HWRGEFBTPALUG

Hardware Rework Guide for EdgeFast Bluetooth Protocol Abstraction Layer

Rev. 9 — 9 October 2023

User manual

CONFIDENTIAL

Document information

Information	Content
Keywords	Hardware Rework, EdgeFast, Bluetooth, PAL, Protocol, Abstraction, Layer
Abstract	This document is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on various boards.

1 Hardware Rework Guide for MIMXRT1060-EVKB and AW-AM510MA

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT1060-EVKB board and AW-AM510MA. The AW-AM510MA user guide is available here.

The hardware rework has three parts:

- HCI UART rework
- I2S2 rework
- M.2 SDIO rework

1.1 Hardware rework

- **HCI UART rework**
  1. Remove R293 and R354, connect R293 pin2 with R354 Pin1.
  2. Remove R241 and R163, connect R93 pin1 with R241 Pin2.
  3. Solder R96, R93, R87, R79, R70, and R345.
  4. Remove R193.

Figure 1. MIMXRT1060-EVKB (Back)

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Figure 2. MIMXRT1060-EVKB (Front)

- **I2S2 rework**
  1. Open jumpers: J35, J36, J37, and J41.
  2. Connect J35 (Pin2) with J19 (Pin3) and solder R341.
  3. Connect J36 (Pin2) with J19 (Pin9) and solder R334
  4. Connect J41 (Pin2) with TP11.
  5. Connect J37 (Pin2) with J16 (Pin5).
  6. Connect R428 with R254 (Pin2), remove R254, R173, and R175.
  7. Remove R86, R76, and R381.

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Figure 3. MIMXRT1060-EVKB (Front)

Figure 4. MIMXRT1060-EVKB (Back)

- **M.2 SDIO rework**
  1. Solder R368, R376, R347, R349, R365, and R363.
  2. Remove R364, R366, R351, R348, R377, and R369.

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Figure 5. MIMXRT1060-EVKB (Back)

2 Hardware Rework Guide for MIMXRT1060-EVKB and AW-CM358MA

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT1060-EVKB board and AW-CM358MA. The AW-CM358MA user guide is available here.

The hardware rework has three parts:

- HCI UART rework
- I2S2 rework
- M.2 SDIO rework

2.1 Hardware rework

- **HCI UART rework**
  1. Remove R293 and R354, connect R293 pin2 with R354 Pin1.
  2. Remove R241 and R163, connect R93 pin1 with R241 Pin2.
  3. Solder R96, R93, R87, R79, R70, and R345.
  4. Remove R193.

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Figure 6. MIMXRT1060-EVKB (Back)

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Figure 7. MIMXRT1060-EVKB (Front)

- **I2S2 rework**
  1. Open jumpers: J35, J36, J37, and J41.
  2. Connect J35 (Pin2) with J19 (Pin3) and solder R341.
  3. Connect J36 (Pin2) with J19 (Pin9) and solder R334.
  4. Connect J41 (Pin2) with TP11.
  5. Connect J37 (Pin2) with J16 (Pin5).
  6. Connect R428 with R254 (Pin2), remove R254, R173, and R175.
  7. Remove R86, R76, and R381.

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Figure 8. MIMXRT1060-EVKB (Front)

Figure 9. MIMXRT1060-EVKB (Back)

- **M.2 SDIO rework**
  1. Solder R368, R376, R347, R349, R365, and R363.
  2. Remove R364, R366, R351, R348, R377, and R369.

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Figure 10. MIMXRT1060-EVKB (Back)

3 Hardware Rework Guide for MIMXRT1060-EVKB and AW-AM457-uSD

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT1060-EVKB board and AW-AM457-uSD. The AW-AM457-uSD user guide is available here.

The hardware rework has two parts:

- HCI UART port rework
- PCM interface rework

3.1 Hardware rework

- **HCI UART rework**
  Make sure resistors R368/R376/R347/R349/R365/R363/R193/R186 are removed.
  Connect the pins of two boards as the following table.

Table 1. Connect pins

Pin Name	AW-AM457-uSD	i.MXRT1060	PIN NAME	GPIO NAME of RT1060
UART_TXD	J10 (pin 4)	J16 (pin 1)	LPUART3_RXD	GPIO_AD_B1_07
UART_RXD	J10 (pin 2)	J16 (pin 2)	LPUART3_TXD	GPIO_AD_B1_06
UART_RTS	J10 (pin 6)	J33 (pin 3)	LPUART3_CTS	GPIO_AD_B1_04
UART_CTS	J10 (pin 8)	J33 (pin 4)	LPUART3_RTS	GPIO_AD_B1_05
GND	J6 (pin 7)	J32 (pin 7)	GND	GND

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Figure 11. MIMXRT1060-EVKB (Front)

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Figure 12. MIMXRT1060-EVKB (Back)

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Figure 13. AW-AM457-uSD

Jumper Setting:

– Connect J4[2-3] for VIO 3.3 V supply

– Connect J11[2-3] for VIO_SD 3.3 V supply

- **PCM interface rework**

  Connect the pins of two boards as the following table.

Table 2. Connect pins

PIN NAME	AW-AM457-USD	I.MXRT1060	PIN NAME OF RT1060	GPIO NAME of RT1060
PCM_IN	J9 (pin 1)	J16 (pin 5)	SAI2_TXD	GPIO_AD_B0_09
PCM_OUT	J9 (pin 2)	TP11	SAI2_RXD	GPIO_AD_B0_08
PCM_SYNC	J9 (pin 3)	J2 (pin 9)	SAI2_RX_SYNC	GPIO_AD_B0_07
PCM_CLK	J9 (pin 4)	J10 (pin 2)	SAI2_RX_BCLK	GPIO_AD_B0_06
GND	J9 (pin 6)	J2 (pin 20)	GND	GND

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Figure 14. MIMXRT1060-EVKB (Front)

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Figure 15. MIMXRT1060-EVKB (Back)

Note:
To support HFP feature, you must remove R381 on MIMXRT1060-EVKB.

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Figure 16. AW-AM457-uSD

4 Hardware Rework Guide for MIMXRT1060-EVKB and AW-CM358-uSD

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT1060-EVKB board and AW-CM358-uSD. The AW-CM358-uSD user guide is available here.

The hardware rework has two parts:

- HCI UART port rework
- PCM interface rework

4.1 Hardware rework

- **HCI UART rework**
  Connect the pins of two boards as the following table.
  Make sure that the resistors R368/R376/R347/R349/R365/R363/R193/R186 are removed.

Table 3. Connect pins

Pin Name	AW-CM358-USD	i.MXRT1060	PIN NAME	GPIO NAME of RT1060
UART_TXD	J10 (pin 4)	J16 (pin 1)	LPUART3_RXD	GPIO_AD_B1_07
UART_RXD	J10 (pin 2)	J16 (pin 2)	LPUART3_TXD	GPIO_AD_B1_06
UART_RTS	J10 (pin 6)	J33 (pin 3)	LPUART3_CTS	GPIO_AD_B1_04

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Table 3. Connect pins*...continued*

Pin Name	AW-CM358-USD	i.MXRT1060	PIN NAME	GPIO NAME of RT1060
UART_CTS	J10 (pin 8)	J33 (pin 4)	LPUART3_RTS	GPIO_AD_B1_05
GND	J6 (pin 7)	J32 (pin 7)	GND	GND

Figure 17. MIMXRT1060-EVKB (Front)

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Figure 18. MIMXRT1060-EVKB (Back)

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Figure 19. AW-CM358-uSD

Jumper Setting:
Connect J4[1-2] for VIO 1.8 V supply.

- **PCM interface rework**
  Connect the pins of two boards as the following table.

Table 4. Connect pins

PIN NAME	AW-CM358-USD	I.MXRT1060	PIN NAME OF RT1060	GPIO NAME of RT1060
PCM_IN	J11 (pin 1)	J16 (pin 5)	SAI2_TXD	GPIO_AD_B0_09
PCM_OUT	J11 (pin 2)	TP11	SAI2_RXD	GPIO_AD_B0_08
PCM_SYNC	J11 (pin 3)	J2 (pin 9)	SAI2_RX_SYNC	GPIO_AD_B0_07
PCM_CLK	J11 (pin 4)	J10 (pin 2)	SAI2_RX_BCLK	GPIO_AD_B0_06
GND	J11 (pin 6)	J2 (pin 20)	GND	GND

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Figure 20. MIMXRT1060-EVKB (Front)

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Figure 21. MIMXRT1060-EVKB (Back)

Note:

To support HFP feature, you must remove R381 on MIMXRT1060-EVKB.

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Figure 22. AW-CM358-uSD

5 Hardware Rework Guide for MIMXRT1060-EVKB and Murata uSD-M.2 Adapter

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT1060-EVKB board and Murata uSD-M.2 adapter. For details on the Murata uSD-M.2 Adapter, see the Murata uSD-M.2 webpage here. The hardware rework consists of three parts:

- Murata uSDM
- 2 jumper settings
- HCI UART and PCM interface rework

5.1 Hardware rework

- **Murata uSD-M.2 jumper settings**
  - J12 = 1-2: WLAN-SDIO & BT-PCM = 1.8 V
  - J13 = 1-2: BT-UART & WLAN/BT-CTRL = 3.3 V
  - J1 = 2-3: 3.3 V from uSD connector
- **HCI UART interface rework**
  Connect the TX/RX/RTS/CTS pins of the two boards as show in Table 5using the jumper cables included in the Murata's uSD-M.2 Adapter kit.

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Table 5. Connect the TX/RX/RTS/CTS pins

Pin name	uSD-M.2 adapter pin	i.MX RT1060-EVKB pin	Pin name of RT1060-EVKB	GPIO name of RT1060-EVKB
BT_UART_TXD_HOST	J9 (pin 1)	J16 (pin 1)	LPUART3_RXD	GPIO_AD_B1_07
BT_UART_RXD_HOST	J9 (pin 2)	J16 (pin 2)	LPUART3_TXD	GPIO_AD_B1_06
BT_UART_RTS_HOST	J8 (pin 3)	J33 (pin 3)	LPUART3_CTS	GPIO_AD_B1_04
BT_UART_CTS_HOST	J8 (pin 4)	J33 (pin 4)	LPUART3_RTS	GPIO_AD_B1_05
GND	J7 (pin 7)	J32 (pin 7)	GND	GND

- **PCM interface rework**
  Connect the PCM_IN/PCM_OUT/PCM_SYNC/PCM_CLK/GND pins of the two boards as shown in Table 6.

Table 6. Connect the PCM_IN/PCM_OUT/PCM_SYNC/PCM_CLK/GND pins

Pin name	uSD-M.2 adapter pin	i.MXRT1060-EVKB pin	Pin name of RT1060-EVKB	GPIO name of RT1060-EVKB
PCM_IN	J5 (pin1)	J16 (pin5)	SAI2_TXD	GPIO_AD_B0_09
PCM_OUT	J5 (pin3)	TP11	SAI2_RXD	GPIO_AD_B0_08
PCM_SYNC	J5 (pin5)	J2 (pin9)	SAI2_RX_SYNC	GPIO_AD_B0_07
PCM_CLK	J5 (pin7)	J10 (pin2)	SAI2_RX_BCLK	GPIO_AD_B0_06
GND	J5 (pin15)	J2 (pin20)	GND	GND

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Figure 23. MIMXRT1060-EVKB board

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Figure 24. SD-M.2_Adapter

6 Hardware Rework Guide for MIMXRT1060-EVKB and AW-AM510-uSD

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT1060-EVKB board and AW-AM510-uSD. The AW-AM510-uSD user guide is available here.

The hardware rework has two parts:

- HCI UART port rework
- PCM interface rework

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6.1 Hardware rework

- **HCI UART rework**
  Make sure resistors R368/R376/R347/R349/R365/R363/R193/R186 are removed.
  Connect the pins of two boards as the following table.

Table 7. Connect pins

Pin Name	AW-AM510-uSD	i.MXRT1060	PIN NAME	GPIO NAME of RT1060
UART_TXD	J10 (pin 4)	J16 (pin 1)	LPUART3_RXD	GPIO_AD_B1_07
UART_RXD	J10 (pin 2)	J16 (pin 2)	LPUART3_TXD	GPIO_AD_B1_06
UART_RTS	J10 (pin 6)	J33 (pin 3)	LPUART3_CTS	GPIO_AD_B1_04
UART_CTS	J10 (pin 8)	J33 (pin 4)	LPUART3_RTS	GPIO_AD_B1_05
GND	J6 (pin 7)	J32 (pin 7)	GND	GND

Figure 25. AW-AM510-uSD

Jumper Setting:

– Connect J4[2-3] for VIO 3.3 V supply

- **PCM interface rework**
  Connect the pins of two boards as the following table.

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Table 8. Connect pins

PIN NAME	AW-AM510-USD	I.MXRT1060	PIN NAME OF RT1060	GPIO NAME of RT1060
PCM_IN	J11 (pin 1)	J16 (pin 5)	SAI2_TXD	GPIO_AD_B0_09
PCM_OUT	J11 (pin 2)	TP11	SAI2_RXD	GPIO_AD_B0_08
PCM_SYNC	J11 (pin 3)	J2 (pin 9)	SAI2_RX_SYNC	GPIO_AD_B0_07
PCM_CLK	J11 (pin 4)	J10 (pin 2)	SAI2_RX_BCLK	GPIO_AD_B0_06
GND	J11 (pin 6)	J2 (pin 20)	GND	GND

Figure 26. AW-AM510-uSD

7 Hardware Rework Guide for MIMXRT1060-EVK and AW-AM457-uSD

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT1060-EVK board and AW-AM457-uSD. The AW-AM457-uSD user guide is available here.

The hardware rework has two parts:

- HCI UART port rework
- PCM interface rework

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7.1 Hardware rework

- **HCI UART rework**
  Connect the pins of two boards as the following table.

Table 9. Connect pins

Pin Name	AW-AM457-uSD	i.MXRT1060	PIN NAME	GPIO NAME of RT1060
UART_TXD	J10 (pin 4)	J22 (pin 1)	LPUART3_RXD	GPIO_AD_B1_07
UART_RXD	J10 (pin 2)	J22 (pin 2)	LPUART3_TXD	GPIO_AD_B1_06
UART_RTS	J10 (pin 6)	J23 (pin 3)	LPUART3_CTS	GPIO_AD_B1_04
UART_CTS	J10 (pin 8)	J23 (pin 4)	LPUART3_RTS	GPIO_AD_B1_05
GND	J6 (pin 7)	J25 (pin 7)	GND	GND

Figure 27. MIMXRT1060-EVK

Figure 28. AW-AM457-uSD

Jumper Setting:

– Connect J4[2-3] for VIO 3.3 V supply

– Connect J11[2-3] for VIO_SD 3.3 V supply

- **PCM interface rework**
  Connect the pins of two boards as the following table.

Table 10. Connect pins

PIN NAME	AW-AM457-USD	I.MXRT1060	PIN NAME	GPIO NAME of RT1060
PCM_IN	J9 (pin 1)	J22 (pin 5)	SAI2_TXD	GPIO_AD_B0_09

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Table 10. Connect pins*...continued*

PIN NAME	AW-AM457-USD	I.MXRT1060	PIN NAME	GPIO NAME of RT1060
PCM_OUT	J9 (pin 2)	TP11	SAI2_RXD	GPIO_AD_B0_08
PCM_SYNC	J9 (pin 3)	J21 (pin 9)	SAI2_RX_SYNC	GPIO_AD_B0_07
PCM_CLK	J9 (pin 4)	J21 (pin 7)	SAI2_RX_BCLK	GPIO_AD_B0_06
GND	J9 (pin 6)	J21 (pin 20)	GND	GND

Figure 29. MIMXRT1060-EVK

Note:

To support HFP feature, you must remove R316 and R323 on MIMXRT1060-EVK.

To run HFP feature, you must remove J47 jumper.

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Figure 30. AW-AM457-uSD

8 Hardware Rework Guide for MIMXRT1060-EVK and AW-CM358-uSD

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT1060-EVK board and AW-CM358-uSD. The AW-CM358-uSD user guide is available here.

The hardware rework has two parts:

- HCI UART port rework
- PCM interface rework

8.1 Hardware rework

1. **HCI UART rework**
   Connect the pins of two boards as the following table.

Table 11. Connect pins

Pin Name	AW-CM358-USD	i.MXRT1060	PIN NAME	GPIO NAME of RT1060
UART_TXD	J10 (pin 4)	J22 (pin 1)	LPUART3_RXD	GPIO_AD_B1_07
UART_RXD	J10 (pin 2)	J22 (pin 2)	LPUART3_TXD	GPIO_AD_B1_06

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Table 11. Connect pins*...continued*

Pin Name	AW-CM358-USD	i.MXRT1060	PIN NAME	GPIO NAME of RT1060
UART_CTS	J10 (pin 8)	J23 (pin 4)	LPUART3_RTS	GPIO_AD_B1_05
UART_RTS	J10 (pin 6)	J23 (pin 3)	LPUART3_CTS	GPIO_AD_B1_04
GND	J6 (pin 7)	J25 (pin 7)	GND	GND

Figure 31. MIMXRT1060-EVK

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Figure 32. AW-CM358-uSD

Jumper Setting:
Connect J4[1-2] for VIO 1.8 V supply.

2. **PCM interface rework**
   Connect the pins of two boards as the following table.

Table 12. Connect pins

PIN NAME	AW-CM358-USD	I.MXRT1060	PIN NAME	GPIO NAME of RT1060
PCM_IN	J11 (pin 1)	J22 (pin 5)	SAI2_TXD	GPIO_AD_B0_09
PCM_OUT	J11 (pin 2)	TP11	SAI2_RXD	GPIO_AD_B0_08
PCM_SYNC	J11 (pin 3)	J21 (pin 9)	SAI2_RX_SYNC	GPIO_AD_B0_07
PCM_CLK	J11 (pin 4)	J21 (pin 7)	SAI2_RX_BCLK	GPIO_AD_B0_06
GND	J11 (pin 6)	J21 (pin 20)	GND	GND

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Figure 33. MIMXRT1060-EVK

Note:

To support HFP feature, you must remove R316 and R323 on MIMXRT1060-EVK.

To run HFP feature, you must remove J47 jumper.

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Figure 34. AW-CM358-uSD

9 Hardware Rework Guide for MIMXRT1060-EVK and Murata uSD-M.2 Adapter

This section is a brief hardware rework guidance of the Edgefast Bluetooth PAL on the NXP i.MX MIMXRT1060-EVK board and Murata uSD-M.2 adapter. For details on Murata uSD-M.2 Adapter, see the Murata's uSD-M.2 webpage.The hardware rework consists only of HCI UART port rework.

9.1 Hardware rework

- **HCI UART rework**

Connect the TX/RX/RTS/CTS pins of two boards as the following table using jumper cables include in Murata's uSD-M.2 Adapter kit.

Table 13. Connect HCI UART pins

Pin name	uSD-M.2 adapter pin	i.MX RT1060 pin	Pin name of RT1060	GPIO name of RT1060
BT_UART_TXD_HOST	J9 (pin 1)	J22 (pin 1)	LPUART3_RXD	GPIO_AD_B1_07
BT_UART_RXD_HOST	J9 (pin 2)	J22 (pin 2)	LPUART3_TXD	GPIO_AD_B1_06
BT_UART_RTS_HOST	J8 (pin 3)	J23 (pin 3)	LPUART3_CTS	GPIO_AD_B1_04
BT_UART_CTS_HOST	J8 (pin 4)	J23 (pin 4)	LPUART3_RTS	GPIO_AD_B1_05

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Figure 35. MIMXRT1060-EVK

Figure 36. Murata uSD-M.2 adapter

Murata uSD-M.2 jumper settings:

- Both J12 and J13 = 1-2 (WLAN-SDIO = 1.8 V; and BT-UART and WLAN/BT-CTRL = 3.3 V)
- J1 = 2-3 (3.3 V from uSD connector)

PCM interface rework

Connect the PCM_IN/PCM_OUT/PCM_SYNC/PCM_CLK/GND pins of the two boards as shown in Table 14.

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Table 14. Connect the PCM_IN/PCM_OUT/PCM_SYNC/PCM_CLK/GND pins

Pin name	uSD-M.2 adapter pin	i.MXRT1060-EVKB pin	Pin name of RT1060-EVKB	GPIO name of RT1060-EVKB
PCM_IN	J5 (pin1)	J16 (pin5)	SAI2_TXD	GPIO_AD_B0_09
PCM_OUT	J5 (pin3)	TP11	SAI2_RXD	GPIO_AD_B0_08
PCM_SYNC	J5 (pin5)	J2 (pin9)	SAI2_RX_SYNC	GPIO_AD_B0_07
PCM_CLK	J5 (pin7)	J10 (pin2)	SAI2_RX_BCLK	GPIO_AD_B0_06
GND	J5 (pin15)	J2 (pin20)	GND	GND

10 Hardware Rework Guide for MIMXRT1060-EVK and AW-AM510-uSD

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT1060-EVK board and AW-AM510-uSD. The AW-AM510-uSD user guide is available here. The hardware rework has one part:

- HCI UART port rework

10.1 Hardware rework

- **HCI UART rework**
  Connect the pins of two boards as the following table.

Table 15. Connect pins

Pin Name	AW-AM510-uSD	i.MXRT1060	PIN NAME	GPIO NAME of RT1060
UART_TXD	J10 (pin 4)	J22 (pin 1)	LPUART3_RXD	GPIO_AD_B1_07
UART_RXD	J10 (pin 2)	J22 (pin 2)	LPUART3_TXD	GPIO_AD_B1_06
UART_RTS	J10 (pin 6)	J23 (pin 3)	LPUART3_CTS	GPIO_AD_B1_04
UART_CTS	J10 (pin 8)	J23 (pin 4)	LPUART3_RTS	GPIO_AD_B1_05
GND	J6 (pin 7)	J25 (pin 7)	GND	GND

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Figure 37. AW-AM510-uSD

Jumper Setting:

– Connect J4[2-3] for VIO 3.3 V supply

- **PCM interface rework**

  Connect the pins of two boards as the following table.

Table 16. Connect pins

PIN NAME	AW-AM510-USD	I.MXRT1060	PIN NAME OF RT1060	GPIO NAME of RT1060
PCM_IN	J11 (pin 1)	J22 (pin 5)	SAI2_TXD	GPIO_AD_B0_09
PCM_OUT	J11 (pin 2)	TP11	SAI2_RXD	GPIO_AD_B0_08
PCM_SYNC	J11 (pin 3)	J21 (pin 9)	SAI2_RX_SYNC	>GPIO_AD_01_07
PCM_CLK	J11 (pin 4)	J21 (pin 7)	SAI2_RX_BCLK	GPIO_AD_B0_06
GND	J11 (pin 6)	J21 (pin 20)	GND	GND

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Figure 38. AW-AM510-uSD

11 Hardware Rework Guide for MIMXRT1170-EVK and AW-AM457-uSD

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT1170-EVK board and AW-AM457-uSD. The AW-AM457-uSD user guide is available here. The hardware rework has one part:

- HCI UART port rework

11.1 Hardware rework

1. HCI UART rework
   Connect the pins of two boards as the following table.

Table 17. Connect pins

Pin Name	AW-AM457-uSD	i.MXRT1170	PIN NAME	GPIONAME of RT1170
UART_TXD	J10 (pin 4)	J25 (pin 13)	LPUART7_RXD	GPIO_AD_01
UART_RXD	J10 (pin 2)	J25 (pin 15)	LPUART7_TXD	GPIO_AD_00
UART_CTS	J10 (pin 8)	J25 (pin 9)	LPUART7_RTS	GPIO_AD_03

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Table 17. Connect pins*...continued*

Pin Name	AW-AM457-uSD	i.MXRT1170	PIN NAME	GPIONAME of RT1170
UART_RTS	J10 (pin 6)	J25 (pin 11)	LPUART7_CTS	GPIO_AD_02
GND	J6 (pin 7)	J26 (pin 1)	GND	GND

Figure 39. MIMXRT1170-EVK

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Figure 40. AW-AM457-uSD

Jumper Setting:

- Connect J4[2-3] for VIO 3.3 V supply
- Connect J11[2-3] for VIO_SD 3.3 V supply

12 Hardware Rework Guide for MIMXRT1170-EVK and AW-CM358MA

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT1170-EVK board and AW-CM358MA. The User's Guide of AW-CM358MA is available here.

12.1 Hardware rework

- **HCI UART rework**
  1. Solder 0 ohm resistor to R1901 and R1902.
  2. Remove resistors R795, R796, R797, R798, R799, R800, and R801.

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3. Remove 0 ohm resistor from R1816.

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13 Hardware Rework Guide for MIMXRT1170-EVK and AW-AM510MA

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT1170-EVK board and AW-AM510MA. The User's Guide of AW-AM510MA is available here.

13.1 Hardware rework

- **HCI UART rework**
  1. Solder 0 ohm resistor to R1901 and R1902.
  2. Remove resistors R795, R796, R797, R798, R799, R800, and R801.

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3. Remove 0 ohm resistor from R1816.

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14 Hardware Rework Guide for MIMXRT1170-EVK with Direct Murata M.2 Module

This section is a brief hardware rework guidance of the Edgefast Bluetooth PAL on the NXP i.MX MIMXRT1170-EVK board and the Murata 1XK or 1ZM solution - direct M.2 connection to Embedded Artists' EAR00385 (1XK) or EAR00364 (1ZM) M.2 modules. The rework is necessary to connect the RADIO_ENABLE (or WL_RTS) signal in addition to two UART signals.

The hardware rework consists of two parts:

- HCI UART port rework
- Radio control signal rework (RADIO_ENABLE)

14.1 Hardware rework

1. **HCI UART rework:**

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On MIMXRT1170-EVK board, populate R1901 and R1902 with zero Ohm resistors. This connects the BT_UART_RXD and BT_UART_CTS signals respectively to the M.2 connector.

2. **Radio control signal rework (WL_CTS):**
   On MIMXRT1170-EVK board, populate R404 with a zero Ohm resistor. Remove R183 resistor. This connects the WL_RST signal directly to the M.2 connector. This signal resets both wireless cores.

15 Hardware Rework Guide for MIMXRT1170-EVK and Murata uSD-M.2 Adapter

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT1170-EVK board and Murata uSD-M.2 adapter. For details on the Murata uSD-M.2 Adapter, see the Murata's uSD-M.2 webpage.

The hardware rework consists only of HCI UART port rework.

15.1 Hardware rework

HCI UART rework:

Connect the TX/RX/RTS/CTS pins of two boards as the following table using jumper cables include in the Murata's uSD-M.2 Adapter kit.

Table 18. Connect HCI UART pins

Pin name	uSD-M.2 adapter pin	i.MX RT1170 pin	Pin name	GPIO name of RT1170
BT_UART_TXD_HOST	J9 (pin 1)	J25 (pin 13)	LPUART7_RXD	GPIO_AD_01
BT_UART_RXD_HOST	J9 (pin 2)	J25 (pin 15)	LPUART7_TXD	GPIO_AD_00
BT_UART_CTS_HOST	J8 (pin 4)	J25 (pin 9)	LPUART7_RTS	GPIO_AD_03
BT_UART_RTS_HOST	J8 (pin 3)	J25 (pin 11)	LPUART7_CTS	GPIO_AD_02

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Figure 41. MIMXRT1170-EVK

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Figure 42. Murata uSD-M.2 adapter

Murata uSD-M.2 jumper settings:

- Both J12 and J13 = 1-2 (WLAN-SDIO = 1.8 V; and BT-UART and WLAN/BT-CTRL = 3.3 V)
- J1 = 2-3 (3.3 V from uSD connector)

16 Hardware Rework Guide for MIMXRT1170-EVKB and Murata 1XK M.2 Adapter

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT1170-EVKB and the Murata 1XK M.2 solution - direct M.2 connection to Embedded Artists' EAR00385 (1XK) M.2 modules.

The hardware rework has two parts:

- HCI UART rework
- PCM interface rework

16.1 Hardware rework

- **HCI UART rework**
  1. Remove resistors R183 and R1816.
  2. Solder 0 ohm resistor to R404, R1901, and R1902.

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Figure 43. MIMXRT1170-EVKB UART Front

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Figure 44. MIMXRT1170-EVKB UART Back

- **PCM interface rework**
  1. Disconnect header J79 and J80.
  2. Connect header J81 and J82.
  3. Remove resistors R1985, R1986, R1987, R1988, R1992, R1993, R1994, and R1995.
  4. Solder 0 ohm resistor to R228, R229, R232, R234, and R1903.

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Figure 45. MIMXRT1170-EVKB PCM Front

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Figure 46. MIMXRT1170-EVKB PCM Back

17 Hardware Rework Guide for MIMXRT1170-EVKB and Murata 1ZM M.2 Adapter

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT1170-EVKB and the Murata 1ZM M.2 solution - direct M.2 connection to Embedded Artists' EAR00364 (1ZM) M.2 modules.

The hardware rework has two parts:

- HCI UART rework
- PCM interface rework

17.1 Hardware rework

- **HCI UART rework**
  1. Remove resistors R183 and R1816.
  2. Solder 0 ohm resistor to R404, R1901, and R1902.

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Figure 47. MIMXRT1170-EVKB UART Front

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Figure 48. MIMXRT1170-EVKB UART Back

- **PCM interface rework**
  1. Disconnect header J79 and J80.
  2. Connect header J81 and J82.
  3. Remove resistors R1985, R1986, R1987, R1988, R1992, R1993, R1994, and R1995.
  4. Solder 0 ohm resistor to R228, R229, R232, R234, and R1903.

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Figure 49. MIMXRT1170-EVKB PCM Front

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Figure 50. MIMXRT1170-EVKB PCM Back

18 Hardware Rework Guide for MIMXRT685-EVK and AW-AM457-uSD

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT685-EVK board and AW-AM457-uSD. The AW-AM457-uSD user guide is available here.The hardware rework has one part:

- HCI UART port rework

18.1 Hardware rework

HCI UART rework

- R398 move from 1-2 to 2-3
- JP12 2-3
- Connect the pins of two boards as the following table.

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Table 19. Connect pins

Pin Name	AW-AM457-uSD	i.MX RT685	PIN NAME	GPIONAME of i.MX RT685
UART_TXD	J10 (pin 4)	J27 (pin 1)	USART4_RXD	FC4_RXD_SDA_MOSI_DATA
UART_RXD	J10 (pin 2)	J27 (pin 2)	USART4_TXD	FC4_TXD_SCL_MISO_WS
UART_RTS	J10 (pin 6)	J47 (pin 9)	USART4_CTS	FC4_CTS_SDA_SSEL0
UART_CTS	J10 (pin 8)	J27 (pin 5)	USART4_RTS	FC4_RTS_SCL_SSEL1
GND	J6 (pin 7)	J29 (pin 6)	GND	GND

Figure 51. MIMXRT685-EVK

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Figure 52. AW-AM457-uSD

Jumper Settings:

- Connect J4[2-3] for VIO 3.3 V supply
- Connect J11[2-3] for VIO_SD 3.3 V supply

PCM interface rework

Connect the pins of two boards as the following table.

Table 20. Connect pins

Pin Name	AW-AM457-uSD	i.MX RT685	PIN NAME of I.MX RT685	GPIONAME of I.MX RT685
PCM_IN	J9 (pin 1)	J47 (pin 7)	I2S2_TXD	FC2_RXD_SDA_MOSI_DATA
PCM_OUT	J9 (pin 2)	J28 (pin 4)	I2S5_RXD	FC5_RXD_SDA_MOSI_DATA
PCM_SYNC	J9 (pin 3)	J28 (pin 5)	I2S5_WS	FC5_TXD_SCL_MISO_WS
PCM_CLK	J9 (pin 4)	J28 (pin 6)	I2S5_SCK	FC5_SCK
GND	J9 (pin 6)	J29 (pin 7)	GND	GND

19 Hardware Rework Guide for MIMXRT685-EVK and AW-CM358-uSD

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT685-EVK board and AW-CM358-uSD. The AW-CM358-uSD user guide is available here. The hardware rework has one part:

- HCI UART port rework

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19.1 Hardware rework

HCI UART rework

R398 move from 1-2 to 2-3.

Connect the pins of two boards as the following table.

Table 21. Connect pins

Pin Name	AW-CM358-USD	i.MXRT685	PIN NAME	GPIONAME of RT685
UART_TXD	J10 (pin 4)	J27 (pin 1)	USART4_RXD	FC4_RXD_SDA_MOSI_DATA
UART_RXD	J10 (pin 2)	J27 (pin 2)	USART4_TXD	FC4_TXD_SCL_MISO_WS
UART_RTS	J10 (pin 6)	J47 (pin 9)	USART4_CTS	FC4_CTS_SDA_SSEL0
UART_CTS	J10 (pin 8)	J27 (pin 5)	USART4_RTS	FC4_RTS_SCL_SSEL1
GND	J6 (pin 7)	J29 (pin 6)	GND	GND

Figure 53. MIMXRT685-EVK

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Figure 54. AW-CM358-uSD

Jumper Setting:

Connect J4[1-2] for VIO 1.8 V supply.

PCM interface rework

Connect the pins of two boards as the following table.

Table 22. Connect pins

Pin Name	AW-CM358-USD	i.MX RT685	PIN NAME of RT685	GPIONAME of RT685
PCM_IN	J11 (pin 1)	J47 (pin 7)	I2S2_TXD	FC2_RXD_SDA_MOSI_DATA
PCM_OUT	J11 (pin 2)	J28 (pin 4)	I2S5_RXD	FC5_RXD_SDA_MOSI_DATA
PCM_SYNC	J11 (pin 3)	J28 (pin 5)	I2S5_WS	FC5_TXD_SCL_MISO_WS
PCM_CLK	J11 (pin 4)	J28 (pin 6)	I2S5_SCK	FC5_SCK
GND	J11 (pin 5)	J29 (pin 7)	GND	GND

20 Hardware Rework Guide for MIMXRT685-EVK and AW-AM510-uSD

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT685-EVK board and AW-AM510-uSD. The AW-AM510-uSD user guide is available here. The hardware rework has one part:

- HCI UART port rework

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20.1 Hardware rework

- **HCI UART rework**
  Connect the pins of two boards as the following table.

Table 23. Connect pins

Pin Name	AW-AM510-uSD	i.MXRT685	PIN NAME	GPIO NAME of RT685
UART_TXD	J10 (pin 4)	J27 (pin 1)	USART4_RXD	FC4_RXD_SDA_MOSI_DATA
UART_RXD	J10 (pin 2)	J27 (pin 2)	USART4_TXD	FC4_TXD_SCL_MISO_WS
UART_RTS	J10 (pin 6)	J47 (pin 9)	USART4_CTS	FC4_CTS_SDA_SSEL0
UART_CTS	J10 (pin 8)	J27 (pin 5)	USART4_RTS	FC4_RTS_SCL_SSEL1
GND	J6 (pin 7)	J29 (pin 6)	GND	GND

Figure 55. AW-AM510-uSD

Jumper Setting:

– Connect J4[2-3] for VIO 3.3 V supply

- **PCM interface rework**
  Connect the pins of two boards as the following table.

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Table 24. Connect pins

PIN NAME	AW-AM510-USD	i.MX RT685	PIN NAME of RT685	GPIONAME of RT685
PCM_IN	J11 (pin 1)	J47 (pin 7)	I2S2_TXD	FC2_RXD_SDA_MOSI_DATA
PCM_OUT	J11 (pin 2)	J28 (pin 4)	I2S5_RXD	FC5_RXD_SDA_MOSI_DATA
PCM_SYNC	J11 (pin 3)	J28 (pin 5)	I2S5_WS	FC5_TXD_SCL_MISO_WS
PCM_CLK	J11 (pin 4)	J28 (pin 6)	I2S5_SCK	FC5_SCK
GND	J11 (pin 6)	J29 (pin 7)	GND	GND

Figure 56. AW-AM510-uSD

21 Hardware Rework Guide for MIMXRT685-EVK and Murata uSD-M.2 Adapter

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT685-EVK board and the Murata uSD-M.2 adapter. For details on the Murata uSD-M.2 Adapter, see Murata's uSD-M.2 webpage.

The hardware rework has one part:

- HCI UART port rework

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21.1 Hardware rework

HCI UART rework :

- JP12 2-3
- Connect the pins of two boards as the following table using jumper cables included in Murata's uSD-M.2 Adapter kit.

Table 25. Connect HCI UART pins

Pin name	uSD-M.2 adapter pin	i.MX RT685 pin	Pin name of RT685	GPIO name of RT685
BT_UART_TXD_HOST	J9 (pin 1)	J27 (pin 1)	USART4_RXD	FC4_RXD_SDA_MOSI_DATA
BT_UART_RXD_HOST	J9 (pin 2)	J27 (pin 2)	USART4_TXD	FC4_TXD_SCL_MISO_WS
BT_UART_RTS_HOST	J8 (pin 3)	J47 (pin 9)	USART4_CTS	FC4_CTS_SDA_SSEL0
BT_UART_CTS_HOST	J8 (pin 4)	J27 (pin 5)	USART4_RTS	FC4_RTS_SCL_SSEL1

Figure 57. MIMXRT685-EVK

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Figure 58. Murata uSD-M.2 adapter

Murata uSD-M.2 jumper settings:

- Both J12 and J13 = 1-2 (WLAN-SDIO = 1.8 V; and BT-UART and WLAN/BT-CTRL = 3.3 V)
- J1 = 2-3 (3.3 V from uSD connector)

22 Hardware Rework Guide for MIMXRT595-EVK with Direct Murata M.2 Module

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT595-EVK board and the Murata's 1XK or 1ZM solution - direct M.2 connection to Embedded Artists EAR00385 (1XK) or EAR00364 (1ZM) M.2 modules.

The hardware rework has one part:

- Debug console serial rework

22.1 Hardware rework

Debug console serial rework:

No special rework is required, except the following to enable the debug port.

- JP4 1-2.
- J27 1 - TX of USB to serial converter
- J27 2 - RX of USB to serial converter

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Figure 59. MIMXRT595

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23 Hardware Rework Guide for MIMXRT595-EVK and AW-AM510MA

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT595-EVK board and AW-AM510MA. The AW-AM510MA user guide is available here. The hardware rework has one part:

- Debug console serial rework

23.1 Hardware rework

Debug console serial rework:

No special rework is required, except the following to enable the debug port.

- Connect J39 with external power.
- Connect JP4 1-2.
- J27 1 — TX of USB to serial converter.
- J27 2 — RX of USB to serial converter.

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Figure 60. MIMXRT595-EVK

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24 Hardware Rework Guide for MIMXRT595-EVK with AW-CM358MA

This section is a brief hardware rework guidance of the Ethermind Bluetooth stack on the NXP i.MX MIMXRT595-EVK board and AW-CM358MA. The AW-CM358MA user guide is available here. The hardware rework has one part:

- Debug console serial rework

24.1 Hardware rework

Debug console serial rework:

- Connect J39 with external power.
- JP4 1-2
- J27 1 - TX of USB to serial converter
- J27 2 - RX of USB to serial converter

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Figure 61. MIMXRT595-EVK

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25 Hardware Rework Guide for MIMXRT1040-EVK with Direct Murata M.2 Module

This section is a brief hardware rework guidance of the Edgefast Bluetooth PAL on the NXP i.MX MIMXRT1040-EVK board and the Murata 1XK or 1ZM solution - direct M.2 connection to Embedded Artists' EAR00385 (1XK) or EAR00364 (1ZM) M.2 modules.

The hardware rework has two parts:

- HCI UART rework
- PCM interface rework

25.1 Hardware rework

1. HCI UART rework
   - Solder R93 and R96
2. PCM interface rework
   - Solder R70 and R79; remove R76 and R86; Connect J80.

Note: *Make sure to disconnect J80 when debugging. Otherwise, the debugger downloading fails.*

26 Hardware Rework Guide for MIMXRT1160-EVK with Direct Murata M.2

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT1160-EVK board and the Murata 1XK or 1ZM solution - direct M.2 connection to the Embedded Artists' EAR00385 (1XK) or EAR00364 (1ZM) M.2 modules.

26.1 Introduction

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT1160-EVK and the Murata 1XK M.2 solution.

The hardware rework has two parts:

- HCI UART rework
- PCM interface rework

26.2 Hardware rework

- HCI UART rework:
  - Remove: R183 R176 R1816
  - Add 0 ohm R404 R1901 R1902

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Figure 62. MIMXRT1160-EVK

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Figure 63. MIMXRT1160-EVK

- PCM interface rework:
  - Remove R1799 R1800
  - Add 0 ohm R1903 R1803 R1804

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Figure 64. MIMXRT1160-EVK

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Figure 65. MIMXRT1160-EVK

26.3 Jumper settings for RT1160-EVK enabling 5 V external supply

- Remove J38 5-6.
- Connect J38 1-2.
- Connect J43 with external power; controlled by SW5 .
  Note: *To run the application after downloading the binary into qspiflash, boot directly from qspiflash and reset the board by pressing SW4 or power off/on the board.*

27 Hardware Rework Guide for MIMXRT1060-EVKC and Murata 1XK M.2 Adapter

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT1060-EVKC and the Murata 1XK M.2 solution - direct M.2 connection to Embedded Artists' EAR00385(1XK) M.2 modules.

The hardware rework has two parts:

- HCI UART rework
- PCM interface rework

27.1 Hardware rework

- **HCI UART rework**

1. Mount R93, R96.
2. Remove R193.
3. Connect J109, connect J76 2-3.

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- **PCM interface rework**

1. Remove J54 and J55, connect J56 and J57.
2. Remove R220.
3. Connect J103.

Note: *When J103 is connected, flash cannot be downloaded. So, remove the connection when downloading flash and reconnect it after downloading.*

Figure 66. MIMXRT1060-EVKC

28 Hardware Rework Guide for MIMXRT1060-EVKC and Murata 1ZM M.2 Adapter

This section is a brief hardware rework guidance of the EdgeFast Bluetooth PAL on the NXP i.MX MIMXRT1060-EVKC and the Murata 1ZM M.2 solution - direct M.2 connection to Embedded Artists' EAR00364(1ZM) M.2 modules.

The hardware rework has two parts:

- HCI UART rework
- PCM interface rework

28.1 Hardware rework

- HCI UART rework

1. Mount R93, R96.
2. Remove R193.
3. Connect J109, connect J76 2-3.

- PCM interface rework

1. Remove J54 and J55, connect J56 and J57.
2. Remove R220.

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3. Connect J103.

Note: *When J103 is connected, flash cannot be downloaded. So, remove the connection when downloading flash and reconnect it after downloading.*

Figure 67. MIMXRT1060-EVKC

29 Hardware Rework Guide for MIMXRT1180-EVK with Direct Murata M.2 1XK Module

This section is a brief hardware rework guidance of the Edgefast Bluetooth PAL on the NXP i.MX MIMXRT1180-EVK board and the Murata 1XK solution - direct M.2 connection to Embedded Artists' EAR00385 (1XK) M.2 modules.

The hardware rework has two parts:

- HCI UART rework
- PCM interface rework

29.1 Hardware rework

- **HCI UART rework**

1. Mount R696, R697.
2. Remove R124, R126.

- **PCM interface rework**

1. Mount R699
2. Remove J78, J79.
3. Connect J80, J81.

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Figure 68. MIMXRT1180-EVK

30 Hardware Rework Guide for MIMXRT1180-EVK with Direct Murata M.2 1ZM Module

This section is a brief hardware rework guidance of the Edgefast Bluetooth PAL on the NXP i.MX MIMXRT1180-EVK board and the Murata 1ZM solution - direct M.2 connection to Embedded Artists' EAR00364 (1ZM) M.2 modules.

The hardware rework has two parts:

- HCI UART rework
- PCM interface rework

30.1 Hardware rework

- **HCI UART rework**

1. Mount R696, R697.
2. Remove R124, R126.

- **PCM interface rework**

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1. Mount R699
2. Remove J78, J79.
3. Connect J80, J81.

Figure 69. MIMXRT1180-EVK

31 Revision history

Table 26 summarizes revisions to this document.

Table 26. Revision history

Revision number	Date	Substantive changes
0	10 June 2021	Initial release
1	08 September 2021	Updated for MCUXpresso SDK 2.10.1
2	01 December 2021	Updated for MCUXpresso SDK 2.11.0
3	11 April 2022	Updated Legal information for MCUXpresso SDK 2.12.0
4	08 August 2022	Updated for MCUXpresso SDK 2.12.1
5	28 November 2022	Added Section 16 and Section 17.

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Table 26. Revision history...*continued*

Revision number	Date	Substantive changes
6	11 January 2023	Updated for MCUXpresso SDK 2.13.0. Updated Section 9.1, Section 10.1, and Section 26.
7	17 April 2023	Added Hardware Rework Guide for MIMXRT1060-EVKC and Murata 1XK M.2 Adapter and Hardware Rework Guide for MIMXRT1060-EVKC and Murata 1ZM M.2 Adapter.
8	27 July 2023	Updated for MCUXpresso SDK for 2.14.0.
9	09 October 2023	Updated for MCUXpresso SDK for 2.14.2 RT1180 B0 EAR2. Added Section 30.

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Tables

Tab. 1. Connect pins ... 9
Tab. 2. Connect pins ... 12
Tab. 3. Connect pins ... 15
Tab. 4. Connect pins ... 18
Tab. 5. Connect the TX/RX/RTS/CTS pins ... 22
Tab. 6. Connect the PCM_IN/PCM_OUT/PCM_SYNC/PCM_CLK/GND pins ... 22
Tab. 7. Connect pins ... 25
Tab. 8. Connect pins ... 26
Tab. 9. Connect pins ... 27
Tab. 10. Connect pins ... 27
Tab. 11. Connect pins ... 29
Tab. 12. Connect pins ... 31
Tab. 13. Connect HCI UART pins ... 33
Tab. 14. Connect the PCM_IN/PCM_OUT/PCM_SYNC/PCM_CLK/GND pins ... 35
Tab. 15. Connect pins ... 35
Tab. 16. Connect pins ... 36
Tab. 17. Connect pins ... 37
Tab. 18. Connect HCI UART pins ... 44
Tab. 19. Connect pins ... 55
Tab. 20. Connect pins ... 56
Tab. 21. Connect pins ... 57
Tab. 22. Connect pins ... 58
Tab. 23. Connect pins ... 59
Tab. 24. Connect pins ... 60
Tab. 25. Connect HCI UART pins ... 61
Tab. 26. Revision history ... 76

Figures

Fig. 1. MIMXRT1060-EVKB (Back) ... 2
Fig. 2. MIMXRT1060-EVKB (Front) ... 3
Fig. 3. MIMXRT1060-EVKB (Front) ... 4
Fig. 4. MIMXRT1060-EVKB (Back) ... 4
Fig. 5. MIMXRT1060-EVKB (Back) ... 5
Fig. 6. MIMXRT1060-EVKB (Back) ... 6
Fig. 7. MIMXRT1060-EVKB (Front) ... 7
Fig. 8. MIMXRT1060-EVKB (Front) ... 8
Fig. 9. MIMXRT1060-EVKB (Back) ... 8
Fig. 10. MIMXRT1060-EVKB (Back) ... 9
Fig. 11. MIMXRT1060-EVKB (Front) ... 10
Fig. 12. MIMXRT1060-EVKB (Back) ... 11
Fig. 13. AW-AM457-uSD ... 12
Fig. 14. MIMXRT1060-EVKB (Front) ... 13
Fig. 15. MIMXRT1060-EVKB (Back) ... 14
Fig. 16. AW-AM457-uSD ... 15
Fig. 17. MIMXRT1060-EVKB (Front) ... 16
Fig. 18. MIMXRT1060-EVKB (Back) ... 17
Fig. 19. AW-CM358-uSD ... 18
Fig. 20. MIMXRT1060-EVKB (Front) ... 19
Fig. 21. MIMXRT1060-EVKB (Back) ... 20
Fig. 22. AW-CM358-uSD ... 21
Fig. 23. MIMXRT1060-EVKB board ... 23
Fig. 24. SD-M.2_Adapter ... 24
Fig. 25. AW-AM510-uSD ... 25
Fig. 26. AW-AM510-uSD ... 26
Fig. 27. MIMXRT1060-EVK ... 27
Fig. 28. AW-AM457-uSD ... 27
Fig. 29. MIMXRT1060-EVK ... 28
Fig. 30. AW-AM457-uSD ... 29
Fig. 31. MIMXRT1060-EVK ... 30
Fig. 32. AW-CM358-uSD ... 31
Fig. 33. MIMXRT1060-EVK ... 32
Fig. 34. AW-CM358-uSD ... 33
Fig. 35. MIMXRT1060-EVK ... 34
Fig. 36. Murata uSD-M.2 adapter ... 34
Fig. 37. AW-AM510-uSD ... 36
Fig. 38. AW-AM510-uSD ... 37
Fig. 39. MIMXRT1170-EVK ... 38
Fig. 40. AW-AM457-uSD ... 39
Fig. 41. MIMXRT1170-EVK ... 45
Fig. 42. Murata uSD-M.2 adapter ... 46
Fig. 43. MIMXRT1170-EVKB UART Front ... 47
Fig. 44. MIMXRT1170-EVKB UART Back ... 48
Fig. 45. MIMXRT1170-EVKB PCM Front ... 49
Fig. 46. MIMXRT1170-EVKB PCM Back ... 50
Fig. 47. MIMXRT1170-EVKB UART Front ... 51
Fig. 48. MIMXRT1170-EVKB UART Back ... 52
Fig. 49. MIMXRT1170-EVKB PCM Front ... 53
Fig. 50. MIMXRT1170-EVKB PCM Back ... 54
Fig. 51. MIMXRT685-EVK ... 55
Fig. 52. AW-AM457-uSD ... 56
Fig. 53. MIMXRT685-EVK ... 57
Fig. 54. AW-CM358-uSD ... 58
Fig. 55. AW-AM510-uSD ... 59
Fig. 56. AW-AM510-uSD ... 60
Fig. 57. MIMXRT685-EVK ... 61
Fig. 58. Murata uSD-M.2 adapter ... 62
Fig. 59. MIMXRT595 ... 63
Fig. 60. MIMXRT595-EVK ... 65
Fig. 61. MIMXRT595-EVK ... 67
Fig. 62. MIMXRT1160-EVK ... 69
Fig. 63. MIMXRT1160-EVK ... 70
Fig. 64. MIMXRT1160-EVK ... 71
Fig. 65. MIMXRT1160-EVK ... 72
Fig. 66. MIMXRT1060-EVKC ... 73
Fig. 67. MIMXRT1060-EVKC ... 74
Fig. 68. MIMXRT1180-EVK ... 75
Fig. 69. MIMXRT1180-EVK ... 76

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Contents

1 Hardware Rework Guide for MIMXRT1060-EVKB and AW-AM510MA 2
1.1 Hardware rework 2
2 Hardware Rework Guide for MIMXRT1060-EVKB and AW-CM358MA 5
2.1 Hardware rework 5
3 Hardware Rework Guide for MIMXRT1060-EVKB and AW-AM457-uSD 9
3.1 Hardware rework 9
4 Hardware Rework Guide for MIMXRT1060-EVKB and AW-CM358-uSD 15
4.1 Hardware rework 15
5 Hardware Rework Guide for MIMXRT1060-EVKB and Murata uSD-M.2 Adapter 21
5.1 Hardware rework 21
6 Hardware Rework Guide for MIMXRT1060-EVKB and AW-AM510-uSD 24
6.1 Hardware rework 25
7 Hardware Rework Guide for MIMXRT1060-EVK and AW-AM457-uSD 26
7.1 Hardware rework 27
8 Hardware Rework Guide for MIMXRT1060-EVK and AW-CM358-uSD 29
8.1 Hardware rework 29
9 Hardware Rework Guide for MIMXRT1060-EVK and Murata uSD-M.2 Adapter 33
9.1 Hardware rework 33
10 Hardware Rework Guide for MIMXRT1060-EVK and AW-AM510-uSD 35
10.1 Hardware rework 35
11 Hardware Rework Guide for MIMXRT1170-EVK and AW-AM457-uSD 37
11.1 Hardware rework 37
12 Hardware Rework Guide for MIMXRT1170-EVK and AW-CM358MA 39
12.1 Hardware rework 39
13 Hardware Rework Guide for MIMXRT1170-EVK and AW-AM510MA 41
13.1 Hardware rework 41
14 Hardware Rework Guide for MIMXRT1170-EVK with Direct Murata M.2 Module 43
14.1 Hardware rework 43
15 Hardware Rework Guide for MIMXRT1170-EVK and Murata uSD-M.2 Adapter 44
15.1 Hardware rework 44
16 Hardware Rework Guide for MIMXRT1170-EVKB and Murata 1XK M.2 Adapter 46
16.1 Hardware rework 46
17 Hardware Rework Guide for MIMXRT1170-EVKB and Murata 1ZM M.2 Adapter 50
17.1 Hardware rework 50
18 Hardware Rework Guide for MIMXRT685-EVK and AW-AM457-uSD 54
18.1 Hardware rework 54
19 Hardware Rework Guide for MIMXRT685-EVK and AW-CM358-uSD 56
19.1 Hardware rework 57
20 Hardware Rework Guide for MIMXRT685-EVK and AW-AM510-uSD 58
20.1 Hardware rework 59
21 Hardware Rework Guide for MIMXRT685-EVK and Murata uSD-M.2 Adapter 60
21.1 Hardware rework 61
22 Hardware Rework Guide for MIMXRT595-EVK with Direct Murata M.2 Module 62
22.1 Hardware rework 62
23 Hardware Rework Guide for MIMXRT595-EVK and AW-AM510MA 64
23.1 Hardware rework 64
24 Hardware Rework Guide for MIMXRT595-EVK with AW-CM358MA 66
24.1 Hardware rework 66
25 Hardware Rework Guide for MIMXRT1040-EVK with Direct Murata M.2 Module 68
25.1 Hardware rework 68
26 Hardware Rework Guide for MIMXRT1160-EVK with Direct Murata M.2 68
26.1 Introduction 68
26.2 Hardware rework 68
26.3 Jumper settings for RT1160-EVK enabling 5 V external supply 72
27 Hardware Rework Guide for MIMXRT1060-EVKC and Murata 1XK M.2 Adapter 72
27.1 Hardware rework 72
28 Hardware Rework Guide for MIMXRT1060-EVKC and Murata 1ZM M.2 Adapter 73
28.1 Hardware rework 73
29 Hardware Rework Guide for MIMXRT1180-EVK with Direct Murata M.2 1XK Module 74
29.1 Hardware rework 74
30 Hardware Rework Guide for MIMXRT1180-EVK with Direct Murata M.2 1ZM Module 75
30.1 Hardware rework 75
31 Revision history 76
32 Legal information 78

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