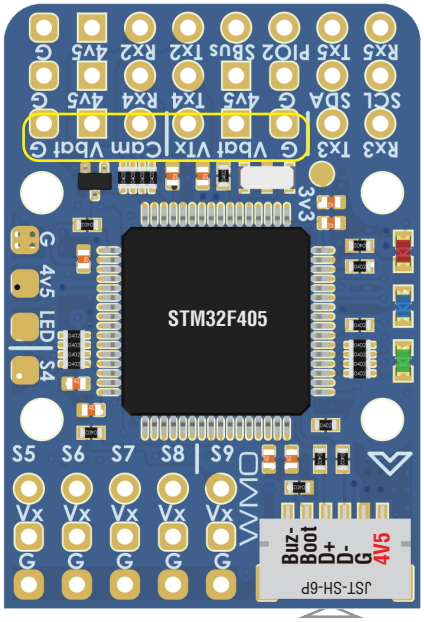
LAYOUT

VTx: Video OUT for Video Transmitter
Cam: Camera video IN

Vbat: Filtered Battery Voltage
ON/OFF control via INAV Modes/USER1
or ArduPilot Relay

PIO2: Low/High level control via INAV Modes/USER2
or ArduPilot Relay



Tx3/Rx3: UART3_Tx/Rx
Tx4/Rx4: UART4_Tx/Rx
Tx5/Rx5: UART5_Tx/Rx

SDA & SCL: I2C_SDA, SCL, for compass / Digital Airspeed

Tx2 & Rx2: for CRSF receiver
Rx2: UART2-RX for Serial_RX by default
Tx2: UART2-TX
*softserial1_tx is an alternative on Tx2 pad in INAV
SBus: UART2_RX + inverter for SBUS receiver

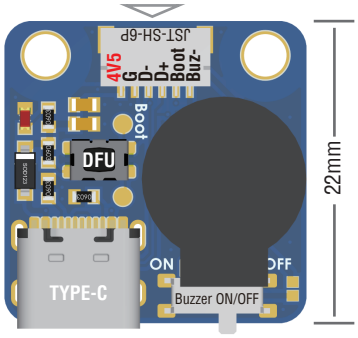
LED 3.3: Red, 3.3V Status
LED 0: Blue, FC Status
LED 1: Green, FC Status

4V5: 4.4~5V, 2A cont.
*** 4V5 is also supplied when connecting USB only
3.3: LDO3.3V 200mA

Vx: BEC for servos, Default 5V, 4.5A cont. 7A peak

			INAV Plane/VTOL	ArduPilot
S1	TIM8_CH4	TIM8	Motor	PWM1 GPIO50
S2	TIM8_CH3			PWM2 GPIO51
S3	TIM1_CH3N	TIM1		PWM3 GPIO52
S4	TIM1_CH1			PWM4 GPIO53
S5	TIM2_CH4	TIM2	Servo	PWM5 GPIO54
S6	TIM2_CH3			PWM6 GPIO55
S7	TIM2_CH2			PWM7 GPIO56
S8	TIM2_CH1			PWM8 GPIO57
S9	TIM12_CH1	TIM12		PWM9 GPIO58
LED	TIM3_CH4	TIM3	2812LED	PWM12 GPIO61

6pin wires



DFU Button: F405 DFU mode.
Connect USB to the PC While holding the boot button in.

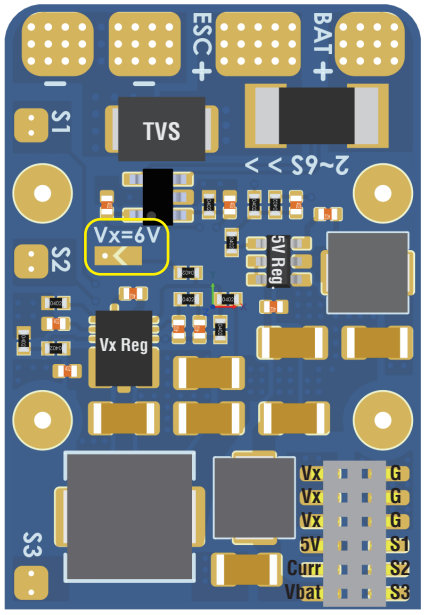
Red LED, USB power indicator.

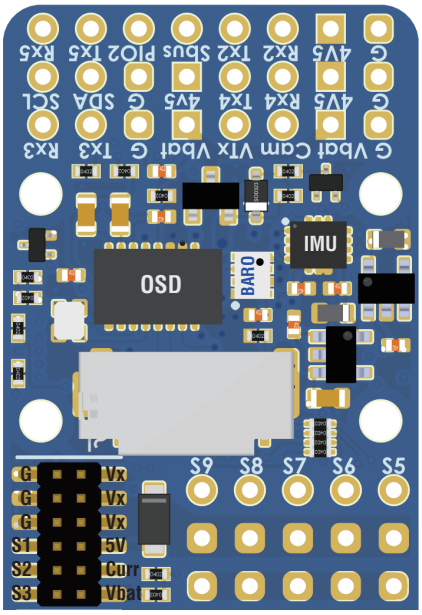
+ & - : Battery & ESC power pads, 5.4~30V DC(2~6S LIPO)
Current Sensor: 132A Range, 90A Cont.

S1/S2/S3: for ESC/motor 1/2/3

Vx= 5V (default)

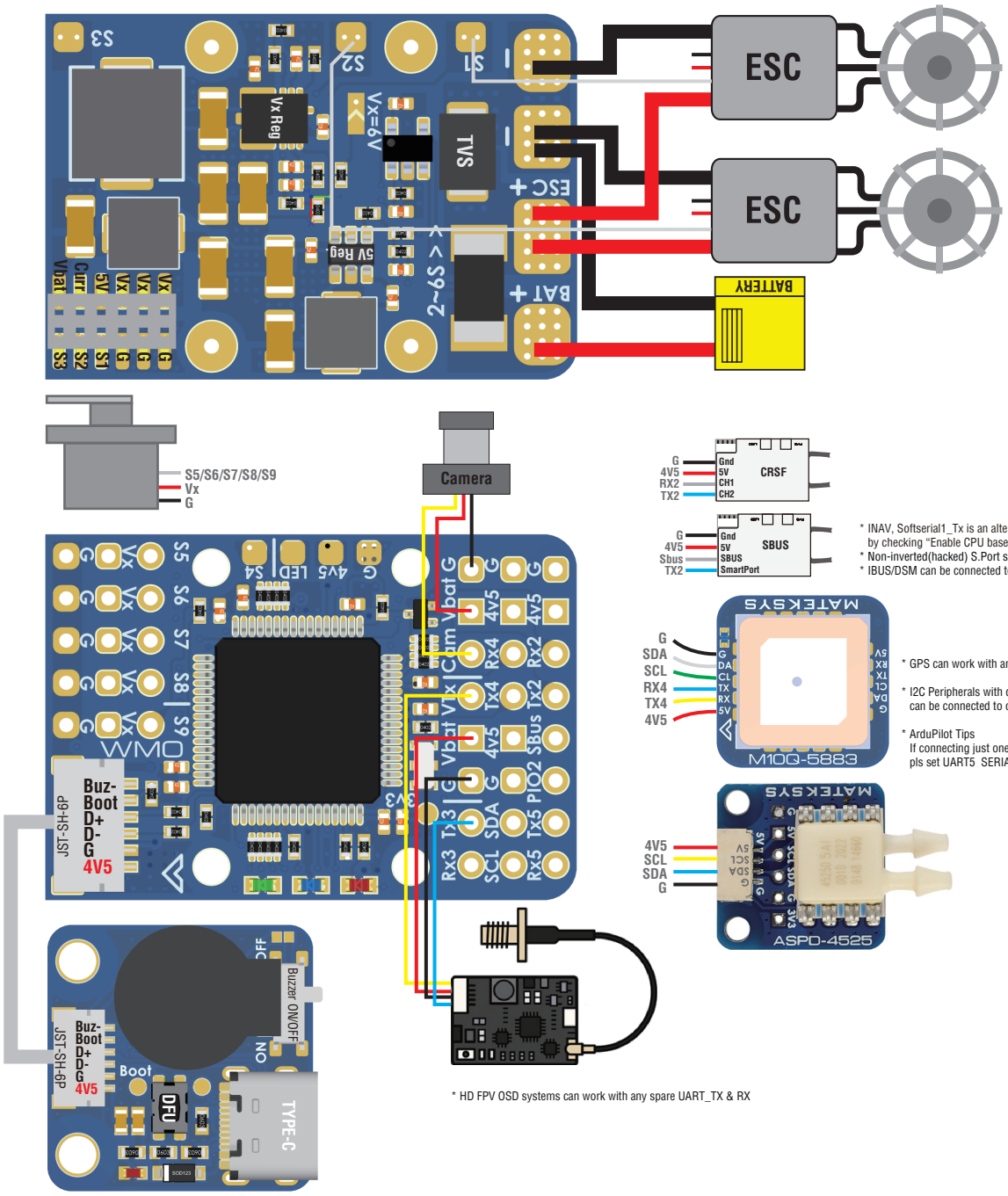
Vx= 6V





Wiring (Plane)

INAV fw: MATEKF405TE_SD
ArduPilot fw: MATEKF405-TE



* INAV, Softserial1_Tx is an alternative on Tx2 pad by checking "Enable CPU based serial ports"
* Non-inverted(hacked) S.Port signal is needed for FPORT
* IBUS/DSM can be connected to any spare UART_RX

* GPS can work with any spare UART_TX & RX

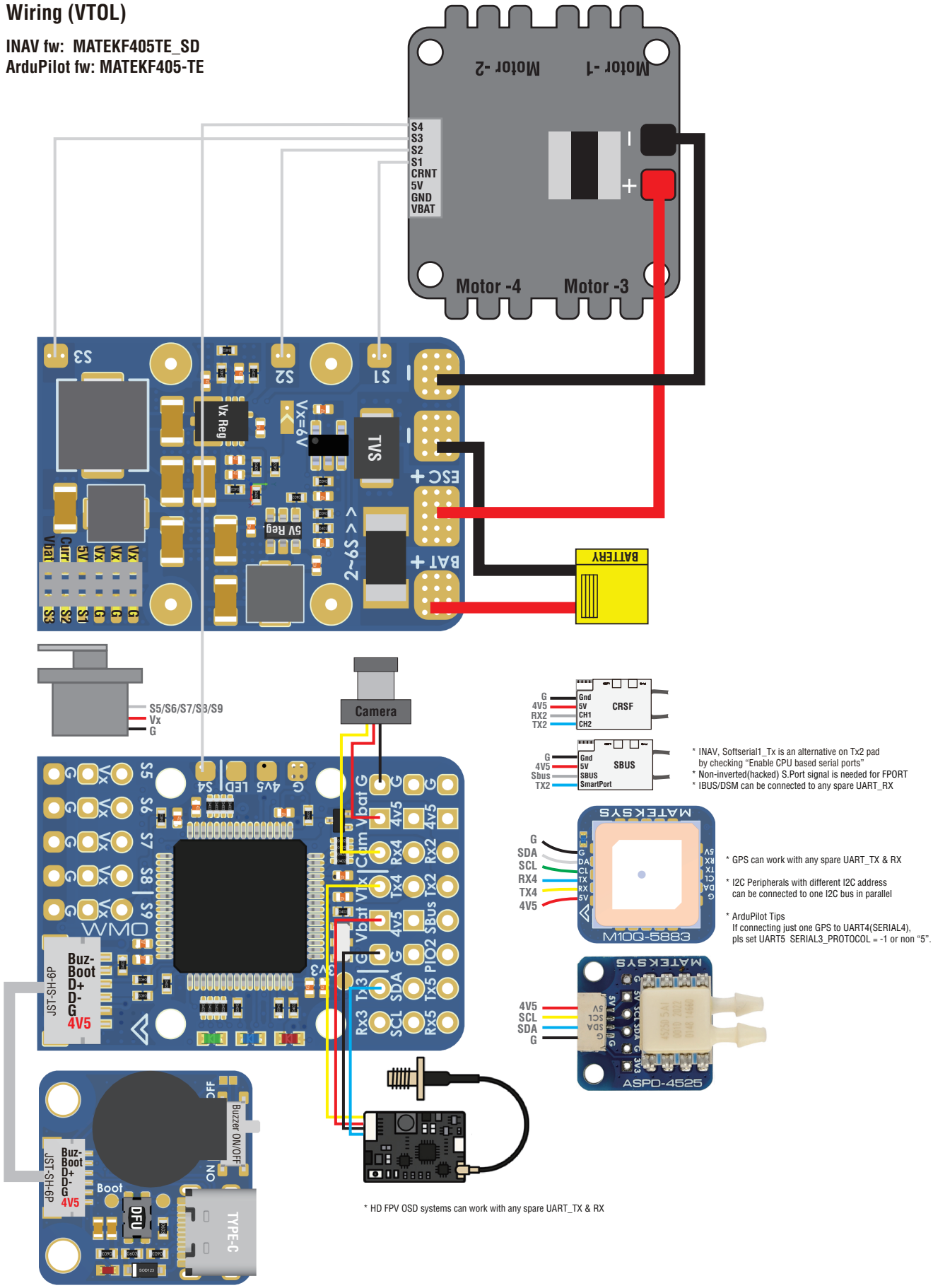
* I2C Peripherals with different I2C address can be connected to one I2C bus in parallel

* ArduPilot Tips
If connecting just one GPS to UART4(SERIAL4), pls set UART5 SERIAL3_PROTOCOL = -1 or non "5".

* HD FPV OSD systems can work with any spare UART_TX & RX

Wiring (VTOL)

INAV fw: MATEKF405TE_SD
ArduPilot fw: MATEKF405-TE



Mapping

INAV fw: MATEKF405TE_SD
ArduPilot fw: MATEKF405-TE

ArduPilot					
PWM 5V tolerant I/O	S1	PWM1 GPIO50	TIM8_CH4	DMA/DShot	Group1
	S2	PWM2 GPIO51	TIM8_CH3	DMA/DShot	
	S3	PWM3 GPIO52	TIM1_CH3N	DMA/DShot	Group2
	S4	PWM4 GPIO53	TIM1_CH1	DMA/DShot	
	S5	PWM5 GPIO54	TIM2_CH4	DMA/DShot	Gourp3
	S6	PWM6 GPIO55	TIM2_CH3	DMA/DShot	
	S7	PWM7 GPIO56	TIM2_CH2	DMA/DShot	
	S8	PWM8 GPIO57	TIM2_CH1	DMA/DShot	
	S9	PWM9 GPIO58	TIM12_CH1	NO DMA	Gourp4
	LED pad	PWM12 GPIO61	TIM3_CH4	DMA/DShot	Gourp5
		SERVO12_FUNCTION 120, NTF_LED_TYPES neopixel			
Mixing Dshot and normal PWM operation for outputs is restricted into groups, ie. enabling Dshot for an output in a group requires that ALL outputs in that group be configured and used as Dshot, rather than PWM outputs. If servo and motor are mixed in same group, make sure this group run lowest PWM frequency according to the servo specification. ie. Servo supports Max. 50Hz, ESC must run at 50Hz in this group.					

ADC	Vbat sensor	0~30V	1K:20K divider builtin	BATT_VOLT_PIN BATT_VOLT_MULT	14 21.0
	Current sensor	0~3.3V	onboard current sense	BATT_CURR_PIN BATT_AMP_PERVLT	15 40

I2C	I2C1	5V tolerant I/O	Compass	COMPASS_AUTODEC	1
			onboard Baro SPL06-001	Address	0x76
			Digital Airspeed I2C MS4525 DLVR-L10D	ARSPD_BUS ARSPD_TYPE ARSPD_TYPE	1 1 9

UART 5V tolerant I/O	USB	USB		console	SERIAL0
	TX3 RX3	USART3	NO DMA	telem2	SERIAL2
	TX5 RX5	UART5	NO DMA	GPS1	SERIAL3
	TX4 RX4	UART4	NO DMA	GPS2	SERIAL4
	TX2 RX2 SBUS	USART2	with DMA	RC input/Receiver	SERIAL6
		RX2	IBUS/DSM/PPM	BRD_ALT_CONFIG 0 Default	
		Sbus pad	SBUS		
		TX2 & RX2	CRSF	BRD_ALT_CONFIG 1 SERIAL6_PROTOCOL 23	SERIAL6_OPTIONS 0
		TX2	uninverted FPort (hacked)		SERIAL6_OPTIONS 4
		TX2	SRXL2		SERIAL6_OPTIONS 4

*** If connecting just one GPS to UART4(TX4/RX4), pls set SERIAL3_PROTOCOL = -1 or non “5”. otherwise ArduPilot will stop searching for GPS during bootup if not found on the first port(SERIAL3/UART5) configured for GPS protocol.
*** set LOG_BACKEND_TYPE = 1 (File) for SD logging

INAV					
PWM	S1	5 V tolerant I/O	TIM8_CH4	TIM8	Motor
	S2	5 V tolerant I/O	TIM8_CH3		
	S3	5 V tolerant I/O	TIM1_CH3N	TIM1	
	S4	5 V tolerant I/O	TIM1_CH1		
	S5	5 V tolerant I/O	TIM2_CH4	TIM2	Servo
	S6	5 V tolerant I/O	TIM2_CH3		
	S7	5 V tolerant I/O	TIM2_CH2		
	S8	5 V tolerant I/O	TIM2_CH1		
	S9	5 V tolerant I/O	TIM12_CH1	TIM12	
	LED	5 V tolerant I/O	TIM3_CH4	TIM3	2812LED

ADC	Vbat voltage	5.4~30V	ADC_CHANNEL_1	voltage scale 2100
	Current	0~3.3V	ADC_CHANNEL_2	current scale 250

I2C	SCL SDA	5V tolerant I/O	onboard Barometer SPL06-001, 0x76	
			Compass/Digital Airspeed sensor/Temperature sensor/OLED	

UART	USB	5V tolerant I/O	USB		
	TX3 RX3		UART3	USER	
	TX4 RX4		UART4	USER	
	TX5 RX5		UART5	USER	
	TX2 RX2		TX2 & RX2	CRSF	
			SBus pad	for SBUS receiver, SBus pad = RX2+inverter	
			RX2 pad	IBUS/DSM	
			TX2 pad	SRXL2	
			TX2 pad	FPORT, uninverted S.Port/F.Port signal (hacked)	
			TX2 pad	SmartPort Telemetry	enable Softserial_Tx1