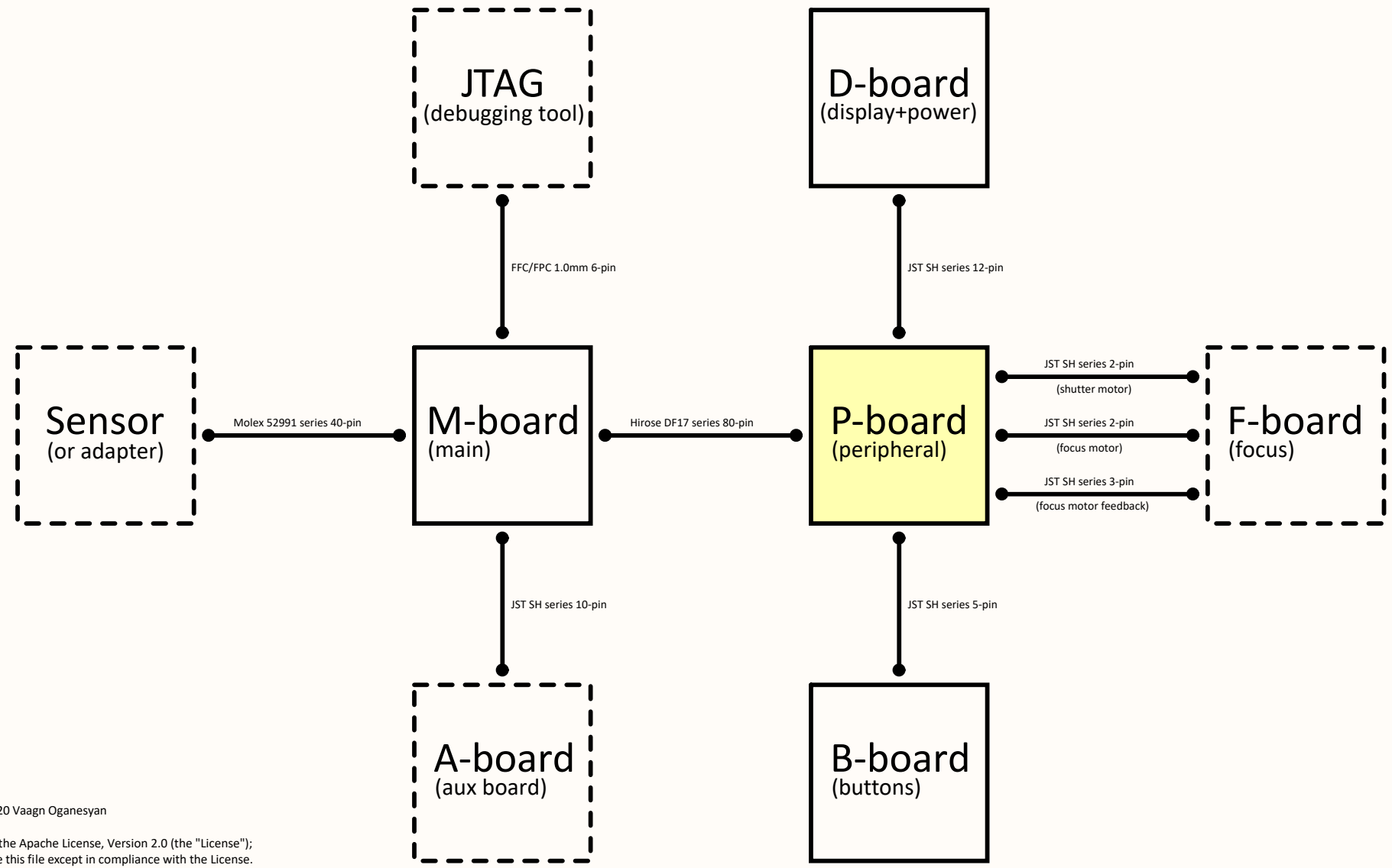
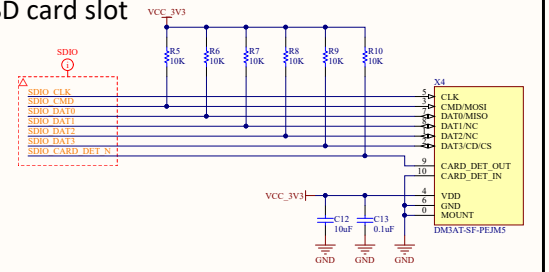


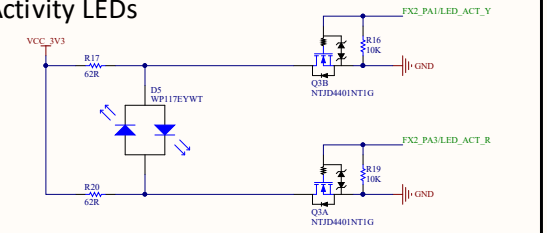
Title: P-board.Header		
File: 0_HEADER.SchDoc	Size: A4	
Drawn by: Vaagn Oganesyan	Version: v1.0.0	
Date: 09.12.2020 Time: 16:04:19	Sheet: 1 of 6	

openIRV

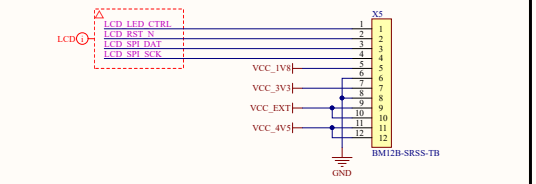
SD card slot



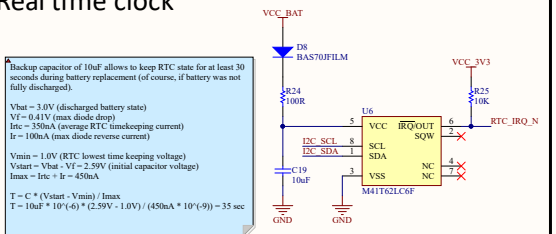
Activity LEDs



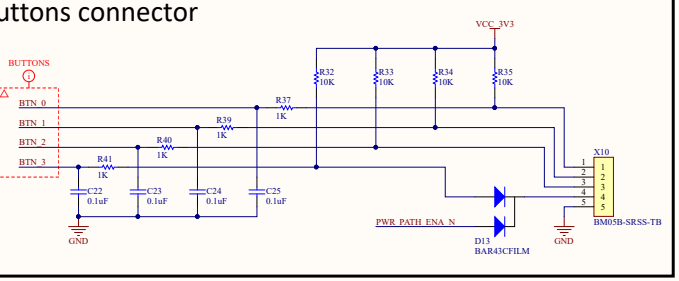
Display & EXT power connector



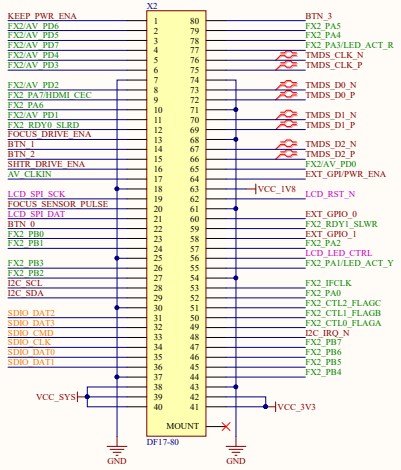
Real time clock



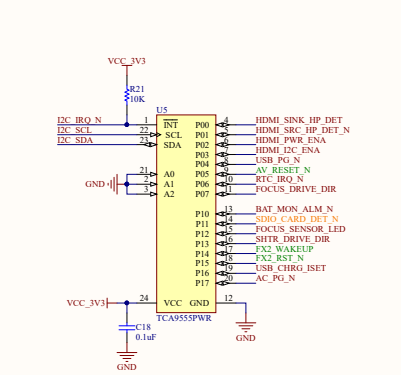
Buttons connector



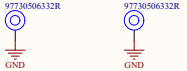
M-board connector



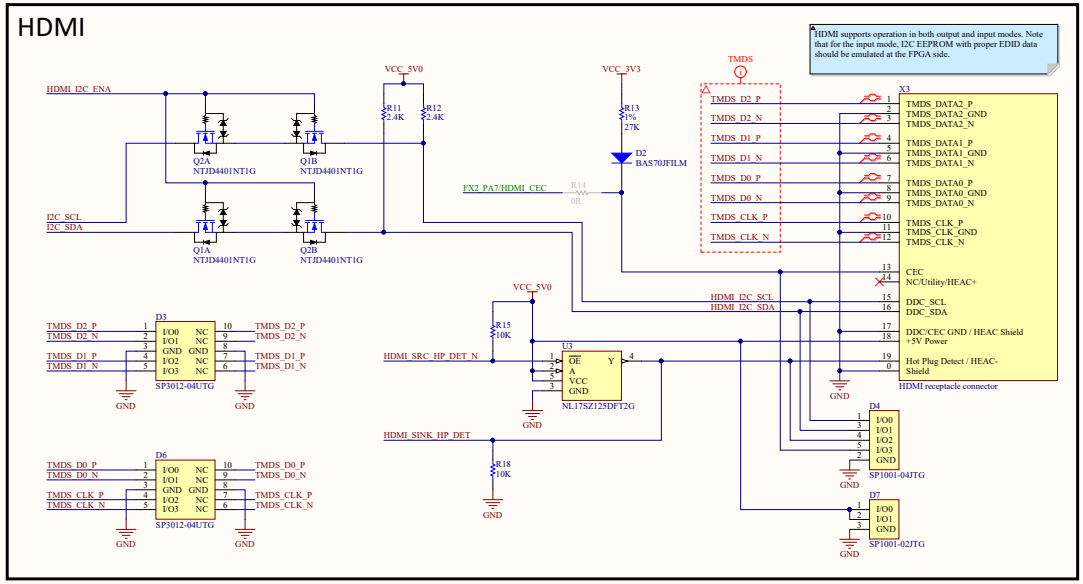
I2C I/O expander



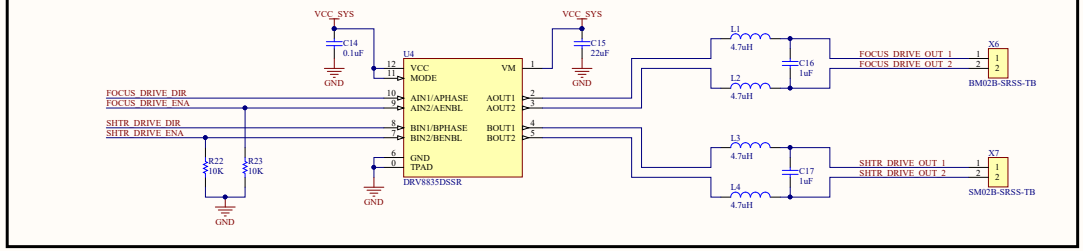
PCB stacking spacers



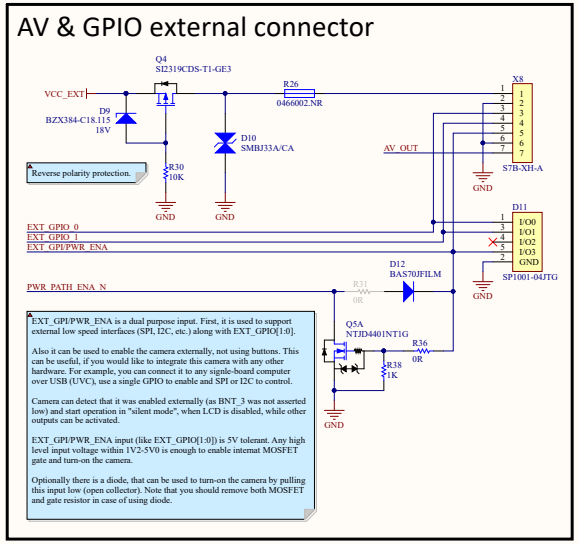
HDMI



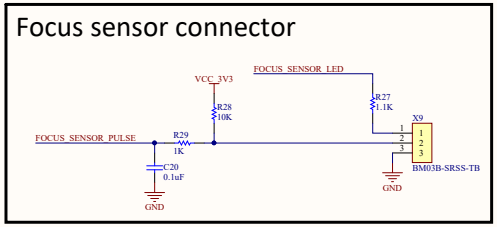
Shutter & focus motor control



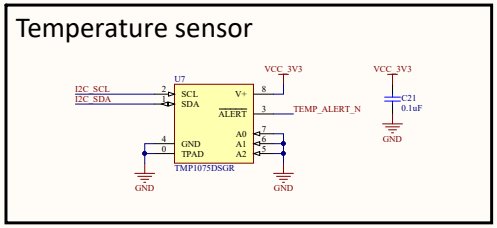
AV & GPIO external connector



Focus sensor connector



Temperature sensor



Title: P-board.Miscellaneous	
File: 1_MISC.SchDoc	Size: A2
Drawn by: Vaagn Oganesyan	Version: v1.0.0
Date: 09.12.2020 Time: 16:04:19	Sheet: 2 of 6

openIRV

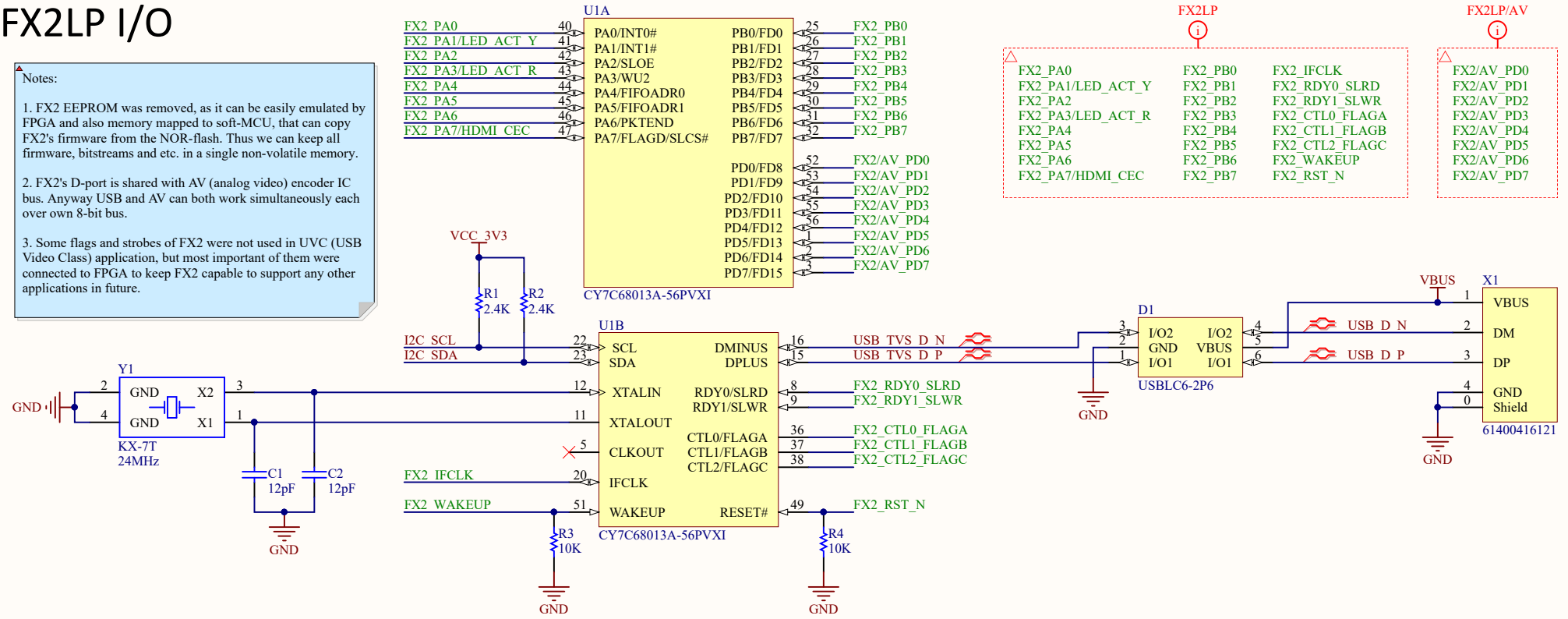
FX2LP I/O

Notes:

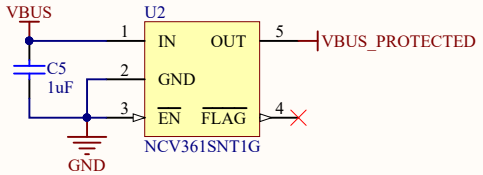
1. FX2 EEPROM was removed, as it can be easily emulated by FPGA and also memory mapped to soft-MCU, that can copy FX2's firmware from the NOR-flash. Thus we can keep all firmware, bitstreams and etc. in a single non-volatile memory.

2. FX2's D-port is shared with AV (analog video) encoder IC bus. Anyway USB and AV can both work simultaneously each over own 8-bit bus.

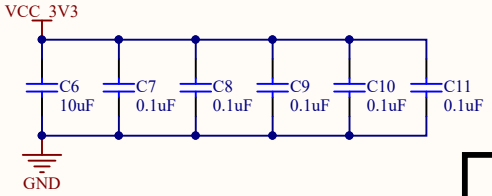
3. Some flags and strobes of FX2 were not used in UVC (USB Video Class) application, but most important of them were connected to FPGA to keep FX2 capable to support any other applications in future.

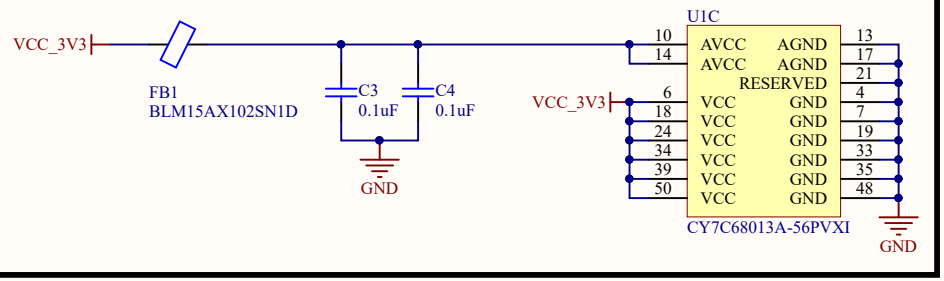


USB power protection



FX2LP power

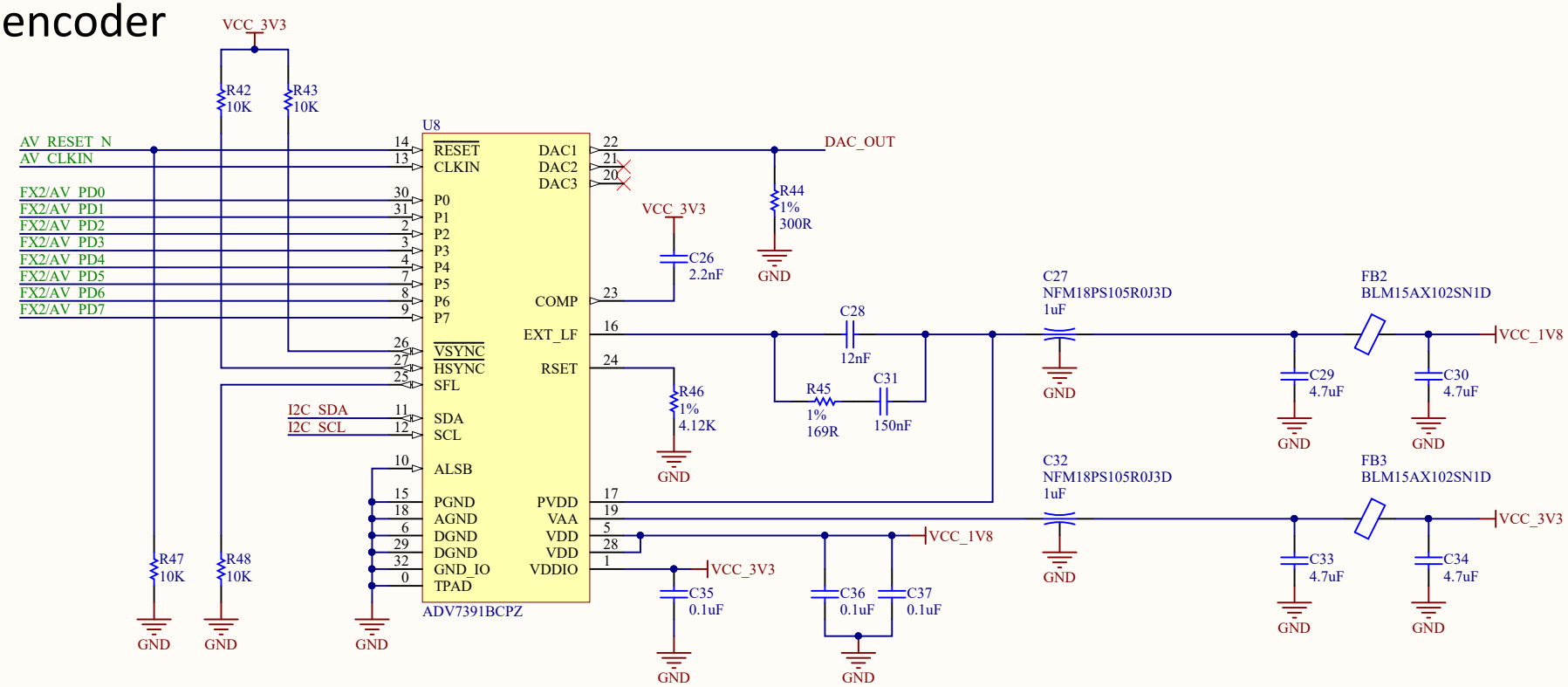




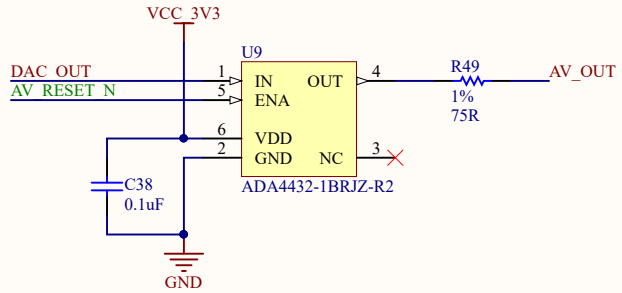
Title: P-board.USB			
File: 2_USB.SchDoc		Size: A4	
Drawn by: Vaagn Oganesyan		Version: v1.0.0	
Date: 09.12.2020	Time: 16:04:19	Sheet: 3 of 6	

openIRV

AV encoder



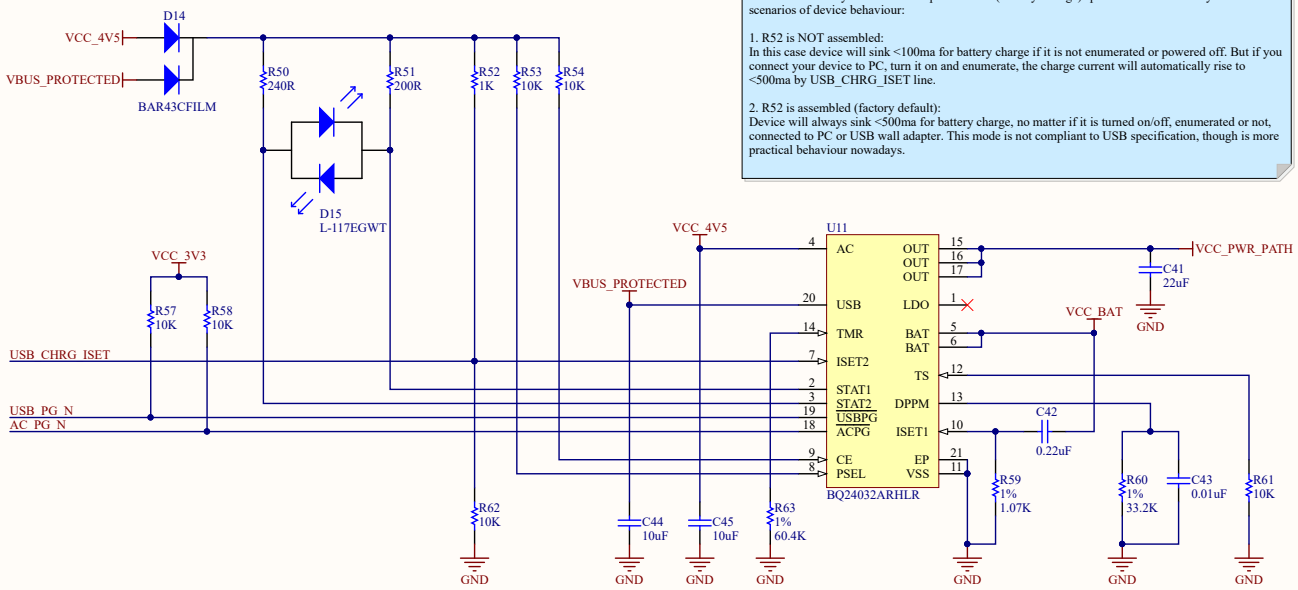
AV output buffer



Title: P-board.Analog Video		
File: 3_AVIDEO.SchDoc	Size: A4	
Drawn by: Vaagn Oganesyan	Version: v1.0.0	
Date: 09.12.2020 Time: 16:04:20	Sheet: 4 of 6	

openIRV

Battery charger



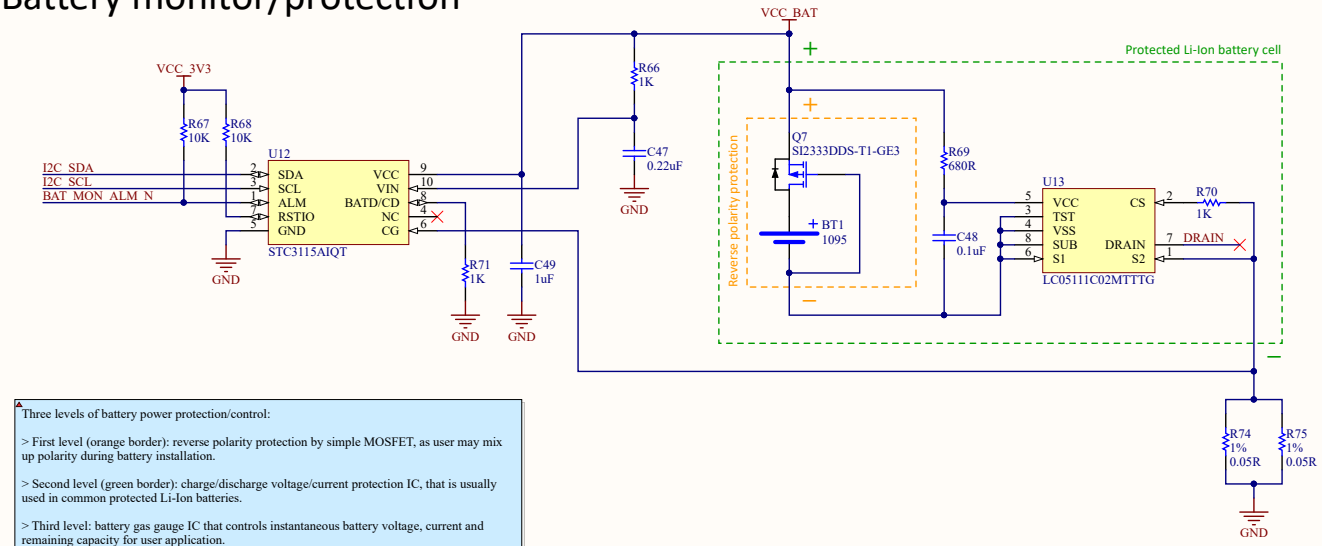
USB battery charge current note:

By default, when USB device is not enumerated at the bus, only 100ma can be sinked from USB power rail. Unfortunatelly FX2 is not compliant to BC (Battery Charge) specification. That's why we have two scenarios of device behaviour:

1. R52 is NOT assembled:
In this case device will sink <100ma for battery charge if it is not enumerated or powered off. But if you connect your device to PC, turn it on and enumerate, the charge current will automatically rise to <500ma by USB_CHRG_ISET line.

2. R52 is assembled (factory default):
Device will always sink <500ma for battery charge, no matter if it is turned on/off, enumerated or not, connected to PC or USB wall adapter. This mode is not compliant to USB specification, though is more practical behaviour nowadays.

Battery monitor/protection



Three levels of battery power protection/control:

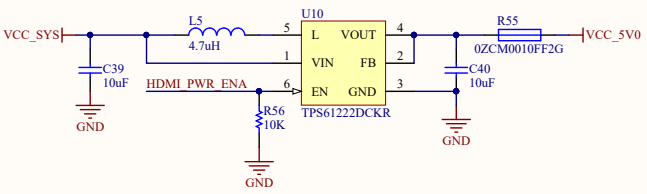
> First level (orange border): reverse polarity protection by simple MOSFET, as user may mix up polarity during battery installation.

> Second level (green border): charge/discharge voltage/current protection IC, that is usually used in common protected Li-Ion batteries.

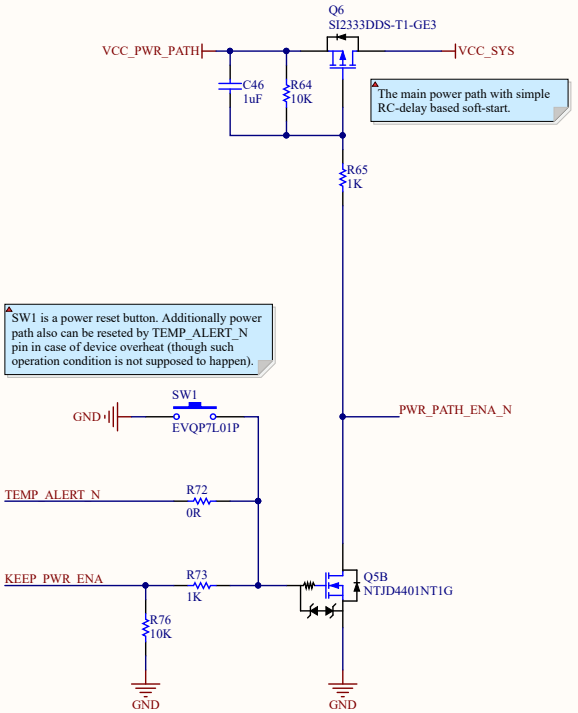
> Third level: battery gas gauge IC that controls instantaneous battery voltage, current and remaining capacity for user application.

NOTE: we refused from using factory protected 18350 Li-Ion batteries, as cell's dimentions (especially length) can vary too much from manufacturer to manufacturer. You simply won't be able to insert the battery into battery holder. At the same time dimentions of unprotected batteries are much more predictable.

HDMI power 5V0



Power on circuit



Title: P-board.Power			
File: 4_POWER.SchDoc		Size: A3	
Drawn by: Vaagn Oganesyan		Version: v1.0.0	
Date: 09.12.2020	Time: 16:04:20	Sheet: 5 of 6	

openIRV

v1.0.0

- initial release

Title: P-board.ChangeLog			
File: 5_CHANGELOG.SchDoc		Size: A4	
Drawn by: Vaagn Oganesyan		Version: v1.0.0	
Date: 09.12.2020	Time: 16:04:20	Sheet: 6 of 6	

openIRV