

Compal Confidential

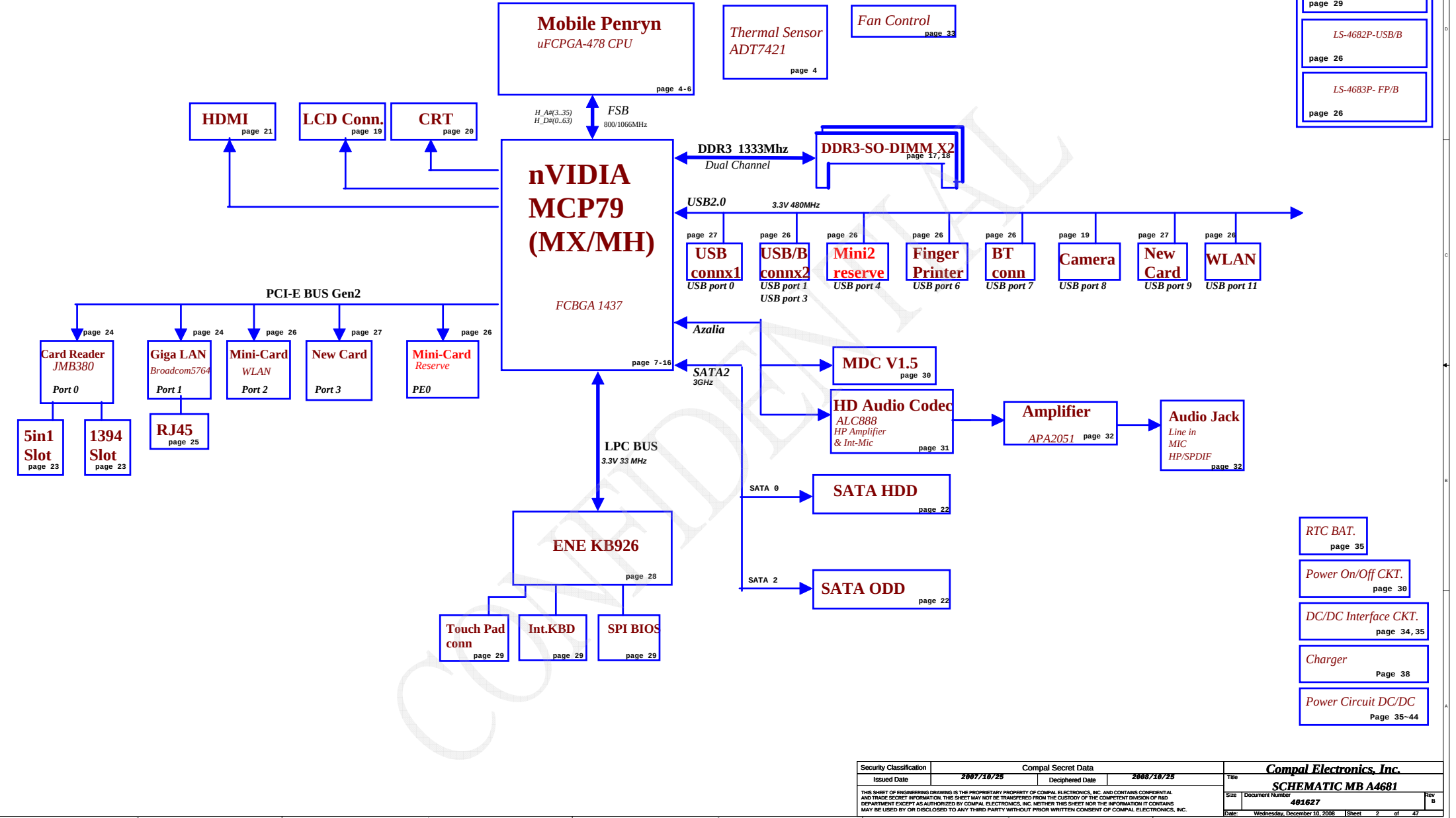
KALA0 Schematics Document

Intel Processor with MCP79

2008-11-25

REV: 0.4

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Issued Date	2007/09/14	Deciphered Date	2008/04/04	Title	SCHEMATIC MB A4681
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Voltage Rails

Power Plane	Description	S0	S3	S5
VIN	Adapter power supply (19V)	N/A	N/A	N/A
B+	AC or battery power rail for power circuit.	N/A	N/A	N/A
+CPU_CORE	Core voltage for CPU	ON	OFF	OFF
+MCP_CORE	Core voltage for MCP79	ON	OFF	OFF
+1.05VS	1.05V switched power rail	ON	OFF	OFF
+1.1Valways	1.1Valways switched power rail	ON	ON	ON
+1.1VS	1.1Valways switched power rail	ON	OFF	OFF
+1.5V	1.5V switched power rail	ON	ON	OFF
+1.5VS	1.5V power rail for DDR3	ON	OFF	OFF
+0.75VS	0.75VS switched power rail	ON	OFF	OFF
+1.8VS	1.8VS switched power rail	ON	OFF	OFF
+3VALW	3.3V always on power rail	ON	ON	ON*
+3V	3.3V power rail for SB	ON	ON	X
+3V_LAN	3.3V power rail for LAN	ON	ON	X
+3VS	3.3V switched power rail	ON	OFF	OFF
+5VALW	5V always on power rail	ON	ON	ON*
+5VS	5V switched power rail	ON	OFF	OFF
+VSB	VSB always on power rail	ON	ON	ON*
+RTCVCC	RTC power	ON	ON	ON

Note : ON* means that this power plane is ON only with AC power available, otherwise it is OFF.

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

Board ID / SKU ID Table for AD channel

Vcc	3.3V +/- 5%			
Ra	100K +/- 5%			
Board ID	Rb	VAD_BID min	VAD_BID typ	VAD_BID max
0	0	0 V	0 V	0 V
1	8.2K +/- 5%	0.216 V	0.250 V	0.289 V
2	18K +/- 5%	0.436 V	0.503 V	0.538 V
3	33K +/- 5%	0.712 V	0.819 V	0.875 V
4	56K +/- 5%	1.036 V	1.185 V	1.264 V
5	100K +/- 5%	1.453 V	1.650 V	1.759 V
6	200K +/- 5%	1.935 V	2.200 V	2.341 V
7	NC	2.500 V	3.300 V	3.300 V

BOARD ID Table

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

BTO Option Table

Default Item	BOM Structure
	A01@
	mini12@
	385@
v	1394@
	Amic@
v	Dmic@

EC SM Bus1 address

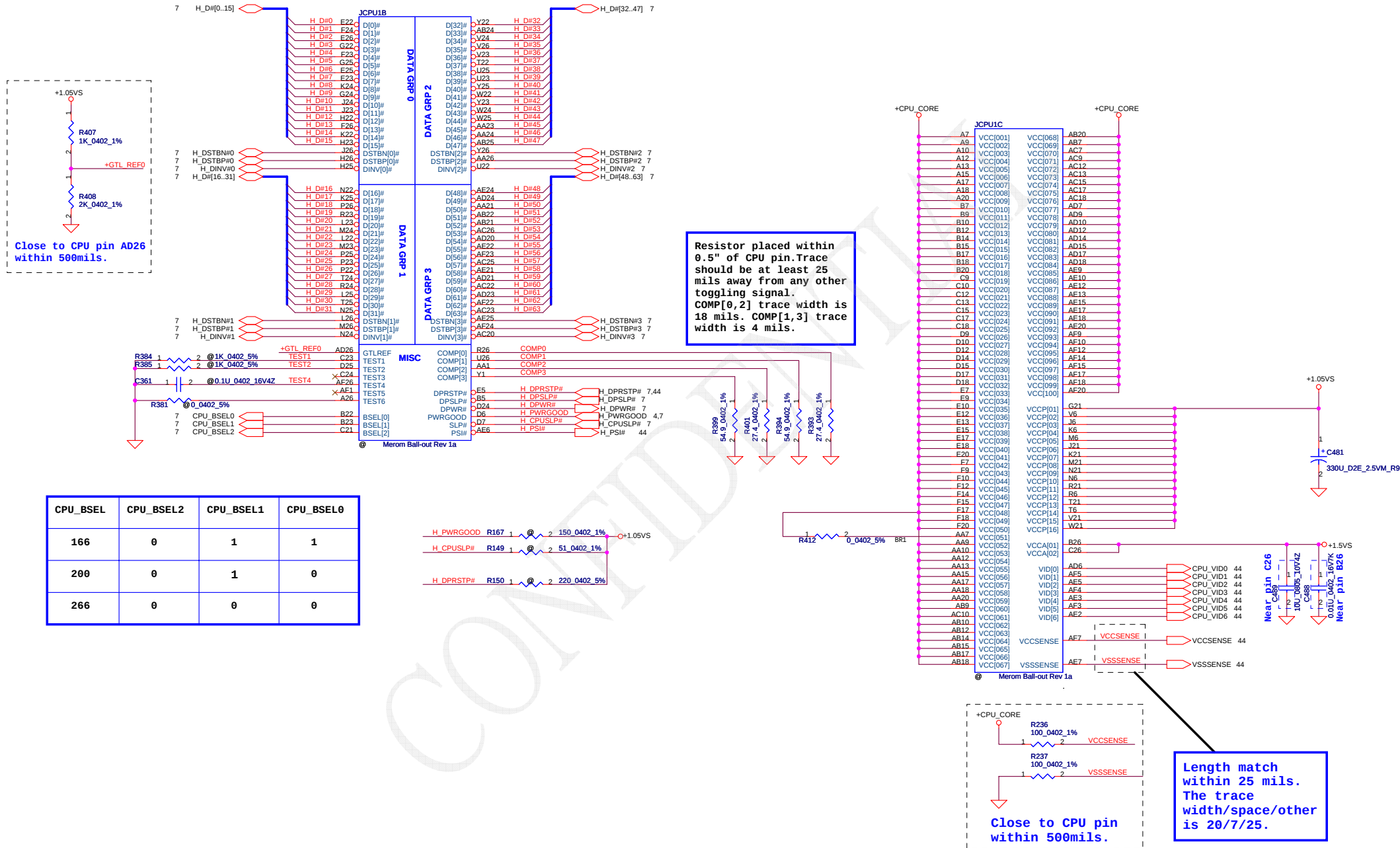
Device	Address	Device	Address
Smart Battery	0001 011X b	BMC1402	1001 100X b

EC SM Bus2 address

MCP79
SM Bus 0 address

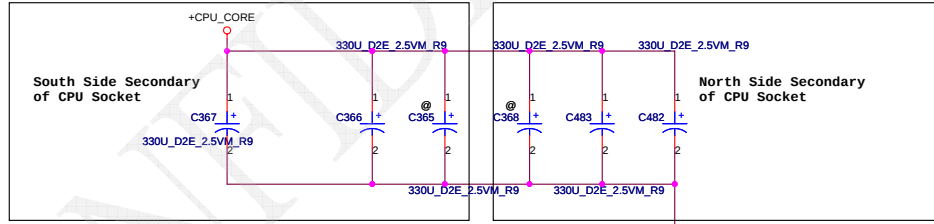
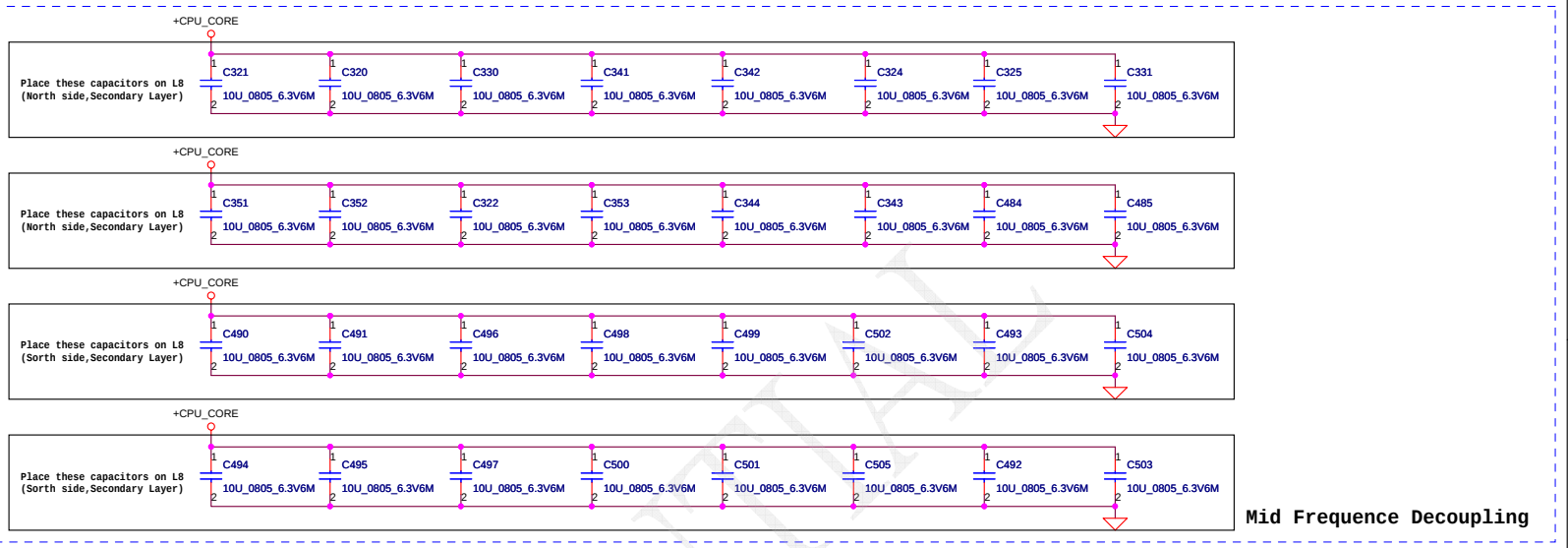
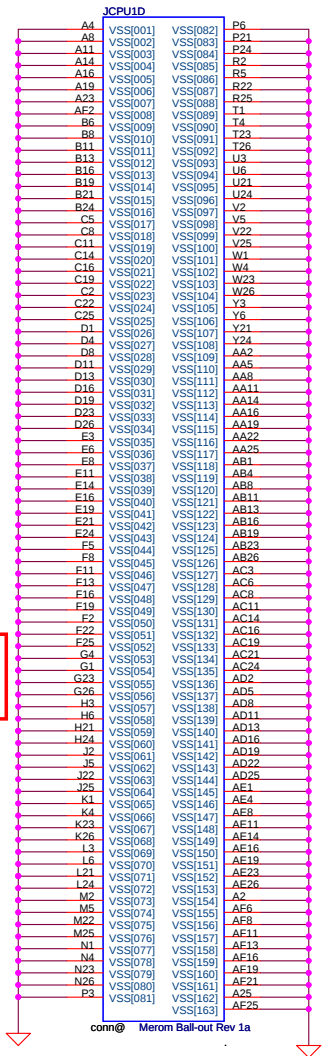
Device	Address	Device	Address
New card		DDR DIMM0	1010 0000
Lan		DDR DIMM1	1010 0010
Minicard			
Minicard			

MCP79
SM Bus 1 address



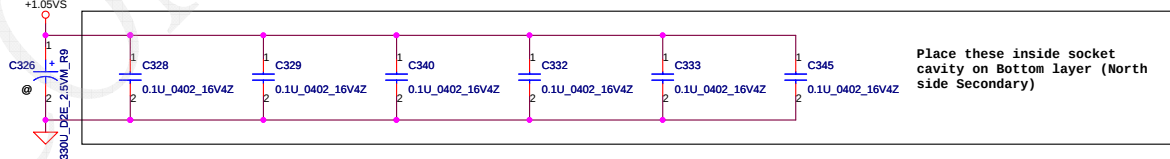
Pin F8
Dual Core: GND (internal)
Quad Core: Floating (internal)

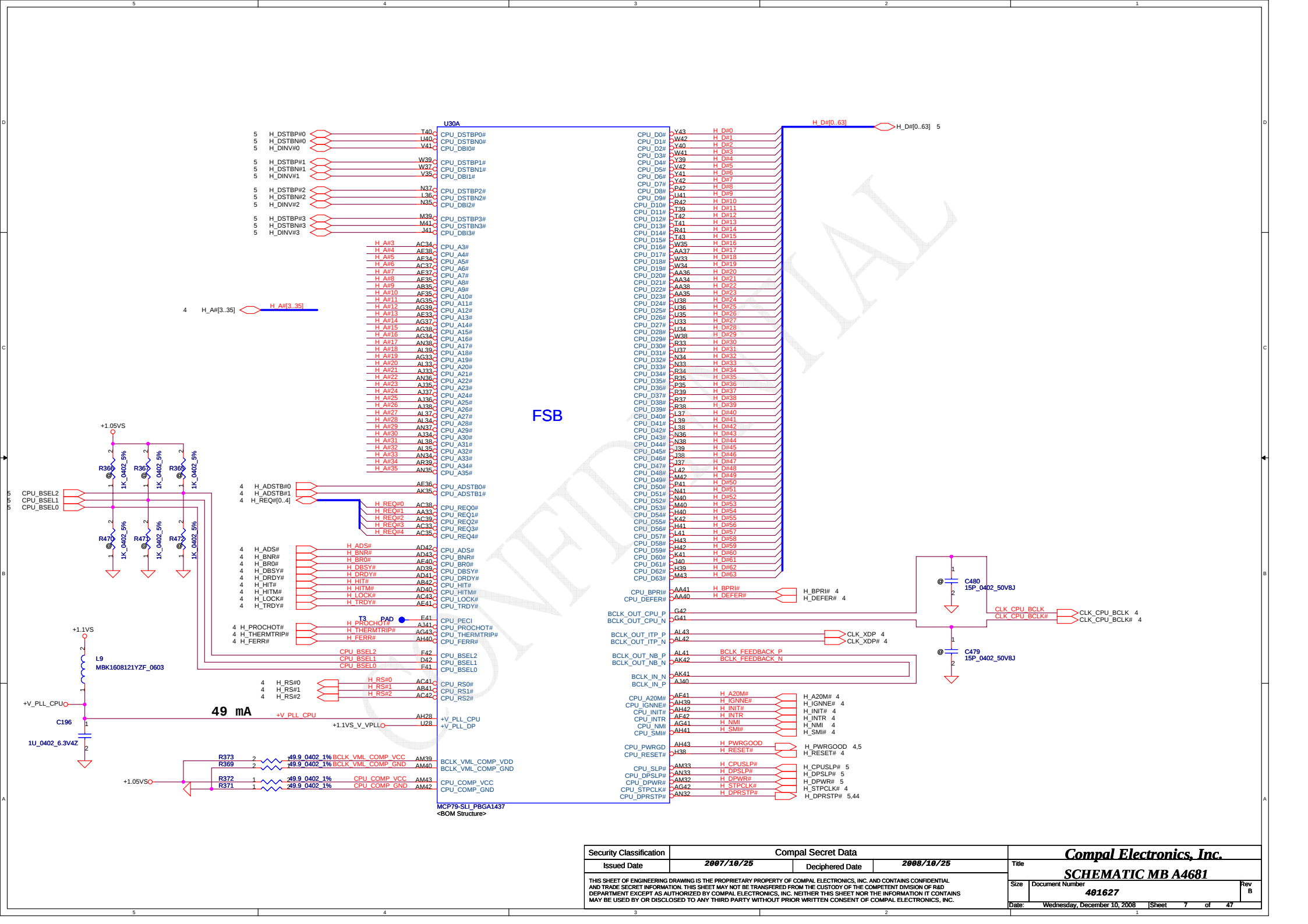
Pin D8,AA8,AC8 and AE8
Reserved for QC

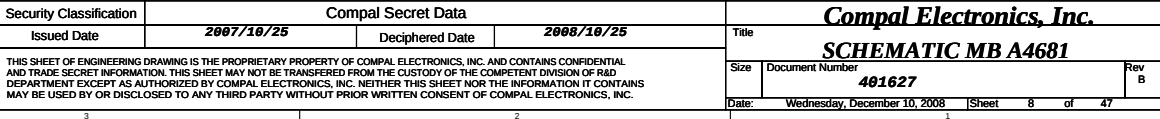


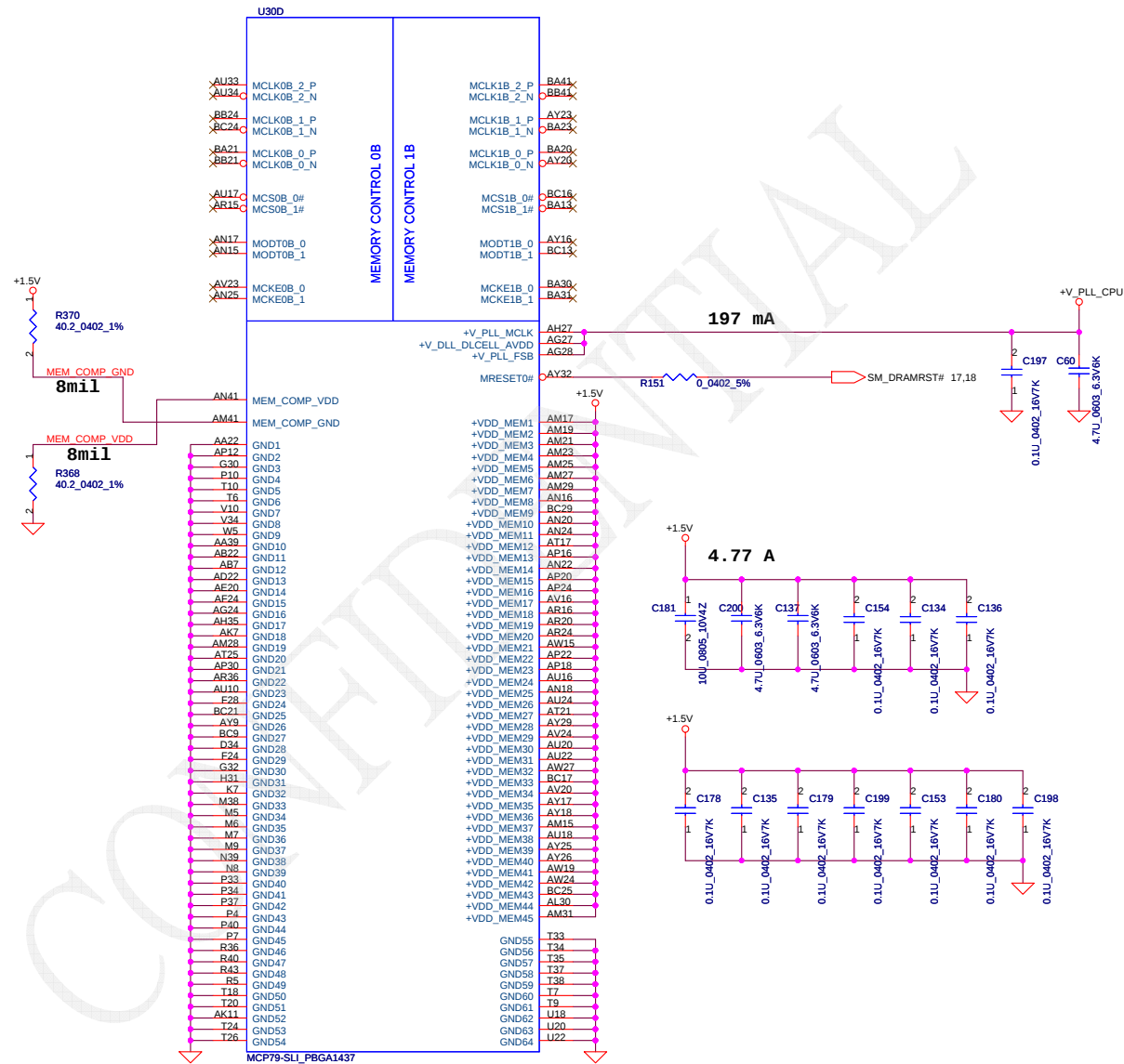
ESR <= 1.5m ohm
Capacitor > 1980uF

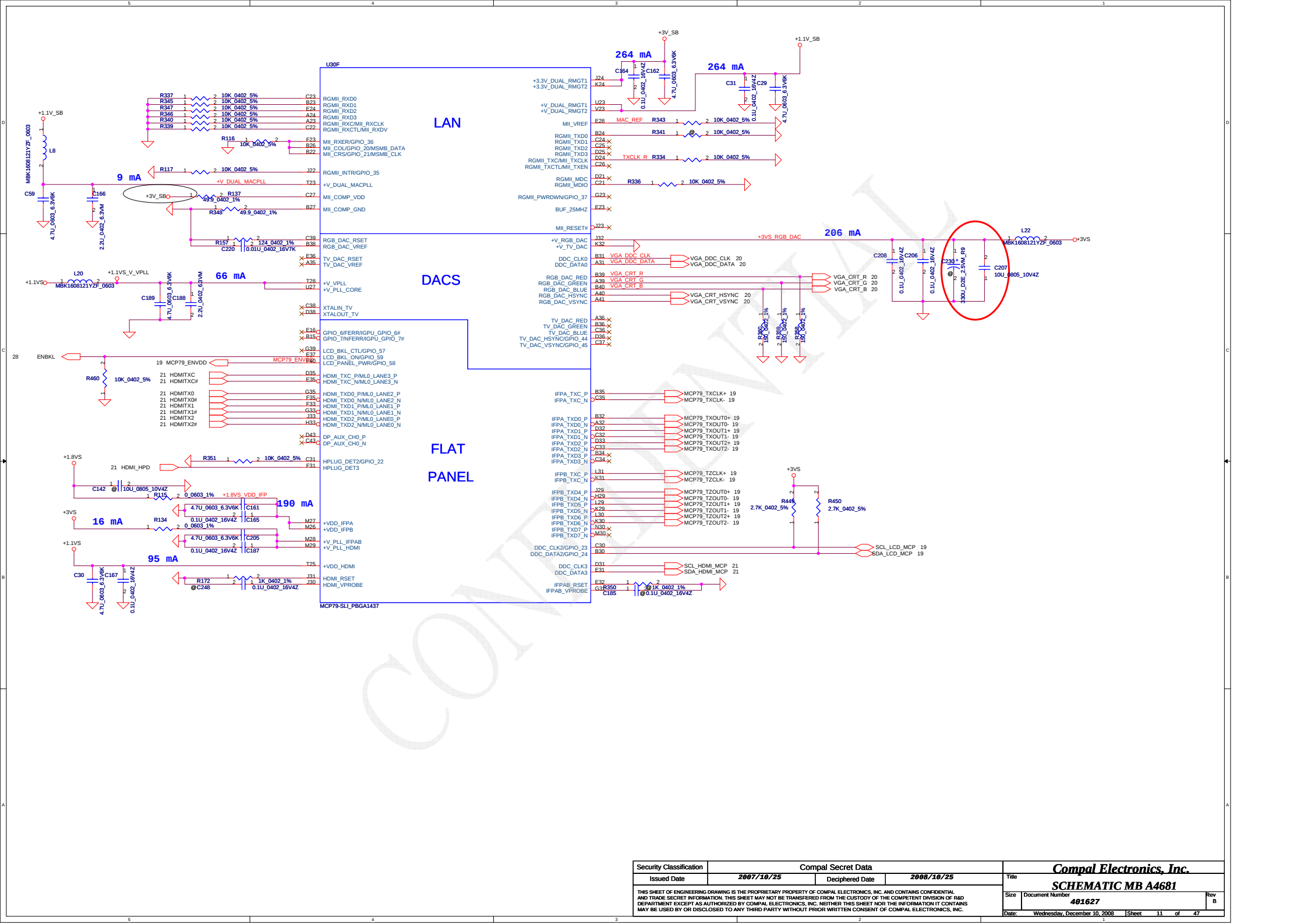
330uF ESR 7m ohm X 6 PCS

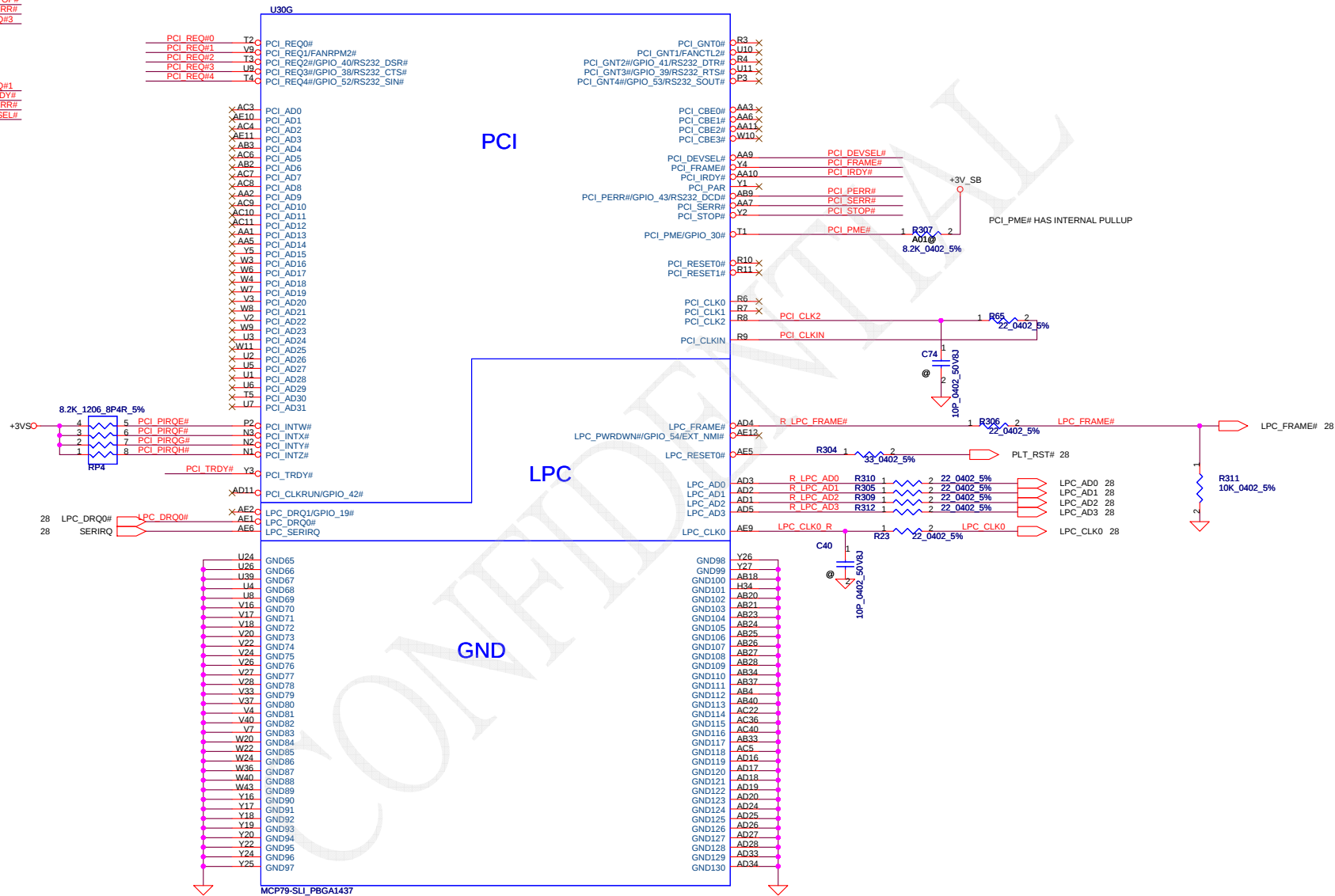
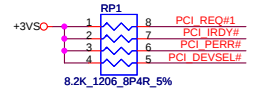
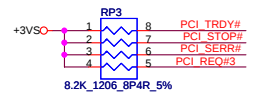
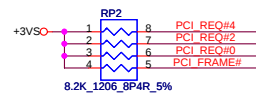




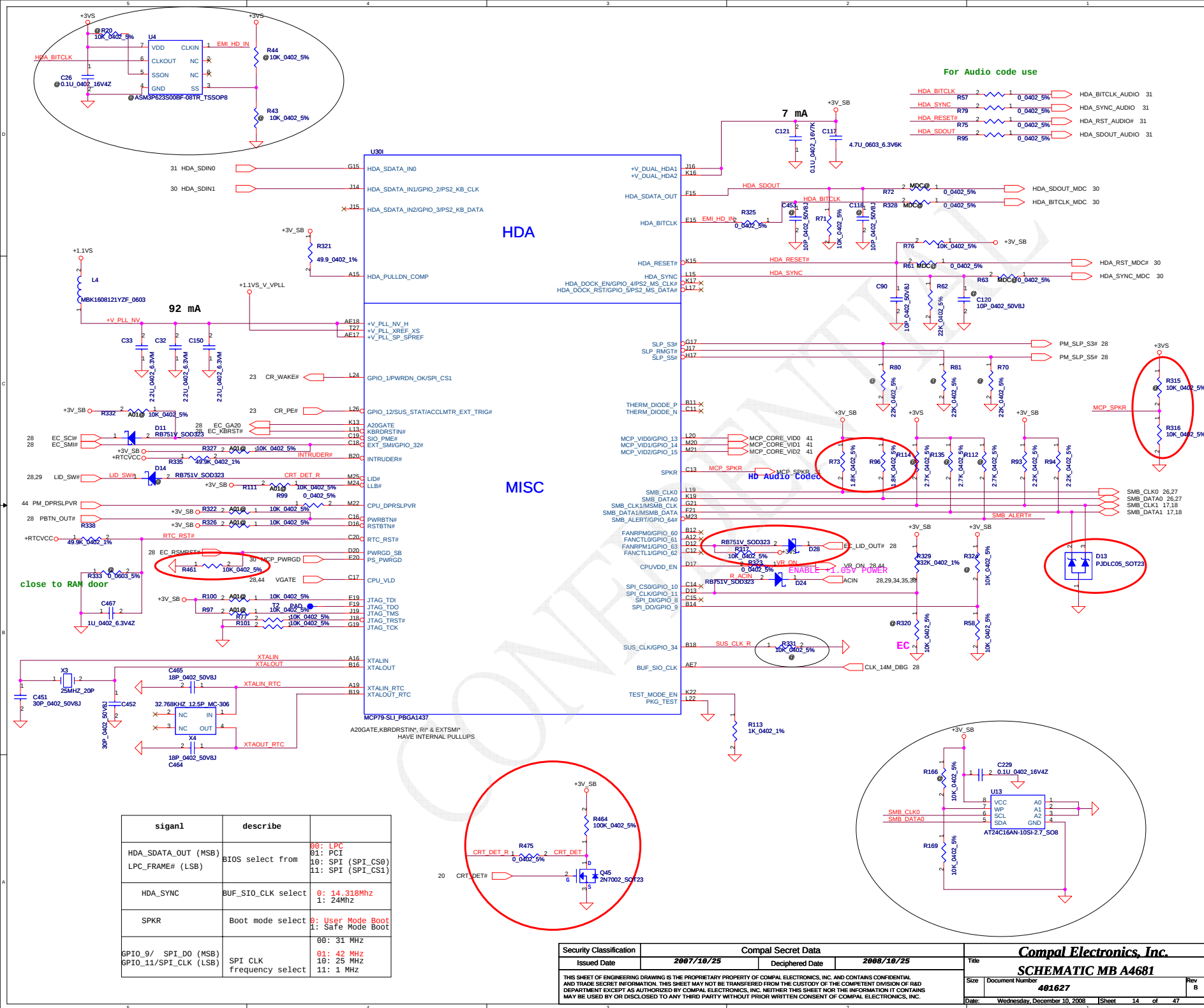




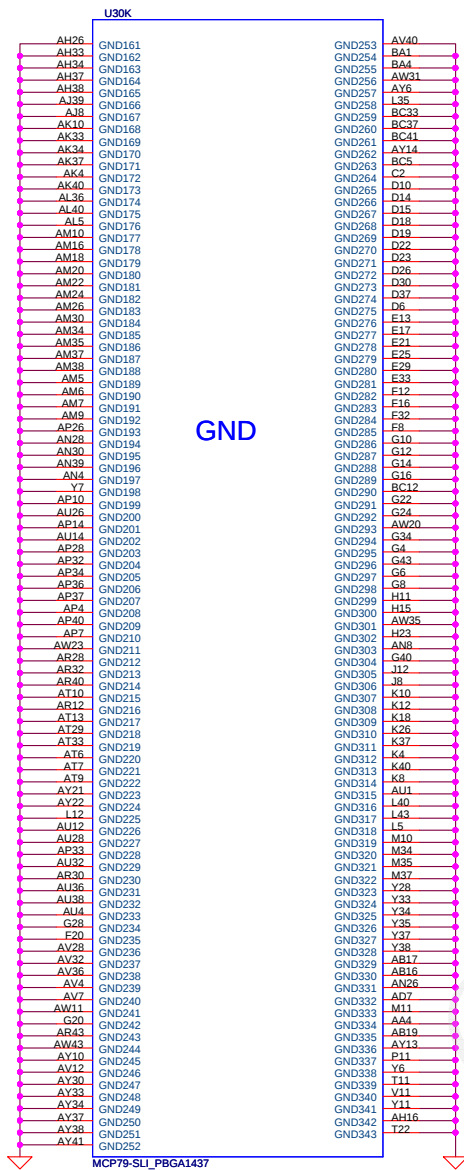




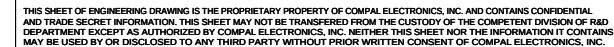
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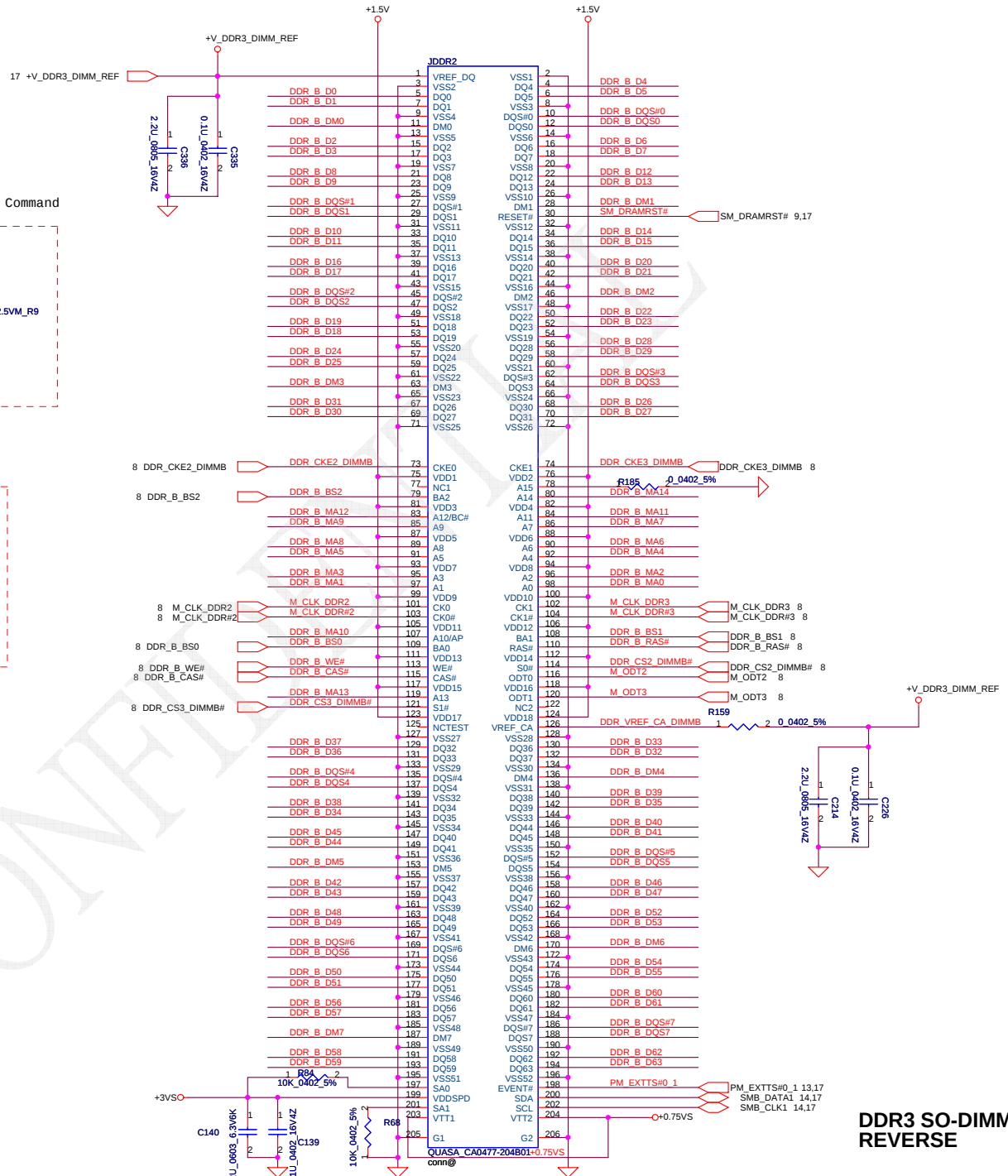
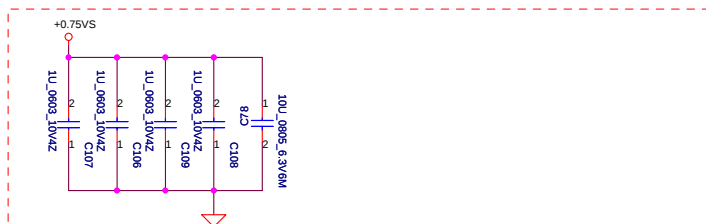
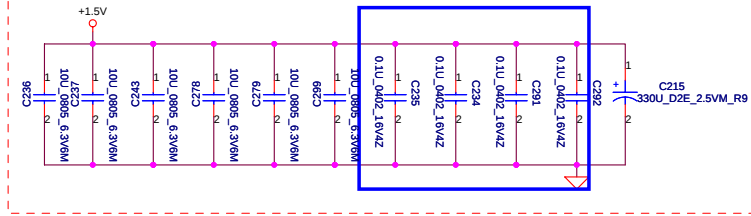
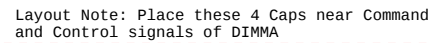
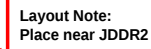


signal	describe	
HDA_SDATA_OUT (MSB)	BIOS select from	00: LPC 01: PCI 10: SPI (SPI_CS0) 11: SPI (SPI_CS1)
HDA_SYNC	BUF_SIO_CLK select	0: 14.318Mhz 1: 24Mhz
SPKR	Boot mode select	0: User Mode Boot 1: Safe Mode Boot
GPIO_9/ SPI_D0 (MSB)		00: 31 Mhz
GPIO_11/SPI_CLK (LSB)	SPI CLK frequency select	01: 42 Mhz 10: 25 Mhz 11: 1 Mhz



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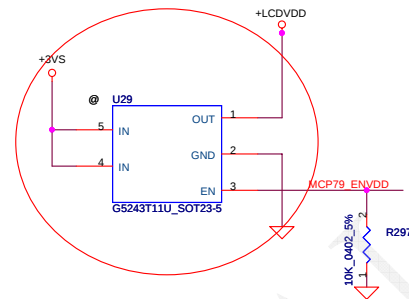
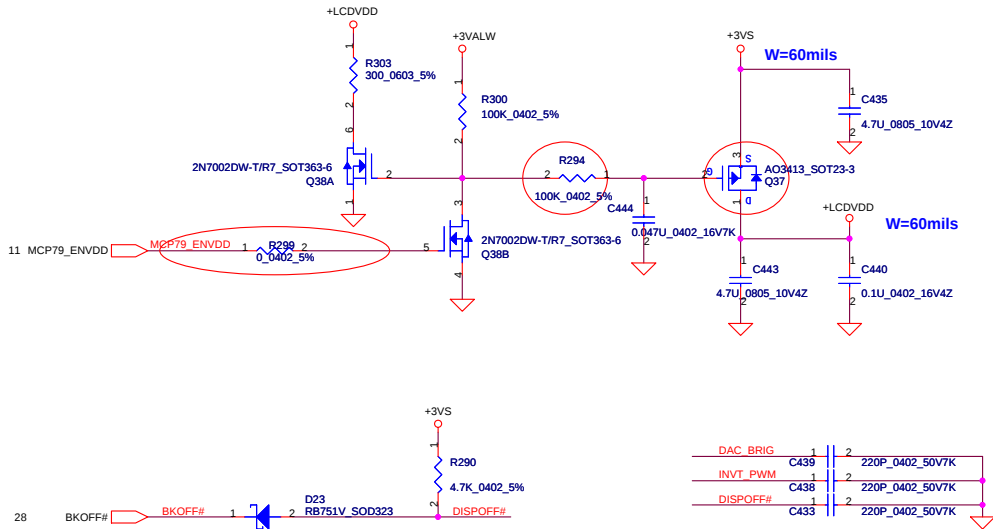




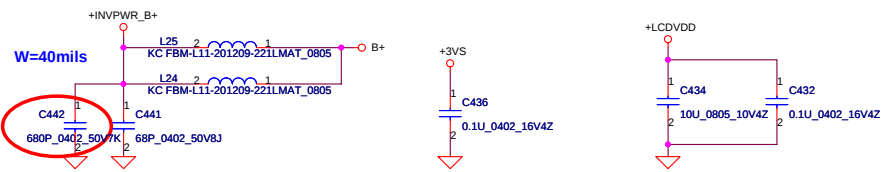
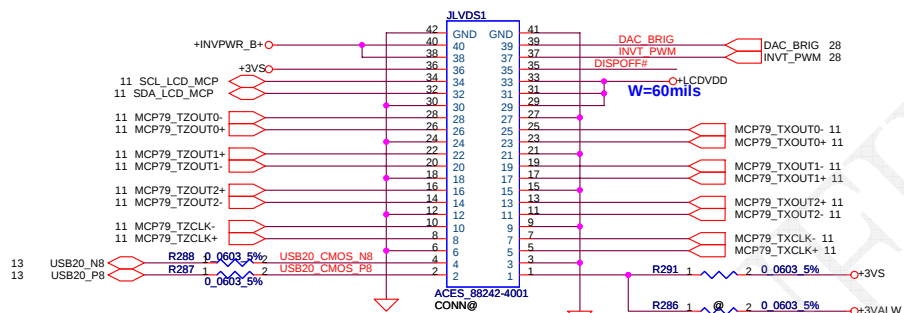
DDR3 SO-DIMM B REVERSE

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LCD POWER CIRCUIT



LCD/PANEL BD. Conn.

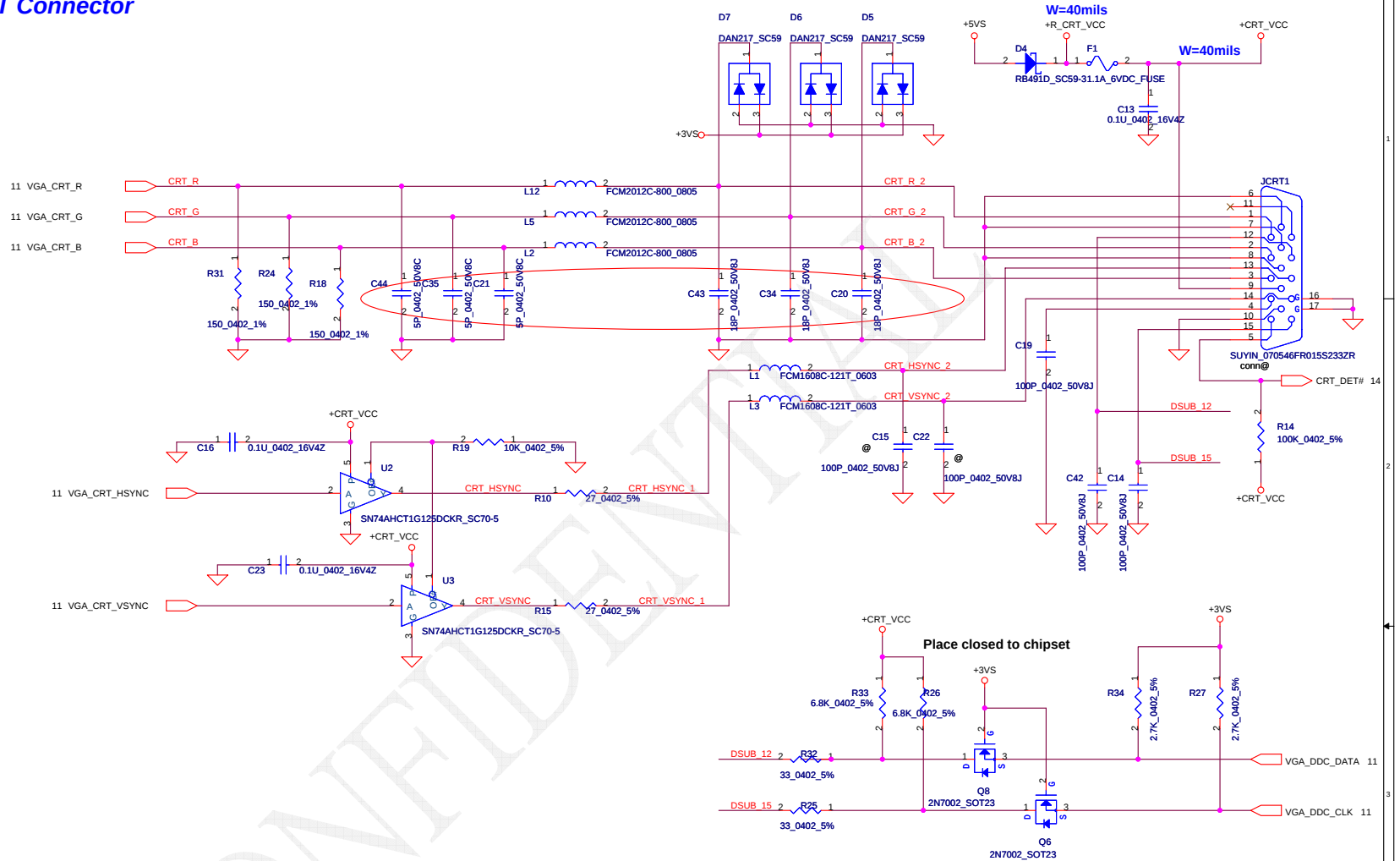


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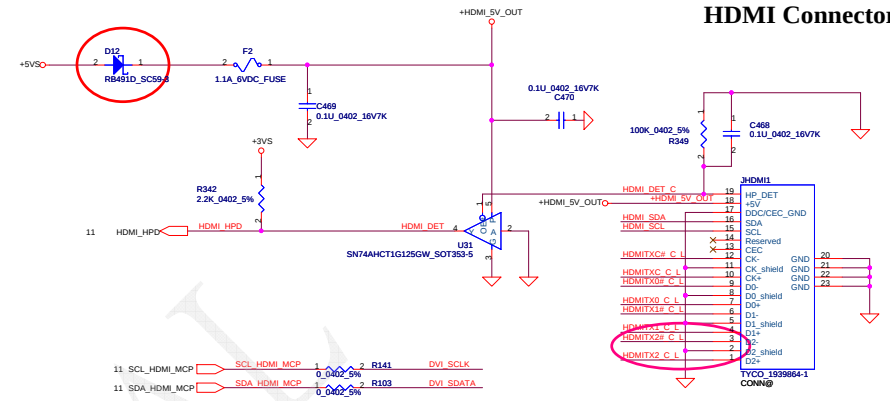
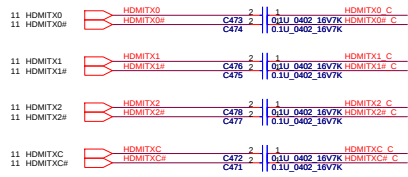
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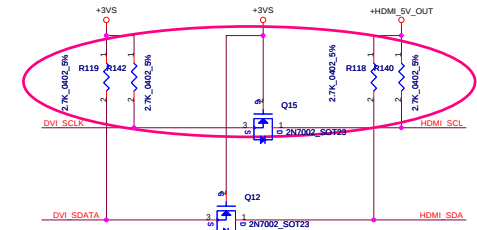
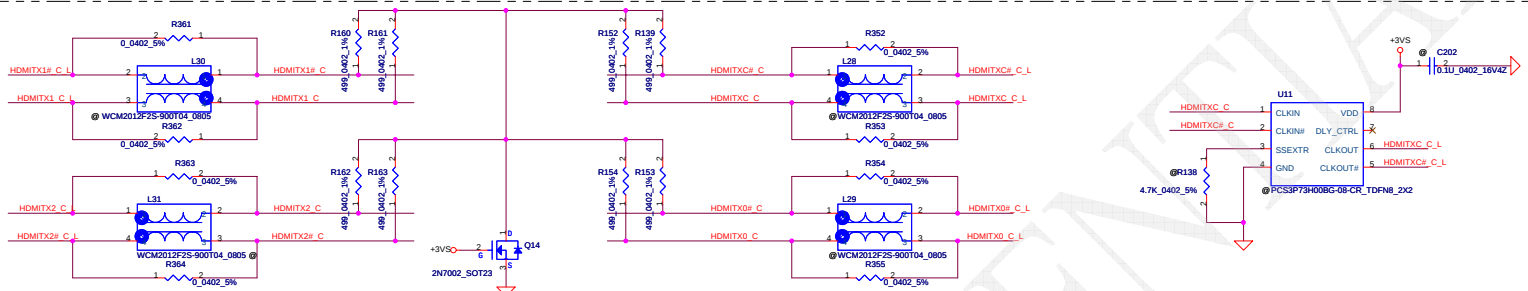
CRT Connector



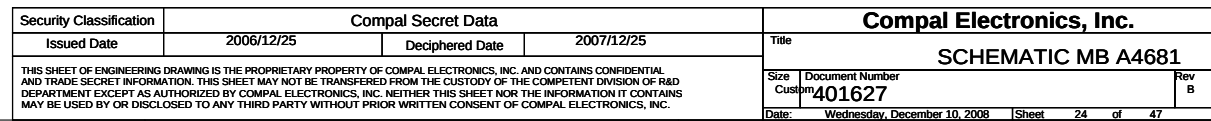
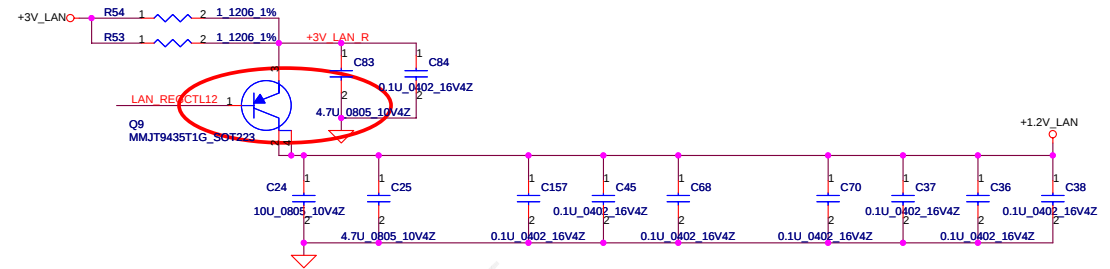
HDMI Connector

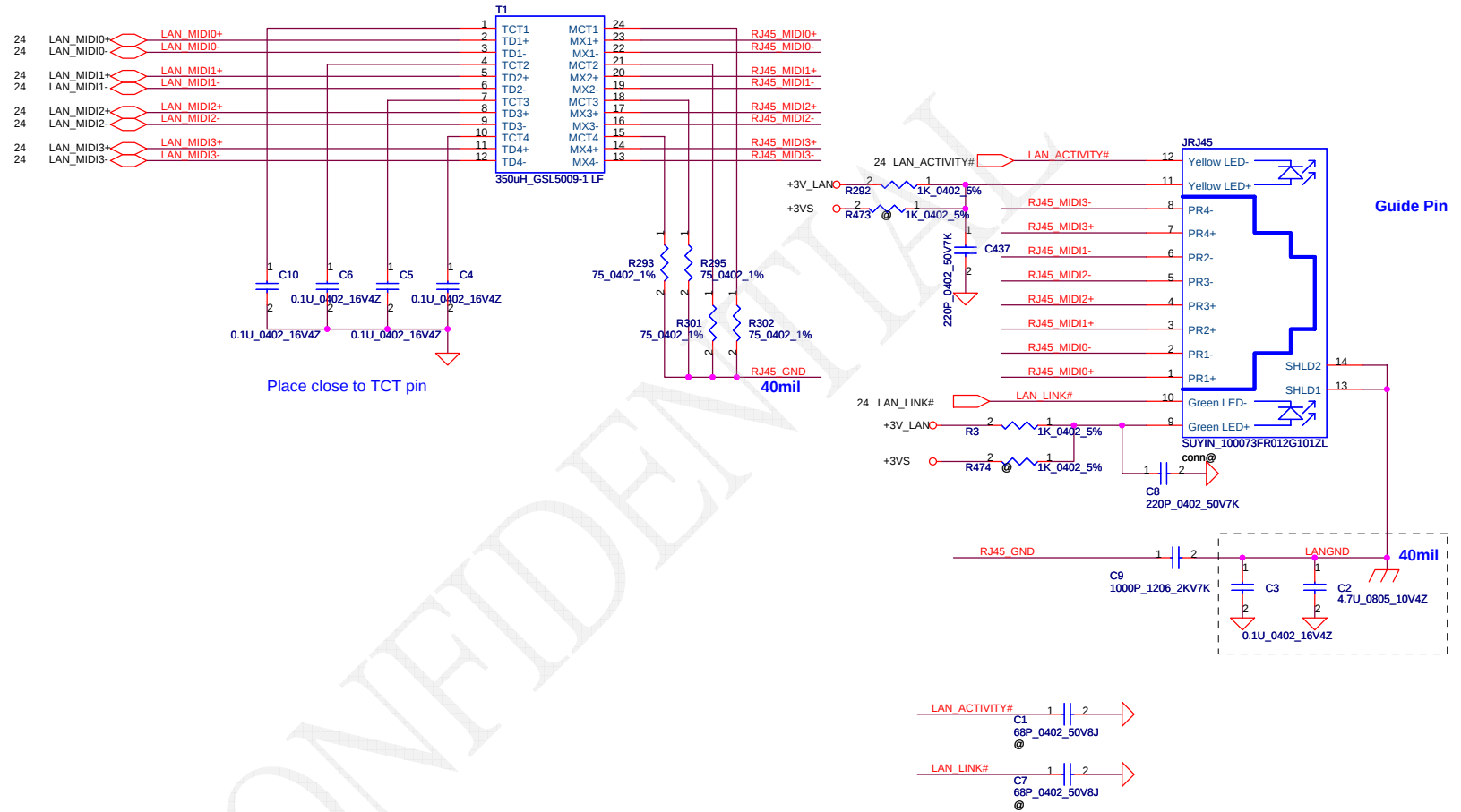


Close to JHDMI connector



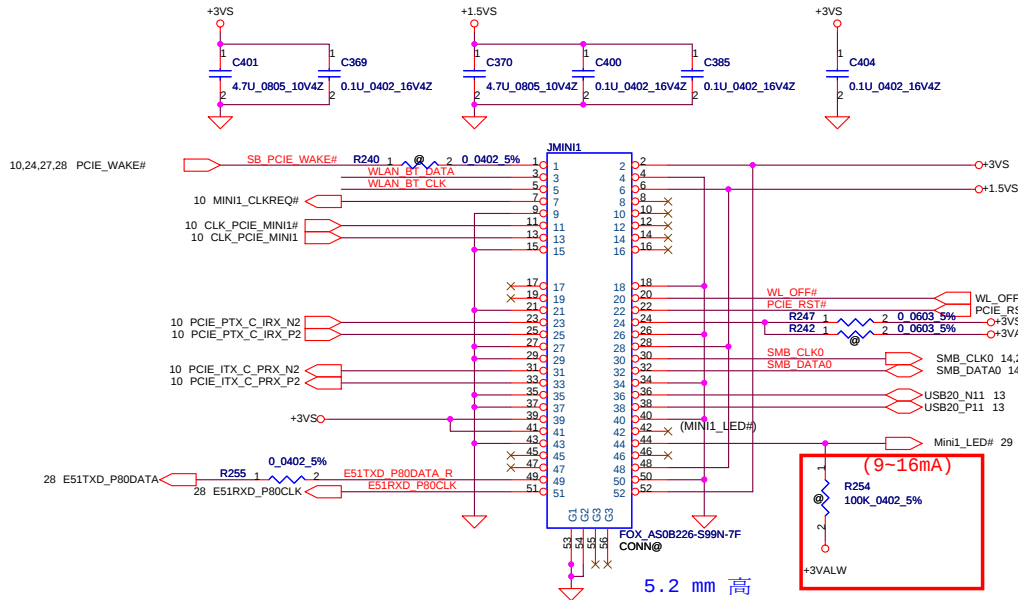
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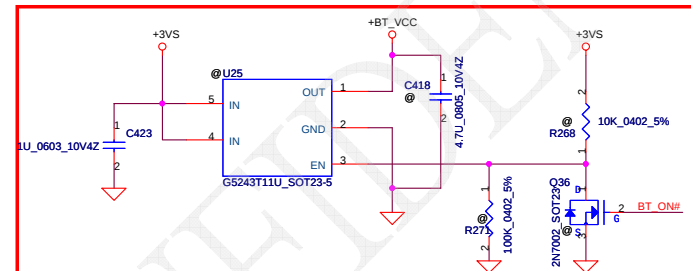


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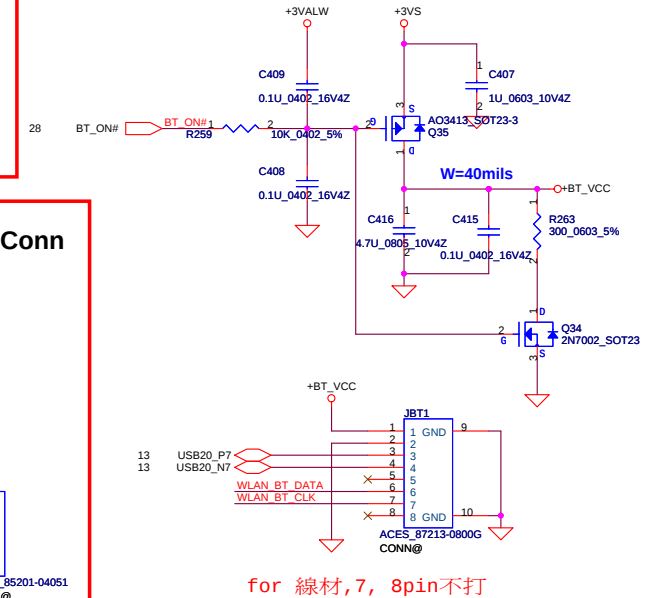
For Wireless LAN



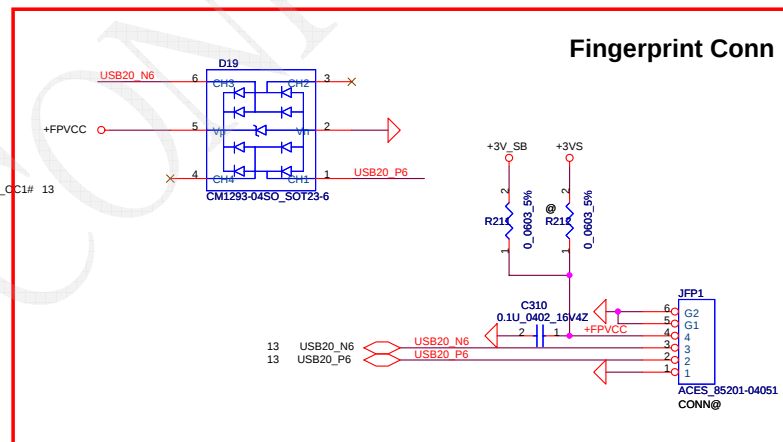
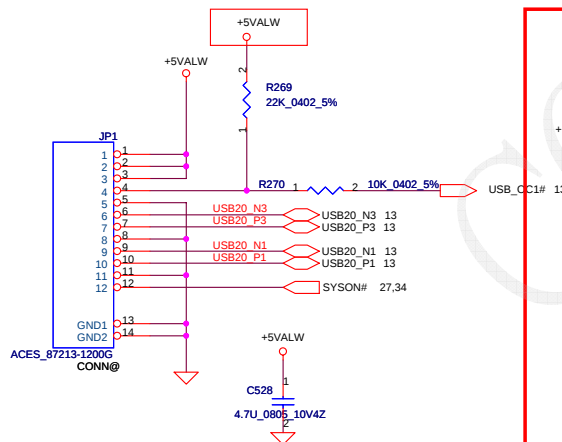
Mini Card Power Rating			
Power	Primary Power (mA)	Auxiliary Power (mA)	
	Peak	Normal	Normal
+3VS	1000	750	
+3V	330	250	250 (wake enable)
+1.5VS	500	375	5 (Not wake enable)



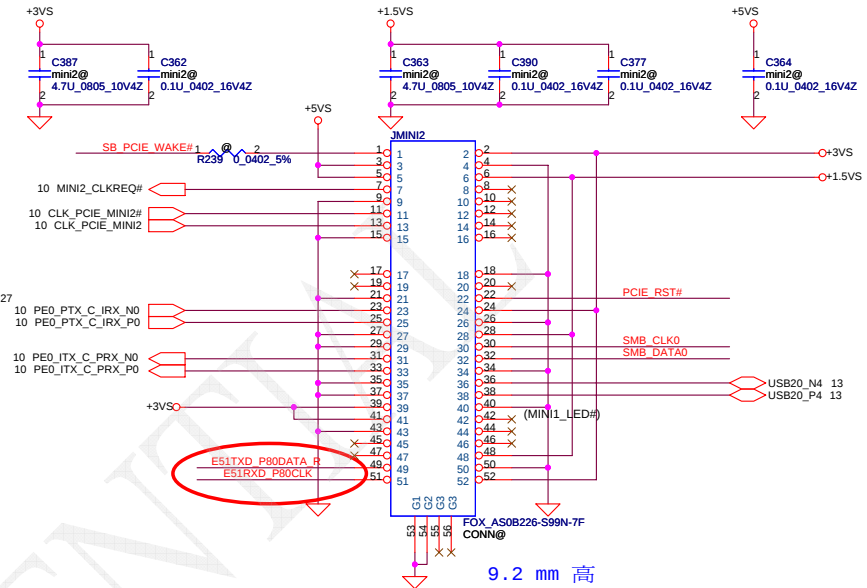
Bluetooth Conn.



To USB/B Connector



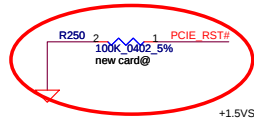
For TV-Tuner/HW MPEG



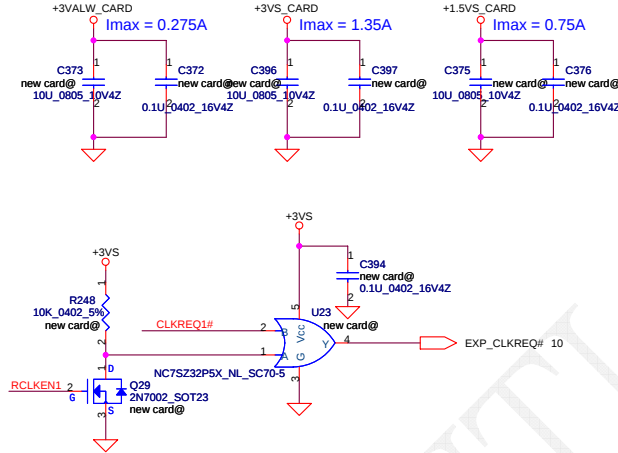
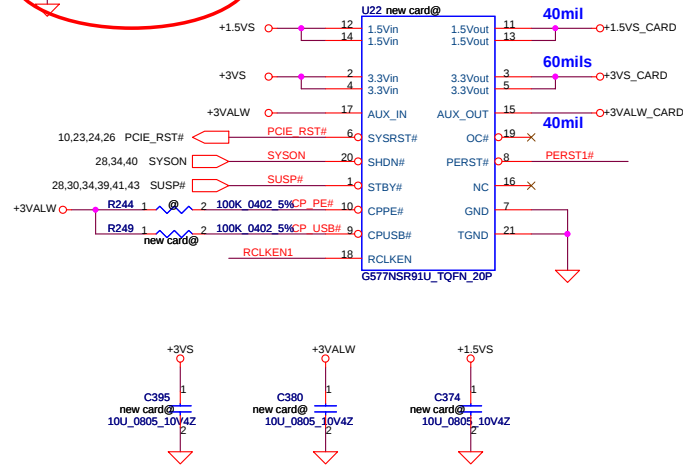
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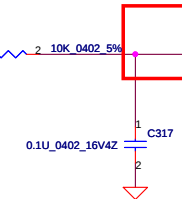
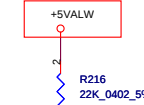
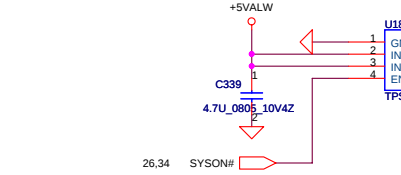
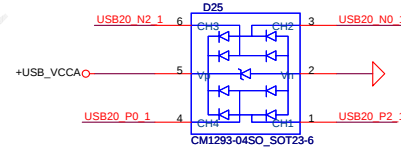
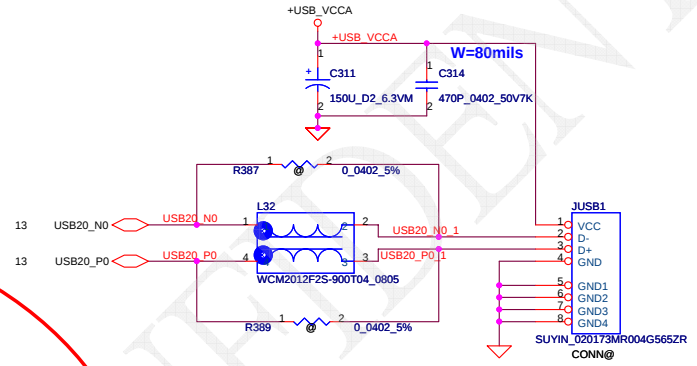
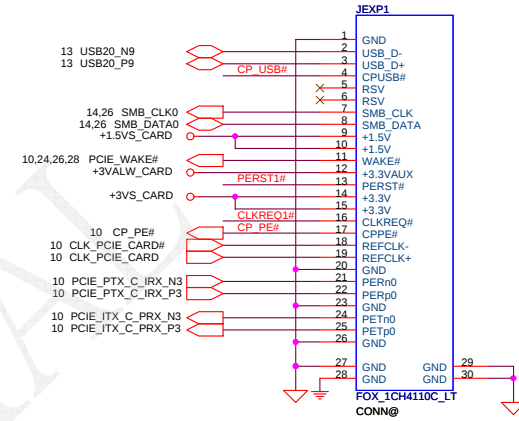
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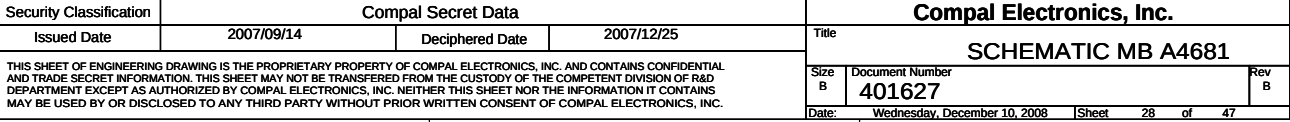
New Card Power Switch



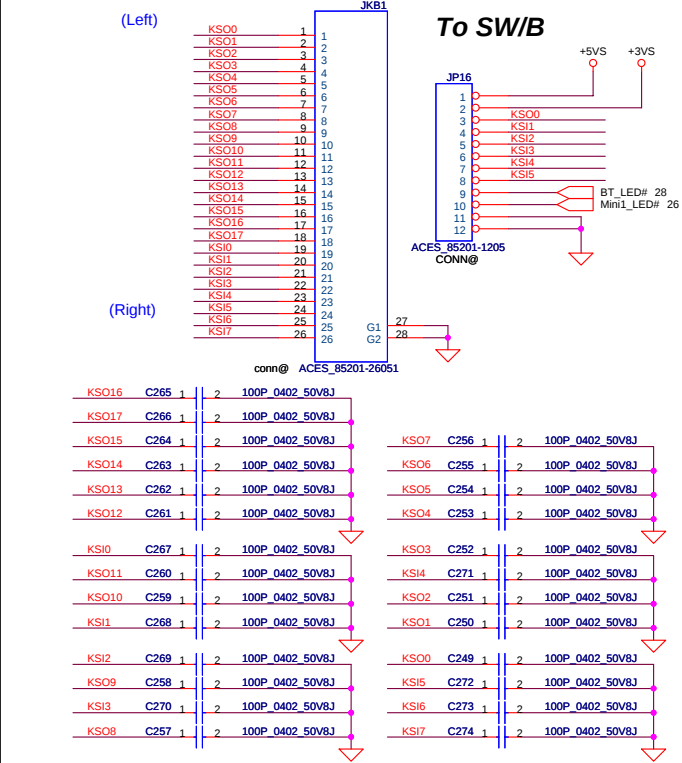
New Card Socket (Left/TOP)



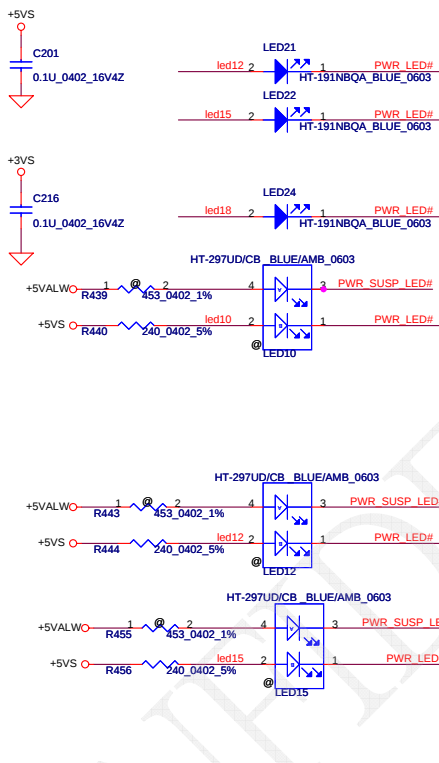
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								Size B	Document Number			Rev B
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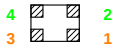
INT_KBD Conn.



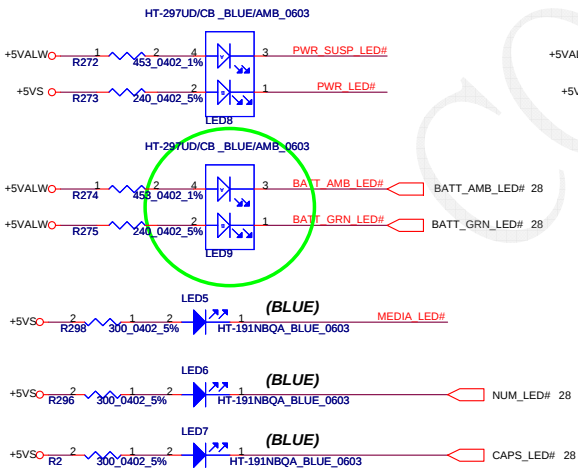
To SW/B



Compal Footprint

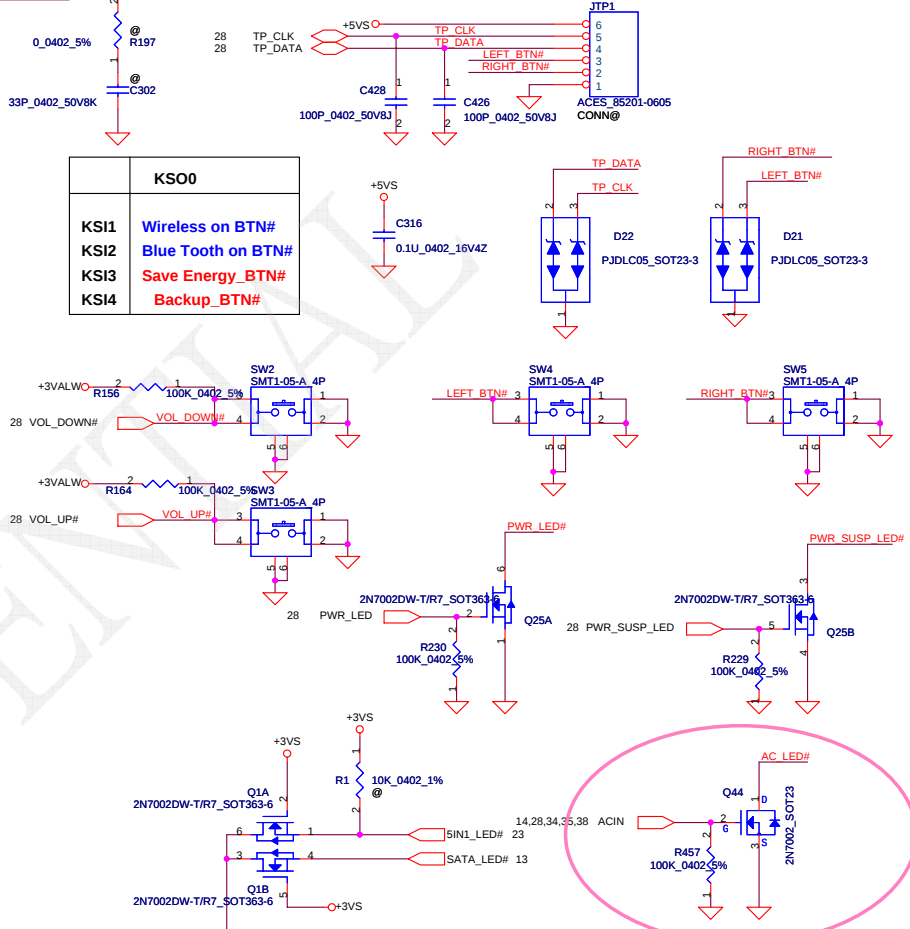


15" ONLY

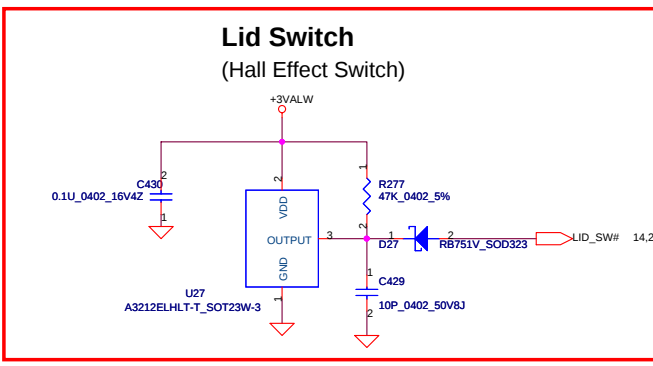


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To TP/B Conn.

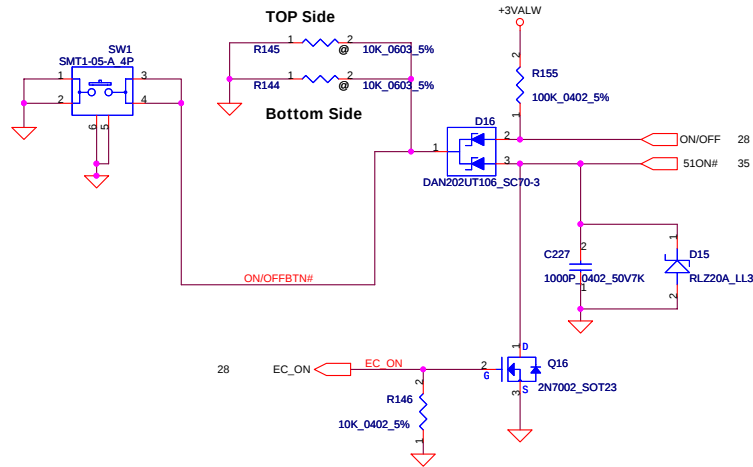


Lid Switch (Hall Effect Switch)

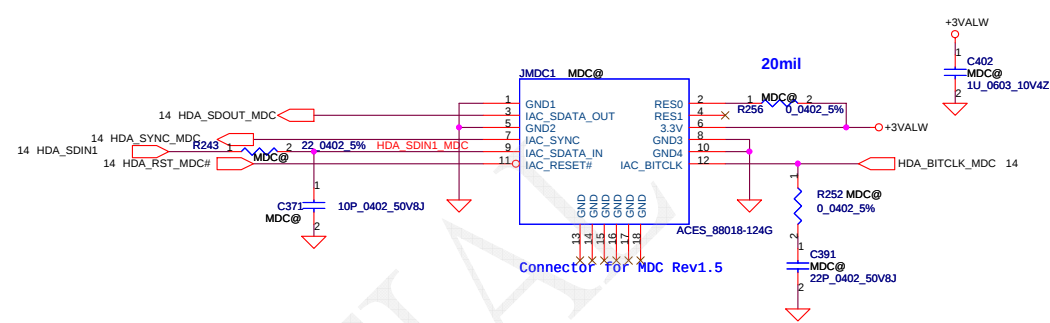


Power Button

ON/OFF switch

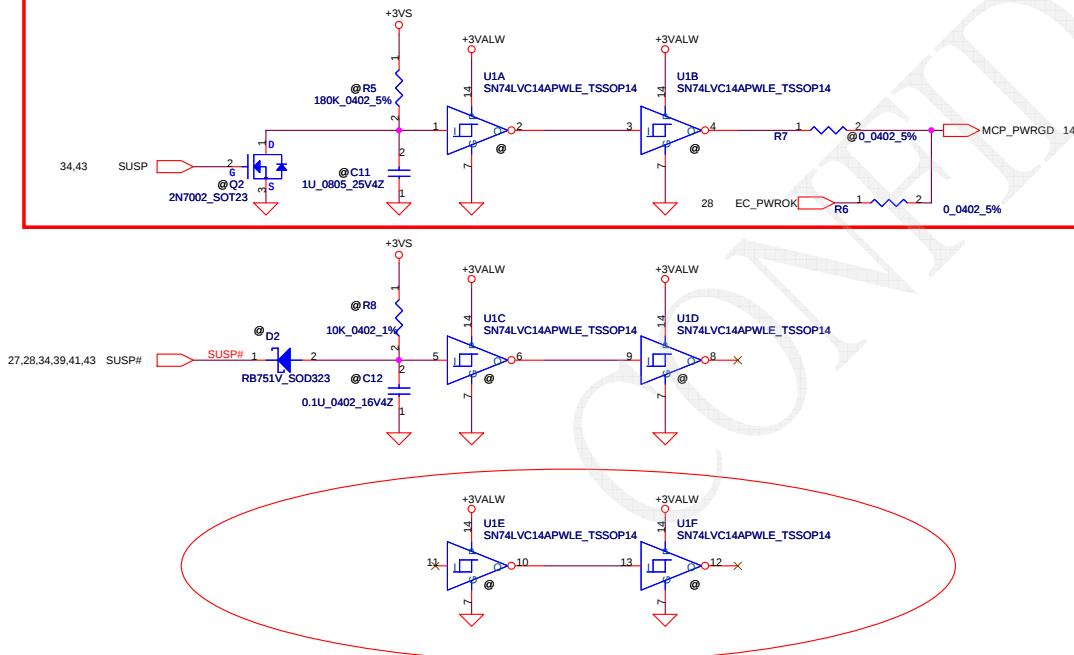


HDA MDC Conn.



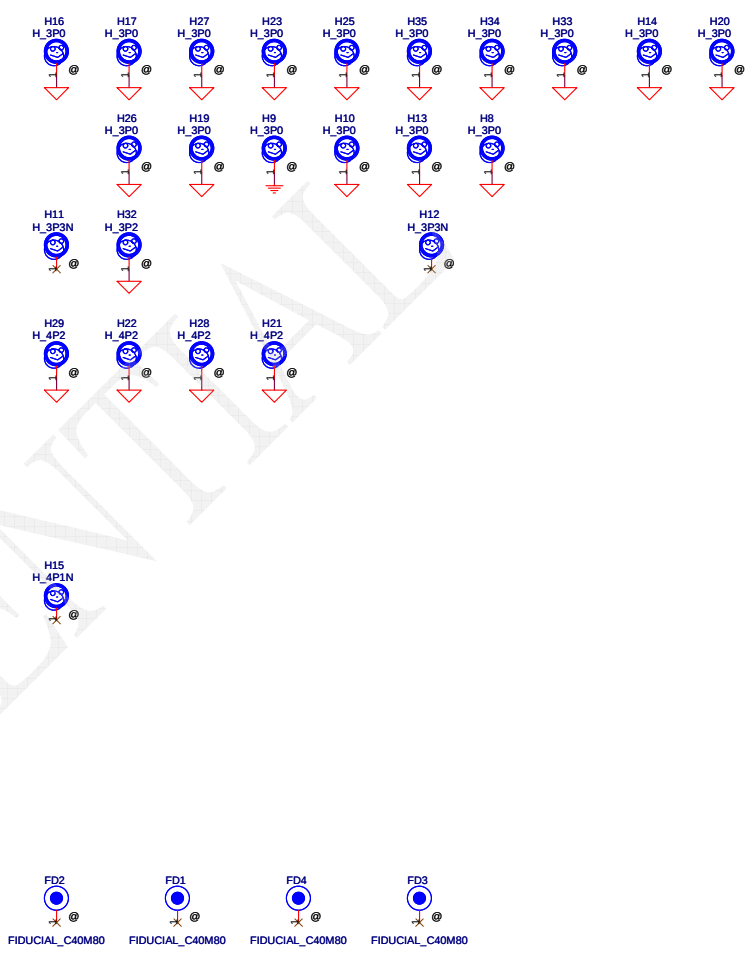
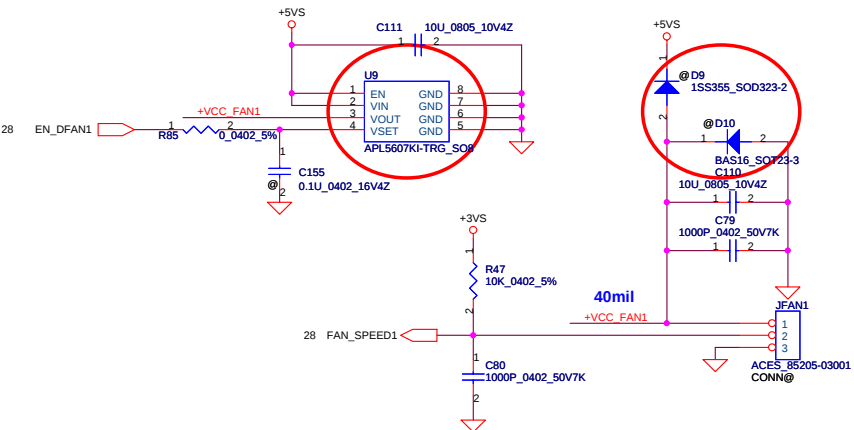
Power ON Circuit

For South Bridge



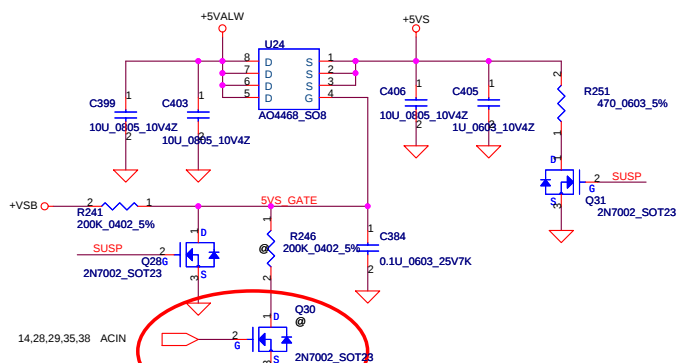
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FAN1 Conn

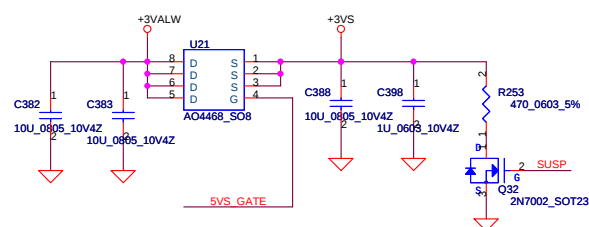


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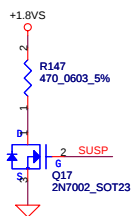
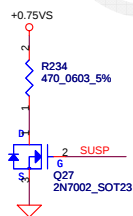
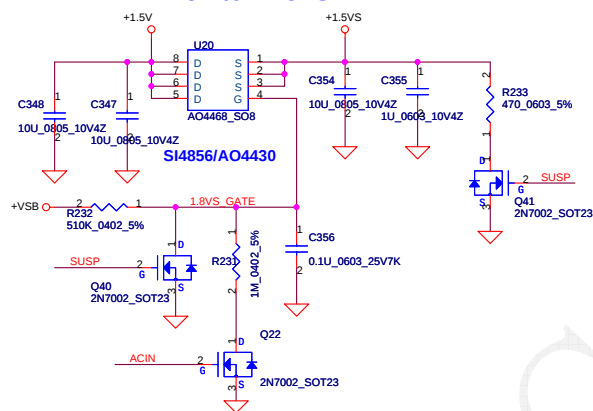
+5VALW TO +5VS



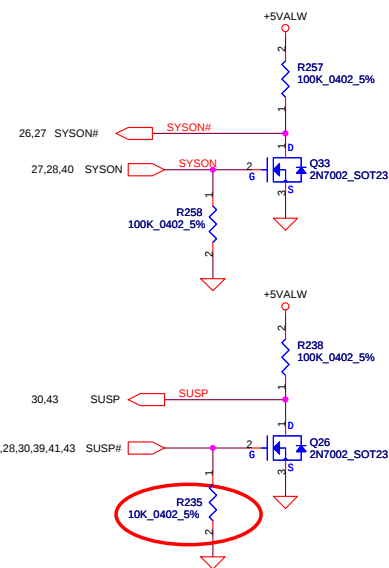
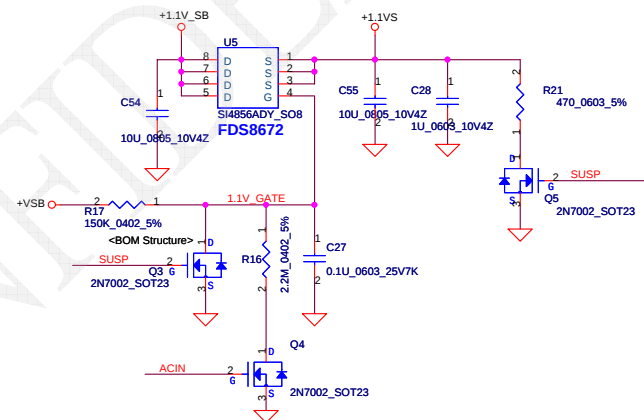
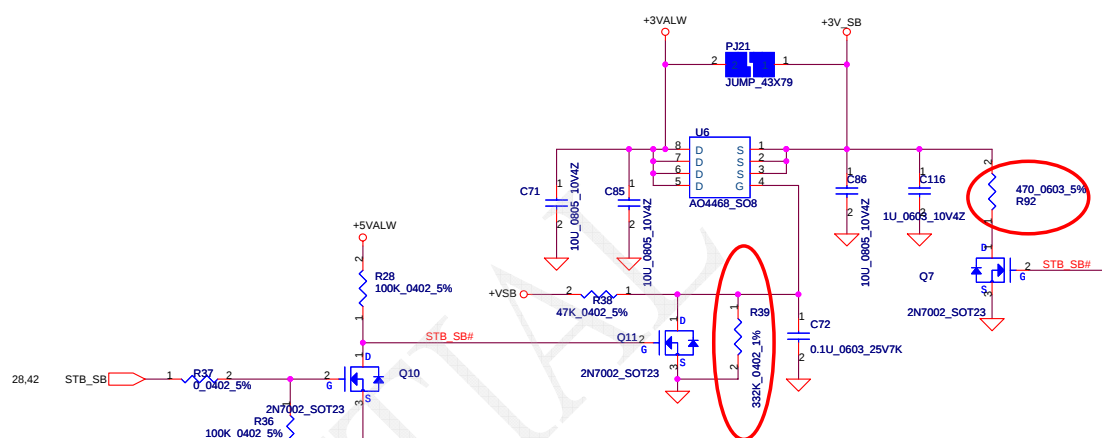
+3VALW TO +3VS



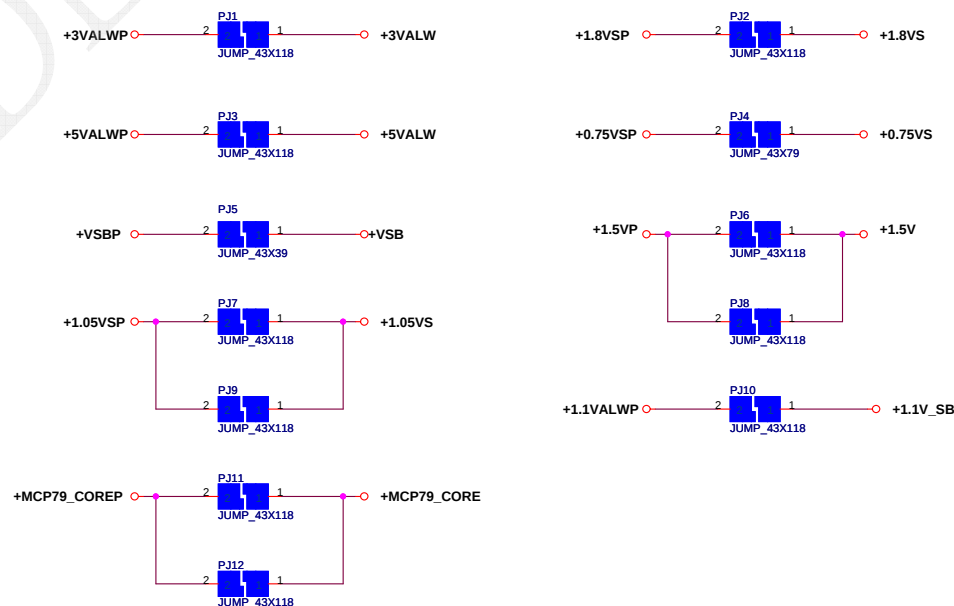
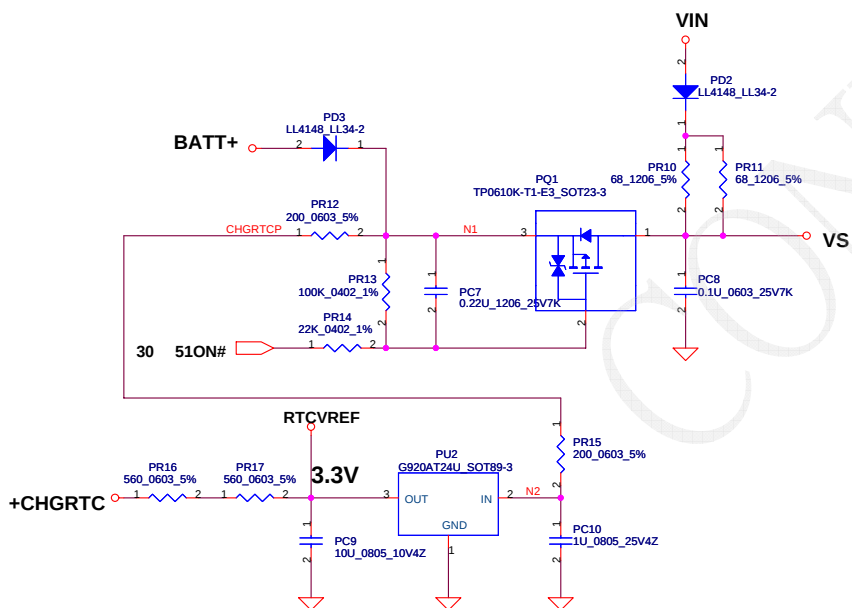
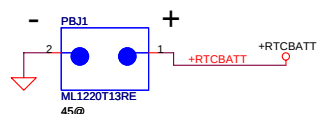
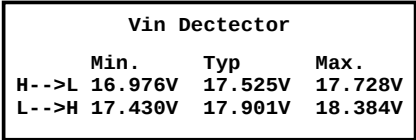
+1.5V to +1.5VS



+3VALW TO +3V_SB

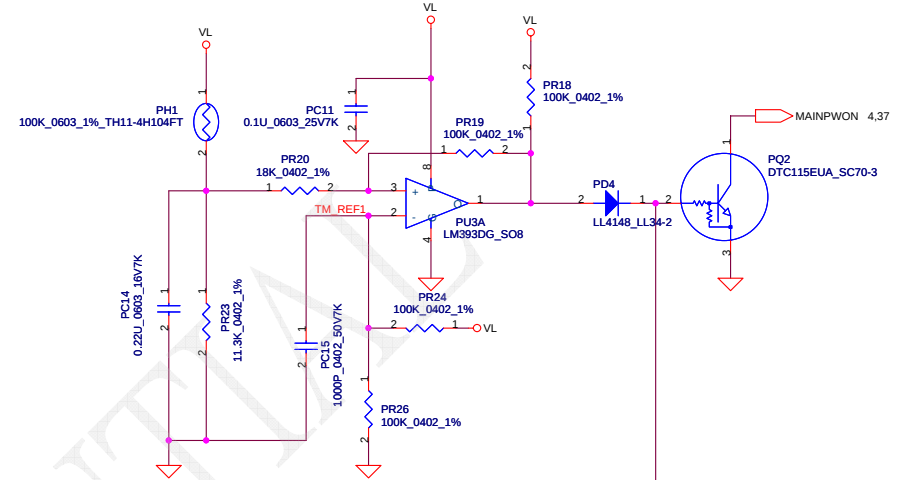
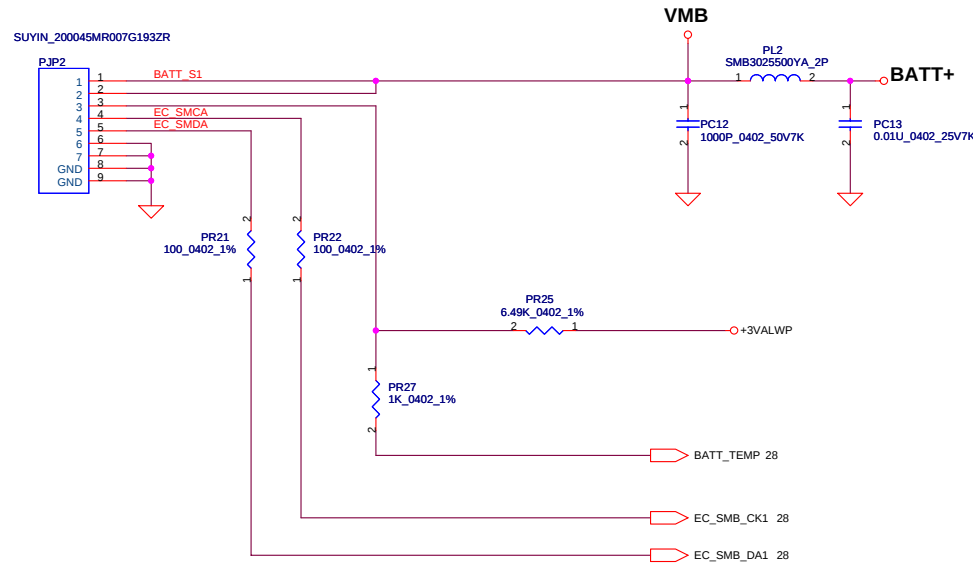


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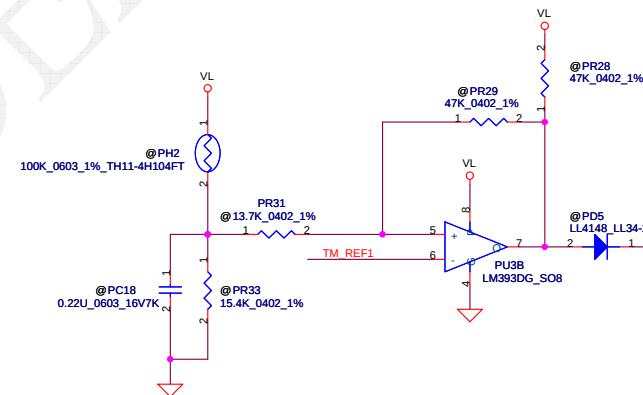
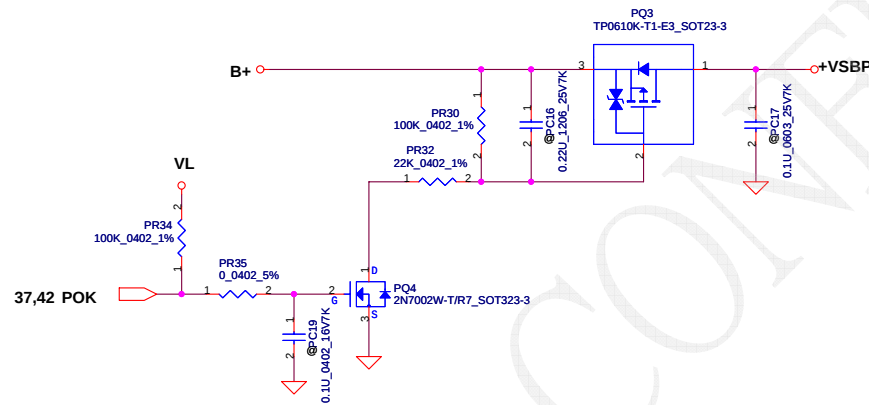


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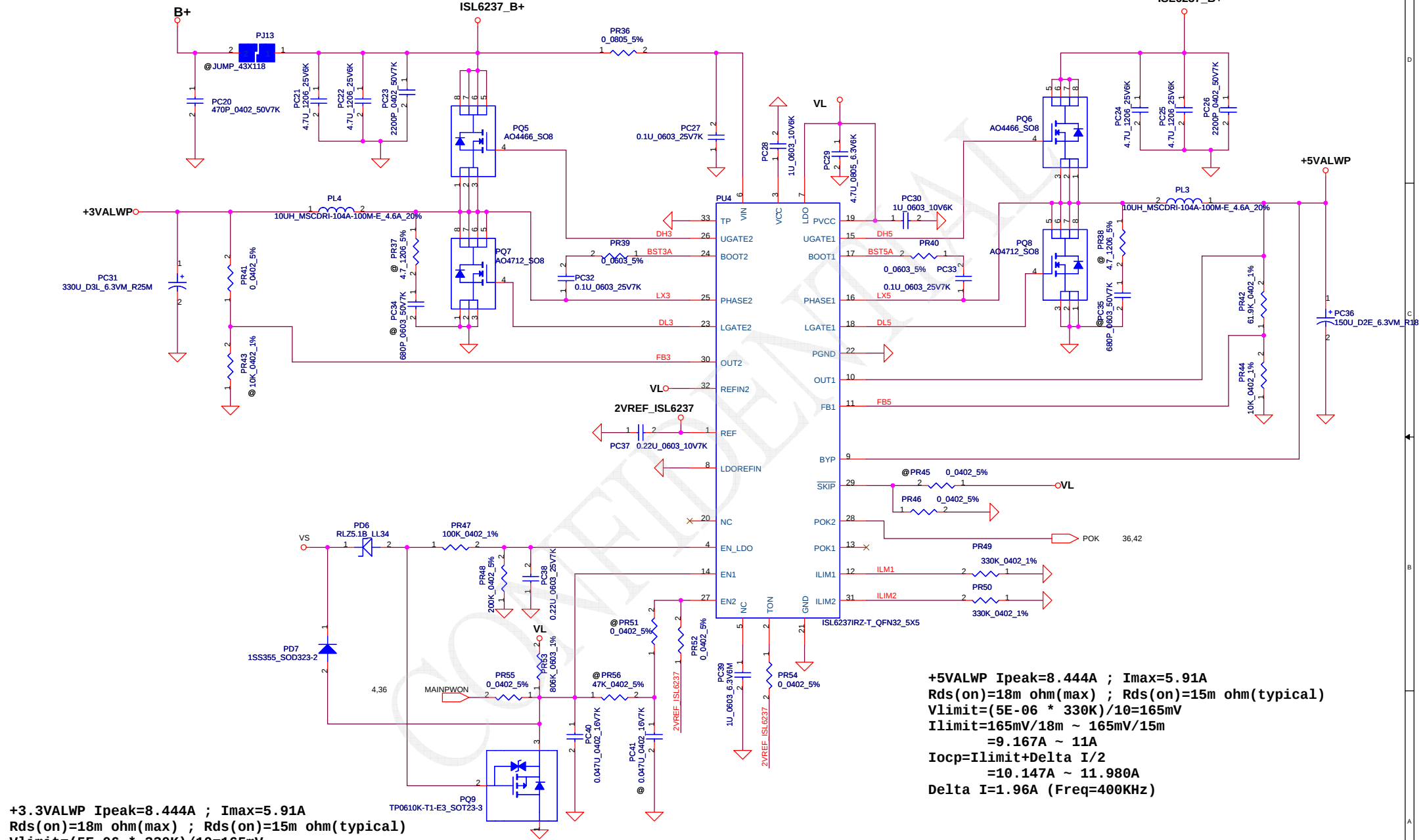
PH1 under CPU botten side :
CPU thermal protection at 92 degree C
Recovery at 70 degree C



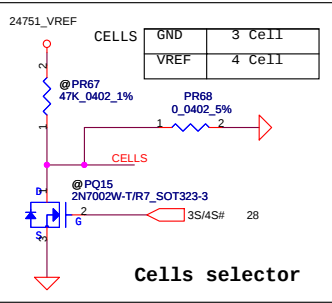
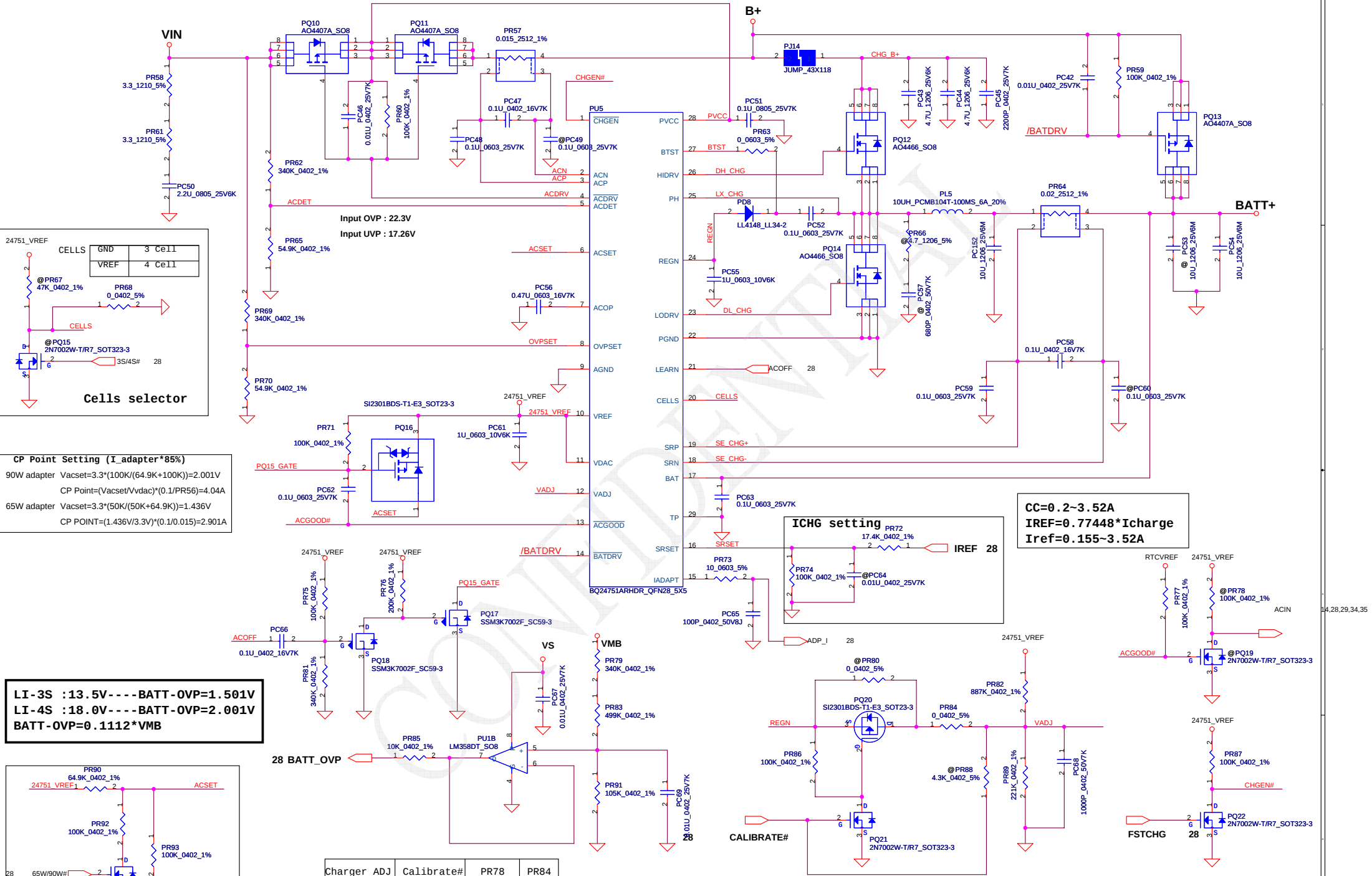
PH2 near main Battery CONN :
BAT. thermal protection at 92 degree C
Recovery at 56 degree C



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CP Point Setting (I_adapter*85%)

90W adapter Vacset=3.3*(100K/(64.9K+100K))=2.001V

CP Point=(Vacset/Vvdac)*(0.1/PR56)=4.04A

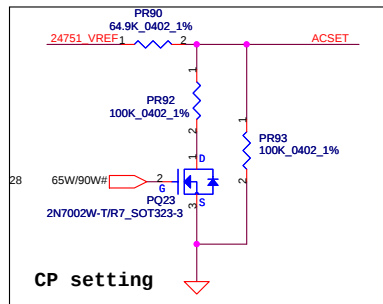
65W adapter Vacset=3.3*(50K/(50K+64.9K))=1.436V

CP POINT=(1.436V/3.3V)*(0.1/0.015)=2.901A

LI-3S :13.5V----BATT-OVP=1.501V

LI-4S :18.0V----BATT-OVP=2.001V

BATT-OVP=0.1112*VMB



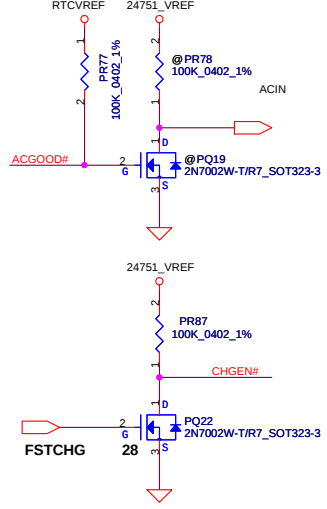
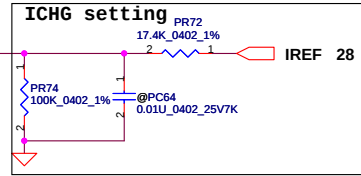
Charger ADJ	Calibrate#	PR78	PR84
4.0V	L	@	@
4.1V	L	887K	221K
4.2V	H	@	@

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CC=0.2~3.52A

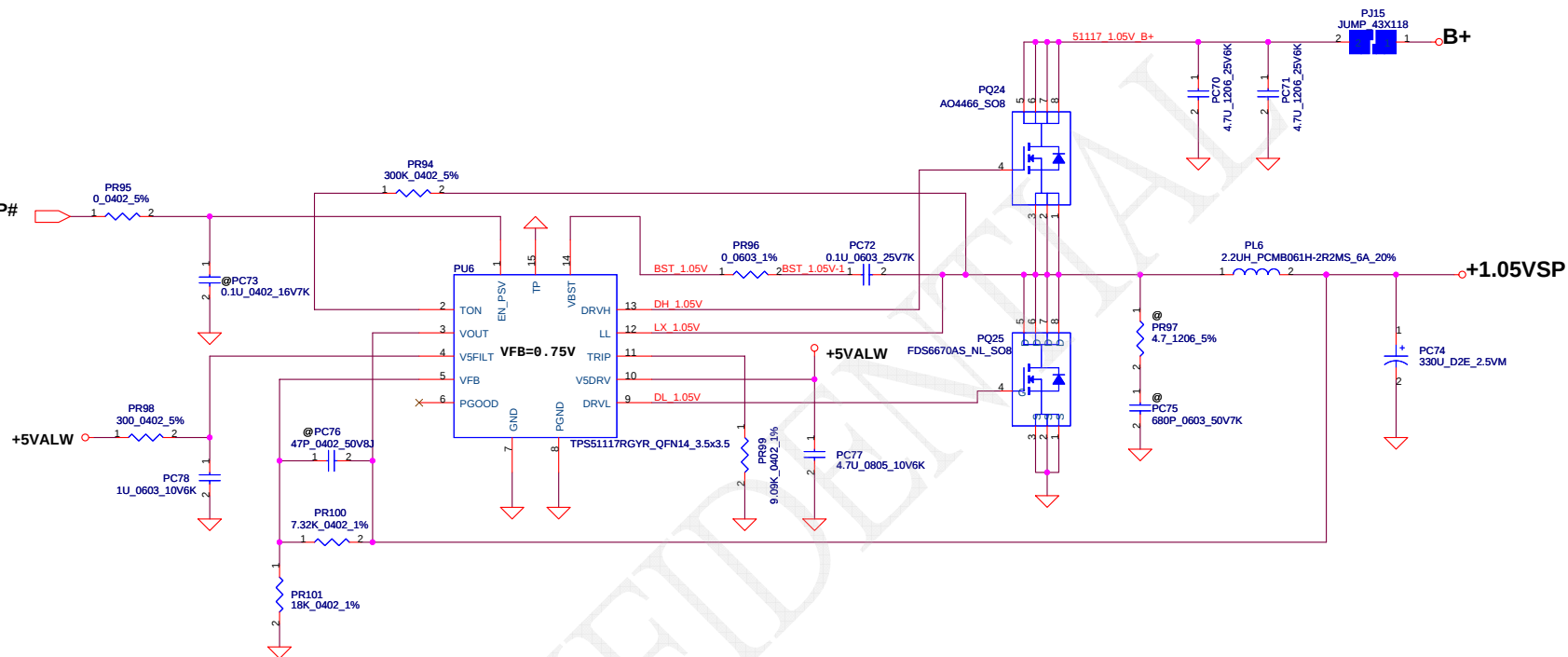
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Iref=0.155~3.52A



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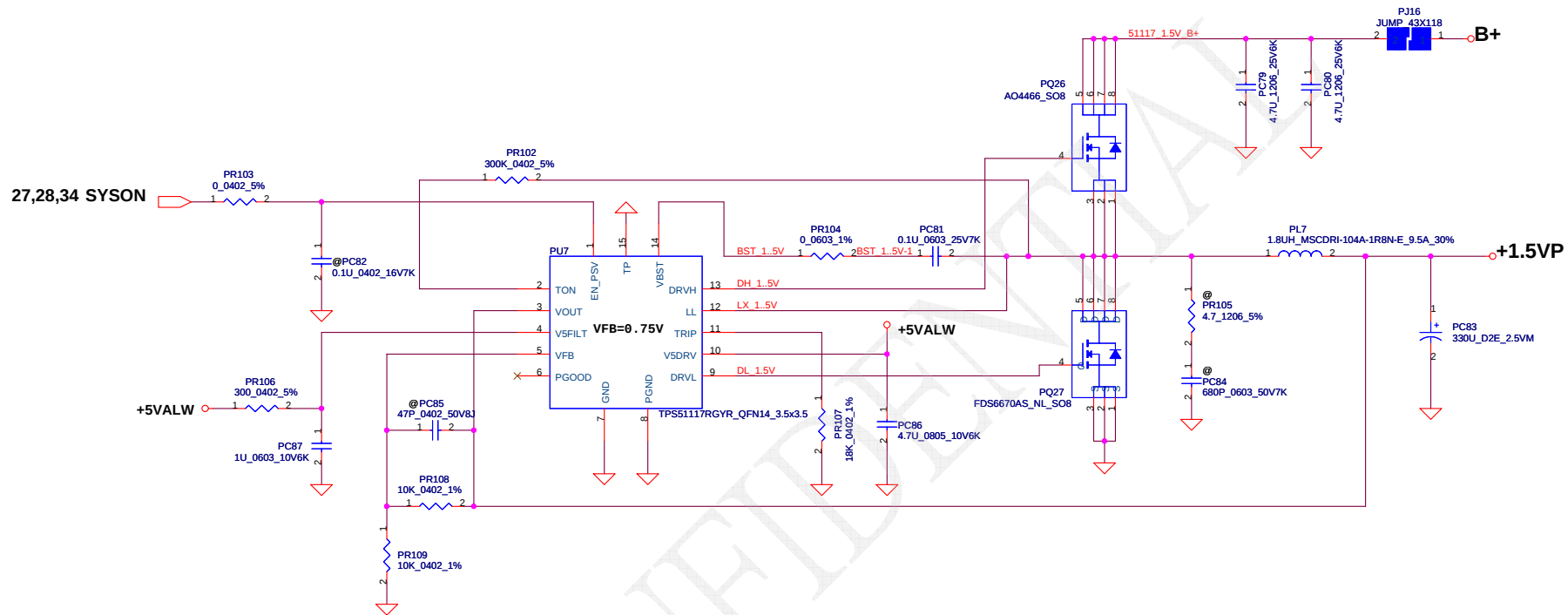
27,28,30,34,41,43 SUSP#



VFB=0.75V
 $V_o = VFB * (1 + PR100 / PR101) = 1.055V$
 $F_{sw} = 262KHz$

$C_{out} ESR = 15m\ ohm$
 $R_{dsonmax} = 11.5m\ ohm, R_{dson typ} = 9m\ ohm$
 $I_{peak} = 7.15A, I_{max} = 3.5A$
 $\Delta I = ((19 - 1.05) * (1.05 / 19)) / (L * F_{sw}) = 2.103A$
 $\Rightarrow 1/2 \Delta I = 1.052A$
 $V_{trip} = R_{trip} * I_{0uA} = 9.09K * 10uA = 0.0909V$
 $I_{ocpmin} = V_{trip} / R_{dsonmax} * 1.3 + 1.052A = 7.132A$
 $I_{ocpmax} = V_{trip} / R_{dson typ} * 1.1 + 1.052A = 10.233A$
 $I_{ocp} = 7.132A - 10.233A$

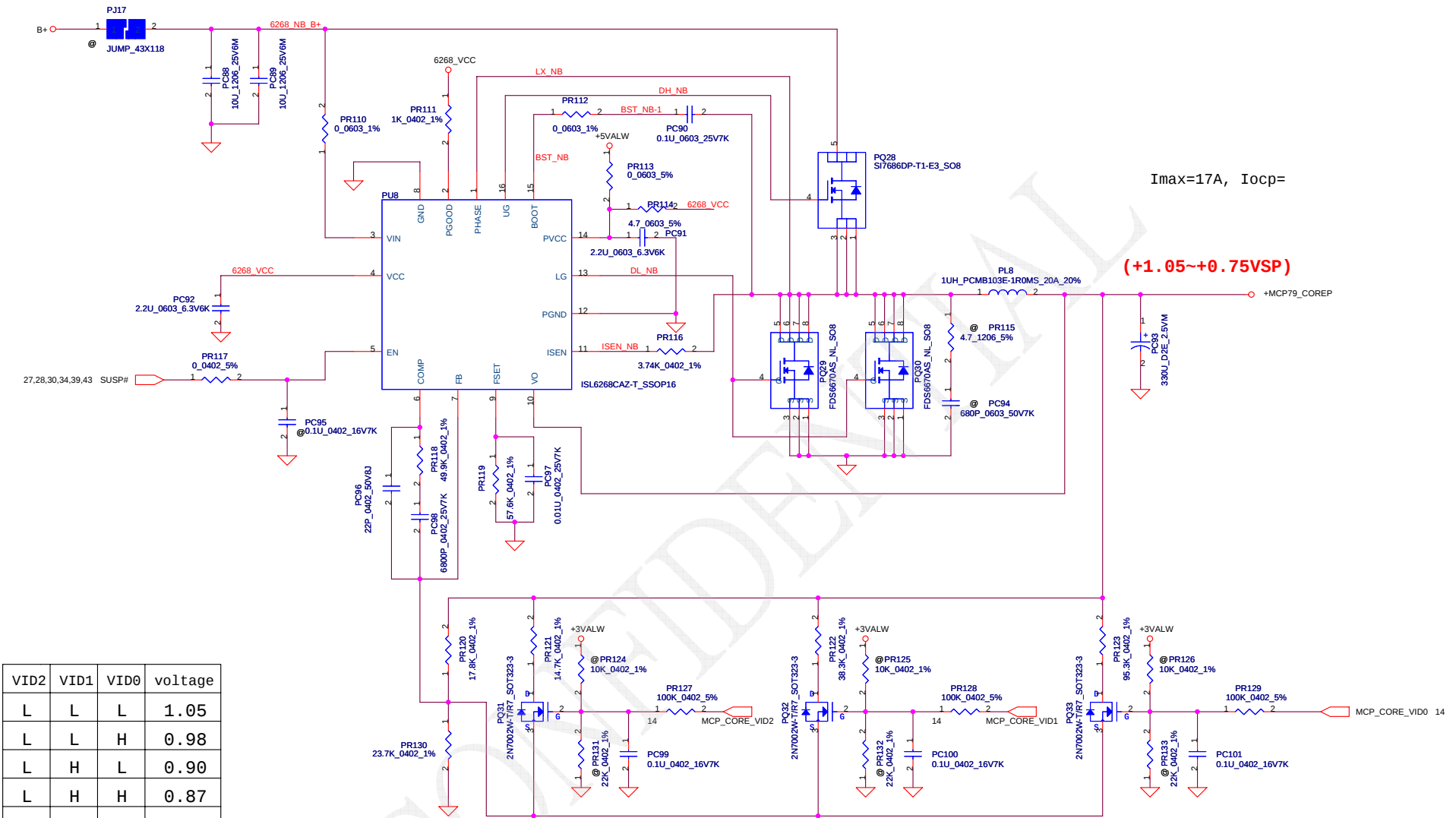
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VFB=0.75V
 $V_o = VFB * (1 + PR108 / PR109) = 1.5V$
 $F_{sw} = 262KHz$
 $C_{out} ESR = 15m\ ohm$
 $R_{dsonmax} = 11.5m\ ohm, R_{dson typ} = 9m\ ohm$
 $I_{peak} = 13.67A, I_{max} = 8A$
 $\Delta I = ((19 - 1.5) * (1.5 / 19)) / (L * F_{sw}) = 2.930A$
 $\Rightarrow 1 / 2 \Delta I = 1.465A$
 $V_{trip} = R_{trip} * I_{out} = 18K * 10uA = 0.180V$
 $I_{ocpmin} = V_{trip} / R_{dsonmax} * 1.4 + 1.465A = 12.645A$
 $I_{ocpmax} = V_{trip} / R_{dson typ} * 1.2 + 1.465A = 18.131A$
 $I_{ocp} = 12.645A - 18.131A$

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VID2	VID1	VID0	voltage
L	L	L	1.05
L	L	H	0.98
L	H	L	0.90
L	H	H	0.87
H	L	L	0.80
H	L	H	0.79
H	H	L	0.77
H	H	H	0.75

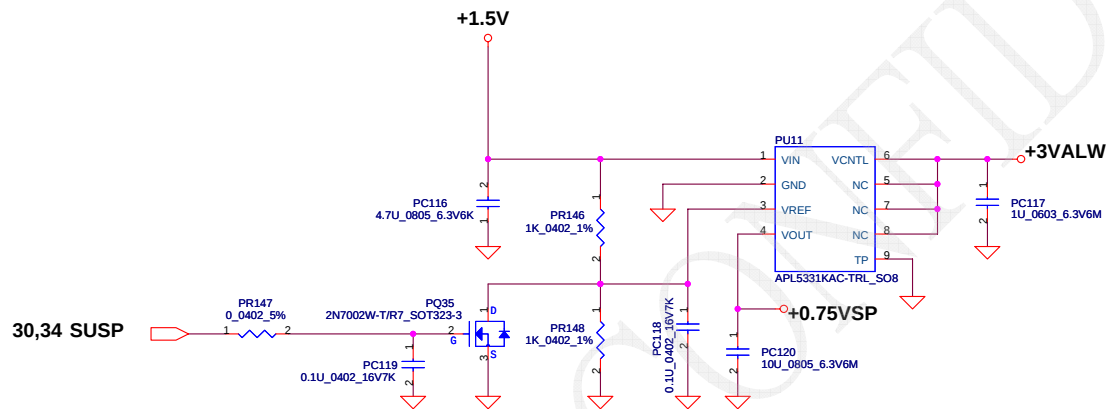
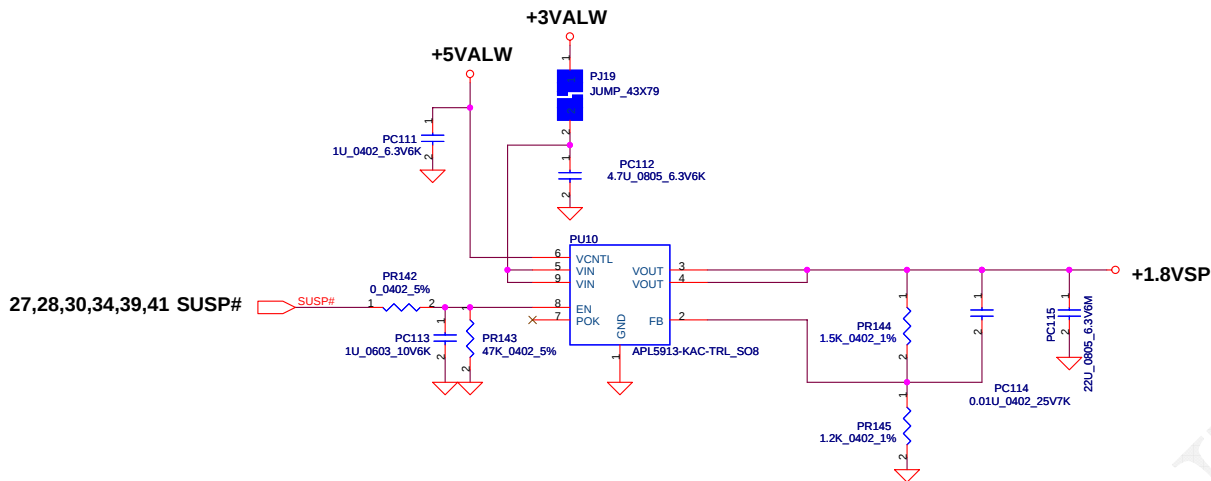


Imax=17A, Iocp=

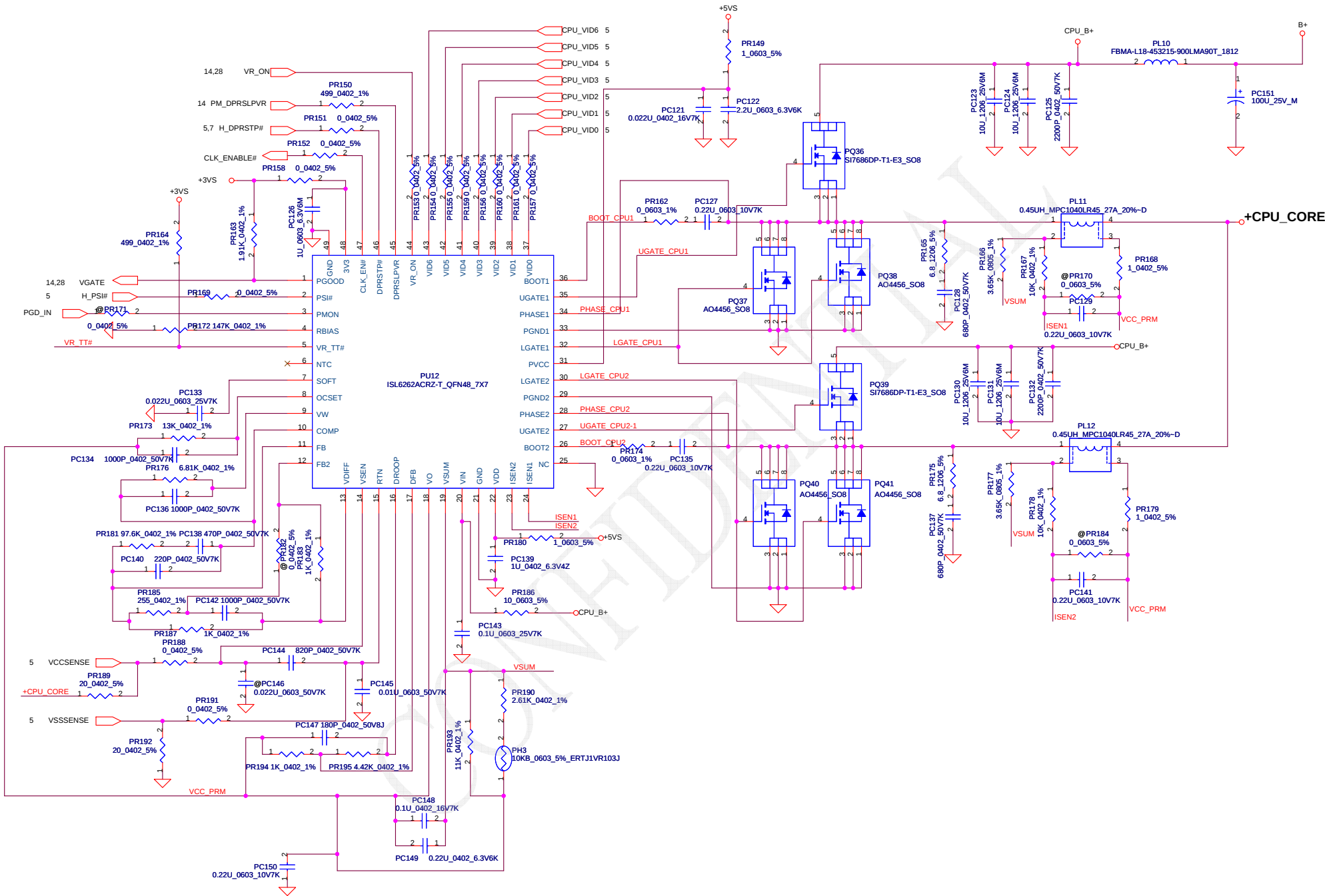
(+1.05~+0.75VSP)

for layout convenience,
do not change net name

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Version change list (P.I.R. List)

Item	Fixed Issue	Reason for change	Rev.	PG #	Modify List	Date	Phase
1	Add PC152	Add PC152 for BQ24751 OVP issue	0.2	38	Add PC152	09/24	DVT
2	Change PQ25 to FDS6670	Change PQ25 to FDS6670 for efficiency	0.2	39	Change PQ25 to FDS6670	09/24	DVT
3	Change PR107 to 18K	Change PR107 to 18K for OCP setting	0.2	40	Change PR107 to 18K	09/24	DVT
4	Change PL7 to 1.8UH	Change PL7 to 1.8UH for OCP setting	0.2	40	Change PL7 to 1.8UH	09/24	DVT
5	Change PQ31,32,33 P/N	Change PQ31,32,33 P/N for 2nd source	0.2	41	Change PQ31,32,33 P/N	09/24	DVT
6	Add STB_SB net for 1.1V-EN	Add STB_SB net for 1.1V-EN for HW debug	0.2	42	Add STB_SB net for 1.1V-EN	09/24	DVT
7	Change 0.75V EN to SUSP	Change 0.75V EN to SUSP	0.2	43	Change 0.75V EN to SUSP	09/24	DVT
8							
9							
10							
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23							

Version change list (P.I.R. List)

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for PWR

Item	Fixed Issue	Reason for change	Rev.	PG #	Modify List	Date	Phase
1		MEMO		20	add Q6 Q8	9/15	0.1
2		MEMO		32	change R416, R418, R420, R421 to 75 ohm	9/15	0.1
3		MEMO		06	del C368	9/15	0.1
4		MEMO		06	add C483	9/15	0.1
5				11	change R137.1 to +3V_SB	9/15	0.2
6				25	swap JRJ45.11 and JRJ45.12	9/15	0.2
7				21	swap JHDM1.1 and JHDM1.3	9/15	0.2
8				26	add 80 port signal to Jmini2	9/15	0.2
9				34	R92 change from 0805 to 0603	9/15	0.2
10				21	change D12 p/n	9/15	0.2
11				14	pop D13	9/15	0.2
12				11	enbkl add pull low resistor	9/15	0.2
13				26	R211.1 change form +3Valw to +3V_SB	9/15	0.2
14				14	add pull low resistor R461 on ec_rsmrst # signal	9/15	0.2
15				29	change LED behavior for ID spec	9/15	0.2
16				23	change U14 JMB380 to JMB385	9/15	0.2
17				27	add JUSB2 port	9/15	0.2
18				28	add R462,R463 KSO1 / KSO2 pull high 47k	9/15	0.2
19				19	LVDS, del U29, pop Q37,R299,C443	9/15	0.2
20				33	fan controller, change U9 to APL5607 , R85 to 0 ohm, del D9,D10	10/9	0.2
21				32	del amplifire LDO, change R413,R411 o 56 ohm	10/9	0.2
22				29	pop D1,D8,D21,D22 for ESD	10/9	0.2
23				14	pop U13, R166,R169,C229 for HDCP	10/9	0.2

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Version change list (P.I.R. List)

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for PWR

Item	Fixed Issue	Reason for change	Rev.	PG #	Modify List	Date	Phase
1				20	add C44,C35,C21, change C43,C34,C20 to 18p	9/15	0.2
2				23	change D17 p/n	10/9	0.2
3				32	change L33,L34 p/n	10/9	0.2
4				31	change R11,R12,R13,R276 p/n	10/9	0.2
5				21	change F2 p/n	10/9	0.2
6				7	reserve BSEL pull low resistor R470,R471,R472	10/9	0.2
7				14	change SMBus pull high value,R73,R96,R93,R94 to 2.2k	10/9	0.2
8				15	del C319	10/9	0.2
9				33	del U19,U28,R221,R289,C323,C431,R223,R285	10/9	0.2
10				21	change HDMI R119,R142,R118,R140 pull high to 2.7k	10/9	0.2
11				19	change R294 to 100k	10/9	0.2
12				29	del LED(10,11,12,15,17,18) , add LED(19,20,21,22,23,24)		0.2
13				34	pop R231,Q22,R16,Q4		0.2
14				28	pop R133, change R132 to 8.2k		0.2
15				29	change LED9 p/n	MEMO	0.2
16				24	change Q9 p/n	11/6	0.3
17				23	del R451, Q18, D17	11/6	0.3
18				25	reserve R473, R474	11/6	0.3
19				29	del LED11,17,20,23 ,pop LED14,LED16,R447,R465	11/6	0.3
20				31	pop D3	11/6	0.3
21				22	unpop C455,C456	11/6	0.3
22				14	change R73,R96 to 1.8k	11/6	0.3
23				14	del R136 add R475, del R132, unpop D3	11/25	1.0

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