Verdin iMX8M Plus

Errata Document

Document Revision History

Date	Doc. Rev.	Notes
21-Apr-2021	Rev. 0.90	Initial Release
15-Jun-2021	Rev. 1.0	Removed former errata #4 and moved it over to the errata documents of the affected Verdin carrier boards (in accordance with the 1.3 version of the Verdin Family Specification)
13-Sep-2021	Rev. 1.1	Errata #4: Added Errata #5: Added
1-Mar-2022	Rev. 1.2	Errata #2: Add information to implemented solution for new module version Errata #3: Add information to implemented solution for new module version

Overview

Errata #1:   HAR-6336 – RX and TX signals swapped for Bluetooth audio I2S interface

Affected Version: **Verdin iMX8M Plus V1.0 (featuring a Wi-Fi/Bluetooth solution)**
Fixed in: **Verdin iMX8M Plus V1.1**

Customer Impact

The Bluetooth audio feature cannot be used. The rest of the Bluetooth and Wi-Fi features are not affected by this issue.

Description

The RX and TX signals of the I2S audio interface between the i.MX 8M Plus SoC and the Wi-Fi module are swapped.

Table 1-1 Wrong Audio Signal Pins between AW-CM276NF and i.MX 8M Plus

AW-CM276NF Pin Name	Wi-Fi module signal direction	i.MX 8MP Ball Name	i.MX 8MP Function	SoC module signal direction
GPIO[6]/PCM_CLK	I	SAI5_RXD2	SAI5_TX_BCLK	O
GPIO[7]/PCM_SYNC	I	SAI2_RXFS	SAI5_TX_SYNC	O
GPIO[5]/PCM_DOUT	O	SAI5_RXD3	SAI5_TX_DATA0	O
GPIO[4]/PCM_DIN	I	SAI5_RXD0	SAI5_RX_DATA0	I

The next revision of the module PCB will correct the connection. In the Verdin iMX8M Plus datasheet, the corrected connection is shown.

Table 1-2 Correct Audio Signal Pins between AW-CM276NF and i.MX 8M Plus

AW-CM276NF Pin Name	Wi-Fi module signal direction	i.MX 8MP Ball Name	i.MX 8MP Function	SoC module signal direction
GPIO[6]/PCM_CLK	I	SAI5_RXD2	SAI5_TX_BCLK	O
GPIO[7]/PCM_SYNC	I	SAI2_RXFS	SAI5_TX_SYNC	O
GPIO[4]/PCM_DIN	I	SAI5_RXD3	SAI5_TX_DATA0	O
GPIO[5]/PCM_DOUT	O	SAI5_RXD0	SAI5_RX_DATA0	I

Workaround

There is no workaround for making the Bluetooth audio feature of the Wi-Fi module available.

Errata #2:   HAR-6503 – Automatic role switching doesn't work on the USB 2.0
               OTG interface

Affected Version: **Verdin iMX8M Plus V1.0**
Fixed in: **Verdin iMX8M Plus V1.1**

Customer Impact

The USB OTG port cannot dynamically switch between host and client function, depending on the OTG cable that is plugged in. The Toradex BSP sets the USB_1 port permanently to the client mode. It is also possible to set the USB_1 port permanently to host mode.

Description

NXP has renamed the USB1_ID pin to USB1_DNU (do not use). With that, they have removed the USB ID function from this pin and recommend using any free GPIO as an ID signal. The USB ID signal is intended for the USB OTG receptacle to distinguish whether a type A (module acts as a USB client) or type B (module acts as a USB host) cable is plugged in.

On the Verdin iMX8M Plus, the SoC pin USB1_ID is available on the module edge connector pin 161 as USB_1_ID. It is intended to be used as the USB ID for a USB OTG implementation on the carrier board. Unfortunately, the SoC pin USB1_ID does not serve any GPIO functionality. With the degradation to USB1_DNU, the pin cannot be used anymore.

Without the USB_1_ID signal, the USB OTG port can only be set permanently to host or client mode by changing the device tree settings. The recovery mode is not affected by this restriction. In the recovery mode, the USB_1 port is always set to client mode, independently of the state of the ID pin.

Workaround

In the device tree, it is possible to set the USB_1 port permanently to host mode. By default, the port is set to client mode.

If the dynamic role switching between host and client modes is required, any free GPIO can be used. This solution requires further changes in the device tree. Please note that this breaks compatibility with other modules in the Verdin family. In the case of custom carrier boards employing this workaround, it is highly recommended to add an assembly option for using the Verdin standard pin 161 as a USB ID for keeping compatibility with other Verdin modules.

Implemented Solution on Module Version 1.1

From the module version 1.1 on, the SoC pin with the name SD1_RESET_B is used as Verdin USB_1_ID. This pin does not have a dedicated USB ID function. Instead, the GPIO2_IO10 function is used. The latest TorizonCore and Toradex Embedded Linux images support this change. This fixes the OTG role switching issue. The Verdin standard pin 161 can be used as the USB ID on these modules.

Errata #3: HAR-6498 – CSI_1_MCLK Clock Output Limited

Affected Version: **Verdin iMX8M Plus V1.0**
Fixed in: **Verdin iMX8M Plus V1.1**

Customer Impact

The optional master clock output of the CSI_1 interface (CSI_1_MCLK) is not usable.

Description

The Verdin pinout contains an optional master clock output for the CSI_1 interface. Most of the CSI camera modules supported by Toradex feature an on-board crystal/oscillator and thus do not require this clock for functioning correctly.

The SAI3_MCLK SoC pin provides the optional Verdin camera interface master clock CSI_1_MCLK output. This signal is available on the module edge connector pin 91. The SoC pin can provide clock signals from the SAI3 and SAI5 audio interfaces. Therefore, a dummy audio driver with a dummy audio stream would be required for enabling the clock output. The current Toradex BSP does not support the CSI_1_MCLK option.

The i.MX 8M Plus SoC features two general-purpose clock outputs that can be used independently from the audio interfaces. Those clock signals are only available as alternate functions of other signal pins. Therefore, the clock signals are not compatible with other Verdin modules.

Table 3-1 General purpose clock outputs (alternate functions, not compatible with other Verdin modules)

X1 Pin#	Verdin Std Function	i.MX 8MP Ball Name	i.MX 8MP Function	I/O	Standard Use Case for this Pin
185	USB_2_EN	GPIO1_IO14	CCM_CLKO1		This pin enables the external USB voltage supply for the USB_2 interface.
116	MSP_13	ECSPI2_MISO			On modules with Wi-Fi/Bluetooth, this pin is used as WLAN_WKUP_HOST.
187	USB_2_OC#	GPIO1_IO15	CCM_CLKO2		USB overcurrent, this pin can signal an overcurrent condition in the USB supply of the USB_2 interface.
128	MSP_18	ECSPI2_SS0			On modules with Wi-Fi/Bluetooth, this pin is used as BT_WKUP_HOST.

Workaround

Instead of using the CSI_1_MCLK, use an external crystal or oscillator for the camera.

If one of the general purposes clock outputs is used, adding an assembly option for using the CSI_1_MCLK pin is highly recommended. This ensures compatibility with existing and future versions of the Verdin iMX8M Plus and other Verdin modules.

Implemented Solution on Module Version 1.1

The Verdin iMX8M Plus module version 1.1 swaps the SoC pins SAI3_MCLK (previously used as CSI_1_MCLK) with the GPIO1_IO15 (previously used as USB_2_OC#). The GPIO1_IO15 SoC pin features the CCM_CLKO2 function. This makes the master clock for the CSI_1 interface usable.

Errata #4:   HAR-8341 – Stitching Capacitor Influences Bluetooth Config Strapping

Affected Version: **Verdin iMX8M Plus Quad 4GB WB IT V1.0B**
Fixed in: **Verdin iMX8M Plus Quad 4GB WB IT V1.0C**

Customer Impact

The Bluetooth solution is not accessible by the system as the host interface strapping signal of the Bluetooth solution is unintentionally influenced by a stitching capacitor on the SoM. This leaves the Bluetooth solution in the UART interface mode instead of SDIO.

Description

The signal used for strapping the HCI (Host Controller Interface) configuration of the Bluetooth solution at the time of powering up the SoM is also available on the Module-specific pin MSP_8 (#104) of the SoM edge connector. Module-specific pins feature stitching capacitors for providing current return paths for cases when those pins are being used for accommodating high-speed signals.

The Verdin iMX8M Plus V1.0B configurations equipped with a Wi-Fi/Bluetooth solution feature one such capacitor (C210) on the MSP_8 signal. During powering up the system, the stitching capacitor delays the transition of the related signal to the intended state and thus results in a wrong configuration being strapped. Instead of SDIO mode, the host interface of the Bluetooth solution gets configured to UART mode. As a result, the Bluetooth solution is not accessible by the system.

Workaround

Remove the stitching capacitor C210 from the SoM. This makes the Bluetooth interface work in case the SoM is connected to a Dahlia V1.1A carrier board.
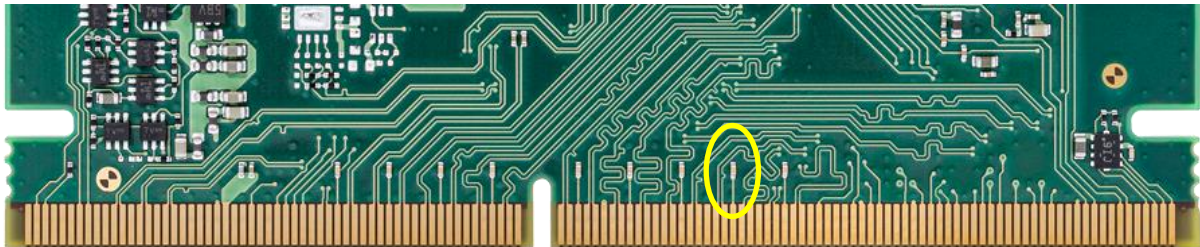

Figure 1 Location of C210 (Bottom Side)

If the SoM is connected to a Verdin Development Board V1.1A, then other stitching capacitors need to be removed from the carrier board as well. The issue will be resolved in future HW versions of these products. Please refer to HAR-8342 in the Verdin Development Board errata for more information.

Errata #5: HAR-8444 – Operating temperature range limitation

Affected Version: **Verdin iMX8M Plus Quad 4GB WB IT V1.0C**
Fixed in: **Verdin iMX8M Plus Quad 4GB WB IT V1.0D**

Customer Impact

The 0058 Verdin iMX8M Plus Quad 4GB WB IT V1.0C does not support the full industrial temperature range and is only usable between 0°C and +70°C.

Description

The 0058 Verdin iMX8M Plus Quad 4GB WB IT V1.0C is a special development version that features a Consumer temperature range SoC part. As a consequence, the product version does not support the full industrial temperature range and is only usable between 0°C and +70°C.

Workaround

There is no workaround to this limitation. If full industrial temperature range support is required, consider using the 0058 Verdin iMX8M Plus Quad 4GB WB IT V1.0D instead.

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