

Mango system on module (SOM) is based on IPQ6000/IPQ6010 SoC from Qualcomm, which incorporates a powerful quad-core ARM Cortex A53 processor with NEON SIMD DSP extension for each core, ideal for Routers, Gateways and Access Points. It comes with a high-power dual-band concurrent radio supporting WIFI 6 (802.11ax) technology 2x2 MiMo. Two Ethernet SerDes to connect to external multi-GbE PHYs. Advanced power management for low active standby power consumption. SOM supports one USB3.0, USB2.0, PCIe 3.0, miscellaneous interfaces, which can be configured as general-purpose I/O pins and other. SoC has hardware NAT engine and high-end security features like crypto engine and others. The module is in a surface mountable form. Commercial temperature range: 0-65°C, industrial temperature range: -40-85°C.

Quick specs

- Wi-Fi 6 (802.11a/n/ac/ax) 5GHz with 2x2 MU-MiMo, 1021Mbps data-rate
- Wi-Fi 6 (802.11b/g/n/ac/ax) 2.4GHz with 2x2 MU-MiMo, 573,5Mbps data-rate
- MIPI DBI v2.0 type B display interface
- CPU – IPQ6000/IPQ6010 (1.2/1.8GHz)
- OpenWRT Linux flash image
- 22 dBm per chain RF output power
- Size – 38,3 by 61,7 mm
- Available interfaces:
64 x GPIO, 1 x PCIe 3.0, 1 x USB3.0, 1 x USB2.0, 2 x UART, 3 x SPI, 2 x I2C,
4 x PWM, 1 x JTAG, 2 x multi-GbE ethernet SerDes, 1 x SDIO3.0/eMMC,
PTA Coex and parallel for NAND flash memory and LCD controller

1. Features

1.1. Features

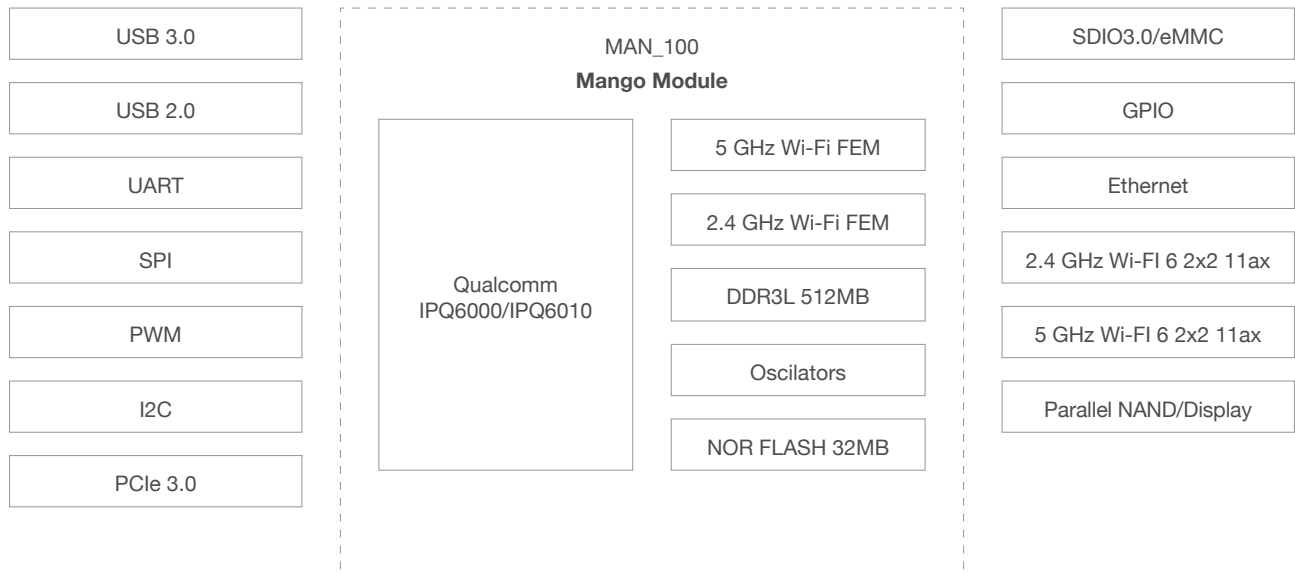
TABLE 1-1. MANGO FEATURES

Feature list		MAN_100 Mango	
Integrated core	Core type	IPQ6000/6010 ARM Cortex-A53	
	Core clock frequency	1.2/1.8GHz	
	Cache	512kB L2	
Memory	DRAM	DDR3L 512MB (up to 2GB)	
	NOR FLASH	32MB	
	NAND FLASH (external)	256MB (Up to 81GB)	
WIFI	IEEE 802.11 b/g/n/ac/ax 2x2 MU-MIMO 2.4GHz 20/40 MHz 1024 QAM	2412-2462MHz 22dBm	
	IEEE 802.11 a/n/ac/ax 2x2 MU-MIMO 5GHz 20/40/80 MHz 1024 QAM	5180-5800MHz 21dBm	
RF pin	RF signal is fed to 2 external module pins	2	
Display	LCD controller	1	
Peripherals	PCIe	PCIe 3.0	1
	USB	USB 3.0	1
		USB 2.0	1
	UART	Universal asynchronous receiver transmitter serial ports	1
	SPI	Serial peripheral interface port	2
	I2C	Inter-integrated circuit interfaces for peripheral de-vices	4
	GPIO	IN/OUT/INT	64
	PWM	Audio Pulse Width Modulation interface	4
	Parallel	For parallel NAND flash memory	1
	Ethernet	SerDes supports 6.25/5/3.125/1.25 Gbps Ethernet 5*1/4*1/2.5/1 GbE PHYs. PSGMII, QSGMII, SGMII/+	1
	Reset	Reset controlled via voltage monitor	1
SDIO3.0/eMMC	Secure Digital Input Output / Embedded Multi Media Card	1	

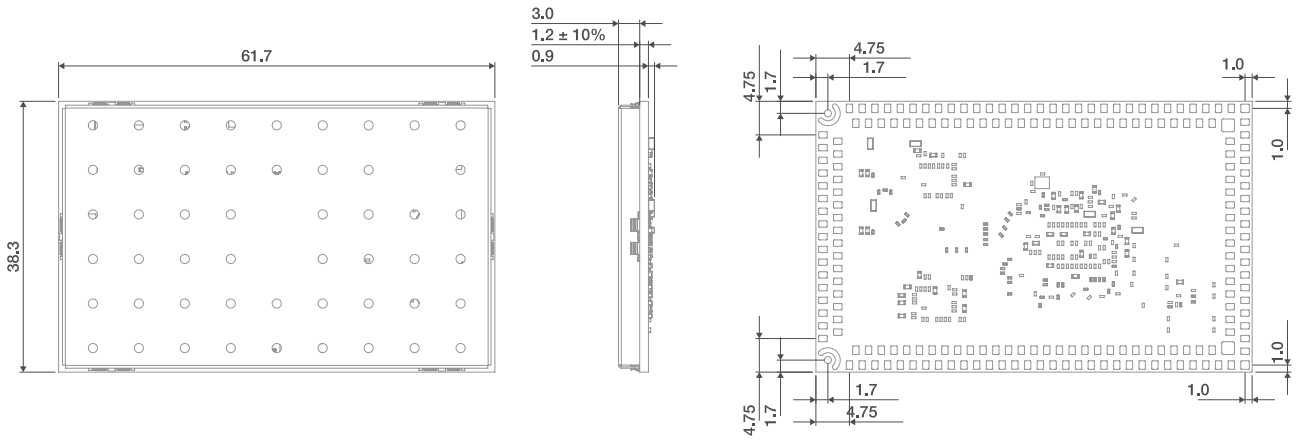
2. Block diagram

The following figure provides a basic overview of the MANGO module.

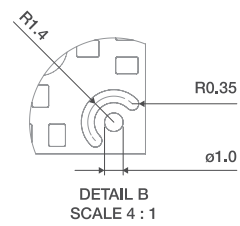
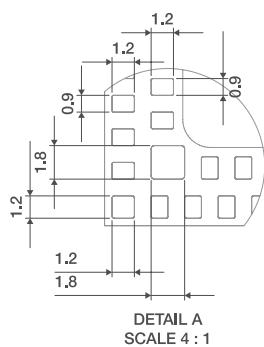
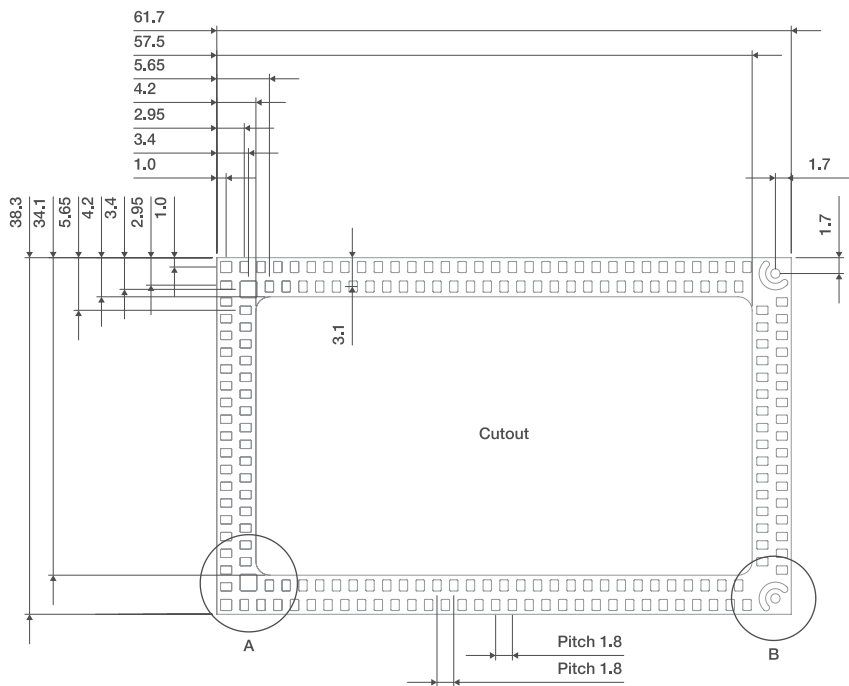
FIGURE 2-1. BLOCK DIAGRAM



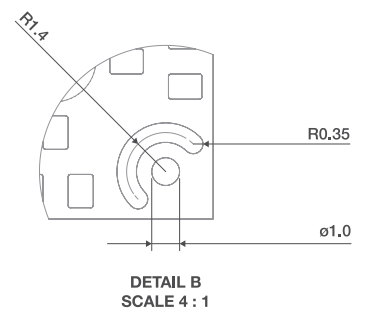
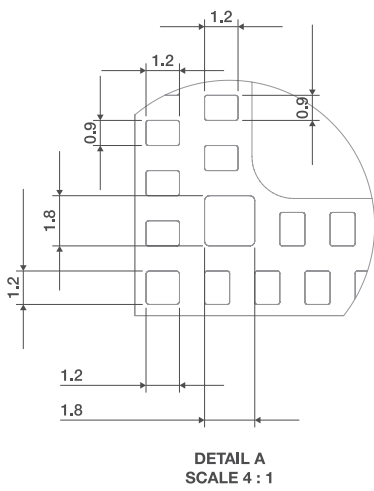
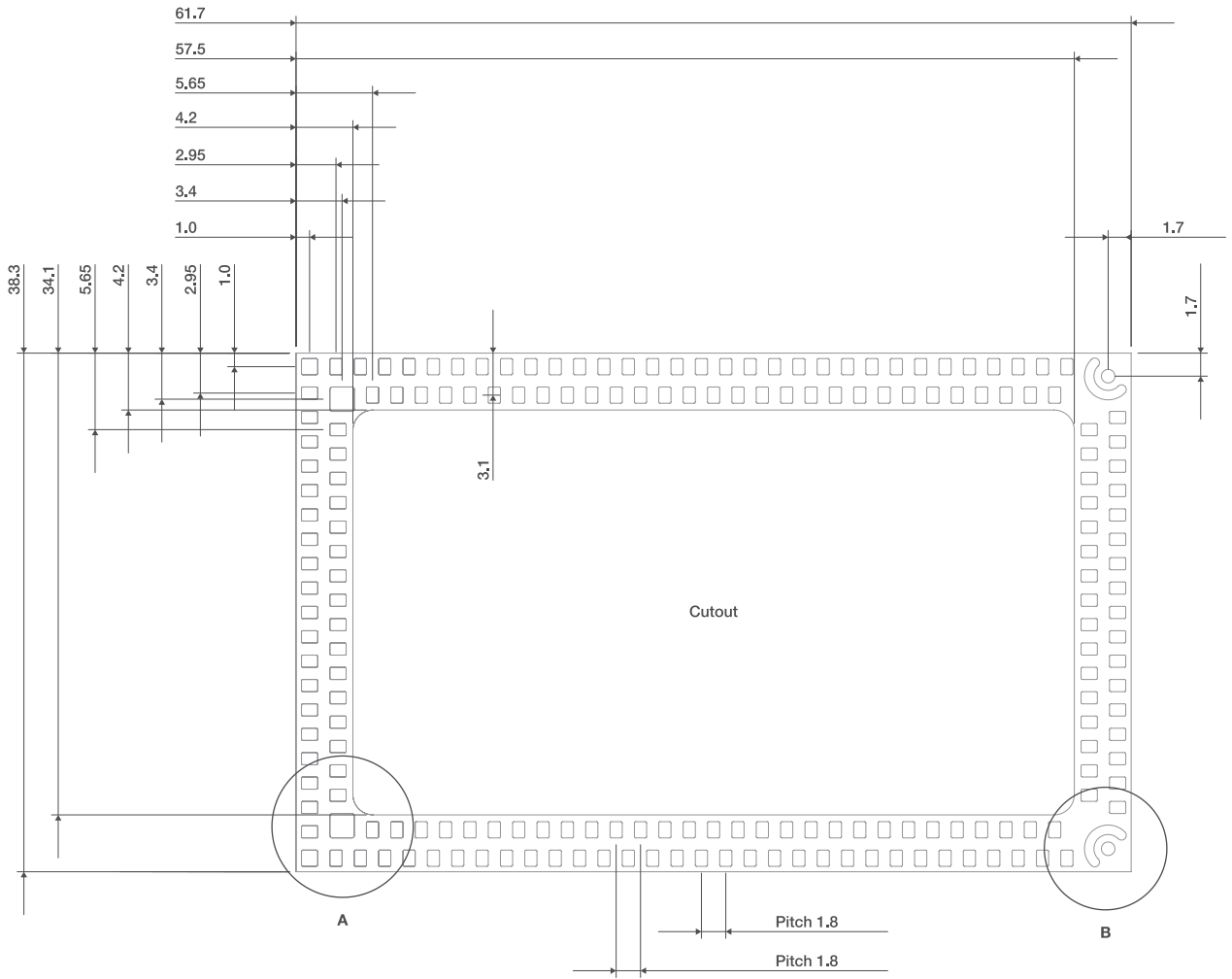
3. Mechanical characteristics



PCB footprint

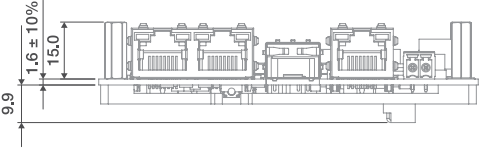
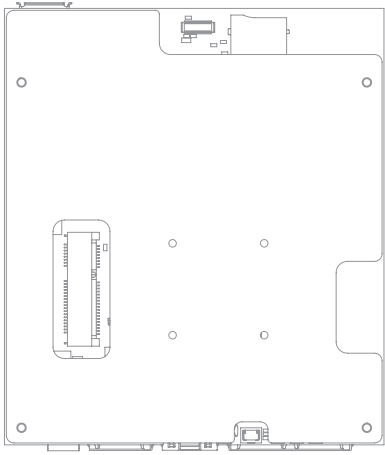
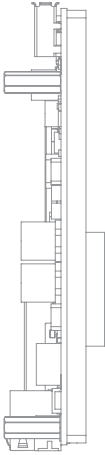
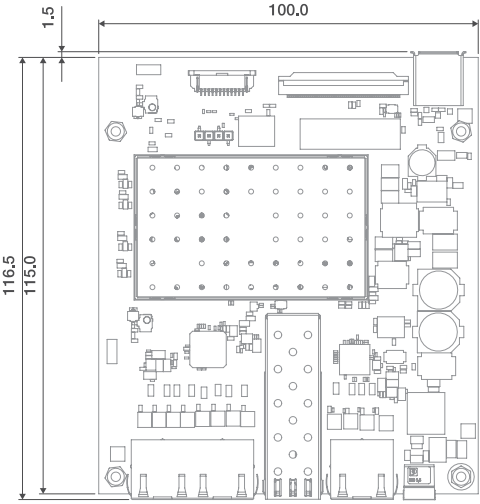


PCB footprint

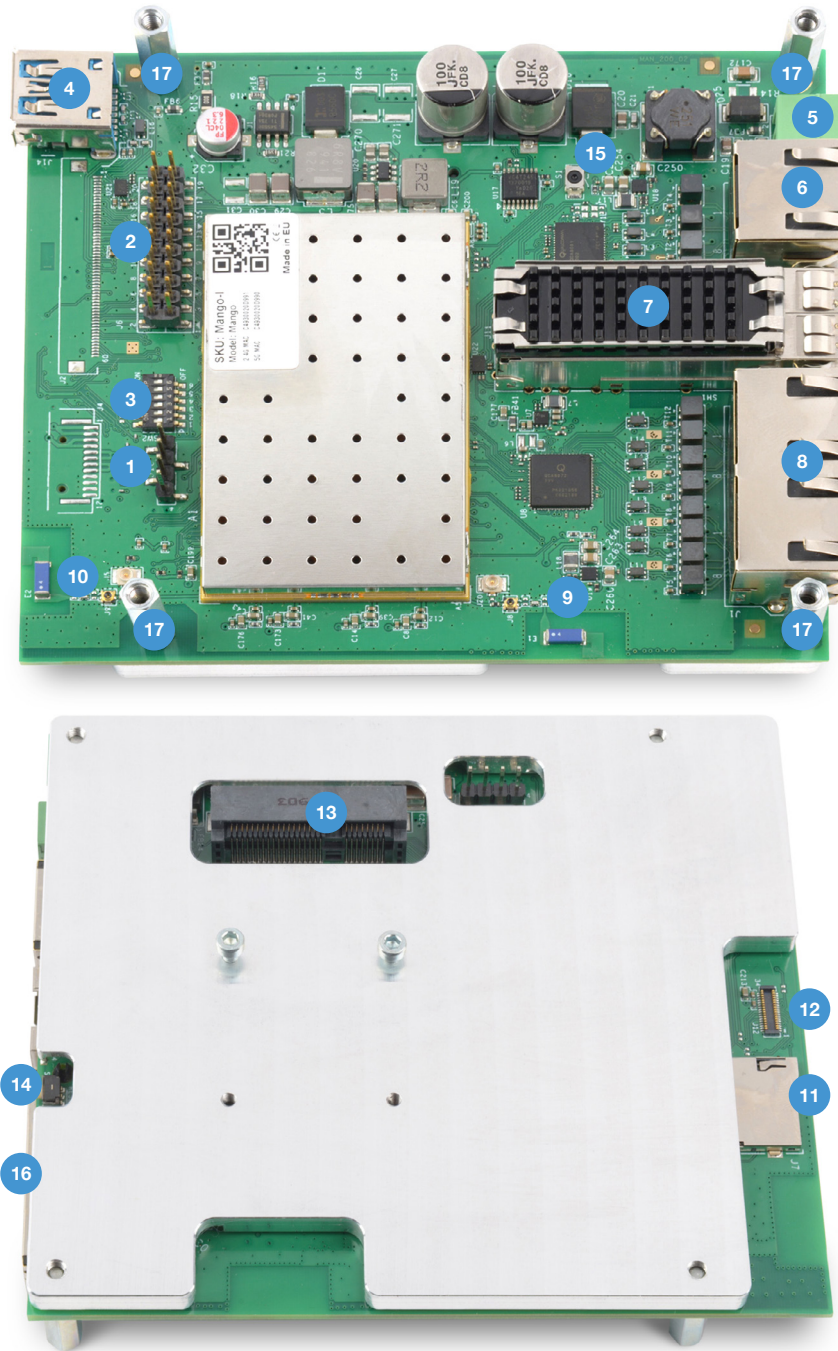


4. Development board

4.1 DVK dimensions

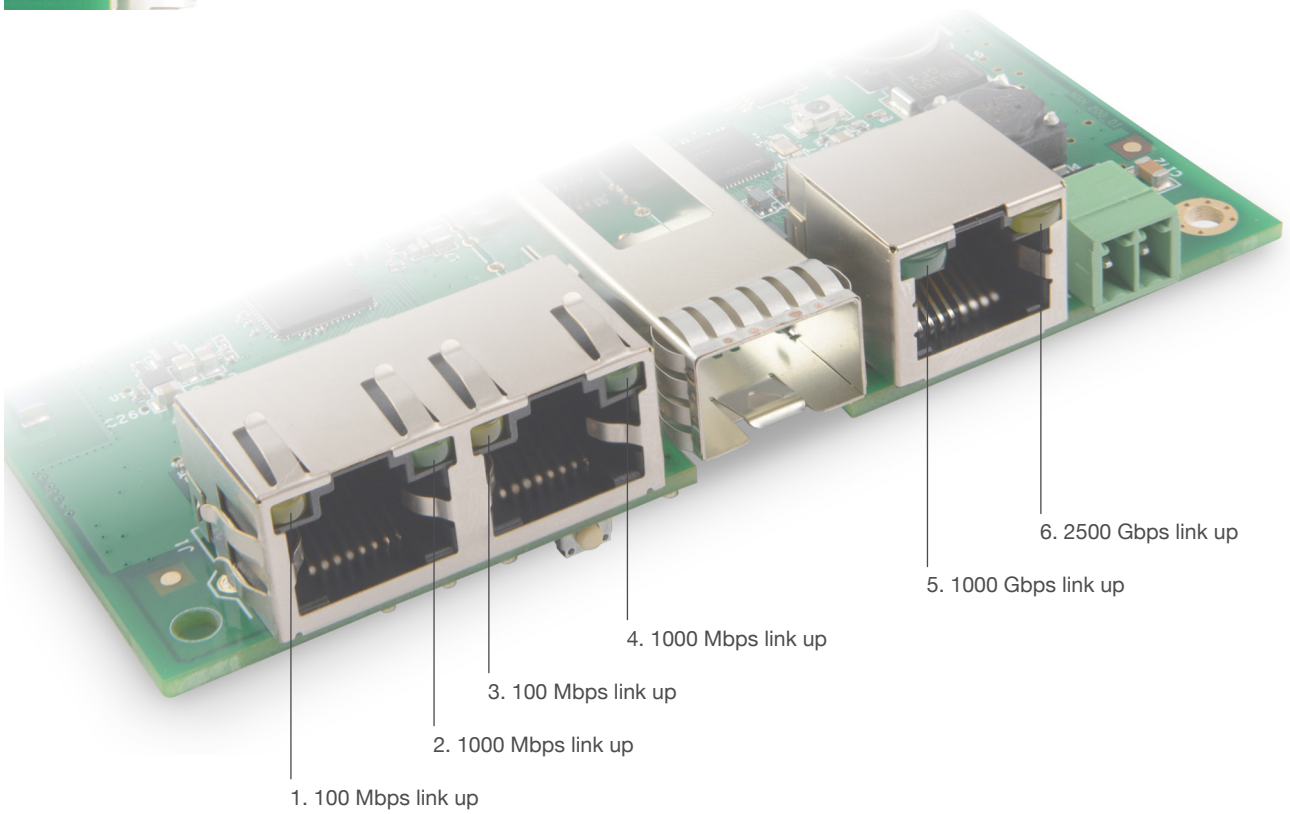
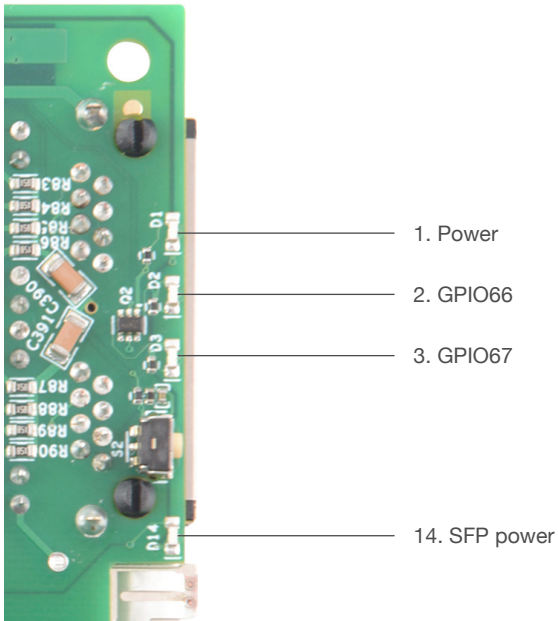


4.2. DVK interfaces

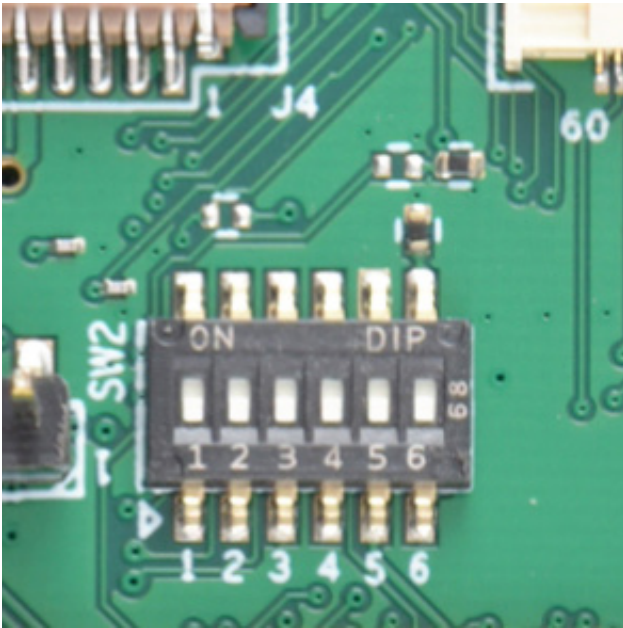


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|---|--|
| 1. UART header | 10. WiFi antenna 2 and U.FL connector for external antenna |
| 2. GPIO header | 11. SD card socket |
| 3. Boot configuration switch | 12. EMMC module socket |
| 4. USB 3.0 interface | 13. mPCIe socket with PCIe3.0, USB2.0 interfaces |
| 5. DC power in/out 9-60V | 14. Programmable button (GPIO79) |
| 6. 2.5 Gbps Ethernet interface + POE passive 24-48V | 15. Reset button |
| 7. SFP Port | 16. LEDs |
| 8. 2 x 1Gbps Ethernet interface | 17. Mounting holes |
| 9. WiFi antenna 1 and U.FL connector for external antenna | |

4.3 LEDs



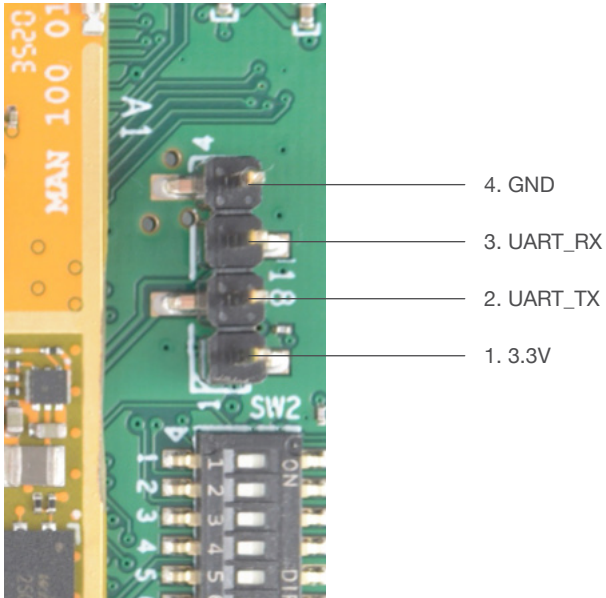
4.4. BOOTSTRAP switch



Config	1 (B23)	2(B26)	3(B29)	4(A15)	5(A60)	6(B80)
Boot from SPI NOR Default	OFF	OFF	OFF	OFF	NA	NA
Boot from eMMC	ON	OFF	OFF	OFF	NA	NA
Boot from NAND	OFF	ON	OFF	OFF	NA	NA
Boot from USB	ON	ON	OFF	OFF	NA	NA
Force boot from USB	ON	ON	OFF	ON	NA	NA
Boot from SPI_NOR_GPT	OFF	OFF	ON	OFF	NA	NA
Enable SFP interface	NA	NA	NA	NA	ON	NA
Enable 2.5 Gbps ETH inter-face	NA	NA	NA	NA	OFF	NA
Enable eMMC interface	NA	NA	NA	NA	NA	ON

4.5. UART header

J18



4. GND

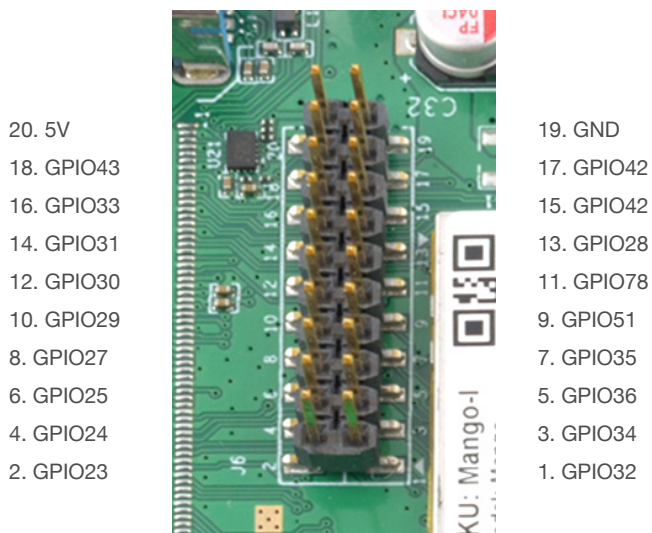
3. UART_RX

2. UART_TX

1. 3.3V

4.6. GPIO HEADER

J6



20. 5V

18. GPIO43

16. GPIO33

14. GPIO31

12. GPIO30

10. GPIO29

8. GPIO27

6. GPIO25

4. GPIO24

2. GPIO23

19. GND

17. GPIO42

15. GPIO42

13. GPIO28

11. GPIO78

9. GPIO51

7. GPIO35

5. GPIO36

3. GPIO34

1. GPIO32

4.7 DVK heatsink

