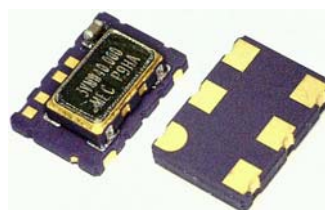


TCXO MW _ P	VCTCXO VMW _ P	Low Cost . Wide Frequency Range.	PECL	Thru-Hole	SMD	15pF	3.3V	Min. 10 MHz	Max. 800 MHz
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Features

- Wide frequency range : [10.0 MHz ~ 800.0 MHz]
- Low cost , low jitter , general purpose



RoHS Compliance

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

Frequency Range			10.0 MHz ~ 800.0 MHz						
Output Wave Form			Differential PECL square wave . Wave code is " P "						
Initial Calibration Tolerance			Models with mechanical trimmer: < ±2.0 ppm (+25°C ±2°C) .						
Standard Frequency (Partial list)			10.000	12.800	16.000	19.440	20.000	25.000	27.000
			30.000	32.000	32.768	38.880	40.000	50.000	54.000
			64.000	65.536	77.760	80.000	100.000	128.000	155.520
			160.000	200.000	204.800	311.040	320.000	409.600	622.080
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 max., per year at 25°C .							
	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 .							
Mechanical Frequency Tuning			± 3.0 ppm (min.) tuning Note: (V)MW57P has no mechanical trimmer built-in .						
Input Voltage Range			+3.3 V (voltage code is " 33 ")						
Output Logic Levels	Logic High " 1 "		V _{OH} = 2.275 V(min.) , V _{DD} -1.025 V(min.) , Condition : RL = 50Ω to V _{DD} -2V						
	Logic Low " 0 "		V _{OL} = 1.680 V(max.) , V _{DD} -1.620 V (max.) , Condition : RL = 50Ω to V _{DD} -2V						
Rise Time and Fall Time			1.5 n sec. (max.) ; 20% ↔ 80% of waveform .						
Current Consumption. (Measured with a PECL Thevenin equivalent load)			10 MHz ≤ f _{out} ≤ 25 MHz : 65 mA (max.) ; 25 MHz ≤ f _{out} ≤ 100 MHz : 85 mA (max.) 100 MHz ≤ f _{out} ≤ 800 MHz : 115 mA (max.)						
Duty Cycle			50% ± 5% measured at V _{DD} -1.3V						
Start-Up Time.			5.0m sec. (typ.) , 10.0m sec. (max.) (reach 90% amplitude and at+25°C±2°C)						
Output Load			50 Ω to V _{DD} -2.0 V						
Pad 1. Option VCTCXO only	Control Voltage Center , Range		+ 1.5 V ± 1.0V						
	Frequency Deviation Range		± 5.0 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 PECL and complimentary PECL 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 to ground (threshold) ; Enable time : 10ns + one period of the output frequency (max.)						
SSB Phase Noise at 25°C [typical]	Offset		10 Hz	100 Hz	1 KHz	10 KHz	100 KHz		
	MW5762P33 - 155.520		-65 dBc / Hz	-95 dBc / Hz	-120 dBc / Hz	-125 dBc / Hz	-121 dBc / Hz		
	MW5762P33 - 622.080		-55 dBc / Hz	-85 dBc / Hz	-109 dBc / Hz	-115 dBc / Hz	-110 dBc / Hz		
Phase Jitter (RMS) (12 KHz to 20 MHz)			2.6 ps (typ.) , 4.0 ps (max.) for 155.520 MHz						
Period Jitter [typical]	Frequency Range		38.880 MHz		77.760 MHz		155.520 MHz	622.080 MHz	
	[RMS]		2.2 ps		3.5 ps		4.3 ps	5.0 ps	
	[Peak to peak]		17.0 ps		25.0 ps		27.0 ps	32.0 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 .

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

Clipped Sine " S "

CMOS " T "

PECL Differential " P "

LVDS Differential " D "

Part Number Format and Example

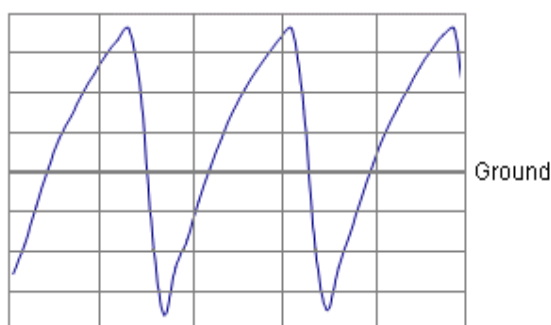
	[1]	[2]	[3]	[4]		[5]		[6]		[7]
	Holder Type	G	Output Wave	Supply Voltage		Center Frequency		Frequency Stability		Operating Temp. Range
Examples	(1) VM38	G	T	5	-	10.000	-	1.5	/	-20+70
	(2) M57		S	3	-	20.000	-	2.5	/	-30+75

Ex (1): VM38GT5 - 10.000 - 1.5 / -20+70 [VCTCXO, VM38 type, RoHS, CMOS output, 5.0V, 10.000MHz, ± 1.5 ppm from -20°C to 70°C]

Ex (2): M57S3 - 20.000 - 2.5 / -30+75 [TCXO, M57 type, Clipped Sine Wave, 3.0V, 20.000MHz, ± 2.5 ppm from -30°C to 75°C]

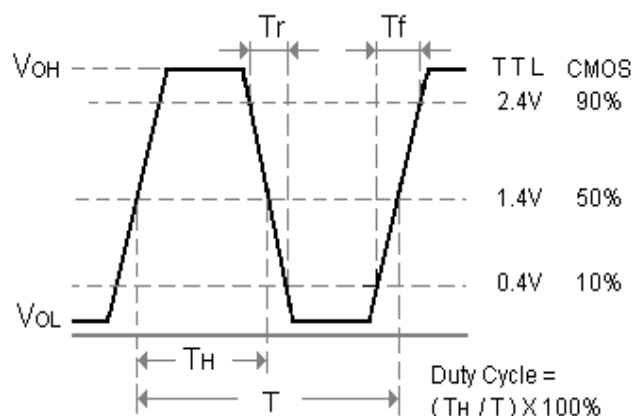
[1]	Holder Type "M" stands for TCXO, "VM" stands for VCTCXO
[2]	Please add "G" after the "type code" for RoHS compliant (Does not apply to (V)M32, (V)M53, (V)M536_, (V)M57_, (V)M576_)
[3]	"S" stands for Clipped Sine Wave; "T" stands for Square Wave; "D" stands for LVDS differential; "P" stands for PECL differential ex 1: M44T --- TCXO, M44 package, CMOS output; ex 2: VM38P --- VCTCXO, VM38 package, PECL differential
[2]	Supply voltage, "28" stands for +2.8V; "3" stands for +3.0V; "33" stands for +3.3V; "5" stands for +5.0V
[3]	Center 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 °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

Clipped Sine Wave, "S" series

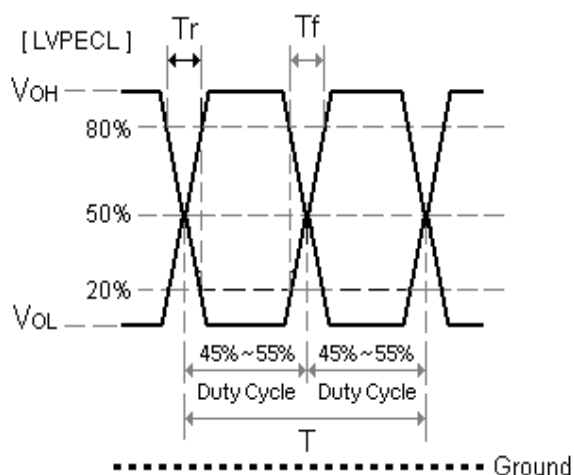


Exception: (V)53S, (V)32S have no DC-block at output

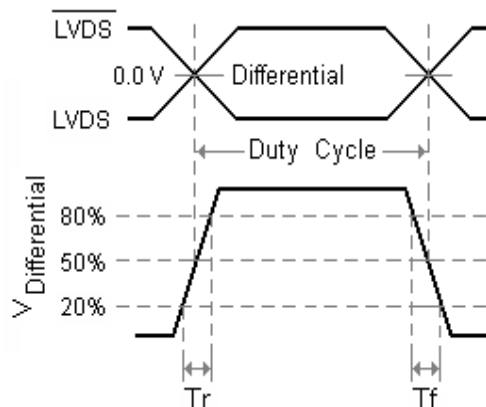
CMOS Output Wave, "T" series



PECL Square Wave Output Wave Form



LVDS Square Wave Output Wave Form



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

Clipped Sine " S "

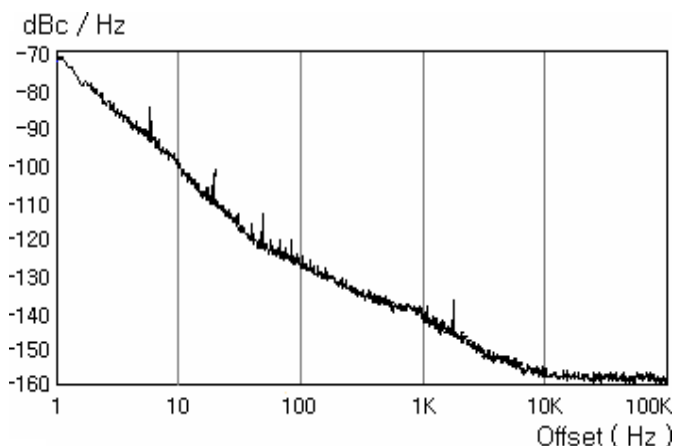
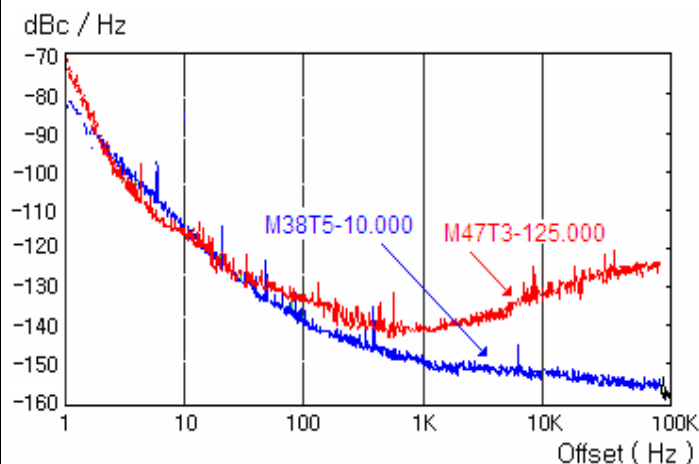
CMOS " T "

PECL Differential " P "

LVDS Differential " D "

Square Wave Typical Phase Noise (M38T5 Series)

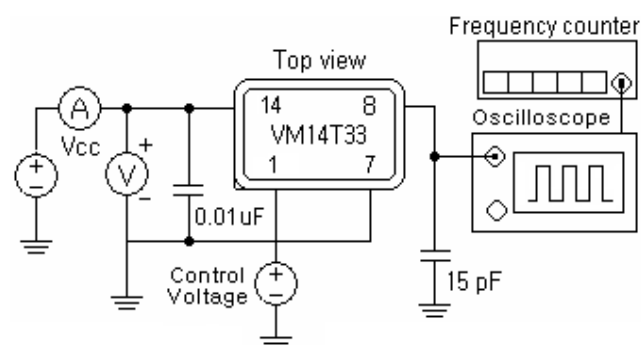
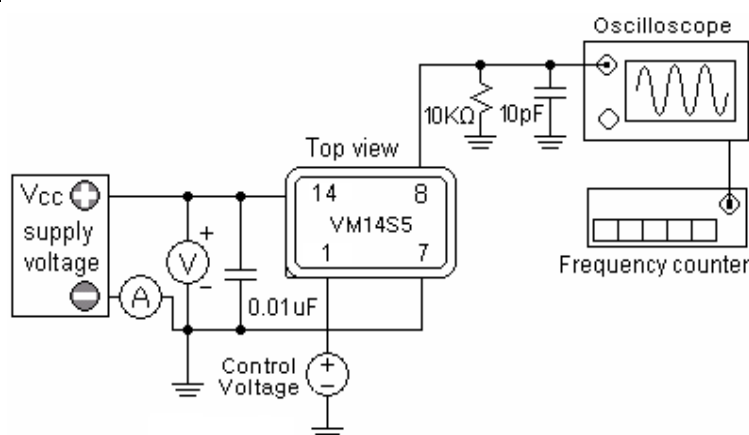
Clipped Sine Wave Typical Phase Noise (M38S5-10.000)



Test Circuits

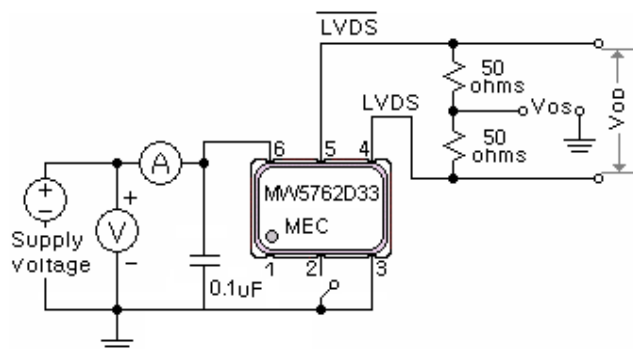
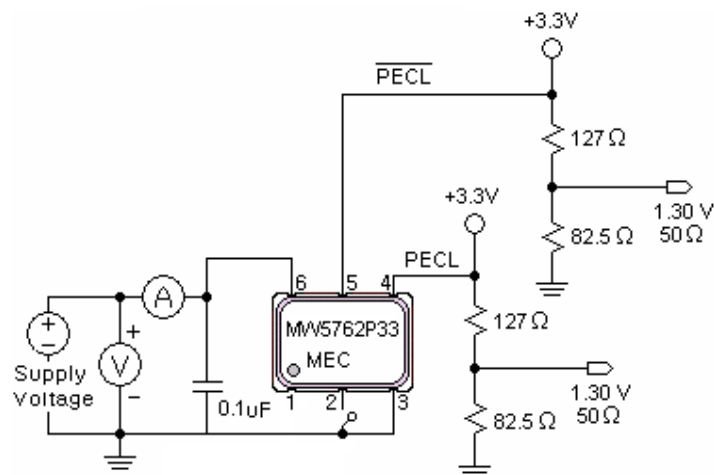
(VC)TCXO with **clipped sine** wave: Ex. VM14S5

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



(VC)TCXO with **PECL** output: Ex. VMW5762P33

(VC)TCXO with **LVDS** output: Ex. VMW5762D33



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

Clipped Sine " S "

CMOS " T "

PECL Differential " P "

LVDS Differential " D "

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

[Please refer to page 6 for product series selections .]

[(V) M_42 _ _] Pad Connections : Pad 1 : Control voltage for VCTCXO. Make no connection if TCXO. Pad 2 : Ground ; Pin 3 : Output , Pin 4 : Supply Voltage	[(V) M_62 _ _] Pad Connections : Pad 1 , 2 , 4 : Ground , Pad 3 : Output , Pad 6 : Supply Voltage Pad 5 : Control voltage for VCTCXO. Make no connection if TCXO.
[(V) M38 _ _] Pin Connections : Pin 1 : Control Voltage for VCTCXO , No physical pin 1 for TCXO (3 pins only) . Pin 7 : Ground ; Pin 8 : Output , Pin 14 : Supply Voltage	[(V) M39 _ _] Pin Connections : Pin 1 : Control voltage for VCTCXO [No physical pin 1 for TCXO. (3 pins only) .] Pin 7 : Ground ; Pin 8 : Output , Pin 14 : Supply Voltage
[(V) M47 _ _] Pin Connections : Pin 1 : Control voltage for VCTCXO , No connection for TCXO . Pin 7 : Ground ; Pin 8 : Output , Pin 14 : Supply Voltage	[(V) M8 _ _] --- Gull - wing SMD is also available . Pin Connections : Pin 1 : Control voltage for VCTCXO ; No connection for TCXO . Pin 4 : Ground ; Pin 5 : Output , Pin 8 : Supply Voltage
[(V) M14 _ _] --- Gull - wing SMD is also available . Pin Connections : Pin 1 : Control voltage for VCTCXO , No connection for TCXO . Pin 7 : Ground ; Pin 8 : Output , Pin 14 : Supply Voltage	[(V) M15 _ _] --- Gull - wing SMD is also available . Pin Connections : Pin 1 : Control voltage for VCTCXO , No connection for TCXO . Pin 7 : Ground ; Pin 8 : Output , Pin 14 : Supply Voltage

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

Clipped Sine " S "

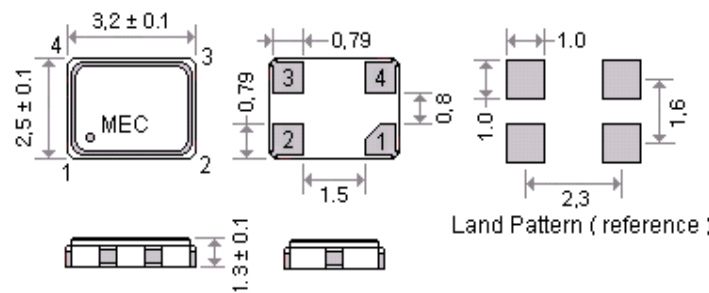
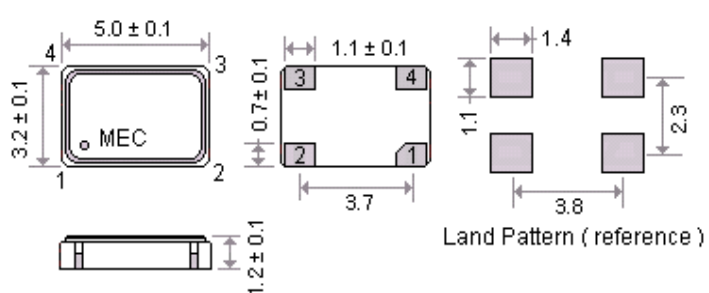
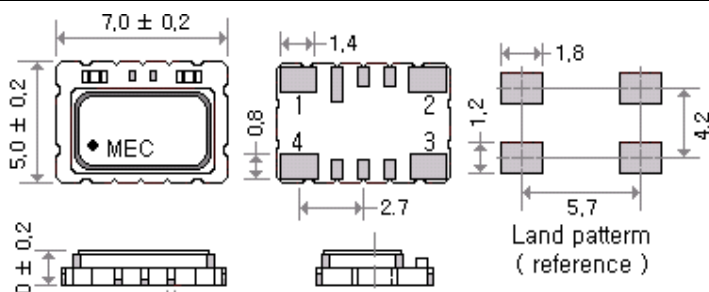
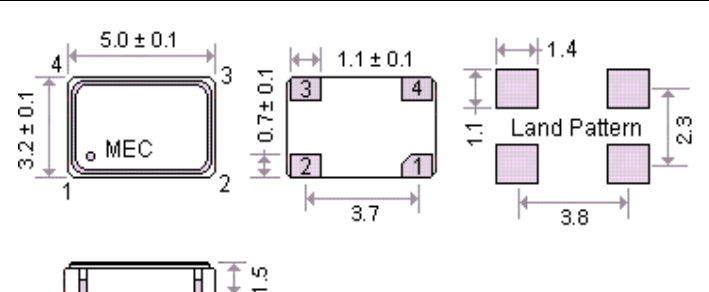
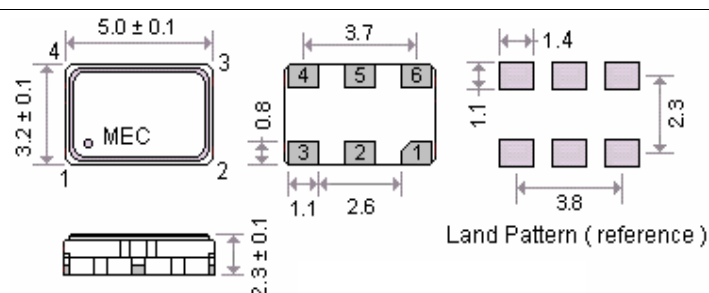
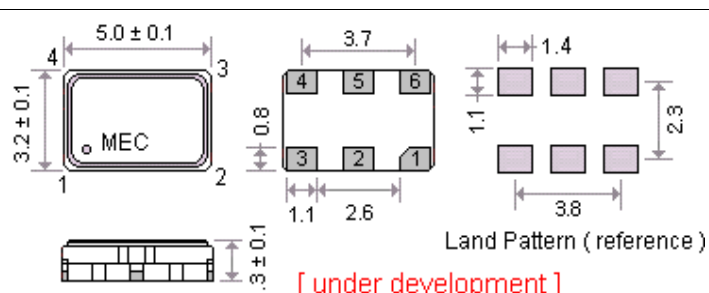
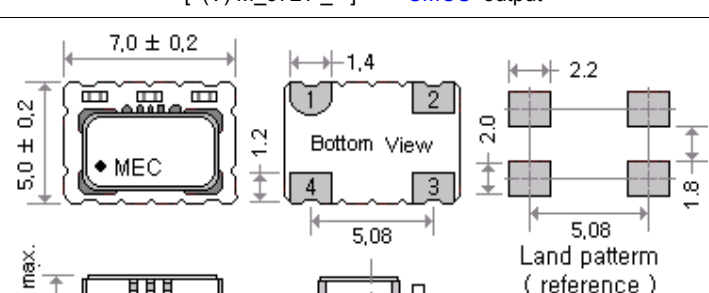
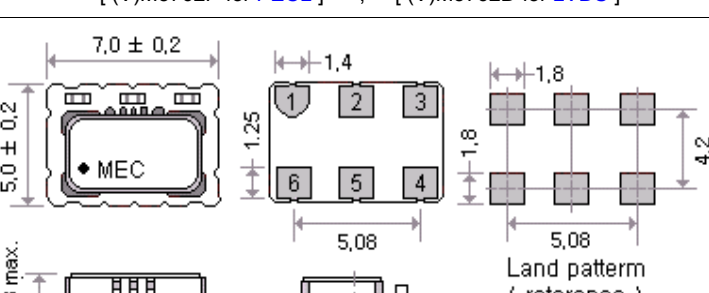
CMOS " T "

PECL Differential " P "

LVDS Differential " D "

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

[Please refer to page 6 for product series selections .]

[(V) M32S] --- Clipped Sine wave  Land Pattern (reference) Pad Connections : Pad 1 : Control voltage for VCTCXO ; Ground for TCXO . Pad 2 : Ground ; Pin 3 : Output , Pin 4 : Supply Voltage	[(V) M53S] --- Clipped Sine wave  Land Pattern (reference) Pad Connections : Pad 1 : Control voltage 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 : Control voltage for VCTCXO ; Ground for TCXO . Pad 2 : Ground ; Pad 3 : Output , Pad 4 : Supply Voltage	[(V) M_531T_] , [(V) M_53T_] --- CMOS output  Land Pattern (reference) Pad Connections : Pad 1 : Control voltage for VCTCXO. Make no connection if TCXO. Pad 2 : Ground ; Pad 3 : Output , Pad 4 : Supply Voltage
[(V) M_536T_] --- CMOS output  Land Pattern (reference) Pad Connections : Pad 1 : Control voltage for VCTCXO. Make no connection if TCXO. Pad 2 : N / C ; Pad 3 : Ground ; Pad 4 : Output Pad 5 : N / C ; Pad 6 : Supply Voltage	[(V)M_536P for PECL] ; [(V)M_536D for LVDS]  Land Pattern (reference) [under development] Pad Connections : Pad 1 : Control voltage for VCTCXO. Make no connection if TCXO. Pad 2 : Tri-state ; Pad 3 : Ground ; Pad 4 : PECL or LVDS output Pad 5 : Complimentary PECL or LVDS Output ; Pad 6 : Supply Voltage
[(V) M_572T_] --- CMOS output  Land pattern (reference) Bottom View Pad Connections : Pad 1 : NC --- TCXO ; Vcon --- VCTCXO Pad 2 : Ground ; Pad 3 : Output , Pad 4 : Supply Voltage	[(V)M5762P for PECL] ; [(V)M5762D for LVDS]  Land pattern (reference) Pad Connections : Pad 1 : Control voltage for VCTCXO. Do not make any connection for TCXO. Pad 2 : Tri-state ; Pad 3 : Ground ; Pad 4 : PECL or LVDS output Pad 5 : Complimentary PECL or LVDS Output ; Pad 6 : Supply Voltage

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