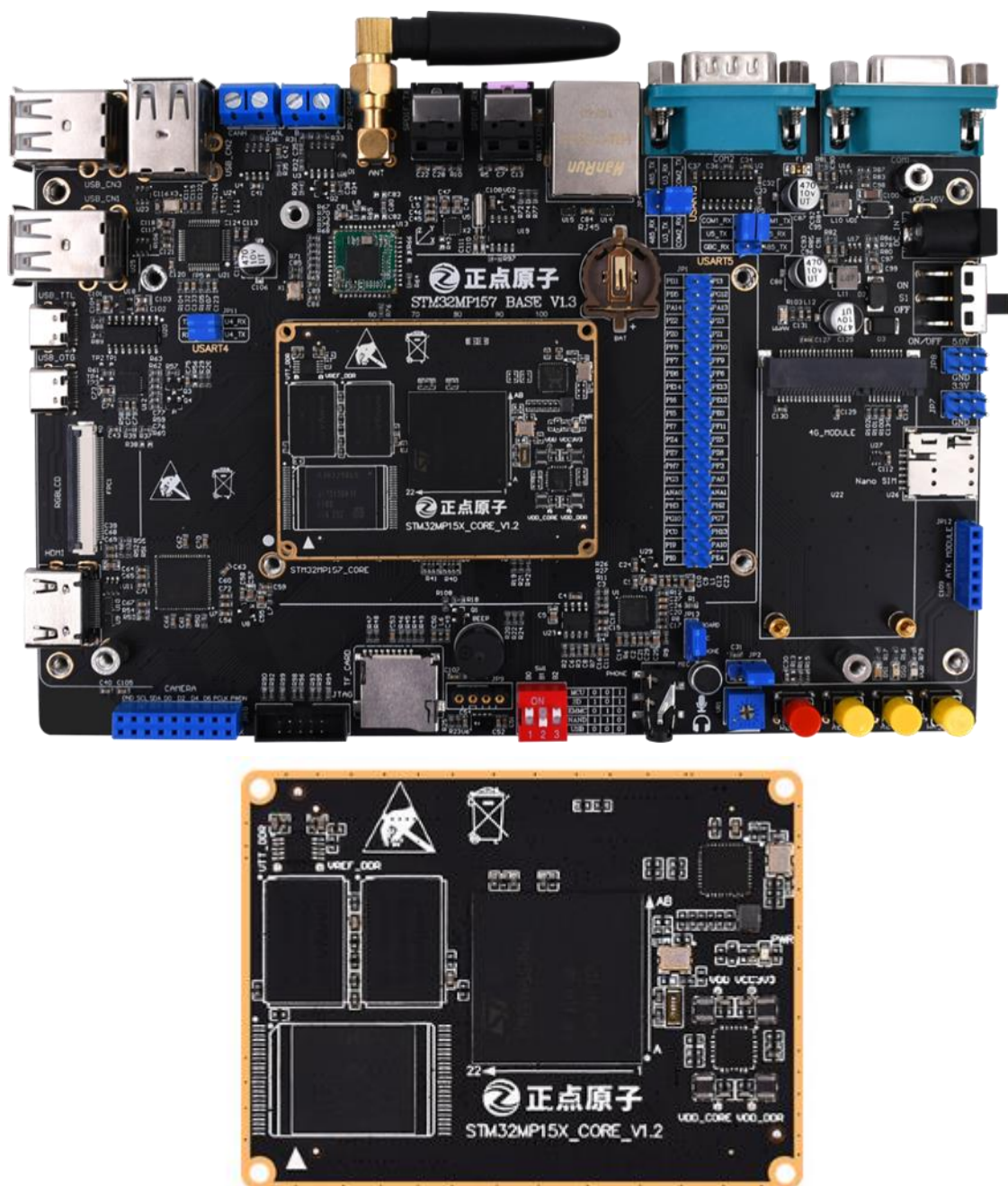


MP157 核心板 BTB

引脚分配手册 V1.0



文档更新说明

版本	版本更新说明	负责人	校审	发布日期
V1.0	初稿:	正点原子 Linux 团队	正点原子 Linux 团队	2021.3.13

目录

前言.....	4
第一章 157 核心板 BTB 引脚	5
1.1 核心板引脚原理图	5
1.2 引脚复用说明	7
1.2.1 查询数据手册.....	7
1.2.2 修改出厂内核配置.....	8
1.3 底板引脚使用及复用功能表格	9

前言

本文参考资料包括:

正点原子 STM32MP157 开发板 STM32MP15x 底板原理图 V1.4

正点原子 STM32MP157 开发板 STM32MP157 核心板原理图 V1.2

STM32MP157A&D 数据手册

资料路径:

开发板光盘 A-基础资料\2、开发板原理图

开发板光盘 A-基础资料\7、STM32MP1 参考资料

第一章 157 核心板 BTB 引脚

1.1 核心板引脚原理图

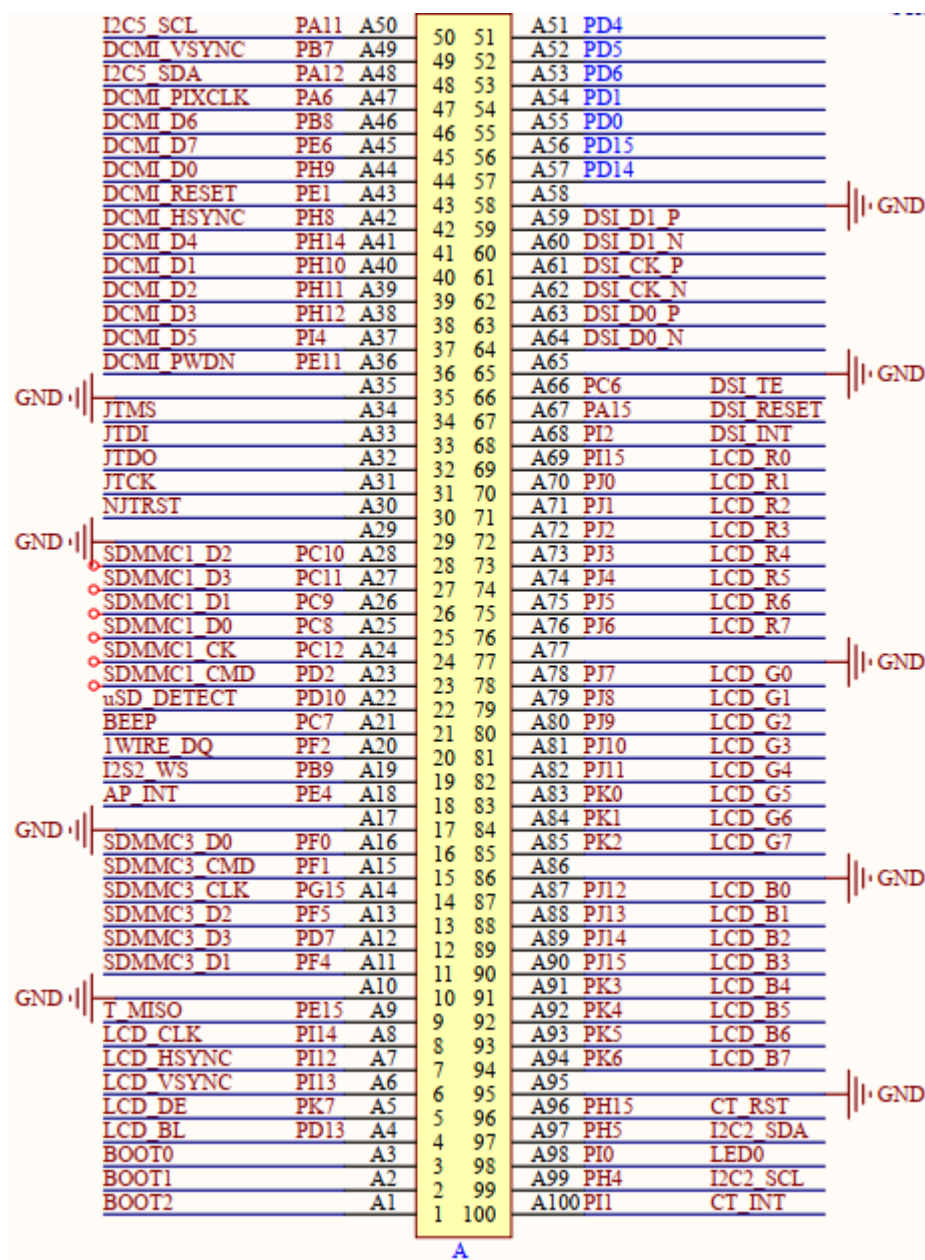


图 1.1-1 核心板引脚原理图 A

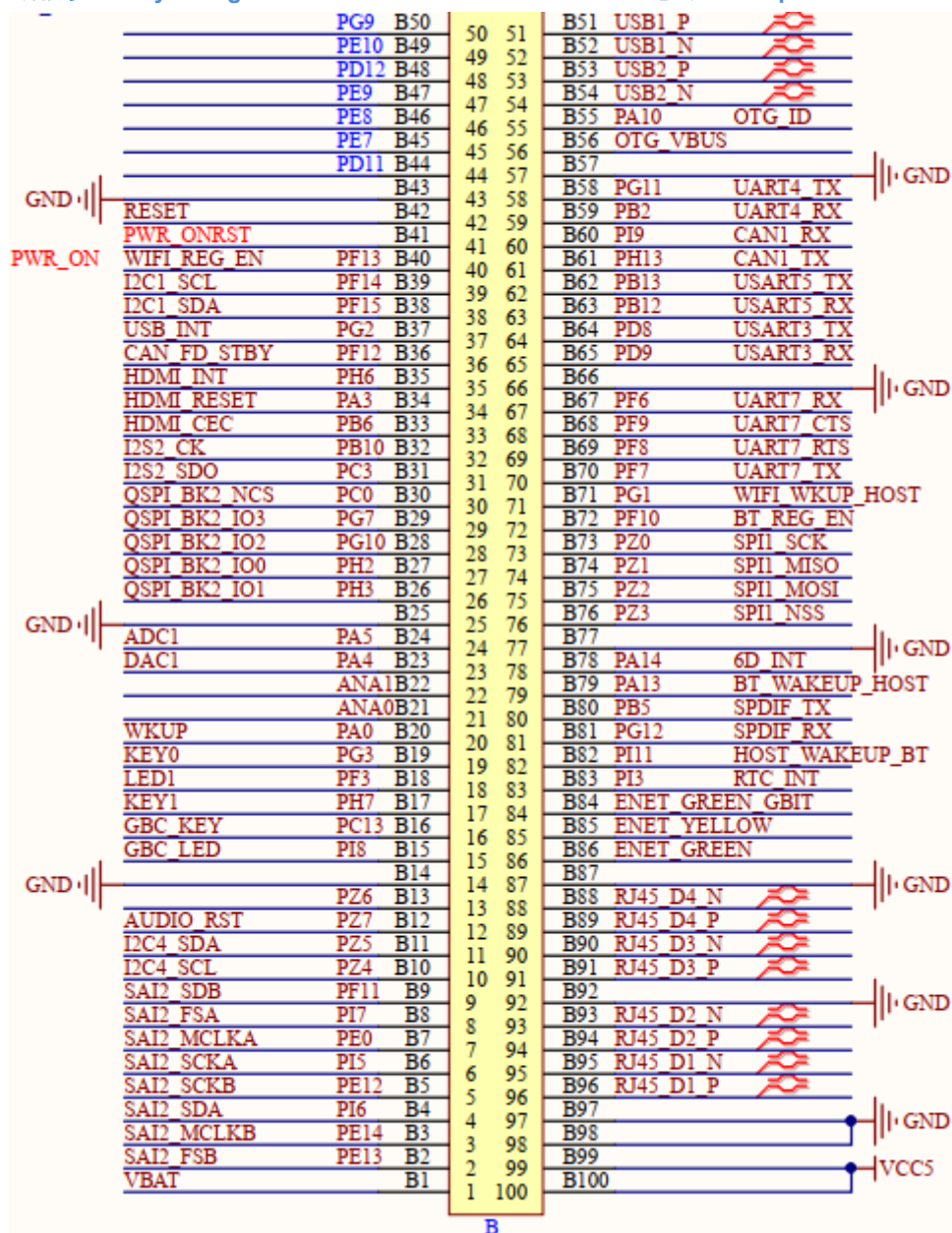


图 1.1-2 核心板引脚原理图 B

STM32MP157 开发板采用底板+核心板的形式。底板采用 2 个 2*50 的 3710F(公座) 板对板连接器来连接核心板。总共在核心板上引出了 144 个 GPIO 以及 35 个其它功能的引脚。

1.2 引脚复用说明

以 PI12 这个 IO 口为例，了解他是如何复用成 LCD_HSYNC 的

T MISO	PE15	A9	10
LCD CLK	PI14	A8	9
LCD HSYNC	PI12	A7	8
LCD VSYNC	PI13	A6	7
LCD DE	PK7	A5	6
LCD BL	PD13	A4	5
BOOT0		A3	4
			3

图 1.2-1 PI12 引脚原理图

1.2.1 查询数据手册

打开 STM32MP157A&D 数据手册 查看芯片引脚定义找到 PI12 这个 IO，从这里可以看到他所有的复用功能。

Table 7. STM32MP157A/D pin and ball definitions (continued)

Pin Number				Pin name (function after reset)	Pin type	I/O structure	Notes	Pin functions	
TFBGA257	LFPGA354	TFBGA361	LFPGA448					Alternate functions	Additional functions
-	-	-	H2	PI12	I/O	FT_h	-	TRACED0, HDP0, LCD_HSYNC, EVENTOUT	-

Table 8. Alternate function AF0 to AF7⁽¹⁾ (continued)

Port		AF0	AF1	AF2	AF3	AF4	AF5	AF6	AF7
		HDP/SYS/RTC	TIM1/2/16/17/ LPTIM1/SYS/ RTC	SAI1/4/I2C6/ TIM3/4/5/12/ HDP/SYS	SAI4/I2C2/ TIM8/ LPTIM2/3/4/5/ DFSDM1 /SDMMC1	SAI4/ I2C1/2/3/4/5/ USART1/ TIM15/LPTIM2/ DFSDM1/CEC	SPI1/I2S1/ SPI2/I2S2/ SPI3/I2S3/ SPI4/5/6/I2C1/ SDMMC1/3/ CEC	SPI3/I2S3/ SAI1/3/4/ I2C4/UART4/ DFSDM1	SPI2/I2S2/ SPI3/I2S3/ SPI6/ USART1/2/3/6/ UART7/ SDMMC2
Port I	PI4	-	-	-	TIM8_BKIN	-	-	-	-
	PI5	-	-	-	TIM8_CH1	-	-	-	-
	PI6	-	-	-	TIM8_CH2	-	-	-	-
	PI7	-	-	-	TIM8_CH3	-	-	-	-
	PI8	-	-	-	-	-	-	-	-
	PI9	HDP1	-	-	-	-	-	-	-
	PI10	HDP0	-	-	-	-	-	-	-
	PI11	MCO1	-	-	-	-	I2S_CKIN	-	-
	PI12	TRACED0	-	HDP0	-	-	-	-	-
	PI13	TRACED1	-	HDP1	-	-	-	-	-

Table 9. Alternate function AF8 to AF15⁽¹⁾ (continued)

Port		AF8	AF9	AF10	AF11	AF12	AF13	AF14	AF15
		SPI6/SAI2/ USART3/ UART4/5/8/ SDMMC1/2/ SPDIFRX	FDCAN1/2/ TIM13/14/ QUADSPI/ SDMMC2/3/ LCD/SPDIFRX	SAI2/4/ QUADSPI/ FMC/ SDMMC2/3/ OTG_FS/ OTG_HS	DFSDM1/ QUADSPI/ SDMMC1/ MDIOS/ETH1/ DSI	SAI4/UART5/ FMC/SDMMC1/ MDIOS	UART7/DCMI/ LCD/DSI/RNG	UART5/LCD	SYS
Port I	PI11	-	LCD_G6	-	-	-	-	-	EVENTOUT
	PI12	-	-	-	-	-	-	LCD_HSYNC	EVENTOUT
	PI13	-	-	-	-	-	-	LCD_VSYNC	EVENTOUT
	PI14	-	-	-	-	-	-	LCD_CLK	EVENTOUT
	PI15	-	LCD_G2	-	-	-	-	LCD_R0	EVENTOUT

图 1.2-2 查询复用功能

1.2.2 修改出厂内核配置

打开正点原子出厂内核，在 `atk-mp1/alientek_linux/arch/arm/boot/dts/stm32mp15-pinctrl.dtsi` 可以看到将 PI12 复用成 AF14 功能，即 PI12 复用成了 LCD_HSYNC

```
ltcdc_pins_b: ltcdc-b-0 {
    pins {
        pinmux = <STM32_PINMUX('I', 14, AF14)>, /* LCD_CLK */
        <STM32_PINMUX('I', 12, AF14)>, /* LCD_HSYNC */
        <STM32_PINMUX('I', 13, AF14)>, /* LCD_VSYNC */
        <STM32_PINMUX('K', 7, AF14)>, /* LCD_DE */
        <STM32_PINMUX('I', 15, AF14)>, /* LCD_R0 */
        <STM32_PINMUX('J', 0, AF14)>, /* LCD_R1 */
    };
};
```

图 1.2-3 内核源码中复用功能示例

1.3 底板引脚使用及复用功能表格

MP 157	信号名称	引脚号	复用功能	底板使用功能
A1	BOOT2	BOOT 2		BOOT2 系统启动模式
A2	BOOT1	BOOT 1		BOOT1 系统启动模式
A3	BOOT0	BOOT 0		BOOT0 系统启动模式
A4	LCD_ BL	PD13	LPTIM1_OUT, TIM4_CH2, I2C4_SDA, I2C1_SDA, I2S3_MCK, QUADSPI_BK1_IO3, SAI2_SCK_A, FMC_A18, DSI_TE, EVENTOUT	LCD_BL LCD 的背光
A5	LCD_ DE	PK7	LCD_DE, EVENTOUT	LCD_DE
A6	LCD_ VSYNC	PI13	TRACED1, HDP1, LCD_VSYNC, EVENTOUT	LCD_VSYNC

A7	LCD_HSYNC	PI12	TRACED0, HDP0, LCD_HSYNC, EVENTOUT	LCD_HSYNC
A8	LCD_CLK	PI14	TRACECLK, LCD_CLK, EVENTOUT	LCD_CLK
A9	T_MISO	PE15	HDP3, TIM1_BKIN, TIM15_BKIN, USART2_CTS/USART2_NSS, UART8_CTS, FMC_NCE2, FMC_AD12/FMC_D12, LCD_R7, EVENTOUT	没有使用的 IO T_MISO
A10	GND			GND
A11	SDMMC3_D1	PF4	USART2_RX, SDMMC3_D1, SDMMC3_D123DIR, FMC_A4, EVENTOUT	SDMMC3_D1
A12	SDMMC3_D3	PD7	TRACED6, DFSDM1_DATIN4, I2C2_SCL, DFSDM1_CKIN1, USART2_CK, SPDIFRX_IN1, SDMMC3_D3, FMC_NE1, EVENTOUT	SDMMC3_D3
A13	SDMMC3_D2	PF5	USART2_TX, SDMMC3_D2, FMC_A5, EVENTOUT	SDMMC3_D2

A14	SDMMC3_CLK	PG15	TRACED7, SAI1_D2, I2C2_SDA, SAI1_FS_A, USART6_CTS/USART6_NSS, SDMMC3_CK, DCMI_D13, EVENTOUT	SDMMC3_CK
A15	SDMMC3_CMD	PF1	I2C2_SCL, SDMMC3_CMD, SDMMC3_CD1R, FMC_A1, EVENTOUT	SDMMC3_CMD
A16	SDMMC3_D0	PF0	I2C2_SDA, SDMMC3_D0, SDMMC3_CKIN, FMC_A0, EVENTOUT	SDMMC3_D0
A17	GND			GND
A18	AP_INT	PE4	TRACED1, SAI1_D2, DFSDM1_DATIN3, TIM15_CH1N, SPI4_NSS, SAI1_FS_A, SDMMC2_CKIN, SDMMC1_CKIN, SDMMC2_D4, SDMMC1_D4, FMC_A20, DCMI_D4, LCD_B0, EVENTOUT	AP_INT
A19	I2S2_WS	PB9	HDP7, TIM17_CH1, TIM4_CH4, DFSDM1_DATIN7, I2C1_SDA, SPI2_NSS/I2S2_WS, I2C4_SDA, SDMMC2_CD1R, UART4_TX, FDCAN1_TX, SDMMC2_D5, SDMMC1_CD1R, SDMMC1_D5, DCMI_D7, LCD_B7, EVENTOUT	I2S2_WS

A20	1WIRE_D Q	PF2	I2C2_SMBA, SDMMC2_D0DIR, SDMMC3_D0DIR, SDMMC1_D0DIR, FMC_A2, EVENTOUT	1WIRE_DQ
A21	BEEP	PC7	HDP4, TIM3_CH2, TIM8_CH2, DFSDM1_DATIN3, I2S3_MCK, USART6_RX, SDMMC1_D123DIR, SDMMC2_D123DIR, SDMMC2_D7, SDMMC1_D7, DCMI_D1, LCD_G6, EVENTOUT	BEEP
A22	uSD_ DETECT	PD10	RTC_REFIN, TIM16_BKIN, DFSDM1_CKOUT, I2C5_SMBA, SPI3_MISO/I2S3_SDI, SAI3_FS_B, USART3_CK, FMC_AD15/FMC_D15, LCD_B3, EVENTOUT	uSD_ DETECT
A23	SDMMC1_ _CMD	PD2	TIM3_ETR, I2C5_SMBA, UART4_RX, UART5_RX, SDMMC1_CMD, DCMI_D11, EVENTOUT	SDMMC1_CMD
A24	SDMMC1_ _CK	PC12	TRACECLK, MCO2, SAI4_D3, SPI3_MOSI/I2S3_SDO, USART3_CK, UART5_TX, SAI4_SD_B, SDMMC1_CK, DCMI_D9, EVENTOUT	SDMMC1_CK
A25	SDMMC1_ _D0	PC8	TRACED0, TIM3_CH3, TIM8_CH3, UART4_TX, USART6_CK, UART5_RTS/UART5_DE, SDMMC1_D0, DCMI_D2, EVENTOUT	SDMMC1_D0

A26	SDMMC1_D1	PC9	TRACED1, TIM3_CH4, TIM8_CH4, I2C3_SDA, I2S_CKIN, UART5_CTS, QUADSPI_BK1_IO0, SDMMC1_D1, DCM1_D3, LCD_B2, EVENTOUT	SDMMC1_D1
A27	SDMMC1_D3	PC11	TRACED3, DFSDM1_DATIN5, SPI3_MISO/I2S3_SDI, USART3_RX, UART4_RX, QUADSPI_BK2_NCS, SAI4_SCK_B, SDMMC1_D3, DCMI_D4, EVENTOUT	SDMMC1_D3
A28	SDMMC1_D2	PC10	TRACED2, DFSDM1_CKIN5, SPI3_SCK/I2S3_CK, USART3_TX, UART4_TX, QUADSPI_BK1_IO1, SAI4_MCLK_B, SDMMC1_D2, DCMI_D8, LCD_R2, EVENTOUT	SDMMC1_D2
A29	GND			GND
A30	NJTRST	NJTRST	JTAG 接口, 没有其它复用功能	NJTRST
A31	JTCK	JTCK		JTCK-SWCLK
A32	JTDO	JTDO		JTDO

A33	JTDI	JTDI		JTDI
A34	JTMS	JTMS		JTMS
A35	GND			GND
A36	DCMI_PWDN	PE11	TIM1_CH2, DFSDM1_CKIN4, SPI4_NSS, USART6_CK, SAI2_SD_B, FMC_AD8/FMC_D8, DCMI_D4, LCD_G3, EVENTOUT	DCMI_PWDN
A37	DCMI_D5	PI4	TIM8_BKIN, SAI2_MCLK_A, DCMI_D5, LCD_B4, EVENTOUT	DCMI_D5
A38	DCMI_D3	PH12	HDP2, TIM5_CH3, I2C4_SDA, I2C1_SDA, DCMI_D3, LCD_R6, EVENTOUT	DCMI_D3
A39	DCMI_D2	PH11	TIM5_CH2, I2C4_SCL, I2C1_SCL, DCMI_D2, LCD_R5, EVENTOUT	DCMI_D2
A40	DCMI_D1	PH10	TIM5_CH1, I2C4_SMBA, I2C1_SMBA, DCMI_D1, LCD_R4, EVENTOUT	DCMI_D1

A41	DCMI_D4	PH14	TIM8_CH2N, UART4_RX, FDCAN1_RX, DCMI_D4, LCD_G3, EVENTOUT	DCMI_D4
A42	DCMI_H SYNC	PH8	TIM5_ETR, I2C3_SDA, DCMI_HSYNC, LCD_R2, EVENTOUT	DCMI_HSYNC
A43	DCMI_R ESET	PE1	LPTIM1_IN2, I2S2_MCK, SAI3_SD_B, UART8_TX, FMC_NBL1, DCMI_D3, EVENTOUT	DCMI_RESET
A44	DCMI_D0	PH9	TIM12_CH2, I2C3_SMBA, DCMI_D0, LCD_R3, EVENTOUT	DCMI_D0
A45	DCMI_D7	PE6	TRACED2, TIM1_BKIN2, SAI1_D1, TIM15_CH2, SPI4_MOSI, SAI1_SD_A, SDMMC2_D0, SDMMC1_D2, SAI2_MCLK_B, FMC_A22, DCMI_D7, LCD_G1, EVENTOUT	DCMI_D7
A46	DCMI_D6	PB8	HDP6, TIM16_CH1, TIM4_CH3, DFSDM1_CKIN7, I2C1_SCL, SDMMC1_CKIN, I2C4_SCL, SDMMC2_CKIN, UART4_RX, FDCAN1_RX, SDMMC2_D4, ETH1_GMII_TXD3/ ETH1_MII_TXD3/ ETH1_RGMII_TXD3, SDMMC1_D4, DCMI_D6, LCD_B6, EVENTOUT	DCMI_D6

A47	DCMI_PIXCLK	PA6	TIM1_BKIN, TIM3_CH1, TIM8_BKIN, SAI4_CK2, SPI1_MISO/I2S1_SDI, SPI6_MISO, TIM13_CH1, MDIOS_MDC, SAI4_SCK_A, DCMI_PIXCLK, LCD_G2, EVENTOUT	DCMI_PIXCLK
A48	I2C5_SDA	PA12	TIM1_ETR, I2C6_SDA, I2C5_SDA, UART4_TX, USART1_RTS/USART1_DE, SAI2_FS_B, FDCAN1_TX, LCD_R5, EVENTOUT	I2C5_SDA
A49	DCMI_VSYNC	PB7	TIM17_CH1N, TIM4_CH2, I2C1_SDA, I2C4_SDA, USART1_RX, SDMMC2_D1, DFSDM1_CKIN5, FMC_NL, DCMI_VSYNC, EVENTOUT	DCMI_VSYNC
A50	I2C5_SCL	PA11	TIM1_CH4, I2C6_SCL, I2C5_SCL, SPI2_NSS/I2S2_WS, UART4_RX, USART1_CTS/USART1_NSS, FDCAN1_RX, LCD_R4, EVENTOUT	I2C5_SCL
A51	PD4		SAI3_FS_A, USART2_RTS/USART2_DE, SDMMC3_D1, DFSDM1_CKIN0, FMC_NOE, EVENTOUT	以下为 NAND 预留接口 如不用 NAND 可以做其它 IO
A52	PD5		USART2_TX, SDMMC3_D2, FMC_NWE, EVENTOUT	NAND 预留接口

A53	PD6		TIM16_CH1N, SAI1_D1, DFSDM1_CKIN4, DFSDM1_DATIN1, SPI3_MOSI/I2S3_SDO, SAI1_SD_A, USART2_RX, FMC_NWAIT, DCM1_D10, LCD_B2, EVENTOUT	NAND 预留接口
A54	PD1		I2C6_SCL, DFSDM1_DATIN6, I2C5_SCL, SAI3_SD_A, UART4_TX, FDCAN1_TX, SDMMC3_D0, DFSDM1_CKIN7, FMC_AD3/FMC_D3, EVENTOUT	NAND 预留接口
A55	PD0		I2C6_SDA, DFSDM1_CKIN6, I2C5_SDA, SAI3_SCK_A, UART4_RX, FDCAN1_RX, SDMMC3_CMD, DFSDM1_DATIN7, FMC_AD2/FMC_D2, EVENTOUT	NAND 预留接口
A56	PD15		TIM4_CH4, SAI3_MCLK_A, UART8_CTS, FMC_AD1/FMC_D1, LCD_R1, EVENTOUT	N NAND 预留接口
A57	PD14		TIM4_CH3, SAI3_MCLK_B, UART8_CTS, FMC_AD0/FMC_D0, EVENTOUT	NAND 预留接口
A58	GND			GND

A59	DSI_D1_ P			MIPI 预留接口
A60	DSI_D1_ N			MIPI 预留接口
A61	DSI_CK_ P			MIPI 预留接口
A62	DSI_CK_ N			MIPI 预留接口
A63	DSI_D0_ P			MIPI 预留接口
A64	DSI_D0_ N			MIPI 预留接口
A65	GND			GND
A66	DSI_TE	PC6	HDP1, TIM3_CH1, TIM8_CH1, DFSDM1_CKIN3, I2S2_MCK, USART6_TX, SDMMC1_D0DIR, SDMMC2_D0DIR, SDMMC2_D6, DSI_TE, SDMMC1_D6,	MIPI 预留接口

			DCMI_D0, LCD_HSYNC, EVENTOUT	
A67	DSI_RES ET	PA15	DBTRGI, TIM2_CH1/TIM2_ETR, SAI4_D2, SDMMC1_CDIR, CEC, SPI1_NSS/I2S1_WS, SPI3_NSS/I2S3_WS, SPI6_NSS, UART4_RTS/UART4_DE, SDMMC2_D5, SDMMC2_CDIR, SDMMC1_D5, SAI4_FS_A, UART7_TX, LCD_R1,EVENTOUT	MIPI 预留接口
A68	DSI_INT	PI2	TIM8_CH4, SPI2_MISO/I2S2_SDI, DCMI_D9, LCD_G7, EVENTOUT	MIPI 预留接口
A69	LCD_R0	PI15	LCD_G2, LCD_R0, EVENTOUT	LCD_R0
A70	LCD_R1	PJ0	TRACED8, LCD_R7, LCD_R1, EVENTOUT	LCD_R1
A71	LCD_R2	PJ1	TRACED9, LCD_R2, EVENTOUT	LCD_R2
A72	LCD_R3	PJ2	TRACED10, DSI_TE, LCD_R3, EVENTOUT	LCD_R3

A73	LCD_R4	PJ3	TRACED11, LCD_R4, EVENTOUT	LCD_R4
A74	LCD_R5	PJ4	TRACED12, LCD_R5, EVENTOUT	LCD_R5
A75	LCD_R6	PJ5	TRACED2, HDP2, LCD_R6, EVENTOUT	LCD_R6
A76	LCD_R7	PJ6	TRACED3, HDP3, TIM8_CH2, LCD_R7, EVENTOUT	LCD_R7
A77	GND			GND
A78	LCD_G0	PJ7	TRACED13, TIM8_CH2N, LCD_G0, EVENTOUT	LCD_G0
A79	LCD_G1	PJ8	TRACED14, TIM1_CH3N, TIM8_CH1, UART8_TX, LCD_G1, EVENTOUT	LCD_G1
A80	LCD_G2	PJ9	TRACED15, TIM1_CH3, TIM8_CH1N, UART8_RX, LCD_G2, EVENTOUT	LCD_G2

A81	LCD_G3	PJ10	TIM1_CH2N, TIM8_CH2, SPI5_MOSI, LCD_G3, EVENTOUT	LCD_G3
A82	LCD_G4	PJ11	TIM1_CH2, TIM8_CH2N, SPI5_MISO, LCD_G4, EVENTOUT	LCD_G4
A83	LCD_G5	PK0	TIM1_CH1N, TIM8_CH3, SPI5_SCK, LCD_G5, EVENTOUT	LCD_G5
A84	LCD_G6	PK1	TRACED4, TIM1_CH1, HDP4, TIM8_CH3N, SPI5_NSS, LCD_G6, EVENTOUT	LCD_G6
A85	LCD_G7	PK2	TRACED5, TIM1_BKIN, HDP5, TIM8_BKIN, LCD_G7, EVENTOUT	LCD_G7
A86	GND			GND
A87	LCD_B0	PJ12	LCD_G3, LCD_B0, EVENTOUT	LCD_B0

A88	LCD_B1	PJ13	LCD_G4, LCD_B1, EVENTOUT	LCD_B1
A89	LCD_B2	PJ14	LCD_B2, EVENTOUT	LCD_B2
A90	LCD_B3	PJ15	LCD_B3, EVENTOUT	LCD_B3
A91	LCD_B4	PK3	LCD_B4, EVENTOUT	LCD_B4
A92	LCD_B5	PK4	LCD_B5, EVENTOUT	LCD_B5
A93	LCD_B6	PK5	TRACED6, HDP6, LCD_B6, EVENTOUT	LCD_B6
A94	LCD_B7	PK6	TRACED7, HDP7, LCD_B7, EVENTOUT	LCD_B7
A95	GND			GND

A96	CT_RST	PH15	TIM8_CH3N, DCMI_D11, LCD_G4, EVENTOUT	CT_RST
A97	I2C2_ SDA	PH5	I2C2_SDA, SPI5_NSS, SAI4_SD_B, EVENTOUT	I2C2_SDA
A98	LED0	PI0	TIM5_CH4, SPI2_NSS/I2S2_WS, DCMI_D13, LCD_G5, EVENTOUT	LED0
A99	I2C2_ SCL	PH4	I2C2_SCL, LCD_G5, LCD_G4, EVENTOUT	I2C2_SCL
A100	CT_INT	PI1	TIM8_BKIN2, SPI2_SCK/I2S2_CK, DCMI_D8, LCD_G6, EVENTOUT	CT_INT
B1	VBAT			VBAT
B2	SAI2_ FSB	PE13	HDP2, TIM1_CH3, DFSDM1_CKIN5, SPI4_MISO, SAI2_FS_B, FMC_AD10/FMC_D10, DCMI_D6, LCD_DE, EVENTOUT	SAI2_FS_B

B3	SAI2_MCLKB	PE14	TIM1_CH4, SPI4_MOSI, UART8_RTS/UART8_DE, SAI2_MCLK_B,SDMMC1_D123DIR, FMC_AD11/FMC_D11, LCD_G0, LCD_CLK, EVENTOUT	SAI2_MCLK_B
B4	SAI2_SDA	PI6	TIM8_CH2, SAI2_SD_A, DCMI_D6, LCD_B6, EVENTOUT	SAI2_SD_A
B5	SAI2_SCKB	PE12	TIM1_CH3N, DFSDM1_DATIN5, SPI4_SCK, SDMMC1_D0DIR, SAI2_SCK_B,FMC_AD9/FMC_D9, LCD_B4,EVENTOUT	SAI2_SCK_B
B6	SAI2_SCKA	PI5	TIM8_CH1, SAI2_SCK_A, DCMI_VSYNC, LCD_B5, EVENTOUT	SAI2_SCK_A
B7	SAI2_MCLKA	PE0	LPTIM1_ETR, TIM4_ETR, LPTIM2_ETR,SPI3_SCK/I2S3_CK, SAI4_MCLK_B, UART8_RX, SAI2_MCLK_A, FMC_NBL0, DCMI_D2, EVENTOUT	SAI2_MCLK_A
B8	SAI2_FSA	PI7	TIM8_CH3, SAI2_FS_A, DCMI_D7, LCD_B7, EVENTOUT	SAI2_FS_A
B9	SAI2_SDB	PF11	SPI5_MOSI, SAI2_SD_B, DCMI_D12, LCD_G5, EVENTOUT	SAI2_SD_B

B10	I2C4_ SCL	PZ4	I2C6_SCL, I2C2_SCL, I2C5_SCL, I2C4_SCL, EVENTOUT	I2C4_SCL
B11	I2C4_ SDA	PZ5	I2C6_SDA, I2C2_SDA, I2C5_SDA, I2C4_SDA, USART1_RTS/USART1_DE, EVENTOUT	I2C4_SDA
B12	AUDIO_ RST	PZ7	I2C6_SDA, I2C2_SDA, USART1_TX, EVENTOUT	AUDIO_RST
B13		PZ6	I2C6_SCL, I2C2_SCL, USART1_CK, I2S1_MCK, I2C4_SMBA, USART1_RX, EVENTOUT	预留 IO
B14	GND			GND
B15	GBC_ LED	PI8	EVENTOUT	GBC_ LED
B16	GBC_ KEY	PC13	EVENTOUT	GBC_ KEY

B17	KEY1	PH7	I2C3_SCL, SPI5_MISO, ETH1_GMII_RXD3/ ETH1_MII_RXD3/ETH1_RGMII_RXD3, MDIOS_MDC, DCMI_D9, EVENTOUT	KEY1
B18	LED1	PF3	ETH1_GMII_TX_ER, FMC_A3, EVENTOUT	LED1
B19	KEY0	PG3	TRACED3, TIM8_BKIN2, DFSDM1_CKIN1, ETH1_GMII_TXD7, FMC_A13, EVENTOUT	EVENTOUT
B20	WKUP	PA0	TIM2_CH1/TIM2_ETR, TIM5_CH1, TIM8_ETR, TIM15_BKIN, USART2_CTS/USART2_NSS, UART4_TX, SDMMC2_CMD, SAI2_SD_B, ETH1_GMII_CRS/ ETH1_MII_CRS, EVENTOUT	预留 IO
B21		ANA0	ADC1_INP0, ADC1_INN1, ADC2_INP0, ADC2_INN1	预留 IO
B22		ANA1	ADC1_INP1, ADC2_INP1	预留 IO
B23	DAC1	PA4	HDP0, TIM5_ETR, SAI4_D2, SPI1_NSS/I2S1_WS, SPI3_NSS/I2S3_WS, USART2_CK, SPI6_NSS, SAI4_FS_A, DCMI_HSYNC,	底板做 DAC 功能

			LCD_VSYNC, EVENTOUT DC1_INP18,ADC2_INP18,DAC_OUT1	
B24	ADC1	PA5	TIM2_CH1/TIM2_ETR,TIM8_CH1N, SAI4_CK1,SPI1_SCK/I2S1_CK, SPI6_SCK,SAI4_MCLK_A, LCD_R4, EVENTOUTADC1_INP19ADC1_INN18, ADC2_INP19,ADC2_INN18, DAC_OUT2	底板做 ADC 功能
B25	GND			GND
B26	QSPI_ BK2_IO1	PH3	DFSDM1_CKIN4, QUADSPI_BK2_IO1, SAI2_MCLK_B, ETH1_GMII_COL/ ETH1_MII_COL, LCD_R1, EVENTOUT	QUADSPI_BK2 _IO1
B27	QSPI_ BK2_IO0	PH2	LPTIM1_IN2, QUADSPI_BK2_IO0, SAI2_SCK_B, ETH1_GMII_CRS/ ETH1_MII_CRS, LCD_R0, EVENTOUT	QUADSPI_BK2 _IO0
B28	QSPI_ BK2_IO2	PG10	TRACED10, UART8_CTS, LCD_G3, SAI2_SD_B, QUADSPI_BK2_IO2, FMC_NE3, DCMI_D2, LCD_B2, EVENTOUT	QUADSPI_BK2 _IO2
B29	QSPI_ BK2_IO3	PG7	TRACED5, SAI1_MCLK_A, USART6_CK,UART8_RTS/UART8_DE, QUADSPI_CLK,QUADSPI_BK2_IO3, DCMI_D13,LCD_CLK, EVENTOUT	QUADSPI_BK2 _IO3

B30	QSPI_ BK2_NCS	PC0	DFSDM1_CKIN0, LPTIM2_IN2, DFSDM1_DATIN4, SAI2_FS_B, QUADSPI_BK2_NCS, LCD_R5, EVENTOUT	QUADSPI_BK2 _NCS
B31	I2S2_ SDO	PC3	TRACECLK, DFSDM1_DATIN1, SPI2_MOSI/I2S2_SDO, ETH1_GMII_TX_CLK/ ETH1_MII_TX_CLK, EVENTOUT	I2S2_SDO
B32	I2S2_ CK	PB10	TIM2_CH3, LPTIM2_IN1, I2C2_SCL, SPI2_SCK/I2S2_CK, DFSDM1_DATIN7, USART3_TX, QUADSPI_BK1_NCS, ETH1_GMII_RX_ER/ ETH1_MII_RX_ER, LCD_G4, EVENTOUT	I2S2_CK
B33	HDMI_ CEC	PB6	TIM16_CH1N, TIM4_CH1, I2C1_SCL, CEC, I2C4_SCL, USART1_TX, FDCAN2_TX, QUADSPI_BK1_NCS, DFSDM1_DATIN5, UART5_TX, DCMI_D5, EVENTOUT	HDMI_CEC
B34	HDMI_ RESET	PA3	TIM2_CH4, TIM5_CH4, LPTIM5_OUT, TIM15_CH2, USART2_RX, LCD_B2, ETH1_GMII_COL/ ETH1_MII_COL, LCD_B5, EVENTOUT	HDMI_RESET
B35	HDMI_ INT	PH6	TIM12_CH1, I2C2_SMBA, SPI5_SCK, ETH1_GMII_RXD2/ ETH1_MII_RXD2/ ETH1_RGMII_RXD2, MDIOS_MDIO, DCMI_D8, EVENTOUT	HDMI_INT

B36	CAN_FD_STBY	PF12	TRACED4, ETH1_GMII_RXD4, FMC_A6, EVENTOUT	CAN_FD_STBY
B37	USB_INT	PG2	TRACED2, MCO2, TIM8_BKIN, ETH1_GMII_TXD6, FMC_A12, EVENTOUT	USB_INT
B38	I2C1_SDA	PF15	TRACED7, I2C4_SDA, I2C1_SDA, ETH1_GMII_RXD7, FMC_A9, EVENTOUT	I2C1_SDA
B39	I2C1_SCL	PF14	TRACED6, DFSDM1_CKIN6, I2C4_SCL, I2C1_SCL, ETH1_GMII_RXD6, FMC_A8, EVENTOUT	I2C4_SCL
B40	WIFI_REG_EN	PF13	TRACED5, DFSDM1_DATIN6, I2C4_SMBA, I2C1_SMBA, DFSDM1_DATIN3, ETH1_GMII_RXD5, FMC_A7, EVENTOUT	WIFI_REG_EN
B41	PWR_ON_RST			PWR_ON_RST
B42	RESET			RESET

B43	GND			GND
B44	PD11		LPTIM2_IN2, I2C4_SMBA, I2C1_SMBA, USART3_CTS/USART3_NSS, QUADSPI_BK1_IO0, SAI2_SD_A,FMC_A16/FMC_CLE, EVENTOUT	NAND 预留接口
B45	PE7		TIM1_ETR, TIM3_ETR, DFSDM1_DATIN2, UART7_RX, QUADSPI_BK2_IO0, FMC_AD4/FMC_D4, EVENTOUT	NAND 预留接口
B46	PE8		TIM1_CH1N, DFSDM1_CKIN2, UART7_TX, QUADSPI_BK2_IO1, FMC_AD5/FMC_D5, EVENTOUT	NAND 预留接口
B47	PE9		TIM1_CH1, DFSDM1_CKOUT, UART7_RTS/UART7_DE, QUADSPI_BK2_IO2, FMC_AD6/FMC_D6, EVENTOUT	NAND 预留接口
B48	PD12		LPTIM1_IN1, TIM4_CH1, LPTIM2_IN1, I2C4_SCL, I2C1_SCL,USART3_RTS/USART3_DE, QUADSPI_BK1_IO1, SAI2_FS_A,FMC_A17/FMC_ALE, EVENTOUT	NAND 预留接口
B49	PE10		TIM1_CH2N, DFSDM1_DATIN4, UART7_CTS, QUADSPI_BK2_IO3, FMC_AD7/FMC_D7, EVENTOUT	NAND 预留接口

B50	PG9		DBTRGO, USART6_RX, SPDIFRX_IN4, QUADSPI_BK2_IO2, SAI2_FS_B, FMC_NE2/FMC_NCE, DCMI_VSYNC, LCD_R1, EVENTOUT	NAND 预留接口
B51	USB1_P			USB1_P
B52	USB1_N			USB1_N
B53	USB2_P			USB2_P
B54	USB2_N			USB1_N
B55	OTG_ID	PA10	TIM1_CH3, SPI3_NSS/I2S3_WS, USART1_RX, MDIOS_MDIO, SAI4_FS_B, DCMI_D1, LCD_B1, EVENTOUT	OTG_ID
B56	OTG_VBUS		USB 供电	OTG_VBUS

B57	GND			GND
B58	UART4_TX	PG11	TRACED11, USART1_TX, UART4_TX, SPDIFRX_IN1, ETH1_GMII_TX_EN/ ETH1_MII_TX_EN/ ETH1_RGMII_TX_CTL/ ETH1_RMII_TX_EN, DCMI_D3, LCD_B3, EVENTOUT	UART4_TX
B59	UART4_RX	PB2	TRACED4, RTC_OUT2, SAI1_D1, DFSDM1_CKIN1, USART1_RX, I2S_CKIN, SAI1_SD_A, SPI3_MOSI/I2S3_SDO, UART4_RX, QUADSPI_CLK, EVENTOUT	UART4_RX
B60	CAN1_RX	PI9	HDP1, UART4_RX, FDCAN1_RX, LCD_VSYNC, EVENTOUT	FDCAN1_RX
B61	CAN1_TX	PH13	TIM8_CH1N, UART4_TX, FDCAN1_TX, LCD_G2, EVENTOU	FDCAN1_TX
B62	USART5_TX	PB13	TIM1_CH1N, DFSDM1_CKOUT, LPTIM2_OUT, SPI2_SCK/I2S2_CK, DFSDM1_CKIN1, USART3_CTS/USART3_NSS, FDCAN2_TX, ETH1_GMII_TXD1/ ETH1_MII_TXD1/ETH1_RGMII_TXD1/ ETH1_RMII_TXD1, UART5_TX, EVENTOUT	UART5_TX

B63	USART5_ RX	PB12	TIM1_BKIN, I2C6_SMBA, I2C2_SMBA, SPI2_NSS/I2S2_WS, DFSDM1_DATIN1, USART3_CK, USART3_RX, FDCAN2_RX, ETH1_GMII_TXD0/ETH1_MII_TXD0/ ETH1_RGMII_TXD0/ ETH1_RMII_TXD0, UART5_RX, EVENTOUT	UART5_RX
B64	USART3_ TX	PD8	DFSDM1_CKIN3, SAI3_SCK_B, USART3_TX, SPDIFRX_IN2, FMC_AD13/FMC_D13, LCD_B7, EVENTOUT	USART3_TX
B65	USART3_ RX	PD9	DFSDM1_DATIN3, SAI3_SD_B, USART3_RX, FMC_AD14/FMC_D14, DCMI_HSYNC, LCD_B0, EVENTOUT	USART3_RX
B66	GND			GND
B67	UART7_ RX	PF6	TIM16_CH1, SPI5_NSS, SAI1_SD_B, UART7_RX, QUADSPI_BK1_IO3, SAI4_SCK_B, EVENTOUT	UART7_RX
B68	UART7_ CTS	PF9	TRACED13, TIM17_CH1N, SPI5_MOSI, SAI1_FS_B, UART7_CTS, TIM14_CH1, QUADSPI_BK1_IO1, EVENTOUT	UART7_CTS

B69	UART7_ RTS	PF8	TRACED12, TIM16_CH1N, SPI5_MISO, SAI1_SCK_B, UART7_RTS/UART7_DE, TIM13_CH1, QUADSPI_BK1_IO0, EVENTOUT	UART7_RTS
B70	UART7_ TX	PF7	TIM17_CH1, SPI5_SCK, SAI1_MCLK_B, UART7_TX, QUADSPI_BK1_IO2, EVENTOUT	UART7_TX
B71	WIFI_WK UP_ HOST	PG1	TRACED1, ETH1_GMII_TXD5, FMC_A11, EVENTOUT	WIFI_WKUP_H OST
B72	BT_REG_ EN	PF10	TIM16_BKIN, SAI1_D3, SAI4_D4, SAI1_D4, QUADSPI_CLK, SAI4_D3, DCMI_D11, LCD_DE, EVENTOUT	BT_REG_EN
B73	SPI1_ SCK	PZ0	I2C6_SCL, I2C2_SCL, SPI1_SCK/I2S1_CK, USART1_CK, SPI6_SCK, EVENTOUT	SPI1_SCK
B74	SPI1_ MISO	PZ1	I2C6_SDA, I2C2_SDA, I2C5_SDA, SPI1_MISO/I2S1_SDI, I2C4_SDA, USART1_RX, SPI6_MISO, EVENTOUT	SPI1_MISO
B75	SPI_ MOSI	PZ2	I2C6_SCL, I2C2_SCL, I2C5_SMBA, SPI1_MOSI/I2S1_SDO, I2C4_SMBA, USART1_TX, SPI6_MOSI, EVENTOUT	SPI1_MOSI

B76	SPI1_NSS	PZ3	I2C6_SDA, I2C2_SDA, I2C5_SDA, SPI1_NSS/I2S1_WS, I2C4_SDA, USART1_CTS/USART1_NSS, SPI6_NSS, EVENTOUT	SPI1_NSS
B77	GND			GND
B78	6D_INT	PA14	DBTRGO, DBTRGI, MCO2, EVENTOUT	6D_INT
B79	BT_WAK EUP_HOST	PA13	DBTRGO, DBTRGI, MCO1, UART4_TX, EVENTOUT	BT_WAKEUP_ HOST
B80	SPDIF_ TX	PB5	ETH_CLK, TIM17_BKIN, TIM3_CH2, SAI4_D1, I2C1_SMBA, SPI1_MOSI/I2S1_SDO, I2C4_SMBA, SPI3_MOSI/I2S3_SDO, SPI6_MOSI, FDCAN2_RX, SAI4_SD_A, ETH1_PPS_OUT, UART5_RX, DCMI_D10, LCD_G7, EVENTOUT	SPDIF_TX
B81	SPDIF_ RX	PG12	LPTIM1_IN1, SPI6_MISO, SAI4_CK2, USART6_RTS/USART6_DE, SPDIFRX_IN2, LCD_B4, SAI4_SCK_A, ETH1_PHY_INTN, FMC_NE4, LCD_B1, EVENTOUT	SPDIF_RX

B82	HOST_WAKEUP_BT	PI11	MCO1, I2S_CKIN, LCD_G6, EVENTOUT	HOST_WAKEUP_BT
B83	RTC_INT	PI3	TIM8_ETR, SPI2_MOSI/I2S2_SDO, DCMI_D10, EVENTOUT	RTC_INT
B84	ENET_GREEN_GBIT			ENET_GREEN_GBIT
B85	ENET_YELLOW			ENET_YELLOW
B86	ENET_GREEN			ENET_GREEN
B87	GND			GND
B88	RJ45_D4_N			RJ45_D4_N

B89	RJ45_D4_ P			RJ45_D4_P
B90	RJ45_D3_ N			RJ45_D3_N
B91	RJ45_D3_ P			RJ45_D3_P
B92	GND			GND
B93	RJ45_D2_ N			RJ45_D2_N
B94	RJ45_D2_ P			RJ45_D2_P
B95	RJ45_D1_ N			RJ45_D1_N
B96	RJ45_D1_ P			RJ45_D1_P

B97	GND			GND
B98	GND			GND
B99	VCC5			VCC5
B100	VCC5			VCC5