SPECTRUM DIGITAL INCORPORATED

TMS320C5502 eZdsp™ Development Kit

Technical Reference

2011 *DSP Development Systems*

TMS320C5502 eZdsp™
Development Kit
Technical Reference

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Contains the schematics for the TMS320C5502 eZdsp
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Contains the mechanical information about the TMS320C5502 eZdsp

About This Manual

This document describes the board level operations of the TMS320C5502 eZdsp. The TMS320C5502 eZdsp is based on the Texas Instruments TMS320C5502 Digital Signal Processor.

The TMS320C5502 eZdsp multi-layer printed circuit board (PCB) that allows engineers and software developers to evaluate certain characteristics of the TMS320C5502 DSP.

Notational Conventions

This document uses the following conventions.

The TMS320C5502 eZdsp will sometimes be referred to as the or C5502 eZdsp, or eZdsp.

Program listings, program examples, and interactive displays are shown is a special italic typeface. Here is a sample program listing.

equations
!rd = !strobe&rw;

Information About Cautions

This book may contain cautions.
This is an example of a caution statement.
A caution statement describes a situation that could potentially damage your software, or hardware, or other equipment. The information in a caution is provided for your protection. Please read each caution carefully.

Related Documents

Texas Instruments Code Composer Studio IDE Users Guide
Data sheet for the TMS320C5502

Chapter 1

Introduction to the TMS320C5502 eZdsp Development KIt

This chapter provides you with a description of the C5502 eZdsp along with the key features.

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1.0 Overview of the C5502 eZdsp

The C5502 eZdsp is an evaluation tool for the Texas Instruments TMS320C5502 Digital Signal Processor (DSP). This USB bus powered tool allows the user to evaluate the following items:

- The TMS320C5502 processor along with its peripherals
- The TLV320AIC3204 codec
- The Code Composer Studio IDE™ software development tools

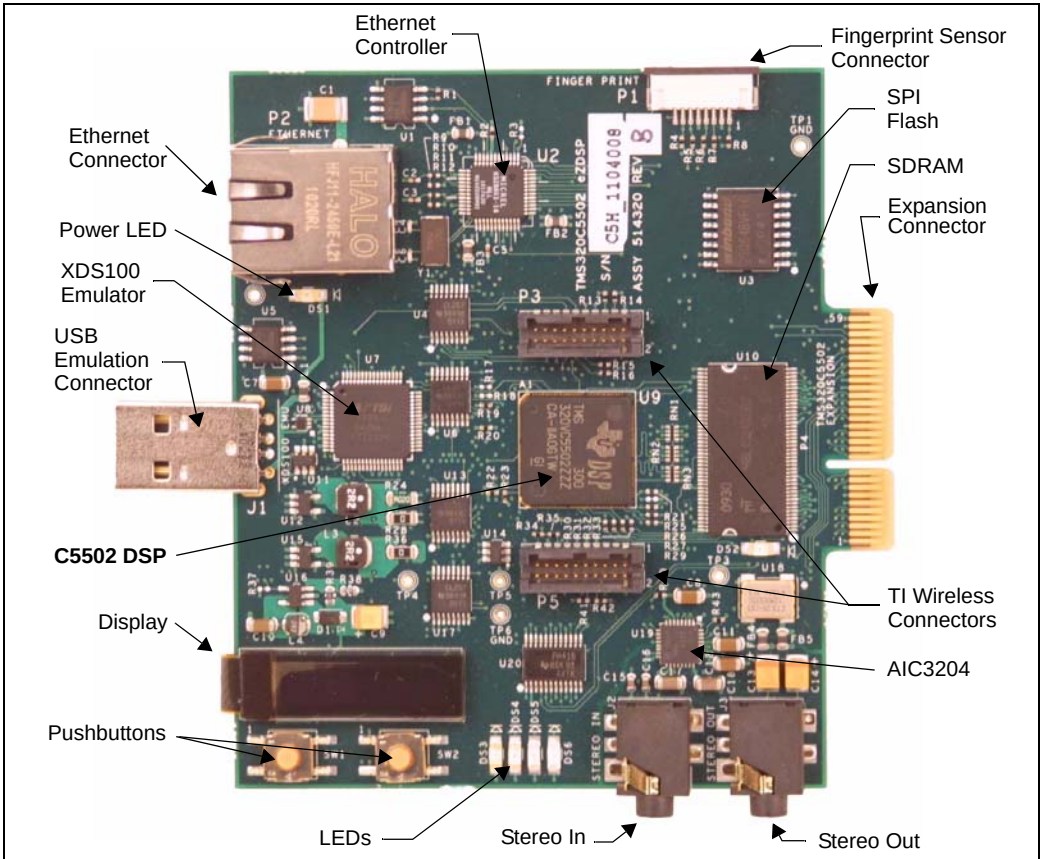

Figure 1-1, Key Features of the C5502 eZdsp (top)

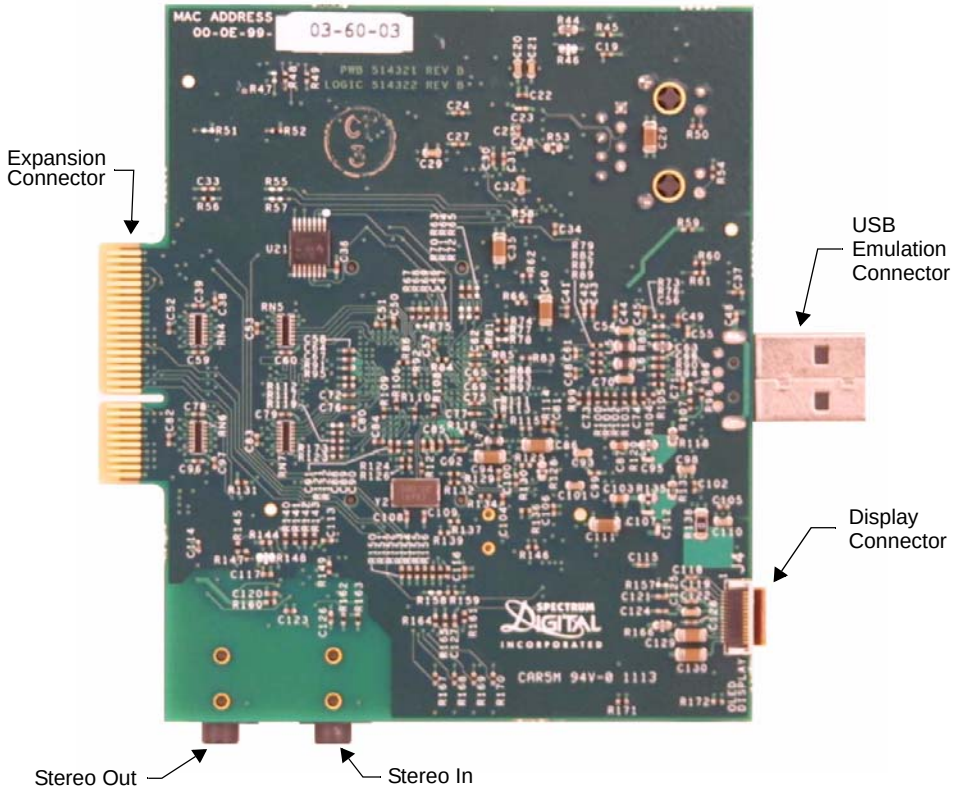

Figure 1-2, Key Features of the C5502 eZdsp (bottom)

1.1 Key Features of the C5502 eZdsp

The C5502 eZdsp has the following features:

- Texas Instrument's TMS320C5502 Digital Signal Processor
- Texas Instruments TLV320AIC3204 Stereo Codec (stereo in, stereo out)
- 10/100 Ethernet controller with RJ45 interface
- Fingerprint sensor interface
- 64 Megabit SPI Flash (boot default)
- 8 Megabytes of SDRAM (32 bits wide)
- I^2C OLED display
- 5 user controlled LEDs
- 2 user readable push button switches
- Embedded USB XDS100v2 JTAG emulator with UART interface option
- TI Wireless interface connectors
- Expansion edge connector
- Power provided by USB interface
- Compatible with Texas Instruments Code Composer Studio v4
- USB extension cable

1.2 C5502 eZdsp Block Diagram

The block diagram of the C5502 eZdsp is shown below.

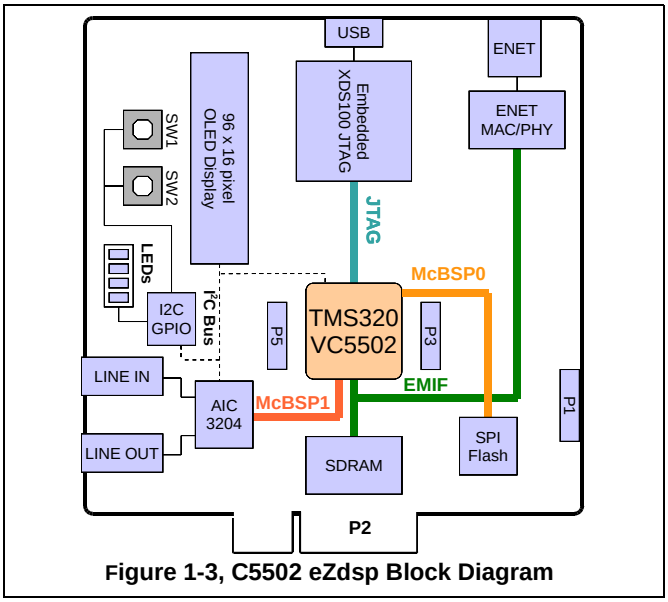

Figure 1-3, C5502 eZdsp Block Diagram

1.3 C5502 eZdsp Memory Map

The C5502 eZdsp supports on chip DARAM, off chip SDRAM, and a memory mapped Ethernet controller. The addressing for each of these memory blocks is shown in the figure below.

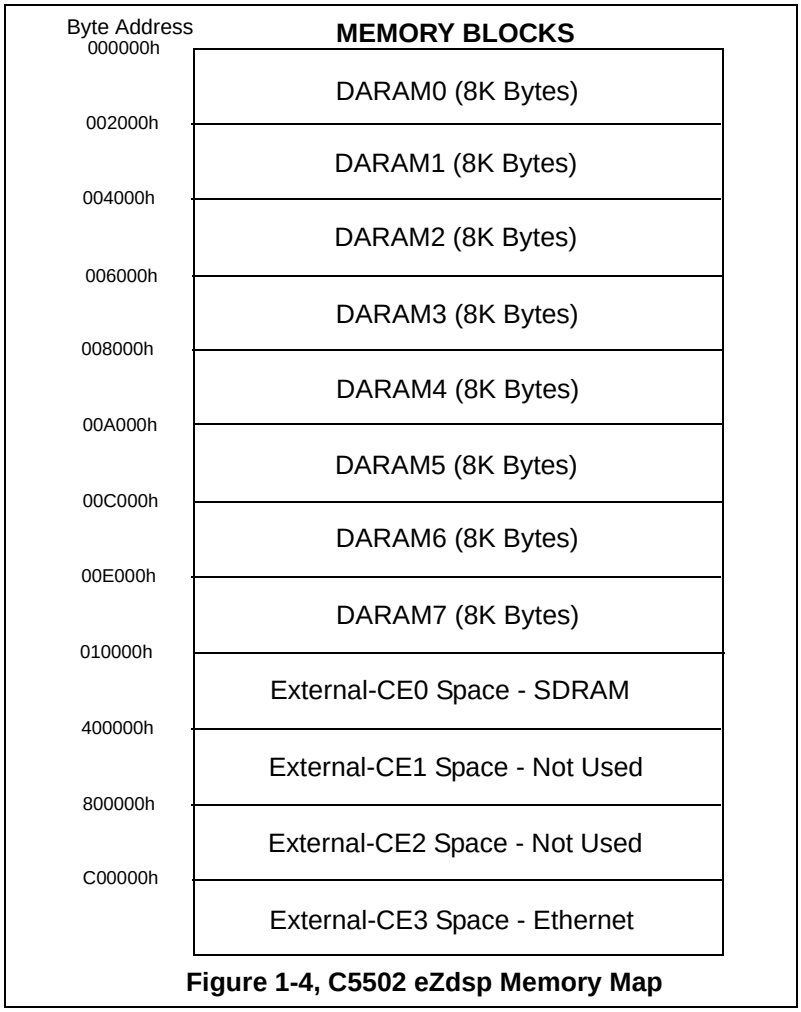

Figure 1-4, C5502 eZdsp Memory Map

1.4 C5502 eZdsp I2C Addressing

The C5502 eZdsp has multiple I2C devices for different purposes. The table below shows the addresses of these devices on the I2C bus.

Table 1: C5502 eZdsp I2C Addresses

eZdsp I2C Device	I2C Address	Function
TLV320AIC3204	0x18	Audio CODEC
TCA6416PW	0x21	I2C Expander bit I/O
OSD9616GLBBG01	0x3C	OLED Display

1.4.1 I2C Expander Definition

The C5502 eZdsp board incorporates a 16 bit I2C Expander to implement user bit I/O and the selecting/enabling of on-board multiplexing options.

The expander is configured as two 8-bit ports, Port0 and Port1. The bit functions for Port0 are shown in the table below.

Table 2: Port0 I2C Expander Definition

Port0 Bit Number	I/O Direction	Function
P00	I/O	Expansion connector
P01	I/O	Expansion connector
P02	I	SW2 Push Button
P03	I	SW1 Push Button
P04	O	DS3, “0” turns on LED
P05	O	DS4, “0” turns on LED
P06	O	DS5, “0” turns on LED
P07	O	DS6, “0” turns on LED

The bit functions for Port1 are shown in the table below

Table 3: Port1 I^2C Expander Definition

Port1 Bit Number	I/O Direction	Function
P10	I/O	Expansion connector
P11	I/O	Expansion connector
P12	I/O	Expansion connector
P13	O	Enable FTDI UART on XDS100v2 0 = enables 5502 UART to FTDI chip 1 = disables 5502 UART to FTDI chip
P14	O	BSP_Sel1_enable 0 = enables McBSP1 Mux 1 = disables McBSP1 Mux
P15	O	BSP_Sel1 0 = Selects McBSP1 to on board AIC when enabled 1 = Selects McBSP1 to finger print connector
P16	O	BSP_Sel0_enable 0 = enables McBSP0 Mux 1 = disables McBSP0 Mux
P17	O	BSP_Sel0 0 = Selects McBSP0 to TI wireless connectors I^2S channel ON when enable is low 1 = Selects McBSP0 to SPI channel on TI wireless connectors when enable is low

Chapter 2

Physical Description

This chapter describes the physical layout of the TMS320C5502 eZdsp.

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2.0 Board Layout

The C5502 eZdsp is a 3.4 x 3.7 inch six (6) layer printed circuit board which is powered off the USB bus of personal computer or laptop computer. This means this board does not require an external power supply.

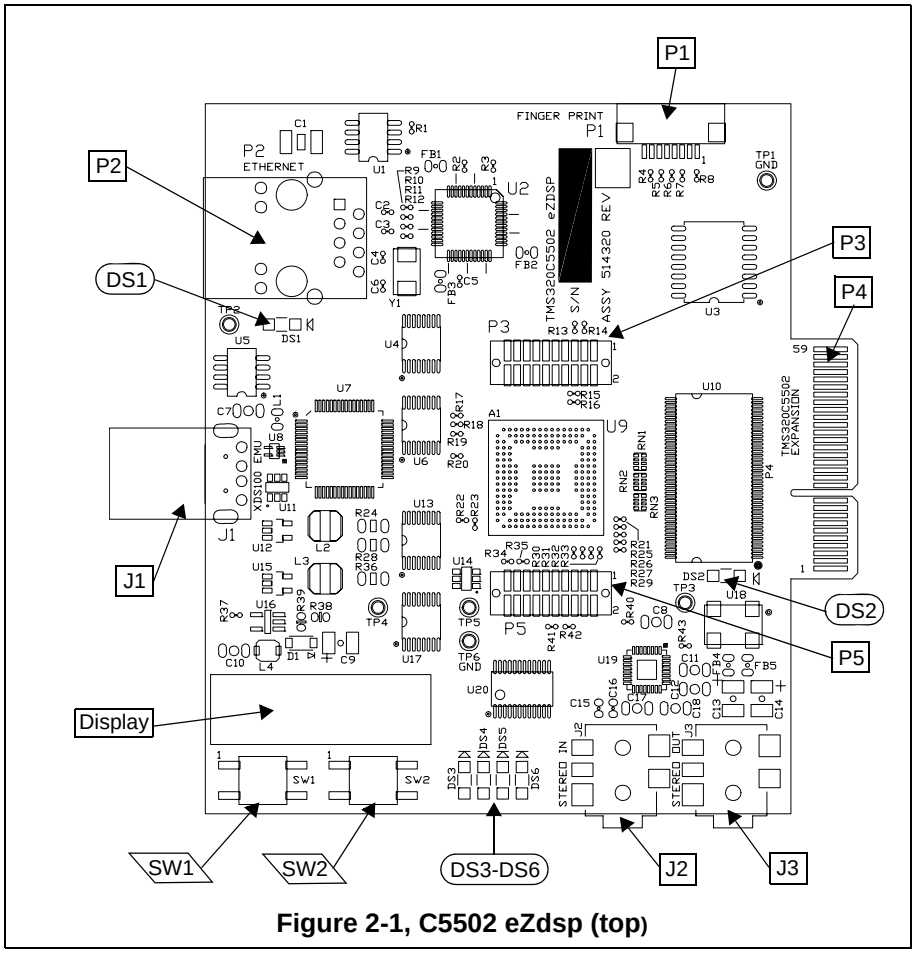

Figure 2-1, C5502 eZdsp (top)

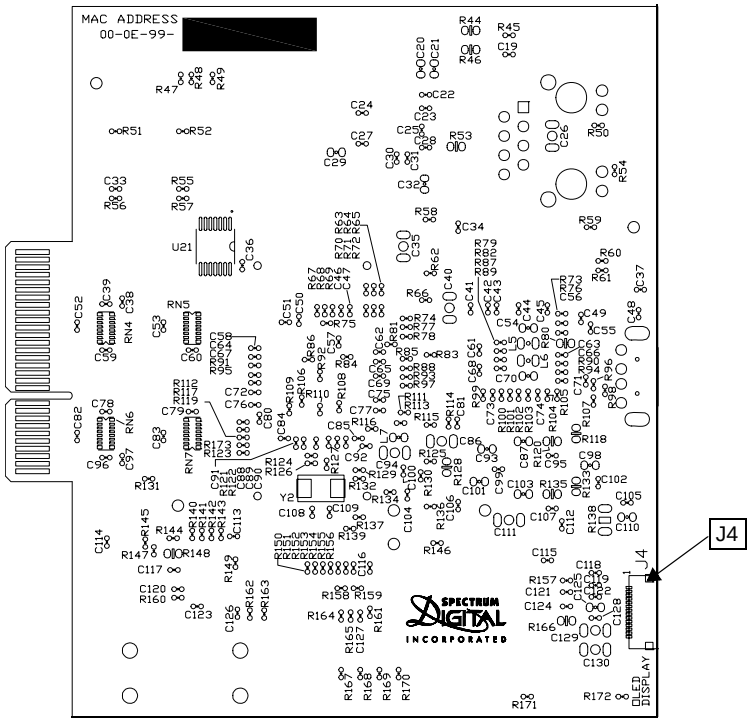

Figure 2-2, C5502 eZdsp (bottom)

2.1 Connector Index

The C5502 eZdsp has nine (9) connectors which provide the user access to various signals on the C5502 eZdsp. These connectors are shown in the table below.

Table 1: C5502 eZdsp Connectors

Connector	# Pins	Function	Schematic Page	Board Side
J1	6	Emulation USB	17	Top
J2	2	Stereo In	11	Top
J3	2	Headphones Out	11	Top
J4	14	LCD Interface	13	Bottom
P1	8	Fingerprint Sensor Interface	15	Top
P2	16	Ethernet Interface	12	Top
P3	20	TI Wireless Interface	9	Top
P4	30 x 2	Expansion	16	Top/Bottom
P5	20	TI Wireless Interface	9	Top

The following manufacturer and parts numbers can be used to interface to the connectors on the C5502 eZdsp:

Table 2: C5502 eZdsp Mating Connectors

Connector	Manufacturer	Part #
J1	PC or laptop	
J3	CUI Inc	CUI SP-3501, Digi-Key CP-3502-ND
J4	CUI Inc	CUI SP-3501, Digi-Key CP-3502-ND
P4	Samtec	Samtec MEC1-130-02-S-D-A, Digi-Key SAM8118-ND Samtec MEC1-130-02-S-D-RAI-SL

2.1.1 J1, XDS100 USB Connector

The USB connector, J1, is used to attach the C5502 eZdsp to a personal computer or laptop. This allows the user to develop and debug software on the C5502 eZdsp. The signals on the pins of this connector are shown below.

Table 3: J1, XDS100 USB Connector

Pin #	Signal Name
1	5V_USB
2	D+
3	D-
4	GND
5	Shield Ground
6	Shield Ground

2.1.2 J2, Stereo In Connector

The Stereo In connector, J2, is used to bring signals into the TLV320AIC3204 codec. The signals on the pins of this connector are shown below.

Table 4: J2, Stereo In Connector

Pin #	Signal Name	AIC3204 Pin #
1	GND-AIC	
2	AIC_LINE2L	15
3	AIC_LINE2R	16
4	No connect	
5	No connect	

The figure below shows a typical stereo jack.

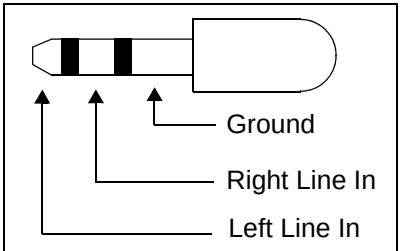

Figure 2-3, Audio In Jack

2.1.3 J3, Headphones Out Connector

The Headphones Out connector, J3, is used to bring signals from the TLV320AIC3204 codec. The signals on the pins of this connector are shown below.

Table 5: J3, Headphones Out Connector

Pin #	Signal Name	AIC3204 Pin #
1	GND-AIC	
2	HEADPHONE_LOUT	25
3	HEADPHONE_ROUT	27
4	No connect	
5	No connect	

The figure below shows a typical headphone jack.

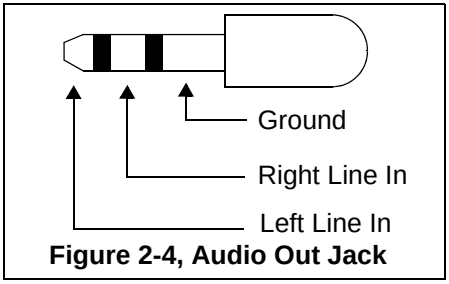

Figure 2-4, Audio Out Jack

2.1.4 J4, LCD Interface

Connector, J4, is used to interface to an LCD character display. The signals on the pins of this connector are shown below.

Table 6: J4, LCD Interface

Pin #	Signal Name
1	C2P
2	C2N
3	C1P
4	C1N
5	VBAT
6	VBREF
7	VSS / GND
8	VDD / VCC_3V3
9	RESn / TARGET_PWR_GOOD
10	SCL / I2C_SCL
11	SDA / I2C_SDA
12	IREF / GND
13	VCOMH
14	VCC / V13

2.1.5 P1, Fingerprint Sensor Interface

Connector P1 is a 1 x 8 pin connector that allows a fingerprint sensor to be plugged into the C5502 eZdsp. The signals on this connector are shown in the table below.

Table 7: P1, Fingerprint Sensor Interface

Pin #	Signal Name
1	SPI_RX
2	VCC_3V3
3	SPI_RESET
4	SPI_CLK
5	GND
6	SPI_DX
7	SPI_CS
8	GND

2.1.6 P2, Ethernet Interface

Connector P2 is a standard RJ45 Ethernet connector allowing the C5502 eZdsp to communicate over Ethernet. The signals present on this connector are shown in the table below.

Table 8: P2, Ethernet Interface

Pin #	Signal Name
1	TXD+ / TXP1, U2, Pin 19
2	TXD- / TXM1, U2, Pin 20
3	RXD+ / RXP1, U2, Pin 16
4	TXD-CT / ENET_3V3A
5	RXD-CT / ENET_3V3A
6	RXD- / RXM1, U2, Pin 17
7	NC1
8	GND
9	LED1+ / VCC_3V3
10	LED1- / P1LED0
11	LED2+ / VCC_3V3
12	LED2- / P1LED1
MH1	NC
MH2	NC
SH1	GND_E_ENET
SH2	GND_E_ENET

The unique Ethernet MAC address for each C5502 eZdsp is programmed into non-volatile memory on the board. It is also shown on the bottom side of the board. The figure shows the position of the MAC address (different for each eZdsp).

Figure 2-5, Ethernet MAC Address Location

2.1.7 P3, P5, TI Wireless Interface

Connectors P3, and P5 are expansion connectors used to provide an interface to TI Wireless modules board. The signals on the pins of these connectors are shown in the tables below.

Table 9: P3, TI Wireless Interface

Pin #	Signal Name	Pin #	Signal Name
1	GND	2	NC
3	UART_RTS/GPIO3	4	NC
5	TIMER/TIM0	6	NC
7	UARTTX	8	NC
9	UARTRX	10	GPIO6
11	I2C_SDA	12	GPIO7
13	I2C_SCL	14	CC_SPI_CS
15	NC	16	CC_SPI_CLK
17	NC	18	CC_SPI_MOSI
19	GND	20	CC_SPI_MOSO

Table 10: P5, TI Wireless Interface

Pin #	Signal Name	Pin #	Signal Name
1	NC	2	GND
3	NC	4	NC
5	NC	6	NC
7	VCC_3V3	8	CC_I2S_RX
9	VCC_3V3	10	CC_I2S_TX
11	CC_I2S_FS	12	NC
13	GPIO25	14	NC
15	GPIO26	16	NC
17	CC_I2S_CLK	18	GPIO5
19	GPIO26	20	GPIO35

2.1.8 P4, Expansion Connector

The Expansion connector, P4, is used to bring signals from C5502 DSP out to a connector for user interface. This card edge connector has all of the odd number (1,3,...,59) tabs on the top side of the board and all of the even number tabs (2,4,...,46) on the bottom side of the board. The diagram below shows the position of these tabs.

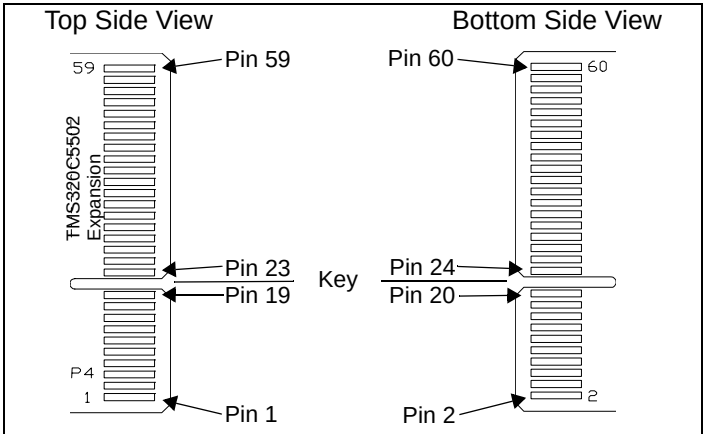

Figure 2-6, P4 Connector Tab Positions

The table below lists the signals that appear on each of the tabs of connector P4. The signals on the pins of this connector are shown below.

Table 11: P4, Expansion Connector

Pin # Top	Signal Name	Pin # Bottom	Signal Name
1	GND	2	GND
3	SPI_CS	4	GPIO1
5	SPI_CLK	6	GPIO0
7	SPI_DX	8	GPIO35
9	SPI_RX	10	TIM0
11	GND	12	GND
13	GND	14	GND
15	GND	16	GND
17	I2C_SDA	18	GPIO7
19	I2C_SDL	20	GPIO2
	Key		Key
23	CC_I2S_CLK	24	I2C_P01
25	CC_I2S_RX	26	I2C_P00
27	CC_I2S_TX	28	DX2
29	CC_I2S_FS	30	DR2
31	GND	32	GND
33	GPIO6	34	GPIO3
35	GPIO33	36	GPIO5
37	GPIO25	38	UARTRX
39	GPIO26	40	UARTTX
41	VCC_3V3	42	VCC_3V3
43	VCC_3V3	44	VCC_3V3
45	AIC_BCLK	46	TIM1
47	AIC_DOUT	48	VCC_3V3
49	AIC_DIN	50	PGPIO39
51	AIC_WCLK	52	PGPIO38
53	I2C_P10	54	PGPIO37
55	I2C_P11	56	PGPIO36
57	VCC_3V3	58	VCC_3V3
59	VCC_3V3	60	VCC_3V3

2.2 System LEDs

The C5502 eZdsp has 6 Light Emitting Diodes (LED). Five of the six LEDs are under the application software control running on the C5502 processor. These LEDs are shown in the table below.

Table 12: System LEDs

LED #	Color	Schematic Page	Signal Name
DS1	Green	17	Emulator status
DS2	Green	2	U9, Pin T6,C5502 XF
DS3	Green	14	U20, Pin 8, LED3
DS4	Red	14	U20, Pin 9, LED2
DS5	Yellow	14	U20, Pin 10, LED1
DS6	Blue	14	U20, Pin 11, LED0

2.3 Switches

The C5502 eZdsp has two push button switches. The push button switches (SW1, SW2) can be read by application software running on the C5502 processor. These switches are shown in the table below.

Table 13: Switches

Switch #	Type	Schematic Page	Signal Name/Reading
SW1	Push button	14	SW0, U20, Pin 7
SW2	Push button	14	SW1, U20, Pin 6

2.4 Test Points

The C5502 eZdsp has six (6) test points for the monitoring of signals. The location of the test points are shown in the figure below.

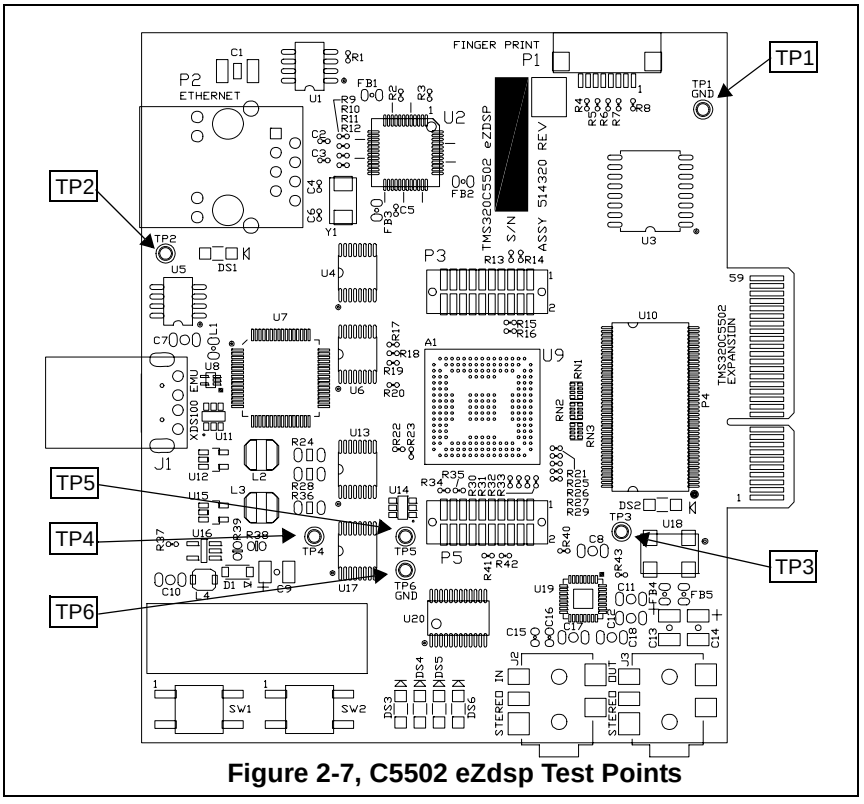

Figure 2-7, C5502 eZdsp Test Points

The signals on the test points are shown in the table below.

Table 14: Test Points

TP #	Schematic Page	Signal Name
TP1	6	GND
TP2	10	TARGET_PWR_GOOD, VCC_3V3
TP3	10	VCC_3V3
TP4	10	VCC_1V26
TP5	5	CLKOUT, U9, Pin R6
TP6	11	GND

Appendix A

Schematics

This appendix contains the schematics for the TMS320C5502 eZdsp.

NOTES, UNLESS OTHERWISE SPECIFIED:

1. RESISTANCE VALUES IN OHMS.

2. CAPACTITANCE VALUES IN MICROFARADS.

3. REFERENCE DESIGNATORS USED:

4. ALL 0.1 uF AND 0.01uF CAPACITORS ARE DECOUPLING CAPS UNLESS OTHERWISE NOTED. THEY ARE SHOWN ON THE PAGE WITH THE INTEGRATED CIRCUITS THEY SHOULD BE PLACED NEAR.

REV	DESCRIPTION	DATE	APPROVED
A	Initial schematic for layout	11/15/2010	RRP
B	Added SDRAM/SPI FLASH/General updates	2/15/2011	RRP

SCHEMATIC CONTENTS

01 - TITLE PAGE
02 - TMS320C5502 GPIO/BSP/SPI/I2C
03 - McBSP MUXES
04 - TMS320C5502 CLK/JTAG
05 - TMS320C5502 EMIF
06 - TMS320C5502 POWER
07 - SPI FLASH
08 - SDRAM
09 - CC BOARD INTERFACE
10 - POWER SUPPLIES
11 - AUDIO CODEC
12 - ETHERNET CONTROLLER
13 - LCD INTERFACE
14 - USER LEDS/SWITCHES
15 - FINGERPRINT INTERFACE
16 - EXPANSION CONNECTOR
17 - XDS100-v2 INTERFACE

REVISION STATUS OF SHEETS

REV												
SHEET												
REV												
SHEET												
REV	A	A	A	A	A	A	A					
SHEET	11	12	13	14	15	16	17					
REV	B	A	B	A	A	A	A	B	A	A	NEXT ASSY	USED ON
SHEET	1	2	3	4	5	6	7	8	9	10	APPLICATION	

DWN	R.R.P.	DATE 11/15/2010
CHK	T.W.K.	DATE 11/15/2010
ENGR	R.R.P.	DATE 11/15/2010
ENGR-MGR	R.R.P.	DATE 11/15/2010
QA	C.M.D.	DATE 11/15/2010
MFG	R.R.P.	DATE 11/15/2010
RLSE	R.R.P.	DATE 11/15/2010

SPECTRUM DIGITAL INCORPORATED		
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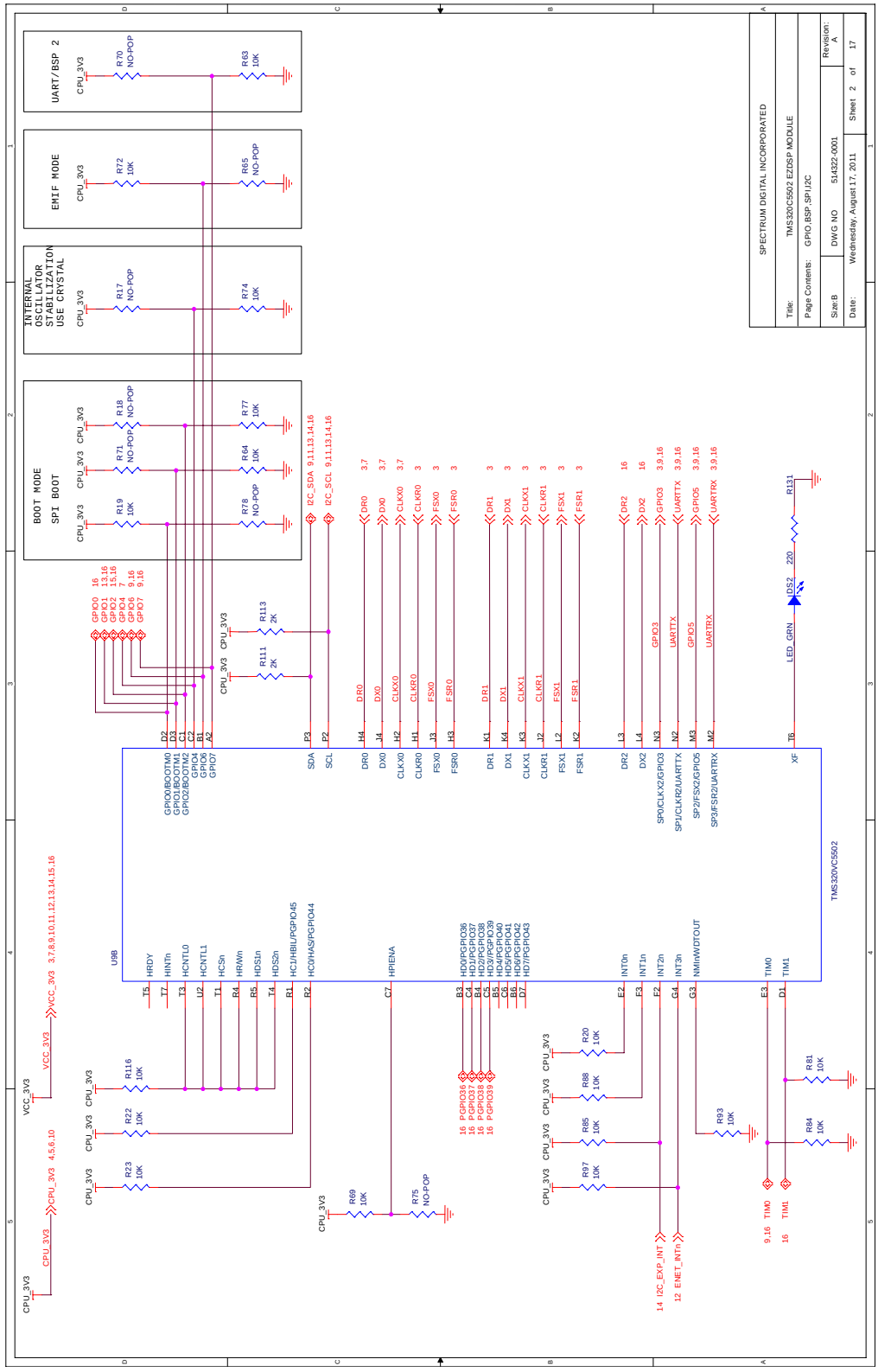
Size:B	DWG NO 514322-0001	Revision: B
Date: Wednesday, August 17, 2011	Sheet 1 of 17	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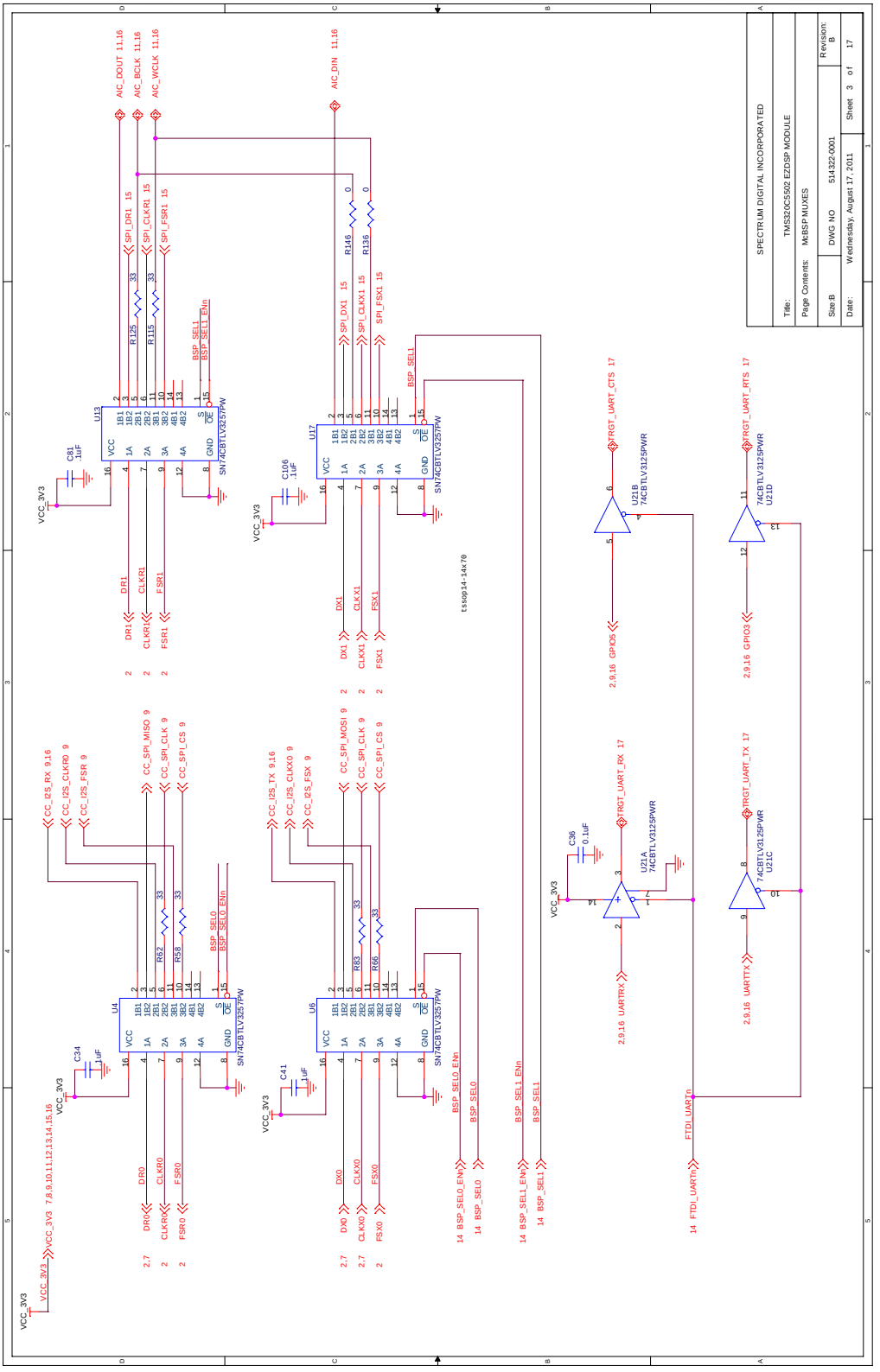
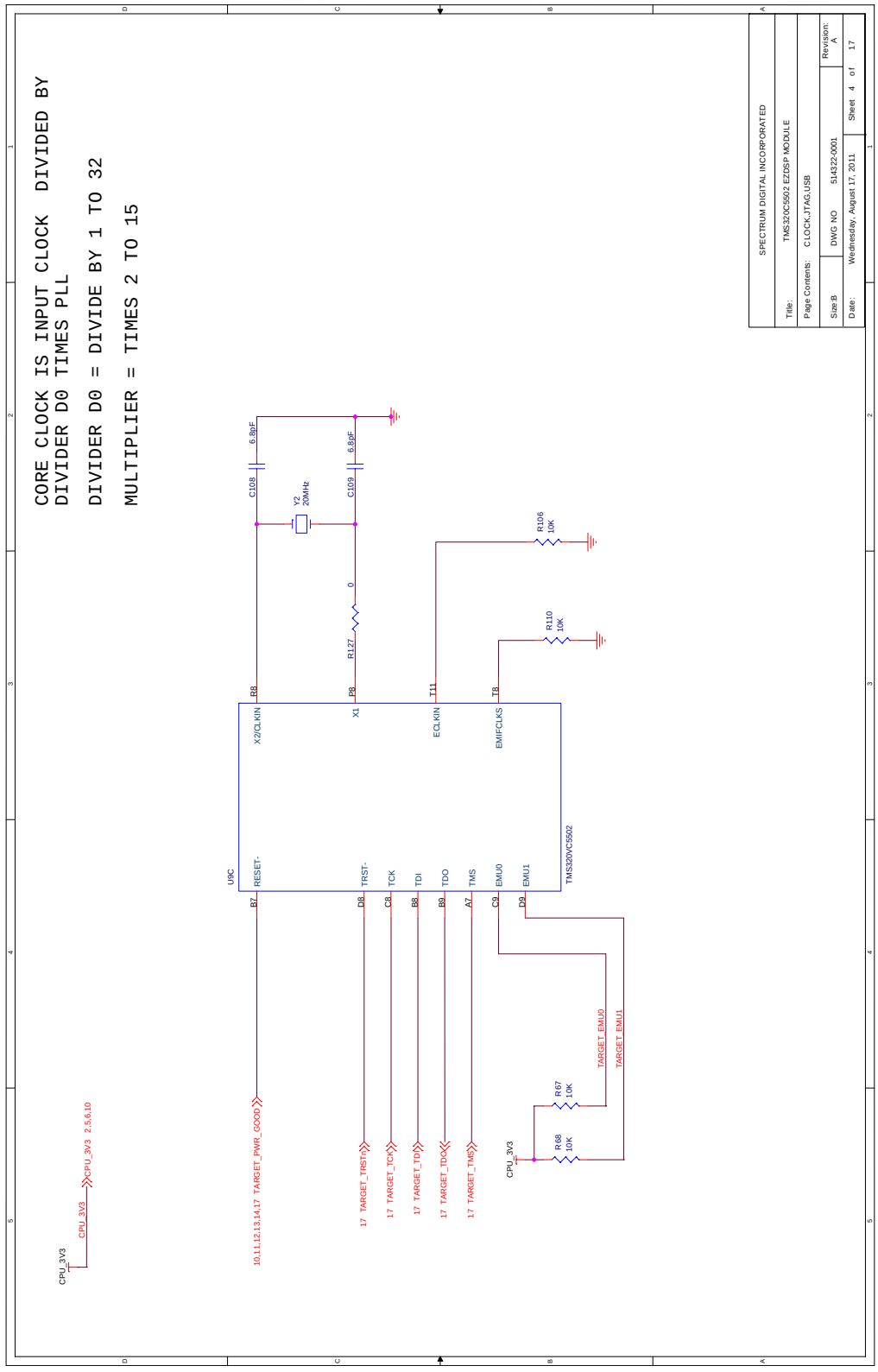
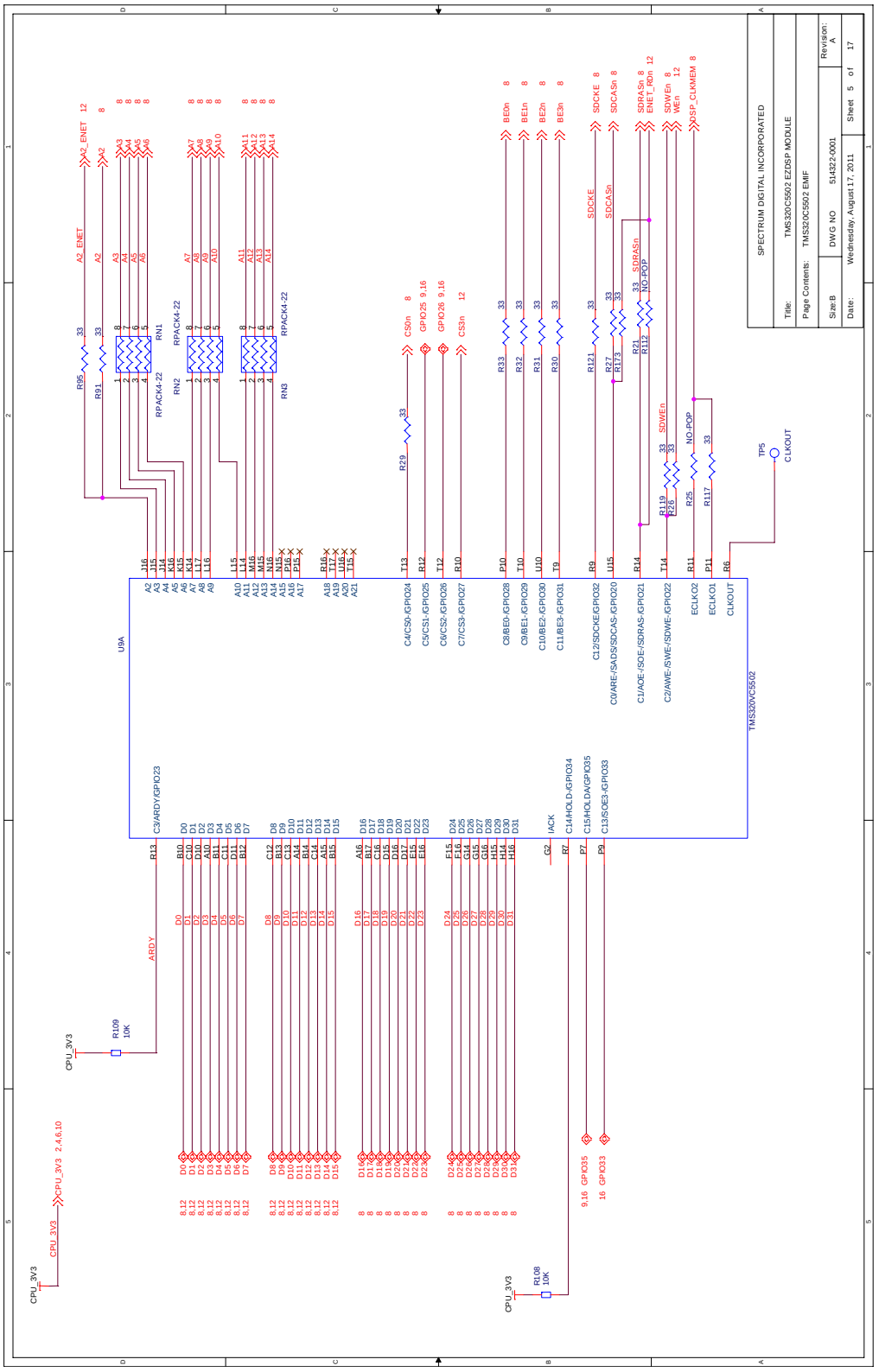
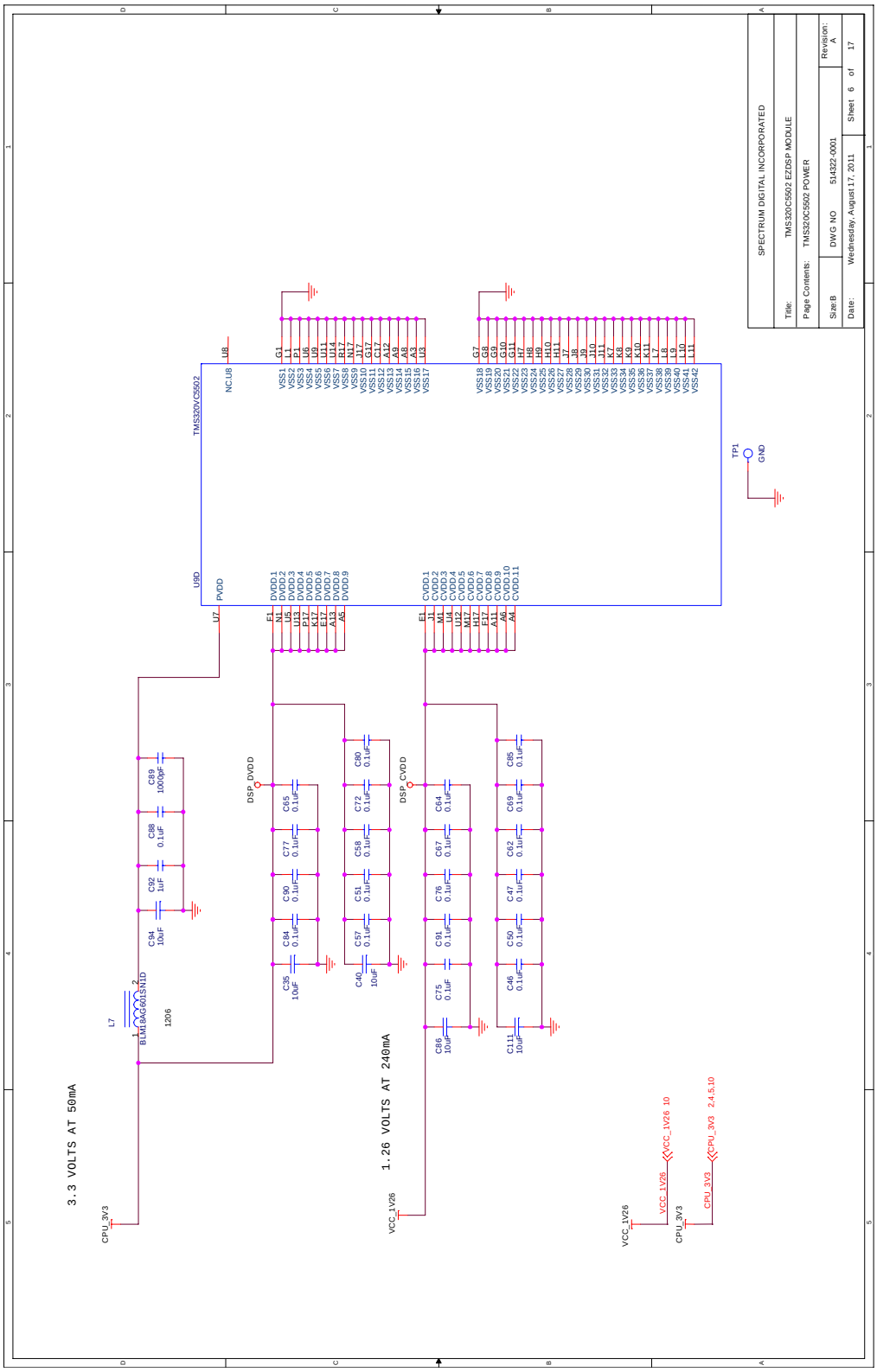
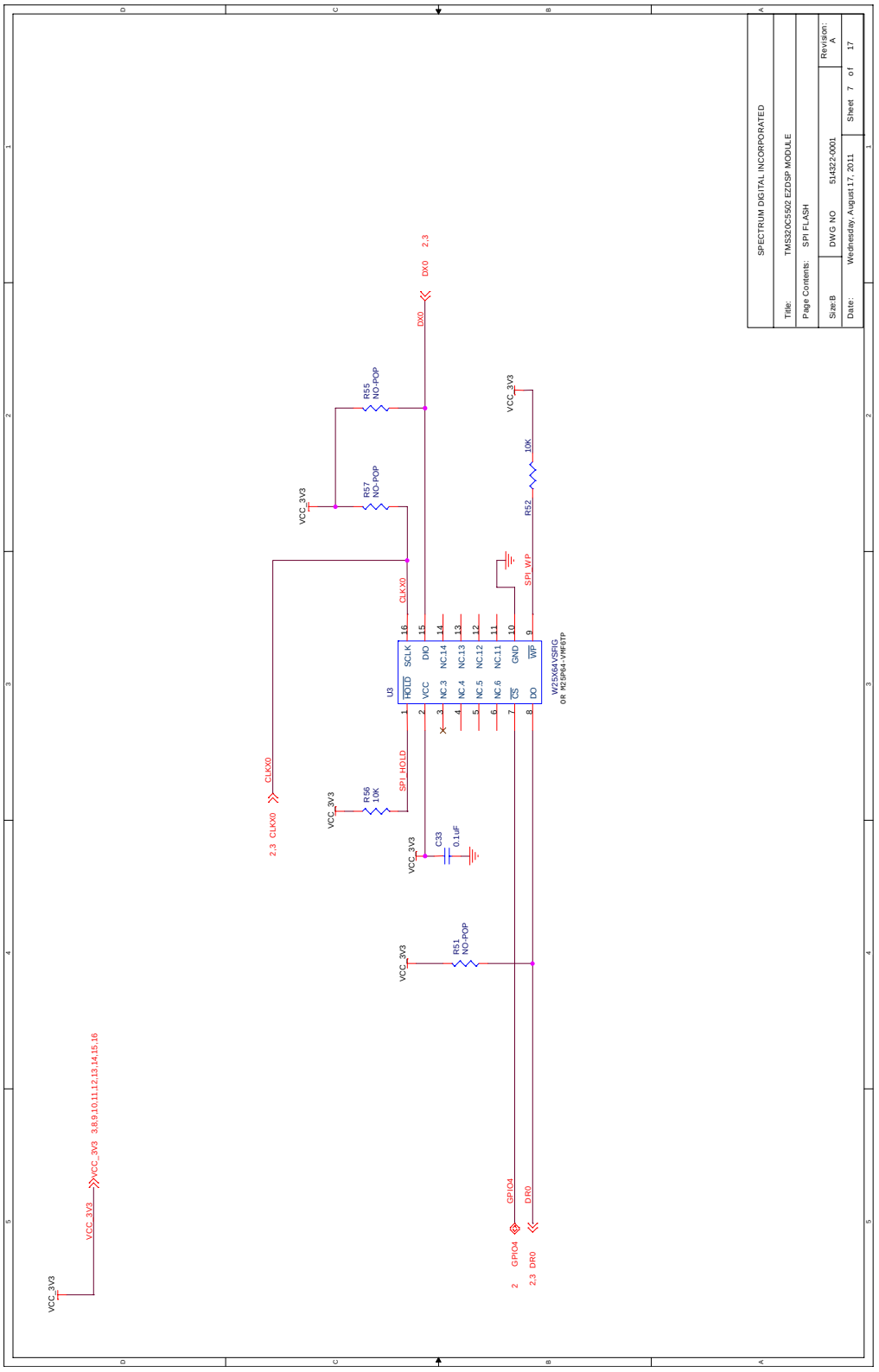
SPI BOOT
INTERNAL OSCILLATOR STABILIZATION USE CRYSTAL
EMIF MODE
UART/BSP 2
U9B
TMS320VC5502
SPECTRUM DIGITAL INCORPORATED
Title: TMS320C5502 EZDSP MODULE
Page Contents: GPIO,BSP,SPI,I2C
Size:B DWG NO 514322-0001 Revision: A
Date: Wednesday, August 17, 2011 Sheet 2 of 17

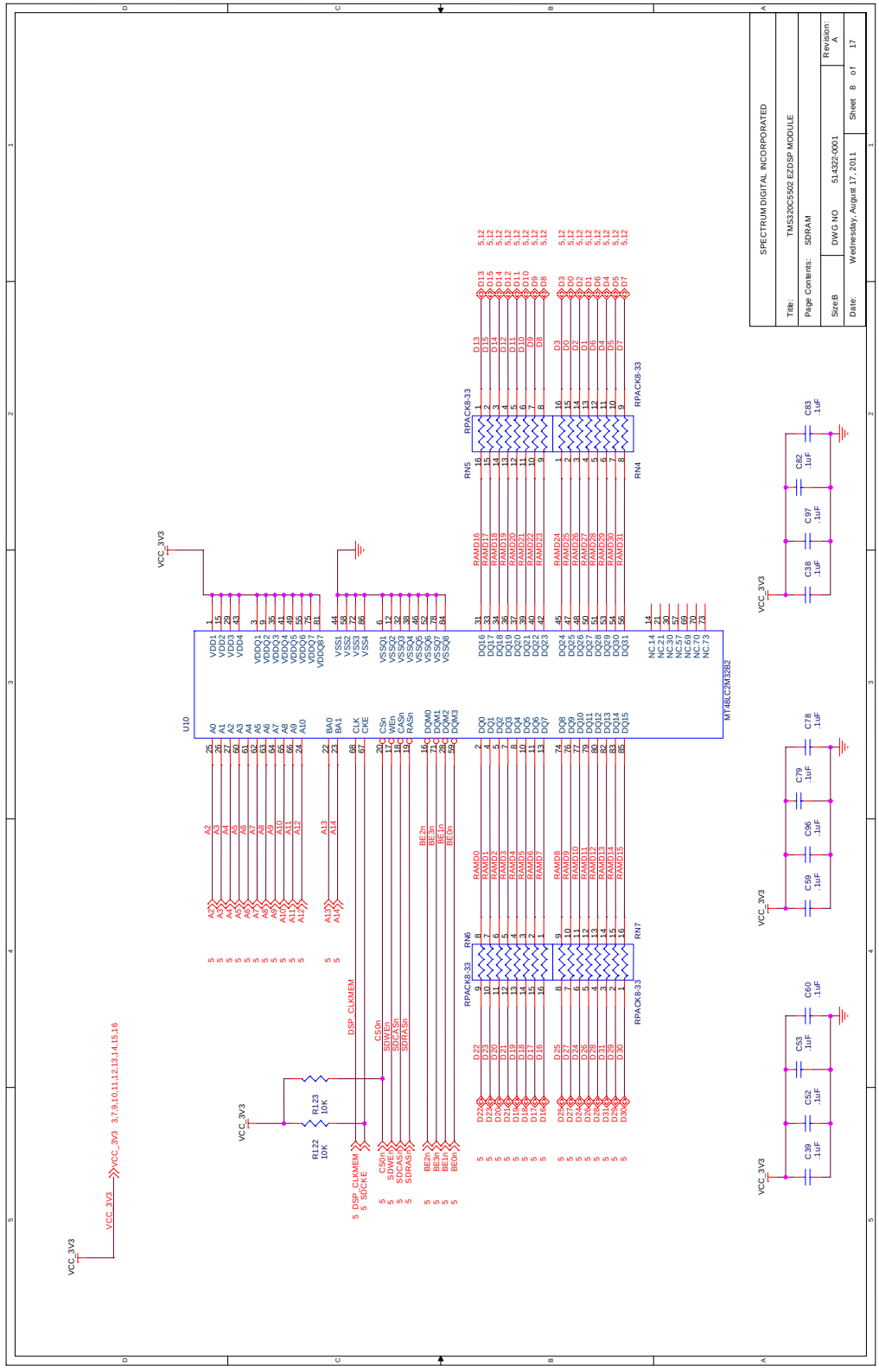

SPECTRUM DIGITAL INCORPORATED
Title: TMS320C5502 EZDSP MODULE
Page Contents: McBSP MUXES
Size:B DWG NO 514322-0001 Revision: B
Date: Wednesday, August 17, 2011 Sheet 3 of 17
SN74CBTLV3257PW
74CBTLV3125PWR
tssop14-14x70
VCC_3V3
AIC_DOUT 11,16
AIC_BCLK 11,16
AIC_WCLK 11,16
AIC_DIN 11,16
CC_I2S_RX 9,16
CC_I2S_CLKR0 9
CC_I2S_FSR 9
CC_I2S_TX 9,16
CC_I2S_CLKX0 9
CC_I2S_FSX 9
CC_SPI_MISO 9
CC_SPI_MOSI 9
CC_SPI_CLK 9
CC_SPI_CS 9
SPI_DR1 15
SPI_CLKR1 15
SPI_FSR1 15
SPI_DX1 15
SPI_CLKX1 15
SPI_FSX1 15
BSP_SEL1
BSP_SEL1_ENn
BSP_SEL0
BSP_SEL0_ENn
TRGT_UART_CTS 17
TRGT_UART_RTS 17
TRGT_UART_RX 17
TRGT_UART_TX 17
2,9,16 GPIO5
2,9,16 GPIO3
2,9,16 UARTRX
2,9,16 UARTTX
14 FTDI_UARTn
14 BSP_SEL1_ENn
14 BSP_SEL1
14 BSP_SEL0_ENn
14 BSP_SEL0

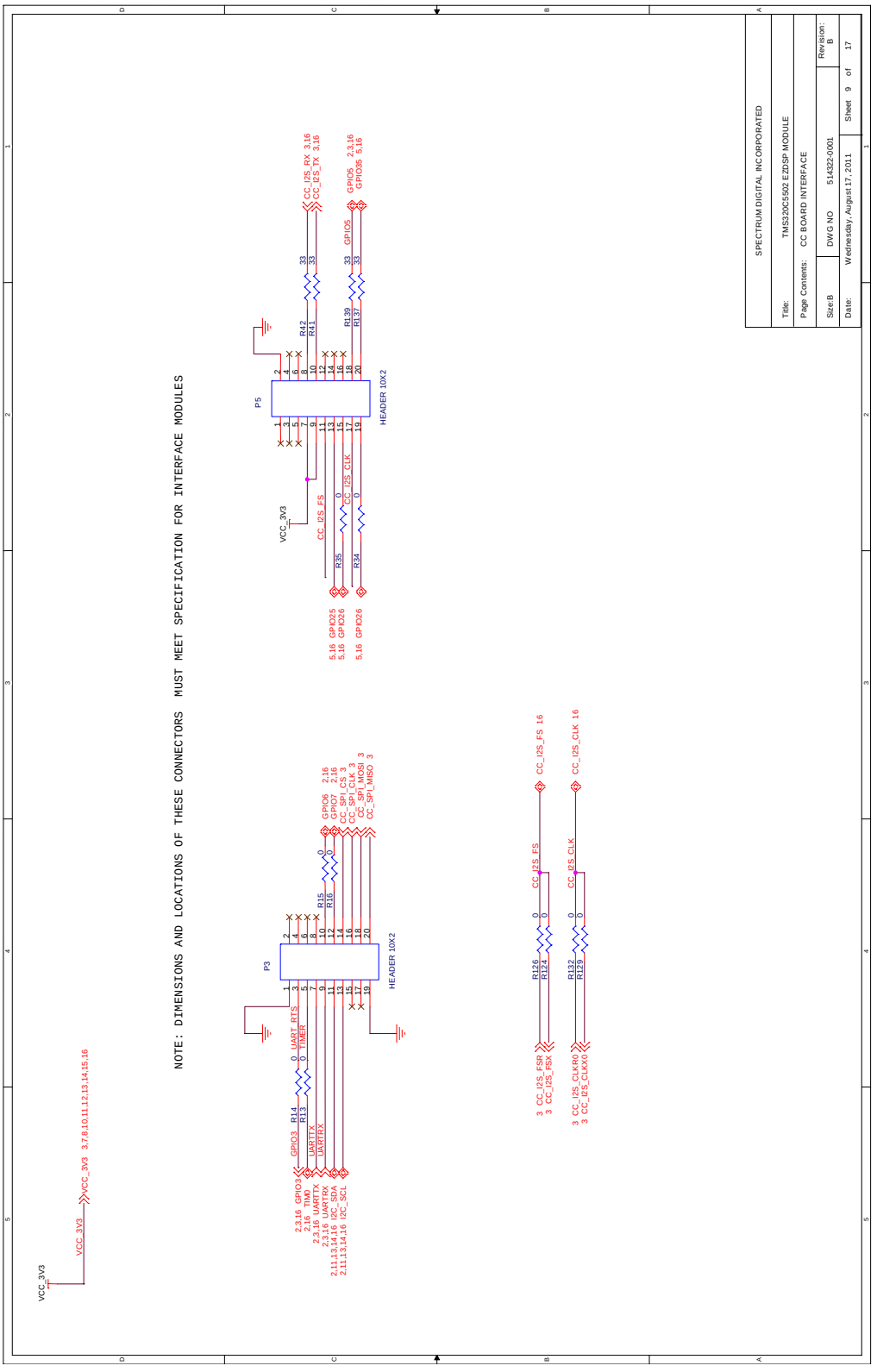

CORE CLOCK IS INPUT CLOCK DIVIDED BY
DIVIDER D0 TIMES PLL
DIVIDER D0 = DIVIDE BY 1 TO 32
MULTIPLIER = TIMES 2 TO 15
SPECTRUM DIGITAL INCORPORATED
Title: TMS320C5502 EZDSP MODULE
Page Contents: CLOCK,JTAG,USB
Size: B
DWG NO 514322-0001
Revision: A
Date: Wednesday, August 17, 2011
Sheet 4 of 17
U9C
X2/CLKIN
X1
ECLKIN
EMIFCLKS
RESET-
TRST-
TCK
TDI
TDO
TMS
EMU0
EMU1
TMS320VC5502
C108 6.8pF
C109 6.8pF
Y2 20MHz
R127 0
R106 10K
R110 10K
R67 10K
R68 10K
CPU_3V3
CPU_3V3 2,5,6,10
10,11,12,13,14,17 TARGET_PWR_GOOD
17 TARGET_TRST
17 TARGET_TCK
17 TARGET_TDI
17 TARGET_TDO
17 TARGET_TMS
TARGET_EMU0
TARGET_EMU1

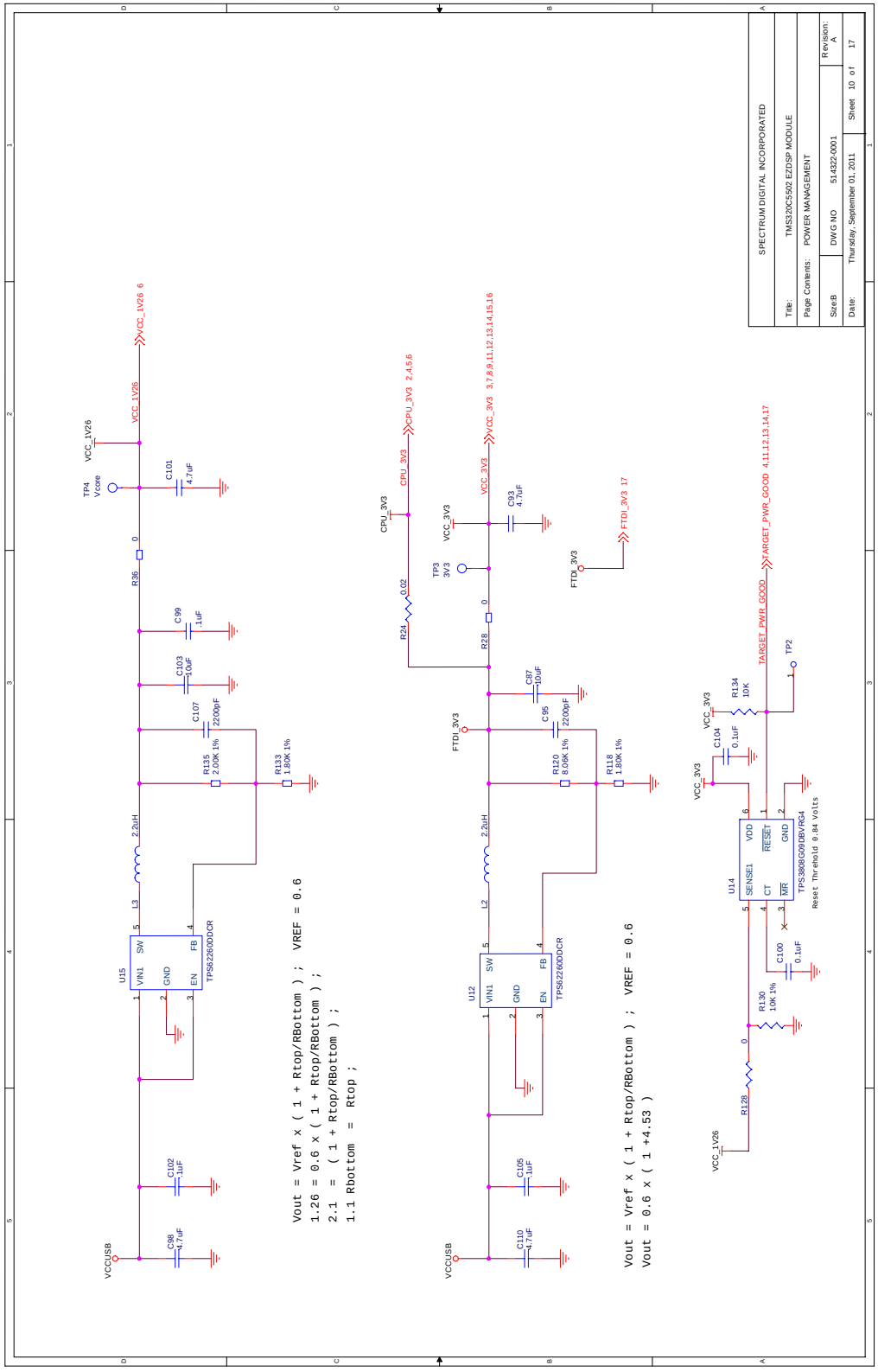

SPECTRUM DIGITAL INCORPORATED
Title: TMS320C5502 EZDSP MODULE
Page Contents: TMS320C5502 EMIF
Size:B
DWG NO 514322-0001
Revision: A
Date: Wednesday, August 17, 2011
Sheet 5 of 17
U9A
TMS320VC5502
RPACK4-22
RN1
RN2
RN3
CPU_3V3
CPU_3V3 2,4,6,10
ARDY
TP5
CLKOUT
SDCKE
SDCASn
SDRASn
SDWEn
NO-POP
ENET_RDn
DSP_CLKMEM
BE0n
BE1n
BE2n
BE3n
CS0n
GPIO25
GPIO26
CS3n
GPIO35
GPIO33
IACK
C3/ARDY/GPIO23
C4/CS0-/GPIO24
C5/CS1-/GPIO25
C6/CS2-/GPIO26
C7/CS3-/GPIO27
C8/BE0-/GPIO28
C9/BE1-/GPIO29
C10/BE2-/GPIO30
C11/BE3-/GPIO31
C12/SDCKE/GPIO32
C0/ARE-/SADS/SDCAS-/GPIO20
C1/AOE-/SOE-/SDRAS-/GPIO21
C2/AWE-/SWE-/SDWE-/GPIO22
ECLKO2
ECLKO1
CLKOUT
C14/HOLD-/GPIO34
C15/HOLDA/GPIO35
C13/SOE3-/GPIO33
R109 10K
R108 10K

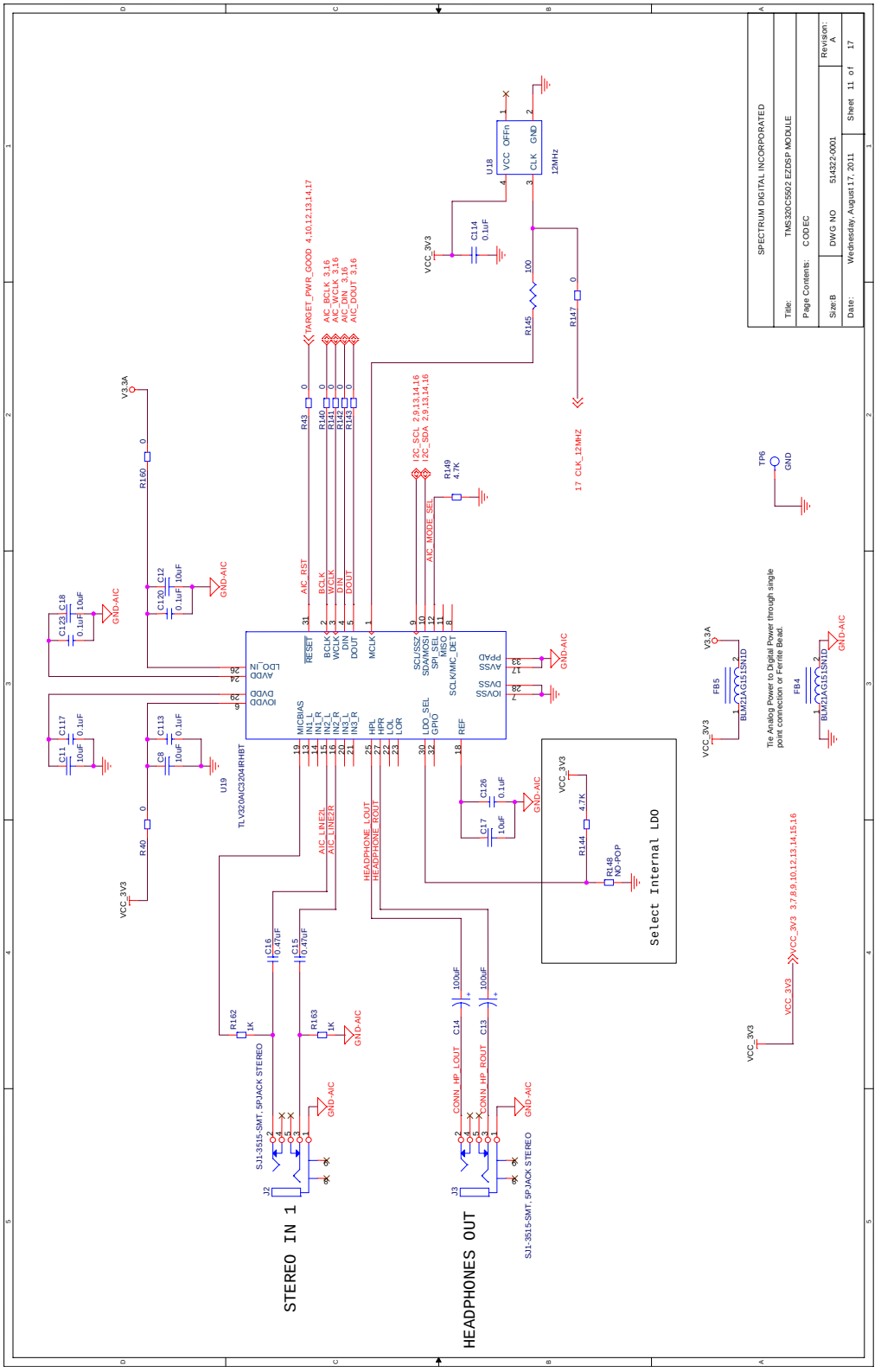

SPECTRUM DIGITAL INCORPORATED
Title: TMS320C5502 EZDSP MODULE
Page Contents: TMS320C5502 POWER
Size:B
DWG NO 514322-0001
Revision: A
Date: Wednesday, August 17, 2011
Sheet 6 of 17
3.3 VOLTS AT 50mA
1.26 VOLTS AT 240mA
TMS320VC5502
U9D
U8
U7
TP1
GND
DSP_DVDD
DSP_CVDD
CPU_3V3
VCC_1V26
L7
BLM18AG601SN1D
1206

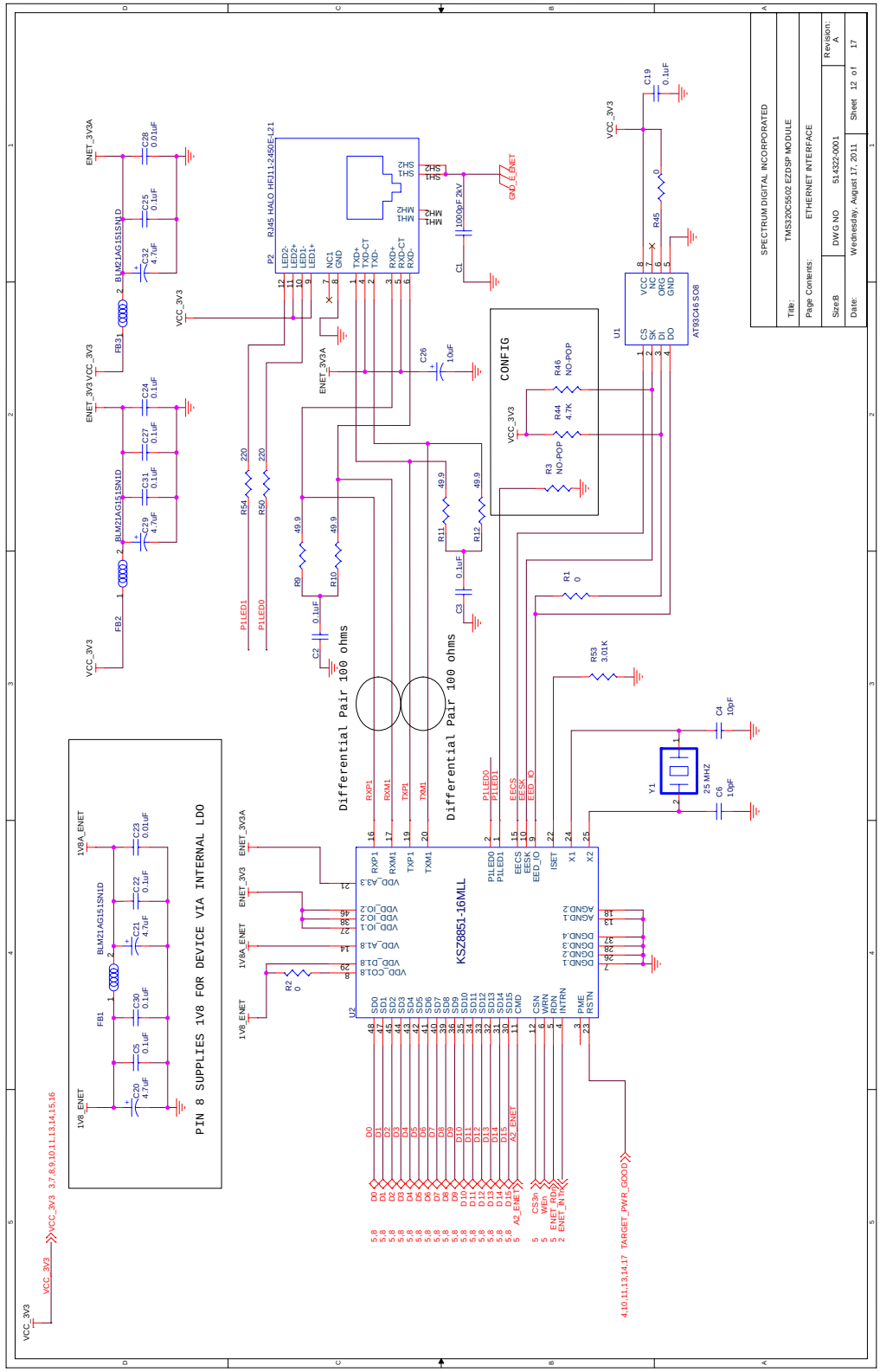

SPECTRUM DIGITAL INCORPORATED
Title: TMS320C5502 EZDSP MODULE
Page Contents: SPI FLASH
Size:B
DWG NO 514322-0001
Revision: A
Date: Wednesday, August 17, 2011
Sheet 7 of 17
U3
W25X64VSFIG
0R M25P64-VMF6TP
R55 NO-POP
R57 NO-POP
R56 10K
R51 NO-POP
R52 10K
C33 0.1uF
VCC_3V3
DX0
CLKX0
SPI_HOLD
SPI_WP
GPIO4
DR0
VCC_3V3 3,8,9,10,11,12,13,14,15,16

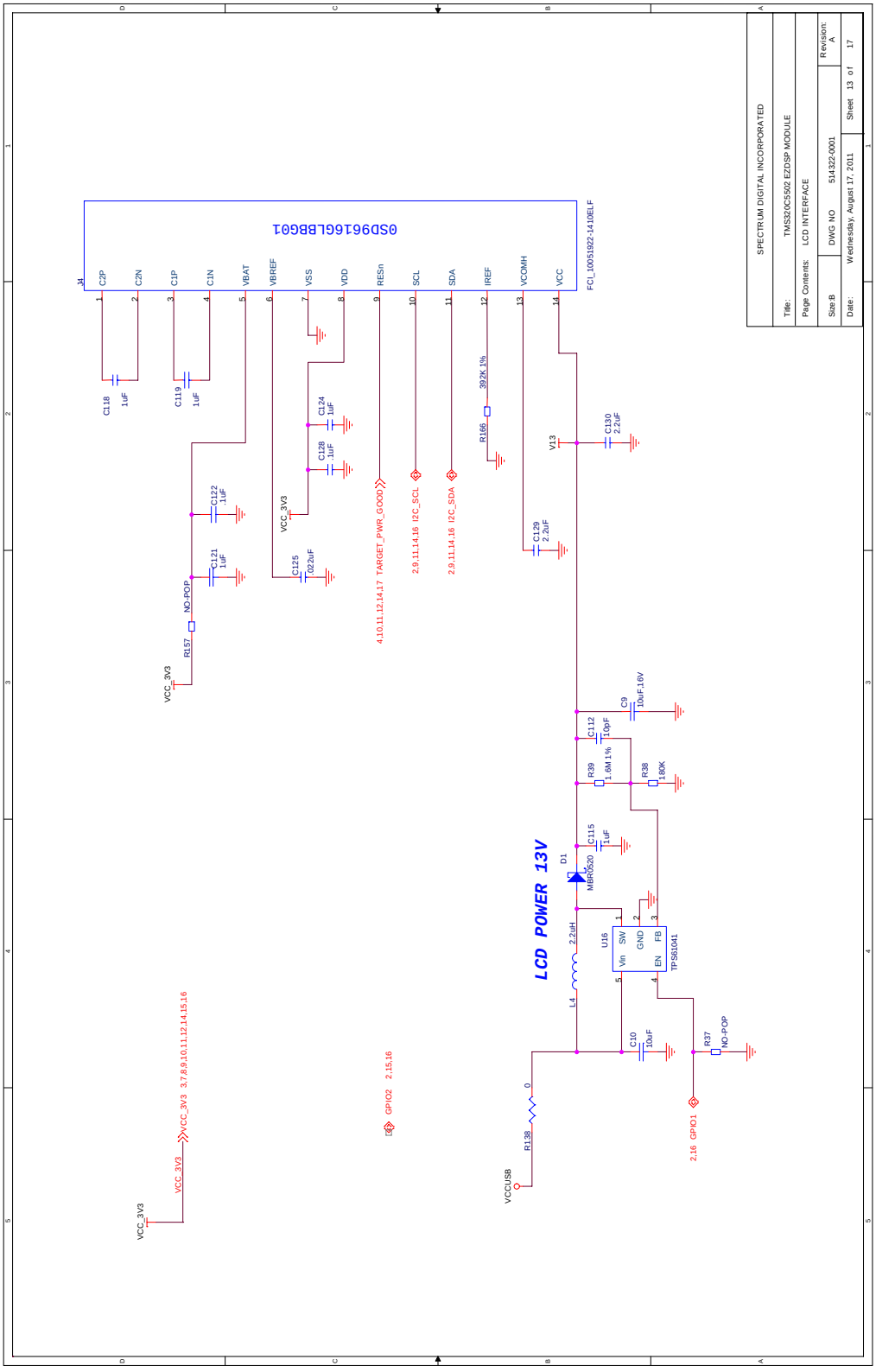

SPECTRUM DIGITAL INCORPORATED
Title: TMS320C5502 EZDSP MODULE
Page Contents: SDRAM
Size:B
DWG NO 514322-0001
Revision: A
Date: Wednesday, August 17, 2011
Sheet 8 of 17
U10
MT48LC2M32B2
RPACK8-33
RN4
RN5
RN6
RN7
VCC_3V3
DSP_CLKMEM
SDCKE
R122 10K
R123 10K
C39 .1uF
C52 .1uF
C53 .1uF
C60 .1uF
C59 .1uF
C96 .1uF
C79 .1uF
C78 .1uF
C38 .1uF
C97 .1uF
C82 .1uF
C83 .1uF

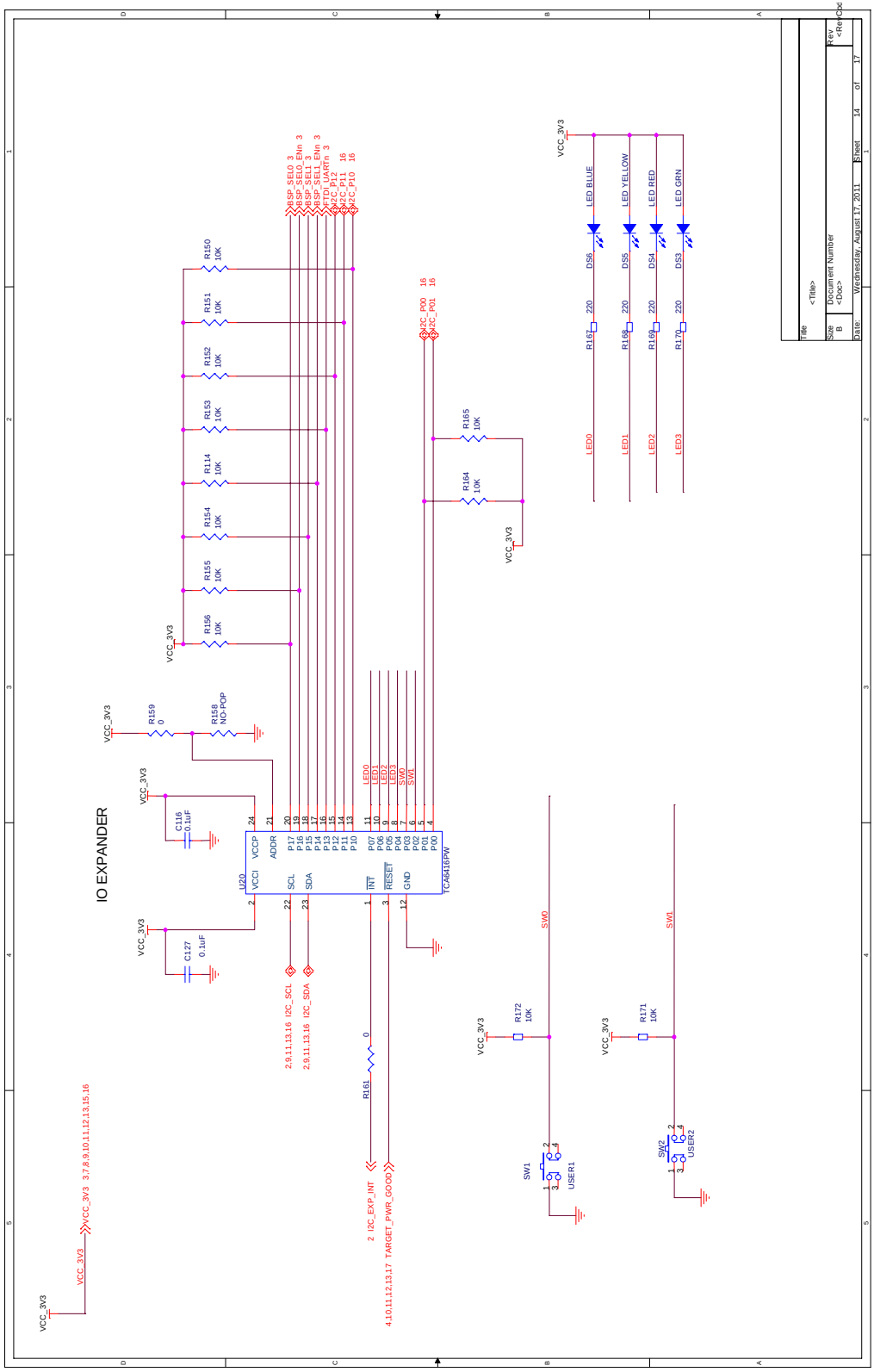

NOTE: DIMENSIONS AND LOCATIONS OF THESE CONNECTORS MUST MEET SPECIFICATION FOR INTERFACE MODULES
SPECTRUM DIGITAL INCORPORATED
Title: TMS320C5502 EZDSP MODULE
Page Contents: CC BOARD INTERFACE
Size:B DWG NO 514322-0001 Revision: B
Date: Wednesday, August 17, 2011 Sheet 9 of 17
P3
HEADER 10X2
P5
HEADER 10X2
VCC_3V3
GPIO3
UART_RTS
TIN0
UARTTX
UARTRX
I2C_SDA
I2C_SCL
GPIO6
GPIO7
CC_SPI_CS_3
CC_SPI_CLK_3
CC_SPI_MOSI_3
CC_SPI_MISO_3
CC_I2S_FS
CC_I2S_CLK
CC_I2S_RX
CC_I2S_TX
GPIO25
GPIO26
GPIO5
GPIO35
R14
R13
R15
R16
R126
R124
R132
R129
R42
R41
R35
R34
R39
R37


SPECTRUM DIGITAL INCORPORATED
Title: TMS320C5502 EZDSP MODULE
Page Contents: POWER MANAGEMENT
Size:B DWG NO 514322-0001 Revision: A
Date: Thursday, September 01, 2011 Sheet 10 of 17
VCC_1V26
VCCUSB
CPU_3V3
VCC_3V3
FTDI_3V3
TARGET_PWR_GOOD
U15 TPS62260DDCR
U12 TPS62260DDCR
U14 TPS3808G09DBVRG4
Reset Threhold 0.84 Volts
Vout = Vref x (1 + Rtop/RBottom) ; VREF = 0.6
1.26 = 0.6 x (1 + Rtop/RBottom) ;
2.1 = (1 + Rtop/RBottom) ;
1.1 Rbottom = Rtop ;
Vout = Vref x (1 + Rtop/RBottom) ; VREF = 0.6
Vout = 0.6 x (1 +4.53)


SPECTRUM DIGITAL INCORPORATED
Title: TMS320C5502 EZDSP MODULE
Page Contents: CODEC
Size:B DWG NO 514322-0001 Revision: A
Date: Wednesday, August 17, 2011 Sheet 11 of 17
STEREO IN 1
HEADPHONES OUT
Select Internal LDO
TLV320AIC3204IRHBT
SJ1-3515-SMT, 5PJACK STEREO
Tie Analog Power to Digital Power through single point connection or Ferrite Bead.
TARGET_PWR_GOOD 4,10,12,13,14,17
AIC_BCLK 3,16
AIC_WCLK 3,16
AIC_DIN 3,16
AIC_DOUT 3,16
I2C_SCL 2,9,13,14,16
I2C_SDA 2,9,13,14,16
17 CLK_12MHz
VCC_3V3 3,7,8,9,10,12,13,14,15,16
12MHz
GND-AIC


SPECTRUM DIGITAL INCORPORATED
Title: TMS320C5502 EZDSP MODULE
Page Contents: ETHERNET INTERFACE
Size: B
DWG NO 514322-0001
Revision: A
Date: Wednesday, August 17, 2011
Sheet 12 of 17
KSZ8851-16MLL
U2
RJ45 HALO HFJ11-2450E-L21
P2
AT93C46 SO8
U1
CONFIG
Differential Pair 100 ohms
Differential Pair 100 ohms
PIN 8 SUPPLIES 1V8 FOR DEVICE VIA INTERNAL LDO
25 MHZ
Y1
TARGET_PWR_GOOD


LCD POWER 13V
SPECTRUM DIGITAL INCORPORATED
Title: TMS320C5502 EZDSP MODULE
Page Contents: LCD INTERFACE
Size:B
DWG NO 514322-0001
Revision: A
Date: Wednesday, August 17, 2011
Sheet 13 of 17
J4
FCI_10051922-1410ELF
C2P
C2N
C1P
C1N
VBAT
VBREF
VSS
VDD
RESn
SCL
SDA
IREF
VCOMH
VCC
C118 1uF
C119 1uF
C122 .1uF
C121 1uF
C124 1uF
C128 .1uF
C125 .022uF
R157 NO-POP
R166 392K 1%
C130 2.2uF
C129 2.2uF
C112 10pF
C9 10uF.16V
R39 1.6M 1%
R38 180K
C115 1uF
D1 MBR0520
U16 TPS61041
Vin SW GND FB EN
L4 2.2uH
C10 10uF
R37 NO-POP
R138 0
VCCUSB
VCC_3V3
GPIO2 2.15.16
GPIO1 2.16
TARGET_PWR_GOOD 4.10.11.12.14.17
I2C_SCL 2.9.11.14.16
I2C_SDA 2.9.11.14.16


IO EXPANDER
U20
TCA6416PW
VCCI
VCCP
ADDR
SCL
SDA
INT
RESET
GND
P17
P16
P15
P14
P13
P12
P11
P10
P07
P06
P05
P04
P03
P02
P01
P00
LED0
LED1
LED2
LED3
SW0
SW1
VCC_3V3
C116
0.1uF
C127
0.1uF
R159
0
R158
NO-POP
R150
10K
R151
10K
R152
10K
R153
10K
R114
10K
R154
10K
R155
10K
R156
10K
R165
10K
R164
10K
R161
0
R172
10K
R171
10K
R167
220
R168
220
R169
220
R170
220
DS6
DS5
DS4
DS3
LED BLUE
LED YELLOW
LED RED
LED GRN
SW1
USER1
SW2
USER2
2,9,11,13,16 I2C_SCL
2,9,11,13,16 I2C_SDA
2 I2C_EXP_INT
4,10,11,12,13,17 TARGET_PWR_GOOD
VCC_3V3 3,7,8,9,10,11,12,13,15,16
Title
<Title>
Size
B
Document Number
<Doc>
Rev
<Rev>
Date:
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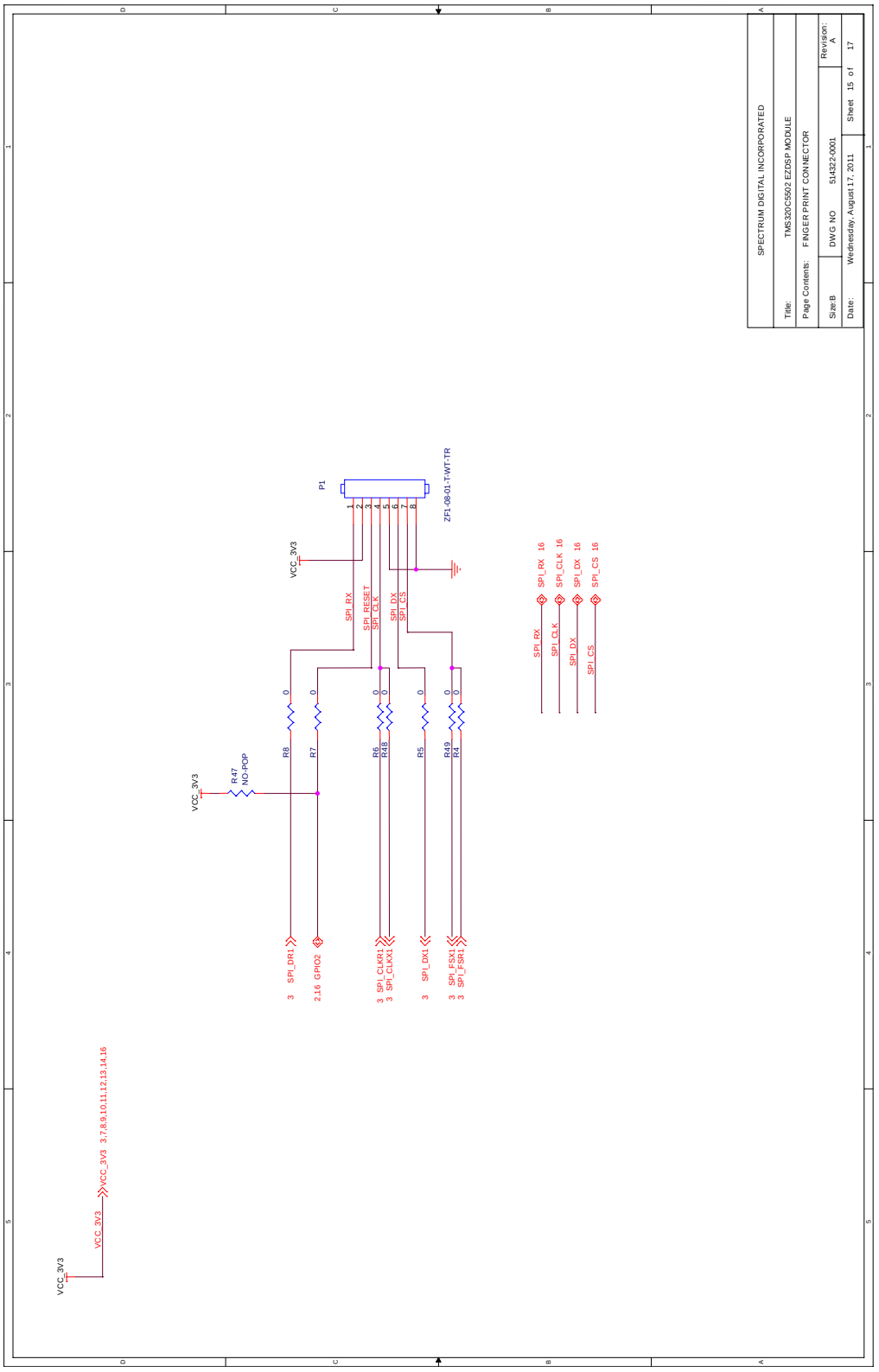
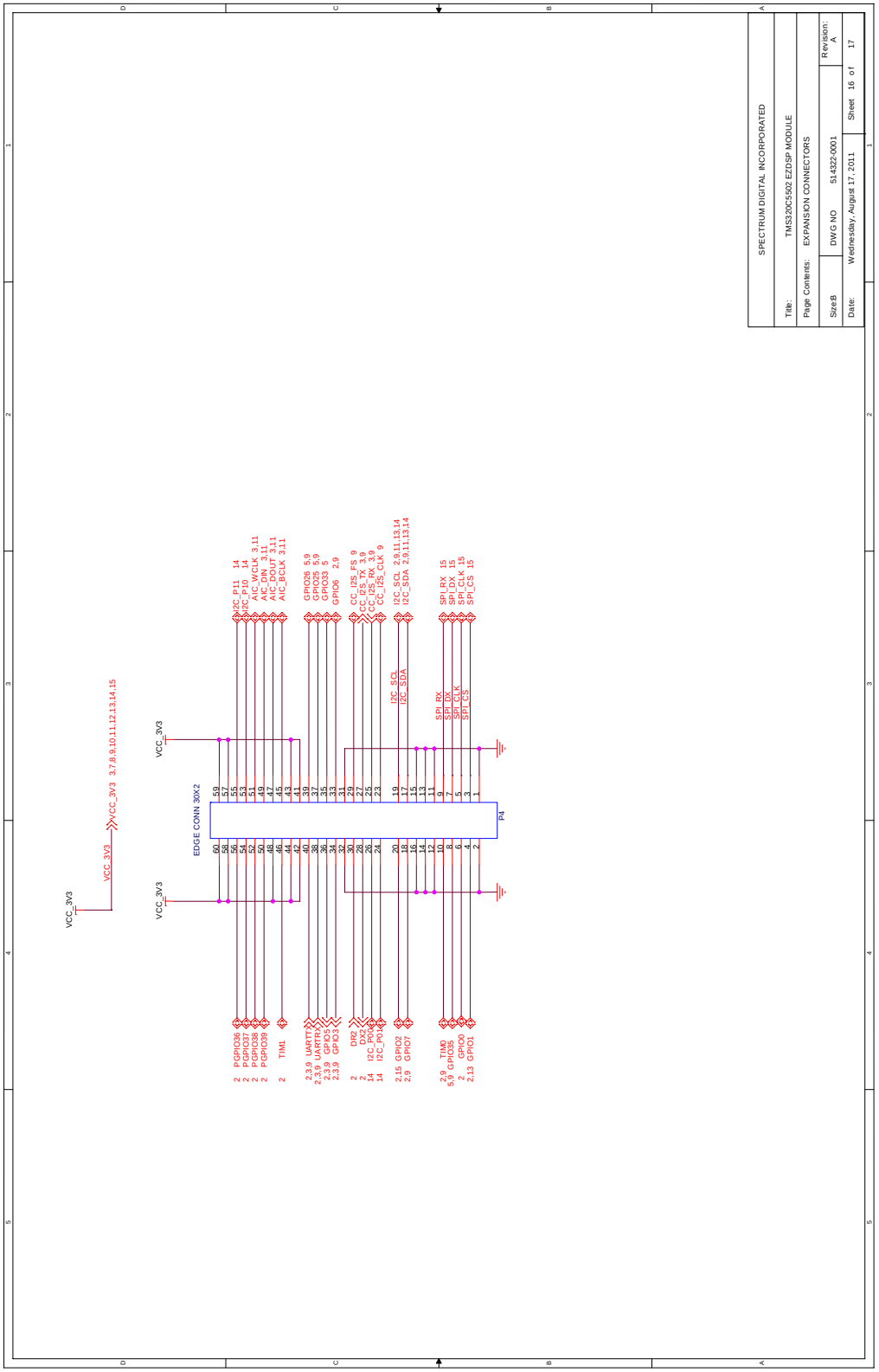
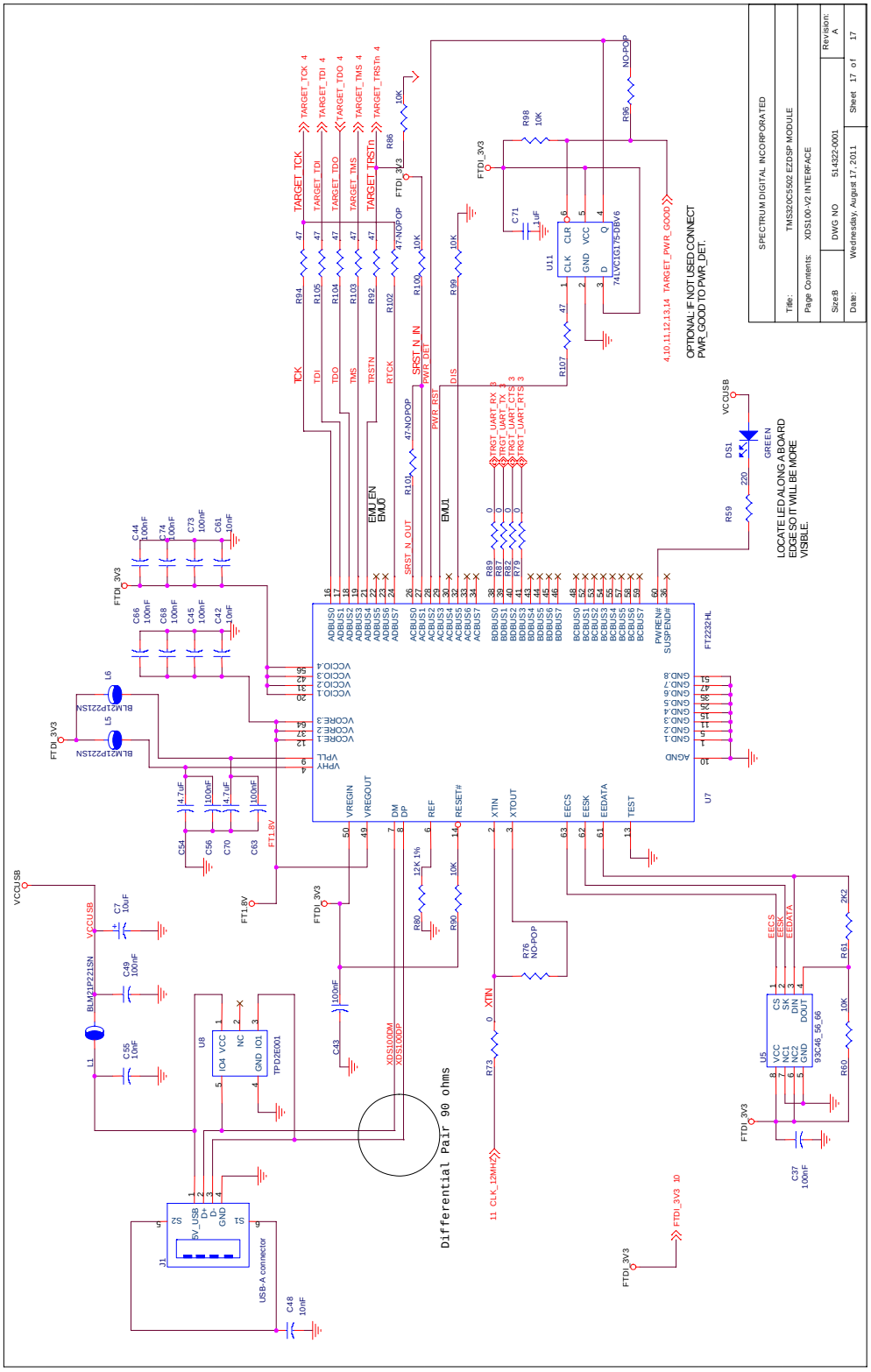
14
of
17


SPECTRUM DIGITAL INCORPORATED
Title: TMS320C5502 EZDSP MODULE
Page Contents: FINGER PRINT CONNECTOR
Size:B
DWG NO 514322-0001
Revision: A
Date: Wednesday, August 17, 2011
Sheet 15 of 17
P1
ZF1-08-01-T-WT-TR
VCC_3V3
SPI_RX
SPI_RESET
SPI_CLK
SPI_DX
SPI_CS
R8
R7
R6
R48
R5
R49
R4
R47
NO-POP
SPI_DR1
2,16 GPIO2
SPI_CLKR1
SPI_CLKX1
SPI_DX1
SPI_FSX1
SPI_FSR1
SPI_RX 16
SPI_CLK 16
SPI_DX 16
SPI_CS 16
VCC_3V3 3,7,8,9,10,11,12,13,14,16

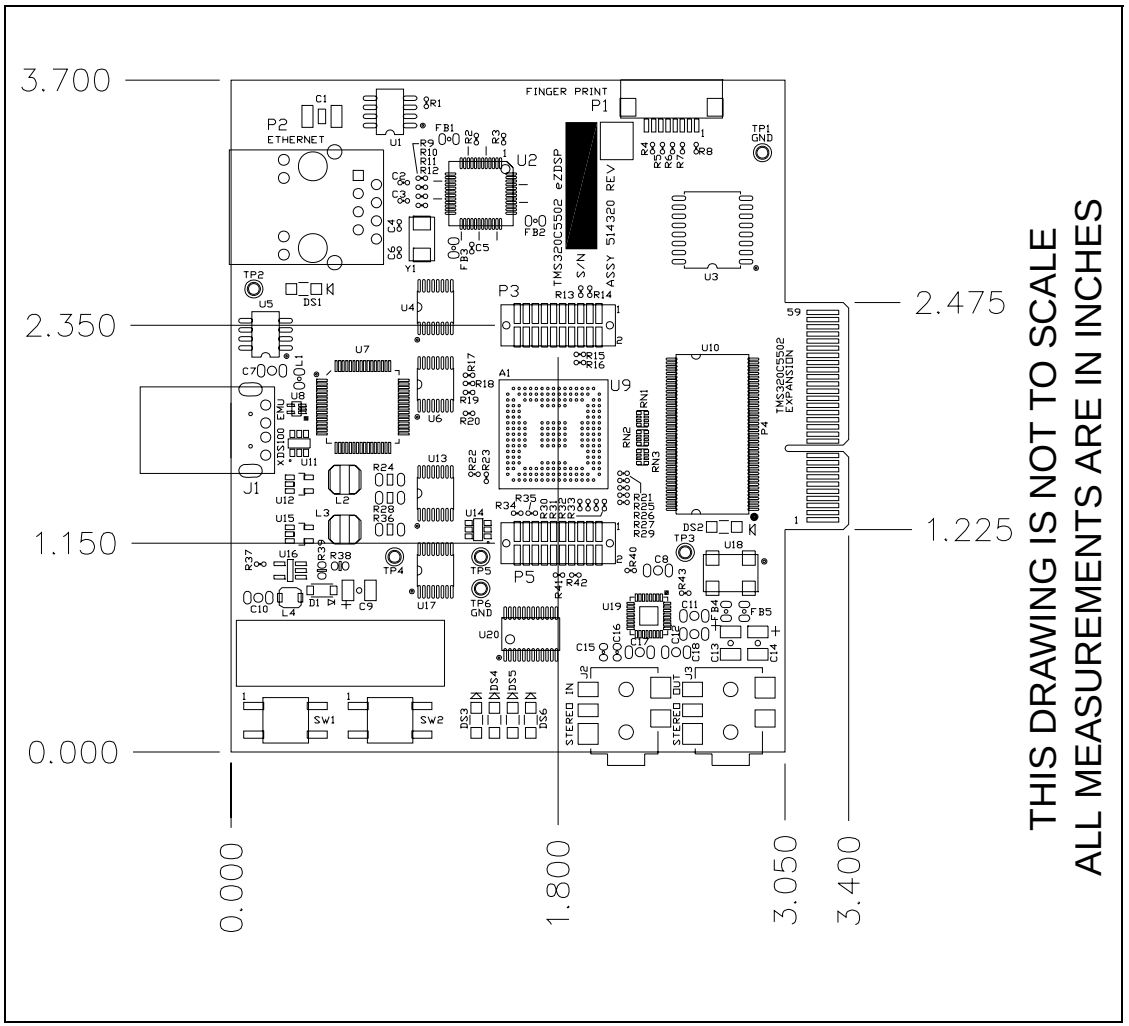

SPECTRUM DIGITAL INCORPORATED
Title: TMS320C5502 EZDSP MODULE
Page Contents: EXPANSION CONNECTORS
Size:B
DWG NO 514322-0001
Revision: A
Date: Wednesday, August 17, 2011
Sheet 16 of 17
EDGE CONN 30X2
P4
VCC_3V3
VCC_3V3 3,7,8,9,10,11,12,13,14,15
I2C_P11 14
I2C_P10 14
I2C_SCL 3,11
AIC_DIN 3,11
AIC_DOUT 3,11
AIC_BCLK 3,11
GPIO26 5,9
GPIO25 5,9
GPIO23 5
GPIO6 2,9
CC_I2S_FS 9
CC_I2S_TX 3,9
CC_I2S_RX 3,9
CC_I2S_CLK 9
I2C_SCL 2,9,11,13,14
I2C_SDA 2,9,11,13,14
SPI_RX 15
SPI_DX 15
SPI_CLK 15
SPI_CS 15
PGPIO38
PGPIO37
PGPIO36
PGPIO35
TIM1
UARTT
UARTR
GPIO4
GPIO3
DR2
DX2
I2C_P0
I2C_P1
GPIO2
GPIO7
TIM0
GPIO5
GPIO0
GPIO1


SPECTRUM DIGITAL INCORPORATED
Title: TMS320C5502 EZDSP MODULE
Page Contents: XDS100-V2 INTERFACE
Size:B
DWG NO 514322-0001
Revision: A
Date: Wednesday, August 17, 2011
Sheet 17 of 17
OPTIONAL: IF NOT USED CONNECT PWR_GOOD TO PWR_DET.
LOCATE LED ALONG A BOARD EDGE SO IT WILL BE MORE VISIBLE.
Differential Pair 90 ohms
USB-A connector
FT2232HL
74LVC1G175-DBV6
93C46_56_66
TPD2E001
BLM21P221SN
BLM21P221SN
VCCUSB
FTDI_3V3
FT1.8V
TARGET_TCK
TARGET_TDI
TARGET_TDO
TARGET_TMS
TARGET_TRSTn
TCK
TDI
TDO
TMS
TRSTN
RTCK
SRST_N_IN
SRST_N_OUT
PWR_DET
PWR_RST
DIS
EMU_EN
EMU0
EMU1
4,10,11,12,13,14 TARGET_PWR_GOOD
11 CLK_12MHZ
FTDI_3V3 10
GREEN
NO-POP
47-NOPOP
12K 1%
2K2
10K
220
100nF
10uF
4.7uF
1uF
0
47
10K

Appendix B

Mechanical Information

This appendix contains the mechanical information about the TMS320C5502 eZdsp produced by Spectrum Digital.


3.700
2.350
1.150
0.000
0.000
1.800
3.050
3.400
2.475
1.225
THIS DRAWING IS NOT TO SCALE
ALL MEASUREMENTS ARE IN INCHES
FINGER PRINT
P1
P2
ETHERNET
P3
P4
P5
TMS320C5502 eZDSP
S/N
ASSY 514320 REV
TMS320C5502
EXPANSION
STEREO IN
STEREO OUT
SW1
SW2
TP1
GND
TP2
TP3
TP4
TP5
TP6
GND

SPECTRUM DIGITAL INCORPORATED

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514325-0001 Rev. A