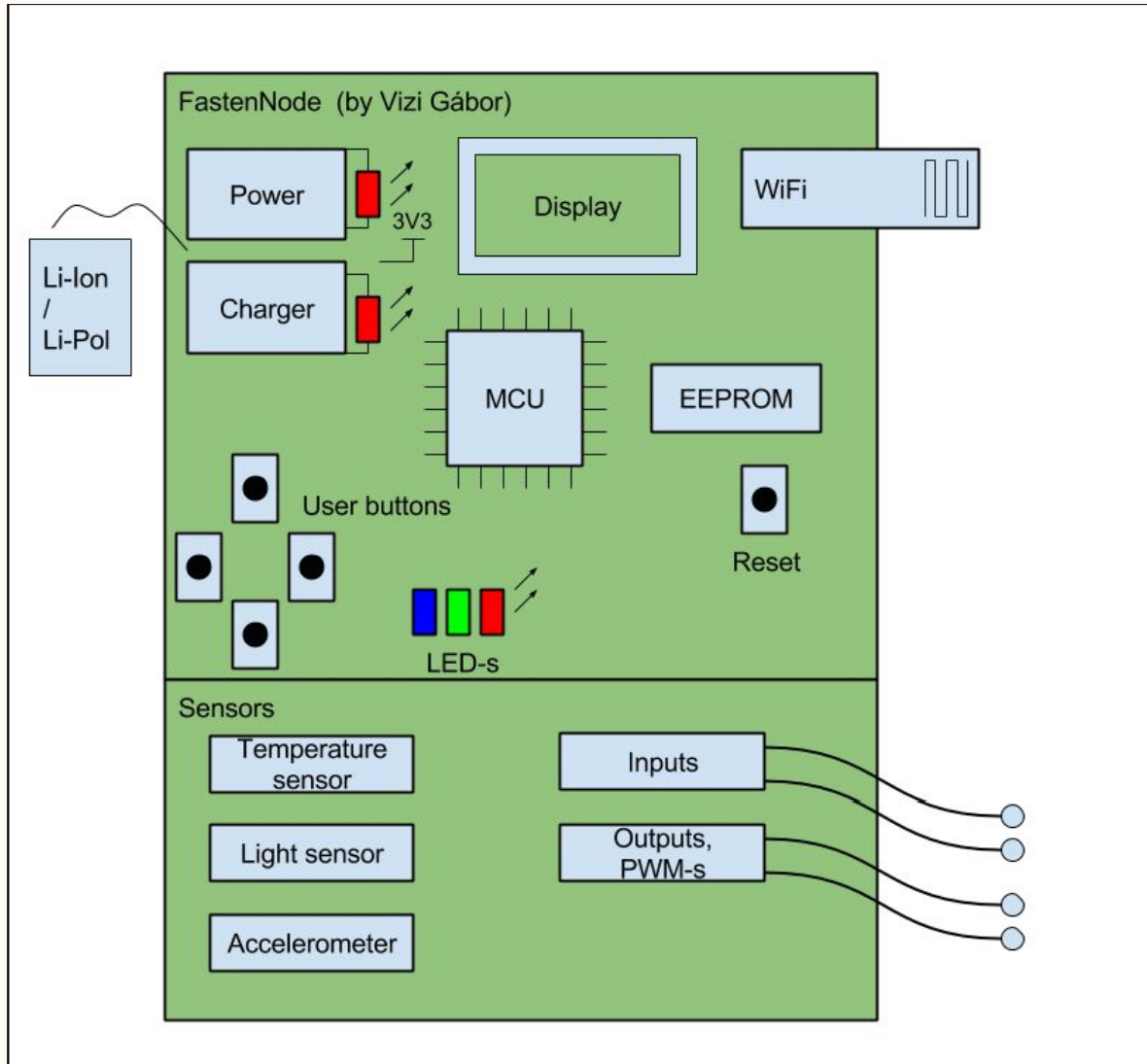


Blockdiagram

[Blockdiagram link \(Google Drive\)](#)



Project FastenNode		Title Blockdiagram	
Size: A4	Number:*	Revision: v1	Drawn by: Vizi Gábor
Date: 2017.04.23.	Time: 19:25:13	Sheet 1 of 10	
File: C:\Engineer\Projects\AltiumProjects\VG_FastenNode\Sheet_ Blockdiagram_NodeSmall.SchDoc			



MCU - F0

▲ Differs from HomeAut NodeSmall:
 - Microphone
 - Oscillator
 + Display
 * FLASH -> EEPROM
 * Power IC -> LDO
 + Charger
 + PWMs

Interrupts:
 PA0 - Button0 - WKUP
 !! PF0 - AccInt1 / PA1 AccInt2
 PF1 - TempOS
 PA4 - Input1
 PA5 - Input2
 PF6 - Input3
 PB8 - Button1
 PB9 - Button2
 PA15 - Button3

SPI-MOSI: PB5
 SPI-MISO: PB4
 SPI-CLK: PB3

▲ Use PF6-7 for weak function (in STM32F030x4/6/8 they are GPIO pin, but in STM32F030xC they are power pins.

▲ Use SWDIO and SWCLK for other function if not need for programming

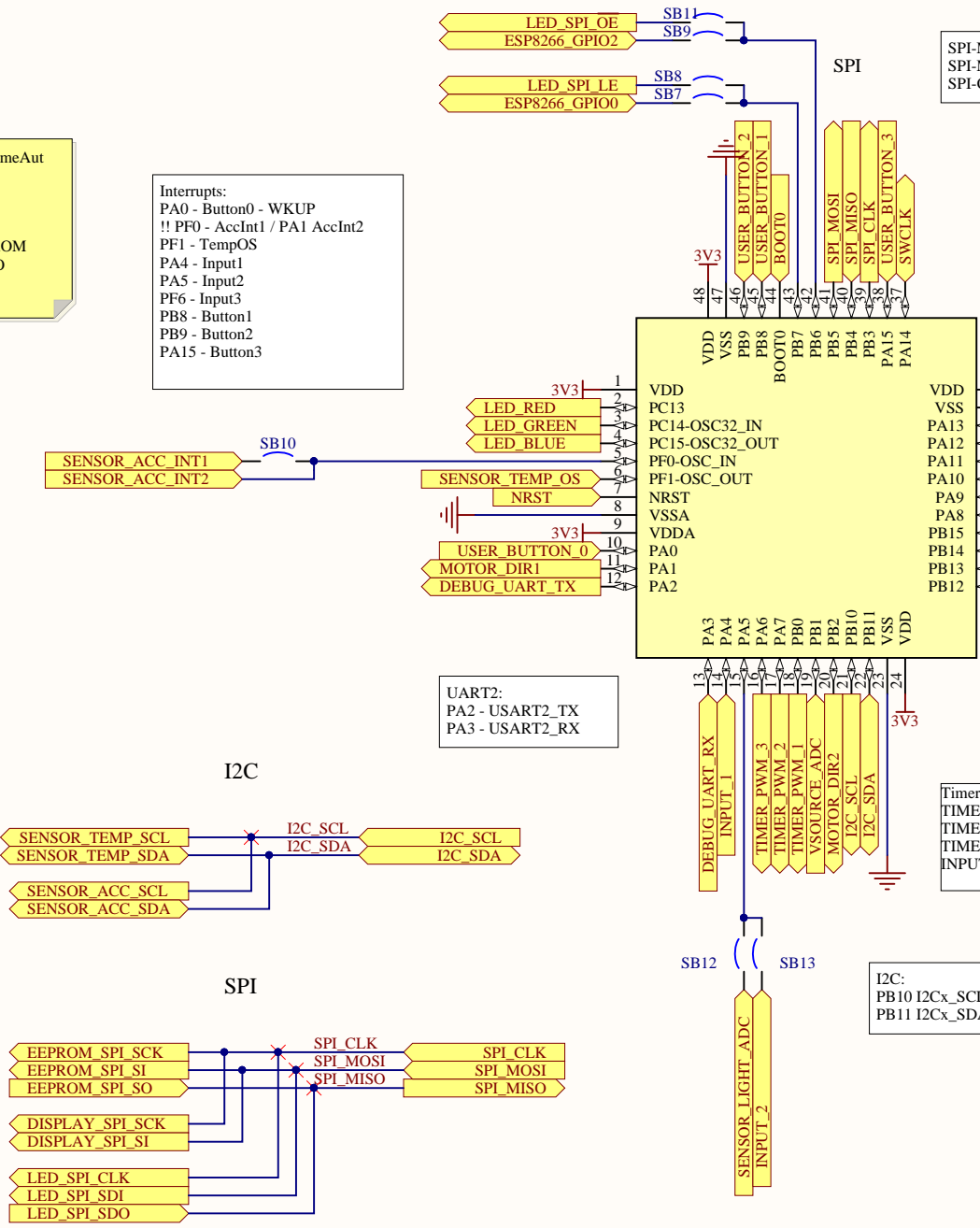
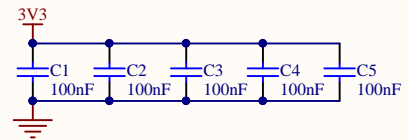
STM32F030x4/6/8:
 pin35 - PF6
 pin36 - PF7
 STM32F030xC:
 pin35 - VSS (GND)
 pin36 - VDD

USART1:
 PA9 - USART1_TX
 PA10 - USART1_RX

UART2:
 PA2 - USART2_TX
 PA3 - USART2_RX

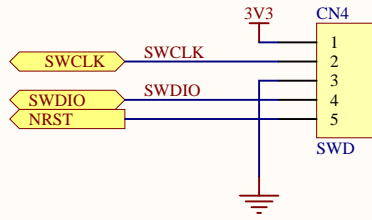
Timers:
 TIMER_PWM_1 - TIM3_CH3 - PB0
 TIMER_PWM_2 - TIM17_CH1 - PA7
 TIMER_PWM_3 - TIM16_CH1 - PA6
 INPUT_1 - TIM14_CH1 - PA4

I2C:
 PB10 I2Cx_SCL
 PB11 I2Cx_SDA

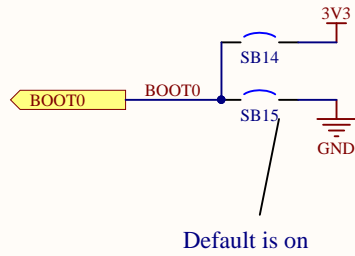


Project FastenNode		Title MCU - F0		
Size: A4	Number: *	Revision: v1	Drawn by: Vizi Gábor	
Date: 2017.04.23.	Time: 19:25:13	Sheet 2 of 10		
File: C:\Engineer\Projects\AltiumProjects\VG_FastenNode\Sheet_MCU_F0.SchDoc				

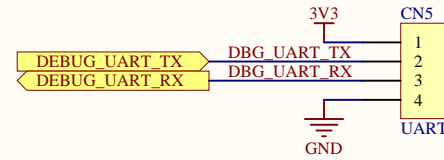
SWD



BOOT0



Debug Uart connector

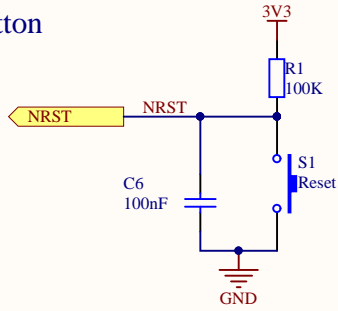


Project FastenNode		Title Core	
Size: A4	Number:*	Revision: v1	Drawn by: Vizi Gábor
Date: 2017.04.23.	Time: 19:25:14	Sheet* of 10	
File: C:\Engineer\Projects\AltiumProjects\VG_FastenNode\Sheet_Core.SchDoc			

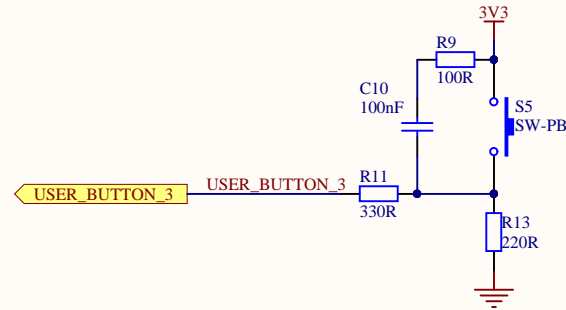
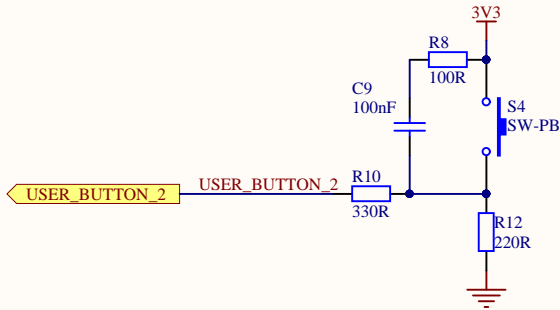
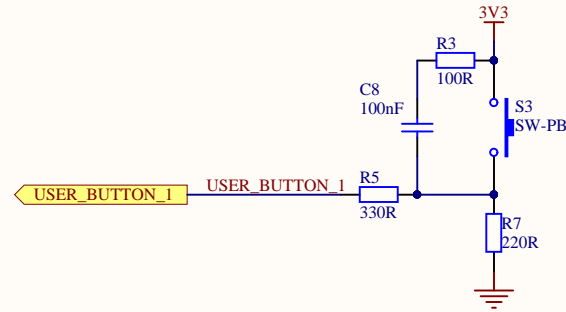
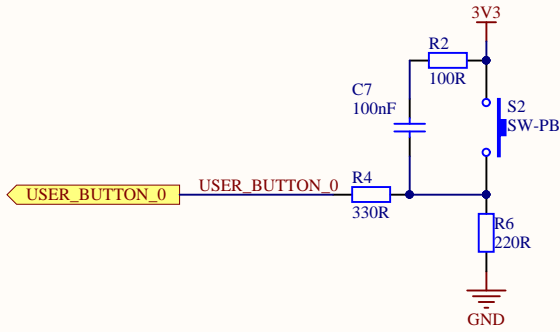


Button

RESET Button



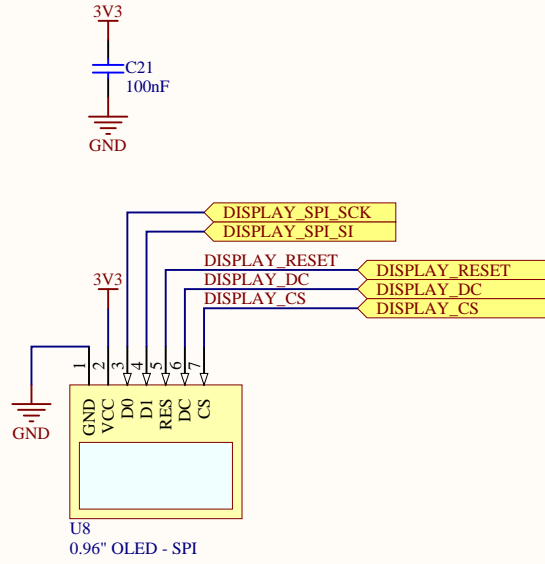
USER & WAKE-UP Button



Project FastenNode		Title Button	
Size: A4	Number:*	Revision: v1	Drawn by:
Date: 2017.04.23.	Time: 19:25:14	Sheet * of 10	Vizi Gábor
File: C:\Engineer\Projects\AltiumProjects\VG_FastenNode\Sheet_Button.SchDoc			



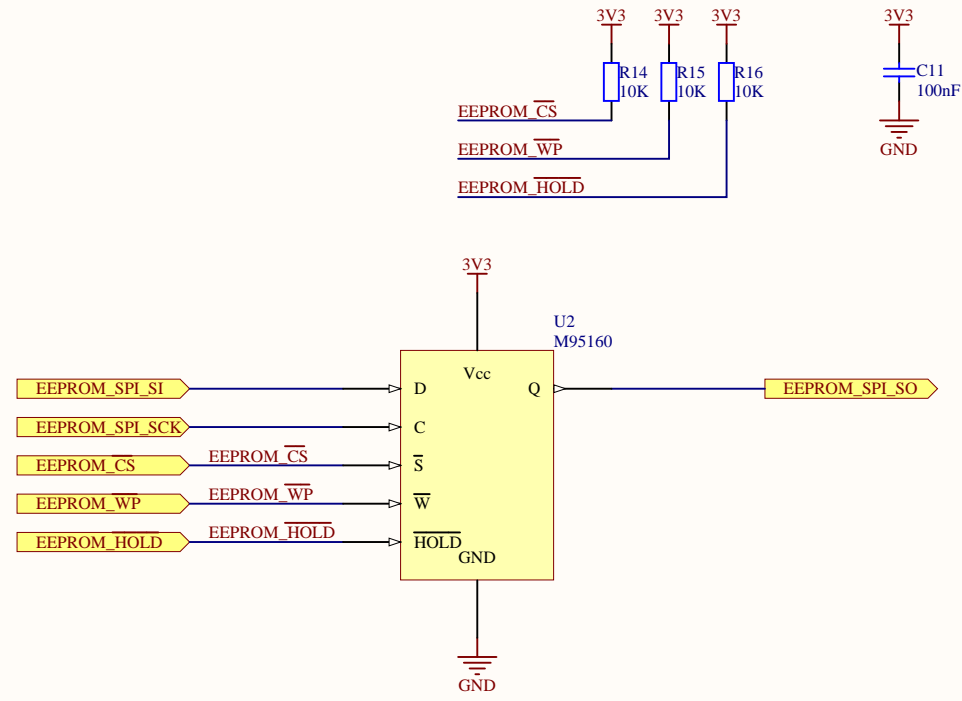
Display



Project FastenNode		Title Display	
Size: A4	Number:*	Revision: v1	Drawn by:
Date: 2017.04.23.	Time: 19:25:14	Sheet* of 10	Vizi Gábor
File: C:\Engineer\Projects\AltiumProjects\VG_FastenNode\Sheet_Display.SchDoc			



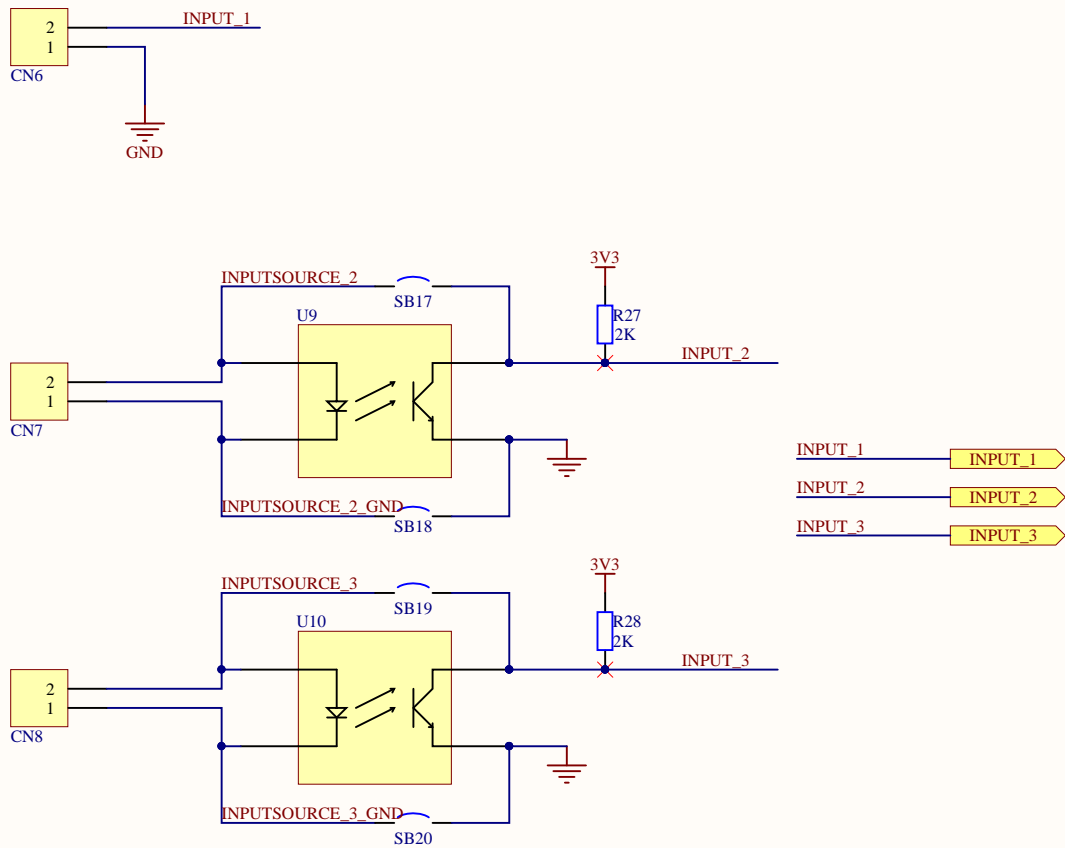
EEPROM



Project FastenNode		Title EEPROM		
Size: A4	Number:*	Revision: v1	Drawn by:	
Date: 2017.04.23.	Time: 19:25:14	Sheet* of 10	Vizi Gábor	
File: C:\Engineer\Projects\AltiumProjects\VG_FastenNode\Sheet_EEPROM.SchDoc				

Input

Digital/Direct Inputs

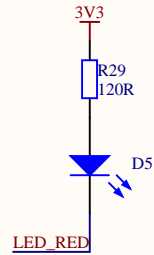


Project FastenNode		Title Input		
Size: A4	Number:*	Revision: v1	Drawn by:	
Date: 2017.04.23.	Time: 19:25:14	Sheet* of 10	Vizi Gábor	
File: C:\Engineer\Projects\AltiumProjects\VG_FastenNode\Sheet_Input.SchDoc				

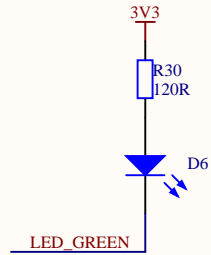
LED

LEDs

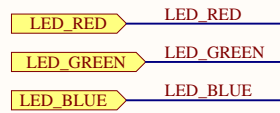
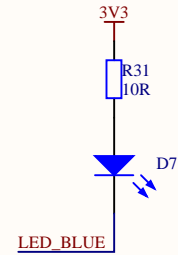
Alarm LED
Red
2,1V -> 10mA
3,3V-2,1V = 1,2V
1,2V / 10mA = 120 Ohm



All Right LED
Green
2,1V -> 10mA
3,3V-2,1V = 1,2V
1,2V / 10mA = 120 Ohm



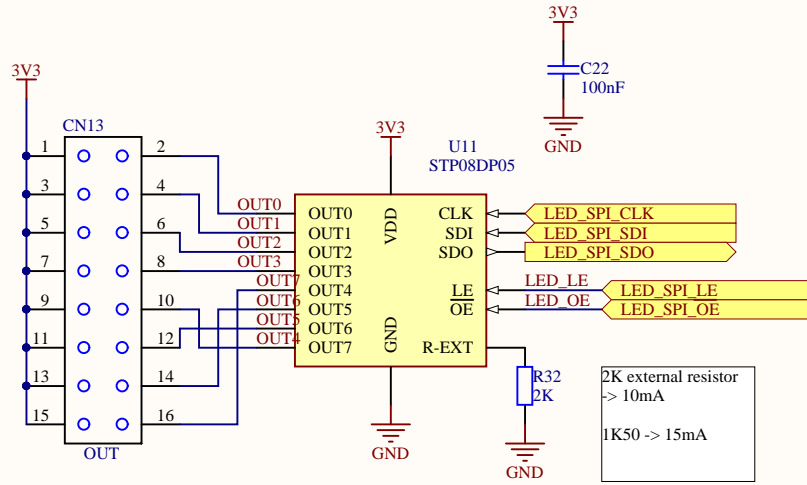
Power LED
Blue
3,4V -> 10mA
00hm



Project FastenNode		Title LED		
Size: A4	Number:*	Revision: v1	Drawn by:	
Date: 2017.04.23.	Time: 19:25:14	Sheet* of 10	Vizi Gábor	
File: C:\Engineer\Projects\AltiumProjects\VG_FastenNode\Sheet_LED.SchDoc				

Output

T

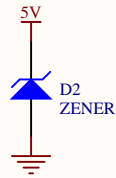
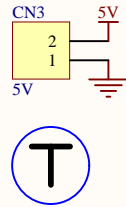
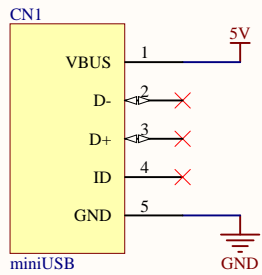


Project FastenNode		Title Output	
Size: A4	Number:*	Revision: v1	Drawn by:
Date: 2017.04.23.	Time: 19:25:14	Sheet* of 10	Vizi Gábor
File: C:\Engineer\Projects\AltiumProjects\VG_FastenNode\Sheet_Output.SchDoc			

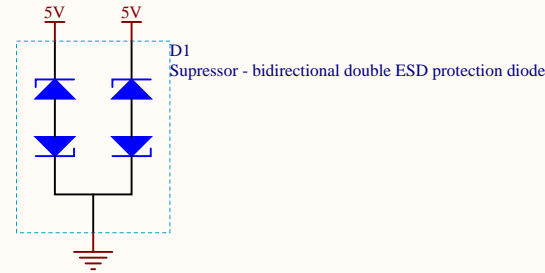


Power

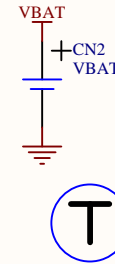
Input power connectors



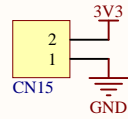
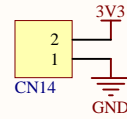
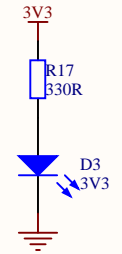
Supressor / Transil



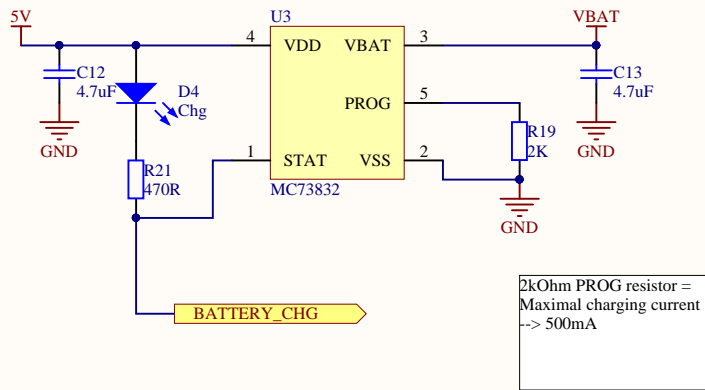
Battery



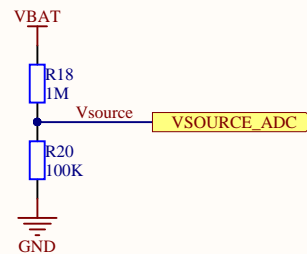
Power LED



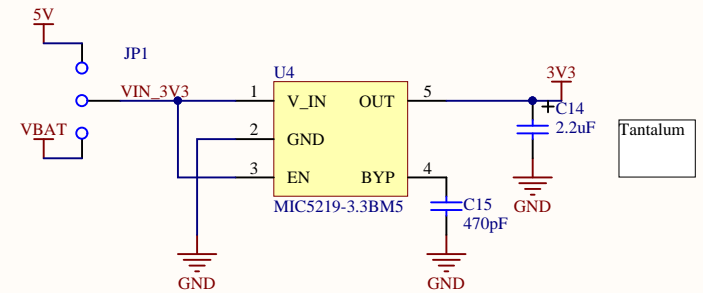
Battery charger



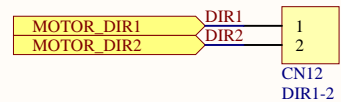
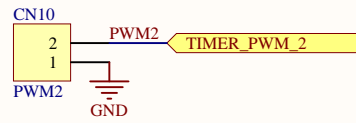
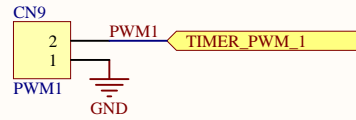
Battery voltage measurement



3V3



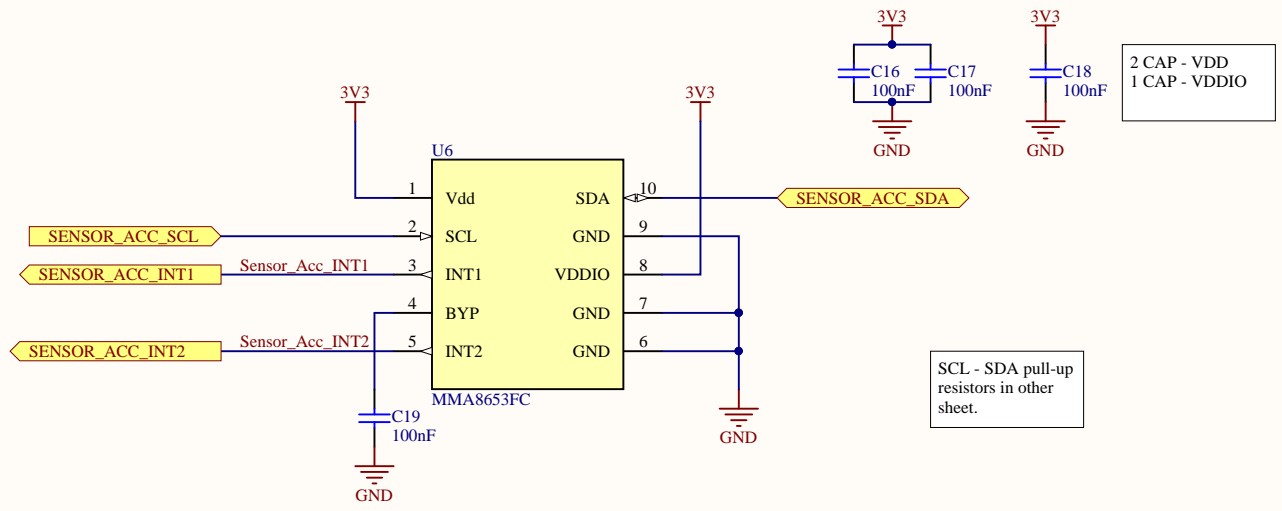
PWM



Project FastenNode		Title PWM	
Size: A4	Number:*	Revision: v1	Drawn by:
Date: 2017.04.23.	Time: 19:25:14	Sheet* of 10	Vizi Gábor
File: C:\Engineer\Projects\AltiumProjects\VG_FastenNode\Sheet_PWM.SchDoc			



Accelerometer

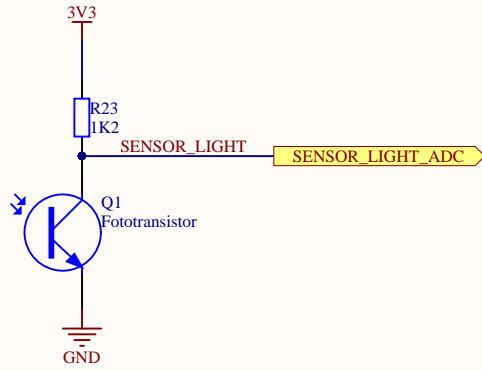



SCL - SDA pull-up resistors in other sheet.

2 CAP - VDD
1 CAP - VDDIO

Project FastenNode		Title Accelerometer		
Size: A4	Number:*	Revision: v1	Drawn by:	
Date: 2017.04.23.	Time: 19:25:14	Sheet* of 10	Vizi Gábor	
File: C:\Engineer\Projects\AltiumProjects\VG_FastenNode\Sheet_SensorAccelerometer.SchDoc				

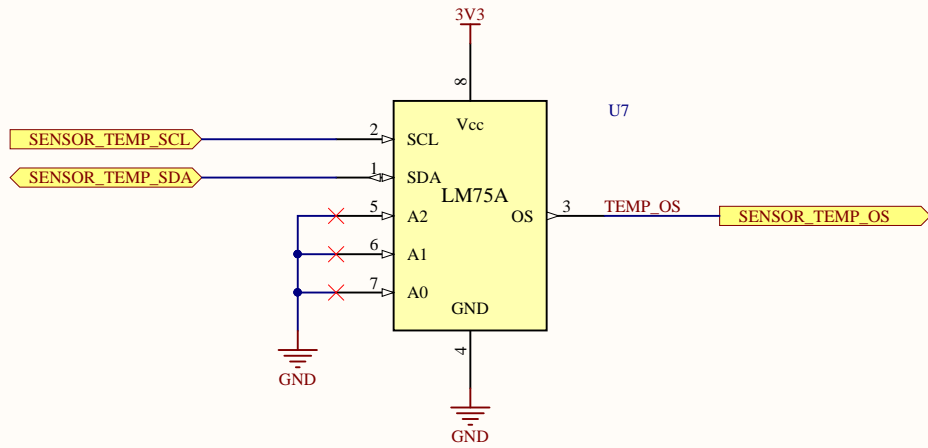
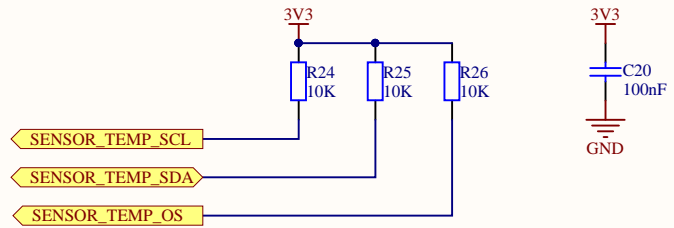
Light Sensor



Project FastenNode		Title Light Sensor		
Size: A4	Number:*	Revision: v1	Drawn by:	
Date: 2017.04.23.	Time: 19:25:15	Sheet* of 10	Vizi Gábor	
File: C:\Engineer\Projects\AltiumProjects\VG_FastenNode\Sheet_SensorLight.SchDoc				

Temperature sensor

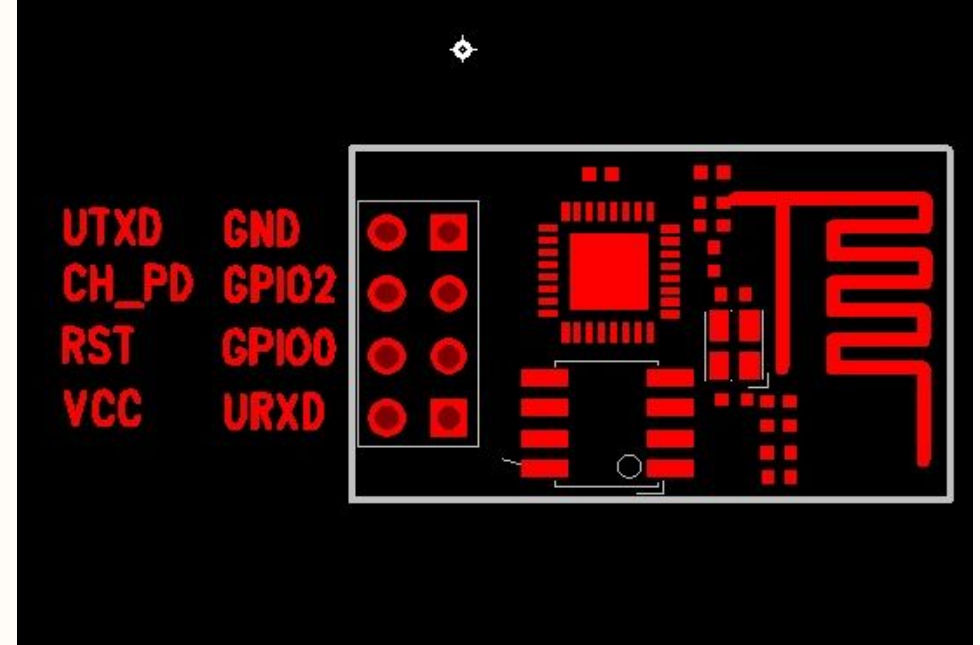
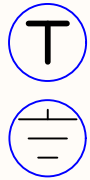
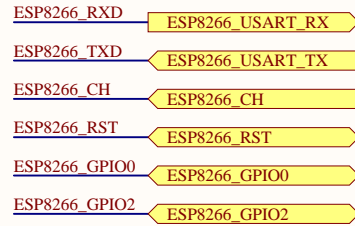
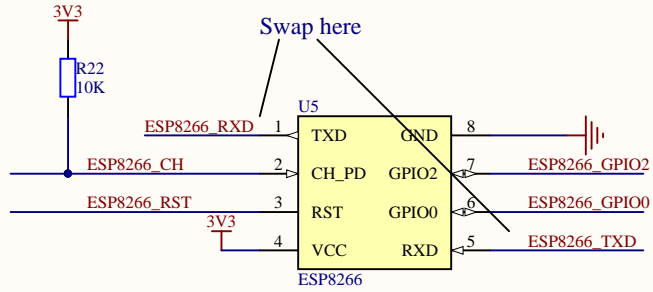
Address:
0b000



Project FastenNode		Title Temperature sensor		
Size: A4	Number:*	Revision: v1	Drawn by:	
Date: 2017.04.23.	Time: 19:25:15	Sheet* of 10	Vizi Gábor	
File: C:\Engineer\Projects\AltiumProjects\VG_FastenNode\Sheet_SensorTemp.SchDoc				

WiFi

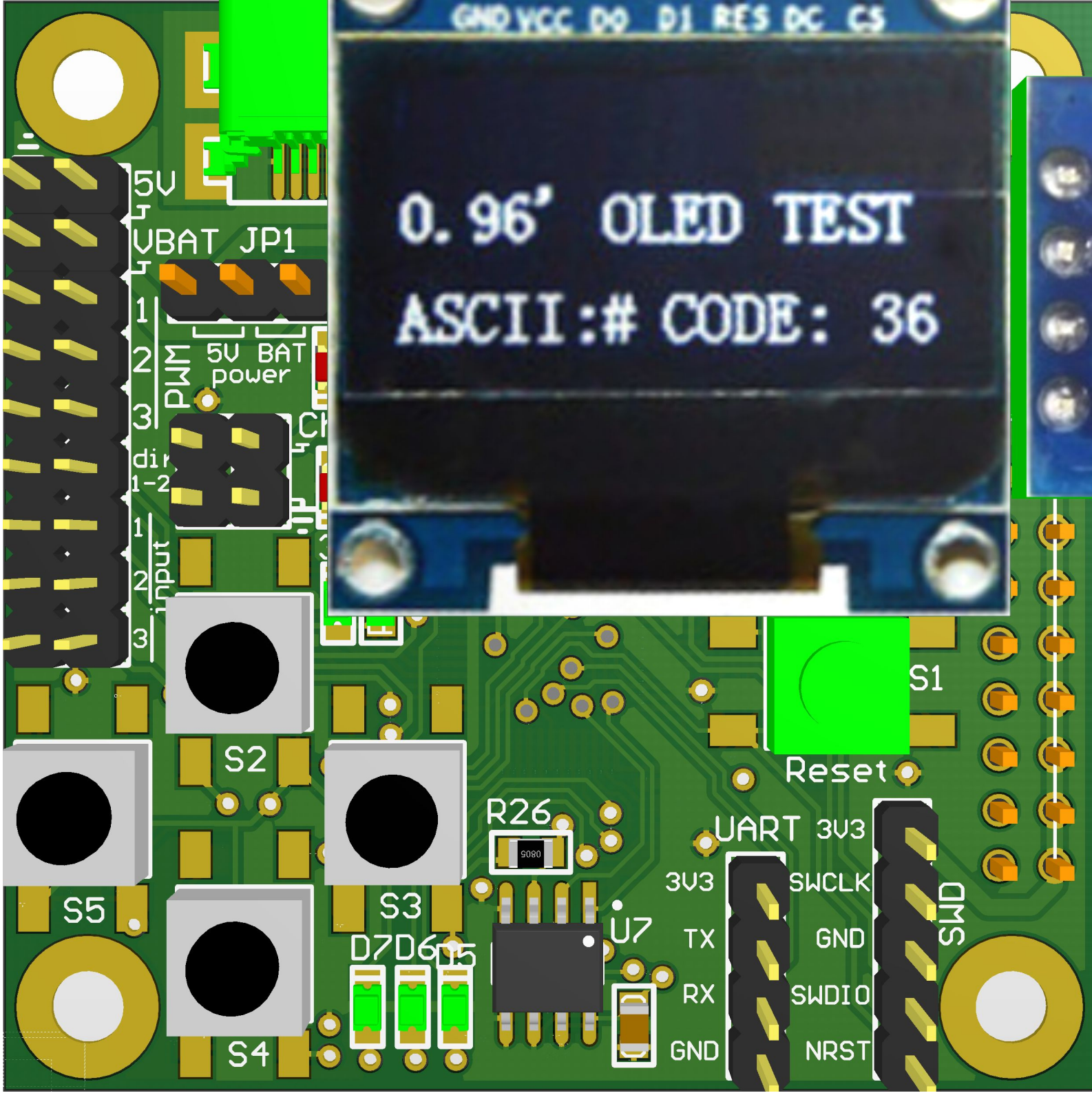
ESP8266
[Link: nurdspace - ESP8266](#)



Project FastenNode		Title WiFi	
Size: A4	Number:*	Revision: v1	Drawn by: Vizi Gábor
Date: 2017.04.23.	Time: 19:25:15	Sheet* of 10	
File: C:\Engineer\Projects\AltiumProjects\VG_FastenNode\Sheet_WiFi.SchDoc			



Comment	Description	Designator	Footprint	LibRef	Quantity
100nF	Capacitor	C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C16, C17, C18, C19, C20, C21, C22	FP_0805_CAP_085	CAP	18
4.7uF	Capacitor	C12, C13	FP_0805_CAP_085	CAP	2
2.2uF	Capacitor - Tantalum	C14	FP_0805_CAP_Tantalum	CAP_Tantalum	1
470pF	Capacitor	C15	FP_0805_CAP_085	CAP	1
miniUSB	USB connector 5pin	CN1	FP_USB_MINIB	USB_connector_5pin	1
VBAT	Battery	CN2	FP_HEADER_1X2	Battery	1
5V	Header, 2-Pin	CN3	FP_HEADER_1X2	Header 2	1
SWD	Header, 5-Pin	CN4	FP_HEADER_1X5	Header 5	1
UART	Header, 4-Pin	CN5	FP_HEADER_1X4	Header 4	1
IN1	Header, 2-Pin	CN6	FP_HEADER_1X2	Header 2	1
IN2	Header, 2-Pin	CN7	FP_HEADER_1X2	Header 2	1
IN3	Header, 2-Pin	CN8	FP_HEADER_1X2	Header 2	1
PWM1	Header, 2-Pin	CN9	FP_HEADER_1X2	Header 2	1
PWM2	Header, 2-Pin	CN10	FP_HEADER_1X2	Header 2	1
PWM3	Header, 2-Pin	CN11	FP_HEADER_1X2	Header 2	1
DIR1-2	Header, 2-Pin	CN12	FP_HEADER_1X2	Header 2	1
OUT	Header 8x2	CN13	FP_CONN_8X2	Header 8x2	1
Header 2	Header, 2-Pin	CN14, CN15	FP_HEADER_1X2	Header 2	2
Suppressor - bidirectional double ESD protection diode	Suppressor - bidirectional double ESD protection diode	D1	FP_SOT23-3	Suppressor - bidirectional double ESD protection diode	1
ZENER	Zener Diode	D2	FP_SOD80-MINIMELF	ZENER	1
3V3	LED - yellow	D3	FP_0805_LED_RED	LED	1
Chg	LED	D4	FP_0805_LED_RED	LED	1
LED	LED	D5, D7	FP_0805_LED_RED	LED	2
LED	LED	D6	FP_0805_LED_GREEN	LED	1
JUMPER-3	Jumper Wire	JP1	FP_CONN3_TUSKE_254 MM	JUMPER-3	1
LOGO_Fasten		Logo - Fasten, Logo - Fasten - 2	FP_LOGO_F	LOGO_Fasten	2
LOGO_GND	Logo - GND	Logo - GND - ESP8266, Logo - GND - Output, Logo - GND - Power	FP_LOGO_GND	LOGO_GND	3
LOGO_VCC	Logo - VCC	Logo - VCC - 5V, Logo - VCC - ESP8266, Logo - VCC - Output, Logo - VCC - Power, Logo - VCC - VBAT	FP_LOGO_VCC	LOGO_VCC	5
Fototransistor	NPN Phototransistor	Q1	FP_0805_PHOTONPN	Photo NPN	1
100K	Resistor	R1, R20	FP_0805_RES	RES	2
100R	Resistor	R2, R3, R8, R9	FP_0805_RES	RES	4
330R	Resistor	R4, R5, R10, R11, R17	FP_0805_RES	RES	5
220R	Resistor	R6, R7, R12, R13	FP_0805_RES	RES	4
10K	Resistor	R14, R15, R16, R22, R24, R25, R26	FP_0805_RES	RES	7
1M	Resistor	R18	FP_0805_RES	RES	1
2K	Resistor	R19, R27, R28, R32	FP_0805_RES	RES	4
470R	Resistor	R21	FP_0805_RES	RES	1
1K2	Resistor	R23	FP_0805_RES	RES	1
120R	Resistor	R29, R30	FP_0805_RES	RES	2
10R	Resistor	R31	FP_0805_RES	RES	1
Reset	Switch	S1	FP_FSMJSMA_button	SW-PB	1
SW-PB	Switch	S2, S3, S4, S5	FP_FSMJSMA_button	SW-PB	4
Soldering bridge	Soldering Bridge	SB1, SB2, SB3, SB4, SB5, SB6, SB7, SB8, SB9, SB10, SB11, SB12, SB13, SB14, SB15, SB17, SB18, SB19, SB20	FP_SB	Soldering bridge	19
STM32F030Cxx	STM32F030Cx - 48pin	U1	FP_LOFP48_QFP127P60 0-8N	STM32F030C-48pin	1
M95160	EEPROM - SPI - 8pin	U2	FP_SO8	EEPROM - SPI - 8pin	1
MC73832	Li-Ion & Li-Pol charger	U3	FP_SOT23-5	Charger - Li-Ion-Pol	1
MIC5219-3.3BM5	LDO - MIC5219	U4	FP_SOT23-5	LDO	1
ESP8266	Wifi module - ESP8266	U5	FP_ESP8266	WIFI-ESP8266	1
MMA8653FC	Accelerometer - MMA8653FC - 10 pin - I2C	U6	FP_DFN_10PIN_2x2x1mm	ACCELEROMETER_MMA8653FC	1
LM75AD	Sensor - Temperature - digital	U7	FP_SO8	Sensor_TemperatureDigital	1
0.96" OLED - SPI	0.96" OLED	U8	FP_DISPLAY_096OLED	Display - 096OLED	1
Photocoupler	Photocoupler - 4pin	U9, U10	FP_DIP4-TLP181	Photocoupler	2
STP08DP05	STP08CP05 Low voltage,	U11	FP_SO16N	LED_DRIVER	1



GND VCC D0 D1 RES DC CS

0.96" OLED TEST
ASCII:# CODE: 36

5V
VBAT JP1
1
2
3
PWM 5V BAT power
dir
1-2
1
2
3
input

S1

Reset

S2

R26
9080

UART 3V3

S5

S3

D7 D6 D5

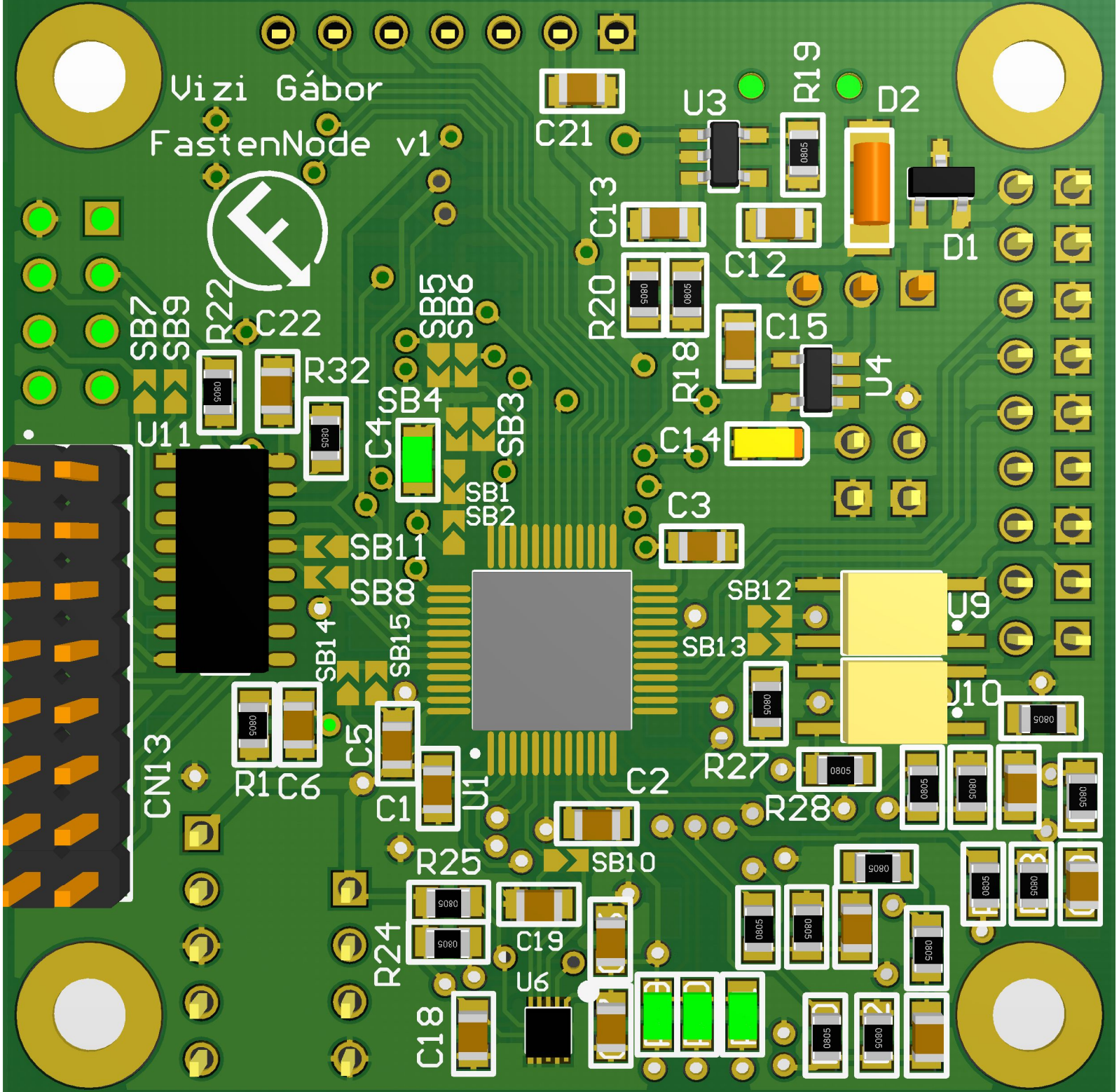
U7

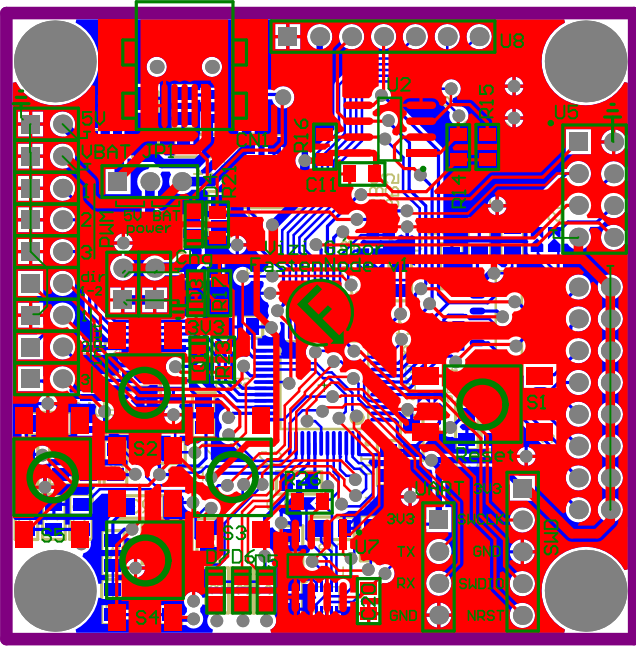
3V3
TX
RX
GND
SWCLK
GND
SWDIO
NRST

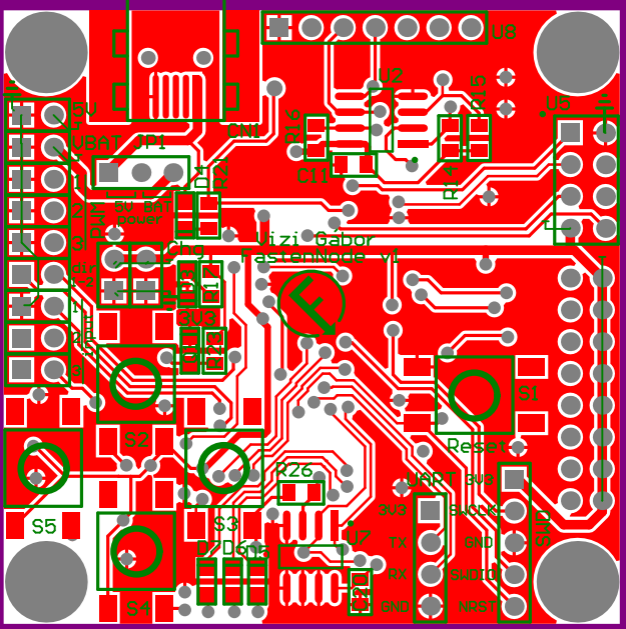
S4

SWD

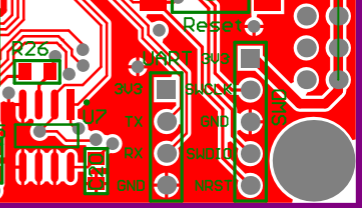
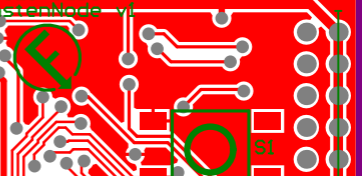
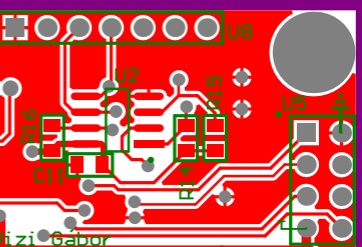
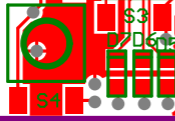
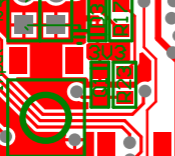
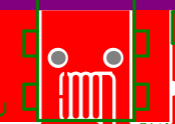
Vizi Gábor
FastenNode v1



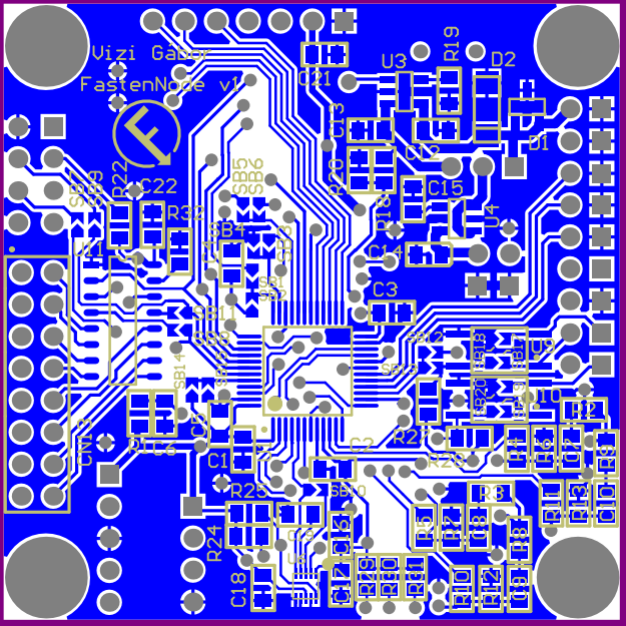


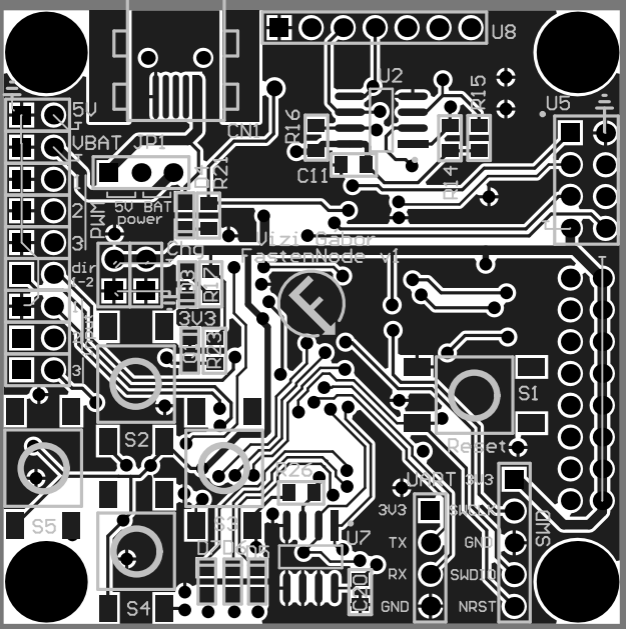


Vizi Gabor
FastenNode v1



Uzi Gabor
FastenNode v1





Ji zi Gabor
FastNode

Vizi Gateway
FastenNode v1

