

## DESCRIPTION

Demonstration circuit DC890B along with PScope™ software provides a USB based Windows PC hosted digital data acquisition system supporting CMOS/LVDS output ADCs up to 250MSPs. The DC890B must be powered from an external 6VDC  $\pm 0.5$ VDC power supply when operating in LVDS mode. When operating in CMOS mode, the external power supply is optional. The Linear Technology supplied PScope evaluation software automatically detects the DC890B and can also detect many of the standard ADC demonstration circuits boards. *The DC890B will not enable LVDS mode unless an external 6.0VDC power source is available.* This system provides for fast and easy performance evaluation of high speed ADCs. DC890B collects up to 256K word samples and then performs

various analyses on the data including calculating SNR, SINAD, THD, SFDR and ENOB. The digitized input, an FFT of the collected data, the primitive wave of the sample set or an IFFT of modified frequency domain data is plotted to a display window to facilitate analyzing distortion products and sources. Figure 1 shows a picture of the DC890B. The DC890B is connected to the ADC demonstration circuit via a 100-pin edge connector, to the PC by a USB A-B cable and to an optional power supply either by a 5mm power plug or optionally by turrets. Figure 2 details the connections.

**Design files for this circuit board are available at**  
<http://www.linear.com/demo>

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## BOARD PHOTO

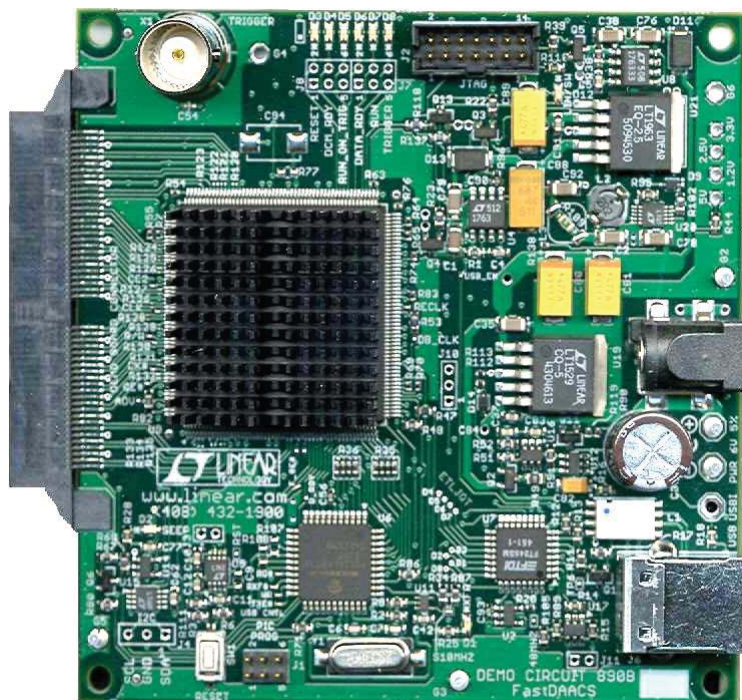


Figure 1. DC890B Board

## OPERATING PRINCIPLES

The DC890B is capable of collecting a block of data samples from an ADC demonstration circuit initiated either by an internally generated trigger or an externally supplied 2.5V CMOS level trigger of user selected edge. The external trigger is TTL or CMOS compatible (the trigger line is diode clamped to the 2.5V Rail through a 475Ω resistor).

Refer to the PScope software help for information on the various operating modes and options. The conversion clock to the DC890B is supplied via the ADC demonstration circuit either from an optional on board oscillator if installed or an external signal generator connected to the ADC demonstration circuit.

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## QUICK START PROCEDURE

To prevent damage to the DC890B, it is important to follow the equipment setup procedure outlined below:

1. Do not plug the DC890B into the PC USB port before running the installation program
2. Download the PScope installation program from <http://www.linear.com/software/>.
3. Run the PScope installation program and follow the on-screen instructions.

**NOTE:** The PScope evaluation software requires a PC running Windows 98, 2000, XP, or later, with an available USB port.

4. Connect the DC890B to the USB port and supply external power to the DC890B, if you will be using the LVDS mode. Do not use a USB cable longer than 2m or the board may not reset properly. (See note in Trouble Shooting section.)
5. Connect only 2.5V CMOS or LVDS output ADC demonstration circuits directly to the DC890B via the 100 pin edge connector. All Linear Technology DC890 compatible demo boards meet these requirements. Apply DC power to the ADC demonstration circuit.
6. Each ADC demonstration board also comes with a quick start guide similar to this one and should be referred to for specific usage details relevant to the demonstration

circuit being evaluated. Please refer to it for proper jumper settings, input power requirements and input signal levels and frequency ranges.

7. Apply an appropriate conversion clock and analog input signal to the ADC demonstration board.
8. ADC board will be automatically detected and configured.
9. Select processing options (the hammer icon) menu and verify that under trigger mode, no trigger wait is selected
10. Enter the exact sample rate in MHz and select the sample size in the provided fields in PScope page 1.

**NOTE:** Minimum sample rate in LVDS mode is 50MSPS.

11. If the sampled signal is not coherent with the encode clock, select an appropriate windowing function from the pull down menu.
12. Initiate a data collection cycle by clicking the green collect button; it will turn red during the collection cycle. An FFT should appear on the screen along with a plot of the sampled data. Make sure the input level is not over ranging the ADC. See online help for specific guidance on using the PScope software.

## QUICK START PROCEDURE

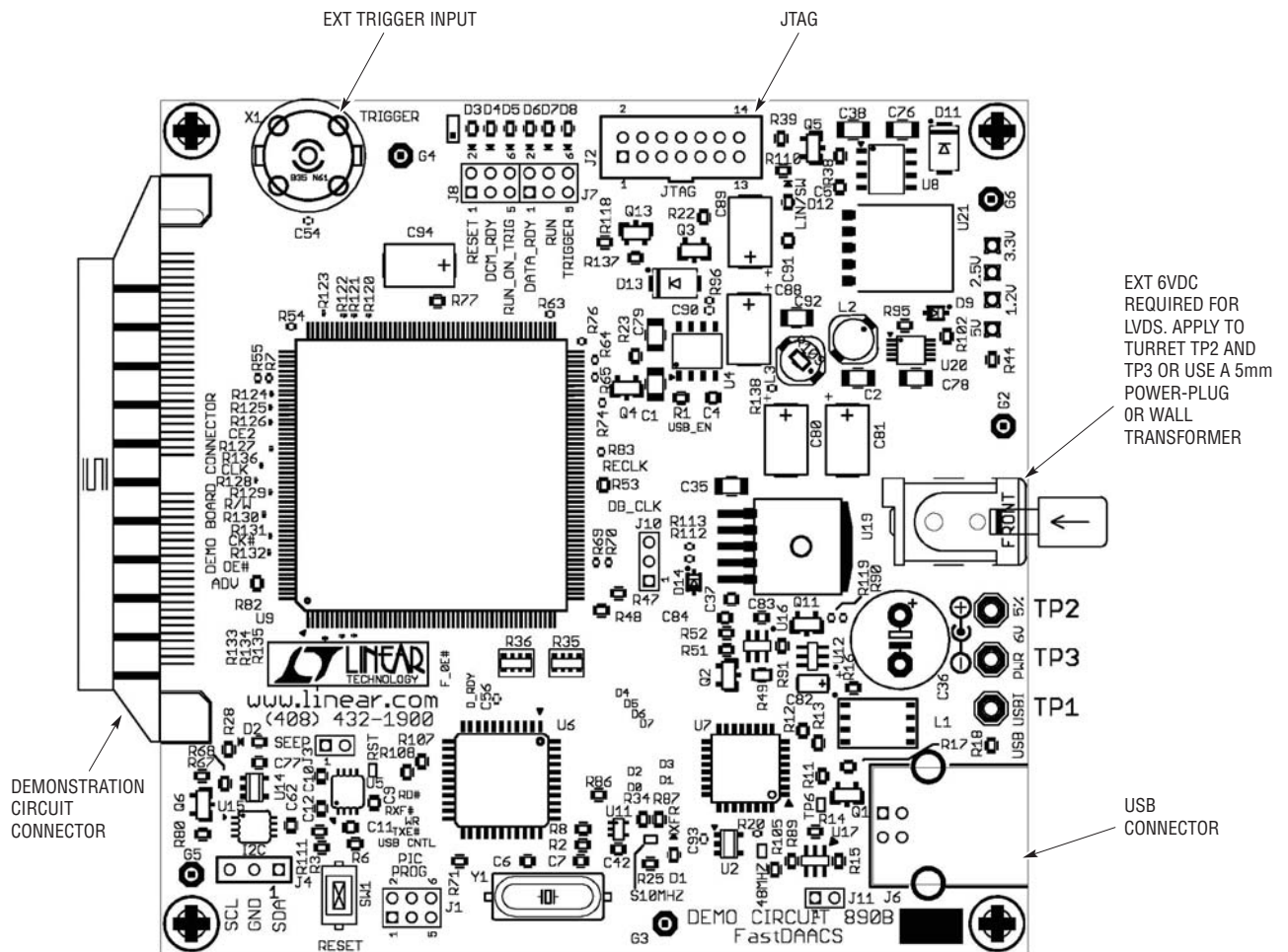


Figure 2. DC890B Basic Connection Locations

## USEFUL SOFTWARE TOOLS

The PScope software includes tools for automatic software updates and for quickly retrieving documentation from the world wide web.

**NOTE:** Adobe Acrobat Reader is required to view the documents and is available at <http://www.adobe.com>.

**To update the PScope software (requires an internet connection):**

- Choose Update Program from the tools menu.

This automatically updates the main program and drivers for individual demo circuits.

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## OPTIONAL CONNECTIONS TO THE DC890B

- In CMOS mode the DC890B can operate from the USB power, however in LVDS mode, the Spartan-III FPGA IO ring drivers draw considerable supply current to bias the active LVDS terminations. The DC890B has provisions for a 5mm power plug for an external  $6V \pm 0.5V$  supply. The DC890B automatically detects the presence of external power and disables the USB power input.
- X1: The DC890B has provisions for an external trigger input, edge selectable by software. This permits initiating data block capture by an external event.
- J2: A JTAG connector is provided for downloading custom FPGA software to the board. Grounding pin 3 of J2 automatically puts the FPGA into JTAG program-

ming mode. User developed code can be loaded into the FPGA without compromising the factory installed code. Jumper pins 4 and 6 of PIC programming connector J1 to disable the microcontroller when using custom FPGA code. Refer to the schematic for further details.

**This feature is provided due to customer requests. Development of custom code will not be supported by the factory.**

- J7 and J8 locations (not installed) provide access to six additional FPGA pins for test purposes. These pins also drive LED indicators useful for debug purposes. Xilinx provides logic analysis and data collection features through JTAG via ChipScope.

## LED INDICATORS

The DC890B provides system status via eight LEDs:

- LED-1. TRANSFER – Indicates a USB data transfer from the PScope to the PC is in progress.
- LED-2. SEEP – Indicates access of the optional demonstration circuit serial electrically erasable PROM on select demonstration boards. Information in this SEEP permits PScope software to configure the DC890B properly for the device under evaluation using the auto detect demo board feature in the configure/device menu.
- LED-3. RST – Indicates assertion of either a hard or soft reset.
- LED-4. DCM\_RDY– In LVDS mode, LED 4 blinks to alert the user that the sample clock is either not present or outside the required frequency range ( $F_{IN}$  must be  $> 50$  MHz). A steady on condition indicates the digital clock module is locked to the input sample clock. In CMOS mode LED 4 functions as a power-on/FPGA programmed Indicator.
- LED-5. RUN ON TRIGGER – Indicates that the board is set to run on trigger (versus halt on trigger mode).
- LED-6. DATA\_RDY – Indicates completion of data block acquisition.
- LED-7. RUN – Indicates the board is ARMED to collect a block of data.
- LED-8. TRIGGER – Indicates that a trigger was received and data collection has started.

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## CIRCUIT DETAILS

A schematic, parts list and parts placement drawings are attached to the end of this quick start guide for reference only.



## TROUBLE SHOOTING GUIDE

**Problem:** DC890B is plugged in, but PScope software still does not recognize DC890B board.

**Solution:** Assuming that the USB hardware in your computer is operational (try verifying an operational USB port with another USB device such as a USB memory stick, printer or scanner if available.), the likely cause is improper installation of the USB drivers, which results in Windows recognizing the DC890B as an *unknown device*. If this is the case, the problem can be corrected by the following procedure:

- 1) Unplug the DC890B board from the USB port.
- 2) Reinstall the PScope software. **Carefully** following the on-screen instructions. This **may** require a reboot of your computer. The on-screen instructions will inform you if that is the case.
- 3) If the problem persists, please choose *contact software support* from the tools menu for assistance from LTC staff.

**Problem:** Demonstration circuit software loads properly, but will not run or gives *device not accessible* errors.

**Solution:** Verify the demonstration circuit is properly powered up and a correct (signal level and frequency) conversion clock is applied. (The DC890B can operate from the USB port power in CMOS mode but will not load the FPGA with the LVDS code unless external power is detected.) Set the correct sample rate for the applied conversion clock as PScope software uses the sample size and rate to determine the watch dog time out period

to reset the DC890B if the USB bus should hang. Refer to the appropriate demonstration circuit quick start guide for details.

**Problem:** Collected data samples look like noise or appear corrupted.

**Solution:** Make sure the proper device has been selected in the PScope software, the factory jumper settings are present and for LVDS output demo boards, external power is applied to the DC890B otherwise the captured data will not be properly interpreted.

**Problem:** PScope reports it cannot reset the DC890B.

**Solution:** Make sure either a powered USB port is used or external power is supplied. **DO NOT USE A USB CABLE LONGER THAN 2 METERS.** The time delay of a longer USB cable may result in the DC890B intercepting the reset.

**Problem:** USB Bus appears to be hung.

**Solution:** As the DC890B is used in a lab environment where power may be inappropriately sequenced, cables unintentionally disconnected etc, some users have reportedly had their USB bus hang. This condition is easily rectified by right clicking properties under my computer ⇒ Hardware ⇒ Device Manager ⇒ and then right clicking on the appropriate USB bus controller and again selecting properties. The device status generally reports that it is working properly. Select the advanced tab. You will notice a refresh button. Device manager has queried the port, and as a result, reset the bus.

## PARTS LIST

| ITEM | QTY | REFERENCE                                                                         | PART DESCRIPTION                    | MANUFACTURER/PART NUMBER                                            |
|------|-----|-----------------------------------------------------------------------------------|-------------------------------------|---------------------------------------------------------------------|
| 1    | 3   | C80, C81, C89                                                                     | CAP, TANT, 470µF, 10V 20% 7343      | AVX TPSE477M010R0050                                                |
| 2    | 0   | C94 (OPTION)                                                                      | CAP, TANT, 470µF, 10V 20% 7343      | AVX TPSE477M010R0050                                                |
| 3    | 0   | C88 (OPTION)                                                                      | CAP, POLY-TA, 1000µF 4V 20% 7343    | KEMET T530X108M004ASE006                                            |
| 4    | 1   | C88                                                                               | CAP, POLY-TA, 680µF 4V 20% 7343     | KEMET T520D687M004ASE025                                            |
| 5    | 1   | C36                                                                               | CAP, 330µF 16V 20PCT                | NICHICON UPH1C331MPD6                                               |
| 6    | 9   | C1, C2, C32, C35, C38, C76, C78, C79, C92                                         | CAP, X5R 10µF 6.3V 20% 1206         | TAIYO YUDEN JMK316BJ106ML-T                                         |
| 7    | 1   | C82                                                                               | CAP, TANT, 4.7µF, 10V 20% 3216      | AVX TAJA475M010R                                                    |
| 8    | 5   | C8, C37, C60, C77, C91                                                            | CAP, X5R 1µF 10V 10% 0603           | AVX 0603ZD105KAT                                                    |
| 9    | 1   | C83                                                                               | CAP, X5R 0.22µF 16V 20% 0603        | AVX 0603YD224MAT                                                    |
| 10   | 15  | C11, C12, C27 TO C31, C34, C42, C44, C52, C53, C57, C62, C85                      | CAP, X7R 0.1µF 16V 10% 0603         | AVX 0603YC104KAT                                                    |
| 11   | 43  | C13 TO C26, C39, C40, C45 TO C50, C54 TO C56, C58, C59, C61, C63 TO C75, C90, C93 | CAP, X5R, 0.1µF, 10V 10% 0402       | AVX 0402ZD104KAT                                                    |
| 12   | 1   | C43                                                                               | CAP, X7R 0.047µF 16V 10% 0603       | AVX 0603YC473KAT                                                    |
| 13   | 5   | C4, C5, C33, C84, C87                                                             | CAP, X7R 0.01µF 16V 10% 0603        | AVX 0603YC103KAT                                                    |
| 14   | 1   | C10                                                                               | CAP, X7R 2200pF 25V 10% 0603        | AVX 06033C222KAT2A                                                  |
| 15   | 0   | C9 (OPTION)                                                                       | CAP, X7R 2200pF 25V 10% 0603        | AVX 06033C222KAT2A                                                  |
| 16   | 1   | C41                                                                               | CAP, X7R 1000pF 25V 10% 0603        | AVX 06033C102KAT2A                                                  |
| 17   | 0   | C86 (OPTION)                                                                      | CAP, X7R 1000pF 25V 10% 0603        | AVX 06033C102KAT2A                                                  |
| 18   | 1   | C51                                                                               | CAP, NPO, 100pF 25V 10% 0603        | AVX 06033A101KAT2A                                                  |
| 19   | 3   | C3, C6, C7                                                                        | CAP, NPO 22pF 50V 10% 0603          | AVX 06035A220KAT                                                    |
| 20   | 9   | D1 TO D8, D12                                                                     | LED, GRN 0603                       | LITE ON LTST-C190KGKT                                               |
| 21   | 1   | D10                                                                               | DIODE, DUAL SCHOTTKY, SOT23         | DIODES INC BAT54S-7                                                 |
| 22   | 2   | D11, D13                                                                          | RECTIFIER, GP 1A 50V SMA            | DIODE INC S1A -13                                                   |
| 23   | 2   | D9, D14                                                                           | DIODE, GP 200V 200MA SOD323         | DIODES INC BAV20WS                                                  |
| 24   | 1   | J1                                                                                | HEADER, 3 × 2, 2mm                  | COMM CON 2202S-06G2                                                 |
| 26   | 1   | J2                                                                                | HEADER, 2 × 7, 2mm                  | MOLEX 87831-1420                                                    |
| 27   | 0   | J3, J11 (OPTION)                                                                  | HEADER, 2 × 1, 2mm                  | COMM CON 3201S-02G2                                                 |
| 28   | 1   | J4                                                                                | HEADER, 3 × 1, 100MIL               | SAMTEC TSW-103-26-L-S                                               |
| 29   | 1   | J5                                                                                | CON, EDGE, 100PIN, 0.063            | SAMTEC MEC8-150-02-L-D-EM2                                          |
| 30   | 1   | J6                                                                                | CON, USB-B, 4 PINS, SINGLE THR HOLE | MILL-MAX 897-30-004-90-000<br><b>ALTERNATE 897-43-004-90-000000</b> |
| 31   | 1   | J9                                                                                | CONNECTOR, POWER 5mm                | CUI INC PJ-002A-SMT                                                 |
| 32   | 0   | J10 (OPTION)                                                                      | HEADER, 3 × 1, 2mm                  | COMM CON 3201S-03G2                                                 |
| 33   | 0   | L1                                                                                | CHOKE, COMMON MODE, QUAD, 5µH       | COILCRAFT TTDLF4500                                                 |
| 34   | 1   | <b>L1 ALTERNATE</b>                                                               | CHOKE, COMMON MODE, QUAD, 5µH       | COILCRAFT PDLF4500                                                  |
| 35   | 1   | L2                                                                                | IND, PWR, 2.2UH, D52LC              | TOKO D52LC #A914BYW-2R2M                                            |
| 36   | 0   | L3 (OPTION)                                                                       | IND, PWR, 2.2UH, D52LC              | TOKO D52LC #A914BYW-2R2M                                            |
| 37   | 5   | Q1, Q6, Q8, Q9, Q12                                                               | XSTR, NPN, SOT23                    | DIODES INC MMBT3904-7                                               |
| 38   | 2   | Q7, Q13                                                                           | XSTR, PNP, SOT23                    | DIODES INC MMBT3906-7                                               |

# DEMO MANUAL DC890B

## PARTS LIST

| ITEM | QTY | REFERENCE                                                            | PART DESCRIPTION                                 | MANUFACTURER/PART NUMBER   |
|------|-----|----------------------------------------------------------------------|--------------------------------------------------|----------------------------|
| 39   | 4   | Q2, Q3, Q4, Q5                                                       | XSTR, MOSFET, SOT23                              | VISHAY SI2316DS -T1        |
|      |     | Q2, Q3, Q4, Q5 <b>ALTERNATE</b>                                      | XSTR, MOSFET, SOT23                              | VISHAY SI2306BDS-T1-E3     |
| 40   | 2   | Q10, Q11                                                             | XSTR, MOSFET, SOT23                              | DIODES INC SEMI 2N7002-7   |
| 41   | 1   | R102                                                                 | RES, 2.2M $\Omega$ 5% 1/16W 0603                 | AAC CR16-225JM             |
| 42   | 1   | R92                                                                  | RES, 422k 1% 1/16W 0603                          | AAC CR16-4223FM            |
| 43   | 1   | R95                                                                  | RES, 324k 1% 1/16W 0603                          | AAC CR16-3243FM            |
| 44   | 1   | R93                                                                  | RES, 200k 1% 1/16W 0603                          | AAC CR16-2003FM            |
| 45   | 5   | R6, R17, R67, R68, R79                                               | RES, 100k 1% 1/16W 0603                          | AAC CR16-1003FM            |
| 46   | 1   | R94                                                                  | RES, 16.2k 1% 1/16W 0603                         | AAC CR16-1622FM            |
| 47   | 1   | R3                                                                   | RES, 14k 1% 1/16W 0603                           | AAC CR16-1402FM            |
| 48   | 14  | R4, R10, R15, R16, R46, R66, R71, R72, R73, R82, R84, R88, R91, R105 | RES, 10k 1% 1/16W 0603                           | AAC CR16-1002FM            |
| 49   | 10  | R61, R81, R83, R90, R96, R112 TO R115, R119                          | RES, 4.75k 1% 1/16W 0402                         | VISHAY CRCW04024751F       |
| 50   | 6   | R21, R103, R104, R117, R118, R137                                    | RES, 4.75k 1% 1/16W 0603                         | AAC CR16-4751FM            |
| 51   | 0   | R77 (OPTION)                                                         | RES, 4.75k 1% 1/16W 0603                         | AAC CR16-4751FM            |
| 52   | 4   | R14, R48, R85, R89                                                   | RES, 2k 1% 1/16W 0603                            | AAC CR16-2001FM            |
| 53   | 1   | R11                                                                  | RES, 1.5k 1% 1/16W 0603                          | AAC CR16-1501FM            |
| 54   | 9   | R8, R18, R40, R41, R44, R45, R78, R80, R106                          | RES, 1k 1% 1/16W 0603                            | AAC CR16-1001FM            |
| 55   | 0   | R75, R107, R108 (OPTION)                                             | RES, 1k 1% 1/16W 0603                            | AAC CR16-1001FM            |
| 56   | 12  | R9, R25 TO 32, R43, R110, R111                                       | RES, 475 $\Omega$ 1% 1/16W 0603                  | AAC CR16-4750FM            |
| 57   | 2   | R47, R53                                                             | RES, 332 $\Omega$ 1% 1/16W 0603                  | VISHAY CRCW06033320F       |
| 58   | 3   | R74, R76, R138                                                       | RES, 332 $\Omega$ 1% 1/16W 0402                  | AAC CR05-3320FM            |
| 59   | 5   | R1, R2, R19, R38, R52                                                | RES, 100 $\Omega$ 1% 1/16W 0603                  | AAC CR16-1000FM            |
| 60   | 0   | R120 TO R136 (OPTION)                                                | RES, 100 $\Omega$ 1% 1/20W 0201                  | VISHAY CRCW0201-101J200RT7 |
| 61   | 17  | R7, R20, R24, R54, R55 TO 60, R62 TO 65, R69, R70, R116              | RES, 49.9 $\Omega$ 1% 1/16 0402                  | AAC CR05-49R9FM            |
| 62   | 3   | R34, R86, R87                                                        | RES, 33.2 $\Omega$ 1% 1/16W 0603                 | AAC CR16-33R2FM            |
| 63   | 2   | R12, R13                                                             | RES, 22.1 $\Omega$ 1% 1/16W 0603                 | AAC CR16-22R1FM            |
| 64   | 4   | R22, R23, R39, R51                                                   | RES, 10 $\Omega$ 5% 1/16W 0603                   | AAC CR16-100JM             |
| 65   | 5   | R97 TO R101                                                          | RES, 10 $\Omega$ 1% 1/8W 1206                    | AAC CR18-10R0FM            |
| 66   | 1   | R42                                                                  | RES, 0 $\Omega$ JUMPER 0402                      | VISHAY CRCW04020000ZSTDE   |
| 67   | 0   | R50 (OPTION)                                                         | RES, 0 $\Omega$ JUMPER 0402                      | VISHAY CRCW04020000ZSTDE   |
| 68   | 1   | R109                                                                 | RES, 0 $\Omega$ JUMPER 0805                      | AAC CJ10-000M              |
| 69   | 1   | R49                                                                  | RES, 0.1 $\Omega$ 1% 1/8W 0805                   | VISHAY WSL0805R1000FEA     |
| 70   | 3   | R5, R33, R37                                                         | RES, 49.9k 1% 1/16W 0603                         | AAC CR16-4992FM            |
| 71   | 2   | R35, R36                                                             | RES 2 $\times$ 4 ARRAY, CHIP, 100 $\Omega$ , ISO | ROHM MNR14E0ABJ101         |
| 72   | 1   | SW1                                                                  | SWITCH, LIGHT TOUCH, 2 PINS                      | PANASONIC EVQPPDA25        |
| 73   | 5   | TP2 TO TP3, G2, G3, G5                                               | TURRET                                           | MILL MAX 2308-2            |

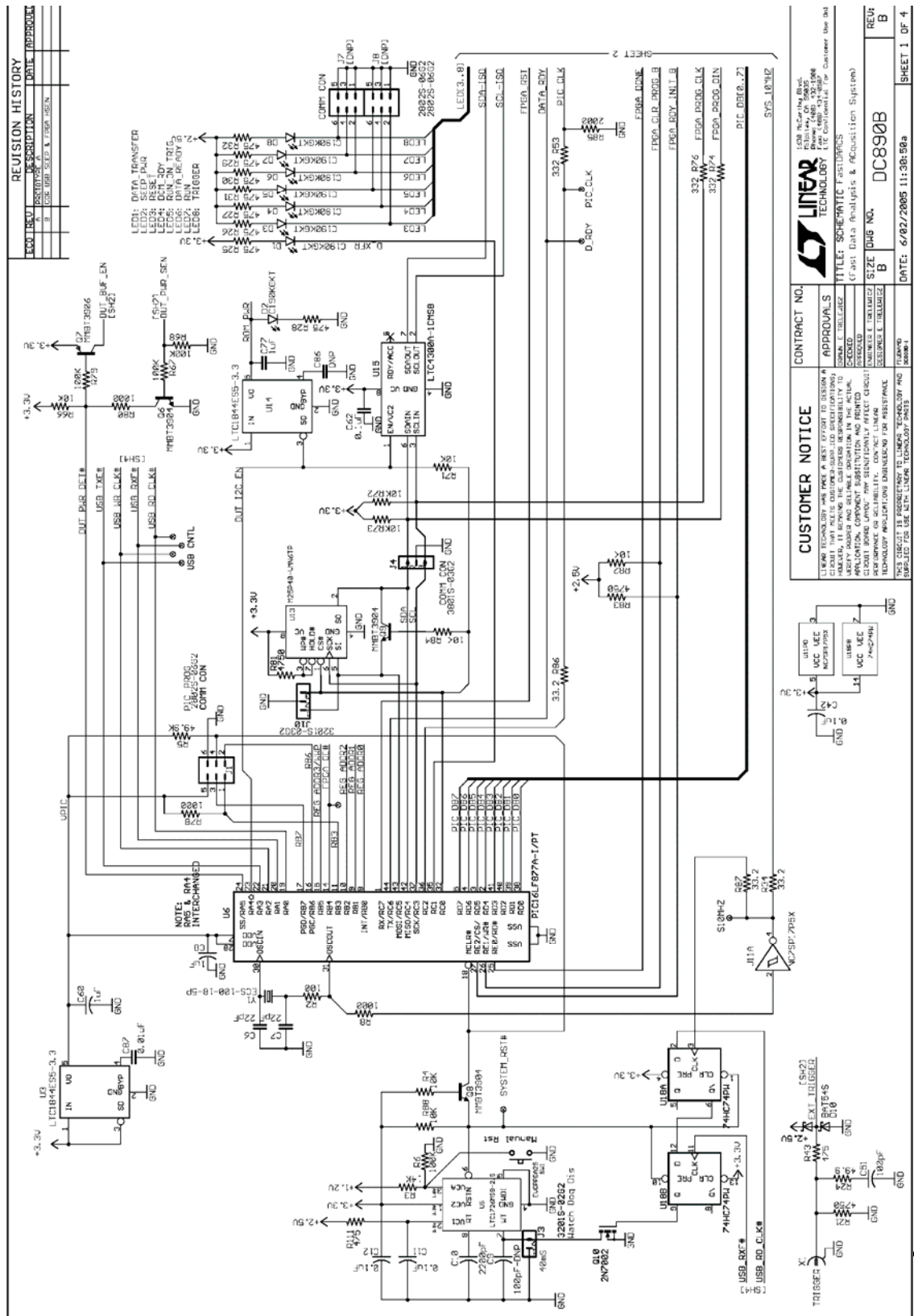


## PARTS LIST

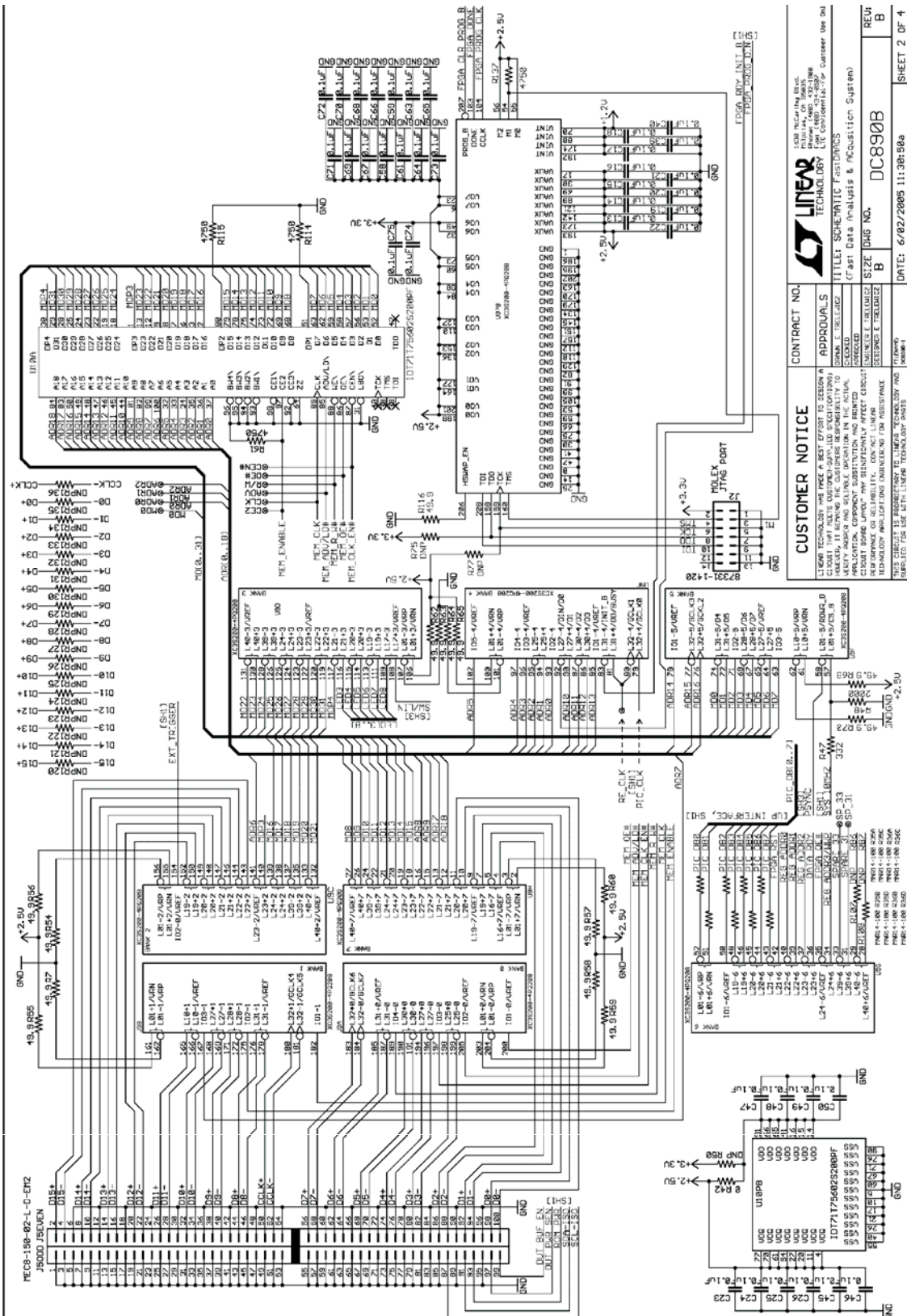
| ITEM | QTY | REFERENCE            | PART DESCRIPTION                | MANUFACTURER/PART NUMBER          |
|------|-----|----------------------|---------------------------------|-----------------------------------|
| 74   | 0   | TP1, G4, G6 (OPTION) |                                 |                                   |
| 75   | 1   | U17                  | IC, 93LC46BT-I/OT, SOT23-6      | MICROCHIP 93LC46BT-I/OT           |
| 76   | 1   | U7                   | IC, FT245BM, LQFP32 (2rs., PbF) | FUTURE TECH (FTDICHIP) FT245BM    |
| 77   | 1   | U10                  | IDT71T75602S200PF               | IDT71T75602S200PF                 |
| 78   | 0   | U10 (OPTION)         | 71V2556S200PF                   | 71V2556S200PF                     |
| 79   | 1   | U19                  | IC, LT1529CQ-5                  | LINEAR TECHNOLOGY LT1529CQ-5      |
| 80   | 1   | U4                   | IC, LT1763CS8                   | LINEAR TECHNOLOGY LT1763CS8       |
| 81   | 1   | U8                   | IC, LT1763CS8-3.3               | LINEAR TECHNOLOGY LT1763CS8-3.3   |
| 82   | 1   | U5                   | IC, LTC1726EMS8-2.5             | LINEAR TECHNOLOGY LTC1726EMS8-2.5 |
| 83   | 2   | U3, U14              | IC, LTC1844ES5-3.3              | LINEAR TECHNOLOGY LTC1844ES5-3.3  |
| 84   | 1   | U21                  | IC, LDO, 1.5A, DD-5(Q PKG)      | LINEAR TECHNOLOGY LT1963EQ-2.5    |
| 85   | 1   | U1                   | IC, LTC2921CGN-3.3              | LINEAR TECHNOLOGY LTC2921CGN-3.3  |
| 86   | 1   | U16                  | IC, LTC4210-1CS6                | LINEAR TECHNOLOGY LTC4210-1CS6    |
| 87   | 1   | U15                  | IC, LTC4300A-1CMS8              | LINEAR TECHNOLOGY LTC4300A-1CMS8  |
| 88   | 1   | U12                  | IC, LTC4410ES6                  | LINEAR TECHNOLOGY LTC4410ES6      |
| 89   | 1   | U2                   | IC, OSC, SOT23-5                | LINEAR TECHNOLOGY LTC6905CS5-96   |
| 90   | 1   | U11                  | IC, NC7SP17P5X                  | FAIRCHILD, NC7SP17P5X             |
| 91   | 1   | U18                  | IC, FF, DUAL, HC, TSSOP14       | PHILIPS, 74HC74PW                 |
| 92   | 1   | U6                   | IC, PIC16LF877A-I/PT            | MICROCHIP, PIC16LF877A-I/PT       |
| 93   | 1   | U9                   | IC, XC3S200-4PQ208              | XILINX, XC3S200-4PQ208C           |
| 94   | 1   | U13                  | IC, SEEPROM, 4M, SO8            | ST MICRO, M25P40-VMN6TP           |
| 95   | 1   | U20                  | IC, SWREG, SYNC, BUCK           | LINEAR LTC3411EMS                 |
| 96   | 1   | X1                   | CONN, BNC 50Ω                   | CONNEX 112404                     |
| 97   | 1   | Y1                   | CRYSTAL, 10MHz, HC49-SMT        | ECS INC. ECS-100-18-5P            |
| 98   | 4   |                      | STAND OFF, 1/4 × 4 TO 40        | MICRO PLASTICS 14HTSP101          |
| 99   | 4   |                      | SCREW, 4 TO 40 - 1/4"           | SCREW 4-40X1/4PAN PH SS PS        |
| 100  | 0   |                      | HEATSINK, BGA (FOR U9)          | AAVID/THERMALLOY 374324B00035     |

# DEMO MANUAL DC890B

## SCHEMATIC DIAGRAM



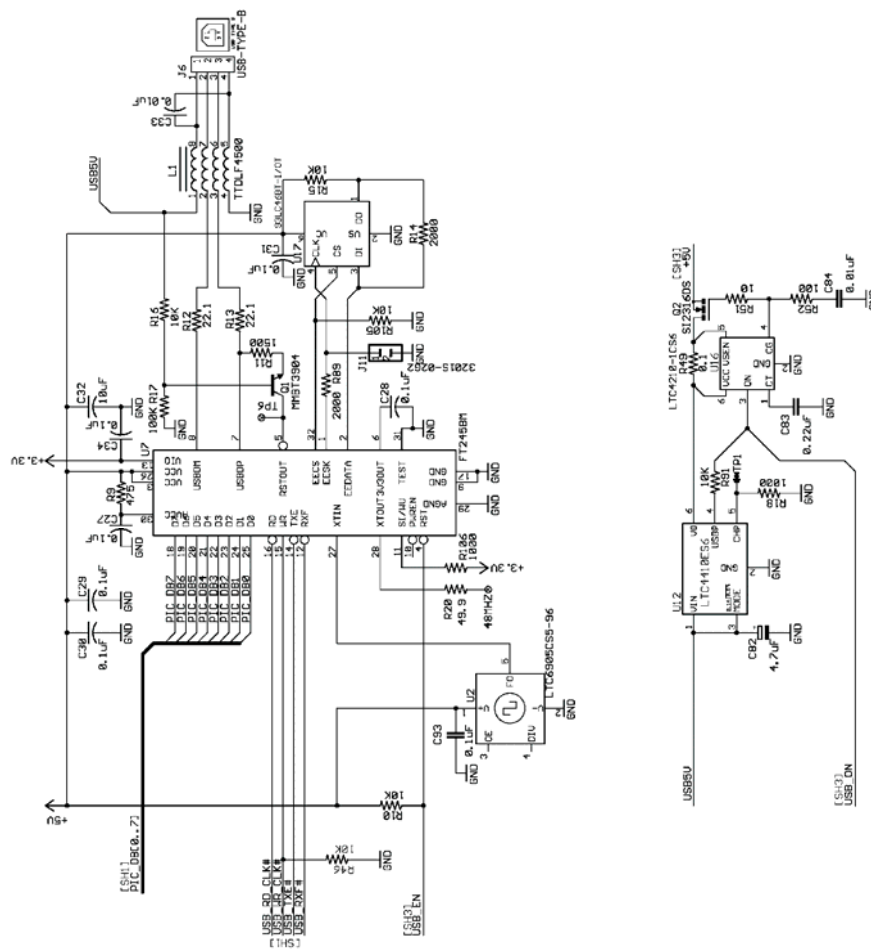
## SCHEMATIC DIAGRAM



## SCHEMATIC DIAGRAM



## SCHEMATIC DIAGRAM

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# DEMO MANUAL DC890B

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## DEMONSTRATION BOARD IMPORTANT NOTICE

Linear Technology Corporation (LTC) provides the enclosed product(s) under the following **AS IS** conditions:

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If this evaluation kit does not meet the specifications recited in the DEMO BOARD manual the kit may be returned within 30 days from the date of delivery for a full refund. THE FOREGOING WARRANTY IS THE EXCLUSIVE WARRANTY MADE BY THE SELLER TO BUYER AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. EXCEPT TO THE EXTENT OF THIS INDEMNITY, NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.

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