Project Name: NSBW140X

Platform：Braswell

PAGE CONTENT

M/B Schematic Version Change List

Release Date	Version	PCB P/N	PCB Description	PCBA P/N	Note

Daughter Board Schematic Version Change List

Release Date	Version	PCB P/N	PCB Description	PCBA P/N	Note

TongFang Inc			
Title	NSBW140X		
Size Custom	Document Number INDEX		Rev B1
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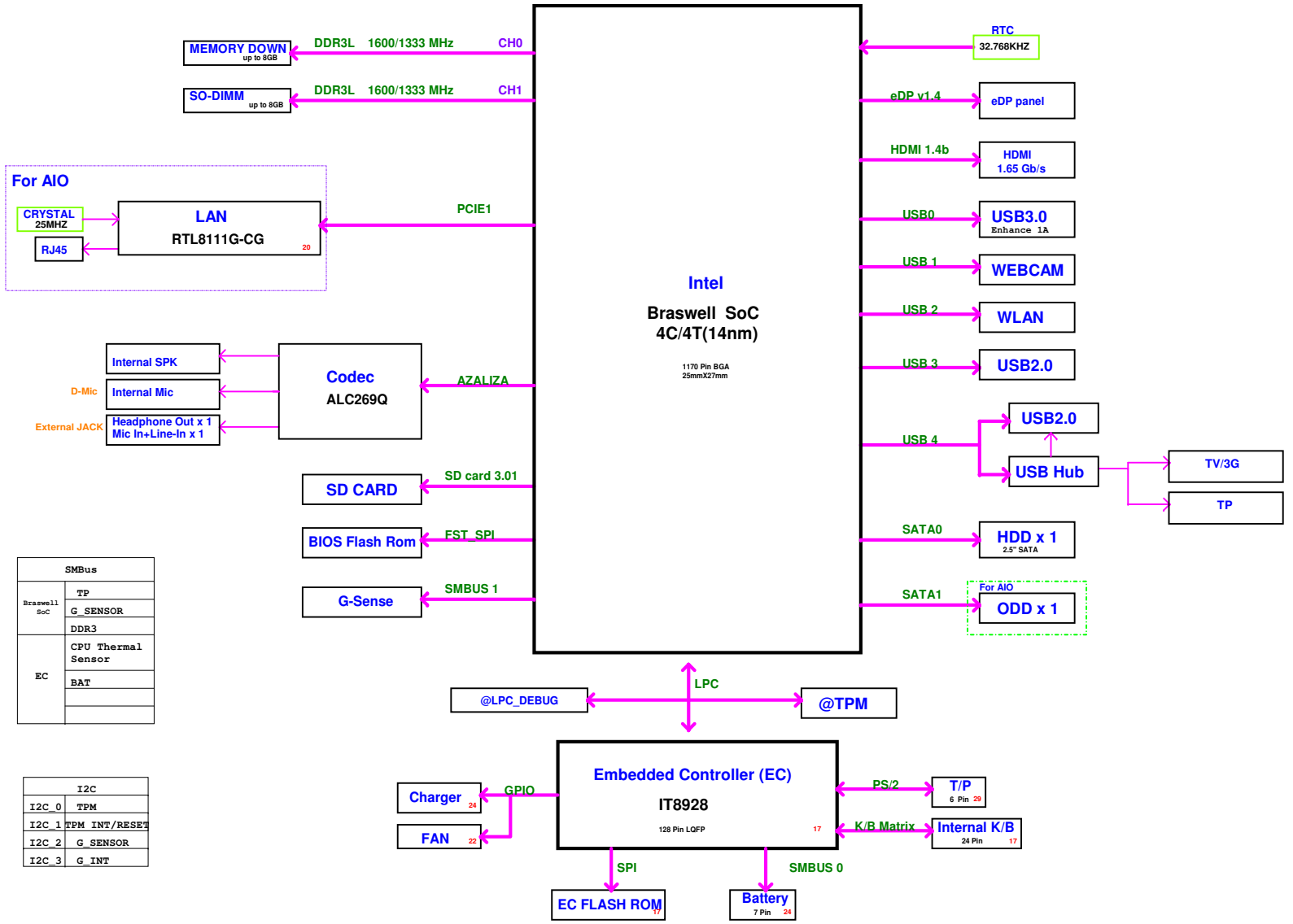
NSBW140X BLOCK DIAGRAM



TongFang Inc		
NSBW1401		
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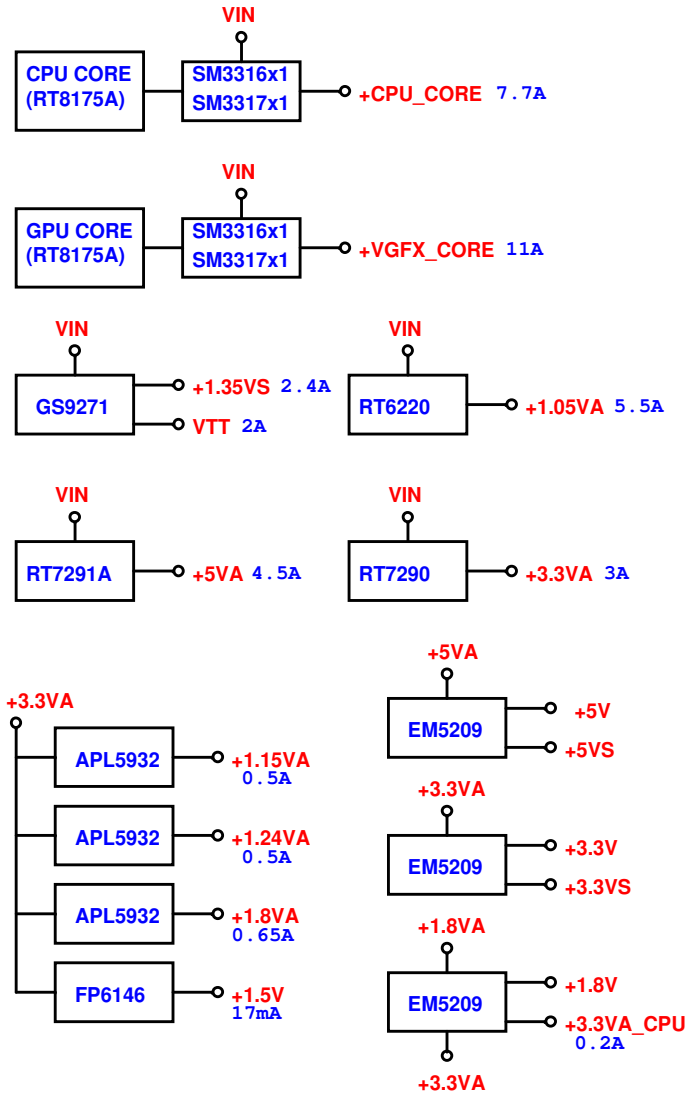
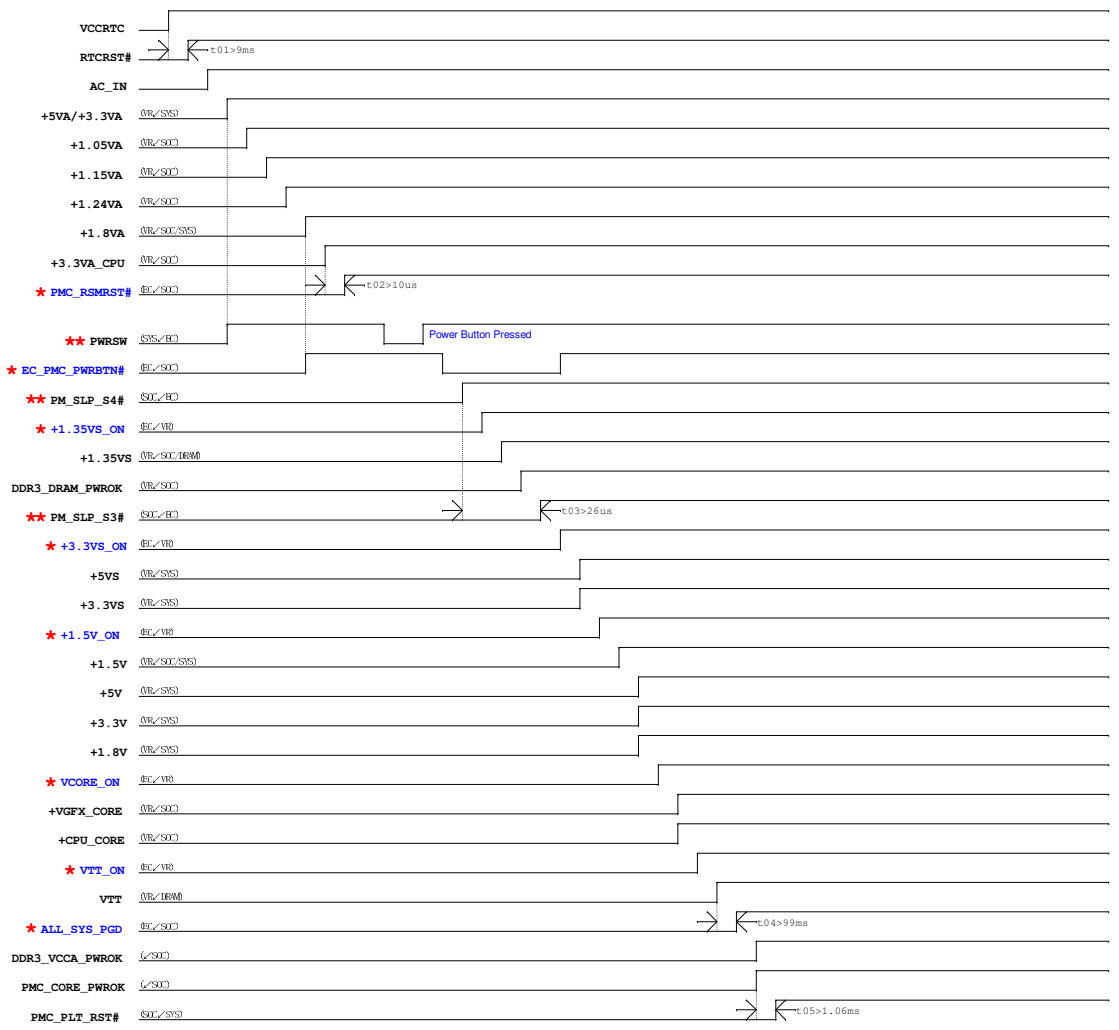
POWER BLOCK DIAGRAM



Power On Sequence



★ EC Control Pin(O/P)
★★ EC Control Pin(I/P)

Input Power	Voltage	Current	Power Rail	Voltage	Current
VIN	12~19V	4.1A	+CPU_CORE	VID	7.7A
			+VGFX_CORE	VID	11.0A
			+1.35VS	1.35V	8.0A
			VTT	0.675V	2.0A
			+1.05VA	1.05V	5.5A
			+5VA	5.0V	5.5A
			+3.3VA	3.3V	3.0A

Input Power	Voltage	Current	Power Rail	Voltage	Current
+3.3VA	3.3V	3.0A	+3.3VA_CPU	3.3V	0.2A
			+1.15VA	1.15V	0.5A
			+1.24VA	1.24V	0.5A
			+1.08VA	1.8V	0.65A
			+1.5V	1.5V	0.02A
			+3.3V/+3.3VS	3.3V	1.5A

Input Power	Voltage	Current	Power Rail	Voltage	Current
+5VA	5.0V	5.5A	+5V/+5VS	5V	5.5A

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ITE8928 Default

	GPIO	Pull/Mode	DSN LEVEL	EC LEVEL	IC LEVEL	Comment
GPA0	PID_1_CHG_R_LED	UP/GPO	3.3VA	3.3V		Reserved
GPA1	PID_2_PWR_LED	UP/GPO	3.3VA	3.3V		Reserved
GPA2	BTL_BEEP	/GPO		3.3V	3.3V	Reserved
GPA3	Fast_Charge	/GPO	3.3V	3.3V	3.3V	
GPA4	+1.05VA_ON	UP / GPO	3.3VA	3.3V	>1.25V	Reserved
GPA5	SENBAT_V	/ GPO	3.3V	3.3V	For NMOS	
GPA6	PMC_RSMRST#	Dn / GPI	3.3V	3.3V	3.3V	
GPA7	+1.35VS_ON	/ GPO	3.3V	3.3V	>1.25V	
GPB0	WLAN_HOST_WAKE	/ GPI	3.3V	3.3V	3.3V	Reserved
GPB1	WLAN_SUSPEND	/ GPO	3.3V	3.3V	3.3V	Reserved
GPB2	WEBCAM_ON	/ GPO	3.3V	3.3V	3.3V	
GPB3	BAT_SMBCLK1	UP/GPIO	3.3VA	1.8VA		
GPB4	BAT_SMBDAT1	UP/GPIO	3.3VA	1.8VA		
GPB5	SOC_BL_EN	/ GPI	1.8VA	1.8/3.3VA	MAX 5.0V	Reserved
GPB6	+3.3V_EC	UP / GPI	3.3VA	1.8/3.3VA	3.3V	
GPB7	SAFTY_PROTECT	Dn / GPO	3.3V	3.3V	For NMOS	
GPC0	3G_Power_ON_EC	/ GPO	3.3VA	1.8/3.3VA	3.3V	Reserved
GPC1	SMB_CLK_EC	UP/ GPIO	3.3VA	1.8/3.3VA	3.3V	
GPC2	SMB_DATA_EC	UP/ GPIO	3.3VA	1.8/3.3VA	3.3V	
GPC3	PWRBTN1#	UP / GPI	3.3VS	3.3V	3.3V	Reserved
GPC4	PANEL_DETECT 2	UP / GPI	3.3VA	3.3V	3.3V	
GPC5	CHG_HI_VOLT#	/ GPO	3.3V	3.3V	For NMOS	
GPC6	PANEL_3.3V_ON	UP /GPO	3.3V	3.3V	For NMOS	
GPC7	VTT_ON	/ GPO	3.3V	1.8/3.3VA	>1.25V	
GPD0	ADAP_IN	Dn / GPI	3.3V	1.8/3.3VA	For NMOS	
GPD1	EC_PMC_PWRBTN#	UP / GPO	1.8VA	1.8/3.3VA	1.8V	
GPD2	PLT_RST#	UP /GPI	3.3V	1.8/3.3VA	3.3V	
GPD3	SMC_WAKE_SCI#	Up / GPO	1.8VA	1.8/3.3VA	1.8V	Reserved
GPD4	EC_EXTSMI#	UP / GPO	1.8VA	1.8/3.3VA	1.8V	
GPD5	NC					
GPD6	+1.5V_ON	/ GPO	3.3V	3.3V	3.3V	
GPD7	PWR_USB#	UP/ GPO	3.3VA	3.3V	3.3V	
GPE0	LID#	UP/ GPI	3.3VA	1.8/3.3VA	3.3V	
GPE1	AMP_MUTE#	/ GPO	3.3V	3.3V	3.3V	
GPE2	ALL_SYS_PGD	/ GPO	3.3V	3.3V	For NMOS	
GPE3	VCORE_ON	/ GPO	3.3V	3.3V	3.3V	
GPE4	PWRSW	UP / GPI	3.3VA	3.3V	3.3V	
GPE5	LVDS_VIN	/ GPO	3.3V	3.3V	For NMOS	
GPE6	3G_SIM_DET_EC	/ GPI	3.3V	1.8/3.3VA	3.3V	Reserved
GPE7	PMC_SLP_S01X#_R	/ GPI	3.3V	1.8/3.3VA	3.3V	Reserved
GPF0	PANEL_VCC	Dn / GPO	3.3V	3.3V	3.3V	Reserved
GPF1	TXE_DISABLE	/ GPO	3.3V	3.3V	For NMOS	
GPF2	3G_Reset_EC	/ GPO	3.3V	1.8/3.3VA	3.3V	Reserved
GPF3	WLAN_ON	/ GPO	3.3V	1.8/3.3VA	For NMOS	
GPF4	TP_CLK	UP / GPIO	3.3V	1.8/3.3VA	3.3V	
GPF5	TP_DATA	UP / GPIO	3.3V	1.8/3.3VA	3.3V	
GPF6	PM_SLP_S3#	UP / GPIO	3.3VA	1.8/3.3VA	connect to level shifter	
GPF7	PM_SLP_S4#	UP / GPI	3.3VA	1.8/3.3VA	connect to level shifter	
GPG0	NC					
GPG1	+3.3VS_ON	/GPO	3.3V	3.3V	3.3V	
GPG2	NC					
GPG3	SPI_CE#	/GPO		3.3V	3.3V	
GPG4	SPI_SI	/GPI		3.3V	3.3V	
GPG5	SPI_SO	/GPO		3.3V	3.3V	
GPG6	LAN_PW_EN	UP/GPO	3.3V	3.3V	For NMOS	
GPG7	SPI_CLK	/GPO		3.3V	3.3V	
GPH0	AUX_OFF	Dn/GPO	3.3VA	1.8/3.3VA	For NMOS	
GPH1	PID_3_RF_LED_ON#	/GPO	3.3VA	1.8/3.3VA	3.3V	
GPH2	EC_LCDVDD_EN	UP/GPO	1.8VA	1.8/3.3VA	1.8V	
GPH3	RST	/GPO	3.3V	3.3V	For NMOS	Reserved
GPH4	PLATFORM_ID1	UP/GPI/ID1	3.3VA	3.3V	3.3V	
GPH5	PLATFORM_ID2	UP/GPI/ID2	3.3VA	3.3V	3.3V	Reserved
GPH6	PLATFORM_ID3	Dn/GPI/ID3	3.3VA	3.3V	3.3V	
GPH7	NC					

	GPIO	Pull/Mode	LEVEL	EC LEVEL	IC LEVEL	Comment
GPI0	CPU_THERMAL_SENSE	UP/GPI/ADC	3.3V	3.3V	3.3V	
GPI1	PANEL_DETECT	UP/GPI	3.3VA	3.3V	3.3V	
GPI2	LAN_WAKE#	UP/GPI	3.3VS	3.3V	3.3V	EC Reserved
GPI3	PWRBTN2#	UP/GPI	3.3VS	3.3V	3.3V	Reserved
GPI4	BAT_I	/GPI/ADC	3.3V	3.3V	3.3V	Reserved
GPI5	BATT_TEMP	UP/GPI/ADC	3.3VA	3.3V	3.3V	
GPI6	ADAPTOR	Dn/GPI/ADC	3.3V	3.3V	3.3V	
GPI7	BAT_V	/GPI/ADC	3.3V	3.3V	3.3V	
GPJ0	EC_BL_ON	/GPO	3.3V	3.3V	<5V	
GPJ1	EC_PROCHOT	/GPO	3.3V	3.3V	For NMOS	
GPJ2	FAN_CTRL0	/GPO/DAC	3.3V	3.3V	3.3V	
GPJ3	WK_TH	/GPO/DAC	3.3V	3.3V	3.3V	
GPJ4	CHG_I	/GPO/DAC	3.3V	3.3V	3V	
GPJ5	SET_V	Dn/GPO/DAC	3.3V	3.3V	3.3V	
GPJ6	BATT_VA_OFF#	Dn/GPO	3.3V	3.3V	For NMOS	
GPJ7	3G_Module_ON_EC	/GPO	3.3V	3.3V	3.3V	Reserved
GPM0	LPC_AD0_EC	/GPIO	1.8V	1.8V	1.8V	
GPM1	LPC_AD1_EC	/GPIO	1.8V	1.8V	1.8V	
GPM2	LPC_AD2_EC	/GPIO	1.8V	1.8V	1.8V	
GPM3	LPC_AD3_EC	/GPIO	1.8V	1.8V	1.8V	
GPM4	CLK_EC_LPC	/GPI	1.8V	1.8V	1.8V	
GPM5	LPC_FRAME#	/GPI	1.8V	1.8V	1.8V	
GPM6	INT_SERIRQ	UP/GPIO	1.8VA	1.8V	1.8V	
GPM7						

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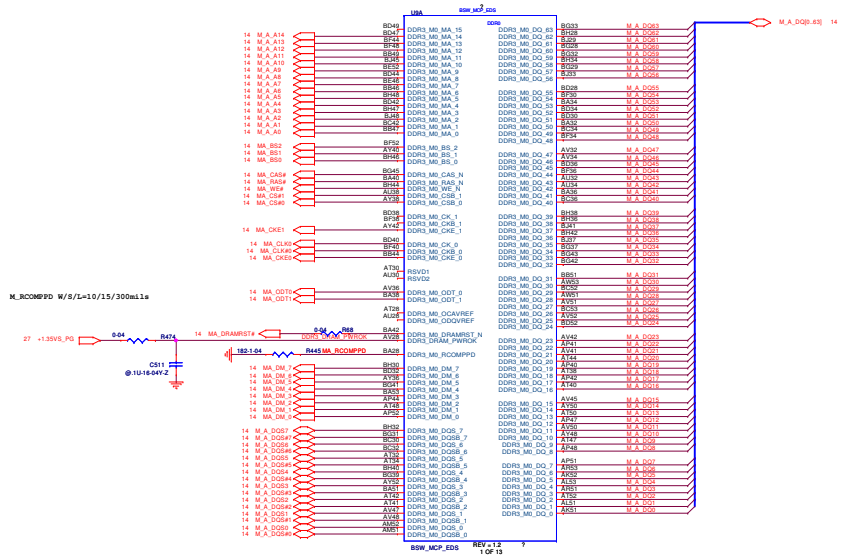

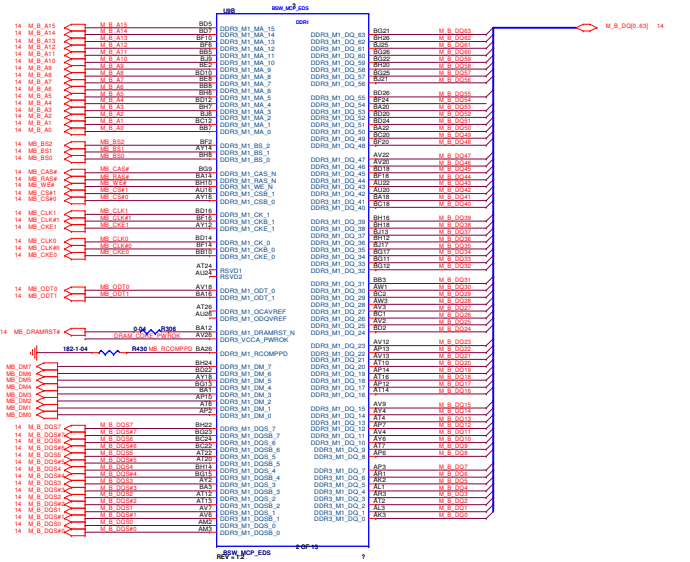

DRAM CORE POWER WORK
CHECK DRAM/PMC POWER WORK (S0) EC

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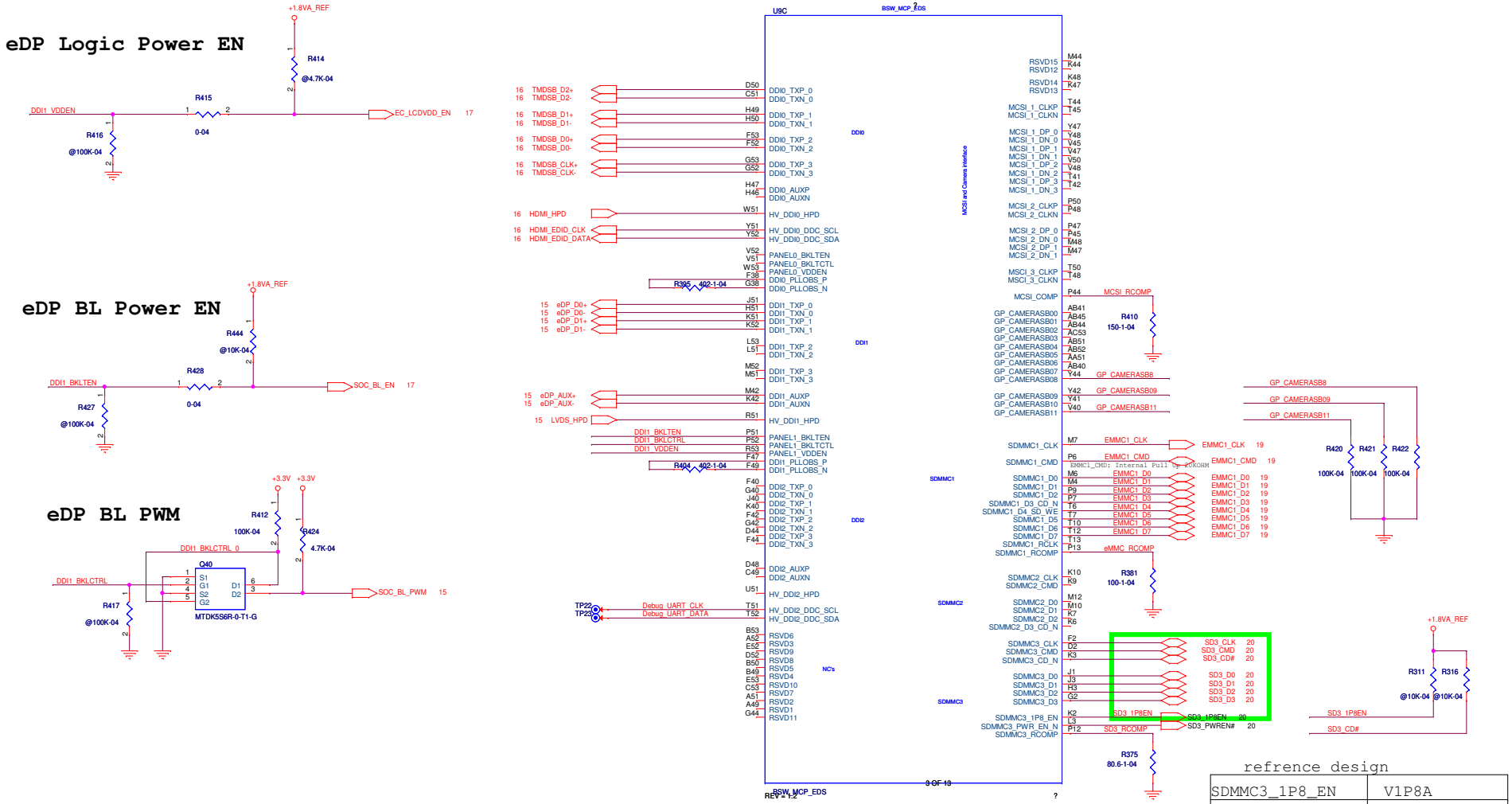

refrence design

SDMMC3_1P8_EN	V1P8A
SDMMC3_CD_N	V1P8A
SDMMC3_CLK	V3P3A/V1P8A
SDMMC3_CMD	V3P3A/V1P8A
SDMMC3_D0	V3P3A/V1P8A
SDMMC3_D1	V3P3A/V1P8A
SDMMC3_D2	V3P3A/V1P8A
SDMMC3_D3	V3P3A/V1P8A
SDMMC3_PWR_EN_N	V1P8A

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Size C	Document Number BW DISPLAY/SD CARD	Rev B1
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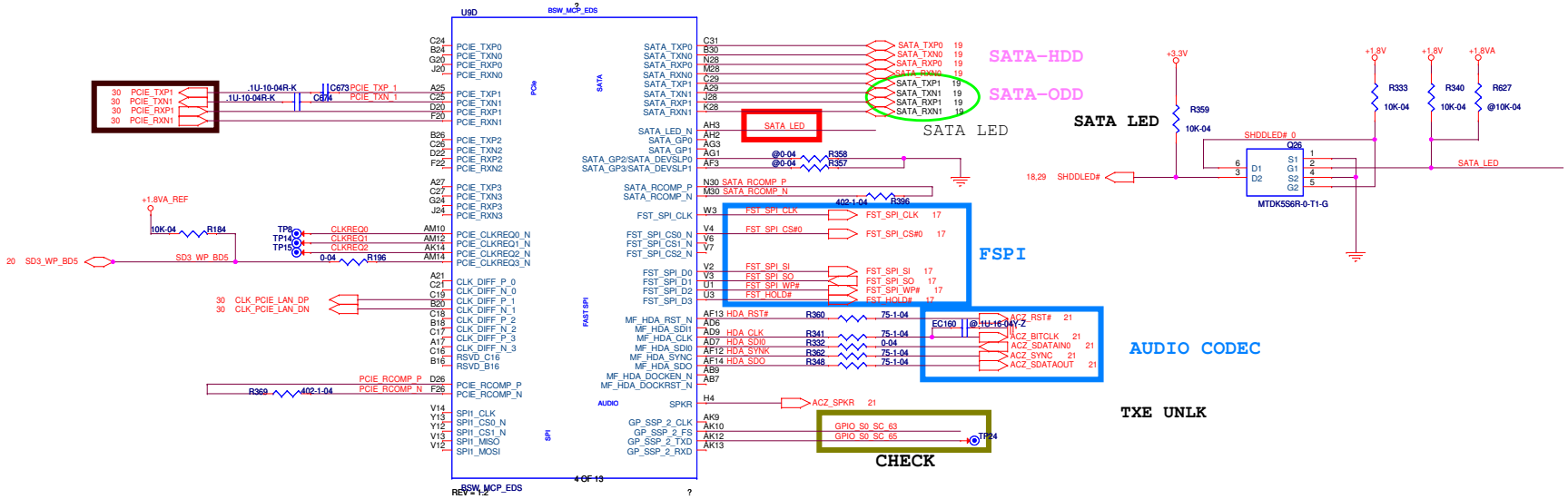

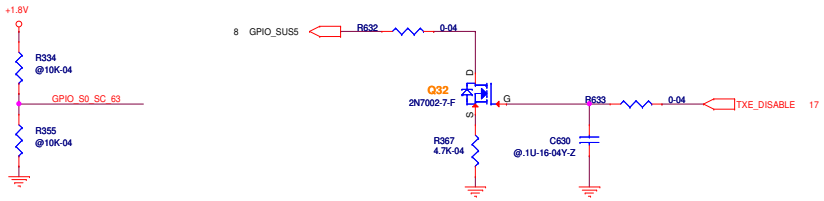

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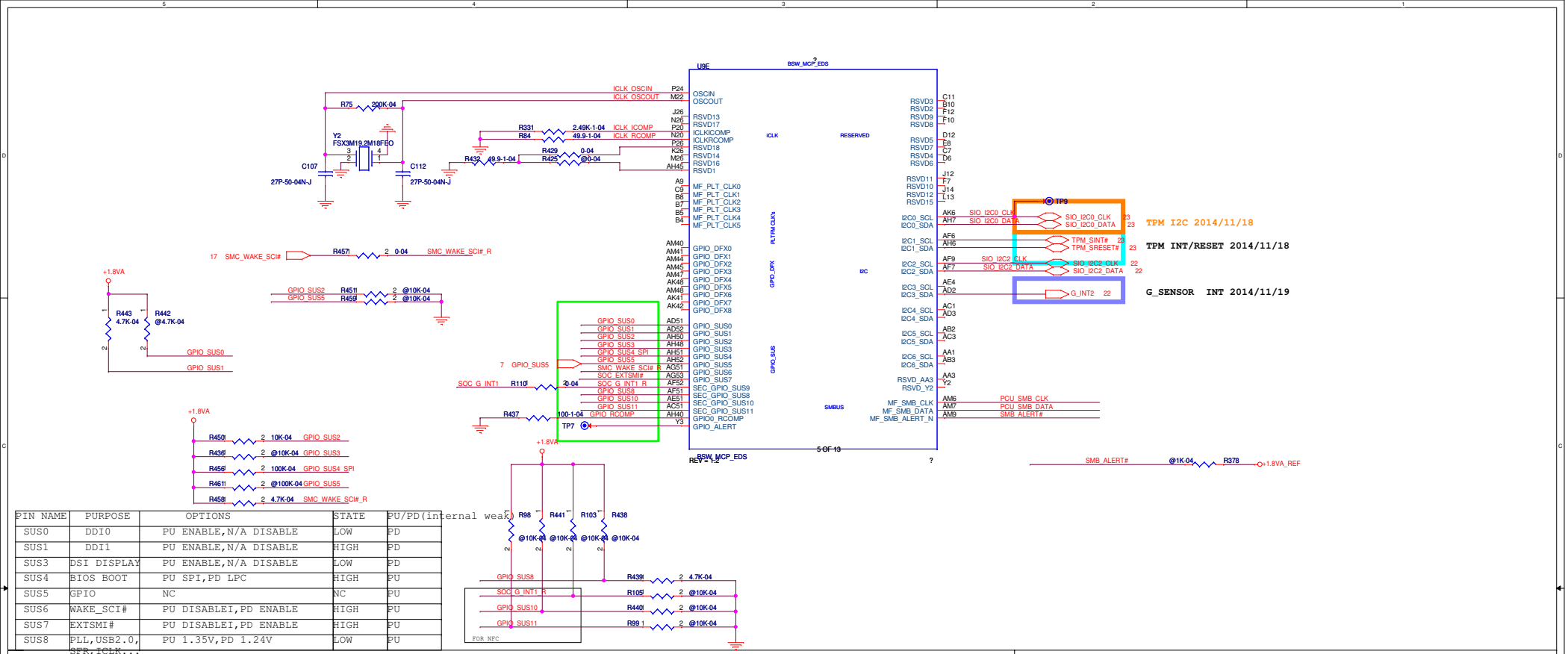
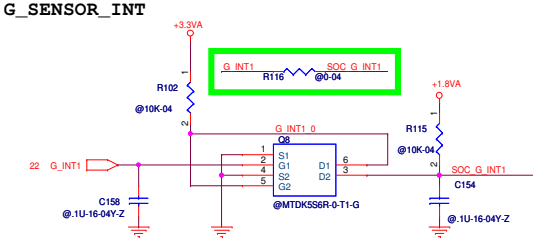


PIN NAME	PURPOSE	OPTIONS	STATE	PU/PD(internal weak)
SUS0	DDI0	PU ENABLE,N/A DISABLE	LOW	PD
SUS1	DDI1	PU ENABLE,N/A DISABLE	HIGH	PD
SUS3	DSI DISPLAY	PU ENABLE,N/A DISABLE	LOW	PD
SUS4	BIOS BOOT	PU SPI,PD LPC	HIGH	PU
SUS5	GPIO	NC	NC	PU
SUS6	WAKE_SCI#	PU DISABLEI,PD ENABLE	HIGH	PU
SUS7	EXTSMI#	PU DISABLEI,PD ENABLE	HIGH	PU
SUS8	PLL,USB2.0, SPR,ICLK...	PU 1.35V,PD 1.24V	LOW	PU

G_SENSOR_INT



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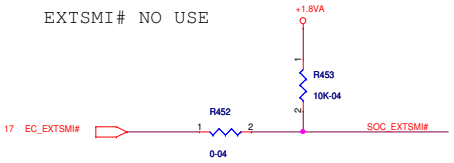
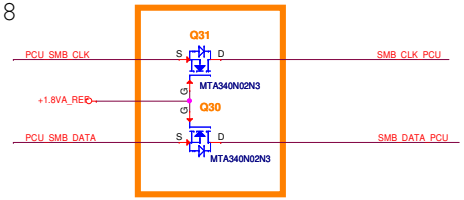
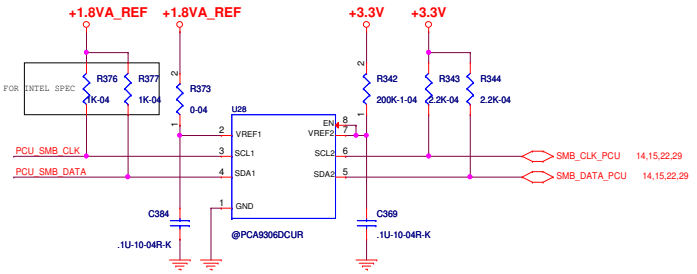


COLAY U28



SMBUS/I2C FOR G-SENSOR/CPD/DRAM



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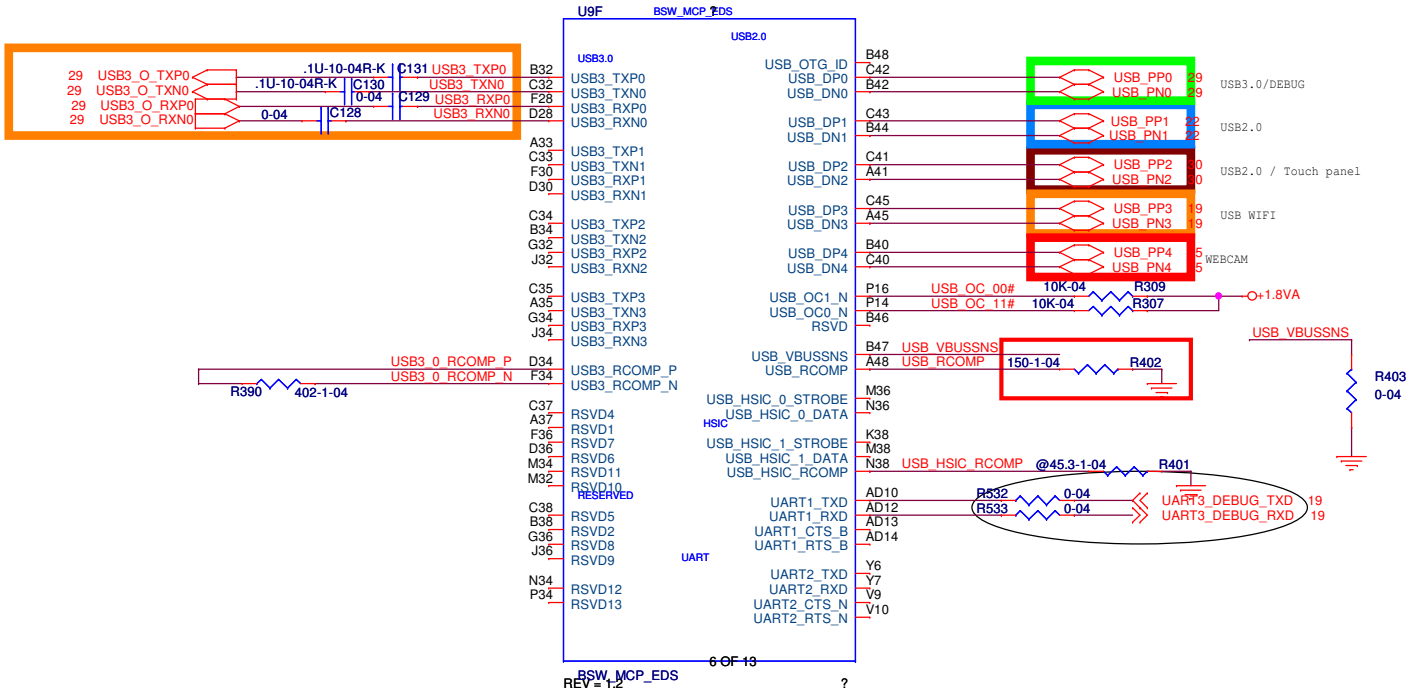
USB 2.0 BUS

USB0	USB3.0/DEBUG
USB1	USB2.0
USB2	USB2.0
USB3	USB WLAN
USB4	USB HUB/ WEBCAM



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Size B	Document Number BW USB2.0/3.0	Rev B1
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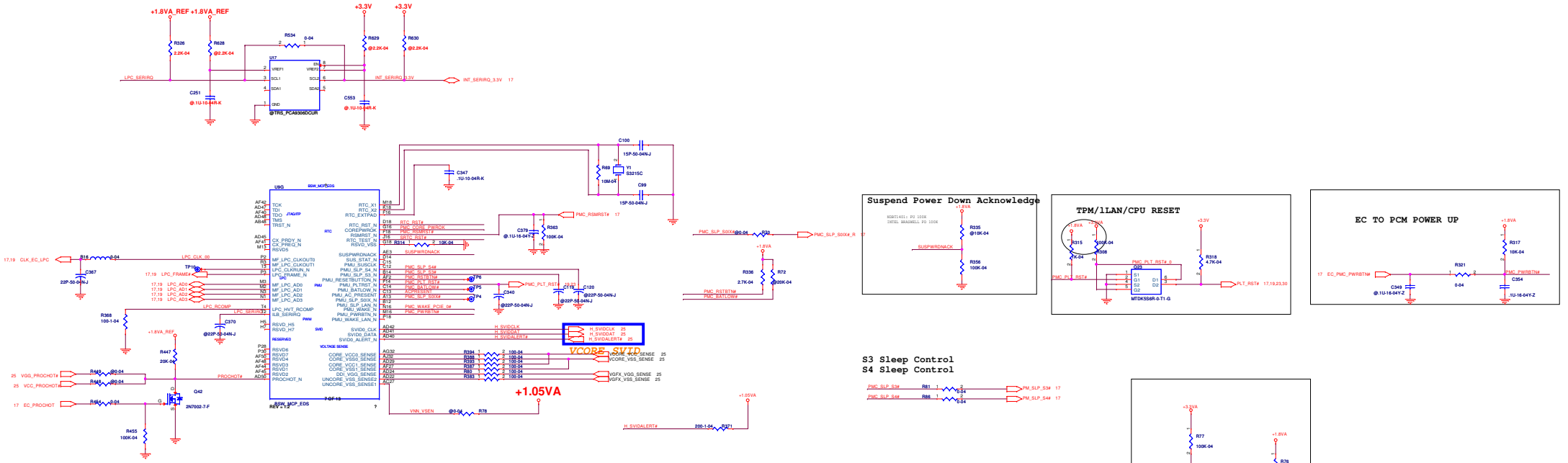
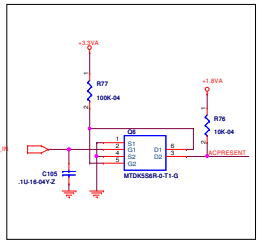
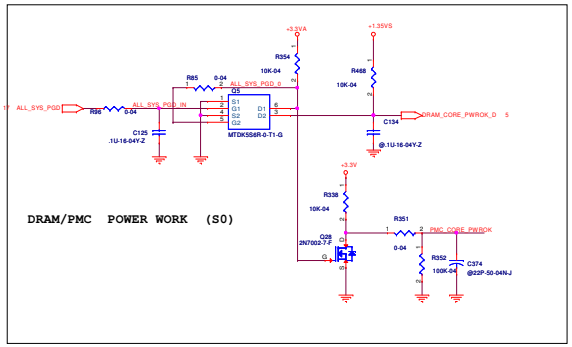
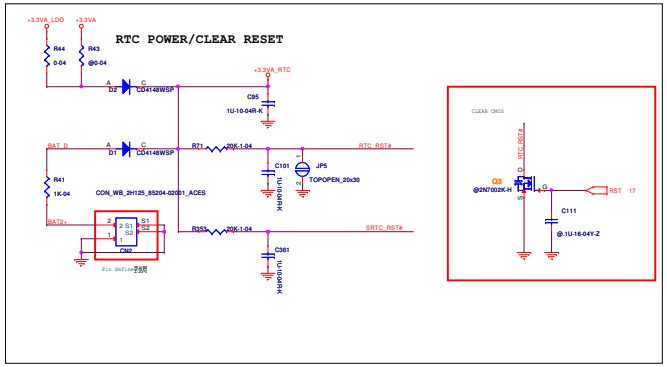
EC/TPM INT_SERIRQ FOR EC 8928 BX

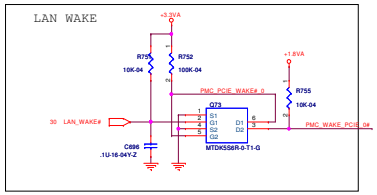


S3 Sleep Control
S4 Sleep Control









Title	NDBW1401		
Size: D	Document Number: BW PMU/RTC/LPC/SVID		Rev: B1
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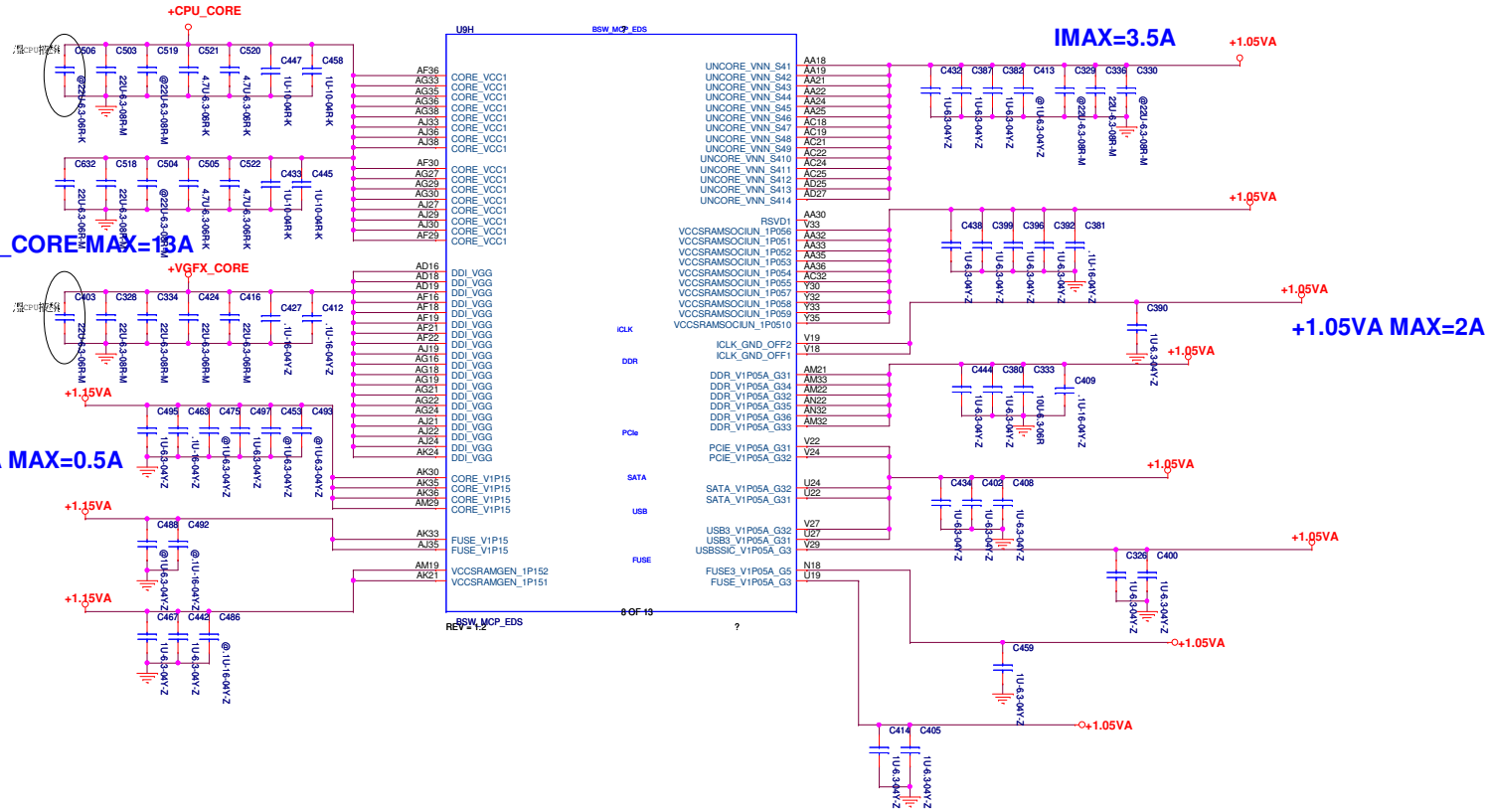
+CPU_CORE MAX=6.4A

+VGFX_CORE MAX=1.3A

+1.15VA MAX=0.5A

IMAX=3.5A

+1.05VA MAX=2A



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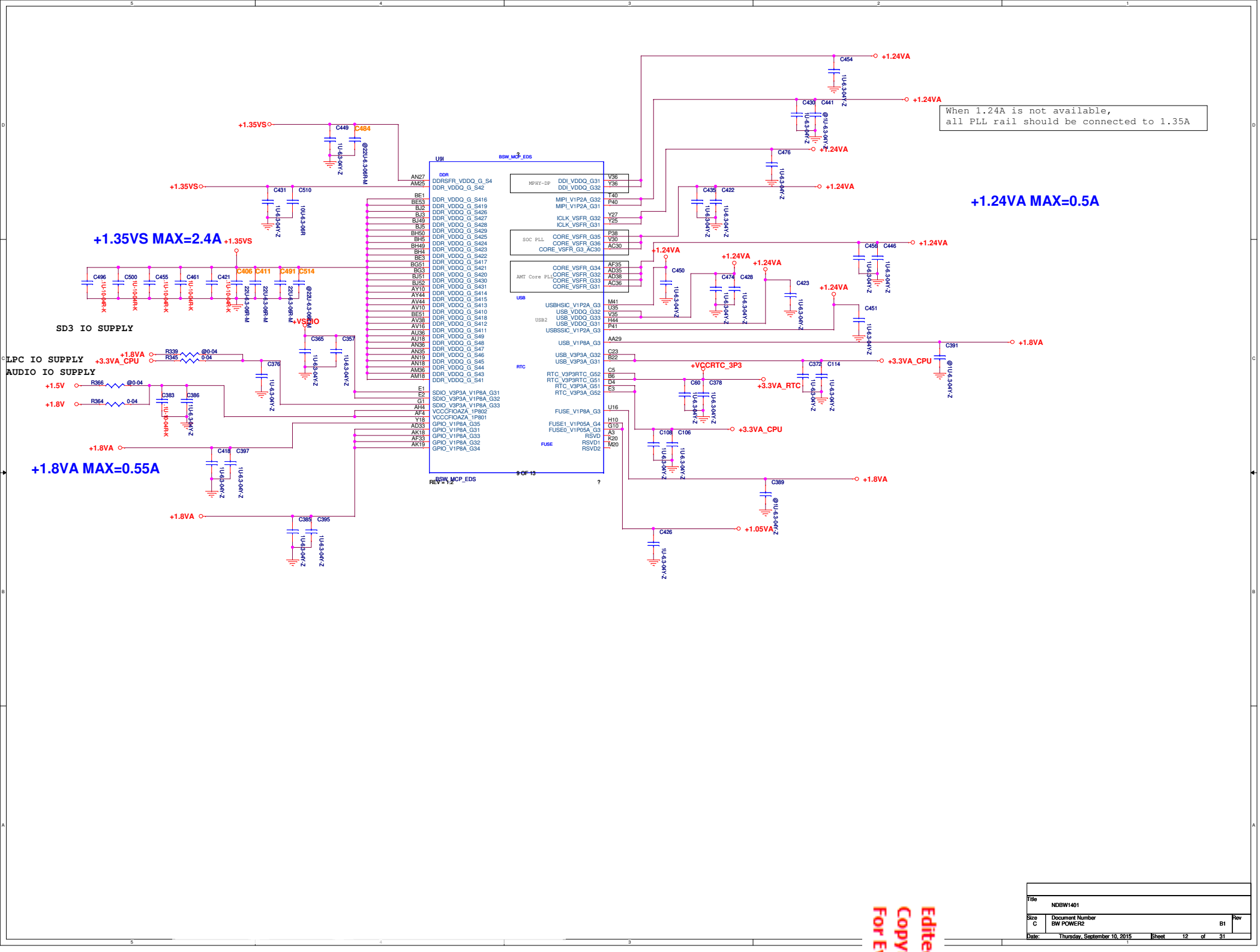

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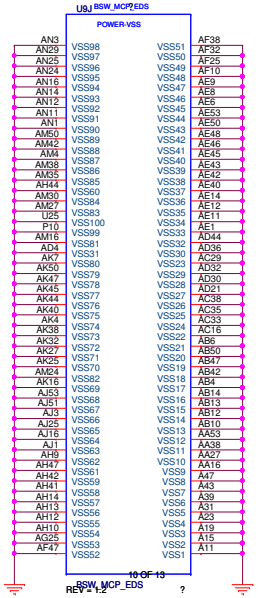

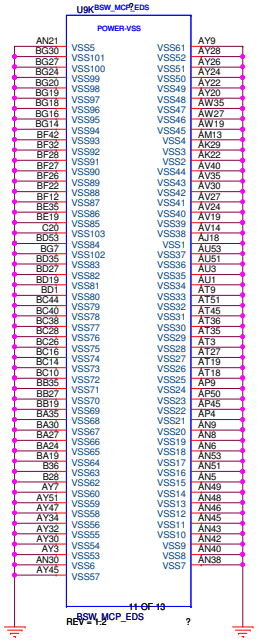

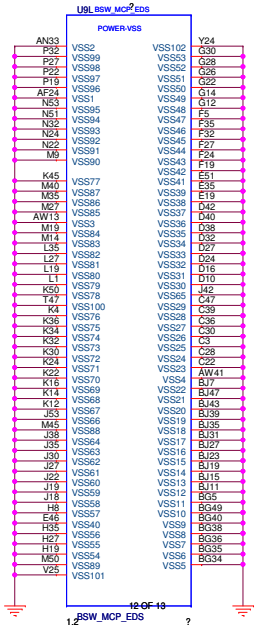

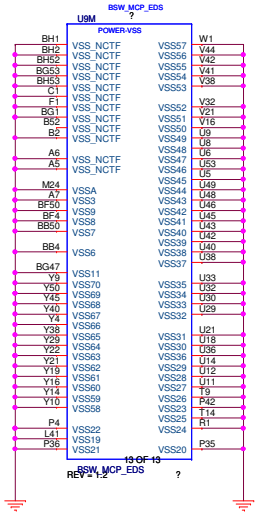

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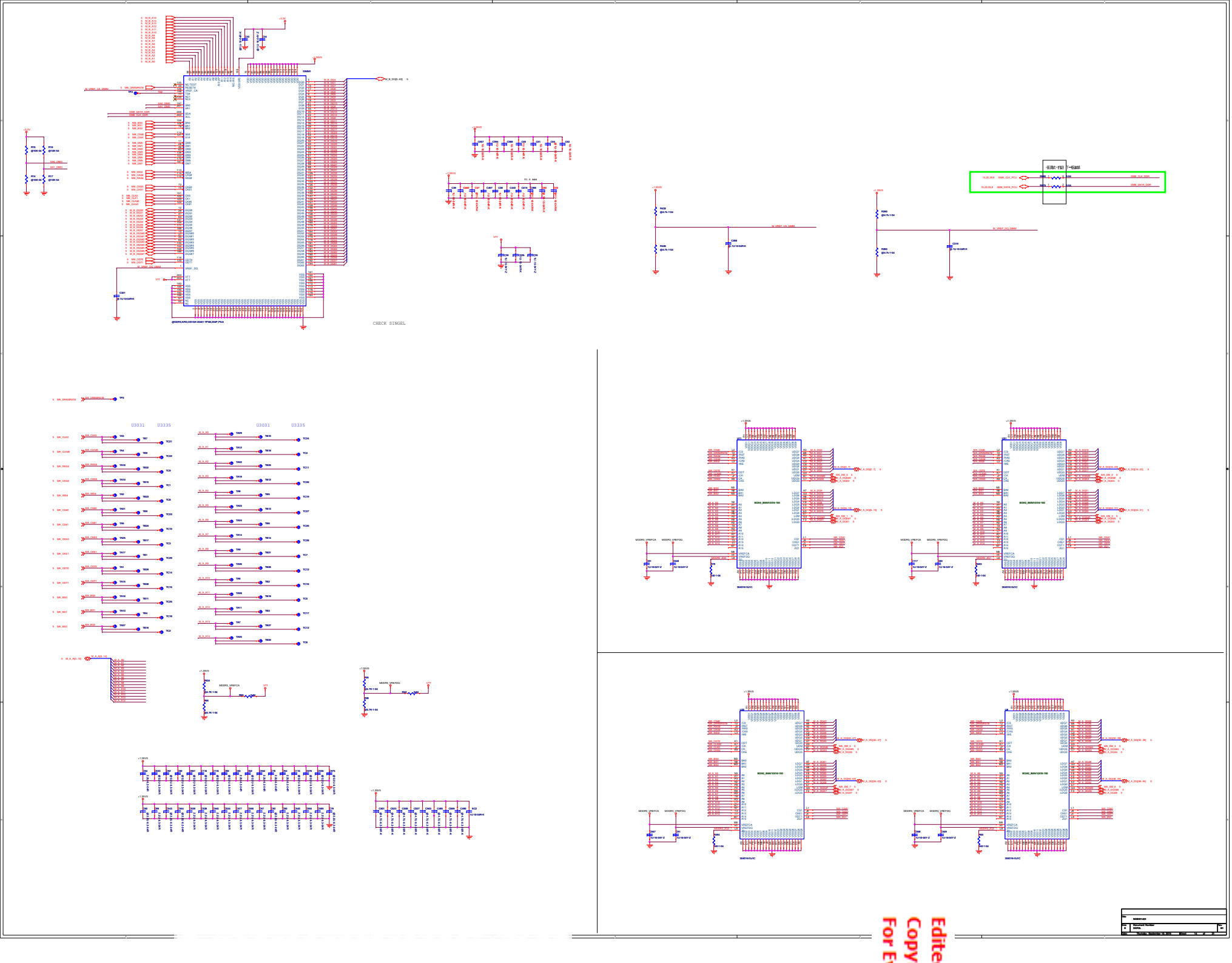
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For Ev

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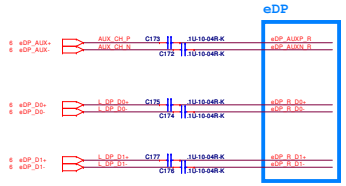
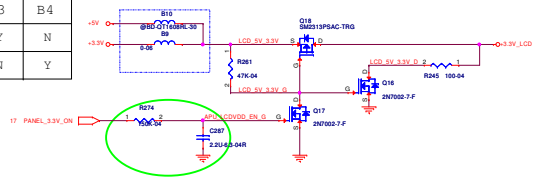


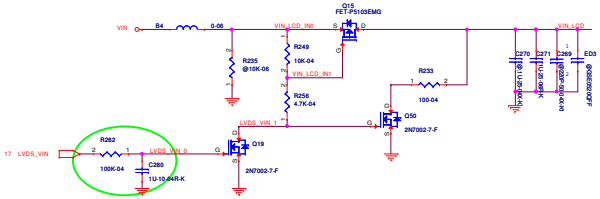
LCD 3.3V/5V

LCD_VDDIO	B3	B4
+5V	Y	N
+3.3V	N	Y

Co-Lay

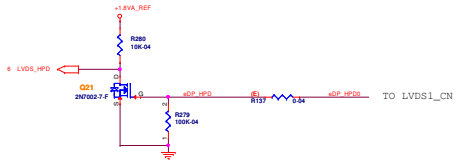


LCD 19V/BAT1+



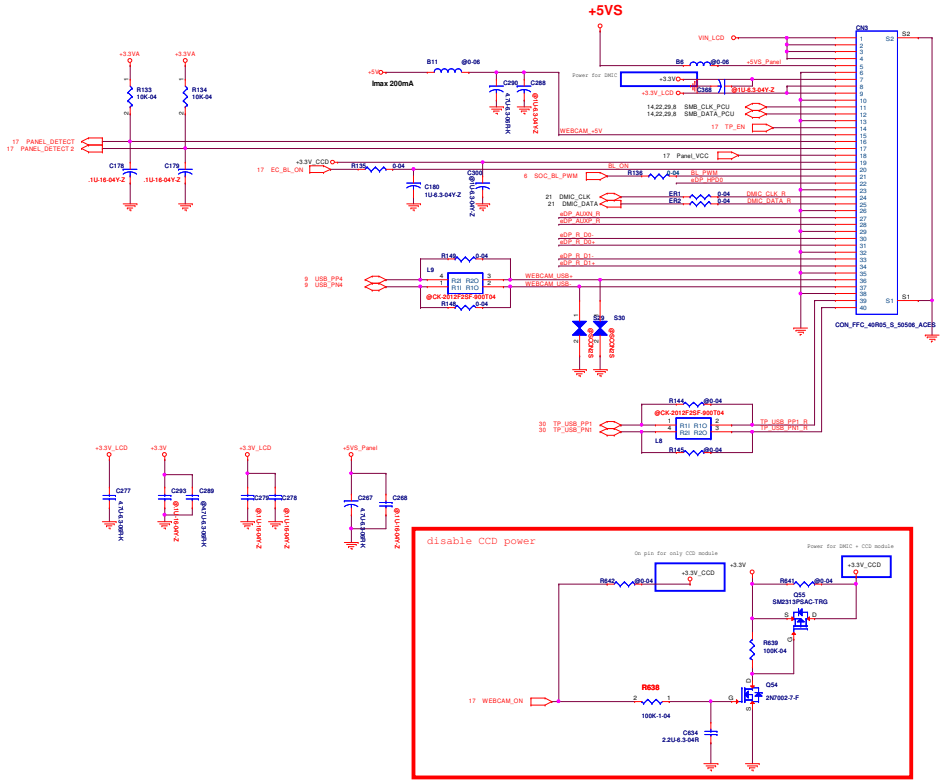
LCD HPD

LCD HPD	R183	R177
LVDS	Y	N
eDP	N	Y



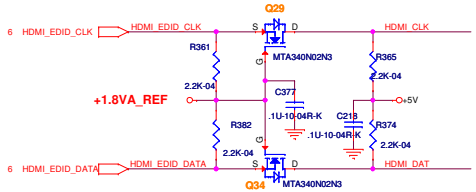
Panel Connecter

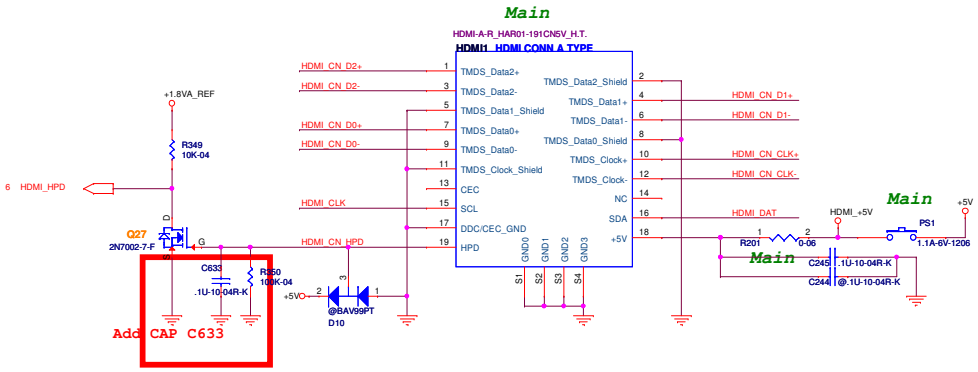
	High	Low
PANEL_DETECT	14"	15"
PANEL_DETECT2	A10	



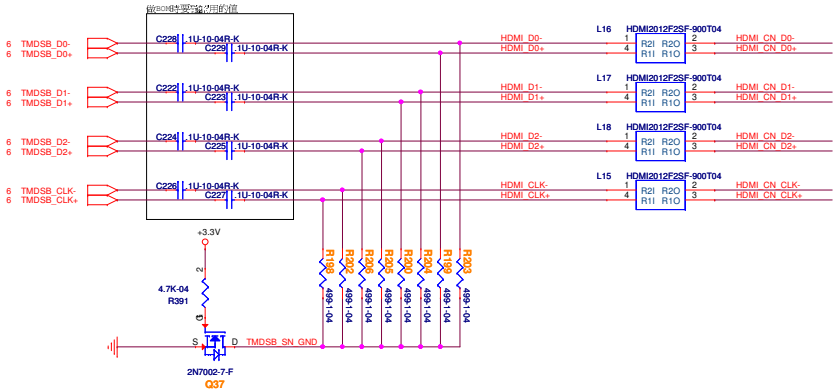
Title	NSBW1401		
Size D	Document Number eDP Panel		Rev B1
Date: Thursday, September 17, 2015	Sheet 15 of 31		

HDMI EDID





HDMI CONN



Title	NDBW1401		
Size Custom	Document Number HDMI		Rev B1
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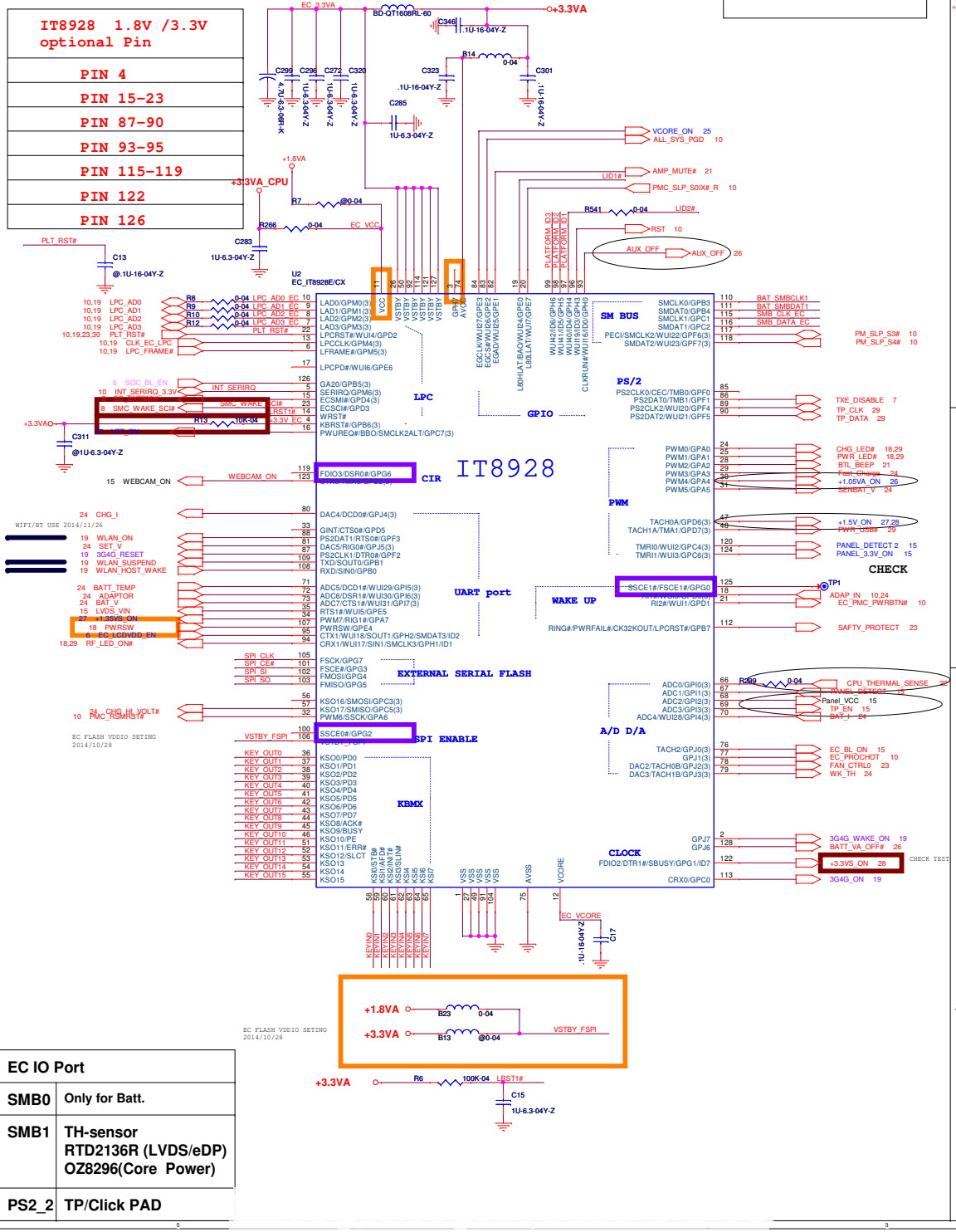
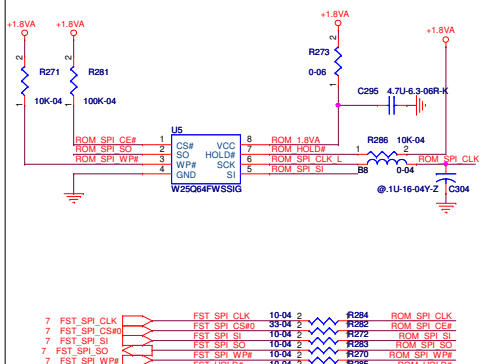
EC

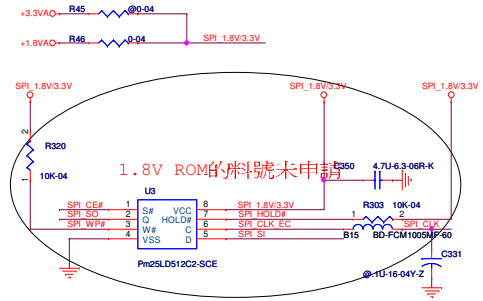


EC IO Port	
SMB0	Only for Batt.
SMB1	TH-sensor RTD2136R (LVDS/eDP) OZ8296(Core Power)
PS2_2	TP/Click PAD

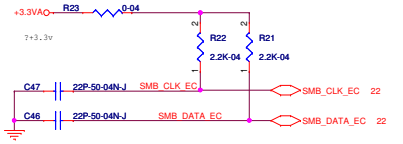
BIOS FLASH ROM(SPI)



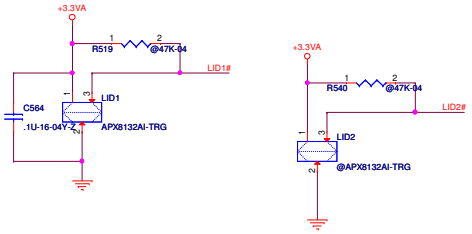
EC FLASH ROM(SPI)



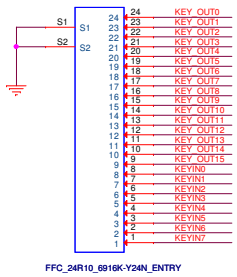
EC SMBUS LEVEL SHIFT



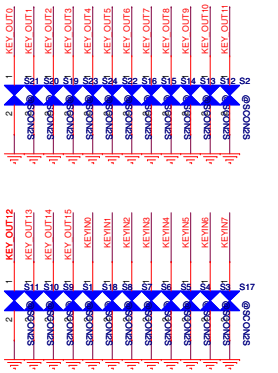
LID SW



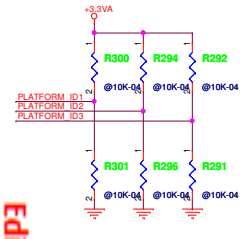
Keyboard



KBT1 EMI



Platform ID



PLATFORM_ID1 : NA

PLATFORM_ID2 : NA

PLATFORM_ID3 : H-->Memory 2G,L-->Memory 4G

Title	TongFang Inc NDBW1401
Size / Custom	Document Number EC ITIT8518/BIOS/KB CONN
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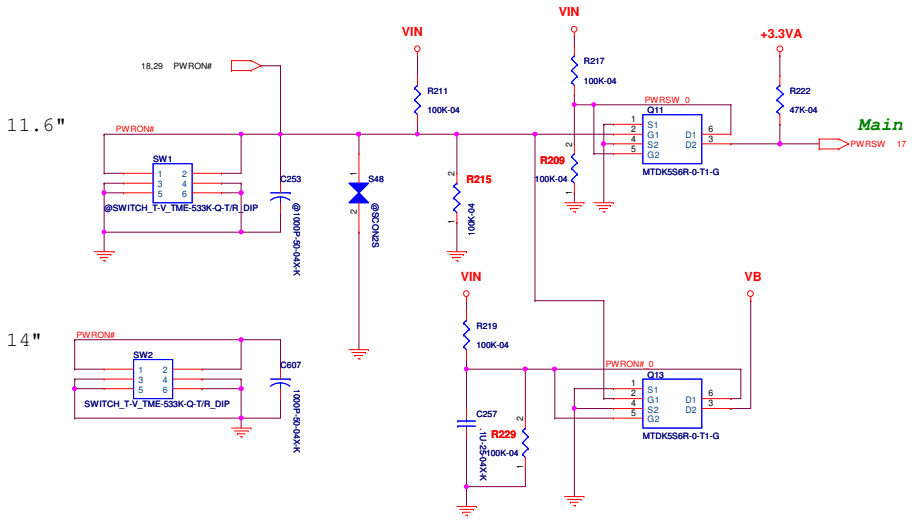
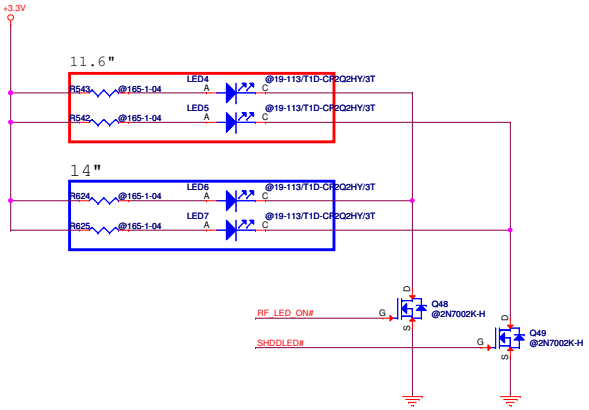
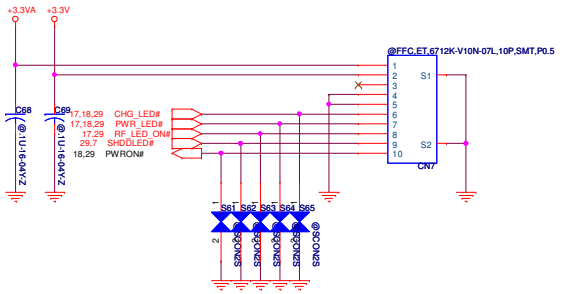
PWR SW



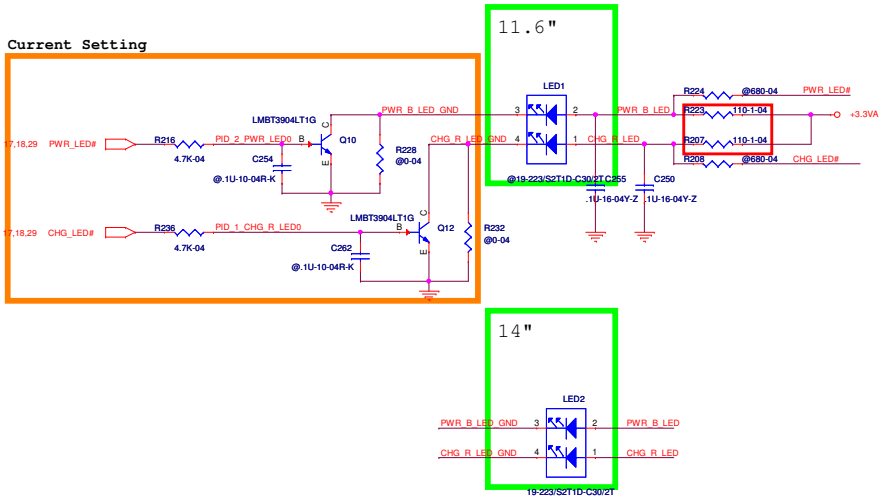
LED for WIFI & HDD



Power Board(Option)



Charge LED



TongFang Inc		
Title: NSBW1401		
Size: Custom	Document Number: PWR Switch & LED	Rev: B1
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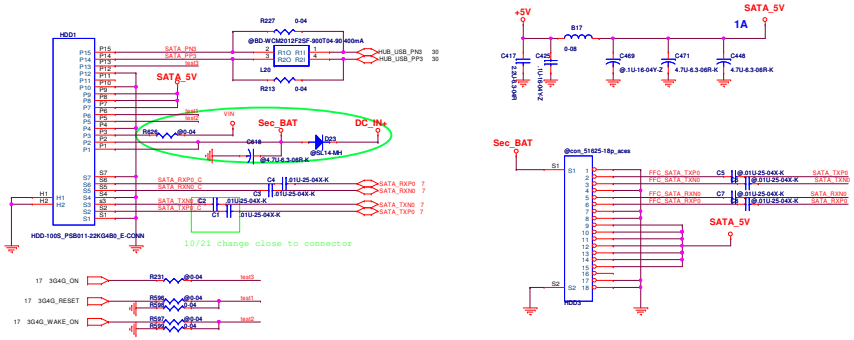
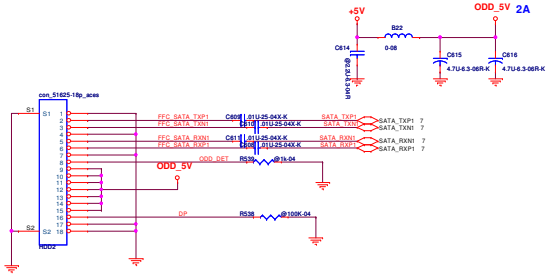
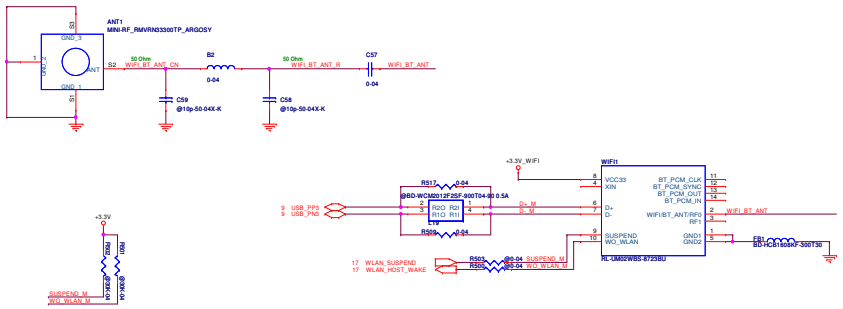
SATA-HDD



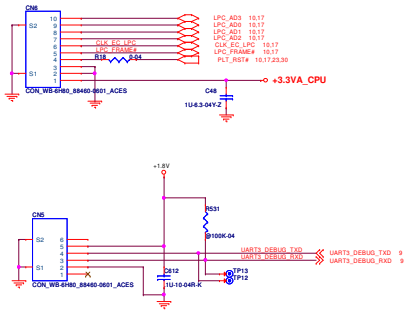
SATA-ODD



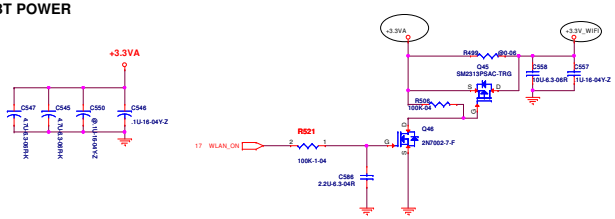
WIFI/BT 2014/11/26



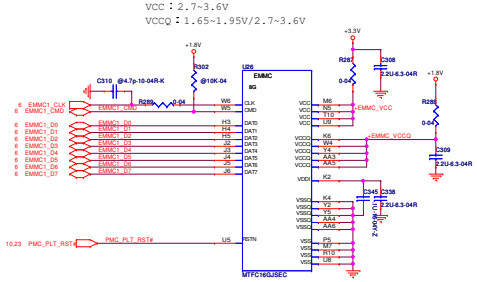
DEBUG CN

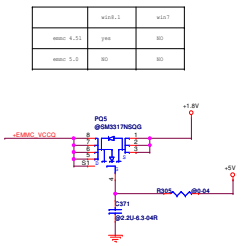


WIFI/BT POWER



EMMC





Title	NDBW1401	
Size: D	Document Number: HDD/ODD/WIFI/DEBUG CN	Rev: B1
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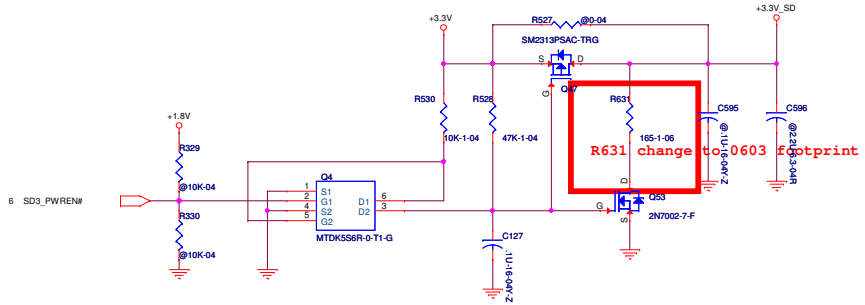
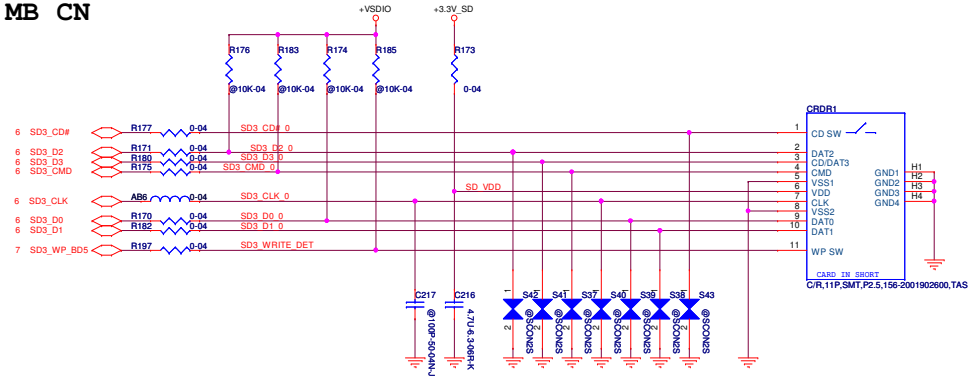
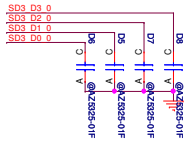
SD POWER



SD MB CN

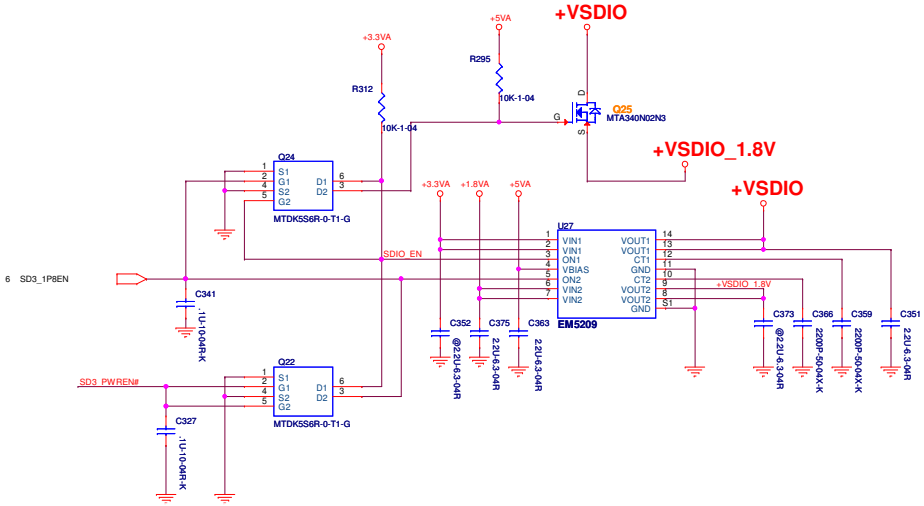


ESD

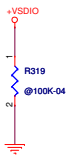


Support Ultra High Speed SD

SD3_1P8EN	High	Low	
ON1	Low	Low	
	1.8V	3.3V	



Discharge Resistor



TongFang Inc

Title W1401

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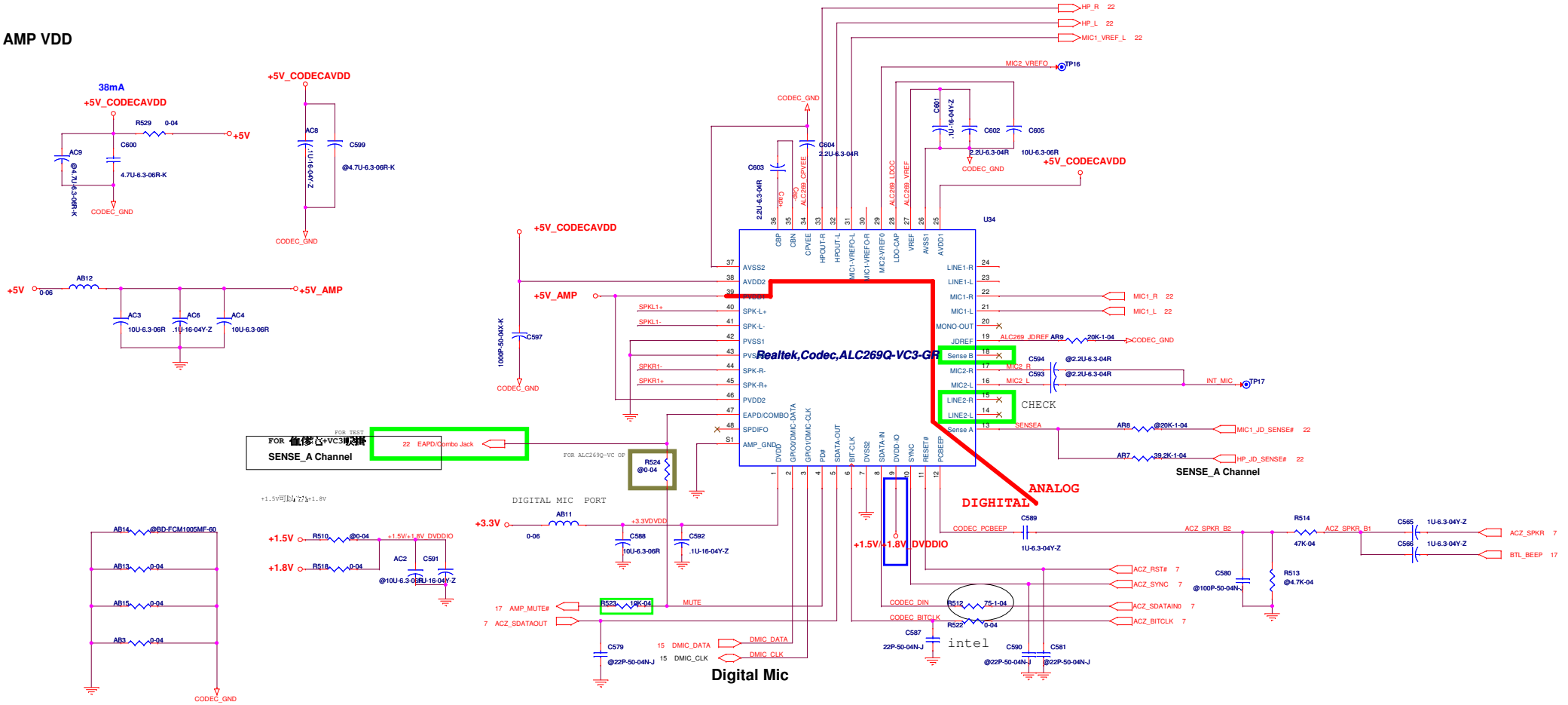
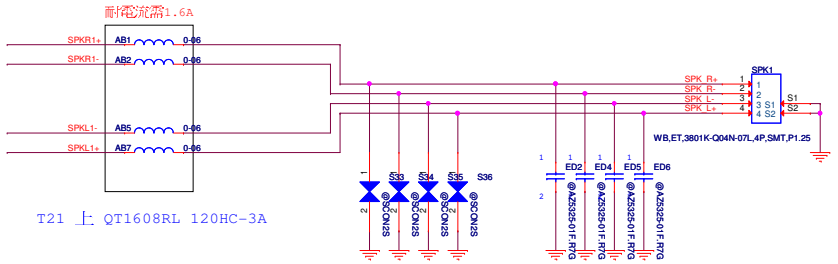
CODEC ALC269Q-VC/VB

AMP VDD



INT_SPEAKER



Title	TongFang Inc
	NDBW1401
Size: Custom	Document Number: CODEC(ALC269)/INT MIC/SPKR
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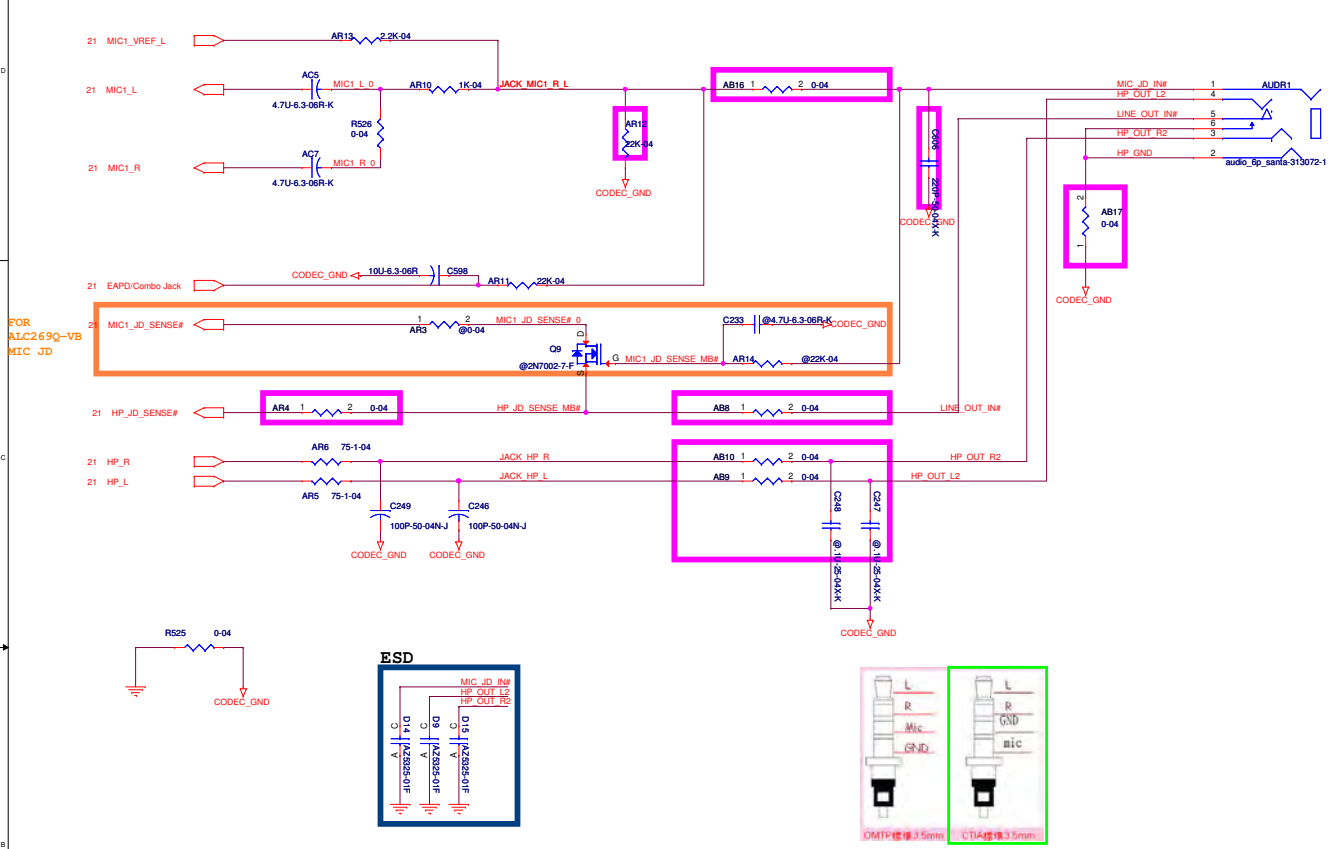
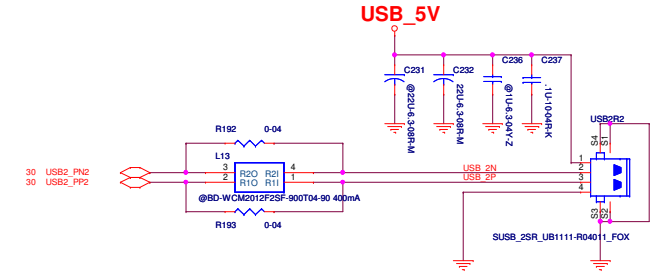
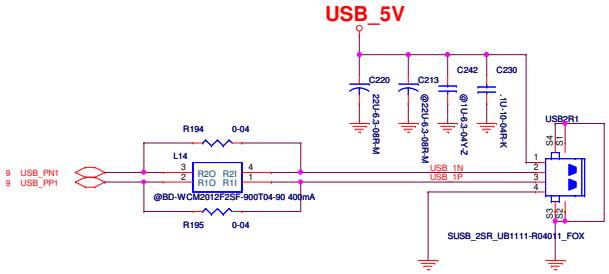
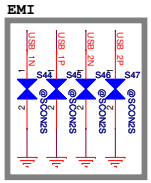
2 IN 1 Audio Jack / USB

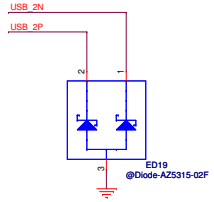


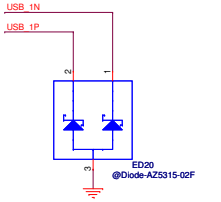
USB2.0



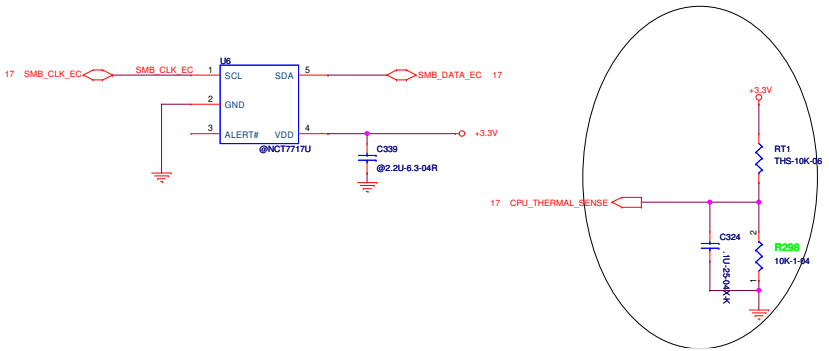




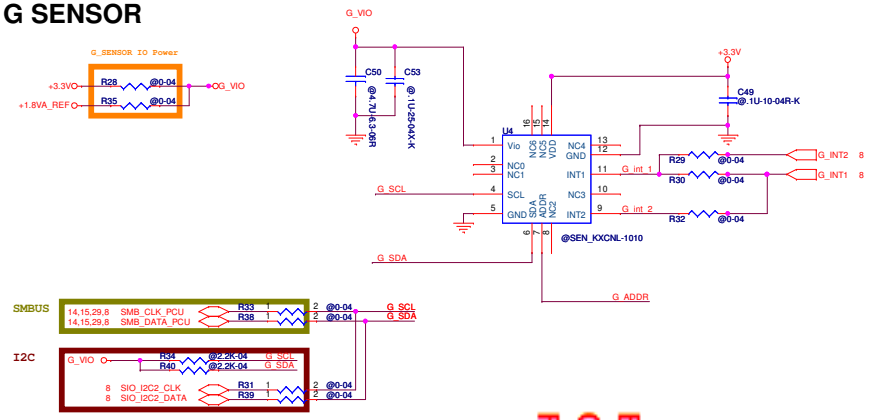




CPU Thermal Sensor



G SENSOR



TongFang Inc	
Title	NDBW1401
Size: Custom	Document Number: HP_J/USB2.0/FAN/G-SEN/TH-SEN
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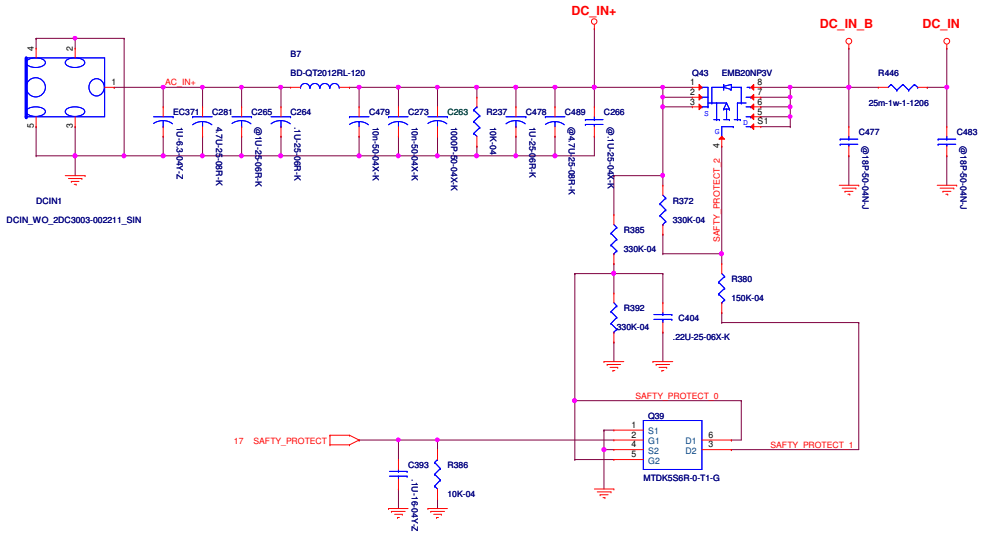
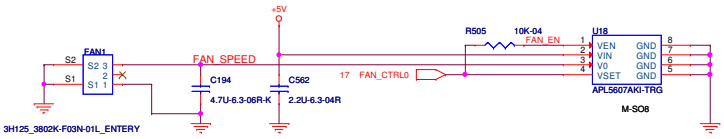
Date: Thursday, September 17, 2015	Sheet 22 of 31

DC IN

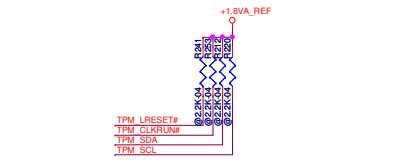
PROJECT	NDBT1401		
Adaptor	40W		
Rsense	25m Ohm		
Stop Charger			

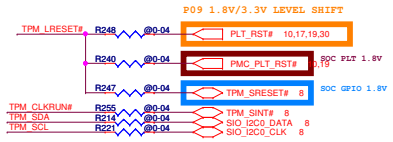


FAN CONTROLLER



TPM I2C Interface for NPCT65X 2014/11/18





Second DC IN

TongFang Inc		
Title: NDBW1401		
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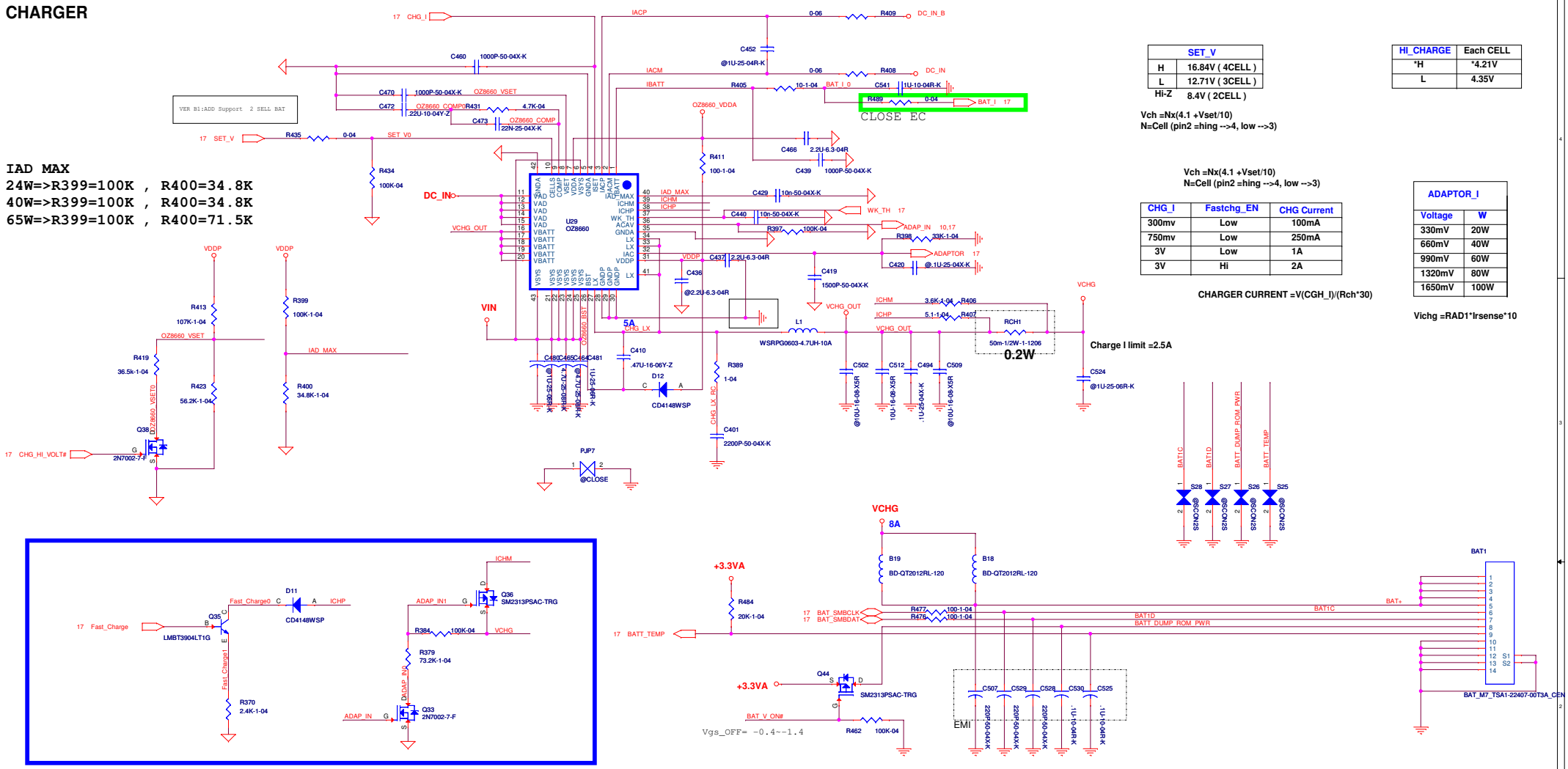
CHARGER



SET_V	
H	16.84V (4CELL)
L	12.71V (3CELL)
Hi-Z	8.4V (2CELL)

Vch =Nx(4.1 +Vset/10)
N=Cell (pin2 =hing -->4, low -->3)

HI_CHARGE	Each CELL
*H	*4.21V
L	4.35V

Vch =Nx(4.1 +Vset/10)
N=Cell (pin2 =hing -->4, low -->3)

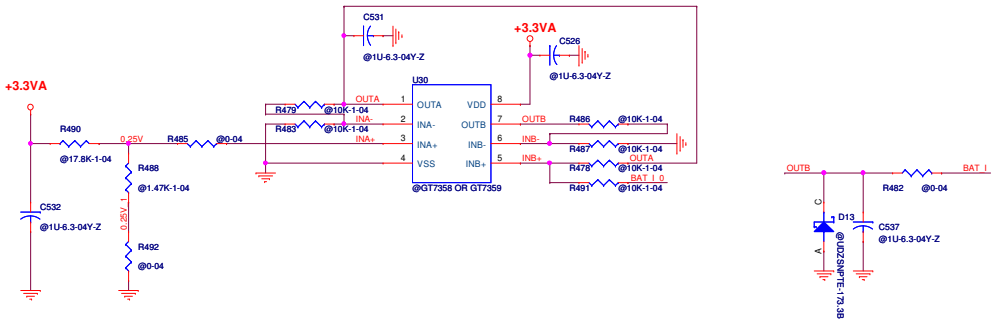
CHG_I	Fastchg_EN	CHG Current
300mv	Low	100mA
750mv	Low	250mA
3V	Low	1A
3V	Hi	2A

CHARGER CURRENT =V(CGH_I)/(Rch*30)

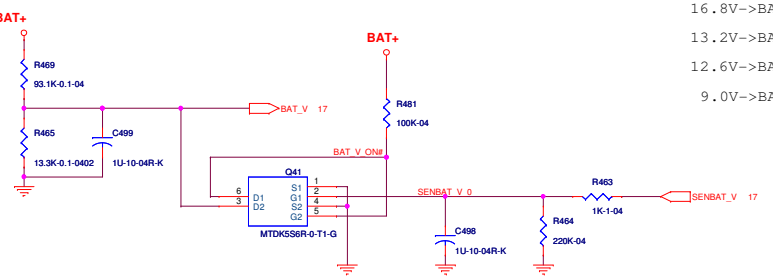
ADAPTOR_I	
Voltage	W
330mV	20W
660mV	40W
990mV	60W
1320mV	80W
1650mV	100W

Vichg =RAD1*Irsense*10

EC 0.25V AD/DA



Battery Voltage Detect



17.6V->BAT_V=2.2V
16.8V->BAT_V=2.1V
13.2V->BAT_V=1.65V
12.6V->BAT_V=1.575V
9.0V->BAT_V=1.125V

TongFang Inc			
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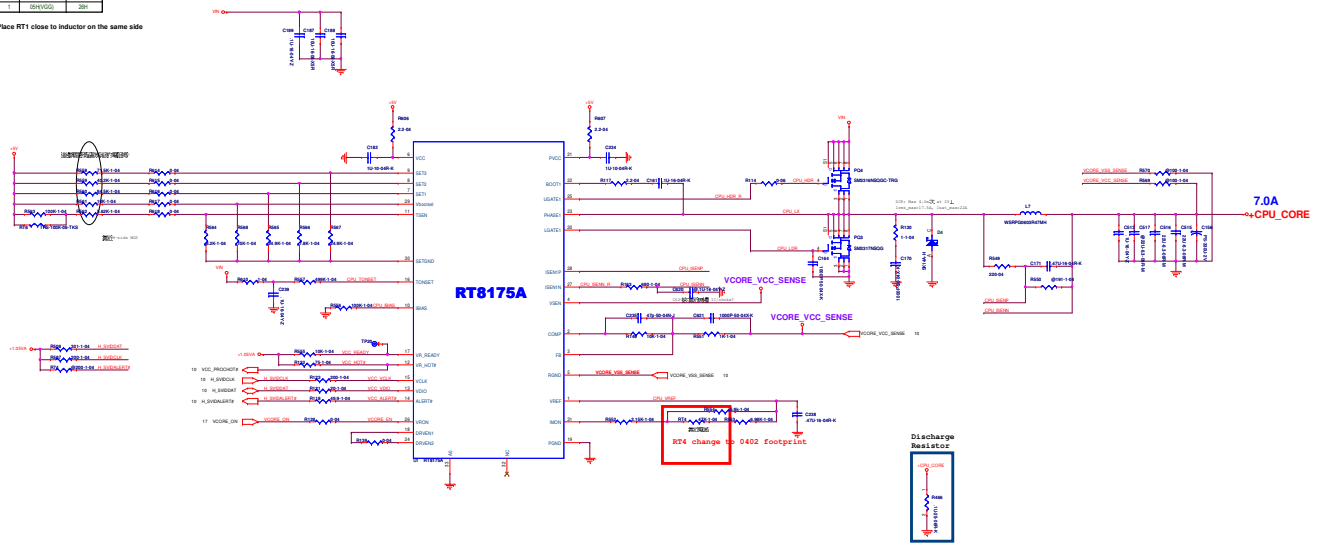
+CPU_CORE

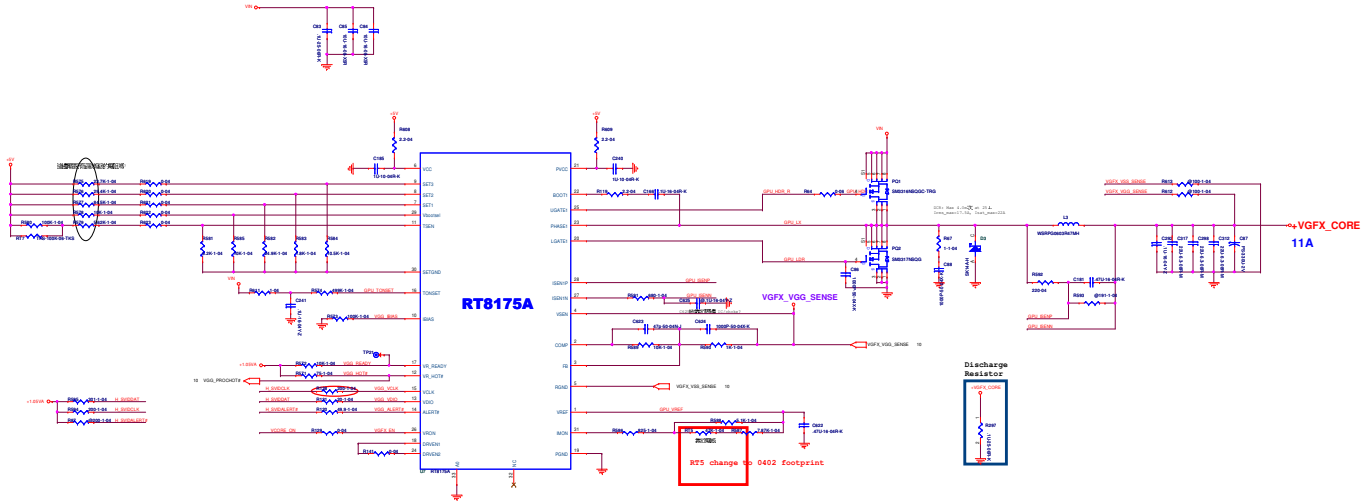
SEL1	SEL0	SVID tel add	I2C write add
0	0	00H(VCCD+VCC1)	20H
1	1	05H(VGG)	26H

Note: Place RT1 close to inductor on the same side

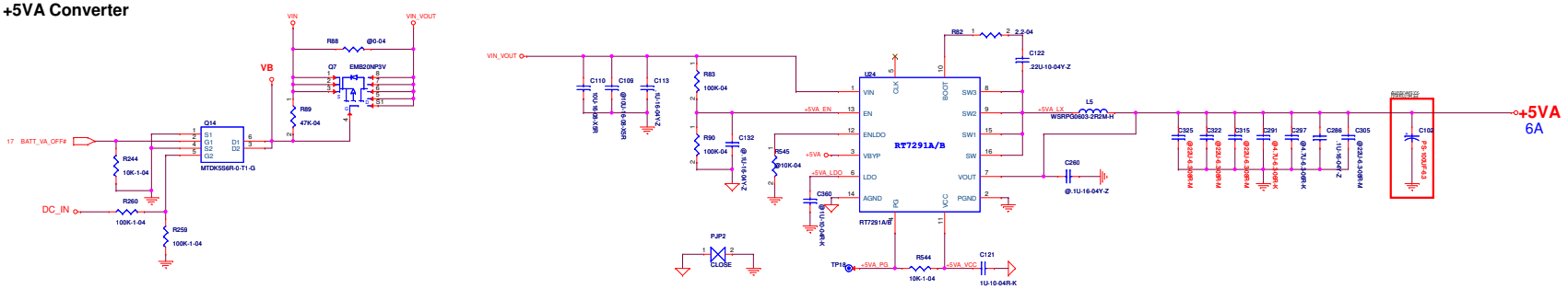


+VGFX_CORE

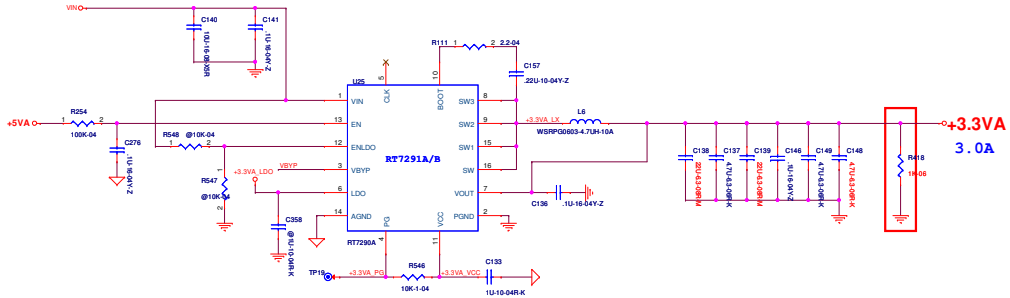
Note: Place RT3 close to inductor on the same side

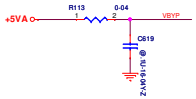


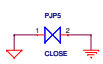
+5VA Converter

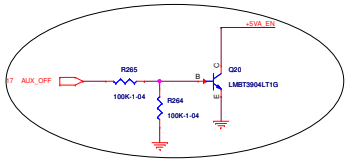


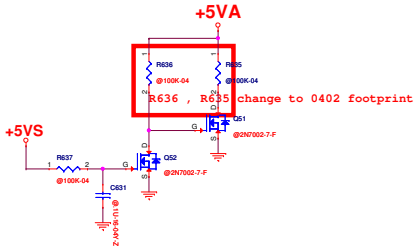
+3.3VA Converter



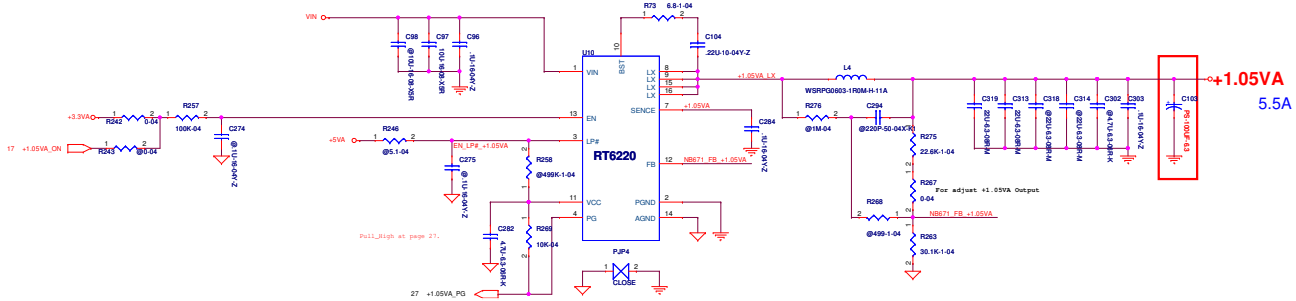








+1.05V Converter



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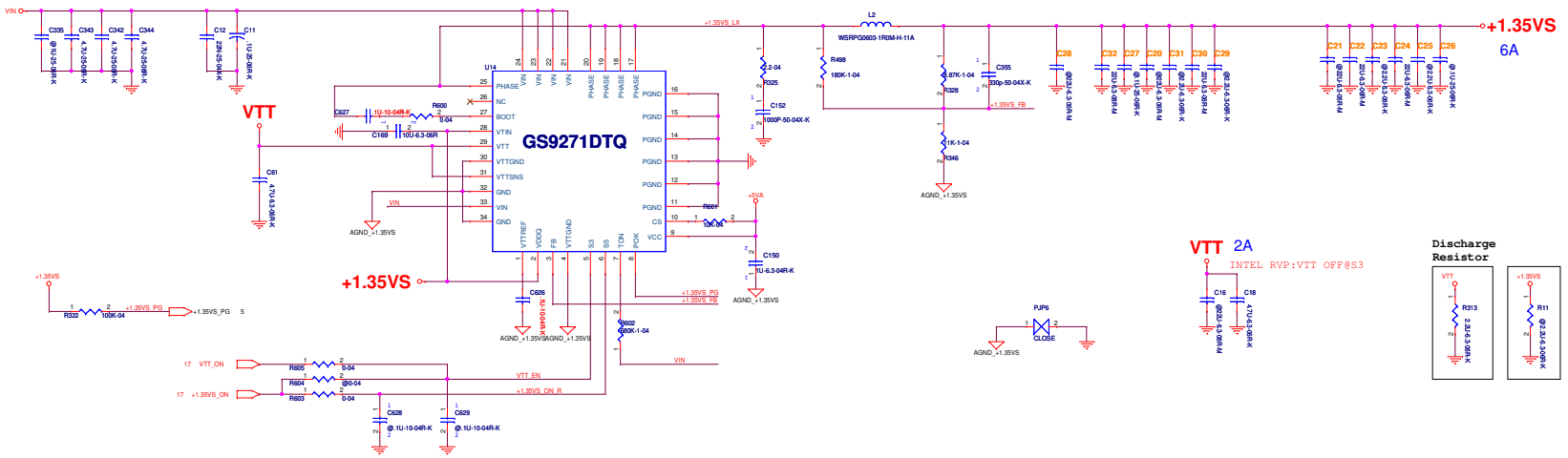
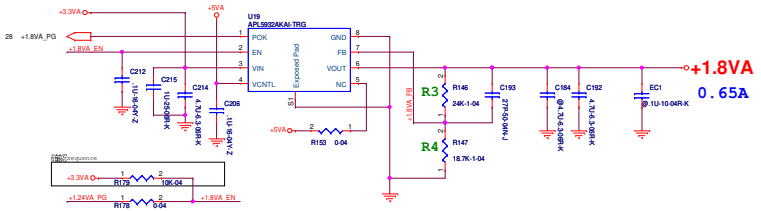
+1.35VS



+1.8VA

VOUT=Vref*(1+R3/R4)

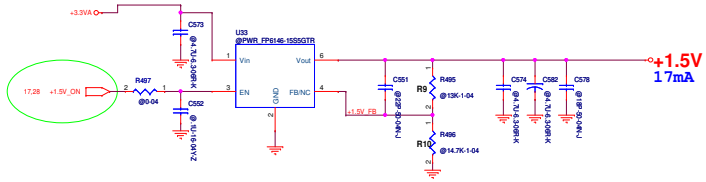
0.8*(1+24/18.7)=1.8267



+1.5V

Vout = 0.8V*(1+R9/R10)

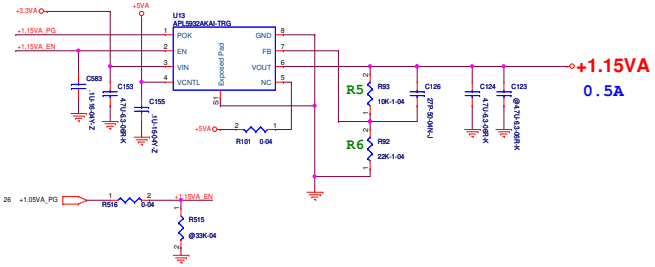
0.8V * (1+13K/14.7K) =1.5075V



+1.15VA

VOUT=Vref*(1+R5/R6)

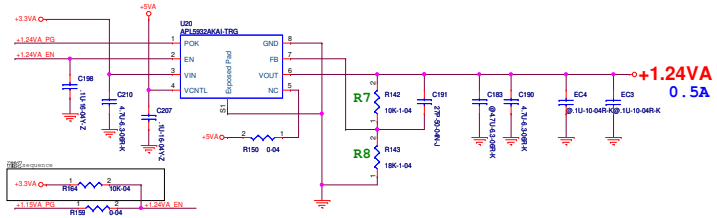
0.8*(1+10/22)=1.164



+1.24VA

VOUT=Vref*(1+R7/R8)

0.8*(1+10/18)=1.244



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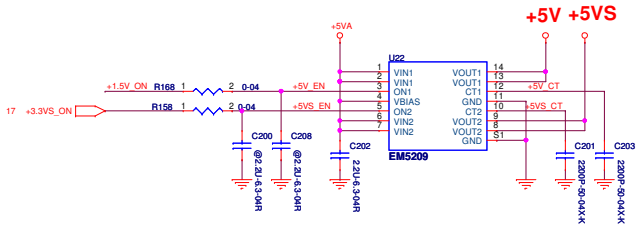
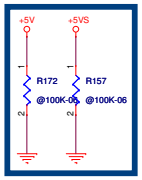
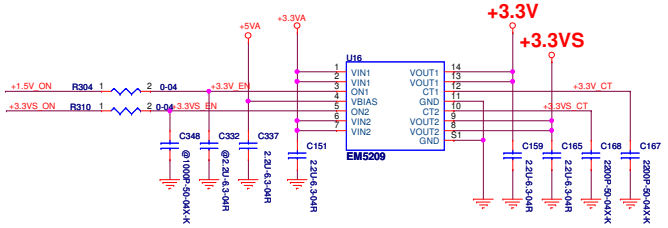
VCCSW +5V/+5VS



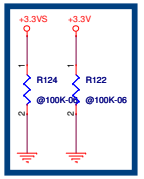
Discharge Resistor



VCCSW +3.3V/+3.3VS

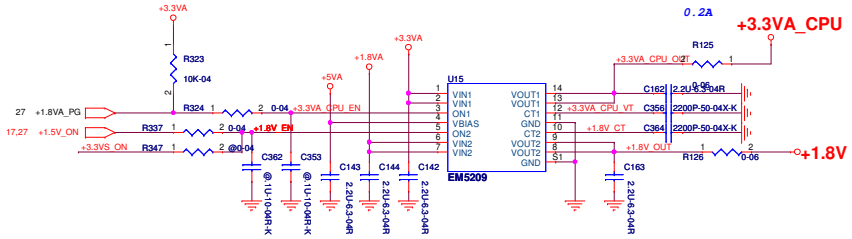


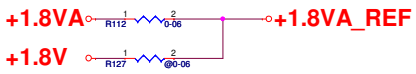
Discharge Resistor



VCCSW +1.8V

VCCSW +3.3VA_CPU





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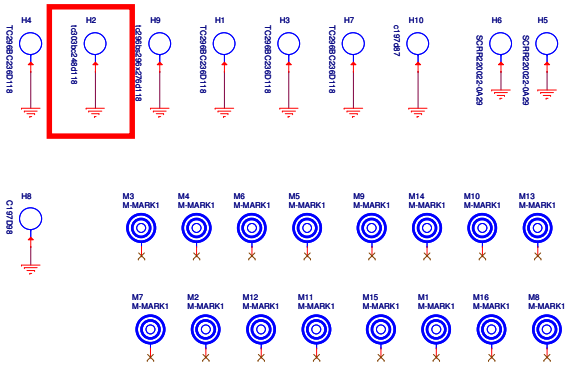
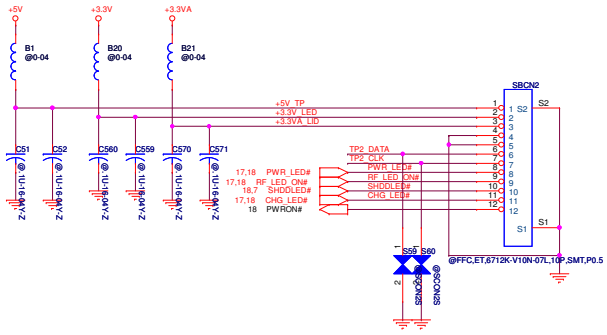
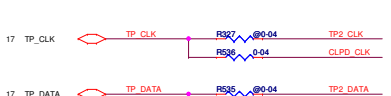
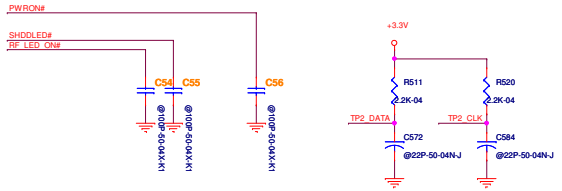


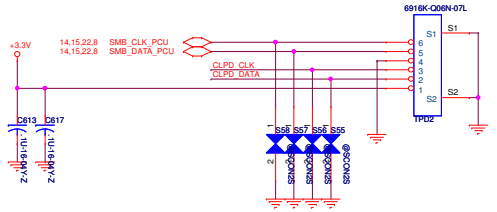
TP DB Connecter



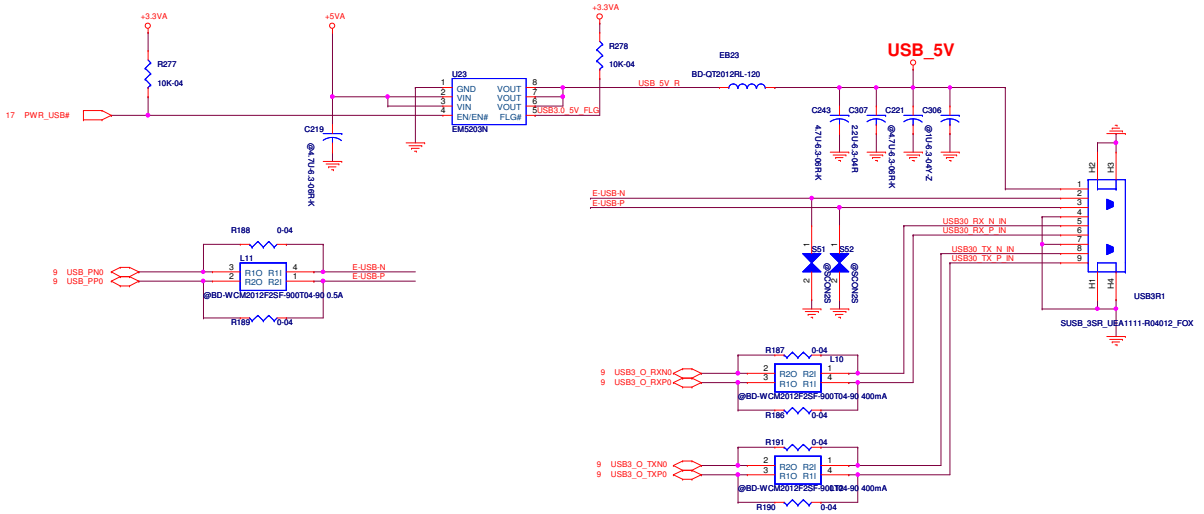


不知道方向 cable摺法 所以無法確認pin define





Enhance USB3.0 Port



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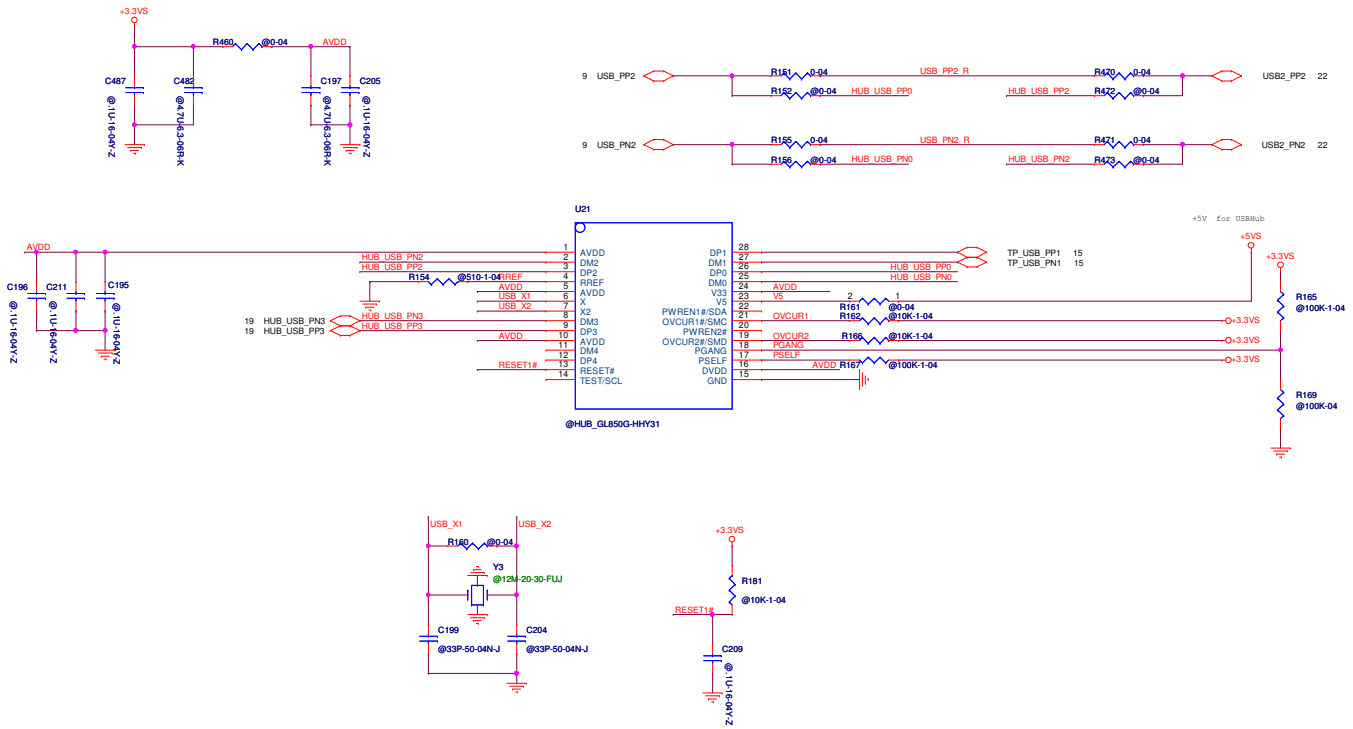
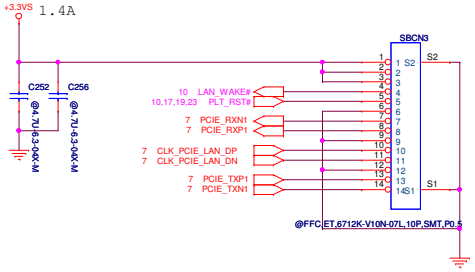


LAN(for AIO)



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B phase

1. ER182, ER183 EMI solution
2. R245修改為100 ohm
3. 新增VIN_LCD放電路徑，R233改為100 ohm，新增Q50
4. 修改+1.5V_PG改為+1.5V_ON
5. R402改為200 ohm，USB2.0 信號才會PASS
6. R305刪除
7. 新增R498 180K, R328改為8.06K, R346改為10K, C355上件容值改為330p
8. +1.05V solution：R276, R268, R258, C294 皆OP
9. Vcore, Vgfx新增snuuber R130, R67：1 ohm, C88, C170：1000p
10. ACZ_BITCLK新增電容EC160
11. VIN_LCD ESD 元件ED3
12. AC_IN+新增1uF電容EC371
13. eMMC VDDQ預留一組switch(PQ5), 原因是SOC漏電會串到1.8V
14. C107, C112修改為27P
15. SERIRQ新增level shift(U17, R326, R628, R629, R630, C251, C553)
16. TXE_disable(GPIO_SUS5)修改
17. 新增TXE disable(Q32)
18. C424, C403, C416改為22uF
19. 新增C447, C458, C433, C445 1uF, C632 22uF
20. R138改為200 ohm
21. EMI要求(Medion)

1uf：C453,C493,C413,C244,C242,C236,C265,C517,C325,C138,C319,C335,C27,C221 共14顆

0.1uF：C397,C441,C293,C278,C268,C311,C68,C469,C266,C526,C260,C358,C619,C274,C26,C51,C52,C560,C570,C613,C306 共21顆

Diode,SMD,GSE0520QFF,GT：ED3,D9,D14,D15

22. 調整transient C621,C624 改為1000p, R140,R589改為10K, R551,R590改為1K

B1

1. RT4,RT5,R635,R636 0603 footprint change to 0402 footprint
2. Del JP
3. Change HDD,ODD 18 pin conn pin define
4. Change H2 footprint
5. Add Q55,Q54,R639,R638,C634,R641 for disable CCD power
6. Add Q53,R631 for cardreader

V1.0

1. 新增5VA poscap(C102), R418加一顆下地電阻(1K ohm) 刪除MLCC(C325,C322,C315,C291,C286)解高頻音
2. 修改CN2 pin define
3. OP R641
4. Co-lay BX/CX EC, 修改SPI ROM的power 1.8V
5. R534上件, SIRIRQ周邊零件OP(U17,R628,R629,R630,C553,R628,C251)
6. 新增C103 100uF POSCAP(BurnIn test)
7. R402改為150 ohm(USB driving)
8. LED R223, R207 改為110 ohm
9. CN5,CN6刪除
10. VCC, VGG家diode(SK34, 位置：D3,D4)
11. +1.05V新增RC(R246,C275)
12. C138, C139 改為22uF(0805), C148上件4.7uF 0603
13. R78 OP
14. B13刪除, B23上件

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