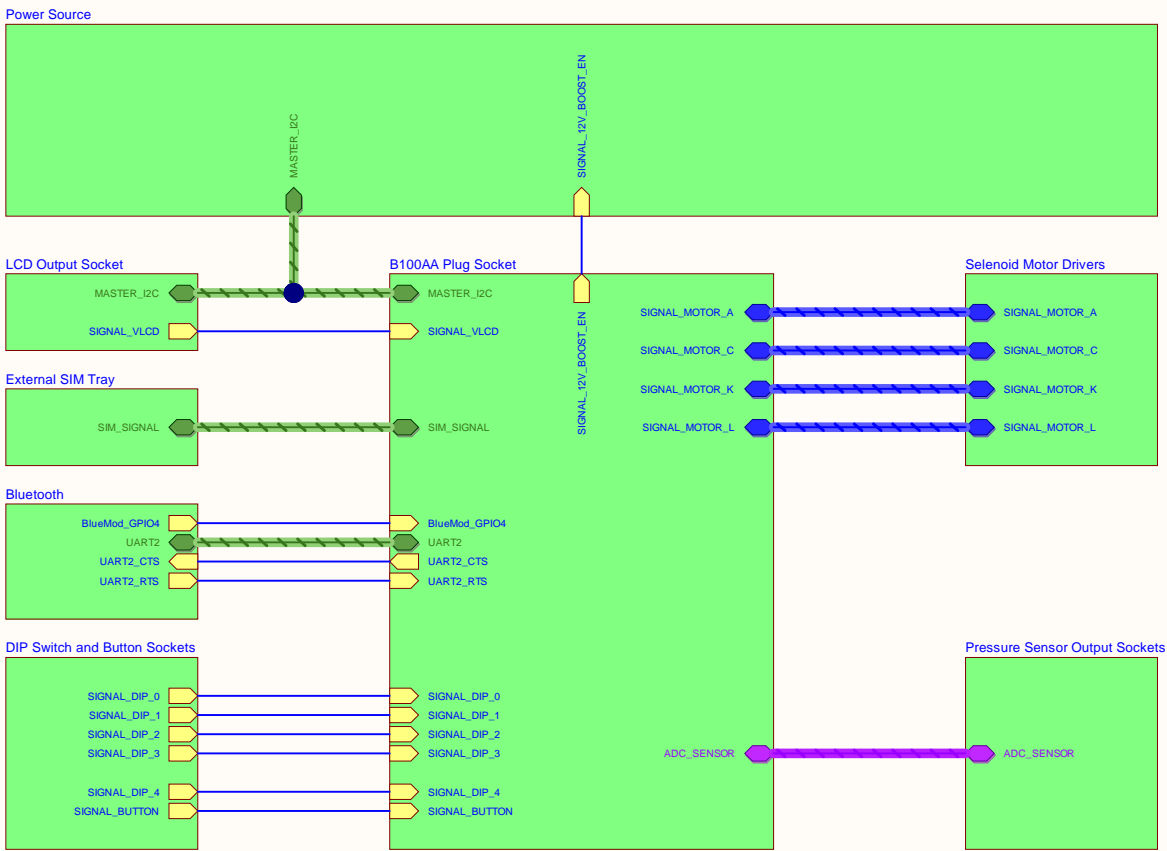



B151BA - Filter Automation System

Revision History

- AA001 (11.01.2021)
* Schematic creation.
- AA002 (11.01.2021)
* Add Bluetooth RTS and CTS pins to MCU.
* Add Bluetooth Boot0 and TestMode pins selectable with 0R resistor.
* Add Bluetooth HangUp pin to MCU.
* Add Bluetooth Test points.



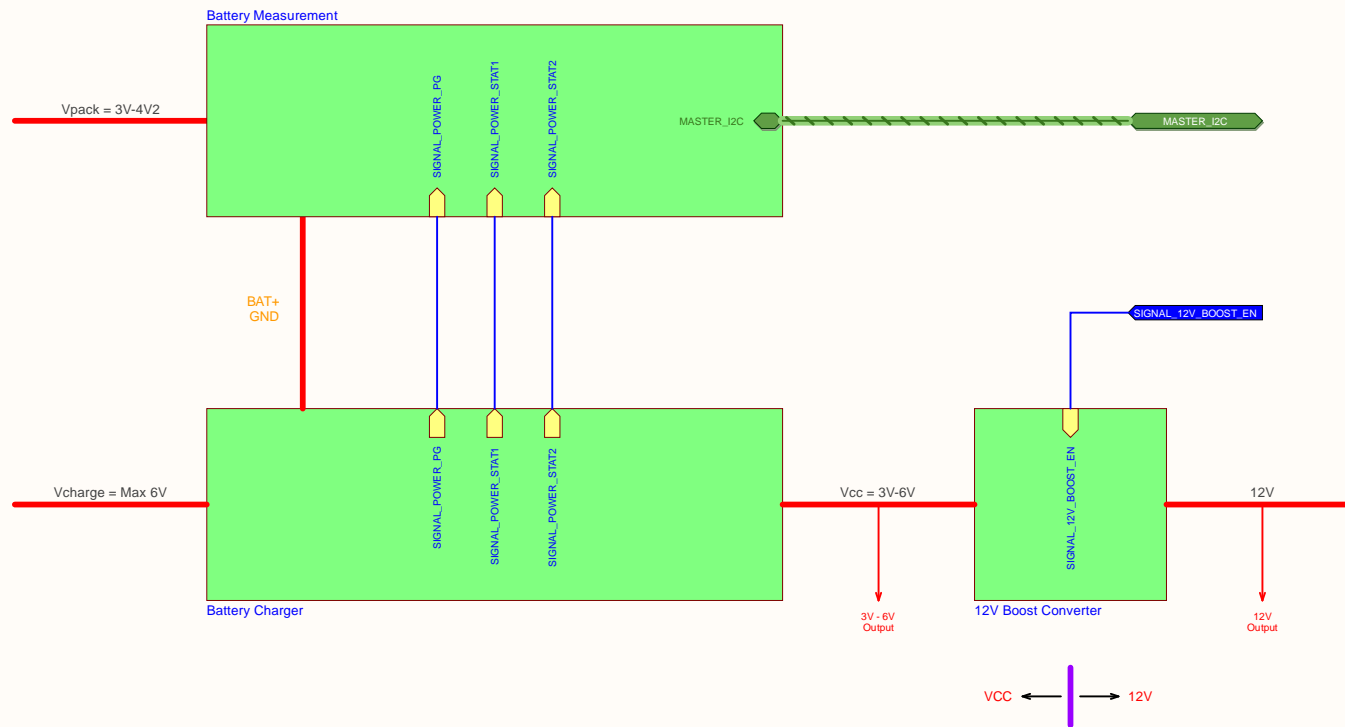
Title: B151BA Block Diagram			Ovoo Electronics Necip Fazıl Mah. Ortarmak Sok. Bırgölü Apt. No: 19/6 Meram / Konya Türkiye	
Size: A4	Number: BA001	Revision: B151BA		
Date: 2.02.2021	Time: 18:11:40	Sheet 1 of		
File: C:\Altium Projects\P511\BA\Electronic\B151BA\Design Files\Schematic\B151BA Block Diagram.SchDoc				



Li-Ion Battery
2 x 2500 mAh



Charge Power Socket



Title **Power Source**

Size: **A4**

Number: **BA001**

Revision: **B151BA**

Date: **2.02.2021**

Time: **18:11:40**

Sheet **2** of

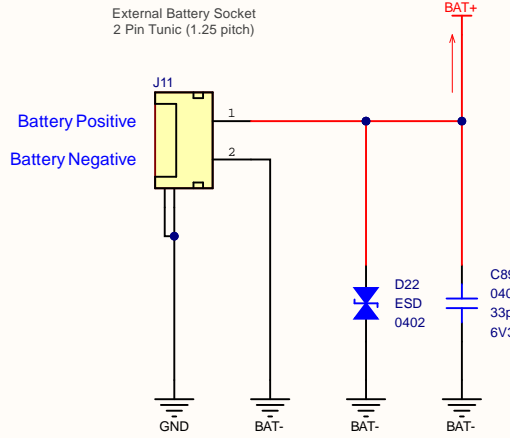
File: **C:\Altium Projects\PS11\BA\Electronic[B151BA]Design Files\Schematic\Power Source.SchDoc**

Ovoo Electronics

Necip Fazıl Mah. Ortarmak Sok.
Bırgölü Apt. No: 19/6
Meram / Konya
Türkiye

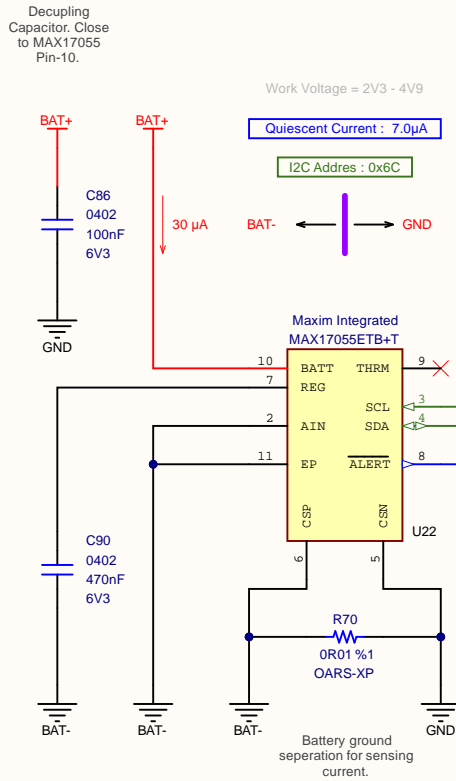


Battery Socket



B151BA module have a battery
socket for 18650 Lilon battery pack.
Advice : 4x2500mAh VTC6

Battery Measurement



Battery Gauge
Alert Pin (Open
Drain) Pull-up

Isolated I2C
Communication
Line Pull-up's

Decupling
Capacitor. Close
to TCA9517 Pin-8.

Work Voltage
VCCA = 0V9 - 5V5
VCCB = 2V7 - 5V5

I2C voltage level
translation.

Bat+

3V3

3V3

C87
0402
100nF
6V3

6 mA

Texas Instruments
TCA9517ADGKR

VCCB VCCA

SCLB SCLA
SDAB SDAA

EN

U21

TCA9517 is
allways EN.

3V3 Level I2C
Communication Line

Vbat Level I2C
Communication Line

SIGNAL GAUGE_ALERT

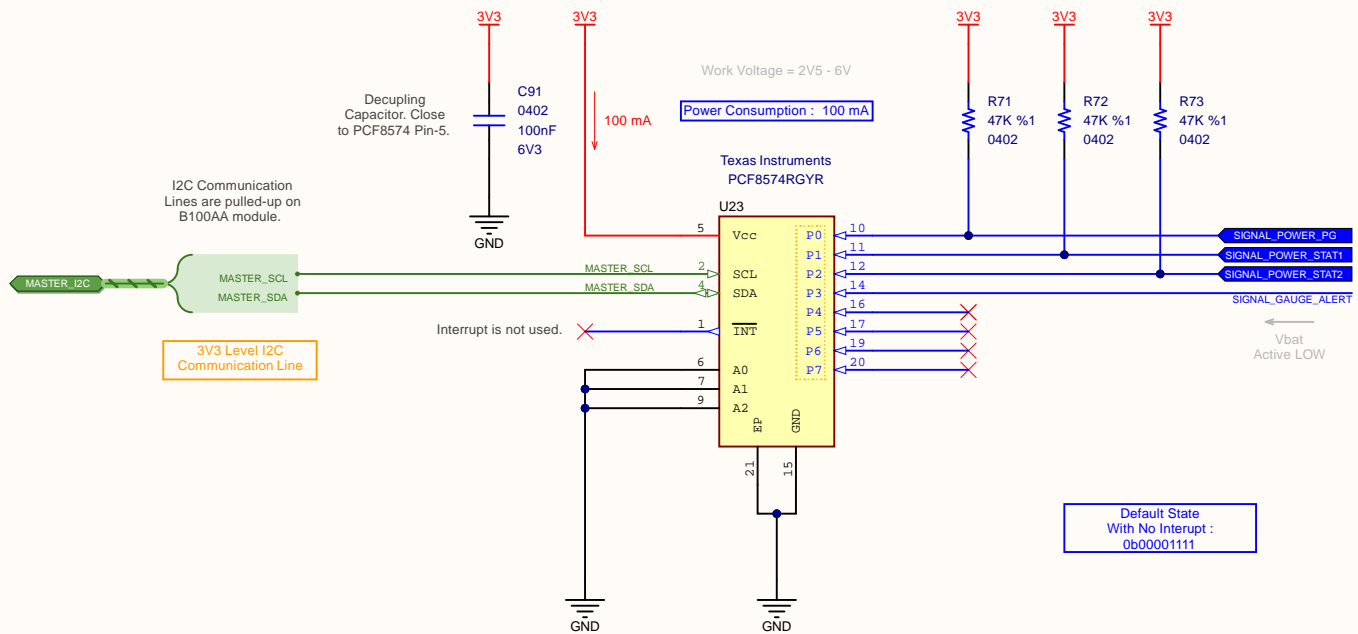
Vbat
Active LOW

Sense resistor is coosed 0R01 for sensing
upto 5.12A with 156.25 uA resolution.
Current sensor is a optional component. If
not want to measure current must be
connect PACK- to GND.

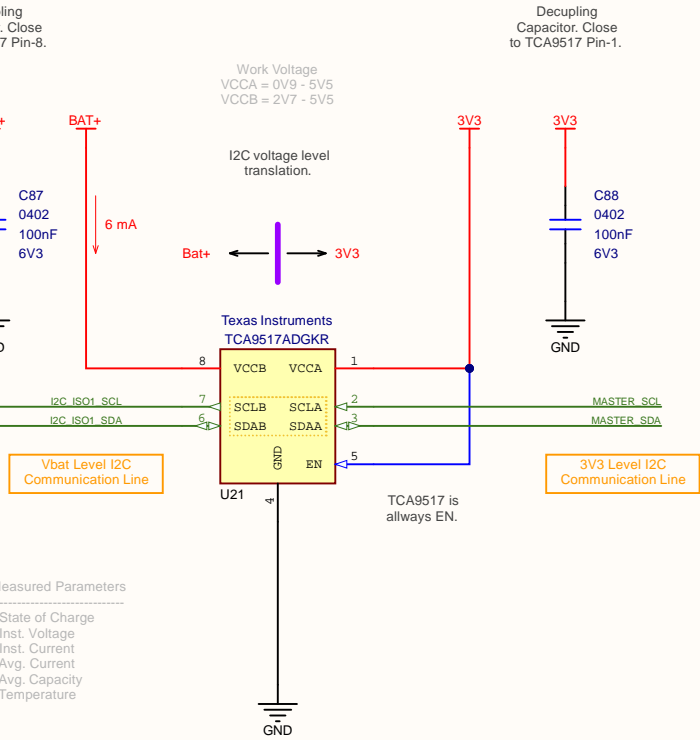
Measured Parameters

- * State of Charge
- * Inst. Voltage
- * Inst. Current
- * Avg. Current
- * Avg. Capacity
- * Temperature

I2C I/O Expander



I2C Buffer (Voltage Translator)



A

B

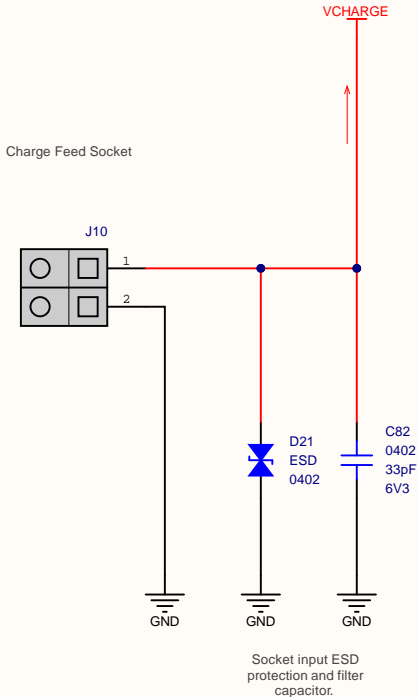
C

D

Charge Feed Socket

Battery Charger

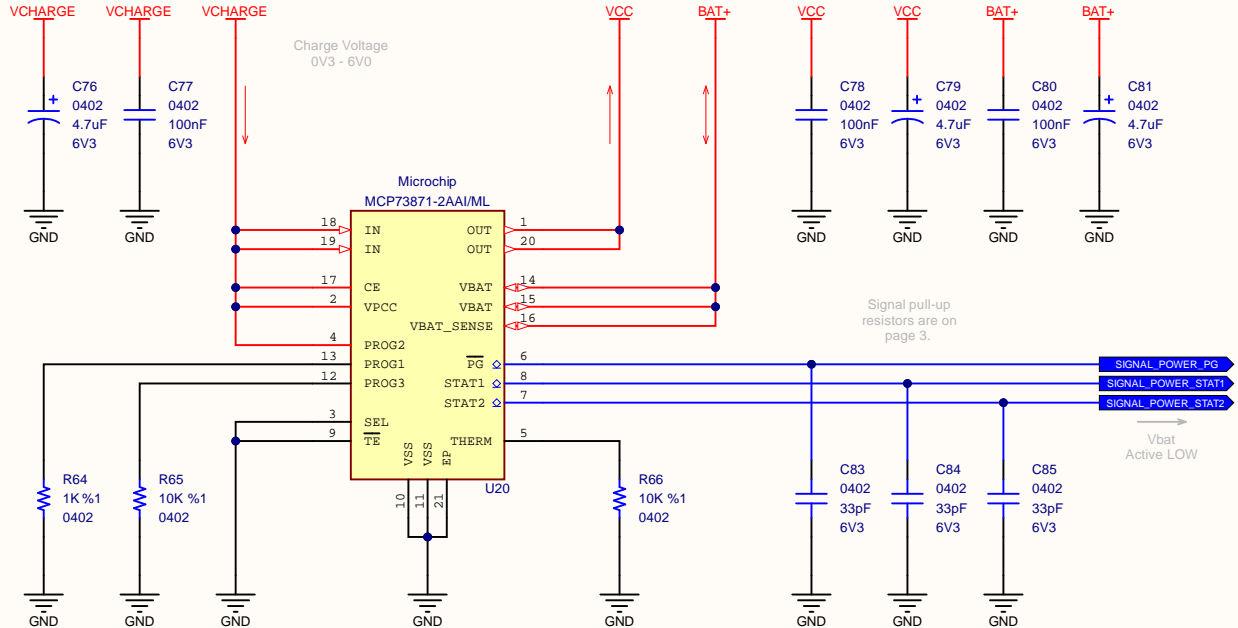
CUI Devices Manufacturer :
Screwless Screw Type :
2 Position :
3.5 mm Pitch :
45 Degree Orientation :
24 - 20 AWG Wire Gauge :
Terminal Color :
Button Color :



By-Pass Capacitors
Close to MCP73871
Pin-18/19 (IN)

By-Pass Capacitors
Close to MCP73871
Pin-1/20 (OUT)

By-Pass Capacitors
Close to MCP73871
Pin-14/15 (OUT)




SEL Pin : Input type selection (Low for USB port, High for other type of power source)

TE Pin : Enables Safety Timer when active Low.

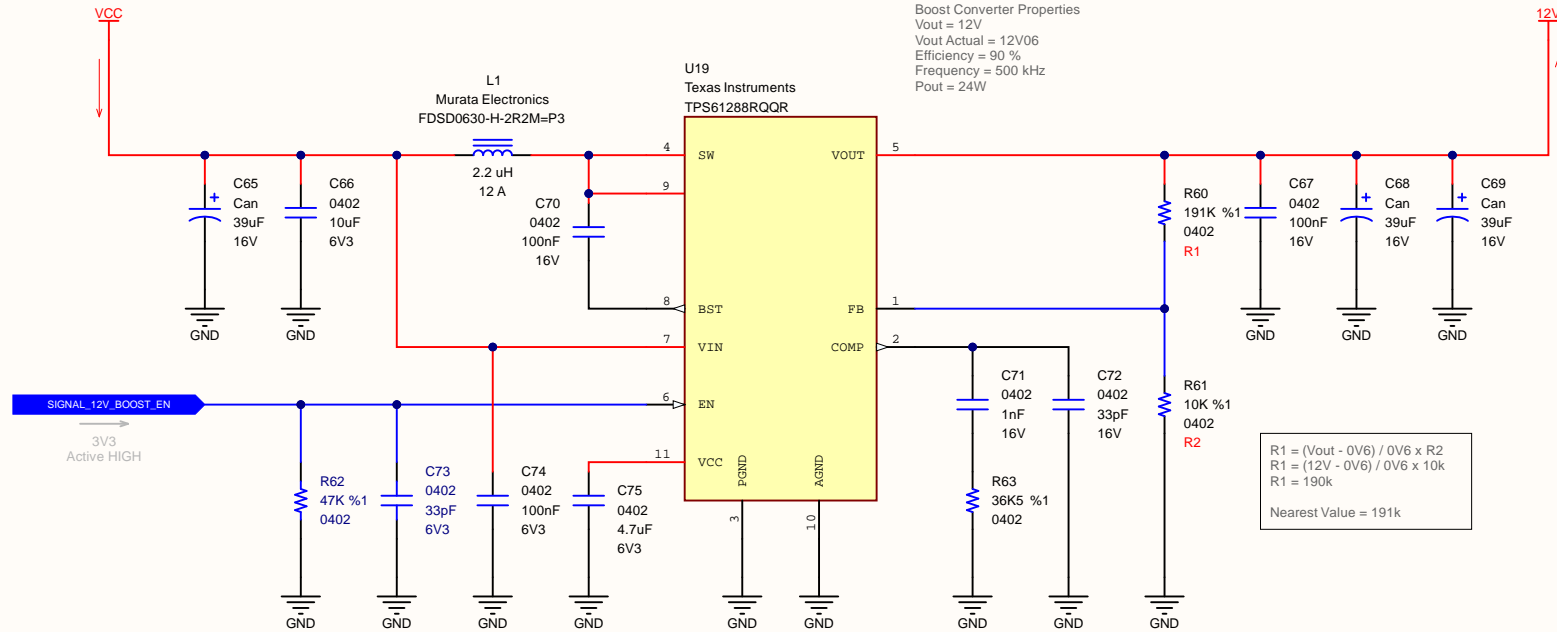
PROG1 Pin : Fast charge current regulation setting with PROG1 = High. Preconditioning set point for both USB port and other type of power source. 1K = 1A charge current limit.

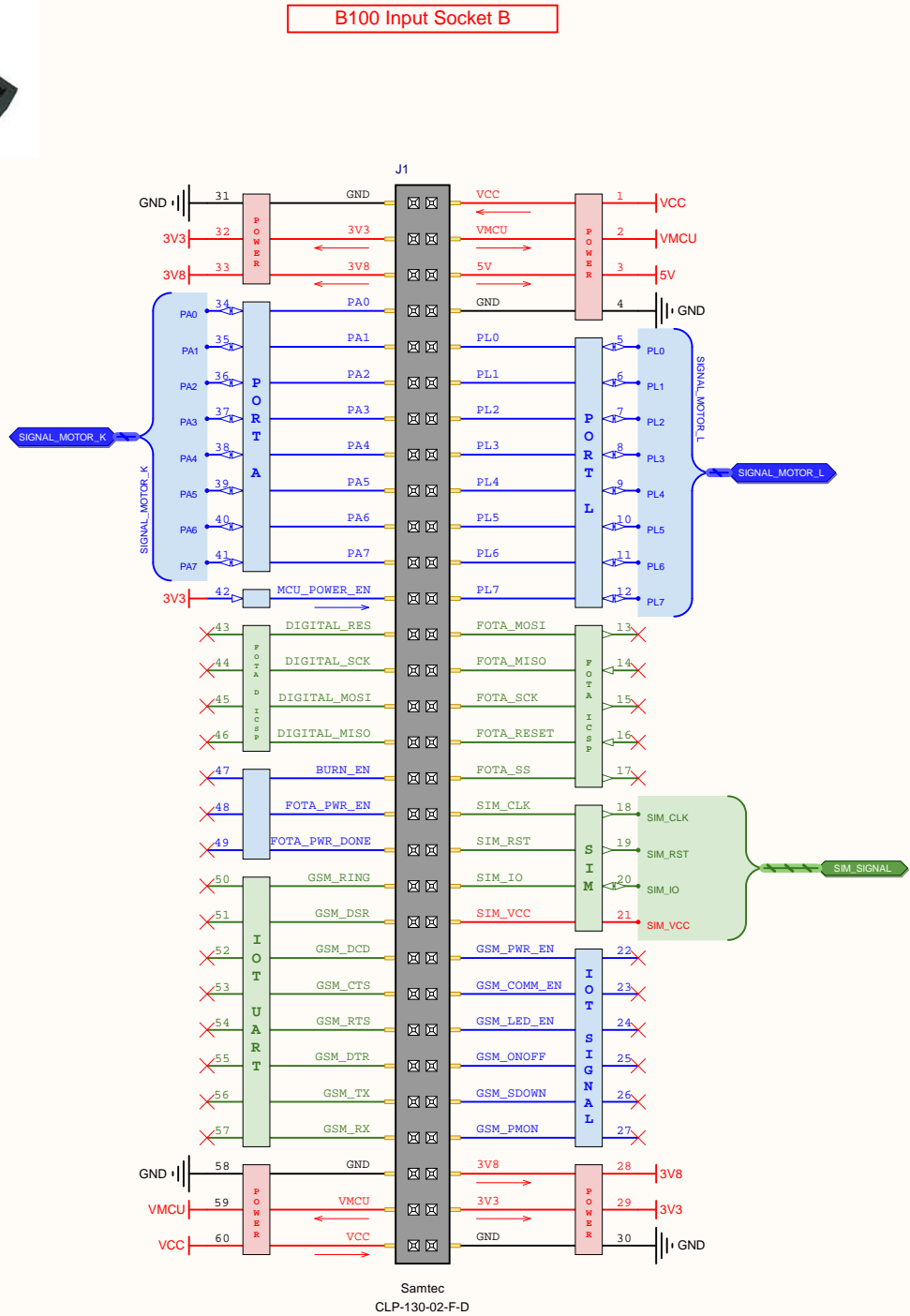
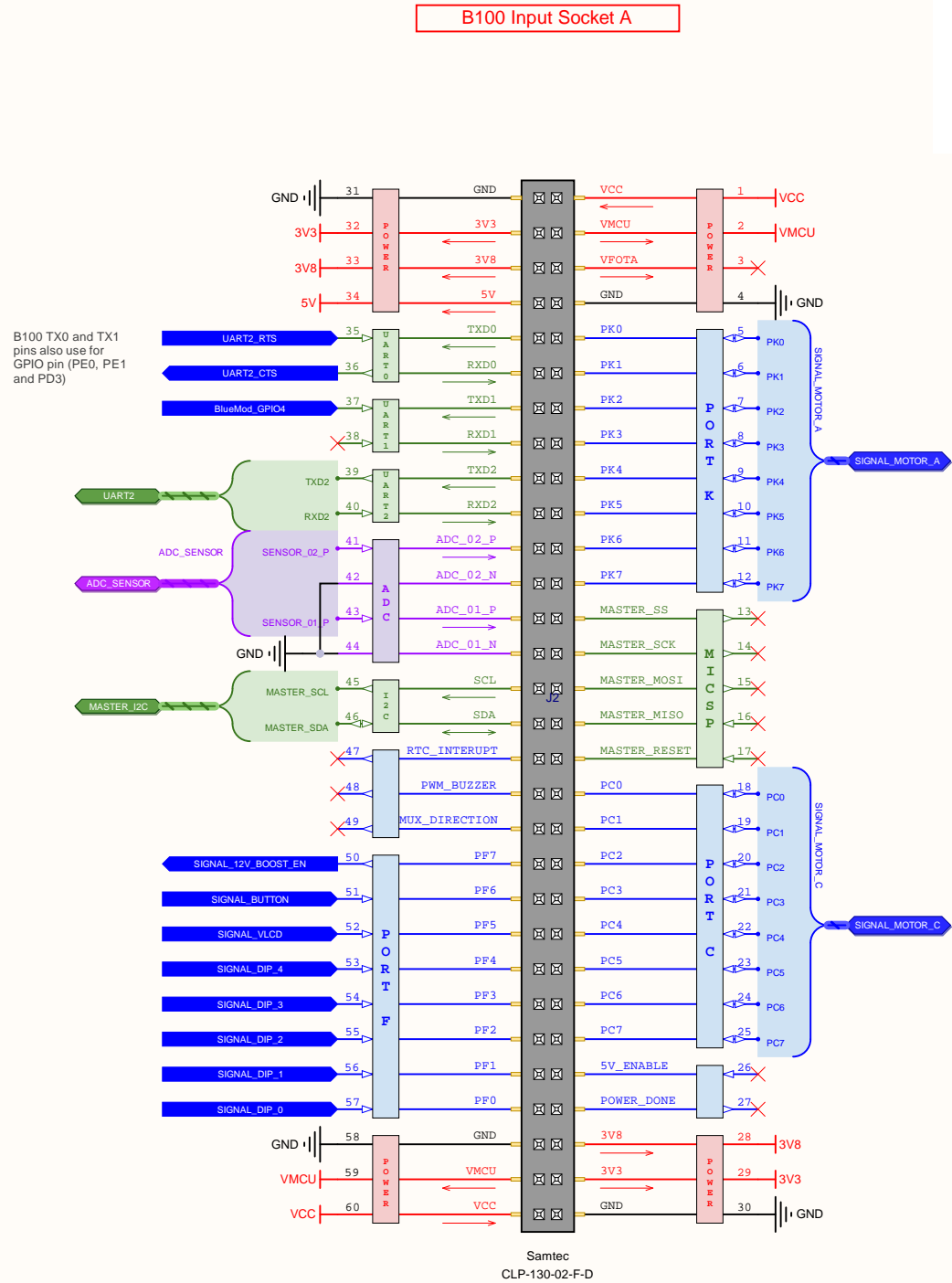
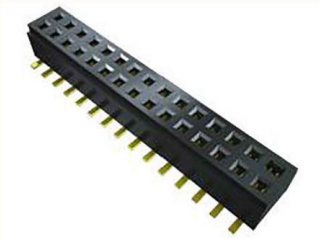
PROG2 Pin : USB port input current limit selection when PROG2 = HIGH. (Low = 100 mA, High = 500 mA)

PROG3 Pin : Termination set point for power source and USB port. Minimum charge current. 10K = 100 mA.

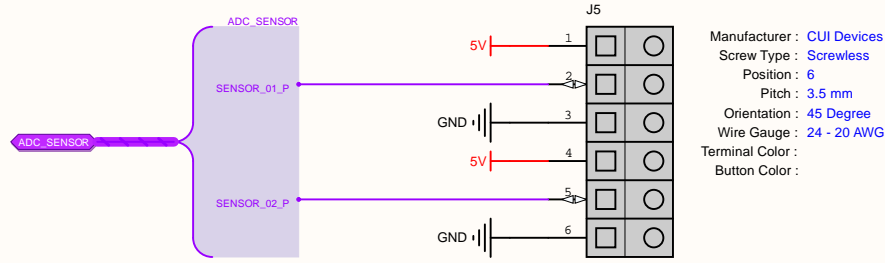
Title Battery Charger			Ovoo Electronics Necip Fazıl Mah. Ortamak Sok. Bırgölü Apt. No: 19/6 Meram / Konya Türkiye		
Size: A4	Number: BA001	Revision: B151BA			
Date: 2.02.2021	Time: 18:11:40	Sheet 4 of 28			
File: C:\Altium Projects\PS111\BA\Electronic\B151BA\Design Files\Schematic\Battery Charger.SchDoc					


12V Synchronous Boost Converter





Analog Pressure Sensor Output Sockets



Title Pressure Sensor Output Sockets			Ovoo Electronics Necip Fazıl Mah. Ortarmak Sok. Bırgölü Apt. No: 19/6 Meram / Konya Türkiye	
Size: A4	Number: BA001	Revision: B151BA		
Date: 2.02.2021	Time: 18:11:41	Sheet 7 of *		
File: C:\Altium Projects\P511\BA\Electronic\B151BA\Design Files\Schematic\Pressure Sensor Output Sockets.SchDoc				

A

B

C

D

A

B

C

D

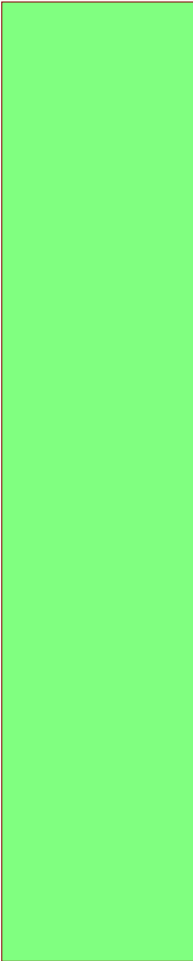
1

2

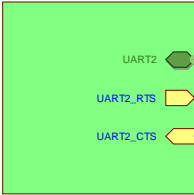
3

4

Power Supply



UART



UART2

UART2_RTS

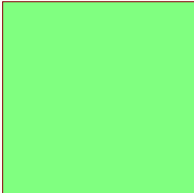
UART2_CTS

UART2

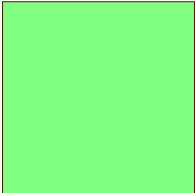
UART2_RTS

UART2_CTS

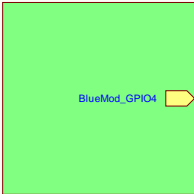
BlueMod+S50



RF Antenna




GPIO



BlueMod_GPIO4

BlueMod_GPIO4

Title Bluetooth Module			Ovoo Electronics Necip Fazıl Mah. Ortarmak Sok. Bırgölü Apt. No: 19/6 Meram / Konya Türkiye		
Size: A4	Number: BA001	Revision: B151BA			
Date: 2.02.2021	Time: 18:11:41	Sheet 8 of *			
File: C:\Altium Projects\PS11\BA\Electronic\B151BA\Design Files\Schematic\BlueTooth Module.SchDoc					

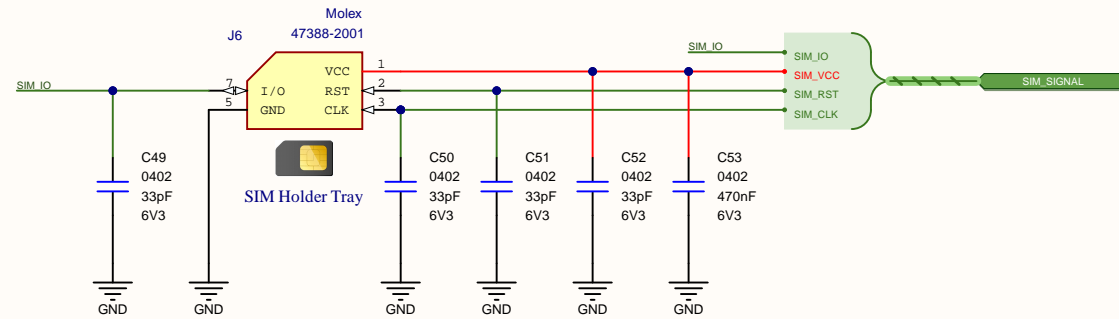
1

2


3

4

OnBoard Sim Tray



SIM_VCC capacitor is
chosed according Telit
SIM integration guide.

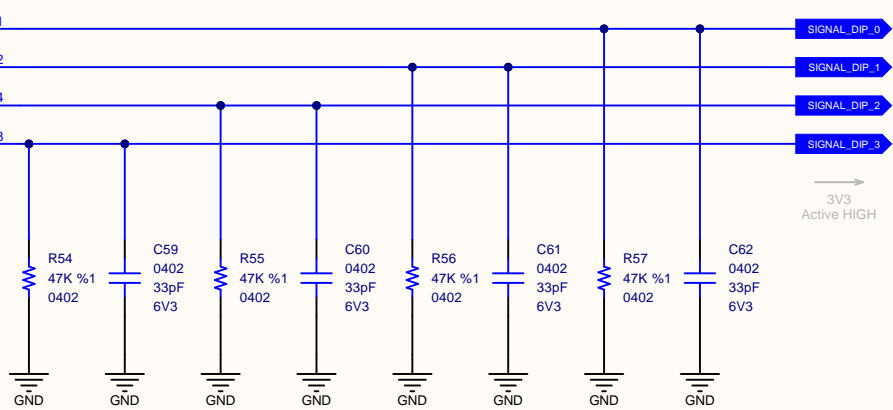
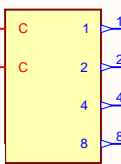
Title External SIM Tray			Ovoo Electronics		
Size: A4	Number: BA001	Revision: B151BA	Necip Fazıl Mah. Ortarmak Sok. Bırgölü Apt. No: 19/6 Meram / Konya Türkiye		
Date: 2.02.2021	Time: 18:11:41	Sheet 9 of *			
File: C:\Altium Projects\P511\BA\Electronic\B151BA\Design Files\Schematic\External SIM Tray.SchDoc					

ON	O					
OFF	●					
TYPE	POS	1	2	4	8	
10 STEP	0	●	●	●	●	
	1	○	●	●	●	
	2	●	○	●	●	
	3	○	○	○	●	
	4	●	●	○	●	
	5	○	●	○	●	
	6	●	○	○	●	
	7	○	○	○	●	
	8	●	●	●	○	
	9	○	●	●	○	
16 STEP	A	●	○	○	○	
	B	○	○	●	○	
	C	●	○	○	○	
	D	○	●	○	○	
	E	●	○	○	○	
	F	○	○	○	○	



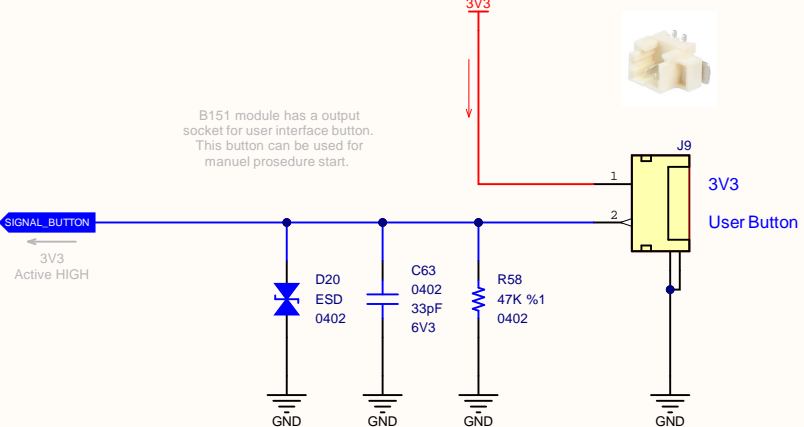
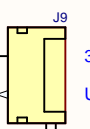
B151 module has a rotary DIP switch for selecting filter count. Max value is 16.

Rotary DIP Switch
Pole Count : 16
SW1



External User Button

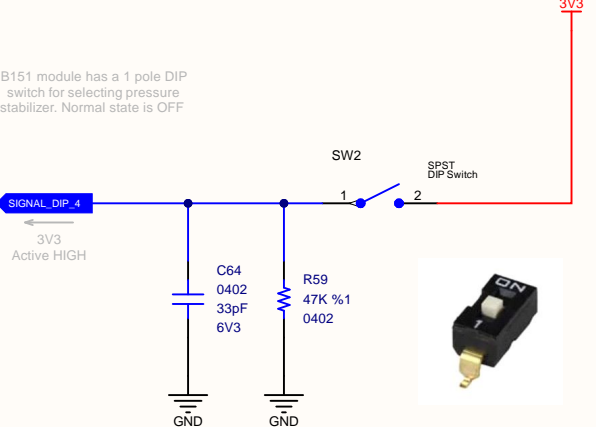
B151 module has a output socket for user interface button. This button can be used for manuel prosedure start.

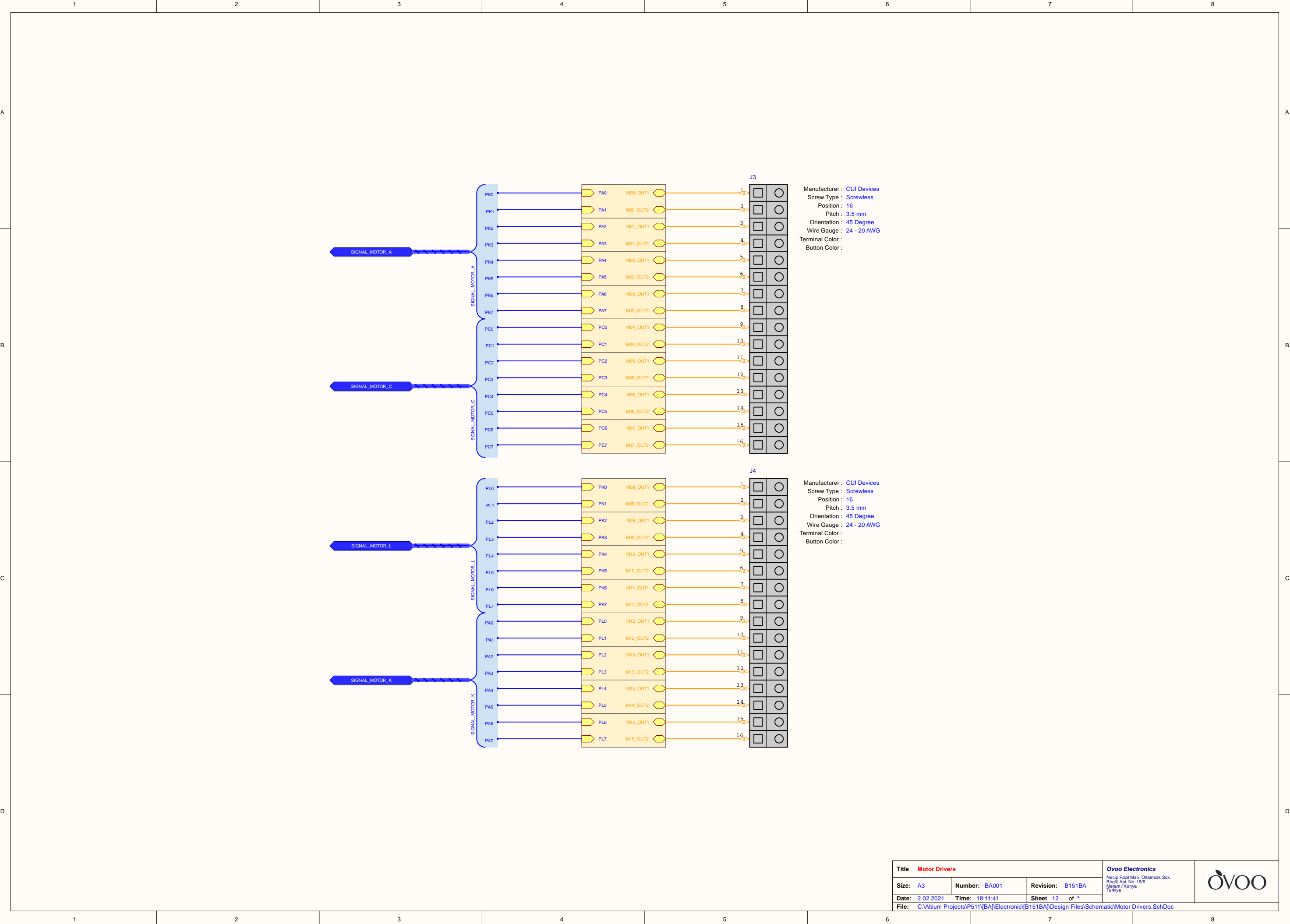


Pressure Stabilizer Selection Switch

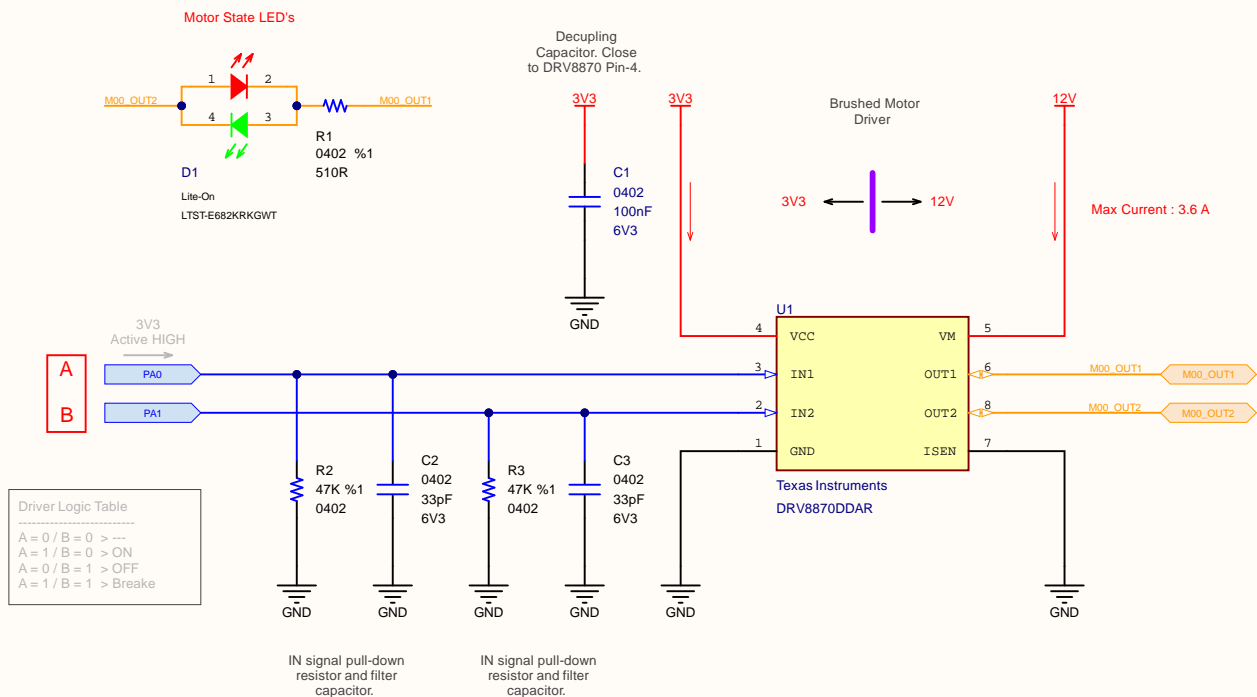
B151 module has a 1 pole DIP switch for selecting pressure stabilizer. Normal state is OFF

SW2
SPST DIP Switch





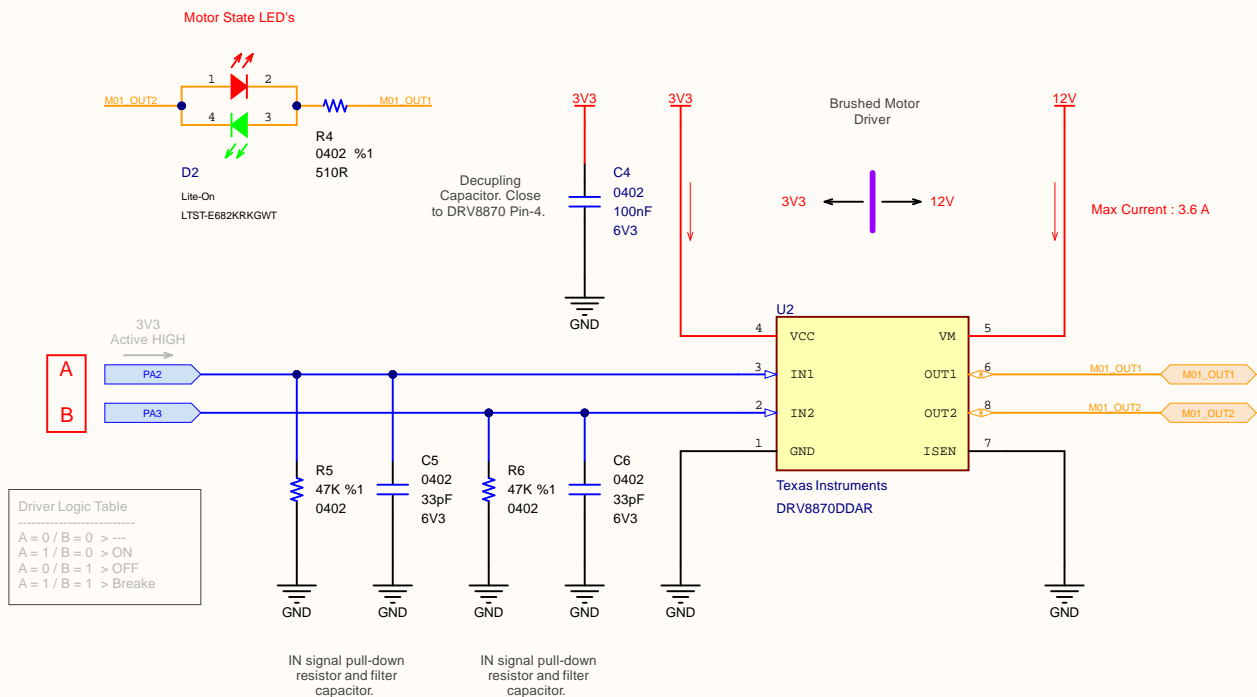
Solenoid Driver 01



Title Solenoid 00 Driver			Ovoo Electronics	
Size: A4	Number: BA001	Revision: B151BA	Necip Fazıl Mah. Ortarmak Sok. Bırgöl Apt. No: 19/6 Meram / Konya Türkiye	
Date: 2.02.2021	Time: 18:11:41	Sheet 13 of *		
File: C:\Altium Projects\PS11\BA\Electronic\B151BA\Design Files\Schematic\Solenoid 00 Driver.SchDoc				

ovoo

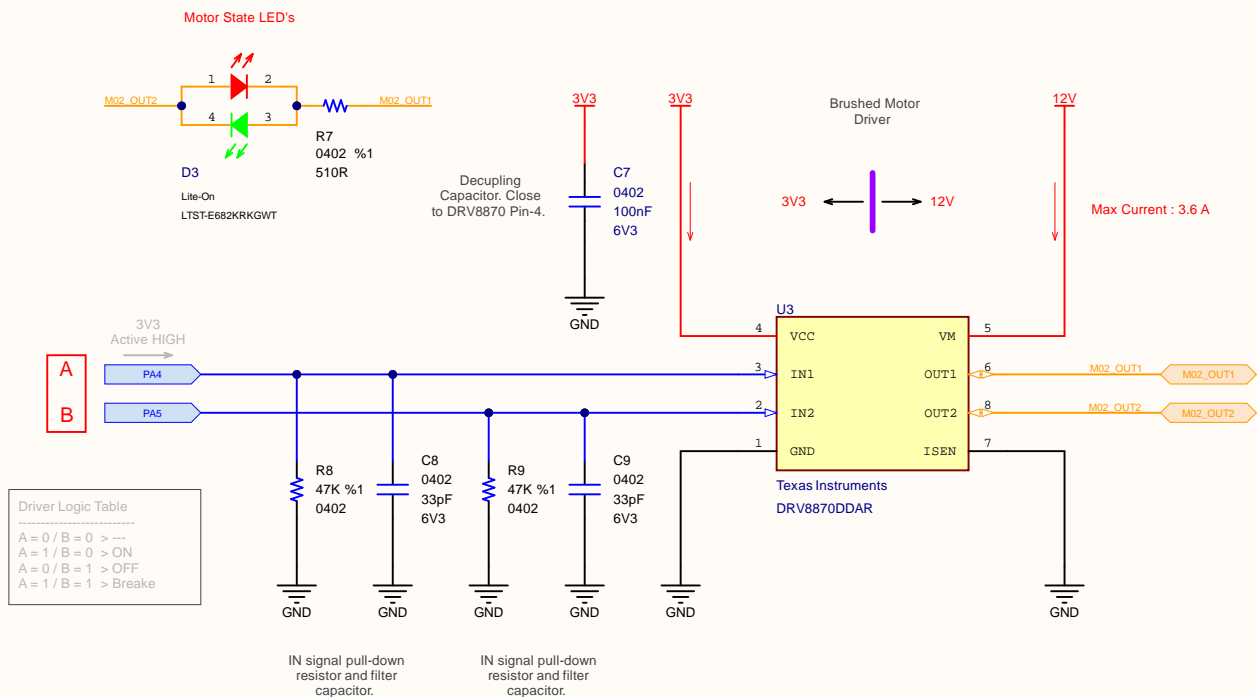
Solenoid Driver 02



Title Solenoid 01 Driver			Ovoo Electronics Necip Fazıl Mah. Ortarmak Sok. Bırgölü Apt. No: 19/6 Meram / Konya Türkiye
Size: A4	Number: BA001	Revision: B151BA	
Date: 2.02.2021	Time: 18:11:41	Sheet 14 of *	
File: C:\Altium Projects\PS511\BA\Electronic\B151BA\Design Files\Schematic\Solenoid 01 Driver.SchDoc			

ovoo

Solenoid Driver 03



Title **Solenoid 02 Driver**

Size: **A4**

Number: **BA001**

Revision: **B151BA**

Date: **2.02.2021**

Time: **18:11:41**

Sheet **15** of *

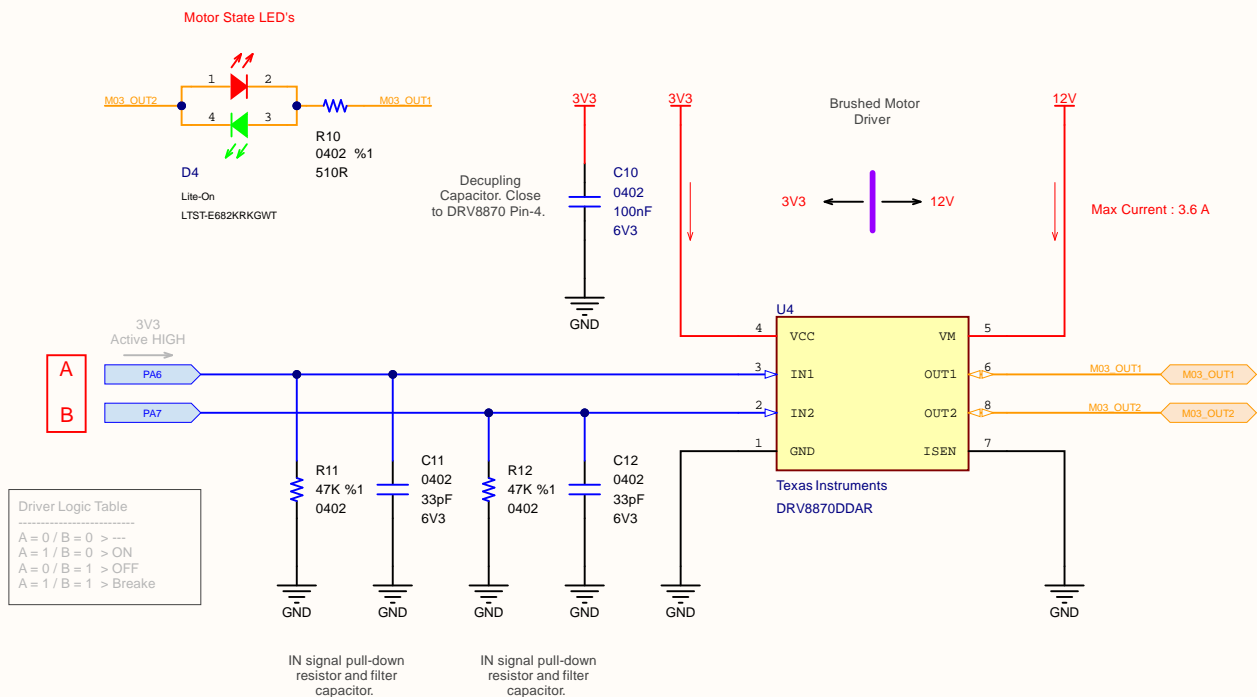
File: **C:\Altium Projects\PS11\BA\Electronic\B151BA\Design Files\Schematic\Solenoid 02 Driver.SchDoc**

Ovoo Electronics

Necip Fazıl Mah. Ortarmak Sok.
Bırgölü Apt. No:19/6
Meram / Konya
Türkiye

ovoo

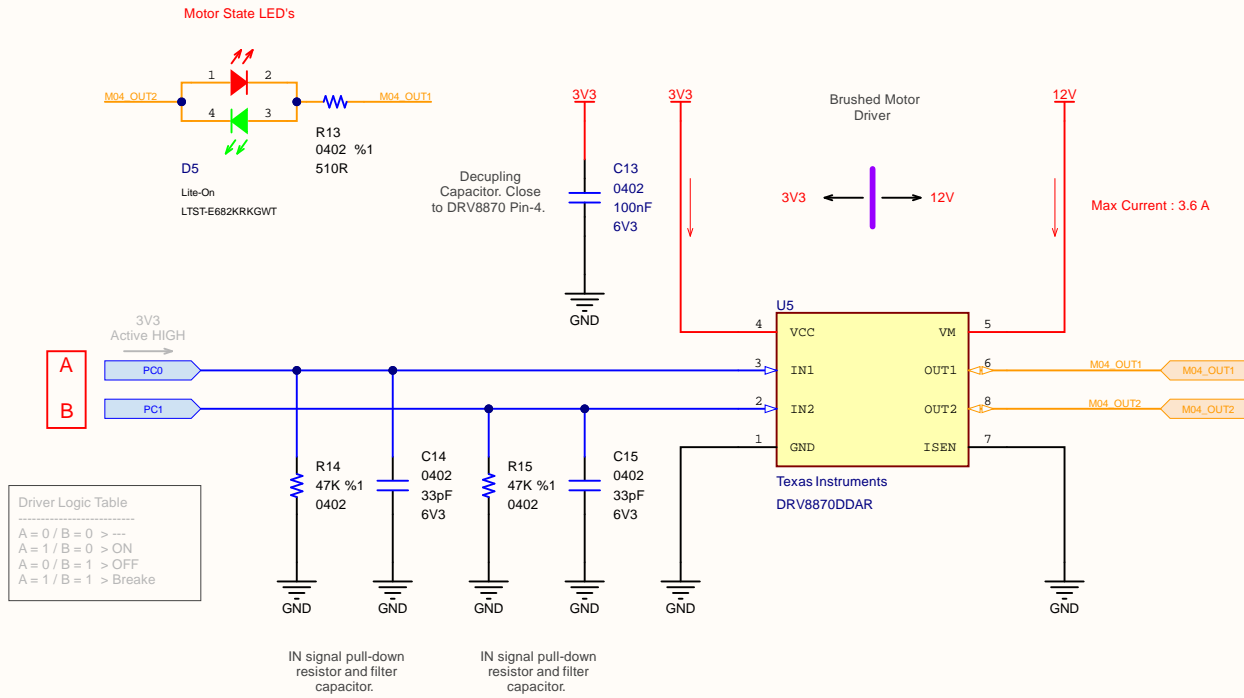
Solenoid Driver 04




Title Solenoid 03 Driver			Ovoo Electronics	
Size: A4	Number: BA001	Revision: B151BA	Necip Fazıl Mah. Ortarmak Sok. Bırgölü Apt. No: 19/6 Meram / Konya Türkiye	
Date: 2.02.2021	Time: 18:11:41	Sheet 16 of *		
File: C:\Altium Projects\IP511\BA\Electronic\B151BA\Design Files\Schematic\Solenoid 03 Driver.SchDoc				

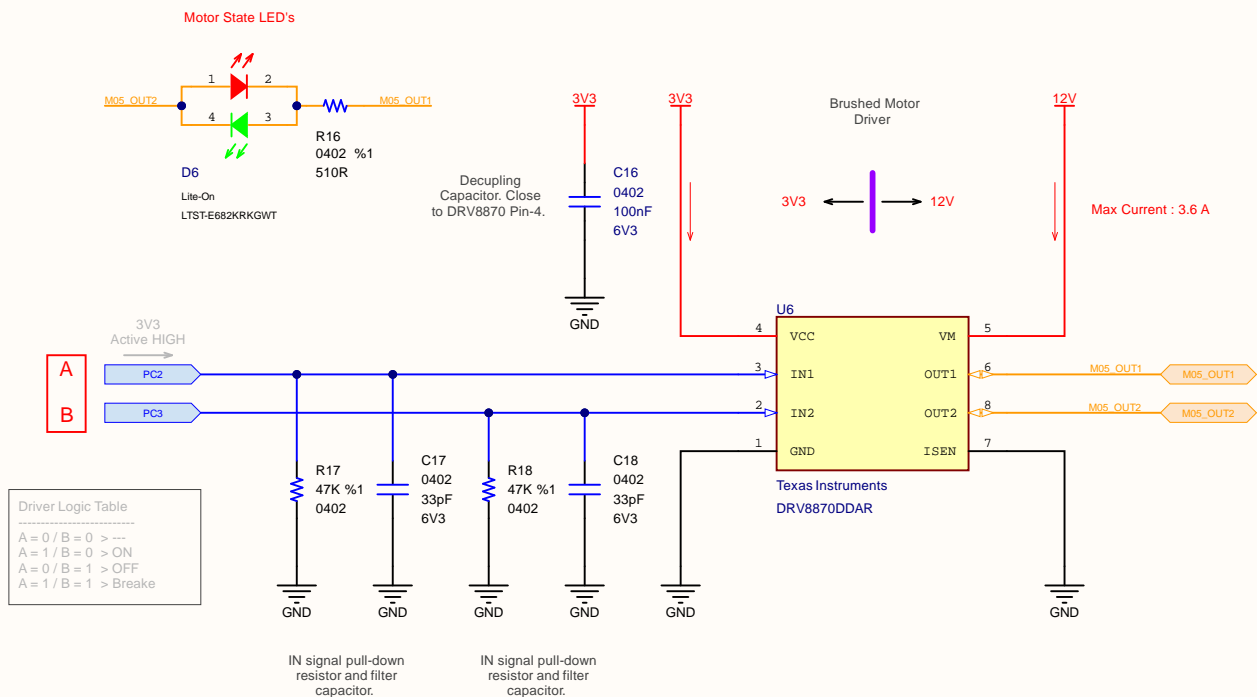
ovoo

Solenoid Driver 05



Title Solenoid 04 Driver			Ovoo Electronics		
Size: A4	Number: BA001	Revision: B151BA	Necip Fazıl Mah, Ortarmak Sok. Bırgöl Apt. No: 19/6 Meram / Konya Turkey		
Date: 2.02.2021	Time: 18:11:41	Sheet 17 of *			
File: C:\Altium Projects\IP511\BA\Electronic\B151BA\Design Files\Schematic\Solenoid 04 Driver.SchDoc					

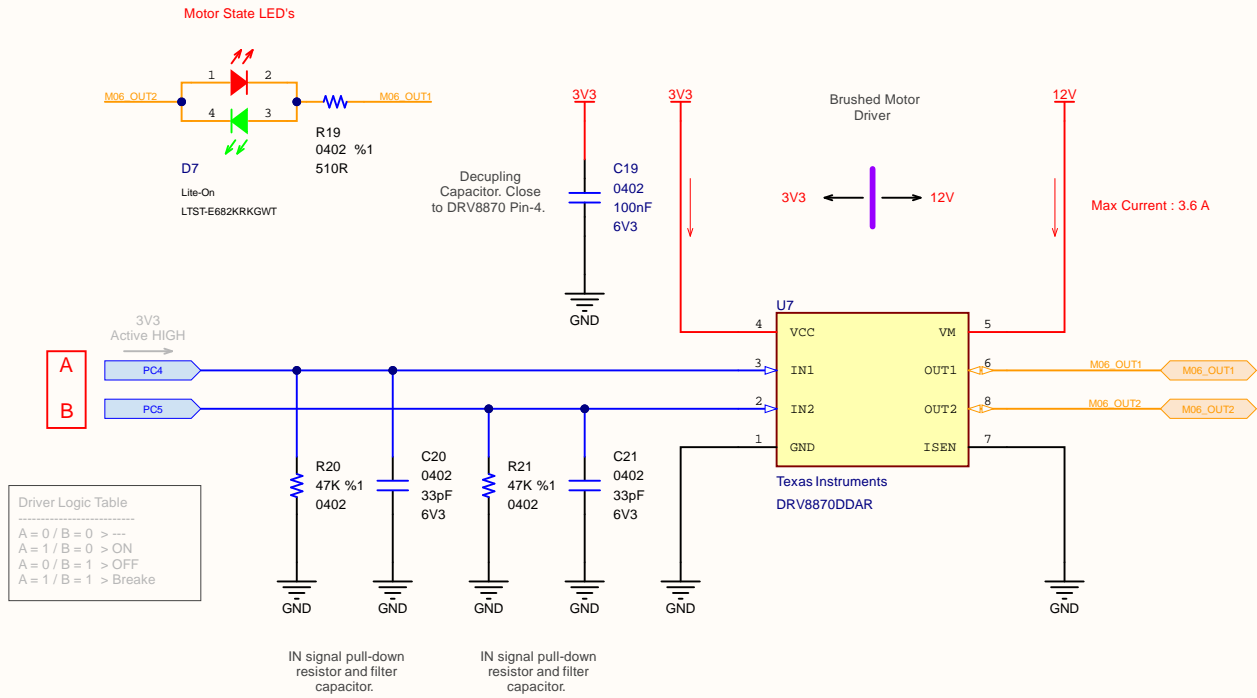
Solenoid Driver 06




Title Solenoid 05 Driver			Ovoo Electronics	
Size: A4	Number: BA001	Revision: B151BA	Necip Fazıl Mah. Ortarmak Sok. Bırgölü Apt. No: 19/6 Meram / Konya Türkiye	
Date: 2.02.2021	Time: 18:11:41	Sheet 18 of *		
File: C:\Altium Projects\IP511\BA\Electronic\B151BA\Design Files\Schematic\Solenoid 05 Driver.SchDoc				

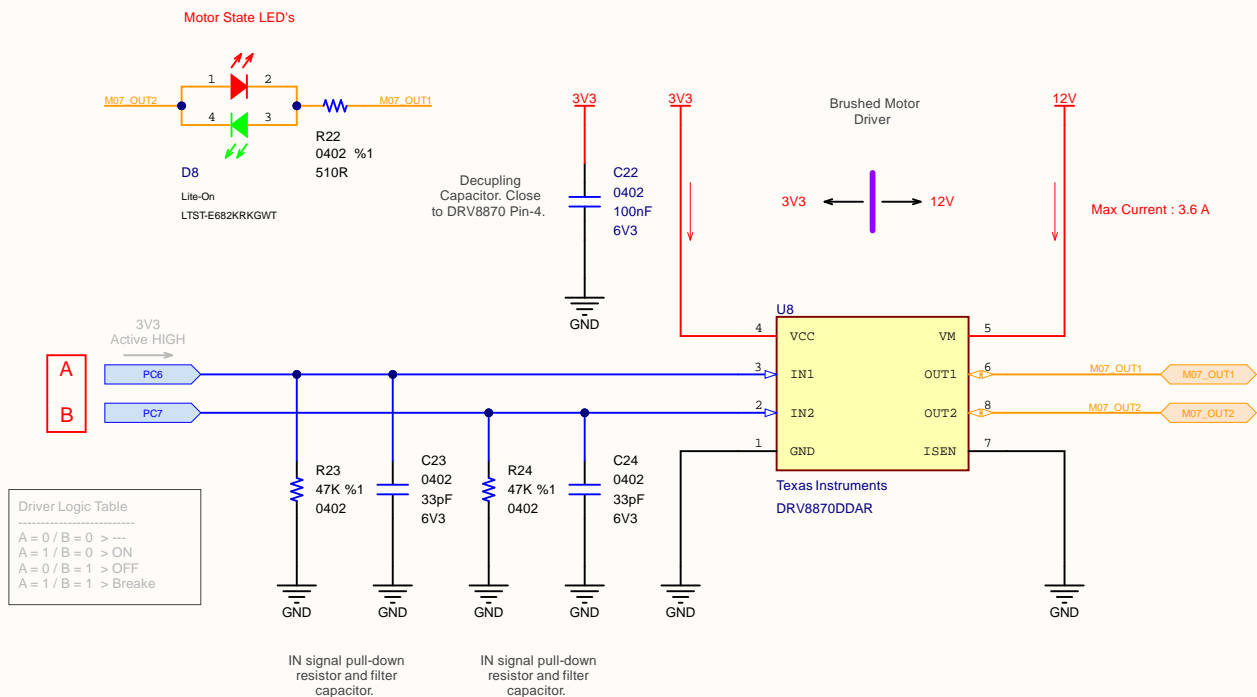
ovoo

Solenoid Driver 07



Title Solenoid 06 Driver			Ovoo Electronics Necip Fazıl Mah. Ortarmak Sok. Bırgölü Apt. No:19/6 Meram / Konya Türkiye		
Size: A4	Number: BA001	Revision: B151BA			
Date: 2.02.2021	Time: 18:11:41	Sheet 19 of *			
File: C:\Altium Projects\IP511\BA\Electronic\B151BA\Design Files\Schematic\Solenoid 06 Driver.SchDoc					

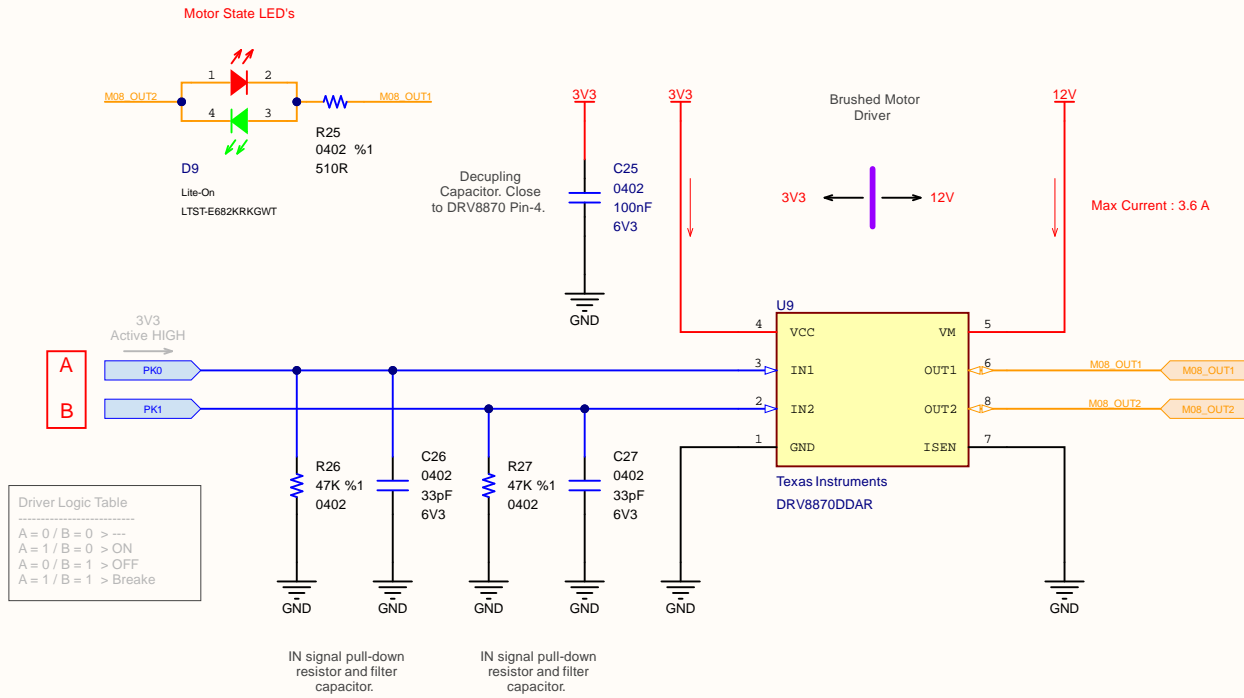
Solenoid Driver 08




Title Solenoid 07 Driver			Ovoo Electronics	
Size: A4	Number: BA001	Revision: B151BA	Necip Fazıl Mah. Ortarmak Sok. Bırgölü Apt. No: 19/6 Meram / Konya Türkiye	
Date: 2.02.2021	Time: 18:11:41	Sheet 20 of *		
File: C:\Altium Projects\IP511\BA\Electronic\B151BA\Design Files\Schematic\Solenoid 07 Driver.SchDoc				

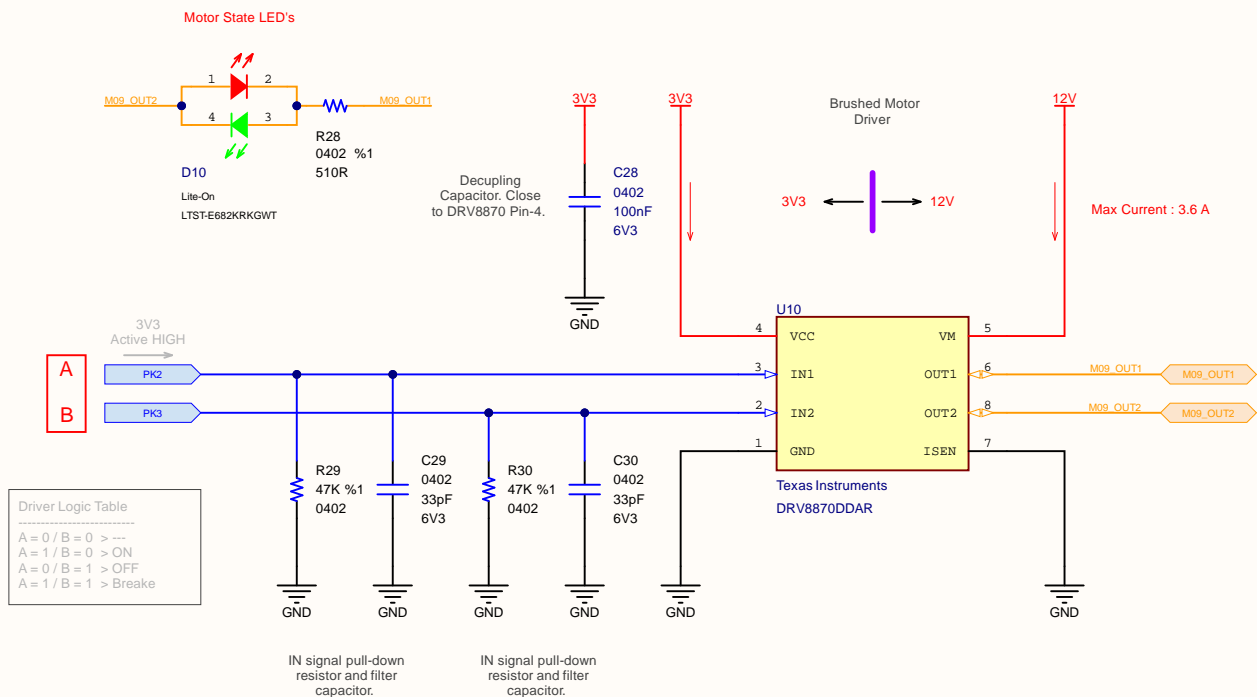
ovoo

Solenoid Driver 09



Title Solenoid 08 Driver			Ovoo Electronics		 <p>Necip Fazıl Mah, Ortarmak Sok. Bırgöl Apt. No: 19/6 Meram / Konya Türkiye</p>
Size: A4	Number: BA001	Revision: B151BA			
Date: 2.02.2021	Time: 18:11:41	Sheet 21 of *			
File: C:\Altium Projects\IP511\BA\Electronic\B151BA\Design Files\Schematic\Solenoid 08 Driver.SchDoc					

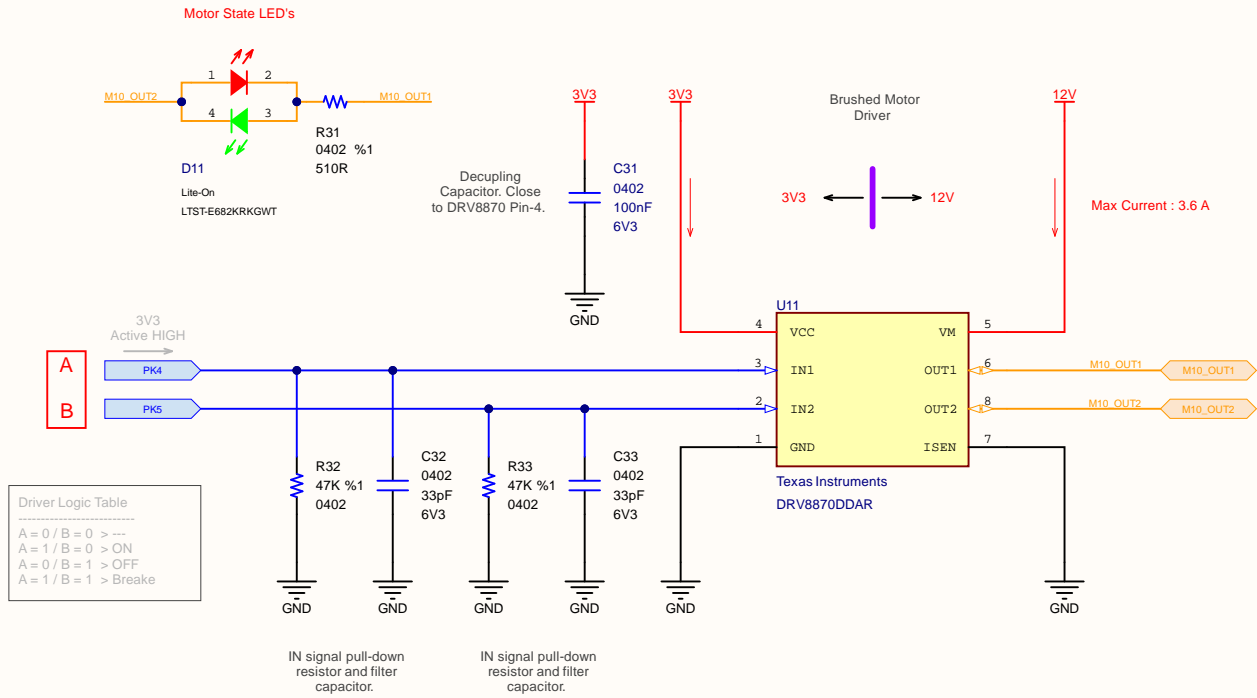
Solenoid Driver 10



Title Solenoid 09 Driver			Ovoo Electronics	
Size: A4	Number: BA001	Revision: B151BA	Necip Fazıl Mah. Ortarmak Sok. Bırgölü Apt. No: 19/6 Meram / Konya Türkiye	
Date: 2.02.2021	Time: 18:11:41	Sheet 22 of *		
File: C:\Altium Projects\IP511\BA\Electronic\B151BA\Design Files\Schematic\Solenoid 09 Driver.SchDoc				

ovoo

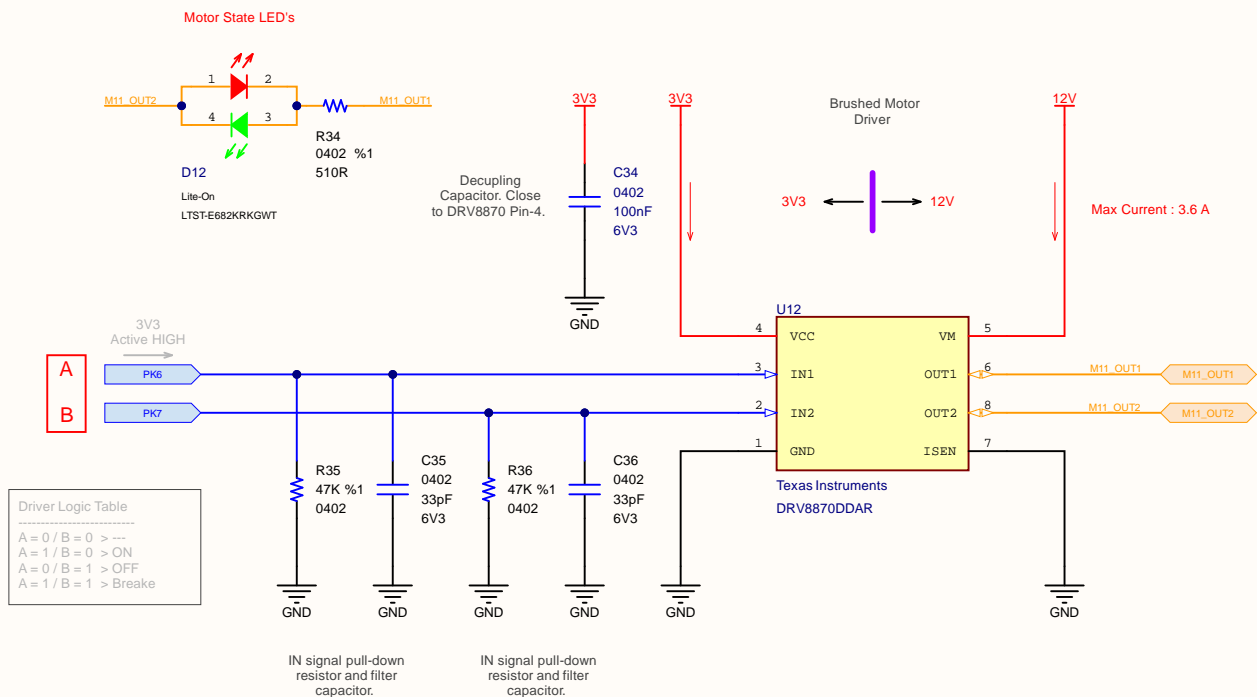
Solenoid Driver 11



Title Solenoid 10 Driver			Ovoo Electronics Necip Fazıl Mah. Ortarmak Sok. Bırgölü Apt. No: 19/6 Meram / Konya Türkiye
Size: A4	Number: BA001	Revision: B151BA	
Date: 2.02.2021	Time: 18:11:42	Sheet 23 of *	
File: C:\Altium Projects\IP511\BA\Electronic\B151BA\Design Files\Schematic\Solenoid 10 Driver.SchDoc			

ovoo

Solenoid Driver 12



Title **Solenoid 11 Driver**

Size: **A4**

Number: **BA001**

Revision: **B151BA**

Date: **2.02.2021**

Time: **18:11:42**

Sheet **24** of *

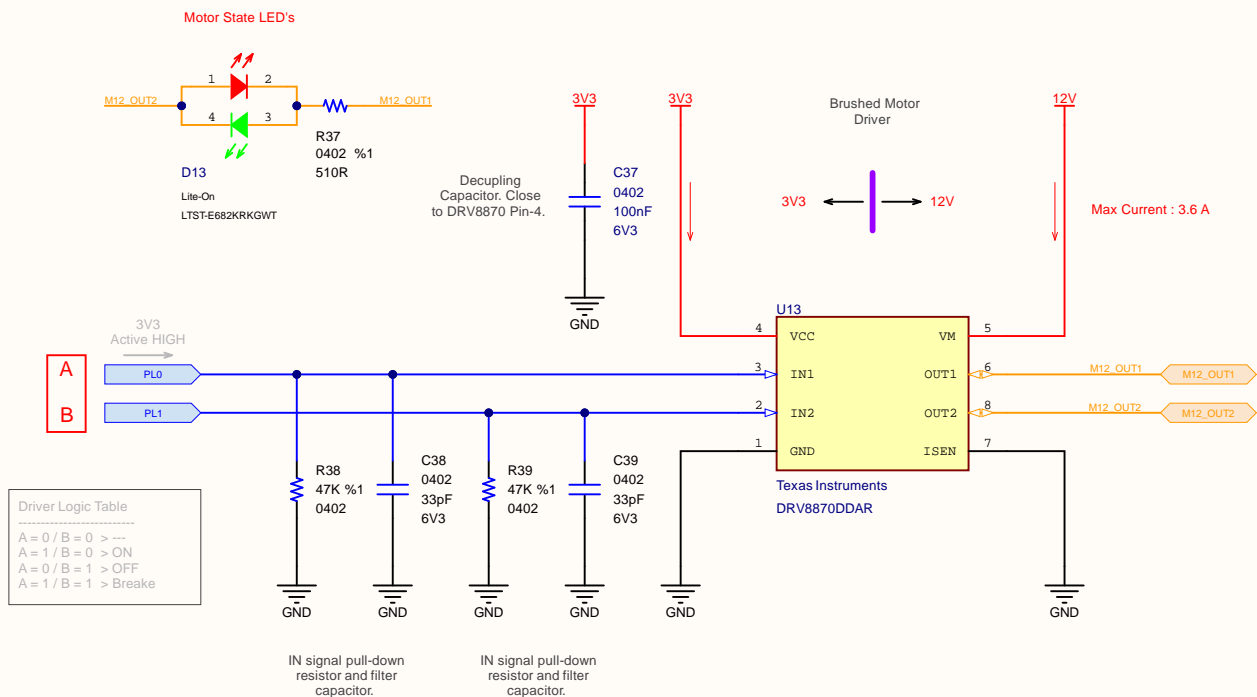
File: **C:\Altium Projects\PS11\BA\Electronic\B151BA\Design Files\Schematic\Solenoid 11 Driver.SchDoc**

Ovoo Electronics

Necip Fazıl Mah. Ortarmak Sok.
Bırgölü Apt. No: 19/6
Meram / Konya
Türkiye

ovoo

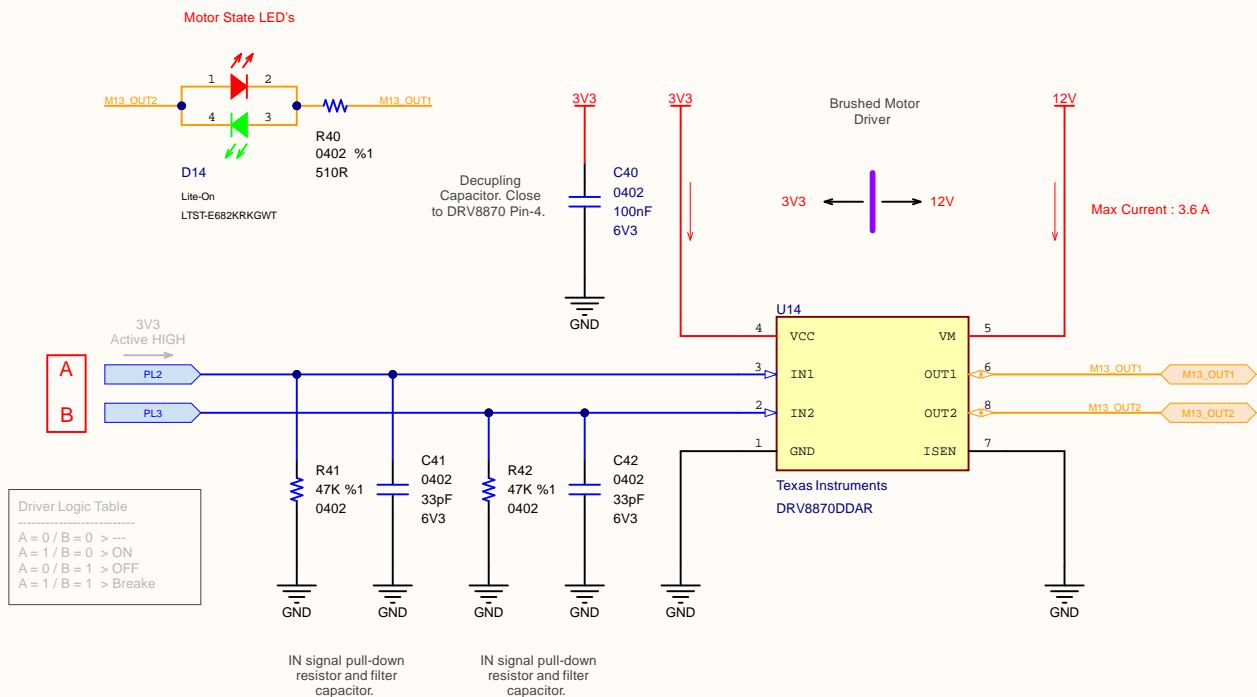
Solenoid Driver 13



Title Solenoid 12 Driver			Ovoo Electronics	
Size: A4	Number: BA001	Revision: B151BA	Necip Fazıl Mah. Ortarmak Sok. Bırgölü Apt. No: 19/6 Meram / Konya Türkiye	
Date: 2.02.2021	Time: 18:11:42	Sheet 25 of *		
File: C:\Altium Projects\IP511\BA\Electronic\B151BA\Design Files\Schematic\Solenoid 12 Driver.SchDoc				

ovoo

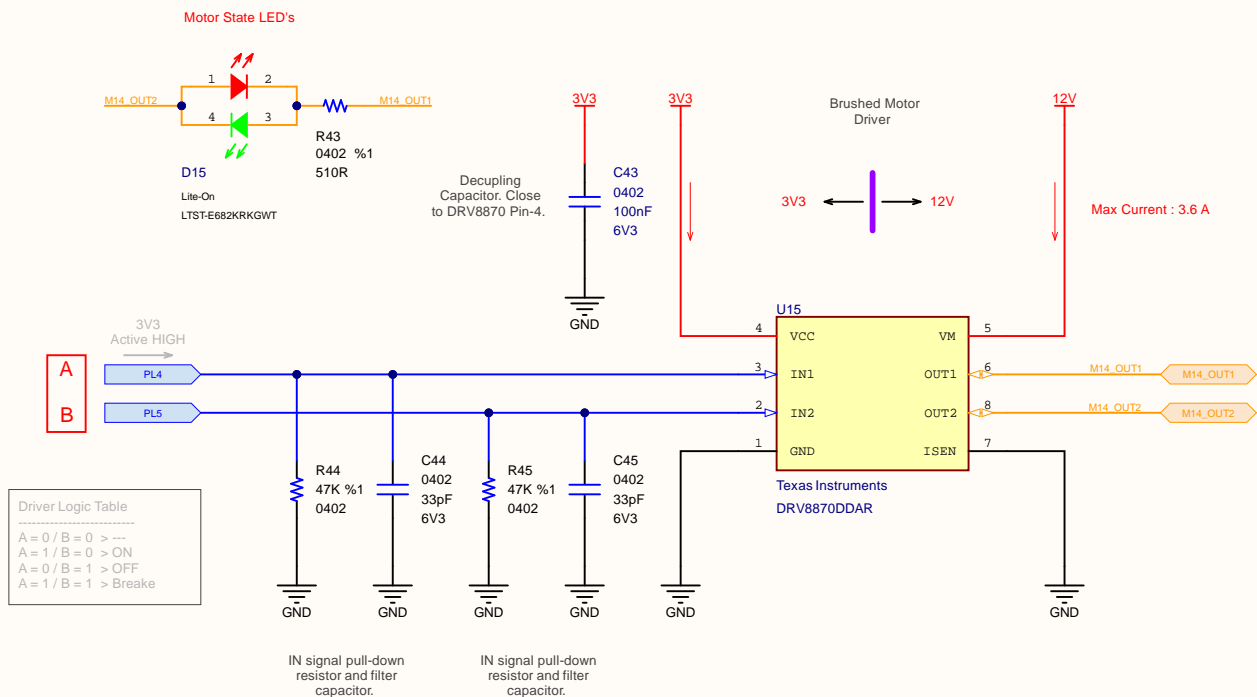
Solenoid Driver 14



Title Solenoid 13 Driver			Ovoo Electronics	
Size: A4	Number: BA001	Revision: B151BA	Necip Fazıl Mah. Ortarmak Sok. Bırgölü Apt. No: 19/6 Meram / Konya Türkiye	
Date: 2.02.2021	Time: 18:11:42	Sheet 26 of *		
File: C:\Altium Projects\IP511\BA\Electronic\B151BA\Design Files\Schematic\Solenoid 13 Driver.SchDoc				

ovoo

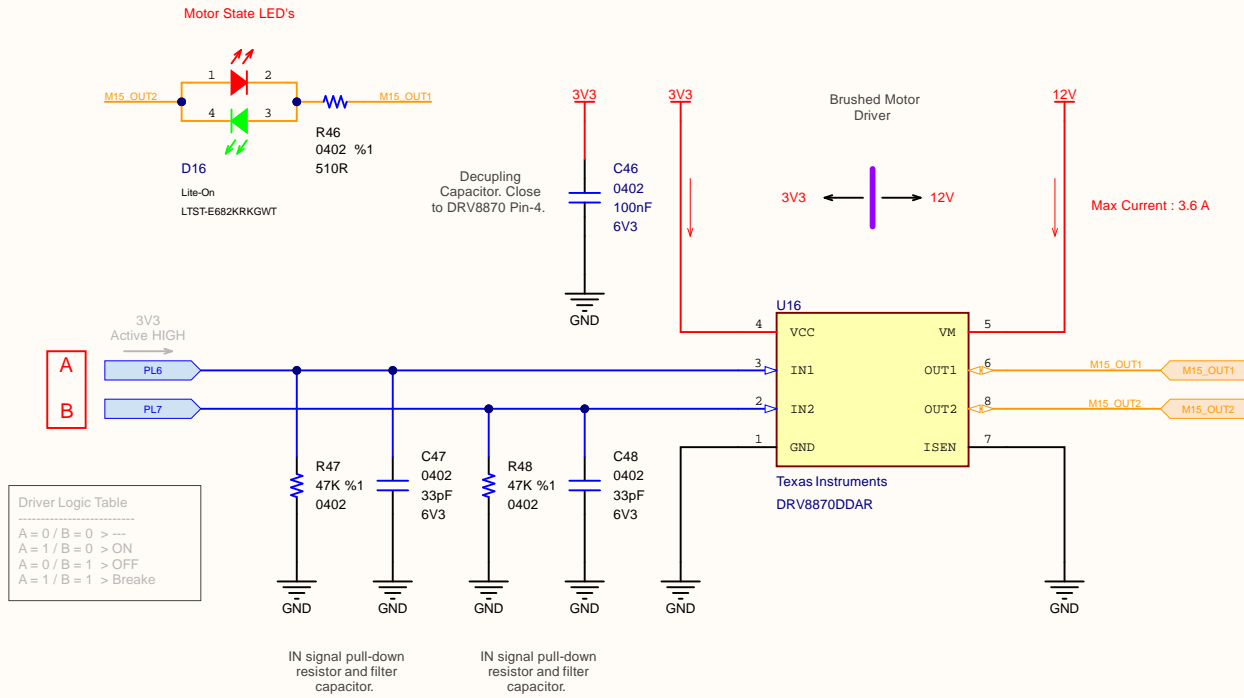
Solenoid Driver 15




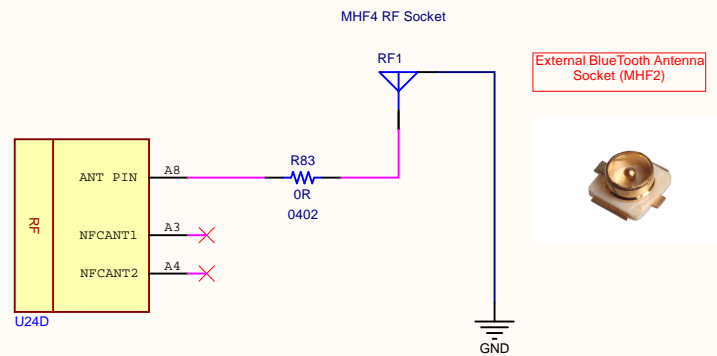
Title Solenoid 14 Driver			Ovoo Electronics	
Size: A4	Number: BA001	Revision: B151BA	Necip Fazıl Mah. Ortarmak Sok. Bırgölü Apt. No: 19/6 Meram / Konya Türkiye	
Date: 2.02.2021	Time: 18:11:42	Sheet 27 of *		
File: C:\Altium Projects\IP511\BA\Electronic\B151BA\Design Files\Schematic\Solenoid 14 Driver.SchDoc				


ovoo

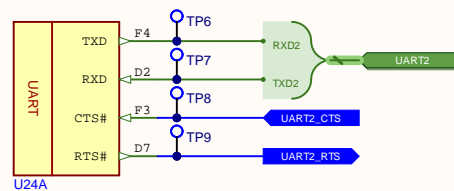
Solenoid Driver 16




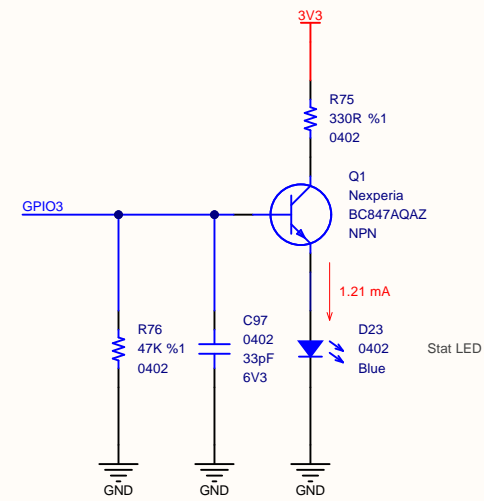
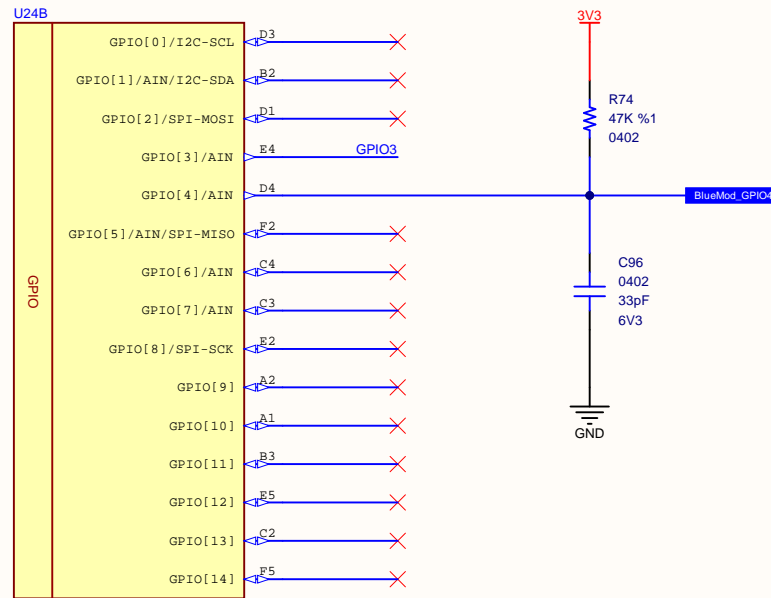
Title Solenoid 15 Driver			Ovoo Electronics		
Size: A4	Number: BA001	Revision: B151BA	Necip Fazıl Mah. Ortarmak Sok. Bırgöl Apt. No: 19/6 Meram / Konya Türkiye		
Date: 2.02.2021	Time: 18:11:42	Sheet 28 of *			
File: C:\Altium Projects\IP511\BA\Electronic\B151BA\Design Files\Schematic\Solenoid 15 Driver.SchDoc					



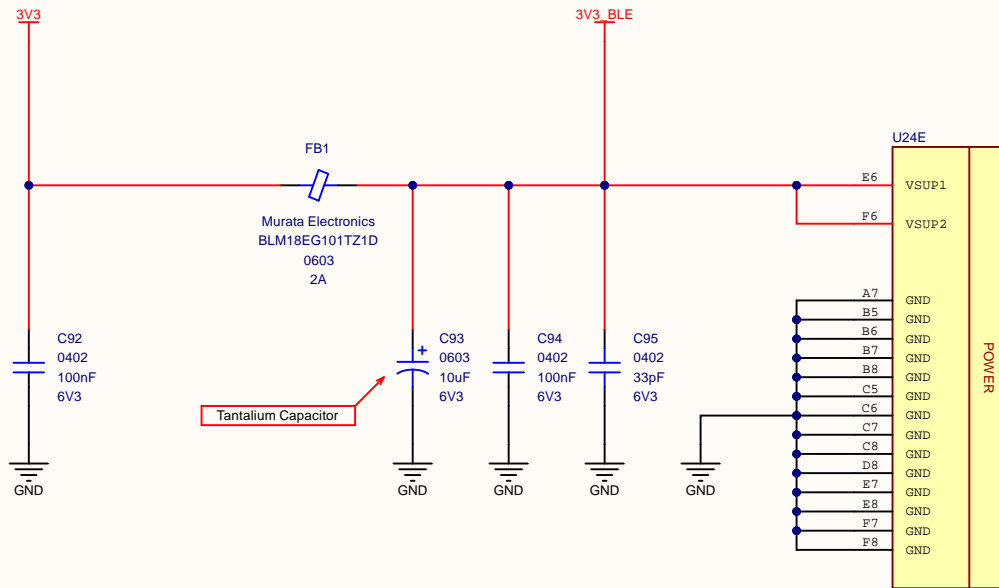
Title BlueMod+S50 Antenna			Ovoo Electronics Necip Fazıl Mah. Ortarmak Sok. Bırgölü Apt. No: 19/6 Meram / Konya Türkiye	
Size: A4	Number: BA001	Revision: B151BA		
Date: 2.02.2021	Time: 18:11:42	Sheet of		
File: C:\Altium Projects\P511\BA\Electronic\B151BA\Design Files\Schematic\BlueMod+S50 Antenna.SchDoc				



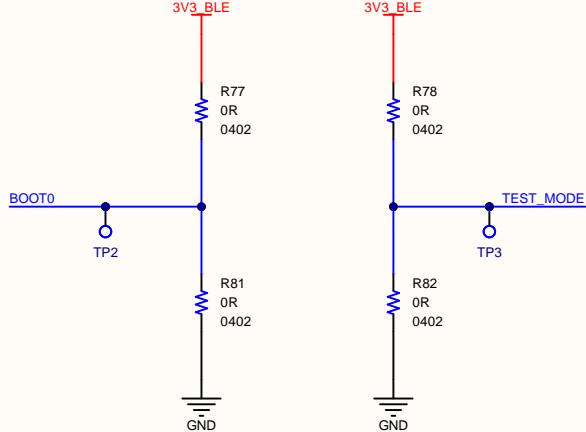
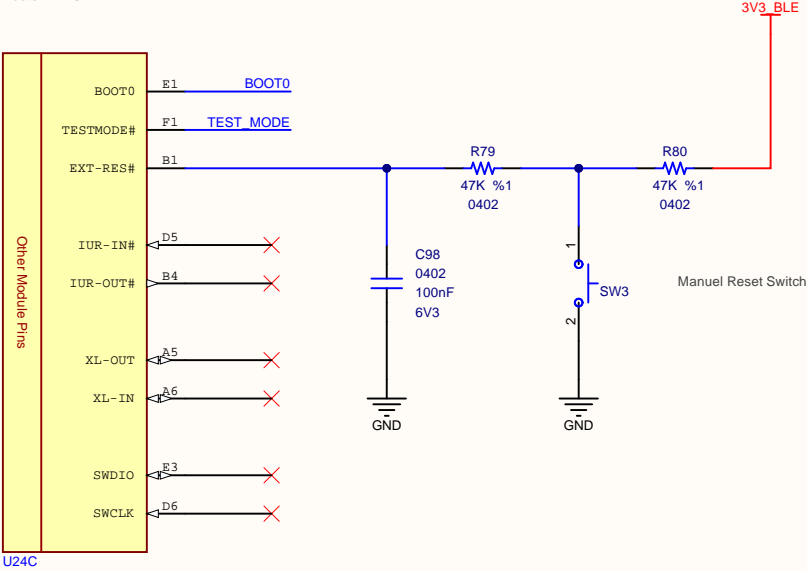
Title BlueMod+S50 Communication			Ovoo Electronics Necip Fazıl Mah. Ortarmak Sok. Bırgölü Apt. No: 19/6 Meram / Konya Türkiye	
Size: A4	Number: BA001	Revision: B151BA		
Date: 2.02.2021	Time: 18:11:42	Sheet of		
File: C:\Altium Projects\PS11\BA\Electronic\B151BA\Design Files\Schematic\BlueMod+S50 Communicatiin.SchDoc				



Title BlueMod+S50 GPIO			Ovoo Electronics Necip Fazıl Mah. Ortarmak Sok. Bırgölü Apt. No: 19/6 Meram / Konya Türkiye
Size: A4	Number: BA001	Revision: B151BA	
Date: 2.02.2021	Time: 18:11:42	Sheet of	
File: C:\Altium Projects\IP511\BA\Electronic\B151BA\Design Files\Schematic\BlueMod+S50 GPIO.SchDoc			



MicroController Mode :
TestMode -> LOW
Boot0 -> HIGH



Test Mode - Boot0
LOW / LOW : Test Mode
LOW / HIGH : DTM (19200, 8N1)
HIGH / LOW : Firmware (115200, 8N1)
HIGH / HIGH : Bootloader