

## Positive ECL (PECL) SJ-870 Series

Rev. F

### Description

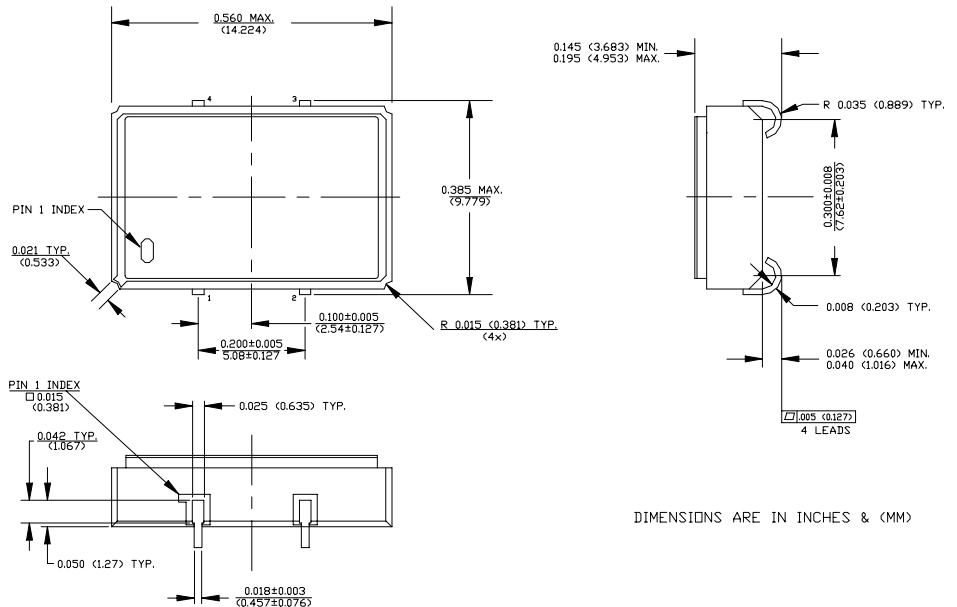
The **SJ-870 Series** of quartz crystal oscillators provide MECL 10K and 10KH series compatible signals in a ceramic SMD package. Systems designers may now specify space-saving, cost-effective packaged PECL oscillators to meet their timing requirements.

### 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
- MECL 10K and 10KH series compatible output on Pin 3
- 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   | N.C.                    |
| 2   | V <sub>EE</sub> /Ground |
| 3   | Output                  |
| 4   | V <sub>CC</sub>         |



**SJ-870 Series** Continued  
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## Operating Conditions and Output Characteristics

### Electrical Characteristics

| Parameter                          | Symbol   | Conditions   | Min            | Typical | Max            |
|------------------------------------|----------|--|----------------|---------|----------------|
| Frequency                          | ----     | ----   | 15.0MHz        | ----    | 250.0MHz       |
| Duty Cycle                         | ----     | @ $V_{CC}-1.29V$   | 45/55%         | ----    | 55/45%         |
| Logic 0 <sup>(2)</sup>             | $V_{OL}$ | ----   | $V_{CC}-1.95V$ | ----    | $V_{CC}-1.60V$ |
| Logic 1 <sup>(2)</sup>             | $V_{OH}$ | ----   | $V_{CC}-1.02V$ | ----    | $V_{CC}-0.74V$ |
| Rise & Fall Time                   | tr,tf    | 20-80% $V_O$ with 50 ohm load to $V_{CC}-2V$   | ----           | 1.0 ns  | ----           |
| Jitter, RMS <sup>(3)</sup>         | ----     | ----   | ----           | ----    | 5 psec         |
| Frequency Stability <sup>(1)</sup> | dF/F     | Overall conditions including:<br>voltage, calibration, temp.,<br>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<br>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 $1 \times 10^{-8}$ atm.cc/sec of helium      |
| ESD Sensitivity     | Human Body Model per ON Semiconductor 10kH series ECL: 500V min. |

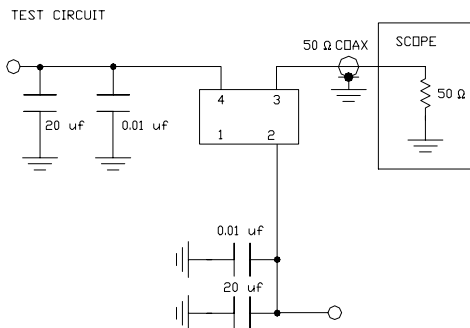
#### Footnotes:

- 1) Standard frequency stability ( $\pm 20, \pm 25, \pm 50$ ppm & 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.

**Creating a Part Number**

**SJ - A87X - FREQ**

|  |               |               |   |      |  |    |  |
|--|---------------|---------------|---|------|--|----|--|
| <p><b>Package Code</b></p> <p>SJ 4 J Lead SMD</p> <p><b>Input Voltage</b></p> <table border="0"> <tr> <td>Code</td> <td>Specification</td> </tr> <tr> <td>A</td> <td>3.3V</td> </tr> <tr> <td></td> <td>5V</td> </tr> </table> | Code          | Specification | A | 3.3V |  | 5V | <p><b>Tolerance/Performance</b></p> <p>0 ±100ppm 0-70°C</p> <p>1 ±50ppm 0-70°C</p> <p>7 ±25ppm 0-70°C</p> <p>9 Customer Specific</p> <p>A ±20ppm 0-70°C</p> <p>B ±50ppm -40 to +85°C</p> <p>C ±100ppm -40 to +85°C</p> |
| Code   | Specification |               |   |      |  |    |  |
| A  | 3.3V          |               |   |      |  |    |  |
|  | 5V            |               |   |      |  |    |  |



TEST CIRCUIT USES A SPLIT SUPPLY OF +2V AND -3V FOR EASE OF TESTING.