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# Crystal Oscillator

## Series HCO-6M, HCMOS/TTL Crystal Oscillator

### FEATURE

- All metal welded package
- Broad frequency range from 0.25MHz to 180MHz
- Built-in C-MOS IC with tri-state function
- 5V and 3.3V supply model available



### ELECTRICAL SPECIFICATIONS

Model type		Full Size		Half Size	
Fan Out Type		TTL/CMOS	CMOS	TTL/CMOS	CMOS
Supply Voltage		5.0V	3.3V	5.0V	3.3V
Frequency Range		0.25-180MHz	0.25-180MHz	0.25-180MHz	0.25-180MHz
Operating Temperature		0-70°C, -20-70°C, -40-85°C			
Frequency Range Input Current (Max)	0.25MHz ~ 9.999MHz	15mA	10mA	15mA	10mA
	10.000MHz ~ 23.999MHz	15mA	10mA	15mA	10mA
	24.000MHz ~ 49.999MHz	30mA	20mA	30mA	20mA
	50.000MHz ~ 79.999MHz	40mA	20mA	40mA	20mA
	80.000MHz ~ 180.000MHz	50mA	30mA	50mA	30mA
Frequency Stability	All Conditions	±5ppm ~ ±100ppm			
Symmetry	AT 1/2 Vdd	45/55%			
Input Voltage	Vol (max)	0.4V/0.5V	0.33V	0.4V/0.5V	0.33V
		2.4V/4.5V	3.0V	2.4V/2.5V	3.0V
Rise/Fall Time	AT 0.1Vdd ~ 0.9Vdd	5ns max			
Driving Ability	CMOS load max	15pF/50pF	15pF	15pF/50pF	15pF
	TTL load max	10TTL		10TTL	
Start-up Time	Load RANGE	5 ms max (15pF) / 10 ms (50pF)			
E/D Function	#1 OPEN	PIN #8 OPEN		#5 OPEN	
	#1 >=2.2V	PIN #8 OPEN		#5 OPEN	
	#1 <=0.8V	PIN #8 HIGHZ		#5 HIGHZ	
PAD Connection		PIN#1 E/D	PIN#8 OUT	PIN#1 E/D	PIN#5 OUT
		PIN#7 GND	PIN#14 Vdd	PIN#4 GND	PIN#8 Vdd

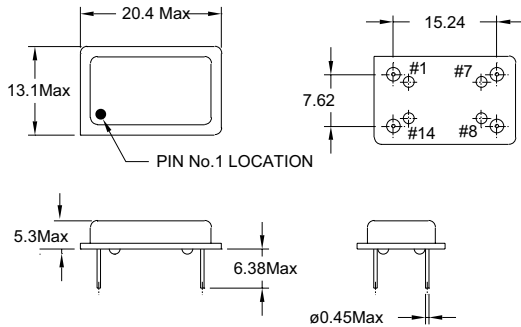


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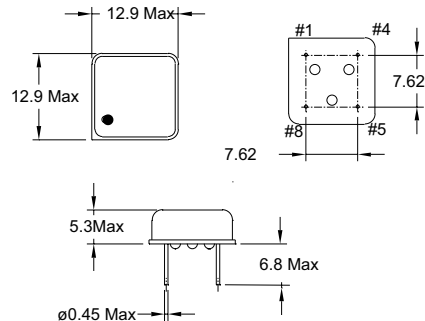
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### MARKING AND DIMENSIONS



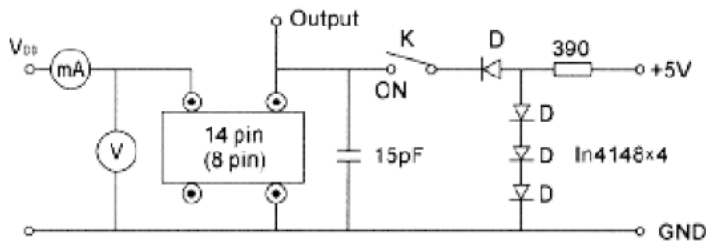
PIN CONNECTION - DIP14	
PIN 1:	NO CONNECTION
PIN 7:	GROUND
PIN 8:	OUTPUT
PIN 14:	V <sub>DD</sub> SUPPLY VOLTAGE

Units:mm



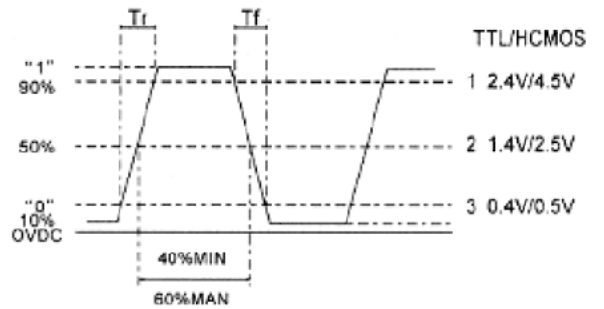
PIN CONNECTION - DIP8	
PIN 1:	NO CONNECTION
PIN 4:	GROUND
PIN 5:	OUTPUT
PIN 8:	V <sub>DD</sub> SUPPLY VOLTAGE

### CIRCUIT PRINCIPLE



K → ON: Test TTL Logic  
 K → OFF: Test HCMOS

### OUTPUT WAVE FORM



### PART NUMBER

HCO -	6MH	12.000	5	50	X	A
	Model type 6MF: Full size. 14pin 6MH: Half size. 8pin	Frequency 12.000:12.000 MHz	Supply voltage 5:5V 3.3:3.3V	Frequency tolerance 50:±50ppm 25:±25ppm	Fan out type X:TTL/CMOS Y:CMOS X:TTL	Temperature range A:0-70°C B:-20-70°C C:-40-85°C

