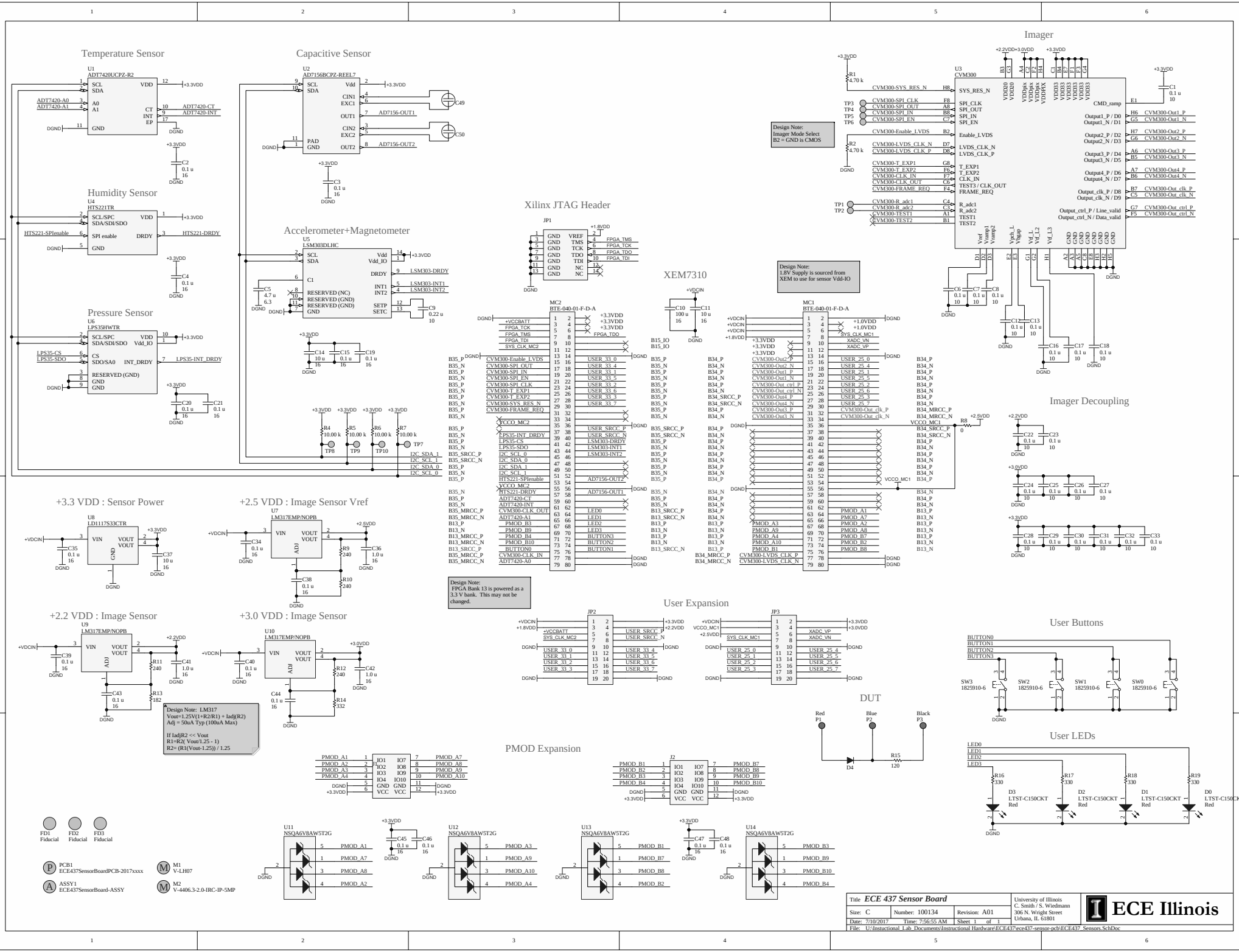
Temperature Sensor
U1
ADT7420UCPZ-R2
SCL
SDA
A0
A1
GND
VDD
CT
INT
EP
ADT7420-A0
ADT7420-A1
ADT7420-CT
ADT7420-INT
+3.3VDD
DGND
C2
0.1 u
16
Humidity Sensor
U4
HTS221TR
SCL/SPC
SDA/SDI/SDO
SPI enable
GND
VDD
DRDY
HTS221-SPIenable
HTS221-DRDY
C4
0.1 u
16
Pressure Sensor
U6
LPS35HWTR
SCL/SPC
SDA/SDI/SDO
CS
SDO/SA0
RESERVED (GND)
GND
VDD
Vdd_IO
INT_DRDY
LPS35-CS
LPS35-SDO
LPS35-INT_DRDY
C20
0.1 u
16
C21
0.1 u
16
Capacitive Sensor
U2
AD7156BCPZ-REEL7
SCL
SDA
PAD
GND
Vdd
CIN1
EXC1
OUT1
CIN2
EXC2
OUT2
AD7156-OUT1
AD7156-OUT2
C49
C50
C3
0.1 u
16
Accelerometer+Magnetometer
U5
LSM303DLHC
SCL
SDA
C1
RESERVED (NC)
RESERVED (GND)
RESERVED (GND)
GND
Vdd
Vdd_IO
DRDY
INT1
INT2
SETP
SETC
LSM303-DRDY
LSM303-INT1
LSM303-INT2
C5
4.7 u
6.3
C9
0.22 u
10
C14
10 u
16
C15
0.1 u
16
C19
0.1 u
16
R4
10.00 k
R5
10.00 k
R6
10.00 k
R7
10.00 k
TP8
TP9
TP10
TP7
I2C_SDA_1
I2C_SCL_1
I2C_SDA_0
I2C_SCL_0
Xilinx JTAG Header
JP1
+1.8VDD
GND
VREF
TMS
TCK
TDO
TDI
NC
FPGA_TMS
FPGA_TCK
FPGA_TDO
FPGA_TDI
Imager
U3
CVM300
SYS_RES_N
SPI_CLK
SPI_OUT
SPI_IN
SPI_EN
Enable_LVDS
LVDS_CLK_N
LVDS_CLK_P
T_EXP1
T_EXP2
CLK_IN
TEST3 / CLK_OUT
FRAME_REQ
R_adc1
R_adc2
TEST1
TEST2
CMD_ramp
Output1_P / D0
Output1_N / D1
Output2_P / D2
Output2_N / D3
Output3_P / D4
Output3_N / D5
Output4_P / D6
Output4_N / D7
Output_clk_P / D8
Output_clk_N / D9
Output_ctrl_P / Line_valid
Output_ctrl_N / Data_valid
CVM300-SYS_RES_N
CVM300-SPI_CLK
CVM300-SPI_OUT
CVM300-SPI_IN
CVM300-SPI_EN
CVM300-Enable_LVDS
CVM300-LVDS_CLK_N
CVM300-LVDS_CLK_P
CVM300-T_EXP1
CVM300-T_EXP2
CVM300-CLK_IN
CVM300-CLK_OUT
CVM300-FRAME_REQ
CVM300-R_adc1
CVM300-R_adc2
CVM300-TEST1
CVM300-TEST2
CVM300-Out1_P
CVM300-Out1_N
CVM300-Out2_P
CVM300-Out2_N
CVM300-Out3_P
CVM300-Out3_N
CVM300-Out4_P
CVM300-Out4_N
CVM300-Out_clk_P
CVM300-Out_clk_N
CVM300-Out_ctrl_P
CVM300-Out_ctrl_N
R1
4.70 k
R2
4.70 k
TP3
TP4
TP5
TP6
TP1
TP2
C1
0.1 u
10
C6
0.1 u
10
C7
0.1 u
10
C8
0.1 u
10
C12
0.1 u
10
C13
0.1 u
10
C16
0.1 u
10
C17
0.1 u
10
C18
0.1 u
10
Design Note:
Imager Mode Select
B2 = GND is CMOS
Design Note:
1.8V Supply is sourced from
XEM to use for sensor Vdd-IO
XEM7310
MC2
BTE-040-01-F-D-A
MC1
BTE-040-01-F-D-A
+VCCBATT
FPGA_TCK
FPGA_TMS
FPGA_TDI
SYS_CLK_MC2
CVM300-Enable_LVDS
CVM300-SPI_OUT
CVM300-SPI_IN
CVM300-SPI_EN
CVM300-SPI_CLK
CVM300-T_EXP1
CVM300-T_EXP2
CVM300-SYS_RES_N
CVM300-FRAME_REQ
VCCO_MC2
LPS35-INT_DRDY
LPS35-CS
LPS35-SDO
I2C_SCL_0
I2C_SDA_0
I2C_SDA_1
I2C_SCL_1
HTS221-SPIenable
HTS221-DRDY
ADT7420-CT
ADT7420-INT
CVM300-CLK_OUT
ADT7420-A1
PMOD_B3
PMOD_B9
PMOD_B4
PMOD_B10
BUTTON0
CVM300-CLK_IN
ADT7420-A0
USER_33_0
USER_33_4
USER_33_1
USER_33_5
USER_33_2
USER_33_6
USER_33_3
USER_33_7
USER_SRCC_P
USER_SRCC_N
LSM303-DRDY
LSM303-INT1
LSM303-INT2
AD7156-OUT2
AD7156-OUT1
LED0
LED1
LED2
LED3
BUTTON3
BUTTON2
BUTTON1
+1.0VDD
SYS_CLK_MC1
XADC_VN
XADC_VP
USER_25_0
USER_25_4
USER_25_1
USER_25_5
USER_25_2
USER_25_6
USER_25_3
USER_25_7
CVM300-Out2_P
CVM300-Out2_N
CVM300-Out1_P
CVM300-Out1_N
CVM300-Out_ctrl_P
CVM300-Out_ctrl_N
CVM300-Out4_P
CVM300-Out4_N
CVM300-Out3_P
CVM300-Out3_N
CVM300-Out_clk_P
CVM300-Out_clk_N
VCCO_MC1
PMOD_A3
PMOD_A9
PMOD_A4
PMOD_A10
PMOD_B1
CVM300-LVDS_CLK_P
CVM300-LVDS_CLK_N
PMOD_A1
PMOD_A7
PMOD_A2
PMOD_A8
PMOD_B7
PMOD_B8
R8
0
+2.5VDD
Design Note:
FPGA Bank 13 is powered as a
3.3 V bank. This may not be
changed.
Imager Decoupling
C22
0.1 u
10
C23
0.1 u
10
C24
0.1 u
10
C25
0.1 u
10
C26
0.1 u
10
C27
0.1 u
10
C28
0.1 u
10
C29
0.1 u
10
C30
0.1 u
10
C31
0.1 u
10
C32
0.1 u
10
C33
0.1 u
10
+3.3 VDD : Sensor Power
U8
LD1117S33CTR
VIN
VOUT
VOUT
GND
+VDCIN
C35
0.1 u
16
C37
10 u
16
+2.5 VDD : Image Sensor Vref
U7
LM317EMP/NOPB
VIN
VOUT
VOUT
ADJ
C34
0.1 u
16
R9
240
C36
1.0 u
16
C38
0.1 u
16
R10
240
+2.2 VDD : Image Sensor
U9
LM317EMP/NOPB
C39
0.1 u
16
R11
240
C41
1.0 u
16
C43
0.1 u
16
R13
182
+3.0 VDD : Image Sensor
U10
LM317EMP/NOPB
C40
0.1 u
16
R12
240
C42
1.0 u
16
C44
0.1 u
16
R14
332
Design Note: LM317
Vout=1.25V(1+R2/R1) + Iadj(R2)
Adj = 50uA Typ (100uA Max)
If IadjR2 << Vout
R1=R2(Vout/1.25 - 1)
R2= (R1(Vout-1.25)) / 1.25
User Expansion
JP2
JP3
+VDCIN
+1.8VDD
+VCCBATT
SYS_CLK_MC2
USER_33_0
USER_33_1
USER_33_2
USER_33_3
USER_33_4
USER_33_5
USER_33_6
USER_33_7
USER_SRCC_P
USER_SRCC_N
+3.3VDD
+2.2VDD
VCCO_MC1
+2.5VDD
SYS_CLK_MC1
USER_25_0
USER_25_1
USER_25_2
USER_25_3
USER_25_4
USER_25_5
USER_25_6
USER_25_7
XADC_VP
XADC_VN
+3.0VDD
User Buttons
BUTTON0
BUTTON1
BUTTON2
BUTTON3
SW3
1825910-6
SW2
1825910-6
SW1
1825910-6
SW0
1825910-6
DUT
Red
P1
Blue
P2
Black
P3
D4
R15
120
User LEDs
LED0
LED1
LED2
LED3
R16
330
R17
330
R18
330
R19
330
D3
LTST-C150CKT
Red
D2
LTST-C150CKT
Red
D1
LTST-C150CKT
Red
D0
LTST-C150CKT
Red
PMOD Expansion
J1
PMOD_A1
PMOD_A2
PMOD_A3
PMOD_A4
IO1
IO2
IO3
IO4
IO7
IO8
IO9
IO10
GND
VCC
PMOD_A7
PMOD_A8
PMOD_A9
PMOD_A10
J2
PMOD_B1
PMOD_B2
PMOD_B3
PMOD_B4
PMOD_B7
PMOD_B8
PMOD_B9
PMOD_B10
FD1
Fiducial
FD2
Fiducial
FD3
Fiducial
PCB1
ECE437SensorBoardPCB-2017xxxx
ASSY1
ECE437SensorBoard-ASSY
M1
V-LH07
M2
V-4406.3-2.0-IRC-IP-5MP
U11
NSQA6V8AW5T2G
U12
NSQA6V8AW5T2G
U13
NSQA6V8AW5T2G
U14
NSQA6V8AW5T2G
C45
0.1 u
16
C46
0.1 u
16
C47
0.1 u
16
C48
0.1 u
16
Title
ECE 437 Sensor Board
Size: C
Number: 100134
Revision: A01
Date: 7/10/2017
Time: 7:56:55 AM
Sheet 1 of 1
File: U:\Instructional_Lab_Documents\Instructional Hardware\ECE437\ece437-sensor-pcb\ECE437_Sensors.SchDoc
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