

### Differential Positive ECL (DPECL) HK-29B0 Series

#### Description

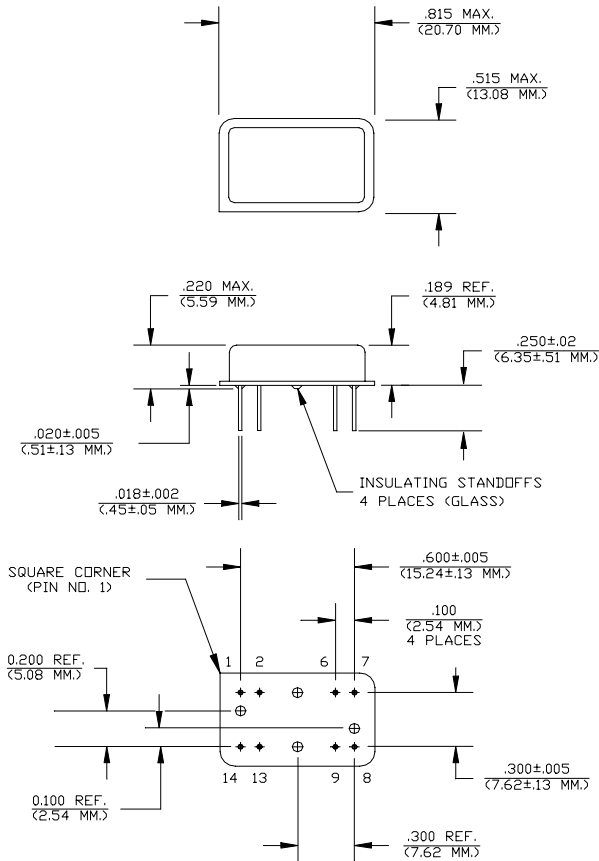
The **HK-29B0 Series** of quartz crystal oscillators provide DPECL Fast Edge compatible signals. This device is to operate using positive voltage and uses multiple ground pins for improved signal integrity. This device is intended to operate on positive voltage for PECL applications.

#### Features

- Wide frequency range—200.0MHz to 525.0MHz
- User specified tolerance available
- Case at electrical ground
- Will withstand vapor phase temperatures of 253°C for 4 minutes maximum
- All metal, resistance weld, hermetically sealed package
- High shock resistance, to 1500g
- Low Jitter
- COTS/Dual use
- Overtone technology
- High Q Crystal actively tuned oscillator circuit
- Power supply decoupling internal
- Dual ground plane for added stability
- No internal PLL avoids cascading PLL problems
- High frequencies due to proprietary design
- RoHS Compliant, Lead Free Construction

#### Electrical Connection

| Pin | Connection           |
|-----|----------------------|
| 1   | V <sub>CC</sub>      |
| 2   | V <sub>EE</sub> Case |
| 6   | V <sub>EE</sub> Case |
| 7   | Output               |
| 8   | /Output              |
| 9   | V <sub>EE</sub> Case |
| 13  | V <sub>EE</sub> Case |
| 14  | Enable/Disable       |



All dimensions expressed in Inches/MM

### HK-29B0 Series Continued Differential Positive ECL (DPECL)

### Operating Conditions and Output Characteristics (5)

#### Electrical Characteristics

| Parameter                          | Symbol          | Conditions   | Min                    | Typical  | Max                    |
|------------------------------------|-----------------|--|------------------------|----------|------------------------|
| Frequency                          | -----           | -----  | 200.0MHz               | -----    | 525.0MHz               |
| Duty Cycle                         | -----           | @ 50% points   | 45/55%                 | -----    | 55/45%                 |
| Logic 0 <sup>(2)</sup>             | V <sub>OL</sub> | -----  | V <sub>CC</sub> -1.95V | -----    | V <sub>CC</sub> -1.60V |
| Logic 1 <sup>(2)</sup>             | V <sub>OH</sub> | -----  | V <sub>CC</sub> -1.02V | -----    | V <sub>CC</sub> -0.74V |
| Rise & Fall Time                   | tr,tf           | 20-80%V <sub>O</sub> with 50 ohm load to V <sub>CC</sub> -2V                                   | -----                  | 350 psec | 600 psec               |
| Jitter, RMS <sup>(3)</sup>         | -----           | -----  | -----                  | -----    | 5 psec                 |
| Enable Voltage <sup>(4)</sup>      | -----           | with V <sub>EE</sub> =0V   | 0V                     | -----    | 1.0V                   |
| Disable Voltage                    | -----           | with V <sub>EE</sub> =0V   | 3.835V                 | -----    | V <sub>CC</sub>        |
| 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 <sub>CC</sub> | -----   | 4.75V  | 5.0V    | 5.25V    |
| Supply Current  | I <sub>CC</sub> | 50 ohm termination<br>To 2.00V below V <sub>CC</sub>                | 0.0 mA | -----   | 120 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    |
| Input: Logic High (ECL) - Disables<br>V <sub>EE</sub> or Open - Enables |                 |   |        |         |          |
| Lead temperature  | T <sub>L</sub>  | Soldering, 10 sec.  | -----  | -----   | 300°C    |
| Load  |                 | 50 Ohm to V <sub>CC</sub> -2V or Thevenin Equivalent, Bias Required |        |         |          |
| Start-up time   | t <sub>s</sub>  | -----   | -----  | 2 ms    | 10 ms    |

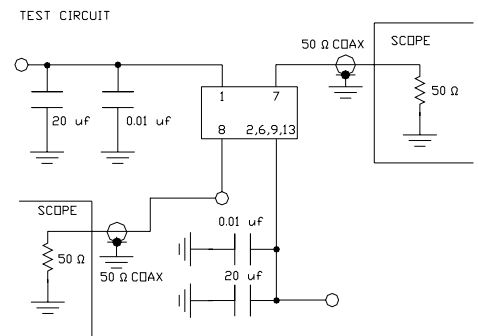
#### Environmental and Mechanical Characteristics

|                     |   |
|---------------------|---|
| Mechanical Shock    | Per MIL-STD-202, Method 213, Condition E                      |
| Thermal Shock       | Per MIL-STD-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 <sup>-8</sup> atm.cc/sec of helium |

#### Footnotes:

- 1) Standard frequency stability (±20,±25,±50ppm & others available)
- 2) V<sub>OL</sub>, V<sub>OH</sub>, referenced to ground
- 3) Jitter performance is frequency dependent. Please contact factory for full characterization. RMS jitter bandwidth of 12kHz to 20MHz.
- 4) Open Enable pin also enables the output.
- 5) All parameters, unless otherwise specified, are at nominal conditions, ie: T=25°C, Nominal Vcc & Nominal Load.

| Creating a Part Number  |                              |
|-------------------------|------------------------------|
| <b>HK - 29BX - FREQ</b> |                              |
| <b>Package Code</b>     | <b>Tolerance/Performance</b> |
| HK Leaded 8 pin (14pin) | 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 -3V FOR EASE OF TESTING.