NXP i.MX Platform Specific:

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1. Which Murata modules will work well with my NXP i.MX EVK?

Check the table below:

	6UL	6ULL/ULZ	6SL	6SLL	6SX	6S/Q/DL	6QP	8MQ	8MMini	RT106A	RT1020	RT1050	RT1060	RT1064
1DX	Y	Y	Y	Y	Y	Y	Y	N	N	On board	Y	Y	Y	Y
1MW*	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N
1LV*	Y	Y	N	N	N	N	N	N	N	N	Y	Y	Y	Y
1CX	N	N	N	N	N	N	N	Y	Y*	N	N	N	N	N

N.B.

i. 1MW compatibility on i.MX RT platforms is only due to software, not hardware interconnect.

ii. 1LV only supports 1.8 V VIO and therefore can only be used with i.MX platforms that support 1.8 V (e.g. i.MX 6UL, i.MX 6ULL).

iii. 1CX provides only WLAN on 8MMini. No Bluetooth is supported.

Adapter requirement for connecting Murata modules are given in the two tables below:

Module	Chipset	RT106A*	RT1060*	RT1050*	RT1064*	RT1020*
1DX	CYW4343W	On board	uSD-M.2	uSD-M.2	uSD-M.2	uSD-M.2
1LV			uSD-M.2	uSD-M.2	uSD-M.2	uSD-M.2

*Wi-Fi Only

Module	Chipset	6UL	6ULL/6ULZ	6SL*	6SLL	6SoloX	6Q/DL/Solo	6QP	8M mini*	8MQ
1DX	CYW4343W	uSD-M.2	uSD-M.2	uSD-M.2	uSD-M.2	uSD-M.2	uSD-M.2	uSD-M.2		
1MW	CYW43455	uSD-M.2	uSD-M.2	uSD-M.2	uSD-M.2	uSD-M.2	uSD-M.2	uSD-M.2		
1LV	CYW43012	uSD-M.2	uSD-M.2							
1CX	CYW4356								M.2	M.2

*Wi-Fi Only

N.B. i.MX RT 1060 EVK with 1DX EVB supports BLE.
For more details about the board compatibility, please visit:
https://wireless.murata.com/products/rf-modules-1/wi-fi-bluetooth-for-nxp-i-mx.html.

2. Can I use a mainline Linux kernel in my NXP i.MX image?

Murata / NXP do not officially support any mainline Linux kernels. It is highly recommended that you use one of the supported Linux kernels. Refer to the table below:

NXP EVK	Linux 4.1.15	Linux 4.9.11	Linux 4.9.88	Linux 4.9.123	Linux 4.14.98
i.MX 8MMini	N	N	N	Y	Y
i.MX 8MQ	N	N	Y	Y	Y
i.MX 6QP	Y	Y	Y	Y	Y
i.MX 6Q	Y	Y	Y	Y	Y
i.MX 6DL	Y	Y	Y	Y	Y
i.MX 6SX	Y	Y	Y	Y	Y
i.MX 6SL	Y	Y	Y	N	Y
i.MX 6UL	Y	Y	Y	Y	Y
i.MX 6ULL	Y	Y	Y	Y	Y

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3. NXP has released a new kernel BSP, but it is not yet supported in Murata github. How do I manually build my image using the new kernel?

This is not recommended and we suggest you use one of the supported Linux kernels only, by following the Linux Quick Start Guide. However, if you are in urgent need to update to the latest Cypress FMAC driver, follow the README included in the Cypress FMAC driver package release.

N.B. Murata can only support customers using one of our published releases.

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4. Which NXP i.MX EVKs support 1.8 V VIO?

Murata customized software supports 1.8V VIO. The i.MX 6UL, i.MX 6ULL and various i.MX RT EVKs currently support 1.8 V VIO mode, as listed below. Please refer to the NXP docs for more details on the NXP platform:

- i.MX 6UL EVK
- i.MX 6ULL EVK
- i.MX RT 1050 EVKB
- i.MX RT 1060 EVK
- i.MX RT 1064 EVK
- i.MX RT 1020 EVK

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5. How to select 1.8 V VIO operation for my Murata Wi-Fi/BT modules on NXP platform?

First make sure the EVK can operate in 1.8 V VIO mode. Currently, NXP i.MX EVKs 6UL and 6ULL support 1.8 V VIO operations. Then you need to prepare a micro SD card, flash an image built for 1.8V operation for the board. Murata's build script provides an option for 1.8V setting. The Murata modules compatible with these EVKs are 1DX, 1MW and 1LV, and require the uSD-M.2 interconnect to interface with the EVKs. The jumper J12 in the uSD-M.2 adapter is used to select the VIO operation voltage:

J12 closed: uSD-M.2 adapter is set to **3.3 V** VIO mode. A BLUE LED will glow, in addition to the GREEN LED.
J12 open: uSD-M.2 adapter is set to **1.8 V** VIO mode. Only the GREEN LED will glow.

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6. Which Murata modules are supported by the latest i.MX RT board SDKs?

The new SDK release for i.MX RT 1050, i.MX RT 1060, i.MX RT 1064 and i.MX RT 1020 boards are posted in NXP website. You can download it from here.

1DX and 1LV are supported in the latest SDK release (SDK 2.6.1). 1MW is planned to be included in the future SDK release. In addition to 1LV support, soft AP and UDP throughput testing are added in the new SDK. BLE and BT pass-through examples have been added in the SDK for i.MX RT 1060 EVK.

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7. What is the expected maximum throughput of Murata modules with NXP i.MX RT boards?

The new SDK release i.e. SDK 2.6.1 includes the support for Murata 1DX and 1LV. 1MW is not included but it is on the roadmap to be included in the future release. If you are able to increase the TCP window size, you should be able to see TCP throughput up to 40 Mbps on receive and 15 to 20 Mbps on transmit. All the steps to increase the TCP window size are included in our quick start guide. You can find it here.

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8. I build a 'core-image-minimal' image for my i.MX EVK board to connect using the default Wi-Fi. However, when the image is loaded, "ifconfig wlan0 up" fails with "No such device" error. What is wrong?

Try a different build, such as 'core-image-base'. The minimal build only allows the board to boot and provides a command line interpreter. It does not contain any additional modules (such as the Wi-Fi driver).

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9. Which Murata module should I use to use with NXP i.MX RT 1050/1060 EVK?

There are two compatible Murata M.2 modules available for NXP's i.MX RT 1060 EVK:

- Type 1DX
- Type 1LV.

Here is the link to the quick start guide to get started with i.MX RT 1050/1060 using M.2 modules.

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10. How do I decide the correct DTB file to use for my Murata module?

The DTB file to use depends on the target board and the SDIO interrupt mode.
Refer to the table below for the correct dtb file name.

Target EVK	SDIO interrupt mode	DTB file name
i.MX 8MMini	N/A	fsl-imx8mm-evk.dtb
i.MX 8MQ	N/A	fsl-imx8mq-evk-pcie1-m2.dtb
i.MX 6QP	OOB IRQ	imx6qp-sabresd-btwifi-m2-oob.dtb
i.MX 6QP	SDIO in-band	imx6qp-sabresd-btwifi-m2.dtb
i.MX 6Q	OOB IRQ	imx6q-sabresd-btwifi-m2-oob.dtb
i.MX 6Q	SDIO in-band	imx6q-sabresd-btwifi-m2.dtb
i.MX 6DL	OOB IRQ	imx6dl-sabresd-btwifi-m2-oob.dtb
i.MX 6DL	SDIO in-band	imx6dl-sabresd-btwifi-m2.dtb
i.MX 6SX	OOB IRQ	imx6sx-sdb-btwifi-m2-oob.dtb
i.MX 6SX	SDIO in-band	imx6sx-sdb-btwifi-m2.dtb
i.MX 6SL	SDIO in-band	imx6sl-evk-btwifi-m2.dtb
i.MX 6UL (14x14)	OOB IRQ	imx6ul-14x14-evk-btwifi-m2-oob.dtb
i.MX 6UL (14x14)	SDIO in-band	imx6ul-14x14-evk-btwifi-m2.dtb
i.MX 6UL (9x9)	OOB IRQ	imx6ul-9x9-evk-btwifi-m2-oob.dtb
i.MX 6UL (9x9)	SDIO in-band	imx6ul-9x9-evk-btwifi-m2.dtb
i.MX 6ULL (14x14)	OOB IRQ	imx6ull-14x14-evk-btwifi-m2-oob.dtb
i.MX 6ULL (14x14)	SDIO in-band	imx6ull-14x14-evk-btwifi-m2.dtb
i.MX 6ULL (9x9)	OOB IRQ	imx6ull-9x9-evk-btwifi-m2-oob.dtb
i.MX 6ULL (9x9)	SDIO in-band	imx6ull-9x9-evk-btwifi-m2.dtb

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11. I cannot get my i.MX8MQ EVK to detect my 1MW Murata module. What is wrong?

1MW requires an M.2-SDIO interface to integrate with an NXP EVK out-of-the-box. Unfortunately, the NXP i.MX8MQ EVK does not provide SDIO interconnect on the M.2 interface. The recommended Murata module to use with NXP i.MX8MQ EVK is 1CX, which is PCIe based.

Alternately, you can use the i.MX8M based EVKs developed by Embedded Artists, as they support all the current Murata Wi-Fi/BT modules (1DX, 1MW, 1LV, 1CX) out-of-the-box.

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12. Which Murata InterConnect module do I need to connect my Murata Wi-Fi/BT module with the NXP i.MX EVK?

Currently, the only Murata Interconnect module that is promoted is the uSD-M.2. The module allows for both 3.3V and 1.8 V VIO operations on supported Wi-Fi/BT modules. The 8M series of EVKs from NXP contains an M.2 slot and hence do not need the interconnect. The table below lists the uSD-M.2 interconnect module compatibility with respect to the NXP i.MX EVKs and Murata Wi-Fi/BT modules:

Murata module	6UL/ULL/ULZ	6SL/SLL	6SX	6Q/QP/DL/S	8MQ	8MMini
1DX	Requires uSD-M.2. Supports 3.3/1.8 V VIO	Requires uSD-M.2. Supports 3.3 V VIO	Requires uSD-M.2. Supports 3.3/1.8 V VIO	Requires uSD-M.2. Supports 3.3 V VIO	Not compatible	Not compatible
1MX	Requires uSD-M.2. Supports 3.3/1.8 V VIO	Requires uSD-M.2. Supports 3.3 V VIO	Requires uSD-M.2. Supports 3.3/1.8 V VIO	Requires uSD-M.2. Supports 3.3 V VIO	Not compatible	Not compatible
1LV	Requires uSD-M.2. Supports 1.8 V VIO	Not compatible	Not compatible	Not compatible	Not compatible	Not compatible
1CX	Not compatible	Not compatible	Not compatible	Not compatible	No interconnect required.	No interconnect required. Supports only Wi-Fi.

13. What is OOB interrupt?

OOB stands for "Out-of-Band" interrupt mechanism between Murata module (SDIO based) and the i.MX processor. In this mode, the WL_HOST_WAKE line on the Murata module is used to send interrupts. The i.MX is required to use a dedicated GPIO (connected to WL_HOST_WAKE) to monitor for interrupts.

The other interrupt mechanism is SDIO "In-band", where no separate line is required for interrupt passing between Murata module and the i.MX processor. The SDIO_DATA_1 line of the SDIO bus is used for interrupt, which is monitored by the i.MX SDIO host controller.

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14. Should I use OOB interrupt?

Murata recommends that the user runs OOB IRQ, whenever possible. Otherwise power-save mechanisms are limited. Specifically, the host cannot shut down the SDIO bus when using SDIO in-band signalling for WLAN interrupt mechanism. However, the following i.MX platforms do not support WLAN OOB IRQ out of the box and requires hardware rework: i.MX 6Q/DL SDB/SDP, i.MX 6QP SDB, i.MX 6SX SDB, i.MX6UL/ULL EVKs. For these platforms, the recommended interrupt mechanism is in-band SDIO, unless the necessary rework is done.
Refer to the Murata Hardware User Manual for the rework details.

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15. Which Murata modules will work with NXP i.MX8MQ board?

Murata module 1CX works with the i.MX 8MQ and has support in Yocto Linux. The module provides Wi-Fi 802.11ac 2x2 MIMO and BT 5.0. It can be obtained from here.

For more detail, please visit Murata's landing page for modules and hardware solutions.

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