

# KXO-HC/KHO-HC Series Crystal Clock Oscillators

HCMOS Drive - TTL or CMOS Compatible

$f_o$ : 1 to 80 MHz

## FEATURES

- 1) High speed CMOS clock oscillator
- 2) High power drive level
- 3) Low current consumption
- 4) Output available with TTL or CMOS compatibility
- 5) Enable/disable option
- 6) KHO-HC in 8 pin DIP

## HOW TO ORDER

**KXO-HC 1 - T S E - 32.0000M T**

① ② ③ ④ ⑤ ⑥

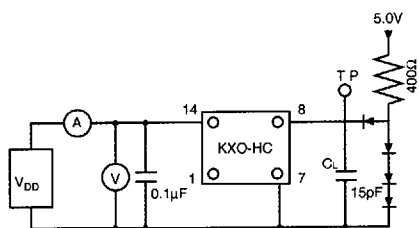
- ① Type: KXO = 14 pin DIP; KHO = 8 pin DIP
- ② Frequency precision:  
S =  $\pm 25$ ppm (special), 0 =  $\pm 50$ ppm, 1 =  $\pm 100$ ppm
- ③ Output level/Duty cycle:  
TS = TTL compatible/45 to 55%  
CS = CMOS compatible/45 to 55%
- ④ Enable/Disable function:  
 = without function, E = with function
- ⑤ Frequency
- ⑥ Packaging:  
T = tube



## SPECIFICATIONS (KXO-HC-T/KHO-HC-T TTL COMPATIBLE)

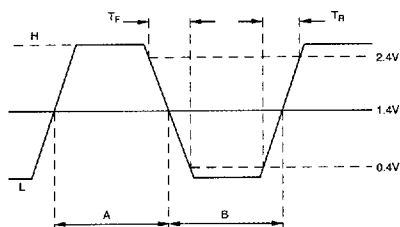
Classification	Code	Rating		Unit	Remarks	
Output Frequency	$f_{OUT}$	1 to 50	>50	MHz		
Frequency Precision	$\Delta f/f_o$	S: $\pm 25$ 0: $\pm 50$ 1: $\pm 100$	S: $\pm 25$ 0: $\pm 50$ 1: $\pm 100$	ppm ppm ppm	0 to 70°C 4.5V to 5.5V	
Operating Temperature Range	$T_{OPR}$	0 to +70	0 to +70	°C		
Voltage	$V_{DD}$	5 $\pm 0.5$	5 $\pm 0.25$	V		
Electrical Current Consumption	$I_{DD}$	50 max	70 max	mA	$f=50$ MHz, $C_L=15$ pF (10TTL load)	
Output	Duty Cycle	$S_Y$	45 to 55	%	1.4V DC level	
	"0" Level	$V_{OL}$	0.4 max	0.4 max	V	At $I_{OL}=16$ mA
	"1" Level	$V_{OH}$	2.4 min	2.4 min	V	At $I_{OH}=-1$ mA
	Rise and Fall Time	$T_R, T_F$	5 max	3.5 max	nsec	0.4V to 2.4V, $C_L=15$ pF (10TTL load)
Fan Out		TTL 10 gates	TTL 10 gates		CMOS level OK	
Time to Enable/Disable		100 max	100 max	nsec	Tristate output	
Input Current	$I_{IH}$	10 max	10 max	$\mu$ A		
	$I_{IL}$	-150 max	-150 max	$\mu$ A		
Input Voltage	$V_{IH}$	2.2 min	2.2 min	V		
	$V_{IL}$	0.8 max	0.8 max	V		

## TEST CIRCUIT (KXO-HC-T/KHO-HC-T)



$C_L=15$ pF max  
(inclusive of test jig and probe capacitance)

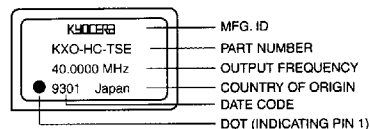
## SHAPE OF OUTPUT WAVE (KXO-HC-T/KHO-HC-T)



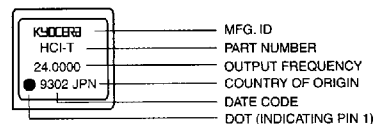
$$\text{Duty Ratio} = \frac{A}{A+B}$$

## MARKINGS

### KXO-HC



### KHO-HC



# KXO-HC/KHO-HC Series Crystal Clock Oscillators

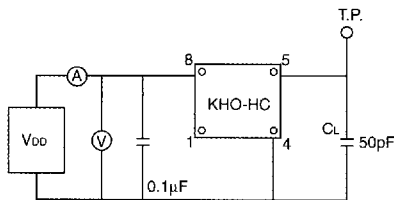
HCMOS Drive - TTL or CMOS Compatible

$f_o$ : 1 to 80 MHz

## SPECIFICATIONS (KXO-HC-C/KHO-HC-C CMOS COMPATIBLE)

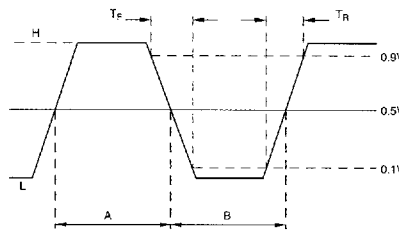
Classification		Code	Rating		Unit	Remarks
Output Frequency		$f_{OUT}$	1 to 50	>50	MHz	
Frequency Precision		$\Delta f/f_o$	S: $\pm 25$ 0: $\pm 50$ 1: $\pm 100$	S: $\pm 25$ 0: $\pm 50$ 1: $\pm 100$	ppm ppm ppm	0 to 70°C 4.5V to 5.5V
Operating Temperature Range		$T_{OPR}$	0 to +70	0 to +70	°C	
Voltage		$V_{DD}$	5 $\pm 0.5$	5 $\pm 0.25$	V	
Electrical Current Consumption		$I_{DD}$	50 max	80 max	mA	$f > 50\text{MHz}$ , $C_L = 15\text{pF}$ $f < 50\text{MHz}$ , $C_L = 50\text{pF}$
Output	Duty Cycle	$S_Y$	45 to 55	45 to 55	%	1/2 $V_{DD}$ level
	"0" Level	$V_{OL}$	0.1 $V_{DD}$ max	0.1 $V_{DD}$ max	V	At $I_{OL} = 16\text{mA}$
	"1" Level	$V_{OH}$	0.9 $V_{DD}$ min	0.9 $V_{DD}$ min	V	At $I_{OH} = -1\text{mA}$
	Rise and Fall Time	$T_R, T_F$	10 max	6 max	nsec	10% $V_{DD}$ to 90% $V_{DD}$ $C_L = 50\text{pF}$
Time to Enable/Disable			100 max	100 max	nsec	Tristate Output
Input Current		$I_{IH}$ $I_{IL}$	10 max -150 max	10 max -150 max	$\mu\text{A}$ $\mu\text{A}$	
Input Voltage		$V_{IH}$ $V_{IL}$	2.2 min 0.8 max	2.2 min 0.8 max	V V	

### TEST CIRCUIT (KXO-HC-C/KHO-HC-C)



$C_L = 50\text{pF}$  max  
(Inclusive of test jig and probe capacitance)

### SHAPE OF OUTPUT WAVE (KXO-HC-C/KHO-HC-C)



$$\text{Duty Cycle} = \frac{B}{A+B}$$

### PIN CONNECTION

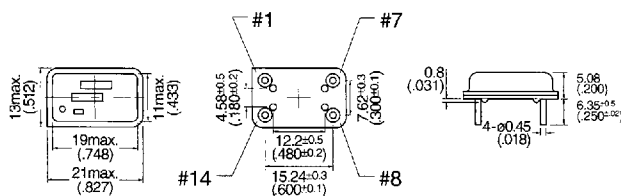
KXO	KHO	
1	1	N.C. or Control
7	4	Case /GND
8	5	Output
14	8	+5.0V D.C.

### ENABLE/DISABLE FUNCTION CHART

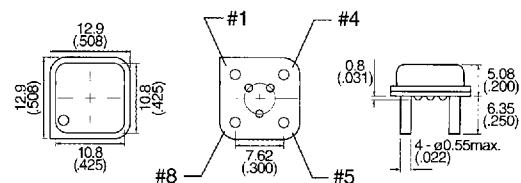
Pin 1	Pin 8
High or Open	Oscillation
Low	High Impedance

### DIMENSIONS

#### KXO-HC



#### KHO-HC



Unit: mm (inch)