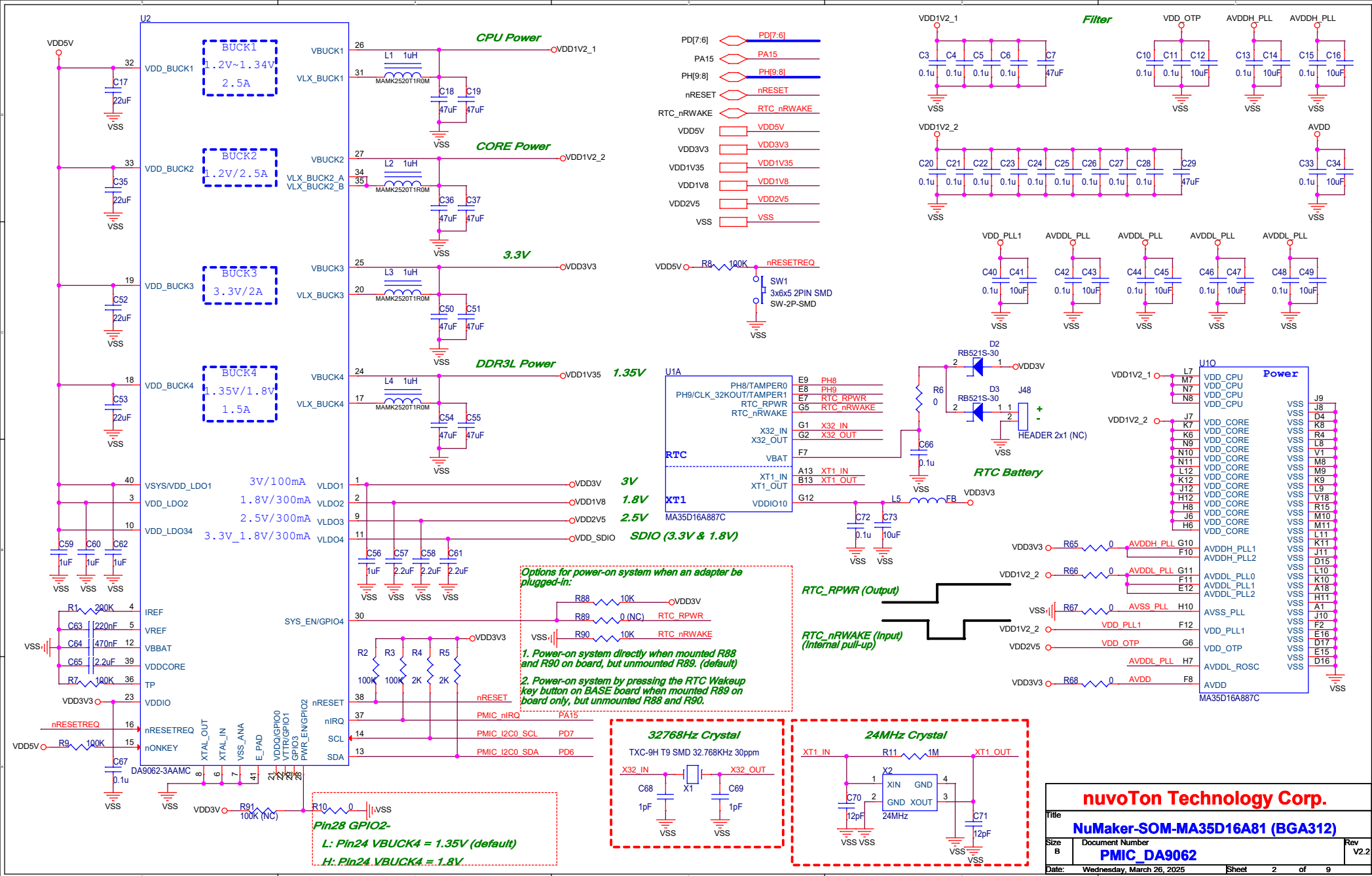


|  |                                 |              |          |
|--|---------------------------------|--------------|----------|
| nuvoTon Technology Corp.                 |                                 |              |          |
| Title<br>NuMaker-SOM-MA35D16A81 (BGA312) |                                 |              |          |
| Size B                                   | Document Number<br>System Block |              | Rev V2.2 |
| Date:                                    | Monday, September 25, 2023      | Sheet 1 of 9 |          |



U1C

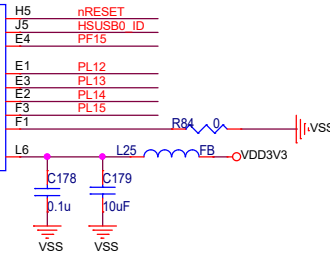
PL12/EPWM0\_SYNC\_IN/UART7\_nCTS/ECAP1\_IC0/UART14\_RXD/SPI0\_SS0/I2S1\_LRCK/SC1\_CLK/EBI\_AD0/HSUSBH\_PWREN/I2C2\_SDA/TM0/EPWM0\_CH2/EBI\_AD11/RGMII0\_PPS/RMII0\_PPS  
PL13/EPWM0\_SYNC\_OUT/UART7\_nRTS/ECAP1\_IC1/UART14\_TXD/SPI0\_CLK/I2S1\_BCLK/SC1\_DAT/EBI\_AD1/HSUSBH\_OVC/I2C2\_SCL/TM0\_EXT/EPWM0\_CH3/EBI\_AD12/RGMII1\_PPS/RMII1\_PPS  
PL14/EPWM0\_CH2/UART7\_RXD/CAN1\_RXD/SPI0\_MOS/I2S1\_DI/SC1\_RST/EBI\_AD2/TM2/INT0/EBI\_AD13  
PL15/EPWM0\_CH1/UART7\_TXD/TRACE\_CLK/CAN1\_TXD/SPI0\_MISO/I2S1\_DO/SC1\_PWR/EBI\_AD3/TM2\_EXT/INT2/EBI\_AD14  
JTAGSEL

nRESET/HSUSB0\_ID,VBUSVLD/HSUSBH\_PWREN,OVC/PWM\_0/UART\_7,14/CAN\_1/SPI\_0/SC\_1/I2C\_2/INT\_0,2

MA35D16A887C

Note: The VDDIO0 is the input voltage of I/O group 0 and its voltage is 3.3V only.

nRESET/WDT\_nRST  
HSUSB0\_ID  
PF15/HSUSB0\_VBUSVLD



U1E

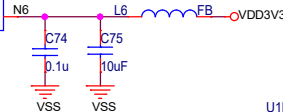
PK8/EPWM1\_CH0/I2C3\_SDA/SPI3\_CLK/EADC0\_ST/EBI\_AD15/EBI\_MCLK/EBI\_ADR15/TM8/QE1\_INDEX  
PK9/I2C3\_SCL/CCAP0\_SCL/EBI\_AD0/EBI\_ADR0  
PK10/CAN1\_RXD/CCAP0\_PIXCLK/EBI\_AD1/EBI\_ADR1  
PK11/CAN1\_TXD/CCAP0\_HSYNC/EBI\_AD2/EBI\_ADR2  
PM0/I2C4\_SDA/CCAP0\_VSYNC/EBI\_AD3/EBI\_ADR3  
PM1/I2C4\_SCL/SPI3\_I2SMCLK/CCAP0\_SFIED/EBI\_AD4/EBI\_ADR4  
PM2/CAN3\_RXD/CCAP0\_DATA0/EBI\_AD5/EBI\_ADR5  
PM3/CAN3\_TXD/CCAP0\_DATA1/EBI\_AD6/EBI\_ADR6  
PM4/I2C5\_SDA/CCAP0\_DATA2/EBI\_AD7/EBI\_ADR7  
PM5/I2C5\_SCL/CCAP0\_DATA3/EBI\_AD8/EBI\_ADR8  
PM6/CAN0\_RXD/CCAP0\_DATA4/EBI\_AD9/EBI\_ADR9  
PM7/CAN0\_TXD/CCAP0\_DATA5/EBI\_AD10/EBI\_ADR10  
PM8/I2C0\_SDA/CCAP0\_DATA6/EBI\_AD11/EBI\_ADR11  
PM9/I2C0\_SCL/CCAP0\_DATA7/EBI\_AD12/EBI\_ADR12  
PM10/EPWM1\_CH2/CAN2\_RXD/SPI3\_SS0/CCAP0\_DATA8/SPI2\_I2SMCLK/EBI\_AD13/EBI\_ADR13  
PM11/EPWM1\_CH3/CAN2\_TXD/SPI3\_SS1/CCAP0\_DATA9/SPI2\_SS1/EBI\_AD14/EBI\_ADR14

CCAP\_0/PWM\_1/CAN\_0,1,2,3/I2C\_0,3,4,5

MA35D16A887C

Note: The VDDIO2 is the input voltage of I/O group 2 and its voltage is 1.8V ~ 3.3V. This voltage should be matched with the voltage of external connected device. (The default is 3.3V on this SOM board)

P17 PK8  
V3 PK9  
V4 PK10  
T4 PK11  
U4 PM0  
P7 PM1  
V5 PM2  
T5 PM3  
U5 PM4  
U6 PM5  
V6 PM6  
T6 PM7  
T7 PM8  
R6 PM9  
U7 PM10  
R5 PM11



U1G

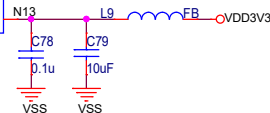
PG8/EPWM1\_CH4/UART12\_RXD/CAN3\_RXD/SPI2\_SS0/LCM\_VSYNC/LCM\_MPU\_RD/EN/I2C3\_SDA/EBI\_AD7/EBI\_nCS0  
PG9/EPWM1\_CH5/UART12\_TXD/CAN3\_TXD/SPI2\_CLK/LCM\_HSYNC/LCM\_MPU\_WR/RW/I2C3\_SCL/EBI\_AD8/EBI\_nCS1  
PK4/UART12\_nCTS/UART13\_RXD/SPI2\_MISO/LCM\_DEN/LCM\_MPU\_RS/EBI\_AD10/EBI\_nWR  
PK5/EPWM1\_CH1/UART12\_nRTS/UART13\_TXD/I2C4\_SCL/SPI2\_CLK/I2S1\_DI/SC0\_DAT/EADC0\_ST/TM8\_EXT/INT1  
PK6/EPWM1\_CH2/UART12\_RXD/CAN0\_RXD/SPI2\_MOS/I2S1\_BCLK/SC0\_RST/TM6/INT2  
PK7/EPWM1\_CH3/UART12\_TXD/CAN0\_TXD/SPI2\_MISO/I2S1\_LRCK/SC0\_PWR/CLKO/TM6\_EXT/INT3  
PI8/UART4\_nCTS/UART3\_RXD/LCM\_DATA0/LCM\_MPU\_D0/EBI\_AD11  
PI9/UART4\_nRTS/UART3\_TXD/LCM\_DATA1/LCM\_MPU\_D1/EBI\_AD12  
PI10/UART4\_RXD/LCM\_DATA2/LCM\_MPU\_D2/EBI\_AD13  
PI11/UART4\_TXD/LCM\_DATA3/LCM\_MPU\_D3/EBI\_AD14  
PI12/UART6\_nCTS/UART5\_RXD/LCM\_DATA4/LCM\_MPU\_D4  
PI13/UART6\_nRTS/UART5\_TXD/LCM\_DATA5/LCM\_MPU\_D5  
PI14/UART6\_RXD/LCM\_DATA6/LCM\_MPU\_D6  
PI15/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/CLK0

MA35D16A887C

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



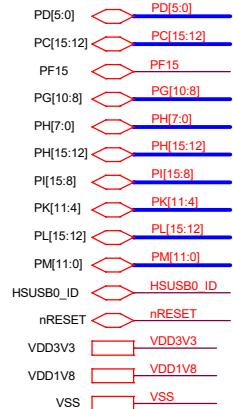
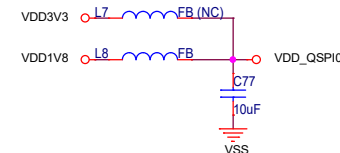
U1H

PD0/UART3\_nCTS/UART4\_RXD/QSPI0\_SS0  
PD1/UART3\_nRTS/UART4\_TXD/QSPI0\_CLK  
PD2/UART3\_RXD/QSPI0\_MOSIO  
PD3/UART3\_TXD/QSPI0\_MISOO  
PD4/UART1\_nCTS/UART2\_RXD/I2C2\_SDA/QSPI0\_MOSI1  
PD5/UART1\_nRTS/UART2\_TXD/I2C2\_SCL/QSPI0\_MISO1

QSPI\_0/UART\_2,3,4/I2C\_2

MA35D16A887C

Note: The VDDIO5 is the input voltage of I/O group 5 and its voltage is 1.8V ~ 3.3V. This voltage should be matched with the voltage of external connected device. (The default is 1.8V on this SOM board)



nuvoTon Technology Corp.

Title  
NuMaker-SOM-MA35D16A81 (BGA312)

Size B Document Number  
VDDIO0/2/4/5

Date: Monday, September 25, 2023 Sheet 3 of 9

Rev  
V2.2

|   |  |
|---|--|
| U1D                                     |  |
| NAND/UART_1,2,3,4,5,8,16                | PA0/UART1_nCTS/UART16_RXD/NAND_DATA0/EBI_AD0/EBI_AD0R<br>PA1/UART1_nRST/UART16_TXD/NAND_DATA1/EBI_AD1/EBI_AD1R<br>PA2/UART1_RXD/NAND_DATA2/EBI_AD2/EBI_AD2R<br>PA3/UART1_TXD/NAND_DATA3/EBI_AD3/EBI_AD3R<br>PA4/UART3_nCTS/UART2_RXD/NAND_DATA4/EBI_AD4/EBI_AD4R<br>PA5/UART3_nRTS/UART2_TXD/NAND_DATA5/EBI_AD5/EBI_AD5R<br>PA6/UART3_RXD/NAND_DATA6/EBI_AD6/EBI_AD6R<br>PA7/UART3_TXD/NAND_DATA7/EBI_AD7/EBI_AD7R<br>PA8/UART5_nCTS/UART4_RXD/NAND_RDY/EBI_AD8/EBI_AD8R<br>PA9/UART5_nRTS/UART4_TXD/NAND_nRE/EBI_AD9/EBI_AD9R<br>PA10/UART5_RXD/NAND_nWE/EBI_AD10/EBI_AD10R<br>PA11/UART5_TXD/NAND_CLE/EBI_AD11/EBI_AD11R<br>PA12/UART7_nCTS/UART8_RXD/NAND_ALE/EBI_AD12/EBI_AD12R<br>PA13/UART7_nRTS/UART8_TXD/NAND_nCS0/EBI_AD13/EBI_AD13R<br>PA14/UART7_RXD/CAN3_RXD/NAND_nWP/EBI_AD14/EBI_AD14R   |
| PowerOnSetting                          | PG0/EPWM0_CH0/UART7_TXD/CAN3_TXD/SPi0_SS0/EADC0_ST/EBI_AD15/I2S1_MCLK/QEI0_INDEX/TM1_CLK/IO/INT0/EBI_AD15/PowerOnSetting<br>PA15/EPWM0_CH2/UART9_nCTS/UART6_RXD/I2C4_SDA/CAN2_RXD/EBI_ALE/QEI0_A/TM1/RGMII0_PPS/RMI0_PPS<br>PG1/EPWM0_CH3/UART9_nRTS/UART6_TXD/I2C4_SCL/CAN2_TXD/EBI_nCS0/QEI0_B/TM1_EXT/RGMII0_PPS/RMI0_PPS/PowerOnSetting<br>PG2/EPWM0_CH4/UART9_RXD/CAN0_RXD/SPi0_SS1/EBI_AD16/EBI_nCS2/QEI0_A/TM3/INT3/PowerOnSetting<br>PG3/EPWM0_CH5/UART9_TXD/CAN0_TXD/SPi2_I2SMCLK/EBI_AD17/EBI_nCS1/EBI_MCLK/QEI0_B/TM3_EXT/I2S1_MCLK/PowerOnSetting<br>PG4/EPWM1_CH0/UART5_nCTS/UART6_RXD/SPi3_SS0/QEI1_INDEX/EBI_AD18/EBI_nCS0/I2S1_DO/SC1_CLK/TM4/INT2/ECAP1_IC2/PowerOnSetting<br>PG5/EPWM1_CH1/UART5_nRTS/UART6_TXD/SPi3_CLK/ECAP0_IC0/EBI_AD19/EBI_ALE/I2S1_DI/SC1_DAT/TM4_EXT/PowerOnSetting<br>PG6/EPWM1_CH2/UART5_RXD/CAN1_RXD/SPi3_MISO/EBI_nRD/SC1_BCLK/SC1_RST/TM7/INT3/PowerOnSetting<br>PG7/EPWM1_CH3/UART5_TXD/CAN1_TXD/SPi3_MISO/ECAP0_IC2/EBI_nWR/I2S1_LRCK/SC1_PWR/TM7_EXT/PowerOnSetting |
| JTAG/I2S_0                              | PG11/JTAG_TDO/I2S0_MCLK/NAND_RDY1/EBI_nWRH/EBI_nCS1/EBI_AD0<br>PG12/JTAG_TCK/SW_CLK/I2S0_LRCK/EBI_nWR/EBI_AD1<br>PG13/JTAG_TMS/SW_DIO/I2S0_BCLK/EBI_MCLK/EBI_AD2<br>PG14/JTAG_TDI/I2S0_DI/NAND_nCS1/EBI_ALE/EBI_AD3<br>PG15/JTAG_nTRST/I2S0_DO/EBI_nCS0/EBI_AD4  |
| QSPi_1/PWM_0/UART_1,15,16               | PD6/EPWM0_SYNC_IN/UART1_RXD/QSPi1_MOSI/I2C0_SDA/I2S0_MCLK/EPWM0_CH0/EBI_AD5/SPi3_SS1/TRACE_CLK<br>PD7/EPWM0_SYNC_OUT/UART1_TXD/QSPi1_MISO/I2C0_SCL/I2S1_MCLK/EPWM0_CH1/EBI_AD6/SC1_nCD/EADC0_ST<br>PD8/EPWM0_BRAKE0/UART16_nCTS/UART15_RXD/QSPi1_SS0/I2S1_LRCK/EPWM0_CH2/EBI_AD7/SC1_CLK/TM0<br>PD9/EPWM0_BRAKE1/UART16_nRTS/UART15_TXD/QSPi1_CLK/I2S1_BCLK/EPWM0_CH3/EBI_AD8/SC1_DAT/TM0_EXT<br>PD10/EPWM1_BRAKE0/UART16_RXD/QSPi1_MOSI/I2S1_DI/EPWM0_CH4/EBI_AD9/SC1_RST/TM2<br>PD11/EPWM1_BRAKE1/UART16_TXD/QSPi1_MISO/I2S1_DO/EPWM0_CH5/EBI_AD10/SC1_PWR/TM2_EXT   |
| I2C_0/I2S_1/SC_1                        | PL0/EPWM1_CH0/UART11_nCTS/UART10_RXD/I2C3_SDA/SPi2_MOSI/QSPi1_MOSI/I2S0_LRCK/EBI_AD11/SC1_CLK/TM5/QEI1_A<br>PL1/EPWM1_CH1/UART11_nRTS/UART10_TXD/I2C3_SCL/SPi2_MISO/QSPi1_MISO/I2S0_BCLK/EBI_AD12/SC1_DAT/TM5_EXT/QEI1_B<br>PL2/EPWM1_CH2/UART11_RXD/CAN3_RXD/SPi2_SS0/QSPi1_SS1/I2S0_DI/EBI_AD13/SC1_RST/TM7/QEI1_INDEX<br>PL3/EPWM1_CH3/UART11_TXD/CAN3_TXD/SPi2_CLK/QSPi1_CLK/I2S1_BCLK/EPWM0_CH3/EBI_AD8/SC1_DAT/TM0_EXT<br>PL4/EPWM1_CH4/UART2_nCTS/UART1_RXD/I2C4_SDA/SPi3_MOSI/QSPi1_MOSI/I2S0_MCLK/EBI_nRD/SC1_nCD/TM9/ECAP0_IC1<br>PL5/EPWM1_CH5/UART2_nRTS/UART1_TXD/I2C4_SCL/SPi3_MISO/QSPi1_MISO/I2S1_MCLK/EBI_nWR/SC0_nCD/TM9_EXT/ECAP0_IC2   |
| QSPi_1/PWM_1                            | PI0/EPWM0_CH0/UART12_nCTS/UART11_RXD/I2C2_SDA/SPi3_SS0/SC0_nCD/EBI_AD0R/TM0/ECAP1_IC0<br>PI1/EPWM0_CH1/UART12_nRTS/UART11_TXD/I2C2_SCL/SPi3_CLK/SC0_CLK/EBI_AD1R/TM0_EXT/ECAP1_IC1<br>PI2/EPWM0_CH2/UART12_RXD/CAN0_RXD/SPi3_MOSI/SC0_DAT/EBI_AD2R/TM1/ECAP1_IC2<br>PI3/EPWM0_CH3/UART12_TXD/CAN0_TXD/SPi3_MISO/SC0_RST/EBI_AD3R/TM1_EXT   |
| I2C_3,4/I2S_0/SC_1/SPi_2                | PL8/EPWM0_CH2/UART14_nCTS/UART13_RXD/I2C5_SDA/SPi3_SS0/EPWM0_CH4/I2S1_LRCK/EBI_AD7/SC0_CLK/TM4/ECAP1_IC2/INT2<br>PL9/EPWM0_CH3/UART14_TXD/I2C5_SCL/SPi3_CLK/EPWM1_CH4/I2S1_BCLK/EBI_AD8/SC0_DAT/TM4_EXT/QEI0_A/INT3<br>PL10/EPWM0_CH4/UART14_RXD/CAN3_RXD/SPi3_MOSI/EPWM0_CH5/I2S1_DI/EBI_AD9/SC0_RST/EBI_nWRH/QEI0_B<br>PL11/EPWM0_CH5/UART14_TXD/CAN3_TXD/SPi3_MISO/EPWM1_CH5/I2S1_DO/EBI_AD10/SC0_PWR/EBI_nWR/CLQEI0_INDEX  |
| UART_1,10,11/CAN_3                      | PK2/EPWM1_CH0/UART16_RXD/CAN2_RXD/SPi3_I2SMCLK/SC0_PWR/EBI_AD10/QEI0_A<br>PK3/EPWM1_CH1/UART16_TXD/CAN2_TXD/SPi3_SS1/SC1_nCD/EBI_AD11/QEI0_B<br>PJ12/EPWM1_CH2/UART2_nCTS/UART1_RXD/I2C5_SDA/SPi3_SS0/SC1_CLK/EBI_AD12/TM2/QEI0_INDEX<br>PJ13/EPWM1_CH3/UART2_nRTS/UART1_TXD/I2C5_SCL/SPi3_MOSI/SC1_DAT/EBI_AD13/TM2_EXT<br>PJ14/EPWM1_CH4/UART2_RXD/CAN3_RXD/SPi3_MISO/SC1_RST/EBI_AD14/TM3<br>PJ15/EPWM1_CH5/UART2_TXD/CAN3_TXD/SPi3_CLK/EADC0_ST/SC1_PWR/EBI_AD15/TM3_EXT/INT1  |
| SPi_3/PWM_0/UART_11,12/CAN_0/I2C_2/SC_0 | PI4/EPWM0_CH4/UART14_nCTS/UART13_RXD/I2C3_SDA/SPi2_SS1/I2S1_LRCK/EBI_AD14/INT0<br>PI5/EPWM0_CH5/UART14_nRTS/UART13_TXD/I2C3_SCL/I2S1_BCLK/EBI_AD15/INT1<br>PI6/EPWM0_BRAKE0/UART14_RXD/CAN1_RXD/I2S1_DI/EBI_AD16/QEI1_INDEX/INT2<br>PI7/EPWM0_BRAKE1/UART14_TXD/CAN1_TXD/I2S1_DO/EBI_AD17/ECAP0_IC0/INT3<br>PK0/EPWM0_SYNC_IN/UART16_nCTS/UART15_RXD/I2C4_SDA/I2S1_MCLK/EBI_AD18/TM7/ECAP0_IC1<br>PK1/EPWM0_SYNC_OUT/UART16_nRTS/UART15_TXD/I2C4_SCL/EADC0_ST/EBI_AD19/TM7_EXT/ECAP0_IC2   |
| SPi_3/PWM_0,1/UART_2,13,14/INT_0,1,2,3  | PD12/EPWM0_BRAKE0/UART11_TXD/UART10_RXD/I2C4_SDA/TRACE_DATA0/EBI_nCS1/EBI_AD4/QEI0_INDEX/TM5/I2S1_LRCK/INT1<br>PD13/EPWM0_BRAKE1/UART11_RXD/UART10_TXD/I2C4_SCL/TRACE_DATA1/EBI_nCS2/EBI_AD5/ECAP0_IC0/TM5_EXT/I2S1_BCLK<br>PD14/EPWM0_SYNC_IN/UART11_nCTS/CAN3_RXD/TRACE_DATA2/EBI_MCLK/EBI_AD6/ECAP0_IC1/TM6/I2S1_DI/INT3<br>PD15/EPWM0_SYNC_OUT/UART11_nRTS/CAN3_TXD/TRACE_DATA3/EBI_ALE/EBI_AD7/ECAP0_IC2/TM6_EXT/I2S1_DO<br>PM12/EPWM1_CH4/UART10_nCTS/TRACE_DATA0/UART11_RXD/I2C2_SDA/SC1_nCD/EBI_AD8/I2S1_MCLK/TM8<br>PM13/EPWM1_CH5/UART10_nRTS/TRACE_DATA1/UART11_TXD/I2C2_SCL/EBI_AD9/ECAP1_IC1/TM8_EXT<br>PM14/EPWM1_BRAKE0/UART10_RXD/TRACE_DATA2/CAN2_RXD/I2C3_SDA/EBI_AD10/ECAP1_IC1/TM10/INT1<br>PM15/EPWM1_BRAKE1/UART10_TXD/TRACE_DATA3/CAN2_TXD/I2C3_SCL/EBI_AD11/ECAP1_IC2/TM10_EXT/INT2  |
| QSPi_1/I2C_3,4/I2S_0/SC_1/SPi_2         | PE14/UART0_TXD<br>PE15/UART0_RXD   |
| UART_0                                  |  |
| MA35D16A887C                            |  |

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

|    |      |            |
|----|------|------------|
| G3 | PA0  | NAND_DATA0 |
| H3 | PA1  | NAND_DATA1 |
| K1 | PA2  | NAND_DATA2 |
| F4 | PA3  | NAND_DATA3 |
| K2 | PA4  | NAND_DATA4 |
| G4 | PA5  | NAND_DATA5 |
| J3 | PA6  | NAND_DATA6 |
| H4 | PA7  | NAND_DATA7 |
| J4 | PA8  | NAND_RDY   |
| K3 | PA9  | NAND_nRE   |
| K5 | PA10 | NAND_nWE   |
| L2 | PA11 | NAND_CLE   |
| K4 | PA12 | NAND_ALE   |
| L1 | PA13 | NAND_nCS   |
| M5 | PA14 | NAND_nWP   |

|     |     |           |
|-----|-----|-----------|
| M2  | PG0 |           |
| G15 | PG1 | PMIC_nIRQ |
| M1  | PG2 |           |
| L3  | PG3 |           |
| M4  | PG4 |           |
| L4  | PG5 |           |
| M3  | PG6 |           |
| L5  | PG7 |           |
| N4  | PG7 |           |

|    |      |  |
|----|------|--|
| P4 | PG11 |  |
| P2 | PG12 |  |
| R2 | PG13 |  |
| R1 | PG14 |  |
| P3 | PG15 |  |

|    |      |               |
|----|------|---------------|
| U1 | PD6  | PMIC_I2C0_SDA |
| U2 | PD8  | PMIC_I2C0_SCL |
| V2 | PD9  |               |
| U3 | PD10 |               |
| T3 | PD11 |               |

|     |     |  |
|-----|-----|--|
| M18 | PL0 |  |
| N18 | PL1 |  |
| F18 | PL2 |  |
| L18 | PL3 |  |
| K18 | PL4 |  |
| J18 | PL5 |  |

|     |     |  |
|-----|-----|--|
| K15 | PI0 |  |
| H15 | PI1 |  |
| J15 | PI2 |  |
| L15 | PI3 |  |

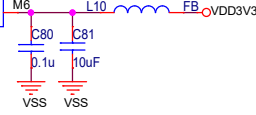
|     |      |  |
|-----|------|--|
| H17 | PL6  |  |
| J17 | PL7  |  |
| K17 | PL8  |  |
| L17 | PL9  |  |
| M17 | PL10 |  |
| N17 | PL11 |  |

|     |      |  |
|-----|------|--|
| K16 | PK2  |  |
| J16 | PK3  |  |
| L16 | PJ12 |  |
| M16 | PJ13 |  |
| P16 | PJ14 |  |
| N16 | PJ15 |  |

|     |     |  |
|-----|-----|--|
| N15 | PI4 |  |
| M15 | PI5 |  |
| F16 | PI6 |  |
| P15 | PI7 |  |
| H16 | PK0 |  |
| G16 | PK1 |  |

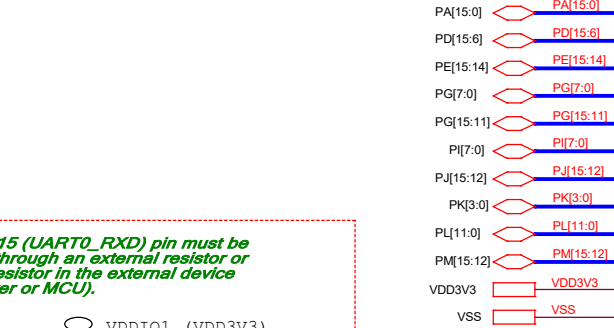
|     |      |  |
|-----|------|--|
| M14 | PD12 |  |
| G14 | PD13 |  |
| L14 | PD14 |  |
| F15 | PD15 |  |
| N3  | PM12 |  |
| N1  | PM13 |  |
| N2  | PM14 |  |
| P1  | PM15 |  |

|    |      |  |
|----|------|--|
| T1 | PE14 |  |
| T2 | PE15 |  |

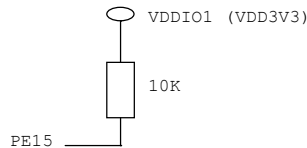


|  |  |  |
|--|--|--|
| Power-on Setting   |  |  |
| PG0 Secure Boot<br>L Secure Boot Enable<br>H Secure Boot Disable   |  |  |
| PG1 Boot Source QSPi0, SD/eMMC I/O Voltage<br>L 3.3V<br>H 1.8V   |  |  |
| PG3 PG2 Boot Source<br>L QSPi0 Flash<br>L H SD/eMMC<br>L NAND Flash<br>H H USB   |  |  |
| PG7 PG6 Booting from QSPi0<br>L L SPI-NAND, 1-bit<br>H L SPI-NOR, 1-bit  |  |  |
| PG6 Booting from SD/eMMC<br>L SD0/eMMC0 booting<br>H SD1/eMMC1 booting   |  |  |
| PG7 Booting from SD/eMMC<br>L eMMC 4-bit booting<br>H eMMC 8-bit booting   |  |  |
| PG5 PG4 Booting from NAND<br>L Ignore<br>L H NAND flash page 2KB<br>H L NAND flash page 4KB<br>H H NAND flash page 8KB |  |  |
| PG7 PG6 Booting from NAND<br>L L Ignore<br>L H BCH T12<br>H L BCH T24<br>H H NO ECC                                    |  |  |
| PG4 Booting from USB<br>L USB0 booting<br>H USBH booting   |  |  |
| PG5 Booting from USBH<br>L USBH port 0 booting<br>H USBH port 1 booting  |  |  |
| PG6 Booting from USBH<br>L Over-current low-active detect<br>H Over-current high-active detect                         |  |  |

Note: These GPIO PG0~PG7 pins are internal pull-low inside MA35D1 chip.



Note: The GPIO PE15 (UART0\_RXD) pin must be pulled to high level through an external resistor or an internal pull-up resistor in the external device (such as a transceiver or MCU).



nuvoTon Technology Corp.

NuMaker-SOM-MA35D16A81 (BGA312)

|       |                       |              |
|-------|-----------------------|--------------|
| Title | Document Number       | Rev          |
|       | VDDIO1                | V2.2         |
| Date: | Tuesday, May 21, 2024 | Sheet 4 of 9 |



Note: If these PC0~PC5 pins (eMMC0\_xxx) are used to connect with eMMC device and act as the booting source, please pulls the PC6 pin (SD0\_nCD) to low.

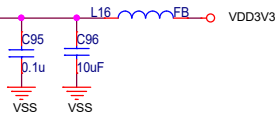
U1I  
PC0/I2C4\_SDA/SD0\_CMD/eMMC0\_CMD  
PC1/I2C4\_SCL/SD0\_CLK/eMMC0\_CLK  
PC2/CAN0\_RXD/SD0\_DAT0/eMMC0\_DAT0  
PC3/CAN0\_TXD/SD0\_DAT1/eMMC0\_DAT1  
PC4/I2C5\_SDA/SD0\_DAT2/eMMC0\_DAT2  
PC5/I2C5\_SCL/SD0\_DAT3/eMMC0\_DAT3  
PC6/CAN1\_RXD/SD0\_nCD  
PC7/CAN1\_TXD/SD0\_WP

eMMC\_0

CAN\_0,1/I2C\_4,5/SD\_0

MA35D16A887C

Note: The VDDIO6 is the input voltage of I/O group 6 and its voltage is 3.3V only.



U1J

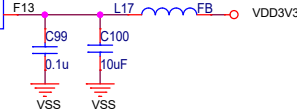
I2C\_1,2,4,5/SPI\_1/SC\_0

PN0/I2C2\_SDA/CCAP1\_DATA0  
PN1/I2C2\_SCL/CCAP1\_DATA1  
PN2/CAN0\_RXD/CCAP1\_DATA2  
PN3/CAN0\_TXD/CCAP1\_DATA3  
PN4/I2C1\_SDA/CCAP1\_DATA4  
PN5/I2C1\_SCL/CCAP1\_DATA5  
PN6/CAN1\_RXD/CCAP1\_DATA6  
PN7/CAN1\_TXD/CCAP1\_DATA7  
PN10/CAN2\_RXD/CCAP1\_SCL  
PN11/CAN2\_TXD/CCAP1\_PIXCLK  
PN12/UART6\_nCTS/UART12\_RXD/I2C5\_SDA/CCAP1\_HSYNC  
PN13/UART6\_nRTS/UART12\_TXD/I2C5\_SCL/CCAP1\_VSYNC  
PN14/UART6\_RXD/CAN3\_RXD/SPI1\_SS1/CCAP1\_SFIED/SPI1\_I2SMCLK  
PN15/EPWM2\_CH4/UART6\_TXD/CAN3\_TXD/I2S0\_MCLK/SPI1\_SS1/SPI1\_I2SMCLK/SC0\_nCD/EADC0\_ST/CLK0/TM6  
PK12/EPWM2\_CH0/UART1\_nCTS/UART13\_RXD/I2C4\_SDA/I2S0\_LRCK/SPI1\_SS0/SC0\_CLK/TM10/INT2  
PK13/EPWM2\_CH1/UART1\_nRTS/UART13\_TXD/I2C4\_SCL/I2S0\_BCLK/SPI1\_CLK/SC0\_DAT/TM10\_EXT  
PK14/EPWM2\_CH2/UART1\_RXD/CAN3\_RXD/I2S0\_DI/SPI1\_MOSI/SC0\_RST/I2C5\_SDA/TM11/INT3  
PK15/EPWM2\_CH3/UART1\_TXD/CAN3\_TXD/I2S0\_DO/SPI1\_MISO/SC0\_PWR/I2C5\_SCL/TM11\_EXT

CCAP\_1/PWM\_2/UART\_1,6,12,13/CAN\_0,1,2,3/INT\_2,3/CLK0

MA35D16A887C

Note: The VDDIO7 is the input voltage of I/O group 7 and its voltage is 1.8V ~ 3.3V. This voltage should be matched with the voltage of external connected device. (The default is 3.3V on this SOM board)



U1M

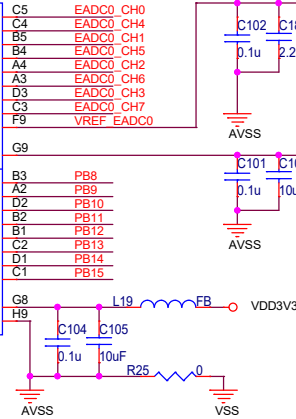
EADC

EADC0\_CH0  
EADC0\_CH4  
EADC0\_CH1  
EADC0\_CH5  
EADC0\_CH2  
EADC0\_CH6  
EADC0\_CH3  
EADC0\_CH7  
VREF\_EADC0  
AVDD\_EADC0  
PB8/EPWM2\_BRAKE0/UART2\_nCTS/UART1\_RXD/I2C2\_SDA/SPI0\_SS1/SPI0\_I2SMCLK/ADC0\_CH0/EBI\_nCS0/TM4/QEI2\_INDEX/KPI\_ROW6  
PB9/EPWM2\_CH4/UART2\_nRTS/UART1\_TXD/I2C2\_SCL/SPI0\_CLK/I2S0\_MCLK/CCAP1\_HSYNC/ADC0\_CH1/EBI\_ALE/EBI\_AD13/TM0\_EXT/I2S1\_MCLK/SC0\_nCD/QEI2\_A/KPI\_ROW7  
PB10/EPWM2\_CH5/UART2\_RXD/CAN0\_RXD/SPI0\_MOSI/EBI\_MCLK/CCAP1\_VSYNC/ADC0\_CH2/EBI\_ADR15/EBI\_AD14/TM5/I2C1\_SDA/INT1/QEI2\_B  
PB11/EPWM2\_BRAKE1/UART2\_TXD/CAN0\_TXD/SPI0\_MISO/I2S1\_MCLK/CCAP1\_SFIED/ADC0\_CH3(VSENSE)/EBI\_nCS2/EBI\_ALE/TM5\_EXT/I2C1\_SCL/INT2/QEI2\_INDEX  
PB12/EPWM2\_CH0/UART4\_nCTS/UART3\_RXD/I2C3\_SDA/CAN2\_RXD/I2S1\_LRCK/ADC0\_CH4(YM)/EBI\_ADR16/ECAP2\_IC0  
PB13/EPWM2\_CH1/UART4\_nRTS/UART3\_TXD/I2C3\_SCL/CAN2\_TXD/I2S1\_BCLK/ADC0\_CH5(YP)/EBI\_ADR17/ECAP2\_IC1  
PB14/EPWM2\_CH2/UART4\_RXD/CAN1\_RXD/I2C4\_SDA/I2S1\_DI/ADC0\_CH6(XM)/EBI\_ADR18/ECAP2\_IC2  
PB15/EPWM2\_CH3/UART4\_TXD/CAN1\_TXD/I2C4\_SCL/I2S1\_DO/ADC0\_CH7(XP)/EBI\_ADR19

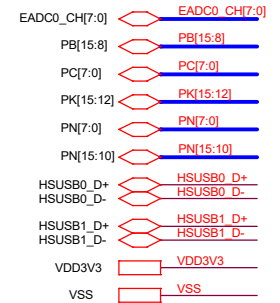
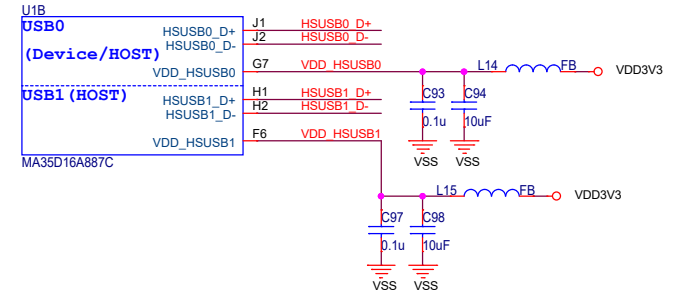
ADC/PWM\_2/UART\_1,2,3,4/CAN\_0,1,2/I2C\_2,3,4/SPI\_0/I2S\_1/INT\_1,2

MA35D16A887C

Note: The AVDD EADC0 and AVDD ADC0 are the input voltages of EADC0 and ADC0 (includes the I/O voltage of PB8~PB15), their input voltages are 3.3V only.



mount R96 when using external VREF  
unmount R96 when using internal VREF



nuvoTon Technology Corp.

Title  
NuMaker-SOM-MA35D16A81 (BGA312)

Size B Document Number  
VDDIO6/7/ADC/USB  
Date: Monday, September 25, 2023 Sheet 6 of 9 Rev V2.2



CC

```

CCAP_1
PE0/UART9_NCTS/UART8_RXD/CCAP1_DATA0/RGMII0_MDC/RGMII0_MDC
PE1/UART9_NRTS/UART8_TXD/CCAP1_DATA1/RGMII0_TXCLK/RGMII0_TXEN
PE2/UART9_RXD/CCAP1_DATA2/RGMII0_TXCTL/RGMII0_TXEN
PE3/UART9_TXD/CCAP1_DATA3/RGMII0_TXD/RGMII0_TXD
PE4/UART4_NCTS/UART3_RXD/CCAP1_DATA4/RGMII0_TXD1/RMII0_TXD1
PE5/UART4_NRTS/UART3_TXD/CCAP1_DATA5/RGMII0_RXCLK/RMII0_REFCLK
PE6/UART4_RXD/RGMII0_TXD/CCAP1_DATA6/RGMII0_RXCTL/RMII0_TXD
PE7/UART4_TXD/CCAP1_DATA7/RGMII0_RXD/RMII0_RXD
PE8/UART13_NCTS/UART12_RXD/CCAP1_SCLK/RGMII0_RXD1/RMII0_RXD1
PE9/UART13_NRTS/UART12_TXD/CCAP1_PCLK/RGMII0_RXD2/RMII0_RXRR
PE10/UART15_NCTS/UART14_RXD/SP15_S0/CCAP1_HS_NVC/RGMII0_RXD
PE11/UART15_TXD/CCAP1_PCLK/CCAP1_VNC/CCAP1_DATA8/RGMII0_TXD
PE12/UART15_TXD/SP15_M0/CCAP1_DATA9/RGMII0_TXD
PE13/UART15_TXD/SP15_MISO/CCAP1_DATA9/RGMII0_TXD

```

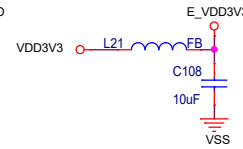
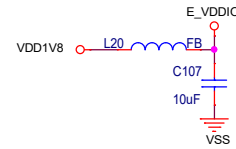
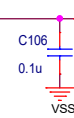
RGMII\_0/RMII\_0/UART\_3,4,8,9,12,14,15

MA35D16A887C

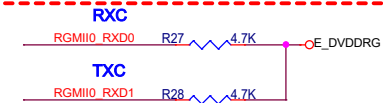
Note: The VDDIO8 is the input voltage of I/O group 8 and its voltage is 1.8V ~ 3.3V. This voltage should be matched with the voltage of external connected device. (The default is 1.8V on this SOM board)

|     |      |              |
|-----|------|--------------|
| C12 | E0   | RGMII0 MDC   |
| B12 | PE1  | RGMII0 MDIO  |
| A12 | PE2  | RGMII0 TXCTL |
| D11 | PE3  | RGMII0 TXD0  |
| C11 | PE4  | RGMII0 TXD1  |
| A11 | PE5  | RGMII0 RXCLK |
| B11 | PE6  | RGMII0 RXCTL |
| C10 | PE7  | RGMII0 RXD0  |
| A10 | PE8  | RGMII0 RXD1  |
| B10 | PE9  | RGMII0 RXD2  |
| D10 | PE10 | RGMII0 RXD3  |
| A9  | PE11 | RGMII0 TXCLK |
| B9  | PE12 | RGMII0 TXD2  |
| C9  | PE13 | RGMII0 TXD3  |

E11  E\_VDDIO



### Pull-up to disable PLL@ALDPS mode



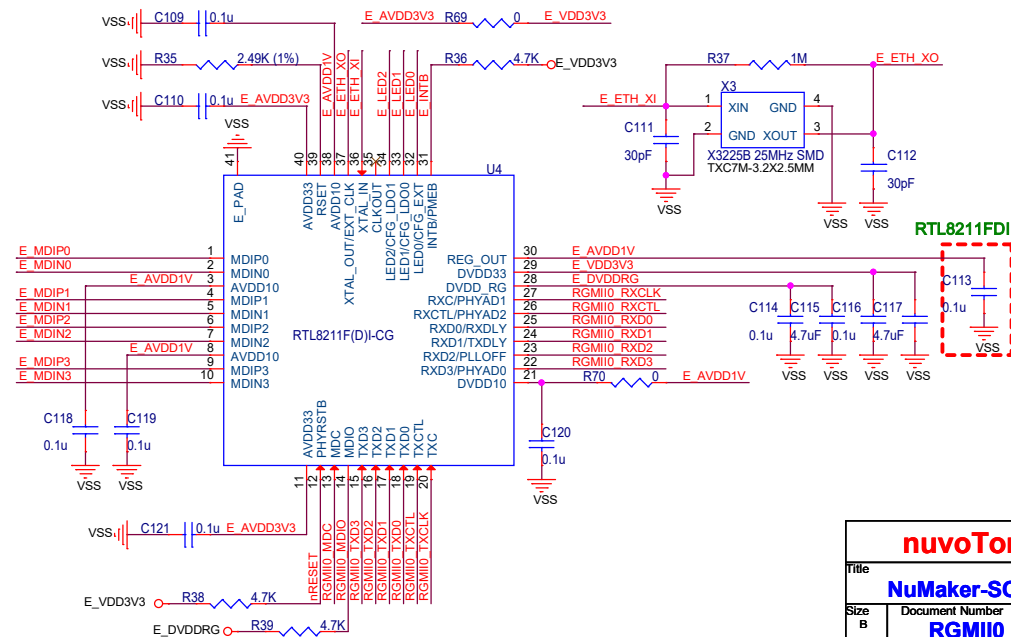
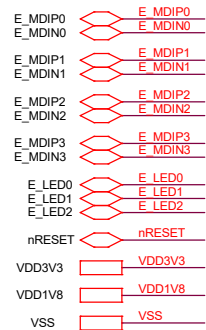
**Pull-up for add 2ns delay to TXC/RXC for data latch**



PHY Address 1 :3'b001



Internal 1.8V ( E\_LED0,1,2=0,0,1)



**nuvoTon Technology Corp.**

|       |                                 |
|-------|---------------------------------|
| Title | NuMaker-SOM-MA35D16A81 (BGA312) |
|-------|---------------------------------|

|           |   |
|-----------|---|
| Size<br>B | Document Number<br><b>RGMI00 RTL8211F(D) (VDDIO8)</b> |
|-----------|---|

Date: Monday, September 25, 2023 Sheet 7 of 9

Rev  
V2.2

PF0/UART2\_nCTS/UART1\_RXD/RGMII0\_RXD3/RGMII1\_MDC/RMII1\_MDC/KPI\_COL0  
 PF1/UART2\_nRTS/UART1\_TXD/RGMII0\_TXCLK/RGMII1\_MDIO/RMII1\_MDIO/KPI\_COL1  
 PF2/UART2\_RXD/RGMII0\_TXD2/RGMII1\_TXCTL/RMII1\_TXEN/KPI\_COL2  
 PF3/UART2\_TXD/RGMII0\_TXD3/RGMII1\_TXD0/RMII1\_TXD0/KPI\_COL3  
 PF4/UART11\_nCTS/UART10\_RXD/I2S0\_LRCK/SP1\_SS0/RGMII1\_TXD1/RMII1\_TXD1/CAN2\_RXD/KPI\_ROW0  
 PF5/UART11\_nRTS/UART10\_TXD/I2S0\_BCLK/SP1\_CLK/RGMII1\_RXCLK/RMII1\_REFCLK/CAN2\_TXD/KPI\_ROW1  
 PF6/UART11\_RXD/I2S0\_DI/SP1\_MISO/RGMII1\_RXCTL/RMII1\_CRSDV/I2C4\_SDA/SC0\_CLK/KPI\_ROW2  
 PF7/UART11\_TXD/I2S0\_DO/SP1\_MISO/RGMII1\_RXD0/RMII1\_RXD0/I2C4\_SCL/SC0\_DAT/KPI\_ROW3  
 PF8/UART13\_RXD/I2C5\_SDA/SP10\_SS0/RGMII1\_RXD1/RMII1\_RXD1/SC0\_RST/KPI\_COL4  
 PF9/UART13\_TXD/I2C5\_SCL/SP10\_SS1/RGMII1\_RXD2/RMII1\_RXERR/SC0\_PWR/KPI\_COL5  
 PF10/UART13\_nCTS/I2S0\_LRCK/SP1\_SS0/RGMII1\_RXD3/SC0\_CLK/KPI\_COL6  
 PF11/UART13\_nRTS/I2S0\_BCLK/SP1\_CLK/RGMII1\_TXCLK/SC0\_DAT/KPI\_COL7  
 PF12/I2S0\_DI/SP1\_MISO/RGMII1\_TXD2/SC0\_RST/KPI\_ROW4  
 PF13/I2S0\_DO/SP1\_MISO/RGMII1\_TXD3/SC0\_PWR/KPI\_ROW5  
 PF14/EPWM2\_BRAKE0/EADC0\_ST/RGMII1\_PPS/RMII1\_PPS/SP10\_I2SMCLK/SP1\_I2SMCLK/CCAP1\_SFIE/SP10\_I2SMCLK/CCAP1\_SFIE/RGMII0\_PPS/TM0/INT0/SP1\_SS1/QEI2\_INDEX/I2S0\_MCLK

RGMII\_1/RMII\_1/UART\_1,2,10,11,13/I2C\_4,5/SP1\_1/I2S\_0/SC\_0/CAN\_2/KPI/INT\_0

MA35D16A887C

Note: The VDDIO9 is the input voltage of I/O group 9 and its voltage is 1.8V ~ 3.3V. This voltage should be matched with the voltage of external connected device. (The default is 1.8V on this SOM board)

VDDIO9

E10 F\_VDDIO

C122 0.1u VSS

D9 PF0 RGMII1 MDC  
 A8 PF1 RGMII1 MDIO  
 B8 PF2 RGMII1 TXCTL  
 C8 PF3 RGMII1 TXD0  
 D8 PF4 RGMII1 TXD1  
 A6 PF5 RGMII1 RXCLK  
 A7 PF6 RGMII1 RXCTL  
 B7 PF7 RGMII1 RXD0  
 D7 PF8 RGMII1 RXD1  
 C7 PF9 RGMII1 RXD2  
 D6 PF10 RGMII1 RXD3  
 A5 PF11 RGMII1 TXCLK  
 C6 PF12 RGMII1 TXD2  
 B6 PF13 RGMII1 TXD3  
 D5 PF14

VSS R40 4.7K RGMII1\_RXD2

Pull-up to disable PLL@ALDPS mode

RXC

RGMII1\_RXD0 R41 4.7K F\_VDDDRG  
 RGMII1\_RXD1 R42 4.7K

TXC

Pull-up for add 2ns delay to TXC/RXC for data latch

RGMII1\_RXD3 R43 4.7K F\_VDDDRG

VSS R44 4.7K RGMII1\_RXCLK  
 VSS R45 4.7K RGMII1\_RXCTL

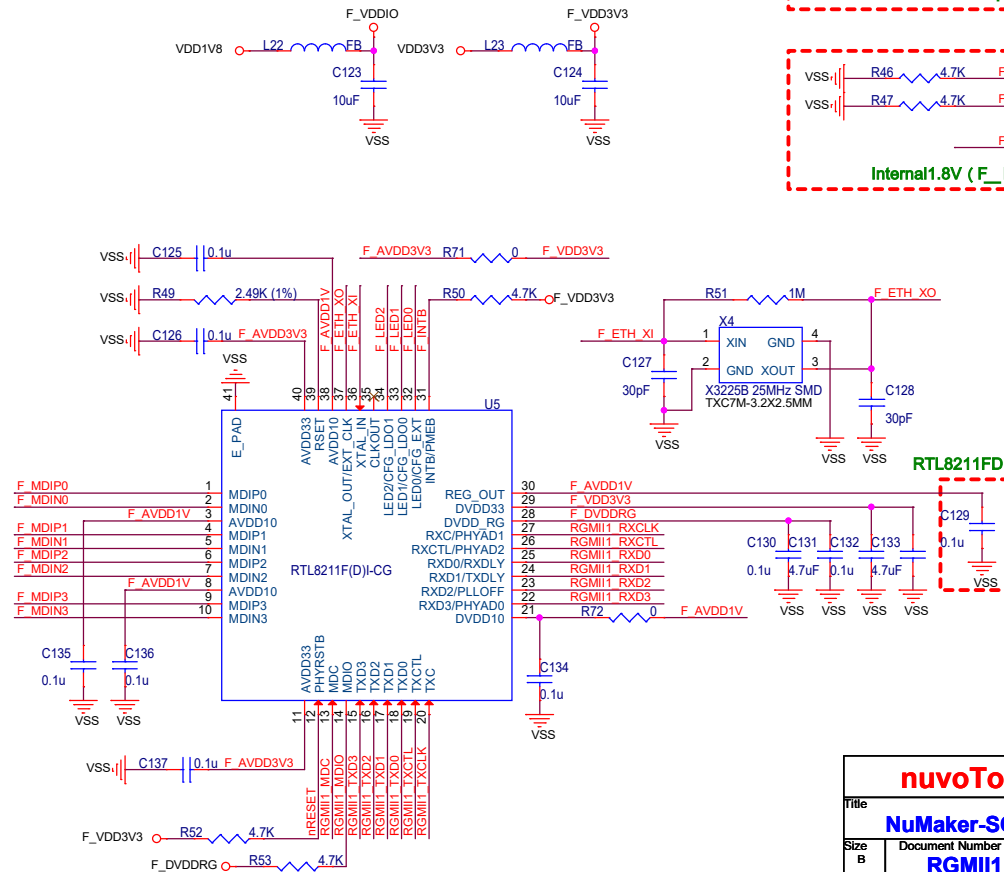
PHY Address 1 : 3'b001

VSS R46 4.7K F\_LED0  
 VSS R47 4.7K F\_LED1

Internal 1.8V ( F\_LED0,1,2=0,0,1)

F\_LED2 R48 4.7K F\_VDD3V3

PF14 PF14  
 F\_MDIP0 F\_MDIP0  
 F\_MDIN0 F\_MDIN0  
 F\_MDIP1 F\_MDIP1  
 F\_MDIN1 F\_MDIN1  
 F\_MDIP2 F\_MDIP2  
 F\_MDIN2 F\_MDIN2  
 F\_MDIP3 F\_MDIP3  
 F\_MDIN3 F\_MDIN3  
 F\_LED0 F\_LED0  
 F\_LED1 F\_LED1  
 F\_LED2 F\_LED2  
 nRESET nRESET  
 VDD3V3 VDD3V3  
 VDD1V8 VDD1V8  
 VSS VSS



nuvoTon Technology Corp.

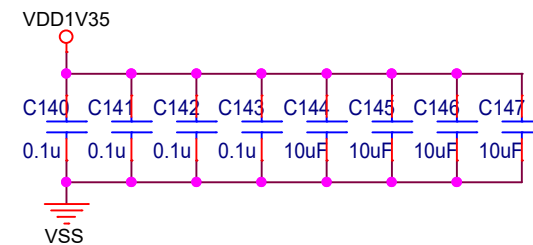
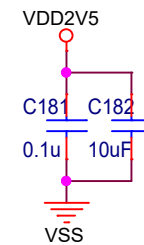
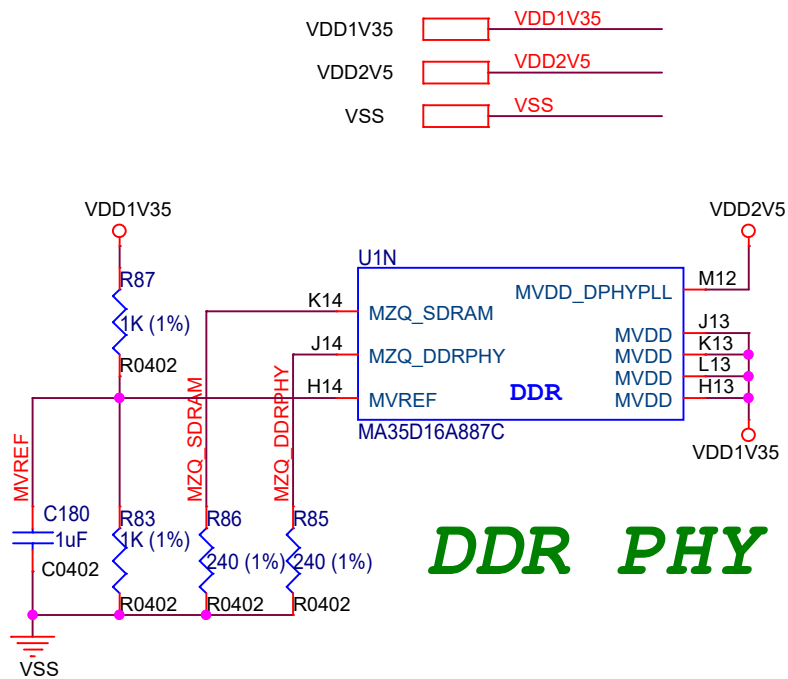
Title  
 NuMaker-SOM-MA35D16A81 (BGA312)

Size B Document Number  
 RGMII1\_RTL8211F(D)I (VDDIO9)

Date: Monday, September 25, 2023 Sheet 8 of 9

Rev  
 V2.2





**nuvoTon Technology Corp.**

Title  
**NuMaker-SOM-MA35D16A81 (BGA312)**

Size A Document Number  
**DDR3L**

Rev  
V2.2

Date: Monday, September 25, 2023 Sheet 9 of 9