



Compal Confidential

NDWG0 Schematics Document

AMD S1g3/ RS880M/ SB710

2009 / 09 / 22

LA-5991P

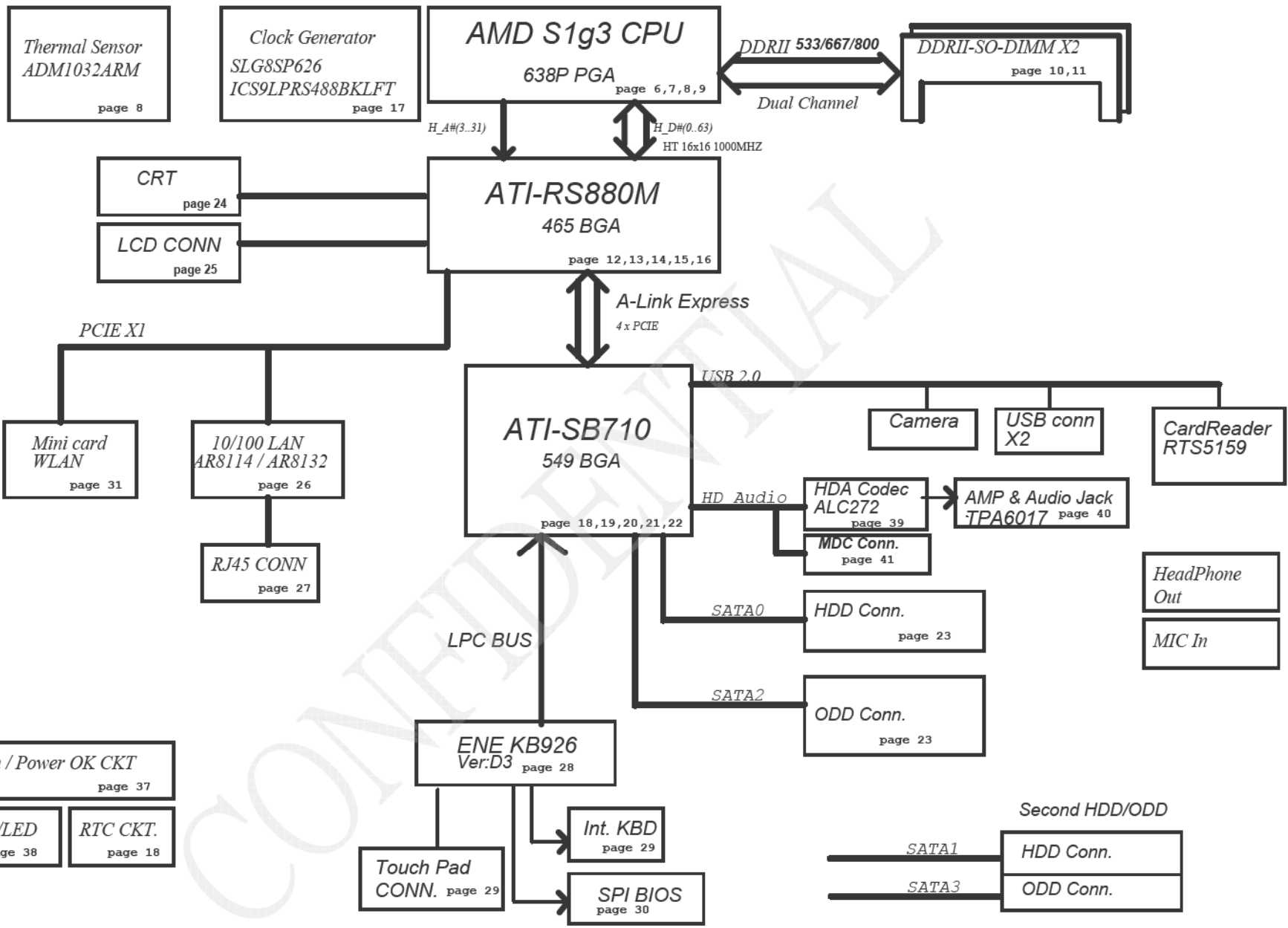
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Project Code: NDWG0/H0

File Name : LA-5991P



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VIN	Adapter power supply (19V)			
B+	AC or battery power rail for power circuit.			
+CPU_CORE	Core voltage for CPU			
+0.9V	0.9V switched power rail for DDR terminator			
+1.2V_HT	1.2V switched power rail	ON	OFF	
+1.5VS	1.5V switched power rail	ON	OFF	OFF
+1.8V	1.8V power rail for DDR	ON		ON*
+1.8VS	1.8V switched power rail		OFF	
+2.5VS	2.5V switched power rail	ON	OFF	OFF
+3VALW	3.3V always on power rail	ON	ON	ON*
+3VS	3.3V switched power rail	ON	OFF	OFF
+5VALW	5V always on power rail	ON	ON	ON*
+5VS	5V switched power rail	ON	OFF	OFF
+VSB	VSB always on power rail	ON	ON	ON*
+RTCVCC	RTC power	ON	ON	ON

STATE \ SIGNAL	SLP_S1#	SLP_S3#	SLP_S4#	SLP_S5#	+VALW	+V	+VS	Clock
Full ON	HIGH	HIGH	HIGH	HIGH	ON	ON	ON	ON
S1 (Power On Suspend)	LOW	HIGH	HIGH	HIGH	ON	ON	ON	LOW
S3 (Suspend to RAM)	LOW	LOW	HIGH	HIGH	ON	ON	OFF	OFF
S4 (Suspend to Disk)	LOW	LOW	LOW	HIGH	ON	OFF	OFF	OFF
S5 (Soft OFF)	LOW	LOW	LOW	LOW	ON	OFF	OFF	OFF

V _{CC}	3.3V +/- 5%			
R _A /R _C /R _E	100K +/- 5%			
Board ID	R _b / R _d / R _f	V _{AD_BID} min	V _{AD_BID} typ	V _{AD_BID} max
0	0	0 V	0 V	0 V
1	8.2K +/- 5%	0.216 V	0.250 V	0.289 V
2	18K +/- 5%	0.436 V	0.503 V	0.538 V
3	33K +/- 5%	0.712 V	0.819 V	0.875 V
4	56K +/- 5%	1.036 V	1.185 V	1.264 V
5	100K +/- 5%	1.453 V	1.650 V	1.759 V
6	200K +/- 5%	1.935 V	2.200 V	2.341 V
7	NC	2.500 V	3.300 V	3.300 V

Device	IDSEL#	REQ#/GNT#	Interrupts
--------	--------	-----------	------------

Board ID	PCB Revision
0	No Support VaryBright
1	
2	
3	Support VaryBright
4	
5	
6	
7	

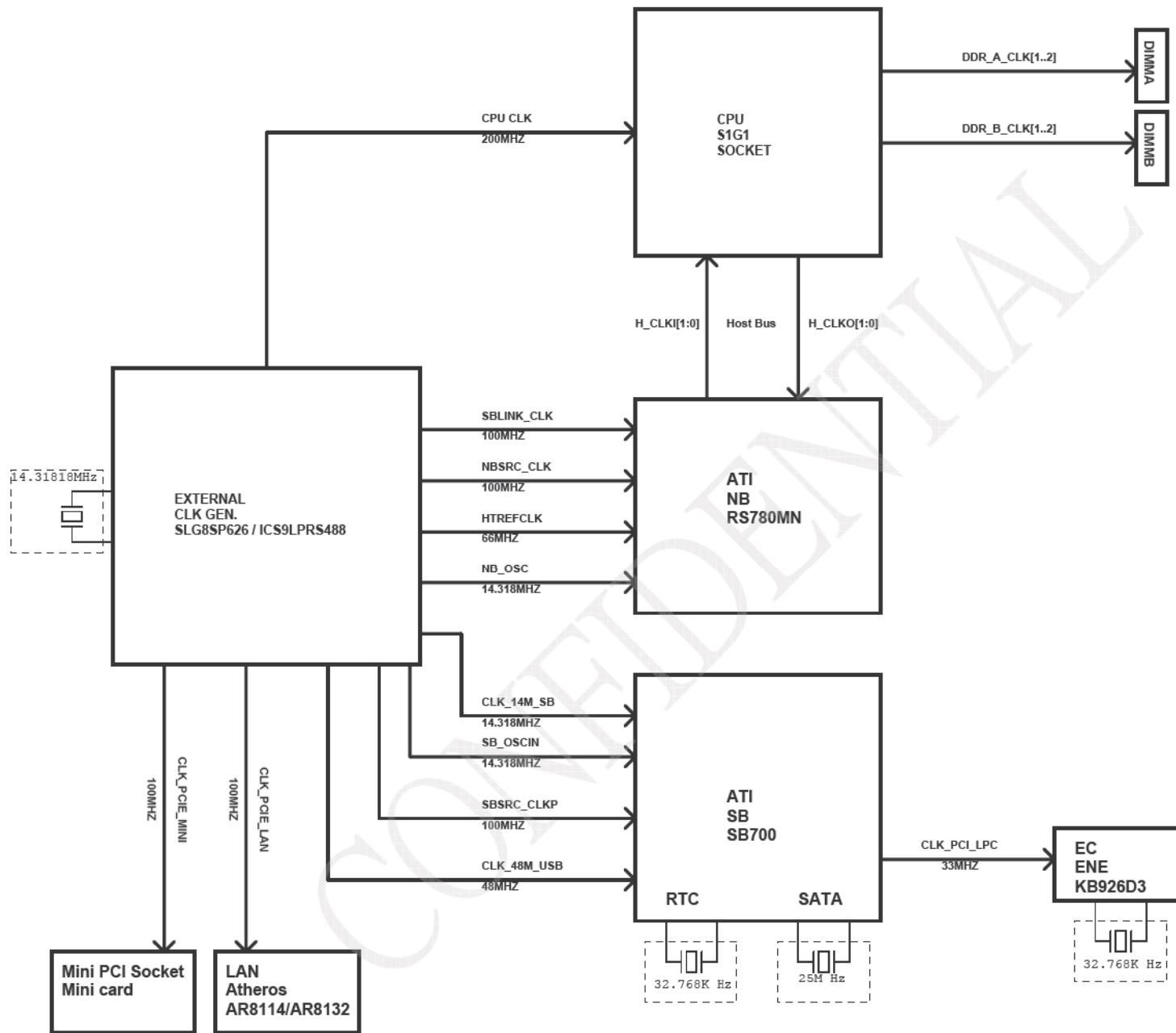
[illegible]

Device	Address	Device	Address
Smart Battery	0001 011X b	ADM1032	1001 100X b

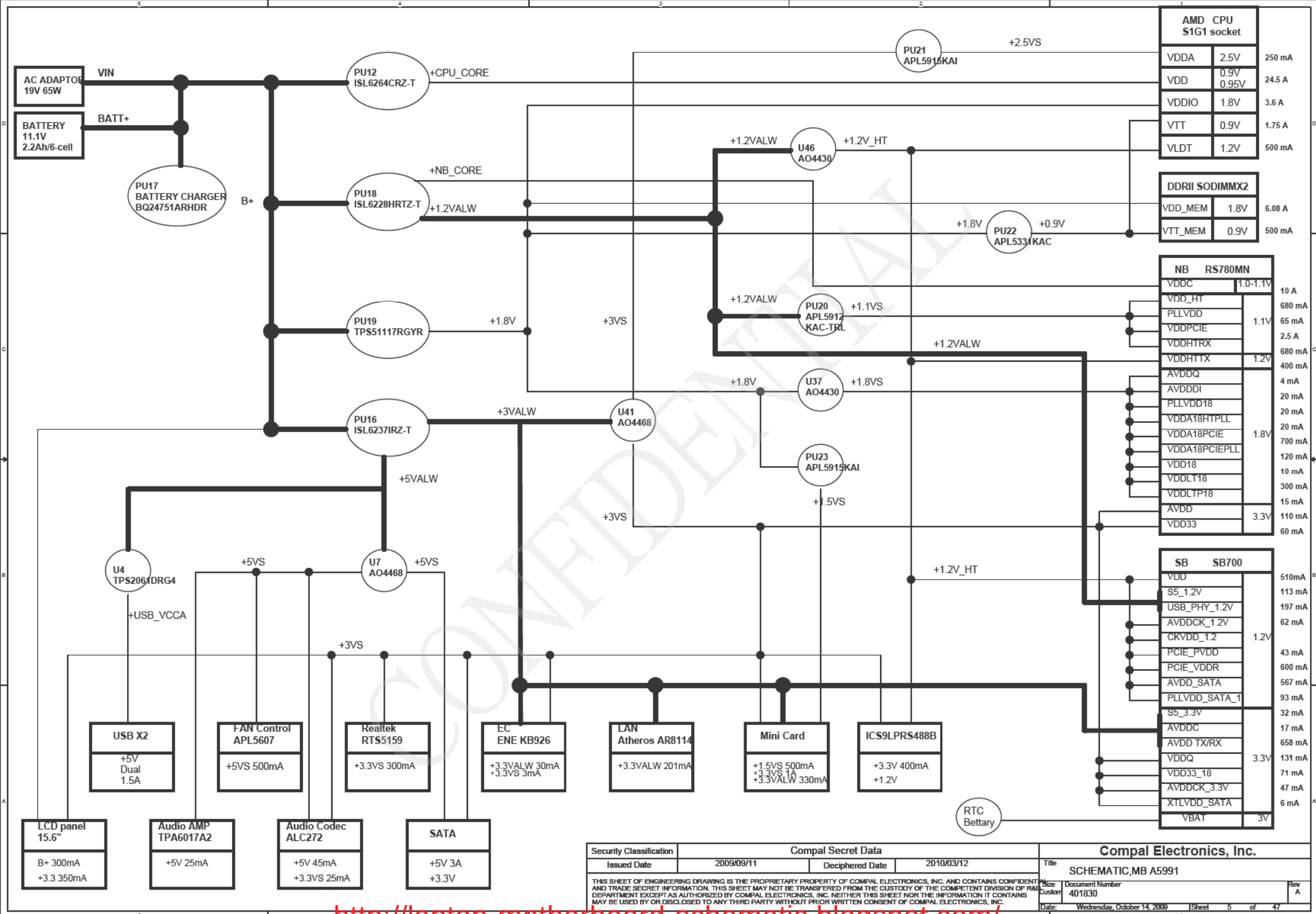
SKU ID	SKU
0	NCWG0
1	
2	
3	NAL00
4	
5	
6	
7	NCWH0

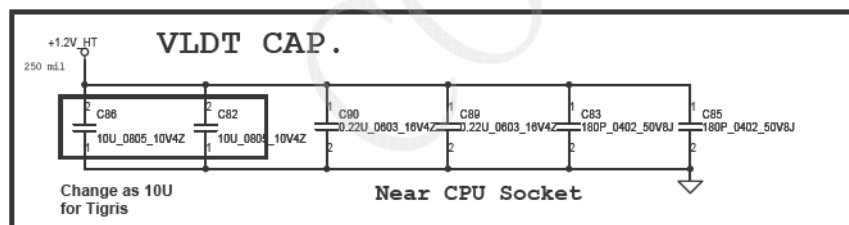
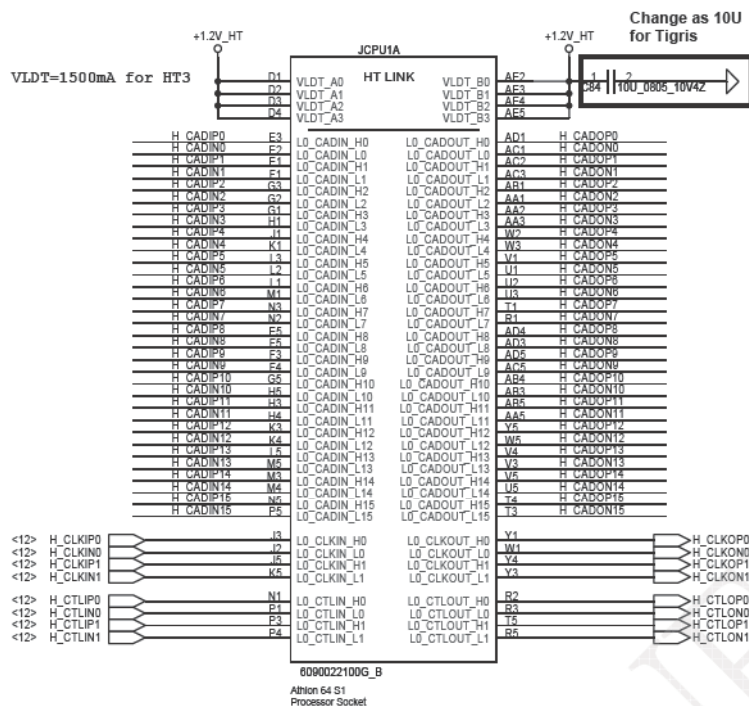
Device	Address	Device	Address
Clock Generator	1101 001Xb	New Card	
DDR DIMM0	1001 000Xb		
DDR DIMM2	1001 010Xb		
Wireless Lan			

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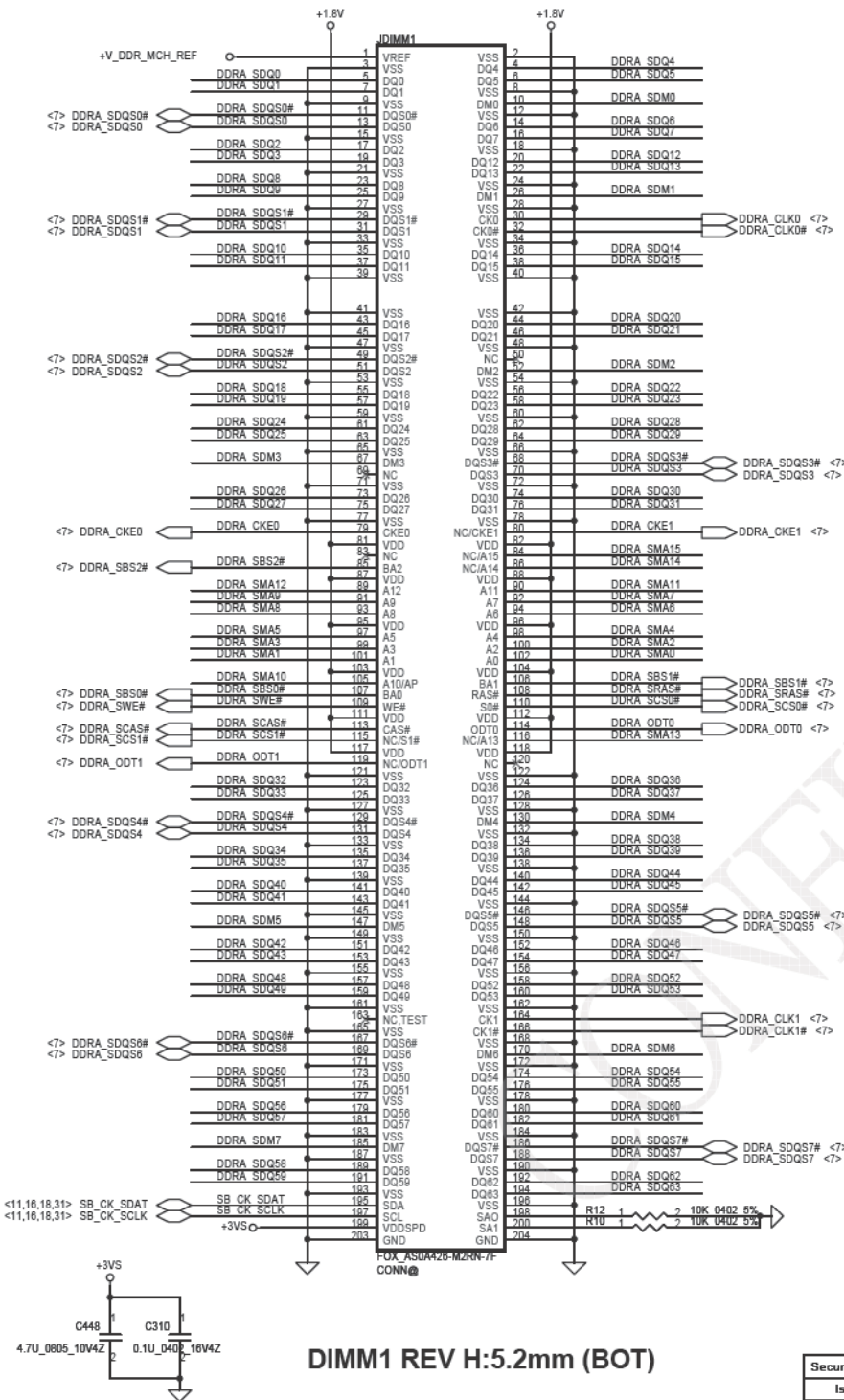


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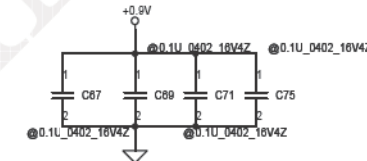
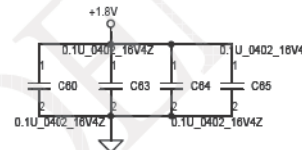
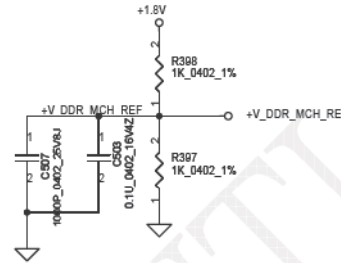




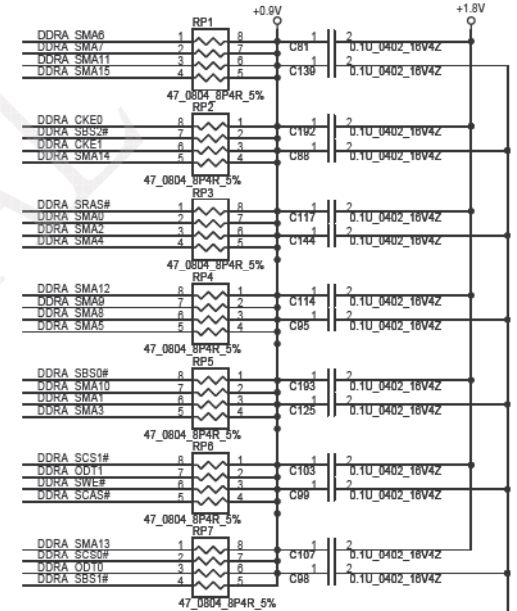
<http://laptop-motherboard.schematic.blogspot.com>



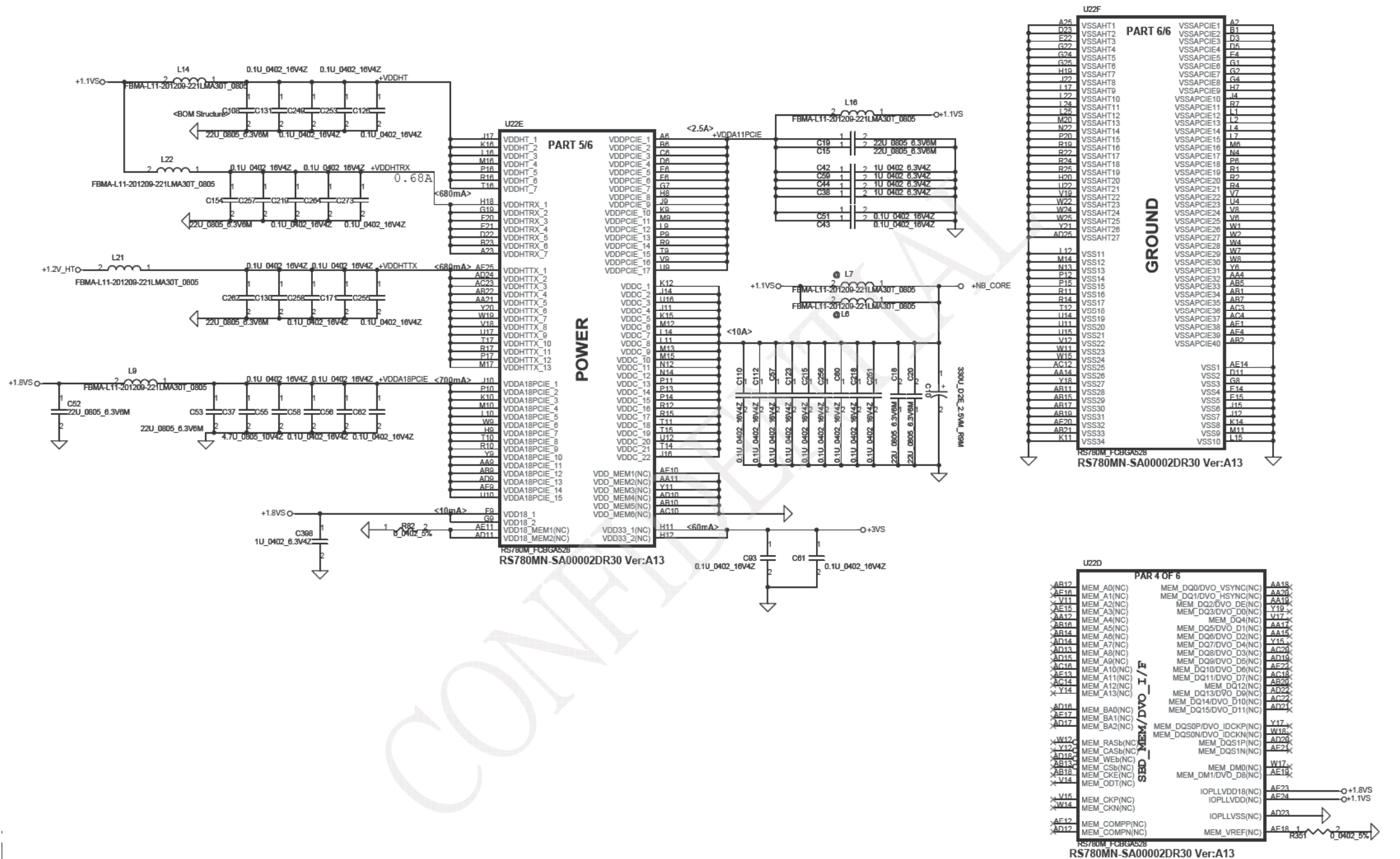
DDRA_SDQ[0..63] → DDRA_SDQ[0..63] <7>
 DDRA_SDM[0..7] → DDRA_SDM[0..7] <7>
 DDRA_SMA[0..15] → DDRA_SMA[0..15] <7>



RESERVE +V_DDR_MCH_REF BUFFER CIRCUIT



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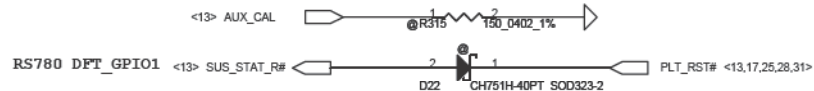


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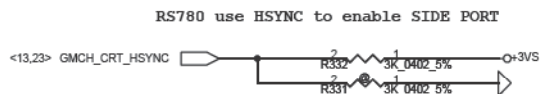
DFT_GPIO5:STRAP_DEBUG_BUS_GPIO_ENABLED

Enables the Test Debug Bus using GPIO. (VSYNC)
1 : Disable (RS780)
0 : Enable (RS780)



DFT_GPIO1: LOAD_EEPROM_STRAPS

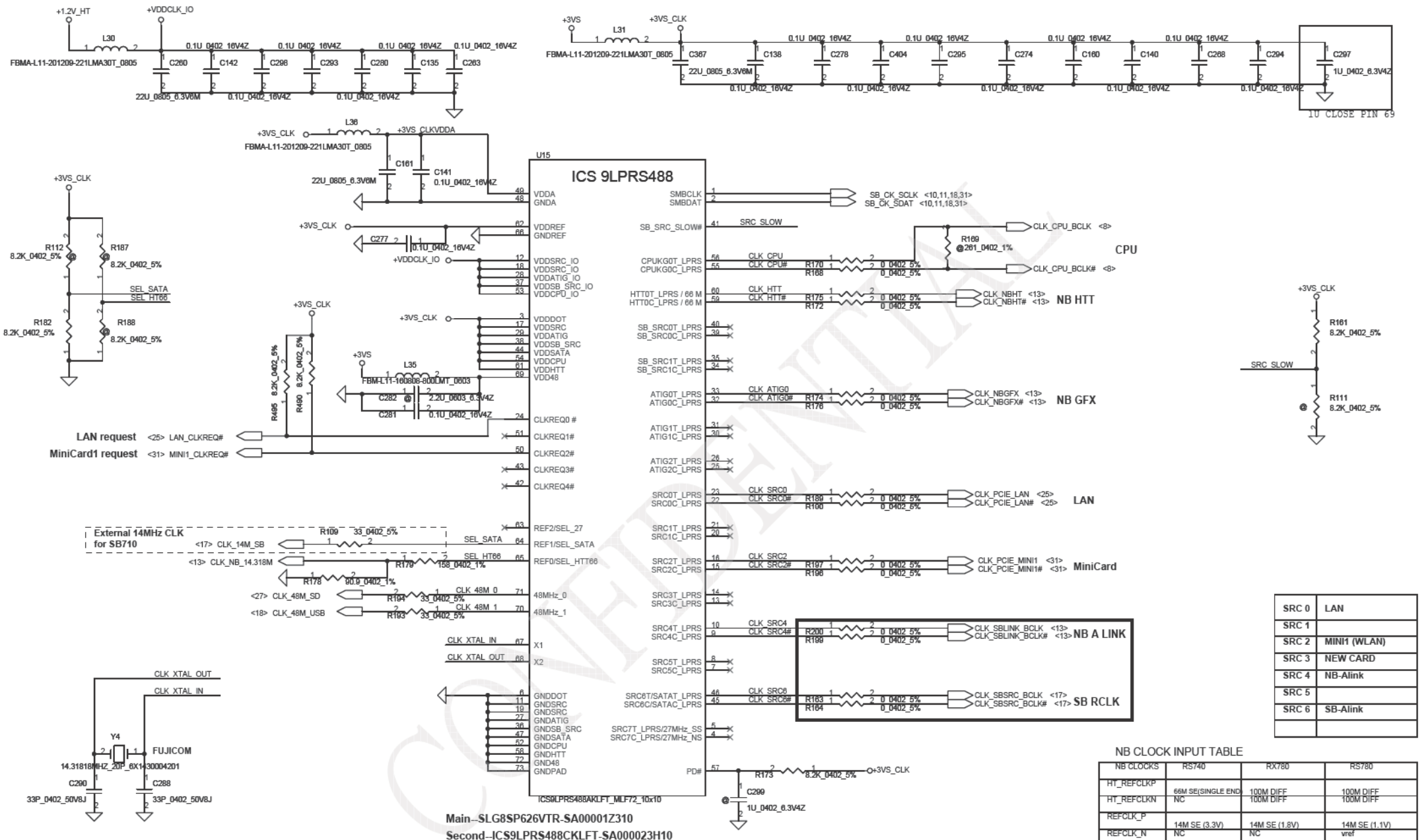
Selects Loading of STRAPS from EPROM
1 : Bypass the loading of EEPROM straps and use Hardware Default Values
0 : I2C Master can load strap values from EEPROM if connected, or use default values if not connected
RS740/RX780: DFT_GPIO1 RS780:SUS_STAT



RS780 use HSYNC to enable SIDE PORT

RS740/RS780: Enables Side port memory (RS780 use HSYNC#)
0 : Enable (RS780)
1 : Disable (RS780)

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SRC 0	LAN
SRC 1	
SRC 2	MINI1 (WLAN)
SRC 3	NEW CARD
SRC 4	NB-Alink
SRC 5	
SRC 6	SB-Alink

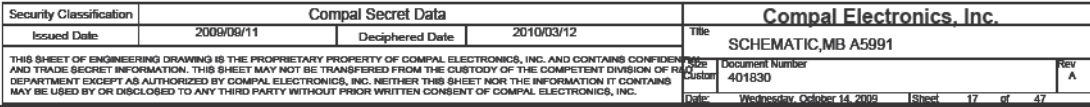
NB CLOCK INPUT TABLE

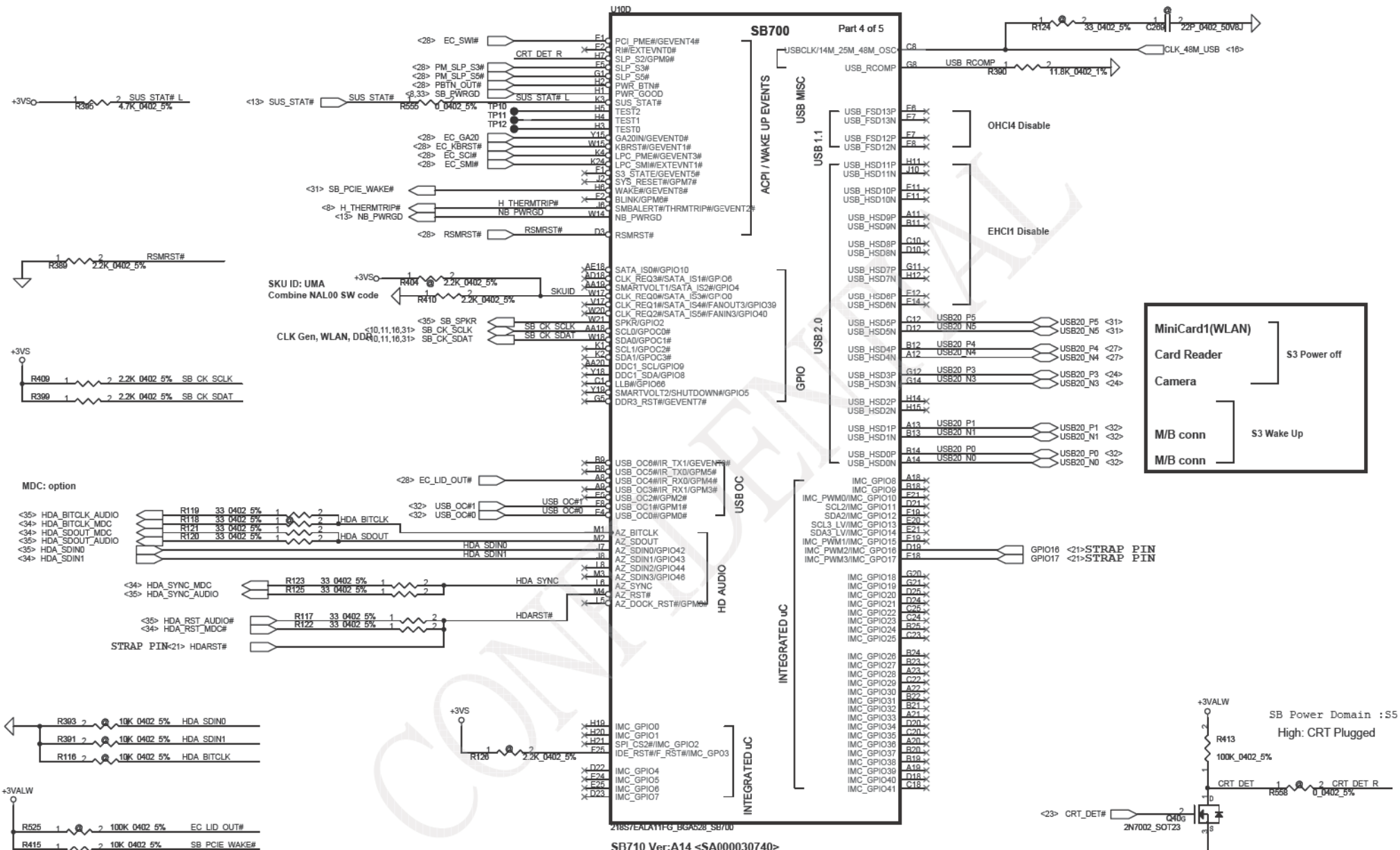
NB CLOCKS	RS740	RX780	RS780
HT_REFCLKP	66M SE(SINGLE END)	100M DIFF	100M DIFF
HT_REFCLKN	NC	100M DIFF	100M DIFF
REFCLK_P	14M SE (3.3V)	14M SE (1.8V)	14M SE (1.1V)
REFCLK_N	NC	NC	vref
GFX_REFCLK	100M DIFF	100M DIFF	100M DIFF(IN/OUT)
GPP_REFCLK	NC	100M DIFF	NC
GPPSB_REFCLK	100M DIFF	100M DIFF	100M DIFF

SEL_HTT06	1	configure as single-ended 66MHz output
	0*	configure as differential 100MHz output
SEL_SATA	1*	SS 100M SATA SRC0 output
	0	SS 100M SATA SRC6 output

SEL_27M	1	configure as 27M and 27M SS output
No used	0	configure as SRC 7 output

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Port Number	Pri/SEC,Mas/Slave assignment	SATA drive controlled by
Port 0	Primary master	SATA controller
Port 1	Secondary master	SATA controller
Port 2	Primary slave	SATA controller
Port 3	Secondary slave	SATA controller
Port 4	Primary (Secondary) master	PATA controller
Port 5	Primary (Secondary) slave	PATA controller

Main
HDD

2nd
HDD

Main
ODD

2nd
ODD

<<> SATA_STX_DRX_P0 <<> AD9 SATA_TX0P
 <<> SATA_STX_DRX_N0 <<> AE8 SATA_TX0N
 <<> SATA_DTX_C_SRX_N0 <<> AB10 SATA_RX0N
 <<> SATA_DTX_C_SRX_P0 <<> AC10 SATA_RX0P
 <<> SATA_STX_DRX_P1 <<> AE10 SATA_TX1P
 <<> SATA_STX_DRX_N1 <<> AD10 SATA_TX1N
 <<> SATA_DTX_C_SRX_N1 <<> AD11 SATA_RX1N
 <<> SATA_DTX_C_SRX_P1 <<> AE11 SATA_RX1P
 <<> SATA_STX_DRX_P2 <<> AB12 SATA_TX2P
 <<> SATA_STX_DRX_N2 <<> AC12 SATA_TX2N
 <<> SATA_DTX_C_SRX_N2 <<> AE12 SATA_RX2N
 <<> SATA_DTX_C_SRX_P2 <<> AD12 SATA_RX2P
 <<> SATA_STX_DRX_P3 <<> AD13 SATA_TX3P
 <<> SATA_STX_DRX_N3 <<> AE13 SATA_TX3N
 <<> SATA_DTX_C_SRX_N3 <<> AB14 SATA_RX3N
 <<> SATA_DTX_C_SRX_P3 <<> AC14 SATA_RX3P

SB700
Part 2 of 5

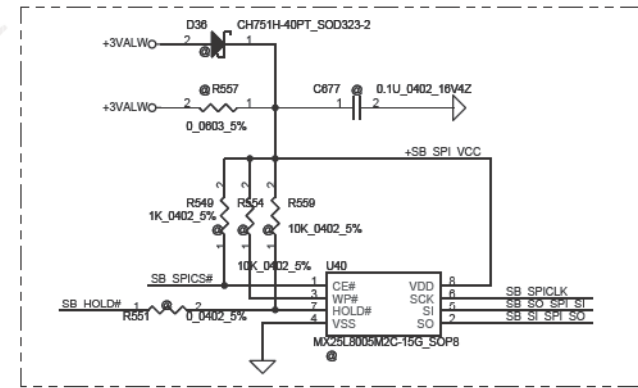
SERIAL ATA

ATA 66/100/133

SPI ROM

HW MONITOR

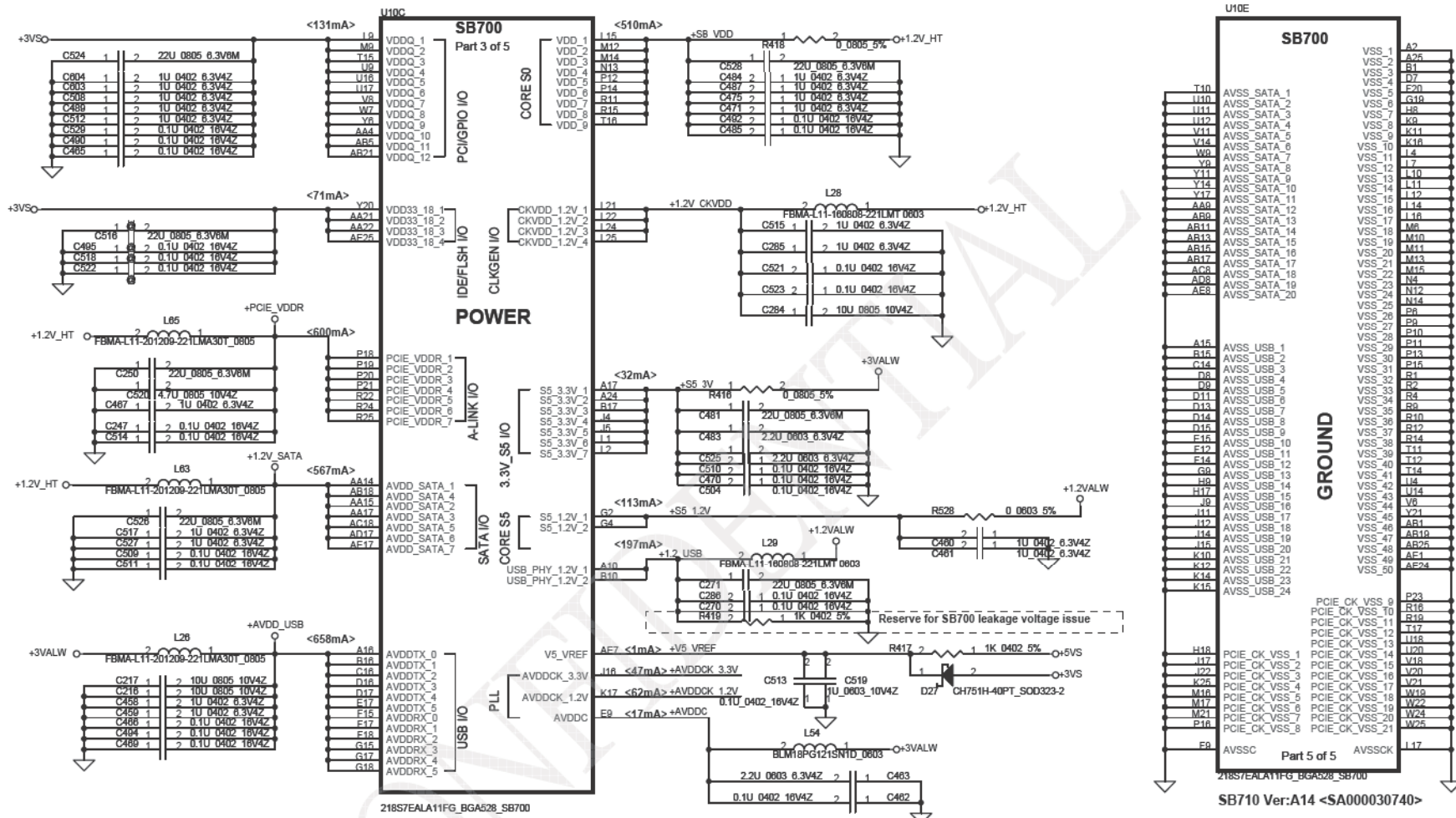
IDE_IORDY# AA24
 IDE_IRQ# Y24
 IDE_A0 AB24
 IDE_A1 Y23
 IDE_A2 Y23
 IDE_DACK# AB24
 IDE_DRQ AC24
 IDE_TOR# AC24
 IDE_IOW# Y24
 IDE_CS1# Y24
 IDE_CS3# Y24
 IDE_D0/GPIO15 AD24
 IDE_D1/GPIO16 AD24
 IDE_D2/GPIO17 AE24
 IDE_D3/GPIO18 AC22
 IDE_D4/GPIO19 AE20
 IDE_D5/GPIO20 AB20
 IDE_D6/GPIO21 AD20
 IDE_D7/GPIO22 AD10
 IDE_D8/GPIO23 AE10
 IDE_D9/GPIO24 AD20
 IDE_D10/GPIO25 AE20
 IDE_D11/GPIO26 AE20
 IDE_D12/GPIO27 AB20
 IDE_D13/GPIO28 AD22
 IDE_D14/GPIO29 AE22
 IDE_D15/GPIO30 AC22
 SPI_DI/GPIO12 G6 SB SI SPI SO
 SPI_DO/GPIO11 D2 SB SO SPI SI
 SPI_CLK/GPIO47 D1 SB SPICLK
 SPI_HOLD#/GPIO31 E4 SB HOLD#
 SPI_CS1#/GPIO32 E3 SB SPICSS#
 LAN_RST#/GPIO13 U115
 ROM_RST#/GPIO14 U11
 FANOUTD/GPIO3 M8
 FANOUT1/GPIO48 M5
 FANOUT2/GPIO49 M7
 FANIN0/GPIO50 R6
 FANIN1/GPIO51 R8
 FANIN2/GPIO52 R8
 TEMP_COMM C6
 TEMP_IN0/GPIO81 R8
 TEMP_IN1/GPIO82 R8
 TEMP_IN2/GPIO83 R8
 TEMP_IN3/TALERT#/GPIO84 R6
 VIN0/GPIO53 B4
 VIN1/GPIO54 B4
 VIN2/GPIO55 C4
 VIN3/GPIO56 C4
 VIN4/GPIO57 D5
 VIN5/GPIO58 D8
 VIN6/GPIO59 D8
 VIN7/GPIO60 B7
 AVDD F8 <5mA> +SB AVDD
 AVSS G7 2.2U_0803_6.3V4Z
 EC_THERM# <28> D25 CH751H-40PT_S00323-2
 ACIN <28,37,38,40> R377 100K_0402_5% +3VS
 R378 100K_0402_5% +3VALW



for ACIN level issue

218S7EALA11FG_BGA528_SB700
SA00001S570 Ver:A12

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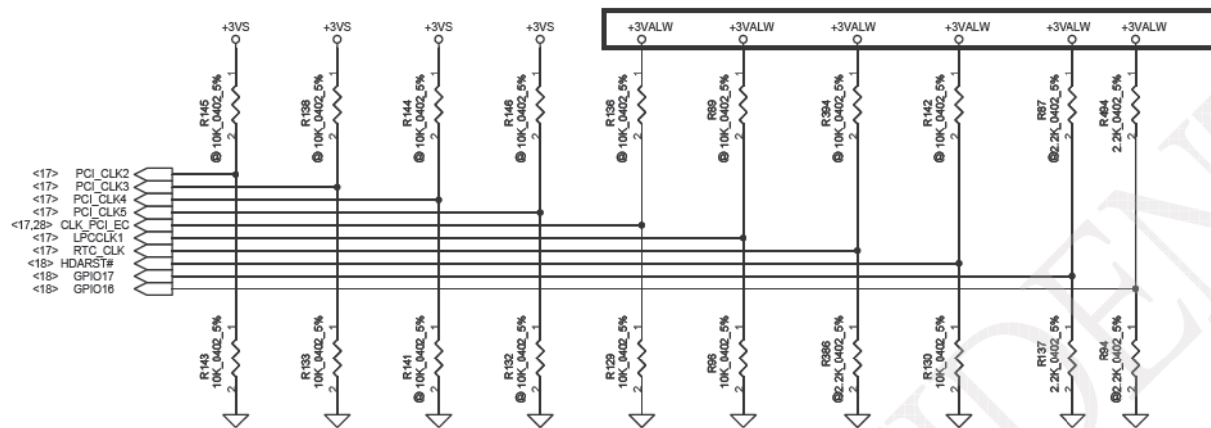


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REQUIRED STRAPS

NOTE: SB700 HAS INTERNAL 15K PULL UP RESISTOR FOR RTC_CLK

	PCI_CLK2	PCI_CLK3	PCI_CLK4	PCI_CLK5	LPC_CLK0 CLK_PCI_EC	LPC_CLK1	RTC_CLK	AZ_RST_CD#	GP17	GP16
PULL HIGH	BOOTFAIL TIMER ENABLED	USE DEBUG STRAPS	RESERVED	RESERVED	ENABLE PCI MEM BOOT	CLKGEN ENABLED	INTERNAL RTC DEFAULT	EC ENABLED	Internal pull up H,H = Reserved H,L = SPI ROM	
PULL LOW	BOOTFAIL TIMER DISABLED DEFAULT	IGNORE DEBUG STRAPS DEFAULT			DISABLE PCI MEM BOOT DEFAULT	CLKGEN DISABLED DEFAULT	EXT. RTC (PD on X1, apply 32KHz to RTC_CLK)	EC DISABLED DEFAULT		L,H = LPC ROM (Default L,NC) L,L = FWH ROM

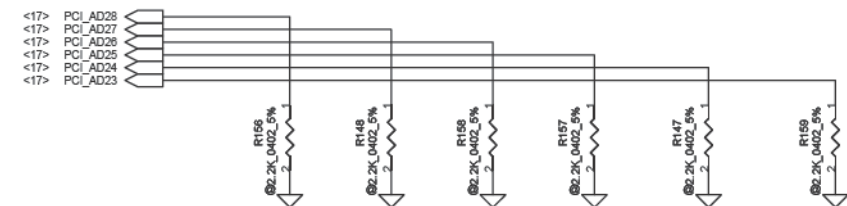


DEBUG STRAPS

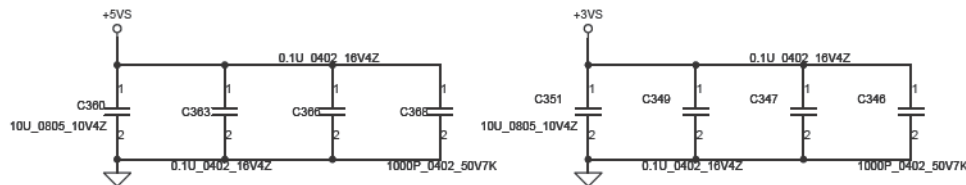
DEBUG STRAPS

SB700 HAS 15K INTERNAL PU FOR PCI_AD[28:23]

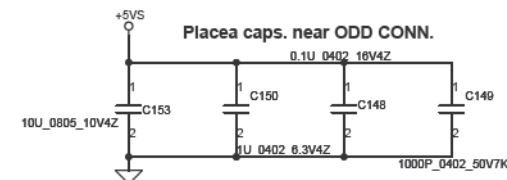
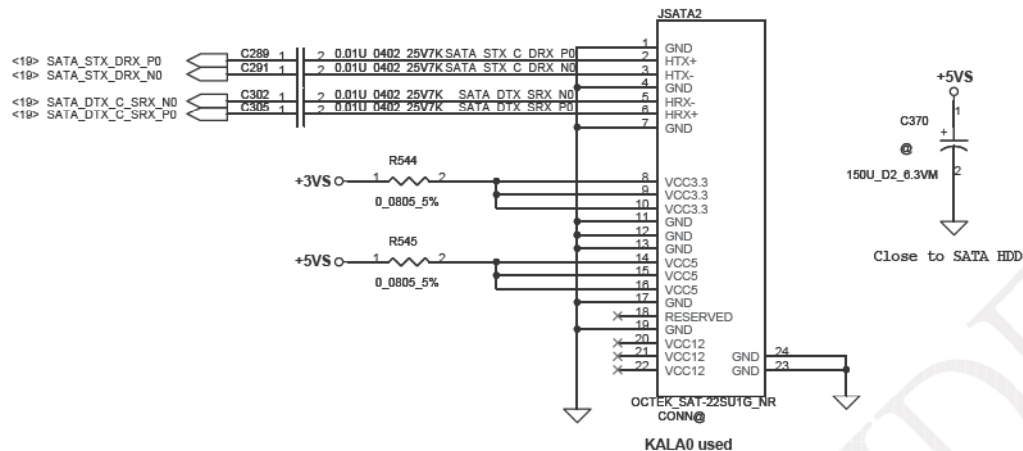
	PCI_AD28	PCI_AD27	PCI_AD26	PCI_AD25	PCI_AD24	PCI_AD23
PULL HIGH	USE LONG RESET DEFAULT	USE PCI PLL DEFAULT	USE ACPI BCLK DEFAULT	USE IDE PLL DEFAULT	USE DEFAULT PCIE STRAPS DEFAULT	RESERVED
PULL LOW	USE SHORT RESET	BYPASS PCI PLL	BYPASS ACPI BCLK	BYPASS IDE PLL	USE EEPROM PCIE STRAPS	



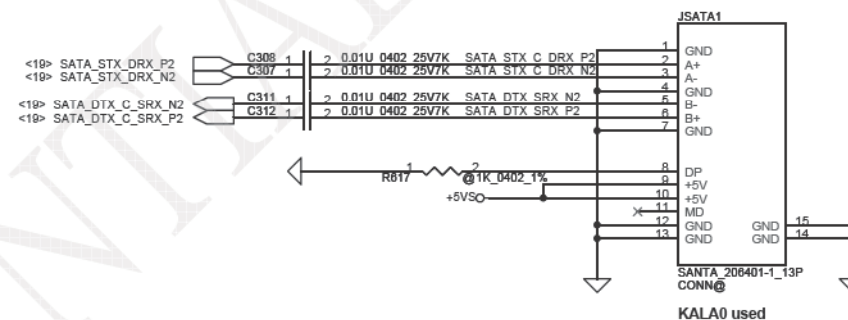
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SATA HDD CONN

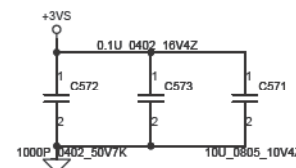
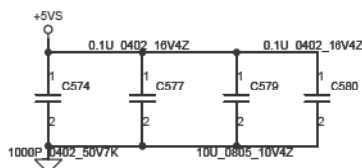
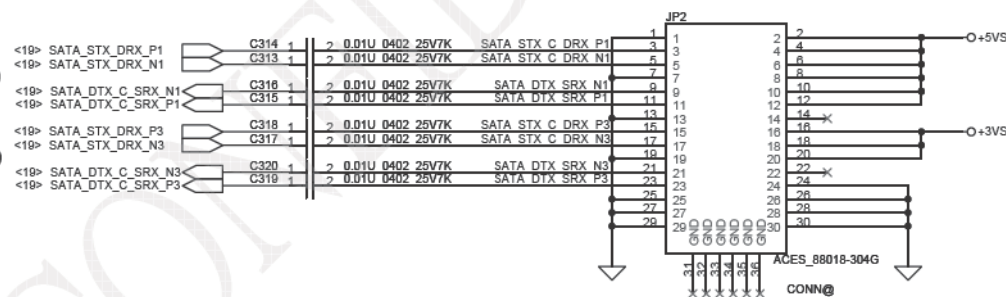


SATA ODD CONN



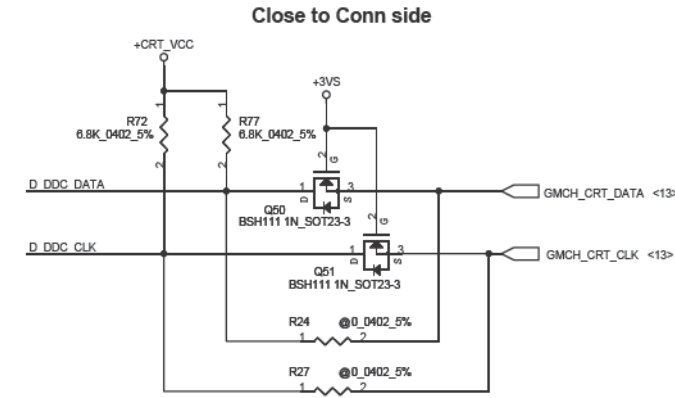
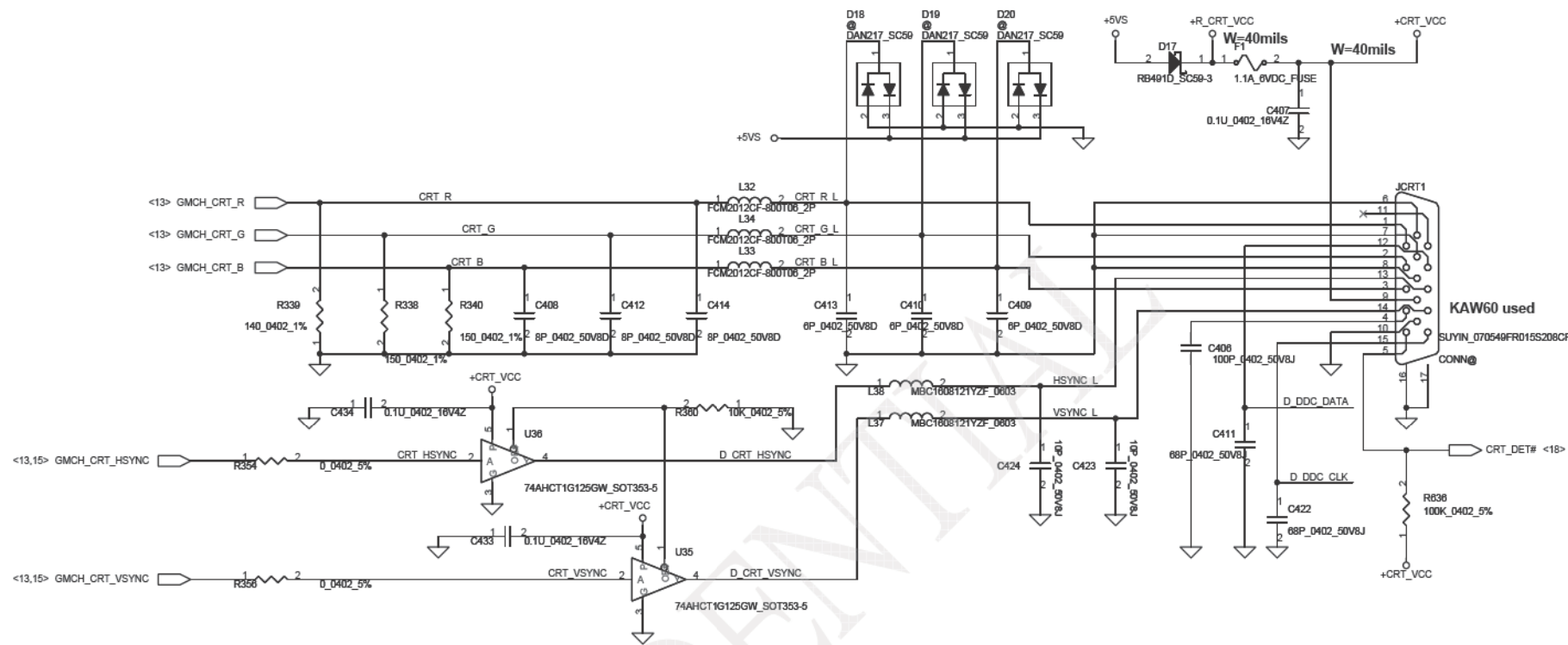
Second HDD

Second ODD



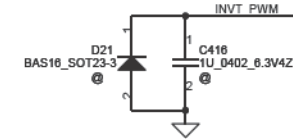
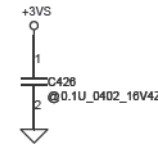
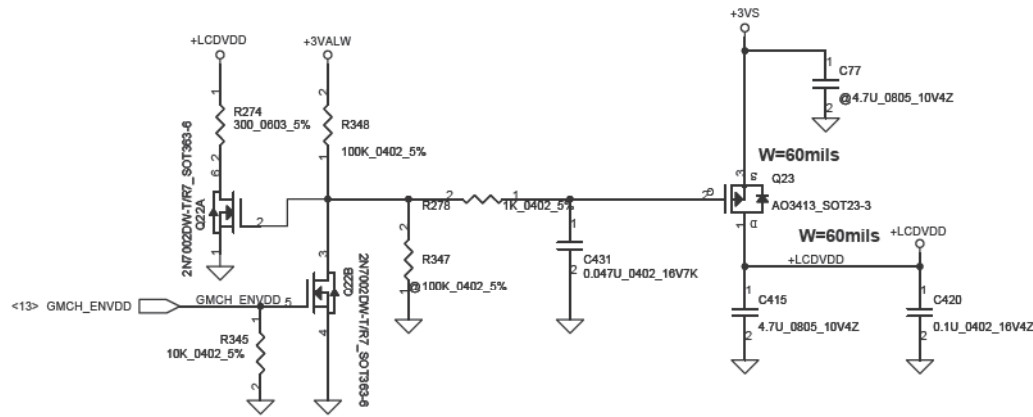
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CRT Connector

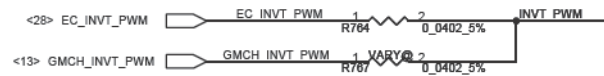
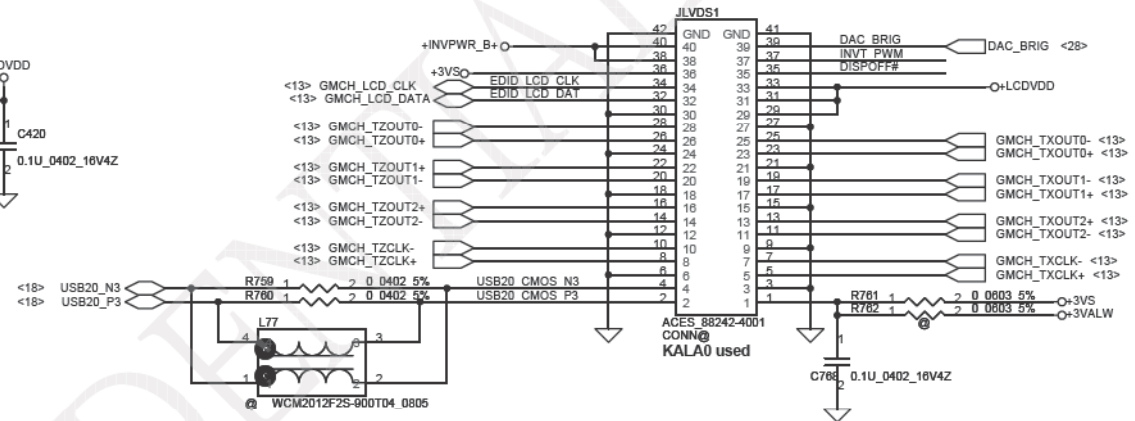


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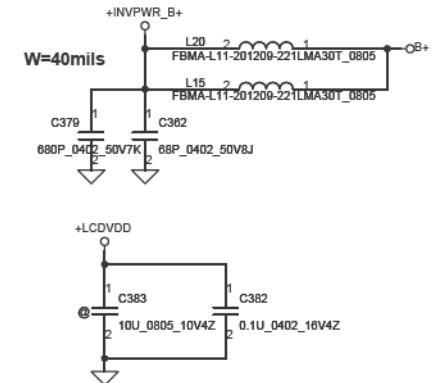
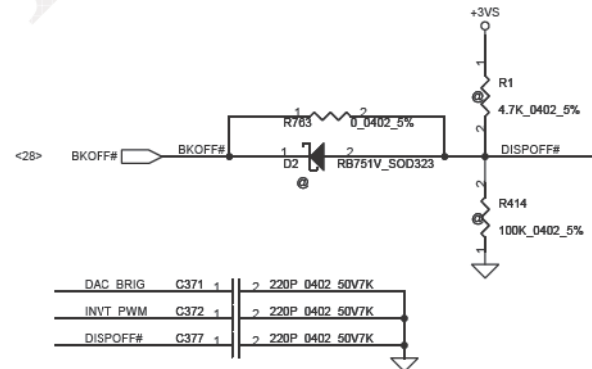
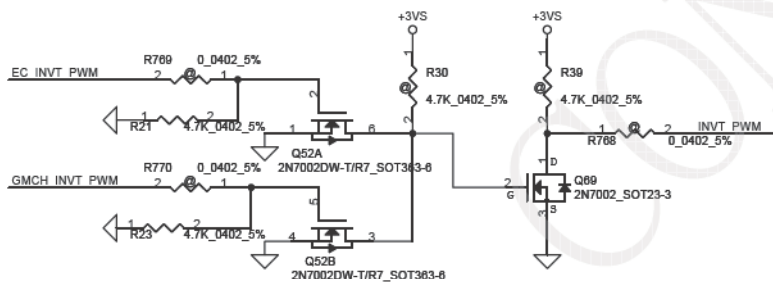
LCD POWER CIRCUIT



LCD/PANEL CONN.

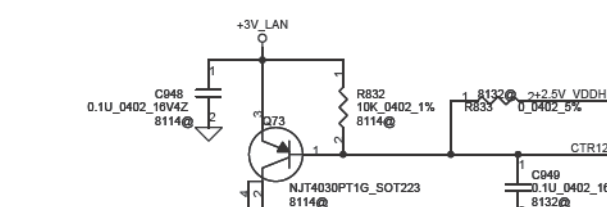
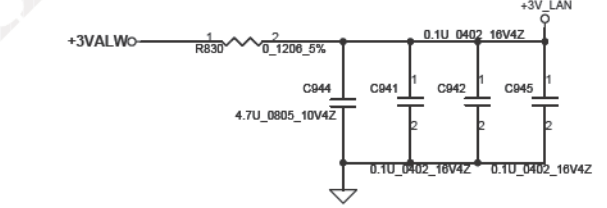
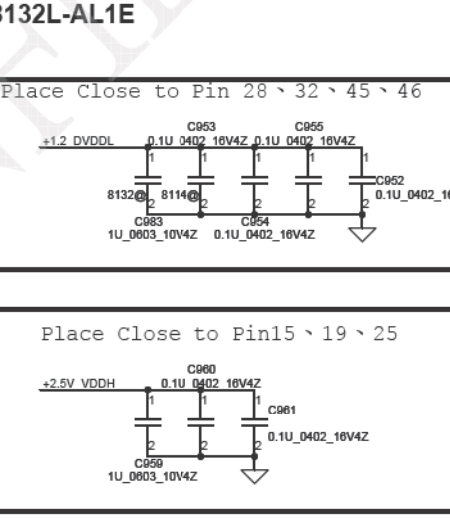
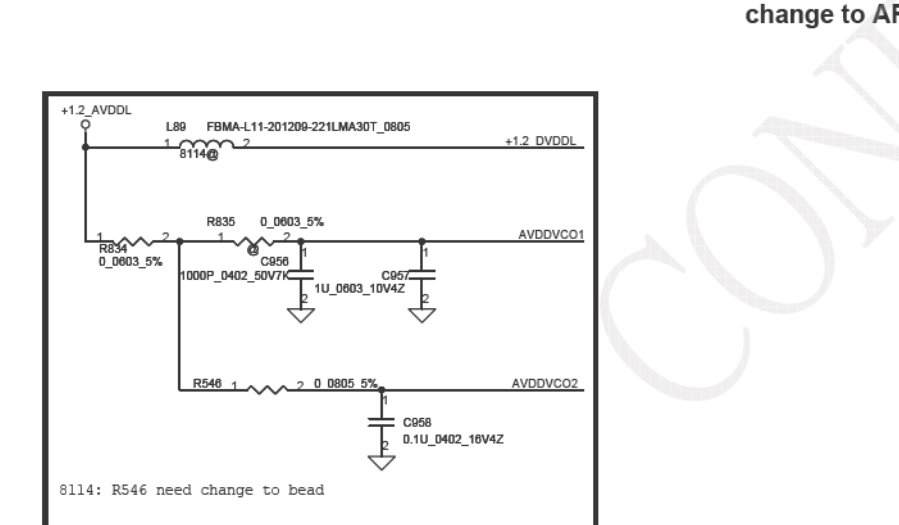
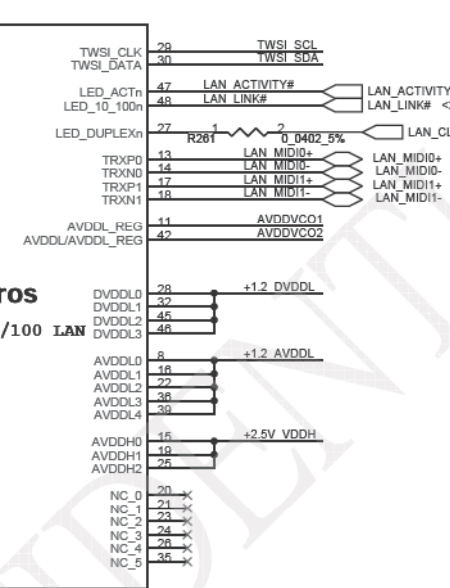
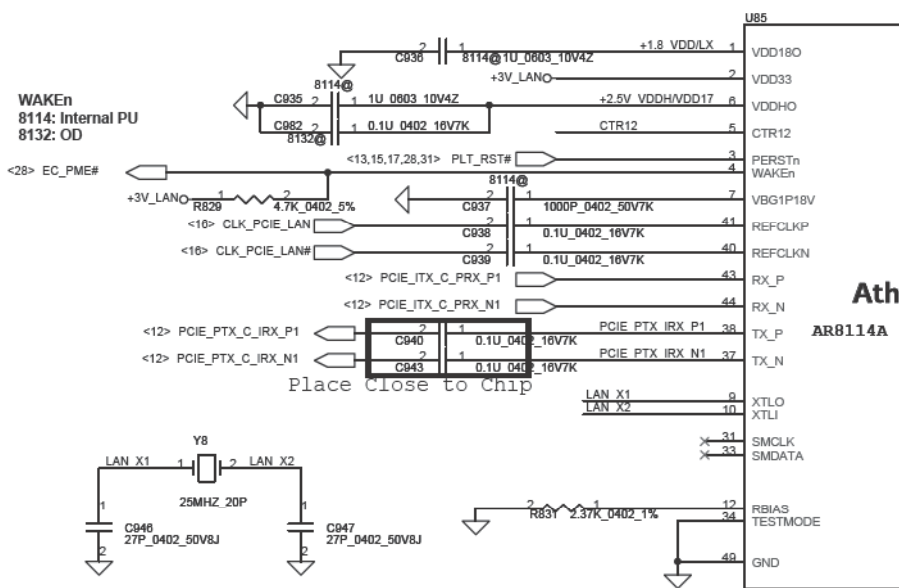
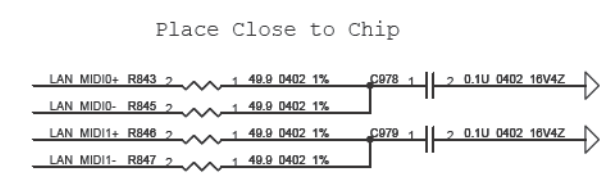
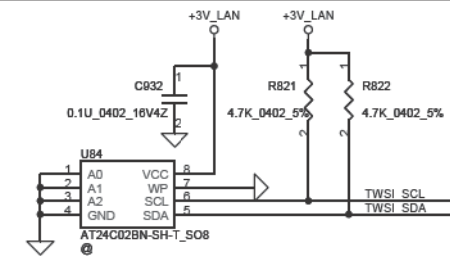
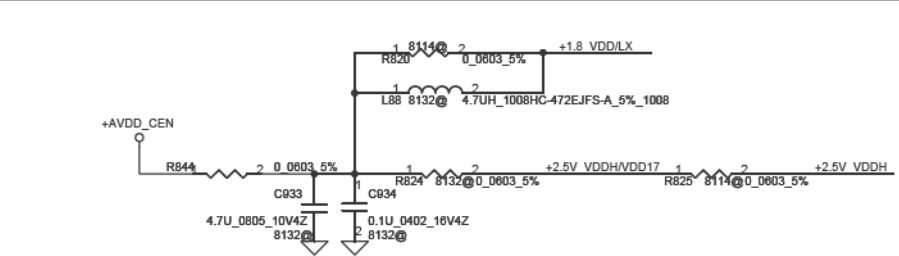


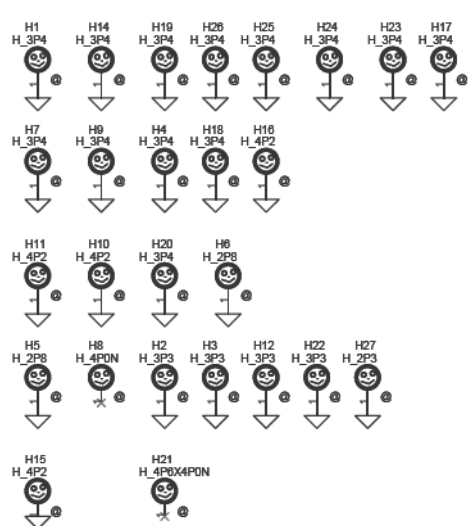
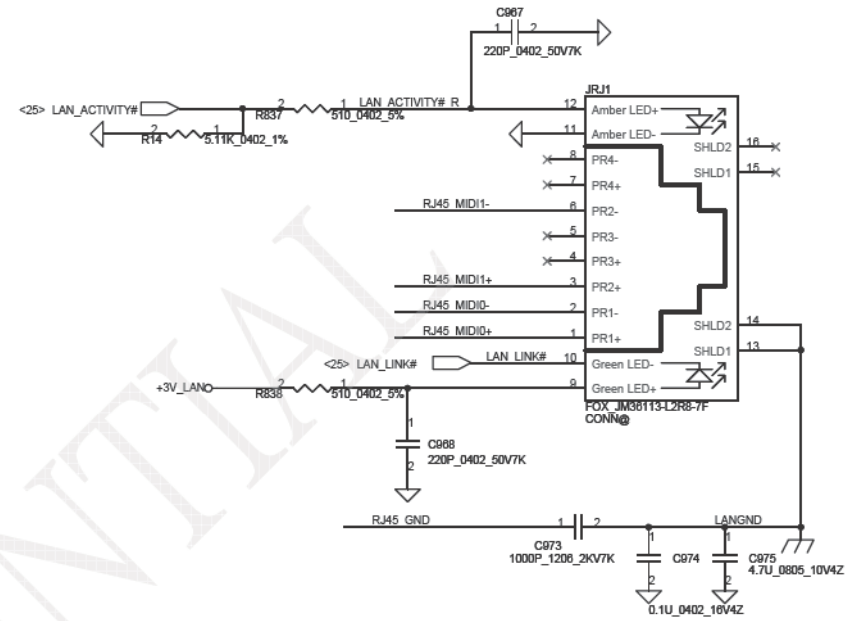
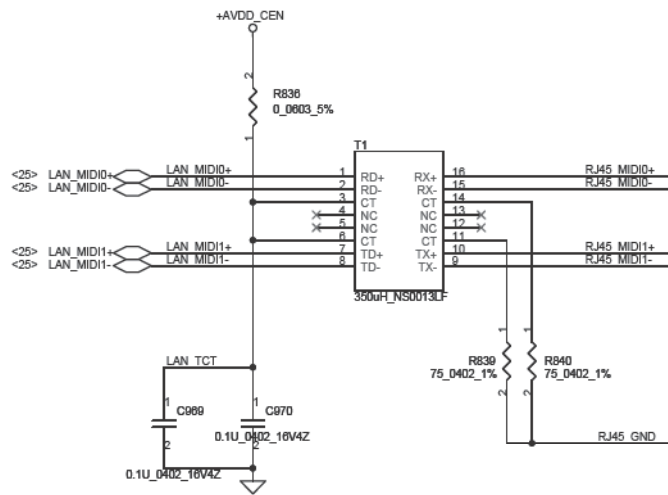
VARYBRIGHT FUNCTION



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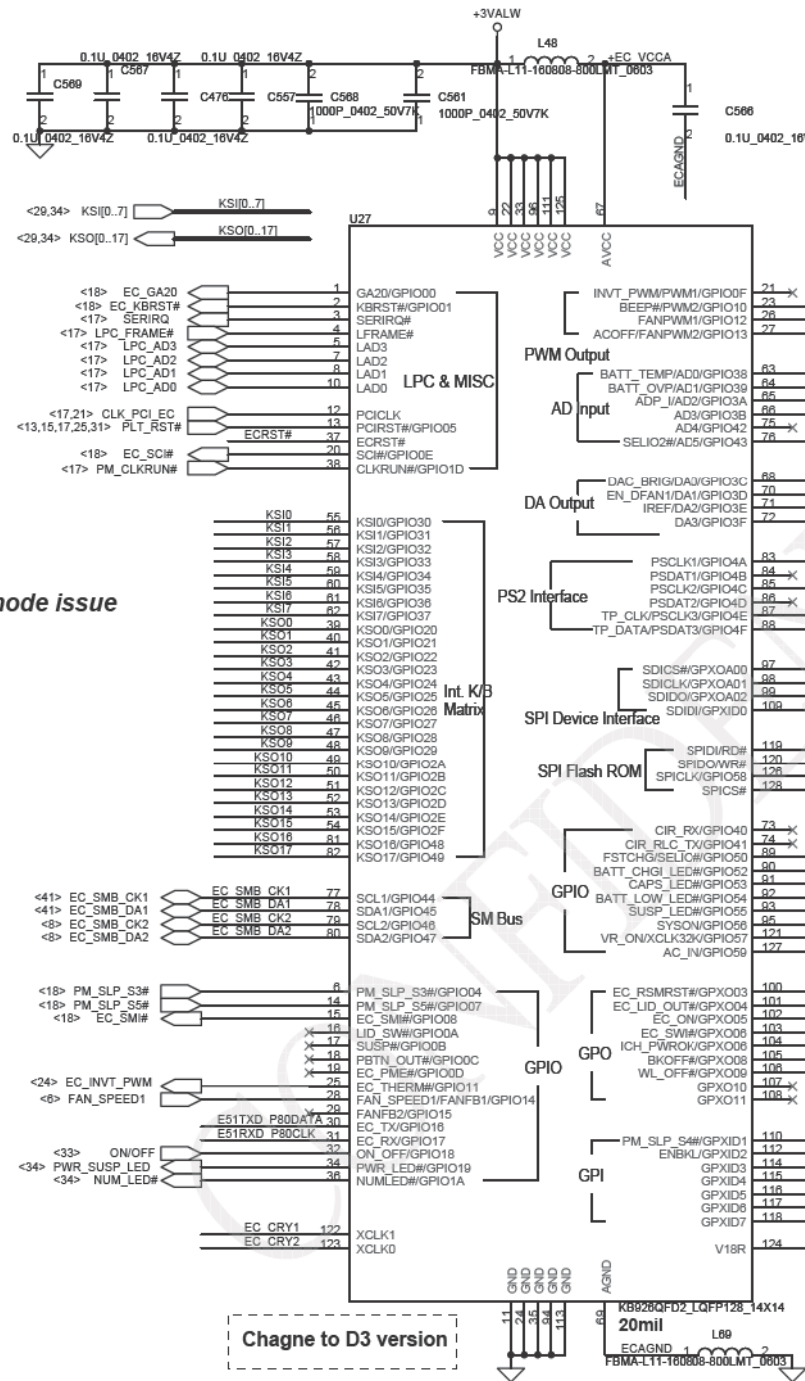
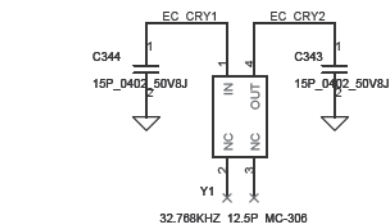
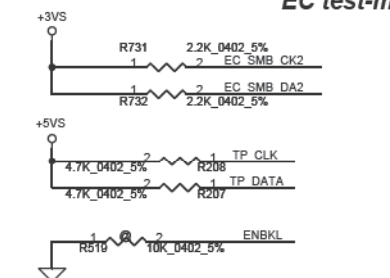
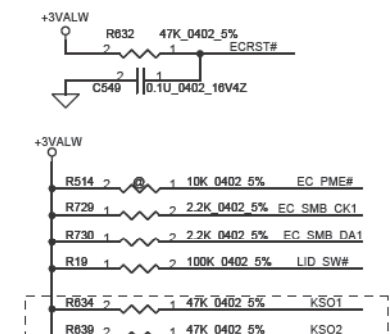
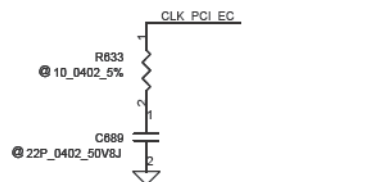
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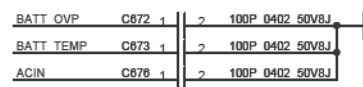


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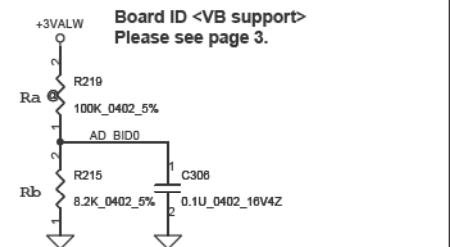
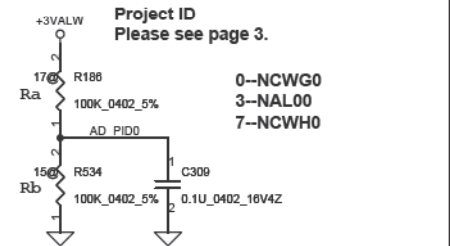
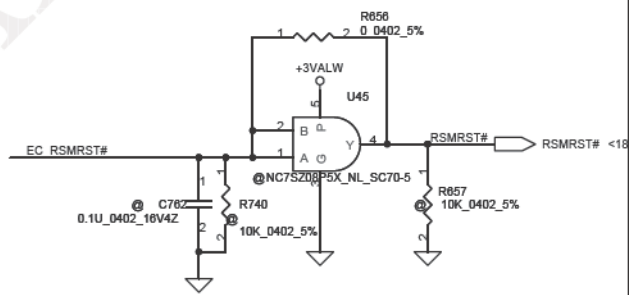
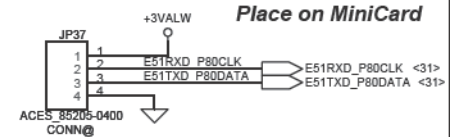




Please close to EC pin



For EC Tools

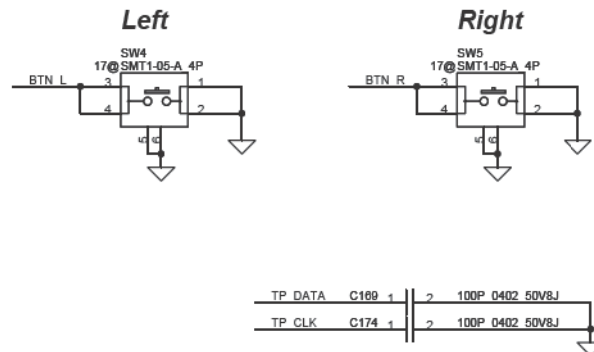


Chagne to D3 version

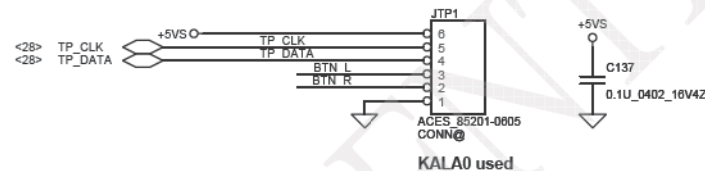
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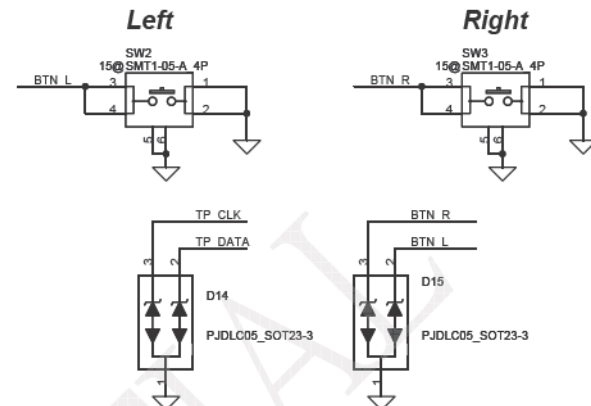
For 17"



To TP/B Conn.

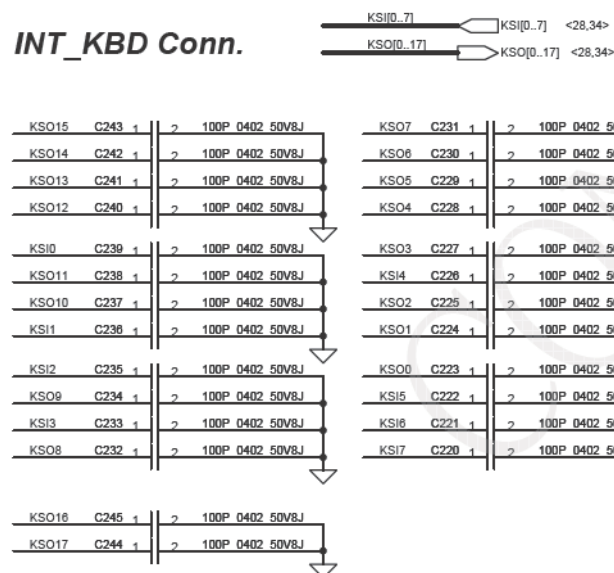


For 15"

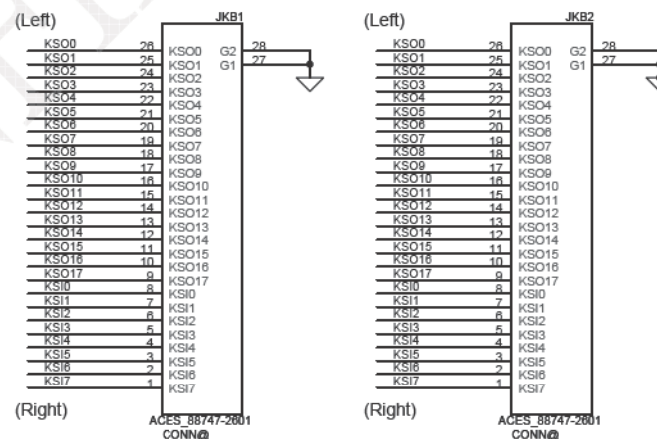


Change to SCA00000200

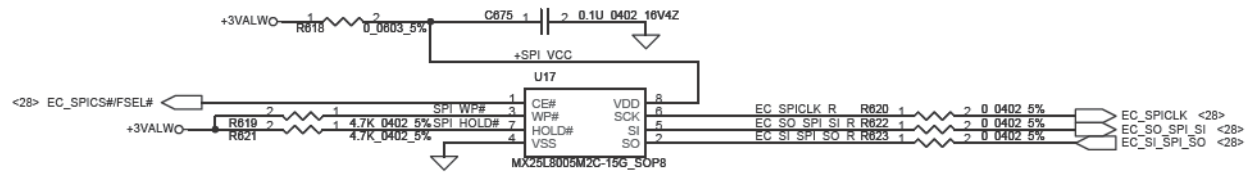
INT_KBD Conn.



KB1 for 15"
KB2 for 17"

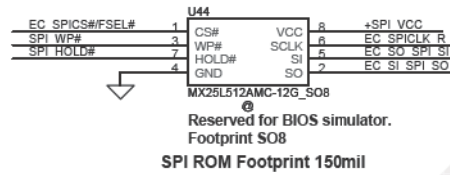


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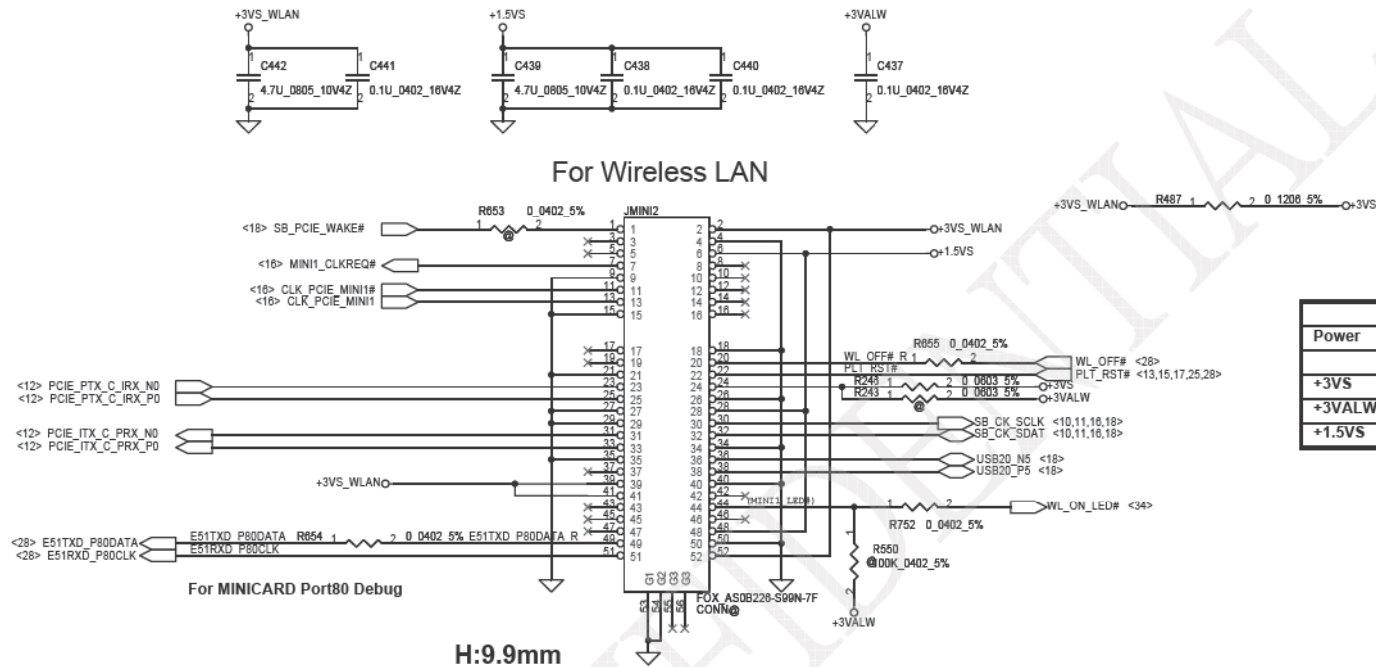


SA00000XT00 : S IC FL 8M MX25L8005M2C-15G SOP 8P
 ENE suggestion SPI Frequency over 66MHz
 SST: 50MHz
 MXIC: 70MHz
 ST: 40MHz

ONLY MXIC used in this project (66MHz)



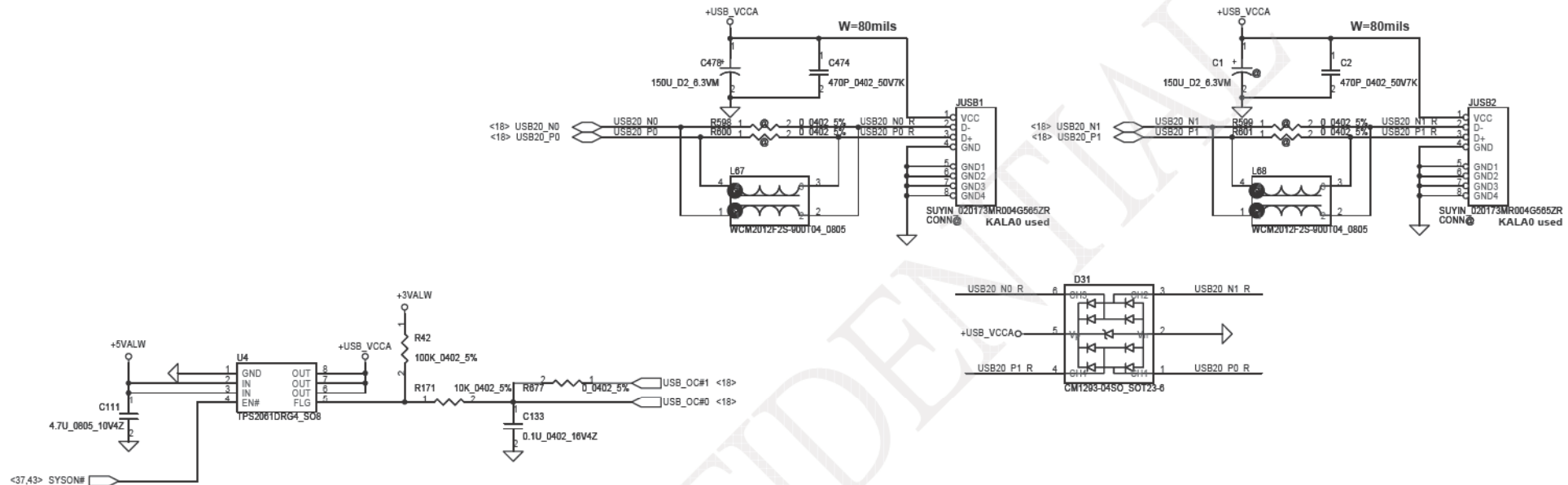
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Mini Card Power Rating			
Power	Primary Power (mA)		Auxiliary Power (mA)
	Peak	Normal	Normal
+3VS	1000	750	
+3VALW	330	250	250 (wake enable)
+1.5VS	500	375	5 (Not wake enable)

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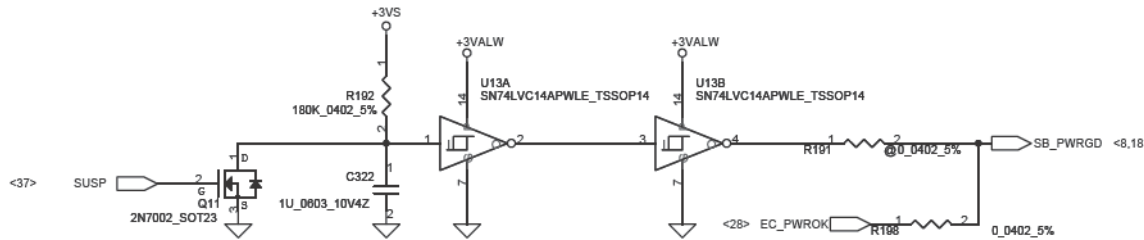
USB CONN. 1 & 2



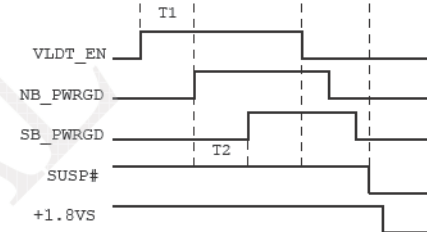
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Power ON Circuit

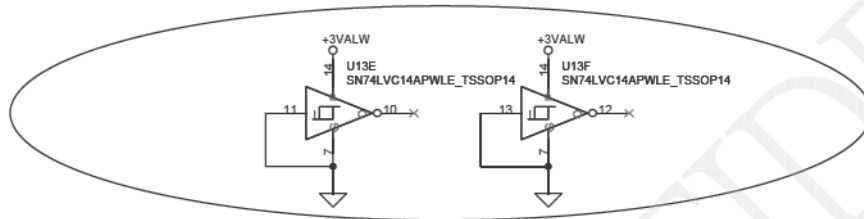
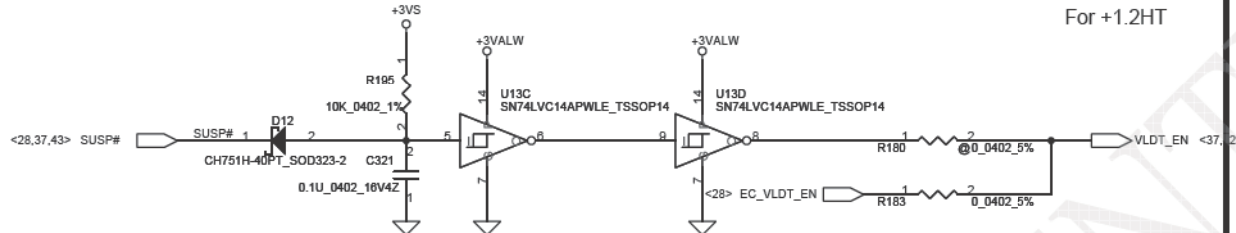
For South Bridge



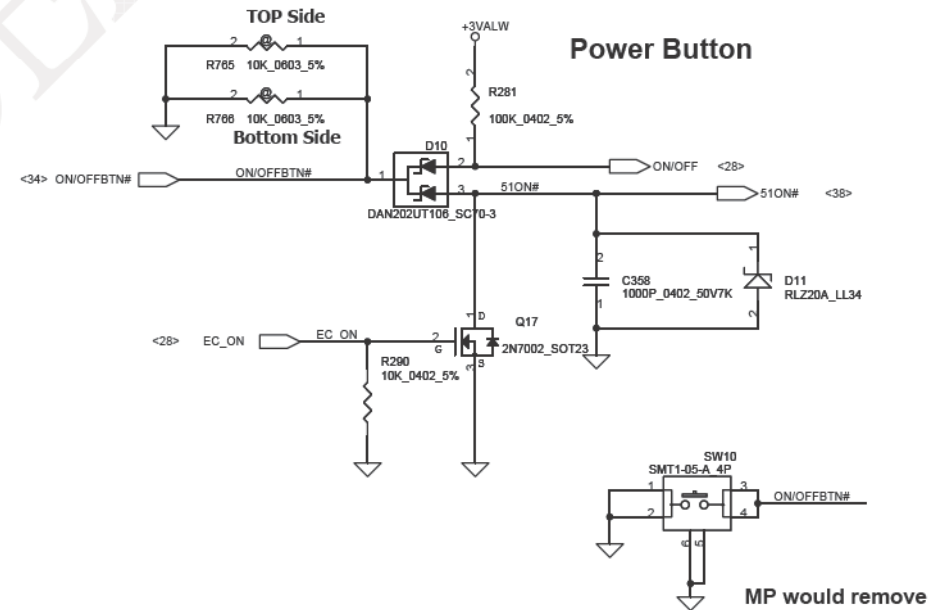
note: T1 minimum 15ms, T2 minimum 33ms/maximum 500ms,
SUSP# goes to low after SB_PWRGD goes to low for power down.



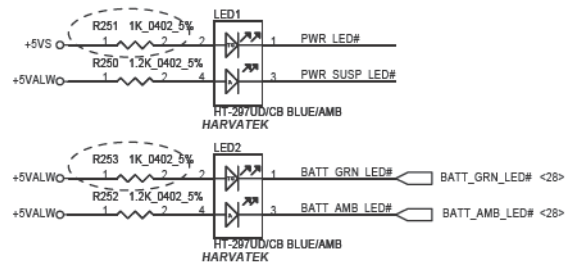
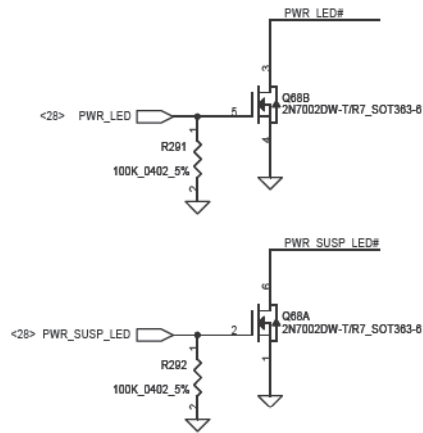
For +1.2HT



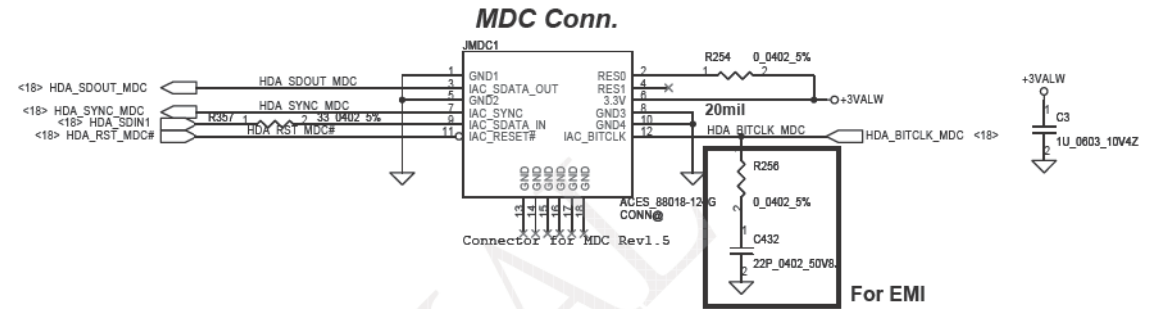
Power Button



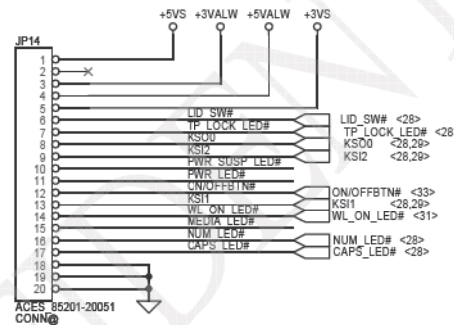
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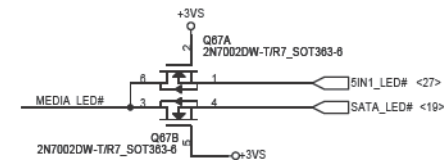
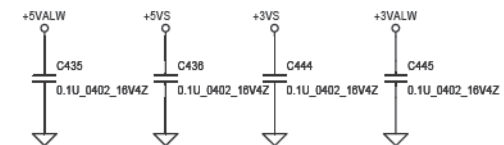
BLUE/AMB LED

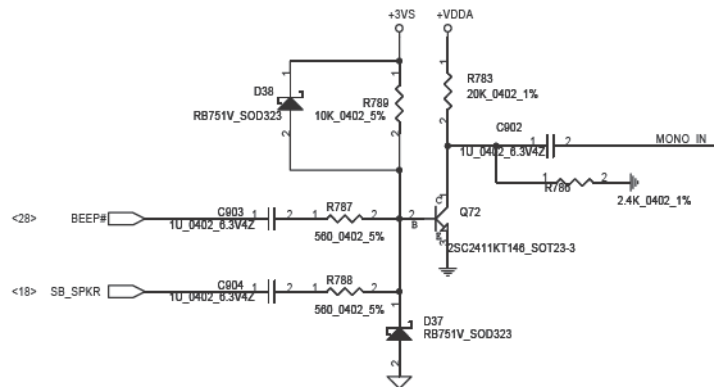


To PWR LED/B

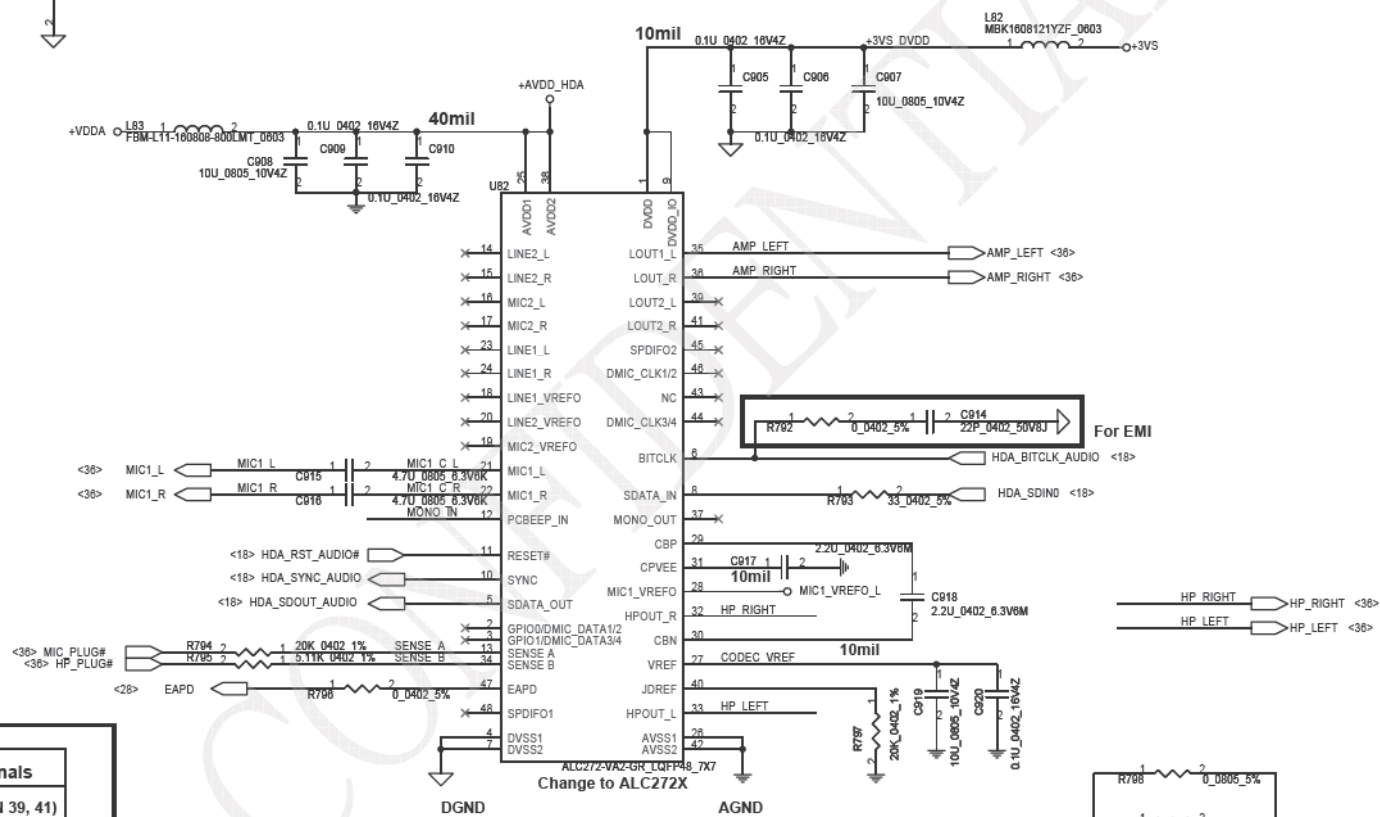
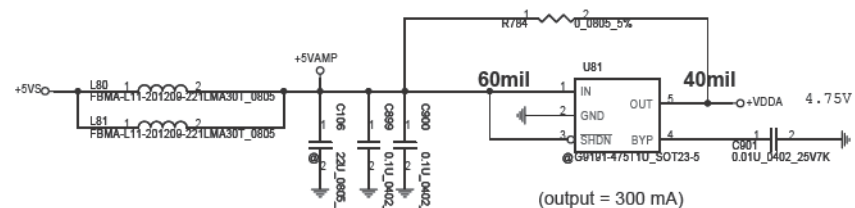


	KSO0
KSI1	WL_BTN#
KSI2	TP_LOCK_BTN#
KSI3	
KSI4	
KSI5	
KSI6	





HD Audio Codec

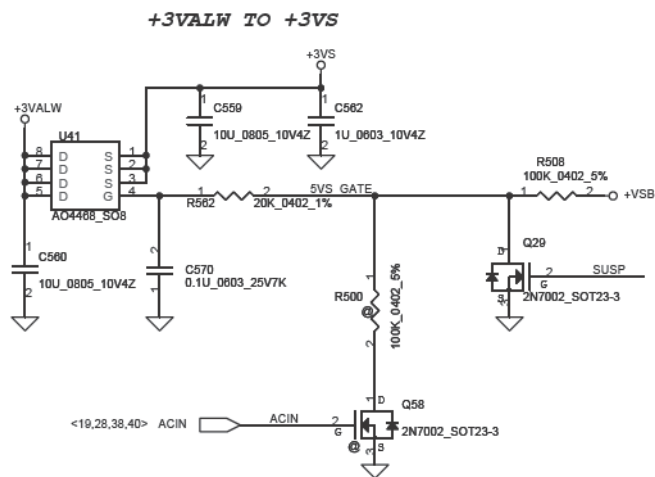


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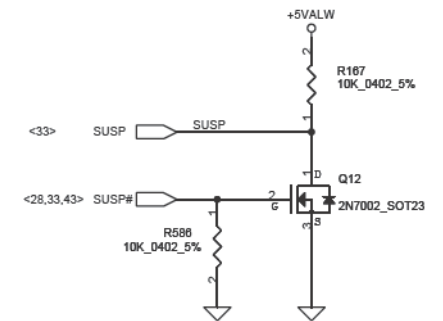
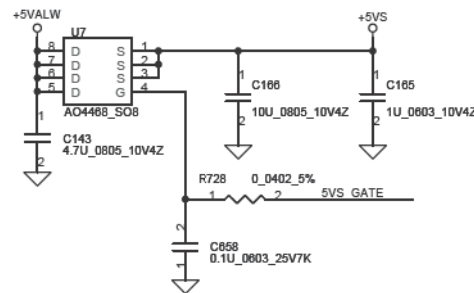
Sense Pin	Impedance	Codec Signals
SENSE A	39.2K	PORT-A (PIN 39, 41)
	20K	PORT-B (PIN 21, 22)
	10K	PORT-C (PIN 23, 24)
	5.1K	PORT-D (PIN 35, 36)
SENSE B	39.2K	PORT-E (PIN 14, 15)
	20K	PORT-F (PIN 16, 17)
	10K	PORT-G (PIN 43, 44)
	5.1K	PORT-H (PIN 45, 46)

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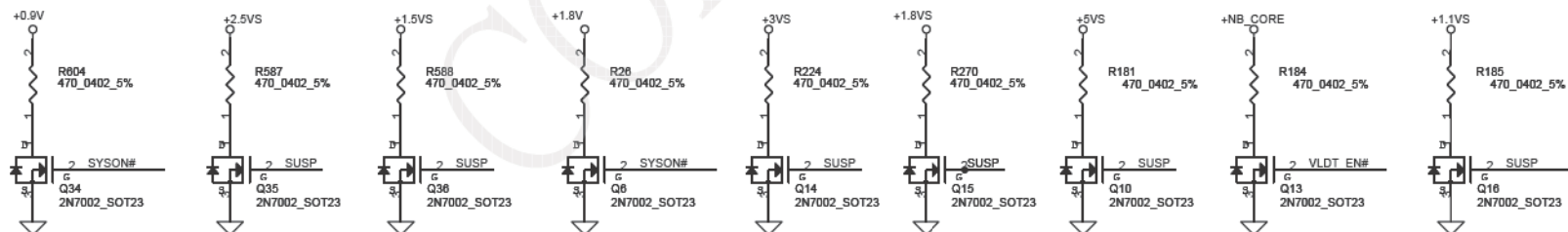
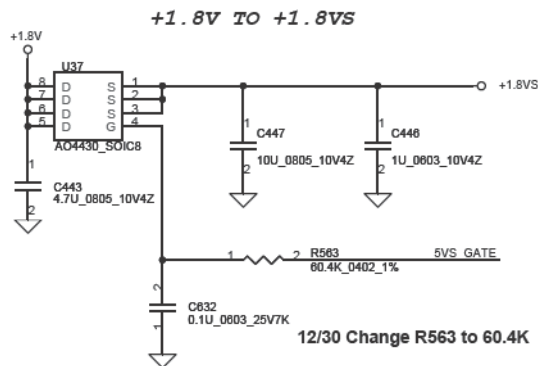
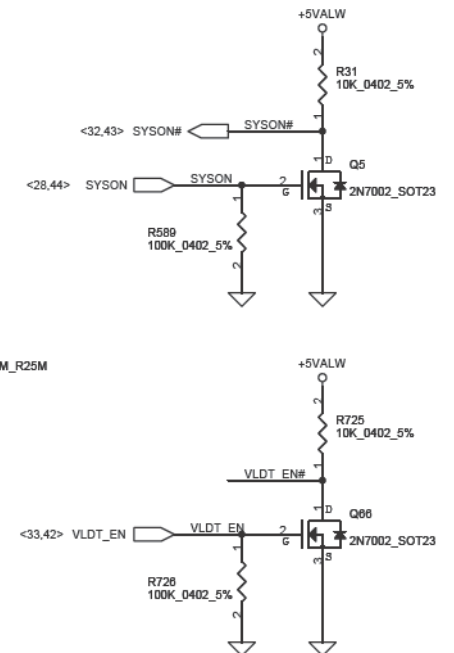
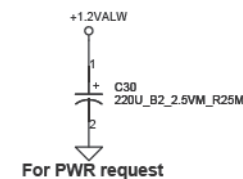
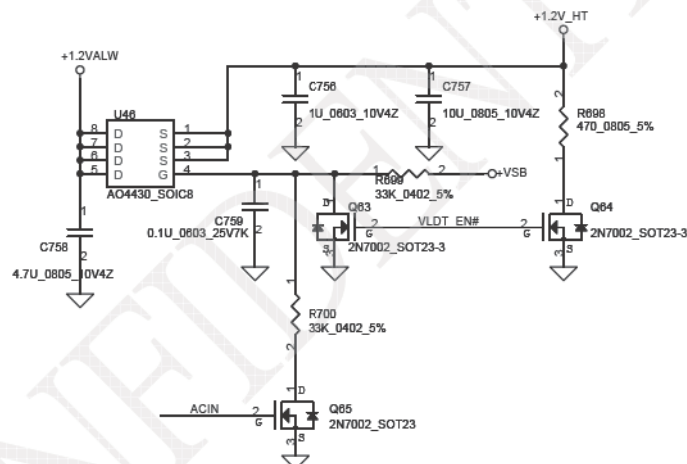
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+5VALW TO +5VS

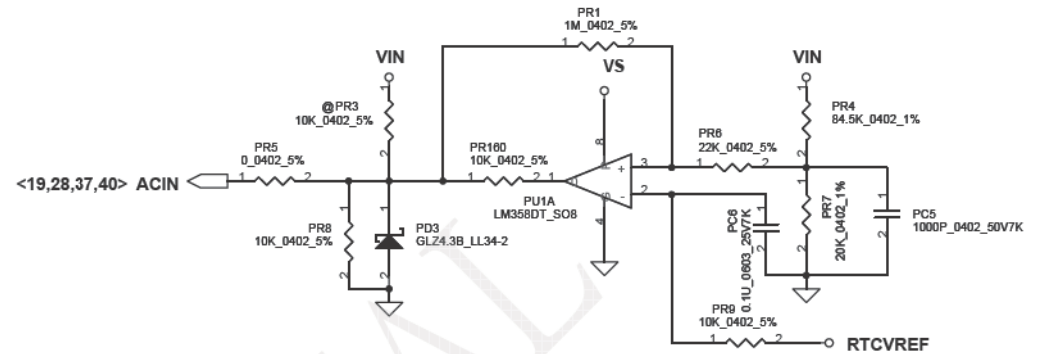
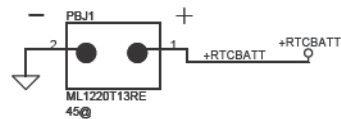
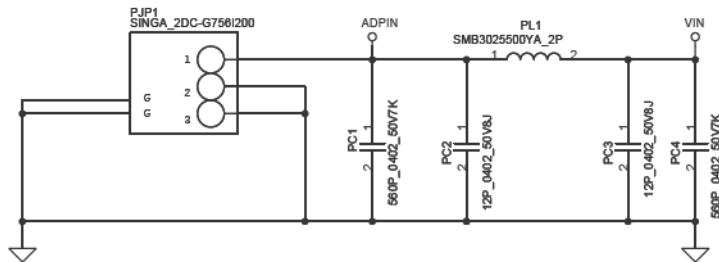


+1.2VALW TO +1.2V_HT

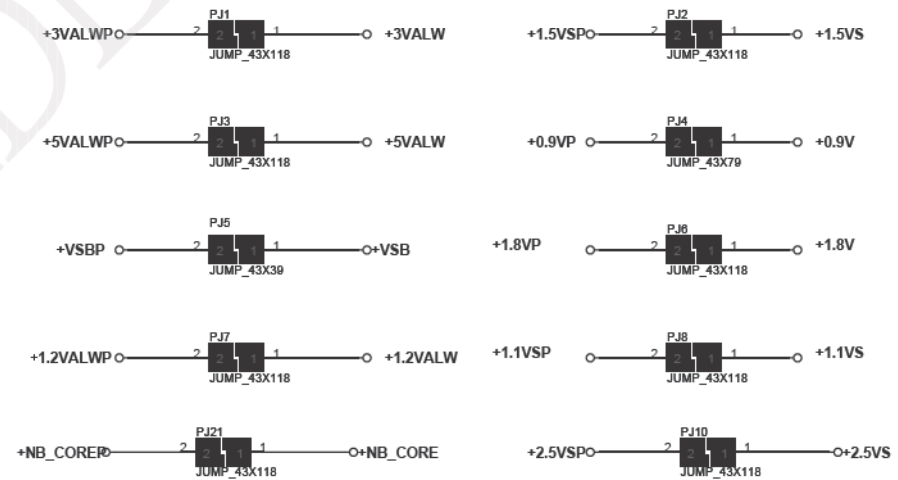
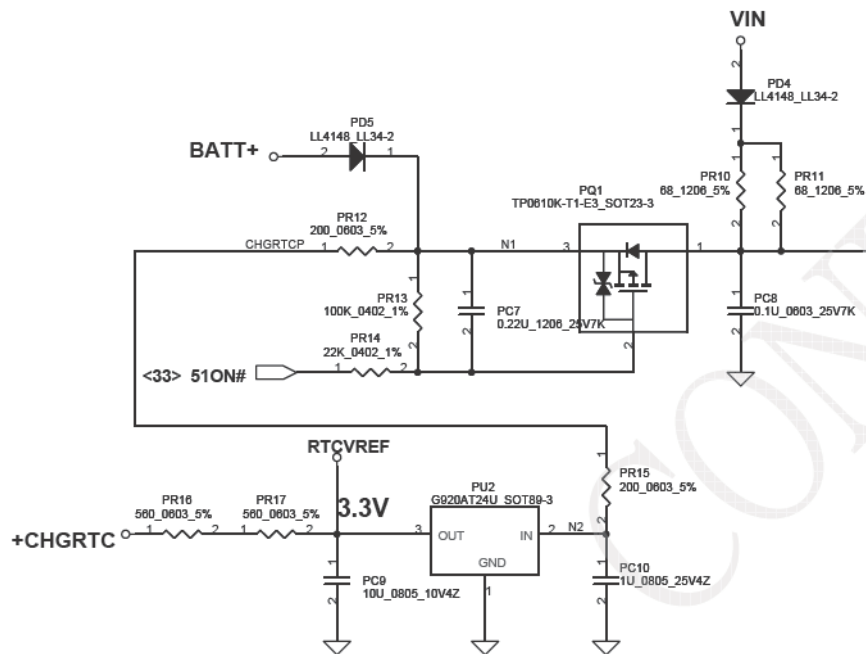


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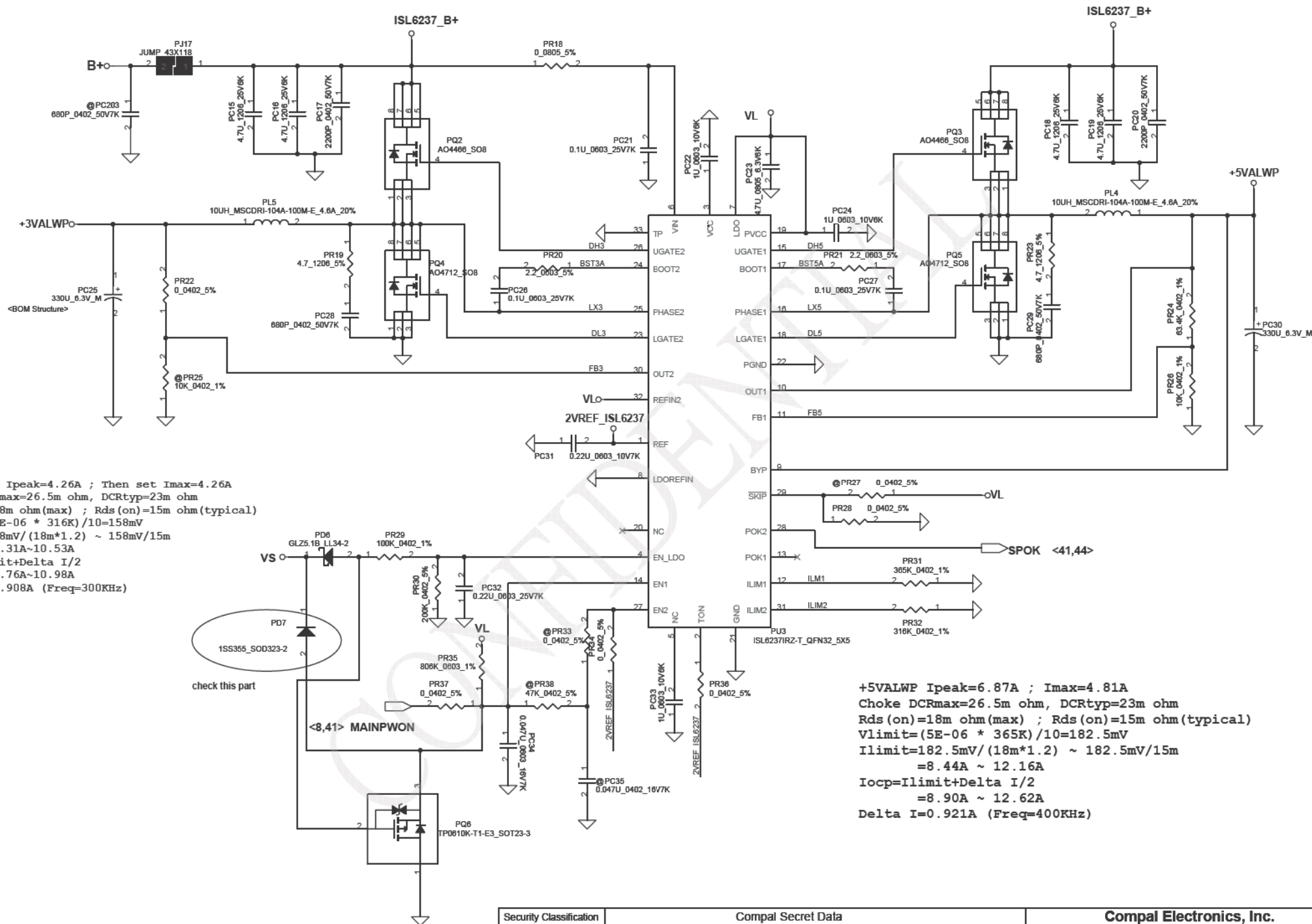
DC231000500



Vin Dectector			
	Min.	Typ	Max.
H-->L	16.976V	17.525V	17.728V
L-->H	17.430V	17.901V	18.384V

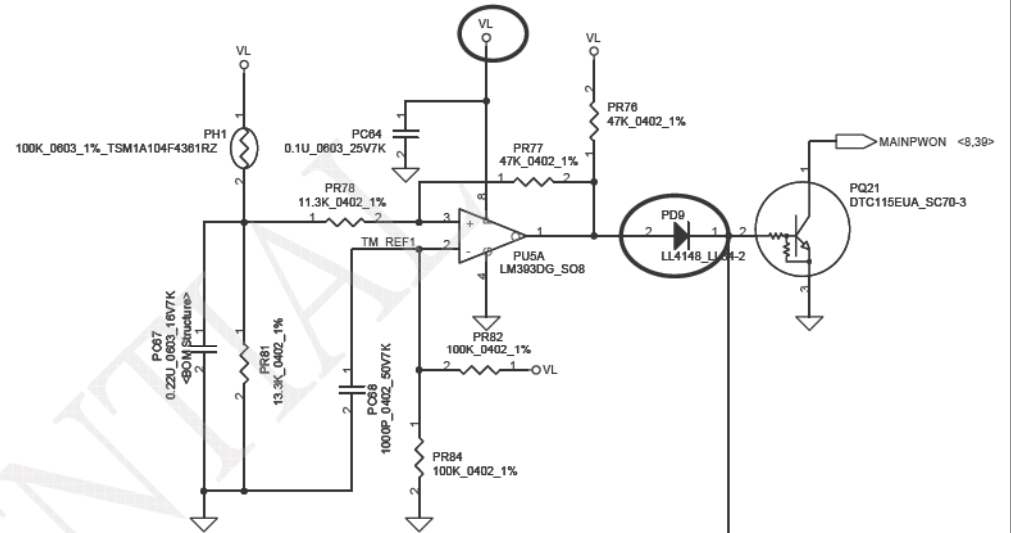


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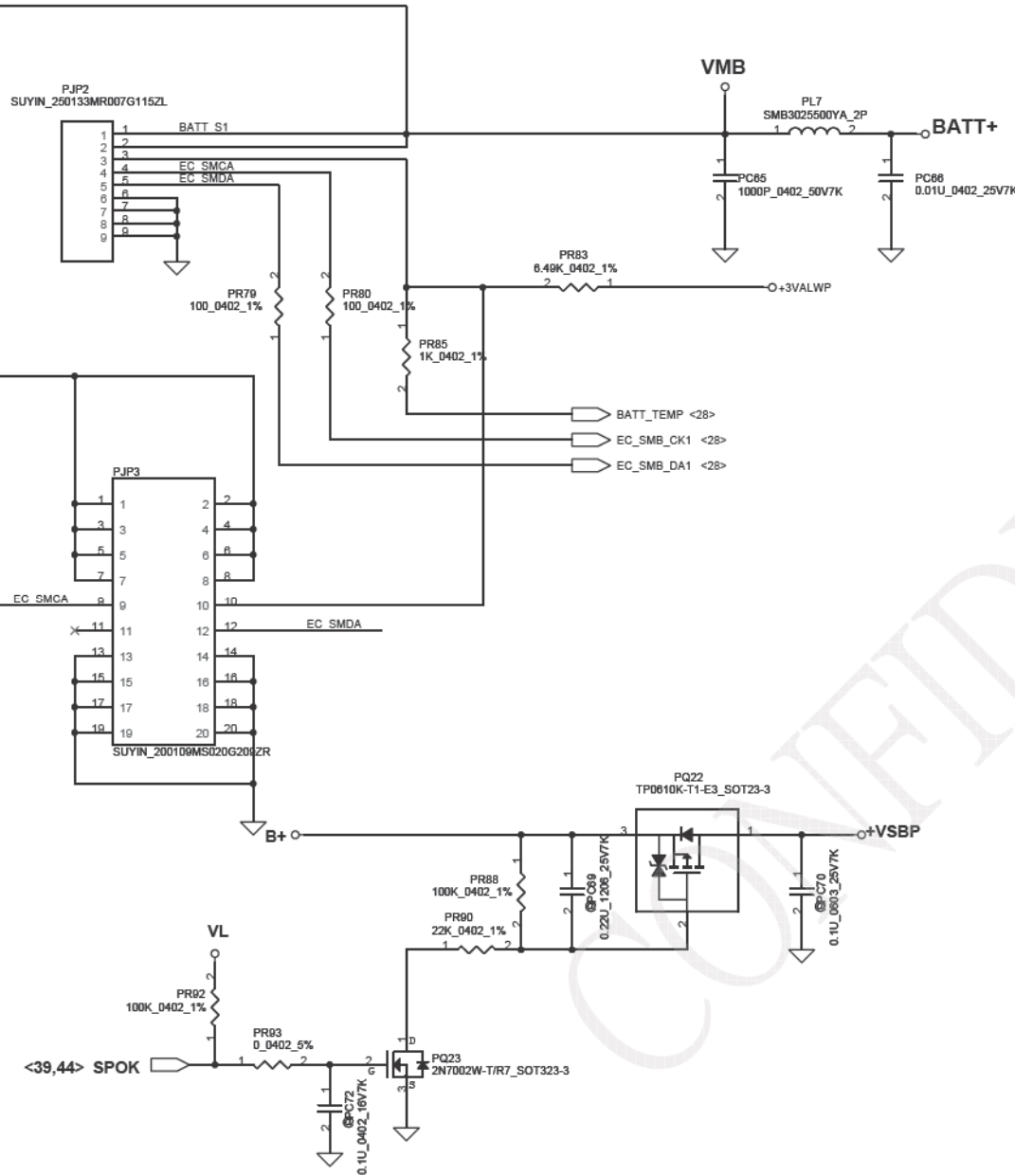
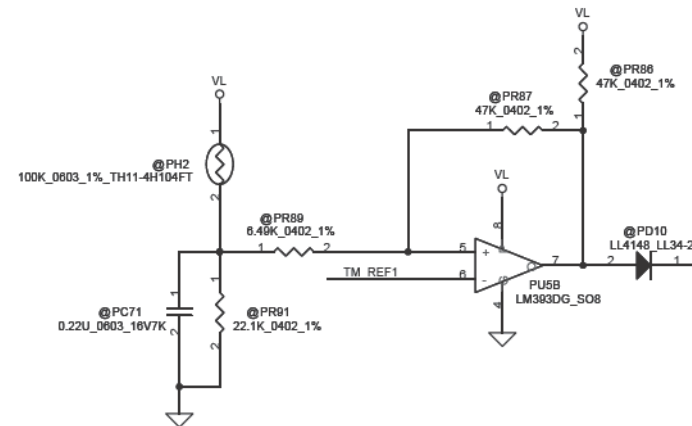


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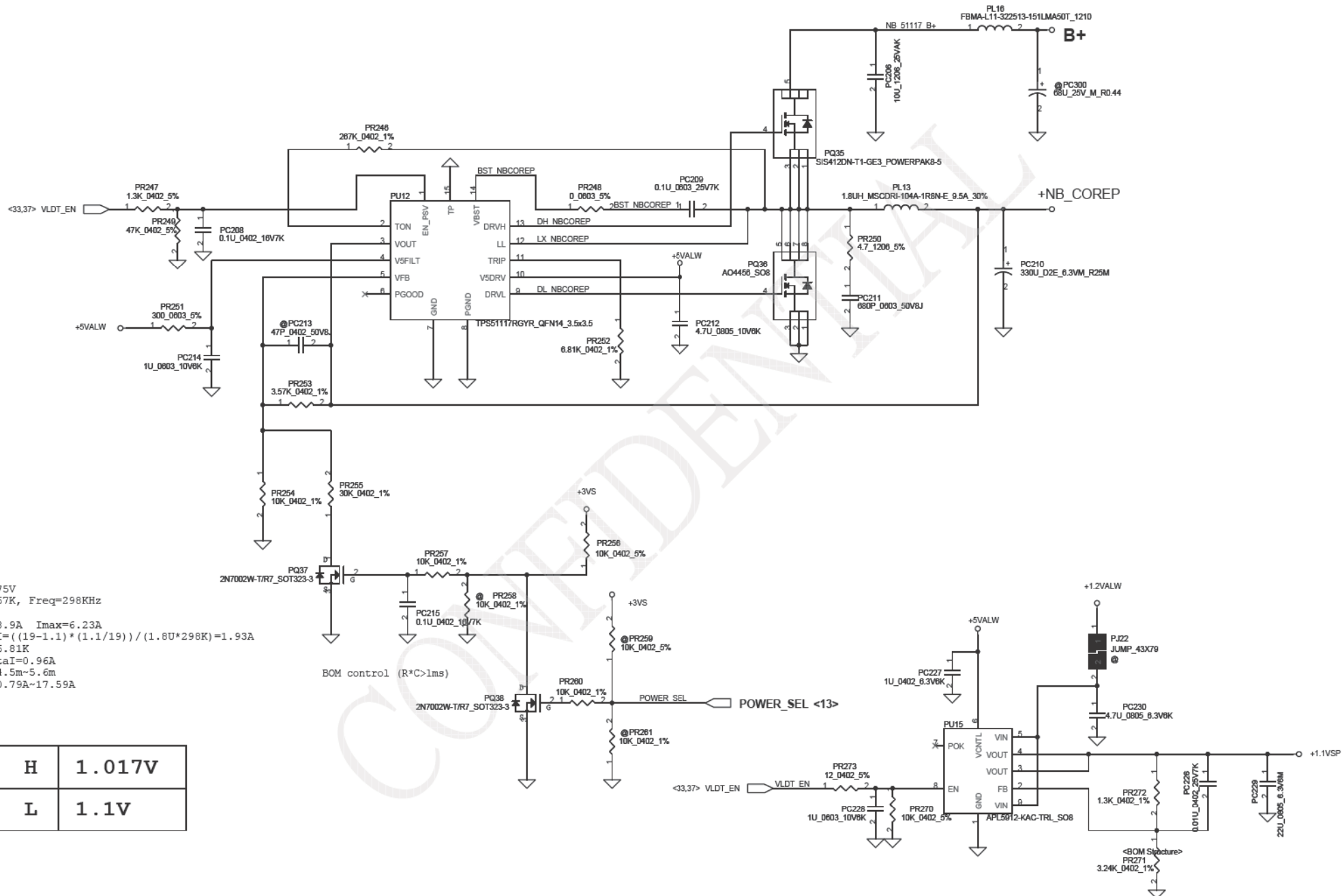
PH1 under CPU botten side :
CPU thermal protection at 92 degree c

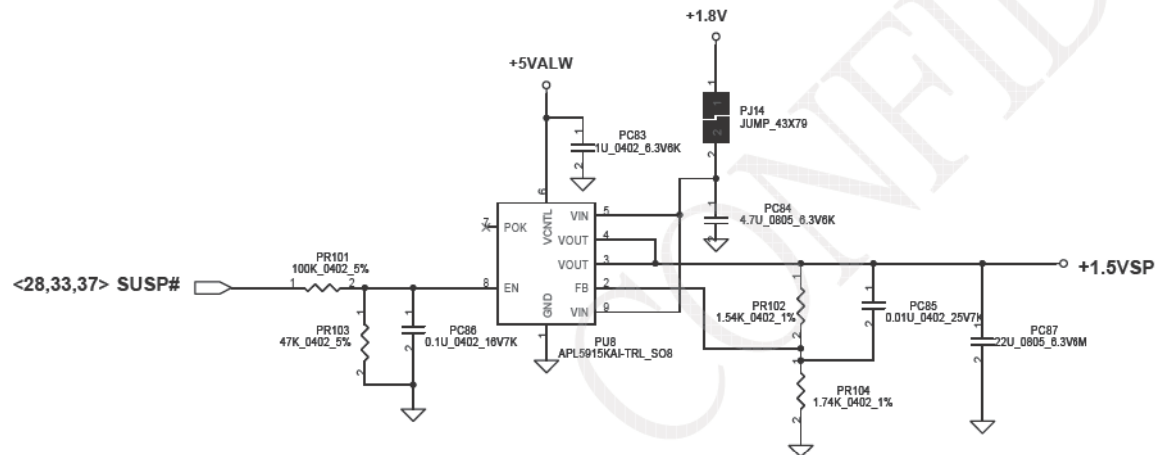
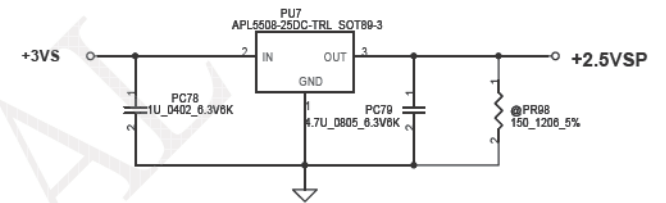
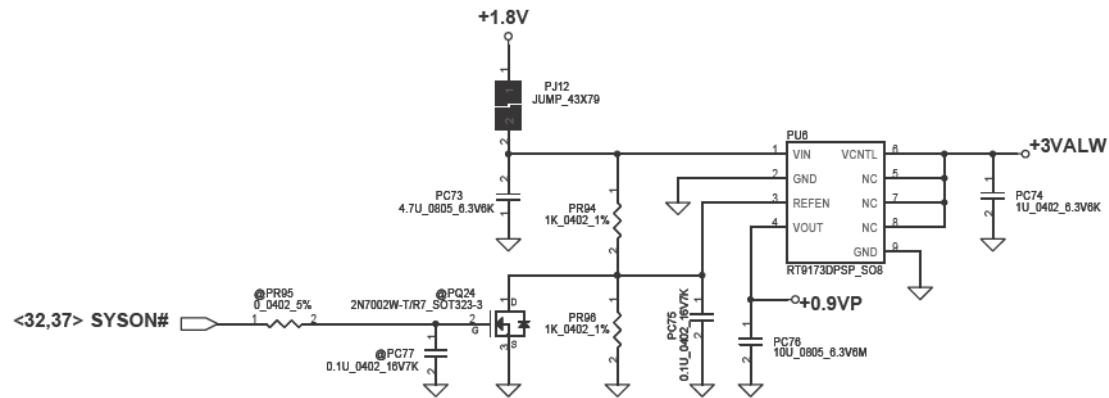


PH2 near main Battery CONN :
BAT. thermal protection at 75 degree c



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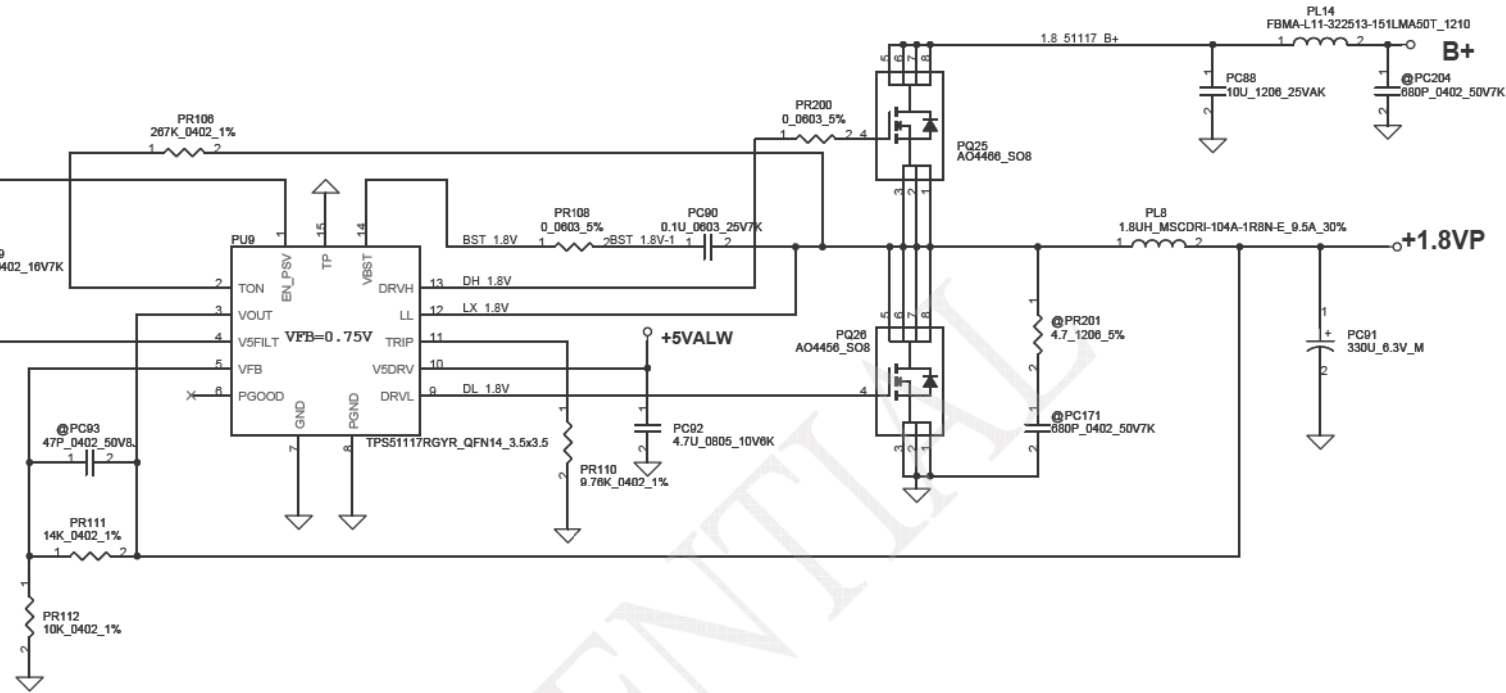


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<28,37> SYSON

VFB=0.75V
 $V_o = VFB * (1 + PR111 / PR112) = 0.75 * (1 + 14K / 10K) = 1.8V$
 $R_{ton} = 267K \Rightarrow F_{sw} = 297KHz$

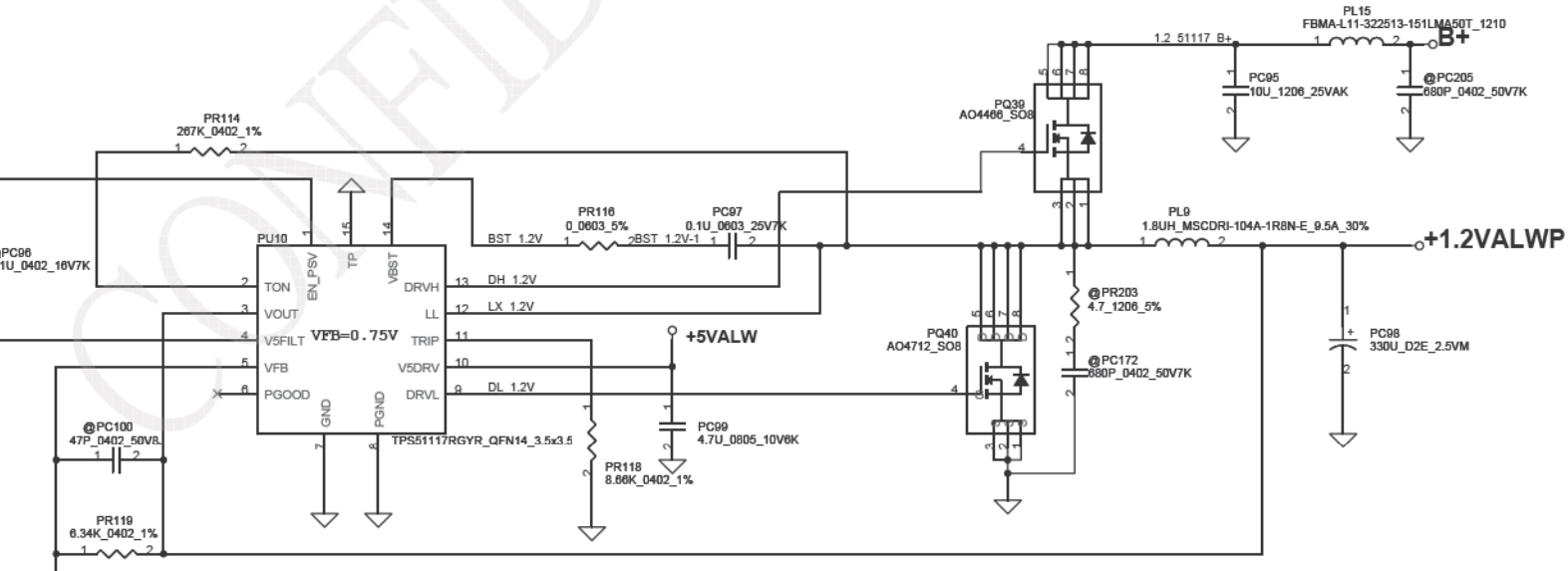
Cout ESR=15m ohm
 $I_{peak} = 11.96A$, $I_{max} = 8.372A$
 $\Delta I = ((19 - 1.8) * (1.8 / 19)) / (L * F_{sw})$
 $((19 - 1.8) * (1.8 / 19)) / (1.8u * 297000) = 3.048A$
 $\Rightarrow 1/2 \Delta I = 1.524A$
 $R_{trip} = 9.76K$
 $I_{ocp} = 15.20A \sim 24.71A$



<39,41> SPOK

VFB=0.75V
 $V_o = VFB * (1 + PR119 / PR120) = 0.75 * (1 + 6.04K / 10K) = 1.203V$
 $R_{ton} = 267K \Rightarrow F_{sw} = 298KHz$

1.2VP $I_{peak} = 7.4A$; $I_{max} = 5.180A$
 $\Delta I = ((19 - 1.2) * (1.2 / 19)) / (L * F_{sw})$
 $((19 - 1.2) * (1.2 / 19)) / (1.8u * 298000) = 2.10A$
 $\Rightarrow 1/2 \Delta I = 1.05A$
 $R_{dson} = 15m / 18m ohm$
 $R_{set} = 8.66K$
 $I_{ocp_min} = 4.77A$
 $I_{ocp_max} = 7.74A$



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