Page 2

Target MCU: LPC1115
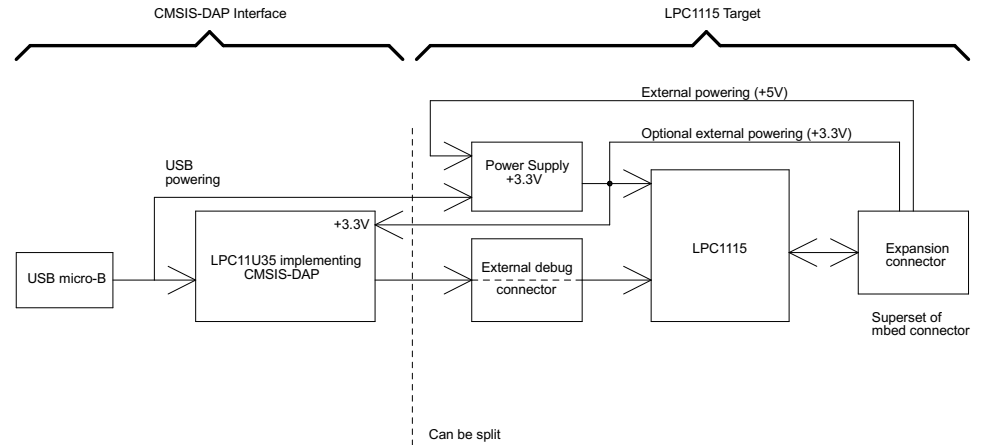
Page 3

LPCXpresso expansion connector

Page 4

CMSIS-DAP interface

Design Overview

CMSIS-DAP Interface

LPC1115 Target

External powering (+5V)

Optional external powering (+3.3V)

USB powering

Power Supply +3.3V

+3.3V

USB micro-B

LPC11U35 implementing CMSIS-DAP

External debug connector

LPC1115

Expansion connector

Superset of mbed connector

Can be split

NXP board number: OM13087

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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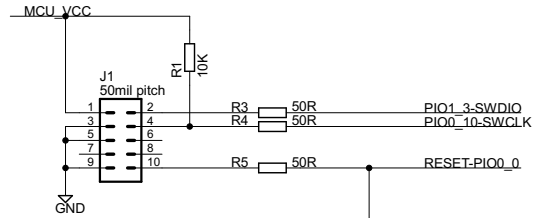TITLE: LPCXpresso1115 with CMSIS-DAP rev A
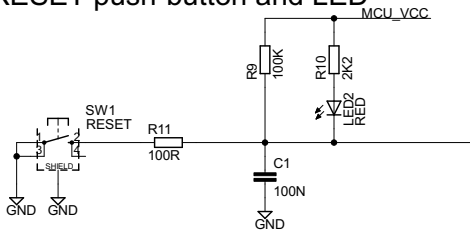
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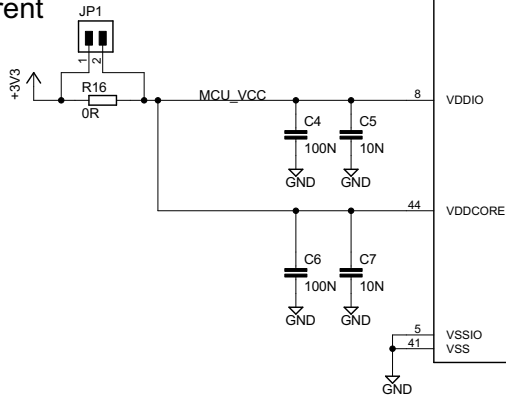Date: 2016-07-16 14:59:35   Sheet: 1/4

Target MCU: LPC1115

Debug connector (SWD)

MCU_VCC

R1
10K

J1
50mil pitch

R3 50R   PIO1_3-SWDIO
R4 50R   PIO0_10-SWCLK

R5 50R   RESET-PIO0_0

GND

RGB-LED

+3V3

R2
0R

LED1

PIO0_7-RED_LED   R6
750R

PIO0_9-BLUE_LED   R7
750R

PIO0_8-GREEN_LED R8
1K5

RESET push-button and LED

MCU_VCC

R9
100K

R10
2K2

LED2
RED

SW1
RESET

R11
100R

C1
100N

GND GND

GND

Bootload enable

MCU_VCC

R14
100K

SW2
ISP-ENABLE   R15
100R   PIO0_1-ISP_EN

GND GND

+3V3

R12 R13
2K2 2K2

U1
LPC1115FBD48/303

RESET/PIO0_0	3	RESET-PIO0_0
PIO0_1/CLKOUT/CT32B0_MAT2	4	PIO0_1-ISP_EN
PIO0_2/SSEL0/CT16B0_CAP0	10	PIO0_2
PIO0_3	14	PIO0_3
PIO0_4/SCL	15	PIO0_4
PIO0_5/SDA	16	PIO0_5
PIO0_6/SCK0	22	PIO0_6
PIO0_7/CTS	23	PIO0_7-RED_LED
PIO0_8/MISO0/CT16B0_MAT0	27	PIO0_8-GREEN_LED
PIO0_9/MOSI0/CT16B0_MAT1	28	PIO0_9-BLUE_LED
SWCLK/PIO0_10/SCK0/CT16B0_MAT2	29	PIO0_10-SWCLK
TDI/PIO0_11/AD0/CT32B0_MAT3	32	PIO0_11

XTALIN   6
XTALOUT 7

Y1
12MHz

C2   C3
18P   18P

GND   GND

Resistor can be replaced to measure current

JP1

+3V3

R16
0R

MCU_VCC

TMS/PIO1_0/AD1/CT32B1_CAP0	33	PIO1_0
TDO/PIO1_1/AD2/CT32B1_MAT0	34	PIO1_1
TRST/PIO1_2/AD3/CT32B1_MAT1	35	PIO1_2
SWDIO/PIO1_3/AD4/CT32B1_MAT2	39	PIO1_3-SWDIO
PIO1_4/AD5/CT32B1_MAT3/WAKEUP	40	PIO1_4
PIO1_5/RTS/CT32B0_CAP0	45	PIO1_5
PIO1_6/RXD/CT32B0_MAT0	46	PIO1_6
PIO1_7/TXD/CT32B0_MAT1	47	PIO1_7
PIO1_8/CT16B1_CAP0	9	PIO1_8
PIO1_9/CT16B1_MAT0	17	PIO1_9
PIO1_10/AD6/CT16B1_MAT1	30	PIO1_10
PIO1_11/AD7	42	PIO1_11

VDDIO   8

C4   C5
100N   10N

GND   GND

VDDCORE 44

C6   C7
100N   10N

GND   GND

PIO2_0/DTR/SSEL1	2	PIO2_0
PIO2_1/DSR/SCK1	13	PIO2_1
PIO2_2/DCD/MISO1	26	PIO2_2
PIO2_3/RI/MOSI1	38	PIO2_3
PIO2_4	19	PIO2_4
PIO2_5	20	PIO2_5
PIO2_6	1	PIO2_6
PIO2_7	11	PIO2_7
PIO2_8	12	PIO2_8
PIO2_9	24	PIO2_9
PIO2_10	25	PIO2_10
PIO2_11/SCK0	31	PIO2_11
PIO3_0/DTR	36	PIO3_0
PIO3_1/DSR	37	PIO3_1
PIO3_2/DCD	43	PIO3_2
PIO3_3/RI	48	PIO3_3
PIO3_4	18	PIO3_4
PIO3_5	21	PIO3_5

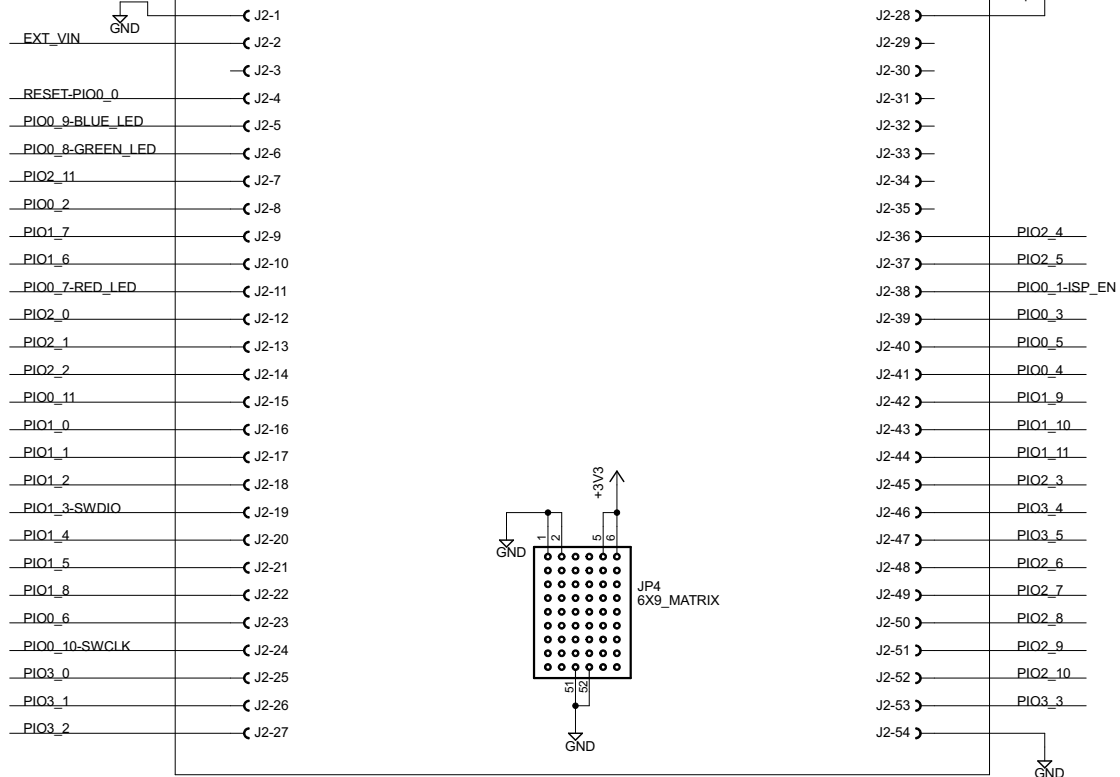VSSIO   5
VSS   41

GND

CMSIS-DAP side

Expansion Connector
(superset of mbed pinning)

Dual row holes (2x27), 100 mil spacing

mbed	LPCXpresso	
GND	GND	
VIN (4.5-14V)	VIN (4.5-5.5V)	
VB (battery supply)	not used	
nR (reset)	PIO0_0	RESET_N
SPI1-MOSI	PIO0_9	MOSI
SPI1-MISO	PIO0_8	MISO
SPI1-SCK	PIO2_11	SCK
GPIO	PIO0_2	SSEL
UART1-TX / I2C1-SDA	PIO1_7	TXD
UART1-RX / I2C1-SCL	PIO1_6	RXD
SPI2-MOSI	PIO0_7	
SPI2-MISO	PIO2_0	
SPI2-SCK / UART2-TX	PIO2_1	
UART2-RX	PIO2_2	
AIN0	PIO0_11	AD0
AIN1	PIO1_0	AD1
AIN2	PIO1_1	AD2
AIN3 / AOUT	PIO1_2	AD3
AIN4	PIO1_3	AD4/SWDIO
AIN5	PIO1_4	AD5
	PIO1_5	
	PIO1_8	
	PIO0_6	
	PIO0_10	SWCLK
	PIO3_0	
	PIO3_1	
	PIO3_2	

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)
PIO2_4		D- (USB)
PIO2_5		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
PIO1_9		PWMOUT0
PIO1_10		PWMOUT1
PIO1_11		PWMOUT2
PIO2_3		PWMOUT3
PIO2_4		PWMOUT4
PIO2_5		PWMOUT5
PIO2_6		
PIO2_7		
PIO2_8		
PIO2_9		
PIO2_10		
PIO3_3		
GND		

GND — J2-1
EXT_VIN — J2-2
J2-3
RESET-PIO0_0 — J2-4
PIO0_9-BLUE_LED — J2-5
PIO0_8-GREEN_LED — J2-6
PIO2_11 — J2-7
PIO0_2 — J2-8
PIO1_7 — J2-9
PIO1_6 — J2-10
PIO0_7-RED_LED — J2-11
PIO2_0 — J2-12
PIO2_1 — J2-13
PIO2_2 — J2-14
PIO0_11 — J2-15
PIO1_0 — J2-16
PIO1_1 — J2-17
PIO1_2 — J2-18
PIO1_3-SWDIO — J2-19
PIO1_4 — J2-20
PIO1_5 — J2-21
PIO1_8 — J2-22
PIO0_6 — J2-23
PIO0_10-SWCLK — J2-24
PIO3_0 — J2-25
PIO3_1 — J2-26
PIO3_2 — J2-27

+3V3

J2-28 — +3V3
J2-29
J2-30
J2-31
J2-32
J2-33
J2-34
J2-35
J2-36 — PIO2_4
J2-37 — PIO2_5
J2-38 — PIO0_1-ISP_EN
J2-39 — PIO0_3
J2-40 — PIO0_5
J2-41 — PIO0_4
J2-42 — PIO1_9
J2-43 — PIO1_10
J2-44 — PIO1_11
J2-45 — PIO2_3
J2-46 — PIO3_4
J2-47 — PIO3_5
J2-48 — PIO2_6
J2-49 — PIO2_7
J2-50 — PIO2_8
J2-51 — PIO2_9
J2-52 — PIO2_10
J2-53 — PIO3_3
J2-54

GND

+3V3

JP4
6X9_MATRIX

GND
GND

CMSIS-DAP Debug Interface

CMSIS-DAP USB interface
(micro-B connector)

J4
ZX62D-B-5P8
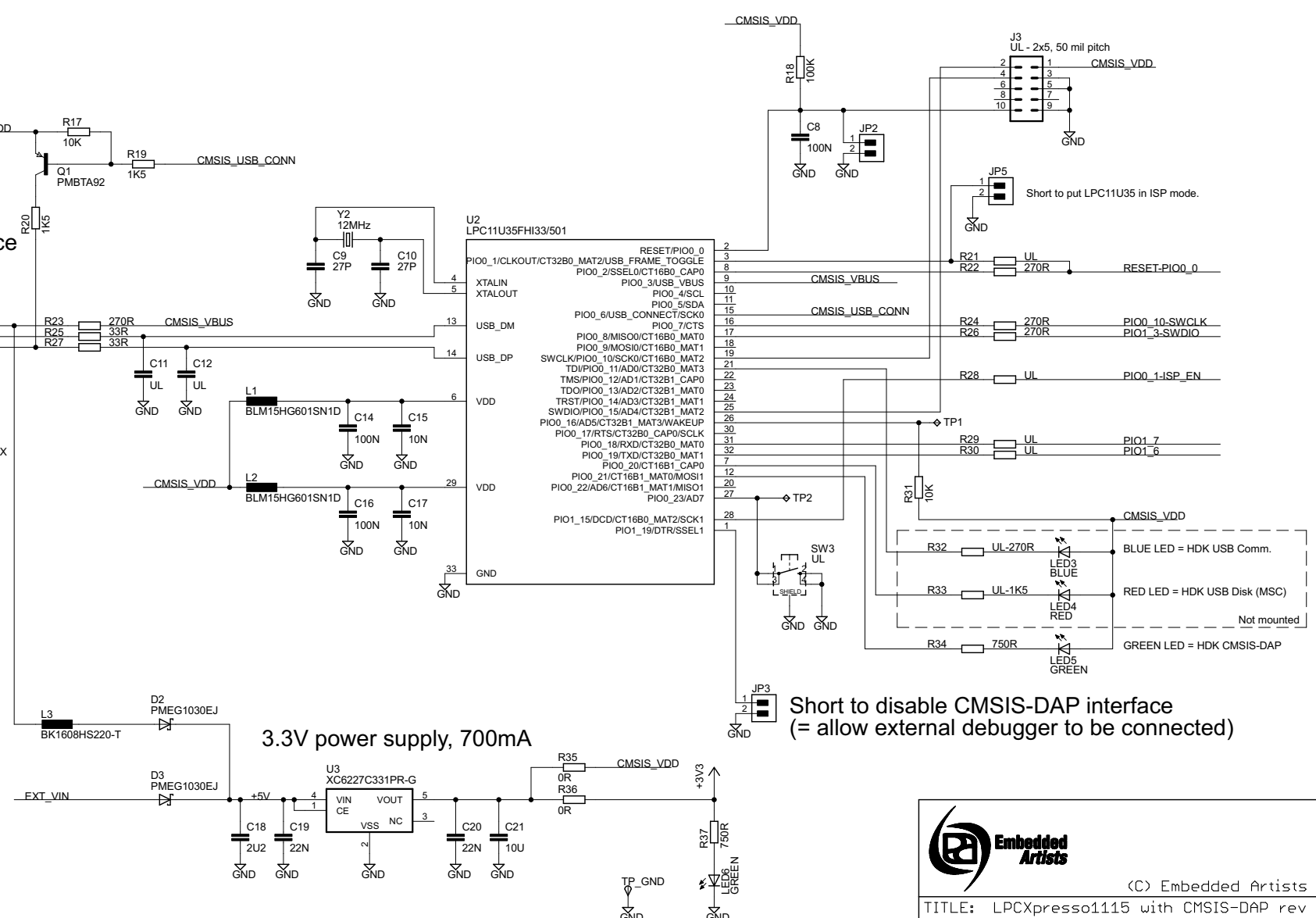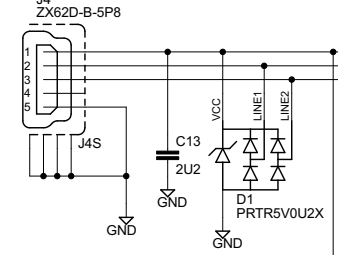
3.3V power supply, 700mA

Short to put LPC11U35 in ISP mode.

J3
UL - 2x5, 50 mil pitch

U2
LPC11U35FHI33/501

RESET/PIO0_0
PIO0_1/CLKOUT/CT32B0_MAT2/USB_FRAME_TOGGLE
PIO0_2/SSEL0/CT16B0_CAP0
PIO0_3/USB_VBUS
PIO0_4/SCL
PIO0_5/SDA
PIO0_6/USB_CONNECT/SCK0
PIO0_7/CTS
PIO0_8/MISO0/CT16B0_MAT0
PIO0_9/MOSI0/CT16B0_MAT1
SWCLK/PIO0_10/SCK0/CT16B0_MAT2
TDI/PIO0_11/AD0/CT32B0_MAT3
TMS/PIO0_12/AD1/CT32B1_CAP0
TDO/PIO0_13/AD2/CT32B1_MAT0
TRST/PIO0_14/AD3/CT32B1_MAT1
SWDIO/PIO0_15/AD4/CT32B1_MAT2
PIO0_16/AD5/CT32B1_MAT3/WAKEUP
PIO0_17/RTS/CT32B0_CAP0/SCLK
PIO0_18/RXD/CT32B0_MAT0
PIO0_19/TXD/CT32B0_MAT1
PIO0_20/CT16B1_CAP0
PIO0_21/CT16B1_MAT0/MOSI1
PIO0_22/AD6/CT16B1_MAT1/MISO1
PIO0_23/AD7
PIO1_15/DCD/CT16B0_MAT2/SCK1
PIO1_19/DTR/SSEL1

XTALIN
XTALOUT

USB_DM
USB_DP

VDD
VDD

GND

Y2
12MHz

C9
27P

C10
27P

C11
UL

C12
UL

L1
BLM15HG601SN1D

C14
100N

C15
10N

L2
BLM15HG601SN1D

C16
100N

C17
10N

CMSIS_VDD

CMSIS_VBUS

CMSIS_USB_CONN

R17
10K

Q1
PMBTA92

R19
1K5

R20
1K5

R18
100K

C8
100N

JP2

JP5

R21   UL
R22   270R   RESET-PIO0_0

R24   270R   PIO0_10-SWCLK
R26   270R   PIO1_3-SWDIO

R28   UL   PIO0_1-ISP_EN

R29   UL   PIO1_7
R30   UL   PIO1_6

R31
10K

TP1
TP2

CMSIS_VDD

SW3
UL

L SHIELD

R32   UL-270R   LED3 BLUE   BLUE LED = HDK USB Comm.
R33   UL-1K5   LED4 RED   RED LED = HDK USB Disk (MSC)
Not mounted
R34   750R   LED5 GREEN   GREEN LED = HDK CMSIS-DAP

JP3
Short to disable CMSIS-DAP interface
(= allow external debugger to be connected)

R23   270R
R25   33R   CMSIS_VBUS
R27   33R

J4S

C13
2U2

D1
PRTR5V0U2X

VCC LINE1 LINE2

L3
BK1608HS220-T

D2
PMEG1030EJ

EXT_VIN

D3
PMEG1030EJ

+5V

U3
XC6227C331PR-G

VIN   VOUT
CE
VSS   NC

C18
2U2

C19
22N

C20
22N

C21
10U

R35
0R   CMSIS_VDD

R36
0R   +3V3

R37
750R   LED6 GREEN

TP_GND

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