

RJ45 & Transformer

The diagram illustrates the electrical connections for an RJ45 module and a transformer. The RJ45 module (J1) is connected to the transformer (T1) as follows:

- DATA_PAIR_1:** Pins 1 and 2 of the RJ45 module are connected to pins 16 and 15 of the transformer.
- DATA_PAIR_2:** Pins 3, 4, 5, and 6 of the RJ45 module are connected to pins 1, 2, 3, and 6 of the transformer.
- SPARE_PAIR_1:** Pin 7 of the RJ45 module is connected to pin 11 of the transformer.
- SPARE_PAIR_2:** Pin 8 of the RJ45 module is connected to pin 10 of the transformer.

The transformer (T1) has two sets of windings. The primary windings are connected to the RJ45 module. The secondary windings are connected to the TPIN+ and TPIN- lines. The TPIN+ and TPIN- lines are connected to a +3.3V supply through resistors R17 and R26 (49.9 ohms) and capacitors C21 and C22 (0.1uF). The TPOUT+ and TPOUT- lines are connected to a +3.3V supply through resistors R14 and R16 (49.9 ohms) and capacitors C18 and C20 (0.1uF). The LEDB_CATH and LEDA_CATH pins are connected to a +3.3V supply through resistors R21 and R22 (56 ohms).

BOM DONE

Ethernet PHY

Ethernet PHY

BOM DONE

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

Circuit diagram showing the connection of the Raspberry Pi Header to an I2C EEPROM (U3) and a pull-up resistor (R20). The diagram includes labels for components like C17, R18, R20, R23, U3, and P1, and their respective values and functions.

U3: dnp-AT24CS32-SSHM
 Housings_SSOP:TSSOP-8_4.4x3mm_Pitch0.65mm
 16-bit addressed I2C EEPROM, 32Kb+
 Stores RPi HAT configuration.

[illegible]

Raspberry Pi Power

Diagram illustrating the Raspberry Pi Power circuit, showing the connection of the 5V source, the PNP transistor (Q2), the PMOS transistor (Q3), the linear regulator (U4), and the output voltage (+3V3).

Components and Values:

- Q1: Low R_{ds} PFET like DMP3099L, 3A, $99m\Omega$ @ 4.5V V_{gs} .
- Q2: Matched PNP pair. Current mirror comparator pulls Q1 gate low (on) when $USB_VBUS_RVP > USB_VBUS$.
- Q3: Q_PMOS_GSD
- U4: AP7365_SOT-23-5
- R13: 1k
- R15: 10k
- R19: 47k
- C19: 1uF
- C20: 1uF
- D6: LED Green
- D7: LED Green

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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Author: Julien Marcus		
OpenFet		
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