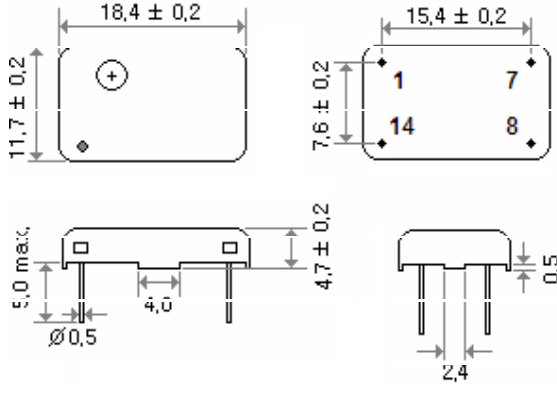
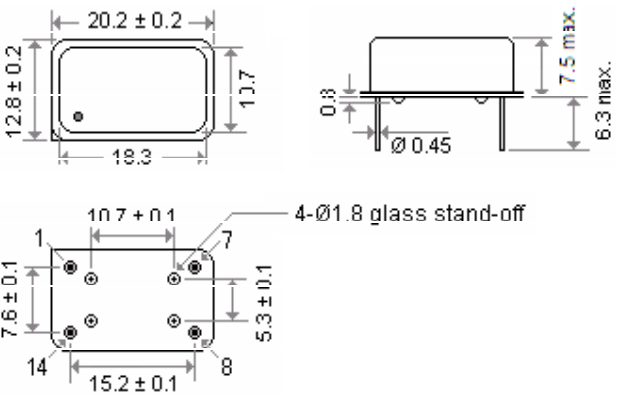
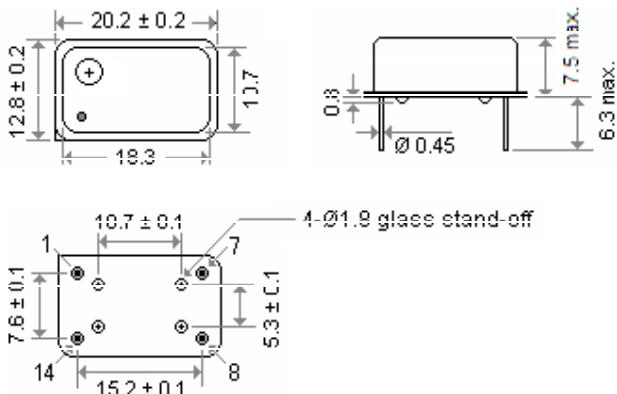
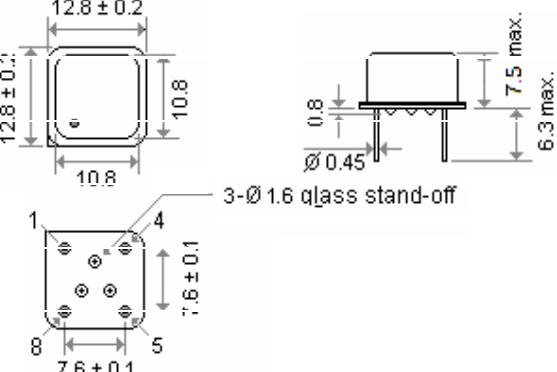
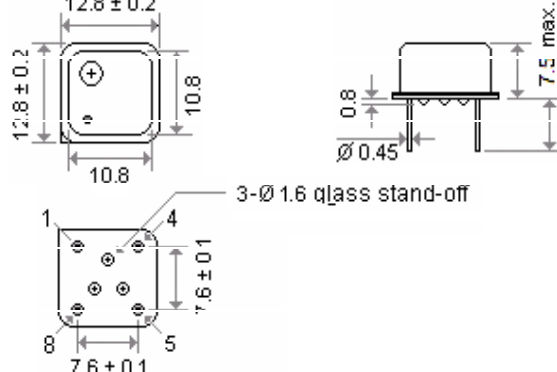
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" TCXO " and " VCTCXO "

Clipped Sine Wave " S " series ; CMOS Output Wave " T " series
PECL Output Wave " P " series ; LVDS Output Wave " D " series

Outline Dimensions (Unit : mm) , Suggest Layout [Thru - Hold Types]

[(V) M38 _ _]	[(V) M39 _ _]
 Pin Connections : Pin 1 : Voltage control for VCTCXO , No physical pin 1 for TCXO (3 pins only) . Pin 7 : Ground ; Pin 8 : Output , Pin 14 : Supply Voltage	 Pin Connections : Pin 1 : Voltage control for VCTCXO [No physical pin 1 for TCXO. (3 pins only).] Pin 7 : Ground ; Pin 8 : Output , Pin 14 : Supply Voltage
[(V) M14 _ _]	[(V) M15 _ _]
 Pin Connections : Pin 1 : Voltage control for VCTCXO , No connection for TCXO . Pin 7 : Ground ; Pin 8 : Output , Pin 14 : Supply Voltage	 Pin Connections : Pin 1 : Voltage control for VCTCXO ; No connection for TCXO. Pin 7 : Ground ; Pin 8 : Output , Pin 14 : Supply Voltage
[(V) M8 _ _]	[(V) M9 _ _]
 Pin Connections : Pin 1 : Voltage control for VCTCXO ; No connection for TCXO. Pin 4 : Ground ; Pin 5 : Output , Pin 8 : Supply Voltage	 Pin Connections : Pin 1 : Voltage control for VCTCXO ; No connection for TCXO. Pin 4 : Ground ; Pin 5 : Output , Pin 8 : Supply Voltage

" TCXO " and " VCTCXO "

Clipped Sine Wave " S " series ; CMOS Output Wave " T " series

PECL Output Wave " P " series ; LVDS Output Wave " D " series



Outline Dimensions (Unit : mm) , Suggest Layout [Gull Wing Types]

[(V) M47 __]	[(V) M55 __]
Pin Connections : Pin 1 : Voltage control for VCTCXO , No connection 1 for TCXO . Pin 7 : Ground ; Pin 8 : Output , Pin 14 : Supply Voltage	Pin Connections : Pin 1 : Voltage control for VCTCXO , No connection for TCXO . Pin 7 : Ground ; Pin 8 : Output , Pin 14 : Supply Voltage
[(V) M24 __]	[(V) M25 __]
Pin Connections : Pin 1 : Voltage control for VCTCXO , No connection 1 for TCXO . Pin 7 : Ground ; Pin 8 : Output , Pin 14 : Supply Voltage	Pin Connections : Pin 1 : Voltage control for VCTCXO , No connection for TCXO . Pin 7 : Ground ; Pin 8 : Output , Pin 14 : Supply Voltage
[(V) M28 __]	[(V) M29 __]
Pin Connections : Pin 1 : Voltage control for VCTCXO , No connection for TCXO . Pin 4 : Ground ; Pin 5 : Output , Pin 8 : Supply Voltage	Pin Connections : Pin 1 : Voltage control for VCTCXO , No connection for TCXO . Pin 4 : Ground ; Pin 5 : Output , Pin 8 : Supply Voltage

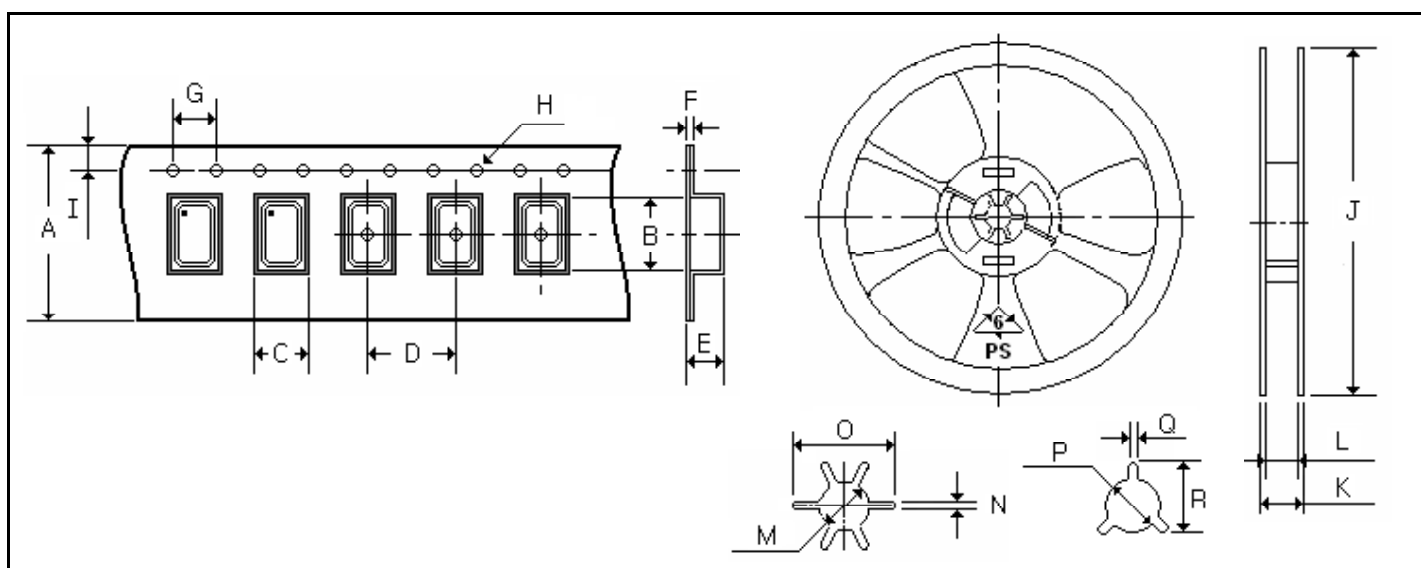
" TCXO " and " VCTCXO "

Clipped Sine Wave " S " series ; CMOS Output Wave " T " series
PECL Output Wave " P " series ; LVDS Output Wave " D " series



Outline Dimensions (Unit : mm) , Suggest Layout [Leadless SMD Types]

[(V) M32 _ _] --- Clipped Sine wave Land Pattern (reference) Pad Connections : Pad 1 : Voltage control for VCTCXO ; Ground for TCXO . Pad 2 : Ground ; Pin 3 : Output , Pin 4 : Supply Voltage	[(V) M53 _ _] --- Clipped Sine wave Land Pattern (reference) Pad Connections : Pad 1 : Voltage control for VCTCXO ; Ground for TCXO . Pad 2 : Ground ; Pad 3 : Output , Pad 4 : Supply Voltage
[(V) M57S _ _] --- Clipped Sine wave Land pattern (reference) Pad Connections : Pad 1 : Voltage control for VCTCXO ; Ground for TCXO . Pad 2 : Ground ; Pad 3 : Output , Pad 4 : Supply Voltage	[(V) M_57T _ _] --- CMOS outputs Land pattern (reference) epoxy encapsulation Pad Connections : Pad 1 : Voltage control for VCTCXO. Do not make any connection for TCXO. Pad 2 : Ground ; Pad 3 : Output , Pad 4 : Supply Voltage
[(V) M_576P _ _] --- PECL outputs Land pattern (reference) epoxy encapsulation Pad Connections : Pad 1 : Voltage control for VCTCXO. Do not make any connection for TCXO. Pad 2 : Tri-state ; Pad 3 : Ground , Pad 4 : Output Pad 5 : PECL output ; Pad 6 : Supply Voltage	[(V) M_576D _ _] --- LVDS outputs Land pattern (reference) epoxy encapsulation Pad Connections : Pad 1 : Voltage control for VCTCXO. Do not make any connection for TCXO. Pad 2 : Tri-state ; Pad 3 : Ground , Pad 4 : Output Pad 5 : LVDS output ; Pad 6 : Supply Voltage
[(V) M42 _ _] ; [(V) M44 _ _] Land Pattern (reference) MEC P/N H (hight) M42 → 2.5 ± 0.2 mm M44 → 4.7 ± 0.2 mm Pad Connections : Pad 1 : Voltage control for VCTCXO. No connection for TCXO . Pad 2 : Ground ; Pin 3 : Output , Pin 4 : Supply Voltage	[(V) M62 _ _] ; [(V) M64 _ _] Land Pattern (reference) MEC P/N H (hight) M62 → 2.5 ± 0.2 mm M64 → 4.7 ± 0.2 mm Pad Connections : Pad 1 , 2 , 4 : Ground . Pad 3 : Output , Pad 6 : Supply Voltage Pad 5 : Voltage control for VCTCXO , No connection for TCXO .



● Carrier Type Dimensions (unit : mm)

	A	B	C	D	E	F	G	H	I
G_534	16.0	5.4	3.6	7.8	1.6	0.3	4.0	1.5	1.8
G_576	16.0	7.9	5.5	8.1	2.0	0.3	4.1	1.4	1.8
G_42	24.1	12.4	10.3	15.6	5.1	0.3	3.9	1.4	1.8
G_44	24.1	12.4	10.3	15.6	5.1	0.3	3.9	1.4	1.8
G_62	24.1	12.4	10.3	15.6	5.1	0.3	3.9	1.4	1.8
G_64	24.1	12.4	10.3	15.6	5.1	0.3	3.9	1.4	1.8
(V)M_53	16.0	5.4	3.6	7.8	1.6	0.3	4.0	1.4	1.8
(V)M_57	24.1	7.9	5.5	8.1	2.0	0.3	4.1	1.4	1.8
(V)M_42	24.1	12.4	10.3	15.6	5.1	0.3	3.9	1.4	1.8
(V)M_44	24.1	12.4	10.3	15.6	5.1	0.3	3.9	1.4	1.8
(V)M_62	24.1	12.4	10.3	15.6	5.1	0.3	3.9	1.4	1.8
(V)M_64	24.1	12.4	10.3	15.6	5.1	0.3	3.9	1.4	1.8
(V)M_64	24.1	12.4	10.3	15.6	5.1	0.3	3.9	1.4	1.8

● Reel Dimensions (unit : mm)

	J	K	L	P	Q	R
G_534	179.0	16.5	19.6	13.4	2.5	19.5
G_576	179.0	16.5	19.6	13.4	2.5	19.5
G_42	330.0	29.2	25.0	13.4	2.5	19.5
G_44	330.0	29.2	25.0	13.4	2.5	19.5
G_62	330.0	29.2	25.0	13.4	2.5	19.5
G_64	330.0	29.2	25.0	13.4	2.5	19.5
(V)M_53	179.0	16.5	19.6	13.4	2.5	19.5
(V)M_57	179.0	16.5	19.6	13.4	2.5	19.5
(V)M_42	330.0	29.2	25.0	13.4	2.5	19.5
(V)M_44	330.0	29.2	25.0	13.4	2.5	19.5
(V)M_62	330.0	29.2	25.0	13.4	2.5	19.5
(V)M_64	330.0	29.2	25.0	13.4	2.5	19.5
(V)M_64	330.0	29.2	25.0	13.4	2.5	19.5