HS-820/830 Series

Description
The HS-820/830 Series of quartz crystal oscillators provide F 100K 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.

Features
- Wide frequency range–15.0MHz 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
- F 100K 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
- RoHS Compliant, Lead Free Construction (unless solder dipped leads are supplied)
- COTS/Dual use

Electrical Connection
HS-820
Pin     Connection
1       N.C.
7       V_{CC}/Ground
8       Output
14      V_{EE} -4.5V

HS-830
Pin     Connection
1       N.C.
7       V_{EE} -4.5V
8       Output
14      V_{CC}/Ground

Dimensions are in inches and (MM)
### Electrical Characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Conditions</th>
<th>Min</th>
<th>Typical</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td></td>
<td>----- @ VCC-1.29V</td>
<td>15.0MHz</td>
<td></td>
<td>250.0MHz</td>
</tr>
<tr>
<td>Duty Cycle</td>
<td></td>
<td>----- VCC-1.95V</td>
<td>45/55%</td>
<td></td>
<td>55/45%</td>
</tr>
<tr>
<td>Logic 0 (2)</td>
<td>V_{OL}</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logic 1 (2)</td>
<td>V_{OH}</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rise &amp; Fall Time</td>
<td>tr,tf</td>
<td>20-80%V_o with 50 ohm load to VCC-2V</td>
<td>1.0 ns</td>
<td></td>
<td>1.5 ns</td>
</tr>
<tr>
<td>Jitter, RMS (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5 psec</td>
</tr>
<tr>
<td>Frequency Stability (1)</td>
<td>dF/F</td>
<td></td>
<td>-100ppm</td>
<td></td>
<td>+100ppm</td>
</tr>
</tbody>
</table>

### General Characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
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<th>Conditions</th>
<th>Min</th>
<th>Typical</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>V_{EE}</td>
<td>50 ohm termination To 2.00V below VCC</td>
<td>-4.8V</td>
<td>-4.5V</td>
<td>-4.2V</td>
</tr>
<tr>
<td>Supply Current I_{EE}</td>
<td></td>
<td>0.0 mA</td>
<td>0.0 mA</td>
<td></td>
<td>80 mA</td>
</tr>
<tr>
<td>Output current I_{O}</td>
<td></td>
<td>Low level Output Current</td>
<td>0.0 mA</td>
<td>0.0 mA</td>
<td>50.0 mA</td>
</tr>
<tr>
<td>Operating temperature T_A</td>
<td></td>
<td></td>
<td>0°C</td>
<td></td>
<td>70°C</td>
</tr>
<tr>
<td>Storage temperature T_S</td>
<td></td>
<td></td>
<td>-55°C</td>
<td></td>
<td>125°C</td>
</tr>
<tr>
<td>Power Dissipation P_D</td>
<td></td>
<td></td>
<td>384 mW</td>
<td></td>
<td>300°C</td>
</tr>
<tr>
<td>Load</td>
<td></td>
<td>50 Ohm to VCC-2V or Thevenin Equivalent, Bias Required</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Start-up time t_s</td>
<td></td>
<td></td>
<td>2 ms</td>
<td></td>
<td>10 ms</td>
</tr>
</tbody>
</table>

### Environmental and Mechanical Characteristics

- Mechanical Shock: Per MIL-STD-202, Method 213, Condition E
- Thermal Shock: Per MIL-STD-883, 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 (VCC) with V_{EE} = -4.5V
3) Jitter performance is frequency dependent. Please contact factory for full characterization.
   RMS jitter bandwidth of 12kHz to 20MHz.

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### Creating a Part Number

**HS-820/830 Series**

**ECL**

**Operating Conditions and Output Characteristics**

**Electrical Characteristics**

- **Parameter**: Symbol
- **Conditions**: Conditions
- **Min**: Min
- **Typical**: Typical
- **Max**: Max

**General Characteristics**

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- **Conditions**: Conditions
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**Creating a Part Number**

**HS - A82X - 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