CONTENT	SHEET
Cover Sheet, Block diagram	1-2
Intel LGA775 CPU - Signals/ Power/ GND	3-5
Intel Eaglelake - FSB, PCIE, DMI	6
Intel Eaglelake - VGA, MSIC	7
Intel Eaglelake - Memory DDR2	8
Intel Eaglelake - Power / GND	9-10
ICH10DO - PCI, USB, DMI, PCIE	11
ICH10DO - Host, DMI, SATA, Audio, SPI, RTC, MSIC	12
ICH10DO - Power, GND	13
DDR2 Chanel-A / Chanel-B	14-15
Clock Gen - ICS9LPRS113	16
Super I/O Fintek F71882	17
VGA	18
SATA / e-SATA / FAN Control	19
LAN Intel82567 (OPT1-vPro)	20
JMB-368 IDEX1 (PCIE)	21
JMB-381 1394 (PCIE)	22
Audio Codec ALC888	23
PCIE x16, x1	24
DVI transfer & switch	25
DISPLAY PORT	26
PCI Slot 1 & 2	27-28
Rear/Fount USB Connector	29
System Power/ACPI Controller UPI	30
DDR2 / NB-Core Switching Power	31
VRD11 - ISL6334 4Phase	32
ATX Power-Con. / F_Panel	33
Manual & Option Parts	34
Revision History	35

MS-7562 UATX Version: 1.1

CPU: Intel Pentium 4, Pentium D, Core2 Duo, Wolfdale, Yorkfield processors in LGA775 Package.

System Chipset:

Intel Eaglelake - Q45 (North Bridge)
Intel ICH10DO (South Bridge)

On Board Device:

CLOCK Gen -- ICS9LPRS113A
LPC Super I/O -- Fintek F71882F
LAN -- LAN Intel 82567
JMB368 IDEX1
JMB381-1394
HD Audio Codec -- ALC888
PCIE to DVI Interface
PCIE to Display port Interface

Main Memory:

Dual-channel DDR-II * 4

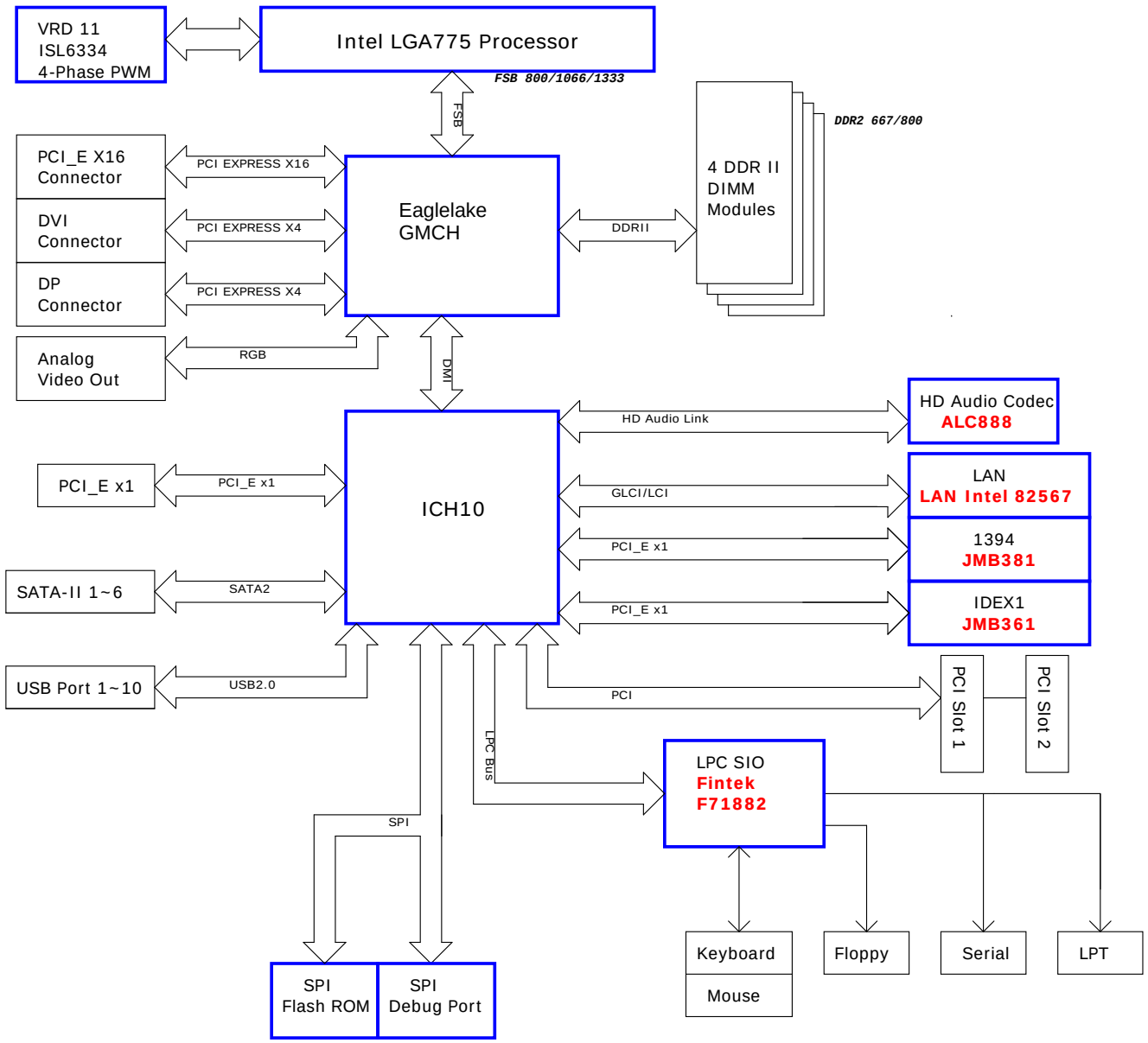
Expansion Slots:

PCI EXPRESS X16 SLOT *1
PCI EXPRESS X4 share to DVI
PCI EXPRESS X4 share to Display port
PCI EXPRESS X1 SLOT * 1
PCI SLOT * 2

PWM: ISL6334 4Phase

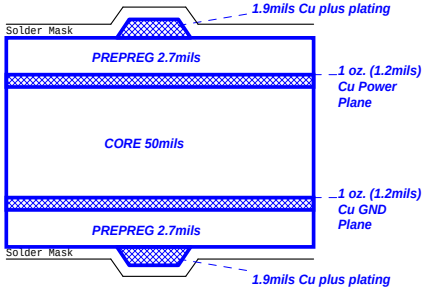
MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7562	
Size: Custom	Document Description: COVER SHEET	Rev: 1.1
Date: Wednesday, December 03, 2008	Sheet 1 of 39	

Block Diagram



Board Stack-up

(1080 Prepreg Considerations)



Single End 50ohm Top/Bottom : 4mils
USB2.0 - 90ohm : 15/4.5/7.5/4.5/15
SATA - 95ohm : 15/4/8/4/15
LAN - 100ohm : 15/4/8/4/15
PCIE - 95ohm : 15/4/8/4/15

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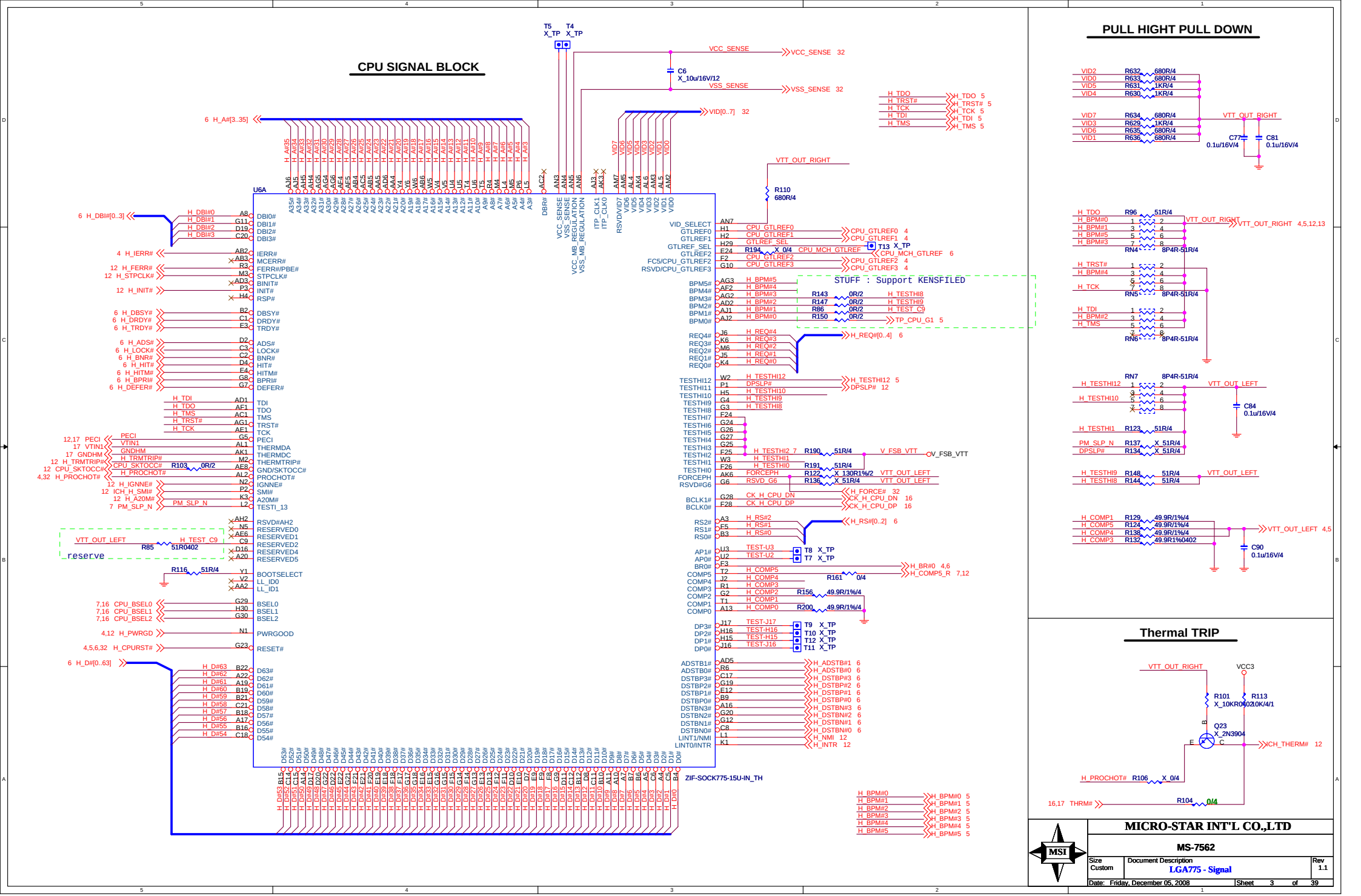
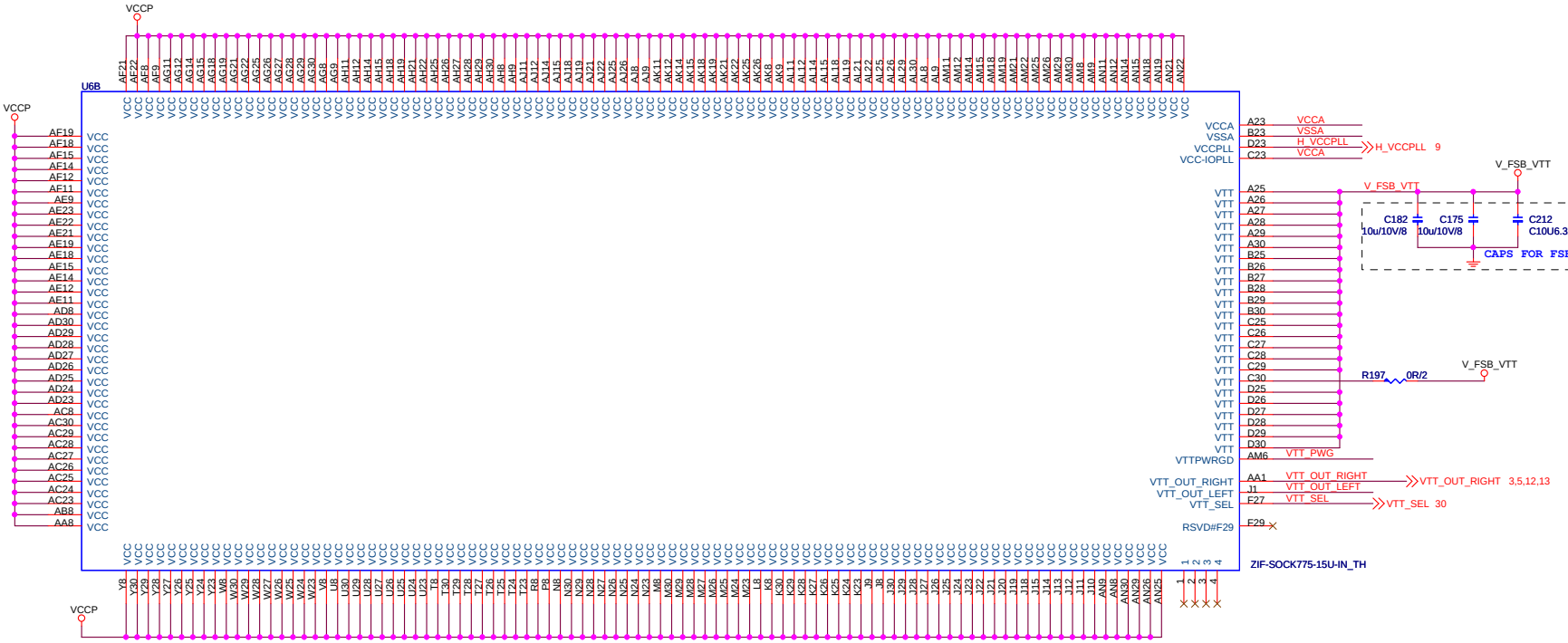
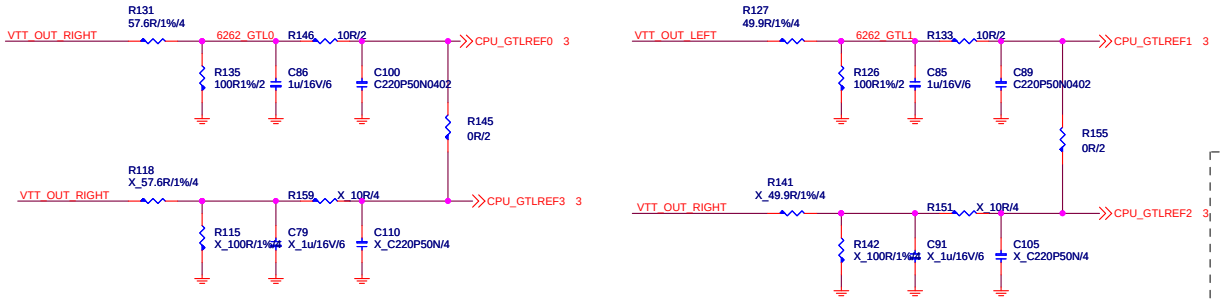
MS-7562		
Size: Custom	Document Description: BLOCK DIAGRAM	Rev: 1.1
Date: Wednesday, December 03, 2008	Sheet 2 of 39	



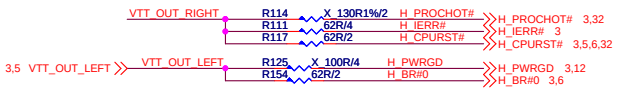


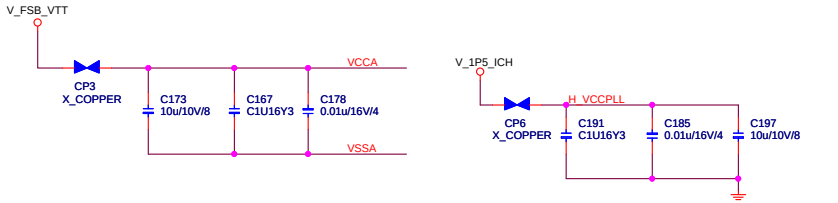
*GTLREF VOLTAGE SHOULD BE
0.635 * VTT = 0.76V (At VTT=1.2V)
0.635 * VTT = 0.7V (At VTT=1.1V)

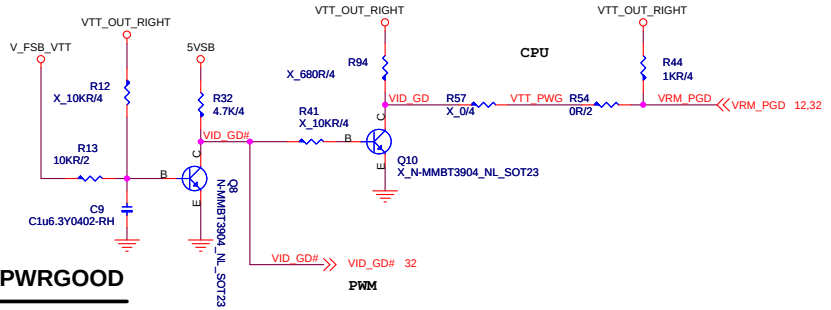
DEMO BOARD CHANGE
(GTLREF0+3/GTLREF1+2)



PLACE AT CPU END OF ROUTE



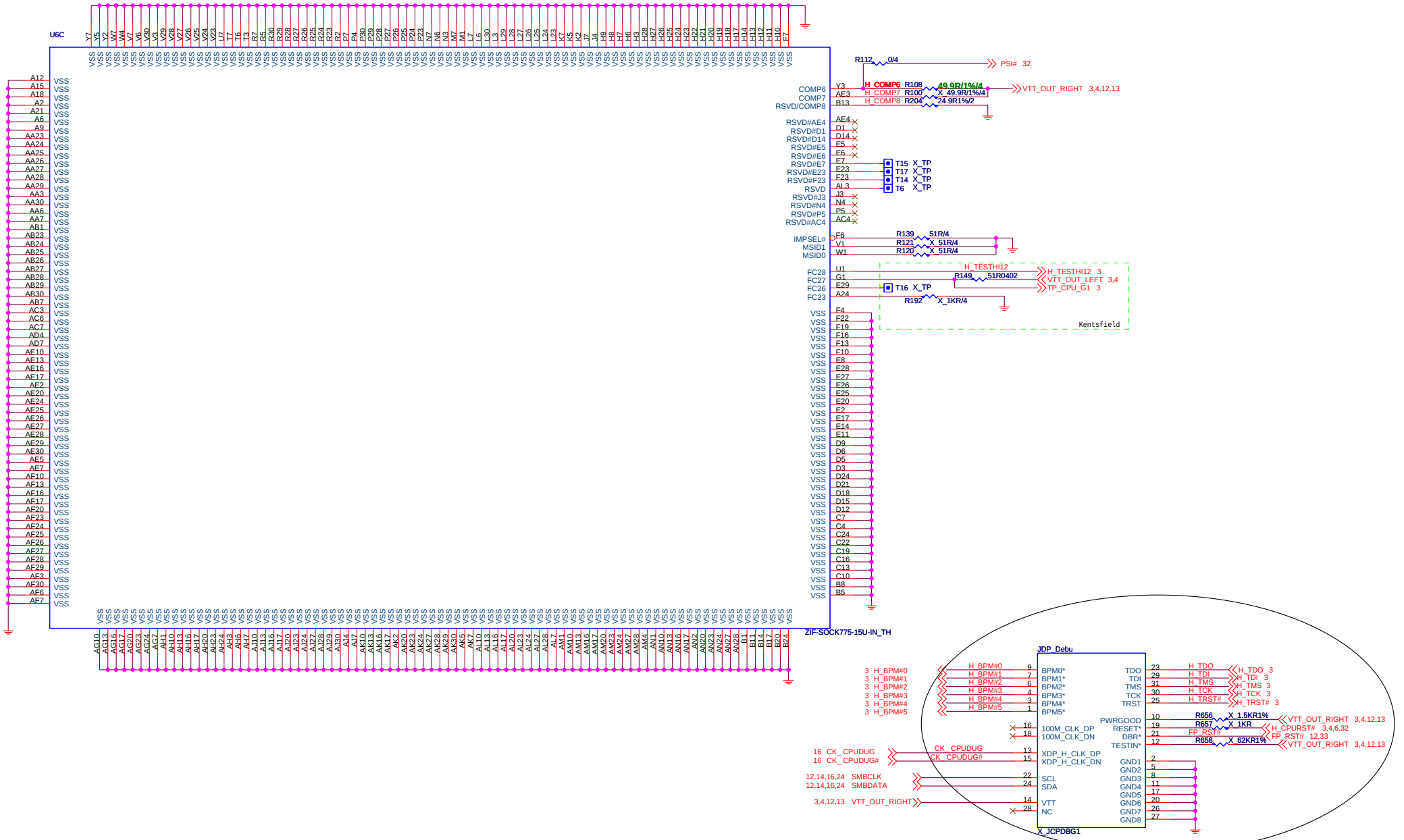




VTT_PWRGOOD

VTT_PG SPEC :
High > 0.9V
Low < 0.3V
Trise < 150ns

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7562	
Size: Custom	Document Description: LGA775 - Power	Rev: 1.1
Date: Wednesday, December 03, 2008	Sheet 4 of 39	



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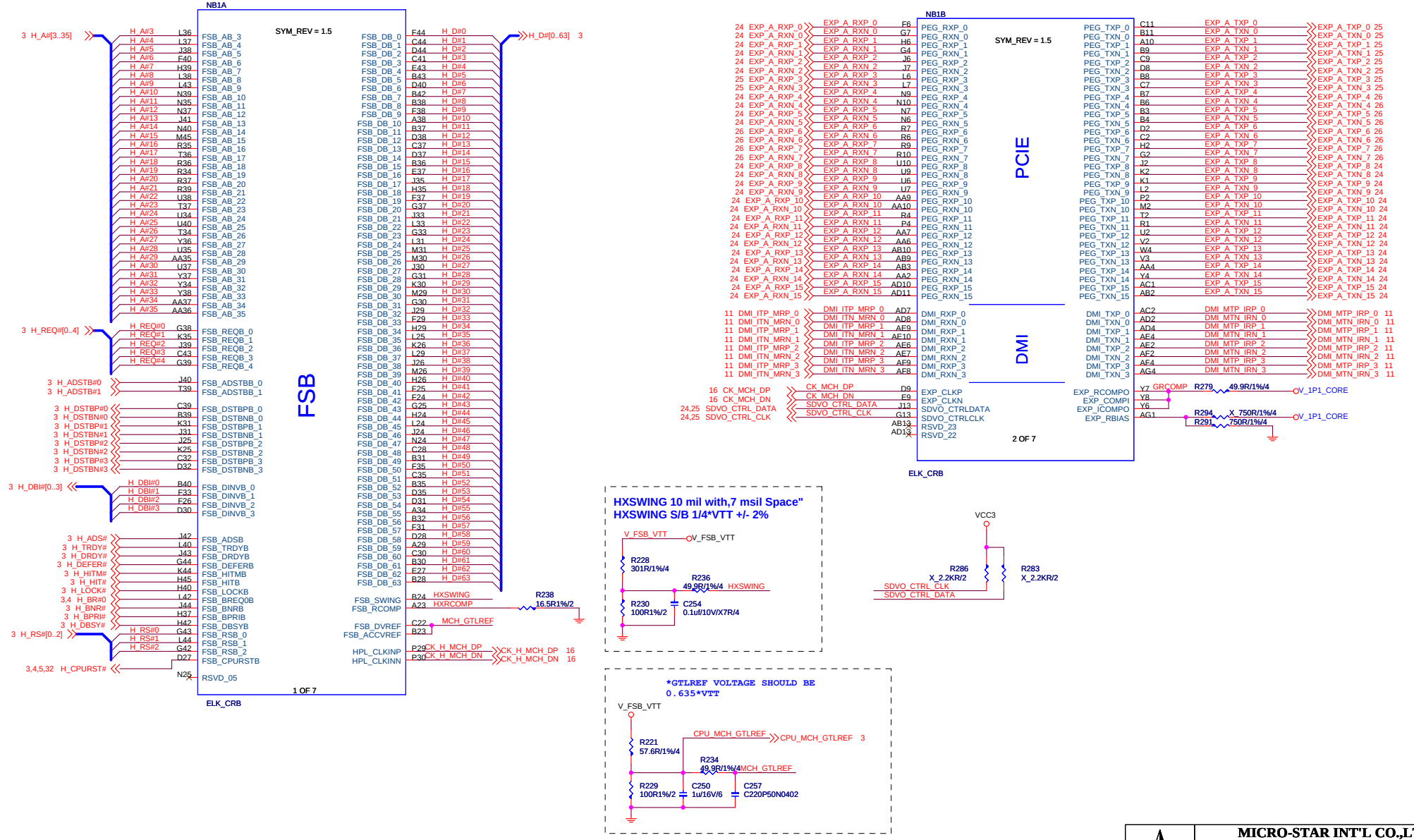
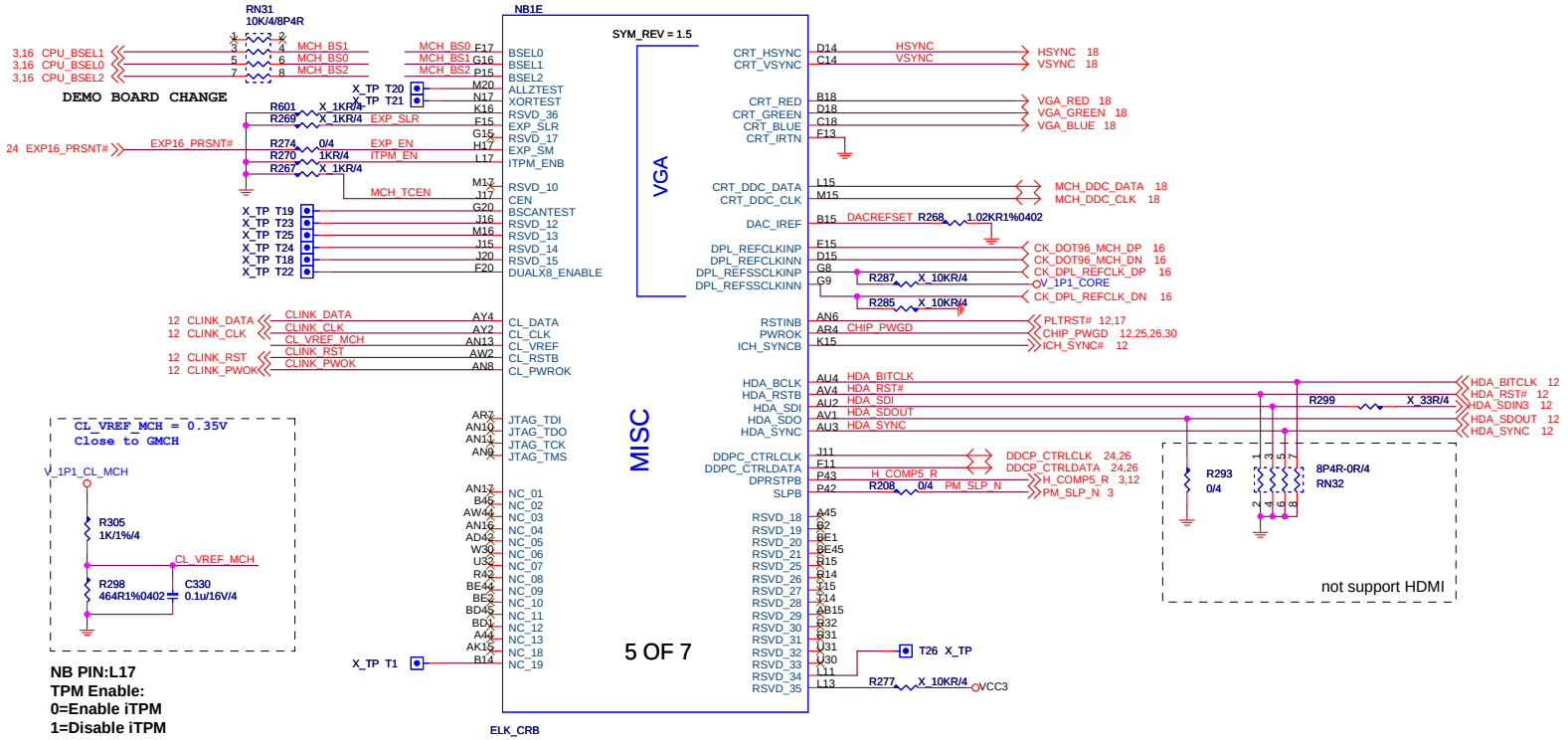
MS-7562		
Size: Custom	Document Description: LGA775 - GND	Rev: 1.1
Date: Wednesday, December 03, 2008	Sheet 5 of 39	





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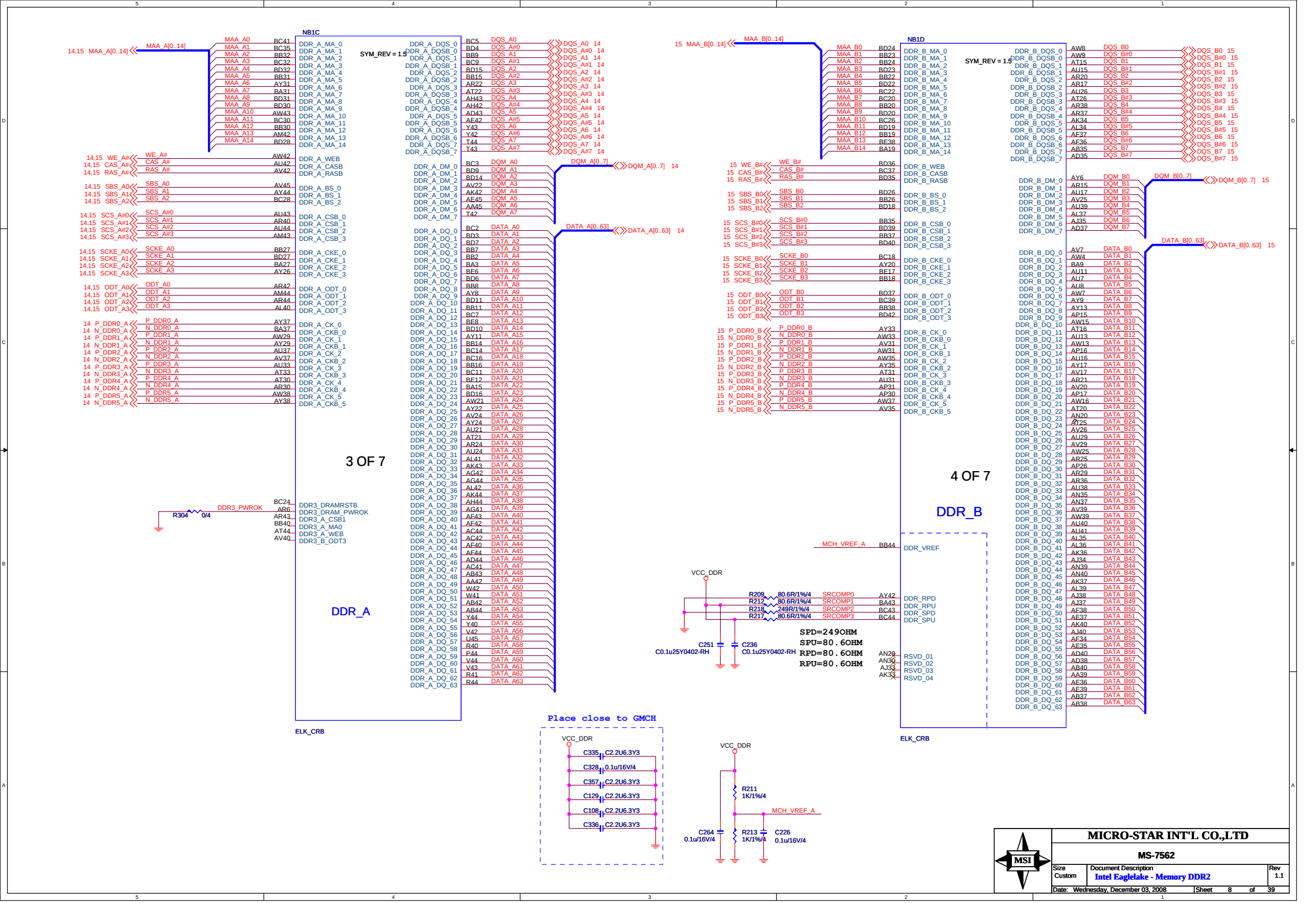
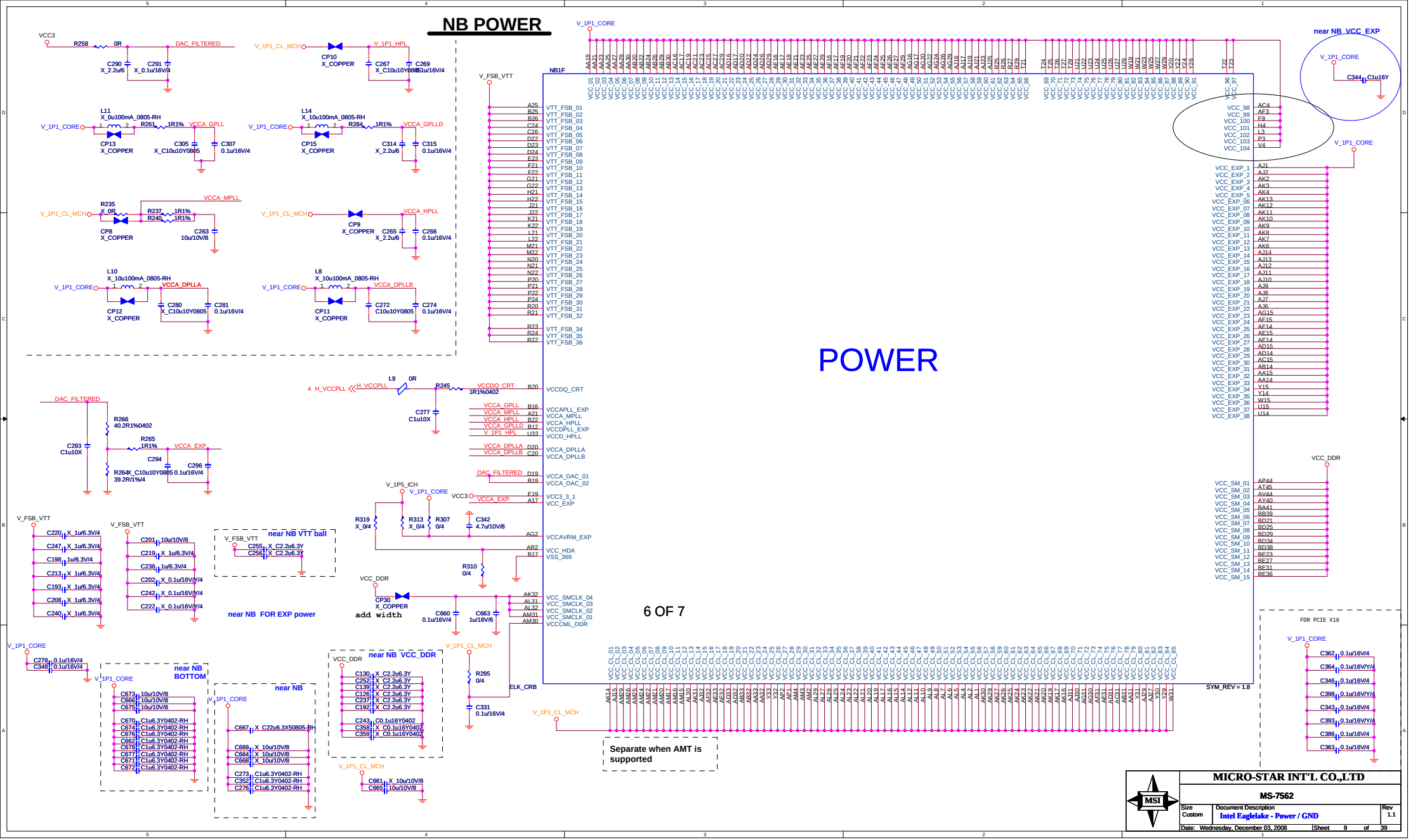
Size: Custom	Document Description: Intel Eaglelake - FSB, PCIE, DMI, VGA, MSIC	Rev: 1.1
Date: Wednesday, December 03, 2008	Sheet 7 of 39	



NB POWER



MICRO-STAR INT'L CO.,LTD	
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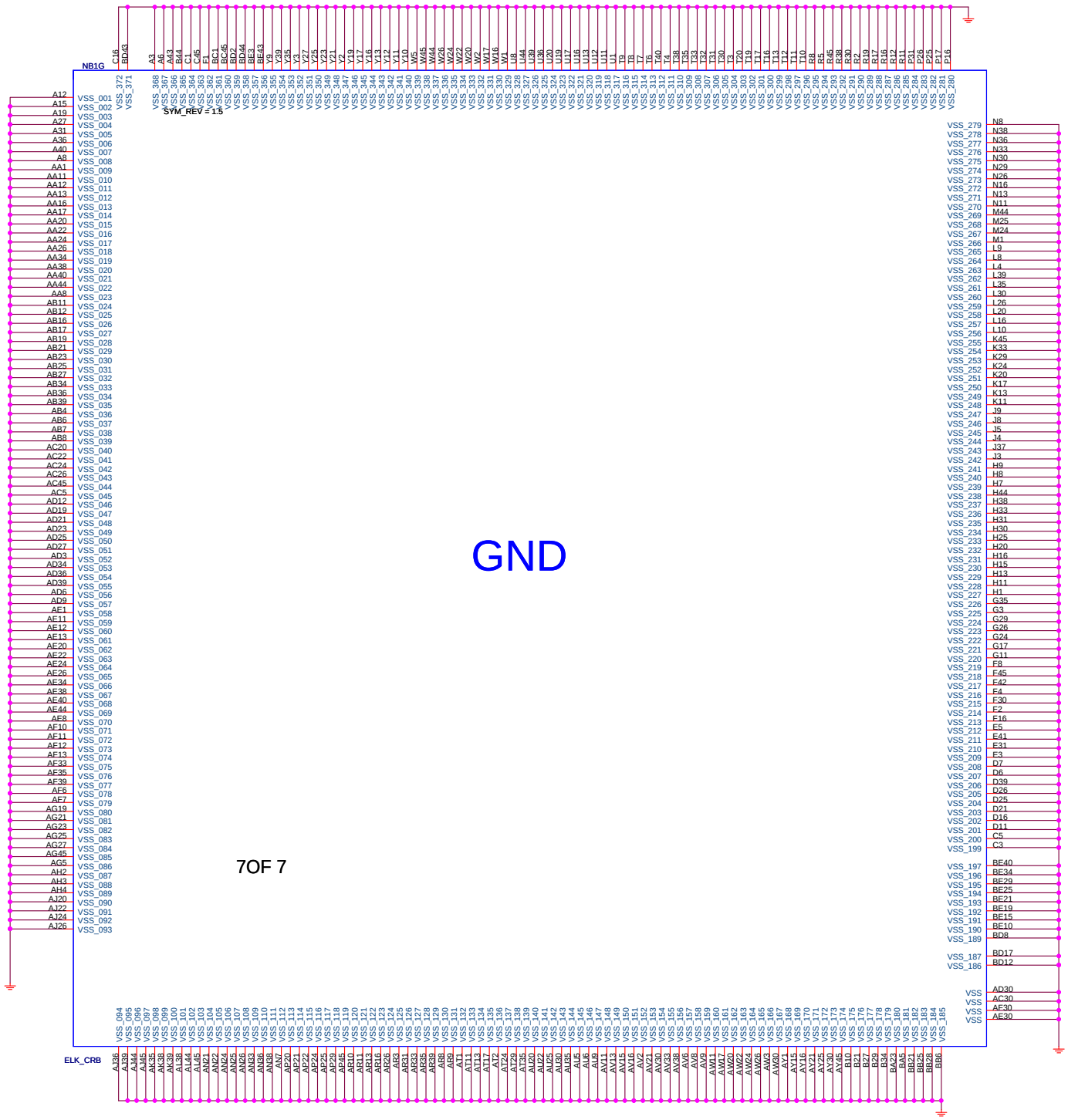
Size: Custom	Document Description: Intel Eaglelake - Power / GND
Rev: 1.1	
Date: Wednesday, December 03, 2008	Sheet 9 of 39



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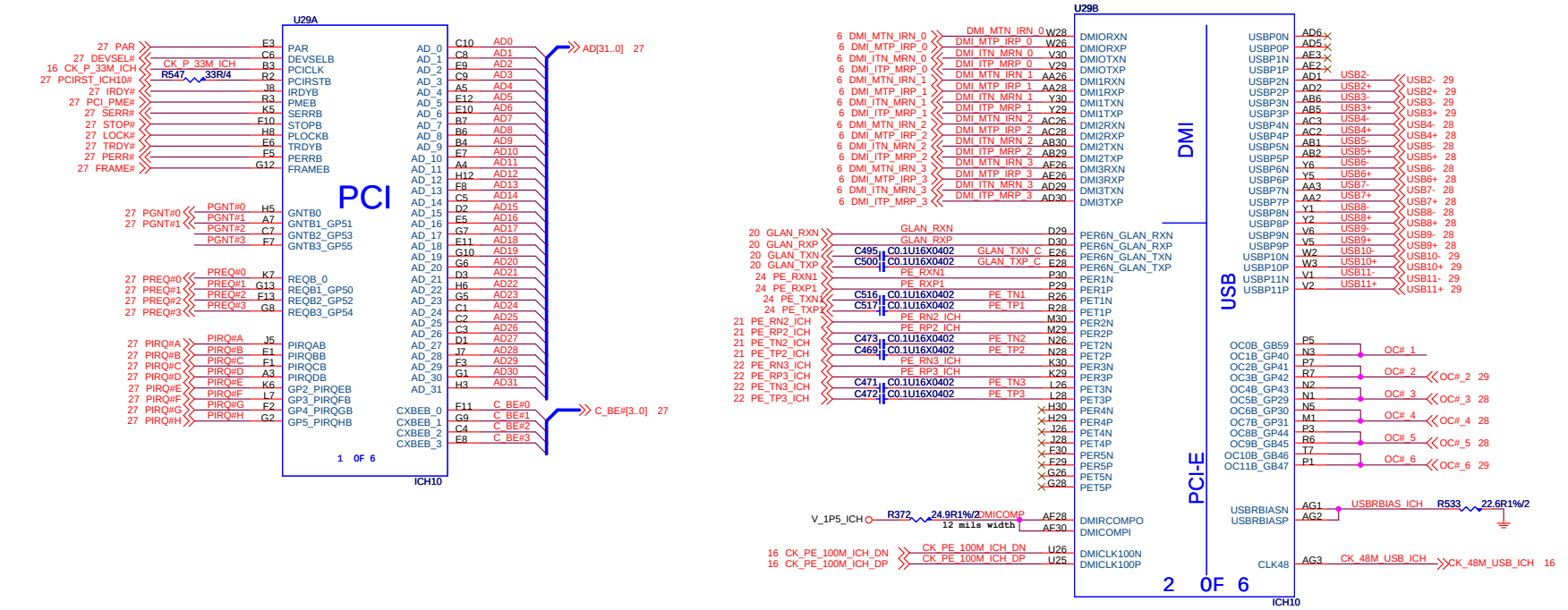
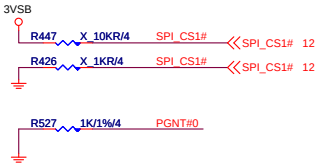
Size: Custom	Document Description: COVER SHEET
Rev: 1.1	
Date: Wednesday, December 03, 2008	Sheet 10 of 39



SB STRAPPING RESISTOR



PGNT#[3:0]Internal Pull-up

SIGNAL	H	L	DES.
GNT3	DIS	EN	A16 OVERIDE
GNT2	N/A	SET BIT	PCIE PORT CONFIG 2 BIT 0 (5-6)

BOOT SELECT STRAPS		
BOOT DEVICE	GNT#0	SPI_CS1#
FWH	1	1
SPI	0	X
PCI	1	0

HDA_SDOUT/HDA_SYNC strap PCI_E port configuration bit[1:0].Internal weak pull down.
00:1X/1X/1X/1X 11:0X/0X/4X

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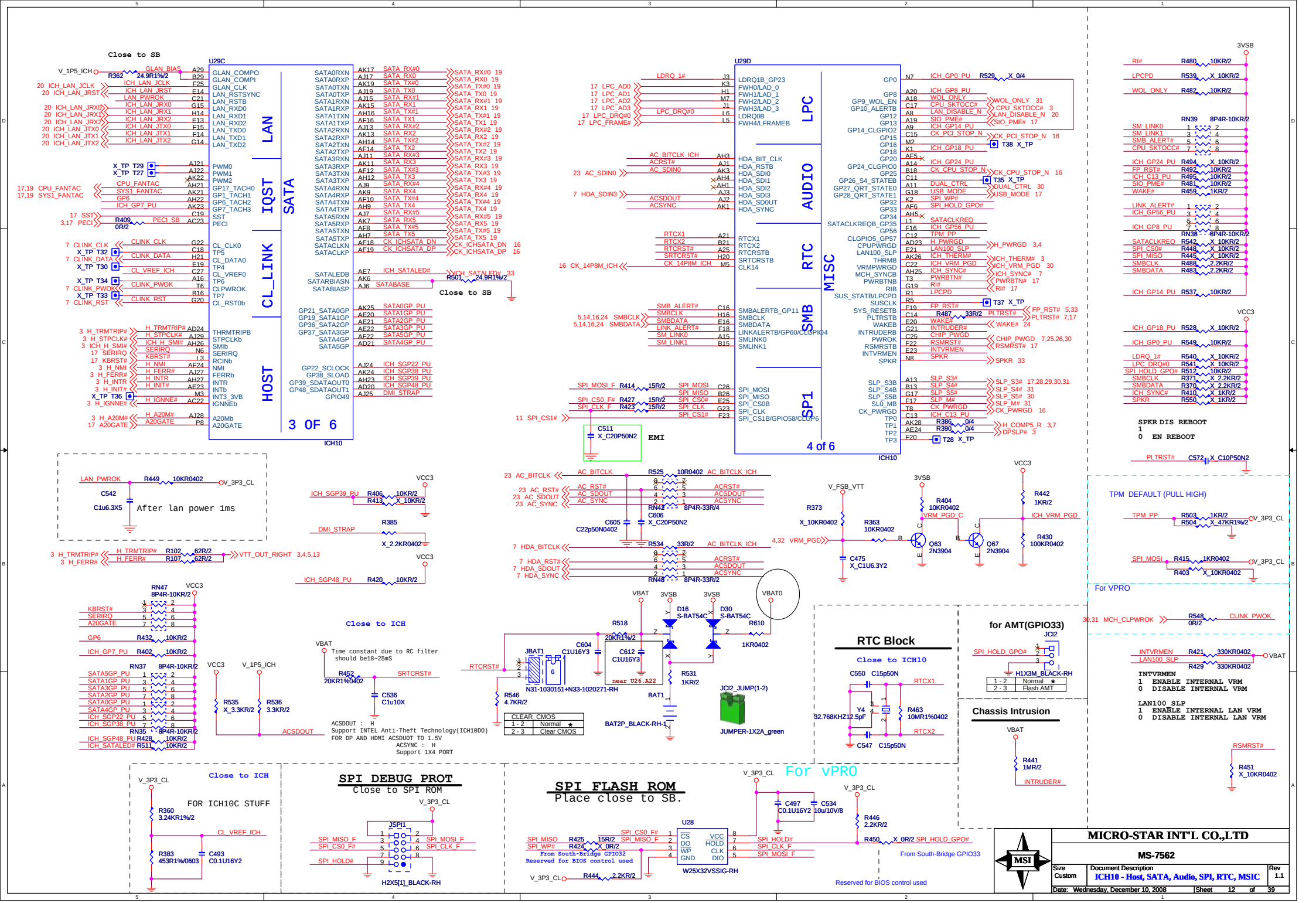
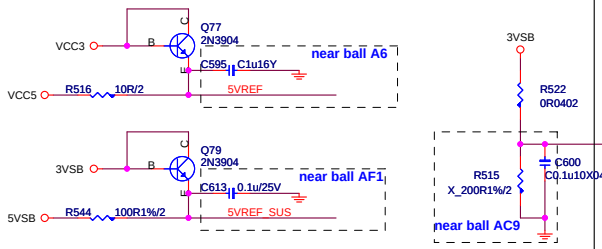
Size: Custom	Document Description: ICH10 - PCI, DMI, USB, PCIE & Slots
Rev: 1.1	
Date: Wednesday, December 03, 2008	Sheet 11 of 39


Close to SB
U29C
LAN
IQST
CL_LINK
SATA
HOST
3 0F 6
ICH10
U29D
LPC
AUDIO
RTC
MISC
SMB
SPI
4 of 6
ICH10
EMI
After lan power 1ms
Close to ICH
Close to SB
RTC Block
Close to ICH10
for AMT(GPIO33)
Chassis Intrusion
SPI DEBUG PROT
Close to SPI ROM
SPI FLASH ROM
Place close to SB.
For vPRO
FOR ICH10C STUFF
TPM DEFAULT (PULL HIGH)
For VPRO
SPKR DIS REBOOT
1 EN REBOOT
0
INTVRMEN
1 ENABLE INTERNAL VRM
0 DISABLE INTERNAL VRM
LAN100_SLP
1 ENABLE INTERNAL LAN VRM
0 DISABLE INTERNAL LAN VRM
MICRO-STAR INT'L CO.,LTD
MS-7562
ICH10 - Host, SATA, Audio, SPI, RTC, MSIC
Rev 1.1
Date: Wednesday, December 10, 2008
Sheet 12 of 39
www.xinxunwei.com 400-800-9990

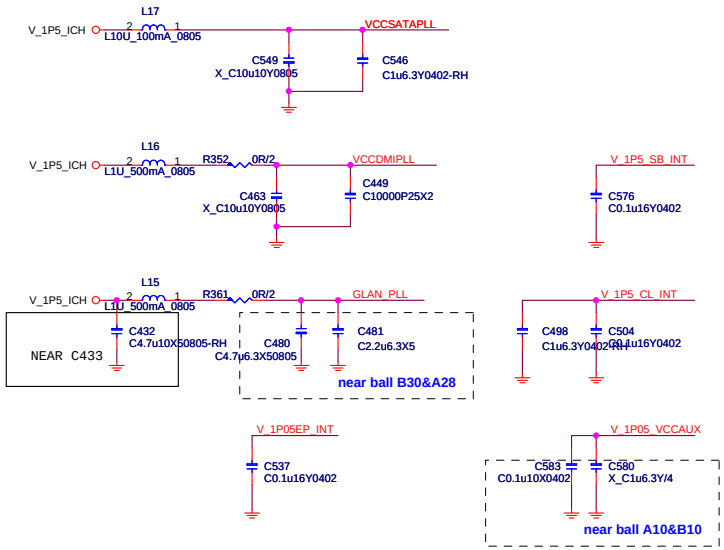
5VREF & 5VREF_SUS Sequencing Circuit

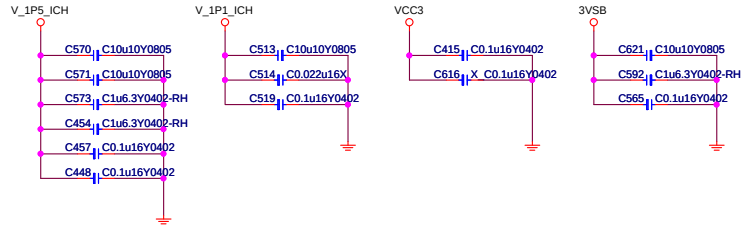
5VREF must be powered up beforeVCC3 or after VCC3 within 0.7V.
Also,V5REF must power down after VCC3 or before VCC3 within 0.7V.
This rule is also applies to V5REF_SUS and 3VSB.
However,the 3VSB is derived from the 5VSB on the power supply
thru a voltage regulator and therefore,they can satisfy the requirement.

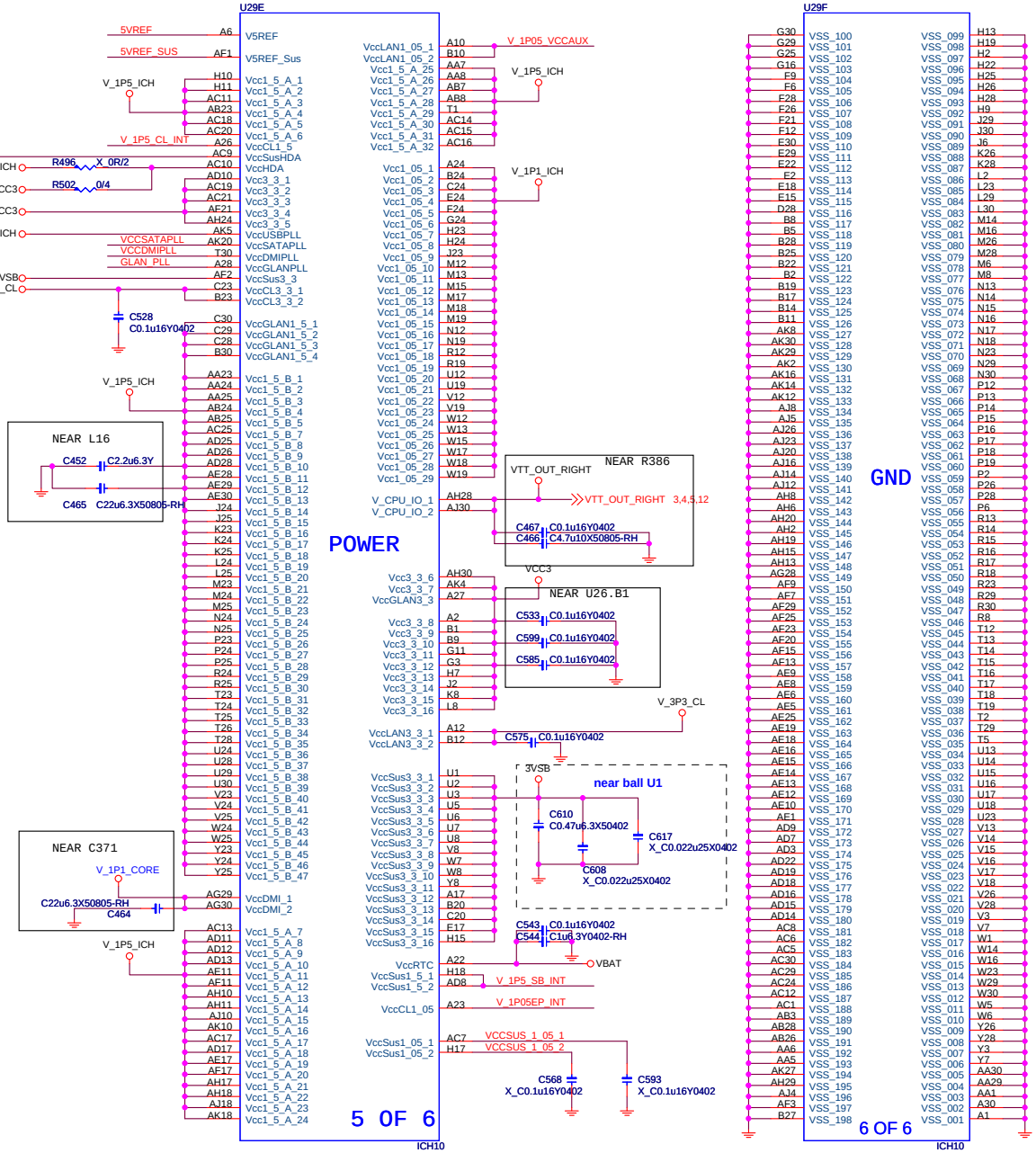


FOR DP AND HDMI VCCHDA,VCCSUSHDA TO 1.5V

SB POWER







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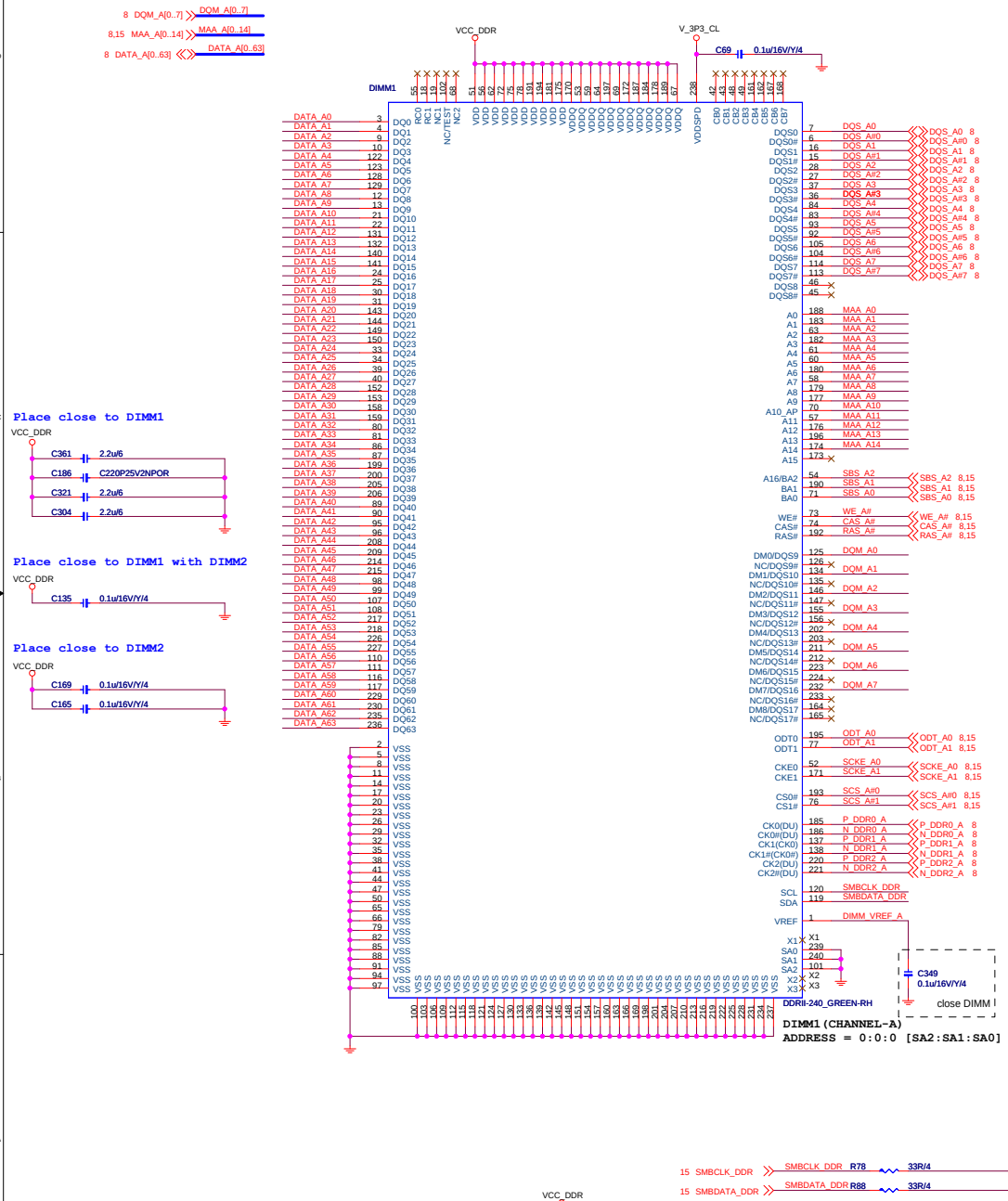
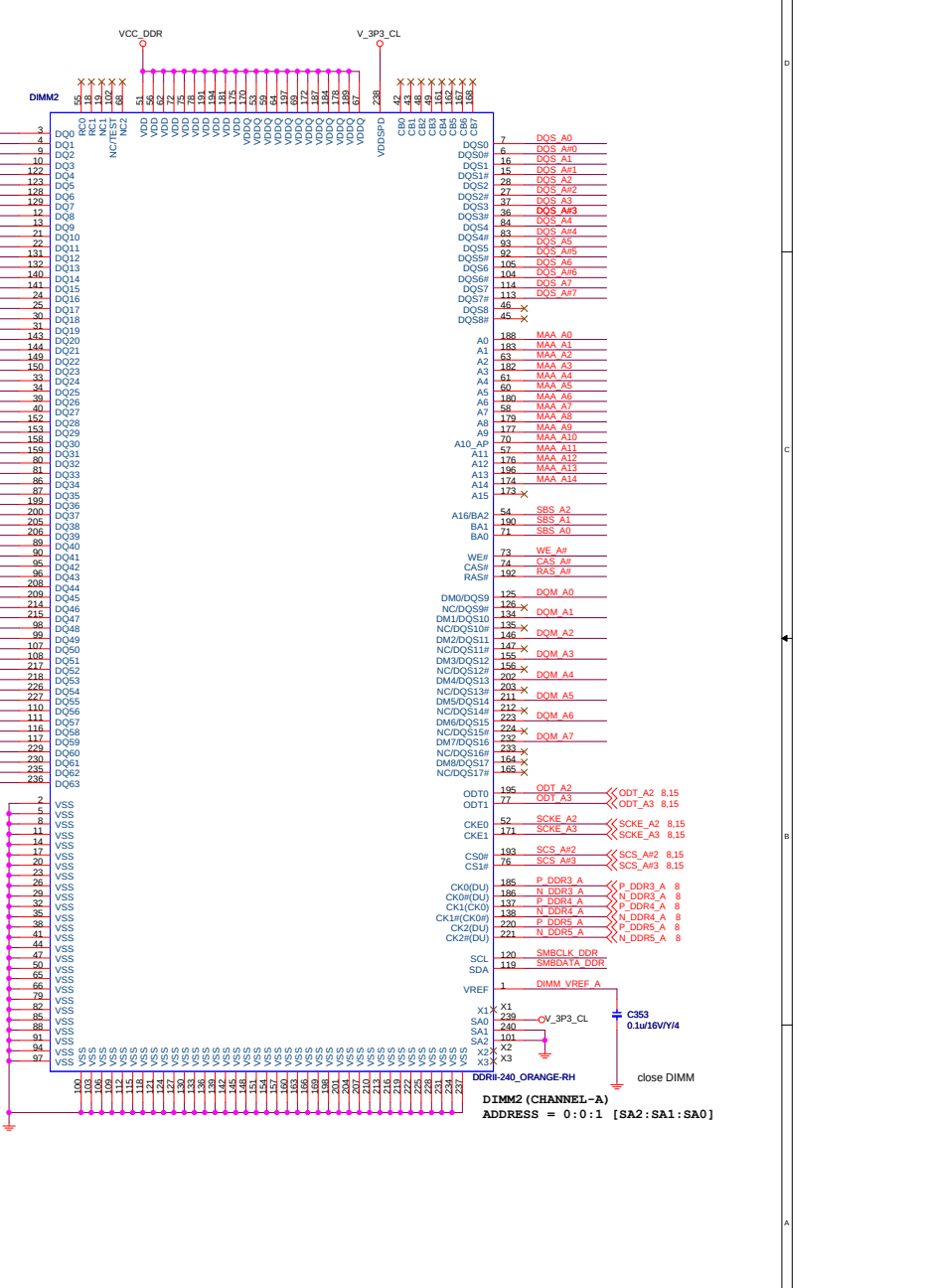
Size: Custom	Document Description: ICH10 - Power, GND
Rev: 1.1	
Date: Wednesday, December 03, 2008	Sheet 13 of 39

DDRII DIMM_A1

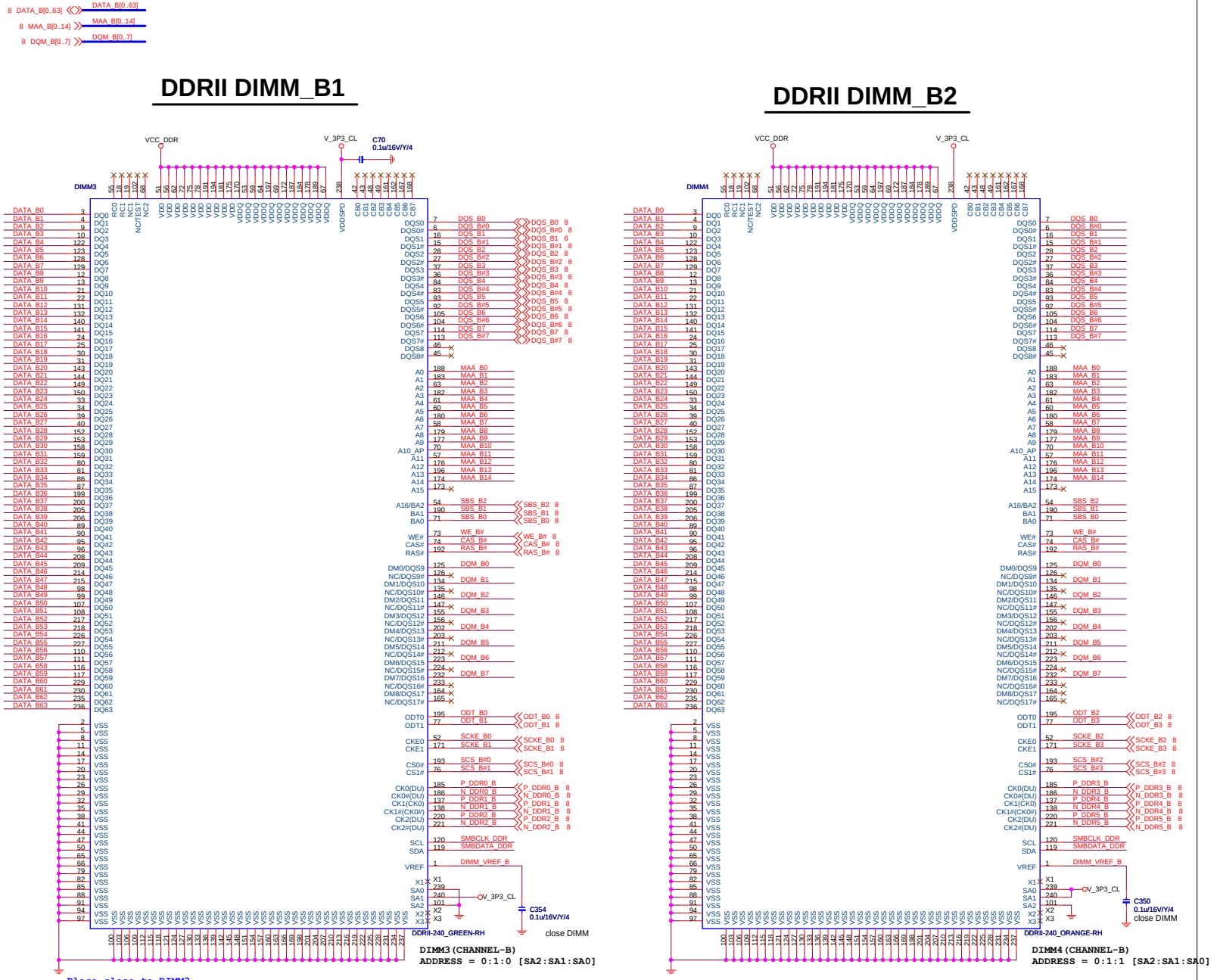


DDRII DIMM_A2



MICRO-STAR INT'L CO.,LTD		
MS-7562		
Size: C	Document Description: DDR3 Chanel-A / Chanel-B	Rev: 1.1
Date: Friday, December 05, 2008	Sheet 14 of 39	

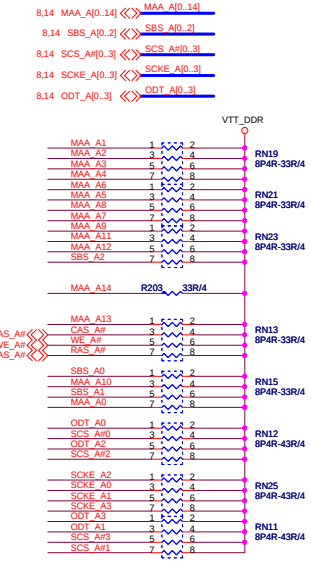
DDRII DIMM_B1

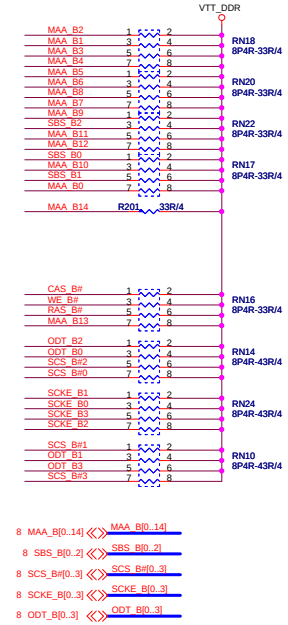


DDRII DIMM_B2

Place close to DIMM3

Place close to DIMM3 with DIMM4





MICRO-STAR INT'L CO.,LTD	
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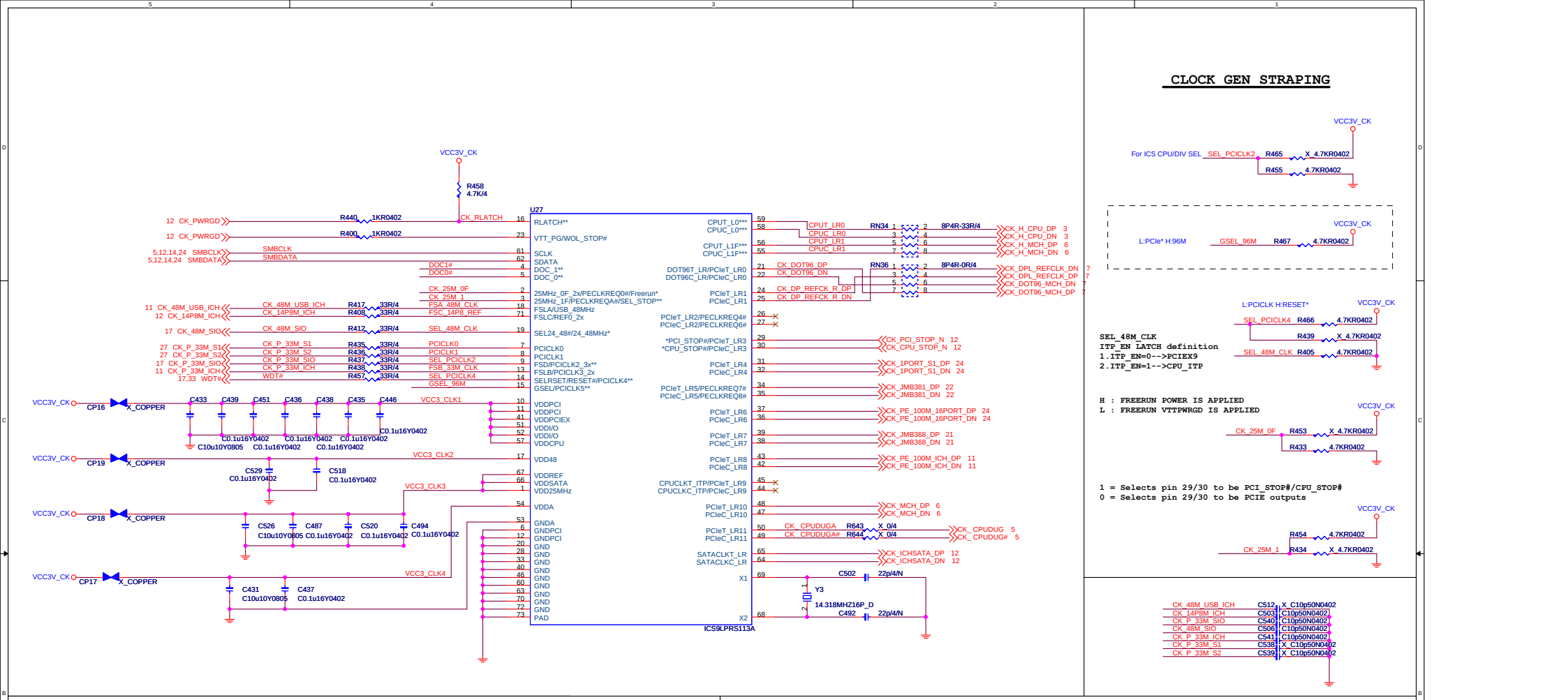
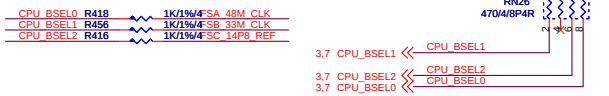
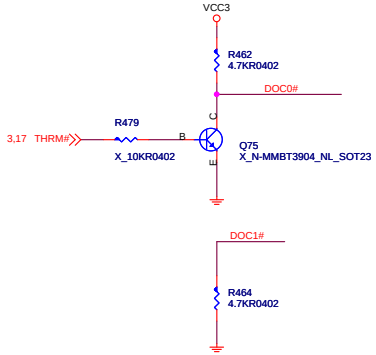
Size: C	Document Description: DDR3 Chanel-A / Chanel-B
Rev: 1.1	
Date: Friday, December 05, 2008	Sheet 15 of 39



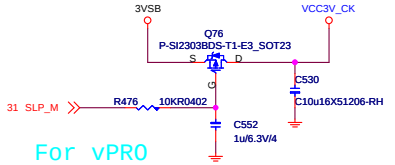
CLOCK GEN STRAPING

BSEL			TABLE
2	1	0	FSB FREQUENCY
0	0	0	266 MHz (1066)
1	0	0	333 MHZ (1333)
0	1	0	200 MHZ (800)
1	1	0	400 MHZ (1600)





AMT POWER



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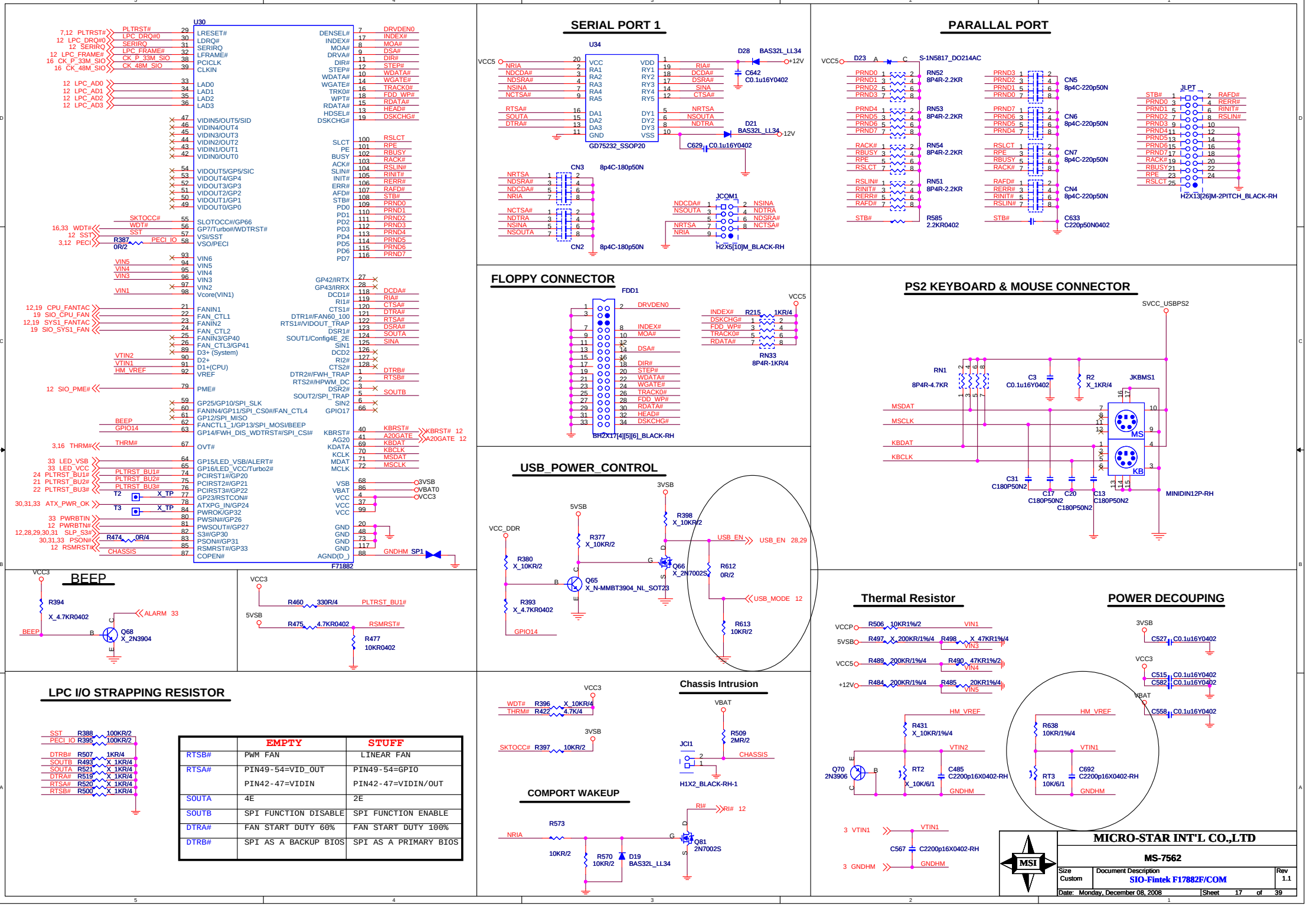
Size	Document Description	Rev
Custom	Clock Gen ICS9LPRS113	1.1

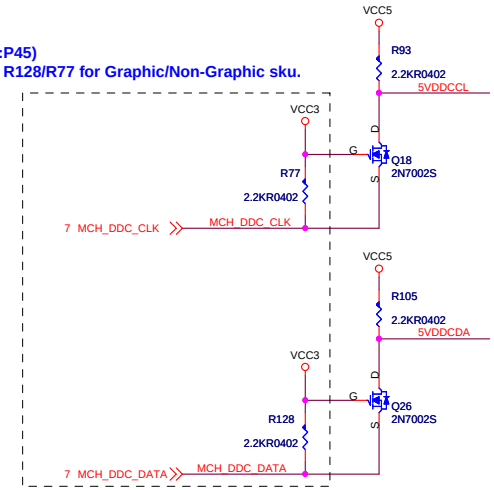
Date: Wednesday, December 03, 2008 Sheet 16 of 39

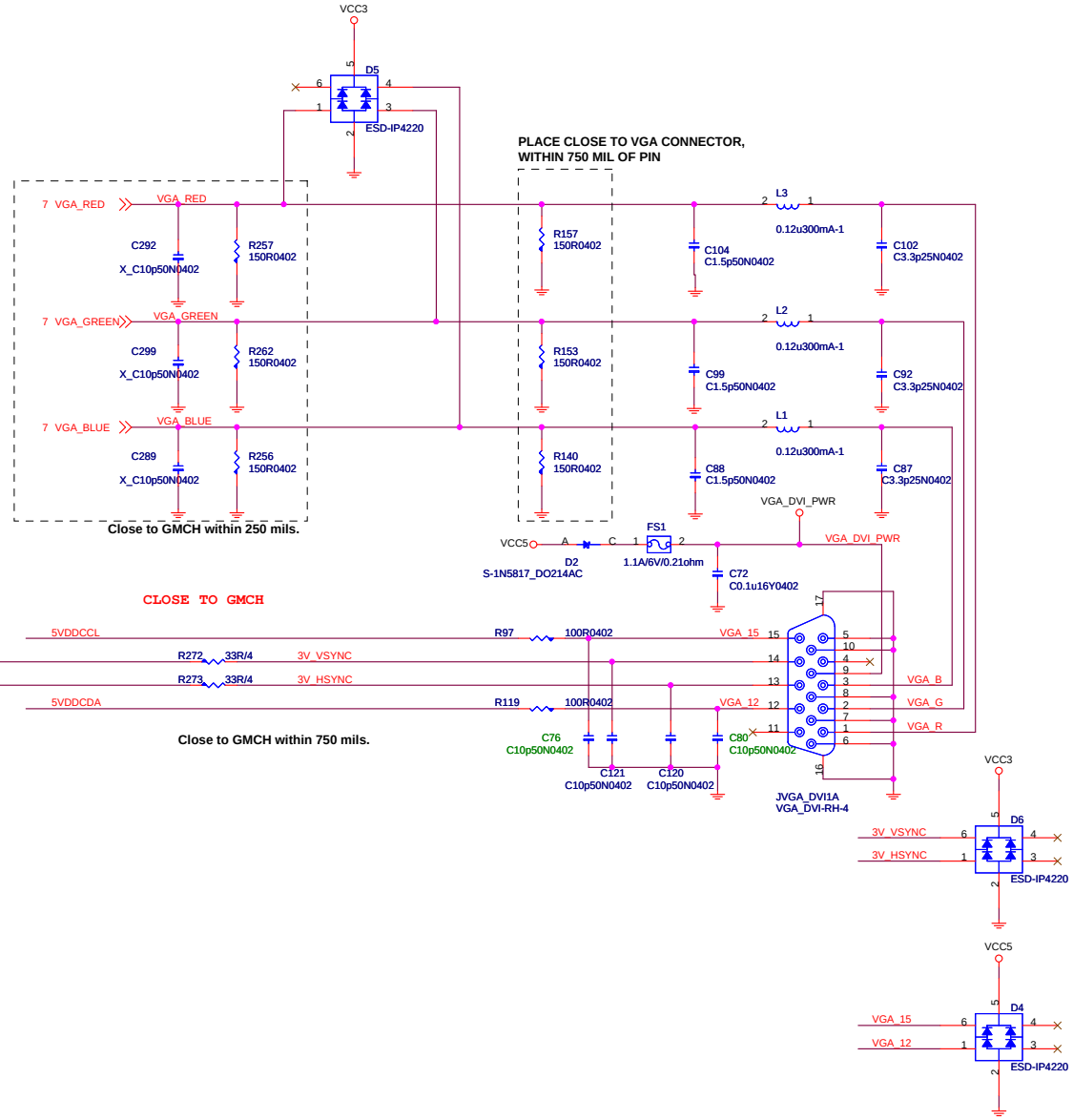


	EMPTY	STUFF
RTSB#	PWM FAN	LINEAR FAN
RTSA#	PIN49-54=VID_OUT PIN42-47=VIDIN	PIN49-54=GPIO PIN42-47=VIDIN/OUT
SOUTA	4E	2E
SOUTB	SPI FUNCTION DISABLE	SPI FUNCTION ENABLE
DTRA#	FAN START DUTY 60%	FAN START DUTY 100%
DTRB#	SPI AS A BACKUP BIOS	SPI AS A PRIMARY BIOS

Video Connector

FOR V10 (NB:P45)
Always Stuff R128/R77 for Graphic/Non-Graphic sku.





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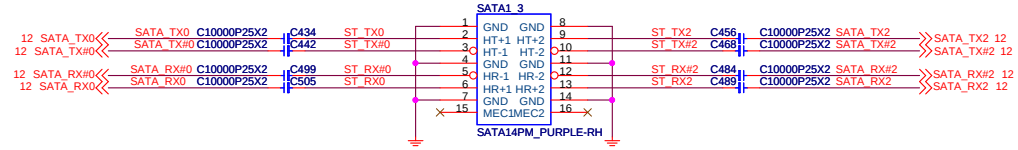
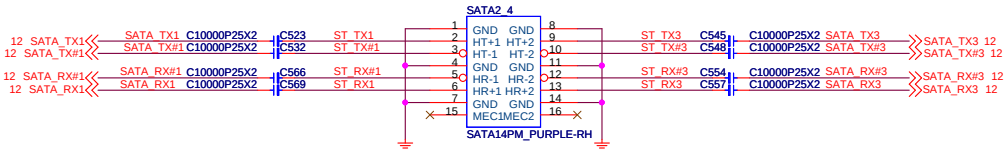
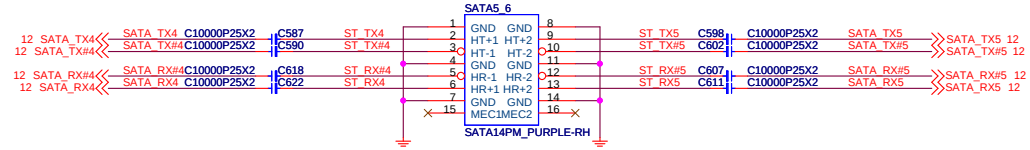
	MS-7562	
Size: Custom	Document Description: VGA	Rev: 1.1
Date: Monday, December 08, 2008	Sheet 18 of 39	

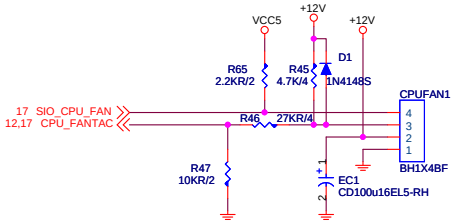
SATA 1- 6 PORT

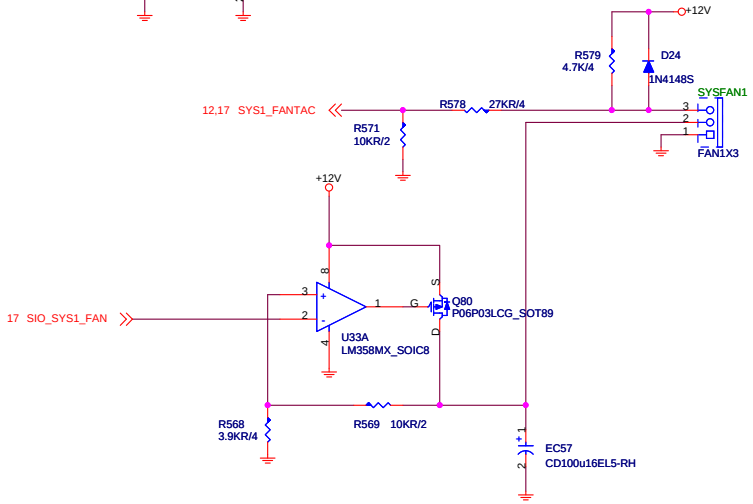






FAN-COUNTROL CIRCUIT





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Size: Custom	Document Description: SATA & e-SATA Ports and Fan Control	Rev: 1.1
Date: Wednesday, December 03, 2008	Sheet 19 of 39	

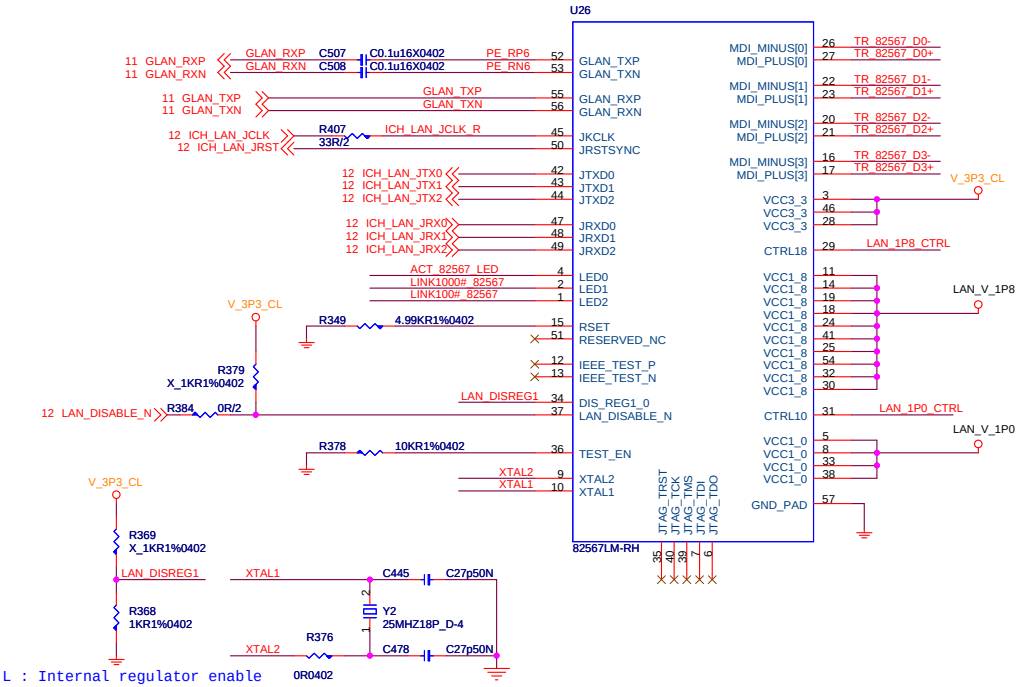
Maximum current of 1.8 V is less then 270mA, Maximum current of 1.0 V is less then 139mA.

For proper and safe operation, the power supplies must follow the following rule:

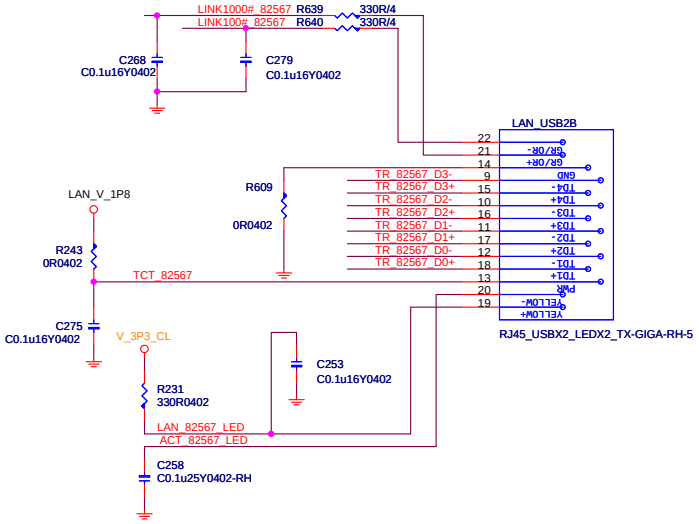
VDDO (3.3V) ≥ AVDD (1.8) ≥ DVDD (1.05V)

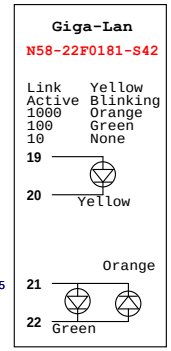
This means that VDDO must start ramping before AVDD and DVDD, but DVDD may reach its nominal operating range before AVDD and VDDO.

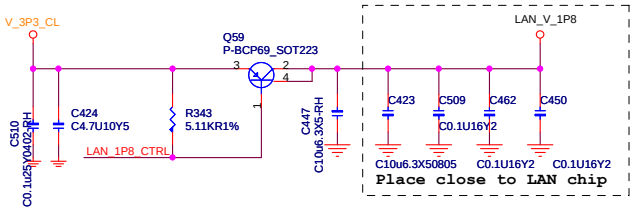
FOR V10 (NB:P45)
LAN_USB1B ==> N53-08M0171-K06

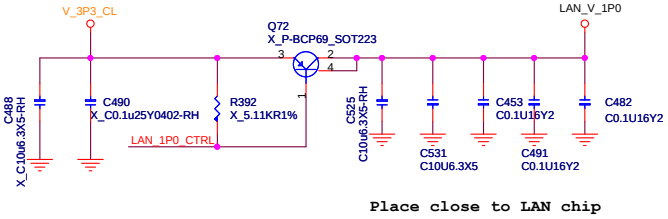


EMI Solution

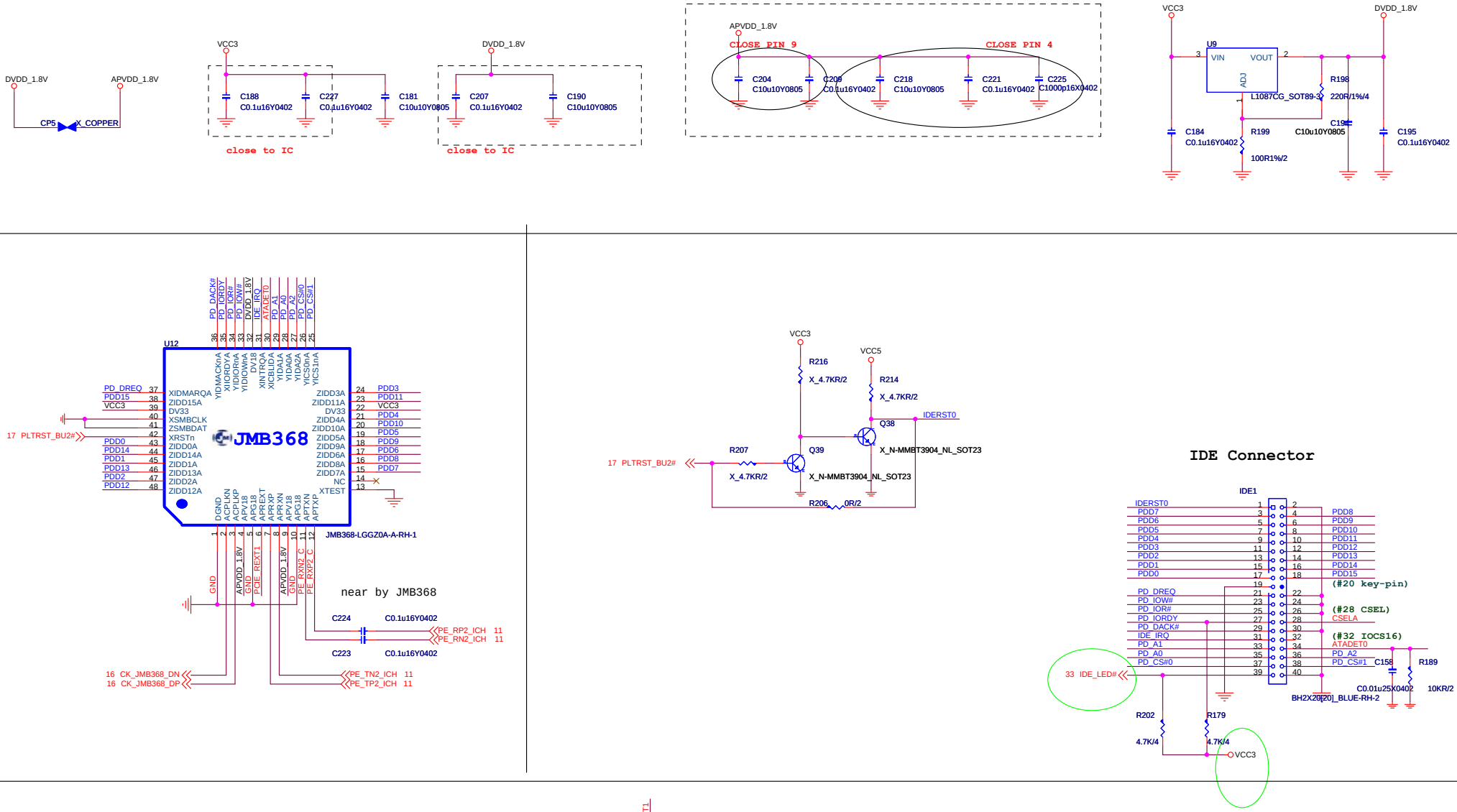








MSI Link to the Future	MICRO-START INT'L CO.,LTD.	
Title: Intel82567		
Size: Custom	Document Number: MS-7562	Rev: 1.1
Date: Wednesday, December 10, 2008	Sheet 20 of 39	



MSI Link to the Future MICRO-START INT'L CO.,LTD.

Title	JMB-363 e-SATA X2/ IDE X1	
Size: Custom	Document Number: MS-7562	Rev: 1.1
Date: Monday, December 08, 2008	Sheet 21 of 39	

1394 CONTROLLER

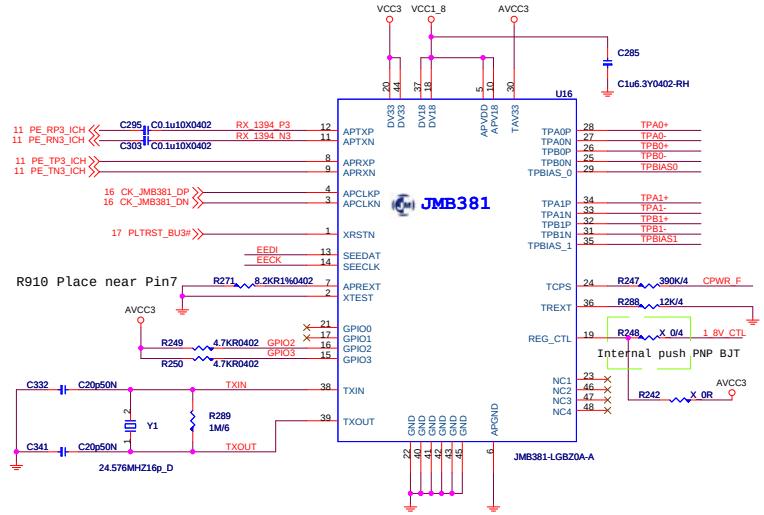
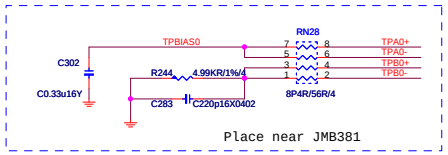
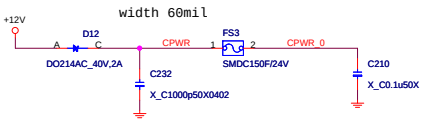


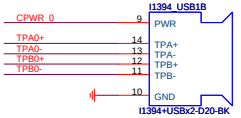
Table 5.1 JMB381 Operating Modes

	Normal	IDDQ	BIST/FL	Nandtree
XTEST	0	1	1	1
GPIO2	x	0	0	1
GPIO3	x	0	1	1

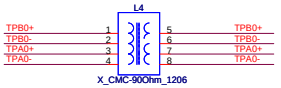
Rear 1394 port



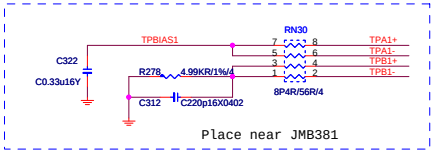


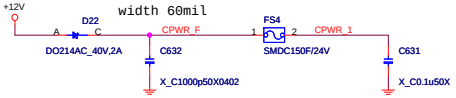


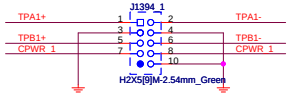
N58-14M0051-L06



Front 1394 pin header

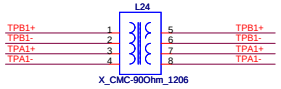




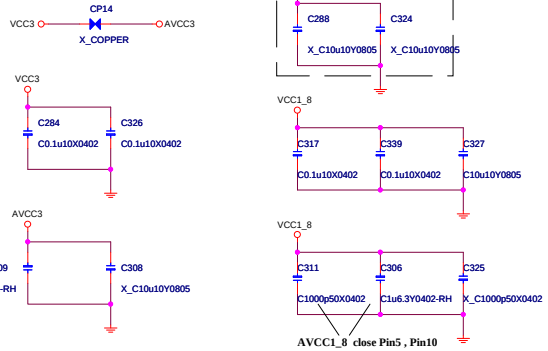


N31-2051551-H06

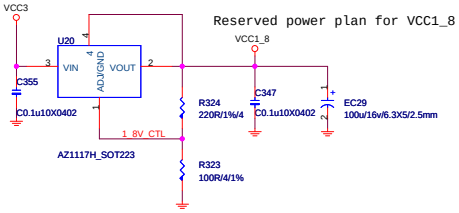
For Intel 1394 pinheader

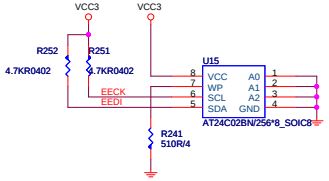


EMI request 11/28



A1117 CO-LAY SOT223 (TO_261) PNP BJT



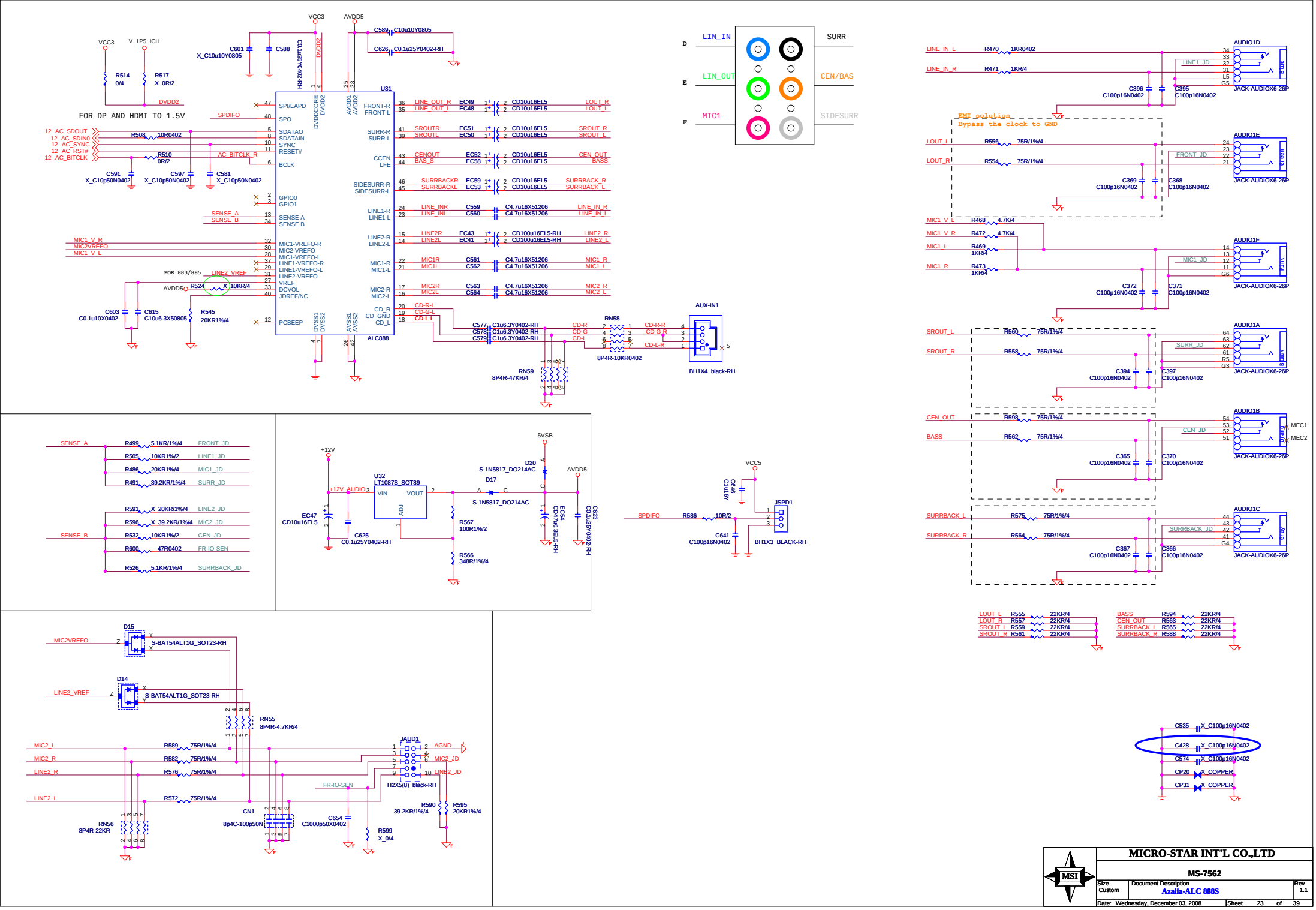


MICRO-START INT'L CO.,LTD.

Title: Intel82567

Size: C | Document Number: MS-7562 | Rev: 1.1

Date: Monday, December 08, 2008 | Sheet 22 of 39



MICRO-STAR INT'L CO.,LTD	
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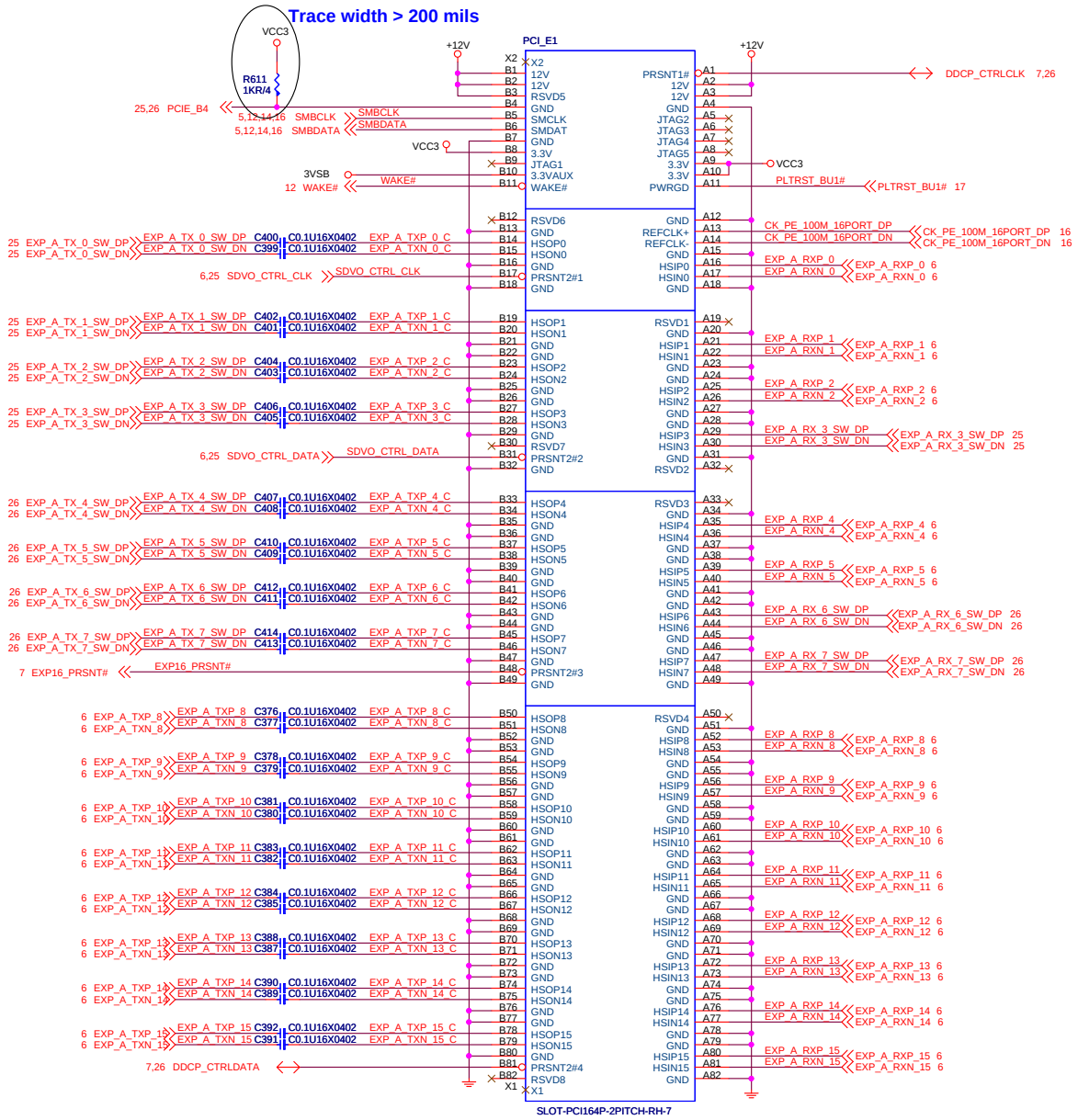
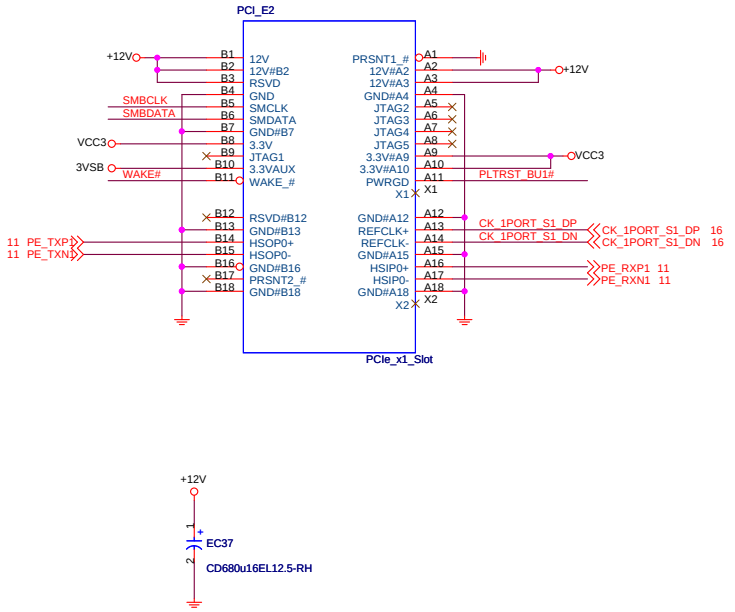
Size: Custom	Document Description: Azalia-ALC 888S
Rev: 1.1	
Date: Wednesday, December 03, 2008	Sheet 23 of 39

PCI Express X16 Slot



PCI Express X1 Slot



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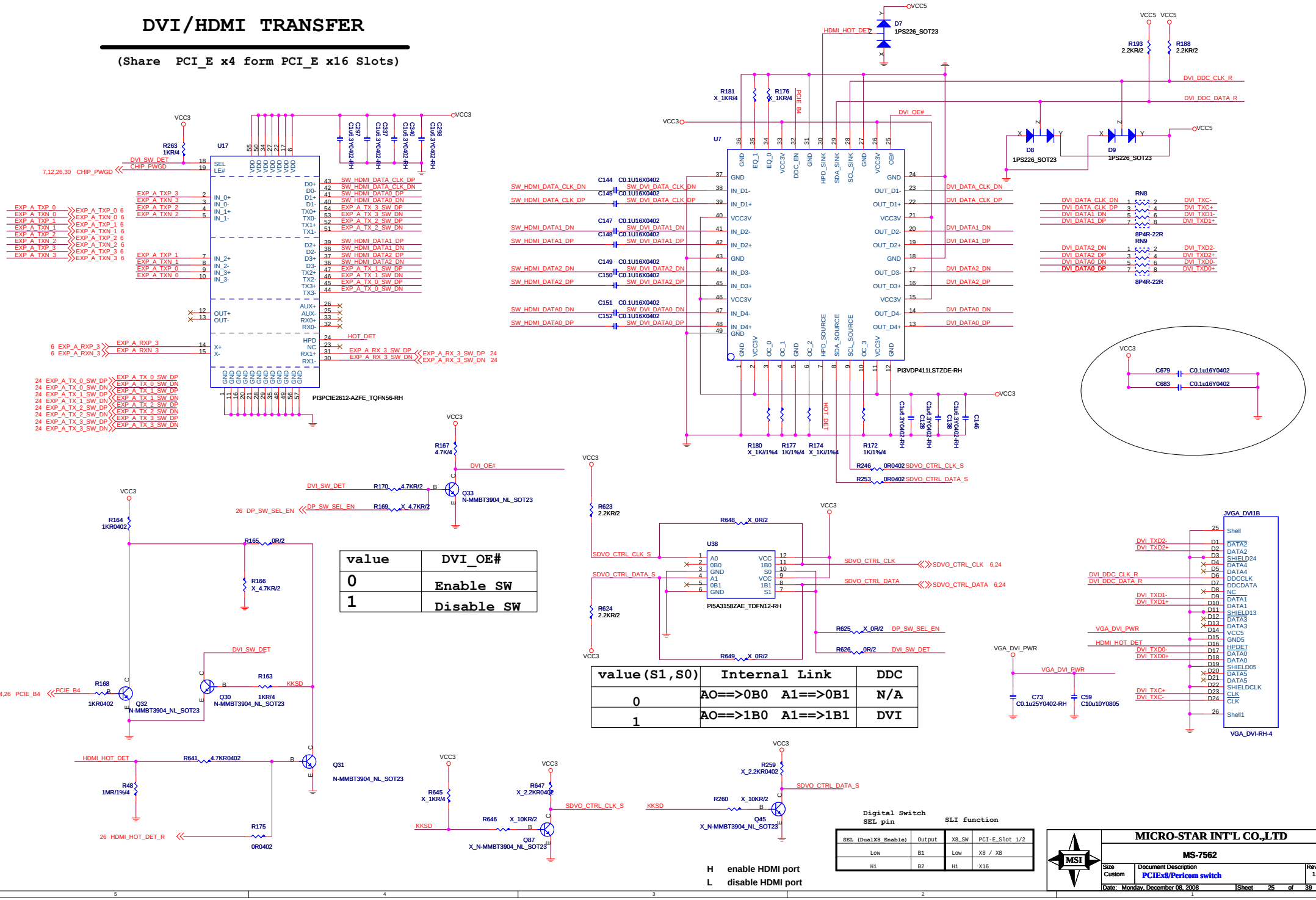
MS-7562	
Size: Custom	Document Description: PCIE x16, x1 & Bus Switch
Rev: 1.1	
Date: Monday, December 08, 2008	Sheet 24 of 39

DVI/HDMI TRANSFER

(Share PCI_E x4 form PCI_E x16 Slots)



value	DVI_OE#
0	Enable SW
1	Disable SW

value(S1,S0)	Internal Link	DDC
0	AO==>0B0 A1==>0B1	N/A
1	AO==>1B0 A1==>1B1	DVI

Digital Switch SEL pin — SLI function

SEL (DualX8_Enable)	Output	X8_SW	PCI-E_Slot 1/2
Low	B1	Low	X8 / X8
Hi	B2	Hi	X16

H enable HDMI port

L disable HDMI port

MICRO-STAR INT'L CO.,LTD

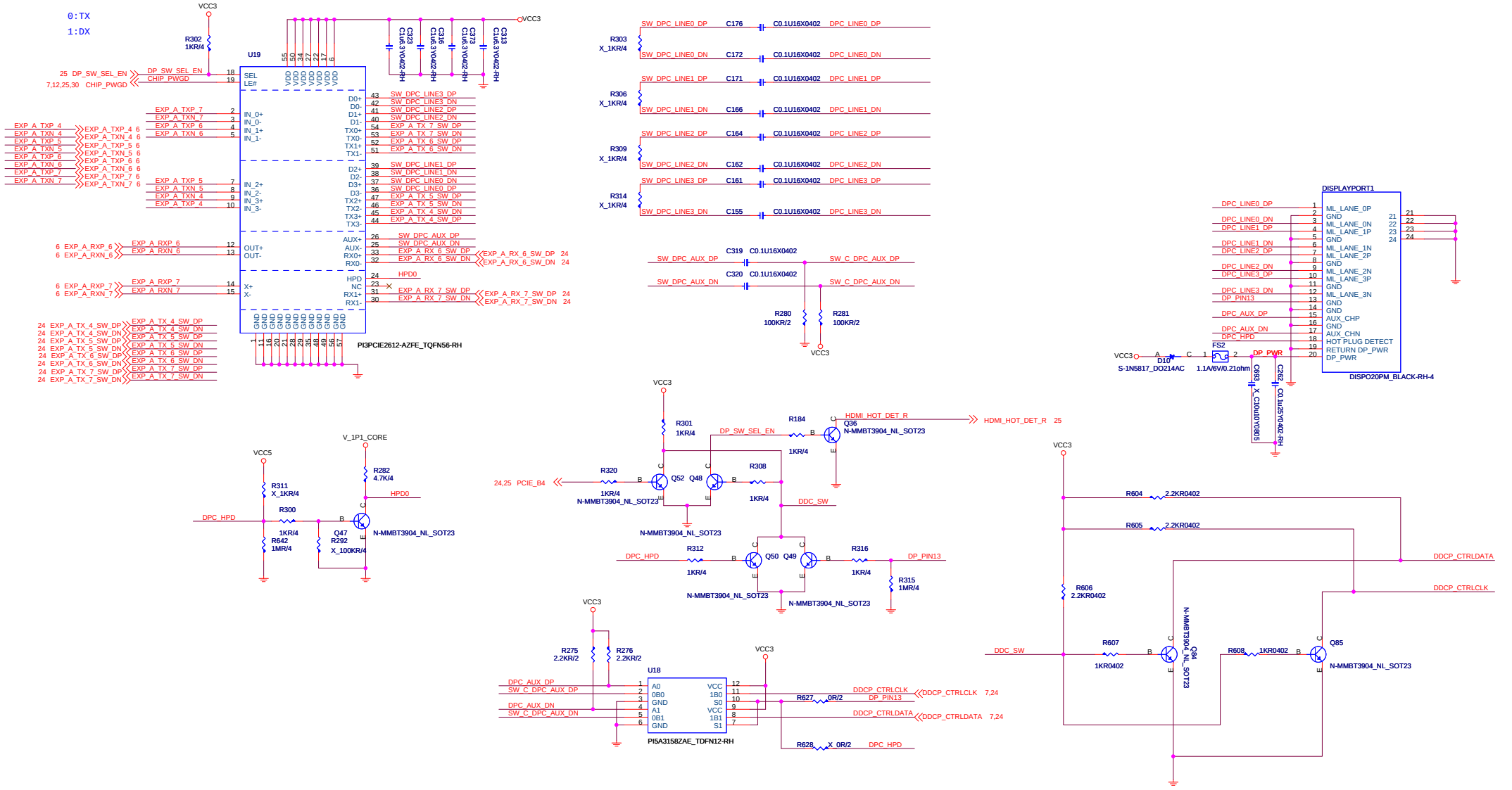
MS-7562

Size: Custom | Document Description: PCIEx8/Pericom switch | Rev: 1.1

Date: Monday, December 08, 2008 | Sheet 25 of 39

DISPLAY PORT

(Share PCI_E x4 form PCI_E x16 Slots)



value(S1,S0)	Internal Link	DDC
0	AO==>0B0 A1==>0B1	N/A
1	AO==>1B0 A1==>1B1	DP

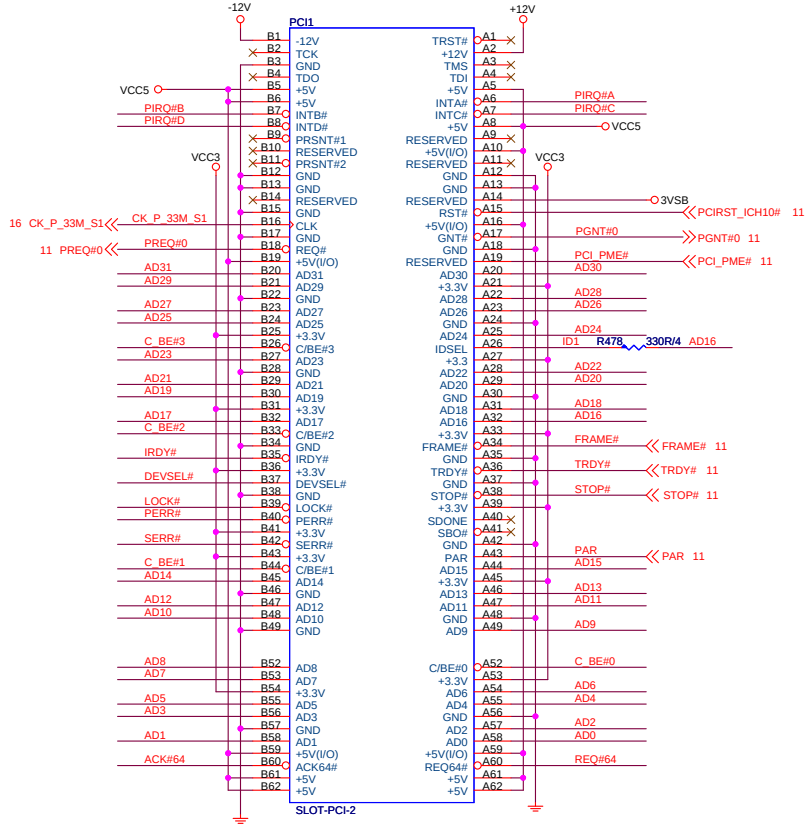
MICRO-STAR INT'L CO.,LTD

MS-7562

Size	Document Description	Rev
Custom	PCIEx8/Pericom switch	1.1

Date: Friday, December 05, 2008 Sheet 26 of 39

PCI SLOT 1 (PCI VER: 2.2 COMPLY)

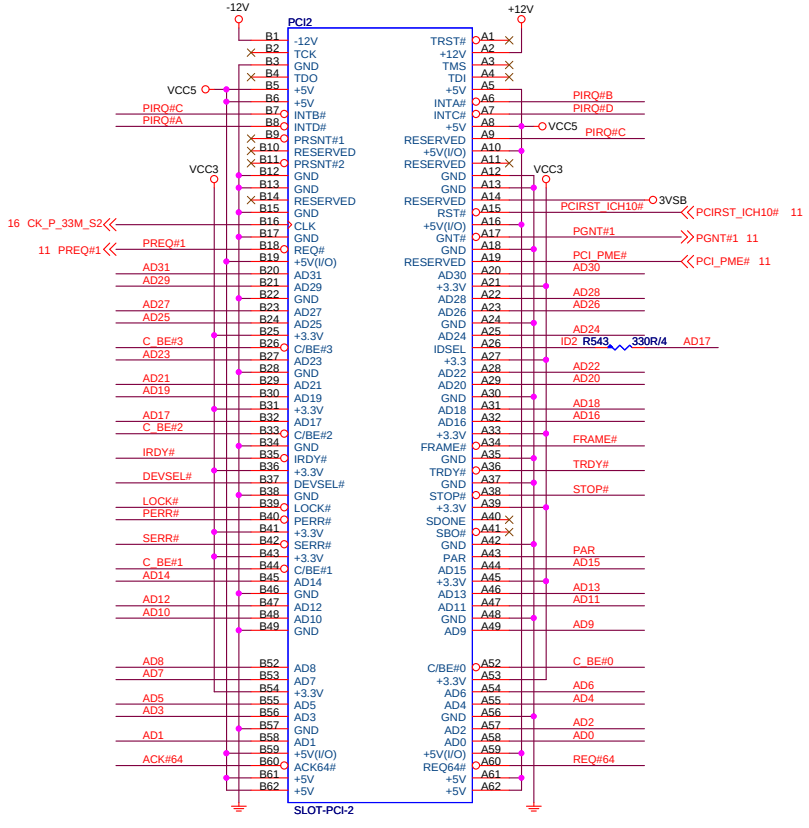


IDSEL = AD16
MASTER = PREQ#0
PIRQ#A

11 AD[31..0] AD[31..0]

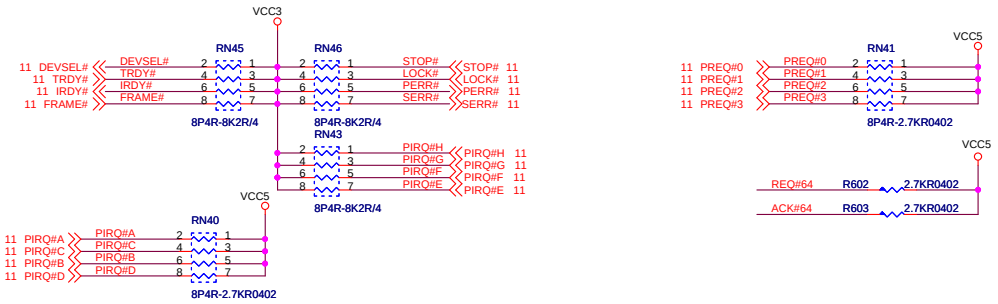
11 C_BE#[3..0] C_BE#[3..0]

PCI SLOT 2 (PCI VER: 2.2 COMPLY)



IDSEL = AD17
MASTER = PREQ#1
PIRQ#B

PCI PULL-UP / DOWN RESISTORS



PCI SLOT DECOUPLING CAPACITORS

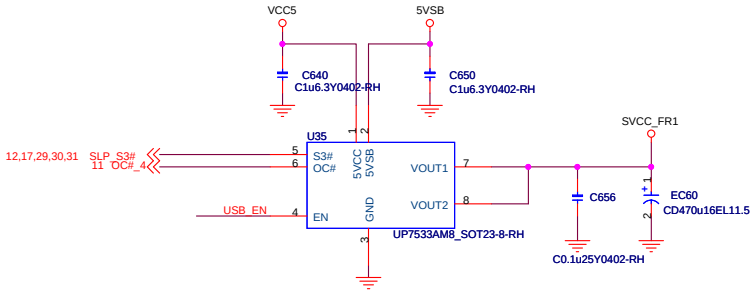
MICRO-STAR INT'L CO.,LTD

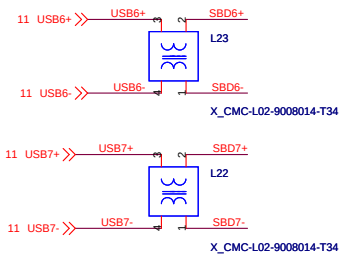
MS-7562

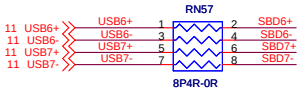
Size	Document Description	Rev
Custom	PCI Slot 1 & 2	1.1

Date: Monday, December 08, 2008 Sheet 27 of 39

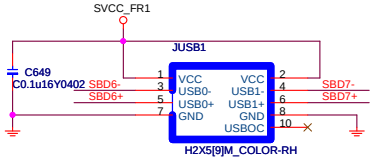
Front USB Connector

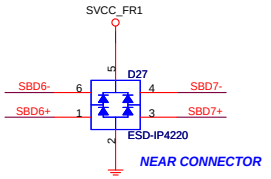


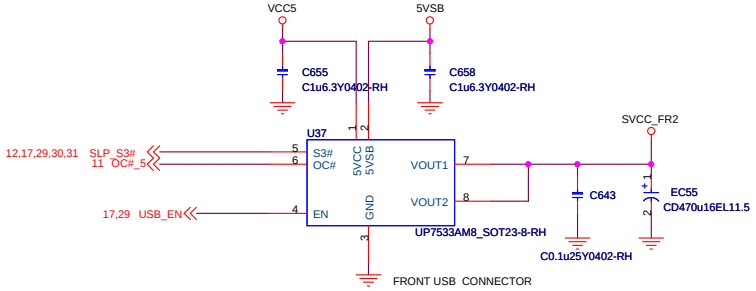


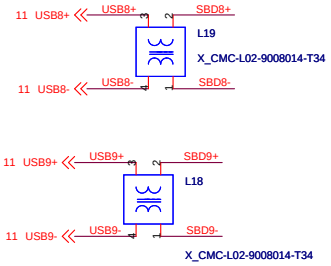


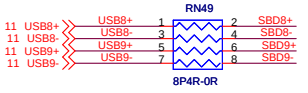
FRONT USB PORT2,3



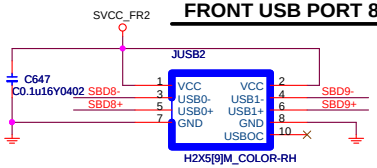


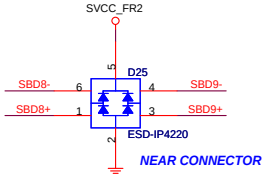


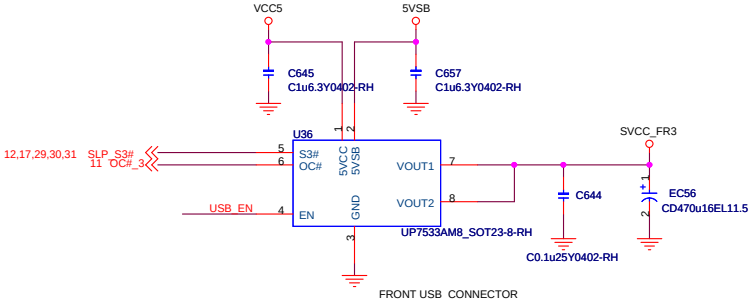


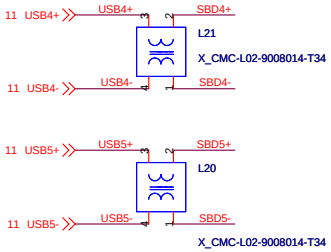


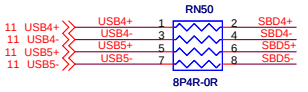
FRONT USB PORT 8,9



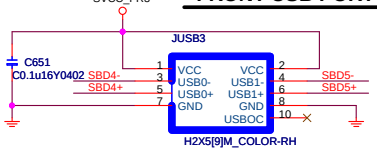


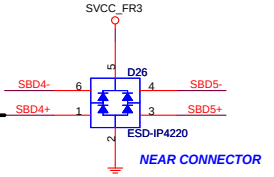






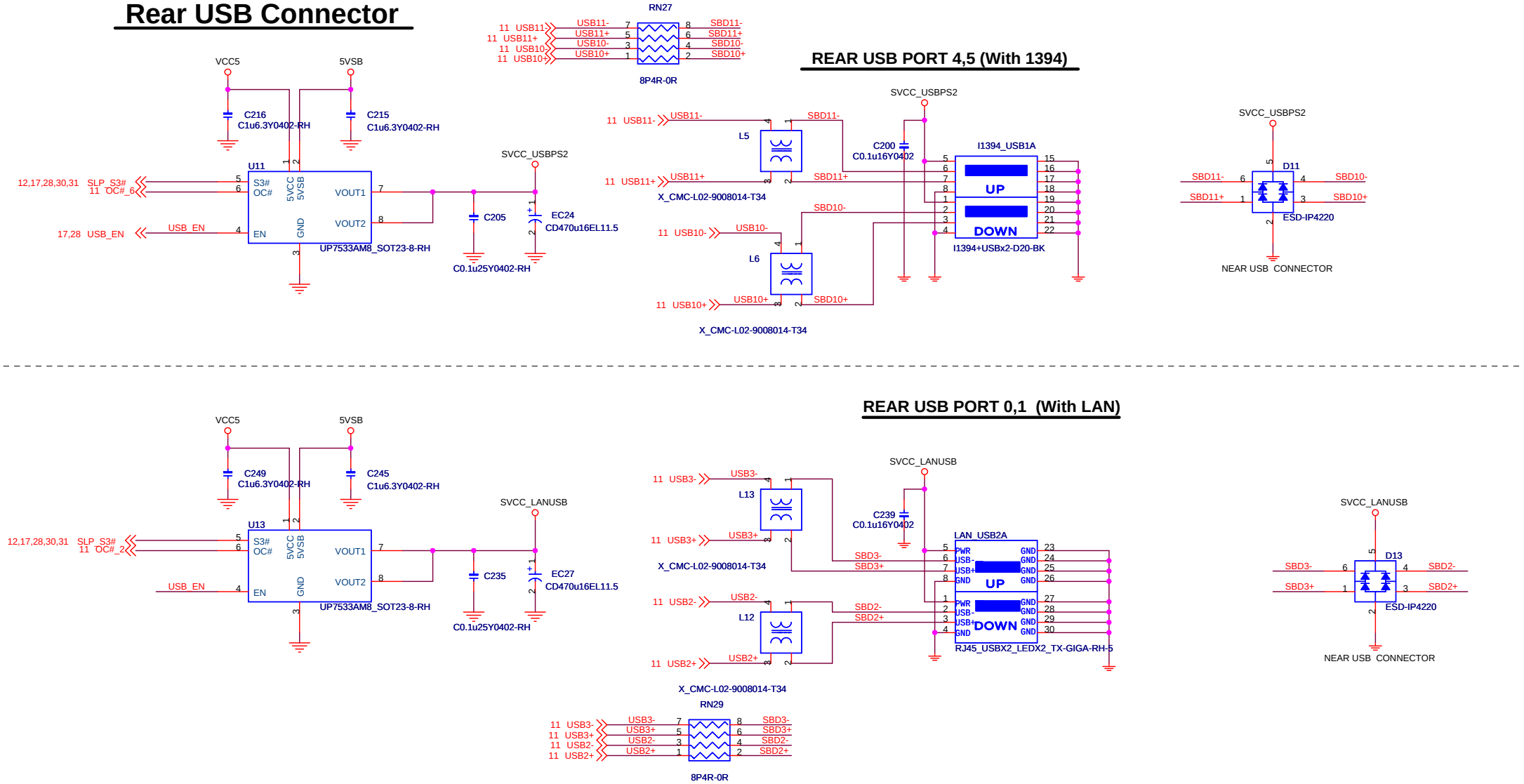
FRONT USB PORT 6,7





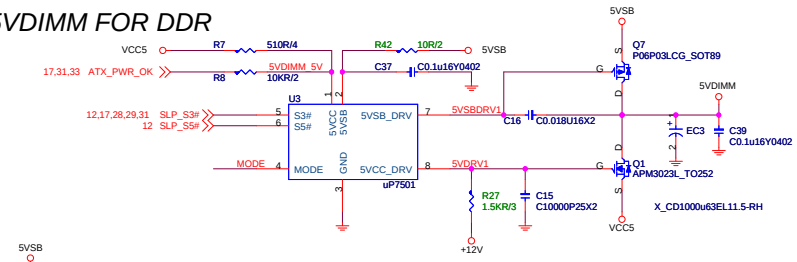
MICRO-STAR INT'L CO.,LTD	
MS-7562	
Size: Custom	Document Description: USB Connector
Rev: 1.1	
Date: Wednesday, December 03, 2008	Sheet 28 of 39

Rear USB Connector



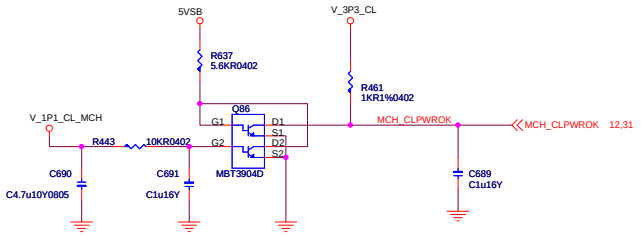
MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7562	
Size B	Document Description: USB Connector	Rev 1.1
Date: Wednesday, December 03, 2008	Sheet 29 of 39	

5VDIMM FOR DDR

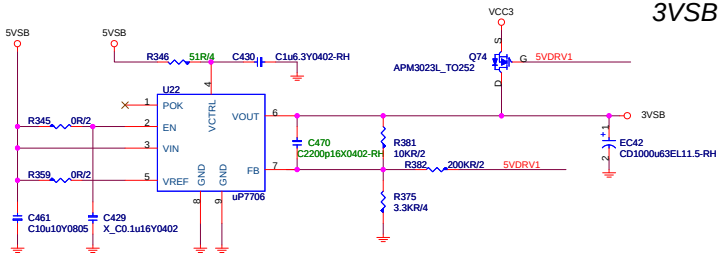


S5#	S3#	DUAL_CTRL	5VDUAL	REMARKS
1	1	X	5VCC	S0/S1/S2(Active)
1	0	X	5VSB	S3
0	X	1	5VSB	S4/S5
0	X	0	Showdown	S4/S5

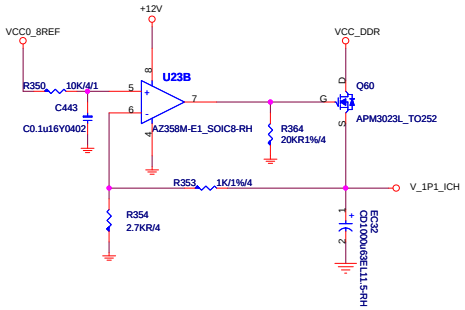
CL_PWROK



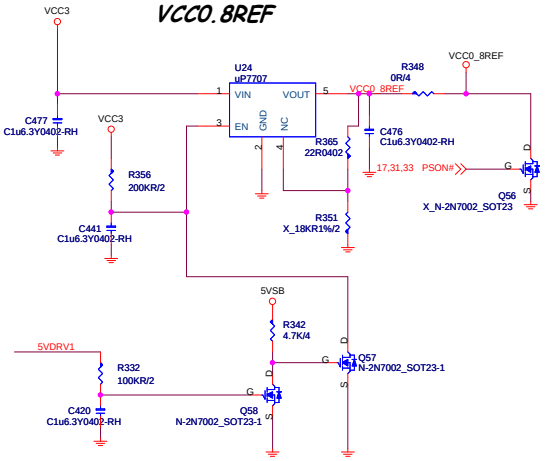
3VSB

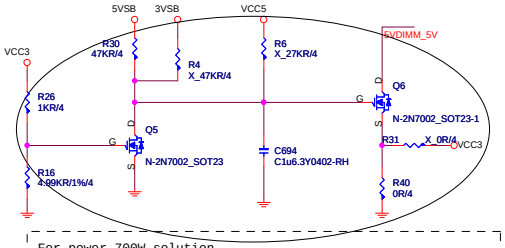


SB 1.1V 1.16A



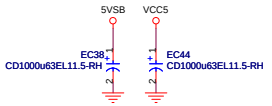
VCC0.8REF





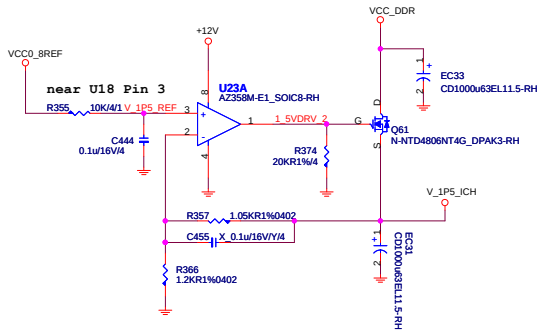
For power 700W solution
The power supply VCC3 delay 12ms after VCC5 assert.
The chip U7501 5VDRV1 work when the VCC5 ready
(When VCC5 up to 4.2V and the 5VDRV1 delay 6ms assert), but
VCC3 not ready and let the 3VSB sequence fail.

	S0	S3	S4			S5		
DUAL_CTRL	X	X	0	1	1	0	1	1
5VSBDRV1	1	0	1	0	0	1	0	0
5VDRV1	1	0	0	0	0	0	0	0
5VSBDRV2	X	0	1	0	0	1	0	0
USB_MODE	X	1	X	1	0	X	1	0
5VDIMM	Y	Y	N	Y	Y	N	Y	Y
USB power	Y	Y	N	Y	N	N	Y	N

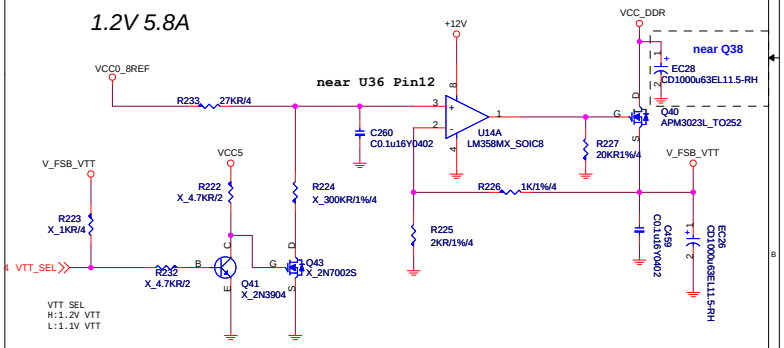


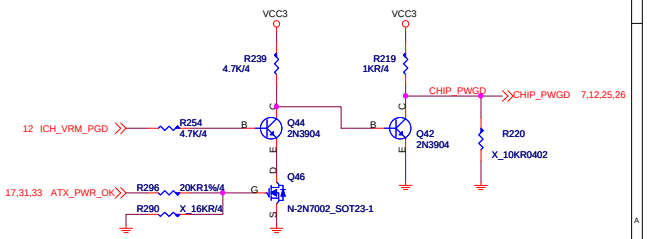
FIELD	OEM/ODM	CHANNEL
ADD	R26,R16,R30,R40,Q5	R6,R31
REMOVE	R6,R31	R26,R16,R30,R40,Q5
CHANGE	R5 => C5=0.1uF	C5=> R5=51Kohm

SB 1.5V 2.4A



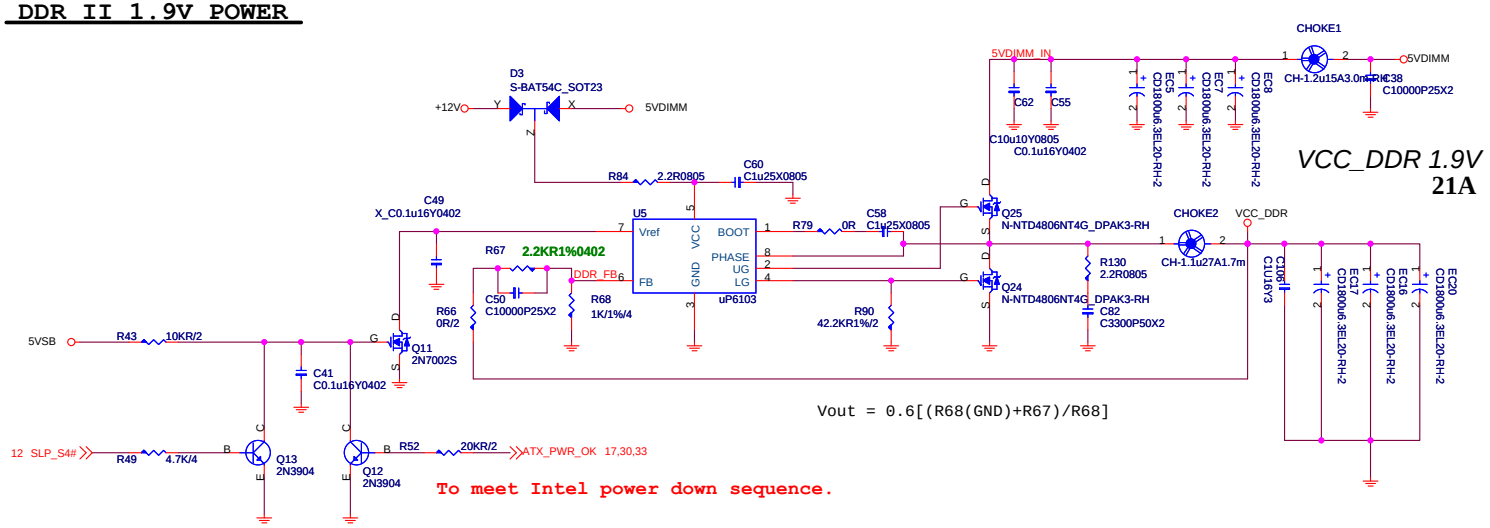
1.2V 5.8A





MICRO-STAR INT'L CO.,LTD		
MS-7562		
Size: Custom	Document Description: ACPI controller UPI	Rev: 1.1
Date: Monday, December 08, 2008	Sheet 30 of 39	

DDR II 1.9V POWER



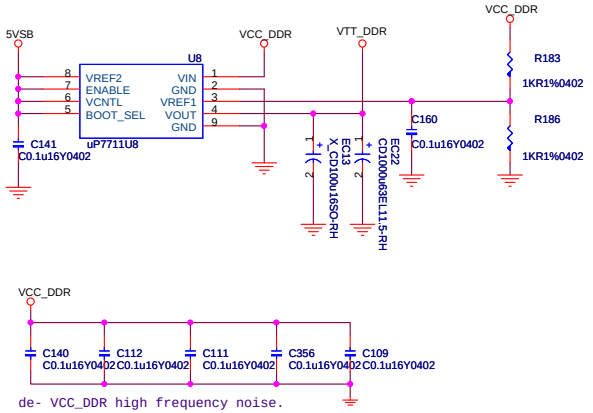
To meet Intel power down sequence.

VCC_DDR 1.9V
21A

To CPU Copper trace width > 250mils , Fill island behind DIMM > 400mils .

DDR VTT Power

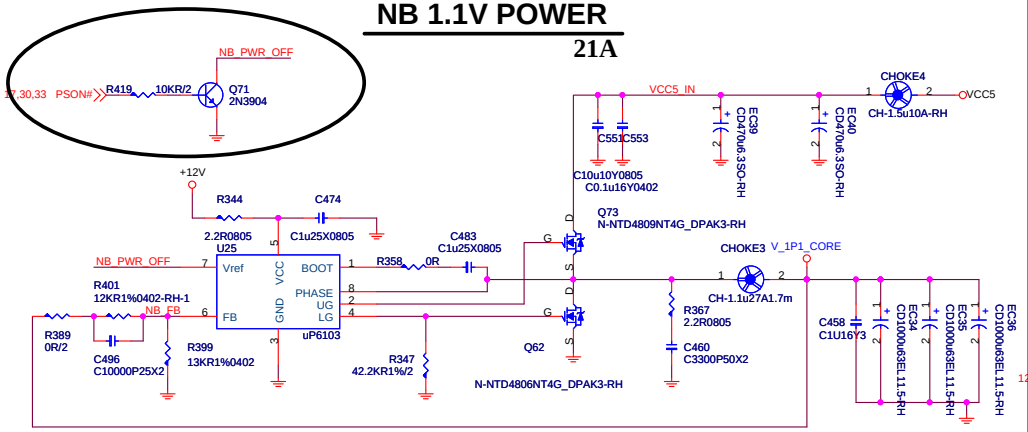
VTT_DDR 0.9V 0.83A



de- VCC_DDR high frequency noise.

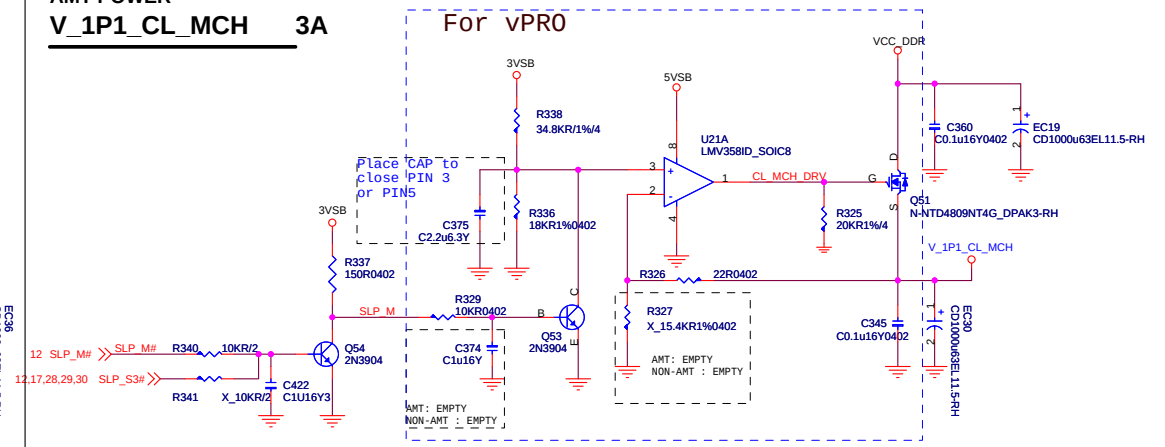
NB 1.1V POWER

21A

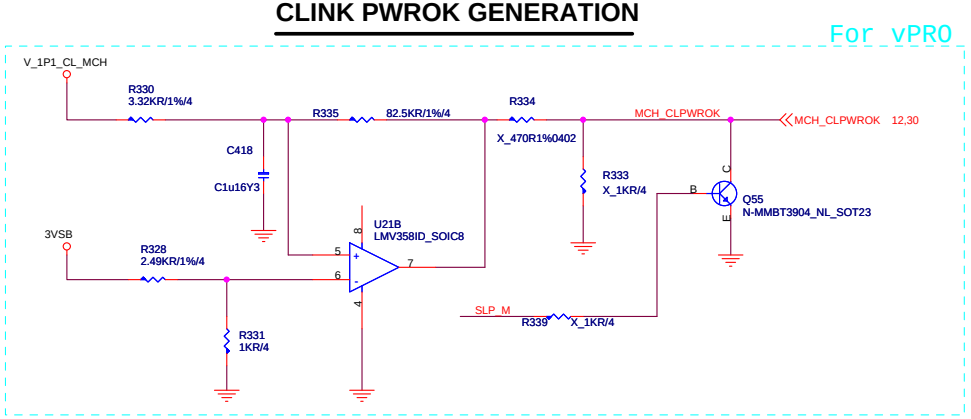


AMT POWER

V_1P1_CL_MCH 3A

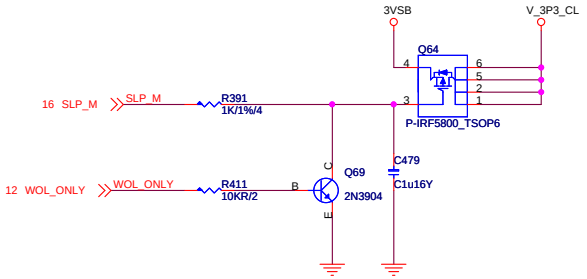


CLINK PWROK GENERATION



V_3P3_CL 711mA

For vPR0



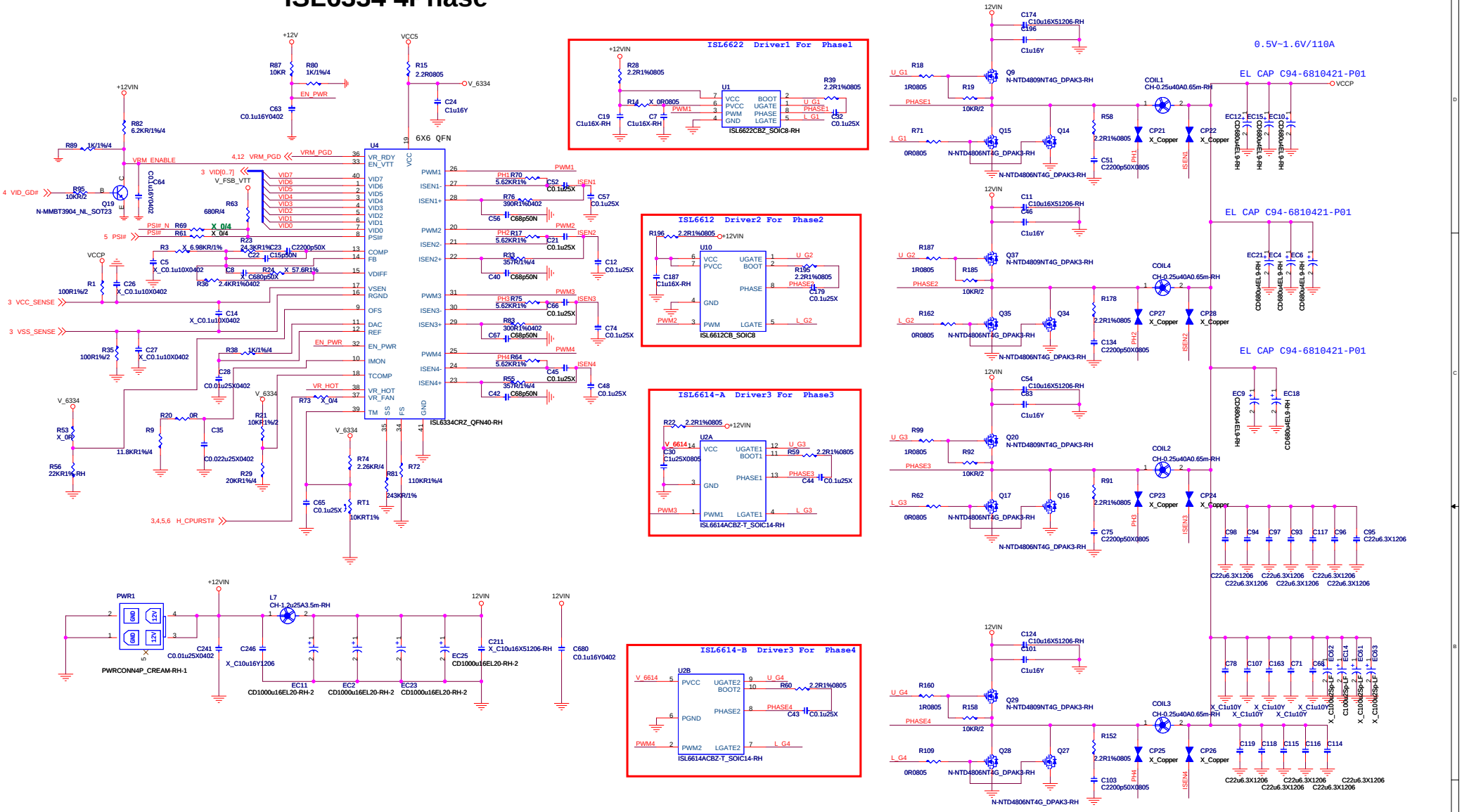
MICRO-STAR INT'L CO.,LTD

MS-7562

Size	Document Description	Rev
Custom	NB Core Power & DDR Power	1.1

Date: Wednesday, December 10, 2008 Sheet 31 of 39

ISL6334 4Phase

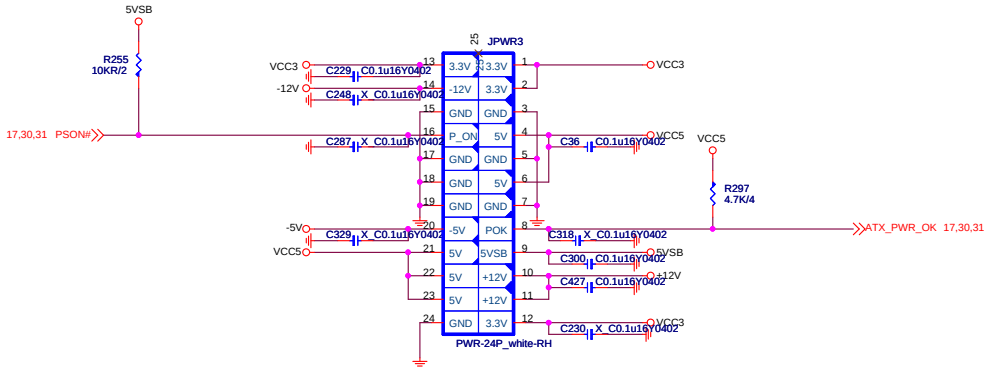


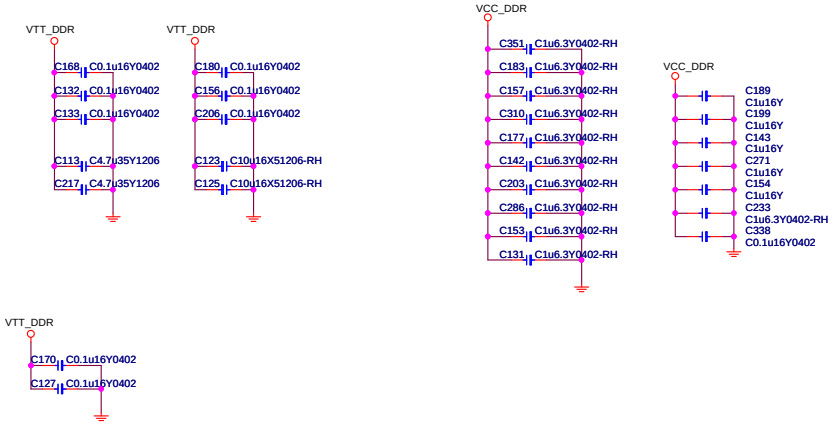
MICRO-STAR INT'L CO.,LTD

Size	Document Description	Rev
C	ISL6334 4-Phase Modulize circuit	1.1

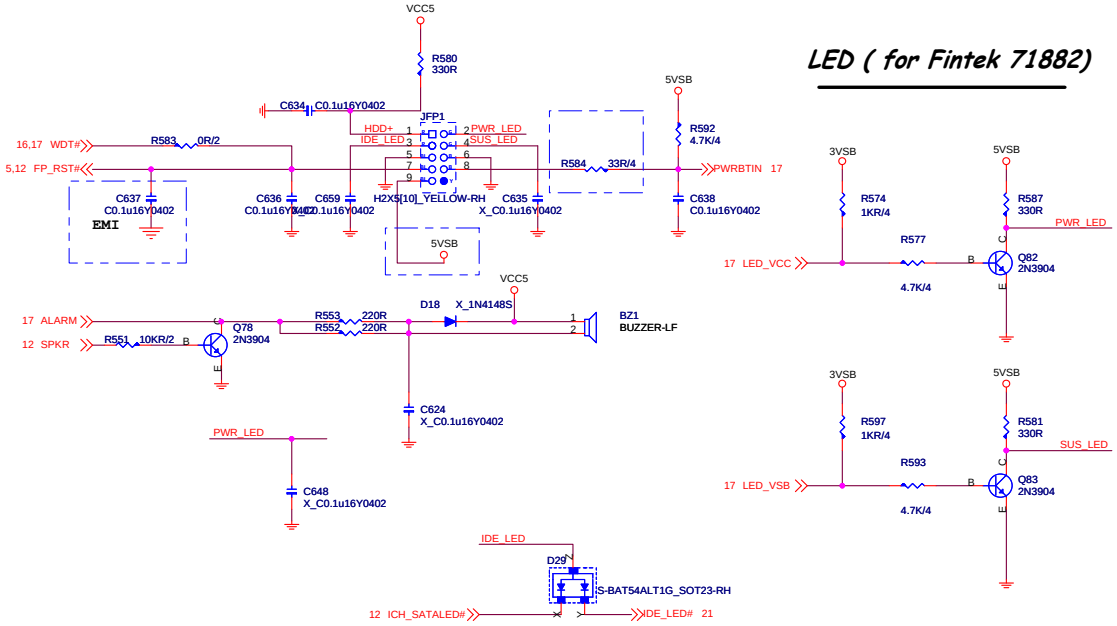
Date: Wednesday, December 10, 2008 | Sheet 32 of 39

ATX POWER CONNECTOR



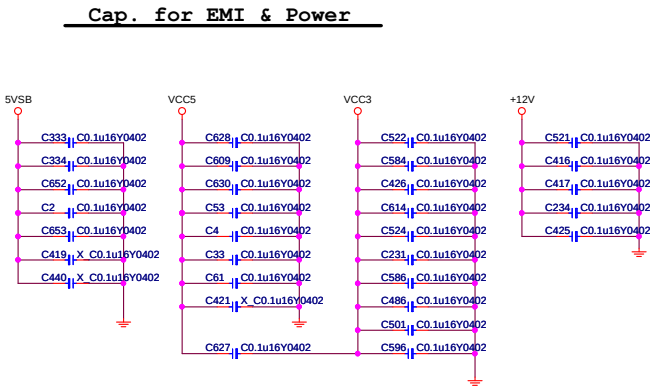


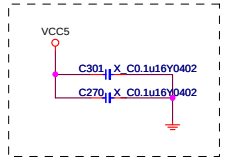
FRONT PANNEL

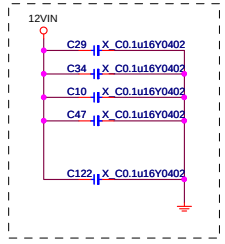


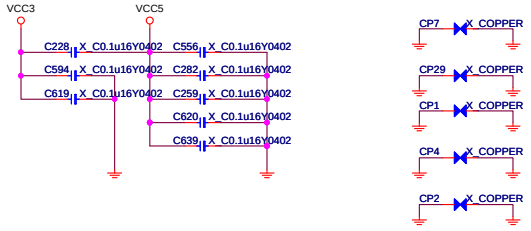
LED (for Fintek 71882)

Cap. for EMI & Power





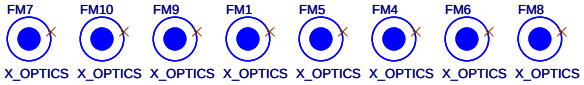




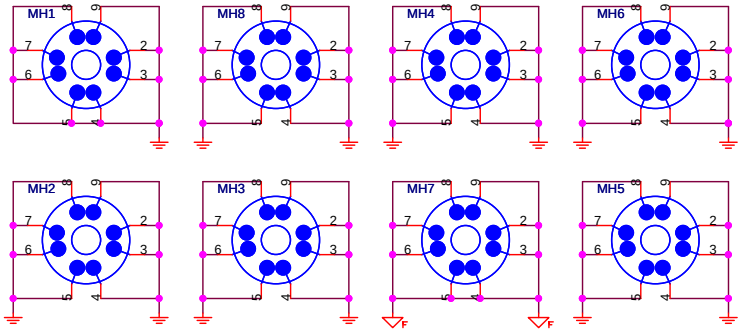
MICRO-STAR INT'L CO.,LTD		
MS-7562		
Size: Custom	Document Description: ATX PWR-Connector & Front Panel	Rev: 1.1
Date: Wednesday, December 03, 2008	Sheet 33 of 39	

Optical Fiducial Marks-120

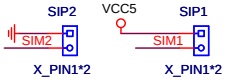
Optical Fiducial Marks-100

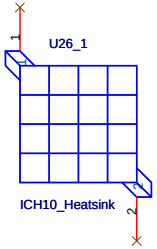


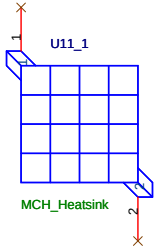
Mounting Holes



Simulation







MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7562	
Size B	Document Description: Manual Parts & Option Parts	Rev 1.1
Date: Monday, December 08, 2008	Sheet 34 of 39	

Ver.	Change List	Page
0B	1. VRM Modify	
	Change R12,16,26,32 =>6.98Kohm ,C16 =>15pF R22=>300ohm,R39=>2.49Kohm,R43=>20Kohm Stuff EC3 EC9	30
	2. Power team recommend	
	change C79=>10nF, EC31=>1000uF replace Q32,34=>D03-0480600-O05	29
	change C328=>10nF,EC33,34 =>remove,EC37,39=>470uF,EC32,35,36=>820uF ADD EC110 =>820uF replace Q43=>D03-0903BDB-N03,Q42,73=>D03-75N022B-N03	29
	3. Add Q72,R362 NB power switch circuit turn off NB power	29
	4. follow demo circuit Add R870 Stuff for NON-Intel LAN	12
	5. For DVI stuff R717,R718,R719, change RN79,RN80 => 22R	24
	6. R133=>1.58K,R295=>10.7K for DDR, NB power margin	29
	7. For customer requests change R909,R910=> 0603	13
	8. Change R92=> 1k for chip_power_good level	28
	9. Improve V_1P5_ICH VR's MOS temperature	28
	remove R326,C383,R320,R608,C379,EC100.R374,Q47 stuff EC41 replace Q52 => D03-75N022B-N03 ,U18=> I71-LM35833-B28	
	10. VRM Modify Improve temperature	
	replace Q2,Q3,Q7,Q9,Q10,Q14,Q15,Q17=> D03-75N022B-N03	30
	11. Add EC33 for V_FSB_VTT	28
	12. For INTEL Design Review	
	Change C740 =>0.1u	08
	Add C980,C981,C982,C983 =>0.1u for VREF_CA_A,VREF_CA_B,VREF_DQ_A,VREF_DQ_B	14,15
	Near SB ball U1 Add C984,C985 =>0.022u	13
	Near SB ball AC9 Add C986 =>0.1u	13
	For VccGLAN1_5 change C445=>4.7u/X5R ,C443=>2.2u/X5R	13
	For 5VREF ,5VREF_SUS change C571 ,C611=>1uF/X7R	13
	For VccRTC near the ball A22 C505 => 1uF/Y5V	13
	For V_1P05_VCCAUX Add C987=>0.1uF/X7R ,C561 => 1uF/Y5V	13
	For VCCA_EXP remove L29 , Add R915=>1Ω ,L39 = 600 Ω (FB) ,C612=> 1uF	09
	For VCCA_DAC Add L39 = 600 Ω (FB) , change R892 =>1Ω ,	09
	For VCCDQ_CRT Add L40 = 600 Ω (FB) , change R702 =>1Ω ,C613=>1u C613 will be 1u for onbroad graphic BOM Option will be 0 ohm for no onbroad graphic	09
	For FSB_VTT require Add C988 C989 C990=> 2.2uF	09
	For VCC_Core require backside caps 10uF x(3/4) and 1uF x(6/8) C300,C562,C767=> 10uF change C307 C323 C382 C416 C884 C975 C977 C371 =>1u	09
	VCC_Core require caps 22uF x3, 1uF x3 and 10uF x3 Add C991,C992.C993 => 22uF Add C763 C765 C762 =>10uF change C976 C302 C311 =>1uF	09
	VCC_EXP require caps 2.2uF x3 Add C994,C995.C996 => 22uF	09
	VCCSM require caps 2.2uF x6 change C262=2.2uF ,,Add C263,C264,C269,C268,C267 =>2.2uF	09

Ver.	Change List	Page
0B	For SRTCRST# Required change R456 => 20KΩ and C513=>1uF	12
	For NB1.AR2 Required change R706 Empty R709 stuff	09
	13. Reserve R578 Q47 R478 & Add R802 for Plug - in issue	30
	14. For INTEL Design Review change C262 to 2.2uF Add C250	09
	15. Change VGA DVI to new VGA DVI (N58-39F0031-SK7)	18,24
	16. COM1 change to JCOM1	17
	17. Add R872 & R873 for NB&DDR power layout	29
	18. Add U56,C997,C998,C999 ,EC108 for KB/MS power circuit	17
	19. change SVCC1,SVCC2 to SVCC_Real	26
	change SVCC3,SVCC4 ,SVCC4 to SVCC_Front change SVCC6 to SVCC_MCR SWAP JUSBF & JUSBMRC	27
	20. ADD C674,C675C677,C680 For EMI	31
	21. change R780,R778,R777,R776 for audio Precision	22
	22. Reserve for Plug - in issue SWAP Q47 D,S	30
	23 Change Vaule Empty or Stuff state In Shm circuit For P45 + ICH10 SKU	
	24 follow intel demo Design change R227 to 150R	29
	25 No-stuff R514, Stuff R505 with 10Kohm	12

1 Disable PSI# patch circuit.
Empty (-)R242,R253,R273,R247,C235,Q53 ,Q65 Stuff R652

2 DDR3 Power Correction.
Change R133 1.58K1% to 1.5K1%

3 Beep sound
Empty R75

4 Replace USB connector.
N53-08M0171-K06 ==> N53-08M0191-F02

5 Remove HDA Function.
Empty (-)R860,R861,R862,R863,R864,R865,R866,R867,R859 ,JHDA1

6 LAN_USB connector
Empty

7 SIO related Issues.
Empty (-)R789 (+)R112

MICRO-STAR INT'L CO.,LTD

MS-7562

Size	Document Description	Rev
Custom	Revision History	1.1

Date: Wednesday, December 03, 2008 Sheet 35 of 39