



HCMOS/TTL CLOCK OSCILLATOR

FEATURES

- Standard 5.0x3.2mm Surface Mount Footprint
- HCMOS/TTL Compatible
- Fundamental and 3rd Overtone Crystals
- Frequency Range 1.0 – 125 MHz
- Frequency Stability, ± 50 ppm Standard (± 25 ppm and ± 20 ppm available)
- +1.8Vdc, +2.5Vdc, +3.3Vdc or +5.0Vdc Operation
- Operating Temperature to -40°C to $+85^{\circ}\text{C}$
- Output Enable Standard
- Tape & Reel Packaging
- **RoHS/Green Compliant (6/6)**

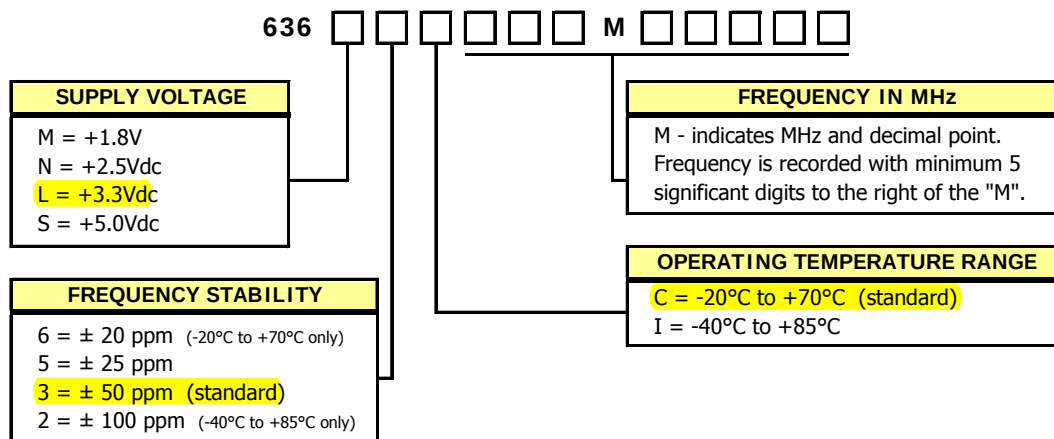
DESCRIPTION

The Model 636 is a ceramic packaged Clock oscillator offering reduced size and enhanced stability. The small size means it is perfect for any application. The enhanced stability means it is the perfect choice for today's communications applications that require tight frequency control.

KLA 0228232-000
CTS 636L3C033M00000



ORDERING INFORMATION



Example Part Number: 636L3C032M76800

ELECTRICAL CHARACTERISTICS

	PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Absolute Maximums	Maximum Supply Voltage	V_{CC}	-	-0.5	-	7.0	V
	Storage Temperature	T_{STG}	-	-55	-	125	°C
	Frequency Range	f_0	-	1.0	-	125	MHz
	Frequency Stability (See Note 1 and Ordering Information)	$\Delta f/f_0$	-	-	-	20,25,50 or 100	± ppm
	Aging	$\Delta f/f_0$	-	-	-	3	± ppm/yr
	Operating Temperature Commercial Industrial	T_A	-	-20 -40	25	70 85	°C
Electrical and Waveform Parameters	Supply Voltage Model 636M Model 636N Model 636L Model 636S	V_{CC}	± 10 %	1.62 2.25 2.97 4.50	1.8 2.5 3.3 5.0	1.98 2.75 3.63 5.50	V
	Supply Current Model 636M	I_{CC}	1.0 MHz to 20 MHz $C_L = 15pF$	-	-	5	mA
			20.1 MHz to 50 MHz $C_L = 15pF$	-	-	15	
			50.1 MHz to 125 MHz $C_L = 15pF$	-	-	20	
	Model 636N		1.0 MHz to 20 MHz $C_L = 15pF$	-	-	7	
			20.1 MHz to 50 MHz $C_L = 15pF$	-	-	15	
			50.1 MHz to 125 MHz $C_L = 15pF$	-	-	25	
	Model 636L		1.0 MHz to 20 MHz $C_L = 15pF$	-	-	7	
			20.1 MHz to 50 MHz $C_L = 15pF$	-	-	20	
			50.1 MHz to 125 MHz $C_L = 15pF$	-	-	30	
	Model 636S		1.0 MHz to 20 MHz $C_L = 15pF$	-	-	10	
			20.1 MHz to 50 MHz $C_L = 15pF$	-	-	30	
			50.1 MHz to 125 MHz $C_L = 15pF$	-	-	40	
	Output Load Model 636M Model 636N & 636L Model 636S	C_L	1.0 MHz to 125 MHz 1.0 MHz to 50 MHz 50.1 MHz to 125 MHz 1.0 MHz to 50 MHz 50.1 MHz to 80 MHz 80.1 MHz to 125 MHz	- - - - - -	- - - - - -	15 30 15 50 30 15	pF
	Output Voltage Levels Logic '1' Level Logic '0' Level	V_{OH} V_{OL}	CMOS Load CMOS Load	90% V_{CC} -	- -	- 10% V_{CC}	V
	Output Current Logic '1' Level (M,N,L,S) Logic '0' Level (M,N,L,S)	I_{OH} I_{OL}	$V_{OH} = 90\%V_{CC}$ $V_{OL} = 10\%V_{CC}$	- -	- -	-2, -4, -8, -16 +2, +4, +8, +16	mA
	Output Duty Cycle	SYM	@ 50% Level	45	-	55	%
	Rise and Fall Time Model 636M, 636N & 636L Model 636S	T_R, T_F	@ 10% - 90% Levels 1.0 MHz to 20 MHz $C_L = 15pF$ 20.1 MHz to 50 MHz $C_L = 15pF$ 50.1 MHz to 125 MHz $C_L = 15pF$ 1.0 MHz to 20 MHz $C_L = 15pF$ 20.1 MHz to 50 MHz $C_L = 15pF$ 50.1 MHz to 125 MHz $C_L = 15pF$	- - - - - - - - - - - -	8 4 2.5 6 3 15	10 6 3 8 5 2	ns
	Start Up Time	T_S	Application of V_{CC}	-	-	10	ms
	Enable Function Enable Input Voltage Model 636M Model 636N Model 636L Model 636S	V_{IH}	Pin 1 Logic '1', Output Enabled Pin 1 Logic '1', Output Enabled Pin 1 Logic '1', Output Enabled Pin 1 Logic '1', Output Enabled	1.26 1.75 2.0 4.0	- - - -	- - - -	V
	Disable Input Voltage Model 636M,N,L Model 636S	V_{IL}	Pin 1 Logic '0', Output Disabled Pin 1 Logic '0', Output Disabled	- -	- -	0.5 0.8	
	Enable Time (M,N,L,S)	T_{PLZ}	Pin 1 Logic '1'	-	-	10	ms
	Standby Current	I_{ST}	Pin 1 Logic '0', Output Disabled	-	-	10	uA
	Period Jitter, Pk-Pk	-	-	-	-	100	
	Period Jitter, RMS	-	-	-	-	25	ps
	Phase Jitter, RMS	-	Bandwidth 12 kHz - 20 MHz	-	< 2	-	

Notes:

1. Inclusive of initial tolerance at time of shipment, changes in supply voltage, load, temperature and aging.

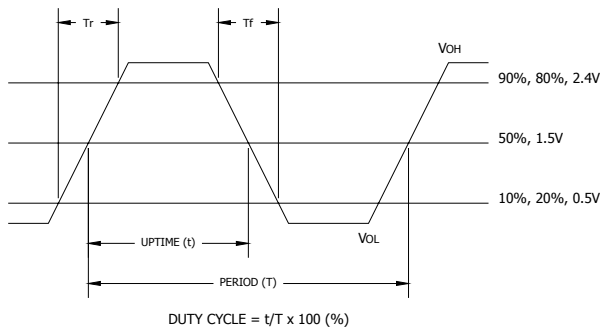


Model 636

5.0x3.2mm Low Cost

HC MOS/TTL Clock Oscillator

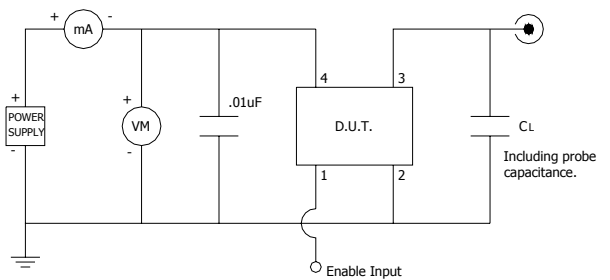
CMOS/TTL OUTPUT WAVEFORM



ENABLE TRUTH TABLE

PIN 1	PIN 3
Logic '1'	Output
Open	Output
Logic '0'	High Imp.

TEST CIRCUIT, CMOS LOAD

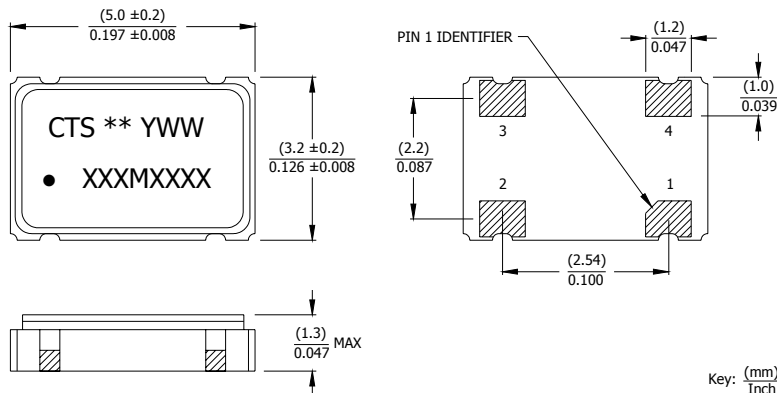


D.U.T. PIN ASSIGNMENTS

PIN	SYMBOL	DESCRIPTION
1	EOH	Enable Input
2	GND	Circuit & Package Ground
3	Output	RF Output
4	V_{CC}	Supply Voltage

MECHANICAL SPECIFICATIONS

PACKAGE DRAWING



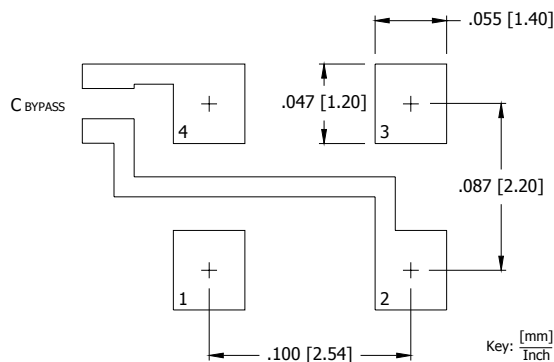
MARKING INFORMATION

1. ** - Manufacturing Site Code.
2. YWW - Date code, Y - year, WW - week.
3. XXXMXXXX - Frequency marked with 4 significant digits after the 'M'.

NOTES

1. Termination pads (e4), barrier-plating is nickel (Ni) with gold (Au) flash plate.
2. Reflow conditions per JEDEC J-STD-020.

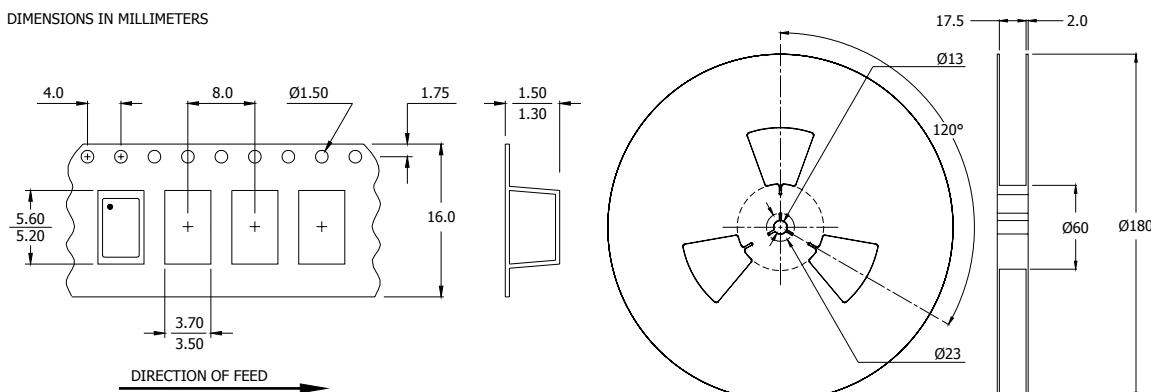
SUGGESTED SOLDER PAD GEOMETRY



C_{BYPASS} should be $\geq 0.01 \mu\text{F}$.

TAPE AND REEL INFORMATION

DIMENSIONS IN MILLIMETERS



Device quantity is 3,000 pieces per 180mm reel.

ENVIRONMENTAL SPECIFICATIONS

Temperature Cycle:	400 cycles from -55°C to +125°C, 10 minute dwell at each temperature, 1 minute transfer time between temperatures.
Mechanical Shock:	1,500g's, 0.5mS duration, ½ sinewave, 3 shocks each direction along 3 mutually perpendicular planes (18 total shocks).
Sinusoidal Vibration:	0.06 inches double amplitude, 10 to 55 Hz and 20g's, 55 to 2,000 Hz, 3 cycles each in 3 mutually perpendicular planes (9 times total).
Gross Leak:	No leak shall appear while immersed in an FC40 or equivalent liquid at +125°C for 20 seconds.
Fine Leak:	Mass spectrometer leak rates less than 2×10^{-8} ATM cc/sec air equivalent.
Resistance to Solder Heat:	Product must survive 3 reflows of +260°C peak, 10 seconds maximum.
High Temperature Operating Bias:	2,000 hours at +125°C, maximum bias, disregarding frequency shift.
Frequency Aging:	1,000 hours at +85°C, full bias, less than ±5 ppm shift.
Moisture Sensitivity Level:	Level 1 per JEDEC J-STD-020.

QUALITY AND RELIABILITY

Quality systems meet or exceed the requirements of ISO 9000:2000 standards.