Eco VENTVENT

v1.1

- No Antenna Diversity
- Internal Motor Current Sensing
(No external sensing resistors)

Revision Notes:

v1.0 - Initial Release	Sep. 2014.
v1.1 -	Jan. 2015.

Replaced Y2 with 16 MHz (STM32L051 max is 24 MHz)
Replaced C37 and C39 18pF with 30pF (performance improvement)
Used 220pF for C38 (based on Ref Design)
Adjusted R23 and R25 values for 5V output
Pull up R26 and R33 to VIN instead to 1V9 (improved current consumption)
Replaced C42 100nF with 10nF (STM recommendation)
Renamed Port names in Main Controller sheet
Removed choke CM1 (not neccessary)
Replaced R39 22R with 200R (optimal light, improved current consumption)
Renamed Radio GPIO names to match SPIRIT1 pin names
Added ESD protection for SWD port lines (D2, R26, R33)
Added ESD protection for spare USART lines (D3, D4)
Replaced Y1 with 7pF load capacitance option (STM recommendation)
Removed U.FL antenna option (not neccessary)
Added one more antenna for antenna diversity w/ RF switch (in v2.0)
Added RF Shield
Replaced Y3 with smaller package to fit under RF shield
Replaced R22 100R with 0R (improved DC/DC performance)
Replaced 1x10 connector with two 1x4 and one 1x2 (low profiles)
Removed SWD test points TP2, TP3, TP4, TP5 (not neccessary)
Replaced U7 with Winbond W25Q80BWSNIG (MX25U8035MI is EOL)
Replaced U3 with Trinamic TMC5130A
Added micro switches interface options
Removed battery ADC circuit, Q2, R13, R45, R46 (not neccessary)
Added switch for SPI Flash power (improved current consumption)
Replaced R25 168 KOhm with 0 Ohm, DNP R23 (5V output settings)
Added 3 more fiducial points for bottom side components
Removed CRS/RTS from UART interface (not neccessary)
V_MOT_FPWM used for Level Shifter power switch (Q2 and R9)
Added negation to V_MOT_EN net name

Mounting Holes

MH1 3/6 MH 3/6mm
MH2 3/6 MH 3/6mm

Fiducial Points

Top

FP1 FP 1/2mm
FP2 FP 1/2mm
FP3 FP 1/2mm

Bottom

FP4 FP 1/2mm
FP5 FP 1/2mm
FP6 FP 1/2mm

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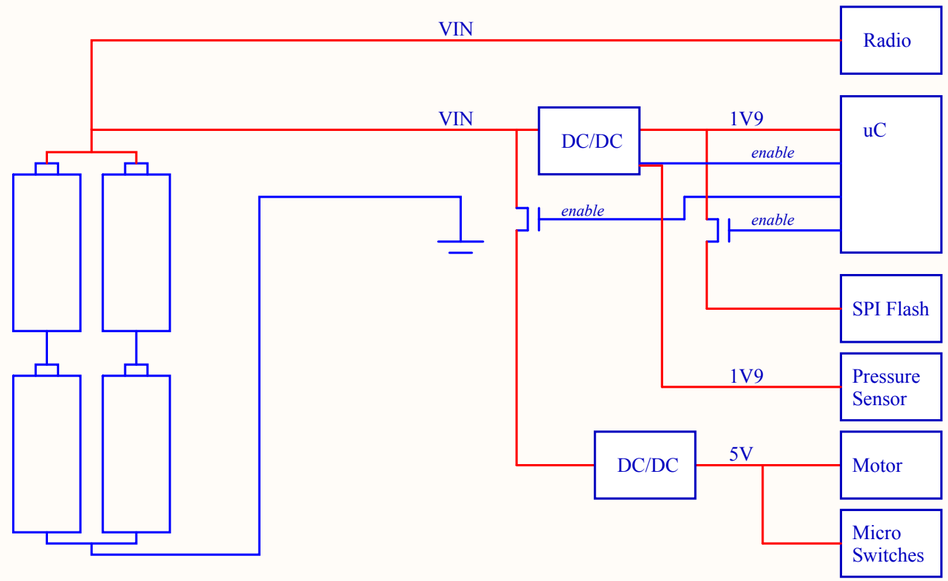

Title: *eVV_Power Supply Block Diagram*			**Bitgear** Stevana Markovica 8 11080 Belgrade Serbia *www.bitgear.rs*
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U_eVV_Cover Page
eVV_Cover Page.SchDoc

U_eVV_Power Supply Block Diagram
eVV_Power Supply Block Diagram.SchDoc

U_eVV_Power Supply
eVV_Power Supply.SchDoc

V_MOT_EN
SEN_PWR_EN
SEN_PWR

U_eVV_Sensors
eVV_Sensors.SchDoc

SEN_PWR
I2C_SDA
I2C_SCL
MCUSW_L
MCUSW_R
DRVSW_L
DRVSW_R

U_eVV_Main Controller
eVV_Main Controller.SchDoc

V_MOT_EN → PA8
SEN_PWR_EN → PA1
I2C1_SDA → PB7
I2C1_SCL → PB6
MCUSW_L → PA15
MCUSW_R → PA3
DRVSW_L
DRVSW_R
PA6 SPI1_MISO
PA7 SPI1_MOSI
PA5 SPI1_CLK
PA4 RADIO_CS
PB9 RADIO_SHDN
PC13 BATTERY_LOW
PB4 RADIO_IO1
PB5 RADIO_IO2
PB3 RADIO_IO3
PB10 LS_POW_EN
PB12 SPI2_CS
PB13 SPI2_CLK
PB14 SPI2_MISO
PB15 SPI2_MOSI
PB11 MOT_EN
PA11 MOT_DIAG0
PA12 MOT_DIAG1

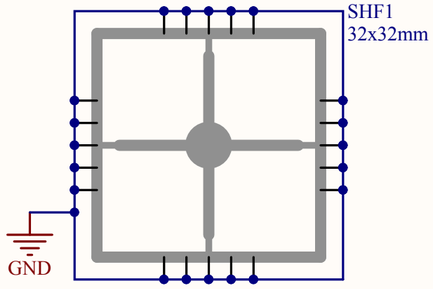
U_eVV_Radio
eVV_Radio.SchDoc

SPI1_MISO
SPI1_MOSI
SPI1_CLK
RADIO_CS
RADIO_SDN
BATTERY_LOW
RADIO_IO1
RADIO_IO2
RADIO_IO3

U_eVV_Driver TMC5130
eVV_Driver TMC5130.SchDoc

LS_POW_EN
SPI2_CS
SPI2_CLK
SPI2_MISO
SPI2_MOSI
MOT_EN
MOT_DIAG0
MOT_DIAG1
REFL
REFR

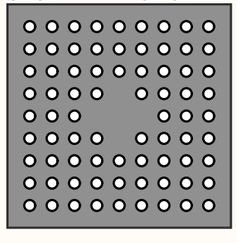
RF Shiled Frame



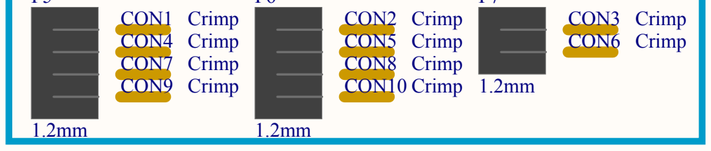
Off-board Parts

RF Shiled Cover

SHC1 32x32mm



P2, P3 and P4 Housings and Crimps



Pressure Sensor

PCB1 v1.1

Micro Switch

TBD

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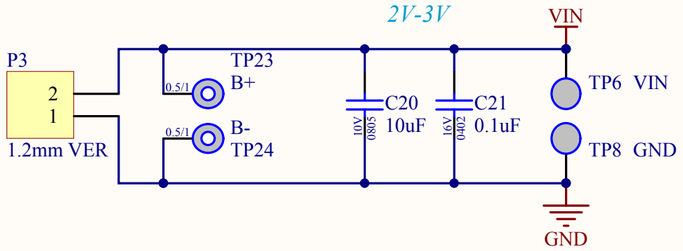
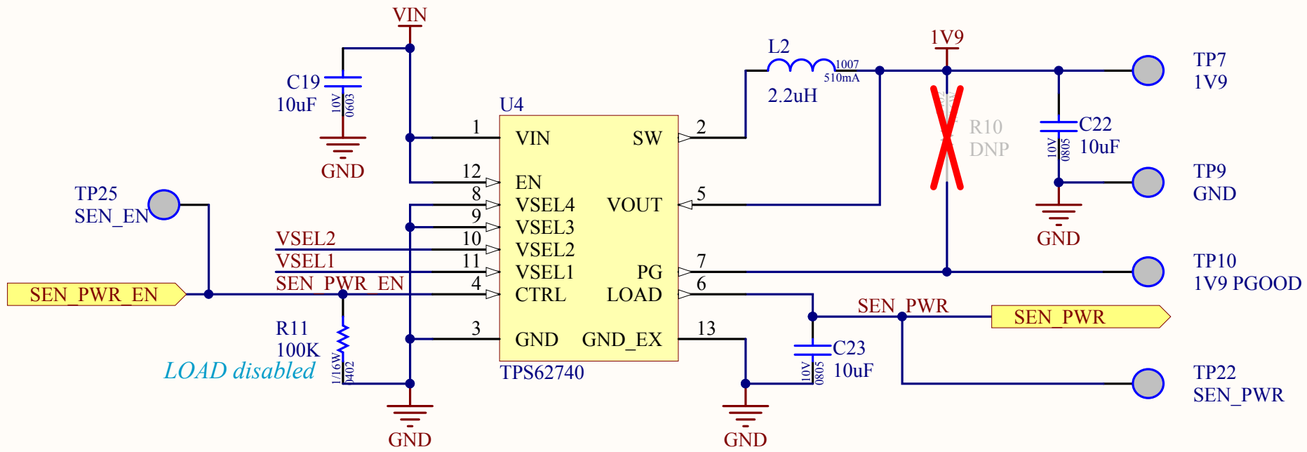
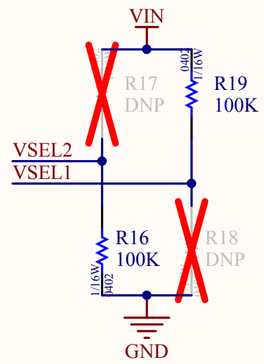
Input Power Stage



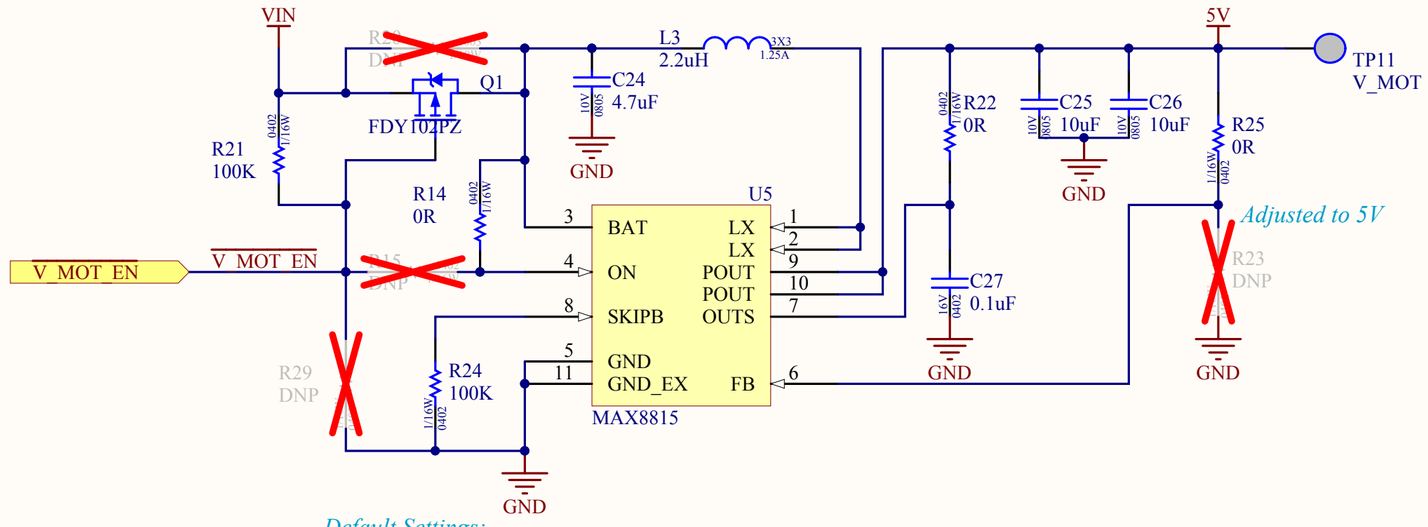
+1.9V Voltage Supply for uC



Voltage Output Selection (Default 1.9V)



+5V Voltage Supply for Motor Circuit



Default Settings:

Motor Switcher is OFF (V_MOT_EN to High-Z)
DC/DC is in Normal Mode(SKIPB=Low)

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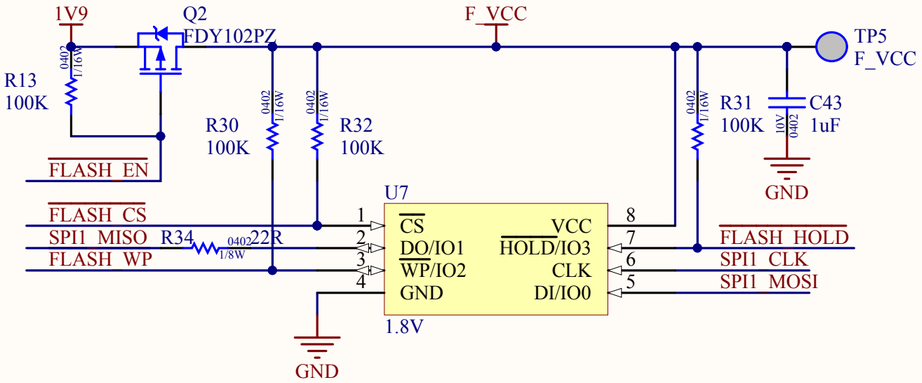
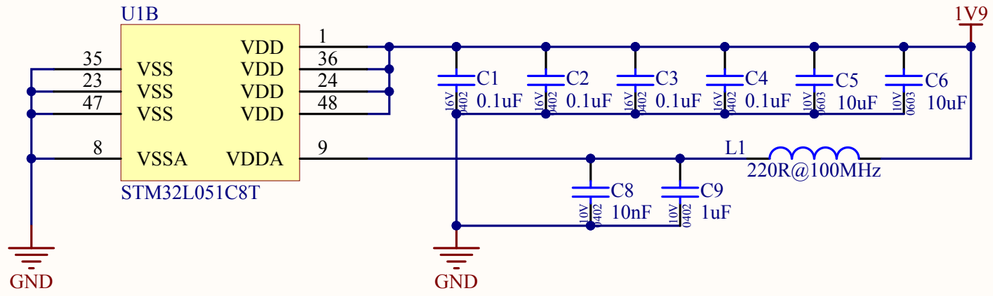
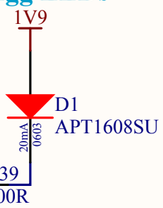
SPI Flash



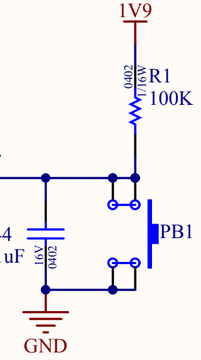
uC Decoupling



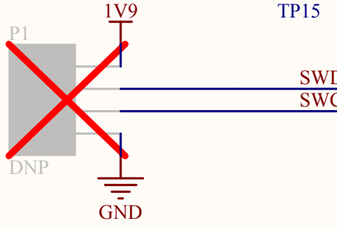
Debugg LEDs



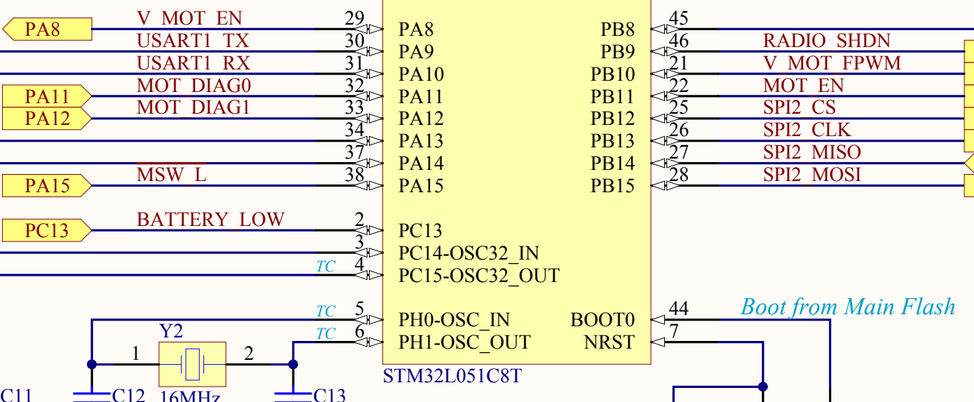
Push Button



Programming Interface

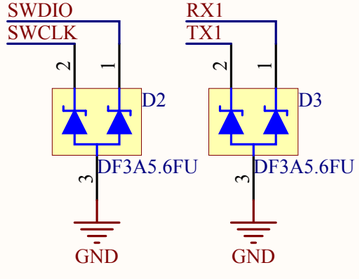


UART Test Points



Firmware Note:
Define PB11 as push pull output

ESD Protection



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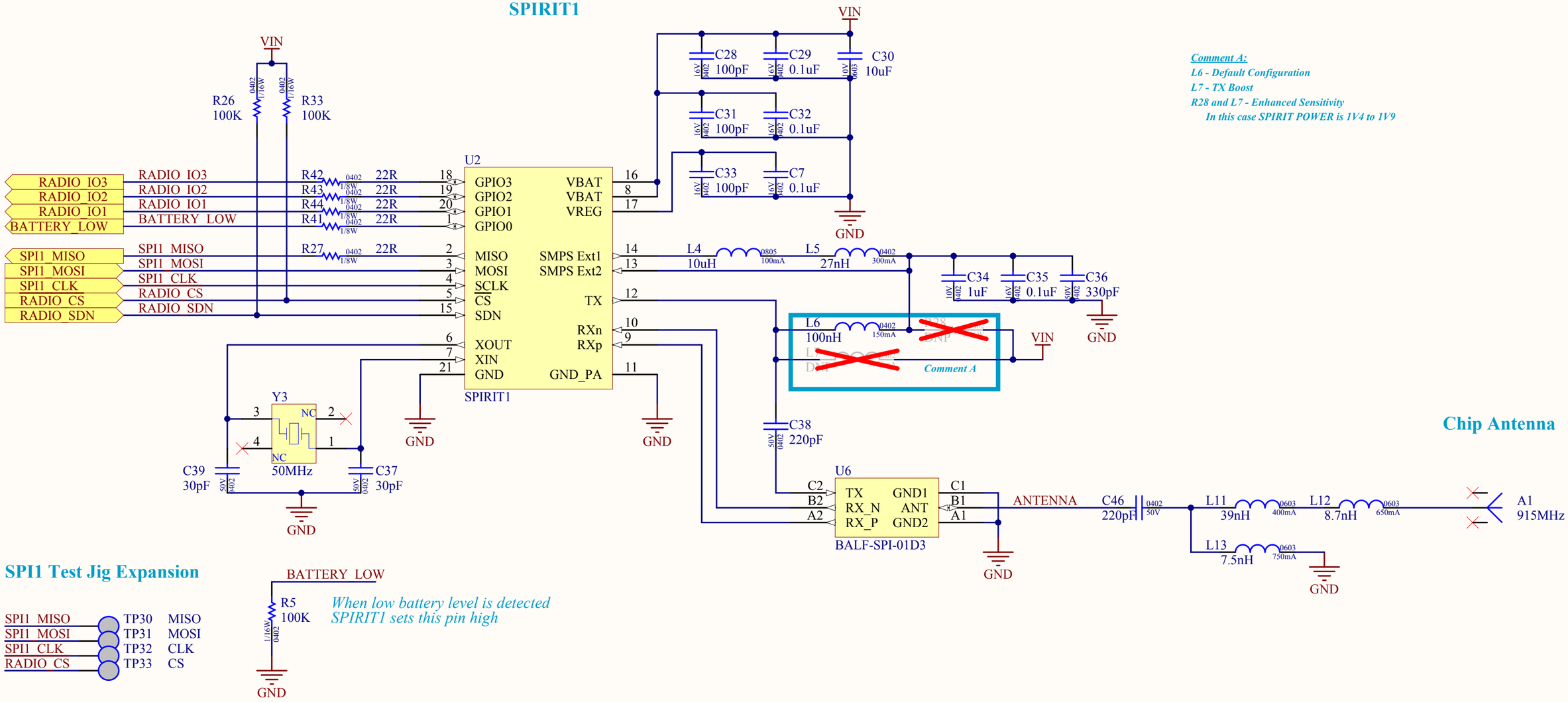
SPIRIT1



Comment A:
L6 - Default Configuration
L7 - TX Boost
R28 and L7 - Enhanced Sensitivity
In this case SPIRIT POWER is 1V4 to 1V9

SPI1 Test Jig Expansion

When low battery level is detected
SPIRIT1 sets this pin high

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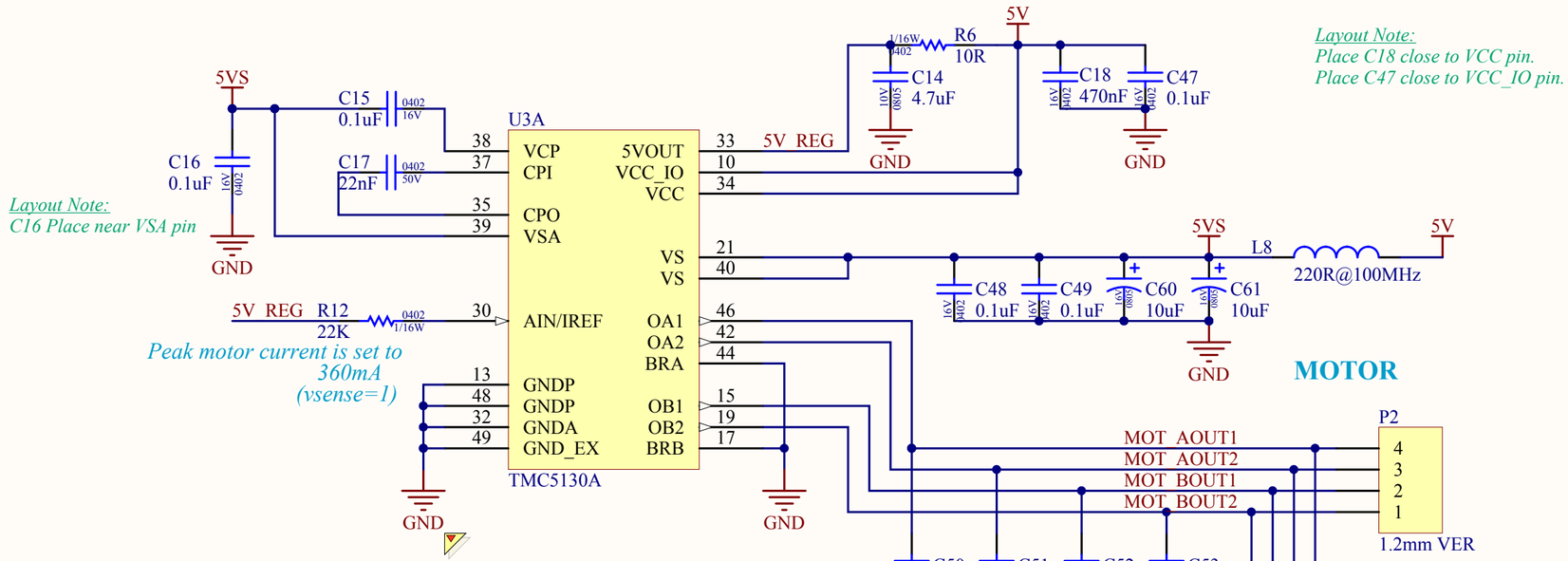
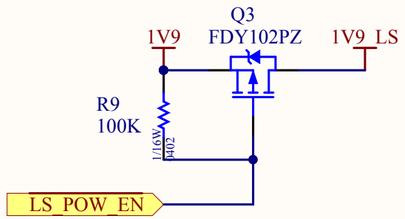
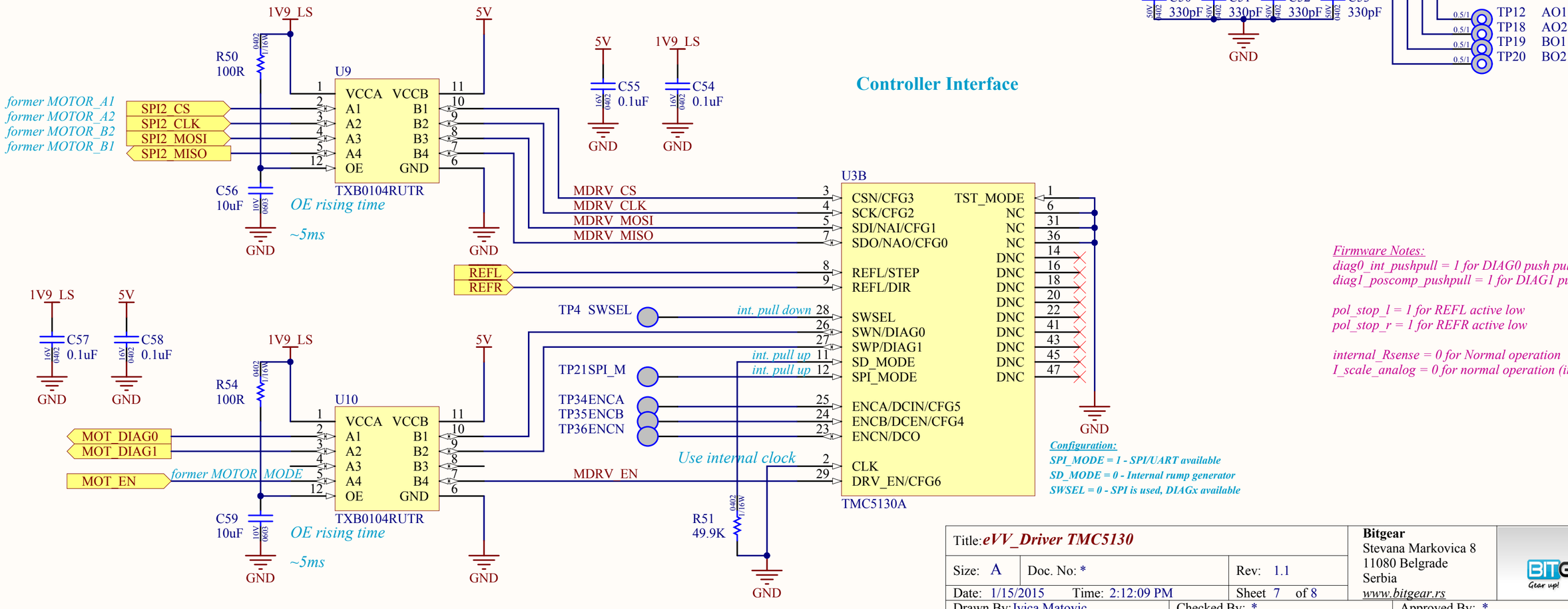
Motor Driver Power



Level Shifter Power Switch



Controller Interface



Title: *eVV_Driver TMC5130*			**Bitgear** Stevana Markovica 8 11080 Belgrade Serbia *www.bitgear.rs*
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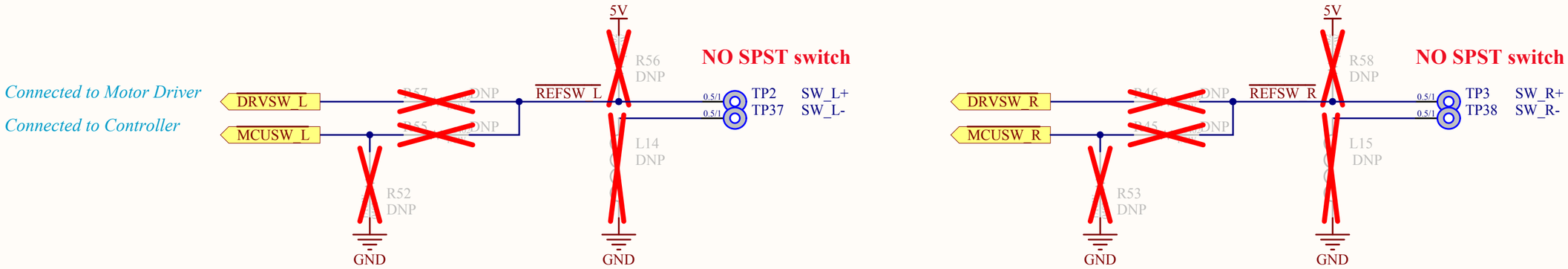
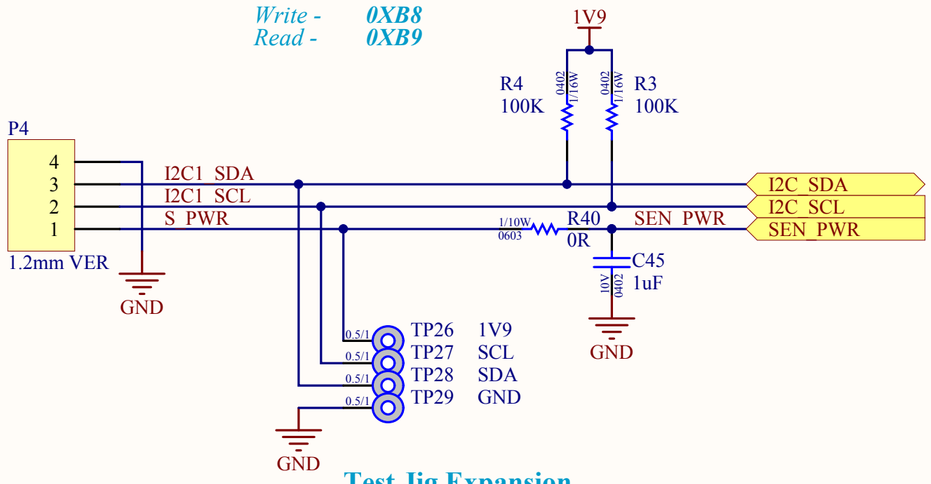
Micro Switches Interface



I2C Pressure Sensor

STM LPS25H:

*Write - **0XB8***
*Read - **0XB9***



Test Jig Expansion

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