



**FEATURES**

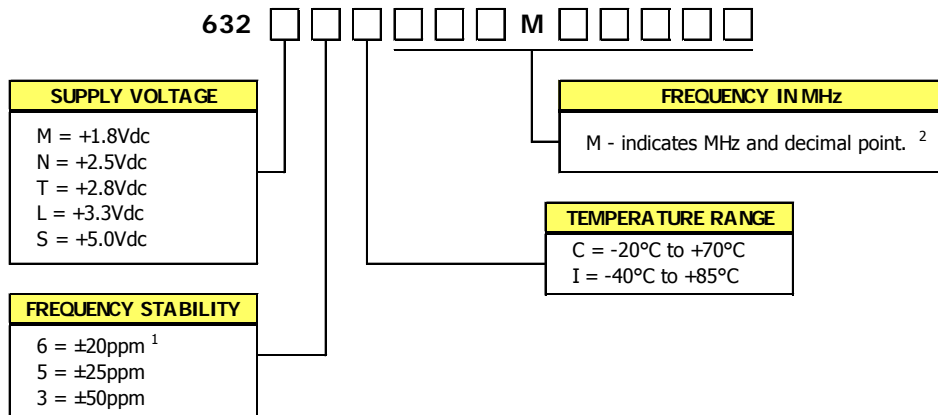
- Standard 3.2mm x 2.5mm 4-Pad Surface Mount Package
- HCMOS Output
- Fundamental and 3<sup>rd</sup> Overtone Crystal Designs
- Frequency Range 1 – 125 MHz
- Frequency Stability ±50 ppm Standard, ±25 ppm and ±20 ppm Available
- Operating Voltages +1.8Vdc, +2.5Vdc, +2.8Vdc, +3.3Vdc or +5.0Vdc
- Operating 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**



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.**



**ELECTRICAL CHARACTERISTICS**

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Maximum Supply Voltage	$V_{CC}$	-	-0.5	-	4.0	V
Storage Temperature	$T_{STG}$	-	-40	-	+100	°C
Frequency Range	$f_0$	-	1.0	-	125	MHz
Frequency Stability [See Note 1 and Ordering Information]	$\Delta f/f_0$	-	-	-	20, 25, 50	± ppm
Aging	$\Delta f/f_0$	-	-	-	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]	$I_{CC}$	$C_L = 15\text{pF}$ 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] Logic '0' Level [M,N,T,L,S]	$I_{OH}$ $I_{OL}$	$V_{OH} = 90\%V_{CC}$ [1.8V, 2.5/2.8V, 3.3V, 5.0V] $V_{OL} = 10\%V_{CC}$ [1.8V, 2.5/2.8V, 3.3V, 5.0V]	- -	- -	-2, -4, -8, -16 +2, +4, +8, +16	mA
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, $C_L = 15\text{pF}$ 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 Disable Input Voltage	$V_{IH}$ $V_{IL}$	Pin 1 Logic '1', Output Enabled Pin 1 Logic '0', Output Disabled	0.7* $V_{CC}$ -	- -	- 0.3* $V_{CC}$	V
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	ps

ELECTRICAL PARAMETERS

Notes:

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

**LVC MOS OUTPUT WAVEFORM**



**TEST CIRCUIT, CMOS LOAD**

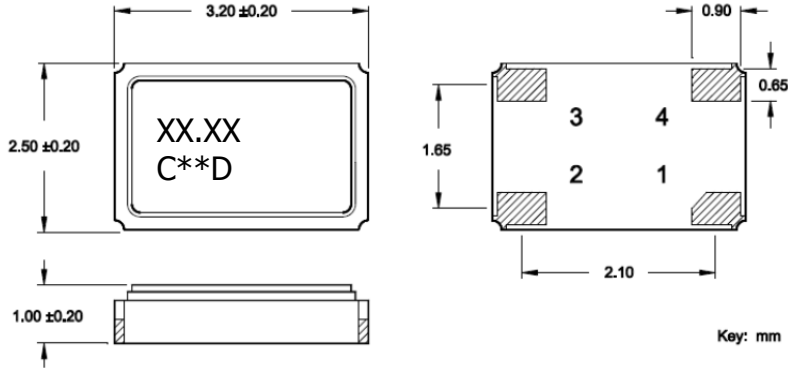


**ENABLE TRUTH TABLE**

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  $\geq 0.01$  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