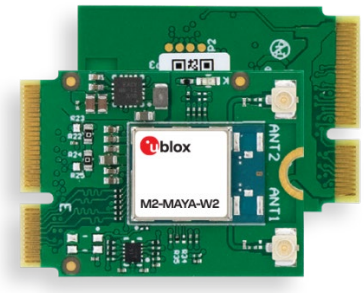
M2-MAYA-W2

M.2 card for the MAYA-W2 Wi-Fi 6, Bluetooth 5.4 and IEEE 802.15.4 module

Data sheet



Abstract

Targeted towards system integrators and design engineers, this technical data sheet includes the functional description, pin definition, specifications, country approval status, handling instructions, and ordering information for M2-MAYA-W2 short-range radio module cards. M2-MAYA-W2 offers 1x1 802.11a/b/g/n/ac/ax Wi-Fi, dual-mode Bluetooth 5.4, and IEEE 802.15.4 connectivity in an M.2 Key E form factor. It provides all the features and functionality supported in the MAYA-W2 module, with the added benefits associated with easy installation and replacement. The card can be inserted in a standard M.2 Key E slot without the need to solder the module on a host or carrier PCB.

Document information

Title	**M2-MAYA-W2**
Subtitle	M.2 card for the MAYA-W2 Wi-Fi 6, Bluetooth 5.4 and IEEE 802.15.4 module
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Product status	Corresponding content status	
Functional sample	Draft	For functional testing. Revised and supplementary data will be published later.
In development / Prototype	Objective specification	Target values. Revised and supplementary data will be published later.
Engineering sample	Advance information	Data based on early testing. Revised and supplementary data will be published later.
Initial production	Early production information	Data from product verification. Revised and supplementary data may be published later.
Mass production / End of life	Production information	Document contains the final product specification.

This document applies to the following products:

Product name	Chipset	Type number	IN/PCN reference	Product status
M2-MAYA-W271	NXP IW612	M2-MAYA-W271-00C-00	N/A	Initial production

Contents

1 Functional description

1.1 Overview

Based on the NXP IW612 chipset, the M2-MAYA-W2 card integrates the MAYA-W2 multi-radio module in M.2 form factor. The card plugs directly to the host platform and can be conveniently inserted in a standard M.2 Key E slot – without the need to solder the module on a host or carrier PCB. This Type 2230 Key E M.2 card supports all features and functionality of the MAYA-W2 module.

MAYA-W2 modules can be operated in the following modes:

- Wi-Fi 1x1 802.11a/b/g/n/ac/ax in 2.4 GHz or 5 GHz bands
- Dual-mode Bluetooth 5.4 (BR/EDR and BLE), can be operated simultaneously with Wi-Fi
- IEEE 802.15.4 that supports the Thread mesh network

Even though the M2-MAYA-W2 card is of standard grade, the module variant integrated on the card is the MAYA-W271-00B professional grade module.

1.2 Product features

As the M2-MAYA-W2 card supports all of the features supported in the MAYA-W2 module, this document describes the extended features of the M2-MAYA-W2 card specifically. For more information about the MAYA-W2 module, see the MAYA-W2 series data sheet [1].

Table 1 describes the features of the M2-MAYA-W2 card.

Grade	
Automotive	
Professional	
Standard	•
Radio	
Chip inside	NXP IW612
Bluetooth qualification	v5.4
Bluetooth profiles	HCI
Bluetooth BR/EDR	•
Bluetooth Low Energy	•
Wi-Fi 6 IEEE 802.11 standards	ax
Wi-Fi frequency band [GHz]	2.4 and 5
Bluetooth output power conducted [dBm]	Up to 20
Wi-Fi output power [dBm]	18
802.15.4 radio	•
Antenna type	2 U.FL connectors
OS support	
Android / Linux drivers (from u-blox)	•
RTOS (via NXP i.MX RT MCUs)	•
Interfaces	
High-speed UART (Bluetooth)	1
PCM, I2S (Bluetooth audio)	1
SDIO (Wi-Fi) [version]	3.0
SPI (802.15.4)	1
Features	
Micro access point [max connects]	16
Wi-Fi direct	•
WPA3	•
RF calibration in OTP	•
Programmed MAC address	•
Secure boot	•

Table 1: Key features of the M2-MAYA-W271 card

1.3 Product description

Product name	Description
M2-MAYA-W271	Standard grade M.2 card module equipped with two separate antenna connectors: one for 2.4 GHz and 5 GHz 802.11 a/b/g/n/ac/ax and another for Bluetooth/Bluetooth Low Energy (LE) 5.4 that is shared with 802.15.4. The module integrates the NXP IW612 chipset.

Table 2: Product description

1.4 Block diagram

Figure 1 shows the block diagram of the M2-MAYA-W271 card that integrates the MAYA-W271 module and includes two antenna connectors for attaching two external antennas: one for Wi-Fi and another for Bluetooth / 802.15.4. The on-card I2C GPIO expander (NXP PCAL6408A) is used to provide the device wake-up and reset sideband signals to the module.

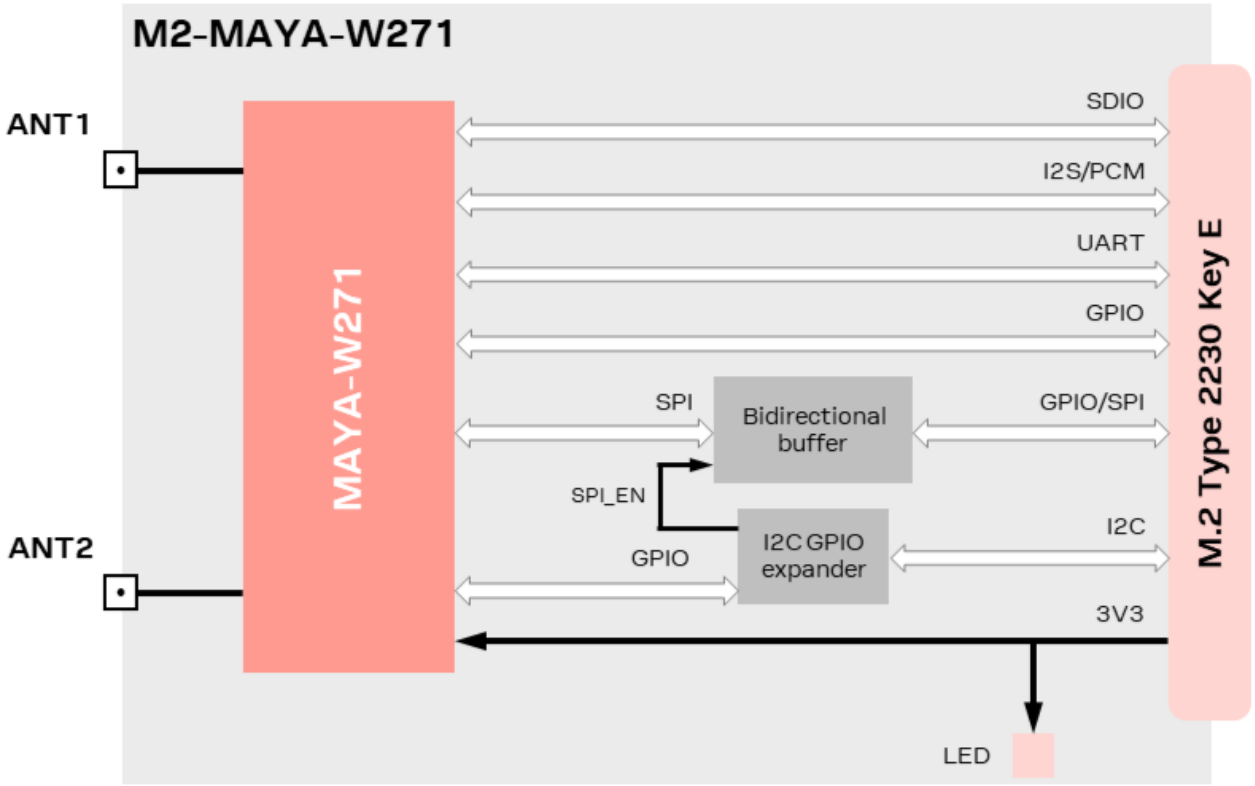

Figure 1: Block diagram of the M2-MAYA-W271 card

The I2C GPIO expander (PCAL6408A) supports 8-bit register sets for configuration, input, output, and polarity inversion. It also features programmable output drive strength, latchable inputs, programmable pull-up/pull-down resistors, and programmable open-drain or push-pull outputs. You can access the expander on the I2C bus at address 0x21.

The signals controlled by the I2C GPIO expander, along with their respective functionalities, are shown in Table 3.

Pin number	Port label	Pin type	Description
2	P0	O	Enable SPI buffer. Active high.
3	P1	O	Independent software reset for 802.15.4 radio. Active low by default. This signal is shared with Bluetooth reset on MAYA-W2 and connected to W_DISABLE2#. See also Table 7.
4	P2	O	Host-to-Wi-Fi radio wake-up signal. Active low by default.
5	P3	O	Host to Bluetooth/802.15.4 radio wake-up signal. Active low by default.
7	P4	I	Bluetooth/802.15.4 independent software reset indicator output signal to host.
8	P5	-	Not used / Not connected.
9	P6	-	Not used / Not connected.
10	P7	-	Not used / Not connected.

Table 3: Pin configuration of the I2C GPIO expander on the M2-MAYA-W271 card

2 Interfaces

The M2-MAYA-W2 card supports all MAYA-W2 module interfaces. For more information about these interfaces, see the MAYA-W2 series data sheet [1].

2.1 Boot configuration pins

By default, the M2-MAYA-W2 card is configured for using the SDIO interface for Wi-Fi and the UART interface for Bluetooth. The IEEE 802.15.4 radio data is communicated over the SPI interface.

Host interface selection and firmware boot options are selected using the MAYA-W2 module configuration pin **CONFIG[1:0]**. The configuration settings for the available boot options are shown in Table 4.

CONFIG[1]	CONFIG[0]	Wi-Fi	Bluetooth	Number of SDIO functions
1	1	SDIO	UART	1 (Wi-Fi)

Table 4: Firmware boot options of the MAYA-W2 module

The M2-MAYA-W2 card supports the same boot options as the MAYA-W2 module. To set the **CONFIG[1:0]** configuration pin to logic-low level ("0"), it must be pulled down with a 51 kΩ resistor to GND. MAYA-W2 has an internal pull-up resistor connected to this pin, which means that no external pull-up resistor is required to set the configuration pin to logic-high level ("1").

Figure 2 shows the "11" default configuration used to select the SDIO interface for Wi-Fi and UART interface for Bluetooth.

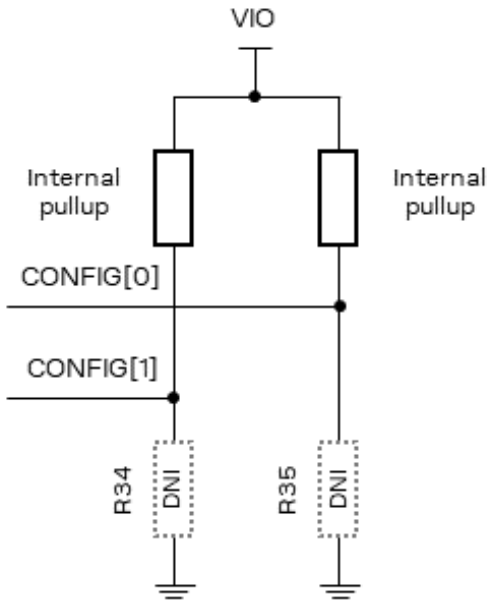

Figure 2: Default configuration of the M2-MAYA-W2 boot pins

Figure 3 shows the physical locations of pull-down resistor positions, R34 and R35.

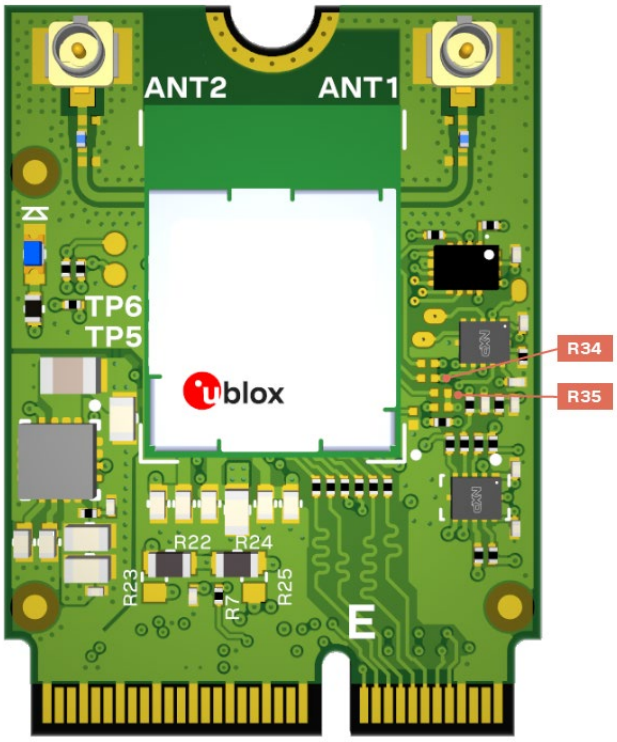

Figure 3: Position of resistors R34 and R35 on M2-MAYA-W1

2.2 SDIO

The SDIO device interface is conformant with the industry standard SDIO 3.0 specification, including default speed (25 MHz), high-speed (50 MHz), SDR12/25/50/104 (12/25/50/104 MB/s), and DDR50 (50 MB/s) modes. The interface supports 1-bit and 4-bit SDIO transfer modes at the full clock range up to 208 MHz for SDR104. All mandatory SDIO commands are supported. All bus speed modes are supplied from the SDIO I/O power supply (by default set to 1.8 V).

2.3 UART

MAYA-W2 series modules support a high-speed UART interface that is conformant with the industry-standard 16550 specification. For information about the features and baud rates supported in the MAYA-W2 series high-speed UART, see the MAYA-W2 data sheet [1].

2.4 SPI interface

MAYA-W2 series modules support an SPI host interface for IEEE 802.15.4 radio with a maximum clock speed of 10 MHz.

2.5 PCM/I2S

M2-MAYA-W2 supports the full functionality of the MAYA-W2 series PCM and I2S interfaces for audio. The pins of the PCM and I2S interfaces are shared. See also, the MAYA-W2 data sheet [1].

2.6 Test points

Test points on the M2-MAYA-W2 card give access to the JTAG interface, as well as to the WCI-2 and PTA coexistence signal interfaces on the MAYA-W2 module. Figure 4 summarizes the functionalities available on those test points and shows the position of each on the M2-MAYA-W2 card.

For information about how these signals are used in NXP platforms, see the Pin description. See also the NXP M.2 Key E Pinout Definition [6].

Test point #	Functionality	Description
TP1	JTAG_TDI	JTAG test data signal (input)
TP2	JTAG_TDO	JTAG test data signal (output)
TP3	JTAG_TMS	JTAG controller select
TP4	JTAG_TCK	JTAG test clock signal
TP5	WCI_SOUT	WCI-2 coexistence serial interface output
TP6	WCI_SIN	WCI-2 coexistence serial interface input
TP7	EXT_GNT/SPI RX	PTA mode: EXT_GNT - External radio grant output signal
TP8	EXT_PRI/SPI_TX	PTA mode: EXT_PRI - External radio priority input signal
TP9	EXT_REQ/SPI_FRM	PTA mode: EXT_REQ - External radio request input signal

Table 5: M.2 pin number and functionality of the test points on the M2-MAYA-W2 card.

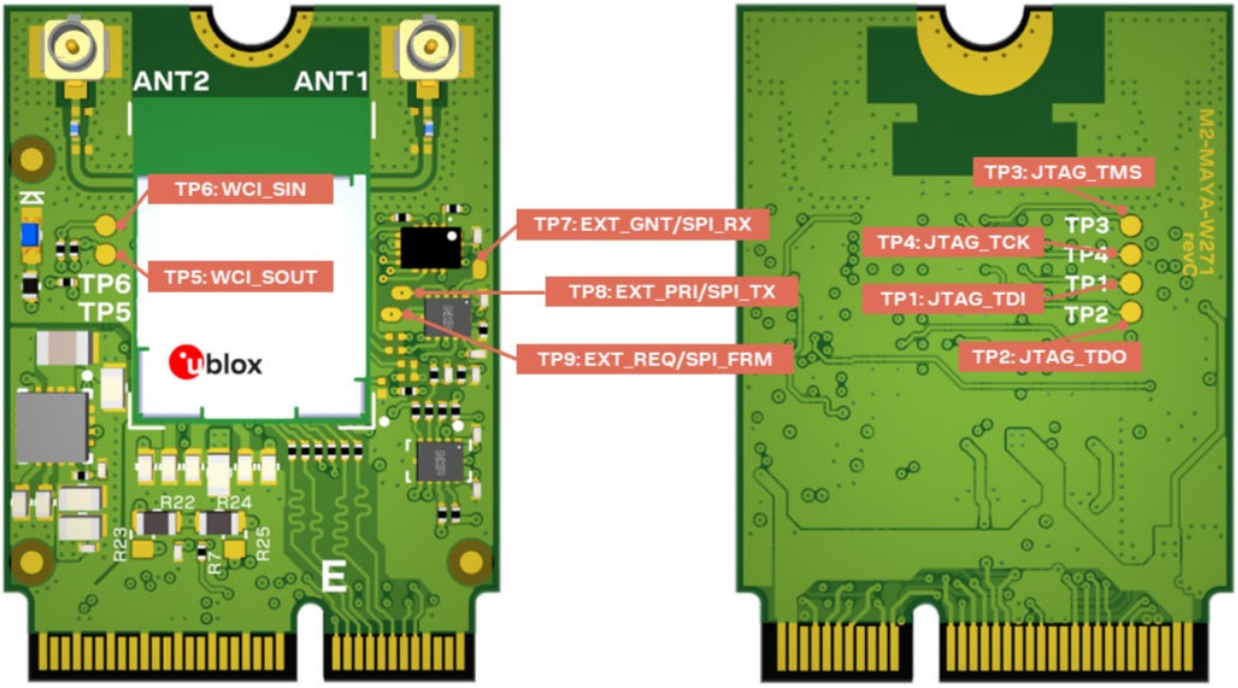

Figure 4: Position of test points on the top side (left) and on the bottom side (right) of the M2-MAYA-W2 card

2.7 Antenna connectors

The M2-MAYA-W271 card features two U.FL connectors:

- Connector J1 for Wi-Fi operation.
- Connector J2 for Bluetooth / 802.15.4.

The physical location of the U.FL connectors on the M.2 card is shown in Figure 5.

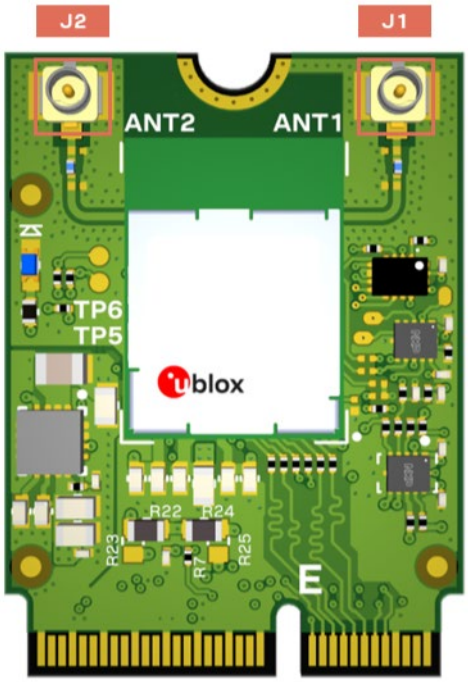

Figure 5: Location of M2-MAYA-W271 antenna U.FL connectors

☞ Given the small size and low profile of the U.FL connector, be sure to follow the manufacturer's instructions to avoid any damage when mating and un-mating the connector. See also the U.FL series guideline [7] and U.FL series data sheet [8].

2.8 Operating and I/O voltages

The M2-MAYA-W2 card requires a 3.3 V power supply. The card takes the 3.3 V supply from the **3V3** pins on the M.2 connector, while the 1.8 V supply is generated by the on-card DC-DC converter.

The default setting for **VIO** is 1.8 V but this can be changed to 3.3 V by moving the 0 Ω resistor in position R22 to R23 (default = DNI), as shown in (a), Figure 6. Note that R22 and R23 share a common pad. Only one of the two resistors R22 and should be present at any time.

The default setting for **VIO_SD** is 1.8 V but this can be changed to 3.3 V by moving the 0 Ω resistor in position R24 to R25 (default = DNI), as shown in (b), Figure 6. Note that R24 and R25 share a common pad. Only one of the two resistors, R24 or R25, should be connected at any time.

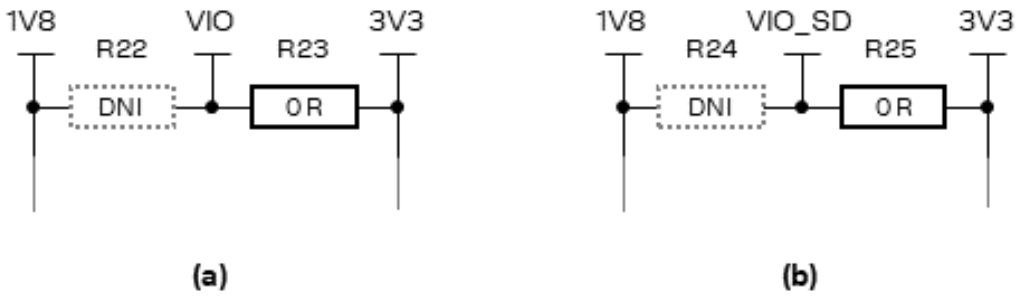

Figure 6: Placement of 0 Ω resistor to change (a) VIO from 1V8 V to 3V3, (b) VIO_SD from 1V8 to 3V3

Figure 7 shows the resistor positions used for changing the voltage supply levels for **VIO** and VIO_SD**.**

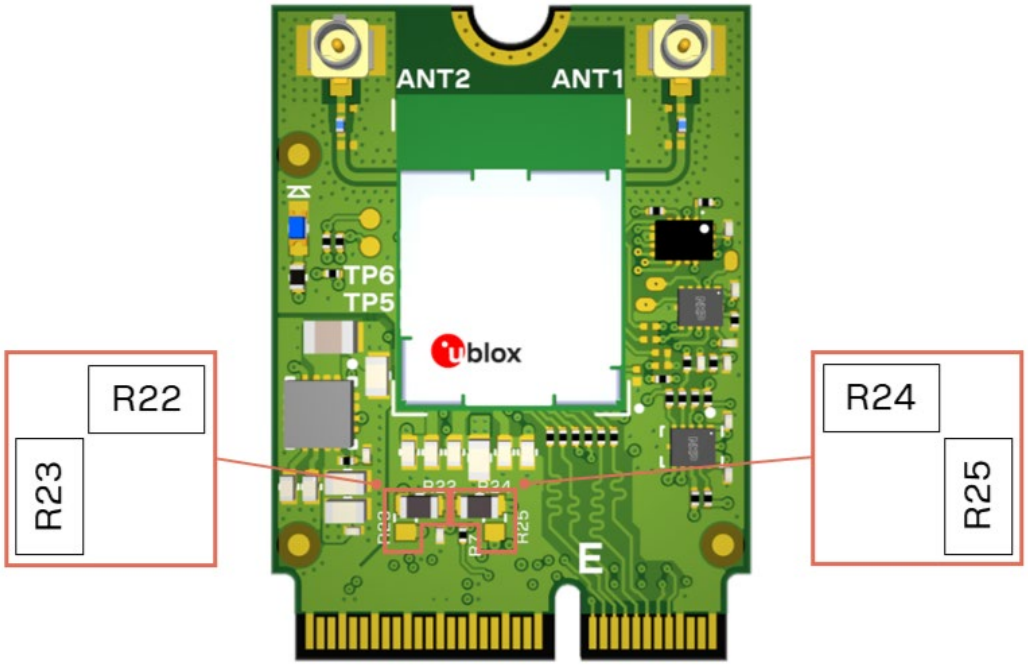

Figure 7: R22 and R23 positions for selecting VIO, and R24 and R25 positions for selecting VIO_SD

Figure 8 shows the on-card level-shifter that translates the M.2 signals, **UART_WAKE#**, **W_DISABLE1#** and **W_DISABLE2#,** from 3V3 to VIO.

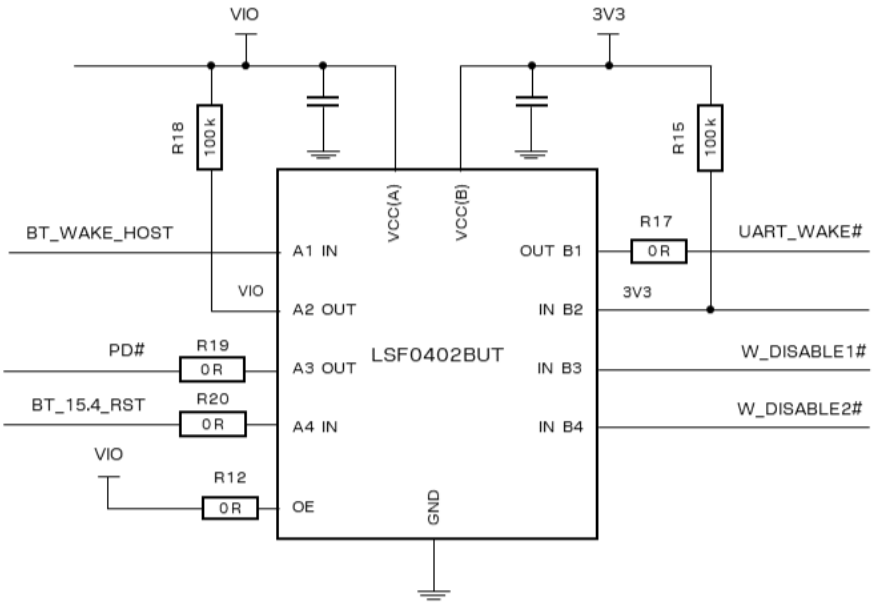

Figure 8: VIO-to-3V3 level shifter

Figure 9 shows the position of the level-shifter (U2) on the card.

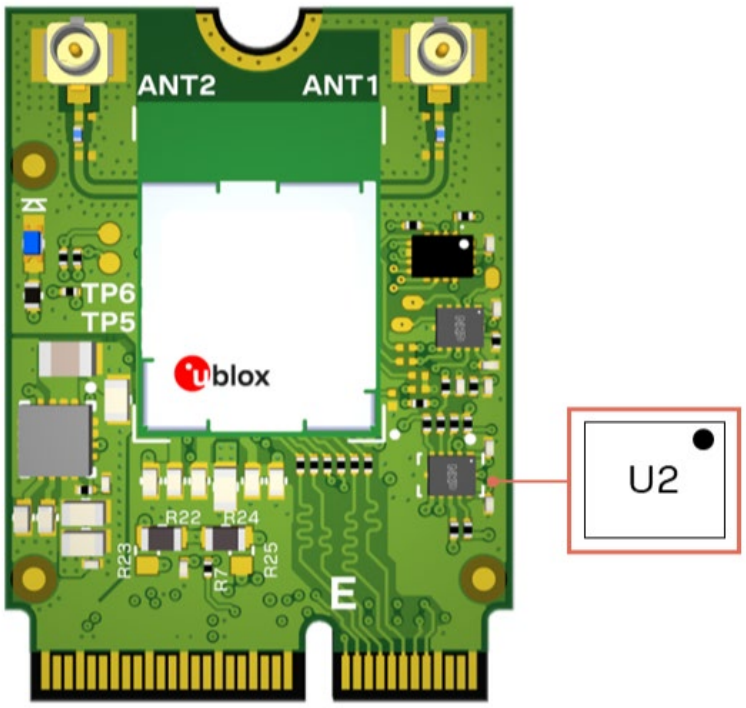

Figure 9: Position of VIO-to-3.3 V level shifter on M2-MAYA-W1

3 Pin definition

The M2-MAYA-W2 card module implements the standard pinout of M.2 mechanical Type E sockets, as defined by the PCI Express M.2 Specification [5]. In co-operation with NXP, the card fully supports the optional sideband and debug signals defined by the NXP Wi-Fi/Bluetooth M.2 Key E Pinout Definition for tri-radio M.2 module design [6].

3.1 Pin assignment

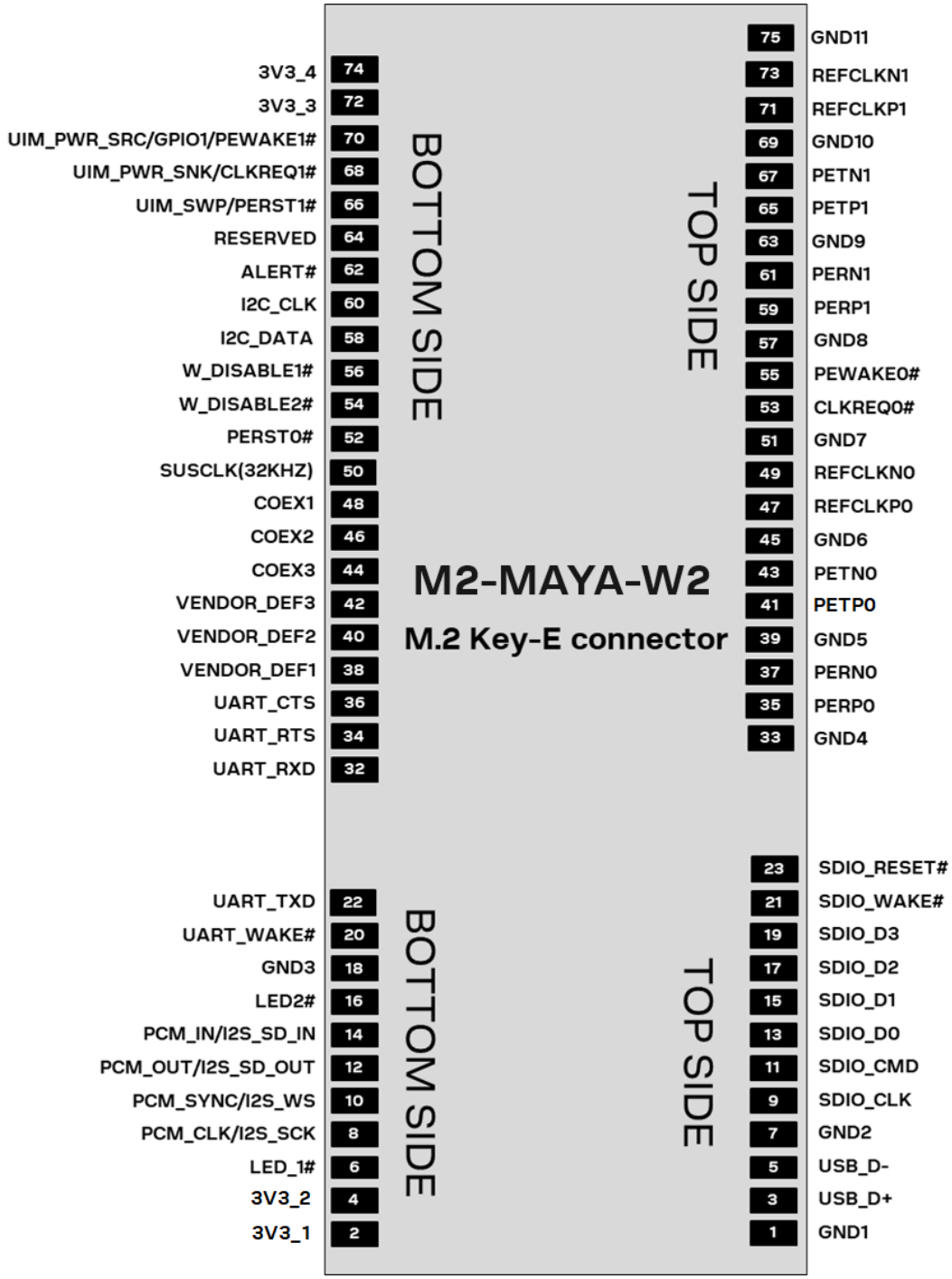

Figure 10: M2-MAYA-W2 pin assignment

3.2 Pin description

Table 6 describes the M2-MAYA-W2 pins located at the top side of the M.2 card. The signal direction of the pins (inputs or outputs) is shown from the M2-MAYA-W2 card perspective.

Pin no.	Pin name	Pin type[1]	Voltage	Description
1	GND1	GND		Ground
3	USB_D+	NC		USB data + serial data interface. Not connected.
5	USB_D-	NC		USB data - serial data interface. Not connected.
7	GND2	GND		Ground
9	SDIO_CLK	I	VIO_SD	SDIO Clock
11	SDIO_CMD	I/O	VIO_SD	SDIO Command
13	SDIO_D0	I/O	VIO_SD	SDIO Data 1
15	SDIO_D1	I/O	VIO_SD	SDIO Data 2
17	SDIO_D2	I/O	VIO_SD	SDIO Data 3
19	SDIO_D3	I/O	VIO_SD	SDIO Data 4
21	SDIO_WAKE#	O	VIO	NXP usage: **WLAN_WAKE_HOST**. Sideband signal used by the Wi-Fi radio to wake up the platform. Active Low by default. Connect to Host GPIO Open drain. A pullup resistor is required on the platform.
23	SDIO_RESET#	I	VIO	NXP usage: **WLAN_INDEPENDENT_RESET**. Sideband signal to independently reset the Wi-Fi radio. Active Low by default. Connect to Host GPIO
M.2 Key E connector notch				
33	GND4	GND		Ground
35	PERP0	NC		PCIe RX. Not connected
37	PERN0	NC		PCIe RX. Not connected
39	GND5	GND		Ground
41	PETP0	NC		PCIe TX. Not connected
43	PETN0	NC		PCIe TX. Not connected
45	GND6	GND		Ground
47	REFCLKP0	NC		PCIe Reference Clock. Not connected
49	REFCLKN0	NC		PCIe Reference Clock. Not connected
51	GND7	GND		Ground
53	CLKREQ0#	NC		PCIe Clock Request. Not connected
55	PEWAKE0#	NC		PCIe PME Wake. Not connected
57	GND8	GND		Ground
59	PERP1	NC		PCIe RX. Not connected
61	PERN1	NC		PCIe RX. Not connected
63	GND9	GND		Ground
65	PETP1	NC		PCIe TX. Not connected
67	PETN1	NC		PCIe TX. Not connected
69	GND10	GND		Ground

[1] I/O notations: I=Input, O=Output, I/O=Input or Output, PU=Pull Up, PD=Pull Down, D=Default, PP=Push-Pull, OD=Open Drain, AI/AO=Analog Input/Output, NC=Not Connected

Pin no.	Pin name	Pin type[1]	Voltage	Description
71	REFCLKP1	NC		PCIe Reference Clock. Not connected
73	REFCLKN1	NC		PCIe Reference Clock. Not connected
75	GND11	GND		Ground

Table 6: M2-MAYA-W2 pinout – top side

Table 7 describes the M2-MAYA-W2 pins located on the bottom side of the M.2 card. The signal direction of the pins (inputs or outputs) is shown from the M2-MAYA-W2 card perspective.

Pin no.	Pin name	Pin type[2]	Voltage	Description
2	3V3_1	PWR	3.3 V	Supply voltage pin
4	3V3_2	PWR	3.3 V	Supply voltage pin
6	LED_1#	NC		Not connected
8	PCM_CLK/I2S_SCK	I/O	VIO	PCM data clock
10	PCM_SYNC/I2S_WS	I/O	VIO	PCM frame sync
12	PCM_OUT/I2S_SD_OUT	O	VIO	PCM data output
14	PCM_IN/I2S_SD_IN	I	VIO	PCM data input
16	LED2#	NC		Not connected
18	VIO_CFG	NC		Not connected
20	UART_WAKE#	O	3.3 V	NXP usage: **BT_WAKE_HOST**. Sideband signal used by the Bluetooth radio to wake up the platform. Active Low by default. Connect to Host GPIO Open drain. Pullup required on platform.
22	UART_TXD	O	VIO	UART transmit. Connected to host platform UART receive (UART_RXD)
		M.2 Key E connector notch		
32	UART_RXD	I	VIO	UART receive. Connected to host platform UART transmit (UART_TXD)
34	UART_RTS	O	VIO	UART Request-To-Send. Connected to host platform UART Clear-To-Send (UART_CTS)
36	UART_CTS	I	VIO	UART Clear-To-Send. Connected to host platform UART Request-To-Send (UART_RTS)
38	VENDOR_DEF1	I/O	VIO	NXP usage: **SPI_RXD**. SPI receive signal input to 802.15.4 radio. PTA mode: EXT_GNT – External radio grant output signal
40	VENDOR_DEF2	I/O	VIO	NXP usage: **SPI_TXD**. SPI transmit signal output from 802.15.4 radio. PTA mode: EXT_PRI – External radio priority input signal
42	VENDOR_DEF3	I	VIO	NXP usage: **SPI_CLK**. SPI clock signal input for 802.15.4 radio.
44	COEX3	NC		Not connected
46	COEX2	O	VIO	WCI_SOUT – WCI-2 coexistence serial interface output
48	COEX1	I	VIO	WCI_SIN – WCI-2 coexistence serial interface input
50	SUSCLK(32KHZ)	NC		Not connected
52	PERST0#	NC		PCIe host indication to reset the device. Not connected
54	W_DISABLE2#	I	3.3 V	NXP usage: **BT_INDEPENDENT_RESET**. Sideband signal to independently reset the Bluetooth radio. Active Low by default. Connected to Host GPIO.
56	W_DISABLE1#	I	3.3 V	NXP usage: **PDn**. Full Power-down for the Wi-Fi/BT radio:

[2] I/O notations: I=Input, O=Output, I/O=Input or Output, PU=Pull Up, PD=Pull Down, D=Default, PP=Push-Pull, OD=Open Drain, AI/AO=Analog Input/Output, NC=Not Connected

Pin no.	Pin name	Pin type[2]	Voltage	Description
				High = normal mode, Low = full power-down mode. Connect to host GPIO.
58	I2C_DATA	I/O	VIO	I2C data for on-card I/O expander. Open drain. Pull-up required on platform.
60	I2C_CLK	I	VIO	I2C clock for on-card I/O expander. Open drain. Pull-up required on platform.
62	ALERT#	O	VIO	NXP usage: **SPI_INT**. SPI interrupt signal. [3]
64	RESERVED	I	VIO	NXP usage: **SPI_FRM**. SPI frame (enable) signal. Active low. PTA mode: EXT_REQ – External radio request input signal
66	UIM_SWP/PERST1#	NC		Not connected
68	UIM_PWR_SNK/ CLKREQ1#	NC		Not connected
70	UIM_PWR_SRC/ GPIO1/ PEWAKE1#	NC		Not connected
72	3V3_3	PWR	3.3 V	Supply voltage pin
74	3V3_4	PWR	3.3 V	Supply voltage pin

Table 7: M2-MAYA-W2 pinout (bottom side)

[3] Current version of M2-MAYA-W271 has that signal configured as a push-pull output. This shall be changed to an open-drain output in a future hardware release.

4 Electrical specifications

⚠ Stressing the device above one or more of the ratings of the Absolute maximum ratings can cause permanent damage. These are stress ratings only. Operating the module at these ratings or in conditions other than those specified in the Operating conditions should be avoided. Exposure to absolute maximum rating conditions for extended periods can affect device reliability.

☞ All given application information is only advisory and does not form part of the specification.

4.1 Absolute maximum ratings

Symbol	Description	Min.	Max.	Units
3V3	Power supply voltage	-	3.96 (DC)	V
$T_{STORAGE}$	Storage temperature	-40	+85	°C

Table 8: Absolute maximum ratings

⚠ The product is not protected against overvoltage or reversed voltages. If necessary, any voltage spikes exceeding the power supply voltage specification given in Table 8 must be limited to values within the specified boundaries by using appropriate protection devices.

4.2 Maximum ESD ratings

Applicability	Min.	Max.	Units
Human Body Model (HBM), according to ANSA/ESDA/JEDEC JS-001-2014	-2000	+2000	V
Charged Device Model (CDM), according to JESD22-C101	-500	+2000	V

Table 9: Maximum ESD ratings

4.3 Operating conditions

Symbol	Parameter	Min.	Typ	Max.	Units
3V3	Power supply voltage	3.14	3.3	3.46	V
T_A	Ambient operating temperature	-40	-	+85	°C

Table 10: Operating conditions

4.4 Digital pad ratings

Symbol	Parameter	VIO	Min.	Max.	Units
V_{IH}	Input high voltage	1.8 V / 3.3 V	0.7*VIO	VIO+0.4	V
V_{IL}	Input low voltage	1.8 V / 3.3 V	-0.4	0.3*VIO	V
V_{HYS}	Input hysteresis	1.8 V / 3.3 V	100	-	mV
V_{OH}	Output high voltage	1.8 V / 3.3V	VIO-0.4	-	V
V_{OH}	Output low voltage	1.8 V / 3.3 V	-	0.4	V

Table 11: DC characteristics VIO

4.5 Power consumption

Peak current condition	Temperature	Supply current	Units
Active transmission at max. rated output power (Wi-Fi)	Room temperature	0.75	A
Active transmission at max. rated output power (Bluetooth)	Room temperature	0.16	A
Firmware initialization	Room temperature	0.61	A

Table 12: Peak current consumption

4.6 Radio specification

4.6.1 Bluetooth

Parameter	Specification
RF Frequency Range	2.402 – 2.480 GHz
Supported Modes	Bluetooth 5.4 Bluetooth Low Energy (LE) • LE long range • Shared RF with BR/EDR • 2 Mbps LE
Modulation	1 Mbit/s: GFSK (BR) 2 Mbit/s: π/4 DQPSK (EDR) 3 Mbit/s: 8DQPSK (EDR)
Transmit Power	Class 1 BR: 19 dBm
	Class 2 BR: 3 dBm
	Class 1 EDR: 9 dBm
	Class 2 EDR: 3 dBm
	Bluetooth LE: 19 dBm
Receiver sensitivity (typical values)	Bluetooth BR 1DH1: -93 dBm
	Bluetooth EDR 2DH1: -93 dBm
	Bluetooth EDR 3DH1: -87 dBm
	Bluetooth LE Coded, 125 kbps: -104 dBm Bluetooth LE Coded, 500 kbps: -103 dBm Bluetooth LE 1M: -99 dBm Bluetooth LE 2M: -97 dBm

Table 13: Bluetooth radio parameters

4.6.2 IEEE 802.15.4

Parameter	Specification
RF Frequency Range	2.405 – 2.480 GHz
Supported Mode	IEEE 802.15.4-2020 • Support for Thread in 2.4 GHz band • Support for Matter over Thread
Modulation	O-QPSK
Transmit Power	Transmit Power up to 21 dBm, Channel 26: 0 dBm
Receiver sensitivity (Typical values)	Channel 11 (2405 MHz): -101 dBm Channel 12 (2410 MHz): -101 dBm Channel 13 (2415 MHz): -101 dBm Channel 14 (2420 MHz): -101 dBm

Parameter	Specification
	Channel 15 (2425 MHz): -101 dBm Channel 16 (2430 MHz): -101 dBm Channel 17 (2435 MHz): -101 dBm Channel 18 (2440 MHz): -100 dBm Channel 19 (2445 MHz): -101 dBm Channel 20 (2450 MHz): -101 dBm Channel 21 (2455 MHz): -101 dBm Channel 22 (2460 MHz): -101 dBm Channel 23 (2465 MHz): -101 dBm Channel 24 (2470 MHz): -101 dBm Channel 25 (2475 MHz): -101 dBm Channel 26 (2480 MHz): -100 dBm

4.6.3 Wi-Fi

M2-MAYA-W2 modules support dual-band Wi-Fi with 802.11a/b/g/n/ac/ax operation in the 2.4 GHz and 5 GHz radio bands. The module is designed to operate in only one frequency band at a time.

Parameter	Operating mode	Specification
RF Frequency range	802.11b/g/n/ax	2.400 – 2.500 GHz
	802.11a/n/ac/ax	4.900 – 5.895 GHz
Modulation	802.11b	CCK and DSSS
	802.11a/g/n/ac/ax	OFDM
Supported data rates	802.11b	1, 2, 5.5, 11 Mbps
	802.11a/g	6, 9, 12, 18, 24, 36, 48, 54 Mbps
	802.11n	MCS0 – MCS7
	802.11 ac	MCS0 – MCS9
	802.11.ax	MCS0 – MCS11
Supported channel bandwidth	802.11b/g	20 MHz
	802.11n	20, 40 MHz
	802.11ac/ax	20, 40, 80 MHz
Supported guard interval (GI)	802.11ax	800, 1600, 3200 ns

Table 14: Wi-Fi radio parameters

Parameter	Operating mode	802.11 EVM limit	Specification (typ. output power tolerance ± 2 dB)
Maximum transmit power 2.4 GHz	DSSS/CCK	-9 dB	18 dBm
	OFDM, BPSK	-8 dB	18 dBm
	OFDM, QPSK	-13 dB	18 dBm
	OFDM, 16-QAM	-19 dB	18 dBm
	OFDM, 64-QAM, 3/4	-25 dB	17 dBm
	OFDM, 64-QAM, 5/6	-27 dB	17 dBm
	OFDM, 1024-QAM, 3/4	-35 dB	16 dBm
	OFDM, 1024-QAM, 5/6	-35 dB	16 dBm

Parameter		Operating mode	802.11 EVM limit	Specification (typ. output power tolerance ± 2 dB)
	5 GHz	OFDM, BPSK	-5 dB	18 dBm
		OFDM, QPSK	-13 dB	18 dBm
		OFDM, 16-QAM	-19 dB	18 dBm
		OFDM, 64-QAM, 3/4	-25 dB	17 dBm
		OFDM, 64-QAM, 5/6	-27 dB	17 dBm
		OFDM, 256-QAM, 3/4	-30 dB	15 dBm
		OFDM, 256-QAM, 5/6	-32 dB	14 dBm
		OFDM, 1024-QAM, 3/4	-35 dB	11 dBm
		OFDM, 1024-QAM, 5/6	-35 dB	10 dBm

Table 15: Wi-Fi radio maximum transmit power parameters

Band	Operating mode	Data rate	Bandwidth	Specification (Typical Values) [1]
2.4 GHz	802.11b	1 Mbps / 2 Mbps	20 MHz	-93 dBm / -92 dBm
		5.5 Mbps / 11 Mbps		-90 dBm / -87 dBm
	802.11g	6 Mbps / 9 Mbps	20 MHz	-90 dBm / -89 dBm
		12 Mbps / 18 Mbps		-88 dBm / -86 dBm
		24 Mbps / 36 Mbps		-83 dBm / -80 dBm
		48 Mbps / 54 Mbps		-75 dBm / -74 dBm
	802.11n	MCS0 / MCS1	20 MHz	-90 dBm / -88 dBm
		MCS2 / MCS3		-85 dBm / -82 dBm
		MCS4 / MCS5		-79 dBm / -75 dBm
		MCS6 / MCS7		-73 dBm / -72 dBm
		MCS0 / MCS1	40 MHz	-87 dBm / -86 dBm
		MCS2 / MCS3		-84 dBm / -80 dBm
		MCS4 / MCS5		-77 dBm / -73 dBm
		MCS6 / MCS7		-71 dBm / -70 dBm
	802.11ax	MCS0 / MCS1	20 MHz	-90 dBm / -88 dBm
		MCS2 / MCS3		-87 dBm / -84 dBm
		MCS4 / MCS5		-81 dBm / -77 dBm
		MCS6 / MCS7		-75 dBm / -74 dBm
		MCS8 / MCS9		-70 dBm / -69 dBm
		MCS10 / MCS11		-64 dBm / -62 dBm
		MCS0 / MCS1	40 MHz	-87 dBm / -86 dBm
		MCS2 / MCS3		-85 dBm / -82 dBm
		MCS4 / MCS5		-79 dBm / -75 dBm
		MCS6 / MCS7		-73 dBm / -72 dBm
		MCS8 / MCS9		-68 dBm / -66 dBm
		MCS10 / MCS11		-63 dBm / -60 dBm
5 GHz	802.11a	6 Mbps/9 Mbps	20 MHz	-92 dBm / -92 dBm
		12 Mbps/18 Mbps		-90 dBm / -88 dBm
		24 Mbps/36 Mbps		-85 dBm / -82 dBm
		48 Mbps/54 Mbps		-78 dBm / -76 dBm
	802.11n	MCS0 / MCS1	20 MHz	-92 dBm / -90 dBm
		MCS2 / MCS3		-88 dBm / -84 dBm

Band	Operating mode	Data rate	Bandwidth	Specification (Typical Values) [1]
		MCS4 / MCS5		-81 dBm / -77 dBm
		MCS6 / MCS7		-75 dBm / -74 dBm
		MCS0 / MCS1	40 MHz	-90 dBm / -88 dBm
		MCS2 / MCS3		-86 dBm / -83 dBm
		MCS4 / MCS5		-79 dBm / -75 dBm
		MCS6 / MCS7		-74 dBm / -72 dBm
	802.11ac	MCS0 / MCS1	20 MHz	-92 dBm / -90 dBm
		MCS2 / MCS3		-88 dBm / -85 dBm
		MCS4 / MCS5		-82 dBm / -77 dBm
		MCS6 / MCS7		-76 dBm / -75 dBm
		MCS8		-70 dBm
		MCS0 / MCS1	40 MHz	-90 dBm / -88 dBm
		MCS2 / MCS3		-86 dBm / -83 dBm
		MCS4 / MCS5		-80 dBm / -76 dBm
		MCS6 / MCS7		-74 dBm / -73 dBm
		MCS8 / MCS9		-69 dBm / -67 dBm
		MCS0 / MCS1	80 MHz	-86 dBm / -85 dBm
		MCS2 / MCS3		-83 dBm / -80 dBm
		MCS4 / MCS5		-77 dBm / -73 dBm
		MCS6 / MCS7		-71 dBm / -70 dBm
		MCS8 / MCS9		-66 dBm / -64 dBm
	802.11ax	MCS0 / MCS1	20 MHz	-93 dBm / -91 dBm
		MCS2 / MCS3		-89 dBm / -86 dBm
		MCS4 / MCS5		-83 dBm / -79 dBm
		MCS6 / MCS7		-78 dBm / -76 dBm
		MCS8 / MCS9		-72 dBm / -71 dBm
		MCS10 / MCS11		-66 dBm / -64 dBm
		MCS0 / MCS1	40 MHz	-90 dBm / -89 dBm
		MCS2 / MCS3		-87 dBm / -84 dBm
		MCS4 / MCS5		-81 dBm / 77 dBm
		MCS6 / MCS7		-76 dBm / -74 dBm
		MCS8 / MCS9		-70 dBm / -69 dBm
		MCS10 / MCS11		-66 dBm / -62 dBm
		MCS0 / MCS1	80 MHz	-87 dBm / -86 dBm
		MCS2 / MCS3		-84 dBm / -81 dBm
		MCS4 / MCS5		-79 dBm / -74 dBm
		MCS6 / MCS7		-74 dBm / -72 dBm
		MCS8 / MCS9		-68 dBm / -66 dBm
		MCS10 / MCS11		-63 dBm / -61 dBm

Table 16: Wi-Fi receiver characteristics

[1] Values are valid at Antenna pin ports at room temperature

5 Mechanical specification

5.1 Physical dimensions

Figure 11 shows the critical physical dimensions of the card.

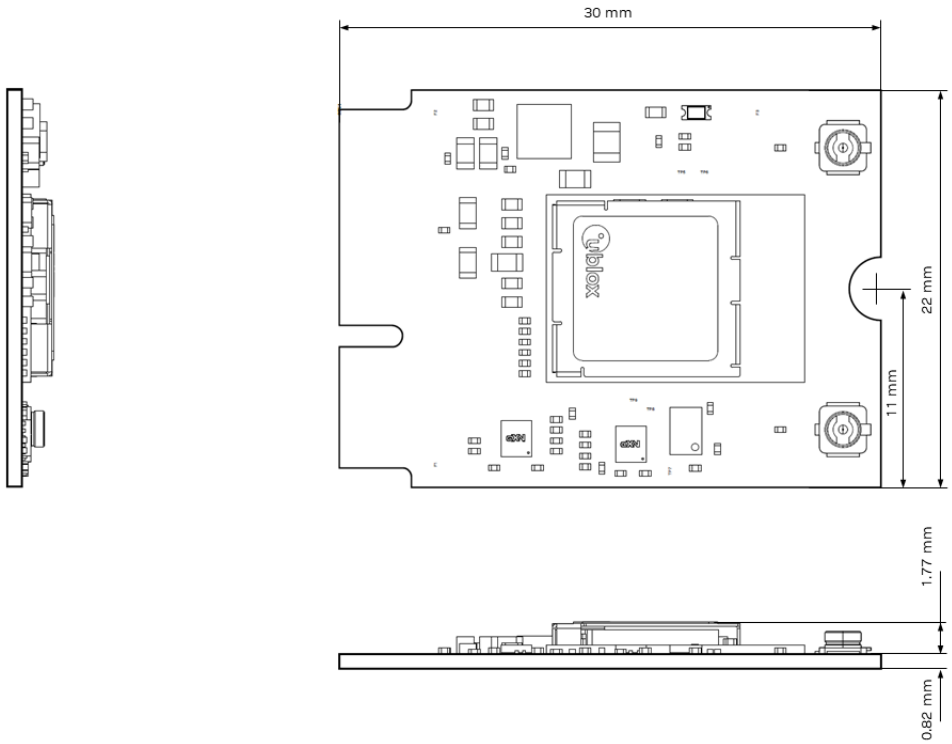

Figure 11: Physical dimensions of the M2-MAYA-W2 card

6 Software

M2-MAYA-W2 cards are based on the NXP IW612 chipset and the drivers and firmware required to operate MAYA-W2 series modules are also developed by NXP. A firmware binary is downloaded by the host operating system driver at start-up.

The following software options are available for the card:

- Open-source Linux/Android driver (`mxm_mwifiex`) for mainstream use is available free of charge and already integrated into the Linux BSP for NXP i.MX application processors
- MCUXpresso Wi-Fi/Bluetooth support for supported NXP MCUs

The software packages typically include:

- Dedicated kernel driver that binds the Wi-Fi device to the kernel. Driver sources are provided.
- Dedicated Wi-Fi/Bluetooth/802.15.4 firmware image that is uploaded during initialization of the device.
- Laboratory and manufacturing tools.

7 Approvals and qualifications

M2-MAYA-W2 cards comply with the regulatory demands of the Federal Communications Commission (FCC), Innovation, Science and Economic Development Canada (ISED), UK standards for Conformity Assessed (UKCA) marking, European standards for CE marking, and the National Communications Commision (NCC) of Taiwan.

☞ For detailed information about the regulatory requirements that must be met when using M2-MAYA-W2 cards in an end product, see the MAYA-W2 system integration manual [2].

7.1 Bluetooth qualification

End products must be qualified and listed with the Bluetooth Special Interest Group (SIG). Product declarations are submitted through the SIG Bluetooth Launch Studio website.

The M2-MAYA-W2 card is qualified as a controller subsystem as defined in the Bluetooth 5.4 specification and is registered with the SIG Qualified Design IDs (QDID), as shown in Table 18.

Model	Product type	QDID	Listing date
M2-MAYA-W271	Controller subsystem	237565	2024-03-13

Table 17: Bluetooth QDID

8 Product handling

8.1 Packaging

Packaged and shipped in trays containing multiple M.2 cards.

8.2 Shipment, storage, and handling

☞ For more information regarding shipment, storage and handling see the u-blox package information guide. [3]

8.2.1 ESD handling precautions

⚠ M2-MAYA-W2 cards are Electrostatic Sensitive Devices (ESD) that demand the observance of special handling precautions against electrostatic damage. Failure to observe the precautions can result in severe damage to the card.

M2-MAYA-W2 cards are manufactured through a highly automated process, which complies with IEC61340-5-1 (STM5.2-1999 Class M1 devices) standard. In compliance with the following European regulations, proper measures must be taken to protect M2-MAYA-W2 from ESD events on any pin that might be exposed to the end user:

- ESD testing standard CENELEC EN 61000-4-2
- Radio equipment standard ETSI EN 301 489-1

The minimum requirements that must be met to satisfy European regulations are described in Table 19.

Application	Category	Immunity level
All exposed surfaces of the radio equipment and ancillary equipment in a representative configuration of the end product.	Contact discharge	4 kV
	Air discharge	8 kV

Table 18: ESD immunity ratings based on EN 61000-4-2

Compliance with standard protection level specified in EN 61000-4-2 is achieved by including proper ESD protection in the production line and close to all areas that are accessible to the end user.

9 Labeling and ordering

The labels applied to M2-MAYA-W2 cards include important product information. Table 20 describes the features on the product label for each product variant.

Reference	Description
1	Text in bold font: “Model:” type number with the product version
2	DataMatrix (product identifier, serial number, datacode) • Product identifier: 3 digits defined by EMS • Serial number Datacode: 4 digits
3	Company logo and trademark
4	Placeholder for CE marking (when certified)
5	Panel position number
6	Production date YY/WW (year/week)

Table 19. M2-MAYA-W2 card label description

Figure 12 shows the label applied to M2-MAYA-W271 cards. Each of the given label references are described in Table 20.

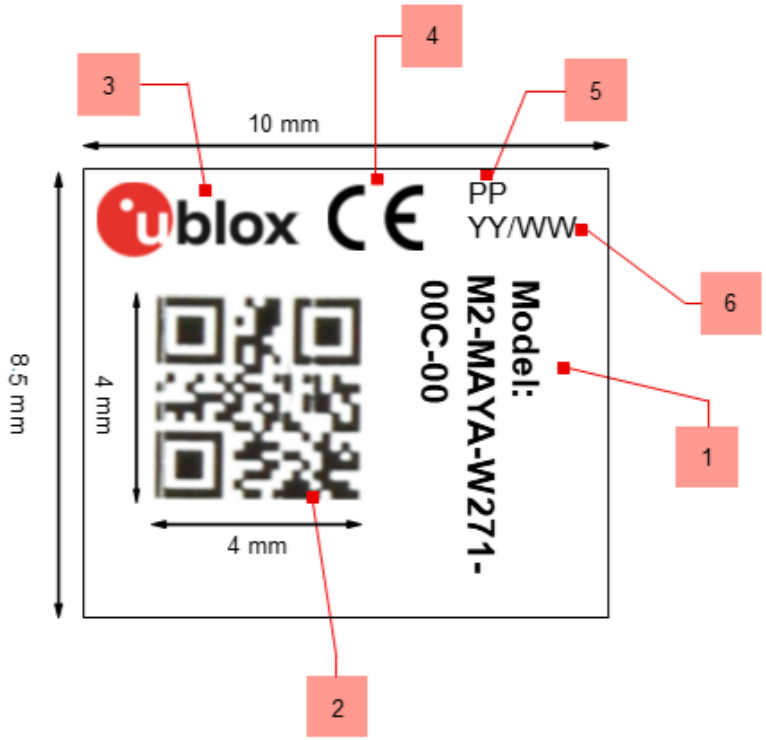

Figure 12: Product label format with dimensions for M2-MAYA-W271

9.1 Ordering codes

Ordering Code	Product name	Product
M2-MAYA-W271-00C	M2-MAYA-W271	M.2 key E card (2230) with two antenna U.FL connectors: one for 2.4 GHz and 5 GHz 802.11a/b/g/n/ac/ax and another for Bluetooth/Bluetooth Low Energy 5.4 and IEEE 802.15.4). Operational temperature -40 ^{0}C to +85 ^{0}C, standard grade module with NXP chipset IW612. Packaged in tray containing multiple M.2 cards.

Table 20: Product ordering codes

☞ Product changes affecting form, fit or function are documented by u-blox. Visit our website for a list of Product Change Notifications (PCNs).

Appendix

A Wi-Fi Tx output power limits

A.1. FCC/ISED regulatory domain

A.1.1. Wi-Fi Output power for 2.4 GHz band

Channel	Modulation	Channel bandwidth	Data rates	Maximum power setting
1 - 11	CCK and DSSS	20 MHz	1, 2, 5.5, 11 Mbps	17 dBm
1	OFDM	20 MHz	6, 9, 12, 18, 24, 36, 48, 54 Mbps	15 dBm
2, 3	OFDM	20 MHz	6, 9, 12, 18, 24, 36, 48, 54 Mbps	16 dBm
2 - 10	OFDM	20 MHz	6, 9, 12, 18, 24, 36 Mbps	17 dBm
2 - 10	OFDM	20 MHz	48 Mbps	16 dBm
2 - 10	OFDM	20 MHz	54 Mbps	15 dBm
11	OFDM	20 MHz	6, 9, 12, 18, 24, 36, 48, 54 Mbps	15 dBm
1	OFDM	20 MHz	HT20 MCS0-MCS7	13 dBm
2 - 10	OFDM	20 MHz	HT20 MCS0-MCS7	15 dBm
11	OFDM	20 MHz	HT20 MCS0-MCS7	13 dBm
3 - 9	OFDM	40 MHz	HT40 MCS0-MCS7	12 dBm

Table 21: FCC Wi-Fi power table for operation in the 2.4 GHz band

A.1.2. Wi-Fi output power for 5 GHz band

Channel	Modulation	Channel bandwidth	Data rates	Maximum power setting
36	OFDM	20 MHz	6, 9, 12, 18, 24, 36, 48, 54 Mbps	16 dBm
40	OFDM	20 MHz	6, 9, 12, 18, 24, 36, 48, 54 Mbps	17 dBm
48 - 60	OFDM	20 MHz	6, 9, 12, 18, 24, 36, 48, 54 Mbps	18 dBm
64	OFDM	20 MHz	6, 9, 12, 18, 24, 36, 48, 54 Mbps	15 dBm
36	OFDM	20 MHz	HT20 MCS0-MCS7	16 dBm
40	OFDM	20 MHz	HT20 MCS0-MCS7	17 dBm
48 - 60	OFDM	20 MHz	HT20 MCS0-MCS7	18 dBm
64	OFDM	20 MHz	HT20 MCS0-MCS7	15 dBm
36	OFDM	20 MHz	VHT20 MCS0-MCS7	16 dBm
40	OFDM	20 MHz	VHT20 MCS0-MCS7	17 dBm
48 - 60	OFDM	20 MHz	VHT20 MCS0-MCS7	18 dBm
64	OFDM	20 MHz	VHT20 MCS0-MCS7	15 dBm
36	OFDM	20 MHz	VHT20 MCS8	15 dBm
40	OFDM	20 MHz	VHT20 MCS8	16 dBm
48 - 60	OFDM	20 MHz	VHT20 MCS8	17 dBm
64	OFDM	20 MHz	VHT20 MCS8	14 dBm
36	OFDM	20 MHz	HE20 MCS0-MCS6	14 dBm
40	OFDM	20 MHz	HE20 MCS0-MCS6	17 dBm
48 - 60	OFDM	20 MHz	HE20 MCS0-MCS6	18 dBm
64	OFDM	20 MHz	HE20 MCS0-MCS6	15 dBm
36	OFDM	20 MHz	HE20 MCS7	14 dBm
40	OFDM	20 MHz	HE20 MCS7	15 dBm
48 - 60	OFDM	20 MHz	HE20 MCS7	17 dBm
64	OFDM	20 MHz	HE20 MCS7	15 dBm
36 - 40	OFDM	20 MHz	HE20 MCS8	14 dBm
48 - 60	OFDM	20 MHz	HE20 MCS8	16 dBm
64	OFDM	20 MHz	HE20 MCS8	14 dBm
36	OFDM	20 MHz	HE20 MCS9	13 dBm
40	OFDM	20 MHz	HE20 MCS9	14 dBm
40 - 60	OFDM	20 MHz	HE20 MCS9	15 dBm
64	OFDM	20 MHz	HE20 MCS9	13 dBm
36	OFDM	20 MHz	HE20 MCS10	12 dBm
40	OFDM	20 MHz	HE20 MCS10	13 dBm
40 - 60	OFDM	20 MHz	HE20 MCS10	14 dBm
64	OFDM	20 MHz	HE20 MCS10	12 dBm
36	OFDM	20 MHz	HE20 MCS11	11 dBm
40	OFDM	20 MHz	HE20 MCS11	12 dBm
40 - 60	OFDM	20 MHz	HE20 MCS11	13 dBm
64 – 100	OFDM	20 MHz	HE20 MCS11	11 dBm
38	OFDM	40 MHz	HT40 MCS0-MCS7	12 dBm
46, 54	OFDM	40 MHz	HT40 MCS0-MCS7	18 dBm
62	OFDM	40 MHz	HT40 MCS0-MCS7	11 dBm
38	OFDM	40 MHz	VHT40 MCS0-MCS6	12 dBm
46, 54	OFDM	40 MHz	VHT40 MCS0-MCS6	18 dBm
62	OFDM	40 MHz	VHT40 MCS0-MCS6	11 dBm
38	OFDM	40 MHz	VHT40 MCS7-MCS8	12 dBm

Channel	Modulation	Channel bandwidth	Data rates	Maximum power setting
46, 54	OFDM	40 MHz	VHT40 MCS7-MCS8	17 dBm
62	OFDM	40 MHz	VHT40 MCS7-MCS8	10 dBm
38	OFDM	40 MHz	VHT40 MCS9	12 dBm
46, 54	OFDM	40 MHz	VHT40 MCS9	16 dBm
62	OFDM	40 MHz	VHT40 MCS9	9 dBm
38	OFDM	40 MHz	HE40 MCS0-MCS6	11 dBm
46, 54	OFDM	40 MHz	HE40 MCS0-MCS6	18 dBm
62	OFDM	40 MHz	HE40 MCS0-MCS6	11 dBm
38	OFDM	40 MHz	HE40 MCS7	11 dBm
46, 54	OFDM	40 MHz	HE40 MCS7	17 dBm
62	OFDM	40 MHz	HE40 MCS7	11 dBm
38	OFDM	40 MHz	HE40 MCS8	11 dBm
46, 54	OFDM	40 MHz	HE40 MCS8	16 dBm
62	OFDM	40 MHz	HE40 MCS8	11 dBm
38	OFDM	40 MHz	HE40 MCS9	11 dBm
46, 54	OFDM	40 MHz	HE40 MCS9	15 dBm
62	OFDM	40 MHz	HE40 MCS9	11 dBm
38	OFDM	40 MHz	HE40 MCS10	11 dBm
46, 54	OFDM	40 MHz	HE40 MCS10	14 dBm
62	OFDM	40 MHz	HE40 MCS10	11 dBm
38	OFDM	40 MHz	HE40 MCS11	11 dBm
46, 54	OFDM	40 MHz	HE40 MCS11	13 dBm
62	OFDM	40 MHz	HE40 MCS11	11 dBm
42	OFDM	80 MHz	VHT80 MCS0-MCS9	10 dBm
58	OFDM	80 MHz	VHT80 MCS0-MCS9	10 dBm
42	OFDM	80 MHz	HE80 MCS0-MCS9	10 dBm
58	OFDM	80 MHz	HE80 MCS0-MCS9	10 dBm
42	OFDM	80 MHz	HE80 MCS10	9 dBm
58	OFDM	80 MHz	HE80 MCS10	10 dBm
42	OFDM	80 MHz	HE80 MCS11	8 dBm
58	OFDM	80 MHz	HE80 MCS11	9 dBm

Table 22: FCC Wi-Fi power table for operation in the 5 GHz U-NII-1 and U-NII-2A bands

Channel	Modulation	Channel bandwidth	Data rates	Maximum power setting
100	OFDM	20 MHz	6, 9, 12, 18, 24, 36, 48, 54 Mbps	15 dBm
104 – 136	OFDM	20 MHz	6, 9, 12, 18, 24, 36, 48, 54 Mbps	17 dBm
140 – 144	OFDM	20 MHz	6, 9, 12, 18, 24, 36, 48, 54 Mbps	15 dBm
100	OFDM	20 MHz	HT20 MCS0-MCS7	15 dBm
104 - 136	OFDM	20 MHz	HT20 MCS0-MCS7	17 dBm
140 – 144	OFDM	20 MHz	HT20 MCS0-MCS7	15 dBm
100	OFDM	20 MHz	VHT20 MCS0-MCS7	15 dBm
104 - 136	OFDM	20 MHz	VHT20 MCS0-MCS7	17 dBm
140 – 144	OFDM	20 MHz	VHT20 MCS0-MCS7	15 dBm
100	OFDM	20 MHz	VHT20 MCS8	15 dBm
104 - 136	OFDM	20 MHz	VHT20 MCS8	16 dBm
140 – 144	OFDM	20 MHz	VHT20 MCS8	15 dBm
100	OFDM	20 MHz	HE20 MCS0-MCS6	14 dBm
104 – 136	OFDM	20 MHz	HE20 MCS0-MCS6	17 dBm
140	OFDM	20 MHz	HE20 MCS0-MCS6	13 dBm
144	OFDM	20 MHz	HE20 MCS0-MCS6	15 dBm
100	OFDM	20 MHz	HE20 MCS7	14 dBm
104 – 136	OFDM	20 MHz	HE20 MCS7	16 dBm
140	OFDM	20 MHz	HE20 MCS7	13 dBm
144	OFDM	20 MHz	HE20 MCS7	15 dBm
100	OFDM	20 MHz	HE20 MCS8	14 dBm
104 – 136	OFDM	20 MHz	HE20 MCS8	15 dBm
140	OFDM	20 MHz	HE20 MCS8	13 dBm
144	OFDM	20 MHz	HE20 MCS8	14 dBm
100	OFDM	20 MHz	HE20 MCS9	13 dBm
104 – 144	OFDM	20 MHz	HE20 MCS9	14 dBm
100	OFDM	20 MHz	HE20 MCS10	12 dBm
104 – 144	OFDM	20 MHz	HE20 MCS10	13 dBm
100	OFDM	20 MHz	HE20 MCS11	11 dBm
104 – 144	OFDM	20 MHz	HE20 MCS11	12 dBm
102	OFDM	40 MHz	HT40 MCS0-MCS7	12 dBm
110, 118	OFDM	40 MHz	HT40 MCS0-MCS7	17 dBm
126, 134	OFDM	40 MHz	HT40 MCS0-MCS7	15 dBm
142	OFDM	40 MHz	HT40 MCS0-MCS7	14 dBm
102	OFDM	40 MHz	VHT40 MCS0-MCS6	12 dBm
110, 118	OFDM	40 MHz	VHT40 MCS0-MCS6	17 dBm
126, 134	OFDM	40 MHz	VHT40 MCS0-MCS6	15 dBm
142	OFDM	40 MHz	VHT40 MCS0-MCS6	14 dBm
102	OFDM	40 MHz	VHT40 MCS7-MCS8	12 dBm
110, 118	OFDM	40 MHz	VHT40 MCS7-MCS8	16 dBm
126, 134	OFDM	40 MHz	VHT40 MCS7-MCS8	15 dBm
142	OFDM	40 MHz	VHT40 MCS7-MCS8	14 dBm
102	OFDM	40 MHz	VHT40 MCS9	12 dBm
110, 118	OFDM	40 MHz	VHT40 MCS9	15 dBm
126, 134	OFDM	40 MHz	VHT40 MCS9	15 dBm
142	OFDM	40 MHz	VHT40 MCS9	14 dBm

Channel	Modulation	Channel bandwidth	Data rates	Maximum power setting
102	OFDM	40 MHz	HE40 MCS0-MCS6	12 dBm
110 – 126	OFDM	40 MHz	HE40 MCS0-MCS6	17 dBm
134 – 142	OFDM	40 MHz	HE40 MCS0-MCS6	15 dBm
102	OFDM	40 MHz	HE40 MCS7	12 dBm
110 – 126	OFDM	40 MHz	HE40 MCS7	16 dBm
134 – 142	OFDM	40 MHz	HE40 MCS7	15 dBm
102	OFDM	40 MHz	HE40 MCS8	12 dBm
110 – 126	OFDM	40 MHz	HE40 MCS8	15 dBm
134 – 142	OFDM	40 MHz	HE40 MCS8	15 dBm
102	OFDM	40 MHz	HE40 MCS9	12 dBm
110 – 126	OFDM	40 MHz	HE40 MCS9	14 dBm
134 – 142	OFDM	40 MHz	HE40 MCS9	14 dBm
102	OFDM	40 MHz	HE40 MCS10	12 dBm
110 – 126	OFDM	40 MHz	HE40 MCS10	13 dBm
134 – 142	OFDM	40 MHz	HE40 MCS10	13 dBm
102	OFDM	40 MHz	HE40 MCS11	11 dBm
110 – 126	OFDM	40 MHz	HE40 MCS11	12 dBm
134 – 142	OFDM	40 MHz	HE40 MCS11	12 dBm
138, 155	OFDM	80 MHz	VHT80 MCS0-MCS9	12 dBm
138, 155	OFDM	80 MHz	HE80 MCS0-MCS7	12 dBm
138, 155	OFDM	80 MHz	HE80 MCS8	11 dBm
138, 155	OFDM	80 MHz	HE80 MCS9	10 dBm
138, 155	OFDM	80 MHz	HE80 MCS10	9 dBm
138, 155	OFDM	80 MHz	HE80 MCS11	8 dBm

Table 23: FCC Wi-Fi power table for operation in the 5 GHz U-NII-2e band

Channel	Modulation	Channel bandwidth	Data rates	Maximum power setting
149 – 153	OFDM	20 MHz	6, 9, 12, 18, 24, 36, 48, 54 Mbps	17 dBm
157 – 165	OFDM	20 MHz	6, 9, 12, 18, 24, 36, 48, 54 Mbps	19 dBm
149 – 153	OFDM	20 MHz	HT20 MCS0-MCS7	17 dBm
157 – 165	OFDM	20 MHz	HT20 MCS0-MCS7	19 dBm
149 – 153	OFDM	20 MHz	VHT20 MCS0-MCS7	17 dBm
157 – 165	OFDM	20 MHz	VHT20 MCS0-MCS7	19 dBm
149 – 153	OFDM	20 MHz	VHT20 MCS8	16 dBm
157 – 165	OFDM	20 MHz	VHT20 MCS8	18 dBm
149 – 153	OFDM	20 MHz	HE20 MCS0-MCS6	17 dBm
157 – 165	OFDM	20 MHz	HE20 MCS0-MCS6	19 dBm
149 – 153	OFDM	20 MHz	HE20 MCS7	16 dBm
157 – 165	OFDM	20 MHz	HE20 MCS7	18 dBm
149 – 153	OFDM	20 MHz	HE20 MCS8	15 dBm
157 – 165	OFDM	20 MHz	HE20 MCS8	17 dBm
149 – 153	OFDM	20 MHz	HE20 MCS9	14 dBm
157 – 165	OFDM	20 MHz	HE20 MCS9	16 dBm
149 – 153	OFDM	20 MHz	HE20 MCS10	13 dBm
157 – 165	OFDM	20 MHz	HE20 MCS10	15 dBm
149 – 153	OFDM	20 MHz	HE20 MCS11	12 dBm
157 – 165	OFDM	20 MHz	HE20 MCS11	14 dBm
151	OFDM	40 MHz	HT40 MCS0-MCS6	16 dBm
159	OFDM	40 MHz	HT40 MCS0-MCS6	18 dBm
151	OFDM	40 MHz	HT40 MCS7-MCS8	15 dBm
159	OFDM	40 MHz	HT40 MCS7-MCS8	17 dBm
151	OFDM	40 MHz	HT40 MCS9	14 dBm
159	OFDM	40 MHz	HT40 MCS9	16 dBm
151	OFDM	40 MHz	VHT40 MCS0-MCS6	16 dBm
159	OFDM	40 MHz	VHT40 MCS0-MCS6	18 dBm
151	OFDM	40 MHz	VHT40 MCS7-MCS8	15 dBm
159	OFDM	40 MHz	VHT40 MCS7-MCS8	17 dBm
151	OFDM	40 MHz	VHT40 MCS9	14 dBm
159	OFDM	40 MHz	VHT40 MCS9	16 dBm
151	OFDM	40 MHz	HE40 MCS0-MCS6	16 dBm
159	OFDM	40 MHz	HE40 MCS0-MCS6	18 dBm
151	OFDM	40 MHz	HE40 MCS7	15 dBm
159	OFDM	40 MHz	HE40 MCS7	17 dBm
151	OFDM	40 MHz	HE40 MCS8	14 dBm
159	OFDM	40 MHz	HE40 MCS8	16 dBm
151	OFDM	40 MHz	HE40 MCS9	13 dBm
159	OFDM	40 MHz	HE40 MCS9	15 dBm
151	OFDM	40 MHz	HE40 MCS10	12 dBm
159	OFDM	40 MHz	HE40 MCS10	14 dBm
151	OFDM	40 MHz	HE40 MCS1	11 dBm
159	OFDM	40 MHz	HE40 MCS11	13 dBm
155	OFDM	80 MHz	VHT80 MCS0-MCS9	12 dBm
155	OFDM	80 MHz	HE80 MCS0-MCS7	12 dBm

Channel	Modulation	Channel bandwidth	Data rates	Maximum power setting
155	OFDM	80 MHz	HE80 MCS8	11 dBm
155	OFDM	80 MHz	HE80 MCS9	10 dBm
155	OFDM	80 MHz	HE80 MCS10	9 dBm
155	OFDM	80 MHz	HE80 MCS11	8 dBm

Table 24: FCC Wi-Fi power table for operation in the 5 GHz U-NII-3 band

B Glossary

Abbreviation	Definition
BLE	Bluetooth Low Energy
BR/EDR	Bluetooth Basic Rate / Enhanced Data Rate
BSP	Board Support Package
BT	Bluetooth
DNI	Do Not Insert
IEEE	Institute of Electrical and Electronics Engineers
I2C	Inter-Integrated Circuit
I2S	Inter-IC-Sound
IC	Integrated Circuit
JTAG	Joint Test Action Group
PCM	Pulse Code Modulation
PTA	Packet Traffic Arbitration
SDIO	Secure Digital Input Output
SPI	Serial Peripheral Interface
TBD	To be defined / determined
UART	Universal Asynchronous Receiver-Transmitter
U.FL	Low-profile SMT coaxial connector
USB	Universal Serial Bus
VIO	Input /Output Voltage
WCI	Wireless Coexistence Interface

Table 25: Explanation of the abbreviations and terms used

Related documentation

[1] MAYA-W2 series data sheet, UBX-22009721
[2] MAYA-W2 series system integration manual, UBX-22011459
[3] Product packaging reference guide, UBX-14001652
[4] NXP IW612 preliminary data sheet, Rev. 4, 27 February 2023
[5] PCI Express M.2 Specification Revision 4.0, Version 1.0, November 5, 2020
[6] Wi-Fi/Bluetooth/802.15.4 M.2 Key E Pinout Definition – NXP Application Note AN13049, Rev.4, 30 May 2023
[7] Hirose Electric Co. LTD - U.FL Series Catalog, August 2021
[8] Hirose Electric Co. LTD - U.FL Series Specification Sheet, June 19, 2020
[9] u-blox Limited Use License Agreement (LULA-M)

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Revision history

Revision	Date	Name	Comments
R01	19-Jul-2023	gmet	Initial release
R02	05-Jun-2024	gmet	Added table data for radio co-existence signals in Pin description and updated power consumption and Wi-Fi performance data in Electrical specifications. Added new sections describing the available Test points, Antenna connectors, and Operating and I/O voltages. Added QDID and Listing date for Bluetooth qualification Updated figures in several sections.
R03	17-Sep-2024	gmet	Updated sections Pin description and Approvals and qualifications. Added Wi-Fi Tx output power limits in Appendix.

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