

ZHG SYSTEM DIAGRAM

PCB STACK UP

LAYER 1 : TOP
 LAYER 2 : GND
 LAYER 3 : IN1
 LAYER 4 : IN2
 LAYER 5 : VCC
 LAYER 6 : BOT

EDP@ -----> eDP panel
 LVDS@ -----> LVDS panel
 HDT@ -----> HDT fuction
 3G@ -----> 3G function
 U2@ -----> USB2.0 only
 U3@ -----> USB3.0 function
 885S@ -----> EC885S
 885L@ -----> EC885L

CHARGER (BQ24707A) PAGE 21

AMD CPU CORE (OZ8380) PAGE 23 *CPU*

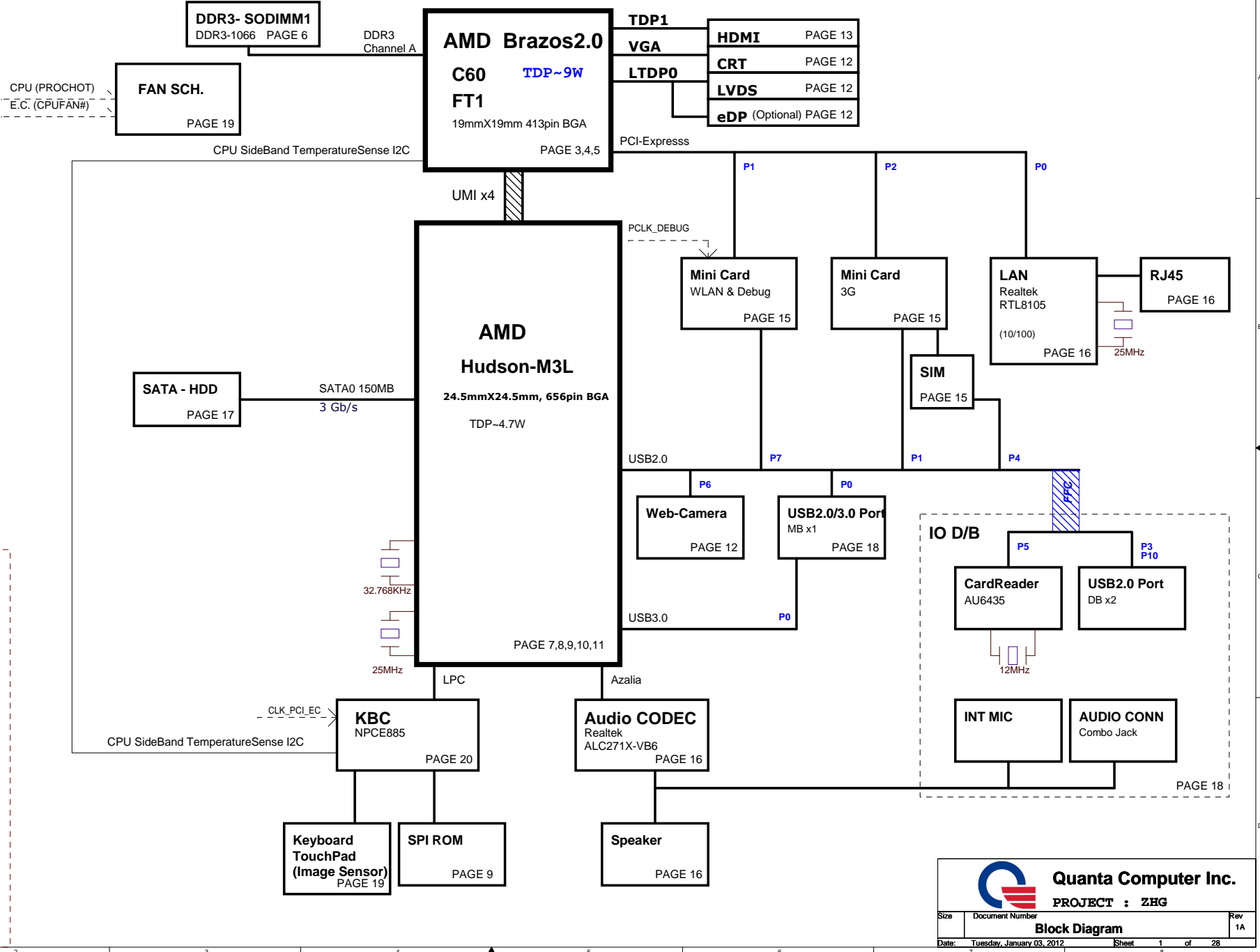
1.-05V (TPS51211) PAGE 25 *NB*

DDR 1.5V(TPS51216) PAGE 26

SYSTEM 5V/3V (RT8223P) PAGE 22

1.1V(TPS51211) PAGE 24

Discharge /Thermal protection PAGE 27



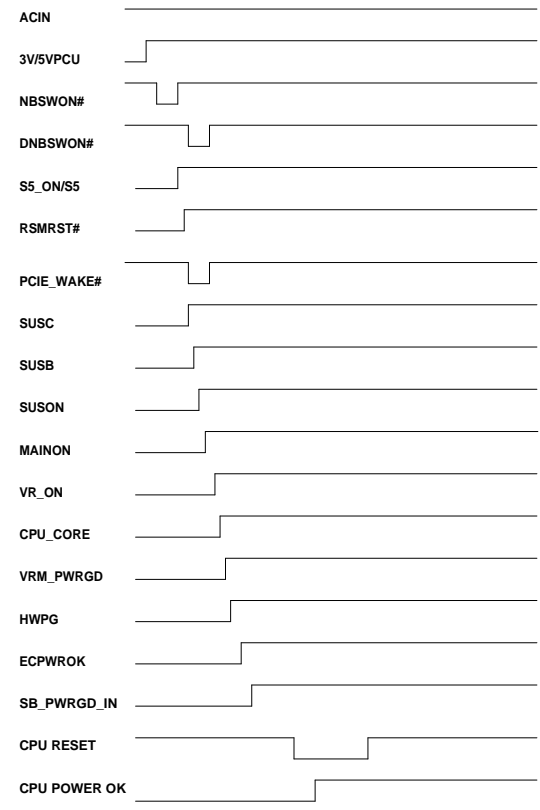
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 PROJECT : ZHG

Size Document Number Rev 1A
Block Diagram

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PAGE#	DESCRIPTION	NOTE
1	BLOCK DIAGRAM	
2	SYSTEM INFORMATION	
3	ONTARIO MEM & PCIe I/F(1/3)	
4	ONTATIO DISPLAY/CLK/MI(2/3)	
5	ONTARIO POWER & DECOUP(3/3)	
6	DDR3 SO-DIMM (STD=5.2)	
7	FCH 1/5(GPIO/USB/AZ)	
8	FCH 2/5(ACPI/PCI/CLK)	
9	FCH 3/5(SATA/VGA/SPI)	
10	FCH 4/5(POWER/GND)	
11	FCH 5/5(Strap/PWRGD)	
12	CRT / LCD / Hall IC / CCD	
13	HDMI	
14	LAN RTL8105TA-VC-CG	
15	MINI CARD / 3G / SIM	
16	Audio Codec ALC271	
17	HDD/LED/PWR Sequence conn	
18	USB Port/DB/HOLE	
19	KB/TP/TPM/FAN	
20	NPCE885/FLASH	
21	Charger (BQ24707A)	
22	SYSTEM 5V/3V (RT8223P)	
23	CPU_CORE_Brazos (OZ8380)	
24	+1.1V_S5(TPS51211)	
25	+1.05V(TPS51211)	
26	DDR 1.5V(TPS51216)	
27	+1.8V/Discharge /Thermal	
28	CHANGE LIST	

Power Sequence



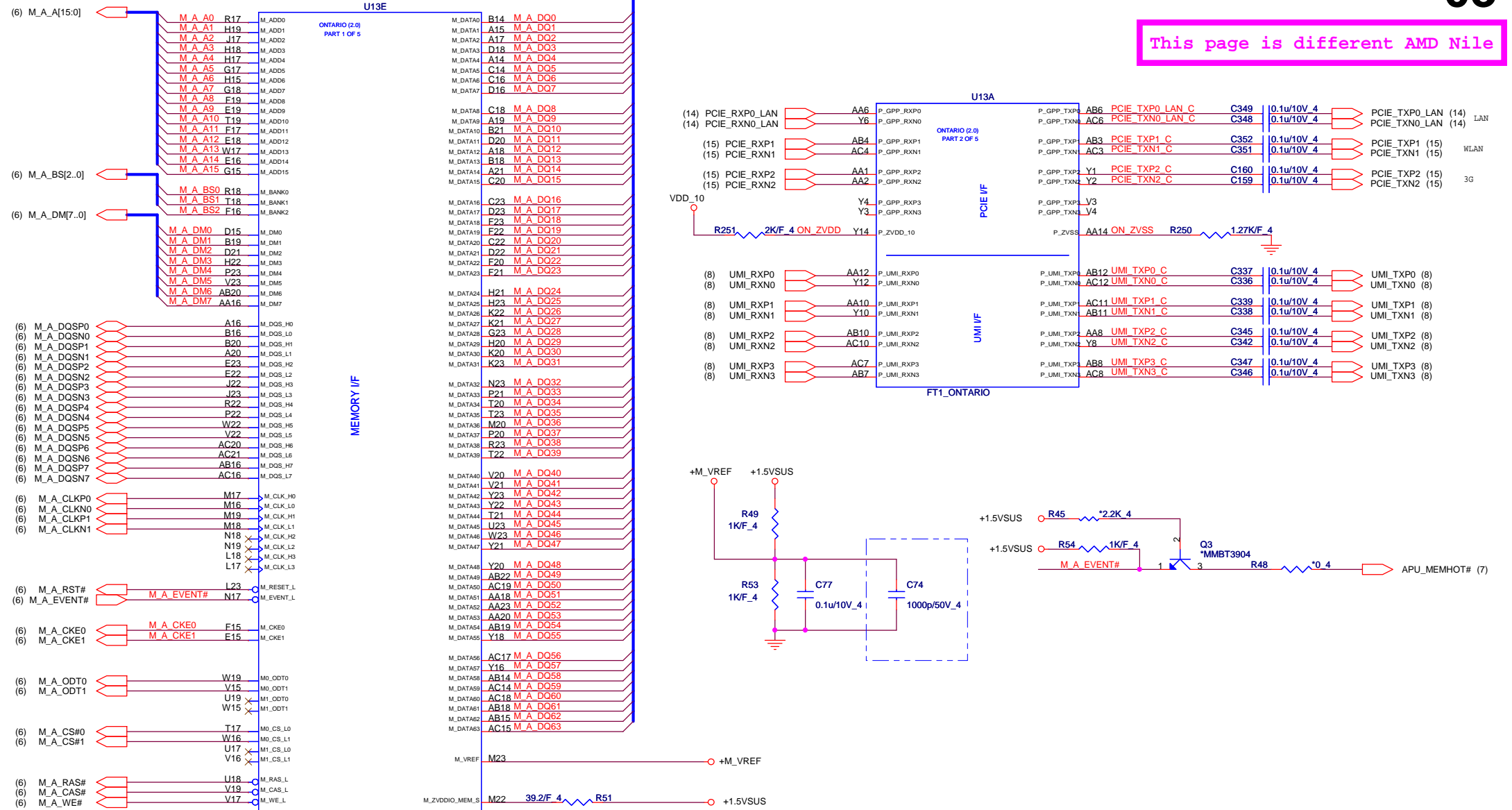
Hudson M3L SMBUS

A68M SMBUS	Pin NO.	SMBUS Function Define
PCLK_SMB PDAT_SMB (+3V)	AD26 AE25	DDR / WLAN / 3G / Image Sensor
SCLK1 SDATA1 (+3V_S5)	T7 R7	Not used
SMB_EC_CLK SMB_EC_DAT (+3V_S5)	H19 G19	Charger / Battery
SB_SCLK3 SB_SDATA3 (+3V_S5)	G22 G21	APU

KBC(EC) SMBUS


NPCE885 SMBUS	Pin NO.	SMBUS Function Define
MBCLK MBDATA (+3VPCU)	70 69	Battery / Charger
APU_SIC_EC APU_SID_EC (+3VPCU)	67 68	APU

(CPU)



This page is different AMD Nile

P/N	Item Description
AJ00C60VT00CPU (413P)CMC60AFPB22GV	1.0G(BGA)
AJ00C60VT01CPU (413P)CMC60AFPB22GV	1.0G(BGA)STN BSQ

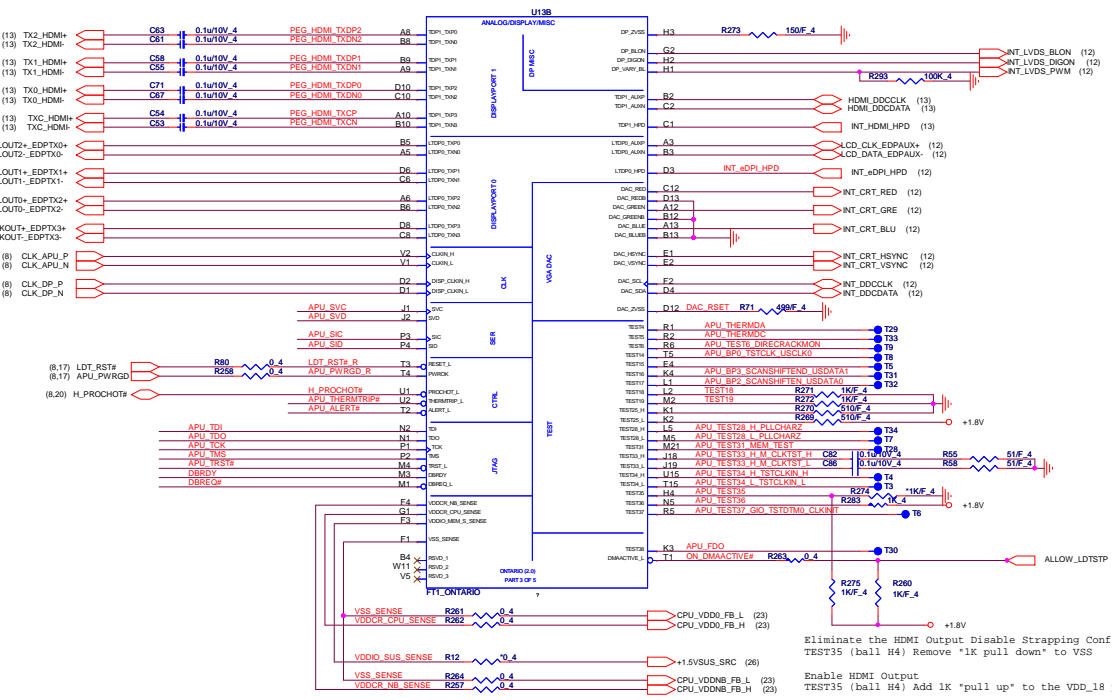
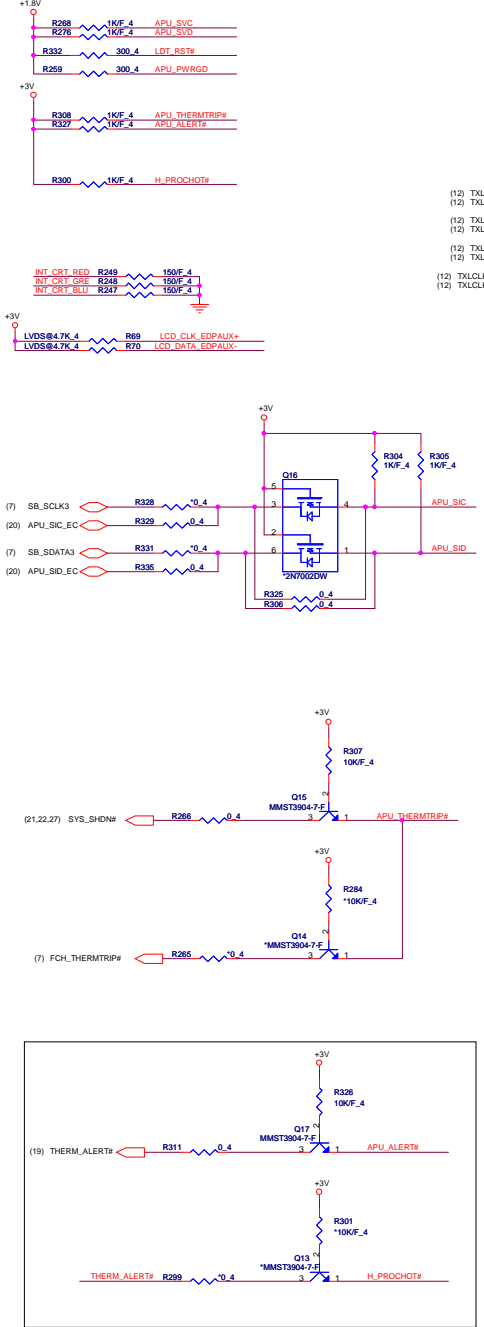


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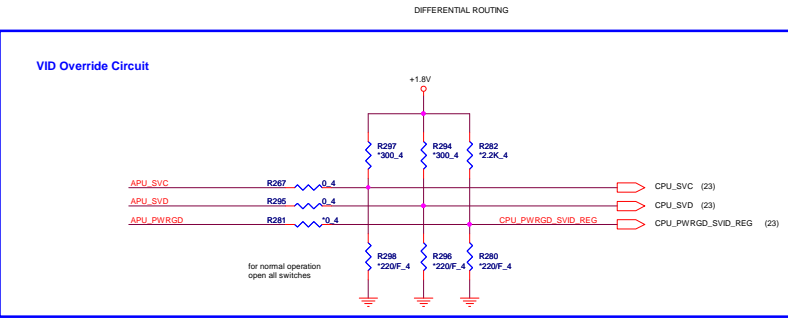
Size	Document Number	Rev
	ONTARIO MEM & PCIE I/F(1/3)	1A
Date:	Tuesday, January 10, 2012	Sheet 3 of 28

(CPU)

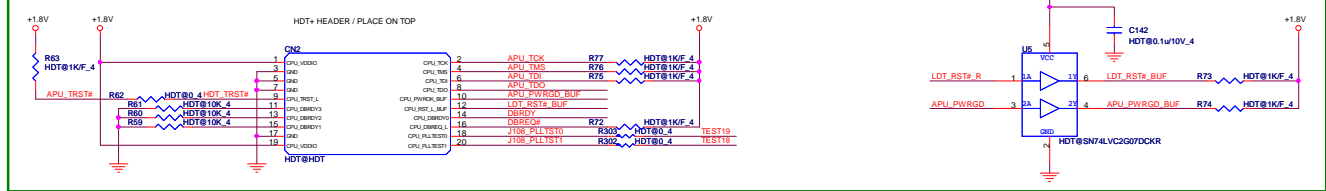


Eliminate the HDMI Output Disable Strapping Configuration TEST35 (ball H4) Remove "1k pull down" to VSS

Enable HDMI Output TEST35 (ball H4) Add 1k "pull up" to the VDD_18 power rail



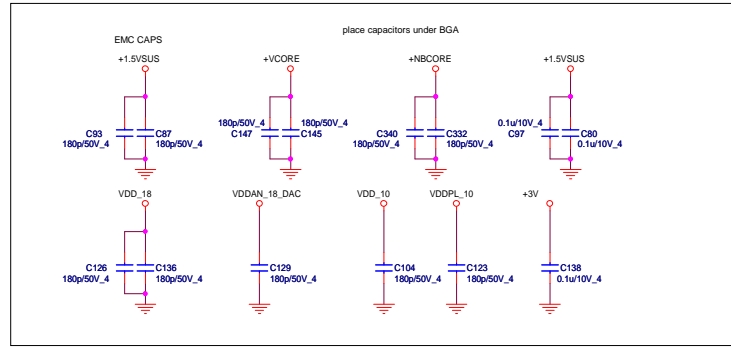
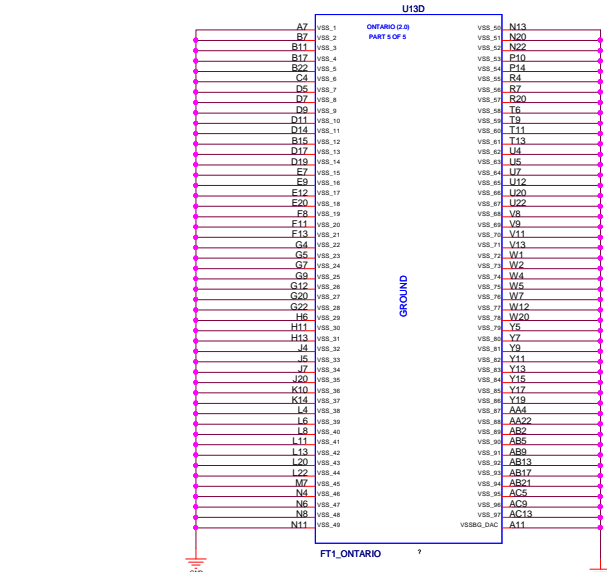
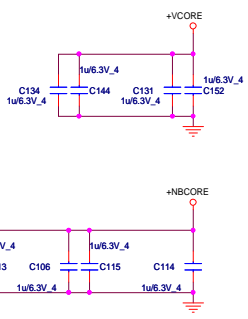
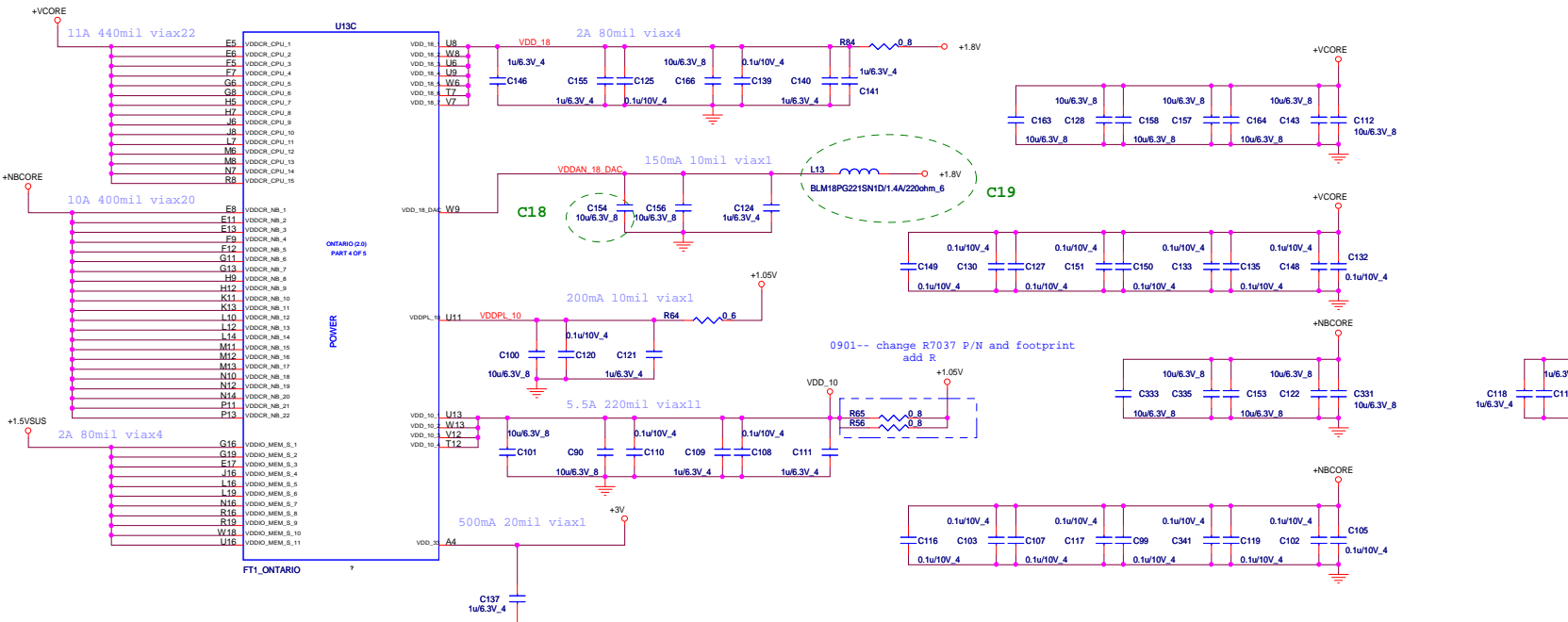
HDT+ Connector(CPU)



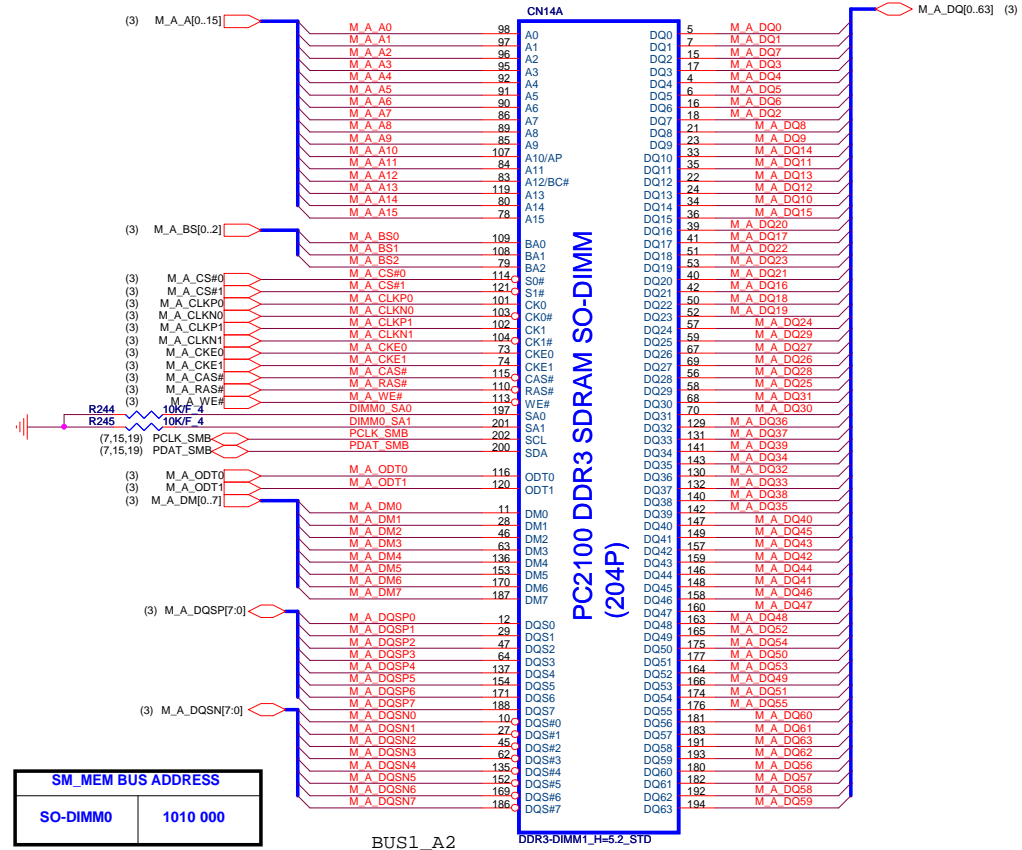
	3	2	1	0	DP AUX+	DP AUX-
HDMI	Clock	CH0	CH1	CH2	DDC Clock	DDC Data
LVDS Panel	Clock	CH0	CH1	CH2	DDC Clock	DDC Data
eDP Panel	ML3	ML2	ML1	ML0	AUX+	AUX-

This page is different AMD Nile

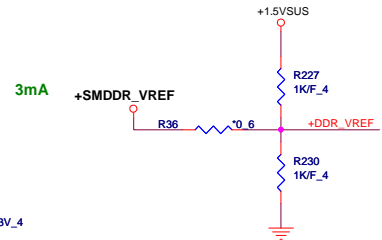
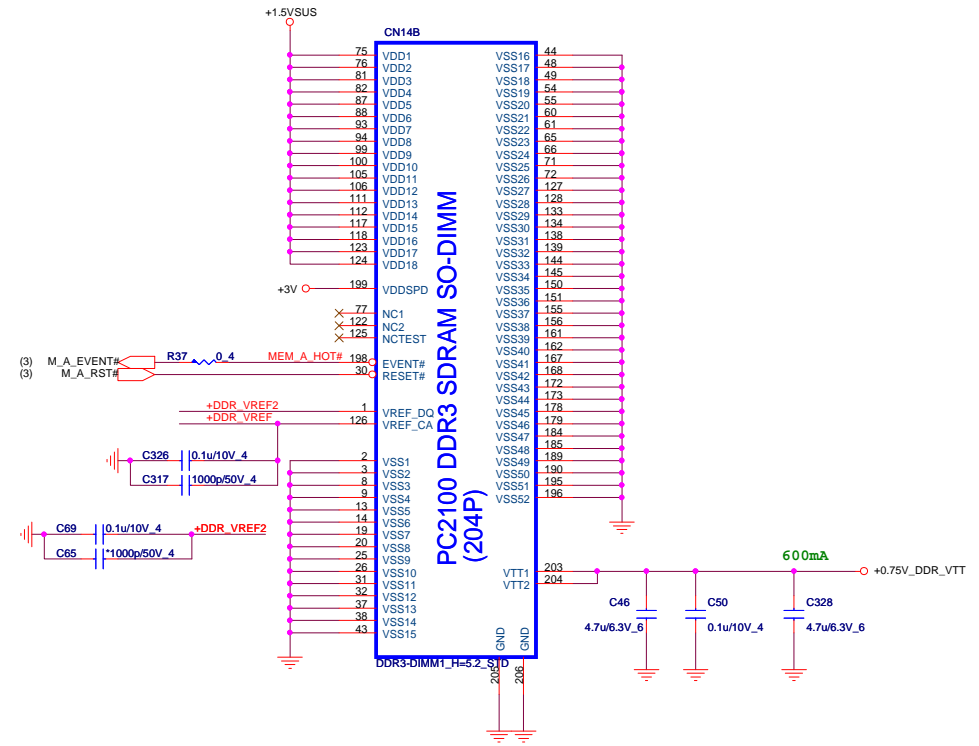
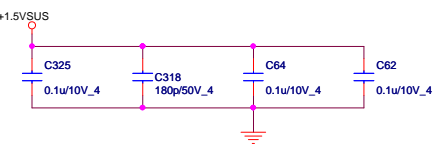
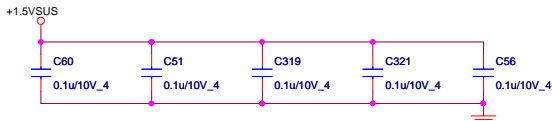
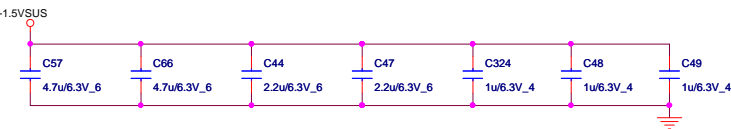
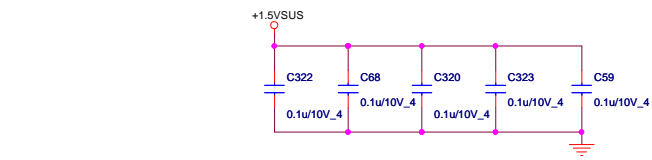
(CPU)



(DDR)



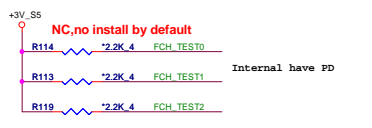
SM_MEM BUS ADDRESS	
SO-DIMM0	1010 000



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Size	Document Number	Rev
	DDR3 SO-DIMM (STD)	1A
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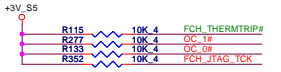
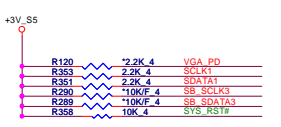
(CLG)



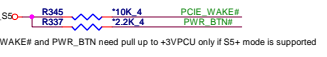
Internal have PD



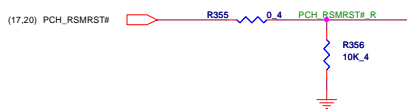
For Dimm, WLAN, TP



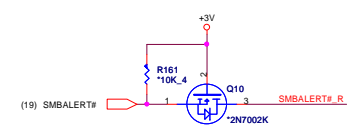
Integrated 8.2-kΩ PU



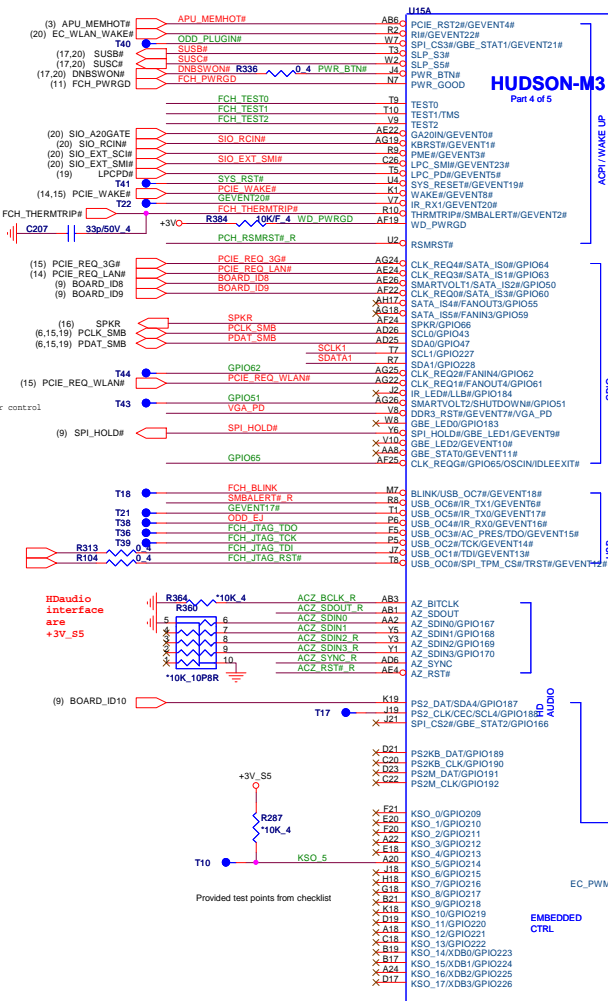
Note:LLB#, WAKE# and PWR_BTN need pull up to +3VPU only if S5+ mode is supported



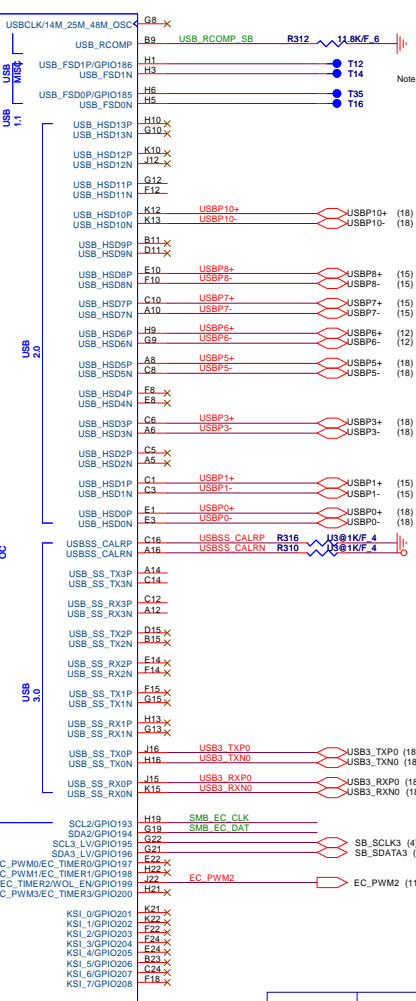
GEVENT12# -18# are +3V_S5



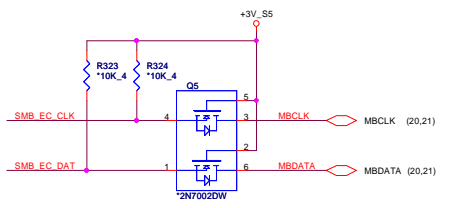
(19) SMBALERT#



HUDSON-M3 Part 4 of 5

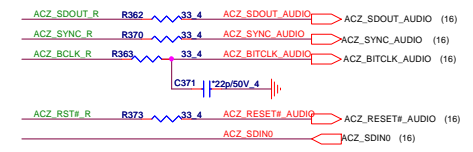


Note: USB PIN pairs with trace lengths up to 10"



USB3.0

To Azalia



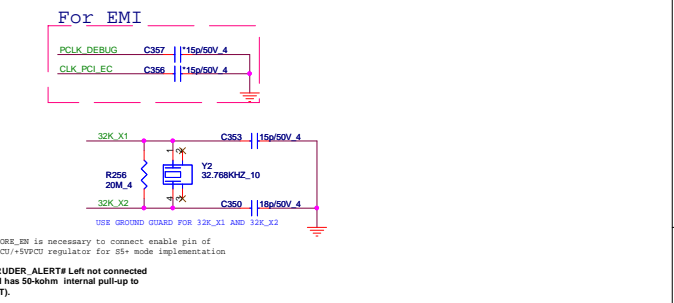
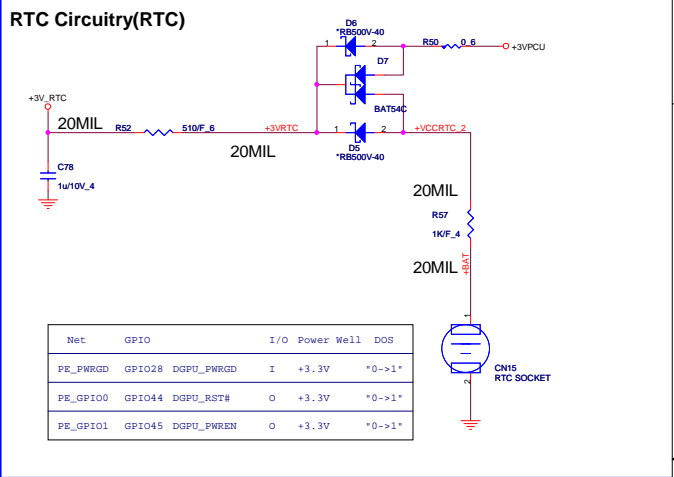
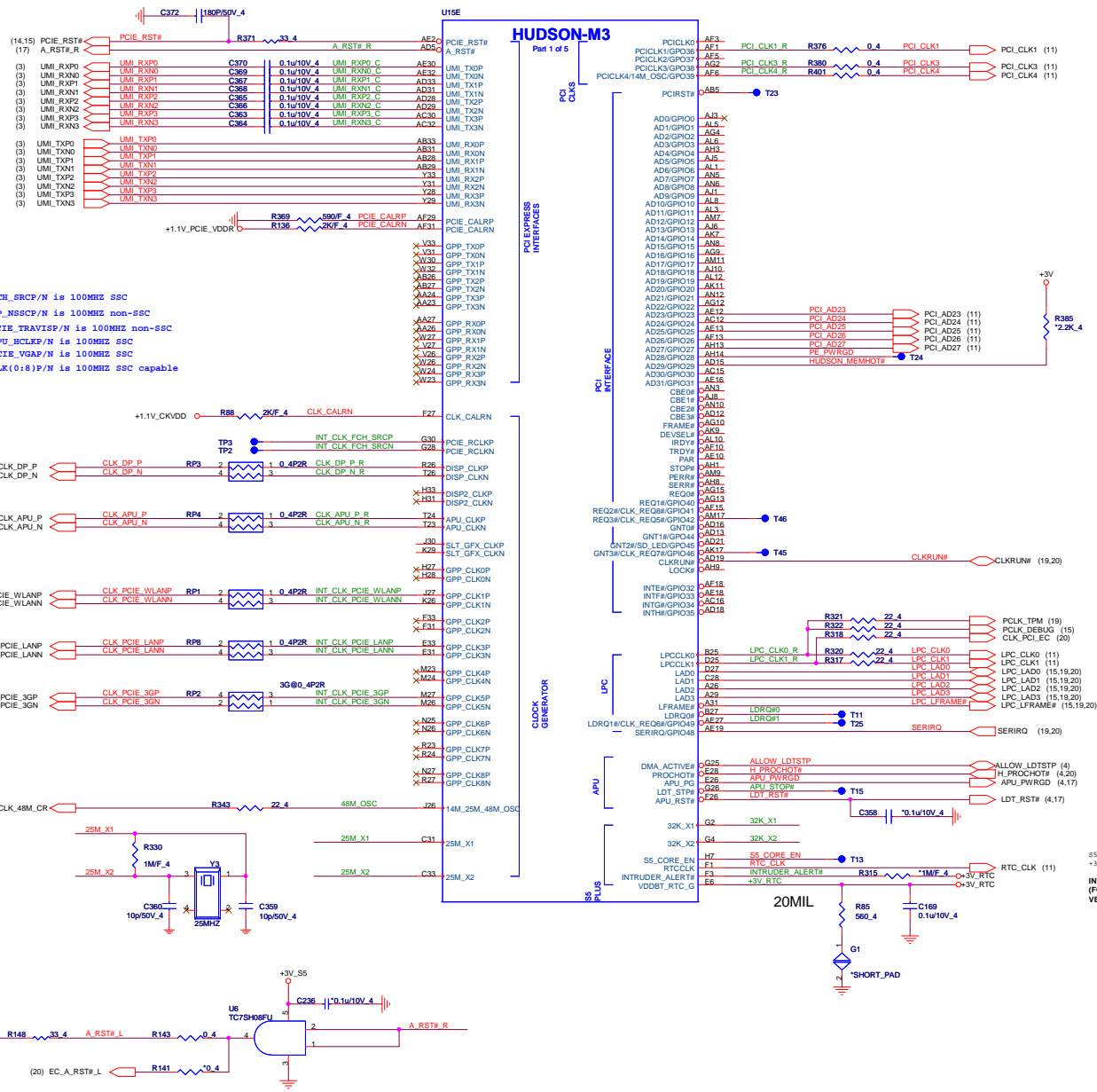
EC	FCH	Device	I2C_Device(S)
I2Ce_1(M)	I2Cf_2(M)	Charger	Battery
I2Ce_2(M)		APU	
I2Ce_3(M)	I2Cf_3(M)	APU	
	I2Cf_1(M)		
	I2Cf_0(M)	DDR	WLAN/3G
			Image Sensor
			S0

EC will Conflict with FCH. Do not mount

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Size Document Number FCH I/5(GPIO/USB/AZ)

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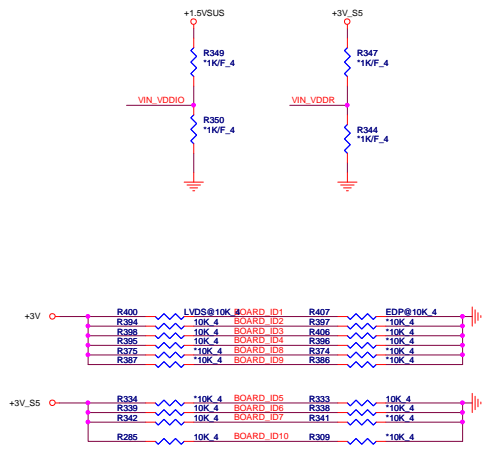
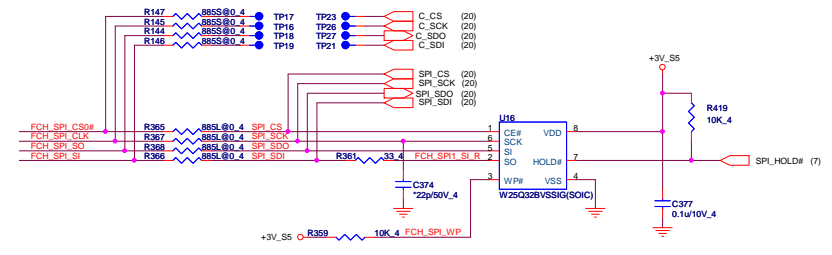
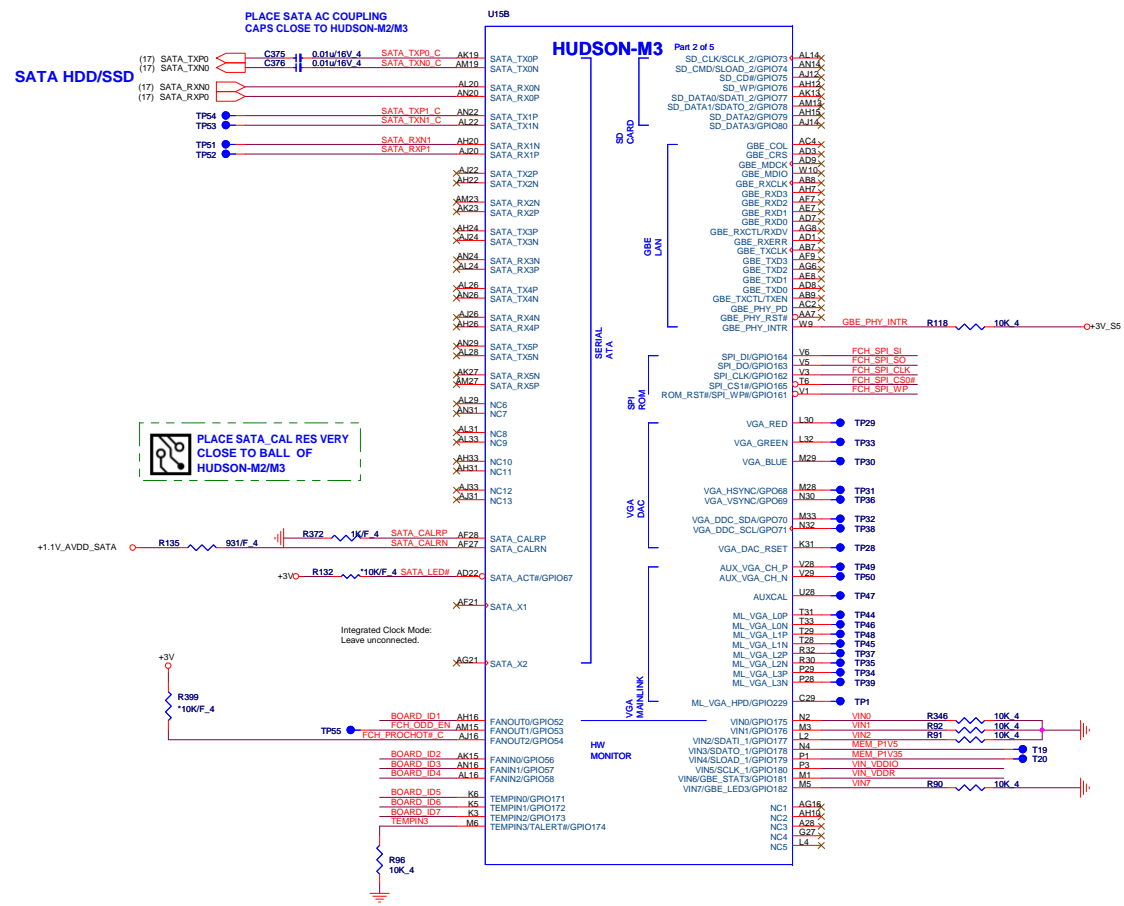


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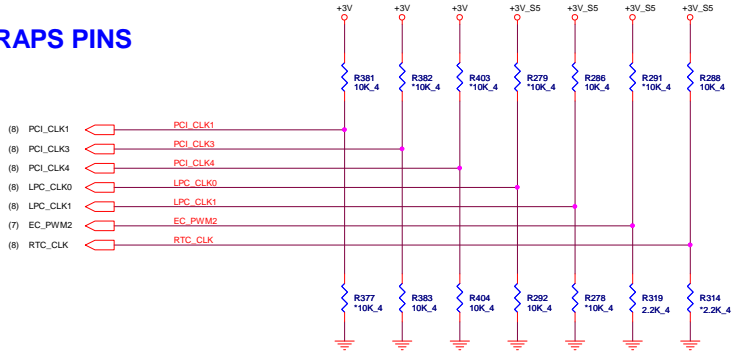
Size: Document Number: **FCH 2/5(ACP/PCI/CLK)** Rev: 1A

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OVERLAP COMMON PADS WHERE POSSIBLE FOR DUAL-OP RESISTORS.

STRAPS PINS



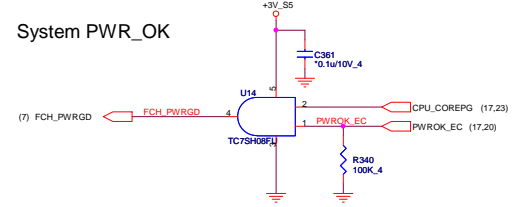
EC_PWM2 ->
SPI ROM: 2.2-KΩ 5t pull-down
LPC ROM: Pull-up to 3.3V_S5.
External pull-up resistor is not required as FCH is integrated 10-KΩ pull-up to 3.3V_S5.

Remove PCI_CLK2 function

REQUIRED STRAPS

	-----	PCI_CLK1	PCI_CLK2	PCI_CLK3	PCI_CLK4	LPC_CLK0	LPC_CLK1	EC_PWM2	RTC_CLK
PULL HIGH	-----	ALLOW PCIE Gen2 DEFAULT	-----	USE DEBUG STRAP	non_Fusion CLOCK MODE	EC ENABLED	CLKGEN ENABLED DEFAULT	LPC ROM	S5 PLUS MODE DISABLED DEFAULT
PULL LOW	-----	FORCE PCIE Gen1	-----	IGNORE DEBUG STRAP DEFAULT	FUSION CLOCK MODE DEFAULT	EC DISABLED DEFAULT	CLKGEN DISABLED	SPI ROM DEFAULT	S5 PLUS MODE ENABLED

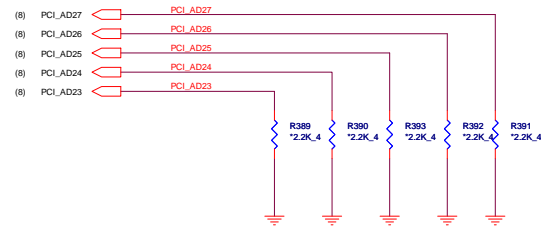
System PWR_OK



FCH PWRGD CKT

DEBUG STRAPS

FCH HAS 15K INTERNAL PU FOR PCI_AD[27:23]

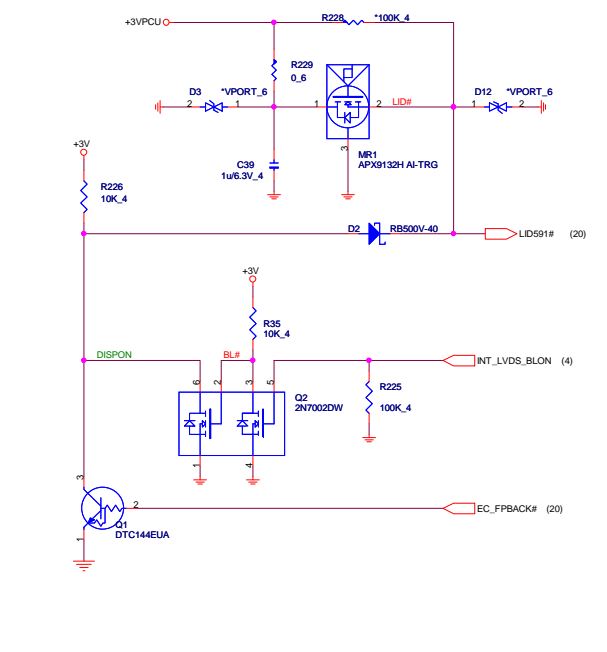


	PCI_AD27	PCI_AD26	PCI_AD25	PCI_AD24	PCI_AD23
PULL HIGH	USE PCI PLL DEFAULT	DISABLE ILA AUTORUN DEFAULT	USE FC PLL DEFAULT	USE DEFAULT PCIE STRAPS DEFAULT	DISABLE PCI MEM BOOT DEFAULT
PULL LOW	BYPASS PCI PLL	ENABLE ILA AUTORUN	BYPASS FC PLL	USE EEPROM PCIE STRAPS	ENABLE PCI MEM BOOT

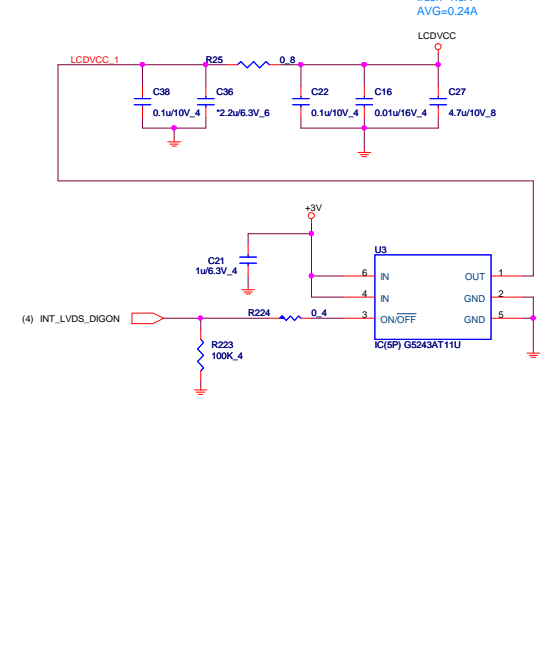
Quanta Computer Inc.
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Size	Document Number	Rev
	FCH 5/5(STRAP & PWRGD)	1A
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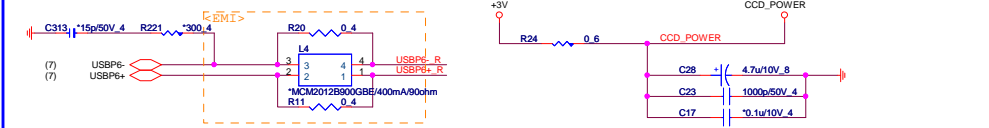
HALL IC (HSR)



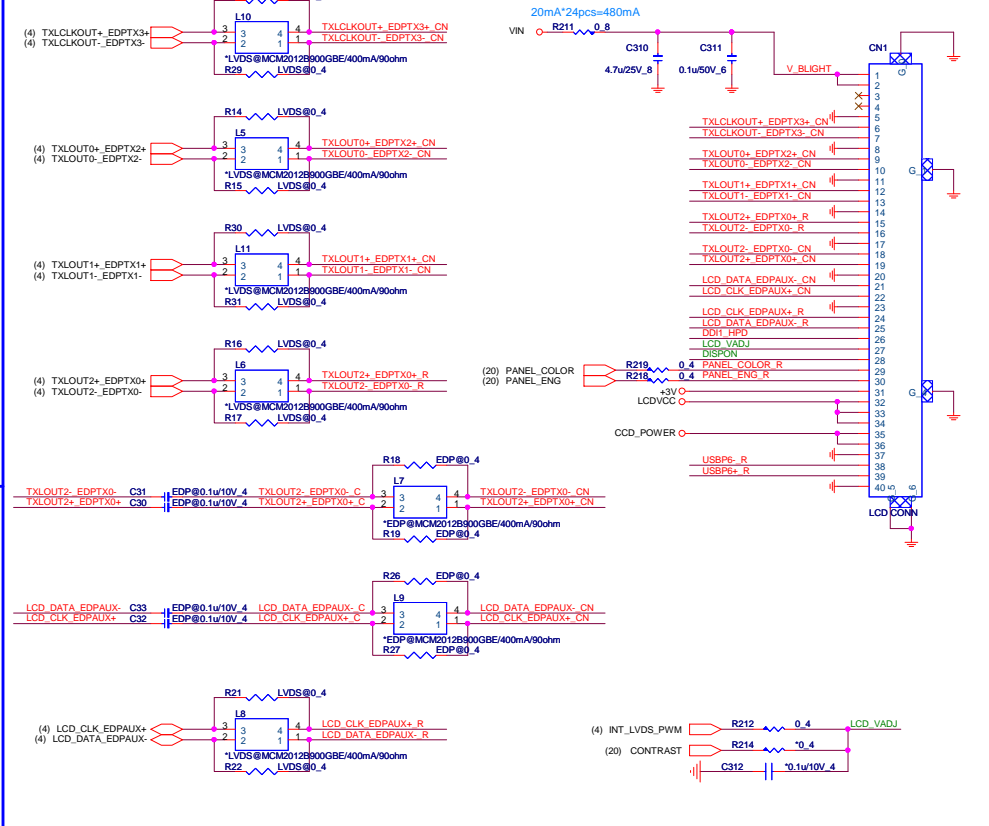
LCD POWER SWITCH (LDS)



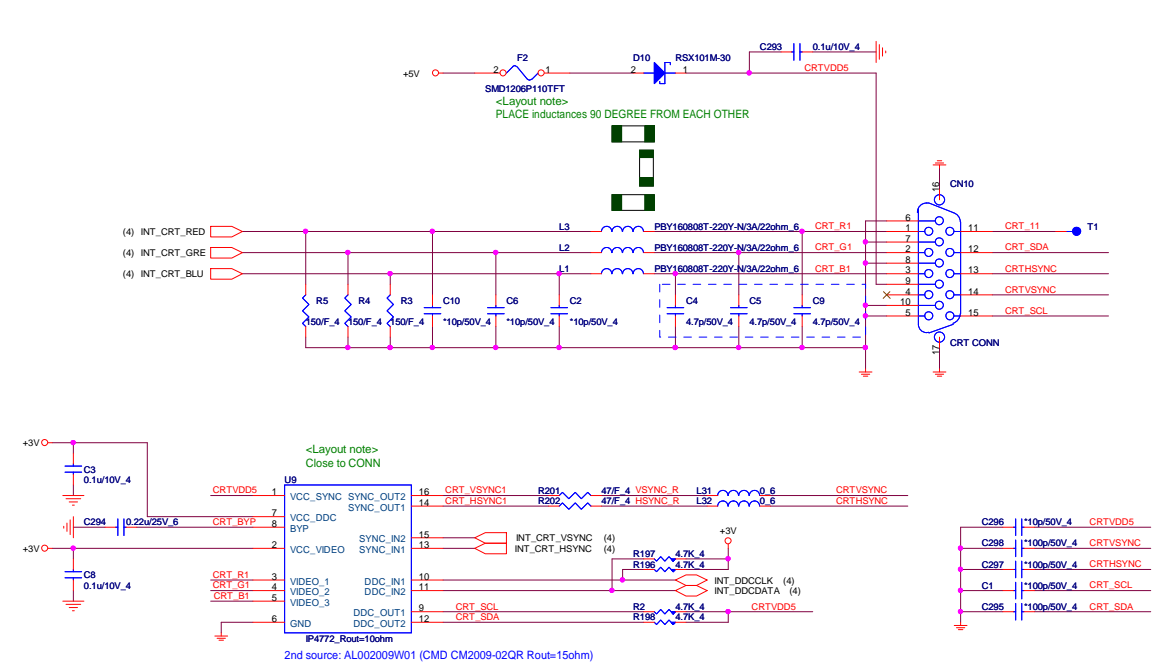
CAMERA POWER (CCD)



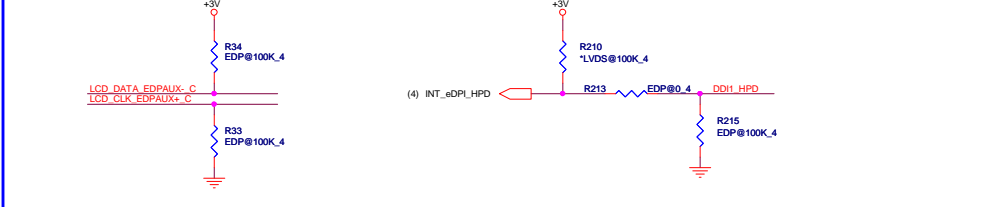
LCD MODULE (LDS)



CRT(CRT)

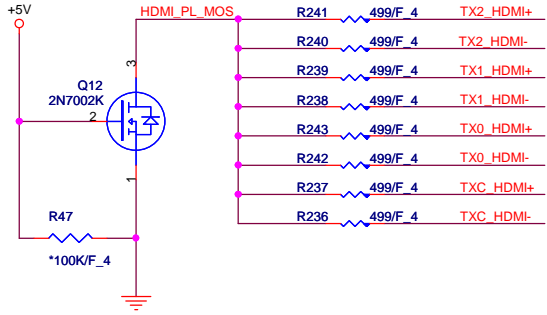


eDP (LDS)

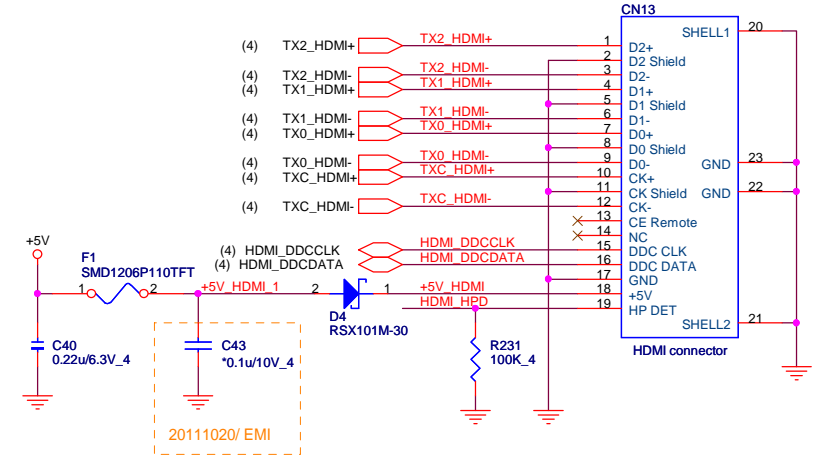
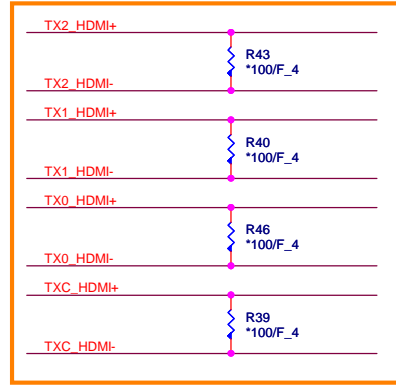


HDMI (HDM)

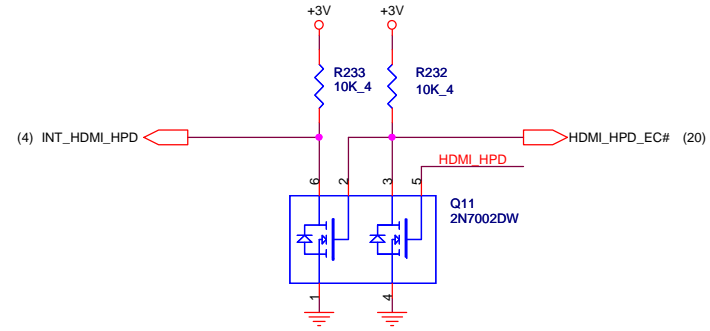
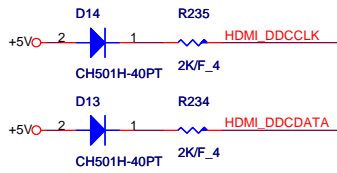
Close to HDMI Connector



EMI reserve for HDMI



SDVO I2C Control (HDM)

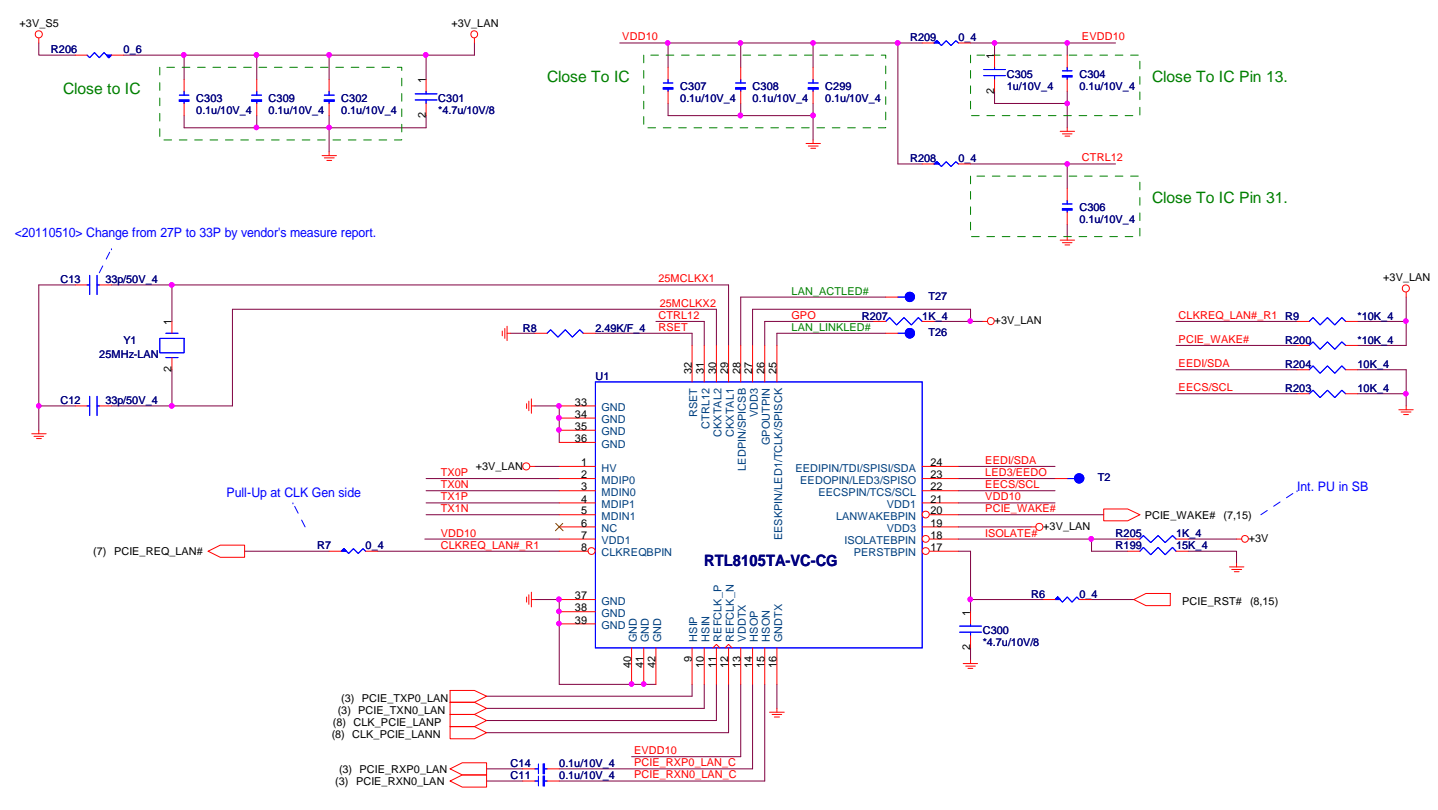


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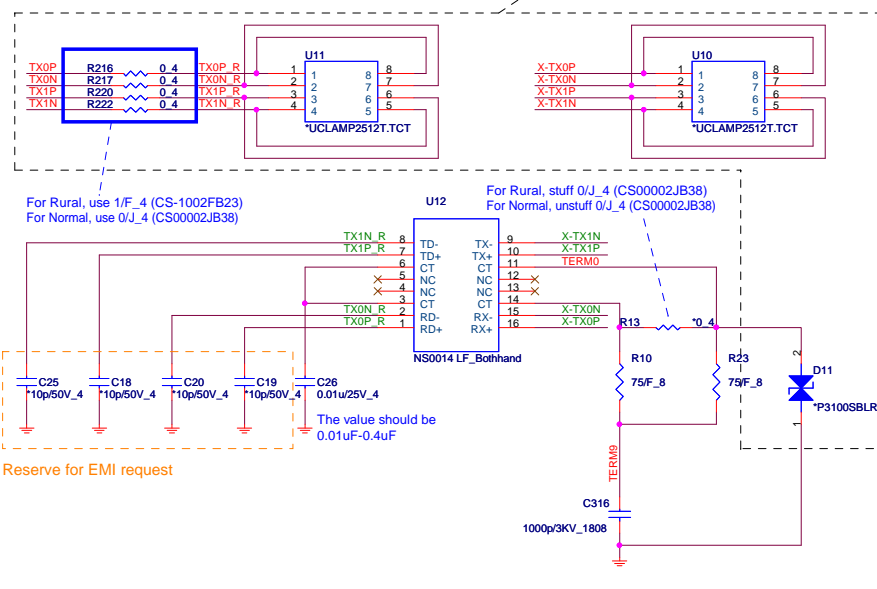
PROJECT : ZHG

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	HDMI	1A
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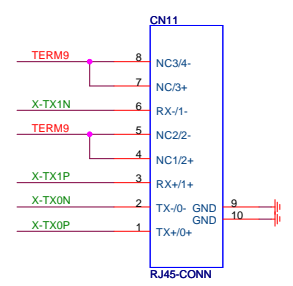
LAN (LAN)



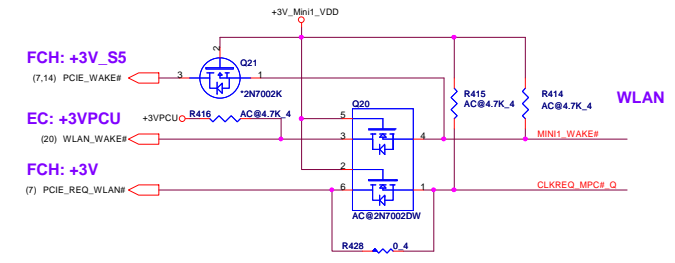
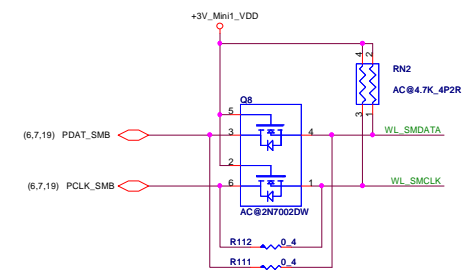
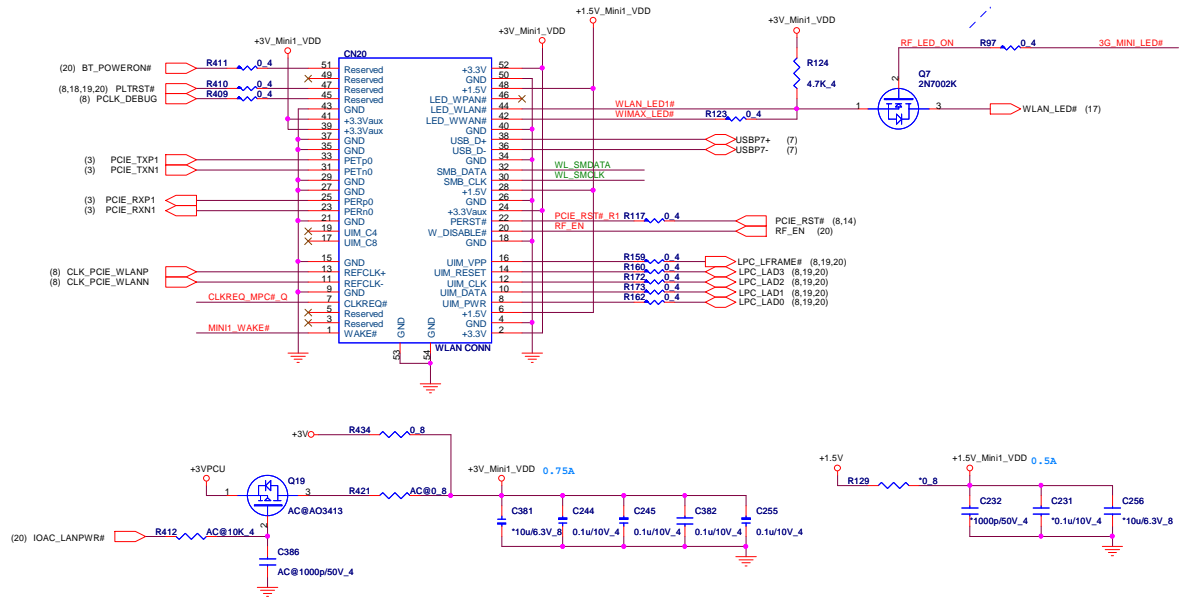
TRANSFORMER (LAN)



RJ45 Connector (LAN)

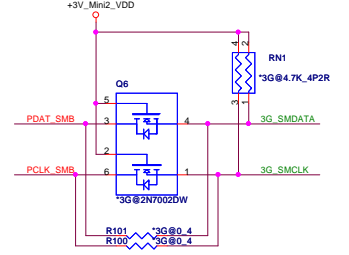
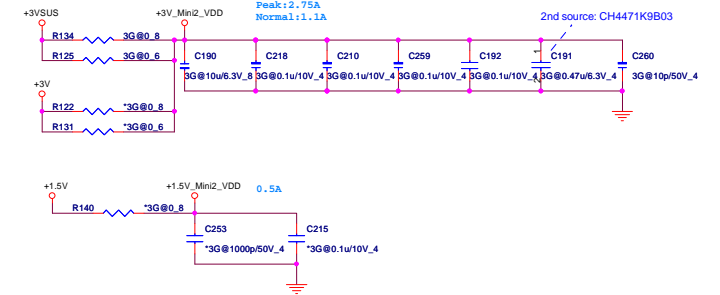
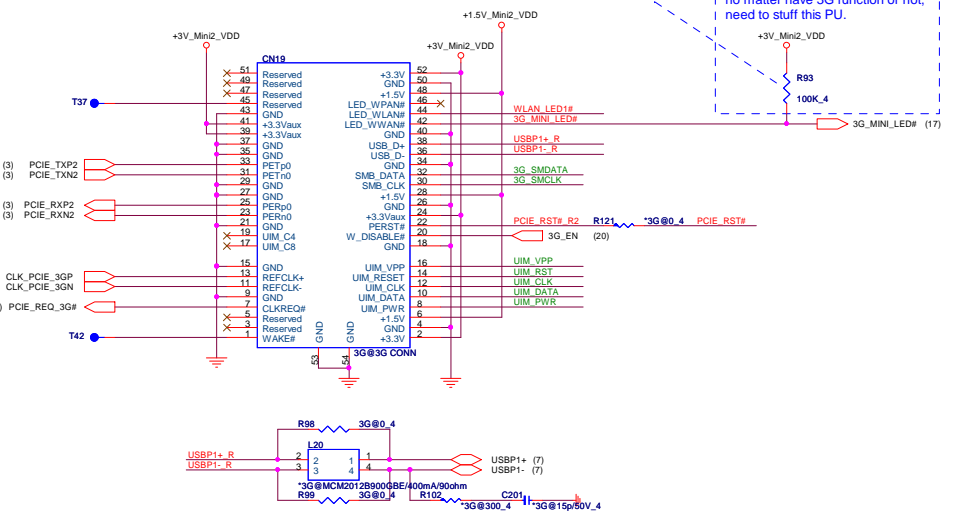


Mini Card 1 (MPC)



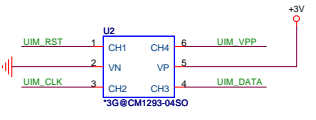
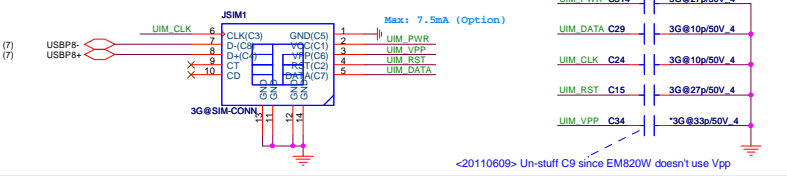
Mini Card 2 (MNC)

<2011/124(E1A)> Change from 10k to 100k to reduce leakage
 no matter have 3G function or not, need to stuff this PU.

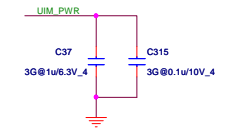


MultiMedia SIM (MNC)

<Layout Notes> Keep USIM signals max length within 8000mils.

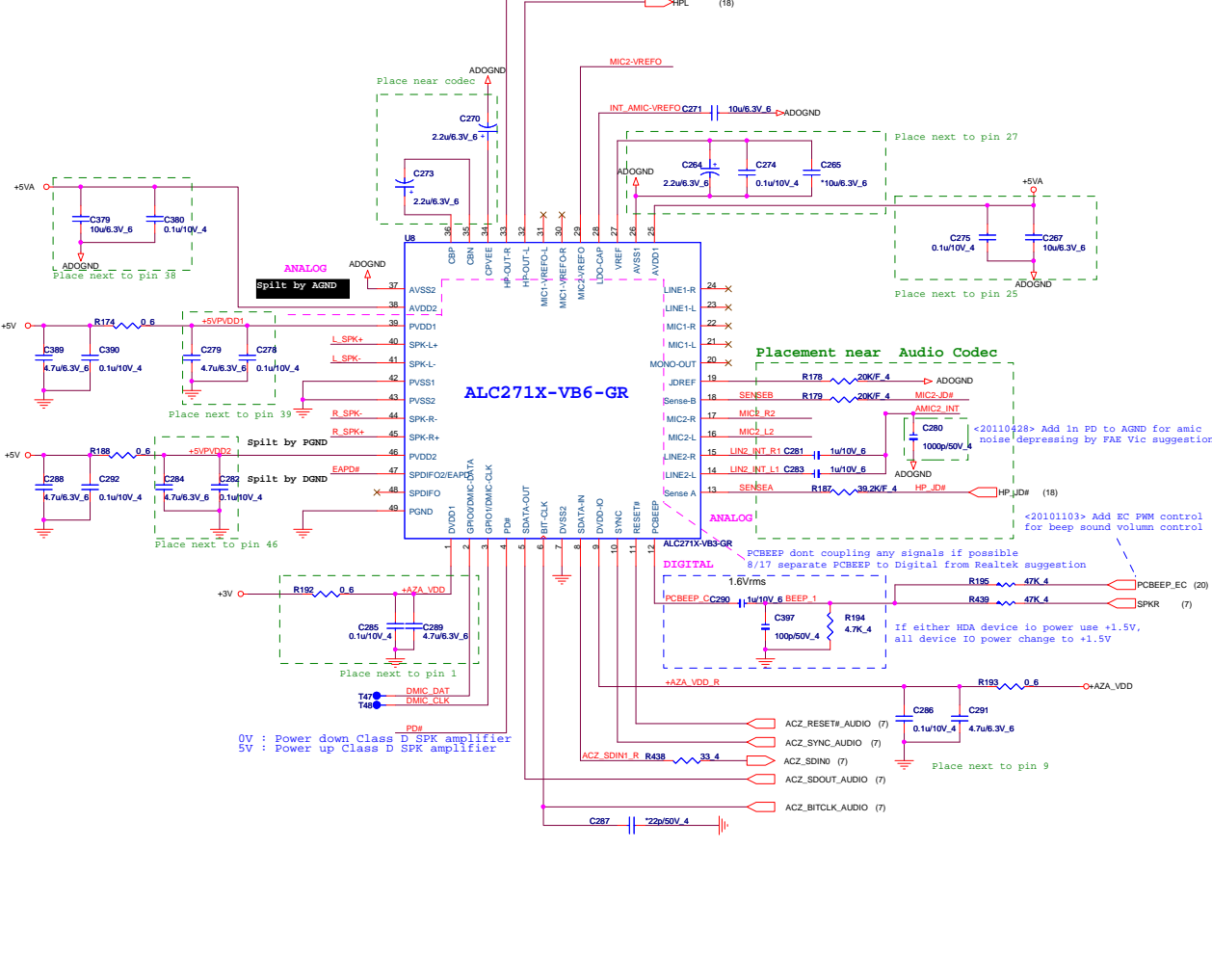


<20090604(A1A)> Qualcomm design guide>
 Place 0.1uF near connector's VCC pin

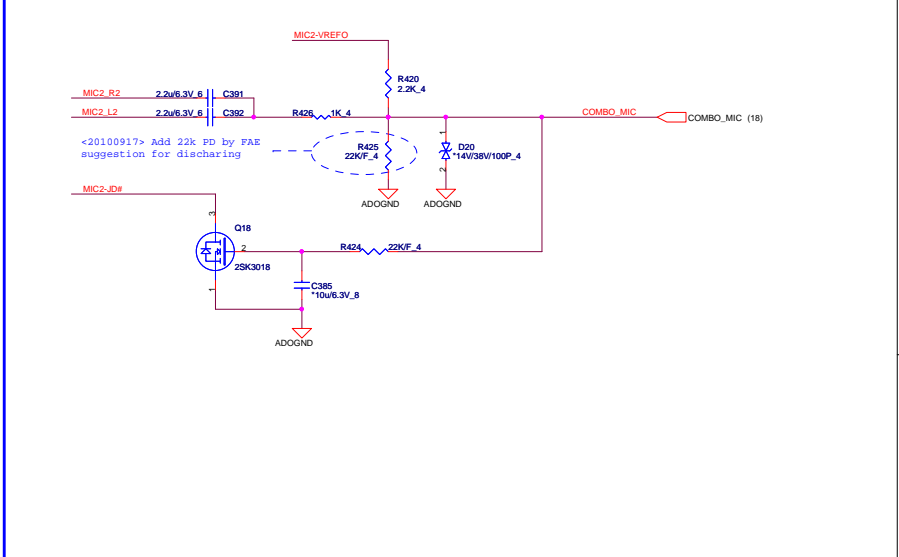


<20110609> Un-stuff C9 since EM820W doesn't use Vpp

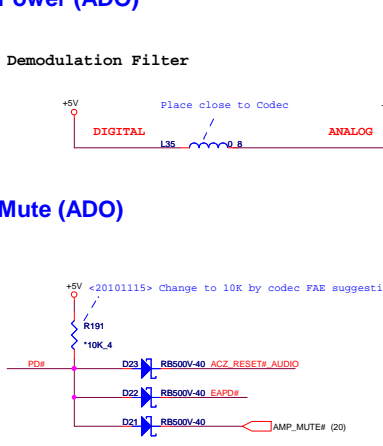
Codec ALC271X (ADO)



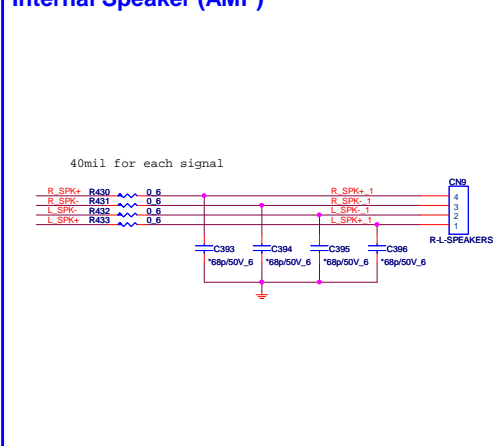
EARPHONE (AMP)



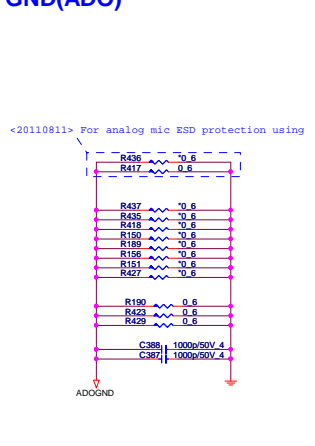
Power (ADO)



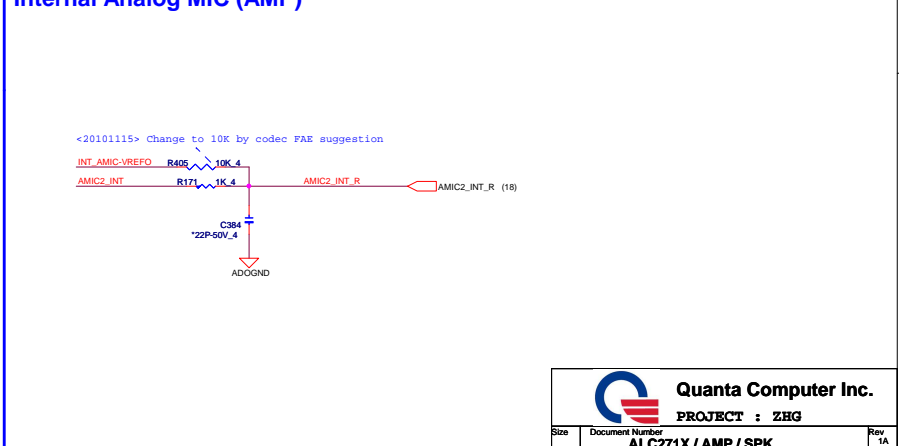
Internal Speaker (AMP)



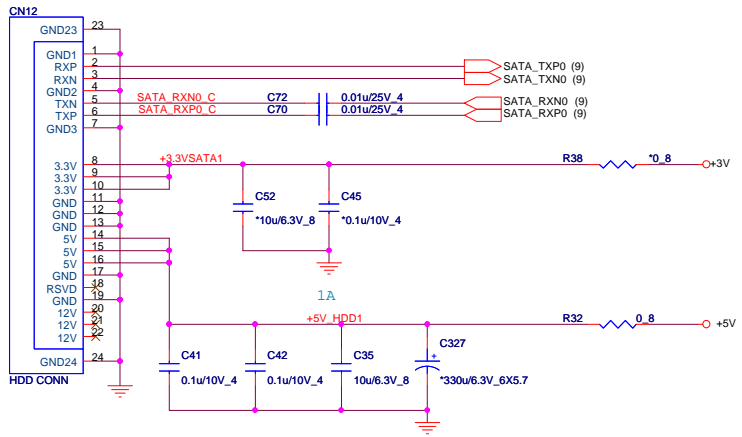
GND(ADO)



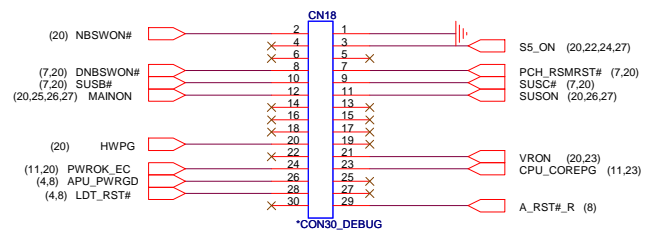
Internal Analog MIC (AMP)



2.5" SATA HDD (HDD)

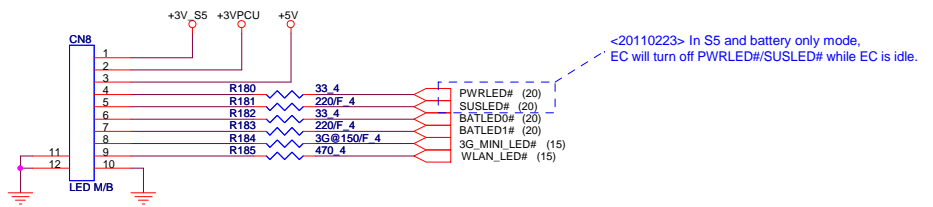


Power Sequence Connector(CPU)

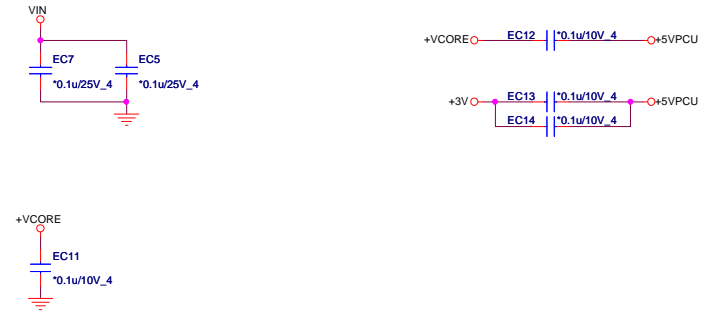


1	GND	11	SUSON	21	VRON
2	NBSWON#	12	MAINON	22	RESERVE
3	S5_ON	13	RESERVE	23	CPU_COREPG
4	RESERVE	14	RESERVE	24	PWROK_EC
5	RESERVE	15	RESERVE	25	RESERVE
6	RESERVE	16	RESERVE	26	APU_PWRGD
7	PCH_RSMRST#	17	RESERVE	27	RESERVE
8	DNBSWON#	18	RESERVE	28	LDT_RST#
9	SUSC#	19	RESERVE	29	A_RST#_R
10	SUSB#	20	HWPG	30	RESERVE

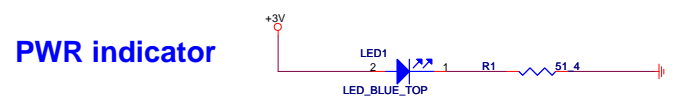
LED DB (UIF)




Stitching Cap(EMC)



POWER LED(UIF)

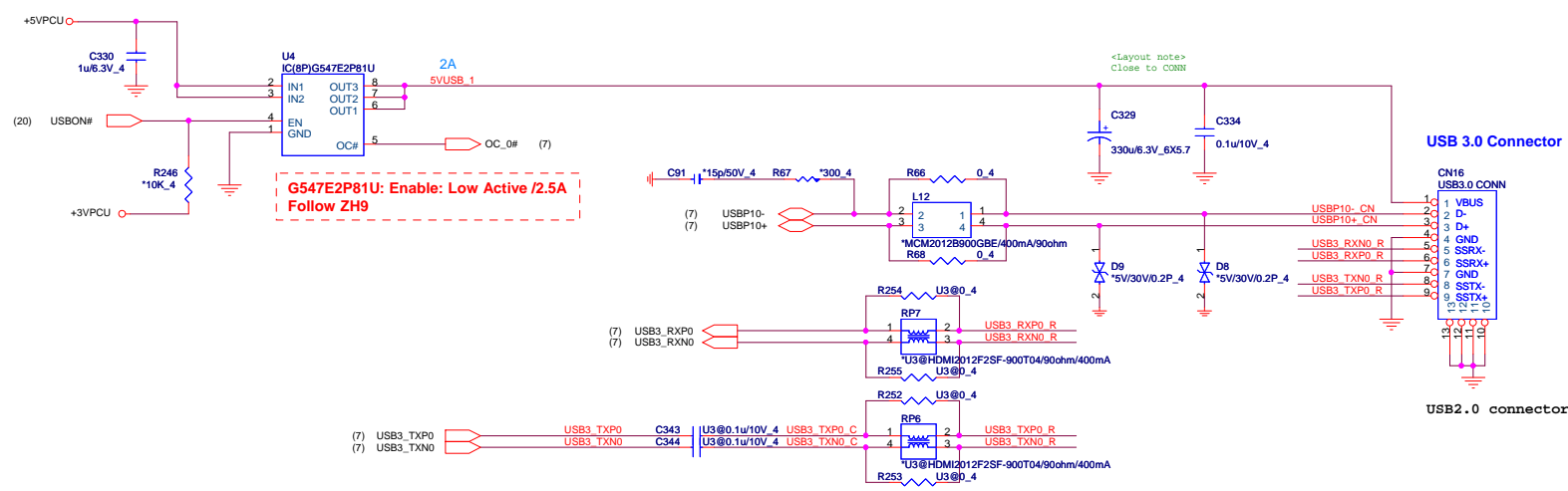




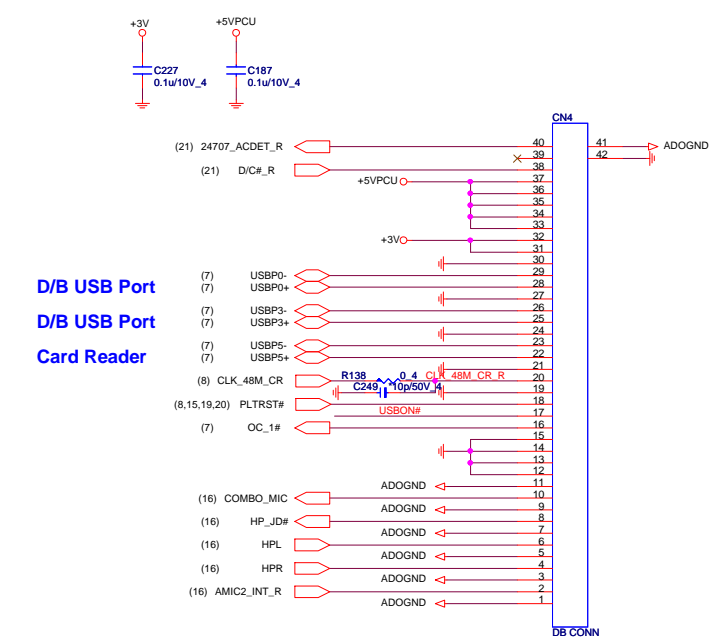
Quanta Computer Inc.
PROJECT : ZHG

Size	Document Number	Rev
	SATA HDD/LED/SW	1A
Date:	Tuesday, January 10, 2012	Sheet 17 of 28

USB Left (USB)



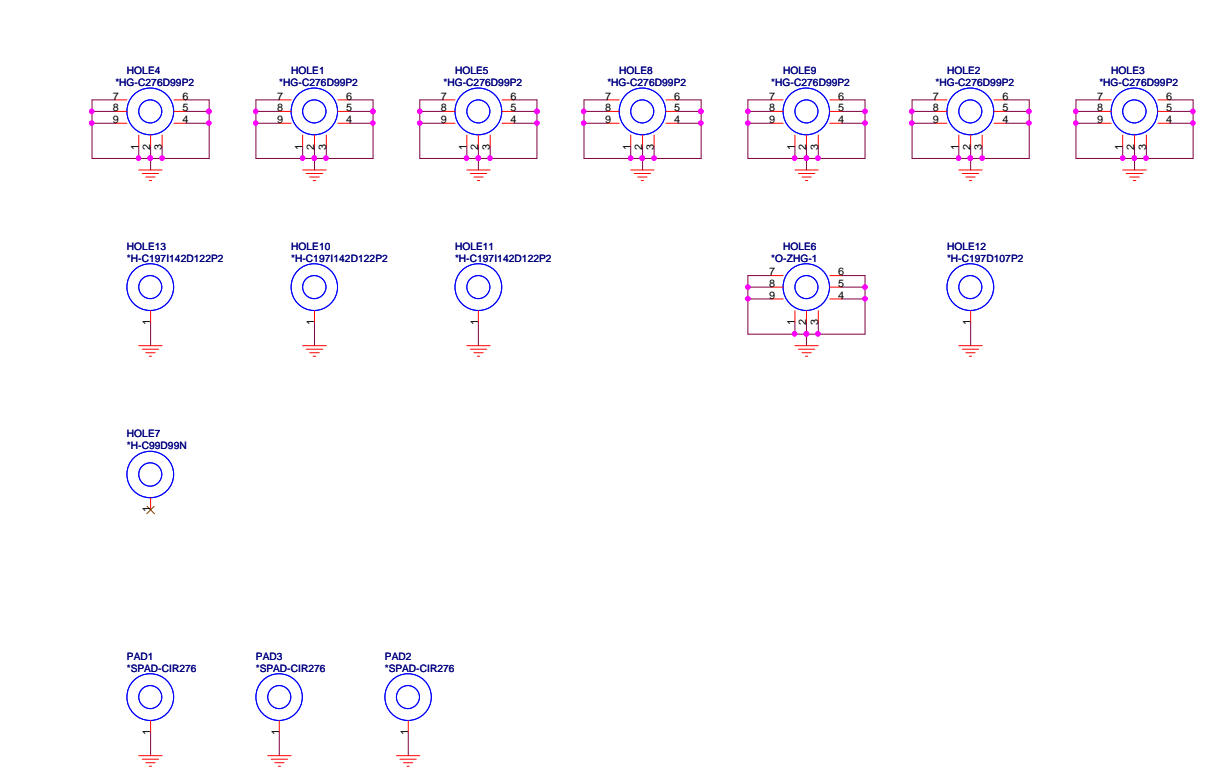
IO D/B (UIF)



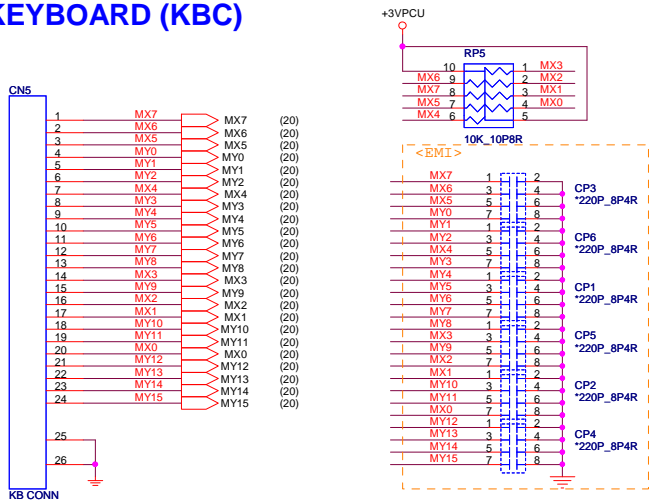
POWER M/B (DCD)



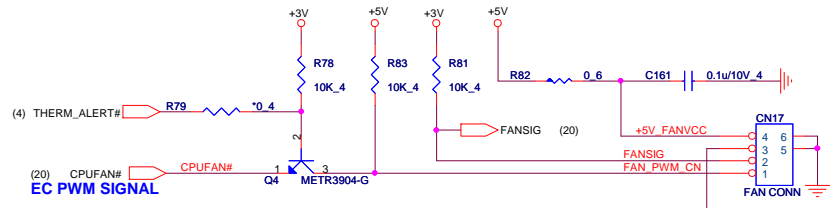
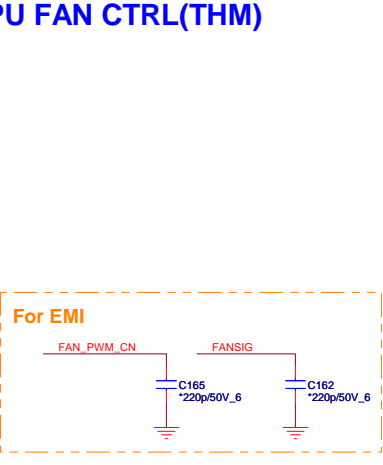
HOLE(OTH)



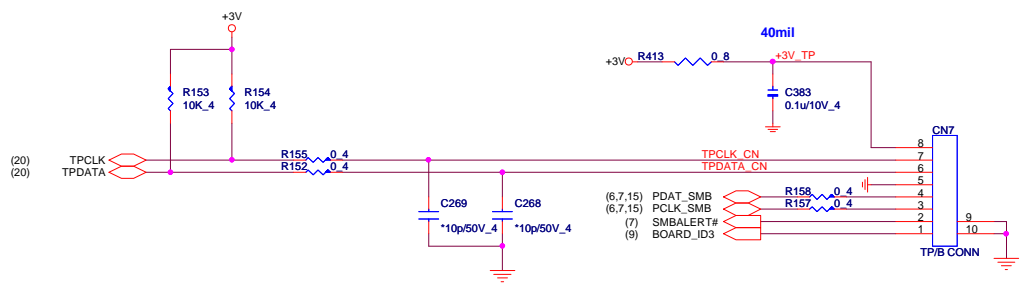
KEYBOARD (KBC)



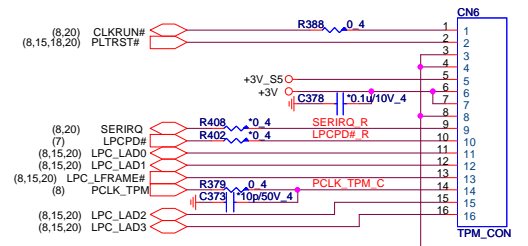
CPU FAN CTRL (THM)



TOUCH PAD (TPD)



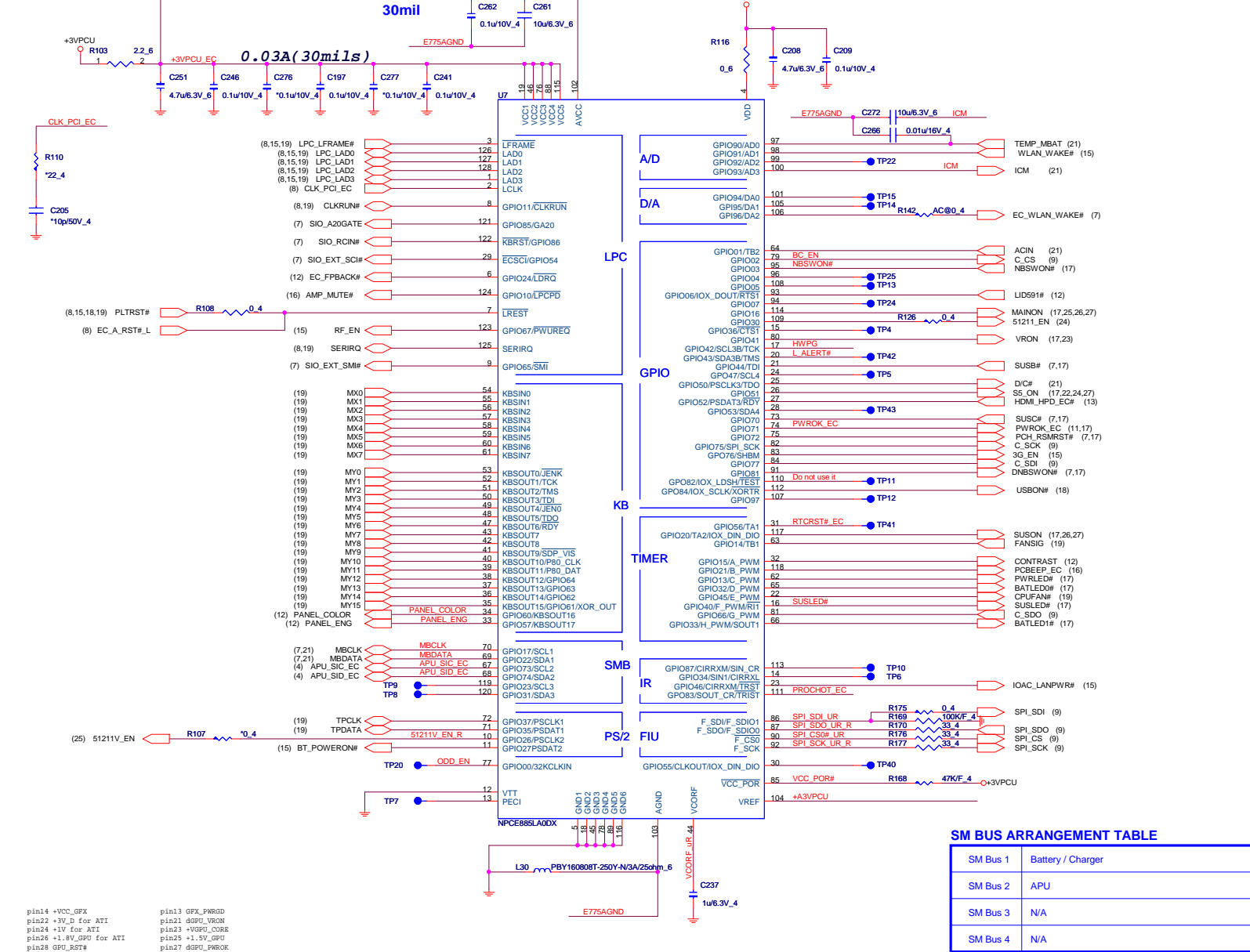
TPM (TPM)



Quanta Computer Inc.
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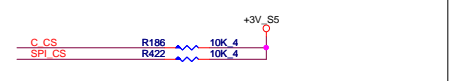
Size	Document Number	Rev
	KB/BT/TP/LED/Power Connector	1A
Date:	Tuesday, January 10, 2012	Sheet 19 of 28

EC(KBC)

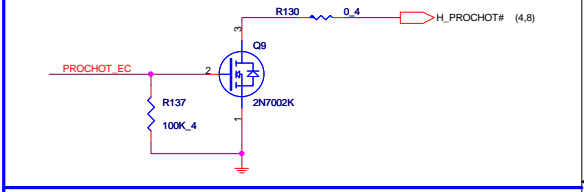
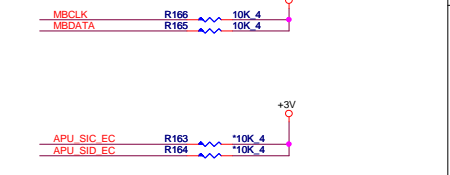


- pin14 +VCC_GFX
- pin22 +3V_D for ATI
- pin24 +1V for ATI
- pin26 +1.8V_GPU for ATI
- pin28 GPU_RST#
- pin13 GFX_PWRGD
- pin21 dGPU_VRON
- pin23 +VGPU_CORE
- pin25 +1.5V_GPU
- pin27 dGPU_PWROK

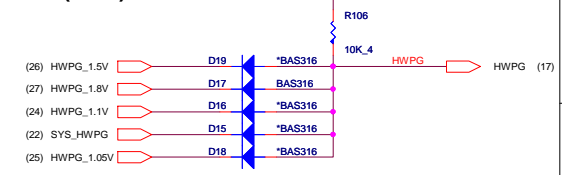
SPI PU(KBC)



SM BUS PU(KBC)



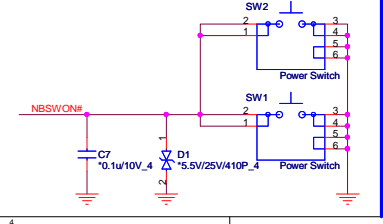
HWPG(KBC)

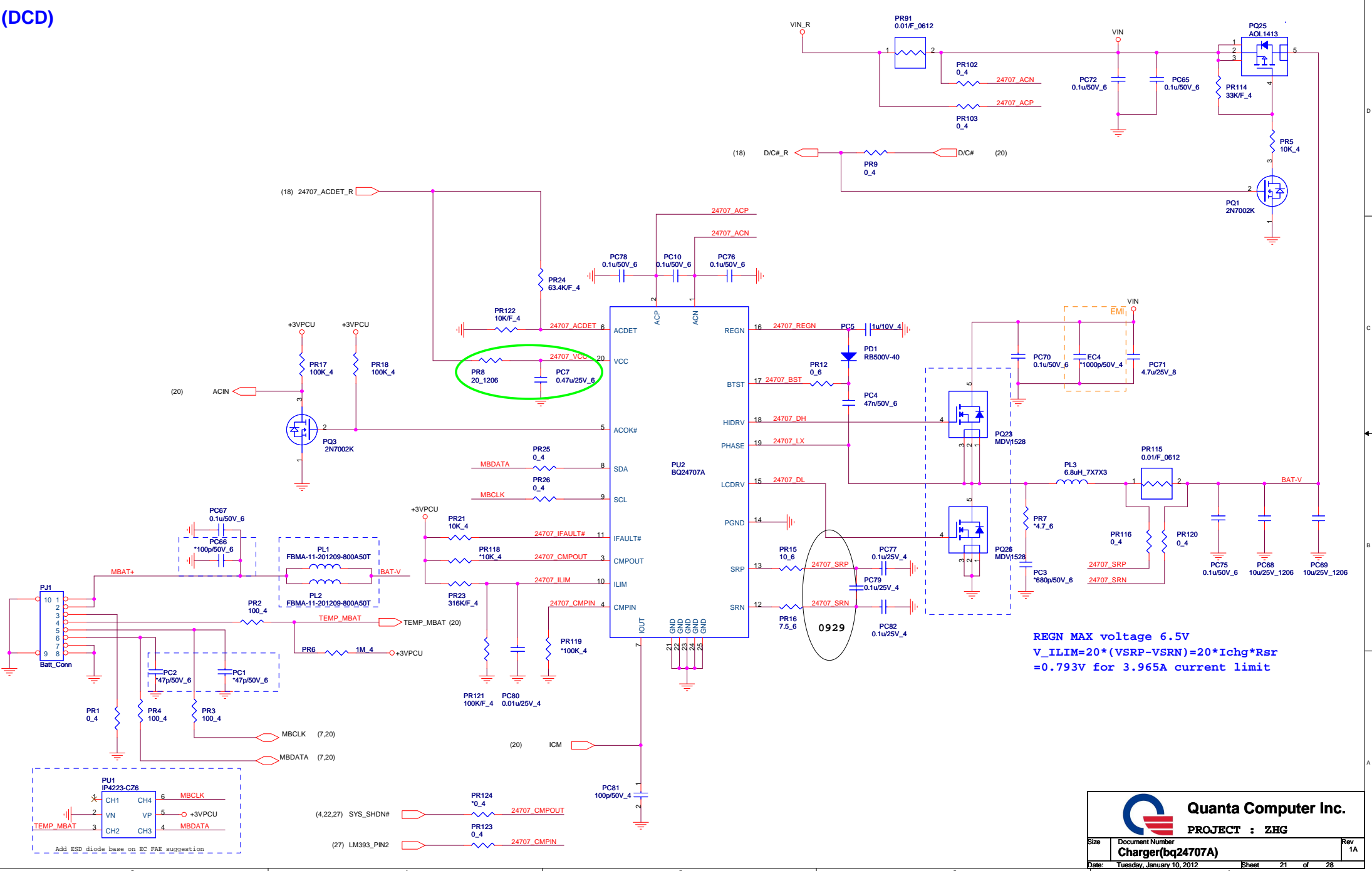


SM BUS ARRANGEMENT TABLE

SM Bus 1	Battery / Charger
SM Bus 2	APU
SM Bus 3	N/A
SM Bus 4	N/A

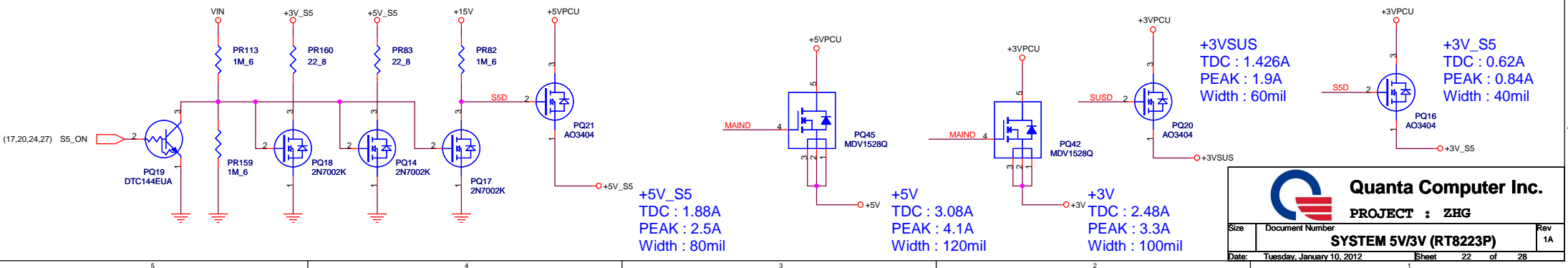
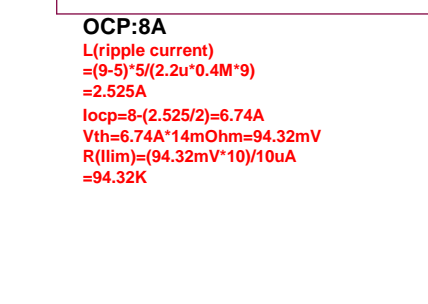
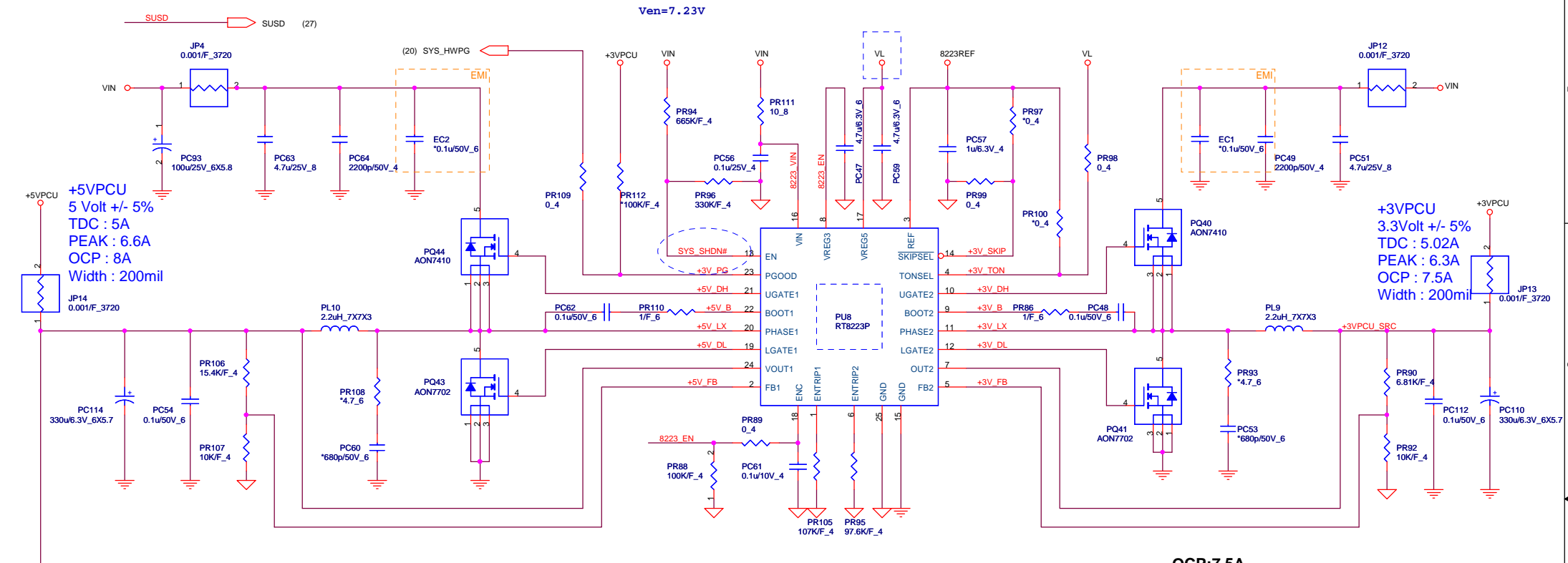
POWER-ON SWITCH (UIF)

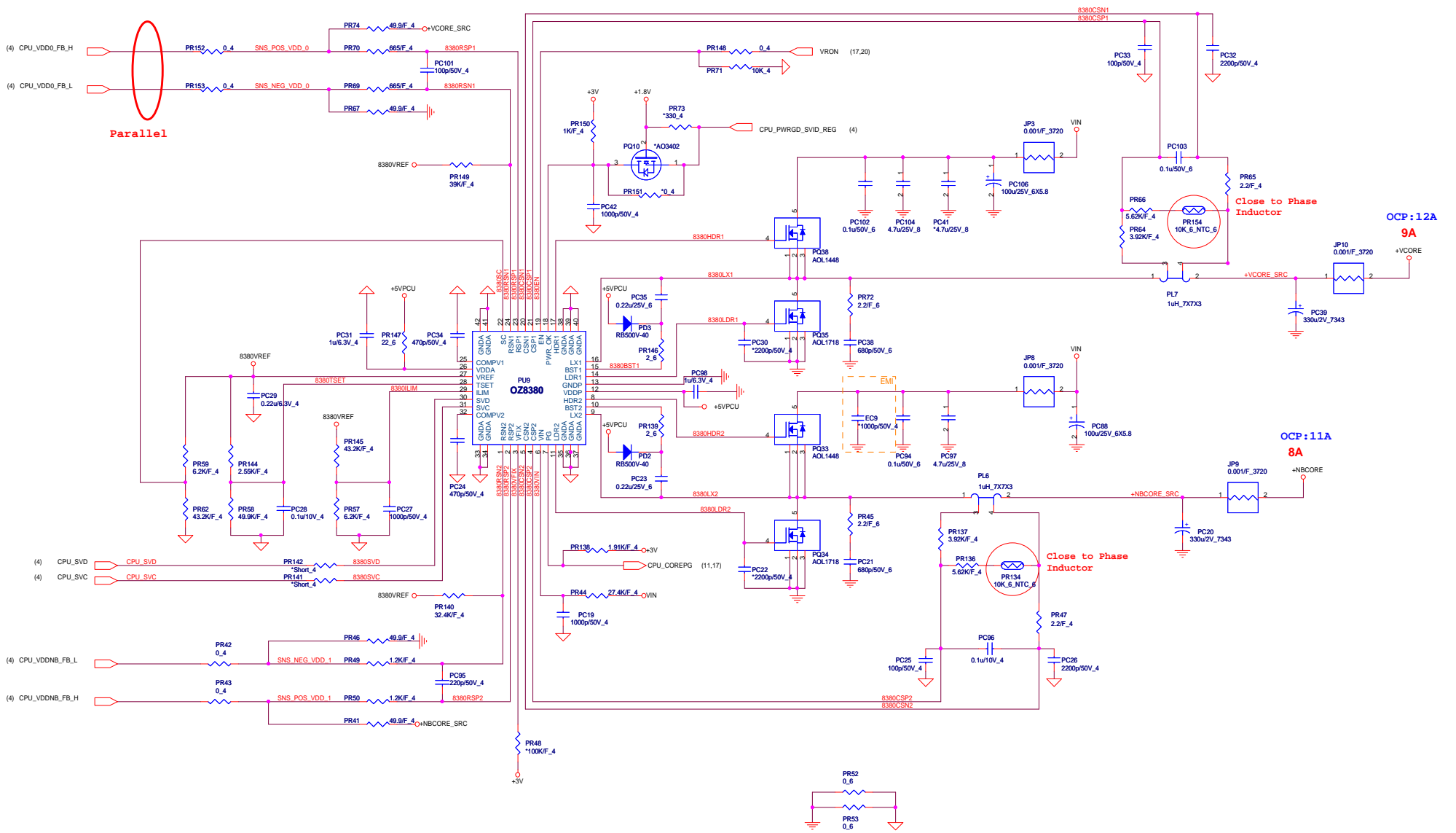




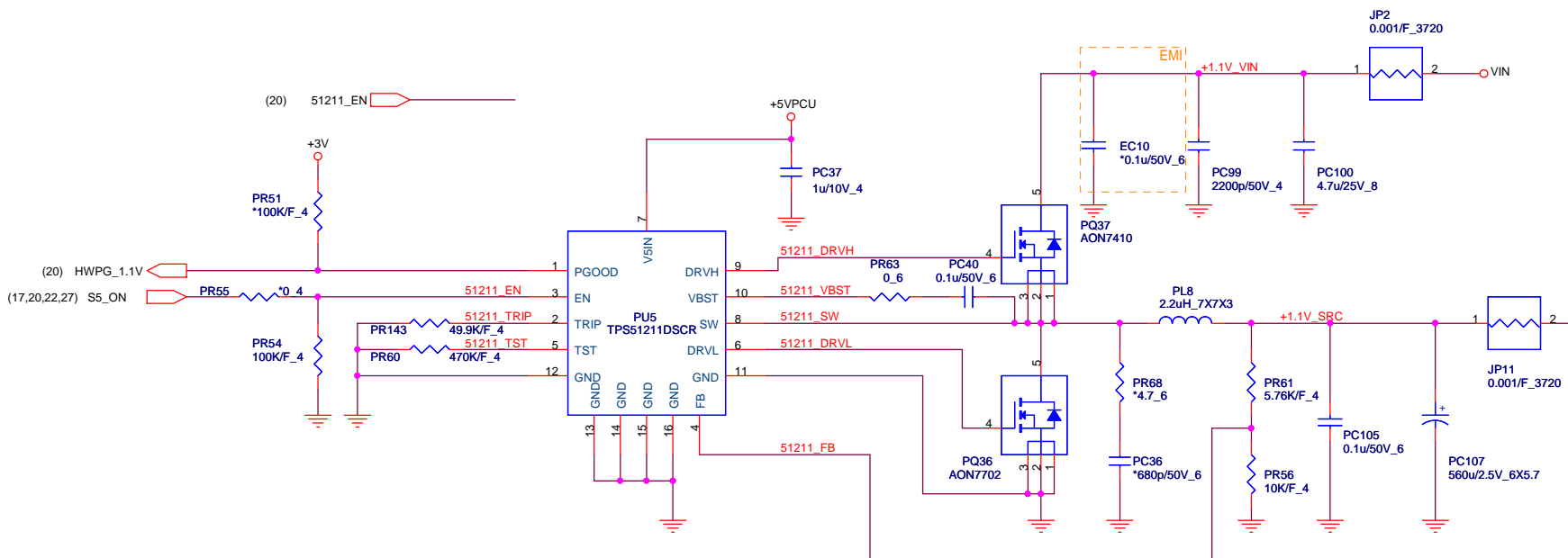
REGN MAX voltage 6.5V
 $V_{ILIM} = 20 * (V_{SRP} - V_{SRN}) = 20 * I_{chg} * R_{sr} = 0.793V$ for 3.965A current limit

		Quanta Computer Inc. PROJECT : ZHG	
Add ESD diode base on EC FAE suggestion		(4,22,27) SYS_SHDN# 24707_CMPOUT (27) LM393_PIN2 24707_CMPIN	
Date:	Tuesday, January 10, 2012	Sheet	21 of 28



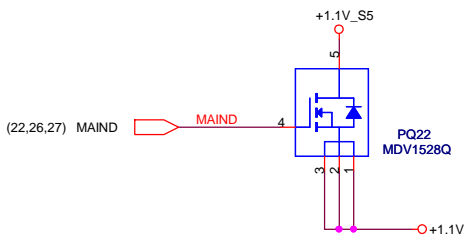


(DCD)




+1.1V_S5
 1.1 Volt +/- 5%
 TDC : 3A
 PEAK : 4A
 OCP : 5A
 Width : 120mil

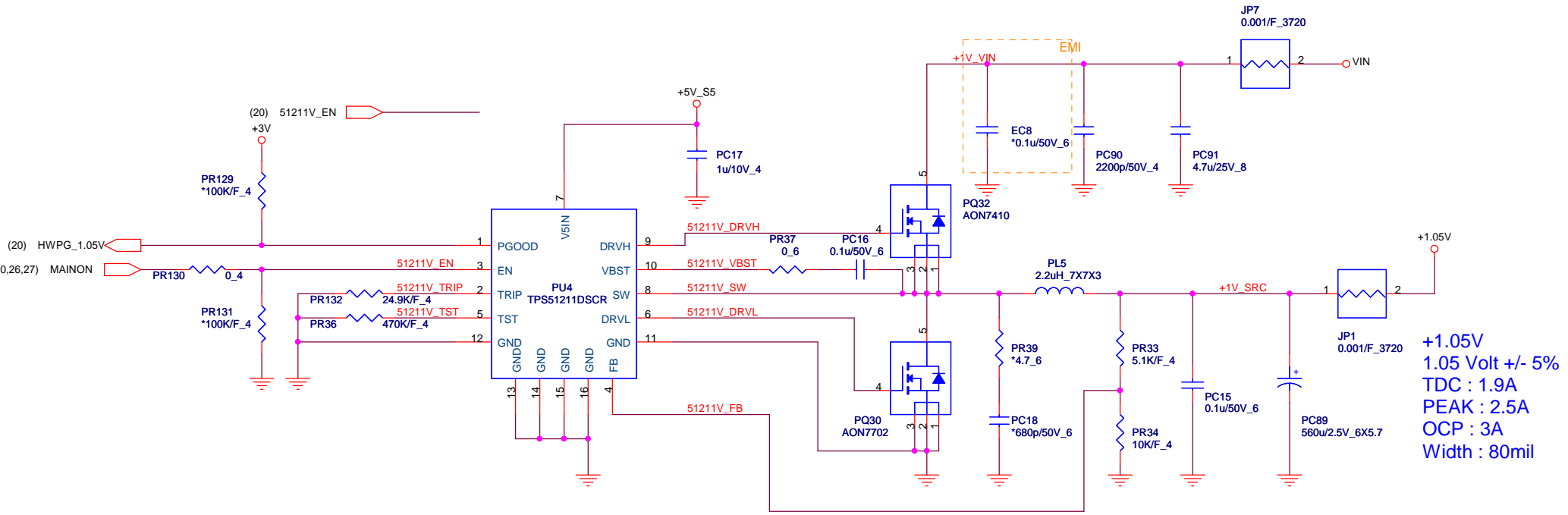
OCP=5A
 L ripple current
 $= (19-1.1) * 1.1 / (2.2u * 290k * 19)$
 $= 1.624A$
 $V_{trip} = 5 - (1.624 / 2) * 14mohm$
 $= 0.058629V$
 $R_{limit} = 0.058629 / 10uA * 8 = 46.9Kohm$



+1.1V
 TDC : 2.73A
 PEAK : 3.64A
 Width : 120mil


 Quanta Computer Inc. PROJECT : ZHG		Size	Document Number	Rev
			VCCP 1.1V(TPS51211)	1A
Date: Wednesday, January 11, 2012		Sheet 24 of 28		

(DCD)

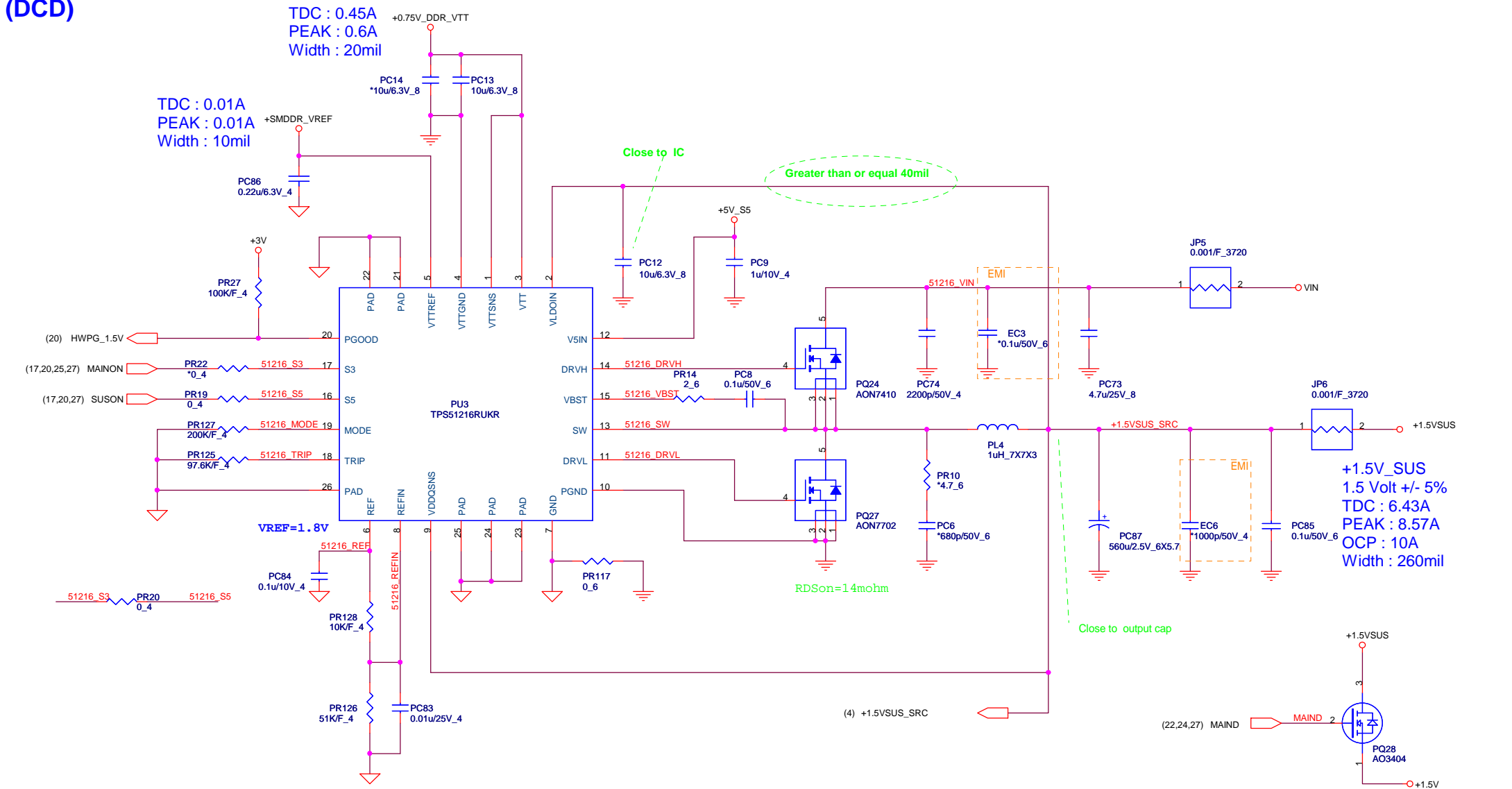


+1.05V
 1.05 Volt +/- 5%
 TDC : 1.9A
 PEAK : 2.5A
 OCP : 3A
 Width : 80mil

OCP=3A
 L ripple current
 $= (19 - 1.05) * 1.05 / (2.2 \mu * 290k * 19)$
 $= 1.555A$
 $V_{trip} = 3 - (1.555 / 2) * 14mohm$
 $= 0.03111V$
 $R_{limit} = 0.03111 / 10 \mu A * 8 = 24.89Kohm$

 Quanta Computer Inc. PROJECT : ZHG		Rev
		1A
Size	Document Number	
+1.05V(TPS51211)		
Date:	Wednesday, January 11, 2012	Sheet 25 of 28

(DCD)



TDC : 0.01A
PEAK : 0.01A
Width : 10mil

TDC : 0.45A
PEAK : 0.6A
Width : 20mil

VREF=1.8V

Greater than or equal 40mil

RDSon=14mohm

+1.5V_SUS
1.5 Volt +/- 5%
TDC : 6.43A
PEAK : 8.57A
OCP : 10A
Width : 260mil

OCP=10A
I ripple current
= (19-1.5)*1.5/(1u*400k*19)
= 3.454A
Vtrip=10-(3.454/2)*14mohm
= 0.1158V
Rlimit=0.1158/10uA*8=92.657Kohm

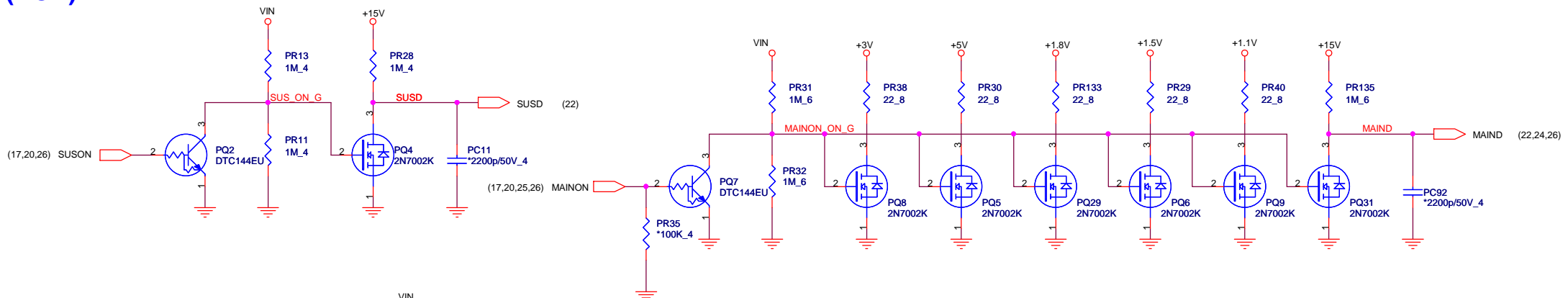
	S3	S5	+1.5VSUS	REF	VTT
S0	1	1	ON	ON	ON
S3 (mainon off)	0	1	ON	ON	OFF
S4/S5	0	0	OFF	OFF	OFF

Quanta Computer Inc.
PROJECT : ZHG

Size Document Number Rev
DDR 1.5V(TPS51216) 1A

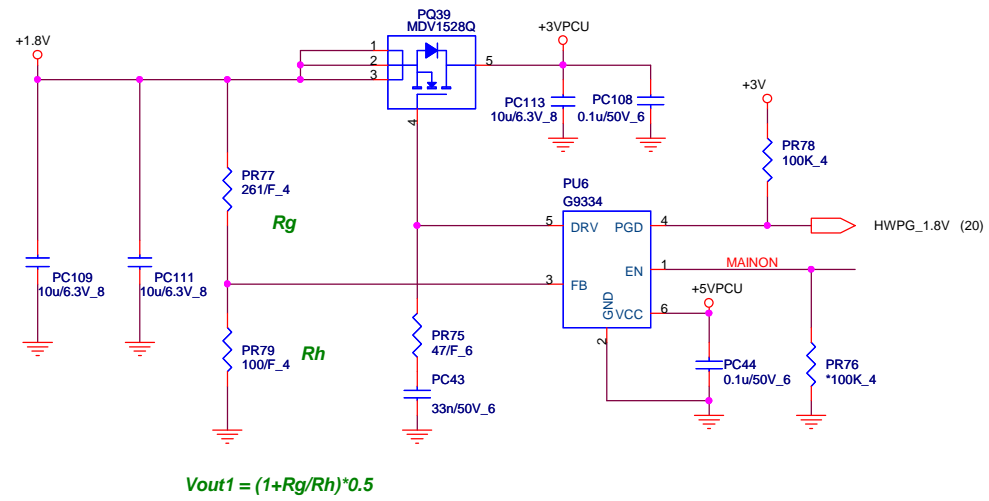
Date: Tuesday, January 10, 2012 Sheet 26 of 28

(DCD)

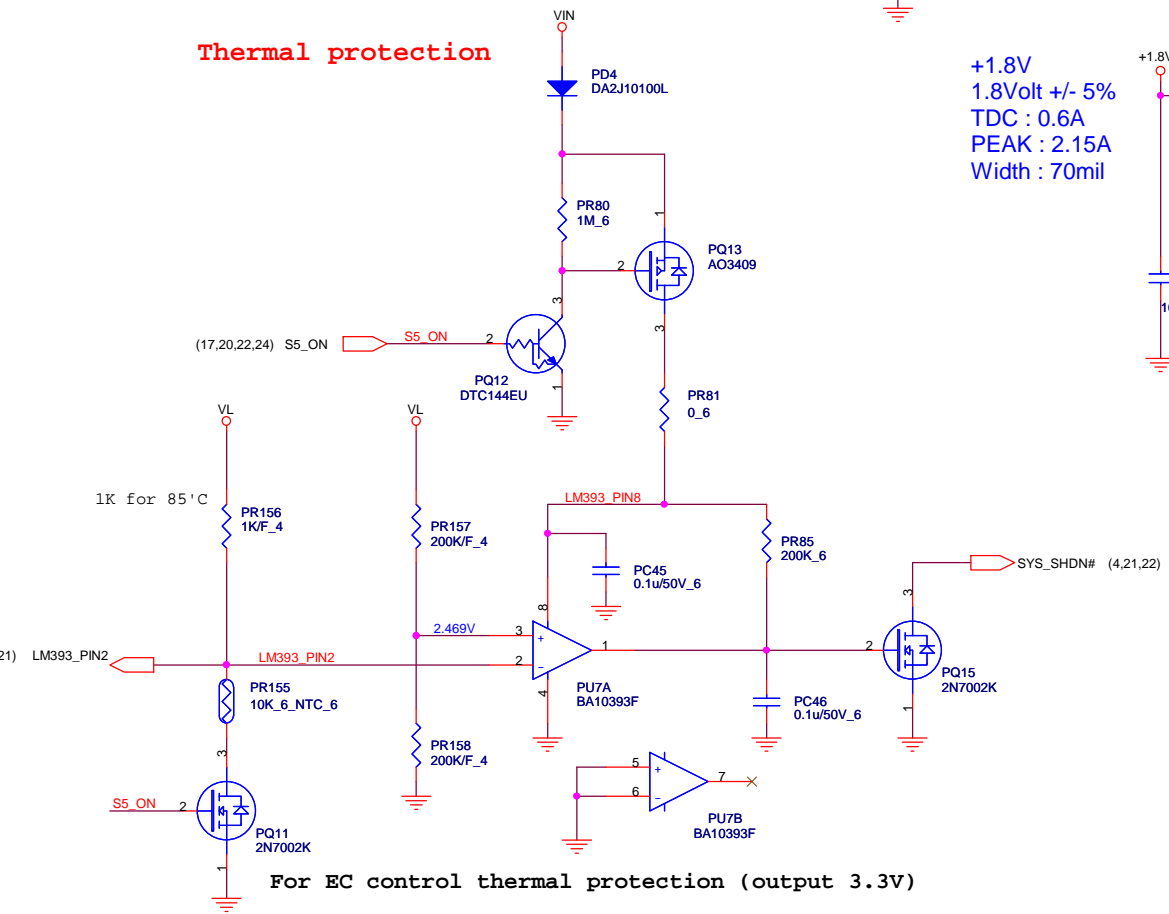


Thermal protection


+1.8V
1.8Volt +/- 5%
TDC : 0.6A
PEAK : 2.15A
Width : 70mil



$V_{out1} = (1 + R_g/R_h) * 0.5$



For EC control thermal protection (output 3.3V)


 Quanta Computer Inc. PROJECT : ZHG		Rev 1A
Discharge /Thermal protection		
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MODEL	REV	CHANGE LIST
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Page	ZHG MB BOARD	
	From	To
1	1A	
2	1A	
3	1A	
4	1A	
5	1A	
6	1A	
7	1A	
8	1A	
9	1A	
10	1A	
11	1A	
12	1A	
13	1A	
14	1A	
15	1A	
16	1A	
17	1A	
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21	1A	
22	1A	
23	1A	
24	1A	
25	1A	
26	1A	
27	1A	
28	1A	
29		
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41		

ZHG M/B	REV	First Release
	A	
	B	<p>Add R3439 Del R237,R204,R222 Change CN3016,CN3017,CN3018 footprint and PN Change PC101,PC104 PN</p> <p>Change CN3015,CN3006,CN3004 footprint SWAP RP9,RP10 Add R3440,R3441,R3442,C6239,C6240,C6241 Del TP53,TP15,TP14,TP24 Change PR20 PN and footprint,PR12 PN Add R3443,R3444,R3446,R3445 Update CN16,CN3011 PN</p> <p>Update CN16,CN3011 footprint Change PC73,PC79,PC80,PC82,PC83,PC90 footprint Swap CP3001,CP3002,CP3003,CP3004,CP3005,CP3006 pin Change CN3001 PN and footprint. Delete R3031,C3036,C3021 Delete C3057,C3064,C3062,C3060,C3056,C3061 Add R3447,R3448 Delete TP21,TP11</p> <p>Add R3449 and change CN3008 PN and footprint Swap CN3001,RP8 Change CN3017,CN3016 PN Delete R113,R125</p> <p>Change R3289 to 0ohm Swap Q3030 pin define PU Board_ID3 and Board_ID2, modify CN3008 net Delete R3009 Change C3013 to 1uF Add R3450,R3451 Change CN3003 pin define</p> <p>Swap L3026 Change R142 to 100K Delete R3435,C3260. Change CN3008 PN and footprint Delete R3272,Q3019,R3256,R3270,TP18,TP25,TP28 and add Q3036,Q3035,R3452 Add PQ45,PR162,SW2,R3453,RP11,D3022 Delete R3438 Unstaff D10,D54,D55,R242,R206 and staff R369,R223,Q3033,RN3001</p> <p>Modify CN3003 and U4 pin define Add Q3037 Unify the value, function code, P/N, description</p>
	C	<p>Delete T6,T15,R215,R202,Q12,R3425,R3426 Add R3454,PQ46,C6242 Add HOLE Update CN3015 PN Change CN3008 pin define Change CN3006 footprint Add R3460,C6243,R3457,R3459,R3455, R3456,Q3038,R3458,R3461 and reserve IOAC function</p> <p>Change Y3 footprint and staff R371 Update U17,CN3015,CN14,CN3001 P/N Change CN3006 footprint Add R3462,Q3039 Delete R163,RT1,R3459 Add L3029~L3035,R3463~3476 for EMI Unstaff C418 Staff R3418,R3200,R3434,R3439 Change CN3008 PN and footprint</p> <p>Staff R115 Delete CN3007 power trace for layout Add PQ47,PQ48,PR163,PR165,PR164,PC118 Delete TP29 and add net 1.1V_S5_EN Add R3477,R3478</p> <p>Modify LVDS common choke pin define Add TP63~TP70 for layout Remove G2,G3 and add T3051,T3052 Change Y3,C3041 footprint Modify PU2 pin define</p> <p>Change PR3,PR20,PR12,PC11 PN Add EC1~EC10 for RF Add EC11~EC18 for EMI Add R3479 and C6244,R3480,R3481 Delete EC7,EC8,EC10,EC4,PAD3</p> <p>Staff PR154,R3480 and unstaff PR149 Staff R206 and unstaff R223</p>

ZHG	PCBA NO : 31ZHGM0000	REV: A	DOC. NO : 206
APPROVED BY : Edison Huang	CHECK BY : Kevin Hsieh	DRAWING BY : Benson Yo	DATE : 2012/01/10



Quanta Computer Inc.
PROJECT : ZHG

Size Document Number Rev
CHANGE LIST 1A

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