

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



<b>TCXO</b>	<b>VCTCXO</b>	<b>SMD</b>	<b>1.8 V</b>	<b>2.5 V</b>	<b>3.3 V</b>	<b>Min.</b>	<b>Max.</b>
<b>MJF538_</b>	<b>VMJF538_</b>					<b>15</b>	<b>2,100</b>
						<b>MHz</b>	<b>MHz</b>

## Features

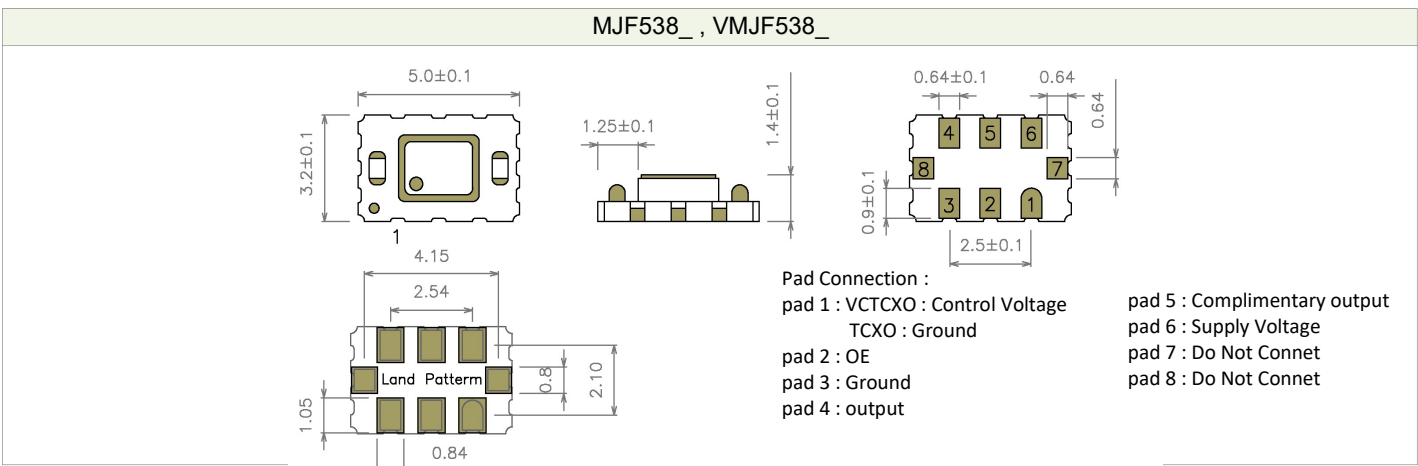
Mercury's QuikXO Quick-Turn TCXO that can be delivered in days, support high frequency up to 2.1 GHz. miniature product size, An integrated phase jitter performance of 300 fs RMS. Supports all popular formats: LVPECL, LVDS, HCSL and CML



## General specifications , at Ta = +25°C

Model	(V) MJF538P	(V) MJF538D	(V) MJF538C	(V) MJF538Q
Output Logic	LVPECL	LVDS	HCSL	CML
Supply Voltage V <sub>DD</sub> ( code )	-- + 2.5 V <sub>DD</sub> ± 10% + 3.3 V <sub>DD</sub> ± 10%	-- + 2.5 V <sub>DD</sub> ± 10% + 3.3 V <sub>DD</sub> ± 10%	+ 1.8 V <sub>DD</sub> ± 5% + 2.5 V <sub>DD</sub> ± 10% + 3.3 V <sub>DD</sub> ± 10%	+ 1.8 V <sub>DD</sub> ± 5% + 2.5 V <sub>DD</sub> ± 10% + 3.3 V <sub>DD</sub> ± 10%
Available Frequency Range	15 ~ 2,100 MHz	15 ~ 2,100 MHz	15 ~ 700 MHz	15 ~ 2,100 MHz
Load	50 Ω into V <sub>DD</sub> - 2V or Thevenin equivalent	100 Ω between output and complimentary output	50 Ω to GND	50 Ω to V <sub>DD</sub>
Output Logic " High " , " 1 "	V <sub>DD</sub> - 1.03 V min. V <sub>DD</sub> - 0.6 V max.	1.4 V Typical 1.6 V max.	V <sub>DD</sub> : 0.66V min. V <sub>DD</sub> : 1.15V max.	V <sub>DD</sub> - 0.085V min. V <sub>DD</sub> = max.
Output Logic " Low " , " 0 "	V <sub>DD</sub> - 1.85 V min. V <sub>DD</sub> - 1.6 V max.	1.1 V Typical 0.9 V min.	V <sub>DD</sub> : 0.0V min. V <sub>DD</sub> : 0.15V max.	V <sub>DD</sub> - 0.6V min. V <sub>DD</sub> - 0.32V max.
Current Consumption ( V <sub>DD</sub> = + 3.3 V )	100 mA typ. 120 mA max.	75 mA typ. 90 mA max.	80 mA typ. 100 mA max.	70 mA typ. 85 mA max.
Current with Output Disabie	99 mA typical	74 mA typical	79 mA typical	69 mA typical
Rise Time / Fall Time ( 20% to 80% Waveform )	0.4 ns max.	0.4 ns max.	0.4 ns max.	0.4 ns max.
Initial Calibration Tolerance	± 1.0 ppm. max. at +25°C ± 2°C.			
Frequency Stability Codes	Temperature (ref to +25°C)	± 2.5 ppm over -40°C to +85°C		
	Aging	± 1.0 ppm max . , per year at 25°C		
	Voltage Change	± 0.2 ppm max . , for a ± 5% input voltage change.		
	Load Change	± 0.2 ppm max . , for a ± 10% load condition change.		
	Reflow	± 1.0 ppm max . , 1 reflow and measured 24 hours afterwards.		
Duty Cycle	50 % ± 5%	Aging at Ta = +25°C	± 3 ppm max. for first year at 25°C	
Start-up Time	5 m sec ( typ. ) ; 10 m sec. ( max.)	Storage Temperature	-55°C to + 150°C	
Phase Jitter , rms ( typical ) ( 12 KHz to 20 MHz )	15 MHz ~ 50 MHz : 500 fsec typical , 51MHz ~ 1,200 MHz : 250 fsec typical			
Control Voltage Function on Pad 1		Output Enable Function on pad 2		
Control Voltage Center and Range	+1.5V ± 1.0V for both V <sub>DD</sub> = 2.5V and 3.3V + 0.9V ± 0.6V for both V <sub>DD</sub> = 1.8V	Output Enable / Disable Function	70% of V <sub>DD</sub> (min.) to enable output. 30% of V <sub>DD</sub> (max.) to disable output	
Frequency Pulling Range	± 8 ppm min.	Ouput Enable Time	200 ns. Max.	
Linearity	± 1 % typical. ± 10% max.	Output Disable Time	50 ns. Max.	
Transfer Function	Positive Transfer			
Input Impedance	5 MΩ typical.			

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



A.1

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**TCXO**  
**MJF538\_**

**VCTCXO**  
**VMJF538\_**

**SMD**

**1.8 V**

**2.5 V**

**3.3 V**

Min.  
**15**  
MHz

Max.  
**2,100**  
MHz

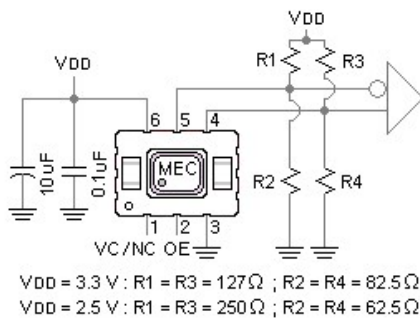
## Part Number Format and Example

Example : MJF538D33-100.000-2.5/-40+85

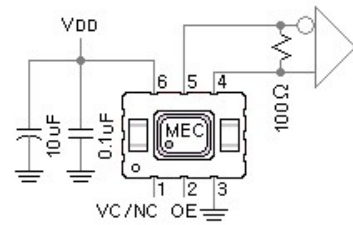
MJF	538	D	33	-	100.000	-	2.5	/	-40+85
Hold Type	Package Size	P : LVPECL	Supply Voltage		Center Freq. ( MHz )		Freq. Stability ( ppm )		Operating Temperature Range(°C)
" MJF " : TCXO	" 538 " ( 5.0 * 3.2 mm ) 8pad	D : LVDS C : HCSSL Q : CML	" 33 " for 3.3V " 25 " for 2.5V " 18 " for 1.8V						

## Test Circuits and Output Waveforms

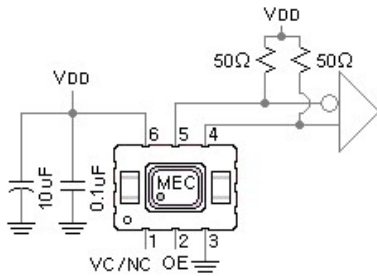
LVPECL Test Circuit



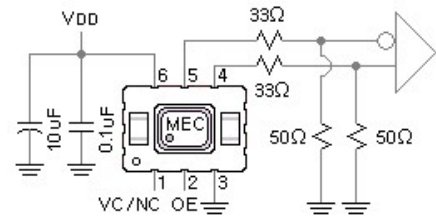
LVDS Test Circuit



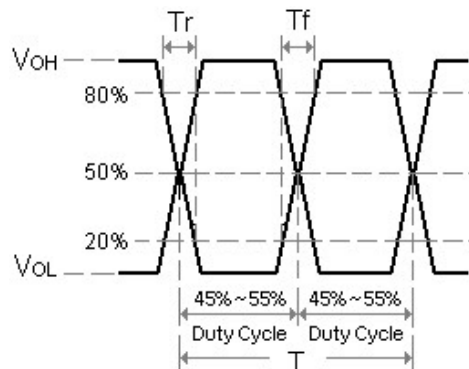
CML Test Circuit



HCSSL Test Circuit



Differential Output Waveforms



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