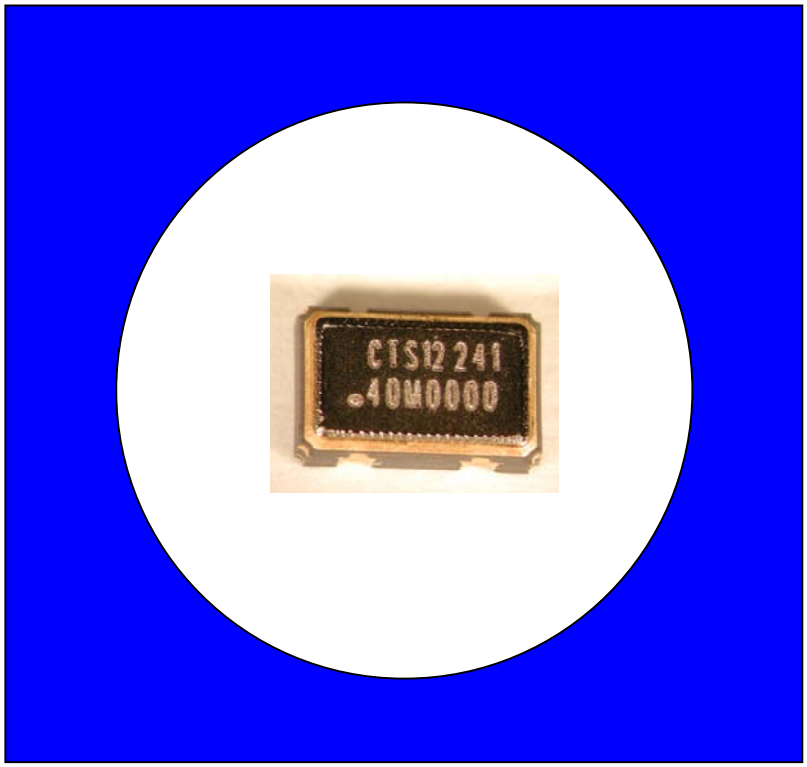
Model 636 Technical Data

CMOS/TTL CLOCK OSCILLATOR

FEATURES

- Standard 5x3.2mm Surface Mount Footprint
- CMOS/TTL Compatible
- 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°C
- Output Enable Standard
- Tape & Reel Packaging
- **RoHS Compliant**



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.

ORDERING INFORMATION

636 ☐ ☐ ☐ ☐ ☐ ☐ ☐ M ☐ ☐ ☐ ☐ ☐

SUPPLY VOLTAGE

M = +1.8V
N = +2.5Vdc
L = +3.3Vdc
S = +5.0Vdc

FREQUENCY IN MHz

M - indicates MHz and decimal point. Frequency is recorded with minimum 5 significant digits to the right of the "M".

OPERATING TEMPERATURE RANGE

C = -20°C to +70°C (standard)
I = -40°C to +85°C

FREQUENCY STABILITY

6 = ± 20 ppm (-20°C to +70°C only)
5 = ± 25 ppm
3 = ± 50 ppm (standard)
2 = ± 100 ppm (-40°C to +85°C only)

Example Part Number: 636L3C032M76800

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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_O	-	1.0	-	125	MHz
	Frequency Stability (See Note 1 and Ordering Information)	$\Delta f/f_O$	-	-	-	20,25,50 or 100	± ppm
	Operating Temperature Commercial Industrial	T_A	-	 -20 -40	 25	 70 85	°C
Electrical and Waveform Parameters	Supply Voltage	V_{CC}	± 10 %				V
	Model 636M			1.62	1.8	1.98	
	Model 636N			2.25	2.5	2.75	
	Model 636L			2.97	3.3	3.63	
	Model 636S			4.50	5.0	5.50	
	Supply Current	I_{CC}					mA
	Model 636M		1.0 MHz to 20 MHz C_L=15pF	-	-	5	
			20.1 MHz to 50 MHz C_L=15pF	-	-	15	
			50.1 MHz to 125 MHz C_L=15pF	-	-	20	
	Model 636N & 636L		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	-	-	20	
	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	C_L					pF
	Model 636M		1.0 MHz to 125 MHz	-	-	15	
	Model 636N & 636L		1.0 MHz to 50 MHz	-	-	30	
			50.1 MHz to 125 MHz	-	-	15	
	Model 636S		1.0 MHz to 50 MHz	-	-	50	
			50.1 MHz to 80 MHz	-	-	30	
			80.1 MHz to 125 MHz	-	-	15	
	Output Voltage Levels						V
	Logic '1' Level	V_{OH}	CMOS Load	90%V_{CC}	-	-	
	Logic '0' Level	V_{OL}	CMOS Load	-	-	10%V_{CC}	
	Output Current						mA
	Logic '1' Level (M,N,L,S)	I_{OH}	V_{OH} = 90%V_{CC}	-	-	-0, -4, -8, -16	
	Logic '0' Level (M,N,L,S)	I_{OL}	V_{OL} = 10%V_{CC}	-	-	+2, +4, +8, +16	
	Output Duty Cycle	SYM	@ 50% Level	45	-	55	%
	Rise and Fall Time	T_R, T_F	@ 10% - 90% Levels				ns
	Model 636M, 636N & 636L		1.0 MHz to 20 MHz C_L=15pF	-	8	10	
			20.1 MHz to 50 MHz C_L=15pF	-	4	6	
			50.1 MHz to 125 MHz C_L=15pF	-	2.5	3	
	Model 636S		1.0 MHz to 20 MHz C_L=15pF	-	6	8	
			20.1 MHz to 50 MHz C_L=15pF	-	3	5	
			50.1 MHz to 125 MHz C_L=15pF	-	1.5	2	
	Start Up Time	T_S	Application of V_{CC}	-	-	10	ms
	Enable Function						V
	Enable Input Voltage						
	Model 636M	V_{IH}	Pin 1 Logic '1', Output Enabled	1.26	-	-	
	Model 636N		Pin 1 Logic '1', Output Enabled	1.75	-	-	
	Model 636L		Pin 1 Logic '1', Output Enabled	2.0	-	-	
	Model 636S		Pin 1 Logic '1', Output Enabled	4.0	-	-	
	Disable Input Voltage						
	Model 636M,N,L	V_{IL}	Pin 1 Logic '0', Output Disabled	-	-	0.5	
	Model 636S		Pin 1 Logic '0', Output Disabled			0.8	
	Enable Time (M,N,L,S)	T_{PLZ}	Pin 1 Logic '1'	-	-	10	ms
	Phase Jitter	tjms	Bandwidth 12 KHz - 20 MHz	-	< 1	-	ps RMS

Notes:
1. Inclusive of initial tolerance at time of shipment, changes in supply voltage, load, temperature and first year aging at an average operating temperature of +40 °C.

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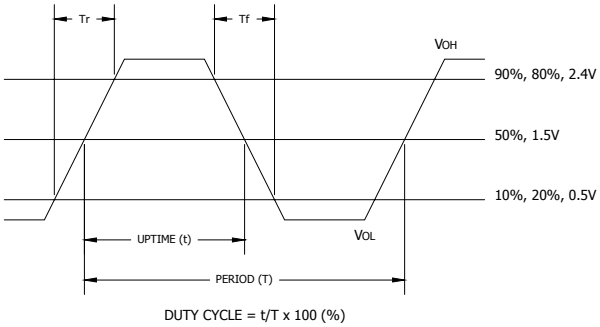
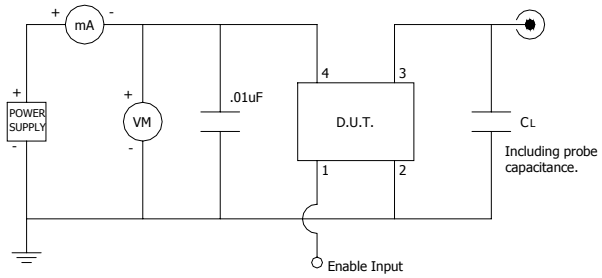
CMOS/TTL OUTPUT WAVEFORM



DUTY CYCLE = t/T x 100 (%)

TEST CIRCUIT, CMOS LOAD



ENABLE TRUTH TABLE

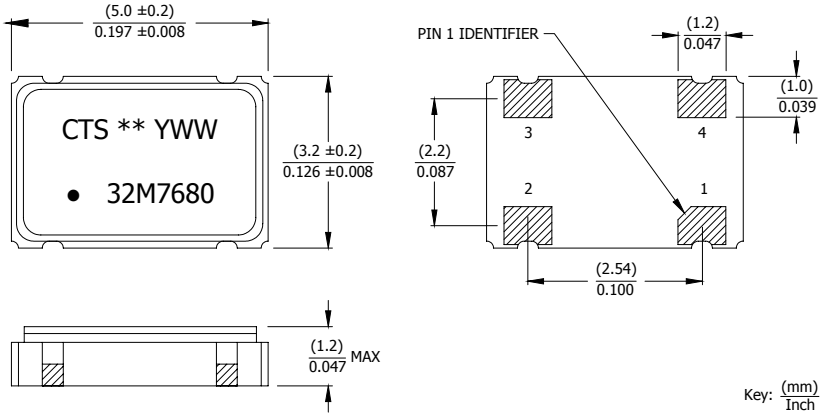
PIN 1	PIN 3
Logic '1'	Output
Open	Output
Logic '0'	High Imp.

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

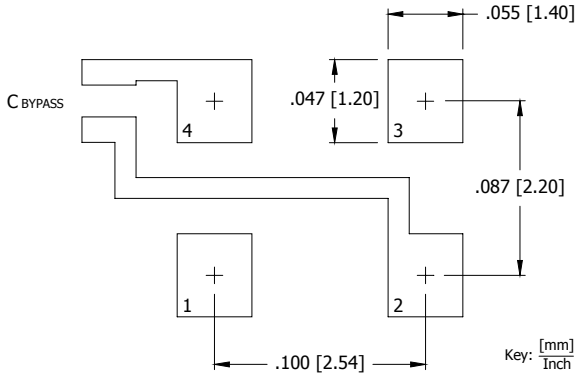


Key: (mm) / Inch

MARKING INFORMATION

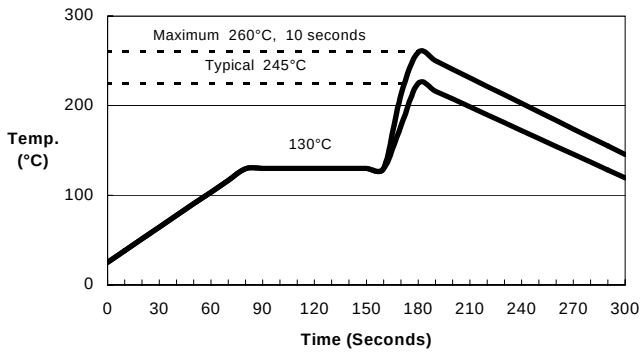
1. ** - Manufacturing Site Code.
2. YWW – Date code, Y – year, WW – week.
3. XXMXXXX - Frequency marked with 4 significant digits after the 'M'.

SUGGESTED SOLDER PAD GEOMETRY



C_{BYPASS} should be ≥ 0.01 uF.

SUGGESTED REFLOW PROFILE



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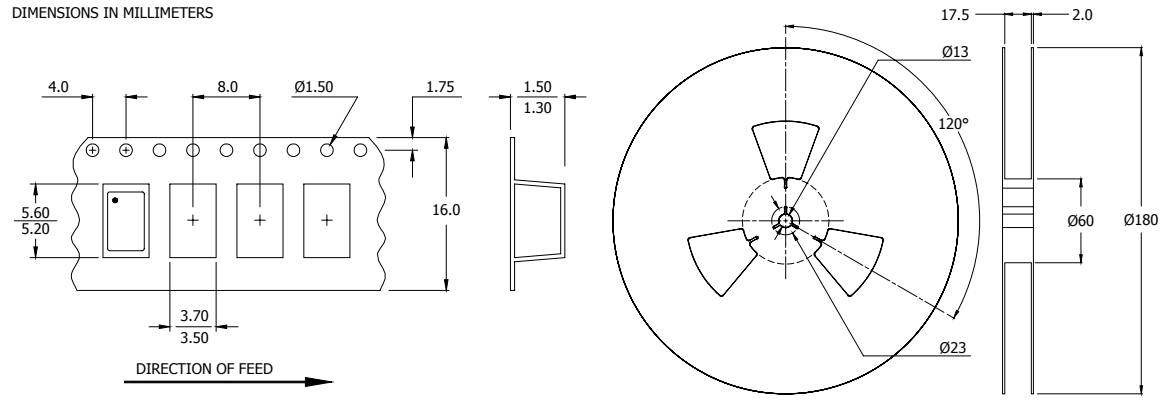
TAPE AND REEL INFORMATION



Device quantity is 1,000 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 $2x10^{-8}$ 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.

QUALITY AND RELIABILITY

Quality systems meet or exceed the requirements of ISO 9000:2000 standards. Reliability audits are performed on this or similar products with results available upon request.