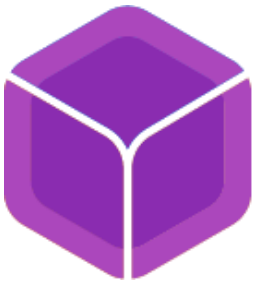


balenaFin

Document Type	Datasheet
Product ID:	BLNFN100001 (20173009)
Product Name	Balena Fin
Document Version	0.0.4
Author	Carlo Maria Curinga
State (Draft/Proposed/Approved)	Proposed

Revision history

Date (dd/mm/yyyy)	Version	Author	Description
24/05/2018	0.0.1	Carlo Maria Curinga	First draft
15/06/2018	0.0.2	Carlo Maria Curinga	First release
26/06/2018	0.0.3	Carlo Maria Curinga	Fixed voltage range in section 2
31/07/2018	0.0.4	Carlo Maria Curinga	Updated device mapping images

Contents

1 Introduction

Balena Fin is a carrier board for the Raspberry Pi Compute Module 3 Lite produced by the Raspberry Pi Foundation. For more informations about the Raspberry Pi Compute Module 3 Lite please refer to the following links:

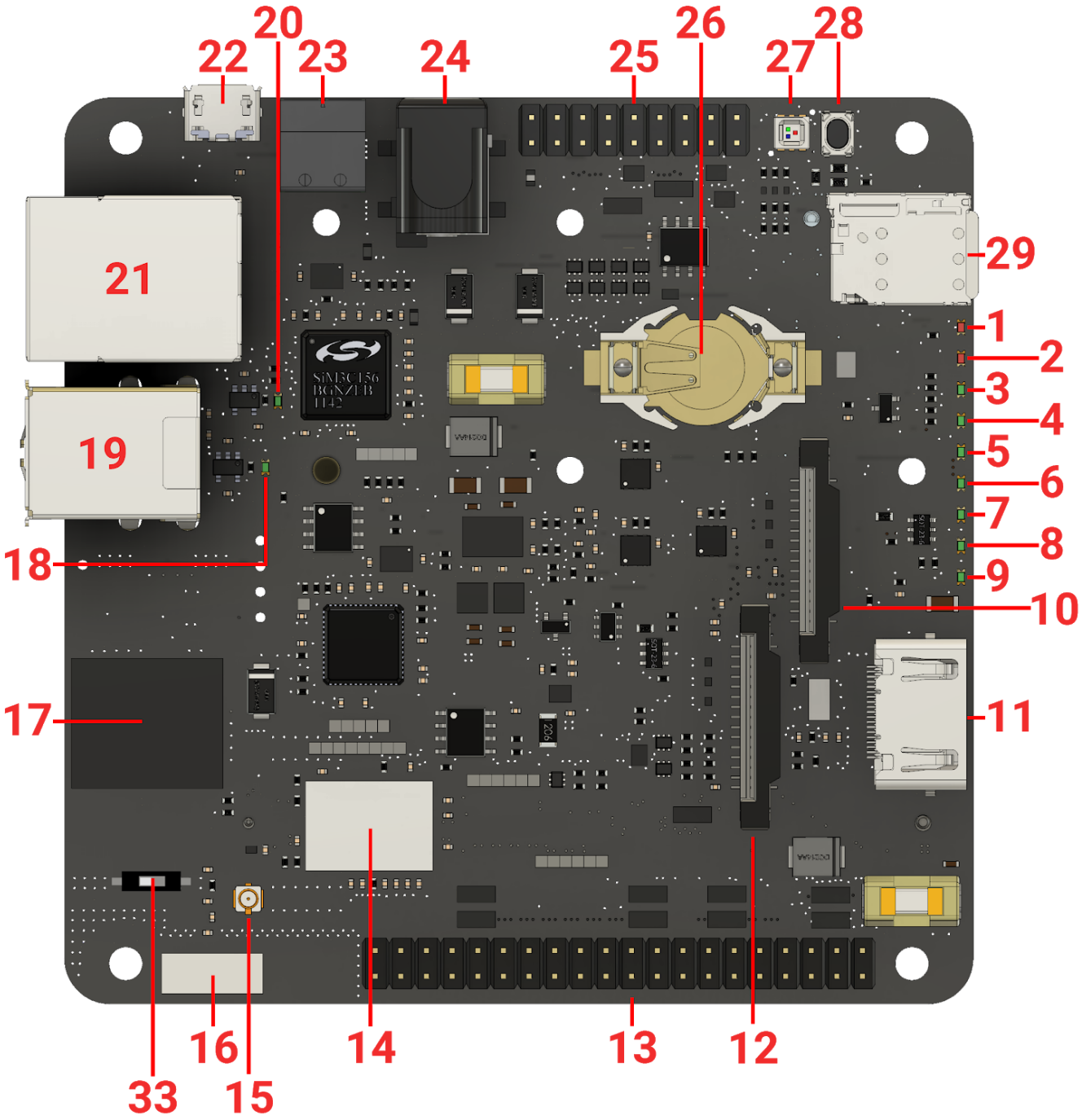
Datasheet:
https://www.raspberrypi.org/documentation/hardware/computemodule/datasheet.md

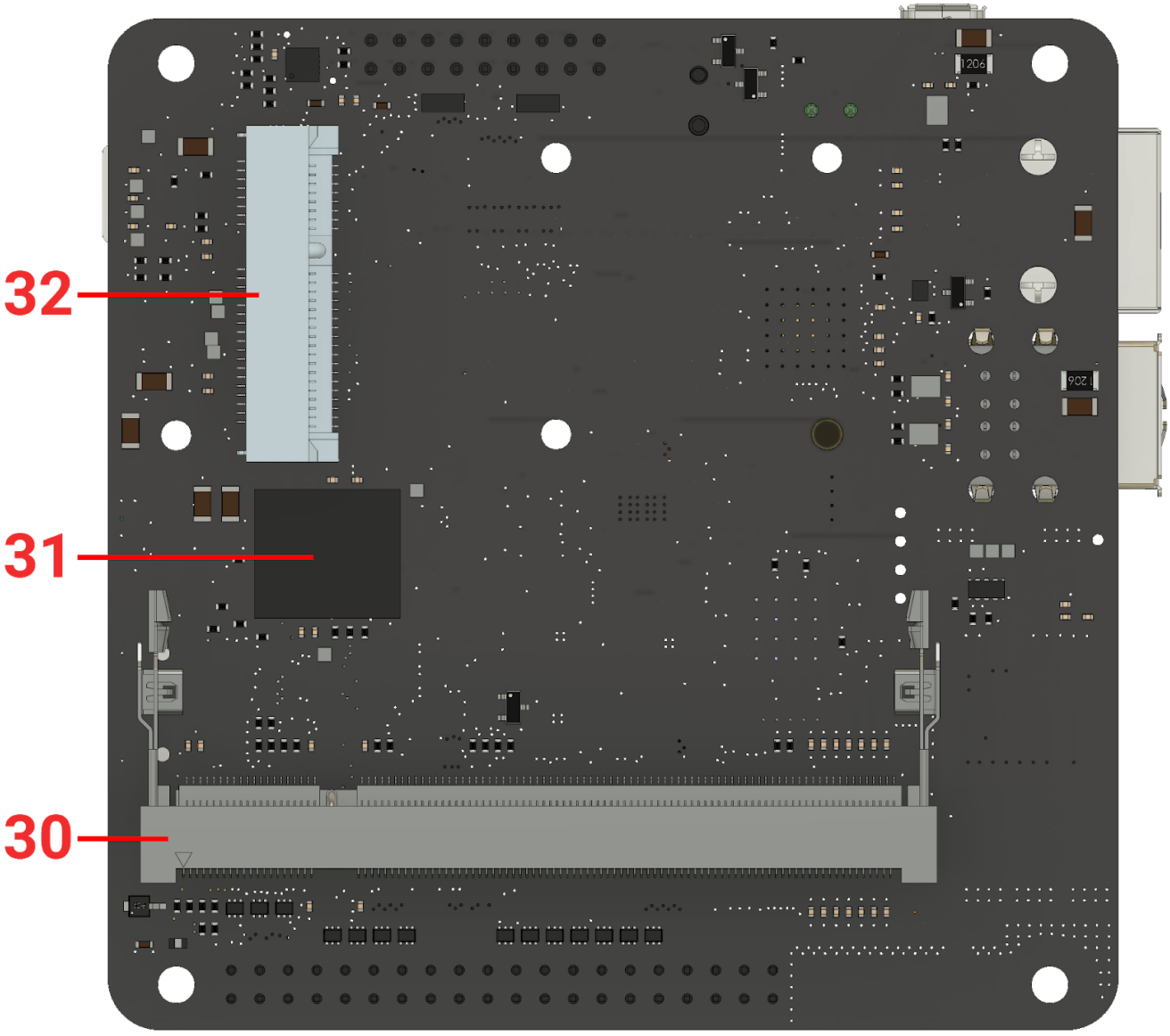
Schematics:
https://www.raspberrypi.org/documentation/hardware/computemodule/schematics.md

2 Availability and Support

Balena Fin (current version or a compatible later revision) availability is guaranteed until at least to January 2023

3 Balena Fin images and mapping

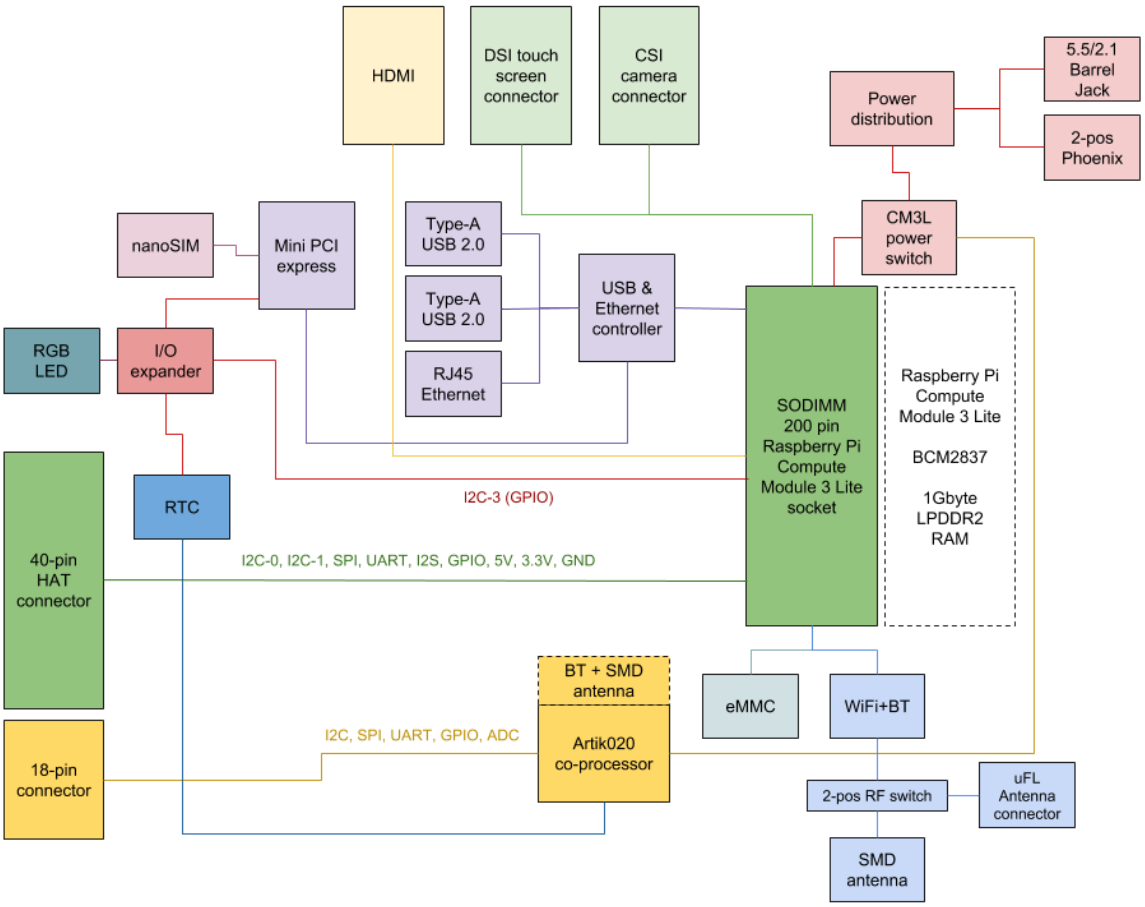




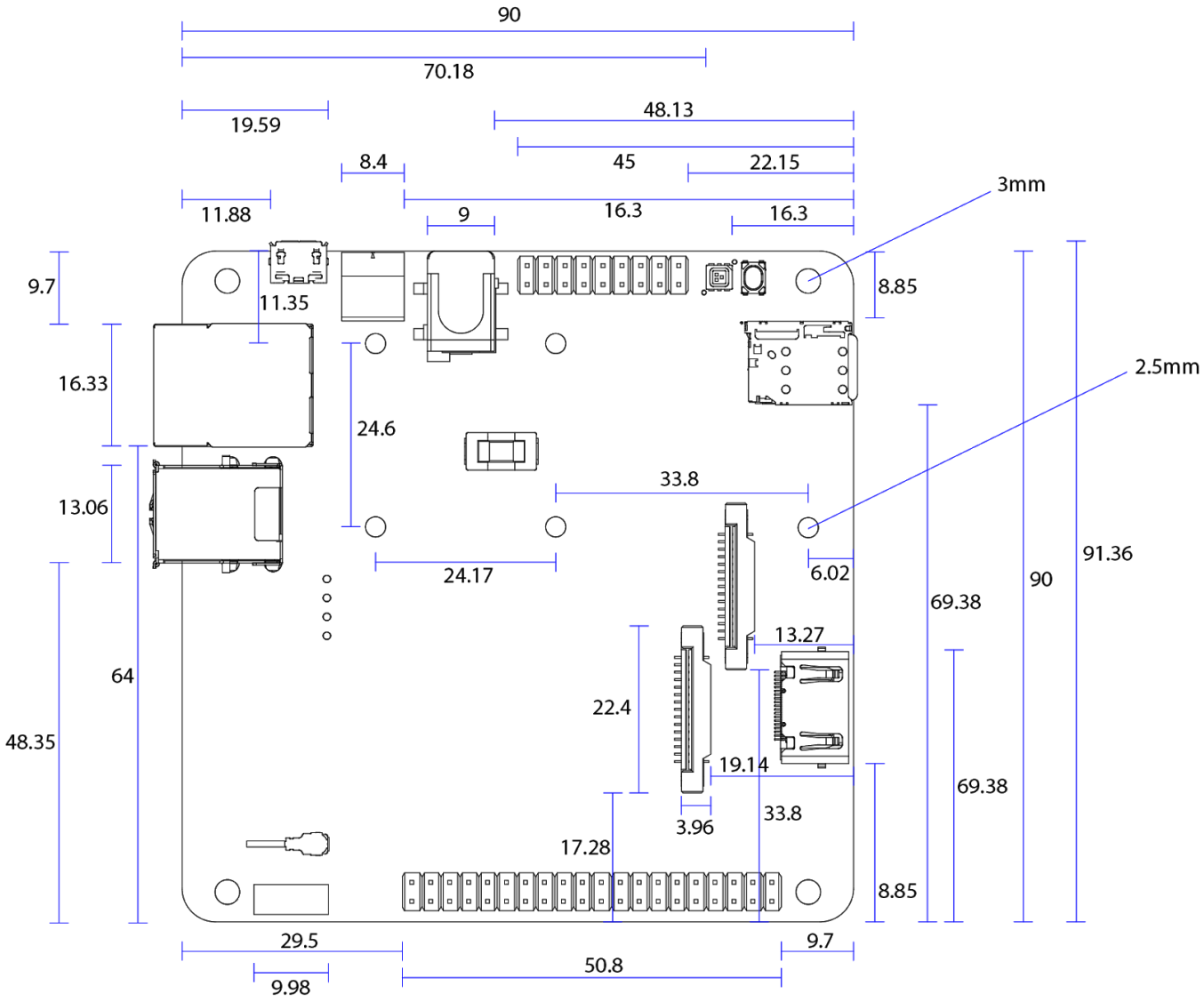
#	Name	Notes/Description
1	5V Status LED	Indicates 5V current flow
2	3V3 Status LED	Indicates 3.3V current flow. This is the same as the red LED on the Raspberry Pi 3 Model B
3	ACT Status LED	CM3L Activity LED. This is the same as the green LED on the Raspberry Pi 3 Model B
4	SPD Status LED	Ethernet Speed LED. off when in 10-Mbps mode, on when in 100-Mbps mode
5	FDX Status LED	Ethernet Full-Duplex indicator
6	LNK Status LED	Ethernet Link/Activity LED
7	PAN Status LED	If supported by the mPCIE (32) card connected, indicates PAN network activity
8	LAN Status LED	If supported by the mPCIE (32) card connected, indicates LAN network activity
9	WAN Status LED	If supported by the mPCIE (32) card connected, indicates WAN network activity
10	DSI connector	Standard full-size Raspberry Pi Display connector
11	HDMI	Full-size HDMI Type A with CEC support
12	CSI connector	Standard full-size Raspberry Pi Camera connector
13	HAT connector	40-pin Raspberry Pi HAT (Hardware Attached on Top) standard connector
14	WiFi/BT combo chip	802.11ac/a/b/g/n 2.4 & 5GHz WiFi + Bluetooth 4.2
15	WiFi/BT uFL antenna connector	If the RF switch is set on the external position, the antenna attached to this connector will become the main Radio antenna for the WiFi/BT combo chip (14)
16	WiFi/BT embedded antenna	Embedded high-performance SMD antenna covering both 2.4 and 5GHz frequencies. It is the default antenna selected for the WiFi/BT combo chip (14)
17	Co-processor	Artik020 MCU
18	USB1 ON Status LED	The green LED stays on as long as there is enough current flowing on the top USB port. When this LED is off, it means a fault or under-voltage is happening on the top USB port

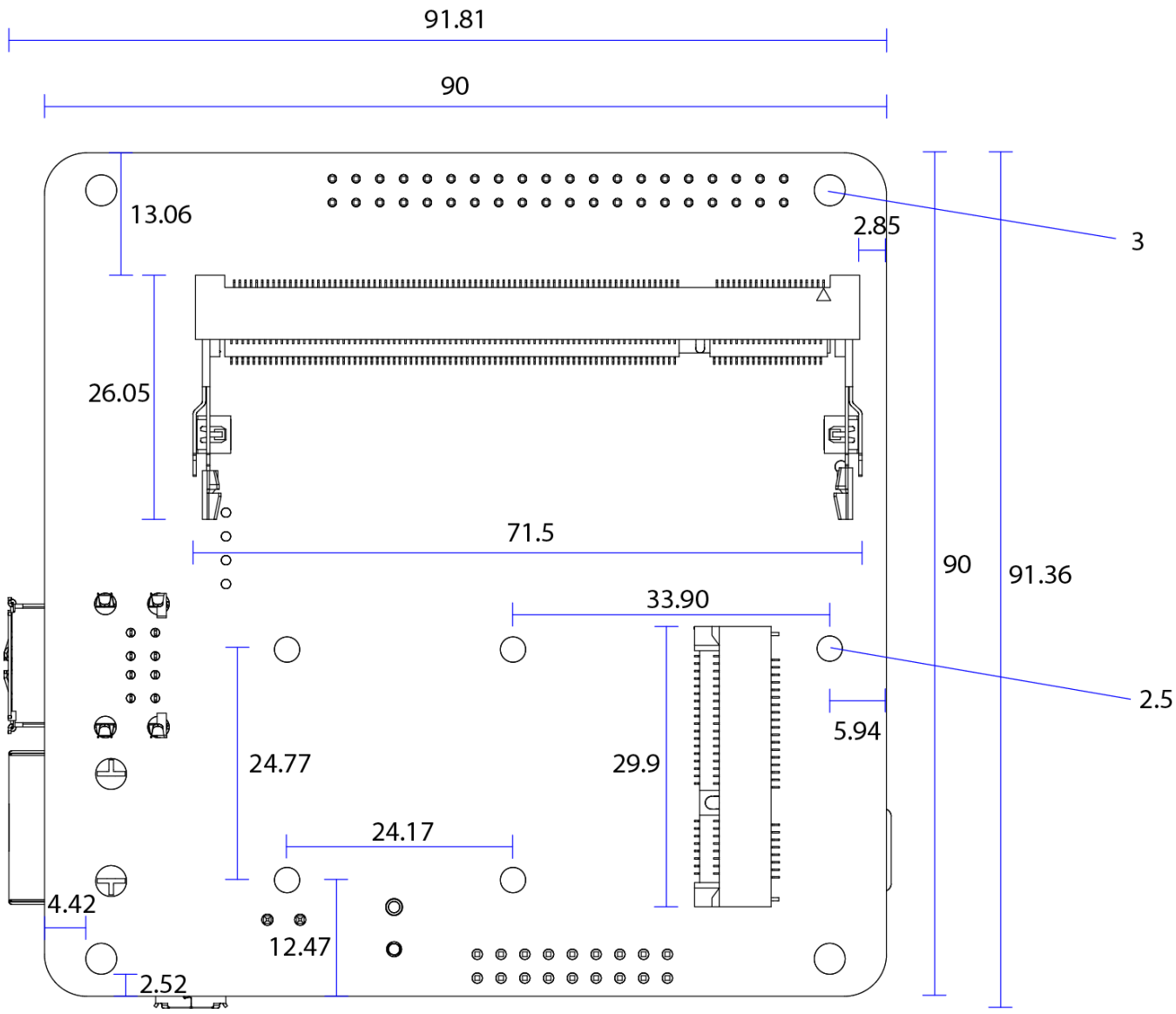
19	USB	2 x USB Type-A
20	USB2 ON Status LED	The green LED stays on as long as there is enough current flowing on the bottom USB port. When this LED is off, it means a fault or under-voltage is happening on the bottom USB port
21	Ethernet	10/100 ethernet RJ45 connector
22	DBG - Programming port	micro-USB connector that allows to flash the eMMC from a host computer using etcher.io or usbboot. If the device is powered on while there is a cable connected to this port, it will enter a programming mode exposing its eMMC as mass-storage to a host computer (via etcher.io or usbboot)
23	2-POS Phoenix connector	6-30V input power. This is a Industry standard connector. ***Use either this or the Barrel Jack connector (24) - never both at the same time!***
24	2.1 / 5.5 mm Barrel Jack connector	6-24V input power. ***Use either this or the Phoenix connector (23) - never both at the same time!***
25	Co-Processor I/O connector	8 x GPIO / ADC 1 x SPI 1 x I2C 1 x Debug UART
26	CR122 RTC coin-cell battery socket	This allows the embedded RTC to keep track of time while the device is powered off
27	RGB LED	RGB LED connected to the CM3L (30) via an I2C I/O expander
28	RESET push-button	When pressed (and released) DS1307 reboots the CM3L (30)
29	nano-SIM socket	This allows the use of a wide portfolio of cellular Modems via the mPCIE socket (32)
30	CM3L socket	SODIMM-200 socket for the Raspberry Pi Compute Module 3 Lite
31	eMMC	8/16/32/64 GB class 5.1 industrial eMMC - main storage for the CM3L (30). Positioned under the CM3L (30)
32	mPCIE	Mini PCI express socket
33	Antenna switch	2 position switch - when set to ON, the WiFi/BT combo chip (14) uses the WiFi/BT embedded antenna (16). When set to OFF, the WiFi/BT combo chip (14) uses the WiFi/BT uFL antenna connector (15)

4 Block diagram



5 Mechanical specifications (mm)





6 General specifications

Parameter	Minimum	Typical	Maximum	Conditions
Power input via power connectors	6V	-	24V	12.5W
Power input via HAT connector	5V	5V	5V	12.5W
Operation temperature	-25 celsius	-	70 celsius	

7 Radio specifications

Parameter	Description	Min.	Typ.	Max.	Unit
Frequency range	11b / g / n (HT20/HT40)	2412	-	2472	MHz
	11a / ac (HT80)	5180	-	5825	MHz
	BT / BLE (main)	2402	-	2480	MHz
	BT / BLE (secondary, co-processor)	2400	-	2483.5	MHz
TX Output Power	11b/11g/11n-2G (20TH/40TH)	10 / 10 / 10	12 / 12 / 12	14/ 14/ 14	dBm
	11a/11n-5G20TH/40TH/11ac	10 / 10 / 8 / 6	12 / 12 / 10 / 8	14 / 14 / 12 / 10	dBm
	BT / BLE (main)	-6	0	4	dBm
	BT / BLE (secondary, co-processor)	-26	-	8	dBm
RX Sensitivity	11b/11g/11n-2G (20TH/40TH)	-	-87/-73/-69/-66	-76 / -65 / -64/-61	dBm
	11a/11n-5G(20TH/40TH)/11ac	-	-71/-68/-65/-57	-65 / -64/-61 /-51	dBm
	BT / BLE (main)	-	-86/-86	-70 / -70	dBm
	BT / BLE (secondary, co-processor)	-	-55.2/-47.2	-	dBm

8 Certification

Certification	Country / Region	Identifier(s)
CE	Europe	RE-18071303
FCC	USA	2APW6BLN-FN-1-00001
IC	Canada	24038-BLNFN100001
MIC	Japan	R-208-180131
RCM	Australia	*ongoing*
OFCA	Hong Kong	

9 Labelling

The end product must be labeled, in a visible area, with the following:

- *Contains FCC ID: 2APW6BLN-FN-1-00001 IC: 24038-BLNFN100001*
- *Contains FCC ID: QOQBGM111 IC: 5123A-BGM111*

10 Compliance and Regulatory Statements

FCC Compliance Statement (USA)

This device complies with Part 15 rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if

not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Non-modification Warning

Any changes or modifications to this device not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

RF Exposure Statement

This equipment complies with FCC/IC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines and RSS-102 of the IC radiofrequency (RF) Exposure rules. This equipment should be installed and operated keeping the radiator at least 20cm or more away from person's body.

Cet équipement est conforme aux limites d'exposition aux rayonnements énoncées pour un environnement non contrôlé et respecte les règles les radioélectriques (RF) de la FCC lignes directrices d'exposition dans et d'exposition aux fréquences radioélectriques (RF) CNR-102 de l'IC. Cet équipement doitêtre installé et utilisé en gardant une distance de 20 cm ou plus entre le dispositif rayonnant et le corps