

Crystal Clock Oscillators

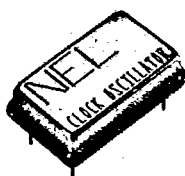
NEL

ECL COMPATIBLE

**HS-600 to HS-630 and
HS-2600/2610 Series**
30 MHz -100 MHz

**HS-650/660 and
HS-2650/2660 Series**
100 + MHz -220 MHz

HS-670 and HS-2670 Series
30 MHz -220 MHz



HS-600/2600 Series

Description

ECL crystal clock oscillators provide MECL 10k, 10 kH and 100 k series compatible signals in industry standard four-pin DIP hermetic packages. Systems designers may now specify space-saving, cost-effective packaged ECL oscillators to meet their timing requirements.

Suggested Applications

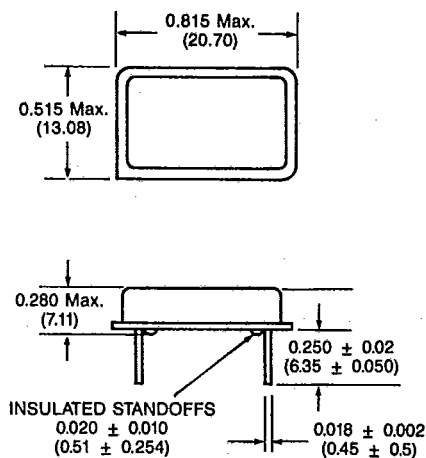
High speed system design applications using ECL technology include:

- ☐ HS-600/610 Series for 10 k
- ☐ HS-620/630 Series for 100 k
- ☐ HS-650/660/670 Series for 10 k or 10 kH
- ☐ HS-2600/2610/2670 Series for complementary 10 k
- ☐ HS-2650/2660 Series for complementary 10 k or 10 kH

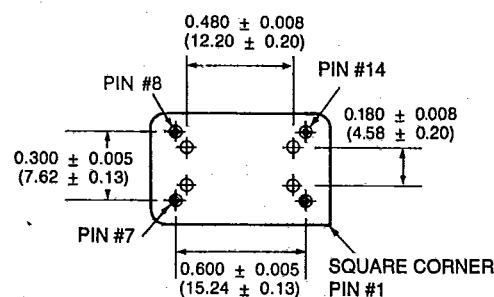
Features

- ☐ Wide frequency range — 30.0 MHz to 220.0 MHz
- ☐ User specified tolerance, from $\pm 0.005\%$
- ☐ Case at electrical ground
- ☐ MECL 10 k, 10 kH and 100 k Series compatible output on Pin 8, complement on Pin 1, or both
- ☐ Space-saving alternative to discrete component oscillators
- ☐ All metal, resistance weld, hermetically sealed package
- ☐ High shock resistance, to 3,000 G's

Dimensions



Dimensions are for reference only, inches (mm).



Pin Connection

See Chart on page 23

(Cont. on next 2 pages)

NEL Crystal Clock Oscillators

ECL COMPATIBLE

HS-600 to HS-630

HS-650 to HS-670

HS-2600/2610 & HS-2650
to HS-2670 Series

(Continued)

Specifications

PARAMETER	CONDITIONS	HS-600/610/670 Series HS-2600/2610/2670 Series		HS-650/660/670 Series HS-2650/2660/2670 Series	
		MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
General Characteristics					
Supply voltage (V _{EE})	Supply -5.2 V	-5%	+5%	-5%	+5%
	Breakdown	+0.5 V	-8.0 V	+0.5 V	-8.0 V
Supply current (I _{EE})	—	—	80 mA	—	80 mA
Output current (I _O)	—	—	60 mA	—	60 mA
Operating temperature (T _A)	Functionality only	0° C	75° C	0° C	75° C
Storage temperature (T _S)	—	-55° C	+125° C	-55° C	+125° C
Output Characteristics ¹					
Frequency	—	30 MHz	100 MHz	100+ MHz	220 MHz
Tolerance ²	@ 25° C	± 0.005%	—	± 0.005%	—
Stability	0° to 75°	± 0.01%	—	± 0.01%	—
Symmetry ³	@ -1.29 V	40/60%	60/40%	40/60%	60/40%
Logic 0 (V _{OL})	T _A = 0°-75° C	-1.87 V	-1.625 V	-1.95 V	-1.60 V
Logic 1 (V _{OH})	T _A = 0°-75° C	-1.06 V	-0.72 V	-1.02 V	-0.74 V
Rise & fall time (t _r , t _f)	T _A = 0°-75° C	—	3.6 ns	—	2.25 ns

Note: Limits are for -5.2 V ± 0.01 V @ 25° C unless otherwise specified.

HS-620/630 Series

PARAMETER	CONDITIONS	MINIMUM	MAXIMUM
General Characteristics			
Supply voltage (V_{EE})	Supply -4.5 V	-4.8 V	-4.2 V
	Breakdown	+0.5 V	-8.0 V
Supply current (I_{EE})	—	—	80 mA
Output current (I_O)	—	—	50 mA
Operating temperature (T_A)	Functionality only	0° C	75° C
Storage temperature (T_S)	—	-55° C	+125° C
Output Characteristics			
Frequency	—	30 MHz	100 MHz
Tolerance ²	@ 25° C	± .005%	—
Stability	0° to 75° C	± 0.01%	—
Symmetry ³	@ -1.33 V	40/60%	60/40%
Logic 0 (V_{OL})	$T_A = 0^\circ\text{-}75^\circ\text{ C}$	-1.81 V	-1.475 V
Logic 1 (V_{OH})	$T_A = 0^\circ\text{-}75^\circ\text{ C}$	-1.165 V	-0.88 V
Rise & fall time (t_r, t_f)	$T_A = 0^\circ\text{-}75^\circ\text{ C}$	—	3.6 ns

Note: Limits are for -4.5 V ± 0.01 V @ 25° C unless otherwise specified.

Footnotes:

1. Tested per test circuit diagram.
2. Unless otherwise specified by customer.
3. Reference test circuit below.
4. Measured between 20% and 80% of output.

(Cont. on next page)

Crystal Clock Oscillators



ECL Product Variations (Pin Connection)

Type	Frequency Range	Pin 1	Pin 7	Pin 8	Pin 14
HS-600	30.0 MHz - 100.0 MHz	NC	Case & GRD (V_{CC})	Output	-5.2 V (V_{EE})
HS-610	30.0 MHz - 100.0 MHz	NC	-5.2 V (V_{EE})	Output	Case & GRD (V_{CC})
HS-620	30.0 MHz - 100.0 MHz	NC	Case & GRD (V_{CC})	Output	-4.5 V (V_{EE})
HS-630	30.0 MHz - 100.0 MHz	NC	-4.5 V (V_{EE})	Output	Case & GRD (V_{CC})
HS-650	100 + MHz - 220.0 MHz	NC	Case & GRD (V_{CC})	Output	-5.2 V (V_{EE})
HS-660	100 + MHz - 220.0 MHz	NC	-5.2 V (V_{EE})	Output	Case & GRD
HS-670	30.0 + MHz - 220.0 MHz	NC	-5.2 V & Case (V_{EE})	Output	GRD (V_{CC})
HS-2600	30.0 MHz - 100.0 MHz	Comp. Output	Case & GRD (V_{CC})	Output	-5.2 V (V_{EE})
HS-2610	30.0 MHz - 100.0 MHz	Comp. Output	-5.2 V (V_{EE})	Output	Case & GRD (V_{CC})
HS-2650	100 + MHz - 220.0 MHz	Comp. Output	Case & GRD (V_{CC})	Output	-5.2 V (V_{CC})
HS-2660	100 + MHz - 220.0 MHz	Comp. Output	-5.2 V (V_{EE})	Output	Case & GRD
HS-2670	30.0 MHz - 220.0 MHz	Comp. Output	-5.2 V & Case (V_{EE})	Output	GRD (V_{CC})

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30 MHz -100 MHz

HS-650/660 and
HS-2650/2660 Series
100 + MHz -220 MHz

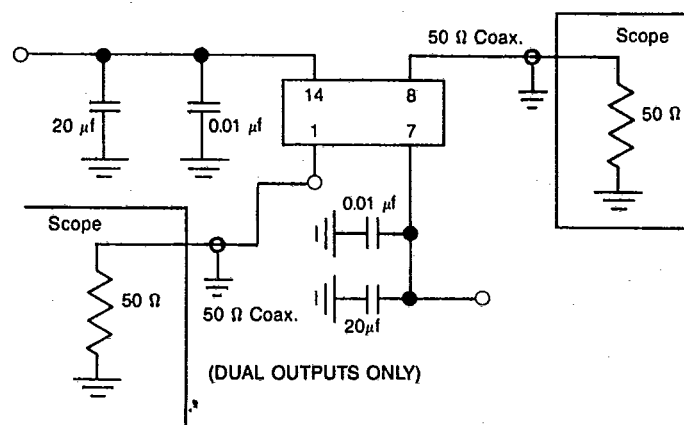
HS-670 and
HS-2670 Series
30 MHz -220 MHz

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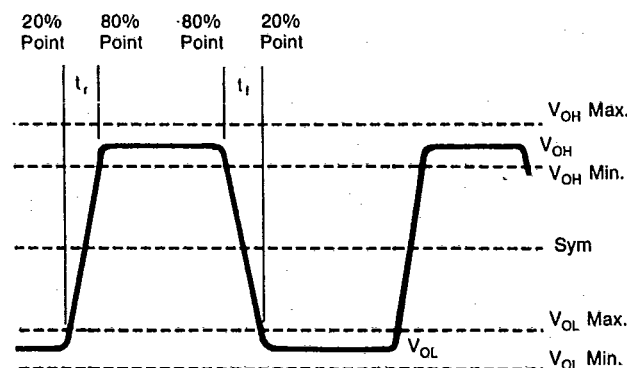
Options

- ☐ Gull wing surface mount package available for all ECL compatible oscillators.
(Dimensions - see page 35)

Test Circuit



Output Waveforms





NEW PRODUCTS

In our continued effort to provide quality products to meet the needs of the changing electronics market, NEL is in the process of developing several new products.

Among these are:

TTL/CMOS Oscillator

Frequency range 70 to 100 MHz. User tolerance available from $\pm .005\%$.

3-State CMOS/TTL

Frequency range extended to 80MHz. User tolerance available from $\pm .005\%$.

Z80/8000/80A/80B Oscillator

Frequency range on HS-380/2890 Series extended to 40.0MHz. User tolerance available from $\pm .0025\%$.

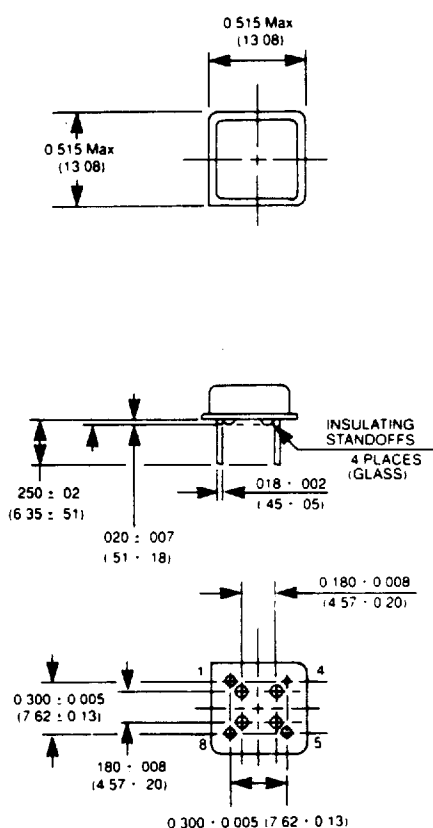
Programmable Video Clock Generator

For use in the computer graphics, disk drive (zone locator) and fiber optics markets.

This product simplifies operations by using phase-locked loop techniques to generate, from the crystal oscillator, all the necessary clocks used in a typical graphics system.

OSCILLATOR METAL HALF PACK AND SURFACE MOUNT DIMENSIONS

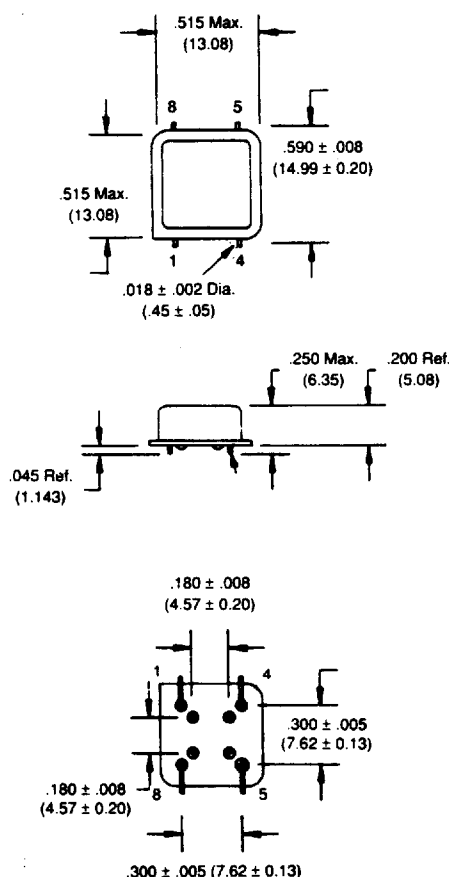
HA Series



Pin number 4 connected to case.

The metal half pack oscillator is available in TTL, CMOS, and Z80 logics. See options on pages 17, 20, 29, and 33 for details.

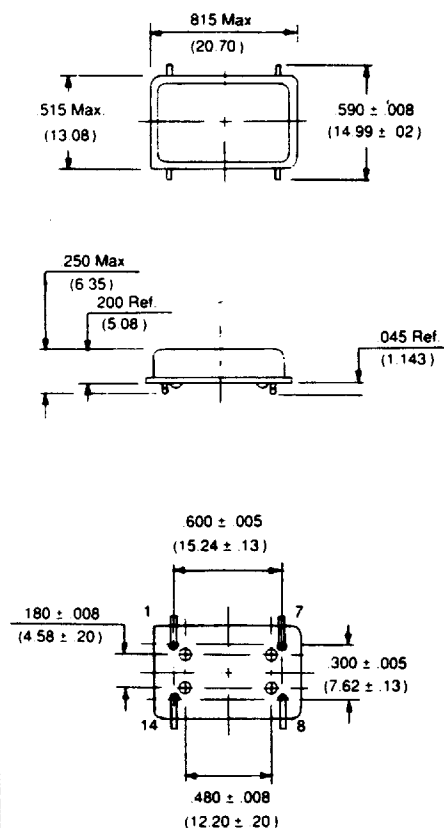
SA Series



Pin number 4 connected to case.

Seating plane = $.005 \text{ Max. (.127)}$
Wire leads to be formed to a 90° angle.

SM Series



Pin number 7 connected to case.

Seating plane = $.005 \text{ Max. (.127)}$
Wire leads to be formed to a 90° angle.

Dimensions are for reference only, inches (mm).