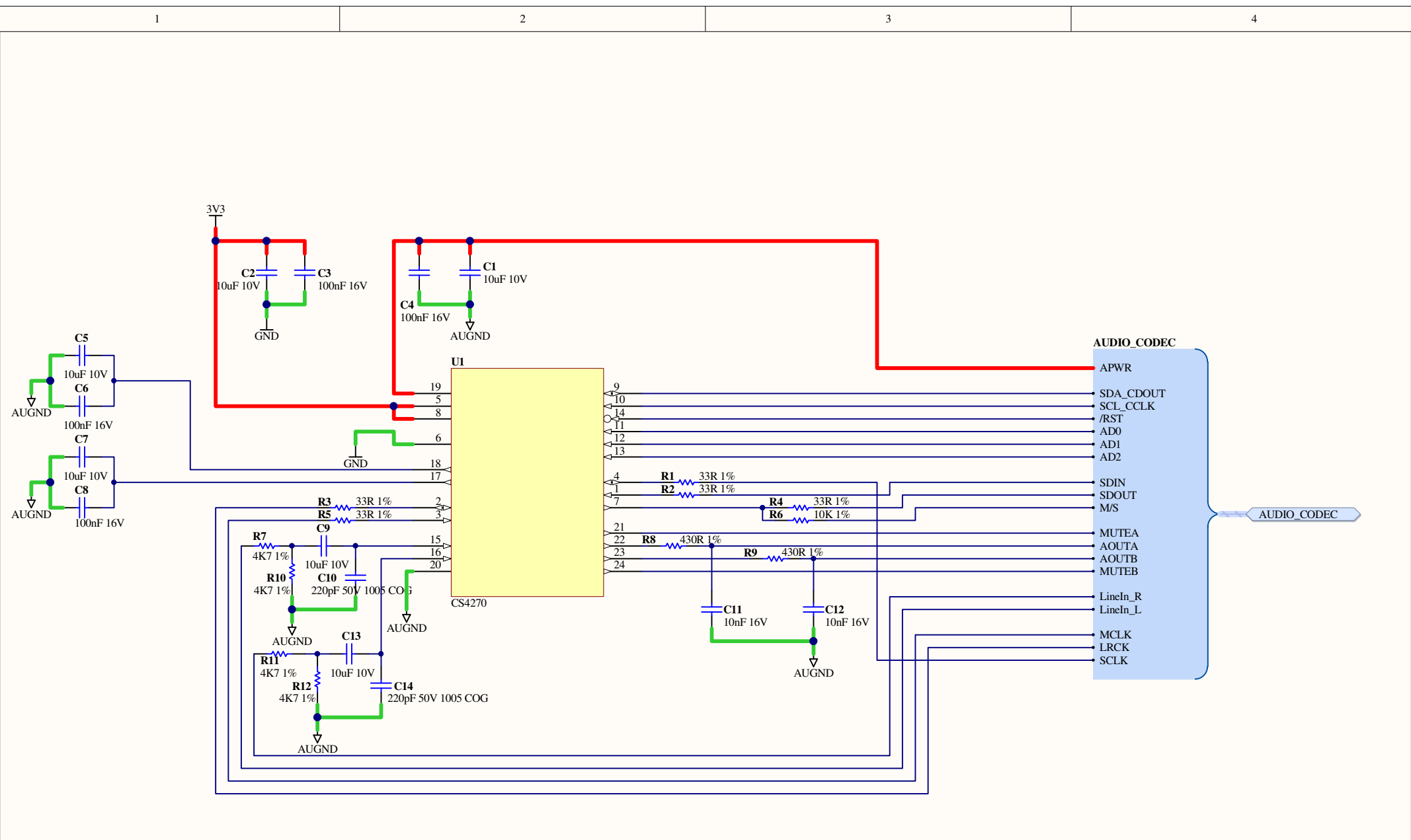

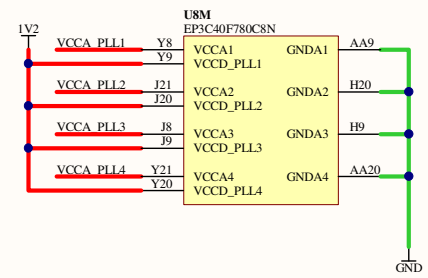
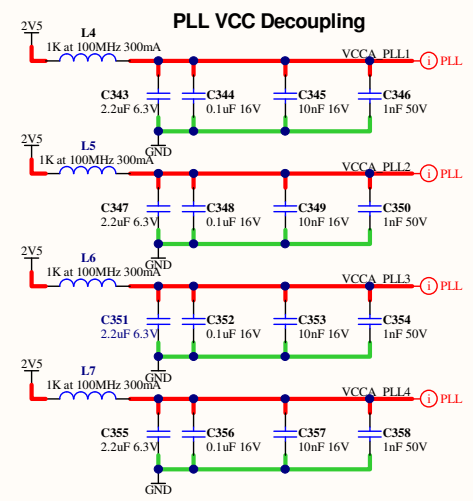
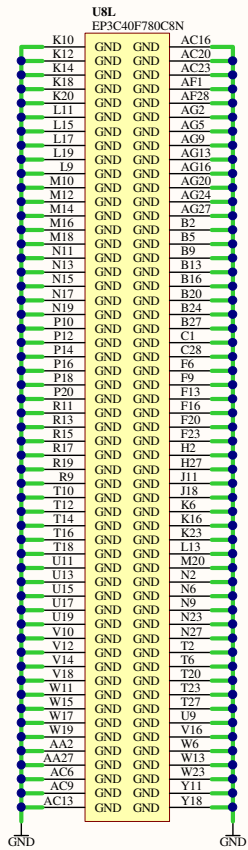
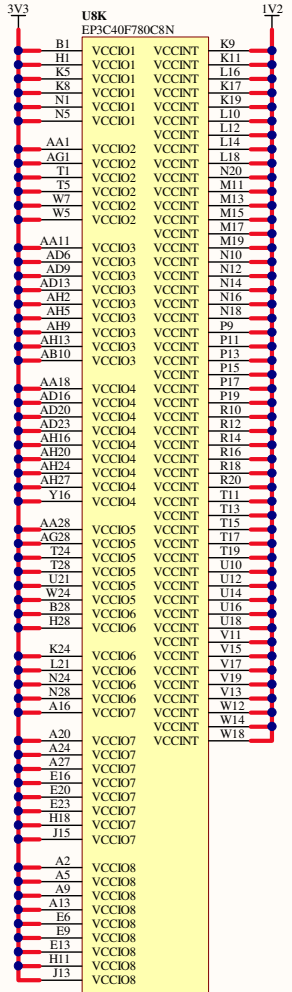
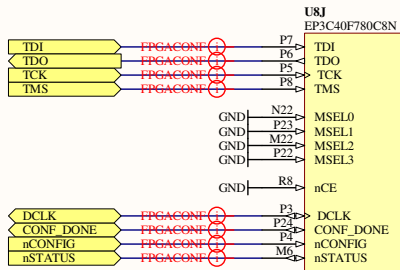
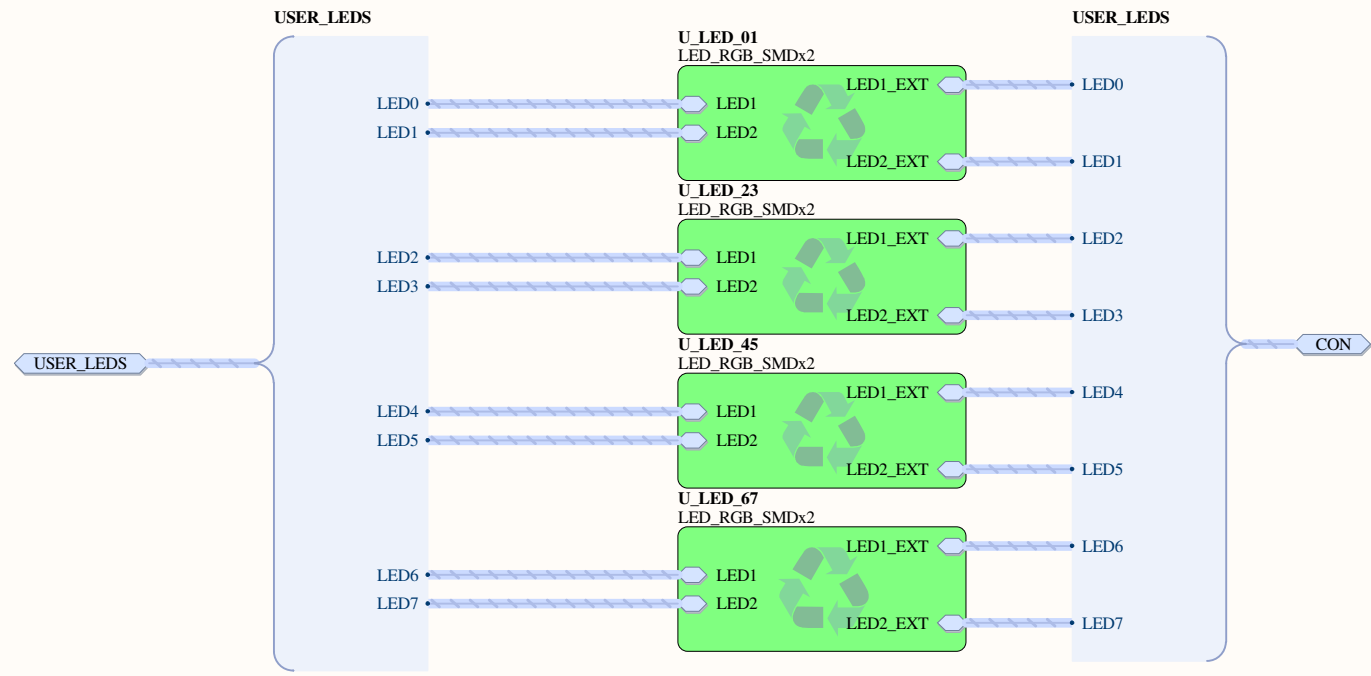



Sheet Title Visual Indicators		Altium Limited 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:09 PM	Sheet 2 of 77		
File: LED_RGB_SMDx2.SCHDOC				



Sheet Title Audio CODEC		Altium Limited 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:10 PM			Sheet 5 of 100
File: AUDIO_CODEC_CS4270.SchDoc				





Sheet Title Visual Indicators Top			Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:10 PM	Sheet 11 of 78		
File: LED_RGB_SMDx8.SCHDOC				

Standoffs For Peripheral Board

PB_MH1
8.5mm spacer, Gold, 2xM3



PB_MH2
8.5mm spacer, Gold, 2xM3



PB_MH3
8.5mm spacer, Gold, 2xM3



PB_MH4
8.5mm spacer, Gold, 2xM3



PB_MH5
8.5mm spacer, Gold, 2xM3



Fiducial Alignment Components

FD1
Fiducial - Round



FD2
Fiducial - Round



FD3
Fiducial - Round



PCB1
NB3000AL Blank PCB
Printed Circuit Board (Bare)

PCB Identifiers

Altium Logo BOT1
Altium(2009)



LOGO1
Nanoboard Logo



Sheet Title **NB3000AL Holes and Graphics**

Project Title **NB3000AL - ALTERA**

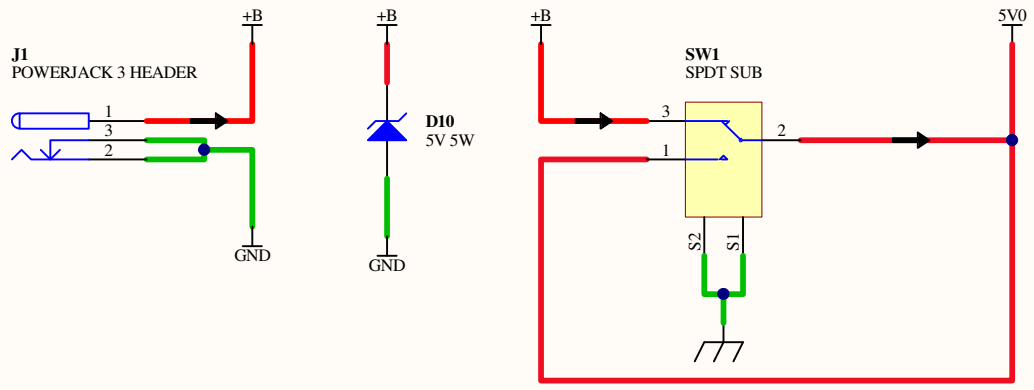
Size: **A4** Assy: **TBA** Revision: **02**


Date: **9/22/2011** Time: **10:42:10 PM** Sheet **20** of **78**

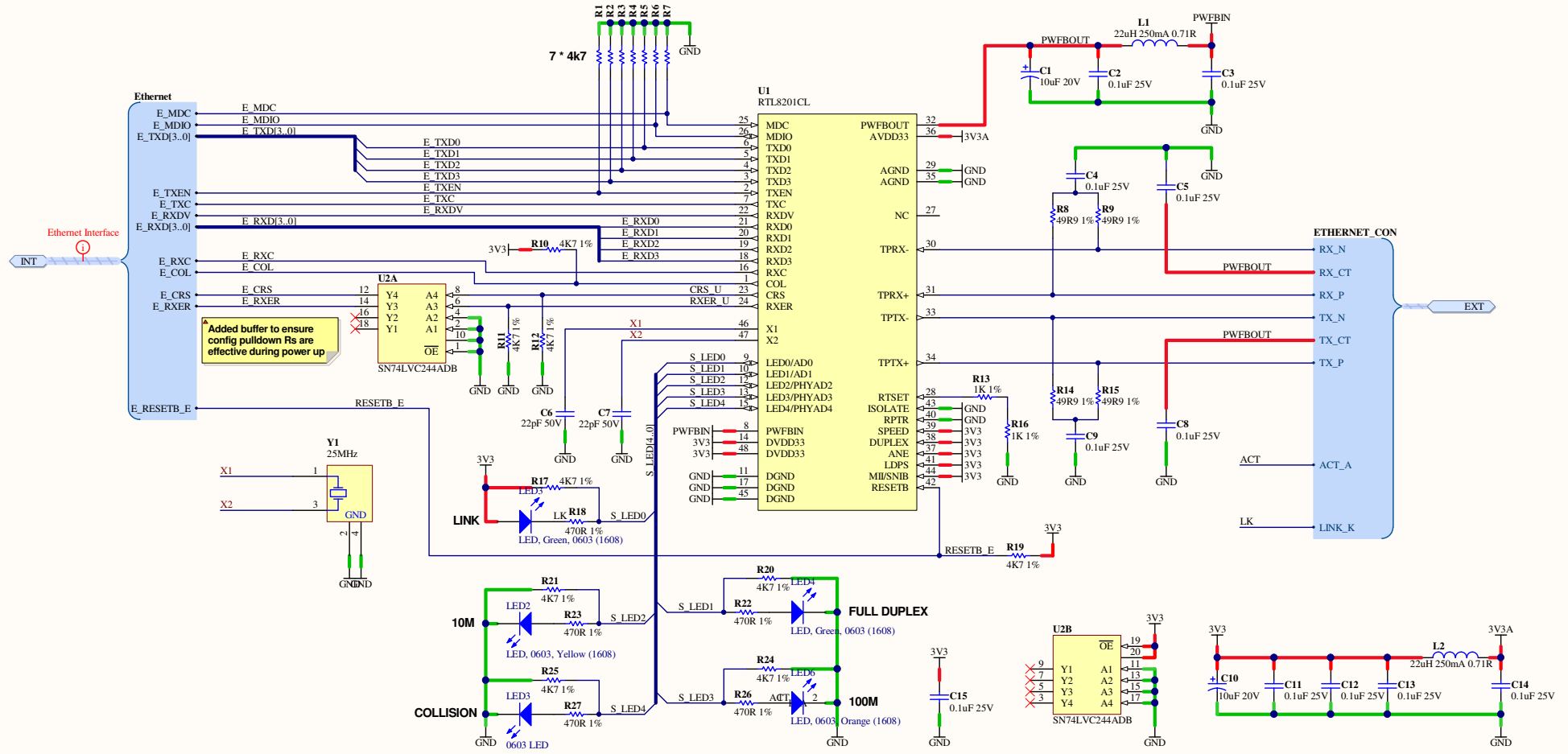
File: **Mounts.SchDoc**

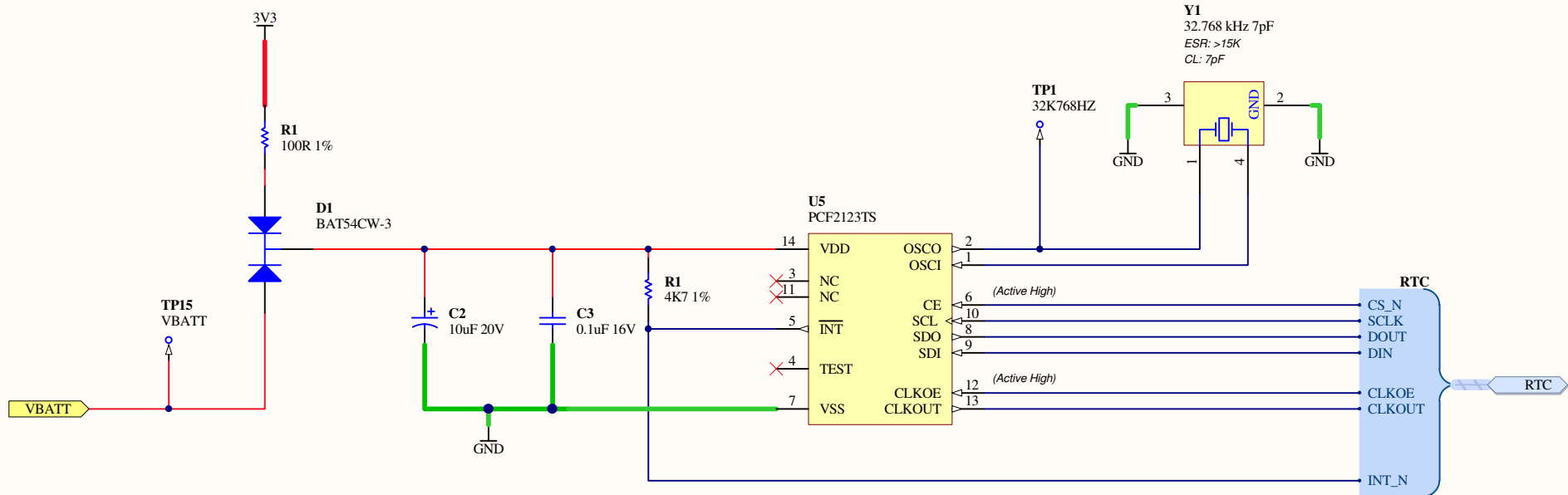
Altium Limited
3 Minna Close
Belrose
NSW 2085
Australia



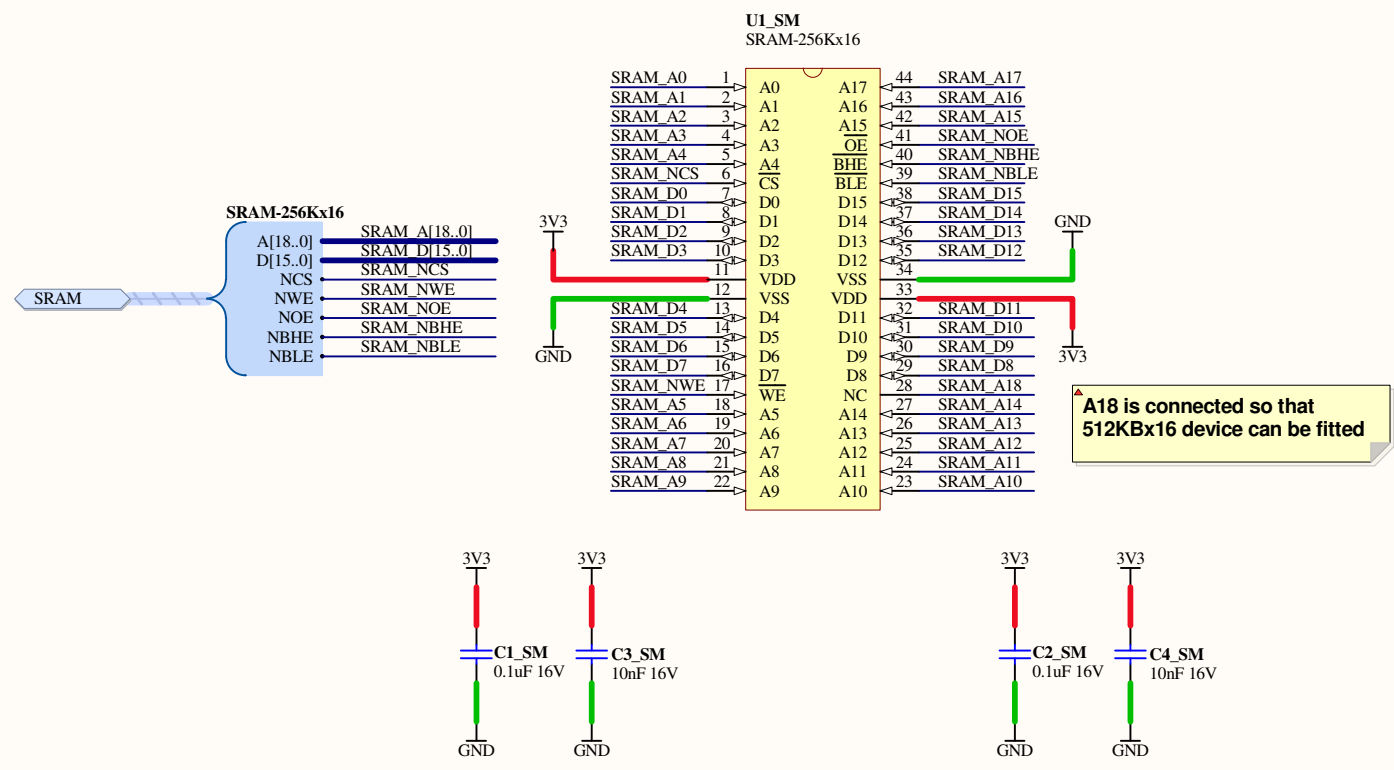


Sheet Title Power Jack & Switch			<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:11 PM	Sheet 21 of 78		
File: PWJACK+SWITCH.SchDoc				

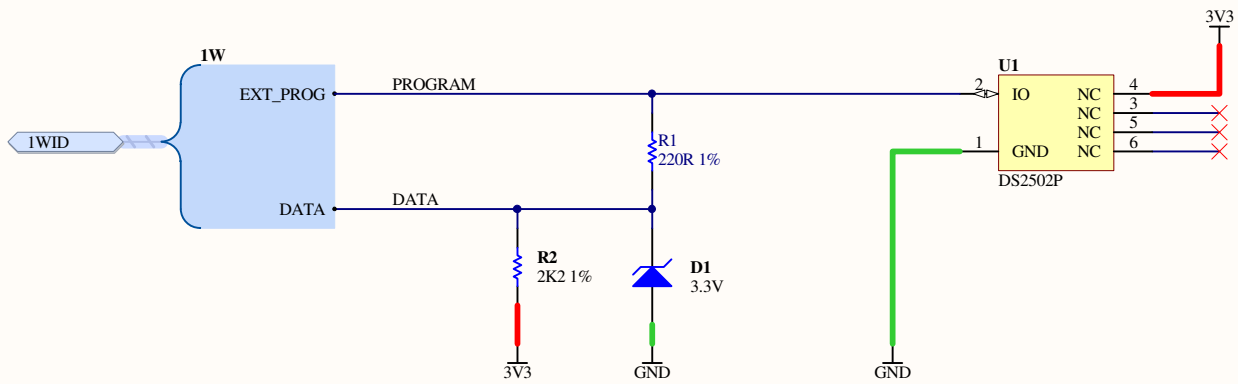





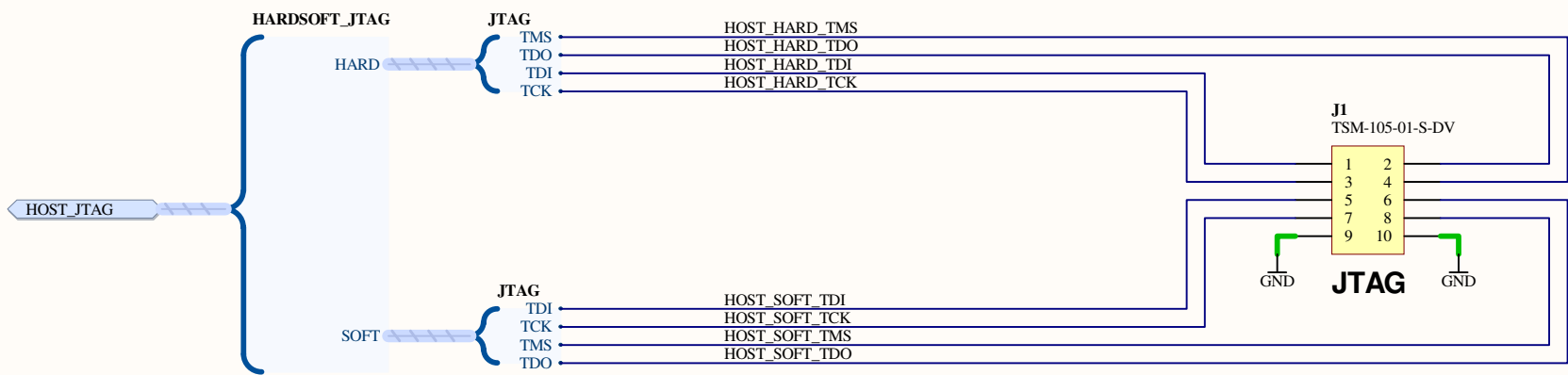
Sheet Title SPI Real Time Clock		Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA			
Size: A4	Assy: TBA	Revision: 02	
Date: 9/22/2011	Time: 10:42:11 PM	Sheet 23 of 80	
File: CLK_PCF2123_RTC.SchDoc			




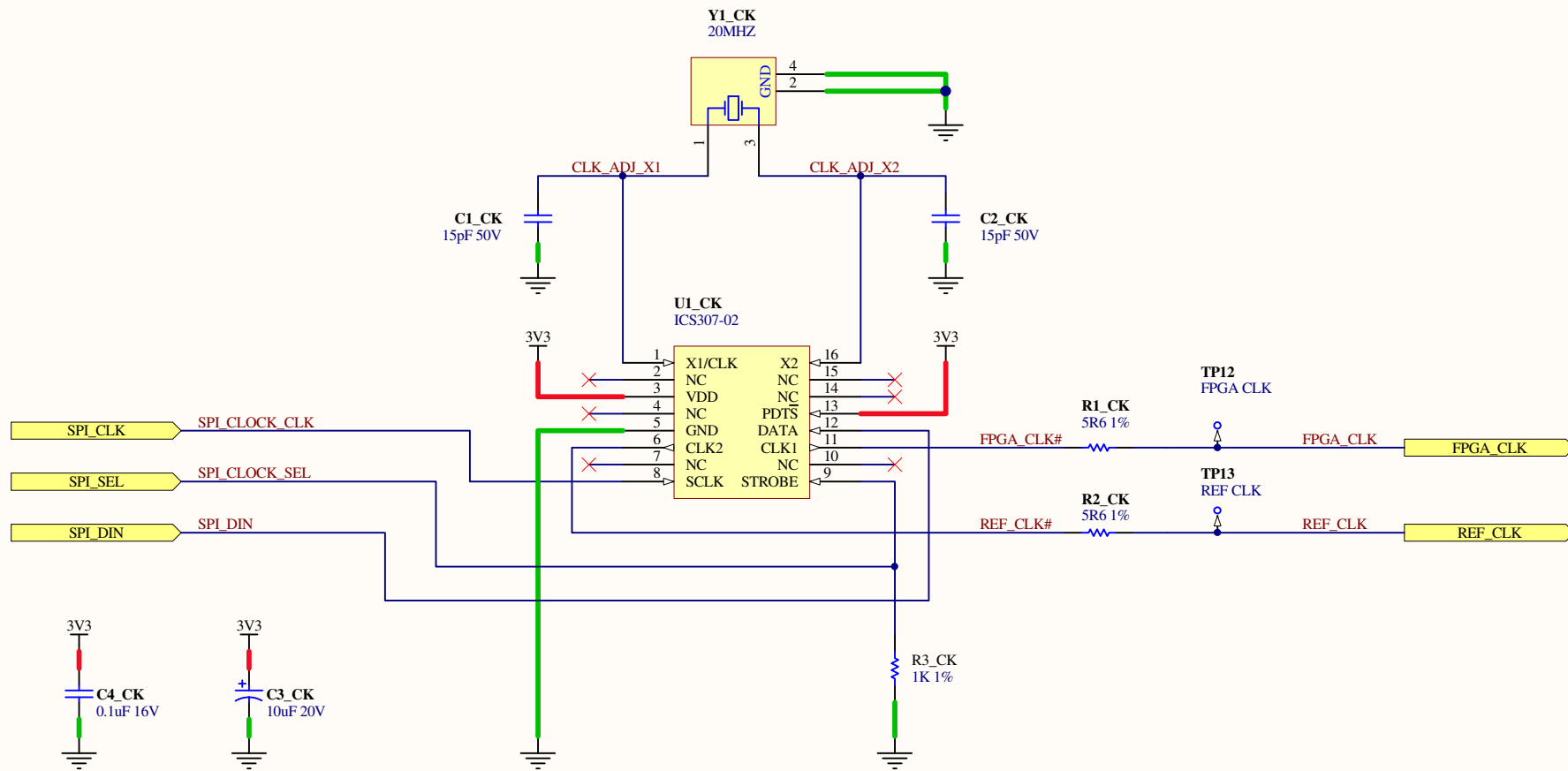
Sheet Title 256K x 16-Bit SRAM		Altium Limited 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:11 PM			Sheet 24 of 80
File: SRAM_256Kx16_TSOP44.SchDoc				




Sheet Title Protected 1-Wire EPROM		Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA			
Size: A4	Assy: TBA	Revision: 02	
Date: 9/22/2011	Time: 10:42:11 PM	Sheet 25 of 80	
File: 1WB_DS2502_ID.SchDoc			



Sheet Title Local MCU Debug Connector		Altium Limited 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:11 PM			Sheet 25 of 78
File: HOST_JTAG.SchDoc				



Sheet Title CLK_1			Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Number: 26	Revision: 02		
Date: 9/22/2011	Time: 10:42:11 PM Sheet 26 of 106			
File: CLK_ICS307-02_PLL.SchDoc				

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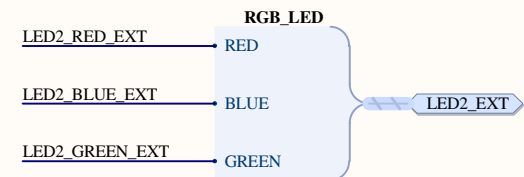
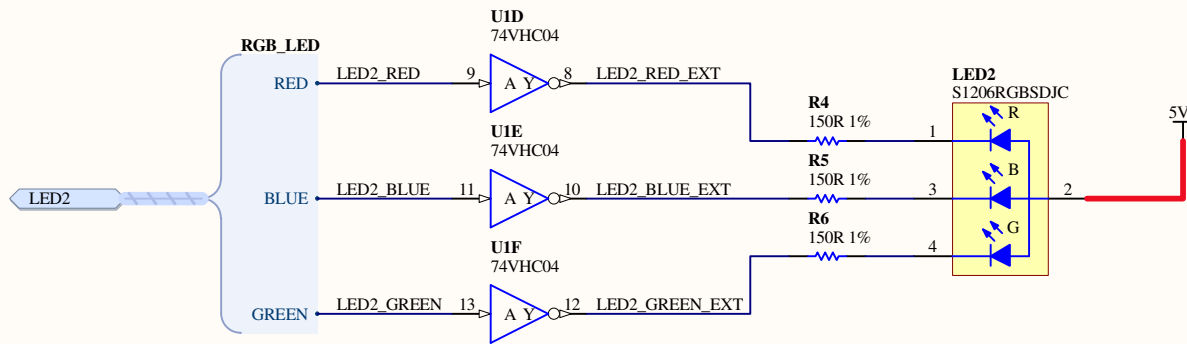
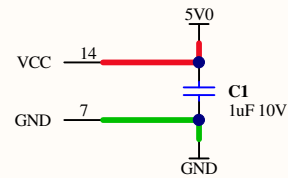
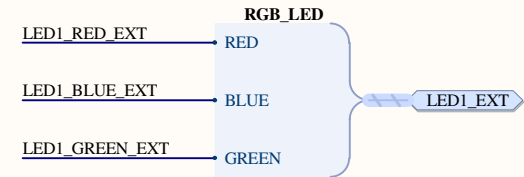
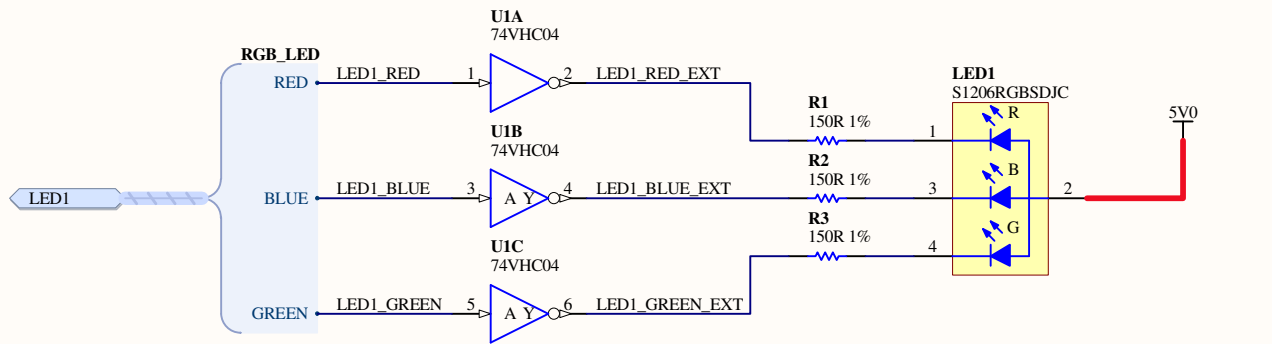
D

1

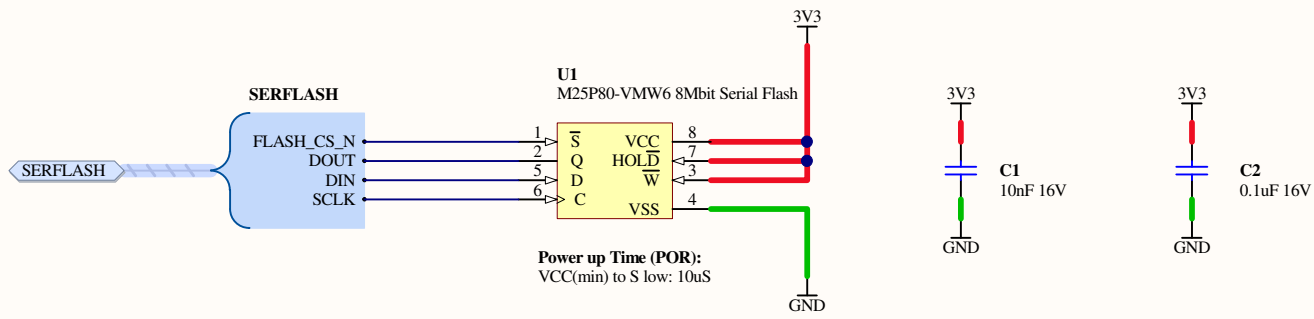
2

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Sheet Title Visual Indicators			Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:11 PM	Sheet 27 of 80		
File: LED_RGB_SMDx2.SCHDOC				



Power up Time (POR):
VCC(min) to S low: 10uS

M25P80-VMW6 8Mbit Serial PROM (75MHz)

8,192,000 BITS

(ID=0x13)

Sheet Title **Host - Dual Serial Flash Memory**

Project Title **NB3000AL - ALTERA**

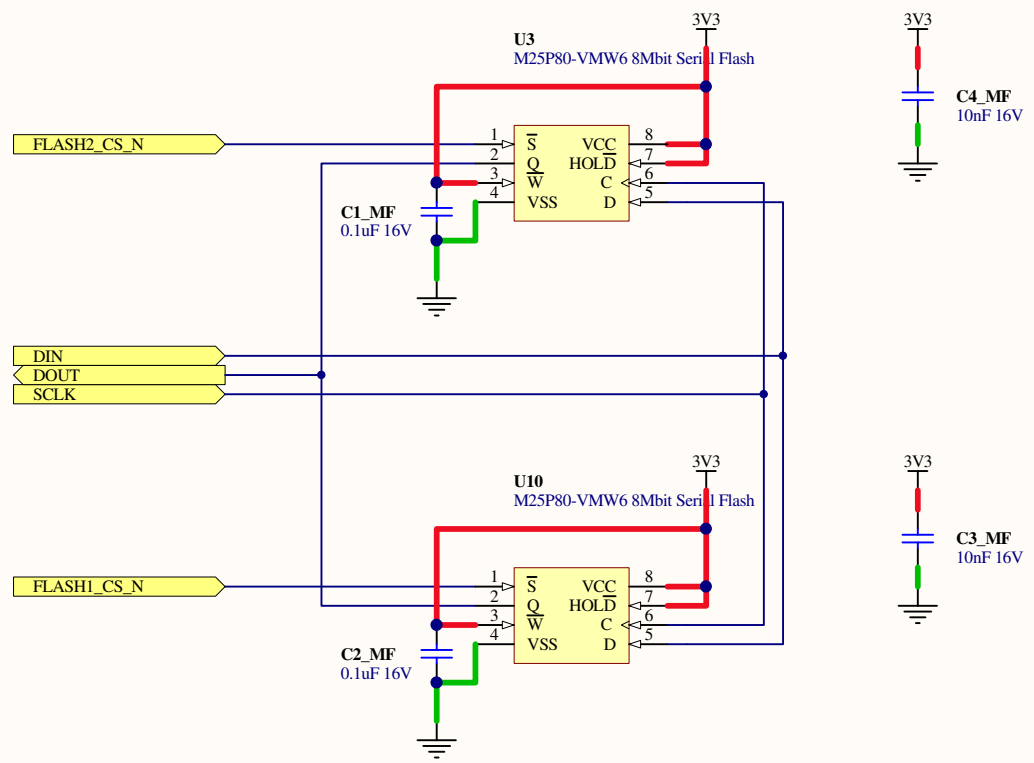
Size: A4 Assy: TBA Revision: 02


Date: 9/22/2011 Time: 10:42:11 PM Sheet 28 of 80

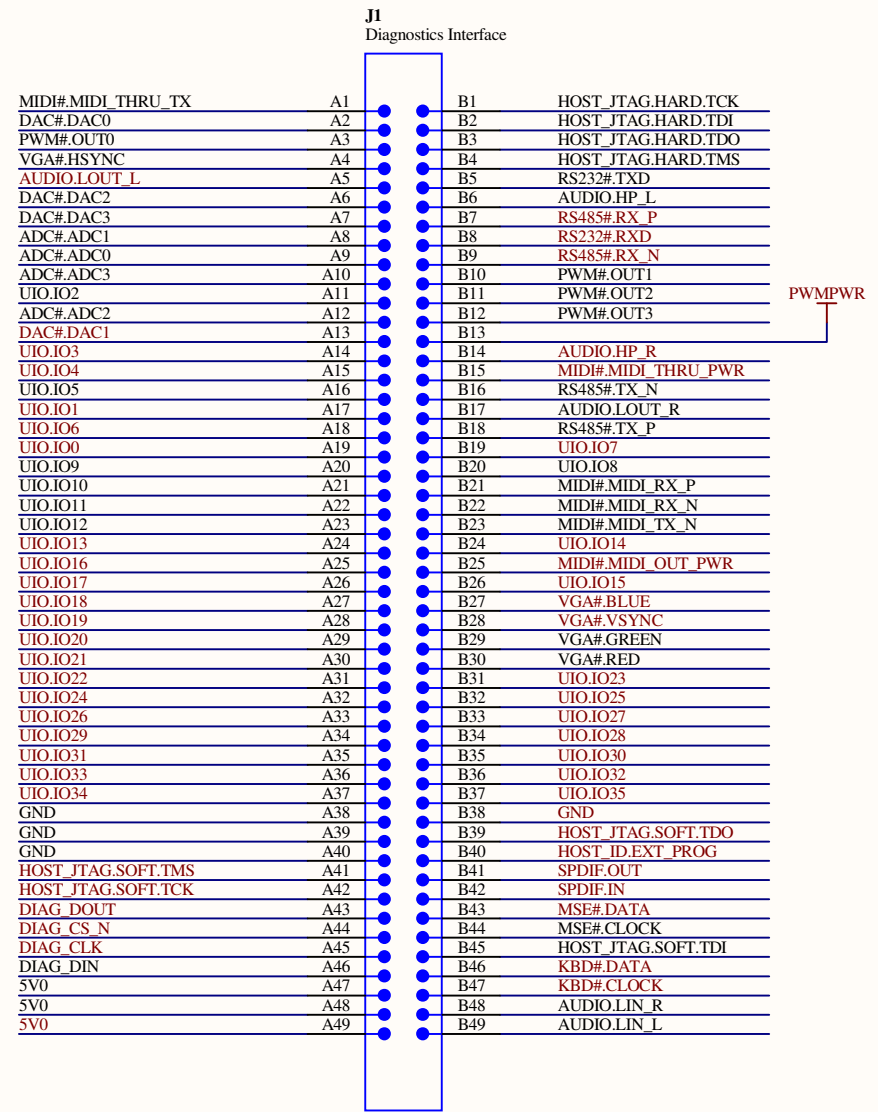
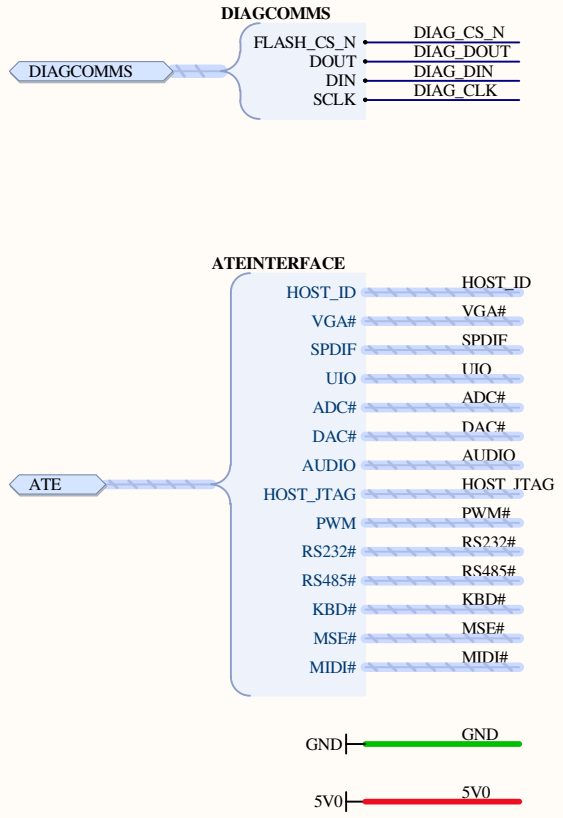
File: FLASH_M25PX0_SPI_8Mbit.SchDoc

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Australia

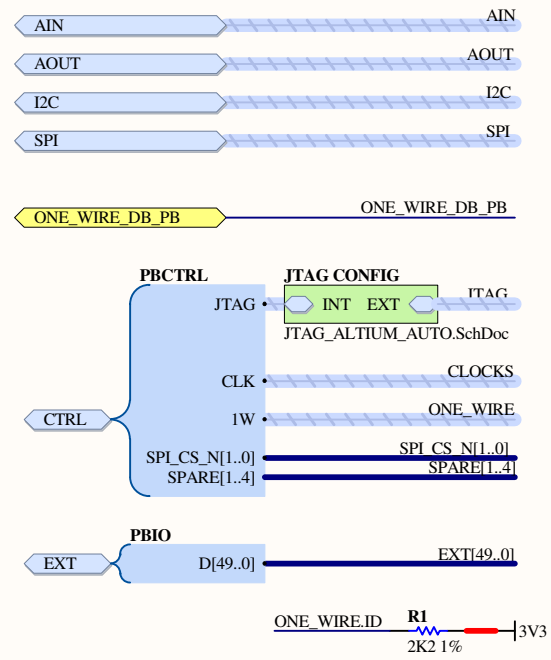




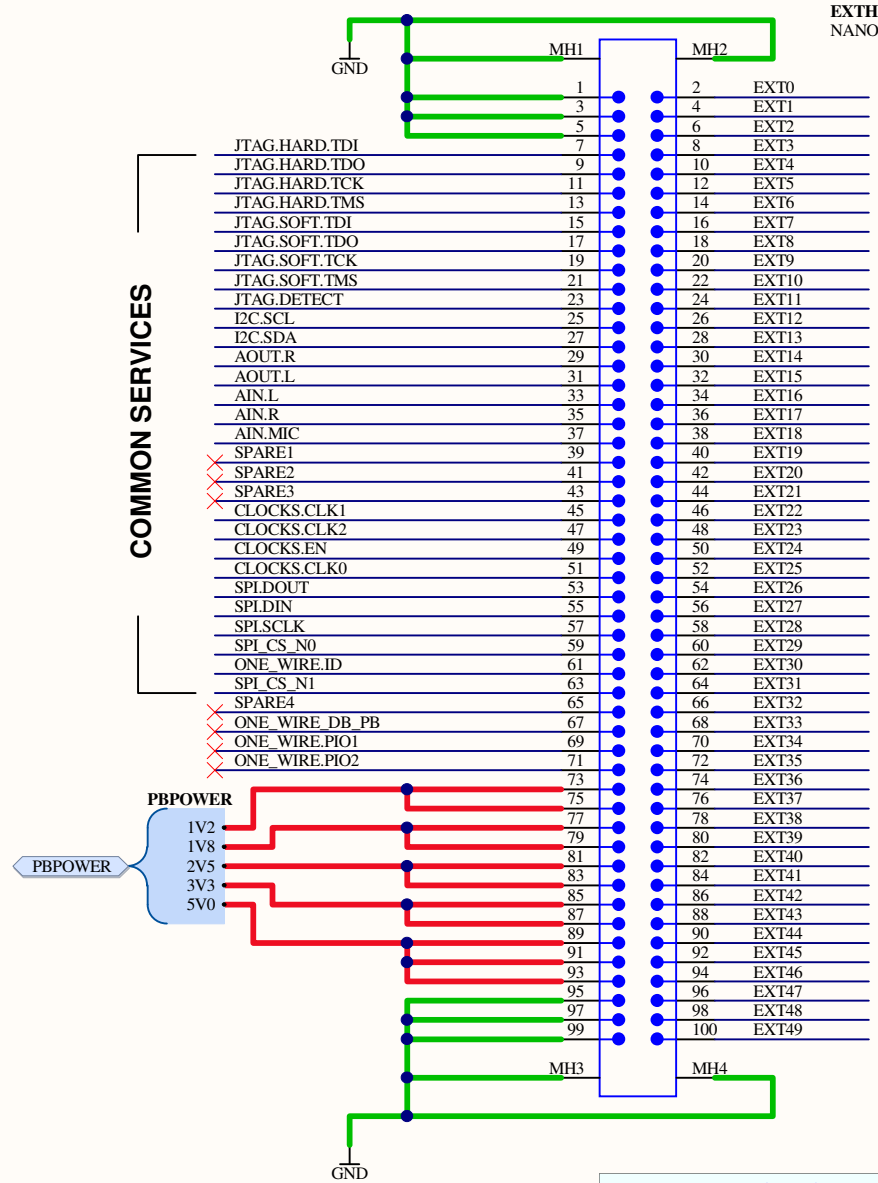
Sheet Title FLASH_2		Altium Limited 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Number: 29			Revision: 02
Date: 9/22/2011	Time: 10:42:11 PM			Sheet 29 of 106
File: FLASHSPI_M25PX0.SchDoc				



Title ATE Interface Connector			Altium Limited. Level 3, 12a Rodborough Rd Frenchs Forest 2086 NSW AUSTRALIA	
Size: A4	Number: 30	Revision: *		
Date: 9/22/2011	Time: 10:42:11 PM	Sheet 30 of 80		
File: C:\Designs\SRKHNB3000ALCON_NB3000_ATE_INTF.SchDoc				



COMMON SERVICES



STANDARD PERIPHERAL INTERFACE

Sheet Title Peripheral Board Connector		Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA			
Size: A4	Assy: TBA	Revision: 02	
Date: 9/22/2011	Time: 10:42:11 PM	Sheet 31 of 80	
File: NB2_PBCON.schdoc			

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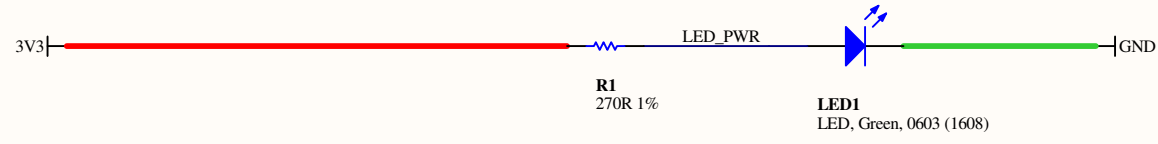
C

C

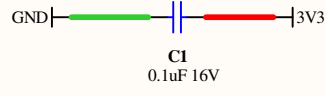
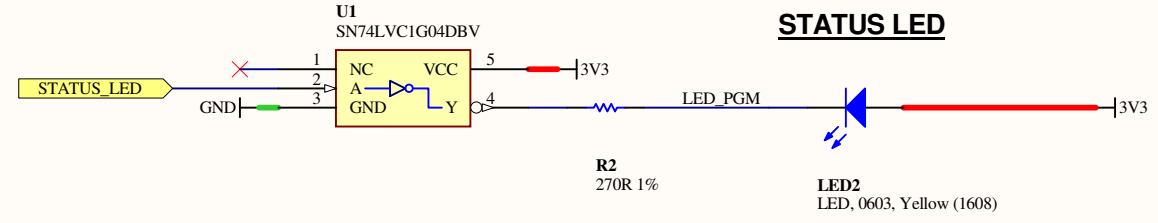
D


D

POWER LED



STATUS LED



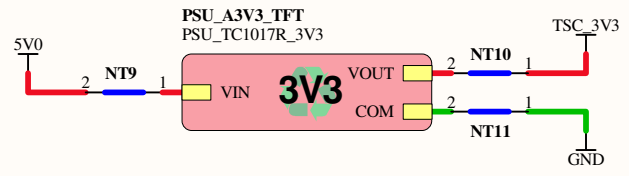
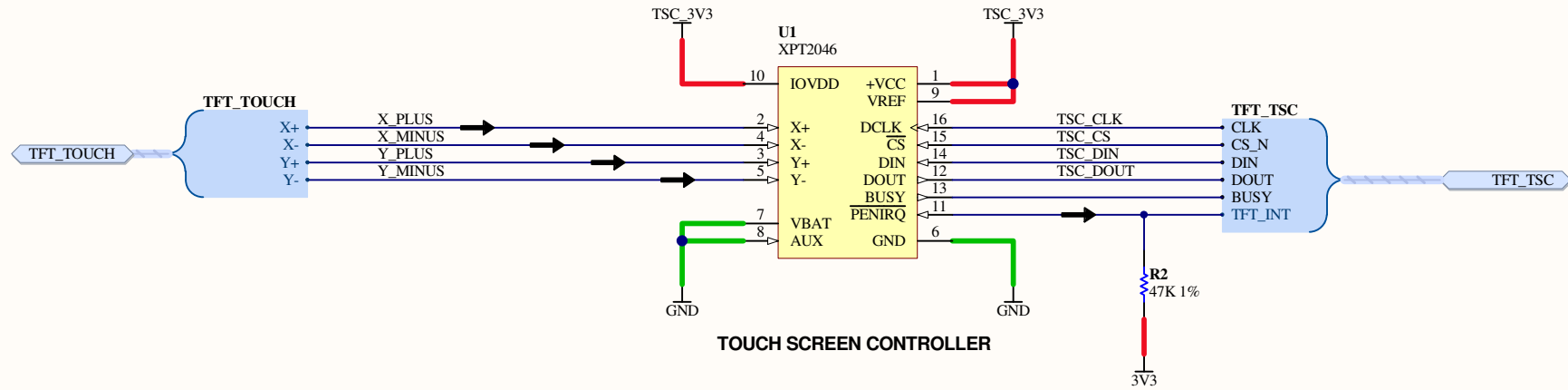
Sheet Title <i>User FPGA Status LEDs</i>		<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia		
Project Title <i>NB3000AL - ALTERA</i>				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:11 PM			Sheet 32 of 80
File: DB_LEDS_0603.SchDoc				


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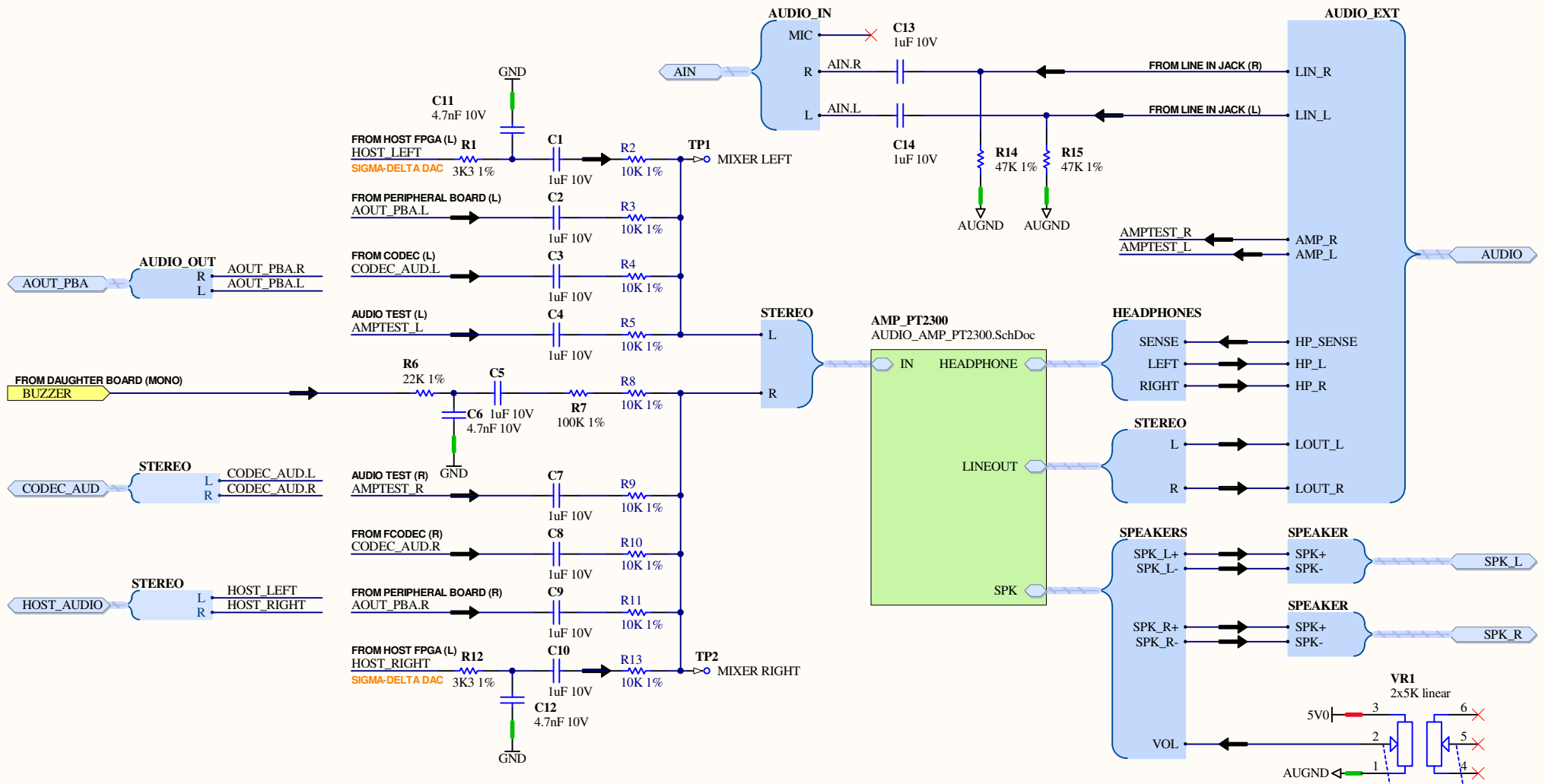
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Sheet Title TFT Touchscreen Interface			Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:11 PM	Sheet 32 of 78		
File: TSC_XPT2046.SchDoc				

Audio Mixer - Left Channel

Audio Signal to Peripheral Board



Audio Mixer - Right Channel

Sheet Title AUDIO SUB-SYSTEM		Altium Limited 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:11 PM			Sheet 33 of 80
File: AUDIO_AMP_NB2C.SchDoc				

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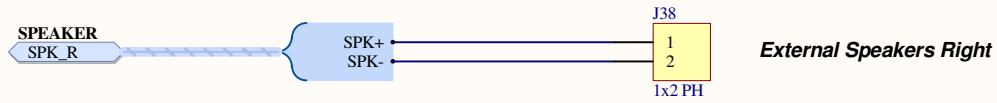
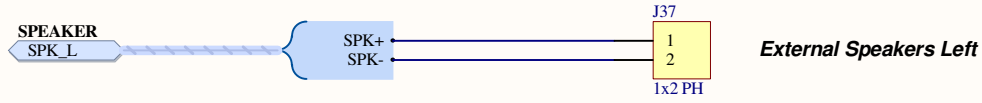
B


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D



Sheet Title External Speaker Connectors			<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:12 PM	Sheet 34 of 80		
File: CON_EXT_SPK.SchDoc				

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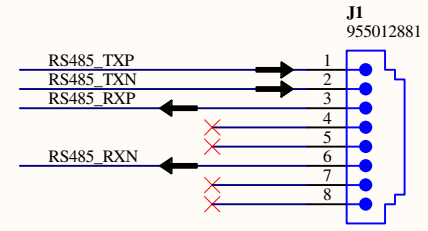
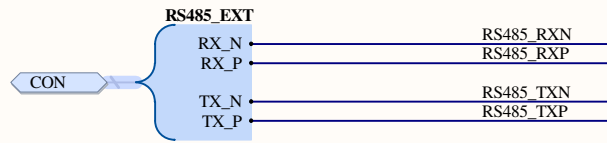
B


C

C

D

D



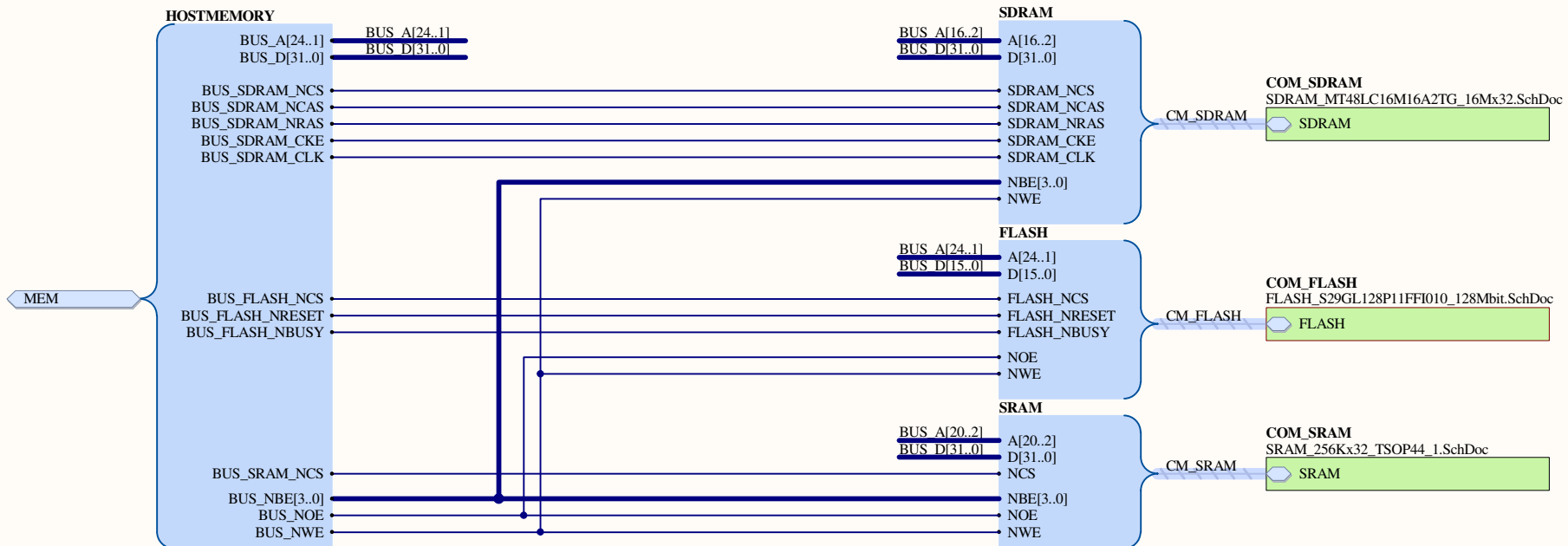
Sheet Title RS485 Connector			<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:12 PM	Sheet 35 of 80		
File: CON_RS485_RJ45.SchDoc				

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Common-Bus Memory Block
 256K x 32-bit SRAM (1 MByte)
 16M x 32-Bit SDRAM (64 MByte)
 8M x 16-Bit Flash (16 MByte)

Sheet Title Common-Bus Memory Block			Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:12 PM	Sheet 36 of 80		
File: NB2_CommonMemory_128Mb_Flash.SchDoc				

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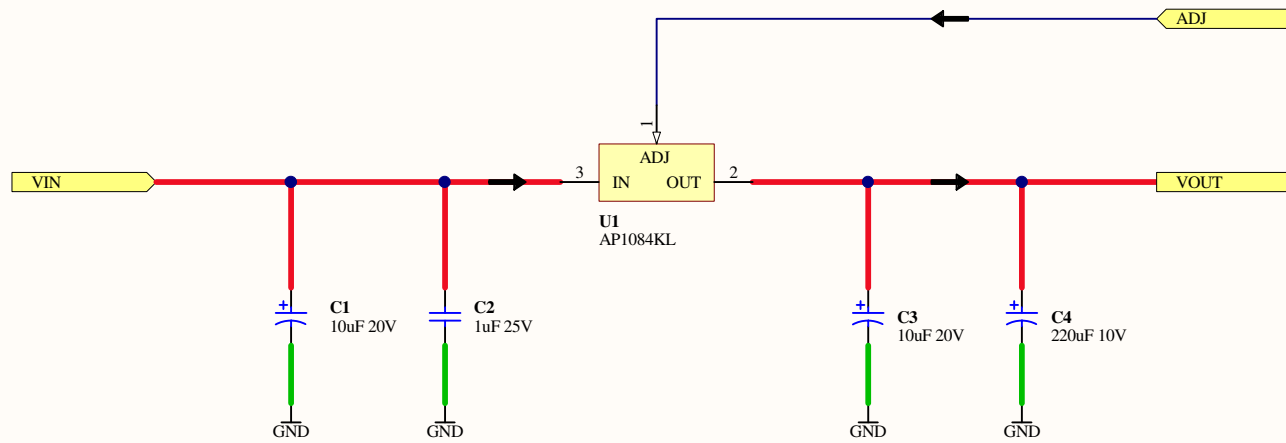
B


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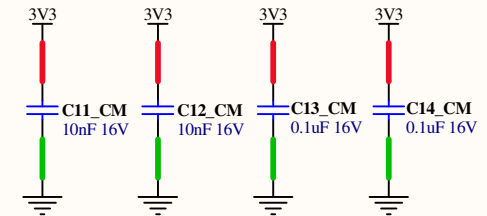
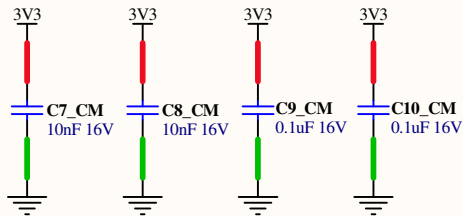
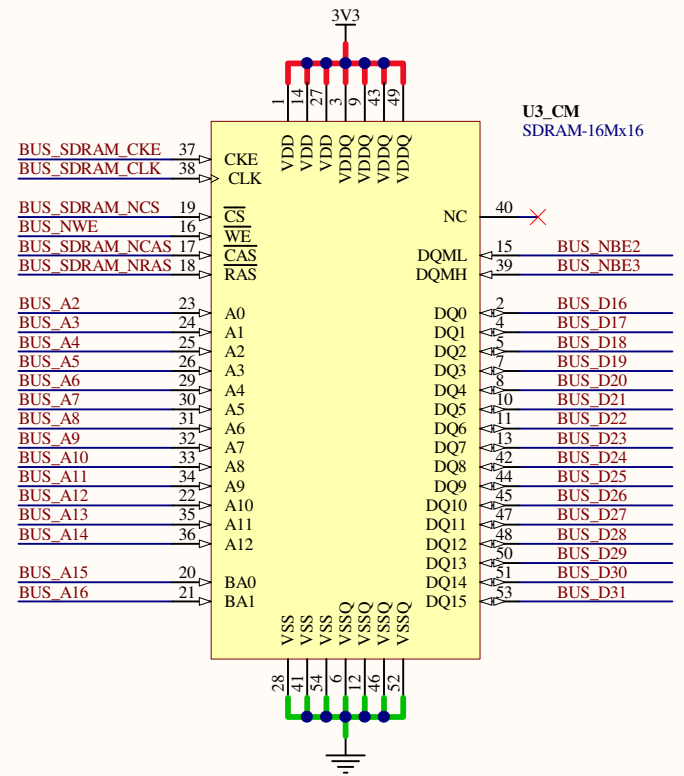
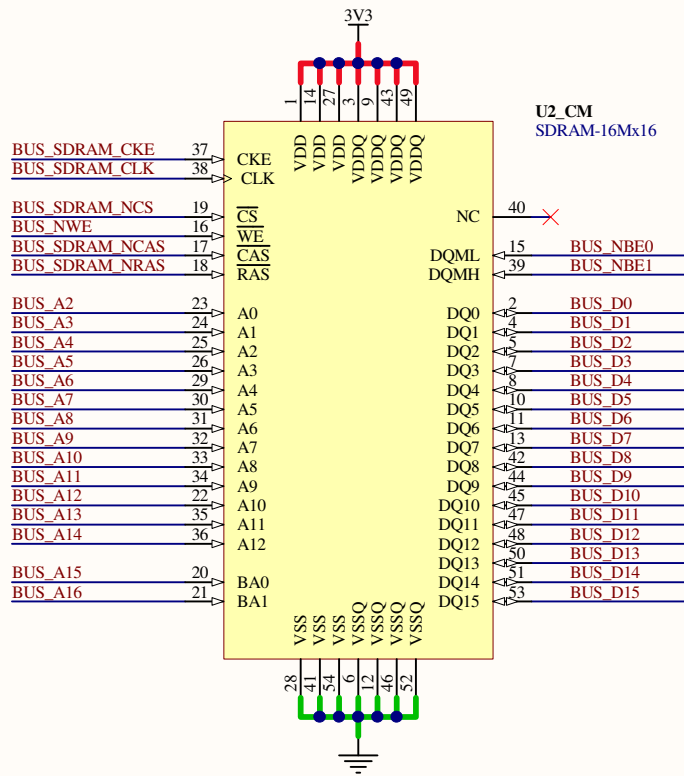
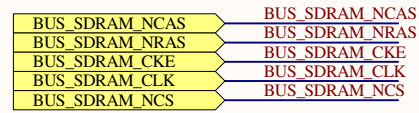
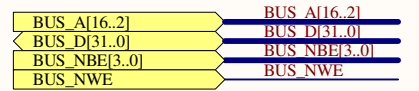
Sheet Title PSU AP1084KL ADJ		<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:12 PM			Sheet 37 of 77
File: PSU_1084_ADJ.SchDoc				

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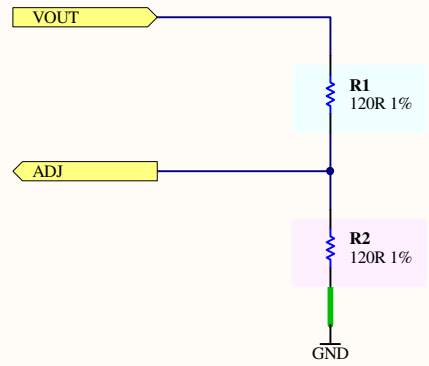


Sheet Title SDRAM_1		
Project Title NB3000AL - ALTERA		
Size: A4	Assy: TBA	Revision: 02
Date: 9/22/2011	Time: 10:42:12 PM	Sheet 37 of 106
File: SDRAM_MT48LC16M16A2TG_16Mx32.SchDoc		

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 Belrose
 NSW 2085
 Australia



2.5V Output




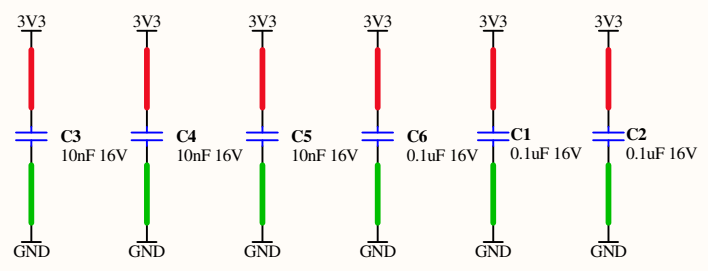
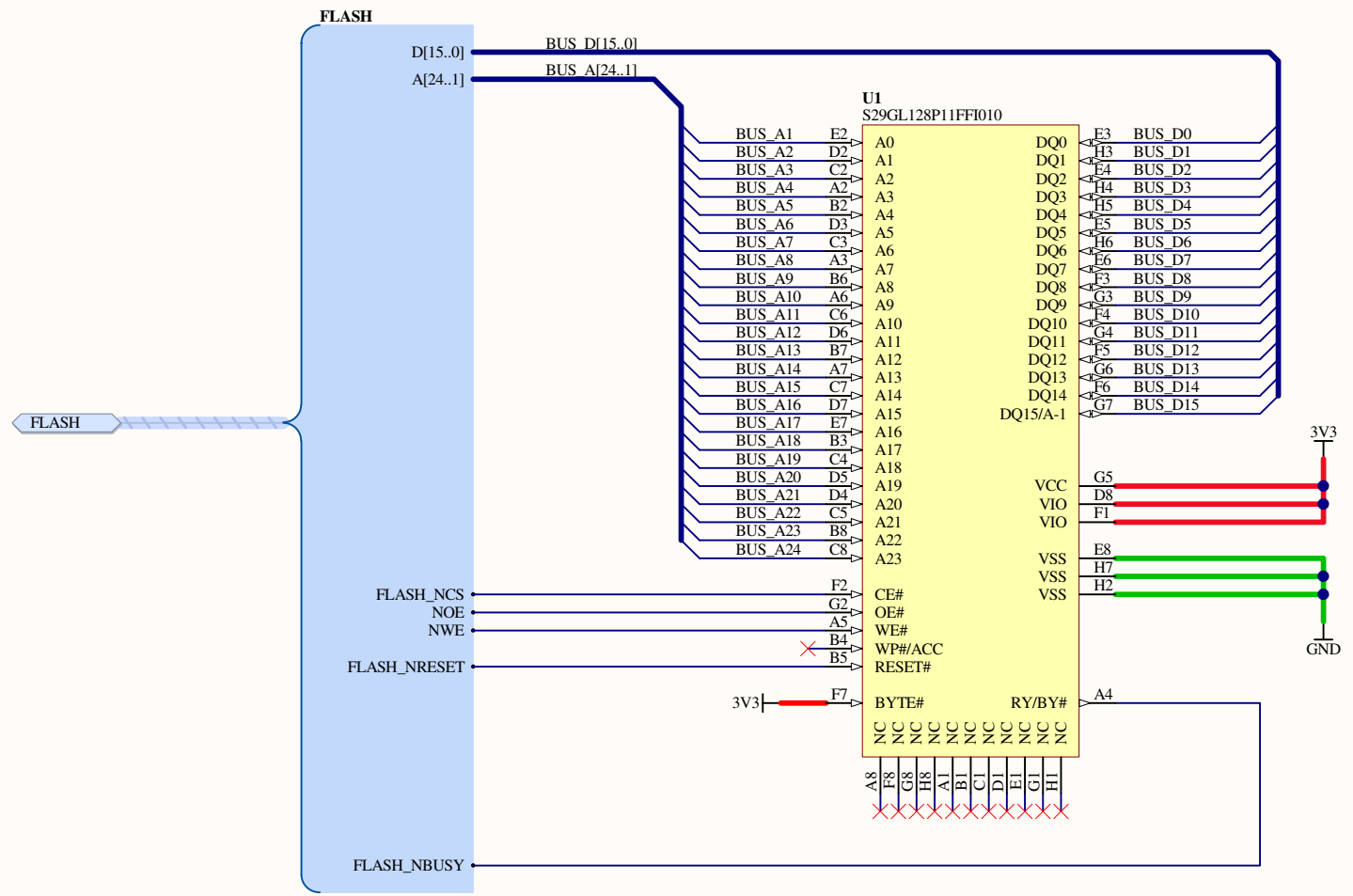
$$V_{out} = V_{REF} \left\{ 1 + \frac{R2}{R1} \right\} + I_{ADJ}R2$$

$$V_{REF} = 1.25v$$


$$I_{ADJ} = 55\mu A (0.000055)$$

▲ Calculation for 2.5V;
 = 1.25V x (1+R2/R1) + 0.000055 x R2
 = 1.25V x (1+120/120) + 0.000055 x 120
 = 1.25V x 2 + 0.0066
 = 2.50066V

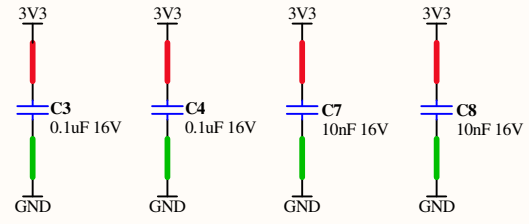
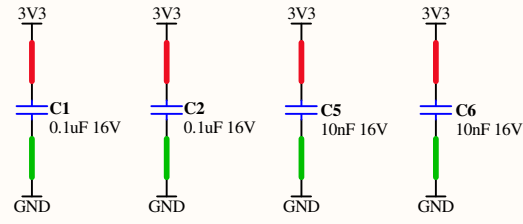
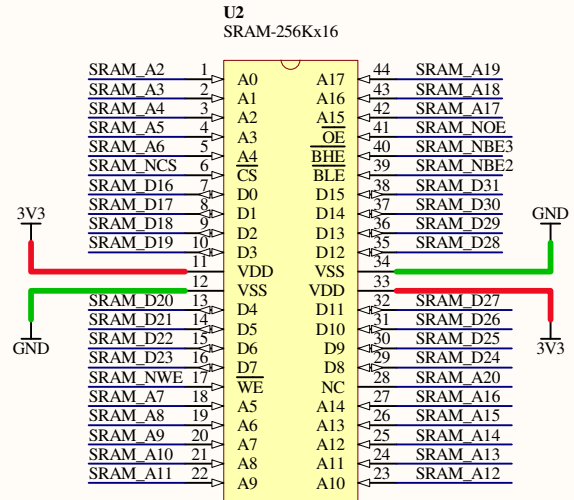
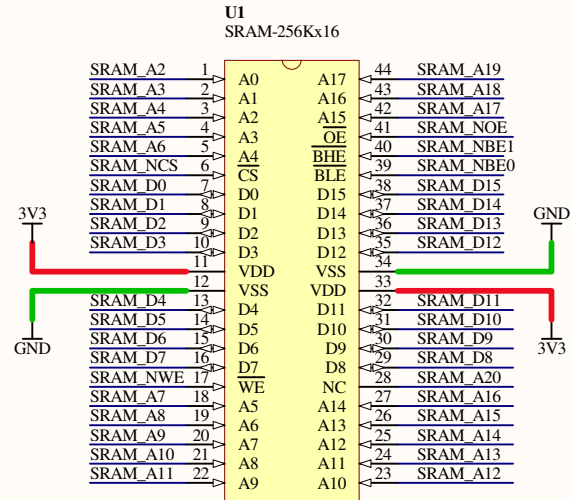
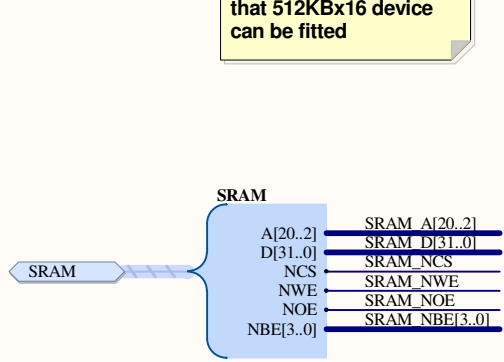
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Project Title NB3000AL - ALTERA			
Size: A4	Assy: TBA	Revision: 02	
Date: 9/22/2011	Time: 10:42:12 PM	Sheet 38 of 77	
File: PSU_1084SET_2V5.SchDoc			



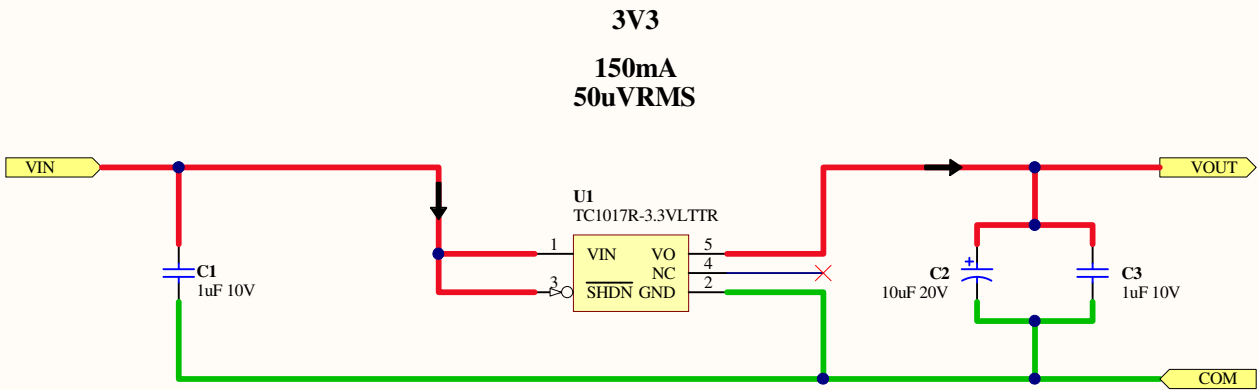
Sheet Title 128M-bit Flash Memory (BGA)		Altium Limited 3 Minna Close Belrose NSW 2085 Australia
Project Title NB3000AL - ALTERA		
Size: A4	Assy: TBA	Revision: 02
Date: 9/22/2011	Time: 10:42:12 PM	Sheet 38 of 80
File: FLASH_S29GL128P11FFI010_128Mbit.SchDoc		




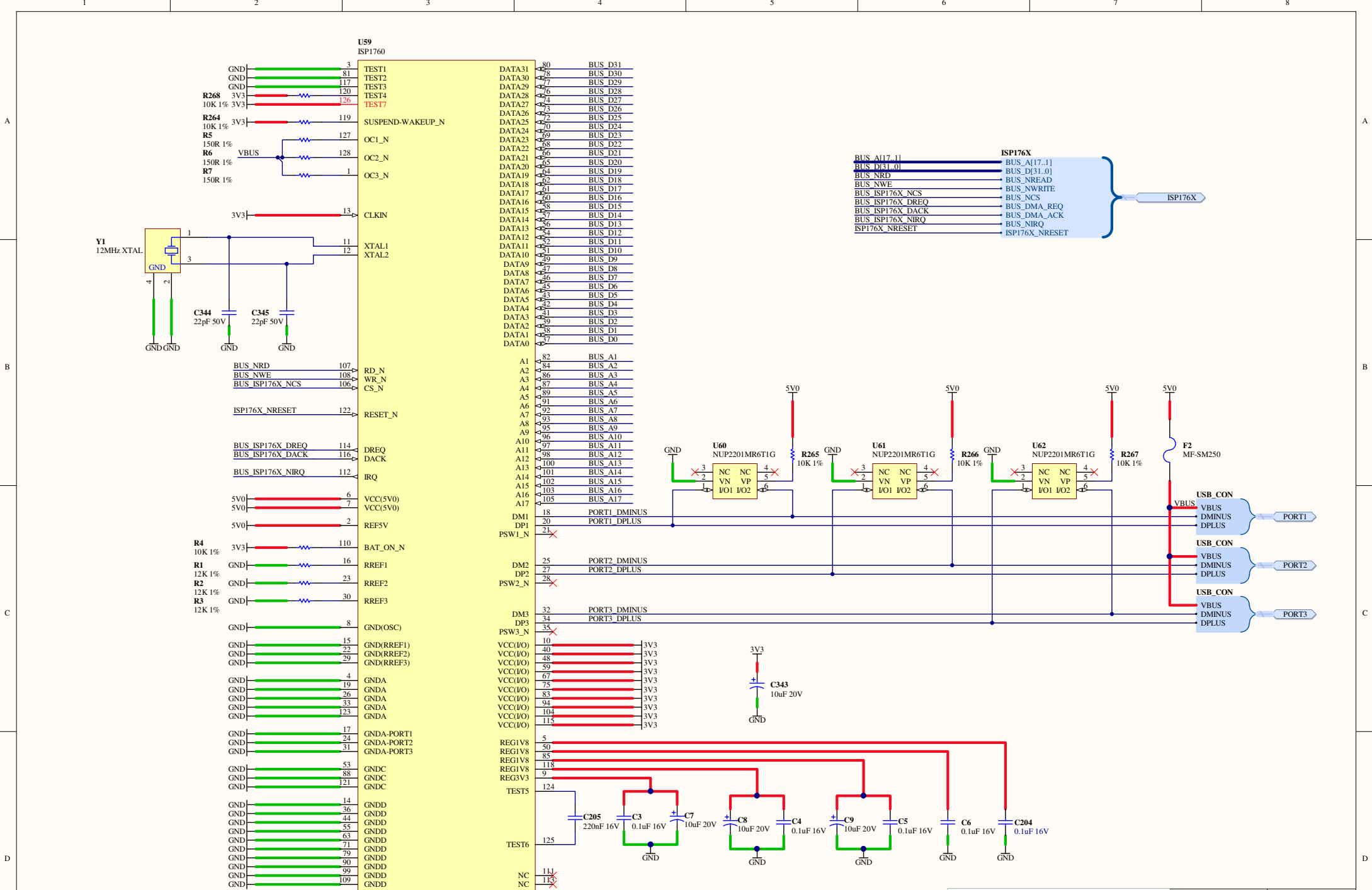
A18 is connected so that 512KBx16 device can be fitted



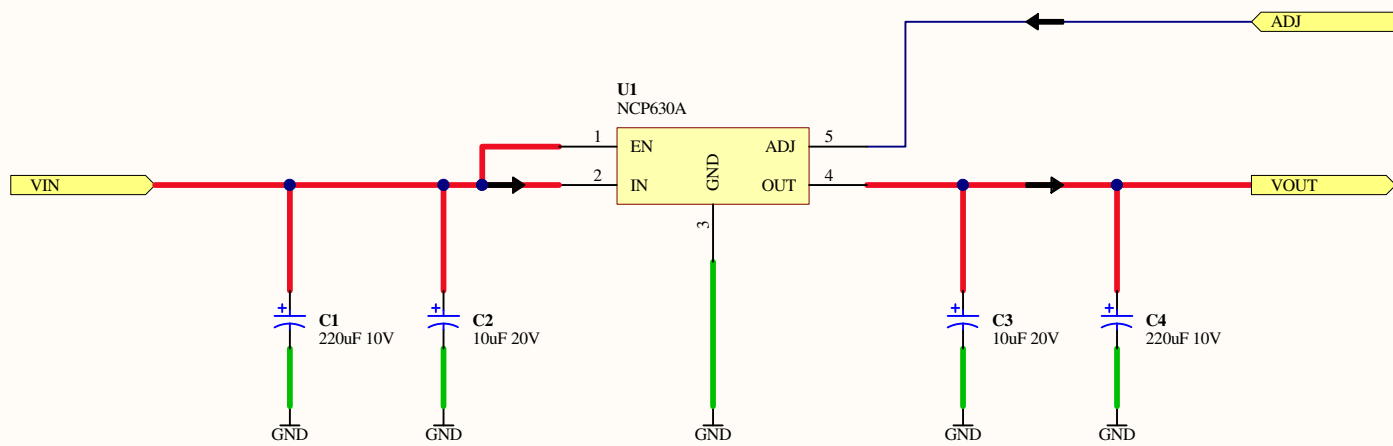
Sheet Title 256K x 32 SRAM - TSOP44 x 2		Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA			
Size: A4	Assy: TBA	Revision: 02	
Date: 9/22/2011	Time: 10:42:12 PM	Sheet 39 of 80	
File: SRAM_256Kx32_TSOP44_1.SchDoc			




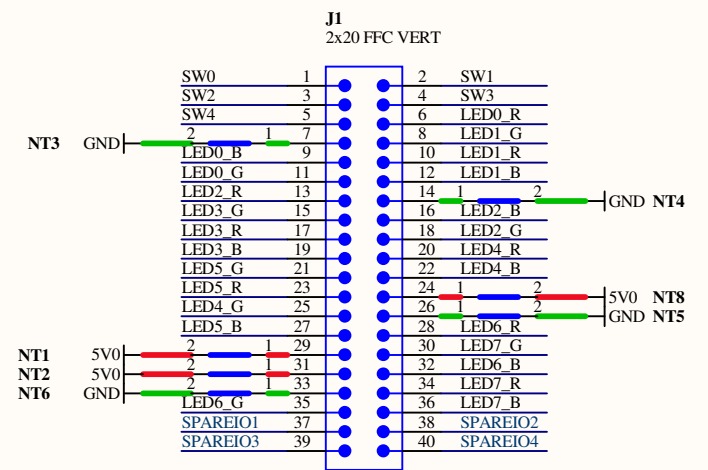
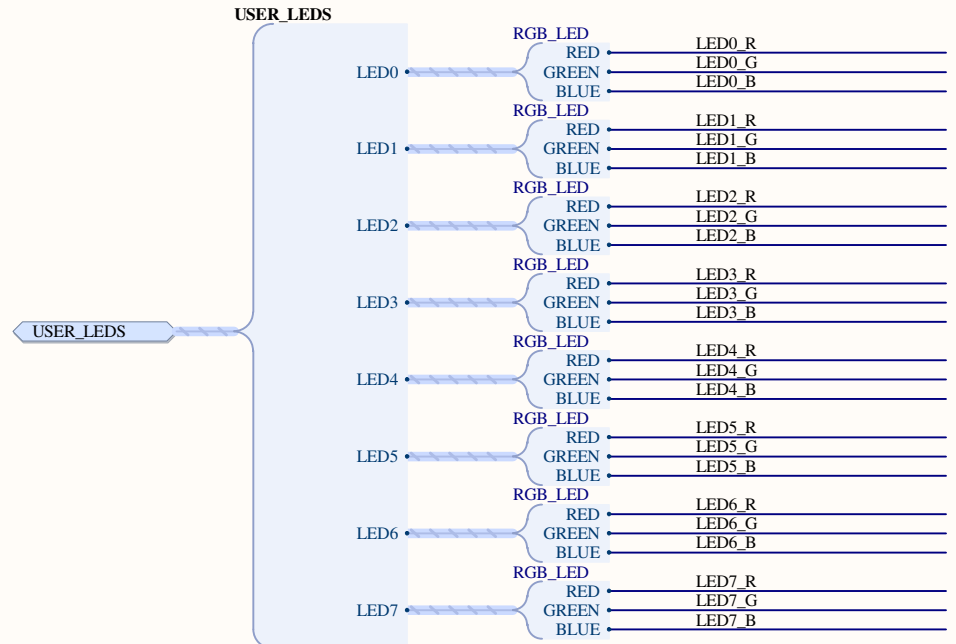
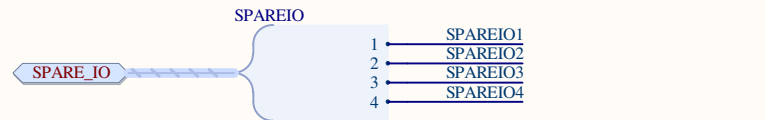
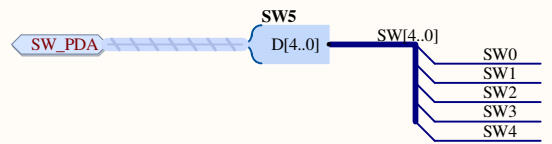
Sheet Title PSU TC1017R 3V3		<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:12 PM			Sheet 40 of 106
File: PSU_TC1017R_3V3.SchDoc				



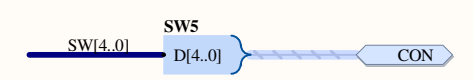
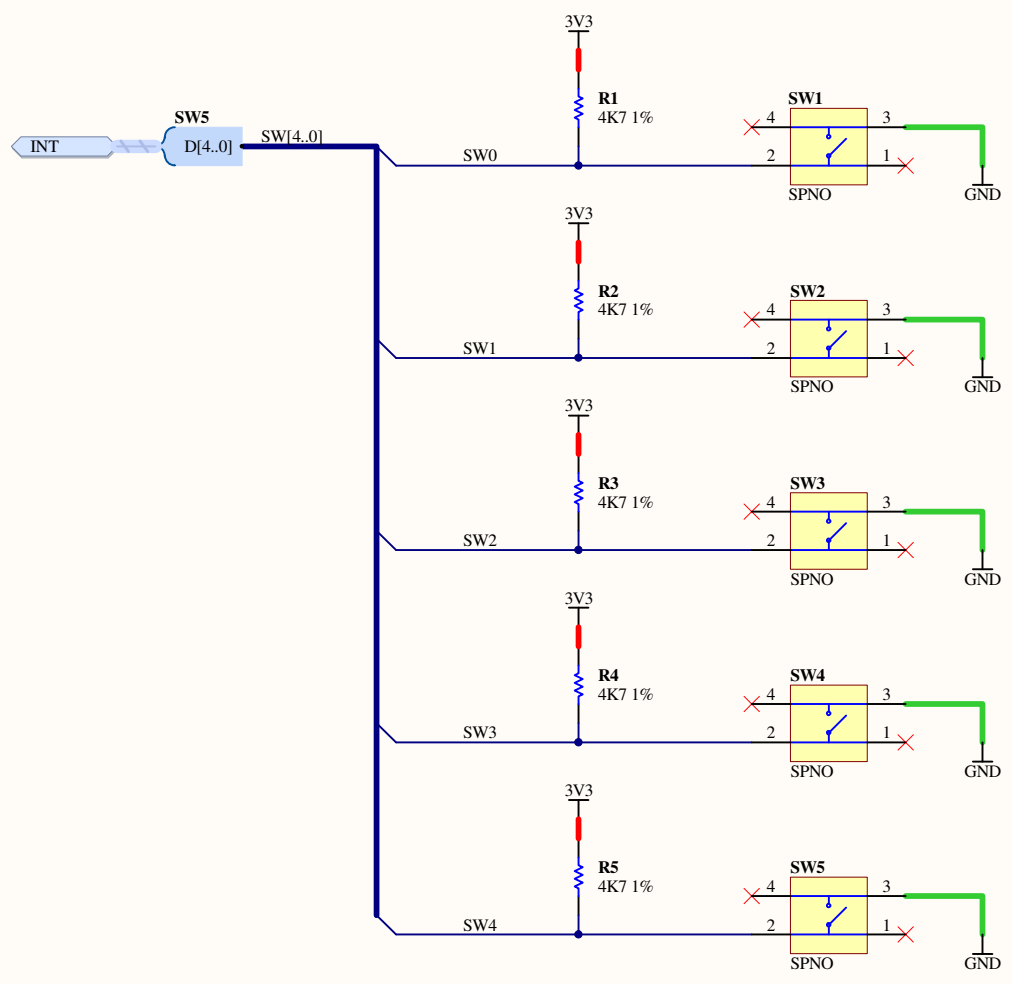
ISP176X	ISP176X
BUS_A[17..1]	BUS_A[17..1]
BUS_D[31..0]	BUS_D[31..0]
BUS_NRD	BUS_NREAD
BUS_NWE	BUS_NWRITE
BUS_ISP176X_NCS	BUS_NCS
BUS_ISP176X_DREQ	BUS_DMA_REQ
BUS_ISP176X_DACK	BUS_DMA_ACK
BUS_ISP176X_NIRQ	BUS_NIRQ
ISP176X_NRESET	ISP176X_NRESET




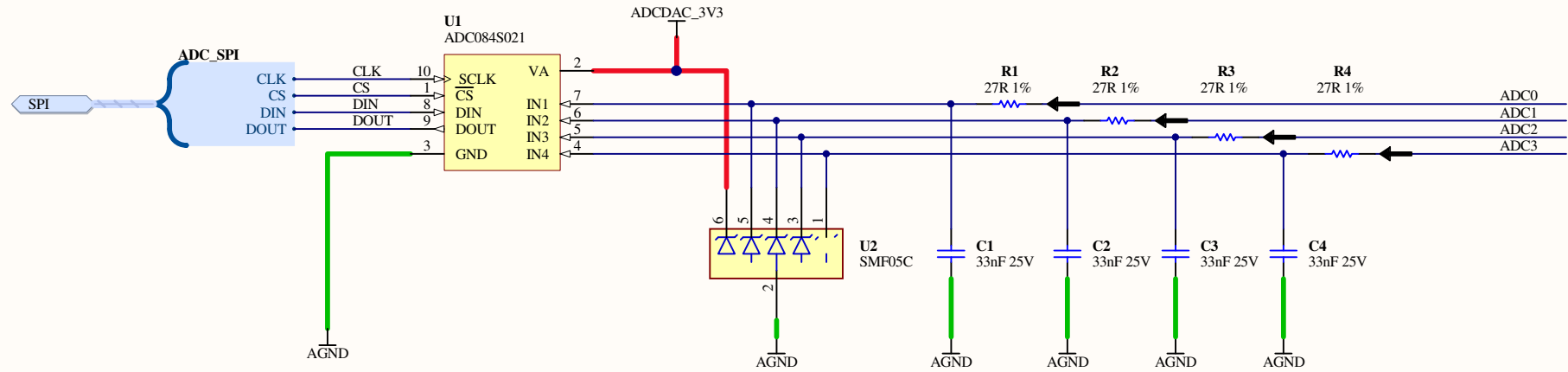
Sheet Title PSU NCP630A ADJ			<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:12 PM	Sheet 41 of 106		
File: PSU_NCP630_ADJ.SchDoc				



Sheet Title LED and Button Ext. Connector		Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA			
Size: A4	Assy: TBA	Revision: 02	
Date: 9/22/2011	Time: 10:42:12 PM	Sheet 41 of 80	
File: CON_NB3000_LEDKB.SCHDOC			



Sheet Title PDA-Style 5 x SPNO Switch			Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:12 PM	Sheet 42 of 80		
File: SW_PB_SPNOx5_SMD.SCHDOC				



ADC maximum sample rate:

8 bit @ 200Ksps

Maximum sample rate (nyquist) : 100kHz

0.012890625v = 1 bit (3V3 ref) resolution

Low Pass Input filter Calculations:

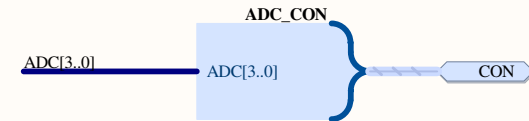
R = 27 Ohms

C = 33nF (0.033uF)

$$f_c = \frac{1}{2\pi RC} \text{ Hz} = \frac{1}{6.38 \times 27 \times 33^{-9}}$$

$$= 178715.6777$$

= Corner frequency rolloff (Knee) of ~ 178KHz



Sheet Title ADC084S021 8-Bit ADC IC			Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:12 PM	Sheet 43 of 80		
File: ADC_ADC084S021_SPI.SchDoc				

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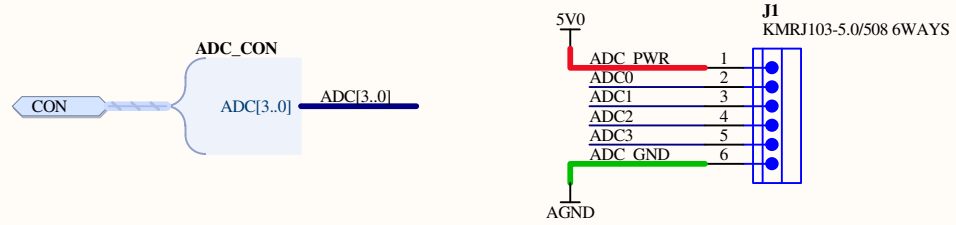
B


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C

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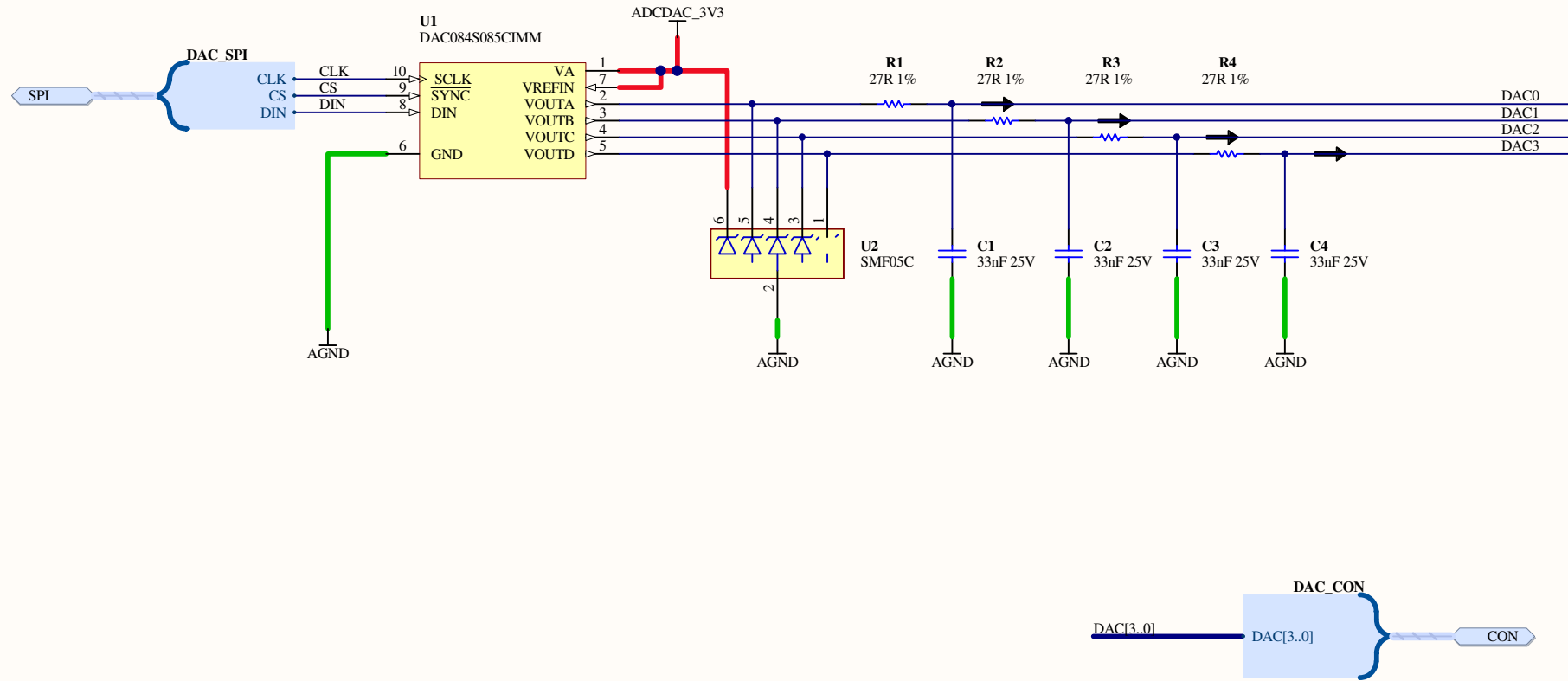
Sheet Title Screw Header For ADC		<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:12 PM			Sheet 44 of 80
File: CON_ADCx4_KMRJIO3_5MM_6WAY.SchDoc				


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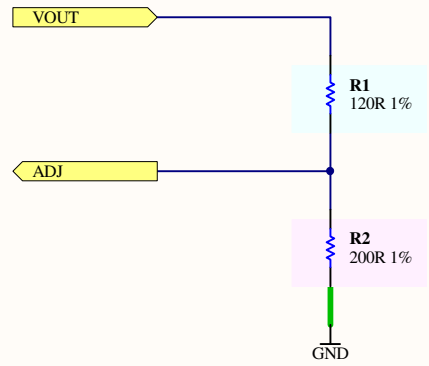
3

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Sheet Title DAC084S085 8-bit DAC IC			Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:12 PM	Sheet 45 of 80		
File: DAC_DAC084S085_SPI.SchDoc				

3.3V Output




$$V_{out} = V_{REF} \left\{ 1 + \frac{R2}{R1} \right\} + I_{ADJ}R2$$

$$V_{REF} = 1.25v$$

$$I_{ADJ} = 55\mu A (0.000055)$$

▲ Calculation for 3.3V;
 = 1.25V x (1+R2/R1) + 0.000055 x R2
 = 1.25V x (1+200/120) + 0.000055 x 200
 = 1.25V x 2.67 + 0.011
 = 3.34433V

Sheet Title PSU AP1084KL SET TO 3V3		<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:12 PM			Sheet 46 of 77
File: PSU_1084SET_3V3.SchDoc				

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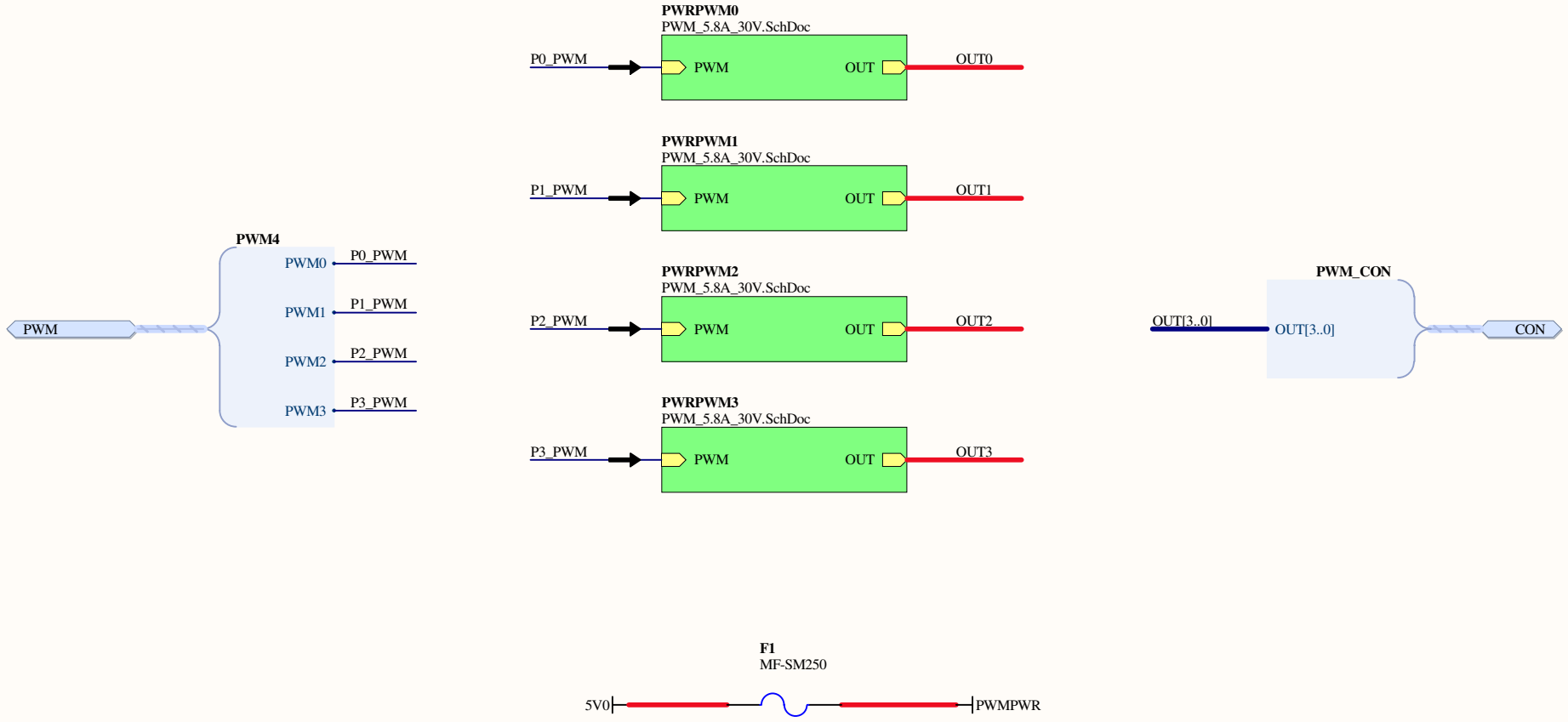
B


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Sheet Title Power Control or PWM			Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:12 PM	Sheet 46 of 80		
File: PWRCTRL_RELAY_PWM_28V2A_X4.SchDoc				

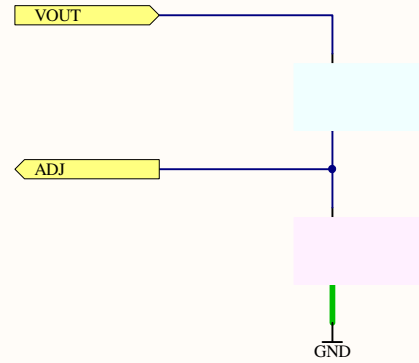
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1.8V Output



$$V_{out} = V_{REF} \left\{ 1 + \frac{R_2}{R_1} \right\} + I_{ADJ} R_2$$

$$V_{REF} = 1.25v$$

$$I_{ADJ} = 55\mu A (0.000055)$$

▲ Calculation for 1.8V;
 = 1.25V x (1+R2/R1) + 0.000055 x R2
 = 1.25V x (1+56/120) + 0.000055 x 56
 = 1.25V x 1.47 + 0.00308
 = 1.83641V

Sheet Title PSU AP1084KL 1V8		Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA			
Size: A4	Assy: TBA	Revision: 02	
Date: 9/22/2011	Time: 10:42:12 PM	Sheet 47 of 77	
File: PSU_1084SET_1V8.SchDoc			

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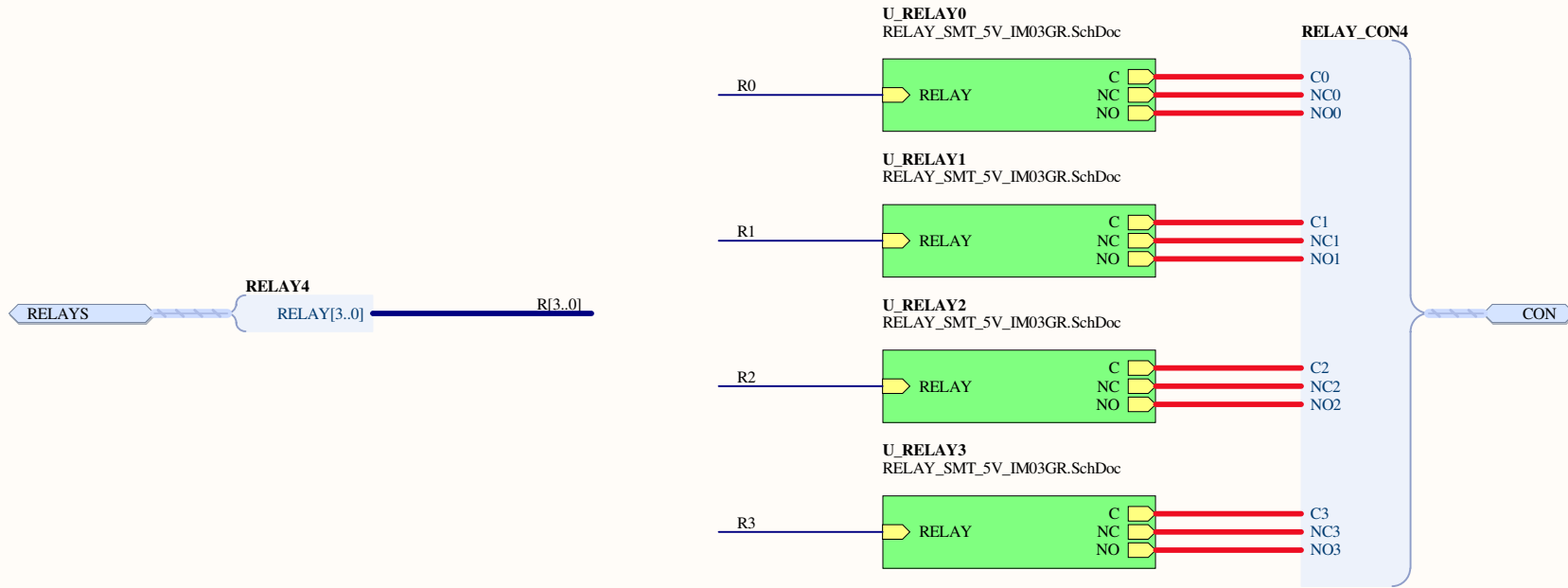
B


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Sheet Title Power Control or PWM			Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:13 PM	Sheet 47 of 80		
File: RELAY_X4_IMO3GR.SchDoc				

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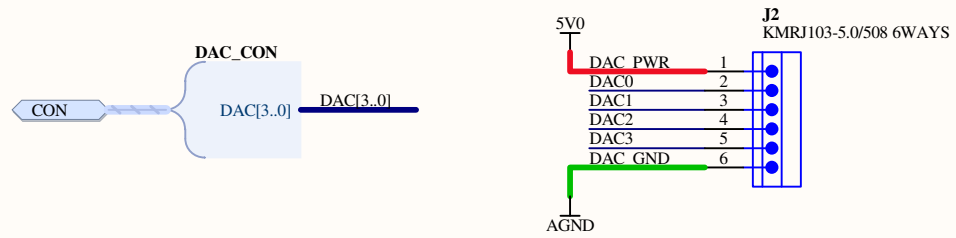
B


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Sheet Title Screw Header For DAC		Altium Limited 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:13 PM			Sheet 48 of 80
File: CON_DACx4_KMRJIO3_5MM_6WAY.SchDoc				

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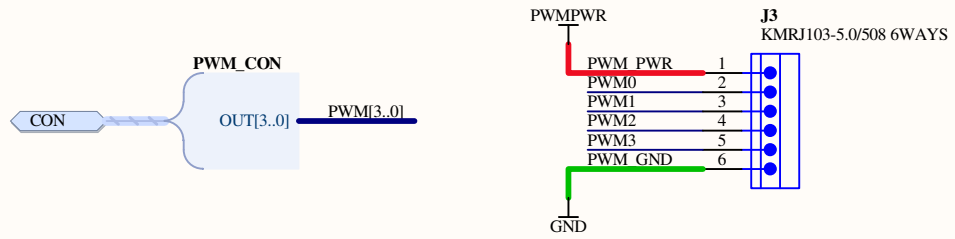
B


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Sheet Title Screw Header For Power PWM		<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:13 PM			Sheet 49 of 80
File: CON_PWMx4_KMRJIO3_5MM_6WAY.SchDoc				

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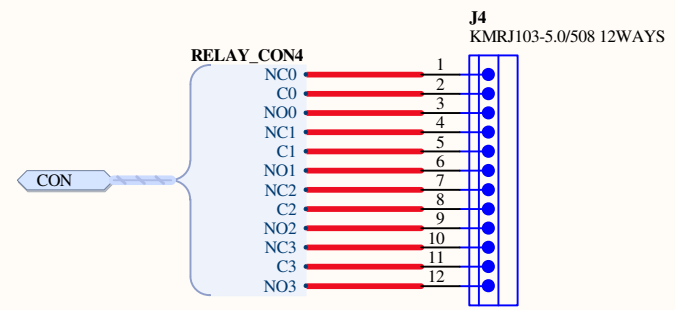
B


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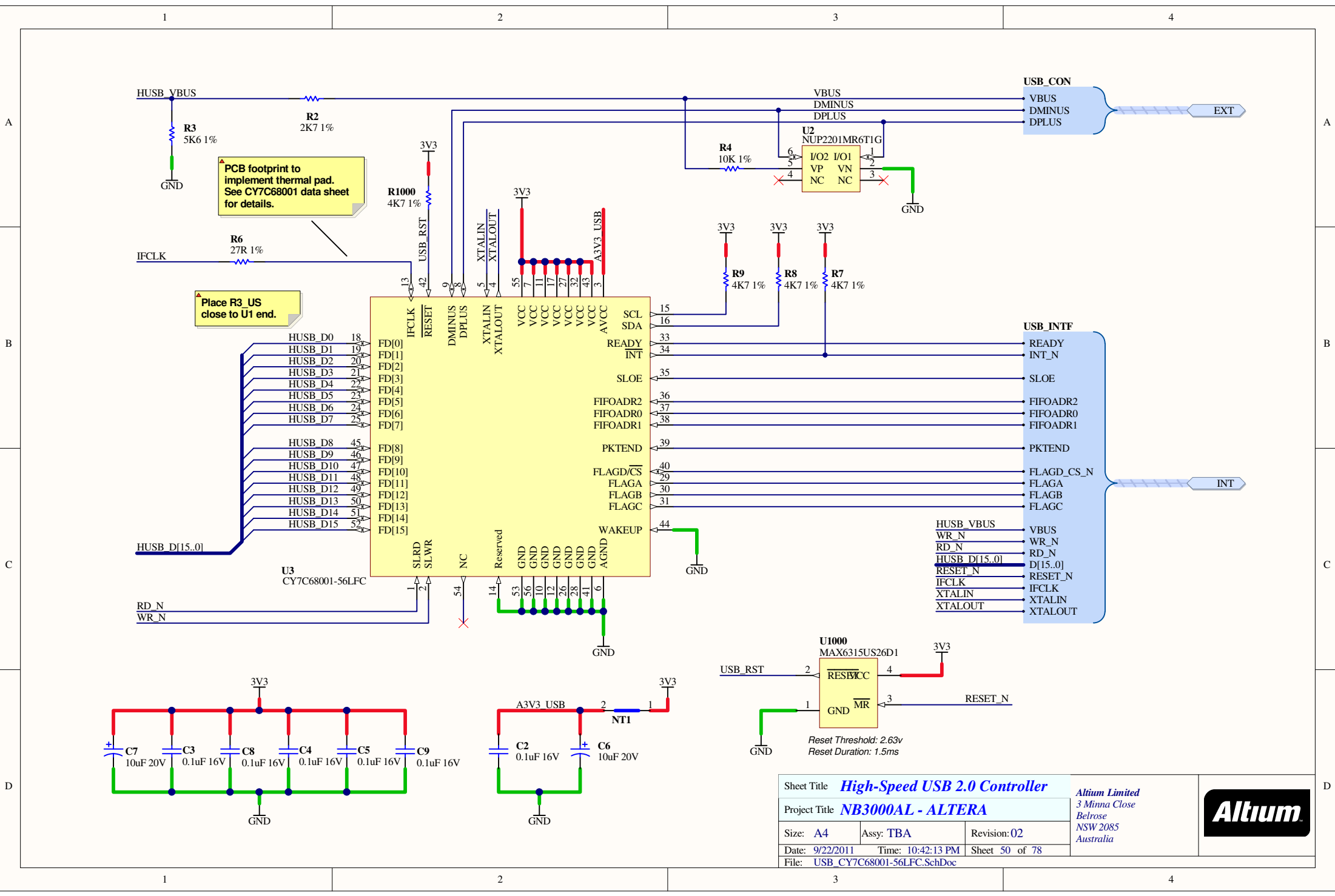
Sheet Title Screw Header For Relays		<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:13 PM			Sheet 50 of 80
File: CON_RELAYx4_KMRJIO3_5MM_12WAY.SchDoc				

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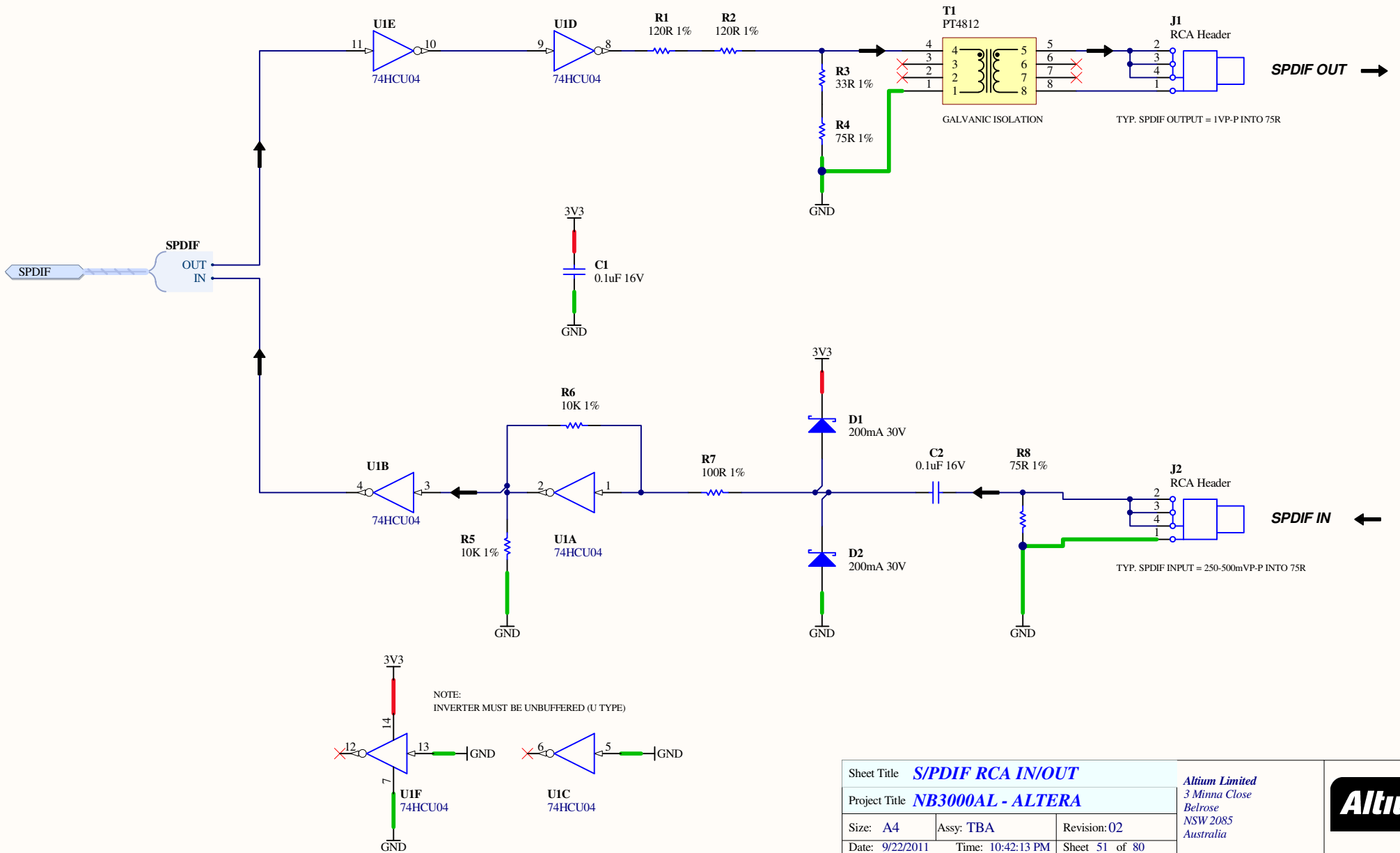
4



Sheet Title High-Speed USB 2.0 Controller		
Project Title NB3000AL - ALTERA		
Size: A4	Assy: TBA	Revision: 02
Date: 9/22/2011	Time: 10:42:13 PM	Sheet 50 of 78
File: USB_CY7C68001-56LFC.SchDoc		

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NSW 2085
Australia

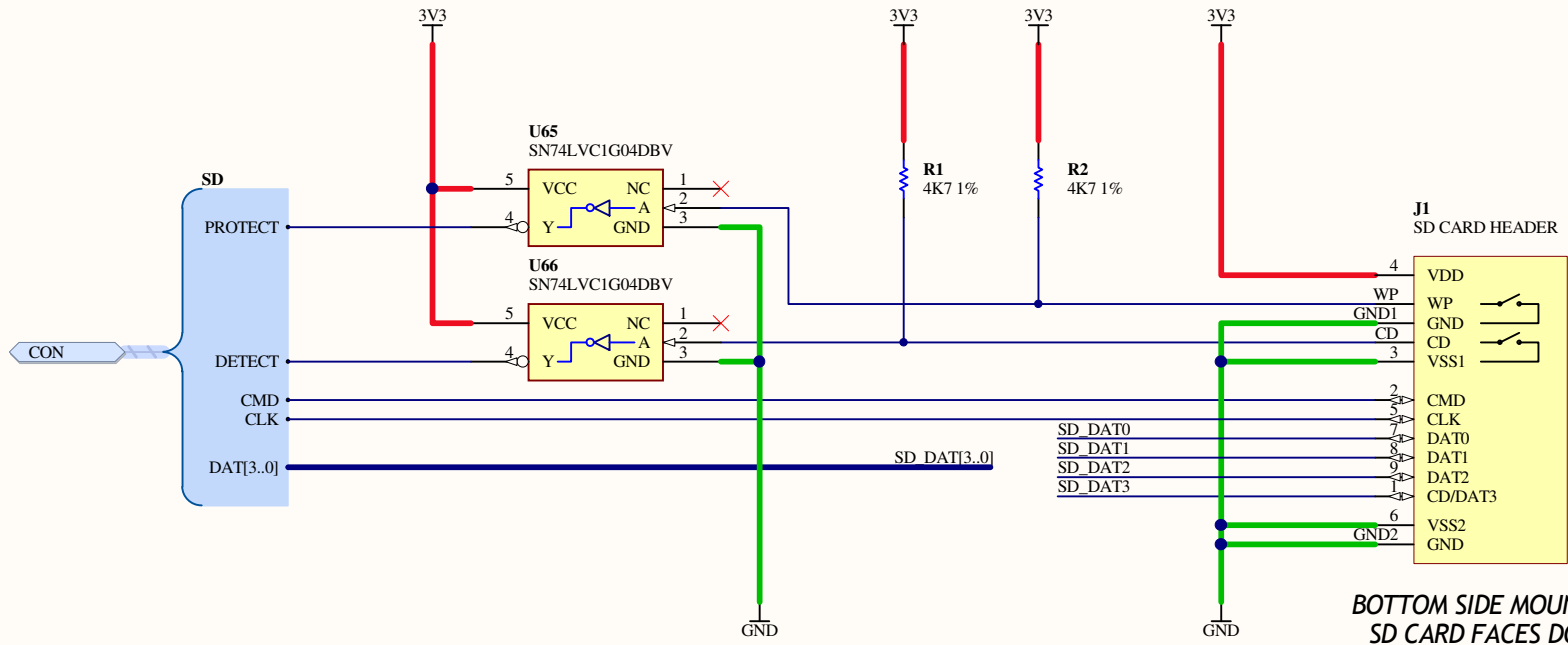




Sheet Title S/SPDIF RCA IN/OUT		
Project Title NB3000AL - ALTERA		
Size: A4	Assy: TBA	Revision: 02
Date: 9/22/2011	Time: 10:42:13 PM	Sheet 51 of 80
File: CON_SPDIF_INOUT_A.SchDoc		

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Belrose
NSW 2085
Australia



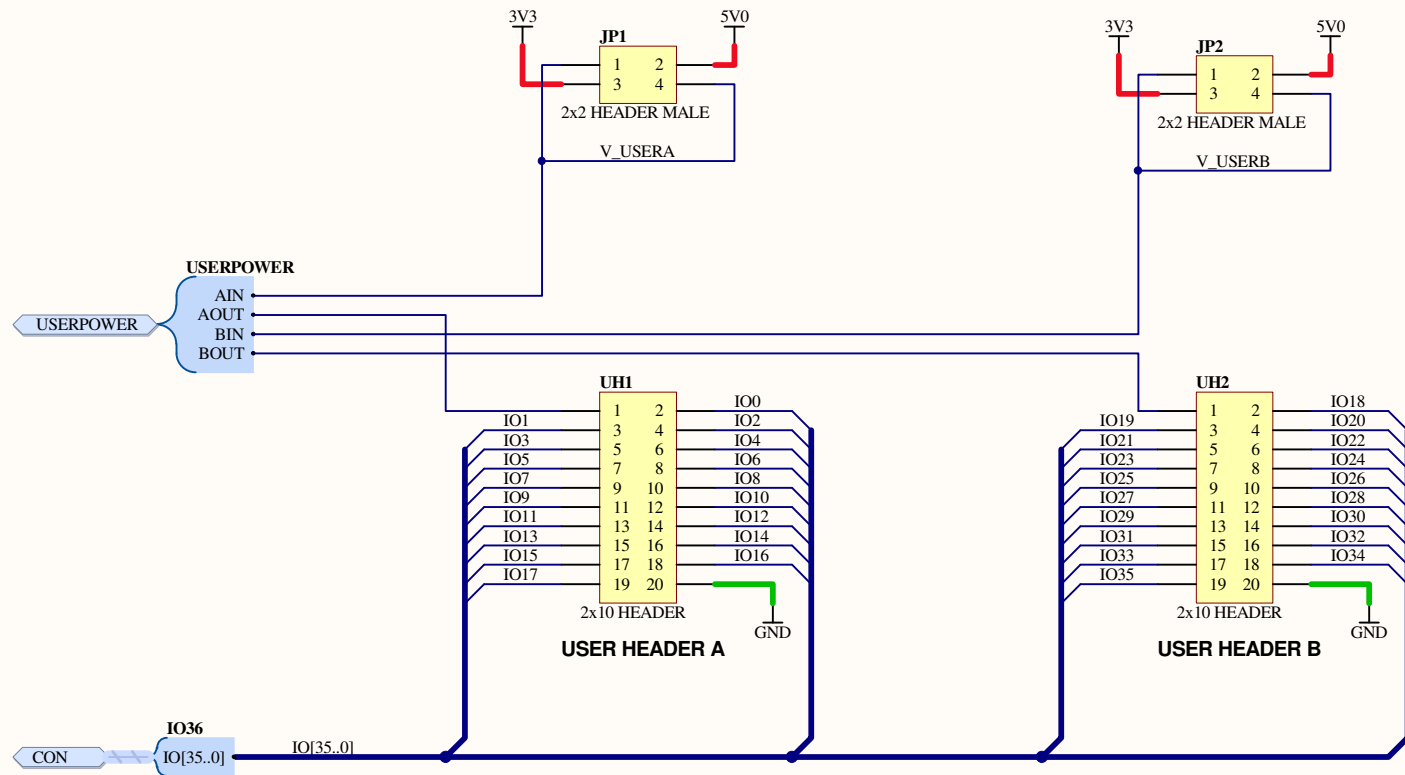



**BOTTOM SIDE MOUNTING
SD CARD FACES DOWN**

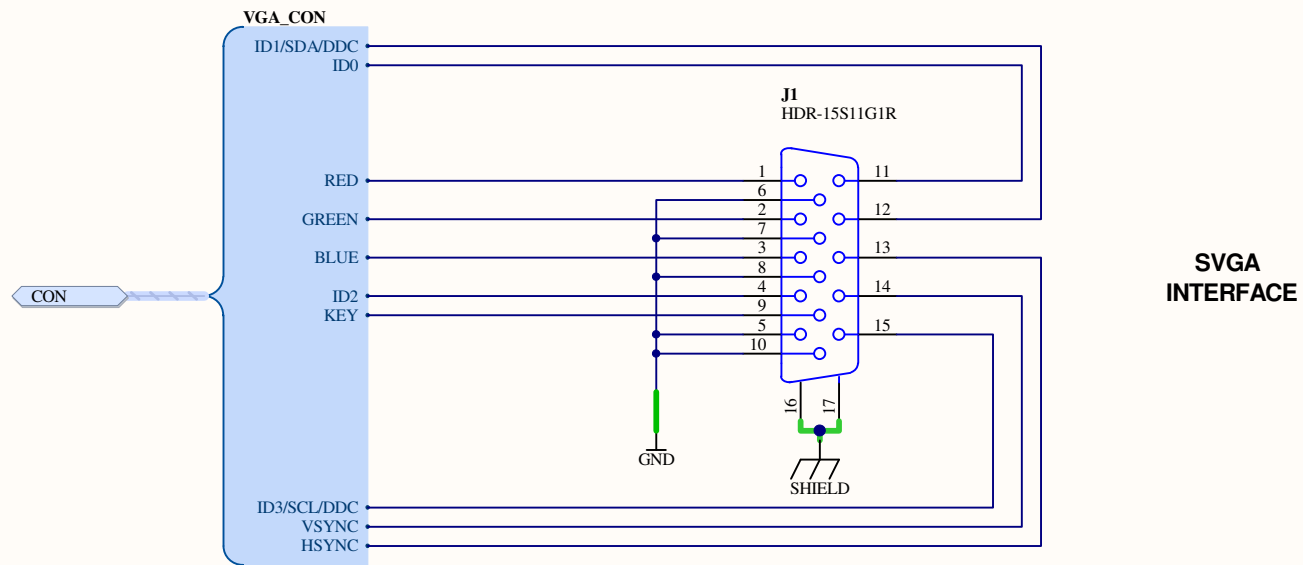
WRITE PROTECT (PIN WP):
 PROTECTED (LOCKED): OPEN - FLOATING
 UNPROTECTED (UNLOCKED): WP CONNECTED TO GND


CARD DETECT (PIN CD):
 CARD REMOVED: OPEN - FLOATING
 CARD INSERTED: CONNECTED TO GND

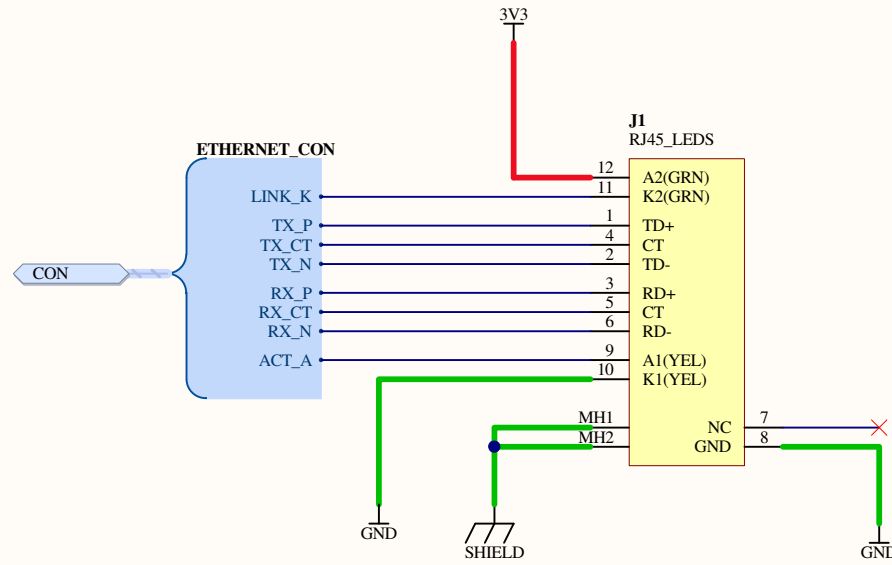
Sheet Title SD-CARD		Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA			
Size: A4	Assy: TBA	Revision: 02	
Date: 9/22/2011	Time: 10:42:13 PM	Sheet 52 of 80	
File: CON_SD_KSDC012551.SchDoc			




Sheet Title 36-Way User I/O Headers			Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:13 PM	Sheet 53 of 80		
File: CON_USER_20WBOXHDRAMx2.SCHDOC				



Sheet Title Video Out Connector		<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:13 PM			Sheet 54 of 80
File: CON_VGA_DB15.SCHDOC				



Sheet Title Ethernet Connector			<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:13 PM	Sheet 55 of 80		
File: CON_ETHERNET_RJ45_LEDS.SchDoc				

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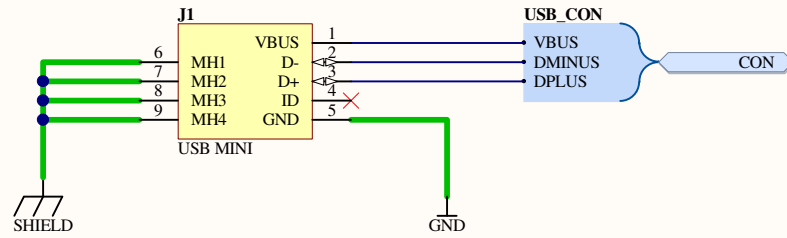
B


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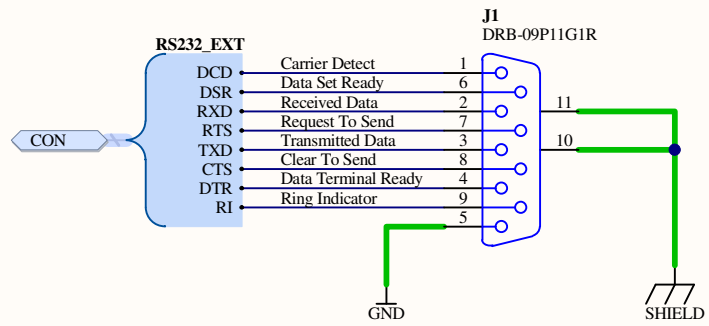
Sheet Title USB 2.0 Type B Connector			<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:13 PM	Sheet 56 of 80		
File: CON_MINI_USBB_RA_KME04-USBMU03A01-1.SchDoc				

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RS232 DB-9 Male Connector
EIA-574 Standard

Sheet Title RS232-DCE DB9		<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:13 PM			Sheet 57 of 80
File: CON_RS232DCE_DB9_TH.SchDoc				

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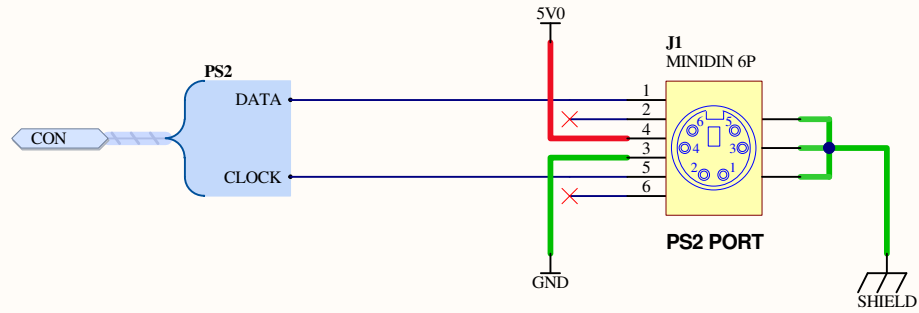
B


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Sheet Title PS2 MINIDIN6F Connector (Black)			<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:13 PM	Sheet 58 of 80		
File: CON_PS2PORT_MINIDIN6F_BLACK.SchDoc				

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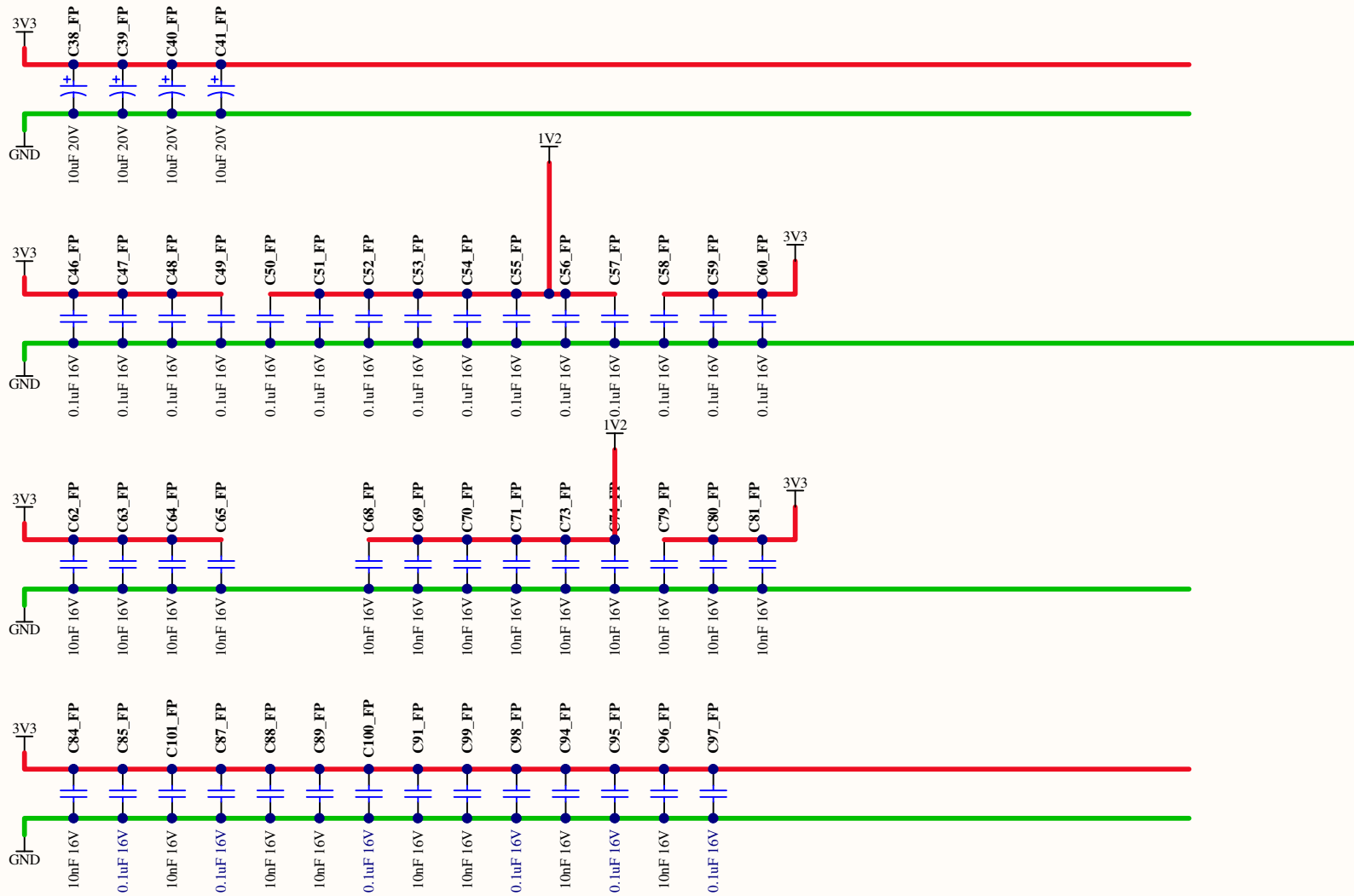
PROTOTYPE

IO35	B32	IO36
IO34	A32	IO35
IO33	H32	IO34
IO32	H31	IO33
IO31	H30	IO32
IO30	H29	IO31
IO29	H28	IO30
IO28	H27	IO29
IO27	H26	IO28
IO26	H25	IO27
IO25	H24	IO26
IO24	H23	IO25
IO23	H22	IO24
IO22	H21	IO23
IO21	H20	IO22
IO20	H19	IO21
IO19	H18	IO20
IO18	H17	IO19
IO17	H16	IO18
IO16	H15	IO17
IO15	H14	IO16
IO14	H13	IO15
IO13	H12	IO14
IO12	H11	IO13
IO11	H10	IO12
IO10	H9	IO11
IO9	H8	IO10
IO8	H7	IO9
IO7	H6	IO8
IO6	H5	IO7
IO5	H4	IO6
IO4	H3	IO5
IO3	H2	IO4
IO2	H1	IO3
IO1	A1	IO2
IO0	B1	IO1



GND	1	GND
1V2	2	1V2
GND	3	GND
1V8	4	1V8
GND	5	GND
2V5	6	2V5
GND	27	GND
3V3	28	3V3
GND	29	GND
5V0	30	5V0
GND	31	GND
+B	32	B+

Sheet Title User Prototyping Area		Altium Limited 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:13 PM			Sheet 59 of 80
File: PROTOTYPE A.SchDoc				



The FPGA bypass capacitors are physically grouped as 10nF and 100nF pairs on all major accessible power pins on the FPGA.

Sheet Title FPGA Bypass 3V3		Altium Limited 3 Minna Close Belrose NSW 2085 Australia
Project Title NB3000AL - ALTERA		
Size: A4	Assy: TBA	Revision: 02
Date: 9/22/2011	Time: 10:42:13 PM	Sheet 59 of 78
File: FPGA_Bypass_3V3.SCHDOC		



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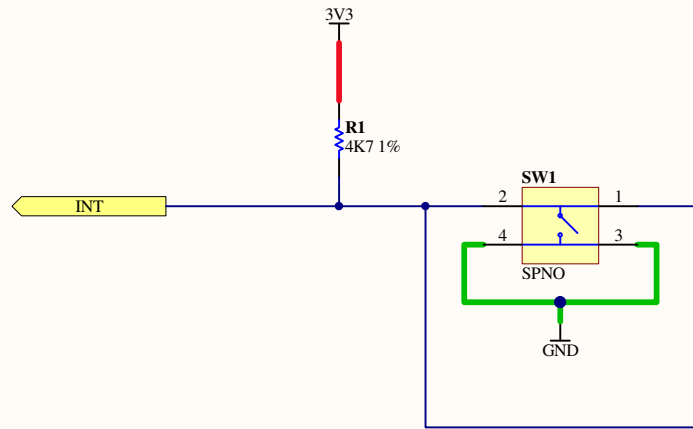
B


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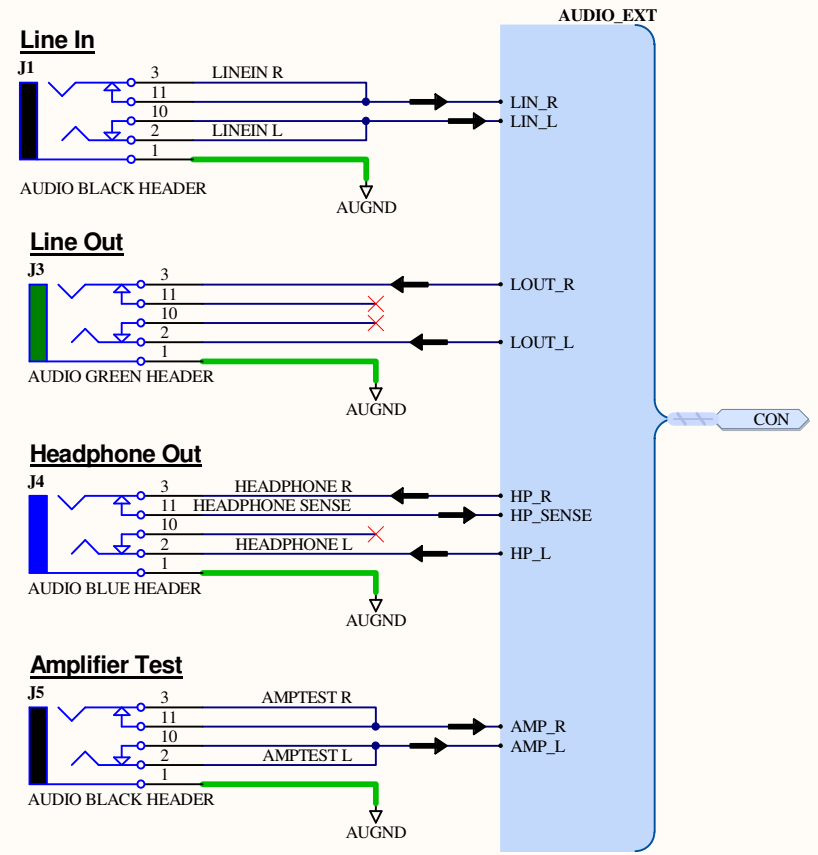
Sheet Title Push Button SPNO Switch			<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:13 PM	Sheet 60 of 80		
File: SW_RESET_SPNO.SCHDOC				


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Sheet Title AUDIO AC99 Interface		Altium Limited 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:13 PM			Sheet 60 of 78
File: CON_AUDIO_AC99_NOMIC.SchDoc				

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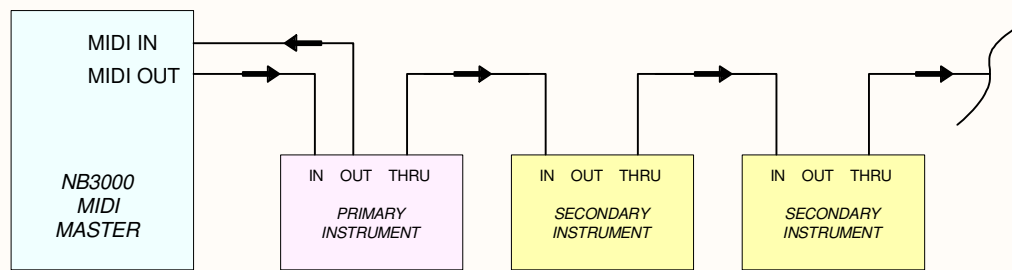
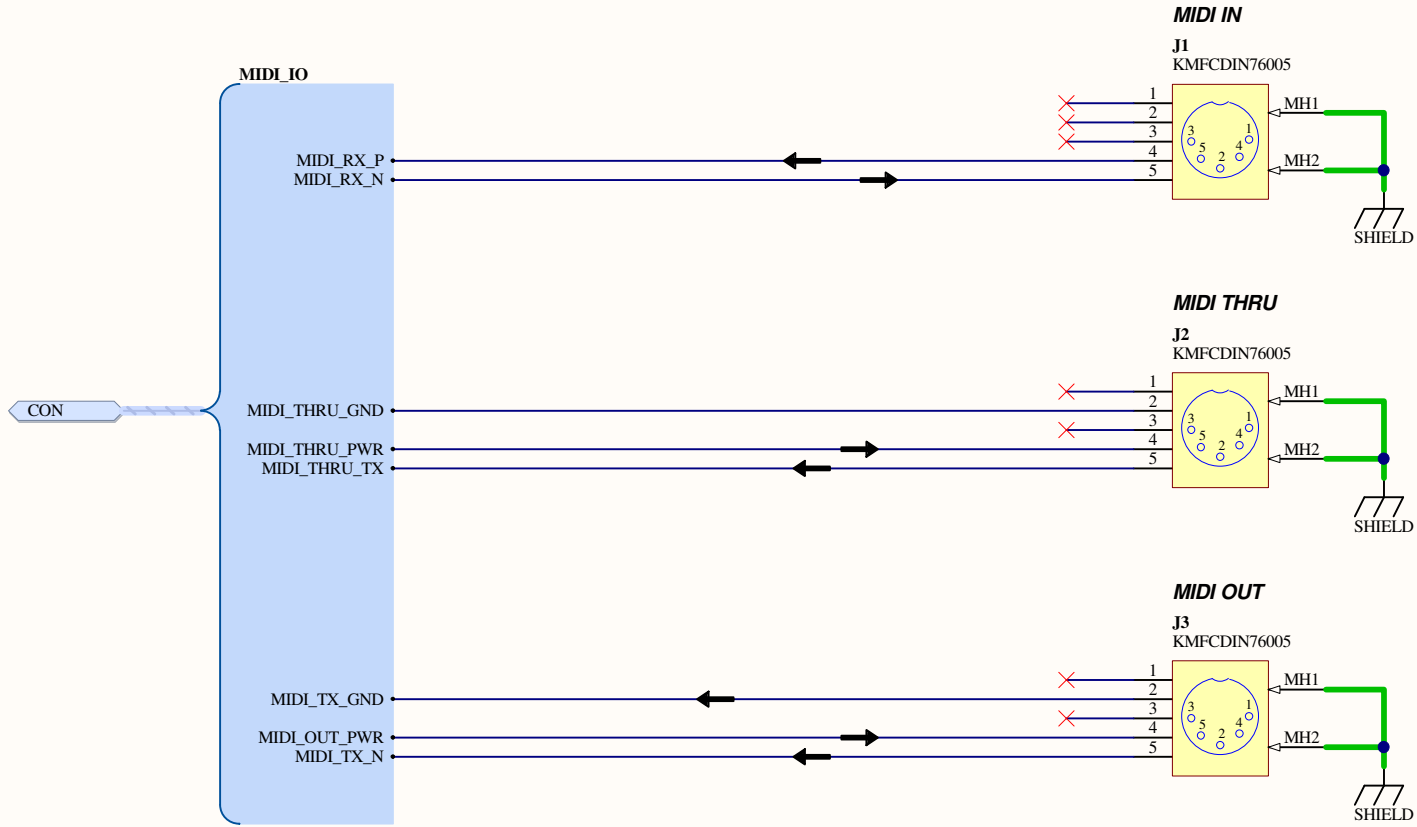
B

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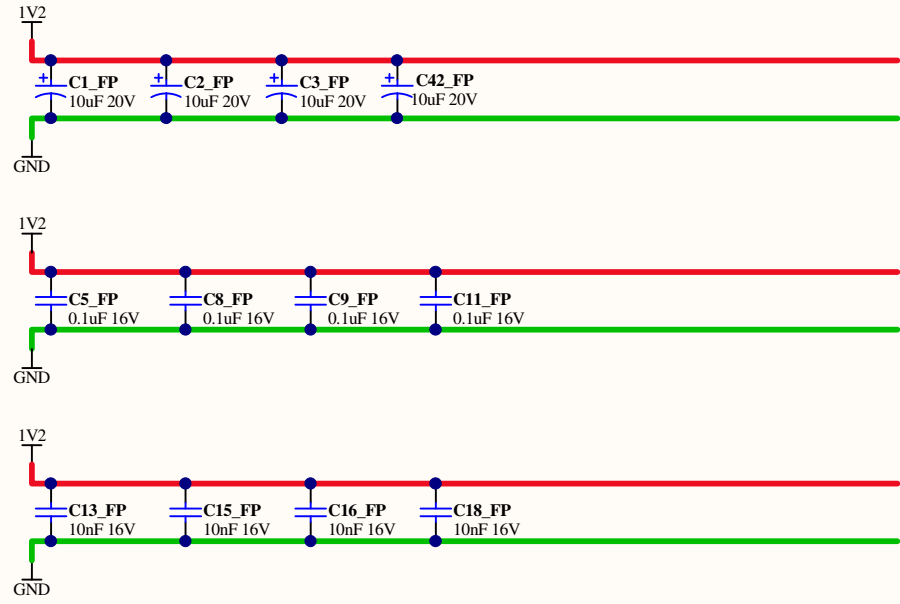
Sheet Title MIDI Connectors		Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA			
Size: A4	Assy: TBA	Revision: 02	
Date: 9/22/2011	Time: 10:42:13 PM	Sheet 61 of 80	
File: CON_MIDI_DIN5.SCHDOC			


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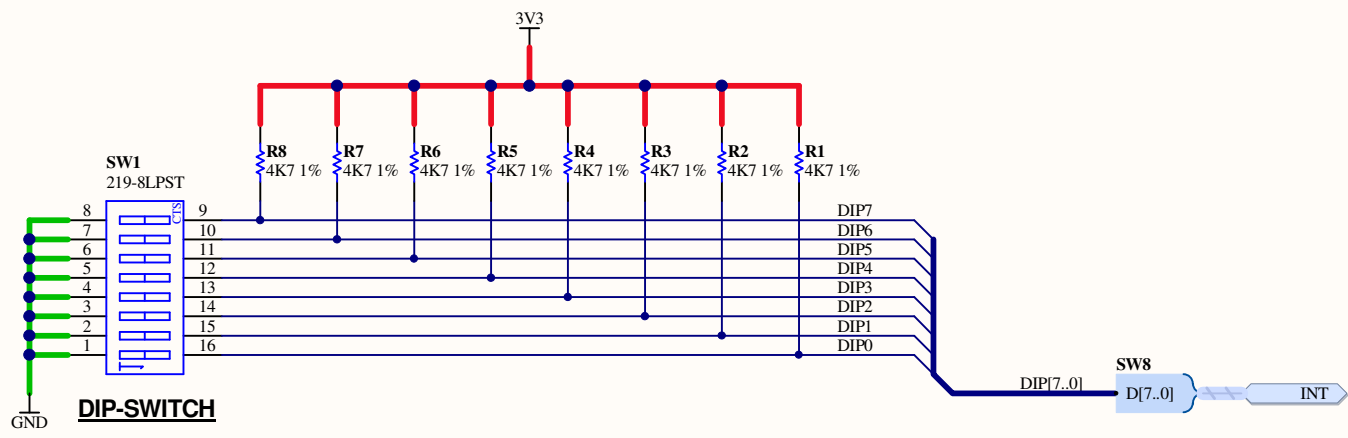
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Sheet Title FPGA Bypass 1V2		Altium Limited 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:13 PM			Sheet 61 of 78
File: FPGA_Bypass_1V2.SCHDOC				



Sheet Title 8-Way SPST DIP Switch (SMT)		Altium Limited 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:13 PM			Sheet 62 of 80
File: SW_DIP8_SMT.SchDoc				

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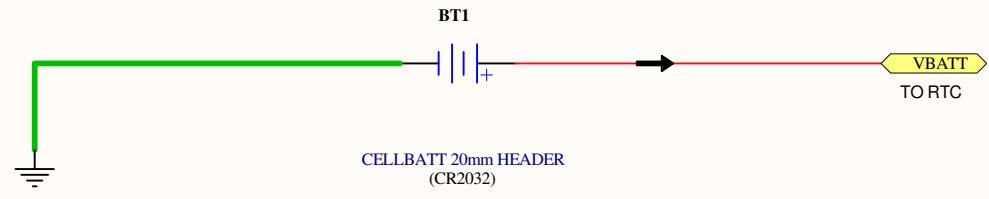
B


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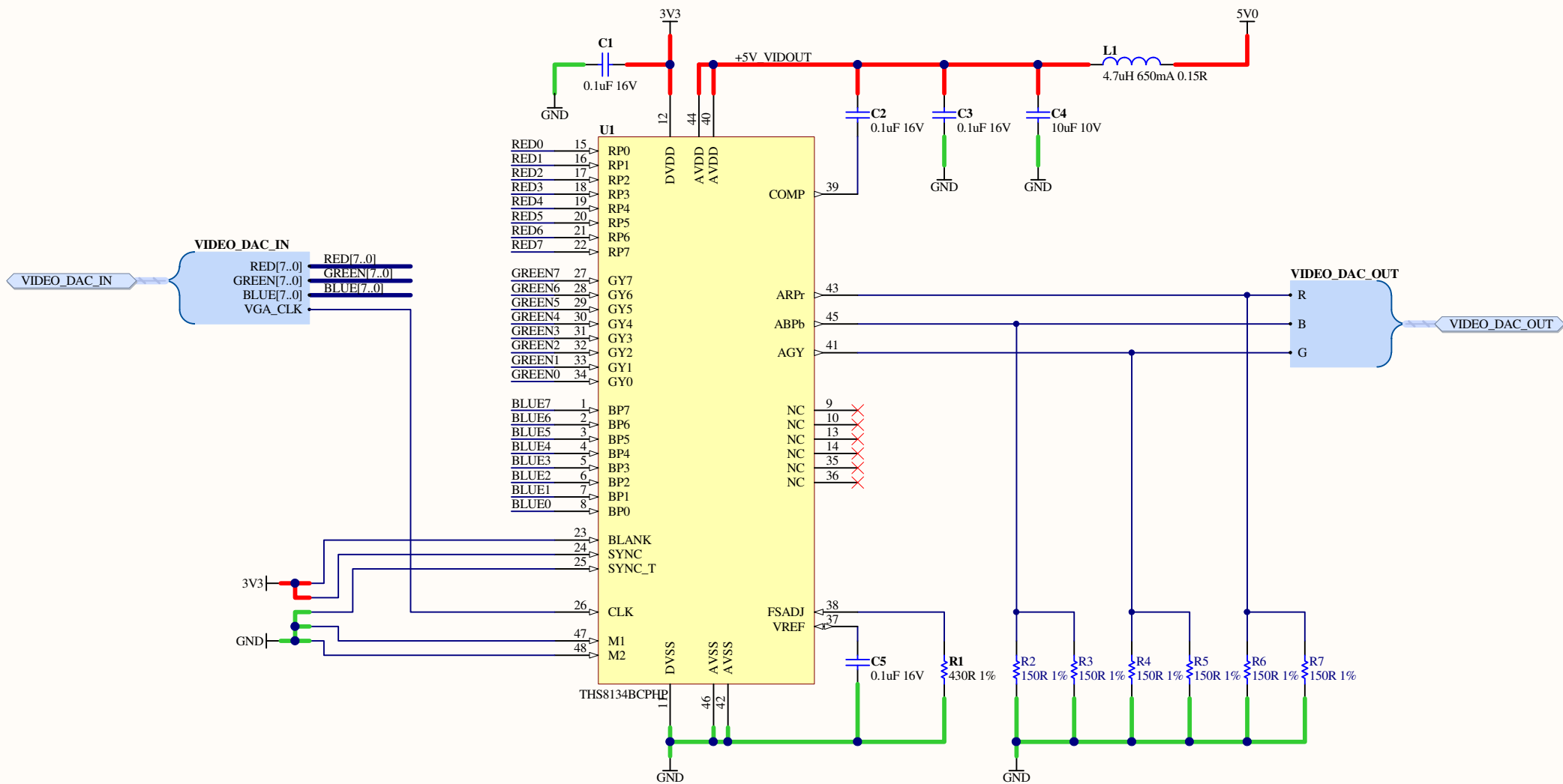
Sheet Title CON_BATT_1			Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Number: 63	Revision: 02		
Date: 9/22/2011	Time: 10:42:13 PM	Sheet 63 of 106		
File: CON_BATT_COIN.SchDoc				


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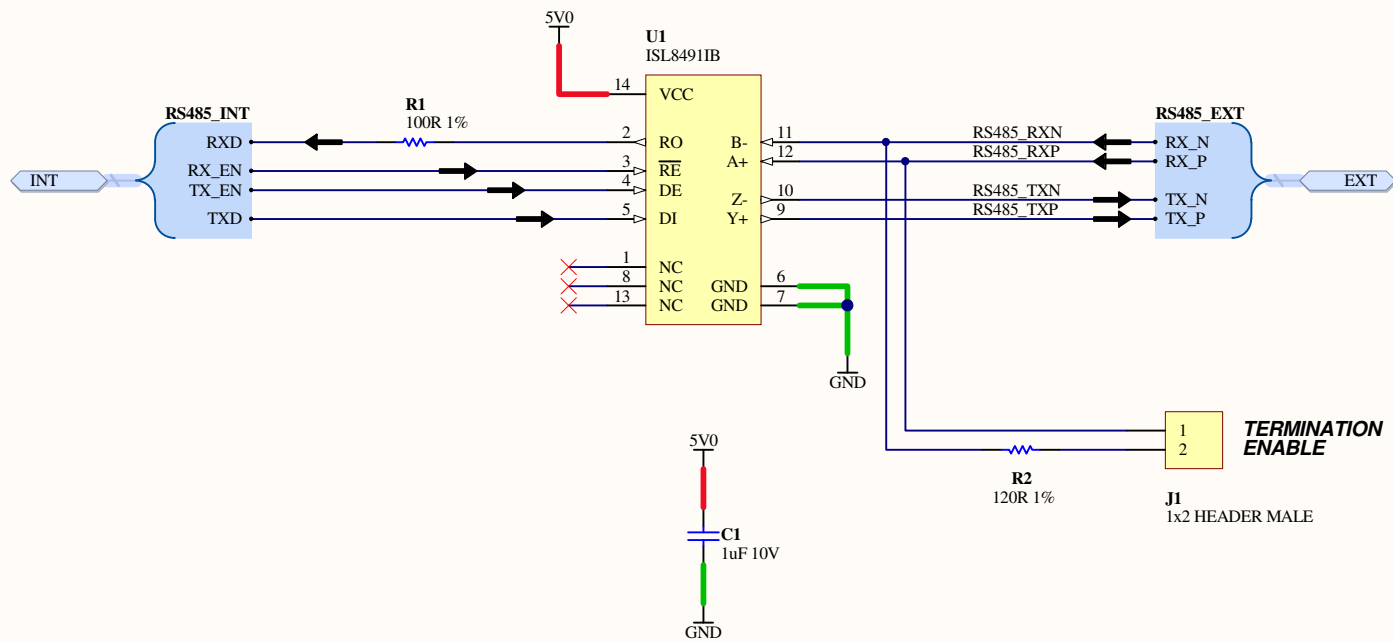
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Sheet Title Video DAC		Altium Limited 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:13 PM			Sheet 63 of 78
File: VIDEO_DAC_THS8134B.SchDoc				



Sheet Title RS485 Communication IC			Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:14 PM	Sheet 64 of 80		
File: RS485_ISL8491.SchDoc				

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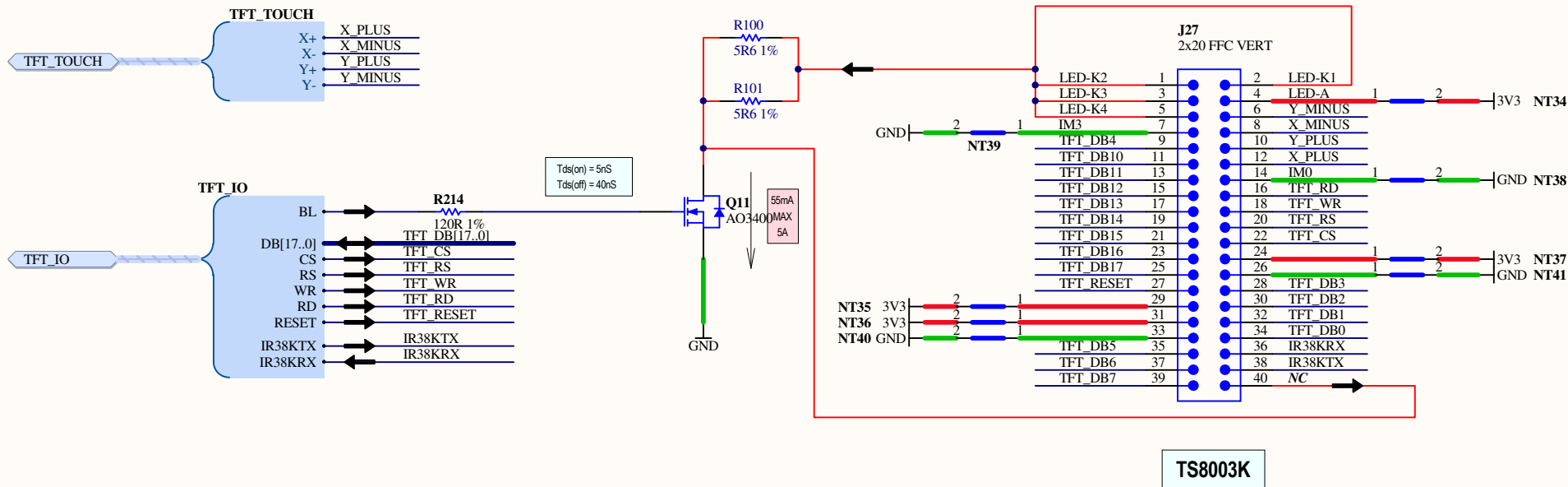
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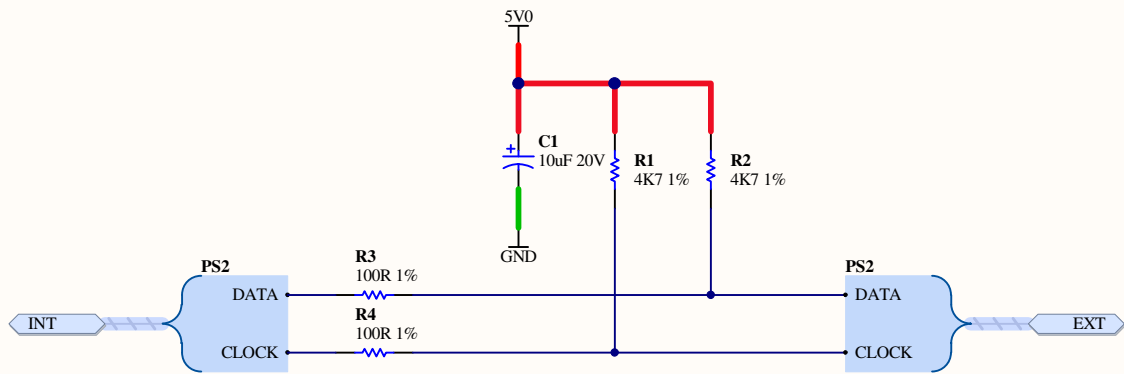
4




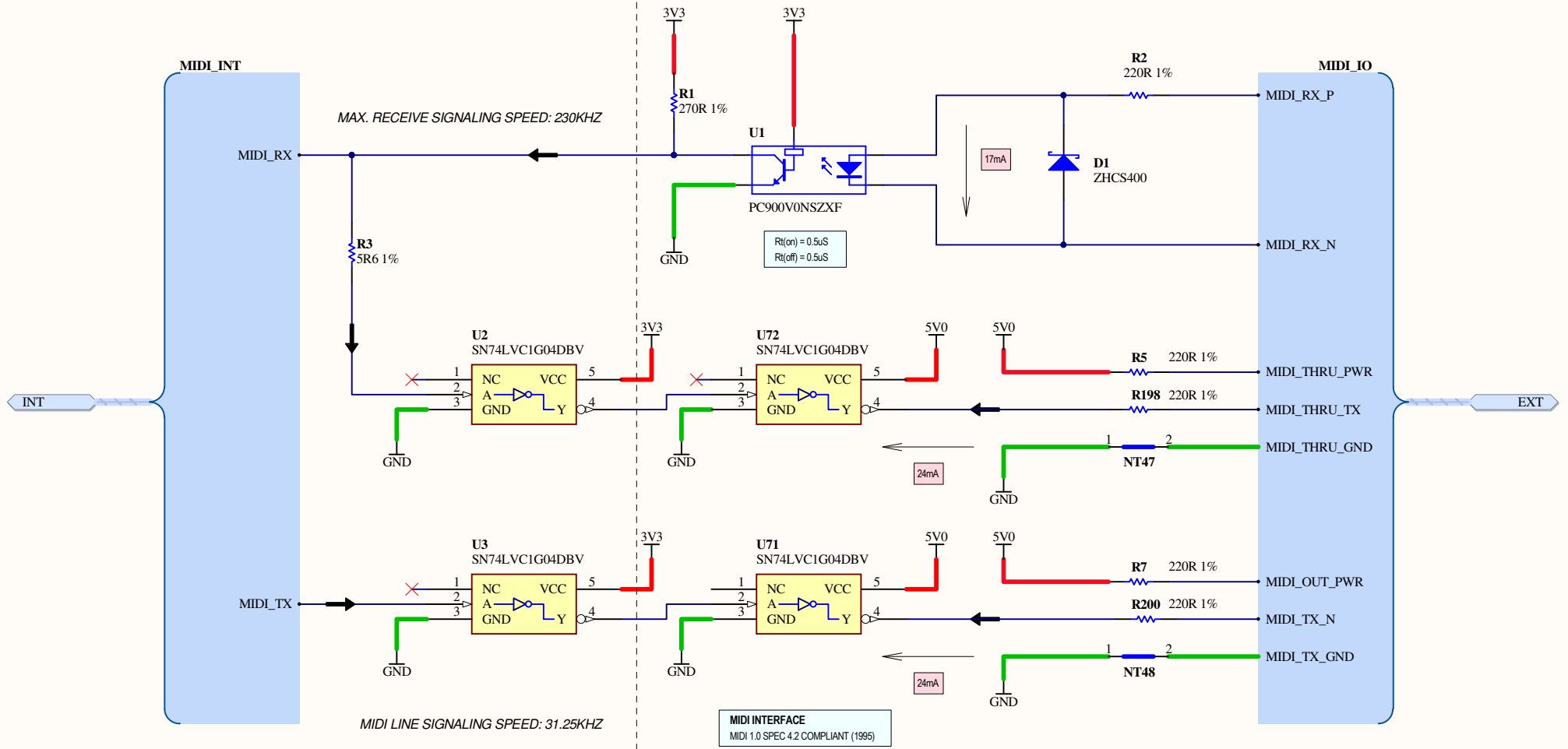
Sheet Title LCD Module Connector		
Project Title NB3000AL - ALTERA		
Size: A4	Assy: TBA	Revision: 02
Date: 9/22/2011	Time: 10:42:14 PM	Sheet 64 of 78
File: CON_FFC40_LCDTFT.SCHDOC		

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3 Minna Close
Belrose
NSW 2085
Australia





Sheet Title PC PS2		<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:14 PM			Sheet 65 of 80
File: PC_PS2.SchDoc				

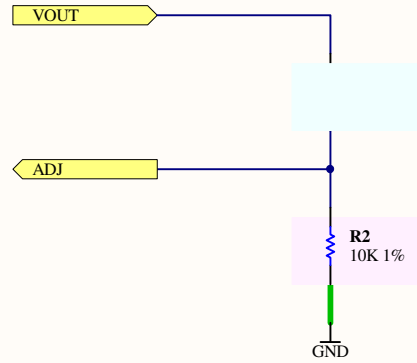


Sheet Title MIDI Sub-system		
Project Title NB3000AL - ALTERA		
Size: A4	Assy: TBA	Revision: 02
Date: 9/22/2011	Time: 10:42:14 PM	Sheet 66 of 80
File: MIDI_FULL.SCHDOC		

Altium Limited
 3 Minna Close
 Belrose
 NSW 2085
 Australia



1.2V Output



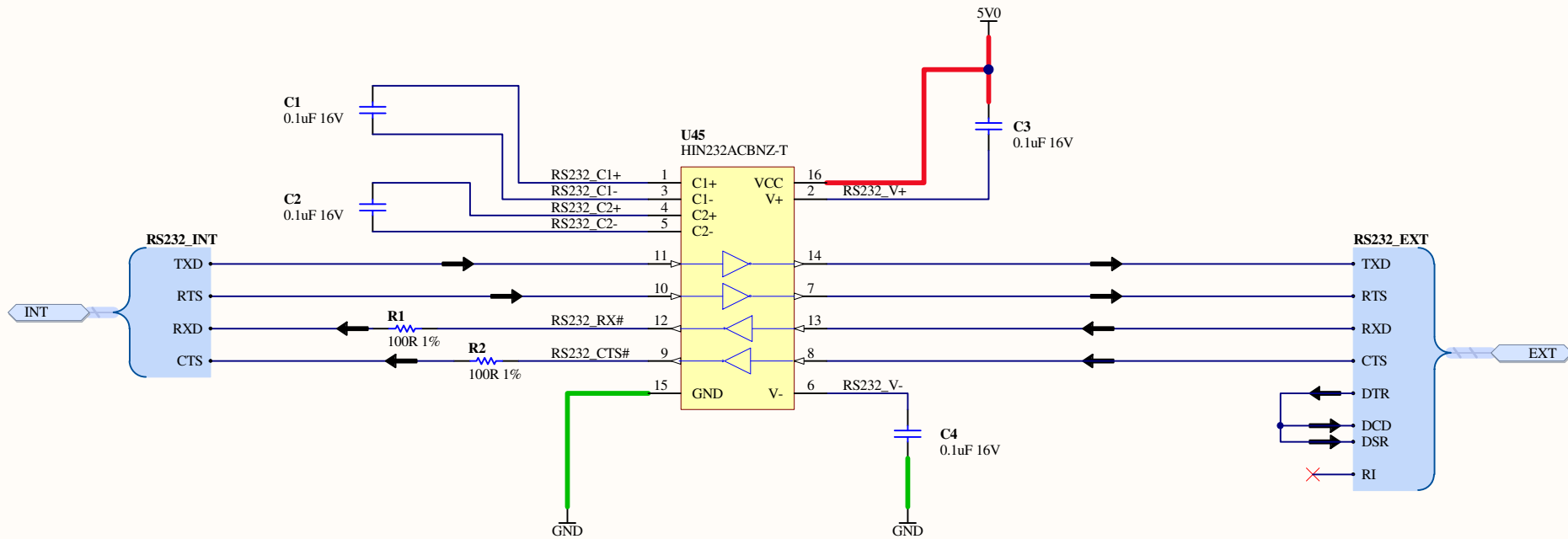
$$V_{out} = V_{REF} \left\{ 1 + \frac{R1}{R2} \right\} + I_{ADJ} R_2$$


$$V_{REF} = 1.216v$$

$$I_{ADJ} = 40nA (0.000000040)$$

▲ Calculation for 1.2V;
 = 1.216V x (1+R1/R2) + 0.000000040 x R2
 = 1.216V x (1+0/10000) + 0.000000040 x 10000
 = 1.216V x 1 + 0.0004
 = 1.2164V

Sheet Title PSU NCP630A SET TO 1V2		Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA			
Size: A4	Assy: TBA	Revision: 02	
Date: 9/22/2011	Time: 10:42:14 PM	Sheet 67 of 106	
File: PSU_NCP630SET_1V2.SchDoc			



Sheet Title RS232 Communication IC		Altium Limited 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:14 PM			Sheet 67 of 80
File: RS232_HIN232.SchDoc				

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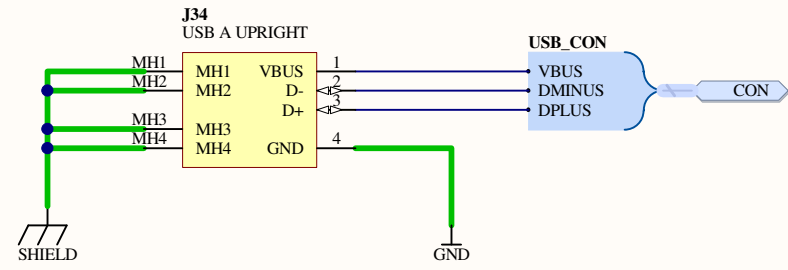
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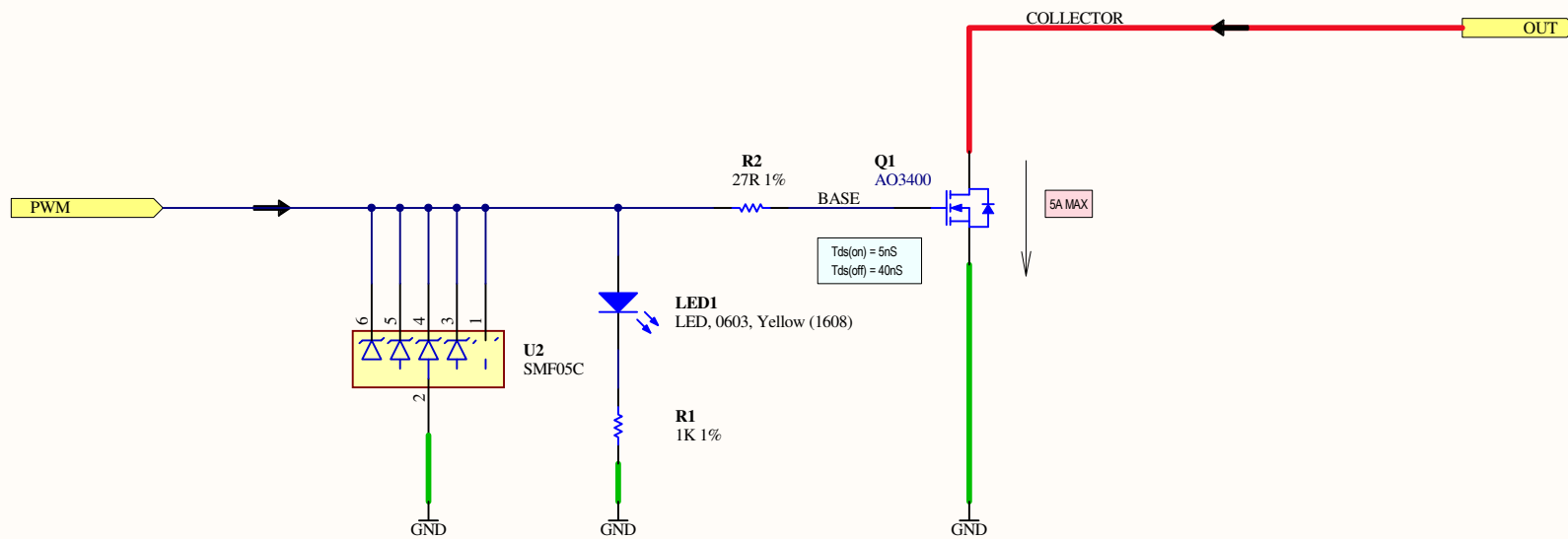
Sheet Title USBA RA Upright Connector			<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:14 PM	Sheet 68 of 80		
File: CON_USBA_RA_UPRIGHT.SchDoc				


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Sheet Title PWM 30V/4A		Altium Limited 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:14 PM			Sheet 69 of 80
File: PWM_5.8A_30V.SchDoc				

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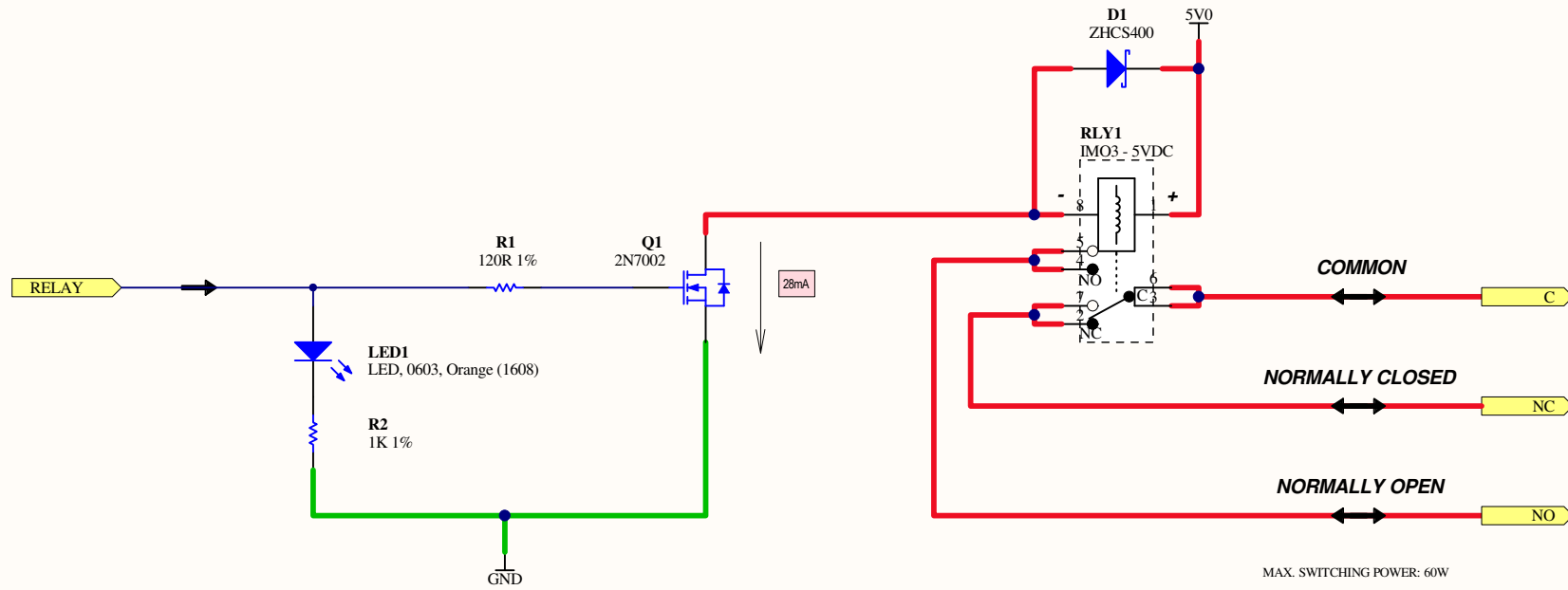
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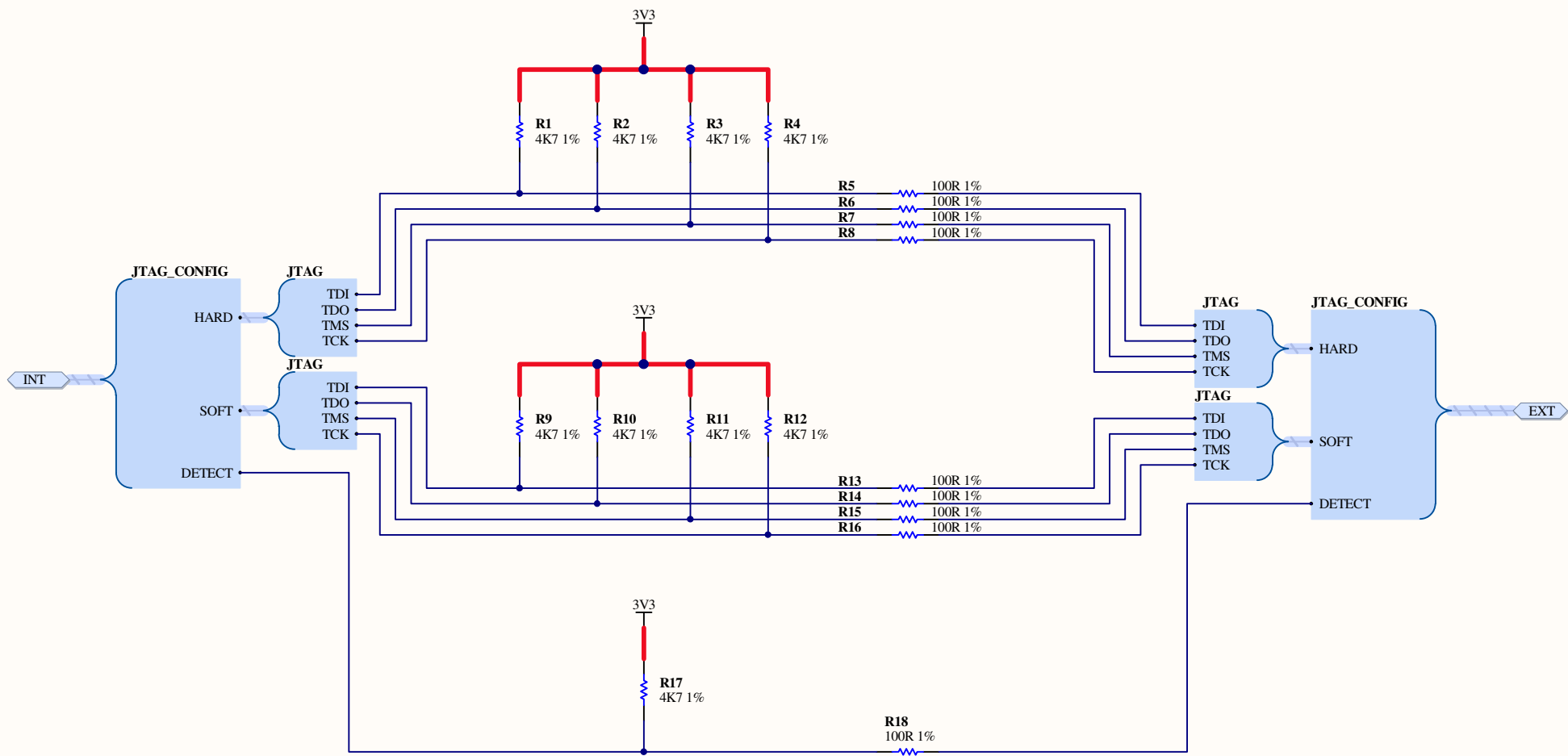
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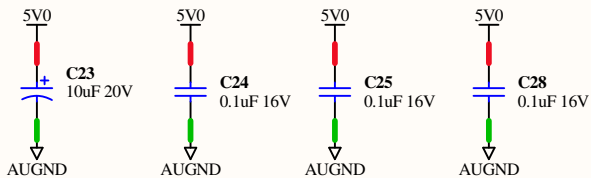
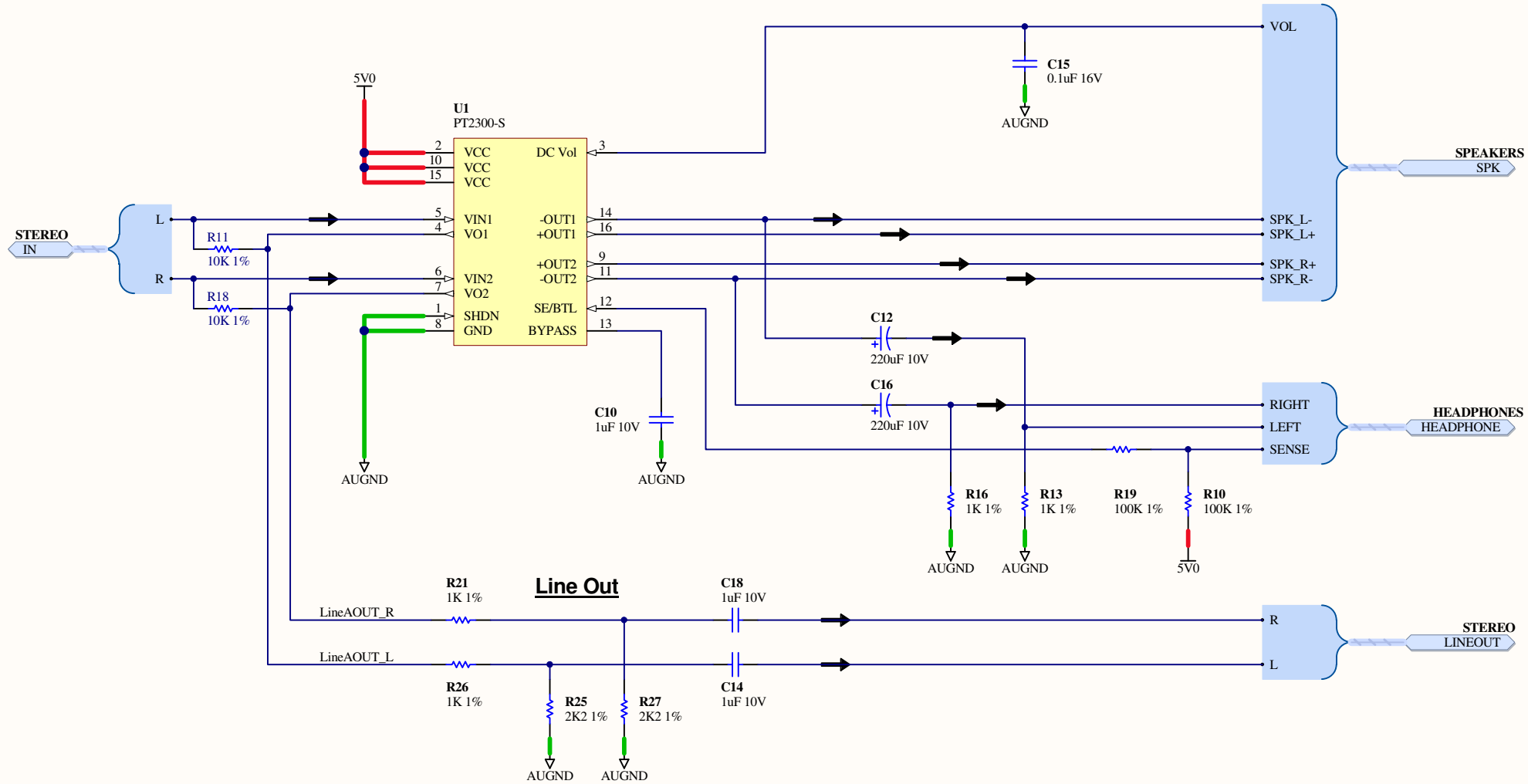
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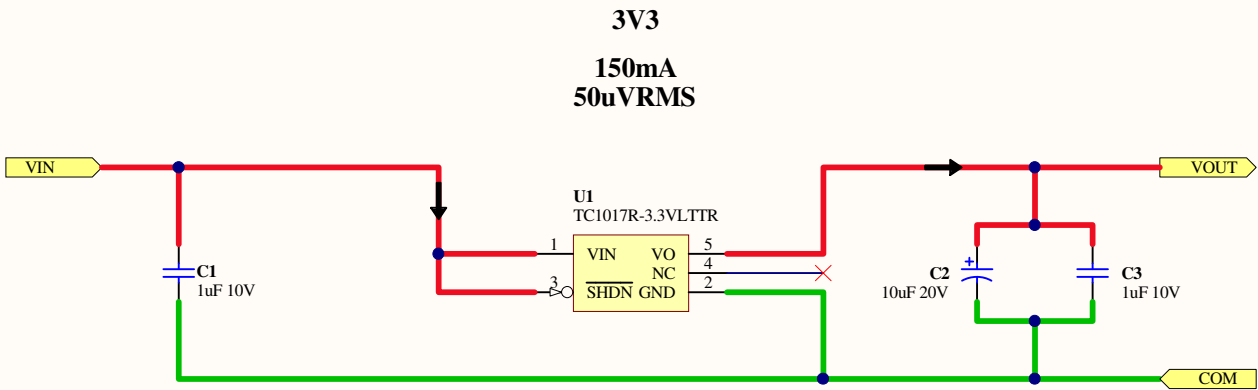
Sheet Title Power Control			Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:14 PM	Sheet 70 of 80		
File: RELAY_SMT_5V_IM03GR.SchDoc				




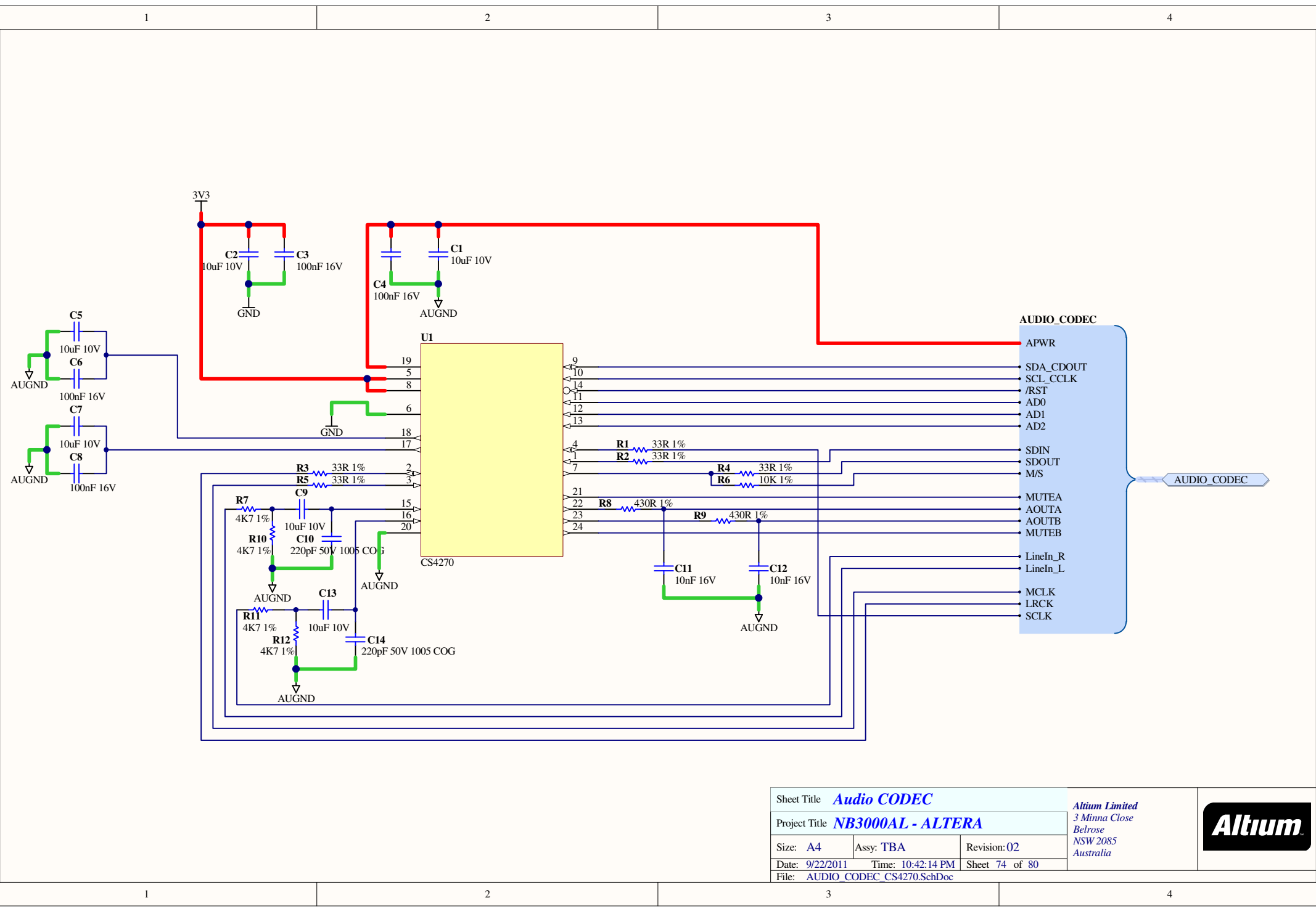
Sheet Title Auto-Detect JTAG Circuit			Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:14 PM	Sheet 71 of 80		
File: JTAG_ALTNUM_AUTO.SchDoc				




Sheet Title AUDIO AMP & MIXER PT2300		Altium Limited 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:14 PM			Sheet 72 of 80
File: AUDIO_AMP_PT2300.SchDoc				



Sheet Title PSU TC1017R 3V3		<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:14 PM			Sheet 73 of 80
File: PSU_TC1017R_3V3.SchDoc				



Sheet Title Audio CODEC		Altium Limited 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:14 PM			Sheet 74 of 80
File: AUDIO_CODEC_CS4270.SchDoc				

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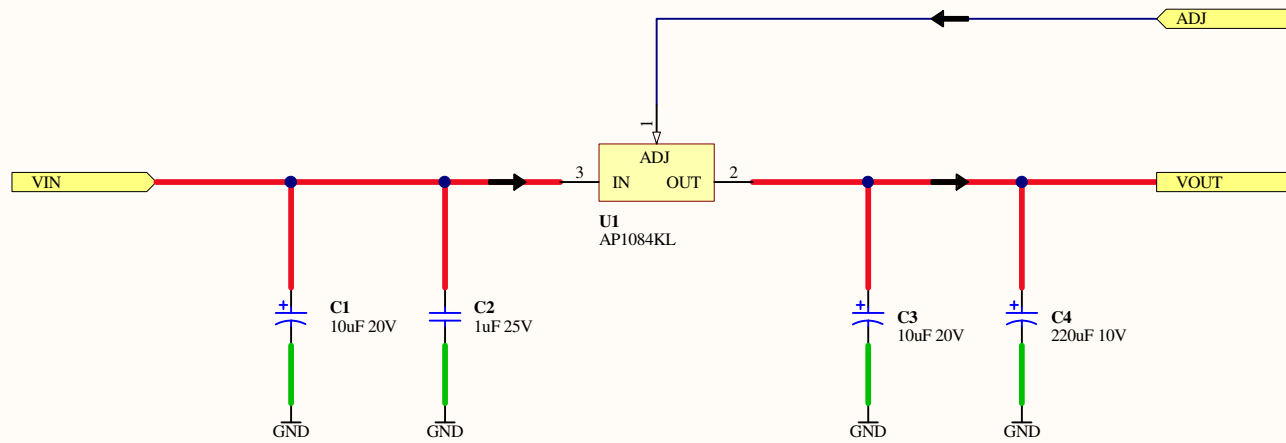
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Sheet Title PSU AP1084KL ADJ		<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:14 PM			Sheet 75 of 80
File: PSU_1084_ADJ.SchDoc				

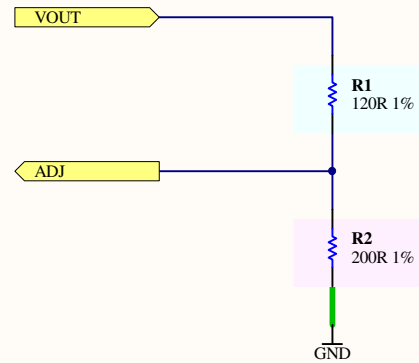
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3.3V Output



$$V_{out} = V_{REF} \left\{ 1 + \frac{R2}{R1} \right\} + I_{ADJ} R2$$

$$V_{REF} = 1.25v$$

$$I_{ADJ} = 55\mu A (0.000055)$$

▲ Calculation for 3.3V;
 = 1.25V x (1+R2/R1) + 0.000055 x R2
 = 1.25V x (1+200/120) + 0.000055 x 200
 = 1.25V x 2.67 + 0.011
 = 3.34433V

Sheet Title **PSU AP1084KL SET TO 3V3**

Project Title **NB3000AL - ALTERA**

Size: A4

Assy: TBA

Revision: 02

Date: 9/22/2011

Time: 10:42:14 PM

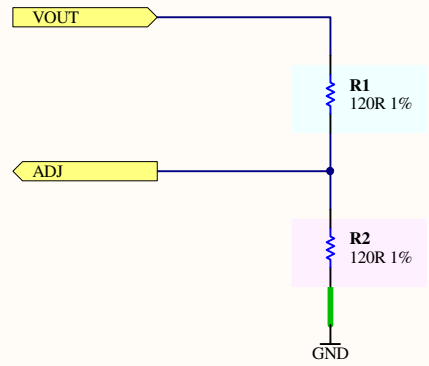
Sheet 76 of 80

File: PSU_1084SET_3V3.SchDoc

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 NSW 2085
 Australia



2.5V Output




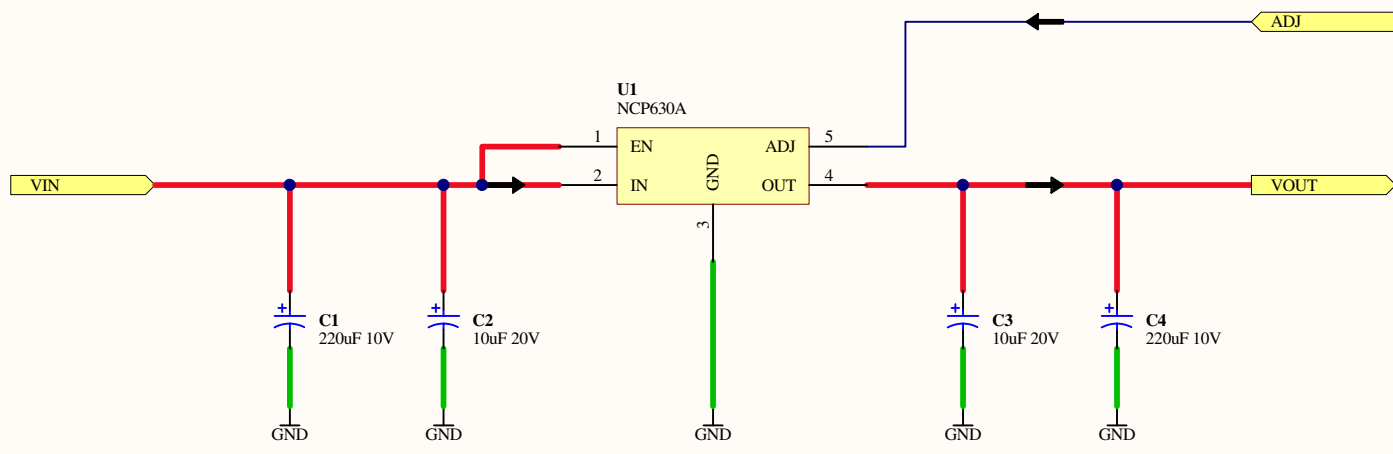
$$V_{out} = V_{REF} \left\{ 1 + \frac{R2}{R1} \right\} + I_{ADJ}R2$$


$$V_{REF} = 1.25v$$

$$I_{ADJ} = 55\mu A (0.000055)$$

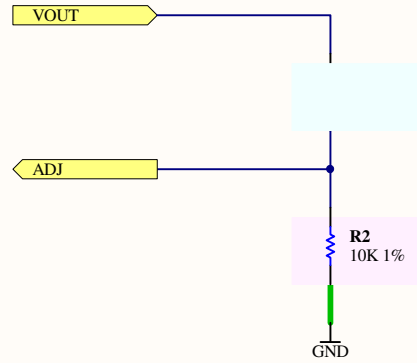
▲ Calculation for 2.5V;
 = 1.25V x (1+R2/R1) + 0.000055 x R2
 = 1.25V x (1+120/120) + 0.000055 x 120
 = 1.25V x 2 + 0.0066
 = 2.50066V

Sheet Title PSU AP1084KL SET TO 2V5		<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia		
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:14 PM			Sheet 77 of 80
File: PSU_1084SET_2V5.SchDoc				



Sheet Title PSU NCP630A ADJ			<i>Altium Limited</i> 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:14 PM	Sheet 78 of 80		
File: PSU_NCP630_ADJ.SchDoc				

1.2V Output



$$V_{out} = V_{REF} \left\{ 1 + \frac{R1}{R2} \right\} + I_{ADJ} R_2$$

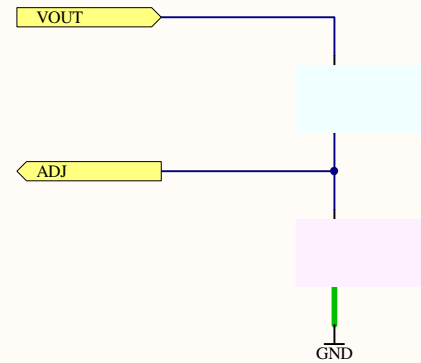
$$V_{REF} = 1.216v$$

$$I_{ADJ} = 40nA (0.000000040)$$

▲ Calculation for 1.2V;
 = 1.216V x (1+R1/R2) + 0.000000040 x R2
 = 1.216V x (1+0/10000) + 0.000000040 x 10000
 = 1.216V x 1 + 0.0004
 = 1.2164V

Sheet Title PSU NCP630A SET TO 1V2		Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA			
Size: A4	Assy: TBA	Revision:02	
Date: 9/22/2011	Time: 10:42:14 PM	Sheet 79 of 80	
File: PSU_NCP630SET_1V2.SchDoc			

1.8V Output



$$V_{out} = V_{REF} \left\{ 1 + \frac{R_2}{R_1} \right\} + I_{ADJ} R_2$$

$$V_{REF} = 1.25v$$

$$I_{ADJ} = 55\mu A (0.000055)$$

Calculation for 1.8V;
 = 1.25V x (1+R2/R1) + 0.000055 x R2
 = 1.25V x (1+56/120) + 0.000055 x 56
 = 1.25V x 1.47 + 0.00308
 = 1.83641V

Sheet Title **PSU AP1084KL 1V8**

Project Title **NB3000AL - ALTERA**

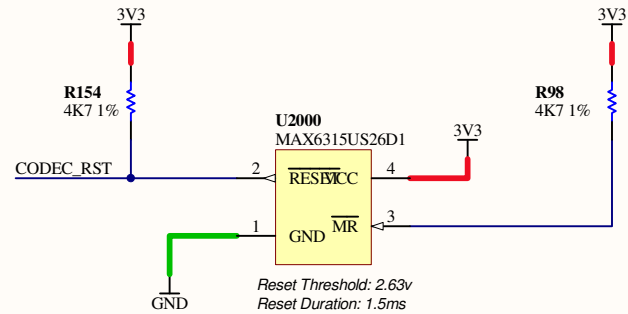
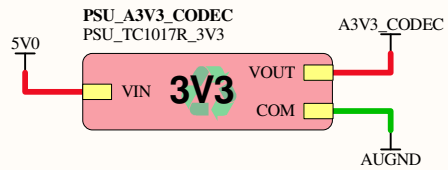
Size: A4 Assy: TBA Revision: 02

Date: 9/22/2011 Time: 10:42:14 PM Sheet 80 of 80

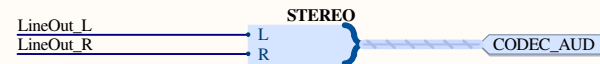
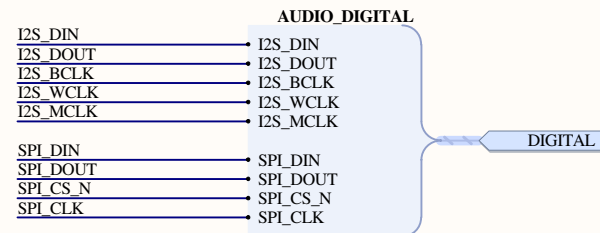
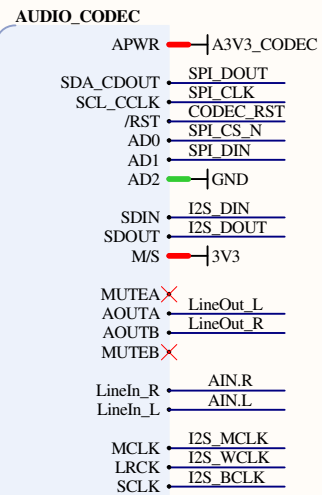
File: PSU_1084SET_1V8.SchDoc


Altium Limited
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 Belrose
 NSW 2085
 Australia

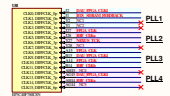
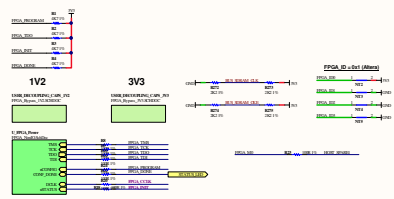
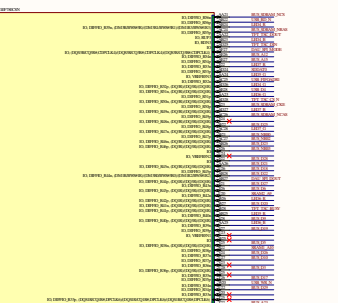
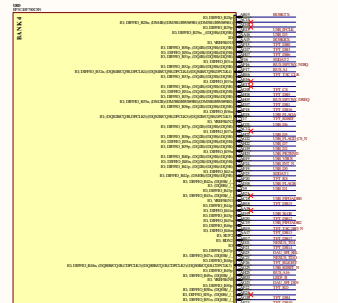
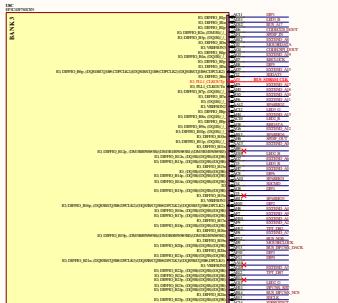
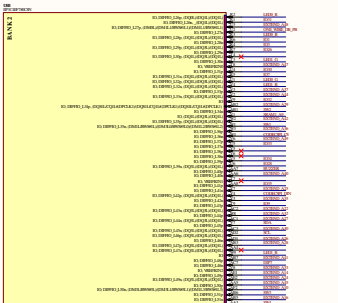
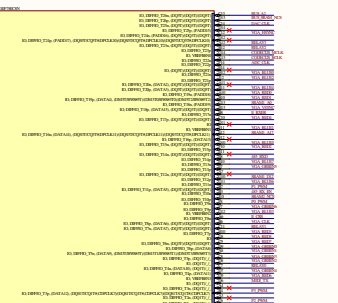
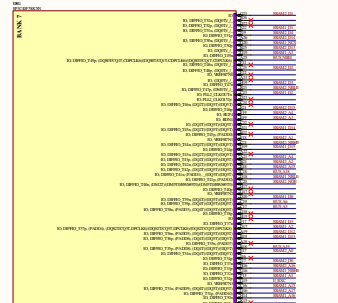
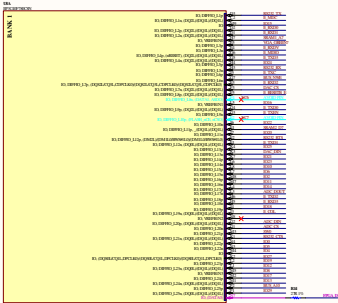
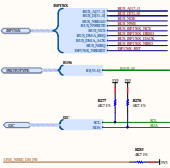
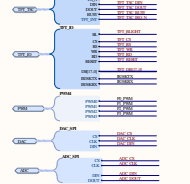
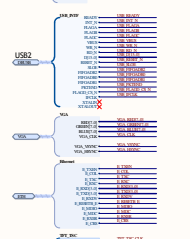
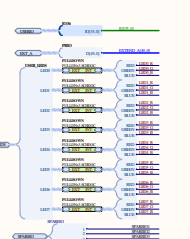
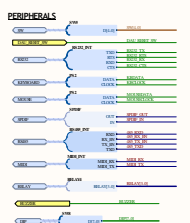
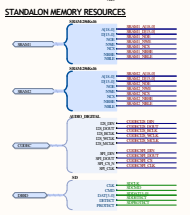
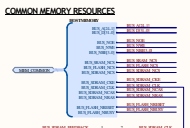
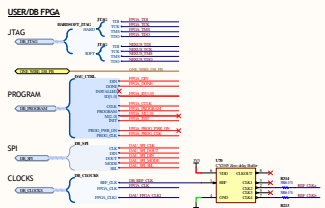


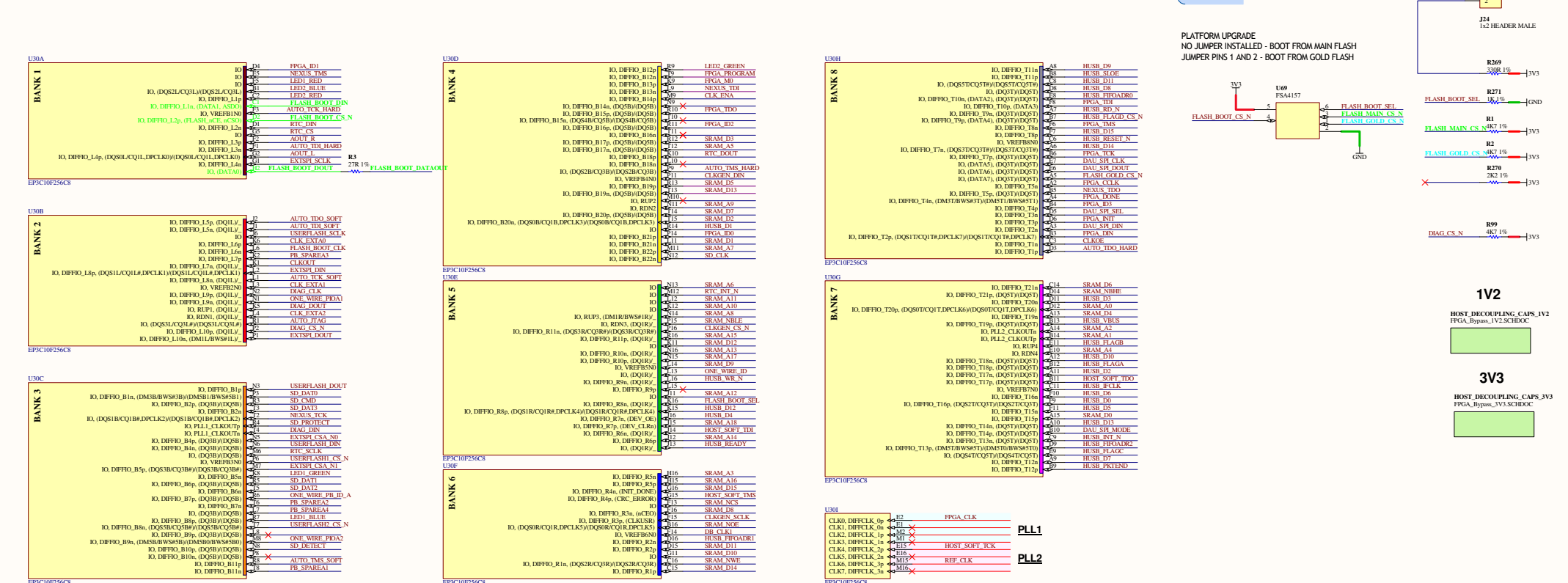
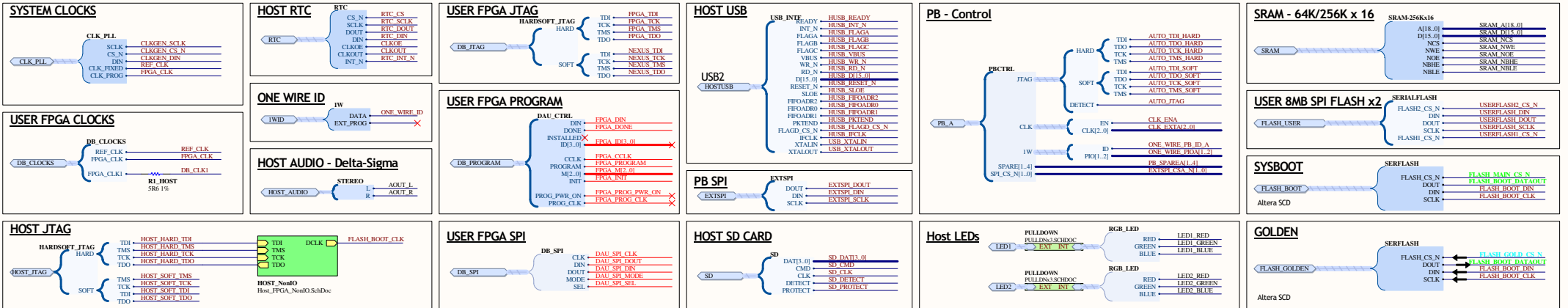


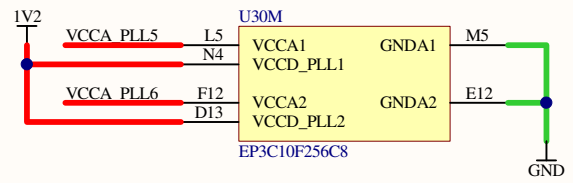
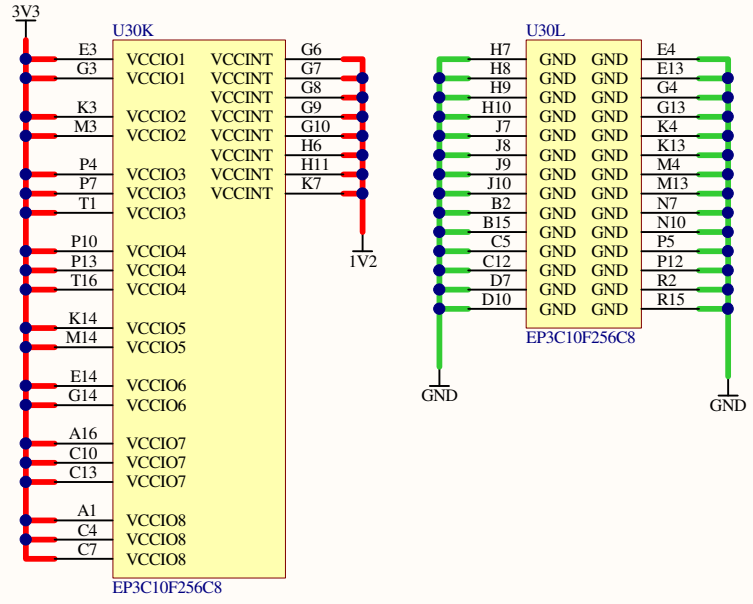
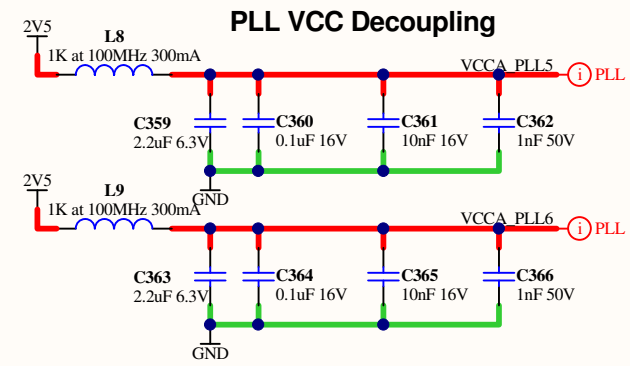
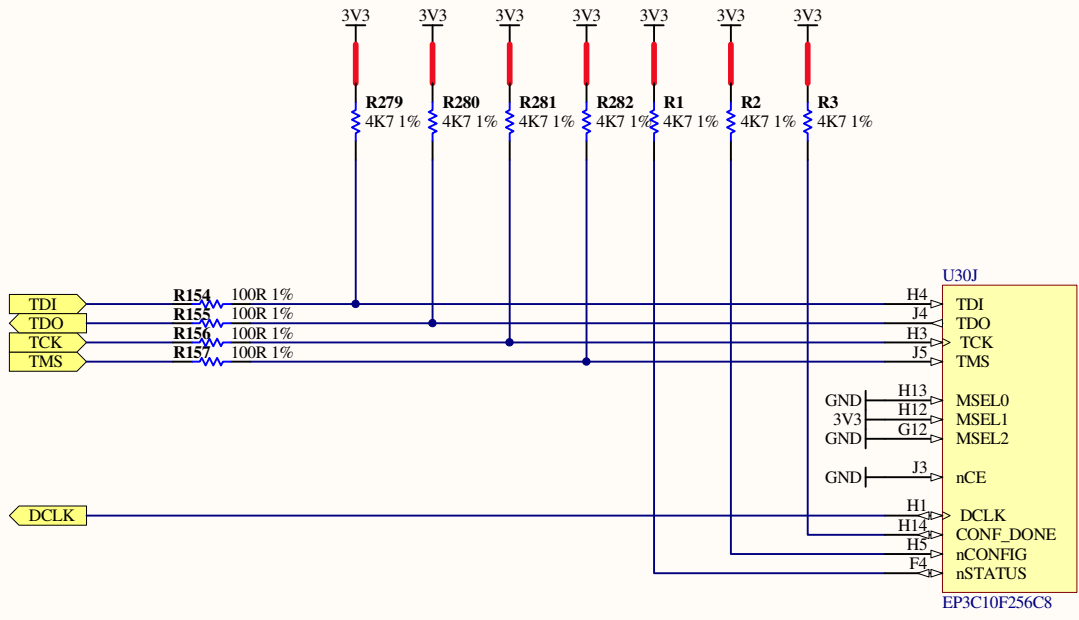
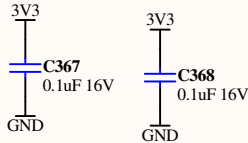
CODEC_CS4270
AUDIO_CODEC_CS4270



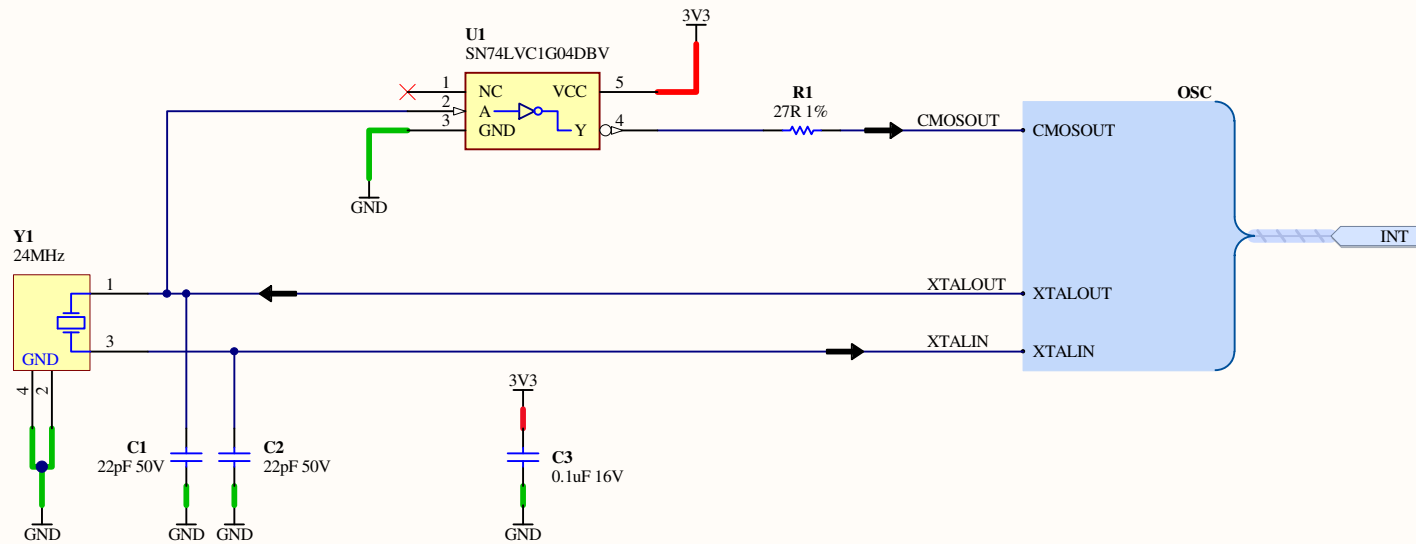
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Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:15 PM			Sheet * of *
File: Audio_Codec.SchDoc				




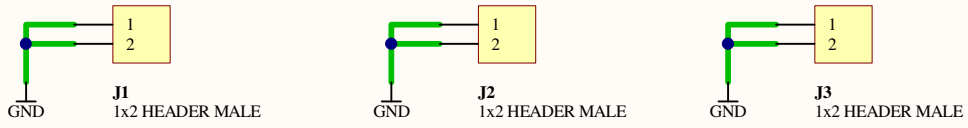
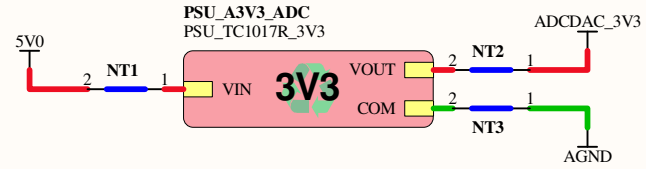
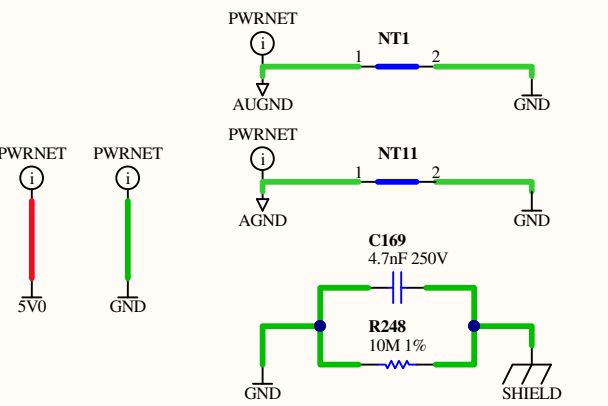
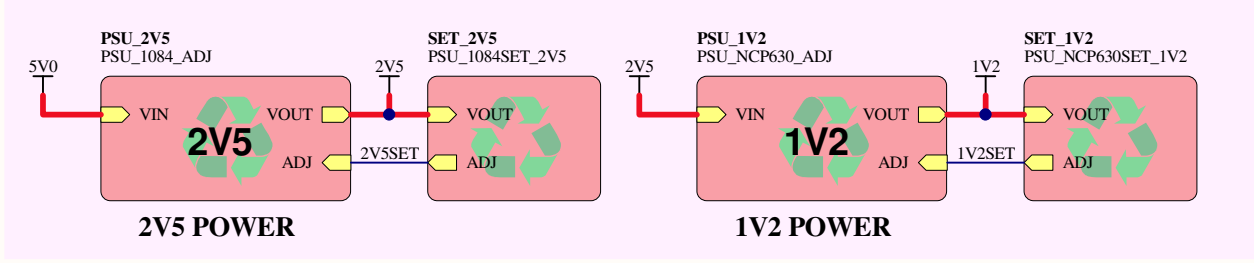
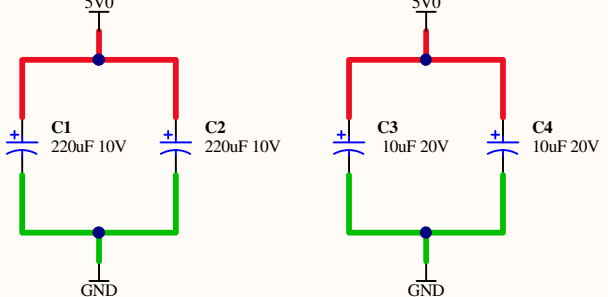
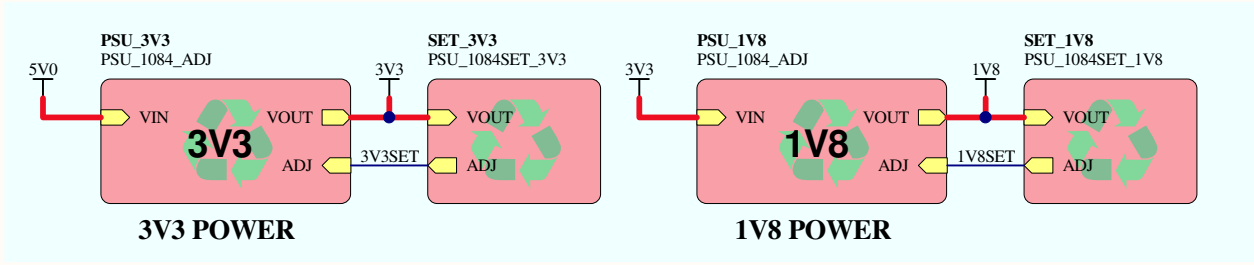




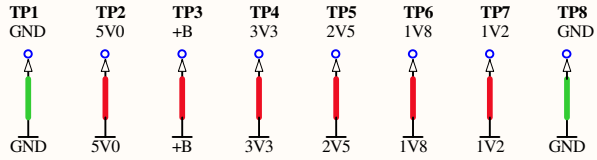
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Project Title NB3000AL - ALTERA			
Size: A4	Assy: TBA	Revision: 02	
Date: 9/22/2011	Time: 10:42:15 PM	Sheet * of *	
File: HOST_FPGA_NonIO.SchDoc			



Sheet Title 24MHz Oscillator		Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA			
Size: A4	Assy: TBA		
Date: 9/22/2011	Time: 10:42:15 PM	Sheet * of *	
File: OSC_24MHZ.SchDoc			



GROUND TEST POINTS



POWER TEST POINTS

Sheet Title NB3000 POWER SUPPLIES			Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:17 PM	Sheet * of *		
File: PSU.SchDoc				

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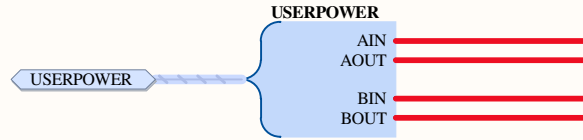
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USER HEADER
POWER LOOPBACK

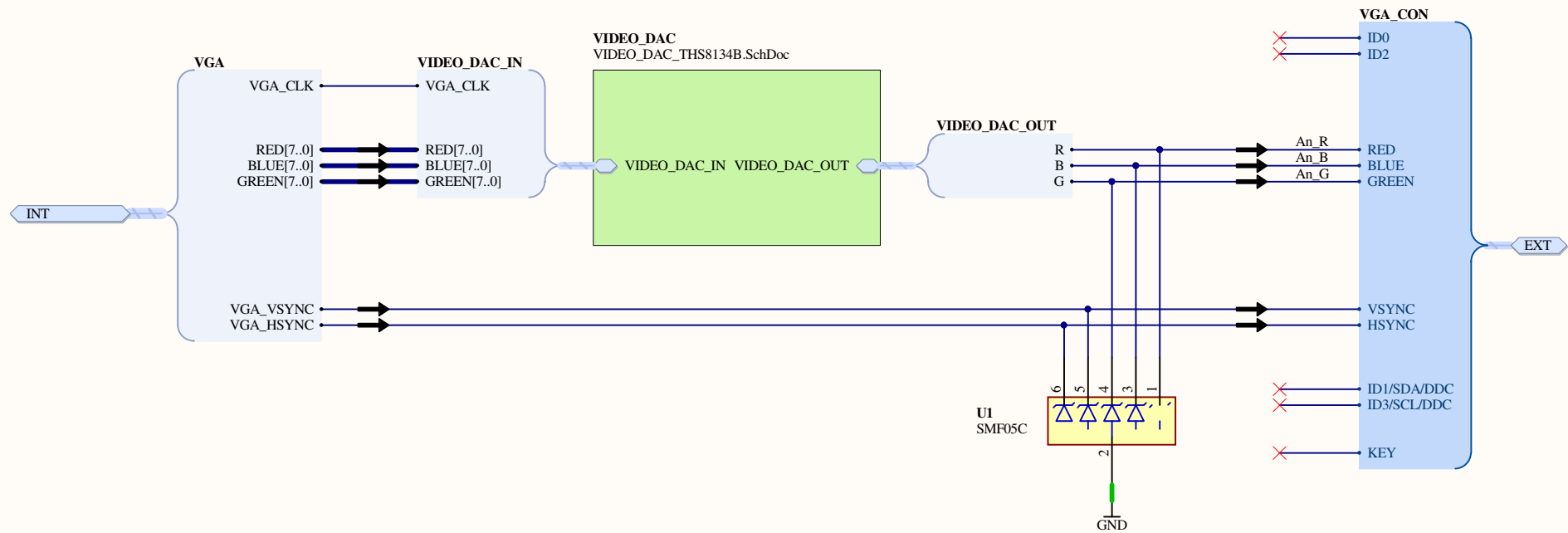
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Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA			Revision: 02
Date: 9/22/2011	Time: 10:42:17 PM			Sheet * of *
File: USERPWR.SchDoc				


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Sheet Title VGA Output			Altium Limited 3 Minna Close Belrose NSW 2085 Australia	
Project Title NB3000AL - ALTERA				
Size: A4	Assy: TBA	Revision: 02		
Date: 9/22/2011	Time: 10:42:17 PM	Sheet * of *		
File: VGA_OUT.SCHDOC				