Camera Module with OV2735

This first production batch will be:

15 pcs of Camera Module ver RGB 15 pcs of Camera Module ver IR

The two version uses the same FPC design with different components mounted.

Version RGB components:

- OV2735 in Portrait slot
- DF40C-34DP-0.4V
- VL53L1
- CMM-4030D-261-I2S-TR

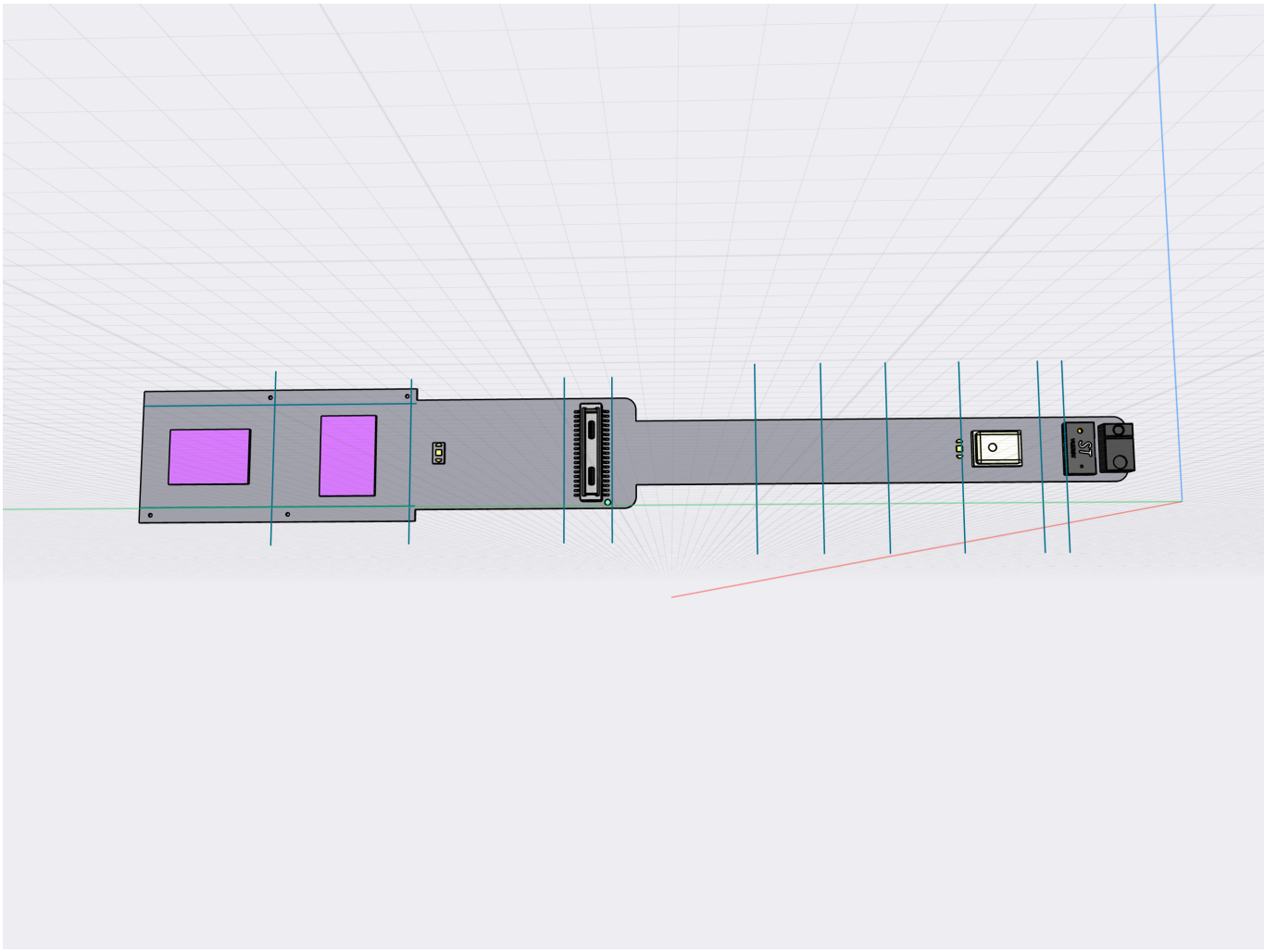
Version IR components:

- OV2735 in Landscape slot
- DF40C-34DP-0.4V
- APDS-9960
- CMM-4030D-261-I2S-TR

A precise drawing of the module is provided. It is essential that the module is shaped and laid out according to the drawing. A 3D Model is also provided. This should be used for precise reference for placing the components.

Bill of Materials

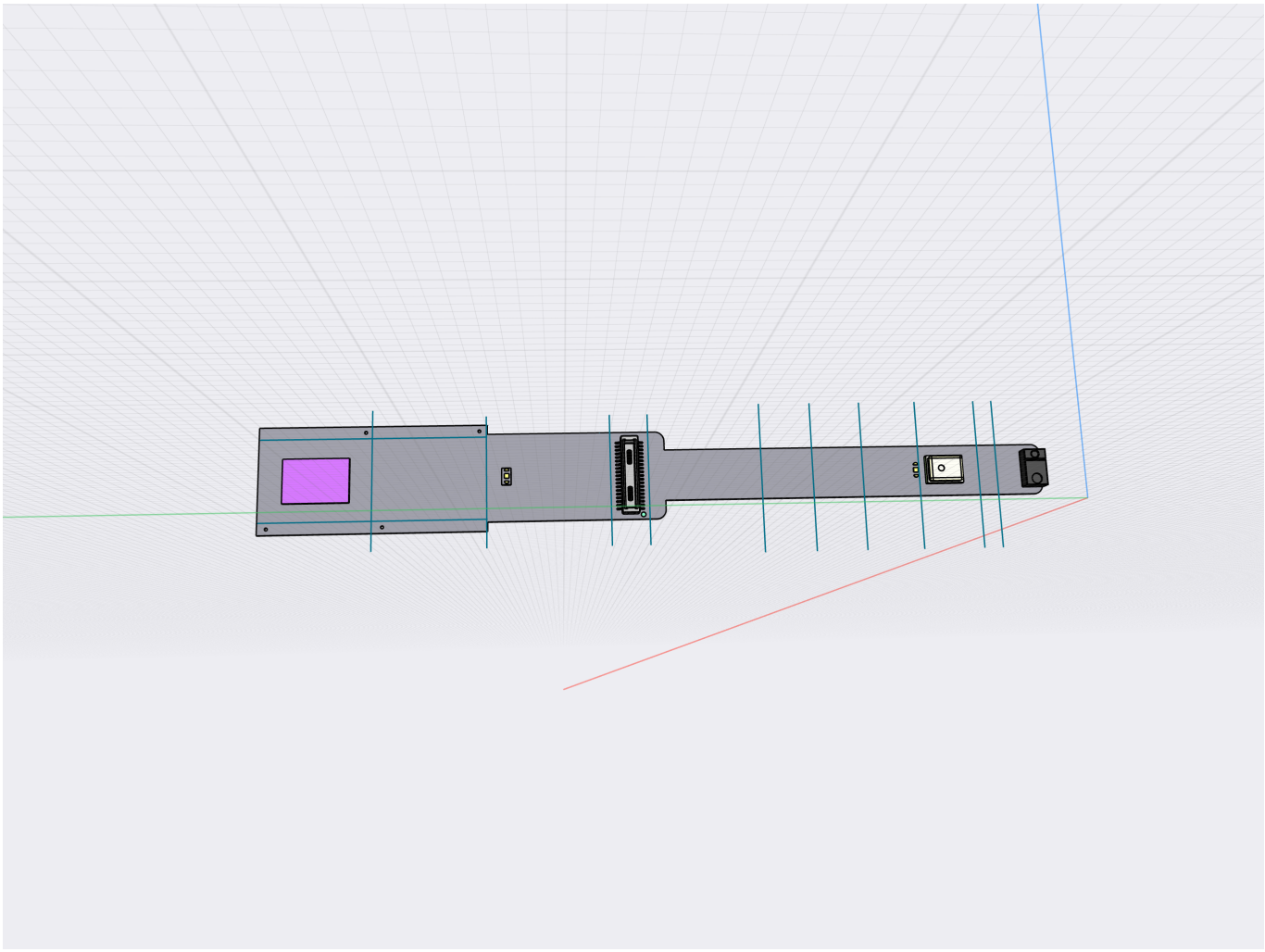
- Omnivision OV2735
- Hirose DF40C-34DP-0.4V B2B Plug (header, standard, non-shielded)
- Broadcom APDS-9960 Proximity Light and Gesture Sensors
- ToF sensor VL53L1
- CUI MEMS microphone CMM-4030D-261-I2S-TR
- Additional resistors and capacitors



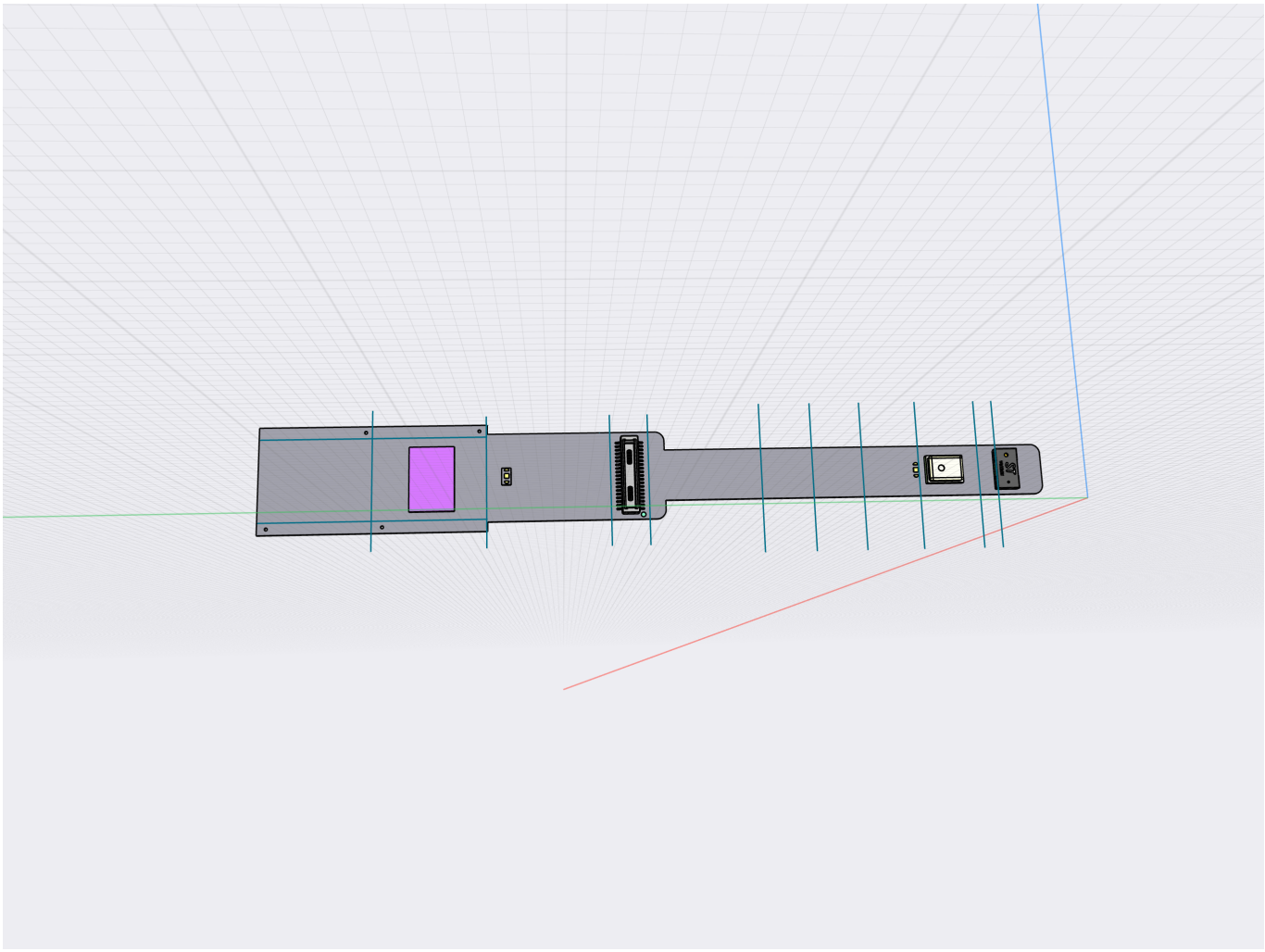
Dual camera setup (only one fitted)

The layout include two ways to mount the image sensor. Only one will be mounted at a time. The pins on both image sensor slots connect directly to eachother and on to the connector. The current version has mounting holes for one type of M7 base over each of the two sensors.

Ideally the FFC produced should support different sizes of M7/M8/M12 lens bases. This implies more holes. For this reason the FFC edges in the Image Sensor section must not conduct signal, see drawing.



Module version IR with components



Module version RGB with components

Time-of-Flight + Ambient sensor

The layout include two additional sensors. Only one will be used at a time

VL53L1 will be combined with image sensor oriented in portrait mode going across the FFC in the RGB version. APDS-9960 will be combined with image sensor oriented in landscape mode going along the FFC in the IR version.

3a. On the RGB version only VL53L1 is mounted, hence connections are: 2.8V, GND, I2C_SDA, I2C_SCL, ATT_INT, ATT_XSHUT. I'm assuming that The OV2735 and VL53L1 can be on the same I2C bus.

3b. On the IR version only APDS-9960 is mounted, hence connections are 2.8V, GND, I2C_SDA, I2C_SCL, ATT_INT. I understand LDR, LED A, LED K as for external IR LED. This sensor is just intended for ambient light measurement. If additional functionality is needed I would introduce it through revisions to this sensor module. I'm assuming that The OV2735 and APDS-9960 can be on the same I2C bus.

Diagram

Drawing & 3D Model bundled with this spec

- Drawing
- Mounting intructions RGB vs IR (in drawing)

- Portrait/Landscape slots pointed out (drawing)
- 3D rendering

Notations printed on the FFC

- Pin 1 Dot by the connector
- Text: "OV2735" between the two image sensor locations
- Text: "Ziloo 201" in empty area between microphone and connector
- Text: "CAM ID" by the I2CID isles
- Text: "MIC SEL" by the MIC SEL isles
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Layout Schematic

- All sensors are connected to either I2S or I2S bus
- ATT_XSHUT connected to VL53L1
- ATT_INT connected to VL53L1 GPIO1 & APDS-9960 INT
- VL53L1 and APDS-9960 uses 2.8V
- Isles added to allow Mic. Select to be soldered to HIGH(1.8V) or LOW(GND)
- Isles added to allow I2CID. Select to be soldered to HIGH(1.8V) or LOW(GND)
- All connector pins(except NC / Reserved) are connected to components
- The edges around image sensors must not carry signal to allow punching extra holes for lens alignment

Pinouts: Hirose DF40 single eye connector 34 pins

Toward thin part with microphone and other sensors

Pin	Code	Type	Details	Voltage
1	AF_VDD	Power	Reserved for Autofocus	3.3V
2	AVDD_2V8	Power	Analog, Max 500mA	2.8V
3	DOVDD	Power	Power for I/O circuit, Max 500mA	1.8V
4	VCC_1V8	Power	1.8V ,MAX 200mA	1.8V
5	GND	Power	GND	
6	CAM_FSIN	I/O	Frame sync input	
7	CAM_STROBE	I/O	Frame sync output	
8	EXTCLK	Input	External Clock Input (MCLK)	
9	ATT_INT	Output	Interrupt Attached Sensor, Active L	1.8V?
10	ATT_XSHUT	Input	Attached Sensor XSHUTDOWN	1.8V
11	Reserved	AF/PWM	PWM Motor control (NC)	
12	I2C_SCL	I/O	I2C1_SCL(pullup resistor 2.2K)	1.8V

Pin	Code	Type	Details	Voltage
13	I2C_SDA	I/O	I2C1_SDA(pullup resistor 2.2K)	1.8V
14	BCLK / SCK	I2S	Bit clock line	1.8V
15	WS / LRCLK	I2S	Word clock line	1.8V
16	SDATA1	I2S	Input data 1	1.8V
17	SDATA2	I2S	Input data 2 (NC)	1.8V

Towards image sensors

Pin	Code	Type	Details	Voltage
34	AGND	Power	Analog ground	
33	RESET	Input	Camera Reset, Active Low (RSTB)	
32	PWRDN	Input	Camera Power Down	
31	Reserved			
30	Reserved			
29	-		GND	
28	CSI_RX_D0P	Camera	MIPI_CSI_RX_D0+	1.8V
27	CSI_RX_D0N	Camera	MIPI_CSI_RX_D0-	1.8V
26	-		GND	
25	CSI_RX_D1P	Camera	MIPI_CSI_RX_D1+	1.8V
24	CSI_RX_D1N	Camera	MIPI_CSI_RX_D1-	1.8V
23	-		GND	
22	CSI_RX_D2P	Camera	MIPI_CSI_RX_D2+	1.8V
21	CSI_RX_D2N	Camera	MIPI_CSI_RX_D2-	1.8V
20	-		GND	
19	CSI_RX_CLKP	Camera	MIPI_CSI_RX_CLK+	1.8V
18	CSI_RX_CLKN	Camera	MIPI_CSI_RX_CLK-	1.8V

Recent changes

- Extra ground pins added
- The pin numbers corrected to make connector layout clear
- I2S is 1.8V, the microphone must connect to 1.8V

THIS IS NOT THE LAYOUT !!!

Toward thin part with microphone and other sensors

Pin	Code	Type	Details	Voltage
1	AF_VDD	Power	Reserved for Autofocus	3.3V
2	AGND	Power	Analog ground	
3	AVDD_2V8	Power	Analog, Max 500mA	2.8V
4	RESET	Input	Camera Reset, Active Low (RSTB)	
5	DOVDD	Power	Power for I/O circuit, Max 500mA	1.8V
6	CAM_PWRDN	Input	Camera Power Down	
7	VCC_1V8	Power	1.8V ,MAX 200mA	1.8V
8	Reserved			
9	Reserved			
10	Reserved			
11	CAM_FSIN	I/O	Frame sync input	
12	Reserved	AF/PWM	PWM Motor control (NC)	
13	CAM_STROBE	I/O	Frame sync output	
14	CSI_RX_D0P	Camera	MIPI_CSI_RX_D0+	1.8V
15	EXTCLK	Input	External Clock Input (MCLK)	
16	CSI_RX_D0N	Camera	MIPI_CSI_RX_D0-	1.8V
17	ATT_INT	Output	Interrupt Attached Sensor, Active L	1.8V?

Towards image sensors

Pin	Code	Type	Details	Voltage
18	-		GND	
19	ATT_XSHUT	Input	Attached Sensor XSHUTDOWN	1.8V
20	CSI_RX_D1P	Camera	MIPI_CSI_RX_D1+	1.8V
21	Reserved	Power		
22	CSI_RX_D1N	Camera	MIPI_CSI_RX_D1-	1.8V
23	I2C_SCL	I/O	I2C1_SCL(pullup resistor 2.2K)	1.8V
24	-		GND	
25	I2C_SDA	I/O	I2C1_SDA(pullup resistor 2.2K)	1.8V
26	CSI_RX_D2P	Camera	MIPI_CSI_RX_D2+	1.8V

Pin	Code	Type	Details	Voltage
27	BCLK / SCK	I2S	Bit clock line	1.8V
28	CSI_RX_D2N	Camera	MIPI_CSI_RX_D2-	1.8V
29	WS / LRCLK	I2S	Word clock line	1.8V
30	-		GND	
31	SDATA1	I2S	Input data 1	1.8V
32	CSI_RX_CLKP	Camera	MIPI_CSI_RX_CLK+	1.8V
33	SDATA2	I2S	Input data 2 (NC)	1.8V
34	CSI_RX_CLKN	Camera	MIPI_CSI_RX_CLK-	1.8V