



# MXO45 & MXO45HS

## HCMOS/TTL Clock Oscillators

### Features

- Standard 14-Pin or 8-Pin Metal DIP Packages
- Fundamental and 3<sup>rd</sup> Overtone Crystal Designs
- Low Phase Jitter Performance
- Frequency Range 1 – 200MHz
- +5.0V Operation
- Output Enable Option Available
- Three Approved Packing Methods.



Part Dimensions:  
 20.8 × 13.2 × 5.1mm • 3.774537g  
 13.2 × 13.2 × 5.1mm • 2.206637g

### Applications

- Computers & Peripherals
- Storage Area Networking
- Broadband Access
- Microcontrollers/FPGAs
- Networking Equipment
- Ethernet/Gigabit Ethernet
- Fiber Channel
- Test and Measurement

### Description

CTS MXO45 and MXO45HS are legacy thru-hole clock oscillators that offer a low cost design supporting older HCMOS/TTL applications. MXO45/MXO45HS is not recommended for new design activity, but is available to support existing applications developed for the full and half-size metal DIP packages.

### Ordering Information

Model	Package Type/ Output Enable	Frequency Stability	Temperature Range	Frequency Code [MHz]
MXO	45	- 3	C	- XXXMXXXXXX

Code	Package/Enable
45	14-Pin DIP/STD Output [no enable]
45T	14-Pin DIP/Output Enable
45HS	8-Pin DIP/STD Output [no enable]
45HST	8-Pin DIP/Output Enable

Code	Temp. Range
C	-20°C to +70°C
I	-40°C to +85°C

Code	Stability
6	±20ppm <sup>1</sup>
5	±25ppm
3	±50ppm
2	±100ppm

Code	Frequency
Product Frequency Code <sup>2</sup>	

Notes:

- 1] Consult factory for availability of 6C Stability/Temperature combination. The 6I combination is not available.
- 2] Frequency is recorded with only 1, 2 or 3 leading significant digits before and 4 - 6 significant digits [including zeroes] after the "M".  
 [Ex. 3M579545 (3.579545MHz), 14M31818 (14.31818MHz), 125M0000 (125MHz)]

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

## Electrical Specifications

### Operating Conditions

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Maximum Supply Voltage	$V_{CC}$	-	-0.5	-	7.0	V
Supply Voltage	$V_{CC}$	$\pm 10\%$	4.5	5.0	5.5	V
Supply Current		Freq Range [tested load noted for TYP values.]				
		1.0MHz to 20MHz [ $C_L = 50\text{pF}$ ]	-	10	26	
		20.001MHz to 40MHz [ $C_L = 30\text{pF}$ ]	-	20	40	
	$I_{CC}$	40.001MHz to 80MHz [ $C_L = 30\text{pF}$ ]	-	30	60	mA
		80.001MHz to 125MHz [ $C_L = 15\text{pF}$ ]	-	40	70	
		125.001MHz to 200MHz [ $C_L = 15\text{pF}$ ]	-	55	80	
Operating Temperature	$T_A$	-	-20 -40	+25	+70 +85	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-	-40	-	+100	$^{\circ}\text{C}$

### Frequency Stability

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Frequency Range	$f_O$	-		1 - 200		MHz
Frequency Stability [Note 1]	$\Delta f/f_O$	-		20, 25, 50 or 100		$\pm\text{ppm}$
Aging	$\Delta f/f_{25}$	First Year @ +25 $^{\circ}\text{C}$ , nominal $V_{CC}$	-5	$\pm 3$	5	ppm

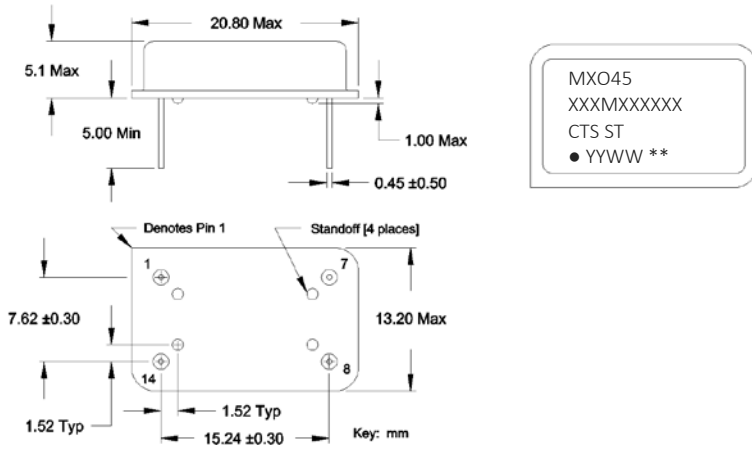
1.] Inclusive of initial tolerance at time of shipment, changes in supply voltage, load, temperature and 1st year aging.

### Output Parameters

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Output Type	-	-		HCMOS		-
Output Load		1.0MHz to 50MHz [CMOS Load]	-	15	50	
	$C_L$	50.001MHz to 80MHz [CMOS Load]	-	15	30	pF
		80.001MHz to 200MHz [CMOS Load]	-	15	15	
		1.0MHz to 200MHz [TTL Load]	-	-	10	TTL
Output Voltage Levels	$V_{OH}$	CMOS Load	$0.9V_{CC}$	-	-	
		10TTL Load	2.4	-	-	V
	$V_{OL}$	CMOS Load	-	-	$0.1V_{CC}$	
		10TTL Load	-	-	0.4	
Output Current Levels	$I_{OH}$	$V_{OH} = 3.9\text{V}$ , $V_{CC} = 4.5\text{V}$	-	-	-16	mA
	$I_{OL}$	$V_{OL} = 0.4\text{V}$ , $V_{CC} = 4.5\text{V}$	-	-	16	
Output Duty Cycle	SYM	@ 50% Level	45	-	55	%
Rise and Fall Time		@ 10%/90% Levels [tested load noted for TYP values.]				
		1.0MHz to 20MHz [ $C_L = 50\text{pF}$ ]	-	8	10	
	$T_R, T_F$	20.001MHz to 80MHz [ $C_L = 30\text{pF}$ ]	-	5	8	ns
		80.001MHz to 125MHz [ $C_L = 15\text{pF}$ ]	-	2.5	5	
		125.001MHz to 200MHz [ $C_L = 15\text{pF}$ ]	-	-	2	
Start Up Time	$T_S$	Application of $V_{CC}$ , $C_L = 15\text{pF}$	-	5	10	ms

### Mechanical Specifications

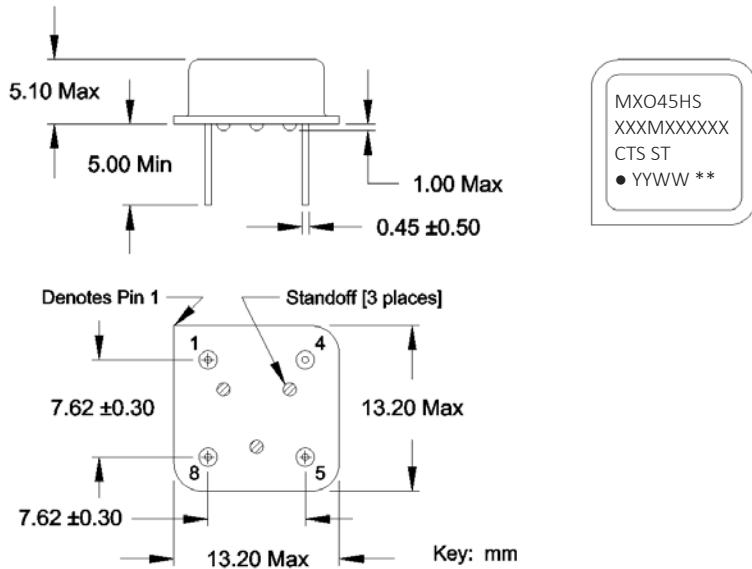
Package Drawing – DIP-14



Marking Information

1. Model Name:  
DIP-14 – MXO45 or MXO45T  
DIP-8 – MXO45HS or MXO45HST
2. XXXMXXXXXX – Frequency is recorded with only 1, 2 or 3 leading significant digits before and 4 - 6 significant digits [including zeroes] after the "M".  
[Ex. 3M579545 (3.579545MHz), 14M31818 (14.31818MHz), 125M0000 (125MHz)]
3. ST – Frequency Stability/Temperature Code.  
[Refer to Ordering Information]
4. YYWW – Date Code; YY – year, WW – week.
5. \*\* - Manufacturing Site Code.

Package Drawing - DIP-8



Notes

1. JEDEC termination code (e1). Lead finish is tin-silver-copper [SnAgCu].
2. Reflow conditions per JEDEC J-STD-020; +260°C maximum, 20 seconds.
3. Hand soldering conditions; solder iron temperature +350°C maximum, 10 seconds.
4. MSL = 1.

### Pin Assignments

Pin	Symbol	Function
1	EOH	Enable
7 or 4	GND	Circuit & Package Ground
8 or 5	Output	RF Output
14 or 8	V <sub>CC</sub>	Supply Voltage