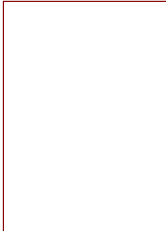CM4

File: [03] CM4_PART1.SchDoc.kicad_sch

PWR
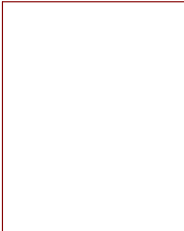
File: [04] PWR.SchDoc.kicad_sch

Mech

File: [05] PCB_Mech.SchDoc.kicad_sch

CM4 MODULE (PART #1)

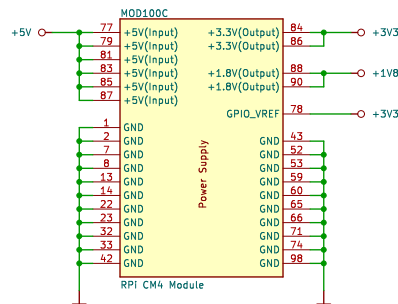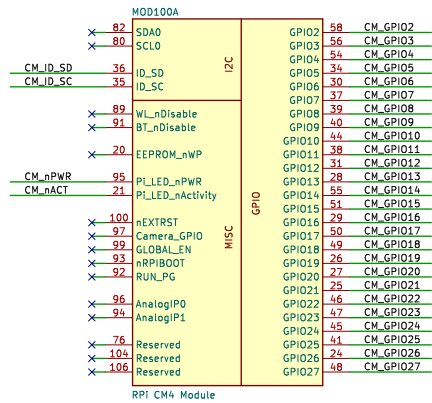## MOD100A — RPI CM4 Module

I2C
- 82 SDA0
- 80 SCL0
- 36 CM_ID_SD — ID_SD
- 35 CM_ID_SC — ID_SC

MISC
- 89 WL_nDisable
- 91 BT_nDisable
- 20 EEPROM_nWP
- 95 CM_nPWR — PI_LED_nPWR
- 21 CM_nACT — PI_LED_nActivity
- 100 nEXTRST
- 97 Camera_GPIO
- 99 GLOBAL_EN
- 93 nRPIBOOT
- 92 RUN_PG
- 96 AnalogIP0
- 94 AnalogIP1
- 76 Reserved
- 104 Reserved
- 106 Reserved

GPIO
Pin	Signal	Net
58	GPIO2	CM_GPIO2
56	GPIO3	CM_GPIO3
54	GPIO4	CM_GPIO4
34	GPIO5	CM_GPIO5
32	GPIO6	CM_GPIO6
37	GPIO7	CM_GPIO7
39	GPIO8	CM_GPIO8
40	GPIO9	CM_GPIO9
44	GPIO10	CM_GPIO10
38	GPIO11	CM_GPIO11
31	GPIO12	CM_GPIO12
28	GPIO13	CM_GPIO13
55	GPIO14	CM_GPIO14
51	GPIO15	CM_GPIO15
49	GPIO16	CM_GPIO16
50	GPIO17	CM_GPIO17
48	GPIO18	CM_GPIO18
26	GPIO19	CM_GPIO19
27	GPIO20	CM_GPIO20
25	GPIO21	CM_GPIO21
46	GPIO22	CM_GPIO22
47	GPIO23	CM_GPIO23
45	GPIO24	CM_GPIO24
41	GPIO25	CM_GPIO25
24	GPIO26	CM_GPIO26
48	GPIO27	CM_GPIO27

SCH:

I2C0 Interface: SCL0 pin (GPIO45) and SDA0 pin (GPIO44) typically are used for Camera and Displays and have internal 1.8k pull up to CM4_3.3V. ID Interface (ID_SD/ID_SC): CM4 datasheet does not mention about pull-up resistors on ID_SD and ID_SC pins.

I2C1 (GPIO2/GPIO3) have 1.8k pull-up resistors added on CM4 module.

SCH:

I2C (ID_SD/ID_SC): This I2C bus is normally used for identifying HATs (HAT ID EEPROM) and controlling CSI0 and DSI0 devices.

At boot time this I2C interface will be interrogated to look for an EEPROM that identifies the attached board and allows automagic setup of the GPIOs (and optionally, Linux drivers).

DO NOT USE these pins for anything other than attaching an I2C ID EEPROM. Leave unconnected if ID EEPROM not required.

J103
CONNECTOR
Mezzanine, 100pin, 3.0mm

SCH:

I2C0 (SDA0/SCL0): This internal I2C bus is normally allocated to the CSI1 and DSI1 as these devices are controlled by the firmware.

SCH:

nRPIBOOT: A low on this pin force booting from an RPI server. If not used leave floating. Internally pulled via 10K to +3.3V.

SCH:

EEPROM_nWP pin: Leaving floating NB internally pulled up to CM4_3.3V via 100k (VIL <0.8V) but can be grounded to prevent writing to the on board EEPROM which stores the bootcode.
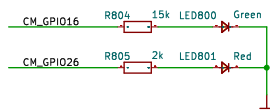
MOD100C — RPI CM4 Module (Power Supply)

- 77 +5V(Input)
- 79 +5V(Input)
- 81 +5V(Input)
- 83 +5V(Input)
- 85 +5V(Input)
- 87 +5V(Input)
- 84 +3.3V(Output) — +3V3
- 86 +3.3V(Output)
- 88 +1.8V(Output) — +1V8
- 90 +1.8V(Output)
- 78 GPIO_VREF — +3V3

GND pins: 1, 2, 7, 8, 13, 14, 22, 23, 32, 33, 42 / 43, 52, 53, 59, 60, 65, 66, 71, 74, 98

SCH:

1.8V and 3.3V Outputs +/-2.5%. Power Output max 300mA per pin for a total of 600mA. This will be powered down during power off or GLOBAL_EN being set low.
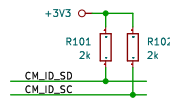
SCH:

GLOBAL_EN: Drive low to power off CM4. Internally pulled up with a 100K to +5V.
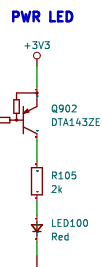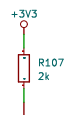
MOD100B — RPI CM4 Module (SDCARD/eMMC (Only CM4L), Gigabit Ethernet)

- 63 SD_DAT0
- 67 SD_DAT1
- 69 SD_DAT2
- 61 SD_DAT3
- 68 SD_DAT4
- 64 SD_DAT5
- 72 SD_DAT6
- 70 SD_DAT7
- 62 SD_CMD
- 57 SD_CLK
- 73 SD_VDD_Override
- 75 SD_PWR_ON

- 12 Ethernet_Pair0_P
- 10 Ethernet_Pair0_N
- 4 Ethernet_Pair1_P
- 6 Ethernet_Pair1_N
- 11 Ethernet_Pair2_P
- 9 Ethernet_Pair2_N
- 3 Ethernet_Pair3_P
- 5 Ethernet_Pair3_N
- 19 Ethernet_nLED1(3.3V)
- 17 Ethernet_nLED2(3.3V)
- 15 Ethernet_nLED3(3.3V)
- 16 Ethernet_SYNC_IN(1.8V)
- 18 Ethernet_SYNC_OUT(1.8V)

40-PIN GPIO HEADER

J100 — 40pin (2x20pin)

Left net	Pin	Pin	Right net
+3V3	1	2	+5V
CM_GPIO2	3	4	+5V
CM_GPIO3	5	6	
CM_GPIO4	7	8	CM_GPIO14
	9	10	CM_GPIO15
CM_GPIO17	11	12	CM_GPIO18
CM_GPIO27	13	14	
CM_GPIO22	15	16	CM_GPIO23
+3V3	17	18	CM_GPIO24
CM_GPIO10	19	20	
CM_GPIO9	21	22	CM_GPIO25
CM_GPIO11	23	24	CM_GPIO8
	25	26	CM_GPIO7
CM_ID_SD	27	28	CM_ID_SC
CM_GPIO5	29	30	
CM_GPIO6	31	32	CM_GPIO12
CM_GPIO13	33	34	
CM_GPIO19	35	36	CM_GPIO16
CM_GPIO26	37	38	CM_GPIO20
	39	40	CM_GPIO21

Used GPIOs:

GPIO16 – STATUS1 LED (Green)
GPIO26 – STATUS2 LED (Red)

TESTPOINTS (DEBUG)

- +5V — TP914
- +3V3 — TP119
- +1V8 — TP120
- TP915
- TP916

Raspberry Pi Pinout

Left	Pin	Pin	Right
3v3 Power	1	2	5v Power
GPIO 2 (I2C1 SDA)	3	4	5v Power
GPIO 3 (I2C1 SCL)	5	6	Ground
GPIO 4 (GPCLK0)	7	8	GPIO 14 (UART TX)
Ground	9	10	GPIO 15 (UART RX)
GPIO 17	11	12	GPIO 18 (PCM CLK)
GPIO 27	13	14	Ground
GPIO 22	15	16	GPIO 23
3v3 Power	17	18	GPIO 24
GPIO 10 (SPI0 MOSI)	19	20	Ground
GPIO 9 (SPI0 MISO)	21	22	GPIO 25
GPIO 11 (SPI0 SCLK)	23	24	GPIO 8 (SPI0 CE0)
Ground	25	26	GPIO 7 (SPI0 CE1)
GPIO 0 (EEPROM SDA)	27	28	GPIO 1 (EEPROM SCL)
GPIO 5	29	30	Ground
GPIO 6	31	32	GPIO 12 (PWM0)
GPIO 13 (PWM1)	33	34	Ground
GPIO 19 (PCM FS)	35	36	GPIO 16
GPIO 26	37	38	GPIO 20 (PCM DIN)
Ground	39	40	GPIO 21 (PCM DOUT)

USER LEDs

- CM_GPIO16 — R804 15k — LED800 — Green
- CM_GPIO26 — R805 2k — LED801 — Red

ID I2C

- +3V3
- R101 2k
- R102 2k
- CM_ID_SD
- CM_ID_SC

3V3 LOAD

- +3V3
- R107 2k

SCH:

Extra load on the 3V3 power rail to fix the HDMI issue with 5V LED.

ACT LED
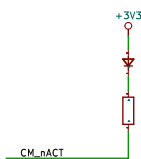
- +3V3
- LED101 Green
- R106 15k
- CM_nACT

SYS LEDs

PWR LED

- +3V3
- Q902 DTA143ZE
- CM_nPWR
- R105 2k
- LED100 Red

SCH:

Pi_nLED_PWR: this pin needs to be buffered to drive an LED.

USB TYPE C

PWR LED

J200

A6	D1+	VBUS	A4 → +5V
A7	D1−	VBUS	A9
B6	D2+	VBUS	B4
B7	D2−	VBUS	B9

USB 2.0 HS

PDC	CC1	A5	USB_CC1
	CC2	B5	USB_CC2

SEC BUS	SBU1	A8
	SBU2	B8

GND	GND	A1
	GND	A12
	GND	B1
	GND	B12
SHIELD	SH

U262−161N−4BVC11

R201
5k1

R203
5k1

+5V

R907
2k

C900
100uF/6V3

+5V

LED900
Green

R901
15k

PCB MOUNTING HOLES

MH950
H270_C600

MH953
H270_C600

M2.5 STEEL SPACERS

MECH952
M2.5, L = 3.0mm
977 403 015 1

MECH953
M2.5, L = 3.0mm
977 403 015 1
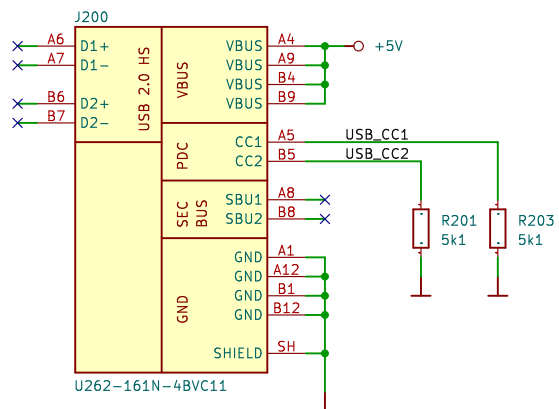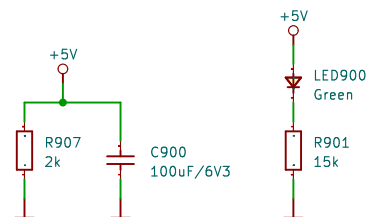
BOM:

SMT Steel Spacer with internal Thread M2.5, L = 3.0mm:
Use Wurth Elektronik, MPN = 977 403 015 1.

PCB MARKING

FID950

FID954

FID955

PCB950
LAYER INDICATOR

Fiducial

Fiducial

Fiducial

PCB_LAYER_STACKUP