

DR1 (Roberts) Schematics Document

uFCPGA Mobile Penryn

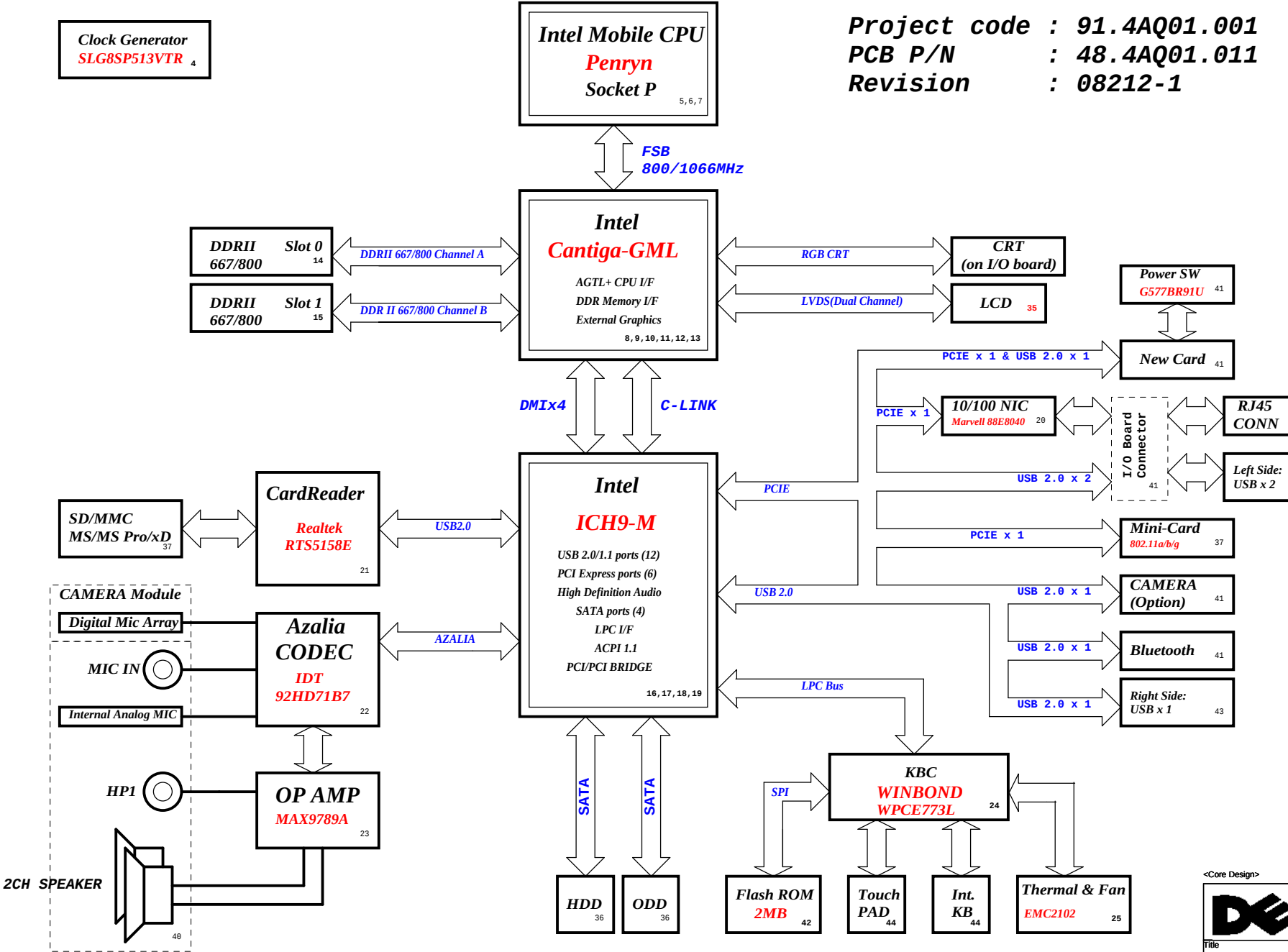
Intel Cantiga-GM + ICH9M

2008-10-02

REV : A00

DY : Nopop Component

Roberts Block Diagram



Project code : 91.4AQ01.001
PCB P/N : 48.4AQ01.011
Revision : 08212-1

CPU DC/DC ISL6266A 28, 29	
INPUTS	OUTPUTS
+PWR_SRC	+VCC_CORE

SYSTEM DC/DC TPS51117 30	
INPUTS	OUTPUTS
+PWR_SRC	+1.05V_VCCP

SYSTEM DC/DC MAX17020 27	
INPUTS	OUTPUTS
+PWR_SRC	+5V_ALW2 +3.3V_RTC_LDO +5V_ALW +3.3V_ALW

SYSTEM DC/DC TPS51116 31	
INPUTS	OUTPUTS
+PWR_SRC	+1.8V_SUS +0.9V_DDR_VTT +V_DDR_MCH_REF

SYSTEM DC/DC APL5912 32	
INPUTS	OUTPUTS
+1.8V_SUS	+1.5V_RUN

SYSTEM DC/DC LDO 34	
INPUTS	OUTPUTS
+5V_ALW +3.3V_ALW	+5V_RUN +3.3V_RUN

MAXIM CHARGER MAX8731A 26	
INPUTS	OUTPUTS
+DC_IN +PBATT	+PWR_SRC

PCB LAYER	
L1: Top	
L2: VCC	
L3: Signal	
L4: Signal	
L5: GND	
L6: Bottom	

<Core Design>

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Title: **Block Diagram**

Size: Custom Document Number: **Roberts** Rev: **A00**

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ICH9M Functional Strap Definitions

ICH9 EDS 642879 Rev.1.5

Signal	Usage/When Sampled	Comment
HDA_SDOU1	XOR Chain Entrance/ PCIE Port Config1 bit1, Rising Edge of PWROK.	Allows entrance to XOR Chain testing when TP3 pulled low. When TP3 not pulled low at rising edge of PWROK, sets bit1 of RPC.PC (Config Registers: offset 224h). This signal has weak internal pull-down.
HDA_SYNC	PCIE config1 bit0, Rising Edge of PWROK.	This signal has a weak internal pull-down. Sets bit0 of PRC.PC (Config Registers: Offset 224h).
GNT2#/ GPIO53	PCIE config2 bit2, Rising Edge of PWROK.	This signal has a weak internal pull-up. Sets bit2 of PRC.PC2 (Config Registers: Offset 224h).
GPIO20	Reserved.	This signal should not be pulled high.
GNT1#/ GPIO51	ESI Strap (Server Only) Rising Edge of PWROK.	ESI compatible mode is for server platforms only. This signal should not be pulled low for desktop and mobile.
GNT3#/ GPIO55	Top-Block Swap override. Rising Edge of PWROK.	Sampled low: Top-Block Swap mode (inverts A16 for all cycles targeting FWH BIOS space). Note: Software will not be able to clear the Top-Swap bit until the system is rebooted without GNT3# being pulled down.
GNT0#: SPI_CS1#/ GPIO58	Boot BIOS Destination Selection 0:1. Rising Edge of PWROK.	Controllable via Boot BIOS Destination bit (Config Registers: Offset 3410h:bit 11:10). GNT0# is MSB, 01-SPI, 10-PCI, 11-LPC
SPI_MOSI	Integrated TPM Enable, Rising Edge of CLPWROK	Sample low: the Integrated TPM will be disable. Sample high: the MCH TPM enable strap is sampled low and the TPM Disable bit is clear, the Integrated TPM will be enable.
GPIO49	DMI Termination Voltage. Rising Edge of CLPWROK.	The signal is required to be low for desktop applications and required to be high for mobile applications.
SATALED#	PCI Express Lane Reversal. Rising Edge of PWROK.	Signal has weak internal pull-up. Sets bit 27 of MPC.LR (Device 28: Function 0:Offset D8).
SPKR	No Reboot. Rising Edge of PWROK.	If sampled high, the system is strapped to the "No Reboot" mode (ICH9 will disable the TCO Timer system reboot feature). The status is readable via the NO REBOOT bit.
TP3	XOR Chain Entrance. Rising Edge of PWROK.	This signal should not be pull low unless using XOR Chain testing.
GPIO33/ HDA_DOCK _EN#	Flash Descriptor Security Override Strap. Rising Edge of PWROK.	Sampled low: the Flash Descriptor Security will be overridden. If high, the security measures will be in effect. This should only be enabled in manufacturing environments using an external pull-up resistor.

ICH9 Integrated pull-up and pull-down Resistors

ICH9 EDS 642879 Rev.1.5

SIGNAL	Resistor Type/Value
CL_CLK[1:0]	PULL-UP 20K
CL_DATA[1:0]	PULL-UP 20K
CL_RST0#	PULL-UP 20K
DPRSLLPVR/GPIO16	PULL-DOWN 20K
ENERGY_DETECT	PULL-UP 20K
HDA_BIT_CLK	PULL-DOWN 20K
HDA_DOCK_EN#/GPIO33	PULL-UP 20K
HDA_RST#	PULL-DOWN 20K
HDA_SDIN[3:0]	PULL-DOWN 20K
HDA_SDOU1	PULL-DOWN 20K
HDA_SYNC	PULL-DOWN 20K
GLAN_DOCK#	The pull-up or pull-down active when configured for native GLAN_DOCK# functionality and determined by LAN controller.
GNT[3:0]#/GPIO[55,53,51]	PULL-UP 20K
GPIO20	PULL-DOWN 20K
GPIO49	PULL-UP 20K
LDA[3:0]#/FWH[3:0]#	PULL-UP 20K
LAN_RXD[2:0]	PULL-UP 20K
LDRQ[0]	PULL-UP 20K
LDRQ[1]/GPIO23	PULL-UP 20K
PME#	PULL-UP 20K
PWRBTN#	PULL-UP 20K
SATALED#	PULL-UP 15K
SPI_CS1#/GPIO58/CLGPIO6	PULL-UP 20K
SPI_MOSI	PULL-DOWN 20K
SPI_MISO	PULL-UP 20K
SPKR	PULL-DOWN 20K
TACH_[3:0]	PULL-UP 20K
TP[3]	PULL-UP 20K
USB[11:0][P,N]	PULL-DOWN 15K

Cantiga chipset and ICH9M I/O controller Hub strapping configuration

Montevina Platform Design guide 22339 Rev.0.5

Pin Name	Strap Description	Configuration
CFG[2:0]	FSB Frequency Select	000 = FSB1067 011 = FSB867 010 = FSB800 others = Reserved
CFG[4:3] CFG8 CFG[15:14] CFG[18:17]	Reserved	
CFG5	DMI x2 Select	0 = DMI x2 1 = DMI x4 (Default)
CFG6	iTPM Host Interface	0 = The iTPM Host Interface is enabled (Note 2) 1 = The iTPM Host Interface is disabled (default)
CFG7	Intel Management engine crypto strap	0 = Transport Layer Security (TLS) cipher suite with no confidentiality 1 = TLS cipher suite with confidentiality(Default)
CFG9	PCIE Graphics Lane	0 = Reserved Lanes, 15->0, 14->1 ect.. 1 = Normal operation (Default): Lane Numbered in Order
CFG10	PCIE Loopback enable	0 = Enable (Note 3) 1 = Disable (Default)
CFG[13:12]	XOR/ALL	00 = Reserve 10 = XOR mode Enabled 01 = ALLZ mode Enable (Note 3) 11 = Disabled (Default)
CFG16	FSB Dynamic ODT	0 = Dynamic ODT Disabled 1 = Dynamic ODT Enabled (Default)
CFG19	DMI Lane Reversal	0 = Normal operation (Default): Lane Numbered in Order 1 = Reverse Lanes DMI x4 mode [MCH->ICH]: {3->0, 2->1, 1->2 and 0->3 DMI x2 mode [MCH->ICH]: {3->0, 2->1}
CFG20	Digital Display Port (SDVO/DP/iHDMI) Concurrent with PCIE	0 = Only Digital Display Port or PCIE is operational (Default) 1 = Digital display Port and PCIE are operating simultaneously via the PEG port
SDVO _CTRLDATA	SDVO Present	0 = No SDVO Card Present (Default) 1 = SDVO Card Present
L_DDC_DATA	Local Flat Panel (LFP) Present	0 = LFP Disabled (Default) 1 = LFP Card Present; PCIE disabled

NOTE:

- All strap signals are sampled with respect to the leading edge of the (G)MCH Power OK (PWROK) signal.
- iTPM can be disabled by a 'Soft-Strap' option in the Flash-decriptor section of the Firmware. This 'Soft-Strap' is activated only after enabling iTPM via CFG6. Only one of the CFG10/CFG12/CFG13 straps can be enabled at any time.

PCIE Routing

LANE2	MiniCard WLAN
LANE3	LAN
LANE5	New Card

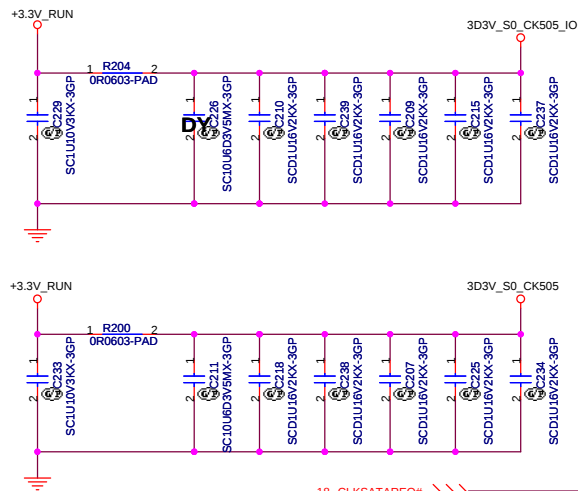
USB Table

USB	
Pair	Device
0	USB1
1	USB2
2	USB3
3	RESERVED
4	MINI CARD
5	RESERVED
6	BLUETOOTH
7	NEW CARD
8	RESERVED
9	RESERVED
10	Card Reader
11	CAMERA

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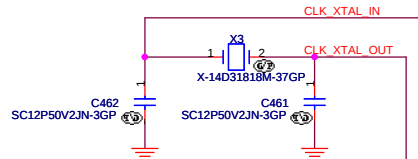
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SSID = CLOCK



18 CLK_SATAREQ# >>>
9 CLKREQ#_B >>>
37 PCLK_FWH >>>
24 PCLK_KBC >>>
16 CLK_PCI_ICH >>>

18 CLK_14M_ICH <<<



21 CLK_48M_CARD <<< R217 1 22R2J-2-GP
18 CLK_48M_ICH <<< R216 1 22R2J-2-GP

18 H_STP_PCI# >>>
18 H_STP_CPU# >>>
14,15,18 ICH_SMBCLK >>>
14,15,18 ICH_SMBDATA >>>
18 CK_PWRGD >>>

18 CLK_SATAREQ# >>>
9 CLKREQ#_B >>>
37 PCLK_FWH >>>
24 PCLK_KBC >>>
16 CLK_PCI_ICH >>>

18 CLK_14M_ICH <<<

18 CLK_14M_ICH <<<

18 CLK_14M_ICH <<<

18 CLK_14M_ICH <<<

18 CLK_14M_ICH <<<

18 CLK_14M_ICH <<<

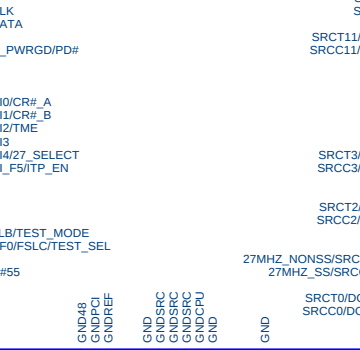
18 CLK_14M_ICH <<<

18 CLK_14M_ICH <<<

18 CLK_14M_ICH <<<

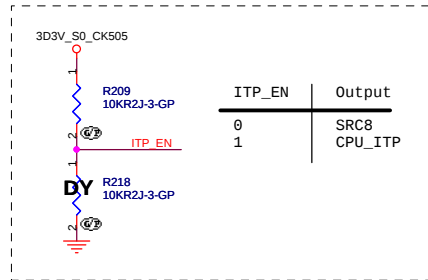
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ICS9LPRS355BKLFT-GP-U

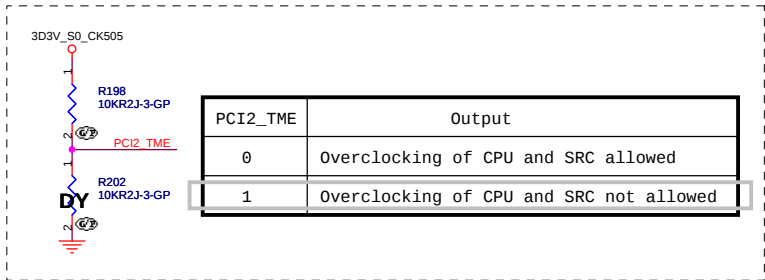


Main source: 71.08513.003 (SLG8SP513VTR)
2nd source: 71.00875.C03 (RTM875N-606-VD-GR7)
3rd source:

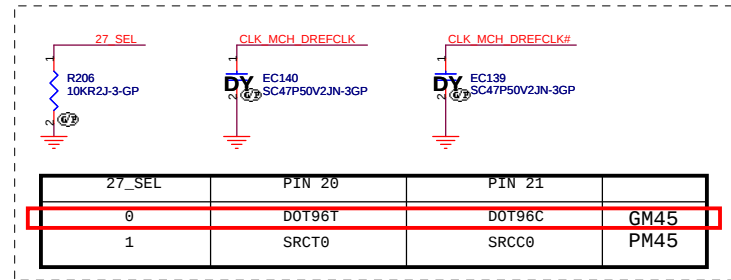
Co-layout Ref: 71.09355.B03 (ICS9LPRS355BKLFT)



ITP_EN	Output
0	SRC8
1	CPU_ITP

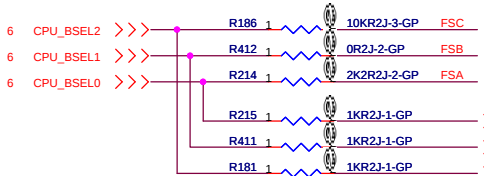


PCI2_TME	Output
0	Overclocking of CPU and SRC allowed
1	Overclocking of CPU and SRC not allowed

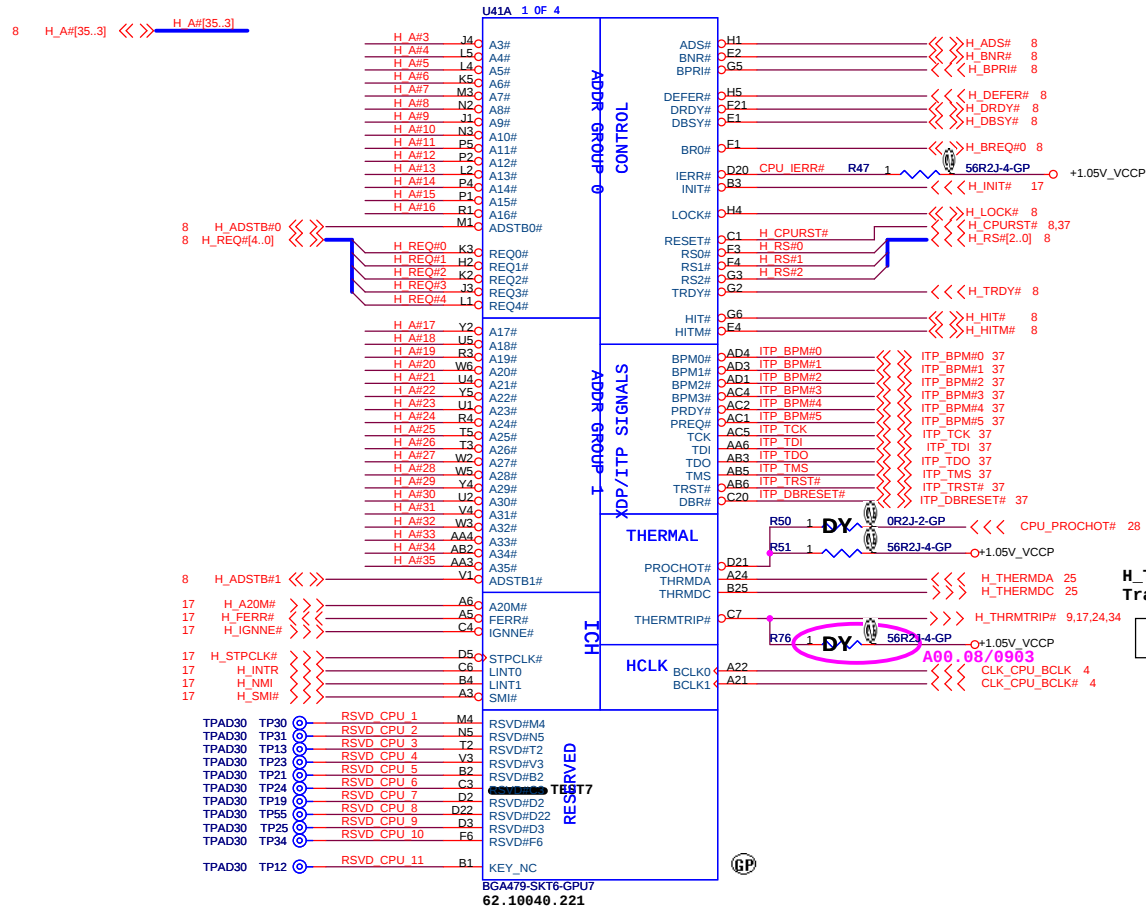


27_SEL	PIN 20	PIN 21	
0	DOT96T	DOT96C	GM45
1	SRCT0	SRCC0	PM45

SEL2 FSC	SEL1 FSB	SEL0 FSA	CPU	FSB
1	0	1	100M	X
0	0	1	133M	533M
0	1	1	166M	667M
0	1	0	200M	800M
0	0	0	266M	1067M

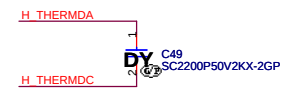


SSID = CPU



H_THERMDA, H_THERMDC routing together,
Trace width / Spacing = 10 / 10 mil

H_THRMTRIP# should connect to
ICH9 and MCH without T-ing.

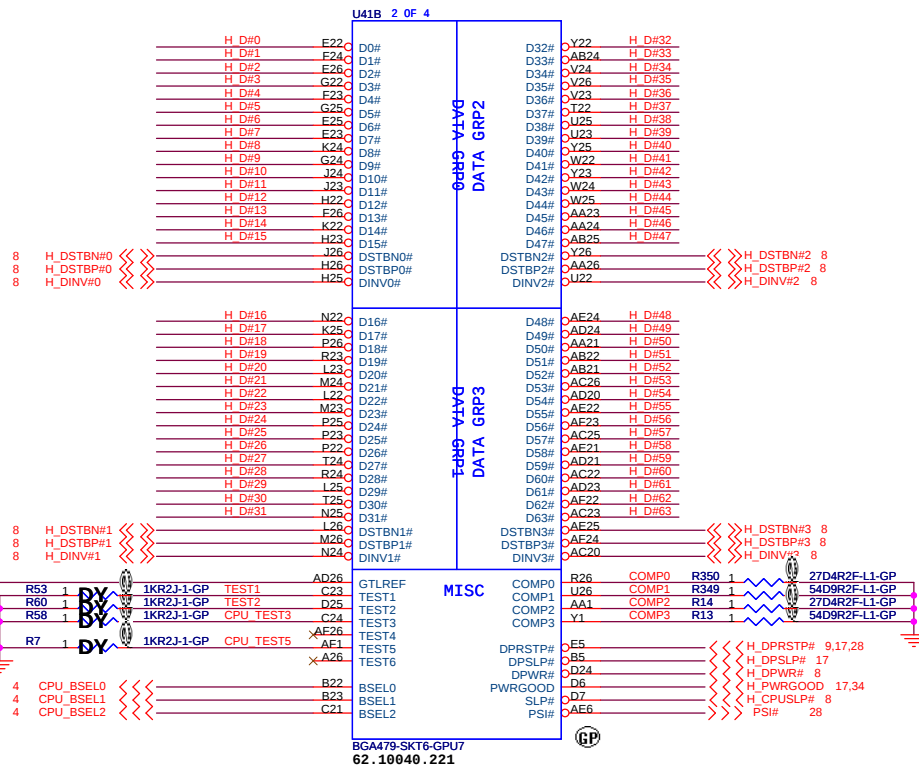
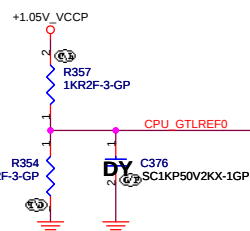


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SSID = CPU

H_DINV#[3..0] << >> H_DINV#[3..0] 8
H_DSTBN#[3..0] << >> H_DSTBN#[3..0] 8
H_DSTBP#[3..0] << >> H_DSTBP#[3..0] 8
H_D#[63..0] << >> H_D#[63..0] 8

Layout notes
Z= 55 Ohm 0.5" MAX for CPU_GTLREF0



Layout Note:
Comp0, 2 connect with Zo=27.4 ohm, make trace length shorter than 0.5".
Comp1, 3 connect with Zo=55 ohm, make trace length shorter than 0.5".

Route the CPU_TEST3 and CPU_TEST5 signals through a ground referenced Zo = 55-ohm trace that ends in a via that is near a GND via and is accessible through an oscilloscope connection.

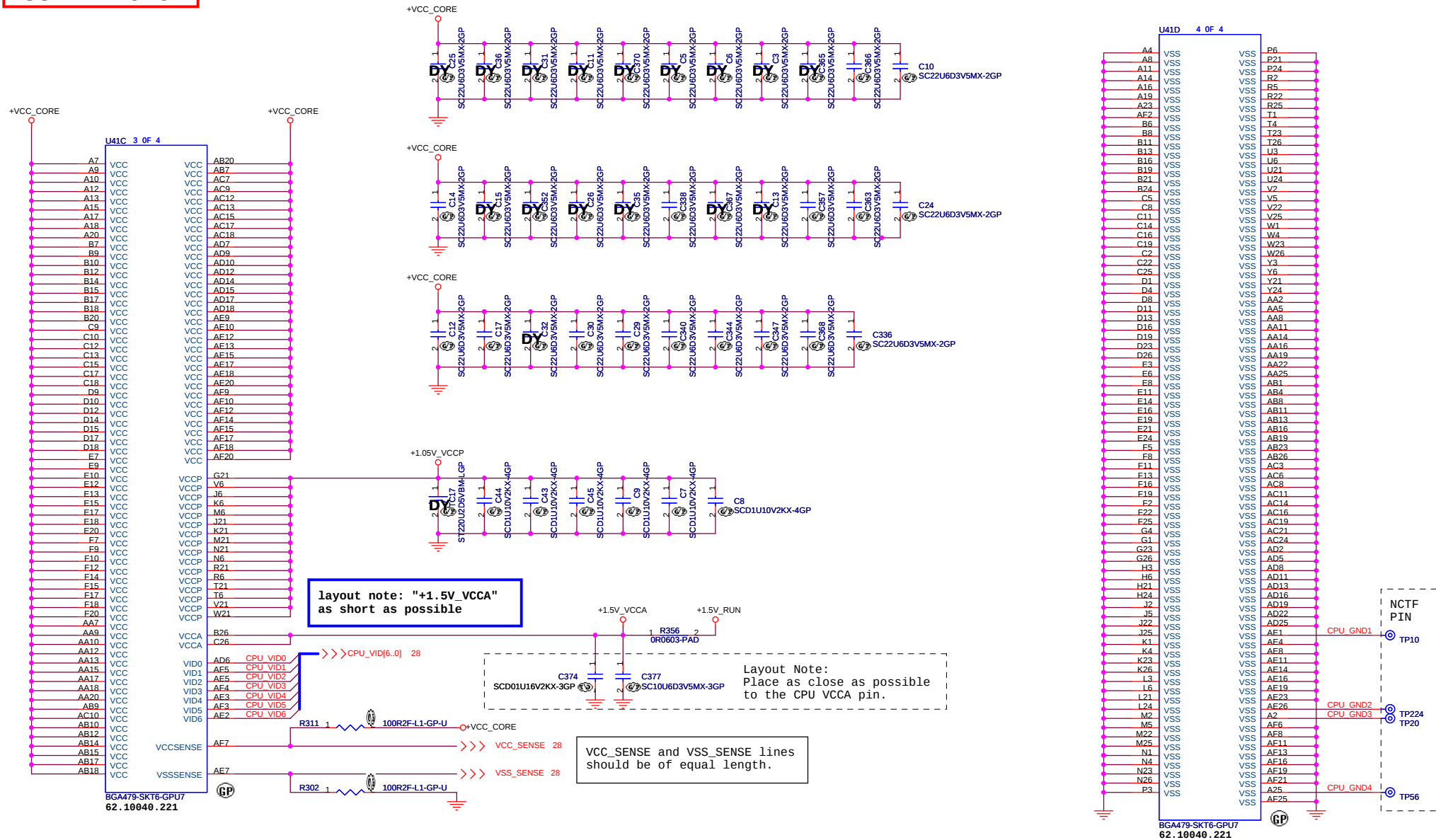
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SSID = CPU

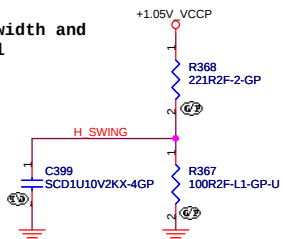


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SSID = MCH

H_SWING routing Trace width and Spacing use 10 / 20 mil

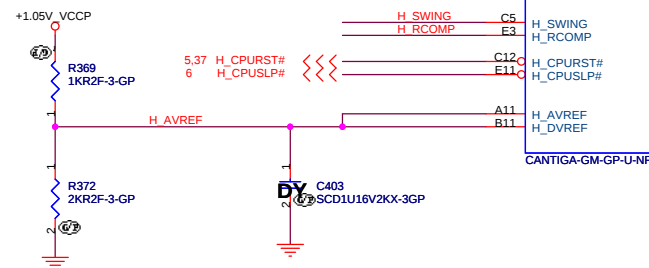
H_SWING Resistors and Capacitors close MCH 500 mil (MAX)



H_RCOMP routing Trace width and Spacing use 10 / 20 mil



Place R51 near to the chip (< 0.5")



U52A

1 OF 10

H_A#35.3]

H_A#35.3]

HOST

<Core Design>



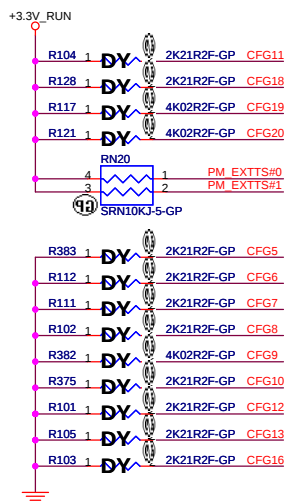
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Title		Cantiga-HOST(1/6)		Rev	A00
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SSID = MCH

* is current setting

CFG Strap	Low	High
CFG 5	DMI X 2	DMI X 4 *
CFG 6	ITPM enable	ITPM disable *
CFG 7	TLS cipher suite with no confidentiality	TLS cipher suite with confidentiality *
CFG 9	PCIE GFX lane reversed	PCIE GFX lane numbered in order *
CFG 10	PCIE loopback enable	PCIE loopback disable *
CFG 12	ALLZ mode enable	ALLZ mode disable *
CFG 13	XOR mode enable	XOR mode disable *
CFG 16	FSB dynamic ODT disable	FSB Dynamic ODT enable *
CFG 19	Normal operation *	Reverse DMI lanes
CFG 20	Only PCIE or SDVO is operational *	PCIE and SDVO are operating simultaneously via the PEG port
SDVO_CTRLDATA	SDVO interface disable*	SDVO interface enable
L_DDC_DATA	LFP disable *	LFP card present
DDPC_CTRLDATA	SDVO/iHDMI/DP interface disabled	SDVO/iHDMI/DP interface enabled



FSB setting

4 MCH_CLKSEL0
4 MCH_CLKSEL1
4 MCH_CLKSEL2

TP86
TP88

TP84
TP85

TP87

18,24,25 PM_PWROK >>>
16,20,21,24,37,41 PLT_RST# >>>
5,17,24,34 H_THRMTRIP#
18,28 DPRSLPVR

R94

100R2F-L1-GP-U

C94

SC100P50V2JN-3GP

TP271

CLKREQ# B

10KR2F-3-GP

10KR2F-3-GP

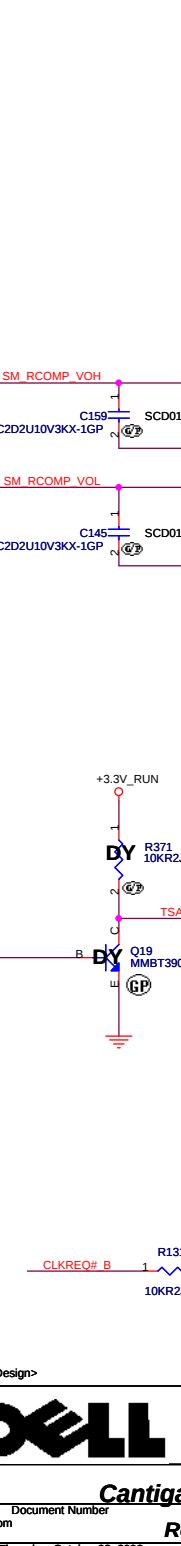
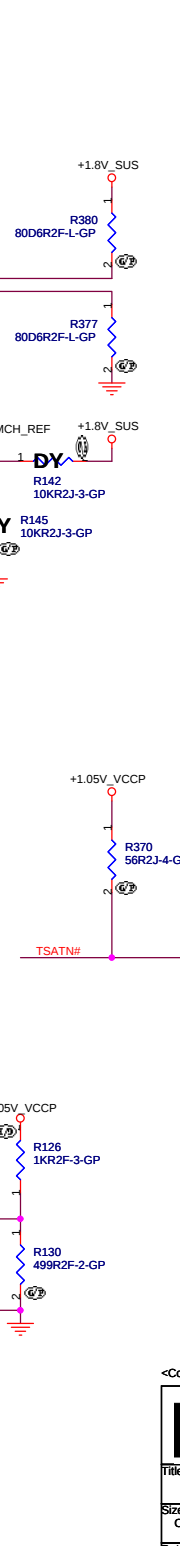
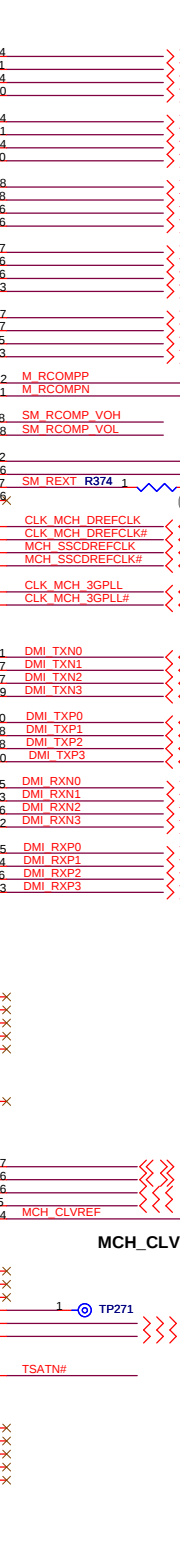
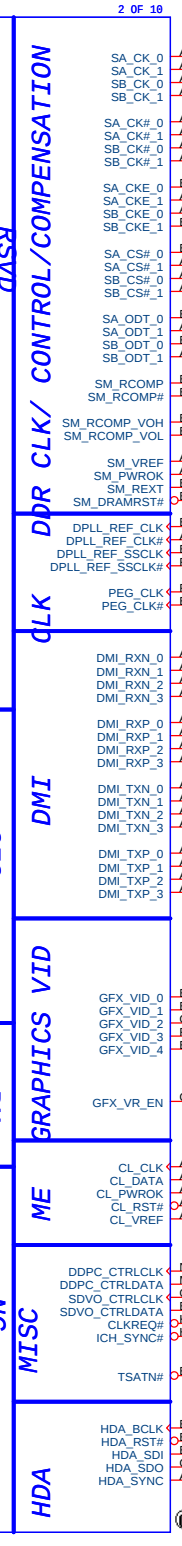
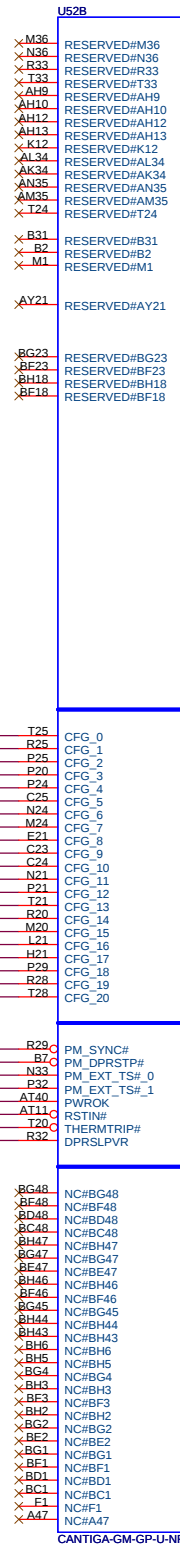
10KR2F-3-GP

10KR2F-3-GP

10KR2F-3-GP

10KR2F-3-GP

10KR2F-3-GP



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DDR SYSTEM MEMORY A

DDR SYSTEM MEMORY B

Cantiga-GM-GP-U-NF

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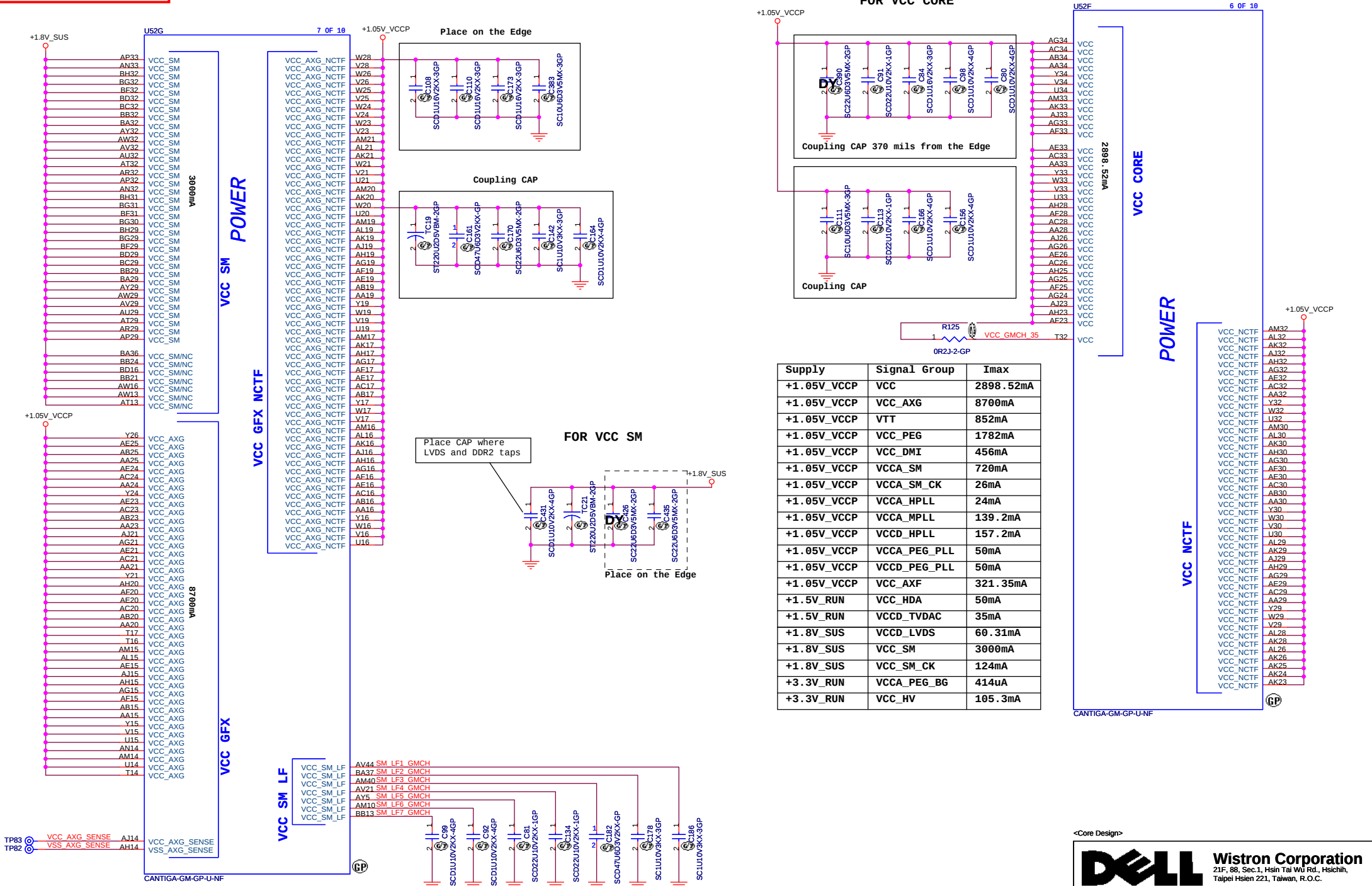
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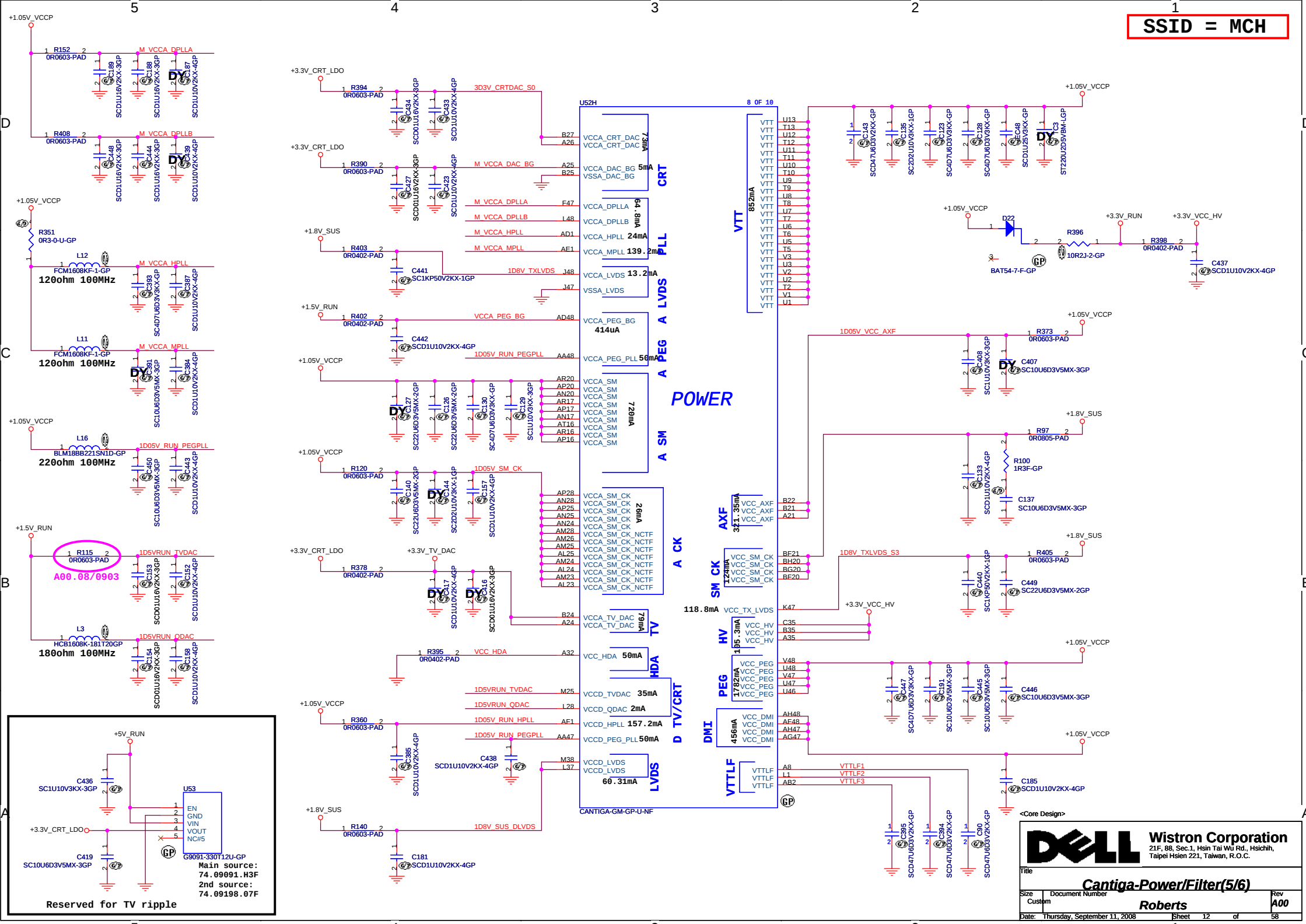
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SSID = MCH



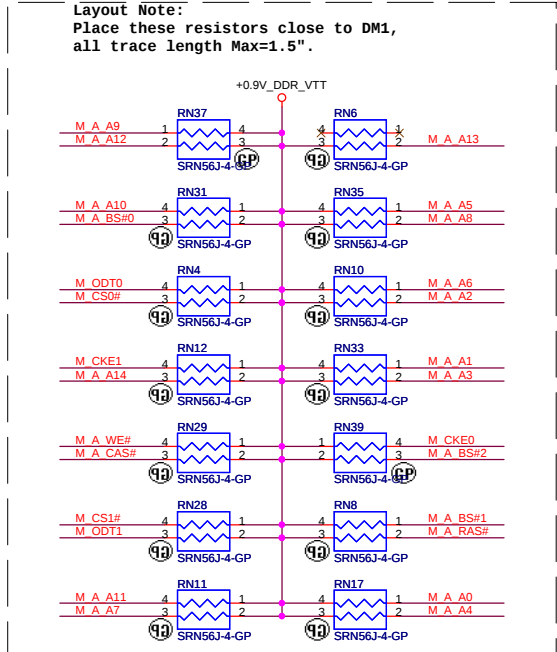
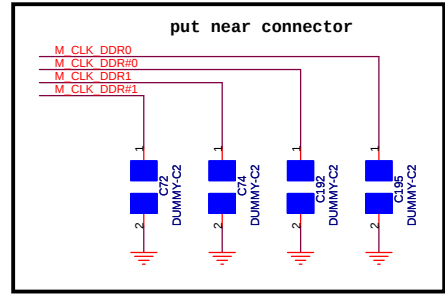
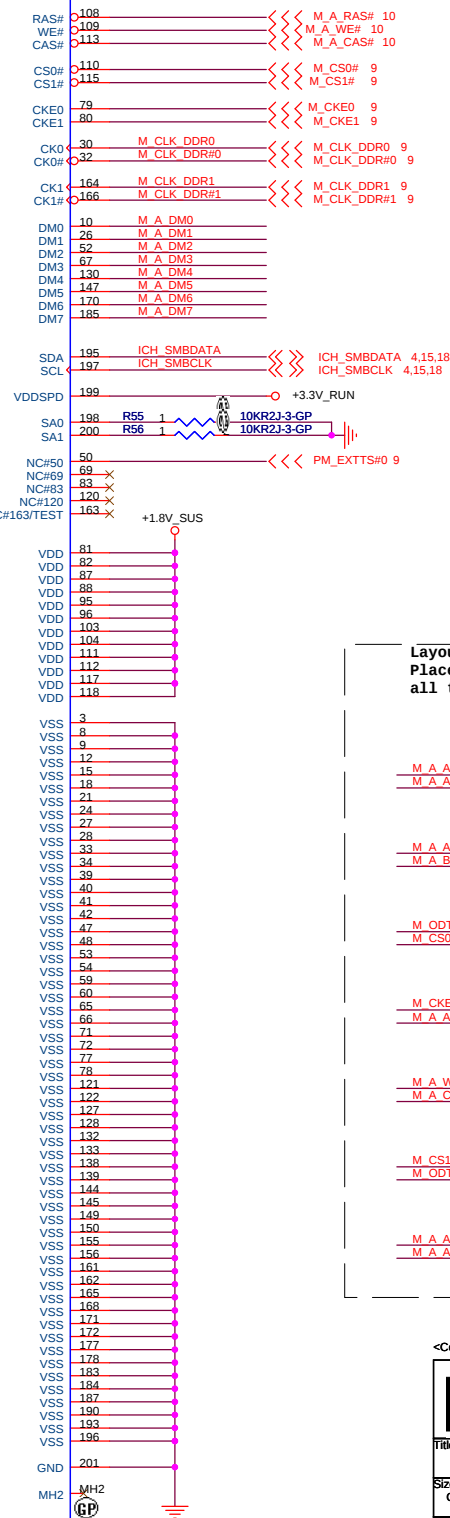
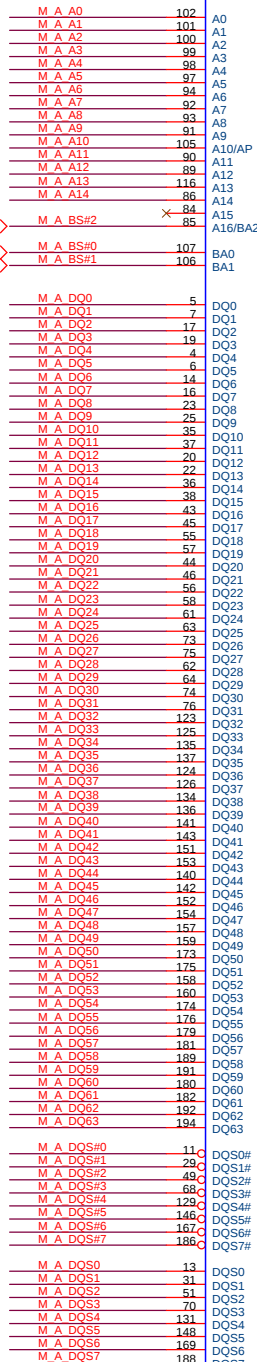
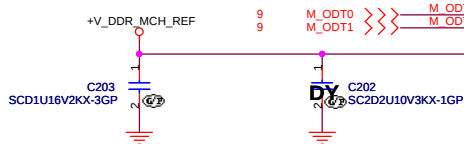
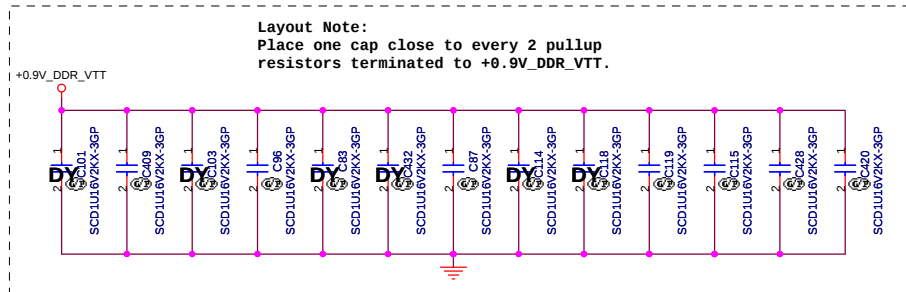
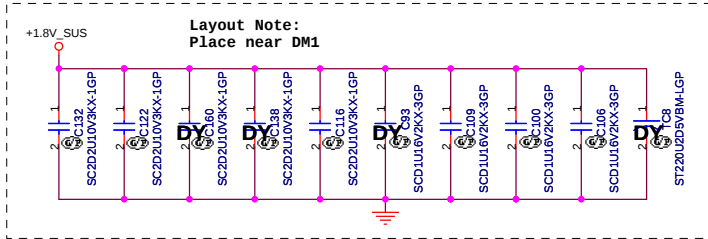


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SSID = MCH

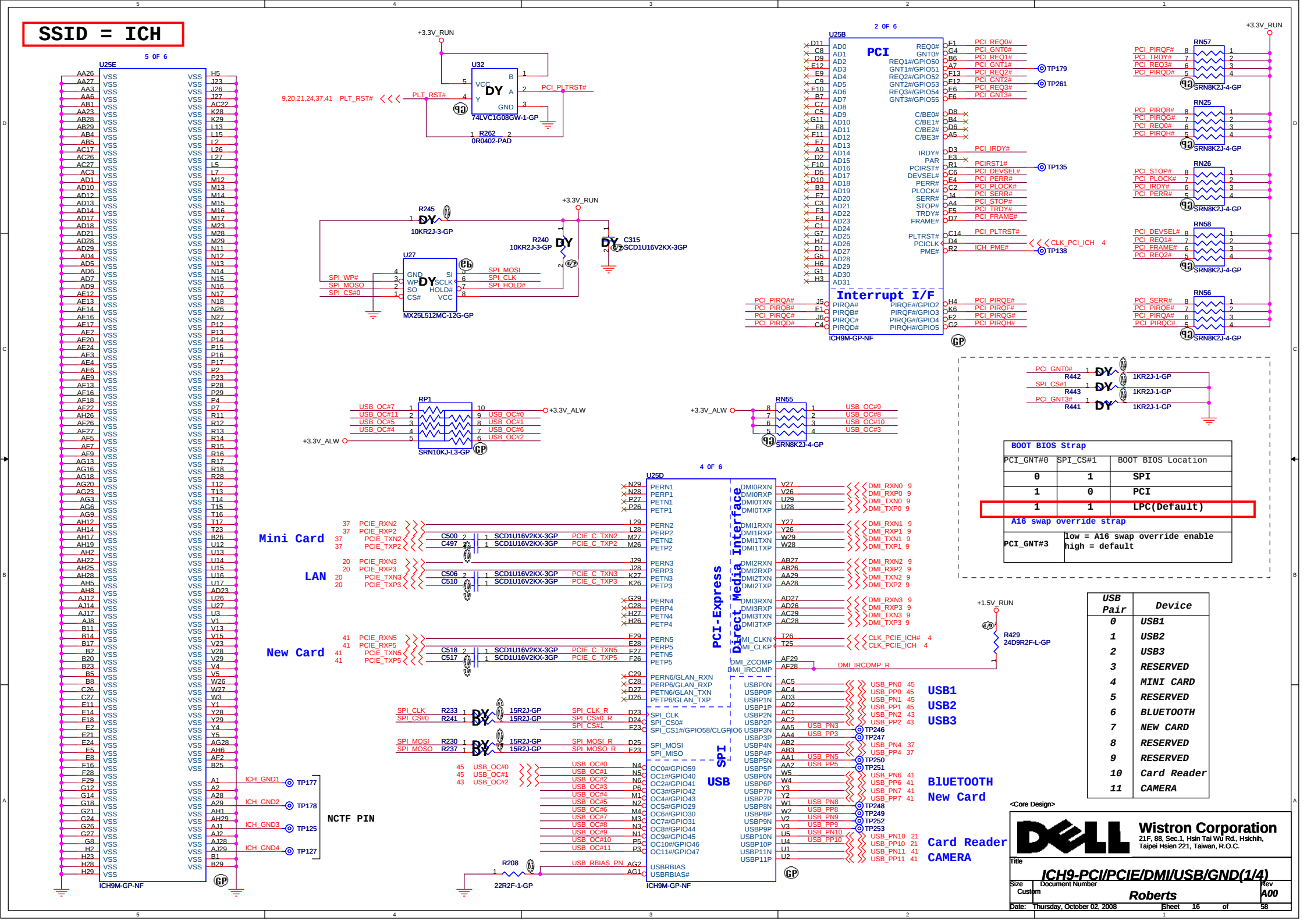


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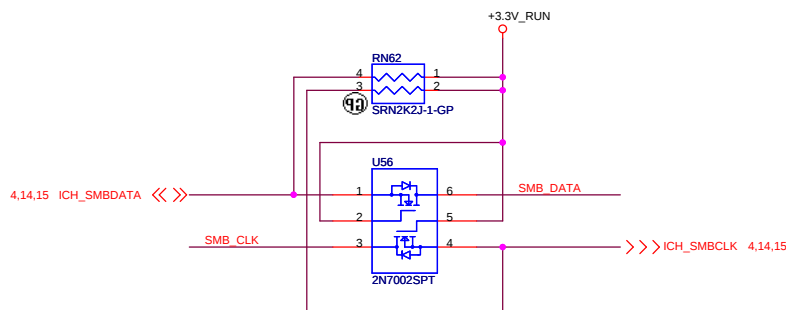
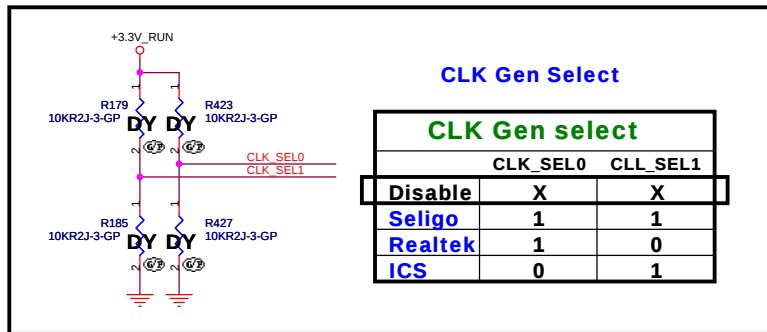
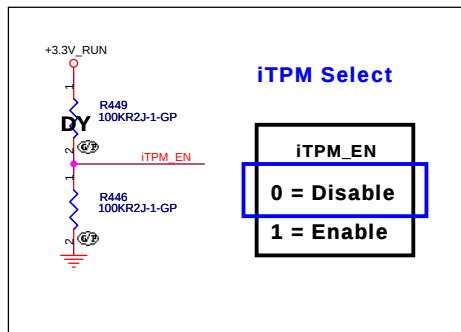
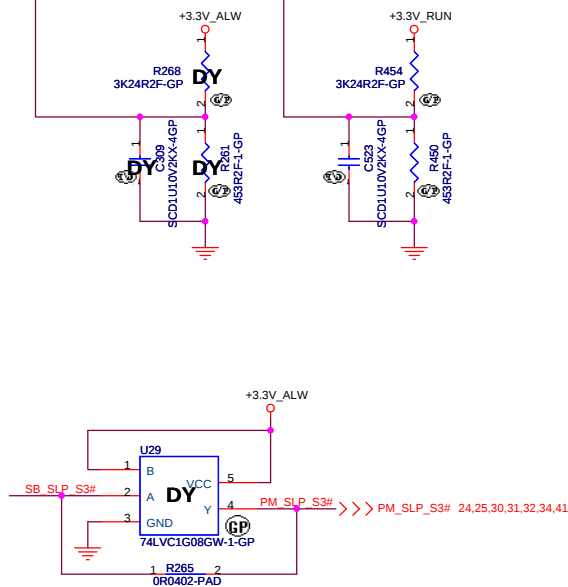
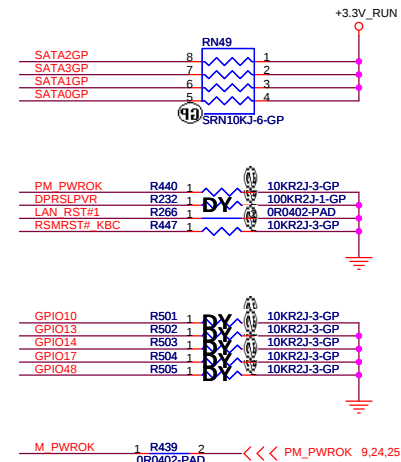
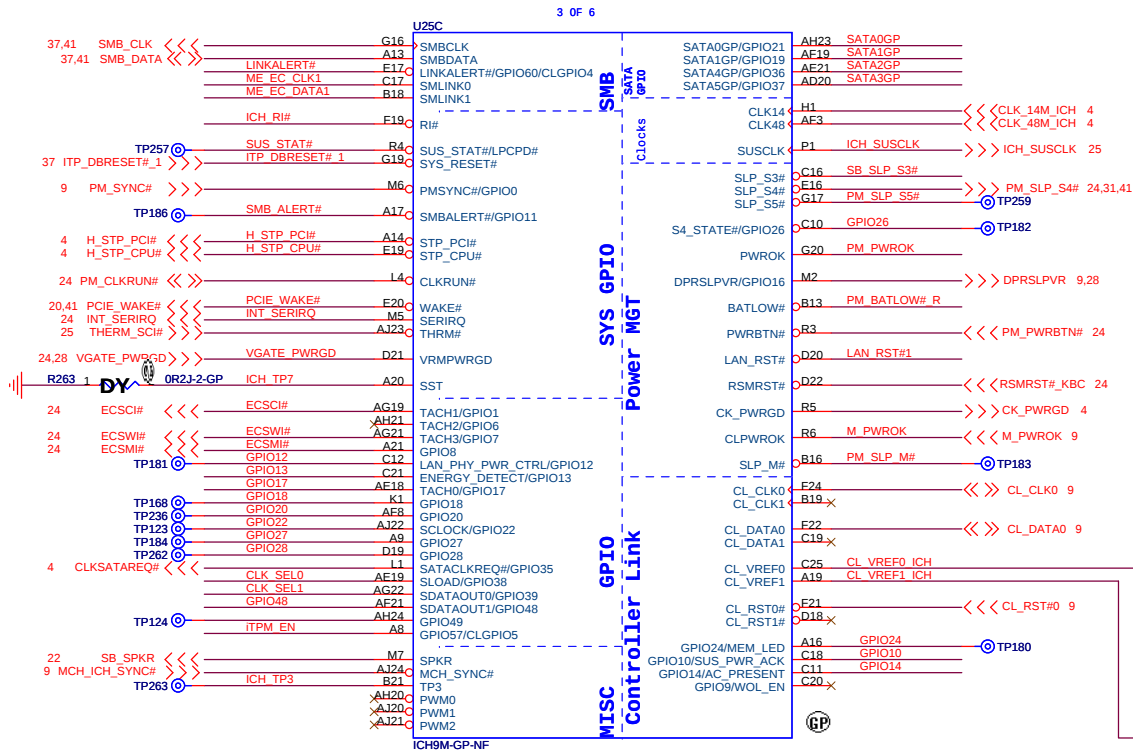
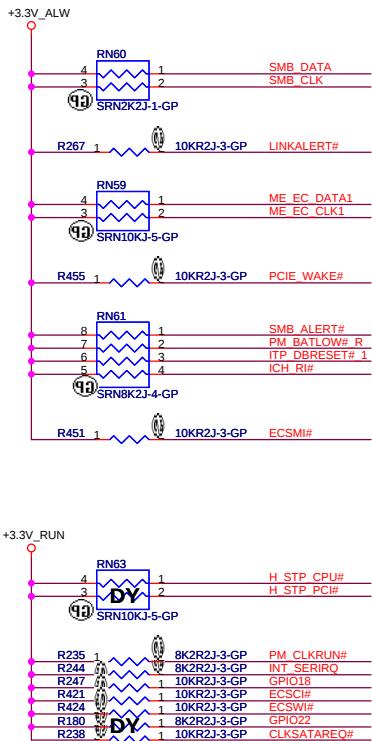
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10 M_A_DQ[63..0] <<<
10 M_A_DM[7..0] <<<
10 M_A_DQS#7[0] <<<
10 M_A_A[14..0] <<<



SSID = ICH

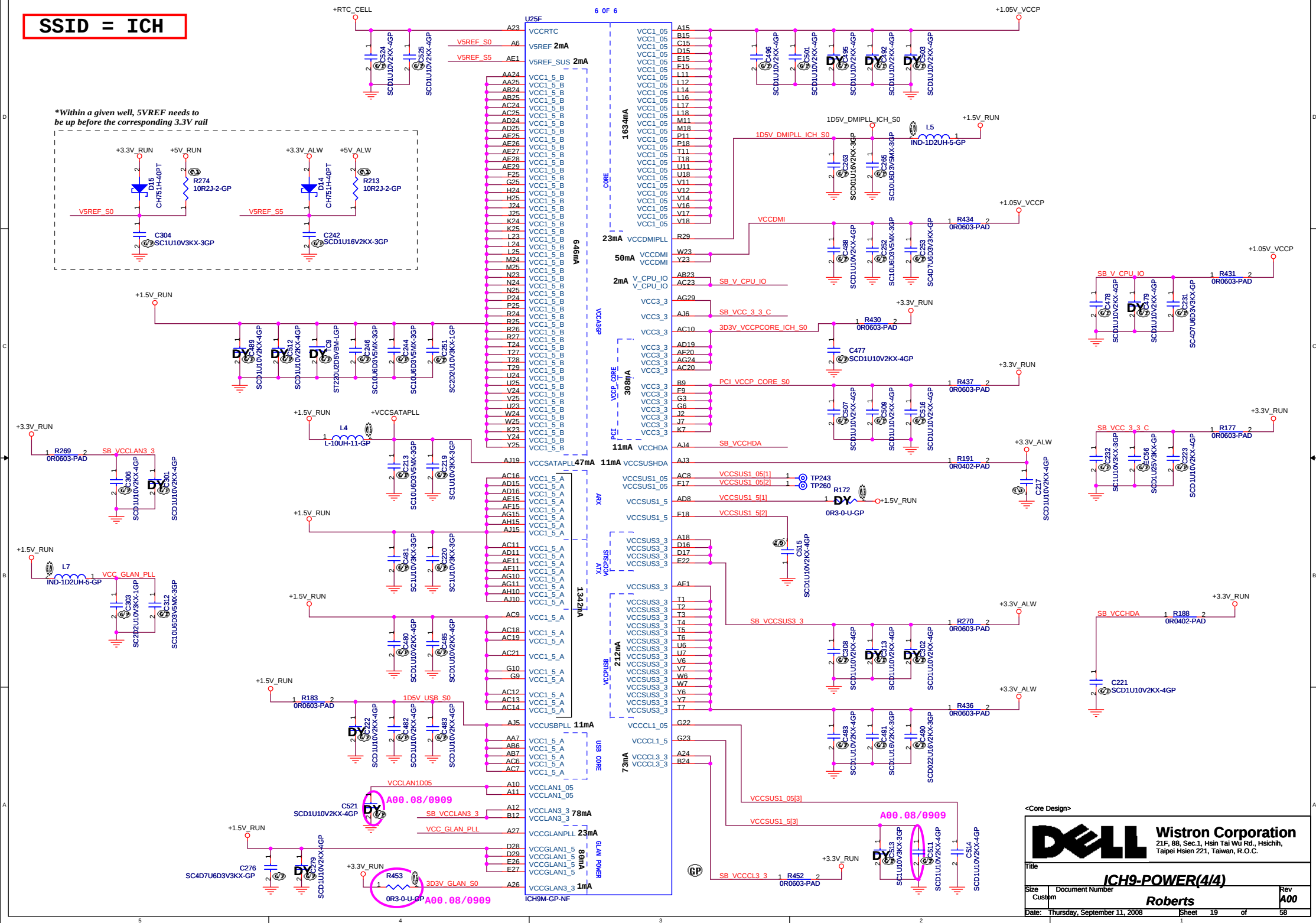


SSID = ICH



SSID = ICH

*Within a given well, 5VREF needs to be up before the corresponding 3.3V rail



<Core Design>

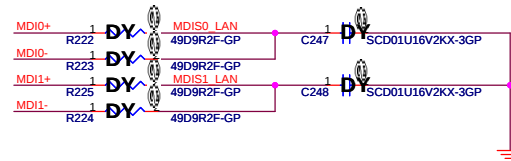
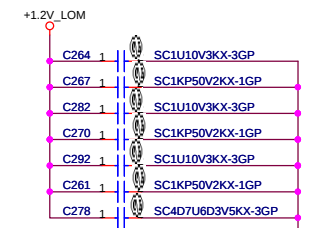
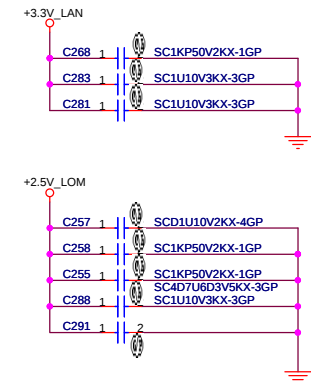
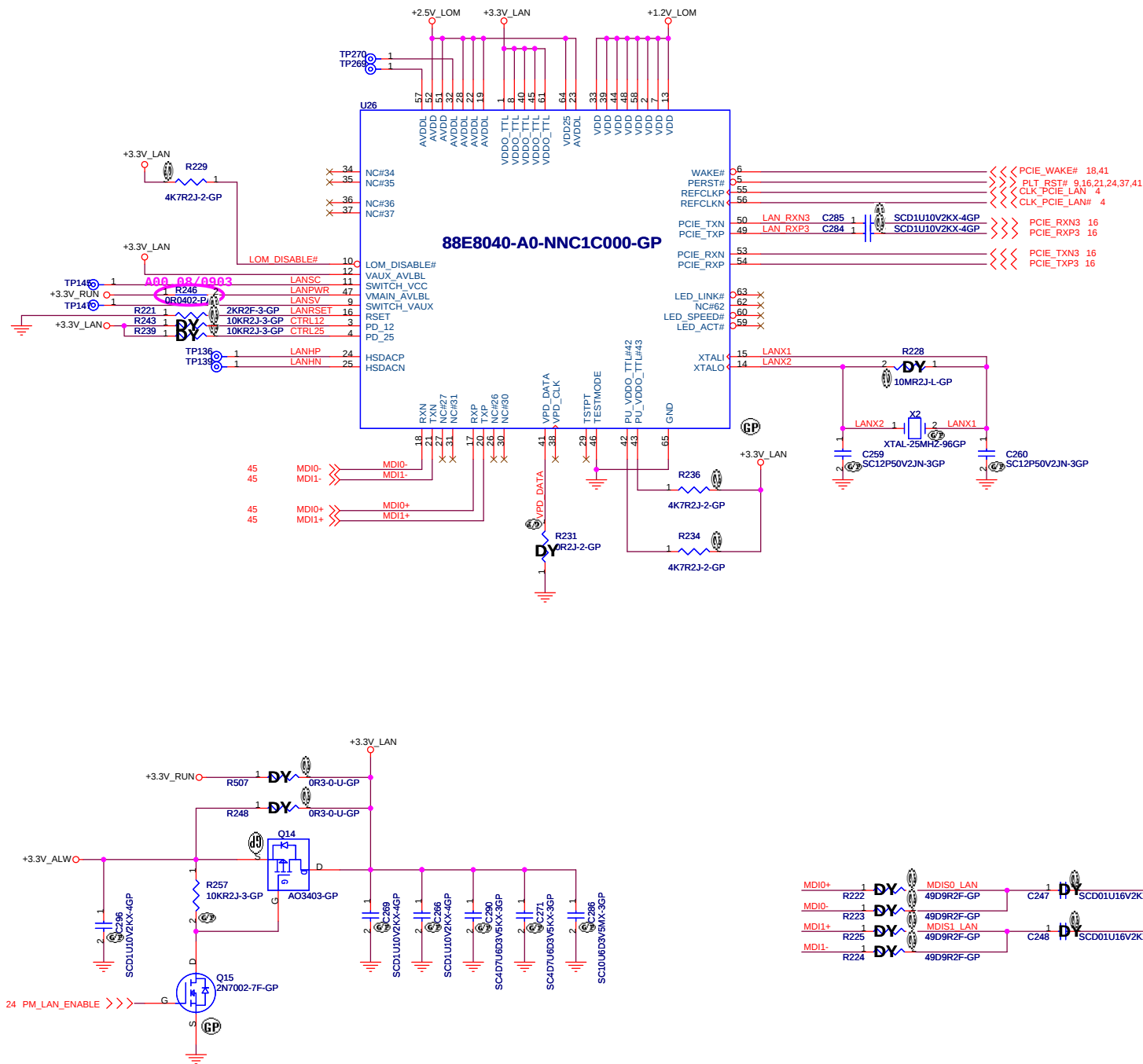
DELL Wistron Corporation
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Taipei Hsien 221, Taiwan, R.O.C.

Title: **ICH9-POWER(4/4)**

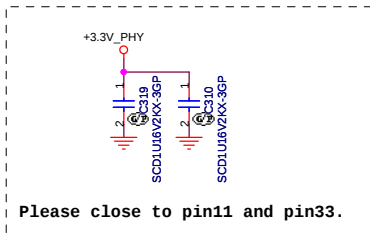
Size: Custom Document Number: **Roberts** Rev: **A00**

Date: Thursday, September 11, 2008 Sheet: 19 of 58

SSID = LOM



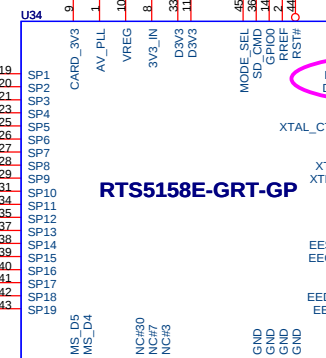
SSID = SDIO



Please close to pin8.

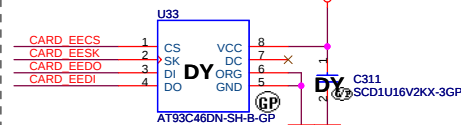
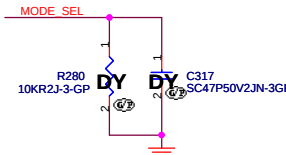
37 XD_CD#
37 XD_WP
37 XD_CD#
37 XD_D4/SD_DAT1
37 XD_D5/MS_BS
37 XD_D3/MS_D1
37 SD_DAT0/XD_D6/MS_D0
37 XD_D2/MS_D2
37 MS_IN#
37 XD_D7/MS_D3
37 SD_CLK/XD_D1/MS_CLK
37 XD_D0
37 XD_WP#
37 XD_RDY#
37 SD_DAT3/XD_WE#
37 SD_DAT2/XD_RE#
37 XD_ALE
37 XD_CE#
37 XD_CLE

SD_CD#
SD_WP
SD_CD#
XD_D4/SD_DAT1
XD_D5/MS_BS
XD_D3/MS_D1
SD_DAT0/XD_D6/MS_D0
XD_D2/MS_D2
MS_IN#
XD_D7/MS_D3
SD_CLK/XD_D1/MS_CLK
XD_D0
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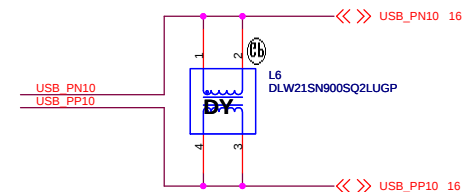


Power mode select

No staff R and C for power saving mode.

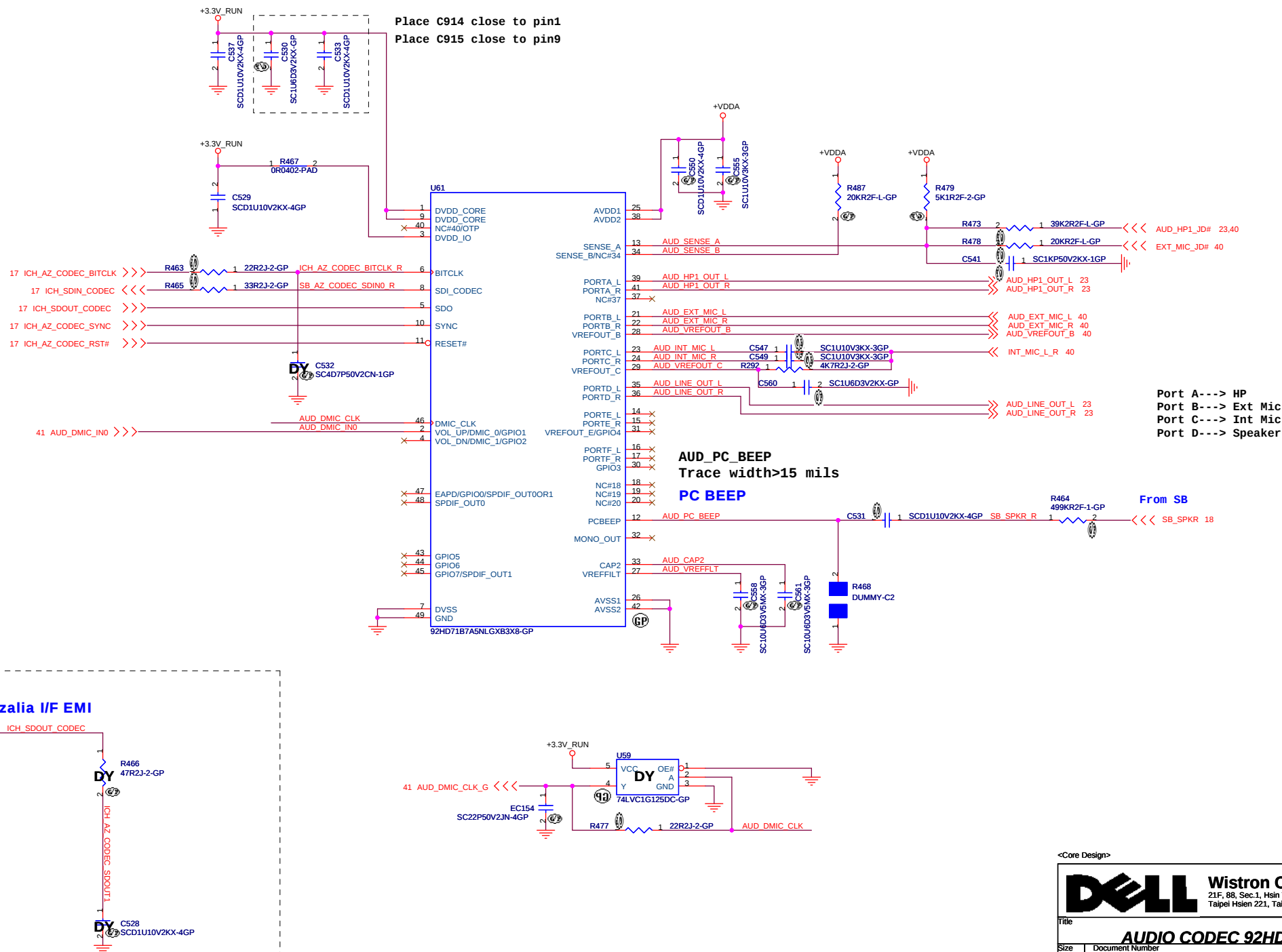


Reserve for changing USB VID/PID.



<Core Design>

SSID = AUDIO



<Core Design>

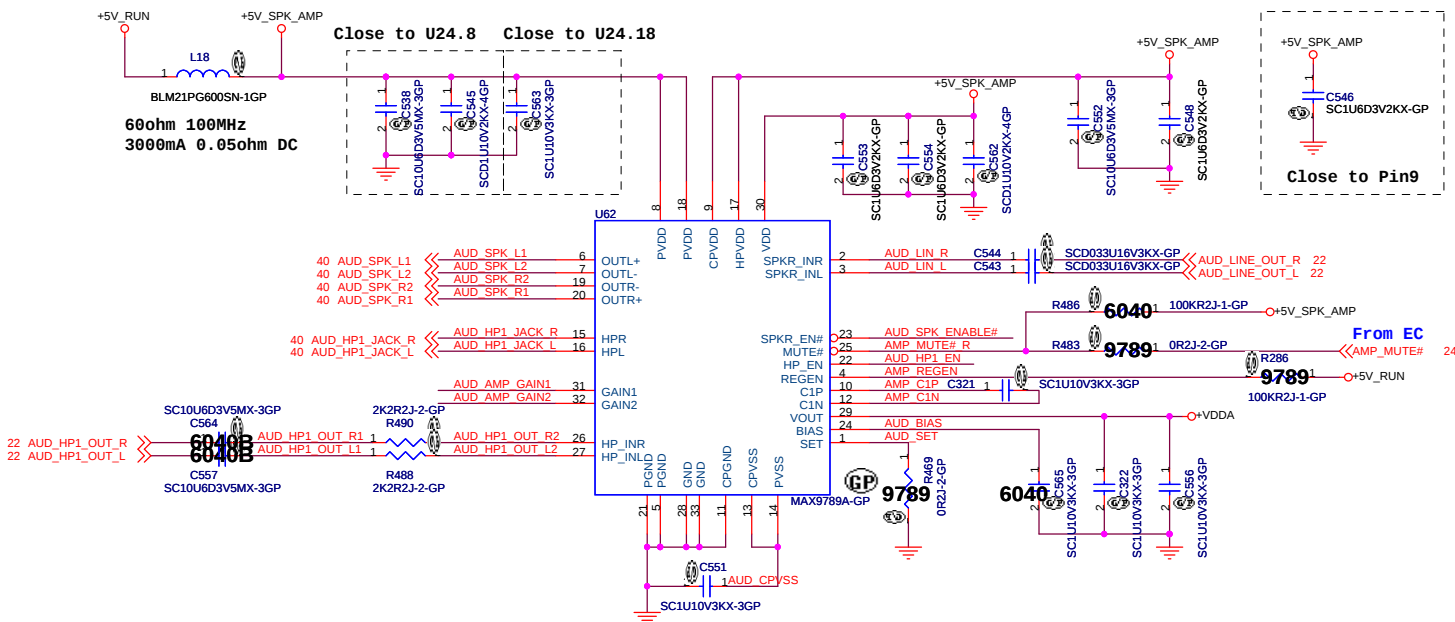
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Taipei Hsien 221, Taiwan, R.O.C.

Title
AUDIO CODEC 92HD71B7

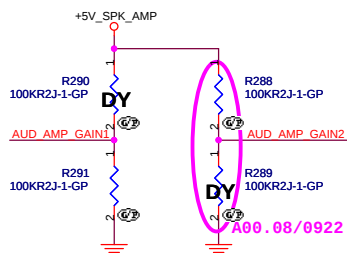
Size Custom Document Number
Roberts

Date: Thursday, October 02, 2008 Sheet 22 of 58

SSID = AUDIO

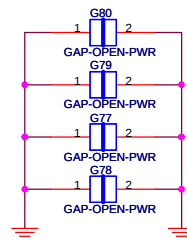


GAIN SETTING

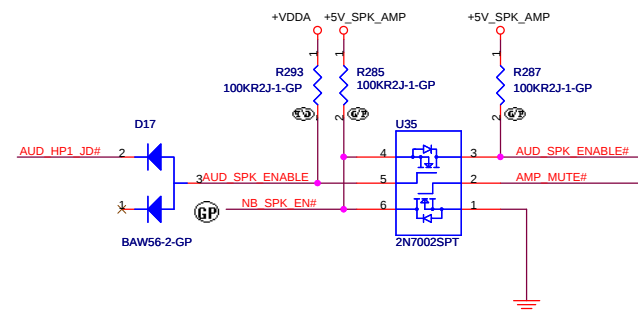
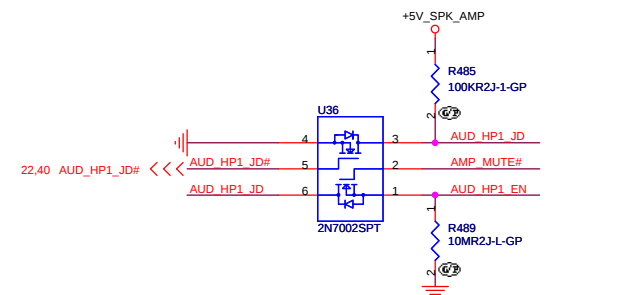


GAIN1	GAIN2	GAIN
0	0	6dB
0	1	10dB
1	0	15.6dB
1	1	21.6dB

	Main source	Second source
	TPA6040A (74.06040.013)	MAX9789A (74.09789.013)
R486	100K	No ASM
R483	No ASM	0 Ohm
R469	No ASM	0 Ohm
R286	No ASM	100K
C535	0.033uF	No ASM
C566	0.033uF	No ASM
C565	1uF	No ASM
C567	No ASM	0.1uF
C564	10uF	2.2uF
C557	10uF	2.2uF



Signal inverter for speaker shutdown

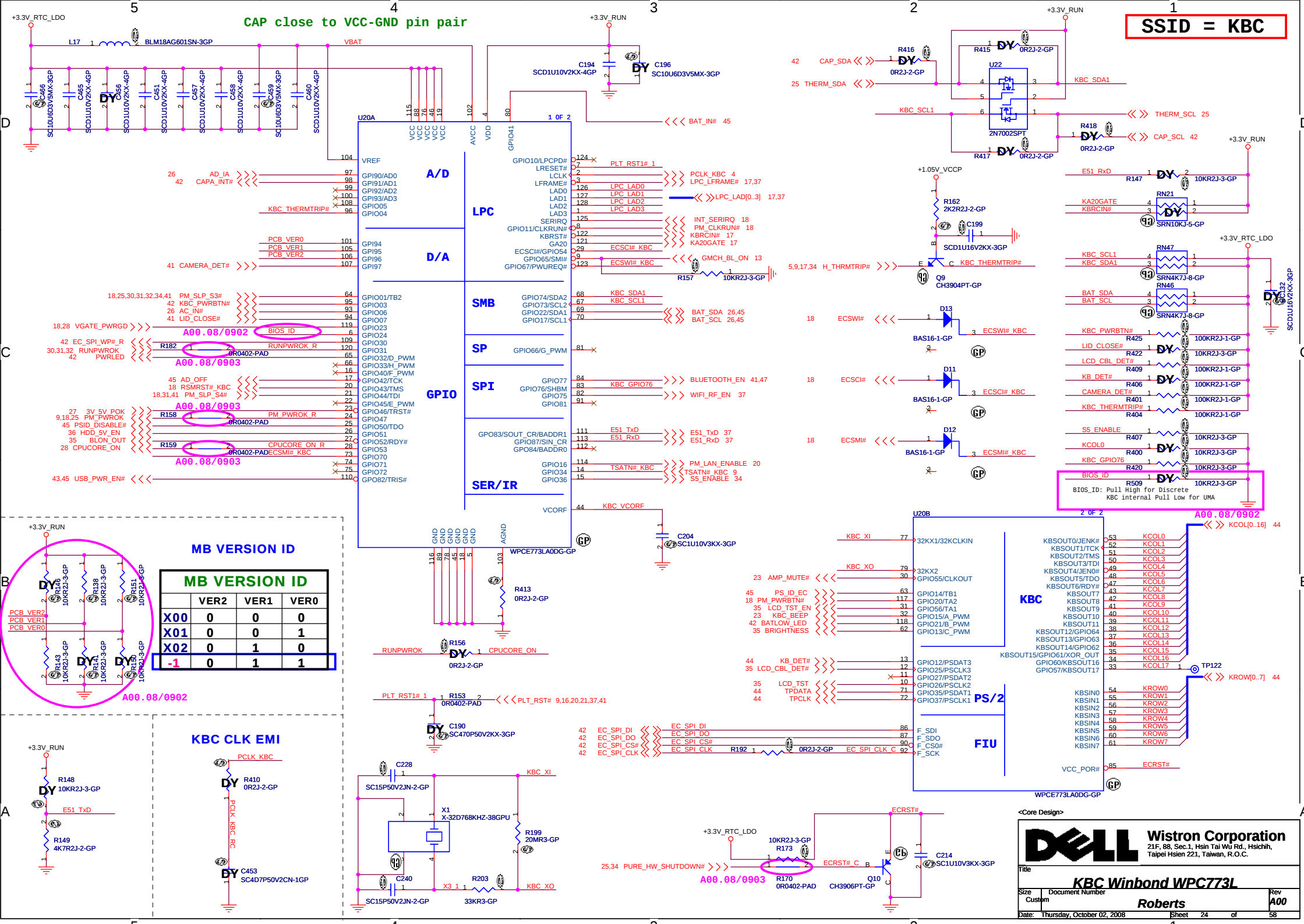


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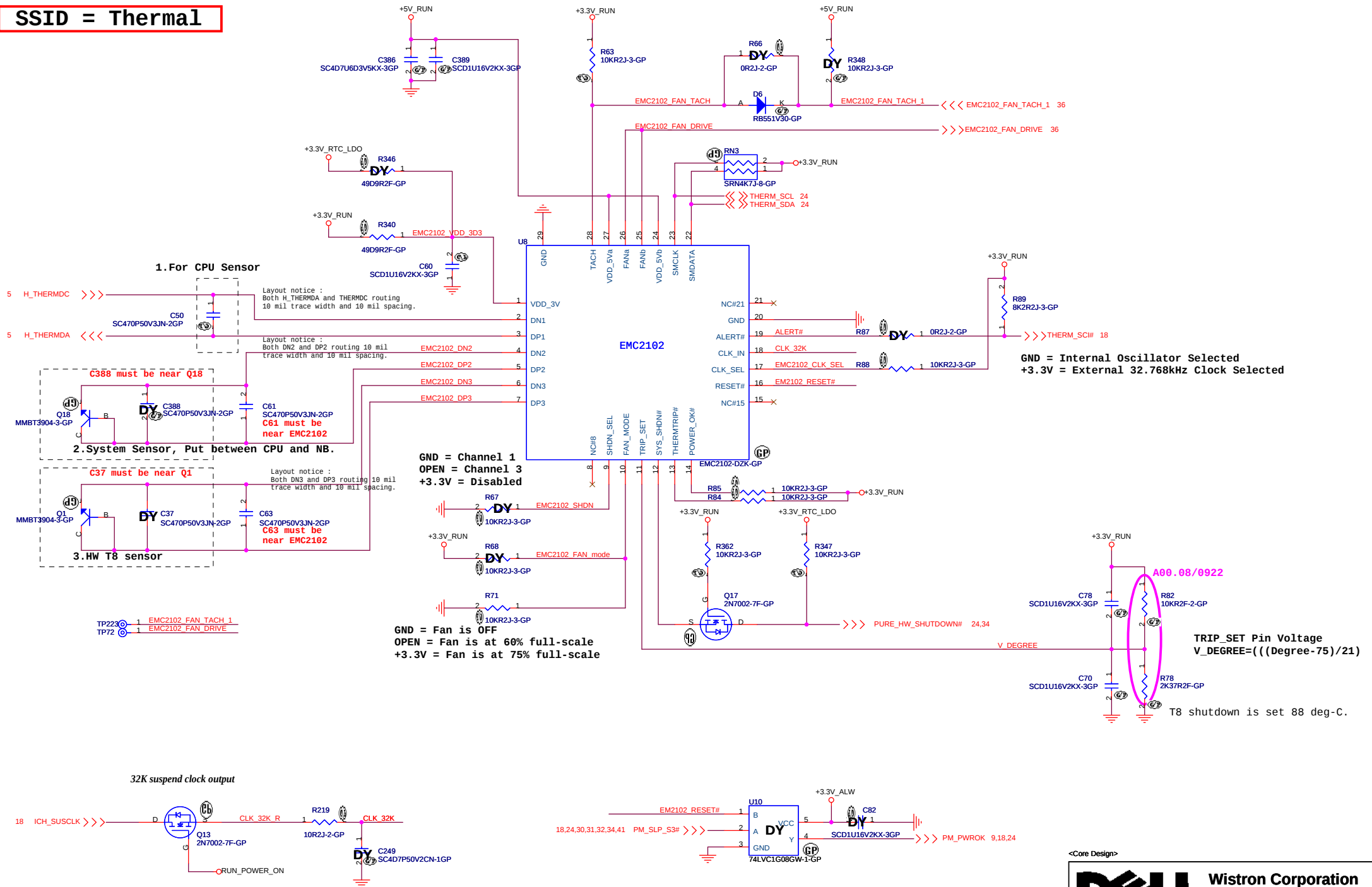


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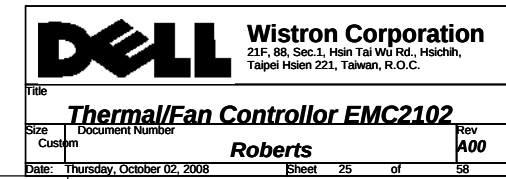
Title			
AUDIO AMP/SPEAKER			
Size	Document Number		Rev
Custom	Roberts		A00
Date:	Thursday, October 02, 2008	Sheet 23 of	58



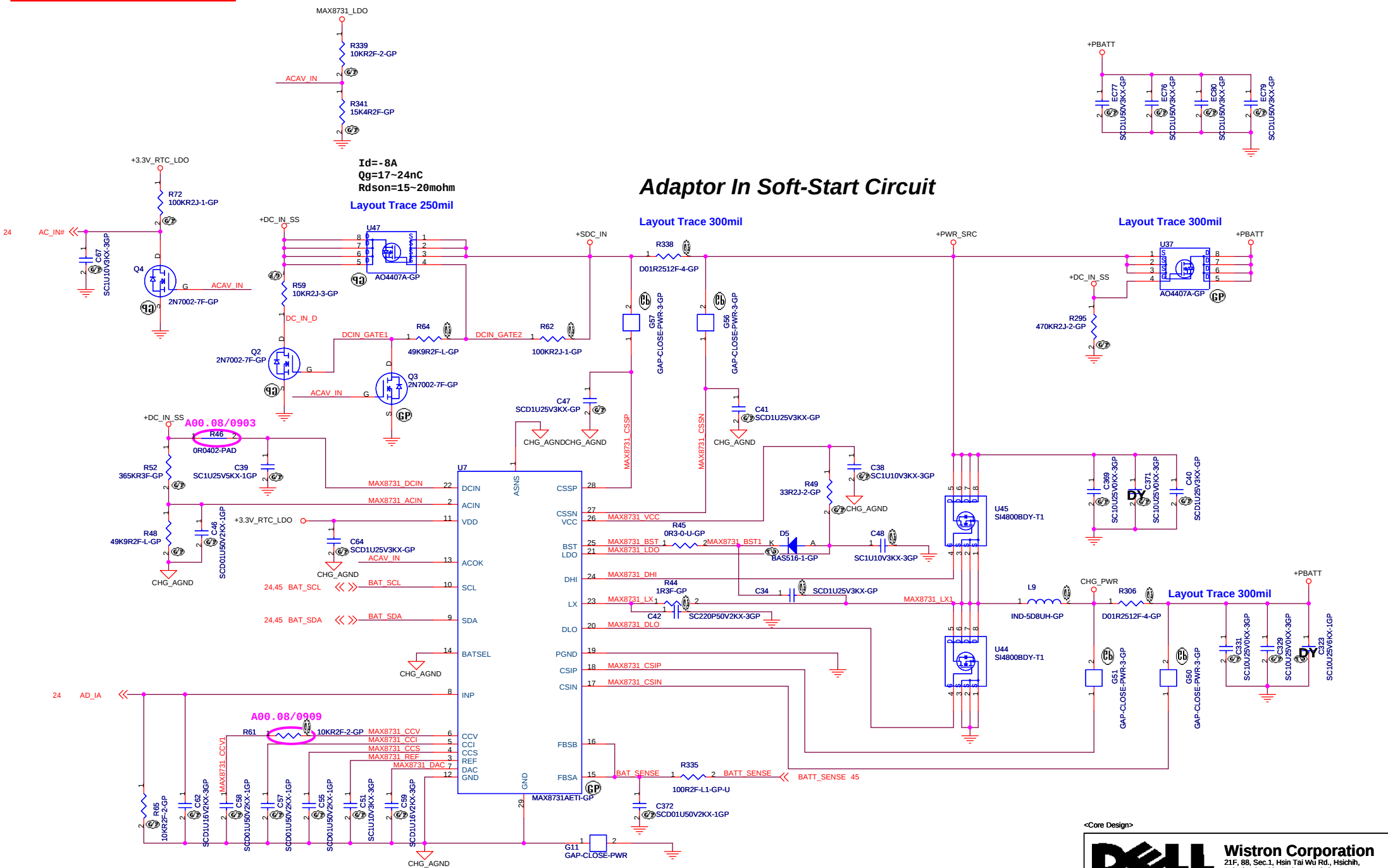
SSID = Thermal



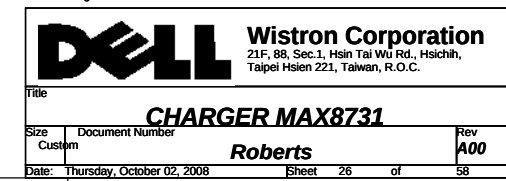
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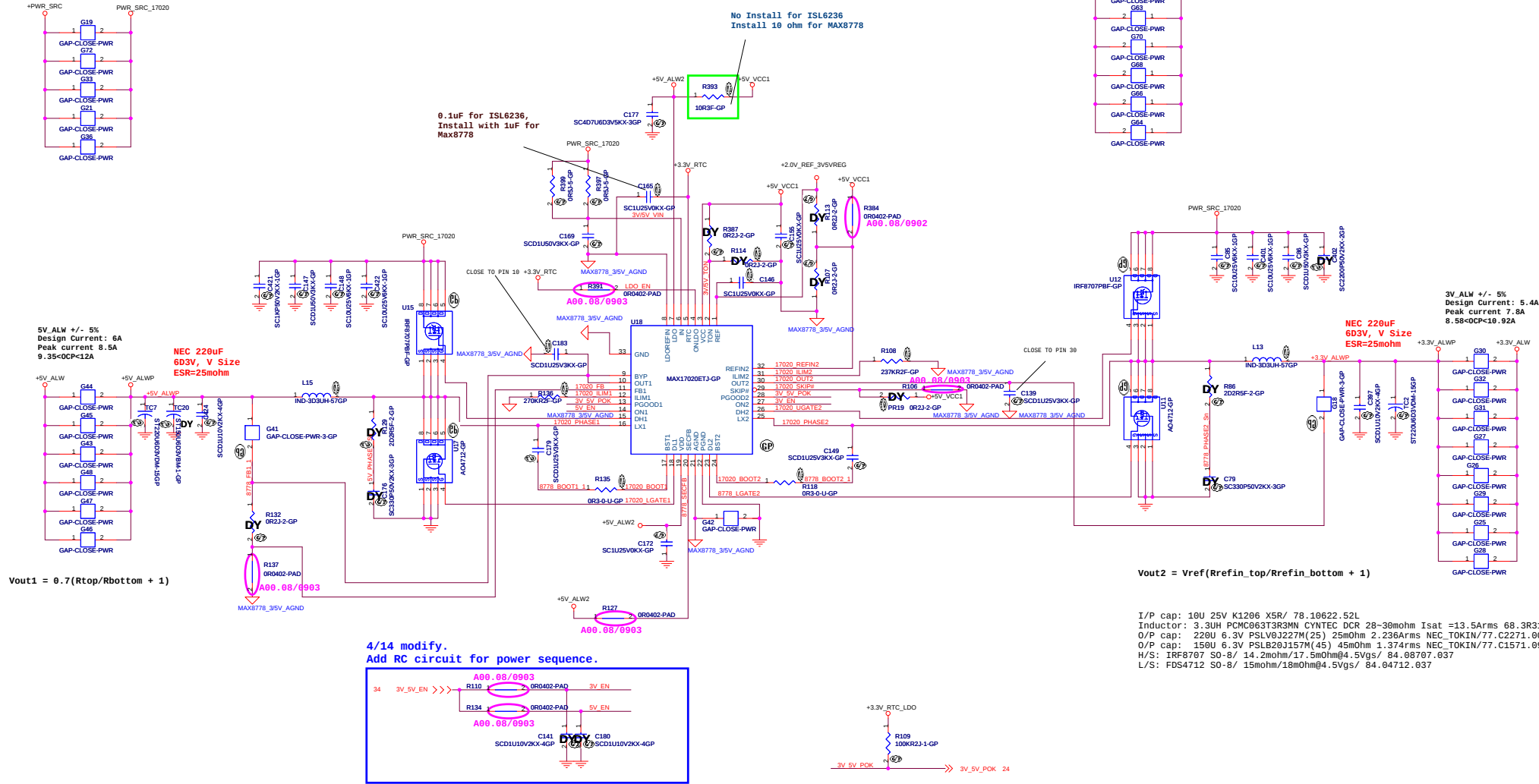
SSID = Charger



<Core Design>



SSID = PWR.Plane.Regulator_3p3v5v



I/P cap: 10U 25V K1206 X5R/ 78.10622.52L
 Inductor: 3.3uH PCMC063T3R3MM CYNTEC DCR 28-30mohm Isat =13.5Arms 68.3R310.20A
 O/P cap: 220U 6.3V PSLV0J227M(25) 25mOhm 2.236Arms NEC_TOKIN/77.C2271.00L
 O/P cap: 150U 6.3V PSLB20J157M(45) 45mOhm 1.374Arms NEC_TOKIN/77.C1571.09L
 H/S: IRF8707 SO-8/ 14.2mohm/17.5mohm@4.5Vgs/ 84.08707.037
 L/S: FDS4712 SO-8/ 15mohm/18mohm@4.5Vgs/ 84.04712.037

SKIPSEL	GND	Open/REF (2V)	High (VCC or 3.3V)
Operating Mode	pulse-skipping mode	ultrasonic mode	forced-PWM operation

TONSEL	GND	Open (REF)	High (VCC)
CH1 Freq	400kHz	400kHz	200kHz
CH2 Freq	500kHz	300kHz	300kHz

LDOREFIN	GND	VCC	VLDOREFIN = 0.5V
Operating Mode	4.90/5.0/5.10	3.23/3.3/3.37	0.96/1.0/1.04

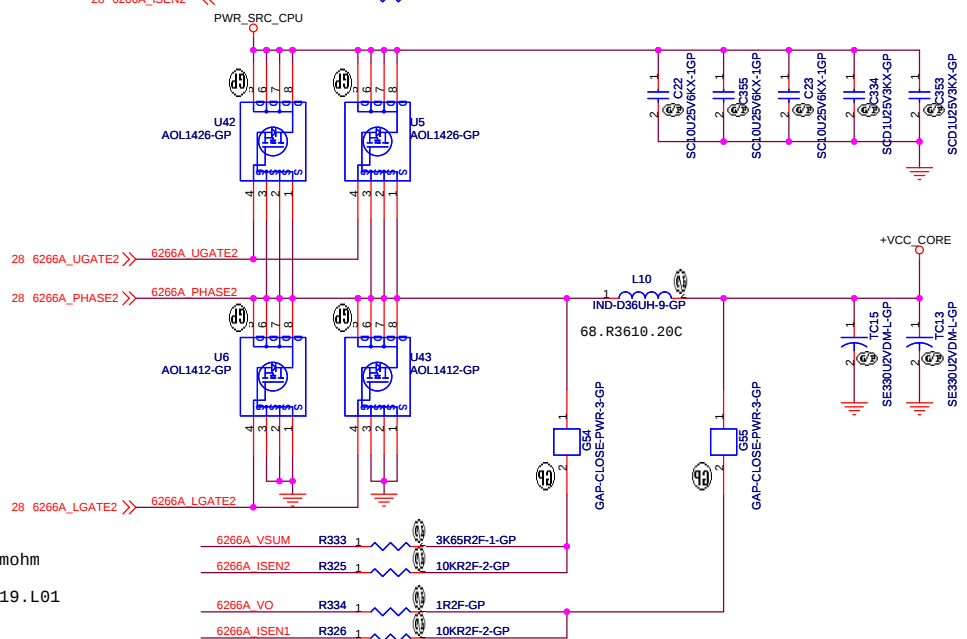
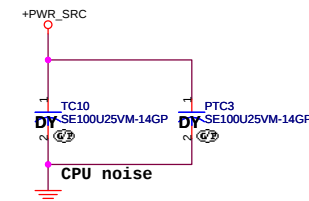
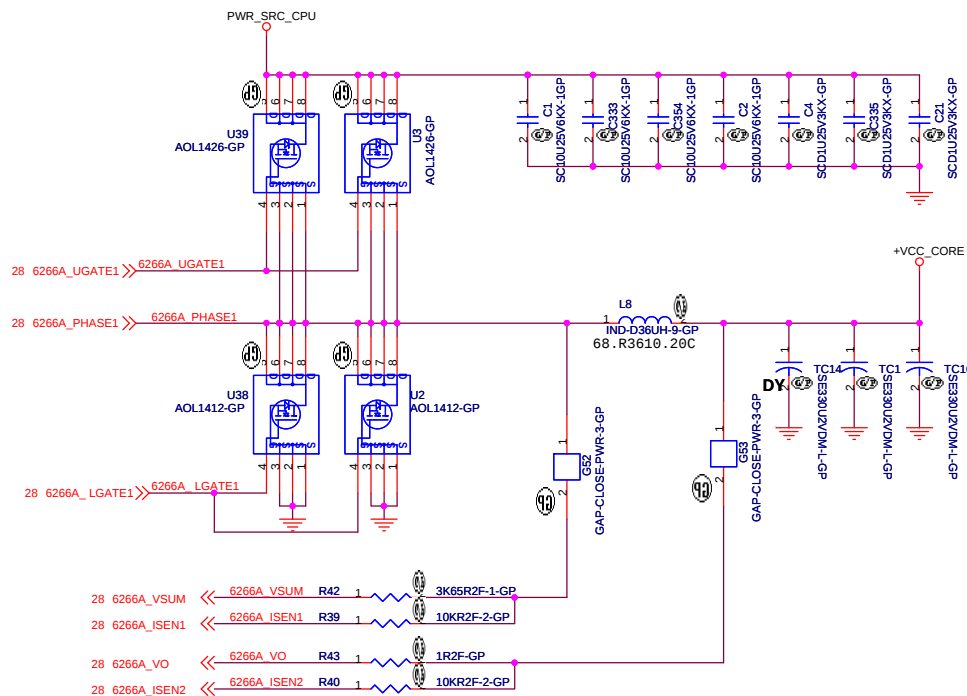
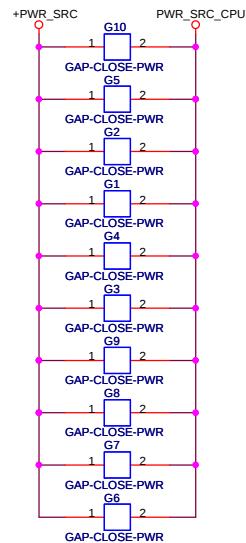
FB1	GND	VCC
Operating Mode	4.925/5.00/5.075	1.482/1.50/1.518

REFIN2	5V	RTC (3.3V)
Operating Mode	3.255/3.30/3.345	1.038/1.050 /1.062

I/P cap: 10U 25V K1206 X5R/ 78.10622.52L
 Inductor: 3.3uH PCMC063T3R3MM CYNTEC DCR 28-30mohm Isat =13.5Arms 68.3R310.20A
 O/P cap: 220U 6.3V PSLV0J227M(25) 25mOhm 2.236Arms NEC_TOKIN/77.C2271.00L
 O/P cap: 150U 6.3V PSLB20J157M(45) 45mOhm 1.374Arms NEC_TOKIN/77.C1571.09L
 H/S: IRF8707 SO-8/ 14.2mohm/17.5mohm@4.5Vgs/ 84.08707.037
 L/S: FDS4712 SO-8/ 15mohm/18mohm@4.5Vgs/ 84.04712.037

<Core Design>

SSID = CPU.Regulator

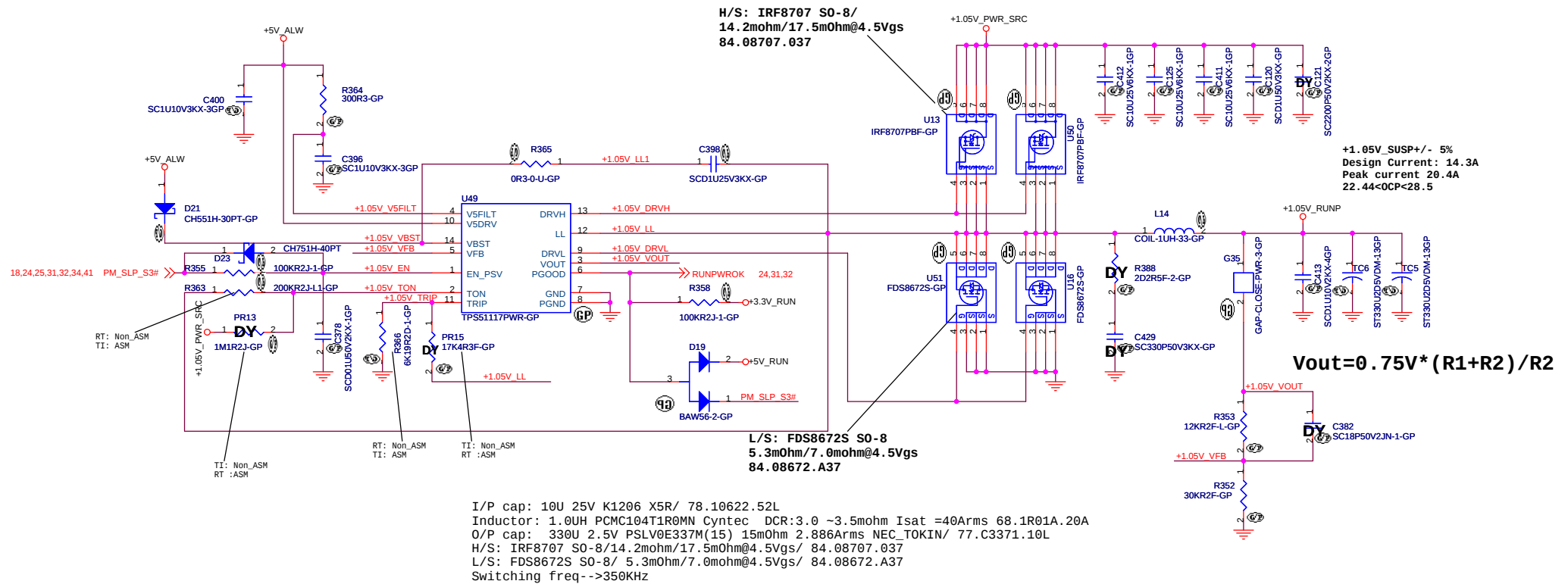
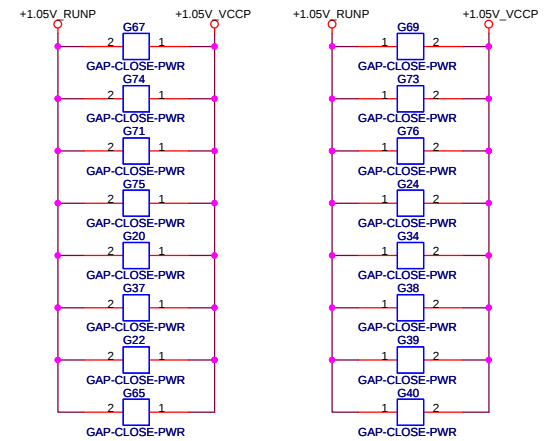
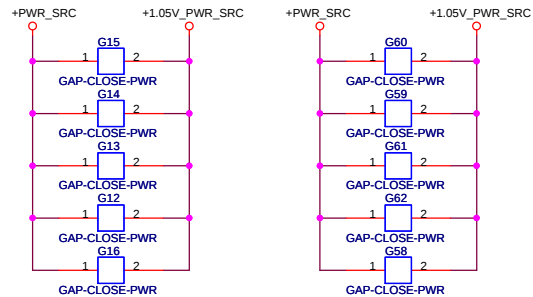


I/P cap: 10U 25V K1206 X5R/ 78.10622.52L
 Inductor: 0.36UH PCMC104T-R36MN1R05J CYNTEC DCR 1.05(+5%--5%)mohm
 Isat =60Arms 68.R3610.20C
 O/P cap: 330U 2V EEF5X0D331ER 9mOhm 3.0Arms Panasonic/79.33719.L01
 H/S: AOL1426 PowerPAK/ 10.2mohm/12.5mOhm@4.5Vgs/84.01426.037
 L/S: AOL1412 PowerPAK/ 3.8mohm/4.65mOhm@4.5Vgs/ 84.01412.037

<Core Design>

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Title			
CPU VCore POWER(2/2)			
Size	Document Number	Rev	
Custom		Roberts	A00
Date:	Thursday, October 02, 2008	Sheet	29 of 58

SSID = PWR.Plane.Regulator_1p05v

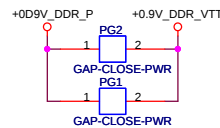
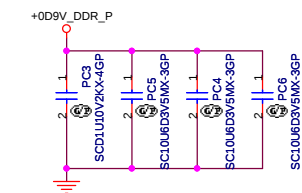
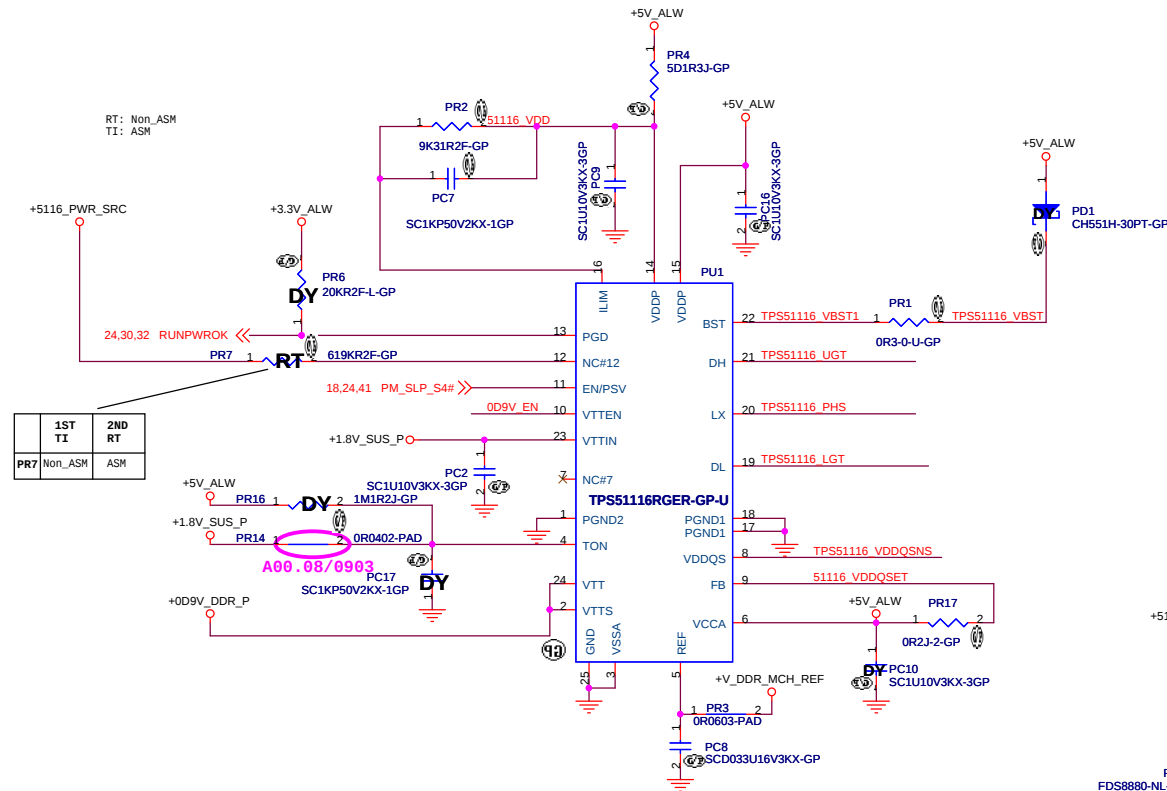


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DELL		Wistron Corporation	
		21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221, Taiwan, R.O.C.	
Title			
DC to DC 1.05V			
Size	Document Number	Rev	
Custom	Roberts	A00	
Date:	Thursday, October 02, 2008	Sheet	30 of 58

SSID = PWR.Plane.Regulator_1p8v0p9v

TI TPS51116 for 1.8V and 0.9V

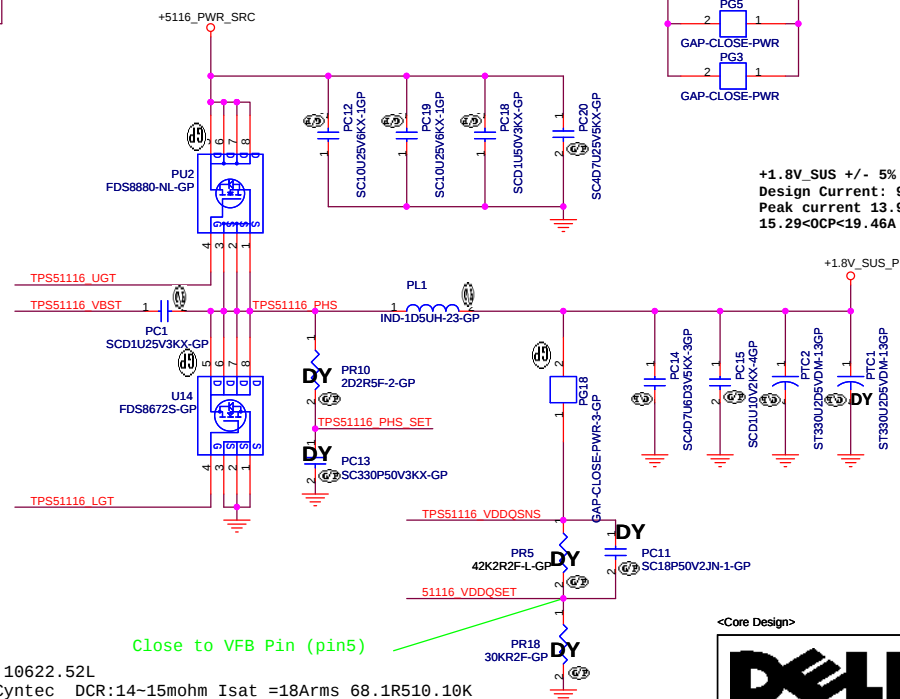
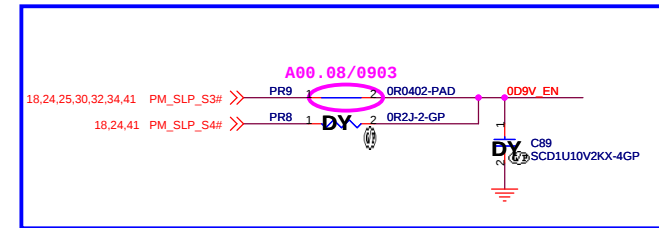


State	S3	S5	VDDR	VTTREF	VTT
S0	H1	H1	On	On	On
S3	Lo	H1	On	On	Off (H1-Z)
S4/S5	Lo	Lo	Off	Off	Off

VDDQSET	VDDQ (V)	VTTREF and VTT	NOTE
GND	2.5	VVDDQNS/2	DDR
V5IN	1.8	VVDDQNS/2	DDR2
FB Resistors	Adjustable	VVDDQNS/2	1.5 V < VVDDQ < 3 V

I/P cap: 10U 25V K1206 X5R/ 78.10622.52L
Inductor: 1.5UHPCMC063T-1R5MN Cyntec DCR:14~15mohm Isat =18Arms 68.1R510.10K
O/P cap: 330U 2.5V PSLV0E337M(15) 15mOhm 2.886Arms NEC.TOKIN/ 77.C3371.10L
H/S: FDS8880 S0-8/9.6mohm/ 12mOhm@4.5Vgs/ 84.08880.037
L/S: FDS8672S S0-8/ 5.3mOhm/7.0mohm@4.5Vgs/ 84.08672.A37
Switching freq-->400KHz

4/14 modify.
Add RC circuit for power sequence.



+1.8V_SUS +/- 5%
Design Current: 9.7A
Peak current 13.9A
15.29<OCP<19.46A

<Core Design>

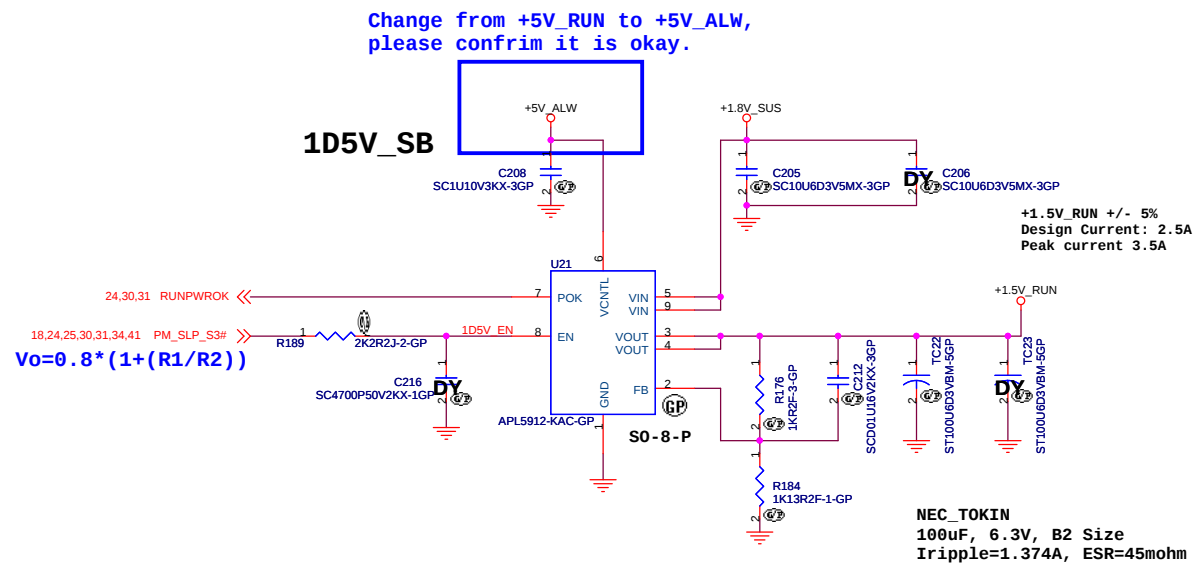
DELL Wistron Corporation
21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih,
Taipei Hsien 221, Taiwan, R.O.C.

Title: **DC to DC 1.8V/0.9V**

Size: Custom Document Number: **Roberts** Rev: **A00**

Date: Thursday, October 02, 2008 Sheet: 31 of 58

SSID = PWR.Plane.Regulator_1p5v



<Core Design>

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		DC to DC 1.5V	
Size Custom	Document Number Roberts	Rev A00	
Date: Thursday, October 02, 2008	Sheet 32 of 58		

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<Core Design>



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Title

VGA Power

Roberts

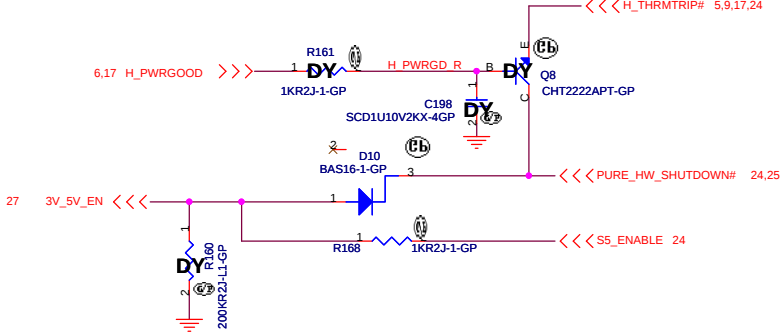
A00

Date: Tuesday, September 09, 2008

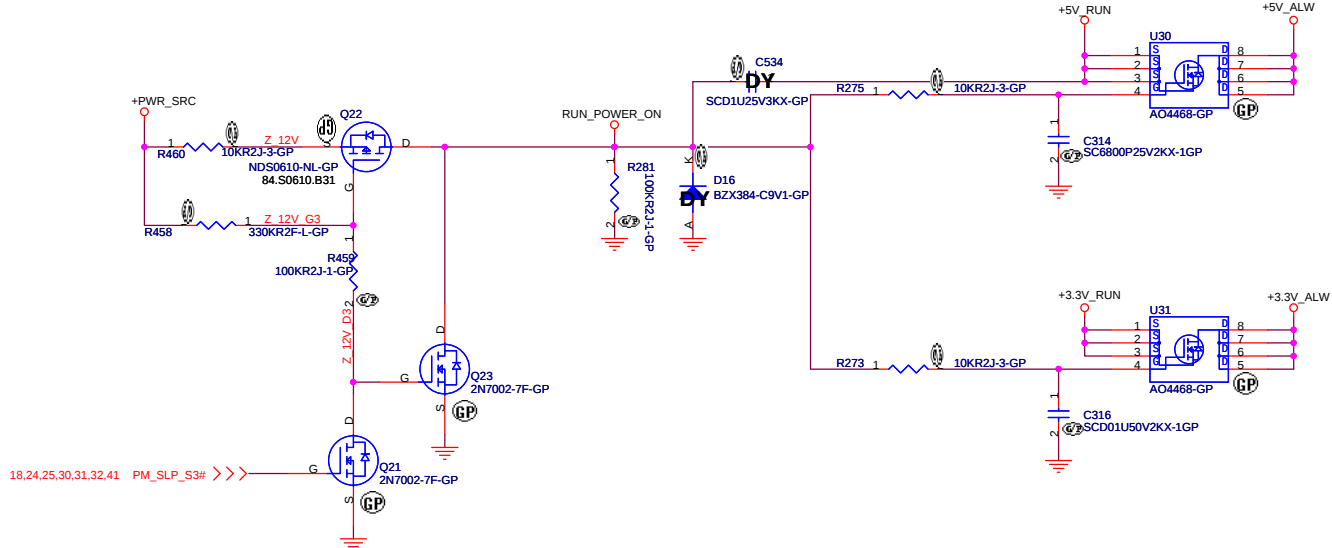
Sheet 33 of 58

1

SSID = Reset.Suspend



Run Power



<Core Design>

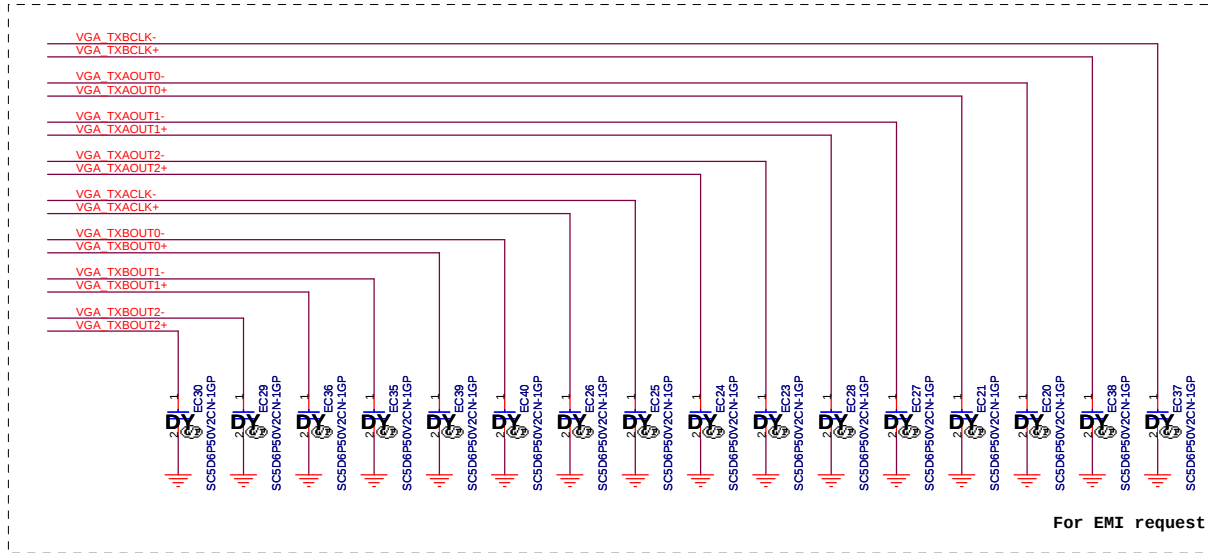
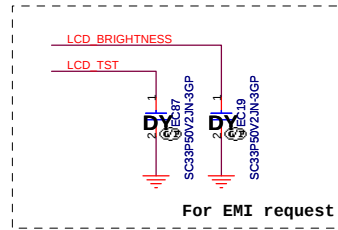
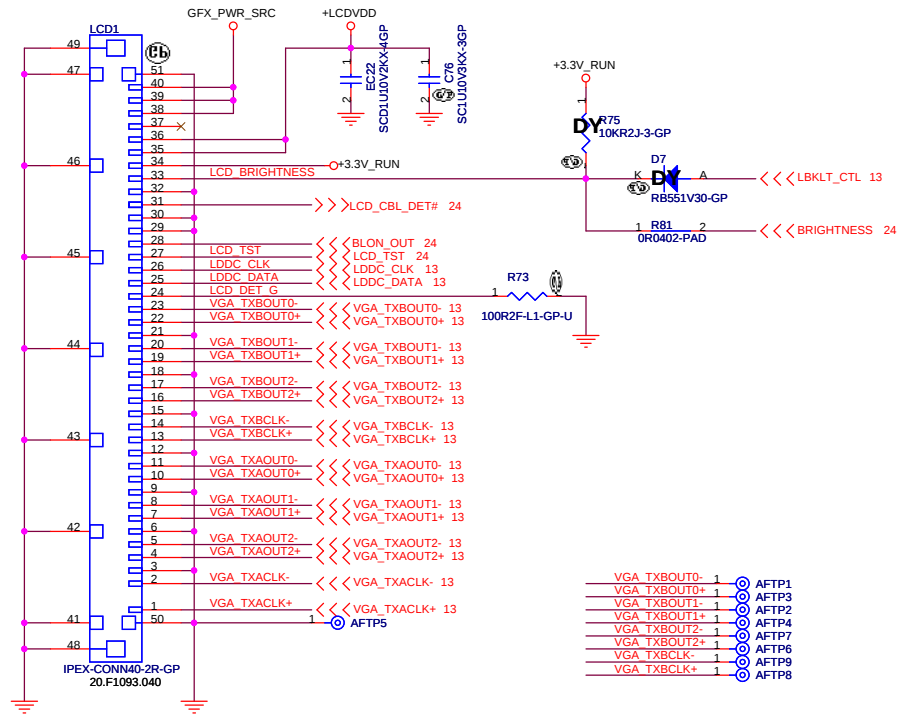


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Taipei Hsien 221, Taiwan, R.O.C.

Title			
<i>Power Plane Enable</i>			
Size	Document Number		Rev
Custom	<i>Roberts</i>		<i>A00</i>
Date: Thursday, October 02, 2008		Sheet 34 of 58	

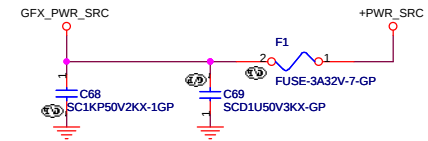
SSID = VIDEO

LVDS CONNECTOR



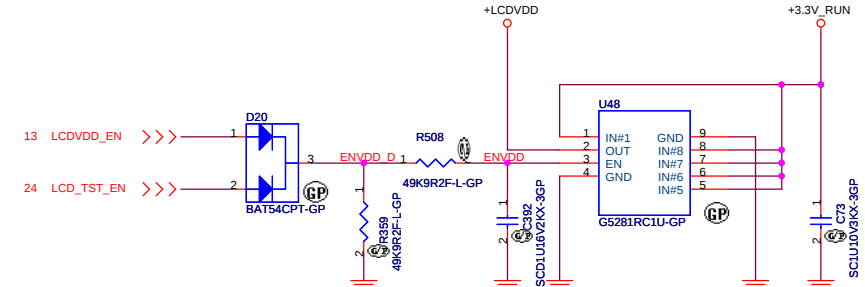
SSID = Inverter

INVERTER POWER

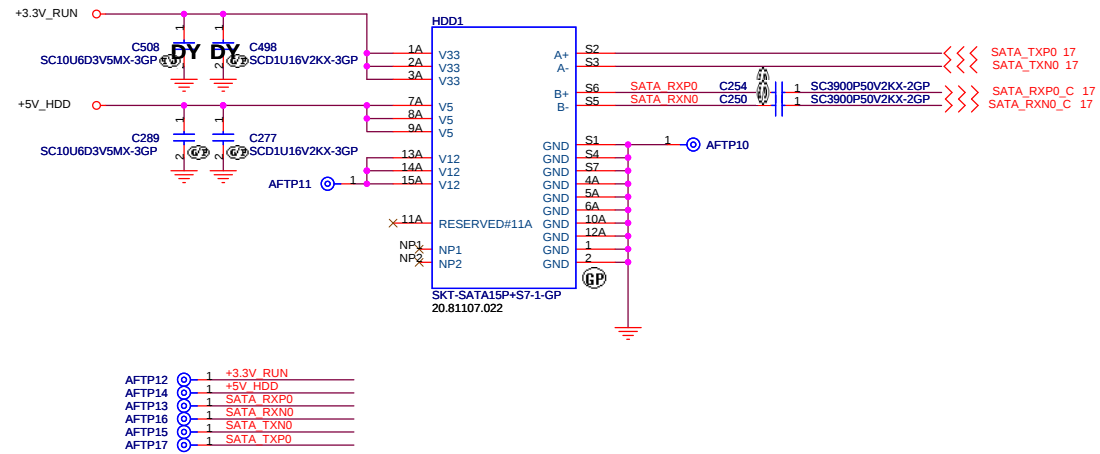
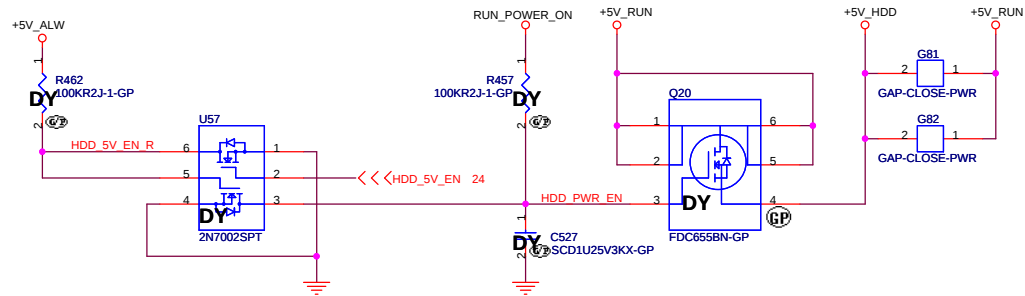


SSID = VIDEO

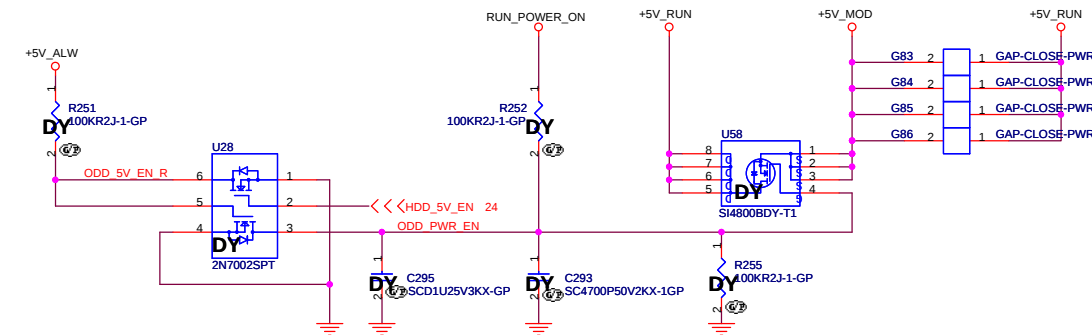
LCD POWER



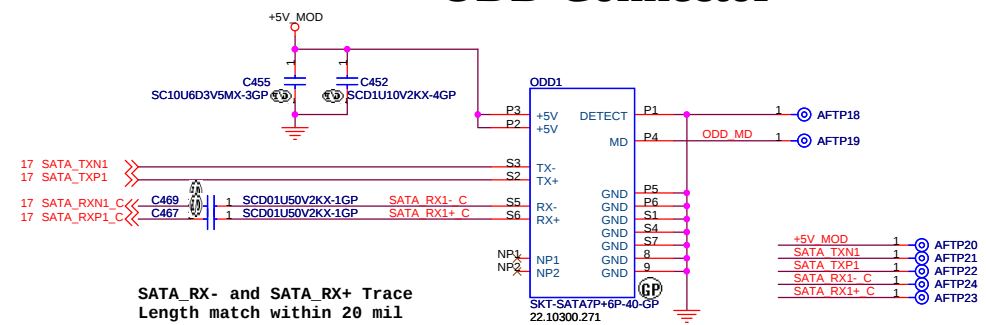
SATA HDD Connector



SSID = SATA

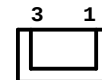
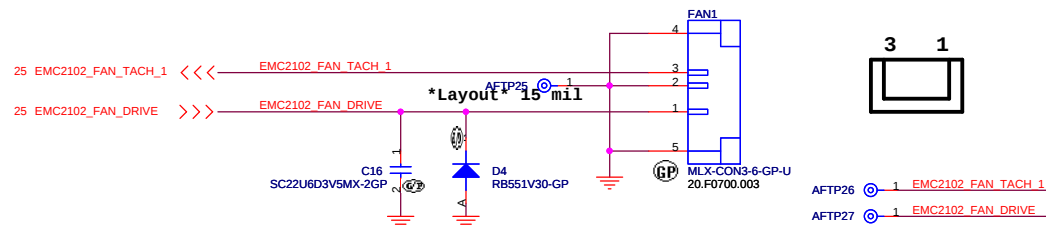


ODD Connector



SSID = Thermal

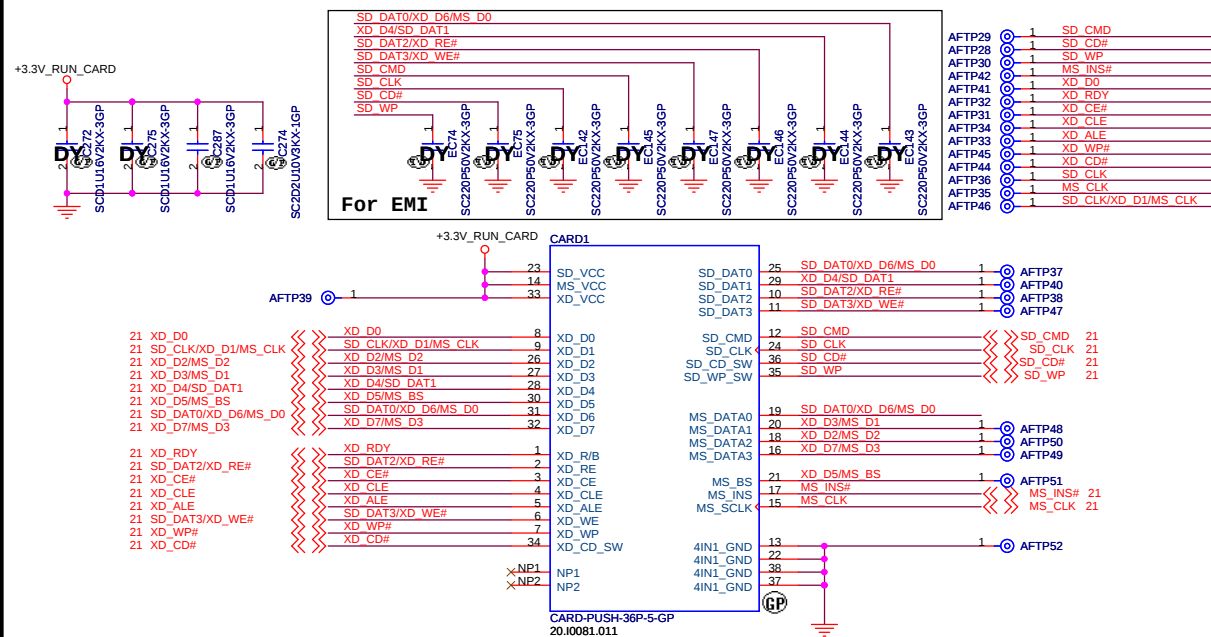
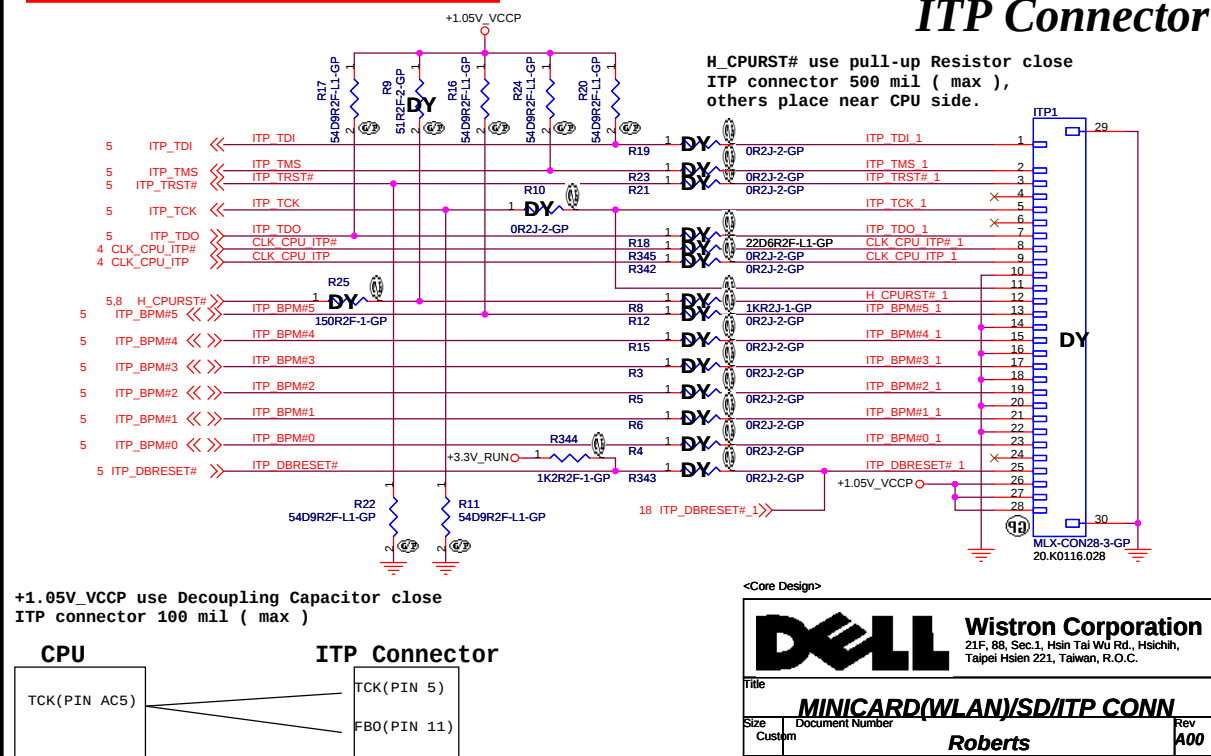
Fan Connector



Mini Card Connector(802.11a/b/g)



SD/XD/MS Card Reader

**SSID = User.Interface**

ITP Connector

H_CPURST# use pull-up Resistor close
ITP connector 500 mil (max),
others place near CPU side.

```
+1.05V_VCCP use Decoupling Capacitor close
ITP connector 100 mil ( max )
```

<Core Design>

DELL

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Taipei Hsien 221, Taiwan, R.O.C.

Title
MINICARD(WLAN)/SD/ITP CONN**Roberts**

A

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<Core Design>



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Title

Size
Custom

Document Number
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A00

Date: Monday, September 22, 2008

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<Core Design>



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Taipei Hsien 221, Taiwan, R.O.C.

Title

MINICARD(WPAN)

Size

Custom

Document Number

Roberts

Rev

A00

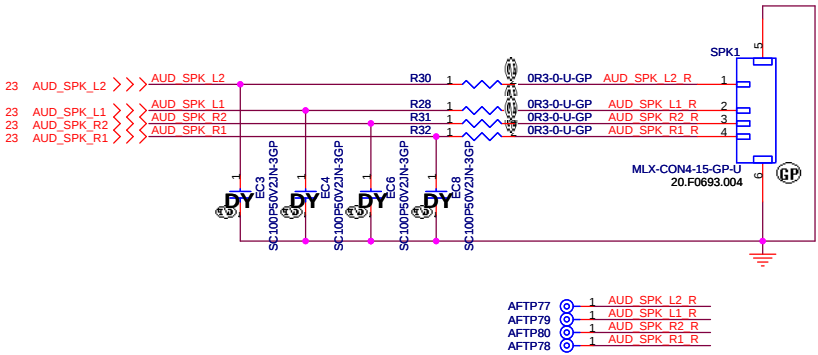
Date: Monday, September 22, 2008

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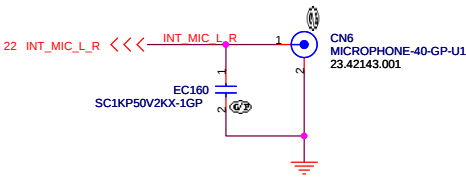
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SSID = AUDIO

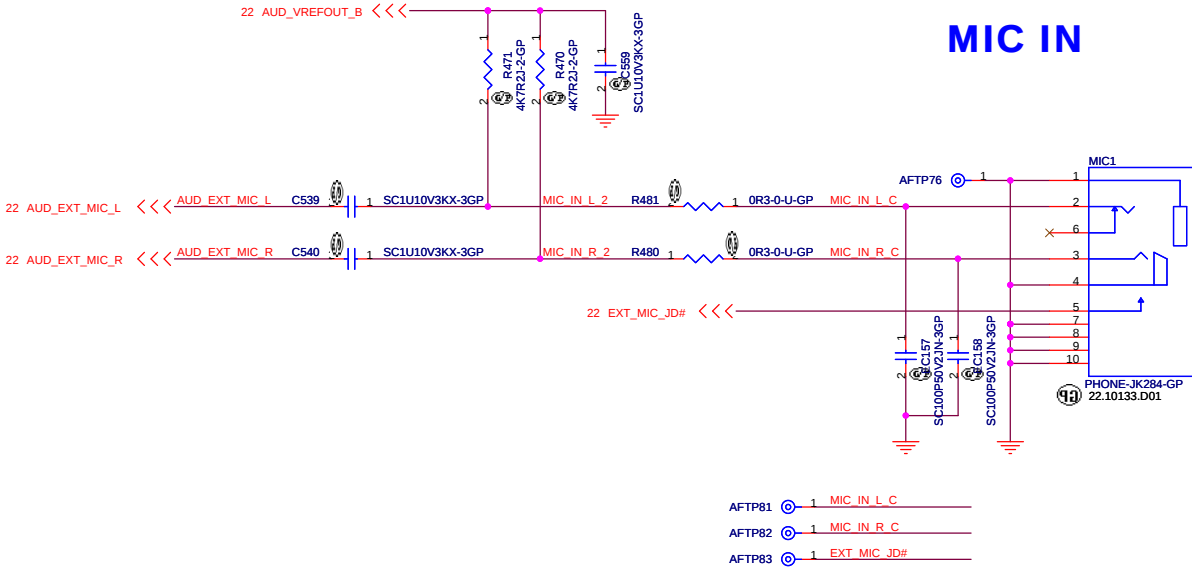
Speaker Connector



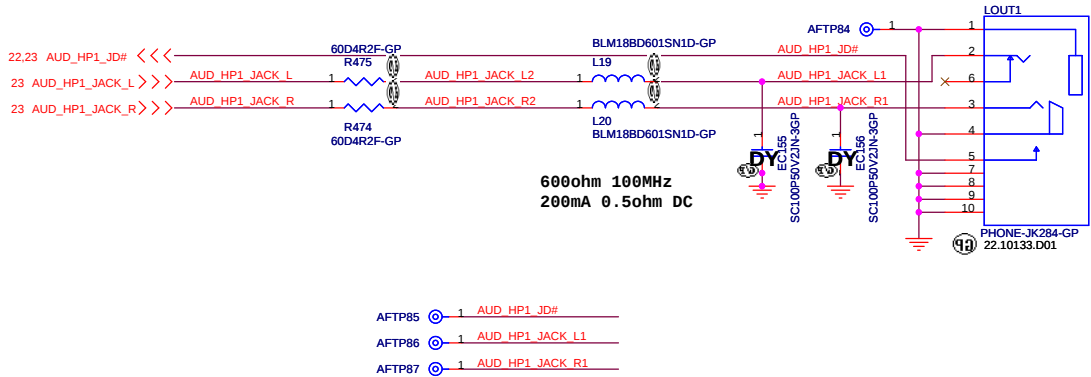
Internal Microphone



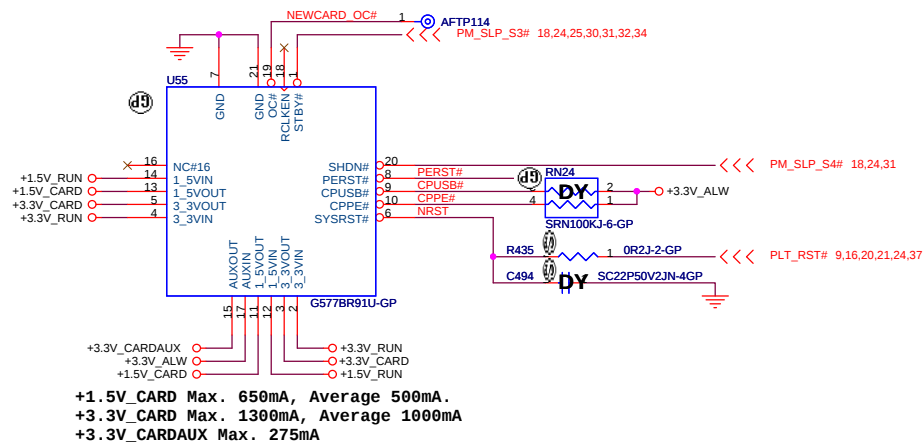
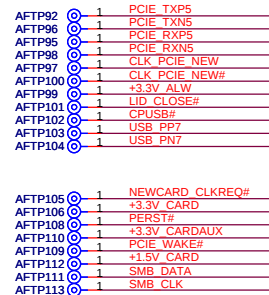
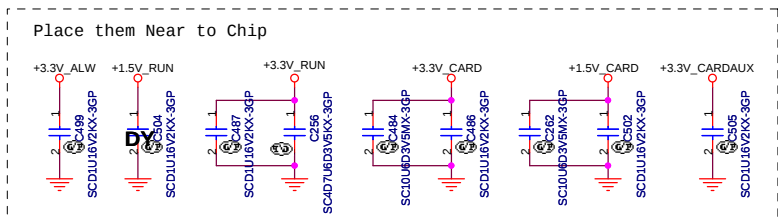
MIC IN



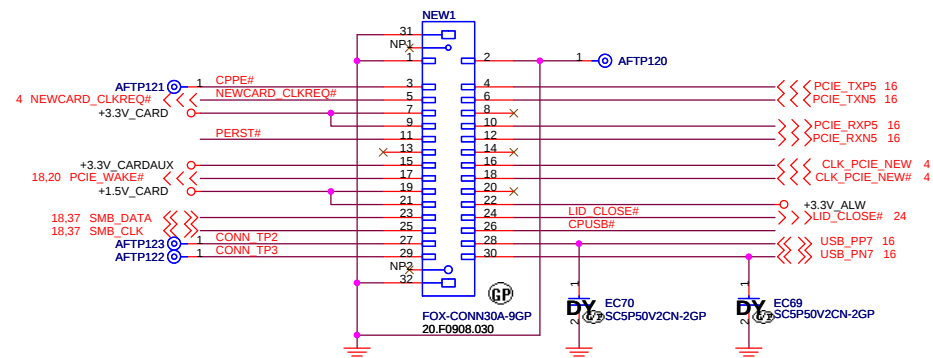
LINE1 OUT



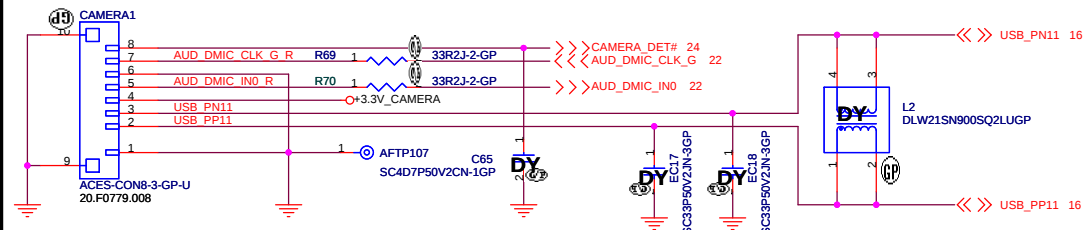
SSID = ExpressCard



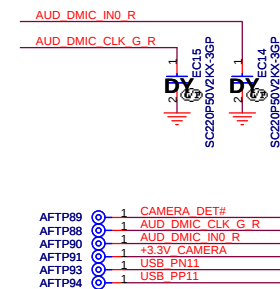
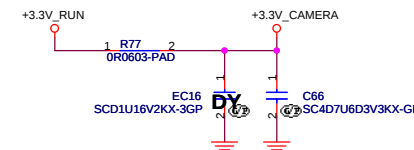
New Card Connector



```
SSID = User.Interface
```

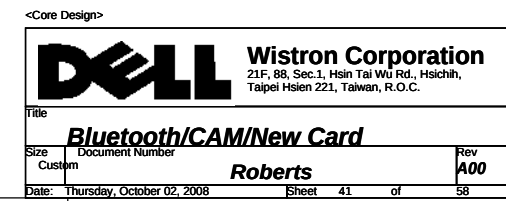
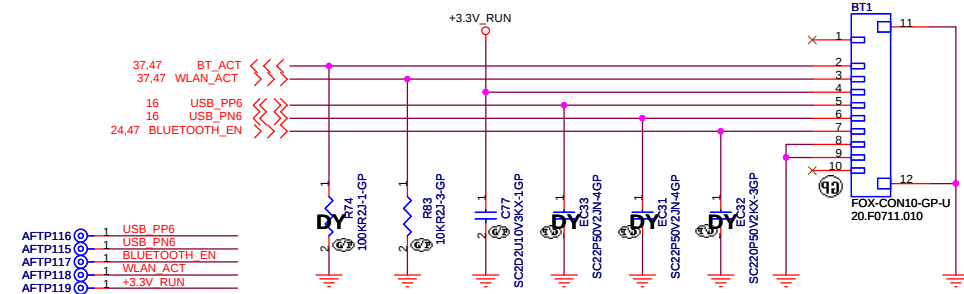


Digital Mic Power

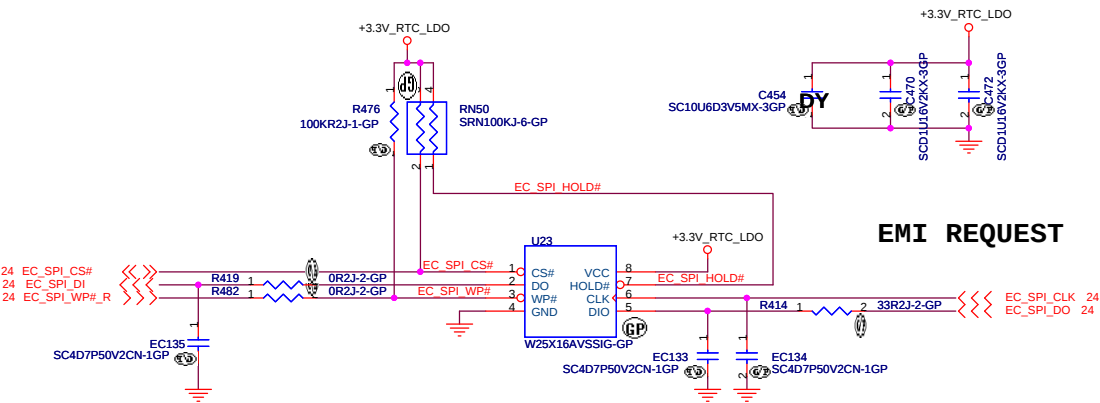


```
SSID = User.Interface
```

Bluetooth Module conn.



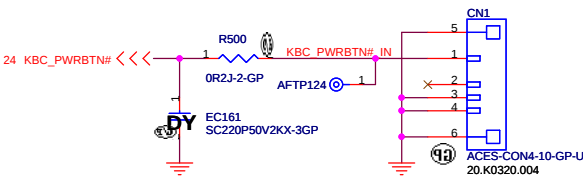
SPI FLASH ROM (16M bits)



SSID = Flash.ROM

SSID = User.Interface

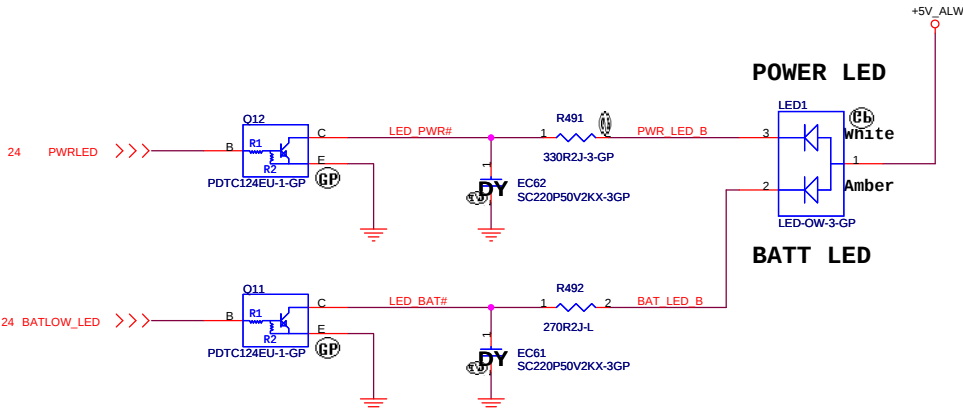
Power Dash Board to Board CONN



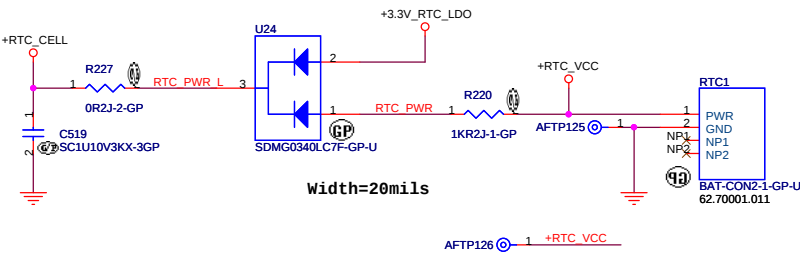
SSID = User.Interface

Power/Battery LED

SSID = RBATT

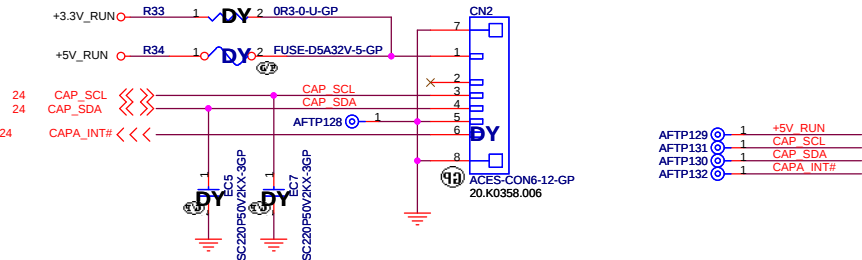


RTC Connector



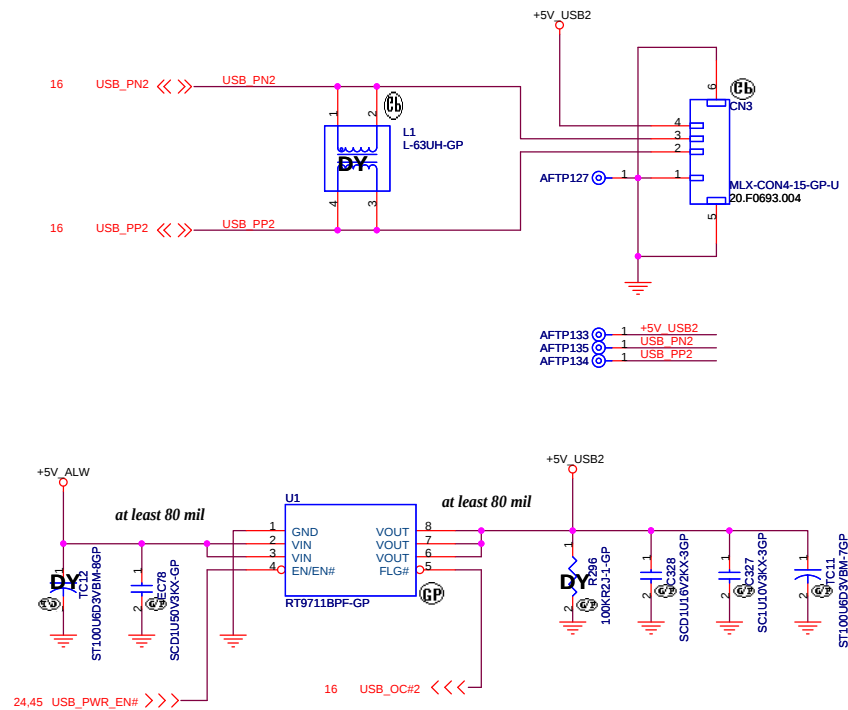
SSID = User.Interface

Capacitive Button



SSID = USB

Right USB Port CONN



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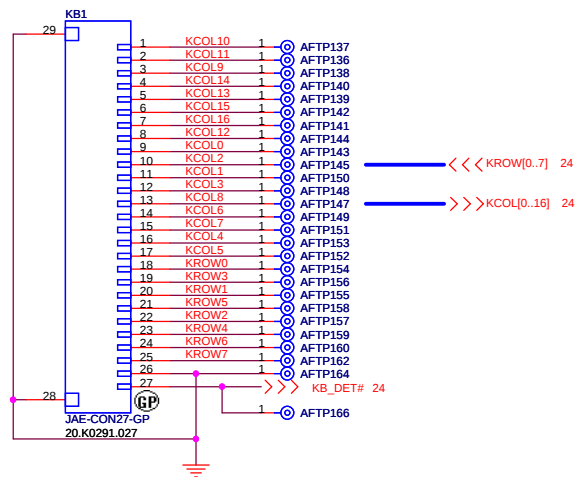


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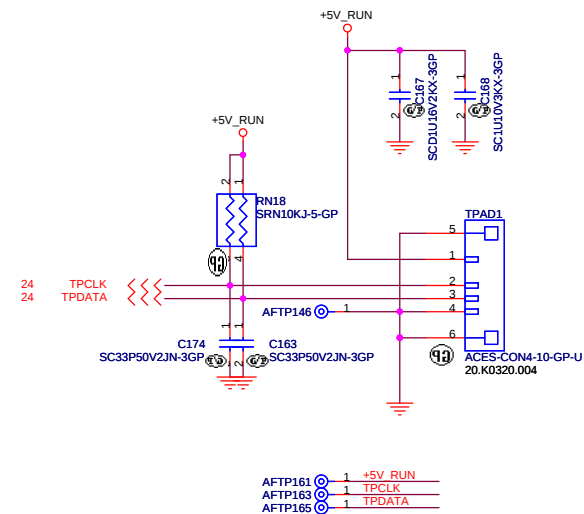
SSID = KBC

Internal KeyBoard Connector

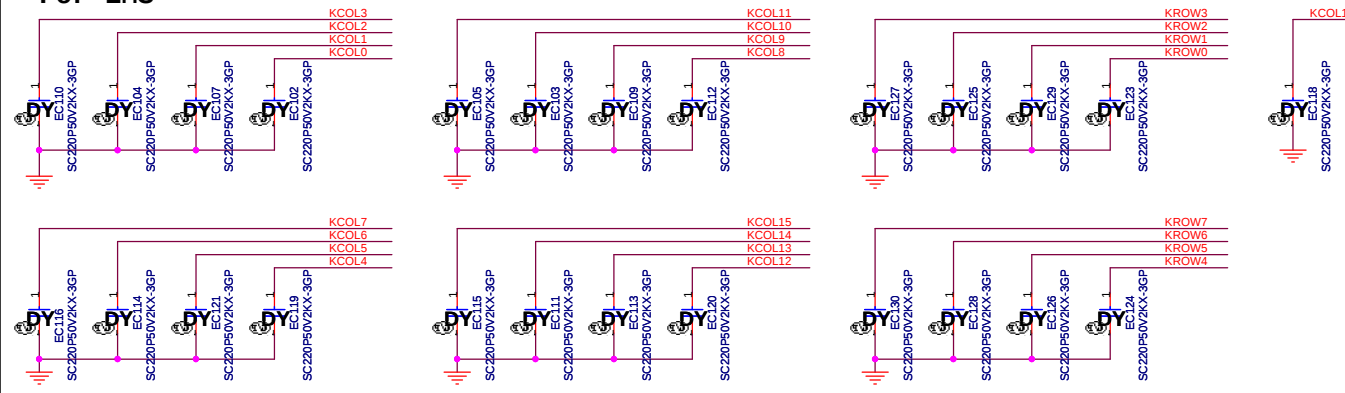


SSID = Touch.Pad

TouchPad Connector



For EMS

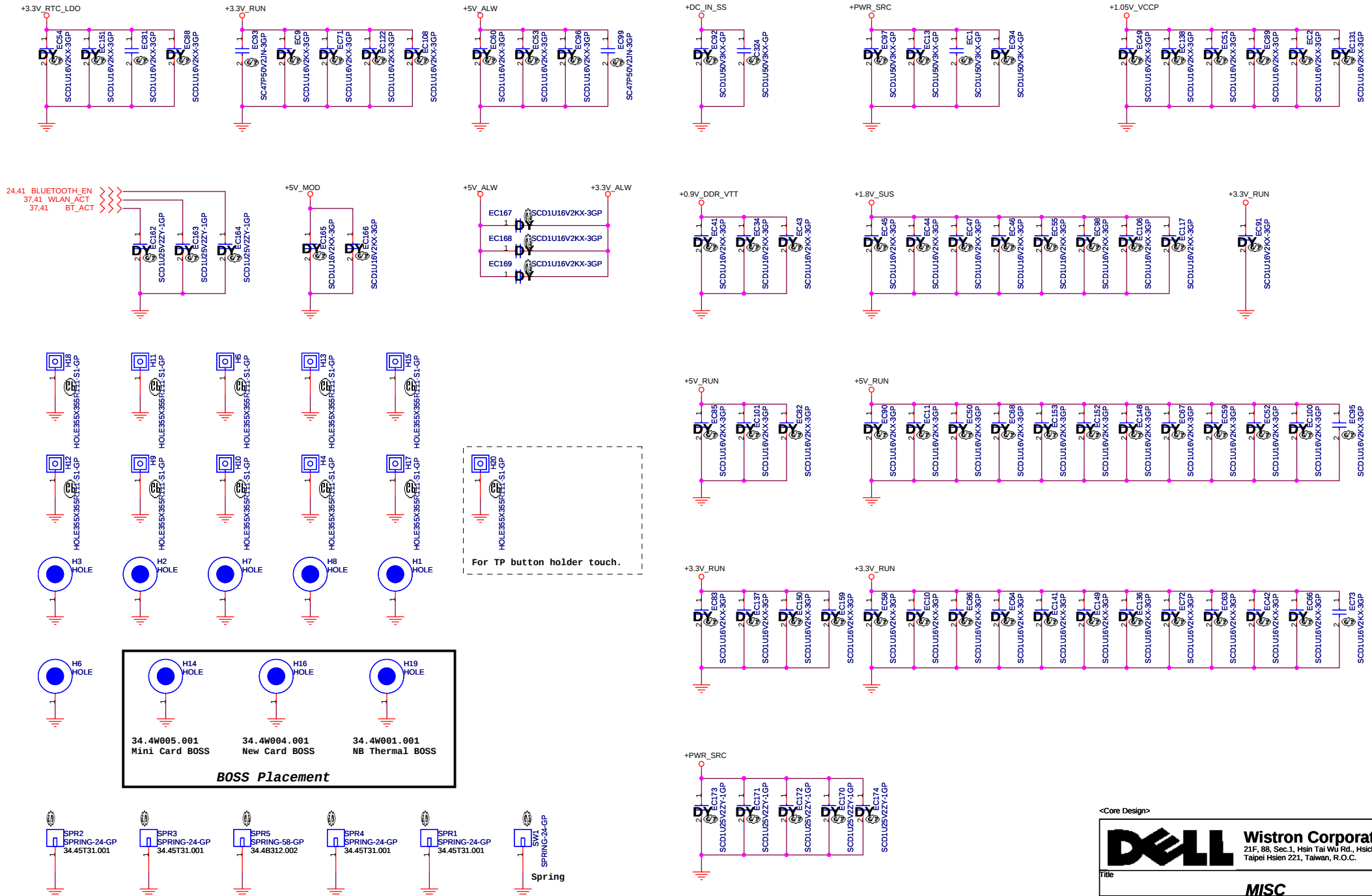


SSID = LOM

SSID = VIDEO

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SSID = Mechanical

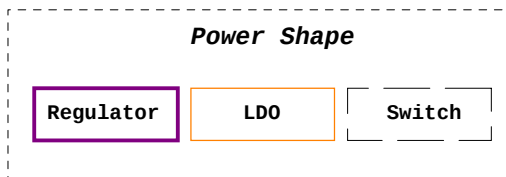
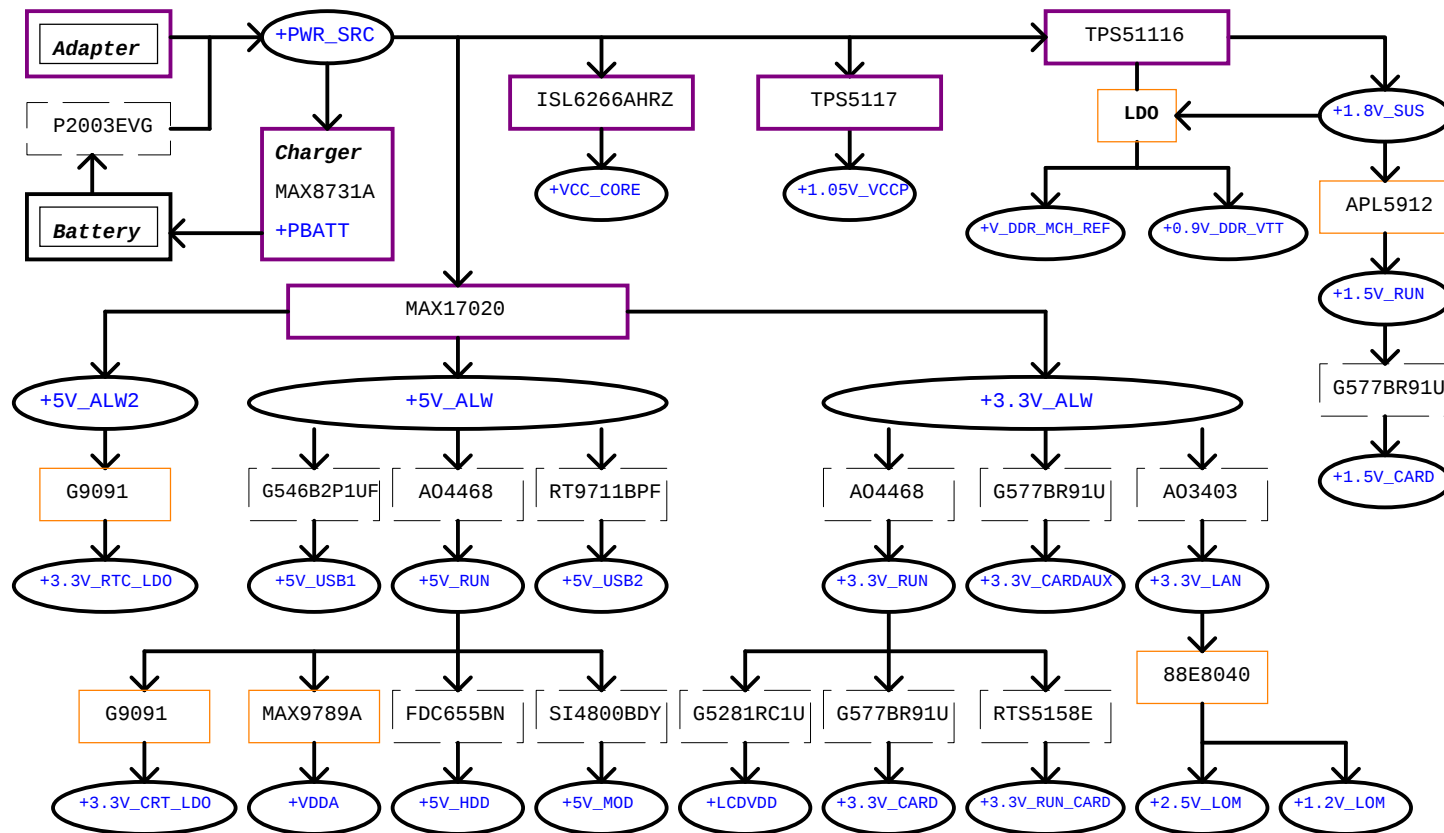


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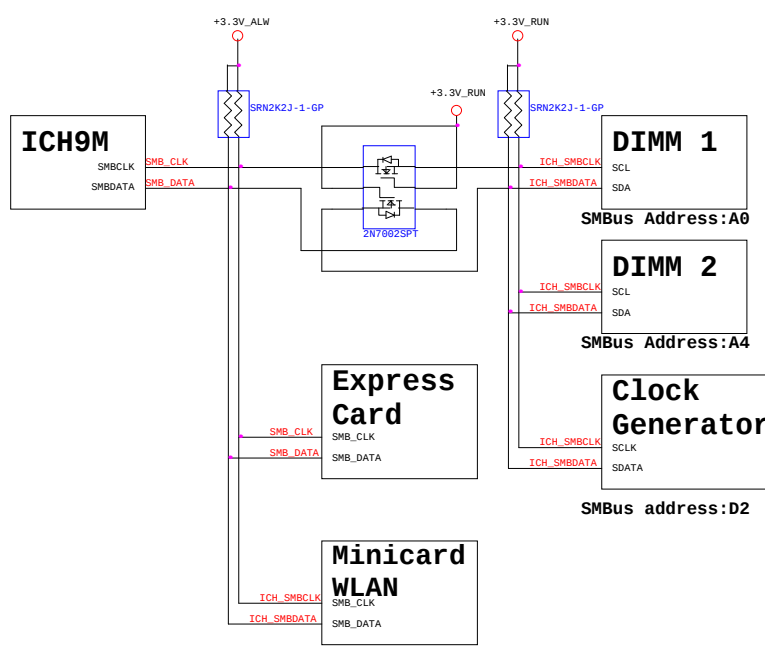


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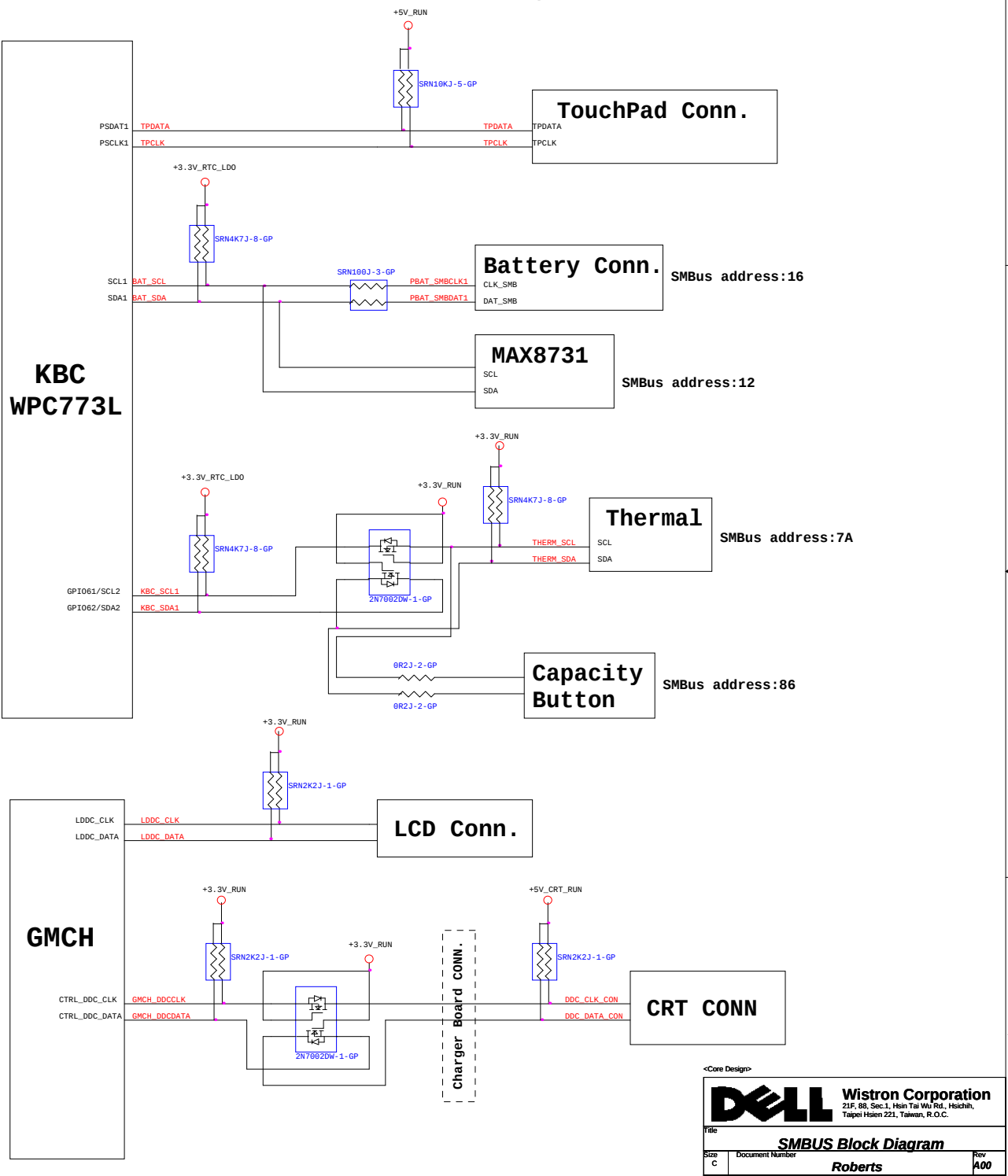
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MISC			
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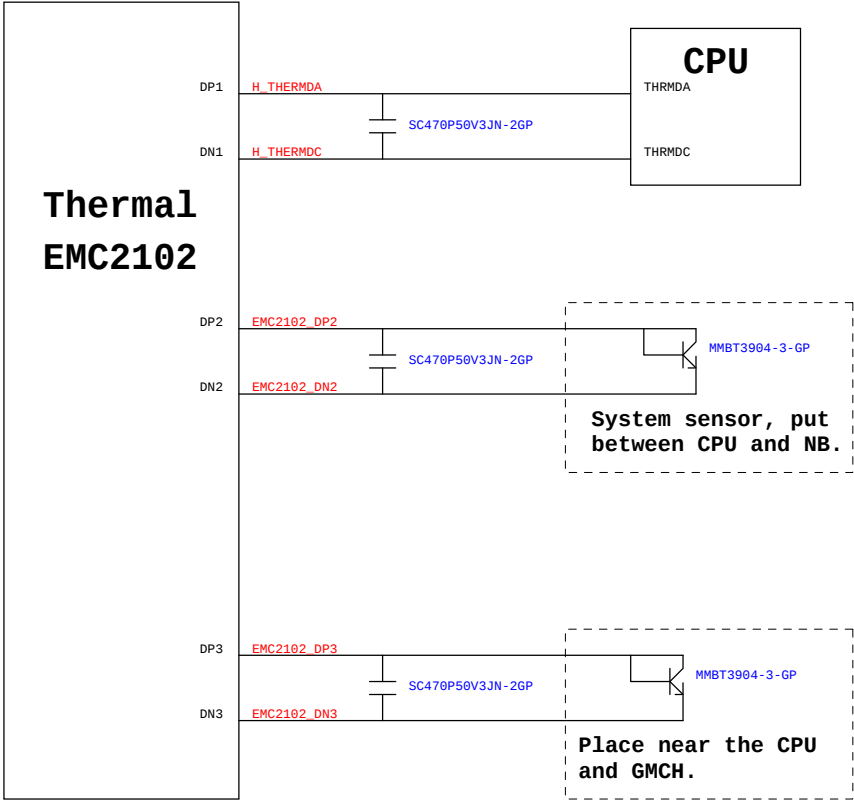
ICH9M SMBus Block Diagram



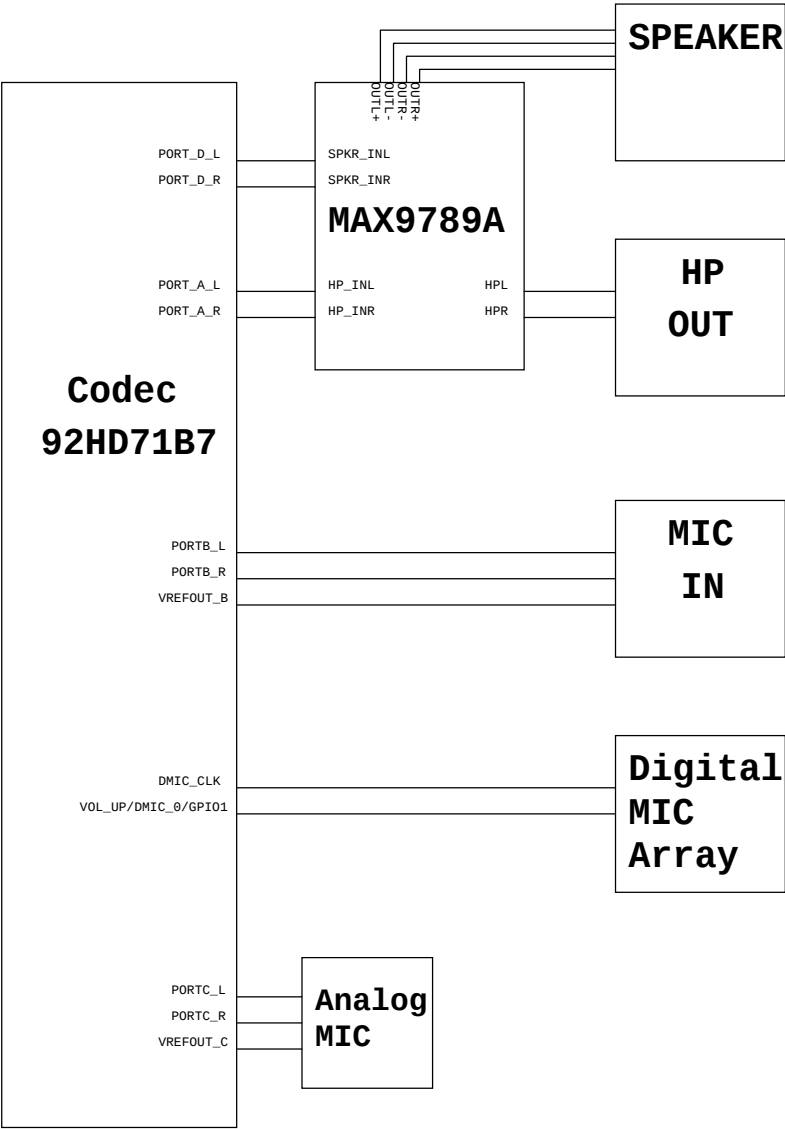
KBC SMBus Block Diagram



Thermal Block Diagram



Audio Block Diagram



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DATE	VERSION	NO	PAGE	Modified List	Issue Description	OWNER
06/03	X01	1	45	CN4 Pin.51 from +DC_IN change to GND.	CN4 Pin.51 should be ground.	EE
		2	24	Dummy R422	LID SW is push-pull type, no need pull high.	EE
		3	41	CAMERA1 conn reduce from 10 to 8 pin.	Follow camera design.	EE
		4	42	RTC1 CONN change p/n: 22.70031.001 to 62.70001.011.	Qty issue to change another.	EE
		5	46	Exchange H14 and H6 names.	Correction. H14 for mini card boss ; H6 is hole.	EE
06/05		6	42	Reverse LED1.	Correction. Amber for BAT_LED_B ; White for PWR_LED_B.	EE
		7	37,41	Remove CN5 and related circuit in page.41. Add dummy R: R493, R494, R495, R496, R497, R498, R499	Remove debug board connector. For debug mini card, change LPC Bus to mini card base. Set dummy res to avoid damaging MB or additional mini card.	EE
		8	37	Dummy R210, R211	For debug mini card. Set dummy res to avoid damaging MB or additional mini card.	EE
		9	24	Dummy R150. Staff R151.	PCB Version for SB.	EE
06/06		10	42	CN1 Pin.2 set to NC. Add R500 and dummy EC161.	Avoid shorting between KBC_PWRBTN# and GND. New R and C are for EMC pre-location.	EE
		11	24	Dummy R406. Change R425, R422, R409, R406, R401, R404 to 100K ohm.	Dummy R406 for no keyboard detect function. R change to 100k for save power.	EE
06/10		12	36	Update HDD symbol.	Update symbol and footprint for only SATA HDD. (no co-layout)	EE
		13	35~45	Change All TP near connectors to AFTP (ZZ.AFT30.101).	For AFTE test pad.	EE
		14	04	Change C461 and C462 from 15pF to 12pF.	For X3 cap choice by report suggestion.	EE
		15	17	Change C520 and C522 from 15pF to 12pF.	For X4 cap choice by report suggestion.	EE
06/12		16	24,42	Add 0 ohm R482 on EC_SPI_WP# and link to KBC/GPIO30. Change RN50 to 100k and Add R476 for EC_SPI_WP#.	KBC can control WP# of Flash ROM. R change to 100k for save power.	EE
		17	40	Change L19 and L20 to 68.00082.531.	For EMI.	EE
		18	45	Change M_RED to CN4 Pin.17 ; M_GREEN to CN4 Pin.21 ; M_BLUE to CN4 Pin.25. CN4 Pin.23 and Pin.27 to GND.	Avoiding noise to impact CRT signals.	EE
		19	47	Add H20.	Add square GND for TP button holder touch.	EE
06/16		20	42	Dummy CN2, R34.	Cap. button function is disable.	EE
		21	47	Add dummy EC162, EC163, EC164. Add dummy EC165, EC166. Add dummy EC167, EC168, EC169.	For EMI.	EE
06/17		22	04	Change R216 to 22 ohm.	The same clock dirve to U25 and U34.	EE
06/18		23	44	Dummy EC110, EC104, EC107, EC102, EC105, EC103, EC109, EC112, EC127, EC125, EC129, EC123, EC118, EC116, EC114, EC121, EC119, EC115, EC111, EC113, EC120, EC130, EC128, EC126, EC124.	For EMI.	EE
06/19		24	43	Short R26, R27.	No need 0 ohm R.	EE
		25	47	Add SW1.	ME request.	EE
		26	35	LCD1.38 link to GFX_PWR_SRC ; LCD1.37 set NC ; LCD1.35 link to +LCDVDD ; LCD1.34 link to +3.3V_RUN ; LCD1.33 link to LCD_BRIGHTNESS ; LCD1.32 to GND ; LCD1.31 link to LCD_CBL_DET#.	For LED backlight panel.	EE
		27	18	Dummy R179, R423.	SW check vender ID by SMBus.	EE
		28	24	Dummy R416, R418.	Cap. button function is disable.	EE
		29	40	Change LOUT1 and MIC1 to 22.10133.D01.	Change jack source.	EE
		30	17,18	Dummy U25.B10 link R506 to GND; U25.C18 link R501 to GND; Dummy U25.C21 link R502 to GND; U25.C11 link R503 to GND; Dummy U25.AE18 link R504 to GND; U25.AF21 link R505 to GND. Dummy R421, R424.	Avoiding abnormal action in U25(ICH9-M).	EE
06/23		31	25	Change R82 to 20K 1% ; Change R78 to 10K 1%.	For T8 shutdown is set 88 deg-C.	EE
		32	47	Add dummy EC170, EC171, EC172, EC173, EC174.	For EMI.	EE
06/27		33	42	Change U23 to 72.25X16.A01.	Better performance.	EE

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		Change List - EE (1/2)	
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DATE	VERSION	NO	PAGE	Modified List	Issue Description	OWNER	
07/30	X02	34	18	Staff R421, R424. (PT build cut-in)	Avoiding always issue interrupt event.	EE	
		35	23	Dummy R290 ; Staff R291. (PT build cut-in)	Adjust audio amp. gain value.	EE	
		36	20	Add dummy R507.	Add RUN power for LAN.	EE	
		37	21	Short R253, R254.	No need 0 ohm R.	EE	
		38	24	Staff R138, R150 ; Dummy R141, R151.	PCB Version for SC.	EE	
		39	35	Add R508 ; Change R359 to 49.9k ohm.	For LCD power sequence.	EE	
		40	22,23	Move C535 (Change 0.033uF), R472 to page.23. Remove C536 (Change 0.033uF), C542. Add R484 to gnd ; Add C566 for AUD_SET, C567 for AUD_BIAS. C565 for 6040 only.	For PC beep.	EE	
		41	36	Material change: HDD1	ME request.	EE	
		42	37	Material change: CARD1	ME request.	EE	
		43	47	Material change: SPR4	ME request.	EE	
08/06		44	09	Add TP271 for U52/ SDVO_CTRLDATA.	TP.	EE	
		45	41	Short R79, R80.	No need 0 ohm R.	EE	
		46	04	Symbol change: U54.	For clock generator co-layout.	EE	
		47	-	Change to close line: R204, R200, R356, R139, R152, R408, R394, R390, R403, R402, R96, R120, R378, R360, R140, R373, R97, R405, R155, R154, R262, R266, R439, R265, R226, R269, R174, R175, R183, R432, R433, R434, R430, R431, R437, R191, R177, R270, R188, R436, R452, R259, R282, R250, R249, R467, R153, R81, R77.	No need 0 ohm R.	EE	
		48	24,32	Move R182 to page.24.	Movement.	EE	
		49	37	Short R428, R426 ; Add DY L21.	Pre-location for Minicard USB trace.	EE	
		08/07	50	-	Short R139, R96 , R155, R154, R226, R174, R175, R432, R433.	No need 0 ohm R.	EE
			51	19	Staff C488.	For DMI.	EE
		08/11	52	23	Use 2.2uF C564 and C557 for Maxim U62 IC.	For improving bobo sound.	EE
		08/15	53	32	Material change: TC23. (DY)	Material issue.	EE
54	11		Material change: TC19, TC21.	Material issue.	EE		
09/02	A00	55	21	USB_PP10 for U34.5 ; USB_PN10 for U34.4. (ST build cut-in)	Schematic modification.	EE	
56		24	Staff R151 ; Dummy R150.	PCB Version for -1(Xbuild).	EE		
09/03		57	24	Add dummy R509 to gnd for KBC GPIO24. (09/10 update)	For GM45.	EE	
		58	05,17	Dummy R76 ; Staff R167	For H_THRMTRIP# to SB.	EE	
		59	12,20, 24	Change to close line: R115, R246, R182, R158, R159, R170.	No need 0 ohm R.	EE	
09/09		60	37	Remove L21.	No need L21.	EE	
		61	19	Staff R453, C511 ; DY C521.	Follow Intel DG 2.0.	EE	
		62	04	Short RN42, RN43, RN44, RN45, RN48, RN22, RN23, RN54, RN53, RN52, RN51.	No need 0 ohm R.	EE	
09/10		63	21	Add dummy R510 and C568. Staff R282 0 ohm.	For U34 power bounce issue.	EE	
09/22		64	04	Dummy R196.	For debug. Normally, no need it.	EE	
		65	25	R82 change to 10k ; R78 change to 2.37k.	For T8 thermal shutdown setting.	EE	
		66	23	Staff R288 ; Dummy R289.	For Audio amp. gain.	EE	
10/02		67	21	Dummy R284, C318. Staff R282 to Bead 68.00082.531. Staff R510 to 2.2K ; Staff C568.	For U34 power bounce issue.	EE	

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06/03	X01	1	32	R189 change to 2.2K ohm, C216 dummy.	For +1.5V_RUN sequence.	Power EE
		2	30	C378 change to 0.01uF.	For +1.05V_VCCP sequence.	Power EE
		3	34	C316 change from 4.7nF to 0.01uF.	For +3.3V_RUN sequence and improve +3.3V_ALW voltage drop due to SW(U31) turn on quickly (higher loading).	Power EE
		4	34	Staff C314 and change from 4.7nF to 6.8nF.	For +5V_RUN sequence and improve +5V_ALW voltage drop due to SW(U30) turn on quickly (higher loading).	Power EE
06/05		5	36	Dummy Q20, U57, R462, R457, C527 and U58, U28, R251, R252, C293, C295 Change R258, R256 to G81, G82 Change R278, R279, R277, R276 to G83, G84, G85, G86	No sniffer function, no control HDD & ODD power.	Power EE
06/06		6	27	R136 change to 270k and R108 change to 237k	For 5V/3.3V OCP	Power EE
		7	28	R38 change to 12.1k R323 change to 3.92k , C360 change to 0.047 uF 10V X7R	R38 for VCORE OCP R323 and C360 for transient and load line.	Power EE
		8	31	PC9 to GND.	PC9 to GND otherwise DC-DC IC can not obtain power to generate 1.8V/0.9V output.	Power EE
		9	31	PR2 change to 9.31k ohm.	For 1.8V OCP.	Power EE
		10	30	Add D23.	For power sequence.	Power EE
		06/10	11	18,24	Remove U60, R482, R476 and change trace name VRMPWRGD to VGATE_PWRGD.	For power sequence.
06/18		12	31	PR7.1 link to +5116_PWR_SRC.	Reserve for other source.	Power EE
06/23		13	30	Rename "+1.05V_SUSP" to "+1.05V_RUNP"	Correct naming.	Power EE
		14	26,45	Material change: U37, U46, U47.	NIKO-SEM P2003EVG component has some risk.	Power EE
07/30	X02	15	31	Change PR7 value from 622k to 619k ohm.	For 2nd source.	Power EE
08/11		16	26,45	Material change: U37, U46, U47.	Power team request.	Power EE
09/03	A00	17	26,27,28,31	Change to close line: R46 ,R137 ,R127,R106 ,R384 ,R391 ,R35 ,R29 ,R307 ,R308 ,R309 ,R303 ,R304 , R298 ,R301 ,R310 ,R313 ,PR14.	No need 0 ohm R.	Power EE
		18	26	R61 change 4.7k to 10k.	Power team request.	Power EE
XX		19 20 21 22				
XX						
XX		23	x	x	x	Power EE
XX		24	x	x	x	Power EE
	25	x	x	x	Power EE	