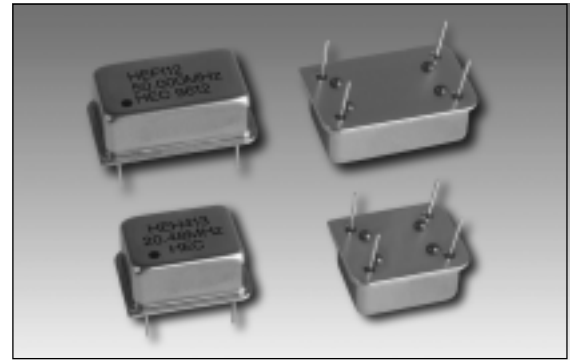


HE-F / HE-H CRYSTAL CLOCK OSCILLATORS

HEC, INC. offers a wide variety of clock oscillators including HCMOS/TTL and ACMOS/TTL outputs, and with or without tristate enable/disable function. The HEF (full size 14 pin) and HEH (half size 8 pin) oscillators are available in a very wide frequency range (0.25 up to 160 MHz) and tight tolerance options. Voltage, symmetry, heavy load, and gull wing options are also available. Encased in its durable metal can, the HEH/HEF industry standard crystal clock oscillator series is a cost effective device for your oscillator requirements.



ELECTRICAL SPECIFICATIONS

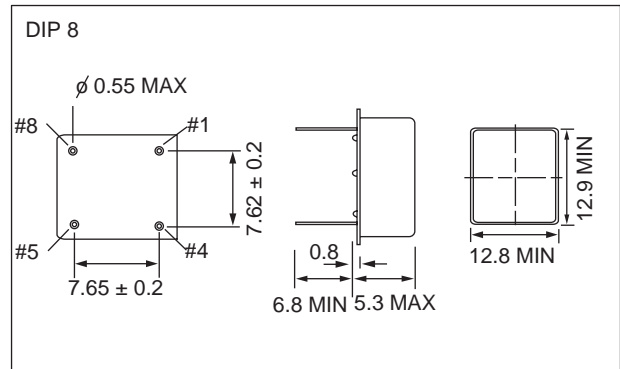
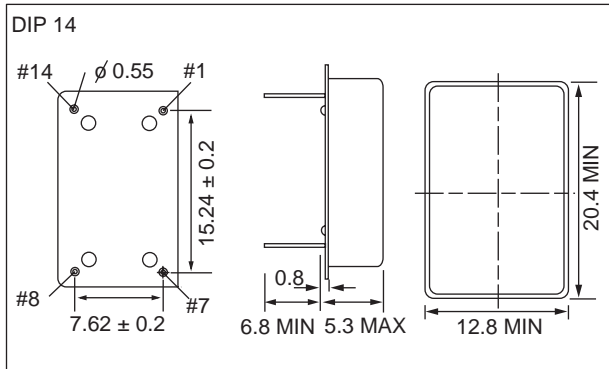
PARAMETERS	MIN. SPECIFICATION	MAX. SPECIFICATION	UNIT
FREQUENCY RANGE	0.5Hz, 8 Hz, 32.768kHz	160	kHz / MHz
FREQUENCY STABILITY*	±5	±100	PPM
OPERATING TEMPERATURE RANGE	0°C to +50°C 0°C to +70°C -20°C to +85°C -40°C to +85°C -55°C to +125°C Customer Specified		°C
STORAGE TEMPERATURE RANGE	-55°C to +125°C // Customer Specified		°C
SUPPLY VOLTAGE	3.3V ~ 15V (5V, 3.3V Standard)		V
OUTPUT LOAD	10 TTL / 15pF Standard Heavy Load Optional		
OUTPUT LEVEL "LOW"	0.4V max.		V
OUTPUT LEVEL "HIGH"	V _{CC} - 0.5V		V
RISE TIME FALL TIME	32.768kHz - 160.00 MHz (0.5V~4.5V) or (0.3V~2.7V) / 5 nS~15 nS 32.768kHz - 160.00 MHz (4.5V ~ 0.5V) or (2.7V~0.3V) / 5 nS~15nS		
CURRENT CONSUMPTION MAX.	0.25 - 4.9 MHz / 10~15 mA 5 - 22.9 MHz / 10~20 mA 23 - 49.9 MHz / 10~50 mA 50 - 160 MHz / 55-65 mA 5V or 30 mA 3.3V		mA
SYMMETRY	40/60% Standard or 45/55% Optional		%
TRISTATE ENABLE / DISABLE	#1 Open - #5 Active #1 > 2.2V - #5 Active #1 < 0.8V - #5 High Z		
PACKAGE	DIP 14 (FULL SIZE) OR DIP 8 (HALF SIZE)		

Test Conditions

Temperature Cycle: 0°C to 25°C to 120°C to 25°C (each temperature 20 minutes, 3 cycle)
 Shock Test: 1000g, 0.5ms, 1/2 sine wave each plane
 Vibration: 10 Hz - 82 Hz, 1.52-mm amplitude
 82 Hz - 2000 Hz, 20g each plane

* Frequency stability: inclusive of calibration tolerance at 25°C, operating temp. range, input voltage change, aging, shock, and vibration.

MECHANICAL DRAWING

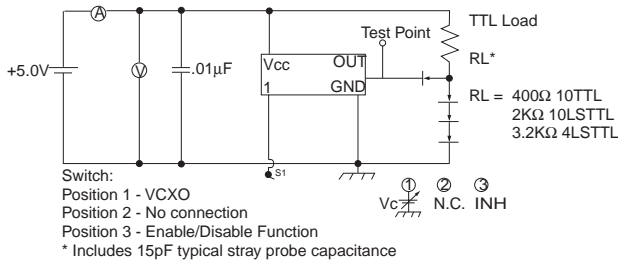


PART NUMBERING GUIDE

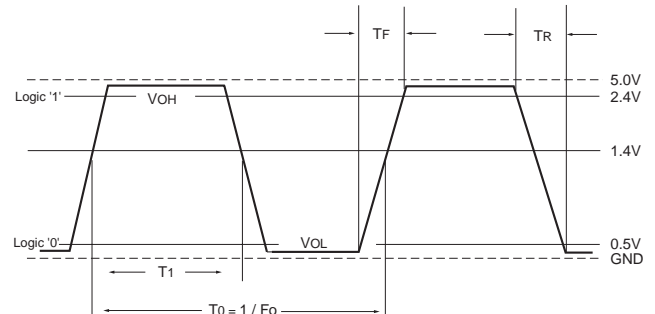
HE	PKG	OUTPUT	TEMP. RANGE	STABILITY	OPTION	VOLT	FREQ	-SPEC.
	F - 14 PIN	1 = HCMOS/TTL	1 = 0°C to +70°C	1 = ±100 PPM	D = 45/55 H=Heavy Load (50pF) H30 = 30pF -Hxx: xxpF xx-Other Load	V = 3.3V	ENTER FREQ.	INDICATE SPECIAL STABILITY OR TEMP. RANGE
	H - 8 PIN	2 = HCMOS ONLY	2 = -20°C to +85°C	2 = ± 50 PPM		BLANK = 5V		
		3 = AC MOS/TTL	3 = -40°C to +85°C	3 = ± 25 PPM		XV = Other		
		4 = TRISTATE HCMOS / TTL	4 = -55°C to +125°C	4 = ± 10 PPM				
		5 = TRISTATE HCMOS ONLY	5 = OTHER (INDICATE)	5 = ± 5 PPM				
		6 = TRISTATE AC MOS/TTL		S = SPECIAL (INDICATE)				

GENERAL CHARACTERISTICS

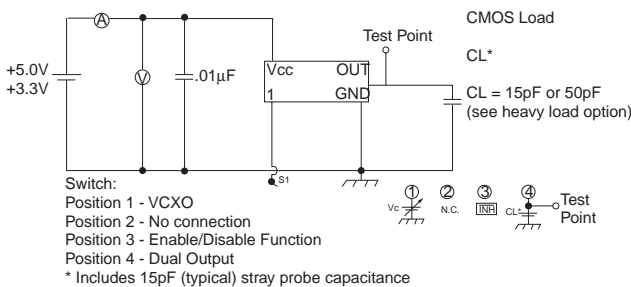
TTL TEST CIRCUIT



TTL WAVEFORM



HCMOS TEST CIRCUIT



HCMOS WAVEFORM

