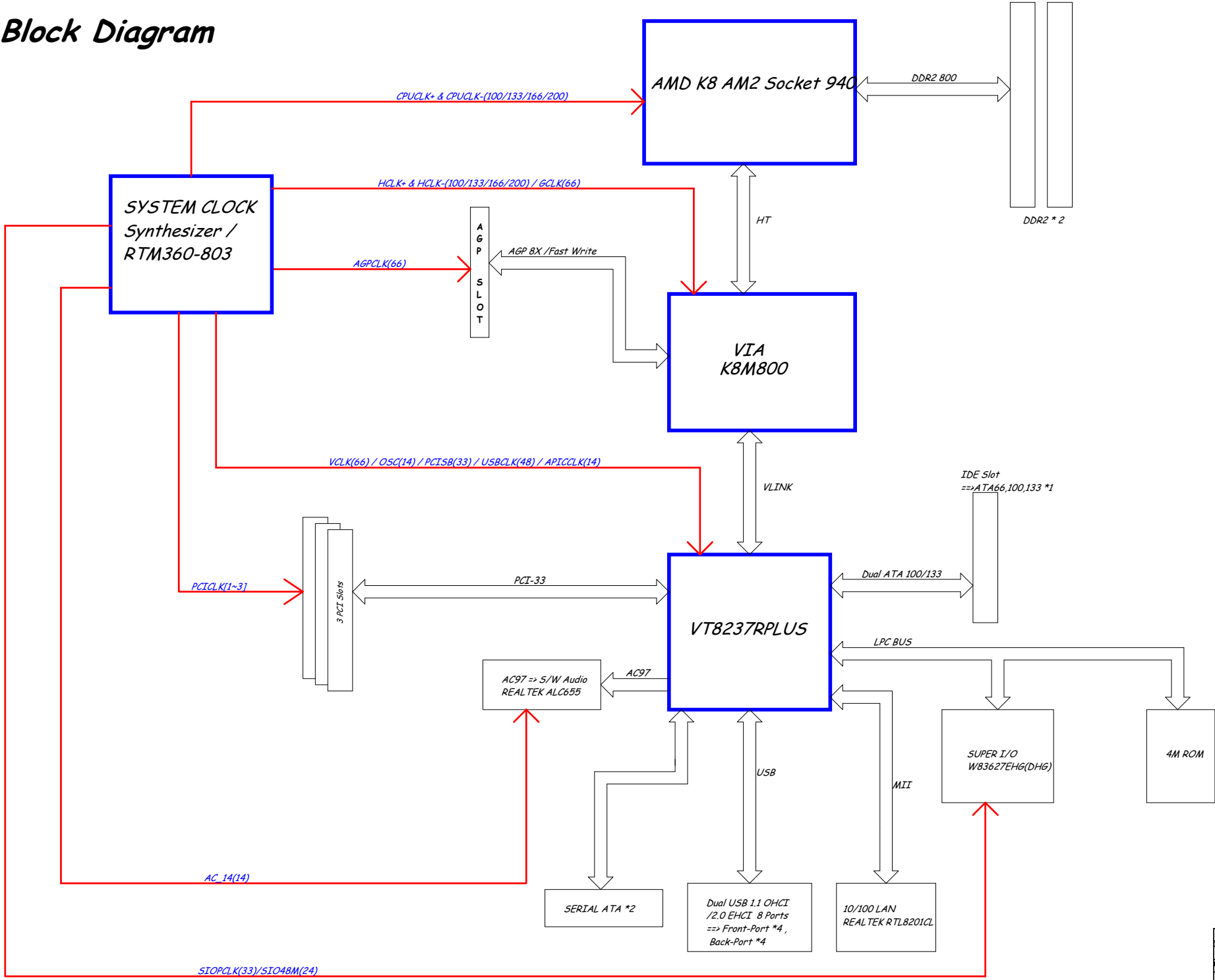


MS-7312 VER:6.0

- *AMD PGA 940 K8-AM2 (DDR2 800)
- *VIA K8M800
- *VIA VT8237RPLUS (AGP 8X / VLink 8X)
- *Winbond 83627EHG(DHG) LPC I/O
- *REALTEK RT8201CL 10/100 PHY
- *USB 2.0 support (integrated into VT8237R)
- *REALTEK ALC655 AC'97 CODEC
- *DDR2 DIMM * 2
- *AGP SLOT * 1 (8X)
- *PCI SLOT * 3

Title	Page
Cover Sheet	1
Block Diagram	2
GPIO SPEC	3
AMD K8 AM2-> 940 PGA Socket	4,5,6
System Memory DDR2 DUAL CHANNEL	7
DDR2 Terminations R & C	8
VGA CONNECTOR	9
Clock Synthesizer	10
NB VIA K8M800/K8T800 PRO (HT)	11,12,13
K8 Vcore Power	14
AGP SLOT 8X	15
VT8237RPLUS	16,17,18
PCI Connectors * 3	19,20
REALTEK ALC655 AC'97 CODEC	21
IDE ATA 66/100/133 Connectors * 1	22
Front and Rear USB Port	23
LPC I/O W83627EHG(DHG)& ROM & Floppy&Fan	24
KeyBoard/Mouse/LPT/COM Connectors	25
REALTEK RTL8201CL 10/100 PHY	26
ACPI Power Controller (MS-6)	27
System Regulator&Front Panel	28
Decoupling Cap.	29
Power Sequence	30
History	31
Option Parts	32
EMI Parts	33

Block Diagram



GPIO FUNCTION

PIN NAME	Default Function	Function define
GPO0 (VDDS)	GPO0	NA
GPO1 (VDDS)	GPO1	NA
GPO2/SUSA# (VDDS)	SUSA#	4.7K ohm Pull up to 3VDUAL
GPO3/SUSST# (VDDS)	SUSST#	SUSST# 4.7K ohm Pull up to 3VDUAL
GPO4/SUSCLK (VDDS)	SUSCLK	4.7K ohm Pull up to 3VDUAL
GPO5/CPUSTP#	CPUSTP#	4.7K ohm Pull up to VCC3
GPO6/PCISTP#	PCISTP#	4.7K ohm Pull up to VCC3
GPO7/GNT5	GPO7	2.7K ohm Pull up to VCC3
* GPO8/GPI8/VGATE	GPI8	4.7K ohm Pull up to VCC3
* GPO9/GPI9/UDPWREN	UDPWREN	NA
* GPO10/GPI10/PICD0	GPI10	330 ohm Pull up to VCC3
* GPO11/GPI11/PICD1	GPI11	330 ohm Pull up to VCC3
* GPO12/GPI12/INTE#	GPI12	NA
* GPO13/GPI13/INTF#	GPI13	NA
* GPO14/GPI14/INTG#	GPI14	NA
* GPO15/GPI15/INTH#	GPI15	INTH# 2.7K ohm Pull up to VCC3
GPO20/GPI20 /ACSDIN2/PCS0#	GPI20/ACSDIN2	4.7K ohm Pull down
GPO21/GPI21/ACSDIN3 /PCS1#/SLPBTN#	GPI21/ACSDIN3	4.7K ohm Pull down
GPO22/GPI22/GHI#	GPI22	4.7K ohm Pull up to VCC3
GPO23/GPI23/DPSLP	GPI23	4.7K ohm Pull up to VCC3
GPO24/GPI24 /GPIOA	GPI24	4.7K ohm Pull down
GPO25/GPI25 /GPIOB	GPI25	4.7K ohm Pull down
GPO26/GPI26/SMBDT2 (VDDS)	SMBDT2	4.7K ohm Pull up to 3VDUAL
GPO27/GPI27/SMBCK2 (VDDS)	SMBCK2	4.7K ohm Pull up to 3VDUAL
GPO28/GPI28/VIDSEL	GPO28 /VIDSEL	SATA_LED
GPO29/GPI29/VRDSLP	GPO29 /VRDSLP	4.7K ohm Pull down
GPO30/GPI30 /GPIOC	GPI30	4.7K ohm Pull down
GPO31/GPI31 /GPIOD	GPI31	4.7K ohm Pull down

PIN NAME	Default Function	Function define
GPI0 (VBAT)	GPI0	4.7K ohm Pull up to VBAT
GPI1 (VSUS3)	GPI1	ATADET0=>Detect IDE1 ATA100/66
GPI2/EXTSMI# (VSUS3)	EXTSMI#	4.7K ohm Pull up to 3VDUAL
GPI3/RING# (VSUS3)	RING#	4.7K ohm Pull up to 3VDUAL
GPI4/LID# (VSUS3)	LID#	ATADET1=>Detect IDE2 ATA100/66
GPI5/BATLOW# (VDDS)	BATLOW#	4.7K ohm Pull up to 3VDUAL
GPI6/AGPBZ	AGPBZ	4.7K ohm Pull up to VCC3
GPI7/REQ5	GPI7	2.7K ohm Pull up to VCC3
* GPI8/VGATE	GPI8	4.7K ohm Pull up to VCC3
* GPI9/UDPWREN	UDPWREN	NA
* GPI10/PICD0	GPI10	330 ohm Pull up to VCC3
* GPI11/PICD1	GPI11	330 ohm Pull up to VCC3
* GPI12/INTE#	GPI12	NA
* GPI13/INTF#	GPI13	NA
* GPI14/INTG#	GPI14	NA
* GPI15/INTH#	GPI15	INTH# 2.7K ohm Pull up to VCC3
GPI16/INTRUDER# (VBAT)	INTRUDER#	1M ohm Pull up to VBAT
GPI17/CPUMISS	CPUMISS	4.7K ohm Pull up to 3VDUAL
GPI18/AOLGP1/THRM#	AOLGP1	THRMS# 4.7K ohm Pull up to 3VDUAL
GPI19/APICCLK	APICCLK	APICCLK

PCI Config.

DEVICE	MCP1 INT Pin	REQ#/GNT#	IDSEL	CLOCK	CLK GEN PIN OUT
PCI Slot 1	INTA# INTB# INTC# INTD#	PREQ#0 PGNT#0	AD19	PCICK1	17 (PCICK2)
PCI Slot 2	INTB# INTC# INTD# INTA#	PREQ#1 PGNT#1	AD20	PCICK2	18(PCICK3)
PCI Slot 3	INTC# INTD# INTA# INTB#	PREQ#2 PGNT#2	AD21	PCICK3	21 (PCICK4)

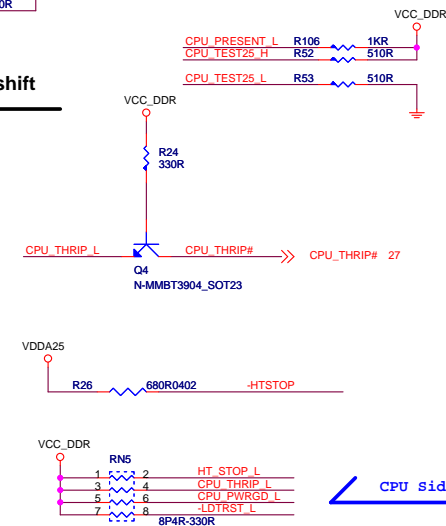
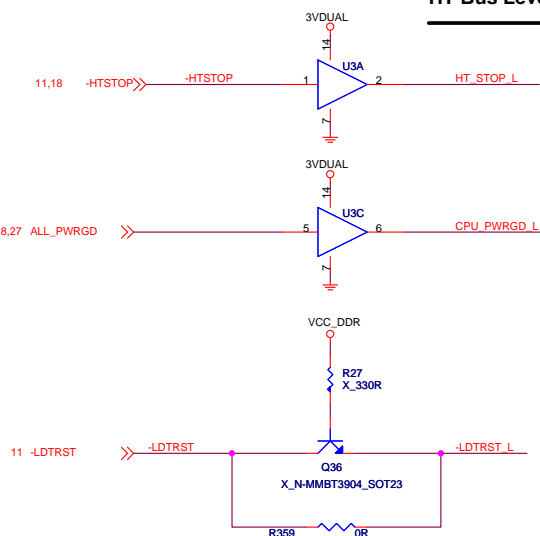
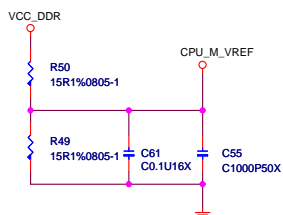
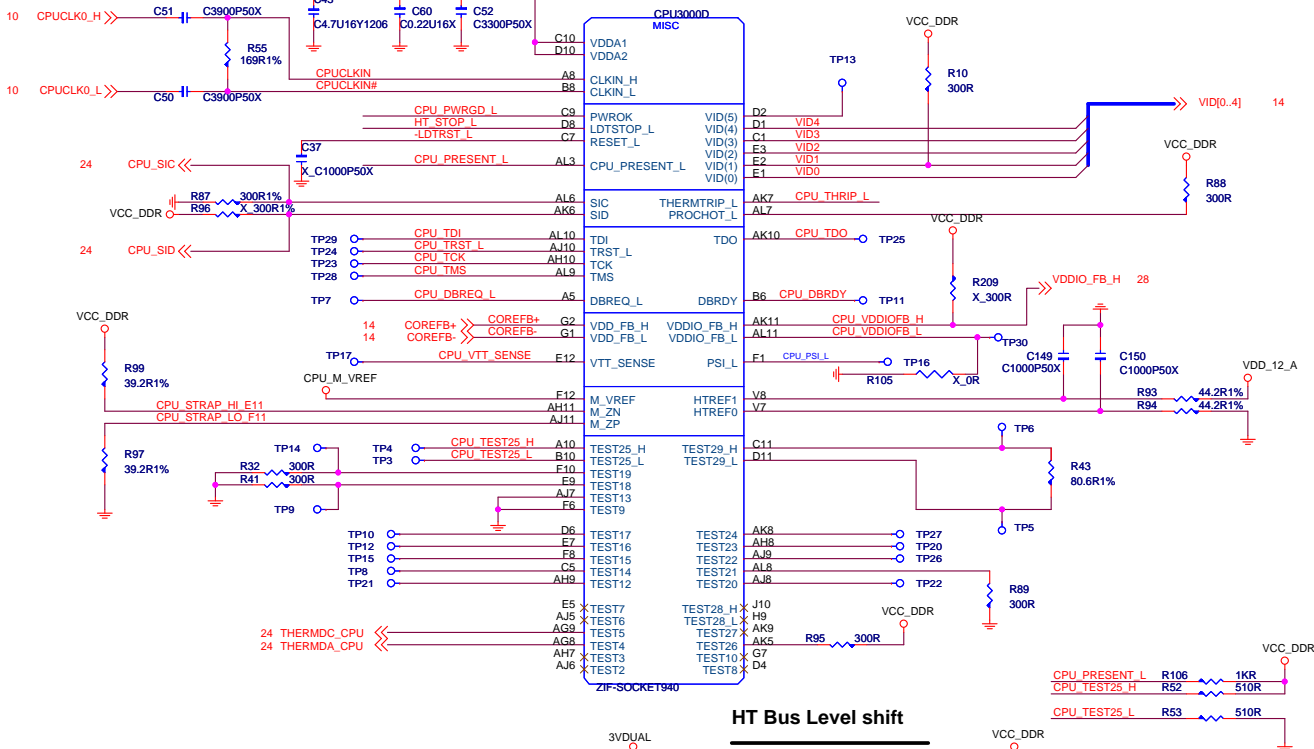
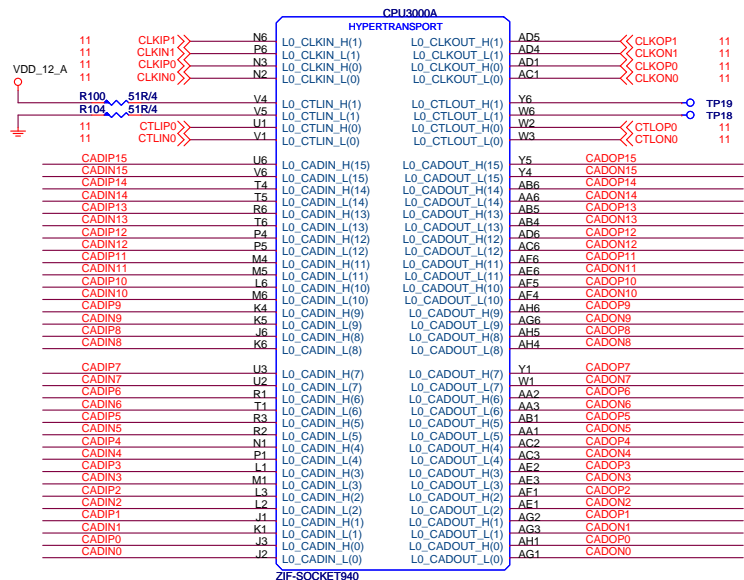
USB	Port	DATA +/-	OC#
Rear	USB1	USB1- USB1+ USB0- USB0+	USB_OC#1 (OC#0~1)
	LAN_USB1	USB2- USB2+ USB3- USB3+	USB_OC#2 (OC#2~3)
Front	JUSB1	USB4- USB4+ USB5- USB5+	USB_OC#5 (OC#4~5)
	JUSB2	USB6- USB6+ USB7- USB7+	

PCI RESET DEVICE

Signals	Target
PCISLOTIRST#	PCI slot 1-3
PCIDEVRST#	NB , Super I/O
HDDRST#	Primary IDE
PCIRST#	AGP SLOT

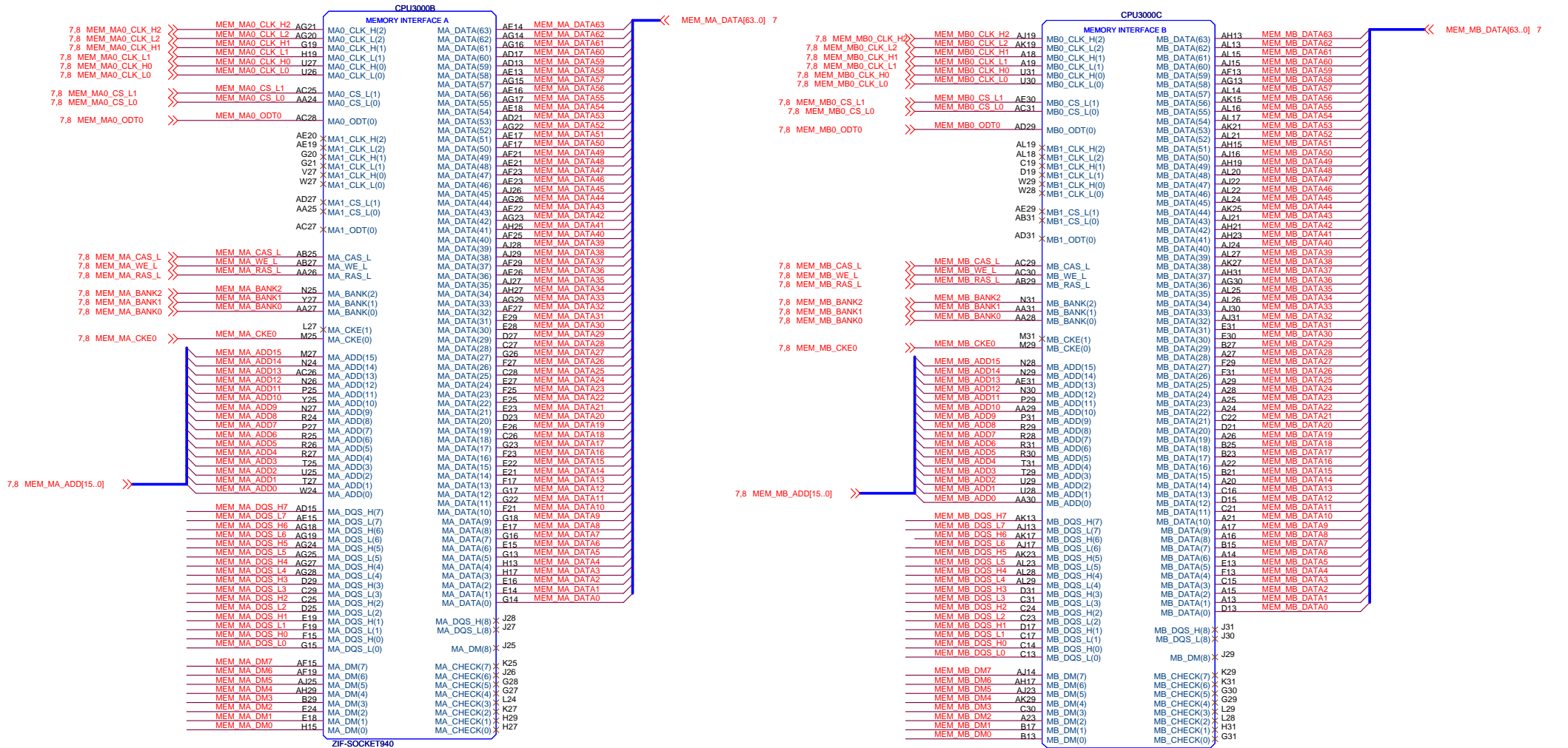
DDR DIMM Config.

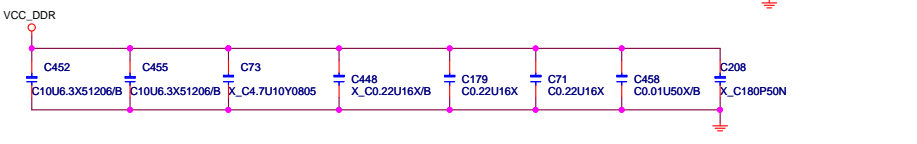
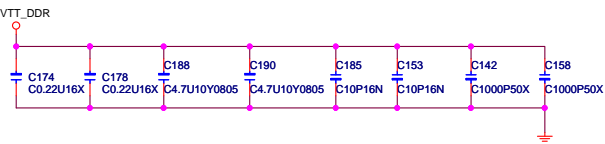
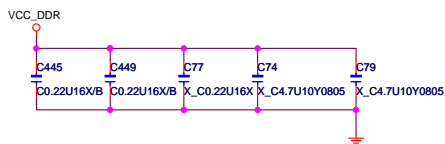
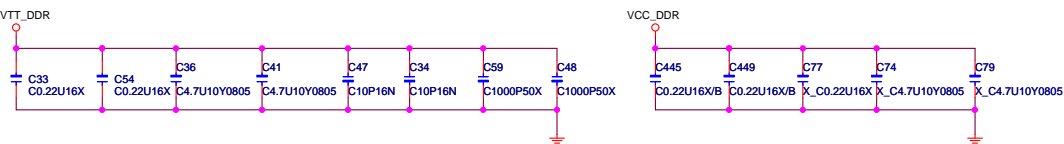
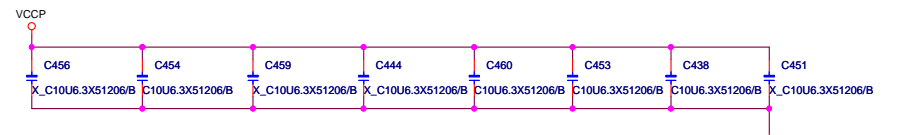
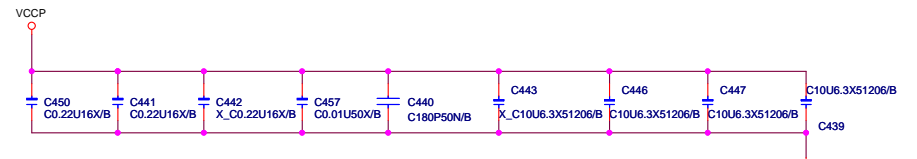
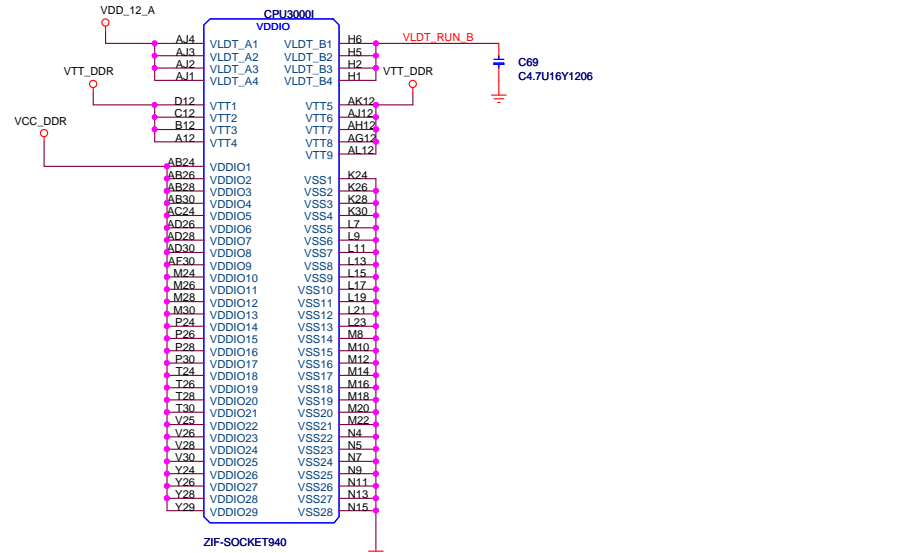
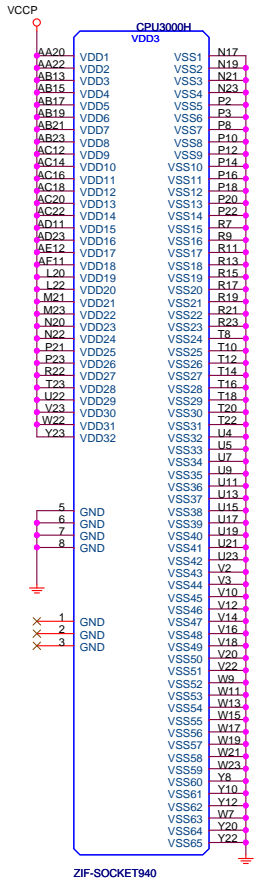
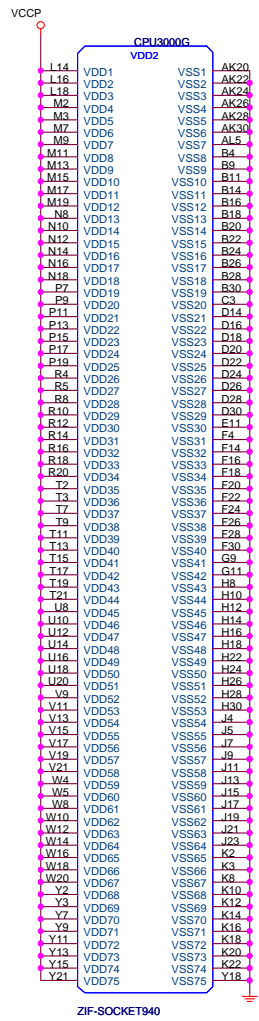
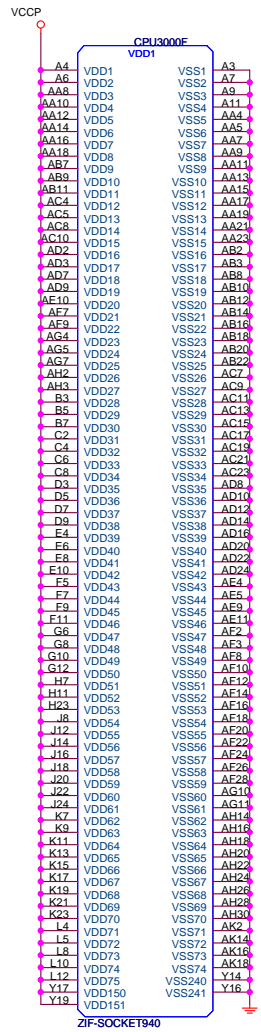
DEVICE	ADDRESS	CLOCK
DIMM 1	1010000XB	MEM_MAO_CLK_H2 MEM_MAO_CLK_L2 MEM_MAO_CLK_H1 MEM_MAO_CLK_L1 MEM_MAO_CLK_H0 MEM_MAO_CLK_L0
DIMM 2	1010001XB	MEM_MBO_CLK_H2 MEM_MBO_CLK_L2 MEM_MBO_CLK_H1 MEM_MBO_CLK_L1 MEM_MBO_CLK_H0 MEM_MBO_CLK_L0

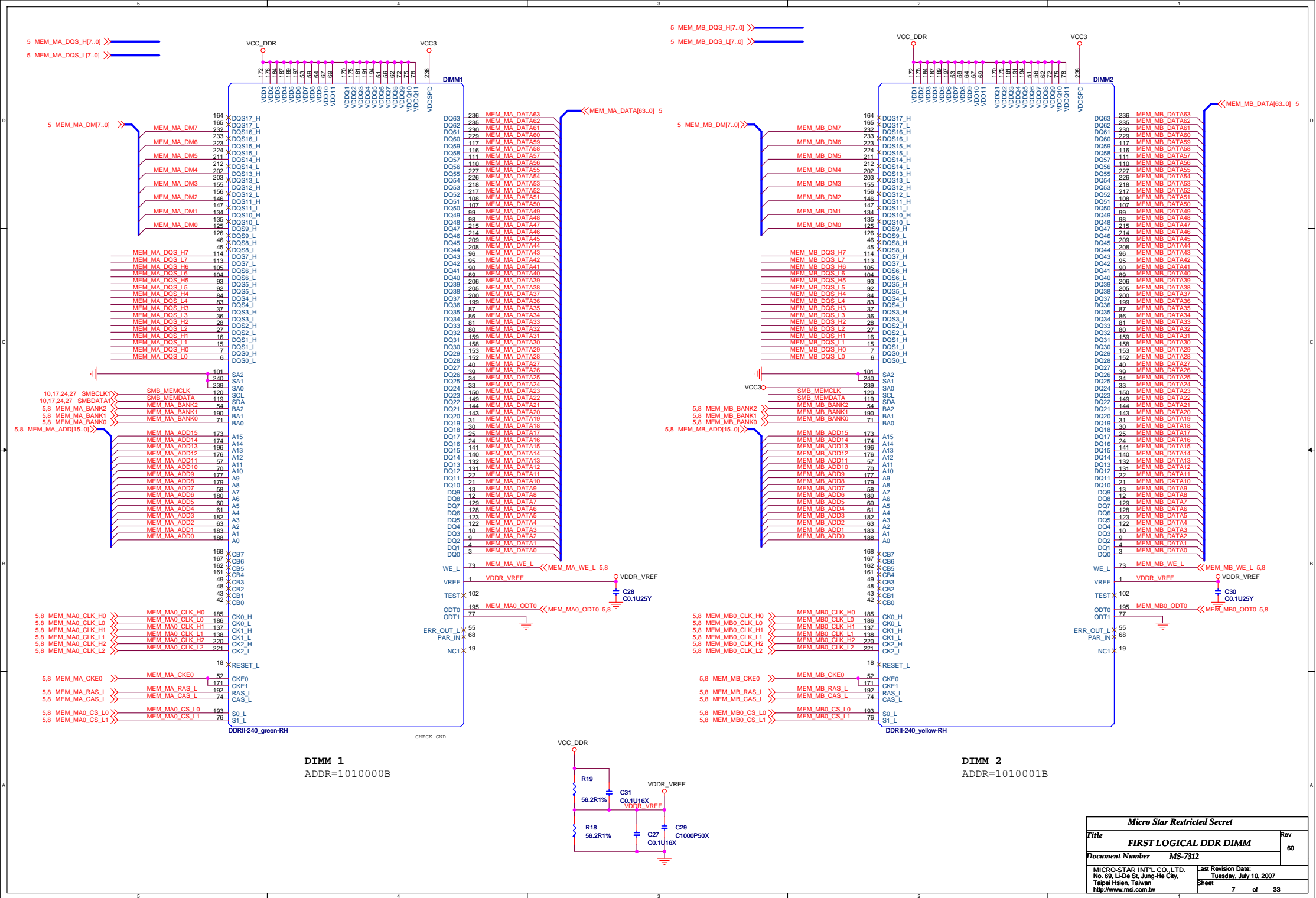


7 MEM_MA_DQS_L[7..0] >> >>
7 MEM_MA_DQS_H[7..0] >> >>
7 MEM_MA_DM[7..0] >> >>

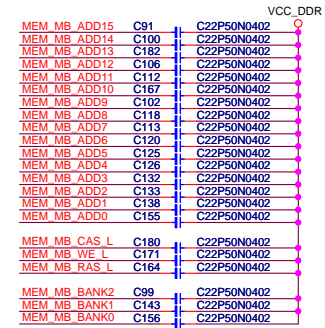
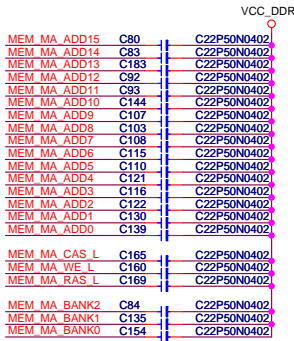
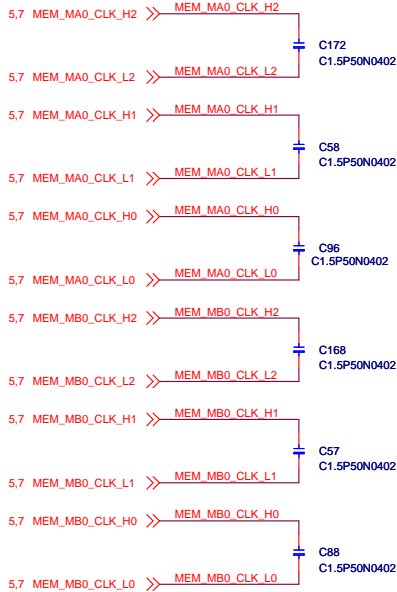
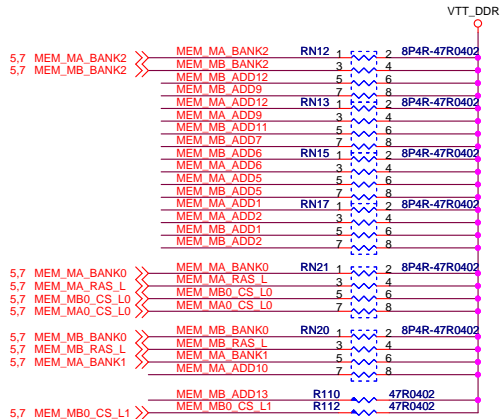
7 MEM_MB_DQS_L[7..0] >> >>
7 MEM_MB_DQS_H[7..0] >> >>
7 MEM_MB_DM[7..0] >> >>







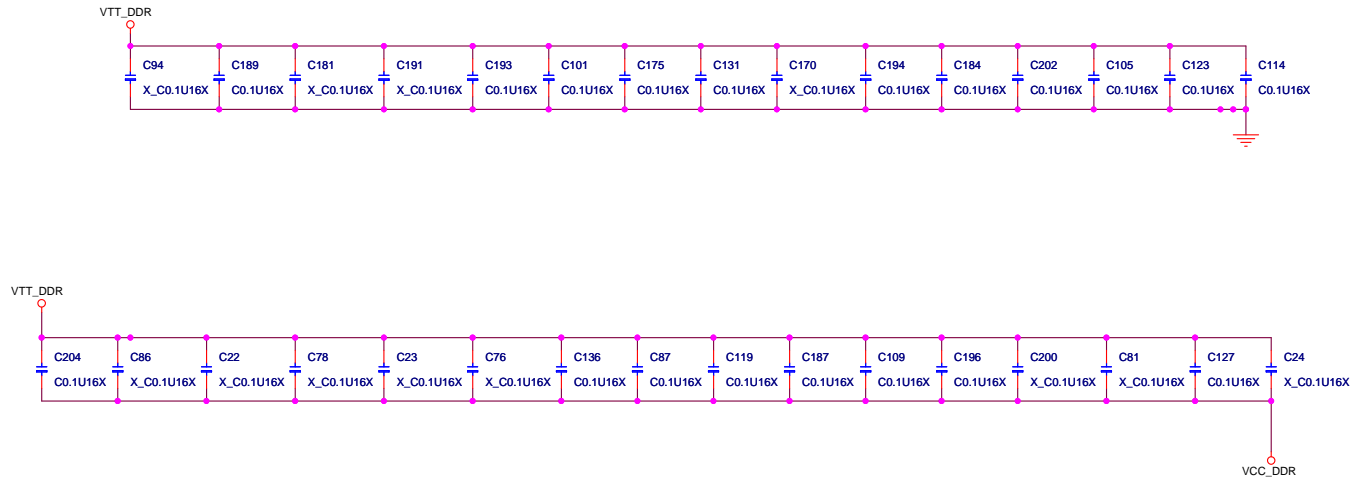
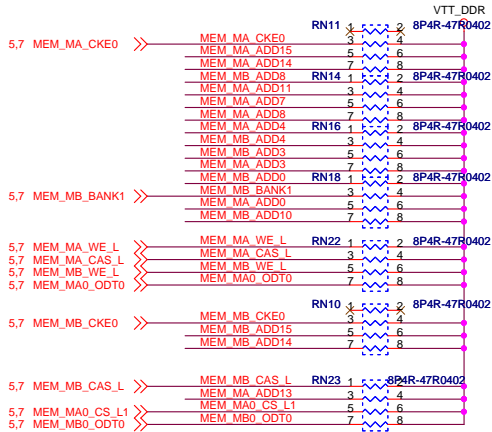
5.7 MEM_MA_ADD[15.0] >>



Decoupling Between Processor and DIMMs

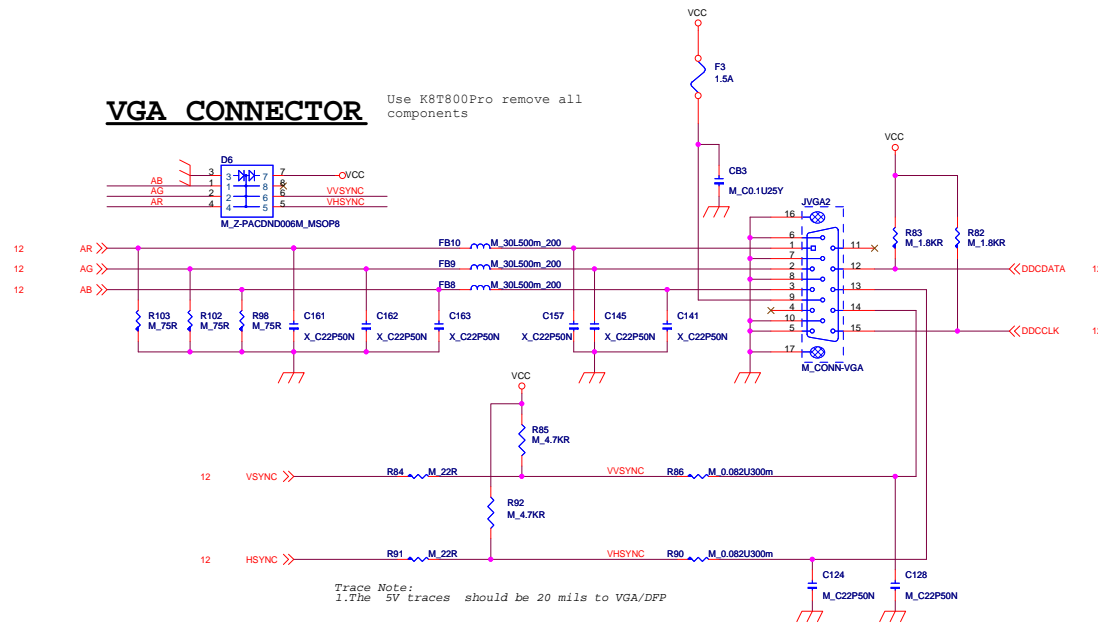
Layout: Spread out on VTT pour

5.7 MEM_MB_ADD[15.0] >>

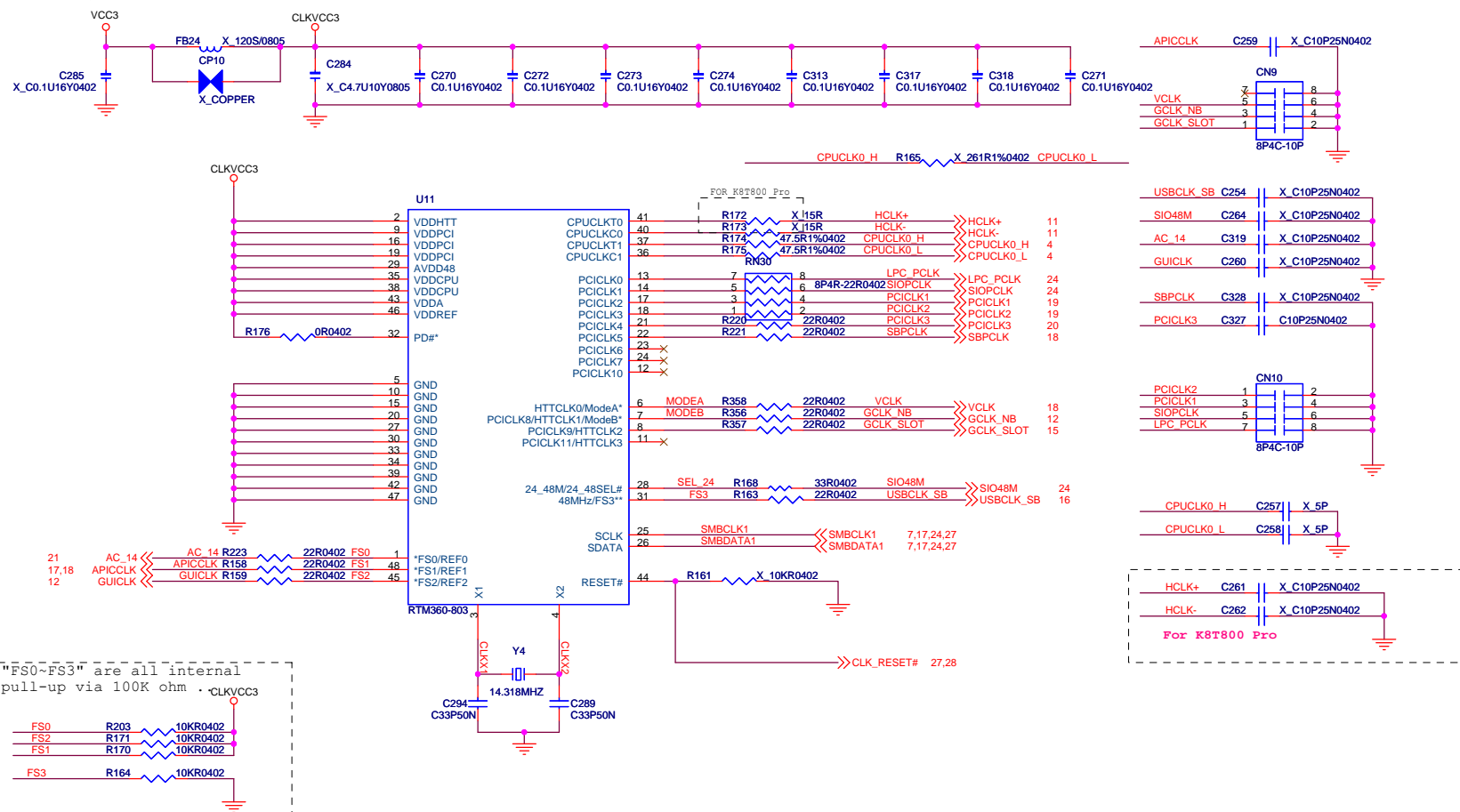


VGA CONNECTOR

Use K8T800Pro remove all components



Clock Synthesizer

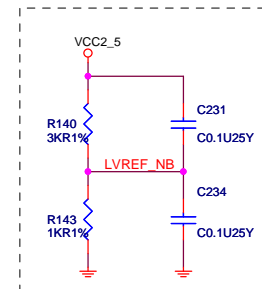


FS(3:0)	CPU	HTT	PCI
0000	100.90	67.27	33.63
0001	133.90	66.95	33.48
0010	168.00	67.20	33.60
0011	202.00	67.33	33.67
0100	100.20	66.80	33.40
0101	133.50	66.75	33.38
0110	166.70	66.68	33.34
0111	200.40	66.80	33.40
1000	150.00	60.00	30.00
1001	180.00	60.00	30.00
1010	210.00	70.00	35.00
1011	240.00	60.00	30.00
1100	270.00	67.50	33.75
1101	233.33	66.67	33.33
1110	266.67	66.67	33.33
1111	300.00	75.00	37.50

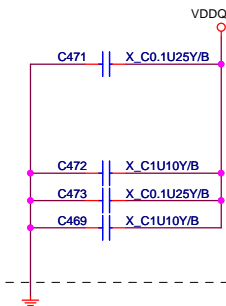
MODE A	MODE B	PIN7	PIN8	PIN11
0	0	HTTCLK1	HTTCLK2	PCICLK11
0	1	HTTCLK1	HTTCLK2	HTTCLK3
1	0	PCICLK8	PCICLK9	PCICLK11
1	1	HTTCLK1	PCICLK9	PCICLK11

SEL_24	PIN28
0	48M
1	24M

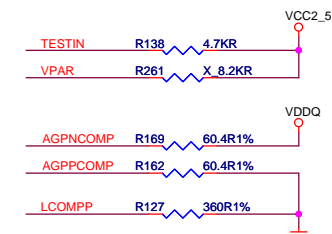
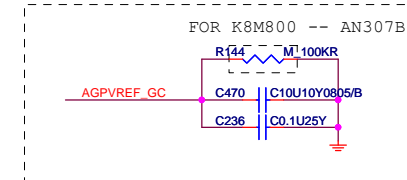
FOR K8T800pro K8M800:00hm;K8T800 pro:bead



LAYOUT: Place caps on the bottom of NB



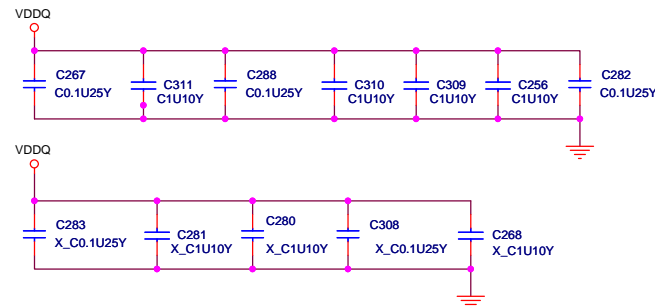
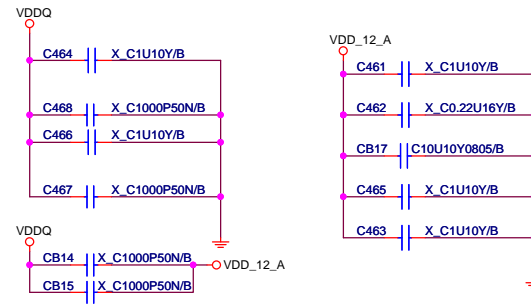
LAYOUT: Place caps as close NB as possible



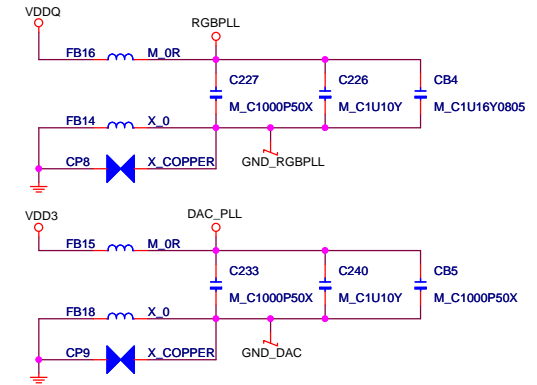
<i>Micro Star Restricted Secret</i>			
Title NORTH BRIDGE (AGP & VLINK)			Rev 60
Document Number MS-7312			
MICRO-STAR INT'L CO. LTD. No. 69, Lide St., Jung-Hsi City, Taichung Hsien, Taiwan		Last Revision Date: Tuesday, July 10, 2007	
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Power and Ground Connections

LAYOUT : Populate caps on the bottom side of NB.

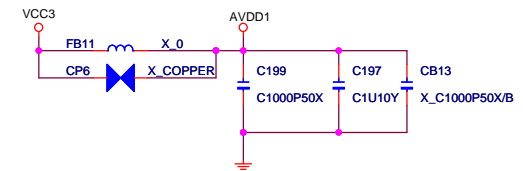


For K8M800 Only



Note: When use K8T800, these power circuit for GFX analog power should be NOPOPed.

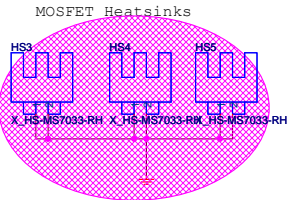
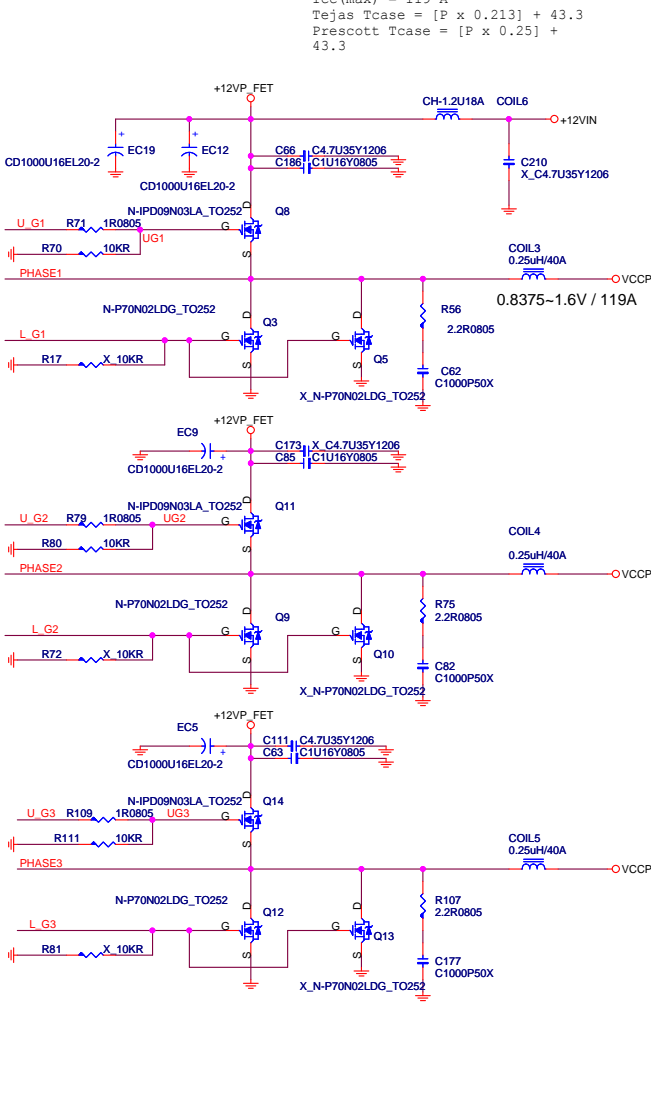
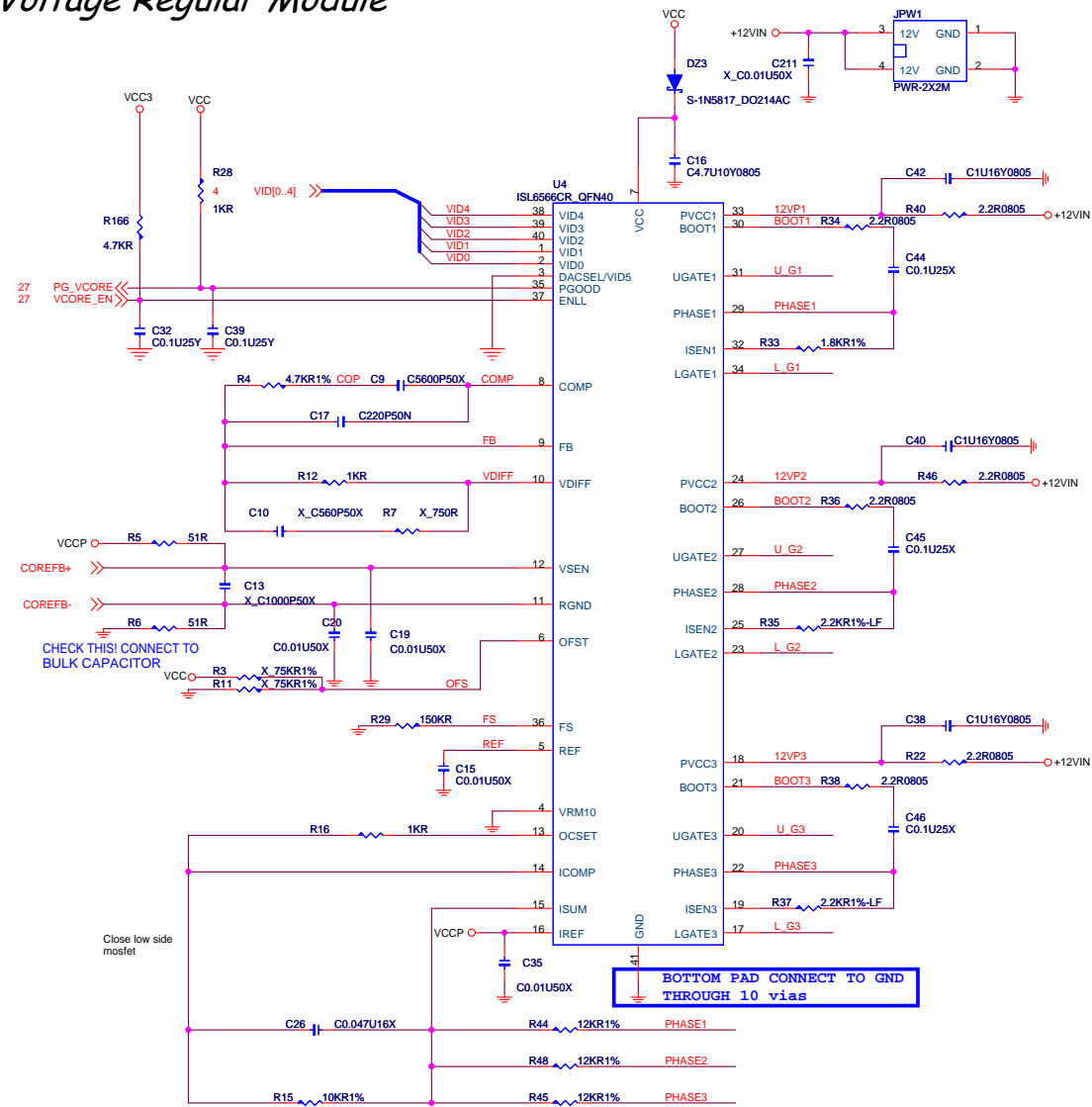
For K8M800/K8T800 Pro Only



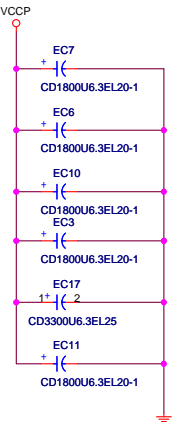
Micro Star Restricted Secret

Title		Rev
NORTH BRIDGE (POWER/GROUND)		60
Document Number		MS-7312
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Sheet		13 of 33

Voltage Regular Module



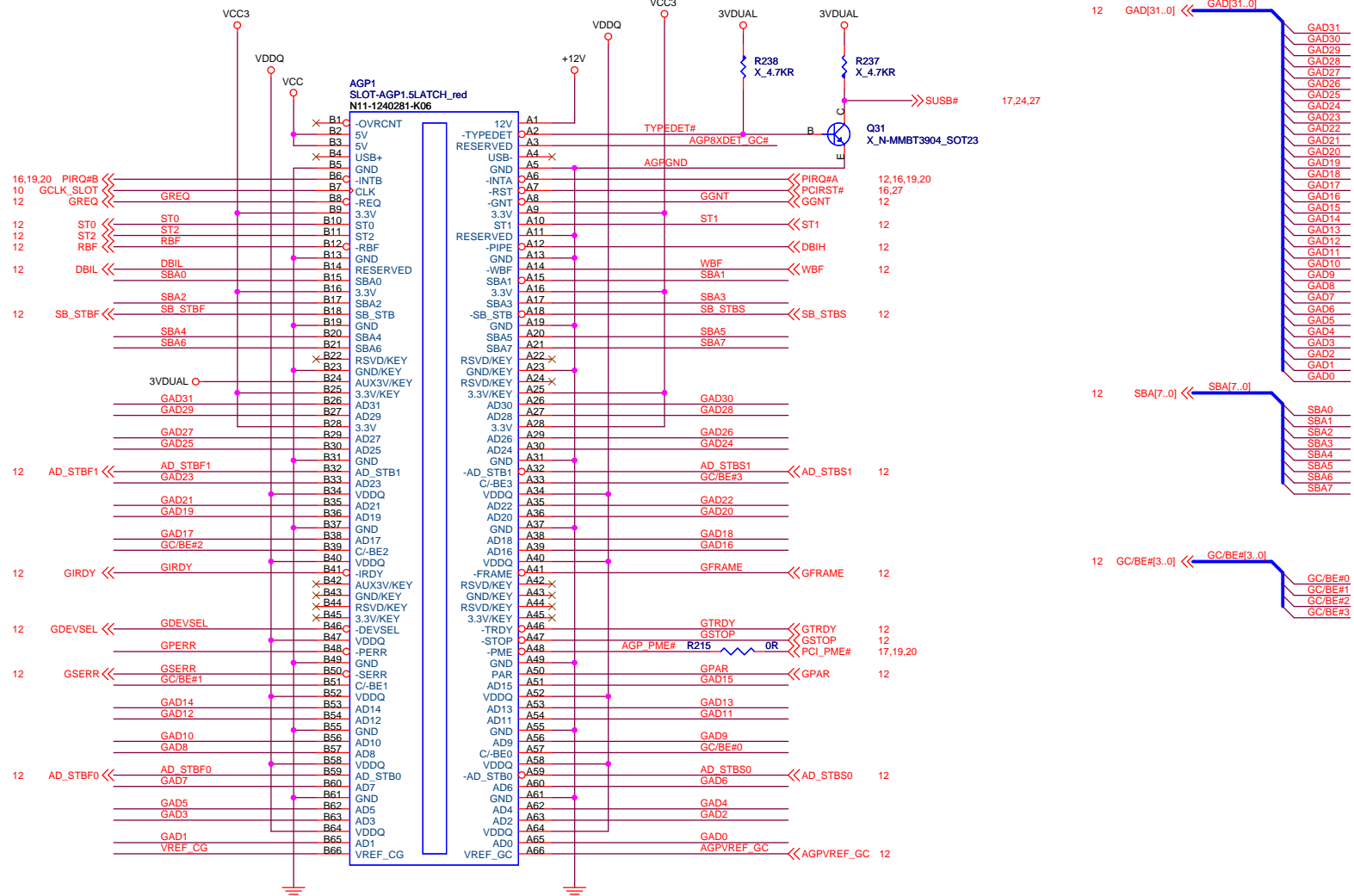
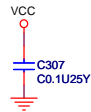
EL Capacitors



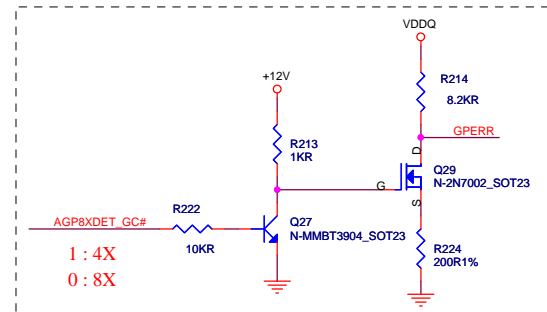
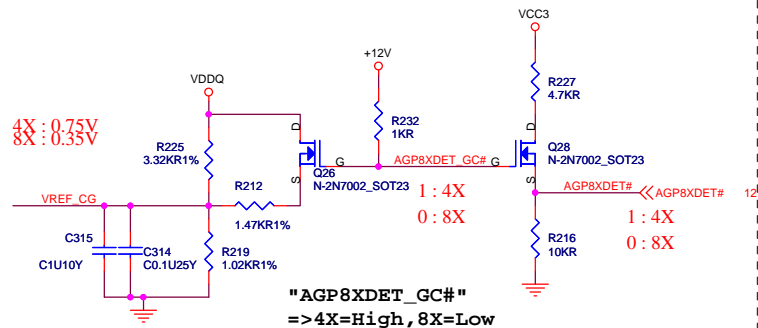
IPF06N03LA	Rds (on)=8.7mΩ (@4.5V, 30A), Vgs (on)=1.2~2V, Id=50A, Ciss=3110pf, Qg=10nC, Vds=25V, Vgs=±20V
C100U2SP	ESR<13mΩ, Ripple cur.<2.7A, LC<12uA, 105C
.CD3300U6.3EL25	ESR<12mΩ, Ripplecur.<2800mA, 105C, longlife3000hrs, KZGSeries
560u_2.5V	ESR=6mΩ, Ripplecur.=4400mA, Lc.<500uA, 105C/2000hrs
1800UF/6.3V	ESR<12mΩ, Ripplecur<2350mA, 105C, longlife change from 2000hrs to 3000hrs ,KZJ series
0.6uH/40A	0.6u/20%, Isat=40A, Rdc=1.2m ohm, PEW wire
CH-1.2U18A	1.2u/20%, Dip-2/vertical17.5mm, 1.2ψ/5.5turns, 18A

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Document Number	MS-7312	
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AGP PRO Connector



AGP "Vref" => 4X : $0.5 \times 1.5V = 0.75 \text{ Volt}$,
8X : $0.23 \times 1.5 = 0.345 \text{ Volt}$

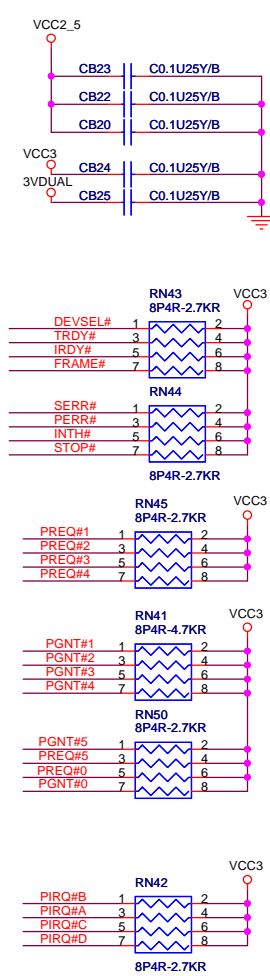
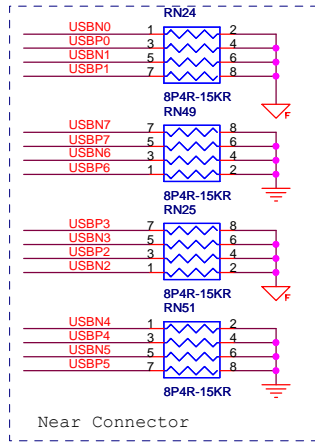
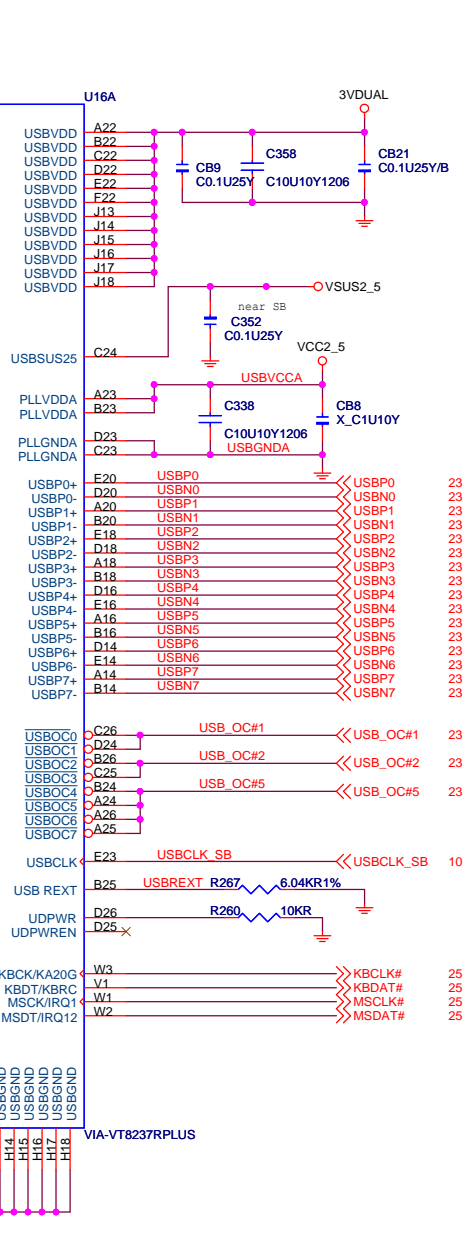
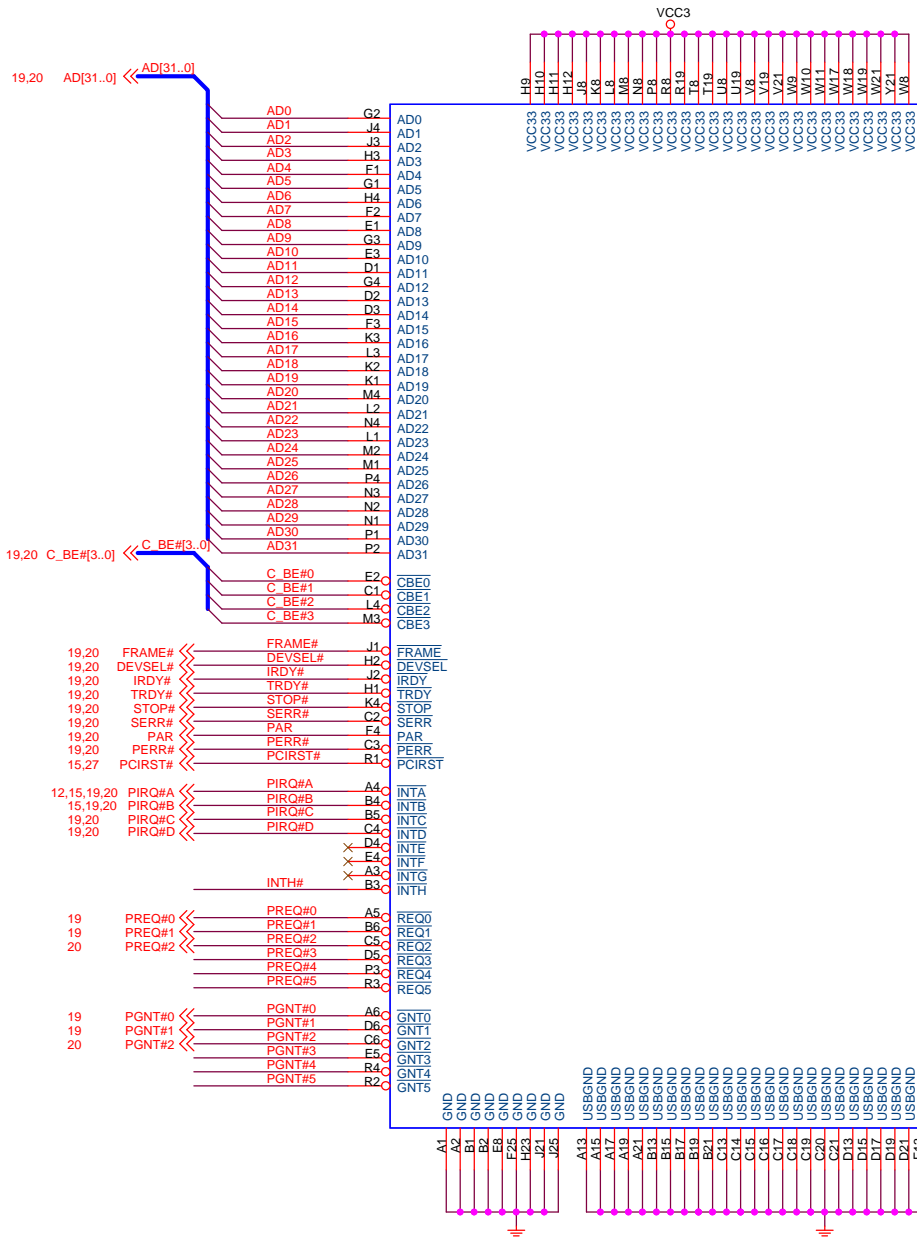


Add-in Card Power

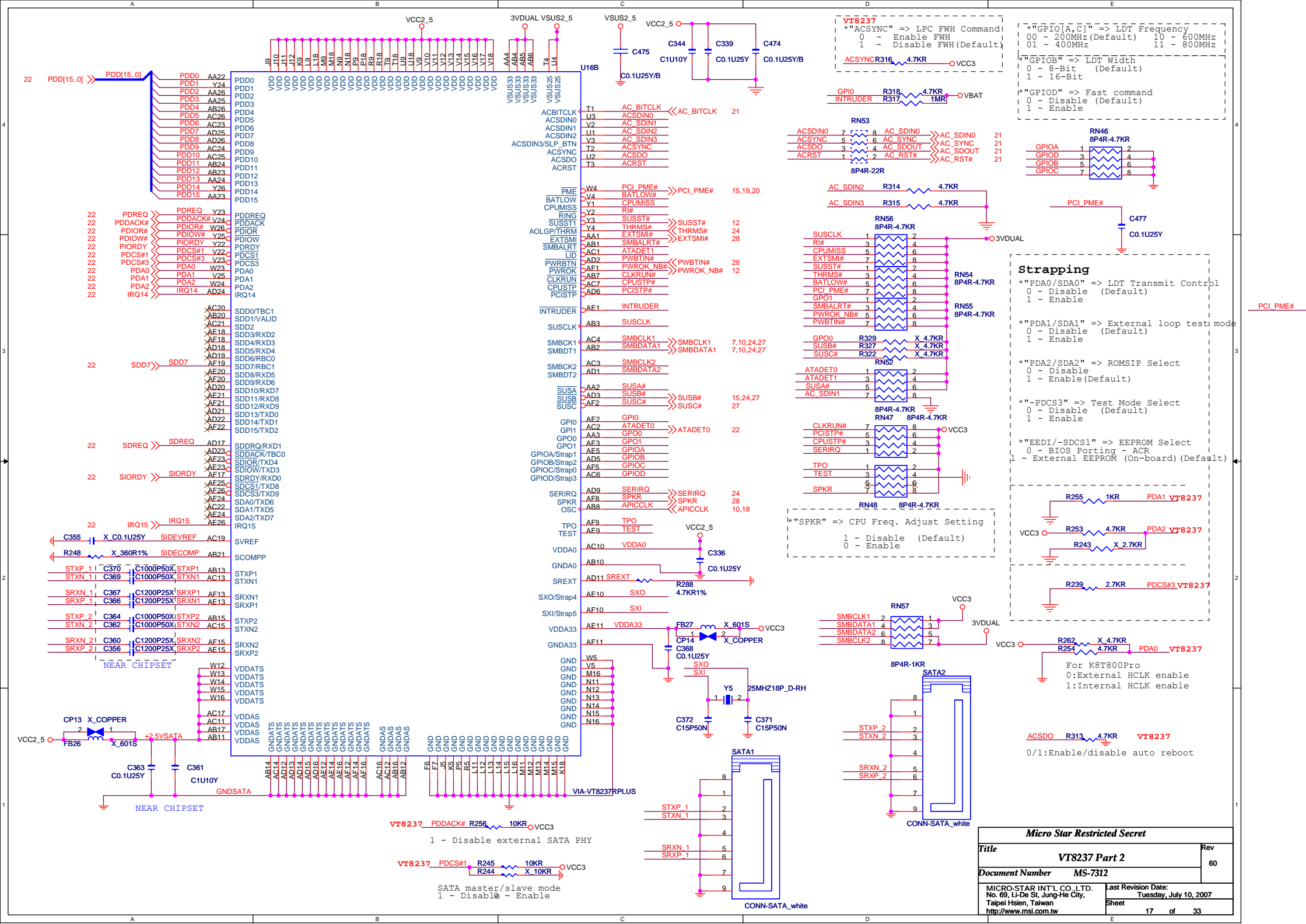
	<i>I_{max}</i>	<i>V_{Min}</i>	<i>V_{Max}</i>	<i>Units</i>
VDDQ	2.0A	1.425	1.575	V
VCC3	6.0A	3.15	3.45	V
3VDUAL	0.75A	3.15	3.45	V
VCC5	2.0A	4.75	5.25	V
VCC12	1.0A	11.4	12.6	V

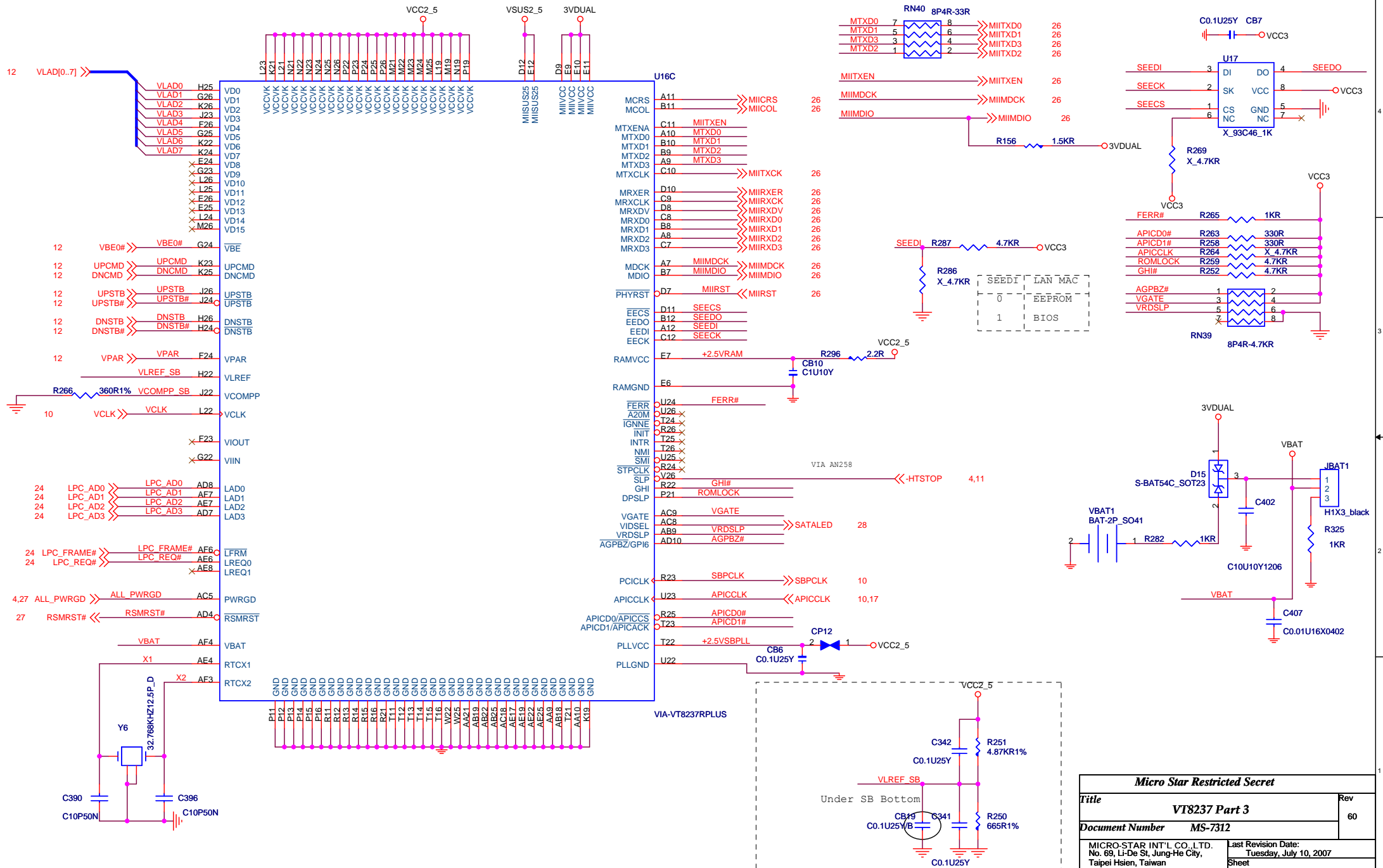
Micro Star Restricted Secret

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AGP PRO Slot		60	
Document Number		MS-7312	
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http://www.msi.com.tw		15 of 33	

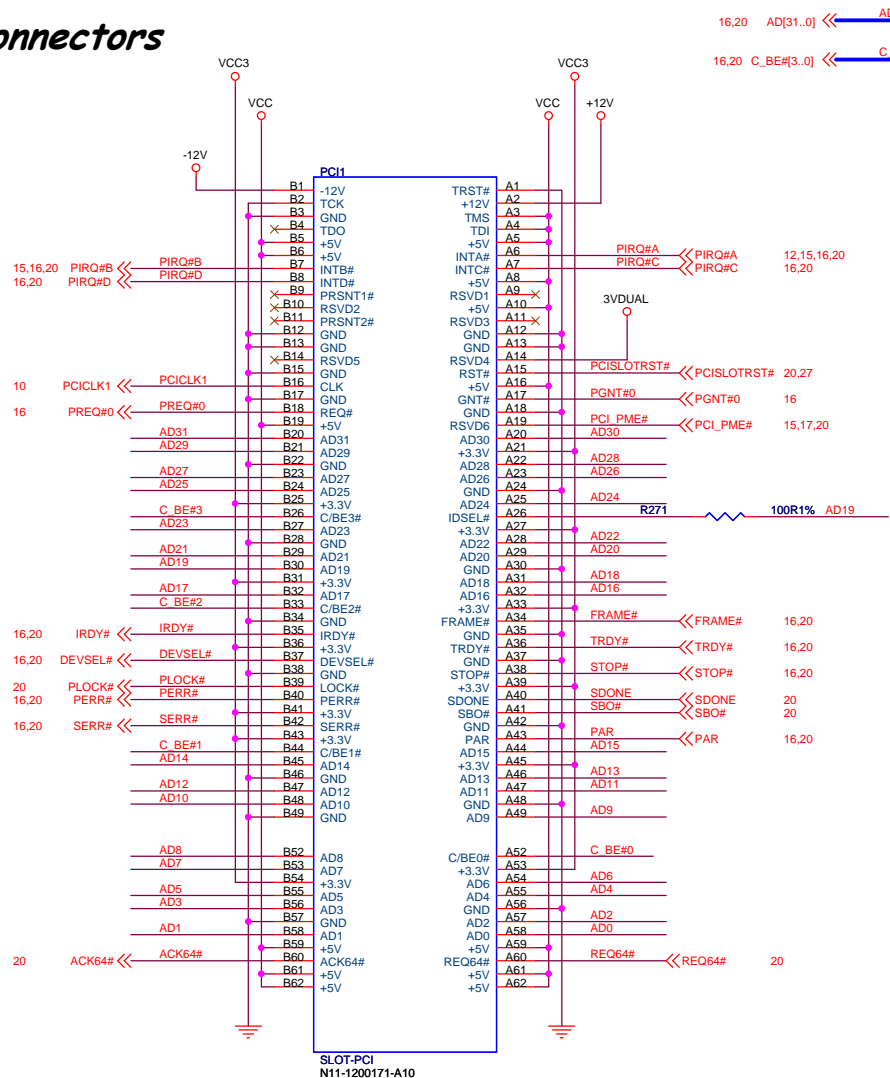


Micro Star Restricted Secret		
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Document Number	MS-7312	
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Tuesday, July 10, 2007 Sheet 16 of 33

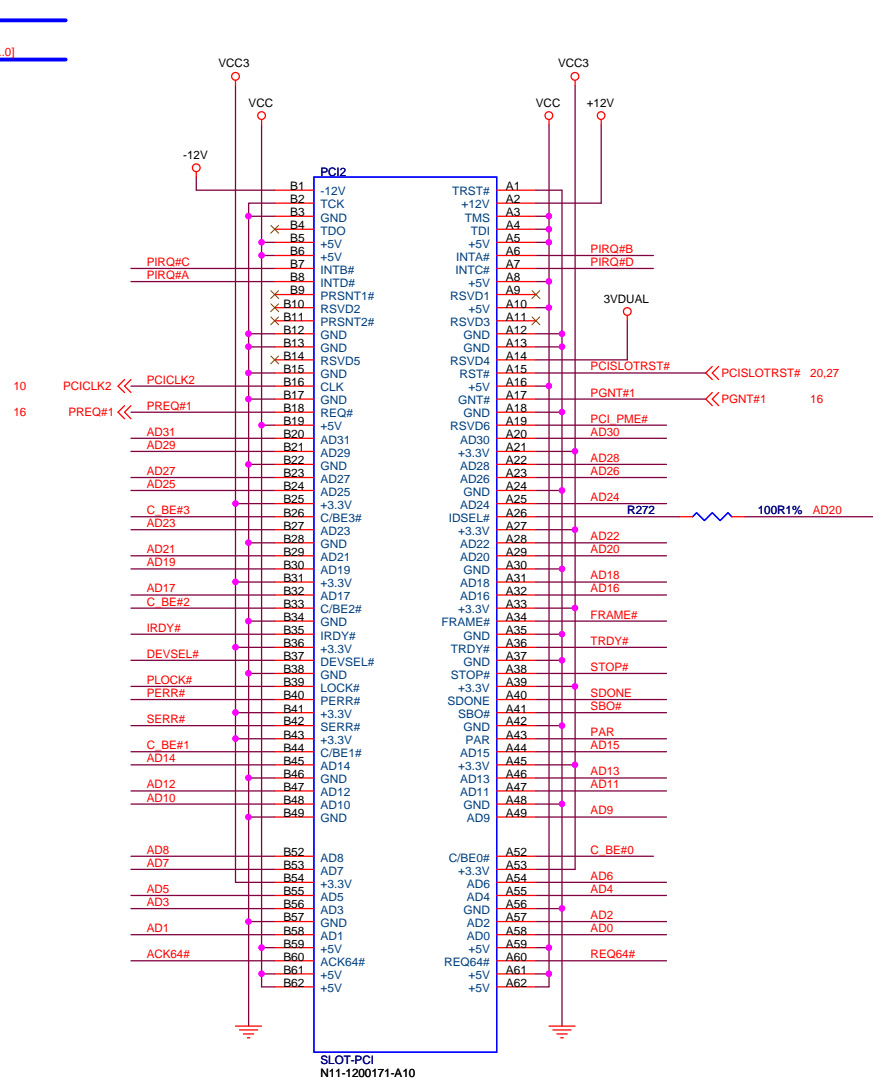




PCI Connectors



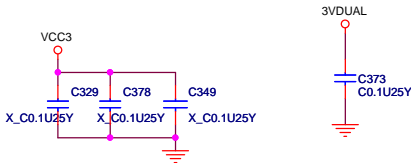
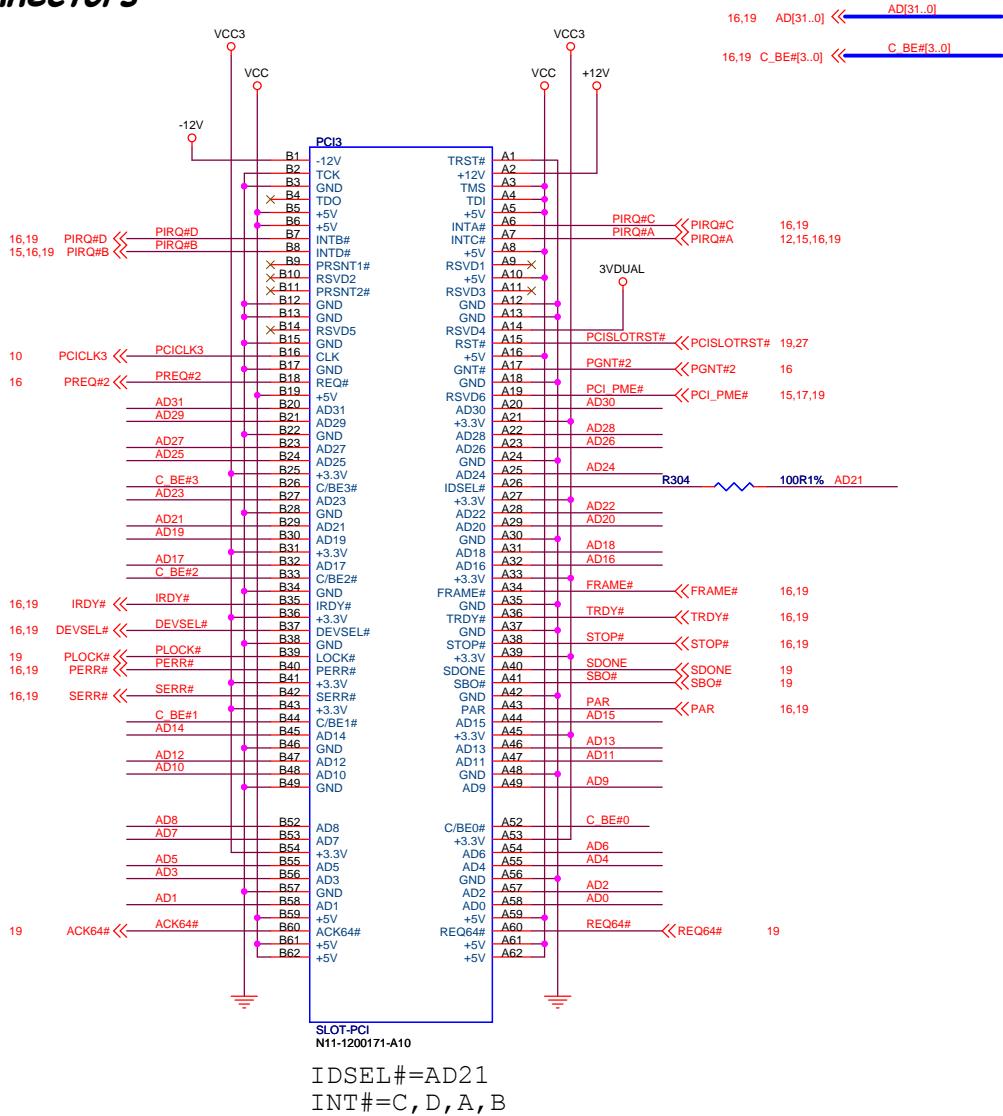
```
IDSEL#=AD19
INT#=A,B,C,D
```



```
IDSEL#=AD20
INT#=B,C,D,A
```

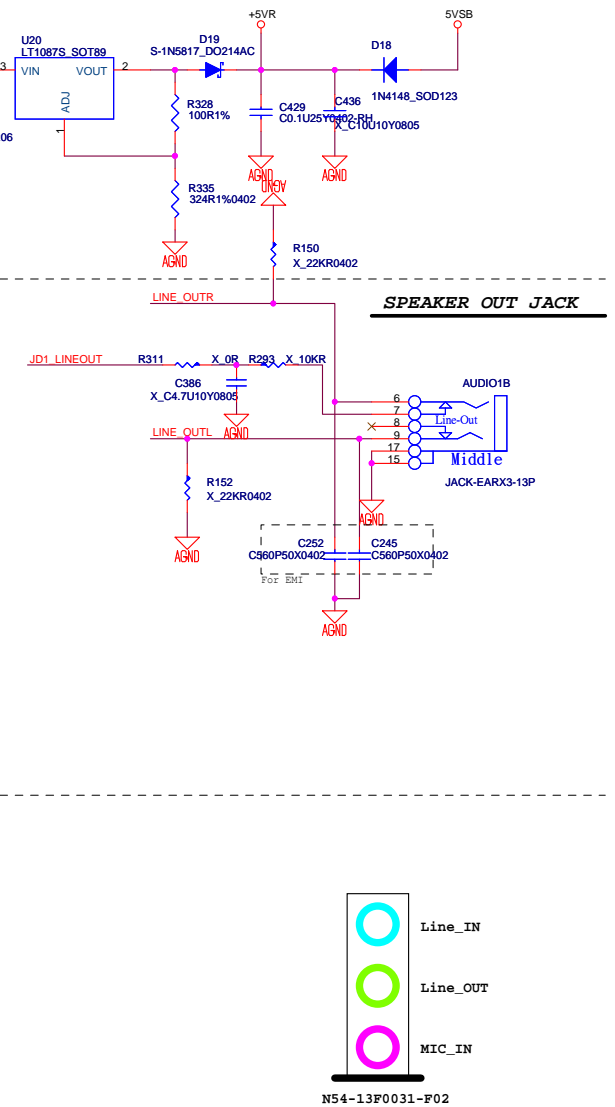
<i>Micro Star Restricted Secret</i>		
<i>Title</i>	<i>PCI Connector 1 & 2</i>	<i>Rev</i>
<i>Document Number</i>	<i>MS-7312</i>	<i>60</i>
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St., Jung-Ho City, Taipei Hsien, Taiwan http://www.msi.com.tw		<i>Last Revision Date:</i> <i>Tuesday, July 10, 2007</i> <i>Sheet</i> 19 of 33

PCI Connectors



Micro Star Restricted Secret		
Title	PCI Connector 3	Rev 60
Document Number	MS-7312	
MICRO-STAR INT'L CO., LTD. No. 68, Li-De St, Jung-Hsi City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Tuesday, July 10, 2007
Sheet	20	of 33

AUDIO CODE REGULATORS



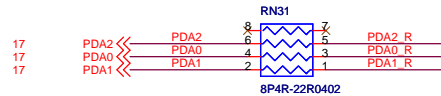
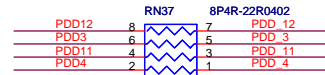
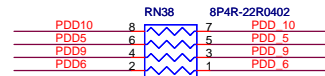
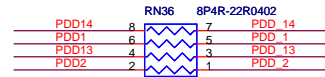
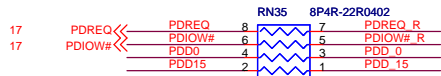
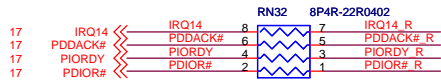
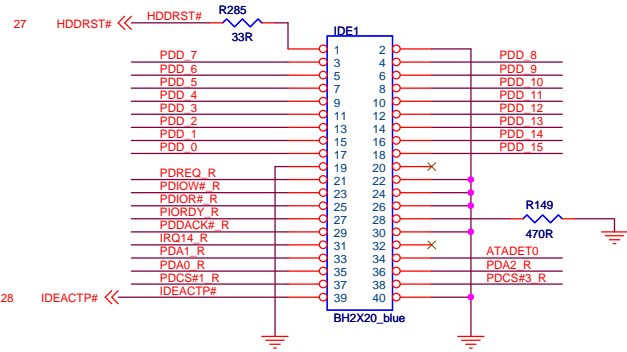
N54-13F0031-F02

<i>Micro Star Restricted Secret</i>		
Title	<i>PCI Connector 3</i>	Rev
Document Number	<i>MS-7312</i>	60
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-He City, Taipai Hsien, Taiwan		Last Revision Date: Tuesday, July 10, 2007
www.msi.com.tw		Sheet 21 of 33

ATA 33/66/100 Connector

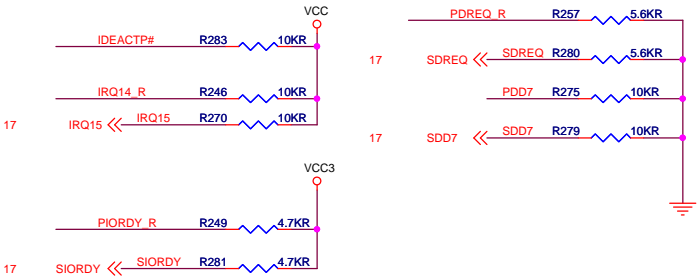
17 PDD[15..0] << PDD[15..0] NEAR S.B SIDE

PRIMARY IDE CONN.



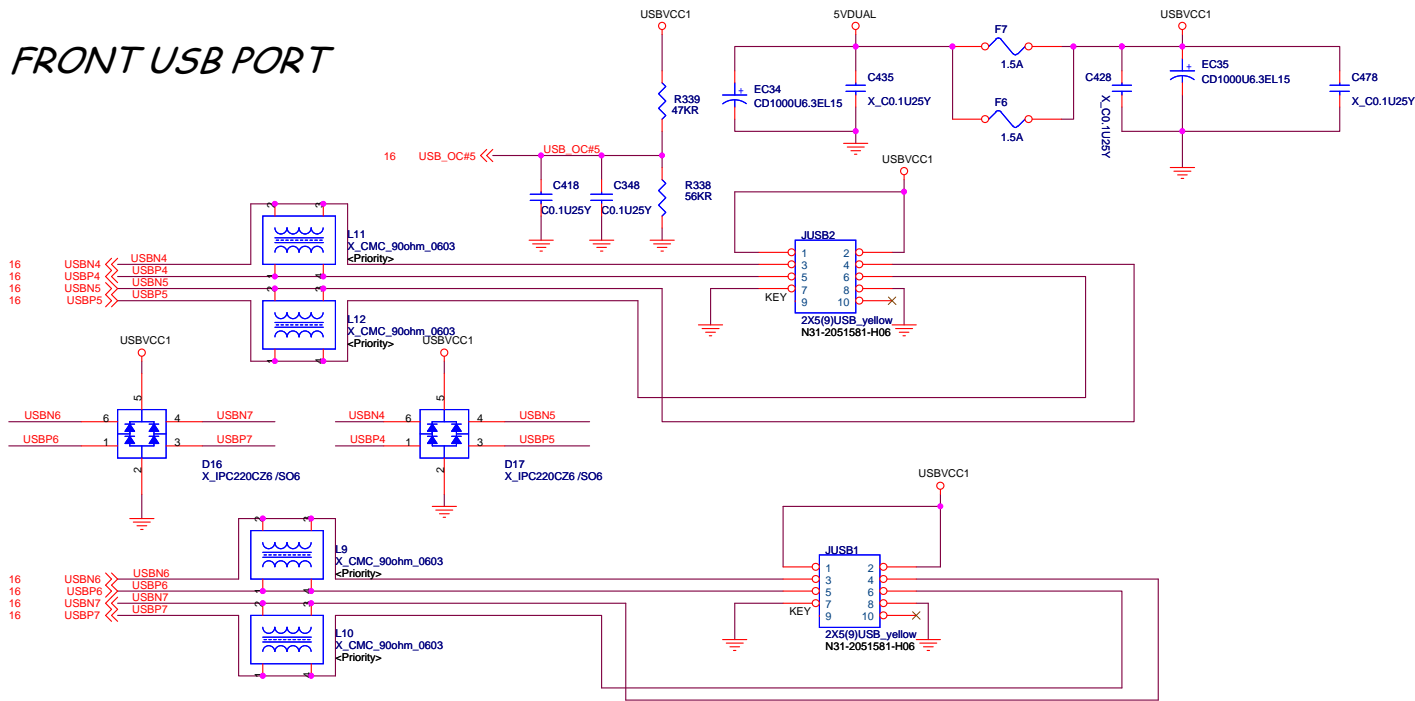
Near SB < 1" (or Damping Rs)

17 ATADET0 << ATADET0



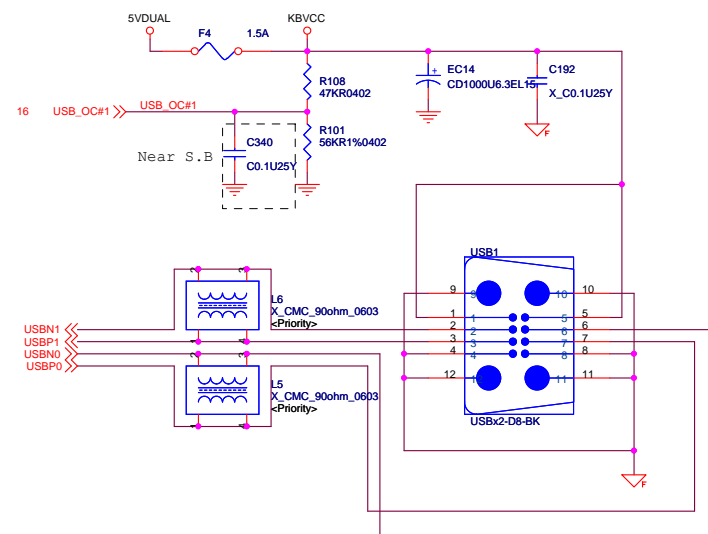
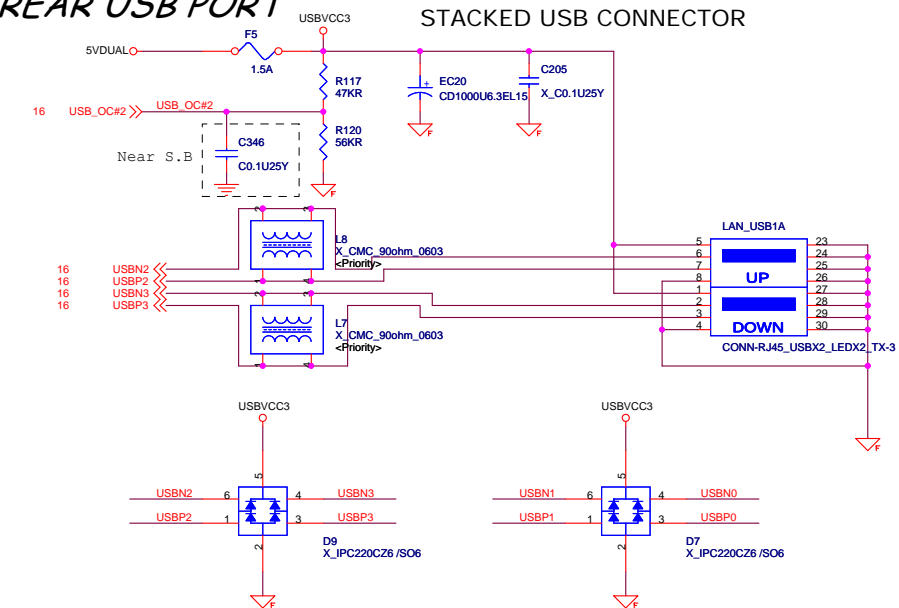
Micro Star Restricted Secret		
Title	ATA 66/100/133 Connector	Rev 60
Document Number	MS-7312	
MICRO STAR INT'L CO., LTD. No. 68, Li-De St, Jung-Hsi City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Tuesday, July 10, 2007
Sheet	22	of 33

FRONT USB PORT



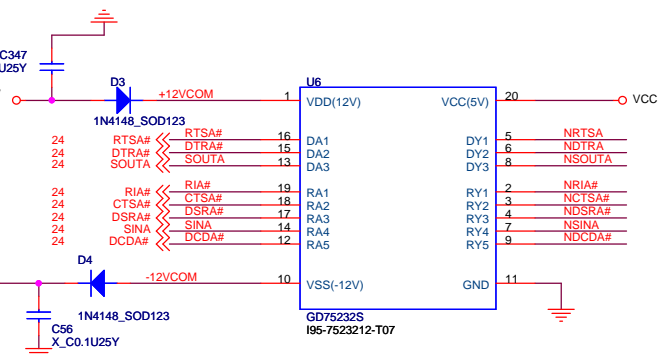
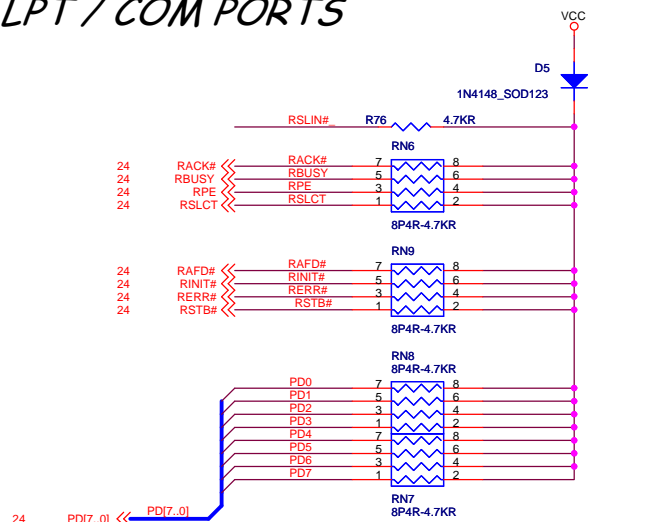
REAR USB PORT

STACKED USB CONNECTOR

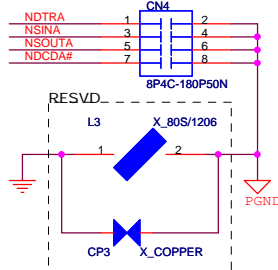
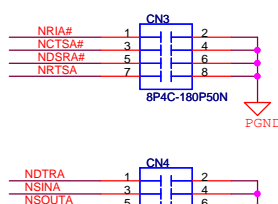
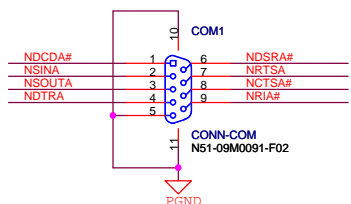


Micro Star Restricted Secret		
Title	USB Port	Rev
Document Number	MS-7312	60
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Tuesday, July 10, 2007
Sheet		23 of 33

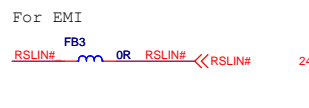
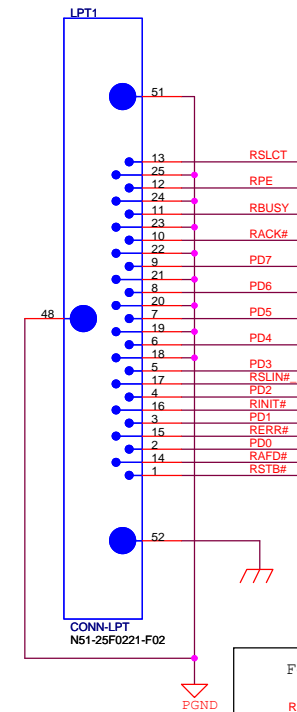
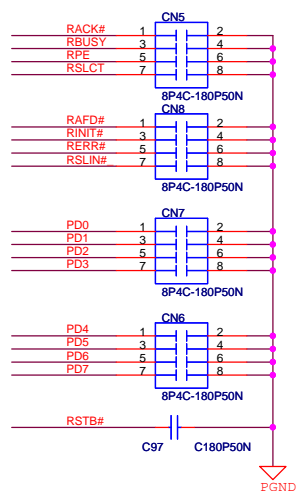
LPT / COM PORTS



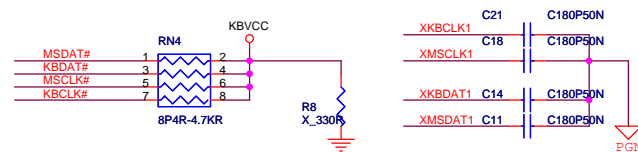
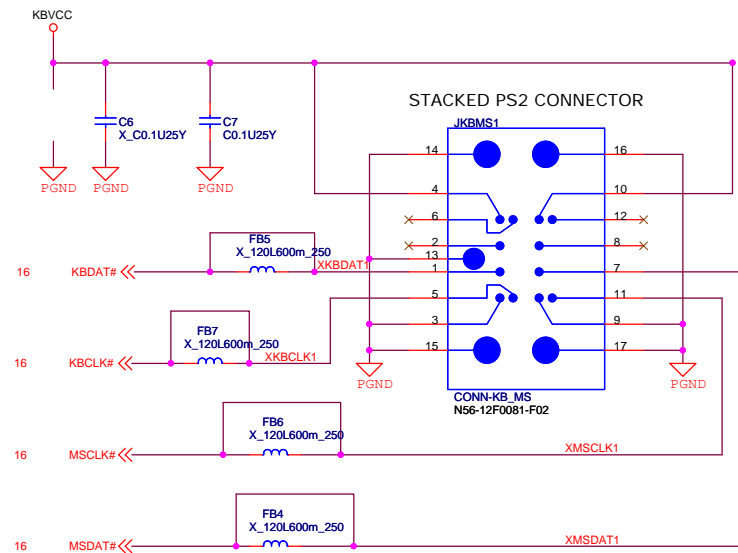
Multiple RS232 Drivers and Receivers



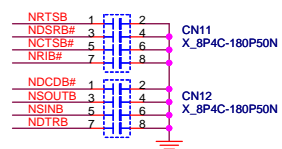
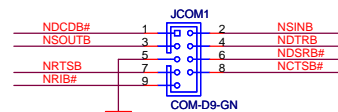
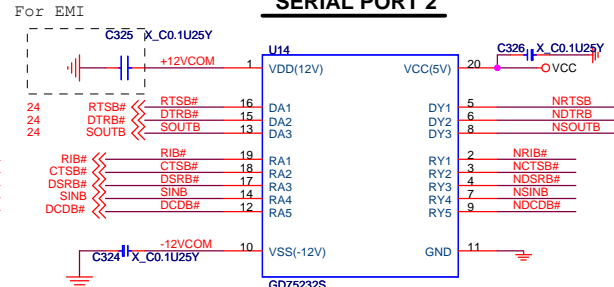
For EMI



Keyboard/Mouse Ports

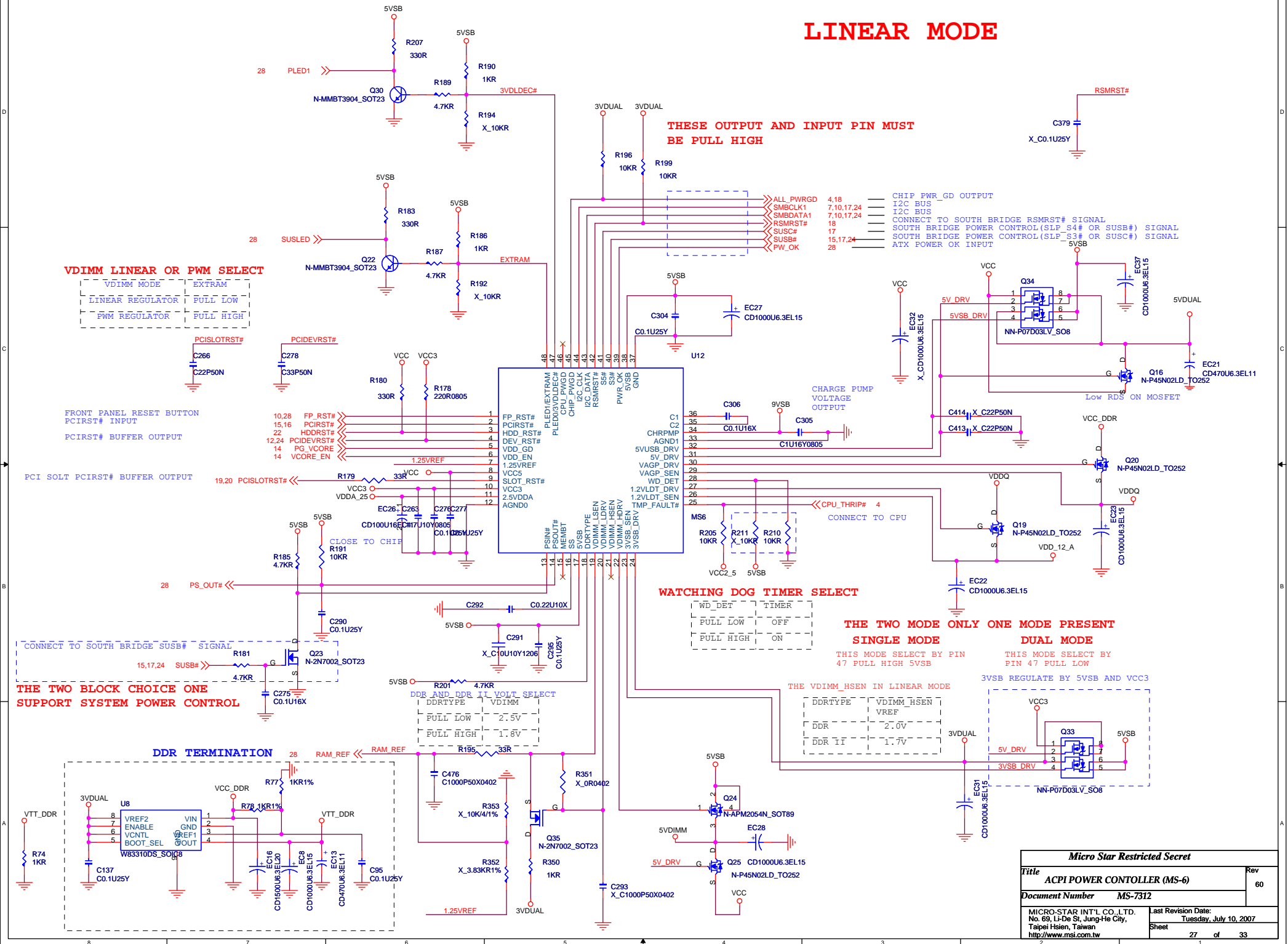


SERIAL PORT 2

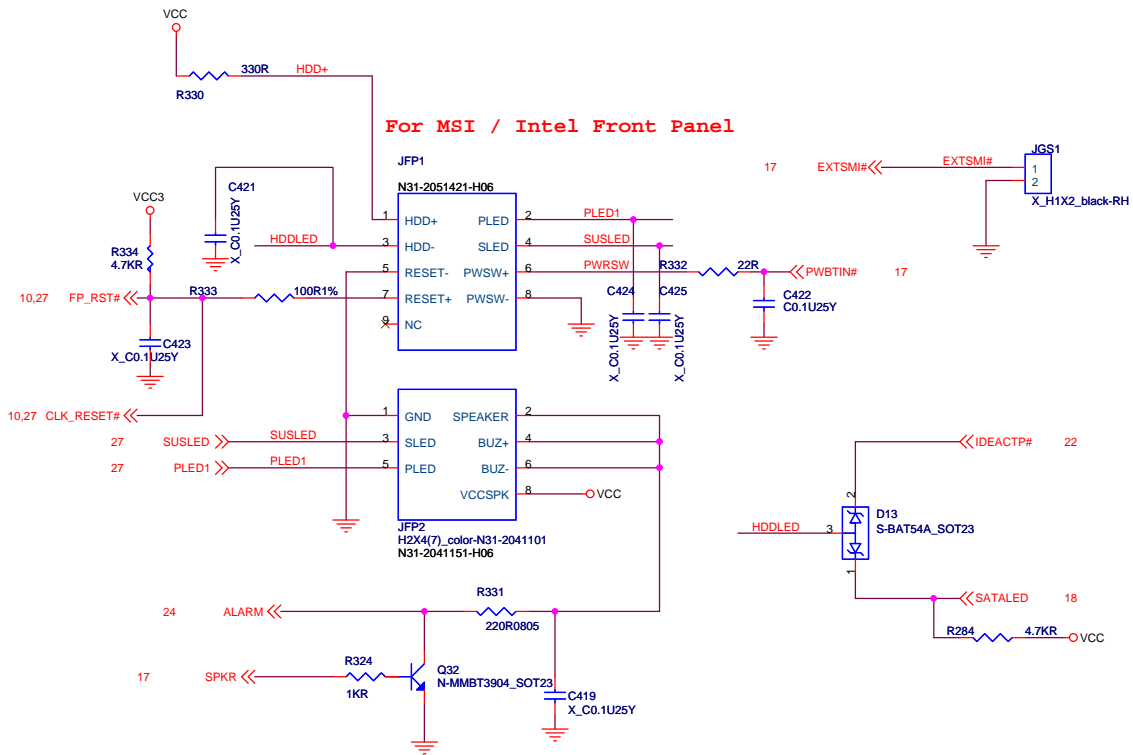


Micro Star Restricted Secret	
Title	KeyBoard/Mouse/LPT/COM
Document Number	MS-7312
MICRO STAR INT'L CO., LTD. No. 68, Li-De St., Jung-Hsi City, Taipei Hsien, Taiwan http://www.msi.com.tw	
Last Revision Date:	Tuesday, July 10, 2007
Sheet	25 of 33

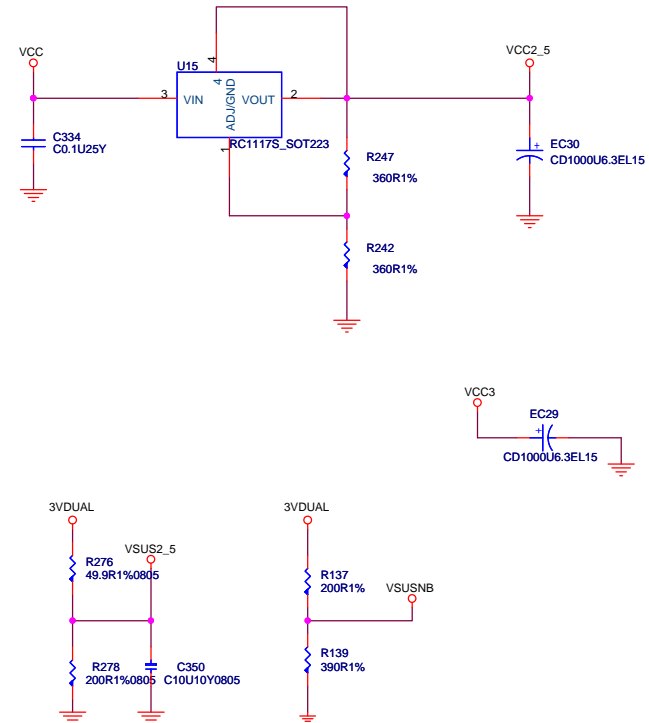
LINEAR MODE



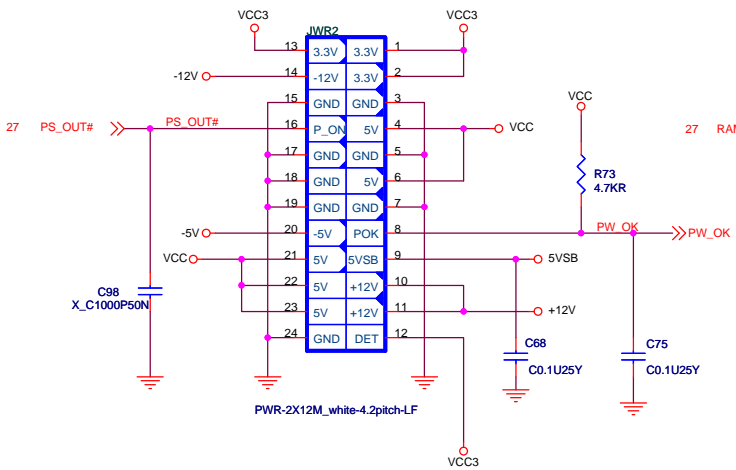
FRONT PANEL



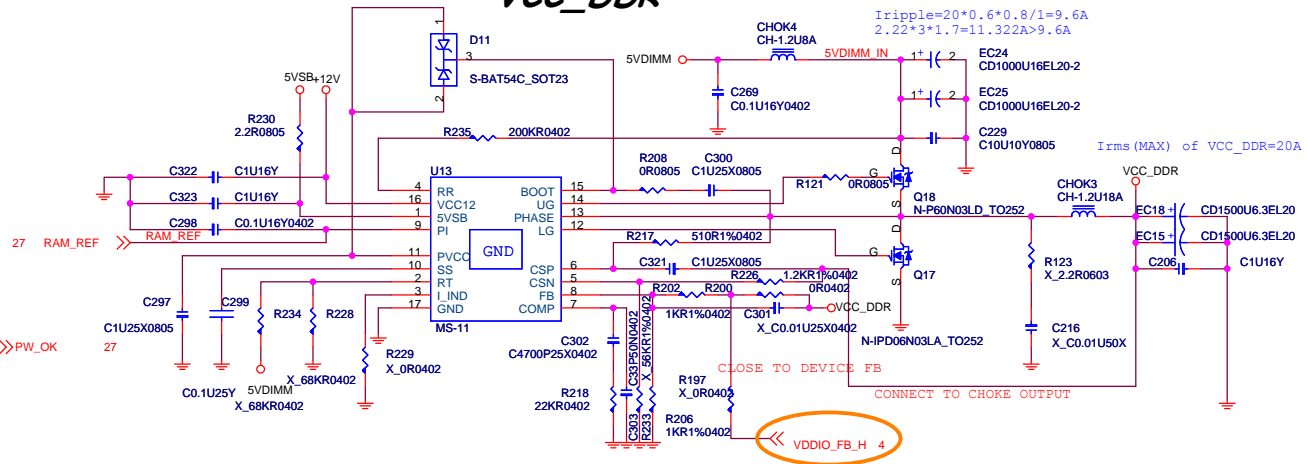
System Voltage Regulator



ATX Power Connector



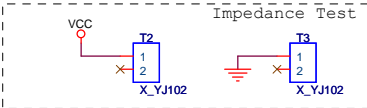
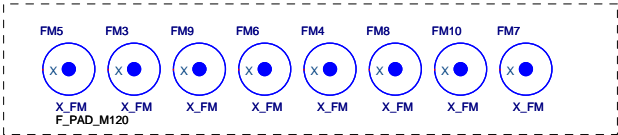
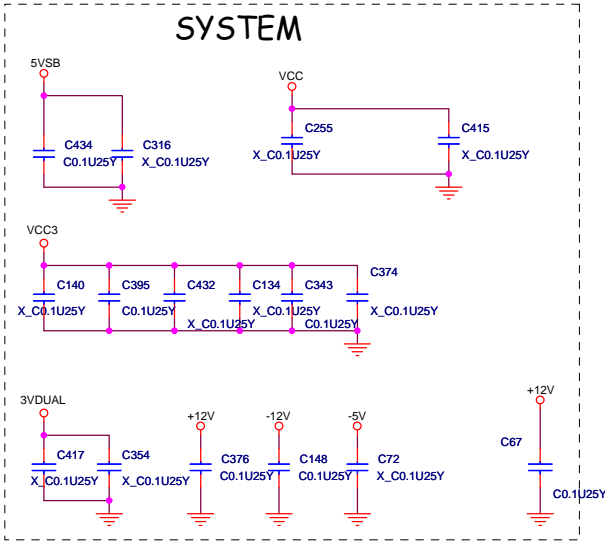
VCC_DDR



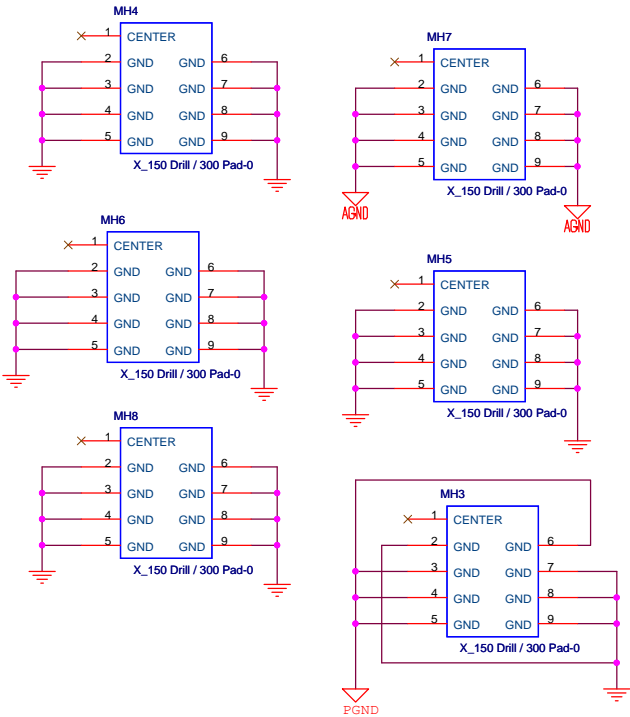
<i>Micro Star Restricted Secret</i>		
<i>Title</i>	<i>System Regulator&Front Panel</i>	Rev
<i>Document Number</i>	<i>MS-7312</i>	60
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Tuesday, July 10, 2007 Sheet 28 of 33

BULK / Decopuling

Place on CPU Solder side



ATX VIA-Hole * 9



Micro Star Restricted Secret		
Title	BULK / Decopuling	Rev
Document Number	MS-7312	60
MICRO-STAR INT'L CO., LTD. No. 68, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Tuesday, July 10, 2007
Sheet	29	of 33

K8 AM2 CPU Power

NB & SB Power

Other Power

CPU Side

DDR Side

K8 Vcore ->
"VCORE" (95A)

VDDA_2.5 Power ->
"VDDA_25" (0.11A)

HT Power ->
"VDD_12_A" (0.5A)

DDR Power ->
"VCC_DDR(1.8V)"
(9.4A)

DDR-VTT Power ->
"VTT_DDR(0.9V)"
(1.2A)

NB VLDT-Power ->
"VDD_12_A" (0.15A)

NB VDD&VAGP ->
"VDDQ" (1.5A)

SB VLINK&VCORE-Power ->
"VCC2_5" (0.576A)

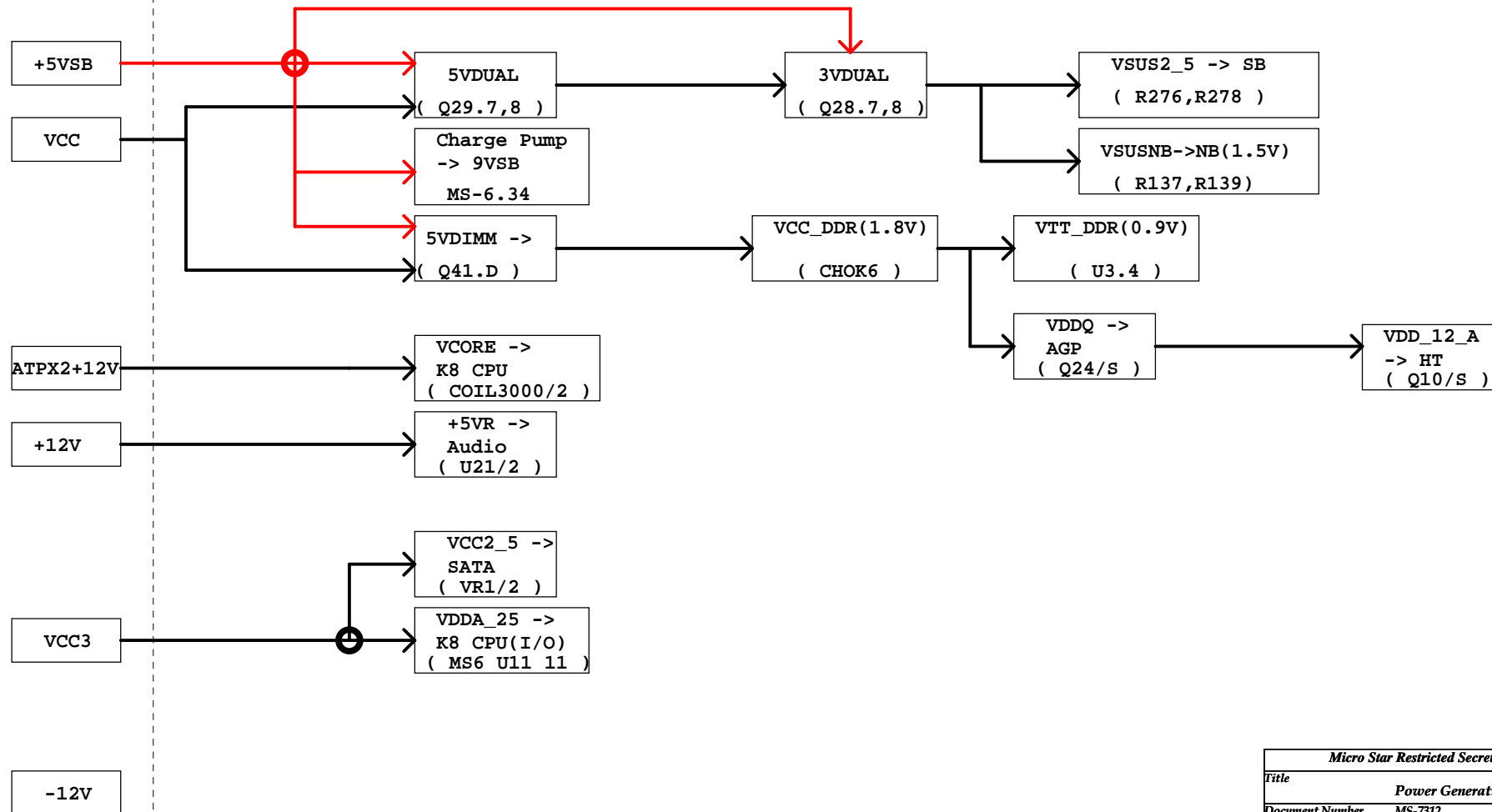
SB VSUS-Power ->
"VSUS2_5&VSUSNB" (0.0675A)

5VDUL

3VDUL

9VSB

ATX Power Supply



Micro Star Restricted Secret

Title		Rev
Power Generation		60
Document Number	MS-7312	
MICRO-STAR INT'L CO., LTD. No. 68, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Tuesday, July 10, 2007
Sheet	30	of 33

Ver. 0A Copy from 7142

CHANGE TO AM2 CPU

Ver. 10

- 1.CHANGE JUSB1.2 PART NUMBER.AND FOOTPRINT
- 2.CHANGE IDE1 PART NUMBER.
- 3.CHANGE JCOM1 FOOTPRINT JFP1
- 4.CHANGE ATXPOWER TO 24 PIN
- 5.CHANGE JAUDIO1 FOOTPRINT JAUD1 FOR 防呆
- 6.DEL R161 FOR CLK GEN. RESET TO 3.3V LEVEL
- 7.CHANGE R176 TO 0 FOR REALTEK CLK GEN. PIN32 IS THE POWER PIN NOT PD#,BUT ICS CLK GEN. IS THE PD#
- 8.ADD Q35,R350~R353,C476 FOR DDR2 POWER MEET 1.8V
AND CHAGNE C299 0.22U TO 0.1U FOR DDR2 POWER POWERUP FAST
- 9.DEL R27, AND U3 7407 CAN'T BE USE .BECAUSE NB LDTRST ONLY 1.5V CAN'T DRIVER 7407,7407 Vih 1.65 V
AND ADD Q36, R27,R359 FOR LEVEL SHIFT
- 10.CHANGE RN3 FROM 4.7K TO 1K FOR WINBOND STRAP
- 11.ADD C477 0.1UF FOR PME# WHEN YOU PLUG THE CARD INTO THE PCI SLOT ,CAN'T AUTO POWER ON.
- 12.ADD R354,R355 FOR VCC5 MONITOR
- 13.R42 CHANGE FORM 232K TO 22K0402 ,AND MONITOR FORM -12V TO 5VSB FOR VOLATGE MONITOR
- 14.CHANGE 3VELEDC# TO PULL HIGH. R190 STUFF ,R194 EMPTY FOR MEET AM2 POWER SEQUENCE
- 15.ADD D18 FOR WINDOWS SHOUT DOWN HAVE A 'BO' POP NOISE
- 16.CHANGE Q20 DRAIN PIN FROM VCC3 TO VCC_DDR FOR Q20 THERMAL
- 17.R3->NC.R16->1K.R44,45,48->12K.R33->1.8K,Q5,10,13->NC FOR 89W
- 18.CHANGE FDD FOOTPRINT FDD_CONN_NP456
- 19.DEL COPPER 11,18,19 ,21,AND C345 EMPTY FOR AUDIO NOISE
- 20.DEL R289,R291,R292
- 21.CHANGE LAN LED GREE LED TO SPEED,ORANGE TO LINK.
- 22.ADD RT4 R289 FOR WINBOND CPU THERMAL UNSTABLE.
- 23.CHANGE CPUTHERMAL TO THERMAL DIODE.

Ver. 60

- 1.因客戶要求.修改文字面

Micro Star Restricted Secret		
Title	History	Rev
Document Number	MS-7312	60
MICRO-STAR INT'L CO.,LTD. No. 68, Li-De St, Jung-Hsi City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Tuesday, July 10, 2007	
Sheet		31 of 33

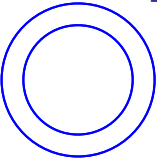
NB FAN/HEAT-SINK

PCB1



7312-0A
PF0-0731260-E48

VBAT1_M



BAT-BCR2032P
D06-0100101-P01

U7-F



X_NB-HEATSINK-W/Fan
-

U7-H



NB-HEATSINK-W/O Fan
E31-0401520-E25

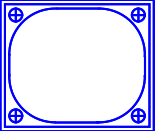
U18_M



LPC Flash ROM-4M

BIOS FLASH ROM

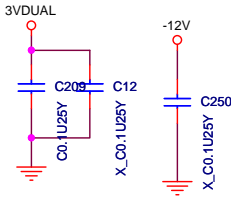
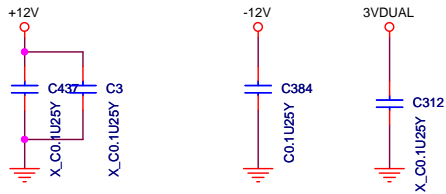
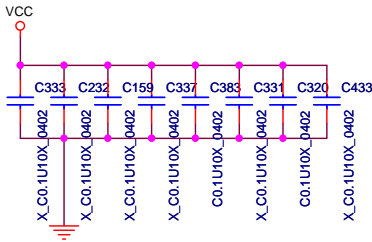
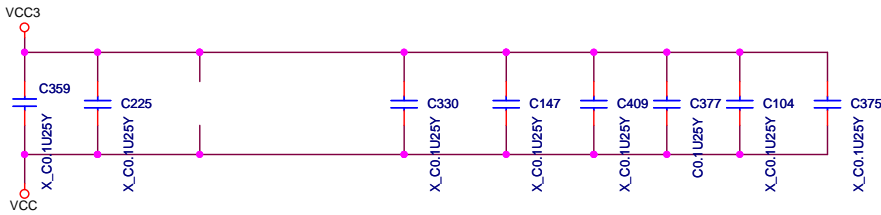
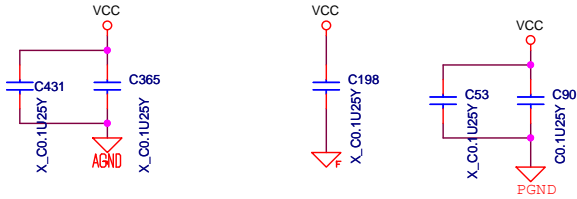
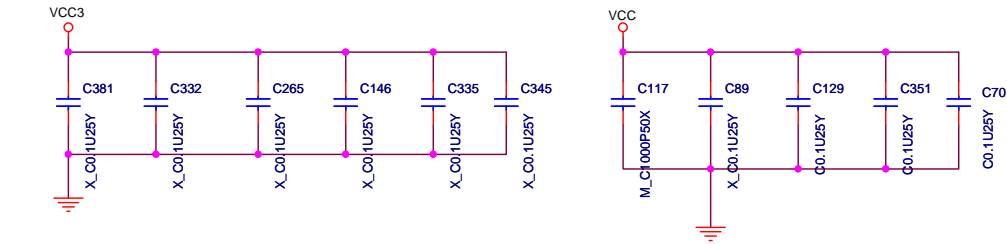
CPU3000_M



E91-0000076

Micro Star Restricted Secret		
Title	OPTION PART	Rev 60
Document Number	MS-7312	
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Tuesday, July 10, 2007
		Sheet 32 of 33

For EMI



Micro Star Restricted Secret		
Title	For EMI	Rev 60
Document Number	MS-7312	
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Tuesday, July 10, 2007
Sheet	33	of 33