

SIM8950x USB Application Note V1.00



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Contents

Contents	3
Version History	4
1. Introduction	5
2. SIM8950x USB application details	5
2.1 USB OTG	5
2.2 USB Hub & Ethernet	6
2.3 USB OTG & Charging	8
2.4 USB Hub & Ethernet & Charging	8

Version History

Date	Version	Description of change	Author
2019-01-28	1.00	Initial release	Yan Zhang

1. Introduction

This document describes implementation details to support software upgrading, debugging, OTG, HUB and Ethernet, with SIM8950x module.

2. SIM8950x USB application details

SIM8950x module provides one USB 3.0/2.0 interface used for software upgrading, debugging, charging, etc. Moreover, SIM8950x has integrated Type-C interface to provide multiple Type-C features, including mode configuration, channel configuration, current advertisement, and active cable support.

Table 1: USB Type-C interface pin definition

Pin Name	Pin#	I/O	Description
VBUS_USB_IN	87	AI	VBUS monitor signal from Type-C connector
USB_DN	147	AI/AO	USB high-speed data
USB_DP	146	AI/AO	
USB_VCONN	165	AI	Power input pin (5 V, 210 mA from VBUS) to drive active cables during the DFP mode.
USB_SS_SWITCH_SEL	188	DO	USB Type-C switch control, cannot be pull up externally
USB_CC2	190	AI/AO	USB Type-C connector configuration channel 1
USB_CC1	191	AI/AO	USB Type-C connector configuration channel 2
USB_SS_RX_P	193	AI	USB super-speed receive – plus
USB_SS_RX_M	194	AI	USB super-speed receive –minus
USB_SS_TX_P	196	AO	USB super-speed transmit – plus
USB_SS_TX_M	197	AO	USB super-speed transmit – minus

2.1 USB OTG

To support OTG function, external 5V power supply is required. USB ID detection logic is achieved by connecting GPIO_140 to PMI8953_GPIO_8 when using USB Type-C connector, or connecting GPIO_140 to USB_ID pin of connector when using micro USB connector.

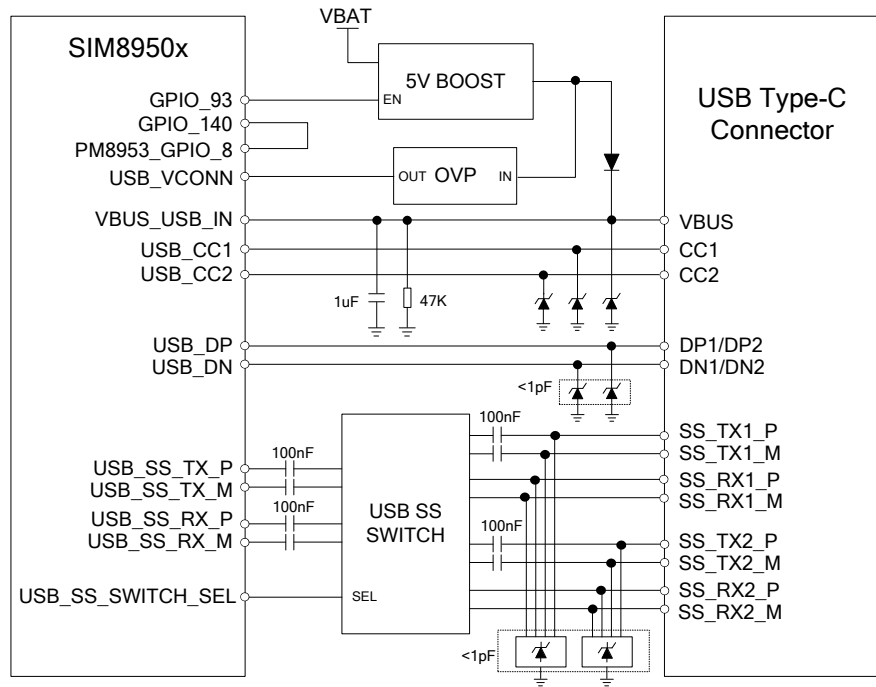


Figure 1: USB Type-C reference circuit

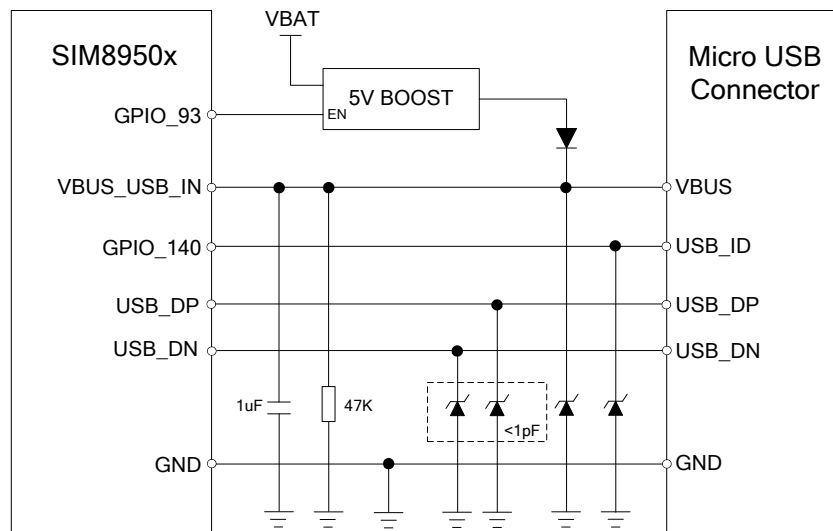


Figure 2: Micro USB reference circuit

2.2 USB Hub & Ethernet

For USB hub & Ethernet applications, SIM8950x should be set to host mode by pulling down USB_ID (GPIO_140) to low level. Meanwhile, a debug/download USB port must be reserved, and SIM8950x should be set to device mode by pulling up USB_ID (GPIO_140) to high level, for debugging and downloading. The automatic alternation of two modes could be achieved by a USB switch and VBUS_IN detection.

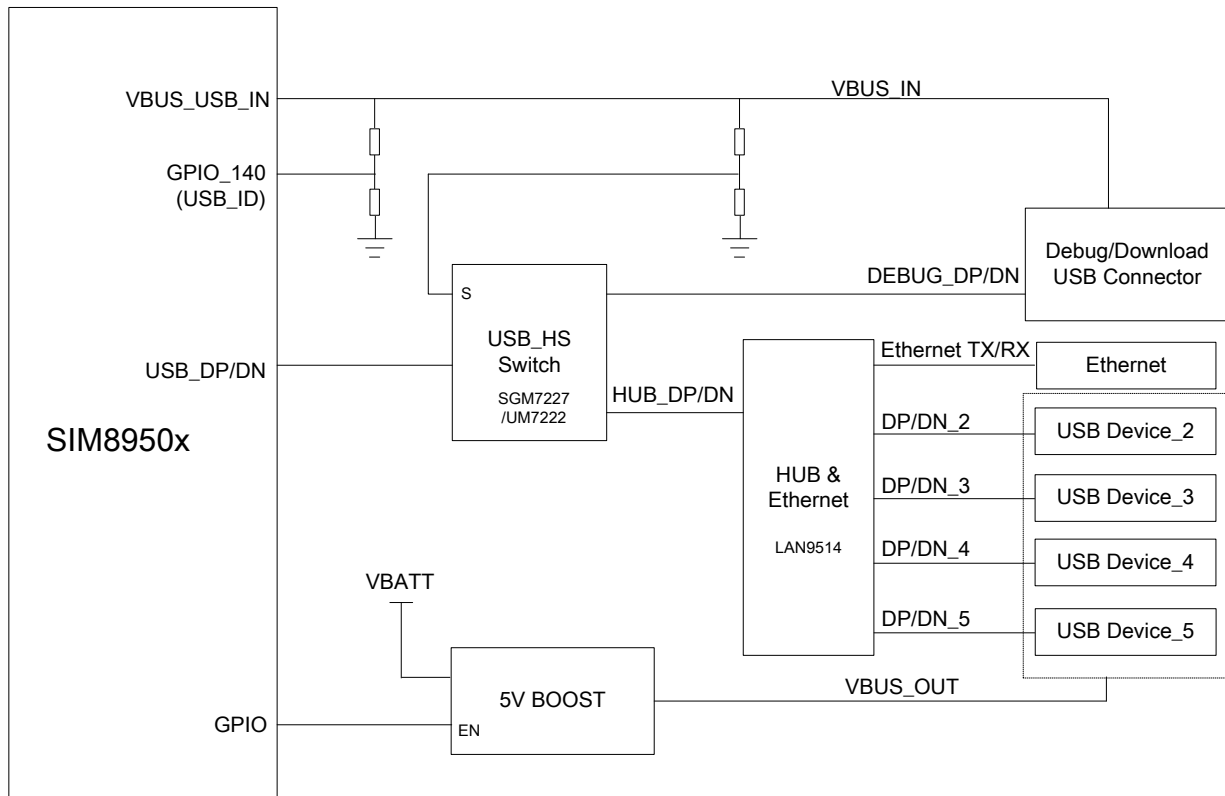


Figure 3: USB 2.0 Hub & 100M Ethernet

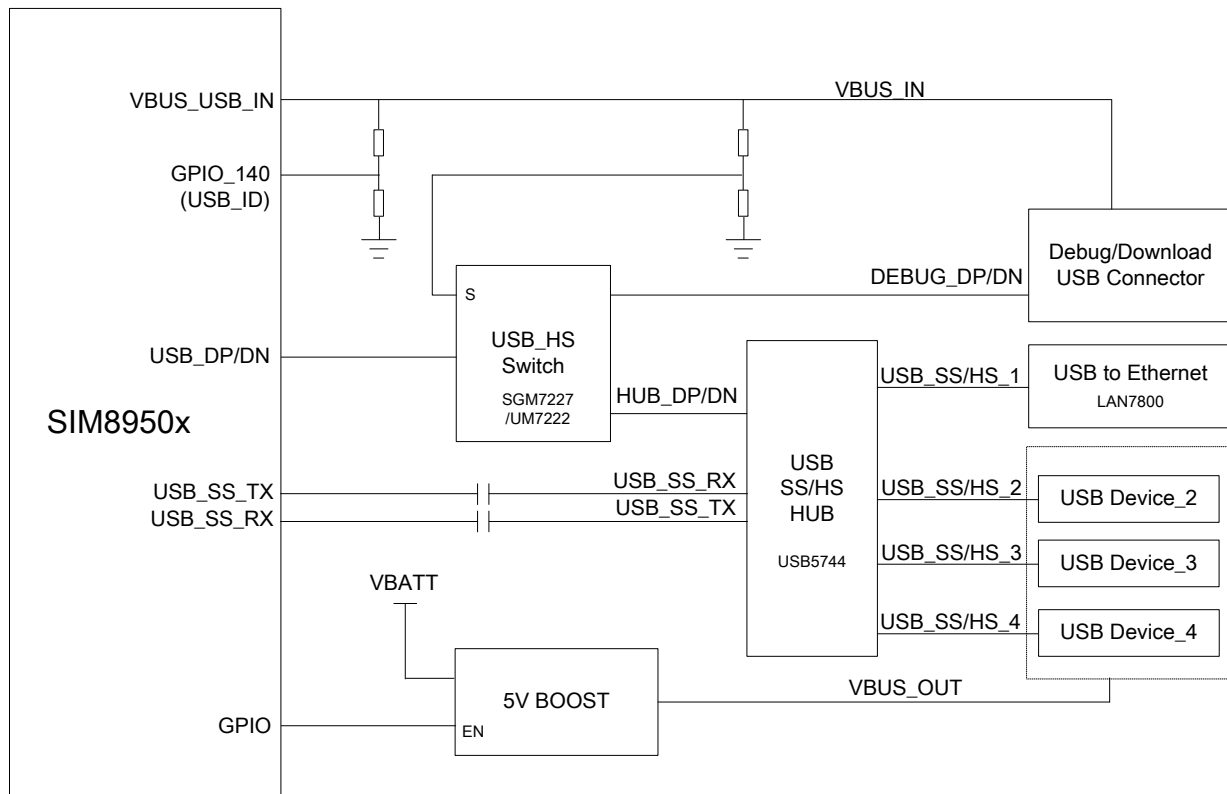


Figure 4: USB 3.0 Hub & 1000M Ethernet

2.3 USB OTG & Charging

If both OTG and charging function are supported, but don't work concurrently, a charger IC with **Host** mode is recommended, such as PMI module designed by SIMCom based on PMI8952.

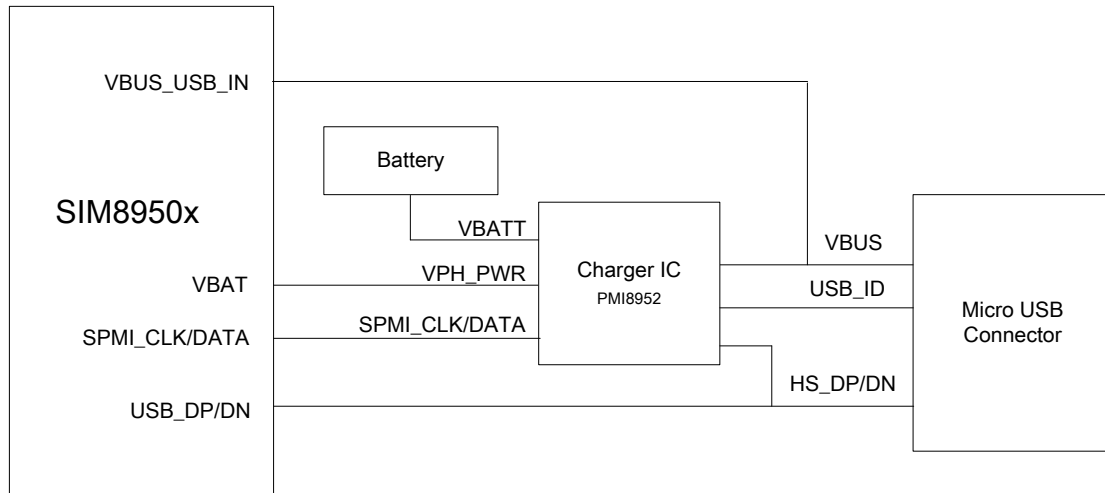


Figure 5: USB OTG & Charging (Micro USB)

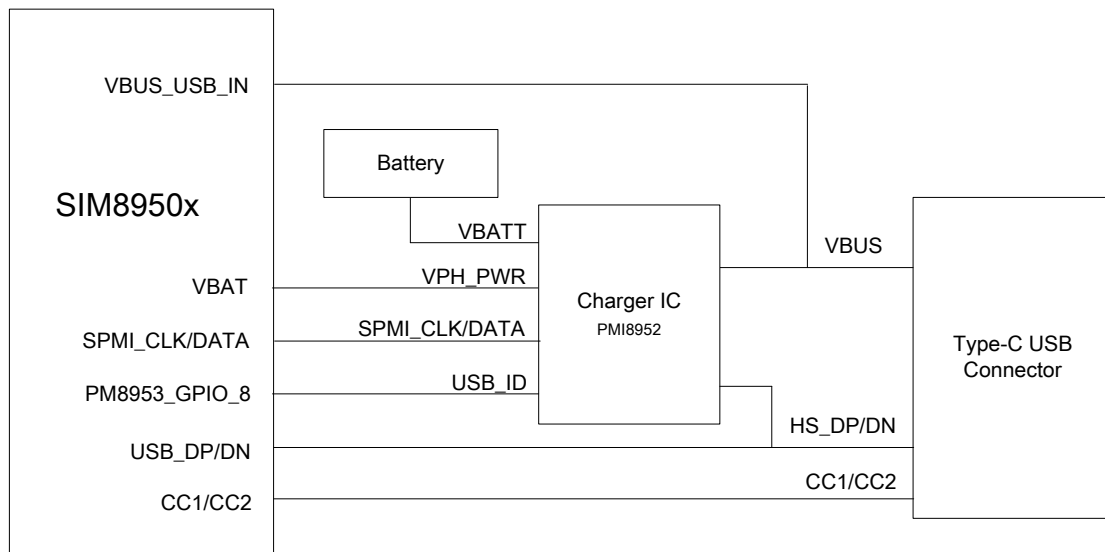


Figure 6: USB OTG & Charging (Type-C)

2.4 USB Hub & Ethernet & Charging

If host mode is supported while device is charging, the OTG power supply must be separated from charging IC. The following figure shows a typical application for USB 2.0 Hub + 100M Ethernet + Charging.

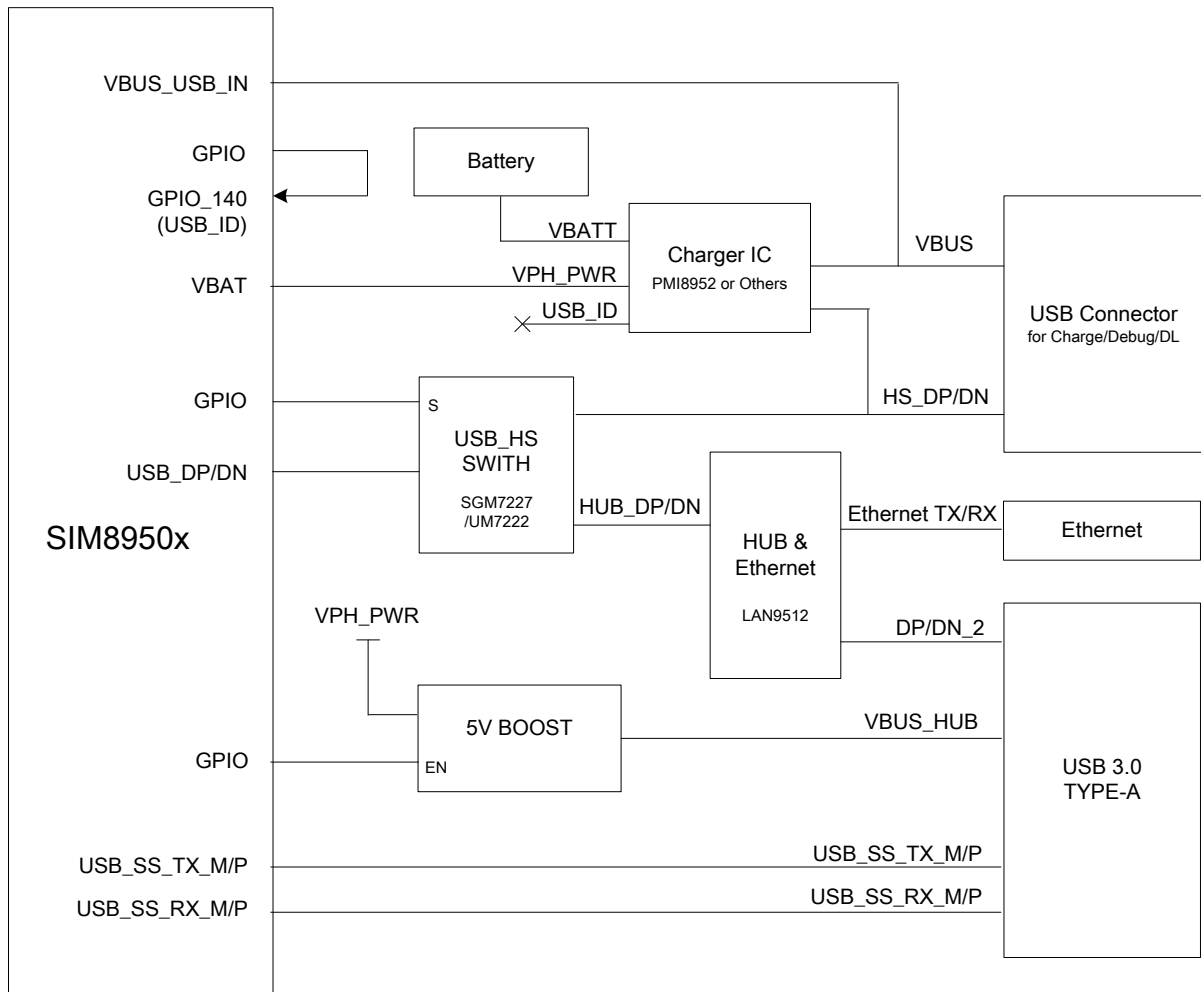


Figure 7: USB 2.0 Hub & 100M Ethernet & Charging

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