MXOHT

High Temperature CMOS Clock Oscillator

Part Dimensions:
20.8 × 13.2 × 5.1mm • 3.774537g
13.2 × 13.2 × 5.5mm • 2.206637g

Features

- Standard 14-Pin or 8-Pin Metal DIP Packages
- Fundamental and 3rd Overtone Crystal Designs
- Frequency Range 1 – 125MHz
- Operating Temperatures, -55°C to +105°C & -55°C to +125°C
- Operating Voltages; +1.8V, +2.5V, +3.3V, +5.0V
- Output Enable Standard
- Three Approved Packing Methods.

Applications

- Industrial High Temperature
- Commercial Military/Aerospace
- Computers and Peripherals
- Microcontrollers and FPGAs
- Broadband Access
- Data Communications
- Ethernet/Gigabit Ethernet
- Fiber Channel
- Test and Measurement

Description

CTS MXOHTA and MXOHTB are legacy thru-hole clock oscillators that offer a low cost design supporting older HCMOS/TTL applications. MXOHTA and MXOHTB are 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	Supply Voltage	Frequency Stability	Temperature Range	Frequency Code [MHz]
MXOHT	A	L	2	P	XXX or XXXX

Code	Package/Enable
A	14-Pin DIP [full-size] [1]
B	8-Pin DIP [half-size] [1]

Code	Stability
3	±50ppm [2]
9	±75ppm
2	±100ppm

Code	Frequency
Product Frequency Code [3]	

Code	Voltage
M	+1.8Vdc
N	+2.5Vdc
L	+3.3Vdc
S	+5.0Vdc

Code	Temp. Range
P	-55°C to +105°C
M	-55°C to +125°C

Notes:

1] The MXOHTA and MXOHTB platform is qualified and manufactured to commercial and industrial standards.

2] Temperature Only. All other stabilities are "all inclusive". See Electrical Specifications.

3] Refer to document 016-1454-0, Frequency Code Tables. 3-digits for frequencies <100MHz, 4-digits for frequencies 100MHz or greater.

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}	±10%	1.62	1.8	1.98	V
			2.25	2.5	2.75	
			2.97	3.3	3.63	
			4.50	5.0	5.50	
Supply Current	I_{CC}	Typical @ Nominal Vcc, C_L = 15 pF, T_A = +25°C				
		@ +1.8V, 1.0MHz to 50MHz	-	10	15	mA
		@ +1.8V, 50.1MHz to 125MHz	-	20	25	
		@ +2.5V, 1.0MHz to 50MHz	-	12	15	mA
		@ +2.5V, 50.1MHz to 125MHz	-	25	30	
		@ +3.3V, 1.0MHz to 50MHz	-	15	20	mA
		@ +3.3V, 50.1MHz to 125MHz	-	30	40	
		@ +5.0V, 1.0MHz to 40MHz	-	20	30	mA
Output Load	C_L	-	-	-	15	pF
Operating Temperature	T_A	-	-55	+25	+105	°C
			-55		+125	
Storage Temperature	T_{STG}	-	-55	-	+125	°C

Frequency Stability

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Frequency Range	f_O	+1.8V, +2.5V, +3.3V		1.0 - 125		MHz
		+5.0V		1.0 - 40		
Frequency Stability [Note 1]	$\Delta f/f_O$	-		50, 75 or 100		±ppm
Aging	$\Delta f/f_{25}$	First Year @ +25°C, nominal V_{CC}	-5	-	5	ppm

1.] Inclusive of initial tolerance at time of shipment, changes in supply voltage, load, temperature and 1st year aging. Except ±50ppm which is temperature only.

Output Parameters

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Output Type	-	-		HCMOS		-
Output Voltage Levels	V_{OH}	Logic '1' Level, CMOS Load	0.9V_{CC}	-	-	V
	V_{OL}	Logic '0' Level, CMOS Load	-	-	0.1V_{CC}	
Output Current Levels	I_{OH}	V_{OH} = 90%V_{CC} [+1.8V,+2.5V,+3.3V,+5.0V]	-	-	-4, -4, -8, -16	mA
	I_{OL}	V_{OL} = 10%V_{CC} [+1.8V,+2.5V,+3.3V,+5.0V]	-	-	+4, +4, +8, +16	
Output Duty Cycle	SYM	@ 50% Level	45	-	55	%
Rise and Fall Time [Note 2]	T_R, T_F	@ 10%/90% Levels, Nominal V_{CC}, C_L = 15pF				
		@ +1.8V, 1.0MHz to 20MHz	-	7	10	ns
		@ +1.8V, 20.1MHz to 125MHz	-	5	7	
		@ +2.5V or +3.3V, 1.0MHz to 20MHz	-	7	10	ns
		@ +2.5V or +3.3V, 20.1MHz to 125MHz	-	4	7	
		@ +5.0V, 1.0MHz to 20MHz	-	7	10	ns
		@ +5.0V, 20.1MHz to 40MHz	-	4	6	
Start Up Time	T_S	Application of V_{CC}	-	2	5	ms

2.] Parameters are worst case and account for comprehensive range of product specification. Performance may vary by application and must be validated by end user.

Electrical Specifications

Output Parameters

Enable Function		Standby				
Enable Input Voltage	V_{IH}	Pin 1 Logic '1', Output Enabled	0.7V_{CC}	-	-	V
Disable Input Voltage	V_{IL}	Pin 1 Logic '0', Output Standby	-	-	0.3V_{CC}	V
Standby Current	I_{STB}	Pin 1 Logic '0', Output Standby	-	-	15	µA
Enable Time	T_{PLZ}	Pin 1 Logic '1', Output Enabled	-	-	5	ms
Phase Jitter, RMS [Note 3]	tjrms	Bandwidth 12kHz - 20MHz	-	0.5	<1	ps

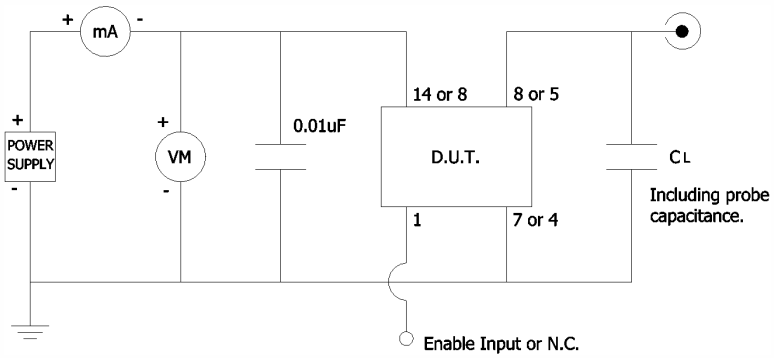
3.] For frequencies 40MHz or less, the measurement Bandwidth is 12kHz - 5MHz.

Enable Truth Table

Pin 1	Pin 8 or Pin 5
Logic '1'	Output Enabled
Open	Output Enabled
Logic '0'	Output Disabled. High Impedance

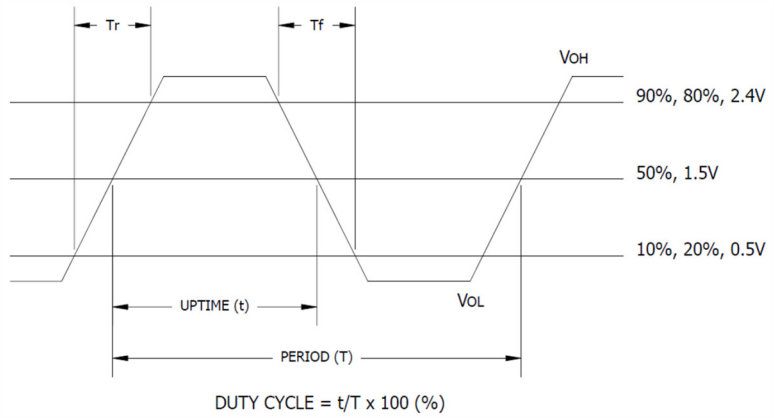
Test Circuit

HCMOS



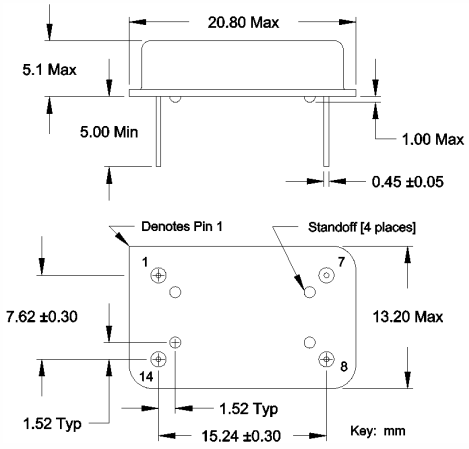
Output Waveform

HCMOS



Mechanical Specifications

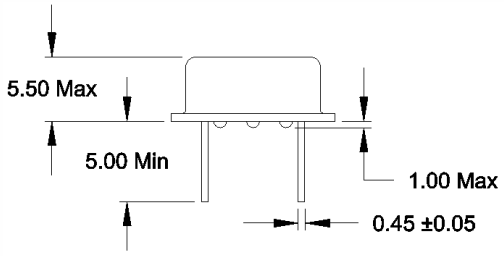
Package Drawing – DIP-14

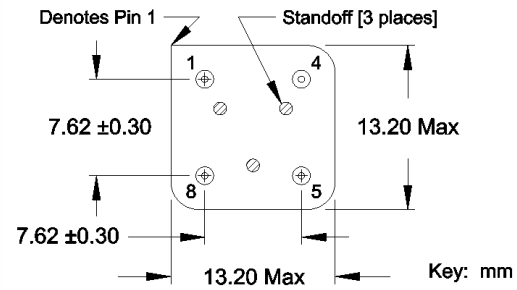


Marking Information

1. Model Name:
   DIP-14 – MXOHTA
   DIP-8 – MXOHTB
2. xxxx – Frequency Code.
   3-digits, frequencies below 100MHz
   4-digits, frequencies 100MHz or greater
   [See document 016-1454-0, Frequency Code Tables.]
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_{CC}	Supply Voltage

Packaging - CTS Approved Methods

Anti-Static Foam in Cardboard Carton

Typical packing format:

1. 50pcs. per anti-static foam layer.
2. 2 layers of anti-static foam [100pcs.] per inner cardboard carton.
   Carton size is approximately 170mm x 120mm x 45mm [LxWxH].
3. An anti-static foam sheet layer is placed as a buffer on top of each layer containing oscillators.
4. Master-pack multiple inner cartons in a larger outer cardboard carton.
   20 inner cartons [100pcs. per carton] per outer carton, is approximately 550mm x 350mm x 180mm [LxWxH].

Anti-Static Plastic Trays

Typical packing format:

1. 50pcs. per plastic tray.
   Tray size is approximately 180mm x 136mm x 18mm [LxWxH].
2. 2 trays per anti-static bag [100pcs.] or 10 trays per anti-static bag [500pcs.]
   Bag height for 10 trays is approximately 175mm.
3. One anti-static bag per inner cardboard carton.
4. Master-pack multiple inner cartons in a larger outer cardboard carton.
   8 inner cartons [10 trays per carton] per outer carton, is approximately 460mm x 380mm x 400mm [LxWxH].

Anti-Static Plastic Tubes

Typical packing format:

1. 10pcs. per plastic tube – Full-Size package.
   15pcs. per plastic tube – Half-Size package.
2. Plastic tubes are master packed in cardboard carton.
   Carton is approximately 35mm x 35mm x 20mm [LxWxH].