Project Name :NTSN1521

Platform : Haswell + Lynx Point+N16P-GX

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: NTSN1521

Size: Custom | Document Number: INDEX | Rev: RB

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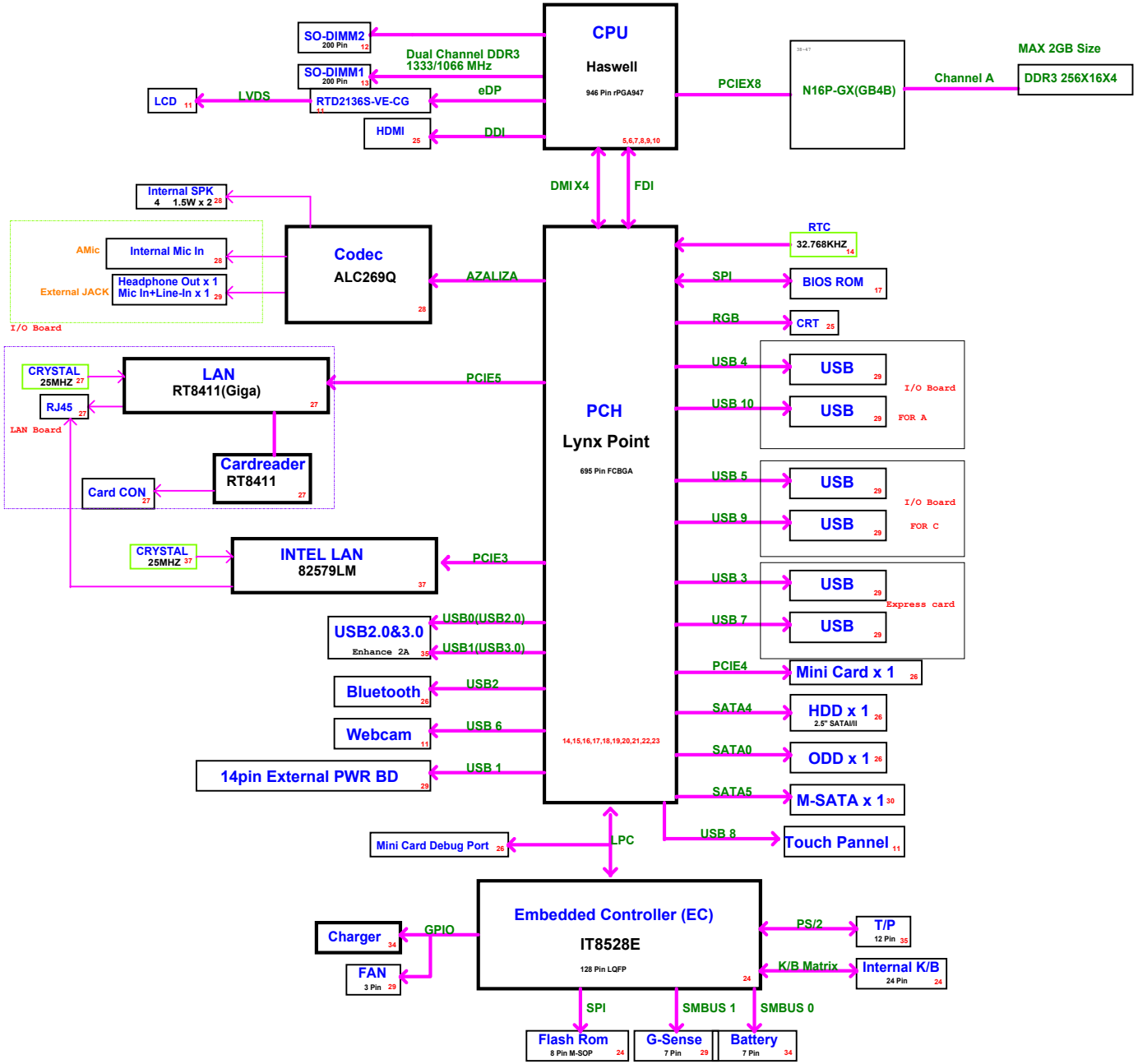
SYSTEM BLOCK DIAGRAM



TongFang Inc.		
Title: NTSN1521		
Size: Custom	Document Number: SYSTEM BLOCK	Rev: RB
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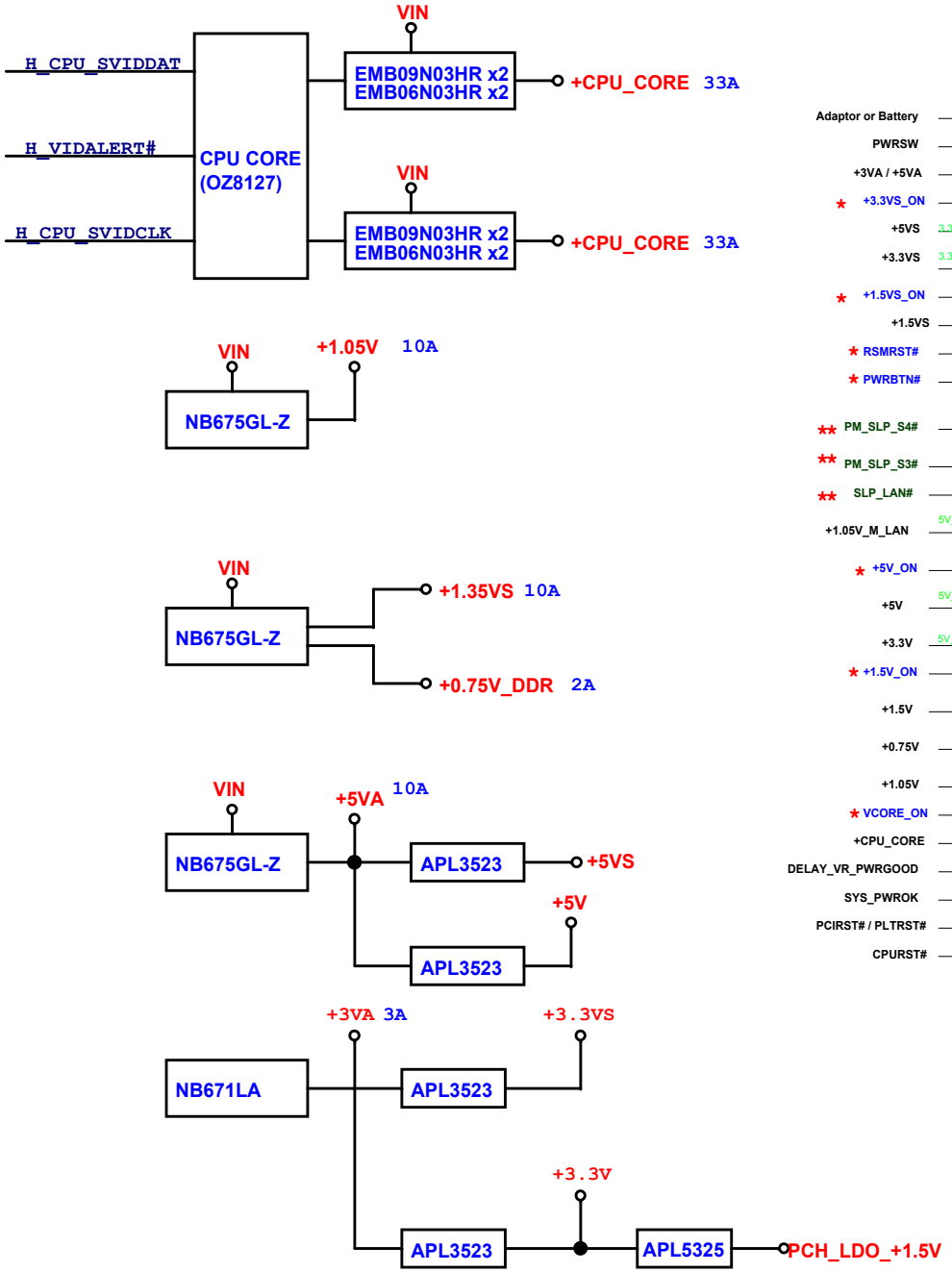
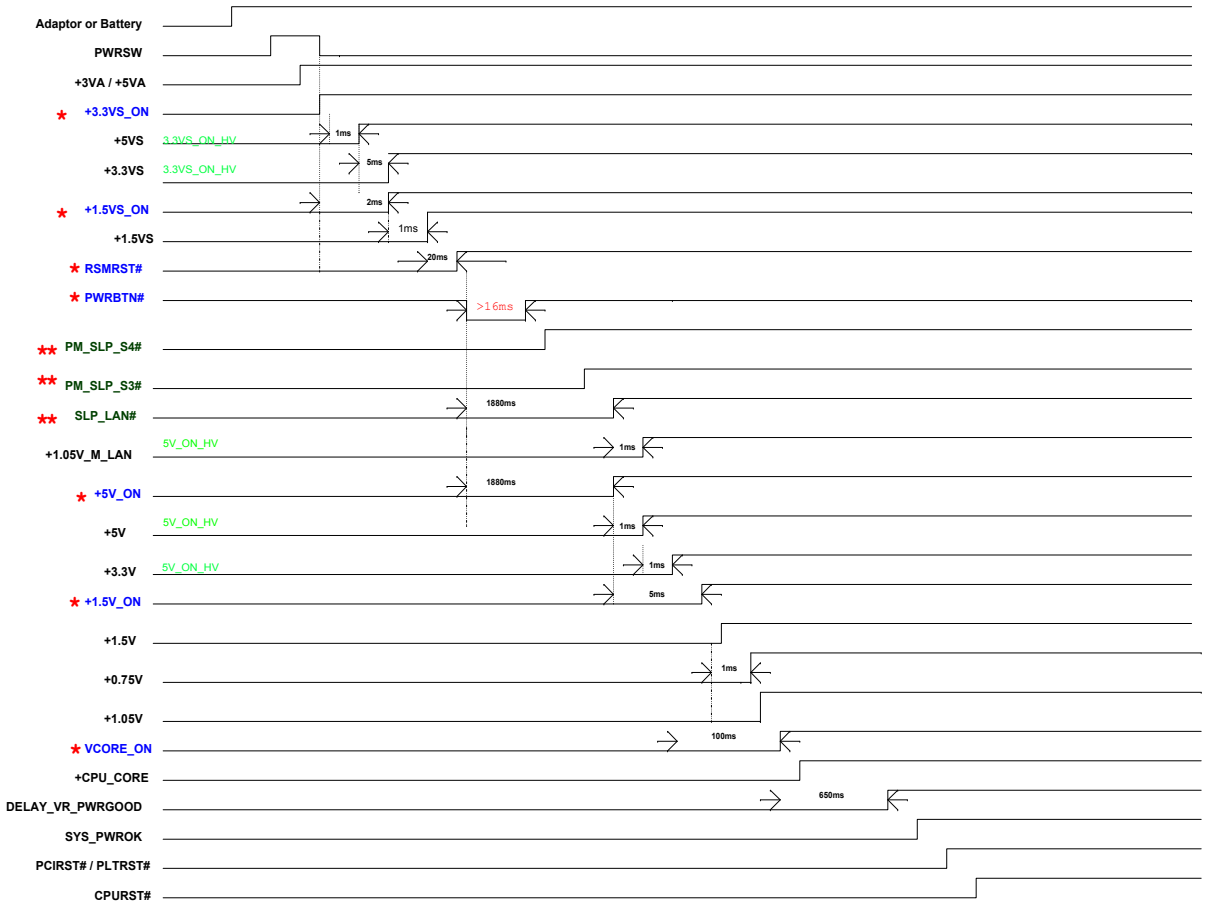
POWER BLOCK DIAGRAM



System Poewr On Sequence



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

TongFang Inc.		
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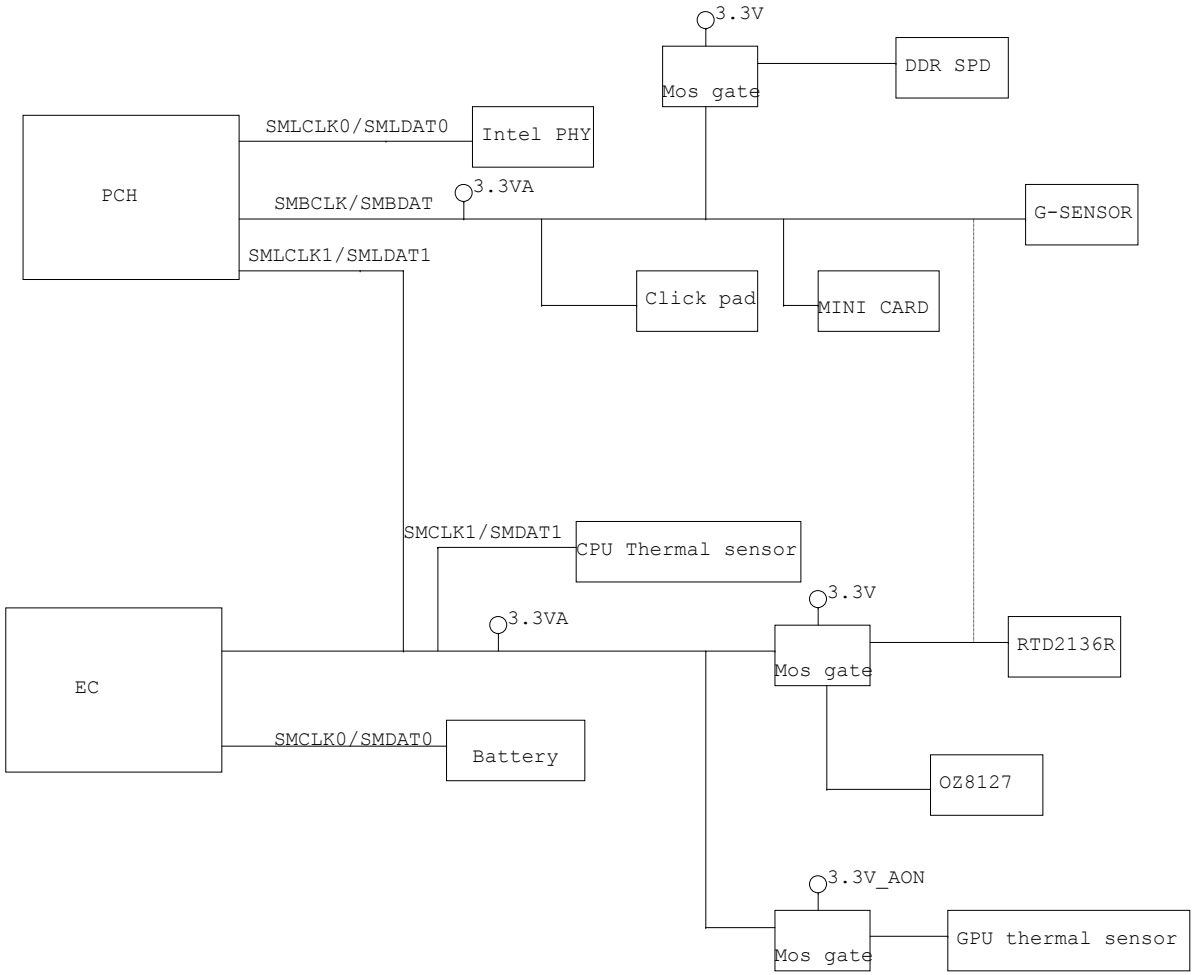
Panther Point GPIO	
GPIO0	S_GPIO
GPIO1	EC_EXTSMI#
GPIO2	G_INT1
GPIO3	INT_PIRQF#
GPIO4	INT_PIRQG#
GPIO5	INT_PIRQH#
GPIO6	TACH2
GPIO7	SMC_WAKE_SCI#
GPIO8	***ICC_EN#***
GPIO9	USB_OC#_10_11
GPIO10	USB_OC#_12_13
GPIO11	SMBALERT#
GPIO12	SSD_DEVSLP
GPIO13	GND
GPIO14	USB_OC#_7
GPIO15	ME_WE#
GPIO16	SATA_DET#4
GPIO17	***DGPU_VDDC_PG_PCH***
GPIO18	CLK_LAN_REQ
GPIO19	BBS_BIT0
GPIO20	MINI_CLKREQ0#
GPIO21	SATA_DET#
GPIO22	BIOS_REC
GPIO23	LDRQ1#
GPIO24	EN_LP#
GPIO25	EXTVGA_CLKREQ
GPIO26	PCIECLKREQ4#
GPIO27	LAN_EN
GPIO28	SYSTEM_PWM_DET
GPIO29	PCH_WLANPWR
GPIO30	SUS_PWR_ACK_R
GPIO31	ADAP_IN
GPIO33	***N.C***
GPIO34	SPK_LED_ON
GPIO35	TP11
GPIO36	PCH_SATA2GP
GPIO37	FDI_OVRVLTG
GPIO38	MFG_MODE
GPIO39	GFX_CRB_DET
GPIO40	USB_OC#_2_3
GPIO41	USB_OC#_4_5
GPIO42	USB_OC#_6_7
GPIO43	USB_OC#_8_9
GPIO44	PCIECLKRQ5
GPIO45	PCIECLKRQ6
GPIO46	PCIECLKRQ7
GPIO47	GFX_CLKREQ
GPIO48	BIOS_RESP
GPIO49	CRIT_TEMP_REP_N
GPIO50	Dgpu_RST#
GPIO51	BBS_BIT1
GPIO52	Dgpu_Select#
GPIO53	GPU_EVENT#_GC6
GPIO54	Dgpu_PWR_ON#
GPIO55	NC
GPIO56	PEGB_CLKRQ
GPIO57	NFC_IRQ
GPIO58	SMBCLK_EC
GPIO59	USB_OC#_0_1
GPIO60	SML0ALERT#
GPIO61	PM_SUS_STAT#
GPIO62	SUSCLK
GPIO63	SLP_S5#_R
GPIO64	CLKOUTFLEX0
GPIO65	CLKOUTFLEX1
GPIO66	CLKOUTFLEX2
GPIO67	DGPU_Present#
GPIO68	FB_EN_GC6
GPIO69	GPU_EVENT#_GC6
GPIO70	USB3_DET_P2_N
GPIO71	USB3_DET_P3_N
GPIO72	PM_BATLOW#
GPIO73	LAN_CLKREQ
GPIO74	SML1ALERT#
GPIO75	SMBDAT_EC

ITE8528 GPIO		Default Pull/Mode
GPA0	PID_3_RF_LED_ON#	UP / GPO
GPA1	T/P LED_PWM	UP / GPO
GPA2	BTL_BEEP	UP / GPO
GPA3	PWM_KB LED	UP / GPO
GPA4	PID_1_CHG_R_LED	UP / GPO
GPA5	PID_0_CHG_B_LED	UP / GPO
GPA6	PM_RSMRST#	UP / GPO
GPA7	EC_BL_PWM/DGPU_Control /EC	UP / GPO
GPB0	PM_SLP_S4#	UP / GPI
GPB1	PM_SLP_S3#	UP / GPI
GPB2	SLP_A#/GPU_Adaptor In	Dn / GPI
GPB3	BAT_SMBCLK	Z / GPI
GPB4	BAT_SMBDAT	Z / GPI
GPB5	H_A20GATE	Z / GPO
GPB6	H_RCIN#	UP / GPI
GPB7	SAFTY_PROTECT	Dn / GPI
GPC0	LAN_PWR	Dn / GPI
GPC1	SMBCLK_EC	Z / GPI
GPC2	SMBDAT_EC	Z / GPI
GPC3	***SENBAT_V***	Dn / GPO
GPC4	PWRBTN3#	Dn / GPO
GPC5	SYS_PWROK	Dn / GPO
GPC6	VCCSA_ON	Dn / GPO
GPC7	+1.5VS_ON	UP / GPO
GPD0	ADAP_IN	UP / GPI
GPD1	PWRBTN#	UP / GPO
GPD2	PLT_RST#	UP / GPI
GPD3	***PM_SUS_STAT#***	UP / GPI
GPD4	EC_EXTSMI#	UP / GPI
GPD5	LED_ON	UP / GPO
GPD6	**+5V_ON**	Dn / GPO
GPD7	PWR_USB#	Dn / GPO
GPE0	LID#	Dn / GPI
GPE1	OVERT#_EC	Dn / GPI
GPE2	+1.5V/1.05V_ON	Dn / GPO
GPE3	Vcore_ON	Dn / GPO
GPE4	PWRSW	UP / GPI
GPE5	LVDS_VIN	Dn / GPO
GPE6	WLAN_ON	Dn / GPO
GPE7	AMP_MUTE#	UP / GPO
GPF0	PANEL_VCC	UP / GPO
GPF1	**BAT_SW_EC**	UP / GPI
GPF2	**BT_ON**	UP / GPO
GPF3	**Q_key1**	UP / GPI
GPF4	TP_CLK	UP / GPI
GPF5	TP_DATA	UP / GPI
GPF6	**EC_PECI**	UP / GPI
GPF7	**Q Key LED**	UP / GPI
GPG0	PWRBTN2#	Z/ GPO
GPG1	+3.3VS_ON	Dn/GPO/ID7
GPG2	**+0.75V_VTT_ON**	Z/ GPO
GPG6	WEBCAN_ON	Z/ GPO
GPH0	PM_CLKRUN#	Dn/GPI/ID0
GPH1	PCH_BL_EN	Dn/GPO/ID1
GPH2	PID_2_PWR_LED	Dn/GPI/ID2
GPH3	EC_HSCS0#	Dn/GPI/ID3
GPH4	EC_HSCK	Dn/GPI/ID4
GPH5	EC_HMISO	Dn/GPI/ID5
GPH6	EC_HMOSI	Dn/GPI/ID6
GPI0	**Q_key2/CRT_DETECT**	/GPI/Z
GPI1	PANEL_DETECT/Boost PAN /EC	/GPI/Z
GPI2	PCIE_WAKE#	/GPI/Z
GPI3	**PWRBTN3#**	/GPI/Z
GPI4	BAT_I	/GPI/Z
GPI5	BATT_TEMP	/GPI/Z
GPI6	Iadapter_I bat	/GPI/Z
GPI7	BAT_V	/GPI/Z
GPJ0	EC_BL_ON	/GPO/Z
GPJ1	EC_PROCHOT	/GPOI/Z
GPJ2	FAN_CTRL0	/GPO/Z
GPJ3	BATT_VA_OFF#	/GPO/Z
GPJ4	CHG_ON	/GPO/Z
GPJ5	CHG_REF	/GPO/Z
GPM0	**LPC_AD0**	/GPI/Z
GPM1	LPC_AD1	/GPI/Z
GPM2	LPC_AD2	/GPI/Z
GPM3	**LPC_AD3**	/GPI/Z
GPM4	CLK_EC_LPC	/GPI/Z
GPM5	LPC_FRAME#	/GPI/Z
GPM6	INT_SERIRQ	/GPI/Z

SMBUS BLOCK



Title	TongFang Inc.
	NTSN1521
Size: Custom	Document Number: GPIO & Power Consumption
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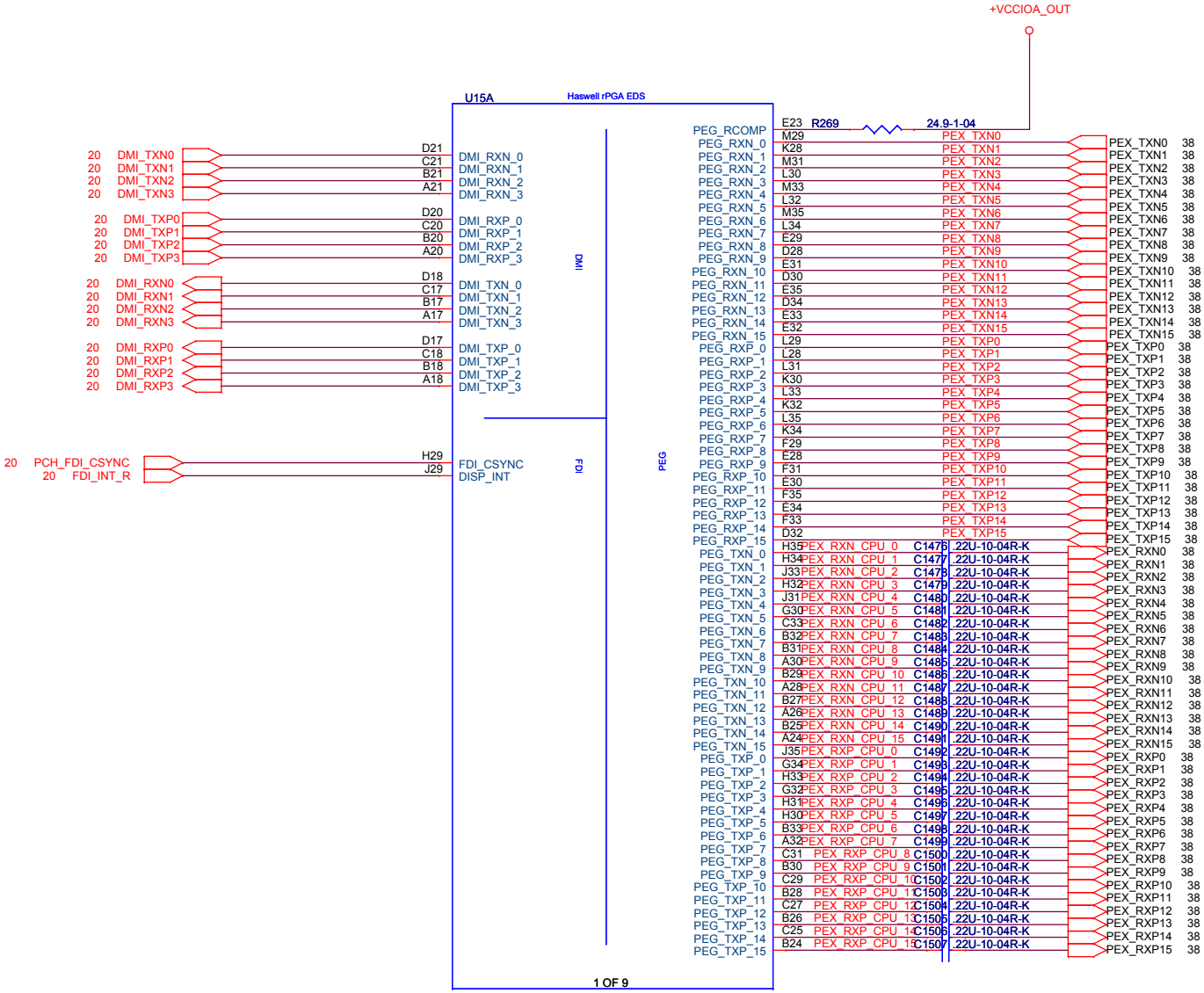

The 16 lanes are associated with root port of device 1
Function 0 refers to the controller of the x16
Function 1 refers to the controller of the x8
Function 2 refers to the controller of the x4

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Title: NTSN1521		
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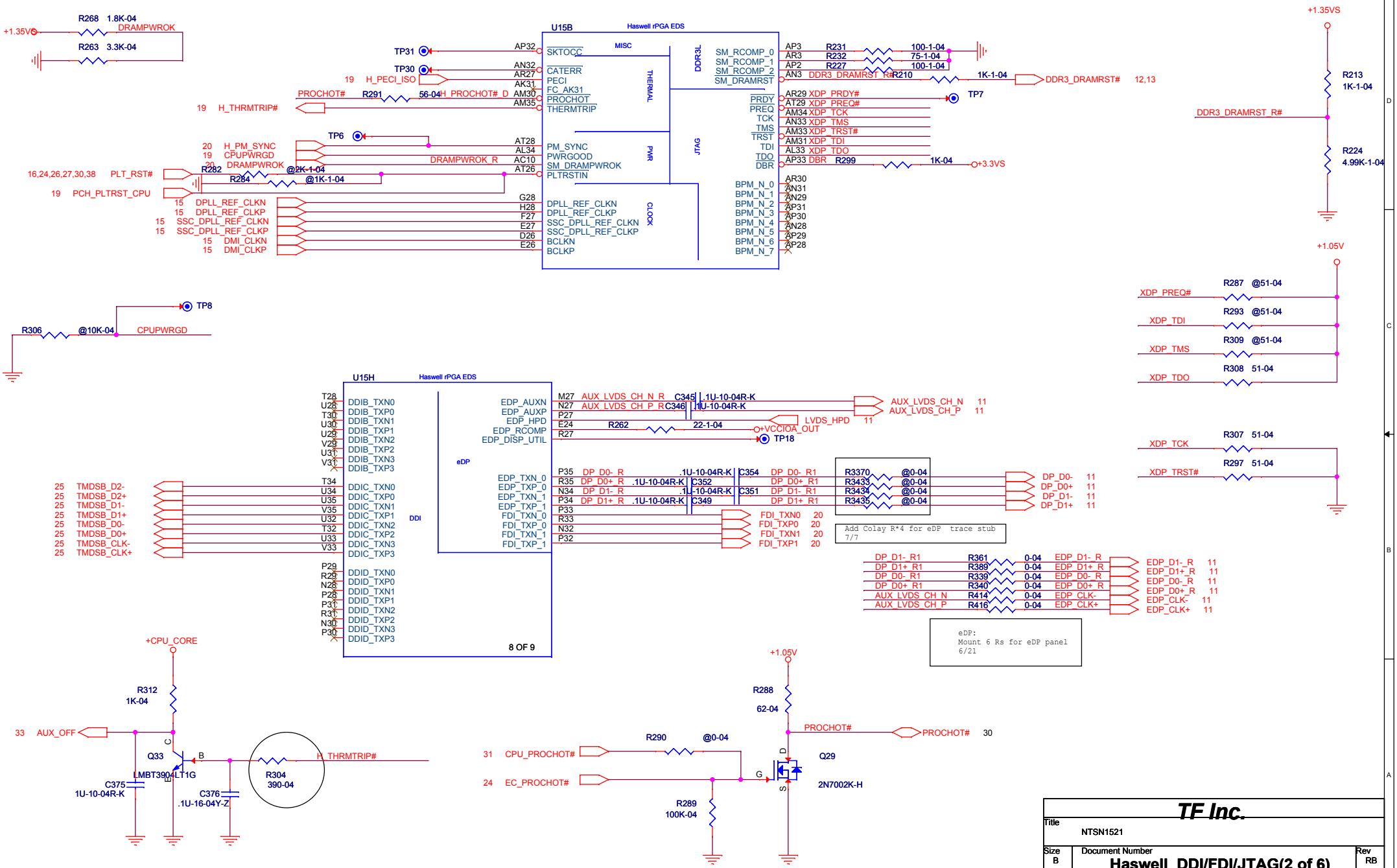
R268 1.8K-04
+1.35VS
DRAMPWROK
R263 3.3K-04
U15B
Haswell rPGA EDS
MISC
THERMAL
DDR3L
PWR
JTAG
CLOCK
SKTOCC
CATERR
PECI
FC_AK31
PROCHOT
THERMTRIP
PM_SYNC
PWRGOOD
SM_DRAMPWROK
PLTRSTIN
DPLL_REF_CLKN
DPLL_REF_CLKP
SSC_DPLL_REF_CLKN
SSC_DPLL_REF_CLKP
BCLKN
BCLKP
SM_RCOMP_0
SM_RCOMP_1
SM_RCOMP_2
SM_DRAMRST
PRDY
PREQ
TCK
TMS
TRST
TDI
TDO
DBR
BPM_N_0
BPM_N_1
BPM_N_2
BPM_N_3
BPM_N_4
BPM_N_5
BPM_N_6
BPM_N_7
TP31
TP30
TP6
TP7
TP8
TP18
19 H_PECI_ISO
PROCHOT# R291 56-04 H_PROCHOT# D
19 H_THRMTRIP#
20 H_PM_SYNC
19 CPUPWRGD
20 DRAMPWROK
DRAMPWROK_R
16,24,26,27,30,38 PLT_RST#
R282 @2K-1-04
R284 @1K-1-04
19 PCH_PLTRST_CPU
15 DPLL_REF_CLKN
15 DPLL_REF_CLKP
15 SSC_DPLL_REF_CLKN
15 SSC_DPLL_REF_CLKP
15 DMI_CLKN
15 DMI_CLKP
R231 100-1-04
R232 75-1-04
R227 100-1-04
R210 1K-1-04
DDR3_DRAMRST# 12,13
XDP_PRDY#
XDP_PREQ#
XDP_TCK
XDP_TMS
XDP_TRST#
XDP_TDI
XDP_TDO
R299 1K-04
+3.3VS
+1.35VS
R213 1K-1-04
DDR3_DRAMRST_R#
R224 4.99K-1-04
+1.05V
R287 @51-04
R293 @51-04
R309 @51-04
R308 51-04
R307 51-04
R297 51-04
R306 @10K-04
CPUPWRGD
U15H
Haswell rPGA EDS
eDP
DDI
8 OF 9
DDIB_TXN0
DDIB_TXP0
DDIB_TXN1
DDIB_TXP1
DDIB_TXN2
DDIB_TXP2
DDIB_TXN3
DDIB_TXP3
DDIC_TXN0
DDIC_TXP0
DDIC_TXN1
DDIC_TXP1
DDIC_TXN2
DDIC_TXP2
DDIC_TXN3
DDIC_TXP3
DDID_TXN0
DDID_TXP0
DDID_TXN1
DDID_TXP1
DDID_TXN2
DDID_TXP2
DDID_TXN3
DDID_TXP3
EDP_AUXN
EDP_AUXP
EDP_HPD
EDP_RCOMP
EDP_DISP_UTIL
EDP_TXN_0
EDP_TXP_0
EDP_TXN_1
EDP_TXP_1
FDI_TXN_0
FDI_TXP_0
FDI_TXN_1
FDI_TXP_1
AUX_LVDS_CH_N_R C345 .1U-10-04R-K
AUX_LVDS_CH_P_R C346 .1U-10-04R-K
AUX_LVDS_CH_N 11
AUX_LVDS_CH_P 11
LVDS_HPD 11
R262 22-1-04
+VCCIOA_OUT
DP_D0- R .1U-10-04R-K C354 DP_D0- R1
DP_D0+ R .1U-10-04R-K C352 DP_D0+ R1
DP_D1- R .1U-10-04R-K C351 DP_D1- R1
DP_D1+ R .1U-10-04R-K C349 DP_D1+ R1
R3370 @0-04
R3433 @0-04
R3434 @0-04
R3435 @0-04
DP_D0- 11
DP_D0+ 11
DP_D1- 11
DP_D1+ 11
FDI_TXN0 20
FDI_TXP0 20
FDI_TXN1 20
FDI_TXP1 20
Add Colay R*4 for eDP trace stub 7/7
25 TMDSB_D2-
25 TMDSB_D2+
25 TMDSB_D1-
25 TMDSB_D1+
25 TMDSB_D0-
25 TMDSB_D0+
25 TMDSB_CLK-
25 TMDSB_CLK+
DP_D1- R1 R361 0-04 EDP_D1- R
DP_D1+ R1 R389 0-04 EDP_D1+ R
DP_D0- R1 R339 0-04 EDP_D0- R
DP_D0+ R1 R340 0-04 EDP_D0+ R
AUX_LVDS_CH_N R414 0-04 EDP_CLK-
AUX_LVDS_CH_P R416 0-04 EDP_CLK+
EDP_D1- R 11
EDP_D1+ R 11
EDP_D0- R 11
EDP_D0+ R 11
EDP_CLK- 11
EDP_CLK+ 11
eDP:
Mount 6 Rs for eDP panel
6/21
+CPU_CORE
R312 1K-04
33 AUX_OFF
Q33
LMBT390ALT1G
C375 1U-10-04R-K
C376 .1U-16-04Y-Z
R304 390-04
H_THRMTRIP#
+1.05V
R288 62-04
PROCHOT#
PROCHOT# 30
R290 @0-04
31 CPU_PROCHOT#
24 EC_PROCHOT#
Q29
2N7002K-H
R289 100K-04
TF Inc.
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NTSN1521
Size B
Document Number
Haswell_DDI/FDI/JTAG(2 of 6)
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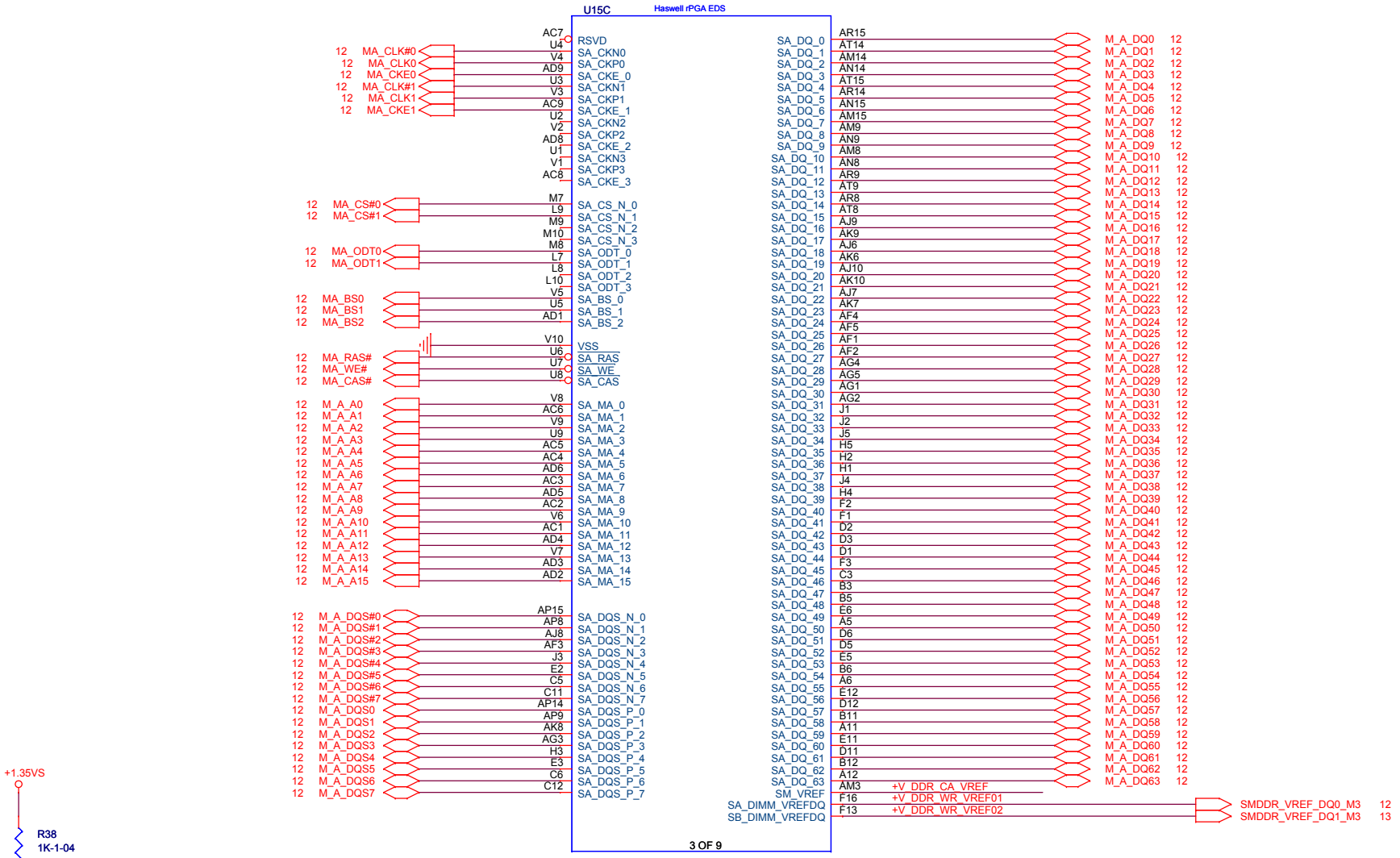

	TongFang Inc.	
Title	NTSN1521	
Size B	Document Number: Haswell_DDR3 BUS (3 of 6)	Rev RB
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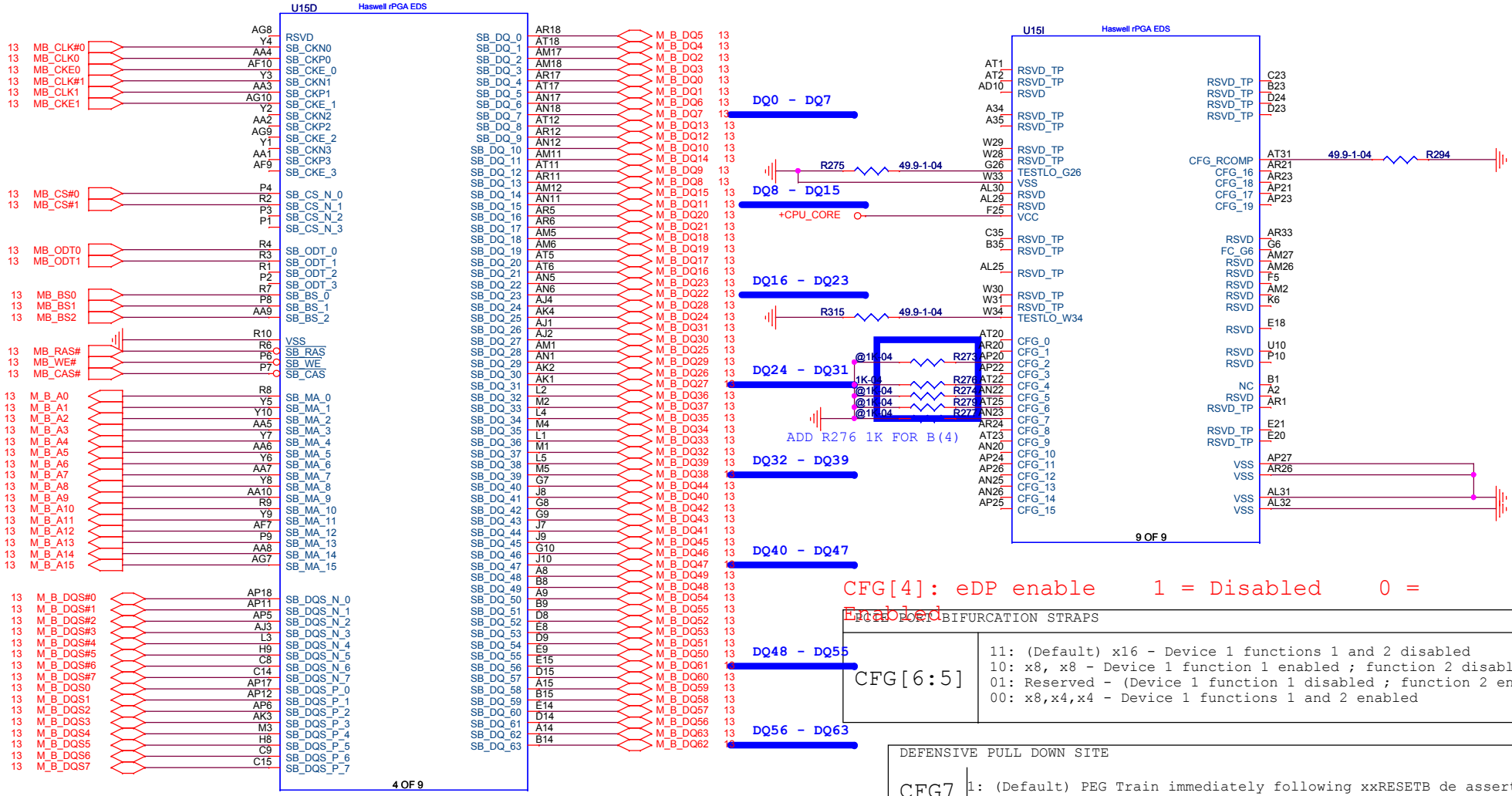

PCIE PORT BIFURCATION STRAPS	
CFG[6:5]	11: (Default) x16 - Device 1 functions 1 and 2 disabled 10: x8, x8 - Device 1 function 1 enabled ; function 2 disabled 01: Reserved - (Device 1 function 1 disabled ; function 2 enabled) 00: x8,x4,x4 - Device 1 functions 1 and 2 enabled

DEFENSIVE PULL DOWN SITE	
CFG7	1: (Default) PEG Train immediately following xxRESETB de assertion 0: PEG Wait for BIOS for training

PCI EXPRESS STATIC LANE REVERSAL FOR ALL PEG PORTS	
CFG2	1: (DEFAULT)NORMAL OPERATION; LANE# DEFINITION MATCHES SOCKET PIN MAP DEFINITION 0: LANE REVERSAL

Title	NTSN1521		
Size B	Document Number Haswell_DDR3 BUS/RSVD (4 of 6)		Rev RB
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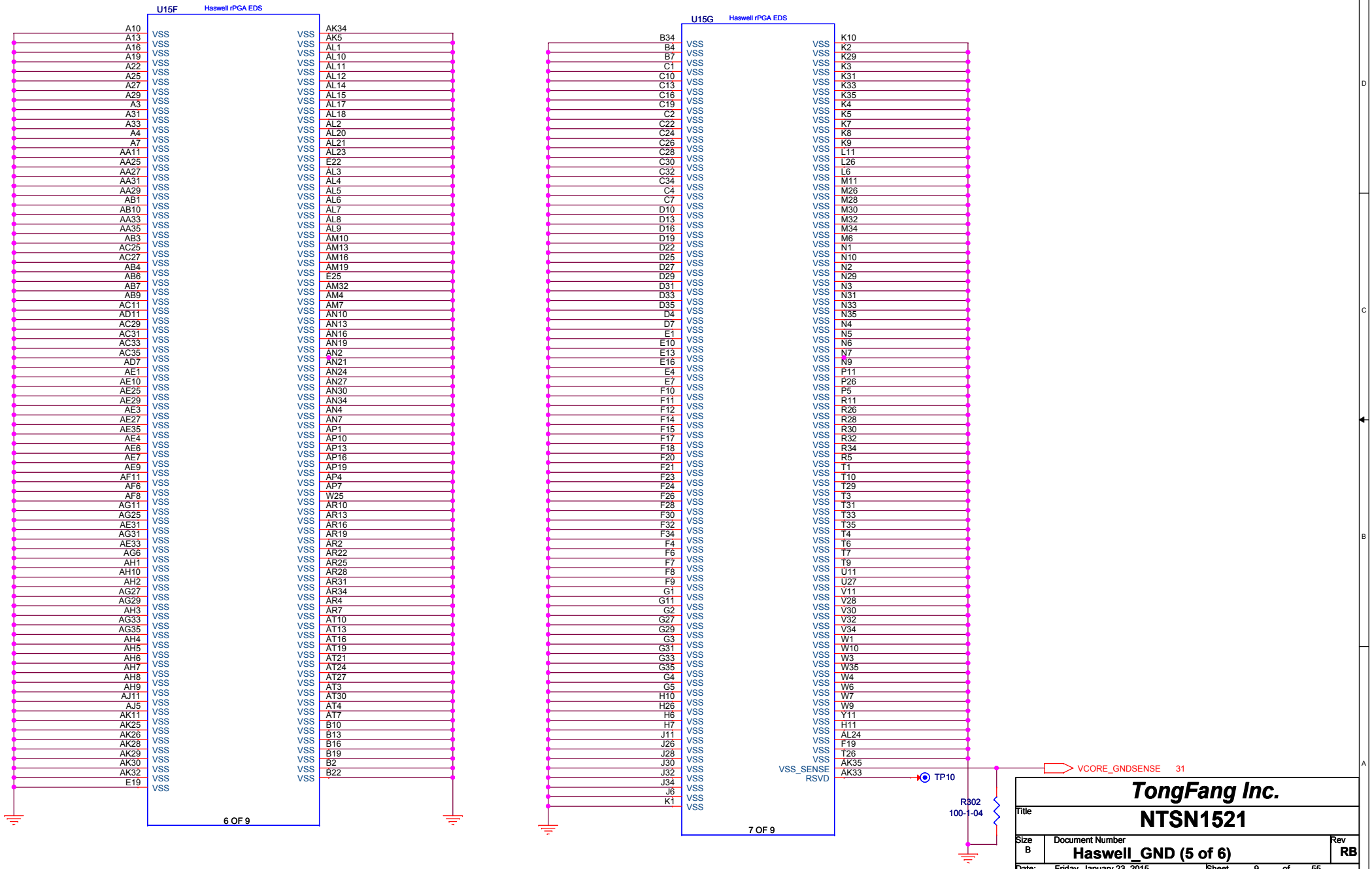
U15F
Haswell rPGA EDS
6 OF 9
U15G
Haswell rPGA EDS
7 OF 9
VSS_SENSE
RSVD
TP10
R302
100-1-04
VCORE_GNDSENSE 31
TongFang Inc.
Title
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B
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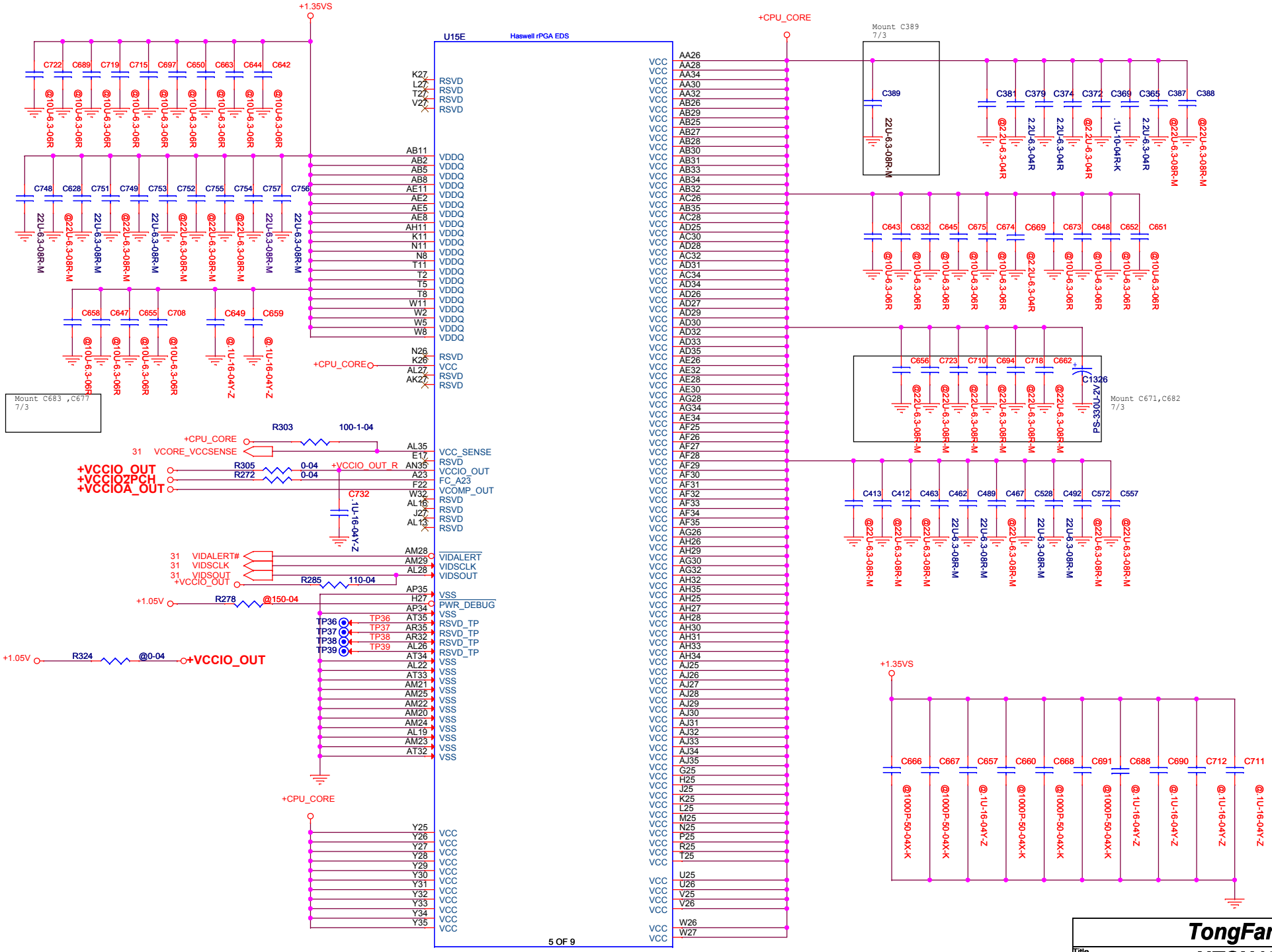

TongFang Inc.		
Title: **NTSN1521**		
Size: Custom	Document Number: **Haswell_PWR (6 of 6)**	Rev: RB
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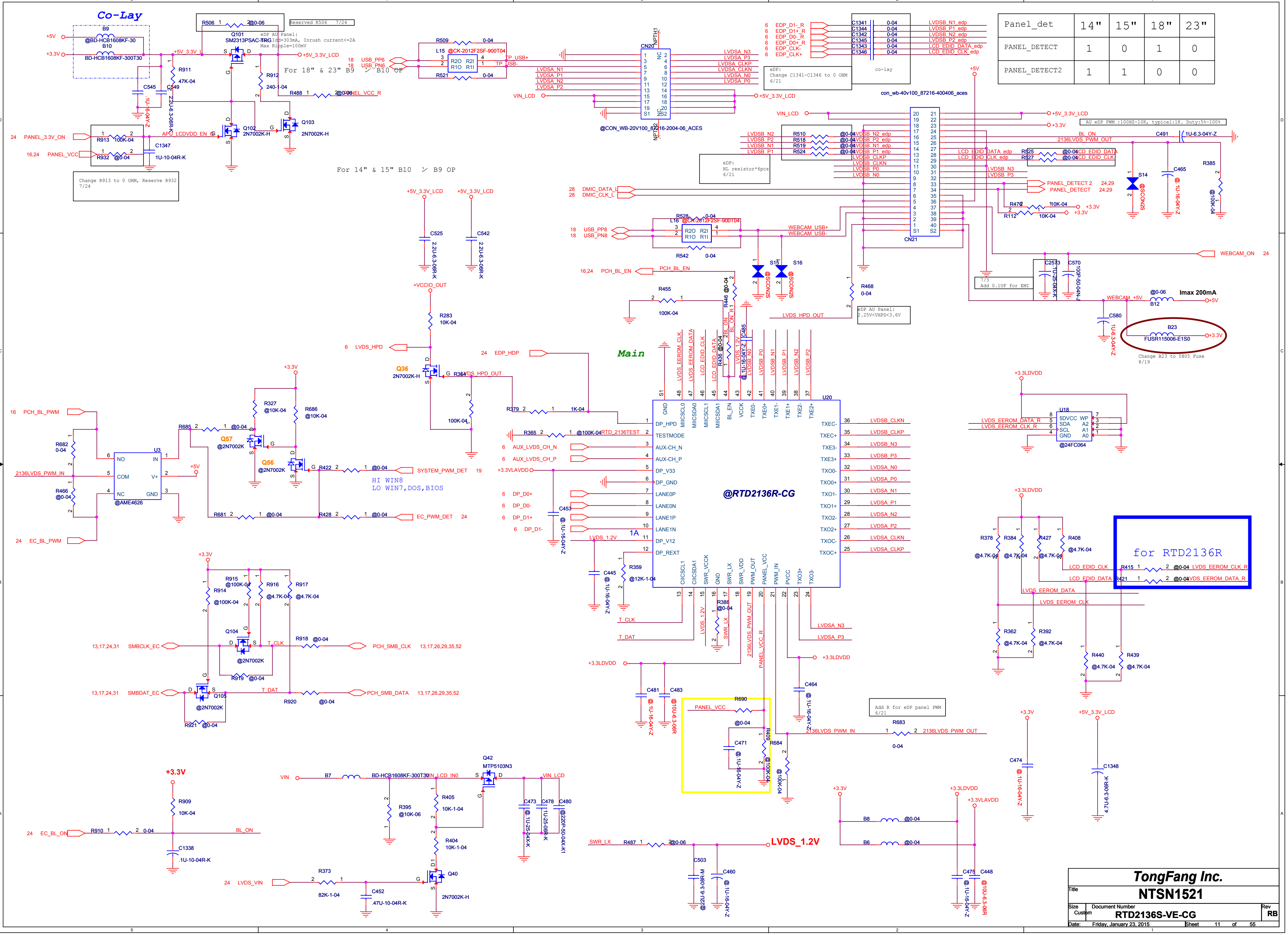

Panel_det	14"	15"	18"	23"
PANEL_DETECT	1	0	1	0
PANEL_DETECT2	1	1	0	0

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Size: Custom | Document Number: RTD2136S-VE-CG | Rev: RB

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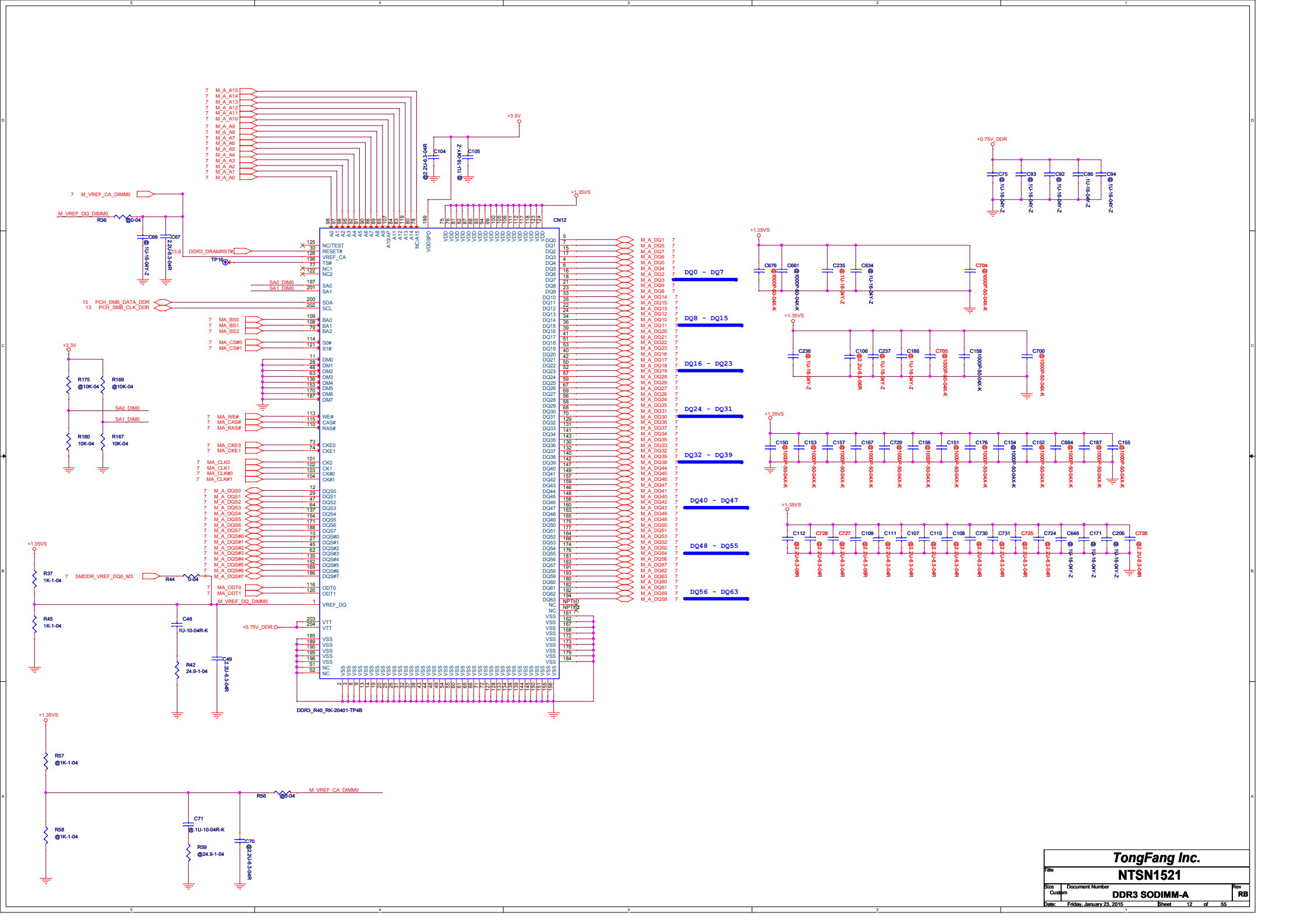

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Title	NTSN1521		
Size: Custom	Document Number: DDR3 SODIMM-A		Rev: RB
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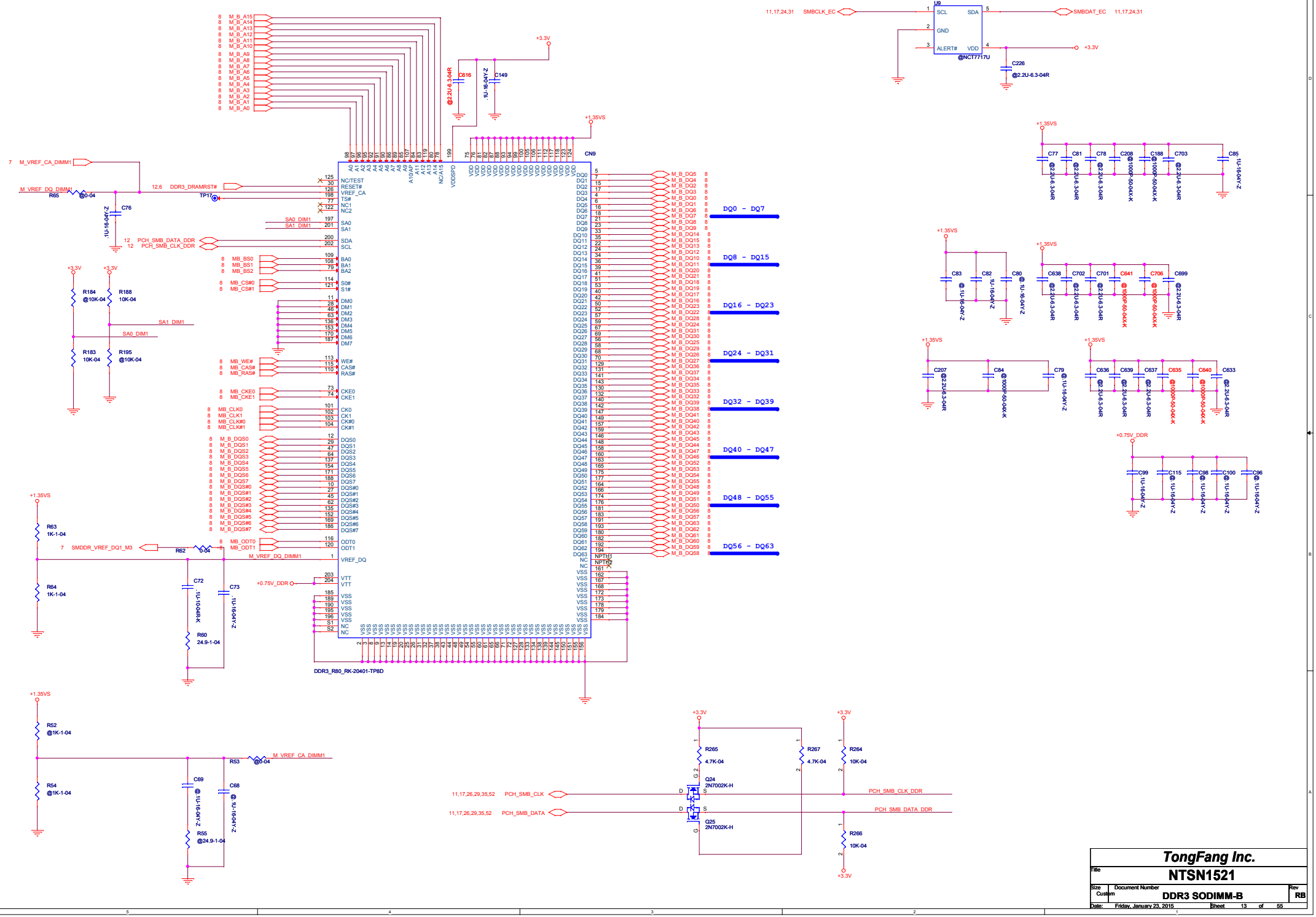
CPU Thermal Sensor



TongFang Inc.			
Title: NTSN1521			
Size: Custom	Document Number: DDR3 SODIMM-B		Rev: RB
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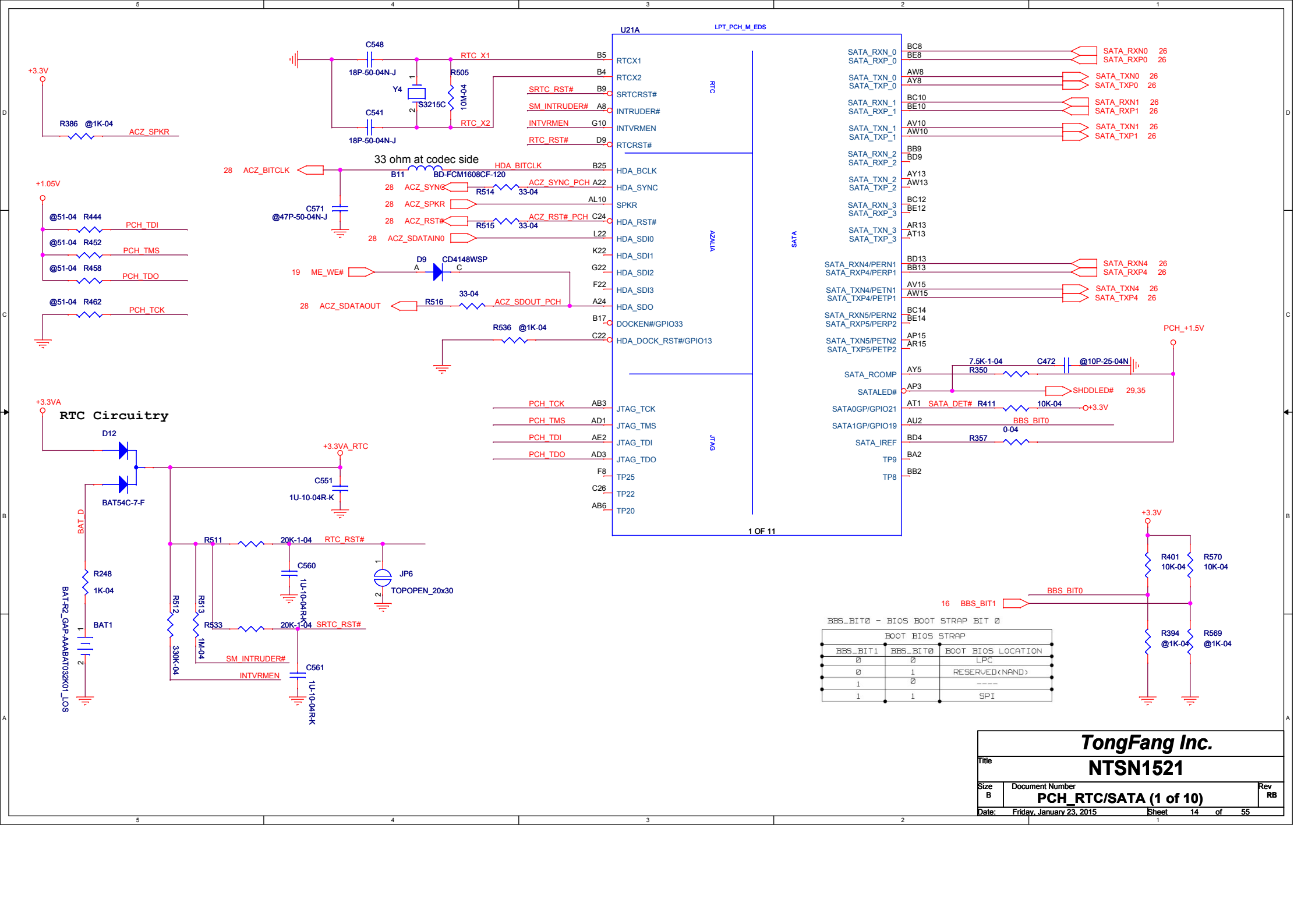

TongFang Inc.		
Title: NTSN1521		
Size: B	Document Number: PCH_RTC/SATA (1 of 10)	Rev: RB
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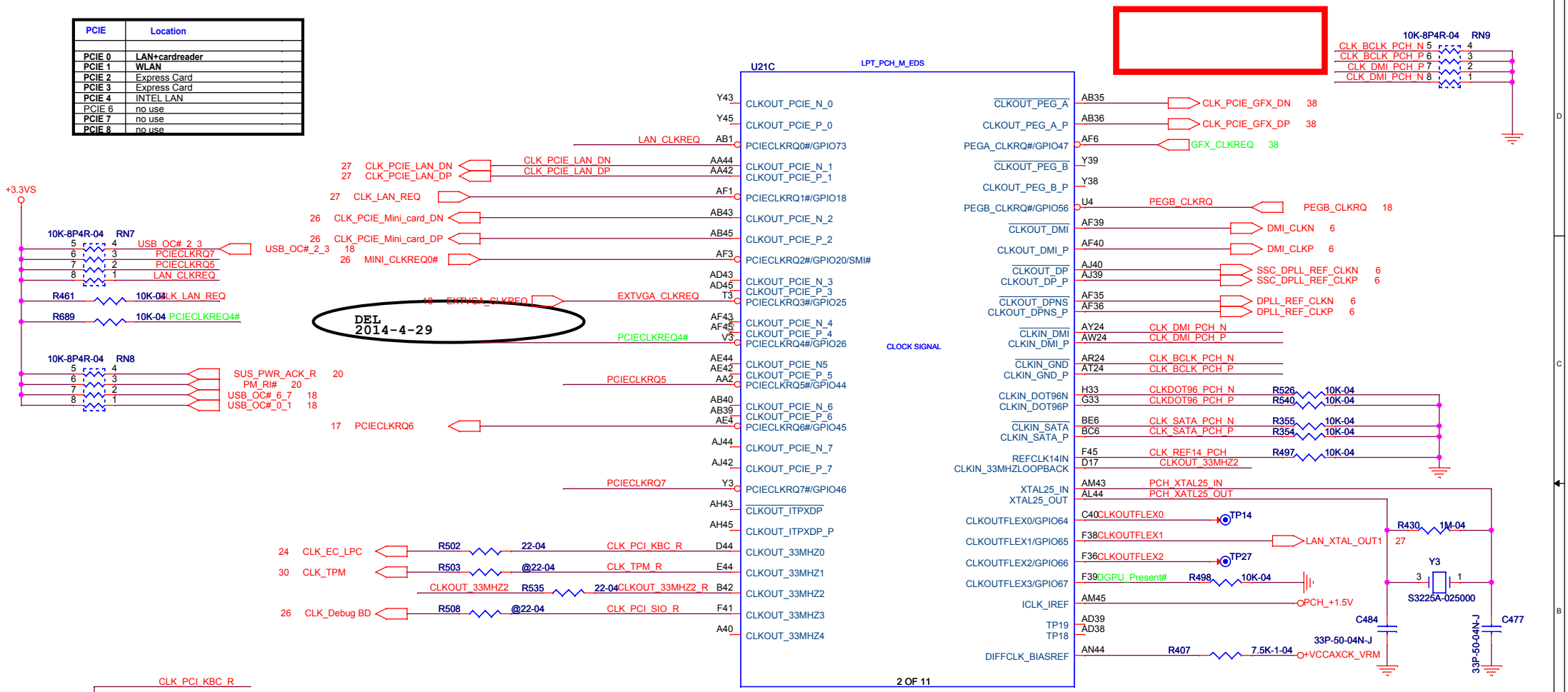
PCIE	Location
PCIE 0	LAN+cardreader
PCIE 1	WLAN
PCIE 2	Express Card
PCIE 3	Express Card
PCIE 4	INTEL LAN
PCIE 6	no use
PCIE 7	no use
PCIE 8	no use



TongFang Inc.			
Title: NTSN1521			
Size: B	Document Number: PCH_CLK(2 of 9)		Rev: RB
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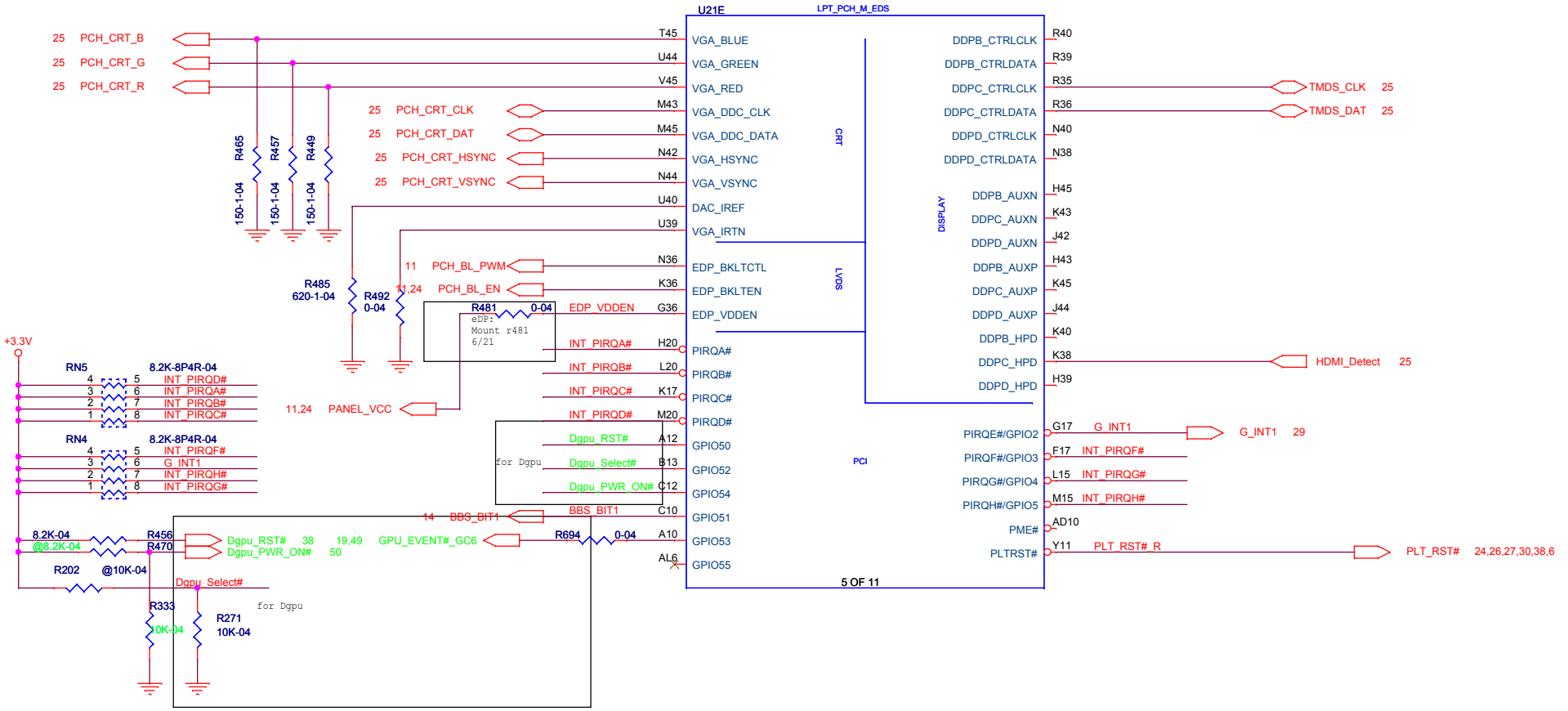

TongFang Inc.		
Title: NTSN1521		
Size: B	Document Number: PCH_PCH_VGA/LVDS (3 of 10)	Rev: RB
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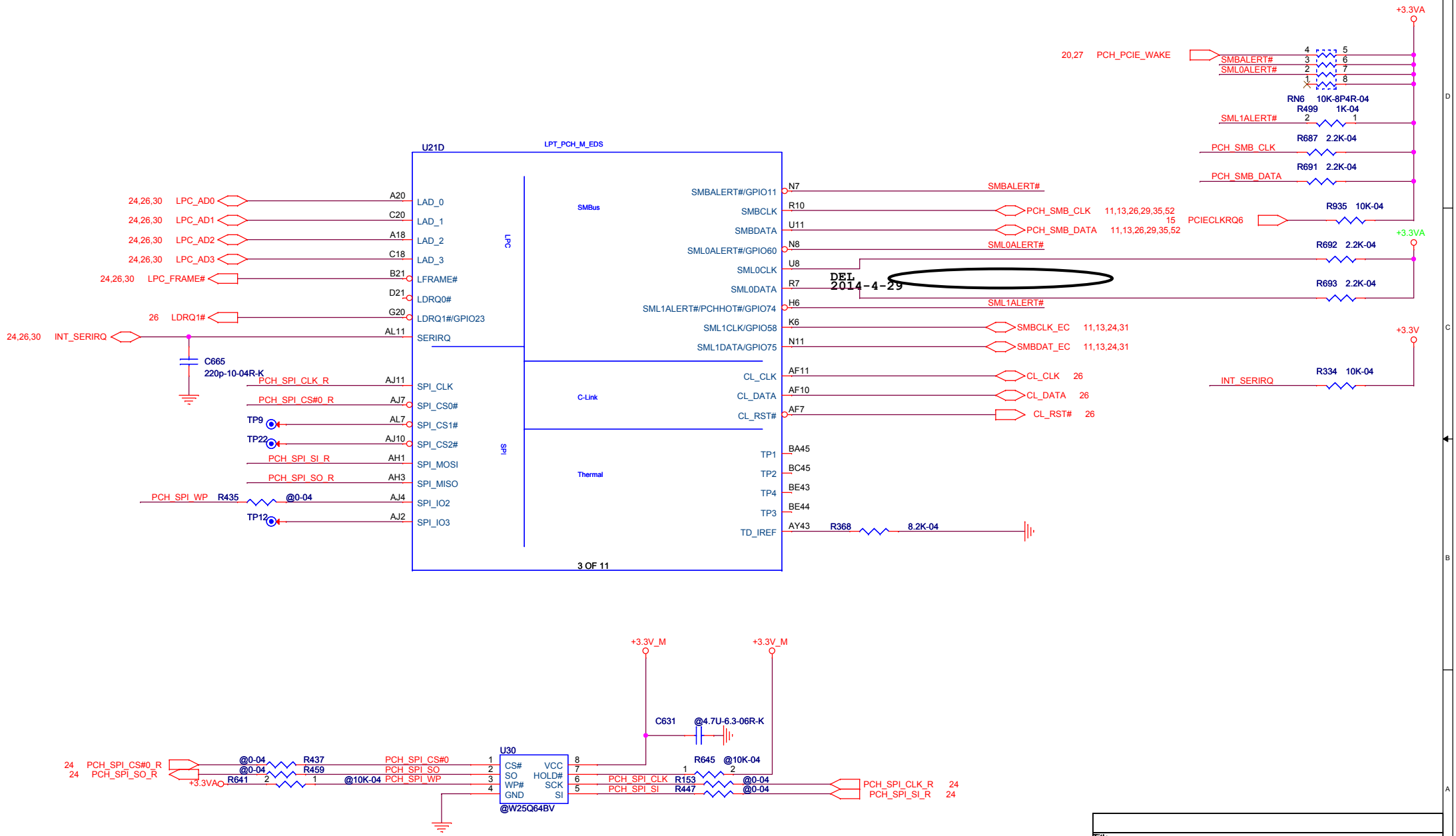

Title	NTSN1521	
Size B	Document Number PCH_SPI/SMB/LAD(4 of 10)	Rev RB
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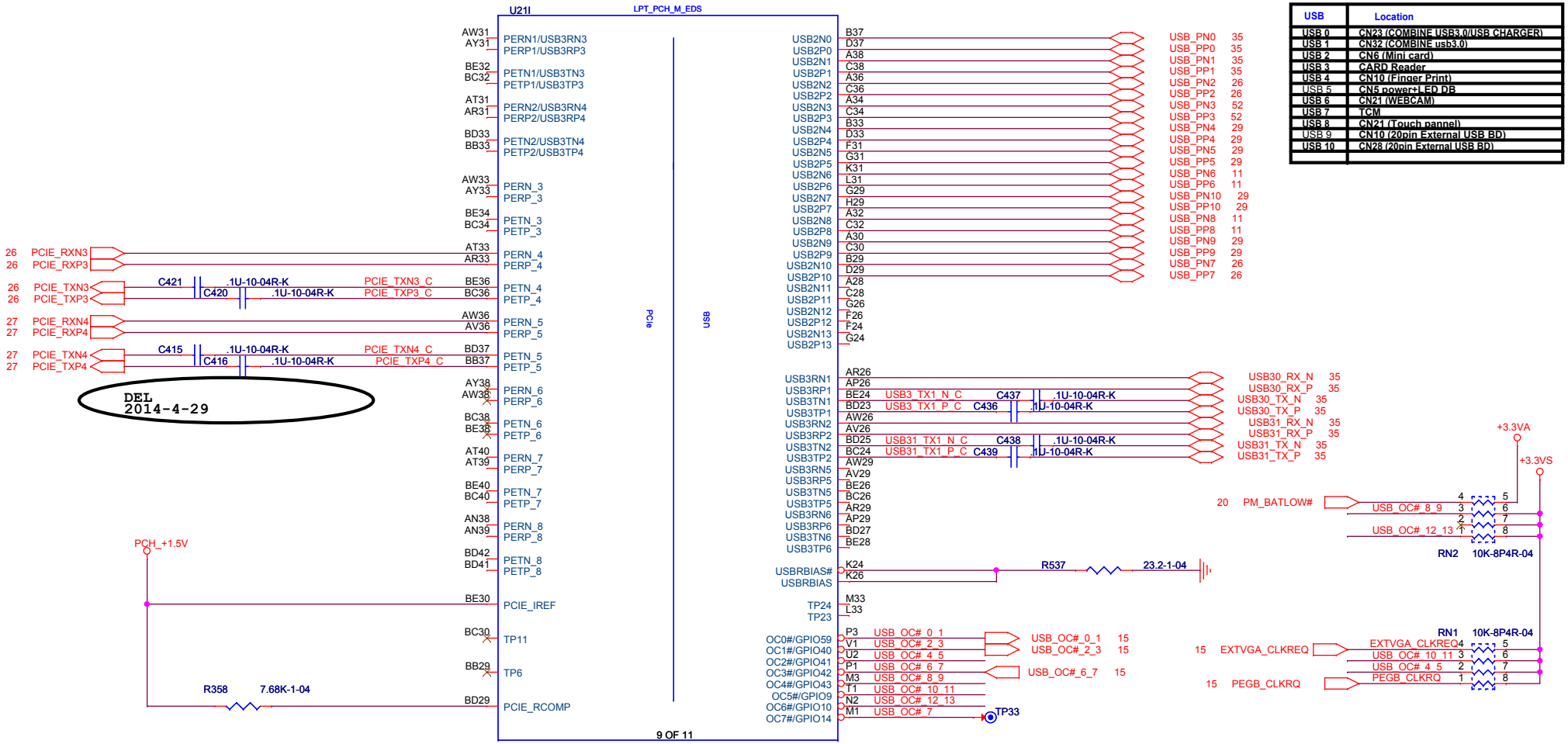

USB	Location
USB 0	CN23 (COMBINE USB3.0/USB CHARGER)
USB 1	CN32 (COMBINE usb3.0)
USB 2	CN6 (Mini card)
USB 3	CARD Reader
USB 4	CN10 (Finger Print)
USB 5	CN5 power+LED DB
USB 6	CN21 (WEBCAM)
USB 7	TCM
USB 8	CN21 (Touch pannel)
USB 9	CN10 (20pin External USB BD)
USB 10	CN28 (20pin External USB BD)

TongFang Inc.

Title: **NTSN1521**

Size	Document Number	Rev
B	PCH_PCIE/USB (5 of 10)	RB

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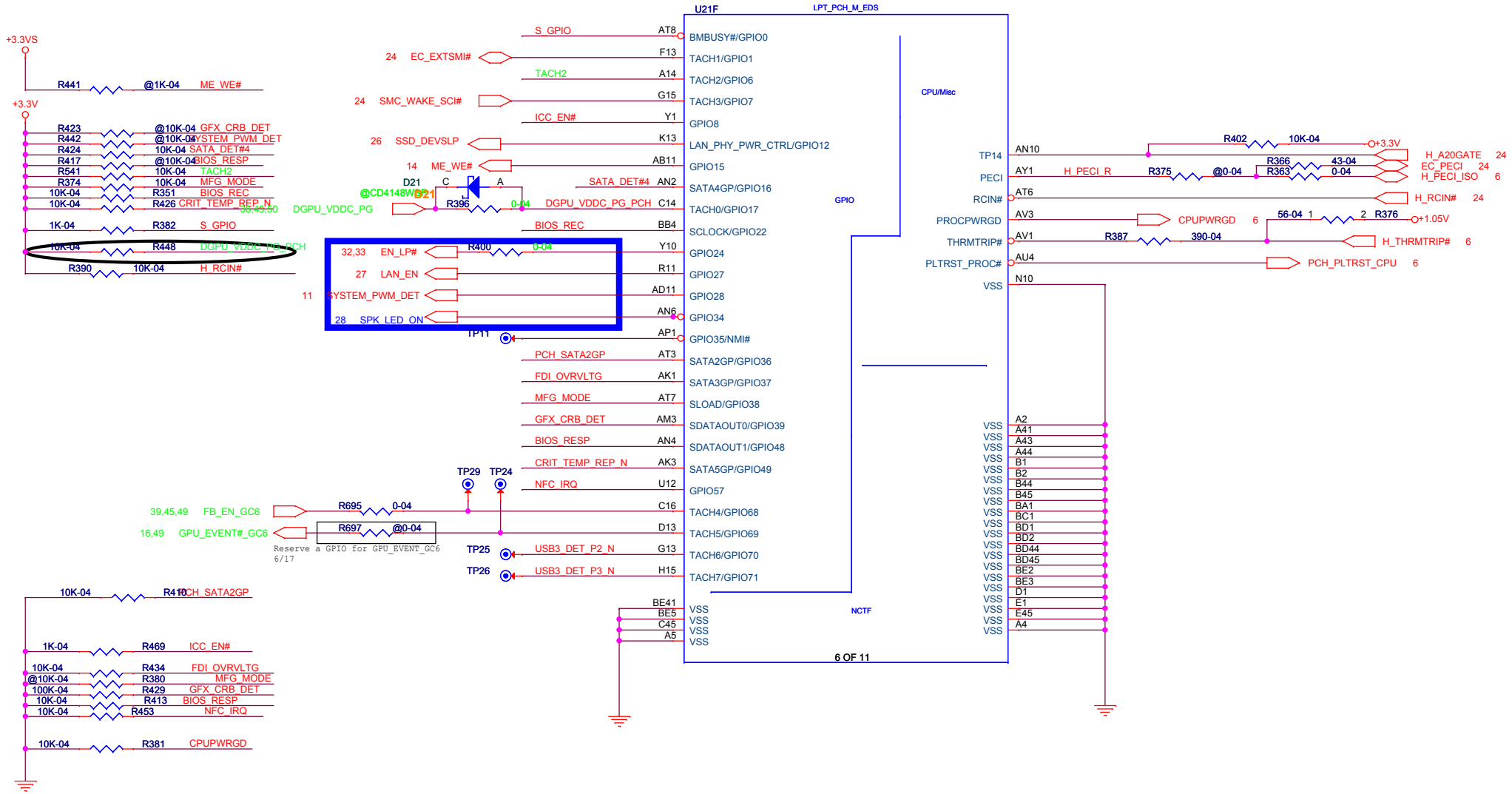

TongFang Inc.		
Title: NTSN1521		
Size: B	Document Number: PCH_GPIO (6 of 10)	Rev: RB
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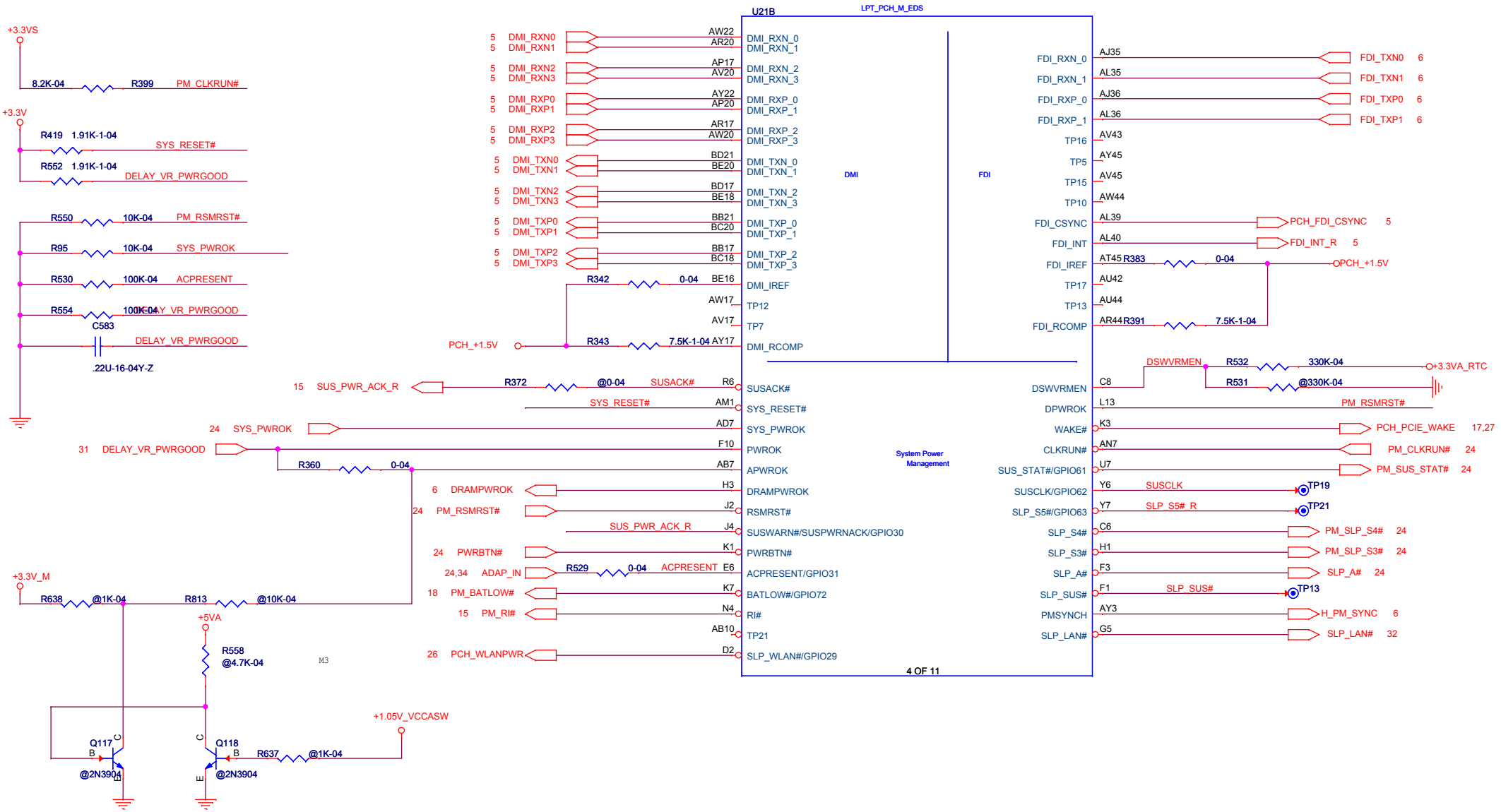

Title	TongFang Inc.
	NTSN1521
Size B	Document Number: PCH_DMI/FDI (7 of 10)
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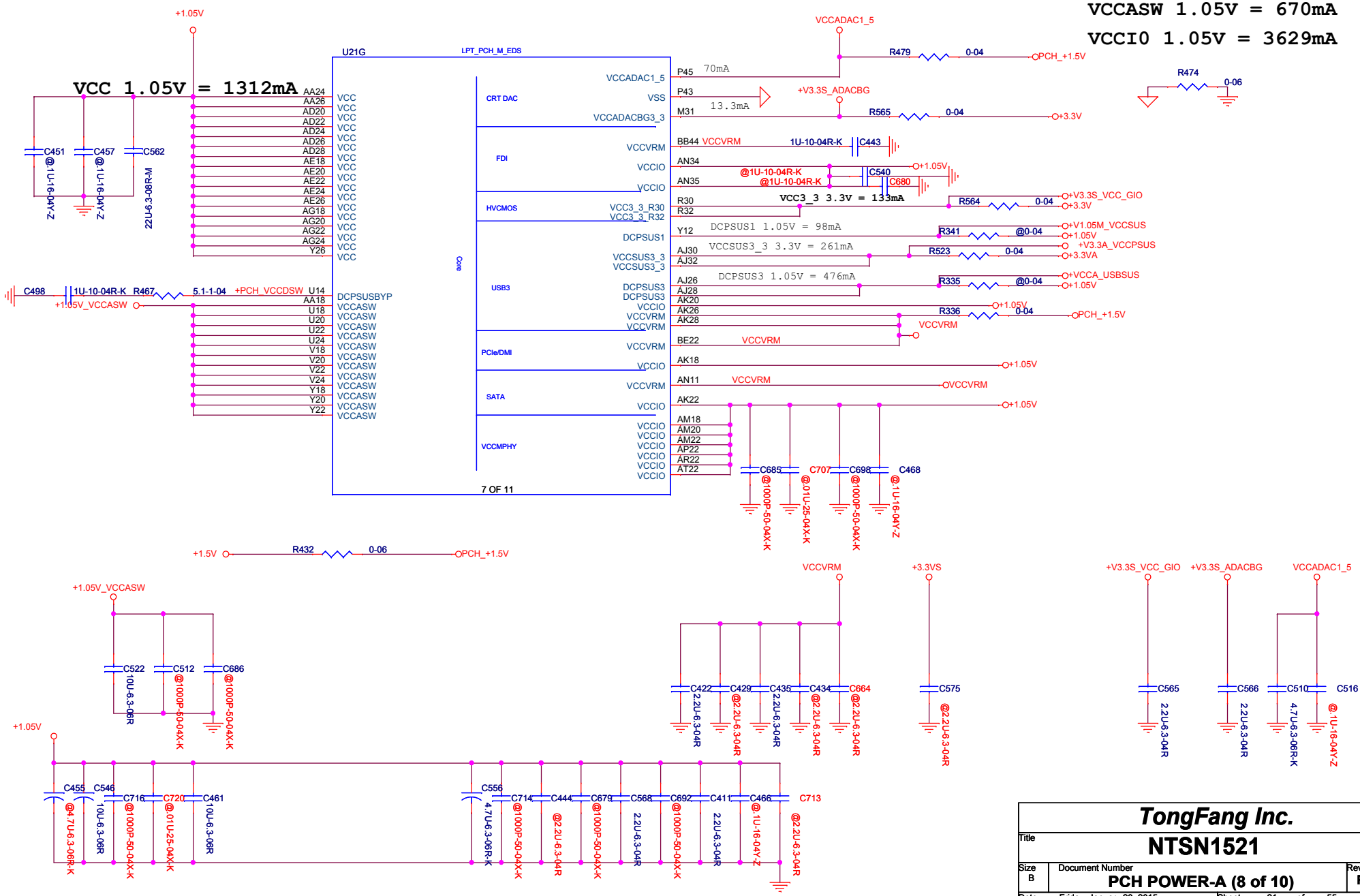
Date:	Friday, January 23, 2015
Sheet	20 of 55

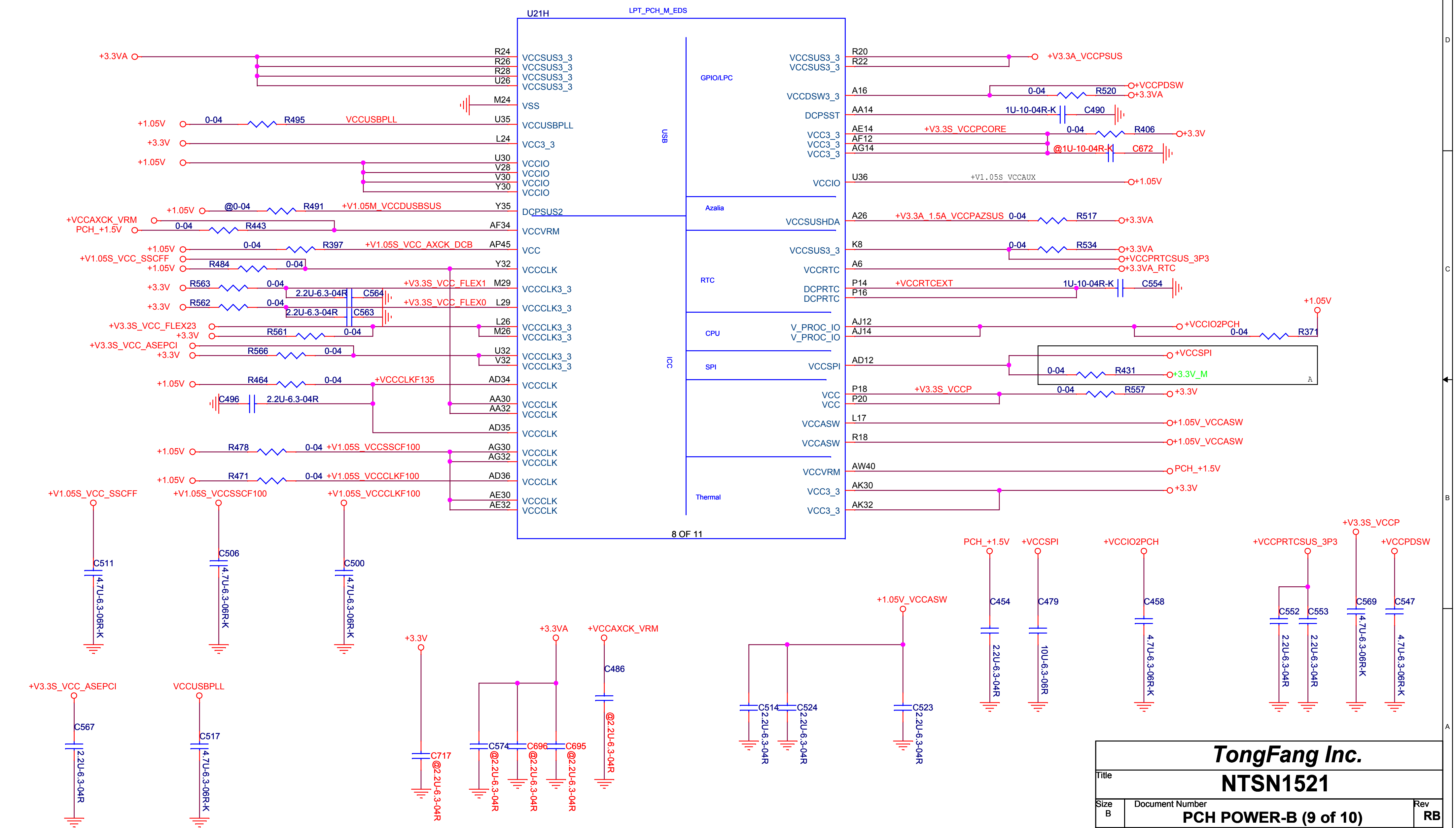
VCCRAM 1.5V = 183mA

VCCASW 1.05V = 670mA

VCCIO 1.05V = 3629mA



TongFang Inc.		
Title: NTSN1521		
Size: B	Document Number: PCH POWER-A (8 of 10)	Rev: RB
Date: Friday, January 23, 2015	Sheet 21 of 55	



TongFang Inc.

Title: NTSN1521

Size: B | Document Number: PCH POWER-B (9 of 10) | Rev: RB

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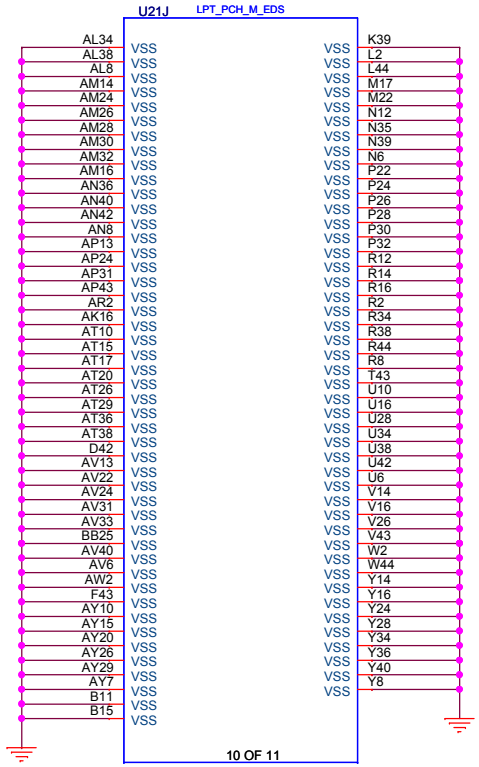

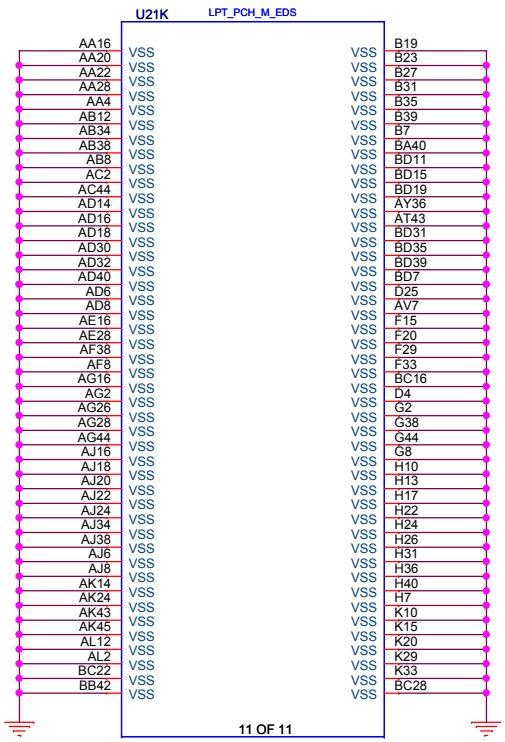

	TongFang Inc.	
Title	NTSN1521	
Size B	Document Number PCH GND (9 of 9)	Rev RB
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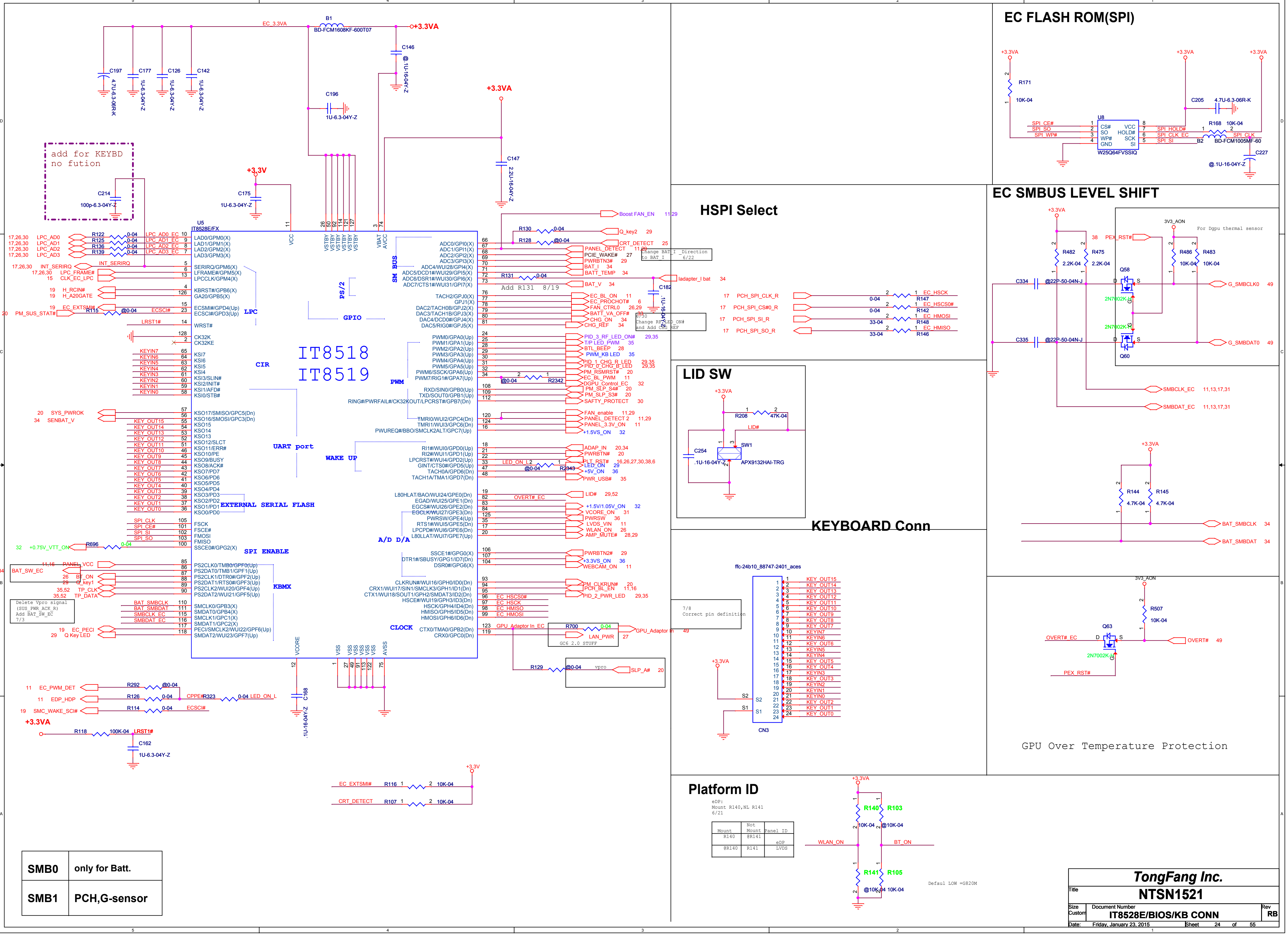

EC FLASH ROM(SPI)
W25Q64FVSSIQ
EC SMBUS LEVEL SHIFT
HSPI Select
LID SW
APX9132HAI-TRG
KEYBOARD Conn
ffc-24b10_88747-2401_aces
GPU Over Temperature Protection
Platform ID
IT8518
IT8519
IT8528E/FX
add for KEYBD
no fution
LPC
CIR
PWM
GPIO
PS/2
SM BUS
UART port
WAKE UP
EXTERNAL SERIAL FLASH
SPI ENABLE
KBMX
CLOCK
A/D D/A
+3.3VA
+3.3V
Delete Vpro signal
(SUS_PWR_ACK_R)
Add BAT_SW_EC
7/3
Change BAT_I _Direction
to BAT_I 6/22
Add R131 8/19
7/8
Correct pin definition
GC6 2.0 STUFF
For Dgpu thermal sensor
Defaul LOW =G820M

SMB0	only for Batt.
SMB1	PCH,G-sensor

eDP: Mount R140,NL R141 6/21	
Mount	Not Mount	Panel ID
R140	@R141	eDP
@R140	R141	LVDS

TongFang Inc.

Title	NTSN1521	
Size Custom	Document Number IT8528E/BIOS/KB CONN	Rev RB
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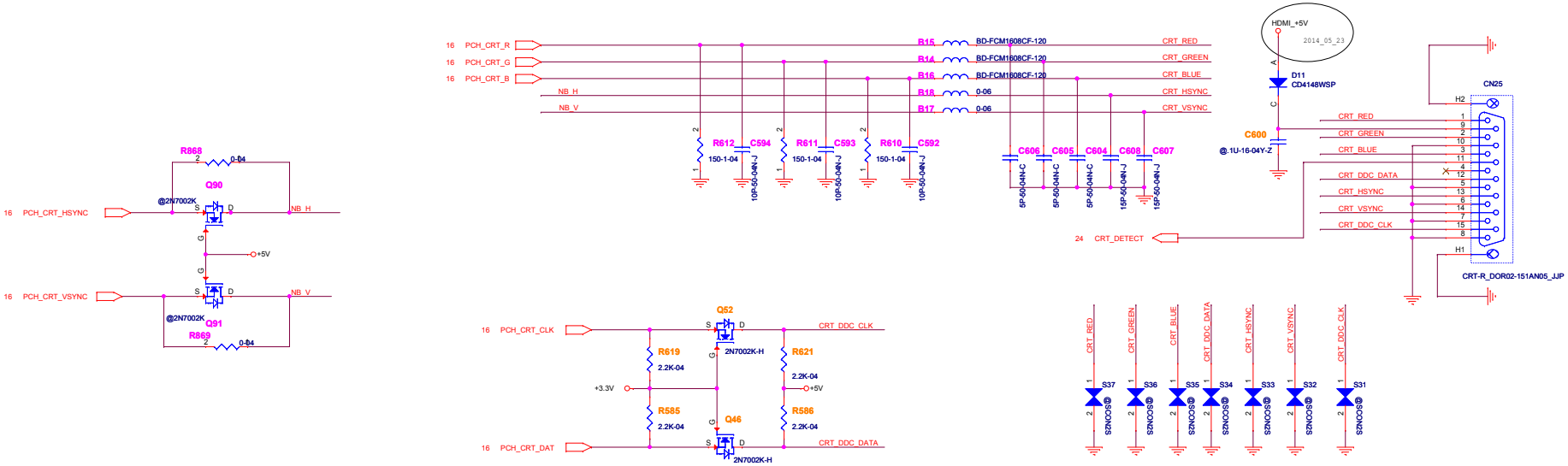
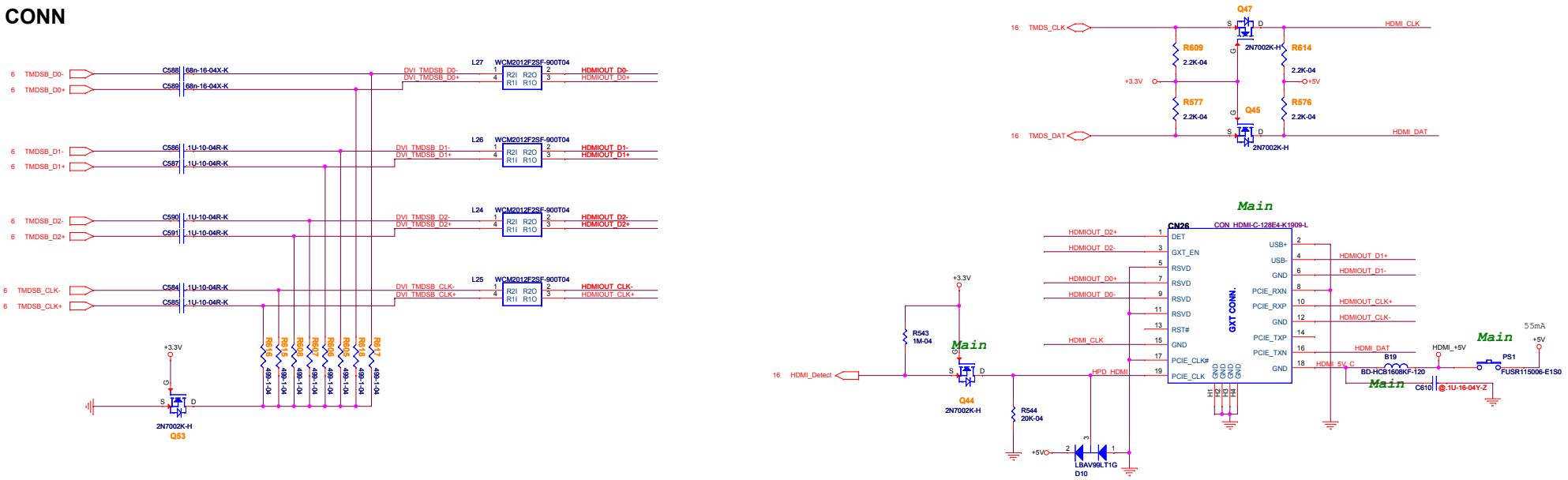
CRT CONN

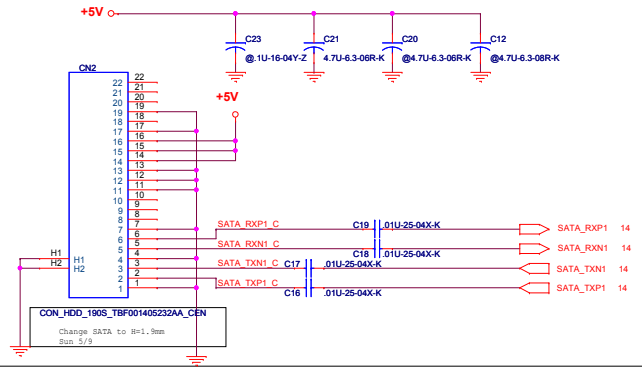


HDMI CONN

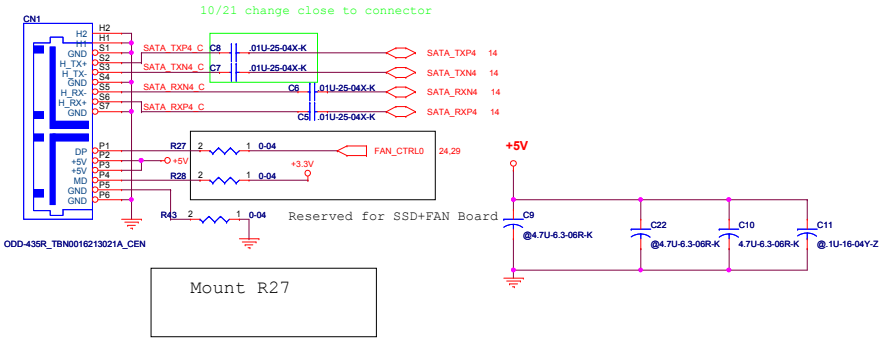


TongFang Inc.		
Title: NTSN1521		
Size: Custom	Document Number: CRT/HDMI	Rev: RB
Date: Friday, January 23, 2015	Sheet 25 of 55	

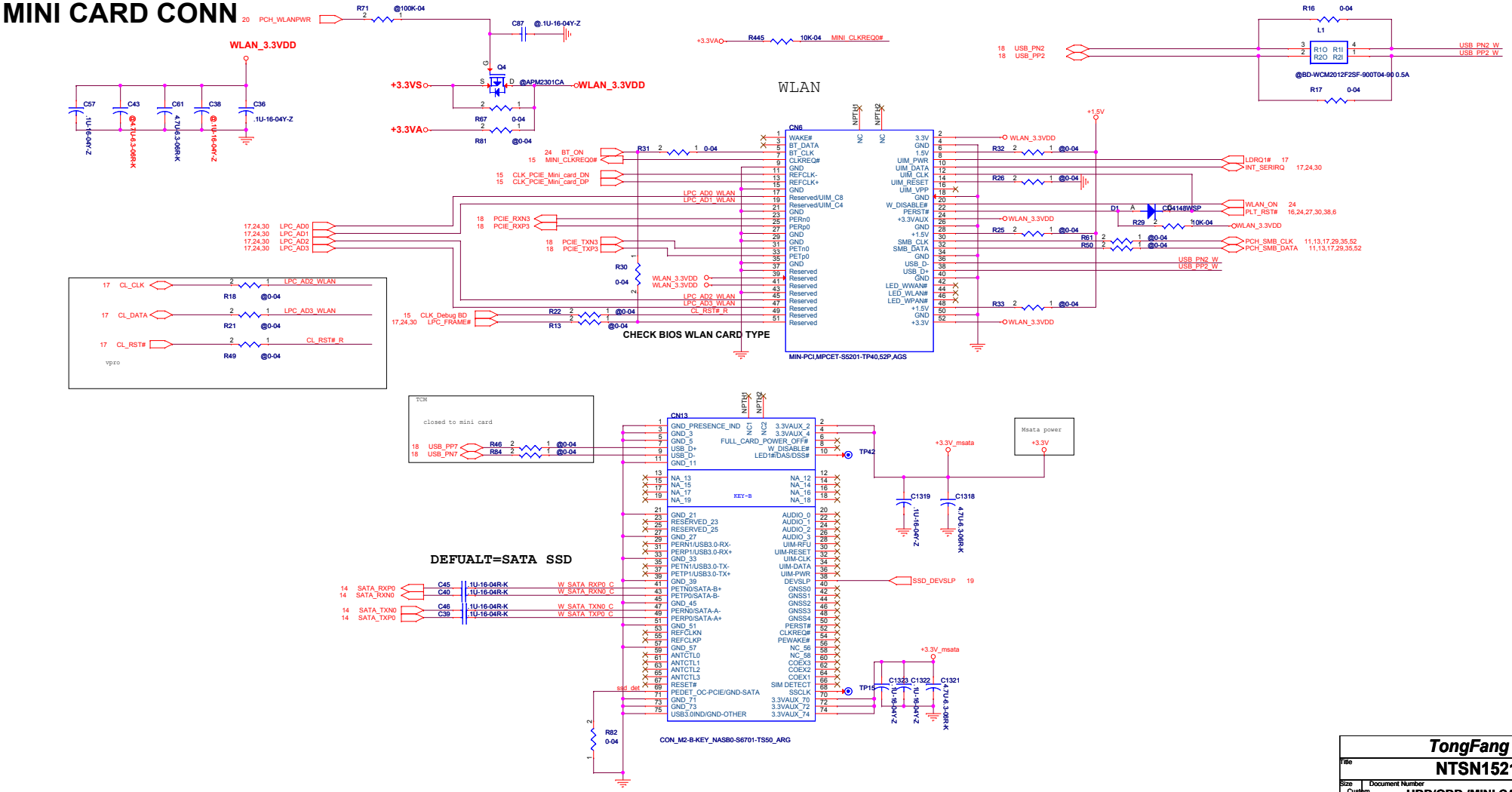
SATA-HDD



CD-ROM



MINI CARD CONN



TongFang Inc.			
Title: NTSN1521			
Size: Custom	Document Number: HDD/ODD /MINI CARD		Rev: RB
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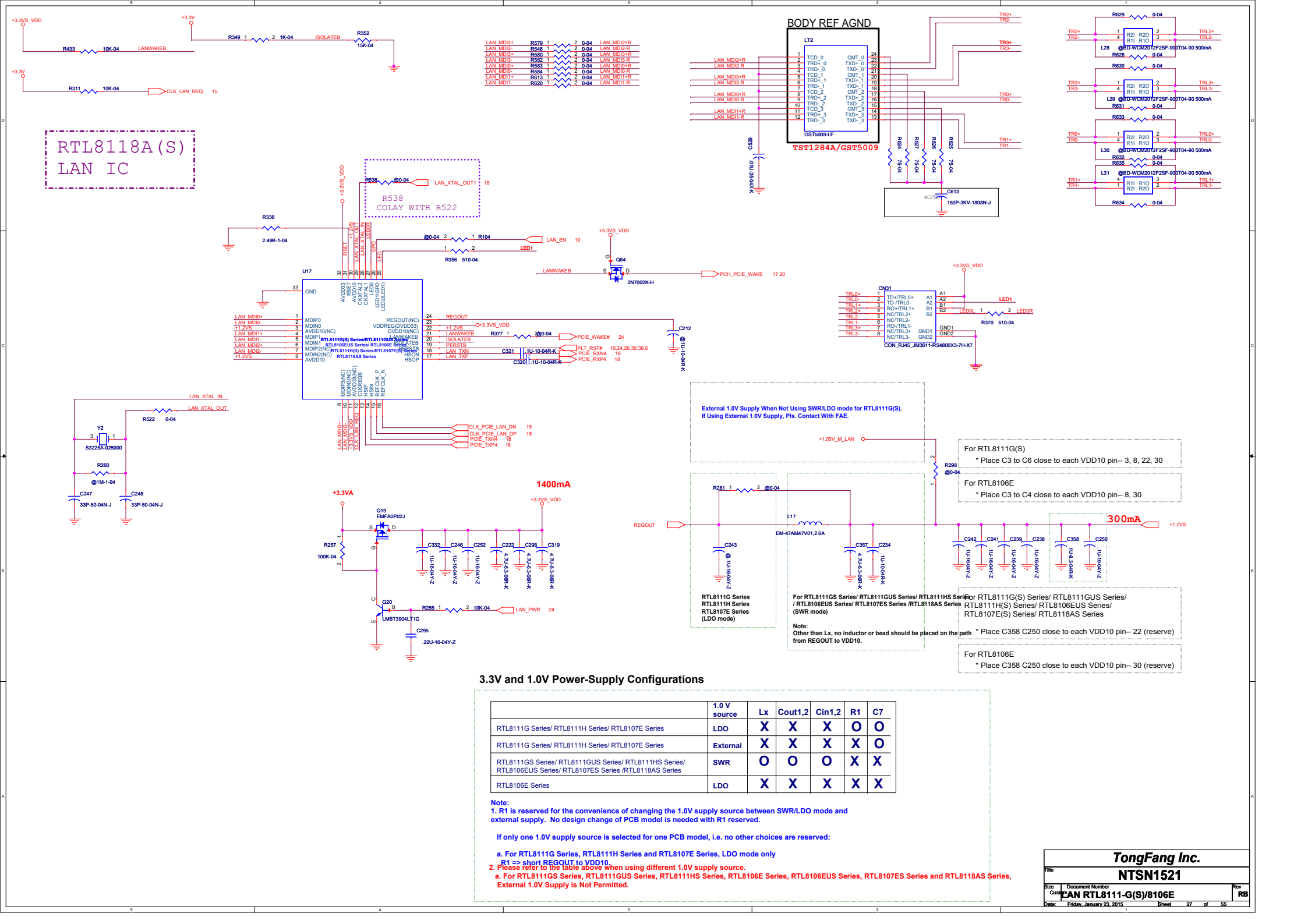

3.3V and 1.0V Power-Supply Configurations

	1.0 V source	Lx	Cout1,2	Cin1,2	R1	C7
RTL8111G Series/ RTL8111H Series/ RTL8107E Series	LDO	X	X	X	O	O
RTL8111G Series/ RTL8111H Series/ RTL8107E Series	External	X	X	X	X	O
RTL8111GS Series/ RTL8111GUS Series/ RTL8111HS Series/ RTL8106EUS Series/ RTL8107ES Series /RTL8118AS Series	SWR	O	O	O	X	X
RTL8106E Series	LDO	X	X	X	X	X

Note:

1. R1 is reserved for the convenience of changing the 1.0V supply source between SWR/LDO mode and external supply. No design change of PCB model is needed with R1 reserved.

   If only one 1.0V supply source is selected for one PCB model, i.e. no other choices are reserved:

   a. For RTL8111G Series, RTL8111H Series and RTL8107E Series, LDO mode only
   R1 => short REGOUT to VDD10.

2. Please refer to the table above when using different 1.0V supply source.
   a. For RTL8111GS Series, RTL8111GUS Series, RTL8111HS Series, RTL8106E Series, RTL8106EUS Series, RTL8107ES Series and RTL8118AS Series, External 1.0V Supply is Not Permitted.

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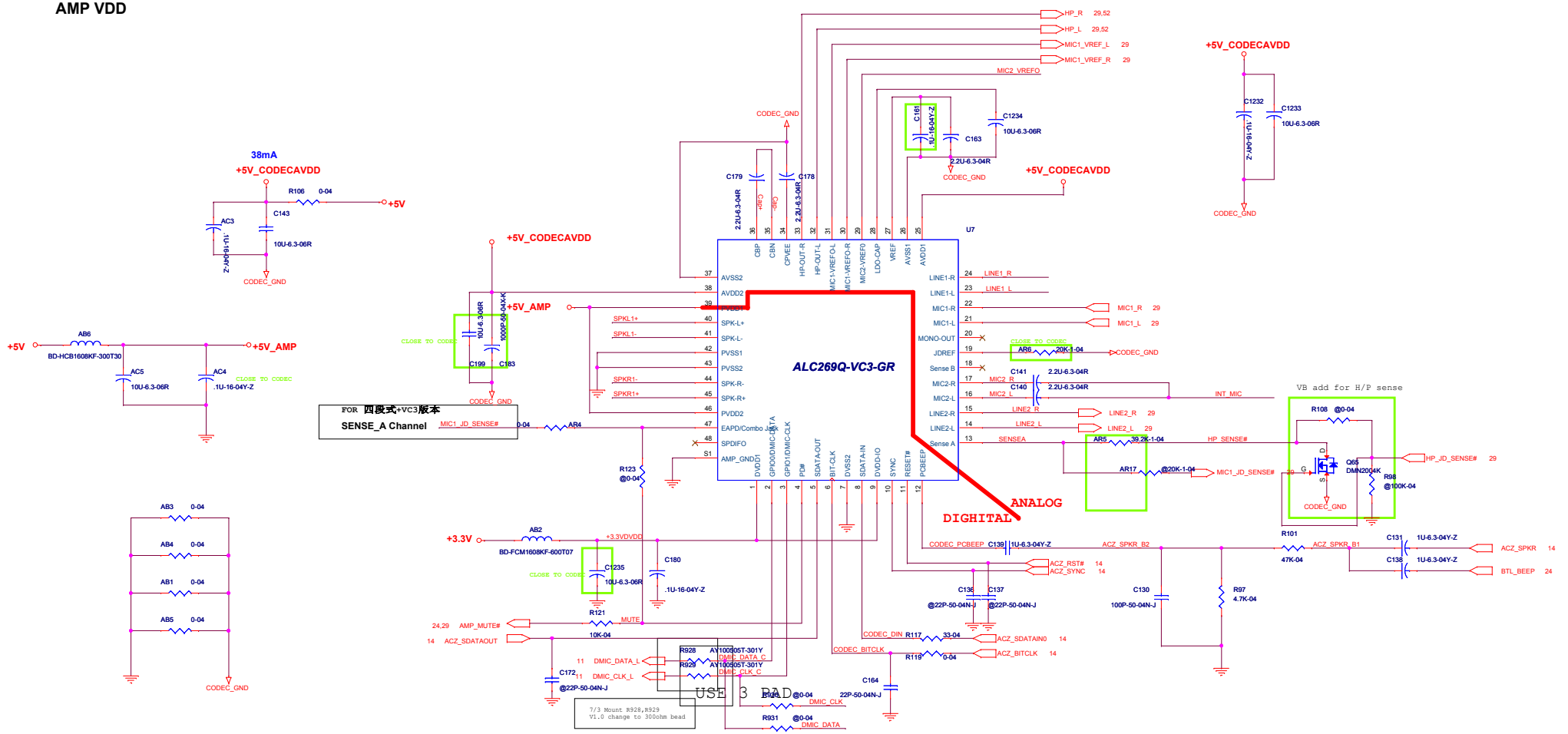
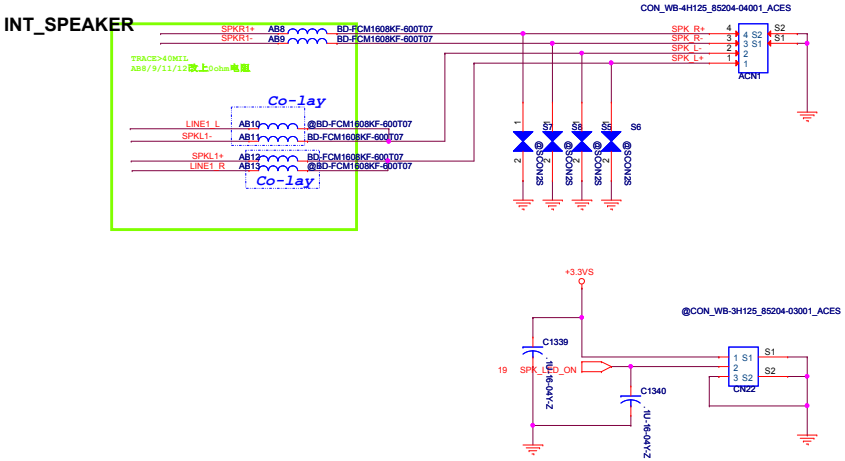
CODEC ALC269Q

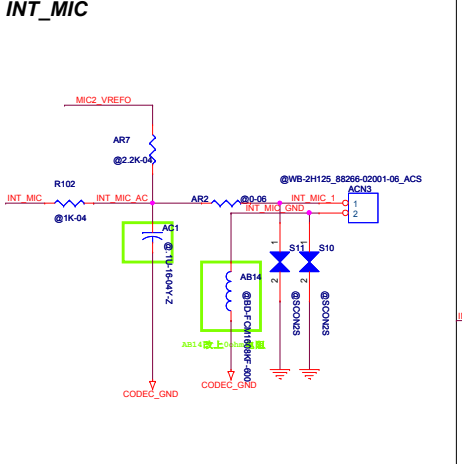
AMP VDD



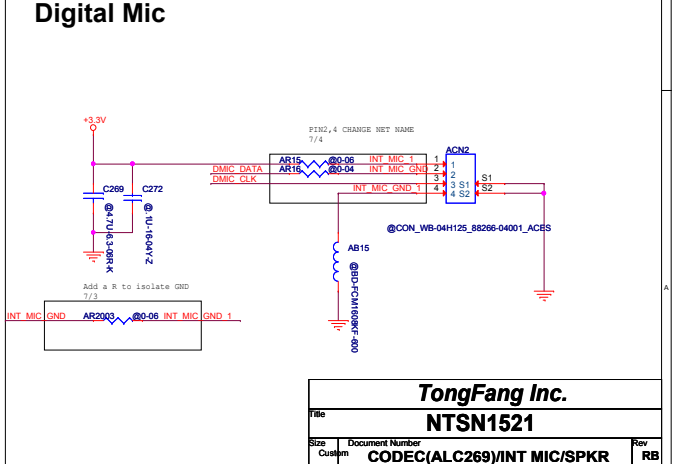
INT_SPEAKER



INT_MIC



Digital Mic



TongFang Inc.		
Title: NTSN1521		
Size: Custom	Document Number: CODEC(ALC269)/INT MIC/SPKR	Rev: RB
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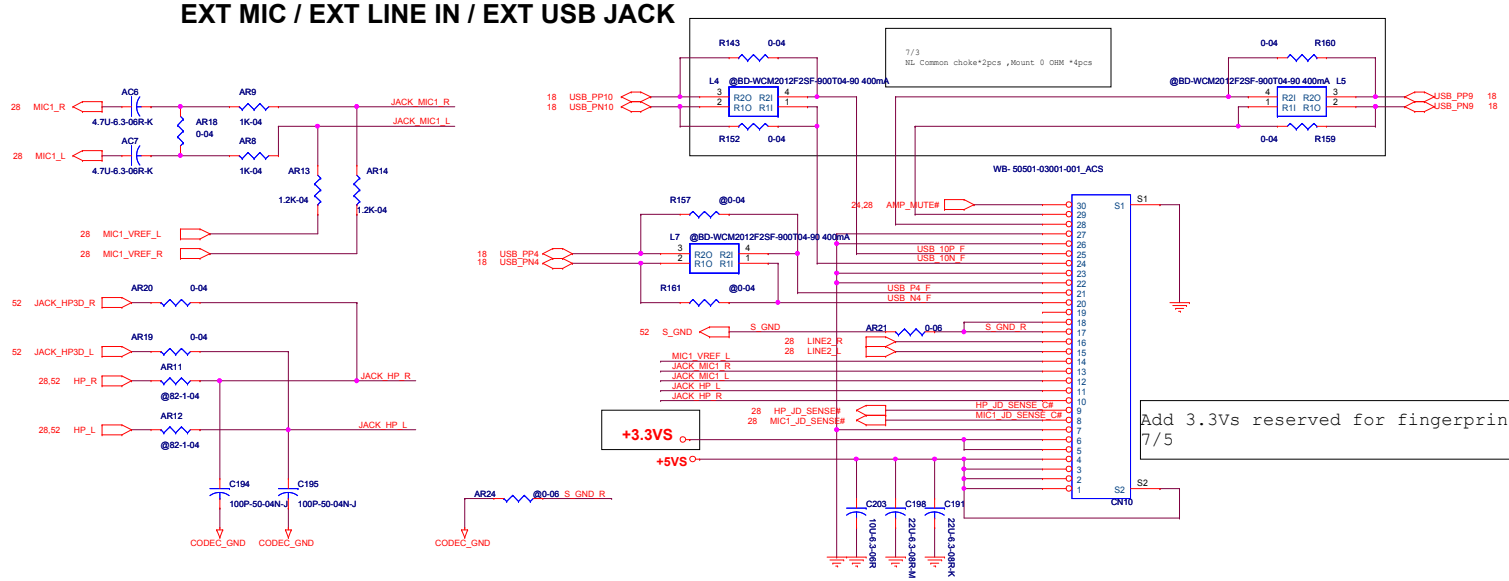
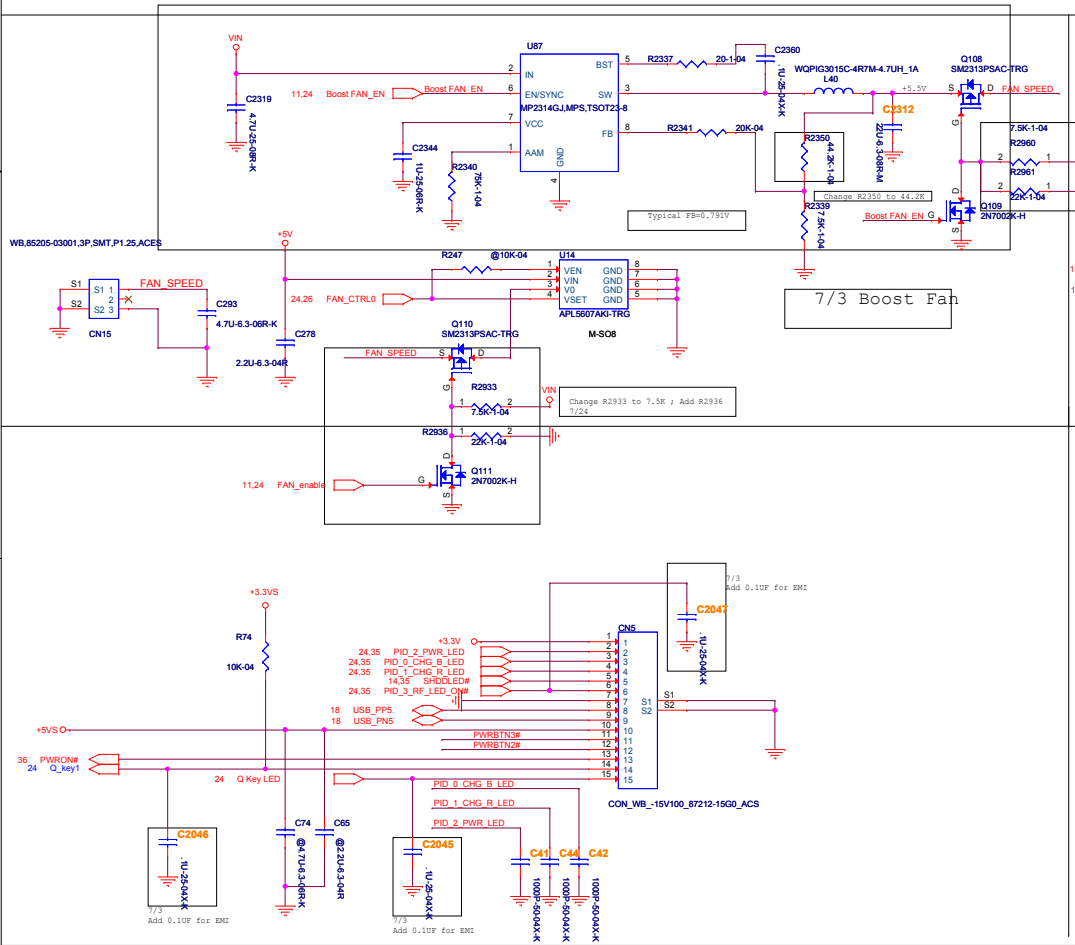
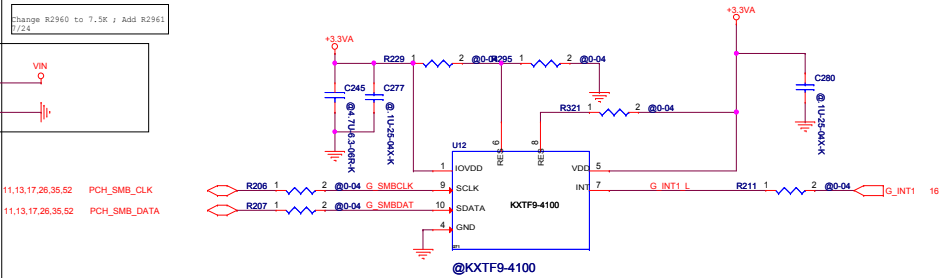
EXT MIC / EXT LINE IN / EXT USB JACK

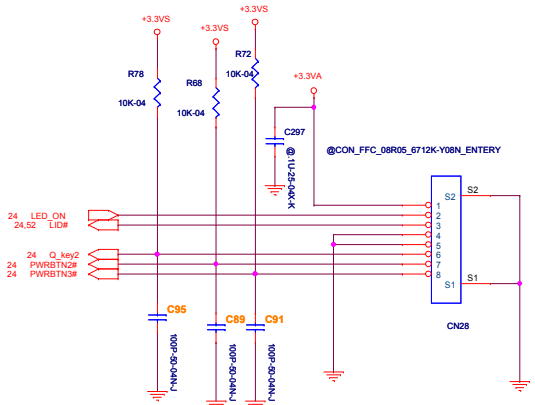


FAN CONTROLLER



G SENSOR





TongFang Inc.	
Title	NTSN1521
Size / Custom	Document Number: EXT_MIC/C_PAD/USB/FAN
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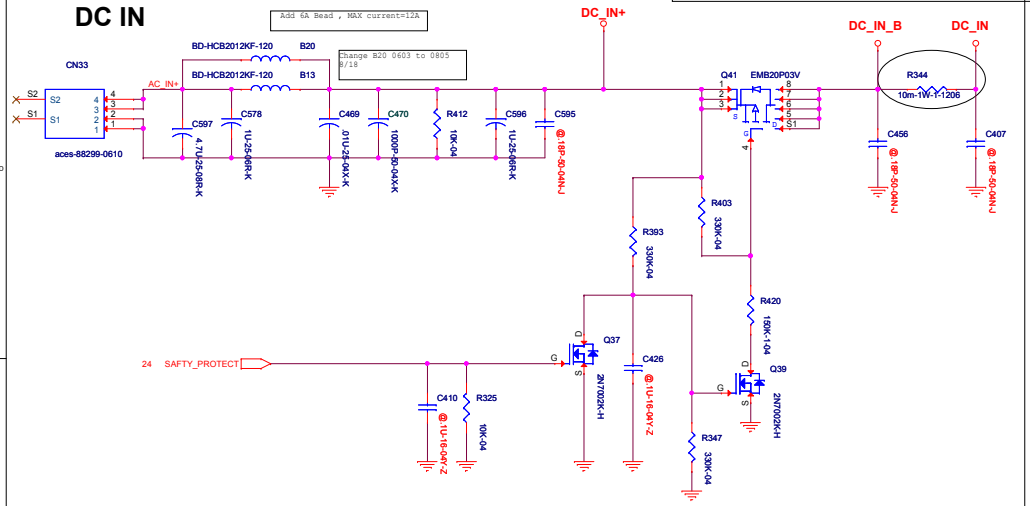
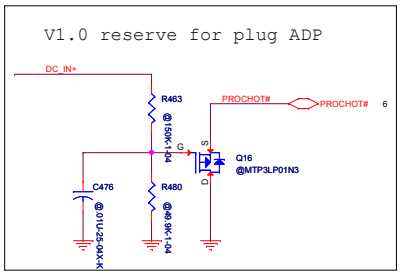
R344 needs to be changed to 20m OHM-2W

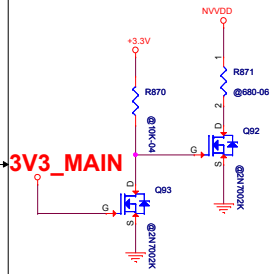
DC IN

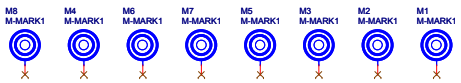


V1.0 reserve for plug ADP

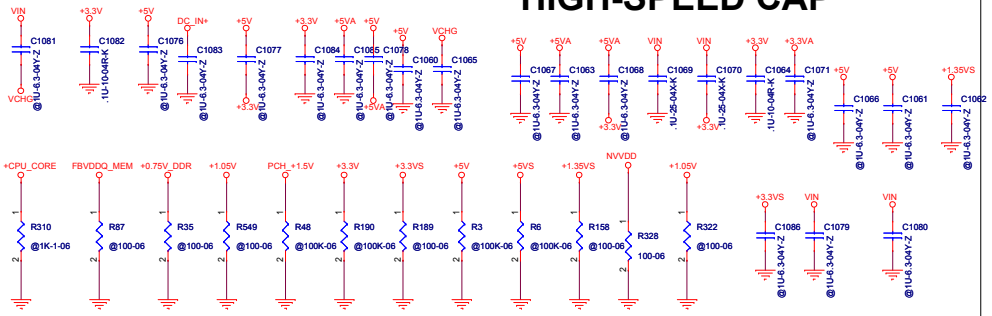


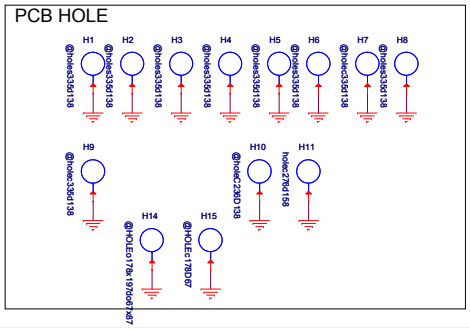
Discharge Resistor

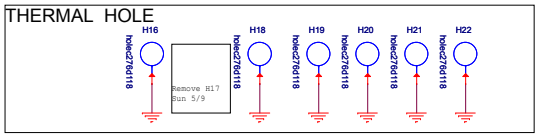


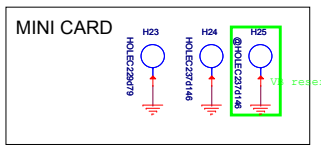


HIGH-SPEED CAP

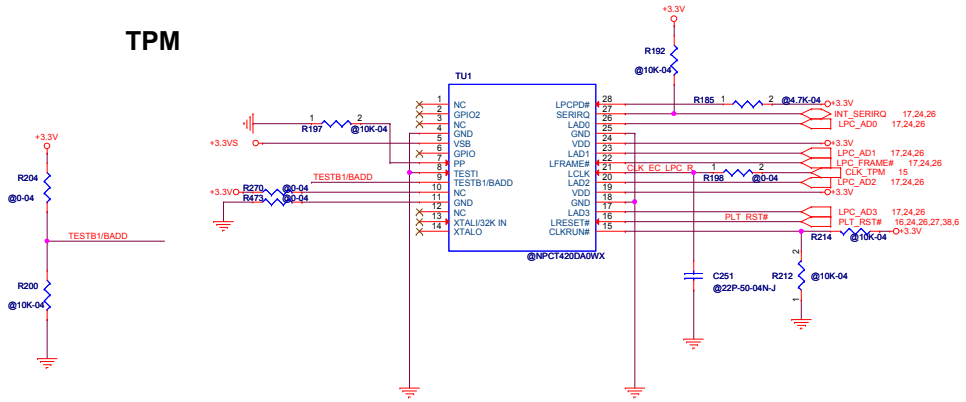








TPM



TongFang Inc.

Title	NTSN1521	
Size: Custom	Document Number: DC IN/MDC/BT/D-Resistor	Rev: RB
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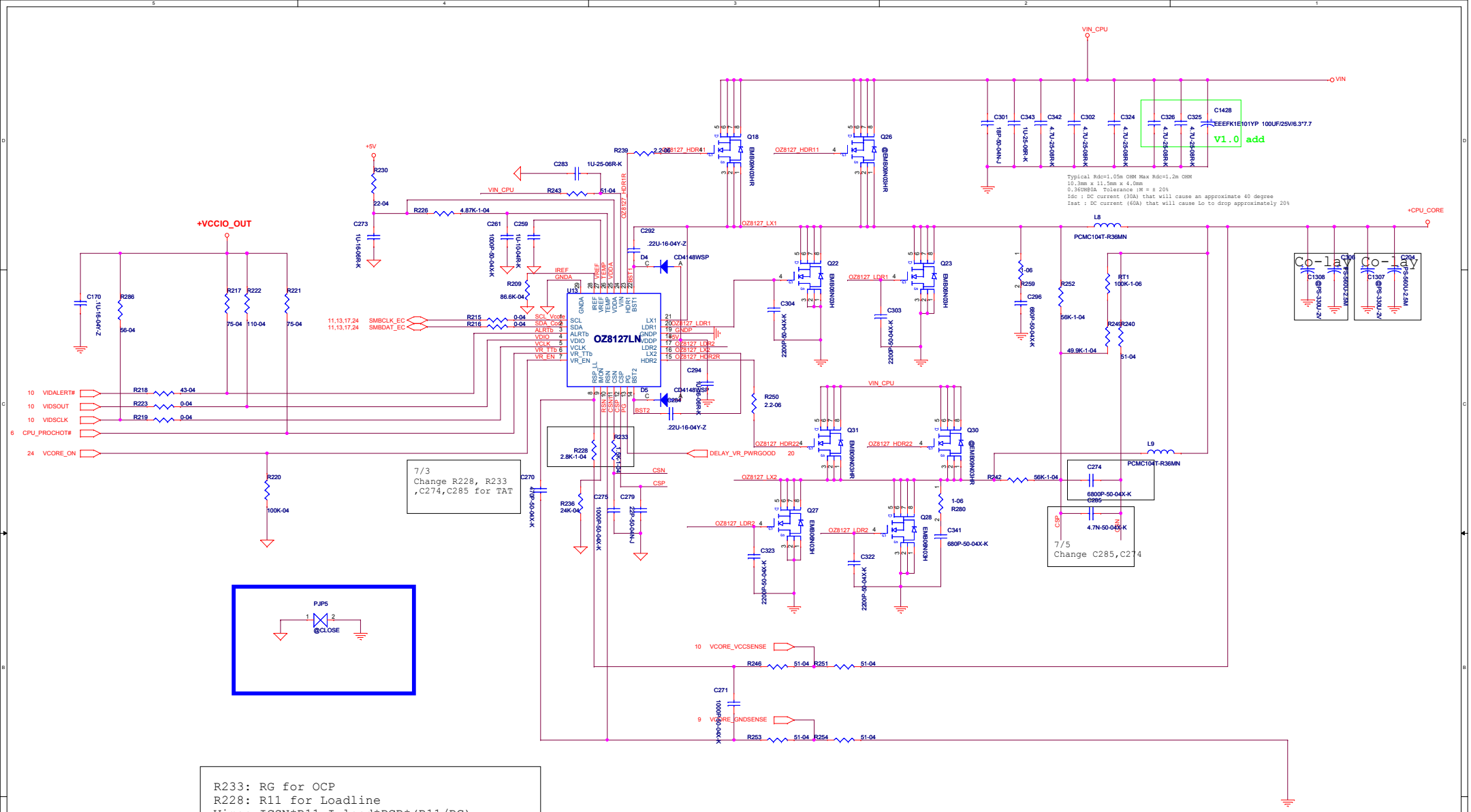

Title	TongFang Inc.
	NTSN1521
Size: Custom	Document Number: CPU CORE (OZ8127)
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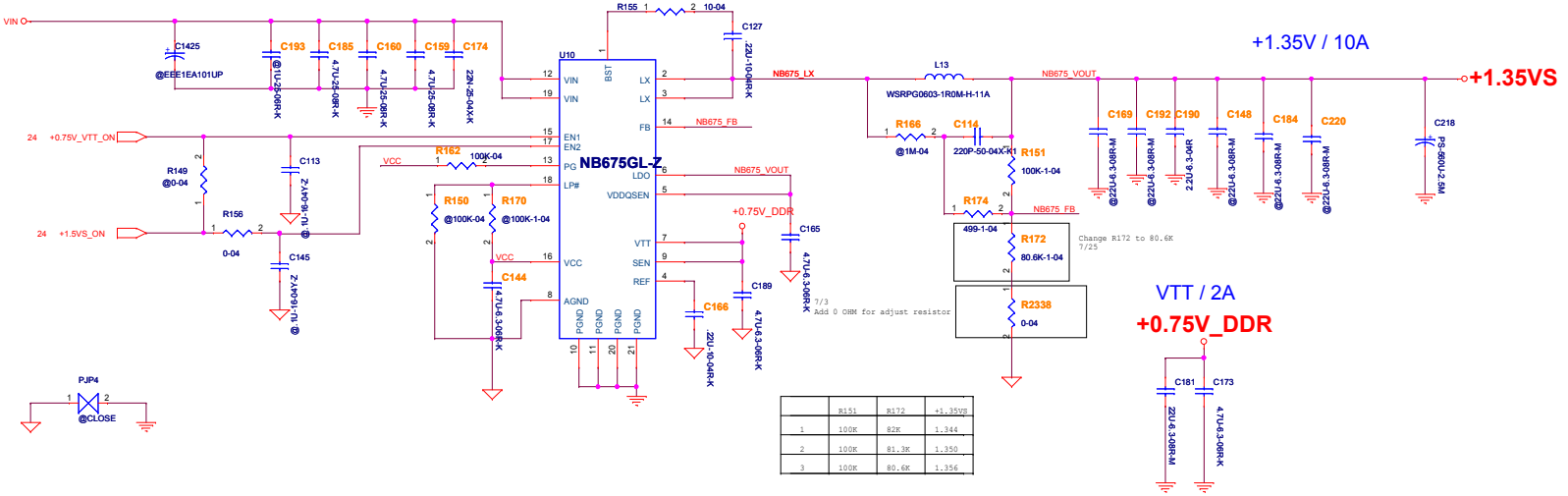
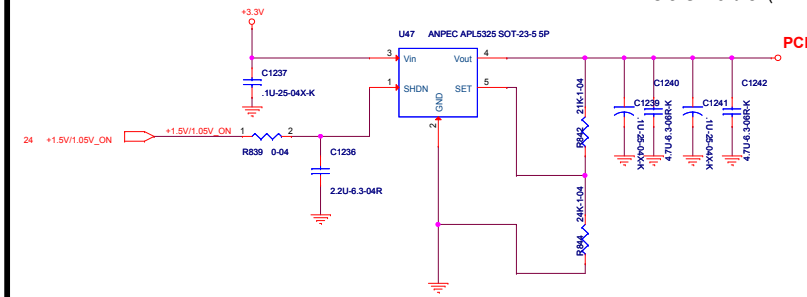
1.35VS/VTT Converter

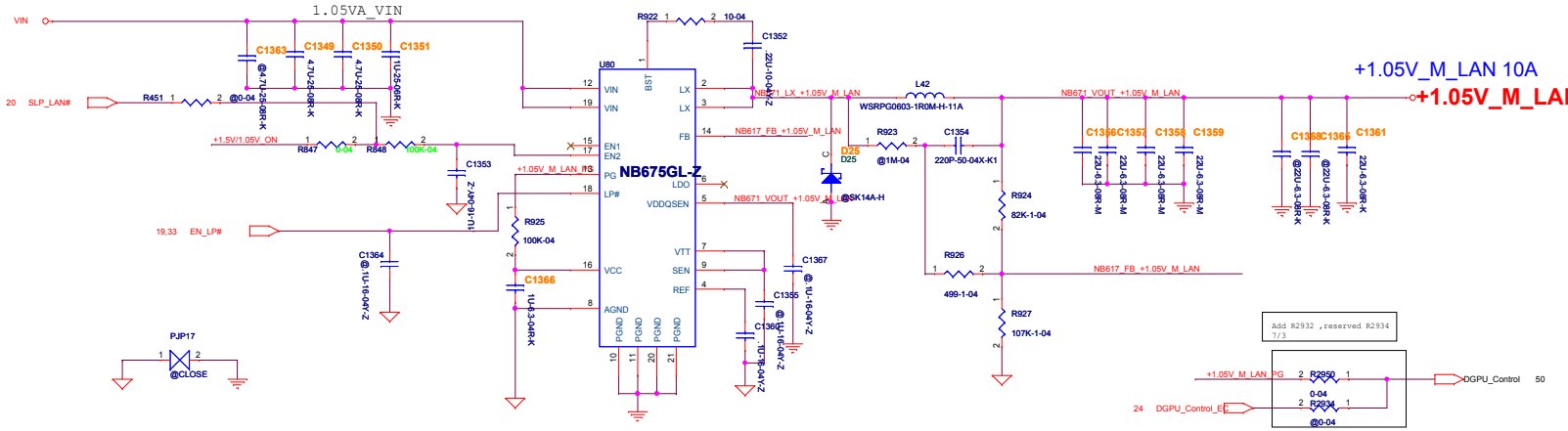


	R151	R172	+1.35VS
1	100K	82K	1.344
2	100K	81.3K	1.350
3	100K	80.6K	1.356

PCH_LDO_+1.5V

Vout=0.8(1+R842/R844)





TongFang Inc.			
Title: NTSN1521			
Size: Custom	Document Number: +1.05V(NB671)/+0.75VS/+1.5V	Rev: RB	
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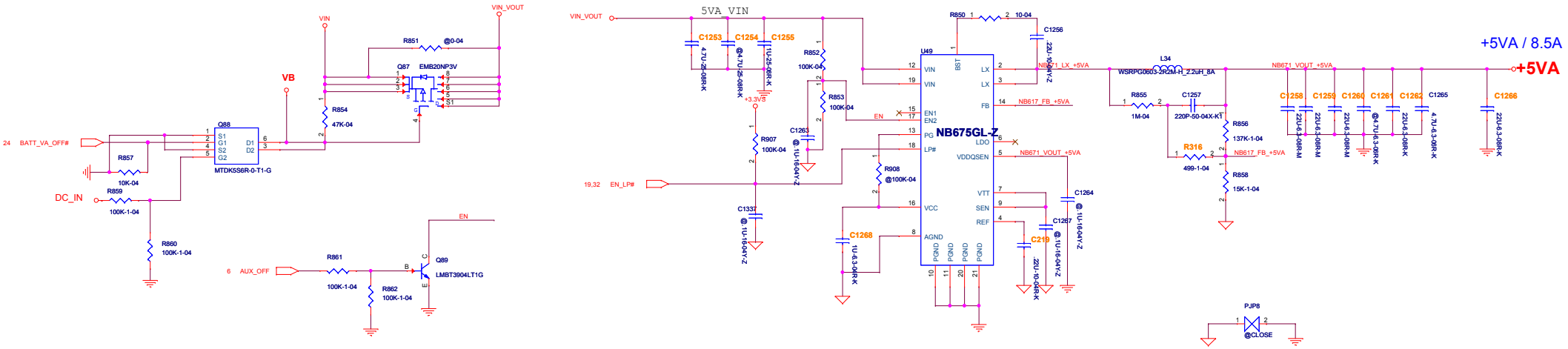
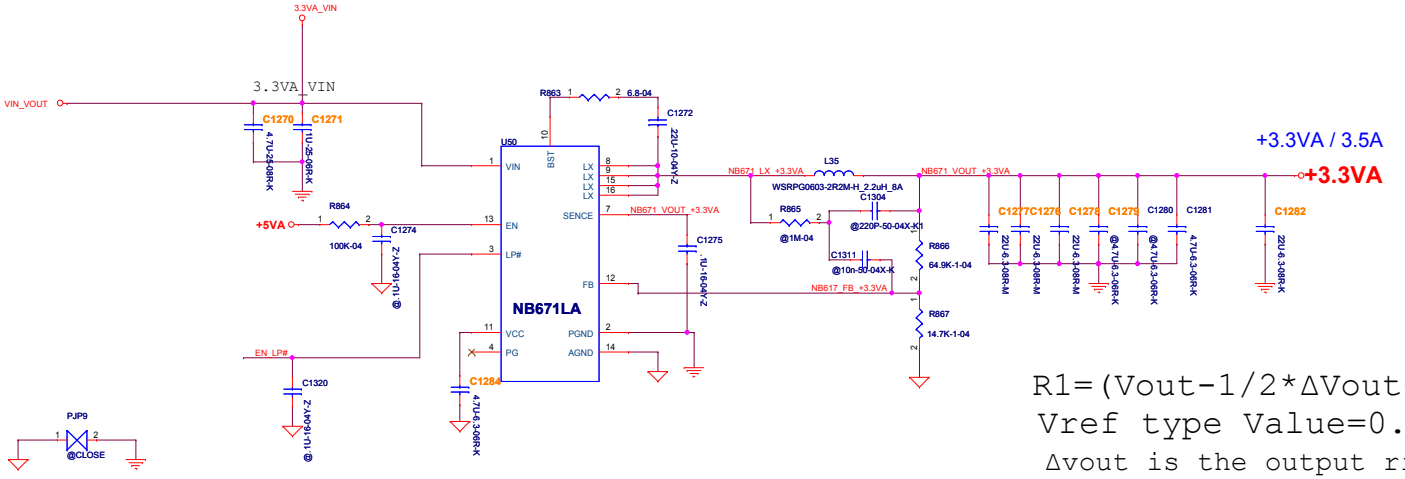
5VA Converter



3.3VA Converter



R1=(Vout-1/2*ΔVout-Vref)/Vref*R2
Vref type Value=0.604 V
Δvout is the output ripple : 5%*Vout

TongFang Inc.		
Title: NTSN1521		
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Voltage=1.674+0.1116*Bat_I

Ideal Voltage	Measured Voltage	Current
0		-6
0.279		-5
0.558		-4
0.837		-3
1.116		-2
1.395		-1
1.674	1.667	0
1.953	1.944	1
2.232	2.224	2
2.511	2.504	3
2.79	2.782	4
3.069	3.062	5
3.348	3.342	6

Real Current(A)=
EC Read(V)/20/0.01 ohm

	Adaptor_I_EC Read(V)	Real Current(A)
	0.1	0.50
	0.5	2.50
	1	5.00
	1.5	7.50
	2	10.00
	2.5	12.50

VB change to DC_IN_B for O2

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

6/12

8/5
Change RCH2 10 mOHM-->25 mOHM

1. AC mode: charger function is OK
2. AC mode+battery-->Remove AC adapter : battery works fine
3. Only battery mode: cannot power on if SW6 is switched floating
7/4

6/12

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

Charge / Discharge Detect

Voutmax=Vcc-1.5V
Input Offset Voltage: typical 1.7mV max:7mV/9mV

CLOSE EC PIN

Change R337 1.5K-->2K R319:16.5K-->22K
7/5

Coly
6/12

Title	TongFang Inc. / NTSN1521
Size	Custom
Document Number	BATT IN/CHARGER(OZ8660)
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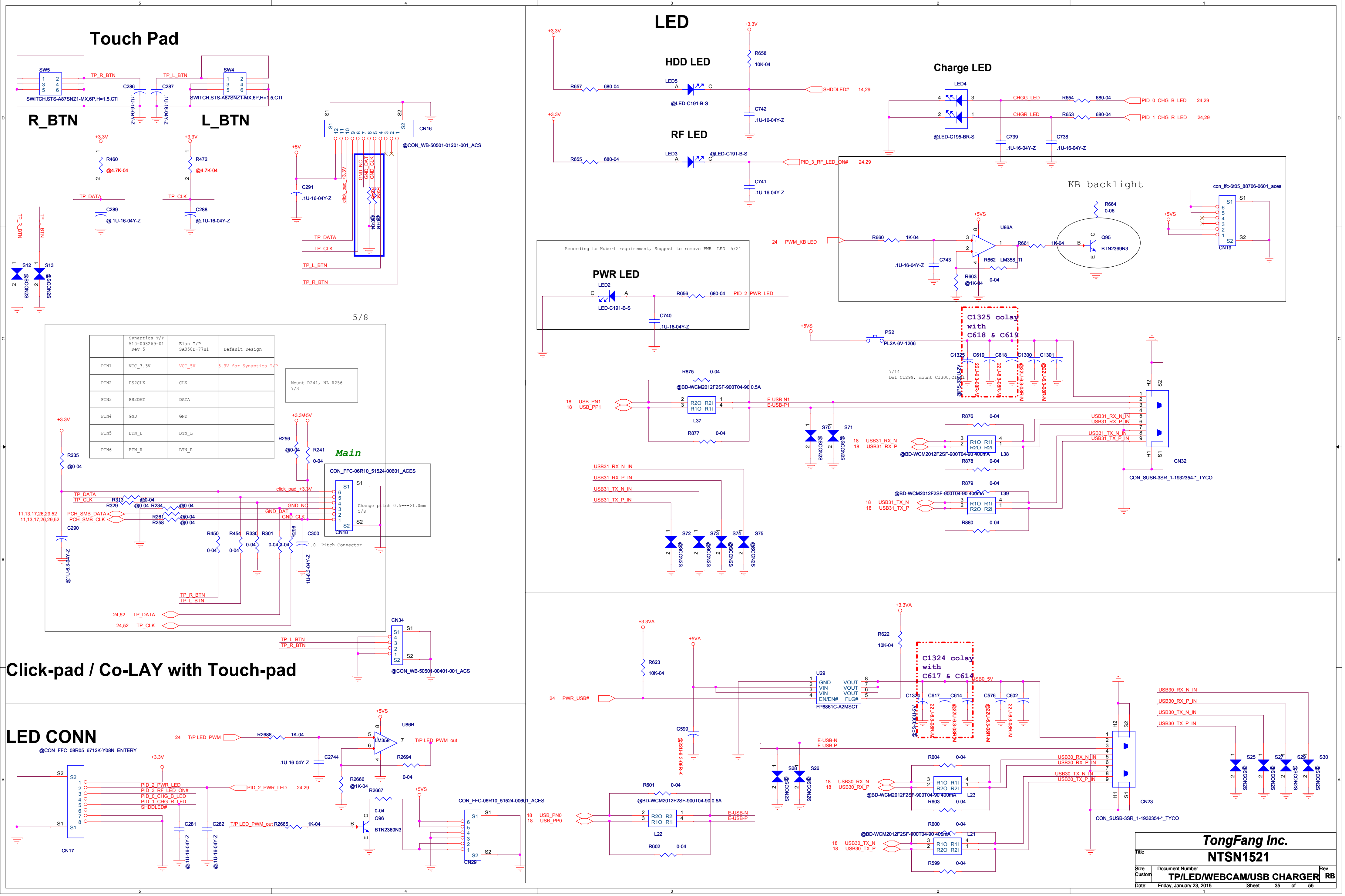

	Synaptics T/P 510-003269-01 Rev 5	Elan T/P SA050D-77H1	Default Design
PIN1	VCC_3.3V	VCC_5V	3.3V for Synaptics T/P
PIN2	PS2CLK	CLK	
PIN3	PS2DAT	DATA	
PIN4	GND	GND	
PIN5	BTN_L	BTN_L	
PIN6	BTN_R	BTN_R	

TongFang Inc.

Title: NTSN1521

Size: Custom | Document Number: TP/LED/WEBCAM/USB CHARGER | Rev: RB

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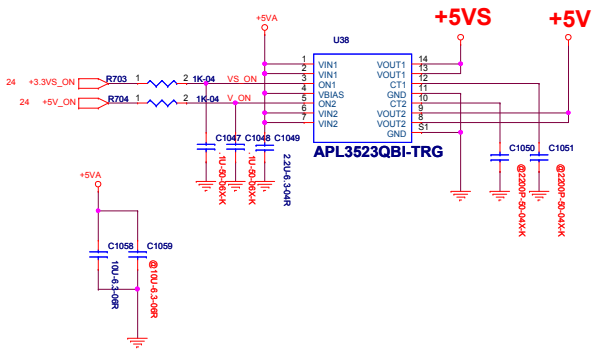
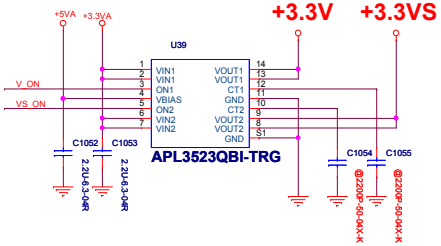
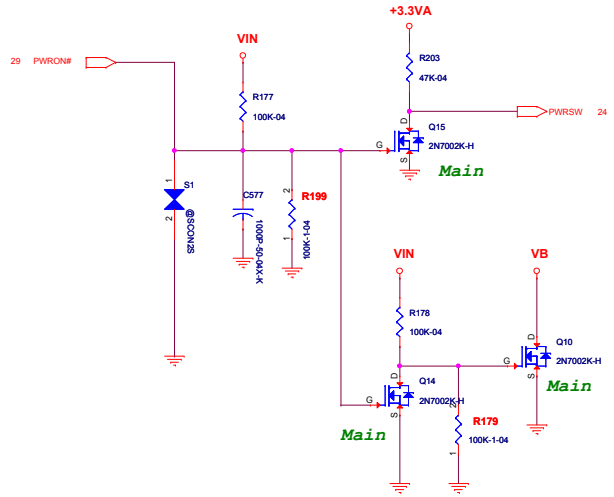
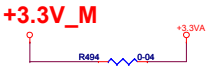




PWR SW





Title	NTSN1521		
Size Custom	Document Number GFX VCC_PWR 10		Rev RB
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TongFang Inc.		
Title: NTSN1521		
Size: B	Document Number: INTEL LAN(82579LM)	Rev: RB
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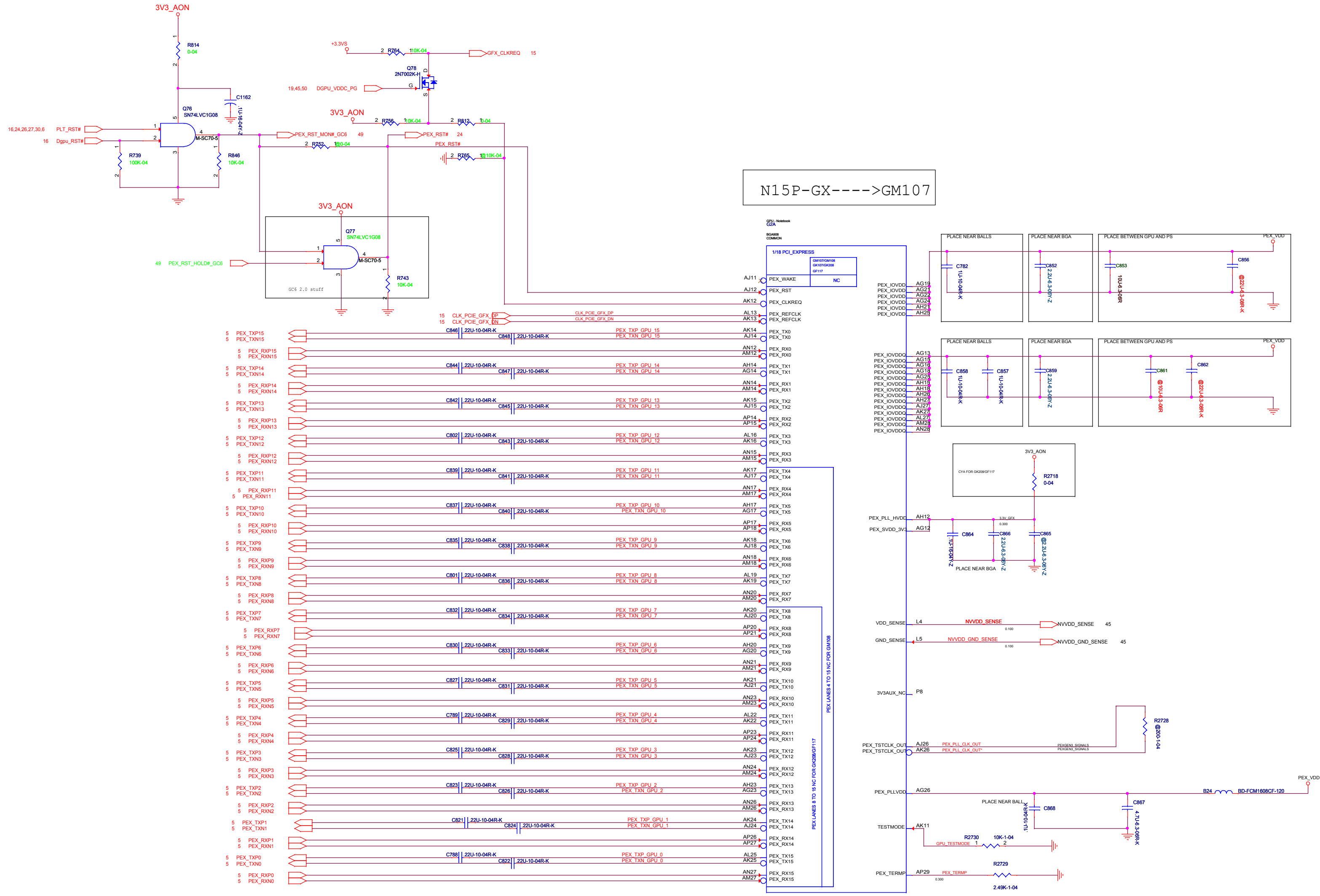
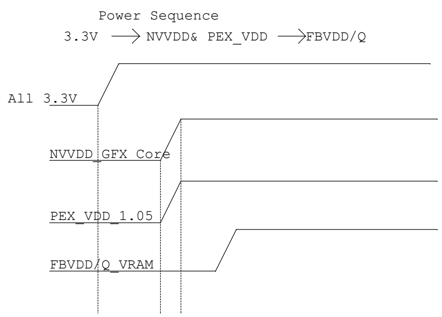


N15P-GX---->GM107
3V3_AON
R814
Q76
SN74LVC1G08
C1162
PLT_RST#
Dgpu_RST#
R739
R846
+3.3VS
R764
GFX_CLKREQ
Q78
2N7002K-H
DGPU_VDDC_PG
PEX_RST_MON#_GC6
PEX_RST#
Q77
SN74LVC1G08
R743
PEX_RST_HOLD#_GC6
GC6 2.0 stuff
1/18 PCI_EXPRESS
PEX_WAKE
PEX_RST
PEX_CLKREQ
PEX_REFCLK
PEX_REFCLK
CLK_PCIE_GFX_DP
CLK_PCIE_GFX_DN
PLACE NEAR BALLS
PLACE NEAR BGA
PLACE BETWEEN GPU AND PS
PEX_VDD
PEX_IOVDD
PEX_IOVDDQ
PEX_PLL_HVDD
PEX_SVDD_3V3
R2718
VDD_SENSE
GND_SENSE
NVVDD_SENSE
NVVDD_GND_SENSE
3V3AUX_NC
PEX_TSTCLK_OUT
R2728
PEX_PLLVDD
B24
BD-FCM1608CF-120
TESTMODE
R2730
10K-1-04
PEX_TERMP
R2729
2.49K-1-04
PEX LANES 4 TO 15 NC FOR GM108
PEX LANES 8 TO 15 NC FOR GK208/GF117



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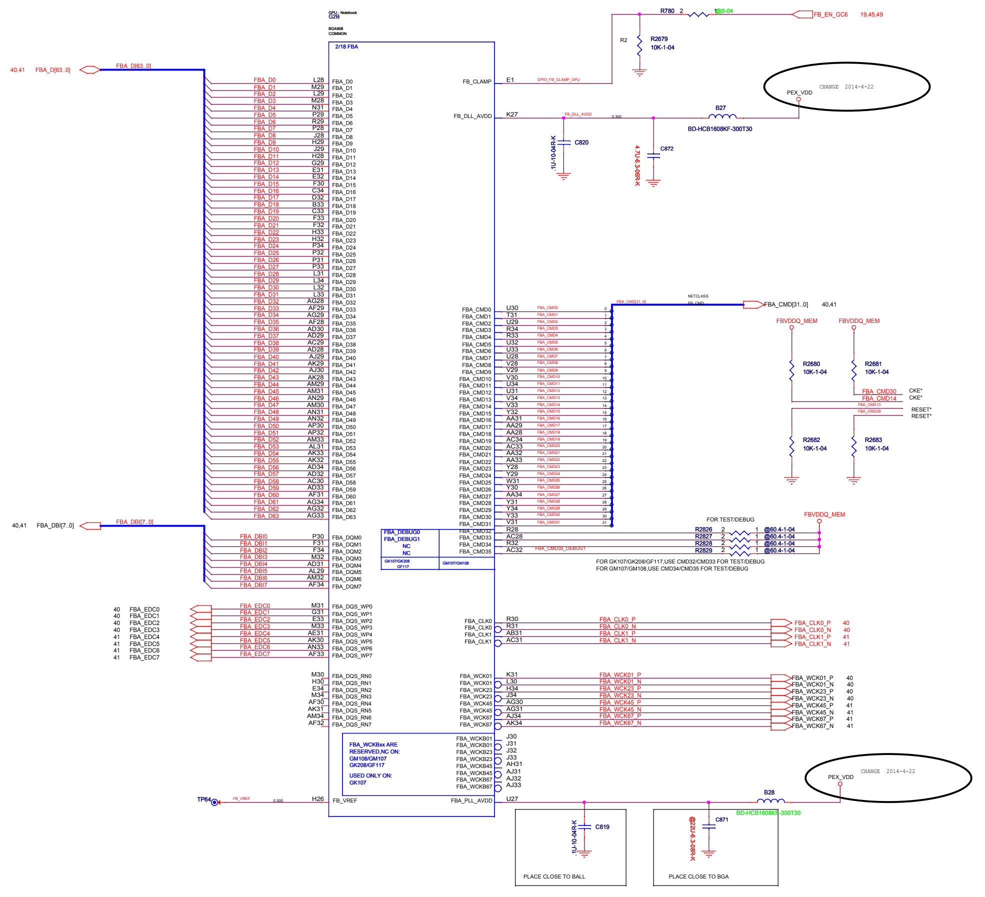
2/18 FBA
FB_CLAMP
FB_DLL_AVDD
FB_EN_GC6
PEX_VDD
CHANGE 2014-4-22
BD-HCB1608KF-300T30
FBA_D[63..0]
FBA_DBI[7..0]
FBA_CMD[31..0]
FBVDDQ_MEM
CKE*
RESET*
FOR TEST/DEBUG
FOR GK107/GK208/GF117,USE CMD32/CMD33 FOR TEST/DEBUG
FOR GM107/GM108,USE CMD34/CMD35 FOR TEST/DEBUG
FBA_WCKBxx ARE
RESERVED,NC ON:
GM108/GM107
GK208/GF117
USED ONLY ON:
GK107
FB_VREF
FBA_PLL_AVDD
PLACE CLOSE TO BALL
PLACE CLOSE TO BGA

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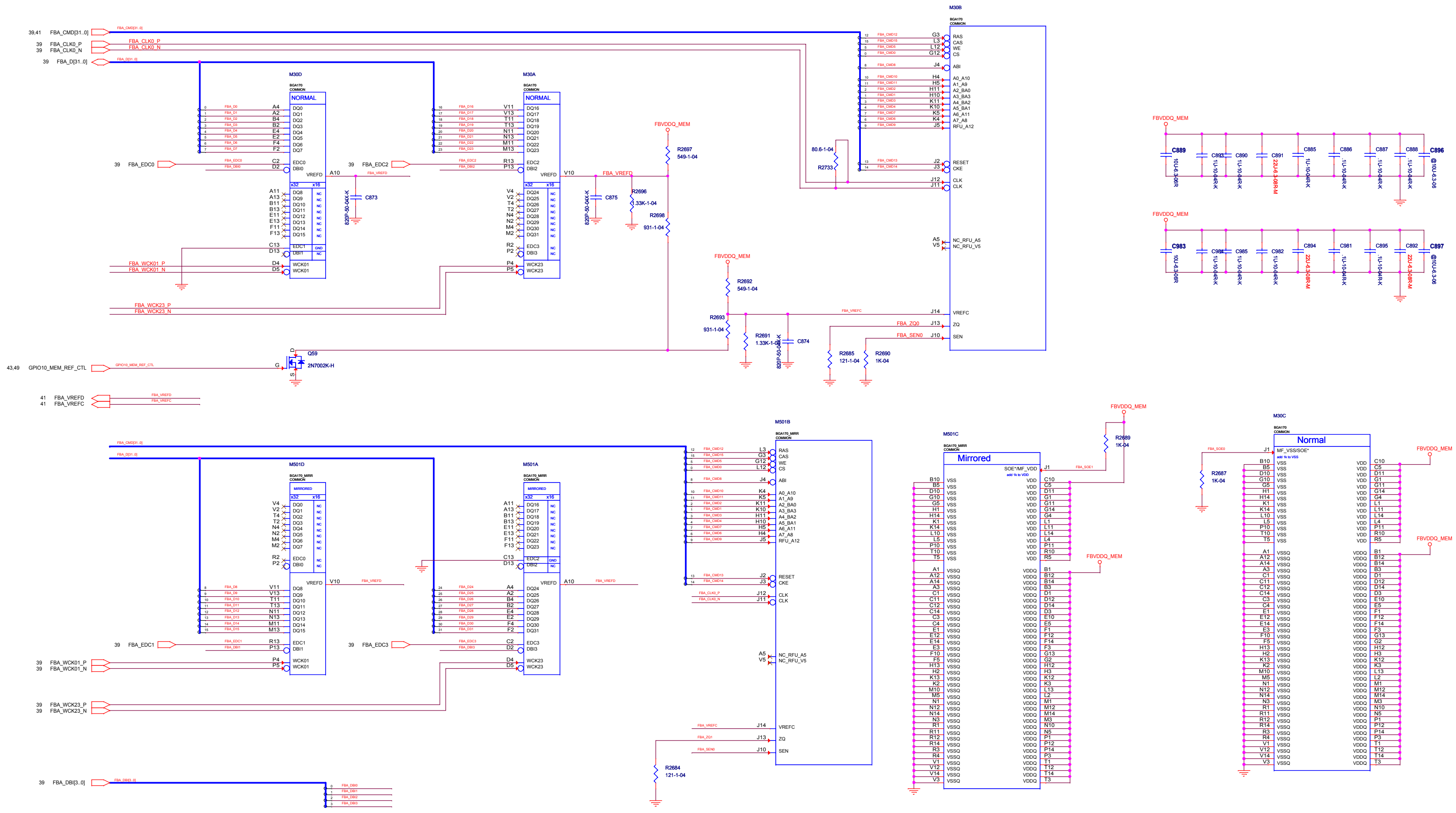
39,41 FBA_CMD[31..0]
39 FBA_CLK0_P
39 FBA_CLK0_N
39 FBA_D[31..0]
M30D
NORMAL
39 FBA_EDC0
FBA_WCK01_P
FBA_WCK01_N
FBA_WCK23_P
FBA_WCK23_N
M30A
NORMAL
39 FBA_EDC2
FBA_VREFD
C873
C875
FBVDDQ_MEM
R2697
549-1-04
R2696
33K-1-04
R2698
931-1-04
R2692
549-1-04
R2693
931-1-04
R2691
1.33K-1-04
C874
R2685
121-1-04
R2690
1K-04
R2733
80.6-1-04
M30B
RAS
CAS
WE
CS
ABI
RESET
CKE
CLK
VREFC
ZQ
SEN
FBA_ZQ0
FBA_SEN0
Q59
2N7002K-H
43,49 GPIO10_MEM_REF_CTL
41 FBA_VREFD
41 FBA_VREFC
C889
C893
C890
C891
C885
C886
C887
C888
C896
C983
C984
C985
C982
C894
C981
C895
C892
C897
M501B
M501D
MIRRORED
M501A
MIRRORED
39 FBA_EDC1
39 FBA_EDC3
39 FBA_WCK01_P
39 FBA_WCK01_N
39 FBA_WCK23_P
39 FBA_WCK23_N
R2684
121-1-04
39 FBA_DBI[3..0]
M501C
Mirrored
R2689
1K-04
M30C
Normal
R2687
1K-04

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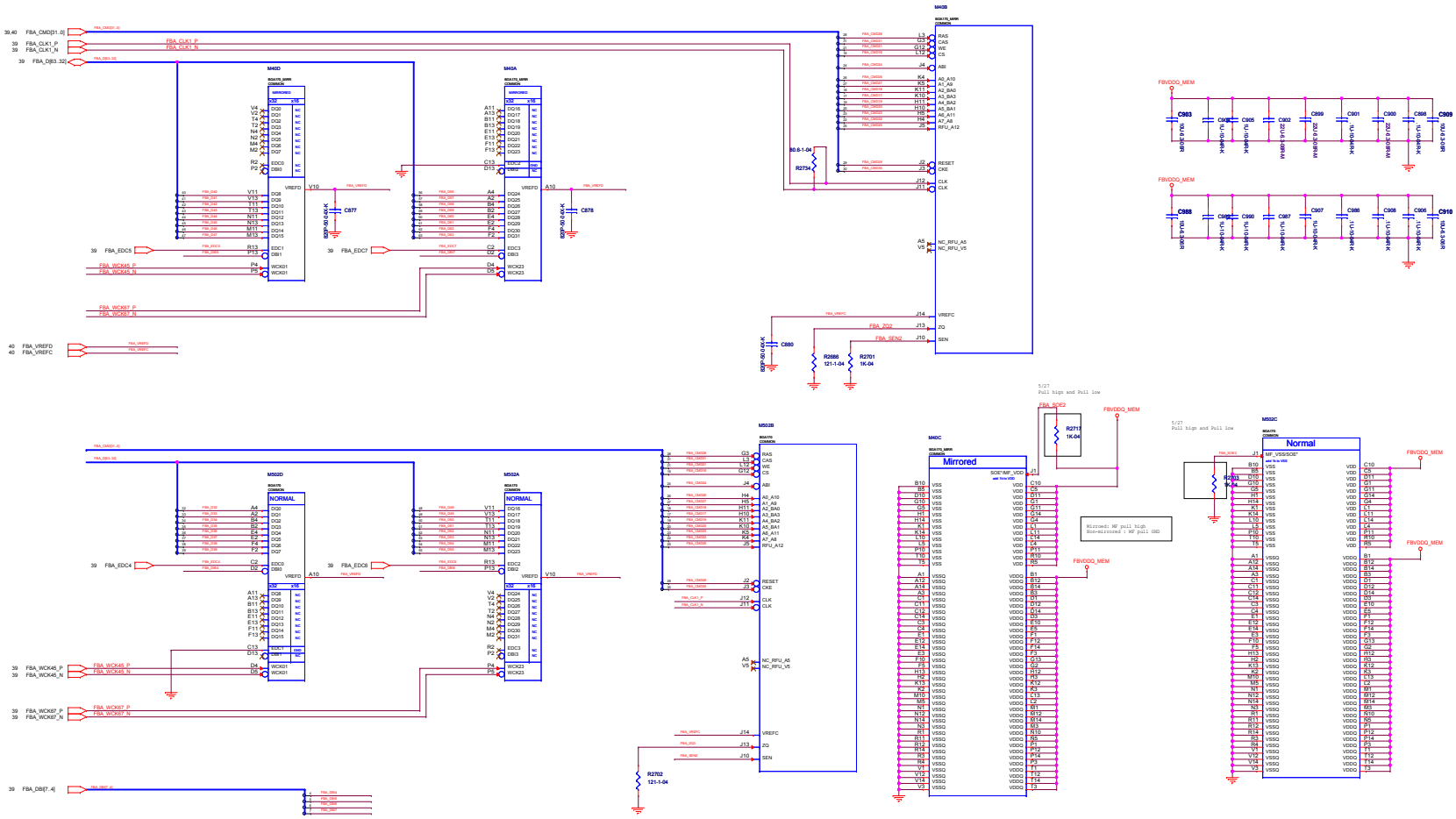

File	NTSN1521		
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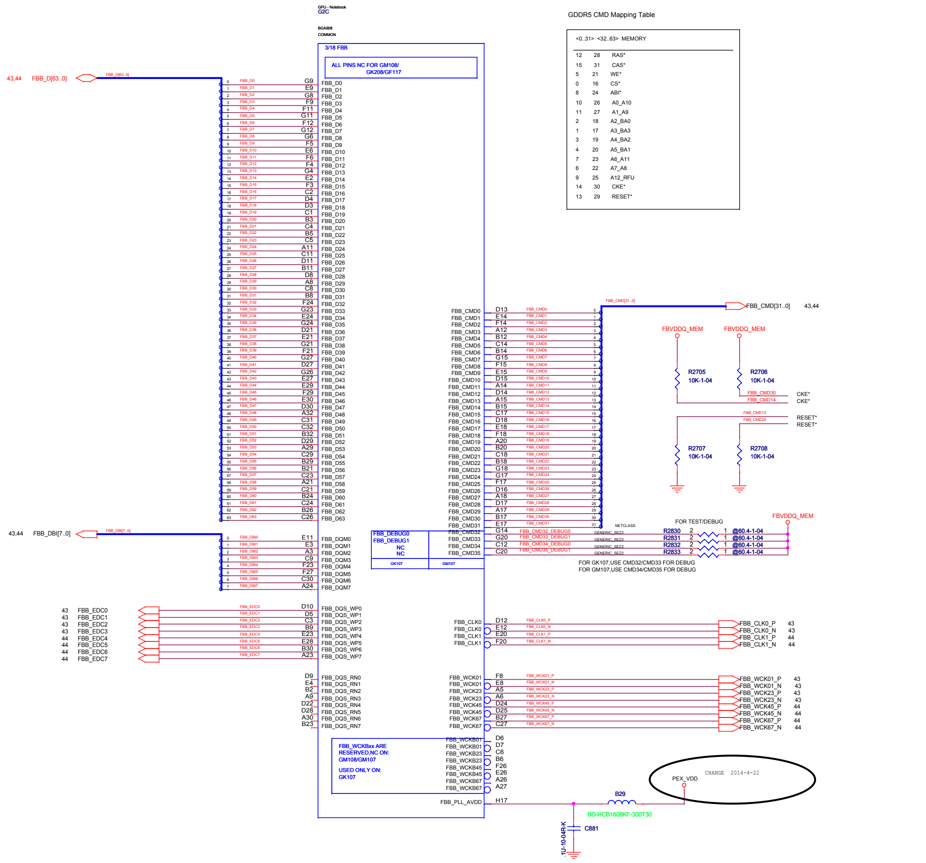
GDDR5 CMD Mapping Table

<0..31>	<32..63>	MEMORY
12	28	RAS*
15	31	CAS*
5	21	WE*
0	16	CS*
8	24	ABI*
10	26	A0_A10
11	27	A1_A9
2	18	A2_BA0
1	17	A3_BA3
3	19	A4_BA2
4	20	A5_BA1
7	23	A6_A11
6	22	A7_A8
9	25	A12_RFU
14	30	CKE*
13	29	RESET*



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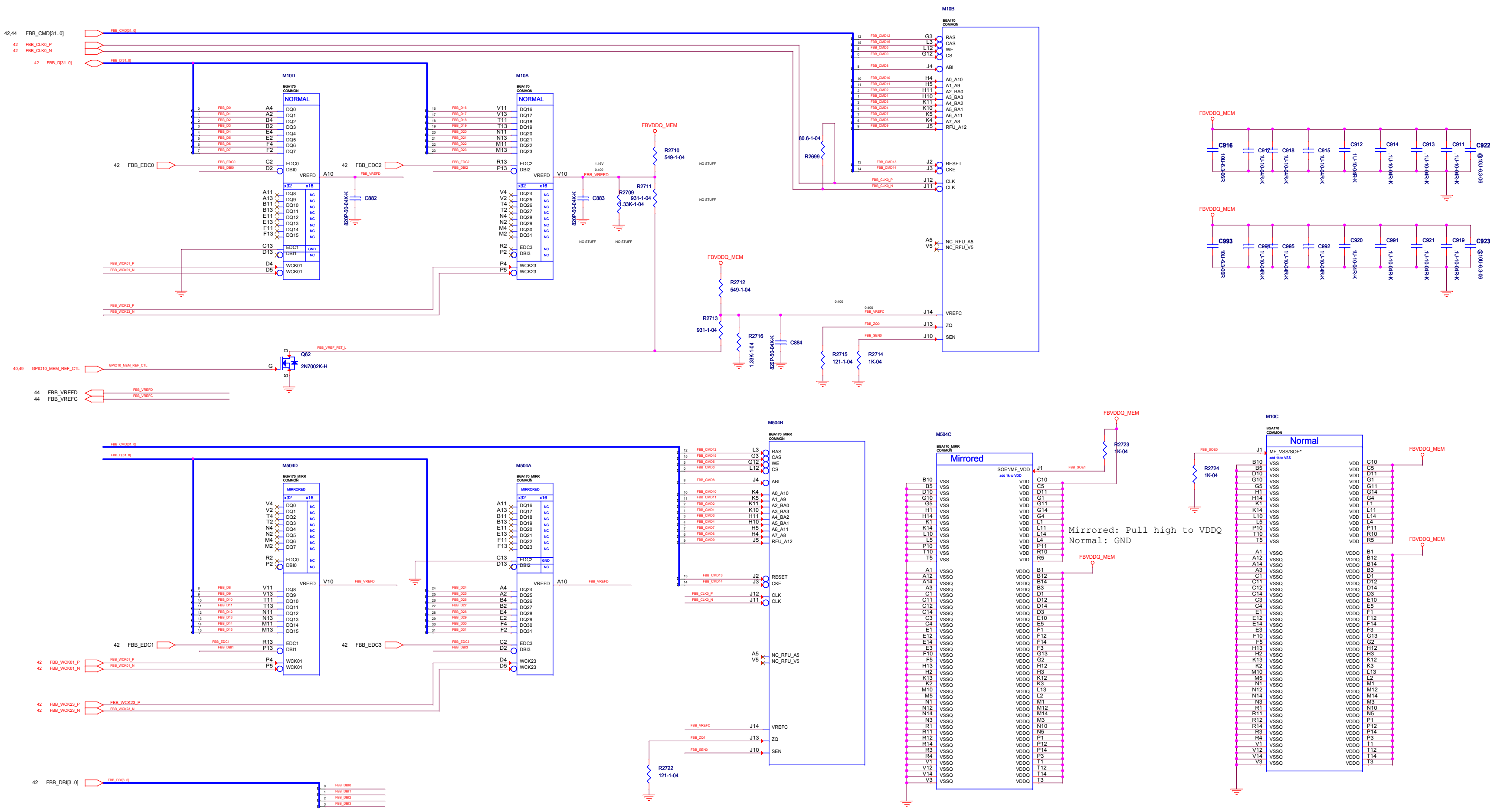

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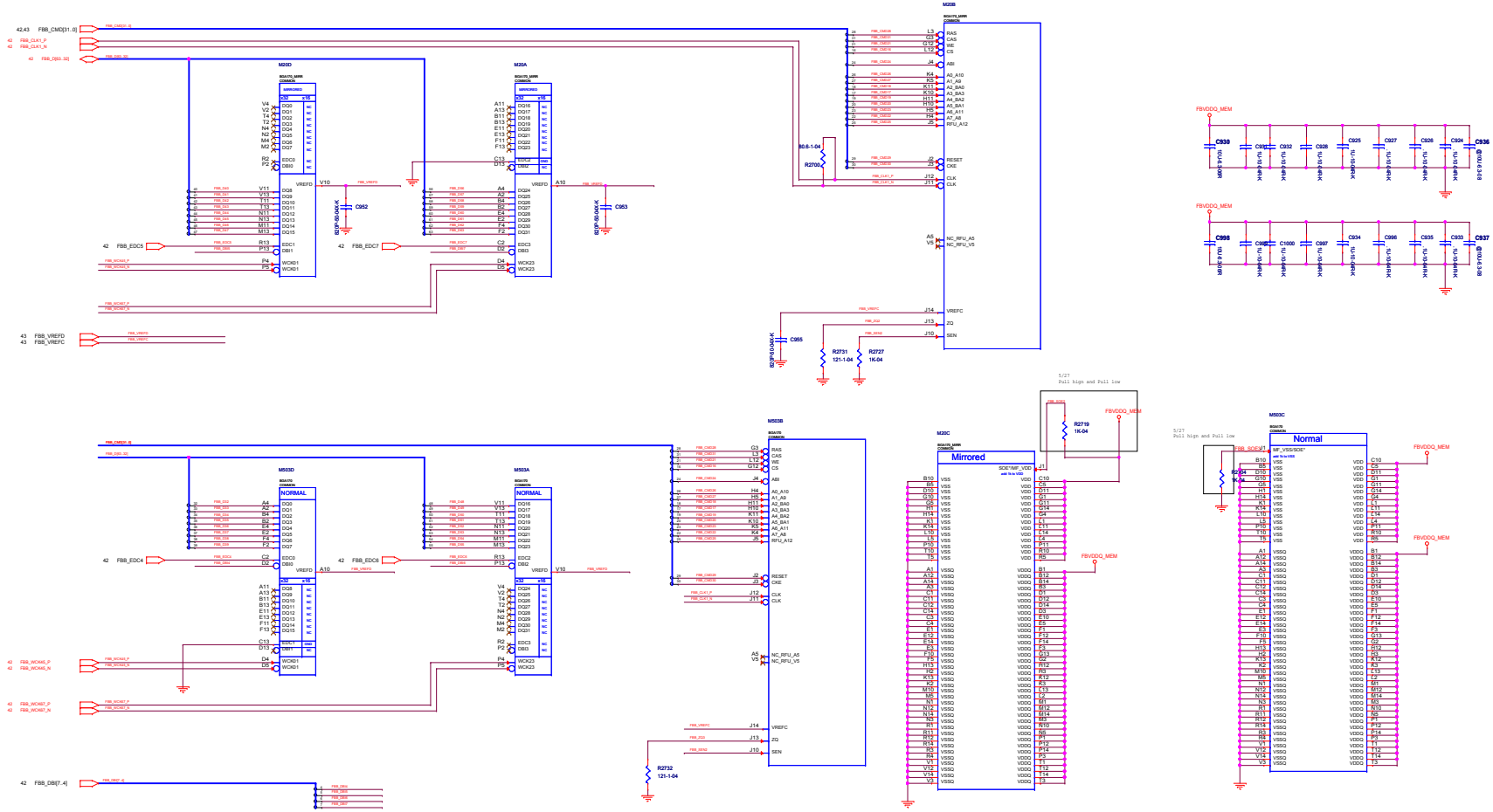

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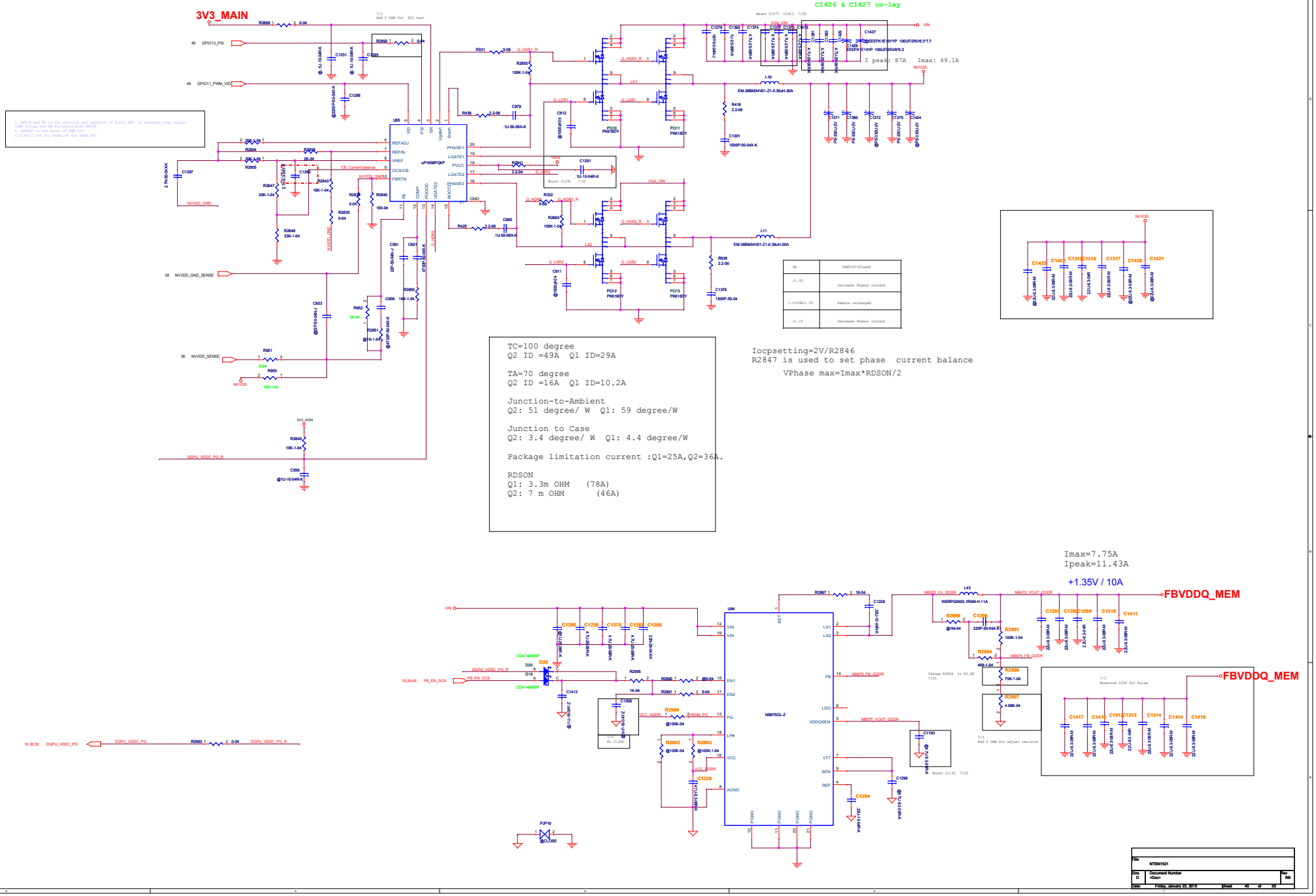
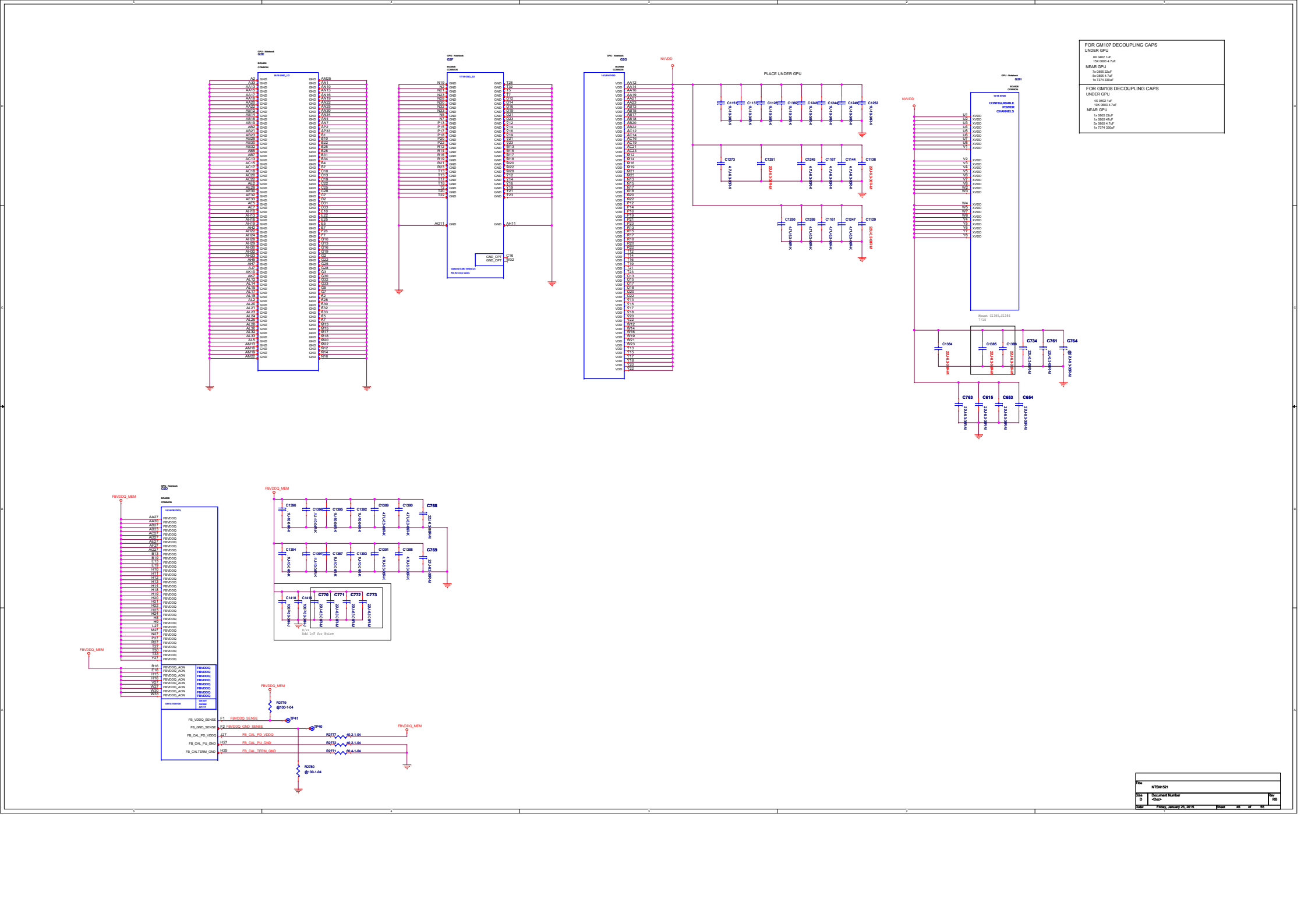

V1.0 add
C1426 & C1427 co-lay
3V3_MAIN
I peak: 87A Imax: 49.1A
TC=100 degree
Q2 ID =49A Q1 ID=29A
TA=70 degree
Q2 ID =16A Q1 ID=10.2A
Junction-to-Ambient
Q2: 51 degree/ W Q1: 59 degree/W
Junction to Case
Q2: 3.4 degree/ W Q1: 4.4 degree/W
Package limitation current :Q1=25A,Q2=36A.
RDSON
Q1: 3.3m OHM (78A)
Q2: 7 m OHM (46A)
Iocpsetting=2V/R2846
R2847 is used to set phase current balance
VPhase max=Imax*RDSON/2
Imax=7.75A
Ipeak=11.43A
+1.35V / 10A
FBVDDQ_MEM
FBVDDQ_MEM


FOR GM107 DECOUPLING CAPS
UNDER GPU
8X 0402 1uF
10X 0603 4.7uF
NEAR GPU
7x 0805 22uF
5x 0805 4.7uF
1x 7374 330uF
FOR GM108 DECOUPLING CAPS
UNDER GPU
4X 0402 1uF
10X 0603 4.7uF
NEAR GPU
1x 0805 22uF
1x 0805 47uF
5x 0805 4.7uF
1x 7374 330uF
PLACE UNDER GPU
NVVDD
FBVDDQ_MEM
FBVDDQ_SENSE
FBVDDQ_GND_SENSE
FB_CAL_PD_VDDQ
FB_CAL_PU_GND
FB_CAL_TERM_GND
CONFIGURABLE POWER CHANNELS
Mount C1385,C1386 7/10
8/21 Add 1nF for Noise
Title
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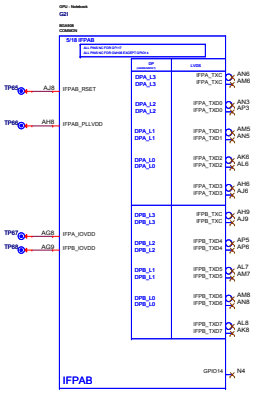

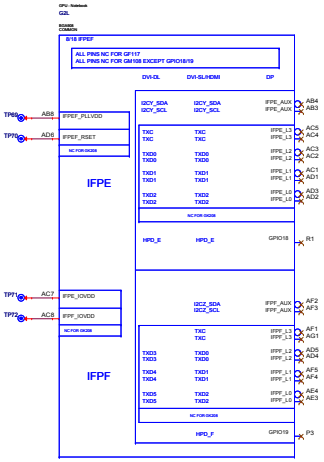

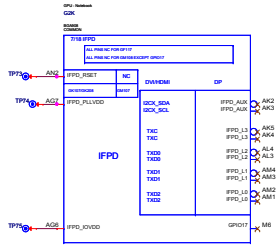

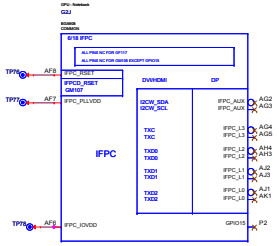

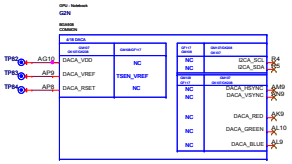

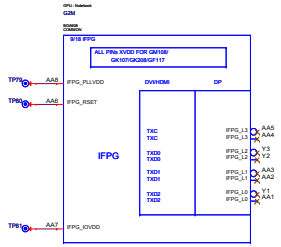

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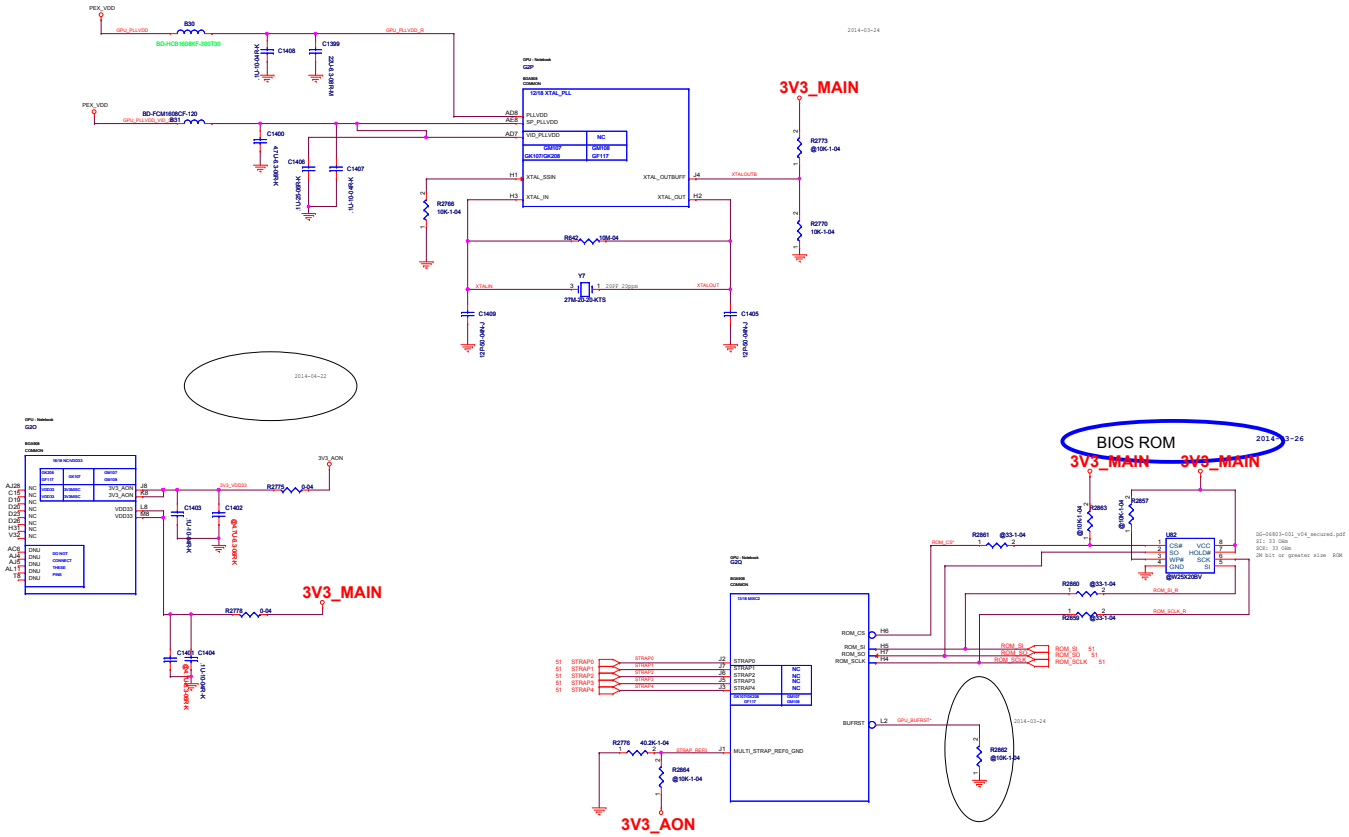

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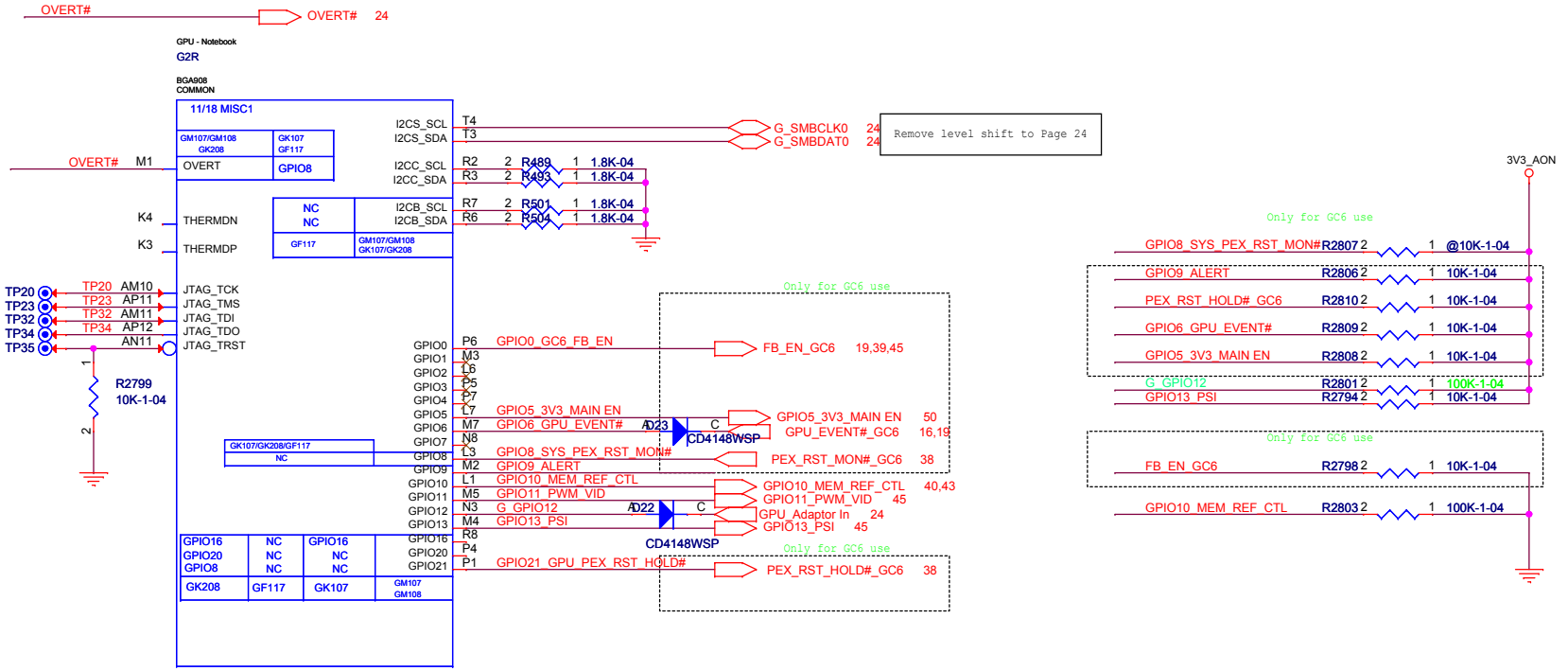

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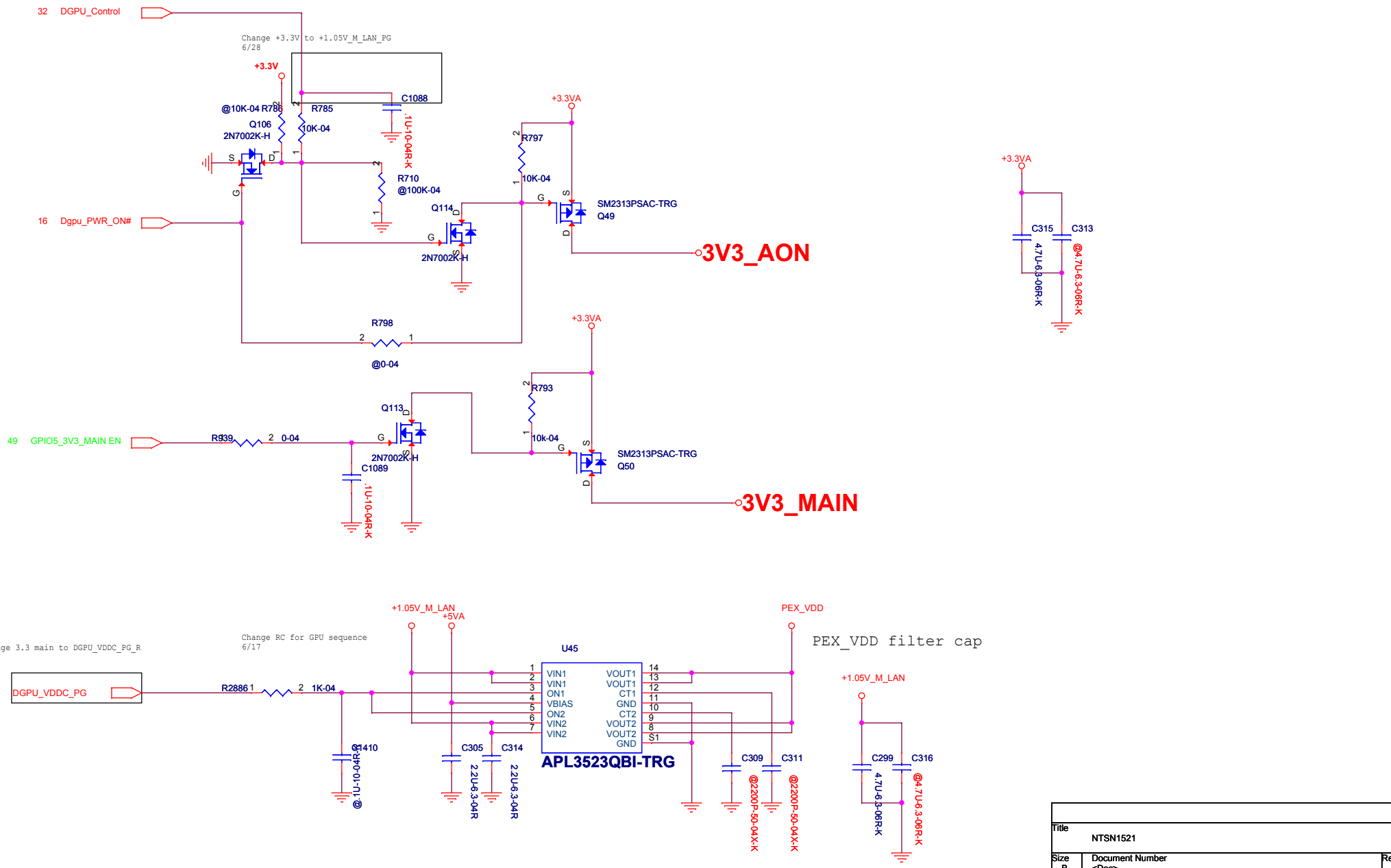

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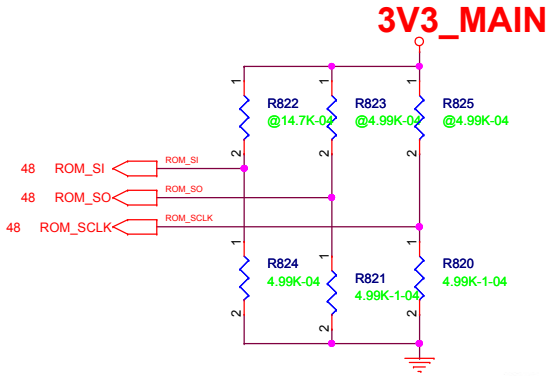
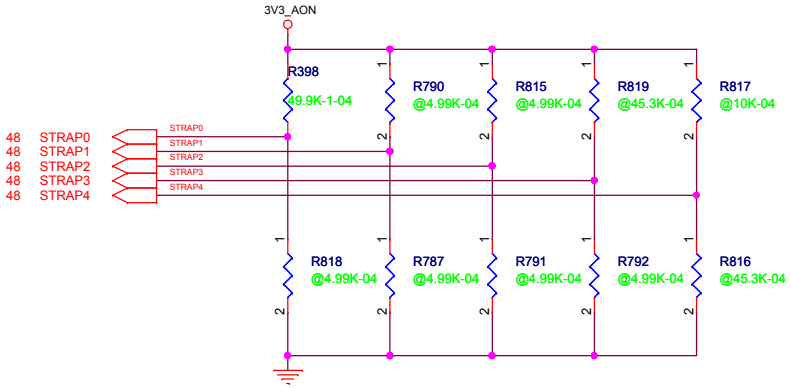
PCI_DEVID5, PCI_DEVID4, & SUBVENDOR Strap Selectable



			R824
Samsung 2G	Samsung 128MX16	0x0	4.99kohm PULL DOWN
HYnix 2G	HYNIX 128MX16	0x1	10kohm PULL DOWN
Micron 2G	MICRON 128MX16	0x5	30.1kohm PULL DOWN
Hynix 4G	HYNIX 256MX16	0x2	15kohm PULL DOWN
Samsung 4G	Samsung 256MX16	0x3	20kohm PULL DOWN
Micron 4G	MICRON 256MX16	0x4	24.9kohm PULL DOWN

Table 11. N15P-GX/GT GDDR5 Recommended Memories

Memory Type	FBVDD/ FBVDDQ	Memory Density	Vendor	Manufacturer Part Number	Die Revision	Strap	Memory Speed CK Grade(MHz)	Memory Date Code Minimum	Status
GDDR5	1.35V/ 1.35V	128Mx16	Samsung	K4G20325FD-FC03	D-die	0x0	2500	N/A	Production ready
			Hynix	H5GC2H24BFR-T2C	B-die	0x1	2500	1347	Production ready
			Micron	EDW2032BBBG-6A-F	B-die	0x5	2500	N/A	Production ready
		256Mx16	Hynix	H5GC4H24MFR-T2C	M-die	0x2	2500	N/A	Production ready
			Samsung	K4G41325FC-HC03	C-die	0x3	2500	N/A	Production ready
			Micron	EDW4032BABG-60-F	A-die	0x4	2500	N/A	Production ready



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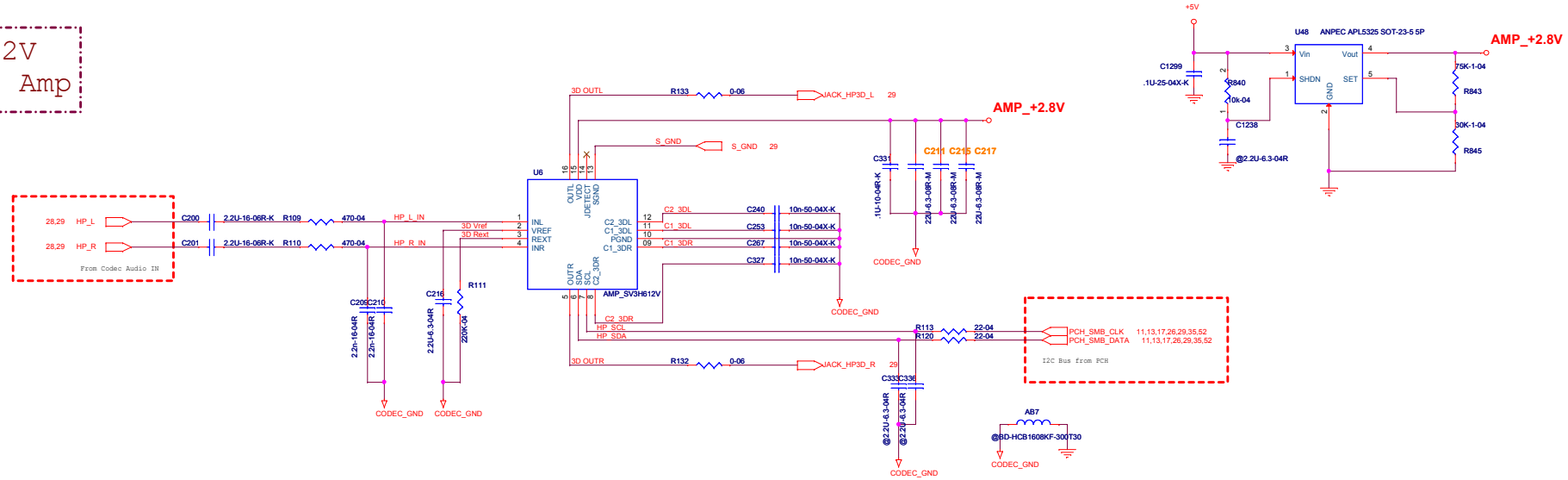
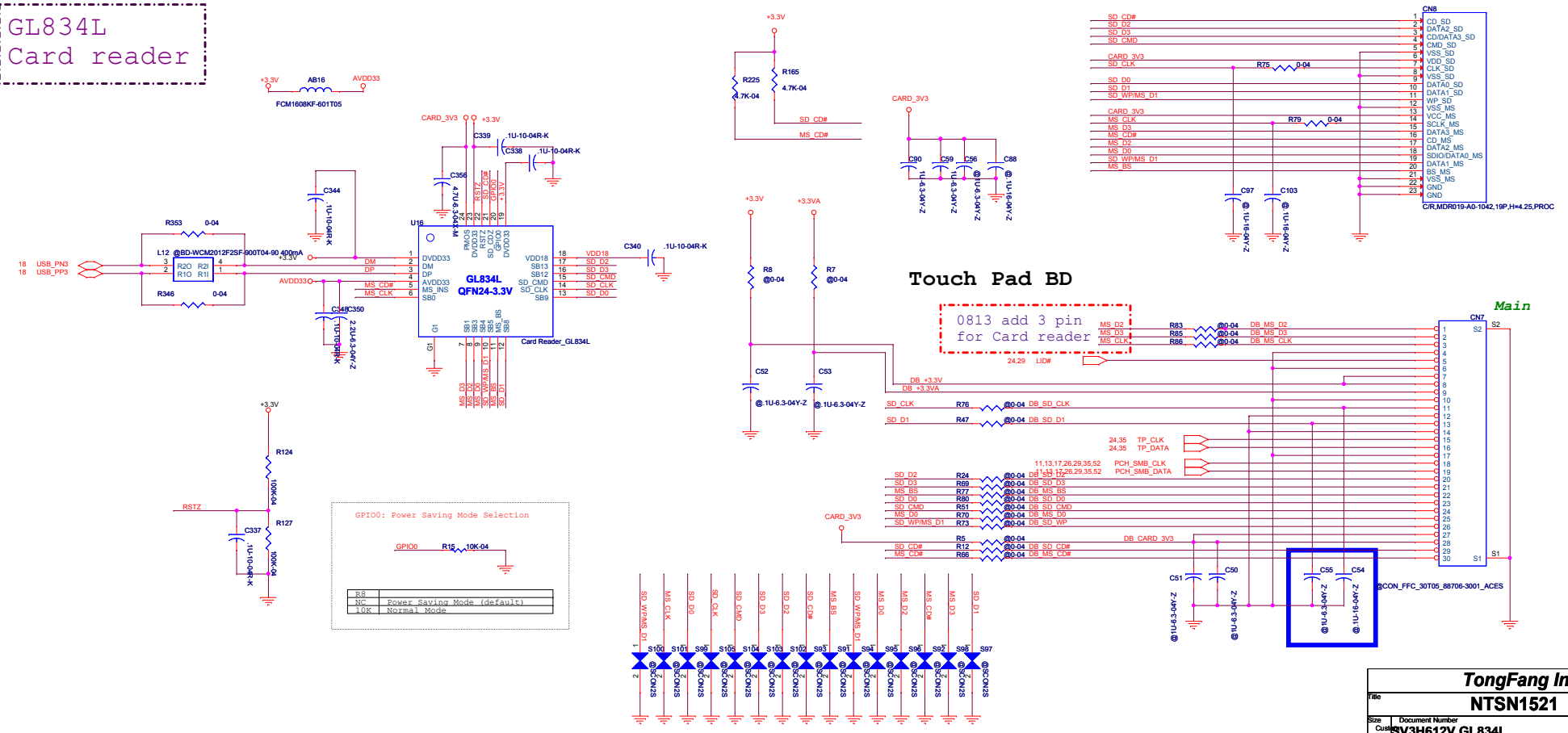
SV3H612V 3D Vol Amp



GL834L Card reader



TongFang Inc.			
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Data	Change Content	
5.23	CRT power shares with HDMI power for safety requirement	
5.26	NV requirement 1. Delete GC6_FB_EC. 2.EC send adapter in to GPU	
5.27	NV requirement 1. Delete R706 for removal of GC6_EVENT_EC from EC\ Pin 86. 2. Change Pull high and Pull low for VRAM to match mirror VRAM 3. Mount R333	
5.28	Change KB LED TP LED Side LED supply voltage to 5VS Change R659 to 0 OHM	
5.29	1. Change Value to match footprint C358,C936,937,C419, C1001, C1002,C1376 2. Change R824 to 15K	
6.10	Change R344 to 10 mOHM ,NL_R555,NL_B12,Change R842 to 22K, Mount R13,R508,Change R154 to 20K	
6.12	1.Change R228 to 2.43K, Change R233 to 1.5K, NL C274 for Vcore Power Test issue	
6.17	Change GC6 control GPIO connection and GPU power sequence controlled by GPU_Vcore_PG Change C1309 to 1nF	
6.20	Mount R140, NL R141 for eDP detection	
6.21	Page 6: Mount 6Rs Page11: Mount eDP components and remove RT2136 and add a R for PWM Page 16: Mount R481 Page 24 :R140,R141 Page35: NL Side LED	
6.22	1. Add BAT_I schematic ,and delete BAT_I_Direction	
6.27	1. Reserve PG control circuit (mount D21, NL R396) 2. Add EMB dual MOS as 2nd source needing to match OCP resistor	
6.28	1.Change +3.3V to 1.05V_LAN_M_PG(1.Add C1088 2.mount R926 1K C1365) 2. NL R456	
6.30	1. Change R233,R228 C274 for CPU core 2.Add text for Imon explanation	
7.3	1. Add 0 OHM for adjust +1.35, 1.05V 2. Add Boost fan 3. Add 0 OHM for PSI 4. Add 0.1UF*5pcs for EMI 5. Change CPU R228,R233,C274,C285 for TAT 6. NL C243, R555,C1309 7.NL Common choke*1pcs ,Mount 0 OHM *4pcs 8. DMIC : 2pcs resistor, 9. EC control DGPU_ON timing 10. Mount 6pcs cap to CPU Core 11. Add cap to GPU core and VRAM power	
7.4	1.Change U2\vin to 5VA 2. Remove D15 in BAT_I detect circuit 3. Delete Vin_AMP,H12 4.Add 0603 CAP to Vcore 5.Reserve POScap to GPU Bottom 6.ACN3 PIN2,4 CHANGE NET NAME 7.Change U2 to AZV331	
7.5	1. Mount R27, R28 for mSATA 2. Remove L7 for no Fingerprint 3. Add +3.3Vs on USB board IO for fingerprint 4.Change R337,R319 R value,C274,C258 C value	
7.7	1. Page 6: Add colay R*4 for decreasing eDP signal stub 2. Page 34: correct CN9's SW_BAT pin 3.Add C3209 4.Add Q48 for battery Leakage 5.Update KB pin definition	
7.9	Update Text for VRAM ID R	

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Data	Change Content	
7/10	Exchange beep and SenBAT_V for EC pin	
7/14	1. Cancel R3 2.Update EC GPIO according to Ted's mail PID_0_CHG_B_LED (GPA5) SENBAT_V (GPC3) BTL_BEEP (GPA2) 2.Del C1299, mount C1300,C1301 3.Del C182, mount C576,C602	
7/16	Add BAT_I EC table	
7/20	Mount C1291 C1377 C1413 C1193 for GPU Core,VRAM	
7/24	Page 29: Change R2960 to 7.5K Add R2961 ; Change R2933 to 7.5K ; Add R2936 for Boost fan Page 11: Change R913 to 0 OHM, Reserve R932 ,Reserved R506 for eDP panel	
7/25	Change R172, R2906 to 80.6K , R2350 to 44.2K	
8/2	Page 45: Add text for explanation of voltage loop control	
8/5	Page 34: Change RCH2 10 mOHM-->25 mOHM	
8/7	Change RTL8411 to RTL8111G(S) + Card reader	
8/7	add 3D VOL IC SV3H612V	
8/11	add RTL8111G(S) VDD10 Power select circuit	
8/11	colay RTL8111 XTAL to PCH	
8/13	add 3 pin for Card reader	
8/13	USB add colay cap(C1325/C1324 colay with C618 & C619/C614 & C617)	
8/19	PCH +1.5V LDO Change to APL5325	
8/21	Page 35: Add GND to T/P LED	
8/21	Page 46: Add filter cap for VRAM noise :C770 C771 C772 C773 Del: C1283,C1248 change C1138,C1251,C1129 to 22uf Del: C1383, C1381,change C1385,C1384,C1386 to 22uf	
8/21	Page 34: 1. Q48: exhange S and D, 2. Reserve R255, 3. Change SW6 connection Page 45: Del Vin Jumper , Page31: Del Vin Jumper Page 27: Change LED_CR to LED0 for RJ45 LED	
8/21	Page 26: Mount R27 for mSATA BD	
8/21	Page 25:R616 , R615 , R608 , R607 , R606 , R605 , R618 , R617: 680-->499 OHM for HDMI Page 34: Change C442's GND to GND for Adaptor_I detector Page11: Not mount CN20	
8/21	Change H14, H15 Footprint	
8/21	Page 34: Add @R257,Reserved for Battery power on Page 41:Change C900,C899, C902 to 22UF Page 40:Change C891,C892,C894 to 22UF Page 32: Colay C1425	
8/21	Page 11:Change B23 to 0805 Fuse,Del C582 Mount C580 Page 24: Add R131	
8/22	page 10: CPU_CORE, Del: C671, C682, C665, C677, C683; Add: C1326 poscap. C1307, C1308不上件, C204, C306上件 page 32:1.35VS, Add: C218 330uf SMD polymer cap co-lay page 36:Del U23,U24 page 32:+1.05V change NB671 to NB675 page 33:+5VA change NB671 to NB675 page 34:C442 move to the right of R572,add 0.1uf Cap C182 close to EC page 27:Del C268,C330,C224,C326,C325,C223,C256;Add C250	
8/25	Page 27:LED0 add R370	
8/27	Page 29 & 52:SV3H612V change CODEC_GND to S_GND Page 50:3V3_AON change APL3523 to use 4 MOS Page 29:Colay +5V to MIC1_VREF_L Page 32:Del D24	
8/28	Page 29:Add +5V 2 0603cap close to AR23 Page 50:Add Q51	
9/01	Page 52:change C328,C214 to (R133,R132) 0ohm	
9/02	Page 45:C1292 change 1U to 2.7nF Page 46:FBVDDQ_SENSE add 100 ohm pull high;FBVDDQ_GND_SENSE add 100 ohm pull down Page 27:add C252 0.1uF Page 24:LED_ON colay with CPPE# Page 48:Modify C1406 to 1uf/0603. Modify C1399 to 22uf/0805. delete R784, VID_PLLVDD can be line to SP_PLLVDD directly. Page 30:reserve 放电电阻for FBVDDQ_MEM Page 49:GPIO8_SYS_PEX_RST_MON#信号预留10K pull up to 3V3_AON Page 48:XTALOUTB信号预留10K pull up。 Page 48:STRAP_REF0信号预留10K pull up。 Page 45:C1292 change to 2.7nf。 Page 46:FBVDDQ_SENSE reserve 100ohm pull up to VDDQ, FBVDDQ_GND_SENSE pull down to GND.	
9/18	Page 48:STRAP_REF0 power change from 3V3_MAIN to 3V3_AON	
9/26	Page 32: 上件R925 Page 52:Del U6 pin13 HP_Sensor pin. U16 pin19 connect to +3.3V Page 28:Add Q65,R98,R108 for HP_Sensor	

Data	Change Content	
10/16	Lead-in A phase DCN(D1409100008,D1409170004,D1409170024,D1410080004)	
10/16	P 32: R923不上件,C218上件,C165上件 P 32: C1349上件, add C1363 P 32: C1361上件, add C1365.C1368 P 45: R2906 change 82k to 75k, R2907 change 0 to 4.99k P 45: R259.R280 Change 0402 type to 0603 type P 31: C285 change 2700p to 4700p, R228 change 2.43K to 4.32K P 45: R2846 change 51k to 33k,R2847 change 33k to 20k P 10: C756,C753上件	
10/16	P 32: Add C220 P 12: C106,C109,C112 change to 0603 P 48: Change R2864 power from 3V3_MAIN to 3V3_AON P 26: SSD change to port 0,HDD change to port 1,ODD change to port 2 P 34: Del R555,C432,R559,R560; R547,D2 pull high power change DC_IN+ to DC_IN_B for O2 P 48: C1405, C1409 change 27pF to 12PF P 11: R913 0 to 100k,C1347 0.47UF to 0402 1uF,R373 change to 82K,C452 1uF to 0.47uF	
10/17	P52, change C209,C210 to 2.2nf P29, swap USB port4 & port9 for debug port P10, Add R324 for VCCIO_OUT, V1.0 OP	
10/18	P36, Del R496,R500 P10 Del C390,C391; P31 Del C709.	
12/5	P11 R476,R112 pull high change +3.3VA to +3.3v. P52 add U48, C1299,R840,R843,R845, change 3D AMP power from 5V to 2.8V. P33 C1262,C1266 上件 Del PJP12,PJP13,PJP14,PJP15,PJP16,JP18,PJP19,PJP20 P31 change R228 from 4.32K to 2.8K, R209 from 75K to 86.6K, R233 from 2.32K to 1.5K P34 C423 上件0.1uf, R367 change from 0 ohm to 10 ohm P33 R855上件, R856 change from 110K to 137K add VIN CAP C1426, C1427, C1428 P45 C1380上件	
01/23	P14 change ODD port2 to port4	