Processor

U2
MC9S08JS16CWJ

5V
R1 1k5
C6 100nF
VDD_BDM

U1C SN74LV125AD
BKGD/SWD_I

VDD_BDM
R3 100K
R4 47R
T_BKGD/SWD
BKGD/SWD_IO

U1B SN74LV125AD
BKGD/SWD_O
BKGD/SWD_DRV

VDD_BDM
R6 100K
R7 47R
T_RST
RST_IO

U1D SN74LV125AD
RSTn_O

VDD_BDM
R8 100K
R9 47R
T_SWCLK
SWCLK_BO

U1A SN74LV125AD
SWCLK_O
SWCLK_DRV

BKGD/SWD_I 8 PTA0/KBIP0/TPMCH0
BKGD/SWD_O 9 PTA1/KBIP1/MISO
SWCLK_O 10 PTA2/KBIP2/MOSI
BKGD/SWD_DRV 11 PTA3/KBIP3/SPSCK
12 PTA4/KBIP4/SS*
PTA5 18 PTA5/KBIP5/TPMCH1
PTA6 19 PTA6/KBIP6/RxD
PTA7 20 PTA7/KBIP7/TxD

Vusb33 17
Vdd 13

PTB4/XTAL 1
PTB5/EXTAL 2
Vssosc 3

RSTn_O 4
SWCLK_DRV 5
BKGD/LED 6
BLMS 7

PTB0/IRQ/TCLK
PTB1/RESET*
PTB2/BKGD/MS
PTB3/BLMS*

USBDN 15
USBDP 16

Vss 14

Gnd1   Gnd2

Vusb   5V
C3 10uF/10V   C1 470nF
C2 100nF   C4 10uF/10V

Y1 CX5032GB12000H0PESZZ
R2 1M
OSC1
C5 18pF
OSC2
C7 18pF

JP1
D1 LED Green
R5 680R
5V
USB Activity

open source hardware

USBDP
USBDM
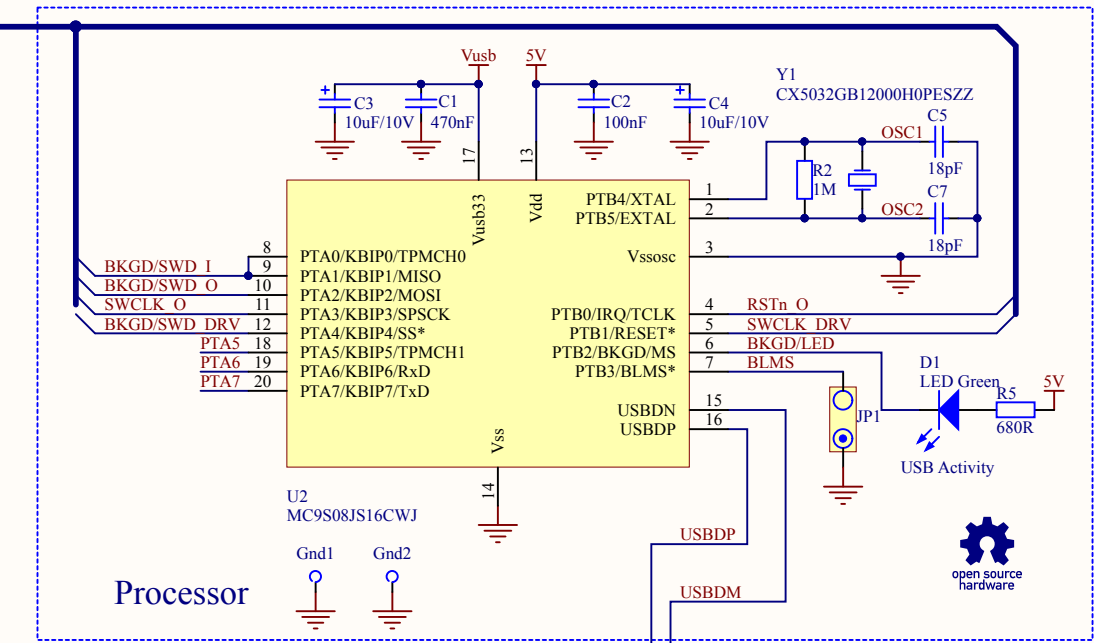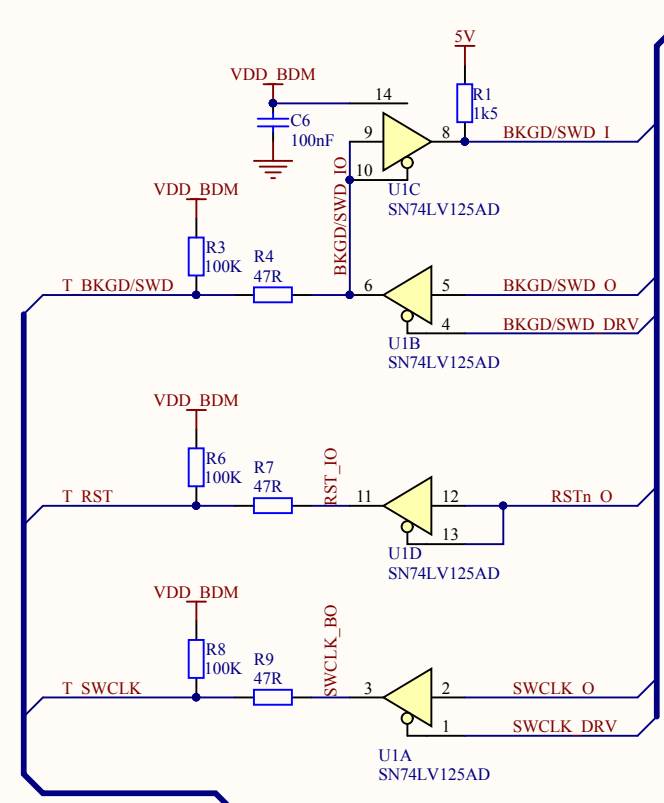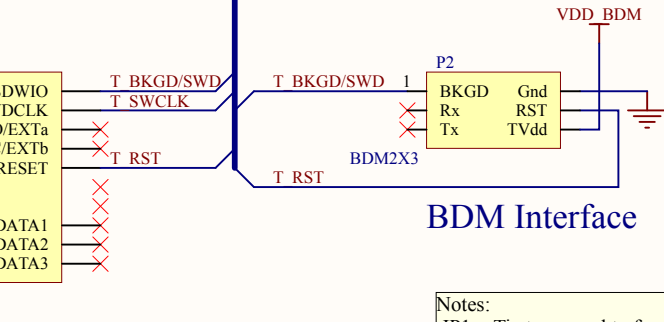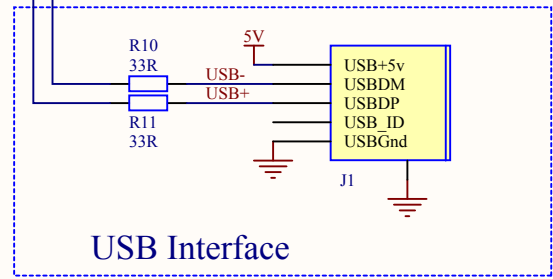
NOTE:
TI SN74LV125 devices must be used since they are 5V I/O tolerant.
Similar devices from other manufacturers may not be.

Revision:
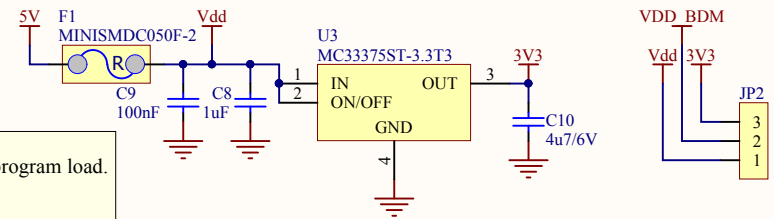1.0 1st Release
1.1 Added missing Gnd connection on PCB
2.1 Added regulator etc

USB Interface

R10 33R
USB-
USB+
R11 33R

5V
USB+5v
USBDM
USBDP
USB_ID
USBGnd

J1

BDM Interface

VDD_BDM
T_BKGD/SWD 1
P2
BKGD   Gnd
Rx   RST
Tx   TVdd
BDM2X3

Kinetis 10p HD Connector

VDD_BDM
P1 1
VTref   SDWIO
Gnd   SWDCLK
Gnd   SWO/EXTa
Key   NC/EXTb
GndDet   nRESET
Gnd   T'DATA1
Gnd   T'DATA2
Gnd   T'DATA3
SWD-2x10

T_BKGD/SWD
T_SWCLK
T_RST

Notes:
JP1 - Tie to ground to force ROM Boot Loader Mode. Only for initial program load.

This version only supports HCS12, HCS08, & CFV1, Kinetis (SWD)
It does not support RS08 or CFV2,3,4 devices
It does not supply target power.
It does not have external target reset detection.

5V
F1 MINISMDC050F-2
Vdd
C9 100nF
C8 1uF
U3 MC33375ST-3.3T3
IN   OUT
ON/OFF
GND
3V3
C10 4u7/6V

VDD_BDM
Vdd 3V3
JP2
3
2
1

JP1 - Tie to ground to force ROM Boot Loader Mode. Only for initial program load.

Title
USBDM_SWD_JS16CWJ.SchDoc
Size A4
Number
Revision 2.1
Date: 8/01/2017
Sheet of
File: C:\Users\..\USBDM_SWD_JS16CWJ.SchDoc   Drawn By:

JP1

D1

U2

74HC9S08J...

C8

R5

R10

J1

R11

GPS

P1

U3

100nF

100nF

USBDM_SWD_JS16CWJ V2.1

NANJSMDC050F-2

F1

470 R4

470 R9

470 R8

100Ω R6

R3
10.0K

C10
10uF

100nF C8

C9 100nF

U1

OSHW

C4 10uF/10V

R5 680R

D1

JP1

J1

R1 1k5

C5

18pF

P2

BDM

100k

SWD

P1

MC9S08JS16CWJ

U2

C2 100nF

1M

R2

Y1

R3

U3

JP2

R10 33R

18pF

C7

5V

3V

R11 33R

C1 470nF

10uF/10V

C3

47R R4 USBDM_SWD_JS16CWJ V2.1

MINISMDC050F-2

R8
100K
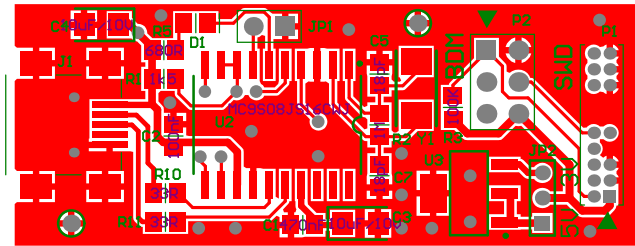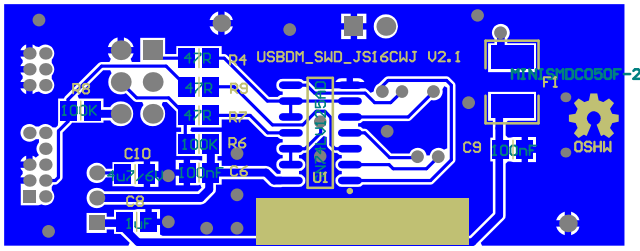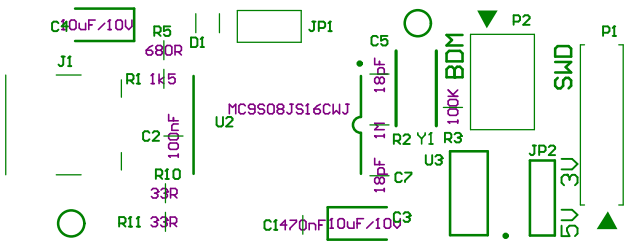
47R R9

47R R7

100K R6

C10
4u7/6V 100nF C6

C9 100nF

C8
1uF

SN74LVU125AD

OSHW

Bill of Materials

USBDM_SOIC20_JS16(Minimal)

Source Data From:		USBDM_SWD_JS16CWJ.PRJPCB	
Project:		USBDM_SWD_JS16CWJ.PRJPCB	
Variant:		None	

Creation Date:	8/01/2017	3:52:25 PM
Print Date:	08-Jan-17	3:52:34 PM

Footprint	Comment	Farnell PN	Digikey	Designator	Description	Quantity
CCNP2012-0805	470nF	1288279		C1	Capacitor SMT	1
CCNP2012-0805	100nF	8820120, 8820120, 1186187		C2, C6, C9	Capacitor SMT	3
CC3216-1206	10uF/10V	9527745		C3, C4	Capacitor Polarized (SMT - Case A)	2
CCNP2012-0805	18pF	1414673		C5, C7	Capacitor SMT	2
CCNP2012-0805	1uF			C8	Capacitor SMT 0805	1
CCNP2012-0805	4u7/6V			C10	Capacitor SMT 0805	1
LED2012-0805-GREEN	LED Green	5790852		D1	LED 0805 Green	1
PTC4532-1812	MINISMDC050F-2	1175839		F1	PolySwitch miniSMDC Series, 500 mA, 1 A, 24 VDC	1
USB_Mini - SMT2	USB_MINI_CONNECTOR	1363522		J1	USB Mini-B Connector	1
HDR1X2S	PIN2X1			JP1		1
Header 1x3 (2mm)	Header 1x3 2mm			JP2	Header, 1x3, 2mm	1
SWD-2x10 - reduced	SWD-2x10	1865289		P1	SWD Connector 2x10-Pin	1
BDM	BDM2X3			P2	HCS12 BDM connector	1
CR2012-0805	1k5	1632464		R1	Resistor SMT	1
CR2012-0805	1M	9236392		R2	Resistor SMT	1
CR2012-0805	100K	9332405		R3, R6, R8	Resistor SMT	3
CR2012-0805	47R	1632490		R4, R7, R9	Resistor SMT	3
CR2012-0805	680R	9334785		R5	Resistor SMT	1
CR2012-0805	33R	1631399		R10, R11	Resistor SMT	2
SO-14_L	SN74LV125AD	9592504	296-1674-5-ND	U1	Quad 3-state Buffer	1
SO-G20	MC9S08JS16CWJ	1704517		U2	Microcontroller with USB	1
SOT223	MC33375ST-3.3T3	1150444		U3	Low Dropout 300mA Voltage Regulator with ON/OFF Control	1
XTAL_SMT - 5x3.2	CX5032GB12000H0PESZZ	1368769		Y1	AVX CRYSTAL, SM, CX-53F, 12MHZ	1
						32
Approved		Notes				