

S720

UART Configuration Guide

Issue 1.0



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Notice

This document provides guide for users to use S720.

This document is intended for system engineers (SEs), development engineers, and test engineers.

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About This Document

Scope

This document is applicable to the S720 series.




Audience

This document is intended for [system engineers \(SEs\)](#), [development engineers](#), and [test engineers](#).

Change History

Issue	Change	Changed By
1.0	Initial draft	Jian Hou

Conventions

Symbol	Indication
	Indicates danger or warning. This information must be followed. Otherwise, a catastrophic module or user device failure or bodily injury may occur.
	Indicates caution. This symbol alerts the user to important points about using the module. If these points are not followed, the module or user device may fail.
	Indicates instructions or tips. This symbol provides advices or suggestions that may be useful when using the module.

1 Overview

Universal Asynchronous Receiver/Transmitter (UART) converts the data to be transmitted between serial communication and parallel communication. As a chip that converts parallel input signals into serial output signals, UART is often integrated in the connection of other communication interfaces.

2 Application of UART

The UARTs introduced by the current platform are divided into three groups:

- DBG_TXD/ DBG_RXD, corresponding to pin94/pin93:
- UART0_TXD/ UART0_RXD, corresponding to pin34/pin35:
- UART2_RXD/ UART2_TXD, corresponding to pin153/pin154:

3 DBG Configuration

3.1 Pinmap Configuration

The pins DBG_TXD and DBG_RXD that need to be used correspond to the following I/O: gpio70 and gpio71.

Find the corresponding configuration in *Neoway_S720_Pin_Definitions*, and set BITS_PIN_AF to 0. Then, the pin can be used as UART.

Pin name	Function 0	Function 1	Function 2	Function 3	Remark
U1RXD	U1RXD	-	DBG_BUS 17 (G1)	GPIO71	-
U1TXD	U1TXD	-	DBG_BUS 16 (G1)	GPIO70	-

Location of the pinmap file:

```
bsp\bootloader\u-boot15\board\spreadtrum\S720\pinmap-sl8541e.c
```

```
{REG_PIN_U1TXD, BITS_PIN_AF(0)},
```

```
{REG_MISC_PIN_U1TXD, BITS_PIN_DS(1)|BIT_PIN_NULL|BIT_PIN_NUL|BIT_PIN_SLP_AP|BIT_PIN_SLP_NUL|BIT_PIN_SLP_OE},
```

```
{REG_PIN_U1RXD, BITS_PIN_AF(0)},
```

```
{REG_MISC_PIN_U1RXD, BITS_PIN_DS(1)|BIT_PIN_NULL|BIT_PIN_WPU|BIT_PIN_SLP_AP|BIT_PIN_SLP_WPU|BIT_PIN_SLP_IE},
```

3.2 DTS Configuration

After the pinmap configuration is completed, the next step is to configure the DTS.

3.2.1 Adding the Aliases

Add the configuration to **bsp/kernel/kernel4.14/arch/arm/boot/dts/S720_sl8541e-1h10_32b.dts**.

```
aliases {
    serial0 = &uart0;
    serial1 = &uart1;
    serial4 = &uart4;
};
```

3.2.2 Adding the UART Configuration

Add the configuration to **bsp/kernel/kernel4.14/arch/arm/boot/dts/S720_sharkle.dtsi**.

Add the UART1 driver configuration. Basic configuration, including reg and interrupt, are already completed and can be directly opened when used.

```
uart1: serial@70100000 {
    compatible = "sprd,sc9836-uart";
    reg = <0x70100000 0x100>;
    interrupts = <GIC_SPI 3 IRQ_TYPE_LEVEL_HIGH>;
    status = "disabled";/*When using the UART node, set status to ok*/
};
```

After the configuration is completed, a node named **ttyS1** will be generated under **dev/**, and the configuration of the UART is completed.

4 UART0 Configuration

4.1 Pinmap Configuration

The pins U0TXD and U0RXD that need to be used correspond to the following I/O: GPIO60 and GPIO61.

Find the corresponding configuration in *Neoway_S720_Pin_Definitions*, and set BITS_PIN_AF to 0. Then, the pin can be used as UART.

Pin name	Function 0	Function 1	Function 2	Function 3	Remark
U0TXD	U0RXD	EXT_XTL_EN2	DBG_BUS10 (G	GPIO60	-
U0RXD	U0RXD	EXT_XTL_EN3	DBG_BUS11 (G	GPIO61	-

Location of the pinmap file:

```
bsp\bootloader\u-boot15\board\spreadtrum\S720\pinmap-s18541e.c
```

```
{REG_PIN_U0TXD, BITS_PIN_AF(0)},
```

```
{REG_MISC_PIN_U0TXD, BITS_PIN_DS(1)|BIT_PIN_NULL|BIT_PIN_NUL|BIT_PIN_SLP_AP|BIT_PIN_SLP_NUL|BIT_PIN_SLP_OE},
```

```
{REG_PIN_U0RXD, BITS_PIN_AF(0)},
```

```
{REG_MISC_PIN_U0RXD, BITS_PIN_DS(1)|BIT_PIN_NULL|BIT_PIN_WPU|BIT_PIN_SLP_AP|BIT_PIN_SLP_WPU|BIT_PIN_SLP_IE},
```

4.2 DTS Configuration

After the pinmap configuration is completed, the next step is to configure the DTS.

4.2.1 Adding the Aliases

Add the configuration to **bsp/kernel/kernel4.14/arch/arm/boot/dts/S720_s18541e-1h10_32b.dts**.

```
aliases {
    serial0 = &uart0;
    serial1 = &uart1;
    serial4 = &uart4;
};
```

4.2.2 Adding the UART Configuration

Add the configuration to `bsp/kernel/kernel4.14/arch/arm/boot/dts/S720_sharkle.dtsi`.

Add the UART0 driver configuration. Basic configuration, including `reg` and `interrupt`, are already completed and can be directly opened when used.

```
uart0: serial@508d0000 {
    compatible = "sprd,sc9836-uart-ex";
    reg = <0x508d0000 0x100>;
    interrupts = <GIC_SPI 1 IRQ_TYPE_LEVEL_HIGH>;
    sprd,aon-apb = <&aon_apb_regs>;
    status = "disabled"; /*When using the UART node, set status to ok*/
};
```

After the configuration is completed, a node named **ttyS0** will be generated under **dev/**, and the configuration of UART0 is completed.

5 UART2 Configuration

5.1 Pinmap Configuration

The pins U2TXDG0 and U2TXDG0 that need to be used correspond to the following I/O: GPIO72 and GPIO73.

Find the corresponding configuration in *Neoway_S720_Pin_Definitions*, and set `BITS_PIN_AF` to `0`. Then, the pin can be used as UART.

Pin name	Function 0	Function 1	Function 2	Function 3	Remark
U2RXD	U2RXD	SE_GPIO5	DBG_BUS15(G	GPIO73	-
U2TXD	U2TXD	SE_GPIO4	DBG_BUS14(G	GPIO72	-

Location of the pinmap file:

```
bsp\bootloader\u-boot15\board\spreadtrum\S720\pinmap-s18541e.c
```

```
{REG_PIN_U2TXD, BITS_PIN_AF(0)},
```

```
{REG_MISC_PIN_U2TXD BITS_PIN_DS(1)|BIT_PIN_NULL|BIT_PIN_NUL|BIT_PIN_SLP_AP|BIT_PIN_SLP_NUL|BIT_PIN_SLP_OE},
```

```
{REG_PIN_U2RXD, BITS_PIN_AF(0)},
```

```
{REG_MISC_PIN_U2RXD, BITS_PIN_DS(1)|BIT_PIN_NULL|BIT_PIN_WPU|BIT_PIN_SLP_AP|BIT_PIN_SLP_WPU|BIT_PIN_SLP_IE},
```

5.2 DTS Configuration

After the pinmap configuration is completed, the next step is to configure the DTS.

5.2.1 Adding the Aliases

Add the **configuration** to `bsp/kernel/kernel4.14/arch/arm/boot/dts/S720_sl8541e-1h10_32b.dts`.

```
aliases {
    serial0 = &uart0;
    serial1 = &uart1;
    serial2 = &uart2;
    serial4 = &uart4;
};
```

5.2.2 Adding the UART Configuration

Add the configuration to **bsp/kernel/kernel4.14/arch/arm/boot/dts/S720_sharkle.dtsi**.

Add the UART2 driver configuration:

```
uart2: serial@70200000 {
    compatible = "sprd,sc9863-uart",
               "sprd,sc9836-uart";
    reg = <0x70200000 0x100>;
    interrupts = <GIC_SPI 4 IRQ_TYPE_LEVEL_HIGH>;
    status = "disabled"; /*When using the UART node, set status to ok*/
};
```

After the configuration is completed, a node named **ttyS2** will be generated under **dev/**, and the configuration of UART2 is completed.