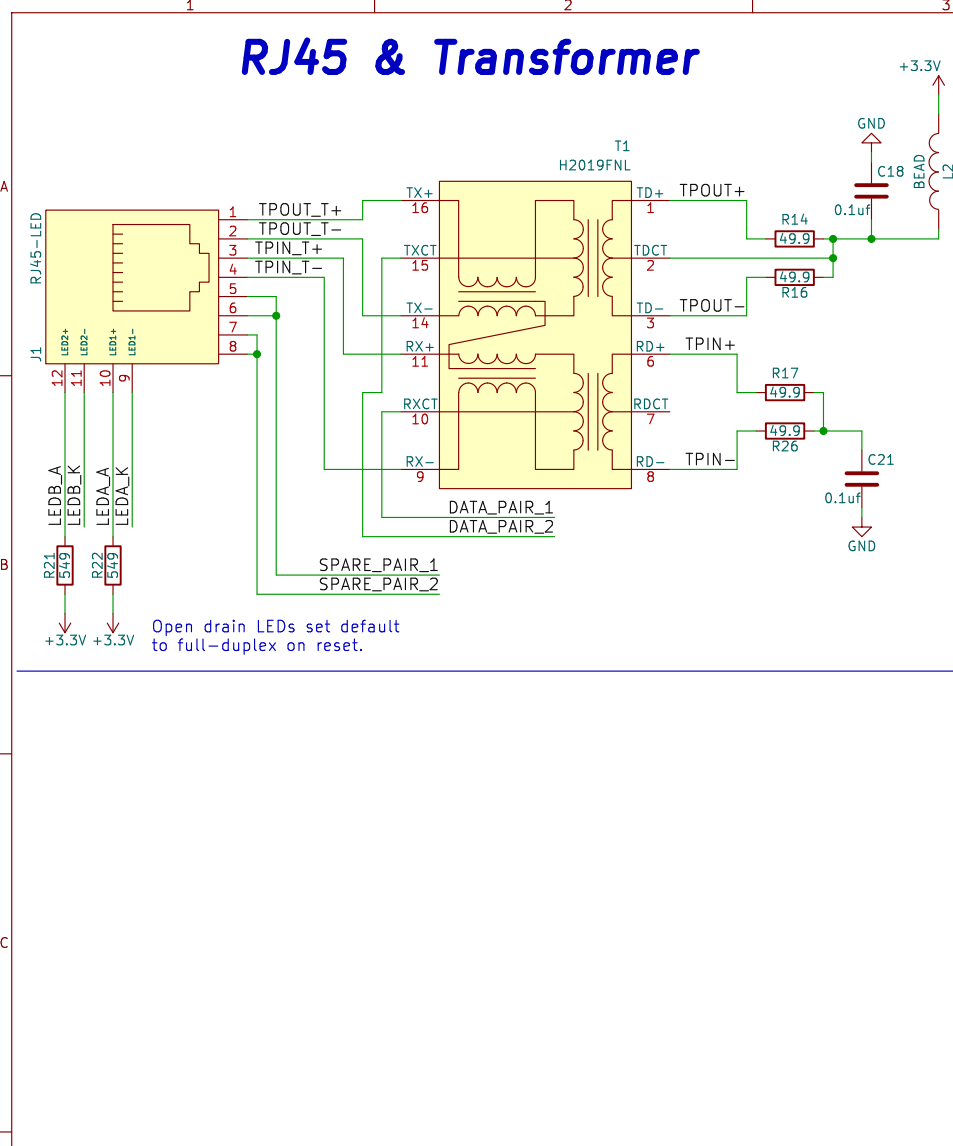
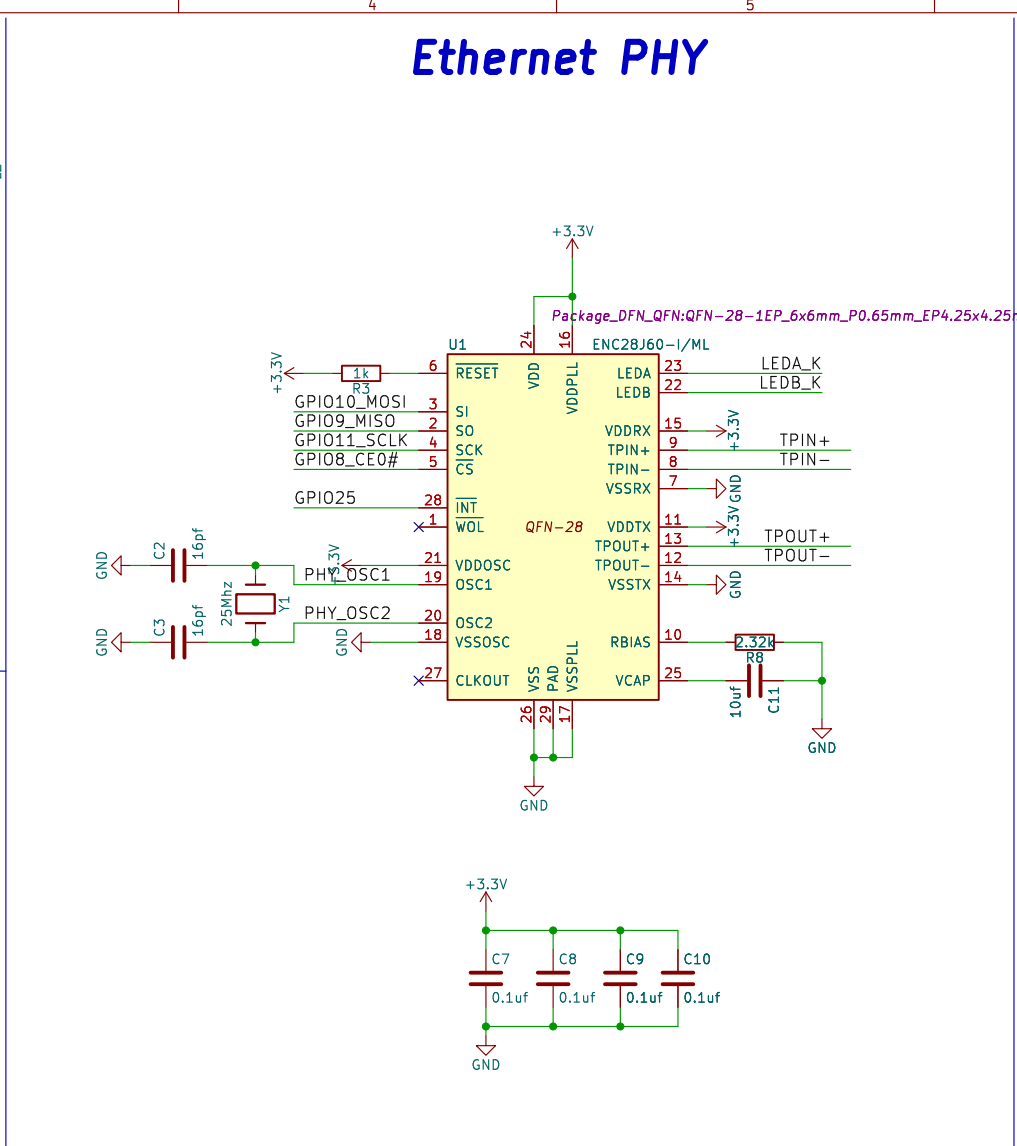


## RJ45 & Transformer

Open drain LEDs set default to full-duplex on reset.

[illegible]

# Raspberry Pi Header

TH Female Bottom or SMT Female Top Header

SMT: Toby Electronics REF-182665-01/REF-182665-03

TH: Digikey 1528-1385-ND

Pin #s Match RPi.

Pin	Signal	Pin	Signal
1	RPI_3V3_1	2	RPI_VBUS
3	GPIO1_SDA1	4	RPI_VBUS
5	GPIO3_SCL1	6	GND
7	GPIO4	8	GPIO14_TXD0
9	GND	10	GPIO15_RXD0
11	GPIO17	12	GPIO18
13	GPIO27	14	GND
15	GPIO22	16	GPIO23
17	RPI_3V3_2	18	GPIO24
19	GPIO10_MOSI	20	GND
21	GPIO9_MISO	22	GPIO25
23	GPIO11_SCLK	24	GPIO8_CEO#
25	GND	26	GPIO7_CEO#
27	GPIO0_ID_SD	28	GPIO1_ID_SC
29	GPIO5	30	GND
31	GPIO6	32	GPIO12
33	GPIO13	34	GND
35	GPIO19	36	GPIO16_CEO#
37	GPIO26	38	GPIO20_MOSI
39	GND	40	GPIO21_SCLK

H1 H3

hole-metalized-no4 hole-metalized-no4

H2 H4

hole-metalized-no4 hole-metalized-no4

+3V3

C17 nostuff-0.1u

W1 TEST\_1P W2 TEST\_1P

R18 nostuff-1k

U3

A0 2 A1 3 A2 7 WP

VCC 8 SDA 5 SCL 6 GND

R20 nostuff-5.8k R23 nostuff-3.9k

GPIO0\_ID\_SD GPIO1\_ID\_SC

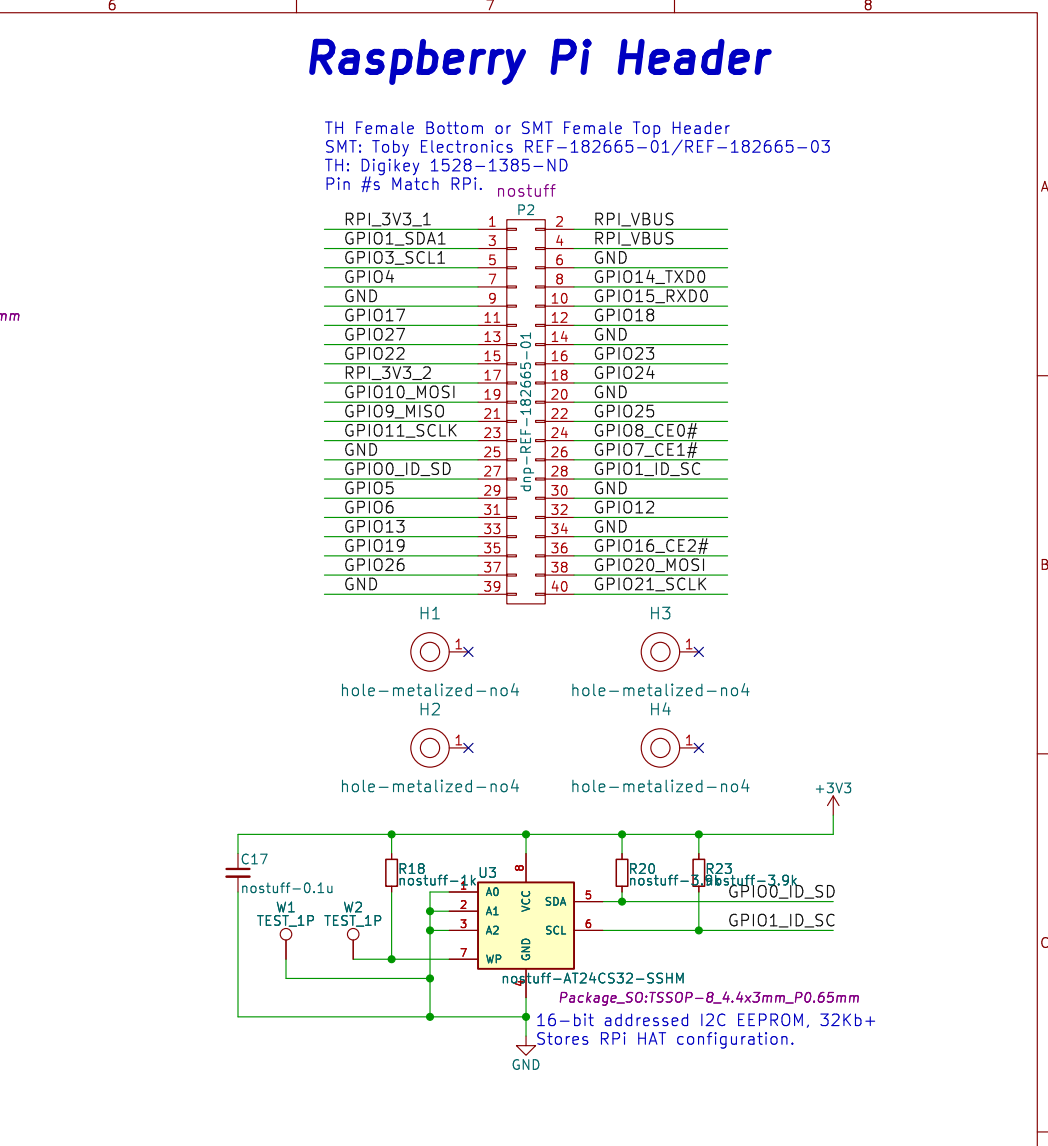
nostuff-AT24CS32-SSHM

Package\_SO:TSSOP-8,4.4x3mm,P0.65mm

16-bit addressed I2C EEPROM, 32Kb+

Stores RPI HAT configuration.

GND



# Passive PoE (4–16V) → 2A Buck–Boost → 5V

DATA\_PAIR\_1

DATA\_PAIR\_2

SPARE\_PAIR\_1

SPARE\_PAIR\_2

POE\_VP

POE\_VN

D1 30A 1V 400mA

D2 30A 1V 400mA

C1 0.1uF 100V

C22 0.1uF 100V

D3 SMAJ58A TVS Diode 20VWM 32.4VC DO214AC

C5 22uF 1206

C6 22uF 1206

R5 10k

C12 10uF 0805

U2\_EN

U2\_VAUX

C4 0.1uF 0603

U2 TP563070RNMR

L1 1.5uH 4.6A Isat

C13 10uF 0805

R1 52.3k

R2 10k

R4 47k

U2\_FB

C14 22uF 1206

C15 22uF 1206

C16 22uF 1206

F1 33V 1.1A 2016 (2.2A Trip) PTC Fuse

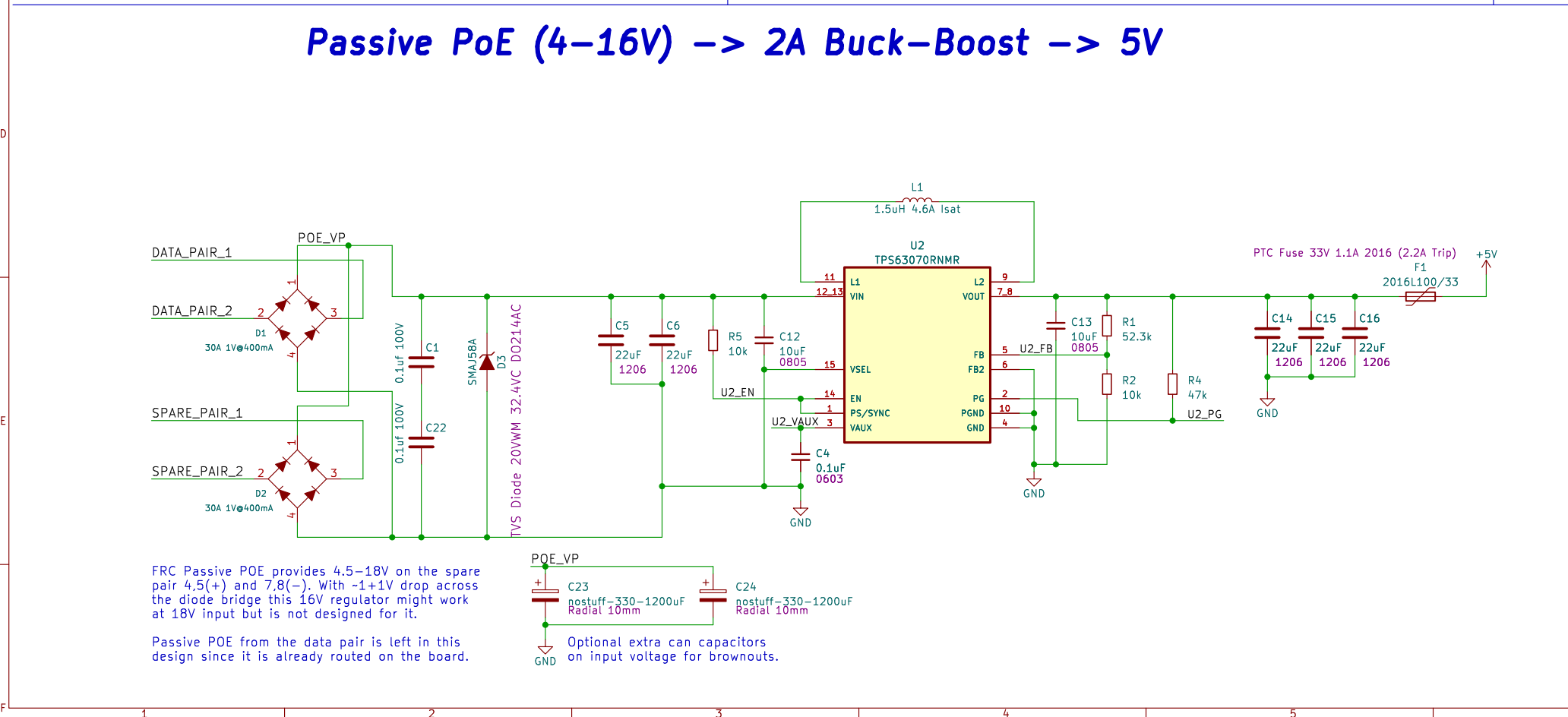
+5V

POE\_VP

C23 postuff-330-1200uF Radial 10mm

C24 postuff-330-1200uF Radial 10mm

Optional extra can capacitors on input voltage for brownouts.



# Raspberry Pi Power

Diagram illustrating the Raspberry Pi Power circuit, showing the connection between the 5V source, the PNP transistor (Q1), the PMOS transistor (Q3), the current mirror, and the linear regulator (U4).

**Components:**

- Q1: Low  $R_{ds}$  PFET like DMP3099L, 3A, 99m $\Omega$  @ 4.5V Vgs.
- Q2: Matched PNP pair. Current mirror comparator pulls Q1 gate low (on) when USB\_VBUS\_RVP > USB\_VBUS.
- Q3: PMOS\_GSD
- U4: AP7365\_SOT-23-5
- R13: 1k
- R15: 10k
- R19: 47k
- C19: 1uF
- C20: 1uF
- D6: LED Green
- D7: LED Green
- R24: 220

**Connections:**

- 5V source (D6) connected to R13, which is connected to the gate of Q1.
- Q1 source connected to R15, which is connected to the gate of Q2.
- Q2 source connected to R19, which is connected to the gate of Q3.
- Q3 source connected to R24, which is connected to the gate of Q1.
- Q1 drain connected to RPI\_VBUS.
- RPI\_VBUS connected to VIN of U4.
- EN of U4 connected to RPI\_VBUS.
- GND of U4 connected to GND.
- VOUT of U4 connected to +3V3.
- +3V3 connected to D7.

**Legend:**

- 5V
- +3V3
- GND
- RPI\_VBUS
- VIN
- VOUT
- EN
- GND

**Notes:**

- Ideal Diode for RPi 5V Source
- Extra Linear Reg. for 3.3V
- Power ethernet phy whether we have PoE or not. Phy requires more power than allowed from RPi 3.3V.

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