ECL HS-2830 Series

Description
The **HS-2830 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
- Metal lid electrically connected to ground to reduce EMI
- Low Jitter
- COTS/Dual use
- F 100K series compatible output on Pin 8, complement on Pin 1
- 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)

Electrical Connection

<table>
<thead>
<tr>
<th>Pin</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Output Complement</td>
</tr>
<tr>
<td>7</td>
<td>VEE -4.5V</td>
</tr>
<tr>
<td>8</td>
<td>Output</td>
</tr>
<tr>
<td>14</td>
<td>VCC Ground</td>
</tr>
</tbody>
</table>

Dimensions in inches and (MM)
# HS-2830 Series Continued

## ECL

### Operating Conditions and Output Characteristics

#### 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></td>
<td>15.0MHz</td>
<td></td>
<td>250.0MHz</td>
</tr>
<tr>
<td>Duty Cycle</td>
<td>@V_{CC}-1.29V</td>
<td></td>
<td>45/55%</td>
<td></td>
<td>55/45%</td>
</tr>
<tr>
<td>Logic 0 (2)</td>
<td>V_{OL}</td>
<td>V_{CC}-1.95V</td>
<td></td>
<td></td>
<td>V_{CC}-1.60V</td>
</tr>
<tr>
<td>Logic 1 (2)</td>
<td>V_{OH}</td>
<td>V_{CC}-1.02V</td>
<td></td>
<td></td>
<td>V_{CC}-0.74V</td>
</tr>
<tr>
<td>Rise &amp; Fall Time</td>
<td>tr, tf</td>
<td>20-80%V_{O} with 50 ohm load to V_{CC}-2V</td>
<td>1.0 ns</td>
<td>1.5 ns</td>
<td></td>
</tr>
<tr>
<td>Tpd (4)</td>
<td></td>
<td></td>
<td>-0.5 ns</td>
<td></td>
<td>+0.5 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>Overall conditions including:</td>
<td>-100ppm</td>
<td></td>
<td>+100ppm</td>
</tr>
</tbody>
</table>

#### General 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>Supply Voltage</td>
<td>V_{EE}</td>
<td>-4.8V</td>
<td>-4.5V</td>
<td>-4.2V</td>
<td></td>
</tr>
<tr>
<td>Supply Current</td>
<td>I_{EE}</td>
<td>50 ohm termination</td>
<td>0.0 mA</td>
<td></td>
<td>80 mA</td>
</tr>
<tr>
<td>Output current</td>
<td>I_{O}</td>
<td>Low level Output Current</td>
<td>0.0 mA</td>
<td>50.0 mA</td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>T_{A}</td>
<td></td>
<td>0°C</td>
<td>70°C</td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>T_{S}</td>
<td></td>
<td>-55°C</td>
<td>125°C</td>
<td></td>
</tr>
<tr>
<td>Power Dissipation</td>
<td>P_{D}</td>
<td></td>
<td>384 mW</td>
<td>300°C</td>
<td></td>
</tr>
<tr>
<td>Lead temperature</td>
<td>T_{L}</td>
<td>Soldering, 10 sec.</td>
<td></td>
<td>300°C</td>
<td></td>
</tr>
<tr>
<td>Load</td>
<td></td>
<td>50 Ohm to V_{CC}-2V or Thevenin Equivalent, Bias Required</td>
<td>2 ms</td>
<td>10 ms</td>
<td></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_{HH} referenced to ground (V_{CC}) with V_{EE} = -4.5V
3) Jitter performance is frequency dependent. Please contact factory for full characterization.
   RMS jitter bandwidth of 12kHz to 20MHz
4) Tpd is phase shift between the falling edge of pin 8 at V_{CC}-1.29V and rising edge of pin 1 at V_{CC}-1.29V.

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# CRYSTAL CLOCK OSCILLATORS

## Data Sheet 0012L

### Package Code

- **HS**: Leaded 4 pin (14 pin)
- **SM**: Leaded 4 pin (14 pin) SMD
- **Gull Wing**: Gull Wing

### 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

### Creating a Part Number

**HS - A283× - FREQ**

- **Code**: Specification
  - **A**: 3.3V
  - **5V**

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