

### FEATURES

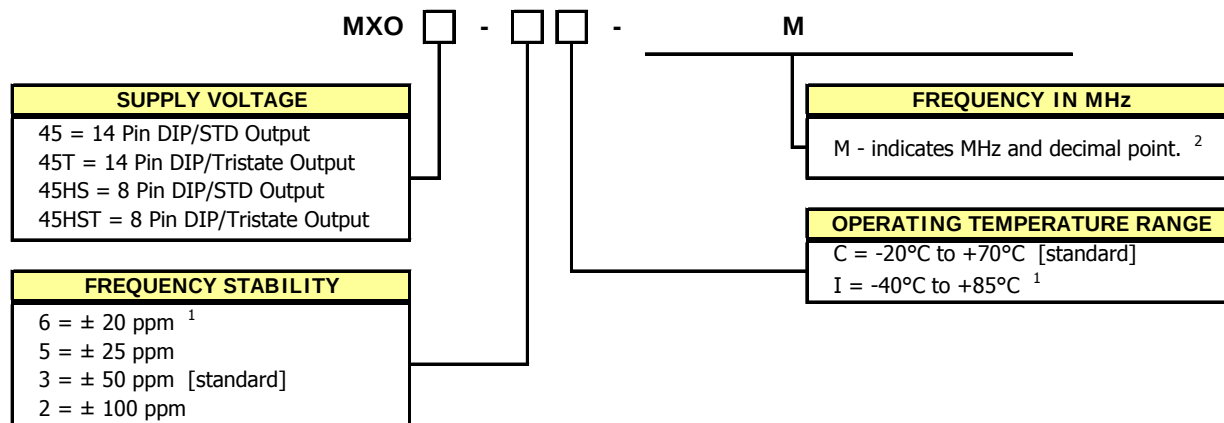
- Standard 14 Pin or 8 Pin DIP Packages
- HCMOS/TTL Compatible Output
- Fundamental and 3<sup>rd</sup> Overtone Crystal Designs
- Frequency Range 1 – 200 MHz
- Frequency Stability  $\pm 50$  ppm Standard
- Operating Voltage +5.0Vdc
- Operating Temperature to -40°C to +85°C
- Output Enable Standard
- Plastic Tray Packaging
- **RoHS/Green Compliant (6/6)**



### APPLICATIONS

Applications for MXO45 and MXO45HS include microprocessors/DSP/FPGA, networking equipment, broadband access, storage area networks, computers and peripherals, test and measurement, Ethernet/Gigabit Ethernet.

### ORDERING INFORMATION



1] 6I Stability/Temperature combination is not available. Check availability for 6C combination.

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

[Ex. XMXXXXXX (3M579545), XXMXXXXX (14M31818), XXXMXXXX (125M0000)]

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

### PACKAGING INFORMATION [reference]

Product is packaged in plastic trays. Typical packaging format is as follows:

- 50 pcs./Plastic Tray.  
Tray size is approximately 180 x 136 x 18mm [LxWxH].
- 2 Trays per Anti-Static Bag [100 pcs.] or 10 Trays per Anti-Static Bag [500 pcs.].  
Bag height for 10 Trays is approximately 175mm.
- 1 anti-static bag per cardboard carton.
- Master-pack multiple cardboard cartons in a larger carton.  
8 cardboard cartons [10 trays per carton] is approximately 460 x 380 x 400mm [LxWxH].

**ELECTRICAL CHARACTERISTICS**

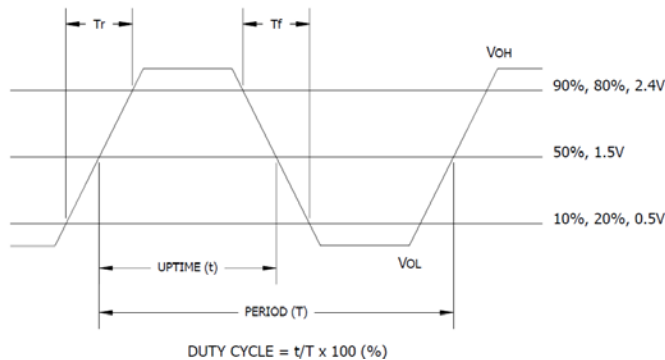
| ELECTRICAL PARAMETERS | PARAMETER              | SYMBOL         | CONDITIONS                                                         | MIN          | TYP | MAX             | UNIT  |
|-----------------------|------------------------|----------------|--------------------------------------------------------------------|--------------|-----|-----------------|-------|
|                       | Maximum Supply Voltage | $V_{CC}$       | -                                                                  | -0.5         | -   | +7.0            | V     |
|                       | Storage Temperature    | $T_{STG}$      | -                                                                  | -40          | -   | +100            | °C    |
|                       | Frequency Range        | $f_0$          | -                                                                  | 1.0          | -   | 200             | MHz   |
|                       | 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  | $T_A$          | -                                                                  | -20          | -   | +70             | °C    |
|                       | Commercial             |                |                                                                    | -40          | +25 | +85             |       |
|                       | Industrial             |                |                                                                    |              |     |                 |       |
|                       | Supply Voltage         | $V_{CC}$       | ±10%                                                               | 4.5          | 5.0 | 5.5             | V     |
|                       | Supply Current         | $I_{CC}$       | Frequency Range<br>Tested load condition noted for typical values. |              |     |                 |       |
|                       |                        |                | 1.0MHz to 20MHz $C_L=50pF$                                         | -            | 10  | 26              | mA    |
|                       |                        |                | 20.001MHz to 40MHz $C_L=30pF$                                      | -            | 20  | 40              |       |
|                       |                        |                | 40.001MHz to 80MHz $C_L=30pF$                                      | -            | 30  | 60              |       |
|                       |                        |                | 80.001MHz to 125MHz $C_L=15pF$                                     | -            | 40  | 70              |       |
|                       |                        |                | 125.001MHz to 200MHz $C_L=15pF$                                    | -            | 55  | 80              |       |
|                       | Output Load            |                |                                                                    |              |     |                 |       |
|                       | CMOS                   | $C_L$          | 1.0MHz to 50MHz                                                    | -            | -   | 50              | pF    |
|                       |                        |                | 50.001MHz to 80MHz                                                 | -            | -   | 30              |       |
|                       |                        |                | 80.001MHz to 200MHz                                                | -            | -   | 15              |       |
|                       | TTL                    |                | 1.0MHz to 200MHz                                                   | -            | -   | 10              | TTL   |
|                       | Output Voltage Levels  |                |                                                                    |              |     |                 |       |
|                       | Logic '1' Level        | $V_{OH}$       | CMOS Load                                                          | 90% $V_{CC}$ | -   | -               | V     |
|                       | Logic '0' Level        | $V_{OL}$       | 10 TTL LOAD                                                        | 2.4          | -   | -               |       |
|                       |                        |                | CMOS                                                               | -            | -   | 10% $V_{CC}$    |       |
|                       |                        |                | TTL Load                                                           | -            | -   | 0.4             |       |
|                       | Output Current         |                |                                                                    |              |     |                 |       |
|                       | Logic '1' Level        | $I_{OH}$       | $V_{OH} = 3.9V$ $V_{CC} = 4.5V$                                    | -            | -   | -16             | mA    |
|                       | Logic '0' Level        | $I_{OL}$       | $V_{OL} = 0.4V$ $V_{CC} = 4.5V$                                    | -            | -   | 16              |       |
|                       | Output Duty Cycle      | SYM            | @ 50% Level                                                        | 45           | -   | 55              | %     |
|                       | Rise and Fall Time     |                | @ 10% - 90% Levels                                                 |              |     |                 |       |
|                       |                        | $T_{R}, T_F$   | Tested load condition noted for typical values.                    |              |     |                 |       |
|                       |                        |                | 1.0MHz to 20MHz $C_L=50pF$                                         | -            | 8   | 10              | ns    |
|                       |                        |                | 20.001MHz to 80MHz $C_L=30pF$                                      | -            | 5   | 8               |       |
|                       |                        |                | 80.001MHz to 125MHz $C_L=15pF$                                     | -            | 2.5 | 5               |       |
|                       |                        |                | 125.001MHz to 200MHz $C_L=15pF$                                    | -            | -   | 2               |       |
|                       | 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:

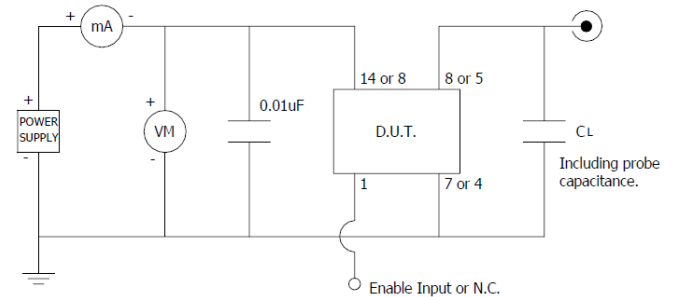
- Inclusive of initial tolerance at time of shipment, changes in supply voltage, load, temperature and 1st year aging.

## ELECTRICAL CHARACTERISTICS

### LVC MOS OUTPUT WAVEFORM



### TEST CIRCUIT, CMOS LOAD



### ENABLE TRUTH TABLE

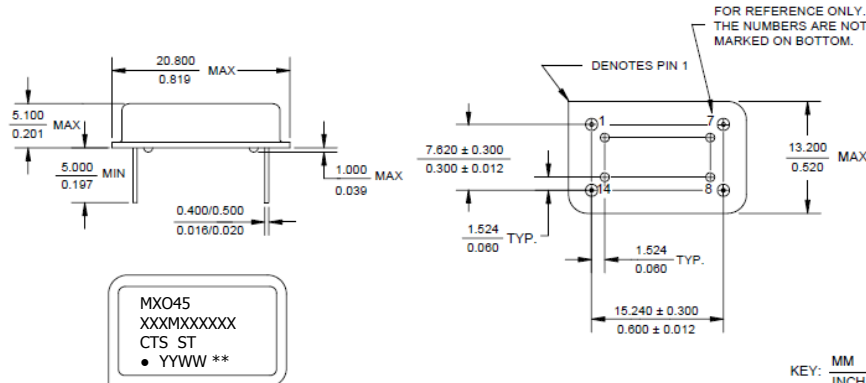
| PIN 1     | PIN 5 or PIN 8 |
|-----------|----------------|
| Logic '1' | Output         |
| Open      | Output         |
| Logic '0' | High Imp.      |

### D.U.T. PIN ASSIGNMENTS

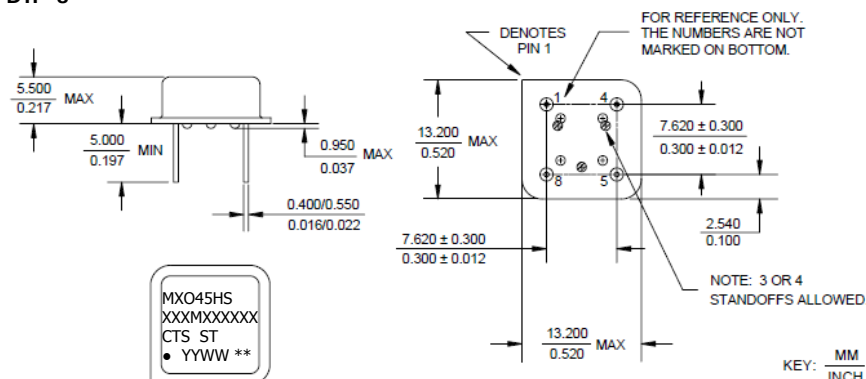
| PIN     | SYMBOL          | DESCRIPTION                |
|---------|-----------------|----------------------------|
| 1       | EOH             | Enable Input or No Connect |
| 7 or 4  | GND             | Circuit & Package Ground   |
| 8 or 5  | Output          | RF Output                  |
| 14 or 8 | V <sub>CC</sub> | Supply Voltage             |

## MECHANICAL SPECIFICATIONS

### PACKAGE DRAWING DIP-14



### DIP-8



### MARKING INFORMATION

- Model Name:  
DIP-14 – MX045 or MX045T.  
DIP-8 – MX045HS or MX045HST.
- XXXXMXXXXX – Frequency is marked with only leading significant digits before the 'M' and 4 – 6 digits after the 'M' (including zeros).  
Ex. XMXXXXXX [3M579545]  
XXMXXXXX [14M31818]  
XXXMXXXXX [125M0000]
- ST – Frequency stability/temperature code.  
[Refer to Ordering Information.]
- YYWW – Date code, YY – year, WW – week.
- \*\* – Manufacturing Site Code.

### NOTES

- Lead finish [e1], SnAgCu.
- Reflow conditions per JEDEC J-STD-020, 260°C maximum.
- Moisture Sensitivity Level 1, per JEDEC J-STD-020.

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## CTS:

[MXO45HST-3C-16M0000](#) [MXO45HS-3C-25M1750](#) [MXO45T-3C-10M0000](#) [MXO45T-3C-66M66666](#) [MXO45HS-3C-10M0000](#) [MXO45HS-3C-16M0000](#) [MXO45-3C-32M0000](#) [MXO45T-3C-64M0000](#) [MXO45-3C-5M0000](#) [MXO45T-3C-20M0000](#) [MXO45HST-3C-25M0000](#) [MXO45HS-3C-8M0000](#) [MXO45-3C-66M66666](#) [MXO45HS-3C-2M4576](#) [MXO45HS-3C-19M6608](#) [MXO45T-3C-7M3728](#) [MXO45-3C-80M0000](#) [MXO45HST-3C-4M0000](#) [MXO45T-3C-1M0000](#) [MXO45T-3C-80M0000](#) [MXO45HS-3C-6M0000](#) [MXO45-3C-14M31818](#) [MXO45-3C-64M0000](#) [MXO45HST-3C-28M3220](#) [MXO45HST-3C-20M0000](#) [MXO45HST-3C-7M3728](#) [MXO45T-3C-25M1750](#) [MXO45HST-3C-5M0688](#) [MXO45HST-3C-80M0000](#) [MXO45HST-3C-10M0000](#) [MXO45-3C-12M0000](#) [MXO45HS-3C-80M0000](#) [MXO45T-3C-4M0000](#) [MXO45HS-3C-40M0000](#) [MXO45T-3C-1M8432](#) [MXO45-3C-6M1440](#) [MXO45HS-3C-66M66666](#) [MXO45T-3C-6M1440](#) [MXO45-3C-3M6864](#) [MXO45HST-3C-1M0000](#) [MXO45HST-3C-64M0000](#) [MXO45T-3C-40M0000](#) [MXO45-3C-16M0000](#) [MXO45HST-3C-6M1440](#) [MXO45HS-3C-20M0000](#) [MXO45HST-3C-2M4576](#) [MXO45T-3C-28M3220](#) [MXO45HST-3C-5M0000](#) [MXO45T-3C-12M0000](#) [MXO45HST-3C-24M0000](#) [MXO45T-3C-25M0000](#) [MXO45HST-3C-14M31818](#) [MXO45HST-3C-2M0000](#) [MXO45-3C-7M3728](#) [MXO45HST-3C-25M1750](#) [MXO45HS-3C-50M0000](#) [MXO45HST-3C-12M0000](#) [MXO45T-3C-5M0688](#) [MXO45HS-3C-7M3728](#) [MXO45-3C-19M6608](#) [MXO45T-3C-5M0000](#) [MXO45-3C-40M0000](#) [MXO45-3C-24M0000](#) [MXO45T-3C-32M0000](#) [MXO45-3C-4M9152](#) [MXO45T-3C-8M0000](#) [MXO45HST-3C-40M0000](#) [MXO45-3C-25M1750](#) [MXO45HS-3C-28M3220](#) [MXO45-3C-50M0000](#) [MXO45-3C-18M4320](#) [MXO45HST-3C-66M66666](#) [MXO45T-3C-14M31818](#) [MXO45HS-3C-4M0000](#) [MXO45-3C-20M0000](#) [MXO45HS-3C-12M0000](#) [MXO45HS-3C-6M1440](#) [MXO45HS-3C-1M8432](#) [MXO45T-3C-2M0000](#) [MXO45-3C-2M0000](#) [MXO45-2C-18M4320](#) [MXO45-2C-19M6608](#) [MXO45-2C-25M0000](#) [MXO45-2C-25M1750](#) [MXO45-2C-50M0000](#) [MXO45-2C-66M66666](#) [MXO45HS-2C-12M0000](#) [MXO45HS-2C-18M4320](#) [MXO45HS-2C-19M6608](#) [MXO45HS-2C-25M1750](#) [MXO45HS-2C-28M3220](#) [MXO45HS-2C-2M0000](#) [MXO45HS-2C-2M4576](#) [MXO45HS-2C-50M0000](#) [MXO45HS-2C-6M1440](#) [MXO45HST-2C-1M8432](#) [MXO45HST-2C-2M4576](#) [MXO45HST-2C-3M6864](#) [MXO45HST-2C-50M0000](#) [MXO45HST-2C-5M0688](#)