User's Guide

SBOU090–August 2010

miniUSB DIG Platform

This user's guide describes the characteristics, operation, and use of the miniUSB DIG Platform. It provides a detailed description of the hardware design. The miniUSB DIG Platform is used as part of several of Texas Instruments evaluation modules; this document supplements the documentation included with those evaluation module kits.

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I^2C is a trademark of NXP Semiconductors.
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1 Overview

The miniUSB DIG Platform is a data acquisition system that generates digital signals. Specifically, the system generates I²C™, SPI™, and general-purpose digital I/O signals.

In general, the miniUSB DIG Platform is connected to a separate test board; these two components, along with the related cables and power supplies, form a complete evaluation module (EVM). An EVM facilitates the evaluation of a specific device. For example, the BUF08832EVM contains the miniUSB DIG Platform, the BUF08832 test board, a power supply, and a USB cable. This EVM allows customers to evaluate and understand all the features on the BUF08832 integrated circuit.

1.1 Hardware Included with a Typical miniUSB DIG Platform

Figure 1 illustrates the typical hardware included with the miniUSB DIG Platform.

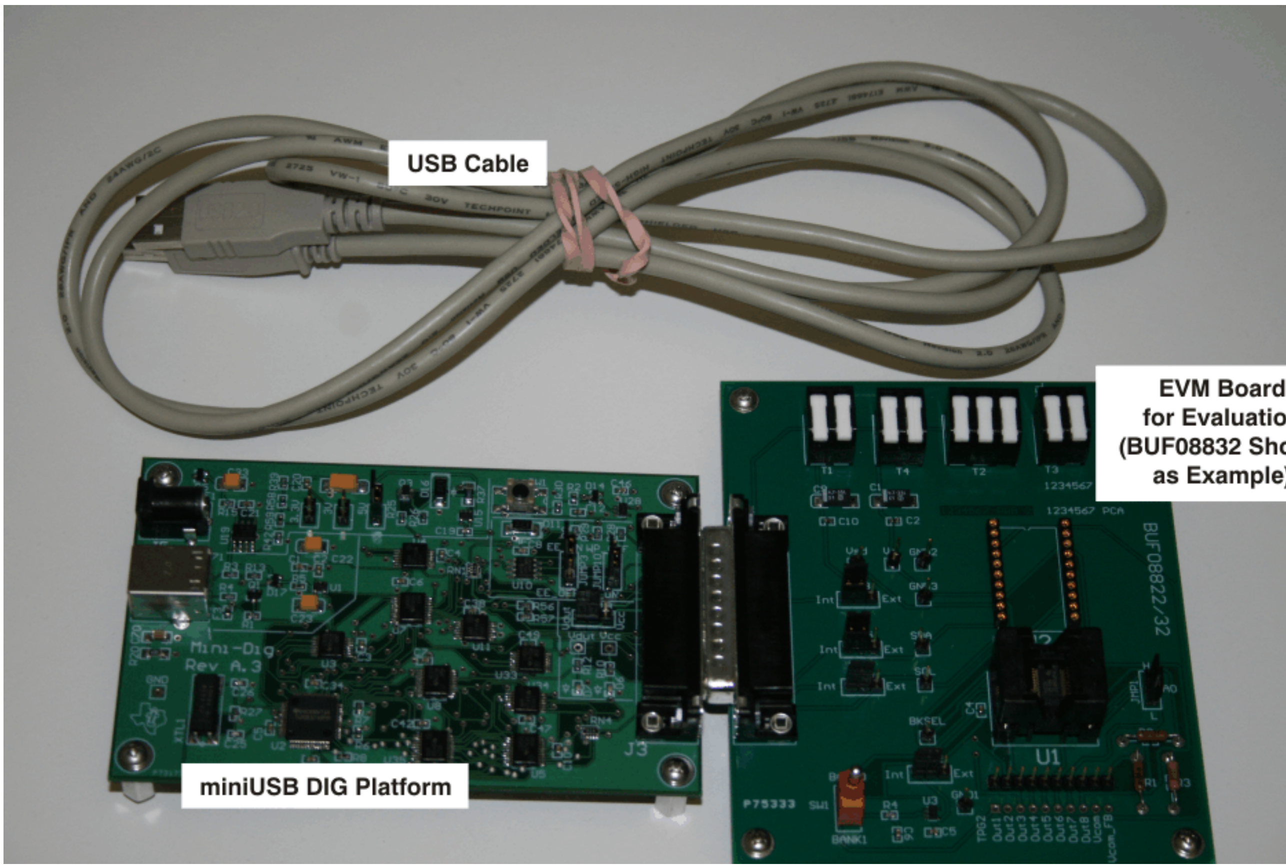

Figure 1. Typical Hardware Included with the miniUSB DIG Platform

1.2 Related Documentation from Texas Instruments

The following documents provide information regarding Texas Instruments integrated circuits used in the assembly of the miniUSB DIG Platform. This user's guide is available from the TI website under literature number SBOU090. Any letter appended to the literature number corresponds to the document revision that is current at the time of the writing of this document. Current versions of all documentation can be obtained from the TI website at http://www.ti.com/, or by calling the Texas Instruments Literature Response Center at (800) 477-8924 or the Product Information Center (PIC) at (972) 644-5580. When ordering, identify the document by both title and literature number.

Document	Literature Number
TUSB3210 Data Sheet	SLLS466F

1.3 If You Need Assistance

If you have questions about the miniUSB DIG Platform evaluation tool, contact the Linear Amplifiers Applications Team at precisionamps@list.ti.com. Include *miniUSB DIG Platform* as the subject heading.

1.4 Information About Cautions and Warnings

This document contains caution statements.

CAUTION

This is an example of a caution statement. A caution statement describes a situation that could potentially damage your software or equipment.

The information in a caution or a warning is provided for your protection. Please read each caution and warning carefully.

1.5 FCC Warning

This equipment is intended for use in a laboratory test environment only. It generates, uses, and can radiate radio frequency energy and has not been tested for compliance with the limits of computing devices pursuant to subpart J of part 15 of FCC rules, which are designed to provide reasonable protection against radio frequency interference. Operation of this equipment in other environments may cause interference with radio communications, in which case the user at his own expense is required to take whatever measures may be required to correct this interference.

2 System Setup

Figure 2 shows the typical system setup for the miniUSB DIG Platform. The PC runs software that communicates with the miniUSB DIG Platform, while the miniUSB DIG Platform generates the digital signals used to communicate with the test board. Connectors on the test board are typically used to connect external signals to the device under test (DUT). Jumpers and other circuitry on the test board allow for different configurations of the DUT.

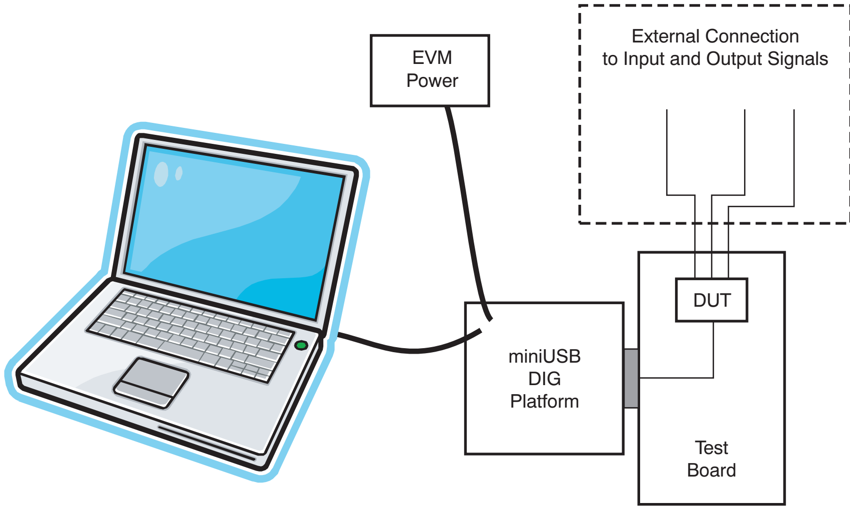

Figure 2. Hardware Setup for the miniUSB DIG Platform

Minimim PC operating requirements:

- Microsoft® Windows® XP or higher
- Available USB port

NOTE: The miniUSB DIG Platform works with both US and European regional settings.

3 Theory of Operation

The miniUSB DIG Platform is a general-purpose data acquisition system that is part of several different Texas Instruments EVMs. Figure 3 illustrates a block diagram of the platform.

The core of the miniUSB DIG Platform is the TUSB3210, an 8052 microcontroller (μC) that has a built-in USB interface. The microcontroller receives information from the host computer that it translates into I^2C, SPI, or other digital I/O patterns. During the digital I/O transaction, the microcontroller reads the response of any device connected to the I/O interface. The response from the device is then sent back to the PC where it is interpreted by the host computer.

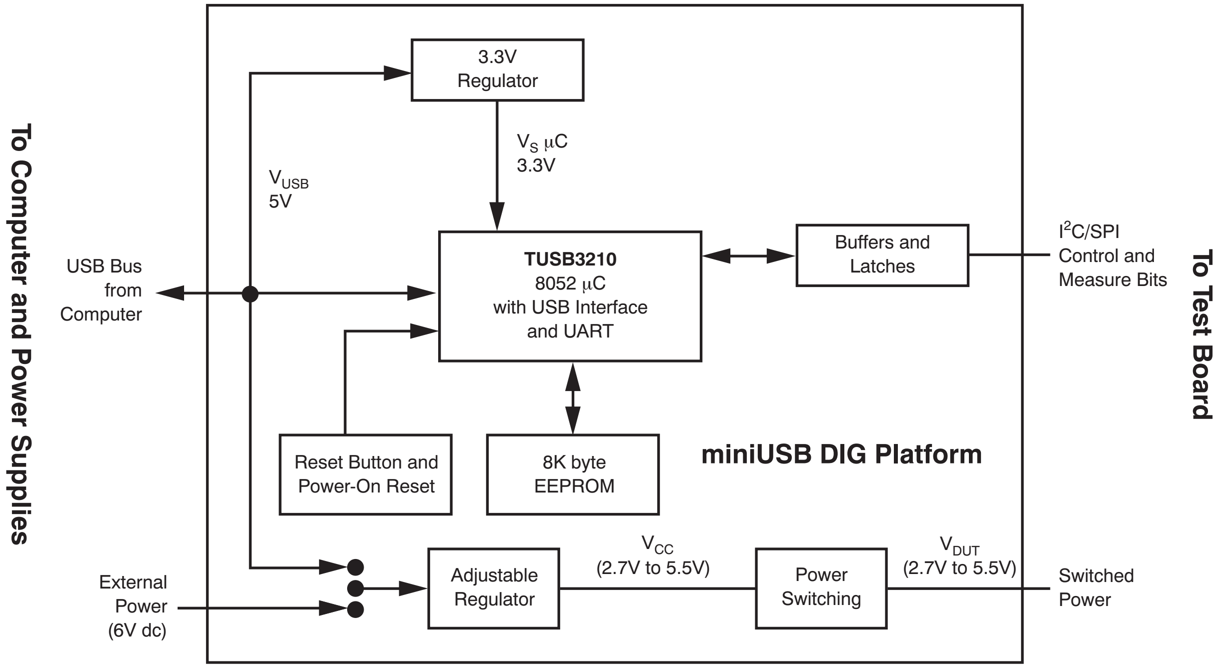

Figure 3. miniUSB DIG Platform Block Diagram

3.1 Digital I/O Area

The following subsections discuss the digital I/O areas that surround the microcontroller. Refer to the complete schematics (appended to this user guide).

3.1.1 Microcontroller

Figure 4 shows the detailed area surrounding the microcontroller. U2 is a TUSB3210 microcontroller—an 8052 core with a built-in USB interface. U2 converts information from the USB bus on the PC to I^{2}C and SPI digital transactions. U2 runs on 3.3V; the inputs are not 5V tolerant. As a result, all external input signals are level-translated.

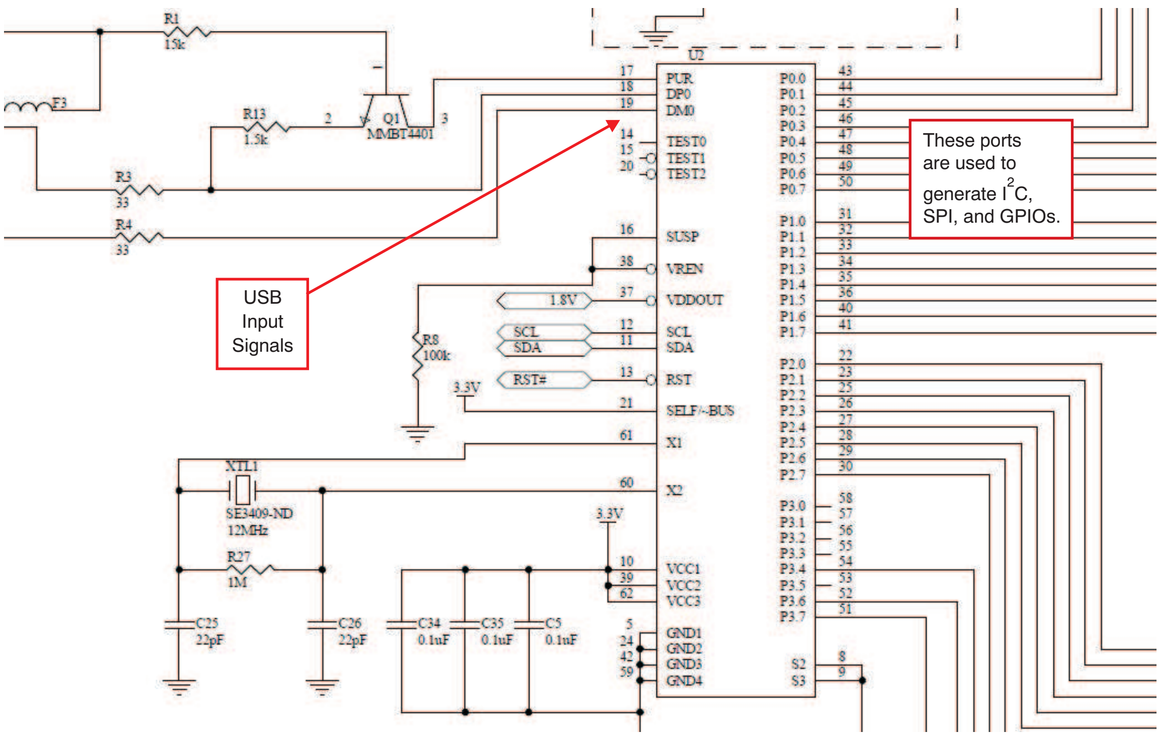

Figure 4. Digital I/O Area—Microcontroller

3.1.2 I²C and SPI

Figure 5 shows the digital I/O area that manages I²C and SPI communications. U3 and U4 are open collector drivers. These devices drive the I²C and SPI output signals. Note that the input is 3.3V and the output follows V_{DUT} (that is, 3V, 3.3V, or 5V). U7 is the input buffer. Note that the inputs are 5V tolerant. The outputs of U7 are compatible with the microcontroller (that is, 3.3V).

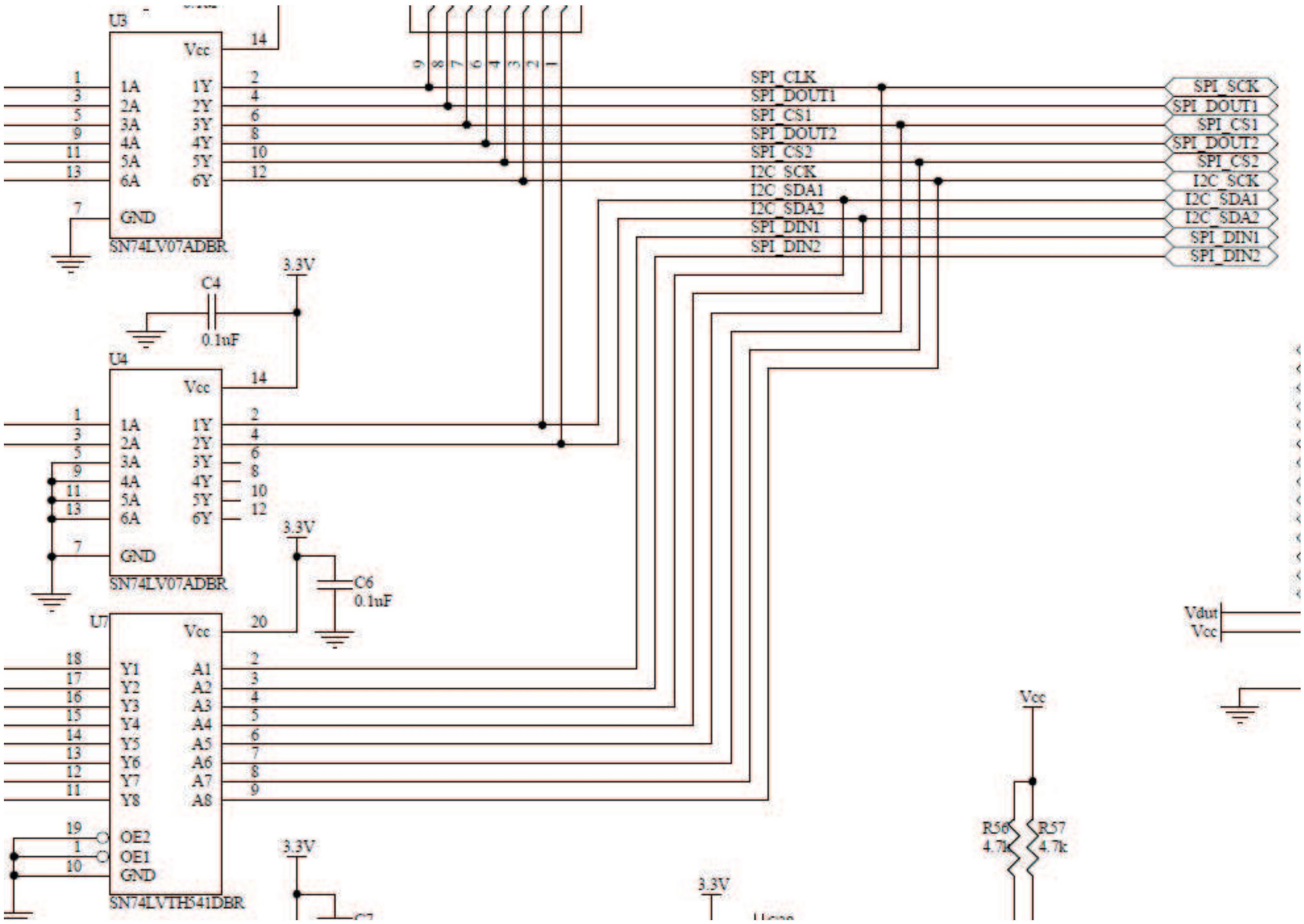

Figure 5. Digital I/O Area—I²C and SPI

3.1.3 Internal Control Signals

Figure 6 shows the digital I/O area used for internal control. U8 is used to latch the internal control signals. A latch is required because microcontroller port 2 is used for multiple purposes. U11 is an open collector buffer that converts the control signals to V_{DUT} logic levels (that is, 3V, 3.3V, or 5V).

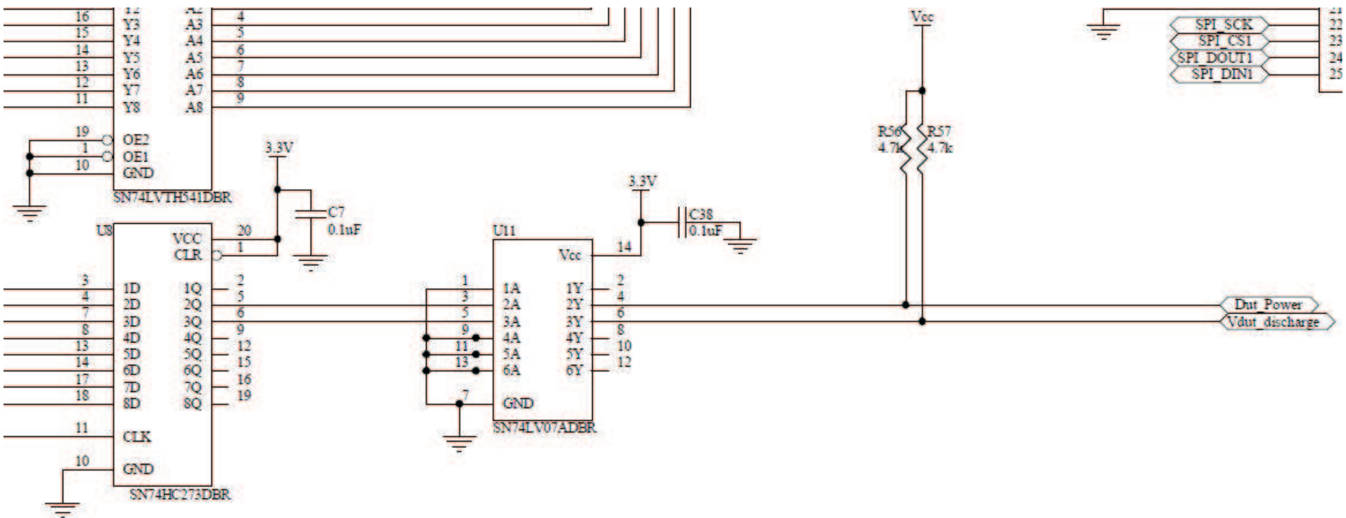

Figure 6. Digital I/O Area—Internal Control Signals

3.1.4 CTRL and MEAS

Figure 7 shows the connection of the CTRL and MEAS circuitry. U34 is the buffer for the general-purpose output (CTRL1 to CTRL8). U5 is the latch for the general-purpose input (MEAS1 to MEAS8).

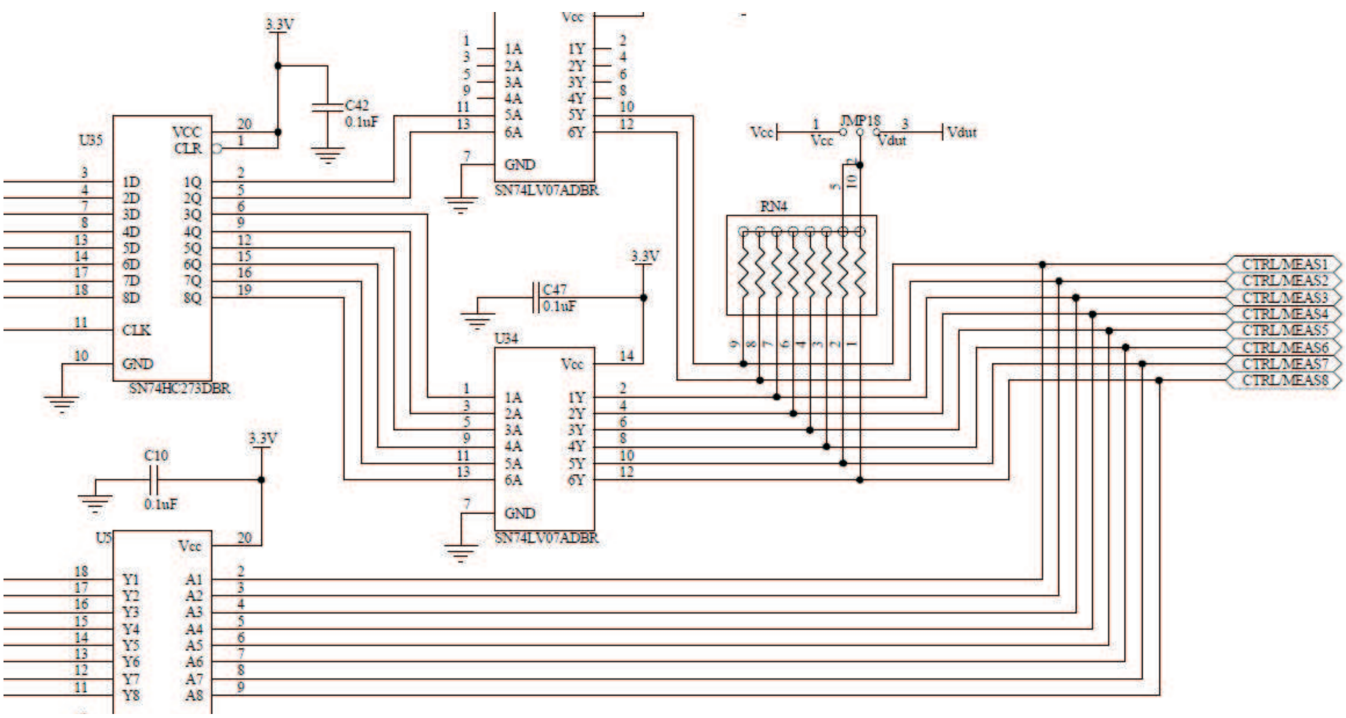

Figure 7. Digital I/O Area—CTRL and MEAS

3.2 Microcontroller Power

Figure 8 shows the power connections to the microcontroller. U1 provides the 3.3V supply for the TUSB3210 microcontroller.

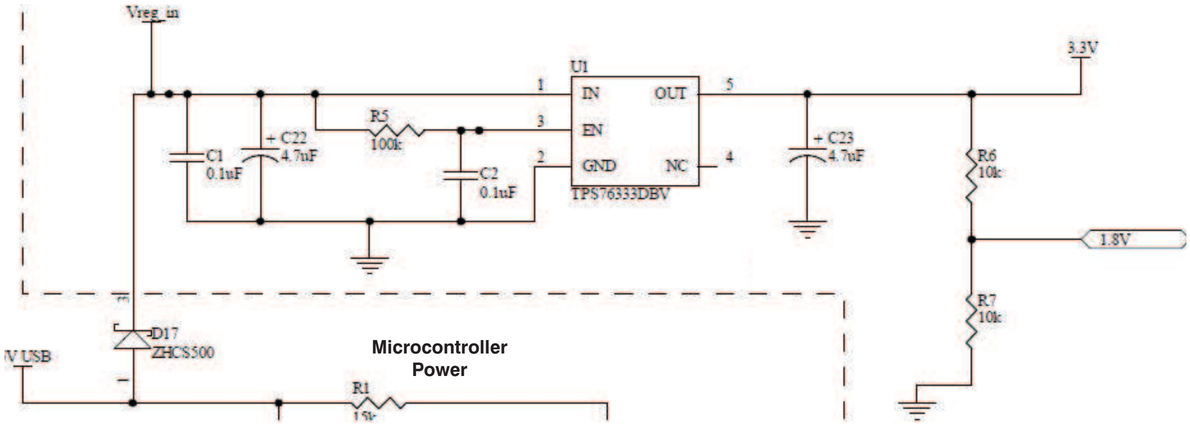

Figure 8. Microcontroller Power

3.3 USB I/O

Figure 9 shows the USB port connection to the microcontroller. J1 connects the USB bus to the TUSB3210 microcontroller. The transistor and resistors are standard support circuitry for this device. See the TUSB3210 data sheet (SLLS466F), available from www.ti.com, for more information.

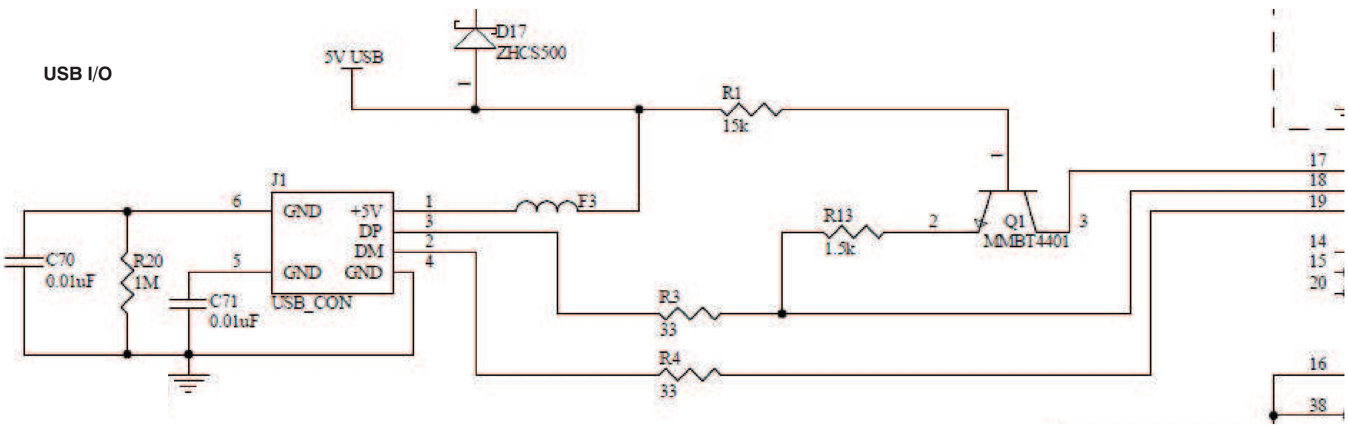

Figure 9. USB I/O

3.4 Firmware EEPROM

Figure 10 shows the firmware EEPROM area. U10 is the 8K-byte EEPROM that contains the firmware program used to run the microcontroller. JUMP3 allows the EEPROM to be disconnected from the microcontroller (*EE OFF*). The EE OFF feature is only used by the factory during EEPROM programming. This jumper must be in the *EE ON* position for normal operation.

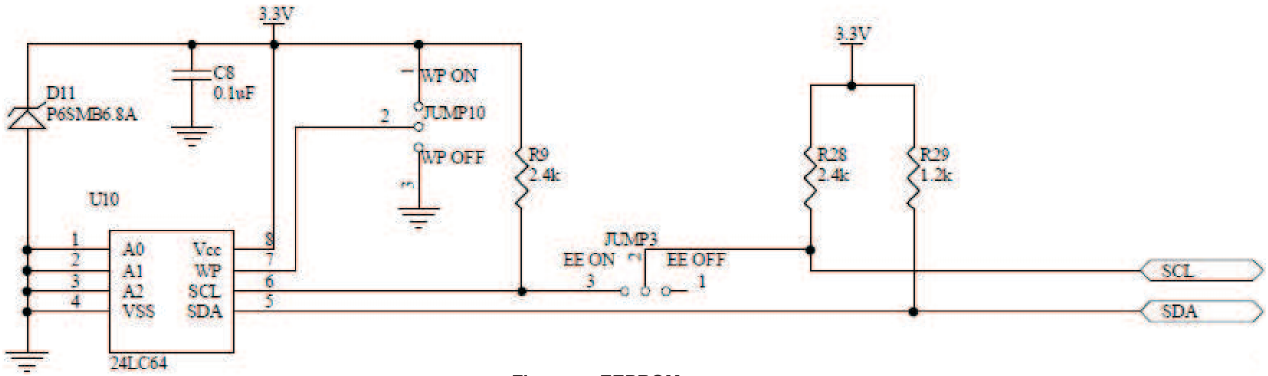

Figure 10. Firmware EEPROM

3.5 Power Indicators

Figure 11 shows the LED power indicators. The LEDs are used to indicate DUT power, 3V power, and microcontroller status. The LED labeled V_{CC} should be on when the system is powered up. V_{DUT} is switched power and can be turned on and off with software.

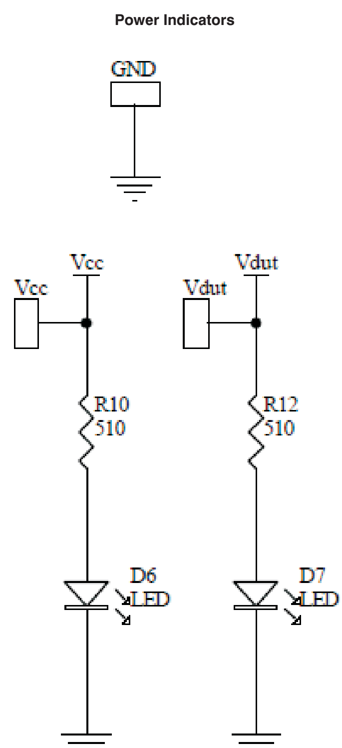

Figure 11. Power Indicators

3.6 Reset

Figure 12 shows the microcontroller reset circuitry. The reset circuit is connected to the $\overline{RST}$ pin on the microcontroller and resets the microcontroller upon power-up. U28 is a Schmitt buffer that is used to create a clean logic high or low (that is, the $\overline{RST}$ pin is connected to 3.3V or 0V and not to intermediate voltage levels).

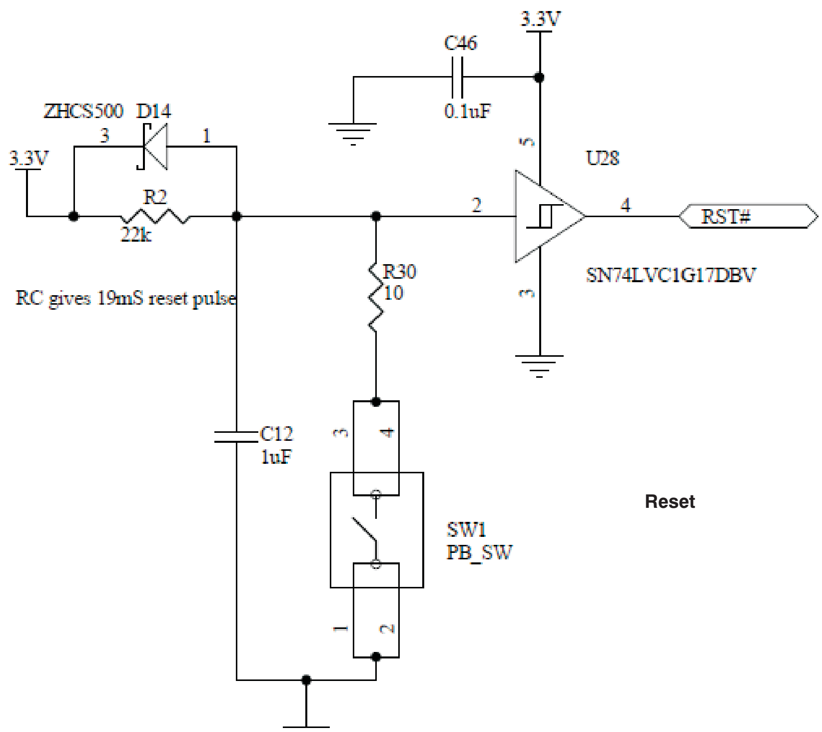

Figure 12. Reset

3.7 DUT Power Switching

Figure 13 shows the DUT power switching. U19 is an adjustable regulator. Three jumpers are included to control the output of U19; the output of U19 can be set to 5V, 3.3V or 3V. Q3 switches the power on or off. The supply before the switch is called V_{CC}, and is a constant 3.3V, 3V or 5V. The supply after the switch is called V_{DUT} and is a switched 3.3V, 3V or 5V (that is, it can be disconnected). U15 is used to discharge any capacitance connected to V_{DUT} after it is disconnected.

DUT Power Switching

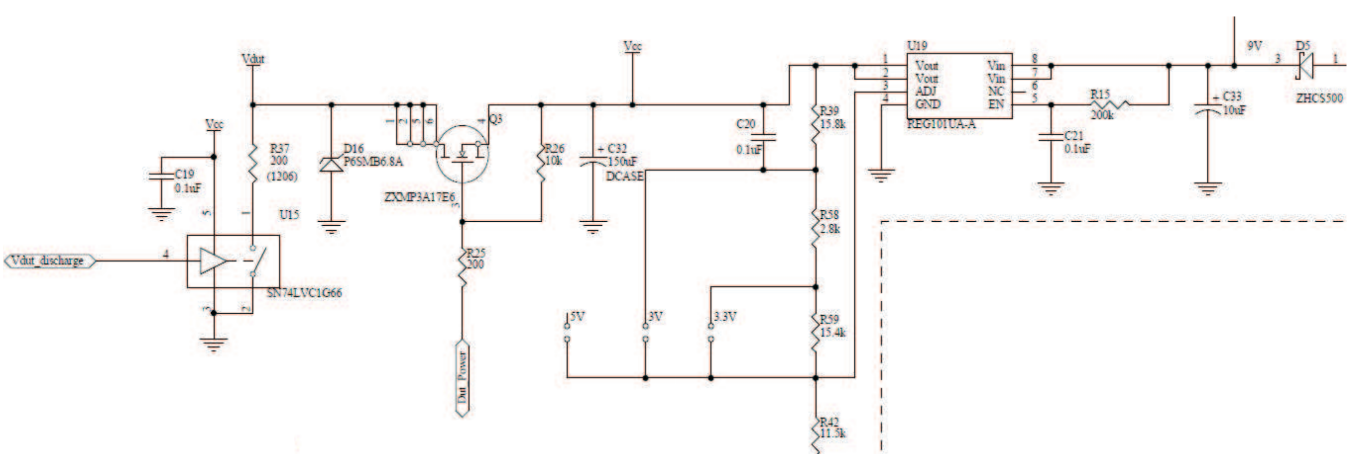

Figure 13. DUT Power Switching

3.8 Default Jumper Settings

3.8.1 5V

Figure 14 shows the jumper settings for the most common miniUSB DIG Platform configuration. This setup is the jumper setting configuration that is shipped from the factory. In this configuration, the digital I/Os are all referenced to 5V. This configuration also uses an external 6V dc supply to provide power for the digital I/O.

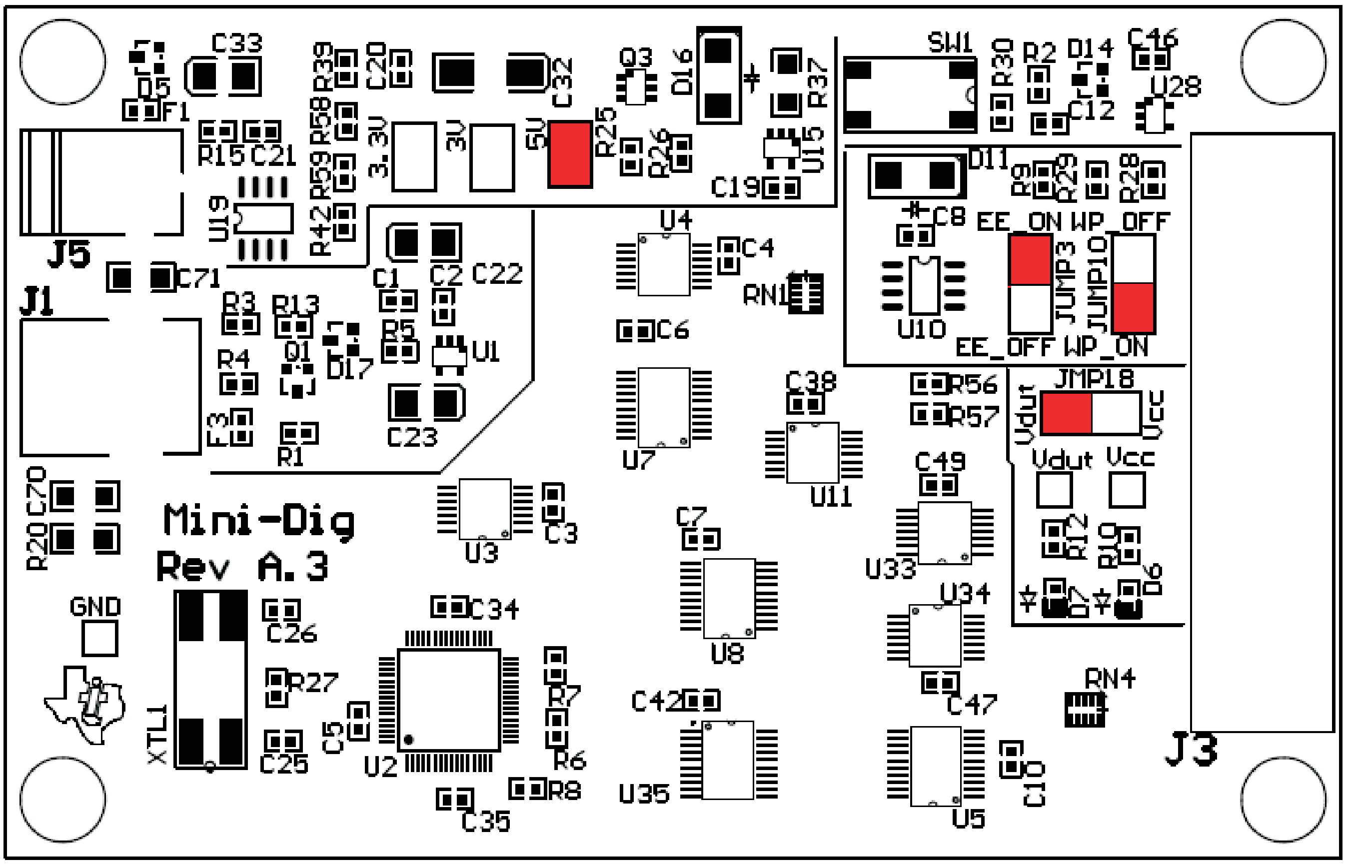

Figure 14. 5V Default Jumper Settings

3.8.2 3V

Figure 15 shows the jumper settings for another typical miniUSB DIG Platform configuration. In this configuration, the digital I/O has 3V levels. This configuration uses an external 6V dc supply to provide power for the digital I/Os.

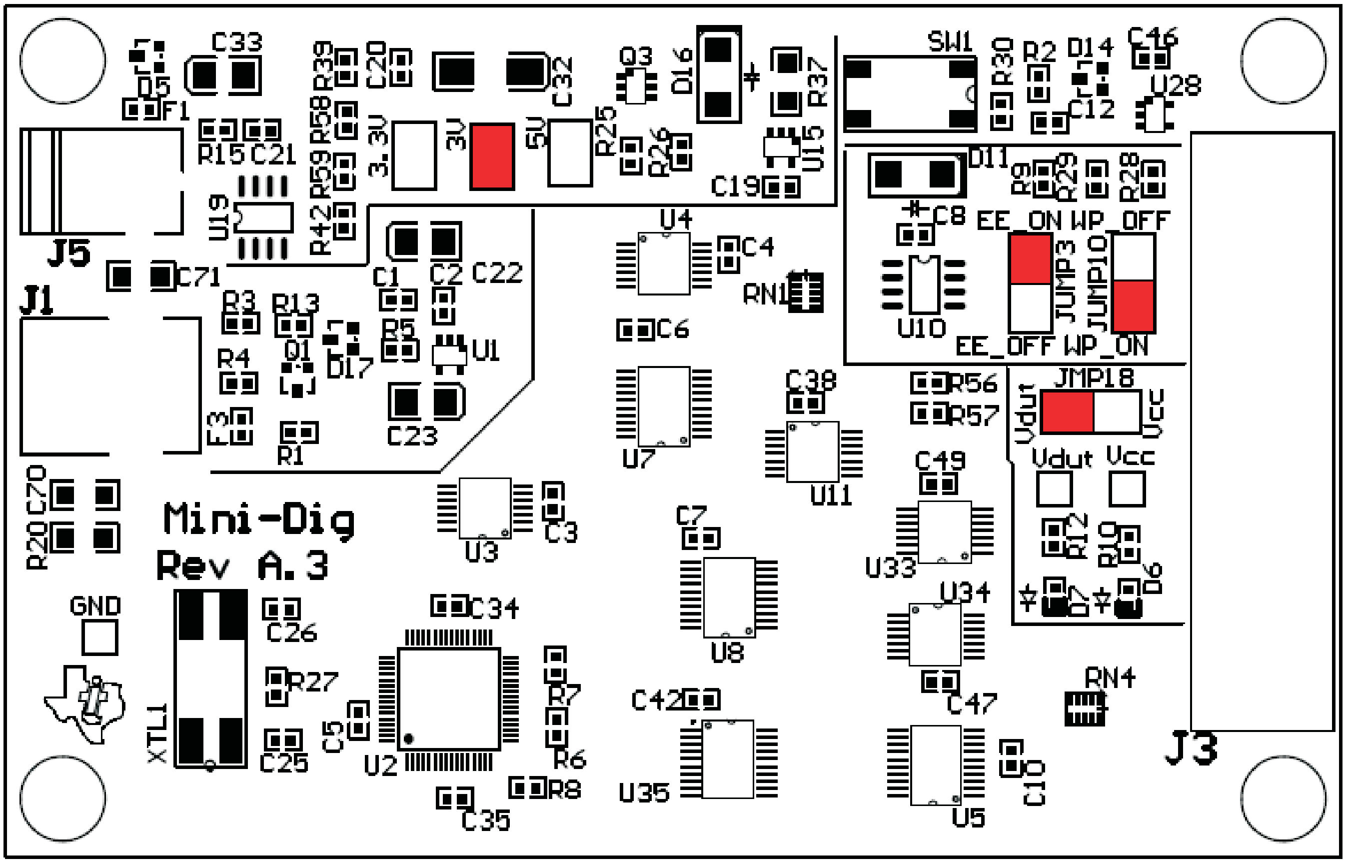

Figure 15. 3V Default Jumper Settings

3.8.3 3.3V

Figure 16 shows the jumper settings for a third typical miniUSB DIG Platform configuration. In this configuration, the digital I/O has 3.3V levels. This configuration also uses an external 6V dc supply to provide power for the digital I/Os.

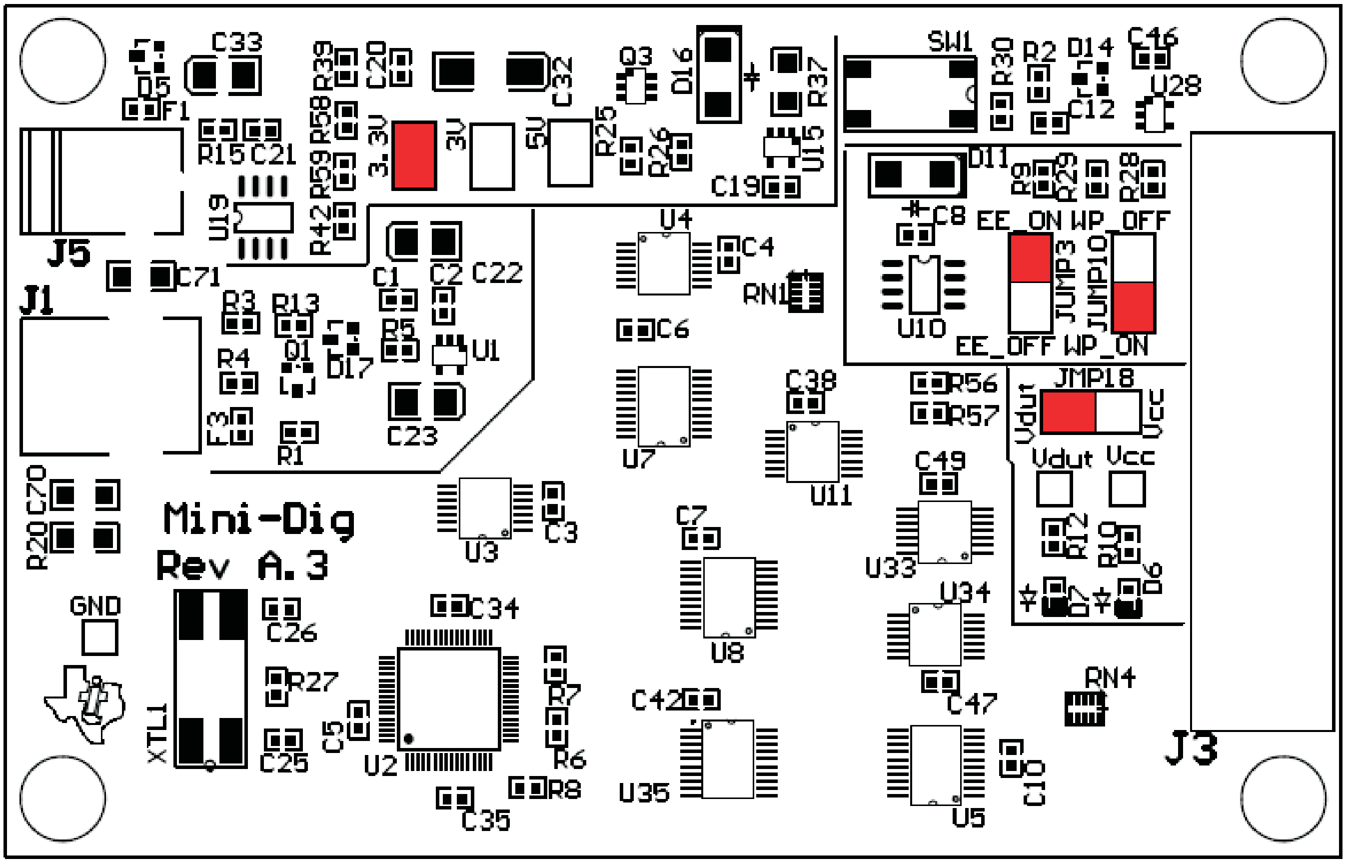

Figure 16. 3.3V Default Jumper Settings

4 Detailed Description of Jumper Settings

Table 1 through Table 3 show the detailed description of jumpers on the miniUSB DIG Platform. For the power supply, it is easiest to use the typical settings described in Figure 14, Figure 15, or Figure 16.

Table 1. Power-Supply Jumper Configuration

Mode	Jumper	Comment
External Power—5V (default jumper settings)	5V jumper used	In this mode, all power is supplied to the EVM via J5. The external supply must be between 5.8V and 10.4V for proper operation. All digital I/Os are regulated to 5V using U19 (REG101). This configuration is the default setup.
External Power—3V (typical jumper settings)	3V jumper used	In this mode, all power is supplied to the EVM via J5 or T3. The external supply must be between 5.8V and 10.4V for proper operation. All digital I/Os are regulated to 3V using U19 (REG101). This configuration is very common. It is the same as the default configuration, except that it uses a 3V supply.
External Power—3.3V (typical jumper settings)	3.3V jumper used	In this mode, all power is supplied to the EVM via J5 or T3. The external supply must be between 5.8V and 10.4V for proper operation. All digital I/Os are regulated to 3.3V using U19 (REG101). This configuration is also very common. It is the same as the default configuration, except that it uses a 3.3V supply.

Table 2. EEPROM Jumpers

Jumper Setting	Comment
JUMP3 = EE On (default)	This position is the default setup for miniUSB DIG Platform users. This position allows the TUSB3210 microcontroller to load the miniUSB DIG Platform firmware upon power-up or reset. The alternate position (EE Off) is used for development or firmware update.
JUMP3 = EE Off	This position disconnects the EEPROM from the TUSB3210 microcontroller. This mode of operation allows new firmware to be loaded from the host computer to the miniUSB DIG Platform using the Texas Instruments Apploader driver (SLLC160). Note that this mode of operation is only used during firmware development.
JUMP10 = WP On	Prevents accidental overwrite of the firmware (normal position).
JUMP10 = WP Off	Allows for writing new firmware (normally done at factory).

EE On is the default position. This jumper is typically only used in factory EEPROM programming. In order to write new firmware into the EEPROM, the miniUSB DIG Platform must be connected to the host computer with the jumper in the *EE Off* position. Once the USB device has been detected, the jumper position must be changed to the *EE On* position. After the jumper position is changed, the EEPROM Burner software may be used to copy new firmware onto the miniUSB DIG Platform.

The following procedure describes the process for programming the EEPROM:

1. JUMP3 = EE Off, JUMP10 = WP Off.
   (a) Connect power.
   (b) Connect the USB cable.
   (c) Press the reset button.
2. JUMP3 = EE On, JUMP10 = WP Off.
   (a) Program the EEPROM.
3. JUMP3 = EE On, JUMP10 = WP On.
   (a) Press the reset button.
   (b) The programming procedure is complete. Test the module.

Table 3. V_{CC}/V_{DUT} Jumper

Jumper Setting	Comment
JUMP18 = V_{DUT}	The digital output (CTRL1 to CTRL8) pull-up resistor is connected to V_{DUT}, a switched power supply of 3V, 3.3V or 5V. This mode of operation is most useful when the digital outputs are connected directly to the device under test (DUT). Thus, if the DUT power supply is turned off, the digital signals connected to the DUT are also turned off.
JUMP18 = V_{CC}	The digital output (CTRL1 to CTRL8) pull-up resistor is connected to V_{CC}, a constant power supply of 3V, 3.3V or 5V. This mode of operation is most useful when the digital outputs are connected to control circuitry that must remain configured regardless of the DUT supply status. For example, this mode would be used when an analog multiplexer is connected to the DUT, and the DUT power must be cycled without affecting the multiplexer configuration.

4.1 Connector Definition

Figure 17 illustrates a functional description of the different connectors on the miniUSB DIG Platform.

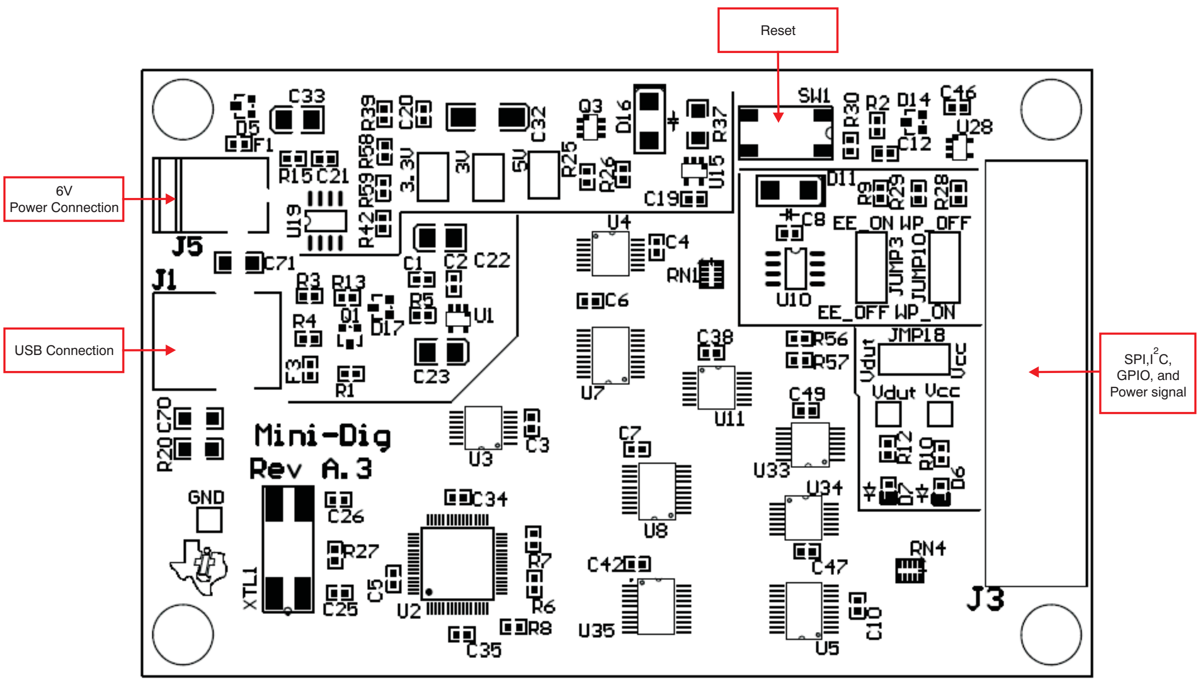

Figure 17. Connector Definition

4.2 Signal Definition of J3 (25-pin Female DSUB)

Table 4 shows the different signals connected to J3 on the miniUSB DIG Platform, and gives a description of each signal.

Table 4. Signal Definition of J3 (25-pin Female DSUB)

Pin on J1	Signal	Description
1	NC	No connection
2	NC	No connection
3	SPI_CS2	SPI chip select for channel 2
4	SPI_DOUT2	SPI data output for channel 2
5	SPI_DIN2	SPI data input for channel 2
6	CTRL/MEAS1	Control/ Measure Bit1 (GPIO)
7	CTRL/MEAS2	Control/ Measure Bit2 (GPIO)
8	CTRL/MEAS3	Control/ Measure Bit3 (GPIO)
9	I2C_SCK	I^2C clock signal (SCL) channel 2
10	I2C_SDA2	I^2C data signal (SDA) channel 2
11	CTRL/MEAS4	Control/ Measure Bit4 (GPIO)
12	I2C_SDA1	I^2C data signal (SDA) channel 1
13	I2C_SCK	I^2C clock signal (SCL) channel 1
14	CTRL/MEAS5	Control/ Measure Bit5 (GPIO)
15	CTRL/MEAS6	Control/ Measure Bit6 (GPIO)
16	CTRL/MEAS7	Control/ Measure Bit7 (GPIO)
17	V_{DUT}	Switched 3V or 5V power. Note that when power is switched off, the digital I/O is also switched off.
18	V_{CC}	This supply is the same voltage as V_{DUT}, but is not switched. For example, if V_{DUT} = 3V, then V_{CC} =3V; however, V_{CC} does not change when V_{DUT} is turned off.
19	CTRL/MEAS8	Control/ Measure Bit8 (GPIO)
20	NC	No connection
21	GND	Common or ground connection for power.
22	SPI_SCK	SPI clock signal for channel 1
23	SPI_CS1	SPI chip select for channel 1
24	SPI_DOUT	SPI data output for channel 1
25	SPI_DIN1	SPI data input for channel 1

5 Bill of Materials

Table 5 shows the parts list.

Table 5. Bill of Materials

Item No	Qty	Value	Ref Des	Description	Vendor	Part Number
1	1	15 k	R1	Resistor, 15.0kΩ 1/10W 1% 0603 SMD	Yageo America	RC0603FR-0715KL
2	1	22 k	R2	Resistor, 22.0kΩ 1/10W 1% 0603 SMD	Rohm Semiconductor	MCR03EZPFX2202
3	2	100 k	R5, R8	Resistor, 100kΩ 1/16W 1% 0603 SMD	Panasonic - ECG	ERJ-3EKF1003V
4	3	10 k	R6, R7, R26	Resistor, 10kΩ 1/10W 1% 0603 SMD	Stackpole Electronics Inc	RMCF 1/16 10K 1% R
5	2	33	R3, R4	Resistor, 33.0Ω 1/10W 1% 0603 SMD	Yageo America	RC0603FR-0733RL
6	1	1 M	R27	Resistor, 1MΩ 1/10W 1% 0603 SMD	Stackpole Electronics Inc	RMCF 1/16 1M 1% R
7	1	1.5 k	R13	Resistor, 1.50kΩ 1/10W 1% 0603 SMD	Yageo America	RC0603FR-071K5L
8	1	10	R30	Resistor, 10.0Ω 1/10W 1% 0603 SMD	Yageo America	RC0603FR-0710RL
9	2	510	R10, R12	Resistor, 510Ω 1/10W 1% 0603 SMD	Yageo America	RC0603FR-07510RL
10	1	1.2 k	R29	Resistor, 1.20kΩ 1/10W 1% 0603 SMD	Yageo America	RC0603FR-071K2L
11	1	200 power	R37	Resistor, 200Ω 1/4W 1% 1206 SMD	Vishay/Dale	CRCW1206200RFKEA
12	1	200	R25	Resistor, 200Ω 1/10W 1% 0603 SMD	Vishay/Dale	CRCW0603200RFKEA
13	1	15.8 k	R39	Resistor, 15.8kΩ 1/10W 1% 0603 SMD	Yageo America	RC0603FR-0715K8L
14	1	2.8 k	R58	Resistor, 2.8kΩ 1/10W 1% 0603 SMD	Vishay/Dale	CRCW06032K80FKEA
15	1	15.4 k	R59	Resistor, 15.4kΩ 1/10W 1% 0603 SMD	Panasonic - ECG	ERJ-3EKF1542V
16	2	4.7 k	R56,R57	Resistor, 4.70kΩ 1/10W 1% 0603 SMD	Yageo America	RC0603FR-074K7L
17	—	—	—	Omit	—	—
18	1	11.5 k	R42	Resistor, 11.5kΩ 1/10W 1% 0603 SMD	Yageo America	RC0603FR-0711K5L
19	1	200 k	R15	Resistor, 200kΩ 1/10W 1% 0603 SMD	Yageo America	RC0603FR-07200KL
20	2	2.4 k	R9, R28	Resistor, 2.40kΩ 1/10W 1% 0603 SMD	Yageo America	RC0603FR-072K4L
21	1	1 M	R20	Resistor, 1.00MΩ 1/4W 1% 1206 SMD	Yageo Corporation	RC1206FR-071ML
22	2	4.7 k Network	RN1, RN4	Resistor array, 4.7kΩ 10Trm Buss SMD	CTS Corporation	746X101472JP
23	2	4.7 µF	C22, C23	Capacitor, Tantalum, 4.7µF 25V 10% SMD 3528-21 (EIA)	AVX Corporation	TPSB475K025R1500
24	18	0.1 µF	C1, C2, C3, C4, C5, C6, C7, C8, C10,C19, C20,C21, C34,C35, C38,C42, C46, C47	Capacitor, .10µF 25V CERAMIC Y5V 0603	Kemet	C0603C104M3VACTU
25	1	1 µF	C12	Capacitor, Ceramic, 1.0µF 25V X5R 0603	TDK Corporation	C1608X5R1E105K
26	1	10 µF	C33	Capacitor, Tantalum 10µF 25V 20% SMD 3528-21(EIA)	AVX Corporation	TPSB106M025R1800
27	1	150 µF	C32	Capacitor, Tantalum 150µF 10V 10% SMD	AVX Corporation	TAJC157K010R
28	2	22 pF	C25, C26	Capacitor, Ceramic 22pF 50V NP0 0603	Yageo America	CC0603JRNPO9BN220
29	2	0.01 µF	C70, C71	Capacitor, Ceramic .01µF 500V X7R 1206	Kemet	C1206C103KCRACTU
30	1	TPS76333DBV	U1	IC 3.3V 150mA LDO Reg SOT-23-5	Texas Instruments	TPS76333DBVT
31	1	TUSB3210	U2	IC USB Cntrlr Storage 64-LQFP	Texas Instruments	TUSB3210PM
32	5	SN74LV07ADBR	U3, U4, U11, U33, U34	IC Hex Buff/Drv w/OD 14-SSOP	Texas Instruments	SN74LV07ADBR
33	1	24LC64	U10	IC Serial EEPROM 64K 2.5V 8-SOIC	Microchip Technology	24LC64-I/SN
34	2	SN74LVTH541DBR	U5, U7	IC Oct Buff/Drvr TRI-ST 20-SSOP	Texas Instruments	SN74LVTH541DBR
35	2	SN74HC273DBR	U8, U35	IC Oct D-Type F-F w/CLR 20-SSOP	Texas Instruments	SN74HC273DBR

Table 5. Bill of Materials (continued)

Item No	Qty	Value	Ref Des	Description	Vendor	Part Number
36	1	SN74LVC1G66	U15	IC Bilateral Analog Switch SOT23-5	Texas Instruments	SN74LVC1G66DBVR
37	1	REG101UA-A	U19	IC LDO Reg Adj 100mA 8-SOIC	Texas Instruments	REG101UA-A
38	1	SN74LVC1G17	U28	IC Schmitt-Trig Buff SOT-23-5	Texas Instruments	SN74LVC1G17DBVR
39	1	12 MHz	XTL1	Crystal 12.0000MHZ 18pF SMD	Epson Electronics America Inc	MA-505 12.0000M-C0:ROHS
40	1	USB CONNECT	J1	Conn Socket USB B-TYPE HORZ	Keystone Electronics	924
41	1	DSUB25F	J3	Conn D-SUB Rl R/A 25POS 30GOLD (with threaded inserts and board locks)	AMP/Tyco Electronics	5747846-4
42	1	WALL-WART-JACK	J5	Conn Pwr Jl 2.5X5.5MM HIGH CUR	CUI Inc	PJ-102BH
43	2	LED	D7, D6	Ultra Bright Red Diffused LED, 0603 pkg	Panasonic	LNJ208R8ARA
44	2	6.0V TVS	D11, D16	Diode TVS 6.0V 400W UNI 5% SMA	Littelfuse Inc	SMAJ6.0A
45	3	Schottky	D5, D14, D17	SOT-23 Schottky Diode, 500mA, 40V	Zetex Semiconductors	ZHCS500
46	1	NPN	Q1	Transistor GP NPN AMP SOT-23	Fairchild Semiconductor	MMBT4401
47	1	MOSFET	Q3	30V P-Channel Enhancement Mode MOSFET, SOT23-6	Zetex Semiconductors	ZXMP3A17E6
48	2	ferrite bead	F1, F3	Ferrite 300mA, 600Ω 0603 SMD	Steward	HZ0603C601R-10
49	1	PB SWITCH	SW1	Switch Tact 6MM SMD gull wing	Alcoswitch/Tyco Electronics	FSM2JSMA
50	3	HEADER STRIP	V_{CC}, V_{DUT}, GND	Conn Header .100 Sl 36POS (cut into single position test points)	SAMTEC	
51	3	JMP3 cut to size	JUMP3, JUMP10, JUMP18	Cl Header .100 Sngl str 36 pos(cut into two position jumpers)	SAMTEC	TSW-150-07-6-5
52	6	Jumper shorting units	Jumpers for JUMP 3,10,18, 3 Power jumpers	Jumper Shorting Units	AMP/Tyco Electronics	881545-2
53	3	JMP2 cut to size	5V, 3.3V, 3V	Conn, Header, 0.100, 36pos (18 jumpers/strip)	3M/ESD	929647-09-36-I
54	4	Standoffs	—	Standoffs, Hex , 4-40 Threaded, 0.500" length, 0.250" OD, Aluminum Iridite Finish	Keystone	2203
55	4	Screws	—	Screw Machine Phil 4-40X1/4 SS	Building Fasteners	PMSSS 440 0025 PH

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EVM Warnings and Restrictions

It is important to operate this EVM within the input voltage range of 5.7V (min) to 9V (max) and the output voltage range of 0V (min) to 5V (max).

Exceeding the specified input range may cause unexpected operation and/or irreversible damage to the EVM. If there are questions concerning the input range, please contact a TI field representative prior to connecting the input power.

Applying loads outside of the specified output range may result in unintended operation and/or possible permanent damage to the EVM. Please consult the EVM User's Guide prior to connecting any load to the EVM output. If there is uncertainty as to the load specification, please contact a TI field representative.

During normal operation, some circuit components may have case temperatures greater than +25°C. The EVM is designed to operate properly with certain components above +25°C as long as the input and output ranges are maintained. These components include but are not limited to linear regulators, switching transistors, pass transistors, and current sense resistors. These types of devices can be identified using the EVM schematic located in the EVM User's Guide. When placing measurement probes near these devices during operation, please be aware that these devices may be very warm to the touch.

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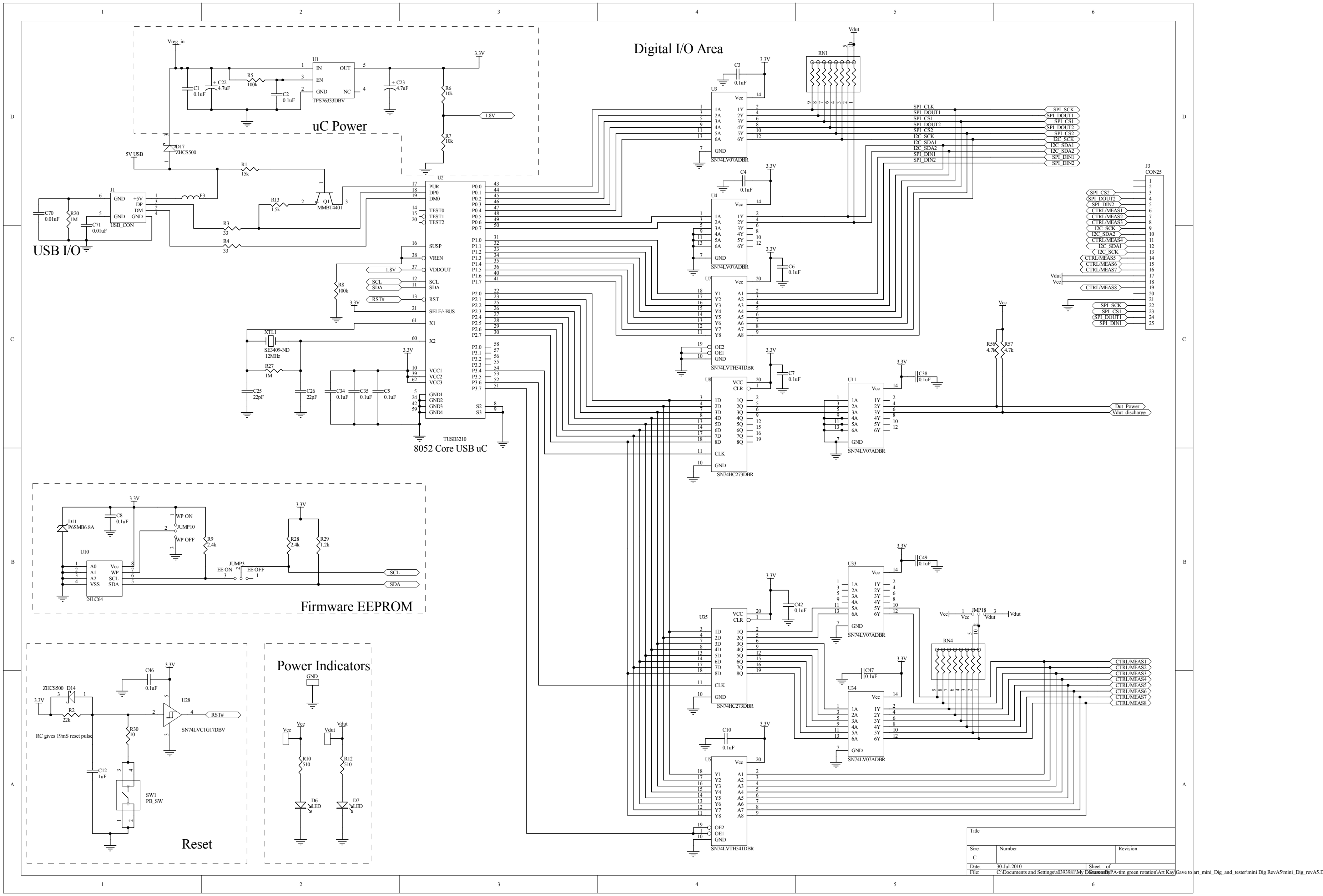
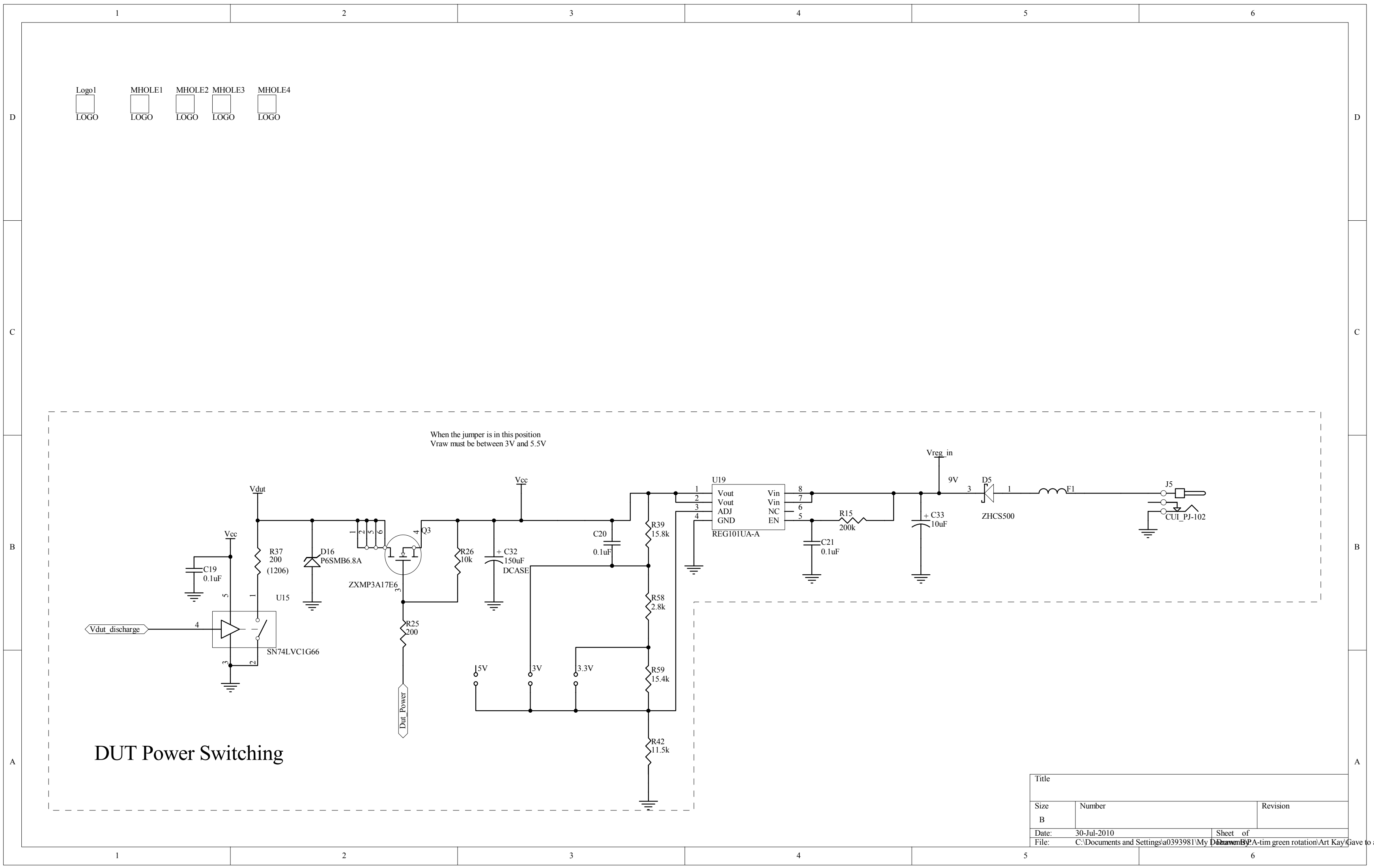

Digital I/O Area
uC Power
USB I/O
8052 Core USB uC
Firmware EEPROM
Power Indicators
Reset
RC gives 19mS reset pulse
Title
Size
C
Number
Revision
Date: 30-Jul-2010
Sheet of
File: C:\Documents and Settings\a0393981\My Documents\PA-tim green rotation\Art Kay\Gave to art_mini_Dig_and_tester\mini Dig RevA5\mini_Dig_revA5.Ddb


Logo1
MHOLE1
MHOLE2
MHOLE3
MHOLE4
LOGO
When the jumper is in this position
Vraw must be between 3V and 5.5V
Vdut
Vcc
R37
200
(1206)
D16
P6SMB6.8A
Q3
ZXMP3A17E6
R26
10k
C32
150uF
DCASE
C20
0.1uF
R39
15.8k
U19
Vout
Vout
ADJ
GND
Vin
Vin
NC
EN
REG101UA-A
R15
200k
C21
0.1uF
C33
10uF
Vreg_in
9V
D5
ZHCS500
F1
J5
CUI_PJ-102
C19
0.1uF
U15
SN74LVC1G66
Vdut_discharge
R25
200
Dut_Power
5V
3V
3.3V
R58
2.8k
R59
15.4k
R42
11.5k
DUT Power Switching
Title
Size
B
Number
Revision
Date:
30-Jul-2010
Sheet of
File:
Drawn By:

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RFID	www.ti-rfid.com	Space, Avionics & Defense	www.ti.com/space-avionics-defense
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