

## Differential Positive ECL (DPECL) SU-A29F0 Series

### Description

The **SU-A29F0 Series** of quartz crystal oscillators provide DPECL compatible signals. Systems designers may now specify space-saving, cost-effective packaged PECL oscillators to meet their timing requirements.

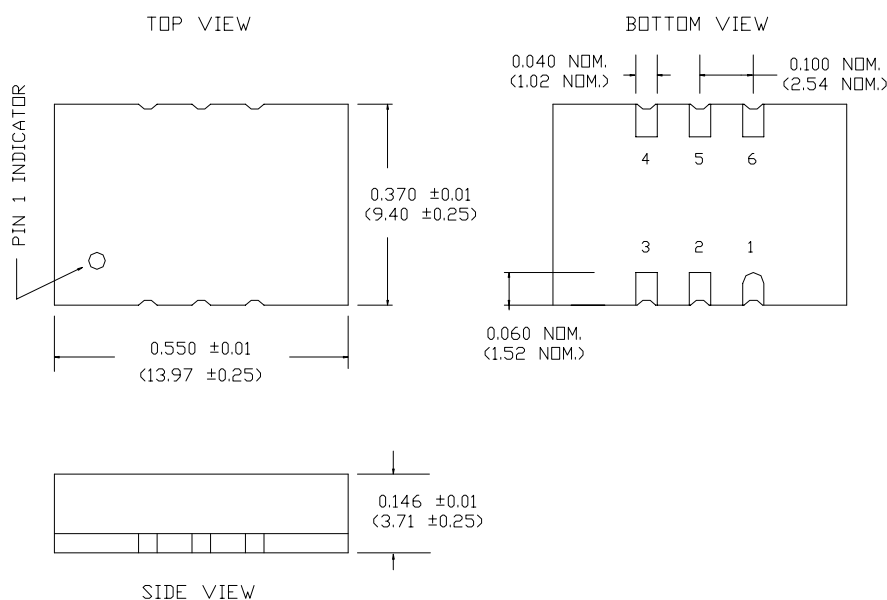
### Features

- Wide frequency range – 280.0+MHz to 350.0MHz
- User specified tolerance available
- Will withstand SMD reflow temperatures of 253°C for 4 minutes maximum
- Space-saving alternative to discrete component oscillators
- High shock resistance, to 1000g
- 3.3 volt operation
- High Reliability - NEL HALT/HASS qualified for crystal oscillator start-up conditions
- Wavecrest jitter characterization available
- Overtone technology
- High Q Crystal actively tuned oscillator circuit
- No internal PLL avoids cascading PLL problems
- Power supply decoupling internal
- Metal lid electrically connected to ground to reduce EMI
- Gold plated pads

### Electrical Connection

Pin Connection

- |   |                 |
|---|-----------------|
| 1 | Enable          |
| 2 | N/C             |
| 3 | Ground          |
| 4 | Q Output        |
| 5 | /Q Output       |
| 6 | V <sub>CC</sub> |



DIMENSIONS IN: INCHES  
(mm)

### SU-A29F0 Series Continued Differential Positive ECL (DPECL)

### Operating Conditions and Output Characteristics

#### Electrical Characteristics

| Parameter                          | Symbol          | Conditions   | Min                     | Typical | Max                    |
|------------------------------------|-----------------|--|-------------------------|---------|------------------------|
| Frequency                          | ----            | ----   | 280.0+MHz               | ----    | 350.0MHz               |
| Duty Cycle                         | ----            | @ V <sub>CC</sub> -1.29V   | 45/55%                  | ----    | 55/45%                 |
| Logic 0 <sup>(2)(7)</sup>          | V <sub>OL</sub> | ----   | ----                    | ----    | V <sub>CC</sub> -1.62V |
| Logic 1 <sup>(2)(7)</sup>          | V <sub>OH</sub> | ----   | V <sub>CC</sub> -1.025V | ----    | ----                   |
| Rise & Fall Time                   | tr,tf           | 20-80%V <sub>O</sub> with 50 ohm load to V <sub>CC</sub> -2V                                   | ----                    | ----    | 500ps                  |
| T <sub>pd</sub> <sup>(6)</sup>     | ----            | ----   | -200psec                | ----    | +200psec               |
| Jitter, RMS <sup>(3)</sup>         | ----            | ----   | ----                    | ----    | 1 ps                   |
| Enable Voltage <sup>(5)</sup>      | ----            | with V <sub>EE</sub> = 0V  | 2.0V                    | ----    | ----                   |
| Disable Voltage                    | ----            | with V <sub>EE</sub> = 0V  | ----                    | ----    | 0.8V                   |
| 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 <sup>(4)</sup> | V <sub>CC</sub>   | 3.3V±5%  | 3.135V | 3.3V    | 3.465V   |
| Supply Current                | I <sub>CC</sub>   | 50 ohm termination<br>To 2.00V below V <sub>CC</sub> | 0.0 mA | ----    | 105 mA   |
| Output current                | I <sub>O</sub>  | Low level Output Current                             | 0.0 mA | ----    | ±50.0 mA |
| Operating temperature         | T <sub>A</sub>  | ----   | 0°C    | ----    | 70°C     |
| Storage temperature           | T <sub>S</sub>  | ----   | -55°C  | ----    | 125°C    |
| Power Dissipation             | P <sub>D</sub>  | ----   | ----   | ----    | 364 mW   |
| Lead temperature              | T <sub>L</sub>  | Soldering, 10 sec.                                   | ----   | ----    | 300°C    |
| Load <sup>(7)</sup>           | 50 Ohm to V <sub>CC</sub> -2V or Thevenin Equivalent, Bias Required | ----   | ----   | ----    | ----     |
| Start-up time                 | t <sub>s</sub>  | ----   | ----   | 2 ms    | 10 ms    |

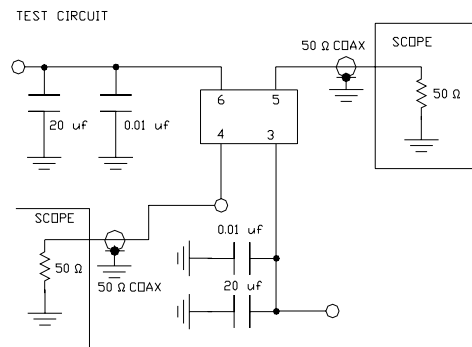
#### Environmental and Mechanical Characteristics

|                     |   |
|---------------------|---|
| 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 <sup>-8</sup> atm.cc/sec of helium |

#### Footnotes:

- Standard frequency stability (±20,±25,±50ppm & others available)
- V<sub>OL</sub>, V<sub>OH</sub>, referenced to ground (V<sub>EE</sub>) with V<sub>CC</sub> = 3.3V
- Jitter performance is frequency dependent. Please contact factory for full Wavecrest characterization. RMS jitter bandwidth of 12kHz to 20MHz.
- Internal high frequency power source decoupling.
- Open to enable pin also enables the output.
- T<sub>pd</sub> is phase shift between the falling edge of pin 4 at 2.0V and the rising edge of pin 5 at 2.01V.
- Logic levels are dependant on specified load of 50 ohms to V<sub>CC</sub>-2 volts.

| Creating a Part Number   |                              |
|--------------------------|------------------------------|
| <b>SU - A29FX - FREQ</b> |                              |
| <b>Package Code</b>      | <b>Tolerance/Performance</b> |
| SU 6 pad 9x14mm SMD      | 0 ±100ppm 0-70°C             |
|                          | 1 ±50ppm 0-70°C              |
|                          | 7 ±25ppm 0-70°C              |
|                          | 9 Customer Specific          |
| <b>Input Voltage</b>     | A ±20ppm 0-70°C              |
| Code Specification       | B ±50ppm -40 to +85°C        |
| A 3.3V                   | C ±100ppm -40 to +85°C       |
| B 2.5V                   |                              |



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