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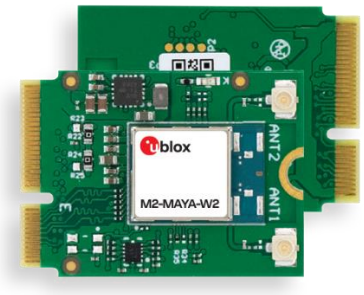
M2-MAYA-W2

M.2 card for the MAYA-W2 Wi-Fi 6, Bluetooth 5.3 and IEEE 802.15.4 module

Product Manual



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 WiFi, dual-mode Bluetooth 5.3, 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.

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Document information

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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 5.3 (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	v5.3
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) 5.3 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.

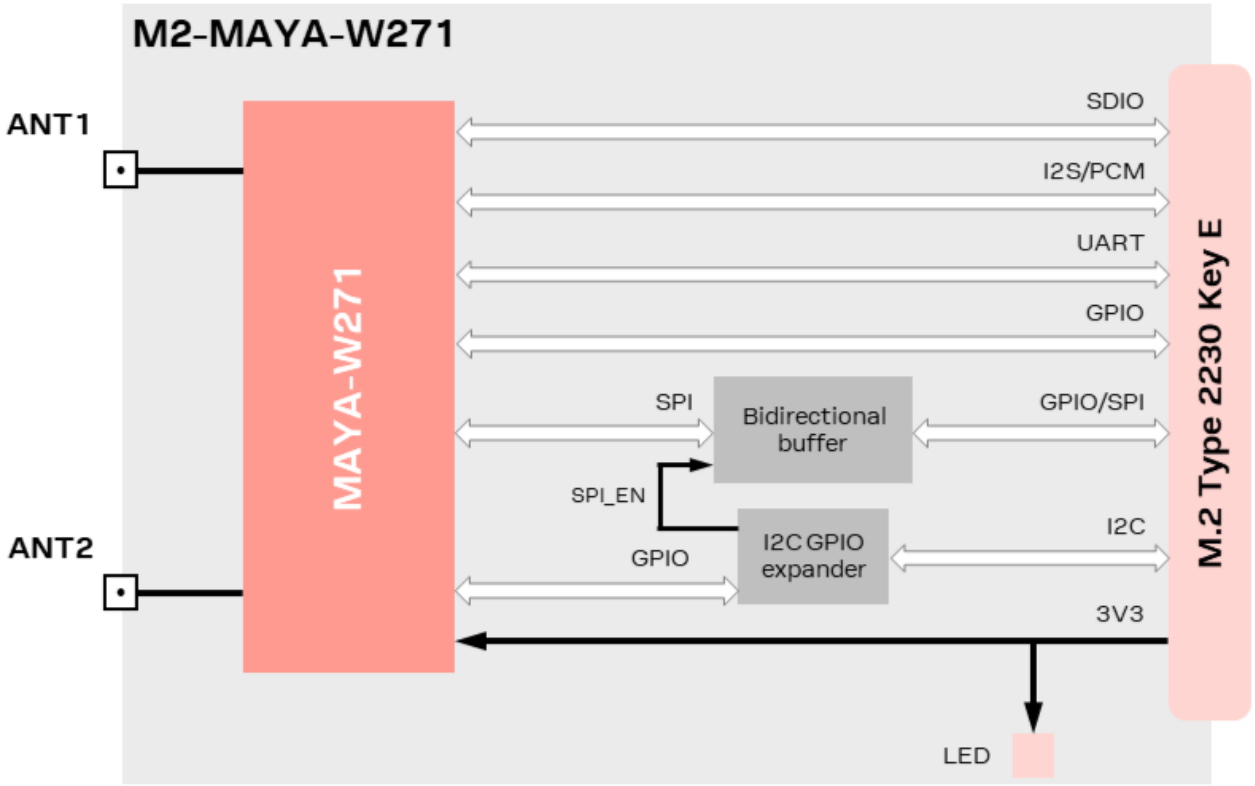

Figure 1: Block diagram of the M2-MAYA-W271 card

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.

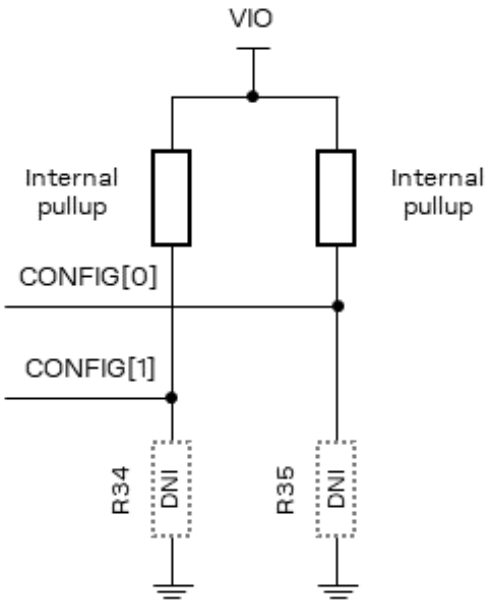

Figure 2: Default configuration of the M2-MAYA-W2 boot pins

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

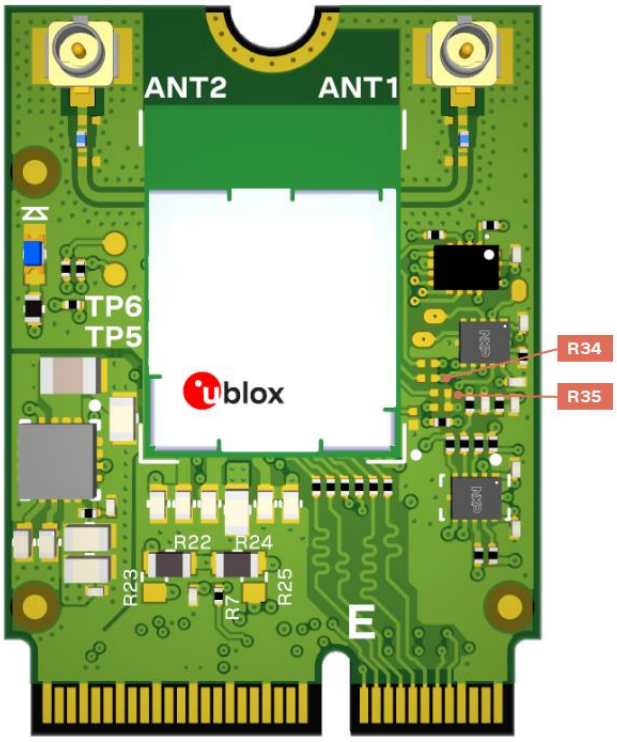

Figure 3: Position of resistors R34 and R35 on M2-MAYA-W2

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.

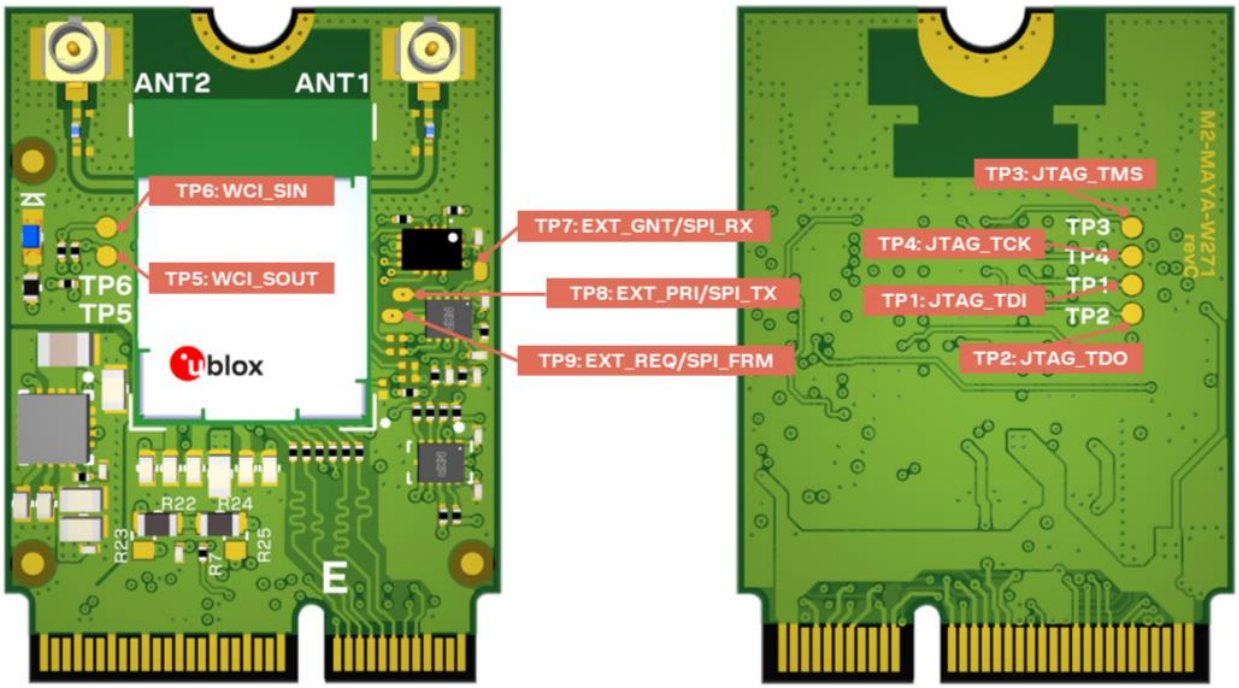

Figure 4: Position of test points on the top side (left) and on the bottom side (right) of the M2-MAYA-W2 card

2.7 Antenna connectors

The M2-MAYA-W271 card features two U.FL connectors: one for each of the two antenna pins.

- Connector J1 is connected to MAYA-W271 pin K1 (**RF_ANT0**) for Wi-Fi operation.
- Connector J2 is connected to MAYA-W271 pin K9 (**RF_ANT1**) for Bluetooth / 802.15.4.

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

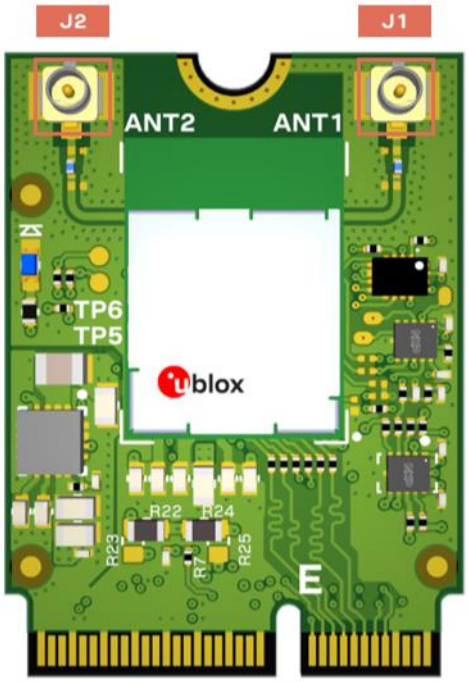

Figure 5: Location of M2-MAYA-W271 antenna U.FL connectors

☞ 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.

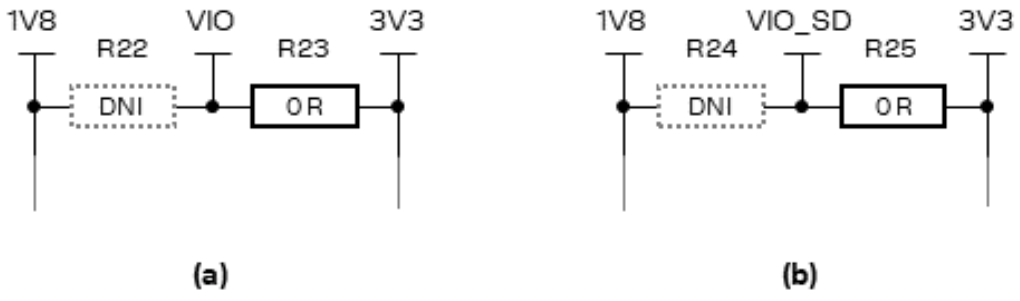

Figure 6: Placement of 0 Ω resistor to change (a) VIO from 1V8 V to 3V3, (b) VIO_SD from 1V8 to 3V3

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

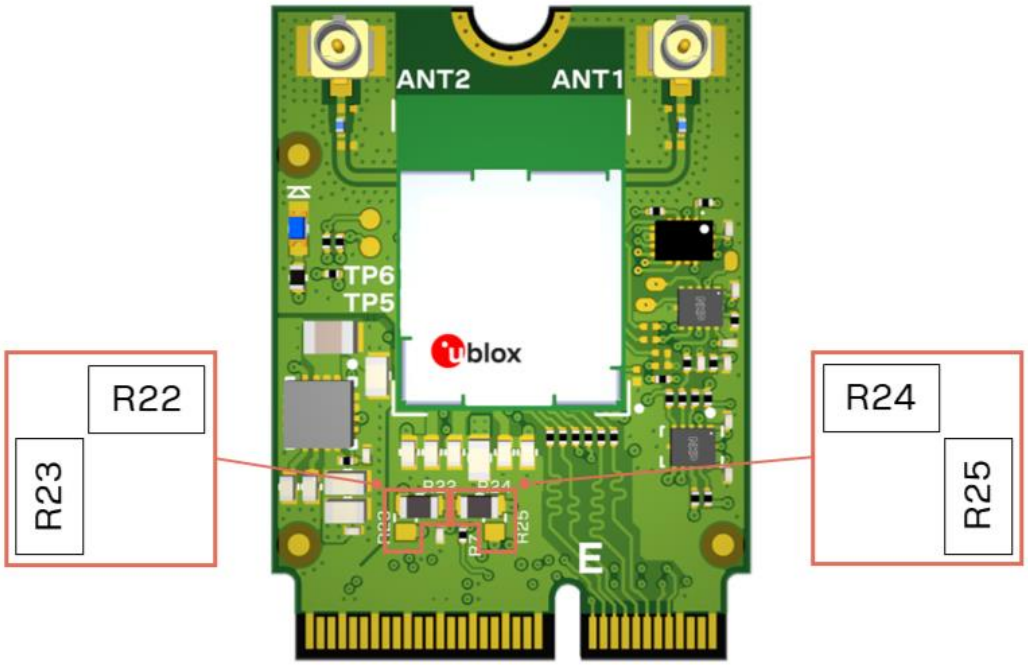

Figure 7: R22 and R23 positions for selecting VIO, and R24 and R25 positions for selecting VIO_SD

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.

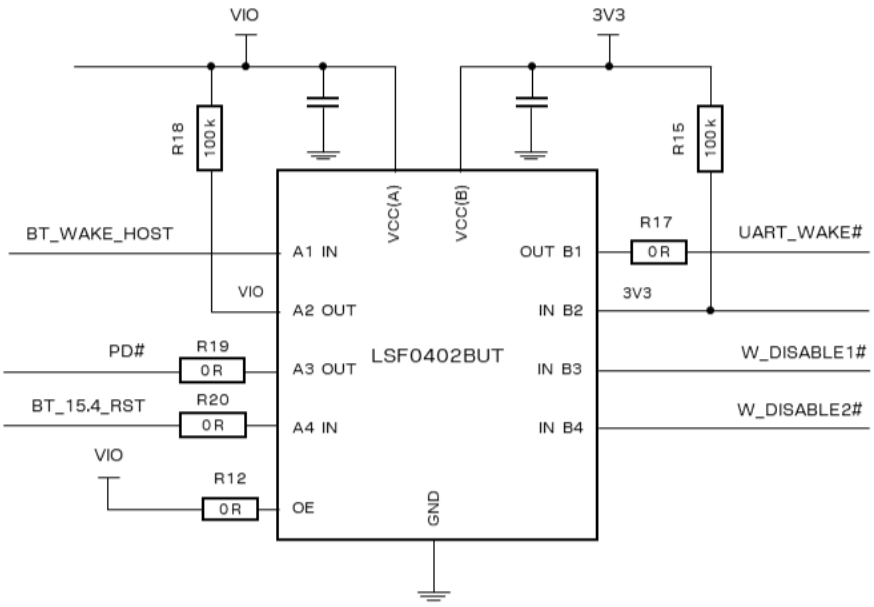

Figure 8: VIO-to-3V3 level shifter

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

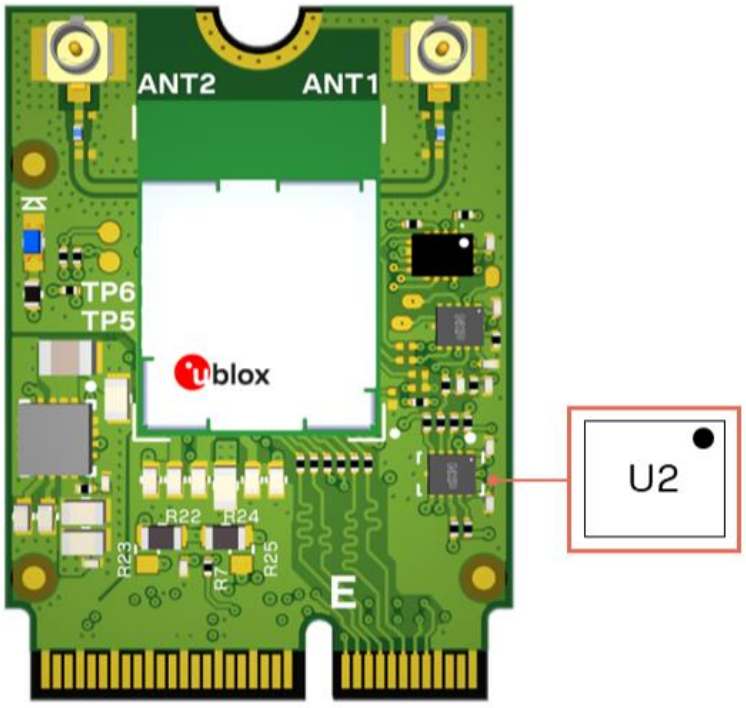

Figure 9: Position of VIO-to-3.3 V level shifter on M2-MAYA-W2

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

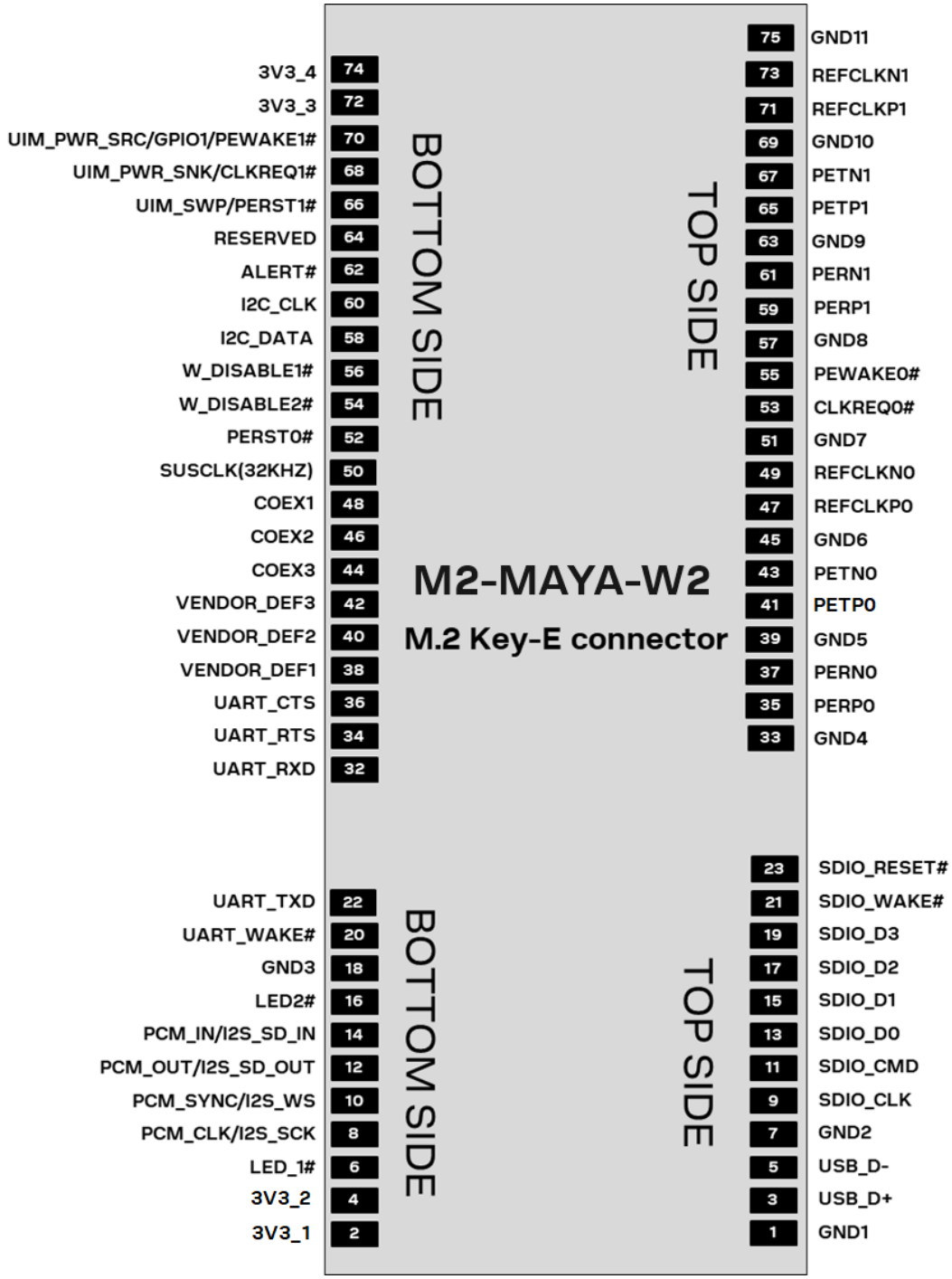

Figure 10: M2-MAYA-W2 pin assignment

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.
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)

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 5.3 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

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
		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

Band	Operating mode	Data rate	Bandwidth	Specification (Typical Values) [1]
		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 15: 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.

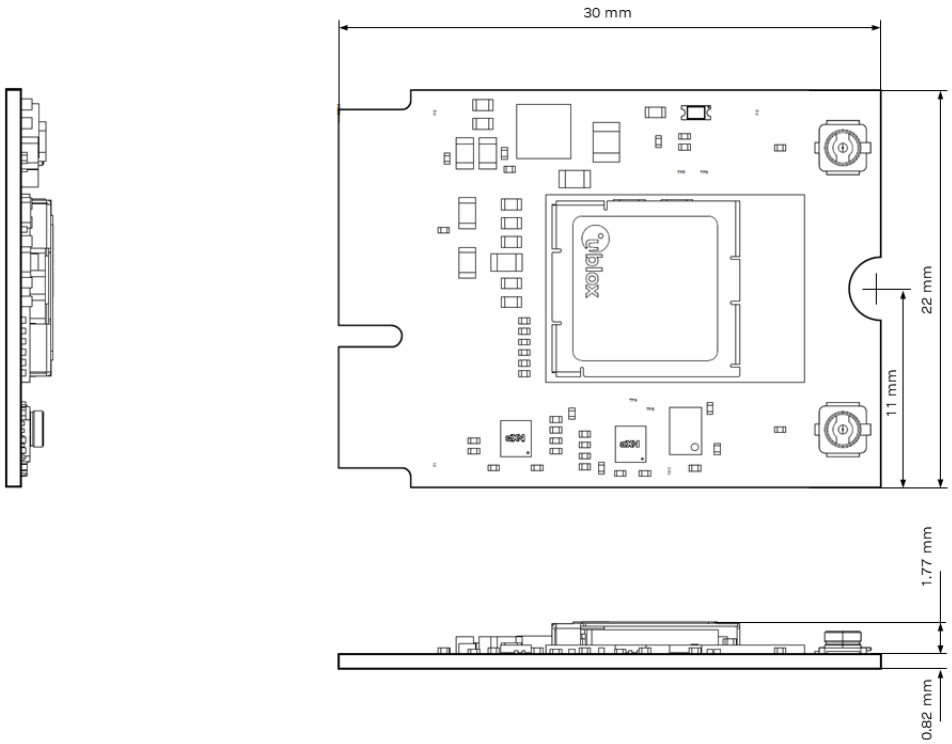

Figure 11: Physical dimensions of the M2-MAYA-W2 card

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

Radio type approvals for Europe (RED), Great Britain (UKCA), the United States (FCC) and Canada are available. Other country certifications can be scheduled on request.

The M2-MAYA-W2 card is certified for use in the following countries/regions:

Country/region	M2-MAYA-W271
Europe	Certified
Great Britain	Certified
USA	Certified
Canada	Certified

Table 16: Certification

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 5.3 specification and is registered with the SIG Qualified Design IDs (QDID), as shown in Table 17.

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

Table 17: Bluetooth QDID

7.2 General requirements

M2-MAYA-W2 card is designed to comply with the regulatory demands of Federal Communications Commission (FCC), , UK Conformity Assessed (UKCA), and European standards for CE marking.[3]

This section contains instructions on the process needed for an integrator when including the M2-MAYA-W2 card into an end-product.

- Any deviation from the process described may cause the M2-MAYA-W2 not to comply with the regulatory authorizations of the module and thus void the user's authority to operate the equipment.
- Any changes to hardware, hosts or co-location configuration may require new radiated emission and SAR evaluation and/or testing.
- The regulatory compliance of M2-MAYA-W2 card does not exempt the end-product from being evaluated against applicable regulatory demands; for example, FCC Part 15B criteria for unintentional radiators
- The end-product manufacturer must follow all the engineering and operating guidelines as specified by the grantee (u-blox).

[3] All approvals pending

- Only authorized antenna(s) may be used. Refer to section 10.3 for the list of authorized antennas. In the end-product, the M2-MAYA-W2 module must be installed in such a way that only authorized antennas can be used.
- The end-product must use the specified antenna trace reference design, as described in the Antenna integration application note **Error! Reference source not found.**.
- Any notification to the end user about how to install or remove the integrated radio module is NOT allowed.

⚠ If these conditions cannot be met or any of the operating instructions are violated, the u-blox regulatory authorization will be considered invalid. Under these circumstances, the integrator is responsible to re-evaluate the end-product including the M2-1 card and obtain their own regulatory authorization, or u-blox may be able to support updates of the u-blox regulatory authorization. See also Antenna requirements.

7.3 FCC/ISED End-product regulatory compliance

u-blox represents that the modular transmitter fulfills the FCC/ISED regulations when operating in authorized modes on any host product given that the integrator follows the instructions as described in this document. Accordingly, the host product manufacturer acknowledges that all host products referring to the FCC ID or ISED certification number of the modular transmitter and placed on the market by the host product manufacturer need to fulfil all of the requirements mentioned below. Non-compliance with these requirements may result in revocation of the FCC approval and removal of the host products from the market. These requirements correspond to questions featured in the FCC guidance for software security requirements for U-NII devices, FCC OET KDB 594280 D02 **Error! Reference source not found.**.

⚠ The approval of the M2-MAYA-W2 product, or any other radio module, does not exempt the end product from being evaluated against applicable regulatory demands.

The evaluation of the end product shall be performed with the M2-MAYA-W2 card installed and operating in a way that reflects the intended end product use case. The upper frequency measurement range of the end product evaluation is the 10th harmonic of 5.8 GHz as described in KDB 996369 D04.

The following requirements apply to all products that integrate a radio module:

- Subpart B - UNINTENTIONAL RADIATORS
  To verify that the composite device of host and module comply with the requirements of FCC part 15B, the integrator shall perform sufficient measurements using ANSI 63.4-2014.
- Subpart C - INTENTIONAL RADIATORS
  It is required that the integrator carries out sufficient verification measurements using ANSI 63.10-2013 to validate that the fundamental and out of band emissions of the transmitter part of the composite device complies with the requirements of FCC part 15C.

When the items listed above are fulfilled, the end product manufacturer can use the authorization procedures as mentioned in Table 1 of 47 CFR Part 15.101, before marketing the end product. This means the customer has to either market the end product under a Suppliers Declaration of Conformity (SDoC) or to certify the product using an accredited test lab.

The description is a subset of the information found in applicable publications of FCC Office of Engineering and Technology (OET) Knowledge Database (KDB). We recommend the integrator to read the complete document of the referenced OET KDB's.

- KDB 178919 D01 Permissive Change Policy
- KDB 447498 D01 General RF Exposure Guidance
- KDB 594280 D01 Configuration Control

- KDB 594280 D02 U-NII Device Security
- KDB 784748 D01 Labelling Part 15 18 Guidelines
- KDB 996369 D01 Module certification Guide
- KDB 996369 D02 Module Q&A
- KDB 996369 D04 Module Integration Guide

7.3.1 Referring to the u-blox FCC/ISED certification ID

If the General requirements, FCC/ISED End-product regulatory compliance regulations, and all Antenna requirements are met, the u-blox modular FCC/ISED regulatory authorization is valid and the end-product may refer to the u-blox FCC ID and ISED certification number. u-blox may be able to support updates to the u-blox regulatory authorization; for example, adding new antennas to the u-blox authorization.

⚠ To use the u-blox FCC / ISED grant and refer to the u-blox FCC ID / ISED certification ID, the integrator must confirm with u-blox that all requirements associated with the Configuration control and software security of end-products are fulfilled.

7.3.2 Obtaining own FCC/ISED certification ID

Integrators who do not want to refer to the u-blox FCC/ISED certification ID, or who do not fulfil all requirements to do so may instead obtain their own certification. With their own certification, the integrator has full control of the grant to make changes.

Integrators who want to base their own certification on the u-blox certification can do so via a process called “Change in ID” (FCC) / “Multiple listing” (ISED). With this, the integrator becomes the grantee of a copy of the u-blox FCC/ISED certification. u-blox will support with an approval letter that shall be filed as a Cover Letter exhibit with the application.

☞ For modules where the FCC ID / ISED certification ID is printed on the label, the integrator must replace the module’s label with a new label containing the new FCC/ISED ID. For more information about the labeling requirements, see in section 10.2.6.

⚠ It is the responsibility of the integrator to comply with any upcoming regulatory requirements.

7.3.3 Antenna requirements

In addition to the general requirement to use only authorized antennas, the u-blox grant also requires a separation distance of at least 20 cm from the antenna(s) to all persons. The antenna(s) must not be co-located with any other antenna or transmitter (simultaneous transmission) as well. If this cannot be met, a Permissive Change as described below must be made to the grant.

☞ In order to support verification activities that may be required by certification laboratories, customers applying for Class-II Permissive changes must implement the setup described in the Radio test guide application note **Error! Reference source not found.**.

7.3.3.1 Separation distance

If the required separation distance of 20 cm cannot be fulfilled, a SAR evaluation must be performed. This consists of additional calculations and/or measurements. The result must be added to the grant file as a Class II Permissive Change.

7.3.3.2 Co-location (simultaneous transmission)

If the module is to be co-located with another transmitter, additional measurements for simultaneous transmission are required. The results must be added to the grant file as a Class II Permissive Change.

7.3.3.3 Adding a new antenna for authorization

If the authorized antennas and/or antenna trace design cannot be used, the new antenna and/or antenna trace designs must be added to the grant file. This is done by a Class I Permissive Change or a Class II Permissive Change, depending on the specific antenna and antenna trace design.

- Antennas of the same type and with less or same gain as an already approved antenna can be added under a Class I Permissive Change.
- Antenna trace designs deviating from the u-blox reference design and new antenna types are added under a Class II Permissive Change.
- For 5 GHz modules, the combined minimum gain of antenna trace and antenna must be greater than 0 dBi to comply with DFS testing requirements.

⚠ Integrators with the intention to refer to the u-blox FCC ID / ISED certification ID must Contact their local support team to discuss the Permissive Change Process. Class II Permissive Changes will be subject to NRE costs.

7.3.4 Configuration control and software security of end-products

☞ "Modular transmitter" hereafter refers to M2-MAYA-W271 (FCC ID XPYMAYAW2A)[4].

As the end-product must comply with the requirements addressed by the OET KDB 594280, the host product integrating the M2-MAYA-W2 card must comply with the following requirements:

- Upon request from u-blox, the host product manufacturer will provide all of the necessary information and documentation to demonstrate how the requirements listed below are met.
- The host product manufacturer will not modify the modular transmitter hardware.
- The configuration of the modular transmitter when installed into the host product must be within the authorization of the modular transmitter at all times and cannot be changed to include unauthorized modes of operation through accessible interfaces of the host product. The Wi-Fi Tx output power limits must be followed. In particular, the modular transmitter installed in the host product will not have the capability to operate on the operating channels/frequencies referred to in the section(s) below, namely one or several of the following channels: 12 (2467 MHz), 13 (2472 MHz), 120 (5600 MHz), 124 (5620 MHz), and 128 (5640 MHz). The channels 12 (2467 MHz), 13 (2472 MHz), 120 (5600 MHz), 124 (5620 MHz), and 128 (5640 MHz) are allowed to be used only for modules that are certified for the usage ("modular transmitter"). Customers must verify that the module in use is certified as supporting DFS client/master functionality.
- The host product uses only authorized firmware images provided by u-blox and/or by the manufacturer of the RF chipset used inside the modular transmitter.
- The configuration of the modular transmitter must always follow the requirements specified in Operating frequencies and cannot be changed to include unauthorized modes of operation through accessible interfaces of the host product.
- The modular transmitter must when installed into the host product have a regional setting that is compliant with authorized US modes and the host product is protected from being modified by third parties to configure unauthorized modes of operation for the modular transmitter, including the country code.
- The host product into which the modular transmitter is installed does not provide any interface for the installer to enter configuration parameters into the end product that exceeds those authorized.
- The host product into which the modular transmitter is installed does not provide any interface to third parties to upload any unauthorized firmware images into the modular transmitter and

[4] Approvals are pending

prevents third parties from making unauthorized changes to all or parts of the modular transmitter device driver software and configuration.

☞ The OET KDB 594280 D01 **Error! Reference source not found.** lists the topics that must be addressed to ensure that the end-product specific host meets the Configuration Control requirements.

☞ The OET KDB 594280 D02 **Error! Reference source not found.** lists the topics that must be addressed to ensure that the end-product specific host meets the Software Security Requirements for U-NII Devices.

7.3.5 Operating frequencies

M2-MAYA-W2 802.11b/g/n operation outside the 2412–2462 MHz band is prohibited in the US and Canada and 802.11a/n operation in the 5600–5650 MHz band is prohibited in Canada. Configuration of the module to operate on channels 12–13 and 120–128 must be prevented accordingly. The channels allowed are described in Table8.

Channel number	Channel center frequency [MHz]	Allowed channels	Remarks
1 – 11	2412 – 2462	Yes	
12 – 13	2467 – 2472	No	
36 – 48	5180 – 5240	Yes	Canada (ISED): Devices are restricted to indoor operation only and the end product must be labelled accordingly.
52 – 64	5260 – 5320	Yes[5]	
100 – 116	5500 – 5580	Yes[5]	
120 – 128	5600 – 5640	No	USA (FCC): Client device operation allowed under KDB 905462
132 – 144	5660 – 5720	Yes[5]	
149 – 165	5745 – 5825	Yes	

Table 8: Allowed channel usage under FCC/ISED regulation

☞ 15.407 (j) Operator Filing Requirement:
Before deploying an aggregate total of more than one thousand outdoor access points within the 5.15–5.25 GHz band, parties must submit a letter to the Commission acknowledging that, should harmful interference to licensed services in this band occur, they will be required to take corrective action. Corrective actions may include reducing power, turning off devices, changing frequency bands, and/or further reducing power radiated in the vertical direction. This material shall be submitted to Laboratory Division, Office of Engineering and Technology, Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046. Attn: U-NII Coordination, or via Web site at https://www.fcc.gov/labhelp with the subject line: “U-NII-1 Filing”.

7.3.6 End product labeling requirements

For an end-product using the M2-MAYA-W2, there must be a label containing, at least, the following information:

This device contains
FCC ID: (XYZ)(UPN)
IC: (CN)-(UPN)

[5] DFS certification is pending.

(XYZ) represents the FCC "Grantee Code", this code may consist of Arabic numerals, capital letters, or other characters, the format for this code will be specified by the Commission's Office of Engineering and Technology[6]. (CN) is the Company Number registered at ISED. (UPN) is the Unique Product Number decided by the grant owner.

The label must be affixed on an exterior surface of the end product such that it will be visible upon inspection in compliance with the modular labeling requirements of OET KDB 784748. The host user manual must also contain clear instructions on how end users can find and/or access the FCC ID of the end product.

The label on the M2-MAYA-W2 card containing the original FCC ID acquired by u-blox can be replaced with a new label stating the end-product's FCC/ISED ID in compliance with the modular labeling requirements of OET KDB 784748.

FCC end product labeling

In accordance with 47 CFR § 15.19, the end product shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: This device may not cause harmful interference, and This device must accept any interference received, including interference that may cause undesired operation.

ISED end product labeling

The end product shall bear the following statement in both English and French in a conspicuous location on the device:

Operation is subject to the following two conditions: This device may not cause interference, and This device must accept any interference, including interference that may cause undesired operation of the device.
Son utilisation est soumise aux deux conditions suivantes: Cet appareil ne doit pas causer d'interférences et il doit accepter toutes interférences reçues, y compris celles susceptibles d'avoir des effets indésirables sur son fonctionnement.

Labels of end products capable to operate within the band 5150–5250 MHz shall also include:

For indoor use only
Pour usage intérieur seulement

When the device is so small or for such use that it is not practicable to place the statements above on it, the information shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC/ISED ID label must be displayed on the device as described above.

In case, where the final product will be installed in locations where the end-consumer is unable to see the FCC/ISED ID and/or this statement, the FCC/ISED ID and the statement shall also be included in the end-product manual.

7.4 Pre-approved antennas

This section lists the different external antennas that are pre-approved for use with the M2-MAYA-W2 card.

[6] 47 CFR 2.926

7.4.1 Wi-Fi / Bluetooth dual band antennas

For Wi-Fi operation in the 2.4 GHz and 5 GHz bands M2-MAYA-W2 has been tested and approved for use with the dual-band antennas shown described below.

Manufacturer	Part Number	Antenna type	Peak gain [dBi]	
			2.4 GHz band	5 GHz band
Linx	ANT-DB1-RAF-RPS	Dual-band dipole antenna	4.1	5.1

Table 9: List of approved dual-band antennas

⚠ Important: For compliance with FCC §15.407(a), the EIRP is not allowed to exceed 125 mW (21 dBm) at any elevation angle above 30° (measured from the horizon) when operated as an outdoor access point in U-NII-1 band, 5.150-5.250 GHz.

7.5 Configuration of Wi-Fi transmit power limits

MAYA-W2 modules contain calibration data for the output power limits in OTP. This calibration data enables the module to achieve maximum transmit power levels that still pass the required EVM and spectral mask limits. The maximum transmit-power levels that can be used in an end-product also depend on:

- Regulatory domain limits
- Restricted band of usage
- Gain of the antenna and antenna trace design

A configuration file on the host system and the utility `mlanutl` is used to reduce the transmit power levels as required.

☞ Transmit power limit configuration files are provided by u-blox for the certified regulatory domains which addresses the reference designs and the approved antennas.

⚠ The correct transmit power limits must be applied to the module after startup of the host system or change of the regulatory domain during runtime.

7.5.1 Wi-Fi power table

The Wi-Fi power table defines the transmit power levels for the Wi-Fi radio. The power levels are based on regulatory compliance, IEEE 802.11 requirements, and product design constraints. The TX power table can be adjusted to achieve the highest transmit power level for each Wi-Fi channel, bandwidth, and modulation within the constraints defined by the certification.

The Wi-Fi power table is defined in a transmit power configuration file, `txpwrlimit_cfg_XX.conf`, where "`XX`" stands for the alpha2 country code. It allows developers to fine tune specific transmit power levels for the Wi-Fi radio, including:

- Band (2G and 5G)
- Channel
- Modulation rate (CCK and OFDM)
- Bandwidth (20, 40, and 80 MHz)

☞ Transmit power configuration files for each completed certification are included in the Yocto meta-layer. Transmit power config files are named as per the name of the certification region, for example `txpwrlimit_cfg_ETSI.conf`. The configuration files are used by the recipe in the meta-layer to derive binary files, which can be automatically loaded by the driver, for each country in the certification region, such as, Germany (DE), France (FR), and so on.

For the exact power limits used for the various certifications, see the Appendix: Wi-Fi Tx output power limits. The MAYA-W2 system integration manual [2] contains details about configuring Wi-Fi Tx output power limits along with examples.

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 18.

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 19 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 19.

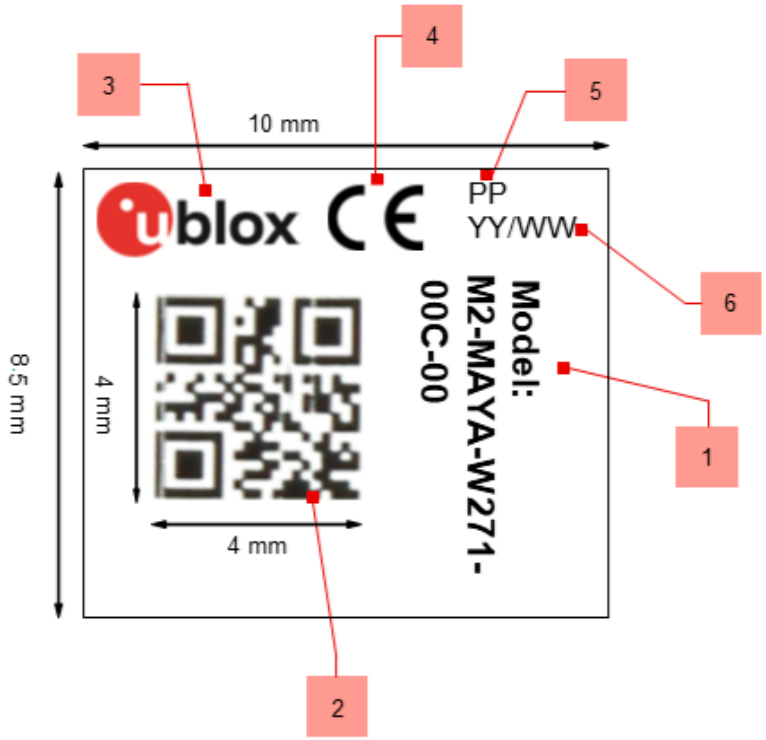

Figure 12: Product label format with dimensions for M2-MAYA-W271

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 5.3 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 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 21: 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)

☞ For product change notifications and regular updates of u-blox documentation, register on our website, www.u-blox.com.

Revision history

Revision	Date	Name	Comments
R01	6-Sept	frca	Initial release

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