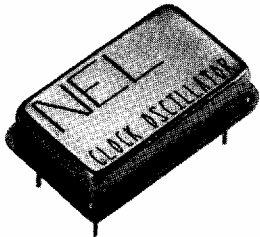


# NEL Crystal Clock Oscillators

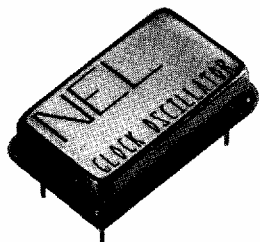
## ECL COMPATIBLE

**HS-600/2600 Series**  
(Available from 30MHz to 64.9 MHz)

**HS-800/2800 Series**  
(Available from 65MHz to 250 MHz)



HS-600/2600 Series



HS-800/2800 Series

## Description

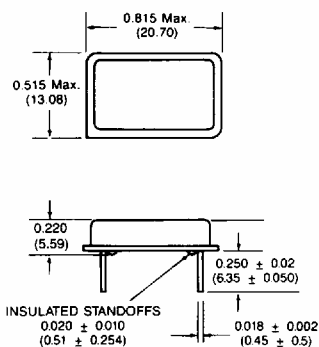
The **HS-600 & HS-800 Series** of quartz crystal clock oscillators provide MECL 10k, 10kH and 100k series compatible signals on pin 8.

The **HS-2600 & HS-2800 series** of quartz crystal clock oscillators provide complementary signals on pin 1. System designers may now specify space saving, cost effective ECL oscillators up to 250 MHz to meet their timing requirement. A wide frequency range is available, from 30 MHz to 250 MHz, with user specified tolerances from  $\pm .005\%$ ,  $0^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$ .

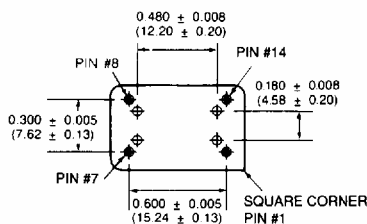
## Features

- Wide frequency range — 30.0 MHz to 250.0 MHz
- User specified tolerance, from  $\pm .005\%$
- 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 Gs

### Dimensions



Dimensions are for reference only, inches (mm).



**Pin Connection**  
See Chart to Right

NEL TYPE, FREQUENCY RANGE, PIN CONNECTIONS						
NEL OSC. TYPE	FREQUENCY RANGE	PIN CONNECTION				SIGNAL COMPATIBILITY
		1	7	8	14	
HS-600	30 MHz to 64.9 MHz	N/C	CASE & GRD (V <sub>CC</sub> )	OUTPUT	V <sub>EE</sub> (-5.2V)	10k & 10kH
HS-610	30MHz to 64.9 MHz	N/C	V <sub>EE</sub> (-5.2V)	OUTPUT	CASE & GRD (V <sub>CC</sub> )	10k & 10kH
HS-620	30MHz to 64.9 MHz	N/C	CASE & GRD (V <sub>CC</sub> )	OUTPUT	V <sub>EE</sub> (-4.5V)	100k
HS-630	30MHz to 64.9 MHz	N/C	V <sub>EE</sub> (-4.5V)	OUTPUT	CASE & GRD (V <sub>CC</sub> )	100k
HS-670	30MHz to 64.9 MHz	N/C	CASE & GRD	OUTPUT	V <sub>CC</sub> (+5V)	10k & 10kH
HS-800	65MHz to 250 MHz	N/C	CASE & GRD (V <sub>CC</sub> )	OUTPUT	V <sub>EE</sub> (-5.2V)	10k & 10kH
HS-810	65MHz to 250 MHz	N/C	V <sub>EE</sub> (-5.2V)	OUTPUT	CASE & GRD (V <sub>CC</sub> )	10k & 10kH
HS-820	65MHz to 250 MHz	N/C	CASE & GRD (V <sub>CC</sub> )	OUTPUT	V <sub>EE</sub> (-4.5V)	100K
HS-830	65MHz to 250 MHz	N/C	V <sub>EE</sub> (-4.5V)	OUTPUT	CASE & GRD (V <sub>CC</sub> )	100K
HS-870	65MHz to 250 MHz	N/C	CASE & GRD	OUTPUT	V <sub>CC</sub> (+5.0V)	10k & 10kH
HS-2600	30MHz to 64.9 MHz	Comp. Out	CASE & GRD (V <sub>CC</sub> )	OUTPUT	V <sub>EE</sub> (-5.2V)	10k & 10kH
HS-2610	30MHz to 64.9 MHz	Comp. Out	V <sub>EE</sub> (-5.2V)	OUTPUT	CASE & GRD (V <sub>CC</sub> )	10k & 10kH
HS-2670	30MHz to 64.9 MHz	Comp. Out	CASE & GRD	OUTPUT	V <sub>CC</sub> (+5.0V)	10k & 10kH
HS-2800	65MHz to 250 MHz	Comp. Out	CASE & GRD (V <sub>CC</sub> )	OUTPUT	V <sub>EE</sub> (-5.2V)	10k & 10kH
HS-2810	65MHz to 250 MHz	Comp. Out	V <sub>EE</sub> (-5.2V)	OUTPUT	CASE & GRD (V <sub>CC</sub> )	10k & 10kH
HS-2870	65MHz to 250 MHz	Comp. Out	CASE & GRD	OUTPUT	V <sub>CC</sub> (+5.0V)	10k & 10kH

## ECL Operating Conditions and Output Characteristics

**ECL  
COMPATIBLE**

**HS-600/2600  
Series  
(Available from  
30MHz to  
64.9 MHz)**

**HS-800/2800  
Series  
(Available from  
65MHz to  
250 MHz)**

PARAMETER	CONDITIONS	HS-600/610 Series HS-800/810 Series HS-2600/2610 Series HS-2800/2810 Series		HS-620/630 Series HS-820/830 Series		HS-670 Series HS-870 Series HS-2670 Series HS-2870 Series		
		MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	
		(Note 1)		(Note 2)		(Note 3)		
<b>General Characteristics</b>								
Supply voltage ( $V_{EE}$ )	-5.2V	-5.46V	-4.94 V	—	—	—	—	
	-4.5V	—	—	-4.8V	-4.2V	—	—	
	+5.0V	—	—	—	—	+4.75V	+5.25V	
	Breakdown	+0.5V	-8.0V	+0.5V	-8.0V	-0.5V	+8.0V	
Supply current ( $I_{EE}$ )	—	—	80 mA	—	80 mA	—	80 mA	
Output current ( $I_O$ )	HS-6XX/26XX Series	—	50 mA	—	50 mA	—	50 mA	
	HS-8XX/28XX Series	—	50 mA	—	50 mA	—	50 mA	
Operating temperature ( $T_A$ )	Functionality only	0° C	70° C	0° C	70° C	0° C	70° C	
Storage temperature ( $T_S$ )	—	-55° C	+125° C	-55° C	+125° C	-55° C	+125° C	
<b>Output Characteristics (1)</b>								
Frequency	HS-6XX/26XX Series	30 MHz	64.9 MHz	30 MHz	64.9 MHz	30 MHz	64.9 MHz	
	HS-8XX/28XX Series	65 MHz	250 MHz	65 MHz	250 MHz	65 MHz	250 MHz	
Tolerance <sup>(2)</sup>	@ 25° C	±0.005%	—	±0.005%	—	±0.005%	—	
Stability	0-70° C	±0.1%	—	±0.1%	—	±0.1%	—	
Symmetry <sup>(3)</sup>	@-1.29 V	40/60%	60/40%	—	—	—	—	
	@-1.33 V	—	—	40/60%	60/40%	—	—	
	@+3.71V	—	—	—	—	40/60%	60/40%	
Logic 0 ( $V_{OL}$ ) <sup>(4)</sup>	HS-6XX/26XX Series	-1.87 V	-1.625 V	-1.81 V	-1.475 V	3.13 V	3.375V	
	HS-8XX/28XX Series	-1.95 V	-1.60 V	-1.81 V	-1.475 V	3.05 V	3.40 V	
Logic 1 ( $V_{OH}$ ) <sup>(4)</sup>	HS-6XX/26XX Series	-1.06 V	-0.74 V	-1.165 V	-0.88 V	3.94 V	4.28 V	
	HS-8XX/28XX Series	-1.02 V	-0.74 V	-1.165 V	-0.88 V	3.98 V	4.26 V	
Rise & fall time ( $t_r, t_f$ ) <sup>(5)</sup>	HS-6XX/26XX Series	—	3.6 ns	—	3.6 ns	—	3.6 ns	
	HS-8XX/28XX Series	—	2.25 ns	—	2.25 ns	—	2.25 ns	

Note 1 – Limits are for -5.2 V ±0.01 V @ 25° C unless otherwise specified.

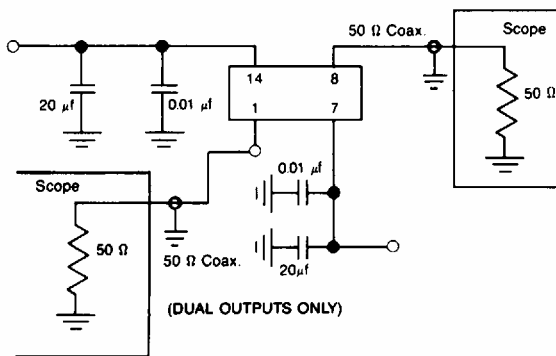
Note 2 – Limits are for -4.5 V ±0.01 V @ 25° C unless otherwise specified.

Note 3 – Limits are for +5.0 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.  $V_{OL}$ ,  $V_{OH}$  referenced to ground
5. Measured between 20% and 80% of output

**Test Circuit**



This information is believed to be reliable at the time of printing; no responsibility is assumed for inaccuracies. NEL Frequency Controls reserves the right to make changes at any time.

**Output Waveform**

