



## METAL DIP CLOCK OSCILLATOR

### FEATURES

- Standard 14 Pin or 8 Pin DIP Footprint
- HCMOS/TTL Compatible
- **Fundamental and 3<sup>RD</sup> Overtone Crystals**
- Frequency Range 1.0 – 105.561 MHz
- Frequency Stability,  $\pm 50$  ppm Standard ( $\pm 25$  ppm and  $\pm 20$  ppm available)
- +5.0Vdc Operation
- Operating Temperature to  $-40^{\circ}\text{C}$  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<br>(See Note 1 and Ordering Information) | $\Delta f/f_o$                     | -                                  | -                              | -                               | 20,25,50<br>or 100 | ± ppm         |   |
|                                    | Operating Temperature<br>Commercial<br>Industrial            | $T_A$                              | -                                  | -20<br>-40                     | 25                              | 70<br>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<br>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<br>Logic '1' Level                     | $V_{OH}$                           | CMOS Load                          | 0.9* $V_{CC}$<br>$V_{CC}-0.6V$ | -                               | -                  | -             | V |
|                                    |                                                              |                                    | 10 TTL LOAD                        |                                | -                               | -                  | -             |   |
|                                    | Logic '0' Level                                              | $V_{OL}$                           | CMOS                               | -                              | -                               | -                  | 0.1* $V_{CC}$ | V |
|                                    |                                                              |                                    | TTL Load                           |                                | -                               | -                  | 0.4           |   |
|                                    | Output Current<br>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:**

1. Inclusive of initial tolerance at time of shipment, changes in supply voltage, load, temperature and first year aging.
2. 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 <sub>CC</sub> | Supply Voltage             |

## MECHANICAL SPECIFICATIONS

### PACKAGE DRAWING DIP-14



### MARKING INFORMATION

1. Model Name: MXO45 or MXO45T.
2. XXMXXXX - 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.



**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 $2 \times 10^{-8}$ 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 $\pm 5$ 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.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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