U1A muc972

PA0 / LD0 / RMII0_MDC
PA.1 / LD1 / RMII0_MDio
PA.2 / LD2 / RMII0_TxD0
PA.3 / LD3 / RMII0_TxD1
PA.4 / LD4 / KPI_Row0 / RMII0_TxEn
PA.5 / LD5 / KPI_Row1 / RMII0_RefClk
PA.6 / LD6 / KPI_Row2 / RMII0_RxD0
PA.7 / LD7 / KPI_Row3 / RMII0_RxD1
PA.8 / LD8 / KPI_Col0 / RMII0_CRSDV
PA.9 / LD9 / KPI_Col1 / RMII0_RxErr
PA.10 / LD10 / KPI_Col2
PA.11 / LD11 / KPI_Col3
PA.12 / LD12 / KPI_Col4 / PWM0
PA.13 / LD13 / KPI_Col5 / PWM1
PA.14 / LD14 / KPI_Col6 / PWM2
PA.15 / LD15 / KPI_Col7 / PWM3

PB.0 / NCS1 / IIC1SCL / UR5Tx / SPI0CS1 / TM1TGL
PB.1 / NRDY1 / IIC1SDA / UR5Rx / SPI1CS1 / TM1CAP
PB.2 / UR6Tx / PWM0 / TM0TGL
PB.3 / UR6Rx / PWM1 / TM0CAP
PB.4 / UR6RTS
PB.5 / UR6CTS
PB.6 / SPI0CS0
PB.7 / SPI0Clk
PB.8 / SPI0Do(D0)
PB.9 / SPI0Di(D1)
PB.10 / UR10Tx / SPI0D2 / CAN0Rx
PB.11 / UR10Rx / SPI0D3 / CAN0Tx
PB.12 / UR10Tx / SPI1CS0
PB.13 / UR10Rx / SPI1Clk
PB.14 / UR10RTS / SPI1Do(D0)
PB.15 / UR10CTS / SPI1Di(D1)

PC.14 / NWP / PWM0
PC.13 / NRDY0 / UR4CTS / TM3CAP
PC.12 / NRE / UR4RTS / TM3TGL
PC.11 / NWE / UR4Rx / TM2CAP
PC.10 / NCLE / UR4Tx / TM2TGL
PC.9 / NALE / UR10CTS / TM1CAP
PC.8 / NCS0 / UR10RTS / TM1TGL
PC.7 / ND7 / UR10Tx / TM0CAP
PC.6 / ND6 / UR10Tx / TM0TGL
PC.5 / ND5 / eMMC_CLK
PC.4 / ND4 / eMMC_CMD
PC.3 / ND3 / eMMC_D3
PC.2 / ND2 / eMMC_D2
PC.1 / ND1 / eMMC_D1
PC.0 / ND0 / eMMC_D0

PD.0 / SD0CMD
PD.1 / SD0CLK
PD.2 / SD0D0
PD.3 / SD0D1
PD.4 / SD0D2
PD.5 / SD0D3
PD.6 / SD0CD
PD.7 / SD0PWR
PD.8 / LD16 / EBI_nCS0
PD.9 / LD17 / EBI_nCS1
PD.10 / LD18 / EBI_nCS2
PD.11 / LD19 / UR9Tx / EBI_nCS3
PD.12 / LD20 / UR9Rx / PWM0 / EBI_nCS4
PD.13 / LD21 / PWM1 / EBI_nWE
PD.14 / LD22 / UR9Rx / PWM2 / EBI_nOE
PD.15 / LD23 / UR9Rx / PWM3 / EBI_nWait

PE.0 / UR0Tx
PE.1 / UR0Rx
PE.2 / RMII1_MDC / SD1CMD / UR1Tx
PE.3 / RMII1_MDIO / SD1CLK / UR1Rx
PE.4 / RMII1_TxD0 / SD1D0 / UR1RTS
PE.5 / RMII1_TxD1 / SD1D1 / UR1CTS
PE.6 / RMII1_TxEn / SD1D2 / UR1DTR
PE.7 / RMII1_RefClk / SD1D3 / UR1DSR
PE.8 / RMII1_RxD0 / SD1CD / UR1Ri
PE.9 / RMII1_RxD1 / SD1PWR / UR1CD
PE.10 / RMII1_CRSDV / UR8Tx
PE.11 / RMII1_RxErr / UR8Rx
PE.12 / UR8RTS / UR3Tx
PE.13 / UR8CTS / UR3Rx
PE.14 / USB0PWREn
PE.15 / USB1PWREn

PJ.4 / nTRST   142 PJ4
PJ.2 / TDI   141 PJ2
PJ.1 / TMS   140 PJ1
PJ.0 / TCK   139 PJ0
PJ.3 / TDO   138 PJ3

PI.0 / EBI_D0
PI.1 / NCS0 / UR7Tx / EBI_D1 / Int6
PI.2 / NWP / UR7Rx / EBI_D2 / Int7
PI.3 / SClko / NALE / IIC1SCL / EBI_D3
PI.4 / SPClk / NCLE / IIC1SDA / EBI_D4
PI.5 / SHsync / NWE / eMMC_Cmd / EBI_D5 / SD1CMD
PI.6 / SVsync / NRE / eMMC_Clk / SC1_Rst / EBI_D6 / SD1CLK
PI.7 / SField / NRDY0 / eMMC_D3 / SC1_PWR / EBI_D7 / SD1D0
PI.8 / SD0 / ND0 / eMMC_D0 / SC1_DAT / EBI_D8 / SD1D1
PI.9 / SD1 / ND1 / eMMC_D1 / SC1_PWR / EBI_D9 / SD1D2
PI.10 / SD2 / ND2 / eMMC_D2 / SC1_CD / EBI_D10 / SD1D3
PI.11 / SD3 / ND3 / SC0_Rst / EBI_D11
PI.12 / SD4 / ND4 / UR8Tx / SC0_Clk / EBI_D12 / SD1CD
PI.13 / SD5 / ND5 / UR8Rx / SC0_DAT / EBI_D13 / SD1PWR
PI.14 / SD6 / ND6 / UR8RTS / SC0_PWR / EBI_D14
PI.15 / SD7 / ND7 / UR8CTS / SC0_CD / EBI_D15

PH.0 / USB0VbusVLD / Int0
PH.1 / USB0C / Int1
PH.2 / IIC1SCL / UR9Tx / CAN0Rx / PWM2 / Int2
PH.3 / IIC1SDA / UR9Rx / CAN0Tx / PWM3 / Int3
PH.4 / KPI_Row0 / UR1Tx / EBI_Add0 / Int4
PH.5 / KPI_Row1 / UR1Rx / EBI_Add1 / Int5
PH.6 / KPI_Row2 / SD1Cmd / UR1RTS / EBI_Add2 / Int6
PH.7 / KPI_Row3 / SD1Clk / UR1CTS / EBI_Add3 / Int7
PH.8 / KPI_Col0 / SD1D0 / UR4Tx / EBI_Add4
PH.9 / KPI_Col1 / SD1D1 / UR4Rx / EBI_Add5
PH.10 / KPI_Col2 / SD1D2 / UR4RTS / EBI_Add6
PH.11 / KPI_Col3 / SD1D3 / UR4CTS / EBI_Add7
PH.12 / KPI_Col4 / SD1CD / UR8Tx / SPI0CS1 / EBI_Add8
PH.13 / KPI_Col5 / UR9Rx / EBI_nCS1 / EBI_Add9
PH.14 / KPI_Col6 / UR8RTS / CAN1Rx / EBI_nBE0
PH.15 / KPI_Col7 / UR8CTS / CAN1Rx / EBI_nBE1

PG.0 / IIC0SCL
PG.1 / IIC0SDA
PG.2 / IIC1SCL
PG.3 / IIC1SDA
PG.4 / NCS1 / UR7Tx / SPI1D2
PG.5 / NRDY1 / UR7Rx / SPI1D3
PG.6 / LClk
PG.7 / LHsync
PG.8 / LVsync
PG.9 / LDEN
PG.10 / IIS_MClk / SC0_RST
PG.11 / IIS_DO / SC0_CLK / UR6Tx
PG.12 / IIS_DI / SC0_DAT / UR6Rx
PG.13 / IIS_BCLK / SC0PWR / UR6RTS
PG.14 / IIS_LRCK / SC0CD / UR6CTS

PF.0 / RMII0_MDC
PF.1 / RMII0_MDio
PF.2 / RMII0_TxD0
PF.3 / RMII0_TxD1
PF.4 / RMII0_TxEn
PF.5 / RMII0_RefClk
PF.6 / RMII0_RxD0
PF.7 / RMII0_RxD1
PF.8 / RMII0_CRSDV
PF.9 / RMII0_RxErr
PF.10 / USBPWREn / WDT_nRst
PF.11 / UR2Tx / TM2TGL / Int0
PF.12 / UR2Rx / TM2CAP / Int1
PF.13 / UR2RTS / TM3TGL / Int2
PF.14 / UR2CTS / TM3CAP / Int3

U1B muc972

UPL1VD12 204   USBPLL1_VDD
USB1_DM   206   USB1_DM
USB1_DP   207   USB1_DP
UHVD33   208   USB1_VDD
          209   USB1_Rext

UPL0VD12 210   USBPLL0_VDD

USB0_DM   212   USB0_DM
USB0_DP   213   USB0_DP
UOVD33   214   USB0_VDD
          215   USB0_Rext
          216   USB0_ID

USB0 ID   205   USB1_VSS
          211   USB0_VSS

ADC
ADC0   55   ADC0
       62   ADC1
       63   ADC2
       64   ADC3
       57   ADC4
       61   ADC5
       56   ADC6
       60   ADC7

UPL1VD12 = VDD12
UPL0VD12 = VDD12
UHVD33 = VDD33
UOVD33 = VDD33

U1C muc972

MCU I/O power pin
VDD33 10, 20, 44, 80, 104, 144, 154, 183

MCU internal core power pin
VDD12 12, 21, 82, 102, 146, 163, 166, 203

DDR power pin
VDD18 14, 16, 18, 148, 150, 152

MVDD MVSS

DDR ground pin
MVSS, SSAV, VSS, PLL_VSS

ADC power in: Vref 65, AVDD 59
RTC power in: RTC_VDD 66, SysPWREn 67, SysnWkUp 68
nRESET 143
PLL_VDD12 164
32.768K: RTCXi 69 XT2_IN, RTCXo 70 XT2_OUT
12M: MainXi 184 XT1_IN, MainXo 185 XT1_OUT

RESET / R3 10K / VDD33
D1 1N4148 / VDD33
Y1 25Mhz / XT1 OUT / GND HOT / GND
Y2 32.768KHz / XT2 IN / XT2 OUT
R1 1M

C6 1uF, C58, C59, C9 100nF, C5 1uF, C7 100nF, C8 4.7uF
AVDD, AGND, GND

J3
VBAT 1 / 2 ...
LCD R0 ... LCD R7, LCD G0 ... LCD G7, LCD B0 ... LCD B7
LCD BL, LCD DE, LCD VSYNC, LCD HSYNC, LCD CLK
RGBLCD

P2 P3 Header 4
PA0 / PA1 / PA4 / PA2 / PA5
R20 R21 R22 R23 R24 R25 10K

VDD33 R19 10K   P1
USB0 ID R18 10K   **USB_ID**

C50 C51 C52 C53 C54 C55 C56 C57
104 4.7uF 104 4.7uF 104 4.7uF 4.7uF

IO RGBLCD
PG5, PG4, PB15, PB14, PB13, PB12, PB11, PH0, PE15, PB5, PB4, PB3, PB1, PB0, PI14, PI12, PI10, PI8, PI6, PI4
SysPWREn, PH5, PH7, PH9, PH11, PH13, PH15, PI1, PI3, PI5, PI7, PI9, PI11, PI13, PI15, PI0, PI2

IO2 RGBLCD
ADC2, ADC3, ADC1, ADC0, PH12, PH10, PH8, PH6, PH4, SysnWkUp, PF14, PF13, PF12, PF11, PG10, PG12, PG14, PG1, PG11, PG13
PH3, PE13, PE11, PE9, PE7, PE5, PH1, PF10, PE15, PH2, PE12, PE10, PE8, PE6, PE4, PG2, PG0

U3 MT29F4G08
I/O0 ... I/O7, CLE, ALE, WE, RE, CE, R/B, WP
N IO0 ... N IO7, N CLE, N ALE, N WE, N RE, N CE, N WP, N R/B
C60 C61 104 4.7uF / VDD33 / GND

R8 R9 10K N R/B N WP

U2 W25Q256
CS, SO(IO1) HOLD/RST(IO3), WP(IO2), GND, VCC, CLK, SI(IO0)
SPI CS, SPI DI(D1), SPI WP(D2), SPI DO(D0)
R12 10K SPI CS / R10 SPI CS / R11 SPI WP(D2) 10K
C62 104 / C63 4.7uF / VDD33 / GND

SD TF_CARD
PD2 SDIO_D0, PD3 SDIO_D1, PD4 SDIO_D2, PD5 SDIO_D3, PD1 SDIO_SCK, PD0 SDIO_CMD
R35 R36 R37 R38 R39 47K
DAT1/IRQ, DAT0/DO, VSS, CLK, VDD, CMD, CS/DATA3, DAT2/NC
C81 104 / VDD33 / GND

JTAG Header6
PJ0, PJ1, PJ2, PJ3, PJ4, GND

UART0 Header6 / P5
UART0_RXD, UART0_TXD, GND

UART0_TXD PE0
UART0_RXD PE1
Y3 12Mhz / HOT GND / XTAL U OUT / XTAL U IN
C67 4.7uF / C68 4.7uF / GND

U5 CH340G USB_DEBUG USB-AB
VCC, XO, XI, D-, D+, V3, RXD, TXD, GND
CTS#, DSR#, RI#, DCD#, DTR#, RTS#, R232, VCC
5V USBIN / UART0_TXD3 / UART0_RXD2
C64 4.7uF / C65 104 / C66 4.7uF
R13, R14, R17 10R / GND

USB USB-AB
USB0_DM, USB0_DP, USB0_ID
R15 10K / R16 22K / 5V USB / USB0_VBUS / GND

VDD33 / C10 C1 C11 C12 C13 C14 C15 C16 C17 C18 C19 C20 C21 104
VDD12 / C22 C23 C24 C25 C26 C27 C28 C29 C30 C31 C32 104
VDD18 / C33 C34 C35 C36 C37 C38 C39 C40 C41 C42 104
GND

GND
I/O
TAP
I/O
GND
K1
5
3
2
1
4
5V_USBIN
TVBAT
GND
BAT
1
2
POWER

TVBAT
D2 SS34
VBAT
C69 C70
47uF 104
GND
R26 10K
V33PG

U6
VIN SW
OUT
EN FB
PG PGND
AGND
U7 MP2144
2
3
5
7
4
6
8
1
L1 1uH
R28
C71 C72
47uF 104
R27 22K
100K
GND
VDD33

VBAT
C73 C74
47uF 104
V33PG

U8 MP2144
VIN SW
OUT
EN FB
PG PGND
AGND
2
3
5
7
4
6
8
1
L2 1uH
R31
C75 C76
47uF 104
R30 100K
100K
GND
VDD12

VBAT
C77 C78
47uF 104
V33PG

MP2144
VIN SW
OUT
EN FB
PG PGND
AGND
2
3
5
7
4
6
8
1
L3 1uH
R34
C79 C80
47uF 104
R33 100K
200K
GND
VDD18
GND

ETH_MDIO R50 510R
ETH_MDC
RMII_TXD0
RMII_TXD1
RMII_TX_EN
RMII_RXD0
RMII_RXD1
RMII_RXER
RMII_CRS_DV
RMII_REF_CLK
ETH_RESET
PD7 R51 10K
R52 12.1K
GND

PHY
MDIO TXP
MDC TXN
RXP
TXD0 RXN
TXD1
TXEN LED1/REGOFF
LED2/nINTSEL
RXD0/MODE0
RXD1/MODE1 VDD1A
RXER/PHYAD0 VDD2A
CSR_DV/MODE2 VDDIO
VDDCR
nINT/REFCLKO GND
nRST
XTAL1/CLKIN
RBIAS XTAL2
LAN8720A
12
13
17
18
16
8
7
10
11
14
15
24
21
20
23
22
3
2
19
1
9
6
25
5
4

TPTX+ R53
TPTX- R54
TPRX+ R55
TPRX- R56
49.9R
49.9R
49.9R
49.9R
VCC3.3E

LINK_LED R57
SPEED_LED
R58
10K
10K
GND

VCC3.3E
VCC3.3E
VCC3.3
C95 C82 C83 C84 C85
104 10uF 104 104 104
GND

R59 1M
Y5
25MHz
C86 22 C87 22 GND

RMII_REF_CLK PF5
ETH_MDIO PF1
RMII_CRS_DV PF8
ETH_MDC PF0
RMII_RXD0 PF6
RMII_RXD1 PF7
RMII_TX_EN PF4
RMII_TXD0 PF2
RMII_TXD1 PF3
ETH_RESET
RMII_RXER PF9

VCC3.3E
TPTX+
TPTX-
TPRX+
TPRX-

VDD33 L4 VCC3.3E
C88 220R,2.0A,0.05DCR C89
104 10uF
GND

EARTHNET
TD+ LED(Y)_A
TCT LED(G)_A
TD- LED(Y)_K
LED(G)_K
RD+
RCT SHILED
RD- SHILED
NC CHS GND
RJ45
1
4
2
3
5
6
7
12 LINK_LED
9 SPEED_LED
11
10
14
13
8
R60 R61
510R 510R
GND

C90 C91 C92 C93 C94
223 10 10 10 10
GND

Title
Size A4
Number
Revision
Date: 2020/4/4
File: C:\Users\..\nuc972_power.SchDoc
Sheet of
Drawn By:

Comment	Description	Designator	Footprint	LibRef	Quantity
POWER	Header, 2-Pin	BAT	HDR1X2	Header 2	1
22pF		C1, C2	C 0603_L	C	2
6pF		C3, C4	C 0603_L	C	2
1uF		C5, C6	C 0603_L	C	2
100nF		C7, C9, C58	C 0603_L	C	3
4.7uF		C8, C51, C53, C55, C57, C59, C61, C63, C64, C66, C67, C68	C 0603_L	C	12
104		C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C50, C52, C54, C56, C60, C62, C65, C70, C72, C74, C76, C78, C80, C81, C83, C84, C85, C88, C95	C 0603_L	C	52
47uF		C69, C71, C73, C75, C77, C79	C 0805_L	C	6
10uF		C82, C89	C 0603_L	C	2
22		C86, C87	C 0603_L	C	2
223		C90	C 0603_L	C	1
10		C91, C92, C93, C94	C 0603_L	C	4
1N4148		D1	MINI_MELF (LL34)	D	1
SS34		D2	SMA	D	1
RJ45		EARTHNET	RJ-45A12	HR911105	1
RGBLCD	FPC-40P-0.5mm	IO, IO2, J3	FPC-TOP40	FPC-40	3
Header6	Header, 3-Pin, Dual row	JTAG	HDR2.54-LI-6P	Header 3X2	1
BUTTON_DIP3	拨动开关SS-12F44	K1	BTN8.8*4.6	BUTTON_DIP3	1
1uH		L1, L2, L3	NR3015	L	3
220R,2.0A,0.05DCR		L4	L 0603	L	1
USB_ID	Header, 3-Pin	P1	HDR2.54-LI-3P	Header 3	1
Header 4	Header, 4-Pin	P2, P3	HDR2.54-LI-4P	Header 4	2
UART0	Header, 3-Pin	P5	HDR2.54-LI-3P	Header 3	1
LAN8720A	ETH PHY	PHY	QFN24 4x4_N	LAN8720	1
1M		R1, R59	R 0603_L	R	2
0R		R2, R4	R 0603_L	R	2
10K		R3, R8, R9, R10, R11, R12, R15, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26, R51, R57, R58	R 0603_L	R	20
12.1K		R5, R6, R52	R 0603_L	R	3
10R		R13, R14	R 0603_L	R	2
22K		R16, R27	R 0603_L	R	2
100K		R28, R30, R31, R33	R 0603_L	R	4
200K		R34	R 0603_L	R	1
47K		R35, R36, R37, R38, R39	R 0603_L	R	5
510R		R50, R60, R61	R 0603_L	R	3
49.9R		R53, R54, R55, R56	R 0603_L	R	4
KEY_M		RESET	TSW DIP-6*6*5	KEY_M	1
SD-MICRO-TF	SD,MICRO,TF	TF_CARD	SD-MICRO-TF	SD-MICRO-TF	1
muc972		U1	LQFP_216	LQFP_216	1
W25Q256	W25Q128	U2	SOP8W_N	W25Q128	1
MT29F4G08	256MB NAND FLASH	U3	TSOP48	K9F2G08U0C	1
CH340G	USB2UART	U5	SOP16_N	CH340G	1
MP2144		U6, U7, U8	SOT23-8L	MP2144	3
USB-AB	MicroUSB	USB, USB_DEBUG	USB-MICRO_B	USB-AB	2
25Mhz	3225贴片无源晶振	Y1	OSC 3225-4P	XTAL_3225	1
32.768KHz	普通晶振	Y2	OSC 3215-2P	XTAL	1
12Mhz	3225贴片无源晶振	Y3	OSC 3225-4P	XTAL_3225	1
25MHz	Crystal Oscillator	Y5	OSC HC-49S	XTAL	1