B2BConnector

File: B2BConnector.kicad_sch

GNSS Mosaic H

File: mosaic-h.kicad_sch

DONINGTON CARRIER BOARD

IMPORTANT: FOR USE WITH EchoPilot AI REV 1B OR NEWER

MainPower

File: MainPower.kicad_sch

GNSS Mosaic X5

File: mosaic-x5.kicad_sch

Connectors

File: Connectors.kicad_sch

M.2

File: M2.kicad_sch

External INS

File: vectornav.kicad_sch

USB3

File: USB3.kicad_sch

J1 Conn_01x01

J2 Conn_01x01

J3 Conn_01x01

J4 Conn_01x01

GND

GND

GND

GND

FID1 Fiducial

FID2 Fiducial

FID3 Fiducial

FID4 Fiducial

FID5 Fiducial

FID6 Fiducial

Checked: C. Shell

Design: B. Stinson

EchoMAV, LLC

Sheet: /

File: pixc4-jetson-universal-carrier.kicad_sch

Title: Donington Carrier

Size: B	Date: 2024-03-27	**Rev: 0**
KiCad E.D.A. kicad 7.0.10		Id: 1/9

TP1
TestPoint
GND

STATUS LEDS
+5V
+5V_FMU
+5V_PROT
+5V_PROT_INS
+3.3V
D3 LED_G
D4 LED_G
D5 LED_G
D6 LED_G
D7 LED_G
R17 1.0K
R18 1.0K
R19 1.0K
R20 1.0K
R21 1.0K
GND

PLANE STITCHING CAPS
+5V
+5V_FMU
C34 0.1uF
C36 0.1uF
C37 0.1uF
C38 0.1uF
C40 0.1uF
C41 0.1uF
C42 0.1uF
C43 0.1uF
+1V1
+3.3V

MAIN SYSTEM 5.1V, 5A
+BATT
C2 2.2uF 100V
C6 2.2uF 100V
C8 2.2uF 100V
GND
U3
TPS54561QDPRRQ1
VIN
EN
RT/CLK
SS/TR
COMP
PWRGD
BOOT
SW
FB
EXP
GND
243K R6
C11 10nF
C17 0.1uF
L4 ASPIAIG-F1040-7R3M-T
D2 PDS760-13
R4 16.9K
C13 4.7nF
C15 47pF
R12 54.9K
R13 10.2K

SUB with SRP1038A-8R2M if L1,L2 not available

Jetson Power
+5V
C22 47uF 10V
C24 47uF 10V
C26 47uF 10V

+BATT
R14 162K
10K R16
C29 47uF 10V
MAX 3.3V at 57V IN
BATT_VOLTAGE_SENS_PROT

POWER IN
J5
1053131304
MOLEX NANO-FIT
PWR_IN
D8 TVS
R24 750m
C32 10uF 100V

REVERSE POLARITY PROTECTION
SQJ463EP-T1_GE3
Q1
+BATT
D_Zener
D10 12V
R27 10K

FMU SYSTEM 5.4V, 5A
+BATT
C1 2.2uF 100V
C4 2.2uF 100V
C7 2.2uF 100V
GND
U2
TPS54561QDPRRQ1
VIN
EN
RT/CLK
SS/TR
COMP
PWRGD
BOOT
SW
FB
EXP
GND
243K R5
C10 10nF
C16 0.1uF
L3 ASPIAIG-F1040-7R3M-T
D1 PDS760-13
R3 16.9K
C12 4.7nF
C14 47pF
R10 57.6K
R11 10.2K

FMU Power
+5V_FMU
C21 47uF 10V
C23 47uF 10V
C25 47uF 10V

+5V
U5
TPS2561
IN
EN1
EN2
OUT1
OUT2
FAULT1
FAULT2
ILM
PAD
GND
0.1uF C30
+5V_PROT_INS
C39 47uF 10V
C35 47uF 10V
R26 37.4K 1%
1.5A LIMIT
CURRENT LIMITED 5V OUT
USED FOR SPARE AND IRIDIUM
J6
Conn_01x02
CURRENT LIMITED 5V OUT
USED FOR INS

USB HUB POWER
+5V
U1
LTC3622IDE-2-PBF
VIN1
VIN2
RUN1
RUN2
SW1
FB1
INTVCC
MODE/SYNC
PHASE
ILIM
SW2
FB2
GND
PGOOD1
PGOOD2
C9 10uF
PGOOD2
INTVCC
C18 1.0uF
+3.3V
L1 1.2uH
C3 22uF
C5 22pF
R1 619K
R2 137K
L2 1.2uH
R8 619K
R9 732K
C19 22pF
C20 22uF
+1V1
R7 10K

GNSS SUPPLY
+5V_FMU
C28 4.7uF
U4
MAX20074
PV
EN
PGND
AV
GND
LX
OUT
SYNC
SSEN
RESET
EP
L5 1uH
+3.3V_GNSS
R22 56.2K
C31 10pF
C33 22uF
D9 LED_G
R23 10K
R25 787
R15 10
C27 1.0uF

3.3V AND 1.1V POWER
RUN/PGOOD LOGIC ENSURES 1.1V SUPPLY IS STABLE FIRST, AS REQUIRED BY USB HUB

Checked: C. Shell
Design: B. Stinson
EchoMAV, LLC
Sheet: /MainPower/
File: MainPower.kicad_sch

Title: Donington Carrier

Size: B	Date: 2024-03-27	**Rev: 0**
KiCad E.D.A. kicad 7.0.10		Id: 2/9

ETHERNET MAGNETICS

U6
HX0068ANLT

ETH_RADIO_RX_P
ETH_RADIO_RX_N
ETH_RADIO_TX_P
ETH_RADIO_TX_N
RD+ RD− TD+ TD− RDCT TDCT
RX+ RX− TX+ TX− RXCT TXCT
ETH_RADIO_RX_POSTMAG_P
ETH_RADIO_RX_POSTMAG_N
ETH_RADIO_TX_POSTMAG_P
ETH_RADIO_TX_POSTMAG_N
R28 75
C44 0.1uF
C48 0.1uF
C58 1000pF
GND

U7
HX0068ANLT

ETH_SPARE_RX_P
ETH_SPARE_RX_N
ETH_SPARE_TX_P
ETH_SPARE_TX_N
RD+ RD− TD+ TD− RDCT TDCT
RX+ RX− TX+ TX− RXCT TXCT
ETH_SPARE_RX_POSTMAG_P
ETH_SPARE_RX_POSTMAG_N
ETH_SPARE_TX_POSTMAG_P
ETH_SPARE_TX_POSTMAG_N
R29 75
C46 0.1uF
C49 0.1uF
C59 1000pF
GND

TO PANEL2 (SHORT – HIGH SPEED)
USB3, ETHERNET AND STATUS LEDS

J7
20879-040E-01

ETH_SPARE_RX_POSTMAG_P
ETH_SPARE_RX_POSTMAG_N
ETH_SPARE_TX_POSTMAG_P
ETH_SPARE_TX_POSTMAG_N
ETH_RADIO_RX_POSTMAG_P
ETH_RADIO_RX_POSTMAG_N
ETH_RADIO_TX_POSTMAG_P
ETH_RADIO_TX_POSTMAG_N

VBUS_EXT1
1A LIMIT
FB2 FerriteBead
C47 150uF
C51 0.1uF
C57 0.1uF
USB_EXT1_D−
USB_EXT1_D+
USB_EXT1_SSRX−
USB_EXT1_SSRX+
USB_EXT1_SSTX−
C54 0.1uF
USB_EXT1_SSTX_CAP−
USB_EXT1_SSTX_CAP+
USB_EXT1_SSTX+
C55 0.1uF

VBUS_EXT2
1A LIMIT
FB1 FerriteBead
C45 150uF
C50 0.1uF
C56 0.1uF
USB_EXT2_D−
USB_EXT2_D+
USB_EXT2_SSRX−
USB_EXT2_SSRX+
USB_EXT2_SSTX_CAP−
USB_EXT2_SSTX_CAP+
USB_EXT2_SSTX−
C52 0.1uF
USB_EXT2_SSTX+
C53 0.1uF

SH
FUTURE EXPANSION
GND

SPARE CONNECTIONS

MAX 2A DUE TO TRACE WIDTH AND RP DIODE ONLY REVERSE POLARITY PROTECTED!!

+BATT
B260S1F-7
D11
J8
Conn_01x04
SPARE BATTERY POWER OUT
GND

SPARE USB 2.0

J12
Conn_01x04
PORT_VBUS_2
USB2−
USB2+
GND

+VDD_5V_PERIPH
CAN_2+
CAN_2−
J14
Conn_01x04
FMU CAN2
GND

+VDD_5V_PERIPH
FMU_I2C_2_SCL
FMU_I2C_2_SDA
J13
Conn_01x04
FMU I2C_2
GND

ADC INPUT PROTECTION/BUFFER

MAX 3.3V at 15V IN

ADC_IN1
D12
R30 36K
C61 10uF
10K R34
U9A
MCP6002-xMC
ADC_IN1_PROT

ADC_IN2
D13
R31 36K
C62 10uF
10K R35
U9B
MCP6002-xMC
ADC_IN2_PROT

ADC_IN3
D14
R32 36K
C63 10uF
10K R36
U8A
MCP6002-xMC
ADC_IN3_PROT

ADC_IN4
D15
R33 36K
C64 10uF
10K R37
U8B
MCP6002-xMC
ADC_IN4_PROT

+3.3V
0.1uF C66
U9C
MCP6002-xMC
0.1uF C65
U8C
MCP6002-xMC
GND

MOSAIC H5 DUAL ANTENNAS

ANT_H_1
50 OHM
L6 744778139A 39nH @ 100MHz 1400MHz
C60 0.1uF 10V
L7 744778139A 39nH @ 100MHz 1400MHz
J11
CONMHF4-SMD-G-T

ANT_H_2
50 OHM
D16
SESD0402X1BN-0010-098
J10
CONMHF4-SMD-G-T

MOSAIC X5 SINGLE ANTENNA
NOTE: ANT1 IS DC-BIASED AND ESD-PORTECTED
ANT2 IS AC-COUPLED AND UNPROTECTED.

ANT_X5_1
50 OHM
J9
CONMHF4-SMD-G-T
GND

TO PANEL1 (LONG – LOW SPEED)

USE CABLE, E.G. 0151200647

J15
0512966094

FMU-CH4-PROT
FMU-CH3-PROT
FMU-CH2-PROT
FMU-CH1-PROT
IO-CH1-PROT
IO-CH2-PROT
IO-CH3-PROT
IO-CH4-PROT
IO-CH5-PROT
IO-CH6-PROT
+12V_PROT_INS
RS422_RX+
RS422_RX−
RS422_TX−
RS422_TX+
+12V_PROT_NMEA2K
JETSON_CAN+
JETSON_CAN−
JETSON CAN1, FOR NMEA2K
+VDD_5V_PERIPH
CAN_1+
CAN_1−
+5V_PROT
FMU CAN
IRID_RX_OUT_3.3
IRID_TX_IN_3.3
IRID_NA_3.3
IRID_RING_3.3
IRID_ON_OFF_3.3
SPARE_GPIO_3.3
nMOD_SLEEP
SLEEP/WAKE
ADC_IN1
ADC_IN2
ADC_IN3
ADC_IN4
FMU_I2C_1_SDA
FMU_I2C_1_SCL
SW1 CFS-0102TB
+VDD_5V_PERIPH
TO LED PWR INDICATOR
FMU I2C1 in this case will drive a RGB LED on the panel board
FUTURE EXPANSION
GND

+12V BOOST REGULATOR FOR NMEA2K

L8 6.8uH
U10
ADP1614ACPZ-2.3-R7
VIN EN CLRES/FREQ SS
SW SW FB COMP
GND GND EPAD
+5V_FMU
C67 47uF 10V
CURRENT LIMIT ~2A
R38 107K
C68 68nF
PDS760-13
D17
+12V_PROT_NMEA2K
R40 165K
R41 19.1K
C71 22uF
R39 3.16K
C69 10pF
C70 39nF
GND

Checked: C. Shell
Design: B. Stinson
EchoMAV, LLC
Sheet: /Connectors/
File: Connectors.kicad_sch

Title: Donington Carrier

Size: B	Date: 2024-03-27	**Rev: 0**
KiCad E.D.A. kicad 7.0.10		Id: 3/9

JETSON

FMU

OPTIONAL SPI EXTERNAL SENSOR

EXT GPS/COMPASS

RC IN

FMU POWER

ADD MAGNETICS TO CARRIER BOARD

J16A
FX23L-80P-0.5SV10

1	1	JETSON_CAN+
2	2	JETSON_CAN-
3	3	GND
4	4	CAM0_SDA0
5	5	CAM0_SCL0
6	6	CAM0_MCLK
7	7	CAM0_GPIO
8	8	GND
9	9	CAM0_D1_P
10	10	CAM0_D1_N
11	11	GND
12	12	CAM0_C_P
13	13	CAM0_C_N
14	14	GND
15	15	CAM0_D0_P
16	16	CAM0_D0_N
17	17	GND
18	18	CAM1_SDA0
19	19	CAM1_SCL0
20	20	CAM1_MCLK
21	21	CAM1_GPIO
22	22	GND
23	23	CAM1_D1_P
24	24	CAM1_D1_N
25	25	GND
26	26	CAM1_C_P
27	27	CAM1_C_N
28	28	GND
29	29	CAM1_D0_P
30	30	CAM1_D0_N
31	31	GND
32	32	CAM0_D2_P
33	33	CAM0_D2_N
34	34	GND
35	35	CAM0_D3_P
36	36	CAM0_D3_N
37	37	I2S0_DIN
38	38	nMOD_SLEEP
39	39	SLEEP/WAKE
40	40	I2S0_FS

J16B
FX23L-80P-0.5SV10

41	41	ETH_SPARE_TX_N
42	42	ETH_SPARE_TX_P
43	43	ETH_SPARE_RX_N
44	44	ETH_SPARE_RX_P
45	45	GND
46	46	ETH_RADIO_RX_P
47	47	ETH_RADIO_RX_N
48	48	ETH_RADIO_TX_P
49	49	ETH_RADIO_TX_N
50	50	GND
51	51	USBSS_RX_P
52	52	USBSS_RX_N
53	53	GND
54	54	USBSS_TX_P
55	55	USBSS_TX_N
56	56	GND
57	57	PORT_VBUS_JETSON
58	58	JETSON_USB1_D_P
59	59	JETSON_USB1_D_N
60	60	GND
61	61	PORT_VBUS_4
62	62	USB4+
63	63	USB4-
64	64	GND
65	65	PORT_VBUS_3
66	66	USB3+
67	67	USB3-
68	68	GND
69	69	PORT_VBUS_2
70	70	USB2+
71	71	USB2-
72	72	GND
73	73	IRID_RING_3.3
74	74	IRID_RX_OUT_3.3
75	75	IRID_TX_IN_3.3
76	76	I2S0_SCLK
77	77	XAVIER_I2C1_SDA
78	78	XAVIER_I2C1_SCL
79	79	GPIO02
80	80	3V3_SYS

USED AS AN INDICATION JETSON IS UP

J16C
FX23L-80P-0.5SV10

P1	81	+5V
P2	82	
P3	83	
P4	84	GND
MNT_1	85	
MNT_2	86	GND

J17A
FX23L-80P-0.5SV10

1	1	FMU-CH6-PROT
2	2	FMU-CH5-PROT
3	3	FMU-CH4-PROT
4	4	FMU-CH3-PROT
5	5	FMU-CH2-PROT
6	6	FMU-CH1-PROT
7	7	IO-CH1-PROT
8	8	IO-CH2-PROT
9	9	IO-CH3-PROT
10	10	IO-CH4-PROT
11	11	IO-CH5-PROT
12	12	IO-CH6-PROT
13	13	IO-CH7-PROT
14	14	IO-CH8-PROT
15	15	+VDD_5V_PERIPH
16	16	GND
17	17	
18	18	FMU_I2C_2_SCL
19	19	FMU_I2C_2_SDA
20	20	GND
21	21	
22	22	CAN_2+
23	23	CAN_2-
24	24	GND
25	25	
26	26	CAN_1+
27	27	CAN_1-
28	28	GND
29	29	
30	30	TELEM1_RTS
31	31	TELEM1_CTS
32	32	TELEM1_RX
33	33	TELEM1_TX
34	34	GND
35	35	ADC_IN1_PROT
36	36	BATT_VOLTAGE_SENS_PROT
37	37	+VDD_SERVO
38	38	GND
39	39	GND
40	40	

ONLY USED TO SENSE VSERVO VOLTAGE

J17B
FX23L-80P-0.5SV10

41	41	+VDD_5V_PERIPH
42	42	SPI5_SCK_EXTERNAL1
43	43	SPI5_MISO_EXTERNAL1
44	44	SPI5_MOSI_EXTERNAL1
45	45	SPI5_CS1_EXTERNAL1
46	46	SPI5_CS2_EXTERNAL1
47	47	GND
48	48	
49	49	GPS1_TX
50	50	GPS1_RX
51	51	FMU_I2C_1_SCL
52	52	FMU_I2C_1_SDA
53	53	GND
54	54	SAFETY_SWITCH_IN
55	55	SAFETY_SWITCH_LED_OUT
56	56	SAFETY_VDD
57	57	BUZZER_1
58	58	GND
59	59	+VDD_5V_RADIO
60	60	RC_INPUT
61	61	GND +5V_FMU
62	62	
63	63	
64	64	
65	65	
66	66	
67	67	
68	68	
69	69	GND
70	70	VDD_POWERA_VALID
71	71	VDD_POWERB_VALID
72	72	S.BUS_OUT
73	73	UART4_TX
74	74	UART4_RX
75	75	GND
76	76	ADC_IN3_PROT
77	77	ADC_IN2_PROT
78	78	ADC_IN4_PROT
79	79	
80	80	

NO B POWER SOURCE ON THIS BOARD, THE FMU WILL PULL THIS UP

J17C
FX23L-80P-0.5SV10

P1	81	+5V
P2	82	
P3	83	
P4	84	GND
MNT_1	85	
MNT_2	86	GND

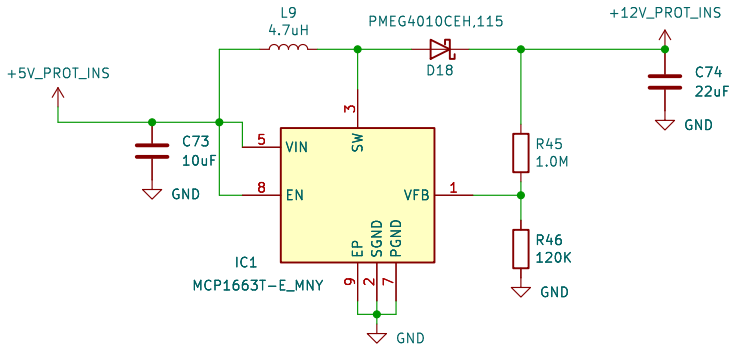
+5V_FMU
R43
220
VDD_POWERA_VALID
Q2
Q_NMOS_GSD
R42
10K
GND

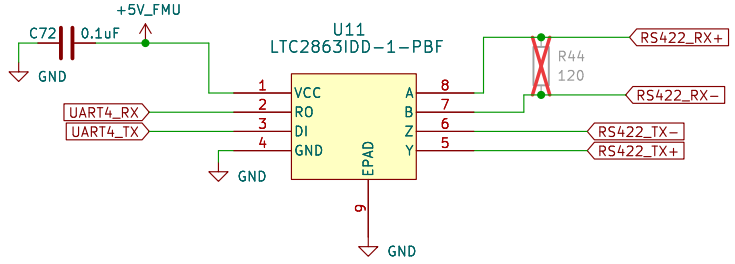
Checked: C. Shell
Design: B. Stinson
EchoMAV, LLC
Sheet: /B2BConnector/
File: B2BConnector.kicad_sch

Title: Donington Carrier

Size: B	Date: 2024-03-27	**Rev: 0**
KiCad E.D.A. kicad 7.0.10		Id: 4/9

UART4 TARGETING EXTERNAL INS SYSTEMS SUCH AS VECTORNAV VN-X10.
CUSTOM CABLE SOLUTIONS WILL BE REQUIRED

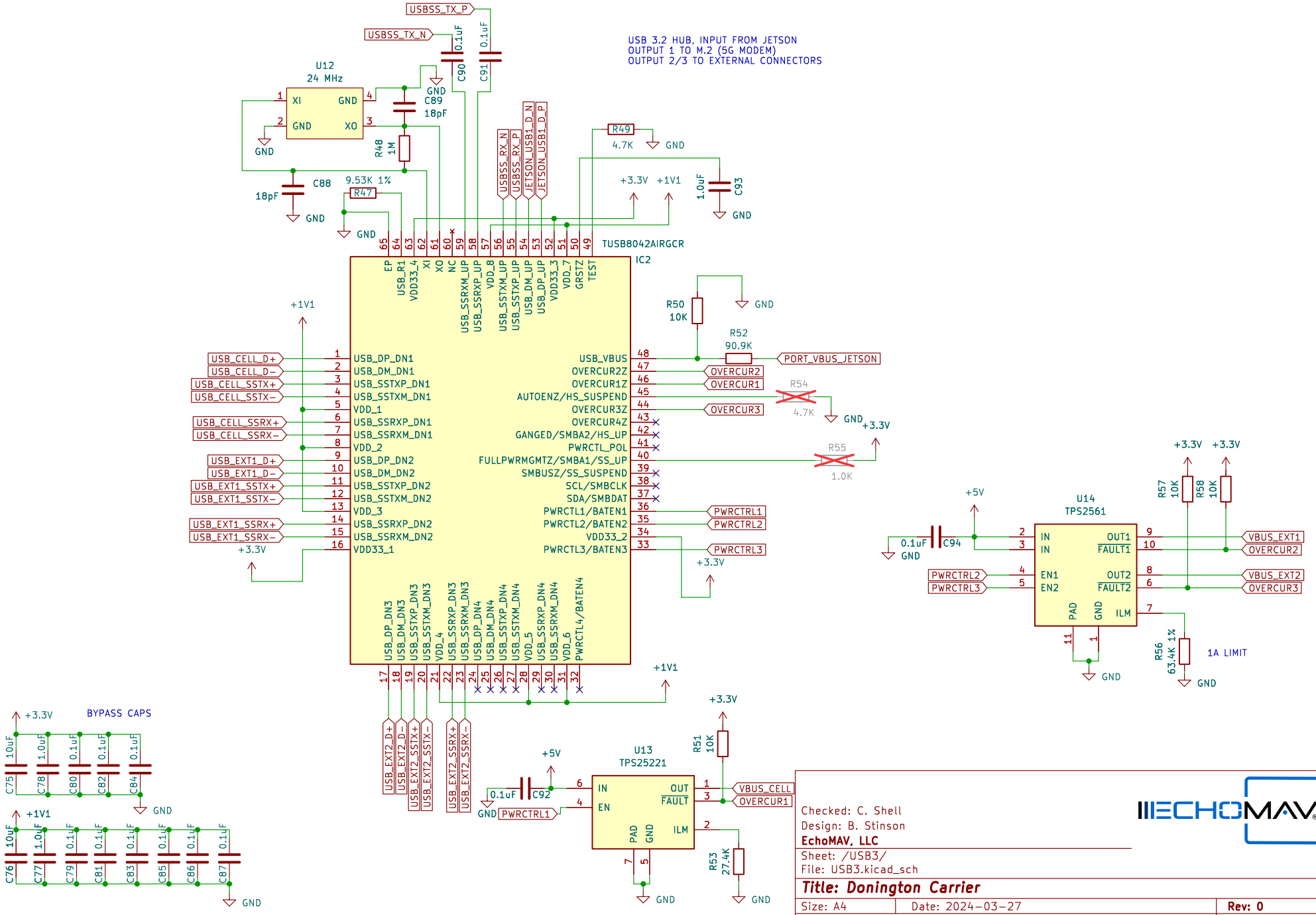


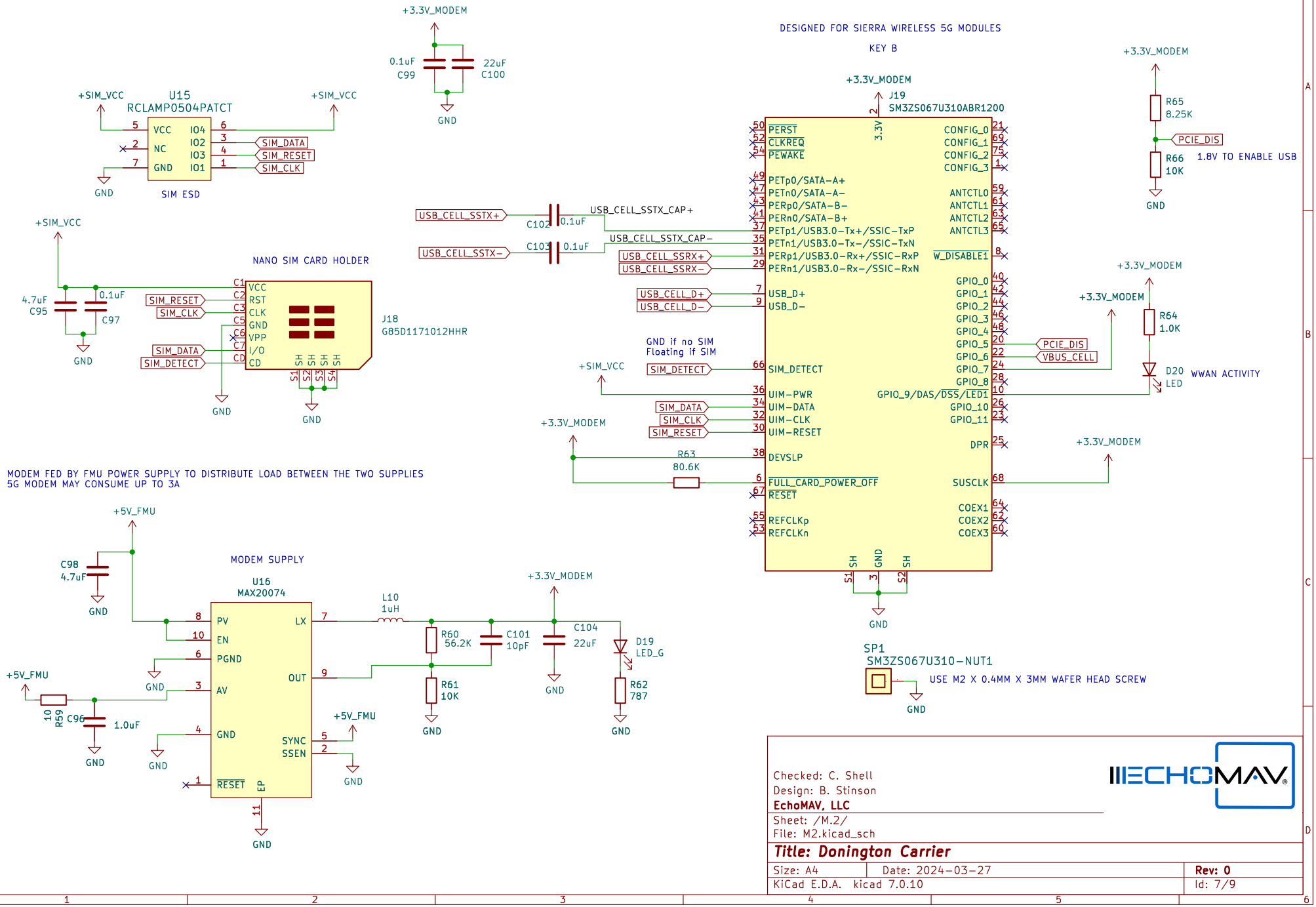


Checked: C. Shell
Design: B. Stinson
EchoMAV, LLC
Sheet: /External INS/
File: vectornav.kicad_sch

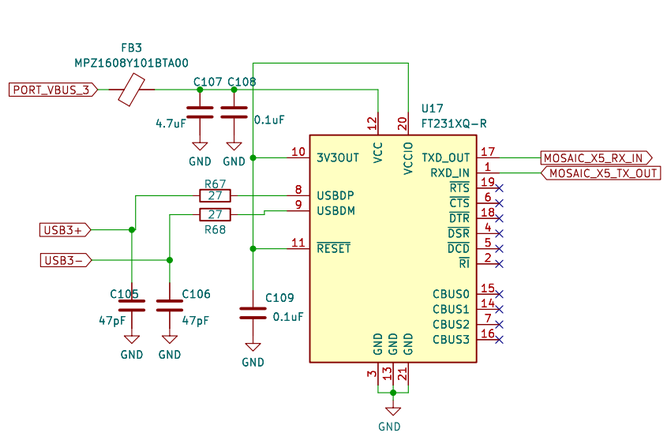
Title: Donington Carrier

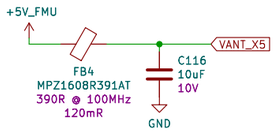
Size: A4	Date: 2024-03-27	**Rev: 0**
KiCad E.D.A. kicad 7.0.10		Id: 5/9

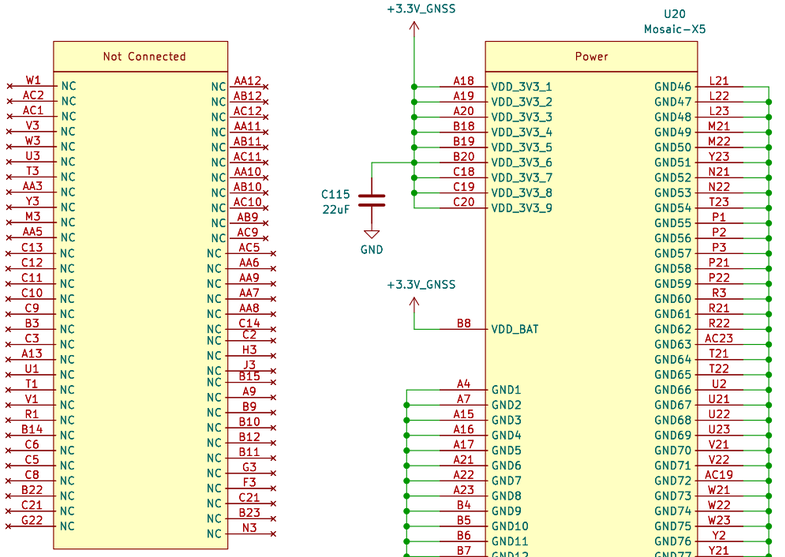

USB 3.2 HUB, INPUT FROM JETSON
OUTPUT 1 TO M.2 (5G MODEM)
OUTPUT 2/3 TO EXTERNAL CONNECTORS
U12
24 MHz
TUSB8042AIRGCR
IC2
U13
TPS25221
U14
TPS2561
BYPASS CAPS
1A LIMIT
Checked: C. Shell
Design: B. Stinson
EchoMAV, LLC
Sheet: /USB3/
File: USB3.kicad_sch
Title: Donington Carrier
Size: A4
Date: 2024-03-27
Rev: 0
KiCad E.D.A. kicad 7.0.10
Id: 6/9

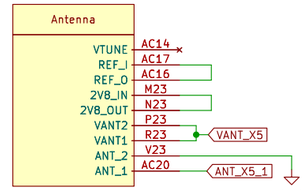


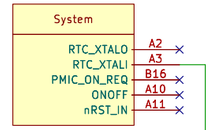
Checked: C. Shell	
Design: B. Stinson	
EchoMAV, LLC	
Sheet: /M.2/	
File: M2.kicad_sch	
Title: Donington Carrier	
Size: A4	Date: 2024-03-27
KiCad E.D.A. kicad 7.0.10	**Rev: 0**
	Id: 7/9

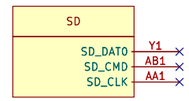


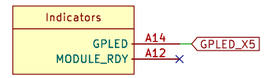


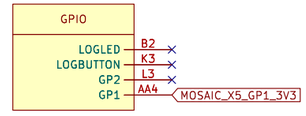


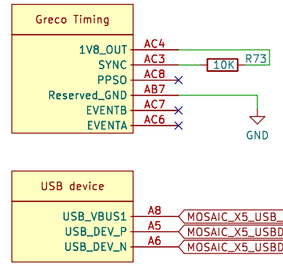


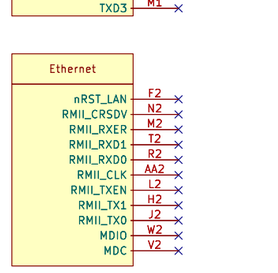


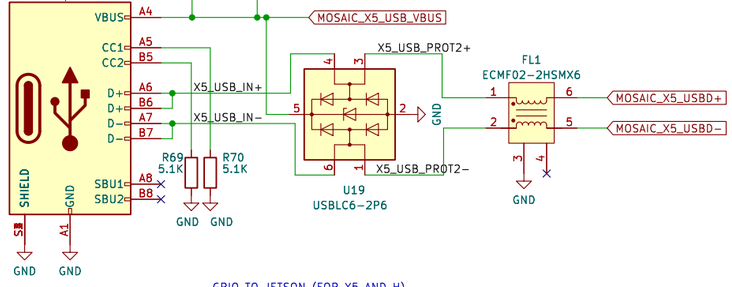


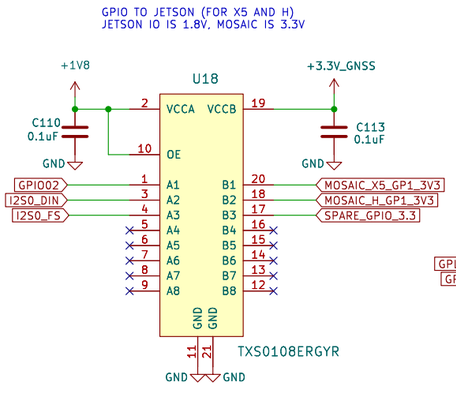


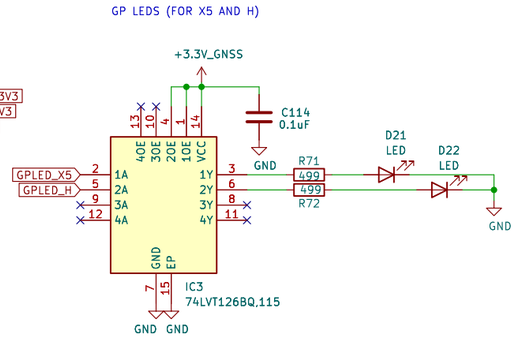












Checked: C. Shell
Design: B. Stinson
EchoMAV, LLC
Sheet: /GNSS Mosaic X5/
File: mosaic-x5.kicad_sch

Title: Donington Carrier

Size: B	Date: 2024-03-27	**Rev: 0**
KiCad E.D.A. kicad 7.0.10		Id: 8/9

MOSAIC H

FB5
MPZ1608Y101BTA00
PORT_VBUS_4
C119 4.7uF
C120 0.1uF
U21
FT231XQ-R
3V3OUT
VCC
VCCIO
USBDP
USBDM
RESET
TXD_OUT
RXD_IN
RTS
CTS
DTR
DSR
DCD
RI
CBUS0
CBUS1
CBUS2
CBUS3
GND
R74 27
R75 27
USB4+
USB4-
C117 47pF
C118 47pF
C121 0.1uF
MOSAIC_H_RX_IN
MOSAIC_H_TX_OUT

+5V_FMU
FB6
MPZ1608R391AT
390R @ 100MHz
120mR
C125
10uF
10V
VANT_H

MOSAIC H USB CONFIG
J21
USB_C_Receptacle_USB2.0
C122 47uF
C123 0.1uF
MOSAIC_H_USB_VBUS
H_USB_IN+
H_USB_IN-
R76 5.1K
R77 5.1K
U22
USBLC6-2P6
H_USB_PROT2+
H_USB_PROT2-
FL2
ECMF02-2HSMX6
MOSAIC_H_USBD+
MOSAIC_H_USBD-

Not Connected

U23
Mosaic-H
Power
+3.3V_GNSS
C124 22uF
VDD_BAT

Antenna
VTUNE
REF_I
REF_O
2V8_IN
2V8_OUT
VANT2
VANT1
ANT_2
ANT_1
VANT_H
ANT_H_2
ANT_H_1

System
RTC_XTALO
RTC_XTALI
PMIC_ON_REQ
ONOFF
nRST_IN

SD
SD_DAT0
SD_CMD
SD_CLK

Indicators
GPLED
MODULE_RDY
GPLED_H

GPIO
LOGLED
LOGBUTTON
GP2
GP1
MOSAIC_H_GP1_3V3

Greco Timing
1V8_OUT
SYNC
PPSO
Reserved_GND
EVENTB
EVENTA
+1V8
R78 10K

USB device
USB_VBUS1
USB_DEV_P
USB_DEV_N
MOSAIC_H_USB_VBUS
MOSAIC_H_USBD+
MOSAIC_H_USBD-

Com
RXD4
TXD4
RTS1
CTS1
RXD1
TXD1
RTS2
CTS2
RXD2
TXD2
RTS3
CTS3
RXD3
TXD3
FMU TELEM1 (USART2) TO H
TELEM1_TX
TELEM1_RX
MOSAIC_H_RX_IN
MOSAIC_H_TX_OUT
TO JETSON VIA FTDI

Ethernet
nRST_LAN
RMII_CRSDV
RMII_RXER
RMII_RXD1
RMII_RXD0
RMII_CLK
RMII_TXEN
RMII_TX1
RMII_TX0
MDIO
MDC

Checked: C. Shell
Design: B. Stinson
EchoMAV, LLC
Sheet: /GNSS Mosaic H/
File: mosaic-h.kicad_sch

Title: Donington Carrier

Size: B	Date: 2024-03-27	**Rev: 0**
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