



**Differential Positive ECL (DPECL)
Fast Edge
HS-2920 Series**

Description

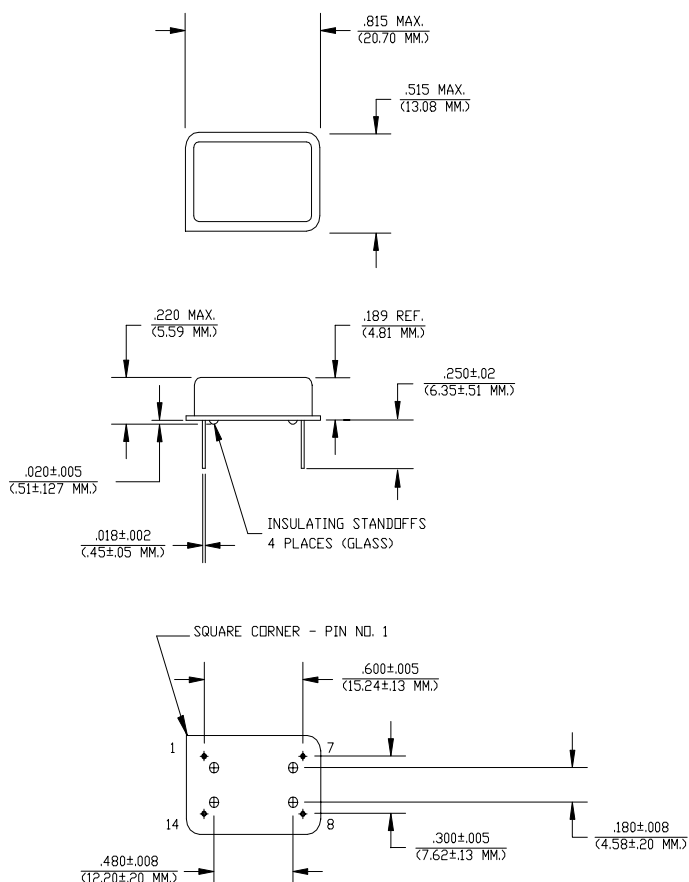
The **HS-2920 Series** of quartz crystal oscillators provide DPECL Fast Edge compatible signals in industry standard four-pin DIP hermetic packages. Systems designers may now specify space-saving, cost-effective packaged PECL oscillators to meet their timing requirements.

Features

- Wide frequency range—50.0MHz to 200.000MHz
- 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
- Fast rise and fall times <600 ps
- Low Jitter
- 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
- RoHS Compliant, Lead Free Construction (unless solder dipped leads are supplied)

Electrical Connection

| Pin | Connection |
|-----|-------------------|
| 1 | Output Complement |
| 7 | V_{EE} /Ground |
| 8 | Output |
| 14 | V_{CC} |



Dimensions are in inches and (MM)

HS-2920 Series Continued Differential Positive ECL (DPECL) Fast Edge

Operating Conditions and Output Characteristics

Electrical Characteristics

| Parameter | Symbol | Conditions | Min | Typical | Max |
|------------------------------------|-----------------|--|-----------|---------|-----------|
| Frequency | ----- | ----- | 50.0MHz | ----- | 200.0MHz |
| Duty Cycle | ----- | @ V _{CC} -1.29V | 45/55% | ----- | 55/45% |
| Logic 0 ⁽²⁾ | V _{OL} | ----- | 1.35V | ----- | 1.70V |
| Logic 1 ⁽²⁾ | 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 ⁽⁴⁾ | ----- | ----- | -200 psec | ----- | +200 psec |
| Jitter, RMS ⁽³⁾ | ----- | ----- | ----- | ----- | 5 psec |
| Frequency Stability ⁽¹⁾ | dF/F | Overall conditions including: voltage, calibration, temp., 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 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 |

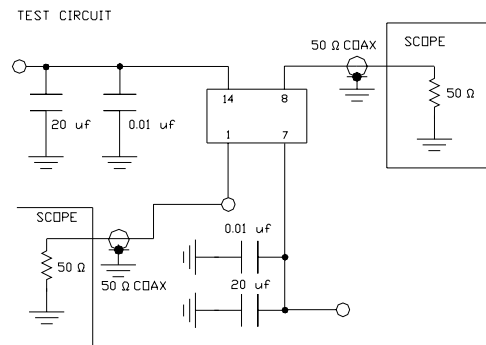
Environmental and Mechanical Characteristics

| | |
|---------------------|---|
| 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 x 10 ⁻⁸ atm.cc/sec of helium |

Footnotes:

- 1) Standard frequency stability (±20,±25,±50ppm & others available)
- 2) V_{OL}, V_{OH}, referenced to ground (V_{EE}) with V_{CC} = 5.0V
- 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 2.0V and the rising edge of pin 1 at 2.01V.

| Creating a Part Number | |
|------------------------------|------------------------------|
| HS - A292X - FREQ | |
| Package Code | Tolerance/Performance |
| HS Leaded 4 pin (14 pin) | 0 ±100ppm 0-70°C |
| SM Leaded 4 pin (14 pin) SMD | 1 ±50ppm 0-70°C |
| Gull Wing | 7 ±25ppm 0-70°C |
| Input Voltage | 9 Customer Specific |
| Code Specification | A ±20ppm 0-70°C |
| A 3.3V | B ±50ppm -40 to +85°C |
| 5V | C ±100ppm -40 to +85°C |



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