DC2073B demo board features Linear Technology’s SOT23 packaged silicon oscillators. The DC2073B demo board is available in eleven different options; DC2073B-A through DC2073B-K. These eleven options provide for the evaluation of resistor-set oscillator ICs and fixed frequency ICs (Table1).

Table 1. Resistor-Set Oscillator ICs and Maximum Frequency Error at TA = 25°C

<table>
<thead>
<tr>
<th>PART NUMBER, BOARD ASSEMBLY</th>
<th>FREQUENCY PROGRAM METHOD</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTC6905, DC2073B-A</td>
<td>Resistor Programmable</td>
<td>17.225MHz ≤ fOSC ≤ 170MHz, ±1.4% at V+ = 2.7V and ±2.2% at V+ = 5V</td>
</tr>
<tr>
<td>LTC1799, DC2073B-B</td>
<td>Resistor Programmable</td>
<td>5kHz ≤ fOSC ≤ 10MHz, ±1.5% at V+ = 3V and ±1.5% at V+ = 5V (Up to 20MHz)</td>
</tr>
<tr>
<td>LTC6900, DC2073B-C</td>
<td>Resistor Programmable</td>
<td>5kHz ≤ fOSC ≤ 10MHz, ±1.5% at V+ = 3V and ±1.5% at V+ = 5V (Up to 20MHz)</td>
</tr>
<tr>
<td>LTC6905-133, DC2073B-D</td>
<td>Three Fixed Frequencies Set by Three-State Input</td>
<td>fOSC = 133MHz, 66.7MHz and 33.5MHz, ±1.0% at V+ = 3V and ±1.5% Typical at V+ = 5V</td>
</tr>
<tr>
<td>LTC6905-100, DC2073B-E</td>
<td>Three Fixed Frequencies Set by Three-State Input</td>
<td>fOSC = 100MHz, 50MHz and 25MHz, ±1.0% at V+ = 3V and ±1.5% Typical at V+ = 5V</td>
</tr>
<tr>
<td>LTC6905-96, DC2073B-F</td>
<td>Three Fixed Frequencies Set by Three-State Input</td>
<td>fOSC = 96MHz, 48MHz and 24MHz, ±1.0% at V+ = 3V and ±1.5% Typical at V+ = 5V</td>
</tr>
<tr>
<td>LTC6905-80, DC2073B-G</td>
<td>Three Fixed Frequencies Set by Three-State Input</td>
<td>fOSC = 80MHz, 40MHz and 20MHz, ±1.0% at V+ = 3V and ±1.5% typical at V+ = 5V</td>
</tr>
<tr>
<td>LTC6906, DC2073B-H</td>
<td>Resistor Programmable</td>
<td>10kHz ≤ fOSC ≤ 1MHz, ±0.5% at V+ = 2.7V to 3.6V and ±0.7% at V+ = 2.25V</td>
</tr>
<tr>
<td>LTC6907, DC2073B-I</td>
<td>Resistor Programmable</td>
<td>400kHz ≤ fOSC ≤ 4MHz, ±0.65% at V+ = 3V to 3.6V</td>
</tr>
<tr>
<td>LTC6908-1, DC2073B-J</td>
<td>Spread Spectrum Modulation, Complementary Outputs (0°/180°) Resistor Programmable</td>
<td>250kHz ≤ fOSC ≤ 5MHz, ±1.5% at V+ = 2.7V and ±2.0% at V+ = 5V</td>
</tr>
<tr>
<td>LTC6908-2, DC2073B-K</td>
<td>Spread Spectrum Modulation, Quadrature Outputs (0°/90°) Resistor Programmable</td>
<td>250kHz ≤ fOSC ≤ 5MHz, ±1.5% at V+ = 2.7V and ±2.0% at V+ = 5V</td>
</tr>
</tbody>
</table>
**QUICK START PROCEDURE**

**Test Equipment:**

1. A single 3V power supply.
2. An oscilloscope with a bandwidth of at least 5x f_{OSC}.
   (For example, if f_{OSC} = 100MHz then use a 500MHz oscilloscope).
3. A screwdriver to adjust the potentiometer.

**Note:** The DC2073B potentiometer is shorted with a zero ohm resistor for factory testing. The zero ohm (RJ10) resistor must be removed to allow setting the frequency with a screwdriver. If the potentiometer is set to a high value (>100k), then touching the DC2073B can produce output jitter.

**Basic Test Procedure:**

1. Connect power supply to V+ and GND, turrets E4 and E5.
2. Connect oscilloscope probe to OUT1 and GND.
   
   **Note:** The ground lead of an oscilloscope probe has a series inductance that can generate a resonant circuit with the probe’s capacitance. Probe resonance adds transient peaks and ringing on a high speed waveform. Reliable probing of the high frequency LTC6905 and LTC6905-XXX (with corresponding demo boards DC2073B-A, -D, -E, -F or -G), must use a very short connection of the oscilloscope probe ground to the board GND (see probe tip picture in Figure 1 Test Setup).
3. Set the JP1 jumper to the N divider position for the desired frequency shown on Table2.
4. Turn on supply.
5. The oscilloscope display shows a 3V squarewave (0V to 3V).
6. For the resistor-set ICs (DC2073B-A, -B, -C, -H, -I, -J or -K) turn the RPOT potentiometer for the desired frequency. (The frequency adjustment is very coarse when the potentiometer is turned near the fully clockwise or counter-clockwise position).

**Verify Oscillator Accuracy**

The f_{OSC} accuracy of the resistor-set ICs (DC2073B-A, -B, -C, -H, -I, -J or -K), can be verified by setting RSET to the exact value from the f_{OSC} equation shown in Table 2. For the DC2073B-A, -B, -C, -J, -K, RSET = RPOT + RSET2. RSET1 and RSET2 are never installed on the same board. Connecting an ohmmeter across RPOT and RSET1 or RSET2 forces current into the IC set pin (Pin 3 or 4) and causes an error in the ohmmeter reading. The RS resistor is in series with RPOT and equal to RSET1 or RSET2 and the equivalent RSET = RPOT + RS.

**Procedure to Verify Oscillator Accuracy**

**a.** Calculate RSET for the desired frequency (RSET in Table 2).
**b.** Remove the power supply leads from DC2073B and connect an ohmmeter from POT (E6) to V+ (DC2073B-A, -B, -C, -J or -K) or GND (DC2073B-H or-I).
**c.** Adjust RPOT for the exact value of RSET needed.

**Note:** If the potentiometer is turned near the fully clockwise or counter-clockwise position the RPOT adjustment may be too coarse for setting an exact RSET value. In addition, for a frequency adjustment near the upper or lower f_{OSC} range, RSET may be greater or less than the default DC2073B RPOT + RSET1 or RSET2 value, in this case the RSET1 or RSET2 resistor must be removed and replaced with a lower or higher value.
QUICK START PROCEDURE

Figure 1. Test Setup

RJ10 is a zero ohm resistor and must be removed for RPOT adjustment.

High speed probing for LTC6905 and LTC6905-XXX.

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# QUICK START PROCEDURE

## Table 2. f_{OSC} Frequency and N Divider Setting

### LTC6905, DC2073B-A

\[
\frac{f_{OSC}}{N} = \frac{\left( 68.5MHz \cdot 10k\Omega \right)}{R_{SET}} + \frac{1.5MHz}{N} \cdot 10k\Omega
\]

- \( N = 1 \) (JP1 to V⁺), 68.9MHz ≤ f_{OSC} ≤ 170MHz
- \( N = 2 \) (JP1 to OPEN), 34.45MHz ≤ f_{OSC} ≤ 85MHz
- \( N = 4 \) (JP1 to GND), 7.225MHz ≤ f_{OSC} ≤ 42.5MHz

### LTC6900, DC1073A-C

\[
\frac{f_{OSC}}{N} = \frac{10MHz}{R_{SET}}, R_{SET} = \frac{20k\Omega}{10MHz}
\]

- \( N = 1 \) (JP1 to GND), 500kHz ≤ f_{OSC} ≤ 20MHz
- \( N = 10 \) (JP1 to OPEN), 50kHz ≤ f_{OSC} ≤ 2MHz
- \( N = 100 \) (JP1 to V⁺), 5kHz ≤ f_{OSC} ≤ 200kHz

### LTC6905-10, DC2073B-E

\[
\frac{f_{OSC}}{N} = \frac{100MHz}{N}
\]

- \( N = 1 \) (JP1 to V⁺), f_{OSC} = 100MHz
- \( N = 2 \) (JP1 to OPEN), f_{OSC} = 50MHz
- \( N = 4 \) (JP1 to GND), f_{OSC} = 25MHz

### LTC6905-80, DC2073B-G

\[
\frac{f_{OSC}}{N} = \frac{80MHz}{N}
\]

- \( N = 1 \) (JP1 to V⁺), f_{OSC} = 80MHz
- \( N = 2 \) (JP1 to OPEN), f_{OSC} = 40MHz
- \( N = 4 \) (JP1 to GND), f_{OSC} = 20MHz

### LTC6907, DC2073B-I

\[
\frac{f_{OSC}}{N} = \frac{4MHz \cdot 50k\Omega}{R_{SET}}, R_{SET} = \frac{4MHz \cdot 50k\Omega}{N}
\]

- \( N = 1 \) (JP1 to GND), 0.4MHz ≤ f_{OSC} ≤ 4MHz
- \( N = 3 \) (JP1 to OPEN), 1.33MHz ≤ f_{OSC} ≤ 3.33MHz
- \( N = 10 \) (JP1 to V⁺), 40kHz ≤ f_{OSC} ≤ 400kHz

### LTC6908-1, DC2073B-K

- Quadrature Outputs (0°/90°) without Modulation: 250kHz ≤ f_{OSC} ≤ 5MHz, (JP1 to DIV/MOD)
  \[
  \frac{f_{OSC}}{N} = \frac{10MHz \cdot 10k\Omega}{R_{SET}}, R_{SET} = \frac{10MHz \cdot 10k\Omega}{N}
  \]

  Spread Spectrum Modulation Rate:
  - (JP1 to GND), f_{OSC}/16
  - (JP1 to OPEN), f_{OSC}/32
  - (JP1 to V⁺), f_{OSC}/64

### LTC6906, DC2073B-H

\[
\frac{f_{OSC}}{N} = \frac{1MHz \cdot 100k\Omega}{R_{SET}}, R_{SET} = \frac{1MHz \cdot 100k\Omega}{N}
\]

- \( N = 1 \) (JP1 to GND), 0.1MHz ≤ f_{OSC} ≤ 1MHz
- \( N = 3 \) (JP1 to OPEN), 33kHz ≤ f_{OSC} ≤ 333kHz
- \( N = 10 \) (JP1 to V⁺), 10kHz ≤ f_{OSC} ≤ 100kHz

### LTC6908-1, DC2073B-J

- Complementary Outputs (0°/180°) without Modulation: 250kHz ≤ f_{OSC} ≤ 5MHz, (JP1 to DIV/MOD)
  \[
  \frac{f_{OSC}}{N} = \frac{10MHz \cdot 10k\Omega}{R_{SET}}, R_{SET} = \frac{10MHz \cdot 10k\Omega}{N}
  \]

  Spread Spectrum Modulation Rate:
  - (JP1 to GND), f_{OSC}/16
  - (JP1 to OPEN), f_{OSC}/32
  - (JP1 to V⁺), f_{OSC}/64

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