









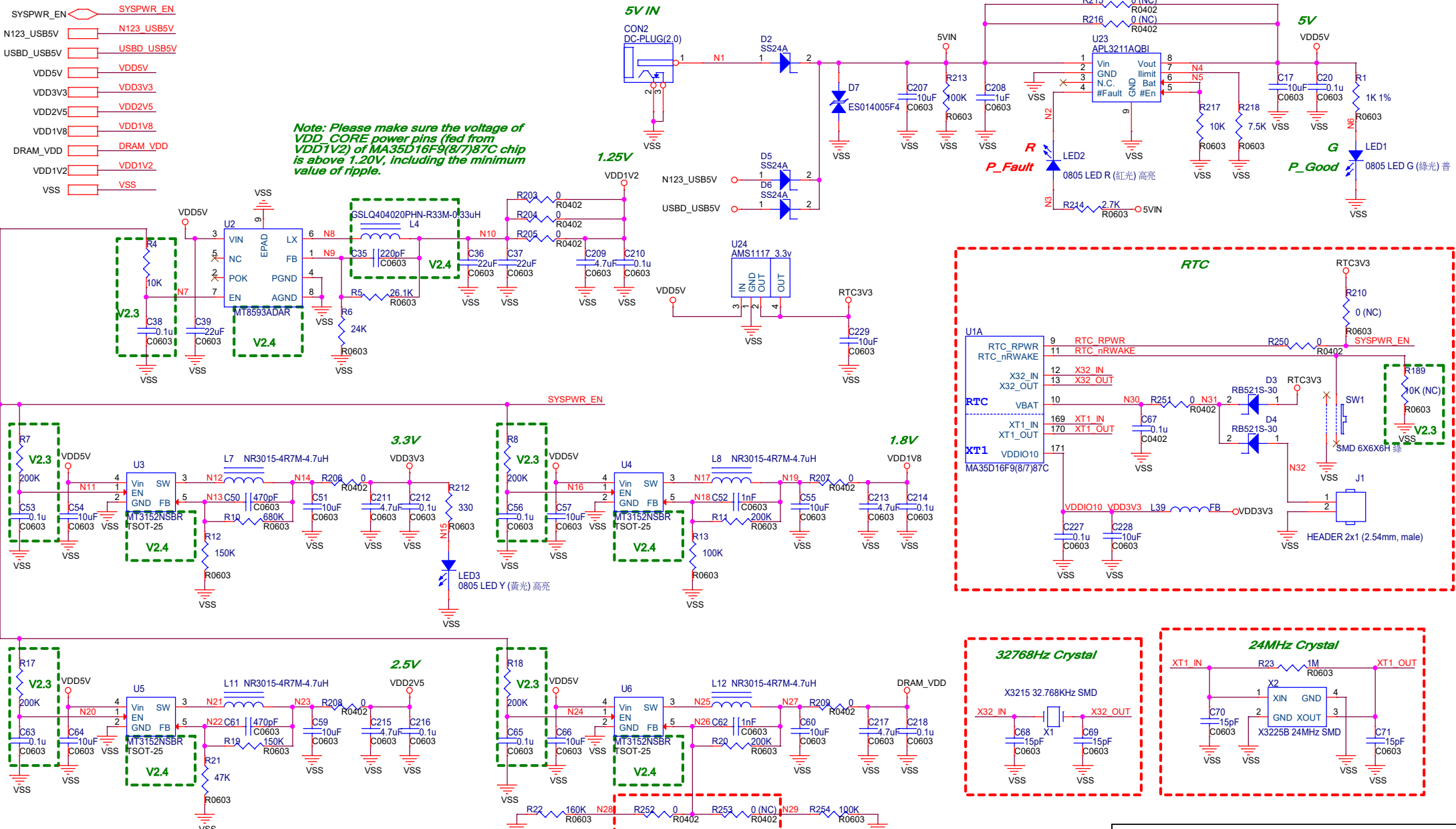


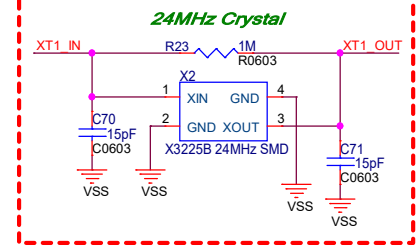
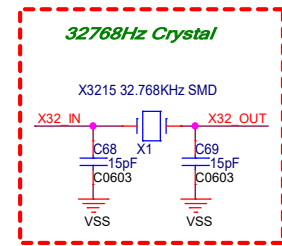
SYSPWR_EN  SYSPWR_EN
 N123_USB5V  N123_USB5V
 USBD_USB5V  USBD_USB5V
 VDD5V  VDD5V
 VDD3V3  VDD3V3
 VDD2V5  VDD2V5
 VDD1V8  VDD1V8
 DRAM_VDD  DRAM_VDD
 VDD1V2  VDD1V2
 VSS  VSS

Note: Please make sure the voltage of VDD_CORE power pins (fed from VDD1V2) of MA35D16F9(8/7)87C chip is above 1.20V, including the minimum value of ripple.

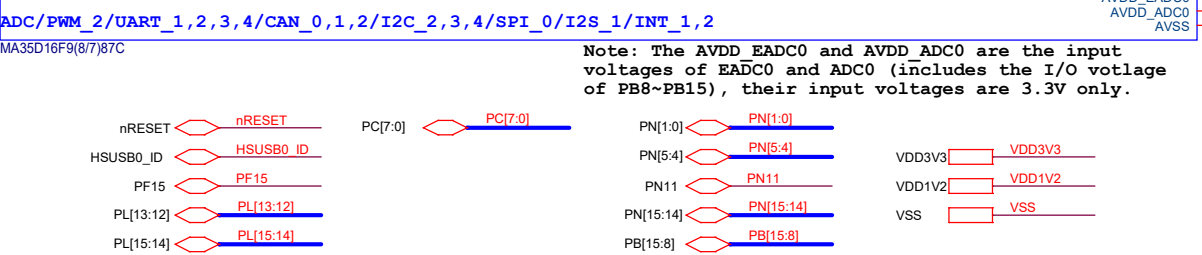
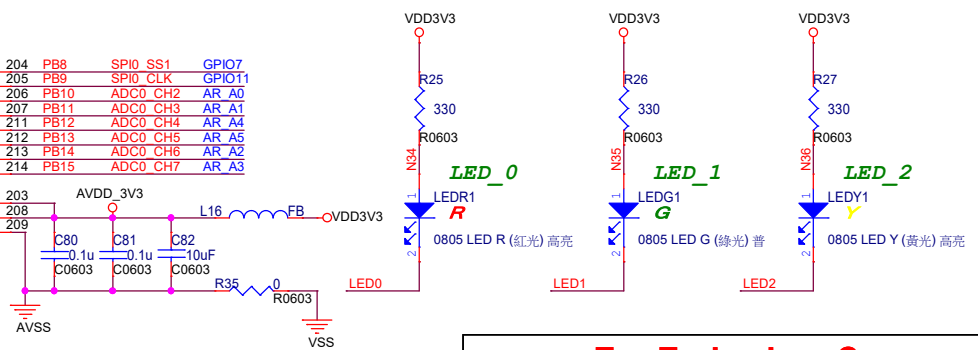
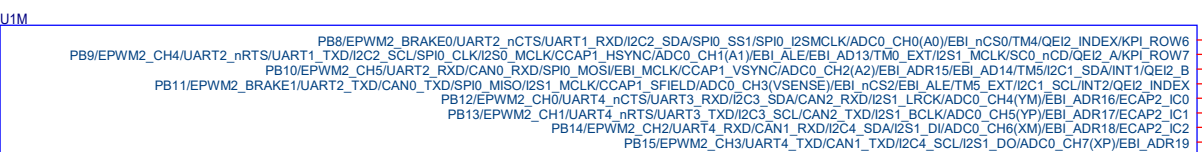
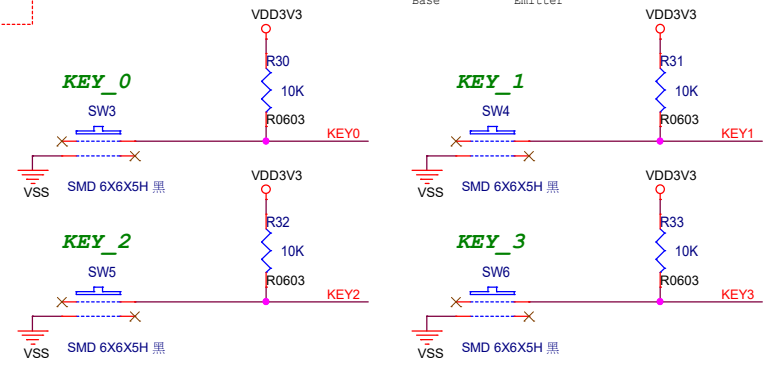
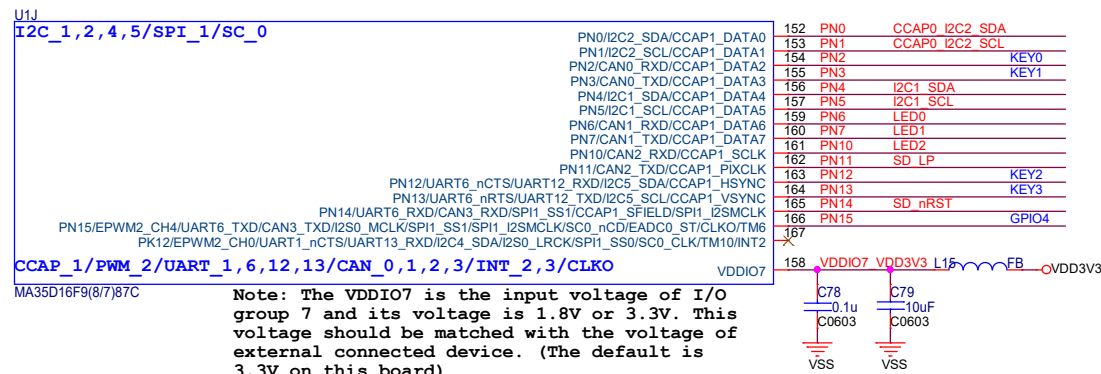
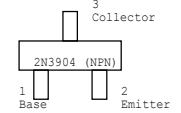
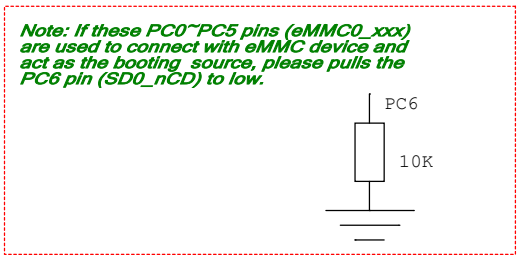
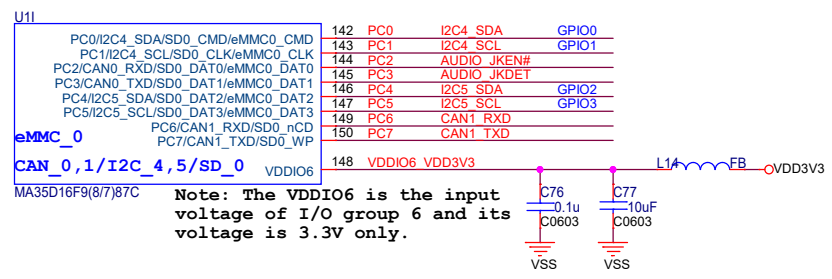
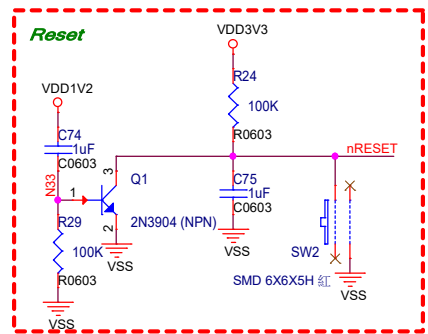
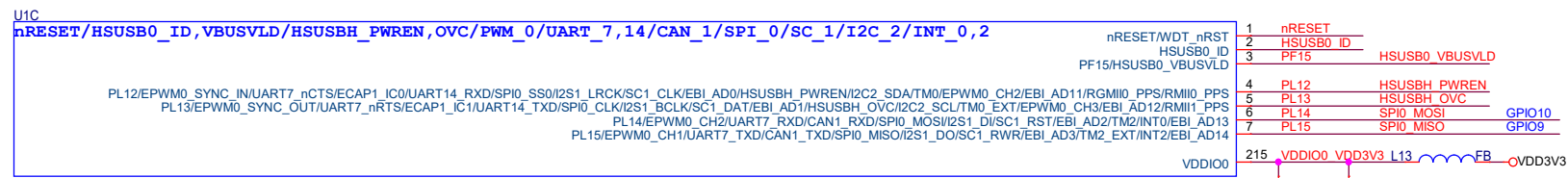


Option for the supply voltage of SDRAM power (DRAM_VDD)

1. Mount R252 only, DRAM_VDD = 1.35V (for MA35D16F987C/MA35D16F87C, DDR3L)
 2. Mount R253 only, DRAM_VDD = 1.8V (for MA35D16F787C, DDR2)



nuvoTon Technology Corp.			
Title	NuMaker-IoT-MA35D16F90 (LQFP216)		
Size B	Document Number	Rev	
	01. Power	V2.4	
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Title
NuMaker-IoT-MA35D16F90 (LQFP216)

Size B Document Number
02. VDDIO0/6/7/ADC

Date: Monday, September 25, 2023 Sheet 3 of 13

Rev V2.4

U1D
NAND/UART_1,2,3,4,5,8,16

PowerOnSetting
INT_0,1,2,3/UART_5,6,9
SC_1/PWM_0,1
SPI_3/I2S_1/CLKO/PWM_0/CAN_0,1,2
JTAG/I2S_0
QSPI_1/PWM_0/USRT_1,15,16
I2C_0/I2S_1/sc_1
UART_0

MA35D16F9(8/7)87C

PA0/UART1_nCTS/UART16_RXD/NAND_DATA0/EBI_AD0/EBI_ADR0
PA1/UART1_nRTS/UART16_TXD/NAND_DATA1/EBI_AD1/EBI_ADR1
PA2/UART1_TXD/NAND_DATA2/EBI_AD2/EBI_ADR2
PA3/UART1_RXD/NAND_DATA3/EBI_AD3/EBI_ADR3
PA4/UART3_nCTS/UART2_RXD/NAND_DATA4/EBI_AD4/EBI_ADR4
PA5/UART3_nRTS/UART2_TXD/NAND_DATA5/EBI_AD5/EBI_ADR5
PA6/UART3_RXD/NAND_DATA6/EBI_AD6/EBI_ADR6
PA7/UART3_TXD/NAND_DATA7/EBI_AD7/EBI_ADR7
PA8/UART5_nCTS/UART4_RXD/NAND_RDY0/EBI_AD8/EBI_ADR8
PA9/UART5_nRTS/UART4_TXD/NAND_nRE/EBI_AD9/EBI_ADR9
PA10/UART5_RXD/NAND_nWE/EBI_AD10/EBI_ADR10
PA11/UART5_TXD/NAND_CLE/EBI_AD11/EBI_ADR11
PA12/UART7_nCTS/UART8_RXD/NAND_ALE/EBI_AD12/EBI_ADR12
PA13/UART7_nRTS/UART8_TXD/NAND_nCS0/EBI_AD13/EBI_ADR13
PA14/UART7_RXD/CAN3_RXD/NAND_nWP/EBI_AD14/EBI_ADR14

PG0/EPWM0_CH0/UART7_TXD/CAN3_TXD/SPI0_SS0/EADC0_ST/EBI_AD15/I2S1_MCLK/QEI0_INDEX/TM1/CLKO/INT0/EBI_ADR15/PowerOnSetting
PA15/EPWM0_CH2/UART9_nCTS/UART6_RXD/I2C4_SDA/CAN2_RXD/EBI_ALE/QEI0_ATM1/RGMIO_PPS/RMIO_PPS
PG1/EPWM0_CH3/UART9_nRTS/UART6_TXD/I2C4_SCL/CAN2_TXD/EBI_nCS0/QEI0_B/TM1_EXT/RM11_PPS/PowerOnSetting
PG2/EPWM0_CH4/UART9_RXD/CAN0_RXD/SPI0_SS1/EBI_ADR16/EBI_nCS2/QEI0_ATM3/INT1/PowerOnSetting
PG3/EPWM0_CH5/UART9_TXD/CAN0_TXD/SPI0_I2SMCLK/EBI_ADR17/EBI_nCS1/EBI_MCLK/QEI0_B/TM3_EXT/I2S1_MCLK/PowerOnSetting
PG4/EPWM1_CH0/UART5_nCTS/UART6_RXD/SPI3_SS0/EBI_ADR18/EBI_nCS0/I2S1_DO/SC1_CLK/TM4/INT2/ECAPI1_IC2/PowerOnSetting
PG5/EPWM1_CH1/UART5_nRTS/UART6_TXD/SPI3_CLK/ECAPO_IC0/EBI_ADR19/EBI_ALE/I2S1_DI/SC1_DAT/TM4_EXT/PowerOnSetting
PG6/EPWM1_CH2/UART5_RXD/CAN1_RXD/SPI3_MOSI/ECAPO_IC1/EBI_nRD/I2S1_BCLK/SC1_RST/TM7/INT3/PowerOnSetting
PG7/EPWM1_CH3/UART5_TXD/CAN1_TXD/SPI3_MISO/ECAPO_IC2/EBI_nWR/I2S1_LRCK/SC1_PWR/TM7_EXT/PowerOnSetting

PG11/JTAG_TDO/I2S0_MCLK/NAND_RDY1/EBI_nWRH/EBI_nCS1/EBI_AD0
PG12/JTAG_TCK/SW_CLK/I2S0_LRCK/EBI_nWRL/EBI_AD1
PG13/JTAG_TMS/SW_DIO/I2S0_BCLK/EBI_MCLK/EBI_AD2
PG14/JTAG_TDI/I2S0_DI/NAND_nCS1/EBI_ALE/EBI_AD3
PG15/JTAG_nTRST/I2S0_DO/EBI_nCS0/EBI_AD4

PE14/UART0_TXD
PE15/UART0_RXD

VDDIO1
VDDIO1

PA0 PA0 NAND DATA0
PA1 PA1 NAND DATA1
PA2 PA2 NAND DATA2
PA3 PA3 NAND DATA3
PA4 PA4 NAND DATA4
PA5 PA5 NAND DATA5
PA6 PA6 NAND DATA6
PA7 PA7 NAND DATA7
PA8 PA8 NAND RDY
PA9 PA9 NAND nRE
PA10 PA10 NAND nWE
PA11 PA11 NAND CLE
PA12 PA12 NAND ALE
PA13 PA13 NAND nCS
PA14 PA14 NAND nWP

PG0 PG0 GPIO8
PG1 PG1
PG2 PG2 AR D2
PG3 PG3 AR D3
PG4 PG4 GPIO21
PG5 PG5 GPIO20
PG6 PG6 GPIO18
PG7 PG7 GPIO19

PG11 PG11
PG12 PG12
PG13 PG13
PG14 PG14
PG15 PG15

PD6 PD6 AR D4
PD7 PD7 AR D5
PD8 PD8 AR D6
PD9 PD9 AR D7
PD10 PD10 AR D8
PD11 PD11 AR D9

PE14 PE14 UART0_TXD
PE15 PE15 UART0_RXD

VDDIO1 VDD3V3 L17 FB VDD3V3

C85 0.1uF C86 0.1uF C87 10uF
C0603 C0603 C0603

VSS VSS VSS

PG0 Secure Boot
L Secure Boot Enable
H Secure Boot Disable

PG1 Boot Source QSPI0, SD/eMMC I/O Voltage
L 3.3V
H 1.8V

PG3 PG2 Boot Source
L QSPI0 Flash
L H SD/eMMC
H L NAND Flash
H H USB

PG7 PG6 Booting from QSPI0
L L SPI-NAND, 1-bit
H L SPI-NOR, 1-bit

PG6 Booting from SD/eMMC
L SD0/eMMC0 booting
H SD1/eMMC1 booting

PG7 Booting from SD/eMMC
L eMMC 4-bit booting
H eMMC 8-bit booting

PG5 PG4 Booting from NAND
L L Ignore
L H NAND flash page 2KB
H L NAND flash page 4KB
H H NAND flash page 8KB

PG7 PG6 Booting from NAND
L L Ignore
L H BCH T12
H L BCH T24
H H NO ECC

PG4 Booting from USB
L USB0 booting
H USBH booting

PG5 Booting from USBH
L USBH port 0 booting
H USBH port 1 booting

PG6 Booting from USBH
L Over-current low-active detect
H Over-current high-active detect

VDD3V3 R188 0 R0603
R202 R40 R201 R39 R233 R38 R37 R36
R0603 R0603 R0603 R0603 R0603 R0603 R0603 R0603

N122
N37 N38 N39 N40 N41 N42 N43 N44

SW7
SW DIP 8 (SMD)

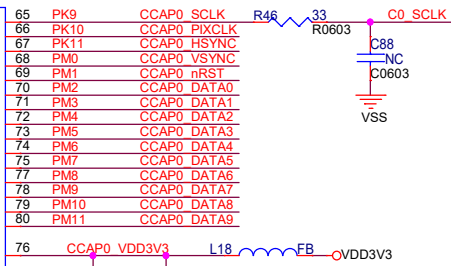
Internal pull-down

Note: The VDDIO1 is the input voltage of I/O group 1 and its voltage is 3.3V only.

PG11~15 Connect to SWJ(I2S0)
PG11 R41 0 (NC) JTAG TDO
PG12 R42 0 (NC) JTAG TCK SW_CLK
PG13 R43 0 (NC) JTAG TMS SW_DIO
PG14 R44 0 (NC) JTAG TDI
PG15 R45 0 (NC) JTAG nTRST








J3 HEADER 2x1 (2.54mm, male)
SWJ nRESET
SWJ Connector
VDD3V3
VSS
JTAG nTRST
JTAG TDI
JTAG TMS SW_DIO
JTAG TCK SW_CLK
JTAG TDO
SWJ nRESET
U39 NSP4201MR6T1G
TSOP-6
U40 NSP4201MR6T1G
TSOP-6
CON12
C221 10uF C0603
L38
FB
VSS

Power-on Setting



The diagram illustrates the power supply connections for the MA35D16F9(8/7)87C chip (U10). The chip is labeled "Power" and "MA35D16F9(8/7)87C". The connections are as follows:

- VDD1V2** is connected to pin 17 (VDD_CORE) via a resistor **R0603** and a capacitor **C0402** (labeled **C19**).
- VDD3V3** is connected to pin 174 (AVDD33_PLL) via a resistor **L2**.
- VDD1V2** is connected to pin 172 (AVDDL_PLL0) via a resistor **L3**.
- VDD2V5** is connected to pin 8 (VDD_OTP) via a resistor **L6**.
- The chip has multiple pins for VDD_CORE (17, 21, 23, 49, 55, 81, 120, 131, 137, 140, 151, 180, 202, 210, 216).
- The chip has pins for AVDDH_PLL2 (174), AVDDL_PLL0 (172), AVDDL_PLL1 (173), and VDD_PLL1 (173).
- The chip has pins for VDD_OTP (8).
- The chip has pins for VSS (128) and EPAD (217).

PC12		PC12
PN[1:0]		PN[1:0]
VDD3V3		VDD3V3
VDD2V5		VDD2V5
DRAM_VDD		DRAM_VDD
VDD1V2		VDD1V2
VSS		VSS

U1G

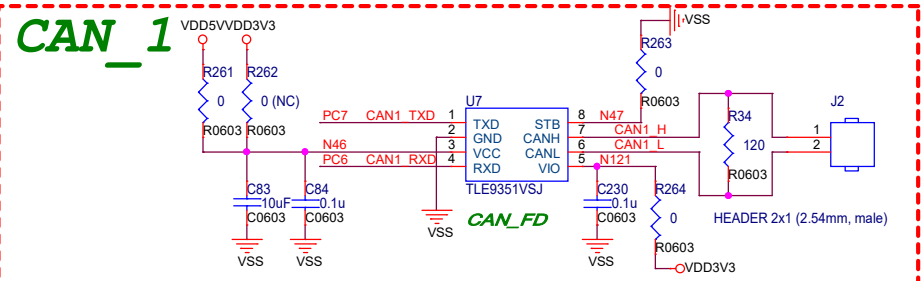
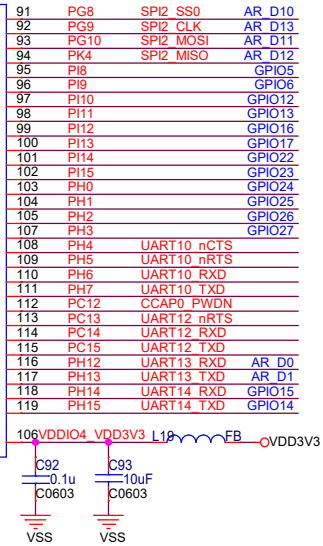
PG8/EPWM1_CH4/UART12_RXD/CAN3_RXD/SPI2_SS0/LCM_VSYNC/LCM_MPU_RD/EN/I2C3_SDA/EBI_AD7/EBI_nCS0
 PG9/EPWM1_CH5/UART12_TXD/CAN3_TXD/SPI2_CLK/LCM_HSYNC/LCM_MPU_WR/RW/I2C3_SCL/EBI_AD8/EBI_nCS1
 PG10/UART12_nRTS/UART13_TXD/SPI2_MOSI/LCM_CLK/EBI_AD9/EBI_nWRH
 PK4/UART12_nCTS/UART13_RXD/SPI2_MISO/LCM_DEN/LCM_MPU_RS/EBI_AD10/EBI_nWRL
 P8/UART4_nCTS/UART3_RXD/LCM_DATA0/LCM_MPU_D0/EBI_AD11
 P9/UART4_nRTS/UART3_TXD/LCM_DATA1/LCM_MPU_D1/EBI_AD12
 P10/UART4_RXD/LCM_DATA2/LCM_MPU_D2/EBI_AD13
 P11/UART4_TXD/LCM_DATA3/LCM_MPU_D3/EBI_AD14
 P12/UART6_nCTS/UART5_RXD/LCM_DATA4/LCM_MPU_D4
 P13/UART6_nRTS/UART5_TXD/LCM_DATA5/LCM_MPU_D5
 P14/UART6_RXD/LCM_DATA6/LCM_MPU_D6
 P15/UART6_TXD/LCM_DATA7/LCM_MPU_D7
 PH0/UART8_nCTS/UART7_RXD/LCM_DATA8/LCM_MPU_D8
 PH1/UART8_nRTS/UART7_TXD/LCM_DATA9/LCM_MPU_D9
 PH2/UART8_RXD/LCM_DATA10/LCM_MPU_D10
 PH3/UART8_TXD/LCM_DATA11/LCM_MPU_D11
 PH4/UART10_nCTS/UART9_RXD/LCM_DATA12/LCM_MPU_D12
 PH5/UART10_nRTS/UART9_TXD/LCM_DATA13/LCM_MPU_D13
 PH6/UART10_RXD/LCM_DATA14/LCM_MPU_D14
 PH7/UART10_TXD/LCM_DATA15/LCM_MPU_D15
 PC12/UART12_nCTS/UART11_RXD/LCM_DATA16/LCM_MPU_D16
 PC13/UART12_nRTS/UART11_TXD/LCM_DATA17/LCM_MPU_D17
 PC14/UART12_RXD/LCM_DATA18/LCM_MPU_CS
 PC15/UART12_TXD/LCM_DATA19/LCM_MPU_TE/LCM_MPU_VSYNC
 PH12/UART14_nCTS/UART13_RXD/LCM_DATA20
 PH13/UART14_nRTS/UART13_TXD/LCM_DATA21
 PH14/UART14_RXD/LCM_DATA22
 PH15/UART14_TXD/LCM_DATA23

LCM/UART_3,4,5,6,7,8,9,10,11,12,13,14

CAN_0,3/I2C_3/PWM_1/SPI_2/INT_1,2,3/CLKO

MA35D16F9(8/7)87C

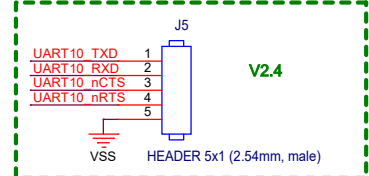
Note: The VDDIO4 is the input voltage of I/O group 4 and its voltage is 1.8V or 3.3V. This voltage should be matched with the voltage of external connected device. (The default is 3.3V on this board)



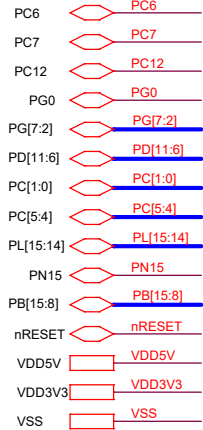
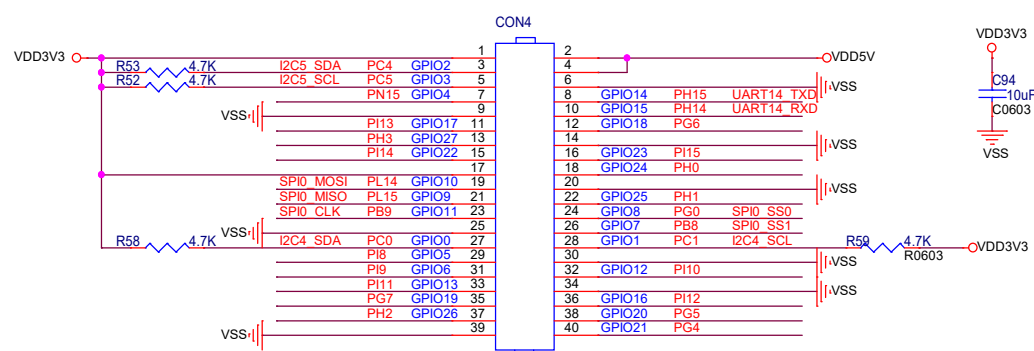
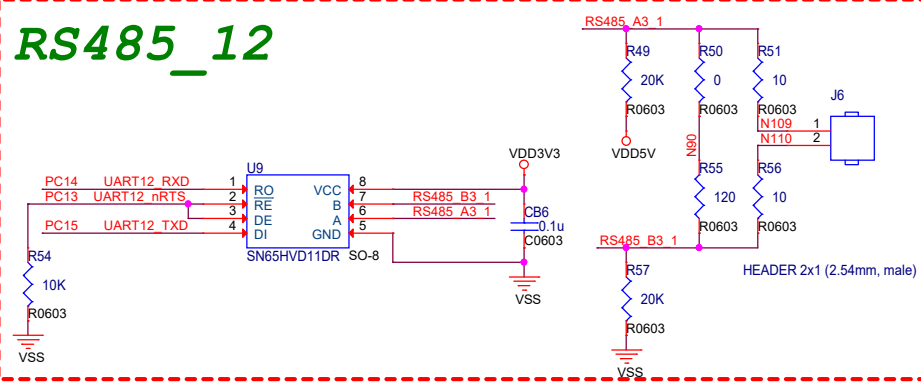
UART_10

V2.4

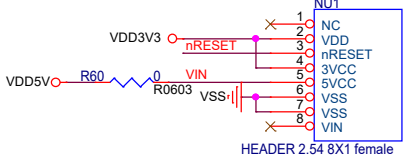
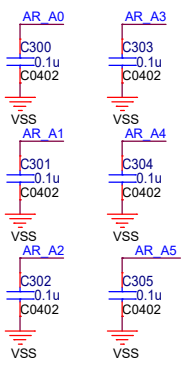
U8 (RS232 Transceiver) is removed in V2.4.



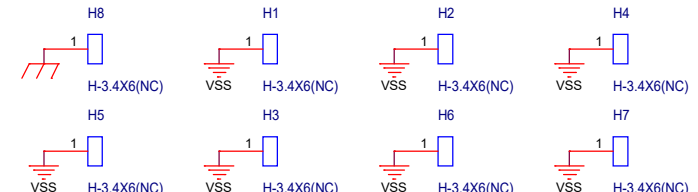
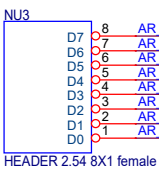
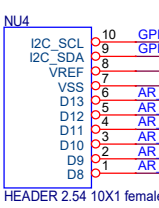
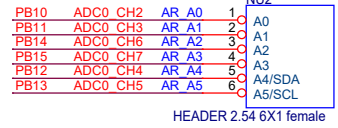
RS485_12



Raspberry Pi Connector



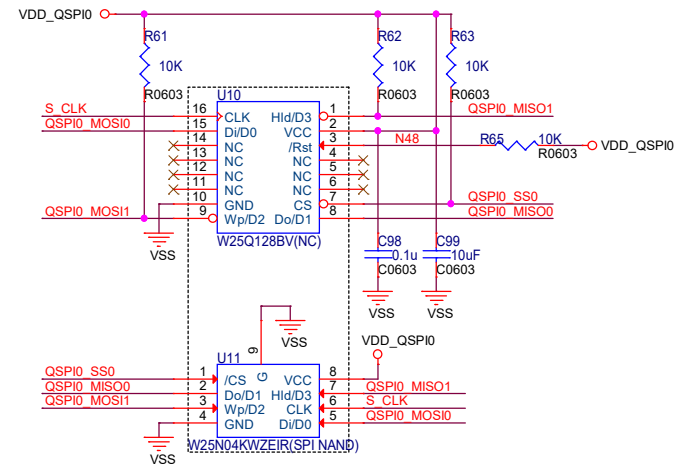
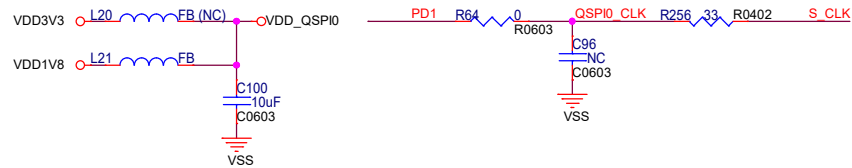
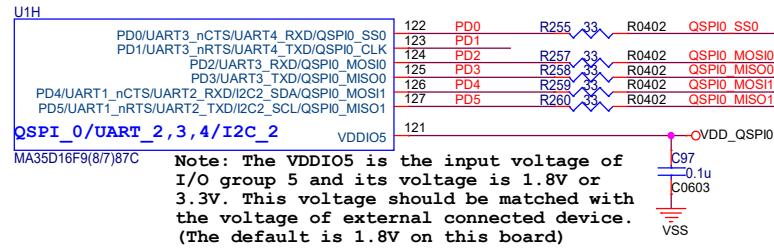
Arduino UNO Connector



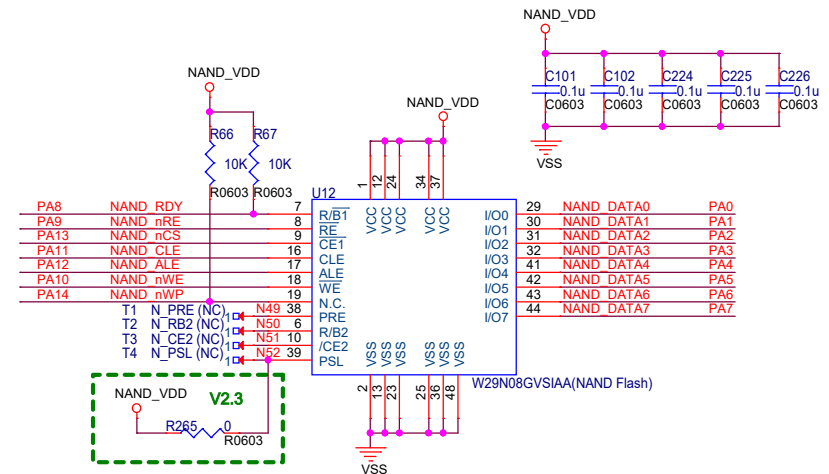
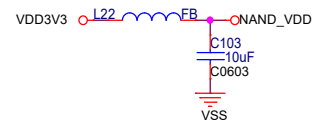
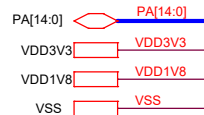
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Title		NuMaker-IoT-MA35D16F90 (LQFP216)	
Size B	Document Number	05. RP PI (VDDIO4)	Rev V2.4
Date:	Monday, September 25, 2023	Sheet 6	of 13

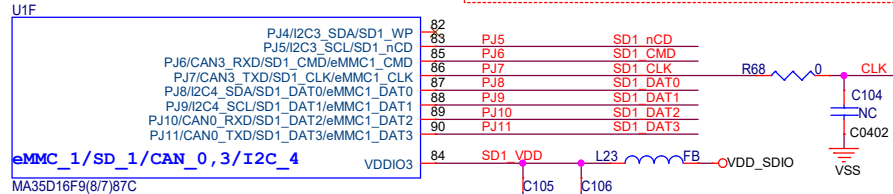
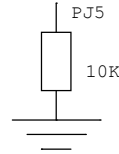
QSPI0_Flash



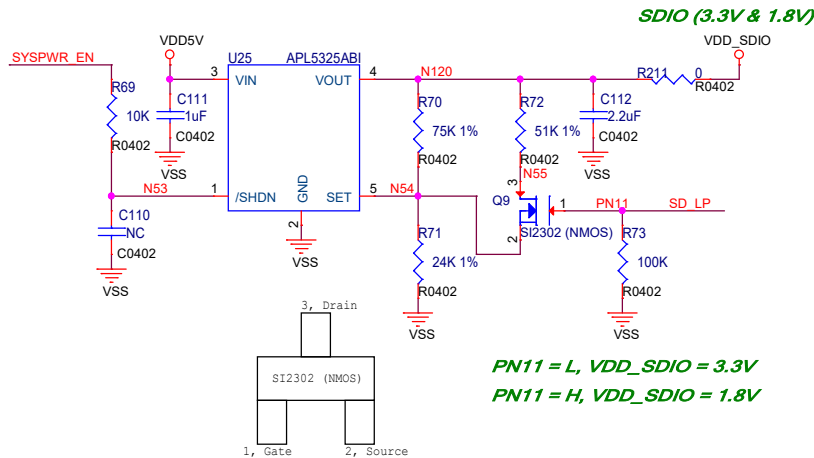
NAND_Flash



Note: If these PJ6~PJ11 pins (eMMC1_xxx) are used to connect with eMMC device and act as the booting source, please pulls the PJ5 pin (SD1_nCD) to low.



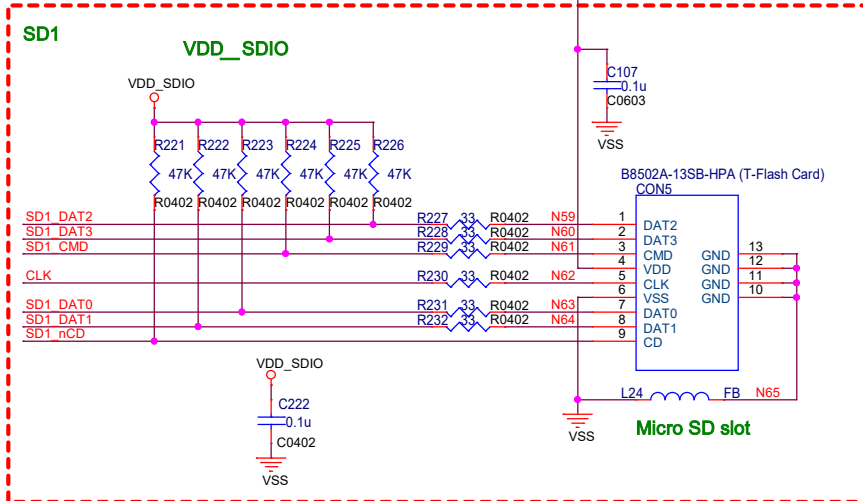
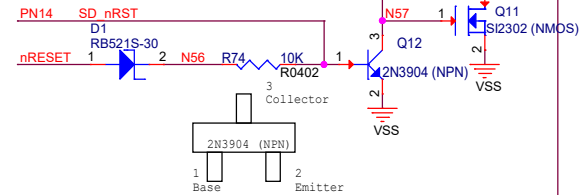
Note: The VDDIO3 is the input voltage of I/O group 3 and its voltage is 1.8V or 3.3V. This voltage should be matched with the voltage of external connected device. (The default is 3.3V but can be controlled by GPIO PN11 high or low state that follows the SD3.0 timing on this board)



For SD card compatibility

PN14 = L, VDD_SD OFF
 PN14 = H, VDD_SD ON

nRESET = L, VDD_SD OFF
 nRESET = H, VDD_SD ON

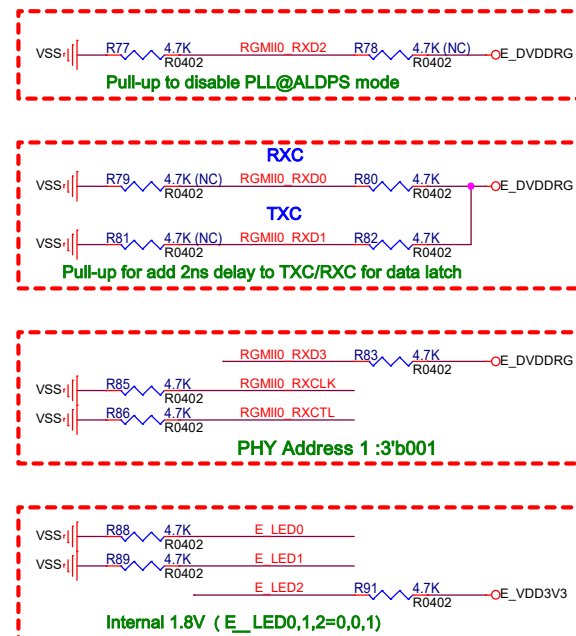
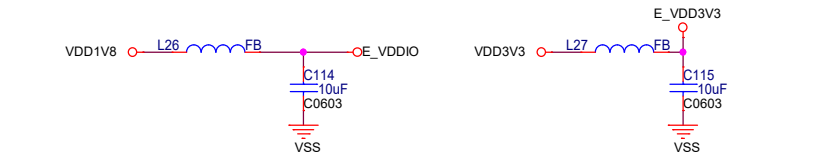


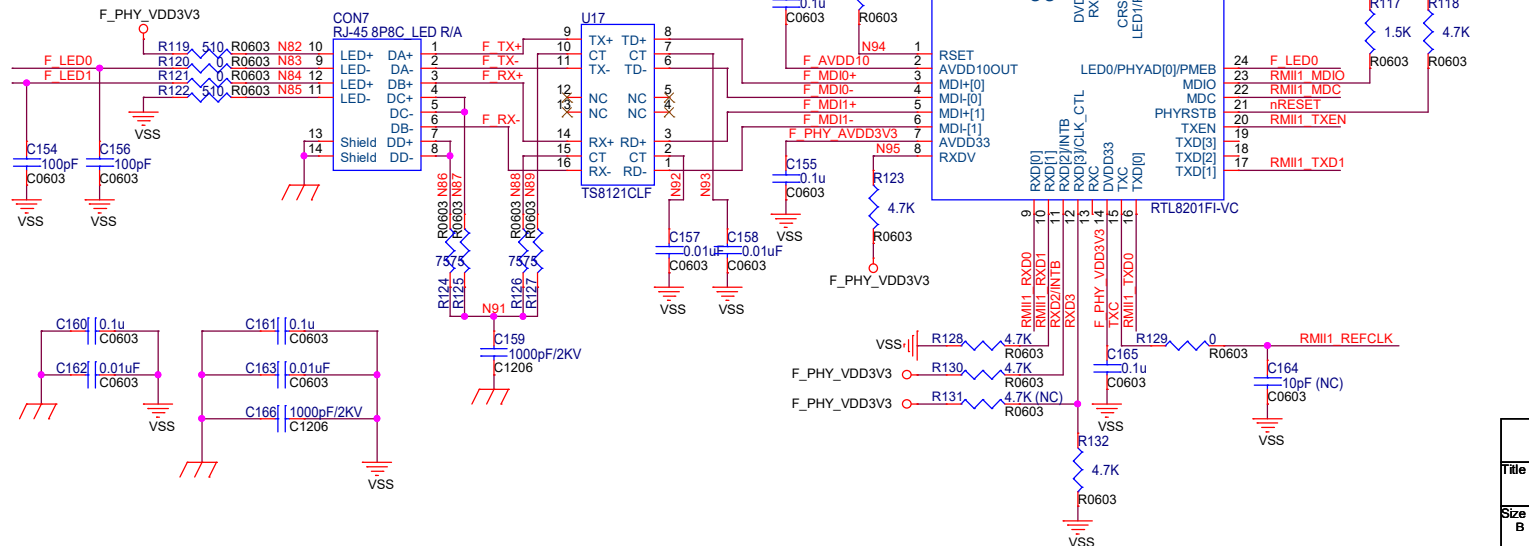
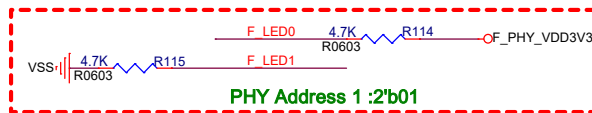
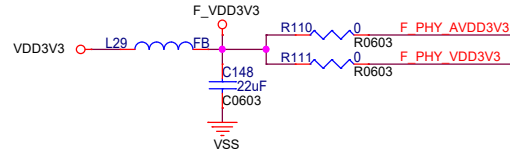
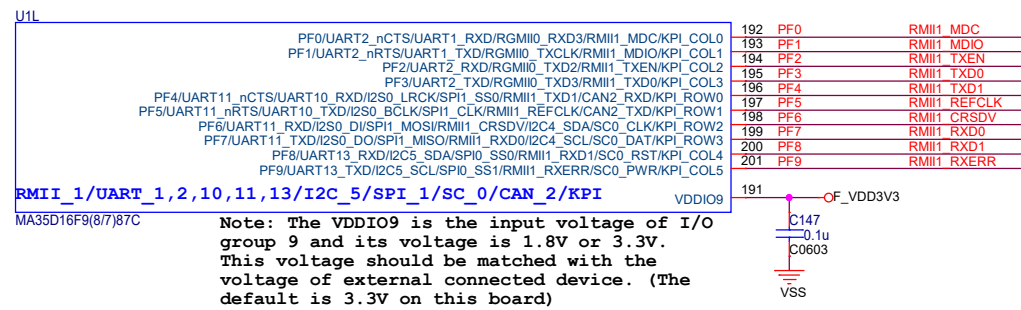
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Size B Document Number
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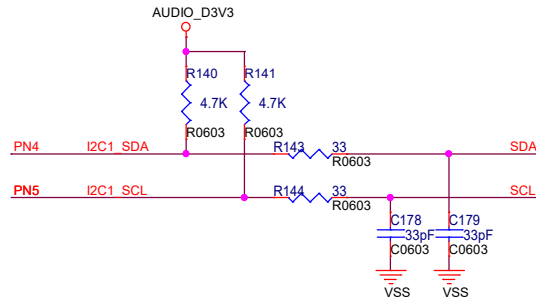
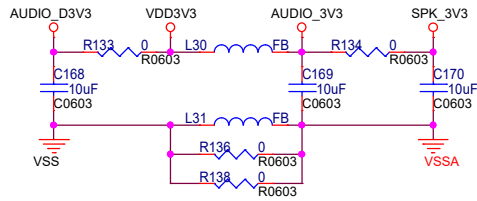
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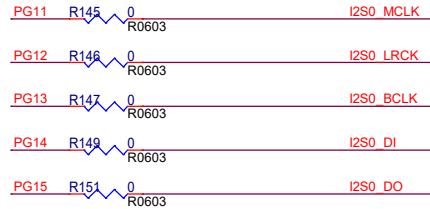
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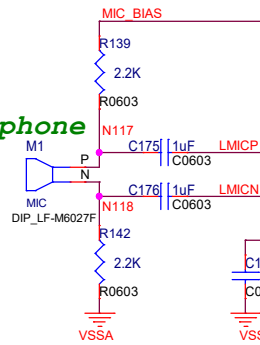
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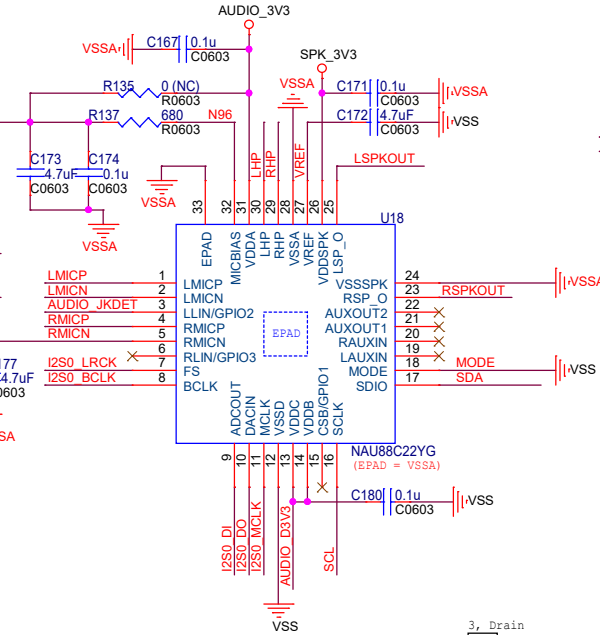
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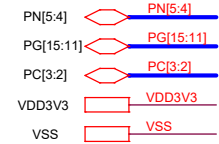
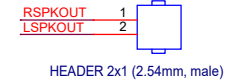
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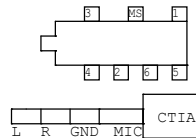
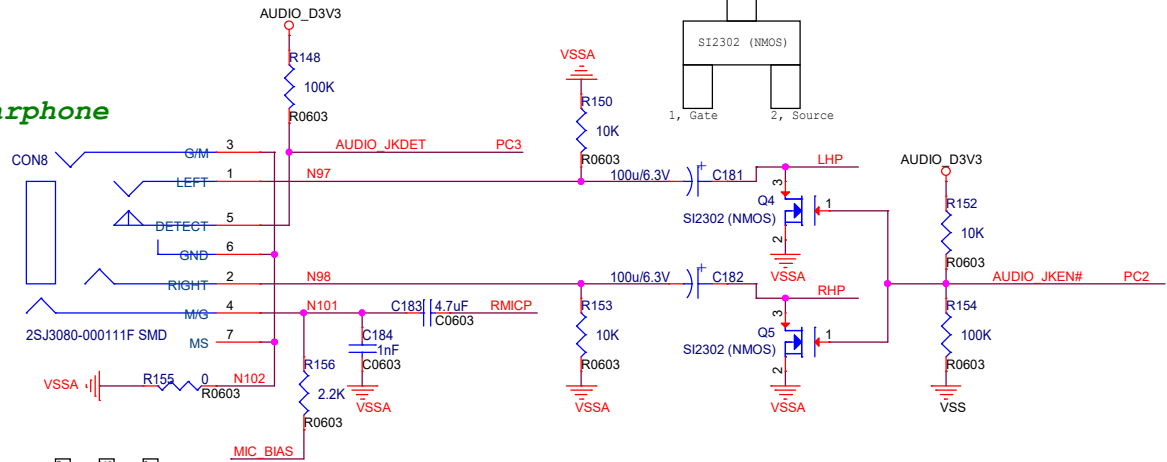
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Speaker



Earphone



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Size B Document Number **10. NAU88C22** Rev V2.4

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