

LTC6930-X.XX, PRECISION DIGITALLY CONTROLLED OSCILLATORS

LTC6930-4.19, LTC6930-5.00, LTC6930-7.37, LTC6930-8.00, LTC6930-8.19

32.768KHZ - 8.192MHZ

DESCRIPTION

Demonstration Circuit 1141A features the LTC6930-X.XX series family of very low power precision silicon oscillators with a frequency error less than 0.09% at 25 °C. For each oscillator, the user can select one of 8 frequencies between 32.768 kHz and 8.192 MHz. Based on fixed master oscillator frequency internal frequency dividers between 1 and 128 provide the 8 different frequencies.

The LTC6930 requires no external components other than power supply bypass capacitors and operates with a single 1.7V to 5.5V supply.

A DC1141A PCB assembly consists of a 2 inch X 2 inch buffer board with a BNC output and a DIP-8 oscillator board mounted on an 8-pin socket. The DIP-8 oscillator board can be removed from the buffer board and used for prototyping.

The three digitally controlled inputs of an LTC6930-X.XX (DIVA, DIVB and DIVC) can be set on a DC1141A-X with three jumpers or set externally by connecting wires to the on board turrets.

The Digital Input and Divider Setting:

| DIVC | DIVB | DIVA | DIVIDE BY |
|------|------|------|-----------|
| 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 2 |
| 0 | 1 | 0 | 4 |
| 0 | 1 | 1 | 8 |
| 1 | 0 | 0 | 16 |
| 1 | 0 | 1 | 32 |
| 1 | 1 | 0 | 64 |
| 1 | 1 | 1 | 128 |

Note: DIVC is the MSB

There are five DC1141A boards:

1. DC1141A-A with an LTC6930-4.19
2. DC1141A-B with an LTC6930-5.00
3. DC1141A-C with an LTC6930-7.37
4. DC1141A-D with an LTC6930-8.00
5. DC1141A-E with an LTC6930-8.19

Design files for these circuit boards are available.

Call the LTC factory.

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THE LTC6930-X.XX FREQUENCIES

The LTC6930-4.19 (DC1141A-A)

| DIVC | DIVB | DIVA | Frequency |
|------|------|------|-------------|
| 0 | 0 | 0 | 4.194304MHz |
| 0 | 0 | 1 | 2.097152MHz |
| 0 | 1 | 0 | 1.048576MHz |
| 0 | 1 | 1 | 524.288kHz |
| 1 | 0 | 0 | 262.144kHz |
| 1 | 0 | 1 | 131.072kHz |
| 1 | 1 | 0 | 65.536kHz |
| 1 | 1 | 1 | 32.768kHz |

The LTC6930-5.00 (DC1141A-B)

| DIVC | DIVB | DIVA | Frequency |
|------|------|------|------------|
| 0 | 0 | 0 | 5.0000MHz |
| 0 | 0 | 1 | 2.5000MHz |
| 0 | 1 | 0 | 1.2500MHz |
| 0 | 1 | 1 | 625.000kHz |
| 1 | 0 | 0 | 312.500kHz |
| 1 | 0 | 1 | 156.250kHz |
| 1 | 1 | 0 | 78.1250kHz |
| 1 | 1 | 1 | 39.0625kHz |

The LTC6930-7.37 (DC1141A-C)

| DIVC | DIVB | DIVA | Frequency |
|------|------|------|-----------|
| 0 | 0 | 0 | 7.3728MHz |
| 0 | 0 | 1 | 3.6864MHz |
| 0 | 1 | 0 | 1.8432MHz |
| 0 | 1 | 1 | 921.6kHz |
| 1 | 0 | 0 | 460.8kHz |
| 1 | 0 | 1 | 230.4kHz |
| 1 | 1 | 0 | 115.2kHz |
| 1 | 1 | 1 | 57.6kHz |

DC1141A QUICK START GUIDE

The LTC6930-8.00 (DC1141A-D)

| DIVC | DIVB | DIVA | Frequency |
|------|------|------|-----------|
| 0 | 0 | 0 | 8.000MHz |
| 0 | 0 | 1 | 4.000MHz |
| 0 | 1 | 0 | 2.000MHz |
| 0 | 1 | 1 | 1.000MHz |
| 1 | 0 | 0 | 500.0kHz |
| 1 | 0 | 1 | 250.0kHz |
| 1 | 1 | 0 | 125.0kHz |
| 1 | 1 | 1 | 62.5kHz |

The LTC6930-8.19 (DC1141A-E)

| DIVC | DIVB | DIVA | Frequency |
|------|------|------|-----------|
| 0 | 0 | 0 | 8.192MHz |
| 0 | 0 | 1 | 4.096MHz |
| 0 | 1 | 0 | 2.048MHz |
| 0 | 1 | 1 | 1.024MHz |
| 1 | 0 | 0 | 512.0kHz |
| 1 | 0 | 1 | 256.0kHz |
| 1 | 1 | 0 | 128.0kHz |
| 1 | 1 | 1 | 64.0kHz |

QUICK START PROCEDURE

Test Equipment:

1. A single power supply, 3V – 5V.
2. An oscilloscope with at least 100MHz bandwidth.
3. A frequency counter

Test Procedure:

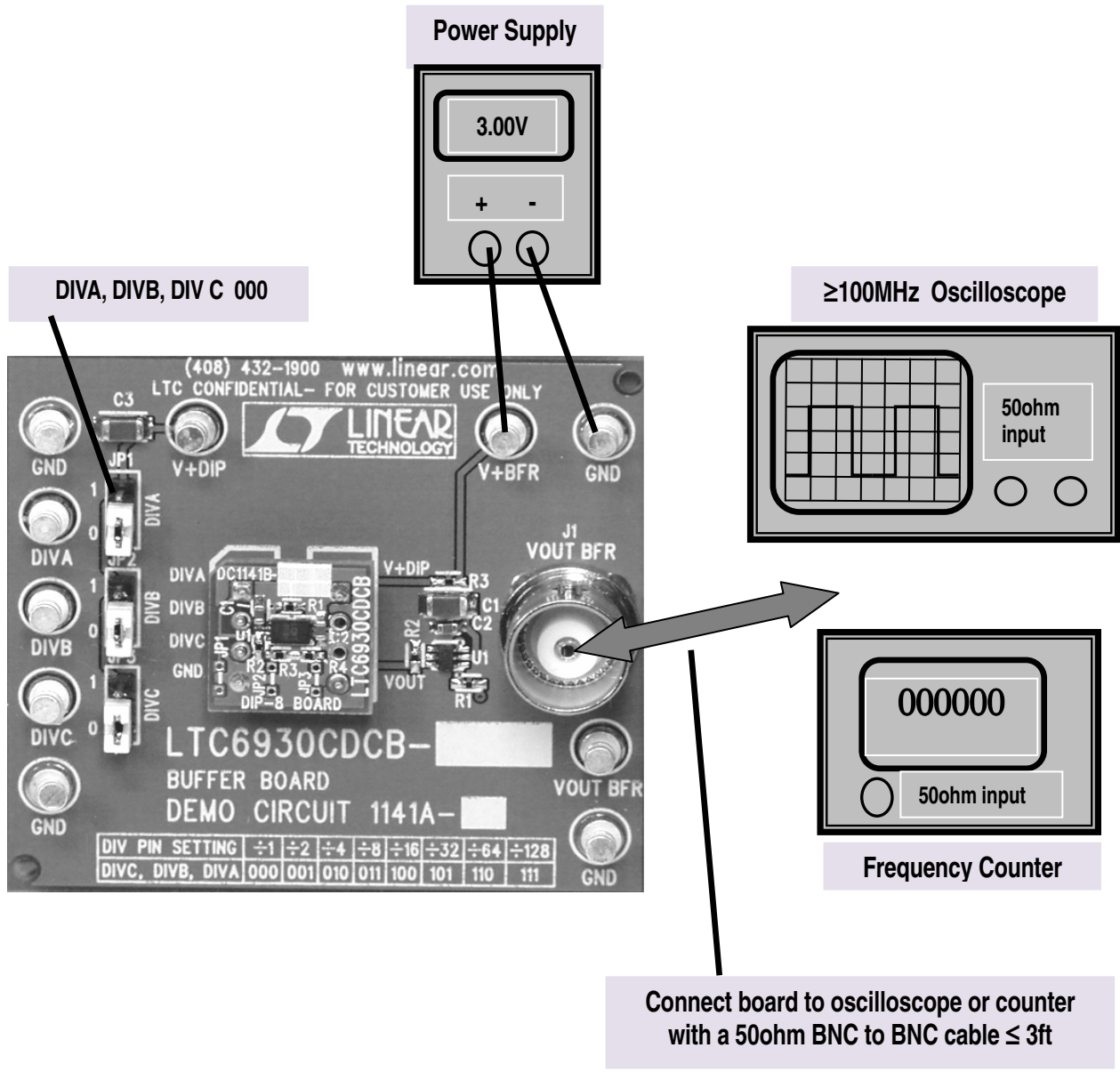
1. On the DC1141A-X.XX board set the DIVA, DIVB and DIVC jumpers to the “0” position.
2. Set power supply for 3.00V.
3. Connect power supply as shown in Figure 1.
4. Connect the VOUT BFR (J1) of the board to an oscilloscope input terminated with 50ohms.
5. Turn on the power supply.
6. The oscilloscope should show a “clean” squarewave 0V to 1.375V (the LTC6930 output is 0V to 3V and is divided by two thru the on board buffer with a typical 2.75V logic high).
7. Remove the board connection to the oscilloscope and connect to a frequency counter.
8. The counter’s frequency should be equal to the highest LTC6930-X.XX frequency $\pm 0.9\%$.

Highest Frequency (DIVC, DIVB, DIVA is 000)

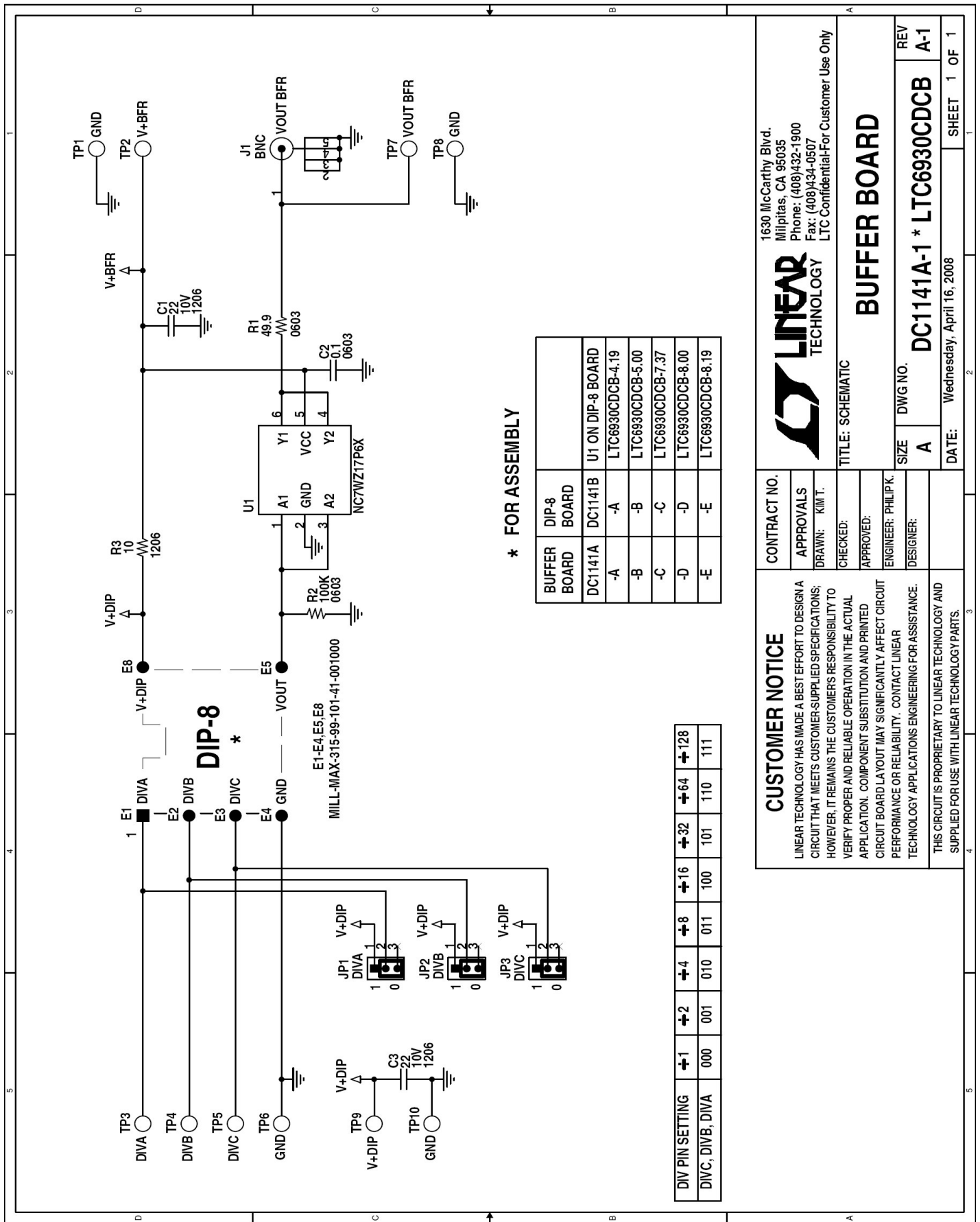
| | |
|-----------|-------------|
| DC1141A-A | 4.194304MHz |
| DC1141A-B | 5.000MHz |
| DC1141A-C | 7.3728MHz |
| DC1141A-D | 8.000MHz |
| DC1141A-E | 8.192MHz |

End of test.

Figure 1. Quick Test Set-Up



DC1141A QUICK START GUIDE



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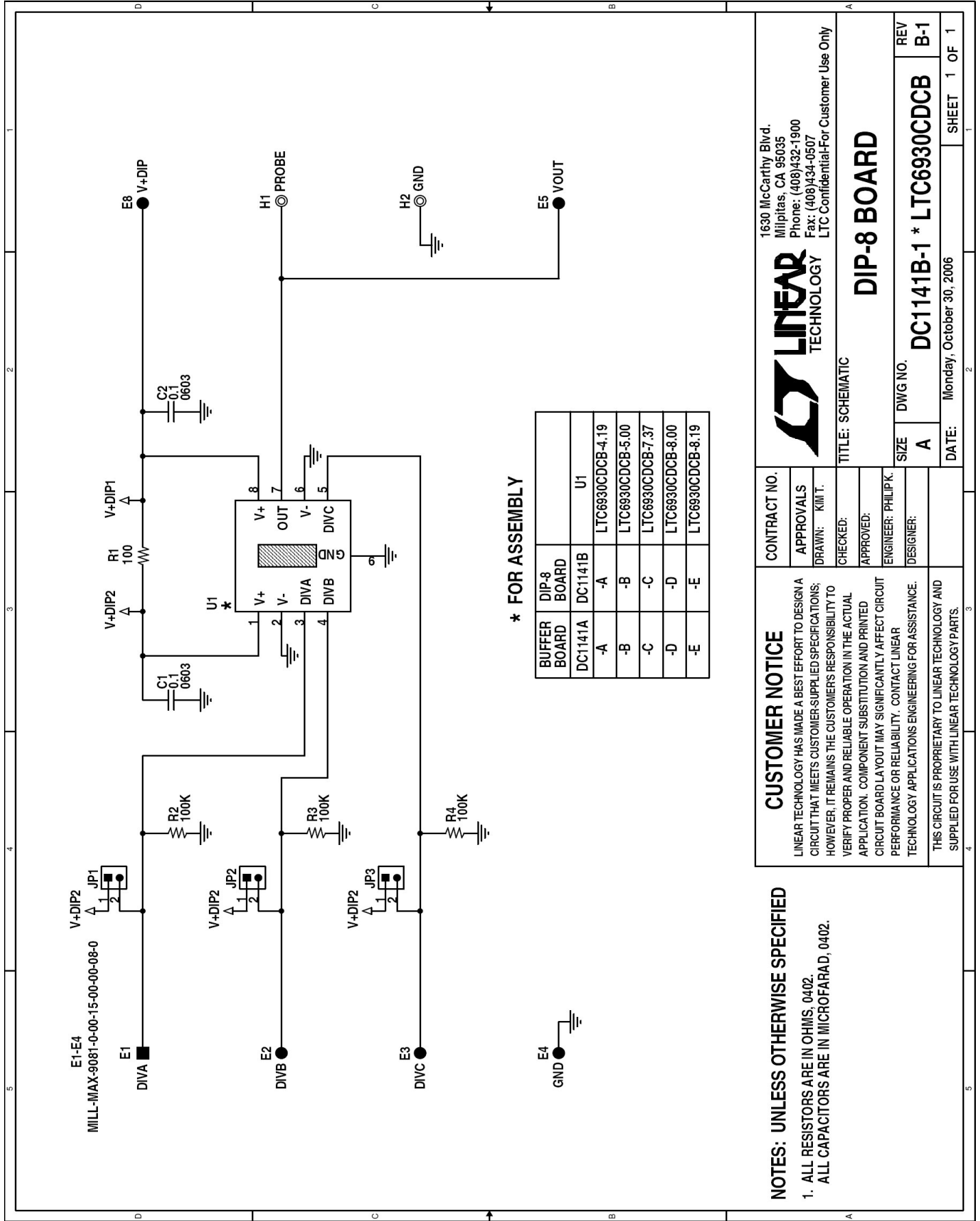
BUFFER BOARD

SIZE: A
 DWG NO.: DC1141A-1 * LTC6930DCB
 REV: A-1

CUSTOMER NOTICE
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 THIS CIRCUIT IS PROPRIETARY TO LINEAR TECHNOLOGY AND SUPPLIED FOR USE WITH LINEAR TECHNOLOGY PARTS.

CONTRACT NO.
 APPROVALS
 DRAWN: KIM T.
 CHECKED:
 APPROVED:
 ENGINEER: PHILIP K.
 DESIGNER:
 DATE: Wednesday, April 16, 2008
 SHEET 1 OF 1

DC1141A QUICK START GUIDE



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CONTRACT NO.
APPROVALS
 DRAWN: KIM T.
 CHECKED:
 APPROVED:
 ENGINEER: PHILIPK.
 DESIGNER:

TITLE: SCHEMATIC
DIP-8 BOARD
 SIZE DWG NO. **DC1141B-1 * LTC6930DCB** REV **B-1**
 DATE: Monday, October 30, 2006 SHEET 1 OF 1

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NOTES: UNLESS OTHERWISE SPECIFIED
 1. ALL RESISTORS ARE IN OHMS, 0402.
 ALL CAPACITORS ARE IN MICROFARAD, 0402.



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