Sheet: USB_POWER
EN_3V3
EN_3V3_L
EN_3V3
VBUS_MCU — PA9_VBUS
USB_P — USB_D_P
USB_N — USB_D_N
USB_OTG_ID — PA10_USB_ID
USB_OC_L — PC2_OTG_FS_OC
USB_PWR_EN — PH12_OTG_FS_PWRON
VBAT_MEAS — LIPO_BAT_MEAS
File: USB_POWER.sch

Sheet: ESP32
ESP32_CLK — ESP_32_SPI2_CLK
ESP32_MOSI — ESP32_SPI2_MOSI
ESP32_MISO — ESP32_SPI2_MISO
ESP32_CS — ESP32_SPI2_CS
ESP32_RESET_L — ESP32_RESET_L_PF7
ESP32_BOOT_L — ESP32_BOOT_L_PI10
ESP32_TX_UART5_RX — ESP32_TX_UART5_RX
UART5_TX_ESP32_RX — ESP32_RX_UART5_TX

ESP32_MTDI — ESP32_MTDI
ESP32_MTCK — ESP32_MTCK
ESP32_MTMS — ESP32_MTMS
ESP32_MTDO — ESP32_MTDO
File: ESP32.sch

Sheet: STM32F7
PD3_SPI2_SCK
SPI2_MOSI
SPI2_MISO
SPI2_CS
PF7
PI10
PD2_UART5_RX
PC12_UART5_TX
PG3
PE3

V2: UART5 TX --> PC12
PG3: NC
PE3: NC

VBAT — VBAT
VREF — VREF
PA4_DAC_OUT1 — PA4_DAC_OUT1
PA5_DAC_OUT2 — PA5_DAC_OUT2
PA3_ADC1_IN3 — PA3_ADC1_IN3
PA7_ADC1_IN7 — PA7_ADC1_IN7
PC0_ADC1_IN10 — PC0_ADC1_IN10
PC1_ADC1_IN11 — PC1_ADC1_IN11

PC10_SPI3_SCK — PC10_SPI3_SCK
PB5_SPI3_COPI — SPI3_COPI
PC11_SPI3_CIPO — PC11_SPI3_CIPO
PI9_UART4_RX — UART4_RX
PH13_UART4_TX — UART4_TX

PB15_USART1_RX — USART1_RX
PB14_USART1_TX — USART1_TX

PB13 — PB13
PB12 — PB12
PB8_CAN1_RX — CAN1_RX
PB9_CAN1_TX — CAN1_TX
PB7_I2C1_SDA — I2C1_SDA
PB6_I2C1_SCL — I2C1_SCL

PC6_TIM3CH1 — PC6_TIM3CH1
PC7_TIM3CH2 — PC7_TIM3CH2
PB0_ADC1_IN8 — PB0_TIM3CH3
PB1_ADC1_IN9 — PB1_TIM3CH4
PG12 — PG12
PC9_TIM8CH4 — PC9_TIM8CH4

RESET_L — RESET_L
BOOT0 — BOOT0
File: STM32F7.sch

PC3_ADC1_IN13
LIPO_BAT_MEAS

QUAD_SPI.CS_L — QUAD_SPI.CS_L
QUAD_SPI.SCK — QUAD_SPI.SCK
QUAD_SPI.IO[0..3] — QUAD_SPI.IO[0..3]

RAM.A[0..15] — RAM.A[0..15]
RAM.CLK — RAM.CLK
RAM.RAS_L — RAM.RAS_L
RAM.CKE_L — RAM.CKE_L
RAM.CAS_L — RAM.CAS_L
RAM.CS_L — RAM.CS_L
RAM.WE_L — RAM.WE_L
RAM.DQML — RAM.DQML
RAM.DQMH — RAM.DQMH
RAM.DQ[0..15] — RAM.DQ[0..15]

Sheet: memory
QUAD_SPI.CS_L
QUAD_SPI.SCK
QUAD_SPI.IO[0..3]

RAM.A[0..15]
RAM.CLK
RAM.RAS_L
RAM.CKE
RAM.CAS_L
RAM.CS_L
RAM.WE_L
RAM.DQML
RAM.DQMH
RAM.DQ[0..15]
File: Ram_Flash.sch

PA0
PA1
PA2
PA9_VBUS
PA10_USB_ID
USB_D_N
USB_D_P
PA13_SWDIO
PA14_SWCLK
PA15_JTDI_T2C1
PC4
PC5
PC8_TIM8CH1
PG11
PG13
PG14
PH10
PC2_OTG_FS_OC
PH12_OTG_FS_PWRON
PB11_I2C2_SDA
PD5
PB3_SWO_T2C2
PB4
PG9
PG10
PD6
PD7

PA13_SWDIO
PA14_SWCLK
PA15
PC4
PC5
PG11
PG13
PG14
PH10
OTG_FS_OC
OTG_FS_PWRON
I2C2_SDA
PD5
PB3
PB4
PG9
PG10
PD6
PD7

PA13_SWDIO — CAS1
PA14_SWCLK — CAS2
DNI TP4

+3V3
R1
0
RESET_L
VREF

Place near MCU
Remove if using external VREF

J1
MEADOWF7MICRO_WITH_CAST_OUTLINE
Wilderness Labs
Meadow F7 Micro

RESET_L   1
+3V3   2
AREF   3
GND   4
A0   5   PA4_DAC_OUT1
A1   6   PA5_DAC_OUT2
A2   7   PA3_ADC1_IN3
A3   8   PB0_ADC1_IN8
A4   9   PB1_ADC1_IN9
A5   10   PC0_ADC1_IN10
SCK   11   PC10_SPI3_SCK
COPI   12   PB5_SPI3_COPI
CIPO   13   PC11_SPI3_CIPO
D00/COM4_RX 14 PI9_UART4_RX
D01/COM4_TX 15 PH13_UART4_TX
D02   16   PH10
D03/CAN_RX 17 PB8_CAN1_RX
D04/CAN_TX 18 PB9_CAN1_TX

+VBAT   32
EN_+3V3   31   EN_3V3
+5V   30
D15   29   PG12
D14   28   PB12
D13/COM1_RX 27 PB15_USART1_RX
D12/COM1_TX 26 PB14_USART1_TX
D11   25   PC9_TIM8CH4
D10/COM6_RX 24 PC7_TIM3CH2
D09/COM6_TX 23 PC6_TIM3CH1
D08/I2C_SCK 22 PB6_I2C1_SCL
D07/I2C_SDA 21 PB7_I2C1_SDA
D06/COM7_RX 20 PB13
D05/COM7_TX 19 PB4

+VBAT   +5V

V2: D14 and D15 --> PB12 & PB13

V2: Pinout updated fully from V1

V2: Pins Changed to free up enet

V2: PH10 <--> PC6

DNI TP3
ESP32_TX_UART5_RX — CAS3
ESP32_RX_UART5_TX — CAS4
ESP32_RESET_L_PF7 — CAS5
CAS6

CAS12
CAS11
CAS10
CAS9
CAS8
CAS7

ESP32_BOOT_L_PI10
ESP32_MTDO — TP2 DNI
ESP32_MTCK
ESP32_MTDI — TP1 DNI
ESP32_MTMS

GND   GND

H1 MTGP356H254
H2 MTGP356H254
H3 MTGP356H254
H4 MTGP356H254

Enet pins
PA7_ADC1_IN7
PC1_ADC1_IN11

+3V3
D1
LTST-C19HE1WT
RED GREEN BLUE
R2 R3 R4
620 300 300
PA2
PA1
PA0

RESET BUTTON
SW2
SW_434153017835
RESET_L

+3V3   DFU BOOT BUTTON   GND
SW1
SW_434153017835
BOOT0

V2: New Buttons

WILDERNESS LABS

Sheet: /
File: PCA_Meadow_F7_Micro.sch
Designer: S.Johnson
Title: F7 Micro Meadow
Size: B   Date: 2021-04-18   Rev: V2.B
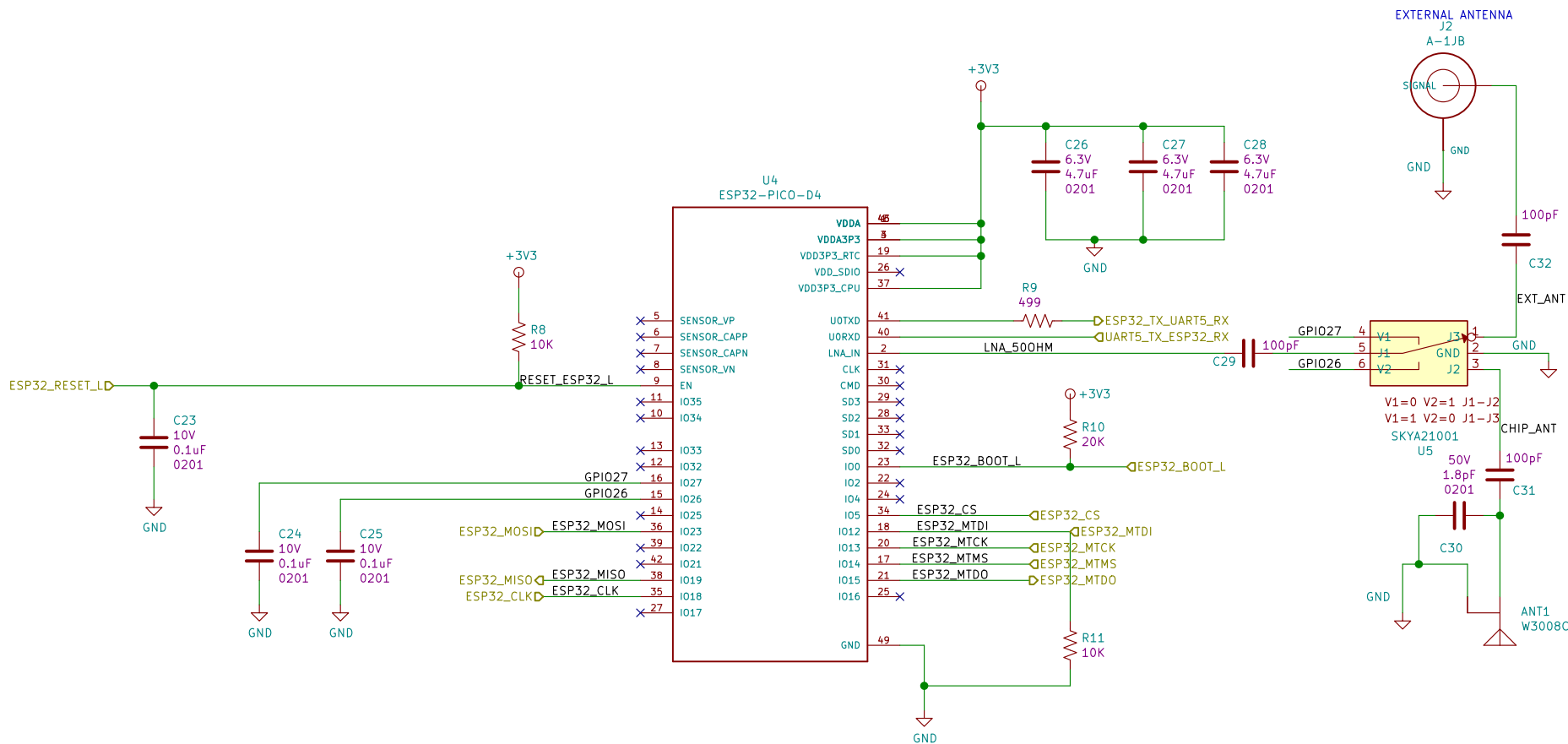KiCad E.D.A. kicad (5.1.8)-1   Id: 1/5

RAM.A[0..15]

RAM.DQ[0..15]

U1
IS42S16160J-7BLI

Pin	Signal		Signal	Pin	Net
H7	A0		DQ0	A8	RAM.DQ0
H8	A1		DQ1	B9	RAM.DQ1
J8	A2		DQ2	B8	RAM.DQ2
J7	A3		DQ3	C9	RAM.DQ3
J3	A4		DQ4	C8	RAM.DQ4
J2	A5		DQ5	D9	RAM.DQ5
H3	A6		DQ6	D8	RAM.DQ6
H2	A7		DQ7	E9	RAM.DQ7
H1	A8		DQ8	E1	RAM.DQ8
G3	A9		DQ9	D2	RAM.DQ9
H9	A10		DQ10	D1	RAM.DQ10
G2	A11		DQ11	C2	RAM.DQ11
G1	A12		DQ12	C1	RAM.DQ12
E2	NC		DQ13	B2	RAM.DQ13
G7	BA0		DQ14	B1	RAM.DQ14
G8	BA1		DQ15	A2	RAM.DQ15

RAM.A0 – RAM.A15

RAM.CLK, RAM.CKE, RAM.CAS_L, RAM.RAS_L, RAM.WE_L, RAM.CS_L

Pin	Signal		Signal	Pin	Net
F2	CLK		DQMH	F1	RAM.DQMH
F3	CKE		DQML	E8	RAM.DQML
F7	CAS_L				
F8	RAS_L				
F9	WE_L				
G9	CS_L				

+3V3

Pin	Signal		Signal	Pin
A9	VDD		VSS	E3
J9	VDD		VSS	J1
E7	VDD		VSS	A1
C7	VDDQ		VSSQ	D7
B3	VDDQ		VSSQ	C3
A7	VDDQ		VSSQ	B7
D3	VDDQ		VSSQ	A3

GND

C1	C2	C3	C4
6.3V	10V	10V	10V
0.47uF	0.1uF	0.1uF	0.1uF
0201	0201	0201	0201

GND

QUAD_SPI.IO[0..3]

U2

QUAD_SPI.IO0, QUAD_SPI.IO1, QUAD_SPI.IO2, QUAD_SPI.IO3

Pin	Signal		Signal	Pin	Net
D3	IO0/SI		VCC	B4	
D2	IO1/SO		SCK	B2	QUAD_SPI.SCK
C4	IO2/WP_L		CS_L	C2	QUAD_SPI.CS_L
D4	IO3/RESET_L		RESET_L	A4	
			VSS	B3	

+3V3

W25Q512JVBIQ

GND

C5
10V
0.1uF
0201

QUAD_SPI.SCK

QUAD_SPI.CS_L

F7 Micro Meadow — STM32F7 Schematic

U3 — STM32F777IIKx

Connect VBAT to 3V3 if you are not using a battery

Left side notes and passives

+3V3

C6	C8	C11	C13	C15	C17
6.3V	6.3V	6.3V	6.3V	6.3V	6.3V
0.47uF	0.47uF	0.47uF	0.47uF	0.47uF	0.47uF
0201	0201	0201	0201	0201	0201

GND

C7	C9	C12	C14
6.3V	6.3V	6.3V	6.3V
0.47uF	0.47uF	0.47uF	0.47uF
0201	0201	0201	0201

GND

VBAT — C18 6.3V 0.47uF 0201 — GND

R5 10K   R7 10K
RESET_LD
BOOT0D

R6 10K

C19 10V 2.2uF 0201
C20 10V 2.2uF 0201 VREFD
C21 6.3V 0.47uF 0201
+VREF

GND

Y1 25MHz
C10 50V 8pF 0201
C16 50V 8pF 0201
GND

Control / config pins

Signal	Pin
PDR_ON	C6
RESET_L / NRST	J1
BYPASS_REG	L4
BOOT0	D6
VCAP_1	M10
VCAP_2	F13
VREF+	P1
VREF-	N1

VBAT

Port I (SPI2 etc.)

Signal	Pin	Port
SPI2_CS	E14	PI0
	D14	PI1
SPI2_MISO	C14	PI2
SPI2_MOSI	C13	PI3
	D4	PI4
	C4	PI5
	C3	PI6
	C2	PI7
UART4_RX	D2	PI8
PI10	D3	PI9
	E3	PI10
	E4	PI11

Port H

Signal	Pin	Port
OSC_IN_PH0	G1	PH0
OSC_OUT_PH1	H1	PH1
SDCKE0 / RAM.CKE	F4	PH2
SDNE0 / RAM.CS_L	G4	PH3
I2C2_SCL	H4	PH4
SDNWE / RAM.WE_L	J4	PH5
	M11	PH6
	N12	PH7
	M12	PH8
	M13	PH9
TIM5_CH1 / PH10	L13	PH10
	L12	PH11
OTG_FS_PWRON	K12	PH12
UART4_TX	E12	PH13
	E13	PH14
	D13	PH15

RAM.A[0..15]

Port G

Signal	Pin	Port
RAM.A10	N7	PG0
RAM.A11	M7	PG1
RAM.A12	L15	PG2
PG3	D14 / K15	PG3
RAM.A14	K14	PG4
RAM.A15	K13	PG5
	J15	PG6
	J14	PG7
RAM.CLK / SDCLK	H14	PG8
SDMMC2_D0 / PG9	C10	PG9
SDMMC2_D1 / PG10	B10	PG10
ETH_TX_EN / PG11	B9	PG11
PG12	B8	PG12
ETH_TXD0 / PG13	A8	PG13
ETH_TXD1 / PG14	A7	PG14
SDNCAS / RAM.CAS_L	B7	PG15

Port F

Signal	Pin	Port
RAM.A0	E2	PF0
RAM.A1	H3	PF1
RAM.A2	H2	PF2
RAM.A3	J2	PF3
RAM.A4	J3	PF4
RAM.A5	K3	PF5
	K2	PF6
PF7	K1	PF7
	L3	PF8
	L2	PF9
	L1	PF10
RAM.RAS_L	R6	PF11
RAM.A6	P6	PF12
RAM.A7	N6	PF13
RAM.A8	R7	PF14
RAM.A9	P7	PF15

Port A (right)

Pin	Signal	Port
N3	BLINKY_B	PA0
N2	BLINKY_G	PA1
P2	BLINKY_R	PA2
R2	ADC1_IN3	PA3_ADC1_IN3
N4	DAC_OUT1	PA4_DAC_OUT1
P4	DAC_OUT2	PA5_DAC_OUT2
P3		PA6
R3	ADC1_IN7	PA7_ADC1_IN7
F15		PA8
E15	USB_OTG_FS_VBUS	PA9
D15	USB_OTG_ID	PA10
C15	USB_OTG_FS_D_N	USB_D_N
B15	USB_OTG_FS_D_P	USB_D_P
A15	SWDIO	PA13_SWDIO
A14	SWCLK	PA14_SWCLK
A13	JTDI	PA15

ETH_REF_CLK
ETH_MDIO
ETH_CRS_DV

Port B (right)

Pin	Signal	Port
R5	PB0_TIM3CH3	PB0_TIM3CH3
R4	PB1_TIM3CH4	PB1_TIM3CH4
M6	QUAD_SPI.SCK	QUAD_SPI.SCK
A10	SDMMC2_D2	PB3
A9	SDMMC2_D3	PB4
A6	SPI3_COPI	SPI3_COPI
B6	I2C1_SCL	I2C1_SCL
B5	I2C1_SDA	I2C1_SDA
A5	CAN1_RX	CAN1_RX
B4	CAN1_TX	CAN1_TX
R12	QUAD_SPI.CS_L	QUAD_SPI.CS_L
R13	I2C_SDA	I2C2_SDA
P12	PB12_I2S_WS	PB12
P13	PB13_I2S_CK	PB13
R14	USART1_TX	USART1_TX
R15	USART1_RX	USART1_RX

Port C (right)

Pin	Signal	Port
M2		PC0_ADC1_IN10
M3	ETH_MDC	PC1_ADC1_IN11
M4		OTG_FS_OC
M5		PC3_ADC1_IN13
N5	ETH_RXD0	PC4
P5	ETH_RXD1	PC5
H15		PC6_TIM3CH1
G15		PC7_TIM3CH2
G14		PC8_TIMBCH1
F14		PC9_TIMBCH4
B14		PC10_SPI3_SCK
B13		PC11_SPI3_CIPO
A12		PC12_UART5_TX
D1		PC13
E1		PC14
F1		PC15

Port D (right)

Pin	Signal	Port
B12	RAM.DQ2	PD0
C12	RAM.DQ3	PD1
D12		PD2_UART5_RX
D11		PD3_SPI2_SCK
D10		PD4
C11		PD5
B11	SDMMC2_CK	PD6
A11	SDMMC2_CMD	PD7
P15	RAM.DQ13	PD8
P14	RAM.DQ14	PD9
N15	RAM.DQ15	PD10
N14	QUAD_SPI.IO0	PD11
N13	QUAD_SPI.IO1	PD12
M15	QUAD_SPI.IO3	PD13
M14	RAM.DQ0	PD14
L14	RAM.DQ1	PD15

Port E (right)

Pin	Signal	Port
A4	FMC_NBL0	RAM.DQML
A3	FMC_NBL1	RAM.DQMH
A2	QUAD_SPI.IO2	PE2
A1	HEADER_D15	PE3
B1		PE4
B2		PE5
B3		PE6
R8	RAM.DQ4	PE7
P8	RAM.DQ5	PE8
P9	RAM.DQ6	PE9
R9	RAM.DQ7	PE10
P10	RAM.DQ8	PE11
R10	RAM.DQ9	PE12
N11	RAM.DQ10	PE13
R11	RAM.DQ11	PE14
R11	RAM.DQ12	PE15

QUAD_SPI.IO[0..3]
RAM.DQ[0..15]

VBAT power pins: C1, C5, C7, F3, G3, G13, J12, J13, K4, N8, N9, N10, R1, C8, H13
VDD, VDDA, VDDSDMMC, VDDUSB

VSS (multiple ground pins along bottom): D5, D7, D8, D9, F2, F6, F7, F9, F12, E12, G2, G6, G7, G8, G9, G10, G11, G12, H6, H7, H8, H9, H10, H11, H12, J6, J7, J8, J9, J10, K6, K7, K8, K9, K10, M8, M9, M1, VSSA

GND

EXTERNAL ANTENNA
J2
A-1JB

U4
ESP32-PICO-D4

Table 1. SKYA21001 Signal Descriptions					
Pin	Name	Description	Pin	Name	Description
1	J3	RF output[1] External Ant	4	V1	DC control voltage GPIO27
2	GND	Ground	5	J1	RF output[1]
3	J2	RF output[1] On Board Antenna	6	V2	DC control voltage GPIO26

[1] A 100 pF blocking capacitor is required for >500 MHz operation. Use larger value capacitors for lower frequency operation.

V1=0 V2=1 J1-J2
V1=1 V2=0 J1-J3

SKYA21001
U5

ANT1
W3008C

CHIP_ANT
EXT_ANT

WILDERNESS LABS

Q2
P-CH_SSM3J46CTB
VBUS_MCU
EN_3V3_L
EN_3V3_L

TP9
PAD_0.6X0.6MM
DNI

+5V

D3

U7
LDL212PV33R
+3V3
VIN   VOUT
EN   SENSE
       GND

EN_3V3

J3
USB_OTG_ZX62-AB-5PA(31)
VBUS
+5V_VBUS
D++
D--
ID
Shield
GND

USB_D_P   R13
USB_D_N   R14   R17
USB_ID

+3V3
USB_P
USB_N
USB_OTG_ID

R19
20K

U8
TPS2065CDBVR-2
OUT   EN/EN
GND   IN
FLT

USB_PWR_EN

R22   R23
10K   10K

EN_3V3_L

Q3
N-CH_RV1C002UNT2CL
100mW

C35
10V
10uF
0402

C36
10V
10uF
0402

C37
10V
0.1uF
0201

TP5
PAD_0.6X0.6MM
DNI

TP10
DNI

PAD_0.6X0.6MM

TP6 TP7 TP8

GND

USB_OC_L

GND

EN_3V3   EN_3V3

GND

GND

V2: Changed USB switch. removes discharge circuit.

R21
10K

GND

J4
S2B-PH-SM4-TB(LF)(SN)
+VBAT
TAB

+VBAT
Q1
P-CH_SSM3J46CTB
+5V

+VBAT

R15
499K
ERJ-1GNF4993C

R18
10K

GND

VBAT_MEAS
VBAT_MEAS

R16
499K
ERJ-1GNF4993C

C22
10V
0.1uF
0201

GND

GND

BATTERY CHARGER

+5V_VBUS

C33
6.3V
4.7uF
0402

R20
1K
ERJ-1GNF1001C

D2
QBLP595-0
ORANGE

U6
VDD   VBAT
       +VBAT
PROG   STAT
VSS

+VBAT

MCP73831T-2A

C34
6.3V
4.7uF
0402

R12
4.7K

CHARGE CURRENT = 200 mA

GND   GND

WILDERNESS LABS

Sheet: /USB_POWER/
File: USB_POWER.sch
Designer: S.Johnson
Title: F7 Micro Meadow
Size: B   Date: 2021-04-18   Rev: V2.B
KiCad E.D.A. kicad (5.1.8)-1   Id: 5/5