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LPC3154 Powering and Unused parts

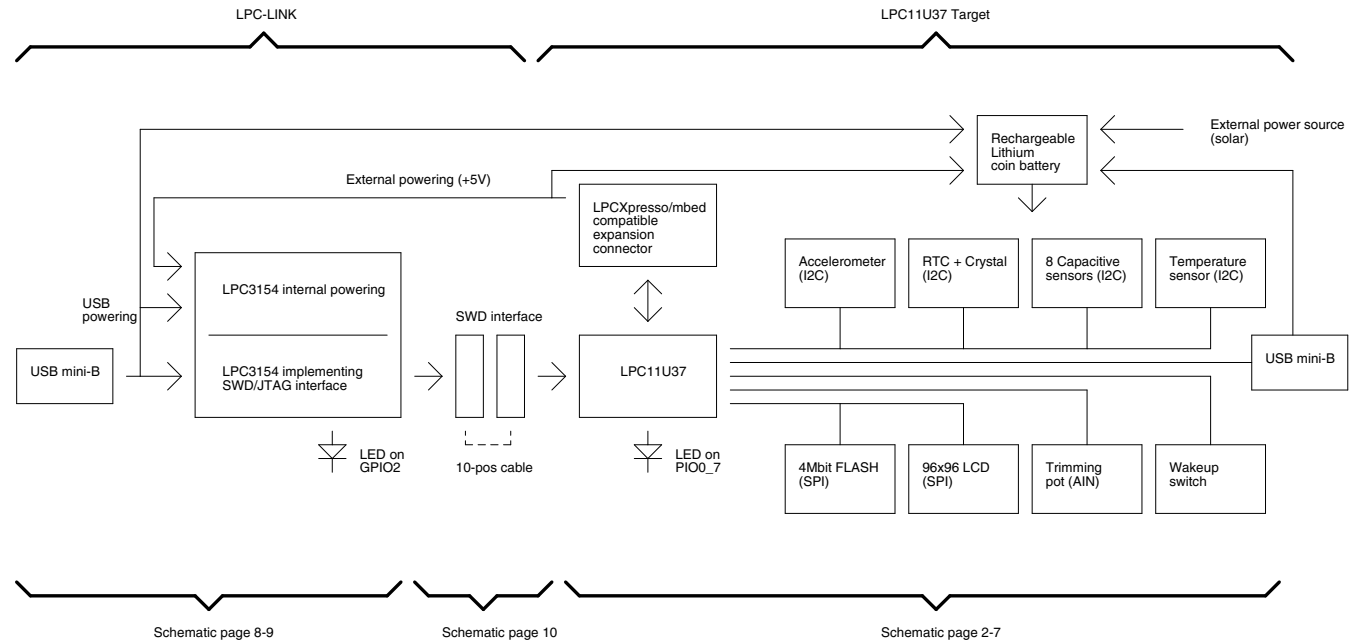
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LPC3154 Digital I/O

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JTAG Interface

Design Overview - Low-power Application Board (Oryx)



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.

Rev B

Changed U1 to LPC11U37. R18 mounted. Q2 not mounted. Added C82-C89, R75, SW4. Changed C43 and C44.

Rev A

First version for volume production.



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TITLE: Low-power Application Board rev B

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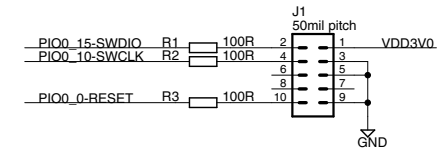
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LPC11U37 MCU and Reset generation

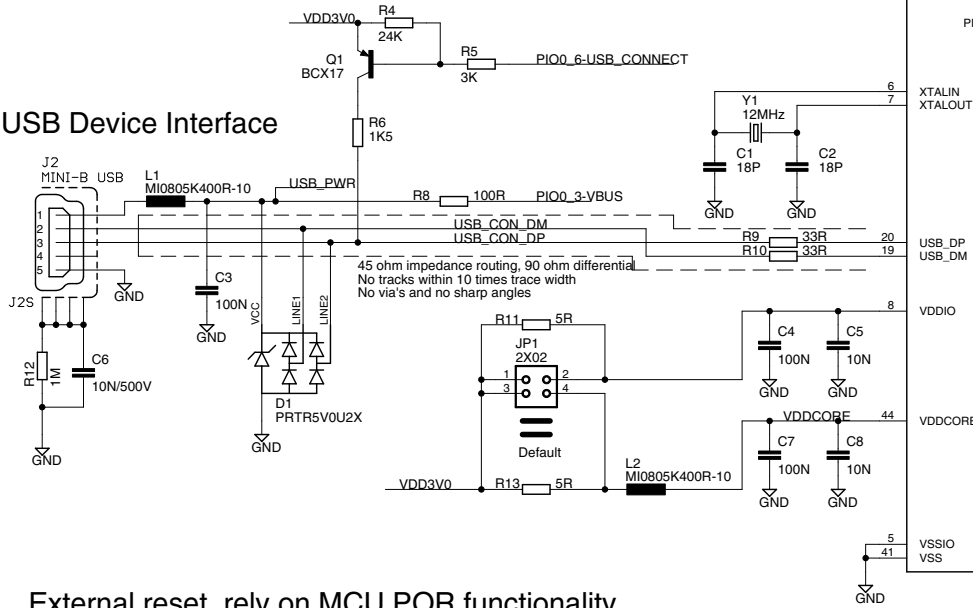
LPC11U37 MCU

50MHz Active mode: 8mA (typ)
 12MHz Active mode: 2mA (typ)
 Deep sleep mode: 360uA (typ)
 Power down mode: 2uA (typ)
 Deep power down mode: 220nA (typ)

SWD interface



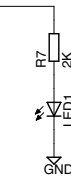
USB Device Interface



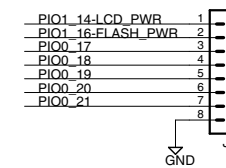
U1
LPC11U37

RESET/PIO0_0	3	PIO0_0-RESET
PIO0_1/CLKOUT/CT32B0_MAT2/USB_FTGGLE	4	PIO0_1-ISP_EN
PIO0_2/SSEL0/CT16B0_CAP0	10	PIO0_2-SSEL0
PIO0_3/USB_VBUS	14	PIO0_3-VBUS
PIO0_4/SCL	15	PIO0_4-SCL
PIO0_5/SDA	16	PIO0_5-SDA
PIO0_6/USB_CONNECT/SCK0	22	PIO0_6-USB_CONNECT
PIO0_7/CTS	23	PIO0_7
PIO0_8/MISO0/CT16B0_MAT0	27	PIO0_8-LCD_DISP
PIO0_9/MOSI0/CT16B0_MAT1	28	PIO0_9-MOSI0
SWCLK/PIO0_10/SCK0/CT16B0_MAT2	29	PIO0_10-SWCLK
TDI/PIO0_11/AD0/CT32B0_MAT3	32	PIO0_11-RTC_IRQ
TMS/PIO0_12/AD1/CT32B1_CAP0	33	PIO0_12-CAP_IRQ
TDO/PIO0_13/AD2/CT32B1_MAT0	34	PIO0_13-AC2_IRQ
TRST/PIO0_14/AD3/CT32B1_MAT1	35	PIO0_14-AC2_IRQ
SWDIO/PIO0_15/AD4/CT32B1_MAT2	39	PIO0_15-SWDIO
PIO0_16/AD5/CT32B1_MAT3/WAKEUP	40	PIO0_16-WAKEUP
PIO0_17/RTS/CT32B0_CAP0/SCLK	45	PIO0_17
PIO0_18/RXD/CT32B0_MAT0	46	PIO0_18
PIO0_19/RXD/CT32B0_MAT1	47	PIO0_19
PIO0_20/CT16B1_CAP0	9	PIO0_20
PIO0_21/CT16B1_MAT0/MOSI1	17	PIO0_21
PIO0_22/AD6/CT16B1_MAT1/MISO1	30	PIO0_22
PIO0_23/AD7	42	PIO0_23-AD7
PIO1_13/DTR/CT16B0_MAT0/TXD	36	PIO1_13-AIN_PWR
PIO1_14/DSR/CT16B0_MAT1/RXD	37	PIO1_14-LCD_PWR
PIO1_15/DCD/CT16B0_MAT2/SCK1	43	PIO1_15-CAP_SLEEP
PIO1_16/RI/CT16B0_CAP0	48	PIO1_16-FLASH_PWR
PIO1_19/DTR/SSEL1	2	PIO1_19-SSEL1
PIO1_20/DSR/SCK1	13	PIO1_20-SCK1
PIO1_21/DCD/MISO1	26	PIO1_21-MISO1
PIO1_22/RX/MOSI1	38	PIO1_22-MOSI1
PIO1_23/CT16B1_MAT1/SSEL1	18	PIO1_23-I2C_PULLUP
PIO1_24/CT32B0_MAT0	21	PIO1_24
PIO1_25/CT32B0_MAT1	1	PIO1_25
PIO1_26/CT32B0_MAT2/RXD	11	PIO1_26
PIO1_27/CT32B0_MAT3/TXD	12	PIO1_27
PIO1_28/CT32B0_CAP0/SCLK	24	PIO1_28
PIO1_29/SCK0/CT32B0_CAP1	31	PIO1_29-SCK0
PIO1_31	25	PIO1_31

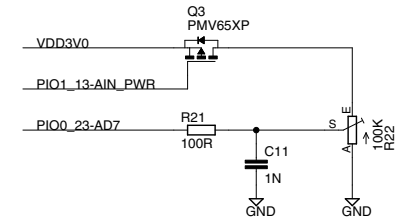
LED on: 3.4mA (typ)



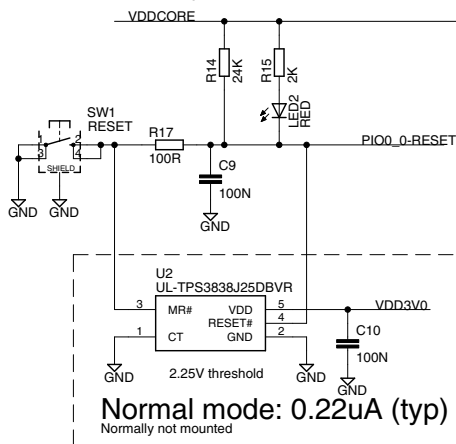
Current consumption indication



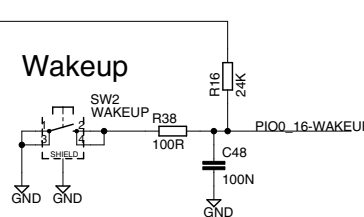
Analog Input Active: 30uA (typ)



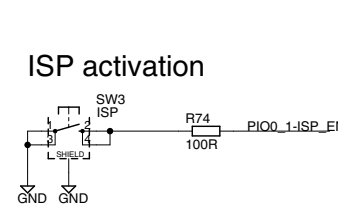
External reset, rely on MCU POR functionality



Wakeup



ISP activation



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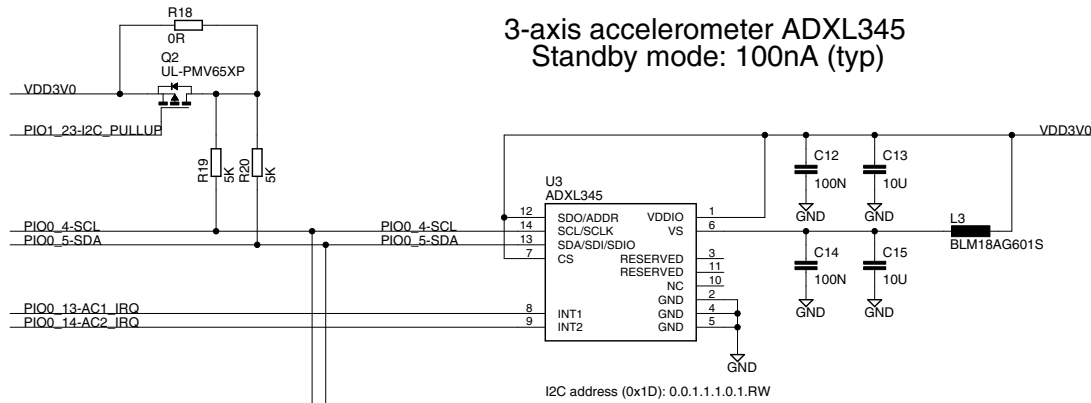
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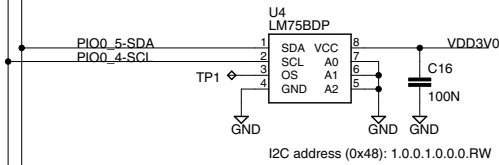
I2C peripheral: RTC, Accelerometer and Temperature sensor

3-axis accelerometer ADXL345
Standby mode: 100nA (typ)

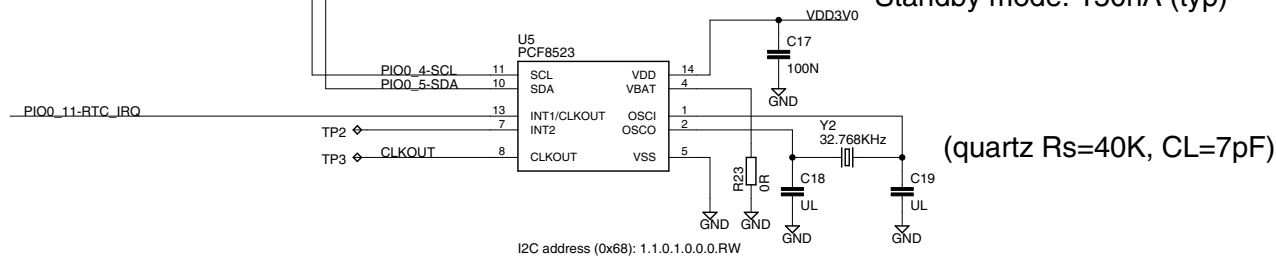


Note: Special mounting to allow for tap detection

Temperature sensor
I2C active: 300uA (max)
Normal mode: 100uA (typ)
Shutdown mode: 0.2uA (typ)



Real Time Clock (PCF8523) with I2C interface
Active mode: 200uA (max, when I2C active)
Standby mode: 150nA (typ)



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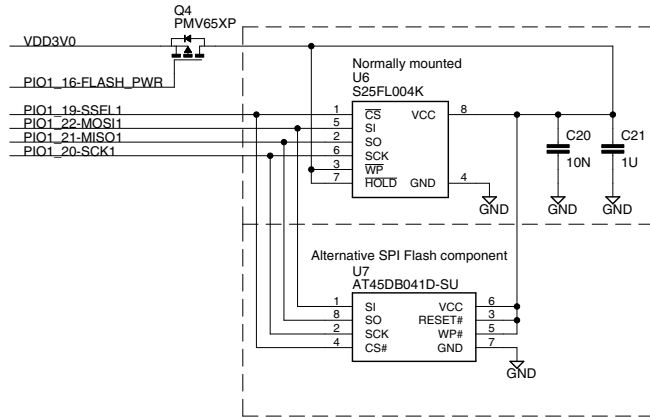
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SPI peripheral: LCD and FLASH

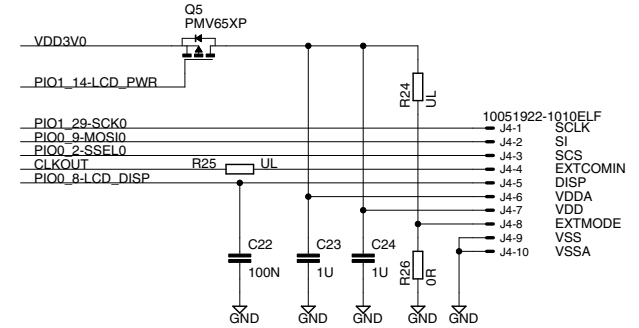
4Mbit SPI-NOR Flash
 Standby mode: 20uA (max)
 Deep power down mode: 1.5uA (typ)

SPI-channel #1



96x96 LCD LS013B4DN04
 Standby mode: 2uA (typ)
 1Hz update mode: 4uA (typ)

SPI-channel #0



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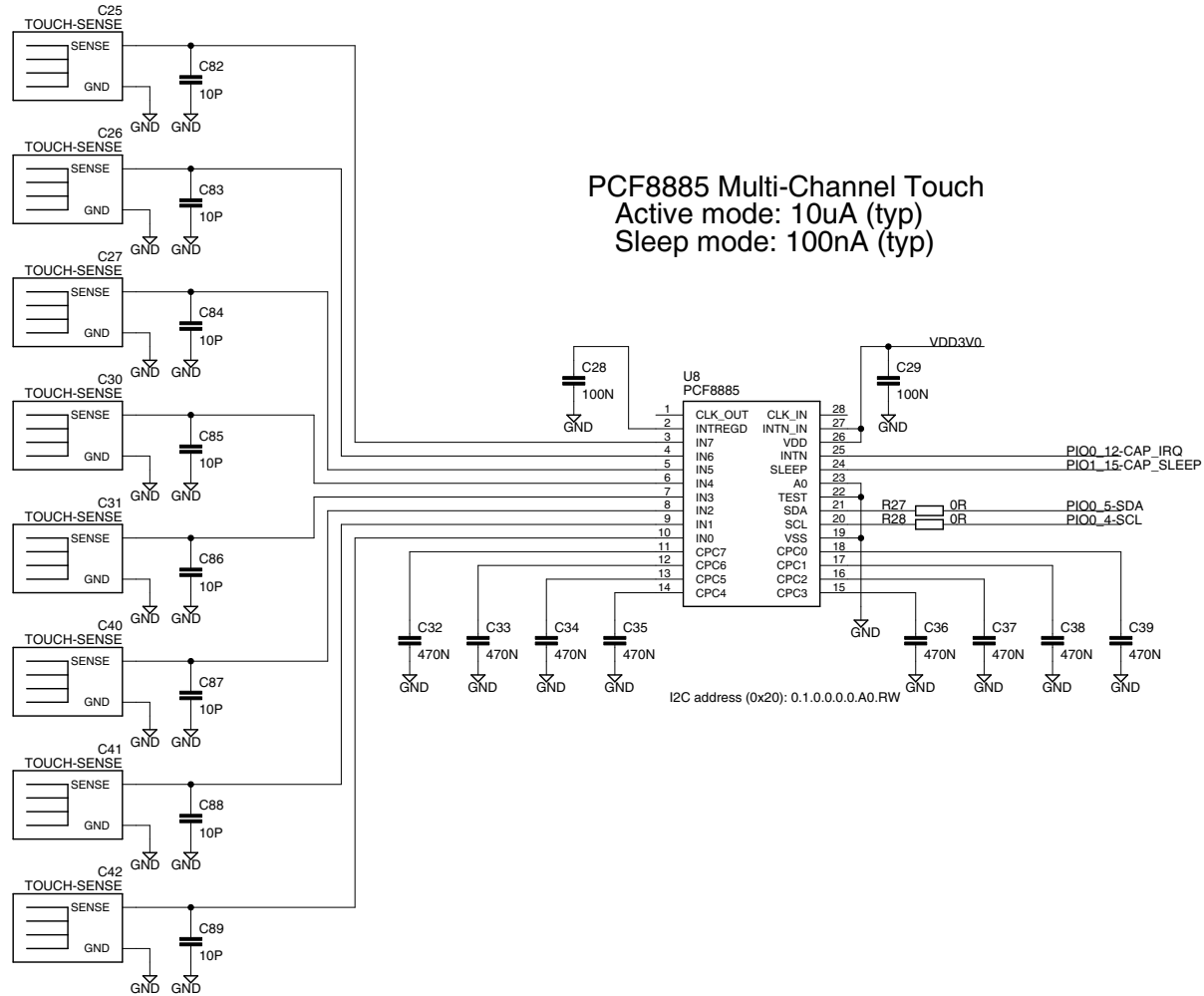
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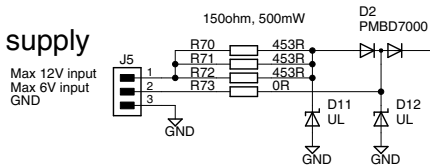
Capacitive sensors

Cap touch Input: 1x Slider, 4x Buttons



Power supply with Rechargeable Lithium battery

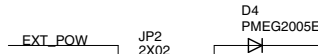
External (solar panel) supply



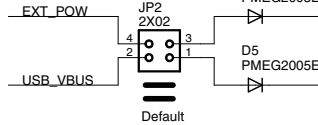
From LPC11U37 USB i/f



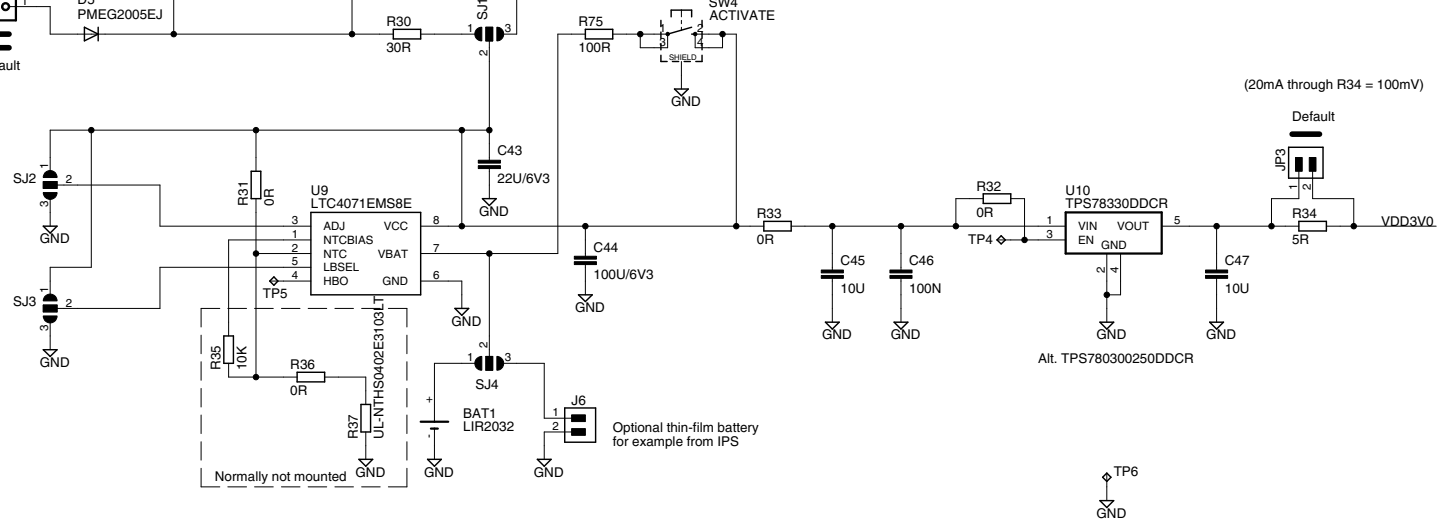
From LPCXpresso pinning i/f



From LPC-LINK USB i/f



Battery activation



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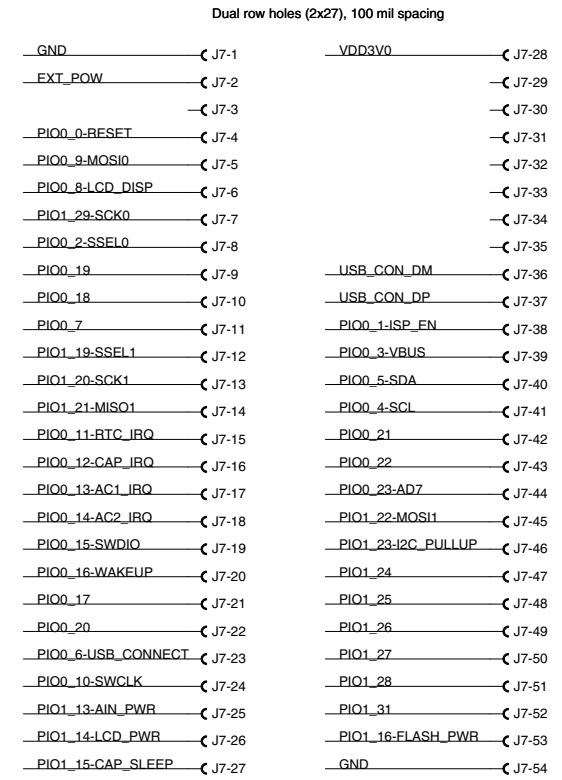
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LPCXpresso connector (not populated)

Expansion Connector
(superset of mbed pinning)

mbed	LPCXpresso
GND	GND
VIN (4.5-14V)	VIN (4.5-5.5V)
VB (battery supply)	not used
nR (reset)	PIO0_0 RESET
SPI1-MOSI	PIO0_9 MOSI/SWO
SPI1-MISO	PIO0_8 MISO
SPI1-SCK	PIO1_29 SCK
GPIO	PIO0_2 SSEL
UART1-TX / I2C1-SDA	PIO0_19 TXD
UART1-RX / I2C1-SCL	PIO0_18 RXD
SPI2-MOSI	PIO0_7
SPI2-MISO	PIO1_19
SPI2-SCL / UART2-TX	PIO1_20
UART2-RX	PIO1_21
AIN0	PIO0_11 AD0
AIN1	PIO0_12 AD1
AIN2	PIO0_13 AD2
AIN3 / AOUT	PIO0_14 AD3
AIN4	PIO0_15 AD4/SWDIO
AIN5	PIO0_16 AD5
	PIO0_17
	PIO0_20
	PIO0_6
	PIO0_10 SWCLK
	PIO1_13
	PIO1_14
	PIO1_15



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-
not used	RD- (Ethernet)
not used	RD+ (Ethernet)
not used	TD- (Ethernet)
not used	TD+ (Ethernet)
USB_DM	D- (USB)
USB_DP	D+ (USB)
PIO0_1	CAN-RD
PIO0_3	CAN-TD
PIO0_5 I2C-SDA	UART3-TX / I2C2-SDA
PIO0_4 I2C-SCL	UART3-RX / I2C2-SCL
PIO0_21	PWMOUT0
PIO0_22	PWMOUT1
PIO0_23	PWMOUT2
PIO1_22	PWMOUT3
PIO1_23	PWMOUT4
PIO1_24	PWMOUT5
PIO1_25	
PIO1_26	
PIO1_27	
PIO1_28	
PIO1_31	
PIO1_16	
GND	



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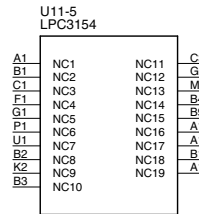
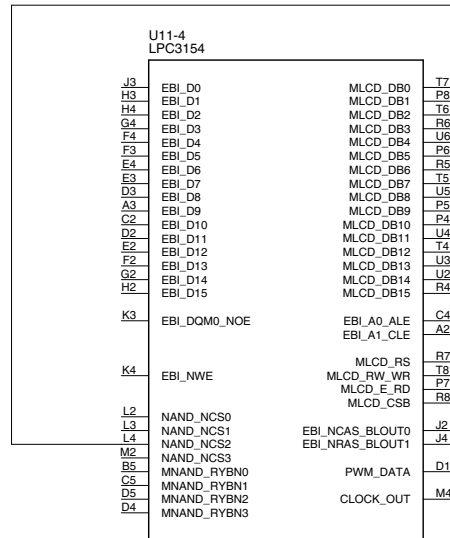
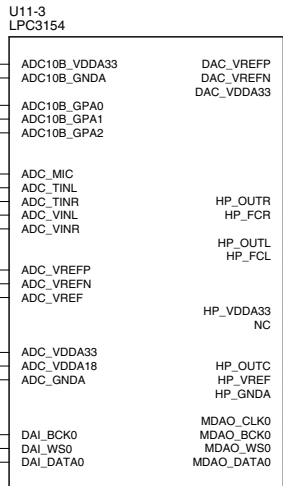
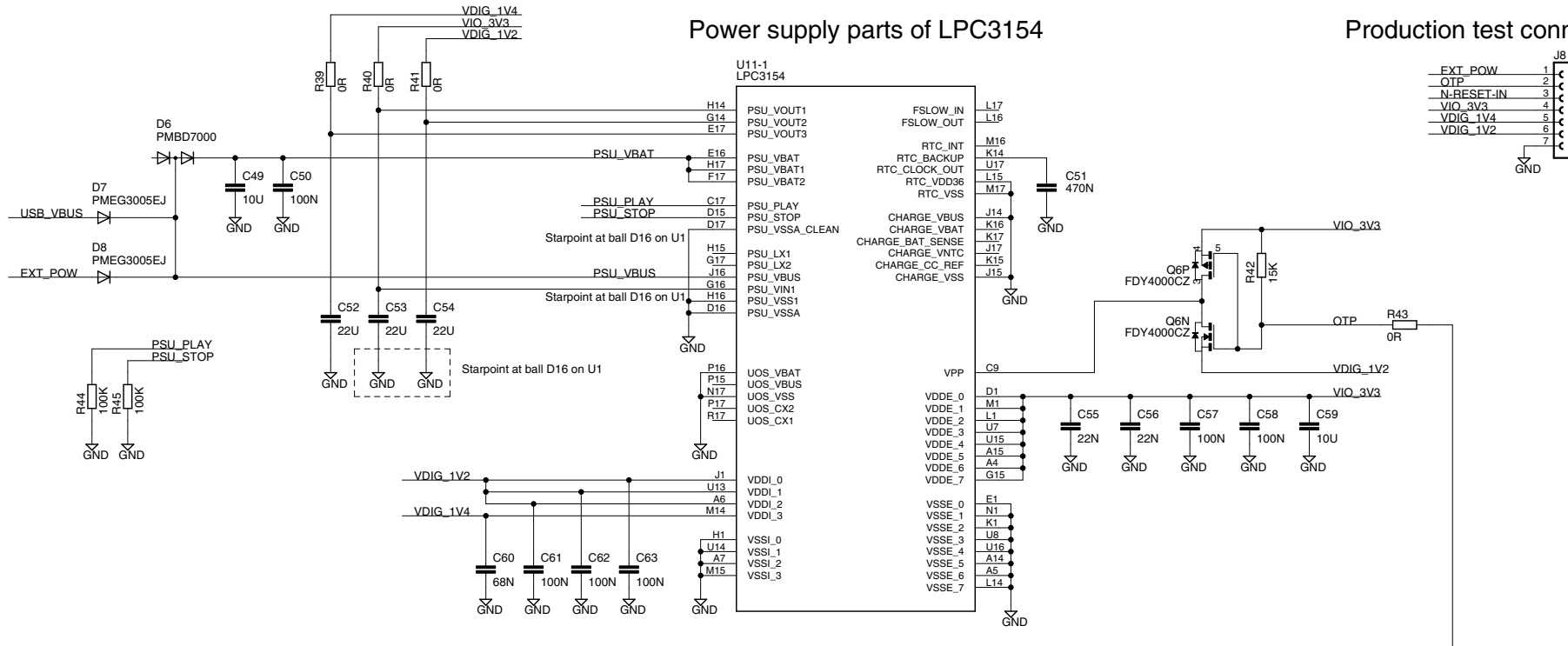
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LPC-Link (Embedded JTAG)

Power supply parts of LPC3154

Production test connector



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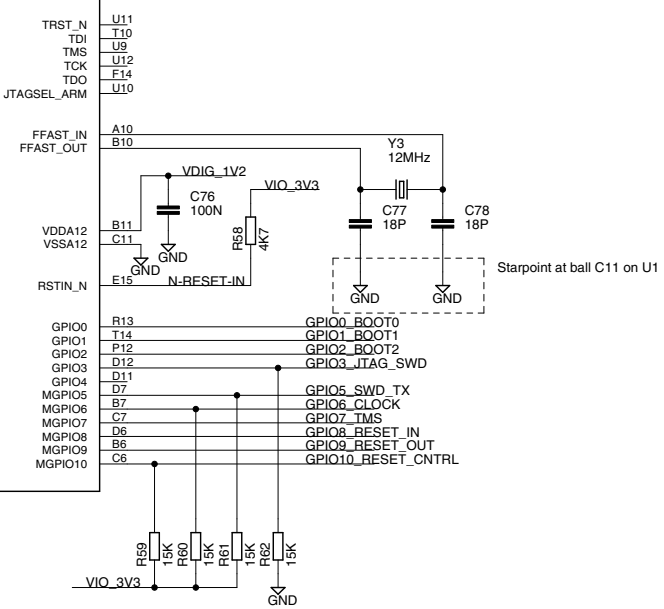
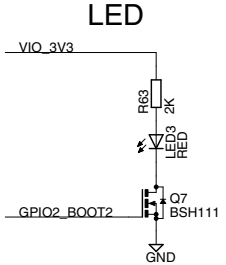
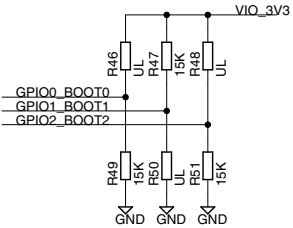
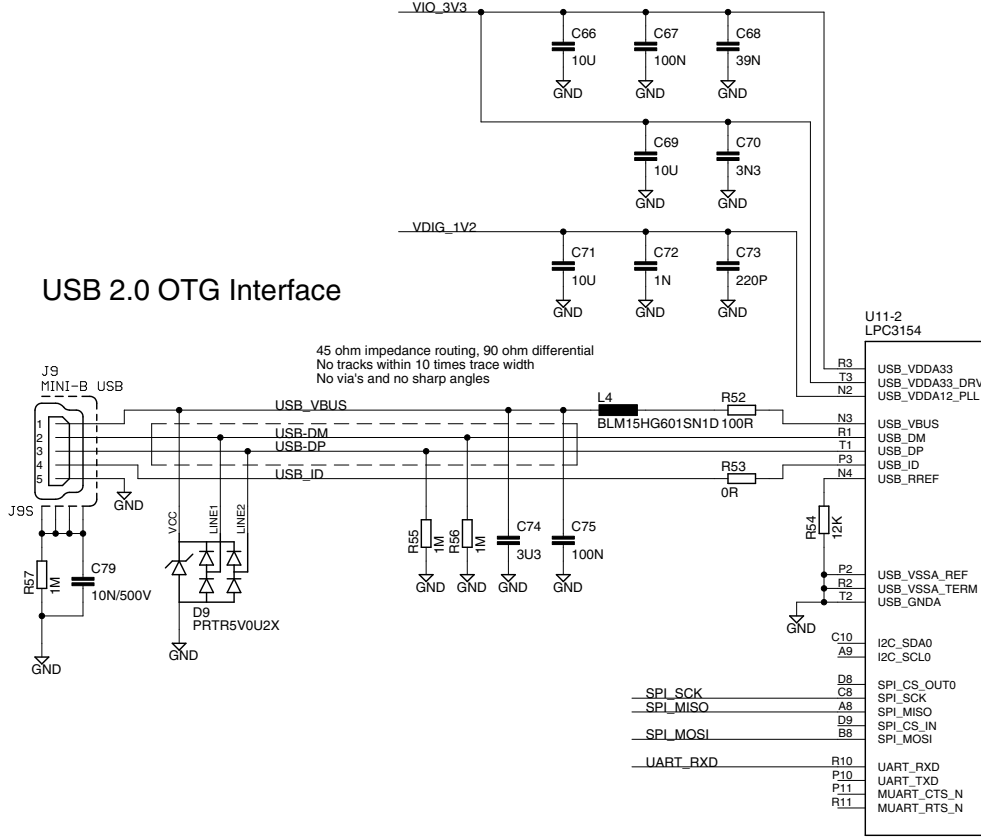

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LPC-Link (Embedded JTAG)

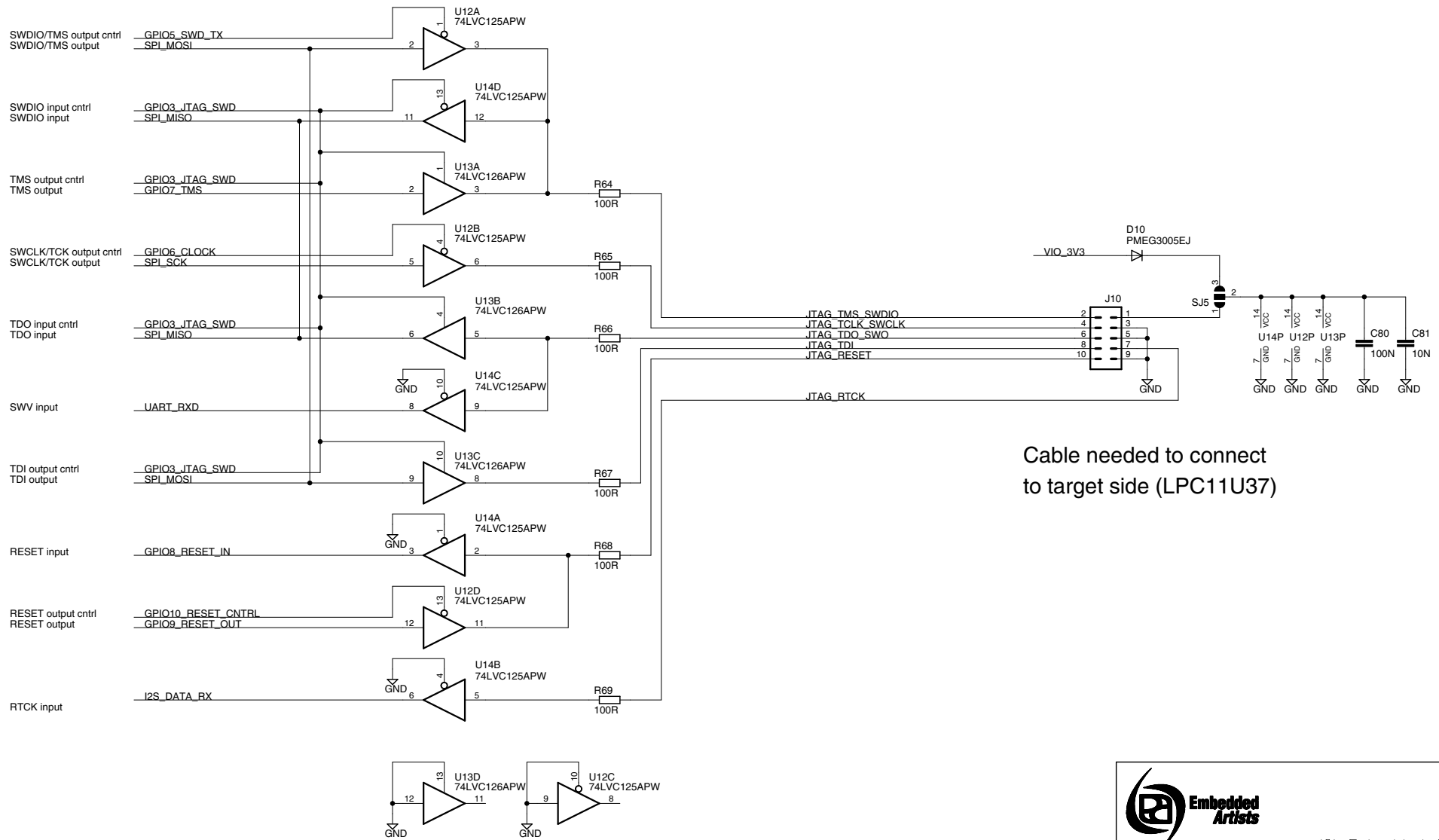
Boot mode - USB via DFU class

USB 2.0 OTG Interface

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SWD/JTAG Interface



Cable needed to connect to target side (LPC11U37)



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