

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

## HCMOS Drive - TTL or CMOS Compatible

KXO-HC  $f_o$ : 1 to 80 MHz  
 KHO-HC  $f_o$ : 1 to 72 MHz

### FEATURES

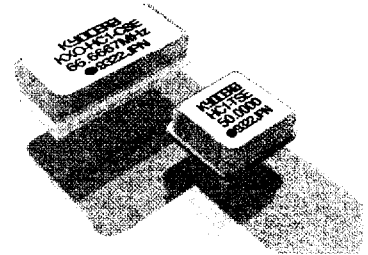
- 1) High speed CMOS clock oscillator
- 2) High power drive level
- 3) Low current consumption
- 4) Output available with TTL or CMOS compatibility
- 5) Enable/disable option
- 6) KHO-HC in 8 pin DIP

### HOW TO ORDER

**KXO-HC 1-TSE-32.0000M T**

① ② ③ ④ ⑤ ⑥

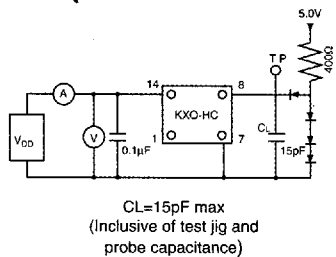
- ① Type: KXO = 14 pin DIP; KHO = 8 pin DIP
- ② Frequency precision:  
 S =  $\pm 25$ ppm (special), 0 =  $\pm 50$ ppm, 1 =  $\pm 100$ ppm
- ③ Output level/Duty cycle:  
 TS = TTL compatible/45 to 55%  
 CS = CMOS compatible/45 to 55%
- ④ Enable/Disable function:  
 □ = without function, E = with function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



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

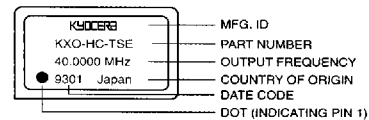
Classification	Code	Rating		Unit	Remarks
Output Frequency	$f_{OUT}$	1 to 50	>50	MHz	
Frequency Precision	$\Delta f/f_o$	S: $\pm 25$	S: $\pm 25$	ppm	0 to 70°C
		0: $\pm 50$	0: $\pm 50$	ppm	4.5V to 5.5V
		1: $\pm 100$	1: $\pm 100$	ppm	
Operating Temperature Range	$T_{OPR}$	0 to +70	0 to +70	°C	
Voltage	$V_{DD}$	5 $\pm$ 0.5	5 $\pm$ 0.25	V	
Electrical Current Consumption	$I_{DD}$	50 max	55 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	V	At $I_{OL}=16$ mA
	"1" Level	$V_{OH}$	2.4 min	V	At $I_{OH}=-1$ mA
	Rise and Fall Time	$T_R, T_F$	5 max	3.5 max	nsec
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)

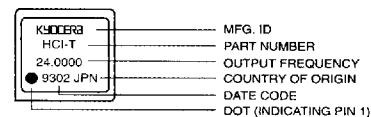


### MARKINGS

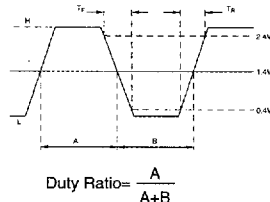
KXO-HC



KHO-HC



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



### PIN CONNECTION

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

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

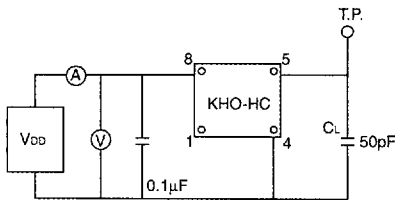
HCMOS Drive - TTL or CMOS Compatible

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 KHO-HC  $f_o$ : 1 to 72 MHz

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

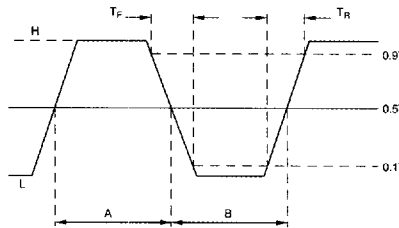
Classification		Code	Rating		Unit	Remarks
Output Frequency		$f_{OUT}$	1 to 50	>50	MHz	
Frequency Precision		$\Delta f/f_o$	S:±25	S:±25	ppm	0 to 70°C 4.5V to 5.5V
			0:±50	0:±50	ppm	
			1:±100	1:±100	ppm	
Operating Temperature Range		$T_{OPR}$	0 to +70	0 to +70	°C	
Voltage		$V_{DD}$	5±0.5	5±0.25	V	
Electrical Current Consumption		$I_{DD}$	50 max	65 max	mA	$f=50\text{MHz } C_L=15\text{pF}$
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		$I_{IH}$	10 max	10 max	μA	
		$I_{IL}$	-150 max	-150 max	μA	
Input Voltage		$V_{IH}$	2.2 min	2.2 min	V	
		$V_{IL}$	0.8 max	0.8 max	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)



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

### PIN CONNECTION

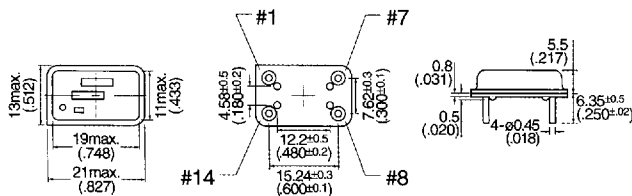
KXO	KHO	
1	1	N.C. or Control
7	4	Case /GND
8	5	Output
14	8	+5.0V D.C.

### ENABLE/DISABLE FUNCTION CHART

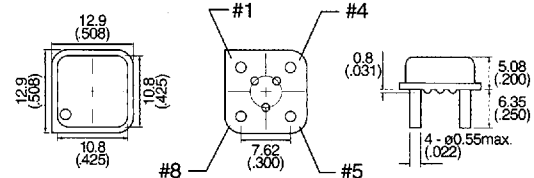
Pin 1	Pin 8
High or Open	Oscillation
Low	High Impedance

## DIMENSIONS

### KXO-HC



### KHO-HC



Unit: mm (inch)