



## 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 (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:**

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



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

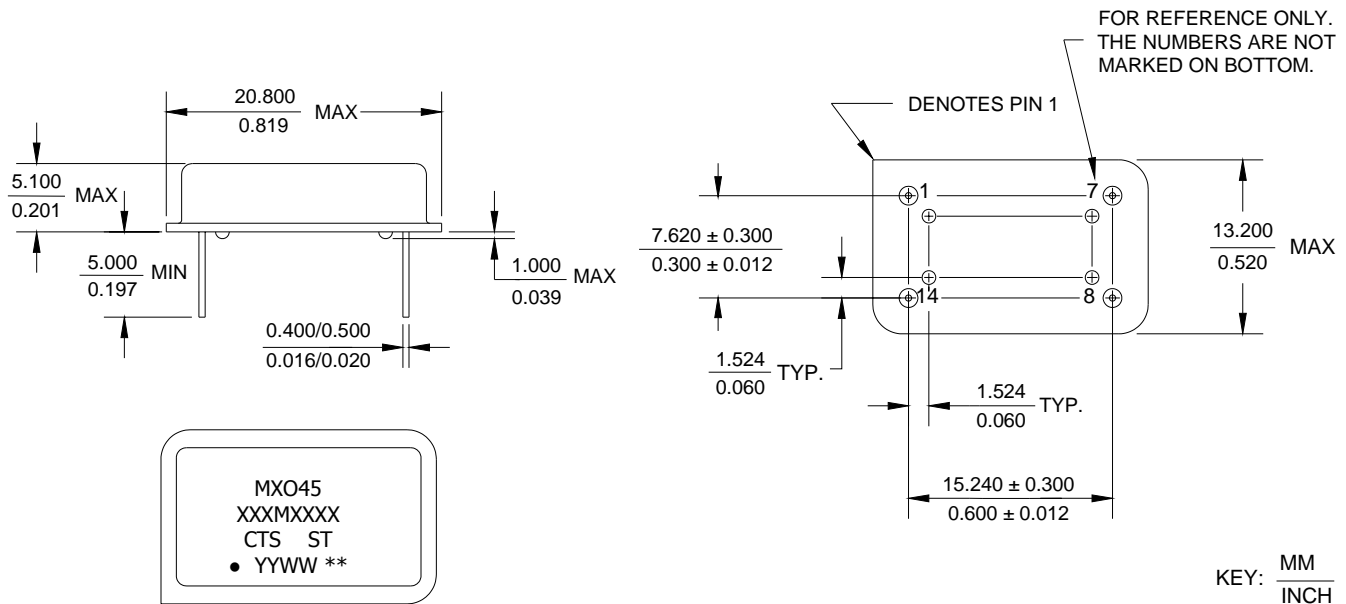


### D.U.T. PIN ASSIGNMENTS

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. 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.

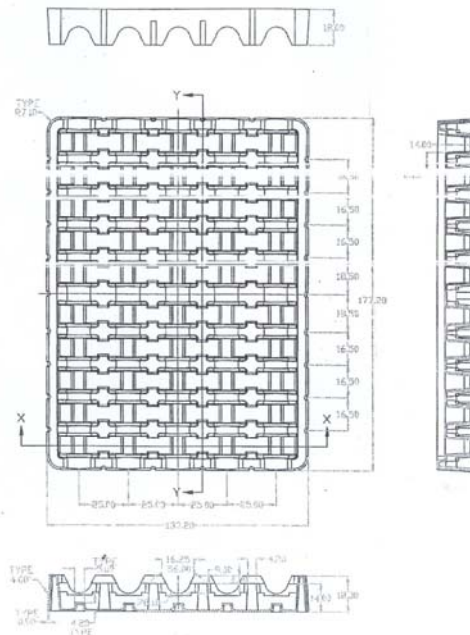
### NOTES

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 $2 \times 10^{-8}$ 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.

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