ECE 453 Tutorial Board
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Revision History:

Date:	Revision:	Comments:
1/12/2015	1	Initial Design for ECE 453 Spring 2016 Tutorial Board

Important Notes about this Schematic:

DESIGN NOTE:
Design notes in gray text boxes give infomation about design requirements and descisions.

LAYOUT NOTE:
Layout notes in red text boxes give infomation regarding layout requirements.

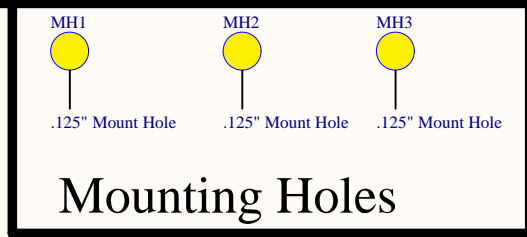## Revision History and Table of Contents

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B			
Date:	2/9/2016	Sheet of	
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FPGA & Debug Header

J1

GPIO_1_D0	GPIO_1_D1	FPGA_D1
GPIO_1_D2	GPIO_1_D3	FPGA_D3
GPIO_1_D4	GPIO_1_D5	FPGA_D5
GPIO_1_D6	GPIO_1_D7	FPGA_D7
GPIO_1_D8	GPIO_1_D9	FPGA_D9
5V0	GND	FPGA_GND1
GPIO_1_D10	GPIO_1_D11	FPGA_D11
GPIO_1_D12	GPIO_1_D13	FPGA_D13
GPIO_1_D14	GPIO_1_D15	FPGA_D15
GPIO_1_D16	GPIO_1_D17	FPGA_D17
GPIO_1_D18	GPIO_1_D19	FPGA_D19
GPIO_1_D20	GPIO_1_D21	FPGA_D21
GPIO_1_D22	GPIO_1_D23	FPGA_D23
GPIO_1_D24	GPIO_1_D25	FPGA_D25
3V3	GND	FPGA_GND2
GPIO_1_D26	GPIO_1_D27	FPGA_D27
GPIO_1_D28	GPIO_1_D29	FPGA_D29
GPIO_1_D30	GPIO_1_D31	FPGA_D31
GPIO_1_D32	GPIO_1_D33	FPGA_D33
GPIO_1_D34	GPIO_1_D35	FPGA_D35

5VDC

SFH11-PBPC-D20-ST-BK
S9200-ND

3.3V
F1 750mA
C3 100µF
GND

P1
Header 20X2

3.3V
R2 2.21k
R3 2.21k

NeoPixelData
BckLite
TPINT0#
RST_N
I2C0SCL
I2C0SDA
LCD_SPI_MOSI
LCD_SPI_CLK
LCD_CD
LCD_RST
LCD_SPI_CS
BT_SW_BTN
BT_WakeUp
BT_UICTS
BT_UIRTS
BT_RST_N
BT_U1Rx
BT_U1Tx
GND

LCD Screen

LCD1
LCD-BW-128X64

LCD_SPI_CS	CS0
LCD_RST	RST
LCD_CD	CD
	WR0
	WR1
	D0
	D1
	D2
	D3
	D4
	D5
LCD_SPI_CLK	D6
LCD_SPI_MOSI	D7
	VDD
	VSS
LCD_VB0+	VB0+
LCD_VB0-	VB0-
LCD_VB1-	VB1-
LCD_VB1+	VB1+
VLCD	VLCD
	BM0
	BM1

NC 23, NC 24, NC 25, NC 26, NC 27, NC 28, NC 29, NC 30

3.3V
R1 100

A 31 LCD_Back_Anode
K 32 LCD_Back_Cath

Q1 FDN339A
D
G
S
LCD_Back_On
R4 100
GND
BckLite

3.3V
C1 10µF
GND

C2 10µF
C4 10µF
C5 10µF
GND GND

Capacitive Keypad

CT1
Capacitive Touch Sensor

Zero
One, Two, Three, A
15, 14, 13, 12, 11
C, -, Nine, Eight, Seven
B
Six, Five, Four

U2
AT42QT2120
Value: AT42QT2120
AT42QT2120-SURCT-ND

R5	Six_R	KEY8	KEY9	Three_R	Three	R6
R7	Nine_R	KEY7	KEY10	One_R	One	R8 562
R9	B_R	KEY6	KEY11	Two_R	Two	R10 562
R11	Zero_R	KEY5	CHANGE		TPINT0#	562
R12	Eight_R	KEY4	SCL		I2C0SCL	
R13	Five_R	KEY3	N/C			
R14	A_R	KEY2	RESET		RST_N	
R15	Seven_R	KEY1	SDA		I2C0SDA	
R16 562	Four_R	KEY0	MODE			
		VSS	VDD			

GND
C8 10µF
GND

Bluetooth Module

3.3V
C7 10µF
GND
C6 10µF
GND
BT_LDO_3V3
D1 Green 571nm

U1
BM77SPPS3MC2
92X8715

BT_U1Rx	RXD	LEDI	
BT_U1Tx	TXD	P05	
BT_U1CTS	CTS/P17	P20	
BT_U1RTS	CTS/P17	P24	
		EAN	
	P04	P31	
	P15	P32	
	SCL/P12	P33	
	SDA/P13	P34	
		P36	
BT_SW_BTN	SW_BTN	P37	
BT_WakeUp	WakeUp		
BT_RST_N	RST_N	PMULDO_O	

BAT_IN
LDO33_O
VDD_IO
LDO18
BT_LED
GND
GND

Neopixel Array

3.3V
NeoPixelData
R17 100
Neo_DIN

U3 NeoPixel	C9 0.1µF	D1_D2
U4 NeoPixel	C10 0.1µF	D2_D3
U5 NeoPixel	C11 0.1µF	D3_D4
U6 NeoPixel	C12 0.1µF	D4_D5
U7 NeoPixel	C13 0.1µF	D5_D6
U8 NeoPixel	C14 0.1µF	D6_D7
U9 NeoPixel	C15 0.1µF	D7_D8
U10 NeoPixel	C16 0.1µF	

DIN VDD DOUT VSS
GND

Mounting Holes

MH1 .125" Mount Hole
MH2 .125" Mount Hole
MH3 .125" Mount Hole

Title

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