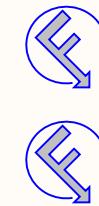
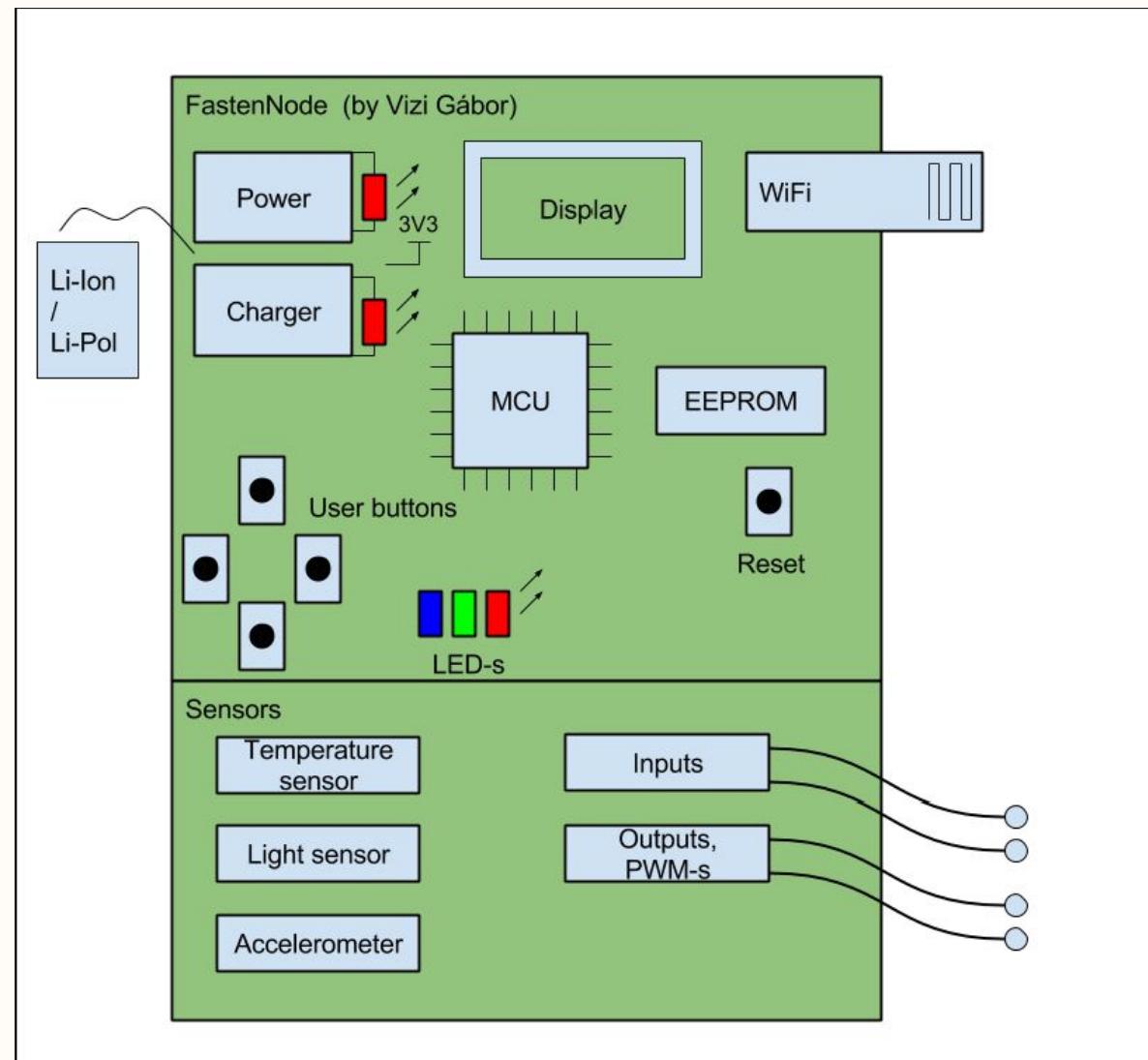


## Blockdiagram

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



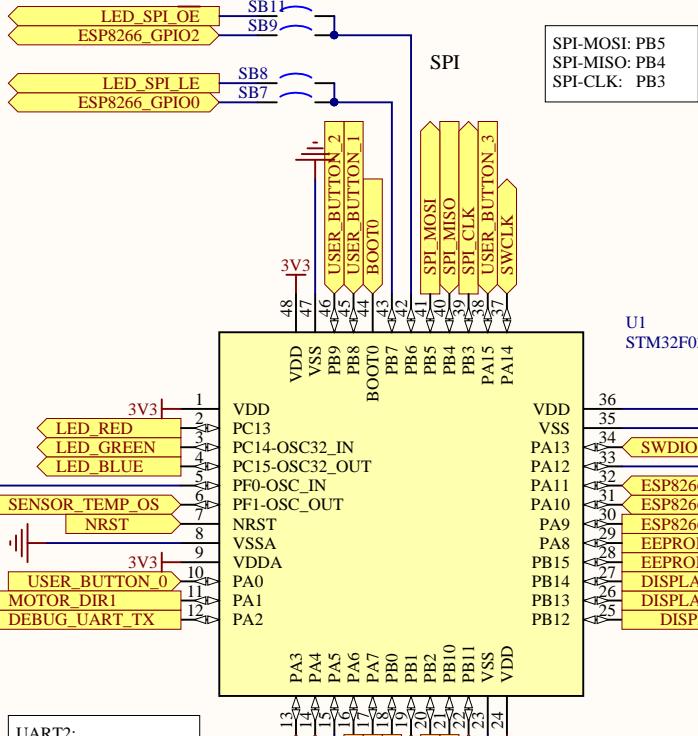
Project <b>FastenNode</b>		Title <b>Blockdiagram</b>	
Size: A4	Number:*	Revision: v1	Drawn by: Vizi Gábor
Date: 2017.04.23.	Time: 19:25:13	Sheet 1 of 10	
File: C:\Engineer\Projects\AltiumProjects\VG_FastenNode\Sheet_Blockdiagram_NodeSmall.SchDoc			

**Altium**

# MCU - F0

▲ Differents 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



▲ 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

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

X

Y

Z

AA

AB

AC

AD

AE

AF

AG

AH

AI

AJ

AK

AL

AM

AN

AO

AP

AQ

AR

AS

AT

AU

AV

AW

AX

AY

AZ

BA

BC

BD

BE

BF

BG

BH

BI

BJ

BK

BL

BM

BN

BO

BP

BQ

BR

BS

BT

BU

BV

BW

BX

BY

BZ

CA

CB

CD

CE

CF

CG

CH

CI

CJ

CK

CL

CM

CN

CO

CP

CQ

CR

CS

## Core

A

A

B

B

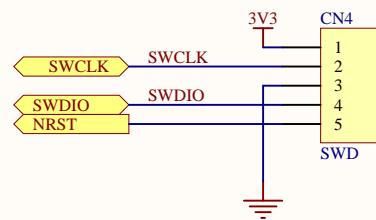
C

C

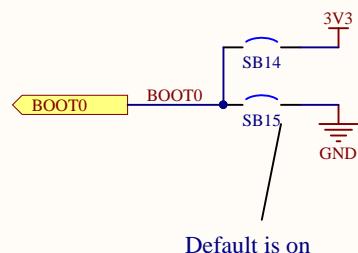
D

D

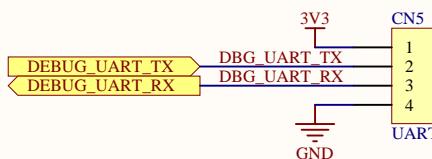
SWD



BOOT0



Debug Uart connector

Project *FastenNode*Title *Core***Altium**

Size: A4

Number:\*

Revision: v1

Drawn by:  
Vizi Gábor

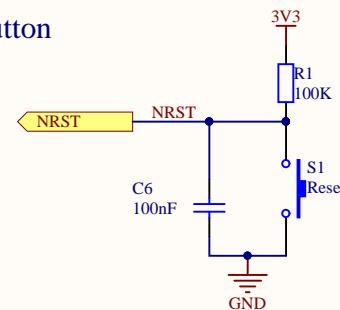
Date: 2017.04.23. Time: 19:25:14

Sheet \* of 10

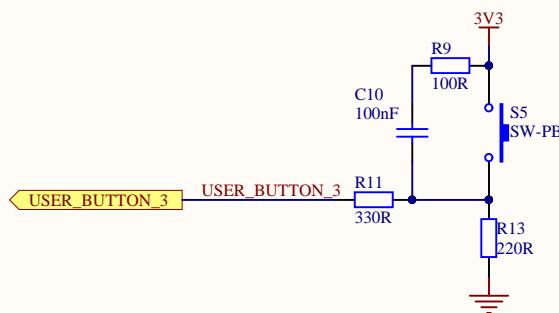
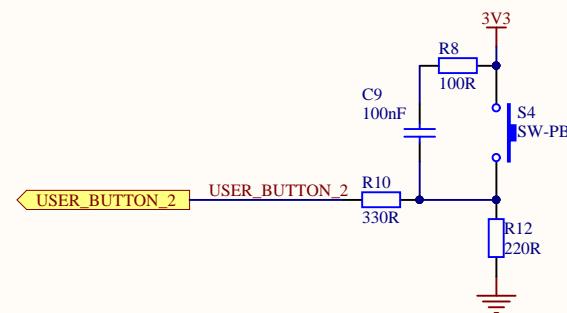
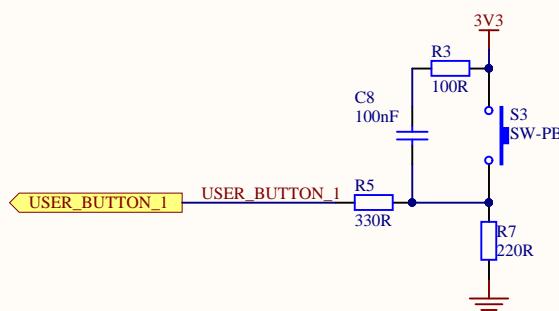
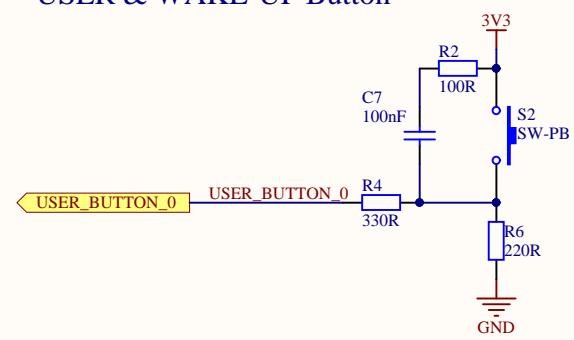
File: C:\Engineer\Projects\AltiumProjects\VG\_FastenNode\Sheet\_Core.SchDoc

Button

## RESET Button



## USER &amp; WAKE-UP Button

Project *FastenNode*Title *Button*

Size: A4

Number:\*

Revision: v1

Drawn by:  
Vizi Gábor

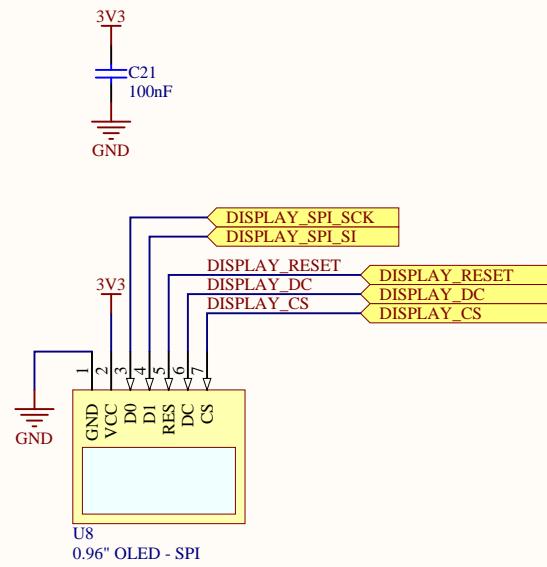
Date: 2017.04.23. Time: 19:25:14

Sheet \* of 10

File: C:\Engineer\Projects\AltiumProjects\VG\_FastenNode\Sheet\_Button.SchDoc

**Altium**

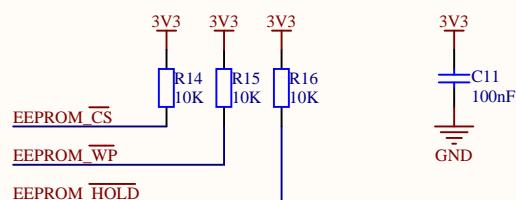
# Display



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

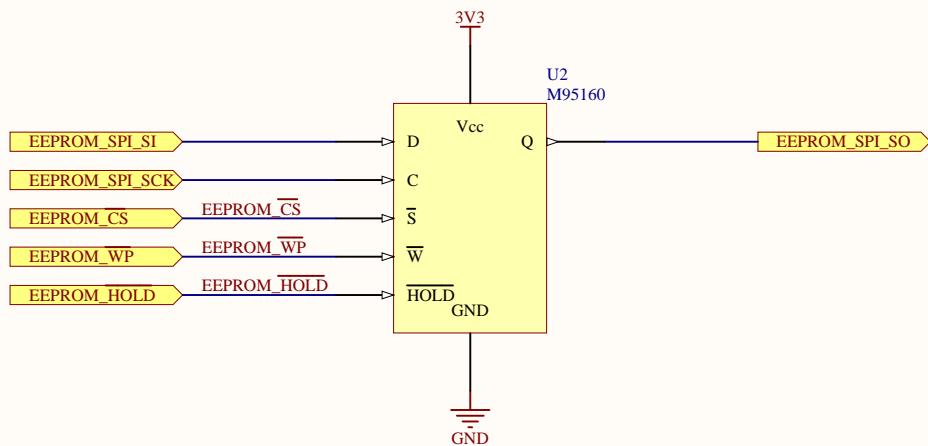
# EEPROM

A



A

B



B

C

C

D

D

Project <i>FastenNode</i>		Title <i>EEPROM</i>	
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_EEPROM.SchDoc			

**Input**

A

A

**Digital/Direct Inputs**

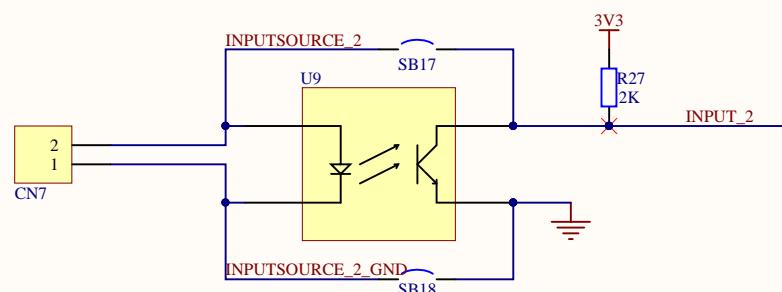
B

B



C

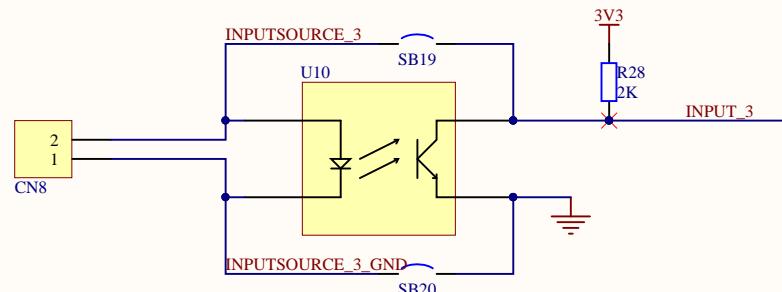
C



- INPUT\_1**
- INPUT\_2**
- INPUT\_3**

D

D



Project <b>FastenNode</b>		Title <b>Input</b>	
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_Input.SchDoc			<b>Altium</b>

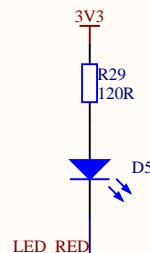
**LED**

A

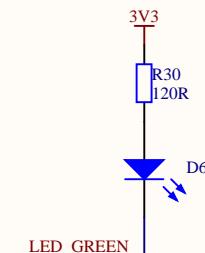
A

**LEDs**

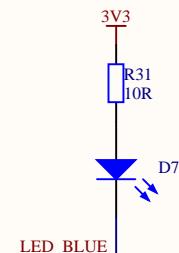
Alarm LED  
Red  
2,1V -> 10mA  
3,3V-2,1V = 1,2V  
 $1,2V / 10mA = 120 \text{ Ohm}$



All Right LED  
Green  
2,1V -> 10mA  
3,3V-2,1V = 1,2V  
 $1,2V / 10mA = 120 \text{ Ohm}$



Power LED  
Blue  
3,4V -> 10mA  
0Ohm



B

B



C

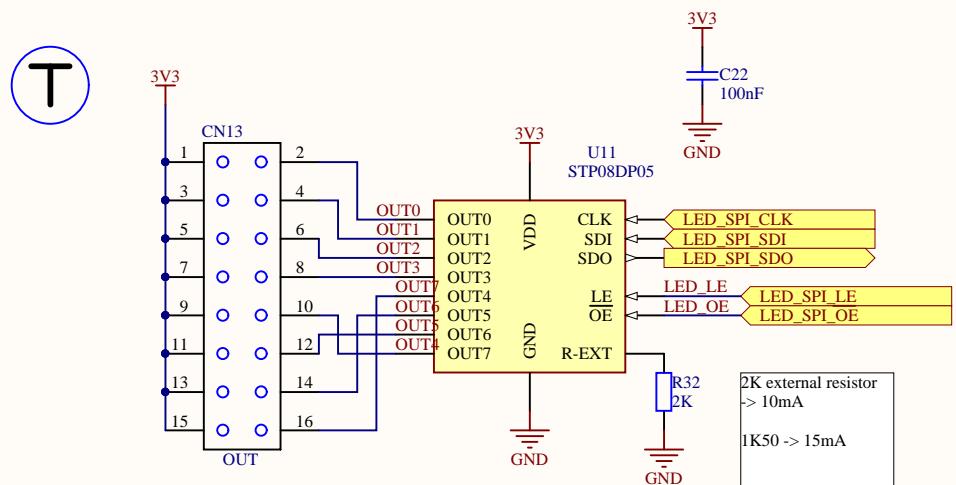
C

D

D

Project <i>FastenNode</i>		Title <i>LED</i>	
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_LED.SchDoc			

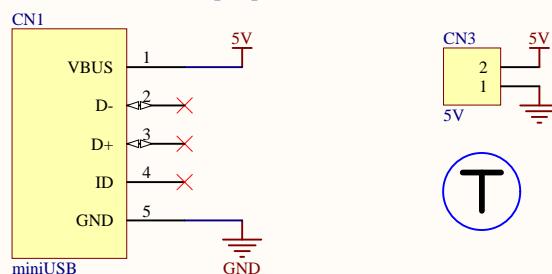
# Output



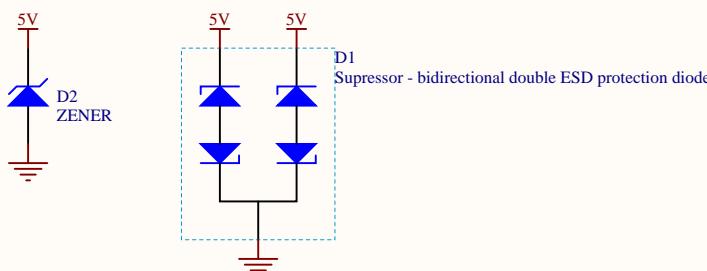
Project <i>FastenNode</i>		Title <i>Output</i>		<b>Altium</b>
Size: A4	Number:*	Revision: v1	Drawn by: Vizi Gábor	
Date: 2017.04.23.	Time: 19:25:14	Sheet * of 10		
File: C:\Engineer\Projects\AltiumProjects\VG_FastenNode\Sheet_Output.SchDoc				

# Power

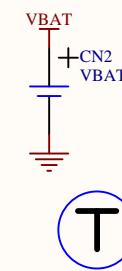
## Input power connectors



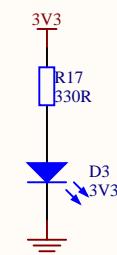
## Suppressor / Transil



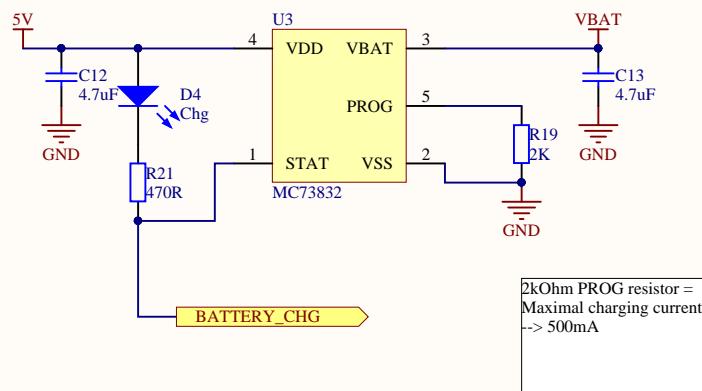
## Battery



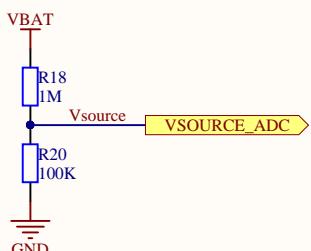
## Power LED



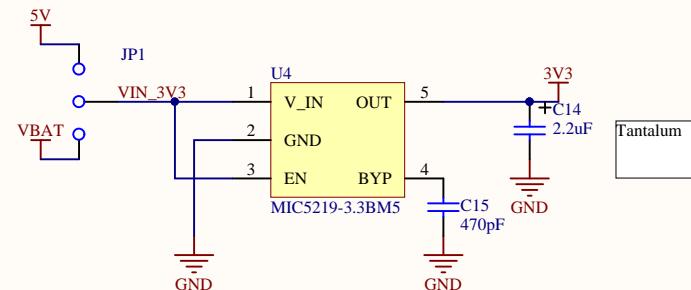
## Battery charger



## Battery voltage measurement

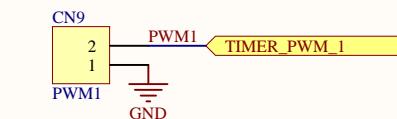


## 3V3

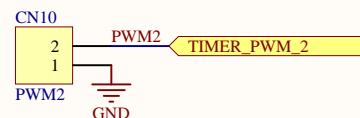


# PWM

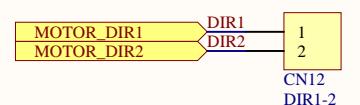
A



B



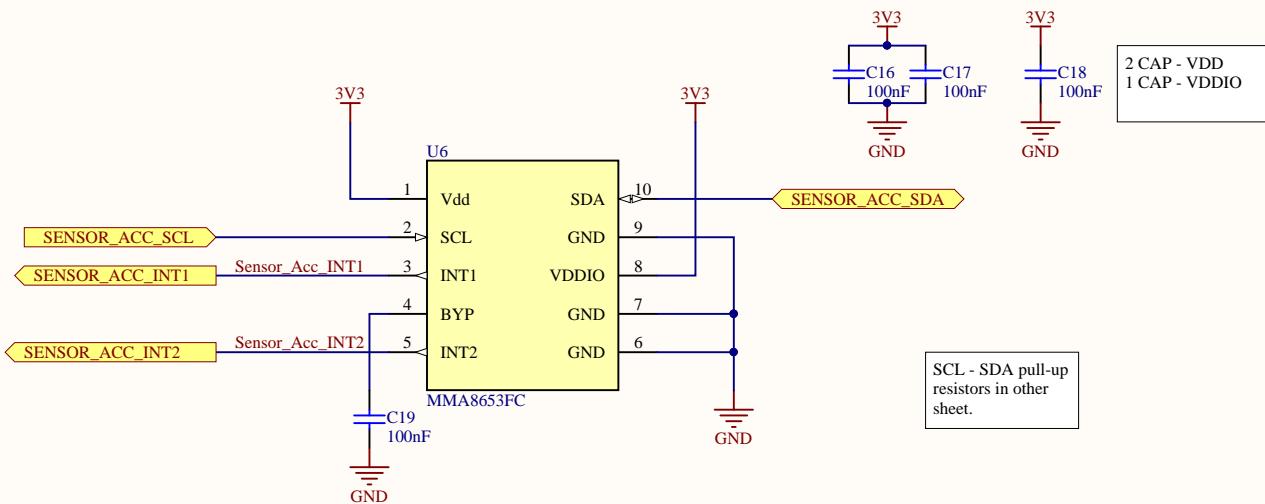
C



D

Project <i>FastenNode</i>		Title <i>PWM</i>	
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_PWM.SchDoc			

# Accelerometer



# Light Sensor

A

A

B

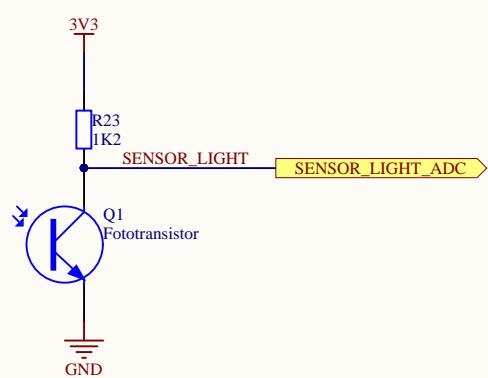
B

C

C

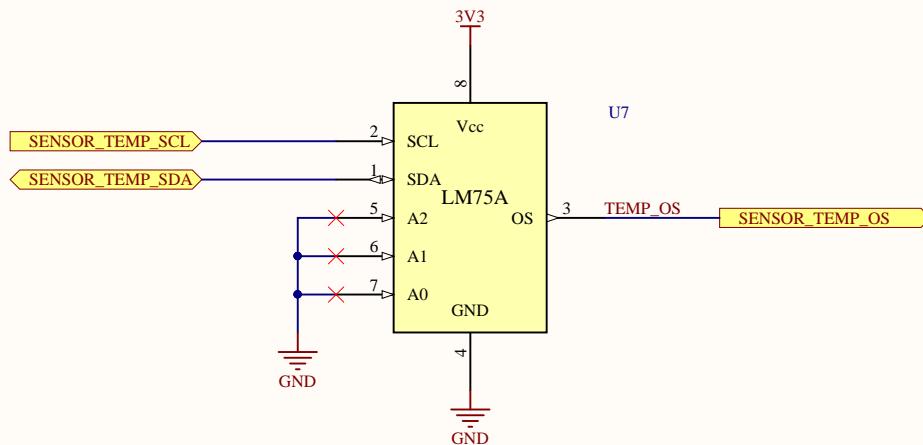
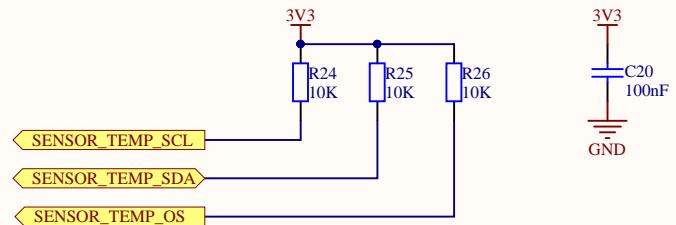
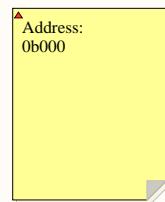
D

D



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

## Temperature sensor

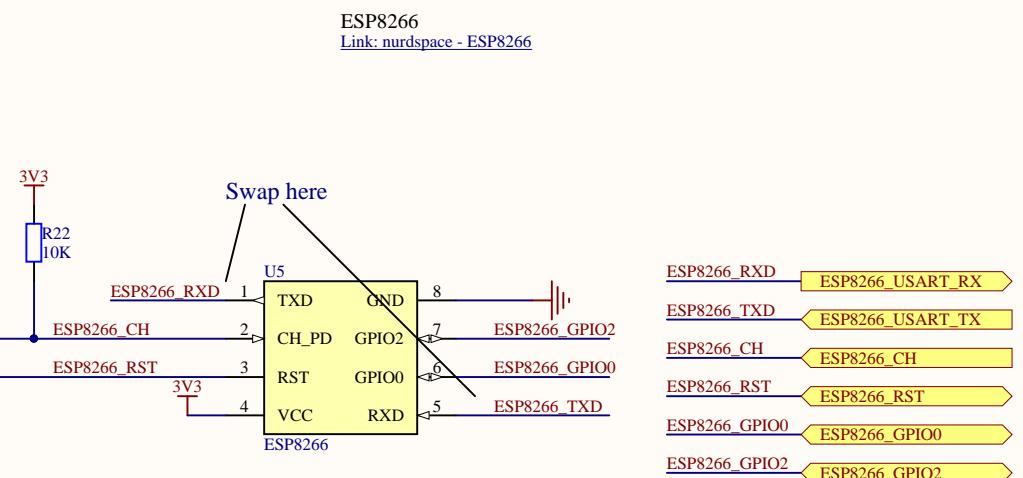


Project <i>FastenNode</i>		Title <i>Temperature sensor</i>	
Size: A4	Number:*	Revision: v1	Drawn by: Vizi Gábor
Date: 2017.04.23.	Time: 19:25:15	Sheet * of 10	
File: C:\Engineer\Projects\AltiumProjects\VG_FastenNode\Sheet_SensorTemp.SchDoc			

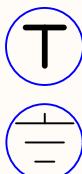
**Altium**

## WiFi

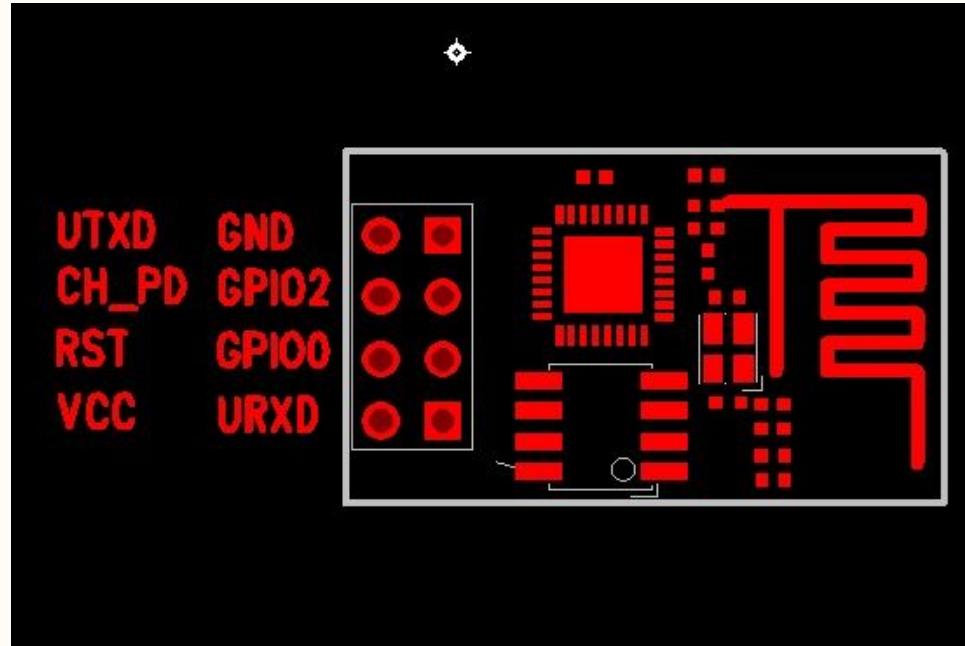
A



B



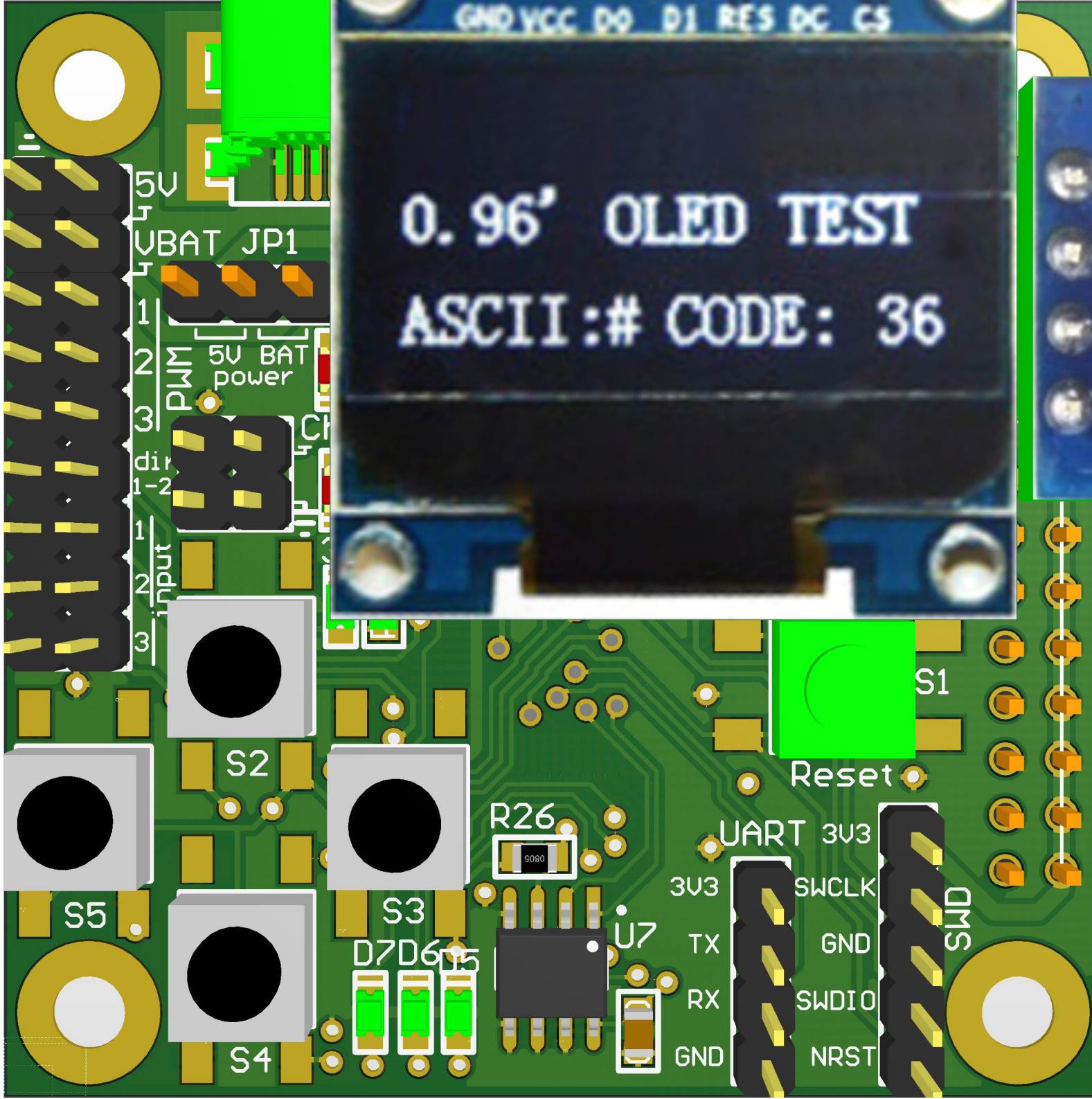
C

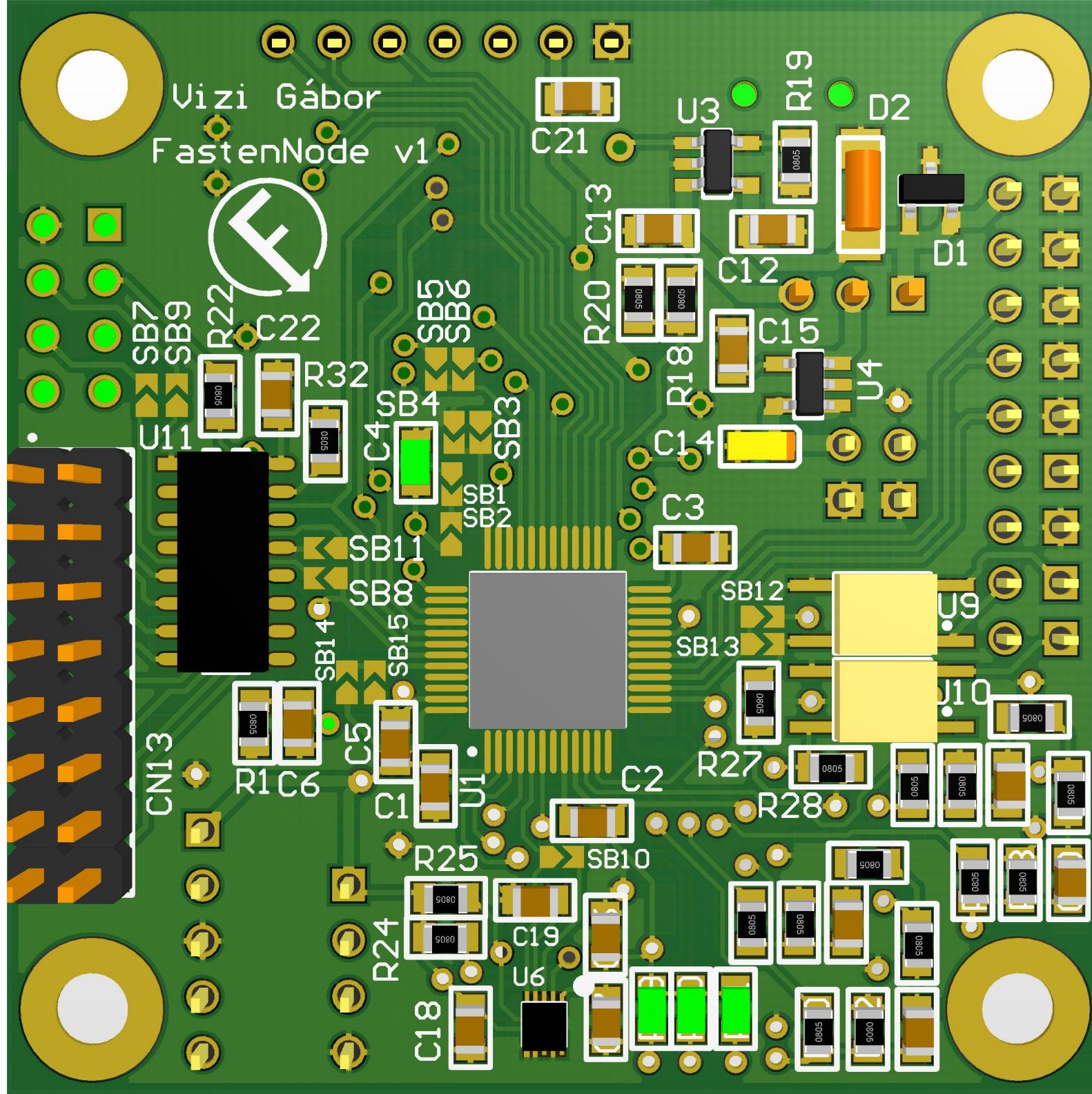


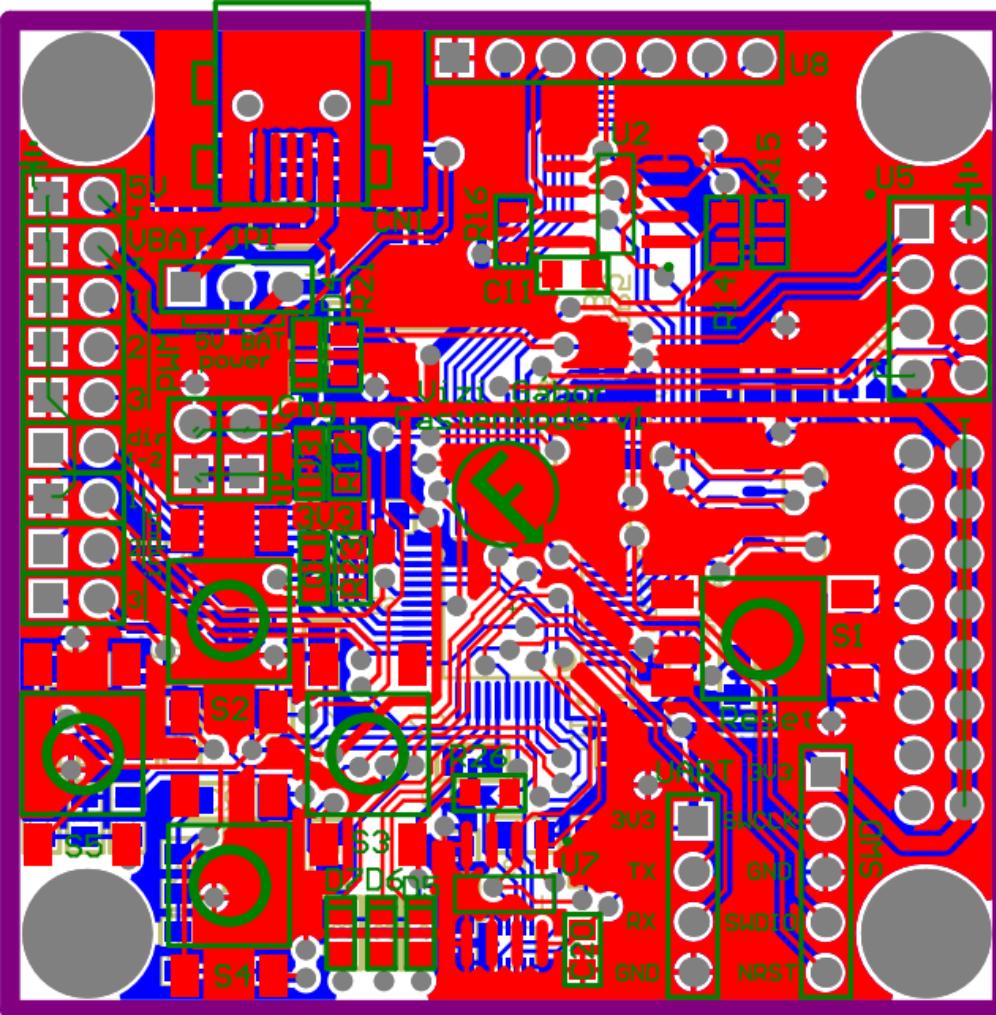
D

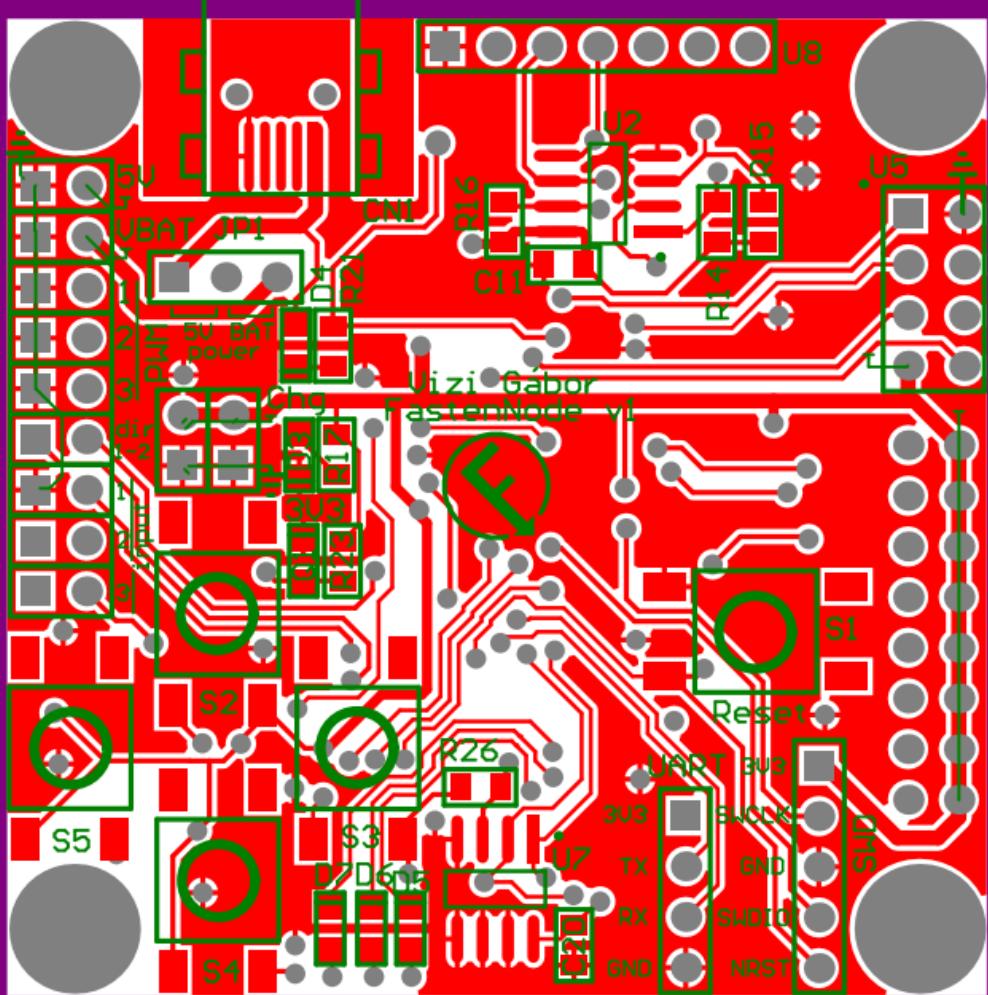
Project <i>FastenNode</i>		Title <i>WiFi</i>	
Size: A4	Number:*	Revision: v1	Drawn by: Vizi Gábor
Date: 2017.04.23.	Time: 19:25:15	Sheet * of 10	
File: C:\Engineer\Projects\AltiumProjects\VG_FastenNode\Sheet_WiFi.SchDoc			<b>Altium</b>

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
Supressor - bidirectional double ESD protection diode	Supressor - bidirectional double ESD protection diode	D1	FP_SOT23-3	Supressor - 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
STM32F030Cx	STM32F030Cx - 48pin	U1	FP_LQFP48_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









Uizi Gaber  
FastenNode v1



R22  
C22  
R32

U1

SB5  
SB6

SB4  
SB5

SB11  
SB8

SB14  
SB9

SB16  
SB15

SB18  
SB17

SB20  
SB19

SB22  
SB21

SB24  
SB23

SB26  
SB25

C18  
C19

C20  
C21

Q21

U3

R19

D2

D1

C15

C14

C3

C2

R27

R29

R3

R5

R7

R9

R11

R12

R13

R15

R17

R19

R21

R23

R25

R27

R3

R5

R7

R9

R11

R13

R15

U3

R17

R19

R21

R23

R25

R27

R29

U3

R19

R21

R23

R25

R27

R29

U3

