

Compal Confidential

Cougar

LA-6851P Schematics Document

Intel Pine View Processor/ Tiger point

2010-10-10

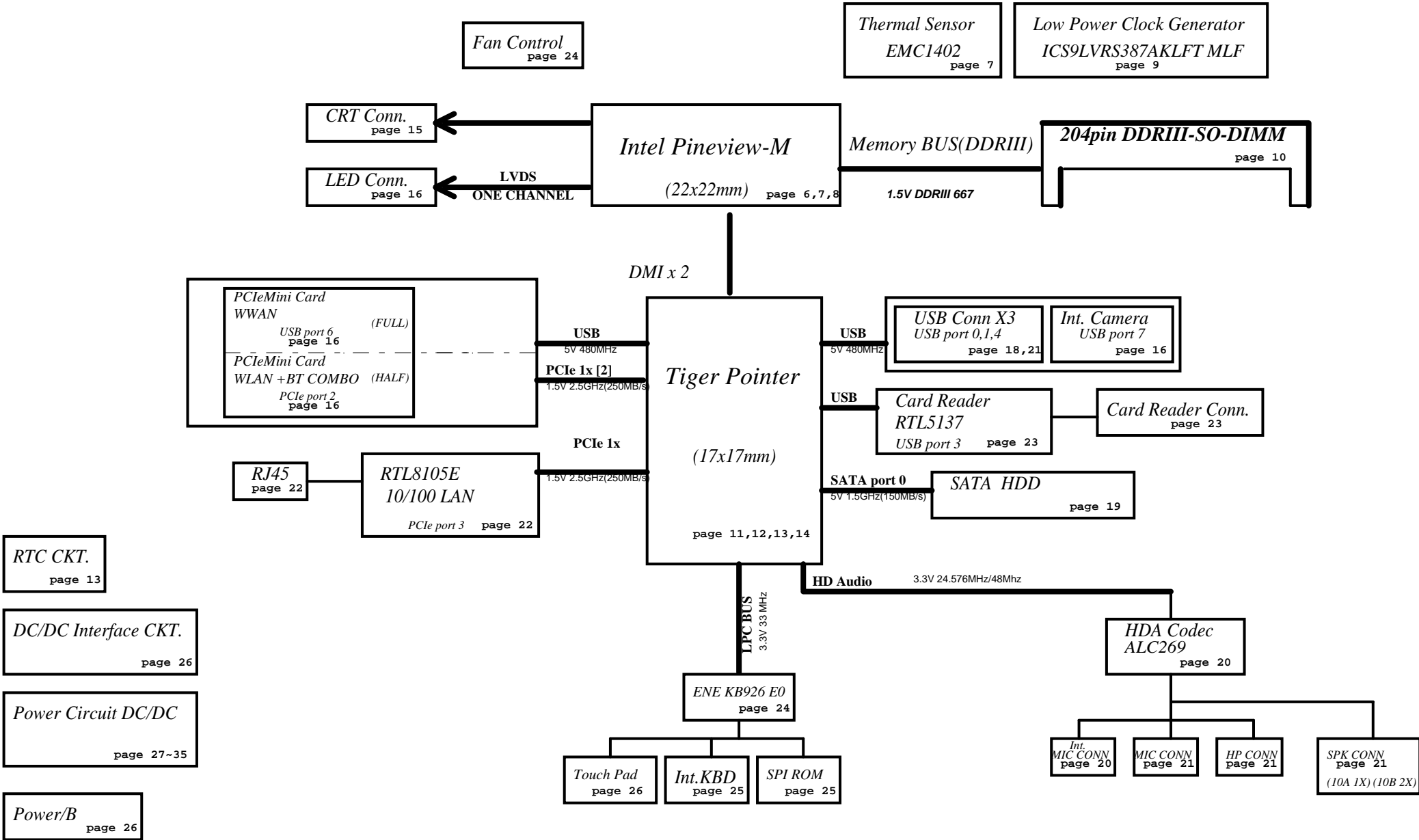
REV: 1.0

Toshiba Satellite NB500 NB505

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Model Name : PBU00
File Name : LA-6851P



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Voltage Rails

Power Plane	Description	S1	S3	S5	G3
VIN	Adapter power supply (19V)	ON	ON	ON	OFF
B+	AC or battery power rail for power circuit.	ON	ON	ON	ON
+CPU_CORE	Core voltage for CPU	ON	OFF	OFF	OFF
+0.89VS	0.89VS GFX support voltage	ON	OFF	OFF	OFF
+0.75VS	0.75V switched power rail for DDR terminator	ON	OFF	OFF	OFF
+1.05VS	VCCP switched power rail	ON	OFF	OFF	OFF
+1.5VS	1.5V switched power rail	ON	OFF	OFF	OFF
+1.5V	1.5V power rail for DDR	ON	ON	OFF	OFF
+1.8VS	1.8VS switched power rail	ON	OFF	OFF	OFF
+3VALW	3.3V always on power rail	ON	ON	ON	OFF
+3V_LAN	3.3V power rail for LAN	ON	ON	OFF	OFF
+3V_WLAN	3.3V power rail for LAN	ON	ON	OFF	OFF
+3VS	3.3V switched power rail	ON	ON	OFF	OFF
+5VALW	5V always on power rail	ON	OFF	ON	OFF
+5VS	5V switched power rail	ON	OFF	OFF	OFF
+VSB	VSB always on power rail	ON	ON	ON	OFF
+RTCVCC	RTC power	ON	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	ON	ON	ON	ON
S1(Power On Suspend)	HIGH	HIGH	HIGH	ON	ON	ON	LOW
S3 (Suspend to RAM)	LOW	HIGH	HIGH	ON	ON	OFF	OFF
S4 (Suspend to Disk)	LOW	LOW	HIGH	ON	OFF	OFF	OFF
S5 (Soft OFF)	LOW	LOW	LOW	ON	OFF	OFF	OFF

BTO Option Table

Function	Mini PCI-E SLOT				CAMERA & MIC		BLUE TOOTH		Clock gen	
description										
explain	Wi-Fi	WiMax	3GGPS	3G	CAMERA	MIC	BLUE TOOTH		Tpye	
BTO	WLAN@	WIMAX@	3GGPS@	3G@	CAM@	MIC@	BT@		low@	normal@

Function			
description			
explain			
BTO			

EC SM Bus1 address

Device	Address	Device	Address
Smart Battery	0001 011X b	EMC1402	1001 010X b

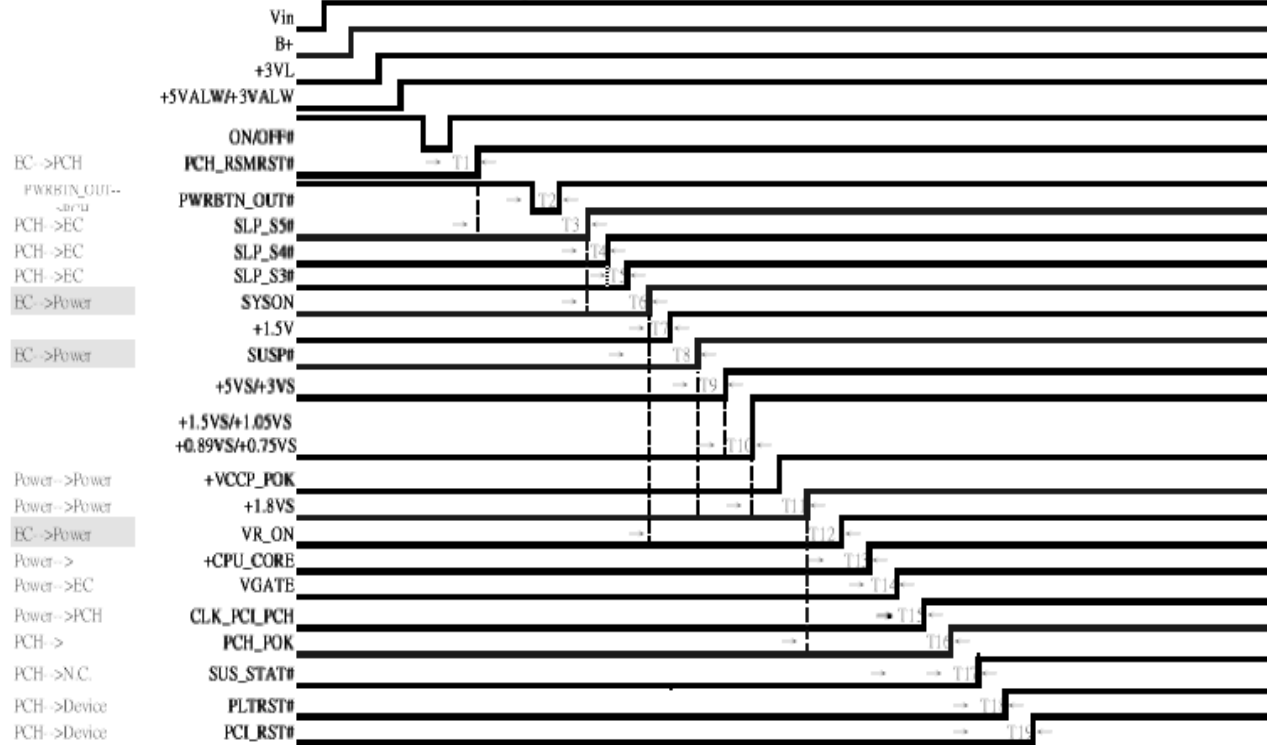
EC SM Bus2 address

ICH7M SM Bus address

Device	Address
Clock Generator (SLG8SP556VTR)	1101 001Xb
DDR DIMMA	1010 000Xb
WWAN/WLAN	

PBU00 Power ON sequence

2010/7/2



Power-on Sequence

Time	Description	Expected
T1	Power Button active to PCH_RSMRST# inactive	> 105ms
T2	Power Button active to PBTN_OUT# inactive	< T1
T3	PCH_RSMRST# inactive to PM_SLP_S5# inactive	< 110ms
T4	PM_SLP_S5# inactive to PM_SLP_S4# inactive	28.992us ~ 64.088us
T5	PM_SLP_S4# inactive to PM_SLP_S3# inactive	28.992us ~ 64.088us
T6	PM_SLP_S5# inactive to SYSON active	>10ms
T7	SYSON active to +1.5V active	>0
T8	PM_SLP_S3# inactive to SUSP# inactive	>10ms
T9	SUSP# inactive to +5VS active	>0
T9	SUSP# inactive to +3VS active	>0
T10	SUSP# inactive to +1.5VS active	> 0
T10	SUSP# inactive to +0.89VS active	> 0
T10	SUSP# inactive to +1.05VS active	> 0
T10	SUSP# inactive to +0.75VS active	>0
T11	+1.05VS inactive to +1.8VS active	>0
T12	SUSP# inactive to VR_ON active	>10ms
T13	VR_ON active to +CPU_CORE active	>0
T14	+CPU_CORE active to VGATE	<10ms
T15	VGATE active to CLK_PCI_ICH stable	< 1.8ms
T16	+1.5VS power active to ICH_PWROK active	>99ms
T17	ICH_PWROK active to SUS_STAT# inactive	0.928ms ~ 1.218ms
T18	SUS_STAT# inactive to PLT_RST# inactive	57.984us ~ 96.132us
T23	SUS_STAT# inactive to PCI_RST# inactive	57.984us ~ 96.132us

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Cougar Power Map

B+

DESIGN CURRENT 250mA

Ipeak=6.97A, Imax=4.88A

DESIGN CURRENT 522mA

+3VALWP +-5%

UP6182CQAG

** The SW just is reserved.
The power passes by jump or
0-ohm resistor.

WOL_EN#

** P-CHANNEL
AO3413

DESIGN CURRENT 300mA

+3V_LAN

Ipeak=3.98A, Imax=2.8A

DESIGN CURRENT 3010mA

+5VALWP +-5%

SUSP

N-CHANNEL

SI4800BDY

DESIGN CURRENT 2286mA

+5VS

SUSP

N-CHANNEL

SI4800BDY

DESIGN CURRENT 5586mA

+3VS

ENVDD

P-CHANNEL
AO3413

DESIGN CURRENT 2000mA

+LCD_VDD

SUSP#

SY8033BDBC

DESIGN CURRENT 2640mA

+0.89VSP

SUSP#

SY8033BDBC

Ipeak=1.308A, Imax=4A

DESIGN CURRENT 3489mA

+1.05VSP +-5%

VR_ON

ADP3211AMNR2G

Imax=3.5A

DESIGN CURRENT 6000mA

+CPU_CORE

SYSON

G5603RU1U

Ipeak=19.6A, Imax=13.72A

DESIGN CURRENT 2000mA

+1.5VP +-5%

SUSP#

IRF8113PBF

DESIGN CURRENT 2112mA

+1.5VSP

SUSP

UP7711U8

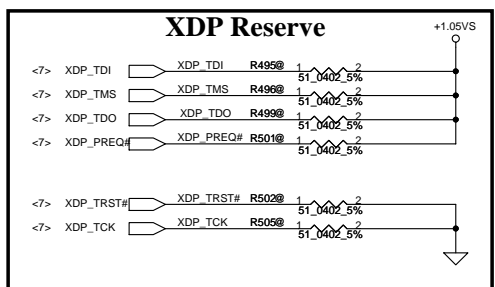
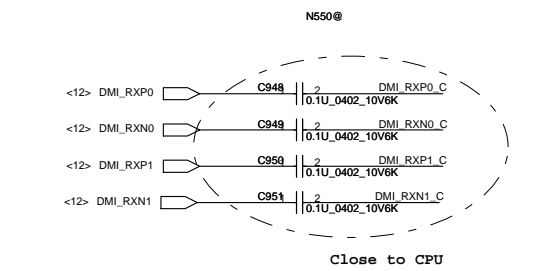
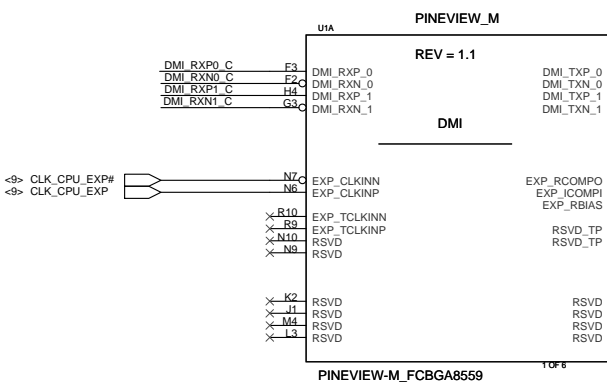
DESIGN CURRENT 500mA

+0.75VSP

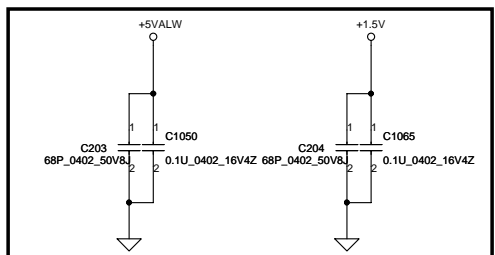
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N455@
U1
U80610006237AA SLBX9 A0 1.66G

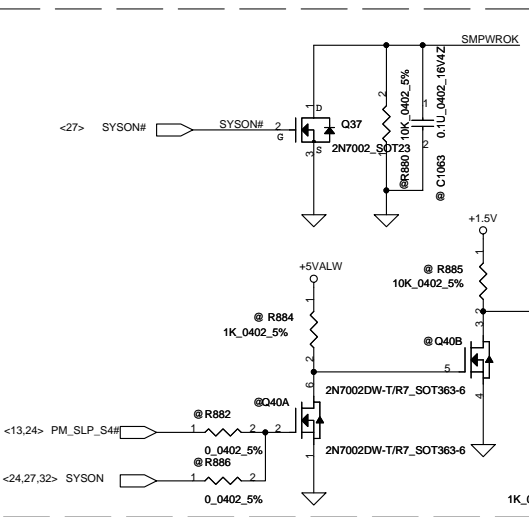
N475@
U1
AU80610006240AA SLBX5



MP Remove XDP resistor for ESD



2010.07.12 RF request



Reserve PM_SLP_S4# to turn on DRAM_PWROK

- <10> DDR_A_DQS#[0..7]
- <10> DDR_A_DQ[0..63]
- <10> DDR_A_DM[0..7]
- <10> DDR_A_DQS[0..7]
- <10> DDR_A_MA[0..14]

- DDR_A_MA0 AH19
- DDR_A_MA1 AJ18
- DDR_A_MA2 AK18
- DDR_A_MA3 AK18
- DDR_A_MA4 AJ14
- DDR_A_MA5 AH14
- DDR_A_MA6 AK14
- DDR_A_MA7 AJ12
- DDR_A_MA8 AH13
- DDR_A_MA9 AK12
- DDR_A_MA10 AK20
- DDR_A_MA11 AH12
- DDR_A_MA12 AJ11
- DDR_A_MA13 AJ24
- DDR_A_MA14 AH10

- <10> DDR_A_WE#
- <10> DDR_A_CAS#
- <10> DDR_A_RAS#
- <10> DDR_A_BS0
- <10> DDR_A_BS1
- <10> DDR_A_BS2

- <10> DDR_CS0#
- <10> DDR_CS1#

- <10> DDR_CKE0
- <10> DDR_CKE1

- <10> M_ODT0
- <10> M_ODT1

- <10> M_CLK_DDR0
- <10> M_CLK_DDR#0
- <10> M_CLK_DDR1
- <10> M_CLK_DDR#1

- DDR_A_WE# AK22C
- DDR_A_CAS# AJ22C
- DDR_A_RAS# AK21C
- DDR_A_BS0 AJ20
- DDR_A_BS1 AH20
- DDR_A_BS2 AK11

- DDR_CS0# AH22C
- DDR_CS1# AK21C
- DDR_CS#0 AJ21C
- DDR_CS#1 AK21C
- DDR_CS#2 AJ21C
- DDR_CS#3 AK21C

- DDR_CKE0 AH10
- DDR_CKE1 AH9
- DDR_CKE#0 AK10
- DDR_CKE#1 AJ8
- DDR_CKE#2 AK10
- DDR_CKE#3 AJ8

- M_ODT0 AK24
- M_ODT1 AK24
- M_ODT#0 AH24
- M_ODT#1 AK27

- M_CLK_DDR0 AG15
- M_CLK_DDR#0 AE15C
- M_CLK_DDR1 AD13
- M_CLK_DDR#1 AC13

- DDR_A_CK_3 AC15
- DDR_A_CK_3# AD15C
- DDR_A_CK_4 AE13
- DDR_A_CK_4# AG13C

- RSVD AD17
- RSVD AC17
- RSVD AB15
- RSVD AB17

- SM_PWROK R881
- DRAM_RST# R878
- DRAM_PWROK AB4
- DRAM_RST# AK8

- RSVD TP T3
- RSVD TP T4
- RSVD TP AB11
- RSVD TP AB13

- DDR_VREF AL28
- DDR_RPD AK28
- DDR_RPU AJ26
- DDR_RPD AK29

- RSVD C953
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- RSVD C953
- RSVD C953

- DDR_A C953
- DDR_A C953
- DDR_A C953
- DDR_A C953

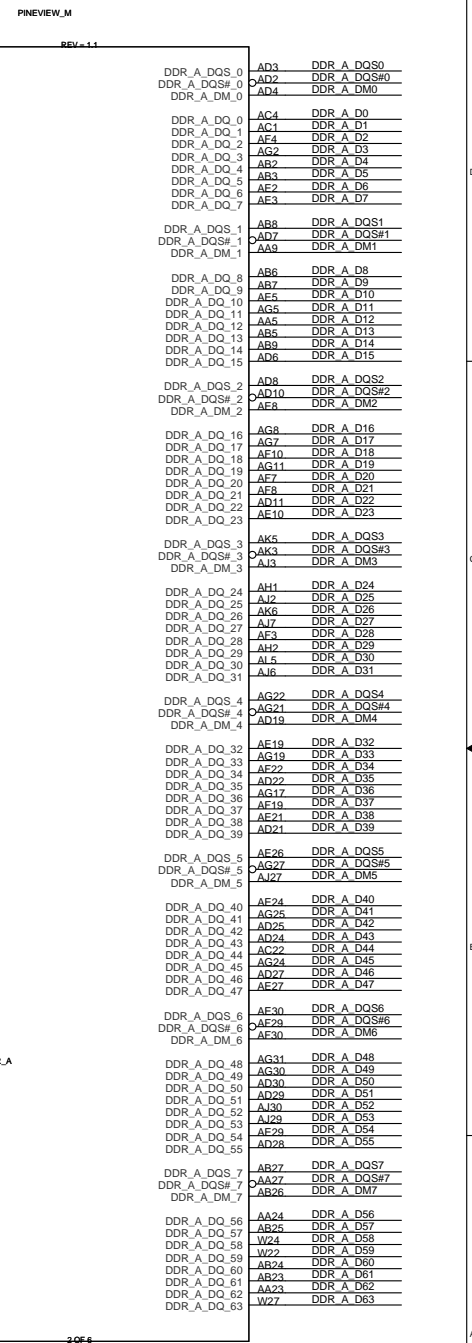
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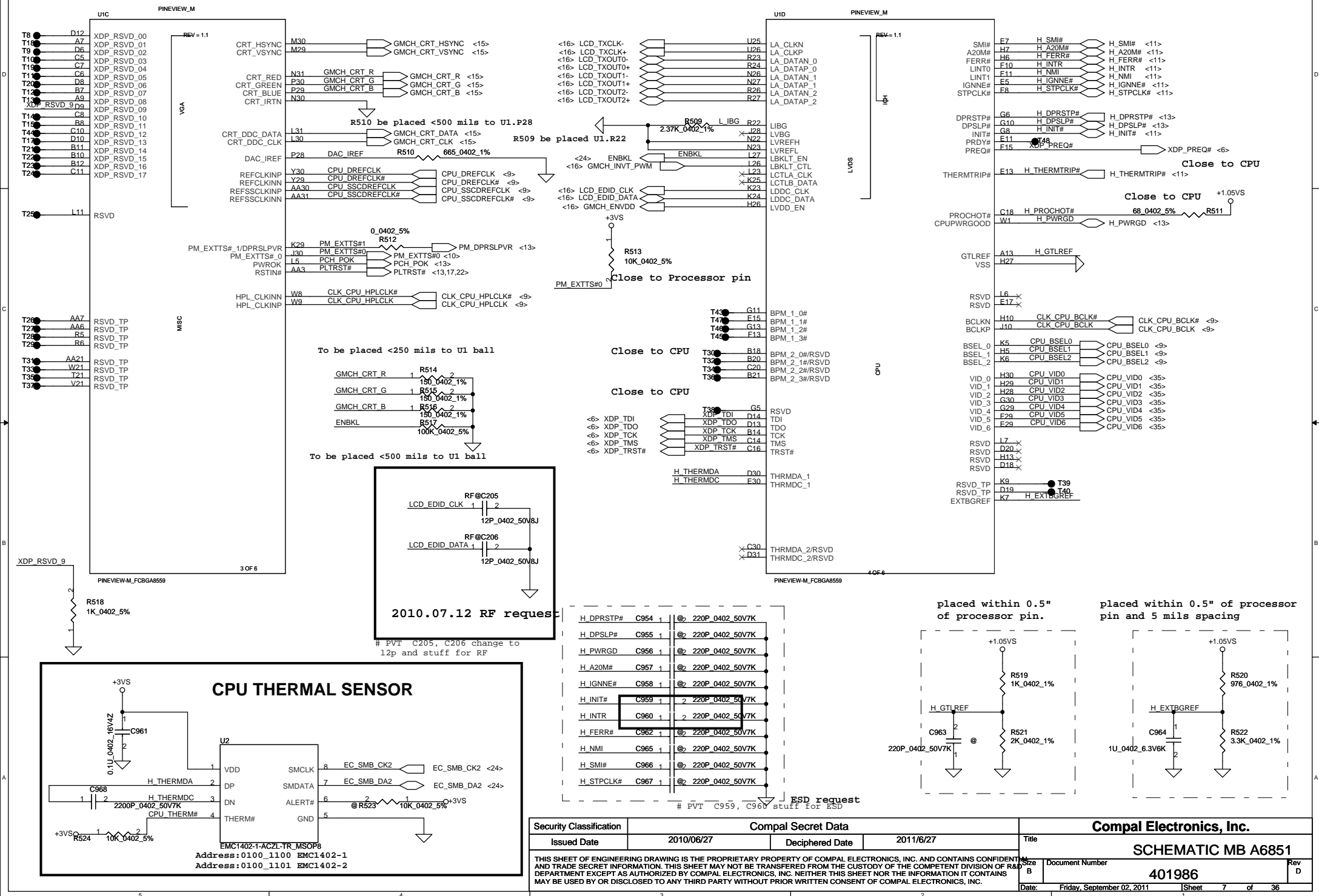
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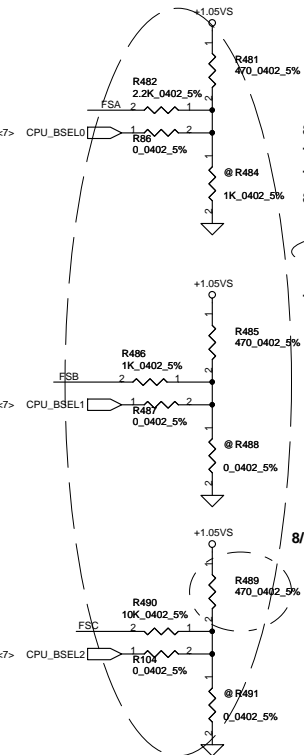


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FSC CLKSEL2	FSB CLKSEL1	FSA CLKSEL0	CPU MHz	SRC MHz	PCI MHz	REF MHz	DOT_96 MHz	USB MHz
0	0	0	266	100	33.3	14.318	96.0	48.0
0	0	1	133	100	33.3	14.318	96.0	48.0
0	1	0	200	100	33.3	14.318	96.0	48.0
0	1	1	166	100	33.3	14.318	96.0	48.0
1	0	0	333	100	33.3	14.318	96.0	48.0
1	0	1	100	100	33.3	14.318	96.0	48.0
1	1	0	400	100	33.3	14.318	96.0	48.0
1	1	1						
Reserved								

	Normal Power	Low Power
R477	@	Stuff
R478	Stuff	@
R479	Stuff	@
R480	@	Stuff
R483	@	Stuff

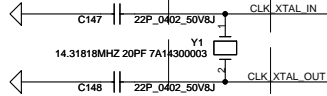


8/24 Change net name to FSB for U3.2
7/13 Add 33pF to GND for RF request
7/21 Reserve 33pF to GND for RF request
8/27 C303, C324, C325, C326, C327 to GND for RF request

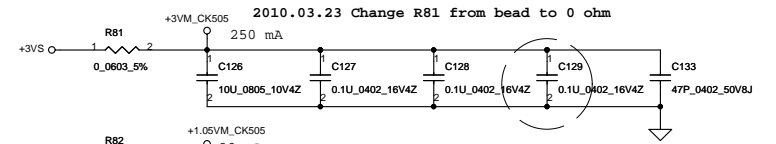
7/22 Add R241 pull up to +3VS for RF Intel request

8/14 Add R250 pull up for Intel request

7/22 Add R242 to R253 for Intel request



2010.03.09 Change Y1 to 5 x3.2 size



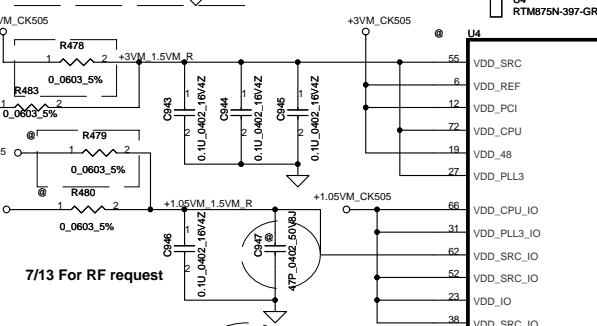
7/13 For RF request

2010.03.23 Change R81 from bead to 0 ohm

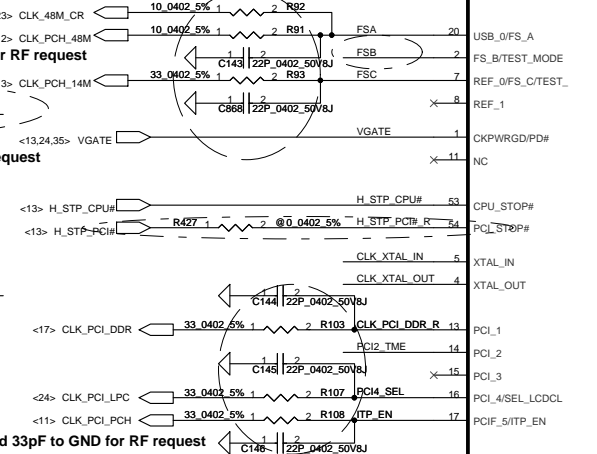
8/27 Delete C93, C94, C95, C102 for low power CLK GEN

SA00003H610 (ICS:CS9LVRS387AKLFT MLF)

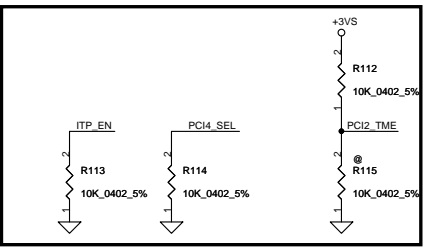
Low power CLK Gen.



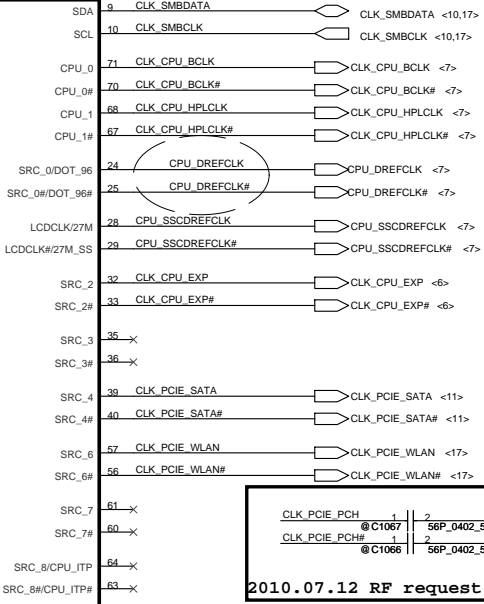
7/13 For RF request



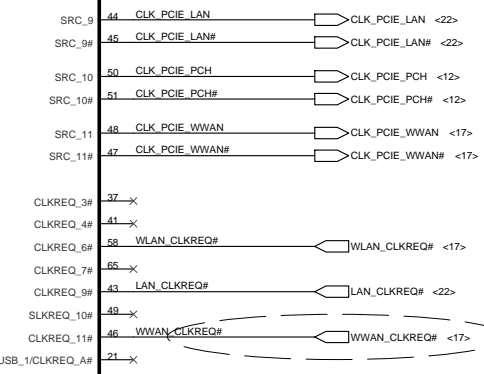
7/13 Add 33pF to GND for RF request
For ITP_EN, 0 = SRC8/SRC8#; 1 = ITP/ITP#
For PCI4_SEL, 0 = Pin24/25 : DOT96 / DOT96#
Pin28/29 : LCDCLK / LCDCLK#
1 = Pin24/25 : SRC_0 / SRC_0#
Pin28/29 : 27M/27M_SS
For PCI2_TME:0=Overclocking of CPU and SRC allowed
(ICS only) 1=Overclocking of CPU and SRC NOT allowed



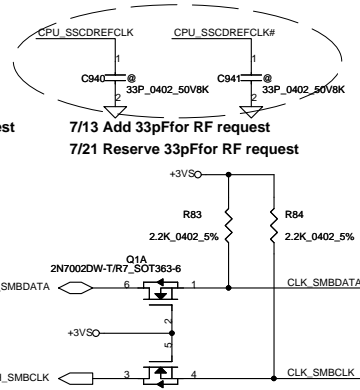
7/21 Delete C296, C297 for RF request
7/13 Add 22pF to gnd and close to U3 for RF request
7/21 Reserve 22pF to gnd and close to U3 for RF request



2010.07.12 RF request



7/21 Change WWAN_CLKREQ# from REQ4 to REQ11



7/13 For RF request

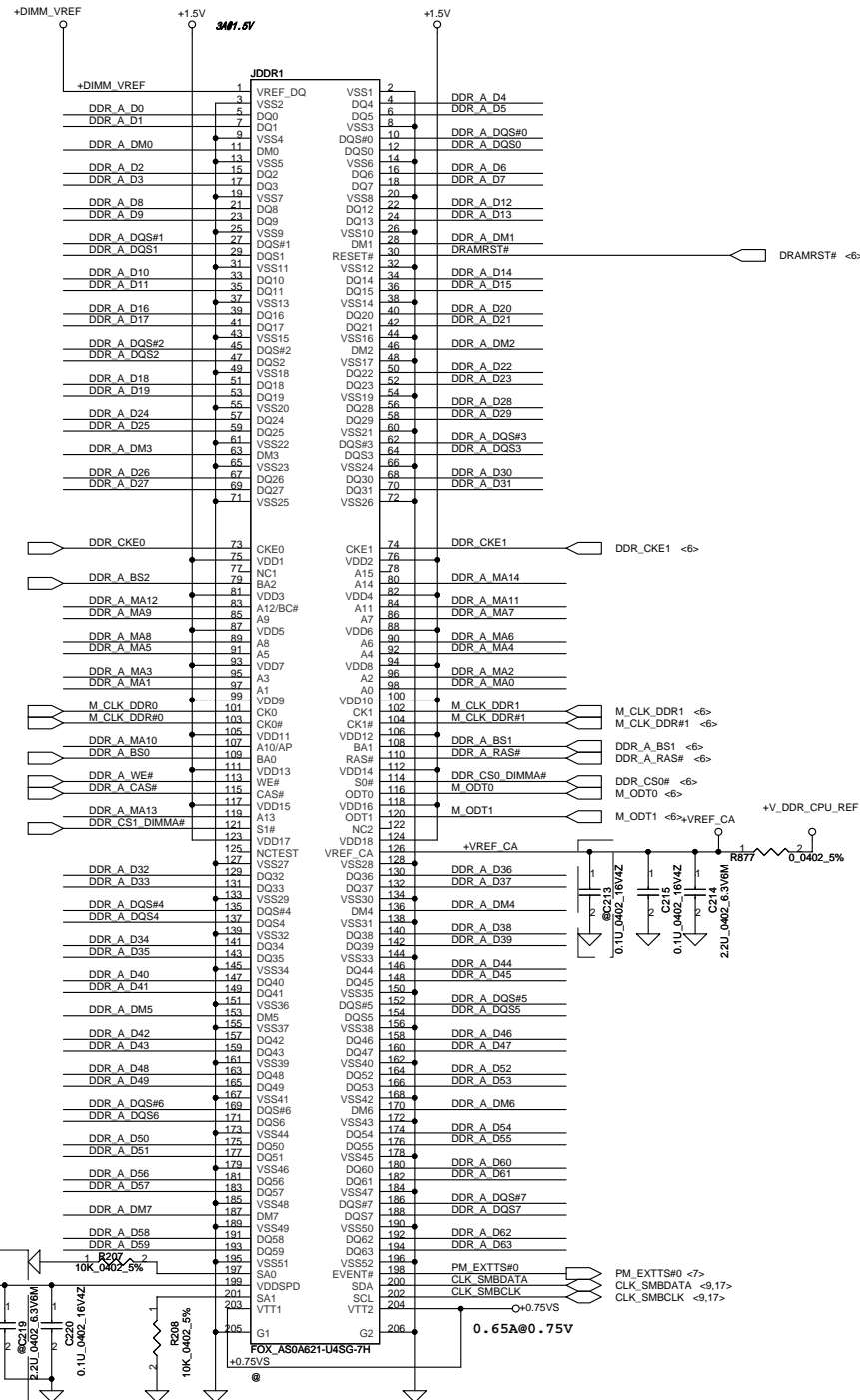
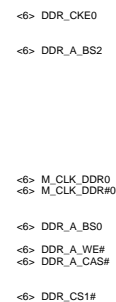
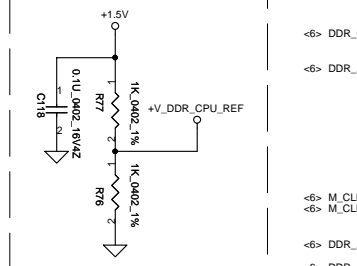
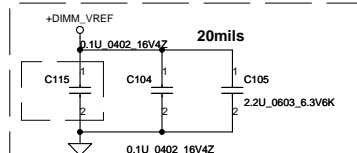
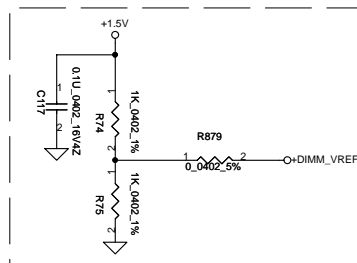
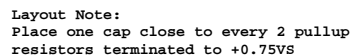
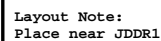
7/13 Add 33pF for RF request
7/21 Reserve 33pF for RF request

SRC PORT LIST

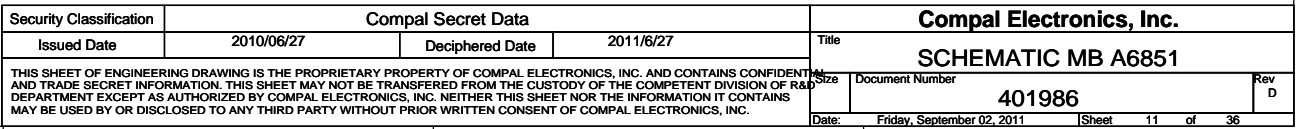
PORT	DEVICE
SRC0	CPU_DREFCLK
SRC2	CPU_EXP
SRC3	
SRC4	PCIE_SATA
SRC6	PCIE_WLAN
SRC7	
SRC8	
SRC9	PCIE_LAN
SRC10	PCIE_PCH
SRC11	PCIE_WWAN

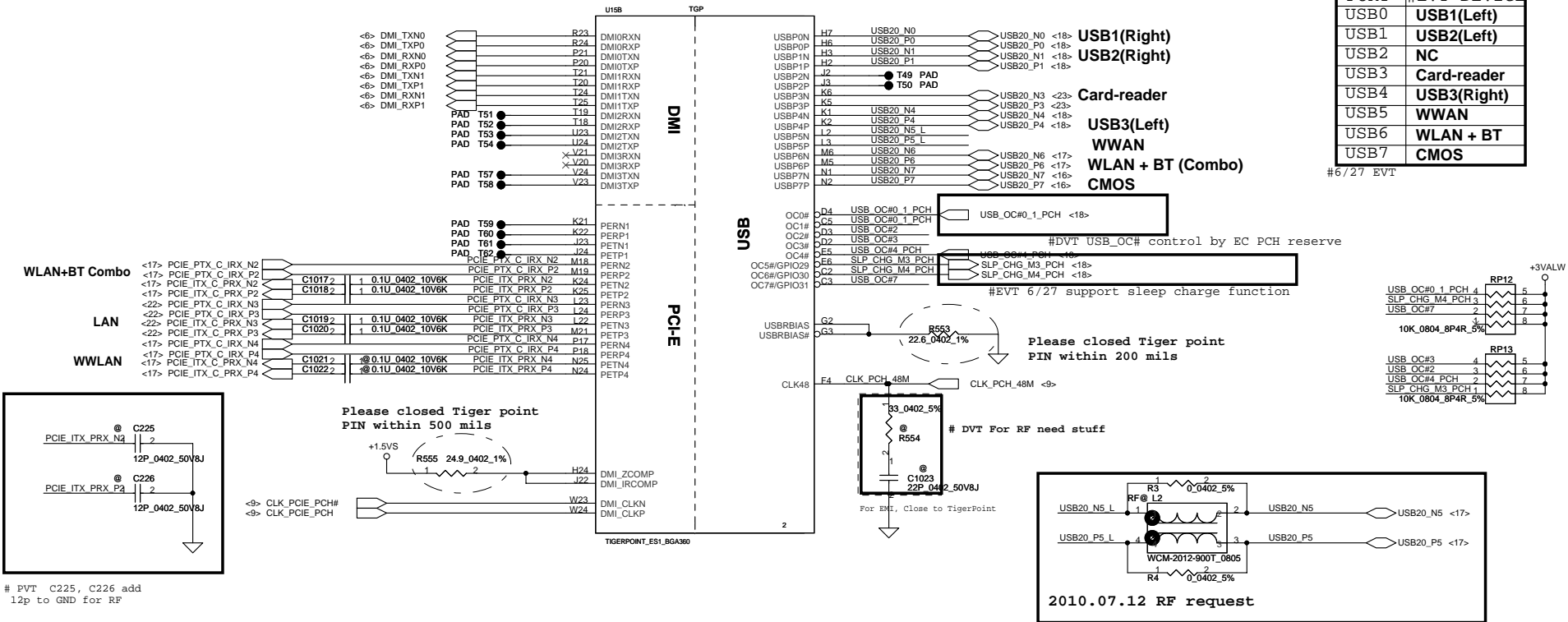
REQ PORT LIST

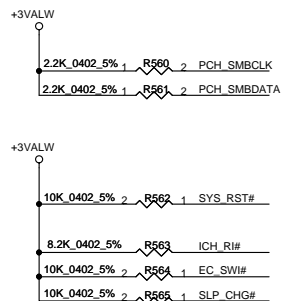
PORT	DEVICE
REQ_3#	
REQ_4#	
REQ_6#	PEIC_WLAN
REQ_7#	
REQ_9#	PCIE_LAN
REQ_10#	
REQ_11#	PEIC_WWAN
REQ_A#	



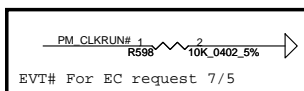
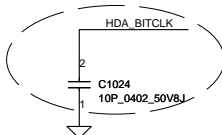
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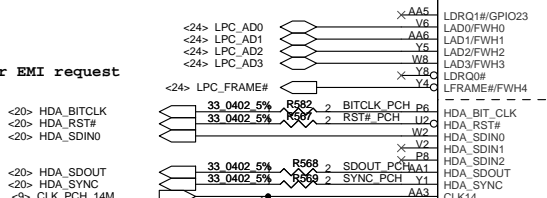
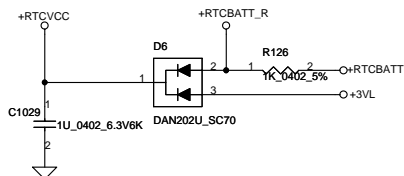
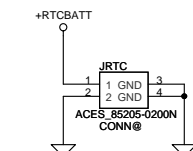
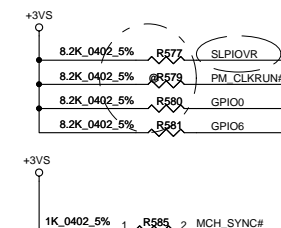
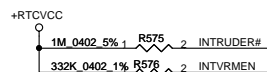
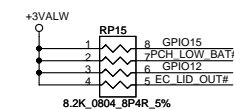
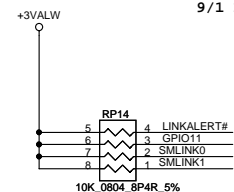


7/2 For EMI, Close to TigerPoint
9/1 C207 change to SE071100J80 for EMI request

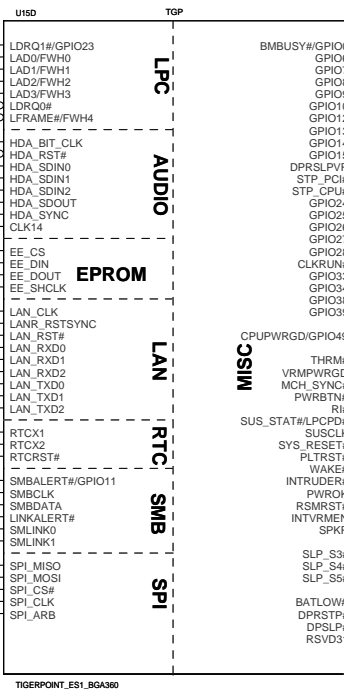
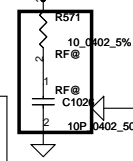


12/17 Add Pull high Resistor for GPIO14

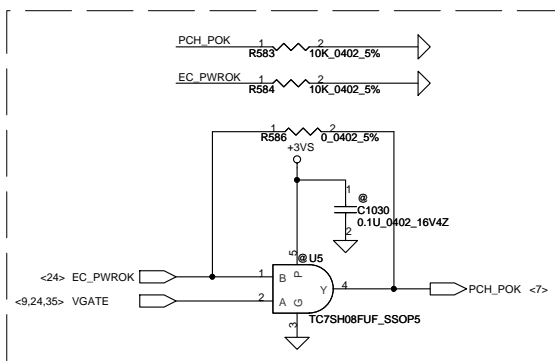
9/1 R125 change to SM010027780 for EMI request



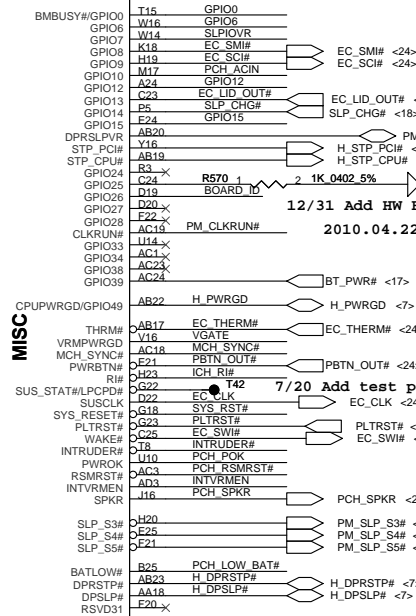
MP C1026 4.7P change to 10p for RF request



TIGERPOINT_ES1_BGA360

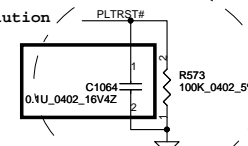


2010.03.22 Un-stuff U5 and C1030



12/31 Add HW Board ID function

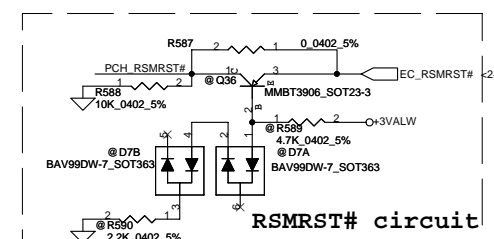
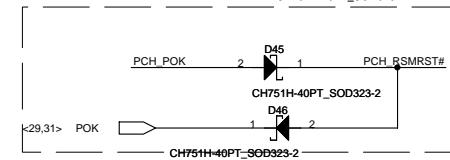
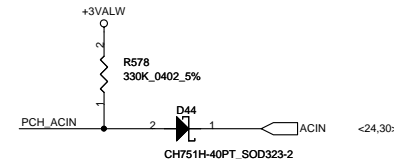
2010.04.22 Add C1064 for ESD solution



7/20 Add test point

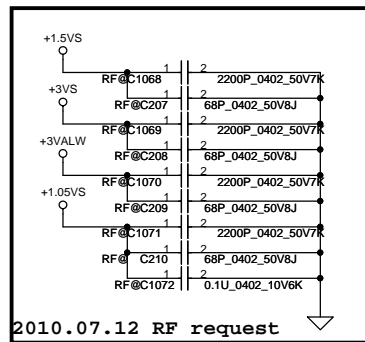
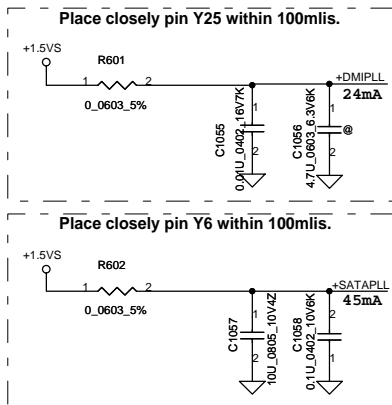
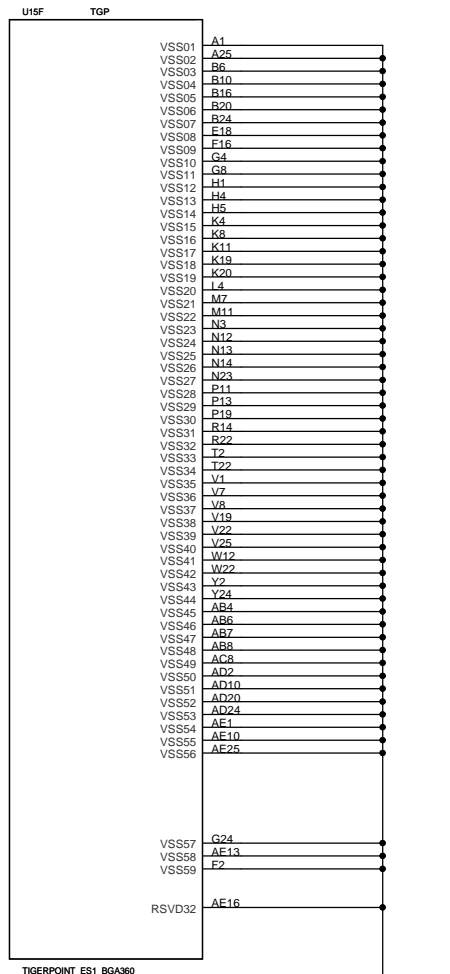
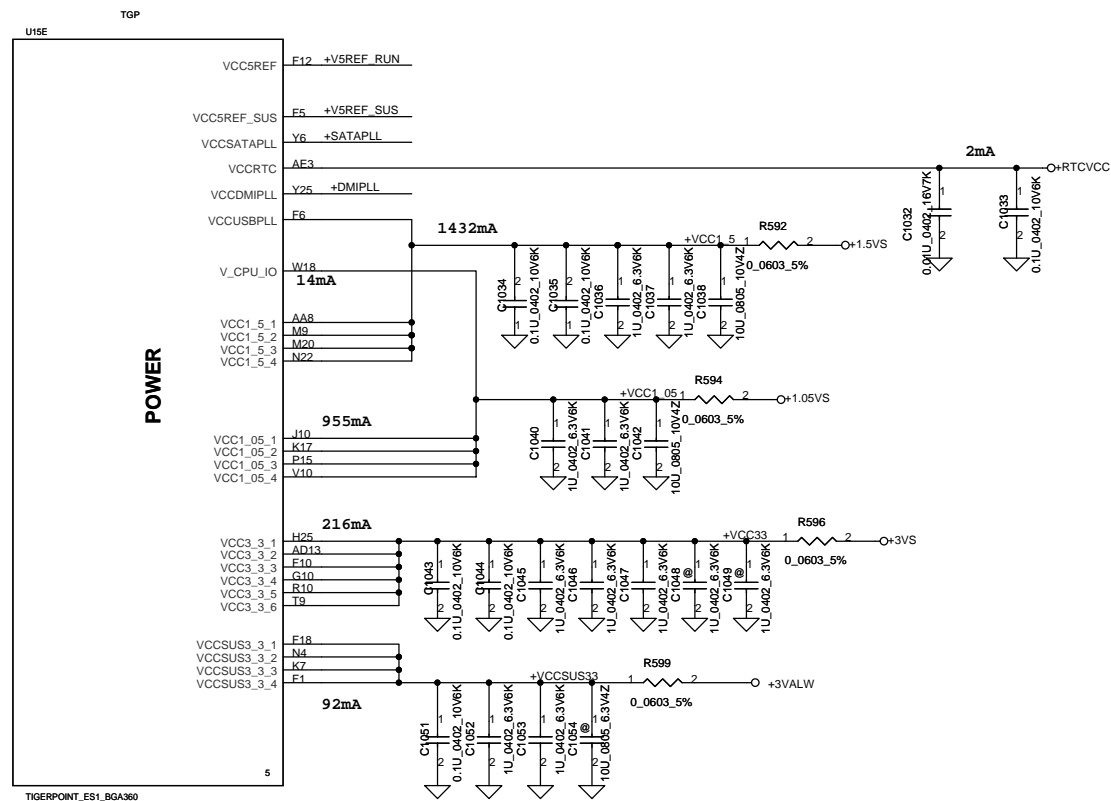
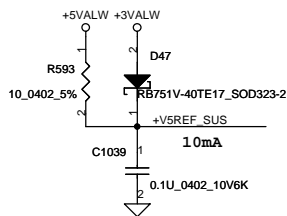
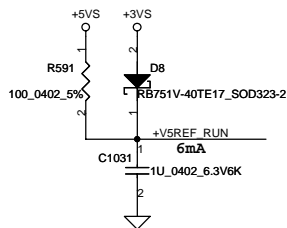
01/11 Reserve EC_CLK for KBC

8/24 Add R254 pull down for EC request



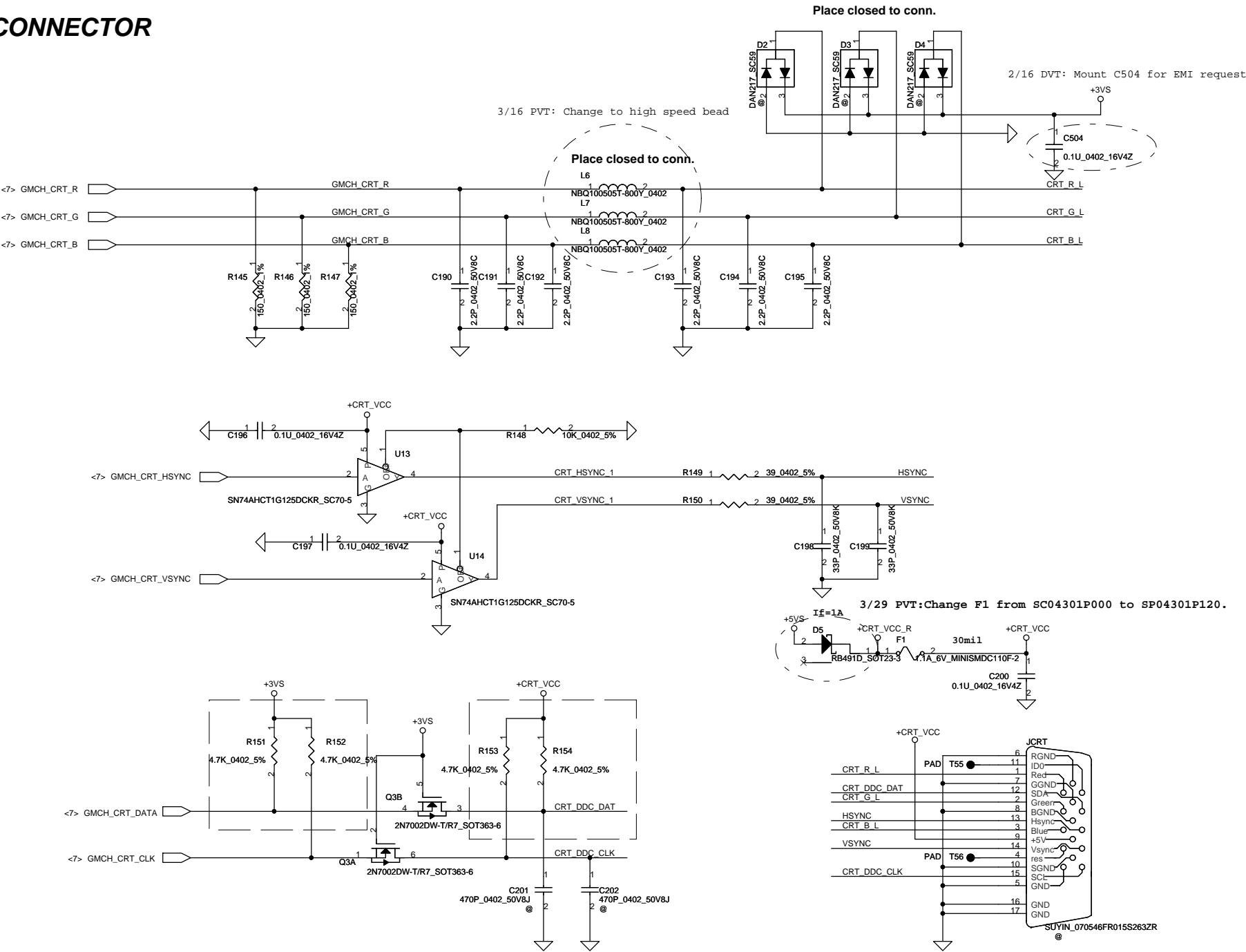
2010.03.22 Un-stuff RSMRST# circuit and use 0 ohm bypass

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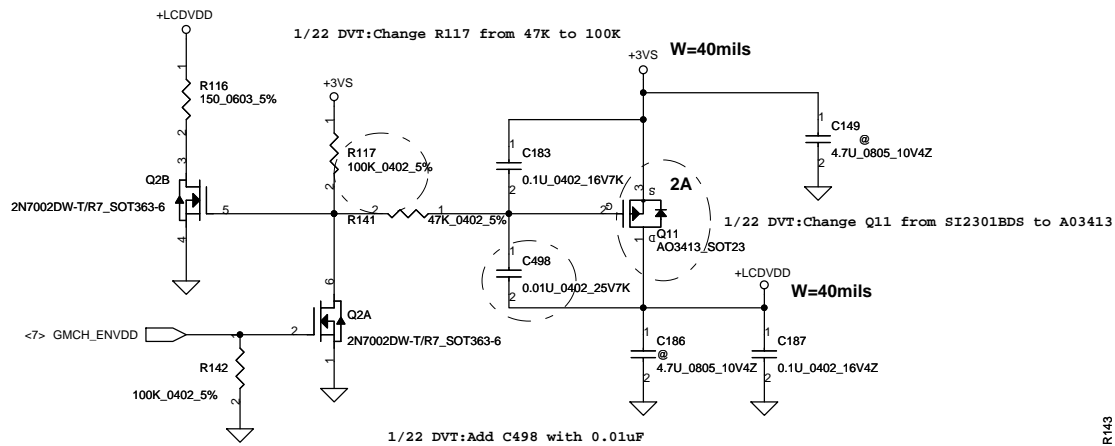
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CRT CONNECTOR

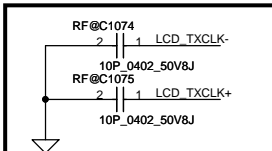
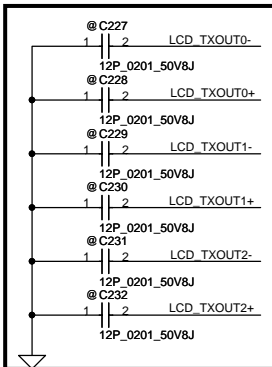


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LCD POWER CIRCUIT

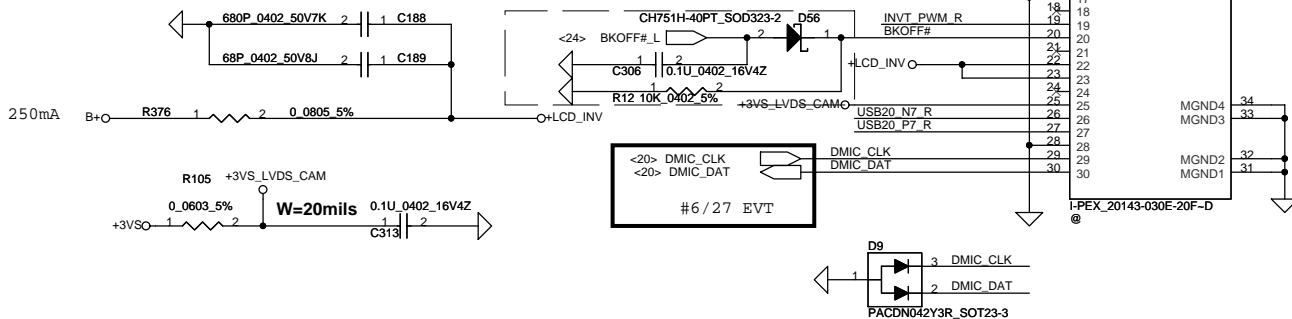


LED/PANEL BD. Conn.



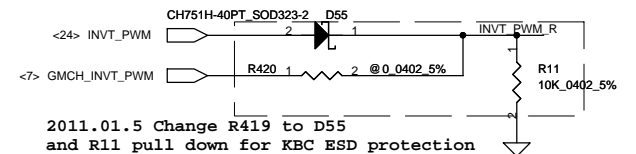
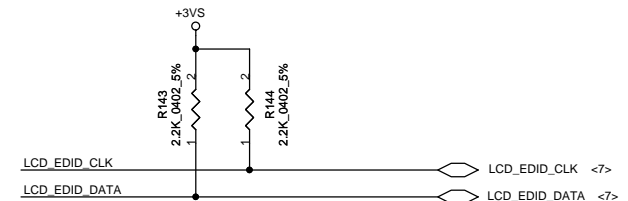
PVT Add C1074, C1075
10p and stuff for RF

2011.01.5 Change R421 to D56
and R12 pull down for KBC ESD protection

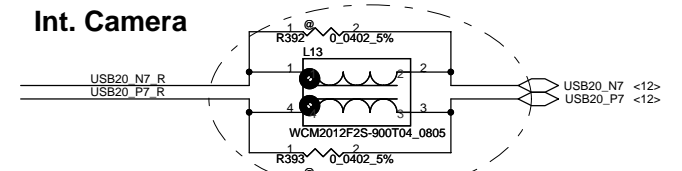


LCD_TXCLK+ C871 1 10P_0402_50V8J LCD_TXCLK-

2/25 PVT:Mount C871 with 10pF



Int. Camera

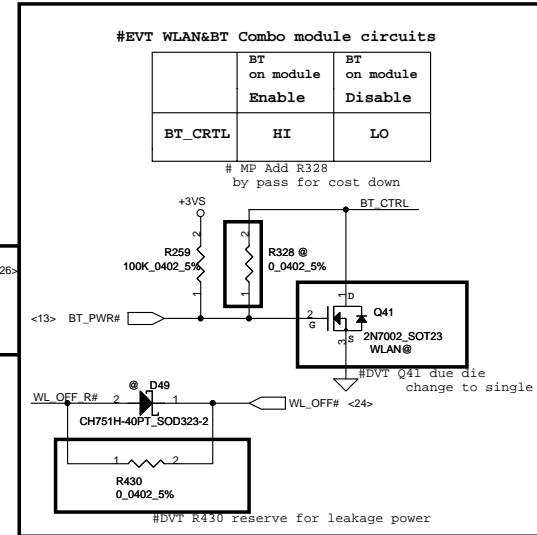
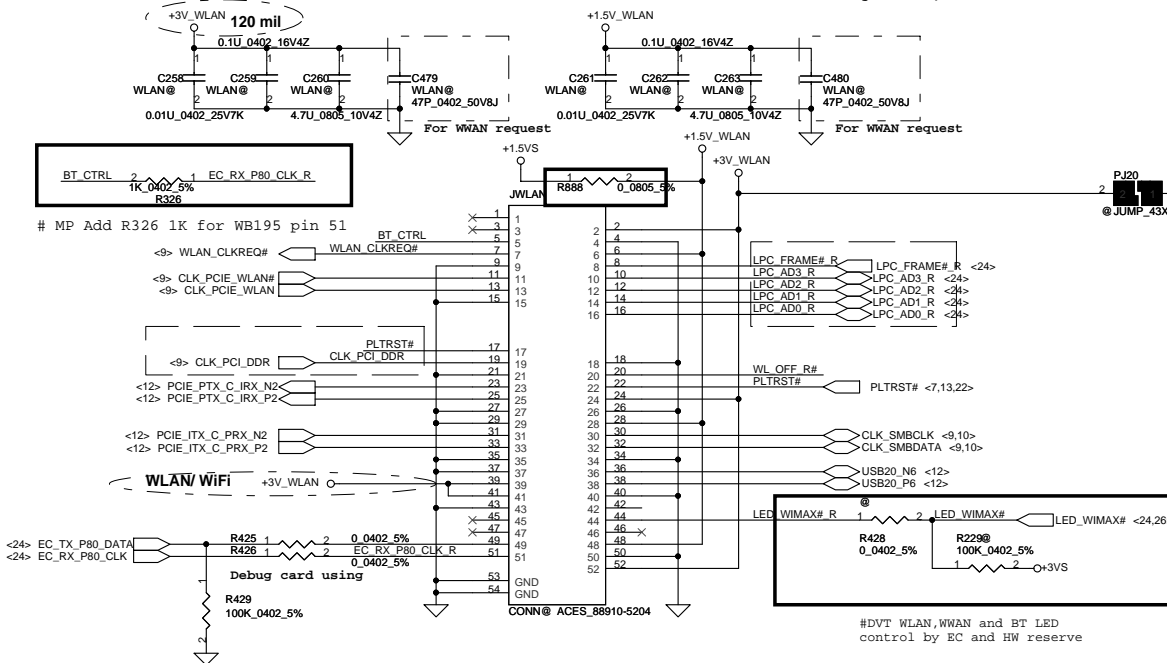


For EMI request

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Mini-Express Card for WLAN/WiMax

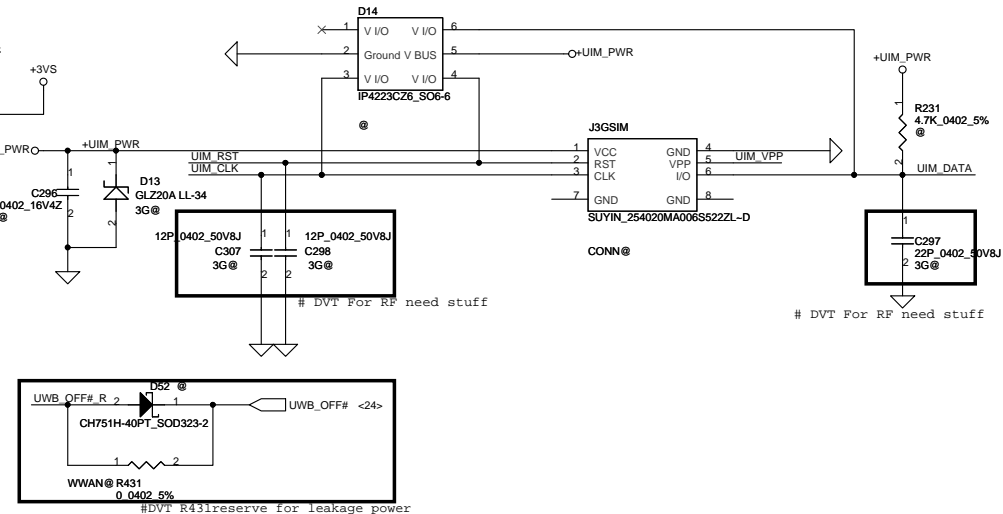
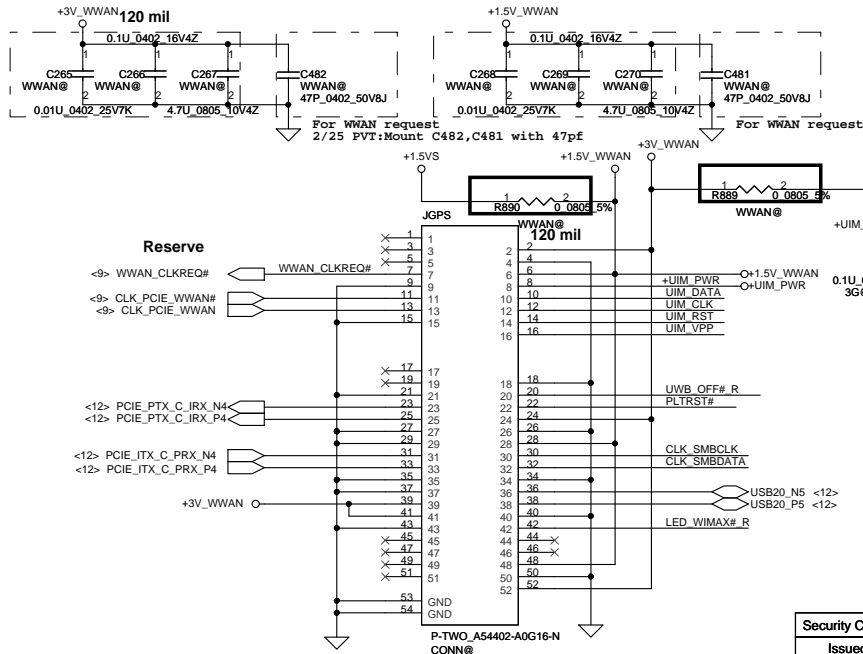
2/25 PVT:Mount C479,C480 with 47pf
3/16 PVT:Add BOM Config of C481,C482 to WLAN@



Mini-Express Card for 3G/GPS

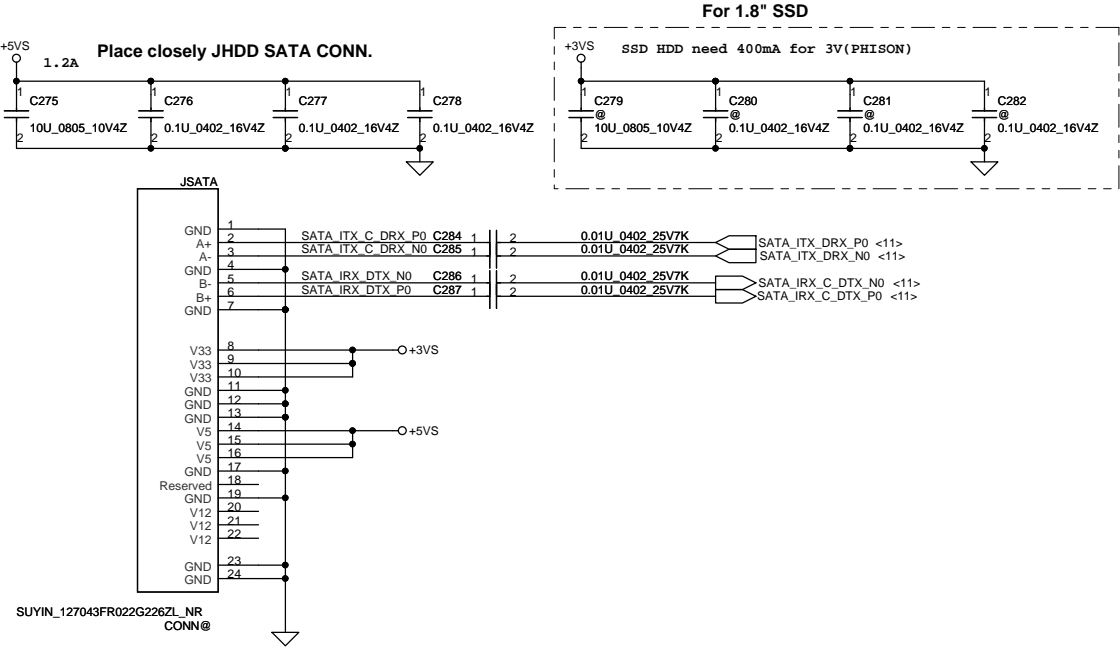
3G current need to 2750mA

3/16 PVT:Add BOM Config of C481,C482 to 3GGPS@



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SATA Conn.



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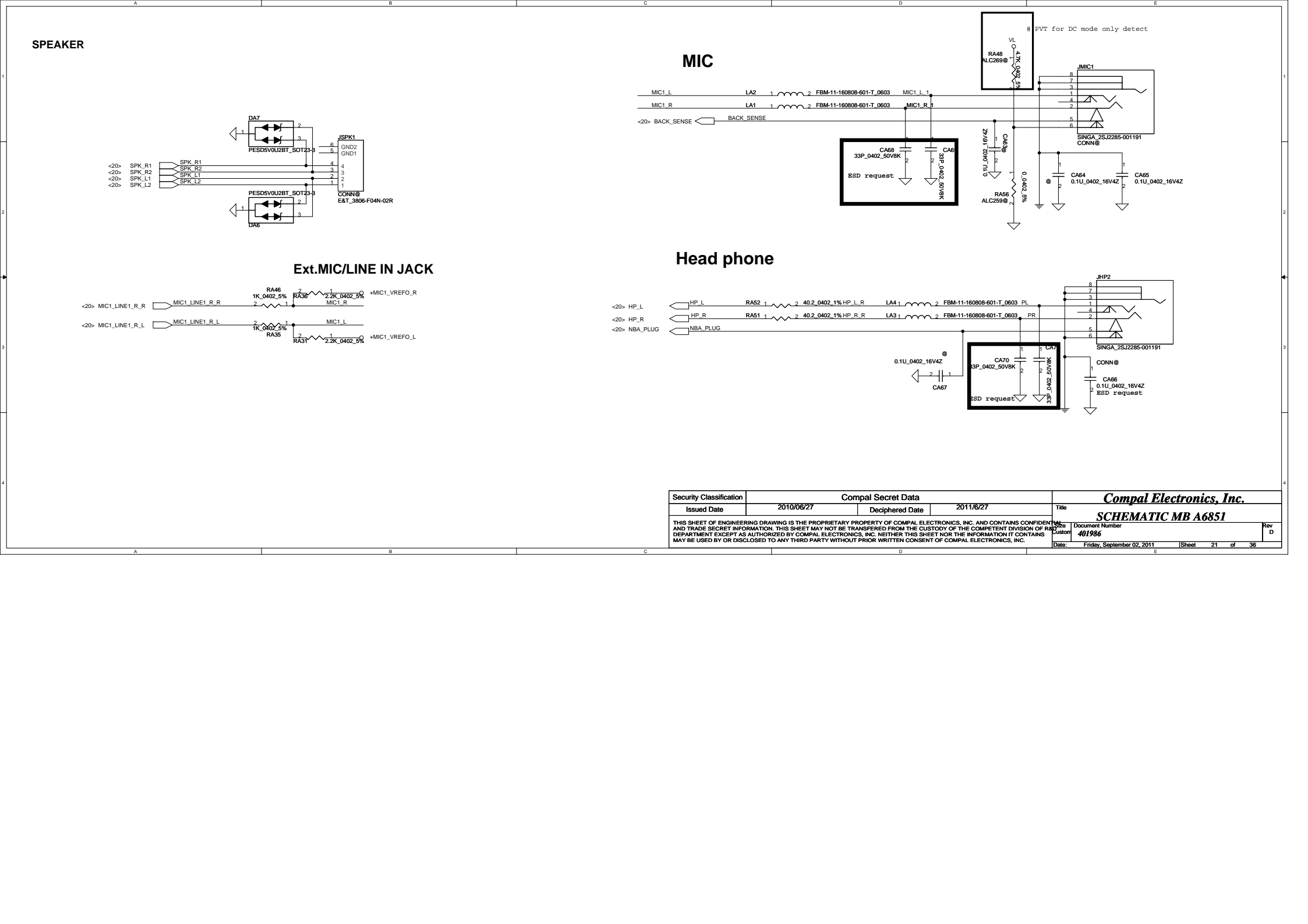
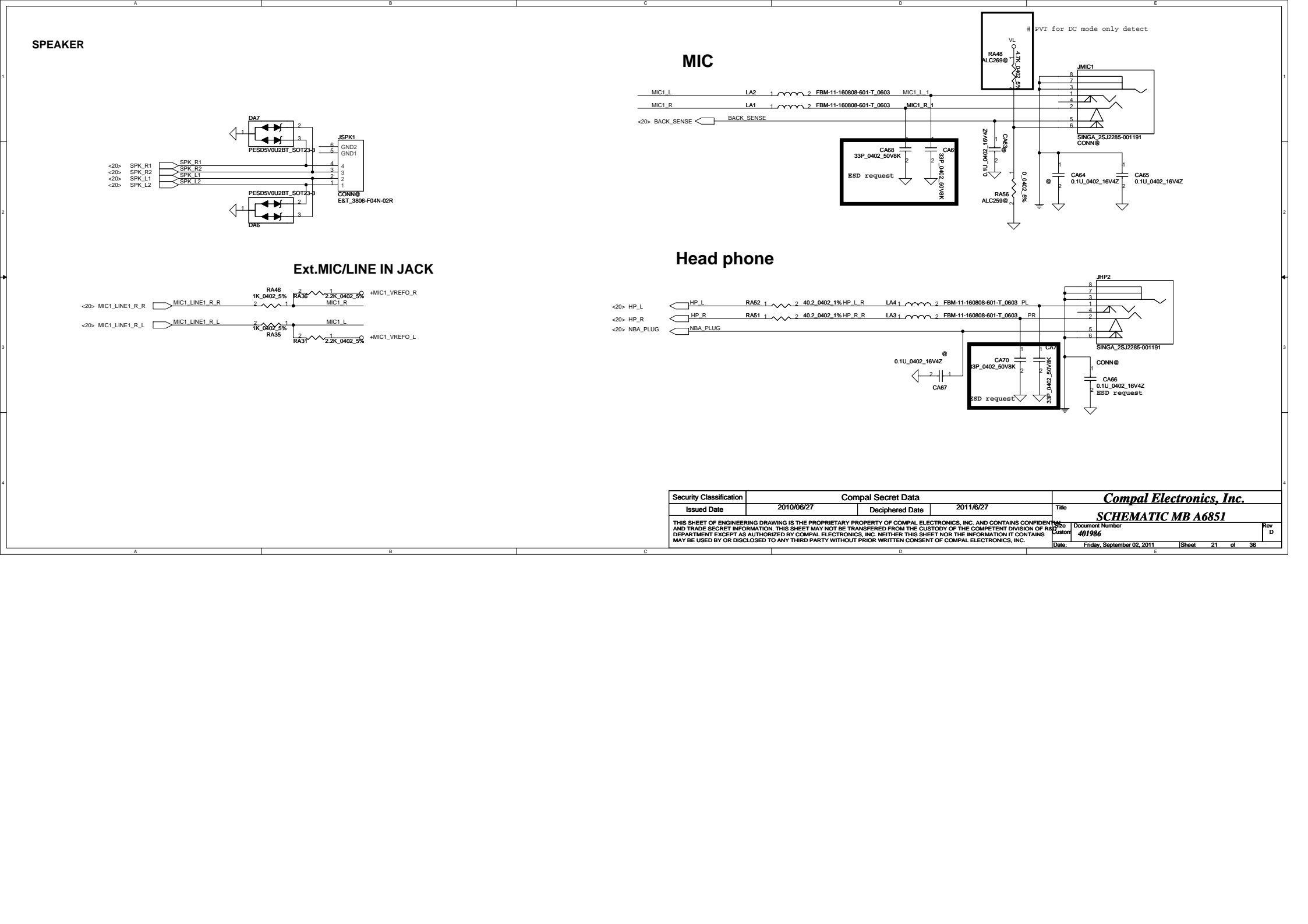
SPEAKER

Ext.MIC/LINE IN JACK

MIC

Head phone

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SPEAKER

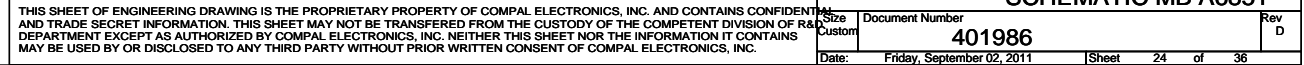
Ext.MIC/LINE IN JACK

MIC

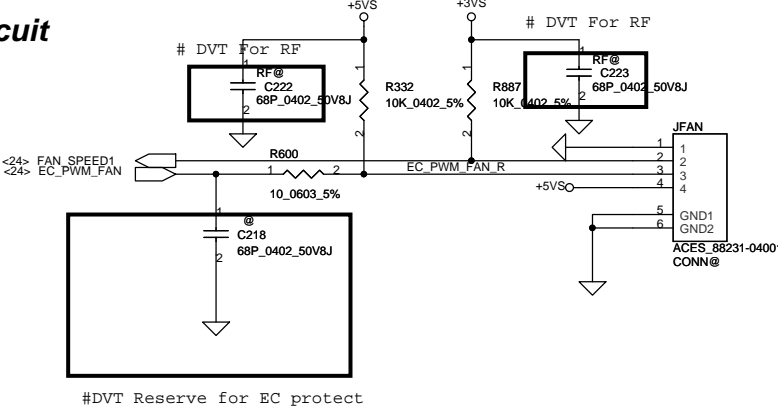
Head phone

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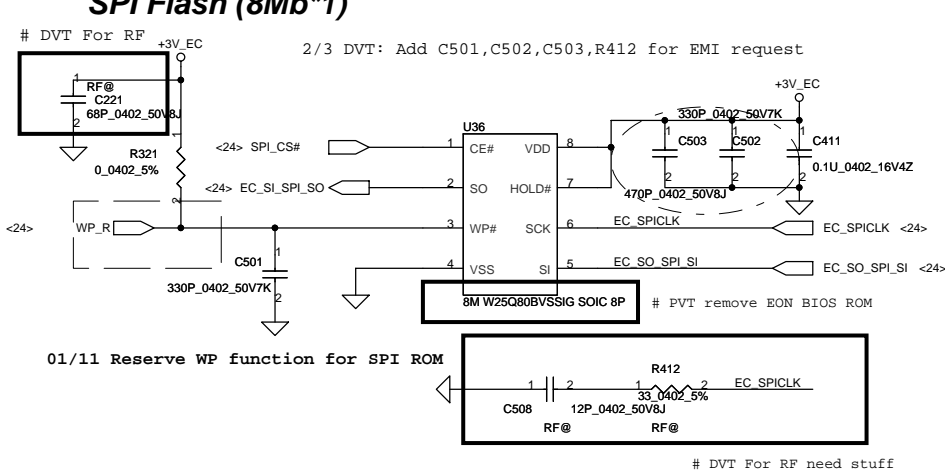
```
#DVT LAN connect pin definid change
# PVT Add pin 7 connect to LANGND
```

FAN Control Circuit

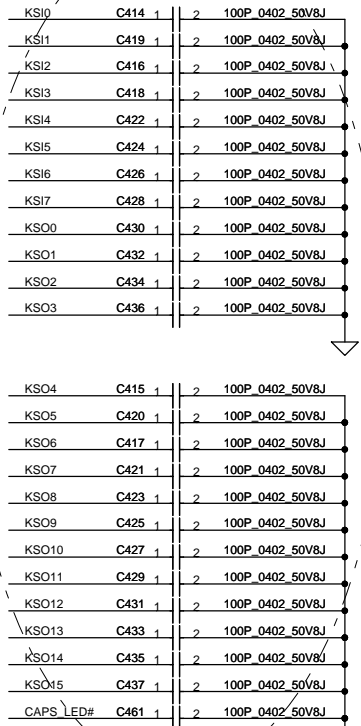
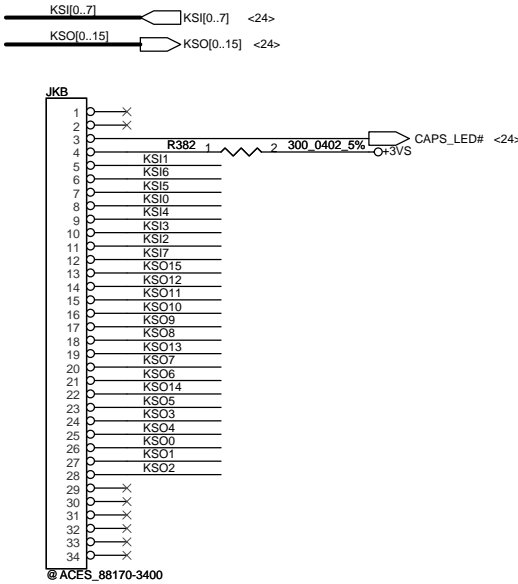


SPI Flash (8Mb*1)



LPC Debug Port

KEYBOARD
CONN.

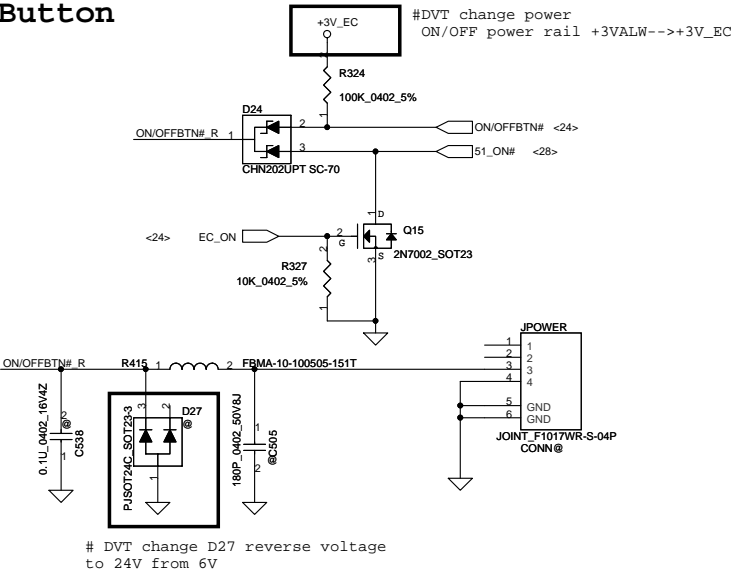


12/18 Follow KB Matrix the same to KSKAA

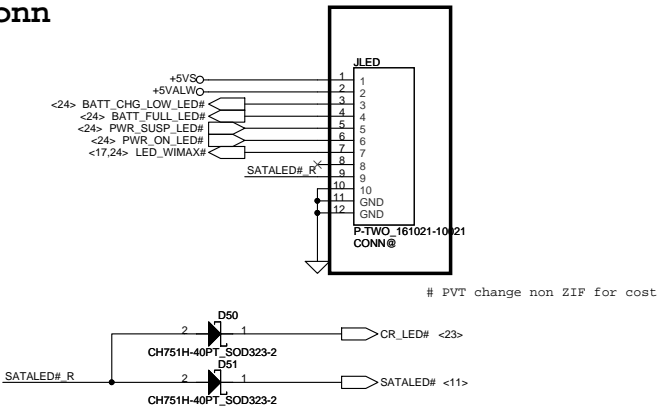
3/4 PVT:Mount C414~C437,C461 for EMI request

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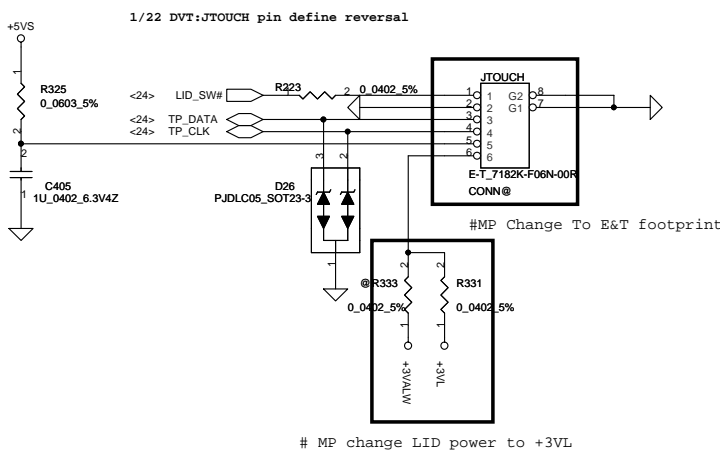
Power Button



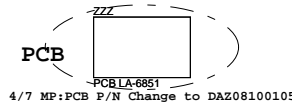
LED Conn



Touch/B Connector

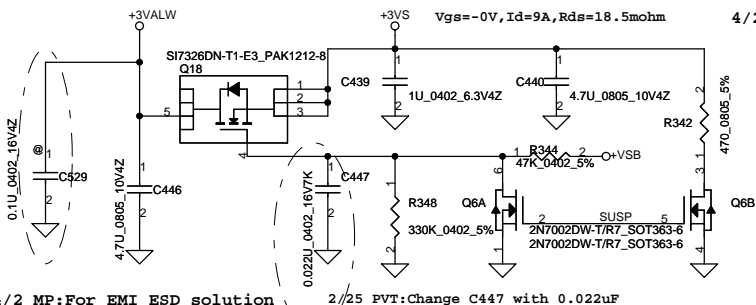


ISPD

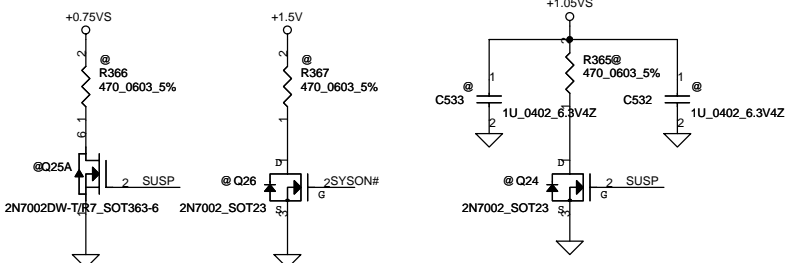
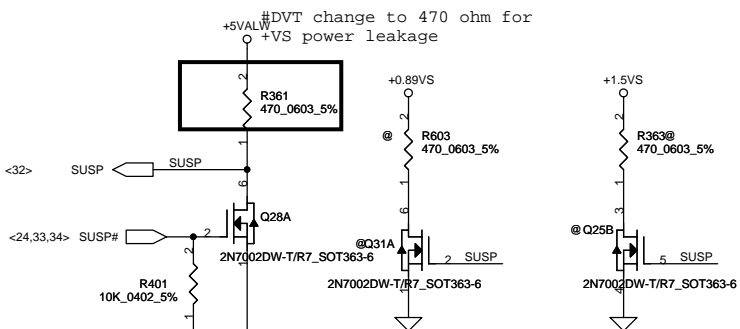
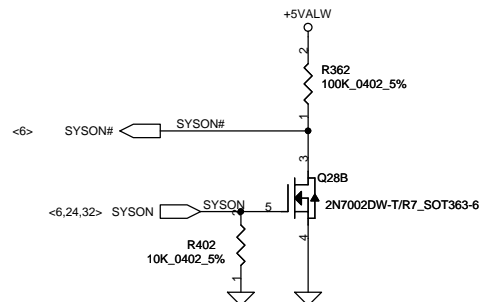
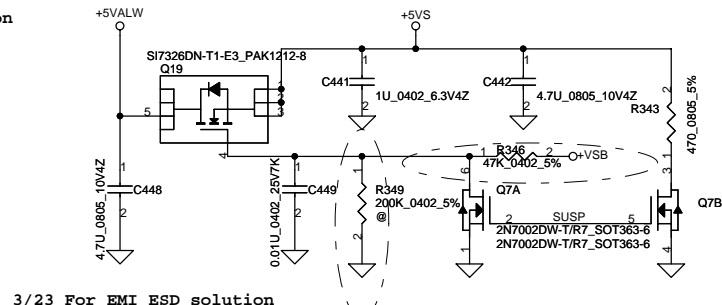


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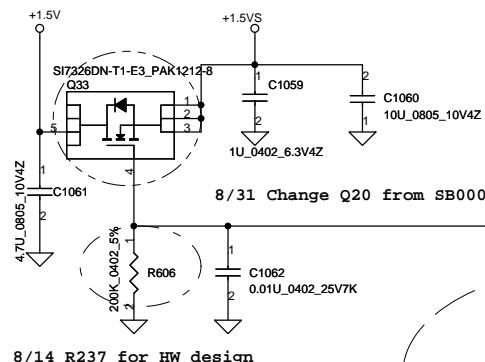
+3VALW TO +3VS



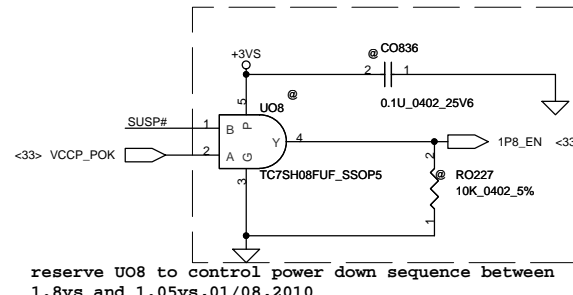
+5VALW TO +5VS



+1.5V TO +1.5VS

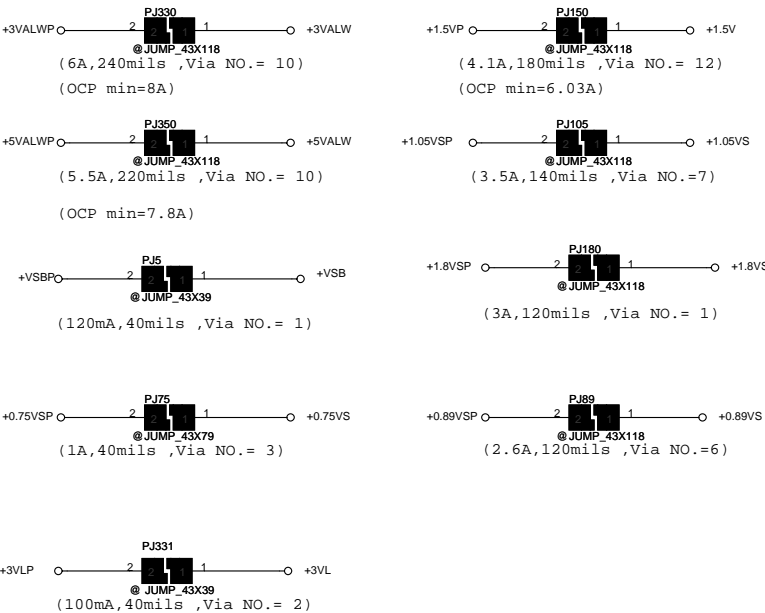
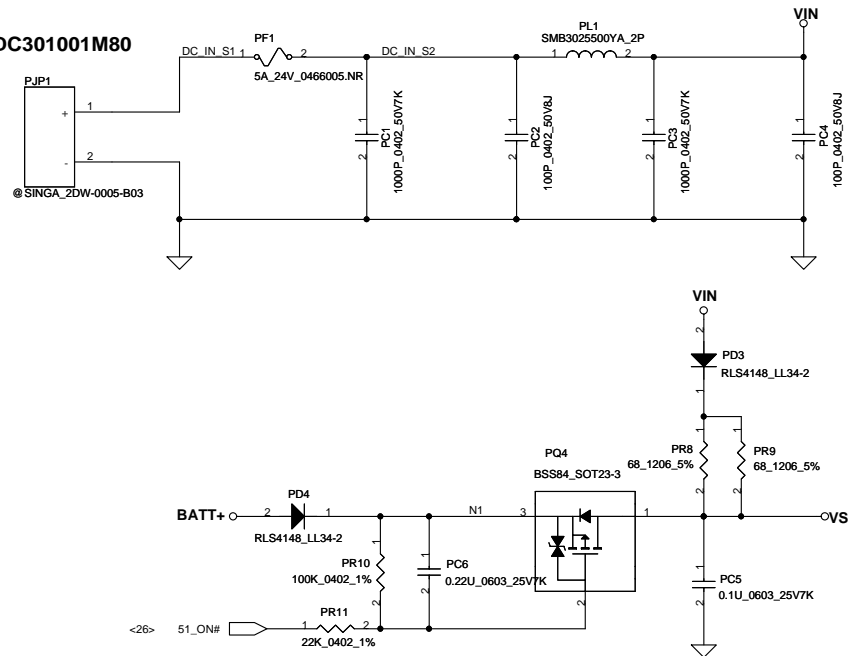


7/9 Add Q29, Q30, R228 for Intel power sequence

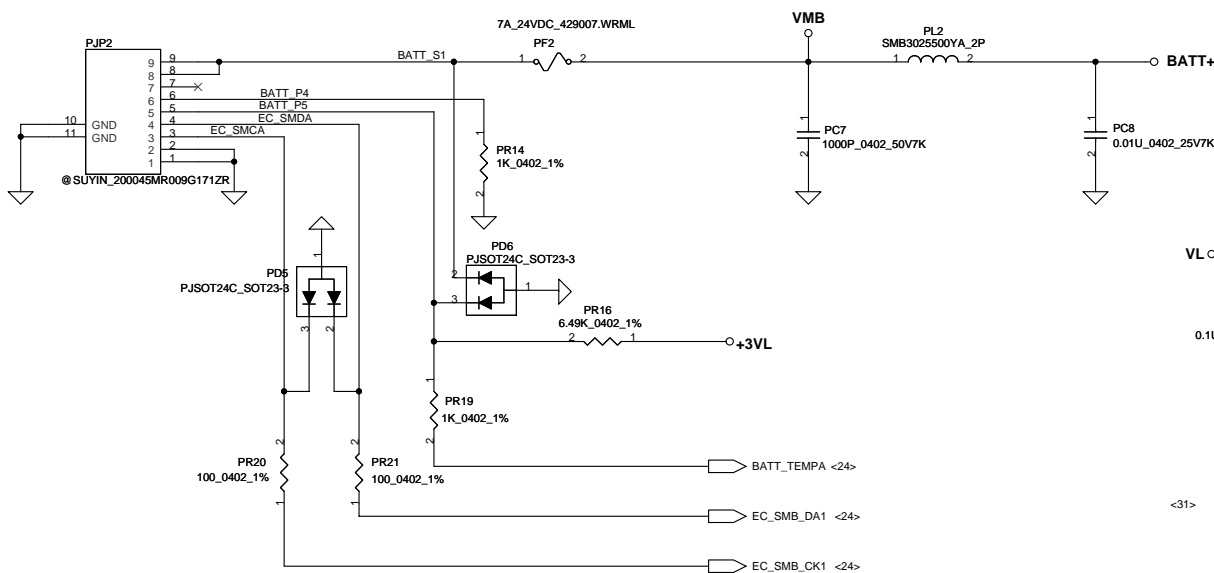


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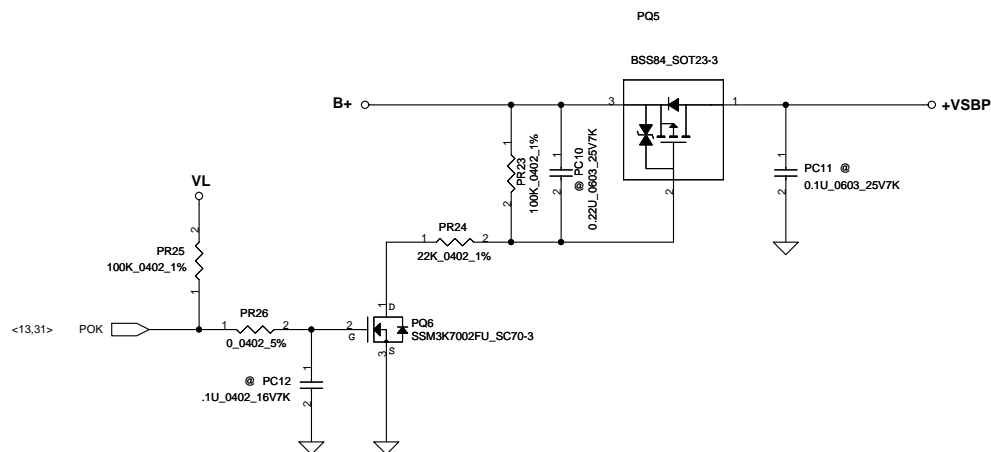
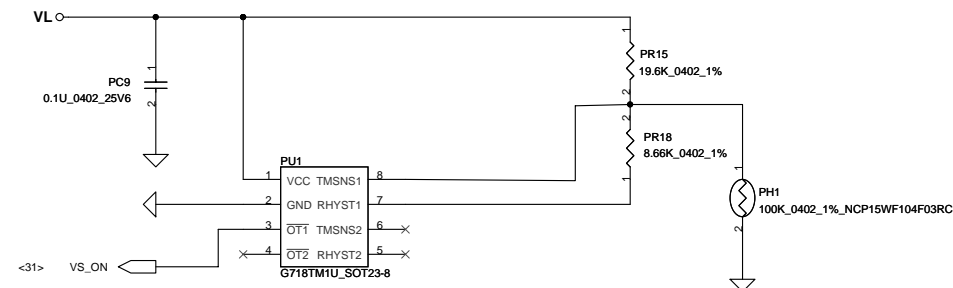
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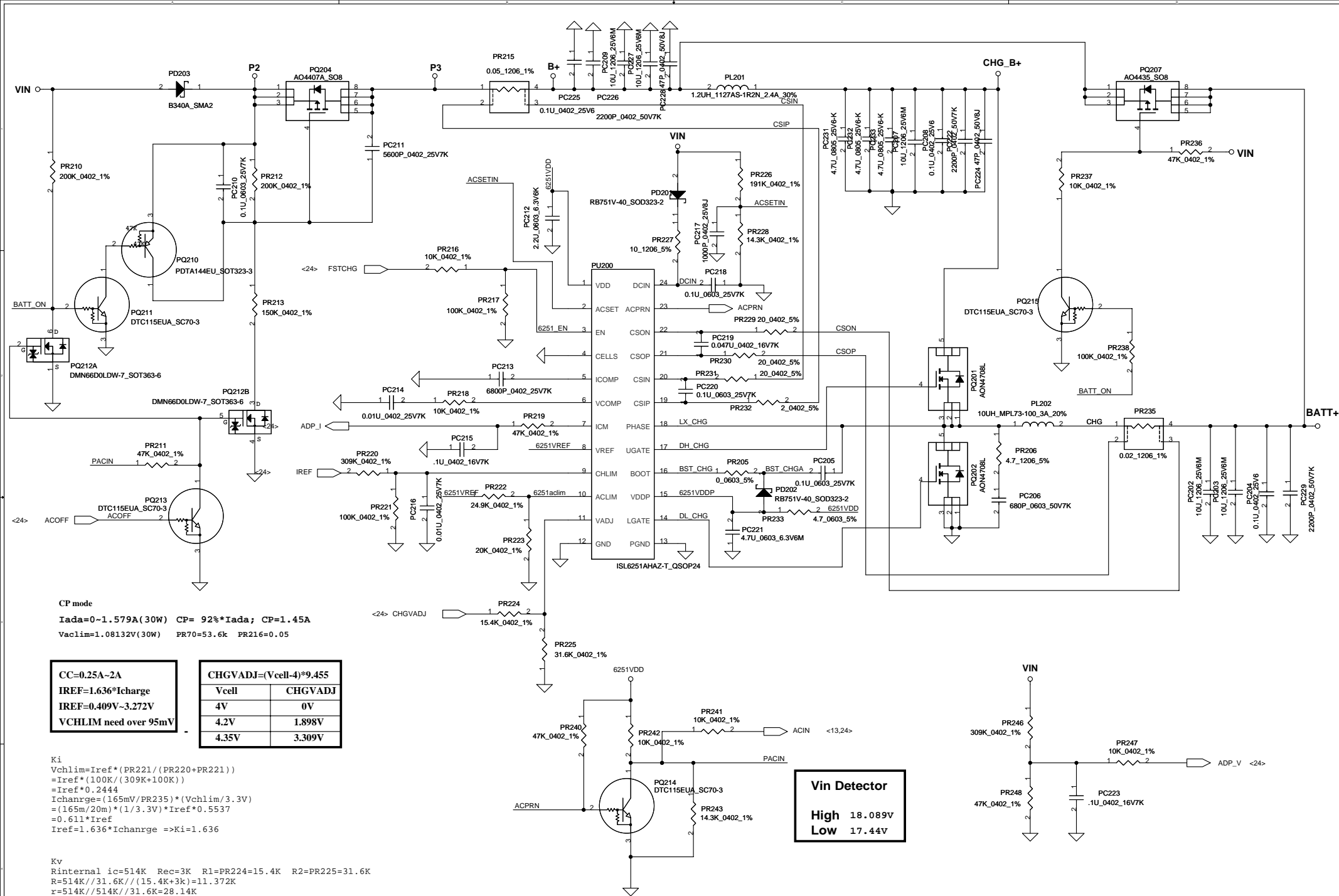
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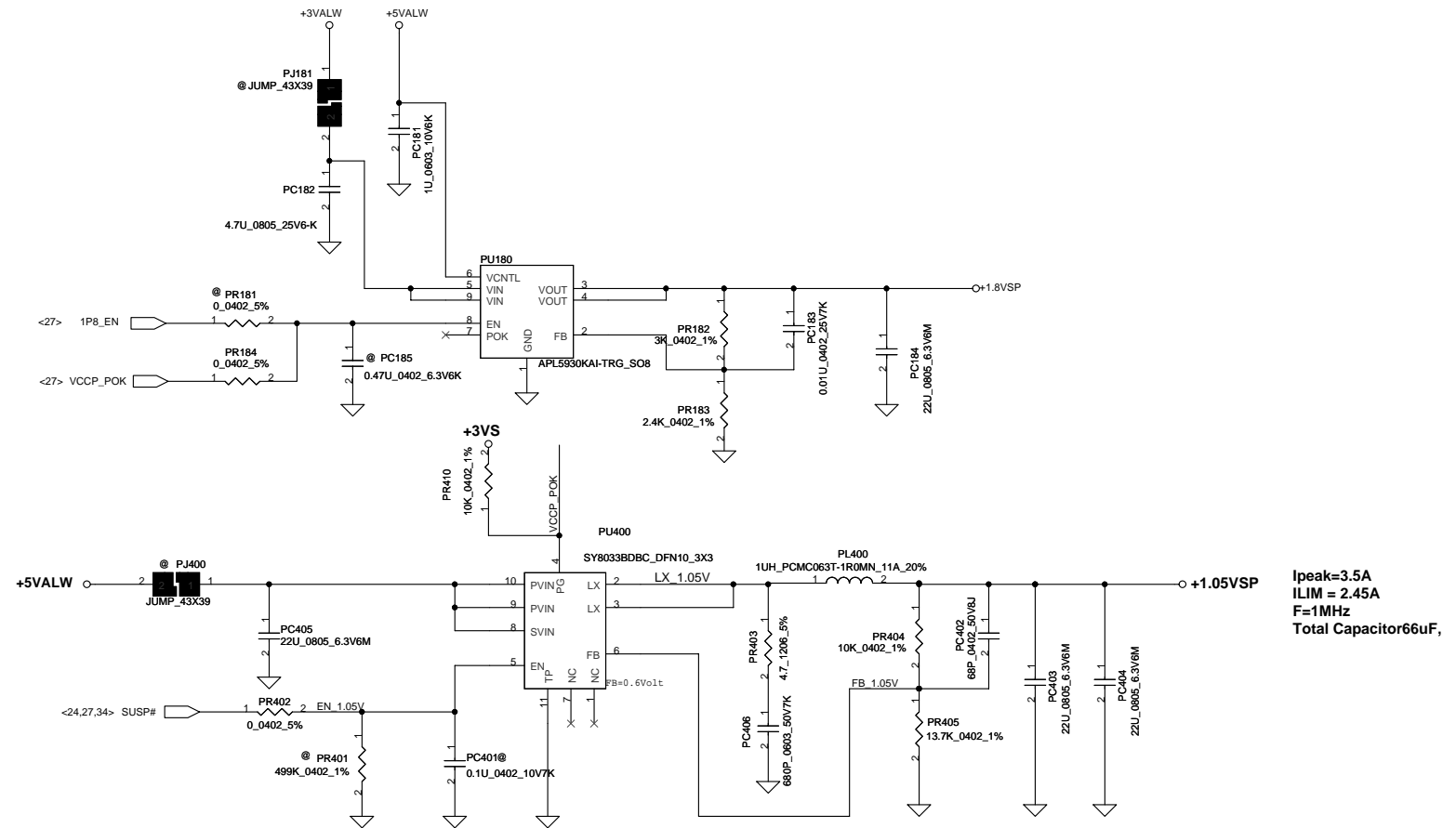


PH1 under CPU bottom side :
 CPU thermal protection at 95 degree C
 Recovery at 56 degree C

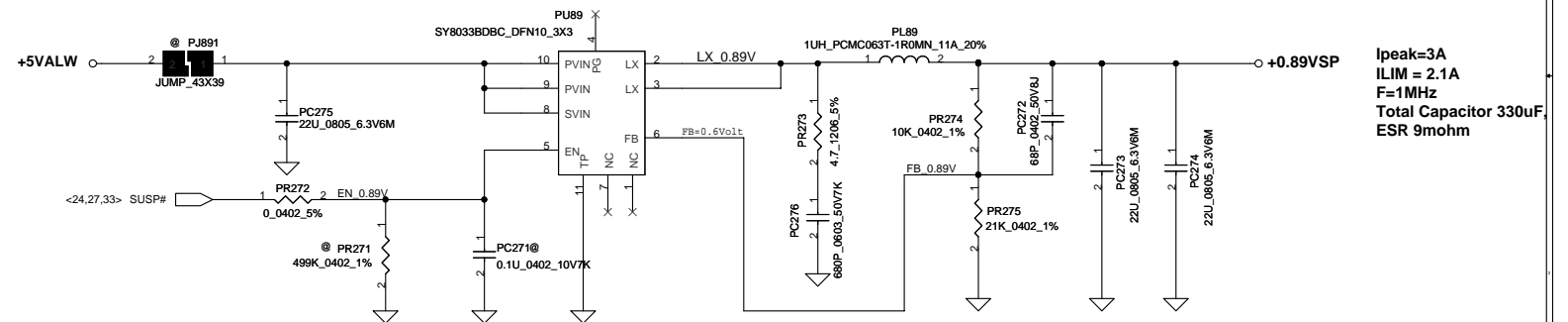


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I_{peak}=3A
 I_{LIM} = 2.1A
 F=1MHz
 Total Capacitor 330uF,
 ESR 9mohm

Pin 1 define same with Pin 2 & Pin 3 that just for SY8035 ,
 SY8035 is for 5A loading , let LX shape can bigger!!

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NO DATE	PAGE	MODIFICATION LIST	PURPOSE
2010/8/23(DVT)	P32 +1.5VP/+0.75VSP	Change PU75 UP7711(SA00003XI00) -->G2992(SA00000VE80)	UPI had patent issue
2010/8/23(DVT)	P30 Charger	Change PU200 G5209(SA00003TK00) -->ISL6251(SA00001EP80)	G5209 had leakage issue
2010/8/23(DVT)	P31 +5VALWP/+3VALWP	Change PU330 UP6182(SA000043H00) -->TI51125A(SA000020C80)	UPI had patent issue
2010/8/23(DVT)	P30 Charger	add PR247(SD034100280) PC223(SE076104K80) PR246(SD034309380) PR248(SD034470280)	Support SA ECO unit
2010/8/23(DVT)	P35 CPU_CORE	Change PR526 174K (SD034174380) -->124K(SD034124380)	debug CPU load issue
2010/8/23(DVT)	All snuber	Change PC273,PC274,PC275,PC403,PC404,PC405 22u(SE000008L80) -->PC273,PC274,PC275,PC403,PC404,PC405 22u(SE000000I10)	Chose the same material s
2010/8/23(DVT)	P30 Charger	Install PC222 PC224 0.1u (SE00000G880)	EMI commond
2010/8/23(DVT)	P30 Charger	Install PC227,PC209,PC207,PC208,PC204 10u (SE142106M80)	EMI commond
2010/8/23(DVT)	P35 CPU_CORE	Change PL500(SM01000BY00)-->(SM01000C000)	Chose the same material s
2010/8/23(DVT)	P31 +5VALWP/+3VALWP	Install PC371,PC369 0.1u (SE00000G880)	RF commond
2010/8/23(DVT)	P31 +5VALWP/+3VALWP	Install PC367 2200P(SE074222K80)	RF commond
2010/8/23(DVT)	P32 +1.5VP	Install PC165 2200P(SE074222K80)	RF commond
2010/8/23(DVT)	P32 +1.5VP	Install PC169,PC168,PC167 0.1u(SE00000G880)	RF commond
2010/8/23(DVT)	P35 CPU_CORE	add PC518 (SE071101J80)	debug CPU VR-ON issue
2010/9/21(PVT)	P30 Charger	Install PC225 PC208PC204 (0.1u) , PC226 PC222 PC229(2200P) Add PC208 add PC228 PC224 (47P),install snubber PR206,PC206	RF commond
2010/9/21(PVT)	P31 +5VALWP/+3VALWP	Add PC372 PC374(0.1u) , PC375(47P) PC371 (2200P)	RF commond
2010/9/21(PVT)	P32 +1.5VP	Add PC170(2200P) install snubber PR156 PC156	RF commond
2010/10/8(pre-MP)	P30 Charger	Change PL210 to 1.2u (SH00000B100)	EMI commond
2010/10/08(Pre-MP)	P31 +5VALWP/+3VALWP	Change PC332 & PC352 to ESR 45 m ohm	cost down plane
2010/10/08(Pre-MP)	P32 +1.5VP	Change PC152 to ESR 35 m ohm	cost down plane
<div> <div> <div>Security Classification</div> <div>Compal Secret Data</div> </div> <div> <div> <div>Issued Date</div> <div>2009/10/02</div> </div> <div> <div>Deciphered Date</div> <div>2010/10/02</div> </div> </div> <div> <div> <div>THIS SHEET OF ENGINEERING DRAWING IS THE PROPRIETARY PROPERTY OF COMPAL ELECTRONICS, INC. AND CONTAINS CONFIDENTIAL AND TRADE SECRET INFORMATION. THIS SHEET MAY NOT BE TRANSFERRED FROM THE CUSTODY OF THE COMPETENT DIVISION OF R&D DEPARTMENT EXCEPT AS AUTHORIZED BY COMPAL ELECTRONICS, INC. NEITHER THIS SHEET NOR THE INFORMATION IT CONTAINS MAY BE USED BY OR DISCLOSED TO ANY THIRD PARTY WITHOUT PRIOR WRITTEN CONSENT OF COMPAL ELECTRONICS, INC.</div> <div> <div>Size</div> <div>Document Number</div> <div>401986</div> <div>Rev D</div> </div> </div> </div> <div> <div>Title</div> <div> <div>Compal Electronics, Inc.</div> <div>SCHEMATIC MB A6851</div> </div> </div> <div> <div>Date:</div> <div>Friday, September 02, 2011</div> <div>Sheet</div> <div>44</div> <div>of</div> <div>36</div> </div> </div>			