

DESCRIPTION

Introduction

Demonstration circuit 2159 provides USB connectivity to an FMC compatible FPGA evaluation board via an FT2232H Dual USB UART/FIFO. It is used in conjunction with various FPGA boards and a Linear Technology data converter evaluation board as part of an evaluation system for Linear Technology products.

Design files for this circuit board are available at <http://www.linear.com/demo/DC2159A>

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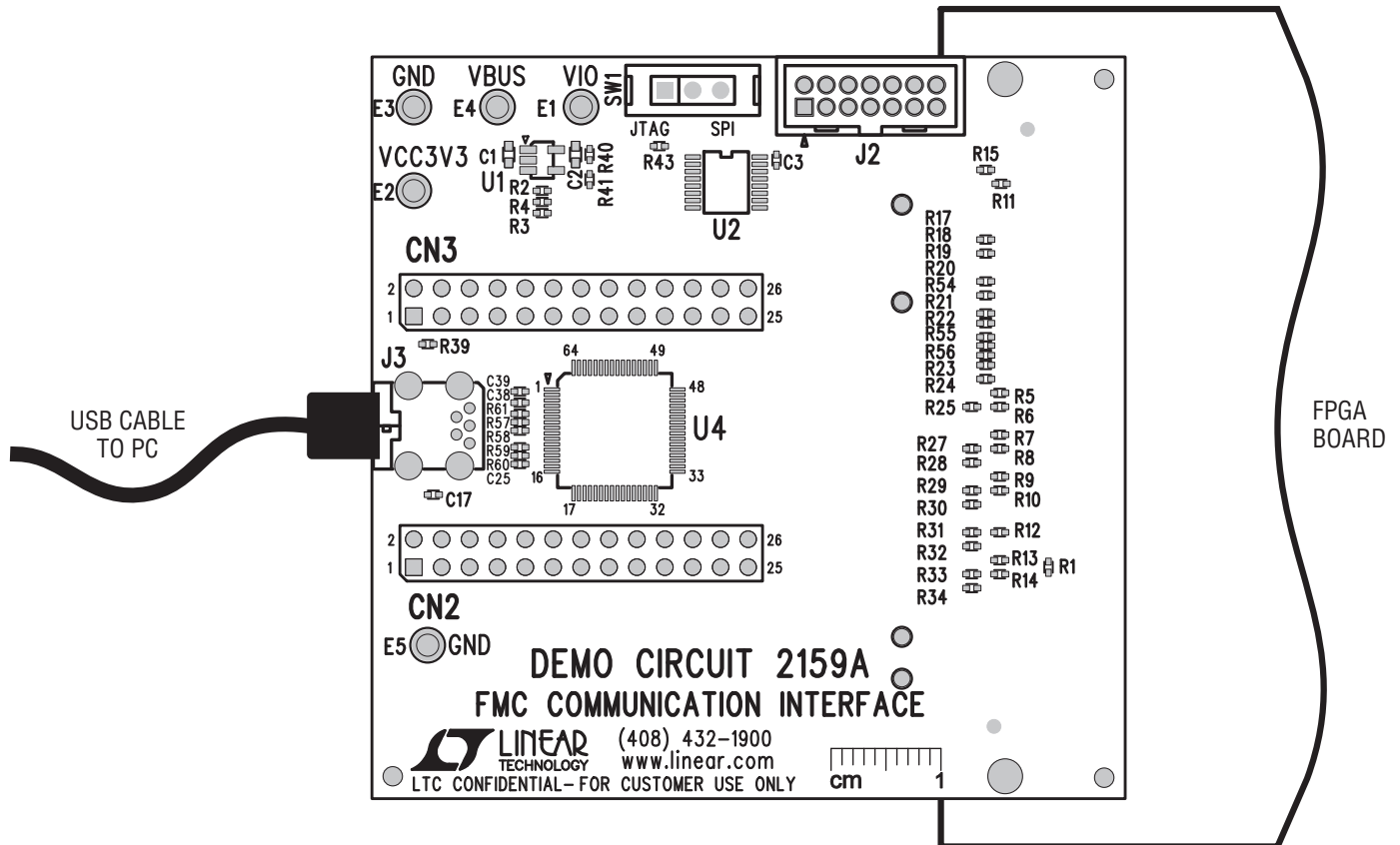


Figure 1. Basic Connections

QUICK START PROCEDURE

Make sure FPGA board power is OFF and no USB cable is connected. Seat the FMC connector on the back side of DC2159 to the mating connector on the FPGA board, pressing evenly across the connector and providing support on the back side of the FPGA board. Install two 4-40 nuts on the two standoffs to secure the connection. Verify that SW1 is in the SPI position.

Follow any additional setup instructions for the data converter board (For example, DC1974 shown in Figure 2.)

Only insert the USB cable AFTER the FPGA board is powered up. (The FT2232 I/O power is only enabled when the

FPGA board is powered up; inserting the USB cable without I/O power causes incorrect identification of the FT2232.)

JTAG Port

J2 provides a JTAG connection that may be used in some evaluation setups. Refer to the data converter's demo manual.

Other Connections

All test points are for factory use only. Do not make any other connections.

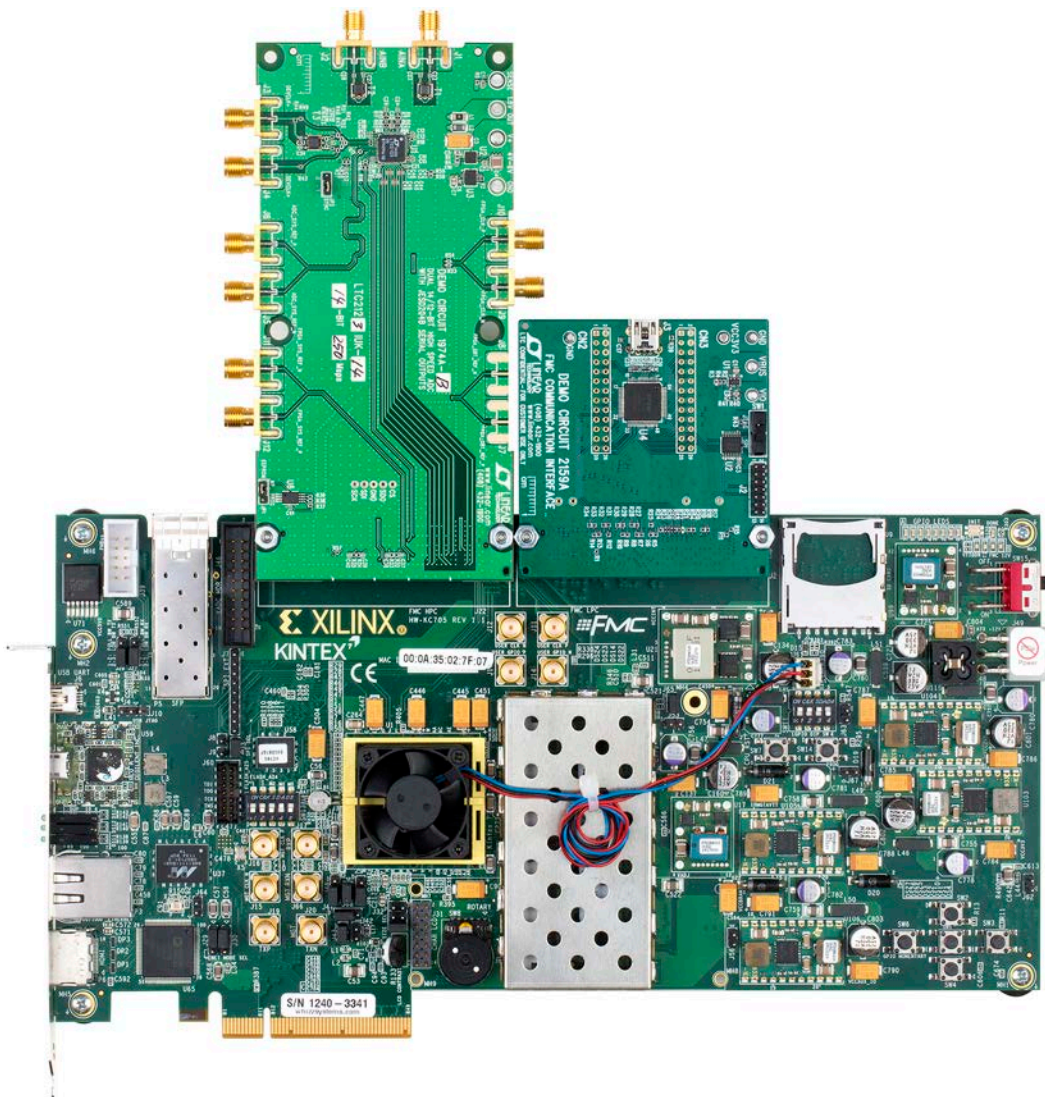


Figure 2. Complete LTC2123 Demonstration System (DC2159, DC1974, and Xilinx KC705 Board)

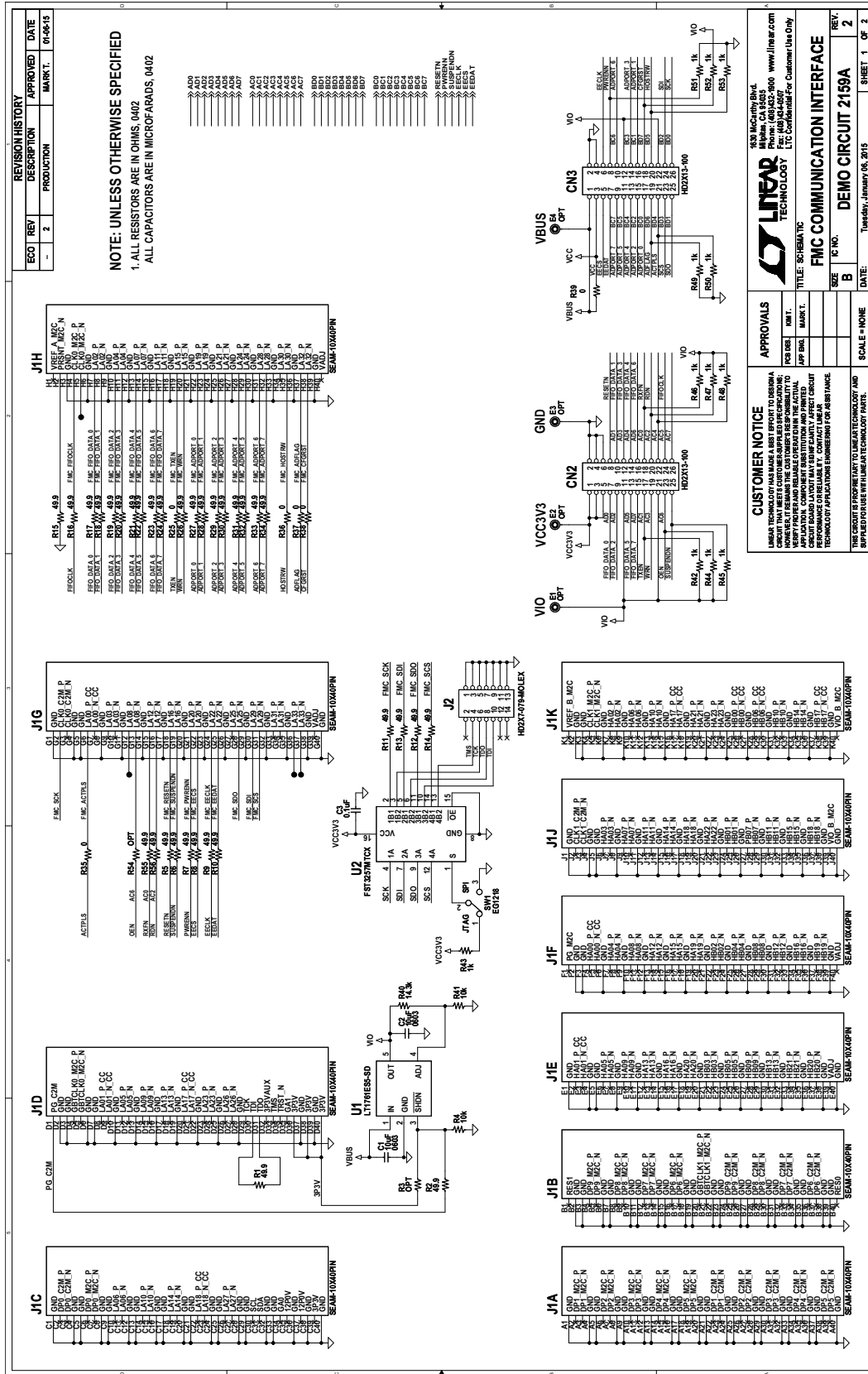
dc2159af

PARTS LIST

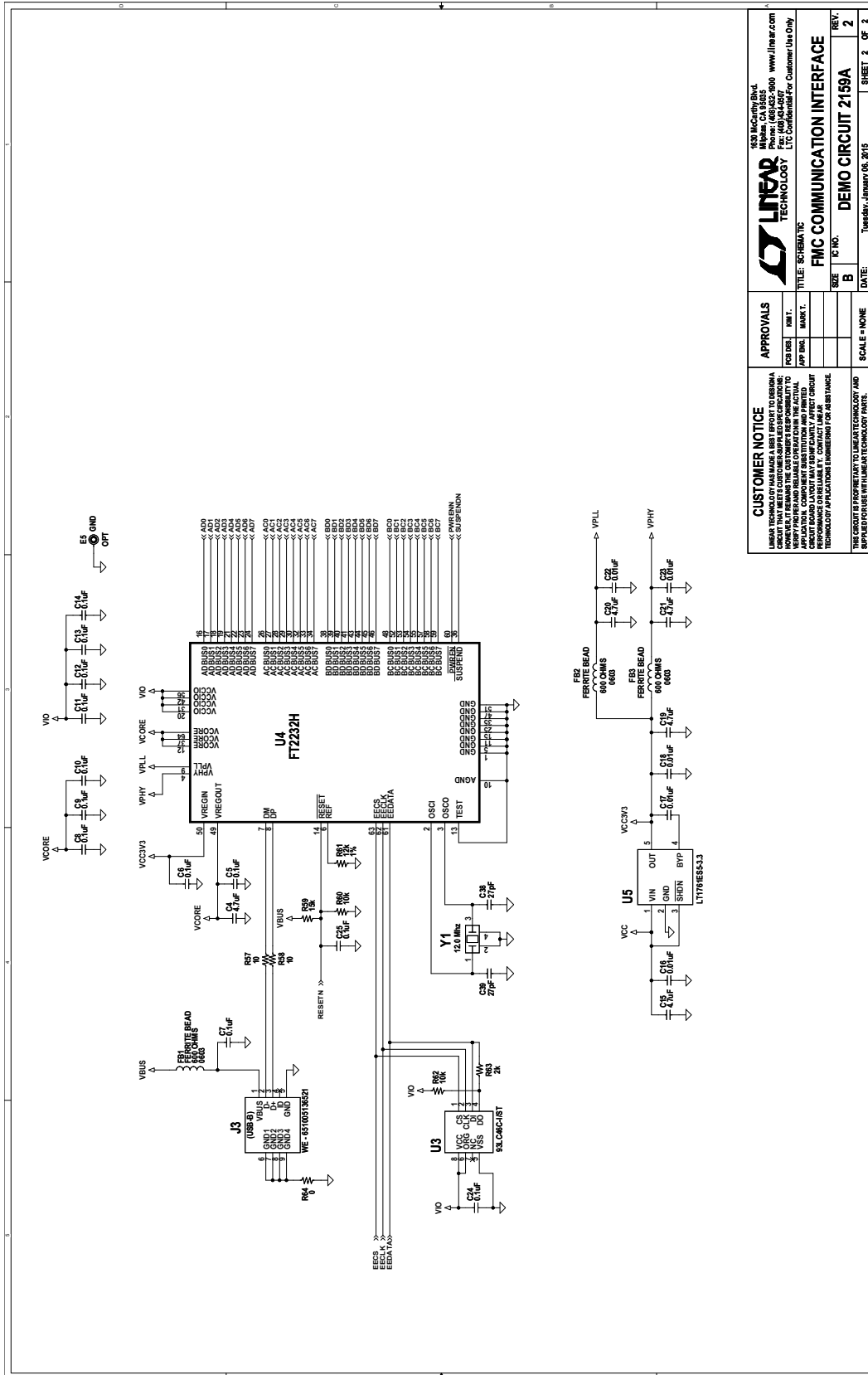
| ITEM | QTY | REFERENCE | PART DESCRIPTION | MANUFACTURER/PART NUMBER |
|------------------------------------|-----|-----------------------------------|---|------------------------------------|
| Required Circuit Components | | | | |
| 1 | 0 | CN2, CN3 | SOCKET, 2X13-100, HD2X13-100 | SAMTEC, BCS-113-L-D-TE |
| 2 | 2 | C1, C2 | CAP., X5R, 10µF 6.3V, 20%, 0603 | AVX, 06036D106MAT2A |
| 3 | 13 | C3, C5-C14, C24, C25 | CAP., X7R, 0.1µF, 10V, 10%, 0402 | AVX, 0402ZC104KAT2A |
| 4 | 5 | C4, C15, C19, C20, C21 | CAP., X5R, 4.7µF, 6.3V, 20%, 0402 | MURATA, GRM155R60J475ME87D |
| 5 | 5 | C16, C17, C18, C22, C23 | CAP., X7R, 0.01µF, 10V, 10%, 0402 | AVX, 0402ZC103KAT2A |
| 6 | 2 | C38, C39 | CAP., COG, 27pF, 50V 5% 0402 | TDK, C1005C0G1H270J |
| 7 | 0 | E1, E2, E3, E4, E5 | TP, TURRET, 0.064" | MILL-MAX, 2308-2-00-80-00-00-07-0 |
| 8 | 3 | FB1, FB2, FB3 | FERRITE BEAD, 600Ω AT 100MHz, 0603 | MURATA, BLM18HG601SN1D |
| 9 | 1 | J1 | BGA CONNECTOR, 40X10 | SAMTEC, SEAM-40-02.0-S-10-2-A-K-TR |
| 10 | 1 | J2 | HEADER, 2X7, 0.079", HD2X7-79 | SULLINS, NRPN072PAEN-RC |
| 11 | 1 | J3 | CONN., MINI USB 2.0 TYPE B, RIGHT ANGLE | WE, 651005136521 |
| 12 | 33 | R1, R2, R5-R24, R26-R34, R55, R56 | RES., CHIP, 49.9Ω, 1/16W, 1%, 0402 | YAGEO, RC0402FR-0749R9L |
| 13 | 0 | R3 | RES., 0402 | OPT |
| 14 | 4 | R4, R41, R60, R62 | RES., CHIP, 10k, 1/16W, 5%, 0402 | YAGEO, RC0402JR-0710KL |
| 15 | 7 | R25, R35-R39, R64 | RES., CHIP, 0Ω, 0402 | YAGEO, RC0402JR-070RL |
| 16 | 1 | R40 | RES., CHIP, 14.3k, 1/16W, 1% 0402 | YAGEO, RC0402FR-0714K3L |
| 17 | 12 | R42-R53 | RES., CHIP, 1k, 1/16W, 5%, 0402 | YAGEO, RC0402JR-071KL |
| 18 | 0 | R54 | RES., 0402 | OPT |
| 19 | 2 | R57, R58 | RES., CHIP, 10Ω, 1/16W, 5%, 0402 | YAGEO, RC0402JR-0710RL |
| 20 | 1 | R59 | RES., CHIP, 15k, 1/16W, 5%, 0402 | YAGEO, RC0402JR-0715KL |
| 21 | 1 | R61 | RES., CHIP, 12k, 1/16W, 5%, 0402 | YAGEO, RC0402JR-0712KL |
| 22 | 1 | R63 | RES., CHIP, 2k, 1/16W, 5%, 0402 | YAGEO, RC0402JR-072KL |
| 23 | 1 | SW1 | SWITCH, SLIDE SPDT 30V 0.2A, THROUGH HOLE | E-SWITCH, EG1218 |
| 24 | 1 | U1 | I.C., LT1761ES5-SD, TSOT23-5 | LINEAR TECH., LT1761ES5-SD |
| 25 | 1 | U2 | I.C., QUAD 2:1 SWITCH, TSSOP16 | FAIRCHILD SEMI., FST3257MTCX |
| 26 | 1 | U3 | I.C., EEPROM 1KBIT 3MHz, TSSOP8 | MICROCHIP, 93LC46C-I/ST |
| 27 | 1 | U4 | I.C., DUAL HIGH SPEED USB, LQFP64 | FTDI, FT2232HL-1000 |
| 28 | 1 | U5 | I.C., LT1761ES5-3.3, TSOT23-5 | LINEAR TECH., LT1761ES5-3.3 |
| 29 | 1 | Y1 | CRYSTAL, 12.0MHz, SMT | ABRACON, ABMM2-12.000MHZ-E2-T |

DEMO MANUAL DC2159A

SCHEMATIC DIAGRAM



SCHEMATIC DIAGRAM



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APPROVALS

| | |
|------------|--------|
| DESIGNER: | DATE: |
| APP. ENG.: | SCALE: |
| MARKT.: | NO.: |

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FMC COMMUNICATION INTERFACE

| | |
|--------|---------------------------|
| TITLE: | SCHEMATIC |
| SIZE: | B |
| REV.: | 2 |
| DATE: | Tuesday, January 04, 2011 |
| SHEET: | 2 OF 2 |

DEMO MANUAL DC2159A

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