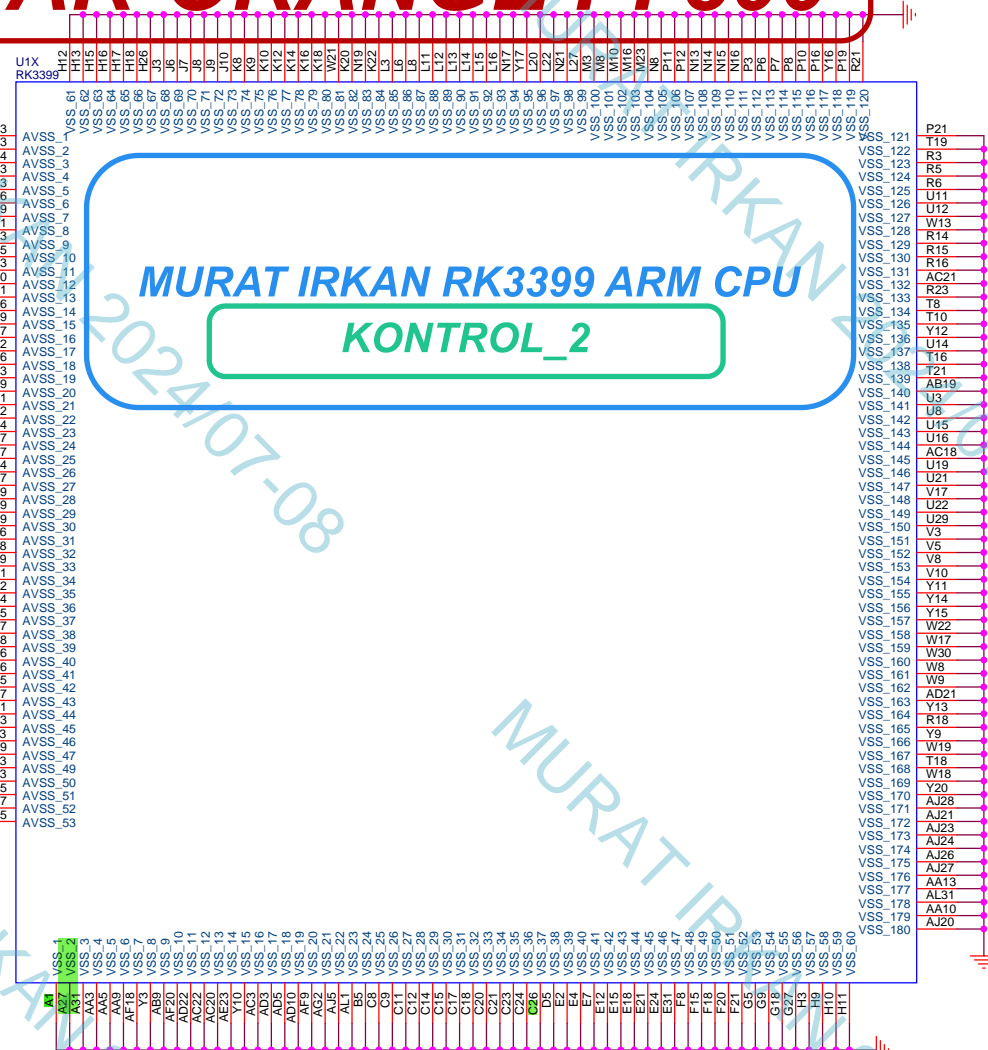
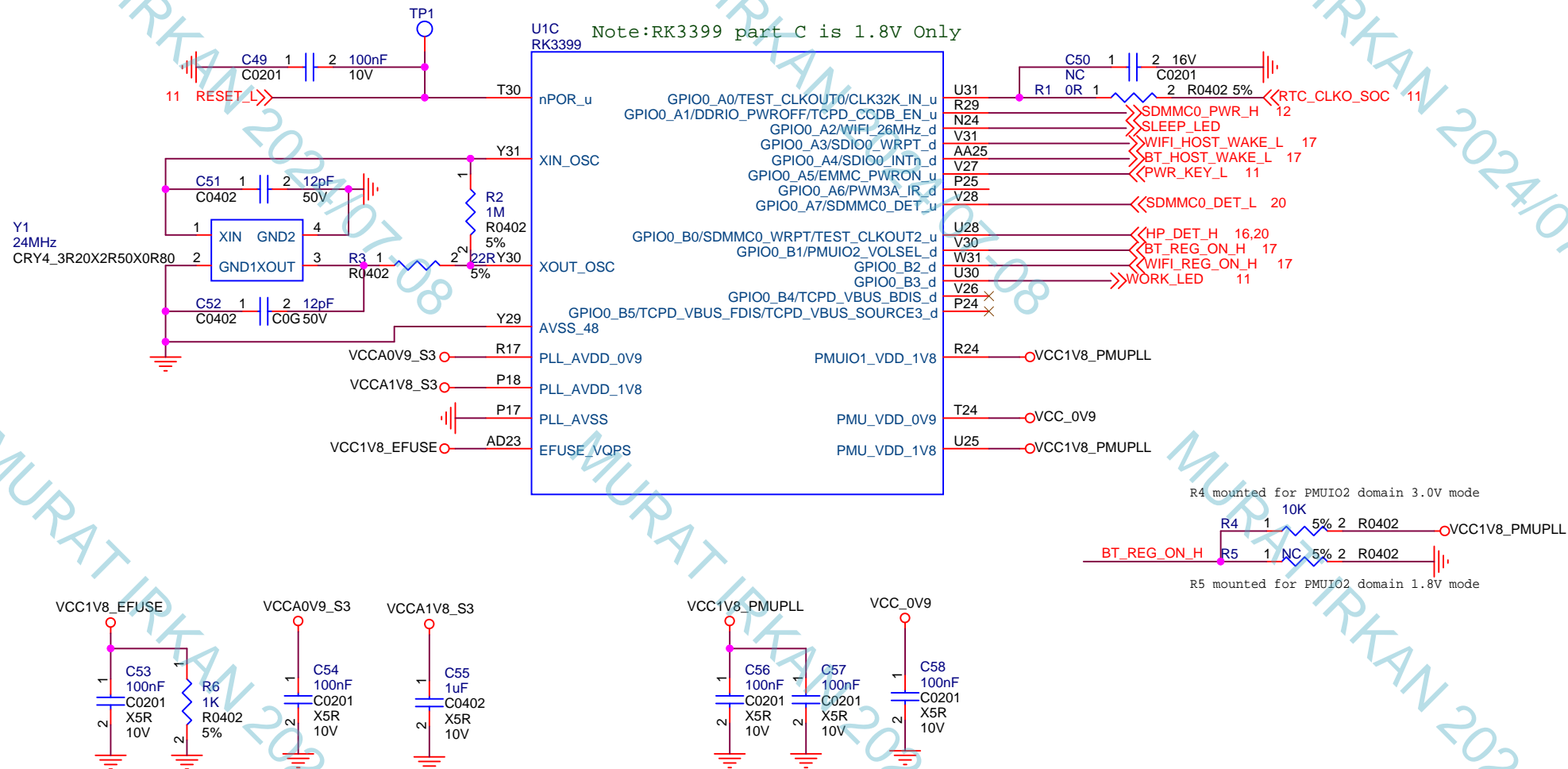


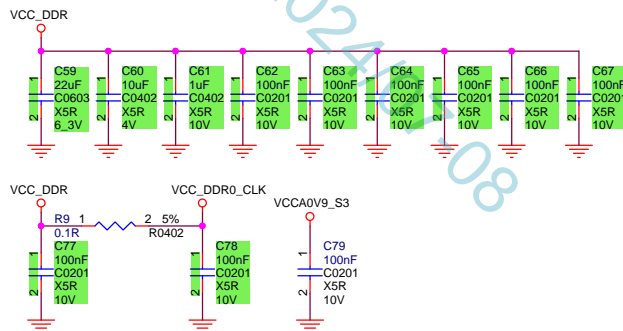
| Version | Date | Author | Change Note | Approved |
|---------|----------|------------|--|----------|
| V21 | 20180708 | XieXiaoMin | 见附件：PinebookPro_V21项目修改评审记录.docx 充电电流参数更改，PD充电电路优化 键盘控制IO加密功能修改：初始化为高阻，启用时为低电平 1.增加Q15，R151 实现高电平通，低电平断。控制麦克风的电源 2.增加D13.实现高电平不干扰WIFI功能，低电平使WIFI无法打开 3.增加D14.实现高电平不干扰USB摄像头的工作，低电平使摄像头的电源打不开 增加U7005 EEPROM 保存键盘状态 增加工作状态灯IO使能控制，Standby LED：GPIO0_A2，Work LED：GPIO0_B3 LCD电源增加MOS管控制，控制IO口为GPIO1_C6，初始化状态为高，休眠时拉低 | WenXue |
| V21 | 20181107 | XieXiaoMin | 低电闪屏现象，增加钽电容，位号CP1，规格TAJB226K020RNJ，详细见18页 针对辐射认证，摄像头USB差分信号兼容共模电感，位号FB3，规格SDCW2012-2-900TF | |
| V21 | 20211207 | XieXiaoMin | 由LPDDR4-366球更改为LPDDR4-200球 13页 USB HUB芯片由SSOP28更改为QFN28封装 22页 EMMC进MASKROM由7脚波动开关更改为2脚拨码开关 14页 | |

01W
BK3399

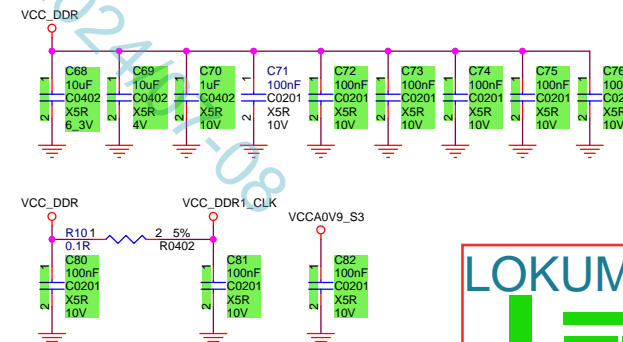




DDR FILTER

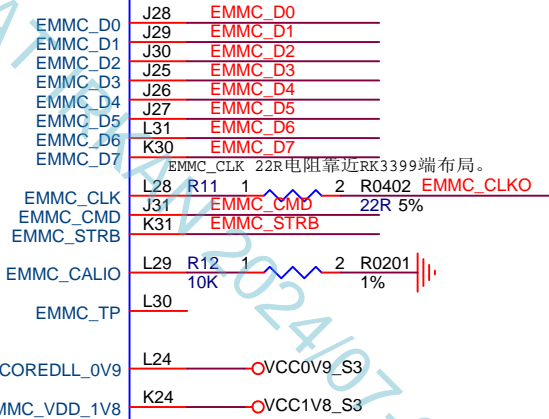


DDR FILTER



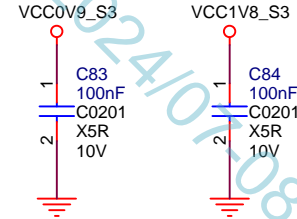
LOKUM NOTEBOOK R3

U1H
RK3399



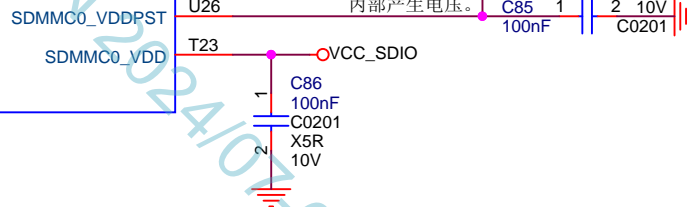
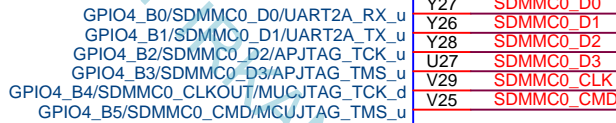
EMMC design rule:

- 1.Data[0:7]、cmd、strobe走线做为一组，并行走线并整组包地，组内等长要求为 $\pm 100\text{mil}$;
- 2.Clck需要单独走线并包地处理，与data间的延时小于20ps;
- 3.Max trace length < 3.93 inches;
- 4.Trace impedance 50ohm $\pm 10\%$;
- 5.与其他信号间距遵循3W原则;
- 6.R1300靠近SOC放置;



EMMC_D0 14
EMMC_D1 14
EMMC_D2 14
EMMC_D3 14
EMMC_D4 14
EMMC_D5 14
EMMC_D6 14
EMMC_D7 14
EMMC_CLKO 14
EMMC_CMD 14
EMMC_STRB 14

U1F
RK3399

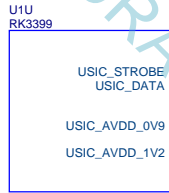


SDMMC design rule:

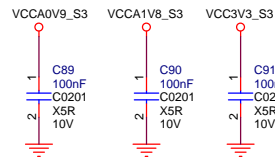
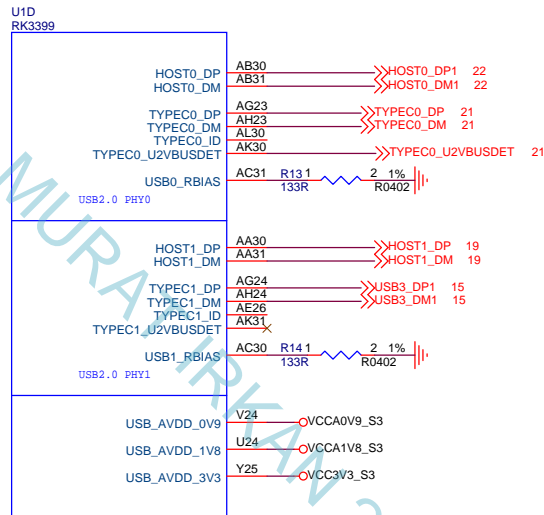
- 1.Data[0:3]、cmd走线做为一组，并行走线并整组包地，组内等长要求为 $\pm 100\text{mil}$;
- 2.Clck需要单独走线并包地处理，与data间的延时小于20ps; ;
- 4.Max trace length < 3.93 inches;
- 5.Trace impedance 50ohm $\pm 10\%$;
- 6.与其他信号间距遵循3W原则;

SDMMC0_D0 20
SDMMC0_D1 20
SDMMC0_D2 20
SDMMC0_D3 20
SDMMC0_CMD 20
SDMMC0_CLK 20

| PINE64 | | |
|--------------|------------------------|---------|
| Title | | |
| Pinebook Pro | | |
| Size | Document Number | Rev |
| A4 | FLASH&SDMMC controller | V2.1 |
| Date: | Sheet | 4 of 23 |



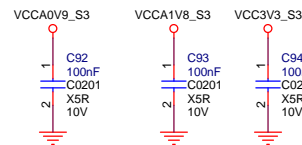
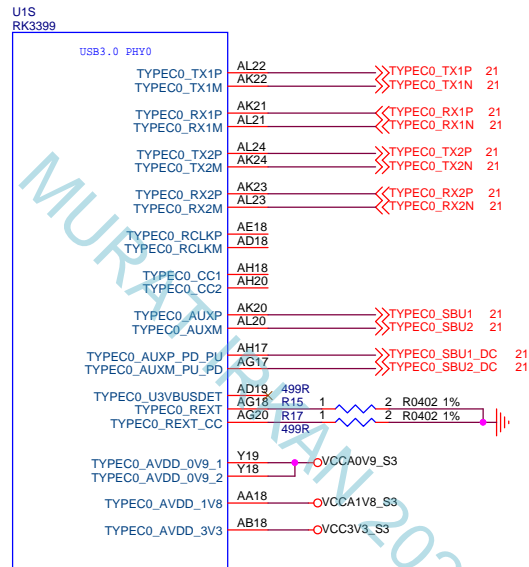
USB2.0



USB2.0 design rule:

- 1.Max intra-pair skew < 4 ps;
- 2.Max trace length between TX and RX < 6 inches;
- 3.Max allowed via < 6;
- 4.Trace impedance 90ohm+/-10%;
- 5.与其他信号间距遵循3W原则;

USB3.0

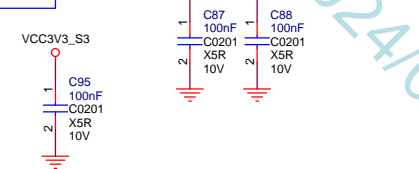
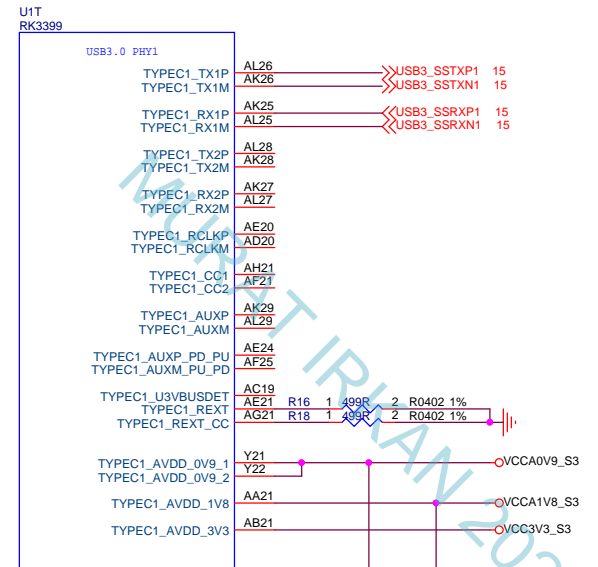


USB3.0 design rule:

- 1.Max intra-pair skew < 4 ps;
- 2.Max length skew between TX and RX < 1.6 ns;
- 3.Max trace length < 6 inches;
- 4.Max allowed via < 4;
- 5.Trace impedance 90ohm+/-10%;
- 6.与其他信号间距遵循3W原则;

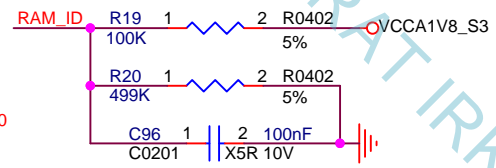
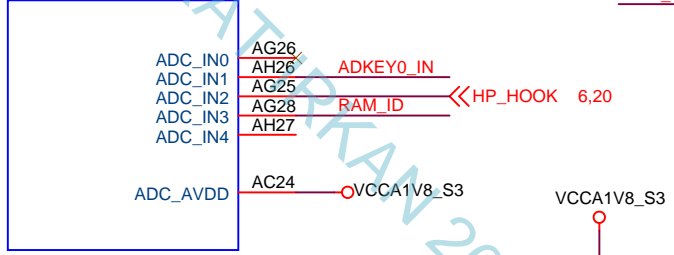
DP design rule:

- 1.Max intra-pair skew < 4 ps;
- 2.Max trace length between TX and RX < 1.6 ns;
- 3.Max allowed via < 4;
- 4.Trace impedance 90ohm+/-10%;
- 5.与其他信号间距遵循3W原则;



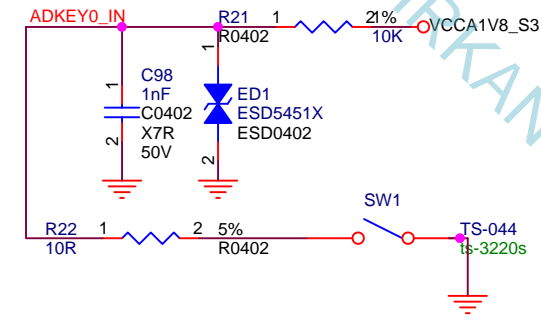
| PINE64 | | |
|--------------|-----------------|---------|
| Pinebook Pro | | |
| Size | Document Number | Rev |
| A3 | USB CONTROLLER | V2.1 |
| Date: | Sheet | 5 of 23 |

U1V
RK3399

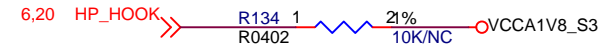
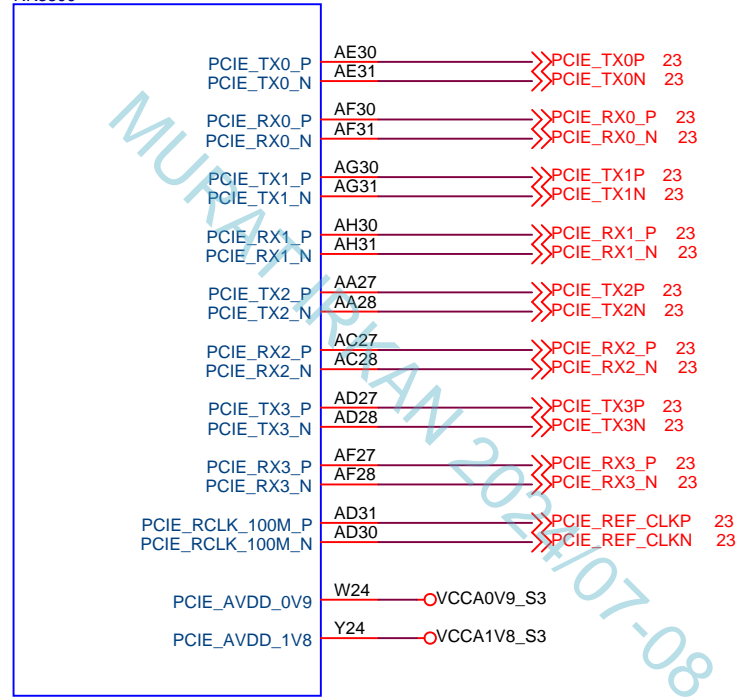


| | RAM ID | R23 PU | R24 PD |
|-------------|--------|--------|--------|
| DDR3 /DDR3L | 0.6V | 200K | 100K |
| LPDDR3 | 0.112V | 150K | 10K |
| LPDDR4 | 1.5V | 100K | 499K |

Note:
系统上电时，如果ADKEY_IN电平为0V，
则RK3399进入Recovery模式；
量产时R1503,SW1500,ED1500可以不用贴片。



U1O
RK3399



U1L
RK3399

GPIO2_A0/VOP_D0/CIF_D0/I2C2_SDA_u G31
GPIO2_A1/VOP_D1/CIF_D1/I2C2_SCL_u H25
GPIO2_A2/VOP_D2/CIF_D2_d H30
GPIO2_A3/VOP_D3/CIF_D3_d F28
GPIO2_A4/VOP_D4/CIF_D4_d H29
GPIO2_A5/VOP_D5/CIF_D5_d F29
GPIO2_A6/VOP_D6/CIF_D6_d H27
GPIO2_A7/VOP_D7/CIF_D7/I2C7_SDA_u G30

GPIO2_B0/VOP_CLK/CIF_VSYNC/I2C7_SCL_u H28
GPIO2_B1/SPI2_RXD/CIF_HREF/I2C6_SDA_u F30
GPIO2_B2/SPI2_TXD/CIF_CLKIN/I2C6_SCL_u H24
GPIO2_B3/SPI2_CLK/VOP_DEN/CIF_CLKOUTA_u H31
GPIO2_B4/SPI2_CS_n0_u F31

APIO2_VDDPST J24
APIO2_VDD K23

U1R
RK3399

MIPI_RX0_D0P AK15
MIPI_RX0_D0N AL15

MIPI_RX0_D1P AK14
MIPI_RX0_D1N AL14

MIPI_RX0_CLKP AK13
MIPI_RX0_CLKN AL13

MIPI_RX0_D2P AK12
MIPI_RX0_D2N AL12

MIPI_RX0_D3P AK11
MIPI_RX0_D3N AL11

MIPI_RX0_REXT AF14

MIPI_RX0_AVDD_1V8 AB14

U1P
RK3399

MIPI_TX1/RX1_D0P AK6
MIPI_TX1/RX1_D0N AL6

MIPI_TX1/RX1_D1P AK7
MIPI_TX1/RX1_D1N AL7


MIPI_TX1/RX1_CLKP AK8
MIPI_TX1/RX1_CLKN AL8

MIPI_TX1/RX1_D2P AK9
MIPI_TX1/RX1_D2N AL9

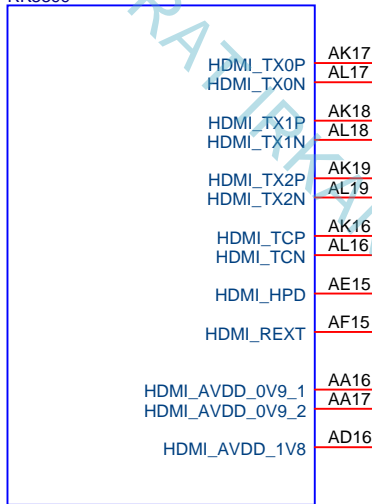
MIPI_TX1/RX1_D3P AK10
MIPI_TX1/RX1_D3N AL10

MIPI_TX1/RX1_REXT AF11

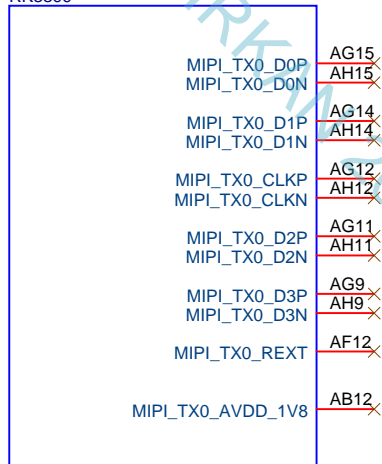
MIPI_TX1/RX1_AVDD_1V8 AC10

| | | | |
|---|-----------------|---------------|-------|
|  | | PINE64 | |
| Title | | | |
| Pinebook Pro | | | |
| Size | Document Number | | Rev |
| A4 | DVP interface | | V2.1 |
| Date: | Sheet | 7 | of 23 |

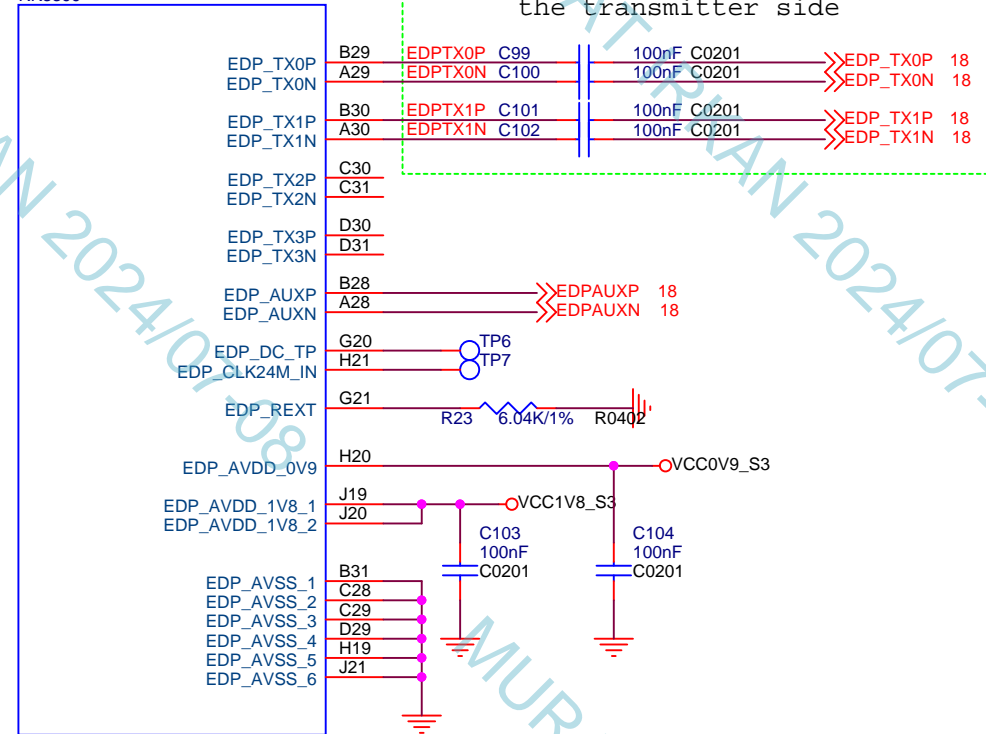
U1N
RK3399



U1Q
RK3399



U1M
RK3399



eDP design rule:

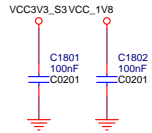
- 1.Max intra-pair skew < 4 ps;
- 2.Max trace length < 6 inches;
- 3.Max allowed via < 4;
- 4.Trace impedance 90ohm+/-10%;
- 5.与其他信号间距遵循3W原则;

| | | | |
|--------|-------------------|--------------|-------|
| PINE64 | | PINE64 | |
| Title | | Pinebook Pro | |
| Size | Document Number | Rev | |
| A4 | Display interface | V2.1 | |
| Date: | Sheet | 8 | of 23 |

U1I
RK3399 Note:RK3399 part I is 3.3V only

GPIO3_A0/MAC_TXD2/SPI4_RXD_d
GPIO3_A1/MAC_TXD3/SPI4_TXD_d
GPIO3_A2/MAC_RXD2/SPI4_CLK_u
GPIO3_A3/MAC_RXD3/SPI4_CS#_u
GPIO3_A4/MAC_TXD0/SPI0_RXD_d
GPIO3_A5/MAC_TXD1/SPI0_TXD_u
GPIO3_A6/MAC_RXD0/SPI0_CLK_u
GPIO3_A7/MAC_RXD1/SPI0_CS#_u
GPIO3_B0/MAC_MDC/SPI0_CS#1_u
GPIO3_B1/MAC_RXDV_d
GPIO3_B2/MAC_RXER/RXCS_SDA_u
GPIO3_B3/MAC_CLK/I2C5_SCL_u
GPIO3_B4/MAC_TXEN/UART1_RX_u
GPIO3_B5/MAC_MDIO/UART1_TX_u
GPIO3_B6/MAC_RXCLK/UART3_RX_u
GPIO3_B7/MAC_CRS/CIF_CLK/OUT/UART3_TX_u
GPIO3_C0/MAC_COL/UART3_CTS#/SPDIF_TX_u
GPIO3_C1/MAC_TXCLK/UART3_RTS#_u

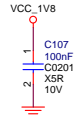
APIO1_VDDPST
APIO1_VDD



U1G
RK3399 Note:RK3399 part G is 1.8V only

GPIO2_C0/UART0_RX_u
GPIO2_C1/UART0_TX_u
GPIO2_C2/UART0_CTS#_u
GPIO2_C3/UART0_RTS#_u
GPIO2_C4/SDIO0_D0/SPI5_RXD_u
GPIO2_C5/SDIO0_D1/SPI5_TXD_u
GPIO2_C6/SDIO0_D2/SPI5_CLK_u
GPIO2_C7/SDIO0_D3/SPI5_CS#_u
GPIO2_D0/SDIO0_CMD_u
GPIO2_D1/SDIO0_CLKOUT/TEST_CLKOUT1_u
GPIO2_D2/SDIO0_DET/NPCIE_CLKREQ#_u
GPIO2_D3/SDIO0_PWREN_d
GPIO2_D4/SDIO0_BK/PWR_d

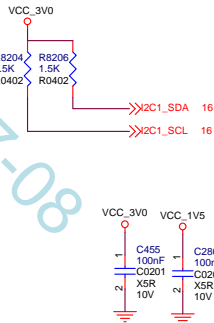
APIO3_VDD_1V8



U1J
RK3399 Note:RK3399 part J is 1.8V/3.0V mode

GPIO3_D0/I2S0_SCLK_d
GPIO3_D1/I2S0_LRCK_RX_d
GPIO3_D2/I2S0_LRCK_TX_d
GPIO3_D3/I2S0_SDIO_d
GPIO3_D4/I2S0_SD1/SDIO3_d
GPIO3_D5/I2S0_SD2/SDIO2_d
GPIO3_D6/I2S0_SD3/SDIO1_d
GPIO3_D7/I2S0_SDIO0_d
GPIO4_A0/I2S1_CLK_d
GPIO4_A1/I2S1_SDA_u
GPIO4_A2/I2S1_SCL_u
GPIO4_A3/I2S1_SCLK_d
GPIO4_A4/I2S1_LRCK_RX_d
GPIO4_A5/I2S1_LRCK_TX_d
GPIO4_A6/I2S1_SDIO_d
GPIO4_A7/I2S1_SDIO0_d

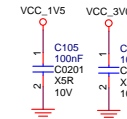
APIO5_VDDPST
APIO5_VDD



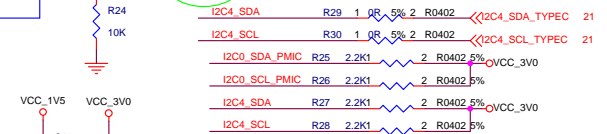
U1E
RK3399 Note:RK3399 part E is 1.8V/3.0V mode

GPIO1_A0/ISP0_SHUTTER_EN/ISP1_SHUTTER_EN/TCPD_VBUS_SINK_EN_d
GPIO1_A1/ISP0_SHUTTER_TRIG/ISP1_SHUTTER_TRIG/TCPD_CO0_VCONN_EN_d
GPIO1_A2/ISP0_FLASHTRIGIN/ISP1_FLASHTRIGIN/TCPD_CC1_VCONN_EN_d
GPIO1_A3/ISP0_FLASHTRIGOUT/ISP1_FLASHTRIGOUT_d
GPIO1_A4/ISP0_PRELIGHT_TRIG/ISP1_PRELIGHT_TRIG_d
GPIO1_A5/AP_PWROFF_d
GPIO1_A6/TSADC_INT_Z
GPIO1_A7/SP1_RXD/M2
GPIO1_B0/SP1_TXD/UART4_TX_u
GPIO1_B1/SP1_CLK/PMCUC_JTAG_TCK_u
GPIO1_B2/SP1_CS#/PMCUC_JTAG_TMS_u
GPIO1_B3/I2C4_SDA_u
GPIO1_B4/I2C4_SCL_u
GPIO1_B5_d
GPIO1_B6/PWM0B_IR_d
GPIO1_B7/SP13_RXD/I2C0_SDA_u
GPIO1_C0/SP13_TXD/I2C0_SCL_u
GPIO1_C1/SP13_CLK_u
GPIO1_C2/SP13_CS#_u
GPIO1_C3/PWM2_d
GPIO1_C4/I2C8_SDA_u
GPIO1_C5/I2C8_SCL_u
GPIO1_C6/TCPD_VBUS_SOURCE0_d
GPIO1_C7/TCPD_VBUS_SOURCE1_d
GPIO1_D0/TCPD_VBUS_SOURCE2_d
DFTJTAG_TMS_u
DFTJTAG_TRST#_d

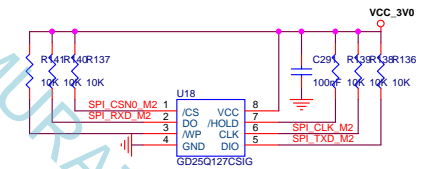
PMUIO2_VDDPST
PMUIO2_VDD



| | |
|-----------|--|
| 1.8V Only | VDDPST=VDDIO=1.8V |
| 3.3V Only | VDDPST=1.8V,VDDIO=3.3V |
| other | 3.0V mode:VDDPST=1.5V,VDDIO=3.0V 1.8V mode:VDDPST=1.8V,VDDIO=1.8V |



SPI FLASH 128M

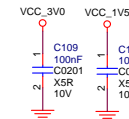


U1K
RK3399 Note:RK3399 part J is 1.8V/3.0V mode

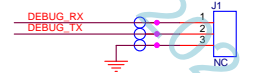
GPIO4_C0/I2C3_SDA/UART2B_RX_u
GPIO4_C1/I2C3_SCL/UART2B_TX_u
GPIO4_C2/PWM0/OP0_PWM/OP1_PWM_d
GPIO4_C3/UART2C_RX_u
GPIO4_C4/UART2C_TX_u
GPIO4_C5/SPDIF_TX_d
GPIO4_C6/PWM1_d
GPIO4_C7/HDMI_CEC/INOUT/EDP_HOTPLUG_u

GPIO4_D0/PD/CIE_CLKREQ#_u
GPIO4_D1/DP_HOTPLUG_d
GPIO4_D2_d
GPIO4_D3_d
GPIO4_D4_d
GPIO4_D5_d
GPIO4_D6_d

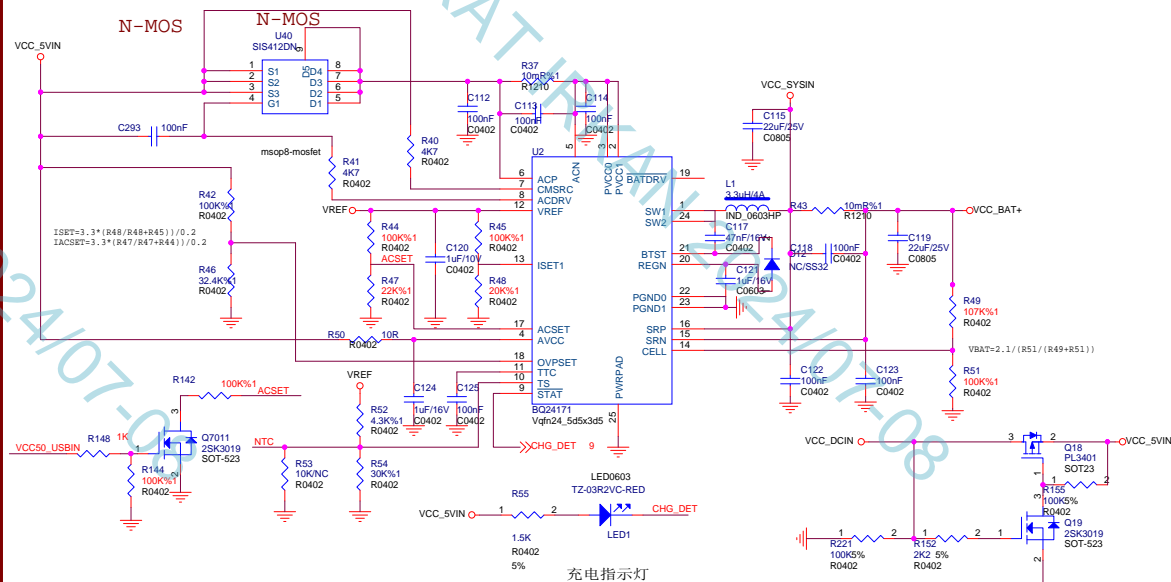
APIO4_VDDPST
APIO4_VDD



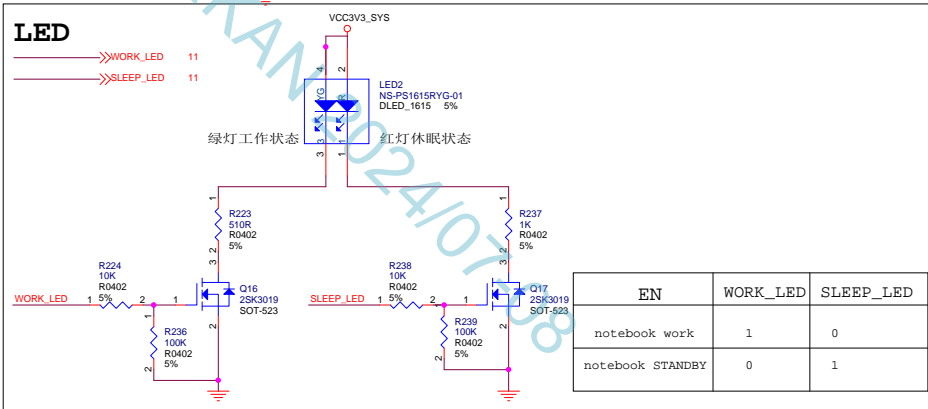
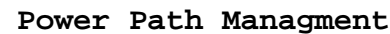
For debug(Default)



CHARGE and Power Path

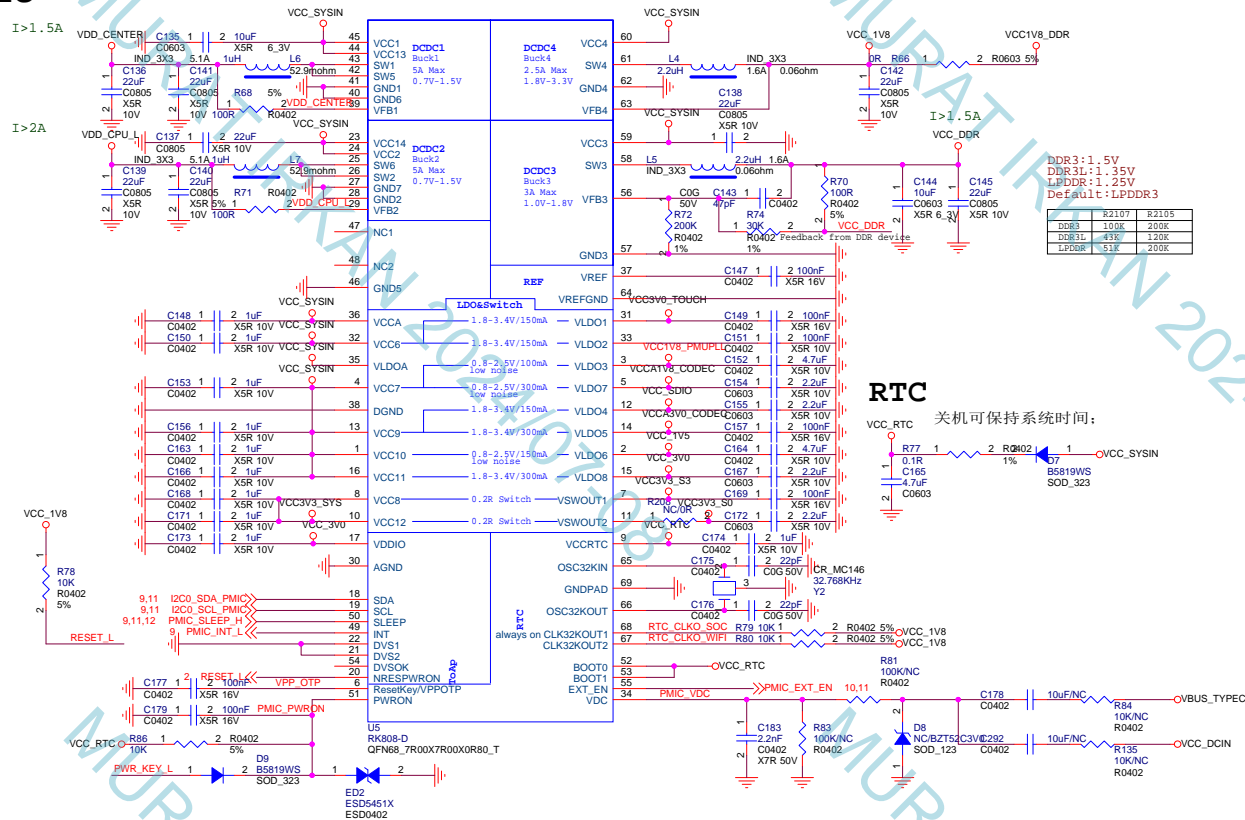


3.3V SYSTEM

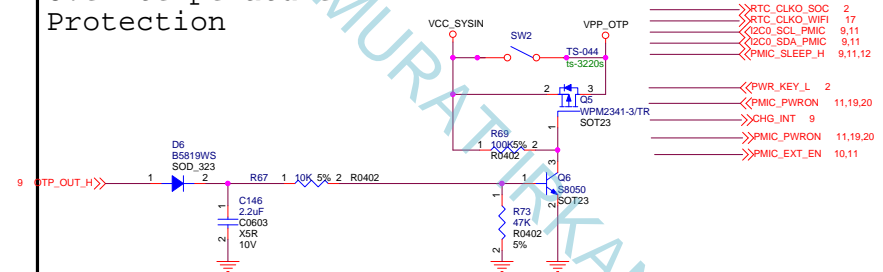


| EN | WORK_LED | SLEEP_LED |
|------------------|----------|-----------|
| notebook work | 1 | 0 |
| notebook STANDBY | 0 | 1 |

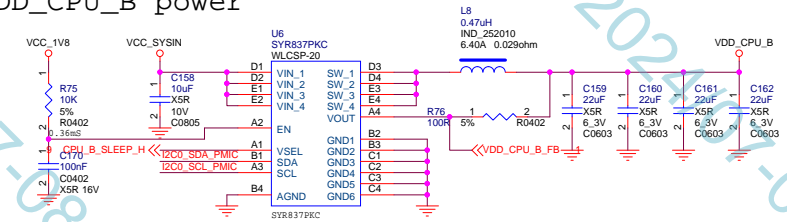
PMIC



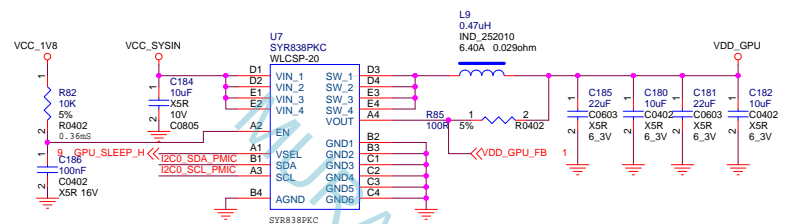
Over-temperature Protection



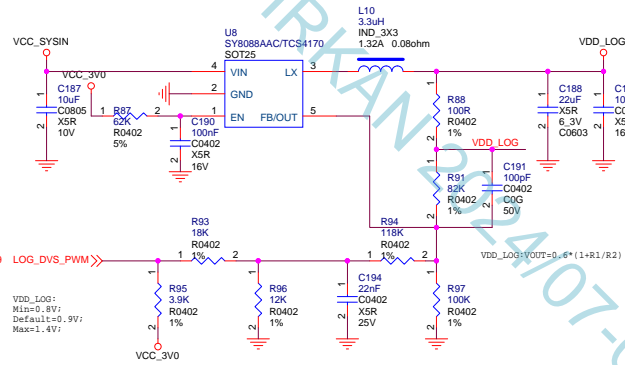
VDD_CPU_B power



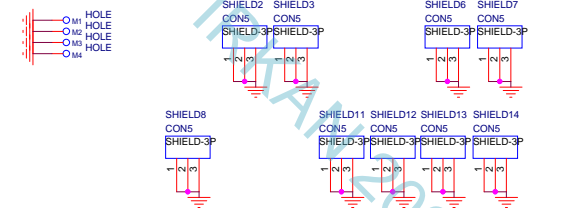
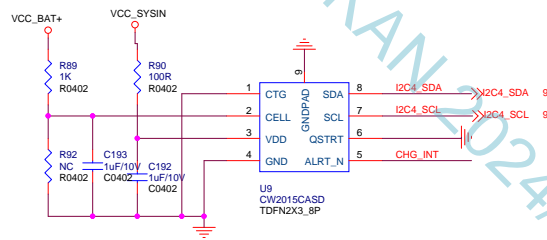
VDD_GPU power



VDD_LOG power

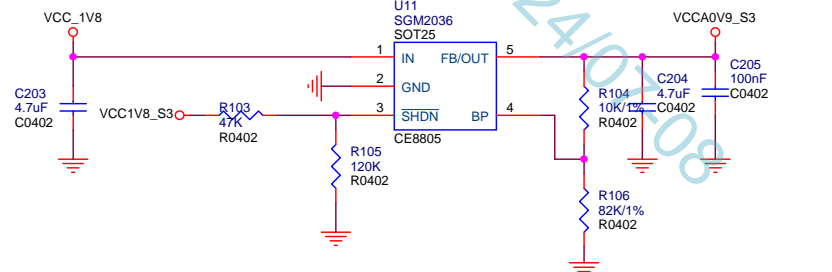
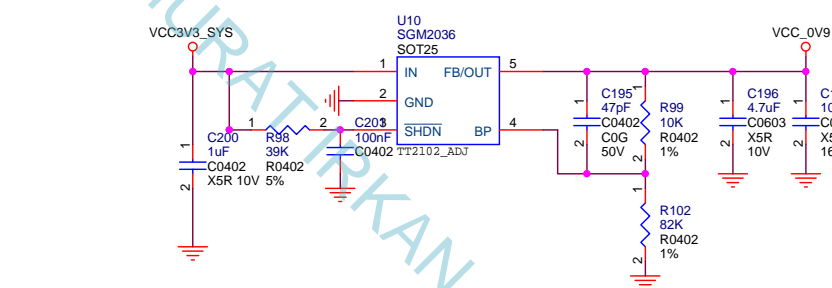


Gas Gauge

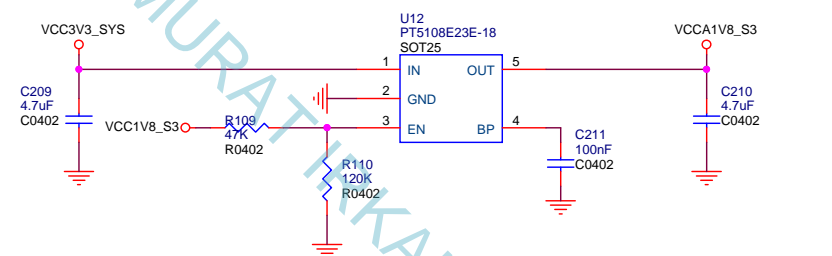


| PINE64 | | |
|--------------|-----------------|----------------|
| Pinebook Pro | | |
| Size | Document Number | Rev |
| Custom | RK808-D 1 | V2.1 |
| Date: | | Sheet 11 of 23 |

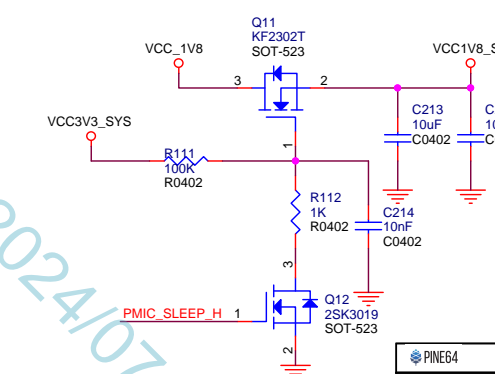
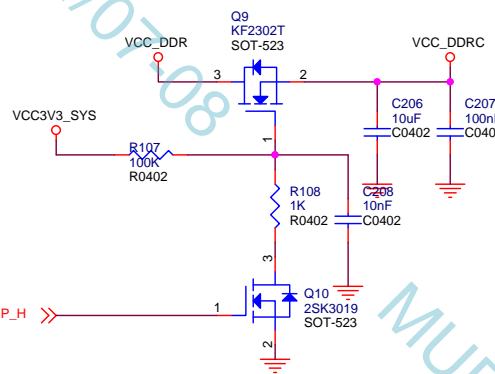
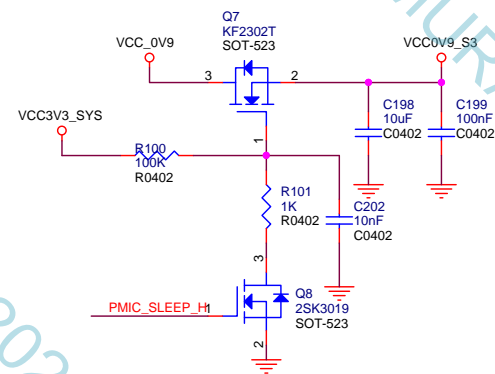
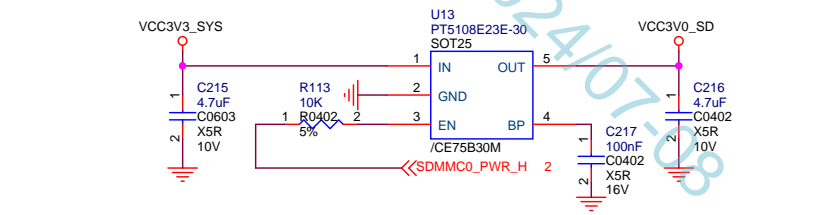
VCC_0V9 power



VCCA1V8_S3 power

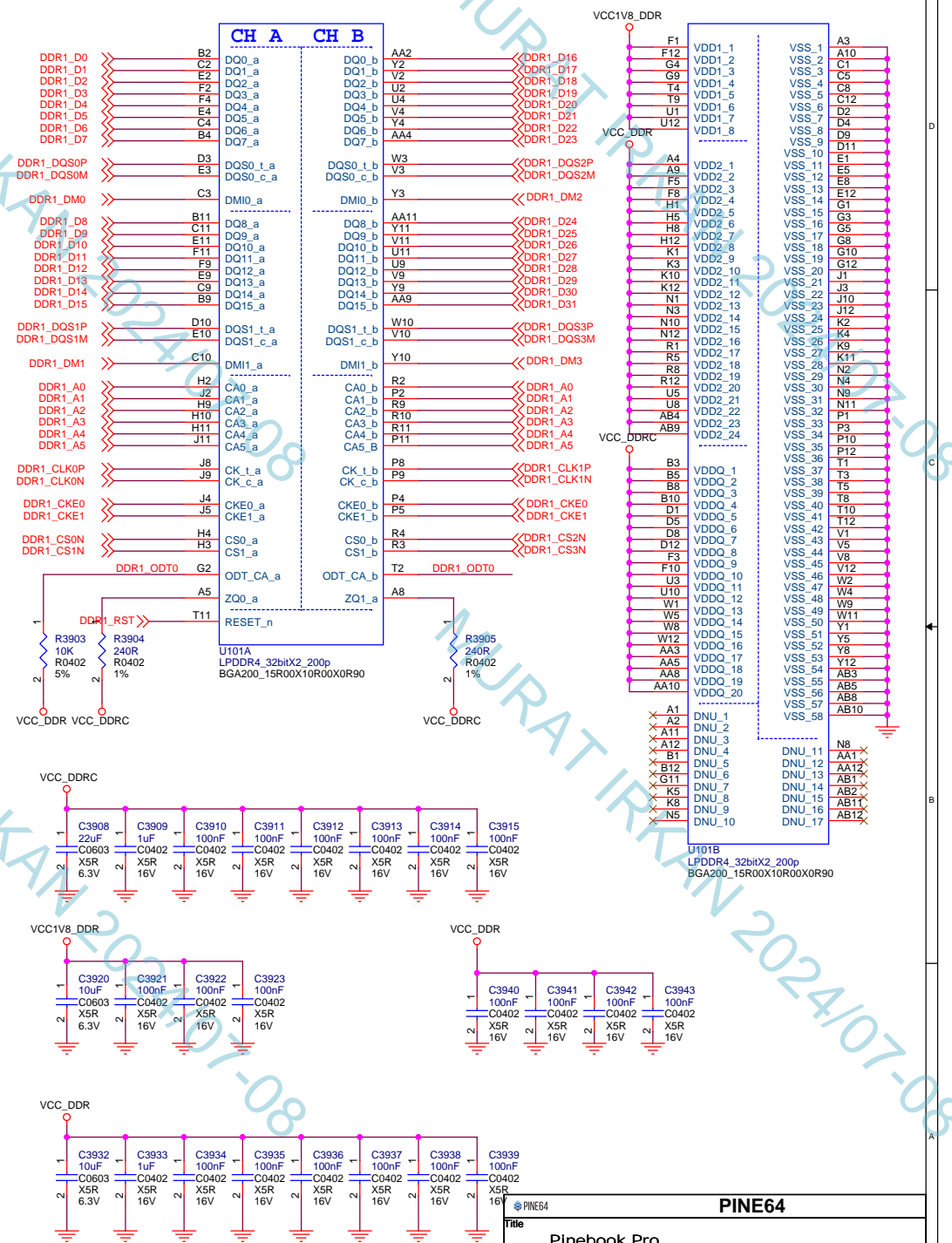
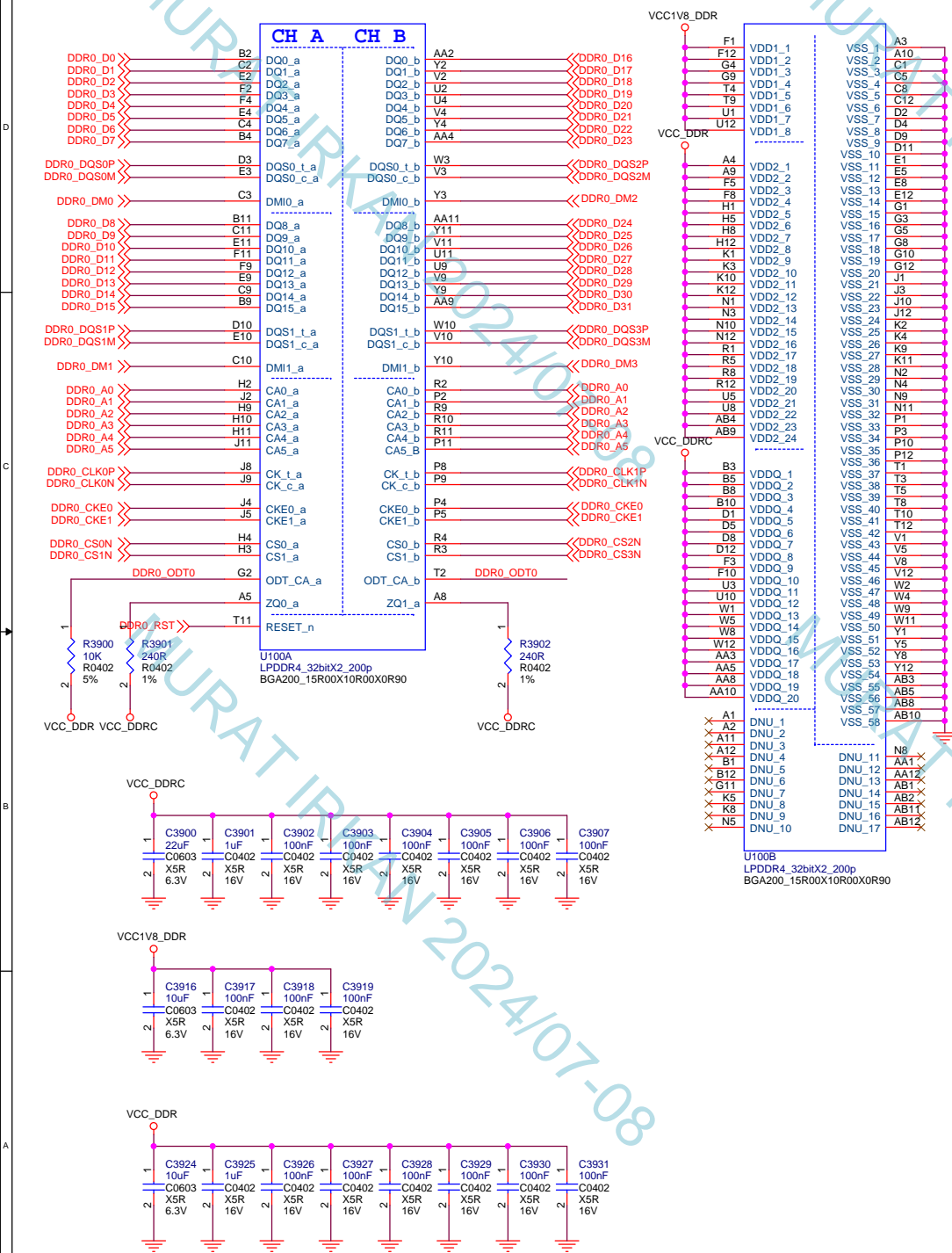


VCC3V0_SD power

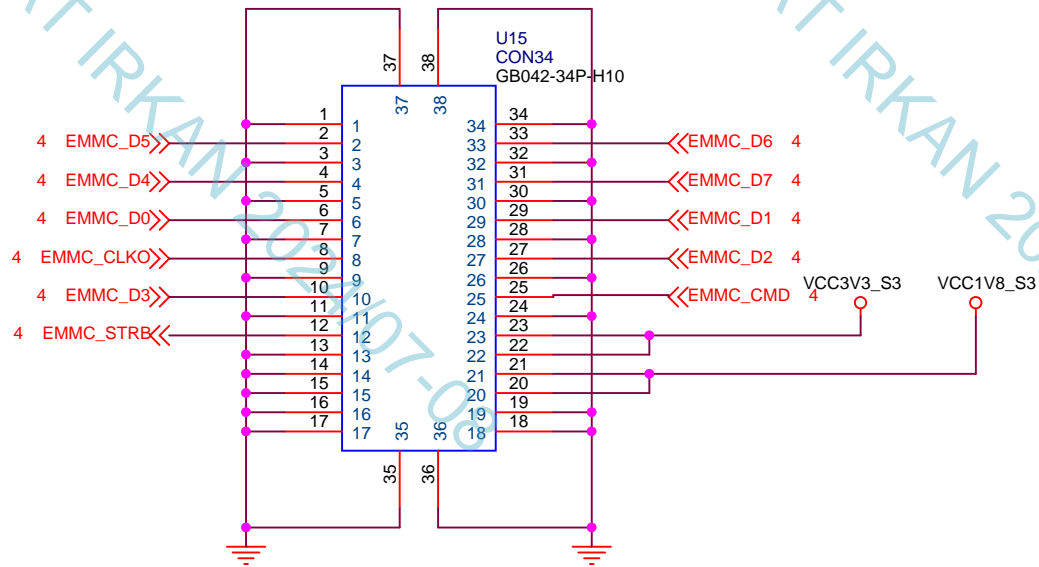


| | | | |
|--------|--|-----------------|--|
| PINE64 | | PINE64 | |
| Title | | Pinebook Pro | |
| Size | | Document Number | |
| B | | RK808-D 2 | |
| Date: | | Sheet 12 of 23 | |
| | | Rev V2.1 | |

LPDDR4

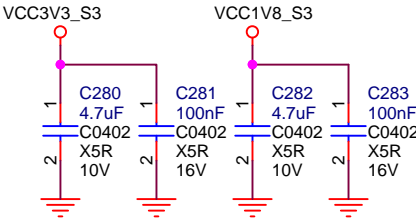


eMMC Port

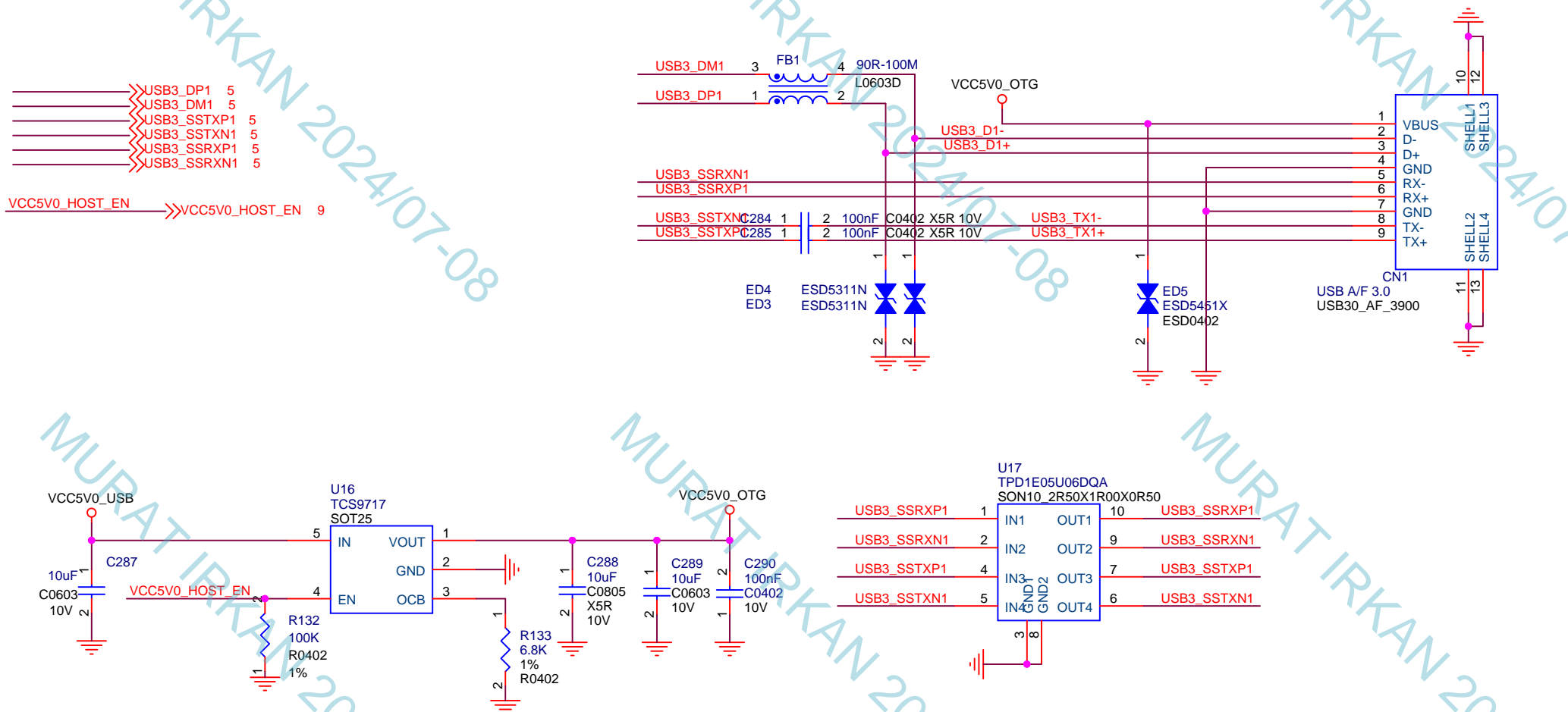


Note:
Reserve SW for Update.

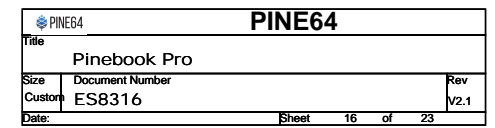
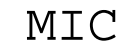
| | SEL | Shunt Status | Function |
|--|-----|--------------|----------|
| | 1 | OFF | eMMC |
| | ON | ON | MASKROM |
| | | | |



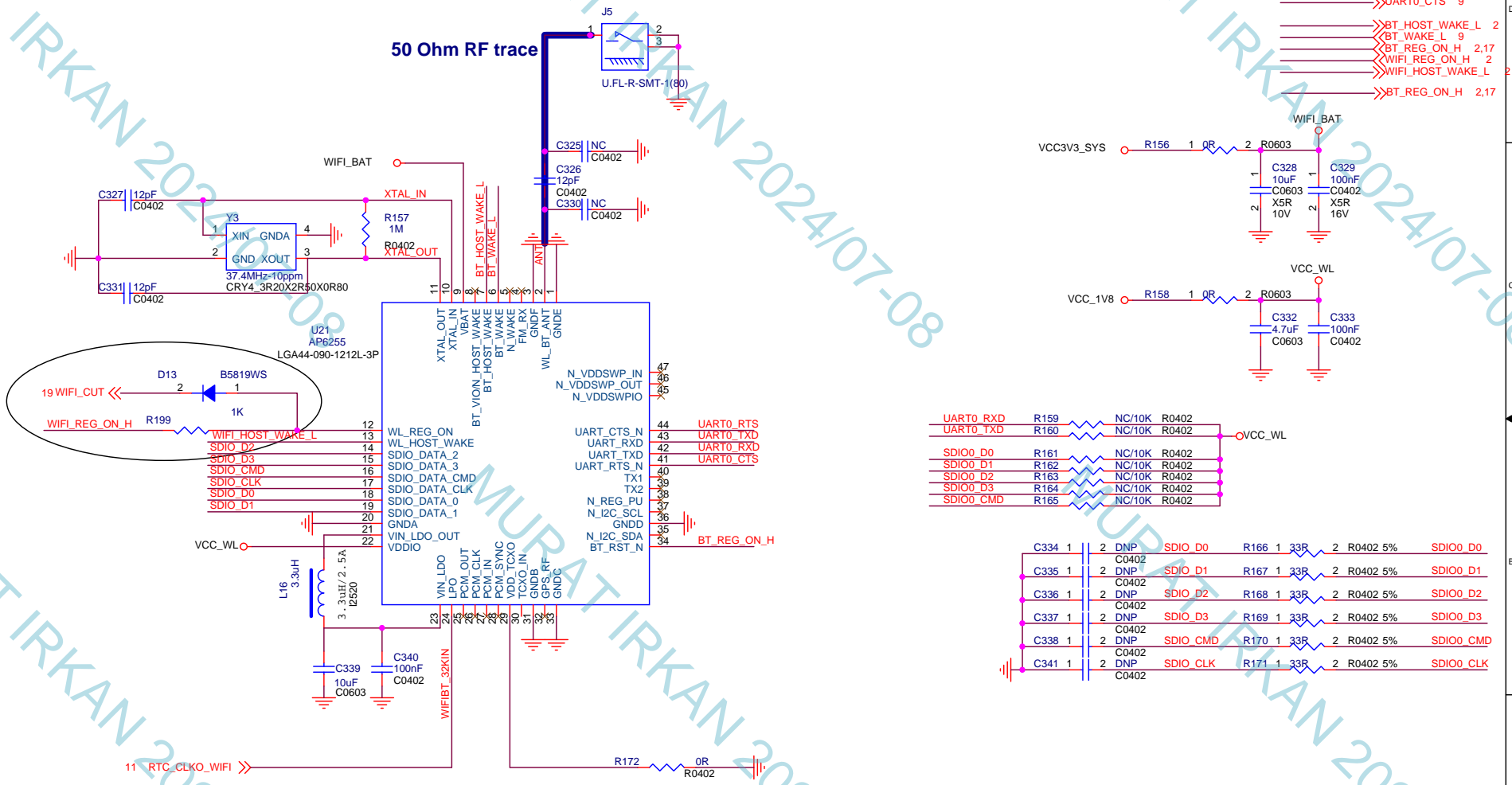
USB3.0 OTG port




SPEAKER

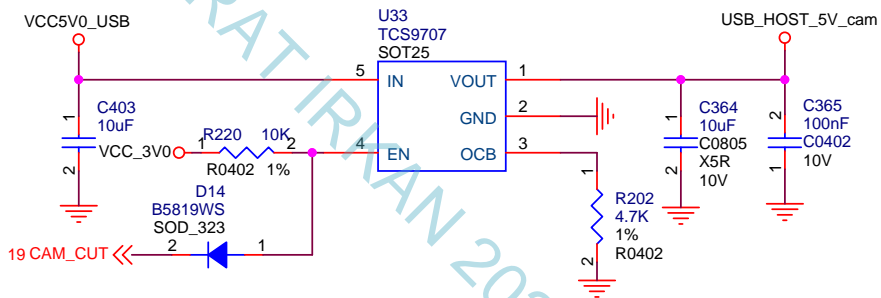


WIFI/BT MODULE

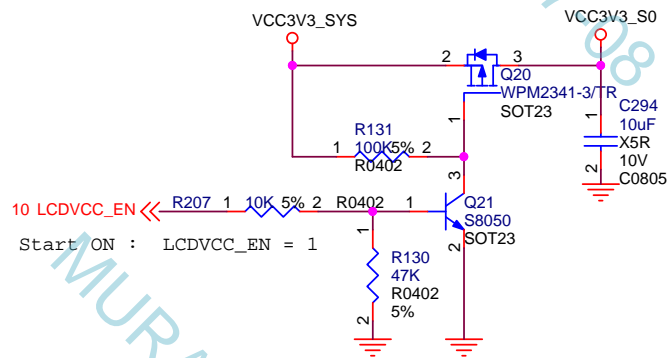


| | | | |
|--|-----------------|---------------|----------|
|  PINE64 | | PINE64 | |
| Title | | Pinebook Pro | |
| Size | Document Number | Rev | |
| B | WIFI | V2.1 | |
| Date: | | Sheet | 17 of 23 |

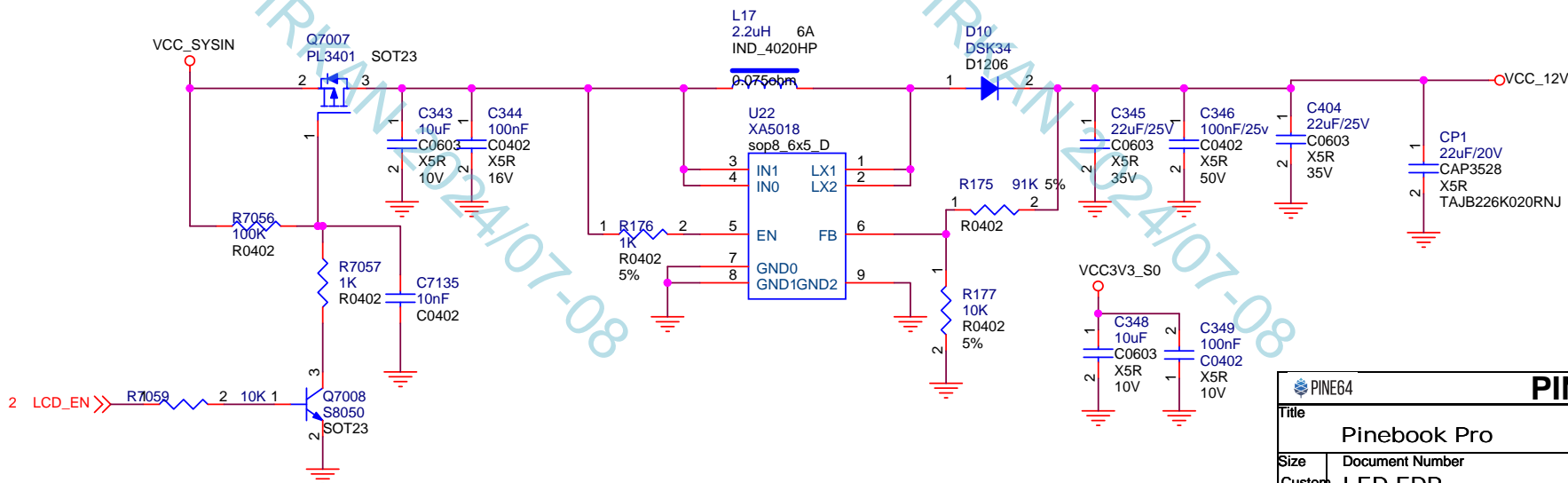
CAM POWER



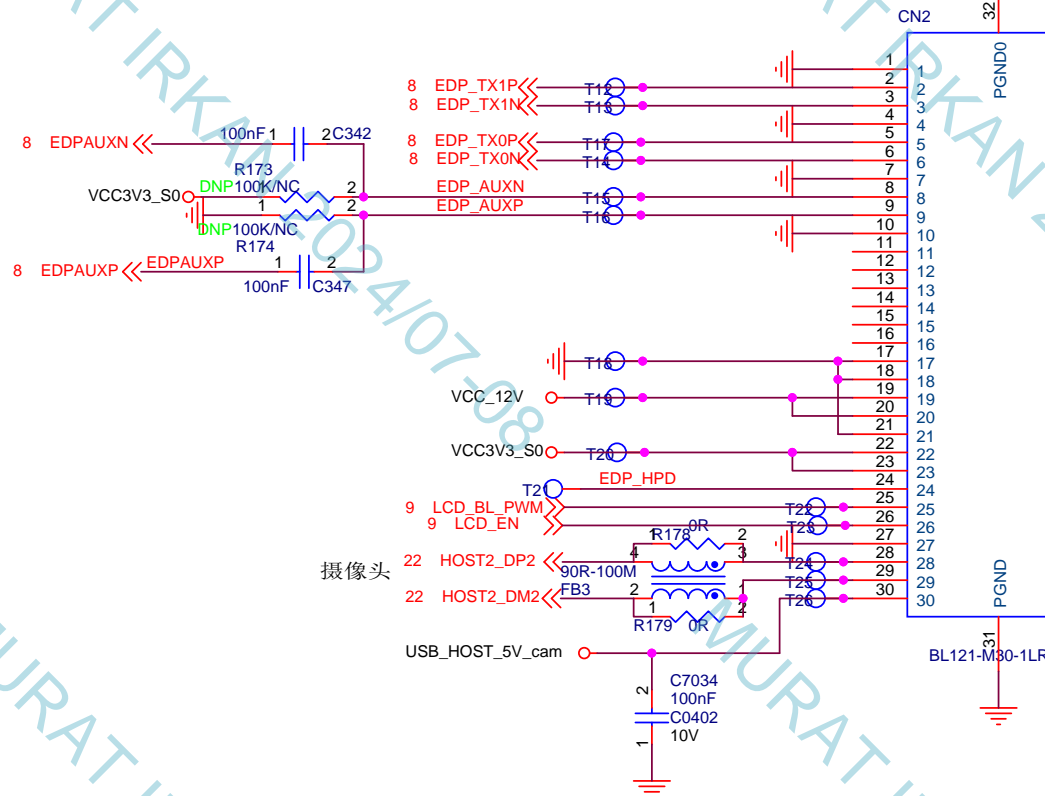
LCD DRIVER



BACKLIGHT

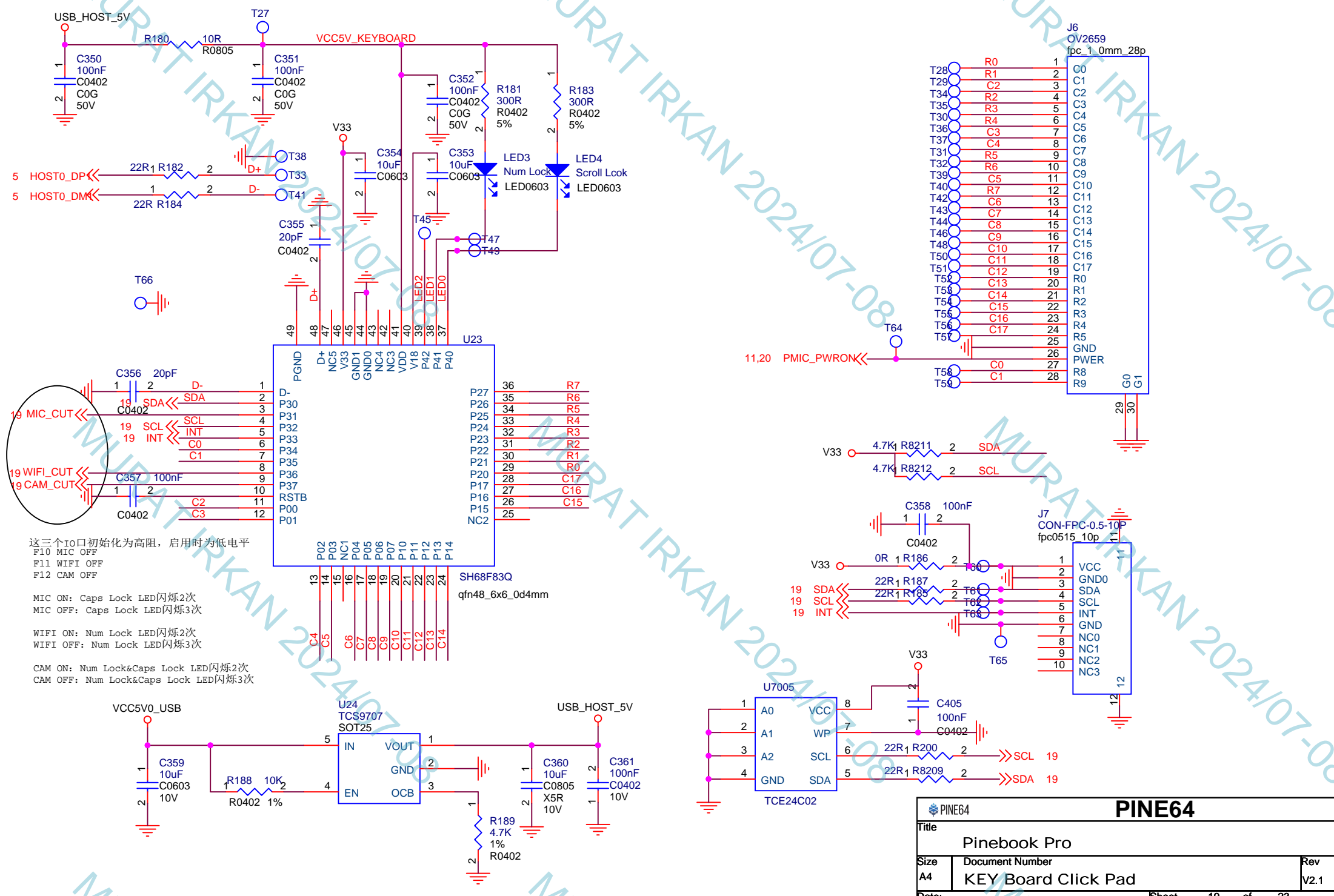


eDP Panel

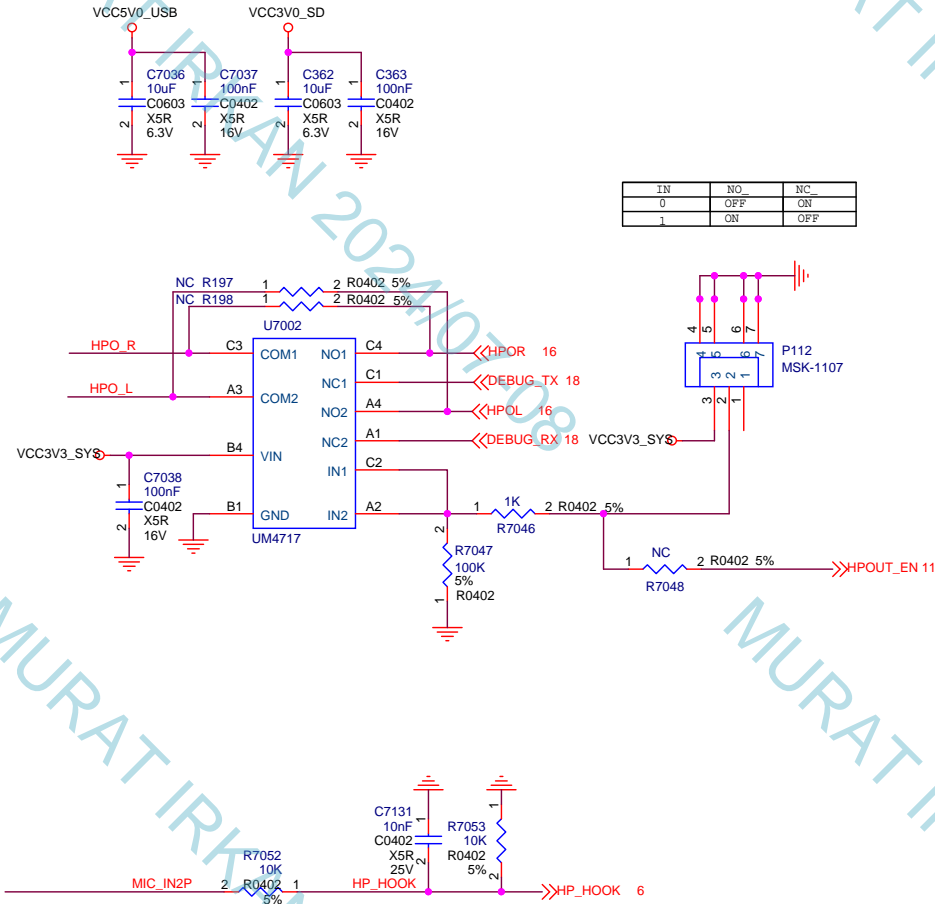
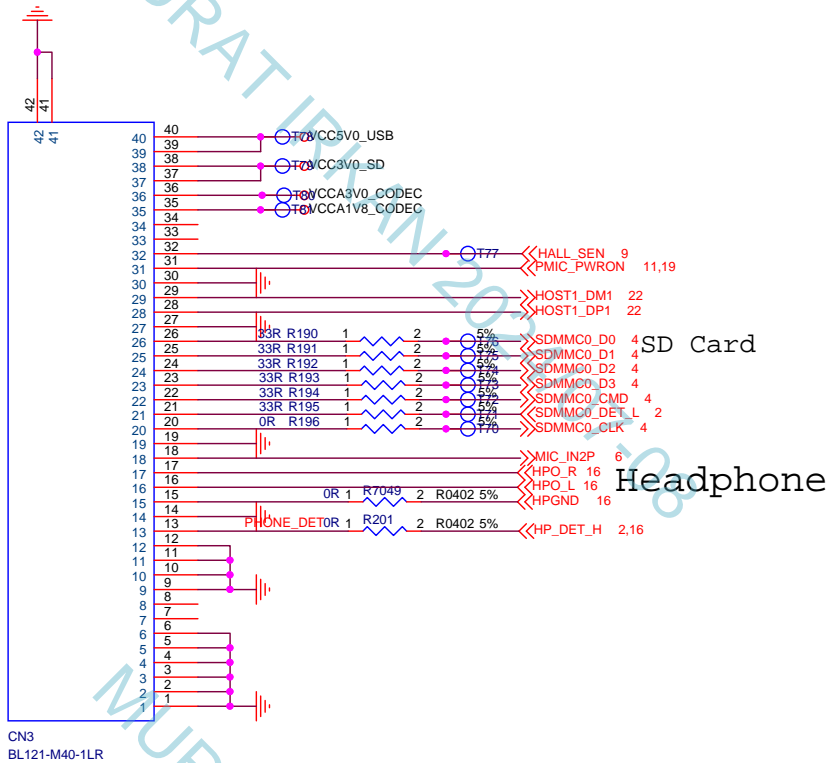


| PINE64 | | | |
|--------------|-----------------|--|----------|
| Title | | | |
| Pinebook Pro | | | |
| Size | Document Number | | Rev |
| Custom | LED EDP | | V2.1 |
| Date: | Sheet | | 18 of 23 |


KEY Board Click Pad



小板连接器：耳机、SD卡、USB



| IN | NO | NC |
|----|-----|-----|
| 0 | OFF | ON |
| 1 | ON | OFF |

| | | | |
|--|--------------------|---------------|--|
|  PINE64 | | PINE64 | |
| Title | | Pinebook Pro | |
| Size | Document Number | Rev | |
| B | PJ-TF CARD-USB 2.0 | V2.1 | |
| Date: | Sheet 20 of 23 | | |

USB HUB

VCC3V3_S0

VCC-3V0

DVDD AVDD

VCC-3V0

C7137
100nF
C0402
X5R
10V

VCC-3V0

C385 100nF
C0402
X5R
10V

C386 100nF
C0402
X5R
10V

C387 100nF
C0402
X5R
10V

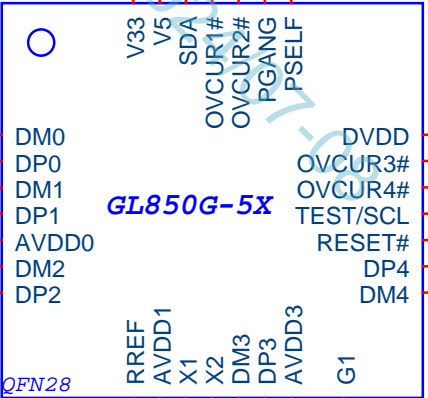
HOST1_DP 5
HOST1_DM 5
HOST1_DP1 20
HOST1_DM1 20
HOST2_DM2 18
HOST2_DP2 18

U32

GL850G-5X

QFN28

HOST1_DM 1
HOST1_DP 2
HOST2_DM2 3
HOST2_DP2 4
AVDD 5
HOST1_DM1 6
HOST1_DP1 7



DVDD

RESET

VCC-3V0 R216 1 10K 5% 2 RESET

C384 100nF
C0402
X5R
10V

VCC-3V0

PGANG R8213 1 10K 5% 2 R0402

OVCUR1 R213 1 10K 5% 2 R0402

PSELF R215 1 10K 5% 2 R0402

C382 20pF
C0402
X5R
10V



12MHz Y4
CRY4_3R20X2R50X0R80

C383 20pF
C0402
X5R
10V

PINE64

PINE64

Title

Pinebook Pro

Size

Document Number

Rev

Custom

USB HUB

V2.1

Date:

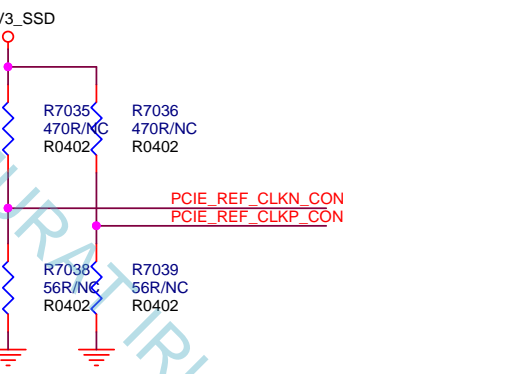
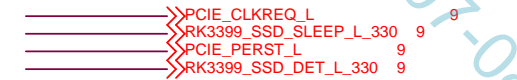
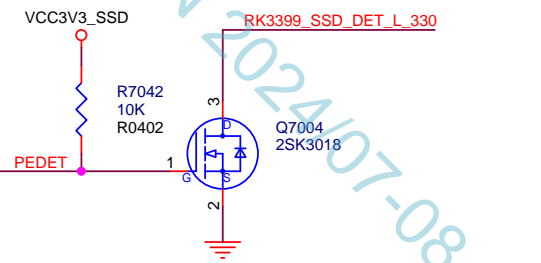
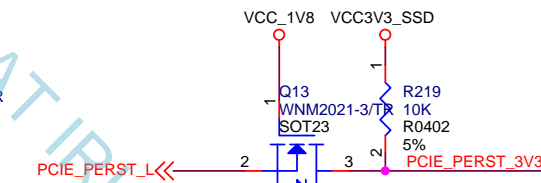
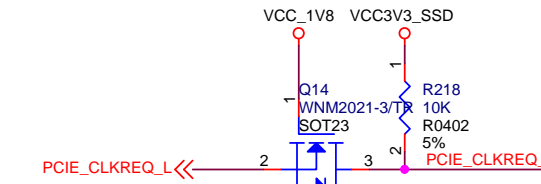
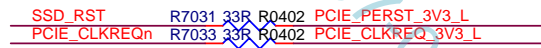
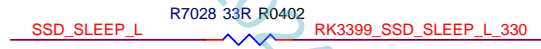
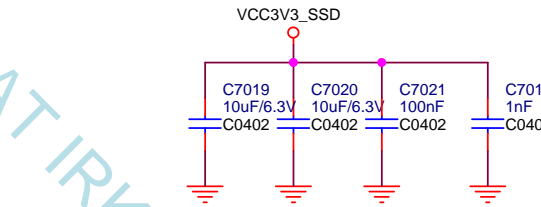
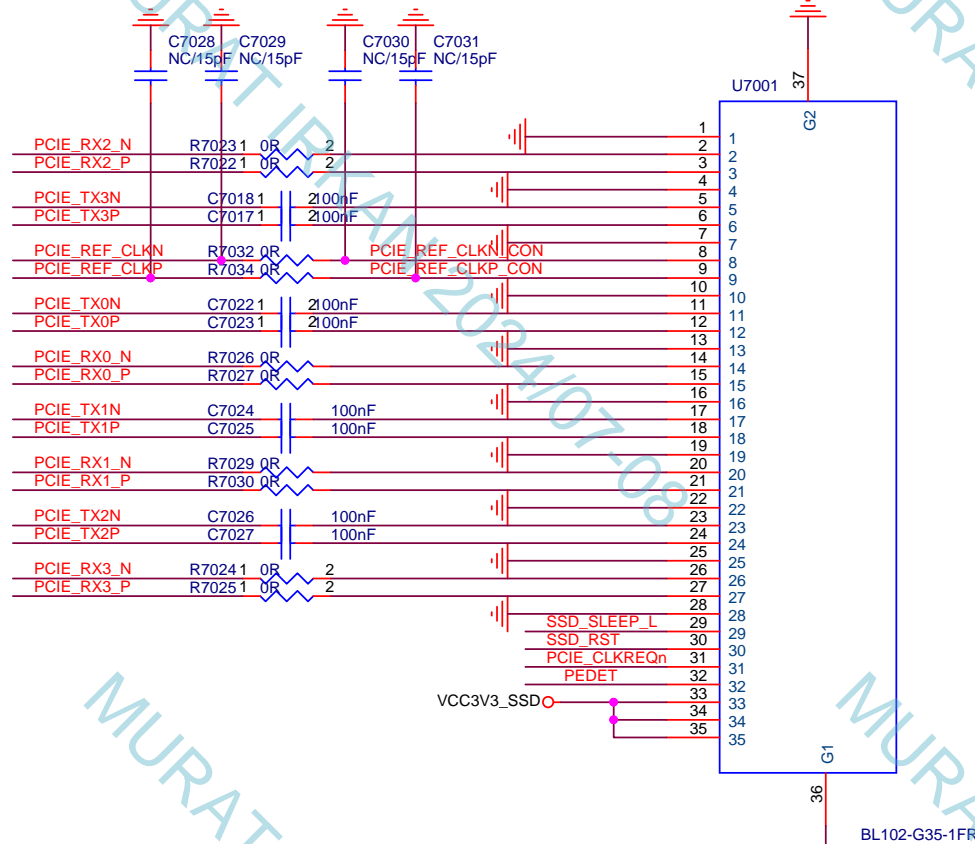
Sheet

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of

23

NGFF M.2 FPC



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|--------|-----------------|----------------|--|
| PINE64 | | PINE64 | |
| Title | | Pinebook Pro | |
| Size | Document Number | Rev | |
| Custom | SSD | V2.1 | |
| Date: | | Sheet 23 of 23 | |