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LPC3154 Powering and Unused parts

Page 3

LPC3154 Digital I/O

Page 4

JTAG Interface

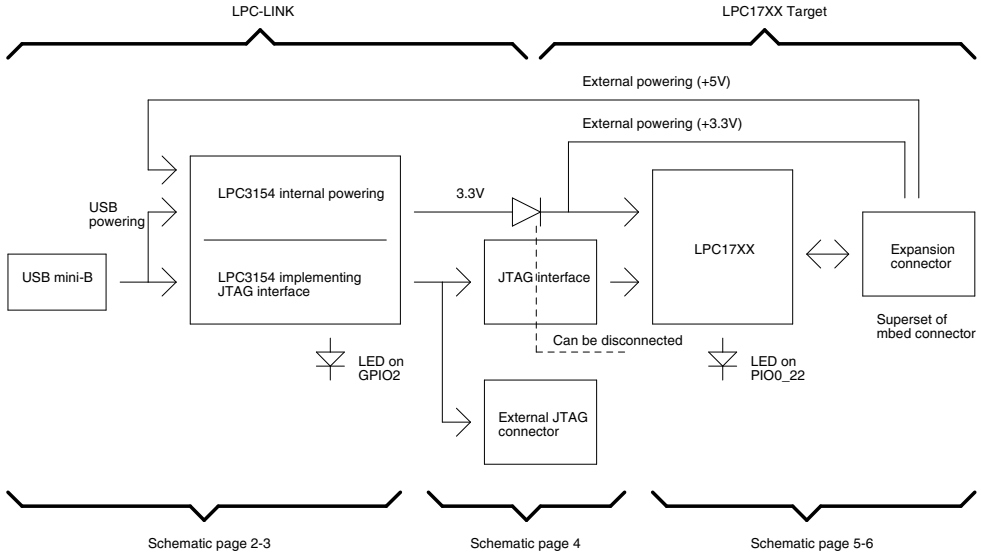
Page 5

LPC17XX with Expansion connector

Page 6

LPC17XX

Design Overview



UL = UnLoaded = normally not mounted component.

Default jumper settings are indicated in the schematic. However, always check jumper positions on actual boards since there is no guarantee that all jumpers are in default place.

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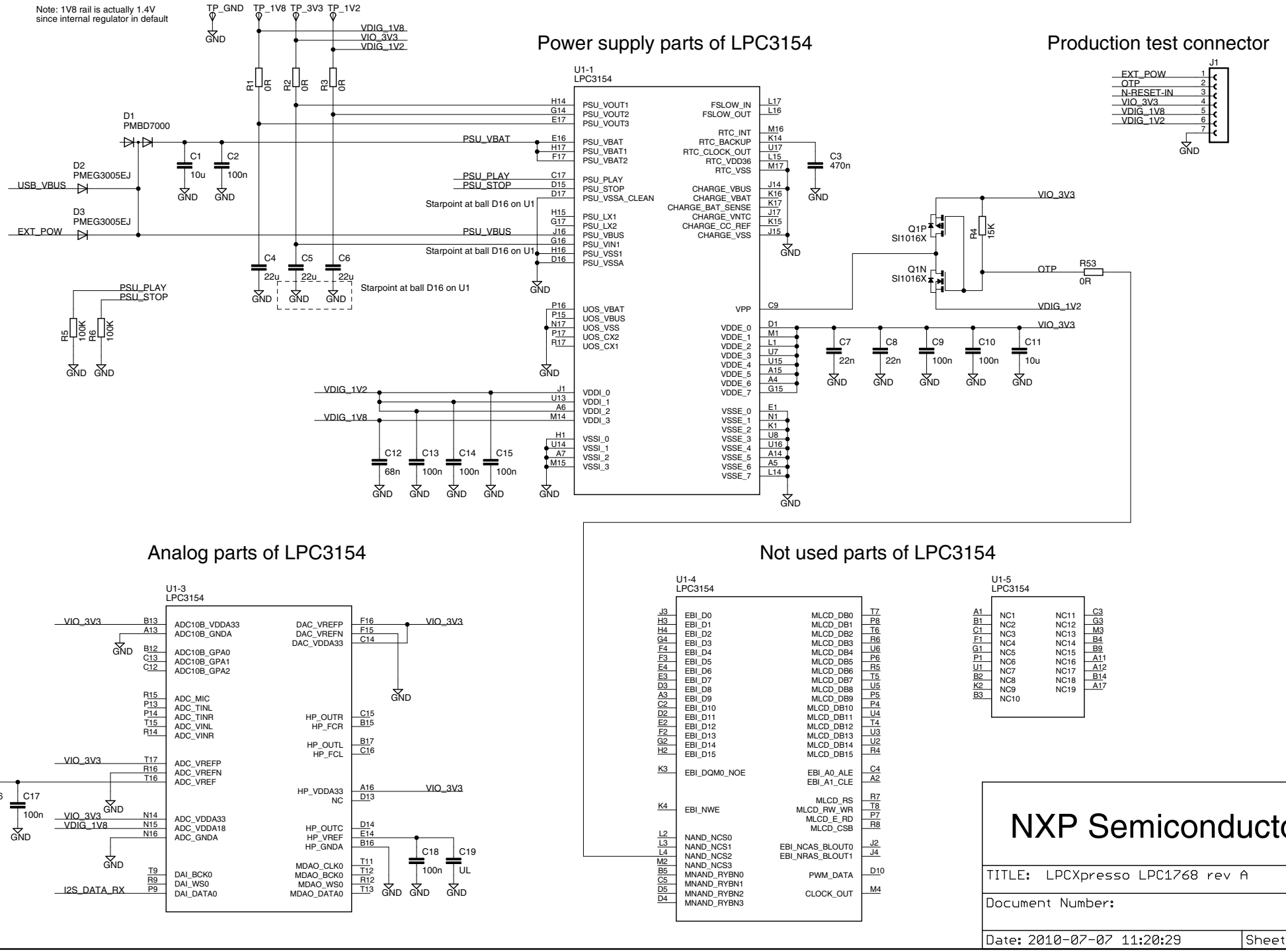
Note: 1V8 rail is actually 1.4V since internal regulator in default
Power supply parts of LPC3154
Production test connector
Analog parts of LPC3154
Not used parts of LPC3154
U1-1 LPC3154
U1-3 LPC3154
U1-4 LPC3154
U1-5 LPC3154
J1
TP_GND TP_1V8 TP_3V3 TP_1V2
VDIG_1V8 VIO_3V3 VDIG_1V2
R1 0R R2 0R R3 0R
D1 PMBD7000
D2 PMEG3005EJ
D3 PMEG3005EJ
USB_VBUS
EXT_POW
PSU_VBAT
PSU_PLAY
PSU_STOP
PSU_VBUS
Starpoint at ball D16 on U1
C1 10u C2 100n C3 470n
C4 22u C5 22u C6 22u
R5 100K R6 100K
PSU_VOUT1 PSU_VOUT2 PSU_VOUT3
PSU_VBAT PSU_VBAT1 PSU_VBAT2
PSU_PLAY PSU_STOP PSU_VSSA_CLEAN
PSU_LX1 PSU_LX2 PSU_VBUS PSU_VIN1 PSU_VSS1 PSU_VSSA
UOS_VBAT UOS_VBUS UOS_VSS UOS_CX2 UOS_CX1
VDDI_0 VDDI_1 VDDI_2 VDDI_3
VSSI_0 VSSI_1 VSSI_2 VSSI_3
FSLOW_IN FSLOW_OUT
RTC_INT RTC_BACKUP RTC_CLOCK_OUT RTC_VDD36 RTC_VSS
CHARGE_VBUS CHARGE_VBAT CHARGE_BAT_SENSE CHARGE_VNTC CHARGE_CC_REF CHARGE_VSS
VPP
VDDE_0 VDDE_1 VDDE_2 VDDE_3 VDDE_4 VDDE_5 VDDE_6 VDDE_7
VSSE_0 VSSE_1 VSSE_2 VSSE_3 VSSE_4 VSSE_5 VSSE_6 VSSE_7
C7 22n C8 22n C9 100n C10 100n C11 10u
C12 68n C13 100n C14 100n C15 100n
Q1P SI1016X Q1N SI1016X R4 15K R53 0R
OTP
EXT_POW OTP N-RESET-IN VIO_3V3 VDIG_1V8 VDIG_1V2
ADC10B_VDDA33 ADC10B_GNDA ADC10B_GPA0 ADC10B_GPA1 ADC10B_GPA2
ADC_MIC ADC_TINL ADC_TINR ADC_VINL ADC_VINR
ADC_VREFP ADC_VREFN ADC_VREF
ADC_VDDA33 ADC_VDDA18 ADC_GNDA
DAI_BCK0 DAI_WS0 DAI_DATA0
I2S_DATA_RX
DAC_VREFP DAC_VREFN DAC_VDDA33
HP_OUTR HP_FCR HP_OUTL HP_FCL
HP_VDDA33 NC
HP_OUTC HP_VREF HP_GNDA
MDAO_CLK0 MDAO_BCK0 MDAO_WS0 MDAO_DATA0
C16 UL C17 100n C18 100n C19 UL
EBI_D0 EBI_D1 EBI_D2 EBI_D3 EBI_D4 EBI_D5 EBI_D6 EBI_D7 EBI_D8 EBI_D9 EBI_D10 EBI_D11 EBI_D12 EBI_D13 EBI_D14 EBI_D15
EBI_DQM0_NOE EBI_NWE
NAND_NCS0 NAND_NCS1 NAND_NCS2 NAND_NCS3 MNAND_RYBN0 MNAND_RYBN1 MNAND_RYBN2 MNAND_RYBN3
MLCD_DB0 MLCD_DB1 MLCD_DB2 MLCD_DB3 MLCD_DB4 MLCD_DB5 MLCD_DB6 MLCD_DB7 MLCD_DB8 MLCD_DB9 MLCD_DB10 MLCD_DB11 MLCD_DB12 MLCD_DB13 MLCD_DB14 MLCD_DB15
EBI_A0_ALE EBI_A1_CLE
MLCD_RS MLCD_RW_WR MLCD_E_RD MLCD_CSB
EBI_NCAS_BLOUT0 EBI_NRAS_BLOUT1
PWM_DATA
CLOCK_OUT
NC1 NC2 NC3 NC4 NC5 NC6 NC7 NC8 NC9 NC10 NC11 NC12 NC13 NC14 NC15 NC16 NC17 NC18 NC19
GND
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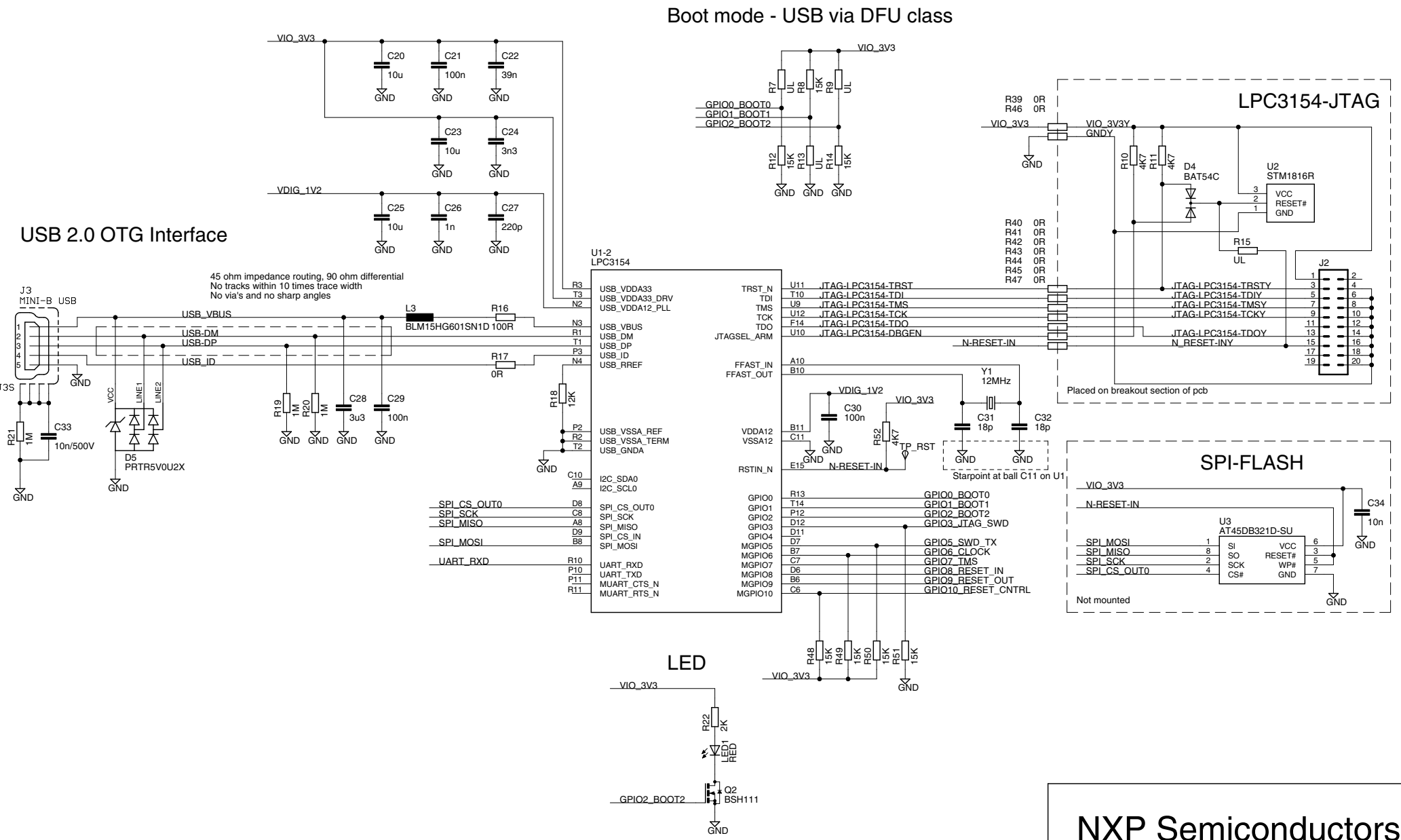
Boot mode - USB via DFU class
USB 2.0 OTG Interface
LPC3154-JTAG
SPI-FLASH
LED
U1-2
LPC3154
J3
MINI-B USB
45 ohm impedance routing, 90 ohm differential
No tracks within 10 times trace width
No via's and no sharp angles
Placed on breakout section of pcb
Starpoint at ball C11 on U1
Not mounted
NXP Semiconductors
TITLE: LPCXpresso LPC1768 rev A
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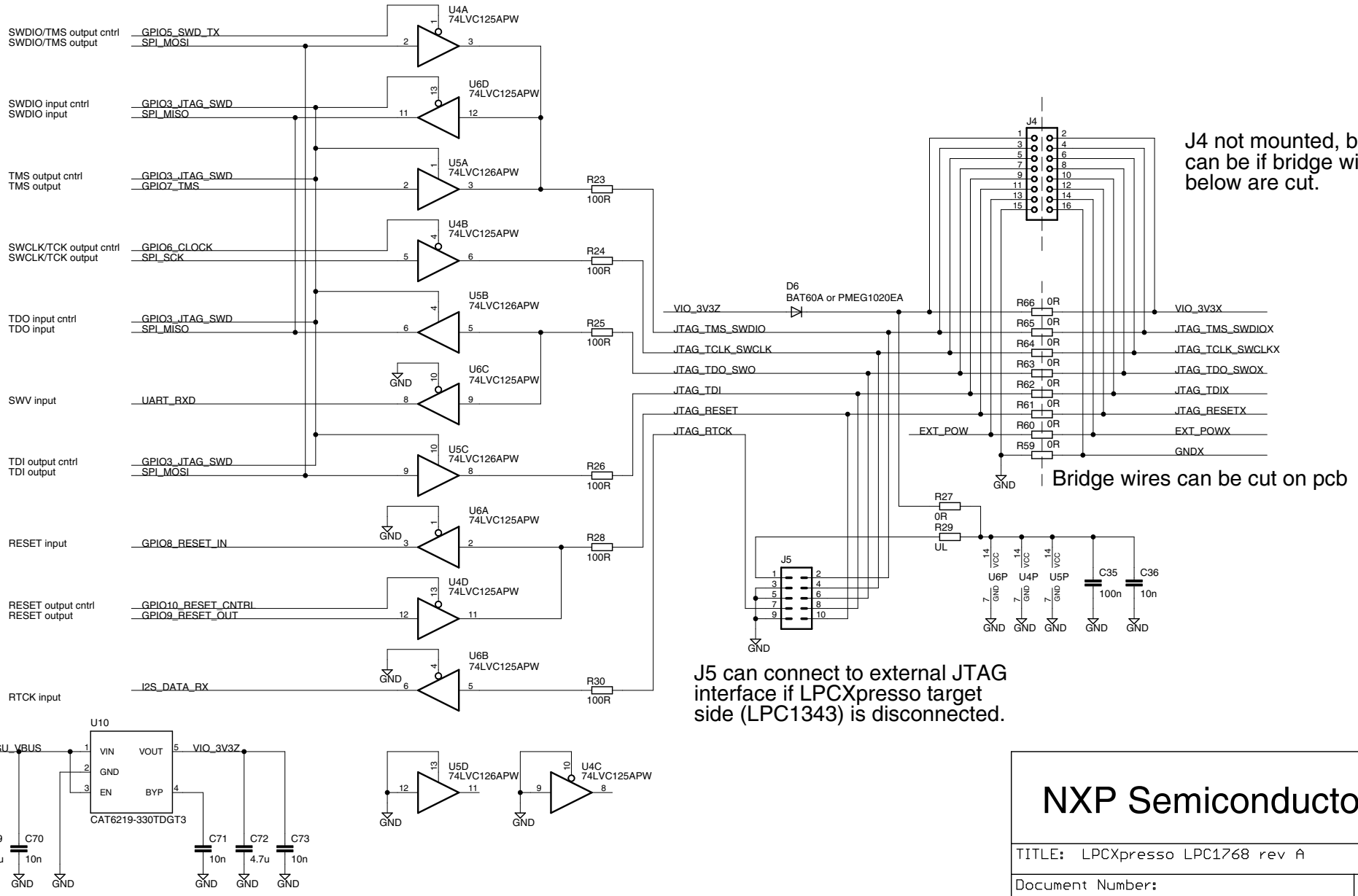
JTAG Interface



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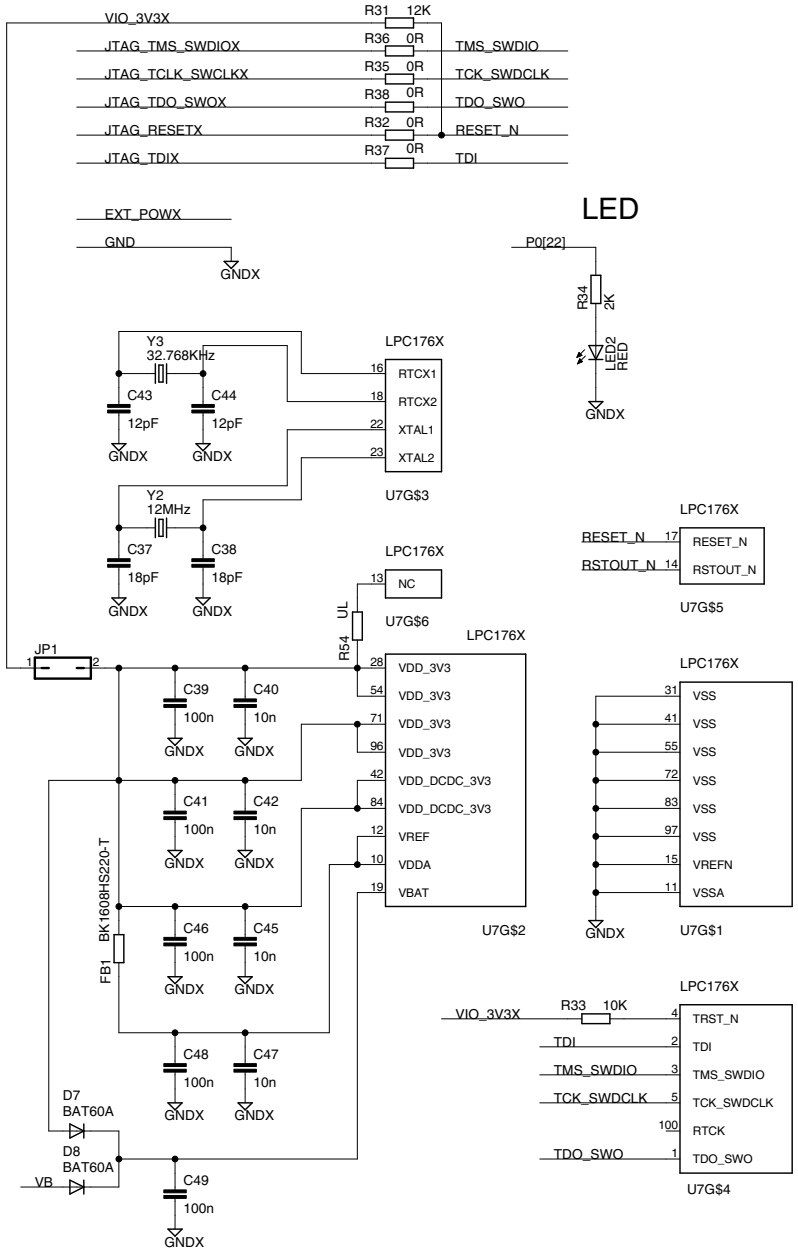
From LPC-LINK Side



LPC1XXX Target Side

Expansion Connector (superset of mbed pinning)

mbed	LPCXpresso
GND	GND
VIN (4.5-14V)	VIN (4.5-5.5V)
VB (battery supply)	VB (battery supply)
nR (reset)	RESET_N
SPI1-MOSI	P0.9 MOSI1
SPI1-MISO	P0.8 MISO1
SPI1-SCK	P0.7 SCK1
GPIO	P0.6 SSEL1
UART1-TX / I2C1-SDA	P0.0 TXD3/SDA1
UART1-RX / I2C1-SCL	P0.1 RXD3/SCL1
SPI2-MOSI	P0.18 MOSI0
SPI2-MISO	P0.17 MISO0
SPI2-SCL / UART2-TX	P0.15 TXD1/SCK0
UART2-RX	P0.16 RXD1/SSEL0
AIN0	P0.23 AD0.0
AIN1	P0.24 AD0.1
AIN2	P0.25 AD0.2
AIN3 / AOUT	P0.26 AD0.3/AOUT
AIN4	P1.30 AD0.4
AIN5	P1.31 AD0.5
	P0.2
	P0.3
	P0.21
	P0.22
	P0.27
	P0.28
	P2.13

Dual row holes (2x27), 100 mil spacing

GNDX	J6-1	VIO_3V3X	J6-28
EXT_POWX	J6-2		J6-29
VB	J6-3		J6-30
RESET_N	J6-4		J6-31
P0[9]	J6-5	RD-	J6-32
P0[8]	J6-6	RD+	J6-33
P0[7]	J6-7	TD-	J6-34
P0[6]	J6-8	TD+	J6-35
P0[0]	J6-9	USB-D-	J6-36
P0[1]	J6-10	USB-D+	J6-37
P0[18]	J6-11	P0[4]	J6-38
P0[17]	J6-12	P0[5]	J6-39
P0[15]	J6-13	P0[10]	J6-40
P0[16]	J6-14	P0[11]	J6-41
P0[23]	J6-15	P2[0]	J6-42
P0[24]	J6-16	P2[1]	J6-43
P0[25]	J6-17	P2[2]	J6-44
P0[26]	J6-18	P2[3]	J6-45
P1[30]	J6-19	P2[4]	J6-46
P1[31]	J6-20	P2[5]	J6-47
P0[2]	J6-21	P2[6]	J6-48
P0[3]	J6-22	P2[7]	J6-49
P0[21]	J6-23	P2[8]	J6-50
P0[22]	J6-24	P2[10]	J6-51
P0[27]	J6-25	P2[11]	J6-52
P0[28]	J6-26	P2[12]	J6-53
P2[13]	J6-27	GNDX	J6-54

LPCXpresso		mbed
VOUT (+3.3V out) if self powered, else +3.3V input		VOUT (3.3V out)
not used		VU (5.0V USB out)
not used		IF+
not used		IF-
RD-		RD- (Ethernet)
RD+		RD+ (Ethernet)
TD-		TD- (Ethernet)
TD+		TD+ (Ethernet)
USB-D-		D- (USB)
USB-D+		D+ (USB)
P0.4	CAN_RX2	CAN-RD
P0.5	CAN_TX2	CAN-TD
P0.10	TXD2/SDA2	UART3-TX / I2C2-SDA
P0.11	RXD2/SCL2	UART3-RX / I2C2-SCL
P2.0	PWM1.1	PWMOUT0
P2.1	PWM1.2	PWMOUT1
P2.2	PWM1.3	PWMOUT2
P2.3	PWM1.4	PWMOUT3
P2.4	PWM1.5	PWMOUT4
P2.5	PWM1.6	PWMOUT5
P2.6		
P2.7		
P2.8		
P2.10		
P2.11		
P2.12		
GND		

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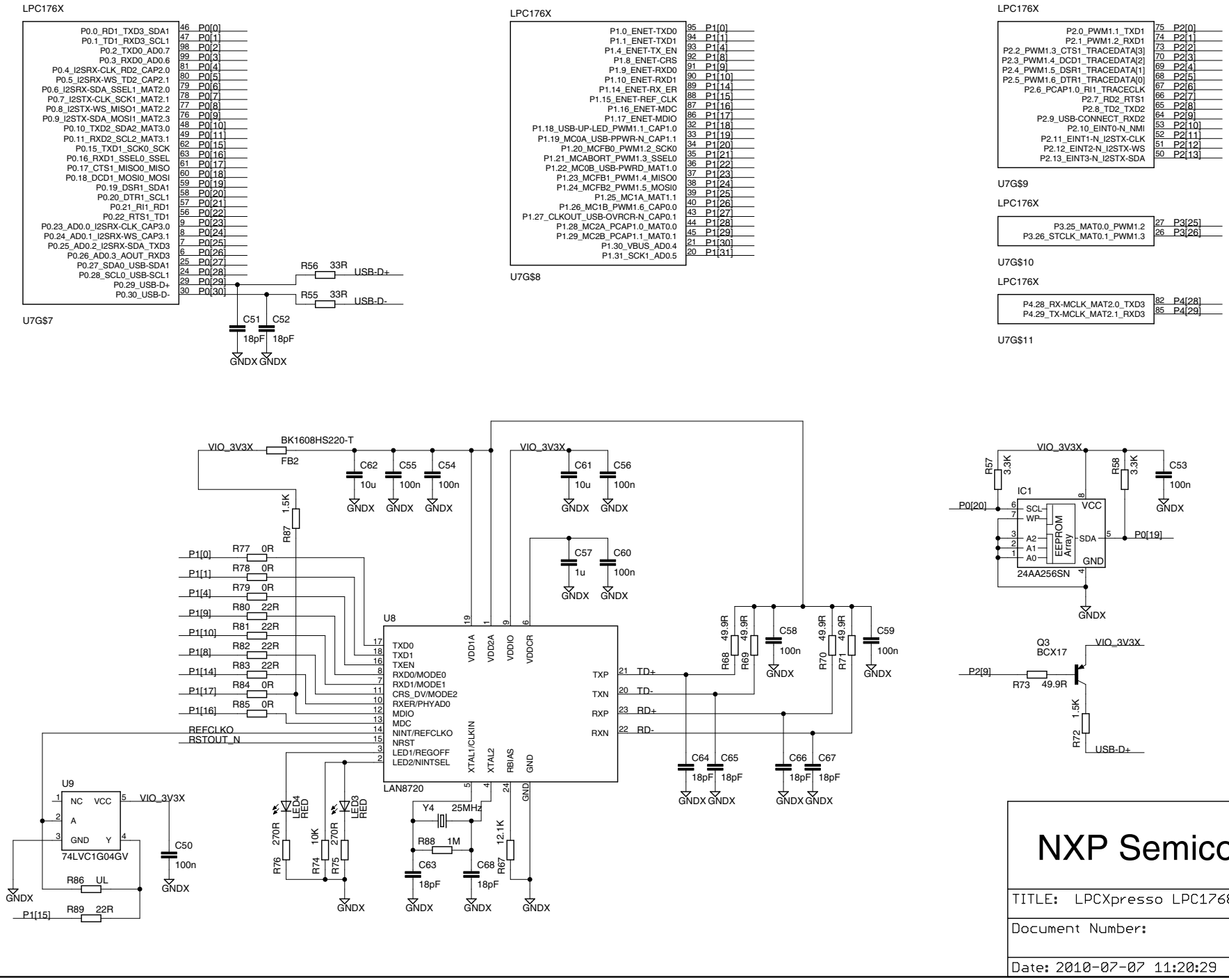
LPC176X
P0.0_RD1_TXD3_SDA1 46 P0[0]
P0.1_TD1_RXD3_SCL1 47 P0[1]
P0.2_TXD0_AD0.7 98 P0[2]
P0.3_RXD0_AD0.6 99 P0[3]
P0.4_I2SRX-CLK_RD2_CAP2.0 81 P0[4]
P0.5_I2SRX-WS_TD2_CAP2.1 80 P0[5]
P0.6_I2SRX-SDA_SSEL1_MAT2.0 79 P0[6]
P0.7_I2STX-CLK_SCK1_MAT2.1 78 P0[7]
P0.8_I2STX-WS_MISO1_MAT2.2 77 P0[8]
P0.9_I2STX-SDA_MOSI1_MAT2.3 76 P0[9]
P0.10_TXD2_SDA2_MAT3.0 48 P0[10]
P0.11_RXD2_SCL2_MAT3.1 49 P0[11]
P0.15_TXD1_SCK0_SCK 62 P0[15]
P0.16_RXD1_SSEL0_SSEL 63 P0[16]
P0.17_CTS1_MISO0_MISO 61 P0[17]
P0.18_DCD1_MOSI0_MOSI 60 P0[18]
P0.19_DSR1_SDA1 59 P0[19]
P0.20_DTR1_SCL1 58 P0[20]
P0.21_RI1_RD1 57 P0[21]
P0.22_RTS1_TD1 56 P0[22]
P0.23_AD0.0_I2SRX-CLK_CAP3.0 9 P0[23]
P0.24_AD0.1_I2SRX-WS_CAP3.1 8 P0[24]
P0.25_AD0.2_I2SRX-SDA_TXD3 7 P0[25]
P0.26_AD0.3_AOUT_RXD3 6 P0[26]
P0.27_SDA0_USB-SDA1 25 P0[27]
P0.28_SCL0_USB-SCL1 24 P0[28]
P0.29_USB-D+ 29 P0[29]
P0.30_USB-D- 30 P0[30]
U7G$7
R56 33R
R55 33R
USB-D+
USB-D-
C51 18pF
C52 18pF
GNDX GNDX
LPC176X
P1.0_ENET-TXD0 95 P1[0]
P1.1_ENET-TXD1 94 P1[1]
P1.4_ENET-TX_EN 93 P1[4]
P1.8_ENET-CRS 92 P1[8]
P1.9_ENET-RXD0 91 P1[9]
P1.10_ENET-RXD1 90 P1[10]
P1.14_ENET-RX_ER 89 P1[14]
P1.15_ENET-REF_CLK 88 P1[15]
P1.16_ENET-MDC 87 P1[16]
P1.17_ENET-MDIO 86 P1[17]
P1.18_USB-UP-LED_PWM1.1_CAP1.0 32 P1[18]
P1.19_MC0A_USB-PPWR-N_CAP1.1 33 P1[19]
P1.20_MCFB0_PWM1.2_SCK0 34 P1[20]
P1.21_MCABORT_PWM1.3_SSEL0 35 P1[21]
P1.22_MC0B_USB-PWRD_MAT1.0 36 P1[22]
P1.23_MCFB1_PWM1.4_MISO0 37 P1[23]
P1.24_MCFB2_PWM1.5_MOSI0 38 P1[24]
P1.25_MC1A_MAT1.1 39 P1[25]
P1.26_MC1B_PWM1.6_CAP0.0 40 P1[26]
P1.27_CLKOUT_USB-OVRCR-N_CAP0.1 43 P1[27]
P1.28_MC2A_PCAP1.0_MAT0.0 44 P1[28]
P1.29_MC2B_PCAP1.1_MAT0.1 45 P1[29]
P1.30_VBUS_AD0.4 21 P1[30]
P1.31_SCK1_AD0.5 20 P1[31]
U7G$8
LPC176X
P2.0_PWM1.1_TXD1 75 P2[0]
P2.1_PWM1.2_RXD1 74 P2[1]
P2.2_PWM1.3_CTS1_TRACEDATA[3] 73 P2[2]
P2.3_PWM1.4_DCD1_TRACEDATA[2] 70 P2[3]
P2.4_PWM1.5_DSR1_TRACEDATA[1] 69 P2[4]
P2.5_PWM1.6_DTR1_TRACEDATA[0] 68 P2[5]
P2.6_PCAP1.0_RI1_TRACECLK 67 P2[6]
P2.7_RD2_RTS1 66 P2[7]
P2.8_TD2_TXD2 65 P2[8]
P2.9_USB-CONNECT_RXD2 64 P2[9]
P2.10_EINT0-N_NMI 53 P2[10]
P2.11_EINT1-N_I2STX-CLK 52 P2[11]
P2.12_EINT2-N_I2STX-WS 51 P2[12]
P2.13_EINT3-N_I2STX-SDA 50 P2[13]
U7G$9
LPC176X
P3.25_MAT0.0_PWM1.2 27 P3[25]
P3.26_STCLK_MAT0.1_PWM1.3 26 P3[26]
U7G$10
LPC176X
P4.28_RX-MCLK_MAT2.0_TXD3 82 P4[28]
P4.29_TX-MCLK_MAT2.1_RXD3 85 P4[29]
U7G$11
VIO_3V3X
BK1608HS220-T
FB2
C62 10u
C55 100n
C54 100n
C61 10u
C56 100n
C57 1u
C60 100n
1.5K R87
P1[0] R77 0R
P1[1] R78 0R
P1[4] R79 0R
P1[9] R80 22R
P1[10] R81 22R
P1[8] R82 22R
P1[14] R83 22R
P1[17] R84 0R
P1[16] R85 0R
REFCLKO
RSTOUT_N
U8
TXD0
TXD1
TXEN
RXD0/MODE0
RXD1/MODE1
CRS_DV/MODE2
RXER/PHYAD0
MDIO
MDC
NINT/REFCLKO
NRST
LED1/REGOFF
LED2/NINTSEL
VDD1A
VDD2A
VDDIO
VDDCR
XTAL1/CLKIN
XTAL2
RBIAS
GND
TXP TD+
TXN TD-
RXP RD+
RXN RD-
LAN8720
R68 49.9R
R69 49.9R
C58 100n
R70 49.9R
R71 49.9R
C59 100n
C64 18pF
C65 18pF
C66 18pF
C67 18pF
U9
NC VCC
A
GND Y
74LVC1G04GV
C50 100n
R86 UL
P1[15] R89 22R
LED4 RED
LED3 RED
270R R76
10K R74
270R R75
Y4 25MHz
R88 1M
C63 18pF
C68 18pF
12.1K R67
R57 3.3K
R58 3.3K
C53 100n
IC1
SCL
WP
A2
A1
A0
VCC
SDA
GND
EEPROM Array
24AA256SN
P0[20]
P0[19]
Q3 BCX17
P2[9]
R73 49.9R
1.5K R72
USB-D+
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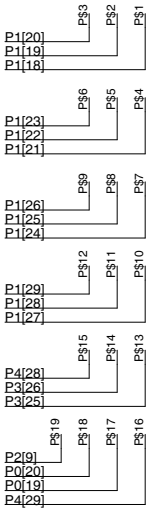

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