Sheet: PowerManagement

SDA_1 — PWR_SDA
SCL_1 — PWR_SCL

PWR_INT — INT

PWR_3_3V — 3_3V
PWR_5V — 5V

D+ — PWR_D+
D− — PWR_D−

File: PowerManagement.sch

Sheet: Sensors

Sensor_X0 — X0
Sensor_X1 — X1
Sensor_X2 — X2
Sensor_X3 — X3
Sensor_X4 — X4
Sensor_X5 — X5
Sensor_X6 — X6
Sensor_X7 — X7

Sensor_Y0A — Y0A
Sensor_Y1A — Y1A
Sensor_Y2A — Y2A
Sensor_Y3A — Y3A
Sensor_Y0B — Y0B
Sensor_Y1B — Y1B
Sensor_Y2B — Y2B
Sensor_Y3B — Y3B

SMP — Sensor_SMP
AIN0 — Sensor_AIN0

File: Sensors.sch

Sheet: LED_Display

3_3V — DISP_3_3V

SDA_2 — DISP_SDA
SCL_2 — DISP_SCL

RSTN — DISP_RSTN
IRQ — DISP_IRQ
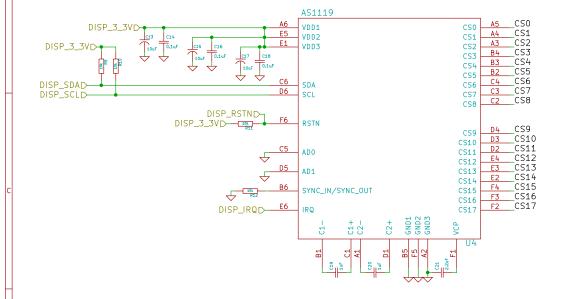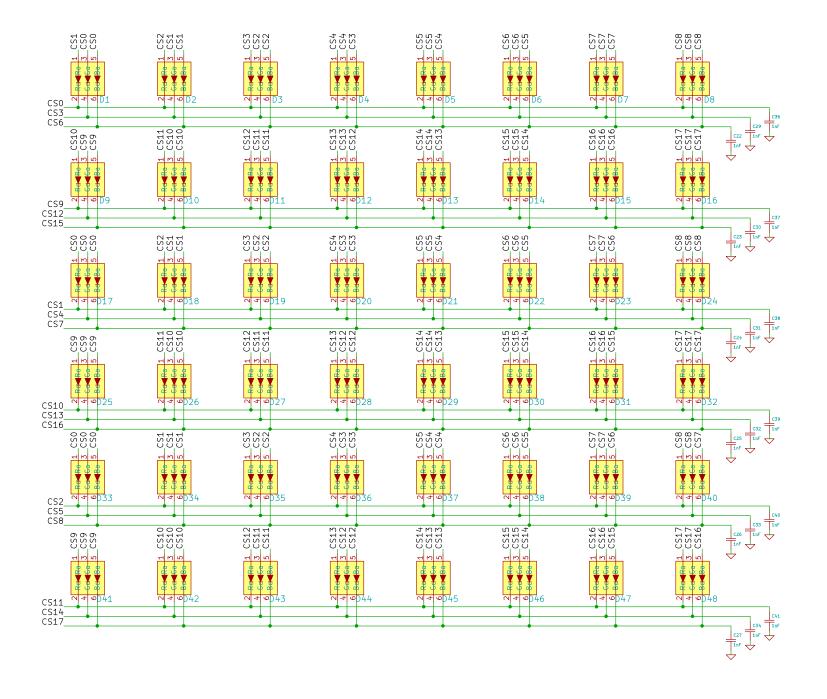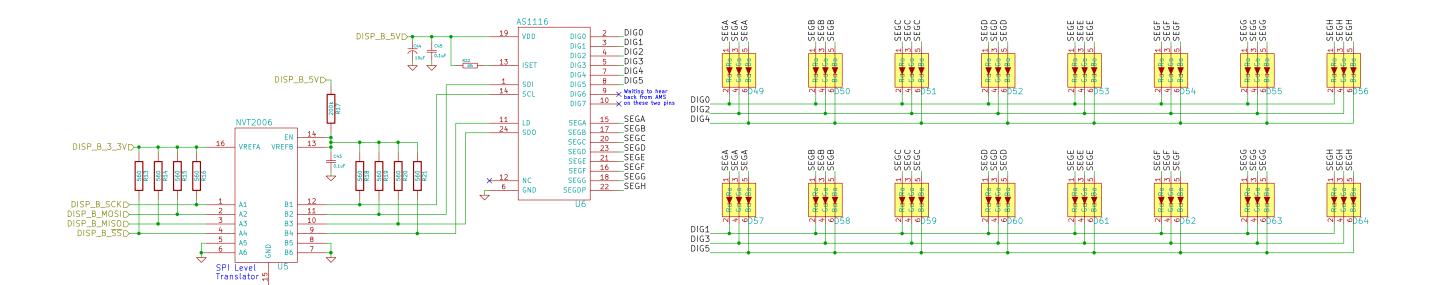
File: LED_Display.sch

Sheet: LED_Display_B

5V — DISP_B_5V
3_3V — DISP_B_3_3V

SCK_2 — DISP_B_SCK
MOSI_2 — DISP_B_MOSI
MISO_2 — DISP_B_MISO
SS_2 — DISP_B_SS
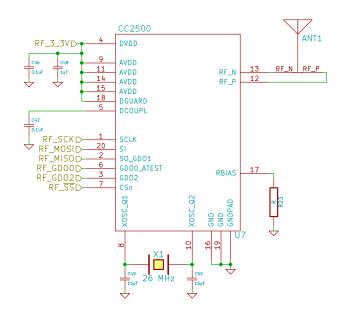
File: LED_Display_B.sch

Sheet: Controller

3_3V — CTRL_3_3V

USB Pins
D− — CTRL_D−
D+ — CTRL_D+

INT — CTRL_INT

SDA_1 — CTRL_SDA_1
SCL_1 — CTRL_SCL_1

SDA_2 — CTRL_SDA_2
SCL_2 — CTRL_SCL_2
RSTN — CTRL_IRQ
IRQ — CTRL_RSTN

SS_1 — CTRL_SS_1
MOSI_1 — CTRL_MOSI_1
MISO_1 — CTRL_MISO_1
SCK_1 — CTRL_SCK_1

SS2_2 — CTRL_SS2_2
SS_2 — CTRL_SS_2
MOSI_2 — CTRL_MOSI_2
MISO_2 — CTRL_MISO_2
SCK_2 — CTRL_SCK_2

QMatrix Pins
CTRL_Y0A — Y0A
CTRL_Y1A — Y1A
CTRL_Y2A — Y2A
CTRL_Y3A — Y3A

CTRL_Y0B — Y0B
CTRL_Y1B — Y1B
CTRL_Y2B — Y2B
CTRL_Y3B — Y3B

CTRL_X0 — X0
CTRL_X1 — X1
CTRL_X2 — X2
CTRL_X3 — X3
CTRL_X4 — X4
CTRL_X5 — X5
CTRL_X6 — X6
CTRL_X7 — X7

CTRL_AIN0 — AIN0
CTRL_SMP — SMP

CC2500 RF Pins
CTRL_GDO0 — GDO0
CTRL_GDO2 — GDO2

CTRL_AREF
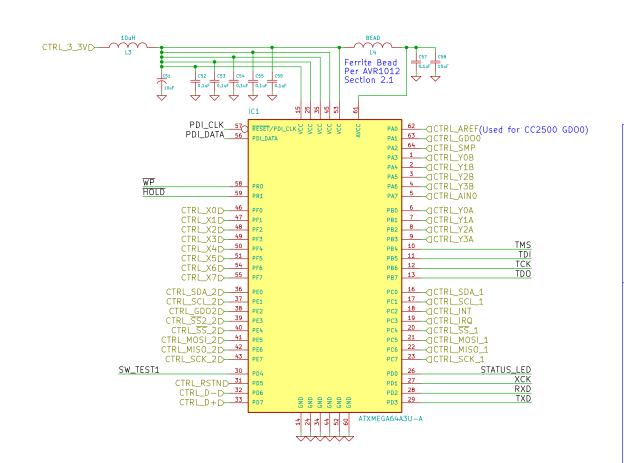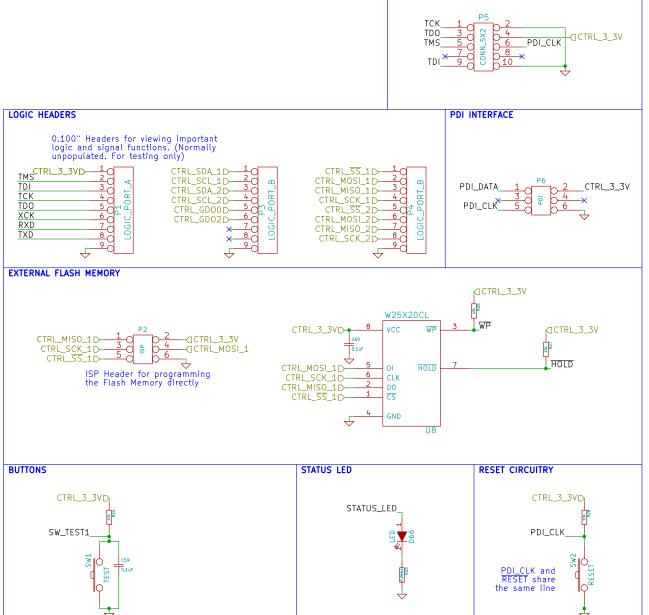
File: Controller.sch

Sheet: RF

3_3V — RF_3_3V

RF_GDO0 — GDO0
RF_GDO2 — GDO2

SCK_2 — RF_SCK
MOSI_2 — RF_MOSI
MISO_2 — RF_MISO
SS2_2 — RF_SS

File: RF.sch

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QM25

QM1 QM9 QM17 QM26

Sensor_X0 RX0 1k QM1 QM27

Sensor_X1 RX1 1k QM2 QM10 QM18 QM28

Sensor_X2 RX2 1k QM3 QM11 QM19 QM29

Sensor_X3 RX3 1k QM4 QM12 QM20 QM30

Sensor_X4 RX4 1k QM5 QM13 QM21 QM31

Sensor_X5 RX5 1k QM6 QM14 QM22 QM32

Sensor_X6 RX6 1k QM7 QM15 QM23

Sensor_X7 RX7 1k QM8 QM16 QM24

RY0 RY1 RY2

Sensor_Y0A Sensor_Y1A Sensor_Y2A Sensor_Y3A
CS0 4.7nF CS1 4.7nF CS2 4.7nF CS3 4.7nF

Sensor_Y0B Sensor_Y1B Sensor_Y2B Sensor_Y3B

Sampling Capacitors should
be X7R or better

RSMP0 RSMP1 RSMP2 RSMP3
4.7k 4.7k 4.7k 4.7k

Sensor_SMP

Sensor_AIN0

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AS1119

Pin	Signal		Pin	Signal

U4

- A6 VDD1
- E5 VDD2
- E1 VDD3
- C6 SDA
- D6 SCL
- F6 RSTN
- C5 AD0
- D5 AD1
- B6 SYNC_IN/SYNC_OUT
- E6 IRQ

- A5 CS0
- A4 CS1
- A3 CS2
- B4 CS3
- B3 CS4
- B2 CS5
- C4 CS6
- C3 CS7
- C2 CS8
- D4 CS9
- D3 CS10
- D2 CS11
- E4 CS12
- E3 CS13
- E2 CS14
- F4 CS15
- F3 CS16
- F2 CS17

DISP_3_3V
DISP_SDA
DISP_SCL
DISP_RSTN
DISP_IRQ

CS0 CS1 CS2 CS3 CS4 CS5 CS6 CS7 CS8 CS9 CS10 CS11 CS12 CS13 CS14 CS15 CS16 CS17

D1 D2 D3 D4 D5 D6 D7 D8
D9 D10 D11 D12 D13 D14 D15 D16
D17 D18 D19 D20 D21 D22 D23 D24
D25 D26 D27 D28 D29 D30 D31 D32
D33 D34 D35 D36 D37 D38 D39 D40
D41 D42 D43 D44 D45 D46 D47 D48

C13 10uF C14 0.1uF
C15 10uF C16 0.1uF
C17 10uF C18 0.1uF
C19 1uF C1 C20 1uF C2 C21 2.2uF
C22 1nF C23 1nF C24 1nF C25 1nF C26 1nF C27 1nF
C29 1nF C30 1nF C31 1nF C32 1nF C33 1nF C34 1nF
C36 1nF C37 1nF C38 1nF C39 1nF C40 1nF C41 1nF

AS1116

U6

NVT2006
SPI Level
Translator
U5

DISP_B_5VD

DISP_B_3_3VD

DISP_B_SCK
DISP_B_MOSI
DISP_B_MISO
DISP_B_SS

Waiting to hear
back from AMS
on these two pins

DIG0
DIG2
DIG4

DIG1
DIG3
DIG5

D49 D50 D51 D52 D53 D54 D55 D56

D57 D58 D59 D60 D61 D62 D63 D64

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CC2500

RF_3_3V

C46 0.1uf
C48 1uf

4 DVDD

9 AVDD
11 AVDD
14 AVDD
15 AVDD
18 DGUARD
5 DCOUPL

C47 0.1uf

RF_SCK 1 SCLK
RF_MOSI 20 SI
RF_MISO 2 SO_GDO1
RF_GDO0 6 GDO0_ATEST
RF_GDO2 3 GDO2
RF_SS 7 CSn

XOSC_Q1

X1 26 MHz

C49 15pF
C50 15pF

XOSC_Q2

GND 16
GND 19
GNDPAD

U7

13 RF_N
12 RF_P

RF_N RF_P

ANT1

17 RBIAS

R23

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CTRL_3_3V

10uH
L3

BEAD
L4
Ferrite Bead
Per AVR1012
Section 2.1

C51 10uF
C52 0.1uF
C53 0.1uF
C54 0.1uF
C55 0.1uF
C56 0.1uF
C57 0.1uF
C58 10uF

IC1

PDI_CLK
PDI_DATA

RESET/PDI_CLK   15 25 35 45 53   VCC VCC VCC VCC VCC
PDI_DATA   61   AVCC

57 RESET/PDI_CLK
56 PDI_DATA

PA0 62 CTRL_AREF (Used for CC2500 GDO0)
PA1 63 CTRL_GDO0
PA2 64 CTRL_SMP
PA3 1   CTRL_Y0B
PA4 2   CTRL_Y1B
PA5 3   CTRL_Y2B
PA6 4   CTRL_Y3B
PA7 5   CTRL_AIN0

WP   58 PR0
HOLD 59 PR1

PB0 6   CTRL_Y0A
PB1 7   CTRL_Y1A
PB2 8   CTRL_Y2A
PB3 9   CTRL_Y3A
PB4 10 TMS
PB5 11 TDI
PB6 12 TCK
PB7 13 TDO

CTRL_X0 46 PF0
CTRL_X1 47 PF1
CTRL_X2 48 PF2
CTRL_X3 49 PF3
CTRL_X4 50 PF4
CTRL_X5 51 PF5
CTRL_X6 54 PF6
CTRL_X7 55 PF7

CTRL_SDA_2 36 PE0
CTRL_SCL_2 37 PE1
CTRL_GDO2   38 PE2
CTRL_SS2_2 39 PE3
CTRL_SS_2   40 PE4
CTRL_MOSI_2 41 PE5
CTRL_MISO_2 42 PE6
CTRL_SCK_2 43 PE7

PC0 16 CTRL_SDA_1
PC1 17 CTRL_SCL_1
PC2 18 CTRL_INT
PC3 19 CTRL_IRQ
PC4 20 CTRL_SS_1
PC5 21 CTRL_MOSI_1
PC6 22 CTRL_MISO_1
PC7 23 CTRL_SCK_1

SW_TEST1 30 PD0
CTRL_RSTN 31 PD1
CTRL_D-   32 PD5
CTRL_D+   33 PD6
          PD7

PD0 26 STATUS_LED
PD1 27 XCK
PD2 28 RXD
PD3 29 TXD

GND 14 24 34 44 52 60

ATXMEGA64A3U-A

JTAG INTERFACE

P5
TCK 1 2
TDO 3 4
TMS 5 6   PDI_CLK   CTRL_3_3V
     7 8
TDI 9 10
CONN_5X2

LOGIC HEADERS

0.100" Headers for viewing important
logic and signal functions. (Normally
unpopulated. For testing only)

CTRL_3_3V 1
TMS   2
TDI   3
TCK   4
TDO   5
XCK   6
RXD   7
TXD   8
           9
P1 LOGIC_PORT_A

CTRL_SDA_1 1
CTRL_SCL_1 2
CTRL_SDA_2 3
CTRL_SCL_2 4
CTRL_GDO0   5
CTRL_GDO2   6
            7
            8
            9
P3 LOGIC_PORT_B

CTRL_SS_1   1
CTRL_MOSI_1 2
CTRL_MISO_1 3
CTRL_SCK_1   4
CTRL_SS_2   5
CTRL_MOSI_2 6
CTRL_MISO_2 7
CTRL_SCK_2   8
             9
P4 LOGIC_PORT_B

PDI INTERFACE

PDI_DATA 1 P6 2 CTRL_3_3V
          3   4
PDI_CLK   5   6
PDI

EXTERNAL FLASH MEMORY

CTRL_MISO_1 1 P2 2 CTRL_3_3V
CTRL_SCK_1   3   4 CTRL_MOSI_1
CTRL_SS_1   5   6
ISP

ISP Header for programming
the Flash Memory directly

W25X20CL
U8
CTRL_3_3V 8 VCC   WP   3 WP   CTRL_3_3V
           C60 0.1uF
CTRL_MOSI_1 5 DI   HOLD 7 HOLD CTRL_3_3V
CTRL_SCK_1   6 CLK
CTRL_MISO_1 2 DO
CTRL_SS_1   1 CS
             4 GND

BUTTONS

CTRL_3_3V
SW_TEST1
SW1 TEST
C59 0.1uF

STATUS LED

STATUS_LED
LED D66

RESET CIRCUITRY

CTRL_3_3V
PDI_CLK
SW2 RESET

PDI_CLK and
RESET share
the same line

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