

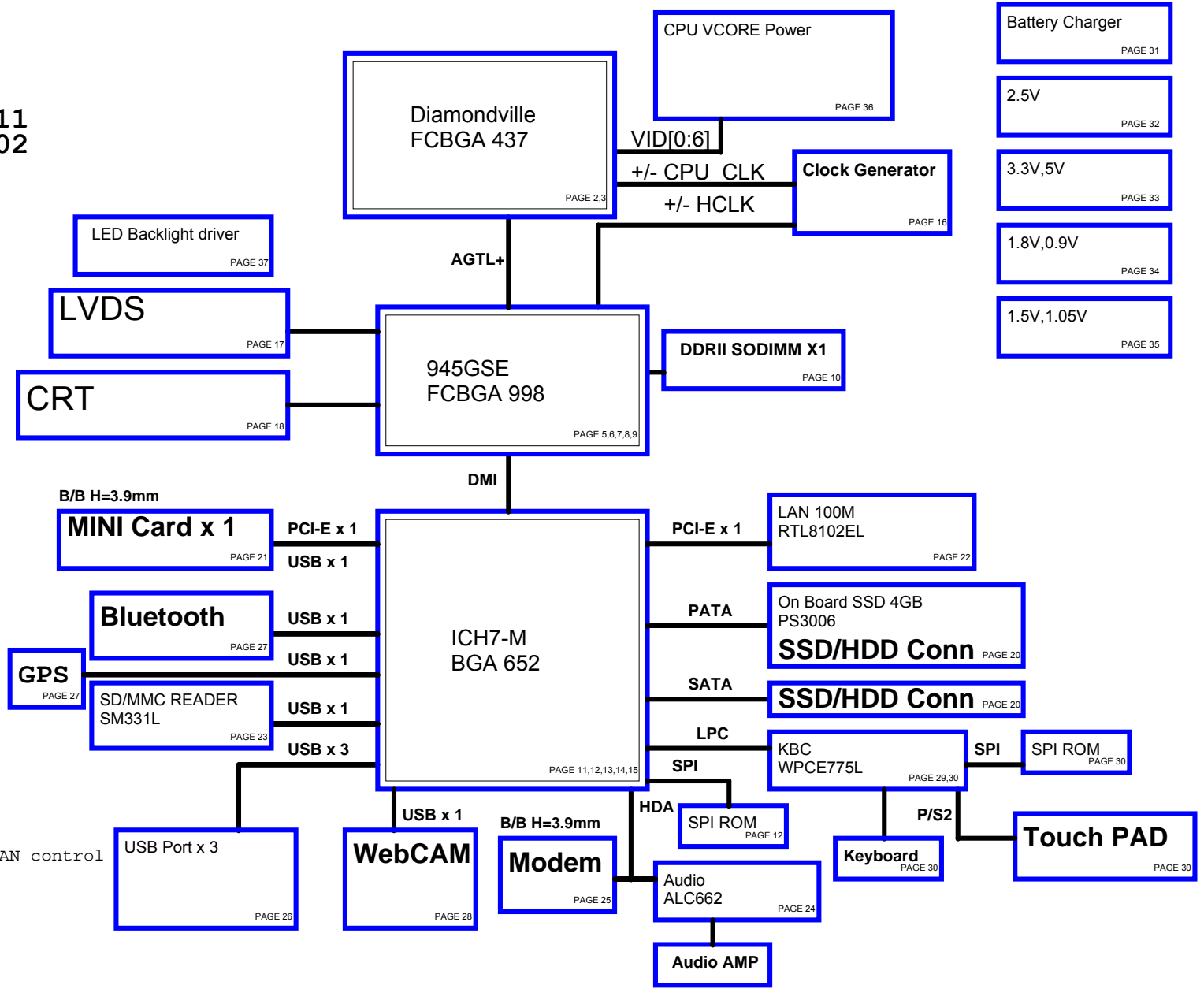
MiTAC INTERNATIONAL Corp.

Rivendell_MB

Rev. R0B

Project Code: D221
PCBA P/N : 411779600011
PCB P/N : 316779600002

- 01-Index and Block diagram
- 02-Diamondville(1/2)
- 03-Diamondville(2/2)
- 04-XDP, THERMAL SENSOR
- 05-945GSE(1/5)
- 06-945GSE(2/5)
- 07-945GSE(3/5)
- 08-945GSE(4/5)
- 09-945GSE(5/5)
- 10-DDR2 SO-DIMM Connector
- 11-ICH7M(1/5)
- 12-ICH7M(2/5)
- 13-ICH7M(3/5)
- 14-ICH7M(4/5)
- 15-ICH7M(5/5)
- 16-CK505
- 17-LVDS Connector
- 18-CRT Connector
- 19-Discharge
- 20-SSD/HDD
- 21-Mini_card(WiFi)
- 22-LAN(RTL8102EL)
- 23-SD/MMC Reader(SM331L)
- 24-Audio(ALC662)
- 25-MDC(Modem)
- 26-USB x 3
- 27-Bluetooth Connector/GPS connector
- 28-WebCAM Connector
- 29-KBC(1/2)
- 30-KBC(2/2)
- 31-D/VMAN, Battery Charger
- 32-2.5V(APU8831)
- 33-3.3V, 5V(MAX 17020)
- 34-1.8V, 0.9V(SC486)
- 35-1.05V, 1.5V(ISL6227)
- 36-CPU_VCORE(MAX8796)
- 37-LED Backlight driver(ACT6358) & FAN control
- 38-LPC PORT80 DEBUG CARD
- 39-Power Sequence-1
- 40-Power Sequence-2
- 41-Power distribution
- 41-Design chang note

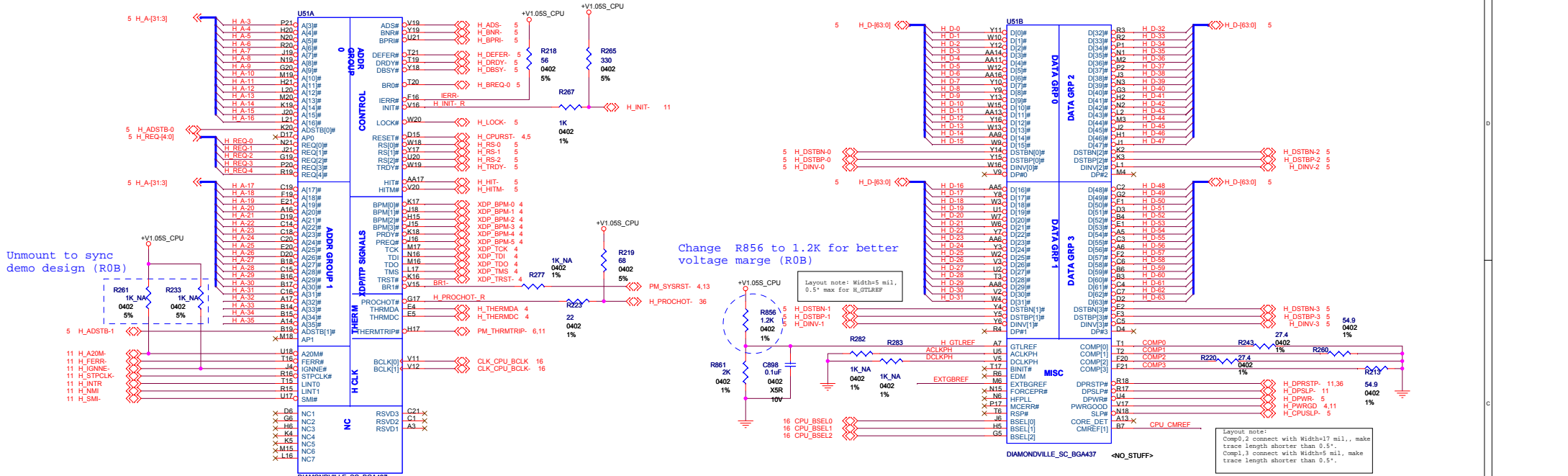


DESIGN	CHECK	APPROVE
Johnney	Johnney	Benny

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Title: Index and Block diagram		
Size: c	Document Number: Rivendell	Rev: R0B
Date: Monday, June 16, 2008 Sheet 1 of 42		

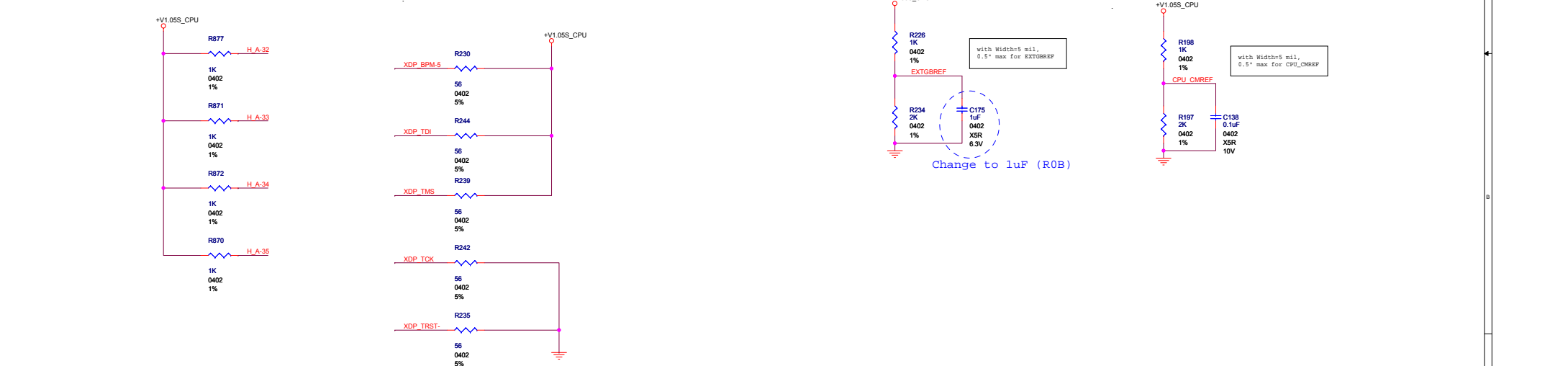


Unmount to sync demo design (R0B)

Change R856 to 1.2K for better voltage margin (R0B)

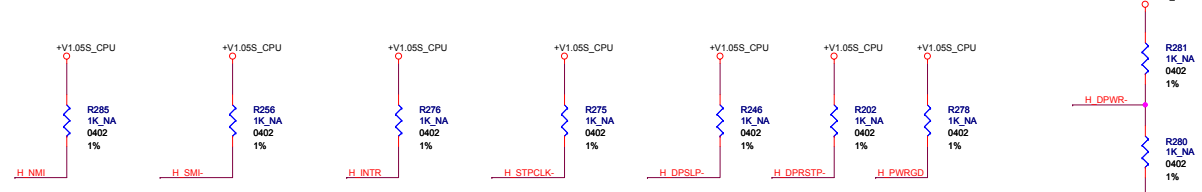
Layout note: Width=5 mil, 0.5" max for H_GTLREF

Layout note: Comp0,2 connect with Width=17 mil, make trace length shorter than 0.5". Comp1,3 connect with Width=5 mil, make trace length shorter than 0.5".



Change to 1uF (R0B)

For defensive design reservation only in this initial release



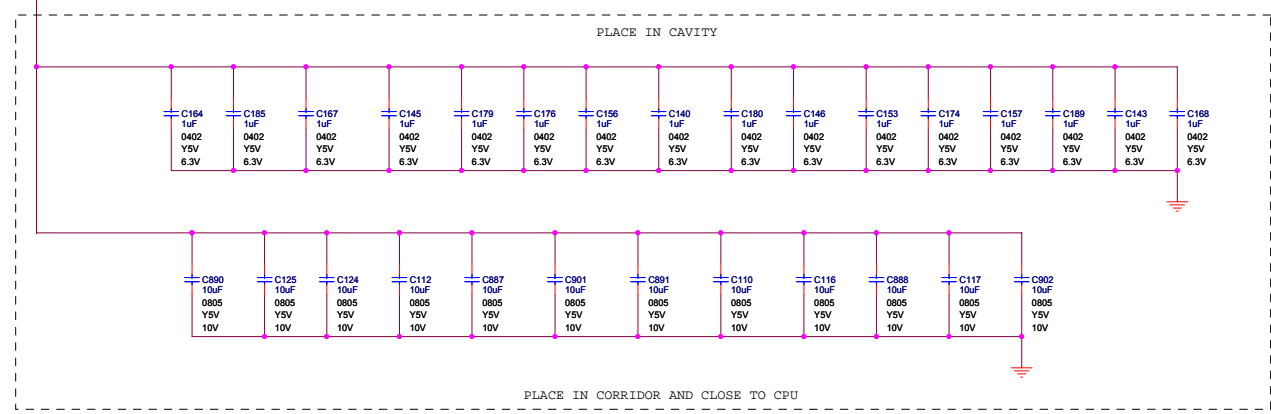
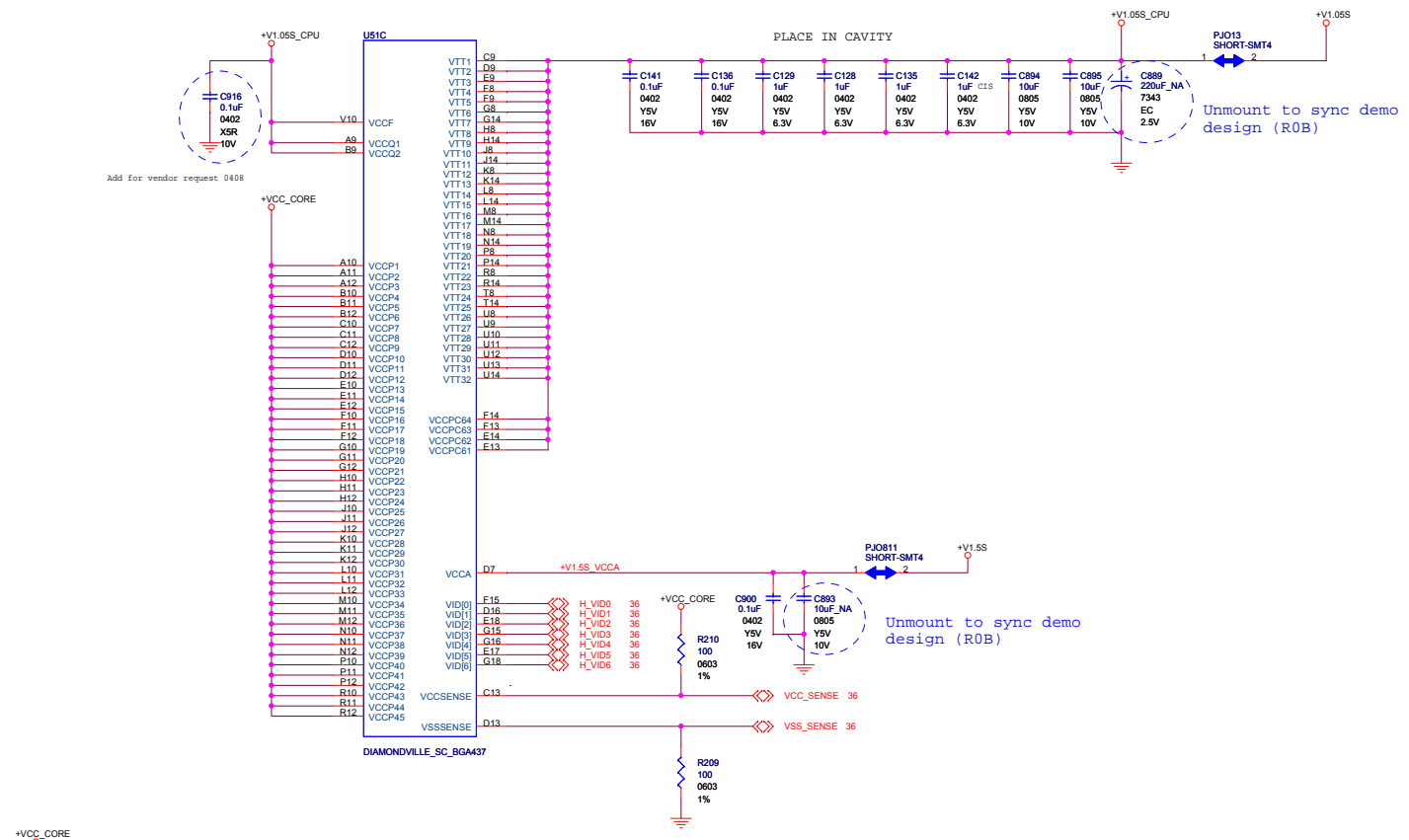
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Title: **Diamondville(1/2)**

Size: Document Number **Rivendell** Rev: R0B

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U51D		
A2	VSS1	VSS162
A4	VSS2	VSS161
A6	VSS4	VSS160
A15	VSS5	VSS159
A18	VSS6	VSS158
A19	VSS7	VSS157
A20	VSS8	VSS156
B1	VSS9	VSS155
B2	VSS10	VSS154
B5	VSS11	VSS153
B8	VSS12	VSS152
B13	VSS13	VSS151
B20	VSS14	VSS150
B21	VSS16	VSS149
C8	VSS16	VSS148
C17	VSS17	VSS147
D1	VSS18	VSS146
D5	VSS19	VSS145
D8	VSS20	VSS144
D14	VSS21	VSS143
D21	VSS22	VSS142
D21	VSS23	VSS141
E3	VSS24	VSS140
E6	VSS25	VSS139
E7	VSS26	VSS138
E8	VSS27	VSS137
E15	VSS27	VSS136
E16	VSS28	VSS135
E19	VSS29	VSS134
E19	VSS30	VSS133
E4	VSS31	VSS132
E5	VSS32	VSS131
F6	VSS33	VSS130
F7	VSS34	VSS129
F18	VSS35	VSS128
G1	VSS37	VSS126
G4	VSS38	VSS125
G7	VSS39	VSS124
G9	VSS41	VSS123
G13	VSS42	VSS122
G21	VSS45	VSS121
H2	VSS46	VSS120
H4	VSS48	VSS119
H7	VSS49	VSS118
H9	VSS51	VSS117
H13	VSS52	VSS116
H18	VSS53	VSS115
H18	VSS54	VSS114
H19	VSS55	VSS113
J5	VSS56	VSS112
J7	VSS57	VSS111
J9	VSS58	VSS110
J13	VSS59	VSS109
J17	VSS60	VSS108
K1	VSS61	VSS107
K6	VSS62	VSS106
K7	VSS63	VSS105
K9	VSS64	VSS104
K13	VSS65	VSS103
K15	VSS66	VSS102
K21	VSS67	VSS101
L3	VSS68	VSS100
L4	VSS69	VSS99
L5	VSS70	VSS98
L6	VSS71	VSS97
L7	VSS72	VSS96
L9	VSS73	VSS95
L13	VSS74	VSS94
L15	VSS75	VSS93
L18	VSS76	VSS92
L19	VSS77	VSS91
M1	VSS78	VSS90
M5	VSS79	VSS89
M7	VSS80	VSS88
M9	VSS81	VSS87
M13	VSS82	VSS86
M21	VSS83	VSS85
N4	VSS84	VSS84

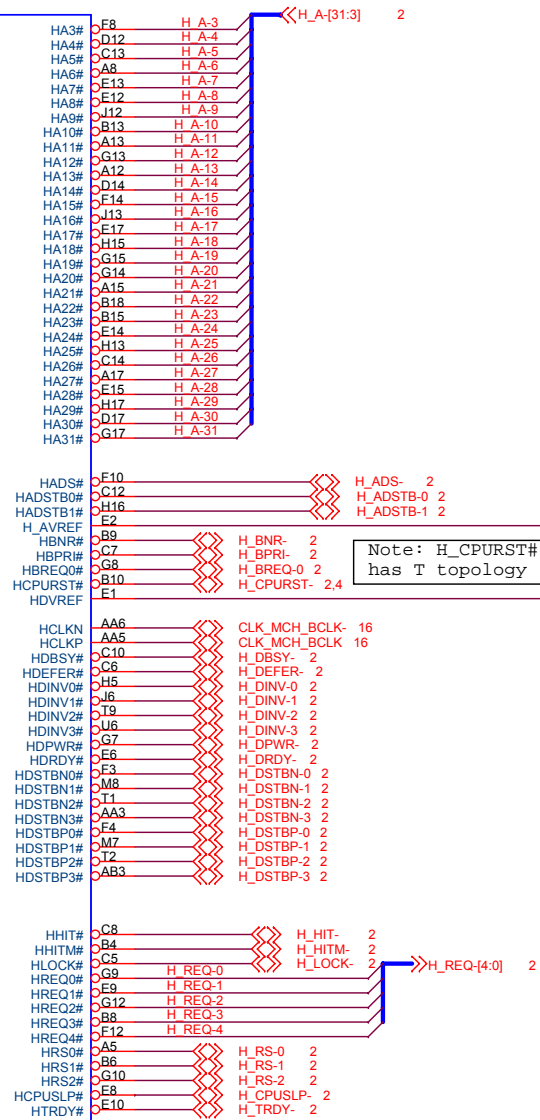
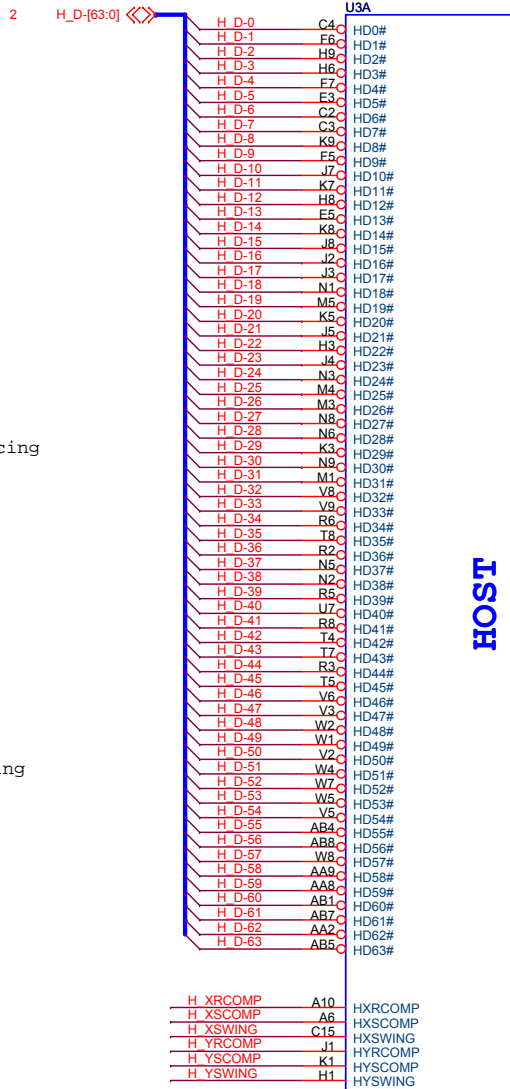
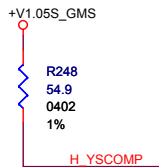
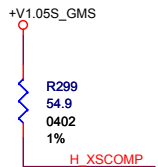
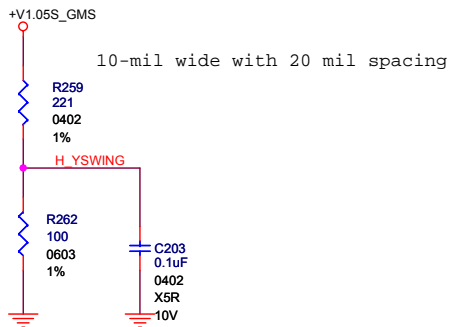
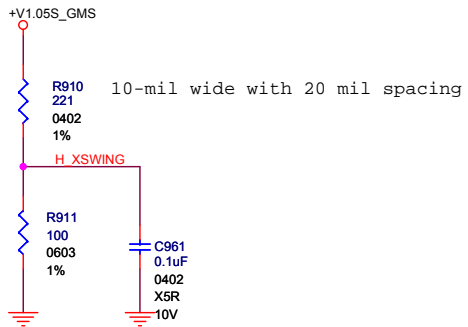
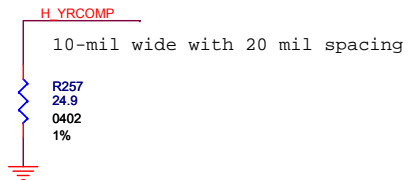
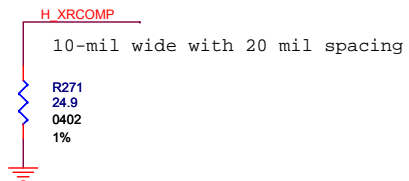


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Title: **Diamondville(2/2)**

Size: Document Number **Rivendell** Rev: ROB

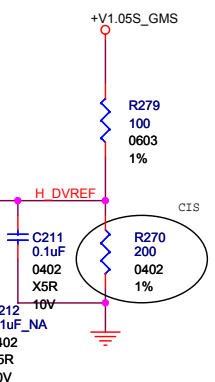
Date: Monday, June 16, 2008 Sheet 3 of 42




HOST

NB_82945

Note: H_CPURST# has T topology



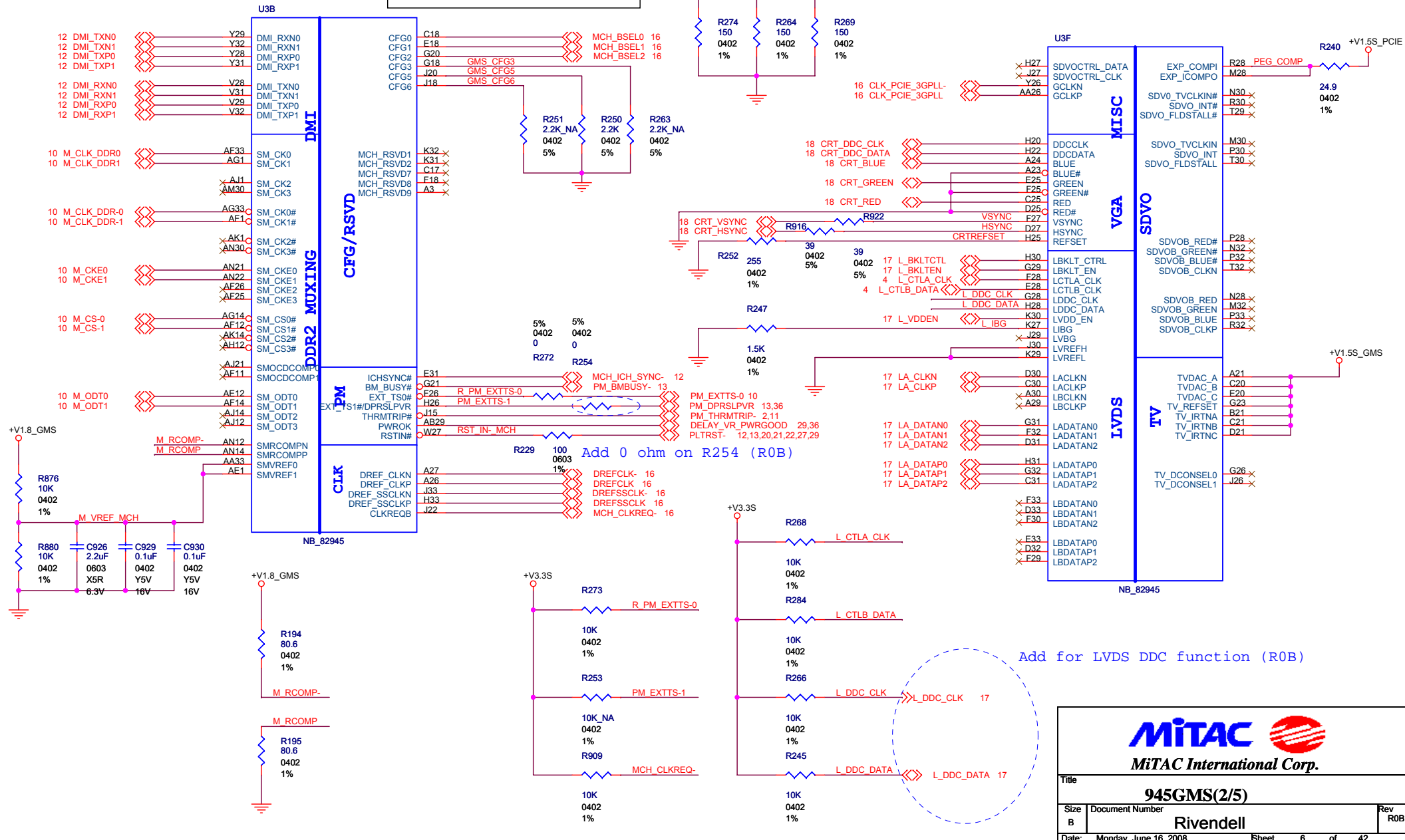
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Title
945GMS(1/5)

Size B	Document Number Rivendell	Rev R0B
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MCH_CFG_3 : Reserve
MCH_CFG_5 :
Low = DMIX2 Default
High = DMIX4 (945GSE not support)
MCH_CFG_6 : Reserve

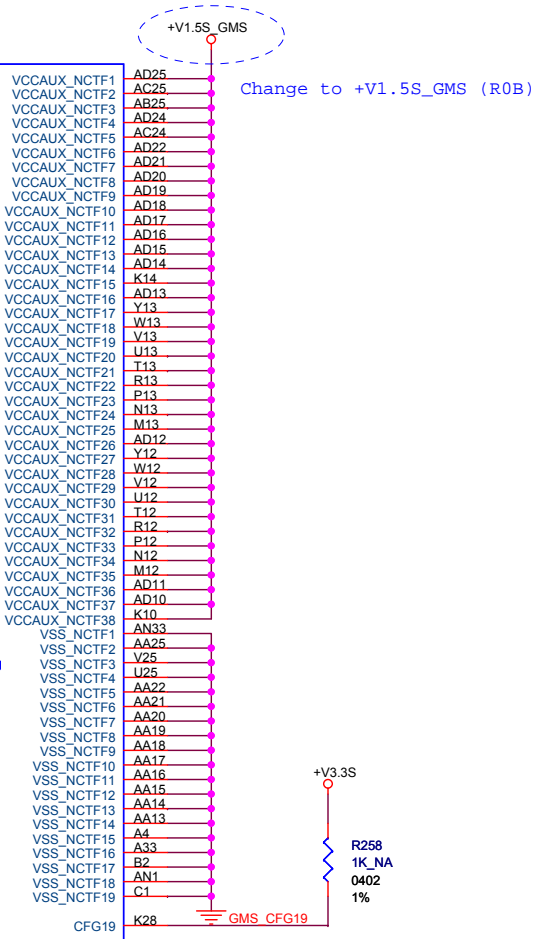
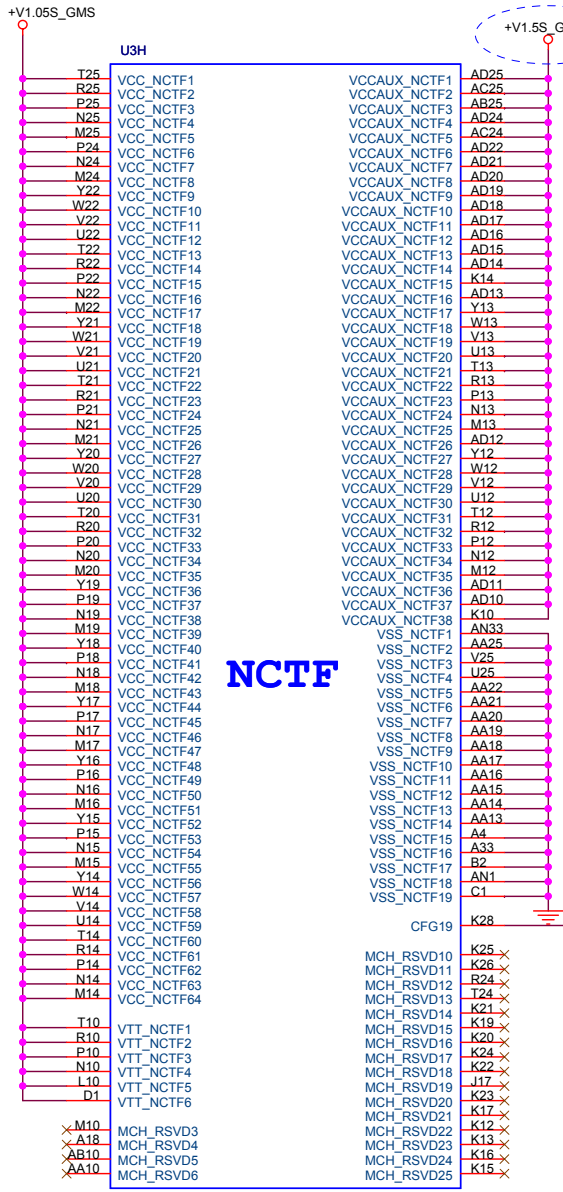
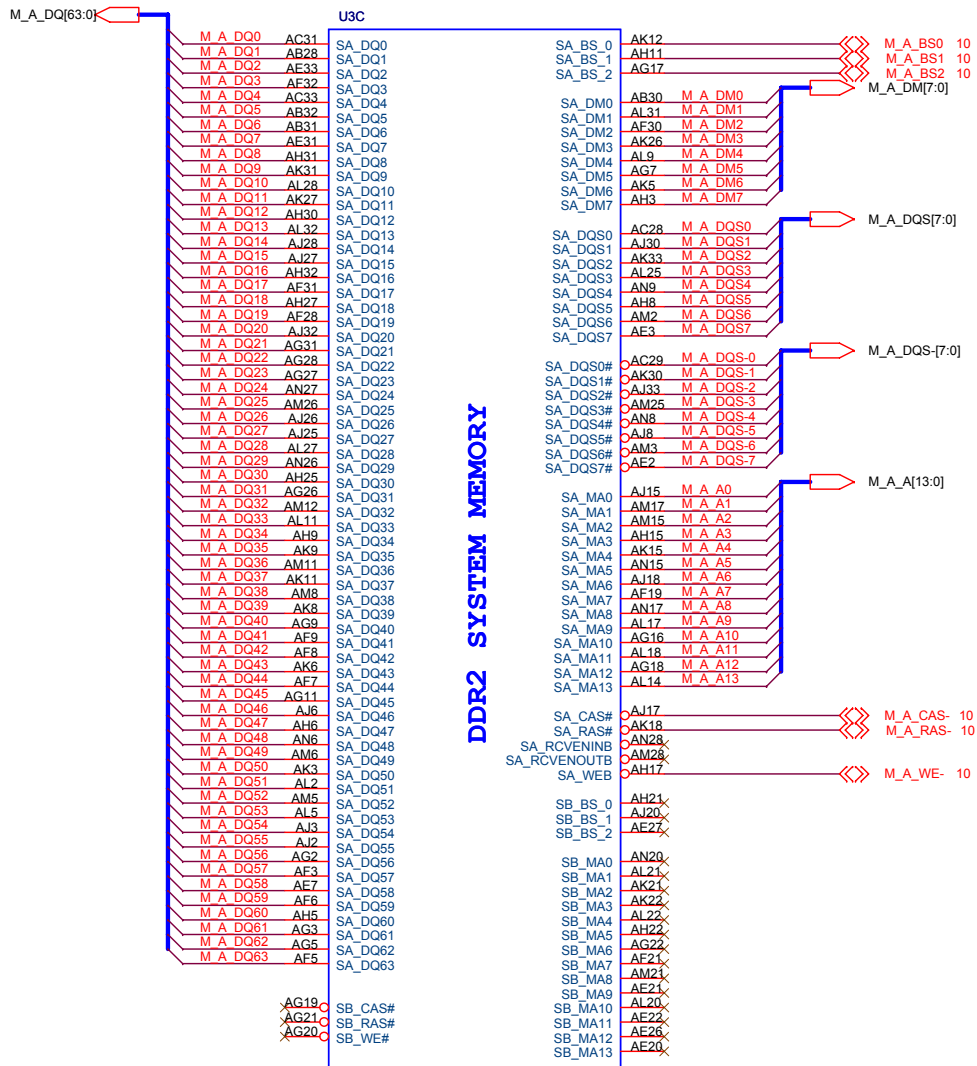


Add 0 ohm on R254 (R0B)


Add for LVDS DDC function (R0B)



Title		
945GMS(2/5)		
Size	Document Number	Rev
B	Rivendell	R0B
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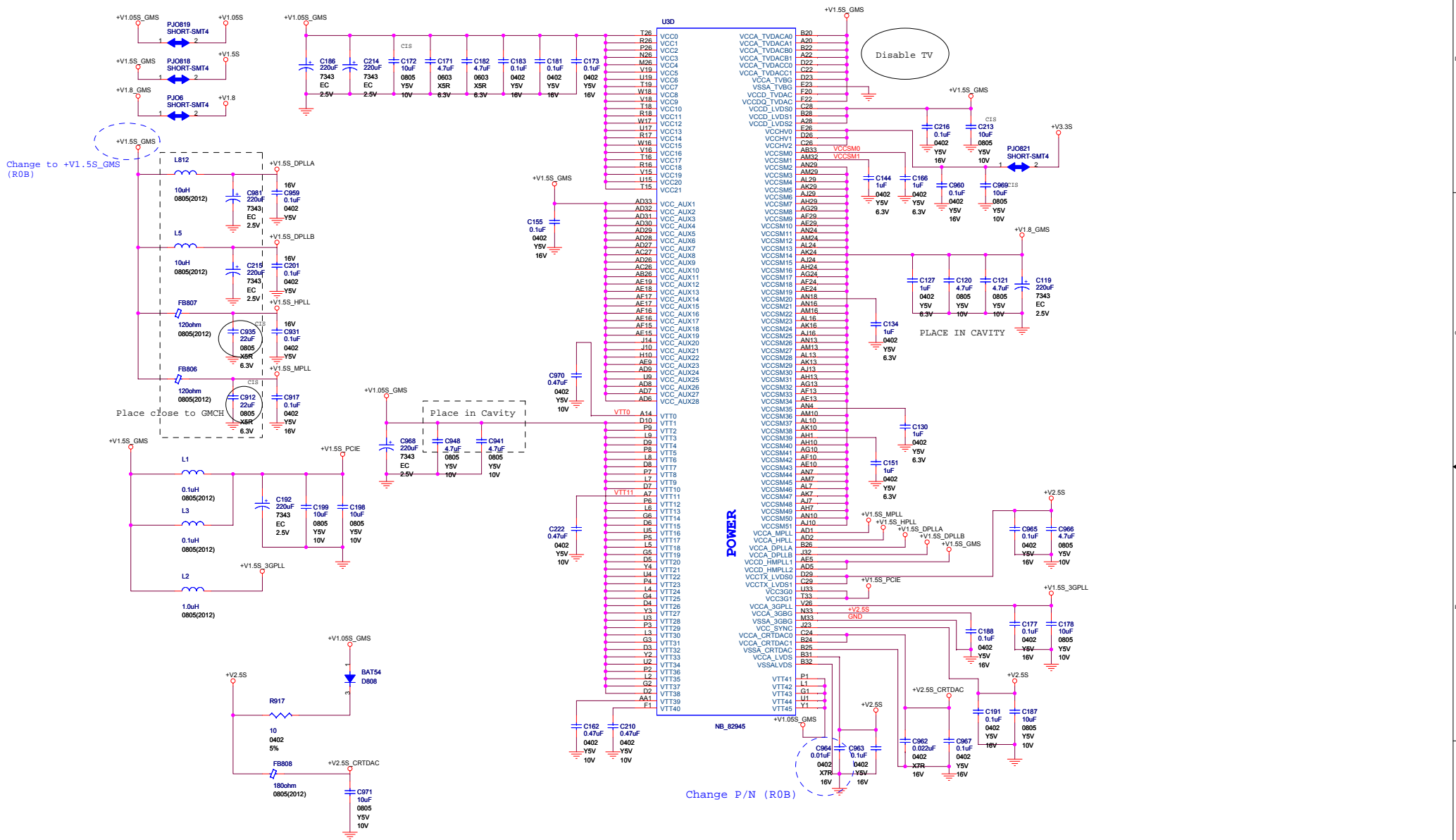


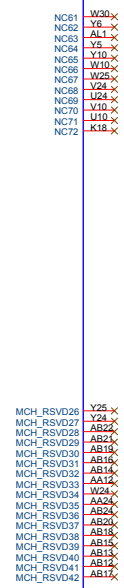
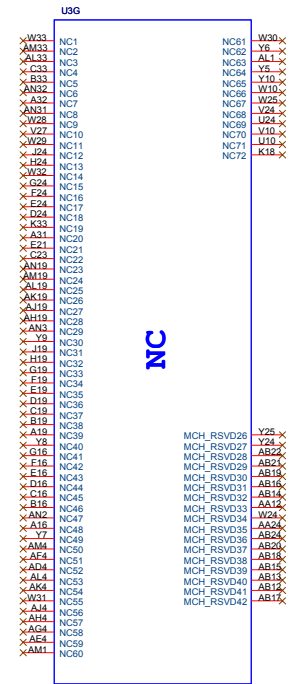
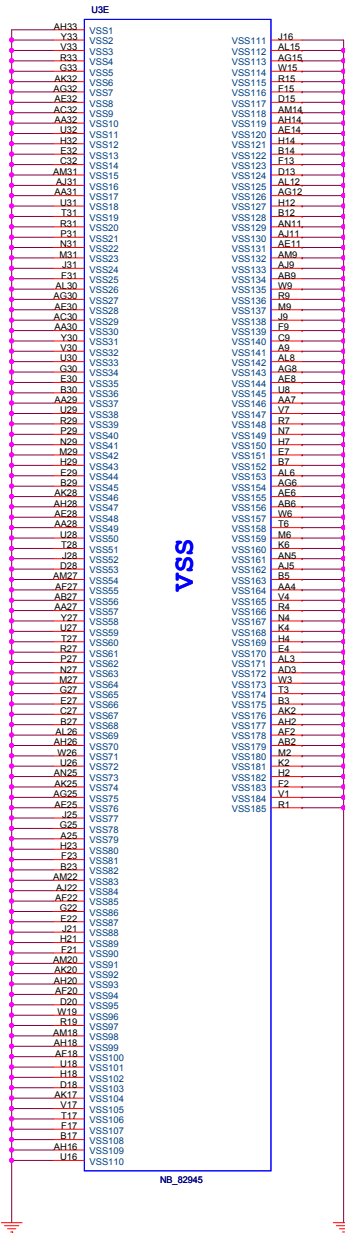
GMS_CFG19 :
Low = Normal
High = LANES REVERSED

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Title: **945GMS(3/5)**

Size: B	Document Number: Rivendell	Rev: R0B
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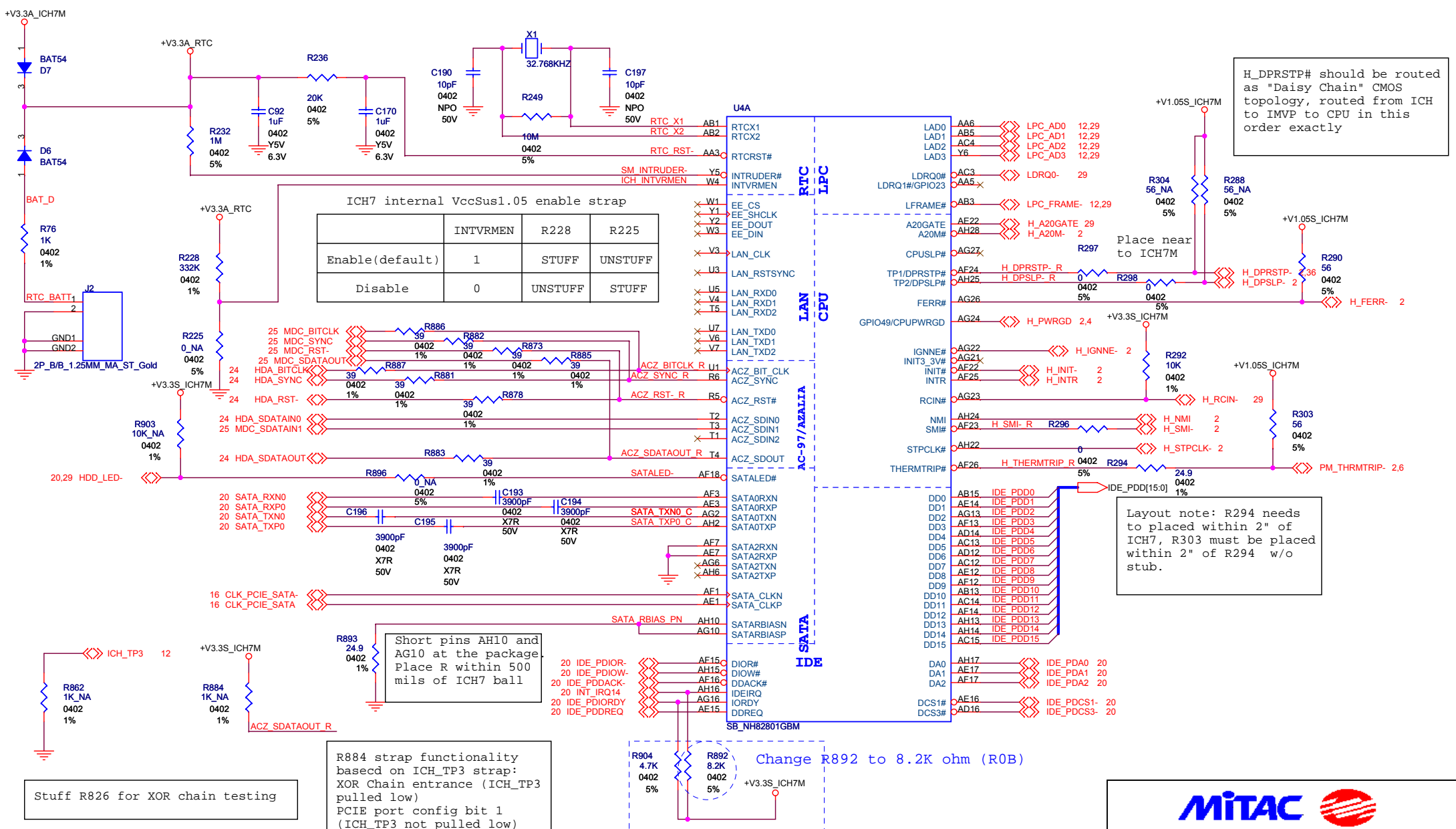
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Title
945GMS(5/5)

Size	Document Number	Rev
C	Rivendell	ROB

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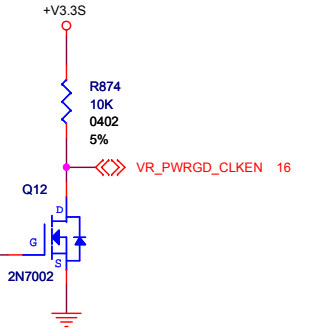
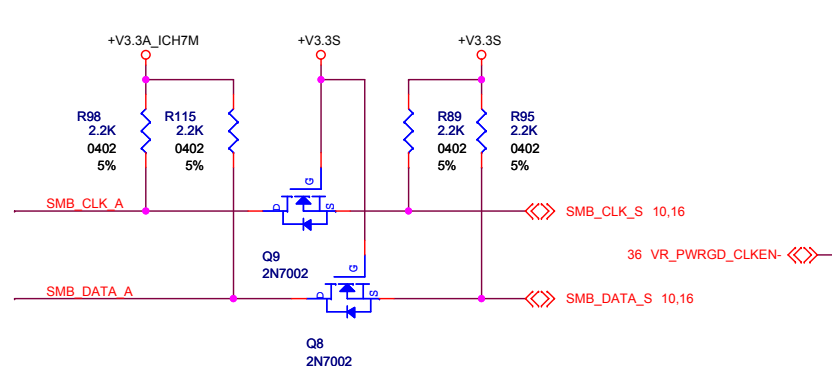
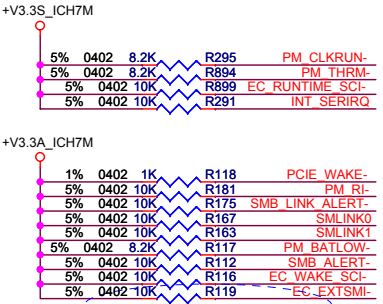
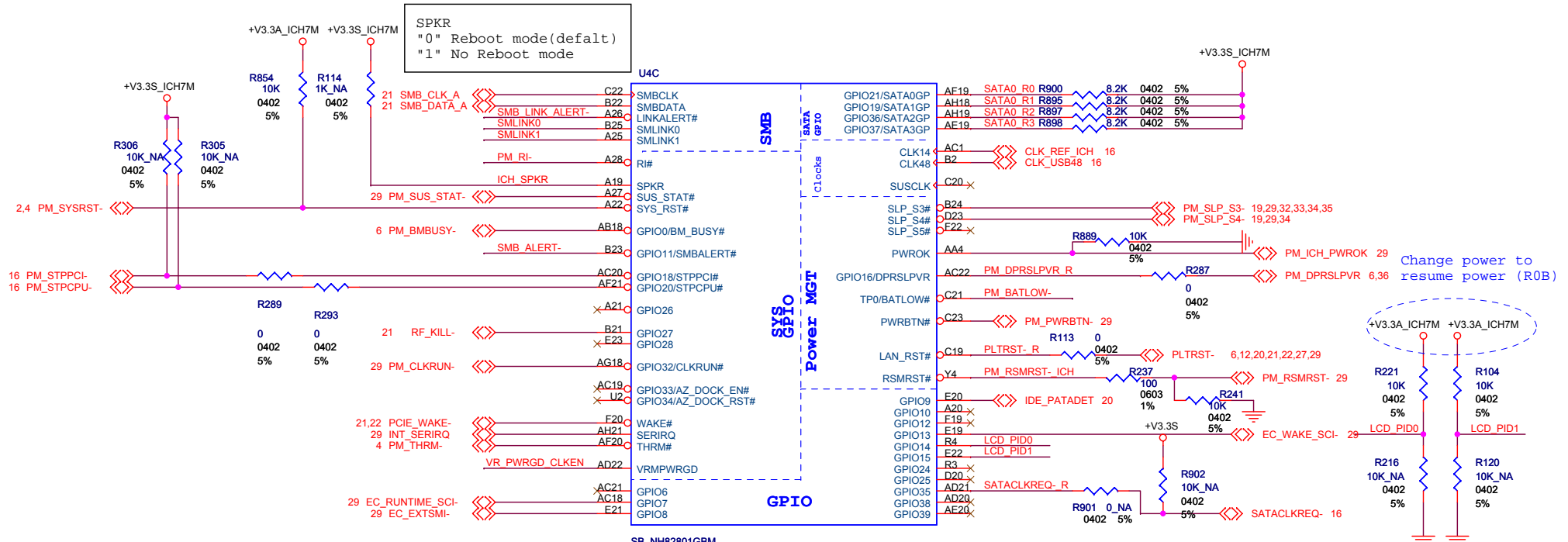
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Title: **ICH7M(1/5)**

Size	Document Number	Rev
B	Rivendell	R0B

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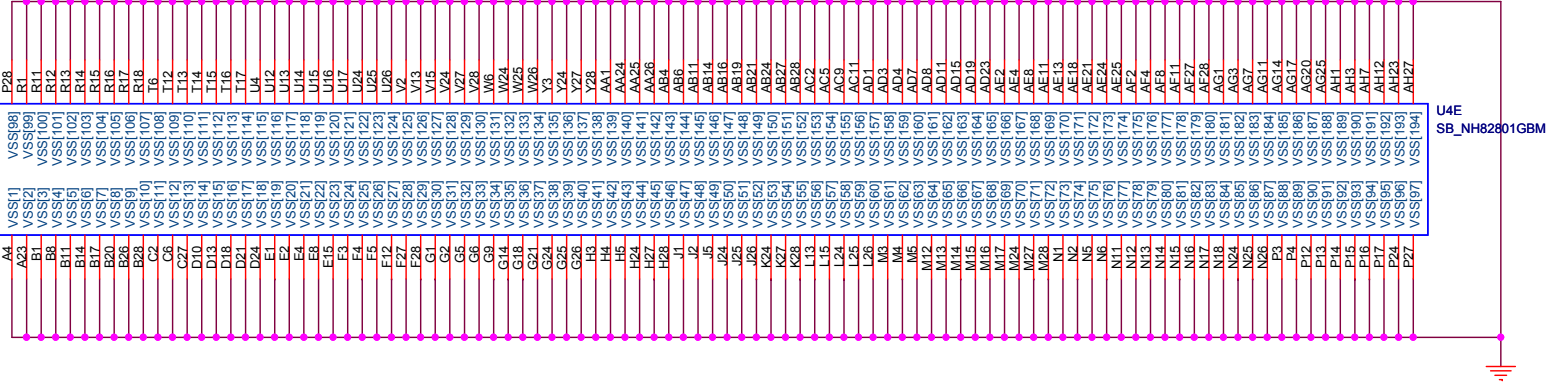


Panel ID Table

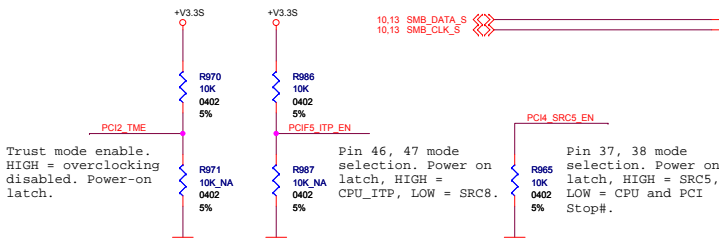
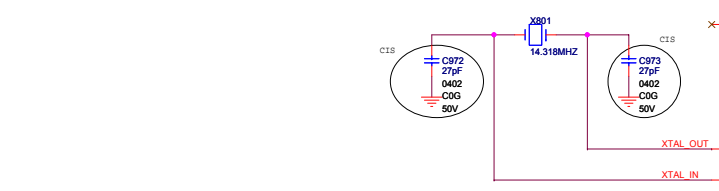
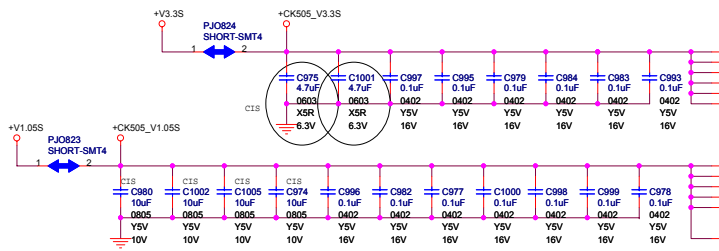
LCD Panel Type	PID1	PID0
Model A	0	0
Model B	0	1
Model C	1	0
Model D	1	1



Title			ICH7M(3/5)		
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Title		
ICH7M(5/5)		
Size	Document Number	Rev
B	Rivendell	R0B
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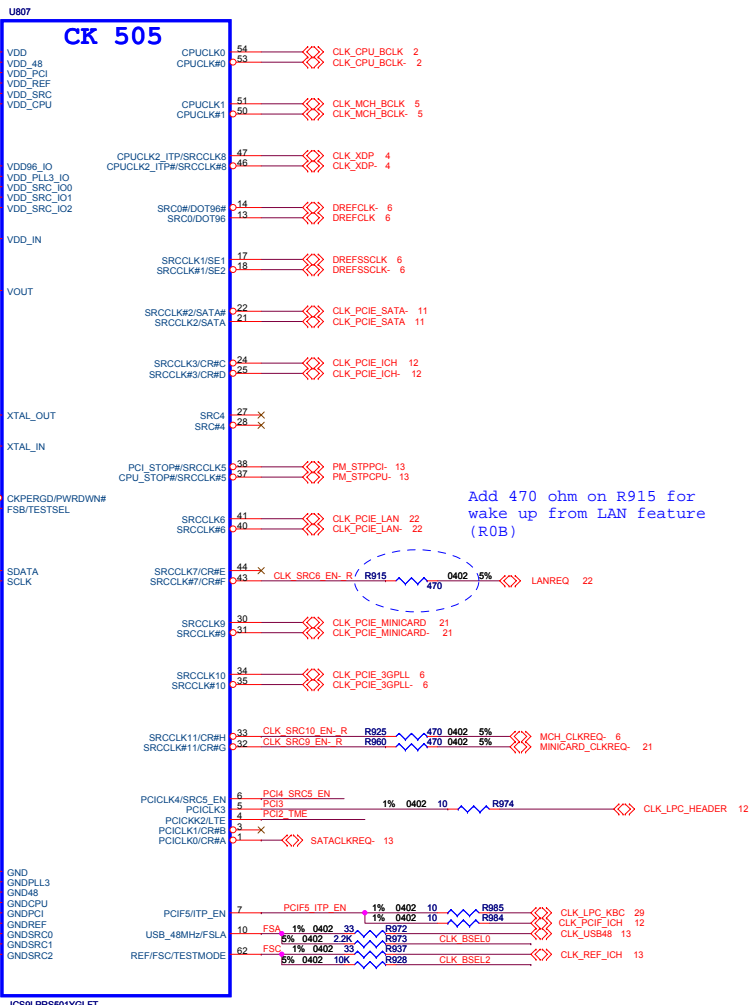
Trust mode enable.
HIGH = overclocking
disabled. Power-on
latch.

Pin 46, 47 mode
selection. Power on
latch, HIGH =
CPU_ITP, LOW = SRC6.

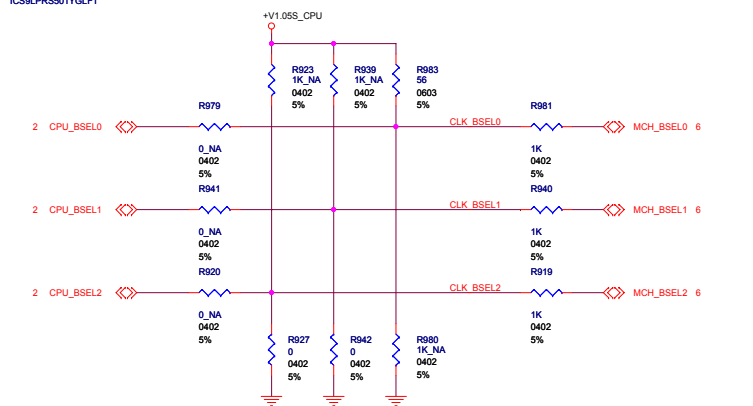
Pin 37, 38 mode
selection. Power on
latch, HIGH = SRC5,
LOW = CPU and PCI
Stop#.

CPU, MCH and XDP BCLK FREQUENCY SELECTION TABLE

BSEL2	BSEL1	BSEL0	Clock FRQ.
FSC	FSB	FSA	
1	0	1	100
0	0	1	133
0	1	1	166
0	1	0	200
0	0	0	266
1	0	0	333
1	1	0	400
1	1	1	RESERVED

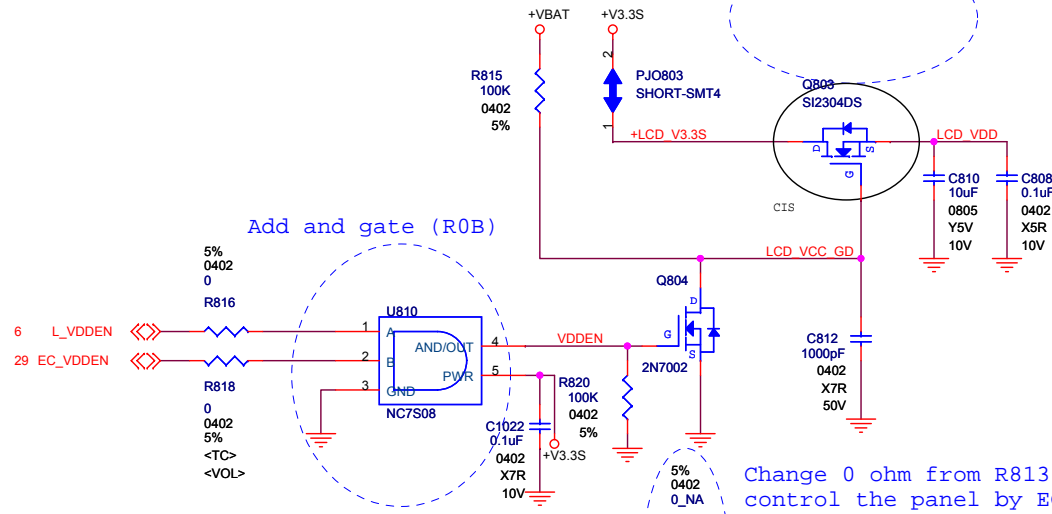


Add 470 ohm on R915 for
wake up from LAN feature
(R0B)



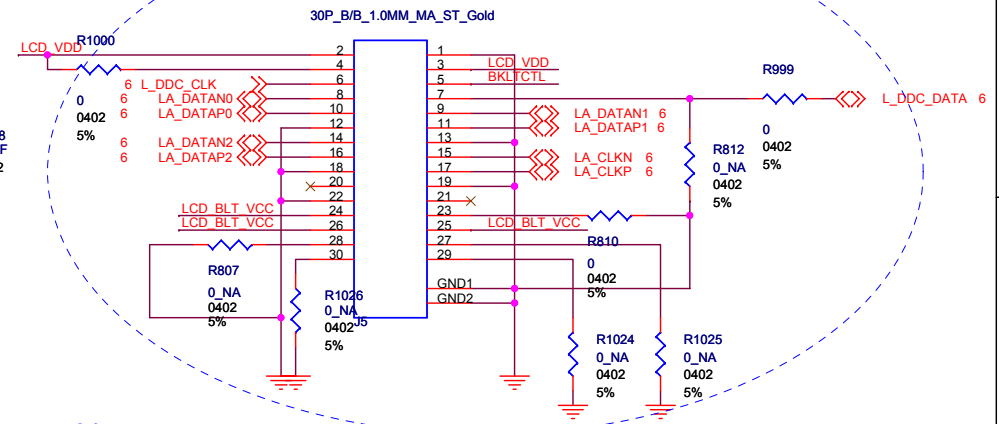
Deleted PJO802 (R0B)

Modify LVDS connector signal for DDC function support (R0B)



Add and gate (R0B)

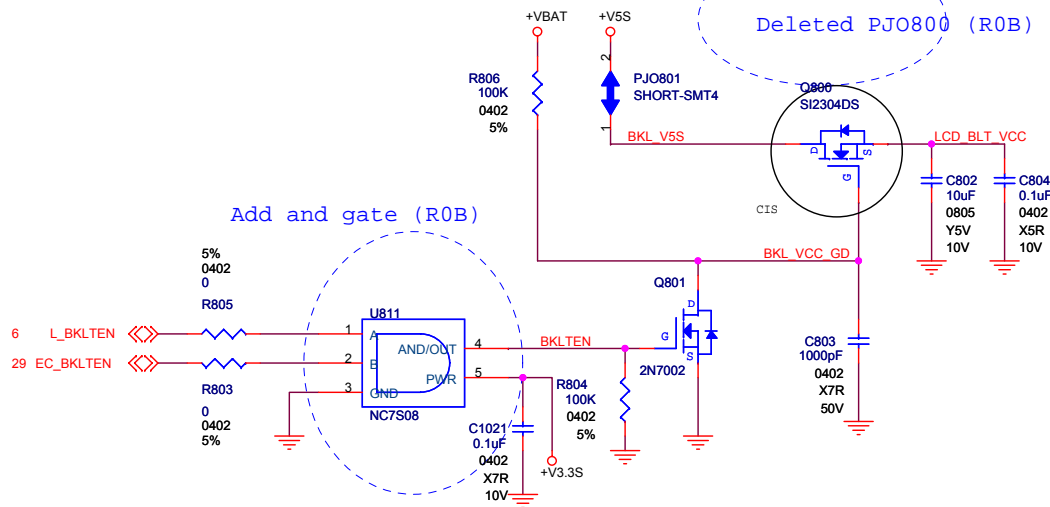
Change 0 ohm from R813 to R84 to control the panel by EC (R0B)




Panel Resistor

Type	R807	R810	R812
7"	Add	NA	Add
8.9"	NA	Add	NA

Deleted PJO800 (R0B)



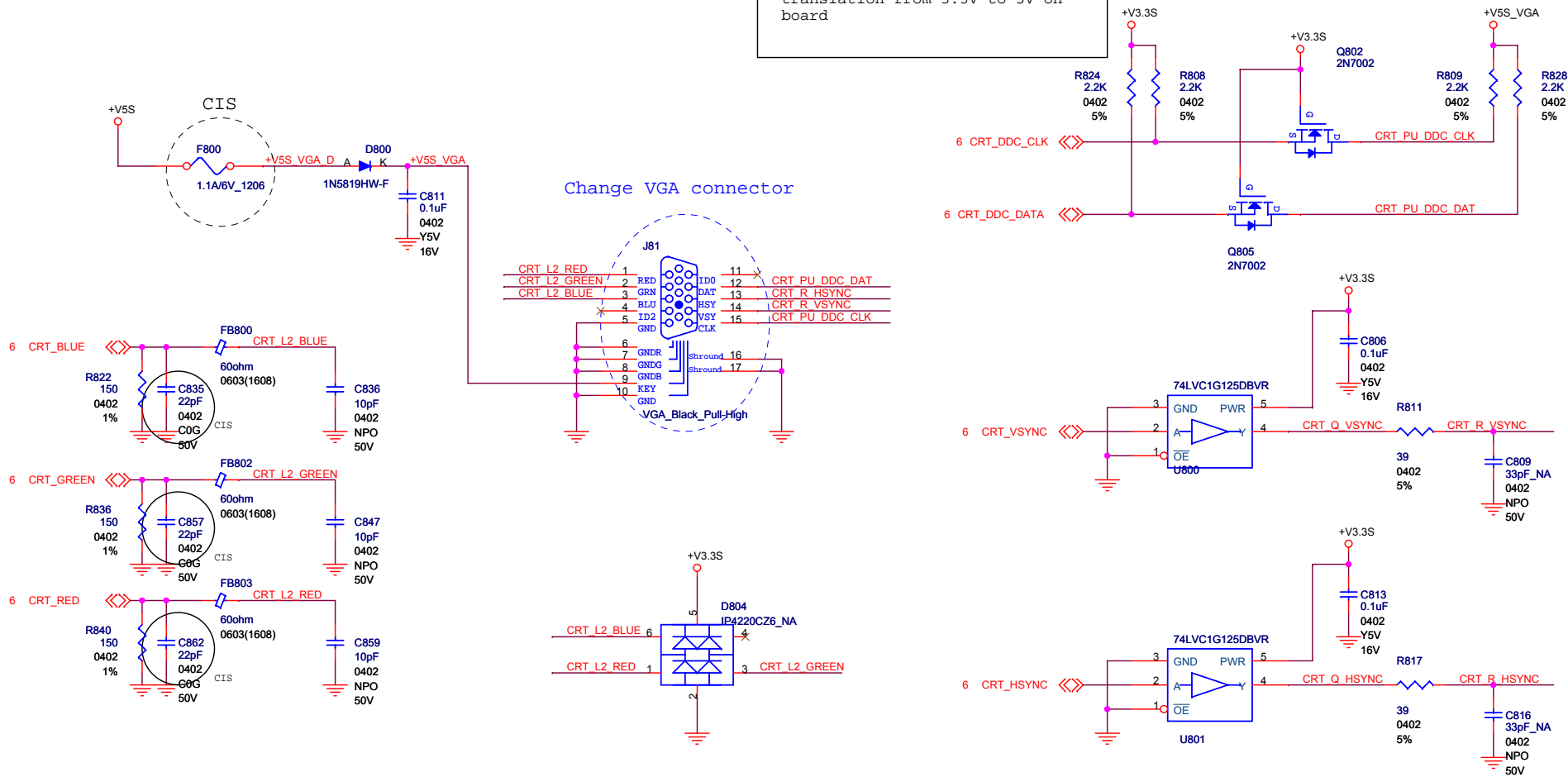
Add and gate (R0B)


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Title: **LVDS Port**

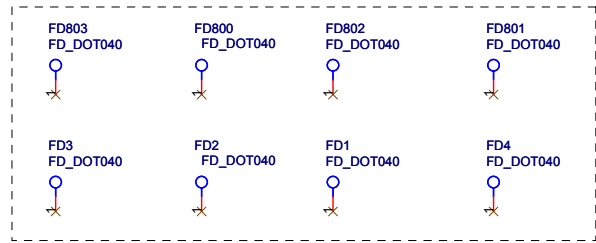
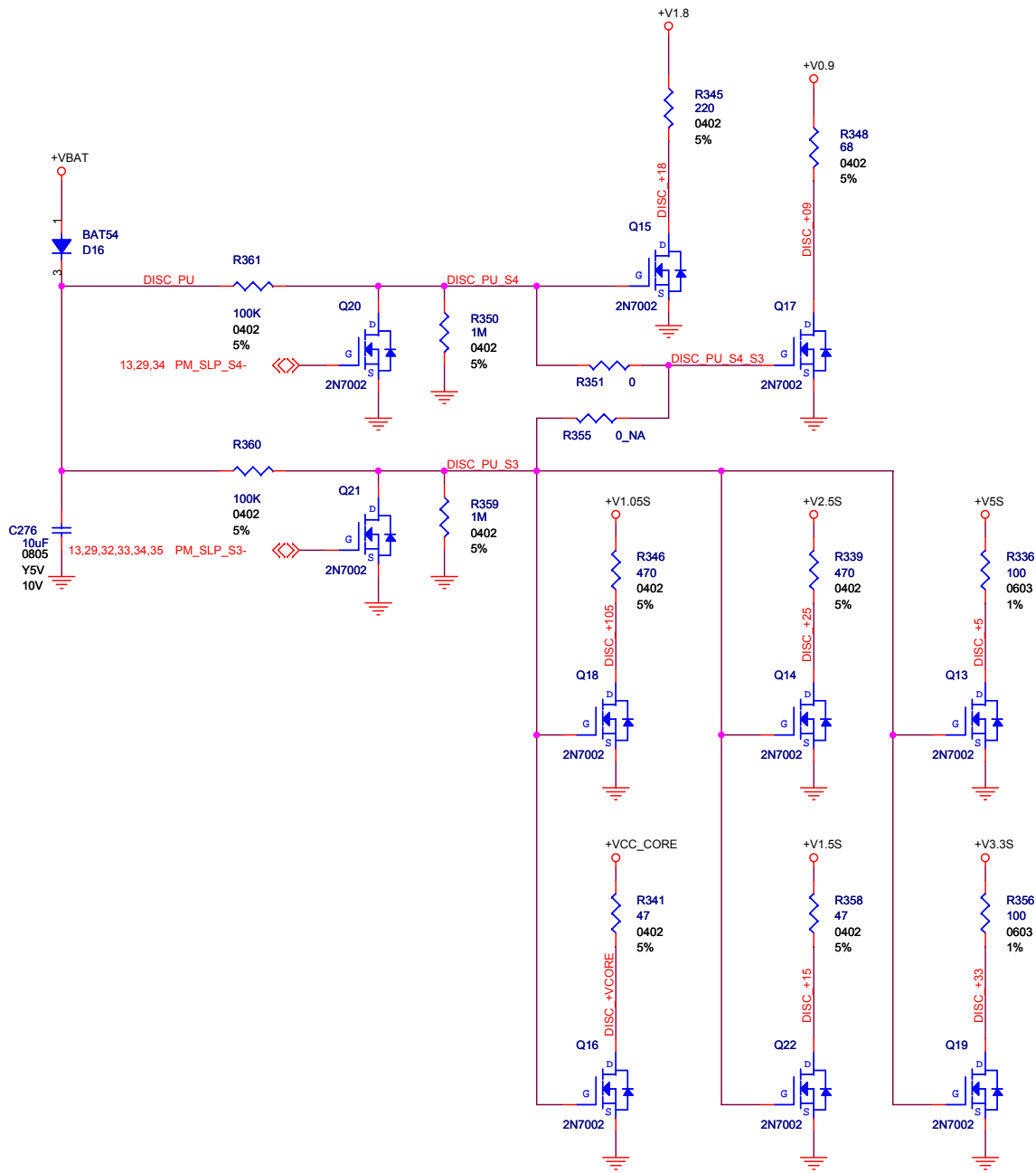
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CRT_DDC_CLK and DATA:
MCH to panel ctrl. Open drain
with weak pullup of ~10-20k to
3.3V rail. Require voltage
translation from 3.3V to 5V on
board

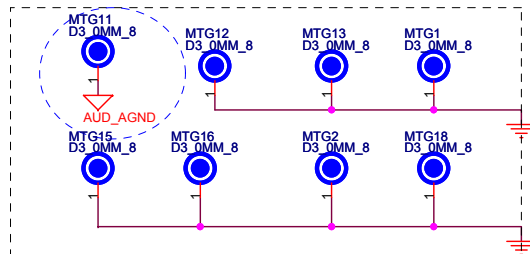


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Title		
CRT Port		
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Change MTG11 to AUD_AGND for layout request (R0B)

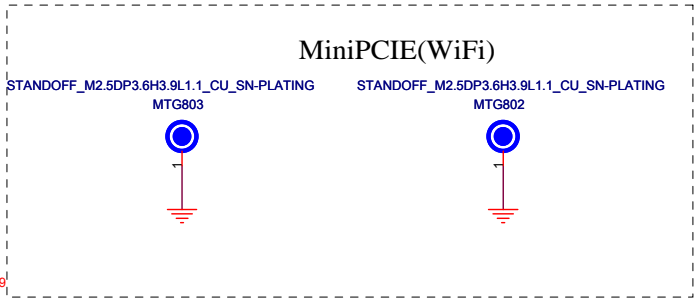
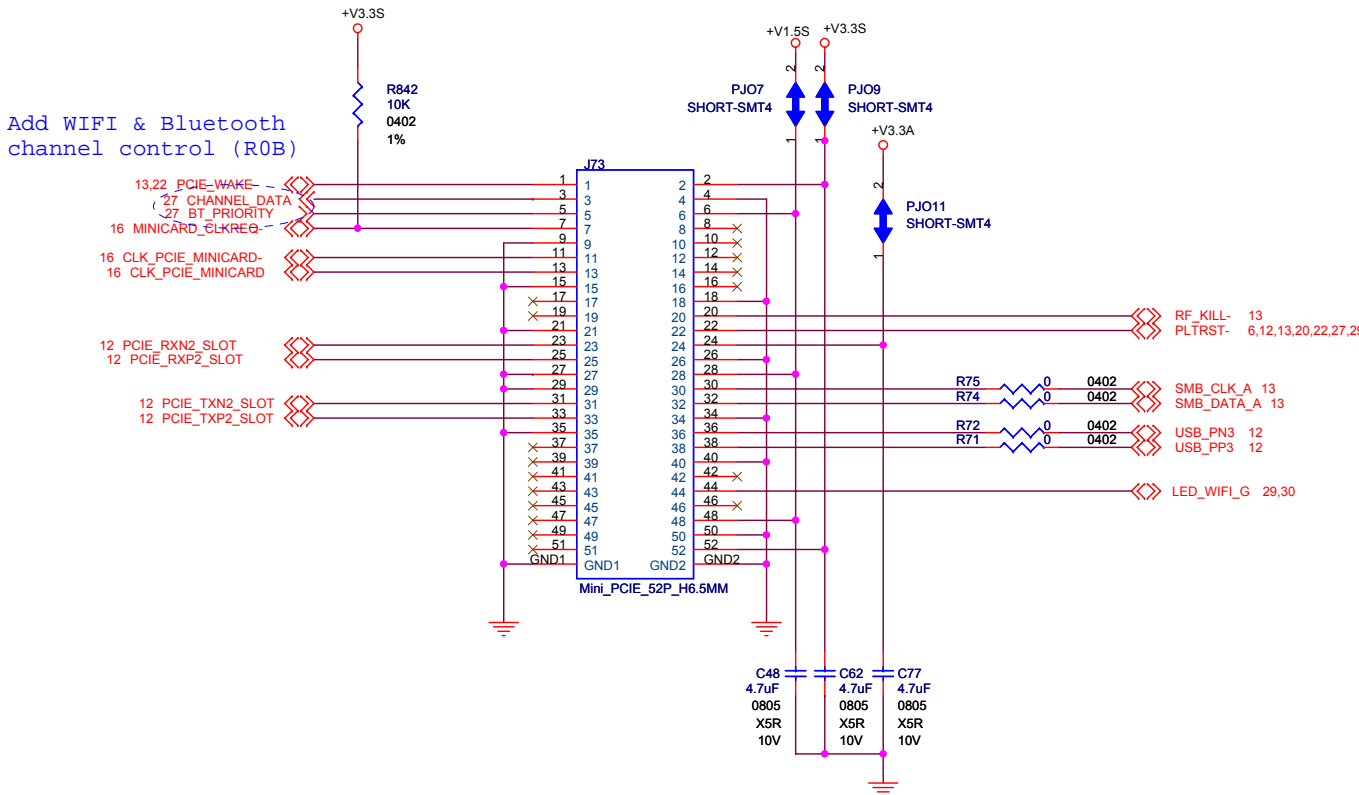



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Title		
Discharge		
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MINI-CARD (WiFi)

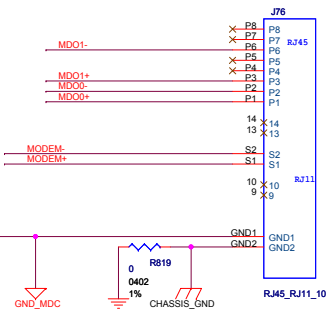


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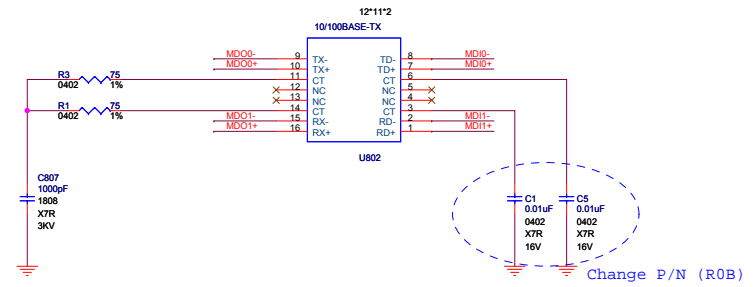
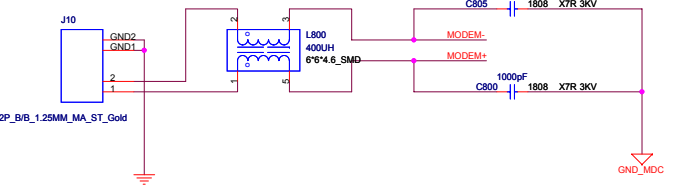
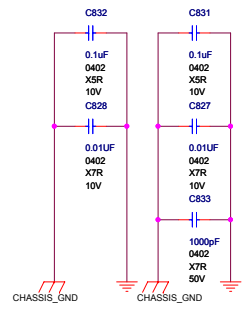
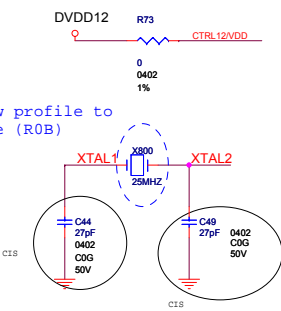
Title: **Mini card(WiFi)**

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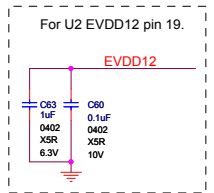
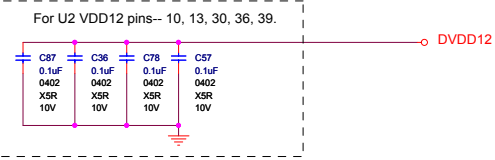
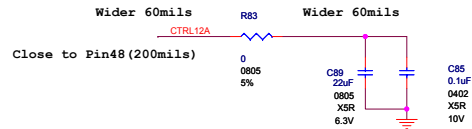
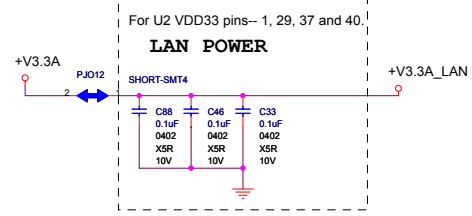
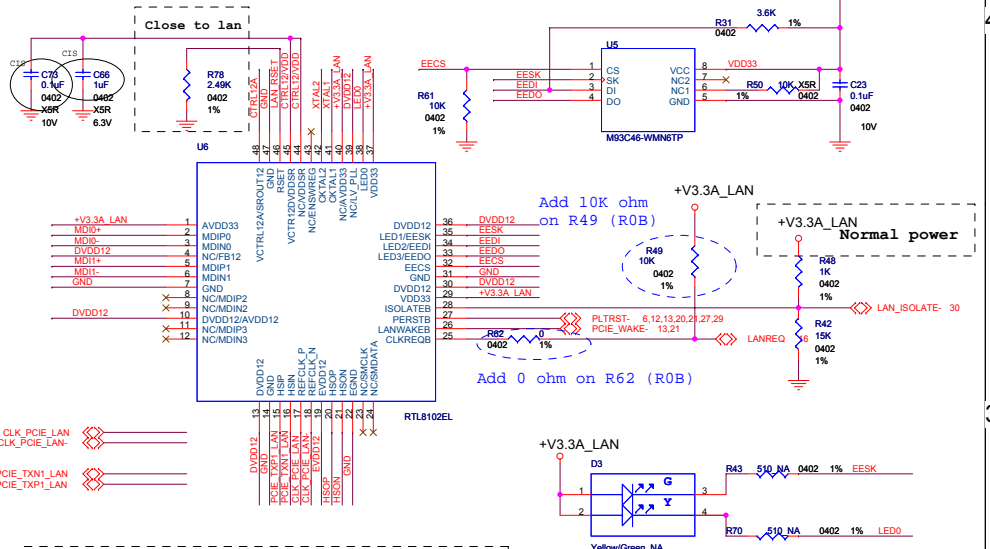
RJ11/RJ45

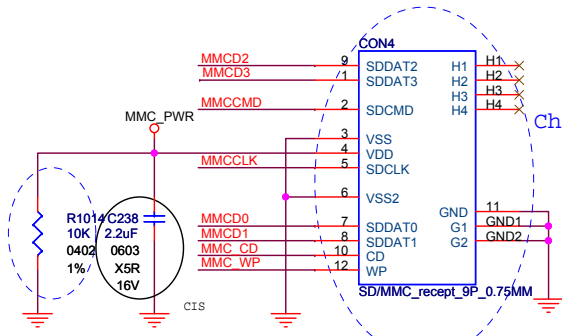


Change X800 to low profile to fix assemble issue (ROB)



Change P/N (ROB)



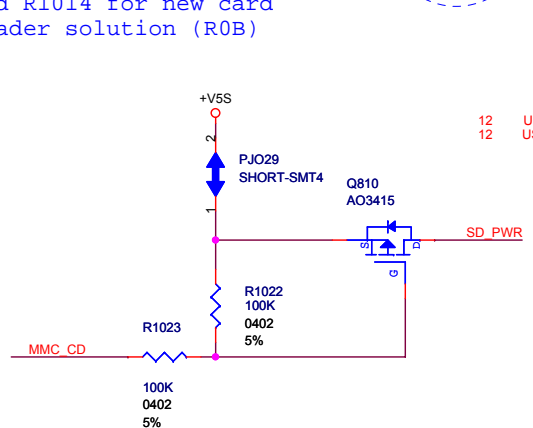


Change to push-push type (R0B)

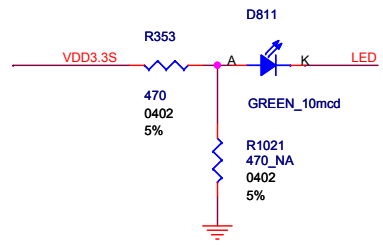
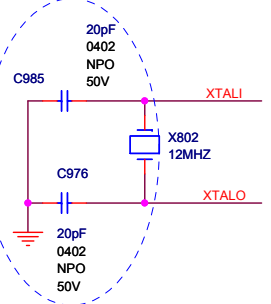
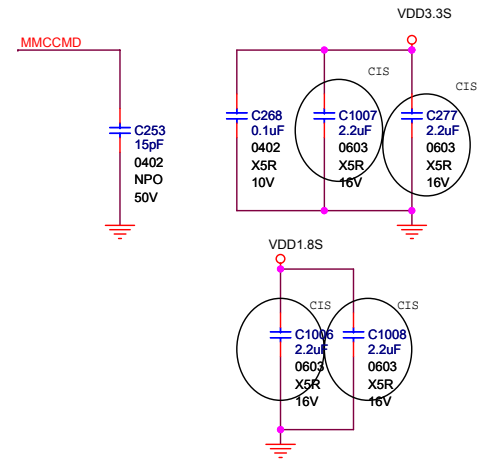
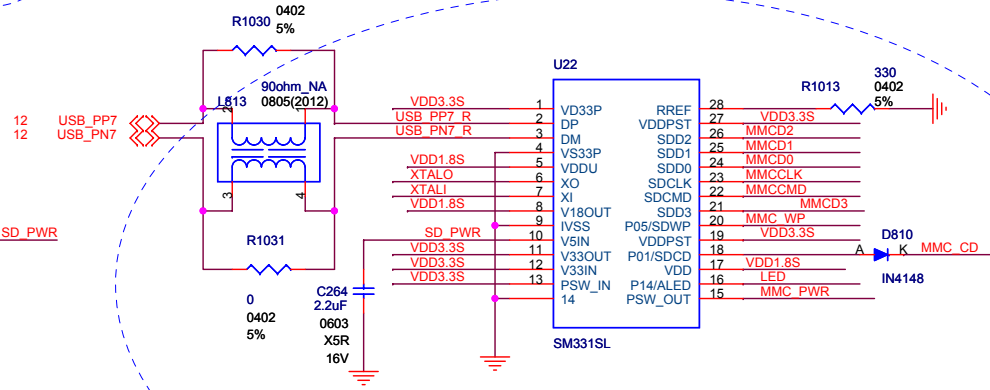
Deleted FB10, R357 & C271 for card reader solution change (R0B)

Add R1014 for new card reader solution (R0B)

Change card reader solution to SM331L



Change to 20pF (R0B)



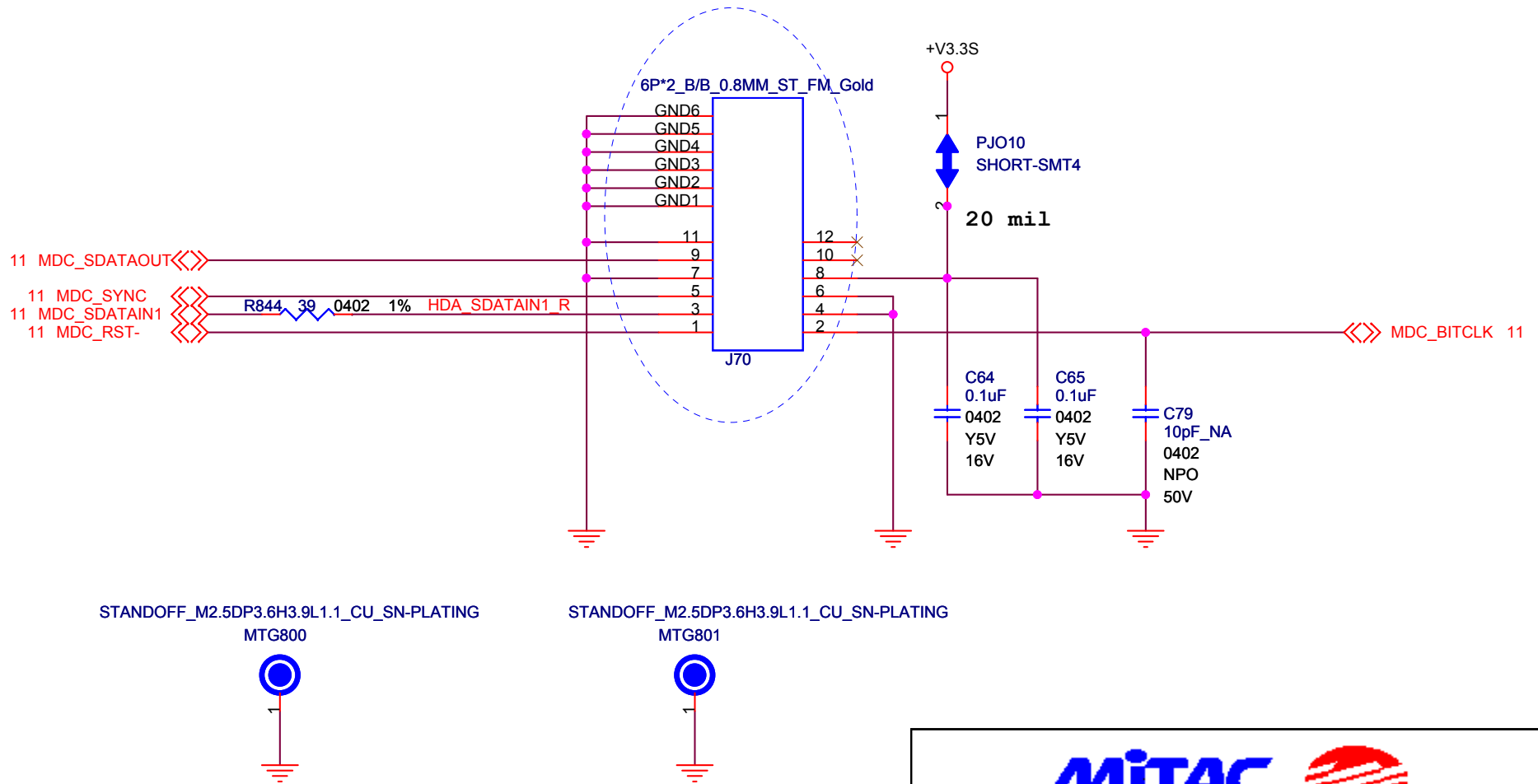
MiTAC


MiTAC International Corp.

Title		
SD/MMC Reader(SM331L)		
Size	Document Number	Rev
B	Rivendell	R0B
Date:	Monday, June 16, 2008	Sheet 23 of 42

Modem

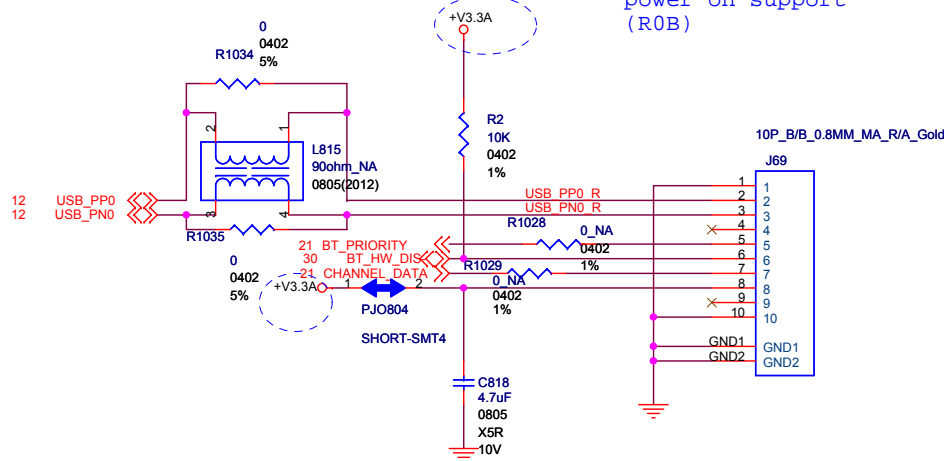
Reverse the connector (R0B)



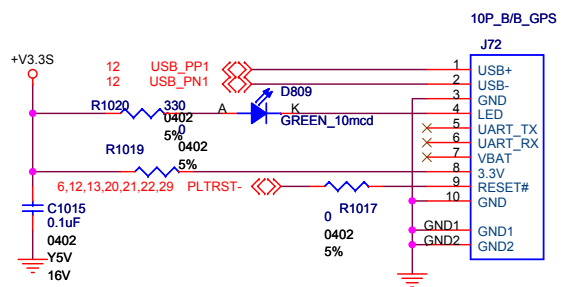
 MiTAC International Corp.		
Title MDC		
Size A	Document Number Rivendell	Rev R0B
Date: Monday, June 16, 2008	Sheet 25	of 42

BLUETOOTH

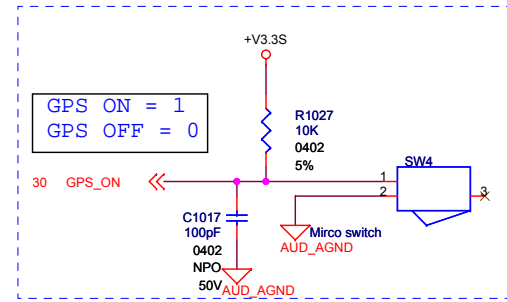
Change to +V3.3A
for blue tooth
power on support
(R0B)



GPS

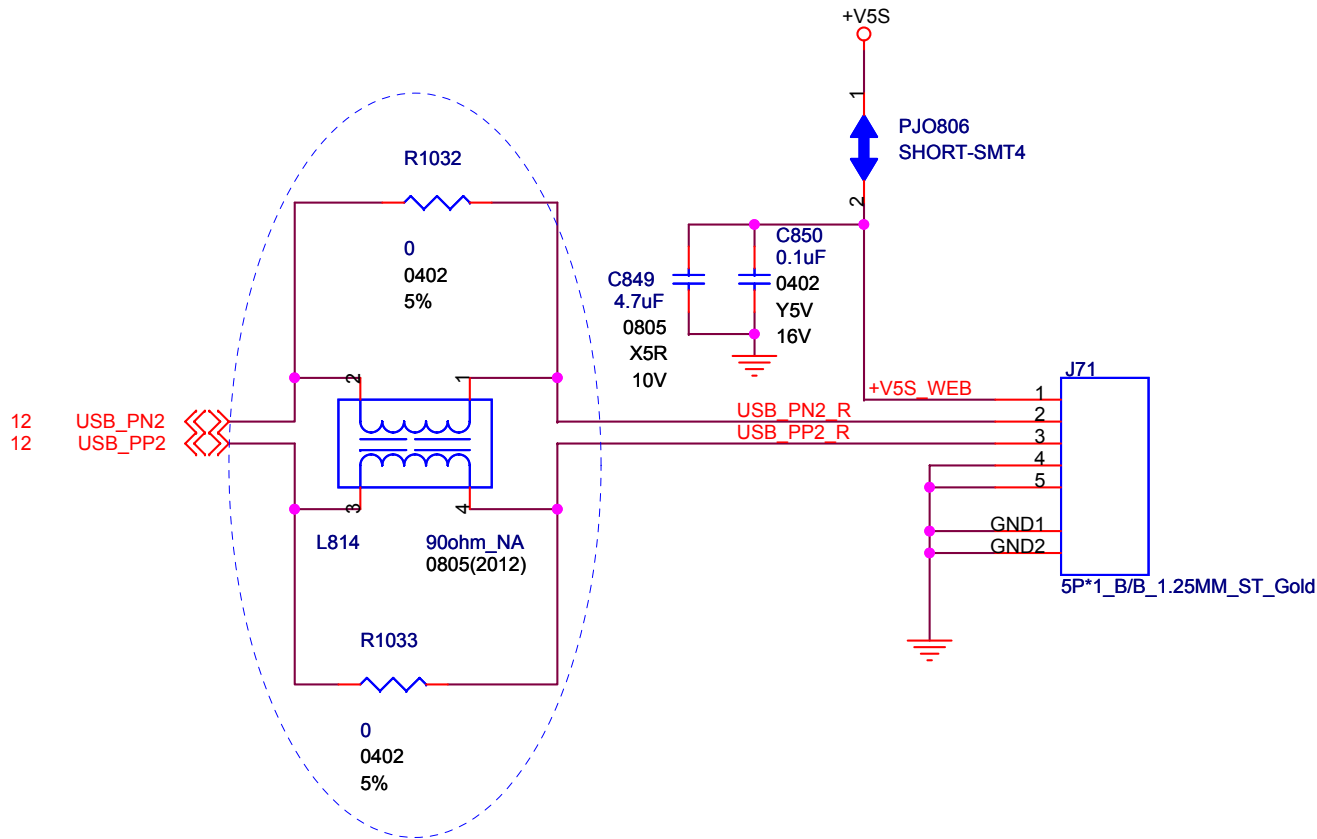


Mirco switch



Title			Rev
Bluetooth Connector/GPS connector			
Size	Document Number	Rev	
B	Rivendell	R0B	
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WebCAM



Add common mode choke option for EMI request (R0B)

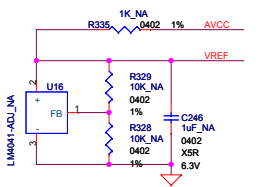


MiTAC International Corp.

Title		
WebCAM Connector		
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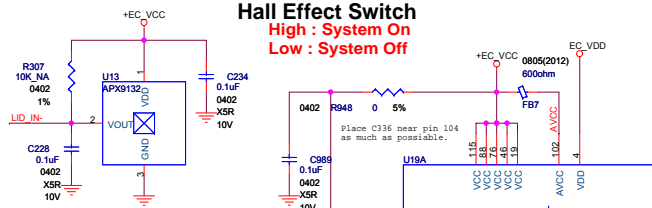
Hall Effect Switch

High : System On
Low : System Off



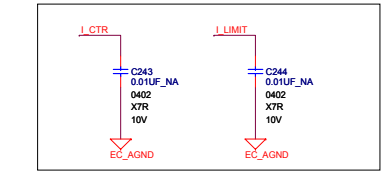
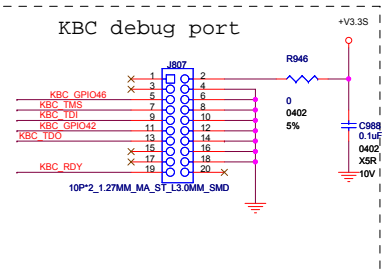
NOTE:

- The ratio between R328 & R329 affects the A/D accuracy. For higher A/D accuracy, use higher accuracy resistors.
- The current ratio between R328 & R329 sets Vref on 2.989V. %
- The Vref range is from 0V to Vcc.
- Other circuits can be considered depending on A/D accuracy requirements.

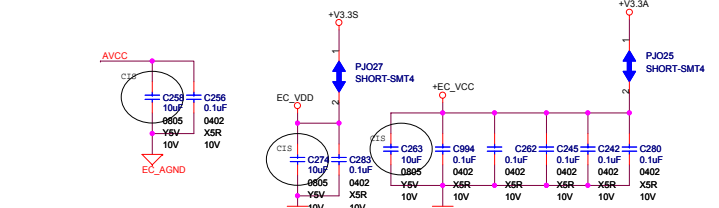
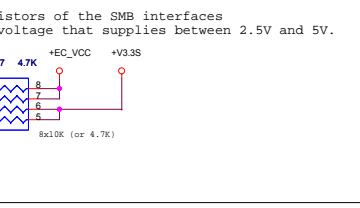
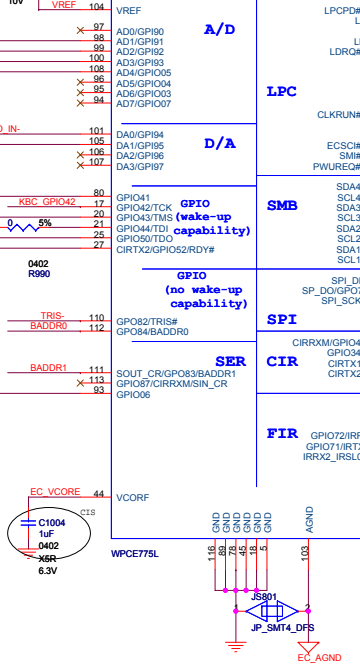
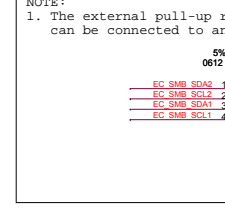
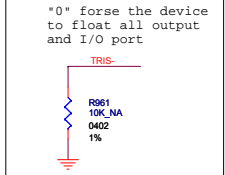
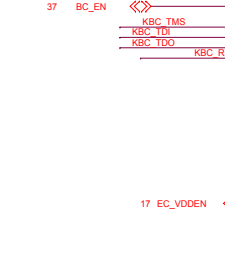
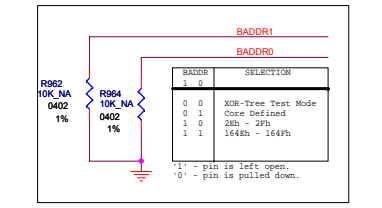


NOTE:

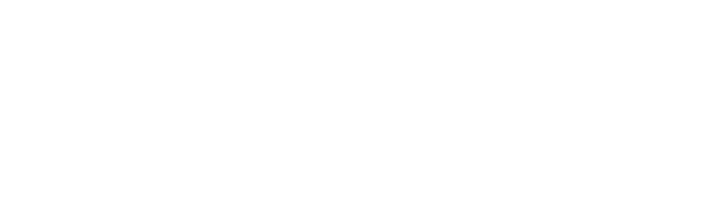
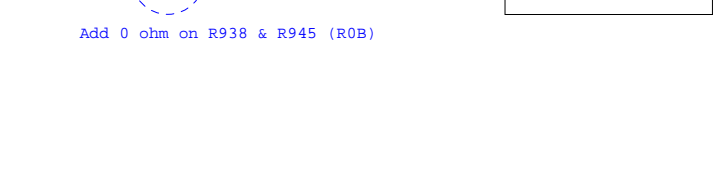
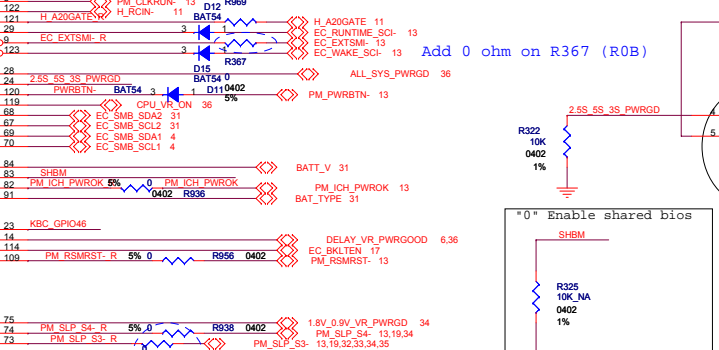
- The ratio between R328 & R329 affects the A/D accuracy. For higher A/D accuracy, use higher accuracy resistors.
- The current ratio between R328 & R329 sets Vref on 2.989V. %
- The Vref range is from 0V to Vcc.
- Other circuits can be considered depending on A/D accuracy requirements.



Note: Mount per ADC input if used.



NOTE: The 10 uF capacitors are for the WPCE775x only and do not apply to any other board products.



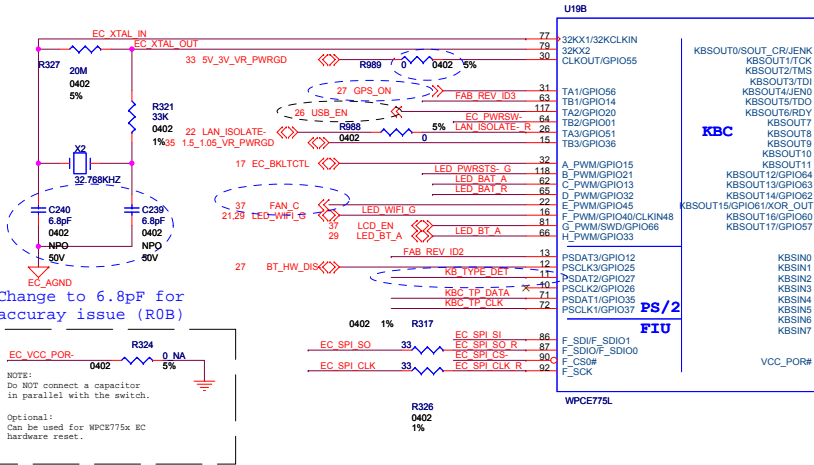
Add 0 ohm on R989 (ROB)

Add GPS control signal (ROB)

Add USB_EN to control the iPod charge function (ROB)

Add fan control circuit (ROB)

Add keyboard type detect (ROB)

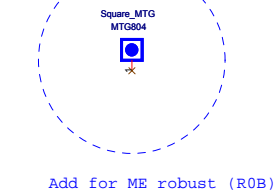
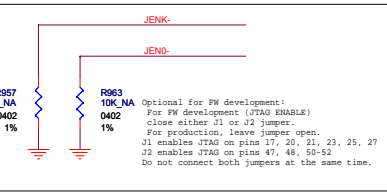


Change to 6.8pF for accuracy issue (ROB)

EC_VCC_POR: R324 0 NA 5% 0402

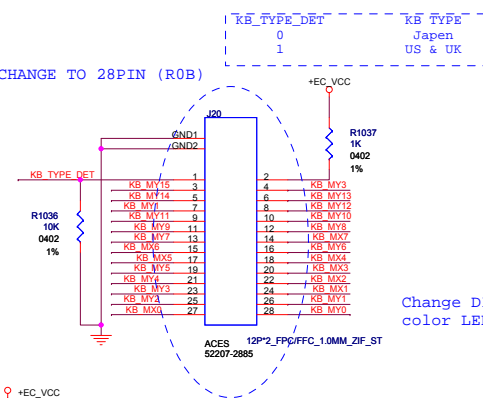
NOTE:
Do NOT connect a capacitor in parallel with the switch.

Optional:
Can be used for WPCE775x RC hardware reset.



Add for ME robust (ROB)

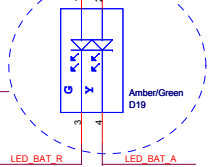
CHANGE TO 28PIN (ROB)



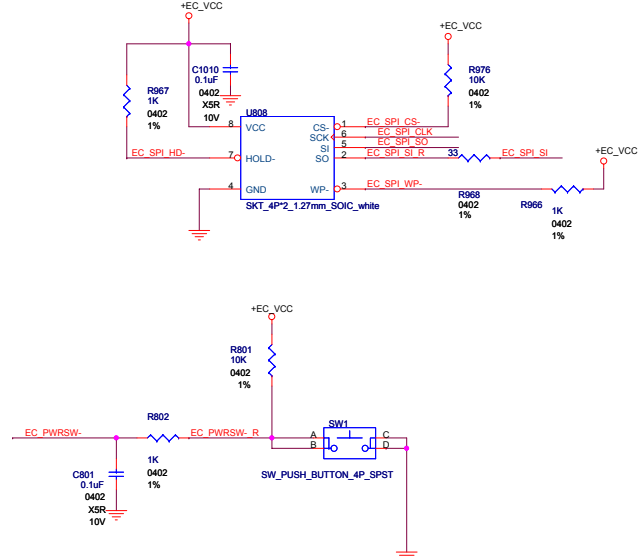
Change D17 to blue color LED (ROB)



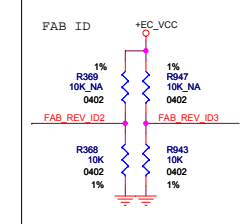
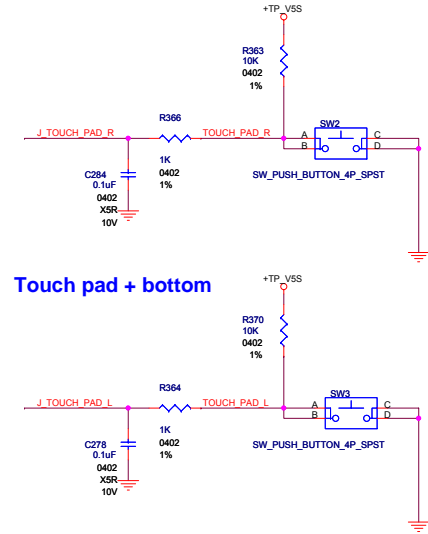
Change LED to amber/green LED (ROB)



SPI ROM



Touch pad + bottom



DC Power Input

Assumed 12V

TOTAL POWER	I_LIMIT
0W	0V
5W	0.1316V
10W	0.2632V
15W	0.3947V
20W	0.5263V
25W	0.6579V
30W	0.7895V
35W	0.9211V
40W	1.0526V

Change to ADINP for AC IN detect (ROB)

Remove R821 for AC in detect function (ROB)
FOR DETECT FUNCTION


Change R825 to 100K ohm (ROB)

Change to ADINP for AC IN detect (ROB)

Change P/N (ROB)

notice meet footprint

	I_CTRL	Charge Current	$V_{IN} - I_{CTRL} * (R142 / (R142 + R164))$	Charge Current = $X/R165$
POWER ON	1V	1A	0.01968V	0.984A
POWER OFF	2V	2A	0.0492V	2.46A



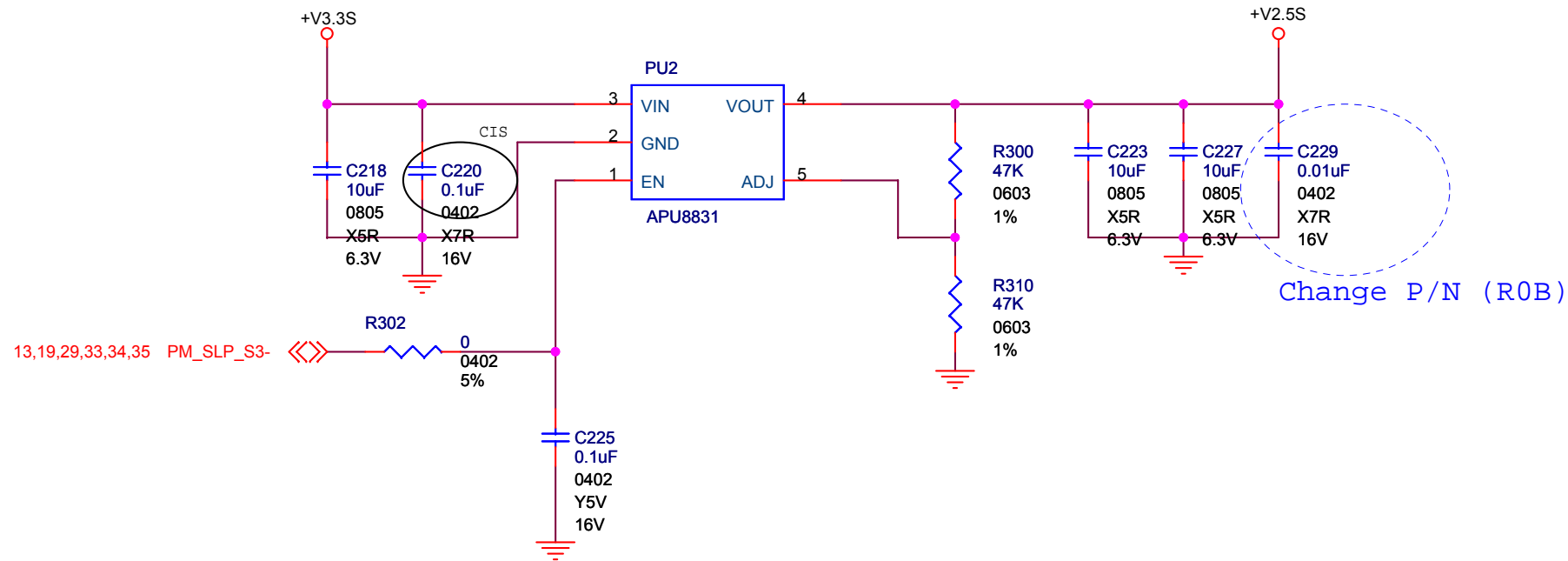
MiTAC International Corp.

D/VMAN, Battery Charger

Size: Document Number: Rivendell

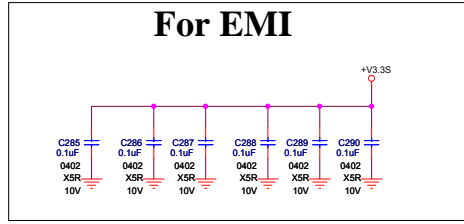
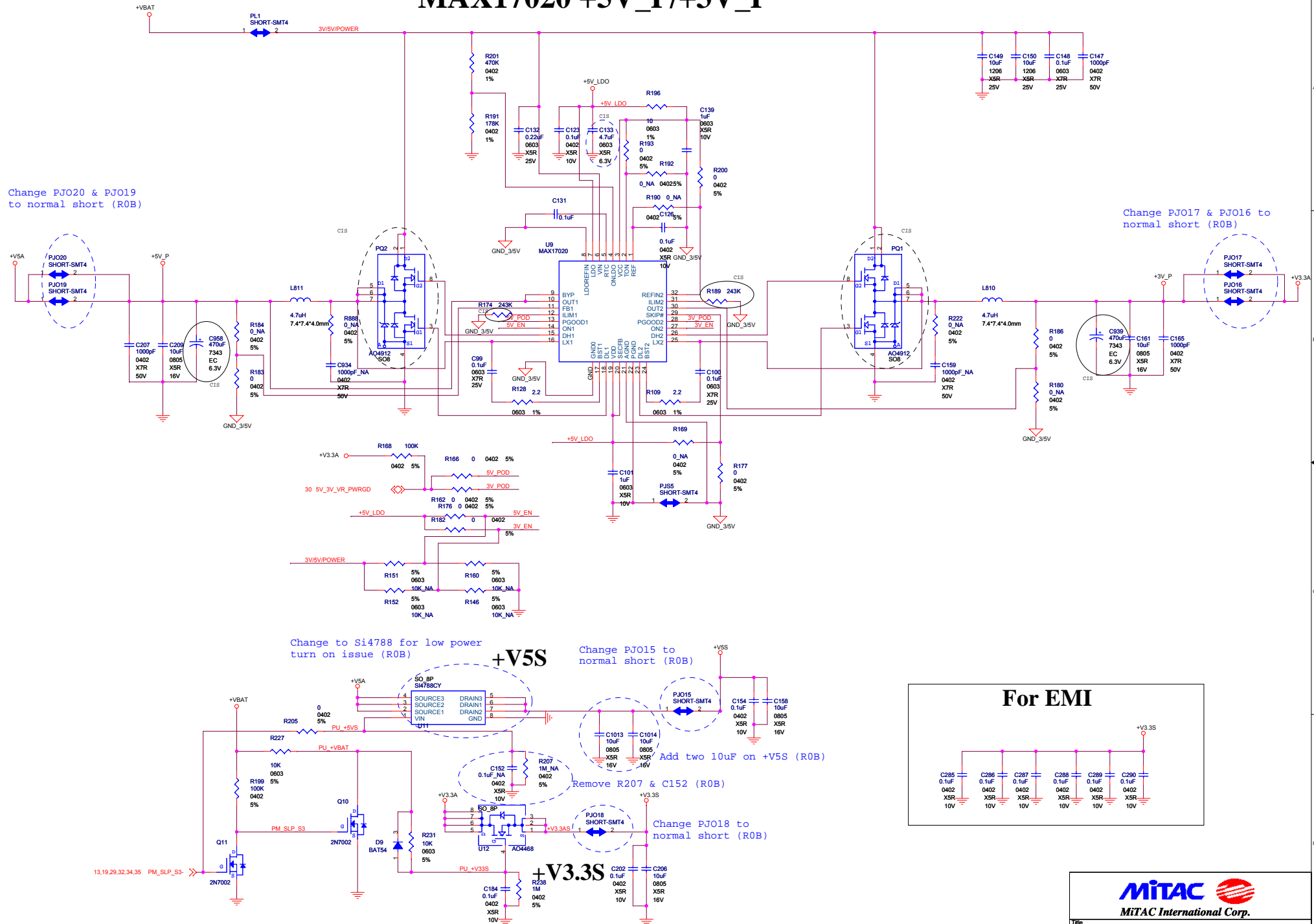
Date: Monday, June 16, 2008 Sheet 31 of 42

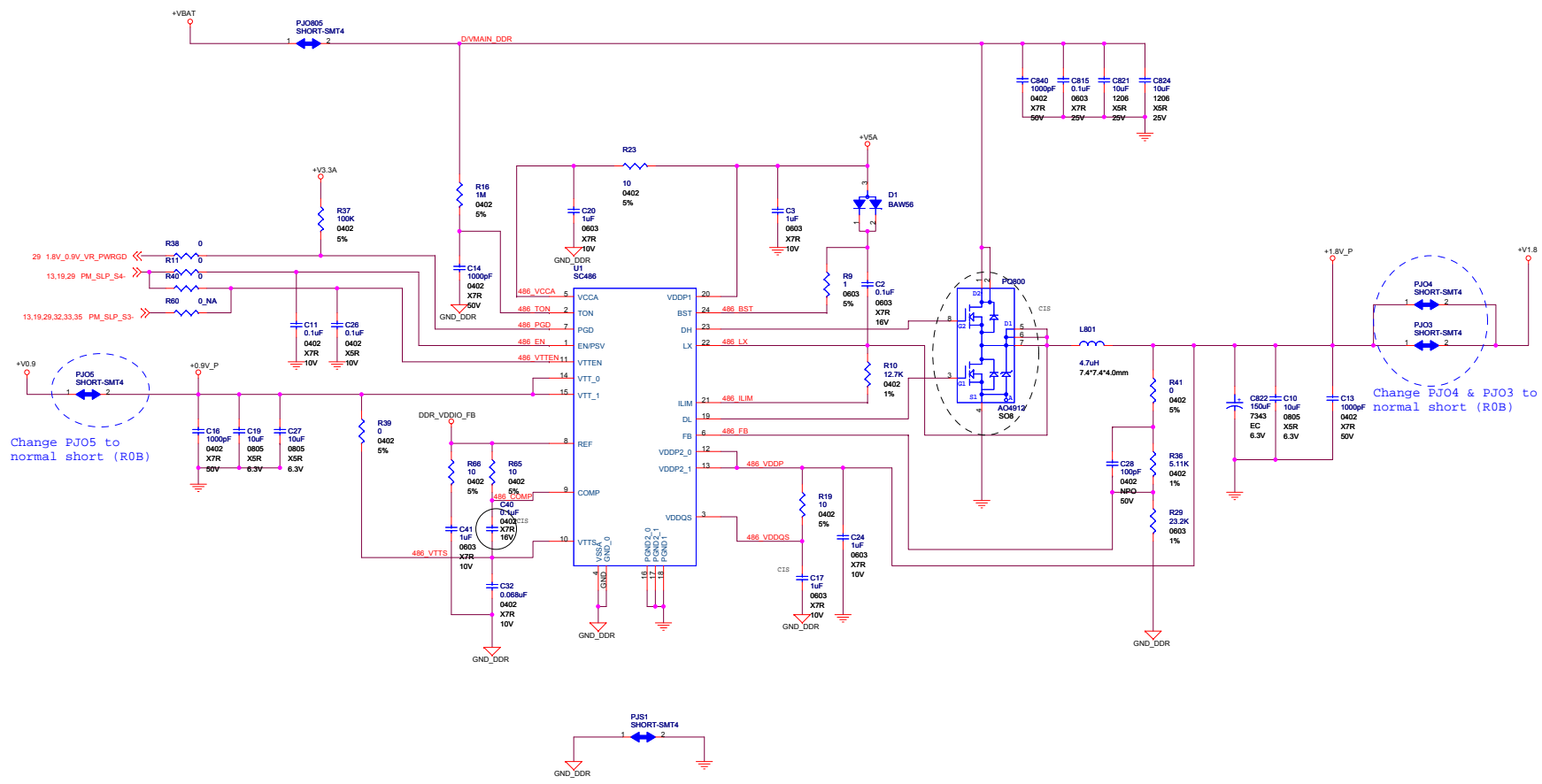
Battery Connect



Title		
2.5V(APU8831)		
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MAX17020 +5V_P/+3V_P

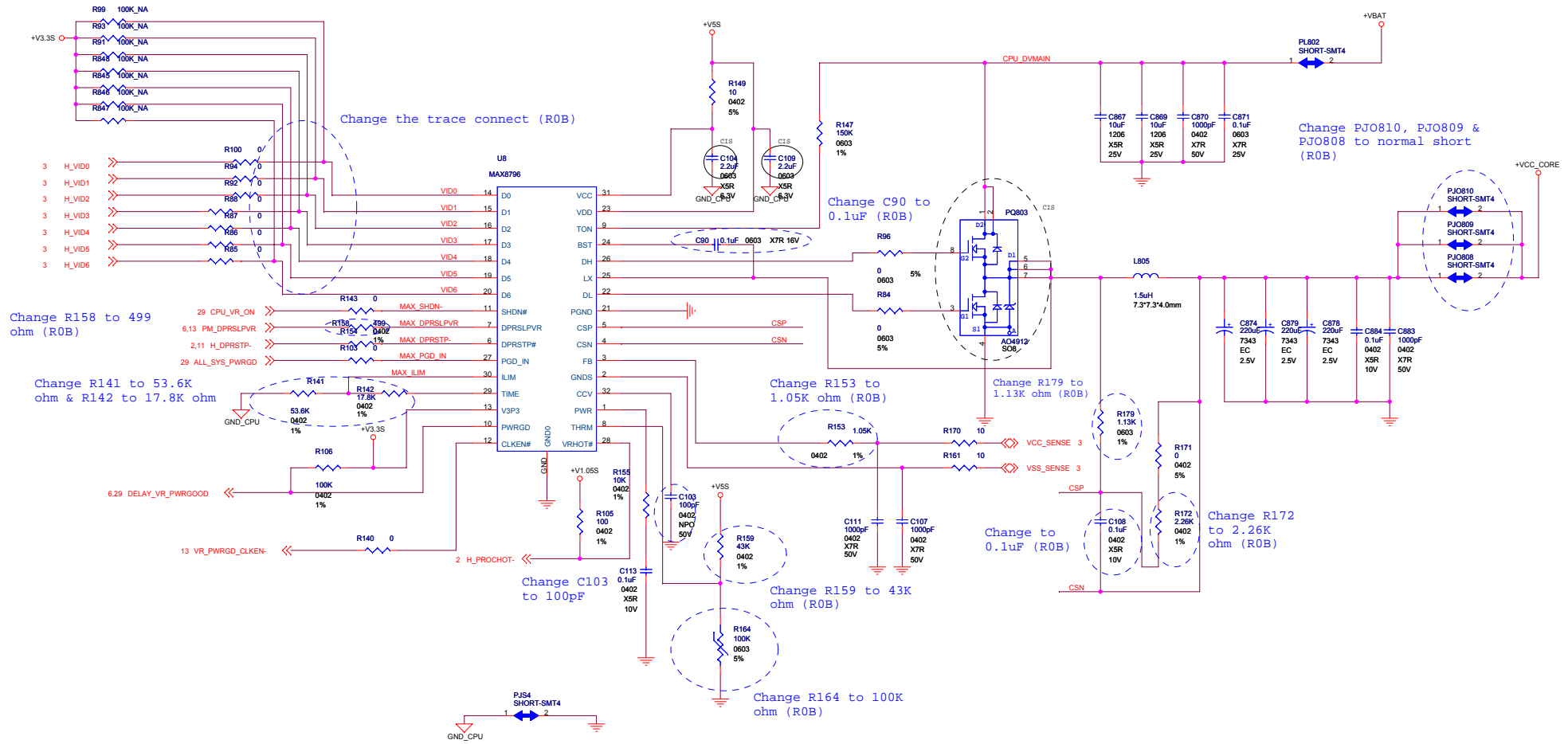




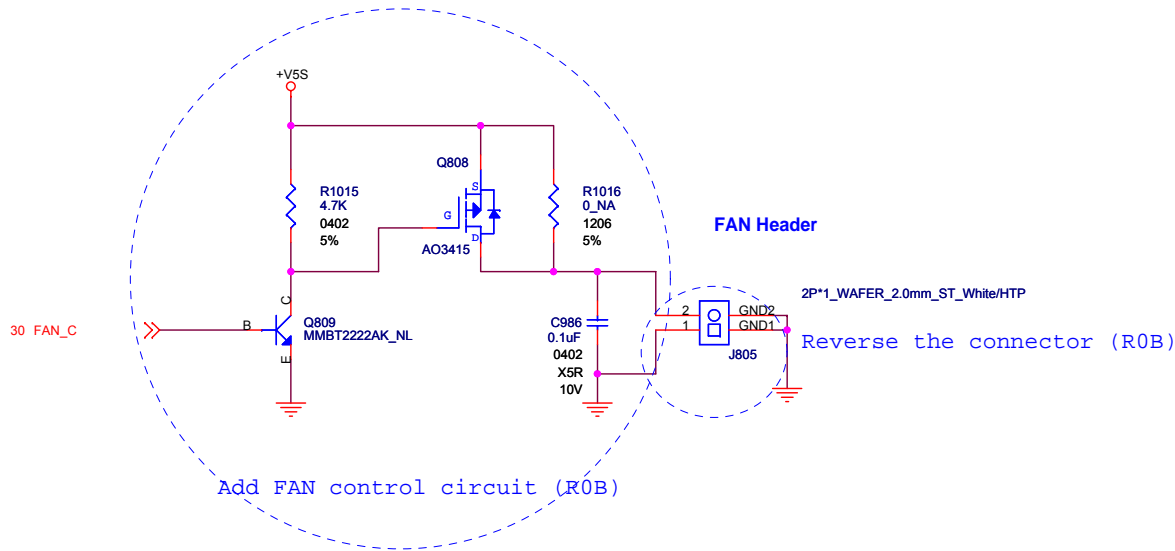
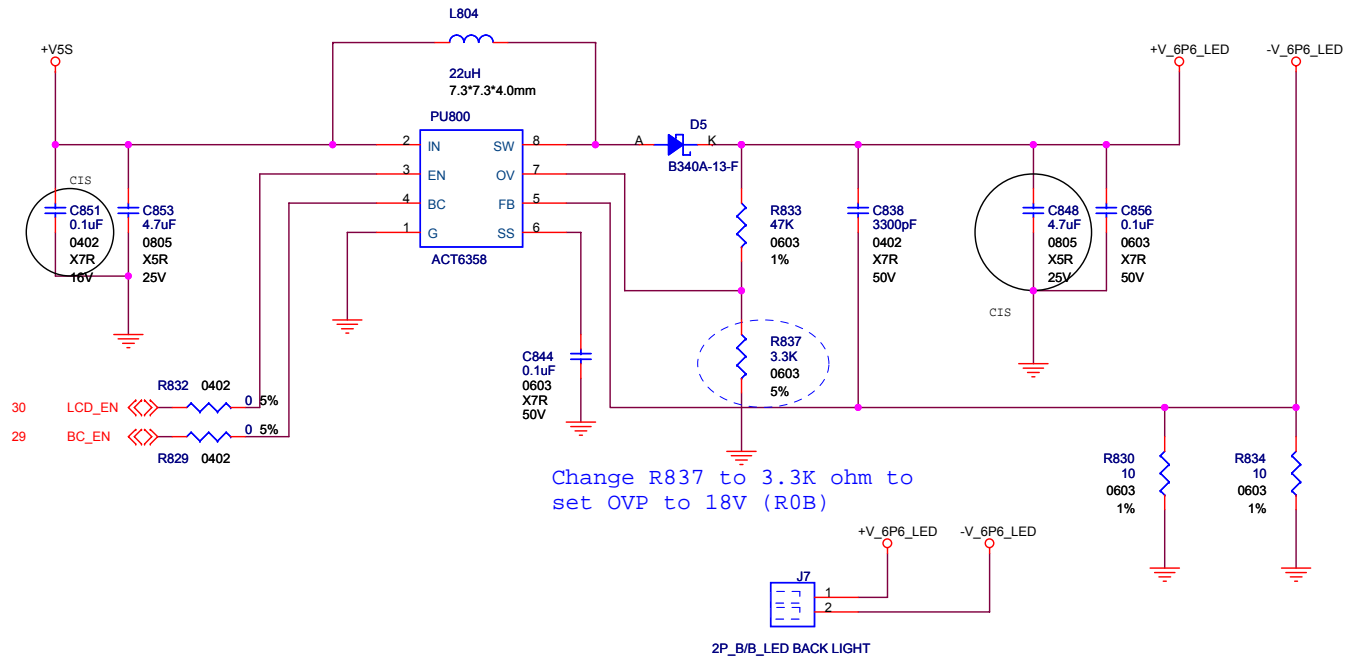
Change PJO5 to normal short (R0B)

Change PJO4 & PJO3 to normal short (R0B)

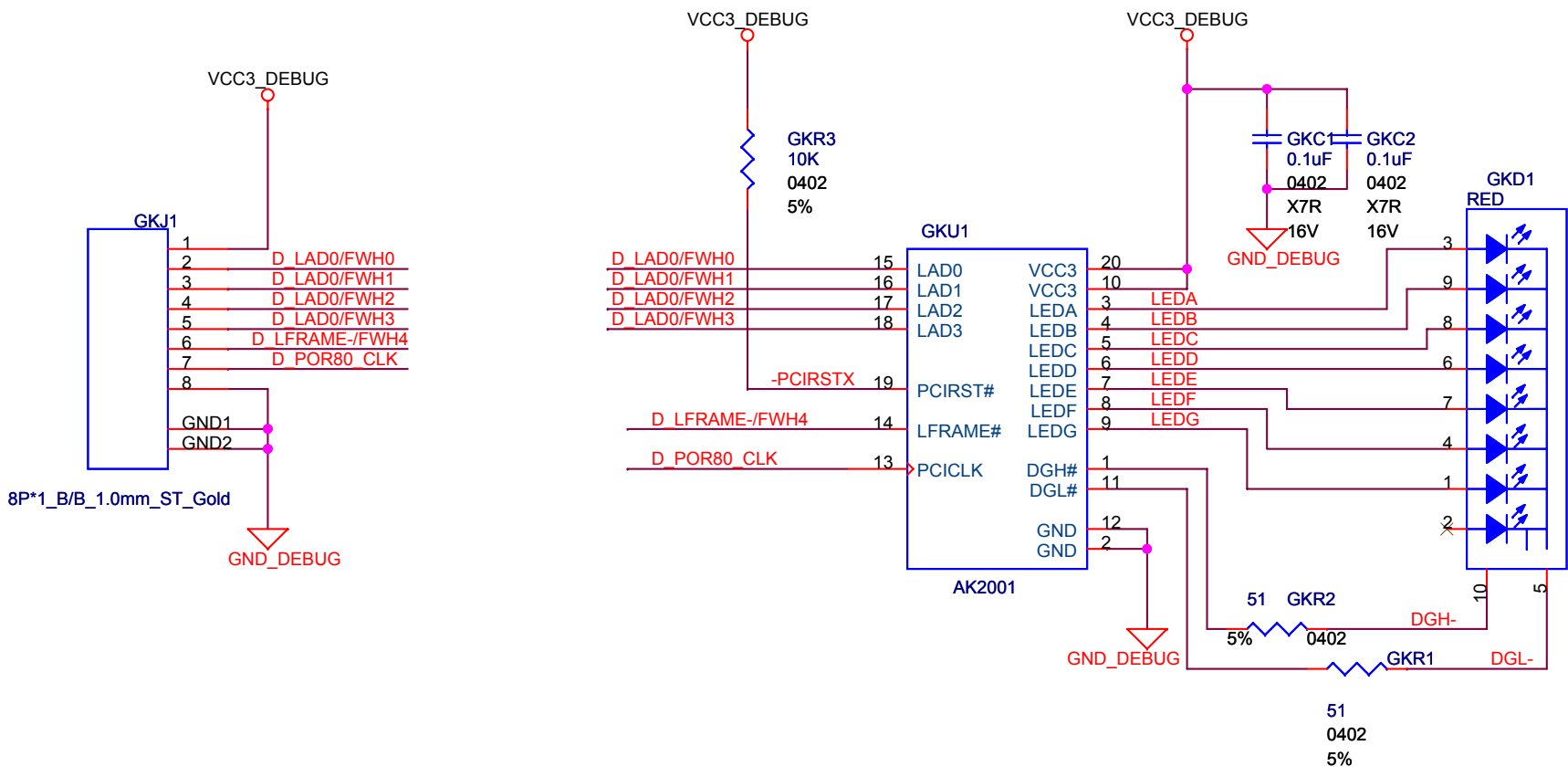
Change PJO4 & PJO3 to normal short (R0B)



LED Driver



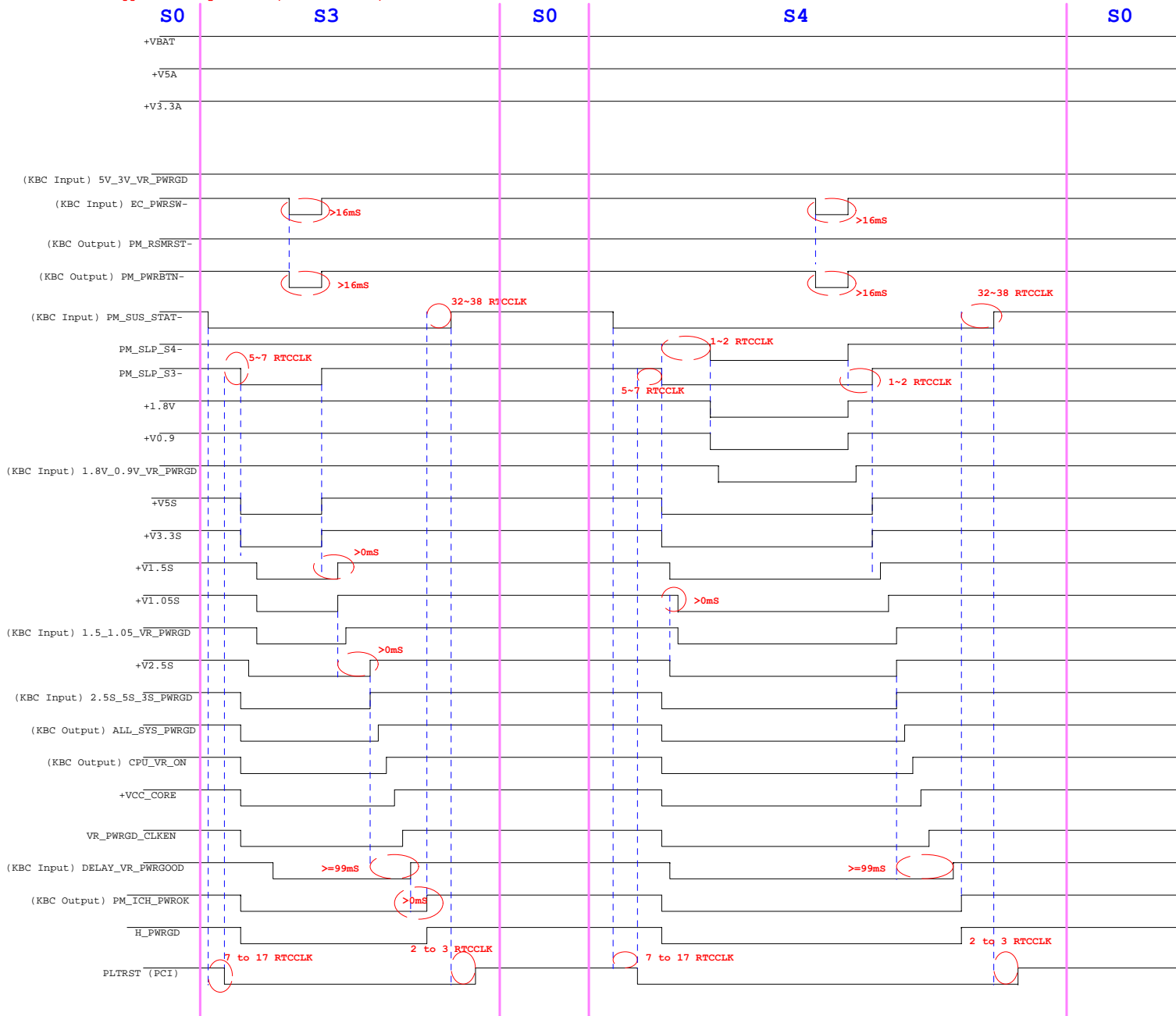
Title		
LED Backlight(ACT6358) & FAN control		
Size	Document Number	Rev
B	Rivendell	R0B
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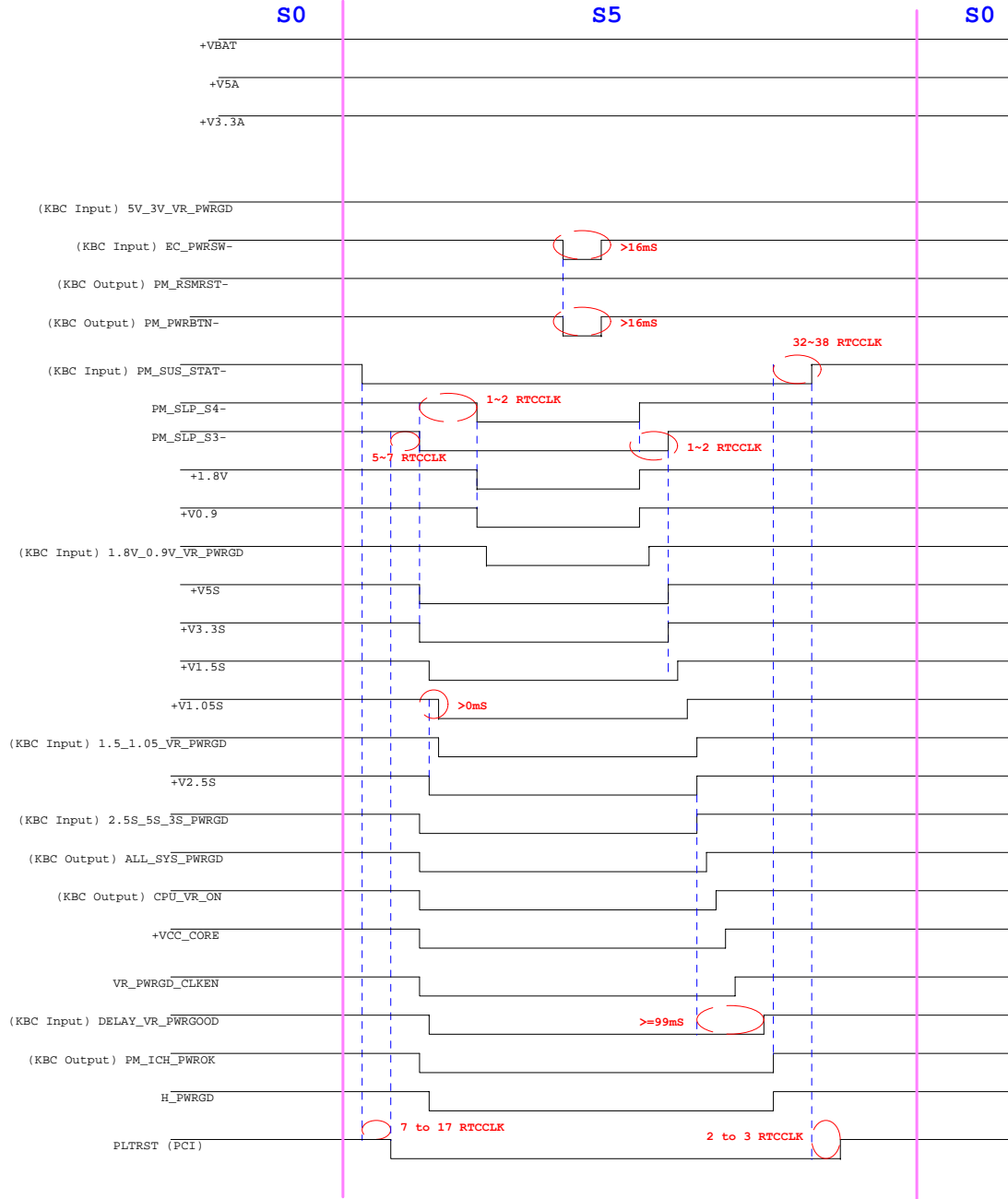
MiTAC International Corp.

Title		
38-LPC PORT80 DEBUG CARD		
Size	Document Number	Rev
A	Rivendell	R0B
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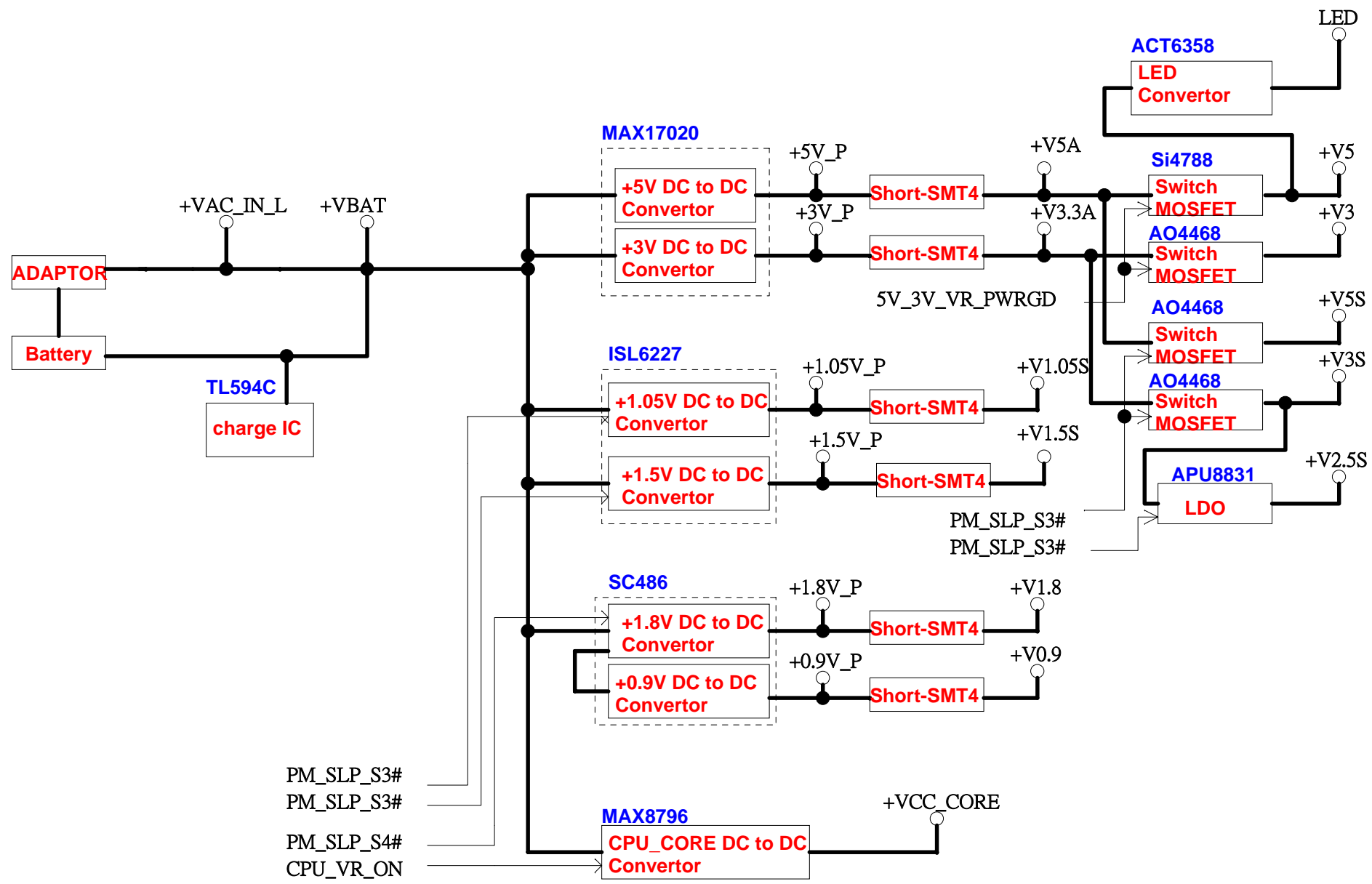
Note: PCICLK is approximately 30 ns
 RTCCLK is approximately 28.992 μ s to 32.044 μ s.



Note: PCICLK is approximately 30 ns
 RTCCCLK is approximately 28.992 μ s to 32.044 μ s.



POWER BLOCK DIAGRAM



a. CPU setting modify (P.2 & P.3)

1. Un-mount the R261 & R233
2. Change C175 to 1uF
3. Change R856 to 1.2K ohm
4. Un-mount the C889 & C893

b. Thermal sensor (P.4)

1. Add 0 ohm on R859 for over heat alert

c. XDP connector (P.4)

1. Remove the CON800, C160, R212, R215, R217, C163 & R224

d. 945GSE (NB) setting modify (P.5-P.9)

1. add 0 ohm on R254 for deeper sleep
2. Add L_DDC_CLK & L_DDC_DATA between 945GSE & LVDS connector
3. change VCCAUX_NCTFX to +V1.5S_GMS
4. Change PLL voltage to +V1.5S_GMS

e. DDR2 SO-DIMM (P.10)

1. Add 2.2uF on C1016

f. NH82801GBM (SB) (P.11-P.15)

1. Change R892 to 8.9K ohm
2. Change X1 to 274013276175 for crystal quality issue
3. Deleted J803 for PCB space issue
4. Change fan connector to P.37
5. Change USB over current pull-high voltage to +V3.3A_ICH7M
6. Change PCI I/F pull-high voltage to +V3.3S
7. Add 0 ohm on R126
8. Un-mount J800 & add R102 for BIOS share function
9. Add USB_PN1 & USB_PP1 for GPS function
10. Change EC_EXTSMI-, LCD_PID0 & LCD_PID1 pull-high voltage to +V3.3A_ICH7M

g. Clock GEN (P.16)

1. Add 0 ohm on R915 for lan wake up feature

h. LVDS port (P.17)

1. Add U810 for LVDS power control
2. Add U811 for LVDS backlight power control
3. Add 0 ohm on R814 & remove the R813 for backlight control
4. Add R1024, R1025 & R1026 for different panel support
5. Add 0 ohm on R999 & R1000 for option

i. CRT port (P.18)

1. Change VGA connector (J81) to meet ME request

j. SSD/HDD (P.20)

1. Add 10K ohm on R334 & R924 for pull-high
2. Add 0 ohm on R343 for flash mode choice
3. Change SSD_FPDY1 to R929 & R907
4. Change SSD_FCE2 to R932
5. Change SSD_FCE4 to R933
6. Change SSD_FCE3 to R908
7. Change SSD_FCE5 to R913
8. Add R996, R997 & R998 for SSD setting
9. Change J801 to new connector

k. Mini card (P.21)

1. Add CHANNEL_DATA on J73 pin 3 for bluetooth & wifi channel control
2. Add BT_PRIORITY on J73 pin 5

l. LAN RTL8102EL (P.22)

1. Change X800 to low profile part
2. Add R62 & R49 for LAN clock request function

m. SD/MMC card reader (P.23)

1. Change CON4 to push-push type
2. Change U22 to new solution (SM331L)
3. Add R1014, R353 & D811
4. Add Q810, R1022 & R1023 for SD/MMC card controller power saving feature

n. Audio codec (P.24)

1. Change R333 to 51K ohm for internal speaker volume fine tune
2. Change C1011 & C1003 to 0805 size for layout issue
3. Add C1019 & C1020 for EMI request
4. Add 1K ohm on R1039, 9.09K ohm on R1040 for internal MIC bias voltage

o. MDC (P.25)

1. Reverse the J70 to meet spec define

p. USB port (P.26)

1. Change J15, J16 7 J17 to reverse type connector
2. Add IPOD charge circuit
 - i. Add Q806 & Q807 for power source control
 - ii. Add U809, R1002, R1003 & R1004 for IPOD charge feature
 - iii. Add R1008, R1009, R1012 & R1010 for virtual USB port setting

q. Bluetooth connector/GPS connector (P.27)

1. Add common mode choke on L815 for EMI request
2. Change bluetooth power to +V3.3A for wake up feature
3. Add J72, R1020, R1019, D809, C1015 & R1017 for GPD feature
4. Add SW4, R1027 & C1017 for GPS ON/OFF detect

r. WebCAM connector (P.28)

1. Add common mode choke L814 for EMI request.

s. KBC (P.29 & P.30)

1. Add 0 ohm on R367 for EC system management interrupt
2. Add 0 ohm on R938 & R945 for S3 & S4 status detect
3. Change D19/D20 to amber/green color LED for product change
4. Change D17 to blue color LED for product change
5. Change J20 to 28pin connector
6. Change X2 to 274013276175 for crystal quality issue
7. Change C240 & C239 to 6.8pF for accuracy issue
8. Add GPS_ON signal on pin 31
9. Add USB_EN signal on pin 117
10. Add FAN_C signal on pin 22
11. Add KB_TYPE_DET on pin 11
12. Add 0 ohm on R989
13. ADD MTG804 for ME request

t. Battery charge (P.31)

1. Change R18 to 100K ohm & connection to ADINP
2. Change R825 to 100K ohm & remove the R821 for AC in detect

u. 3.3V, 5V power system (P.33)

1. Change P3020, P3019, P3017, P3016, P3015 & P3018 to default short
2. Change U11 to S14788 & add 0 ohm on R205 to connect with PM_SLP_S3-
3. Un-mount the R207, C152
4. Add 10uF on C1013 & C1014

v. 1.8V, 0.9V power system (P.34)

1. Change P304, P30 & P305 to default short

w. 1.05V, 1.5V power system (P.35)

1. Change P30813, P30814, P30815 & P30812 to default short
2. Change C82 to 220uF for power team request
3. Change L808 to small size part

y. CPU VCORE power system (P.36)

1. Change R142 to 47.8K ohm & R141 to 53.6K ohm for slew rate
2. Change R158 to 499 ohm to meet spec request
3. Change VID pull-high position
4. Change R164 to 100K ohm thermistor & R159 to 43K ohm for thermal detect point setting
5. Change R179 to 1.13K ohm, R172 to 2.26K ohm & C108 to 0.1uF for current sense
6. Change R153 to 1.05K ohm for feedback setting
7. Change C103 to 100pF & C90 to 0.1uF
8. Change P30810, P30809 & P30808 to default short

z. LED backlight & fan control (P.37)

1. Change R837 to 3.3K ohm for over voltage setting
2. Add Q808, R1015, C986, Q809 for fan on/off control



Title		Design change note	
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