

Project Name: BRASWELL NDBW1401

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M/B Schematic Version Change List

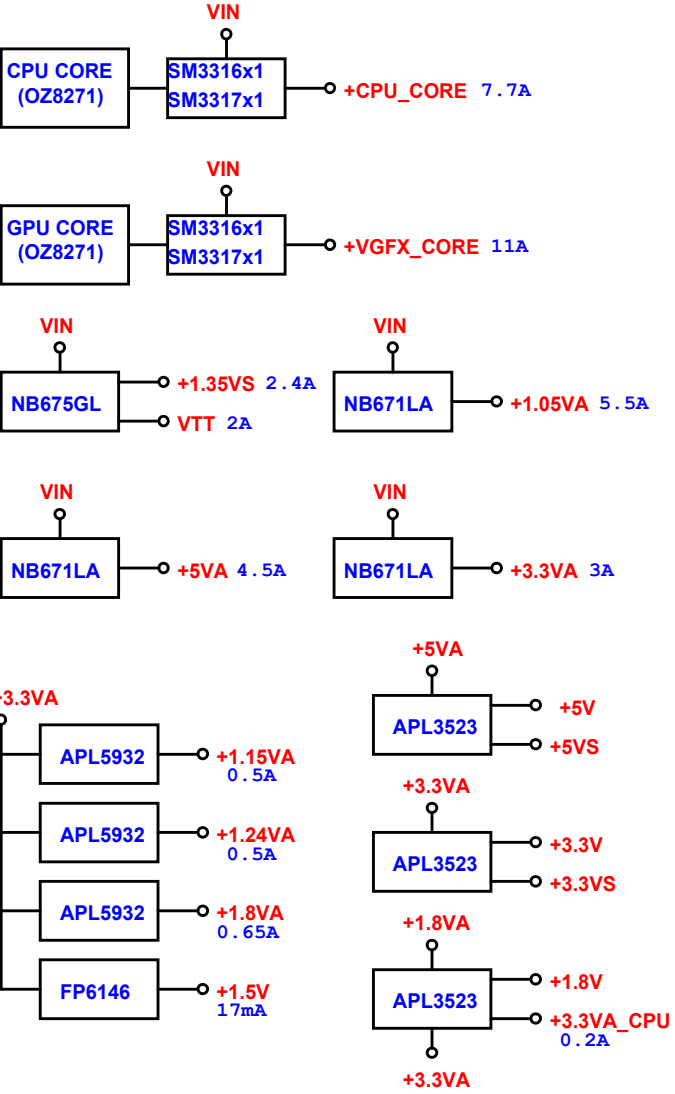
Release Date	Version	PCB P/N	PCB Description	PCBA P/N	Note

Daughter Board Schematic Version Change List

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

<b>TongFang Inc</b>			
File <b>NDBW1401</b>			
Size	Document Number		Rev
Custom	<b>SYSTEM BLOCK</b>		<b>A</b>
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POWER BLOCK DIAGRAM

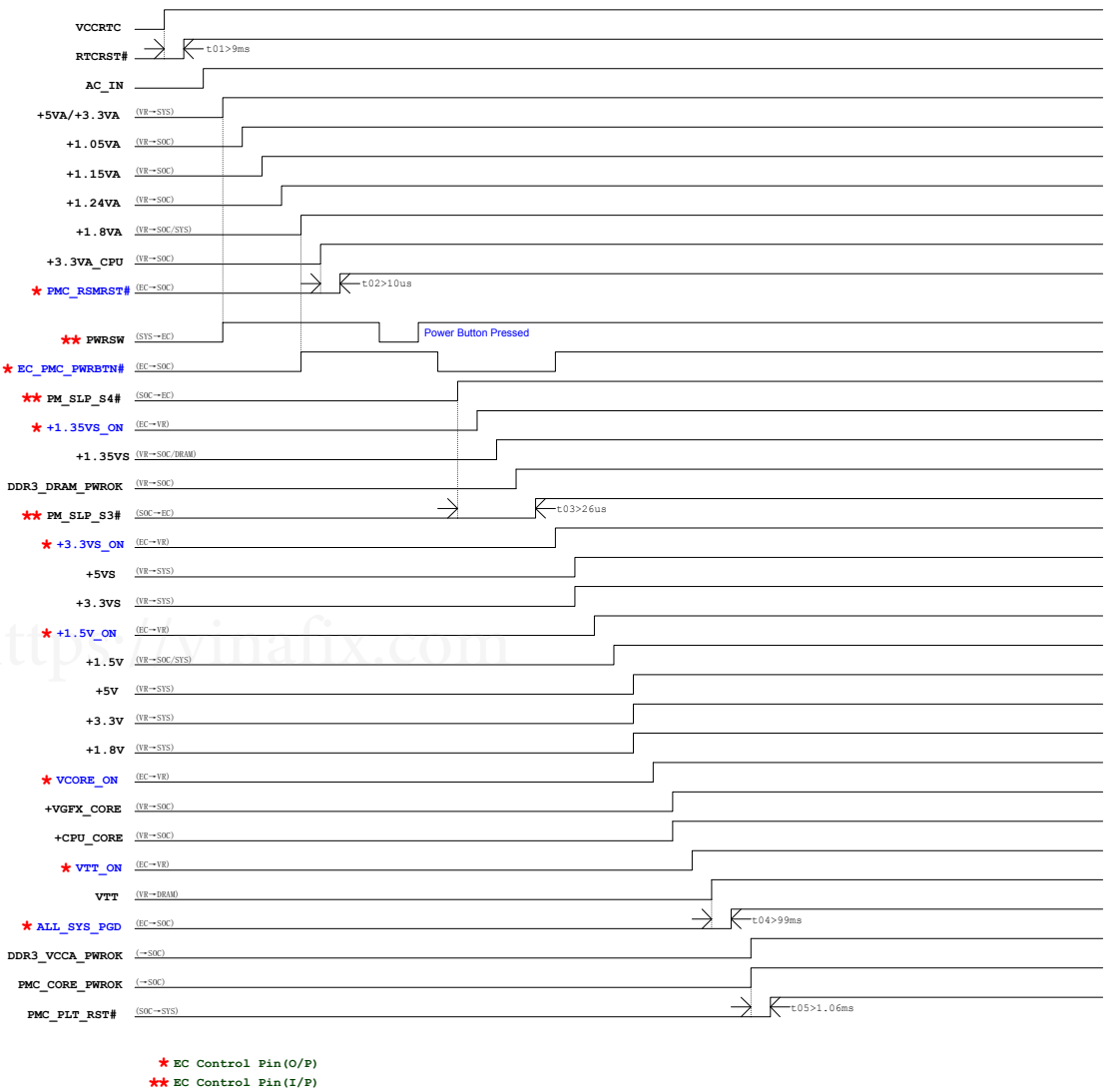


Input Power	Voltage	Current	Power Rail	Voltage	Current
VIN	19.0V	4.1A	+CPU_CORE	VID	7.7A
			+VGFX_CORE	VID	11.0A
			+1.35VS	1.35V	8.0A
			VTT	0.75V	2.0A
			+1.05VA	1.05V	5.5A
			+5VA	5.0V	5.5A
			+3.3VA	3.3V	3.0A

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

Power On Sequence



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

## 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	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_S0IX#_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						

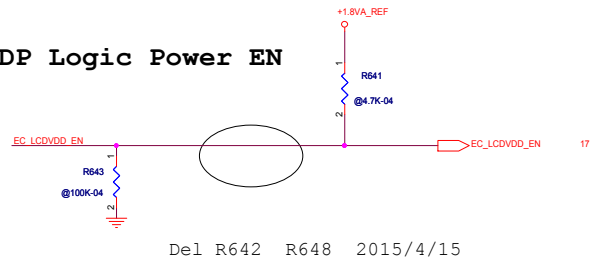
<https://vinafix.com>

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**NDBW1401**

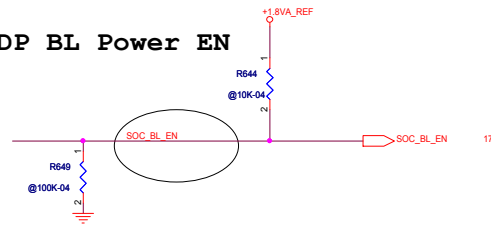
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Size	GPIO & Power Consumption	A
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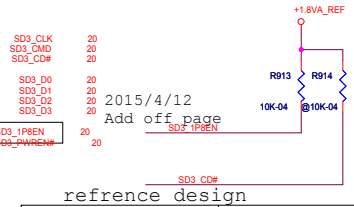
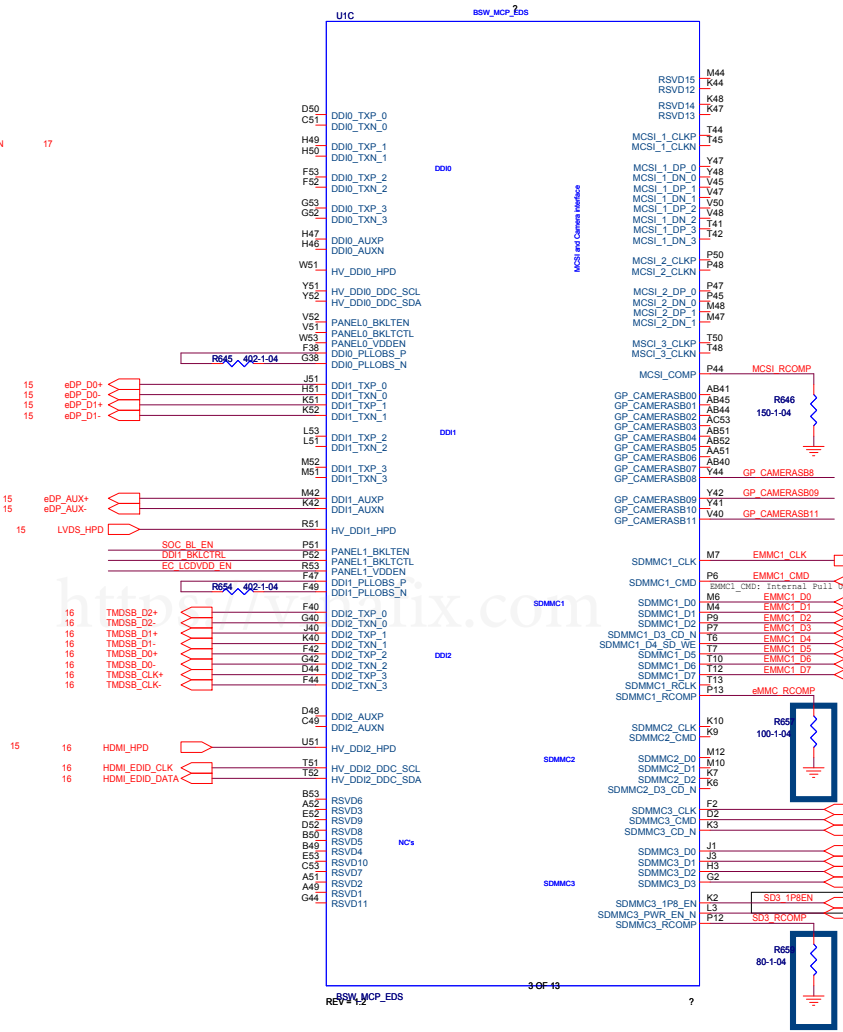
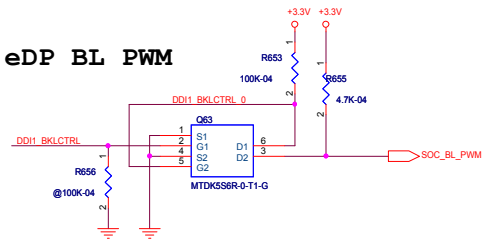
## eDP Logic Power EN



## eDP BL Power EN



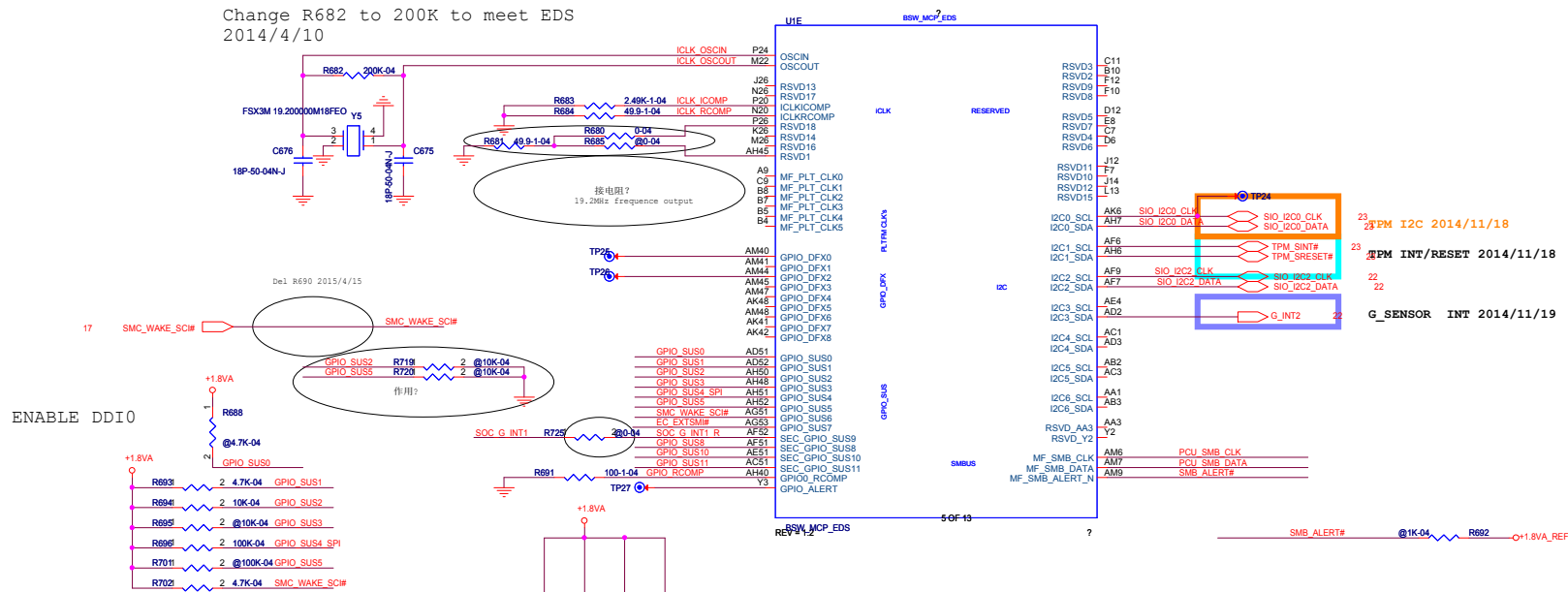
## eDP BL PWM



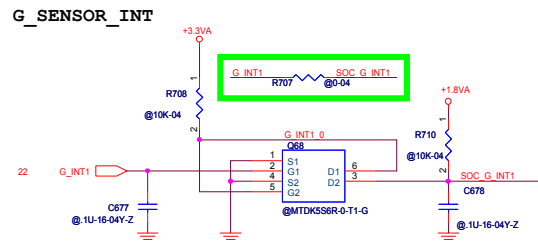
reference design	
SDMMC3_1P8_EN	V1P8A
SDMMC3_CD_N	V1P8A
SDMMC3_CLK	V3P3A/V1P8A
SDMMC3_CMD	V3P3A/V1P8A
SDMMC3_D0	V3P3A/V1P8A
SDMMC3_D1	V3P3A/V1P8A
SDMMC3_D2	V3P3A/V1P8A
SDMMC3_D3	V3P3A/V1P8A
SDMMC3_PWR_EN_N	V1P8A



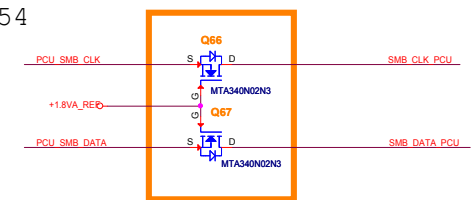
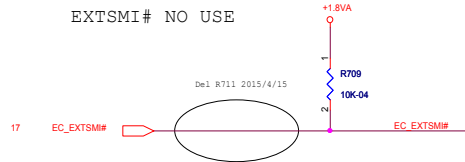
Change R682 to 200K to meet EDS  
2014/4/10



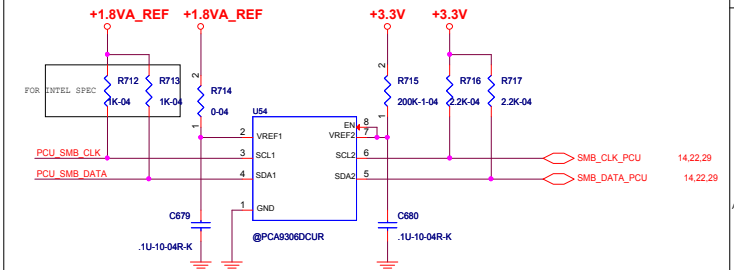
PIN NAME	PURPOSE	OPTIONS	STATE	FU/PD(in)
SUS0	DDIO	FU ENABLE, N/A DISABLE	LOW	FD
SUS1	DDI1	FU ENABLE, N/A DISABLE	HIGH	PD
SUS3	DSI DISPLAY	FU ENABLE, N/A DISABLE	LOW	PD
SUS4	BIOS BOOT	FU SPI, PD LFC	HIGH	FU
SUS5	GPIO	NC	NC	FU
SUS6	WAKE_SCI#	FU DISABLE1, PD ENABLE	HIGH	FU
SUS7	EXTSM1#	FU DISABLE1, PD ENABLE	HIGH	FU
SUS8	PLL_USB2.0, SPR_CLK...	FU 1.35V, PD 1.24V	LOW	FU



EXTSMI# NO USE



SMBUS/I2C FOR G-SENSOR/CPD/DRAM



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

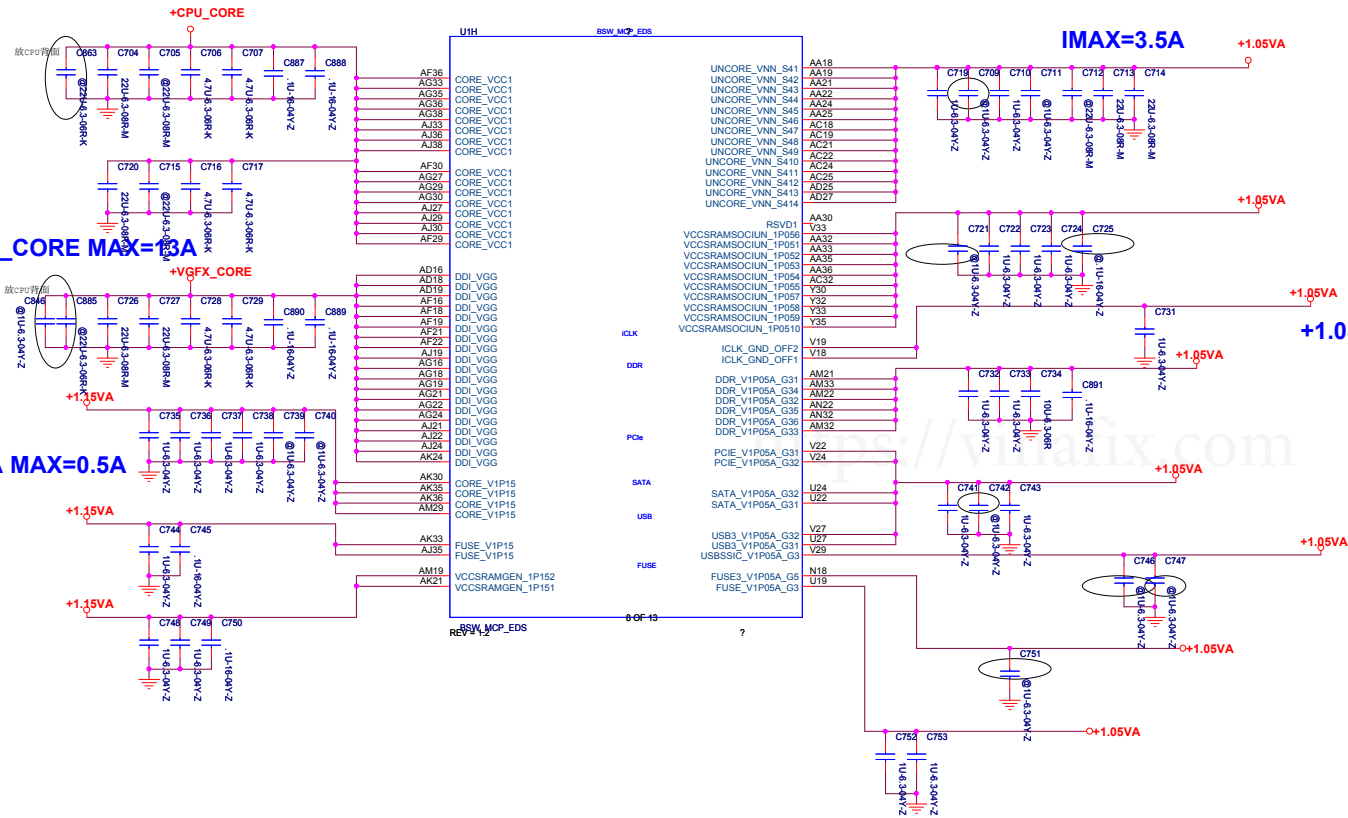
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NDBW1401			
Size	Document Number		Rev
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+CPU\_CORE MAX=6.4A

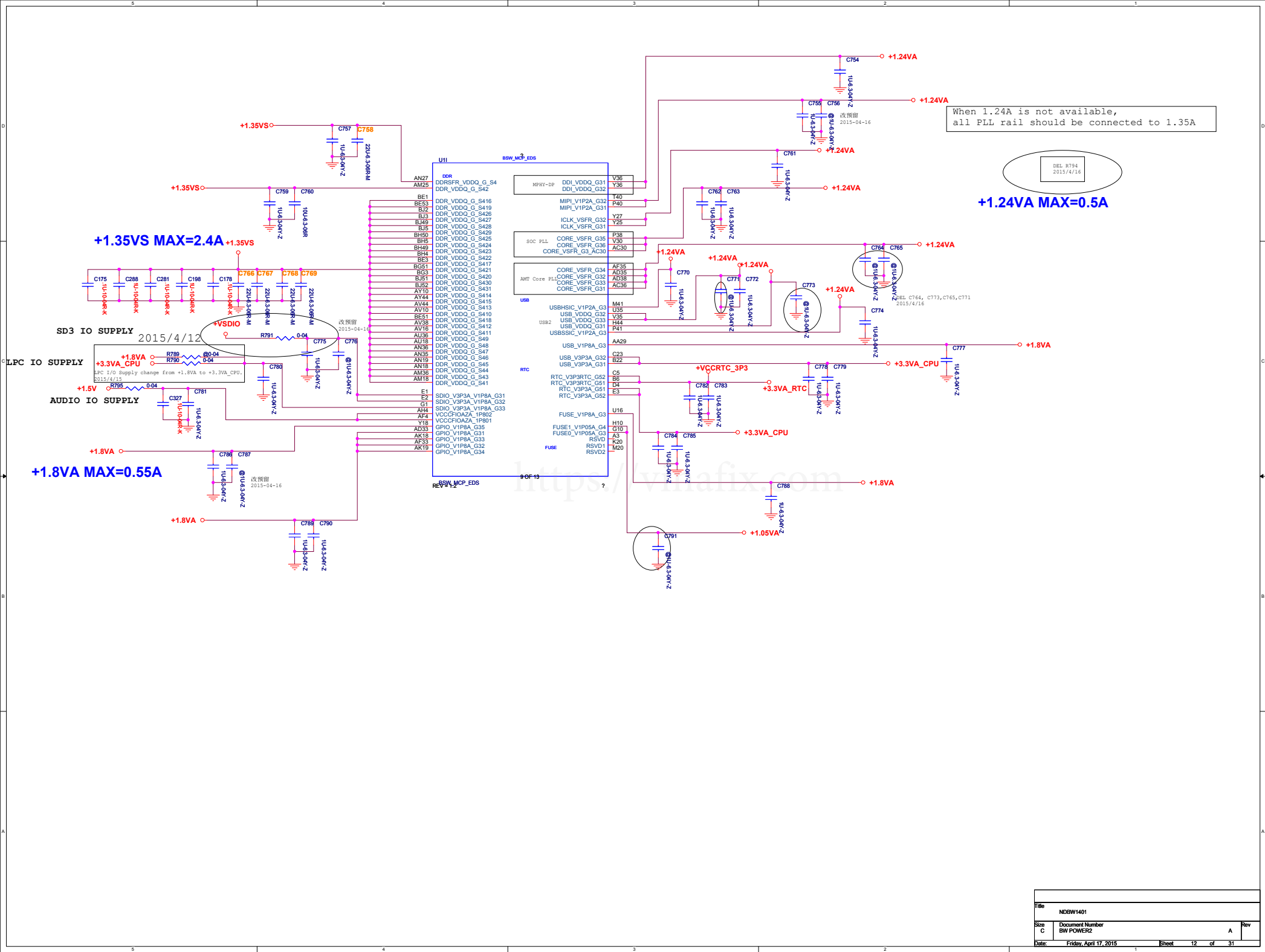
+VGFX\_CORE MAX=1.5A

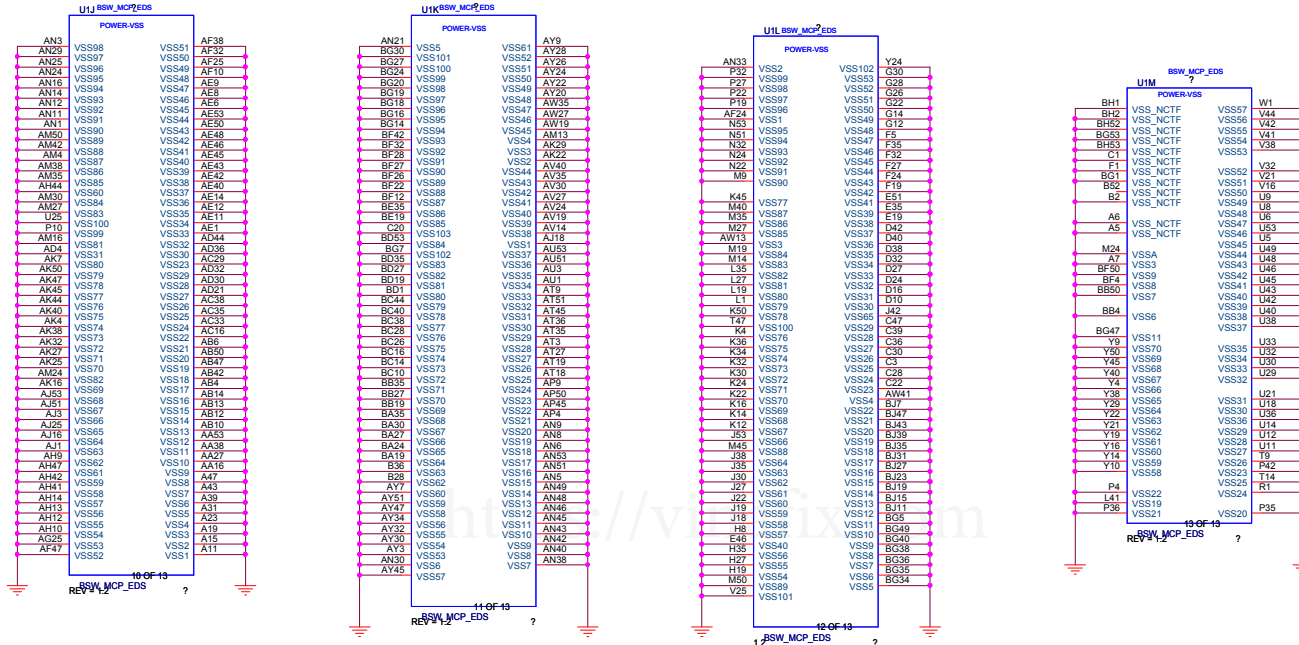
+1.15VA MAX=0.5A

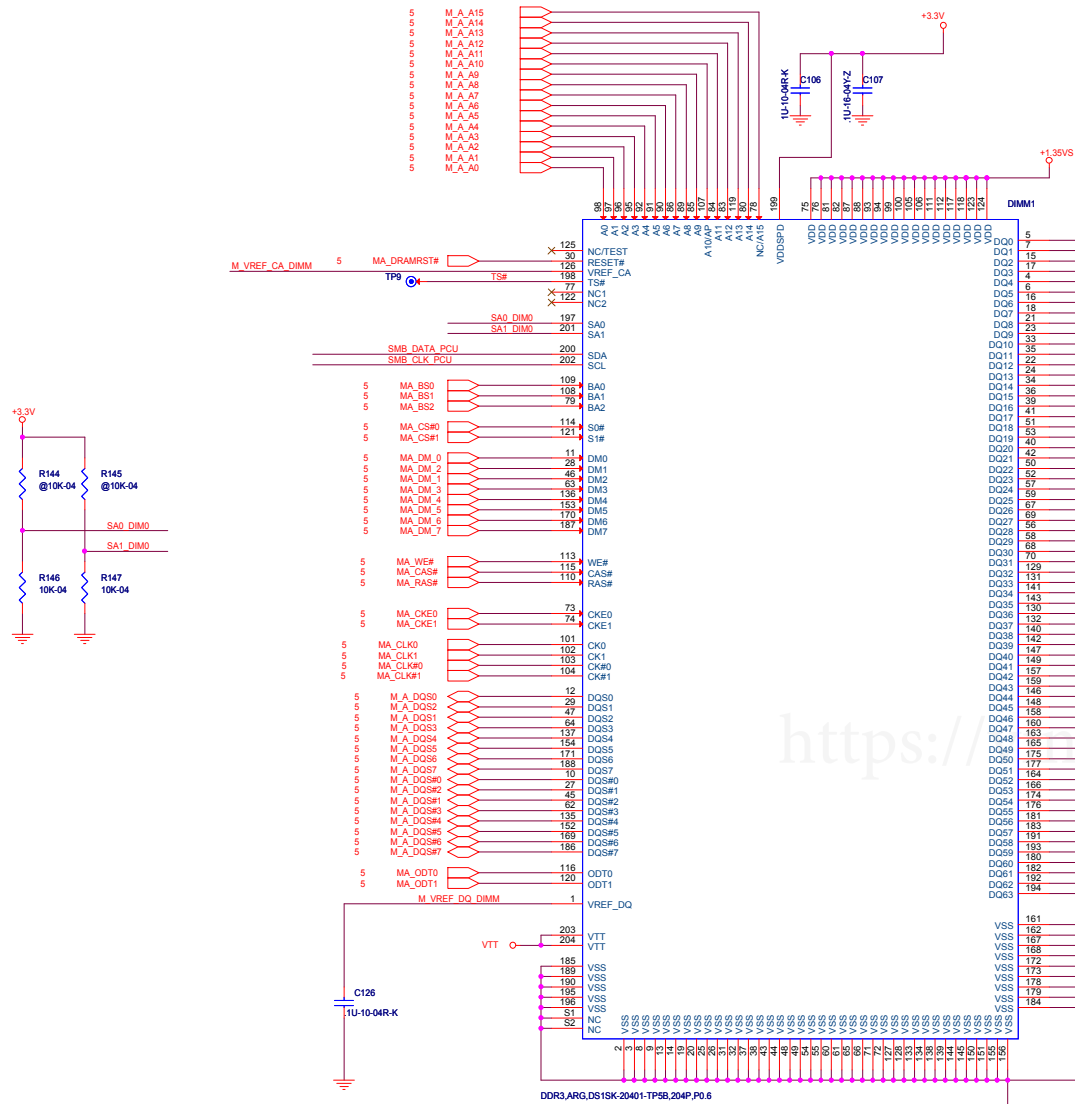


IMAX=3.5A

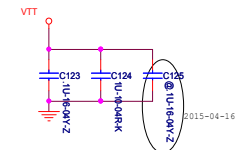
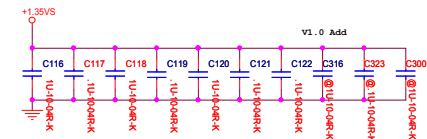
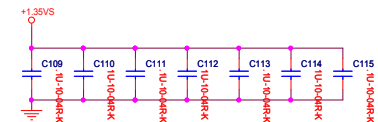
+1.05VA MAX=2A







- dq0 - dq7
- dq16 - dq23
- dq8 - dq15
- dq24 - dq31
- dq32 - dq39
- dq40 - dq47
- dq48 - dq55
- dq56 - dq63



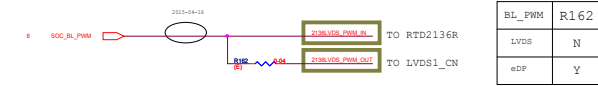
Del R406, R412  
2015/4/16

CHECK SINGEL



Title			
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## BL PWM



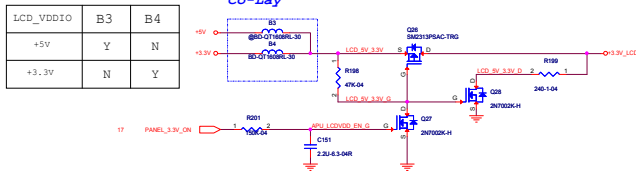
COLAY1	R22	R23	R12	R13	R14	R15	C9	C10	C5	C6	C7	C8
eDP	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N
LVDS	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y

COLAY2	C129	C130	C131	C132	C133	C134	R166	R165	R161	R160	R164	R163
eDP	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N
LVDS	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y

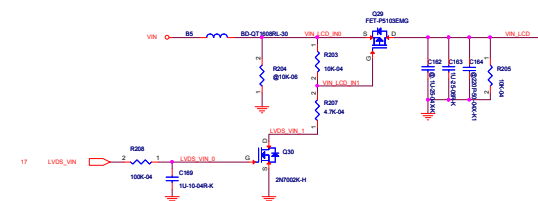
## BL EN



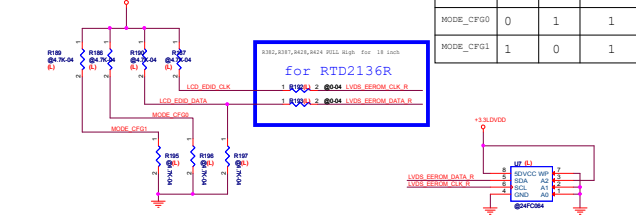
## LCD 3.3V/5V



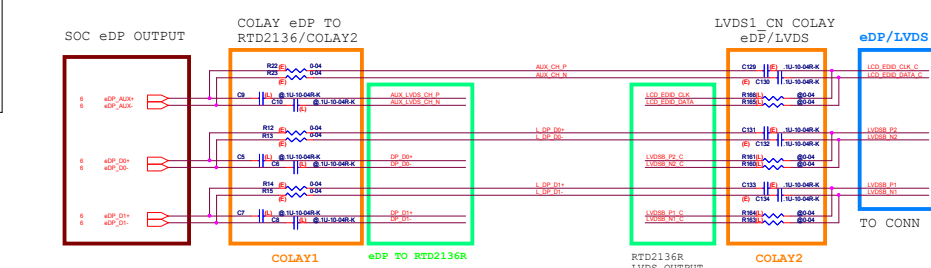
## LCD 19V/BAT1+



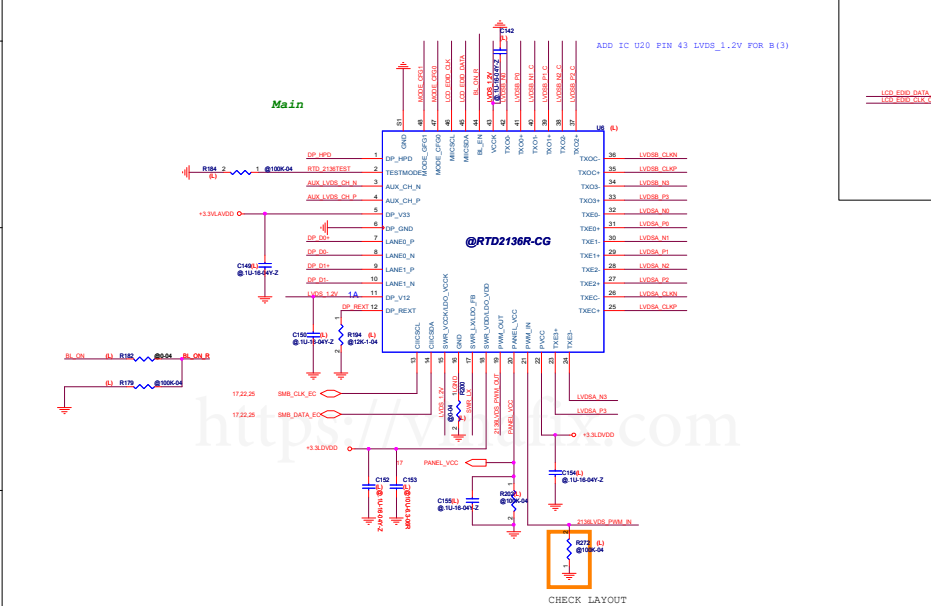
## LCD EDID



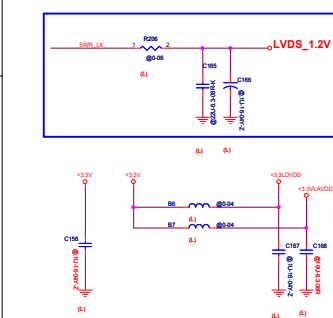
## eDP/LVDS COLAY CHECKLAYOUT



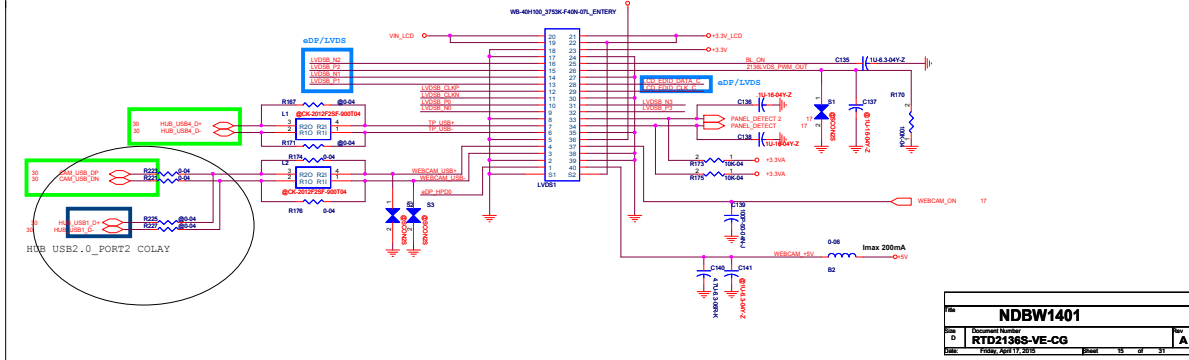
## RTD2136R



## RTD2136R POWER



## LVDS1

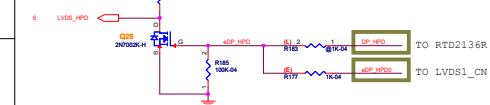


## LCD TABLE

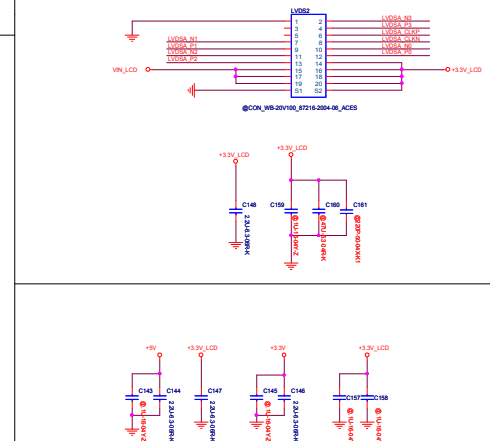
Panel_det	14"	15"	18"	23"
PANEL_DETECT	1	0	1	0
PANEL_DETECT2	1	1	0	0

## LCD HPD

LCD HPD	R183	R177
LVDS	Y	N
eDP	N	Y

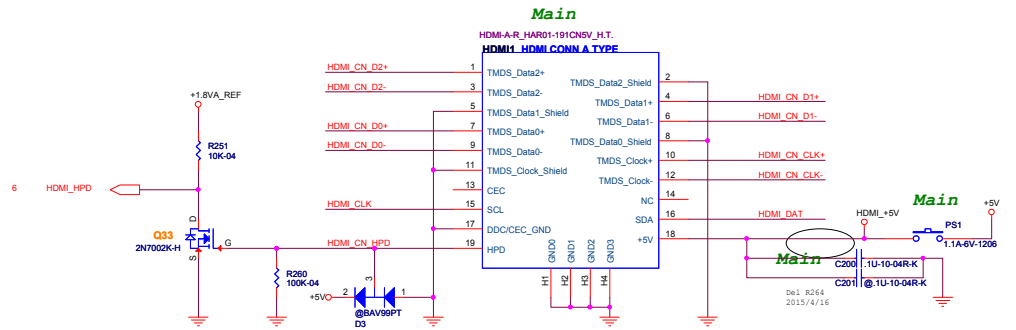
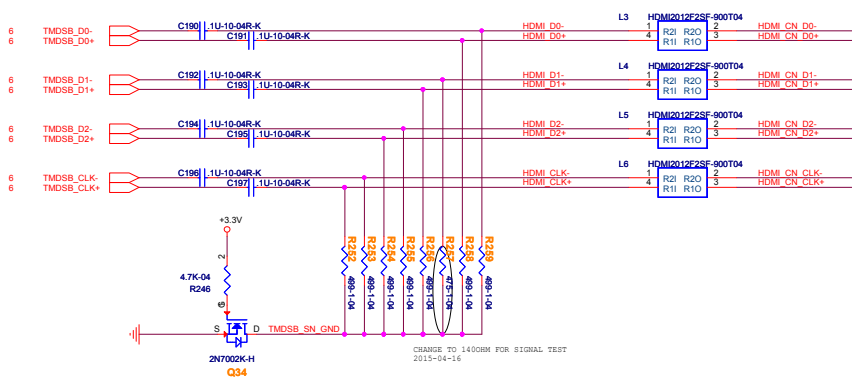
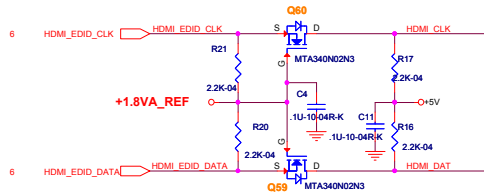


## LVDS2



## HDMI CONN

## HDMI EDID

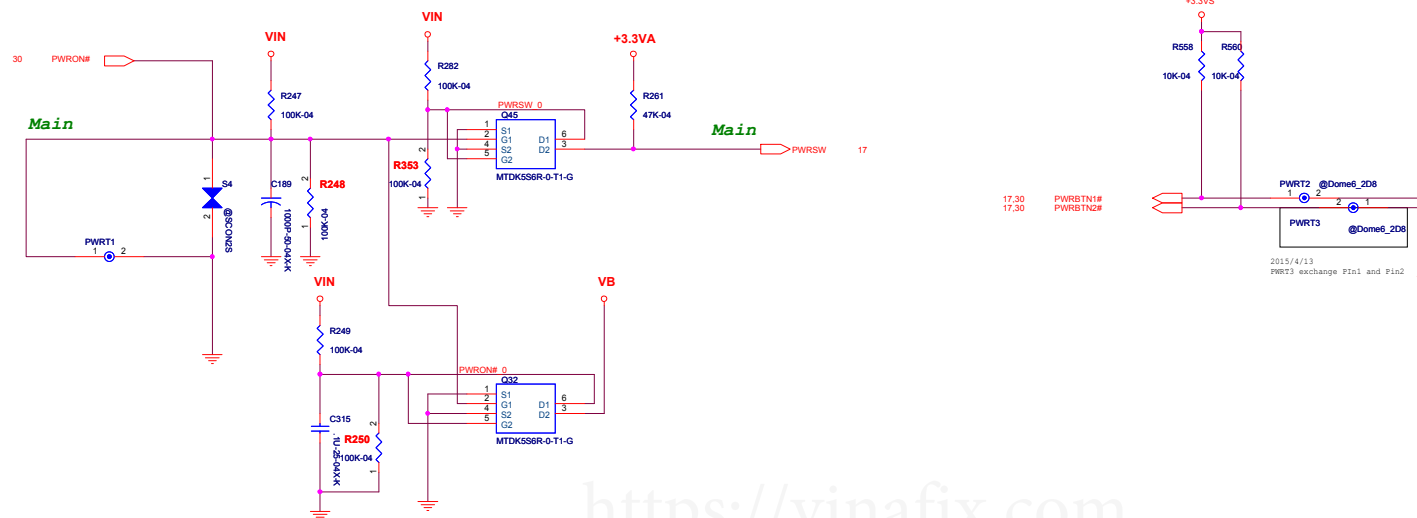


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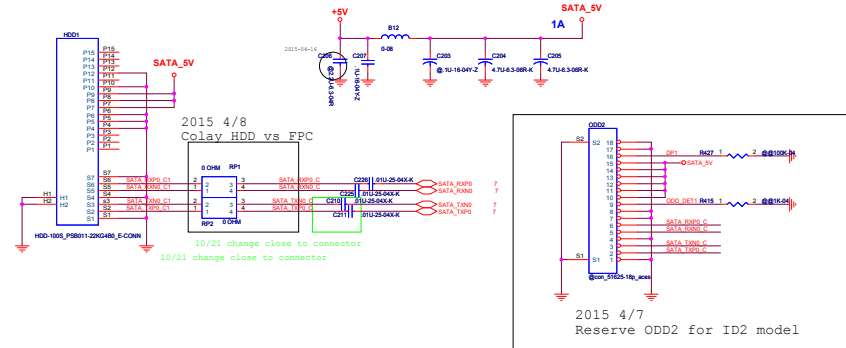




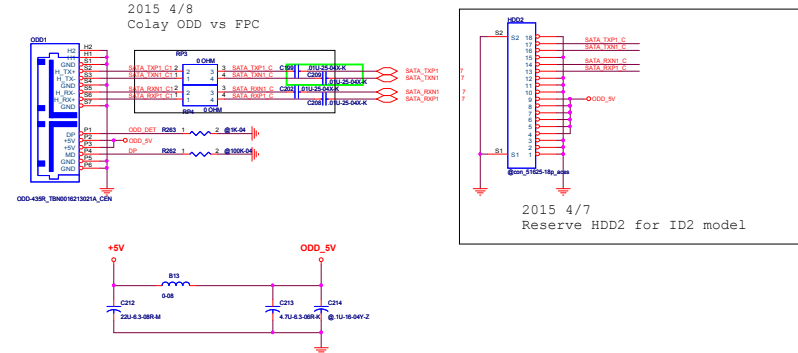
# PWR SW



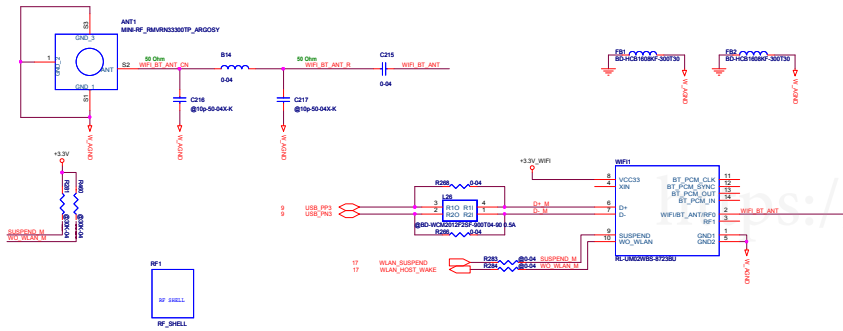
## SATA-HDD



## CD-ROM

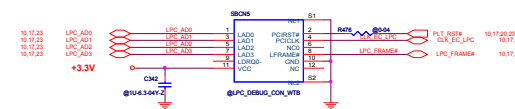


## WIFI/BT 2014/11/26

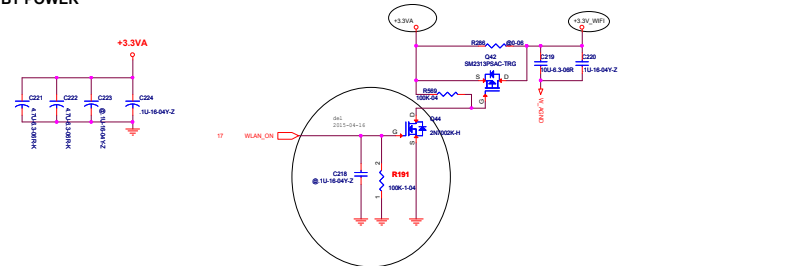


## DEBUG CN

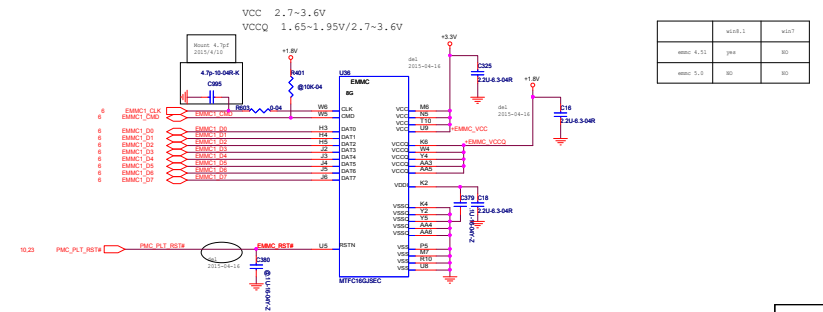
Vinafix.com



## WIFI/BT POWER

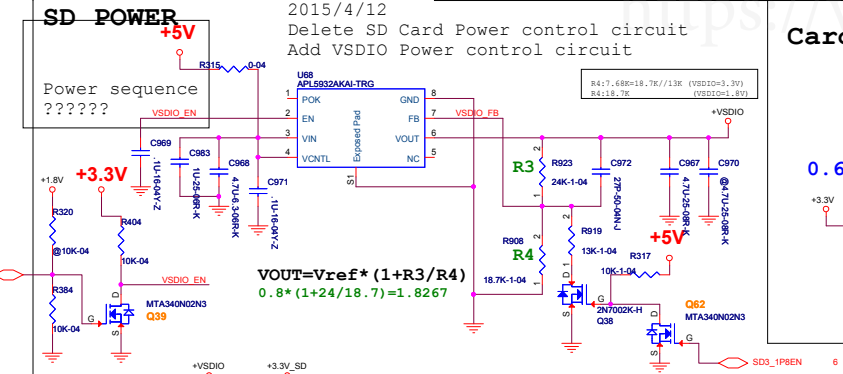
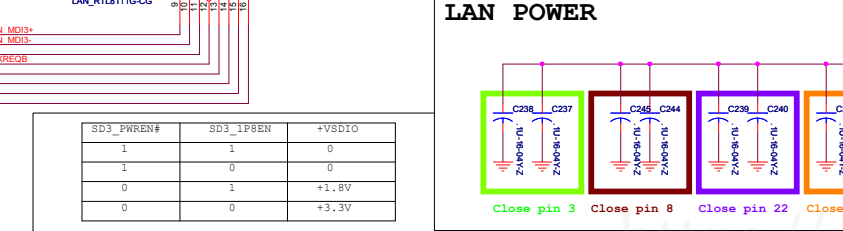
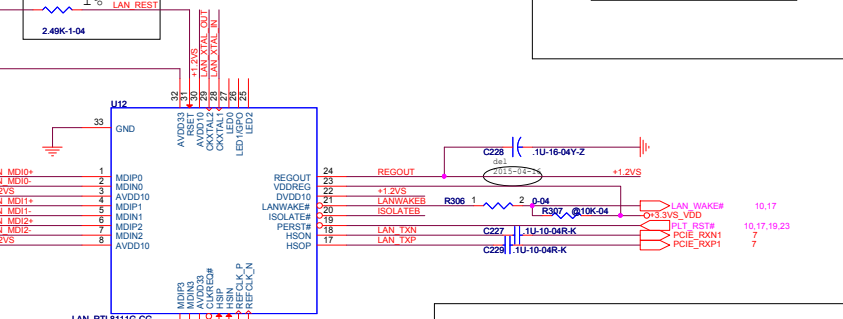
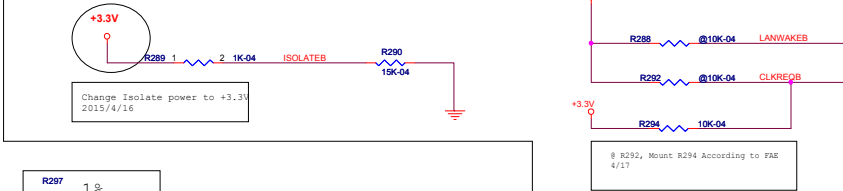


## EMMC

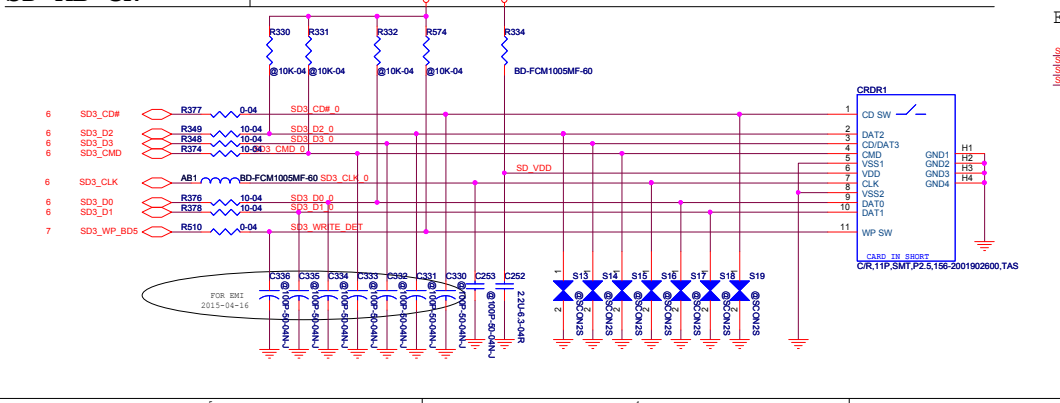


**LAN**

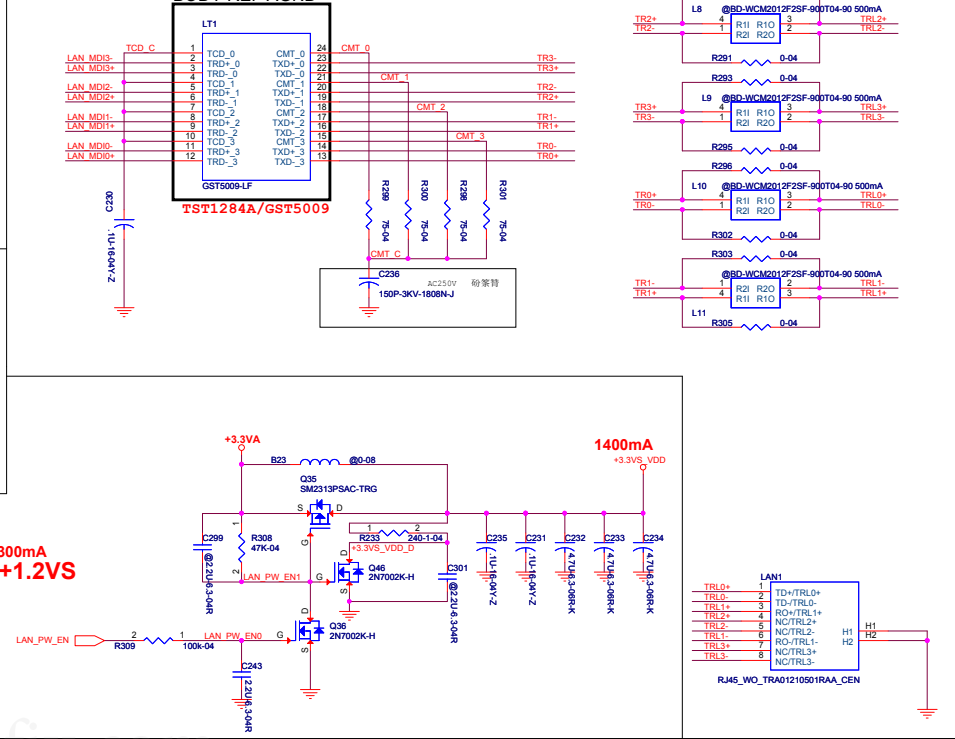
## LAN SETING CHECK



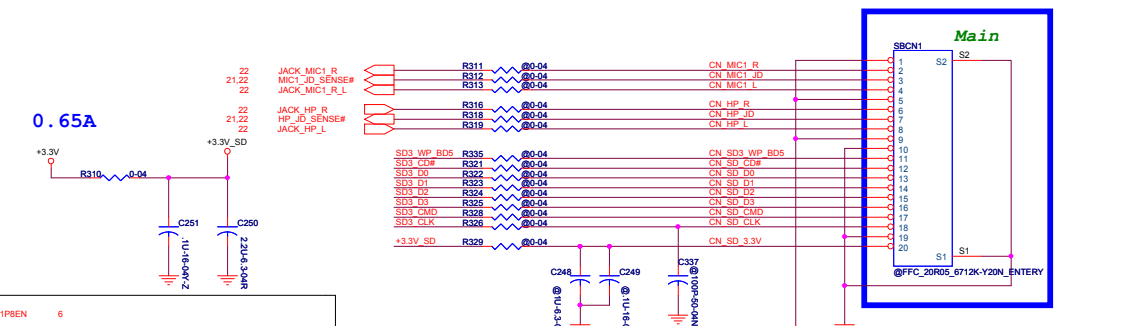
## SD MB CN



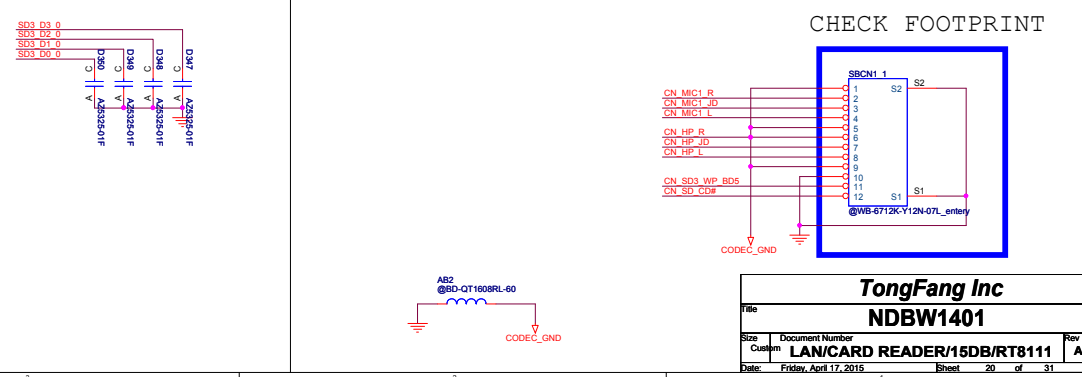
## LAN CN



Cardreader/USB & HP BD    SBCN1/SBCN6 COLAY

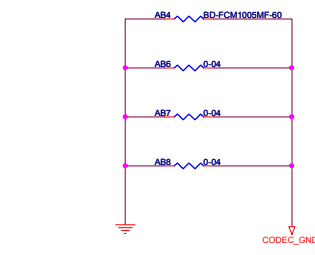
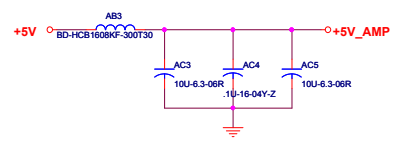
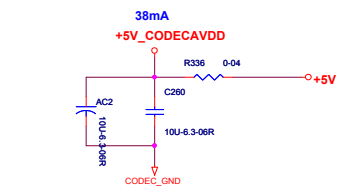


## ESD

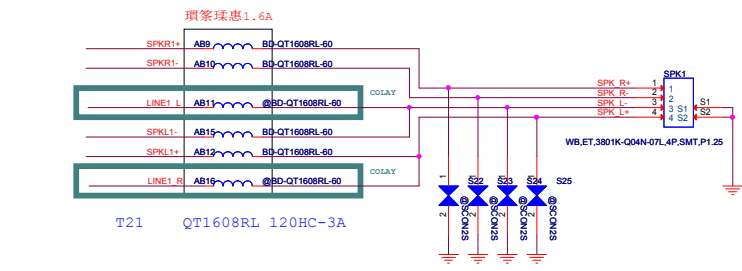


CODEC ALC269Q-VC/VB

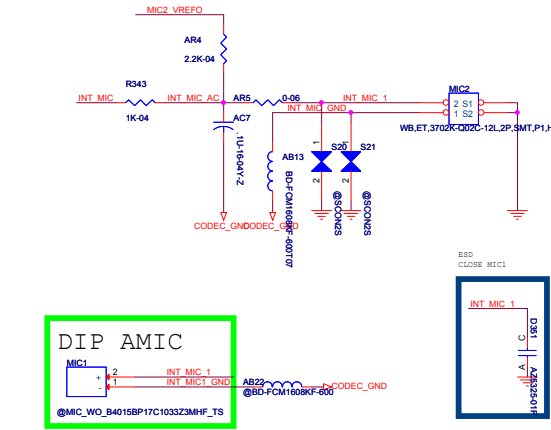
AMP VDD



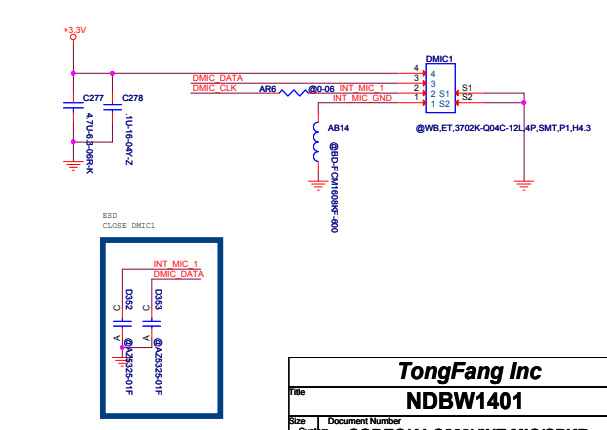
INT\_SPEAKER



INT\_MIC



Digital Mic

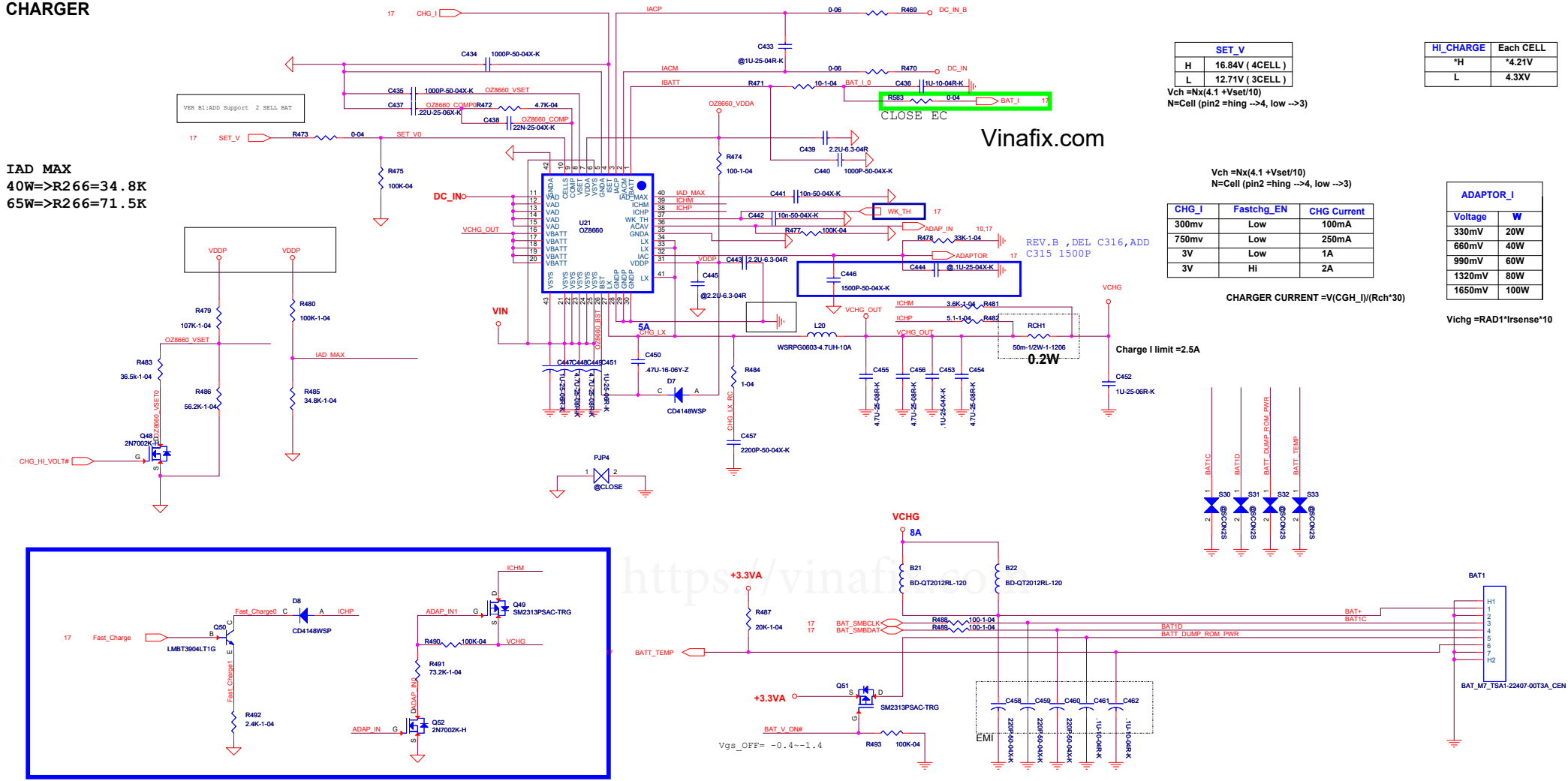






# CHARGER

IAD MAX  
40W=>R266=34.8K  
65W=>R266=71.5K



SET_V	
H	16.84V (4CELL)
L	12.71V (3CELL)

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

HI_CHARGE	Each CELL
H	4.21V
L	4.3XV

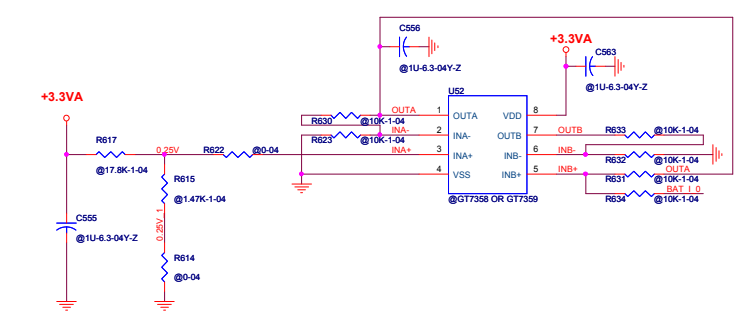
CHG_I	Fastchg_EN	CHG Current
300mv	Low	100mA
750mv	Low	250mA
3V	Low	1A
3V	Hi	2A

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

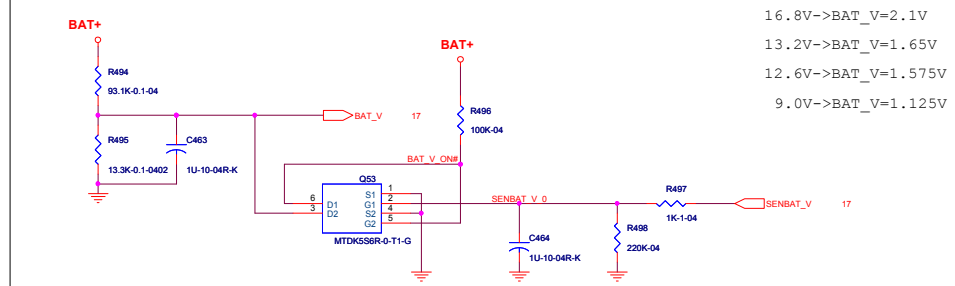
CHARGER CURRENT = V(CGHI\_I)/(Rch\*30)

Vichg = RAD1\*Irsense\*10

## EC 0.25V AD/DA



## Battery Voltage Detect



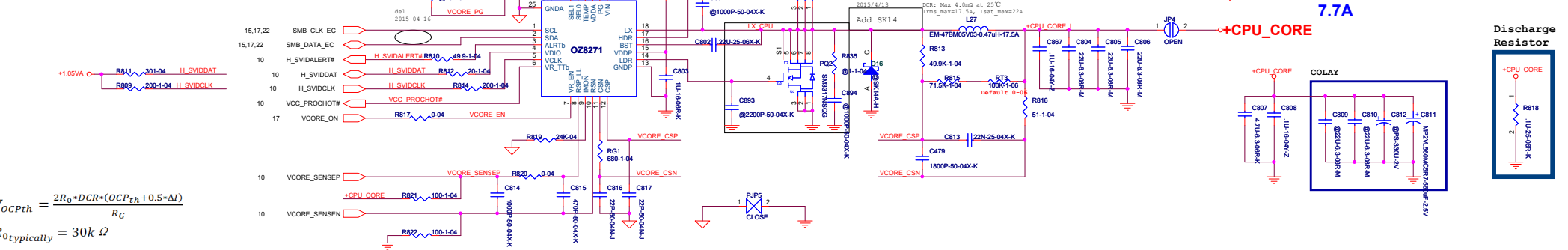
17.6V->BAT\_V=2.2V  
16.8V->BAT\_V=2.1V  
13.2V->BAT\_V=1.65V  
12.6V->BAT\_V=1.575V  
9.0V->BAT\_V=1.125V



## +CPU\_CORE

SEL1	SEL0	SVID rail addr	I2C write addr
0	0	00H(VCC0+VCC1)	20H
1	1	05H(VGG)	26H

Note: Place RT1 close to inductor on the same side



$$V_{OCpTh} = \frac{2R_0 \cdot DCR \cdot (OCpTh + 0.5 \cdot \Delta I)}{R_G}$$

$$R_{0\text{typically}} = 30k \Omega$$

$$OCpTh = 1.3 \cdot I_{cc\_max} \quad \Delta I = 0.3 \cdot I_{cc\_max}$$

$$I_{cc\_max} = 6.4A \quad (\text{Need to be written in EC})$$

$$V_{IMON} = I_{load} \cdot DCR \cdot \frac{R_{802}}{R_G}$$

## +VGFX\_CORE

Note: Place RT3 close to inductor on the same side

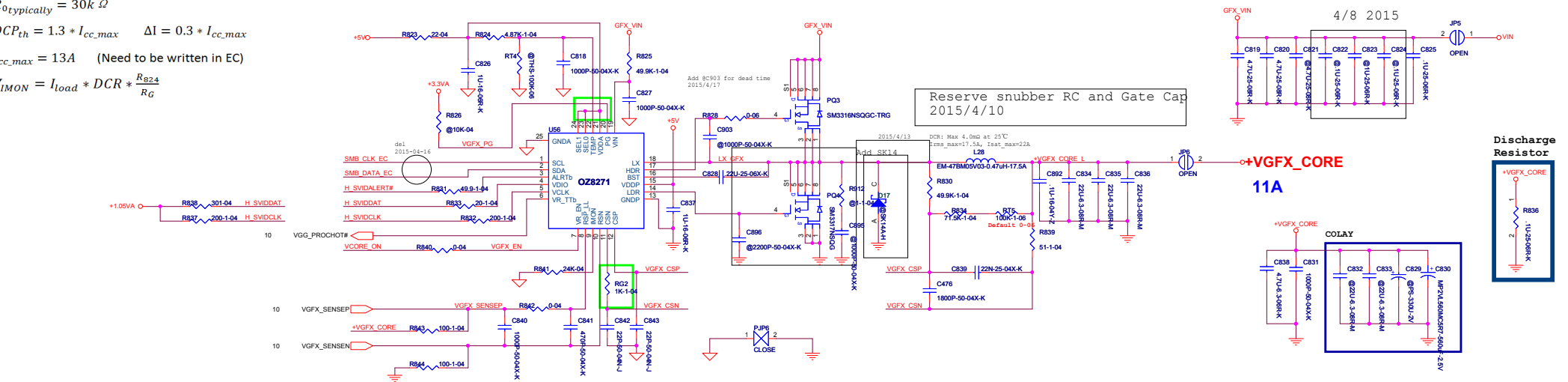
$$V_{OCpTh} = \frac{2R_0 \cdot DCR \cdot (OCpTh + 0.5 \cdot \Delta I)}{R_G}$$

$$R_{0\text{typically}} = 30k \Omega$$

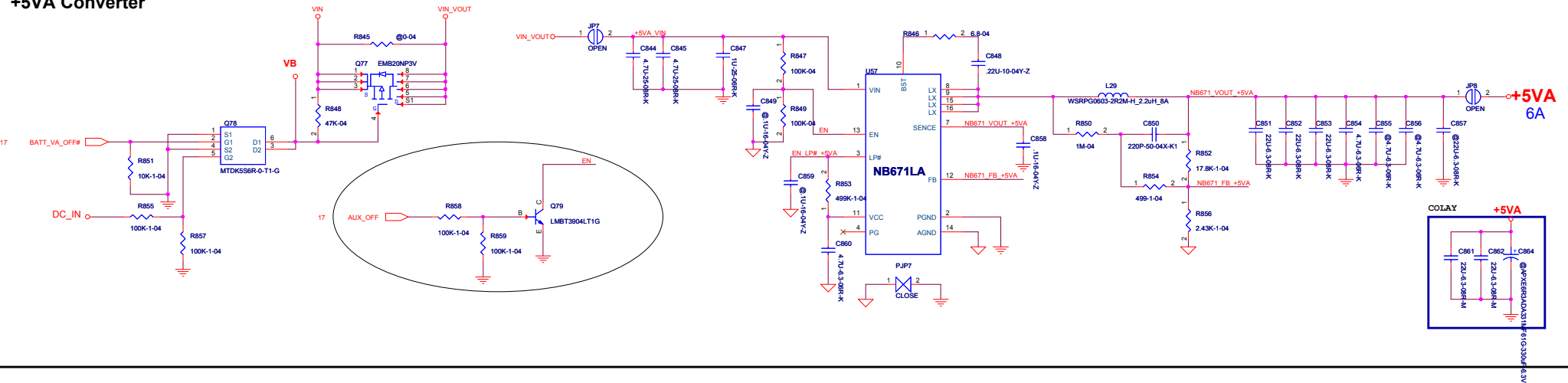
$$OCpTh = 1.3 \cdot I_{cc\_max} \quad \Delta I = 0.3 \cdot I_{cc\_max}$$

$$I_{cc\_max} = 13A \quad (\text{Need to be written in EC})$$

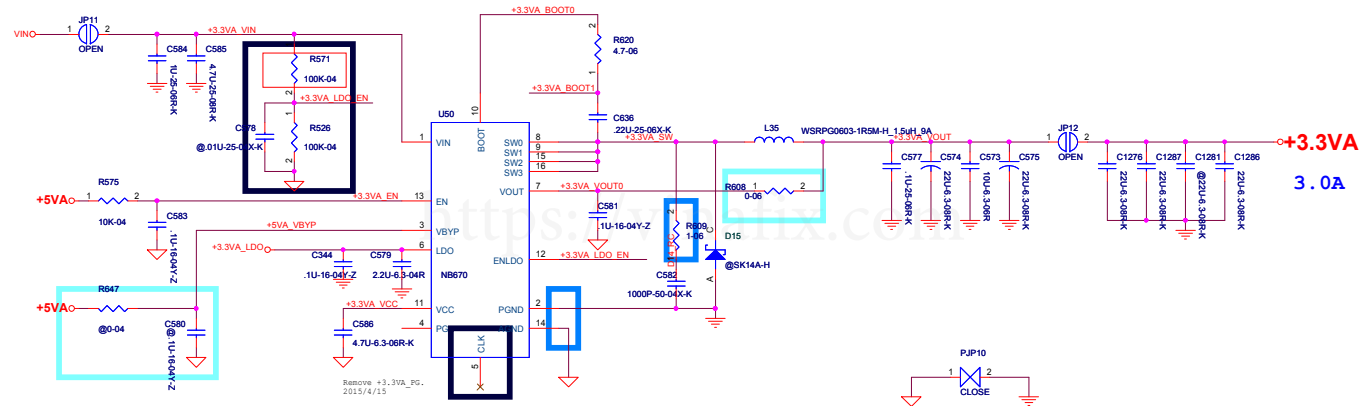
$$V_{IMON} = I_{load} \cdot DCR \cdot \frac{R_{824}}{R_G}$$



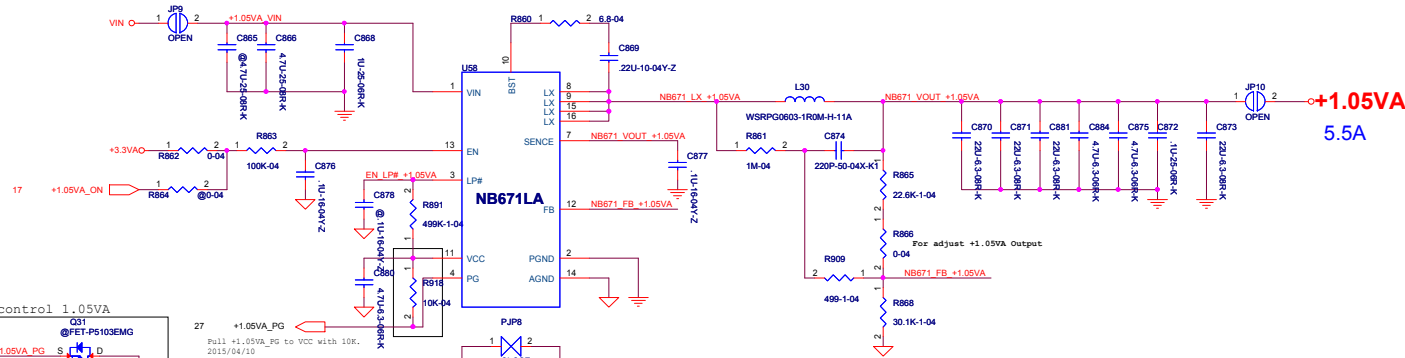
## +5VA Converter



## +3.3VA Converter

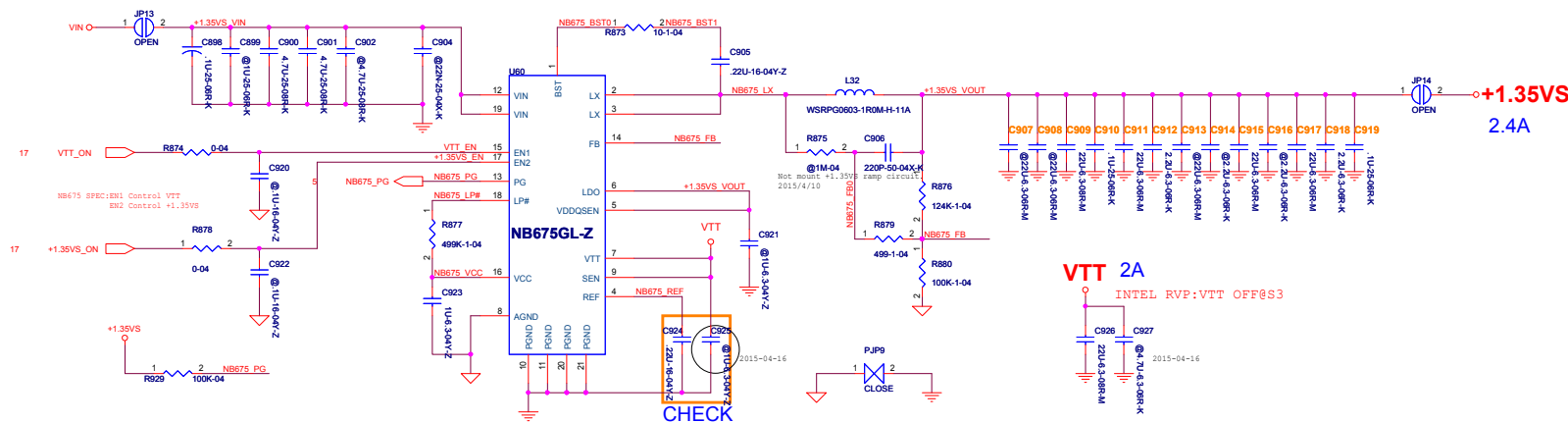


## +1.05V Converter

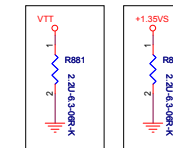


Title	NDBW1401
Size	Document Number
Customer	+5VA/+3VA/+1.05V
Date	Friday, April 17, 2015
Sheet	26 of 31

**+1.35VS**



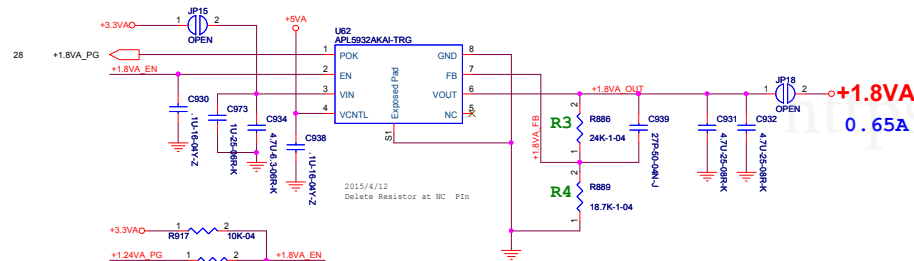
Discharge



**+1.8VA**

$$V_{OUT} = V_{ref} * (1 + R_3/R_4)$$

$$0.8 * (1 + 24/18.7) = 1.8267$$



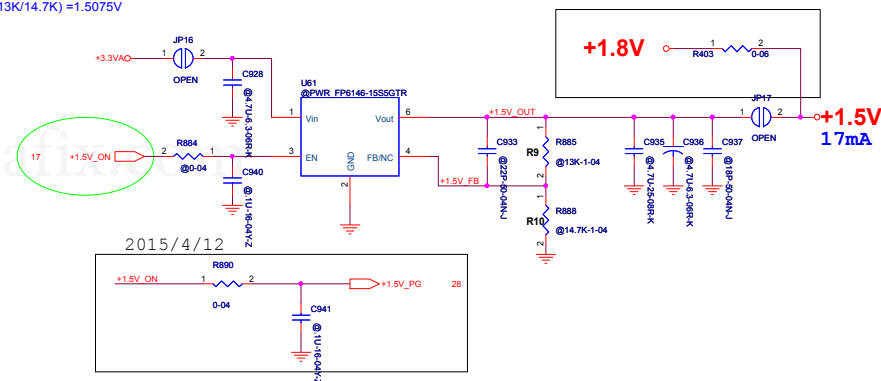
Vinafix.com

**+1.5V**

$$V_{out} = 0.8V * (1 + R_9/R_{10})$$

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

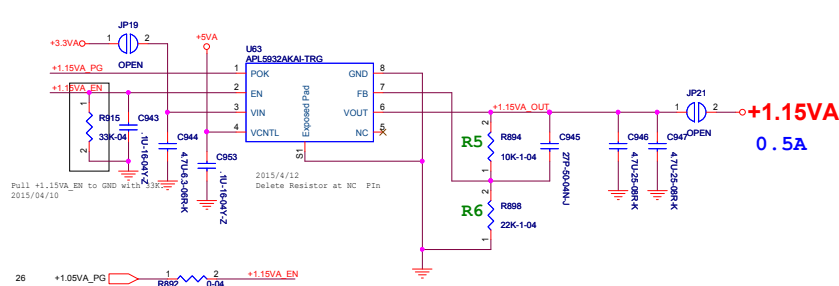
2015 4/10  
+1.8V replace +1.5V



**+1.15VA**

$$V_{OUT} = V_{ref} * (1 + R_5/R_6)$$

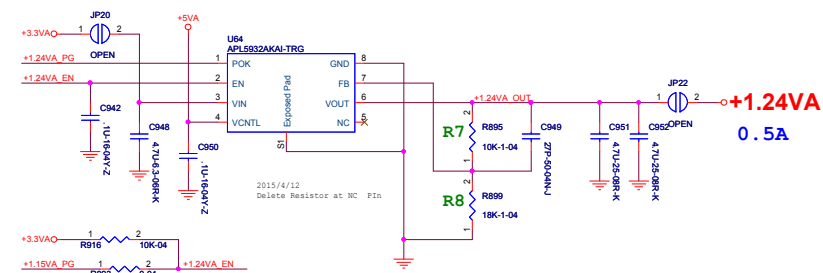
$$0.8 * (1 + 10/22) = 1.164$$



**+1.24VA**

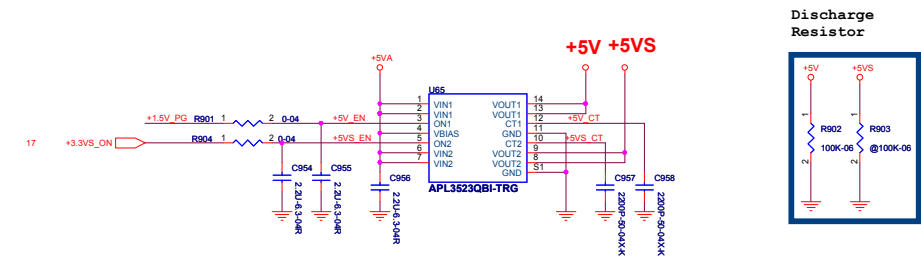
$$V_{OUT} = V_{ref} * (1 + R_7/R_8)$$

$$0.8 * (1 + 10/18) = 1.244$$

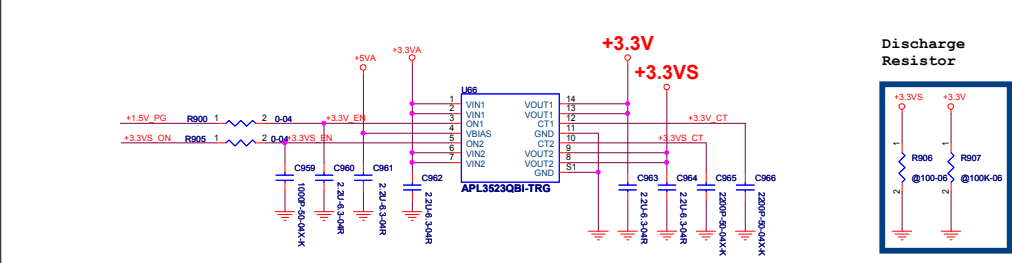


Title			
NDBW1401			
Size	Document Number	Rev	
Custom	+1.35V/+1.8VA/+1.5VS	A	
Date:	Friday, April 17, 2015	Sheet	27 of 31

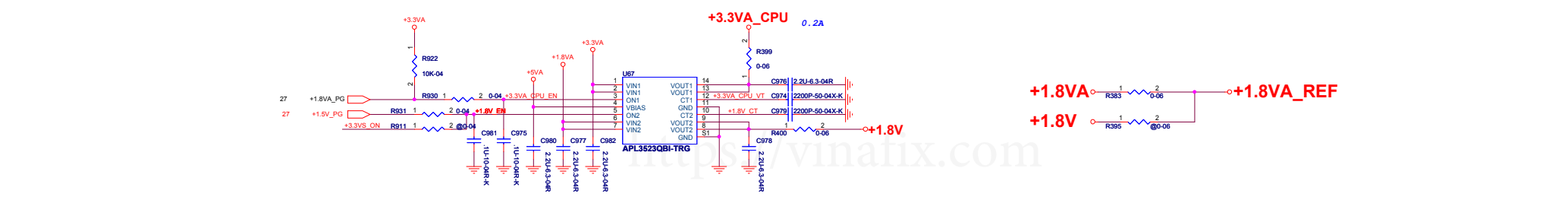
VCCSW +5V/+5VS



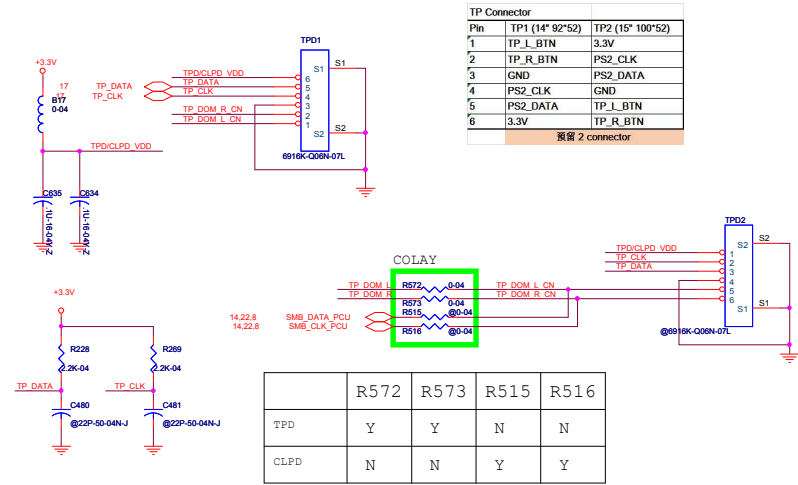
VCCSW +3.3V/+3.3VS



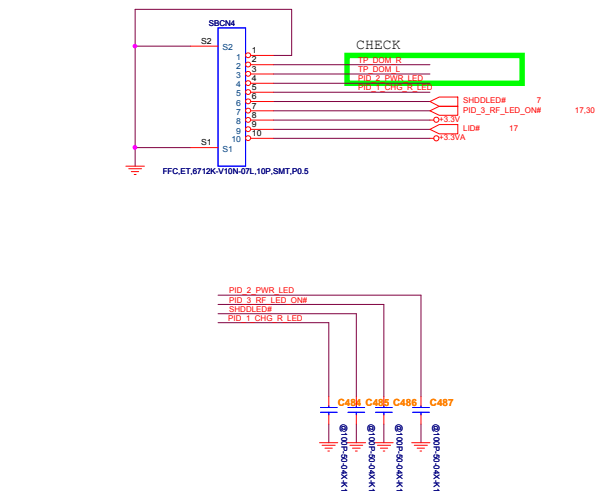
VCCSW +1.8V  
VCCSW +3.3VA\_CPU



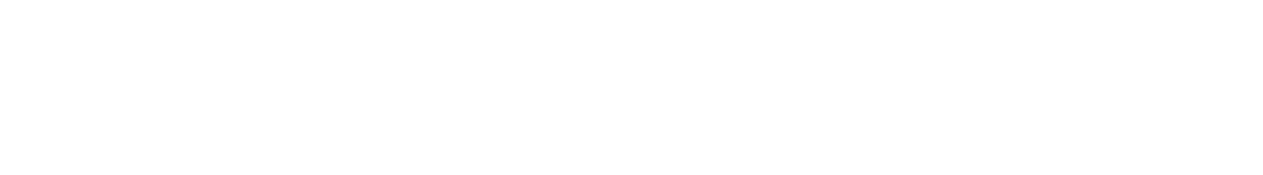
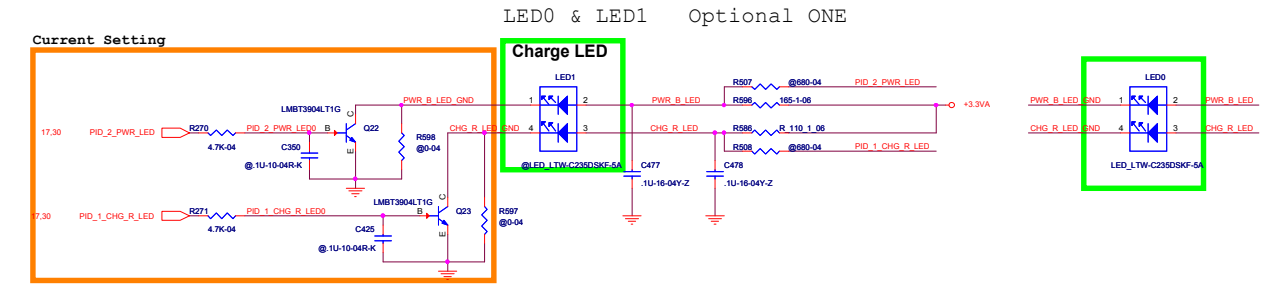
Touch Pad Charles Modify 0930



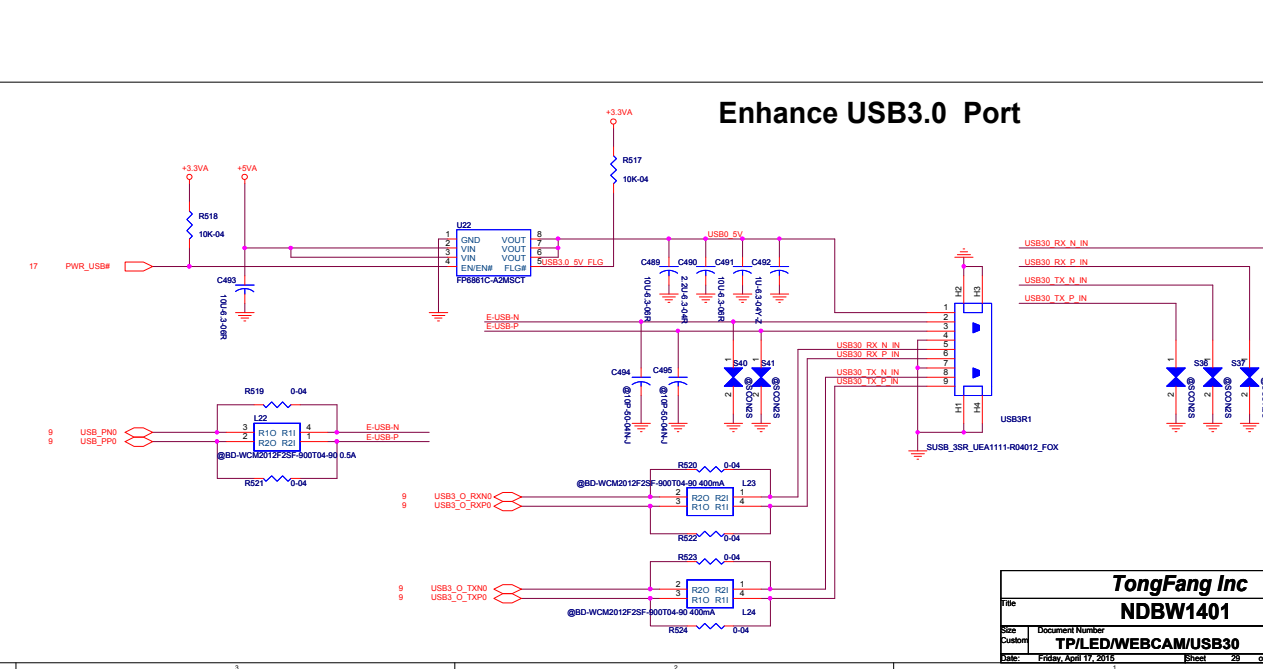
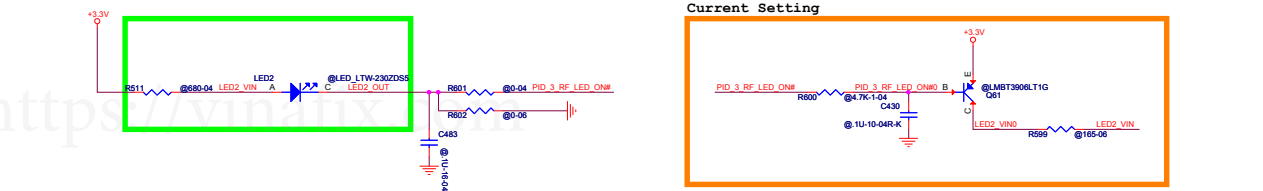
TP DOME /LED CONN



LED



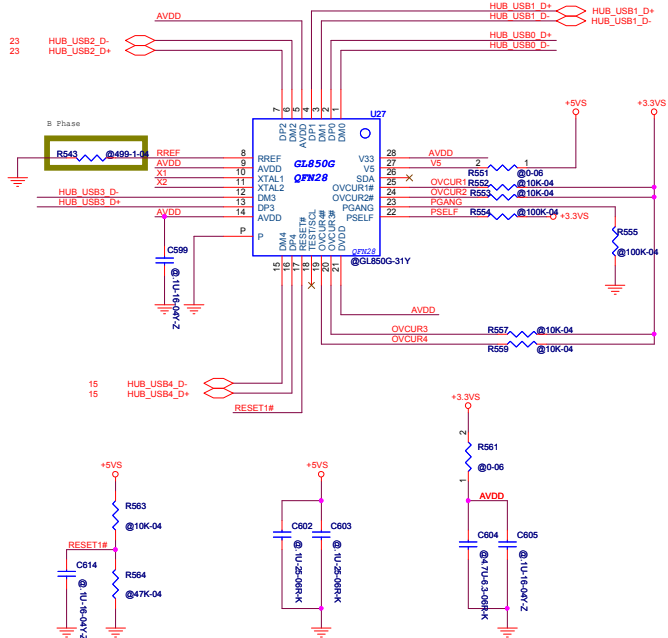
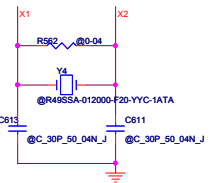
WLAN LED



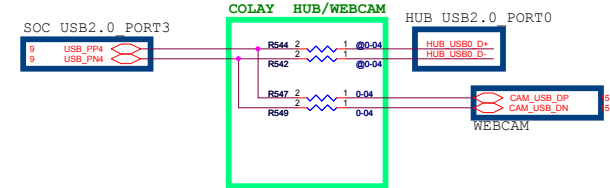
# USB HUB

R466 Value:  
14'' -->604ohm  
15'' -->464ohm  
18'' -->464ohm

HUB1 COLAY WEBCAM  
HUB2 TV/3G  
HUB3 DB USB PORT2/TSP  
HUB4 WIFI/BT



# USB HUB COLAY



# LEFT DB USB/BTN/LED

<https://vinafix.com>

