



# M630x Series

## 5x7 mm, TCXO/VCTCXO

### FEATURES

Frequencies from 10 MHz to 1.4 GHz  
 Supports both TCXO and VCTCXO formats  
 RF Output: LVPECL/LVDS/CML/CMOS  
 Tight stability  $\pm 1$ ppm over  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$   
 Wide operating temperature option available,  
 $-55^{\circ}\text{C}$  to  $+105^{\circ}\text{C}$   
 Low phase noise  
 Operating Voltage: 1.8/2.5/3.3 V

### APPLICATIONS

Telecom / Datacom  
 Industrial Controls  
 Communications & Navigation

### ORDERING INFORMATION

	<b>M630x</b>	<b>2</b>	<b>J</b>	<b>B</b>	<b>V</b>	<b>P</b>	<b>C</b>	<b>00.0000 MHz</b>
<b>Product Series</b>								
M6300 = 3.3 V								
M6301 = 2.5 V								
M6302 = 1.8 V								
<b>Temperature Range</b>								
1: $0^{\circ}\text{C}$ to $+70^{\circ}\text{C}$		3: $-55^{\circ}\text{C}$ to $+105^{\circ}\text{C}$						
6: $-20^{\circ}\text{C}$ to $+70^{\circ}\text{C}$		4: $-55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$						
2: $-40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$								
<b>Stability</b>								
G: $\pm 0.5$ ppm		J: $\pm 1.0$ ppm		K: $\pm 2.0$ ppm				
H: $\pm 2.5$ ppm		L: $\pm 4.6$ ppm		E: $\pm 10$ ppm				
<b>Enable/Disable Function</b>								
B: Enable High (Pad 1)		G: Enable High (Pad 2)						
S: Enable Low (Pad 1)		M: Enable Low (Pad 2)						
U: No Enable/Disable Function								
<b>Output Type</b>								
F: No Voltage Control (TCXO)								
V: Voltage Control (VCTCXO)								
<b>Output Waveform</b>								
P: LVPECL		L: LVDS		M: CML		C: CMOS		
<b>Package/Lead Configurations</b>								
N: Leadless Ceramic (9 Pad)								
C: Leadless Ceramic (6 Pad)								

Example Part Number: M63002JBFC 100.0000 MHz

## ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Frequency Range	$F_0$	10 10		1400 135	MHz MHz	LVPECL, LVDS, CML <sup>1</sup> CMOS
<b>Frequency Stabilities</b>						
Initial Accuracy		-1.0		+1.0	ppm	@ +25°C
vs. Operating Temperature	$\Delta F/F$	See ordering information			ppm	(FMAX-FMIN)/2 <sup>2</sup>
vs. Supply Voltage			±0.40		ppm	5% voltage variation
vs. Reflow			±0.75		ppm	2 reflows max
vs. Supply Voltage			±0.20		ppm	5% load variation
vs. Aging		-3.0 -1.0		+3.0 +1.0	ppm Ppm	1st year Per year after 1st year
<b>RF Output</b>						
Output Load		50 Ω to ( $V_{CC} - 2$ ) VDC 100 Ω Differential 15 pF				LVPECL <sup>3</sup> LVDS, CML <sup>3</sup> CMOS <sup>3</sup>
Symmetry (duty cycle)	$T_{DC}$	45 45 45		55 55 55	% % %	@ 50% of waveform (LVPECL) @ 1.25 V (LVDS) @ 50% $V_{CC}$ (CMOS)
Logic "1" Level	$V_{OH}$	$V_{CC} - 1.02$ 90% $V_{CC}$			V	LVPECL Load
Logic "0" Level	$V_{OL}$			$V_{CC} - 1.63$ 10% $V_{CC}$	V	LVPECL Load
Output Skew			20 15 20		ps ps ps	LVPECL CML LVDS
Differential Output Voltage		250	425	500	mV	LVDS Load
Common Mode Voltage			1.2		V	LVDS Output
Output Voltage Level		1.1	1.5	1.9	$V_{pk-pk}$	CML
Rise/Fall Time	$T_R/T_F$			0.35 6.0	ns ns	LVPECL, LVDS, CML CMOS
Start-up Time	$T_{SU}$			10	ms	
<b>Frequency Adjustment</b>						
Control Voltage Range	$V_C$	0.18 0.25 0.30	0.90 1.25 1.65	1.62 2.25 3.00	V V V	@ 1.8 V supply @ 2.5 V supply @ 3.3 V supply
Tuning Range		±5.0			ppm	VCTCXO only <sup>4</sup>
Linearity				10	%	
Input Impedance		500			kΩ	
<b>Enable/Disable</b>						
Enable/Disable Logic (Option B or G)		80% $V_{CC}$		0.35	V V	Output Enabled Output disabled to HIGH Z
Enable/Disable Logic (Option S or M)		80% $V_{CC}$		0.35	V V	Output Enabled Output disabled to HIGH Z

## ELECTRICAL SPECIFICATIONS

### Operating Voltage and Current

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Operating Voltage	V <sub>CC</sub>	3.135	3.300	3.465	V	M6300
		2.375	2.500	2.625	V	M6301
		1.710	1.800	1.890	V	M6302
Operating Current	I <sub>CC</sub>			125	mA	LVPECL
				100	mA	LVDS
				110	mA	CML
				90	mA	CMOS

### Temperature

Operating Temperature	T <sub>A</sub>	See ordering information			°C	
Storage Temperature	T <sub>S</sub>	-55		+125	°C	

### Notes

Note 1	Contact factory for frequencies over 945 MHz.
Note 2	Contact factory for less than ±1 ppm frequency stability.
Note 3	Refer to the load circuit diagram in this data sheet.
Note 4	Contact factory for other tuning range options.

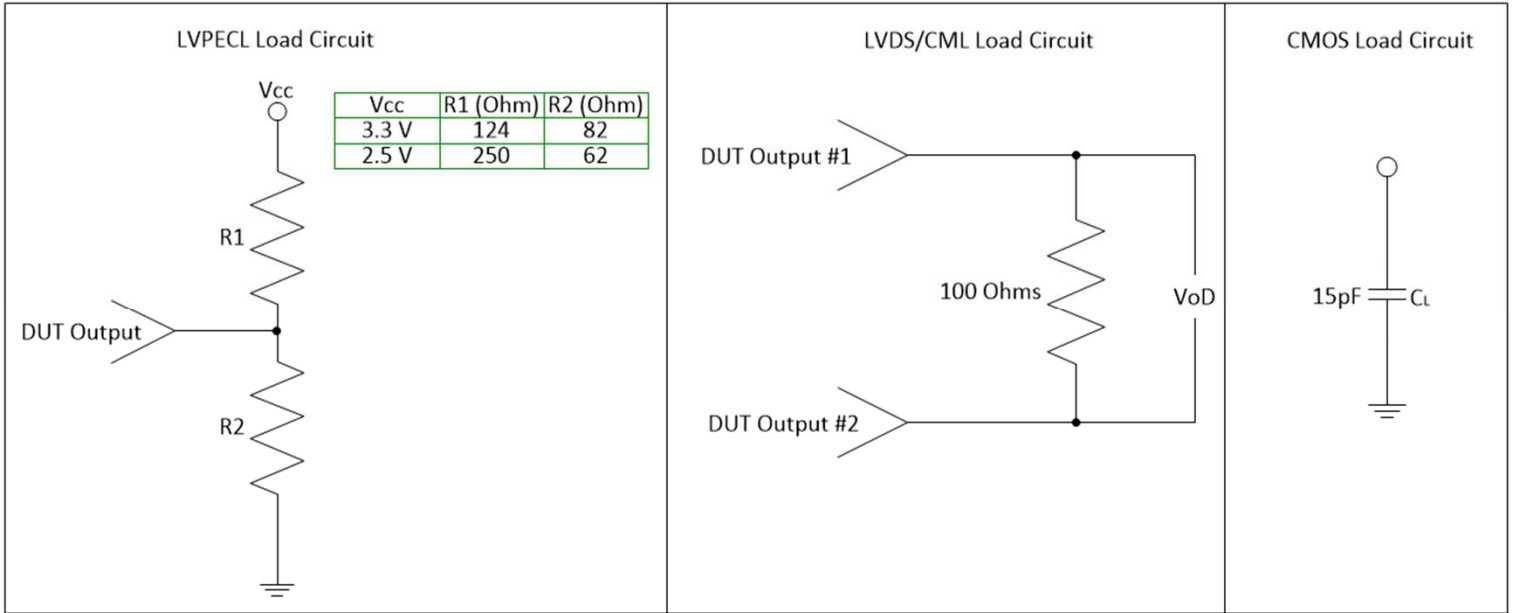
## TEMPERATURE vs. STABILITY

	±0.5 ppm	±1.0 ppm	±2.0 ppm	±2.5 ppm	±4.6 ppm
0°C to +70°C	Available	Available	Available	Available	Available
-20°C to +70°C	Contact Factory	Available	Available	Available	Available
-40°C to +85°C	Contact Factory	Available	Available	Available	Available
-55°C to +105°C	Contact Factory	Contact Factory	Contact Factory	Contact Factory	Available
-55°C to +125°C	Contact Factory	Contact Factory	Contact Factory	Contact Factory	Available

## ENVIRONMENTAL CONDITIONS

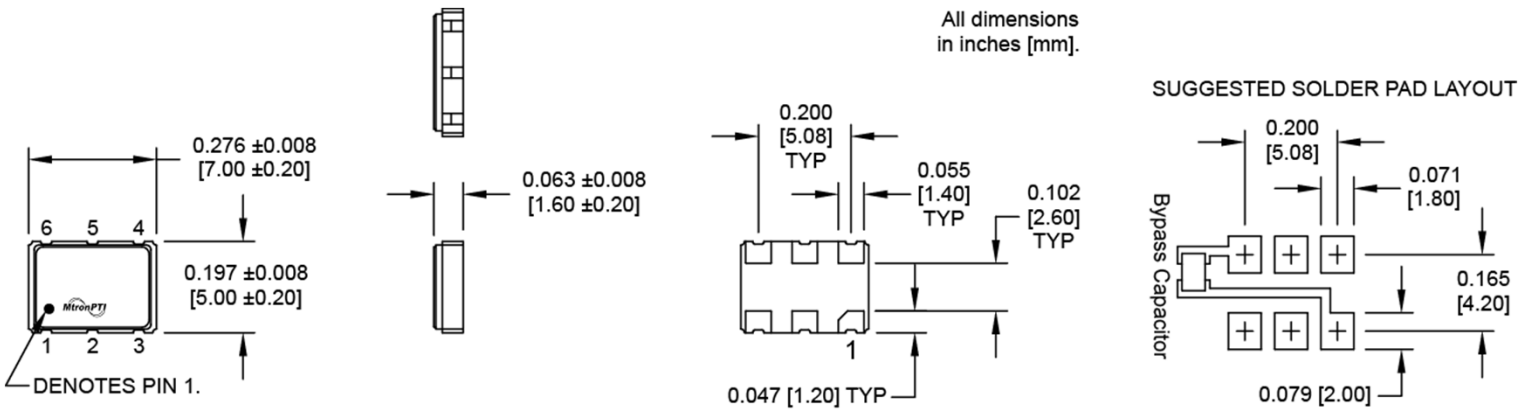
Shock	Per MIL-STD-202, Method 213, Condition C
Vibration	Per MIL-STD-202, Methods 201 & 204
Solderability	Per EIAJ-STD-002
Hermeticity	Per MIL-STD-202, Method 112 (1 x 10 <sup>-8</sup> atm cc/s of helium)
Thermal Shock	Per MIL-STD-883, Method 1011, Condition A
Thermal Cycle	Per MIL-STD-883, Method 1010, Condition B

## LOAD CIRCUIT DIAGRAMS

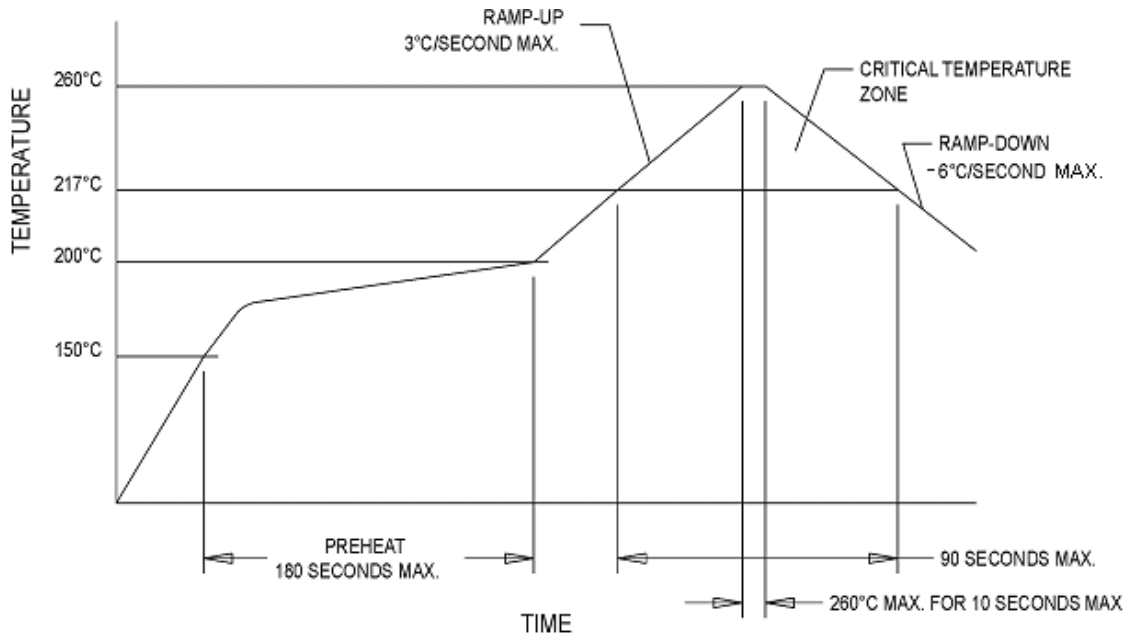


## MECHANICAL AND PIN OUT INFORMATION

Pad	Function
1	Enable/Disable, Voltage Control or N/C
2	Enable/Disable, Voltage Control or N/C
3	Ground
4	Output Q (LVPECL, LVDS, CML, CMOS)
5	Output $\bar{Q}$ (LVPECL, LVDS, CML)
6	Supply Vcc+

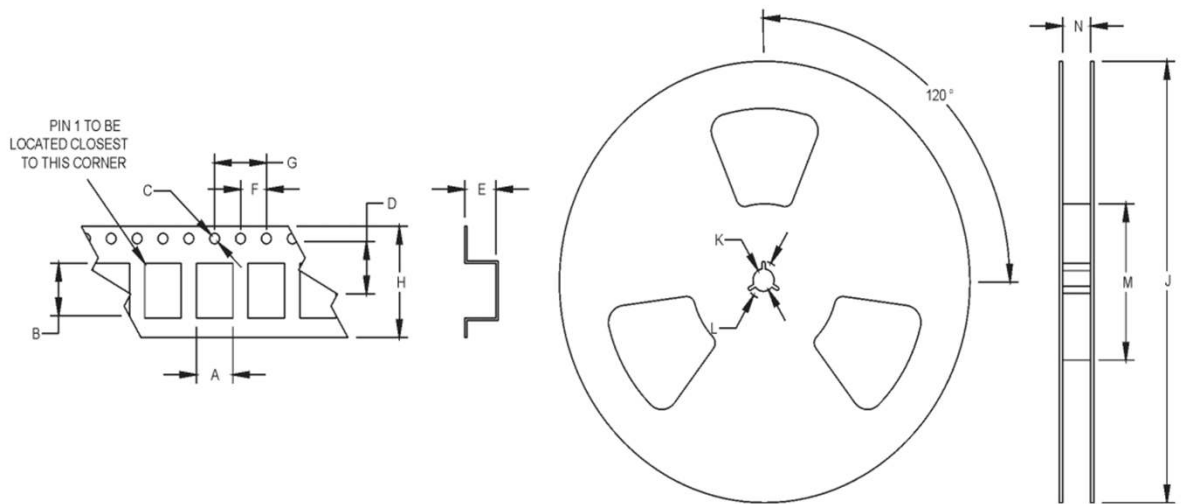


## LEAD FREE SOLDER PROFILE



## TAPE AND REEL SPECIFICATIONS

All units in mm



A	B	C	D	E	F	G	H	J	K	L	M
5.32	7.28	1.5	7.5	2.2	4	8	16	178	13.5	24.8	80