

Compal Confidential

Model Name : Z5WAH

File Name : LA-B161P

Compal Confidential

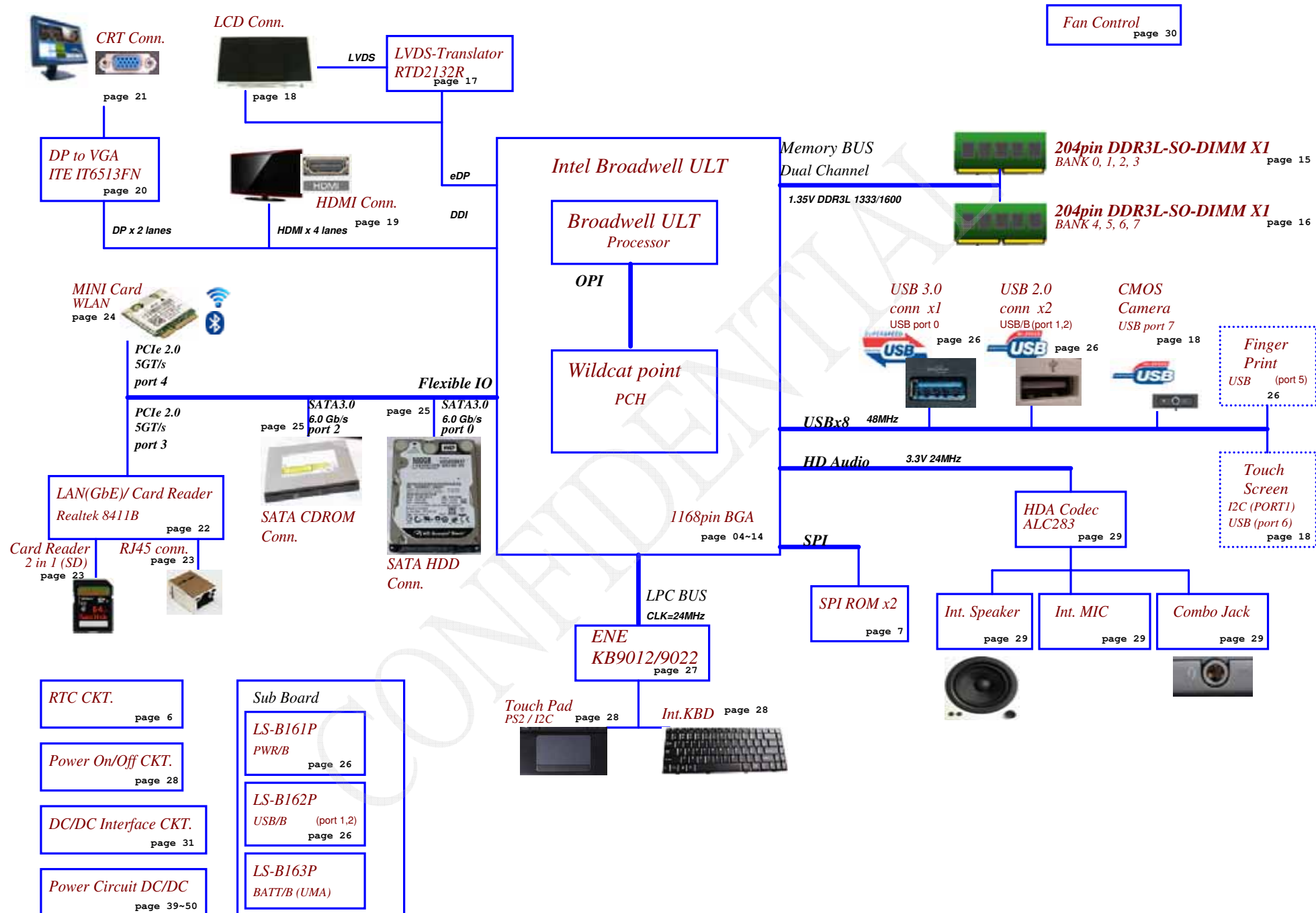
EA50_HB M/B Schematics Document

Intel Broadwell ULT (Broadwell + Wildcat point)

2013-12-18

REV: 0.2

Security Classification		Compal Secret Data		Compal Electronics, Inc.	
Issued Date	2013/10/30	Deciphered Date	2014/10/30	Title Cover Page	
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Voltage Rails

[illegible]

EC SM Bus1 address

Device	Address
Smart Battery	0001 011X

EC SM Bus2 address

Device	Address
On Board Thermal Sensor	0100 110x
VGA Internal Thermal Sensor	0100 000x
G Sensor	0011 000x

PCH SM Bus address

Device		Address	
ChannelA	DIMM0	1001 000x	JDIMM1
ChannelB	DIMM1	1001 010x	JDIMM2

State	Full ON	LOW	HIGH	HIGH	LOW	ON	ON	ON	ON
S1 (Power On Suspend)	LOW	HIGH	HIGH	HIGH	ON	ON	ON	ON	LOW
S3 (Suspend to RAM)	LOW	LOW	HIGH	HIGH	ON	ON	OFF	OFF	OFF
S4 (Suspend to Disk)	LOW	LOW	LOW	HIGH	ON	OFF	OFF	OFF	OFF
S5 (Soft OFF)	LOW	LOW	LOW	LOW	ON	OFF	OFF	OFF	OFF

Board ID / SKU ID Table for AD channel

Vcc		3.3V +/- 5%			
Ra/Rc/Re		100K +/- 5%			
	Board ID	Rb / Rd / Rf	VAD_BID min	VAD_BID typ	VAD_BID max
	0	0	0 V	0 V	0 V
★	1	12K +/- 5%	0.347 V	0.354 V	0.360 V
	2	15K +/- 5%	0.423 V	0.430 V	0.438 V
	3	20K +/- 5%	0.541 V	0.550 V	0.559 V
	4	27K +/- 5%	0.691 V	0.702 V	0.713 V
	5	33K +/- 5%	0.807 V	0.819 V	0.831 V
	6	43K +/- 5%	0.978 V	0.992 V	1.006 V
	7	56K +/- 5%	1.169 V	1.185 V	1.200 V
	8	75K +/- 5%	1.398 V	1.414 V	1.430 V
	9	100K +/- 5%	1.634 V	1.650 V	1.667 V
	10	130K +/- 5%	1.849 V	1.865 V	1.881 V
	11	160K +/- 5%	2.015 V	2.031 V	2.046 V
	12	200K +/- 5%	2.185 V	2.200 V	2.215 V
	13	240K +/- 5%	2.316 V	2.329 V	2.343 V

BOARD ID Table

Board ID	PCB Revision
0	0.1
1	0.2
2	0.3
3	0.4
4	0.5
5	1.0
6	
7	

USB Port Table

USB 2.0	Port	3 External USB Port
EHCI1	0	USB Port(Left 3.0)
	1	USB Port(Right 2.0)
	2	USB Port(Right 2.0)
	3	
	4	Mini Card (WLAN+BT)
	5	Finger Print
	6	Touch Screen
	7	Camera

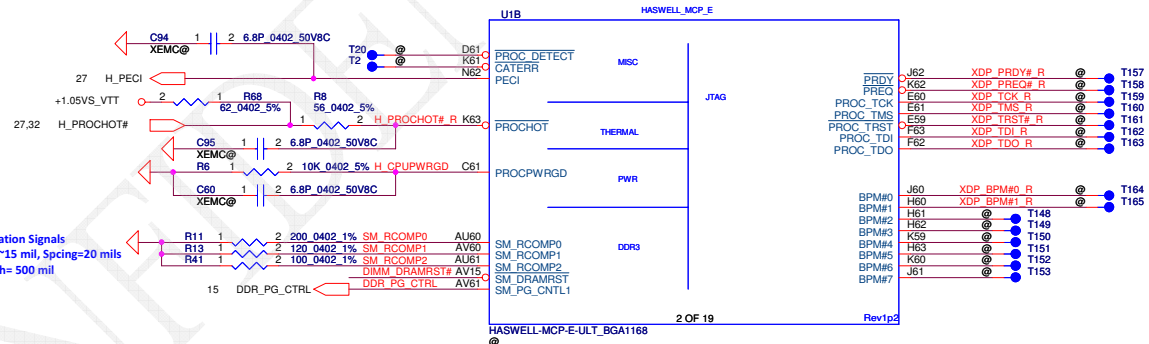
USB 3.0	Port	
XHCI	0	USB Port(Left 3.0)
	1	
	2	
	3	

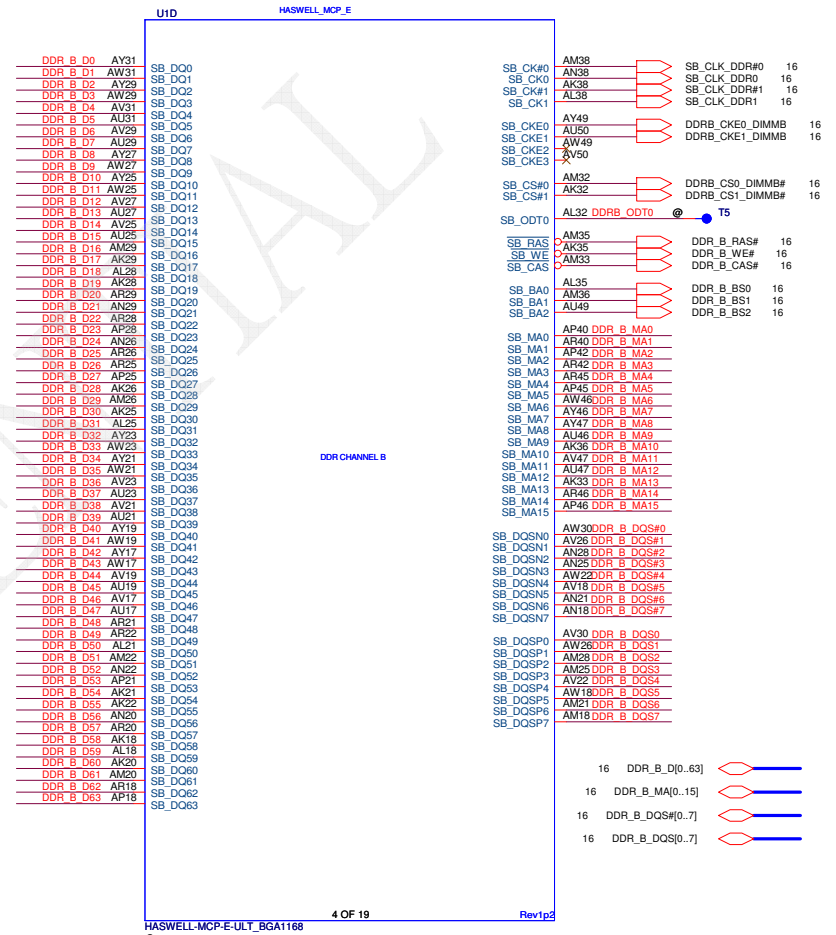
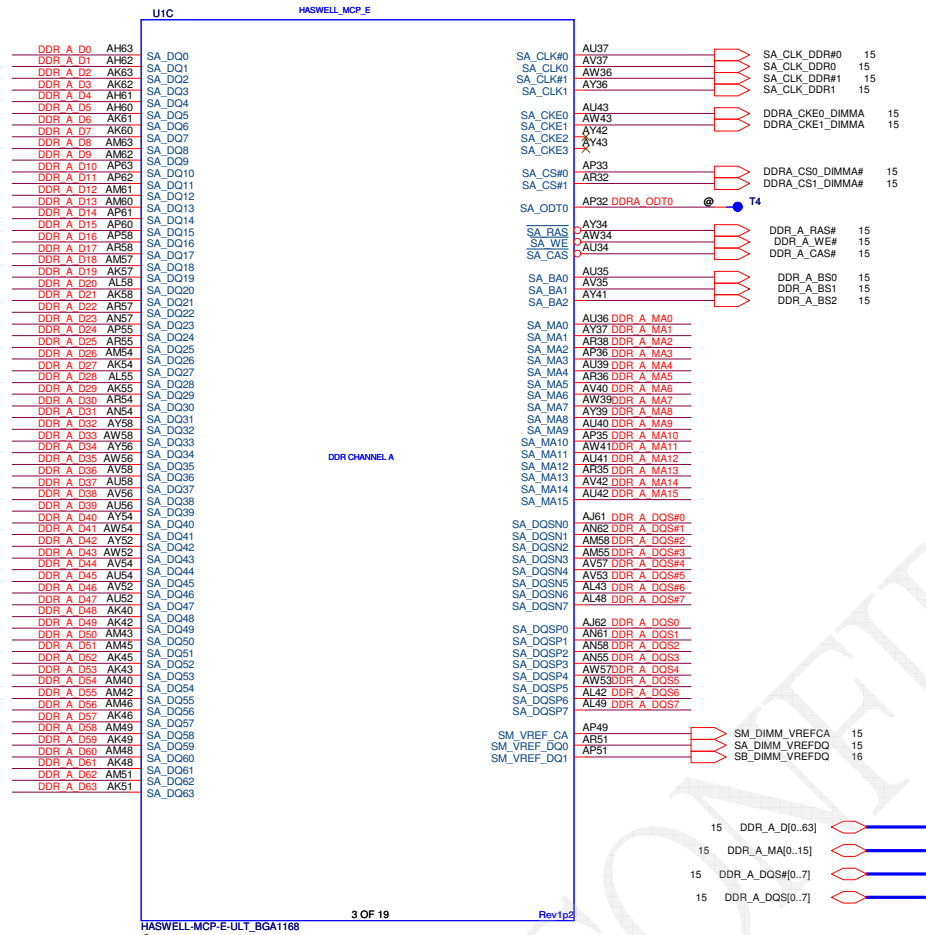
BTO Option Table

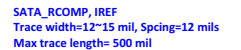
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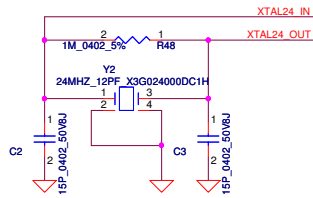
+1.35V
 1
 R184
 470_0603_5%
 2
 C96
 6.8P_0402_50V8C
 1
 XEMC8000
 Close to AV15

5

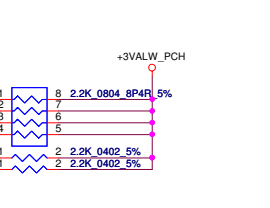
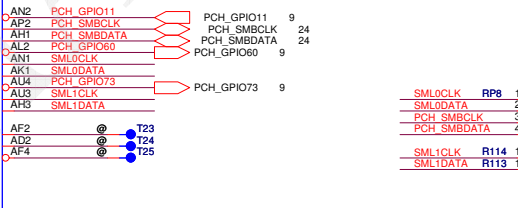
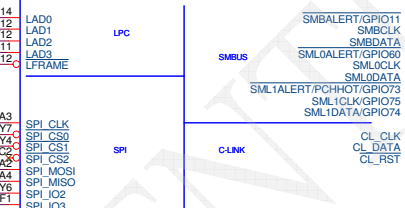
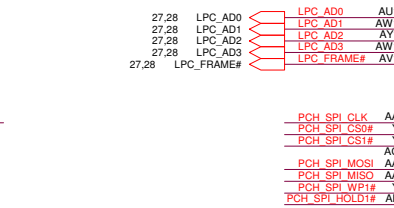
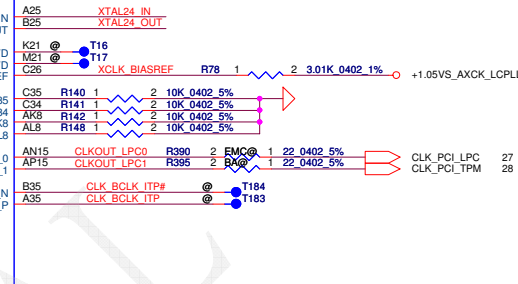
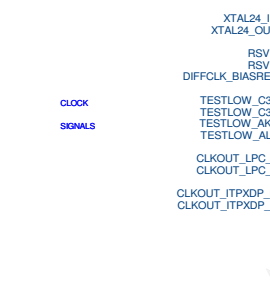
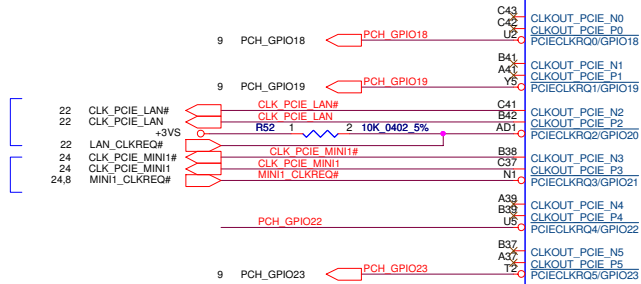




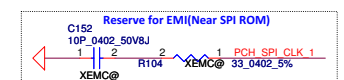
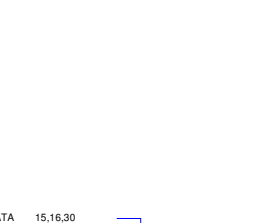
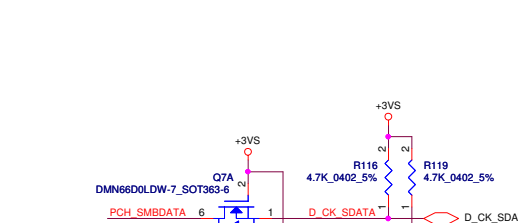
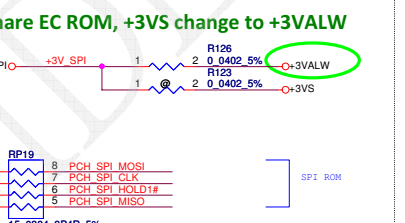
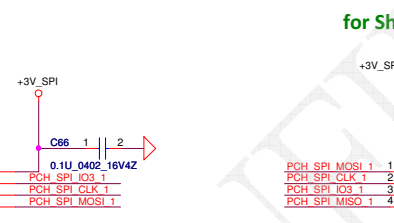
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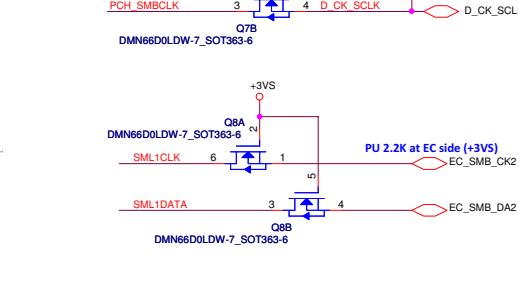
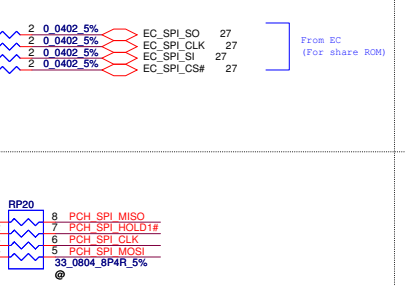
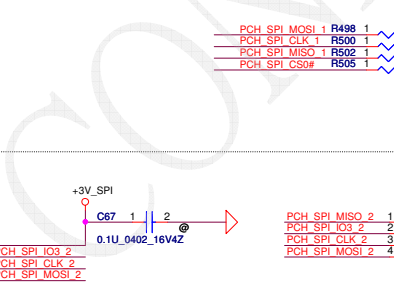
PCIE LAN
WLAN



SPI ROM (8MByte)

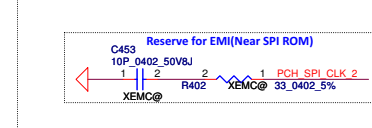


SPI ROM (4MByte)

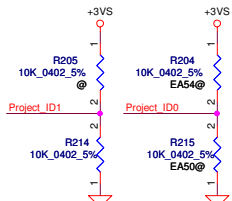
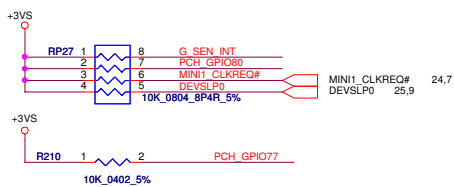
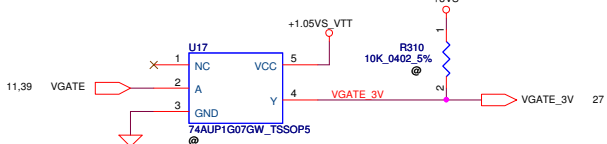
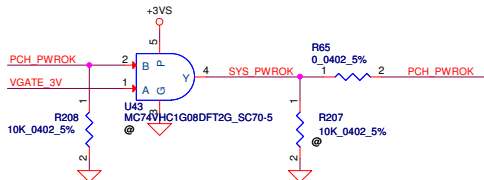
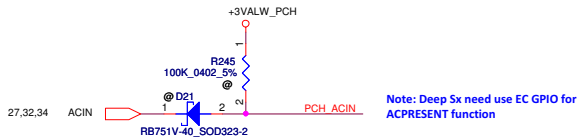
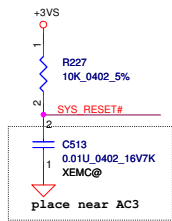


2ROM is SPI ROM 2M + 4M Byte

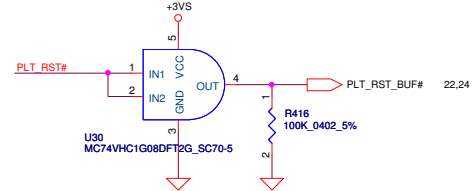
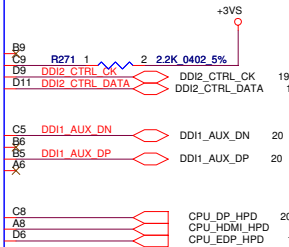
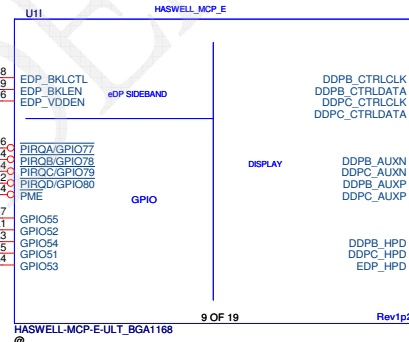
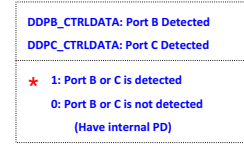
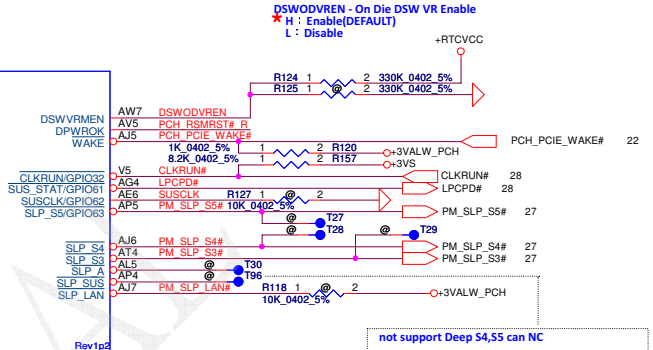
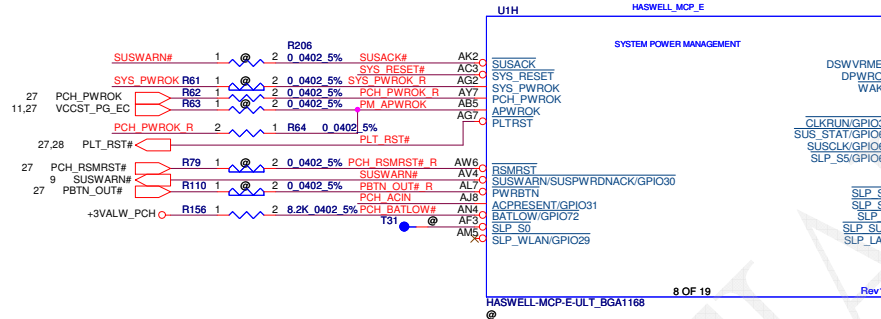
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RP19 33 Ohm SD309330A80
U6 SA00004UG00
POP R102,R103,RP20,C67,U7,R109

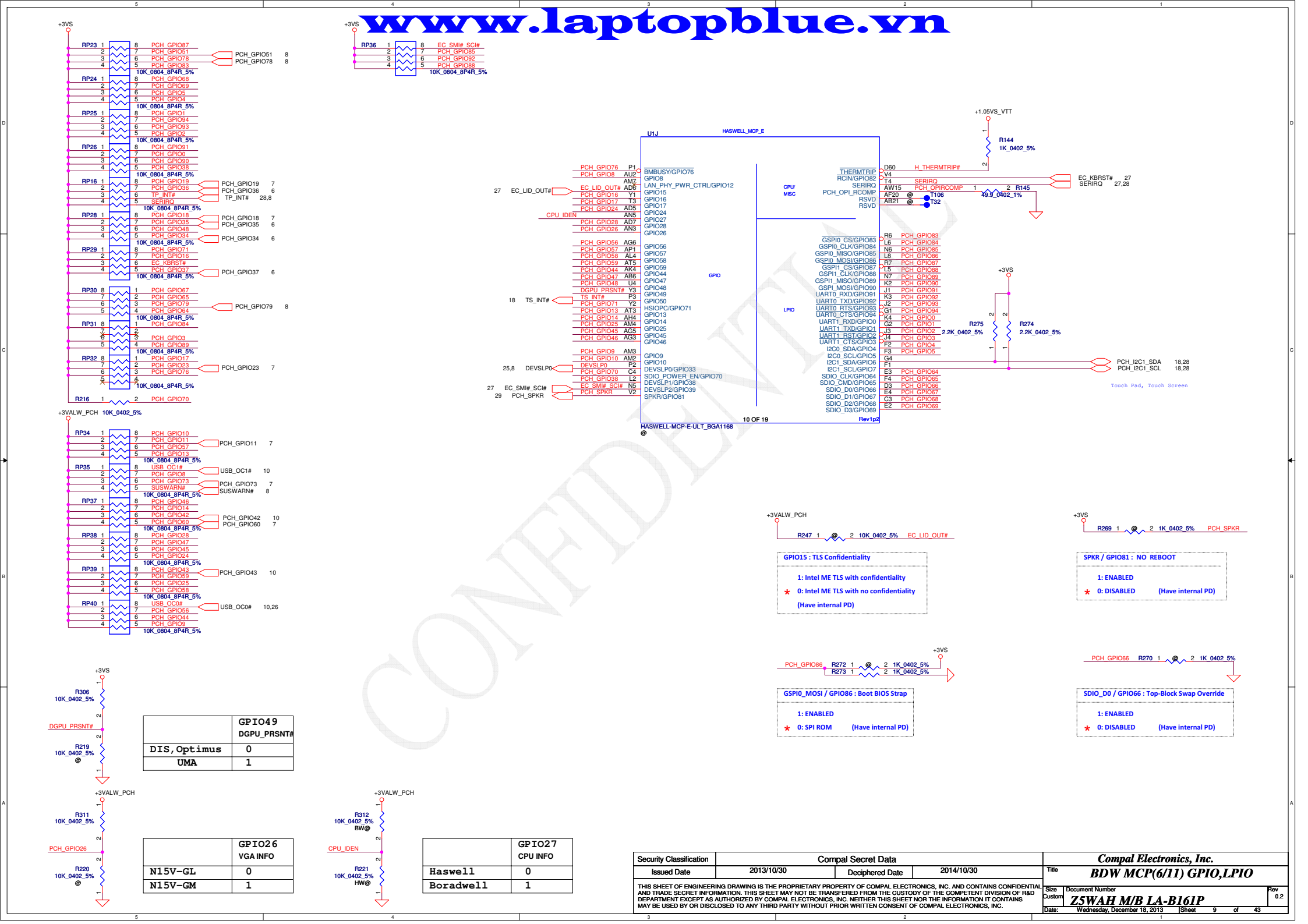


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Project ID	Project_ID1 GPIO54	Project_ID0 GPIO53
*EA50	0	0
EA54	0	1
Reserved	1	0
Reserved	1	1

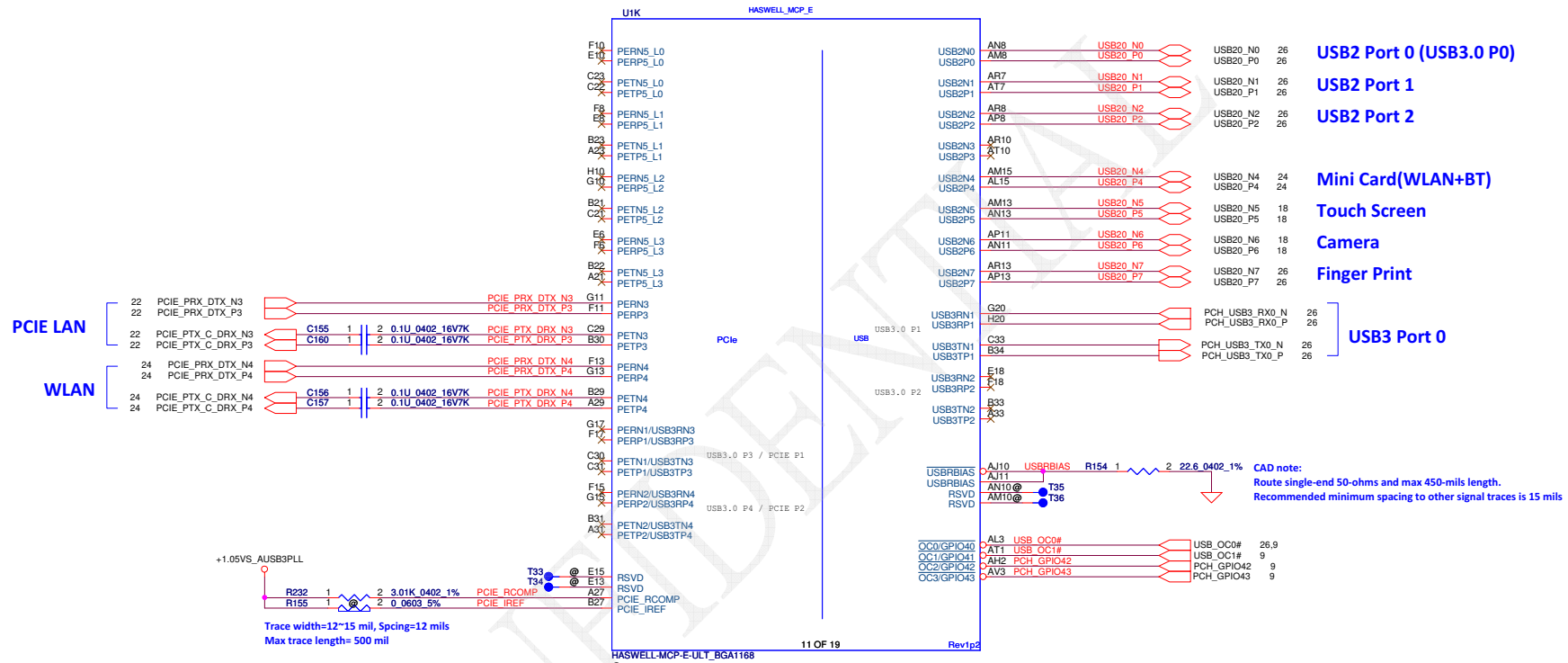




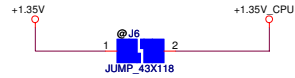
	GPIO26 VGA INFO
N15V-GL	0
N15V-GM	1

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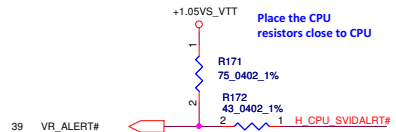
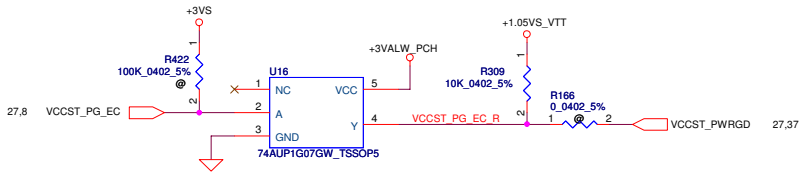
www.laptopblue.vn



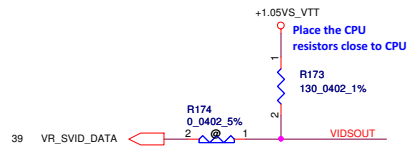
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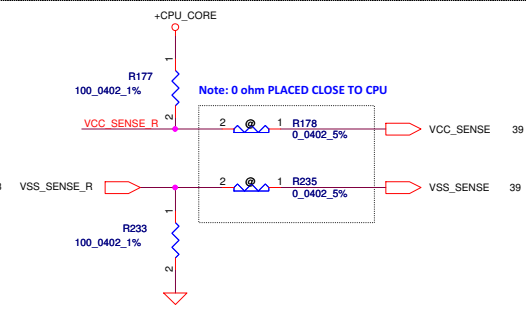
Shark Bay ULT have internal gate for VDDQ



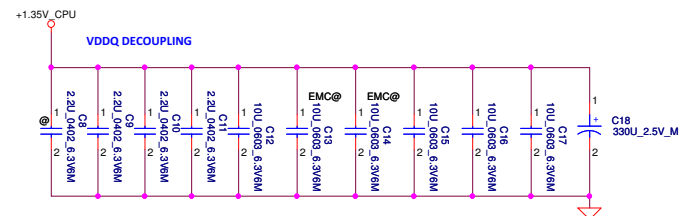
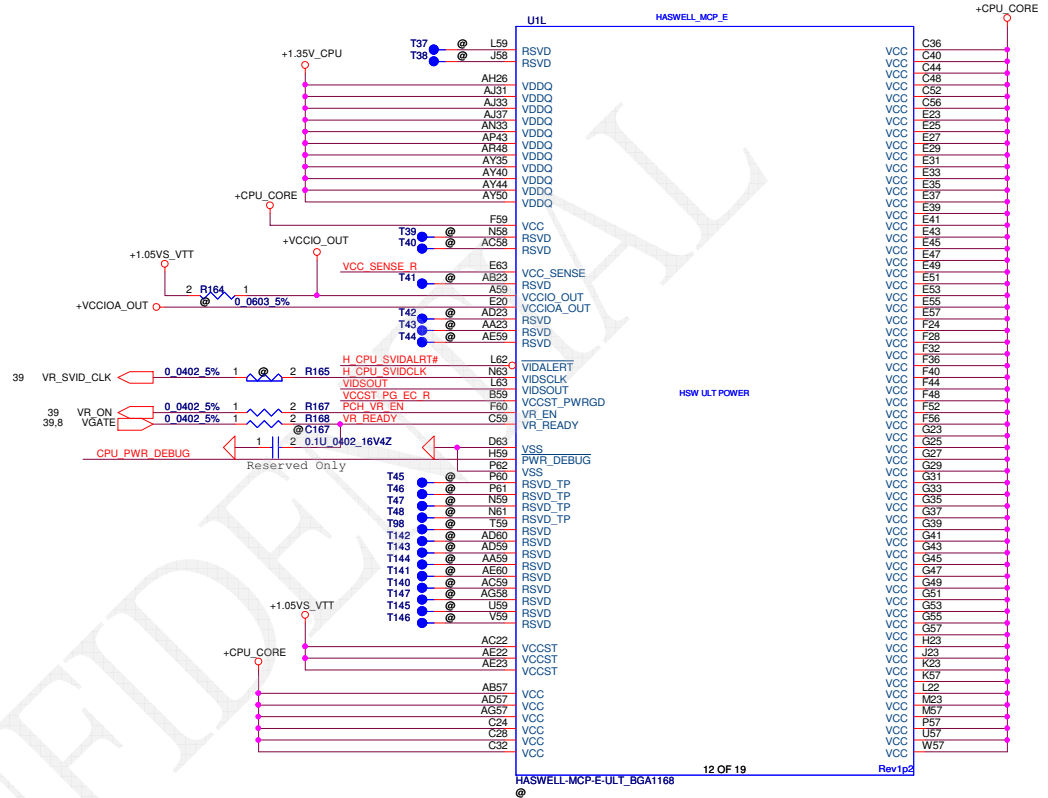
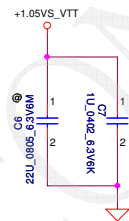
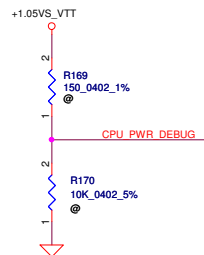
**Place the CPU
resistors close to CPU**



Place the CPU
resistors close to CPU

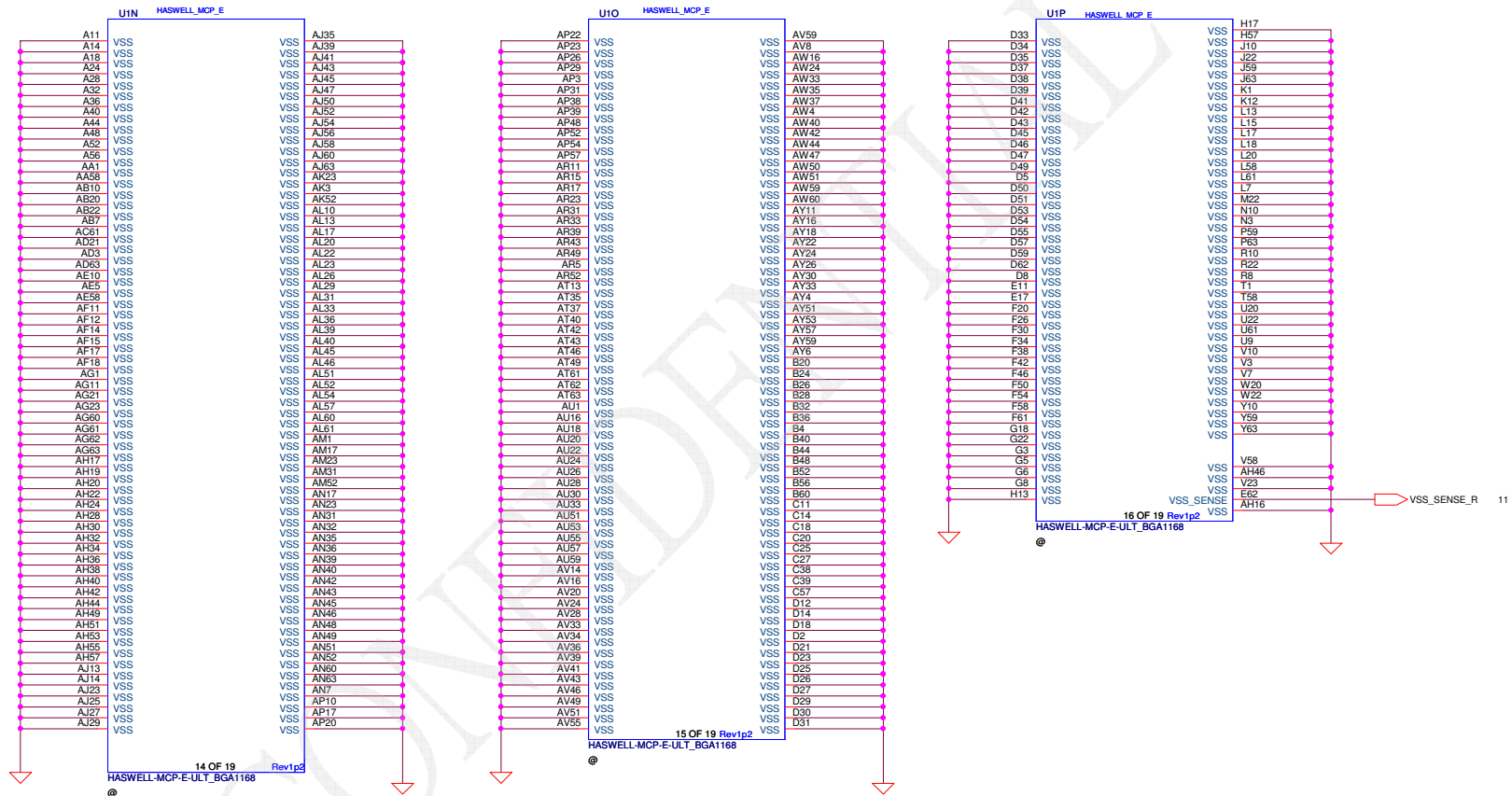


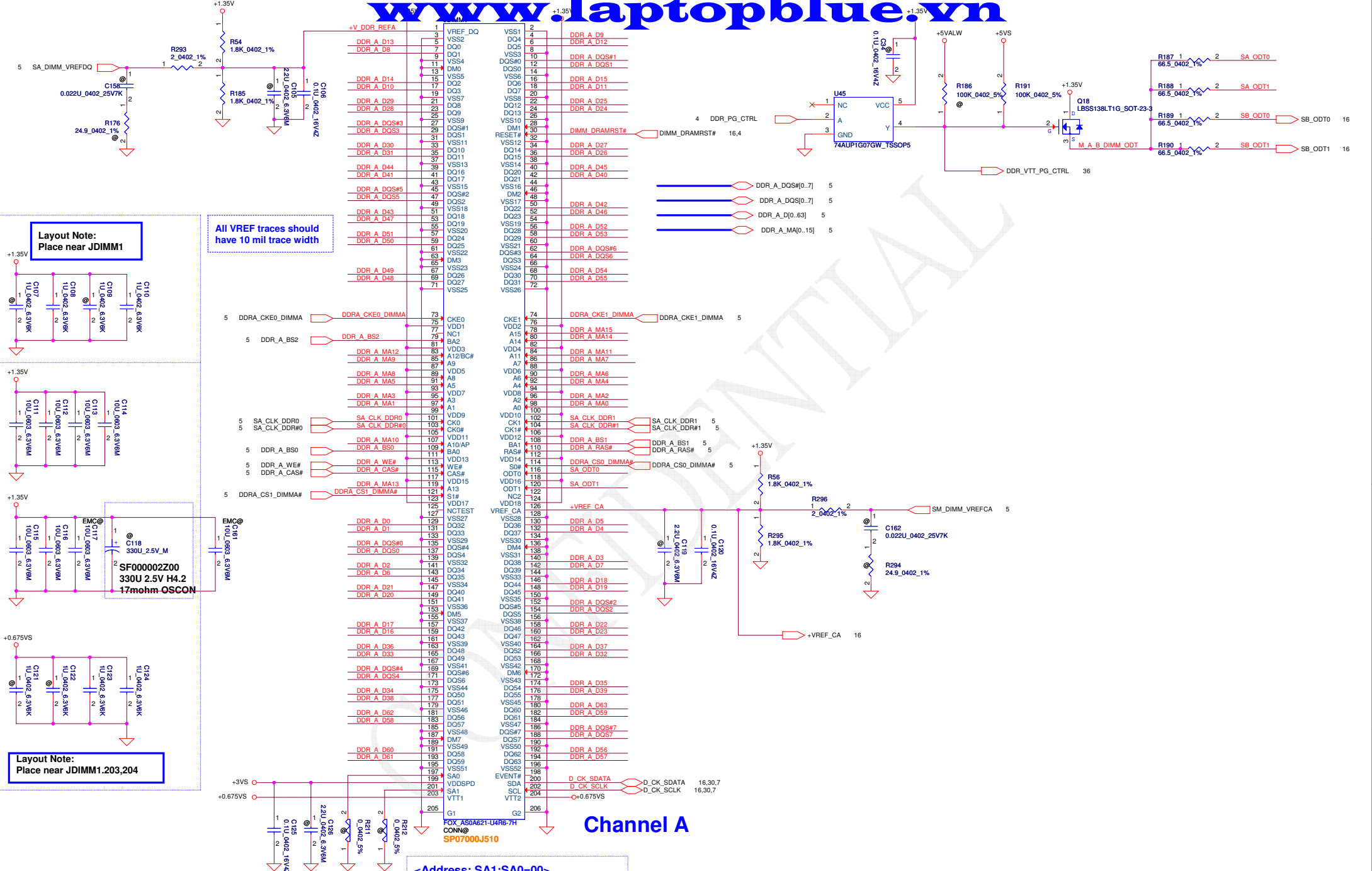
Note: 0 ohm PLACED CLOSE TO CPU

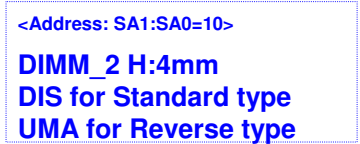


```
+1.35V : 470UF/2V/7343 *2
          10UF/6.3V/0603 * 6
          2.2UF/6.3V/0402 * 4
```

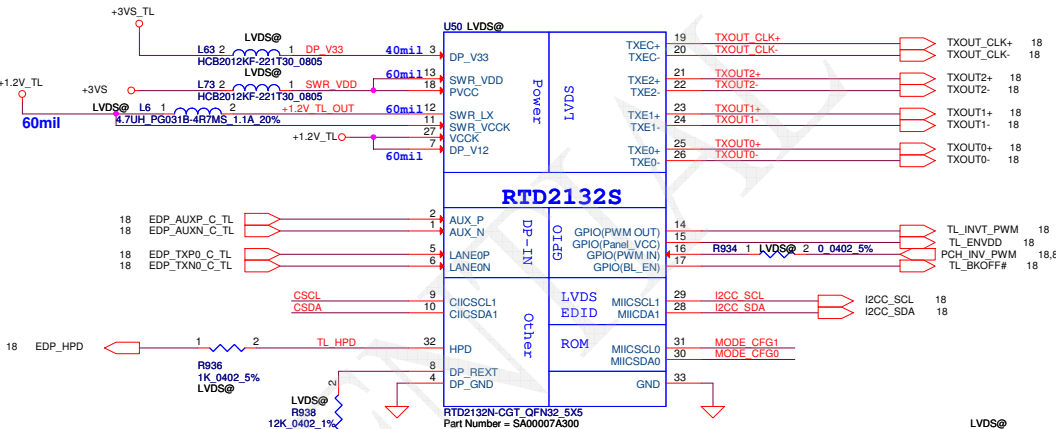
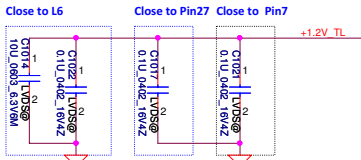
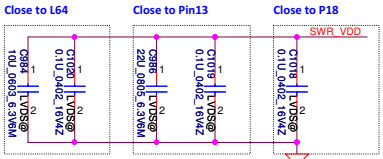
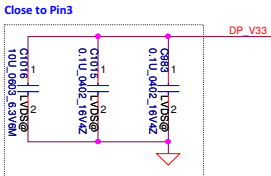
Security Classification		Compal Secret Data		Compal Electronics, Inc. BDW MCP(8/11) Power		
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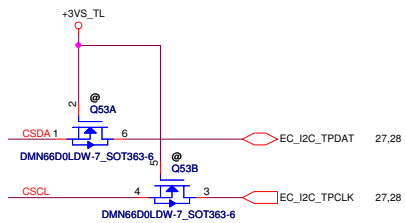
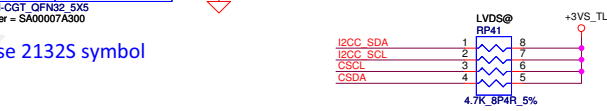




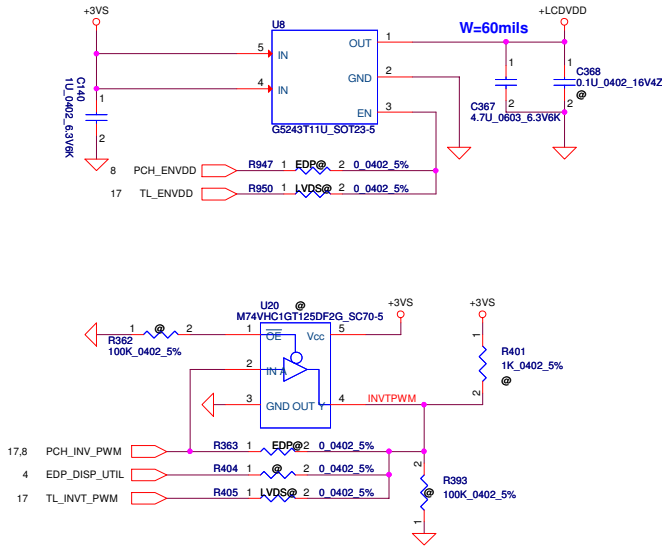
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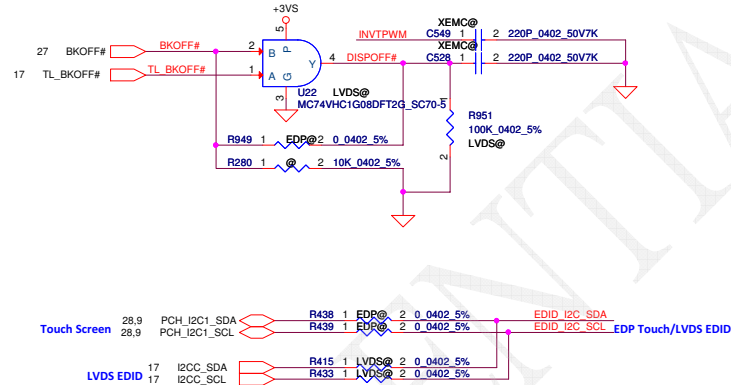
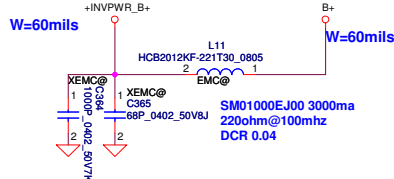
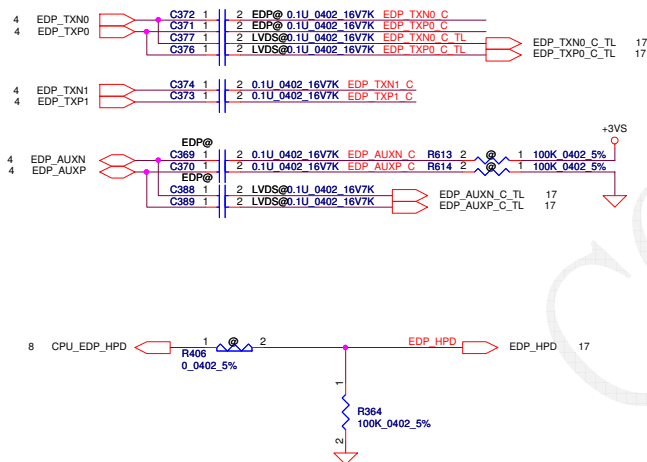
MODE_CFG0(PIN30)		
	0	1
MODE_CFG1(PIN31)	X	EP MODE
	ROM ONLY MODE*	EEPROM MODE



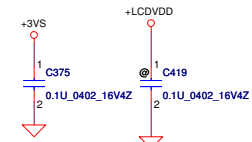
LCD POWER CIRCUIT



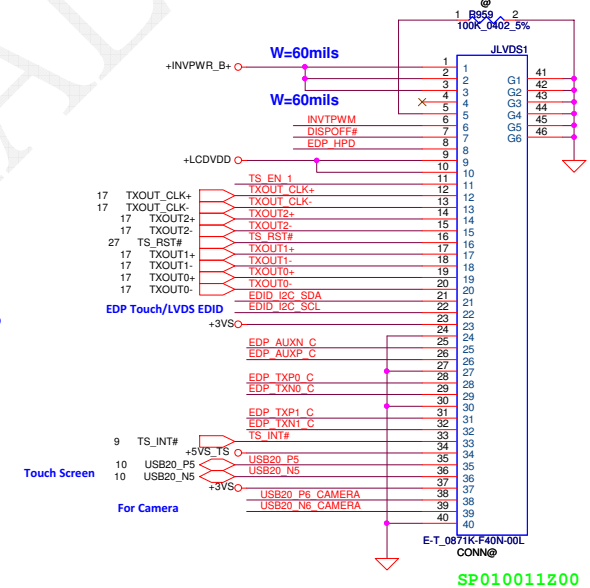
eDP



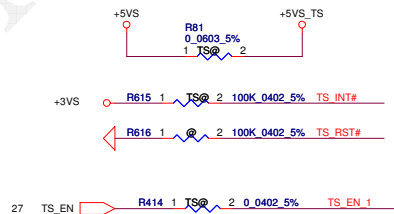
Place closed to JLVDS1



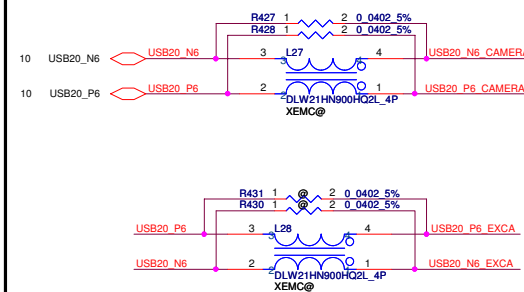
LCD/ LED PANEL Conn.



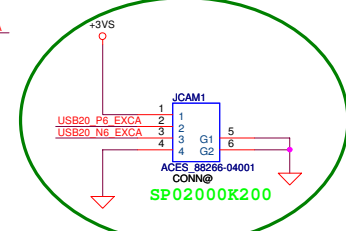
Touch Screen



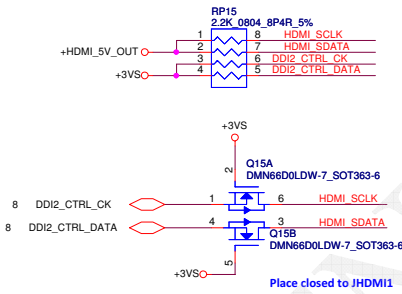
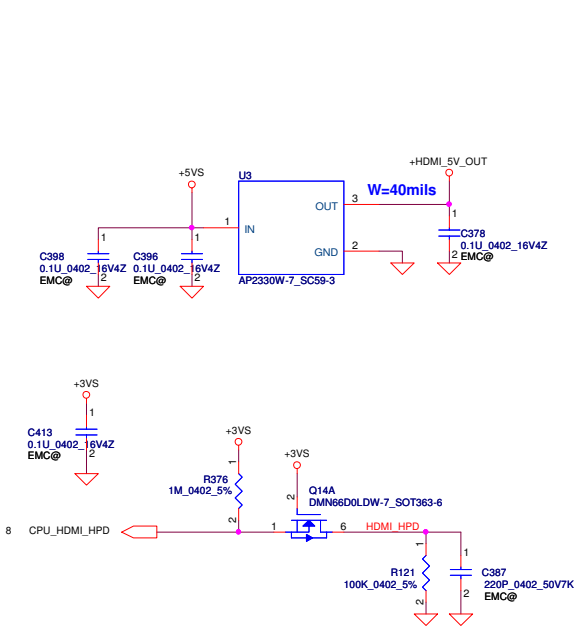
Camera



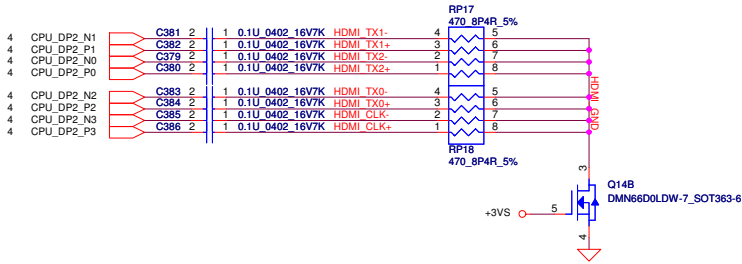
pin define, conn need to confirm



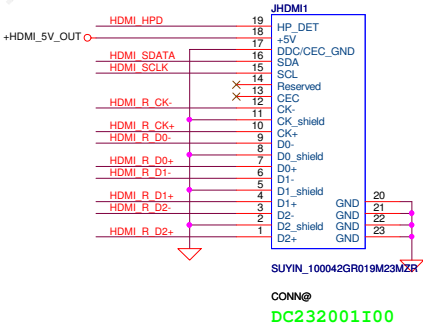
HDMI conn.

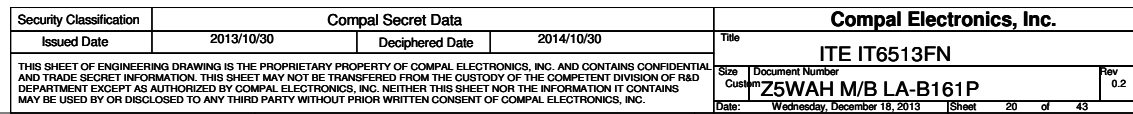


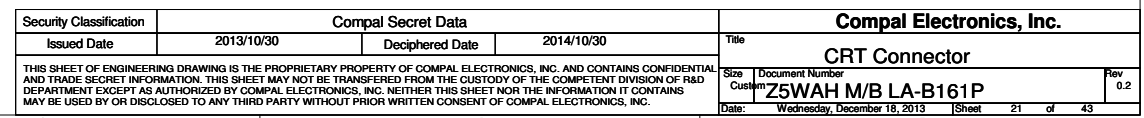
SM070001310 400ma 90ohm@100mhz DCR 0.3									
HDMI_CLK-	R368	1	2	0.0402	5%	HDMI_R_CLK-			
HDMI_CLK+	R369	1	2	0.0402	5%	HDMI_R_CLK+			
HDMI_TX0-	R370	1	2	0.0402	5%	HDMI_R_D0-			
HDMI_TX0+	R371	1	2	0.0402	5%	HDMI_R_D0+			
HDMI_TX1-	R372	1	2	0.0402	5%	HDMI_R_D1-			
HDMI_TX1+	R373	1	2	0.0402	5%	HDMI_R_D1+			
HDMI_TX2-	R374	1	2	0.0402	5%	HDMI_R_D2-			
HDMI_TX2+	R375	1	2	0.0402	5%	HDMI_R_D2+			

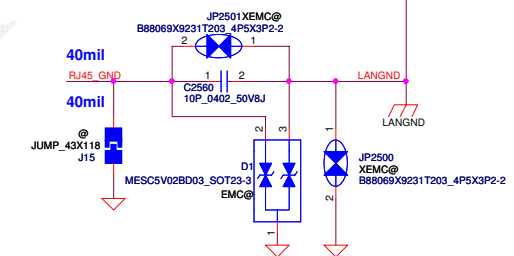


HDMI connector









Close to Card Reader CONN

SD card pins: 22 SD_D3_R, 22 SD_CMD_R, 22 SD_CLK_R, 22 SD_D0_R, 22 SD_D1_R, 22 SD_D2_R, 22 SD_CD#, 22 SD_WP

Connector pins: 1 CD/DAT3, 2 CMD, 3 VSS1, 4 VDD, 5 CLK, 6 VSS2, 7 DAT0, 8 DAT1, 9 DAT2, 10 CD, 11 WP, 12 G1, 13 G2, 14 G3, 15 G4

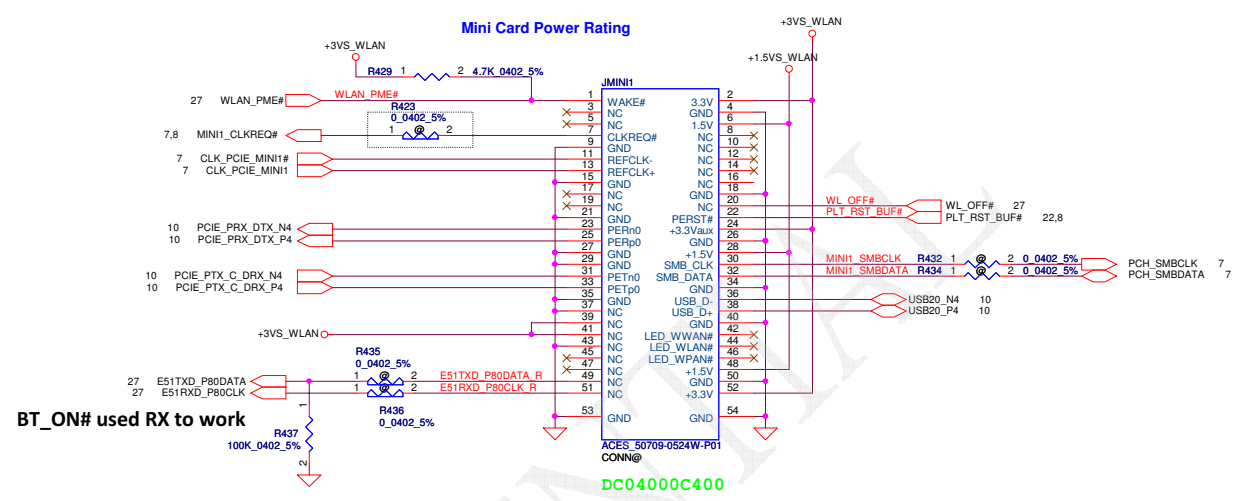
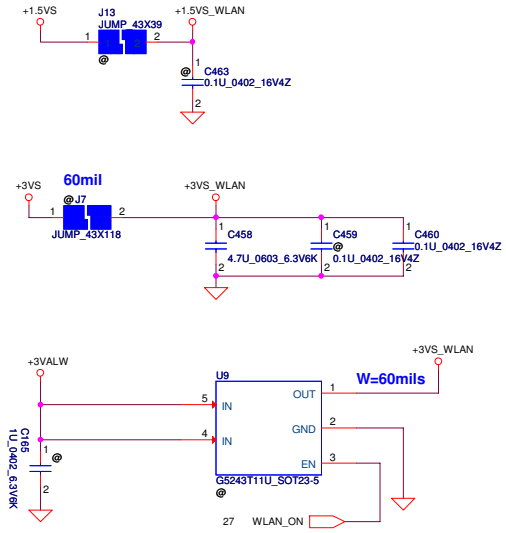
Power: +CARD_3V3

SD card labels: 017U 04K2 167K, 4.77U 06K2 5.596K

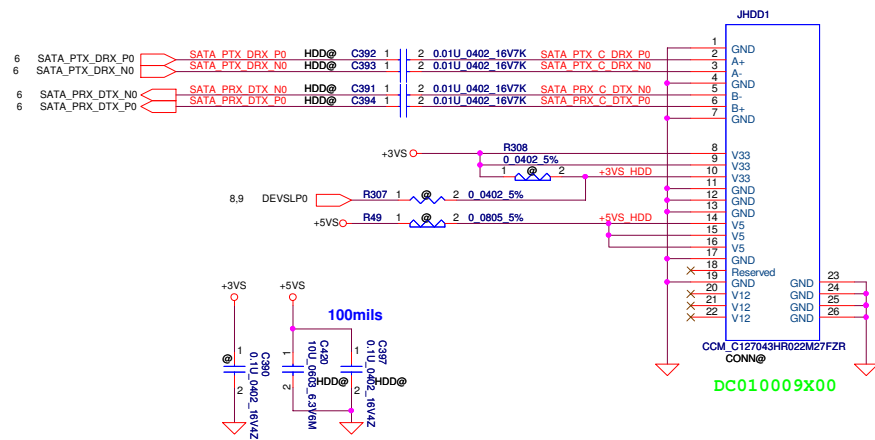
Connector label: TAITW PSDAT4-11GLBS1NNH2 CONN@

SP07000ZC00

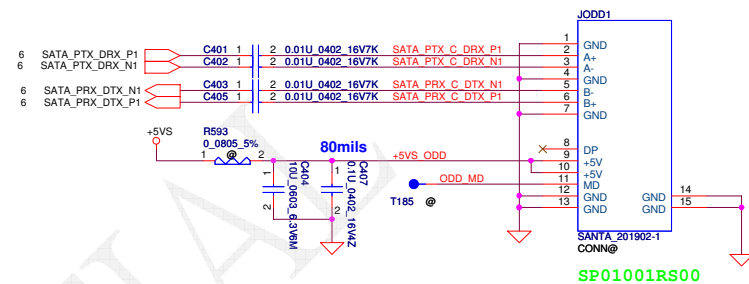
Security Classification		Compal Secret Data		Compal Electronics, Inc.				
Issued Date		2013/10/30	Deciphered Date	2014/10/30	Title			
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					Size Custom	Document Number		Rev
					Z5WAH M/B LA-B161P		0.2	
					Date:	Wednesday, December 18, 2013	Sheet 23 of 43	



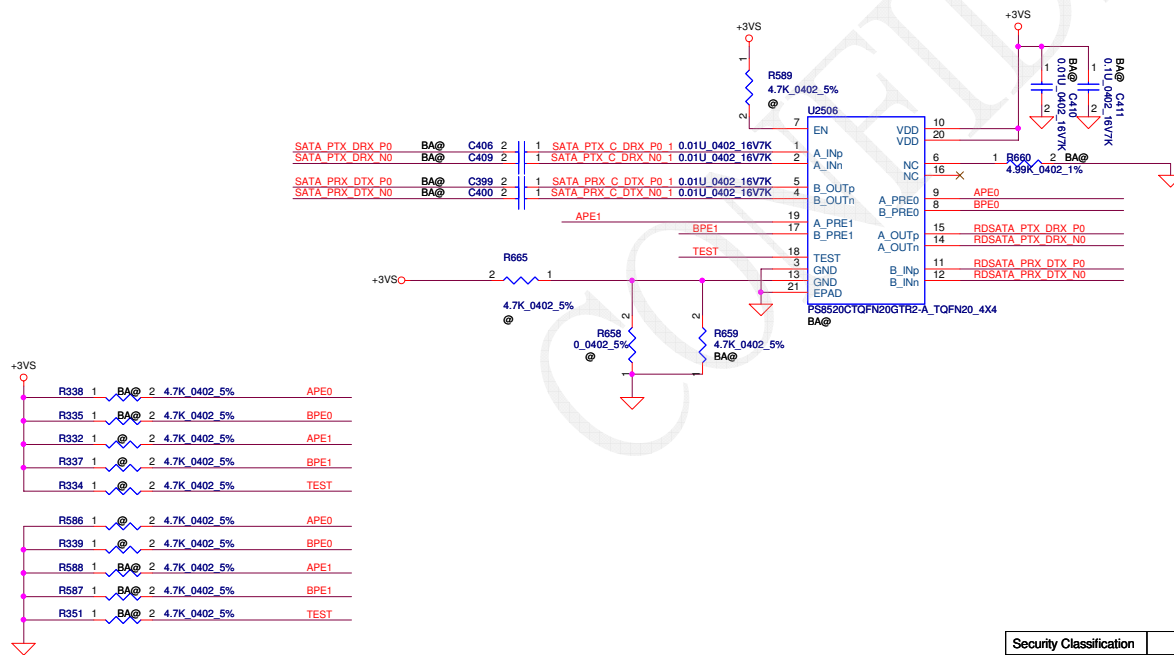
SATA HDD1 Conn.



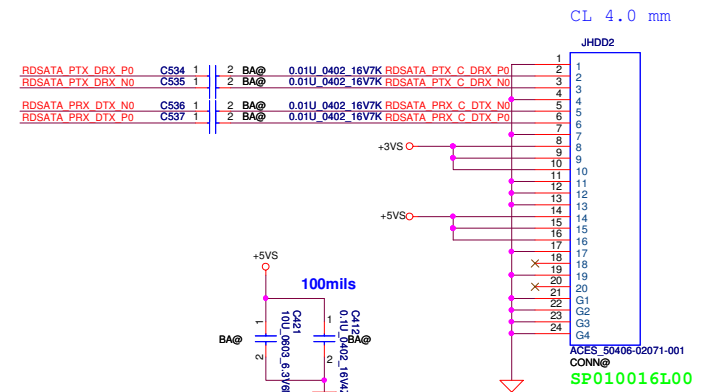
SATA ODD Conn.



SATA Re-Driver HDD Conn. Reserve

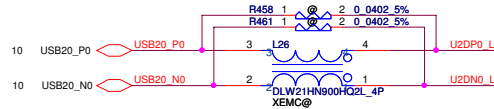
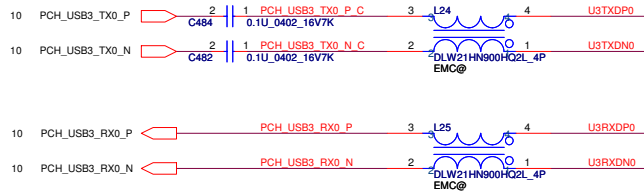


SATA HDD1 Conn.

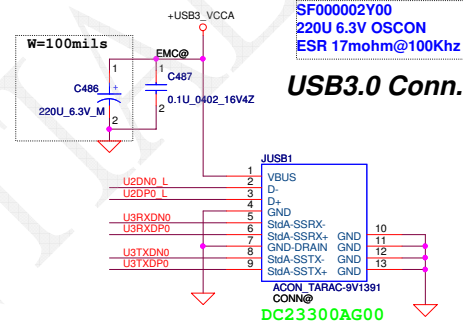
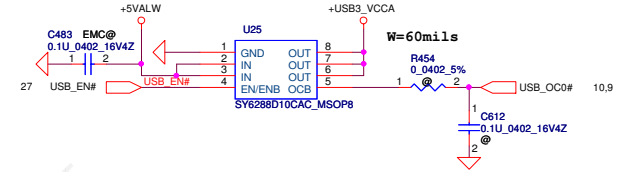
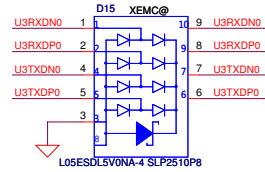


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Size		Document Number		Rev	
Custom		Z5WAH M/B LA-B161P		0.2	
Date		Wednesday, December 18, 2013		Sheet 25 of 43	

USB3.0 (Port 0)



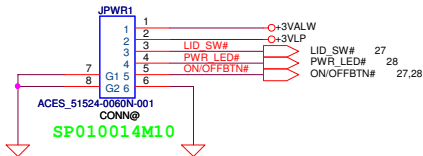
For ESD request



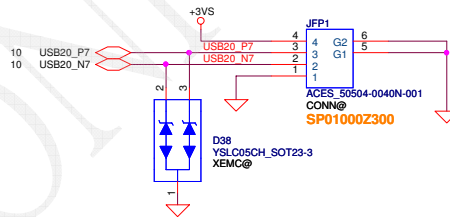
SF000002Y00
220U 6.3V OSCON
ESR 17mohm@100Khz

USB3.0 Conn.

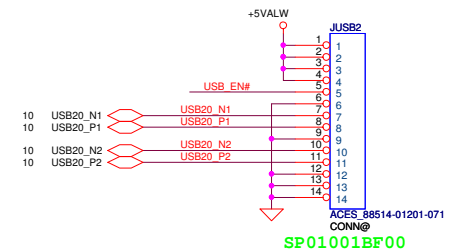
PWR/B



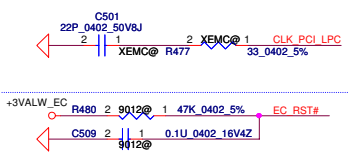
Finger Print /B Reserve



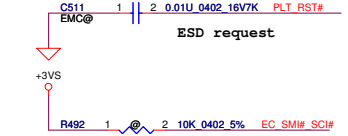
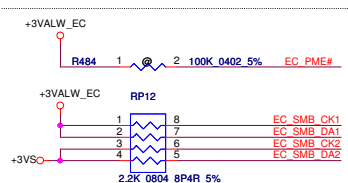
USB/B (USB Port 1, Port2)



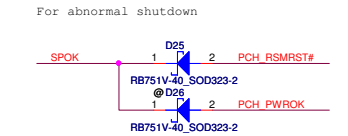
Security Classification		Compal Secret Data		Compal Electronics, Inc.	
Issued Date	2013/10/30	Deciphered Date	2014/10/30	Title	
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Size		Document Number		Rev	
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Date		Wednesday, December 18, 2013		Sheet 26 of 43	



9022: ECRST# is internally pull-up to VCC via 40Kohm resistor, so can remove external pull-up resistor and capacitor.

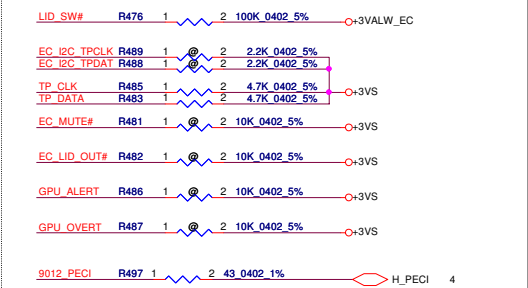
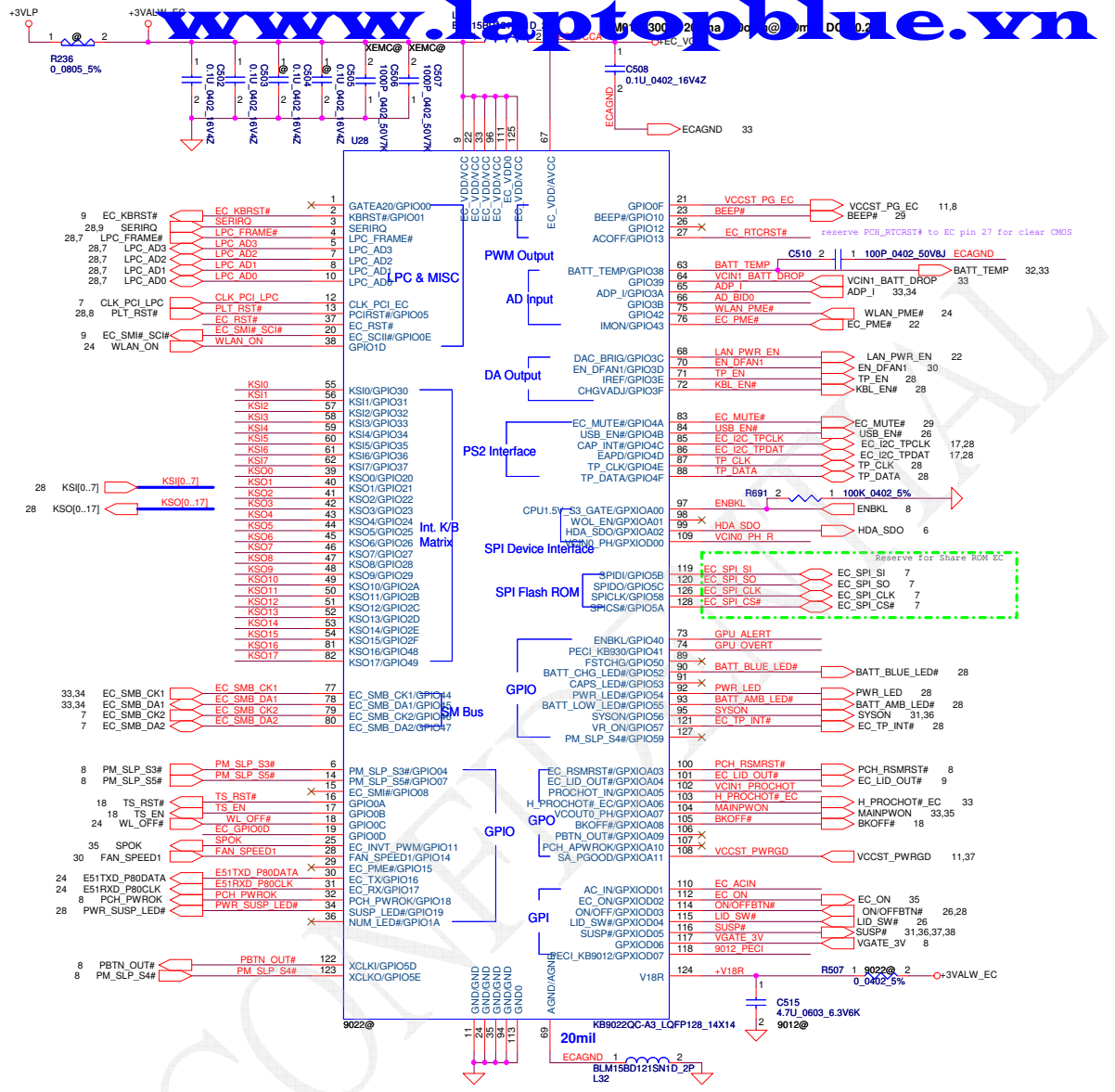
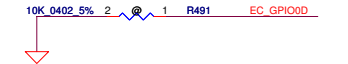


9022: Change control method from push-pull to open-drain, so EC_SCI# must be pull high. *PU on PCH side (Pull high in PCH side)

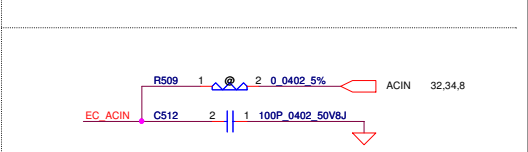
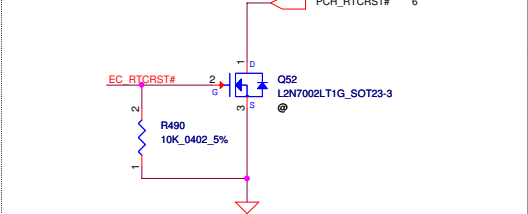


Board ID Analog Board ID definition, Please see page 3.

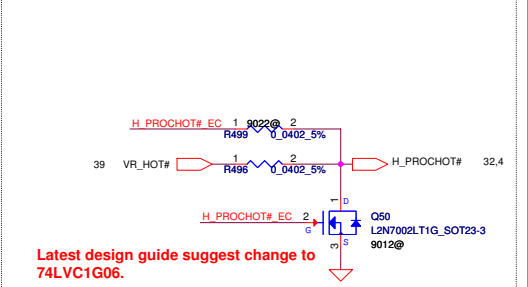
R491 reserve for RTD2132 EP_MODE



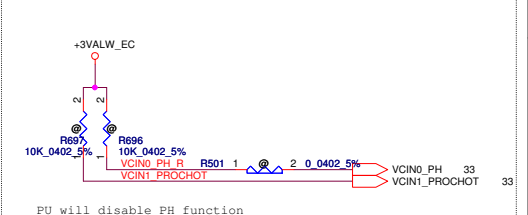
reserve PCH_RTCRST# to EC pin 27 for clear CMOS



KB9022&9012 Co-Layout Item

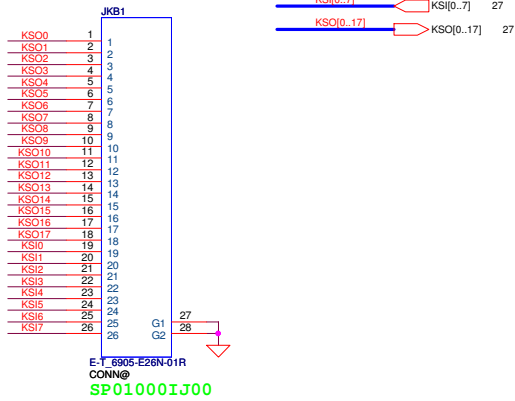


Latest design guide suggest change to 74LVC1G06.

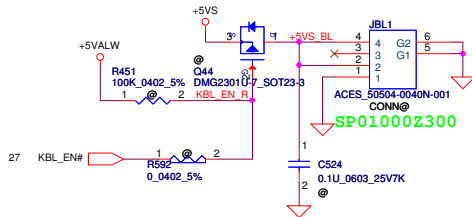


PU will disable PH function

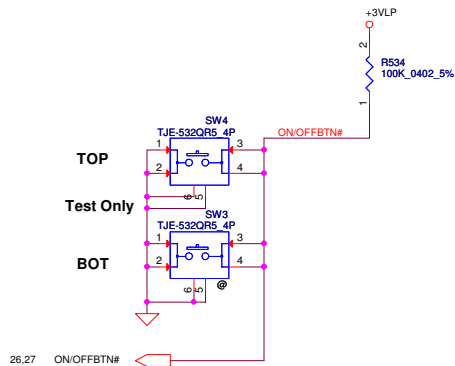
KB Conn.



KB BackLight Conn. Reserve

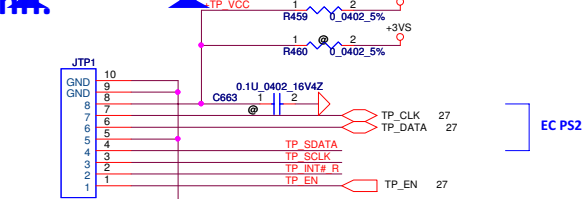


ON/OFF BTN



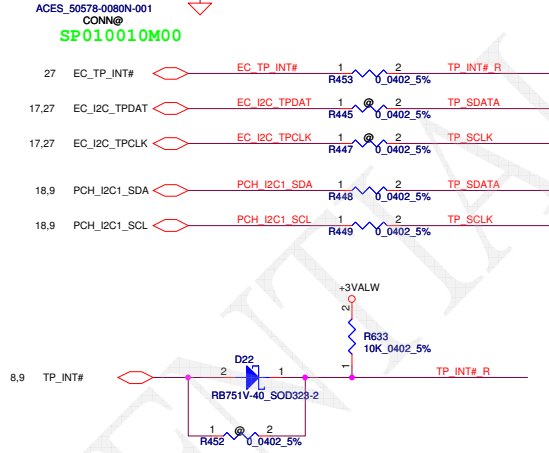
www.laptopblue.vn

TP/B Conn.

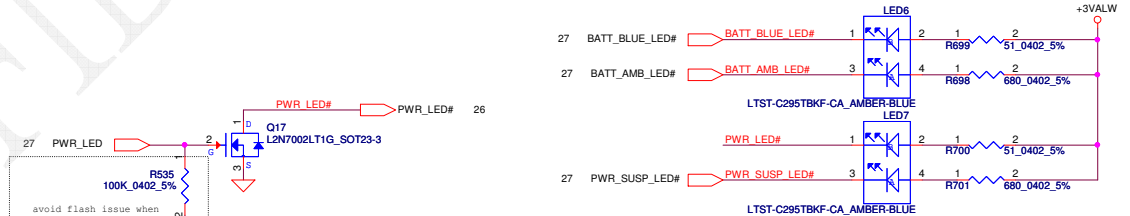


EC I2C

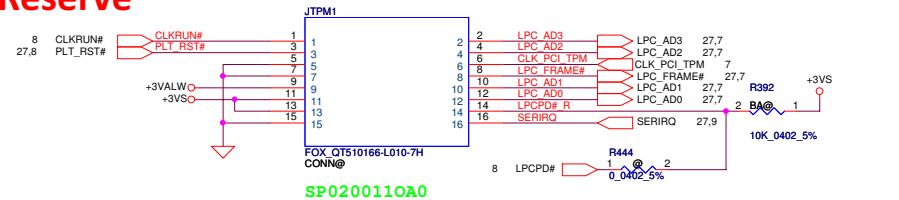
PCH I2C



LED



TPM Board Reserve

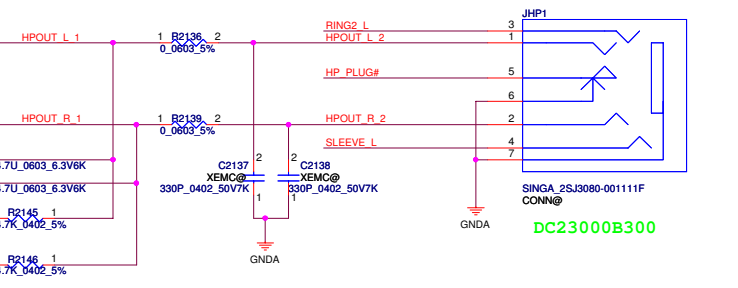
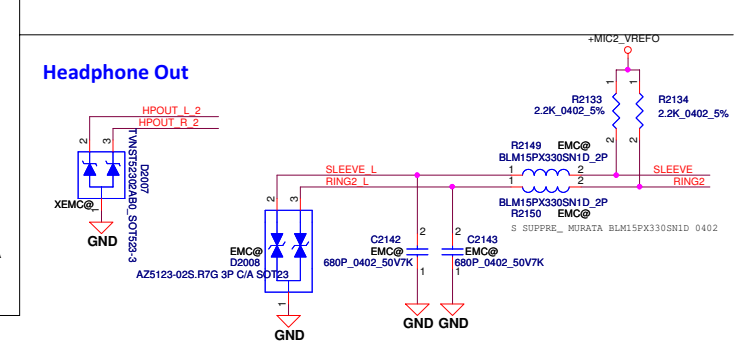
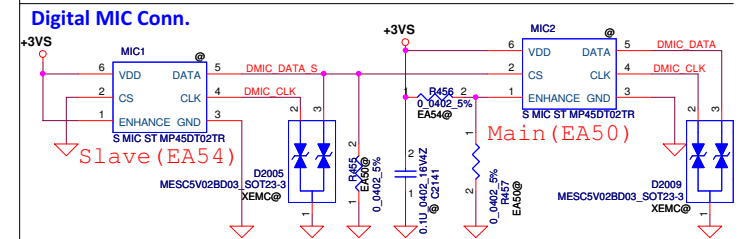
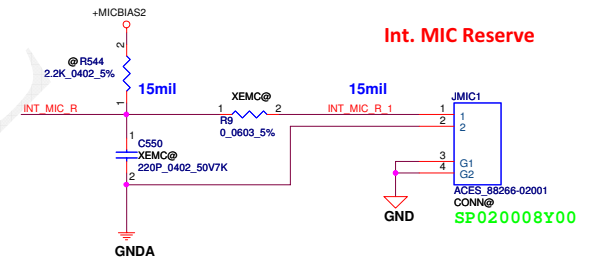
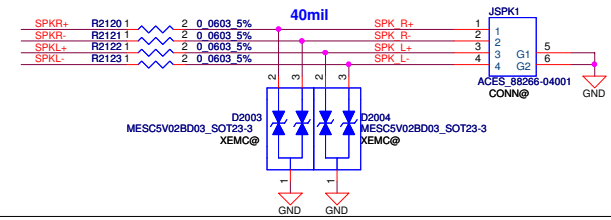
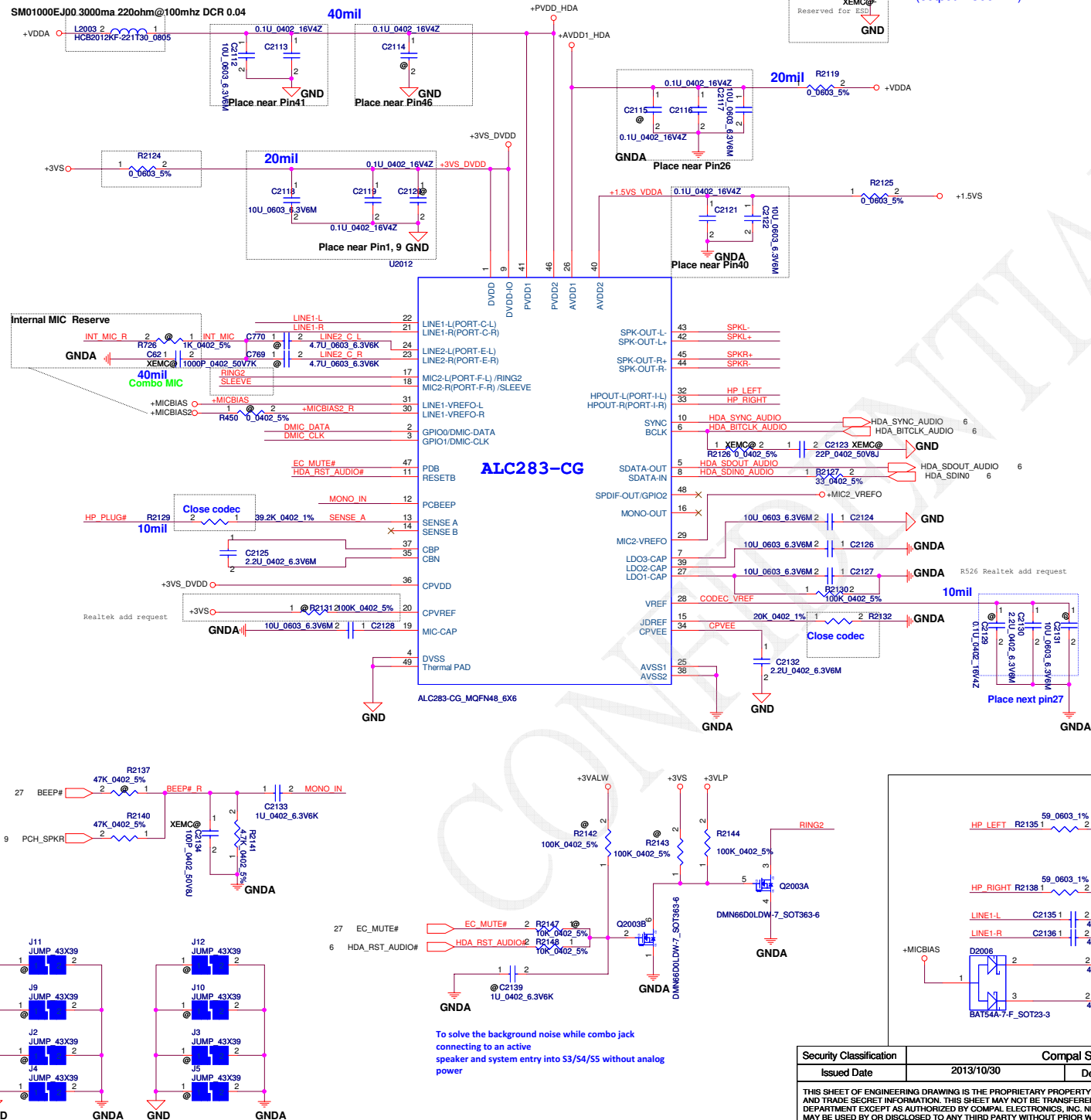


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				Customer	Z5WAH M/B LA-B161P
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HD Audio Codec

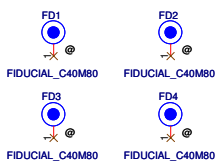
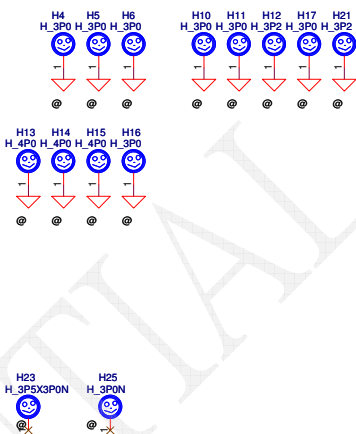
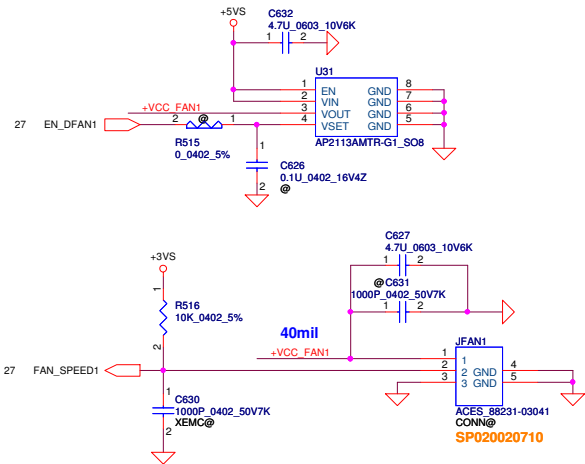
www.laptopblue.vn

Int. Speaker Conn.

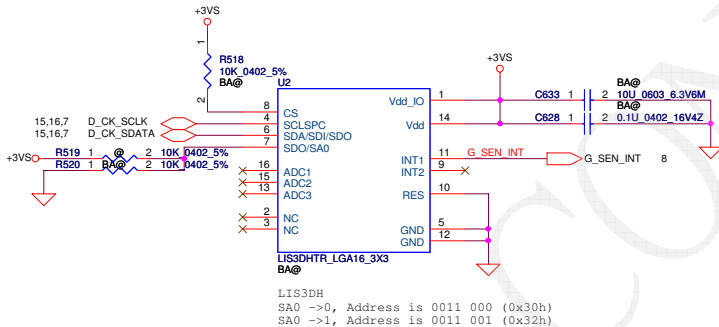


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				Customer Document Number	0.2
				Z5WAH M/B LA-B161P	
Date:		Wednesday, December 18, 2013		Sheet	29 of 43

FAN1 Conn

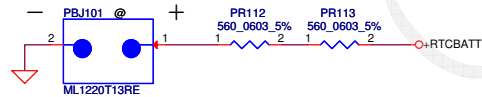
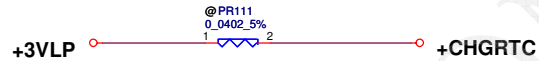
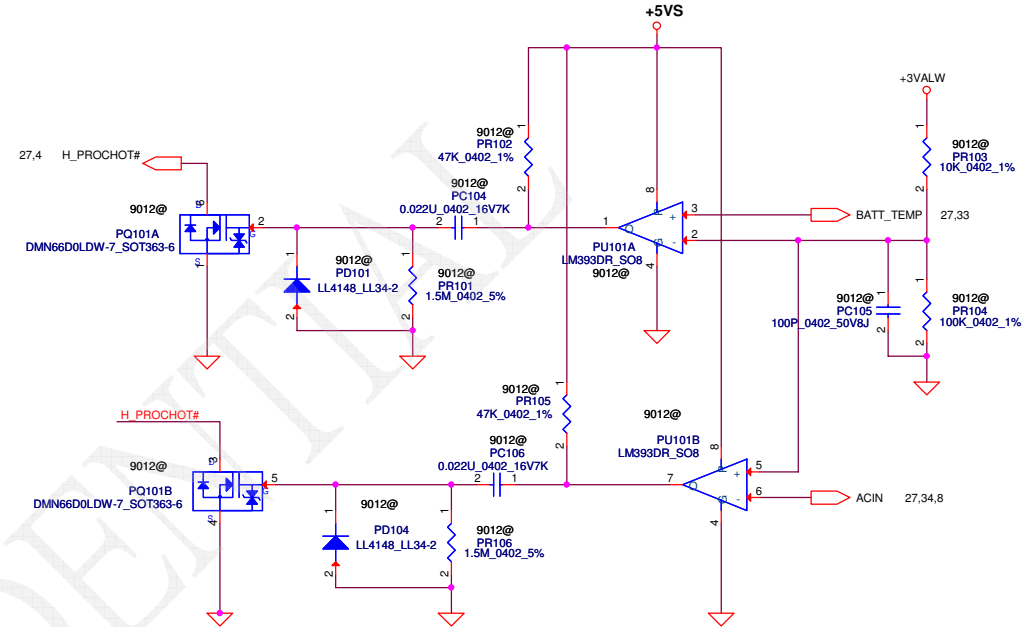
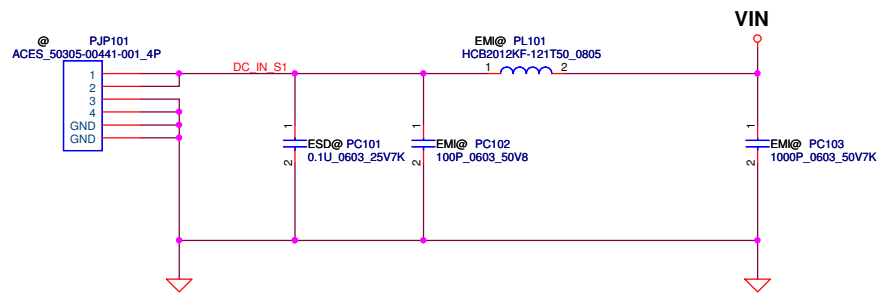


G-Sensor Reserve

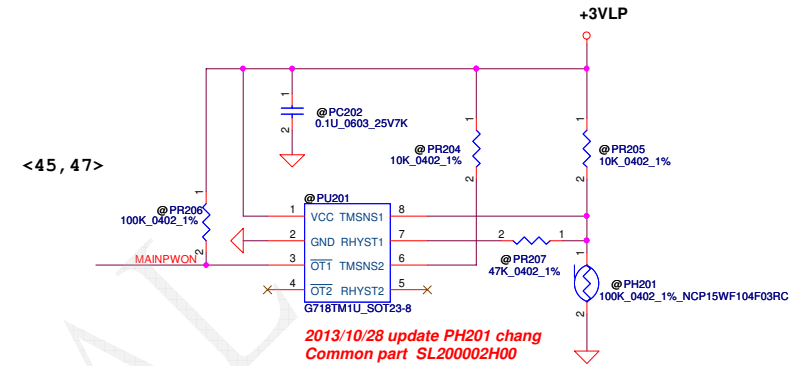
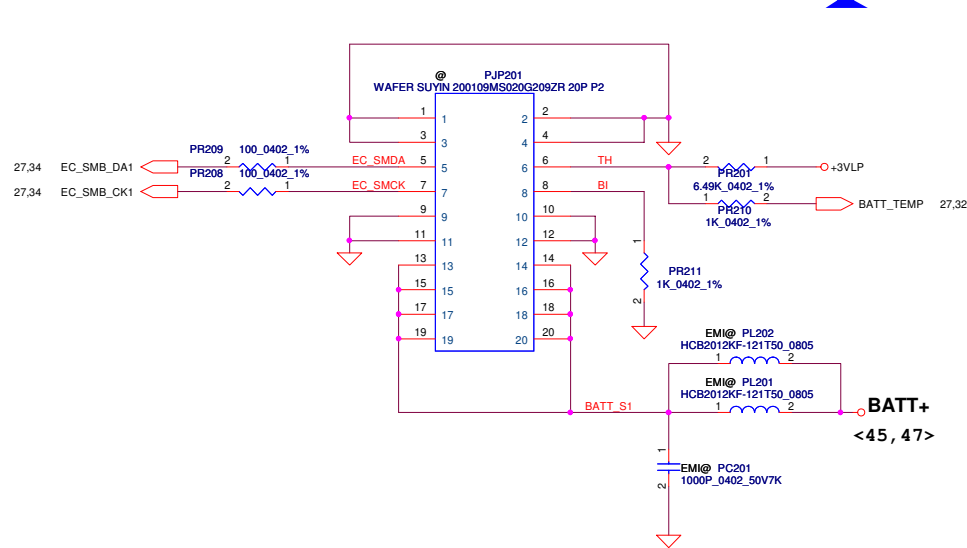


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Issued Date				2013/10/30		Deciphered Date		2014/10/30		Title	
										FAN & Screw Hole & G-Sensor	
										Size	
										Customer	
										Z5WAH M/B LA-B161P	
										Rev	
										0.2	
										Date:	
										Wednesday, December 18, 2013	
										Sheet	
										30	
										of	
										43	

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				Customer	Z5WAH M/B LA-B161P	0.2
				Date:	Wednesday, December 18, 2013	Sheet 31 of 43



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Date: Wednesday, December 18, 2013				Rev 0.2
Sheet 32 of 43				



---Battery_pin define---

PIN1 GND
PIN2 GND
PIN3 SMD
PIN4 SMC
PIN5 TS
PIN6 B/I
PIN7 Batt++
PIN8 Batt++

---Battery Con_pin define---

PIN8 GND
PIN7 GND
PIN6 SMD
PIN5 SMC
PIN4 TS
PIN3 B/I
PIN2 Batt++
PIN1 Batt++

	For KB9012 OTP	For KB9022 OTP
92°C	1.2V	1.0V
56°C	1.2V	1.0V
PR216	22.6K ohm	32.4K ohm
PR227	26.1K ohm	30K ohm

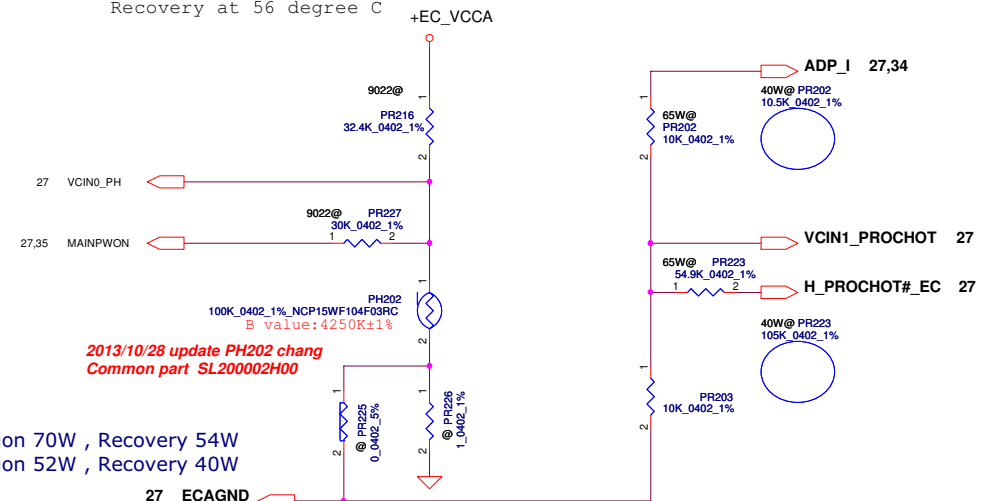
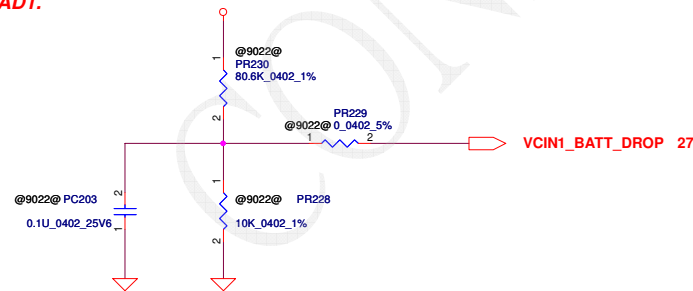
2013/10/14 update

For KB9022 sense 20mΩ	Active	Recovery
40W	52W, 0.51V	40W, 0.51V
65W	84.5W, 0.82V	65W, 0.82V

PH201 under CPU bottom side :
CPU thermal protection at 92 degree C (shutdown)
Recovery at 56 degree C

2013/10/02
Add for ENE9022 Battery Voltage drop detection. B+
Connect to ENE9022 pin64 AD1.

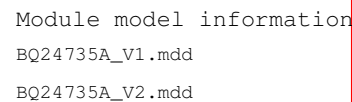
Battery is 3-cell design.
B+=9V



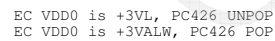
For 65W adapter==>action 70W , Recovery 54W
For 40W adapter==>action 52W , Recovery 40W

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0.2											

PR303 10m ohm chang -->20m ohm
SD00000S120



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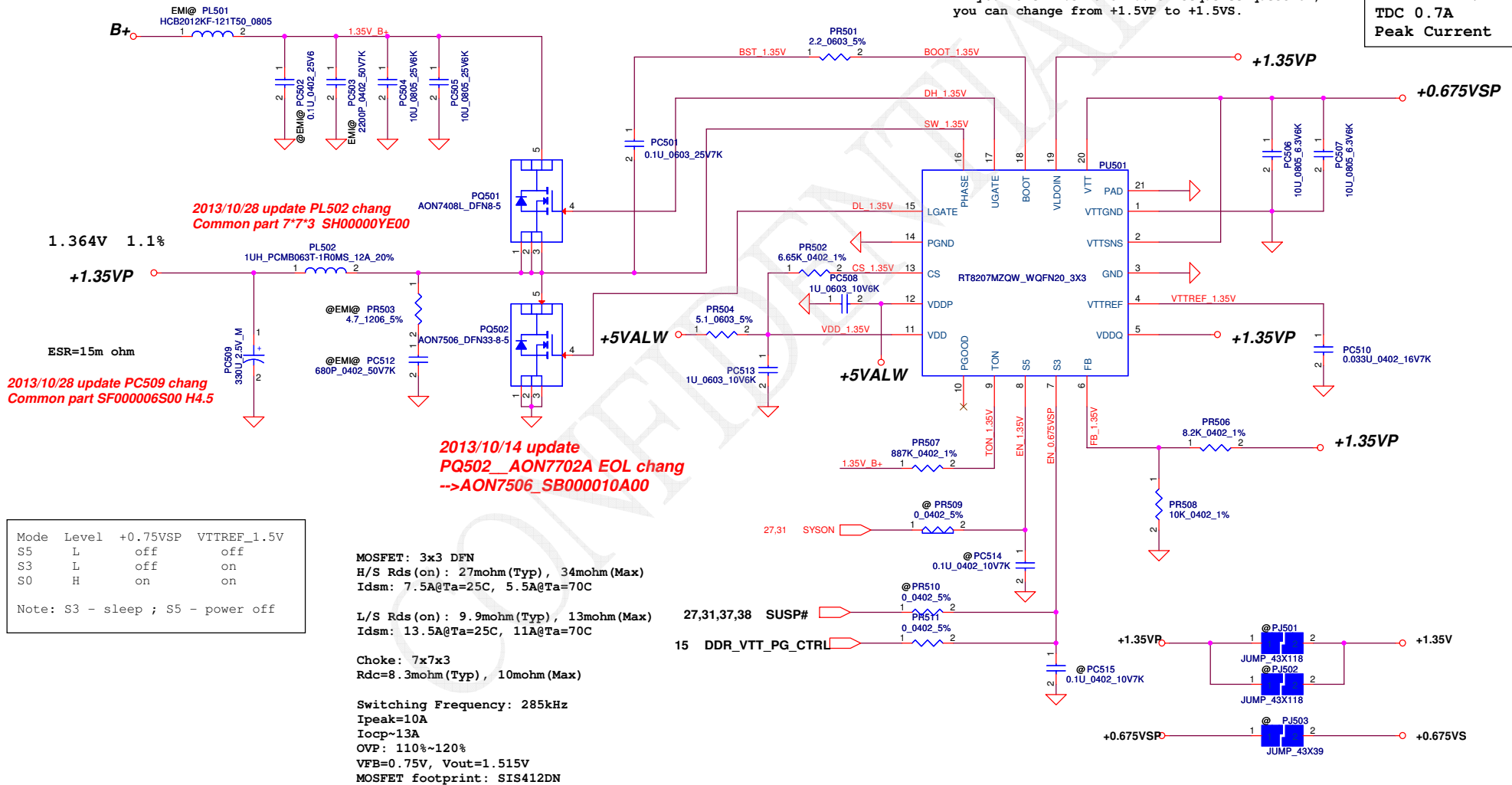
DATE: 12/18/2013 OF: 43 NS:	Document Number Custom	Rev 0.2
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Module model information

RT8207M_V1.mdd For Single layer
RT8207M_V2.mdd For Dual layer

Pin19 need pull separate from +1.5VP.
If you have +1.5V and +0.75V sequence question,
you can change from +1.5VP to +1.5VS.

0.75Volt +/- 5%
TDC 0.7A
Peak Current 1A

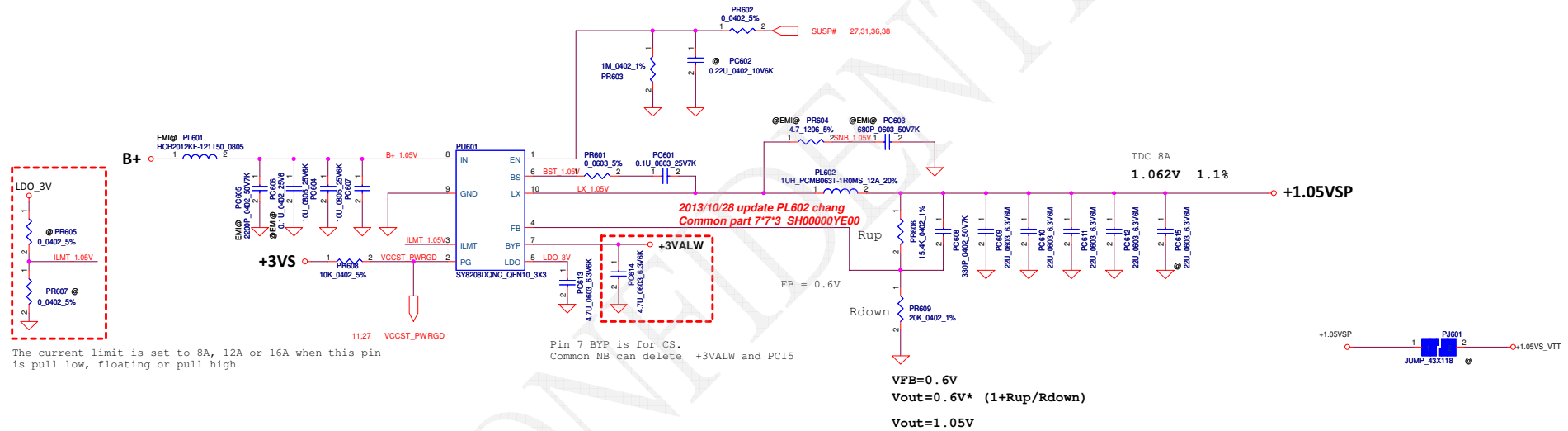


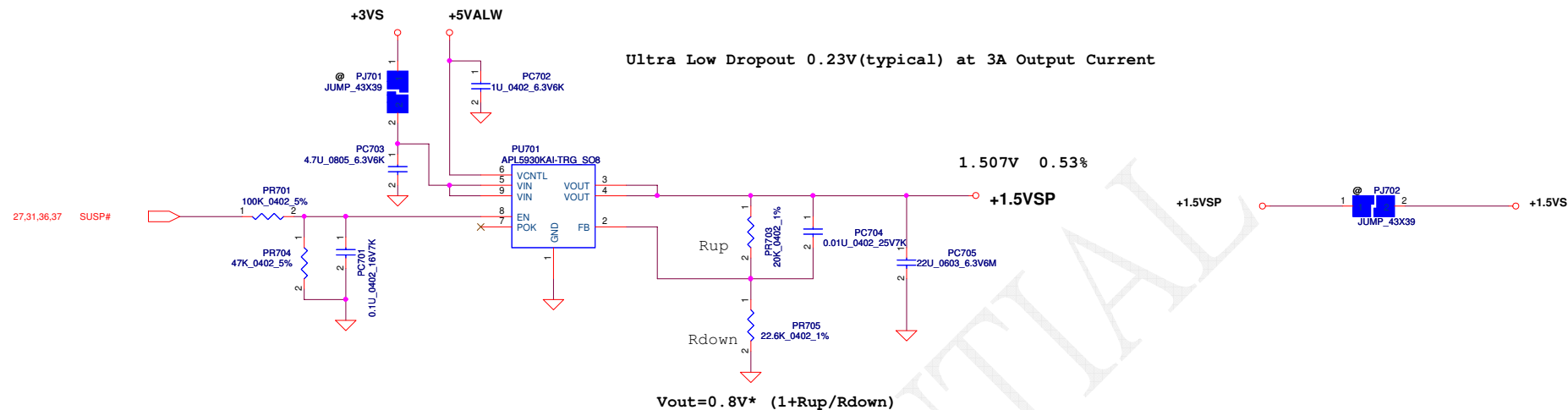
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Module model information

SY8208D_V1.mdd

EN pin don't floating
If have pull down resistor at HW side, pls delete PR2





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		Custom			0.2
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Module model information:
ISL95813 (for 15W & 28W CPU)

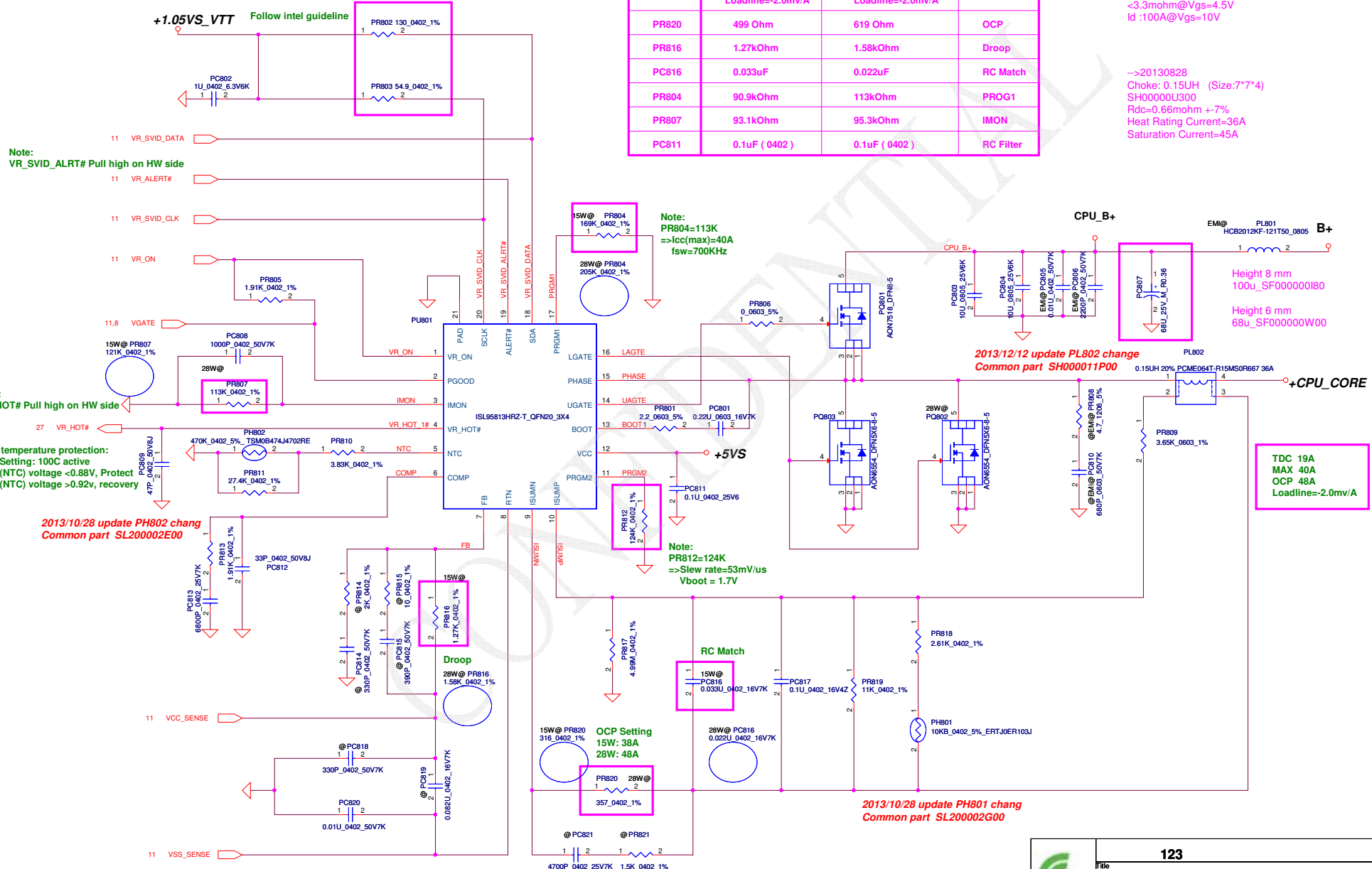
Base on BDW PDDG Rev_0_73

Location	15W	28W	Note
	TDC 14A MAX 32A OCP 38.4A Loadline=-2.0mv/A	TDC 19A MAX 40A OCP 48A Loadline=-2.0mv/A	
PR820	499 Ohm	619 Ohm	OCP
PR816	1.27kOhm	1.58kOhm	Droop
PC816	0.033uF	0.022uF	RC Match
PR804	90.9kOhm	113kOhm	PROG1
PR807	93.1kOhm	95.3kOhm	IMON
PC811	0.1uF (0402)	0.1uF (0402)	RC Filter

H-side MOS: MDV1525URH
Rds(on):
<10.1mohm@Vgs=10V
<14.0mohm@Vgs=4.5V
Id :24A@Vgs=10V

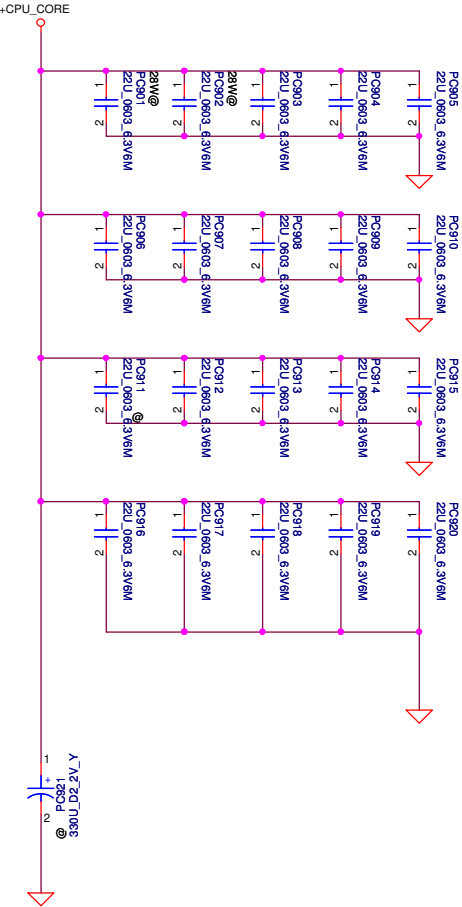
L-side MOS: MDU1511RH
Rds(on):
<2.4mohm@Vgs=10V
<3.3mohm@Vgs=4.5V
Id :100A@Vgs=10V

-->20130828
Choke: 0.15uH (Size:7*7*4)
SH000000U300
Rdc=0.66mohm +/-7%
Heat Rating Current=36A
Saturation Current=45A



TDC 19A
MAX 40A
OCP 48A
Loadline=-2.0mv/A

PWR Rule
需確認最新SPEC.
Modify 8/6.



30 X 22uF 0805
2012/10/23
check the output cap Qty!!!
2012/10/24
23 pcs 22uF and reserve 7 pcs
2013/01/14
22uF*17 unpop:22uF*3

20130828
15W: 22uF*14
28W: 22uF*16

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				Custom		0.2
3		2		Date	Wednesday, December 18, 2013 1 Sheet 40 of 43	

Item	Fixed Issue	Reason for change	PG#	Modify List	Date	Phase
1	Design Update		P.35 P.37 P.37 P.39 P.34 P.33	Add unpop PC428 PC427,22U_0603_6.3V6M_SE00000M000 Add unpop PC615,22U_0603_6.3V6M_SE00000M000 PC609 PC610,SE00000PL00 change to 0603_6.3V6M_SE00000M000 PL801 PC807,Swap positions. PL302,10uH_10104_SH000005Z80 change to 10uH_773_SH00000YB00 Add PL202_SM01000C000	11/29	EVT
2	Design Update		P.35	PR410 R-short change to PD401_SCS00000Z00	12/09	EVT
3	Design Update	CPU Transient Test	P.39 P.40 P.40 P.40 P.33	PL802_SH00000U300 change to Common part SH000011P00 PC906 PC910 PC915 22U_0603_SE00000M000 SMT PC901 PC902 22U_0603_SE00000M000,SMT change to 28W@ PC916 PC915 22U_0603_SE00000M000 ,28W@ change to SMT PR227_30.9K_0402_1%_SD034309280 change to_30K_0402_1%_SD034300280	12/12	EVT
4	Design Update	CPU Transient Test		PR820_348_0402_SD00000EI80 change to 357_0402_SD034357080 (28W) PR820_348_0402_SD00000EI80 change to 316_0402_SD000003480 (15W) PR814_2K_0402_1%_SD034200180 change to unpop PC814_330P_0402_50V7K_SE074331K80 change to unpop PR813_5.9K_0402_SD034590180 change to 1.91K_0402_SD000009080 PR807_95.3K_0402_1%_SD034953280 change to 113K_0402_SD034113380 (28W) PR807_95.3K_0402_1%_SD034953280 change to 121K_0402_1%_SD034121380 (15W) PR817_Unpop change to 4.99M_0402_SD00000VO00	12/13	EVT
12						
13						
14						
15						
16						
17						

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Item	Fixed Issue	Reason for change	PG#	Modify List	Date	Phase
1	Module Design	Module Design change 3/5V solution	3/5V	Un-pop PR1	11/13	DVT
2						
12						
13						
14						
15						
16						
17						

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Item	Fixed Issue	Reason for change	PG#	Modify List	Date	Phase
1		extra cap	24	unpop C165	1107	DVT
2	Desidn change	change EC board ID	27	AD_BID0 > change R506 to 12K POP R503	1107	DVT
3	Desidn change	change net "LINE1-L/LINE1-R" cap material	29	change C2135,C2136 to 4.7u 0402 to 0603	1107	DVT
4	Desidn change	modify ON/OFFBYN# circuit	27,28	DEL D24 , ON/OFF change to ON/OFFBTN#	1112	DVT
5	Desidn change	change CRT RGB bead material	21	change L2503,L2504,L2505 to 0402 bead(SM01000FH00)	1112	DVT
6	Desidn change	change +EC_VCCA ,EC_GND bead material	27	change L31 L32 to SM010009U00	1112	DVT
7	Desidn change	change USB port assign	18	Change USB port6 for CCD Change USB port5 for TS	1112	DVT
8	Desidn change	change USB port assign	26	Change USB port7 for CR(USB)_FP	1112	DVT
9	Desidn change	reserve RTCRST# to EC	27	reserve RTCRST# to EC pin 27 for clear CMOS	1115	DVT
10	Desidn change	reserve RTCRST# to EC	28	add Q52 R490 reserve to EC RTCRST#	1115	DVT
11	Desidn change	share ROM function	7	POP R498,R500,R502,R505 for share ROM	1115	DVT
12	Desidn change	option LVDS EDID/EDP touch	18	change R438,R439,R415,R433 for option LVDS EDID/EDP touch	1115	DVT
13	Desidn change	EC_SMB_DA2	17	change to EC_I2C_TPDAT	1118	DVT
15	Desidn change	EC_SMB_CK2	17	change to EC_I2C_TPCLK	1118	DVT
16	Desidn change	RTD2132 EP_MODE	27	Add R491 reserve for RTD2132 EP_MODE	1118	DVT
17	Desidn change	change TP POWER	28	Change TP power to +3VALW	1118	DVT
18	CRT leakage	CRT_DATA/CRT_CLK add level shift	20	add R2502,R2503,Q2501 for level shift	1126	DVT
19	CRT leakage	change CRT POWER from 5VS to 3VS	20	add R2549	1126	DVT
20	CRT leakage	change CRT POWER from 5VS to 3VS	20	change pin PCSDA,PCSCL to +3VS_6513	1126	DVT
21	CRT leakage	change CRT POWER from 5VS to 3VS	20	change pin MCUVDDH to +3VS_6513	1126	DVT
22	Desidn change	change T/P int net connection support S3 wake	28	Change Q51 to D22 ,TP_INT# ,POP R633,del R452	1126	DVT
23	Desidn change	change EC_PME# pull up	22	add R2550 pull up to +3VLAN	1128	DVT
24	Desidn change	change EC_PME# pull up	27	unpop R484	1128	DVT
25	Desidn change	solve ESD	19	add C413 to +3VS	1204	DVT
26	Desidn change	solve ESD	29	add C2140,C2142,R2149,R2150	1205	DVT
27	Desidn change	solve ESD	29	change D2008 package	1205	DVT
28	Desidn change	ME drawing change	30	Del H9	1205	DVT
29	Desidn change	solve EMI	26	add R459,R460,R462,R463,L7,L8 for EMI request	1206	DVT
30	Desidn change	Change part number	18	change U22 PN	1209	DVT
31	Desidn change	Change part number	11	change C18 to SF000006S00	1209	DVT
32	Desidn change	Change part number	12	change C408 to SF000006R00	1209	DVT
33	Desidn change	Change part number	15	change C118 to SF000006S00	1209	DVT
34	Desidn change	Change part number	26	change C486 to SF000006R00	1209	DVT
35	Desidn change	Change part number	6	change C153 to 15pF to SE071150J80	1210	DVT
36	Desidn change	Change part number	7	change C2,C3 to 15pF to SE071150J80	1210	DVT
37	Desidn change	Change part number	22	change C2558,C2559 to 10pF to SE071100J80	1210	DVT
38	Desidn change	Change part number	29	change R2135,R2138 to 59 Ohm 0603	1210	DVT
39	Desidn change	solve EMI	29	change R2149,R2150 to SM01000NA00	1210	DVT
40	Desidn change	solve ESD	29	change C2142 , C2143 to 680pF	1210	DVT
41	Desidn change	Change part number	28	change SW to SN100000K00	1210	DVT
42	Desidn change	TP leakage from change TP VCC	28	add R452,R459,R460	1211	DVT
43	Desidn change	Change part number	23	change D1 to SCA00002M00	1216	DVT