Additional Schematic Drawings

MSP430

MSP430.sch

Teensy

Teensy.sch

Sensors

Sensors.sch

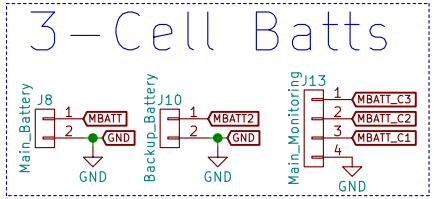
Power

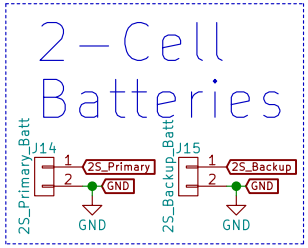
Power.sch

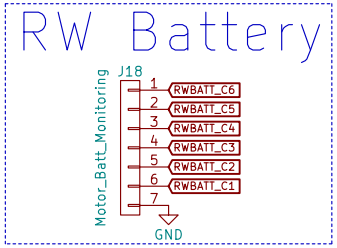
TVS and TP

TVS and TP.sch

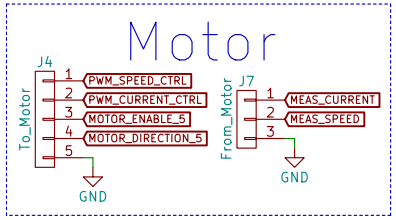
Battery & Power Connections

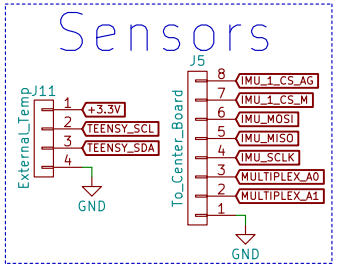


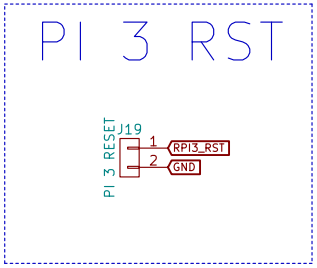




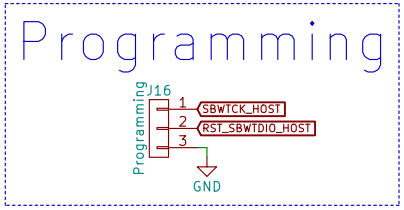
Teensy 3.6 Interfaces

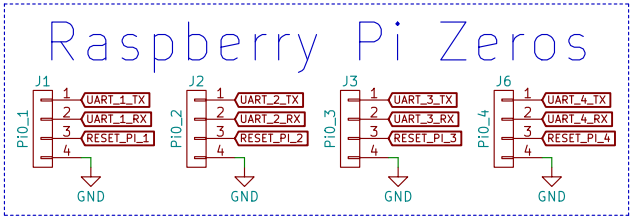


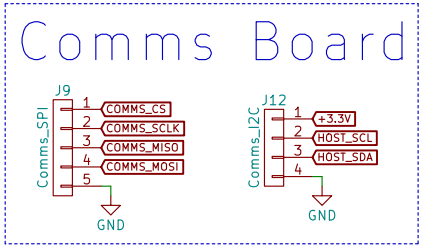




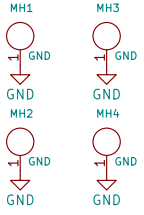
MSP-430 Interfaces



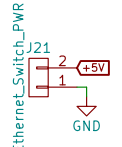




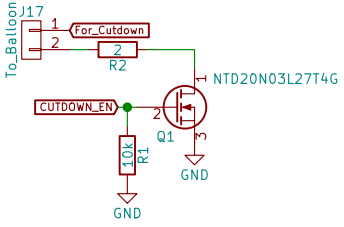
Mounting Holes



Network Switch PWR



Cutdown Mechanism



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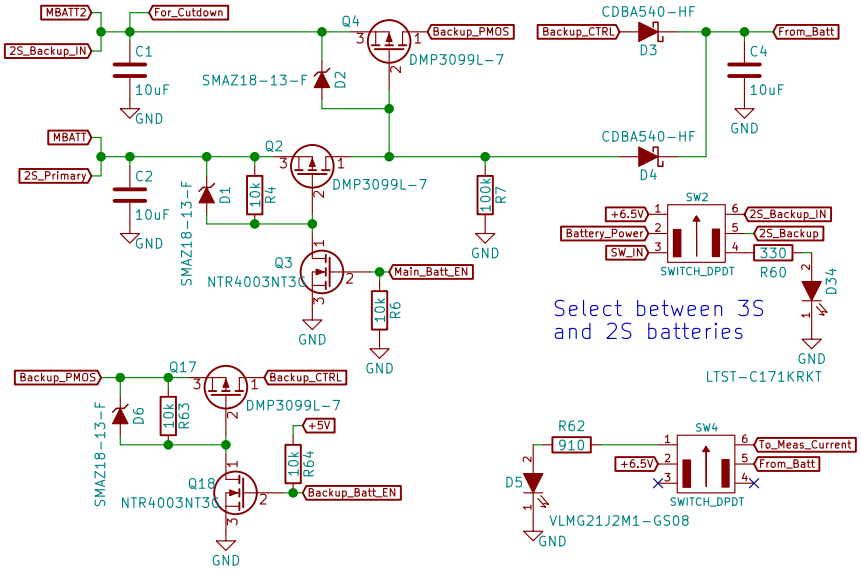
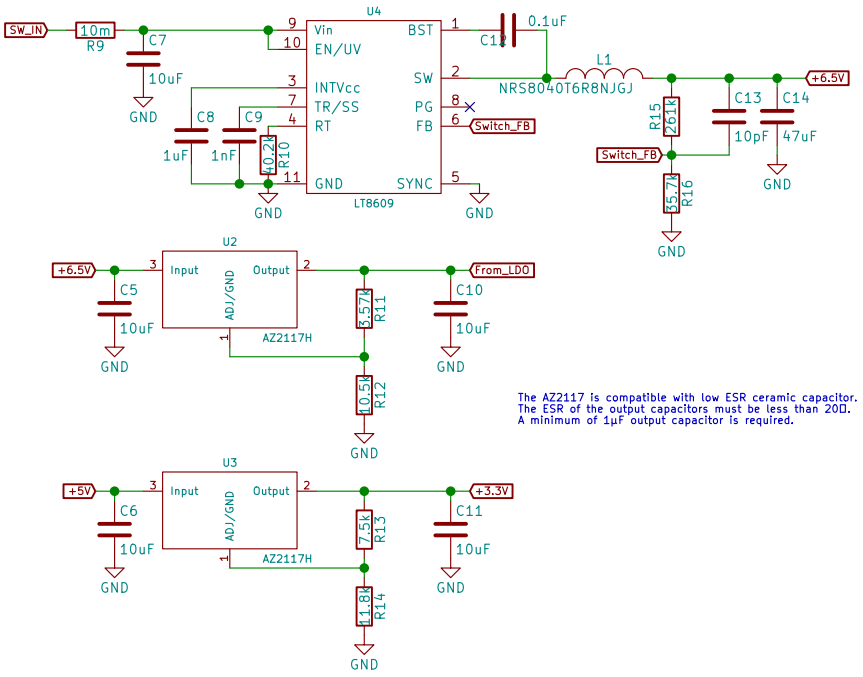
Battery Input and Switchover

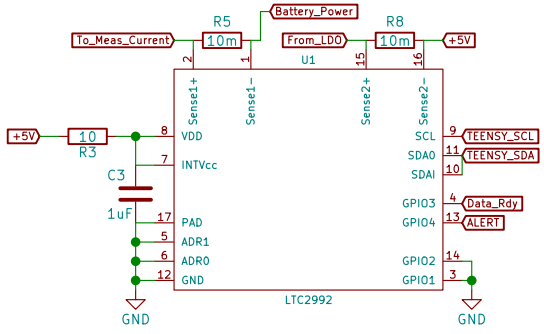
The system is initially powered off of the backup battery but then switches to the main battery during the initialization sequence by toggling the "Batt_EN" GPIO high



DC–DC Regulators



Current Measurement



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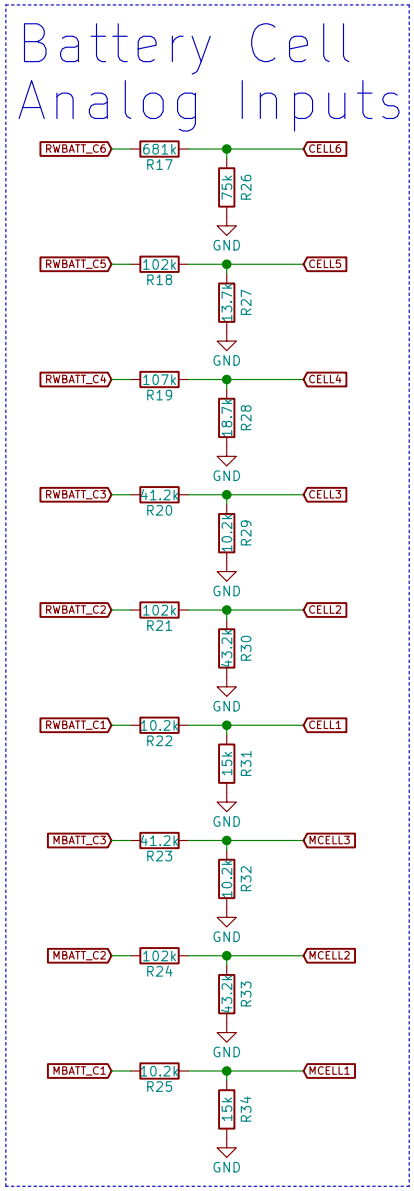

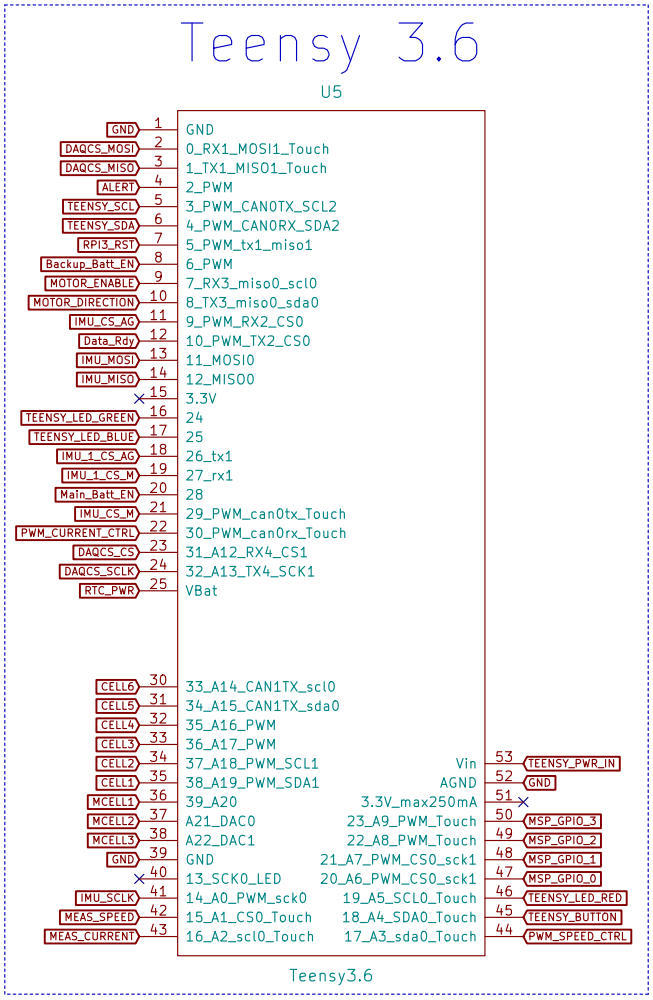

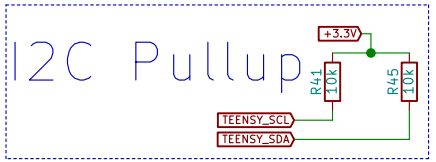

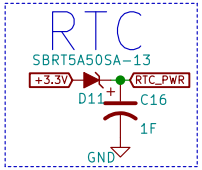

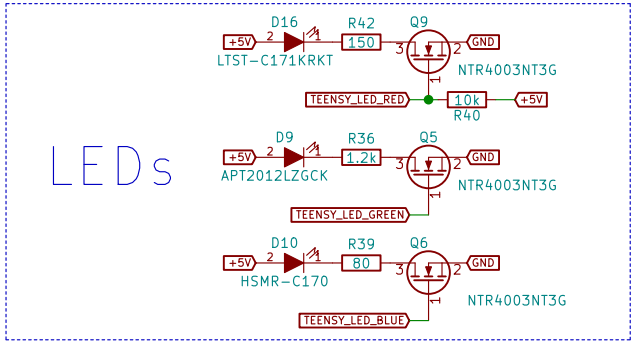

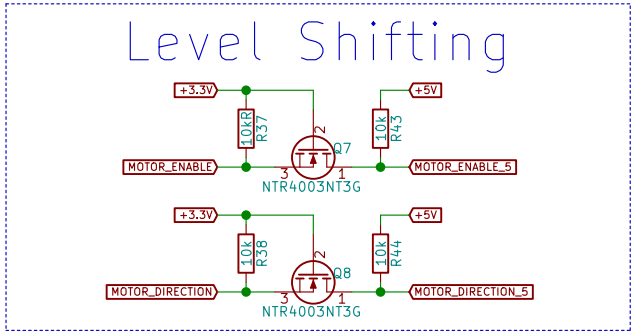

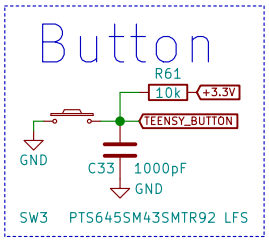

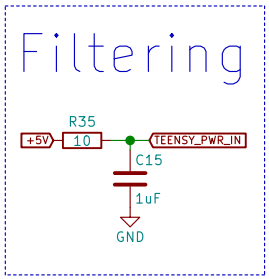

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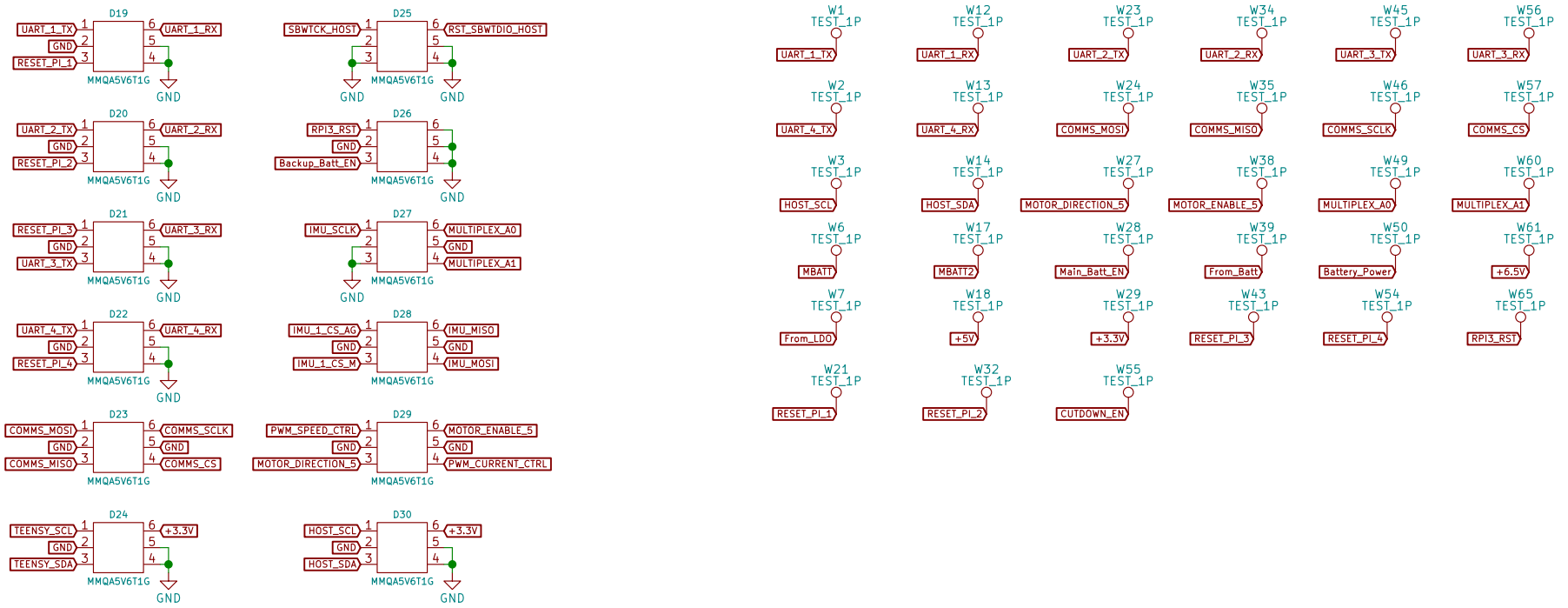

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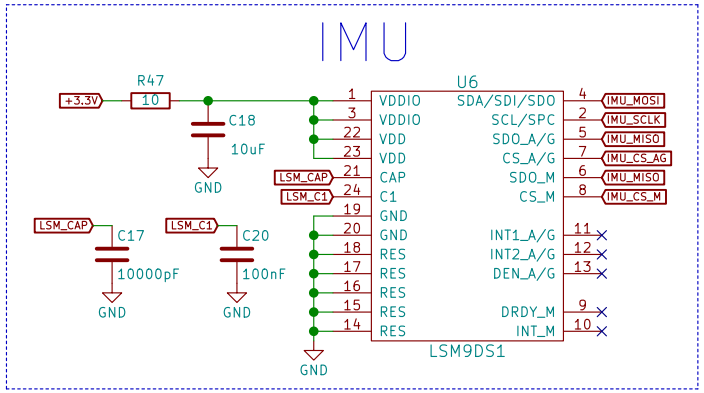

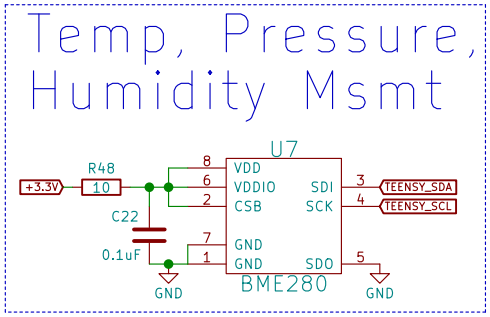

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KiCad E.D.A. kicad 4.0.4-stable		Id: 5/6

Host MSP430 Pinout

Layout: Place decoupling capacitor as close to pins as possible

U8

+3.3V — 10 R49 — C23 100nF — GND; 0 R50

AVCC1 80
DVCC1 61
DVCC2 20
DVCC3 40

MSP_LED_GREEN 1 P1.0_TA0.1_DMAE0_RTCCLK_A0_C0_VREF-_VEREF
MSP_LED_BLUE 2 P1.1_TA0.2_TA1CLK_COUT_A1_C1_VREF+_VEREF+
MSP_LED_RED 3 P1.2_TA1.1_TA0CLK_COUT_A2_C2
DAQCS_CS 16 P1.3_TA1.2_UCB0STE_A3_C3
MULTIPLEX_A0 17 P1.4_TB0.1_UCA0STE_A4_C4
MULTIPLEX_A1 18 P1.5_TB0.2_UCA0CLK_A5_C5
DAQCS_MOSI 51 P1.6_TB0.3_UCB0SIMO_UCB0SDA_TA0.0
DAQCS_MISO 52 P1.7_TB0.4_UCB0SOMI_UCB0SCL_TA1.0

4 P3.0_A12_C12
5 P3.1_A13_C13
6 P3.2_A14_C14
7 P3.3_A15_C15
47 P3.4_TB0.3_SMCLK
48 P3.5_TB0.4_COUT
49 P3.6_TB0.5
50 P3.7_TB0.6

COMMS_MOSI 53 P5.0_UCB1SIMO_UCB1SDA
COMMS_MISO 54 P5.1_UCB1SOMI_UCB1SCL
COMMS_SCLK 55 P5.2_UCB1CLK_TA4CLK
COMMS_CS 56 P5.3_UCB1STE
UART_3_TX 65 P5.4_UCA2TXD_UCA2SIMO_TB0OUTH
UART_3_RX 66 P5.5_UCA2RXD_UCA2SOMI_ACLK
67 P5.6_UCA2CLK_TA4.0_SMCLK
68 P5.7_UCA2STE_TA4.1_MCLK

HOST_SDA 13 P7.0_UCB2SIMO_UCB2SDA
HOST_SCL 14 P7.1_UCB2SOMI_UCB2SCL
25 P7.2_UCB2CLK
26 P7.3_UCB2STE_TA4.1
27 P7.4__TA4.0_A16
28 P7.5_A17
29 P7.6_A18
30 P7.7_A19

21 PJ.0_TDO_TB0OUTH_SMCLK_SRSCG1_C6
22 PJ.1_TDI_TCLK_MCLK_SRSCG0_C7
23 PJ.2_TMS_ACLK_SROSCOFF_C8
24 PJ.3_TCK_SRCPUOFF_C9
LF_IN 77 PJ.4_LFXIN
LF_OUT 78 PJ.5_LFXOUT
HF_IN_1 74 PJ.6_HFXIN
75 PJ.7_HFXOUT

41 P2.0_TB0.6_UCA0TXD_UCA0SIMO_TB0CLK_ACLK
42 P2.1_TB0.0_UCA0RXD_UCA0SOMI
43 P2.2_TB0.2_UCB0CLK
63 P2.3_TA0.0_UCA1STE_A6_C10
64 P2.4_TA1.0_UCA1CLK_A7_C11
35 P2.5_TB0.0_UCA1TXD_UCA1SIMO
36 P2.6_TB0.1_UCA1RXD_UCA1SOMI
62 P2.7

31 P4.0_A8
32 P4.1_A9
33 P4.2_A10
34 P4.3_A11
57 P4.4_TB0.5
58 P4.5
59 P4.6
12 P4.7

8 P6.0_UCA3TXD_UCA3SIMO
9 P6.1_UCA3RXD_UCA3SOMI
10 P6.2_UCA3CLK
11 P6.3_UCA3STE
69 P6.4_UCB3SIMO_UCB3SDA
70 P6.5_UCB3SOMI_UCB3SCL
71 P6.6_UCB3CLK
72 P6.7_UCB3STE

15 P8.0
44 P8.1
45 P8.2
46 P8.3

37 TEST_SBWTCK
38 RST_NMI_SBWTDIO_N

79 AVSS1
76 AVSS2
73 AVSS3
60 DVSS1
19 DVSS2
39 DVSS3

UART_1_TX 41
UART_1_RX 42
DAQCS_SCLK 43
UART_2_TX 35
UART_2_RX 36
CUTDOWN_EN 31
RESET_PI_1 57
RESET_PI_2 58
RESET_PI_3 59
RESET_PI_4 12
UART_4_TX 8
UART_4_RX 9
MSP_GPIO_0 15
MSP_GPIO_1 44
MSP_GPIO_2 45
MSP_GPIO_3 46
SBWTCK_HOST 37
HOST_RST_SBWTDIO 38

GND

MSP430FR5994

Low-Freq. Oscillator

Y1: LF_IN — C30 22pF — 32.768 kHz — C31 22pF — LF_OUT; GND

High-Freq. Oscillator

U9: 1 Standby, 2 GND, Output 3 HF_IN_1, VDD 4 — 10 R59 +3.3V — C32 10000pF — GND

ASEMB-24MHZ-XY-T

LEDs

D31 LTST-C171KRKT — R57 150 — Q14 NTR4003NT3G — MSP_LED_RED — 10k R46 +5V

D7 APT2012LZGCK — R54 1.2k — Q12 NTR4003NT3G — MSP_LED_GREEN

D8 HSMR-C170 — R55 80 — Q15 NTR4003NT3G — MSP_LED_BLUE

+5V, GND

I2C Pullup

+3.3V — R51 10k — R52 10k — HOST_SCL, HOST_SDA

Reset

R53 10k +3.3V — RST_SBWTDIO_HOST — C24 1000pF — GND

SW1 PTS645SM43SMTR92 LFS

DC Filtering

+3.3V — C25 1uF — C26 10uF — C27 100nF — C28 100nF — C29 100nF — GND

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