Rev. S

Positive ECL (PECL) - Enable/Disable

HS-1870 Series

Description

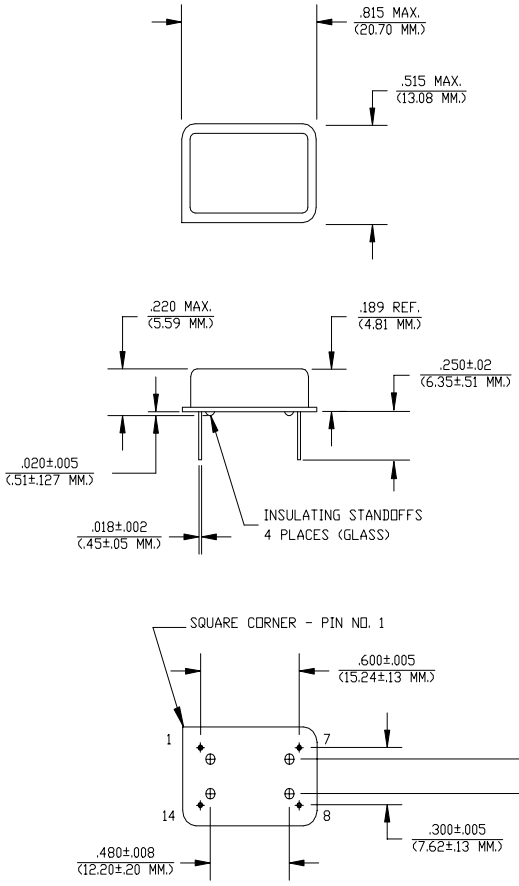
The **HS-1870 Series** of quartz crystal oscillators provide MECL 10K and 10KH series compatible signals in industry standard four-pin DIP hermetic packages. Systems designers may now specify space-saving, cost-effective packaged PECL oscillators to meet their timing requirements. This device is intended to operate on positive voltage for PECL applications.

Features

- Wide frequency range–90.0MHz to 250.0MHz
- User specified tolerance available
- Will withstand vapor phase temperatures of 253°C for 4 minutes maximum
- Space-saving alternative to discrete component oscillators
- High shock resistance, to 3000g
- All metal, resistance weld, hermetically sealed package
- Low Jitter
- MECL 10K and 10KH series compatible output on Pin 8
- High Q Crystal actively tuned oscillator circuit
- Power supply decoupling internal
- No internal PLL avoids cascading PLL problems
- High frequencies due to proprietary design
- Gold plated leads - Solder dipped leads available upon request

Electrical Connection

Pin	Connection
1	/EN
7	V_{EE} /Ground
8	Output
14	V_{CC} +5.0V



Dimensions are in inches and (MM)

NEL FREQUENCY CONTROLS, INC.

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Rev. S

HS-1870 Series Continued
Positive ECL (PECL) - Enable/Disable

Operating Conditions and Output Characteristics

Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typical	Max
Frequency	-----	-----	90.0MHz	-----	250.0MHz
Duty Cycle	-----	@ V_{CC}-1.29V	45/55%	-----	55/45%
Logic 0 (2)	V_{OL}	-----	V_{CC}-1.95V	-----	V_{CC}-1.60V
Logic 1(2)	V_{OH}	-----	V_{CC}-1.02V	-----	V_{CC}-0.74V
Rise & Fall Time	tr,tf	20-80%V_O with 50 ohm load to V_{CC}-2V	-----	1.0 ns	1.5 ns
Jitter, RMS(3)	-----	-----	-----	-----	5 psec
Frequency Stability (1)	dF/F	Overall conditions including: voltage, calibration, temp., 10 yr aging, shock, vibration	-100ppm	-----	+100ppm

General Characteristics

Parameter	Symbol	Conditions	Min	Typical	Max
Supply Voltage	V_{CC}	-----	4.75V	5.0V	5.25V
Supply Current	I_{CC}	50 ohm termination To 2.00V below V_{CC}	0.0 mA	-----	80 mA
Output current	I_O	Low level Output Current	0.0 mA	-----	±50.0 mA
Operating temperature	T_A	------	0°C	-----	70°C
Storage temperature	T_S	-----	-55°C	-----	125°C
Power Dissipation	P_D	-----	-----	-----	420 mW
Lead temperature	T_L	Soldering, 10 sec.	-----	-----	300°C
Load	50 Ohm to V_{CC}-2V or Thevenin Equivalent, Bias Required				
Start-up time	t_S	-----	-----	2 ms	10 ms

Environmental and Mechanical Characteristics

Mechanical Shock	Per MIL-STD-202, Method 213, Condition E
Thermal Shock	Per MIL-STD-833, Method 1011, Condition A
Vibration	0.060" double amplitude 10 Hz to 55 Hz, 35g's 55Hz to 2000 Hz
Soldering Condition	300°C for 10 seconds
Hermetic Seal	Leak rate less than 1 x 10^{-8} atm.cc/sec of helium
ESD Sensitivity	Human Body Model per ON Semiconductor 10kH series ECL: 500V min.

Footnotes:
1) Standard frequency stability (±20,±25,±50ppm & others available)
2) V_{OL}, V_{OH}, referenced to ground (V_{EE}) with V_{CC} = 5V
3) Jitter performance is frequency dependent. Please contact factory for full characterization.
4) /EN must be logic to Enable and logic high to Disable. Capacitance on pin should be less than 25pf external to the oscillator. Pin 8 is logic low when disabled.

Creating a Part Number

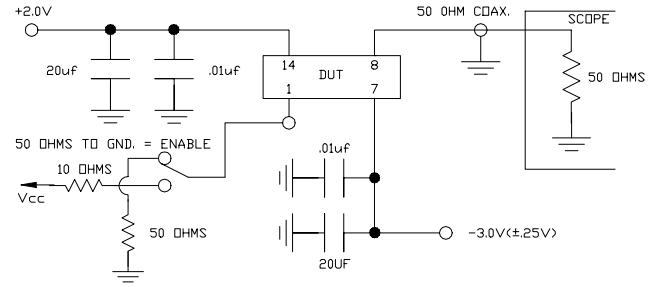
HS - A187X - FREQ

Package Code
HS Leaded 4 pin (14 pin)
SM Leaded 4 pin (14 pin) SMD Gull Wing

Input Voltage
Code Specification
A 3.3V
5V

Tolerance/Performance
0 ±100ppm 0-70°C
1 ±50ppm 0-70°C
7 ±25ppm 0-70°C
9 Customer Specific
A ±20ppm 0-70°C
B ±50ppm -40 to +85°C
C ±100ppm -40 to +85°C

TEST CIRCUIT



NOTE: +2.0V AND -3.0V IS SUPPLIED ON THE APPROPRIATE PINS (SEE PIN-OUT, PAGE 1) FOR EASE IN TEST SETUP.

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