PoE_supply

{MDI}

HRESET

File: PoE_supply.kicad_sch

main_power_stage

{I2C}
{SPI}

HRESET
FTDI_MUX_SW

File: main_power_stage.kicad_sch

USBPD_output

{MDI}

{I2C}

{USB}

File: USBPD_output.kicad_sch

FTDI

FTDI_MUX_SW
HRESET

{SPI}
{I2C}
{USB}

File: FTDI.kicad_sch

MP1
MP_Pad5.4mm_Drill2.7mm

R72
0R

GND

MP2
MP_Pad5.4mm_Drill2.7mm

R73
0R

GND

MP3
MP_Pad5.4mm_Drill2.7mm

R74
0R

GND

MP4
MP_Pad5.4mm_Drill2.7mm

R75
0R

GND

ETH + PoE in

J1
5-2337992-8

- P1 — 1 MDI0_P
- P2 — 2 MDI0_N
- P3 — 3 MDI1_P
- P6 — 6 MDI1_N
- P7 — 7 MDI2_P
- P8 — 8 MDI2_N
- P9 — 9 MDI3_P
- P10 — 10 MDI3_N

{MDI} {MDI}

- P4 — 17 LED_YEL+
- P5 — 18 LED_YEL−
- 15 LED_GRN+
- 16 LED_GRN−
- VC1 — 11 VC1
- VC2 — 12 VC2
- VC3 — 13 VC3
- VC4 — 14 VC4
- 19 SHIELD

+3V3
+3V3
R65 270R
R30 270R
YEL_led
GRN_led
R46 200R
C35 100n
GND GND
C37 10n
PoE
GND

ETH LED's and TPS65987DDHRSHR enable

VBUS
R67 150k
YEL_led
Q3 BSS123
R66 100k
GND GND

R77 12k
VDD
GRN_led
+3V3
R79 100k
+3V3
U13 ACPL-217-500E
PoE PoE
Q2 BSS123
PG
Q4 BSS123
HRESET
GNDD GND

PoE negotiation stage

VC1
VC2
VC3
VC4

D1 CD-MMBL110S
D2 CD-MMBL110S

PWR_FLAG
PTVS58VS1UR.115 D3
PWR_FLAG
VSS

C1 100n 100V
R2 24k9
PoE

U1 TPS2372-3RGWR
- 1 VDD — TPH 18
- 2 DEN — TPL 17
- — BT 19
- 3 CLSA
- 6 CLSB
- 4 VSSA
- 5 VSSB
- 21 PAD_VSSC — PG 13
- 8 AMPS_CTL
- 7 REF IRSHDL_EN 16
- 9 MPS_DUTY
- 10 AUTCLS — RTNA 11 / RTNB 12

CLSA
CLSB
R49 63R4
R64 90R9
PoE
R1 1k3
R5 49k9
R6 0R
PoE
PoE
For choosing MPS duty cycle

PoE
R27 51k D7 Red
R68 51k D8 Red
R71 51k D9 Red
R8 470k
C53 22u 100V
C50 22u 100V
C54 22u 100V
VDD
GNDD GNDD GNDD

PoE R4 PoE
10k
PG
R10 100k
GNDD
GNDD

28V buck

U4 IEA48003A280V-001-R
VDD
- 1 VIN+ — VOUT+ 8
- — SENSE+ 7
- 2 ON — TRIM 6
- — SENSE− 5
- 3 VIN− — VOUT− 4

PWR_FLAG +28V
R11 0R
R12 0R
C2 10n DNP
PoE
PG
Q1 BSS123
GNDD GNDD GND

Variable buck

U2
LV14540DDAR

+28V

C3 4u7
C4 2u2
C5 2u2
C6 100n
C7 3n3
R9 27k

VIN
EN
SS
RT
EP
GND
BOOT
SW
FB

C8 100n
L1 6u8/6.1A
D4 PDS760-13
C9 47u 25V
C10 47u 25V
C39 100u DNP

VBUS

R13 200k
R14 7k68 — FB1
R15 2k7 — FB2
R16 2k7 — FB3
R17 4k7 — FB4
R18 17k4

H1
FK 250 08 LF PAK

5V buck

U7
LV14540DDAR

+28V

C17 4u7
C18 2u2
C19 2u2
C20 100n
C21 3n3
R24 27k

VIN
EN
SS
RT
EP
GND
BOOT
SW
FB

C22 100n
L3 4u7/1.55A
D5 1N5819HW-7-F
C23 47u 25V
C24 47u 25V

+5V

R25 200k
R26 33k

USBPD controller

U6A
TPS65987DDHRSHR

+3V3

PDC_LDO_1V8
PDC_LDO_3V3

C25 10u
C26 100n
C27 10u
C28 10u

VIN_3V3   35
LDO_1V8
LDO_3V3   9

HRESET
R63 0R
R32 10k
PDC_RESET 44   HRESET
GND

PDC_LDO_3V3
R28 100k   PDC_ADCIN1 6   ADCIN1
R29 33k
R7 10k   PDC_ADCIN2 10   ADCIN2
R31 100k

GPIO0   16
GPIO1   17
GPIO2   18
GPIO3   30
GPIO4   31

R58 1M

I2C3_SCL   21   TP5
I2C3_SDA   22   TP6
I2C3_IRQ   23   TP7

SPI_POCI   36   R44 0R   TPS_SDI
SPI_PICO   37   TPS_SDO
SPI_CLK   38   TPS_SCK   R50 0R
SPI_CS   39   TPS_CS

GPIO12   40
GPIO13   41
GPIO14   42   FB4 1   TP12
GPIO15   43   FB3 1   TP11
GPIO16   48
GPIO17   49   FB2 1   TP10

GPIO20   54   FB1 1   TP9
GPIO21   55

I2C1_IRQ   29   TP8
I2C1_SCL   27
I2C1_SDA   28

I2C2_IRQ   34   TP2
I2C2_SCL   32   TP3
I2C2_SDA   33   TP4

GND   20
GND_EP   59

R59 1k
SW1
CAS-120TA
GND-Configuration 2
3V3-Safe Configuration
PDC_LDO_3V3

R55 0R   SDA   {I2C}
R56 0R   SCL

3V3 LDO

U11
AP7366-33W5-7

+5V   IN   OUT   +3V3
EN
GND

C52 10u
C51 10u

External FLASH

FLASH_SDO 1   TP15
FLASH_SDI 1   TP16
FLASH_SCK 1   TP17
FLASH_CS 1   TP18

{SPI}   {SPI}
FTDI_SCK
FTDI_SDO
FTDI_SDI
FTDI_CS

+3V3
R42 0R
R62 1k in case of mistake
FTDI_MUX_SWD
R43 1k

U8
74CBTLV3257BQ,115

S   1
1B1   2
FTDI_CS   3
FLASH_CS   4
TPS_SDO   5
FTDI_SDO   6
FLASH_SDO   7
GND   8

3A   9   FLASH_SCK
3B2   10   FTDI_SCK
3B1   11   TPS_SCK
1A   12   FLASH_SDI
4A   13   FTDI_SDI
4B2   14   TPS_SDI
4B1   15
OE   16
VCC   +3V3

S
1B1
1B2
1A
2B1
2B2
2A

R57 0R
C40 1n0

U9
W25Q80DVSNIG

FLASH_SDO   R60 0R   SI/IO0   VCC   8   PWR_FLAG
FLASH_SDI   R61 0R   SO/IO1
PDC_LDO_3V3   3   WP/IO2
PDC_LDO_3V3   7   HOLD/IO3
FLASH_SCK   SCLK
FLASH_CS   1   CS   VSS   4

D6 RB521S30T1G   PDC_LDO_3V3
C32 100n

PWR FLAGs

+28V   VBUS   +3V3
PWR_FLAG   PWR_FLAG   PWR_FLAG

PWR_FLAG

GND

FTDI_MUX_SW

{USB}
D+
D−

{SPI}
FTDI_SDO
FTDI_SDI
FTDI_CS
FTDI_SCK

{I2C}
SDA
SCL

+3V3

C42 C45 C44 C43
1n0 1n0 1n0 1n0
GND GND GND GND

+3V3 +3V3
R22   R23
4k7   4k7

R53
OR   SCL

U5
FT4232H−56Q−REEL

ORR21

WP1
R54
OR   SDA

TP1

Vcore

C29
4u7

GND

FB3
600Z/0.5A

PWR_FLAG

+3V3

44 VREGIN
16 VCCIO
43 VREGOUT
5   VPHY
9   VPLL
2   VCORE

ADBUS0 12
ADBUS1 13
ADBUS2 14
ADBUS3 15
ADBUS4 17
ADBUS5 18
ADBUS6 19
ADBUS7 20

Vcore

FB2
600Z/0.5A

C11 C13   C14 C30
4u7 4u7   100n 100n
GND GND   GND GND

PWR_FLAG

BDBUS0 22
BDBUS1 23
BDBUS2 24
BDBUS3 25
BDBUS4 26
BDBUS5 27
BDBUS6 28
BDBUS7 29

FTDI_SCK
FTDI_SDO
FTDI_SDI
FTDI_CS

D+   8   D+
D−   7   D−

+3V3
R20
1k
11 RESET

Y1
ABM8G−12.000MHZ−18−D2Y−T
12 MHz

1   EECS
66 EECLK
65 EEDATA

CDBUS0 32
CDBUS1 33
CDBUS2 34
CDBUS3 35
CDBUS4 37
CDBUS5 38
CDBUS6 39
CDBUS7 40

FTDI_MUX_SW

after reset RTS#

HRESET   after reset dtr#

OSCI   3   OSCI
OSCO   4   OSCO

C12   C31
18p   18p

GND GND GND

DDBUS0 42
DDBUS1 45
DDBUS2 46
DDBUS3 47
DDBUS4 48
DDBUS5 49
DDBUS6 51
DDBUS7 52
        53

6   REF

R19
12k

GND

10 TEST
21 GND

PWREN   54
SUSPEND 30

GND

ETH out

C38
10n
GND
PWR_FLAG
GND

{MDI} {MDI}

J2
7499111121A

9	VCC
1	D1+
2	D1−
3	D2+
6	D2−
4	D3+
5	D3−
7	D4+
8	D4−
10	GND
	SH

MDI0_P
MDI0_N
MDI1_P
MDI1_N
MDI2_P
MDI2_N
MDI3_P
MDI3_N

LED1_Y+ 11
LED1_Y− 12
LED2_G+ 13
LED2_G− 14

PWR_FLAG

R47
0R
GND

C36
100n
GND

R48
200R
GND

Power measurement

TP13 1 SDA
TP14 1 SCL

U3
INA230AIRGTR

+3V3

IN+ 13 IN+ IN− 12 IN− R69 10k
IN− 11 VBUS +3V3
ALERT 3
SDA 4 SDA Vs 9
SCL 5 SCL
A1 1 A1 EP 17
A0 2 A0 GND 10

{I2C} {I2C}
R41 0R SDA
R51 0R SCL

C41
1n0
GND
GND

I2C address selection

+3V3
SDA SCL
R33 R35
A1
R35
GND

+3V3
SDA SCL
R37 R40
A0
R39
GND

USBPD output

VBUS

C33
4u7
GND

C34
100n
GND

R3
R_0R_22.4A_0603
0R
22.4A

R45
0R
GND

U6B
TPS65987DDHRSHR

11	PP_HV1		VBUS1	13
1	PP_HV2		VBUS2	3
25	PP1_CABLE		C1_CC1	24
			C1_CC2	26
15	DRAIN1		C1_USB_P	50
52	DRAIN2		C1_USB_N	51

just connect with other pins
and make pad as big as possible

PWR_FLAG +5V

C15
4u7
GND

IN+ IN−
R52
0R15

C16
1u
GND

C46 C47 C48 C49
10n 10n 10n 10n
GND GND GND GND

J3
USB-C_GCT_USB4105-GF-A

A4	VBUS	
C1_CC1	CC1	A5
C1_CC2	CC2	B5
{USB}	D+ DA+	A6
	D− DA−	A7
	D+ DB+	B6
	D− DB−	B7
	SBU1	A8
	SBU2	B8
	GND	A1
	SH	

FB1
600Z/0.5A
GNDGND

{USB}

C1_CC2
C1_CC1
D+
D−

U10
TPD4E05U06QDQARQ1
GND

www.antmicro.com
Antmicro Ltd.
Sheet: /USBPD_output/
File: USBPD_output.kicad_sch
Title: PoE to USBC PD adapter

Size: A3	Date: 2024−08−12	**Rev: 1.0.0**
KiCad E.D.A. kicad−cli 7.0.11+dfsg−1build4		Id: 5/5