

## Differential Positive ECL (DPECL) Fast Edge PJ-A2940 Series

### Preliminary

### Description

The **PJ-A2940 Series** of quartz crystal oscillators provide DPECL Fast Edge compatible signals. Systems designers may now specify space-saving, cost-effective packaged PECL oscillators to meet their timing requirements.

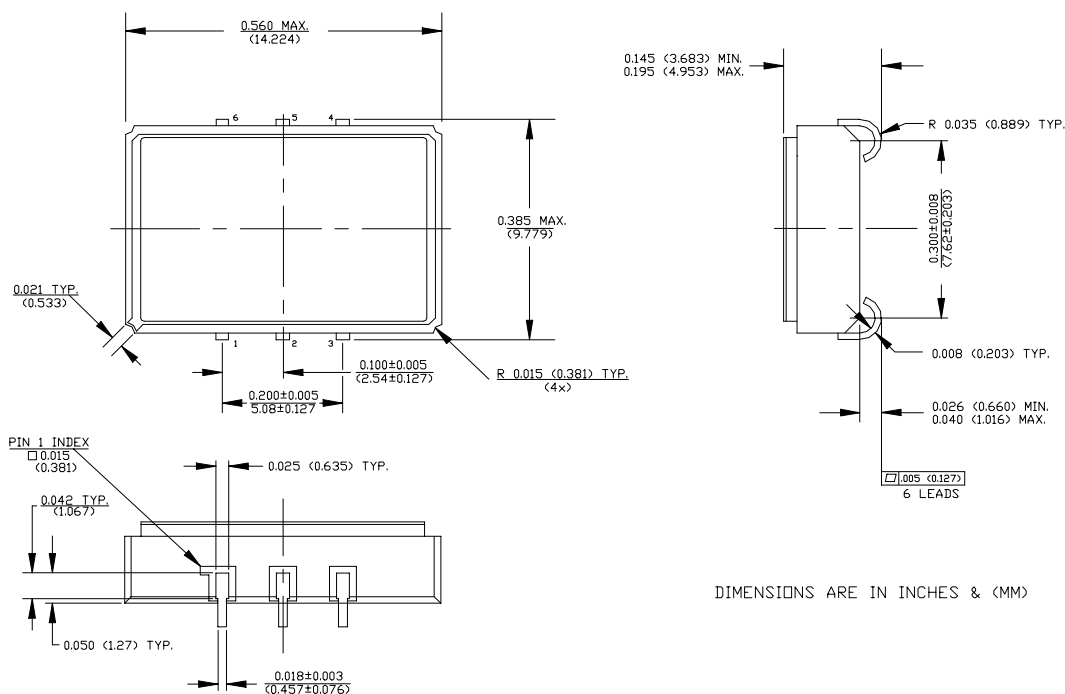
### Features

- Wide frequency range—80.0MHz to 200.0MHz
- 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
- 3.3 volt operation
- Fast rise and fall times <600 ps
- Metal lid electrically connected to ground to reduce EMI
- High Reliability - NEL HALT/HASS qualified for crystal oscillator start-up conditions
- Low Jitter - Wavecrest jitter characterization available
- Overtone technology
- 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 | Enable/Disable    |
| 2 | NC                |
| 3 | V <sub>EE</sub>   |
| 4 | Output            |
| 5 | Output Complement |
| 6 | V <sub>CC</sub>   |



**FREQUENCY  
CONTROLS, INC.**

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**PJ-A2940 Series** Continued  
Differential Positive ECL (DPECL) Fast Edge

Rev. E

**Operating Conditions and Output Characteristics****Electrical Characteristics**

| Parameter                          | Symbol   | Conditions                                                                                     | Min       | Typical | Max       |
|------------------------------------|----------|------------------------------------------------------------------------------------------------|-----------|---------|-----------|
| Frequency                          | -----    | -----                                                                                          | 80.0MHz   | -----   | 200.0MHz  |
| Duty Cycle                         | -----    | @ $V_{CC}$ -1.29V                                                                              | 45/55%    | -----   | 55/45%    |
| Logic 0 <sup>(2)</sup>             | $V_{OL}$ | -----                                                                                          | 1.35V     | -----   | 1.70V     |
| Logic 1 <sup>(2)</sup>             | $V_{OH}$ | -----                                                                                          | 2.28V     | -----   | 2.56V     |
| Rise & Fall Time                   | tr,tf    | 20-80% $V_O$ with 50 ohm load to $V_{CC}$ -2V                                                  | -----     | -----   | 600 psec  |
| Tpd <sup>(4)</sup>                 | -----    | -----                                                                                          | -200 psec | -----   | +200 psec |
| Jitter, RMS <sup>(3)</sup>         | -----    | -----                                                                                          | -----     | -----   | 3 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        | $V_{CC}$                                                     | -----                                         | 3.15V  | 3.3V    | 3.45V    |
| Supply Current        | $I_{CC}$                                                     | 50 ohm termination<br>To 2.00V below $V_{CC}$ | 0.0 mA | -----   | 110 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     | $P_D$                                                        | -----                                         | -----  | -----   | 276 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             |

**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  $V_{CC} = 3.3V$
- 3) Jitter performance is frequency dependent. Please contact factory for full Wavecrest characterization.
- 4) Tpd is phase shift between the falling edge of pin 3 at 2.0V and the rising edge of pin 1 at 2.01V.

**Creating a Part Number****PJ - A294X - FREQ****Package Code**

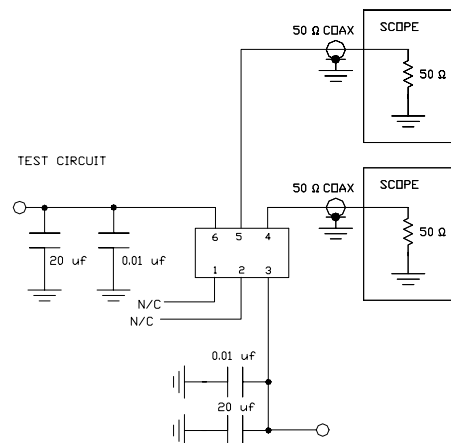
PJ 6 J Lead SMD

**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 USES A SPLIT SUPPLY OF +2V AND -1.3V FOR EASE OF TESTING.



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