



METAL DIP CLOCK OSCILLATOR

FEATURES

- Standard 14 Pin or 8 Pin DIP Footprint
- HCMOS/TTL Compatible
- **Fundamental and 3RD Overtone Crystals**
- Frequency Range 1.0 – 105.561 MHz
- Frequency Stability, ± 50 ppm Standard (± 25 ppm and ± 20 ppm available)
- +5.0Vdc Operation
- Operating Temperature to -40°C to $+85^{\circ}\text{C}$
- Output Enable Option
- **RoHS/Green Compliant (6/6)**

DESCRIPTION

The MXO45/MXO45HS is a DIP packaged Clock oscillator offering reliable performance at an economical cost. The enhanced stability means it is the perfect choice for today's communications applications that require tight frequency control.



ORDERING INFORMATION



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

Example Part Number: MXO45-3C-32M7680 or MXO45HS-3C-32M7680

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 | - | 1.0 | - | 105.561 | MHz | |
| | Frequency Stability (See Note 1 and Ordering Information) | $\Delta f/f_o$ | - | - | - | 20,25,50 or 100 | ± ppm | |
| | Operating Temperature Commercial Industrial | T_A | - | -20 -40 | 25 | 70 85 | °C | |
| Electrical and Waveform Parameters | Supply Voltage | V_{CC} | ± 10 % | 4.5 | 5.0 | 5.5 | V | |
| | Supply Current | I_{CC} | 1.0 MHz to 20 MHz $C_L=50pF$ | - | 10 | 25 | mA | |
| | | | 20.1 MHz to 80 MHz $C_L=30pF$ | - | 30 | 50 | | |
| | | | 80.1 MHz to 105.561 MHz $C_L=15pF$ | - | 40 | 100 | | |
| | Output Load CMOS | C_L | 1.0 MHz to 50 MHz | - | - | 50 | pF | |
| | | | 50.1 MHz to 80 MHz | - | - | 30 | | |
| | TTL | | 80.1 MHz to 105.561 MHz | - | - | 15 | TTL | |
| | | | 1.0 MHz to 105.561 MHz | - | - | 10 | | |
| | Output Voltage Levels Logic '1' Level | V_{OH} | CMOS Load | 0.9* V_{CC} $V_{CC}-0.6V$ | - | - | - | V |
| | | | 10 TTL LOAD | | - | - | - | |
| | Logic '0' Level | V_{OL} | CMOS | - | - | - | 0.1* V_{CC} | V |
| | | | 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} | $V_{OL} = 0.4V$ $V_{CC} = 4.5V$ | - | | - |
| | Output Duty Cycle | SYM | @ 50% Level | 45 | - | 55 | % | |
| Rise and Fall Time | T_{R} T_{F} | @ 10% - 90% Levels | - | - | - | ns | | |
| | | 1.0 MHz to 50 MHz $C_L=50pF$ | - | 8 | 10 | | | |
| | | 50.1 MHz to 80 MHz $C_L=30pF$ | - | 4 | 8 | | | |
| | | 80.1 MHz to 105.561 MHz $C_L=15pF$ | - | 2.5 | 5 | | | |
| Start Up Time | T_S | Application of V_{CC} | - | - | 10 | ms | | |
| Enable Function (See Note 2) | | | | | | | | |
| 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 | V | | |
| Enable Time | T_{PLZ} | Pin 1 Logic '1' | - | - | 100 | ns | | |
| Period Jitter, Pk-Pk | - | - | - | - | 50 | ps | | |
| Period Jitter, RMS | - | - | - | - | 5 | | | |
| Phase Jitter, RMS | - | Bandwidth 12 kHz - 20 MHz | - | - | 1 | | | |

Notes:

- Inclusive of initial tolerance at time of shipment, changes in supply voltage, load, temperature and first year aging.
- Reference CTS Application Note 014-0002-0.

CMOS/TTL OUTPUT WAVEFORM



$$\text{DUTY CYCLE} = t/T \times 100 (\%)$$

ENABLE TRUTH TABLE

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

TEST CIRCUIT, CMOS LOAD

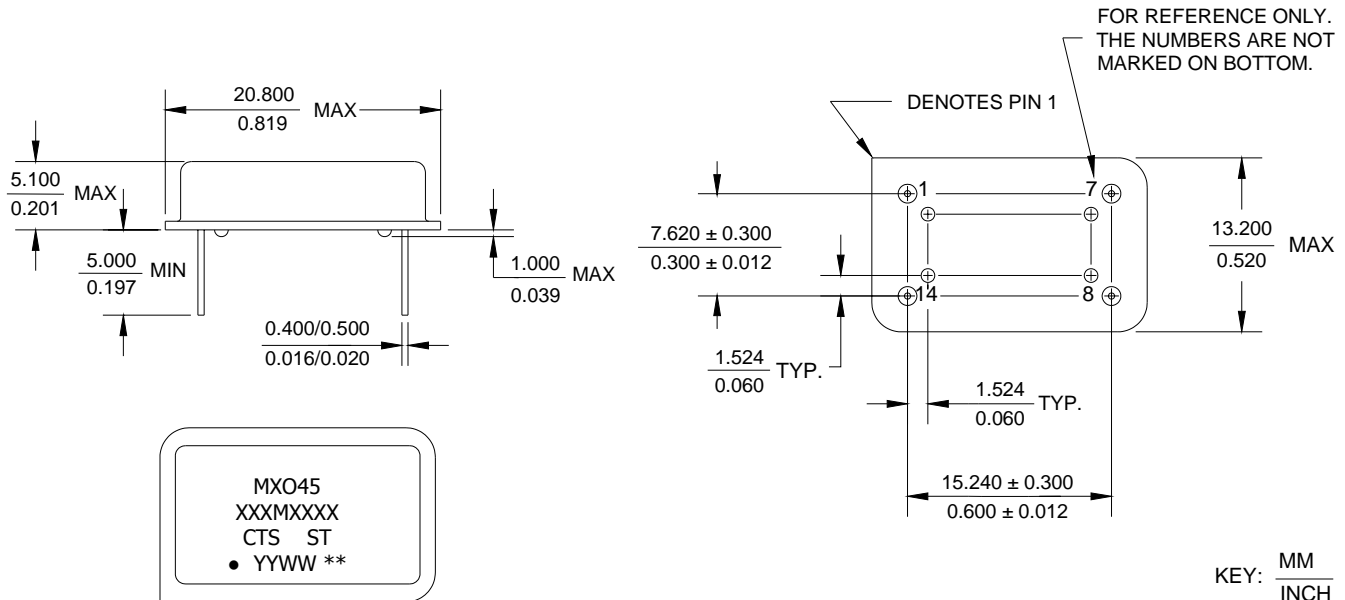


D.U.T. PIN ASSIGNMENTS

| 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 _{CC} | Supply Voltage |

MECHANICAL SPECIFICATIONS

PACKAGE DRAWING DIP-14



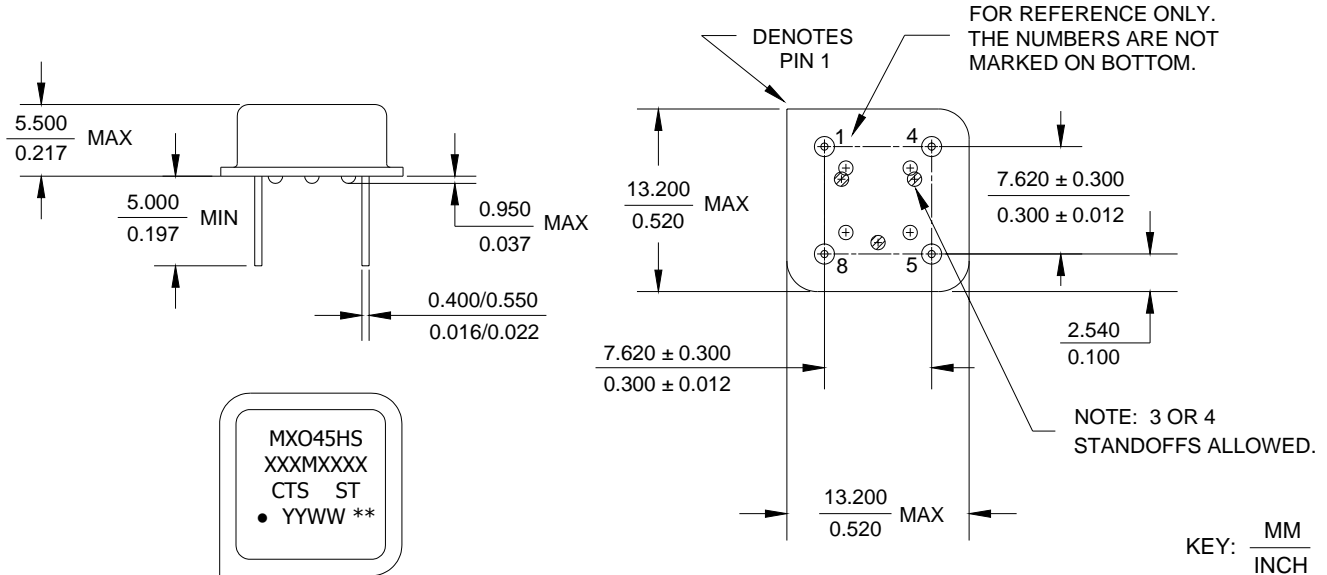
MARKING INFORMATION

1. Model Name: MXO45 or MXO45T.
2. XXXMXXXX - Frequency marked with 4 significant digits after the 'M'.
3. ST - Frequency stability/temperature code. (Reference Ordering Information.)
4. YYWW - Date code, YY - year, WW - week.
5. ** - Manufacturing Site Code.

NOTES

1. Lead finish (e1), SnAgCu.
2. Reflow conditions per JEDEC J-STD-020.

PACKAGE DRAWING
DIP-8



MARKING INFORMATION

1. Model Name: MXO45HS or MXO45HST.
2. XXXMXXXX - Frequency marked with 4 significant digits after the 'M'.
3. ST - Frequency stability/temperature code. (Reference Ordering Information.)
4. YYWW - Date code, YY - year, WW - week.
5. ** - Manufacturing Site Code.

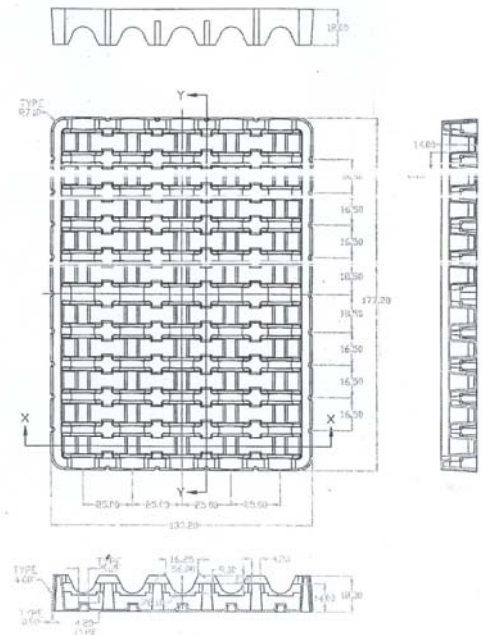
NOTES

1. Lead finish (e1), SnAgCu.
2. Reflow conditions per JEDEC J-STD-020.

PACKAGING

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

- 50 pcs./Plastic Tray.
Tray size is approximately 180x136x18mm (LxWxH).
- 2 Trays/Anti-Static Bag (100 pcs.)
or
10 Trays/Anti-Static Bag (500 pcs.).
Bag height for 10 Trays is approximately 175mm.
- 1 Anti-Static Bag/Cardboard Carton.
- Master-pack multiple Cardboard Cartons in a larger carton.
8 Cardboard Cartons (10 trays per carton) is approximately 460x380x400mm (LxWxH).



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 2×10^{-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.