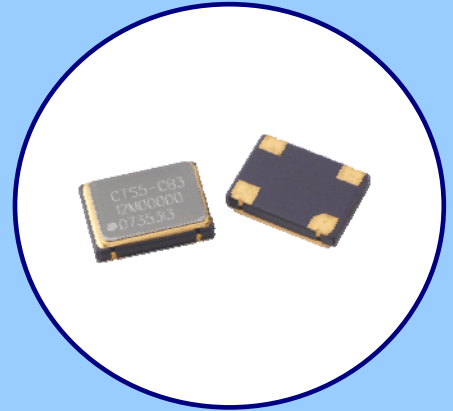


### FEATURES

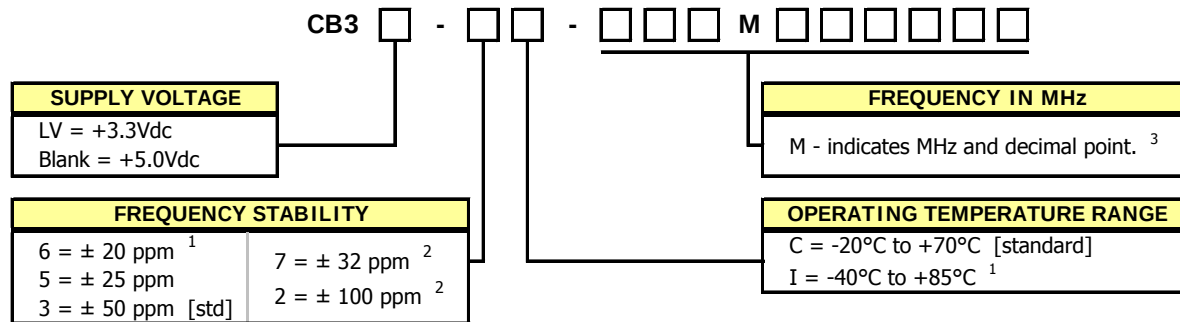
- Standard 7.0mm x 5.0mm 4-Pad Surface Mount Package
- HCMOS/TTL Compatible Output
- Fundamental and 3<sup>rd</sup> Overtone Crystal Designs
- Frequency Range 1 – 200 MHz
- Frequency Stability  $\pm 50$  ppm Standard,  $\pm 25$  ppm and  $\pm 20$  ppm Available
- Operating Voltages +5.0Vdc or +3.3Vdc
- Operating Temperature to -40°C to +85°C
- Output Enable Standard
- Tape & Reel Packaging
- **RoHS/Green Compliant (6/6)**



### APPLICATIONS

Applications for Model CB3 and CB3LV include digital video, networking equipment, wireless communications, broadband access, Ethernet/Gigabit Ethernet, microprocessors/DSP/FPGA, storage area networks, fiber channel, computers and peripherals, test and measurement, SONET/SDH/DWDM, base stations and Pico cells.

### ORDERING INFORMATION



1] 6I Stability/Temperature combination is not available.

2] These stabilities are not recommended for new designs.

3] Frequency is recorded with only leading significant digits before the 'M' and 4 - 6 significant digits after the 'M' (including zeros).

[Ex. 3.579545 MHz, code as 3M579545; 14.31818 MHz, code as 14M31818; 125 MHz, code as 125M0000]

4] CTS Distributors may add a -T or -1 at the end of the part number to indicate Tape and Reel packaging.

**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 1,000 pieces maximum per reel.



**ELECTRICAL CHARACTERISTICS**

| ELECTRICAL PARAMETERS | PARAMETER              | SYMBOL         | CONDITIONS                                                                    | MIN                           | TYP         | MAX                 | UNIT  |
|-----------------------|------------------------|----------------|-------------------------------------------------------------------------------|-------------------------------|-------------|---------------------|-------|
|                       | Maximum Supply Voltage | $V_{CC}$       | -                                                                             | -0.5                          | -           | +7.0                | V     |
|                       | Storage Temperature    | $T_{STG}$      | -                                                                             | -40                           | -           | +100                | °C    |
|                       | Frequency Range        |                |                                                                               |                               |             |                     |       |
|                       | CB3                    | $f_0$          | -                                                                             | 1.5                           | -           | 107                 | MHz   |
|                       | CB3LV                  |                | -                                                                             | 1.5                           | -           | 200                 |       |
|                       | Frequency Stability    | $\Delta f/f_0$ | See Note 1 and Ordering Information                                           | -                             | -           | 20,25,50 or 100     | ± ppm |
|                       | Aging                  | $\Delta f$     | First year                                                                    | -                             | 3           | 5                   | ± ppm |
|                       | Operating Temperature  |                |                                                                               |                               |             |                     |       |
|                       | Commercial             | $T_A$          | -                                                                             | -20                           | 25          | +70                 | °C    |
|                       | Industrial             |                |                                                                               | -40                           |             | +85                 |       |
|                       | Supply Voltage         |                |                                                                               |                               |             |                     |       |
|                       | CB3                    | $V_{CC}$       | ±10%                                                                          | 4.5                           | 5.0         | 5.5                 | V     |
|                       | CB3LV                  |                |                                                                               | 3.0                           | 3.3         | 3.6                 |       |
|                       | Supply Current         |                | Frequency Range                                                               |                               |             |                     |       |
|                       | CB3                    | $I_{CC}$       | Tested load condition noted for typical values.<br>1.5MHz to 20MHz $C_L=50pF$ | -                             | 10          | 25                  | mA    |
|                       |                        |                | 20.001MHz to 80MHz $C_L=50pF$                                                 | -                             | 30          | 50                  |       |
|                       |                        |                | 80.001MHz to 107MHz $C_L=15pF$                                                | -                             | 40          | 80                  |       |
|                       | CB3LV                  |                | 1.5MHz to 20MHz $C_L=15pF$                                                    | -                             | 7           | 12                  |       |
|                       |                        |                | 20.001MHz to 80MHz $C_L=15pF$                                                 | -                             | 20          | 40                  |       |
|                       |                        |                | 80.001MHz to 200MHz $C_L=15pF$                                                | -                             | 30          | 60                  |       |
|                       | Output Load            | $C_L$          | 1.5MHz to 50MHz<br>50.001MHz to 80MHz<br>80.001MHz to 200MHz                  | -<br>-<br>-                   | -<br>-<br>- | 50<br>30<br>15      | pF    |
|                       | Output Voltage Levels  |                |                                                                               |                               |             |                     |       |
|                       | Logic '1' Level        | $V_{OH}$       | CMOS Load<br>10 TTL LOAD                                                      | 90% $V_{CC}$<br>$V_{CC}-0.6V$ | -           | -                   | V     |
|                       | Logic '0' Level        | $V_{OL}$       | CMOS<br>TTL Load                                                              | -                             | -           | 10% $V_{CC}$<br>0.4 |       |
|                       | Output Current         |                |                                                                               |                               |             |                     |       |
|                       | Logic '1' Level        | $I_{OH}$       | $V_{OH} = 3.9V/2.2V$ $V_{CC} = 4.5V/3.0V$                                     | -                             | -           | -16/-8              | mA    |
|                       | Logic '0' Level        | $I_{OL}$       | $V_{OL} = 0.4V$ $V_{CC} = 4.5V/3.0V$                                          | -                             | -           | +16/+8              |       |
|                       | Output Duty Cycle      | SYM            | @ 50% Level                                                                   | 45                            | -           | 55                  | %     |
|                       | Rise and Fall Time     |                | @ 10% - 90% Levels                                                            |                               |             |                     |       |
|                       | CB3                    | $T_R, T_F$     | Tested load condition noted for typical values.<br>1.5MHz to 20MHz $C_L=50pF$ | -                             | 8           | 10                  | ns    |
|                       |                        |                | 20.001MHz to 80MHz $C_L=50pF$                                                 | -                             | 5           | 8                   |       |
|                       |                        |                | 80.001MHz to 200MHz $C_L=15pF$                                                | -                             | 2.5         | 5                   |       |
|                       | CB3LV                  |                | 1.5MHz to 20MHz $C_L=15pF$                                                    | -                             | 6           | 8                   |       |
|                       |                        |                | 20.001MHz to 80MHz $C_L=15pF$                                                 | -                             | 3           | 5                   |       |
|                       |                        |                | 80.001MHz to 200MHz $C_L=15pF$                                                | -                             | 1.5         | 3                   |       |
|                       | Start Up Time          | $T_S$          | Application of $V_{CC}$                                                       | -                             | -           | 10                  | ms    |
|                       | Enable Function        |                |                                                                               |                               |             |                     |       |
|                       | Enable Input Voltage   | $V_{IH}$       | Pin 1 Logic '1', Output Enabled                                               | 2.0                           | -           | -                   | V     |
|                       | Disable Input Voltage  | $V_{IL}$       | Pin 1 Logic '0', Output Disabled                                              | -                             | -           | 0.8                 |       |
|                       | Enable Time            | $T_{PLZ}$      | Pin 1 Logic '1'                                                               | -                             | -           | 200                 | ns    |
|                       | Standby Current        | $I_{ST}$       | Pin 1 Logic '0', Output Disabled                                              | -                             | -           | 10                  | µA    |
|                       | Period Jitter, Pk-Pk   | -              | -                                                                             | -                             | -           | 50                  | ps    |
|                       | Period Jitter, RMS     | -              | -                                                                             | -                             | -           | 5                   |       |
|                       | Phase Jitter, RMS      | -              | Bandwidth 12kHz - 20MHz                                                       | -                             | -           | 1                   |       |

Notes:

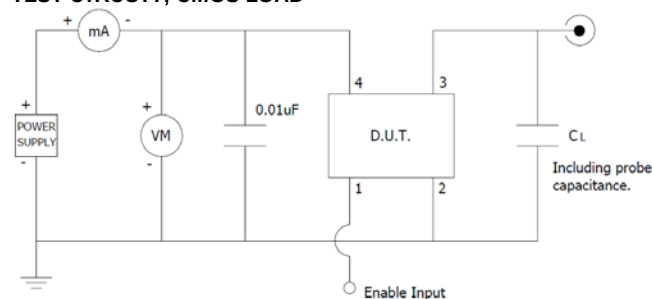
1. Inclusive of initial tolerance at time of shipment, changes in supply voltage, load, temperature and 1st year aging.

## ELECTRICAL CHARACTERISTICS

### LVC MOS OUTPUT WAVEFORM



### TEST CIRCUIT, CMOS LOAD



### ENABLE TRUTH TABLE

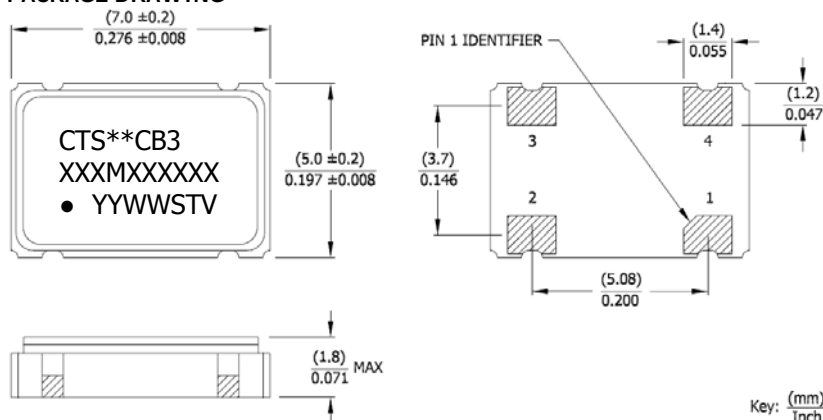
| PIN 1     | PIN 3     |
|-----------|-----------|
| Logic '1' | Output    |
| Open      | Output    |
| Logic '0' | High Imp. |

### D.U.T. PIN ASSIGNMENTS

| PIN | SYMBOL          | DESCRIPTION              |
|-----|-----------------|--------------------------|
| 1   | EOH             | Enable                   |
| 2   | GND             | Circuit & Package Ground |
| 3   | Output          | RF Output                |
| 4   | V <sub>CC</sub> | Supply Voltage           |

## MECHANICAL SPECIFICATIONS

### PACKAGE DRAWING



### MARKING INFORMATION

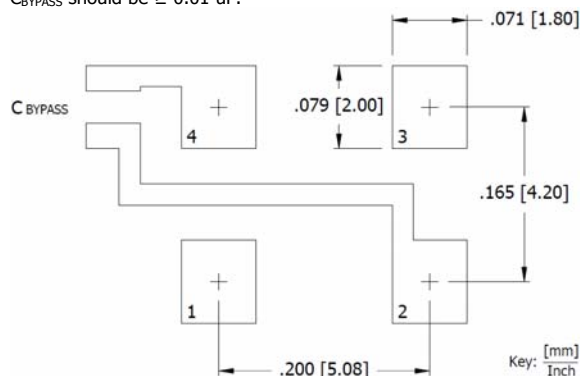
- \*\* – Manufacturing Site Code.  
[Note a dash may follow the site code and is acceptable.]
- XXMXXXXXX – Frequency is marked with only leading significant digits before the 'M' and 4 – 6 digits after the 'M' (including zeros).  
Ex. XMXXXXXX [3M579545]  
XXMXXXXXX [14M31818]  
XXMXXXXXX [125M0000]
- YYWW – Date code, YY – year, WW – week.
- ST – Frequency stability/temperature code.  
[Refer to Ordering Information.]
- V – Voltage code. 3 = 3.3V, 5 = 5.0V.

### NOTES

- Termination pads [e4]. Barrier-plating is nickel [Ni] with gold [Au] flash plate.
- Reflow conditions per JEDEC J-STD-020, 260°C maximum.
- Moisture Sensitivity Level 1 per JEDEC J-STD-020.

### SUGGESTED SOLDER PAD GEOMETRY

C<sub>BYPASS</sub> should be ≥ 0.01 uF.



# Mouser Electronics

Authorized Distributor

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## CTS:

[CB3-3C-49M152000](#) [CB3-3C-32M768000](#) [CB3LV-3C-4M000000](#) [CB3LV-3C-29M491200](#) [CB3-3C-44M736000](#)  
[CB3LV-3C-24M000000](#) [CB3-3C-33M333000](#) [CB3LV-3C-10M000000](#) [CB3LV-3C-16M384000](#) [CB3-3C-12M000000](#)  
[CB3LV-3C-20M480000](#) [CB3-3C-40M000000](#) [CB3-3C-14M318180](#) [CB3LV-3C-20M000000](#) [CB3LV-3C-1M843200](#)  
[CB3LV-3C-30M000000](#) [CB3-3C-3M686400](#) [CB3-3C-18M432000](#) [CB3LV-3C-60M000000](#) [CB3-3C-72M000000](#) [CB3-](#)  
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[66M666600](#) [CB3-3C-15M360000](#) [CB3LV-3C-32M768000](#) [CB3-3C-4M000000](#) [CB3LV-3C-14M318180](#) [CB3-3C-](#)  
[45M000000](#) [CB3-3C-20M000000](#) [CB3-3C-60M000000](#) [CB3-3C-10M000000](#) [CB3LV-3C-45M000000](#) [CB3-3C-](#)  
[20M480000](#) [CB3LV-3C-80M000000](#) [CB3LV-3C-15M360000](#) [CB3LV-3C-66M666600](#) [CB3-3C-32M000000](#) [CB3LV-](#)  
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[3C-24M704000](#) [CB3LV-3C-3M686400](#) [CB3LV-3C-12M352000](#) [CB3LV-3C-6M176000](#) [CB3LV-3I-20M0000](#) [CB3LV-3I-](#)  
[33M0000](#) [CB3LV-3I-24M5760](#) [CB3LV-3I-125M0000](#) [CB3LV-3I-66M0000](#) [CB3LV-3I-33M3333](#) [CB3LV-3I-27M0000](#)  
[CB3LV-3I-48M0000](#) [CB3LV-3I-100M0000](#) [CB3-3I-7M3728](#) [CB3-3I-1M8432](#) [CB3LV-3I-51M8400](#) [CB3LV-3I-3M6864](#)  
[CB3-3I-24M7040](#) [CB3-3I-16M0000](#) [CB3LV-3I-1M8432](#) [CB3LV-3I-24M7040](#) [CB3LV-3I-49M1520](#) [CB3-3I-18M4320](#)  
[CB3LV-3I-1M5440](#) [CB3LV-3I-20M0000](#) [CB3LV-3I-7M3728](#) [CB3-3I-32M7680](#) [CB3-3I-32M0000](#) [CB3LV-3I-14M31818](#)  
[CB3-3I-72M0000](#) [CB3LV-3I-6M1760](#) [CB3LV-3I-80M0000](#) [CB3-3I-8M0000](#) [CB3LV-3I-29M4912](#) [CB3LV-3I-60M0000](#)  
[CB3-3I-6M1760](#) [CB3-3I-15M3600](#) [CB3LV-3I-45M0000](#) [CB3LV-3I-8M0000](#) [CB3-3I-12M3520](#) [CB3-3I-12M2880](#)  
[CB3LV-3I-15M3600](#) [CB3LV-3I-66M6666](#) [CB3LV-3I-19M4400](#) [CB3LV-3I-64M0000](#) [CB3LV-3I-24M0000](#) [CB3LV-3I-](#)  
[16M3840](#) [CB3LV-3I-40M0000](#) [CB3LV-3I-33M3330](#) [CB3-3I-29M4912](#) [CB3-3I-25M0000](#) [CB3-3I-49M1520](#) [CB3-3I-](#)  
[10M0000](#) [CB3LV-3I-16M0000](#) [CB3-3I-24M0000](#)