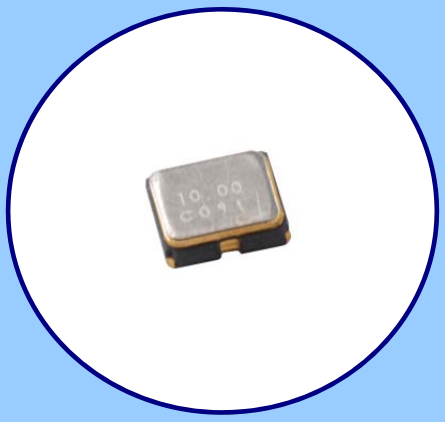
Model 632

HCMOS Clock Oscillator

FEATURES

- **Standard 3.2mm x 2.5mm 4-Pad Surface Mount Package**
- **HCMOS Output**
- **Fundamental and 3rd Overtone Crystal Designs**
- Frequency Range 1 – 125 MHz
- Frequency Stability ±50 ppm Standard, ±25 ppm and ±20 ppm Available
- Operating Voltages +1.8Vdc, +2.5Vdc, +2.8Vdc, +3.3Vdc or +5.0Vdc
- Operating Temperature to -40°C to +85°C
- Output Enable Standard
- Tape & Reel Packaging Standard, EIA-418
- **RoHS/Green Compliant [6/6]**



APPLICATIONS

Model 632 is ideal for applications; such as broadband access, Ethernet/Gigabit Ethernet, microprocessors/DSP/FPGA, networking equipment computers and peripherals, digital video, cameras and other portable devices.

ORDERING INFORMATION

632 ☐ ☐ ☐ ☐ ☐ ☐ M ☐ ☐ ☐ ☐ ☐

SUPPLY VOLTAGE

M = +1.8Vdc
N = +2.5Vdc
T = +2.8Vdc
L = +3.3Vdc
S = +5.0Vdc

FREQUENCY IN MHz

M - indicates MHz and decimal point. [2]

TEMPERATURE RANGE

C = -20°C to +70°C
I = -40°C to +85°C

FREQUENCY STABILITY

6 = ±20ppm [1]
5 = ±25ppm
3 = ±50ppm

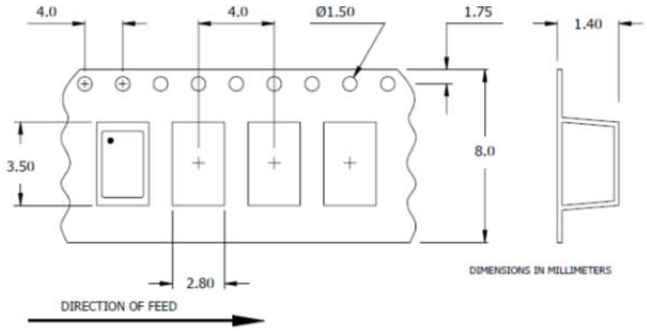
1] Consult factory for 6l Stability/Temperature availability.

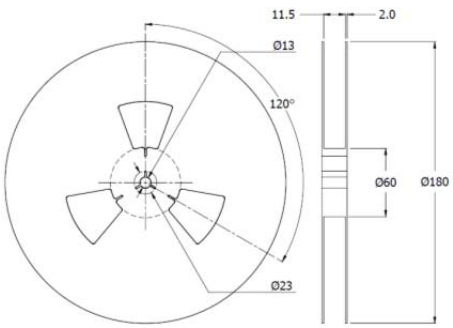
2] Frequency is recorded with three leading significant digits before the 'M' and 5 significant digits after the 'M' [including zeros].
[Ex. 3.579545 MHz, code as 003M57954; 14.31818 MHz, code as 014M31818; 125 MHz, code as 125M00000]

Not all performance combinations and frequencies may be available.
Contact your local CTS Representative or CTS Customer Service for availability.

PACKAGING INFORMATION [reference]

Device quantity is 1k pcs. minimum and 3k pcs. maximum per 180mm reel. 8mm tape width.





CTS ELECTRONIC COMPONENTS

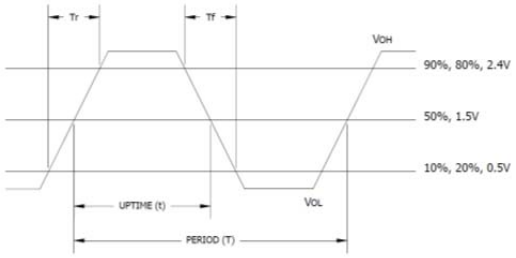
Model 632
3.2mm x 2.5mm Low Cost HCMOS Clock Oscillator

ELECTRICAL CHARACTERISTICS

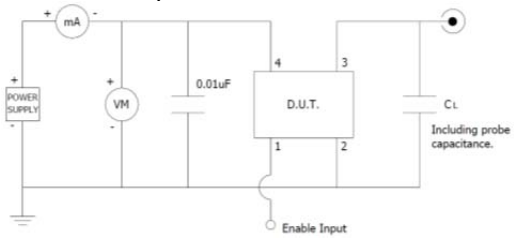
	PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
ELECTRICAL PARAMETERS	Maximum Supply Voltage	V_{CC}	-	-0.5	-	4.0	V
	Storage Temperature	T_{STG}	-	-40	-	+100	°C
	Frequency Range	f_O	-	1.0	-	125	MHz
	Frequency Stability [See Note 1and Ordering Information]	$\Delta f/f_O$	-	-	-	20, 25, 50	± ppm
	Aging	$\Delta f/f_O$	-	-	-	3	± ppm/yr
	Operating Temperature Commercial Industrial	T_A	-	 -20 -40	 +25	 +70 +85	°C
	Supply Voltage Model 632M Model 632N Model 632T Model 632L Model 632S	V_{CC}	± 10 %	 1.62 2.25 2.52 2.97 4.50	 1.8 2.5 2.8 3.3 5.0	 1.98 2.75 3.08 3.63 5.50	V
	Supply Current Model 632M [+1.8V] Model 632N, 632T [+2.5V, +2.8V] Model 632L, 632S [+3.3V, +5.0V]	I_{CC}	C_L = 15pF 1.0 MHz to 100 MHz 100.1 MHz to 125 MHz 1.0 MHz to 100 MHz 100.1 MHz to 125 MHz 1.0 MHz to 100 MHz 100.1 MHz to 125 MHz	 - - - - - -	 - - - - - -	 7 12 10 20 15 25	mA
	Output Load	C_L		-	-	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,T,L,S]	 I_{OH}	 V_{OH} = 90%V_{CC} [1.8V, 2.5/2.8V, 3.3V, 5.0V]	 -	 -	 -2, -4, -8, -16	mA
	Logic '0' Level [M,N,T,L,S]	I_{OL}	V_{OL} = 10%V_{CC} [1.8V, 2.5/2.8V, 3.3V, 5.0V]	-	-	+2, +4, +8, +16	
	Output Duty Cycle	SYM	@ 50% Level	45	-	55	%
	Rise and Fall Time Model 632M [+1.8V] Model 632N, 632T [+2.5V, +2.8V] Model 632L, 632S [+3.3V, +5.0V]	T_R, T_F	@ 10% - 90% Levels, C_L = 15pF 1.0 MHz to 20 MHz 20.1 MHz to 125 MHz 1.0 MHz to 20 MHz 20.1 MHz to 125 MHz 1.0 MHz to 20 MHz 20.1 MHz to 125 MHz	 - - - - - -	 - - - - - -	 5 4 4 3 3 2	ns
	Start Up Time	T_S	Application of V_{CC}	-	-	2	ms
	Enable Function Enable Input Voltage	 V_{IH}	 Pin 1 Logic '1', Output Enabled	 0.7*V_{CC}	 -	 -	V
	Disable Input Voltage	V_{IL}	Pin 1 Logic '0', Output Disabled	-	-	0.3*V_{CC}	
	Enable Time [M,N,T,L,S]	T_{PLZ}	Pin 1 Logic '1'	-	-	2	ms
	Standby Current	I_{ST}	Pin 1 Logic '0', Output Disabled	-	-	15	µA
	Period Jitter, pk-pk	pjpk-pk	-	-	-	40	ps
	Phase Jitter, RMS	tjrms	Bandwidth 12 kHz - 20 MHz	-	-	1	

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

LVCMOS OUTPUT WAVEFORM



TEST CIRCUIT, CMOS LOAD

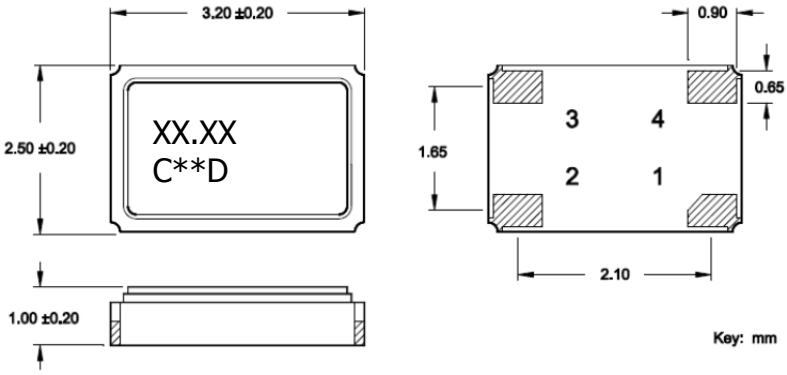


ENABLE TRUTH TABLE

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

MECHANICAL SPECIFICATIONS

PACKAGE DRAWING



MARKING INFORMATION

1. XX.XX – Frequency in MHz.
2. C – CTS and Pin 1 identifier.
3. ** - Manufacturing Site Code.
4. D – Manufacturing Date Code.
   [See Table 1 for codes.]
5. Complete CTS part number, frequency value and date code information must appear on reel and carton labels.

NOTES

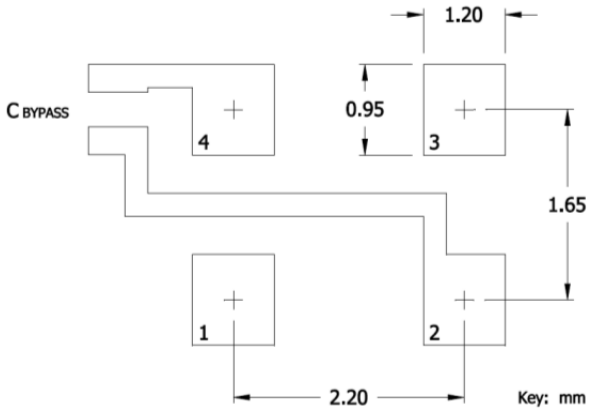
1. Termination pads (e4). Barrier-plating is nickel [Ni] with gold [Au] flash plate.
2. Reflow conditions per JEDEC J-STD-020; 260°C maximum, 20 seconds.
3. MSL = 1.

TABLE I

YEAR \ MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2001	2005	2009	2013	2017	A	B	C	D	E	F	G	H	J	K	L	M
2002	2006	2010	2014	2018	N	P	Q	R	S	T	U	V	W	X	Y	Z
2003	2007	2011	2015	2019	a	b	c	d	e	f	g	h	j	k	l	m
2004	2008	2012	2016	2020	n	p	q	r	s	t	u	v	w	x	y	z

SUGGESTED SOLDER PAD GEOMETRY

C_{BYPASS} should be ≥ 0.01 uF.



D.U.T. PIN ASSIGNMENTS

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