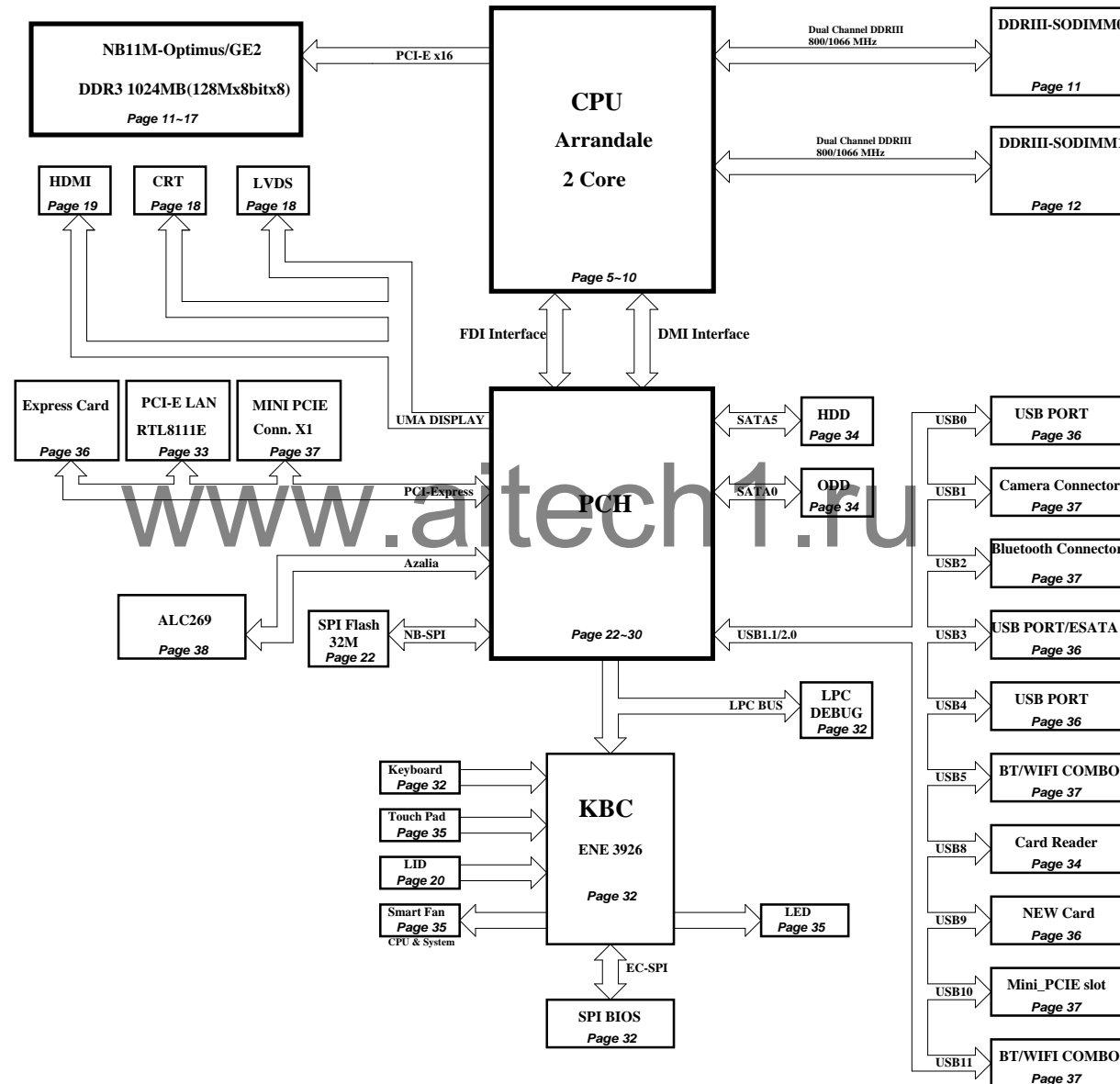
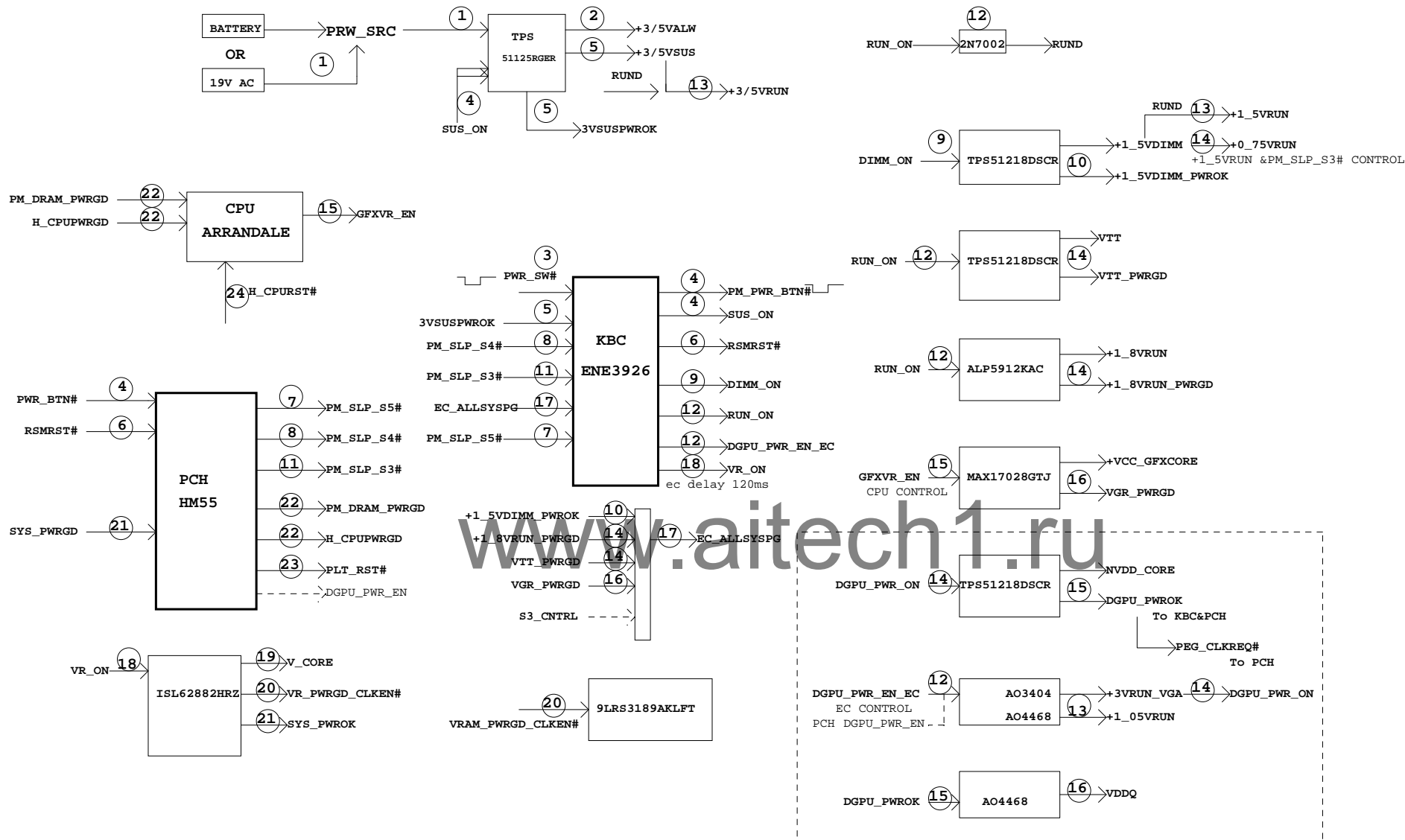


## Table of Contents

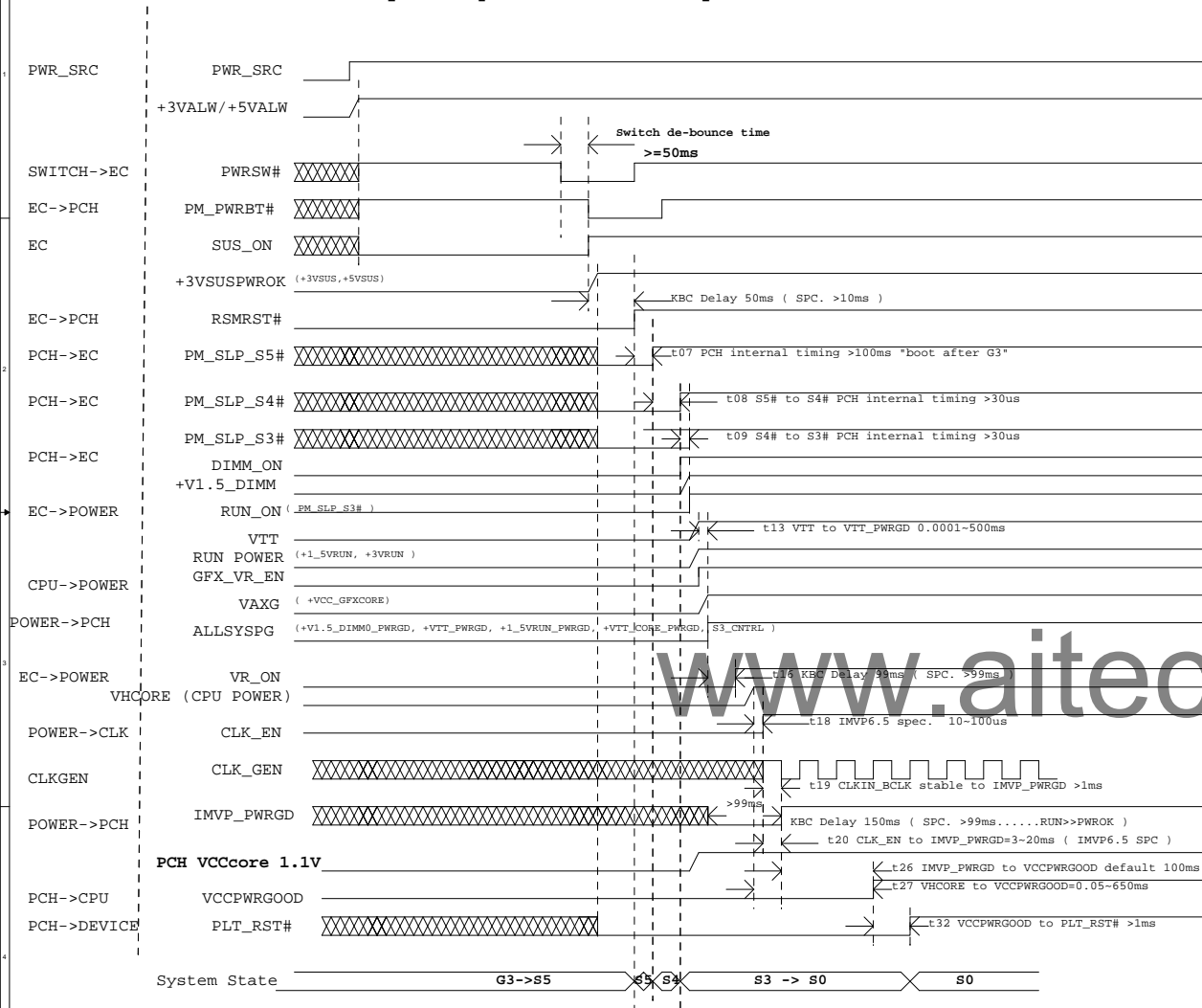
## Page Description

01 : BLOCK DIAGRAM
02 : Power Delivery
03 : Power Sequency
04 : Clock/SMBus Distribution
05 : PROCESSOR-1 (HOST BUS)
06 : PROCESSOR-2 (DDR3)
07 : PROCESSOR-3 (POWER)
08 : PROCESSOR-4 (GRAPHICS POWER)
09 : PROCESSOR-5 (GND)
10 : PROCESSOR-6 (RESERVE)
11 : DDR3 SODIMM 0
12 : DDR3 SODIMM 1
13 : NB11M_GE2(PCIE_Interface)
14 : NB11M_GE2(FB interface)
15 : NB11M_GE2(VRAM)
16 : NB11M_GE2(VRAMB)
17 : NB11M_GE2(CRT/LVDS)
18 : NB11M_GE2(GPIO)
19 : NB11M_GE2(STRAPS)
20 : CRT,LVDS connector & LID
21 : LEVEL SHIFT&HDMI
22 : PCH-1 (HDA,JTAG,SATA)
23 : PCH-2 (PCI-E,SMBUS,CLK)
24 : PCH-3 (DMI,FDI,GPIO)
25 : PCH-4 (LVDS,DDI)
26 : PCH-5 (PCI,USB,NVRAM)
27 : PCH-6 (GPIO,VSS_NCTF,RSVD)
28 : PCH-7 (POWER)
29 : PCH-8 (POWER)
30 : PCH-9 (GND)
31 : Clock Generator (9LRS3199AKL)
32 : KBC/EC/uP (KB3926)
33 : PCI-E Lan (RTL8111E)
34 : Cardreader ( UB6250)
35 : FAN,Lauch board
36 : HDD,CDROM,USB,NEWCARD,ESATA
37 : MINIPICIE,CAMERA,BLUETOOTH,SW
38 : CODEC(ALC269)
39 : M_Battery select
40 : M_Battery Charger
41 : M_System Power
42 : SMDDR_VTERM/1_5VRUN
43 : VTT POWER,+1.8VRUN
44 : M_CPU power
45 : M_Graphic Core
46 : NVVDD,+1.03VRUN
47 : Screw/ ME
48 : 168AA_USB BOARD
49 : 168AB_Lauch board
50 : EMI
51 : Change List



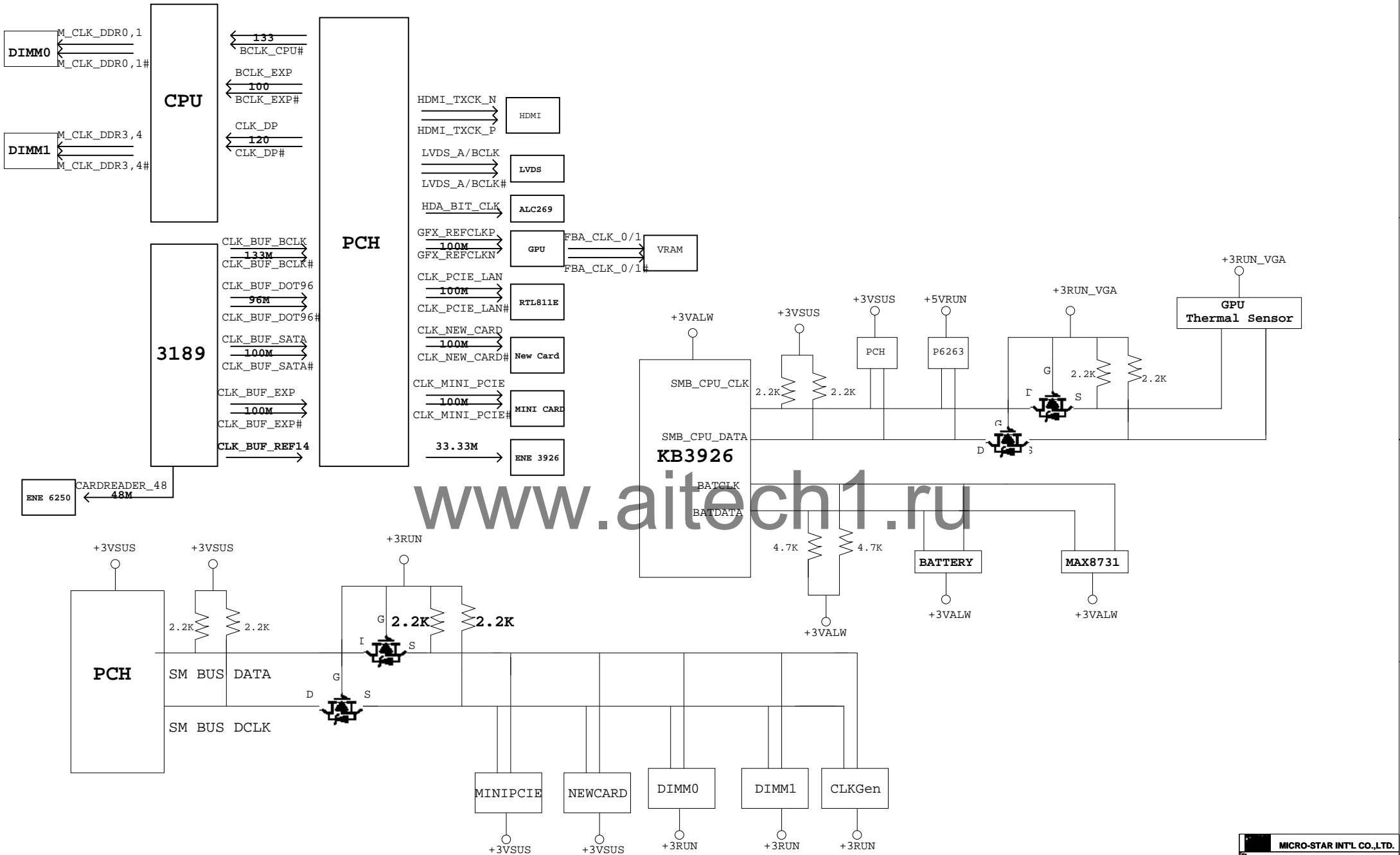


# Calpella System Power on Sequence DC mode

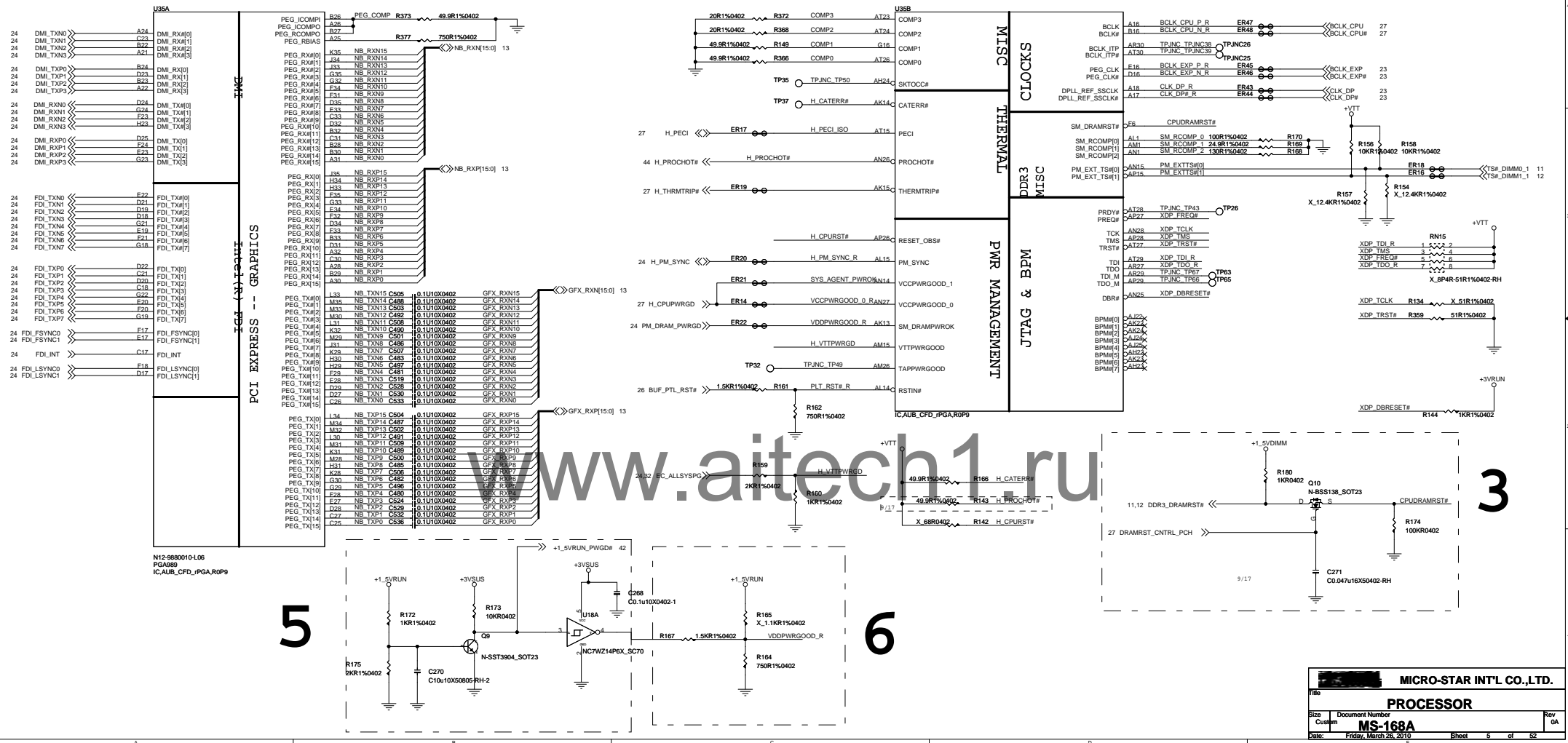


# Power down Sequence DC mode S0 to G3

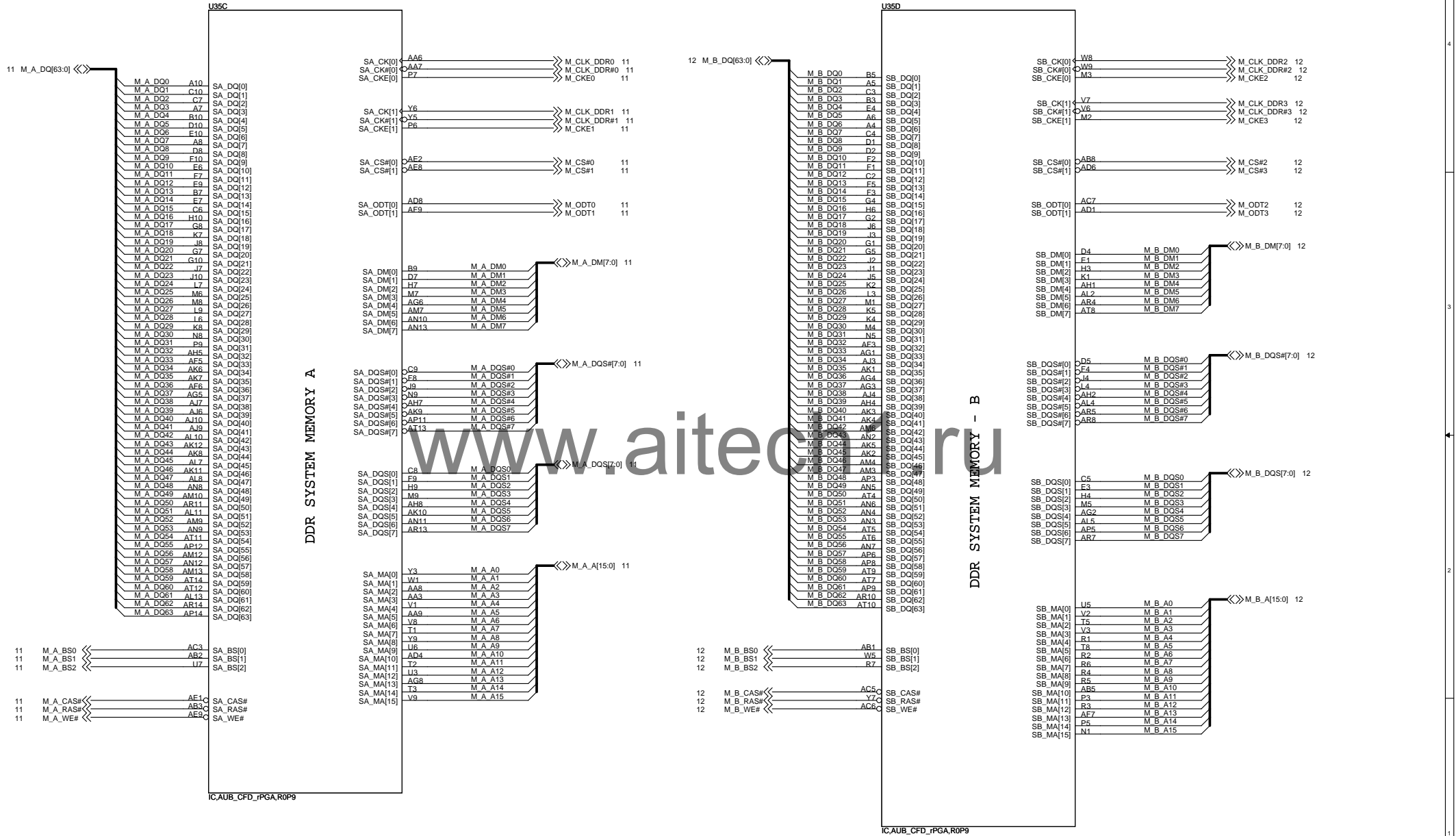




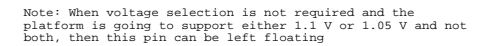
## ARRANDALE PROCESSOR (CLK,MISC,JTAG)



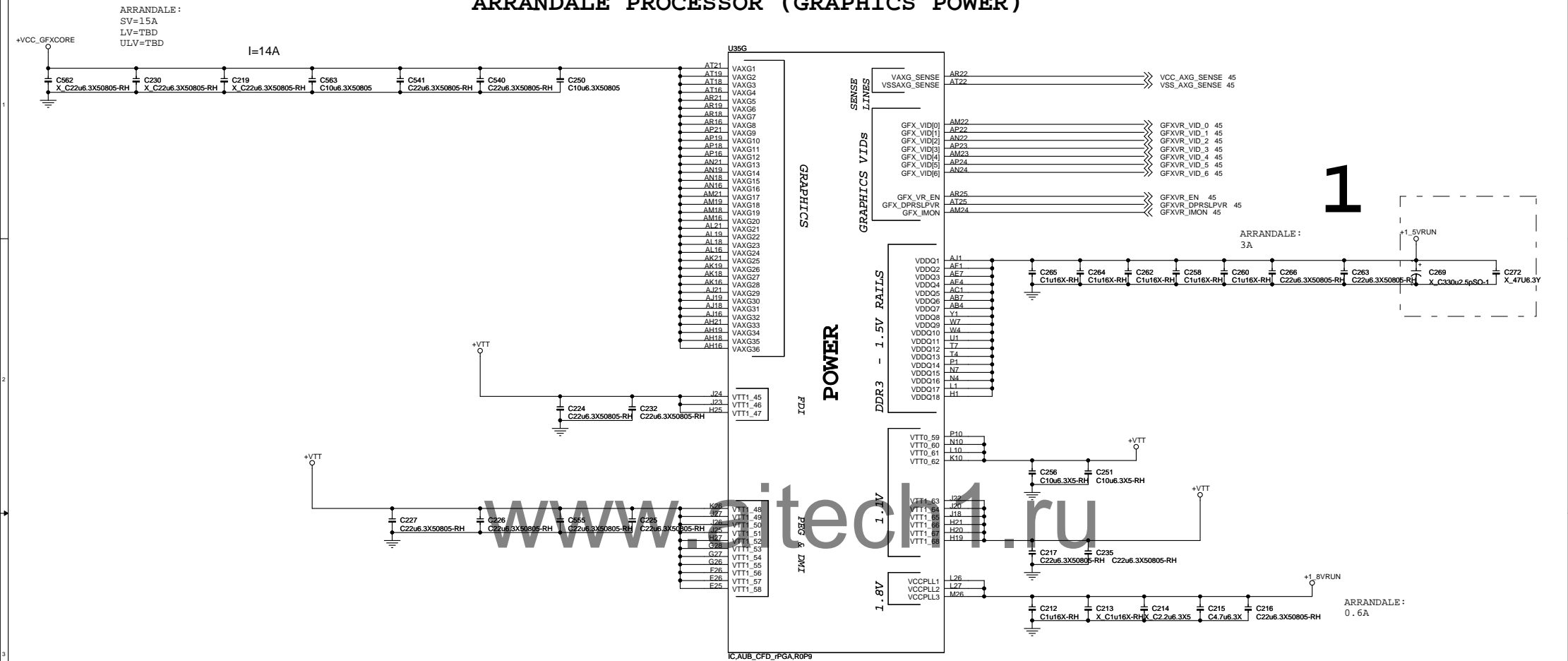
# ARRANDALE PROCESSOR (DDR3)



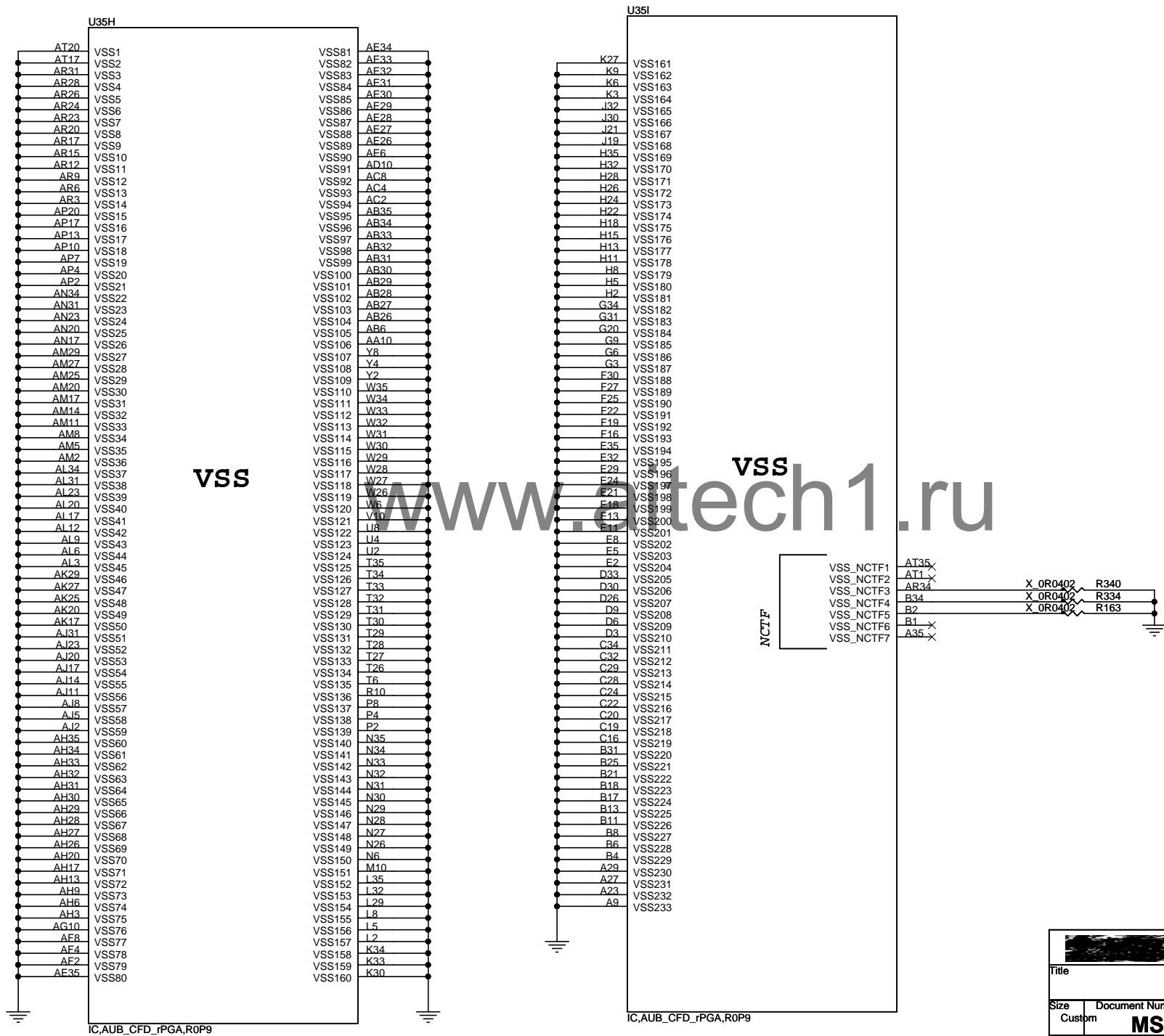
## PROCESSOR CORE POWER




## ARRANDALE PROCESSOR (GRAPHICS POWER)

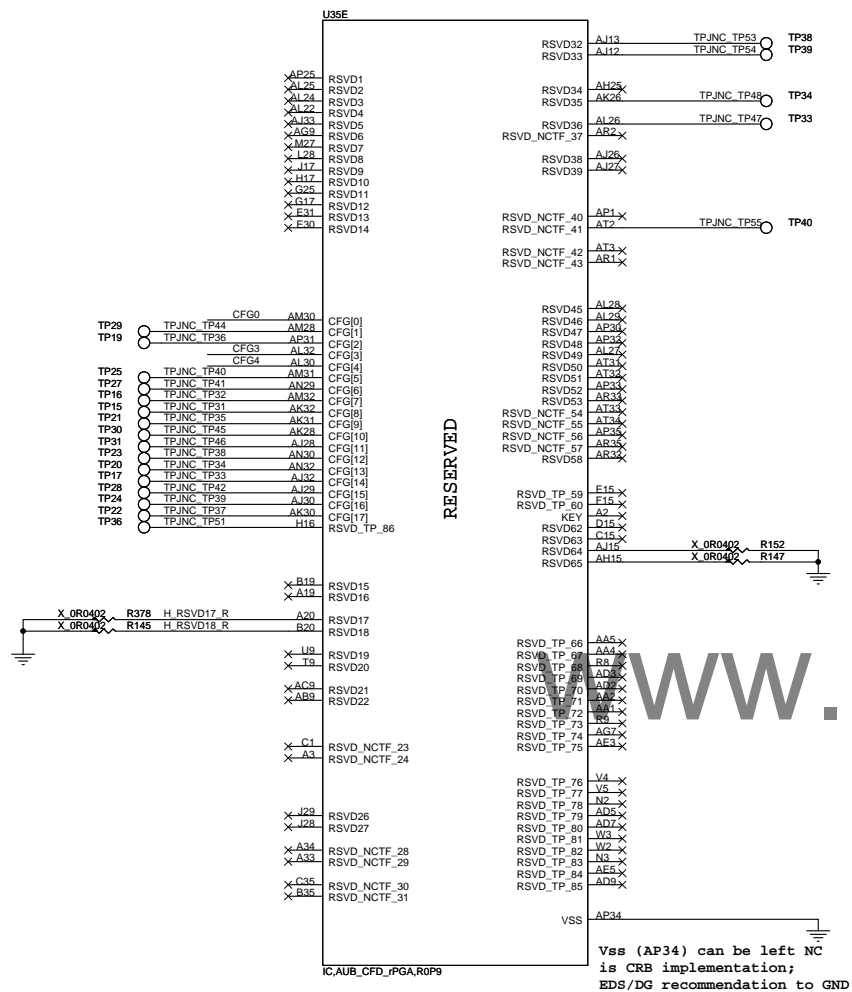


# ARRANDALE PROCESSOR (GND)



			MICRO-STAR INT'L CO.,LTD.		
Title					
PROCESSOR GND					
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## ARRANDALE PROCESSOR (RESERVED)



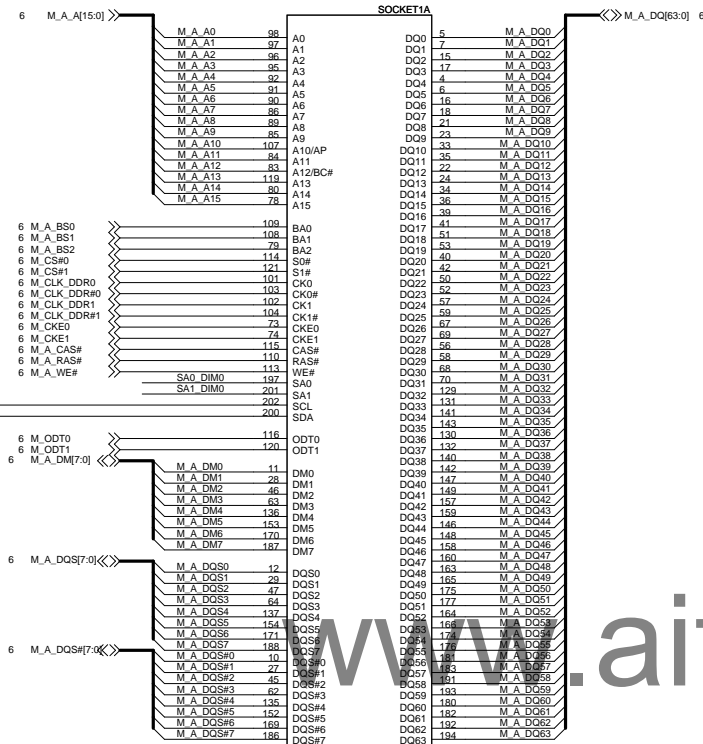
PCI-Express Configuration Select	
CFG0	1:Single PEG 0:Bifurcation enabled

CFG3 - PCI-Express Static Lane Reversal	
CFG3	1 :Normal Operation 0 :Lane Numbers Reversed 15 -> 0, 14 -> 1, ...

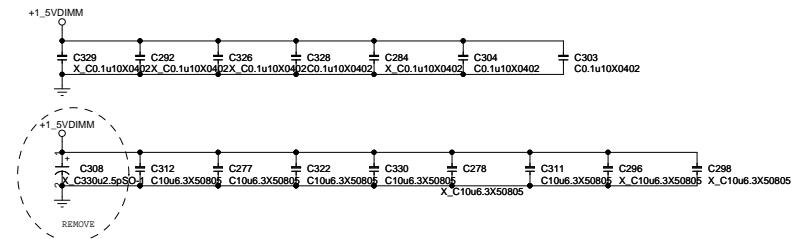
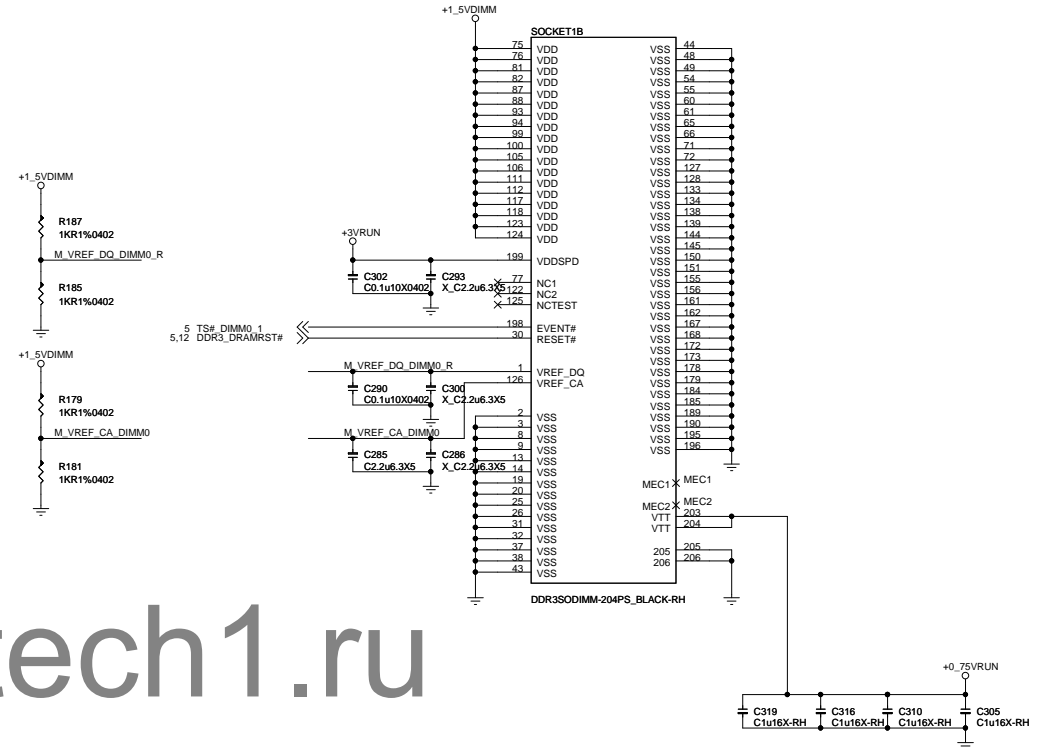
CFG4 - Display Port Presence	
CFG4	<p>1:Disabled: No Physical Display Port attached to Embedded Display Port</p> <p>0:Enabled: An external Display Port device is connected to the Embedded Display Port</p>

Layout Note:  
Location of all CFG strap resistors needs  
to be close to trace to minimize stub

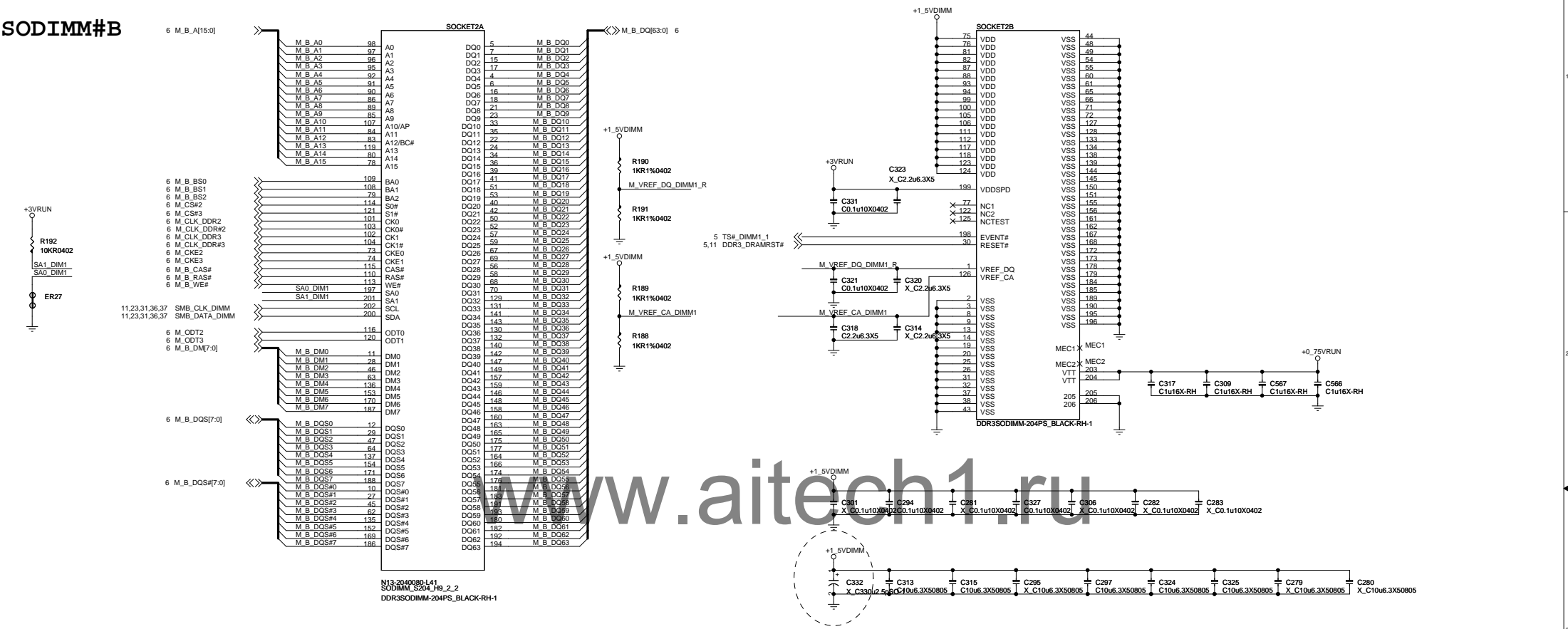
# SODIMM#A



N13-2040060-L41  
SODIMM\_S204\_H5\_2  
DDR3SODIMM-204PS\_BLACK-RH



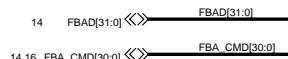
SODIMM#B



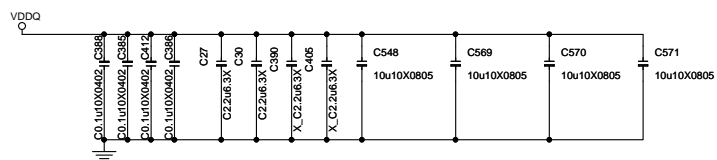
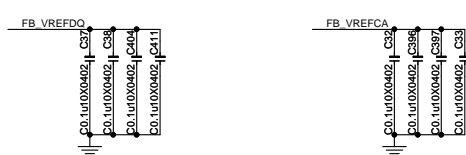
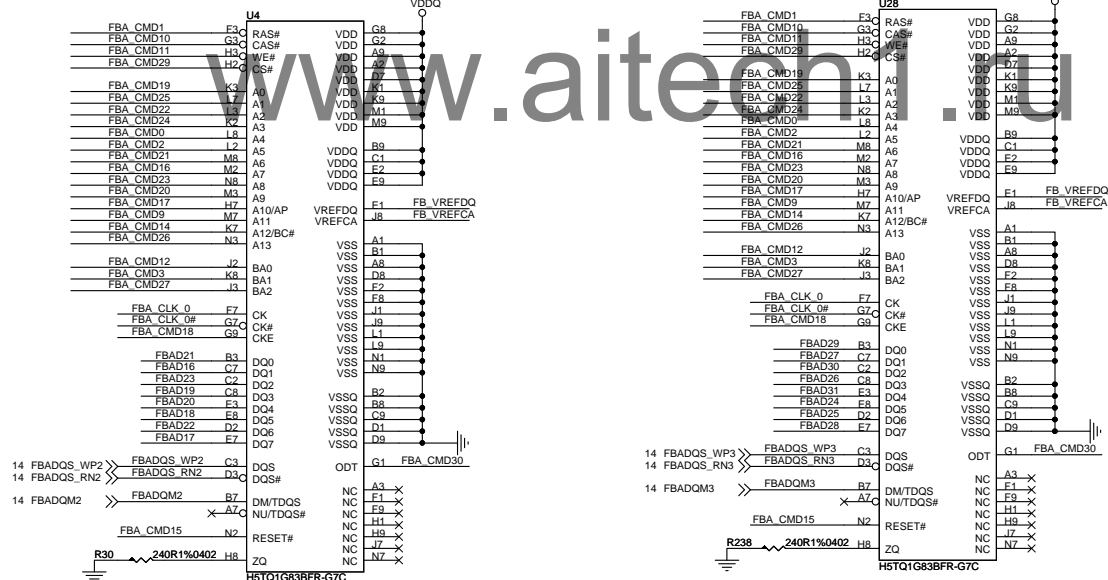
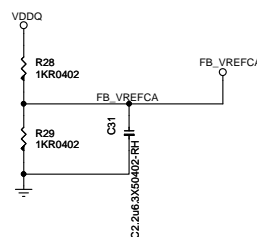
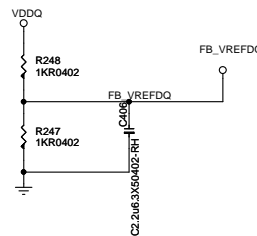
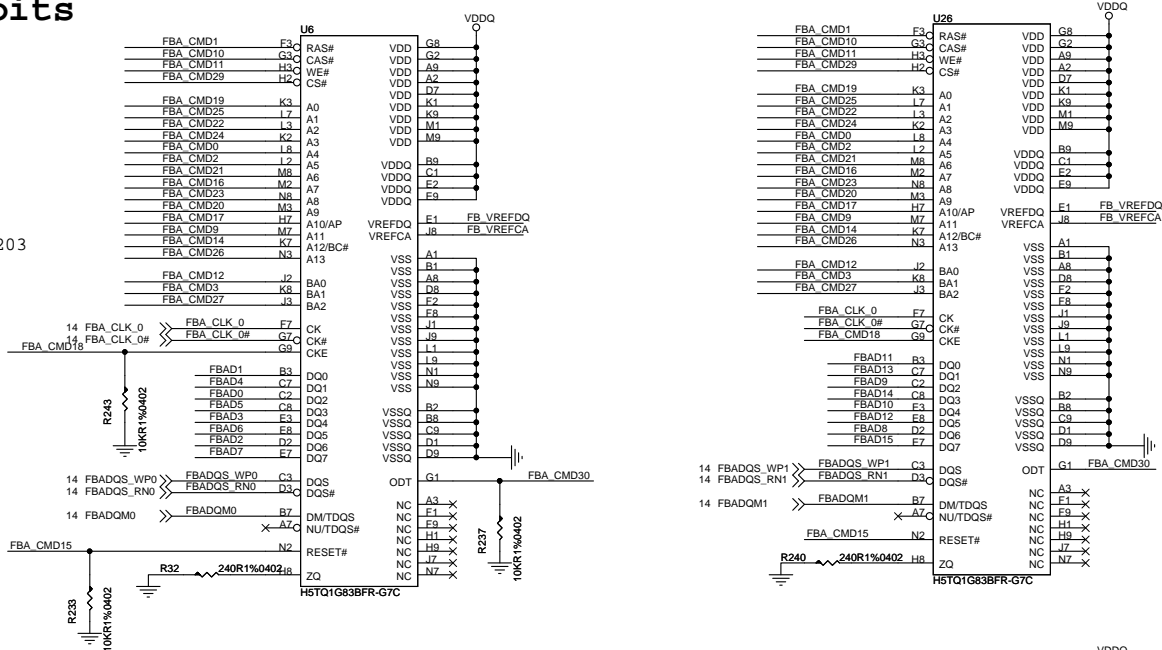




# DDR3 128Mx8bits



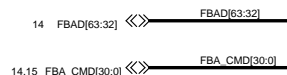
R252 need change to 242 ohm.1203



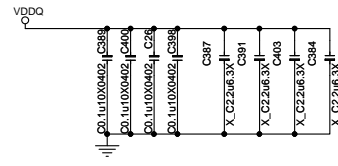
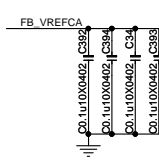
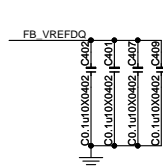
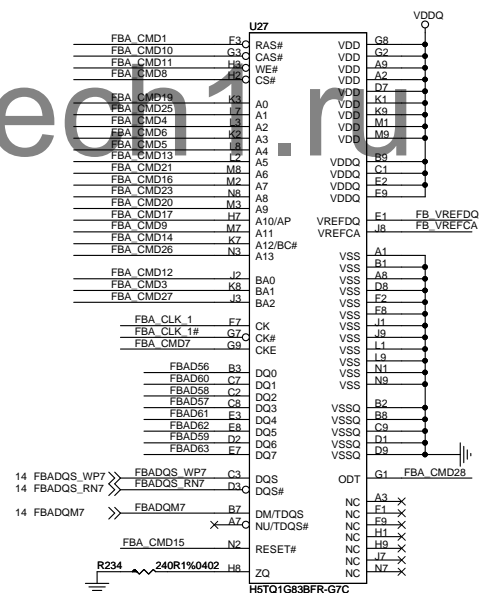
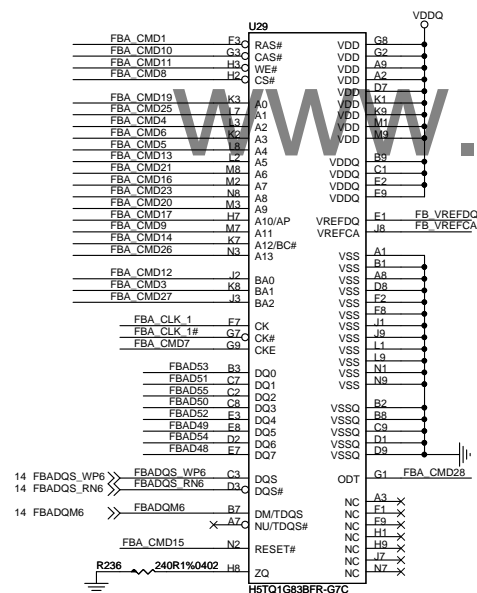
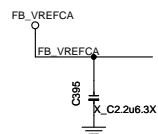
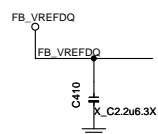
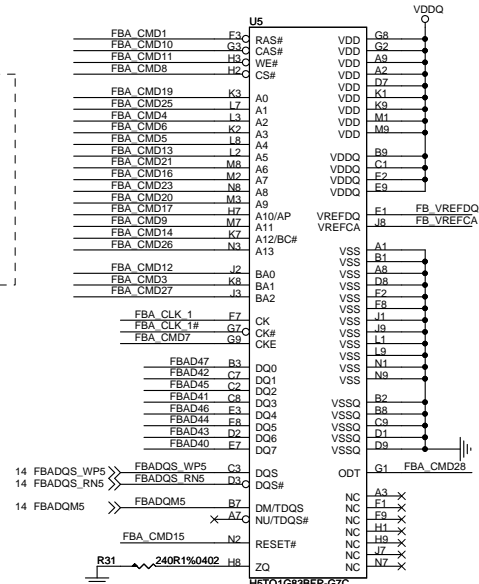
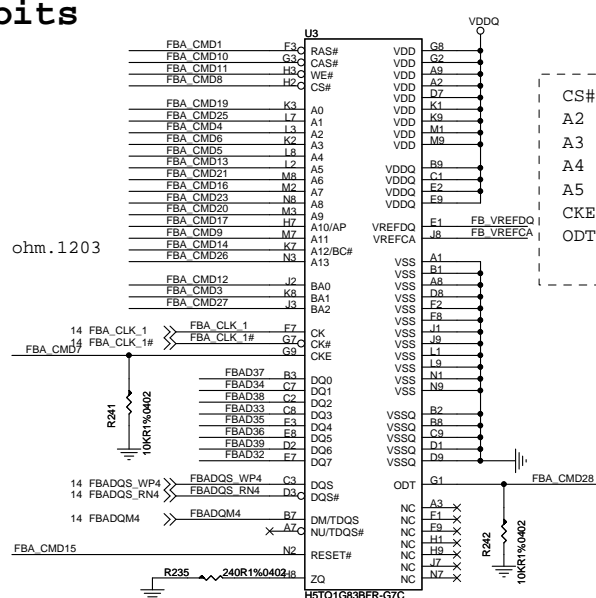
Each group(top & bottom) put a 0.1uF

MSI CORPORATION		
Title		
PARK-POWER		
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DDR3 128Mx8bits

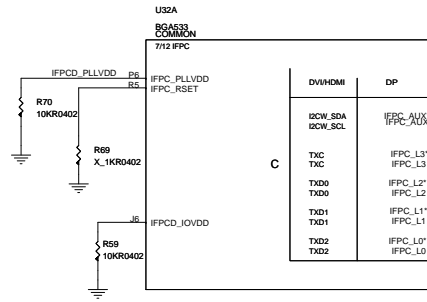
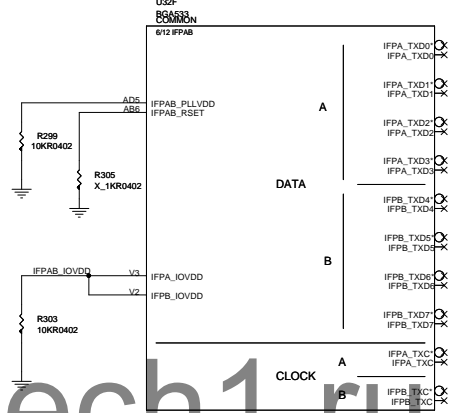
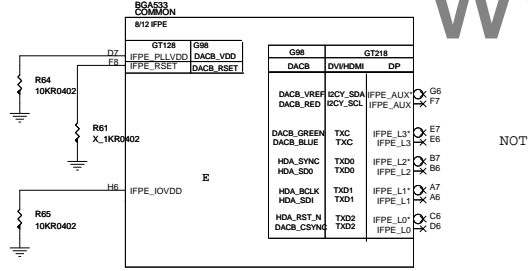
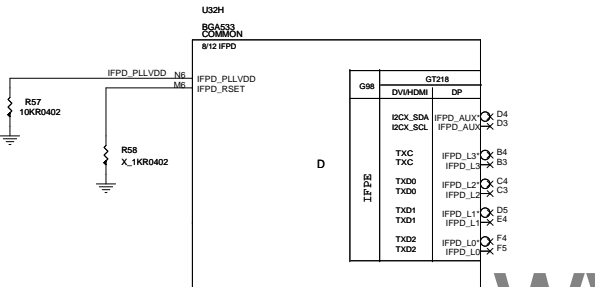
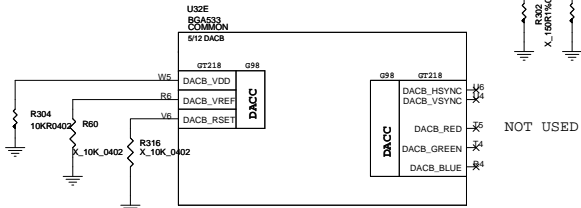
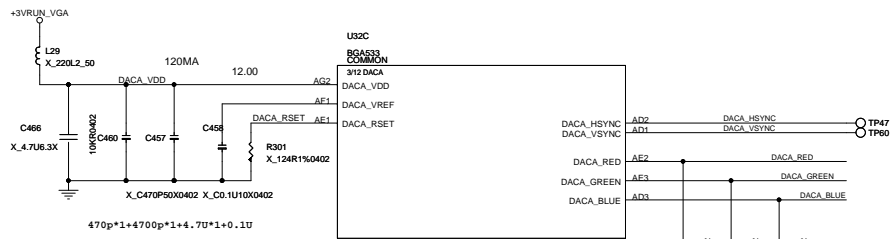


R264 need change to 242 ohm.1203



Each group(top & bottom) put a 0.1uF

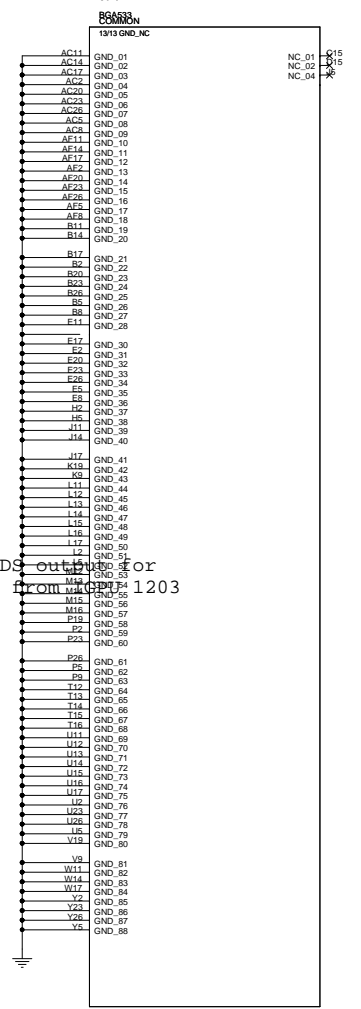
<b>MSI CORPORATION</b>			
Title			
<b>PARK-power straps</b>			
Size	Document Number		Rev
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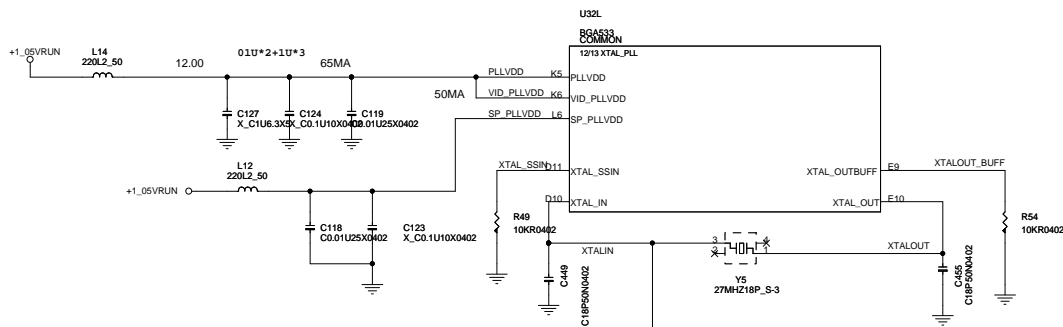
need delete DGPU output 1125

delete DGPU LVDS output for Optimus output from 1203

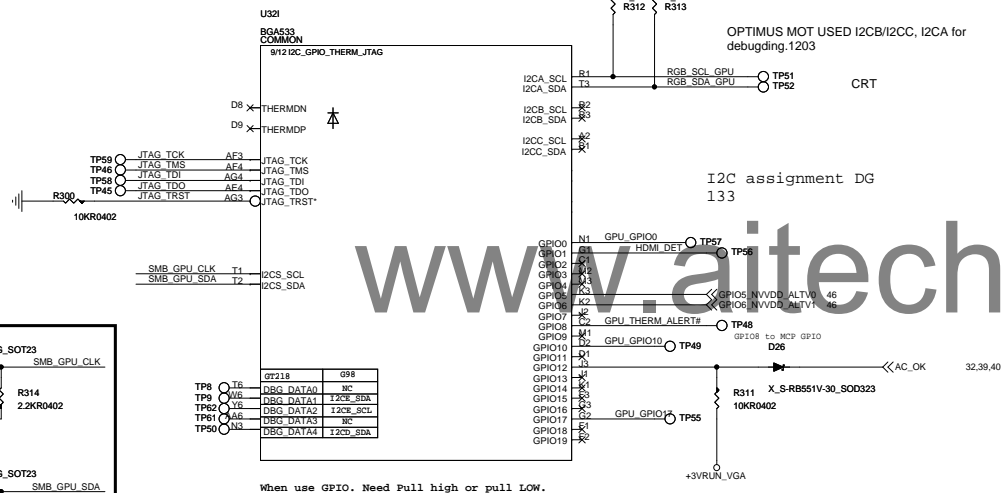
OPTIMUS not use GPU HDMI, delete 1203



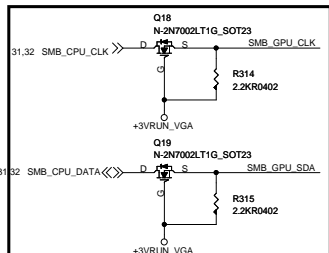
MICRO-STAR INT'L CO., LTD.			
PARK MEM I/F			
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X\_0R0402 R297  
Place this resistor as close as possible to crystal and add a testpin in XTALOUT to balance trace capacitance/Aaron



When use GPIO. Need Pull high or pull LOW.

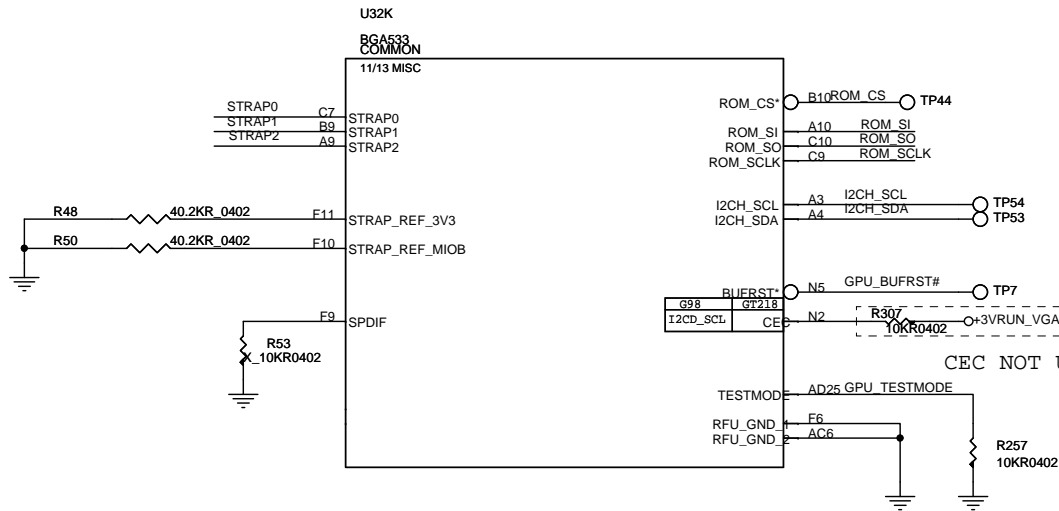


For Optimus system VGA no power @IGP mode 1203/zong

#### GPIO USAGE

GPIO	I/O	ACTIVE	USAGE
0	IN	N/A	HDMI HOTPLUG DETECT
1	IN	N/A	DVI/HDMI LINKC HOTPLUG DETECT
2	OUT	HIGH	PANEL BACKLIGHT PWM
3	OUT	HIGH	PANEL POWER ENABLE
4	OUT	HIGH	PANEL BACKLIGHT ENABLE
5	OUT	HIGH	NVVDD ALT0
6	OUT	HIGH	NVVDD ALT1
7	OUT	HIGH	FBVDD VDD0
8	IN	LOW	OVERTEMP ALERT
9	OUT	LOW	THERMAL ALERT
10	OUT	HIGH	DYNAMIC FB VREF GDDR3 ( not used for DDR2)
11	OUT	HIGH	SLI SYNC0 (not used for GB1-64)
12	IN	N/A	AC DETECT
13	OUT	LOW	POWER SUPPLY CONTROL0
14	OUT	HIGH	POWER SUPPLY CONTROL1
15	IN	N/A	HPD_E
16	IN	N/A	DVI_E
17	IN	N/A	HDMI_E
18	IN	N/A	DVI_F (not used)
19	IN	N/A	HDMI_F (not used)

GPIO6	GPIO5	NVVDD(N10M-SEL1)
1	1	1.03V
1	0	0.85
0	1	TDB
0	0	0.85



CEC NOT USED 1130

### N10M SE1

STRAP0	USER 3	1
PU 45K	USER 2	1
	USER 1	1
	USER 0	1
STRAP1	3GIO_PADCFG 3	0
P4 95K	3GIO_PADCFG 2	0
	3GIO_PADCFG 1	0
	3GIO_PADCFG 0	1
STRAP2	PCI_DEVID3	0
PD 5K	PCI_DEVID2	0
	PCI_DEVID1	0
	PCI_DEVID0	0
ROM_SCLK	PCI DEVID 4	1
PU 15K	SUBVENDOR	0
	SLOT_CLK	1
	PEX_PLL_EN	0
ROM_SI	RAMCFG 3	0
PD 5K	RAMCFG 2	0
	RAMCFG 1	0
	RAMCFG 0	0
ROM_SO	XCLK_417	1
PD 10K	FB_0_BAR_SIZE	0
	SMB_ALT_ADDR	0
	VGA_DEVICE	0

SM BUS define resolution 1111

PUN-04992-001-V01  
NOTEBOOK 0001

0X0A70 0000  
NB11M-GE2

Rvalue	PU	PD
5K	1000	0000
10K	1001	0001
15K	1010	0010
20K	1011	0011
25K	1100	0100
30K	1101	0101
35K	1110	0110
45K	1111	0111

VBIOS is in system bios

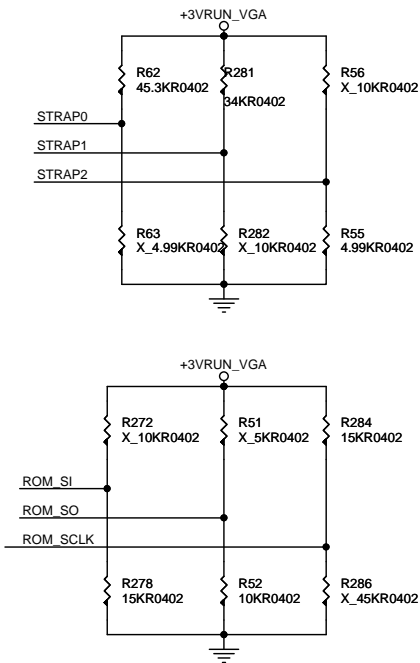
GPU and MCH do not share a common clock

disable pci express PLL termination

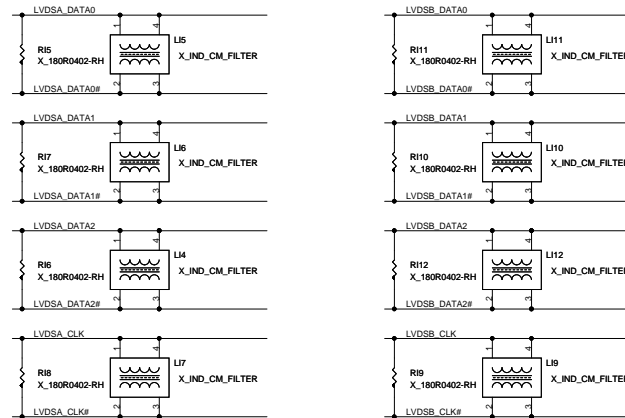
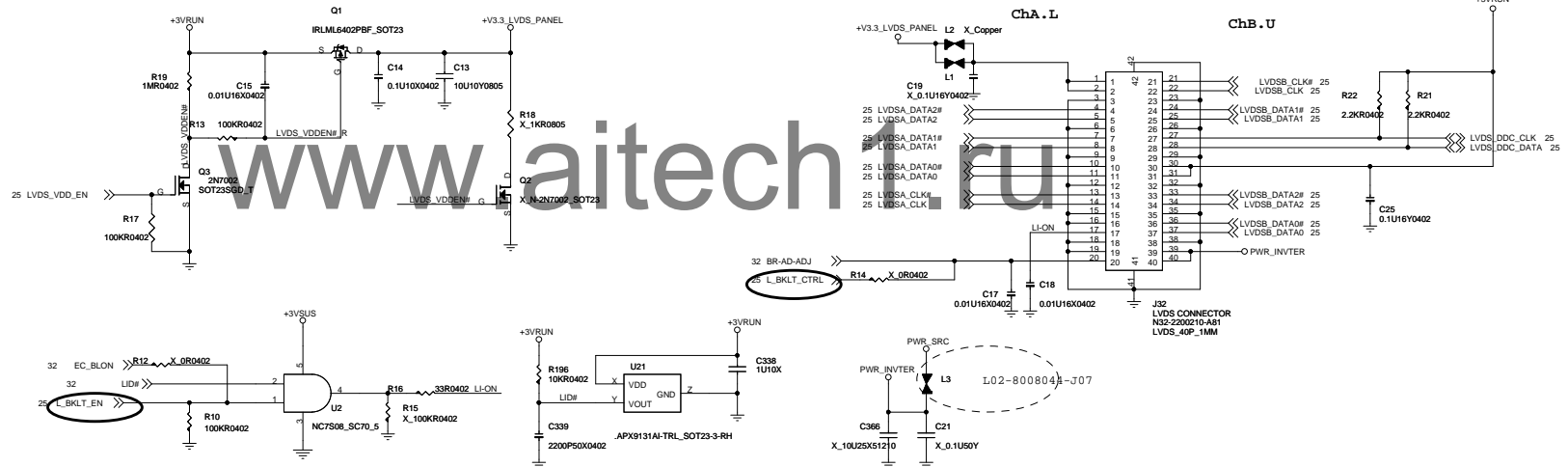
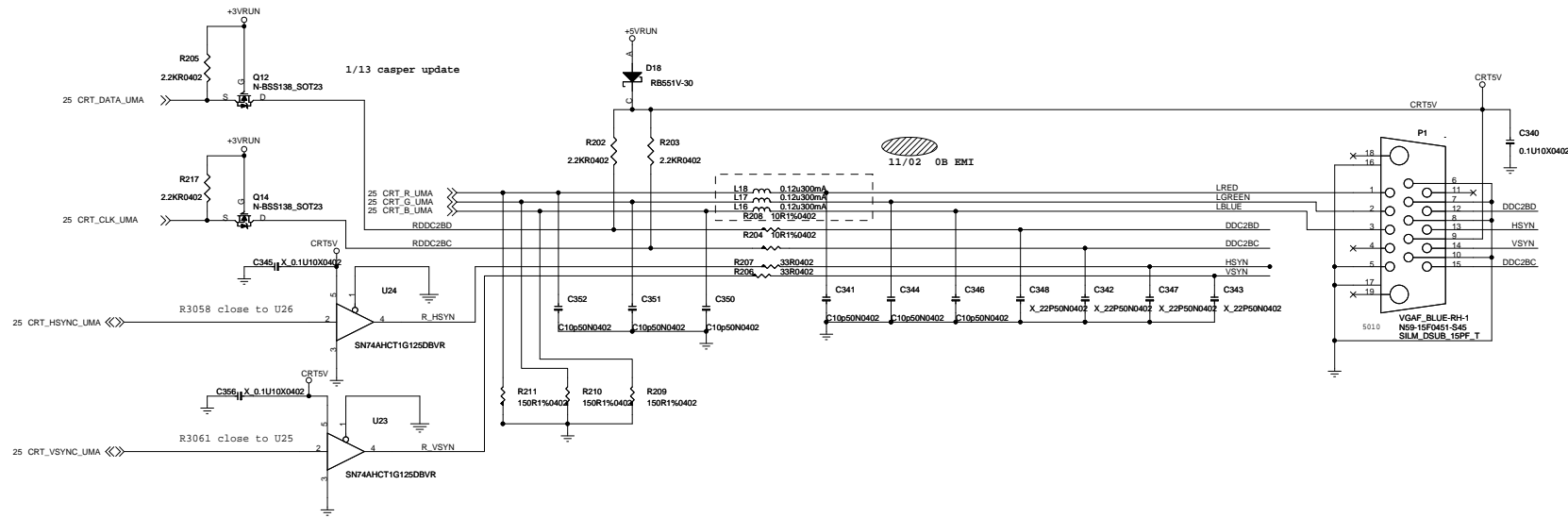
SEE PUN update 1130

Have 27M hz CRYSTAL

SPEC have no TV function

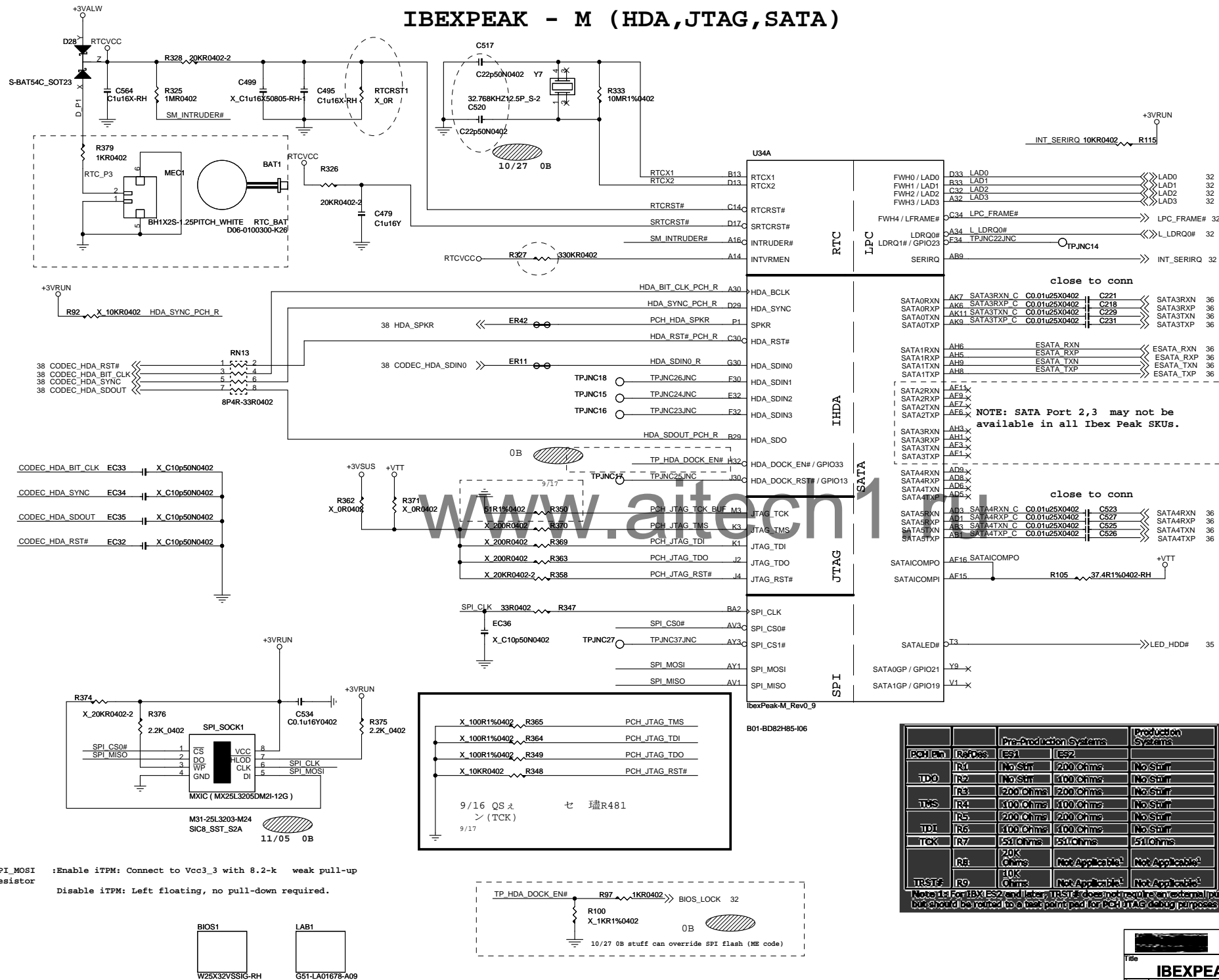


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PARK MEM DDR3 A1		
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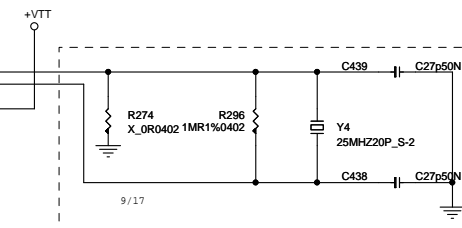
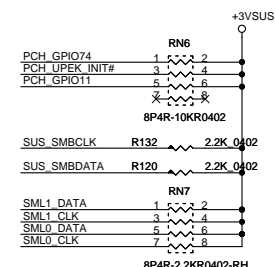
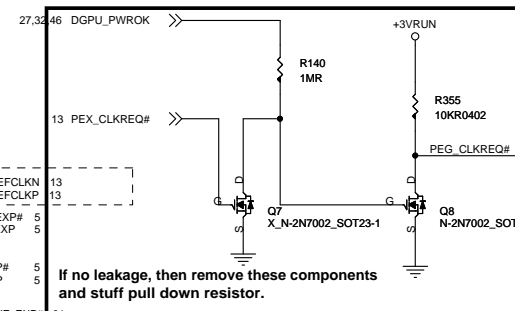
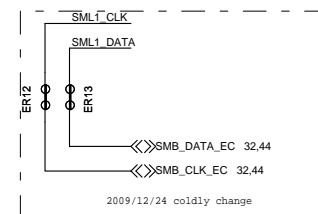
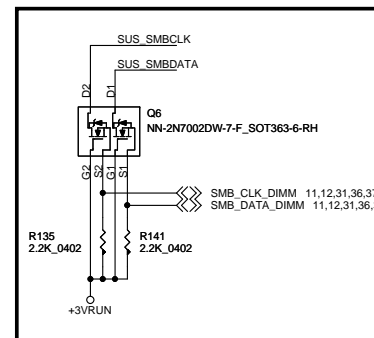
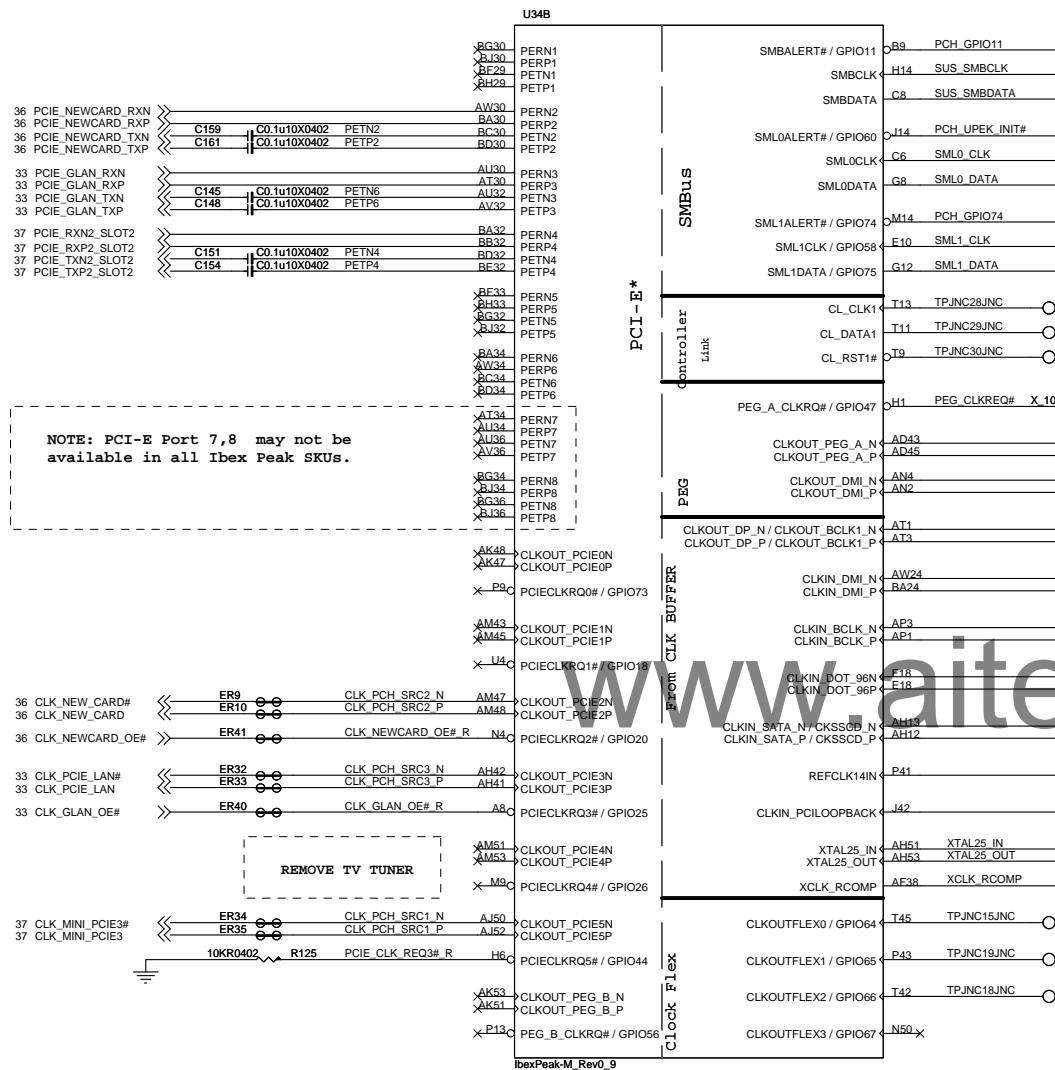
**IBEXPEAK - M (HDA,JTAG,SATA)**



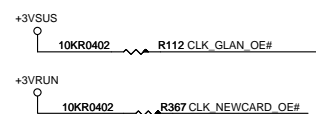
		Pre-Production Systems		Production Systems
PCH Pin	RefDes	Ess1	Ess2	
TD0	R1	No Stn	200 Ohms	No Stn
	R2	No Stn	100 Ohms	No Stn
	R3	200 Ohms	200 Ohms	No Stn
TMS	R4	100 Ohms	100 Ohms	No Stn
	R5	200 Ohms	200 Ohms	No Stn
TD1	R6	100 Ohms	100 Ohms	No Stn
TCK	R7	551 Ohms	551 Ohms	551 Ohms
	R8	20K Ohms	Not Applicable <sup>1</sup>	Not Applicable <sup>2</sup>
	R9	10K Ohms	Not Applicable <sup>3</sup>	Not Applicable <sup>2</sup>

Notes: 1) For TBX Ess2 and later, TRST1 does not require an external pull-up, but should be routed to a test point pin for PCH UTAG debug purposes

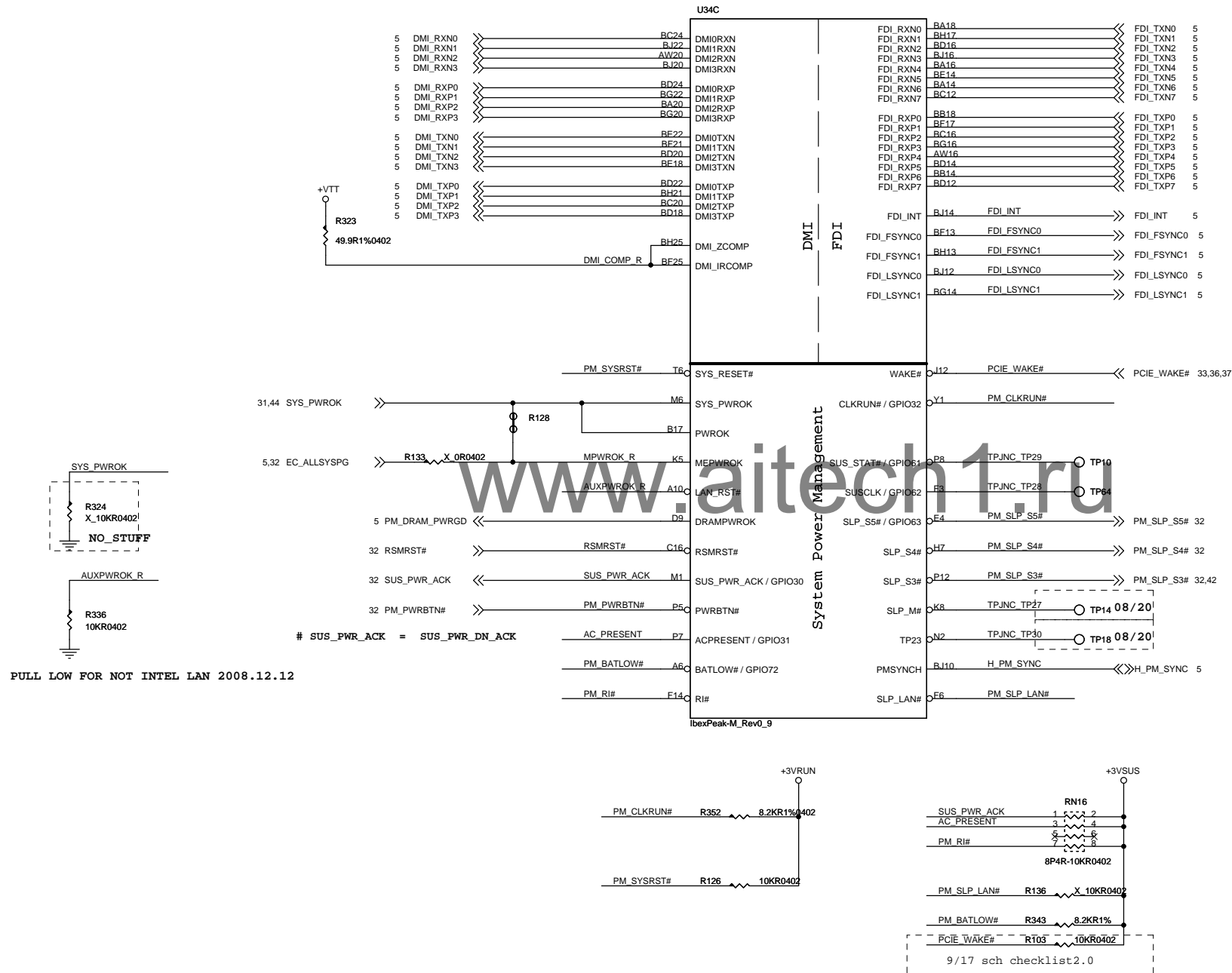
**IBEXPEAK - M (PCI-E, SMBUS, CLK)**



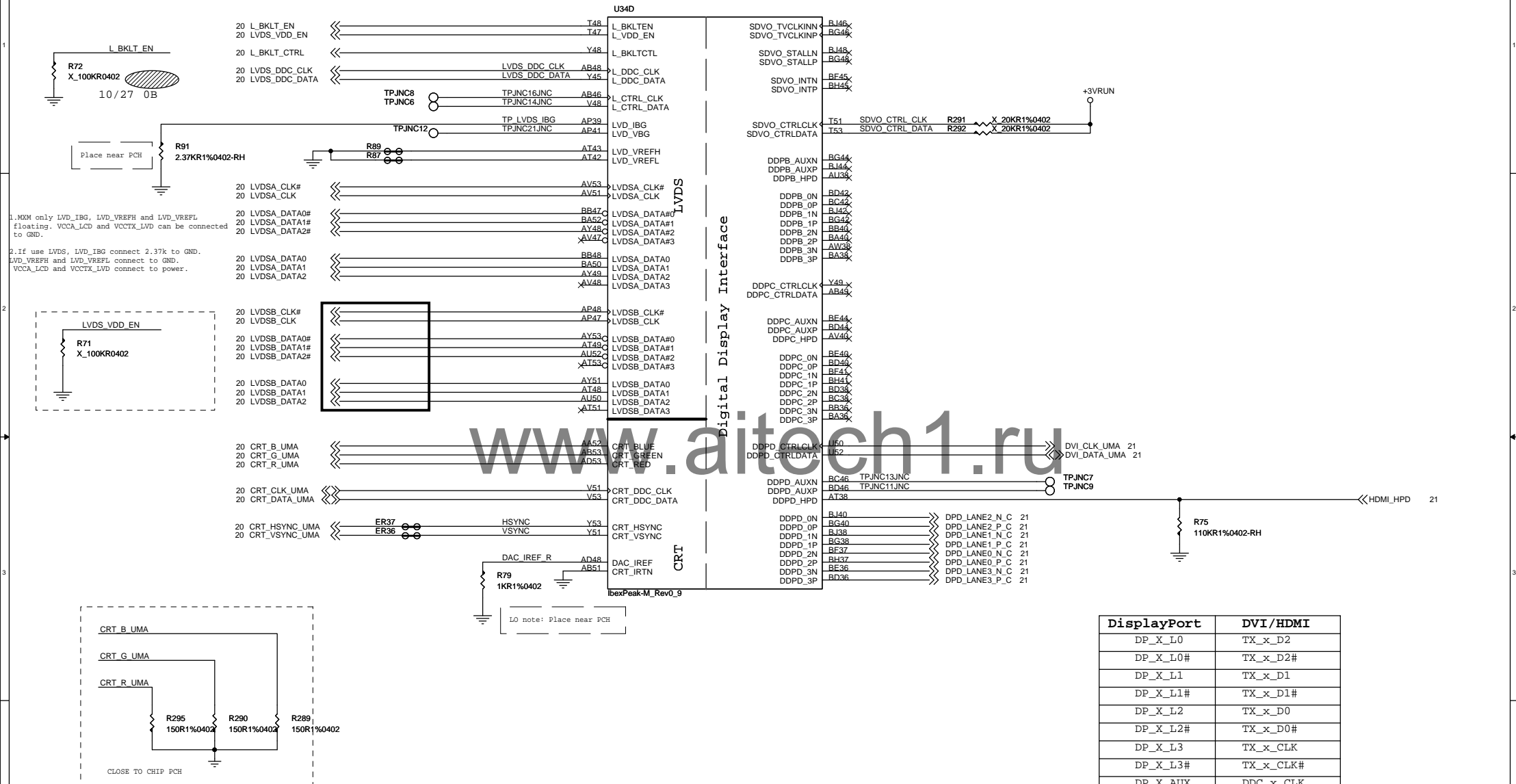
PCIECLKRQ1# / GPIO18 PCIECLKRQ1# / GPIO20	RUN Well
PCIECLKRQ0# and PCIECLKRQ3# - PCIECLKRQ7# PEG_A_CLKRQ# PEG_B_CLKRQ#	SUS Well



# IBEXPEAK - M (DMI,FDI,GPIO)



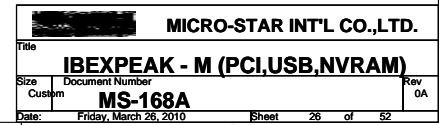
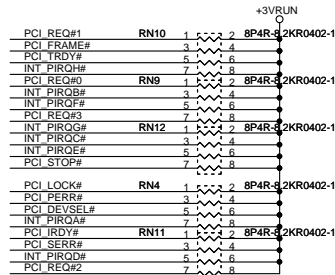
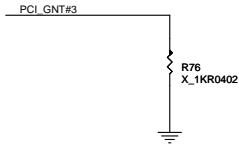
# IBEXPEAK - M (LVDS,DDI)



DisplayPort	DVI/HDMI
DP_X_L0	TX_x_D2
DP_X_L0#	TX_x_D2#
DP_X_L1	TX_x_D1
DP_X_L1#	TX_x_D1#
DP_X_L2	TX_x_D0
DP_X_L2#	TX_x_D0#
DP_X_L3	TX_x_CLK
DP_X_L3#	TX_x_CLK#
DP_X_AUX	DDC_x_CLK
DP_X_AUX#	DDC_x_DATA

INT PIROG#	K53C	PIROG# / GPIO3	USB7N	B21-X	available in all Tbox Peak SKUs.
INT PIROG#	A36C	PIROG# / GPIO4	USB7P	D21-X	
INT PIROG#	A44C	PIROG# / GPIO5	USB7T	X	
			USB8N	USB PNA	USB PNA 34
			USB8P	USB PPE	USB PPE 34
			USB9P	USB PNB	USB PNB 34
			USB9T	USB PNE	USB PNE 34
PCI SERR#	PCIRST#		USB10N	USB PPI0	USB PPI0 37
PCI SERR#			USB10P	USB PPI1	USB PPI1 37
PCI SERR#			USB11N	USB PPI2	USB PPI2 37
PCI SERR#			USB11P	USB PPI3	USB PPI3 37

A16 swap override Strap/Top-Block Swap Override jumper	
PCI_GNT#3	Low = A16 swap override/Top-Block Swap Override enabled High = Default



# IBEXPEAK - M (GPIO,VSS\_NCTF,RSVD)

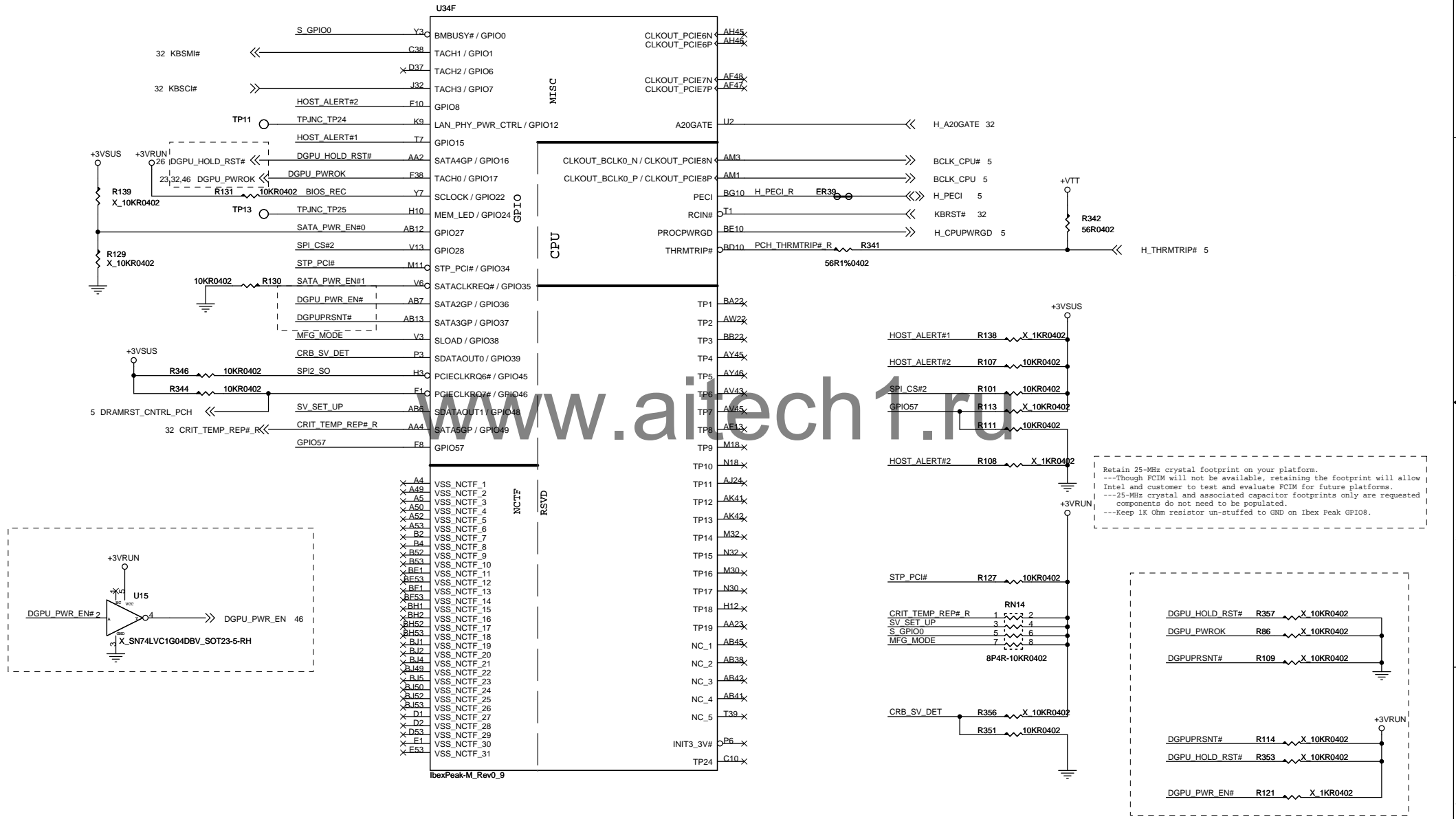


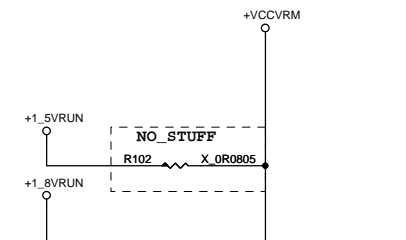



Diagram showing the pin connections for AT24. The pins are labeled as follows:

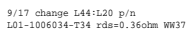
- Pin 1: AV28
- Pin 2: VCCIO[37]
- Pin 3: AW26
- Pin 4: VCCIO[38]
- Pin 5: AW28
- Pin 6: VCCIO[39]
- Pin 7: BA26
- Pin 8: VCCIO[40]
- Pin 9: BA28
- Pin 10: VCCIO[41]
- Pin 11: BB26
- Pin 12: VCCIO[42]
- Pin 13: BB28
- Pin 14: VCCIO[43]
- Pin 15: RC26
- Pin 16: VCCIO[44]

Additional connections shown:

- VCCVIRM[2] connected to Pin 17 (VCCIO[45])
- AT24 connected to Pin 18 (VCCIO[46])
- VCCDM[1] connected to Pin 19 (VCCIO[47])
- AT15 connected to Pin 20 (VCCIO[48])
- VCCDM[2] connected to Pin 21 (VCCIO[49])
- AU16 connected to Pin 22 (VCCIO[50])

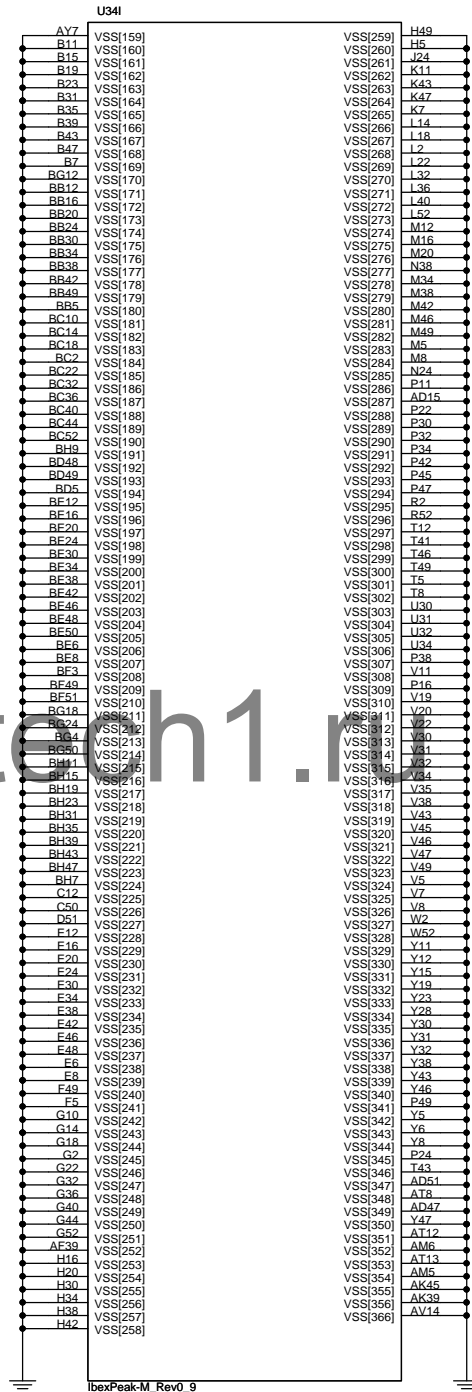
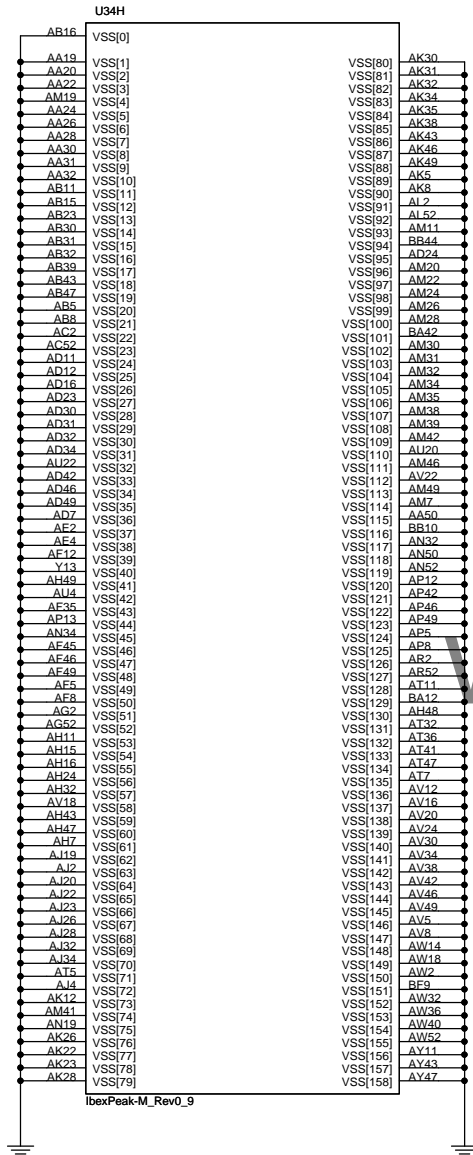



 <b>MICRO-STAR INT'L CO.,LTD.</b>	
Title	
<b>IBEXPEAK - M (POWER)</b>	
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**IBEXPEAK - M (POWER)**

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# IBEXPEAK - M (GND)

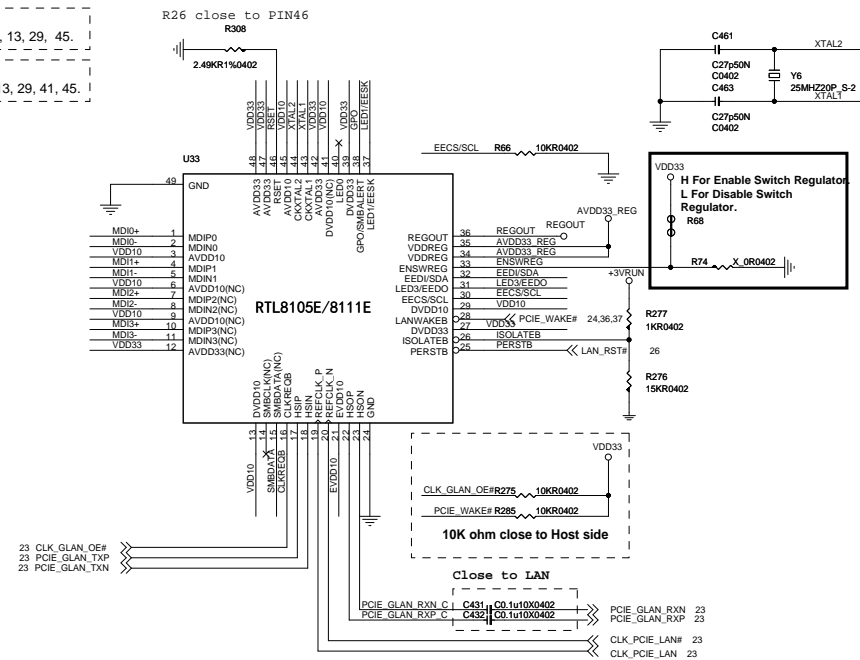
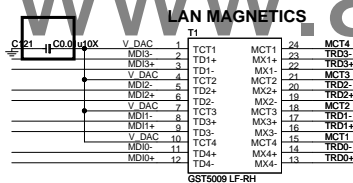
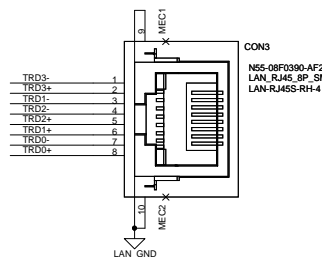
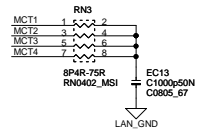
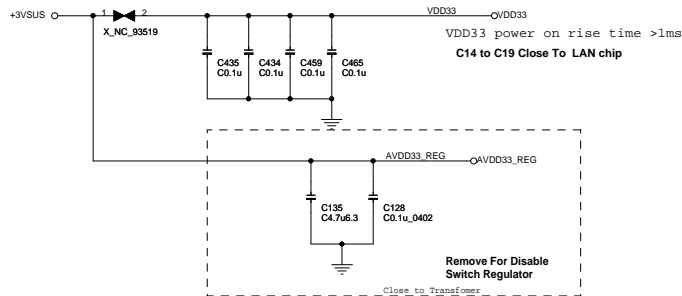
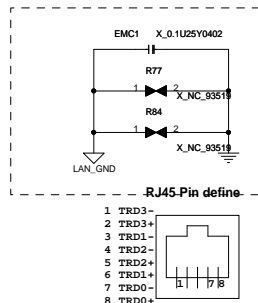
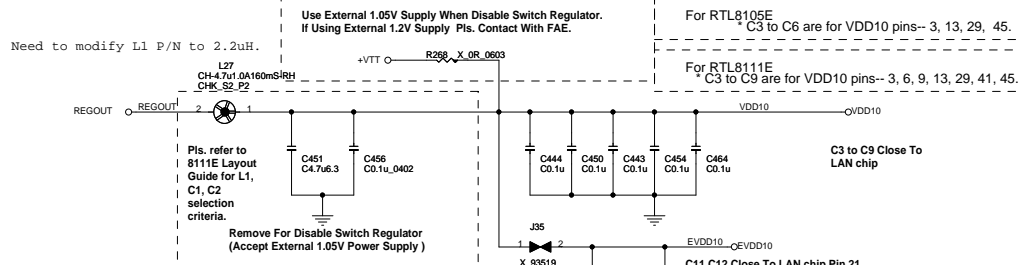


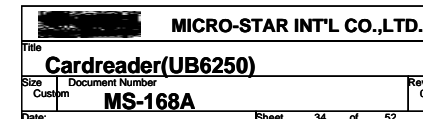
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Title <b>IBEXPEAK - M (GND)</b>			
Size Custom	Document Number <b>MS-168A</b>		Rev 0A
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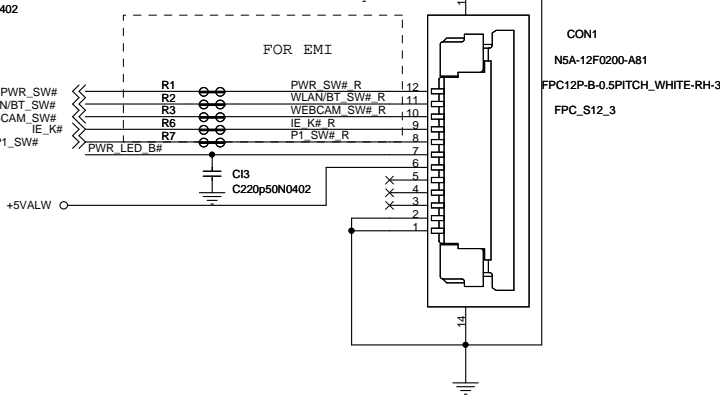
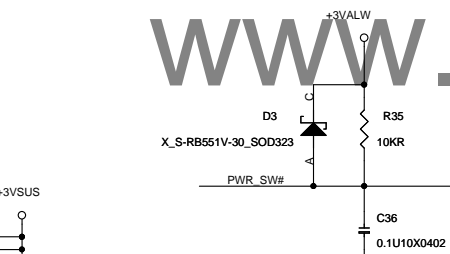
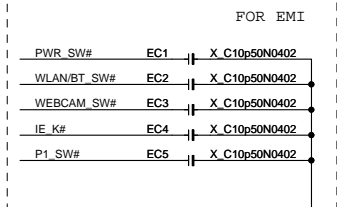
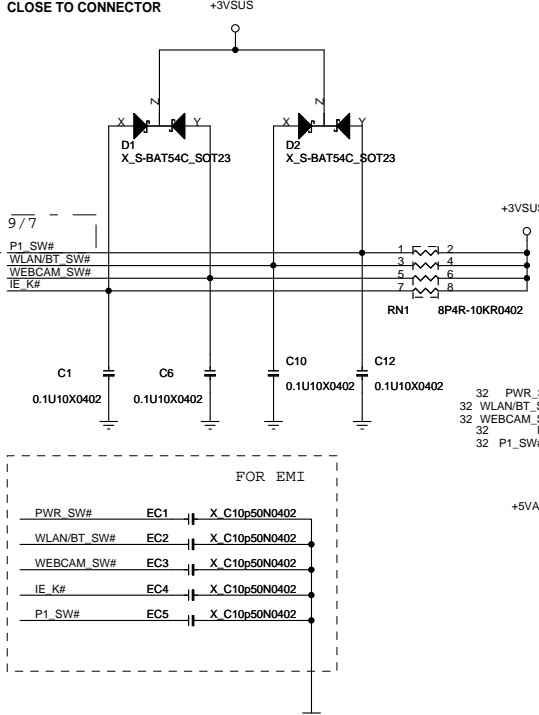
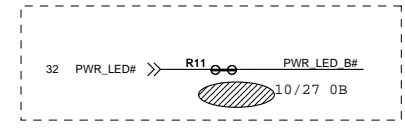
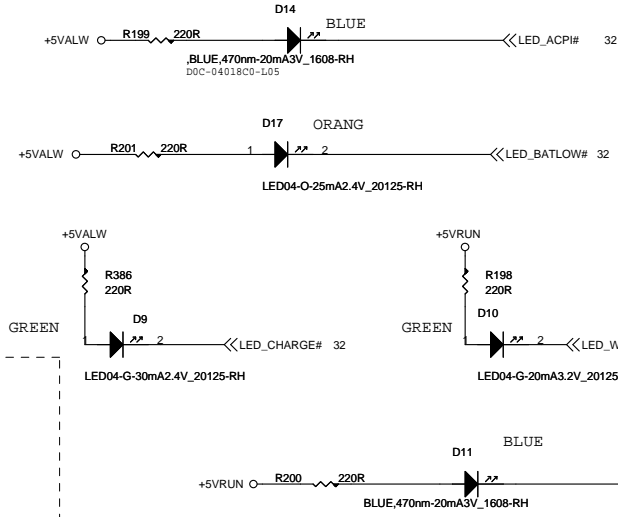
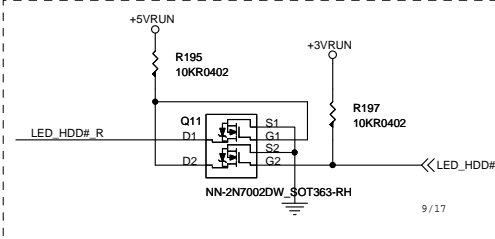
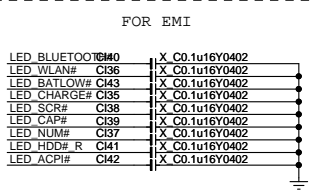
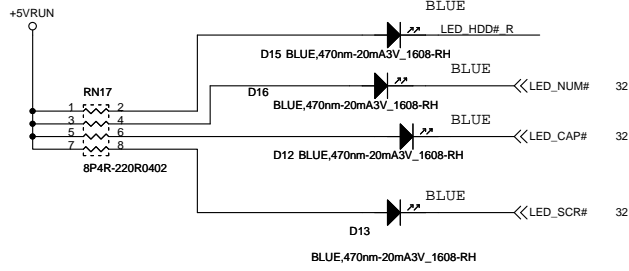




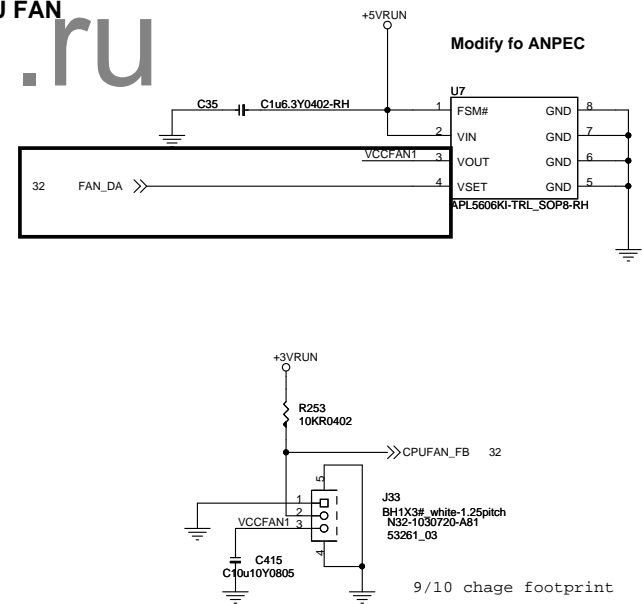
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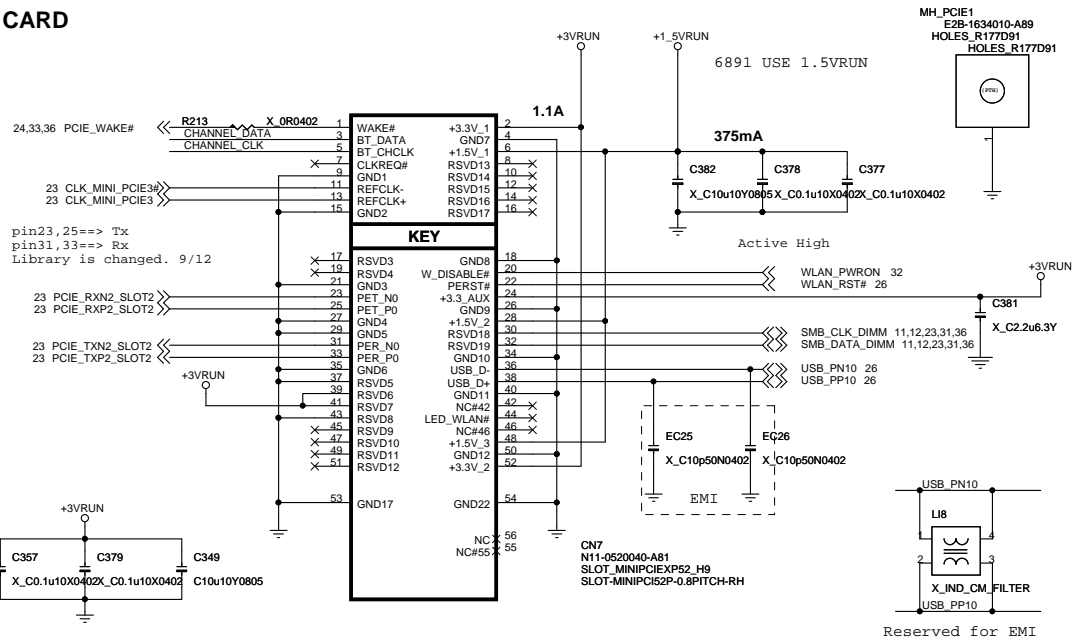


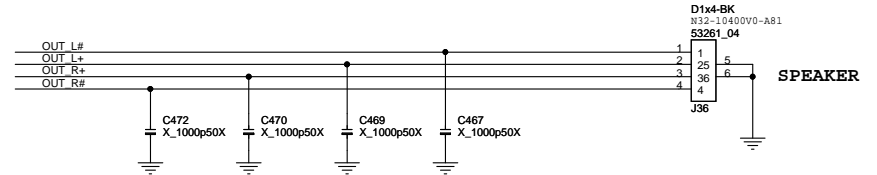
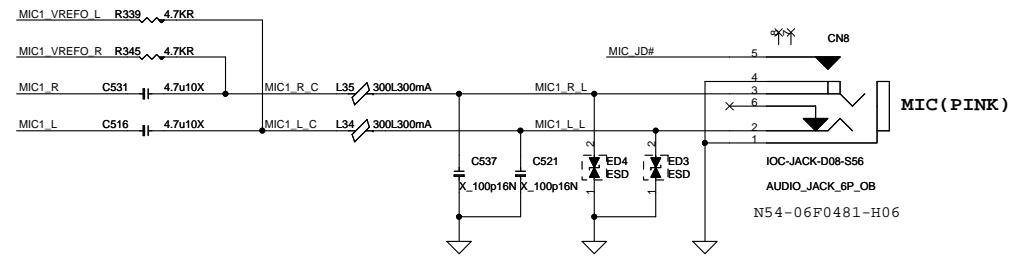
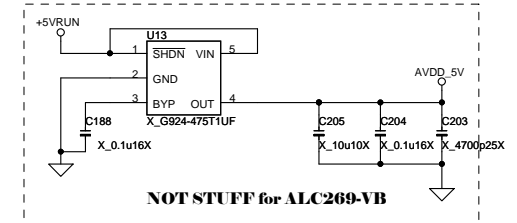
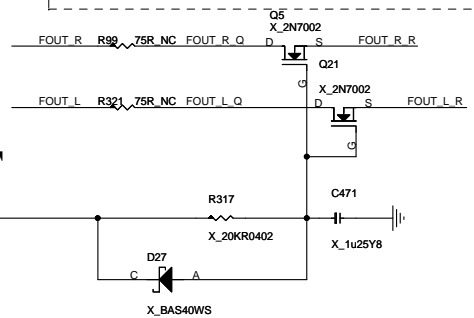
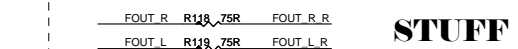
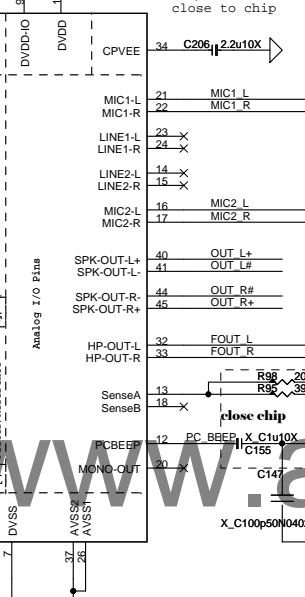
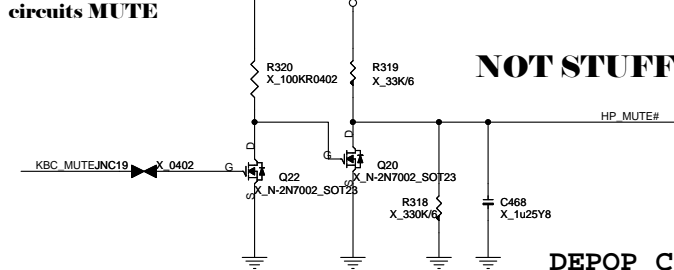
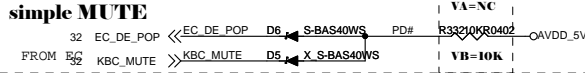
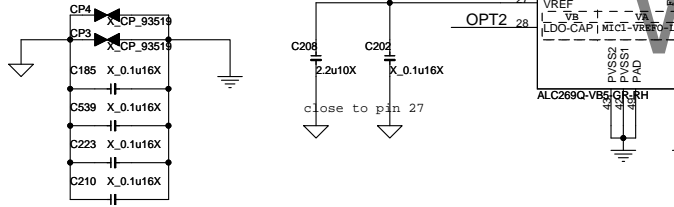
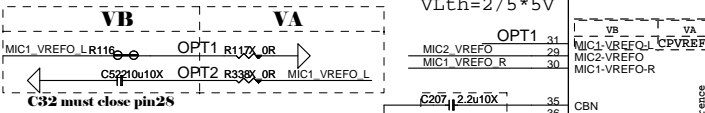
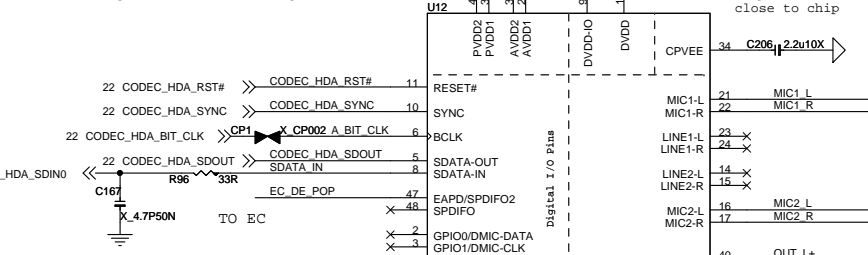
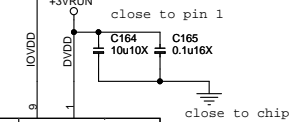
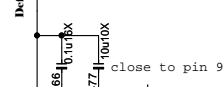
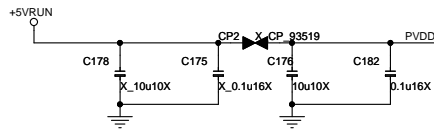
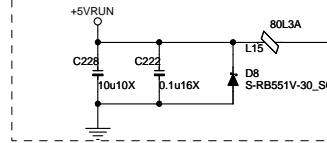
CPU FAN



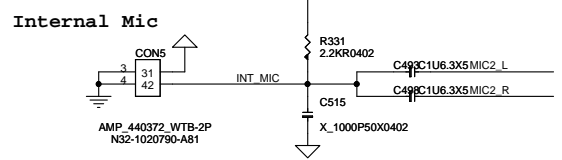
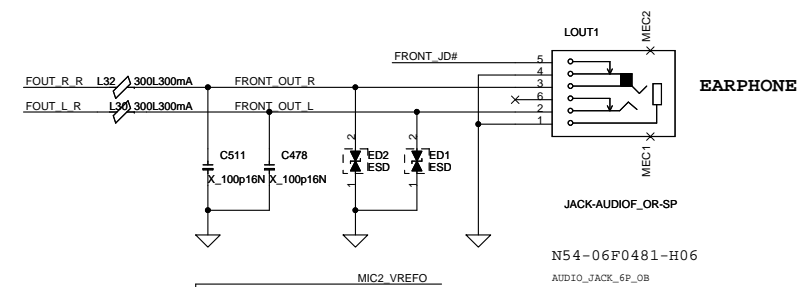


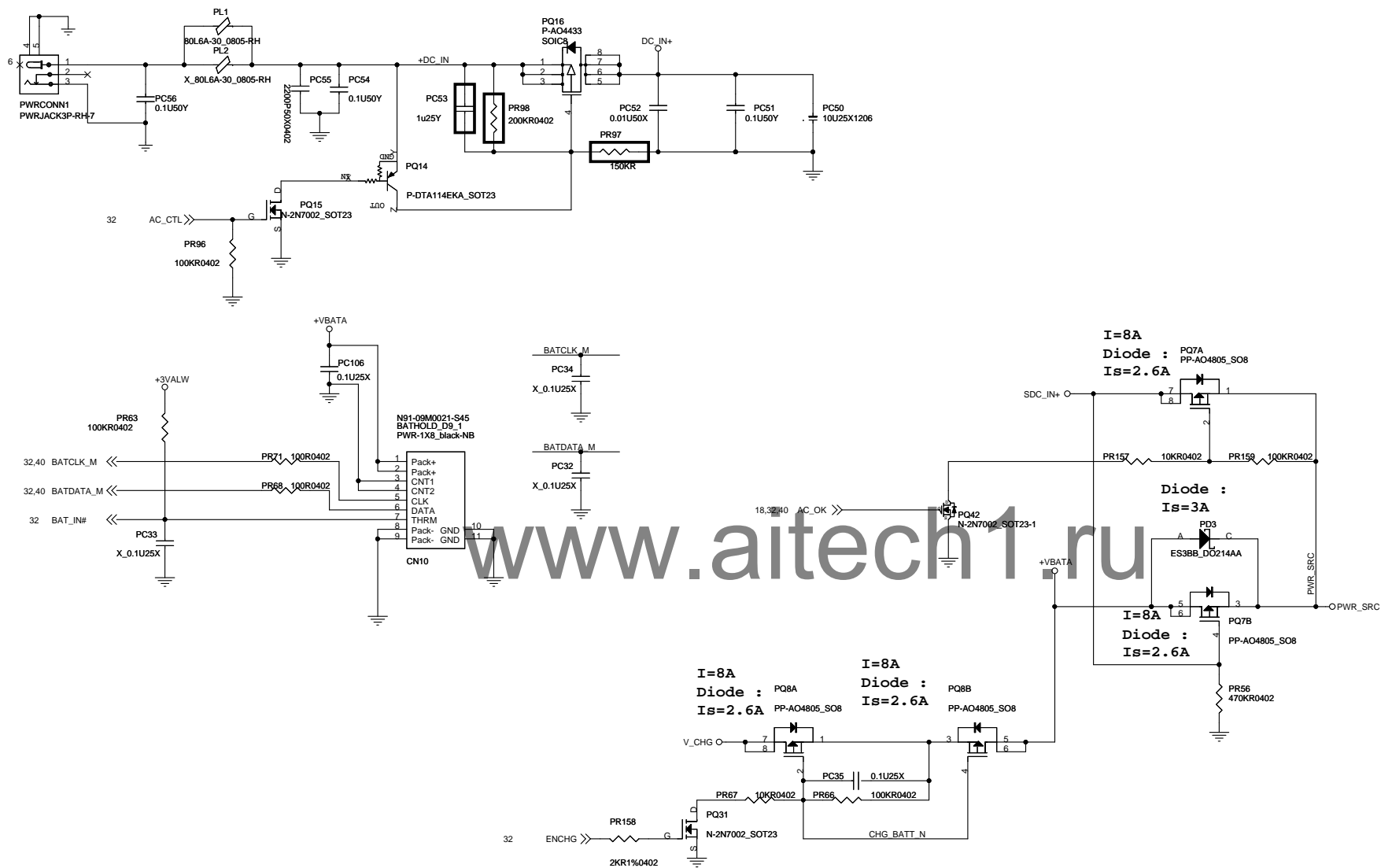
## WLAN CARD

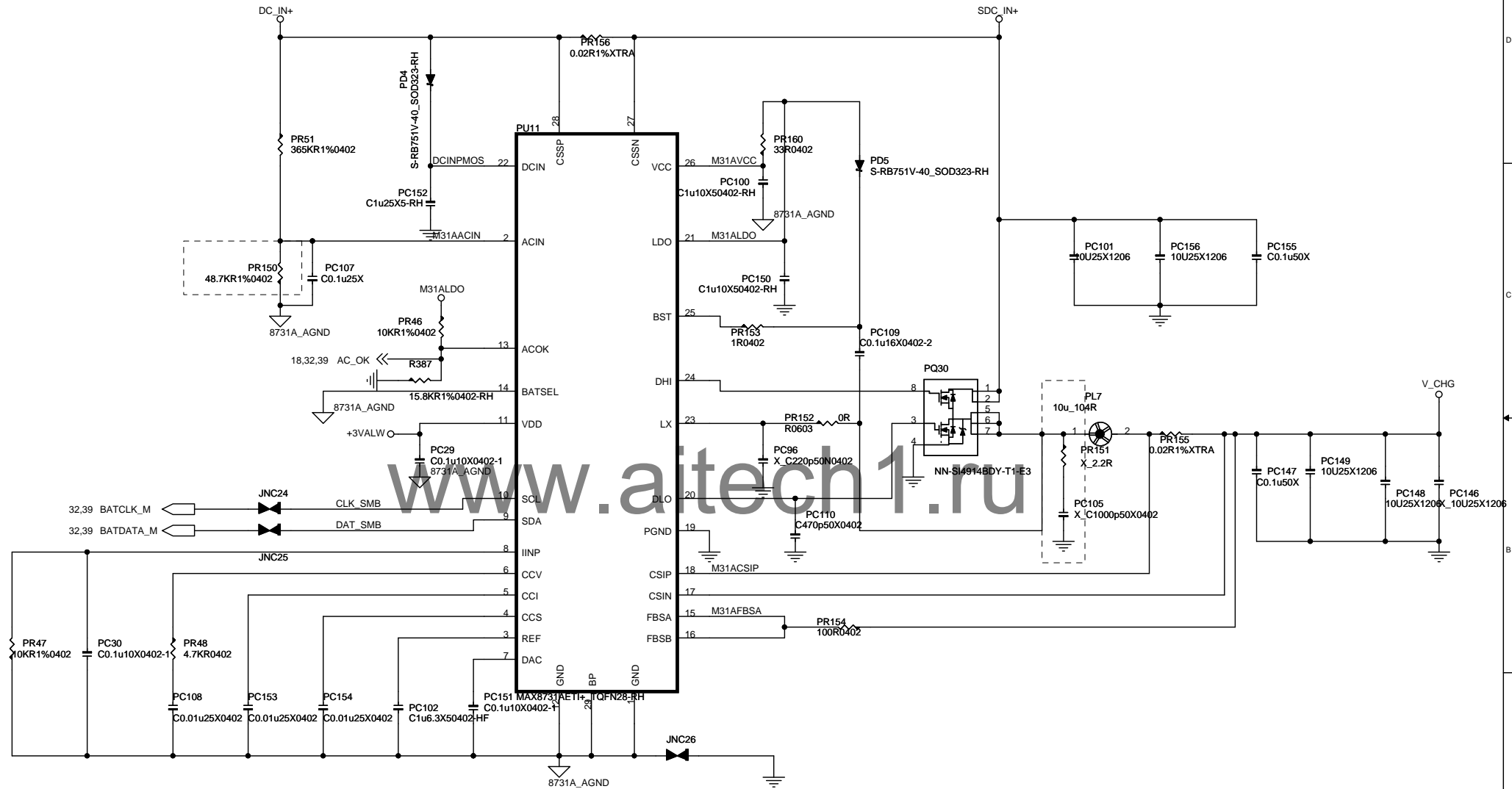




```
Speaker length < 20MM
4ohm loading-----20 mil trace width
8ohm loading-----10 mil trace width
```







1. The transconductance from (CSSP - CSSN) to IINP is 3mA/V.
2.  $V_{IINP} = IINP_{UT} \times RS1 \times 3mA/V \times PR25$

**MICRO-STAR INT'L CO.,LTD.**

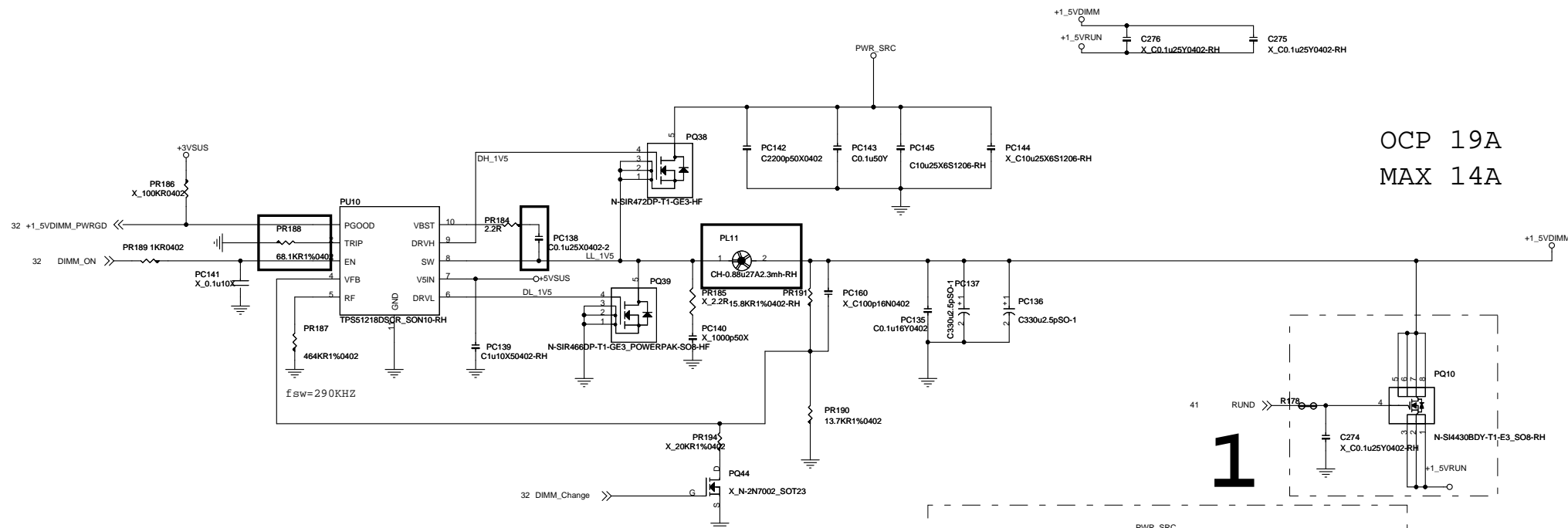
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Size B	Document Number			Rev 0A	
		<b>MS-168A</b>			
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Current limit at 6A for +3.3VSUS

Current limit at 6A for +5VSUS

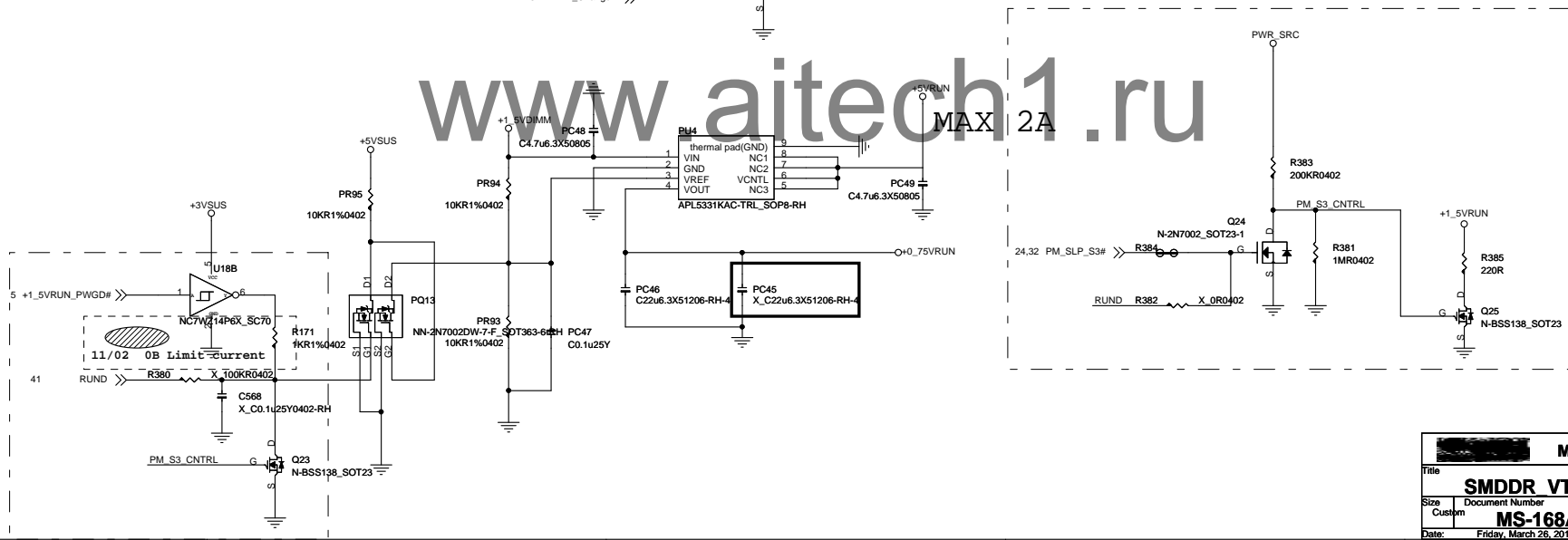
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8



1

2



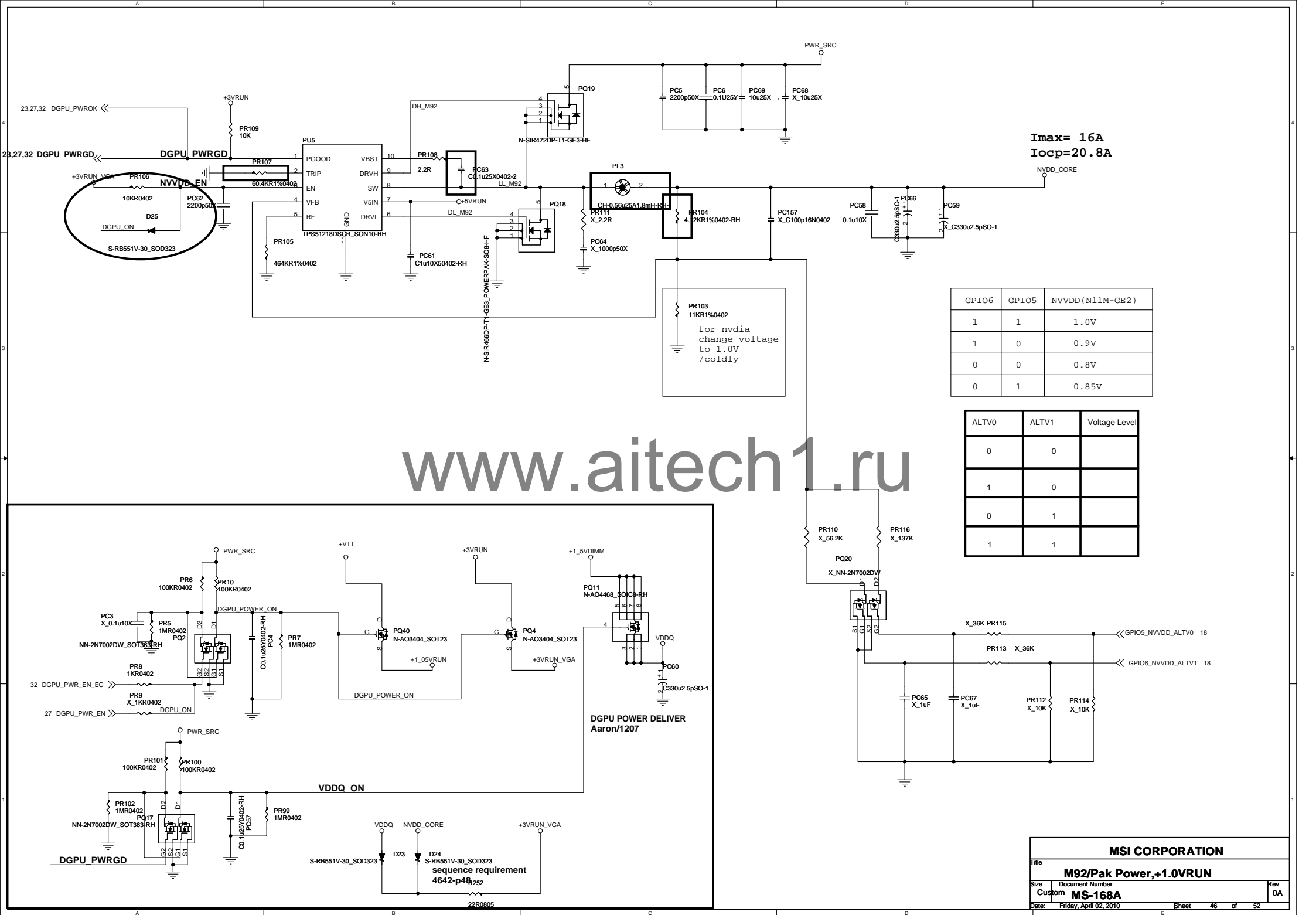
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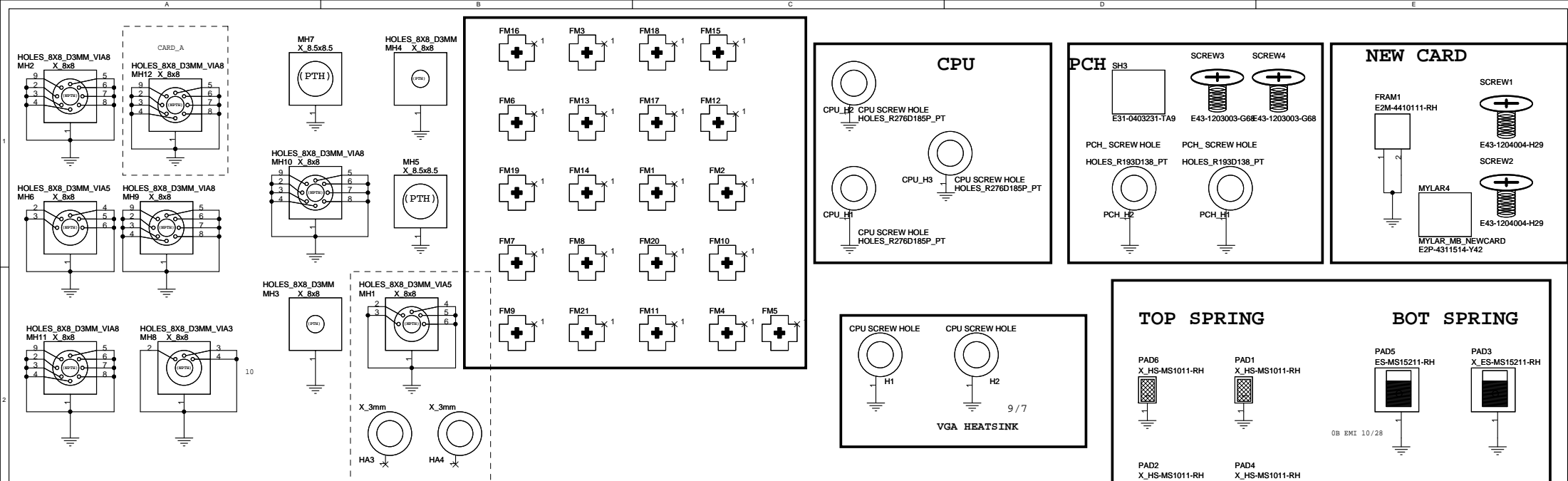
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Title			
SMDDR VTERM /1 5VRUN			
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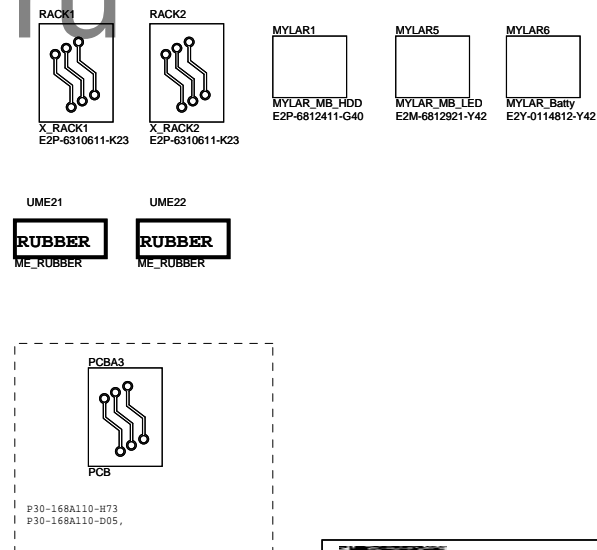




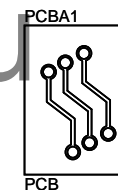
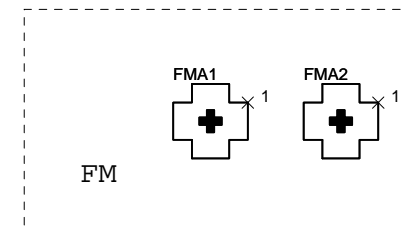
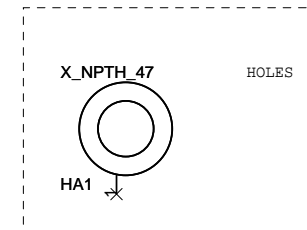
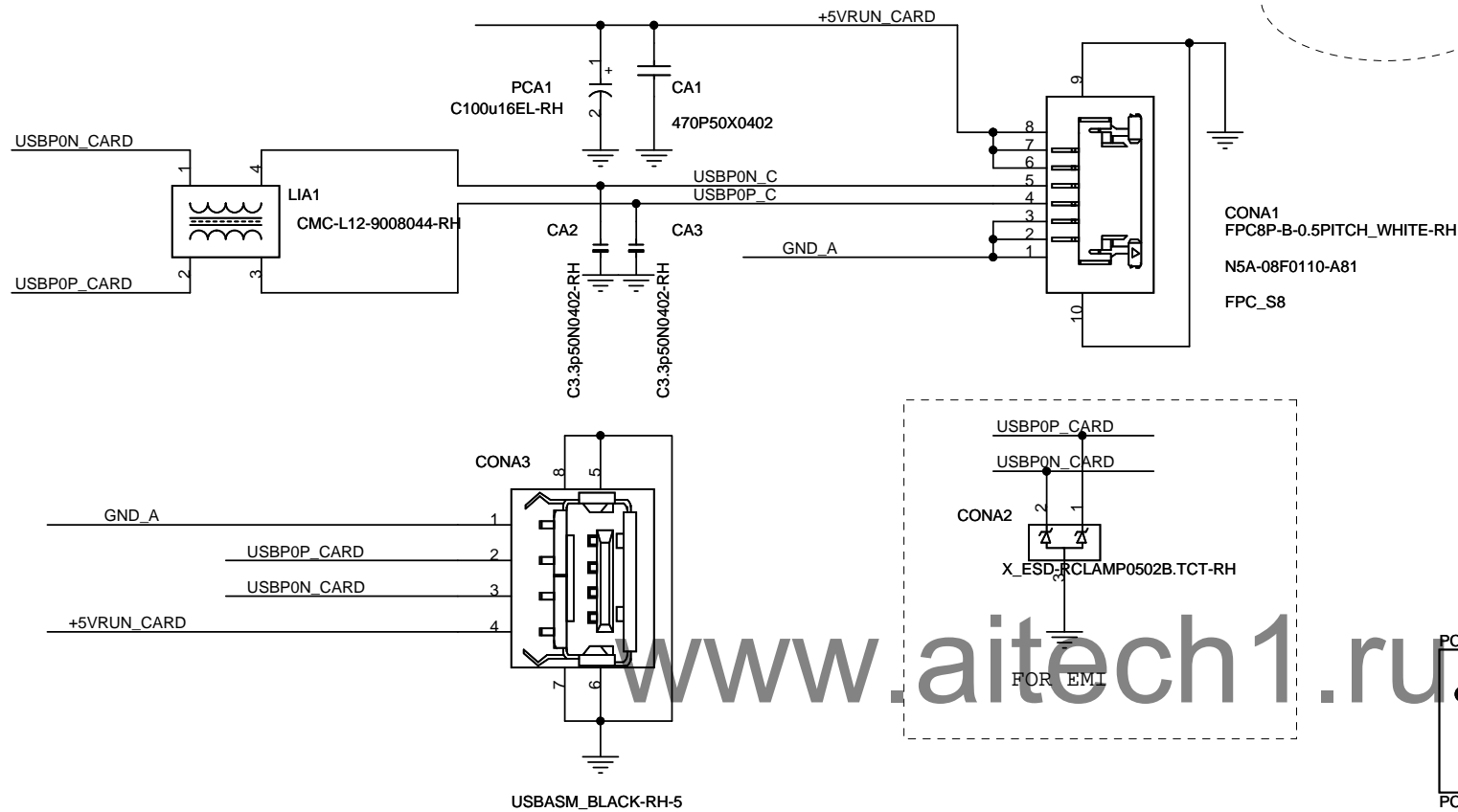




TOP	LAYER3	LAYER4	BOTTOM	Impedance
<p>J10 L1 5mil 50 Ohm X_H1X2_black-RH</p>	<p>J10 L3 4.5mil 50 Ohm X_H1X2_black-RH</p>	<p>J21 L4 4.5mil 50 Ohm X_H1X2_black-RH</p>	<p>J24 L6 5mil 50 Ohm X_H1X2_black-RH</p>	50ohm_single
<p>J9 L1 8mil 37.5 Ohm X_H1X2_black-RH</p>	<p>J6 L3 8mil 39 Ohm X_H1X2_black-RH</p>	<p>J25 L4 8mil 39 Ohm X_H1X2_black-RH</p>	<p>J22 L6 8mil 37.5 Ohm X_H1X2_black-RH</p>	37.5ohm_single
<p>J1 L1 DIFF 4.5/9/20 90 Ohm+ L1 DIFF 4.5/9/20 90 Ohm- X_H1X4_black-RH</p>	<p>J6 L3 DIFF 4.5/9/20 90 Ohm+ L3 DIFF 4.5/9/20 90 Ohm- X_H1X4_black-RH</p>	<p>J26 L4 DIFF 4/10/20 100 Ohm+ L4 DIFF 4/10/20 100 Ohm- X_H1X4_black-RH</p>	<p>J20 L6 DIFF 4/10/20 100 Ohm+ L6 DIFF 4/10/20 100 Ohm- X_H1X4_black-RH</p>	100ohm_differential
<p>J3 L1 DIFF 4/6/20 90 Ohm+ L1 DIFF 4/6/20 90 Ohm- X_H1X4_black-RH</p>	<p>J4 L3 DIFF 4/5/20 90 Ohm+ L3 DIFF 4/5/20 90 Ohm- X_H1X4_black-RH</p>	<p>J27 L4 DIFF 4/4/20 85 Ohm+ L4 DIFF 4/4/20 85 Ohm- X_H1X4_black-RH</p>	<p>J18 L6 DIFF 4.5/9/20 90 Ohm+ L6 DIFF 4.5/9/20 90 Ohm- X_H1X4_black-RH</p>	90ohm_differential
<p>J5 L1 DIFF 4/4/20 85 Ohm+ L1 DIFF 4/4/20 85 Ohm- X_H1X4_black-RH</p>	<p>J2 L3 DIFF 4/4/20 85 Ohm+ L3 DIFF 4/4/20 85 Ohm- X_H1X4_black-RH</p>	<p>J28 L4 DIFF 7/4/20 68 Ohm+ L4 DIFF 7/4/20 68 Ohm- X_H1X4_black-RH</p>	<p>J19 L6 DIFF 4/4/20 85 Ohm+ L6 DIFF 4/4/20 85 Ohm- X_H1X4_black-RH</p>	85ohm_differential
<p>J11 L1 DIFF 7/4/20 68 Ohm+ L1 DIFF 7/4/20 68 Ohm- X_H1X4_black-RH</p>	<p>J13 L3 DIFF 7/4/20 68 Ohm+ L3 DIFF 7/4/20 68 Ohm- X_H1X4_black-RH</p>	<p>J29 L4 DIFF 7/4/20 68 Ohm+ L4 DIFF 7/4/20 68 Ohm- X_H1X4_black-RH</p>	<p>J29 L6 DIFF 7/4/20 68 Ohm+ L6 DIFF 7/4/20 68 Ohm- X_H1X4_black-RH</p>	68ohm_differential

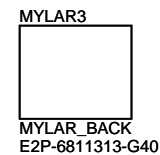
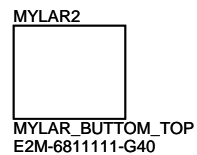
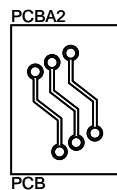
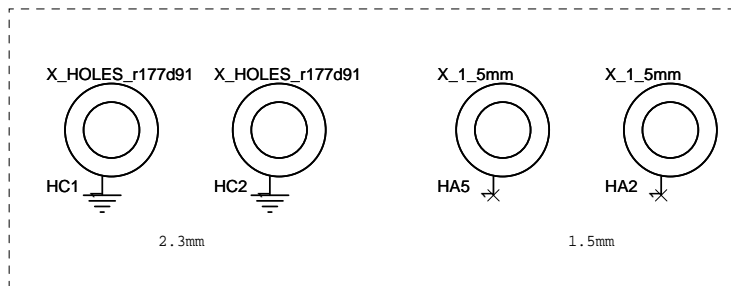
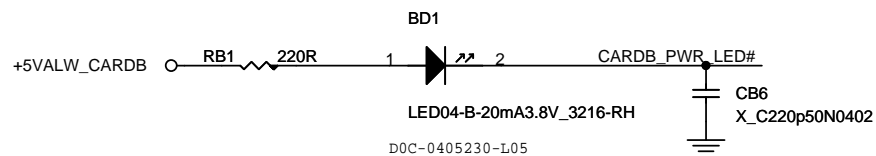
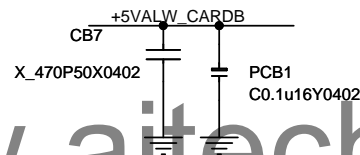
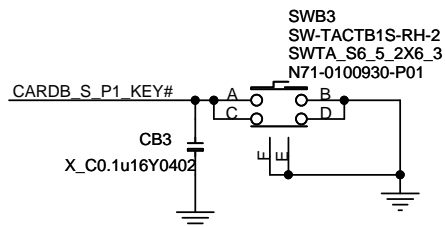
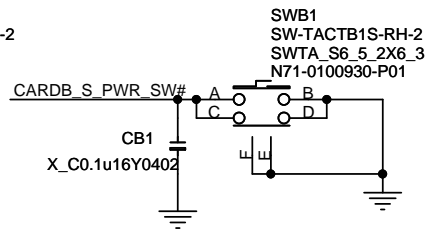
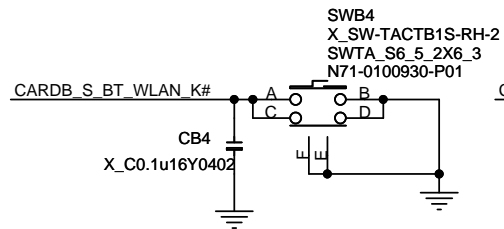
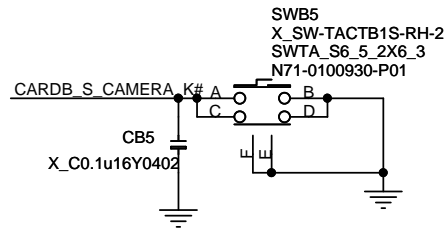
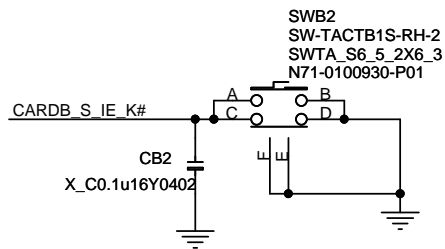


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P30-168AA10-D05

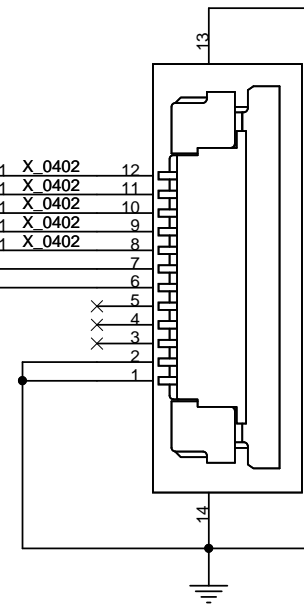
MICRO-STAR INT'L CO.,LTD.		
Title		
USB BOARD_A		
Size	Document Number	Rev
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P30-168AB10-H73

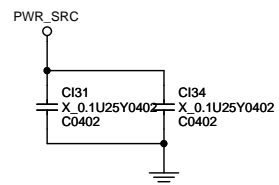
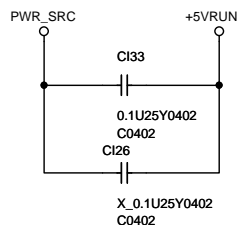
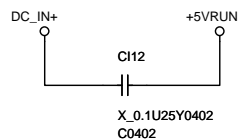
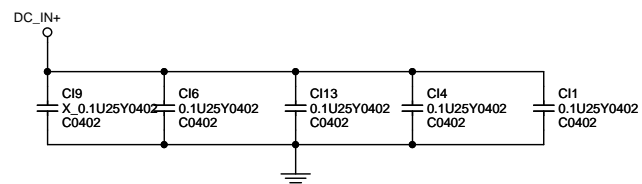
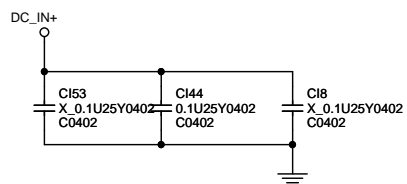
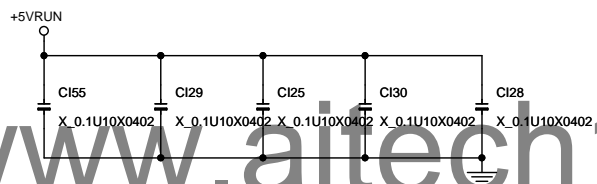
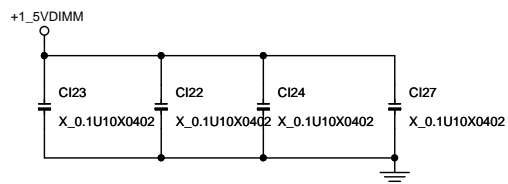
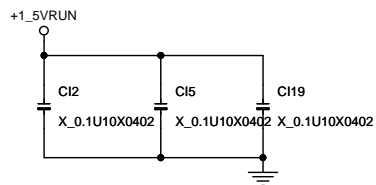
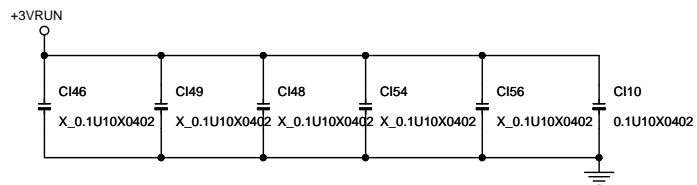
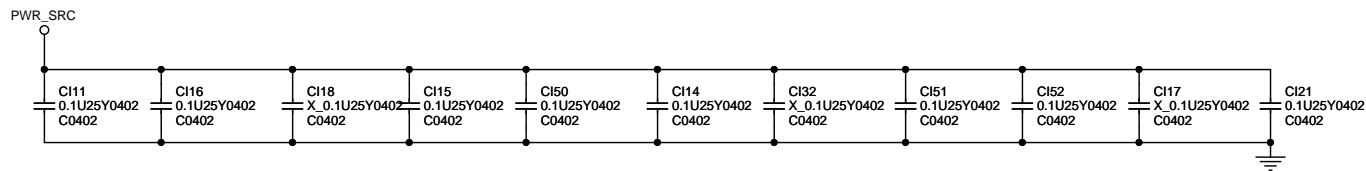
## CARD\_B\_ BUTTOM

CARDB_S PWR SW#	JNCB1	2	1	X_0402	12
CARDB_S BT WLAN K#	JNCB4	2	1	X_0402	11
CARDB_S CAMERA K#	JNCB5	2	1	X_0402	10
CARDB_S IE K#	JNCB2	2	1	X_0402	9
CARDB_S P1 KEY#	JNCB3	2	1	X_0402	8
CARDB_PWR_LED#			7		7
+5VALW_CARDB			6		6
			5		5
			4		4
			3		3
			2		2
			1		1




FPC2  
FPC12P-B-0.5PITCH\_WHITE-RH-3  
N5A-12F0200-A81  
FPC\_S12\_3

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