

Mango system on module (SOM) is based on IPQ6000/IPQ6010 SoC from Qualcomm, which in-corporates 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, 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, 1 x I2S/TDM, 2 x PSGMII, QSGMII, SGMII+, 1 x SDIO3.0/eMMC, PTA Coex and parallel for NAND flash memory and LCD controller

1. Features

1.1. Features

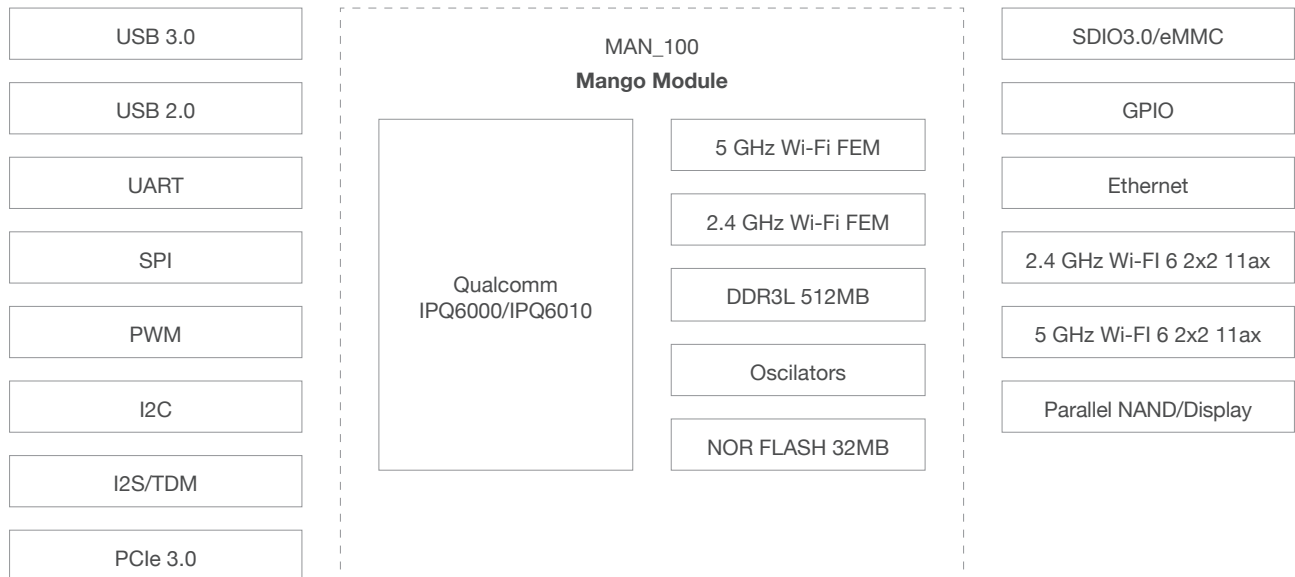
TABLE 1-1. MANGO FEATURES

Feature list		MAN_100 Mango	
Integrated core	SoC	IPQ6000/6010 ARM quad core Cortex-A53	
	Clock frequency	1.2/1.8GHz	
	Cache	512kB L2	
Memory	DRAM	DDR3L 512MB (up to 2GB)	
	NOR FLASH	32MB	
	NAND FLASH (external)	256MB	
WIFI	IEEE 802.11 b/g/n/ac/ax 2x2 MU-MIMO 2.4GHz 20/40 MHz 1024 QAM DL MU-MIMO (2ss, 2 users) DL-OFDMA (8 users) Explicit beamforming	2402-2482MHz 22dBm	
	IEEE 802.11 b/g/n/ac/ax 2x2 MU-MIMO 5GHz 20/40/80 MHz 1024 QAM DL MU-MIMO (2ss, 2 users) DL-OFDMA (8 users) Explicit beamforming	4920-5920MHz 21dBm	
RF pin	RF signal is fed to 2 external module pins	2	
Display	Display 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	3
	I2C	Inter-integrated circuit interfaces for peripheral de-vices	1
	GPIO	IN/OUT/INT	64
	PWM	Audio Pulse Width Modulation interface	4
	I2S/TDM	Multichannel interfaces for digital audio support	1
	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/+	2
	Reset	Reset controlled via voltage monitor	1
SDIO3.0/eMMC	Secure Digital Input Output / Embedded Multi Media Card	1	

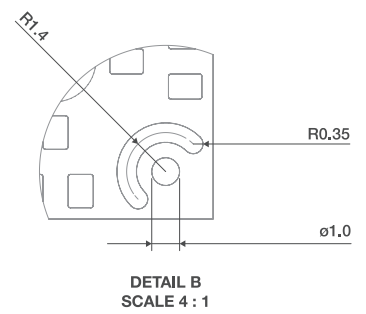
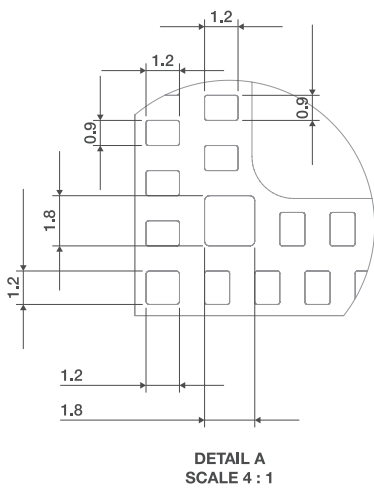
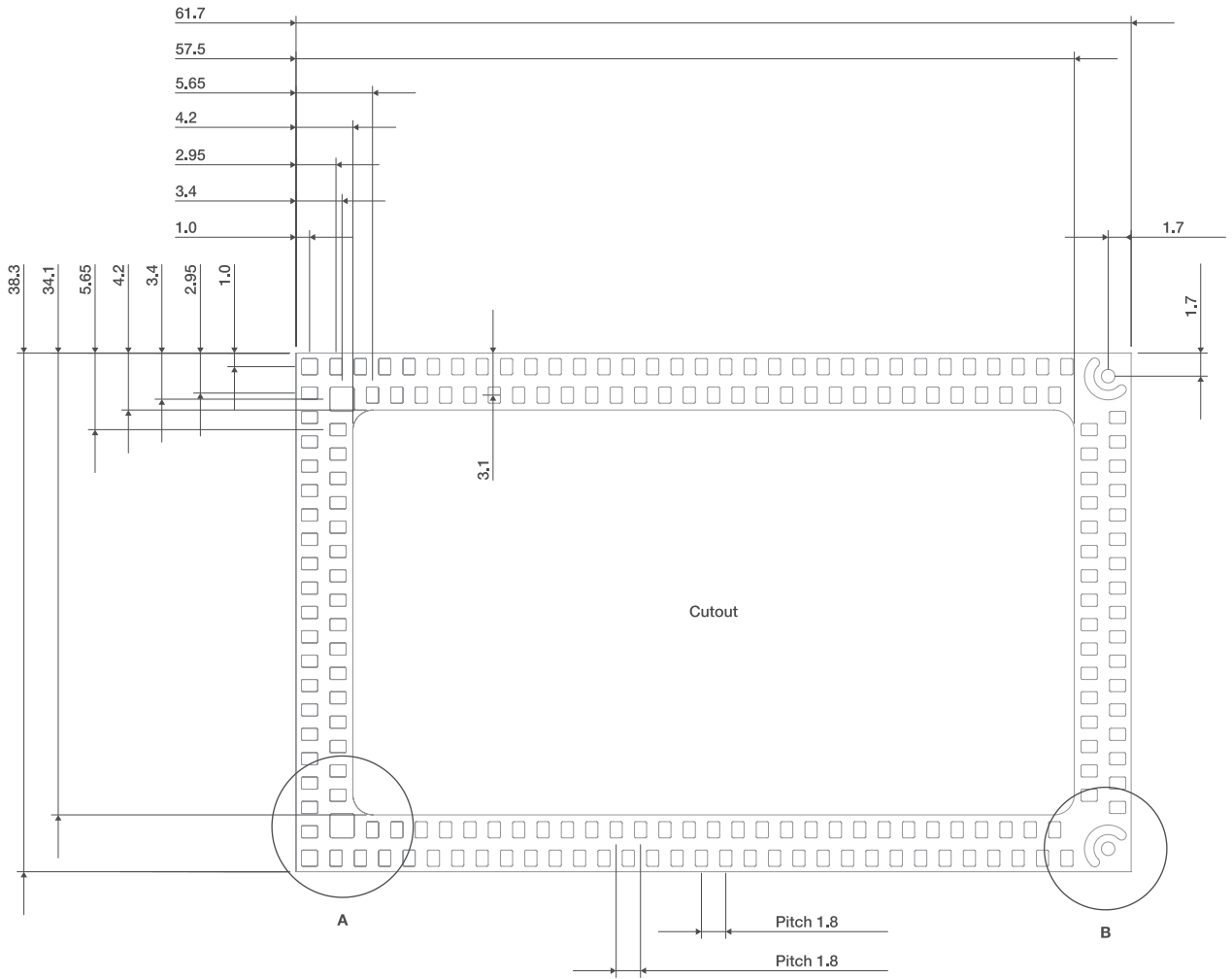
2. Block diagram

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

FIGURE 2-1. BLOCK DIAGRAM

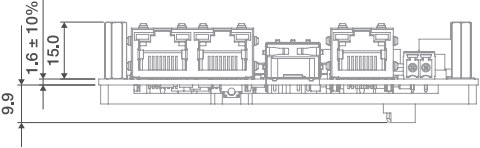
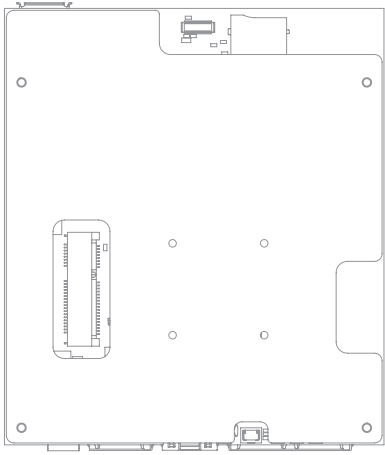
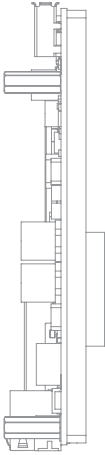
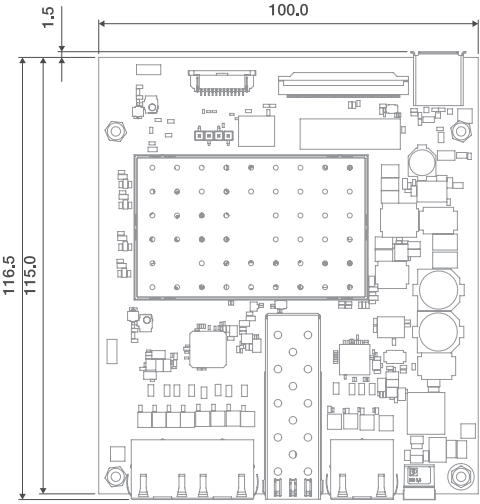


PCB footprint

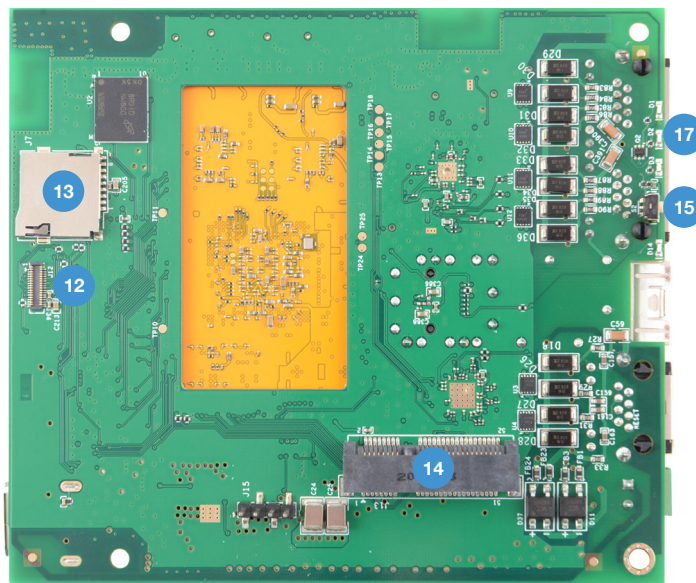
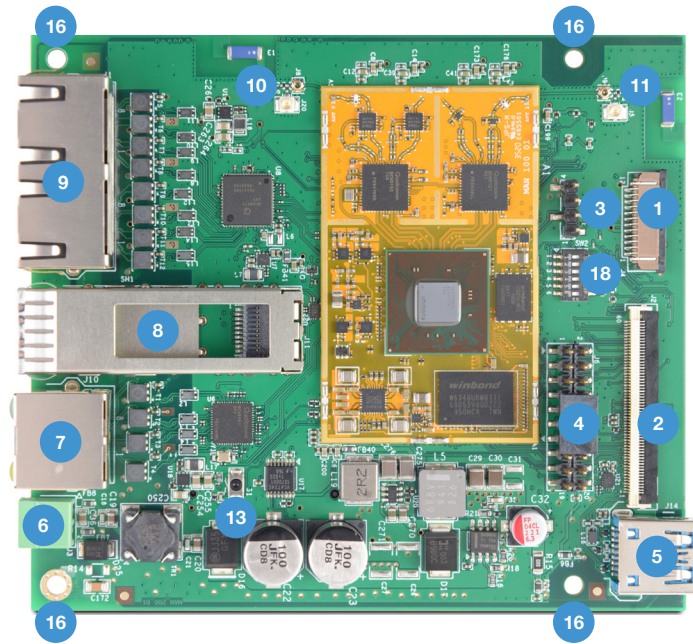


4. Development board

4.1 DVK dimensions

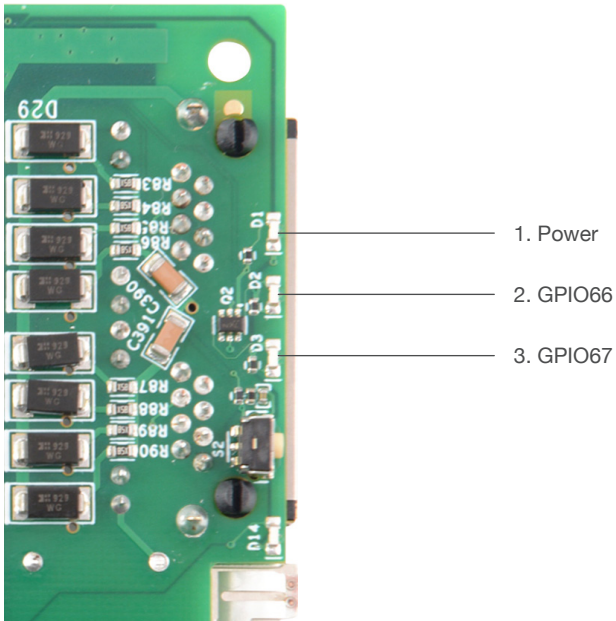


4.2 DVK interfaces



- | | |
|--|--|
| 1. Optional FPC power bus board to board connector | 11. WiFi antenna 2 and U.FL connector for external antenna |
| 2. Optional FPC power bus board to board connector | 12. EMMC module socket |
| 3. UART header | 13. SD card socket |
| 4. GPIO header | 14. mPCIe socket with PCIe3.0, USB2.0 interfaces |
| 5. USB3.0 interface | 15. Buttons (Power ON/OFF device, GPIO79) |
| 6. DC power supply 9-60V | 16. Mounting holes |
| 7. 2.5 Gbps ETH interface + POE passive 24-48V | 17. LEDs |
| 8. SFP port | 18. Configuration switch |
| 9. 2x ETH 1Gbps interface | |
| 10. WiFi antenna 1 and U.FL connector for external antenna | |

4.3 LEDs



4.4 BOOTSTRAP switch

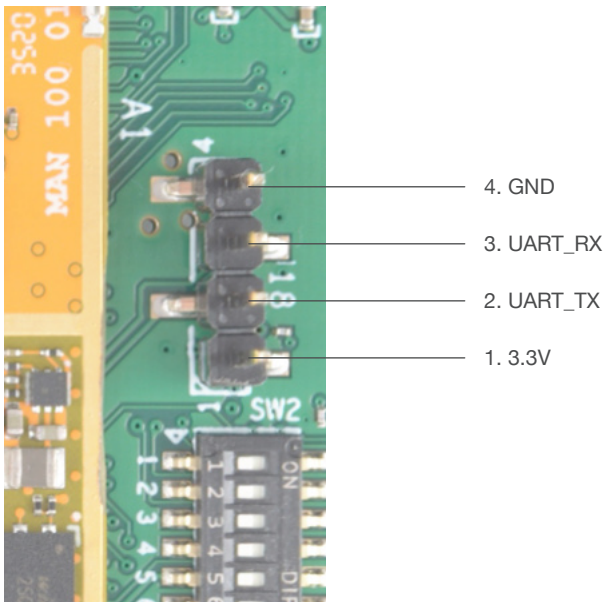
	1	2	3	4	5	6
	GPIO_3	GPIO_10	GPIO_17	GPIO_26	SGMII MUX_SEL	eMMC_MODE
ON	1	1	1	normal boot	SFP connector	Enable eMMC
OFF	0	0	0	force USB boot	2.5 Gbps ETH interface enable	Disable eMMC

GPIO_3, GPIO_10 AND GPIO_17 CONFIRGURATION

GPIO_3	GPIO_10	GPIO_17	Boot mode
0	0	0	SPI NOR (default)
0	0	1	eMMC
0	1	0	QPIC, parallel NAND
0	1	1	USB 2.0
1	0	0	SPI-NOR-GPT

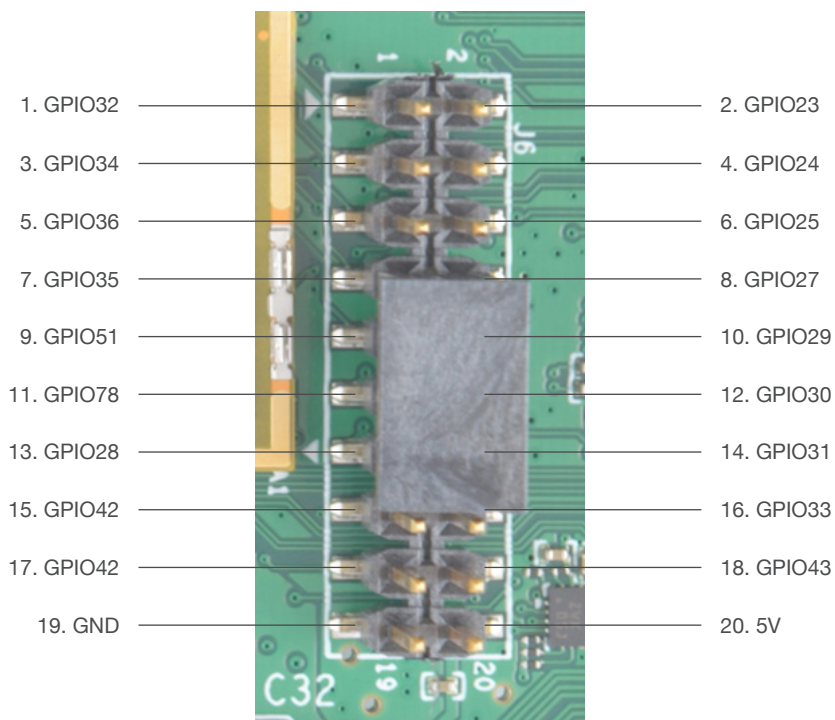
4.5 UART header

J18



4.5 GPIO HEADER

J6



4.6 DVK heatsink

