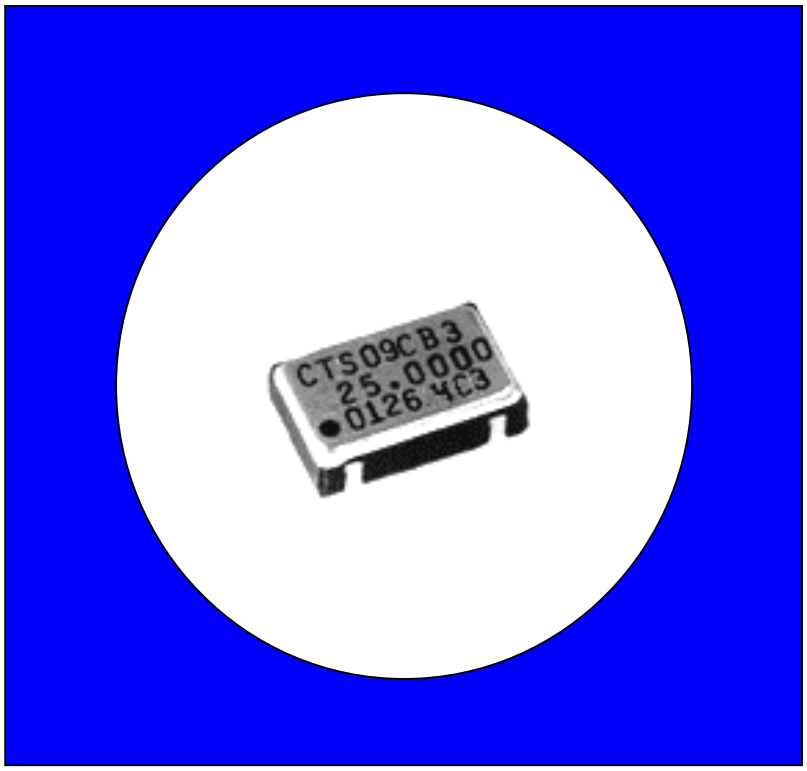
Stratum IV CB3 & CB3LV

HCMOS/TTL CLOCK OSCILLATOR

FEATURES

- Standard 7.5x5.0mm Surface Mount Footprint
- HCMOS/TTL Compatible
- Fundamental and 3rd Overtone Crystals
- Frequency Range 1.5 – 80 MHz
- Frequency Stability, ±32 ppm for 20 Years
- +3.3Vdc or +5.0Vdc Operation
- Operating Temperature to –40°C to +85°C
- Output Enable Standard
- Tape & Reel Packaging
- **RoHS/Green Compliant**



DESCRIPTION

The CB3/CB3LV 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

CB3 ☐ - ☐ ☐ - M

SUPPLY VOLTAGE
LV = +3.3Vdc
Blank = +5.0Vdc

FREQUENCY STABILITY
S4 = ± 32 ppm

FREQUENCY IN MHz
M - indicates MHz and decimal point. Frequency is recorded with minimum 4 significant digits to the right of the "M".

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

Example Part Number: CB3LV-S4-32M7680 or CB3-S4-32M7680

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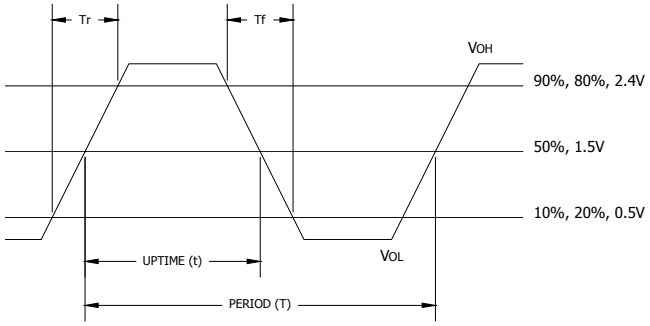
• • • www.ctscorp.com • • •

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	-	1.5	-	80	MHz
	Frequency Stability (See Note 1 and Ordering Information)	$\Delta f/f_O$	20 Years	-	-	32	± ppm
	Operating Temperature Commercial Industrial	T_A	-	 -20 -40	25	 70 85	°C
Electrical and Waveform Parameters	Supply Voltage CB3 CB3LV	V_{CC}	± 10 %	 4.5 3.0	 5.0 3.3	 5.5 3.6	V
	Supply Current CB3 CB3LV 	I_{CC}	 1.5 MHz to 20 MHz C_L=50pF 20.1 MHz to 80 MHz C_L=50pF 1.5 MHz to 20 MHz C_L=15pF 20.1 MHz to 80 MHz C_L=15pF	 - - - -	 10 30 7 20	 25 50 12 40	mA
	Output Load	C_L	1.5 MHz to 50 MHz 50.1 MHz to 80 MHz	- -	- -	50 30	pF
	Output Voltage Levels Logic '1' Level Logic '0' Level	V_{OH} V_{OL}	 CMOS Load 10 TTL LOAD CMOS TTL Load	 0.9*V_{CC} V_{CC}-0.6V -	 - -	 - 0.1*V_{CC} 0.4	V
	Output Current Logic '1' Level Logic '0' Level	 I_{OH} I_{OL}	 V_{OH} = 3.9V/2.2V V_{CC} = 4.5V/3.0V V_{OL} = 0.4V V_{CC} = 4.5V/3.0V	 - -	 - -	 -16/-8 +16/+8	mA
	Output Duty Cycle	SYM	@ 50% Level	45	-	55	%
	Rise and Fall Time CB3 CB3LV 	T_R, T_F	@ 10% - 90% Levels 1.5 MHz to 20 MHz C_L=50pF 20.1 MHz to 80 MHz C_L=50pF 1.5 MHz to 20 MHz C_L=15pF 20.1 MHz to 80 MHz C_L=15pF	 - - - -	 8 4 6 3	 10 8 8 4	ns
	Start Up Time	T_S	Application of V_{CC}	-	-	10	ms
	Enable Function (See Note 2) Enable Input Voltage Disable Input Voltage	 V_{IH} V_{IL}	 Pin 1 Logic '1', Output Enabled Pin 1 Logic '0', Output Disabled	 2.0 -	 - -	 - 0.8	V
	Enable Time CB3 CB3LV	T_{PLZ}	Pin 1 Logic '1'	 - -	 - -	 100 10	 ns ms
	Phase Jitter	tjms	Bandwidth 12 kHz - 20 MHz	-	-	1	ps RMS

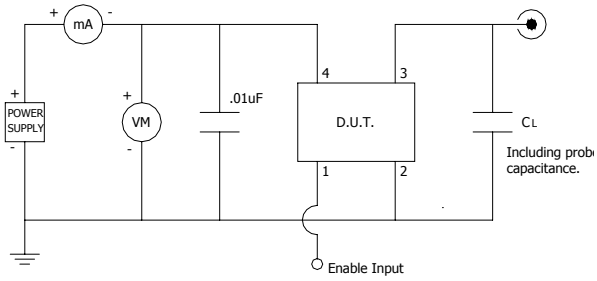
Notes:
1. Inclusive of initial tolerance at time of shipment, changes in supply voltage, load, temperature and 20 year aging at an average operating temperature of +40 °C.
2. Reference CTS Application Note 014-0002-0.

CMOS/TTL OUTPUT WAVEFORM



DUTY CYCLE = t/T x 100 (%)

TEST CIRCUIT, CMOS LOAD



ENABLE TRUTH TABLE

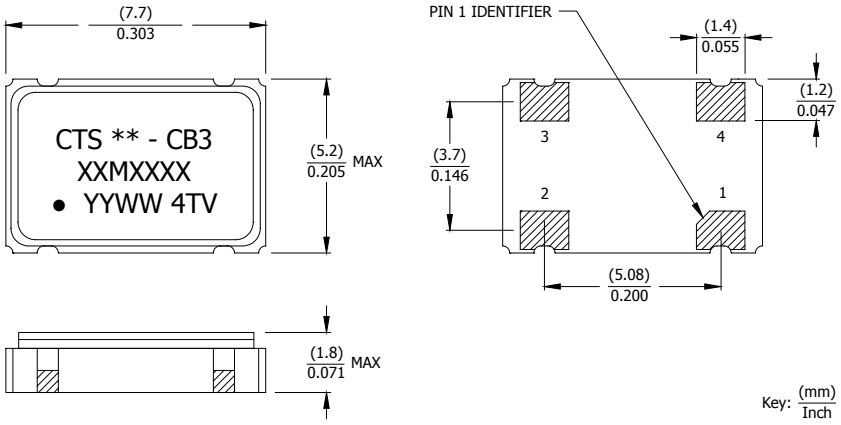
PIN 1	PIN 3
Logic '1'	Output
Open	Output
Logic '0'	High Imp.

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

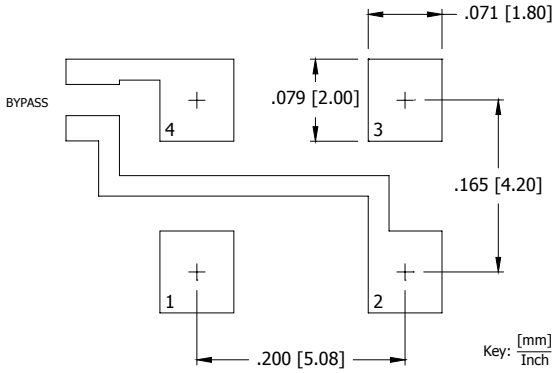


MARKING INFORMATION

1. ** - Manufacturing Site Code.
2. XXMXXXX - Frequency marked with 4 significant digits after the 'M'.
3. YYWW – Date code, YY – year, WW – week.
4. 4 – Stratum IV Stability.
5. T – Temperature code. (Reference Ordering Information.)
6. V – Voltage code. 3 = 3.3V, 5 = 5.0V.

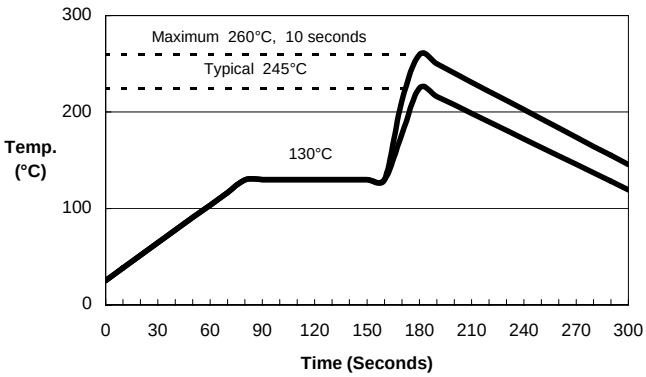
NOTES
1. Termination pads (e4), barrier-plating is nickel (Ni) with gold (Au) flash plate.
2. Reflow conditions per JEDEC J-STD-020.

SUGGESTED SOLDER PAD GEOMETRY

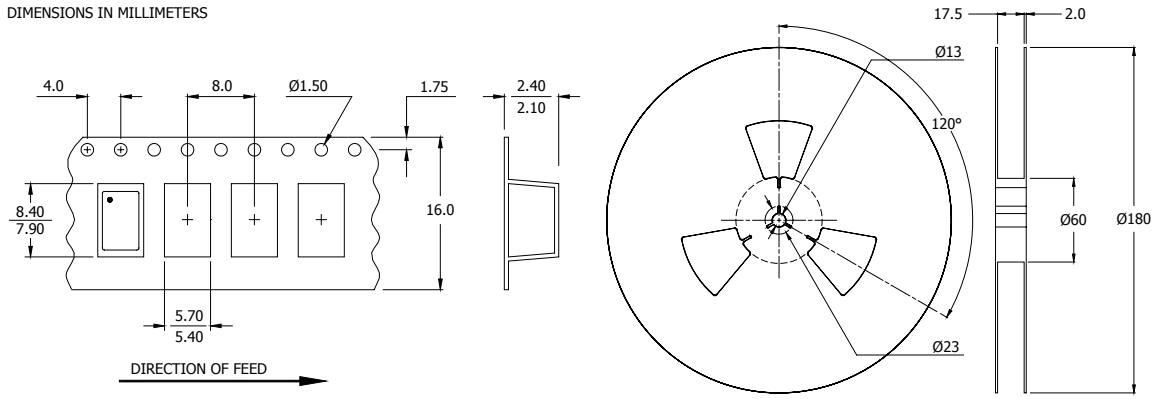


C_{BYPASS} should be ≥ 0.01 uF.

SUGGESTED REFLOW PROFILE



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.
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.