VERSION HISTORY

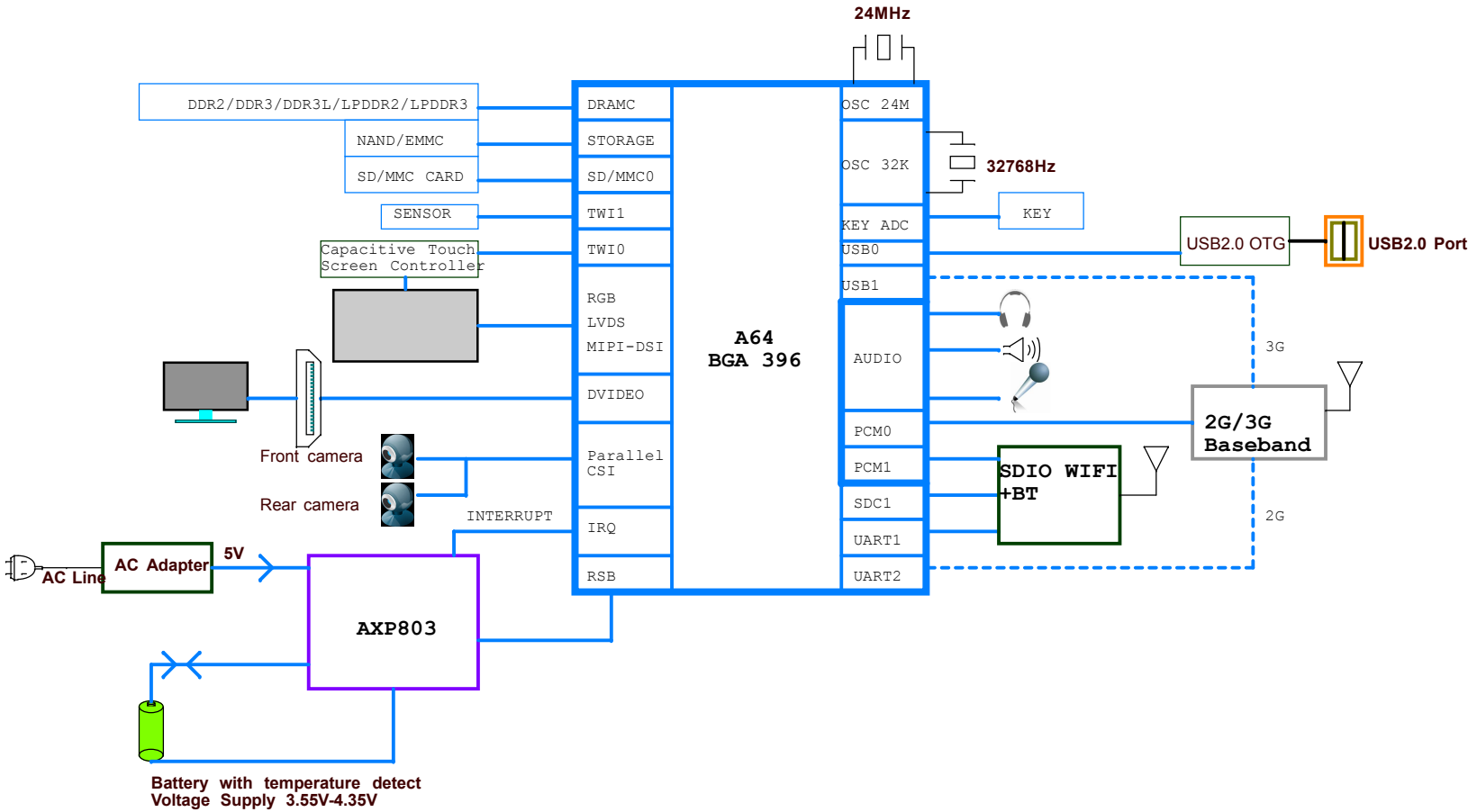
Index:

01 VERSION HISTORY
02 BLOCK DIAGRAM
03 POWER TREE
04 LPDDR3 FGBA178
05 CPU
06 PMIC
07 FLASH
08 AUDIO
09 USB/T-CARD
10 CAMERA
11 LCM/CTP
12 SENSORs/MT/KEY
13 DIGITAL VIDEO
14 WIFI-BT
15 LCD-eDP
16 EDP/MIPI-LCD

Revision	Description	Date	Drawn	Checked	Approved
Ver 3.0	Release version	2017-05-03			

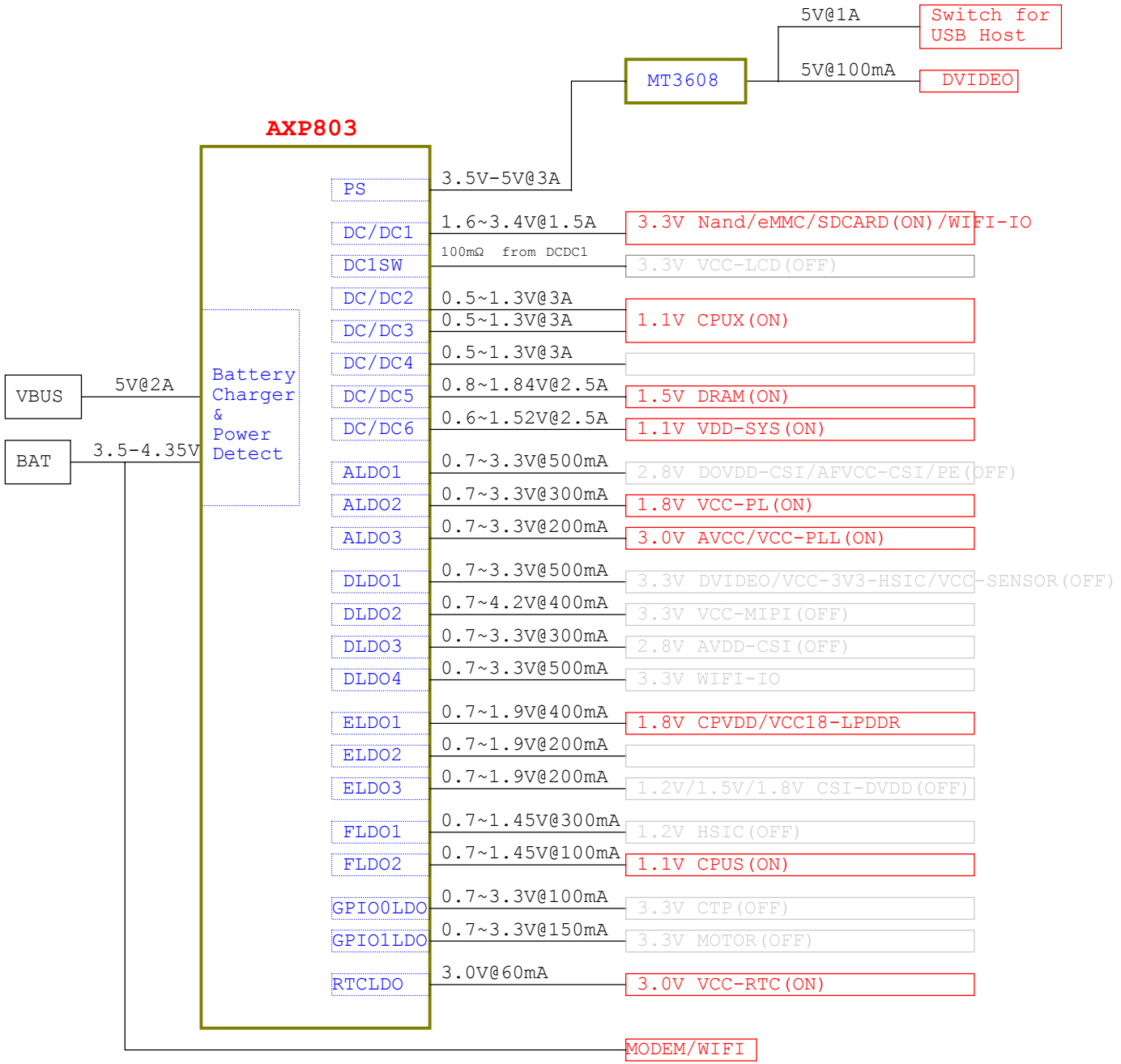
	PINE64
Title	Pinebook
Document Number	VERSION HISTORY
Size A3	Rev V3.0
Date: Wednesday, May 03, 2017	Sheet 1 of 16

BLOCK DIAGRAM



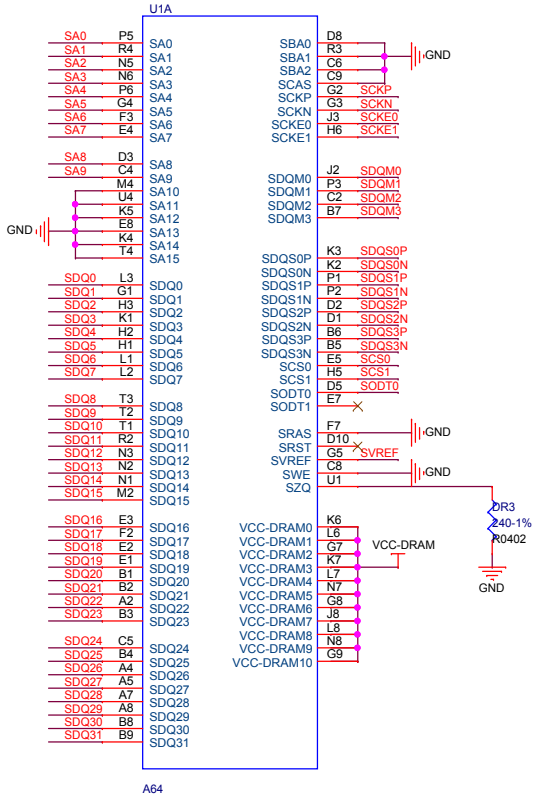
	PINE64	
Title	Pinebook	
Document Number	BLOCK DIAGRAM	
Size A3		Rev V3.0
Date: Wednesday, May 03, 2017	Sheet 2 of 16	

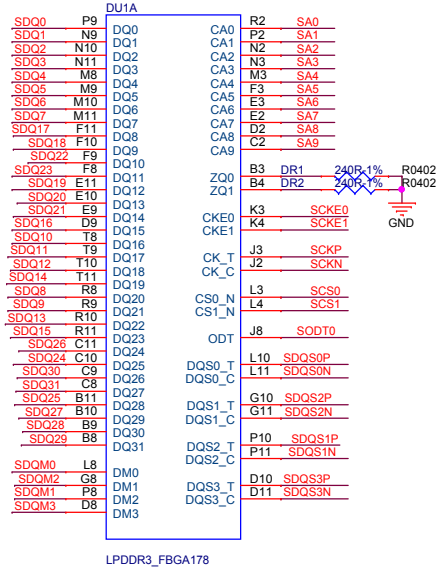
POWER TREE

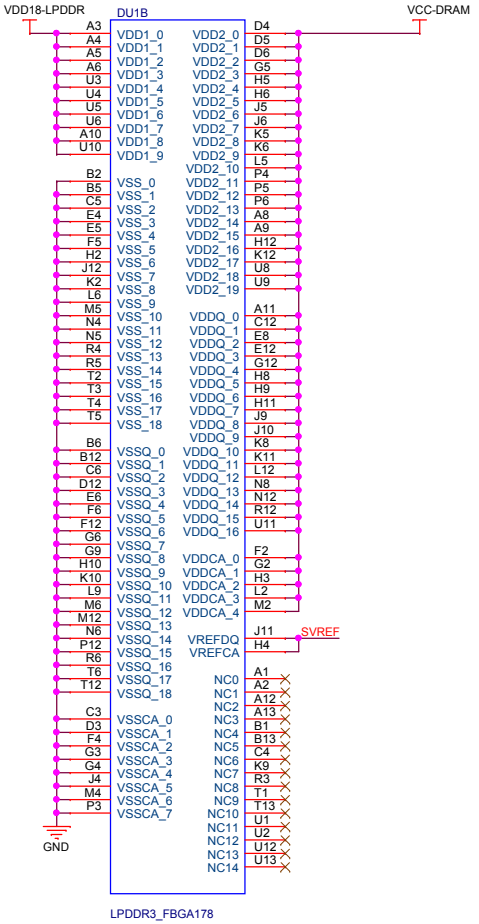


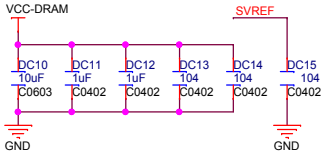
	PINE64
Title	Pinebook
Document Number	POWER TREE
Size	A3
Rev	V3.0
Date:	Wednesday, May 03, 2017
Sheet	3 of 16

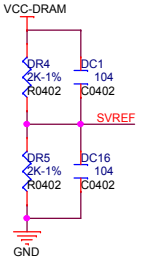
LPDDR3

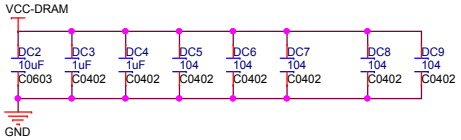


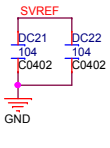


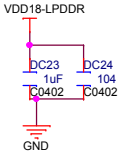


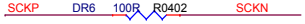












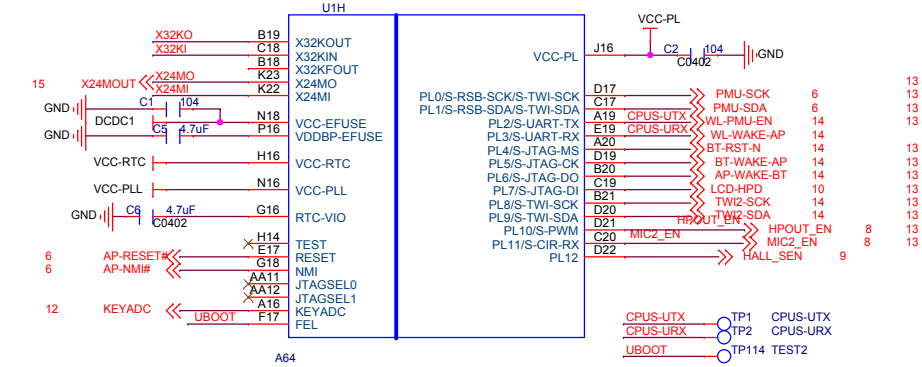
2017-01-10

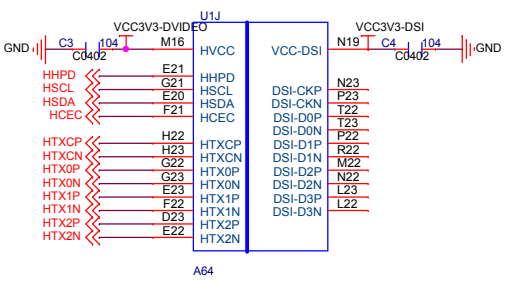
2017-01-10

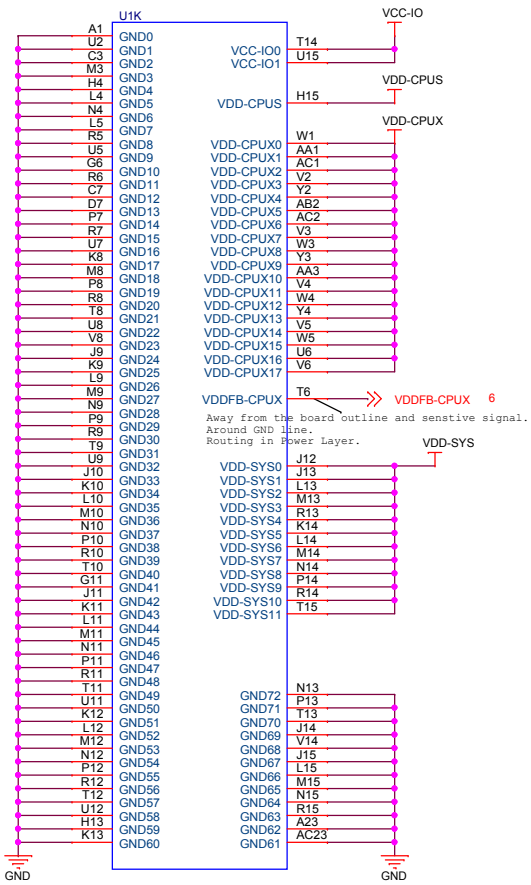
PINE64

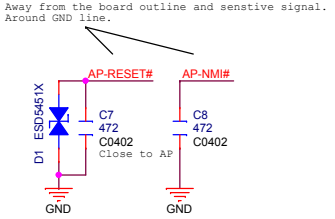
Title	Pinebook
Document Number	LPDDR3-FBGA178
Size	A3
Rev	V3.0
Date:	Wednesday, May 03, 2017
Sheet	4 of 16

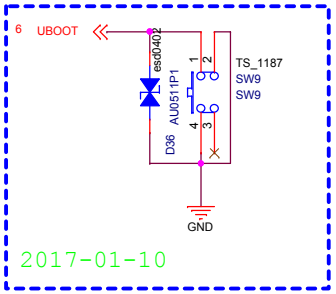
CPU

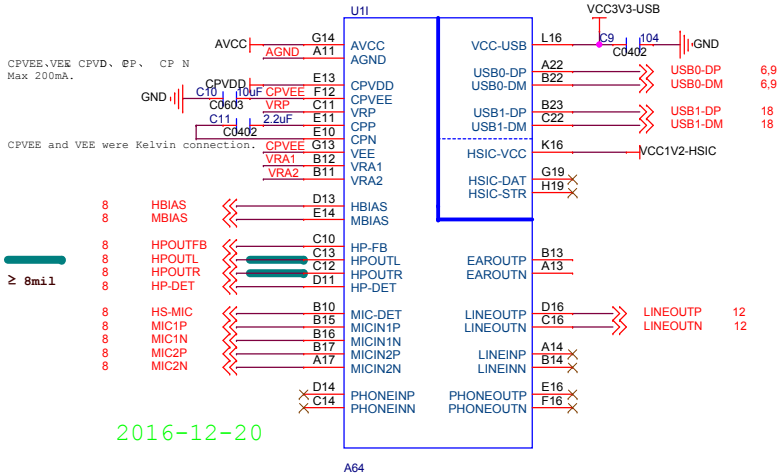


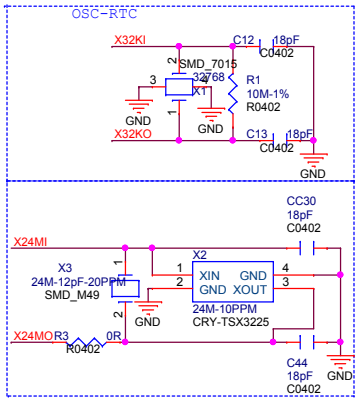


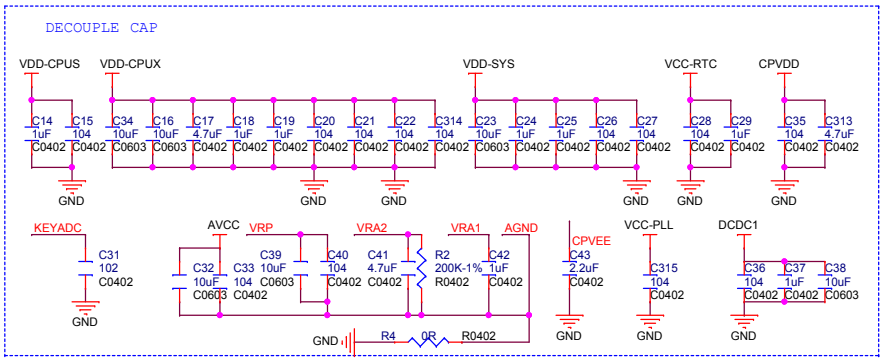


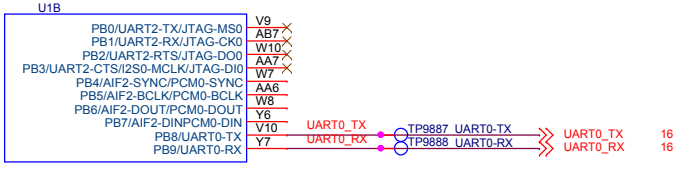












PINE64			
Title	Pinebook		
Size A3	Document Number CPU		Rev V3.0
Date: Wednesday, May 03, 2017		Sheet 5 of 16	

Power

From AC adapter

J1 DCIN DC-058 — DC 5V — F1 FUSE1206 — 5% CH — R9 1R R1206 — ESD1 DC5 0.1uF/25V C0603 — MLVG0402100NV05 V30 — OC6 10uF/25V C0805 — C241 100uF/16V C1210 — OC7 10uF/25V C0805 — GND

U9018 WS3205D: ACIN1, EN, GND, FLAG, ACIN, OUT1, OUT — R9693 NC 1206 5% CH — R9735 0402 100K 1% — C2705 10UF 20% 10V X5R 0603 — OC8 22uF/10V C1206 — OC9 22uF/10V C1206 — DC5V

5V BOOST USB HOST MODE POWER

PS — SWPA5012S1R0NT — L2071 1.0UH 4.4A BOOST_LX — C2050 10UF 30% 6.3V X5R 0402 — GPIO0-LDO — CH 5% 0402 2K R2053

U2004 LP6253H: LX, LX1, VIN, EN, GND, PAD, FB, OUT, OUT1 — IC

+V5P0_USB — C2051 22UF 20% 10V X5R 0603 — R2010 180K 1% CH 0402 — 5P0_BOOST_FB — R2011 56K 1% 0402 CH

Vout = 0.6 x (1 + RA/RB)
Imax = 3A

PMIC

U2 AXP803

ACIN1, ACIN2 — C45 10uF C0603 — DC5V — C47 10uF C0603 — USBVBUS — R9781 NC/0R R0805 — VBUS — C50 10uF C0603 — PS — PS1, PS2

Vth < 1.5V
R < 30m ohm
VGS < 4.5V

Q1 WPM1481 — D5 D4 D3 D2 D1 — VBAT — C52 10uF C0603 — C54 1uF C0402 — R7 0R01 R0805 — 4mil s

N_BATDRV, BATSENSE — LOADSENSE — C56 10uF C0603 — C58 10uF C0603 — L4 1.0uH-3A_DCR<0.1R SML2520_1P2H — LX_CHG — C64 10uF C0402 — VIN_CHG

Charger & Meter

充电 灯 — R2012 1K 0402 5% CH — D25 RED LED0603 — TS — EXT_CHG_LED — CHGLED

2017-01-18

DP, DM — 9,10 PWRON — R13 1K R0402 — C67 104 C0402 — PWRON — 9 USB-DRVVBUS — N_VBUSEN — VCC-RTC R15 10K R0402 — 5 PMU-SCK — 5 PMU-SDA — SCK, SDA — 5 AP-NMI# — 5 AP-RESET# — IRQ, PWROK — VCC_RTC

ALDOIN — C70 10uF C0603 — C71 10uF C0603 — ALDO1 — C74 4.7uF C0603 — ALDO2 — C76 4.7uF C0603 — ALDO3 — C78 4.7uF C0603 — ALDOs

C79 472 C0402 — GPIO0-LDO — C81 4.7uF C0603 — GPIO1-LDO — C9708 4.7uF C0603

2016-12-13

VINT — C85 1uF C0603 — C87 1uF C0603 — VREF

FLDOIN — C89 10uF C0603 — FLDO1 — C90 4.7uF C0402 — FLDO2 — C91 4.7uF C0603 — FLDOs

AXP803

DC/DC1

L1 1.0uH-2A_DCR<0.1R SML2520_1P2H — DCDC1 — C46 10uF C0603 — LX1, DCDC1, SWOUT, VIN1 — DC1-SW — C48 10uF C0603 — C49 10uF C0603

DC/DC2

L2 SML2520_1P2H 1.0uH-3A_DCR<0.1R — LX2_1, LX2_2, DCDC2, VIN2_1, VIN2_2 — VDDFB-CPUX — C51 10uF C0603 — C53 10uF C0603

DC/DC3

L3 SML2520_1P2H 1.0uH-3A_DCR<0.1R — LX3_1, LX3_2, DCDC3, VIN3 — VDDFB-CPUX — C57 10uF C0603 — C59 10uF C0603

DCDC2-3 — C55 10uF C0603

DC/DC4

LX4, DCDC4, VIN4

DC5SET :
Floating : 1.24V
GND : 1.5V
VINT : 1.36V

A and B mount Close to AP.

DC/DC5

L5 CD21 1.0uH-2A_DCR<0.1R — DCDC5 — A — C65 10uF C0603 — LX5, DCDC5, VIN5, DC5SET — C66 10uF C0603 — R14 NC/0R R0402

DC/DC6

L6 CD21 1.0uH-2A_DCR<0.1R — DCDC6 — B — C69 10uF C0603 — LX6, DCDC6, VIN6 — C68 10uF C0402

DLDOs

DLDOIN — DLDO1 C72 10uF C0402 — DLDO2 C73 4.7uF C0402 — DLDO3 C75 4.7uF C0402 — DLDO4 C80 4.7uF C0402

ELDOs

ELDOIN — ELDO1 C83 10uF C0402 — ELDO2 C84 4.7uF C0603 — ELDO3 C86 4.7uF C0402

GND1, GND2, GND3, GND4, GND5

400mil
150mil
100mil
50mil
30mil

1.1V

DCDC6 — VDD-SYS
FLDO2 — VDD-CPUS
DCDC2-3 — VDD-CPUX

1.2V

FLDO1 — VCC1V2-HSIC

1.2V/ 1.35V/ 1.5V

DCDC5 — VCC-DRAM

1.8V

ELDO1 — R17 NC-0R R0603 — VCC-PC — VDD18-LPDDR — CPVDD
ELDO2 — +V1P8A

3V

ALDO3 — AVCC, VCC-PLL, VCC-RTC

BB

WIFI

DLDO4 — VCC-WIFI
DLDO4 — VCC-PG — VCC-WIFI-IO
ELDO1 — R19 NC/0R R0402 — R20 0R R0402

CAMERA

ELDO3 — DVDD1V8-CSI
ALDO1 — AFVCC-CSI, DOVDD-CSI, VCC-PE

3.3V

DLDO1 — VCC3V3-DVIDEO, VCC3V3-DSI, VCC-SENSOR
DCDC1 — VCC-CARD, VCC-NAND, VCC-PC, VCC-EMMC, VCC3V3-USB, VCC-IO, VCC-DMIC, VCC-PD
R18 0R R0402
DC1-SW — VCC-LCD
GPIO1-LDO — VCC-CTP

5V

+V5P0_USB — VCC-5V

PL

ALDO2 — VCC-PL

eDP 2.5V

DLDO2 — VDD2V5-LCD

BAT

J9715 HS8805 — TP9884 TP_SMD_1 — VBAT — TP_5X2_5MM — BATTHERM1 — TS — BATT_THERM1 — TP_SMD_1 — R26 NC/10K R0402 — TP_5X2_5MM — BATT_THERM2 — TP9882 TP_SMD_1 — GND7 TP_5X2_5MM

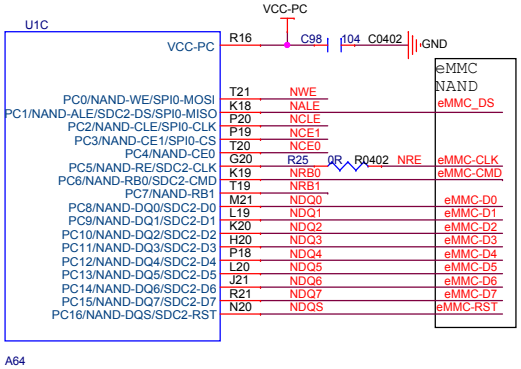
20170329

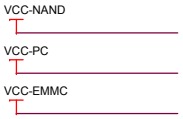
DCIN

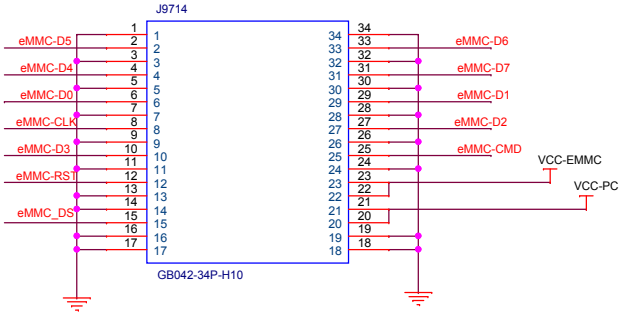
DC5V — Max 2A — R28 NC/0R R0805 — Max 2A — USBVBUS

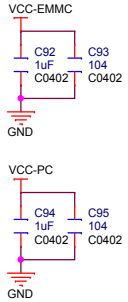
PINE64	
Title	Pinebook
Document Number	POWER
Size	A3
Rev	V3.0
Date:	Wednesday, May 03, 2017
Sheet	6 of 16

NAND/eMMC







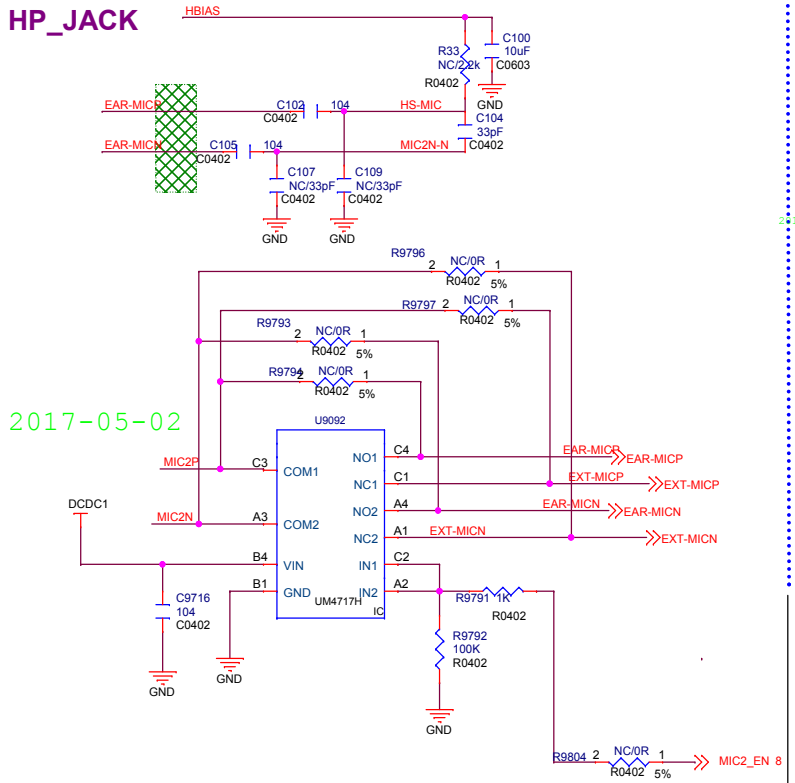


Both eMMC NAND and first TSOP NAND layout together

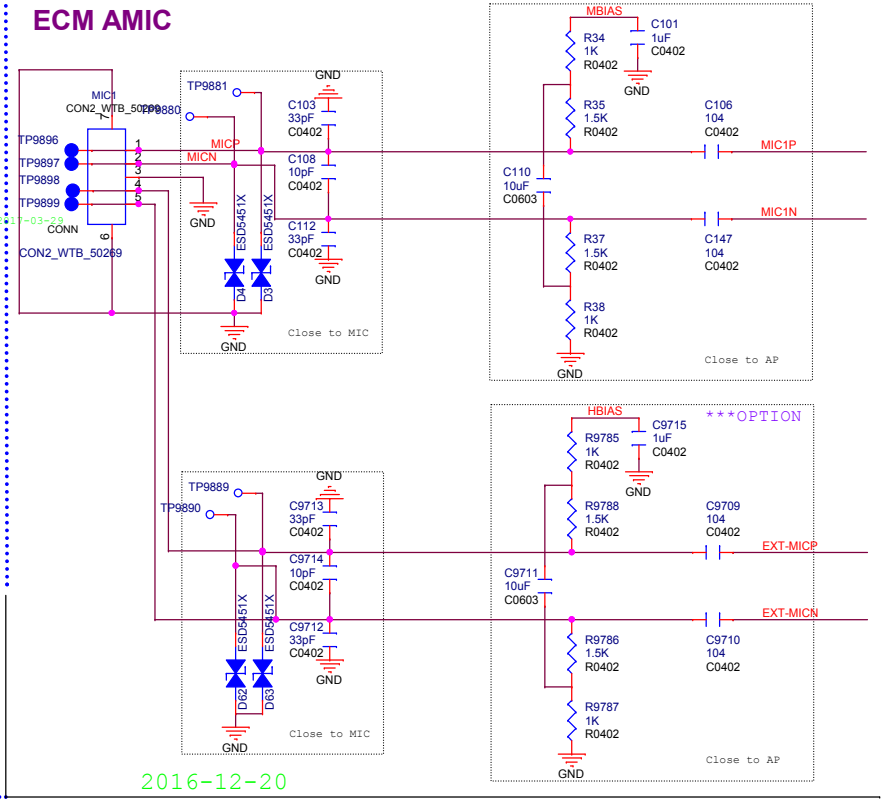
PINE64		
Title: Pinebook		
Size: A3	Document Number: EMMC/NAND flash	Rev: V3.0
Date: Wednesday, May 03, 2017	Sheet 7 of 16	

AUDIO

HP_JACK



ECM AMIC



HPOUTFB
MIC2N-N

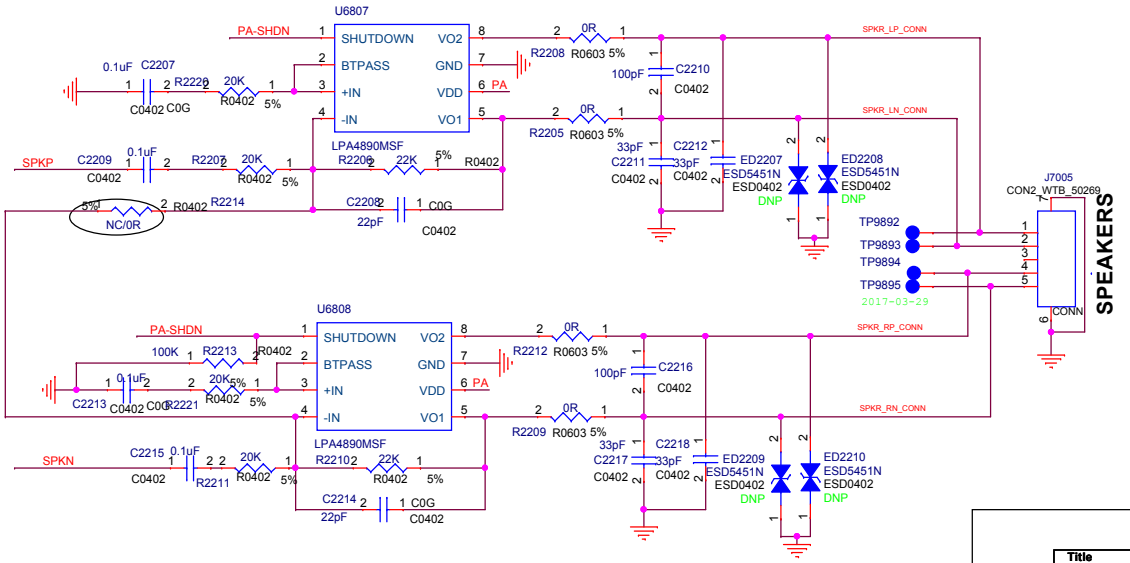
5 MBIAS
5 HBIAS
5 HP-DET
5 HPOUTFB
5 HPOUTL
5 HPOUTR
5 MIC2N
5 MIC2P
5 MIC1N
5 MIC1P
5 HS-MIC
5 PHONE1N
5 PHONE1P
5 LINEOUTP
5 LINEOUTN
9 PA-SHDN

SPKP
SPKN
PA-SHDN

AVCC
VCC-5V

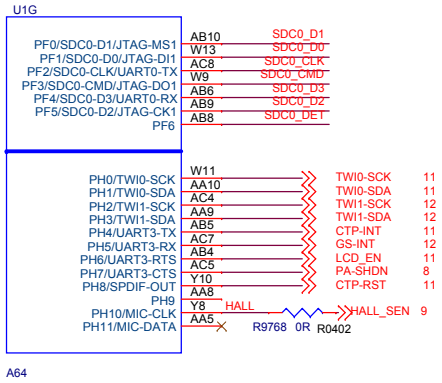
+V5P0_USB
30mil
0R R2222 R0805 5%
PA
C238 22uF C0805
C237 22uF C0805

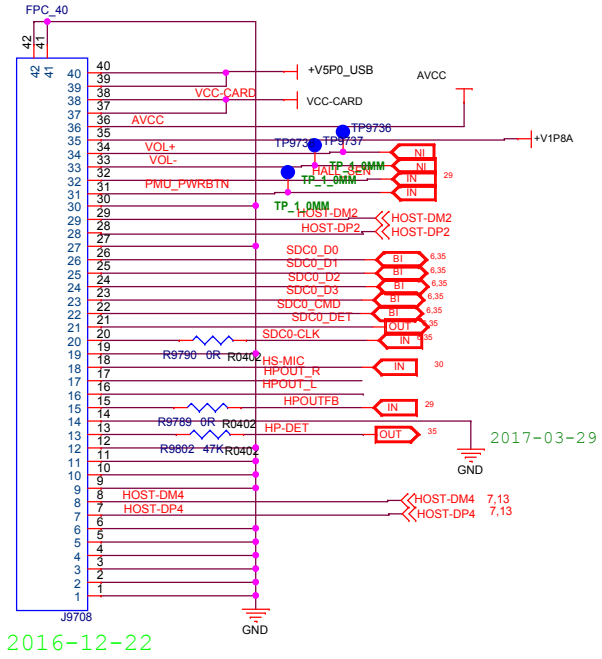
SPEAKER

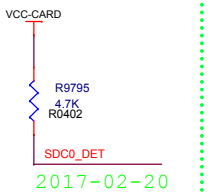


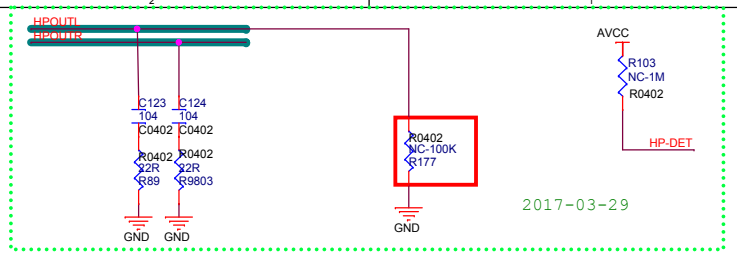
PINE64		
Title	Pinebook	
Size A3	Document Number AUDIO	Rev V3.0
Date: Wednesday, May 03, 2017	Sheet 8 of 16	

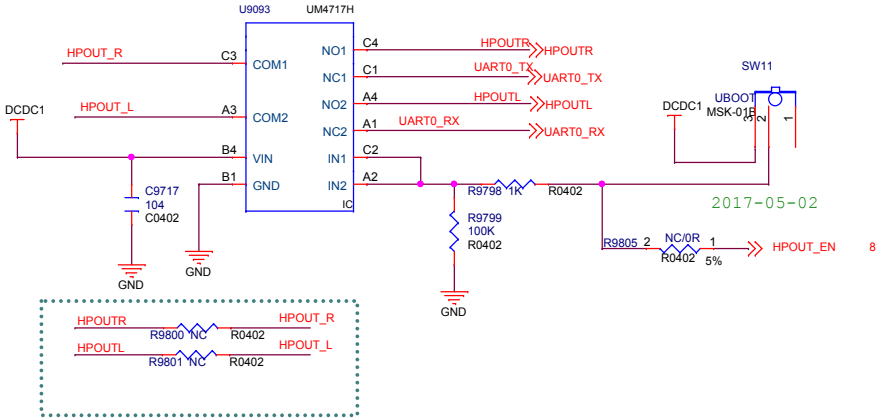
T-CARD/USB

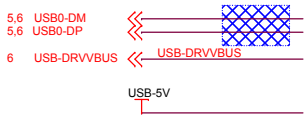


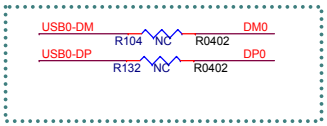






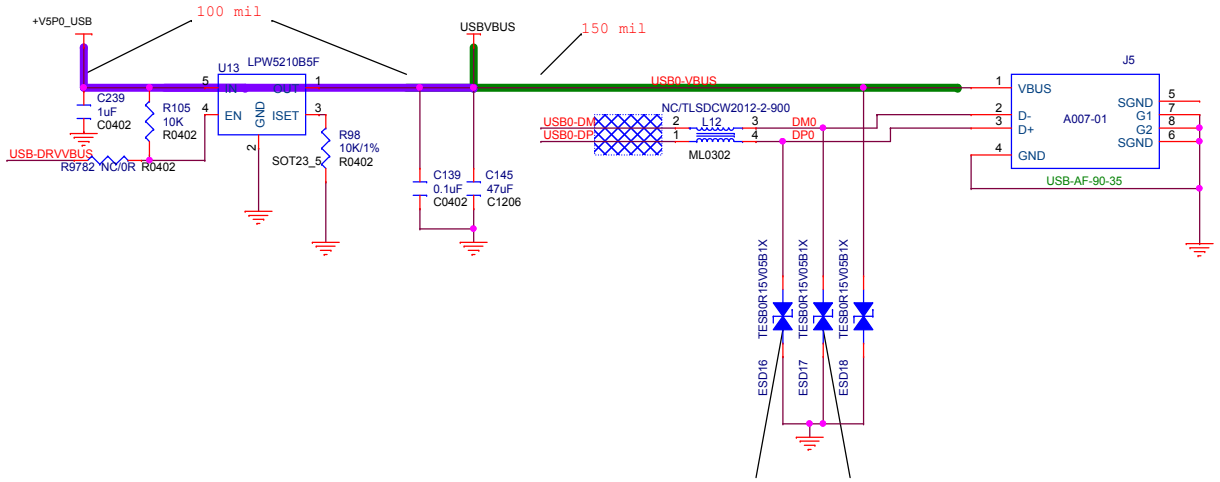






USB

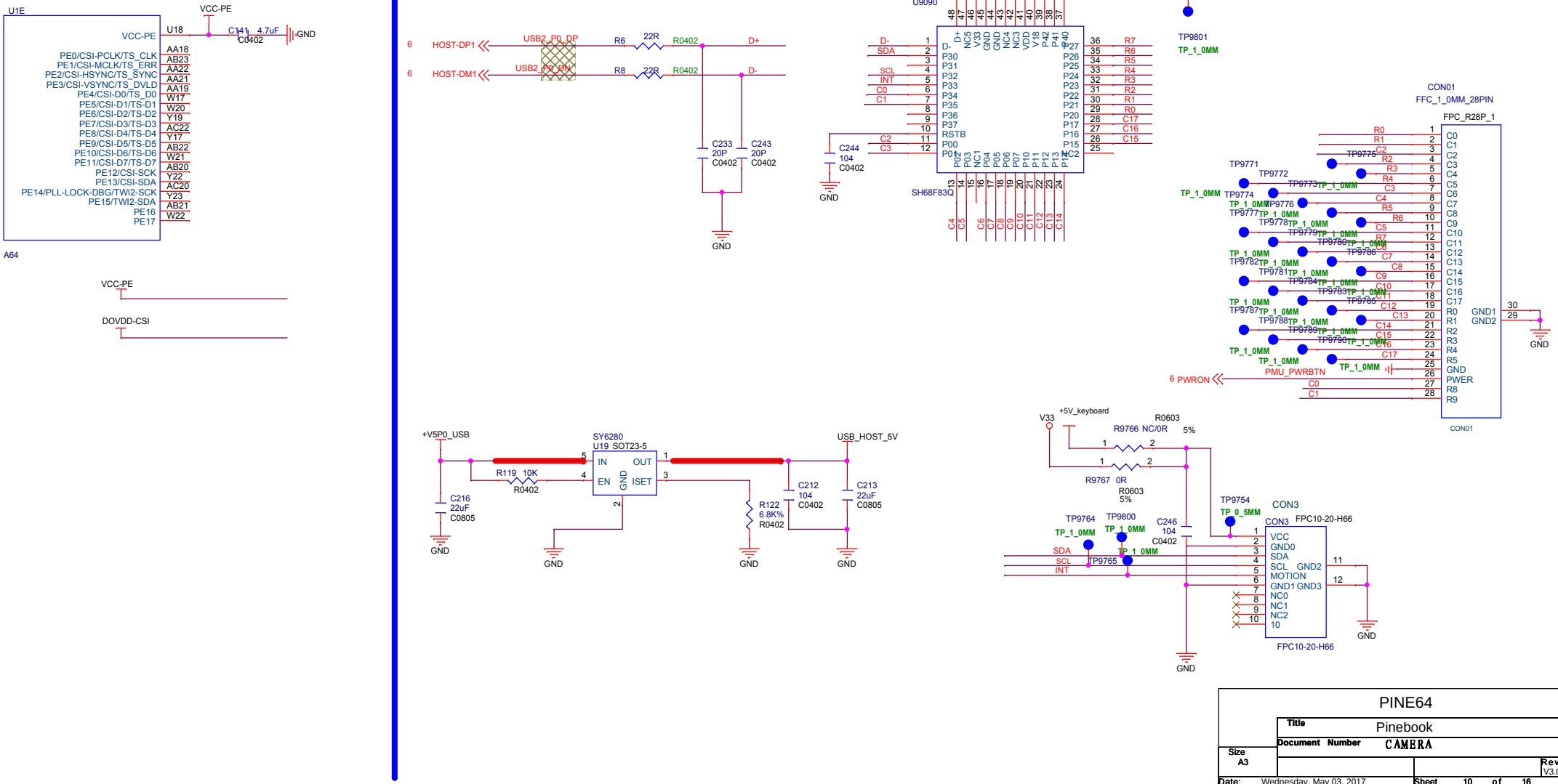
Differential pairs Z0= 90 ohm



The ESD part's parasitic capacitance < 5pF.

	PINE64	
	Title: Pinebook	
Size: A3	Document Number: T-CARD/USB	Rev: V3.0
Date: Wednesday, May 03, 2017	Sheet 9 of 16	

CAMERA

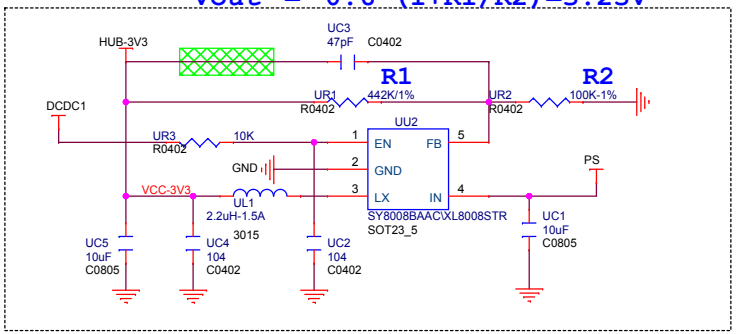


PINE64	
Title	Pinebook
Document Number	CAMERA
Size	A3
Rev	V3.0
Date:	Wednesday, May 03, 2017
Sheet	10 of 16

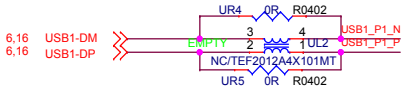
CTP

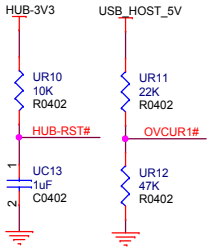
VCC-3V3

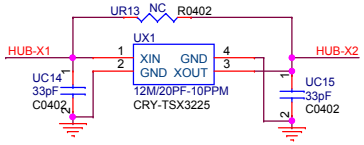
Vout = 0.6*(1+R1/R2)=3.25V



Differential pairs
Z0= 90 ohm +/-5 ohm

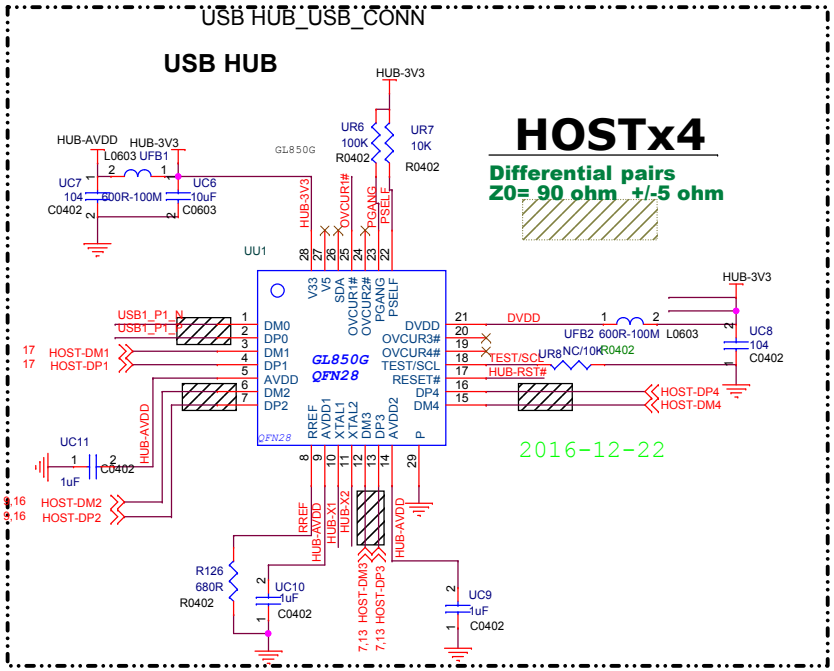


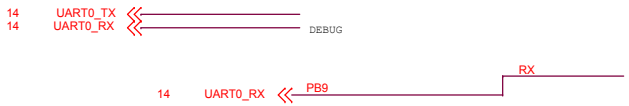


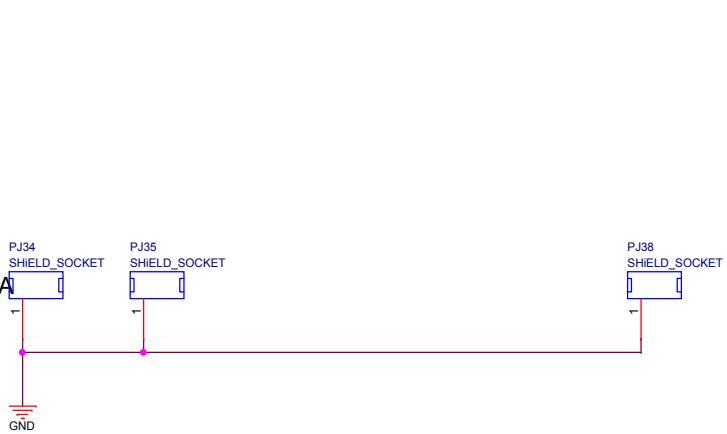


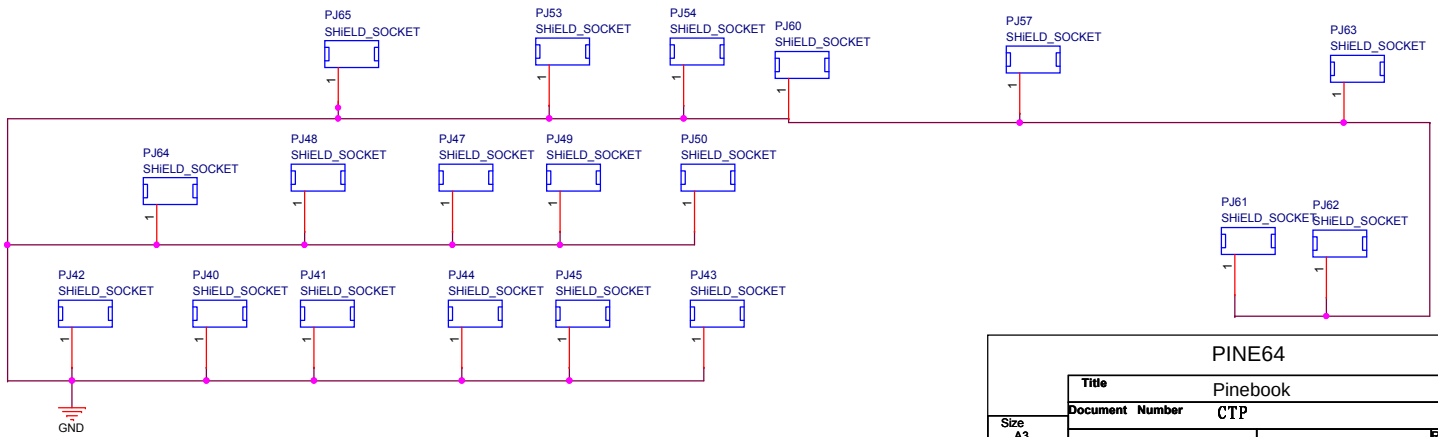
USB HUB_USB_CONN

USB HUB







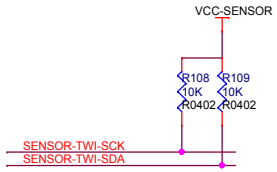


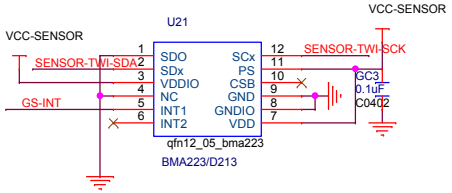
PINE64

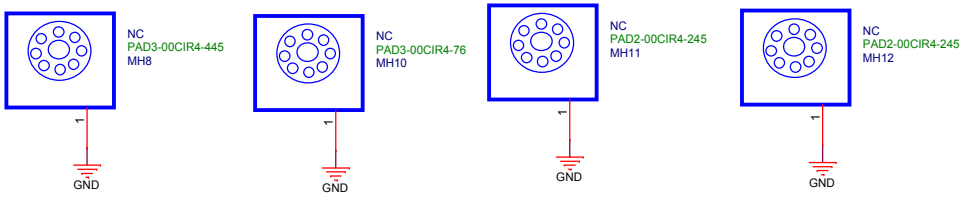
Size A3	Title: Pinebook	
	Document Number: CTP	Rev V3.0
Date: Wednesday, May 03, 2017	Sheet 11 of 16	

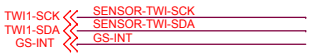
SENSORs/MT/KEY

SENSOR

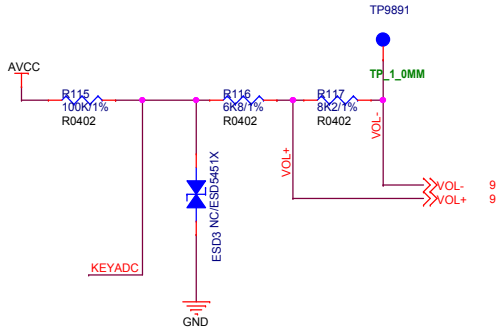






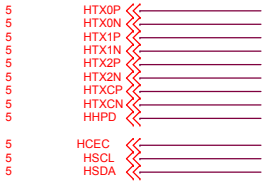


KEY

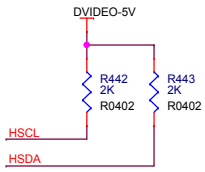


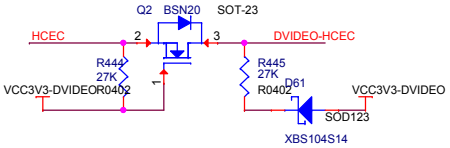
PINE64			
Title: Pinebook			
Size: A3	Document Number: SENSOR/KEY		Rev: V3.0
Date: Wednesday, May 03, 2017		Sheet 12 of 16	

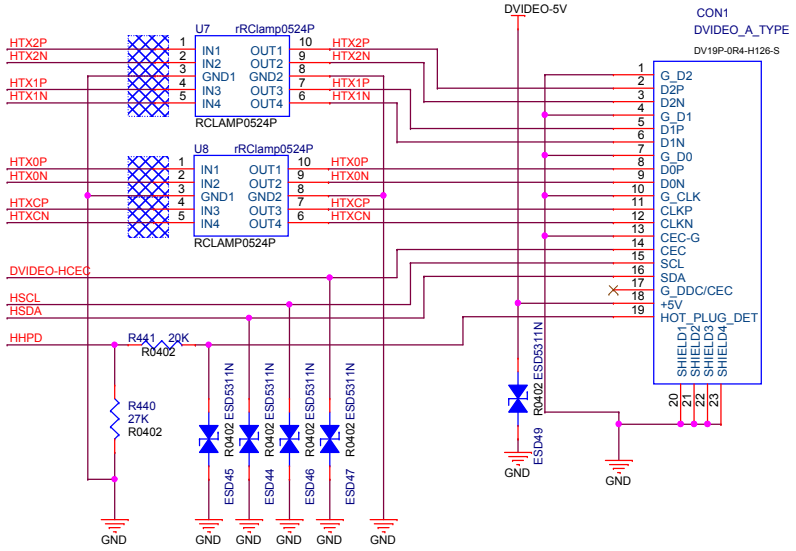
DIGITAL VIDEO



Differential pairs
Z0= 100 ohm

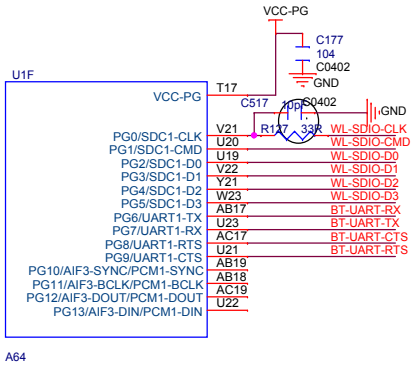




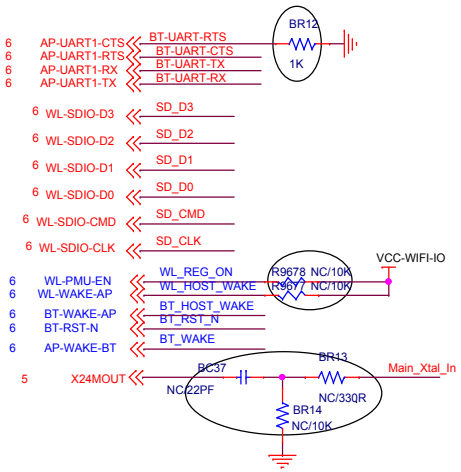


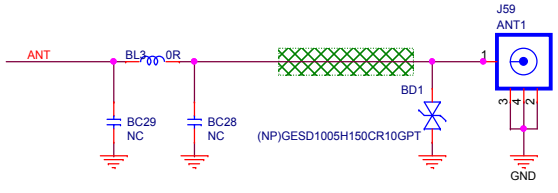
PINE64			
Title: Pinebook			
Document Number: DIGITAL VIDEO			
Size: A3			Rev: V3.0
Date: Wednesday, May 03, 2017		Sheet 13 of 16	

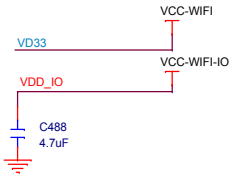
RTL8703AS/8723BS-COB

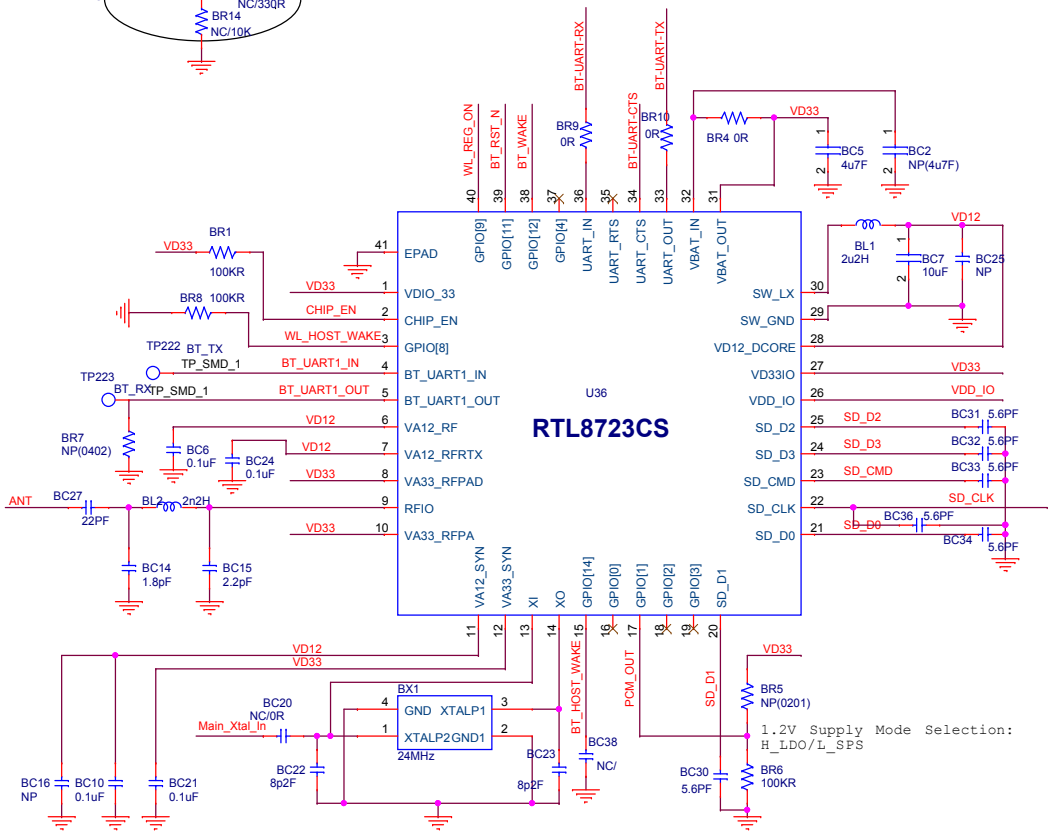


VCC-WIFI-IO









1.2V Supply Mode Selection:
H_LDO/L_SPS

GPIO[8]/EXT_WOL/WL_WAKE_HST/WL_LED/BT_LED/ANTSEL2/ SD_OB_INT

BT_UART1_IN/BT_3DD_SEL/BT_GPIO/BT_LED/ ANTSEL1/ANTSEL1

BT_UART1_OUT/BT_3DD_SYNC/BT_GPIO/(WL_WAKE_HST)/TEST_MD_SEL/ANTSEL0

GPIO[9]/WL_DISn/EXT_WOL0

GPIO[11]/BT_DISn/ BT_EXT_WOL

GPIO[12]/HST_WAKE_DEV/LTE_COEX/FM_I2S_SDOUT/WPS

GPIO[4]/EEPROM_SEL/WL_LTE_UART_OUT/BT_GPIO(BT_WAKE_HST)/FM_I2S_WS/FM_I2C_SDA

GPIO[14]/DEV_WAKE_HST/(WL_WAKE_HST)

GPIO[0]/ICFG0/BT_GPIO0/PCM_IN

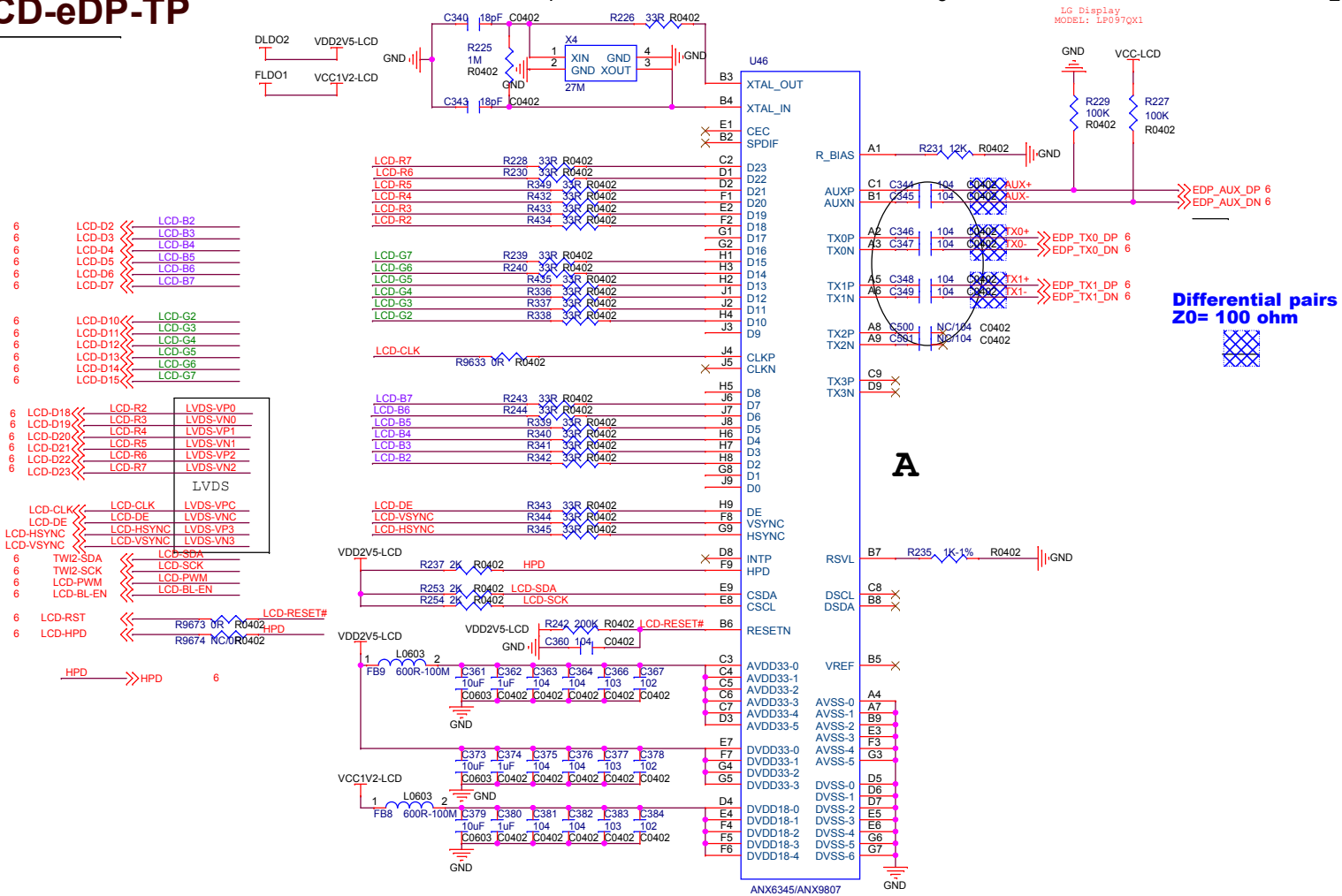
Supply Voltage Options

Part	VBAT==3.3V	VBAT=3.3~5.5V(Battery)
BR4	0R	NP
BR1	100KR	NP(CHIP_EN: Off Module Pull High)
BC2	NP	4.7uF

PINE64

Title	Pinebook	
Document Number	WIFI+BT	
Size A3		Rev V3.0
Date: Wednesday, May 03, 2017	Sheet 14 of 16	

LCD-eDP-TP



PINE64

Title: Pinebook

Document Number: LCD-eDP

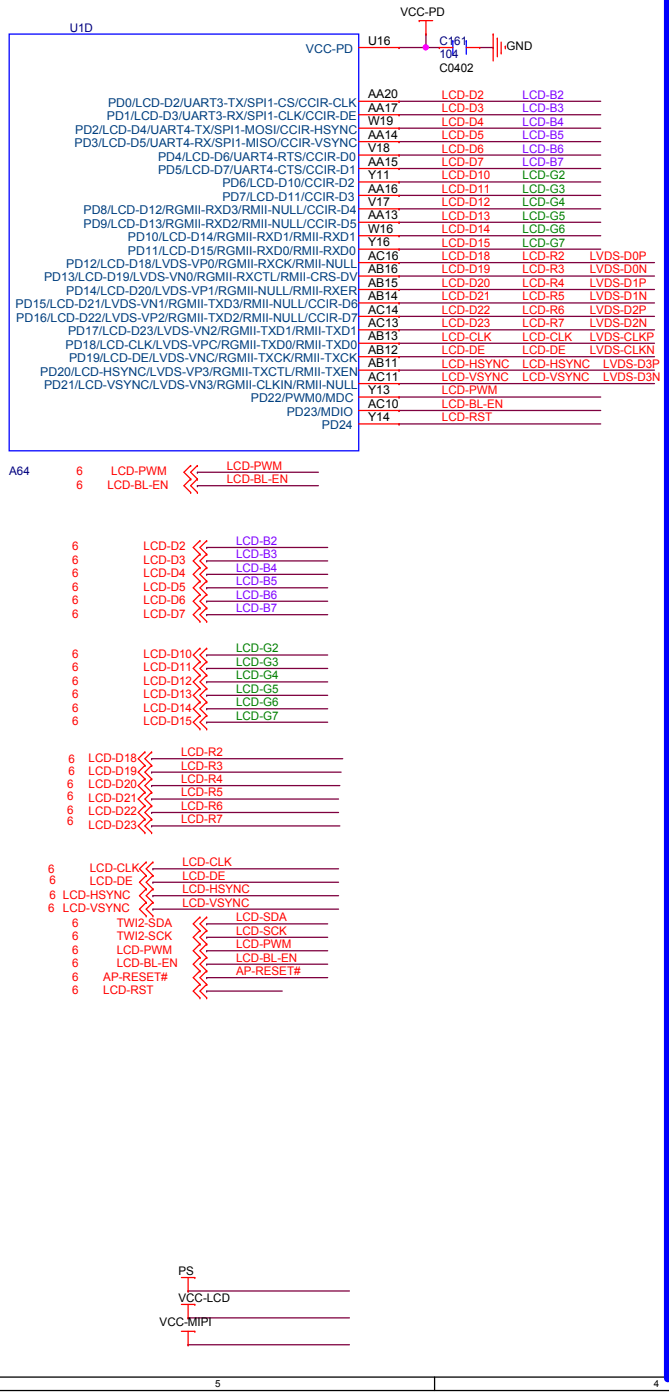
Size: A3

Rev: V3.0

Date: Wednesday, May 03, 2017

Sheet 15 of 16

EDP/MIPI



A64
6 LCD-PWM
6 LCD-BL-EN

6 LCD-D2
6 LCD-D3
6 LCD-D4
6 LCD-D5
6 LCD-D6
6 LCD-D7

6 LCD-D10
6 LCD-D11
6 LCD-D12
6 LCD-D13
6 LCD-D14
6 LCD-D15

6 LCD-D18
6 LCD-D19
6 LCD-D20
6 LCD-D21
6 LCD-D22
6 LCD-D23

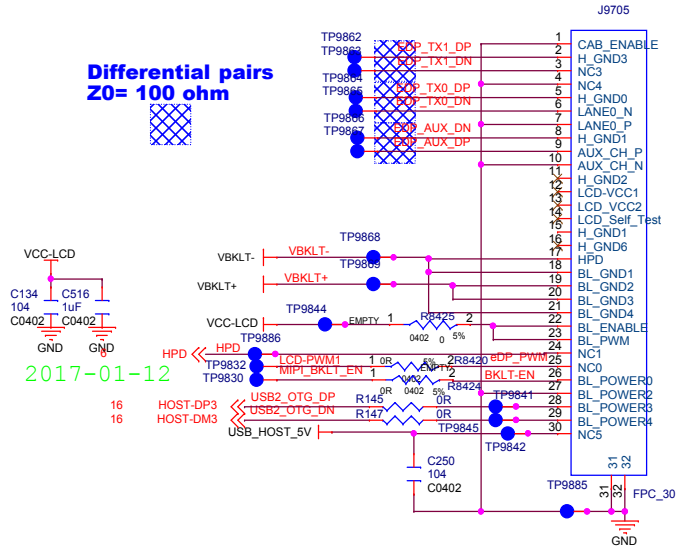
6 LCD-CLK
6 LCD-DE
6 LCD-HSYNC
6 LCD-VSYNC

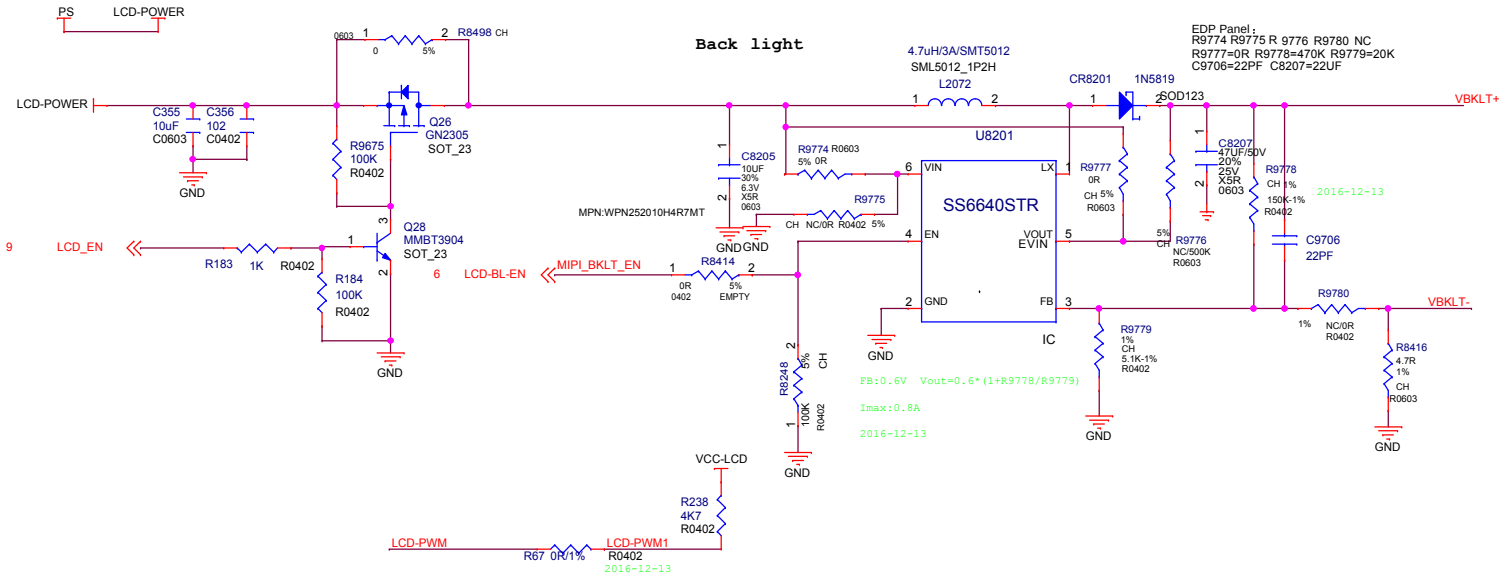
6 TWI2-SDA
6 TWI2-SCK
6 LCD-PWM
6 LCD-BL-EN
6 AP-RESET#
6 LCD-RST

PS
VCC-LCD
VCC-MIPI

12 EDP_AUX_DP
12 EDP_AUX_DN
12 EDP_TX0_DP
12 EDP_TX0_DN
12 EDP_TX1_DP
12 EDP_TX1_DN

Differential pairs
Z0= 100 ohm





Title	Pinebook
Document Number	EDP/MIPI-LCD
Size	A3
Rev	V3.0
Date:	Wednesday, May 03, 2017
Sheet	16 of 16

PINE64