Appendix A

eZdsp™ F28335 Schematics

The schematics for the eZdsp™ F28335 can be found on the CD-ROM that accompanies this board. The schematics were drawn on ORCAD.

The schematics are correct for both the socketed and unsocketed version of the eZdsp™.

WARNING !

The TMS320F28335 supports +3.3V Input/Output levels which are NOT +5V tolerant. Connecting the eZdsp to a system with +5V Input/Output levels will damage the TMS320F28335. If the eZdsp is connected to another target then the eZdsp must be powered up first and powered down last to prevent lactchup conditions.

Design Notes:

1. The TMS320F28335 X1/CLKIN pin is +1.8 volt input. The clock input is buffered with a SN74LVC1G14 whose supply is +1.8 volts. This provides +3.3 volts to the +1.8 volt clock translation. Refer to sheet 4 of the schematics.

REVISIONS

REV	DESCRIPTION	DATE	APPROVED
A	ALPHA RELEASE	29-July-2007	

SCHEMATIC CONTENTS

REVISION STATUS OF SHEETS

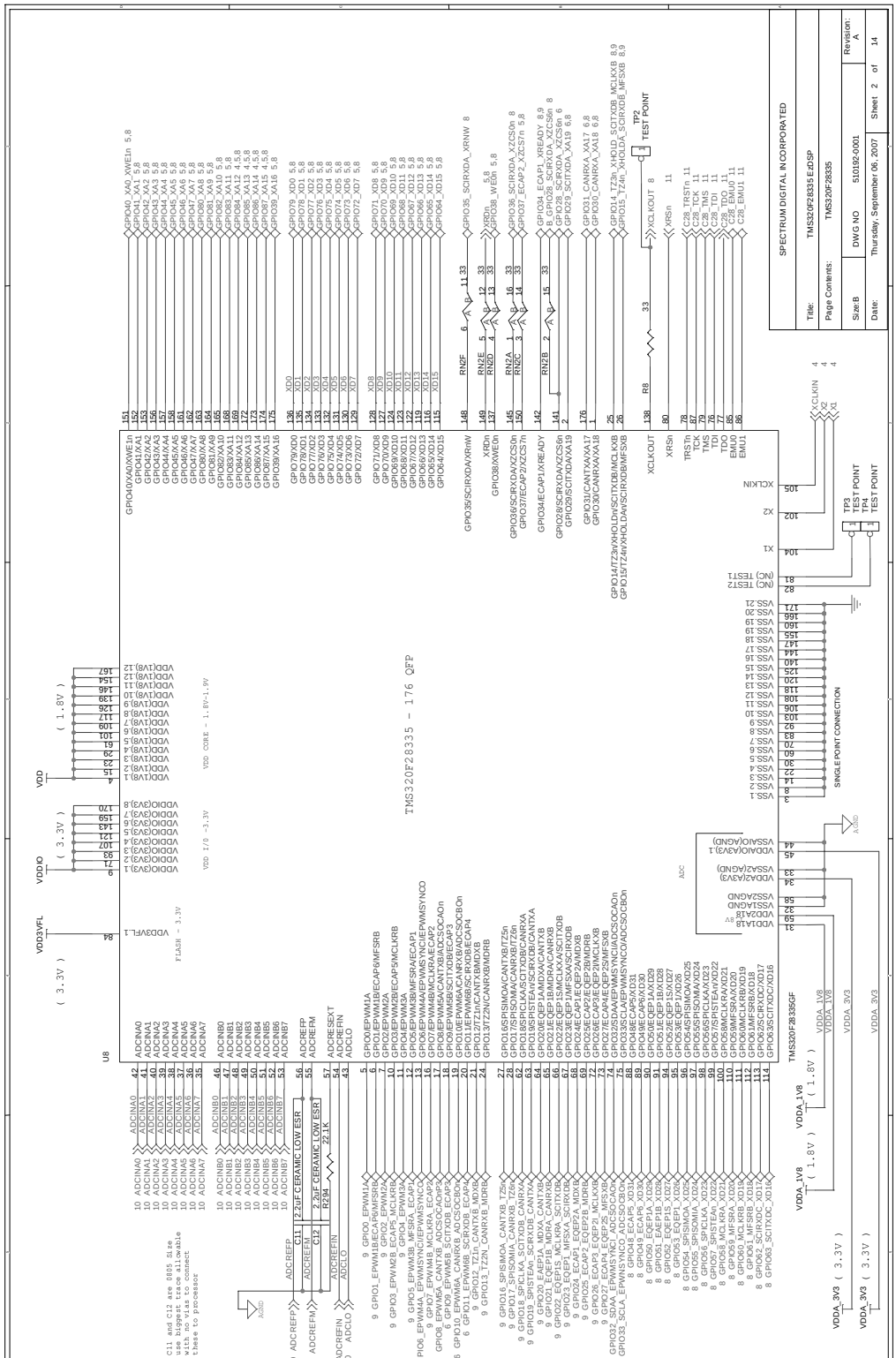
REV														
SH	1	2	3	4	5	6	7							
REV	A	A	A	A	A	A	A	A						
SH	8	9	10	11	12	13								

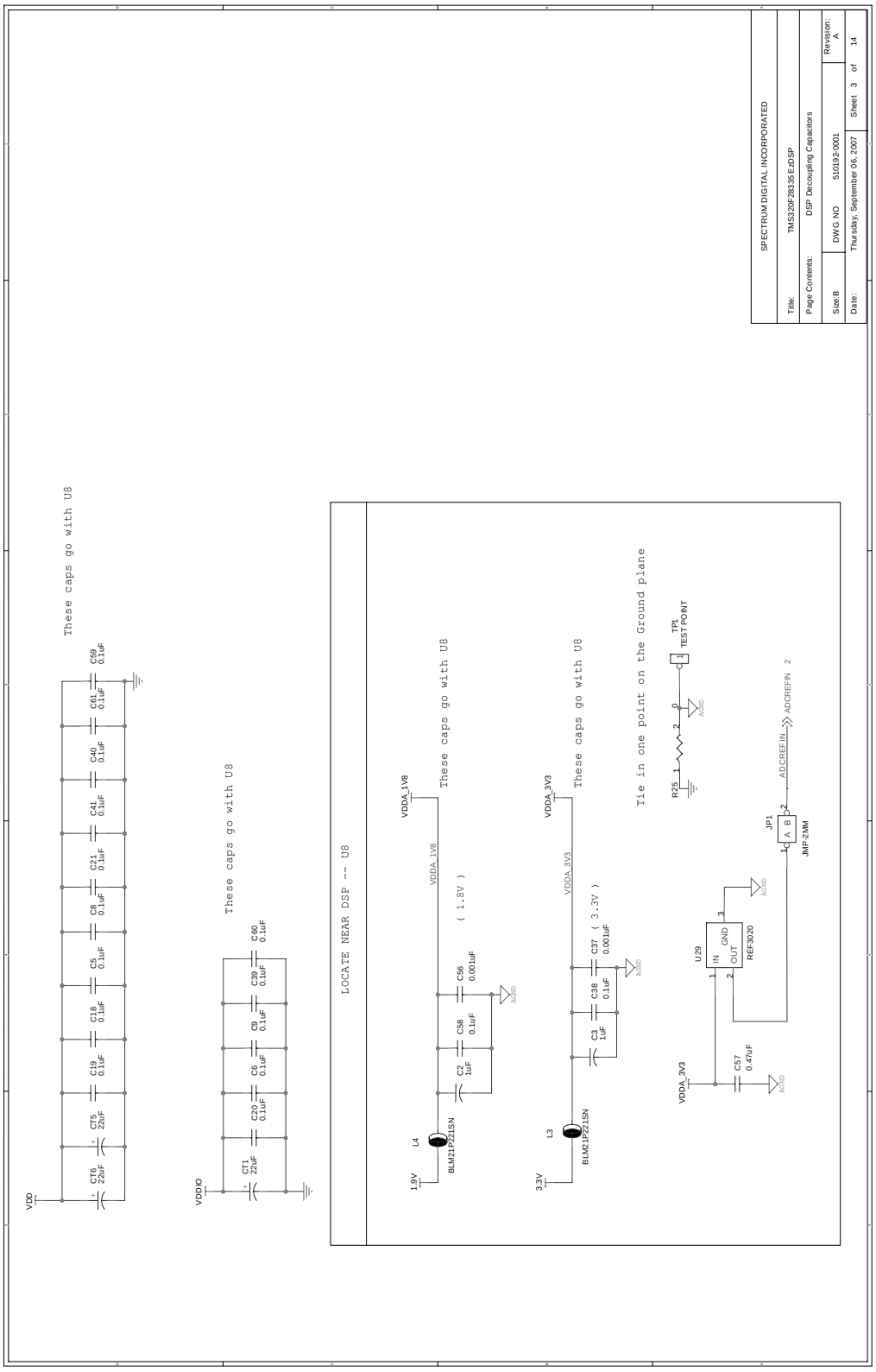
DRAWN		DATE	
CHK		DATE	
ENGR		DATE	
ENGR-MGR		DATE	
QA		DATE	
MFG		DATE	
RLSE		DATE	

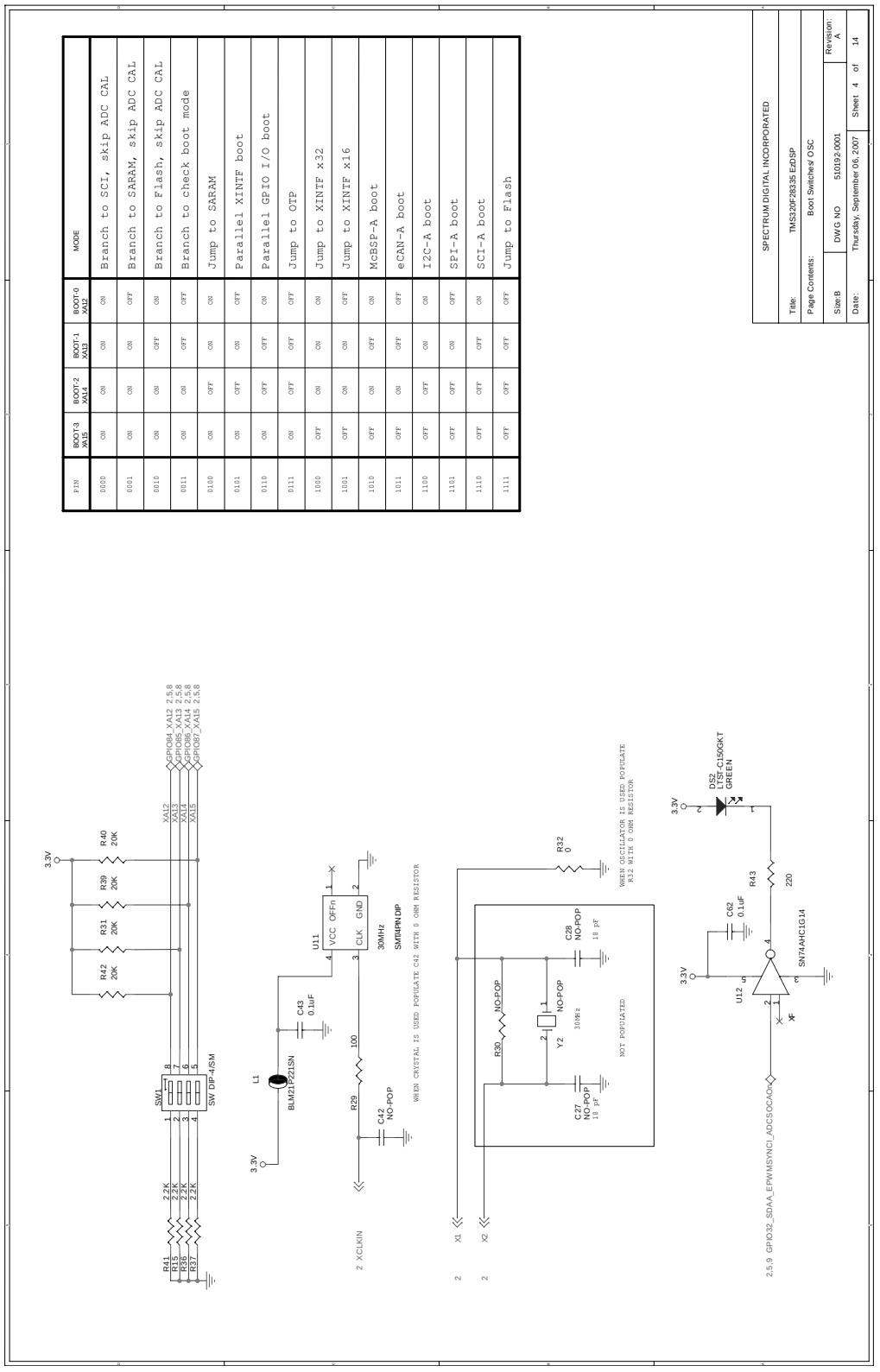
NEXT ASSY | USED ON | APPLICATION

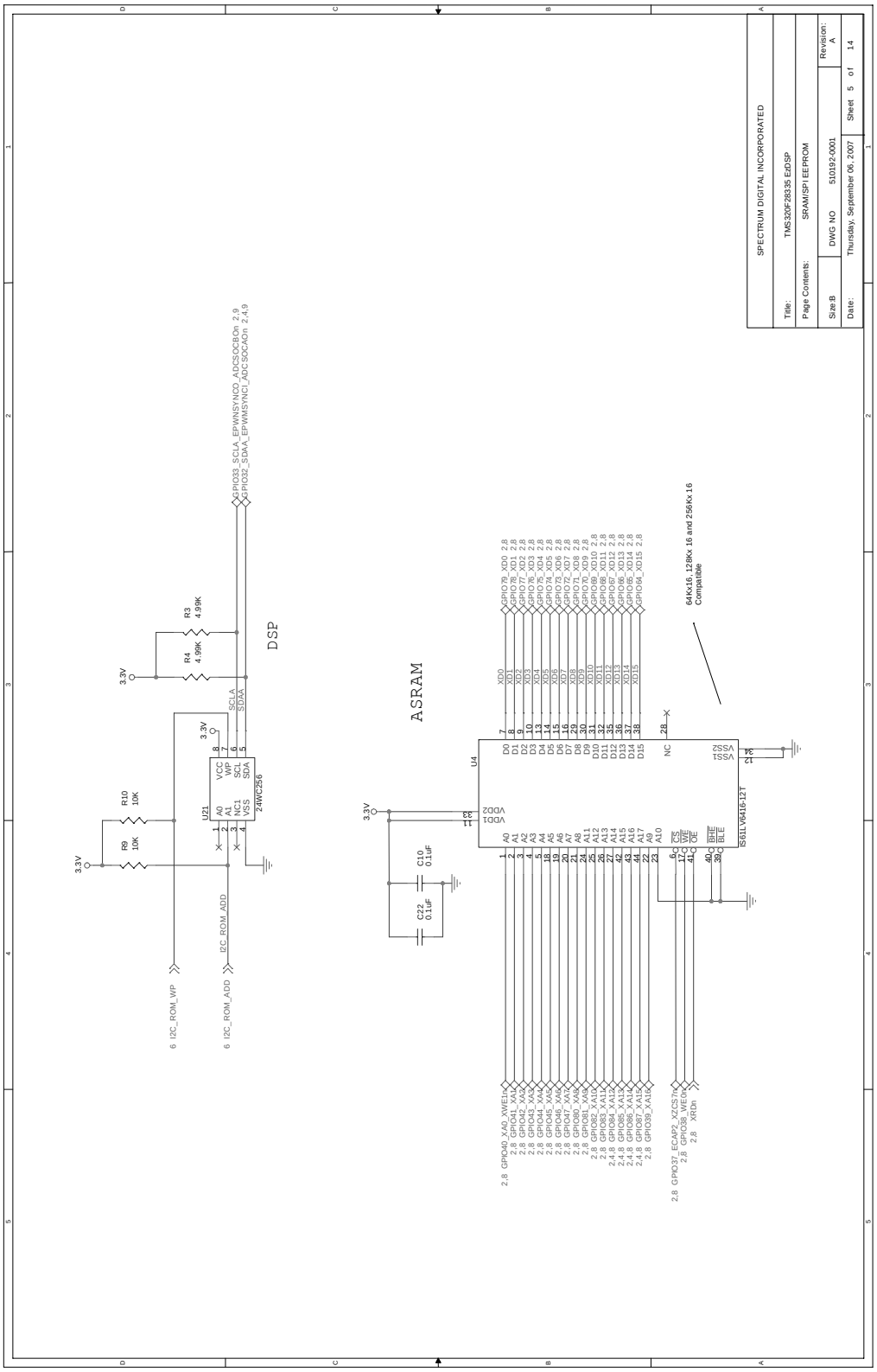
SPECTRUM DIGITAL INCORPORATED

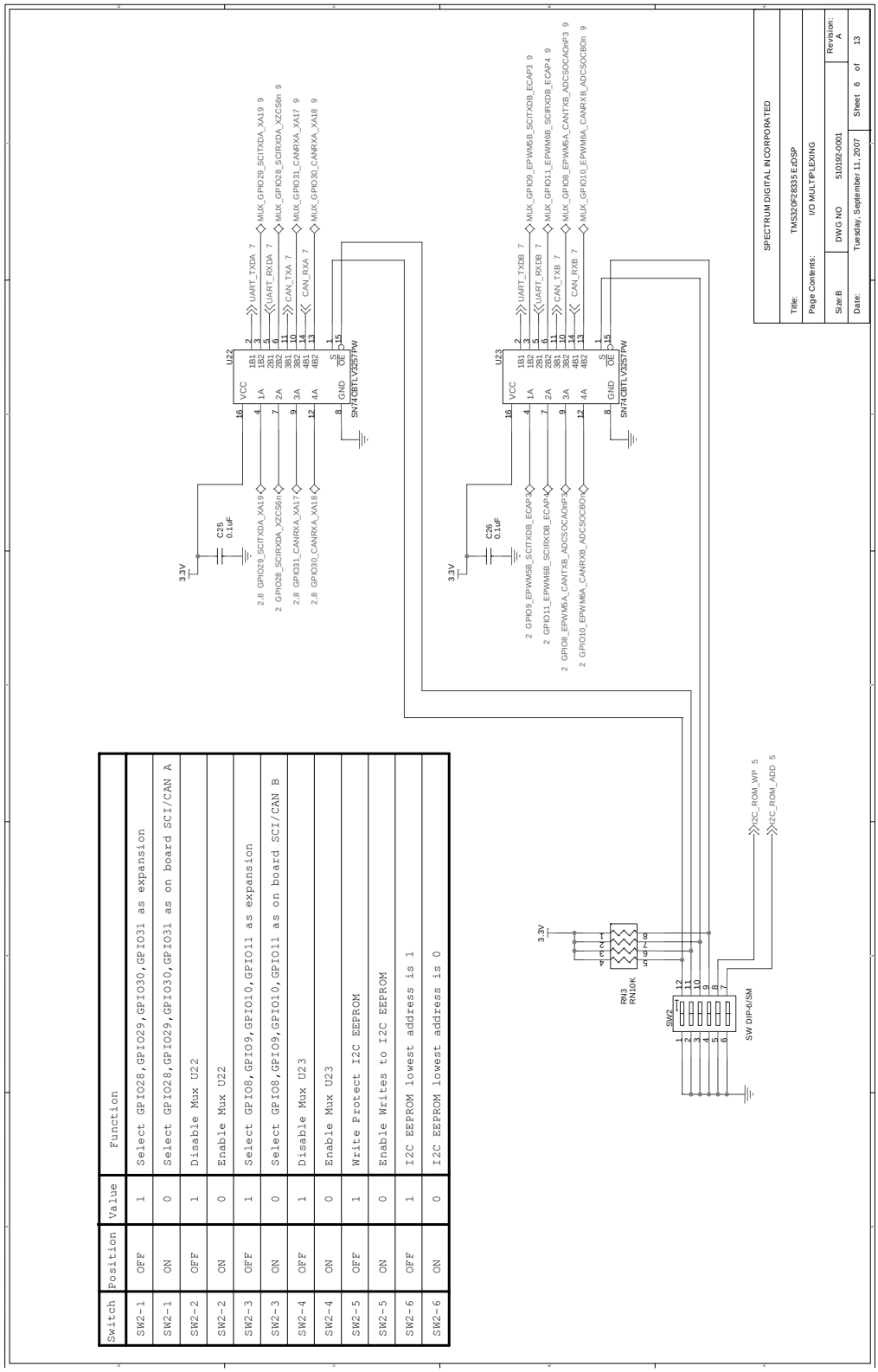
Title:	TMS320F28335 EzDSP		
Page Contents:	Title Block		
Size:B	DWG NO 510L92-0001		Revision: A
Date:	Thursday, September 06, 2007	Sheet 1 of 14	



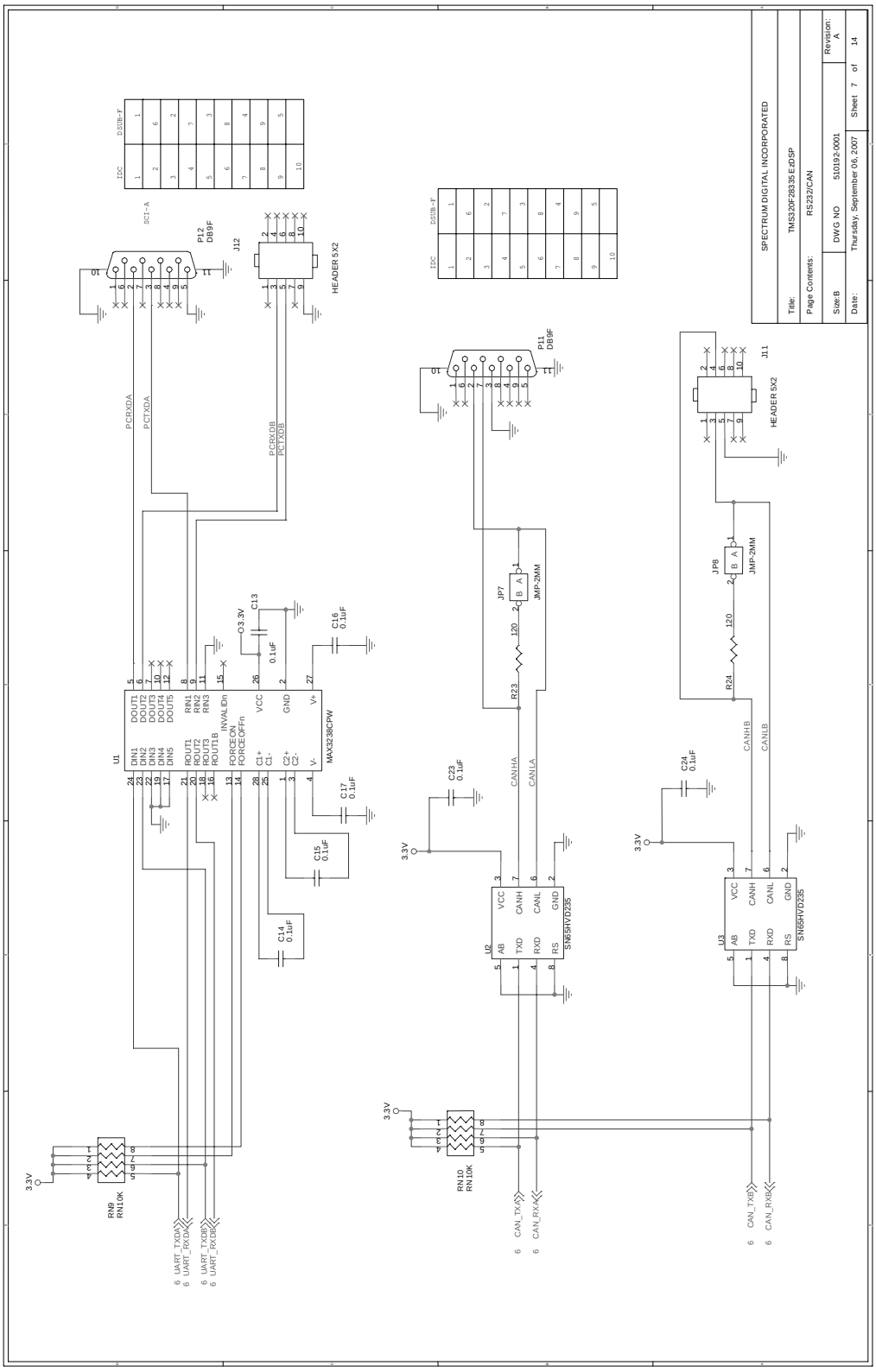

These caps go with U8
These caps go with U8
LOCATE NEAR DSP -- U8
These caps go with U8
(1.8V)
These caps go with U8
(3.3V)
Tie in one point on the Ground plane
ADCREFIN
ADCREFIN 2
SPECTRUM DIGITAL INCORPORATED
Title: TMS320F28335 E-DSP
Page Contents: DSP Decoupling Capacitors
Size:B
DWG NO 510192-0001
Revision: A
Date: Thursday, September 06, 2007
Sheet 3 of 14

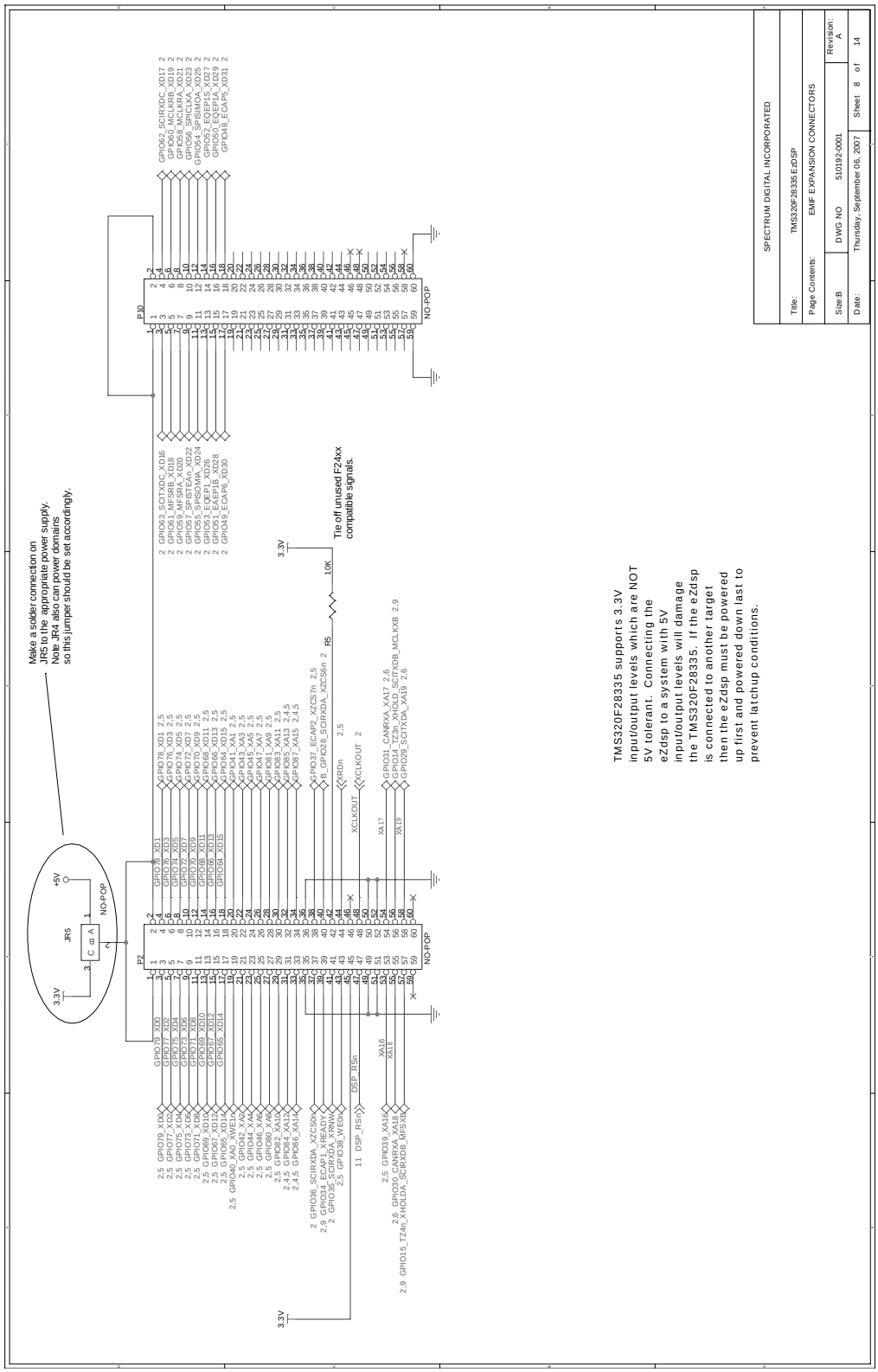

PIN
BOOT-3 XA15
BOOT-2 XA14
BOOT-1 XA13
BOOT-0 XA12
MODE
0000 ON ON ON ON Branch to SCI, skip ADC CAL
0001 ON ON ON OFF Branch to SARAM, skip ADC CAL
0010 ON ON OFF ON Branch to Flash, skip ADC CAL
0011 ON ON OFF OFF Branch to check boot mode
0100 ON OFF ON ON Jump to SARAM
0101 ON OFF ON OFF Parallel XINTF boot
0110 ON OFF OFF ON Parallel GPIO I/O boot
0111 ON OFF OFF OFF Jump to OTP
1000 OFF ON ON ON Jump to XINTF x32
1001 OFF ON ON OFF Jump to XINTF x16
1010 OFF ON OFF ON McBSP-A boot
1011 OFF ON OFF OFF eCAN-A boot
1100 OFF OFF ON ON I2C-A boot
1101 OFF OFF ON OFF SPI-A boot
1110 OFF OFF OFF ON SCI-A boot
1111 OFF OFF OFF OFF Jump to Flash
SPECTRUM DIGITAL INCORPORATED
Title: TMS320F28335 ExDSP
Page Contents: Boot Switches/ OSC
Size:B DWG NO 510192-0001 Revision: A
Date: Thursday, September 06, 2007 Sheet 4 of 14
3.3V
R40 20K
R39 20K
R31 20K
R42 20K
XA12
XA13
XA14
XA15
GPIO84_XA12 2,5,8
GPIO85_XA13 2,5,8
GPIO86_XA14 2,5,8
GPIO87_XA15 2,5,8
SW1
SW DIP-4/SM
R41 2.2K
R35 2.2K
R36 2.2K
R37 2.2K
L1
BLM21PZ221SN
C43 0.1uF
U11
VCC OPFn CLK GND
30MHz
SM74PN DIP
R29 100
C42 NO-POP
2 XCLKIN
WHEN CRYSTAL IS USED POPULATE C42 WITH 0 OHM RESISTOR
R32 0
WHEN OSCILLATOR IS USED POPULATE R32 WITH 0 OHM RESISTOR
C28 NO-POP 18 pF
R30 NO-POP
Y2 30MHz
C27 NO-POP 18 pF
NOT POPULATED
2 X1
2 X2
DS2 LTST-C150GKT GREEN
R43 220
C62 0.1uF
U12
SN74AHC1G14
2,5,9 GPIO32_SDAA_EPWMSYNCI_ADCSOCAO

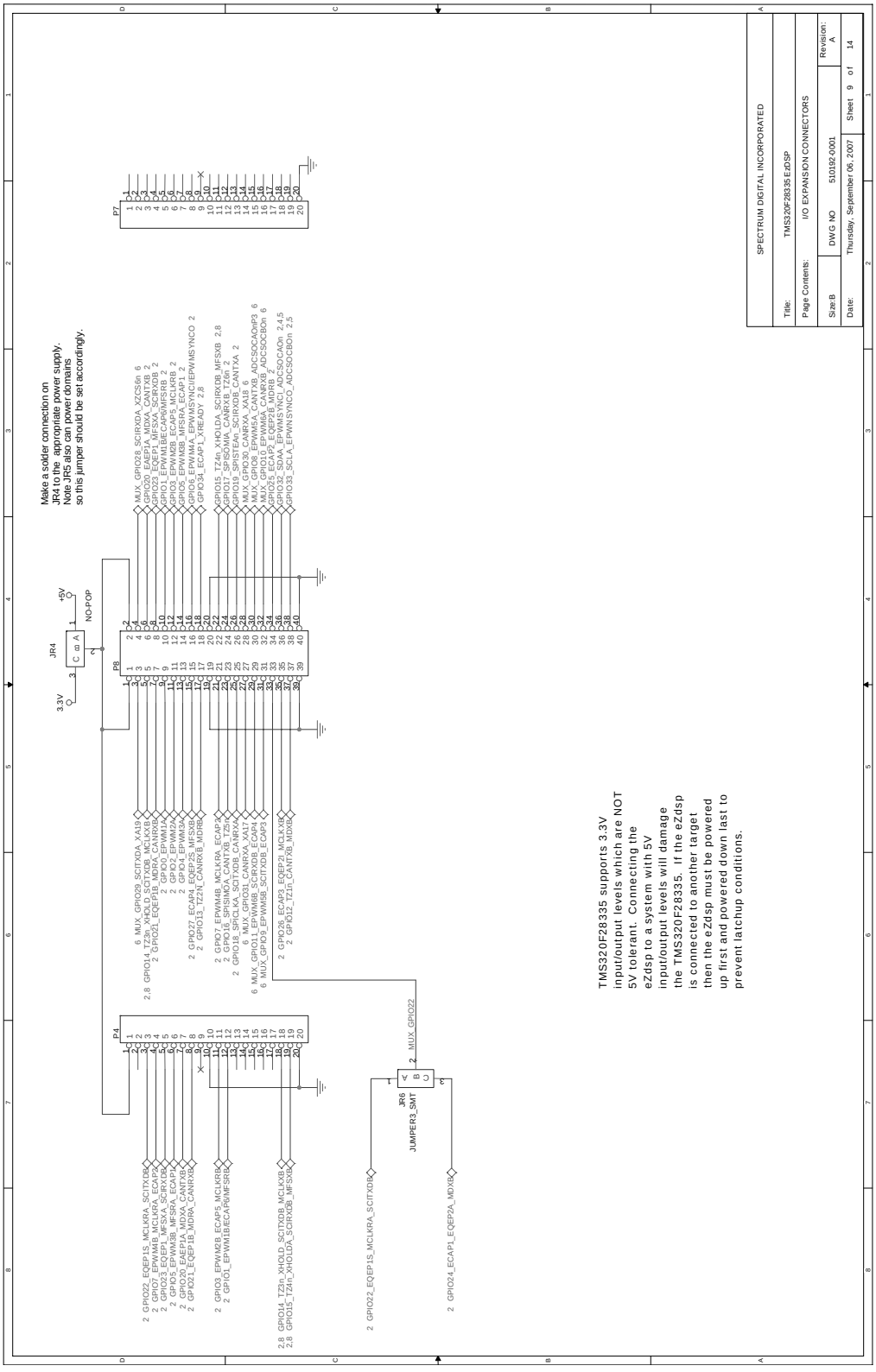

SPECTRUM DIGITAL INCORPORATED
Title: TMS320F28335 EzDSP
Page Contents: SRAM/SPI EEPROM
Size:B DWG NO 510192-0001 Revision: A
Date: Thursday, September 06, 2007 Sheet 5 of 14
DSP
ASRAM
64Kx16, 128Kx 16 and 256Kx 16 Compatible
U4
IS61LV6416-12T
U21
24WC256
R3 4.99K
R4 4.99K
R9 10K
R10 10K
C10 0.1uF
C22 0.1uF
3.3V
I2C_ROM_WP
I2C_ROM_ADD
SCLA
SDAA
GPIO33_SCLA_EPWMSYNCO_ADCSOCBOn 2,9
GPIO32_SDAA_EPWMSYNCI_ADCSOCAOn 2,4,9



Switch	Position	Value	Function
SW2-1	OFF	1	Select GPIO28,GPIO29,GPIO30,GPIO31 as expansion
SW2-1	ON	0	Select GPIO28,GPIO29,GPIO30,GPIO31 as on board SCI/CAN A
SW2-2	OFF	1	Disable Mux U22
SW2-2	ON	0	Enable Mux U22
SW2-3	OFF	1	Select GPIO8,GPIO9,GPIO10,GPIO11 as expansion
SW2-3	ON	0	Select GPIO8,GPIO9,GPIO10,GPIO11 as on board SCI/CAN B
SW2-4	OFF	1	Disable Mux U23
SW2-4	ON	0	Enable Mux U23
SW2-5	OFF	1	Write Protect I2C EEPROM
SW2-5	ON	0	Enable Writes to I2C EEPROM
SW2-6	OFF	1	I2C EEPROM lowest address is 1
SW2-6	ON	0	I2C EEPROM lowest address is 0


SPECTRUM DIGITAL INCORPORATED
Title: TMS320F28335 eZDSP
Page Contents: RS232/CAN
Size: B
DWG NO 5101192-0001
Revision: A
Date: Thursday, September 06, 2007
Sheet 7 of 14
SCI-A
P12 DB9F
J12 HEADER 5X2
P11 DB9F
J11 HEADER 5X2
DSUB-F
IDC
U1 MAX3238CPW
U2 SN65HVD235
U3 SN65HVD235
JP7 JMP-2MM
JP8 JMP-2MM
R23 120
R24 120
RN9 RN10K
RN10 RN10K
C13 0.1uF
C14 0.1uF
C15 0.1uF
C16 0.1uF
C17 0.1uF
C23 0.1uF
C24 0.1uF
3.3V
PCRXDA
PCTXDA
PCRXDB
PCTXDB
CANHA
CANLA
CANHB
CANLB
UART_TXDA
UART_RXDA
UART_TXDB
UART_RXDB
CAN_TXA
CAN_RXA
CAN_TXB
CAN_RXB


Make a solder connection on
JR5 to the appropriate power supply.
Note JR4 also can power domains
so this jumper should be set accordingly.
JR5
+5V
3.3V
NO-POP
P2
P10
Tie off unused F24xx
compatible signals.
10K
3.3V
TMS320F28335 supports 3.3V
input/output levels which are NOT
5V tolerant. Connecting the
eZdsp to a system with 5V
input/output levels will damage
the TMS320F28335. If the eZdsp
is connected to another target
then the eZdsp must be powered
up first and powered down last to
prevent latchup conditions.
SPECTRUM DIGITAL INCORPORATED
Title: TMS320F28335 EZDSP
Page Contents: EMIF EXPANSION CONNECTORS
Size:B DWG NO 510192-0001 Revision: A
Date: Thursday, September 06, 2007 Sheet 8 of 14


Make a solder connection on
JR4 to the appropriate power supply.
Note JR5 also can power domains
so this jumper should be set accordingly.
JR4
3.3V
+5V
NO-POP
JR5
JUMPER3_SMT
MUX_GPIO22
P4
P7
P8
TMS320F28335 supports 3.3V input/output levels which are NOT 5V tolerant. Connecting the eZdsp to a system with 5V input/output levels will damage the TMS320F28335. If the eZdsp is connected to another target then the eZdsp must be powered up first and powered down last to prevent latchup conditions.
SPECTRUM DIGITAL INCORPORATED
Title: TMS320F28335 EzDSP
Page Contents: I/O EXPANSION CONNECTORS
Size:B
DWG NO 510192-0001
Revision: A
Date: Thursday, September 06, 2007
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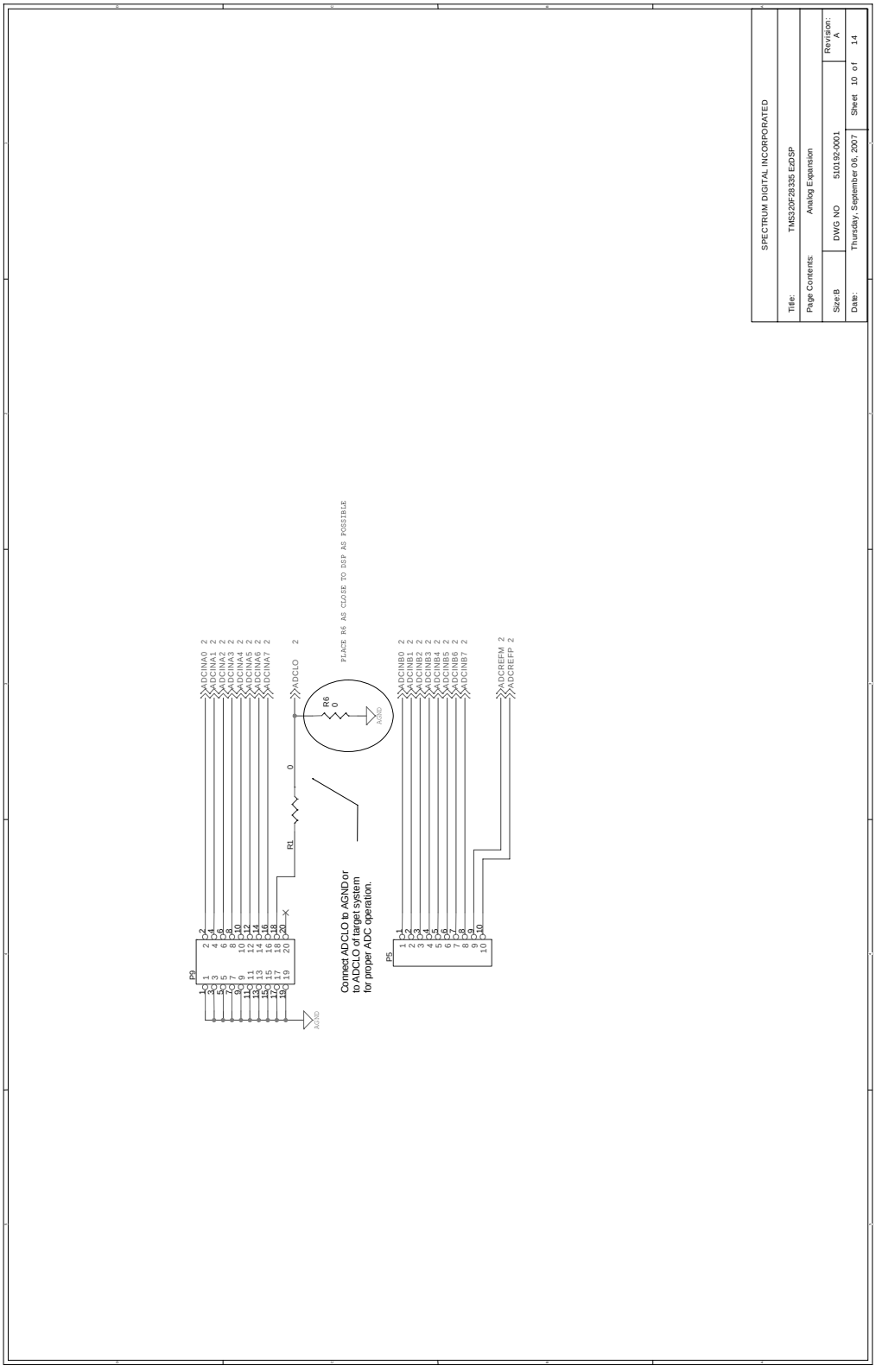
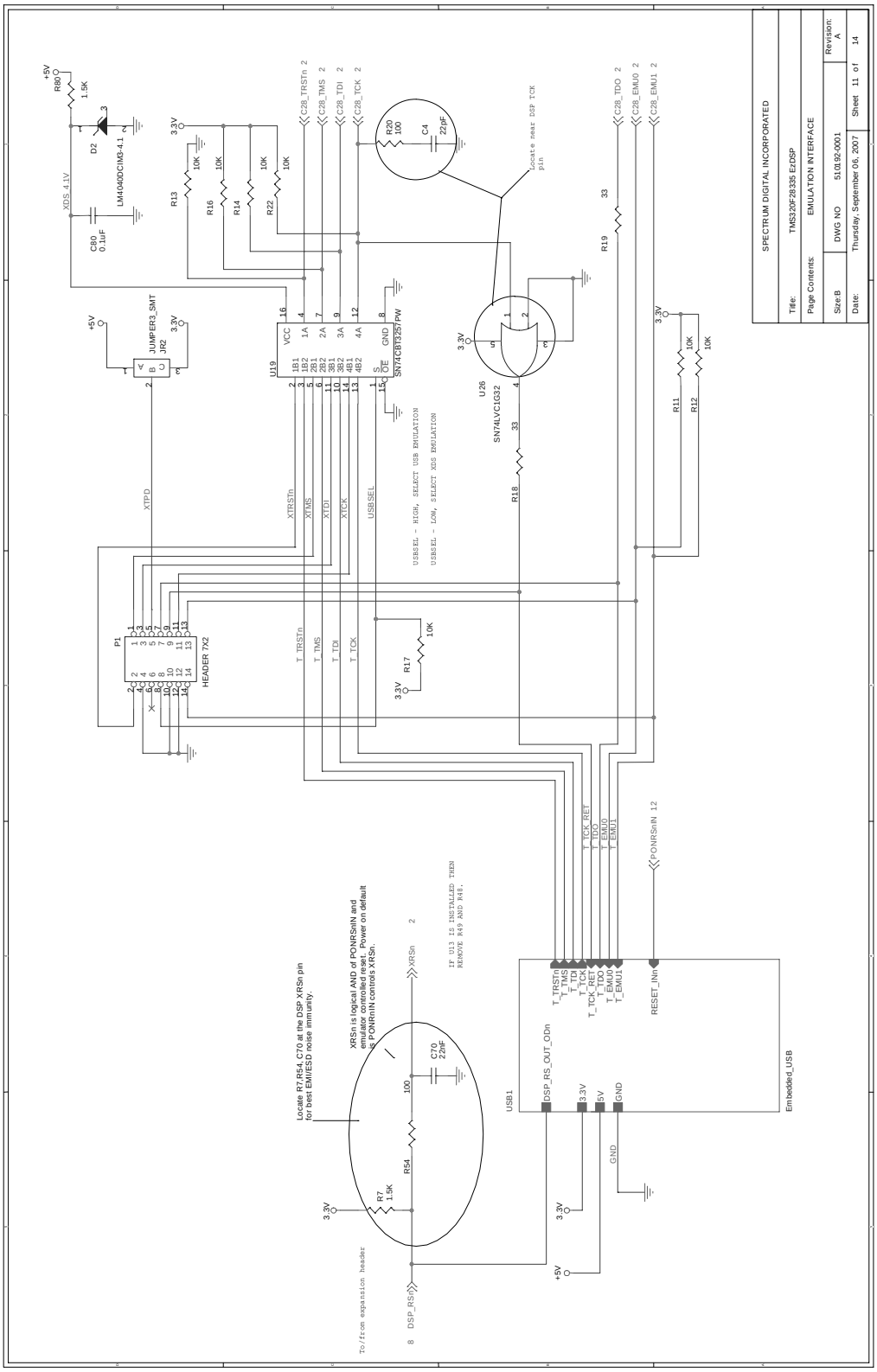
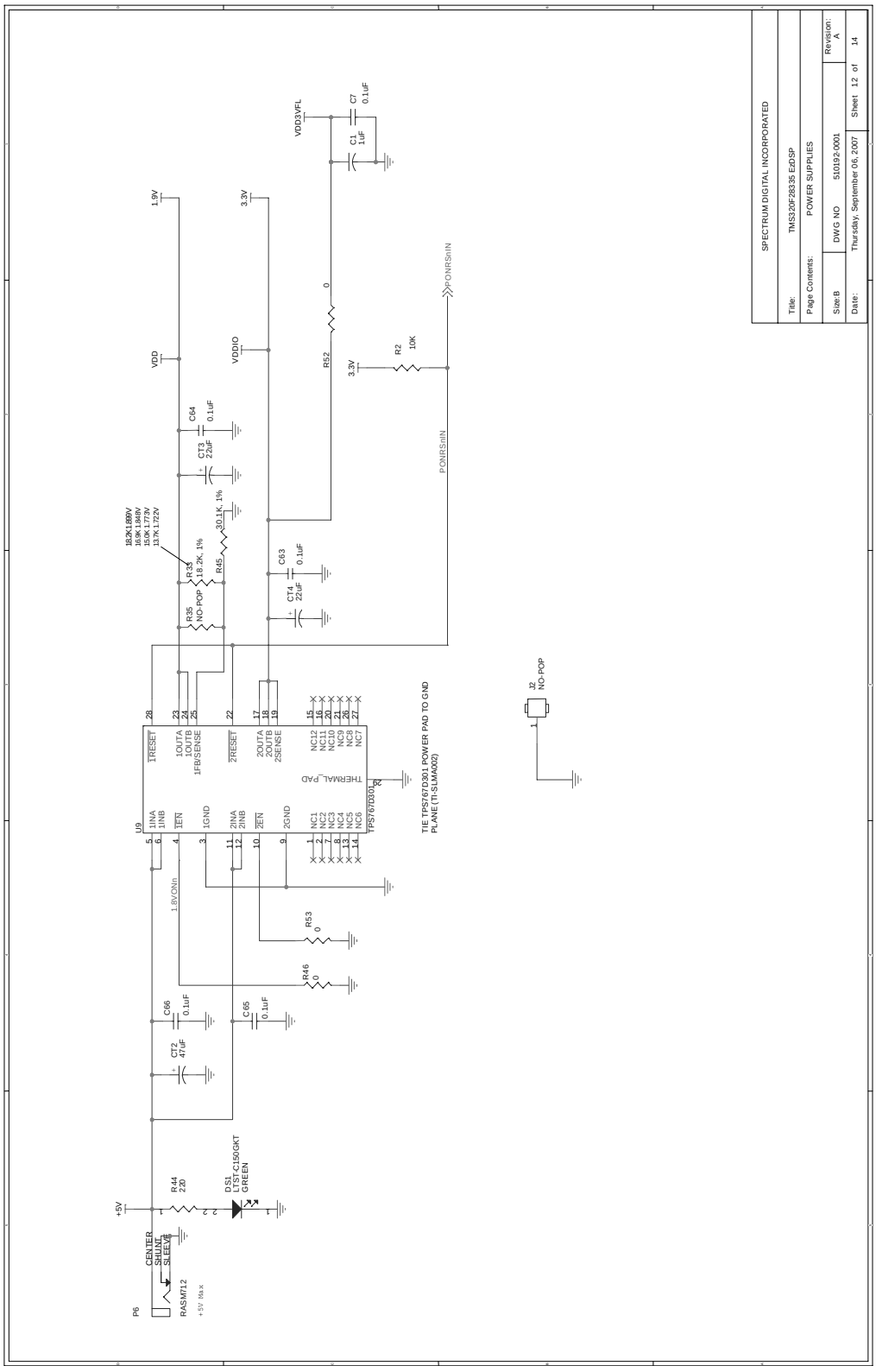
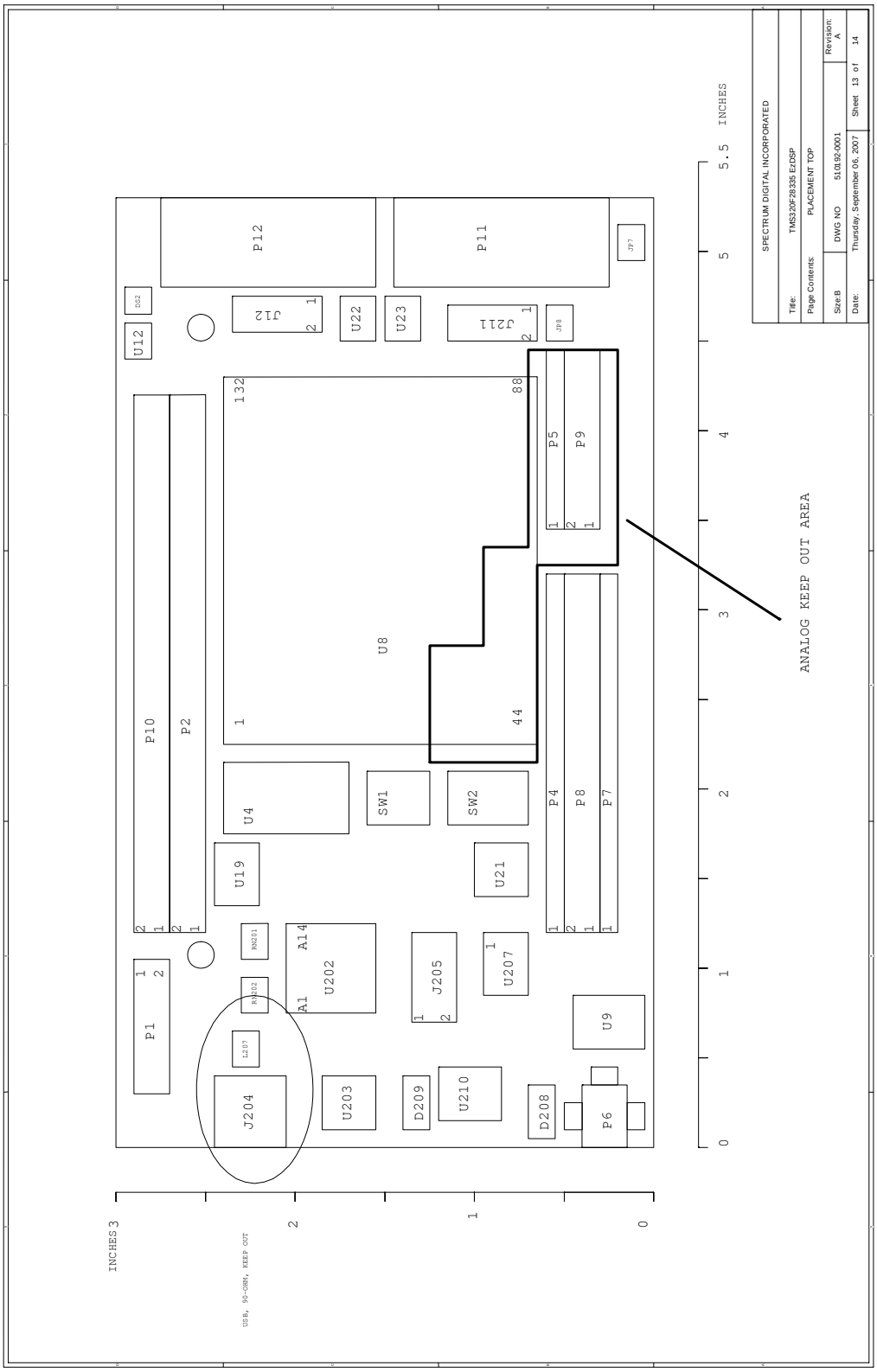
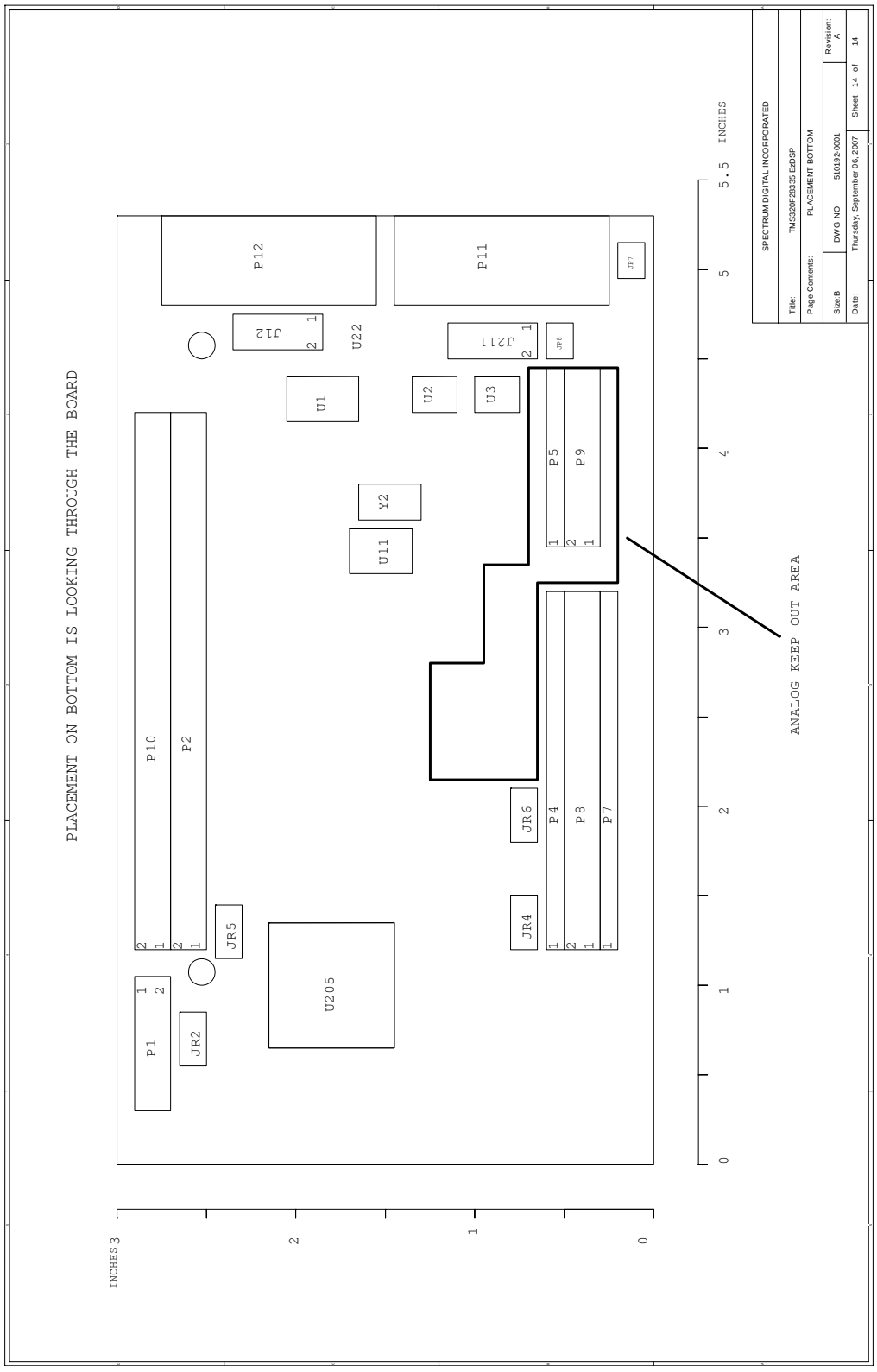

SPECTRUM DIGITAL INCORPORATED
Title: TMS320F28335 ExDSP
Page Contents: Analog Expansion
Size:B
DWG NO 510192-0001
Revision: A
Date: Thursday, September 06, 2007
Sheet 10 of 14
PLACE R6 AS CLOSE TO DSP AS POSSIBLE
Connect ADCLO to AGND or to ADCLO of target system for proper ADC operation.
R1
0
R6
0
P9
P5
ADCINA0
ADCINA1
ADCINA2
ADCINA3
ADCINA4
ADCINA5
ADCINA6
ADCINA7
ADCLO
ADCINB0
ADCINB1
ADCINB2
ADCINB3
ADCINB4
ADCINB5
ADCINB6
ADCINB7
ADCREFM
ADCREFP
AGND


SPECTRUM DIGITAL INCORPORATED
Title: TMS320F28335 EzDSP
Page Contents: EMULATION INTERFACE
Size:B
DWG NO 510.92-0001
Revision: A
Date: Thursday, September 06, 2007
Sheet 11 of 14
XDS 4.1V
LM4040DCIM3-4.1
JUMPER3_SMT
SN74CBT3257PW
SN74LVC1G32
HEADER 7X2
Locate near DSP TCK pin
USBSEL - HIGH, SELECT USB EMULATION
USBSEL - LOW, SELECT XDS EMULATION
IF U13 IS INSTALLED THEN REMOVE R49 AND R48.
XRSn is logical AND of PONRSnIN and emulator controlled reset. Power on default is PONRnIN controls XRSn.
Locate R7,R54, C70 at the DSP XRSn pin for best EMI/ESD noise immunity.
To/from expansion header
Embedded_USB


SPECTRUM DIGITAL INCORPORATED
Title: TMS320F28335 eZDSP
Page Contents: POWER SUPPLIES
Size:B DWG NO 5.10192.0001 Revision: A
Date: Thursday, September 06, 2007 Sheet 12 of 14
VDD3VFL
C7 0.1uF
C1 1uF
1.9V
3.3V
VDD
VDDIO
R52 0
R2 10K
PONRSnIN
C64 0.1uF
CT3 22uF
C63 0.1uF
CT4 22uF
R36 NO-POP
R45 18.2K, 1%
30.1K, 1%
18.2K 1.889V
16.9K 1.846V
15.0K 1.773V
13.7K 1.722V
U9
TPS767D301
THERMAL_PAD
1RESET
1OUTA
1OUTB
1FB/SENSE
2RESET
2OUTA
2OUTB
2SENSE
1INA
1INB
1EN
1GND
2INA
2INB
2EN
2GND
NC1
NC2
NC3
NC4
NC5
NC6
NC7
NC8
NC9
NC10
NC11
NC12
TIE TPS767D301 POWER PAD TO GND PLANE (TI-SLMA002)
J2 NO-POP
1.8VONn
R53 0
R46 0
C66 0.1uF
C65 0.1uF
CT2 47uF
+5V
R44 220
DS1 LTST-C150GKT GREEN
P6
CENTER SHUNT SLEEVE
RASM712
+5V Max


SPECTRUM DIGITAL INCORPORATED
Title: TMS320F28335 EzDSP
Page Contents: PLACEMENT TOP
Size:B DWG NO 510.92-0001 Revision: A
Date: Thursday, September 06, 2007 Sheet 13 of 14
INCHES
ANALOG KEEP OUT AREA
P12
P11
P10
P2
P1
P5
P9
P4
P8
P7
U8
U4
U12
U19
U21
U22
U23
U9
U202
U203
U207
U210
J204
J205
J212
J211
SW1
SW2
P6
D208
D209
JP7
JP8
A14
A1
RN201
RN202
L207
U52


PLACEMENT ON BOTTOM IS LOOKING THROUGH THE BOARD
ANALOG KEEP OUT AREA
P12
P11
J12
J211
JP7
JP8
U22
U1
U2
U3
P5
P9
Y2
U11
P10
P2
JR6
P4
P8
P7
JR4
JR5
U205
P1
JR2
INCHES
SPECTRUM DIGITAL INCORPORATED
Title: TMS320F28335 ExDSP
Page Contents: PLACEMENT BOTTOM
Size:B
DWG NO 510192-0001
Revision: A
Date: Thursday, September 06, 2007
Sheet 14 of 14