

CONTENT	SHEET
Cover Sheet, Block diagram	1-2
Intel LGA775 CPU - Signals/ Power/ GND	3-5
Intel Bearlake - FSB, PCIE, DMI, VGA, MSIC	6
Intel Bearlake - Memory DDR3	7
Intel Bearlake - Power / GND	8-9
ICH9 - PCI, USB, DMI, PCIE x1 slot,	10
ICH9 - Host, DMI, SATA, Audio, SPI, RTC, MSIC	11
ICH9 - Power, GND	12
DDR3 Chanel-A / Chanel-B	13-14
Clock Gen ICS9LPRS900	15
Super I/O Fintek F71882 & IO-Port / TPM	16
VGA Port	17
SATA / e-SATA / FAN Control	18
LAN Realtek RTL8111B(PCIE)	19
20 Audio Codec ADI197	20
PCIE x16	21
PCI Slot 1	22
Marvell 88SE6111 PCIE to IDE/ SATA	23
USB Connectors	24
IEEE1394 VT6308	25
MS12 &MS13 COLAY &DDR POWER	26
GMCH CORE POWER (1.25V_21.3A)	27
VRD 11 - ISL6322 (4 Phases)	28
ATX Power-Con. / F_Panel	29
Power Delivery	30
Manual & Option Parts	31
GPIO Setting & PCI Routing	32
Reset & PWROK map	33
Revision History	34

MS-7359

uATX Version: 0A

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

System Chipset:

Intel Bearlake - Q/G/P (G33, P35, Q35/33North Bridge)
Intel ICH9 (South Bridge)

On Board Device:

CLOCK Gen -- ICS 9LPRS900
LPC Super I/O -- Fintek F71882
LAN -- Realtek 8111 (PCIE)
HD Audio Codec -- ADI197
1394 Controller -- VT6308 (Rear x1, Front x1)
PCIE to PATA/SATA Bridge -- Marvel 88SE6111

Main Memory:

Dual-channel DDR-III * 4

Expansion Slots:


PCI EXPRESS X16 SLOT *1

PCI EXPRESS X1 SLOT * 2
PCI SLOT * 1

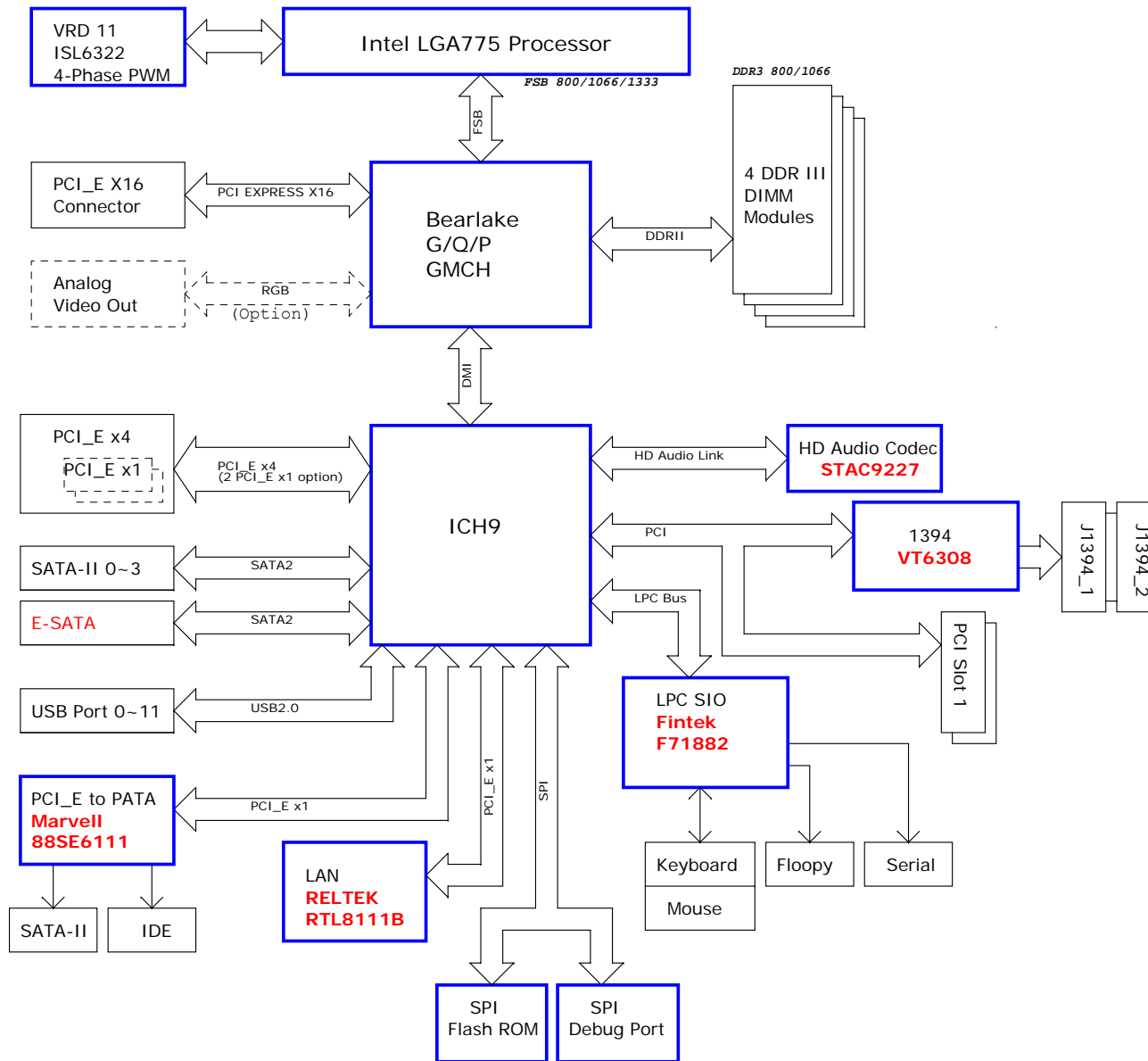
PWM: Intersil ISL6322 (4 Phases) w/ ISL6612 driver

Configuration and BOM match up

Option	Function	Orcad Configure	BOM
STD	Bearlake-G/ICH9/ICH-Fan/Non-PCIEx4	cfg-STD	601-7359-A10

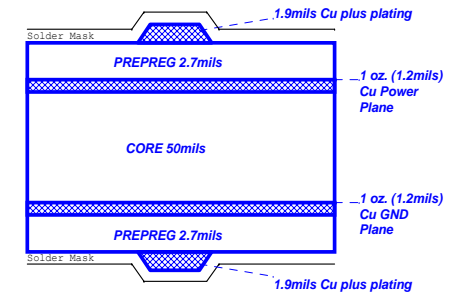
				MICRO-STAR INT'L CO.,LTD			
				MS-7359			
Size	Custom	Document Description	COVER SHEET		Rev	0A	
Date:	Wednesday, January 24, 2007	Sheet	1	of	34		

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
 IEEE1394 - 110ohm : 15/4/9/4/15
 IDE : 15/4/8/4/15

[illegible]

Thermal TRIP

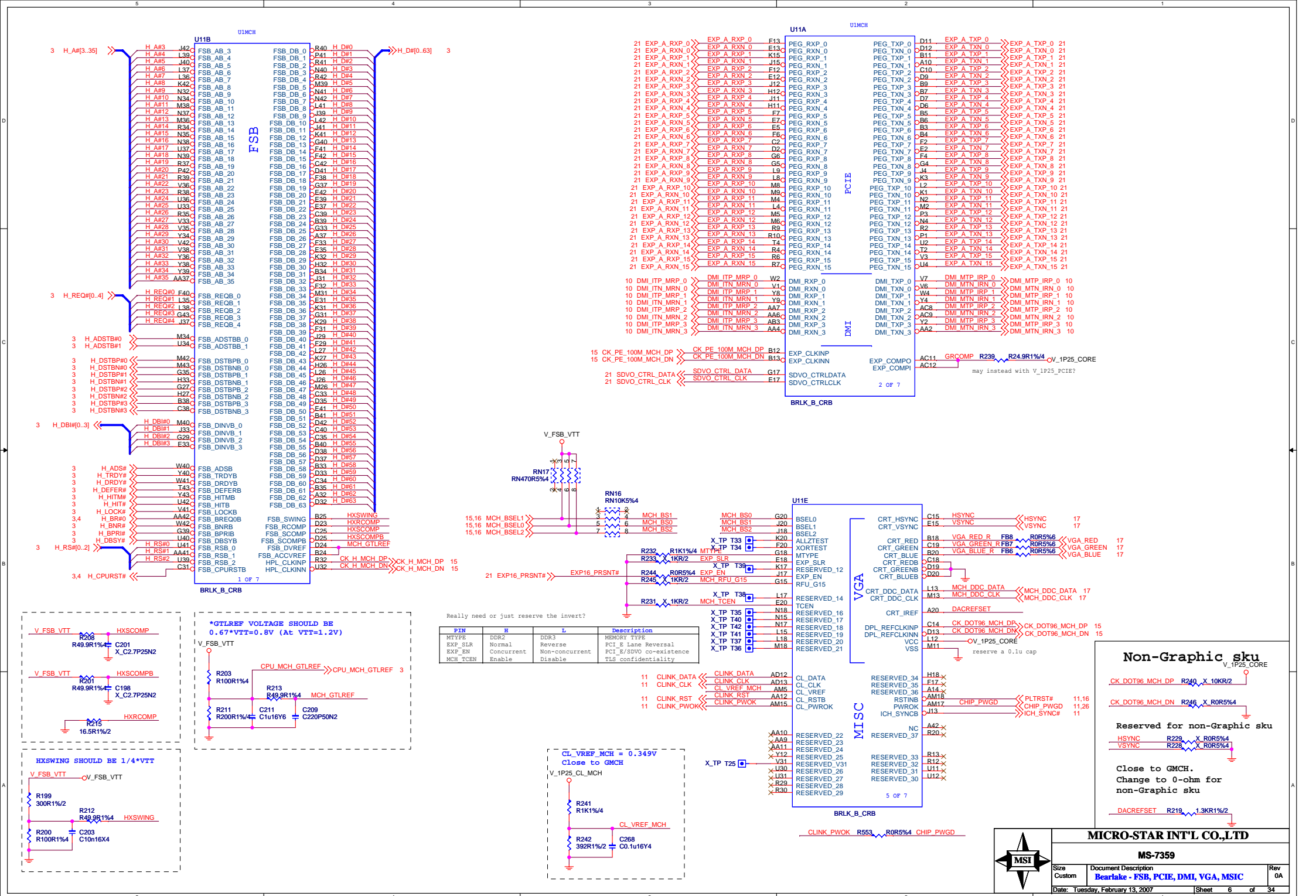
The schematic diagram illustrates the Thermal TRIP circuit. It shows the connection of various input signals to the 8P4R-680R connector. The signals include VID2, VID5, VID6, VID7, VID3, VID6, VID1, and RN6. The bottom section shows the connection of H_BPM#0, H_BPM#1, H_BPM#3, H_TRST#, H_BPM#4, H_TDO, H_TCK, H_TDI, H_BPM#2, H_TMS, H_TESTHI12, H_TESTHI11, H_TESTHI9, H_TESTHI10, H_TESTHI8, H_TESTHI1, H_TESTHI13, and RN12 to the RN51R5%4 connector. The circuit also includes capacitors C0.1u16Y4, C63, C79, and C82. The bottom section shows the connection of VTT_OUT_RIGHT, FORCEPH, H_PROCHOT#, and THRM# to the R109, R94, R87, and R112 resistors, respectively. The output of the circuit is VTT_OUT_RIGHT, which is connected to the VTT_OUT_RIGHT pin of the 8P4R-680R connector.

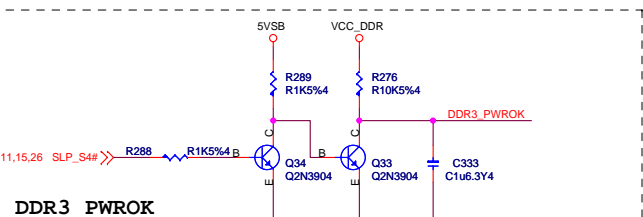
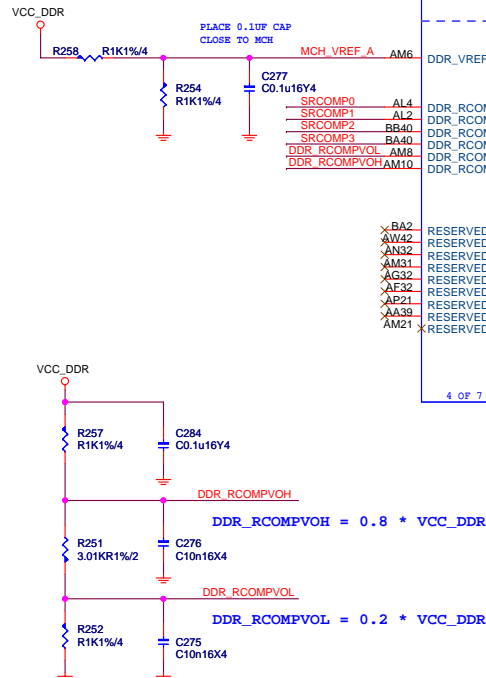
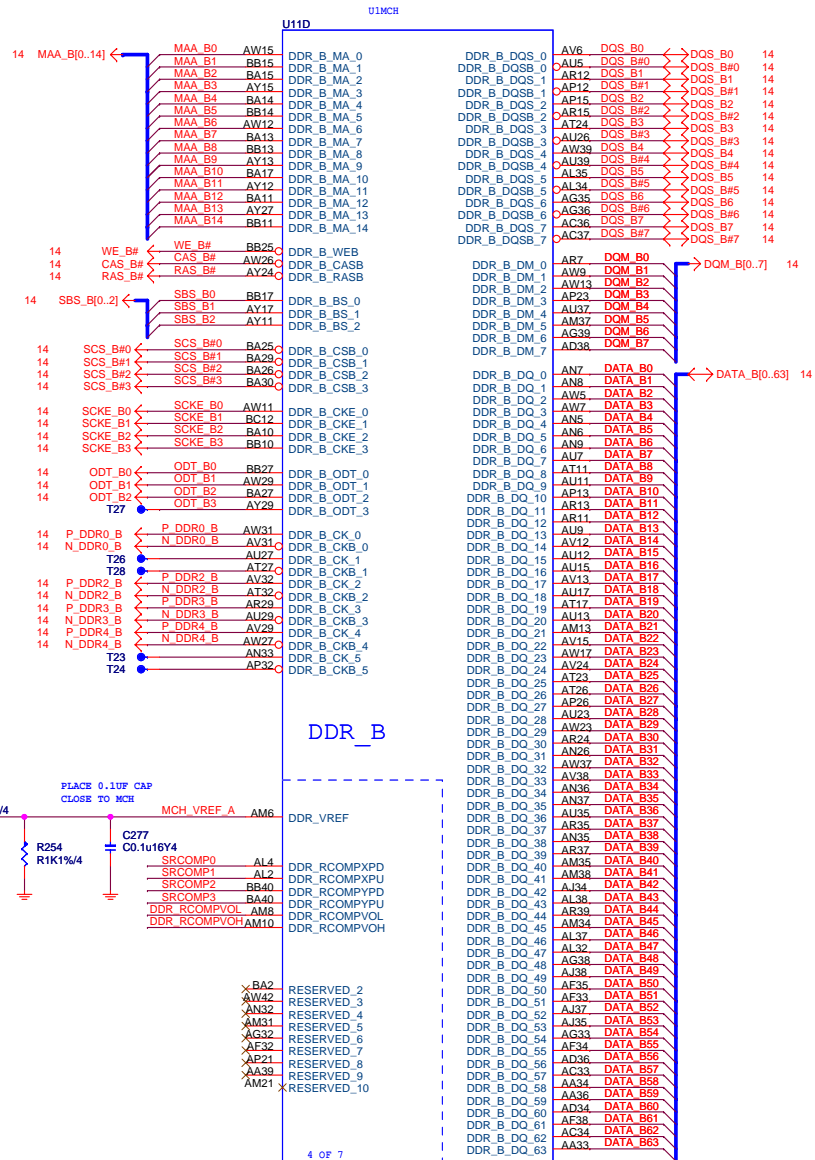
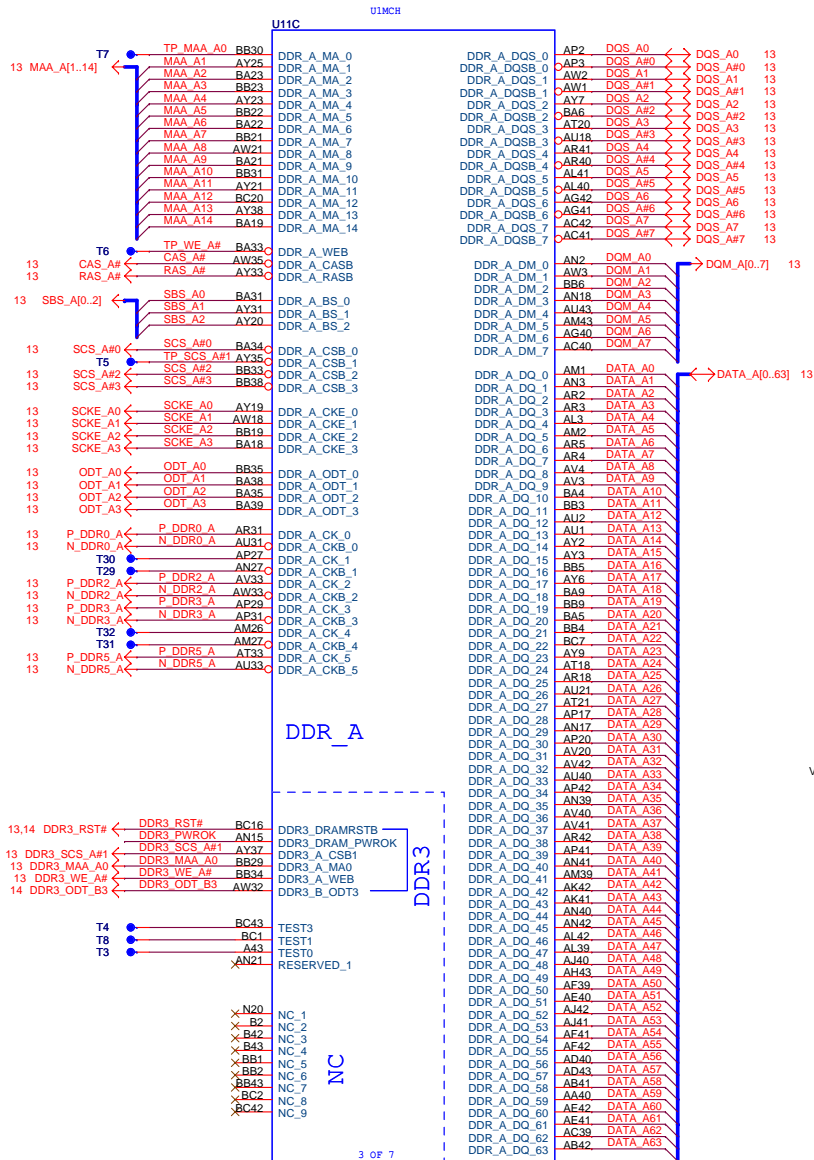


MS-7359

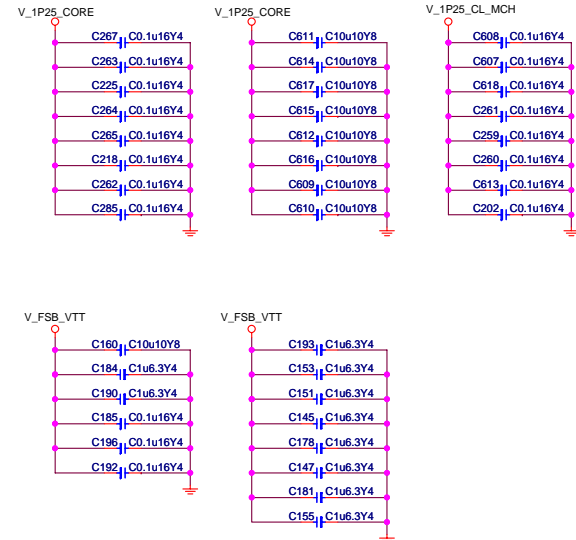
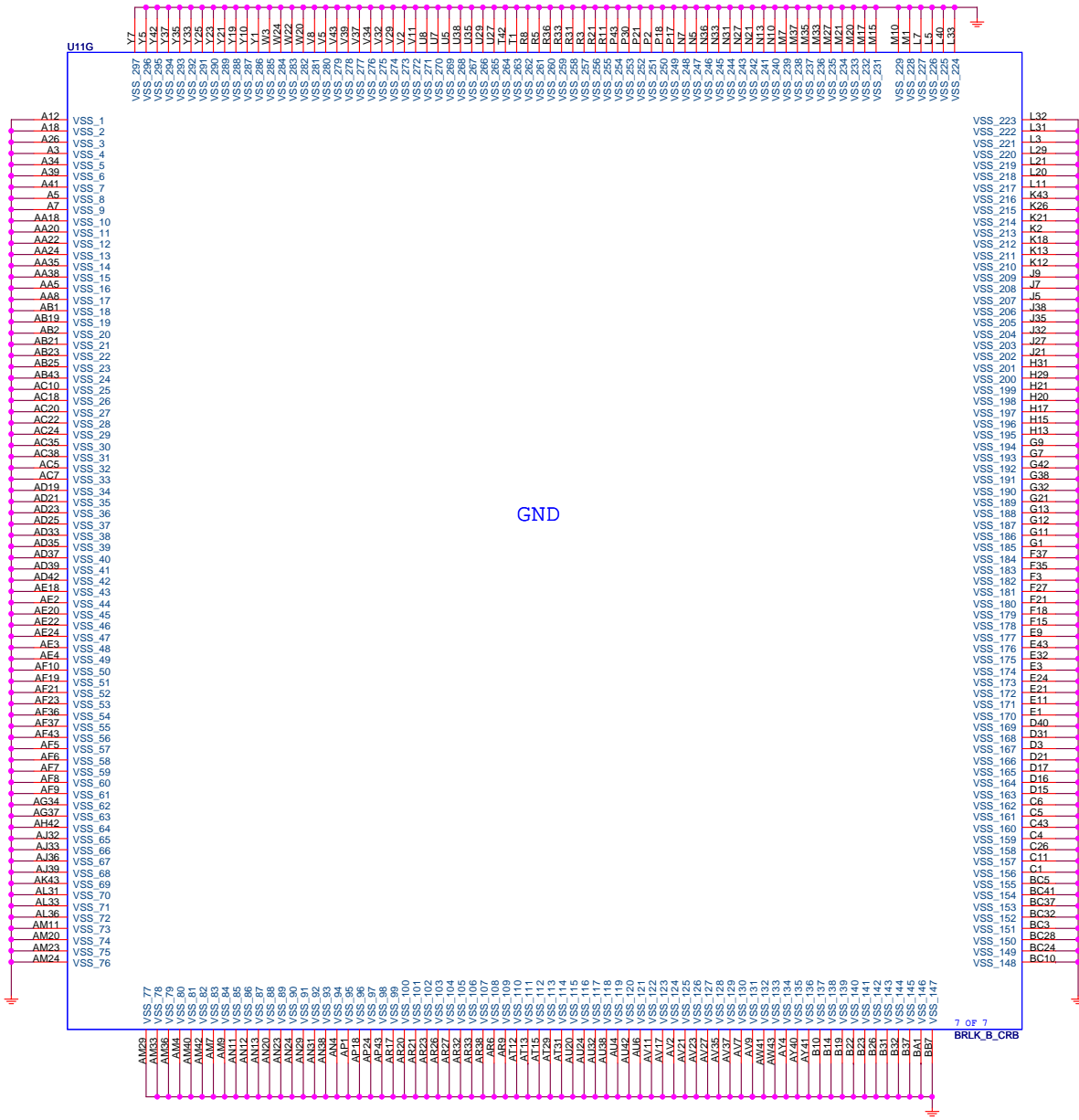
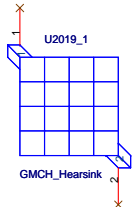
Size Custom	Document Description LGA775 - Signal	Rev 0A
Date: Tuesday, February 13, 2007		Sheet 3 of 34

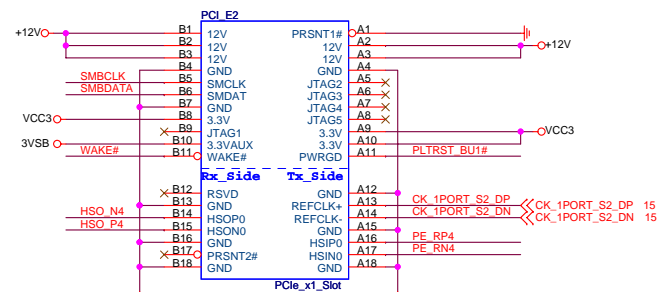
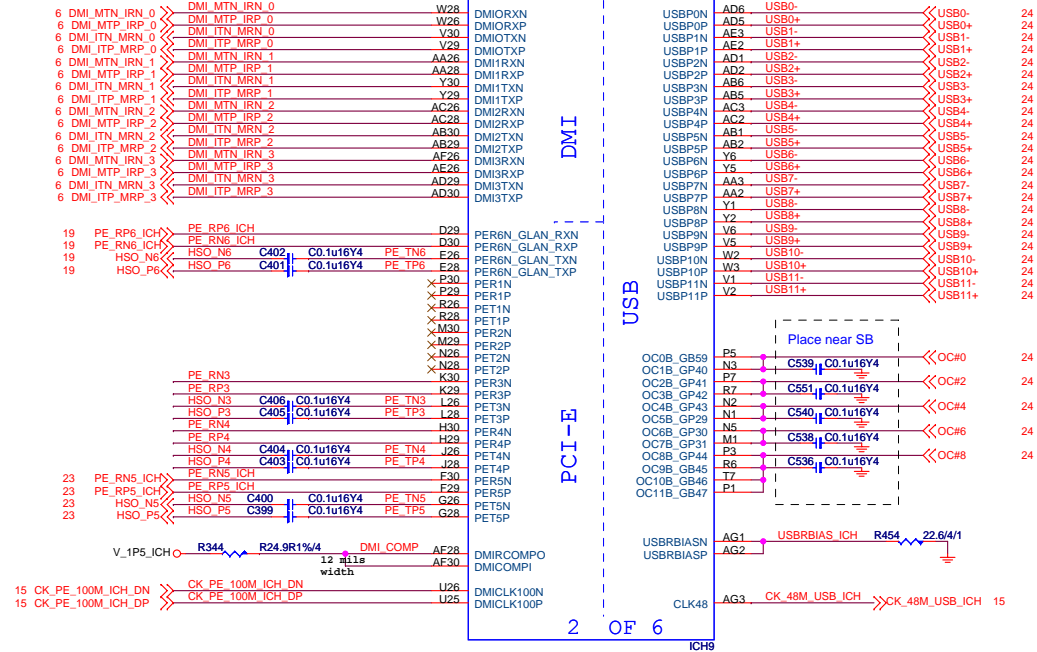





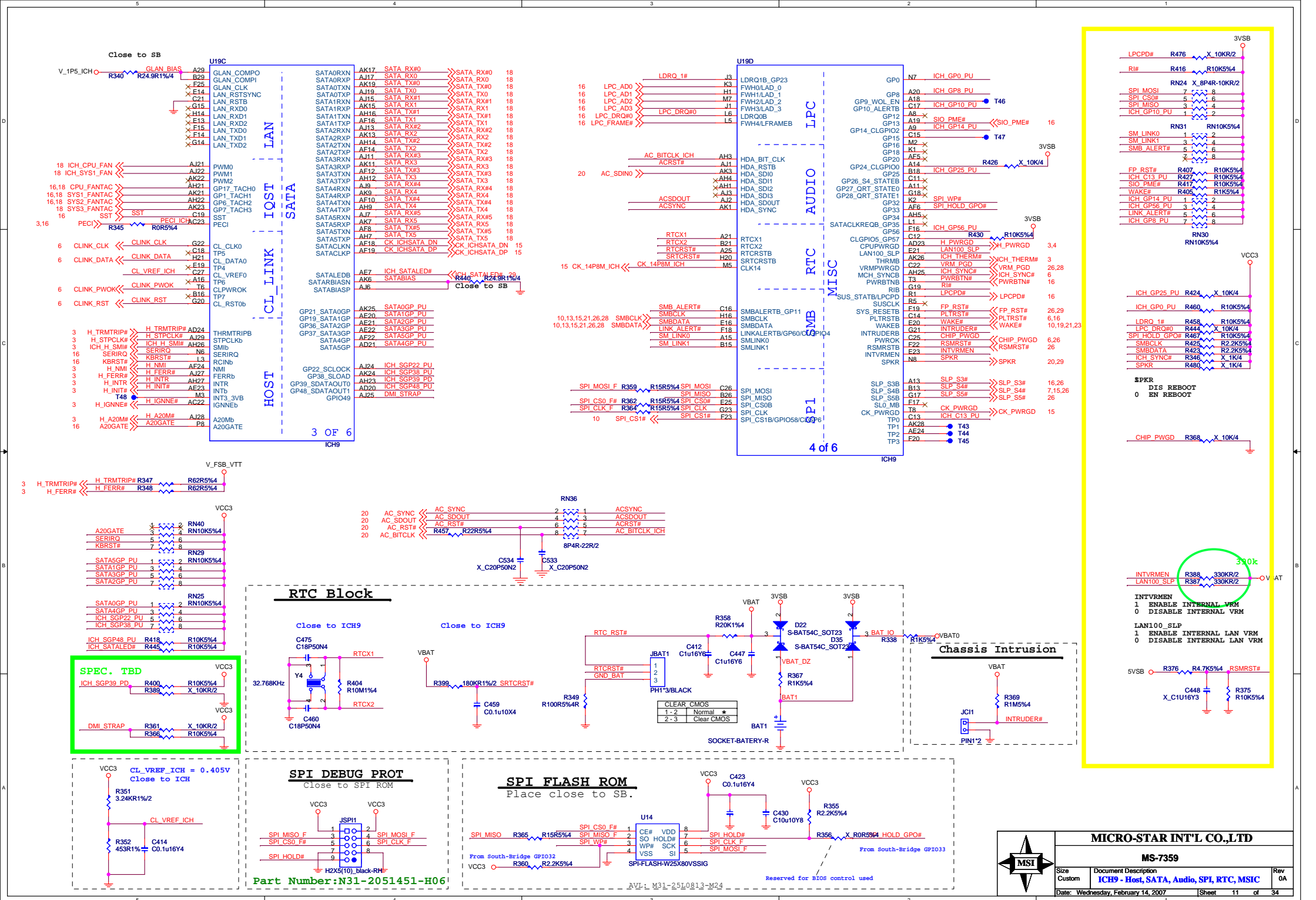


MICRO-STAR INT'L CO.,LTD		
MS-7359		
Size	Document Description	Rev
Custom	Bearlake - Memory	0A
Date: Tuesday, February 13, 2007		
Sheet 7 of 34		

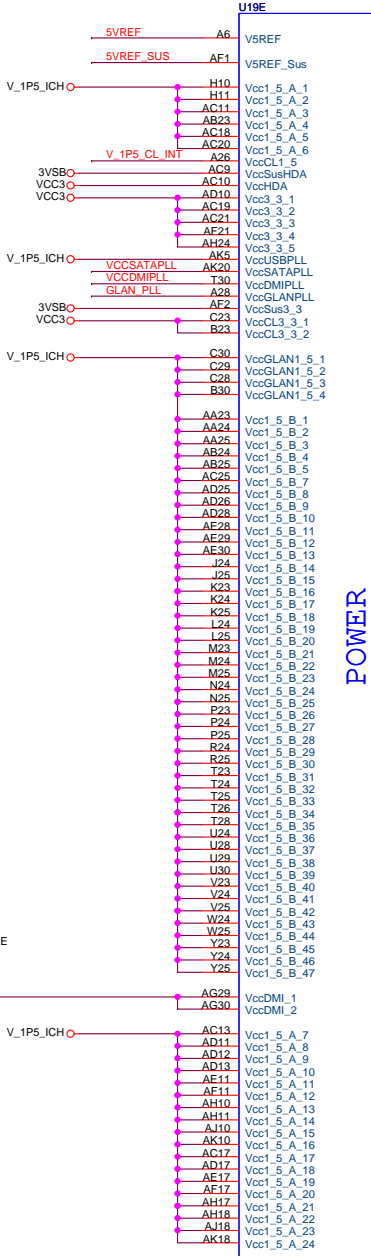
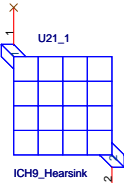
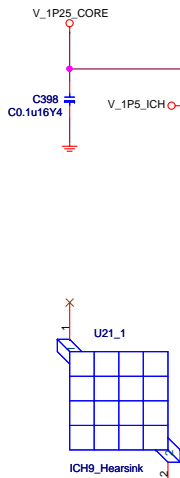
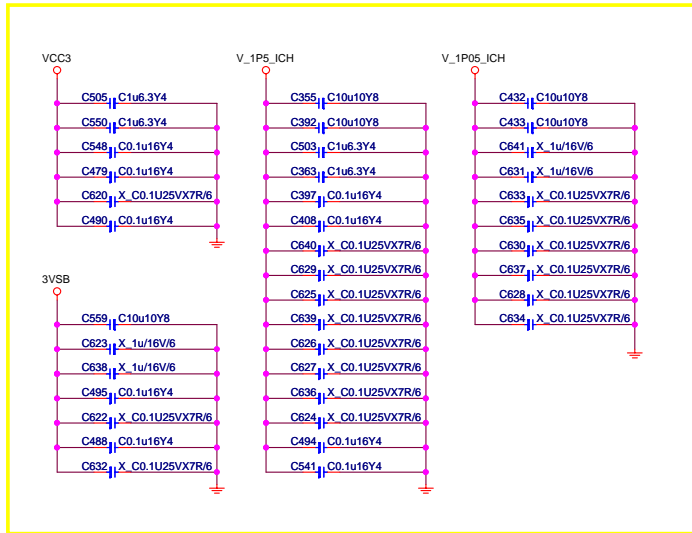
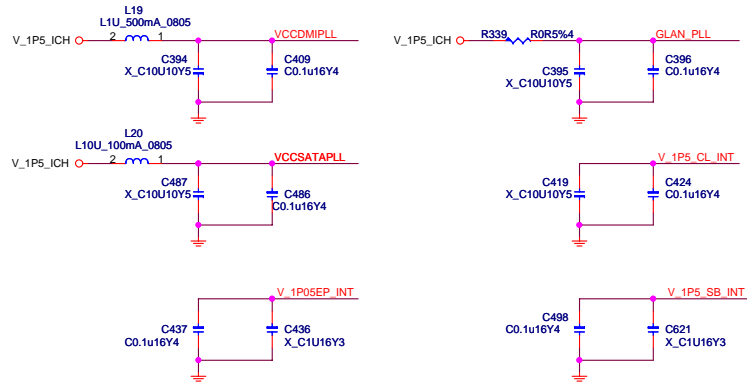
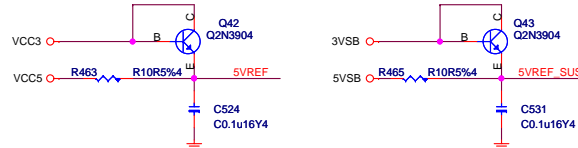




	MICRO-STAR INT'L CO.,LTD		
	MS-7359		
	Size Custom	Document Description ICH9 - PCI, DMI, USB, PCIE & Slots	Rev 0A
	Date: Wednesday, February 14, 2007	Sheet 10 of 34	



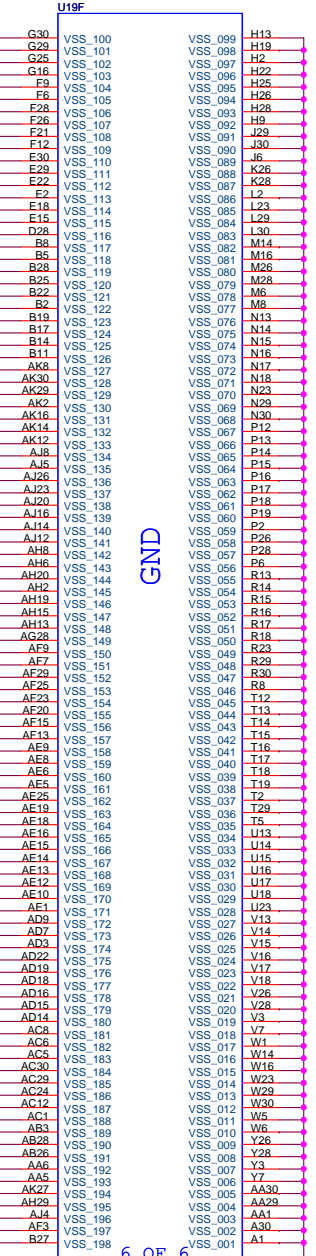
5VREF & 5VREF_SUS Sequencing Circuit



POWER

5 OF 6

ICH9



GND

6 OF 6

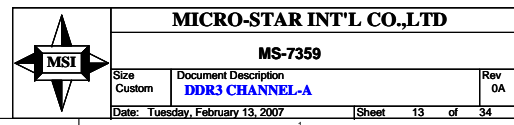
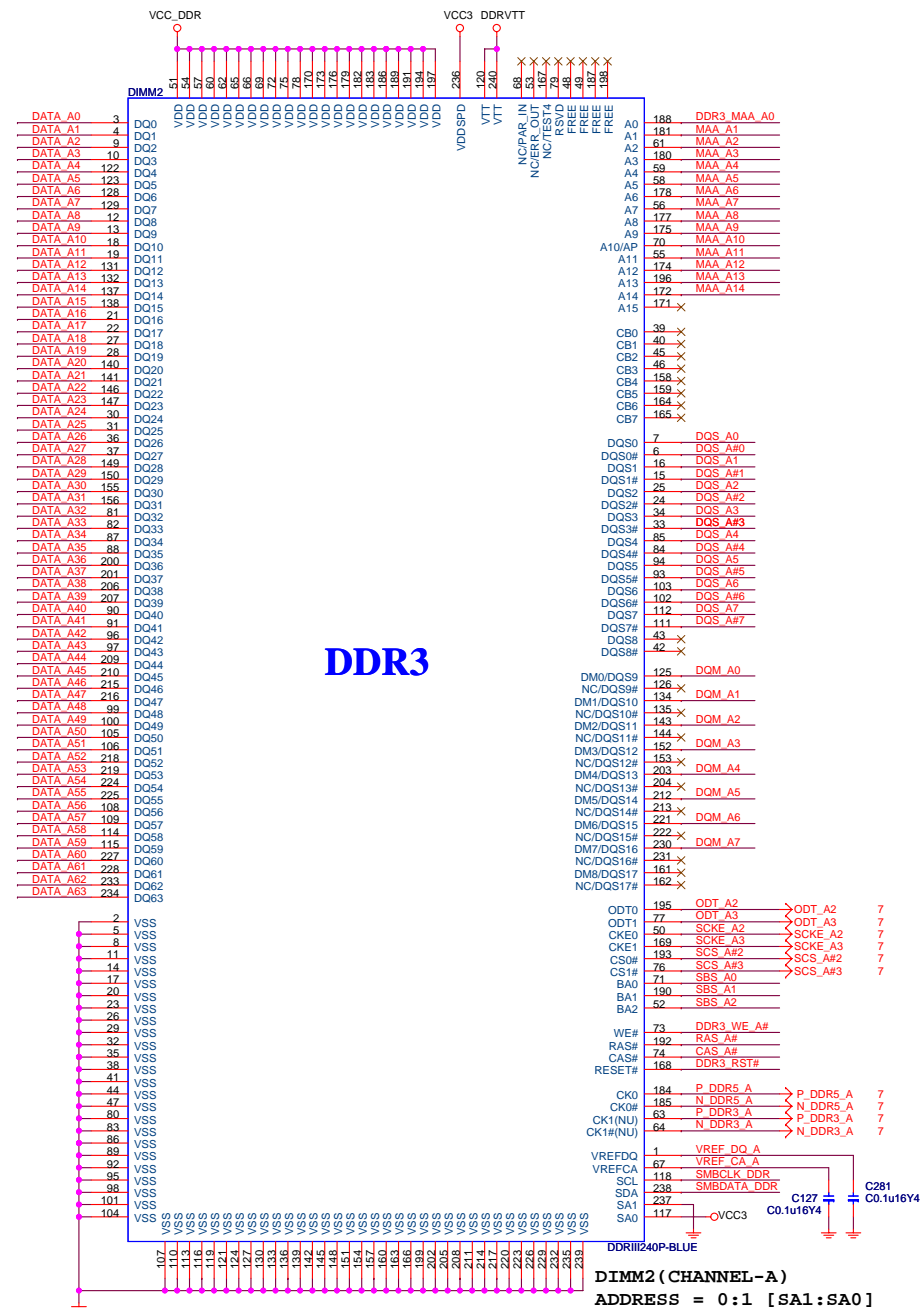
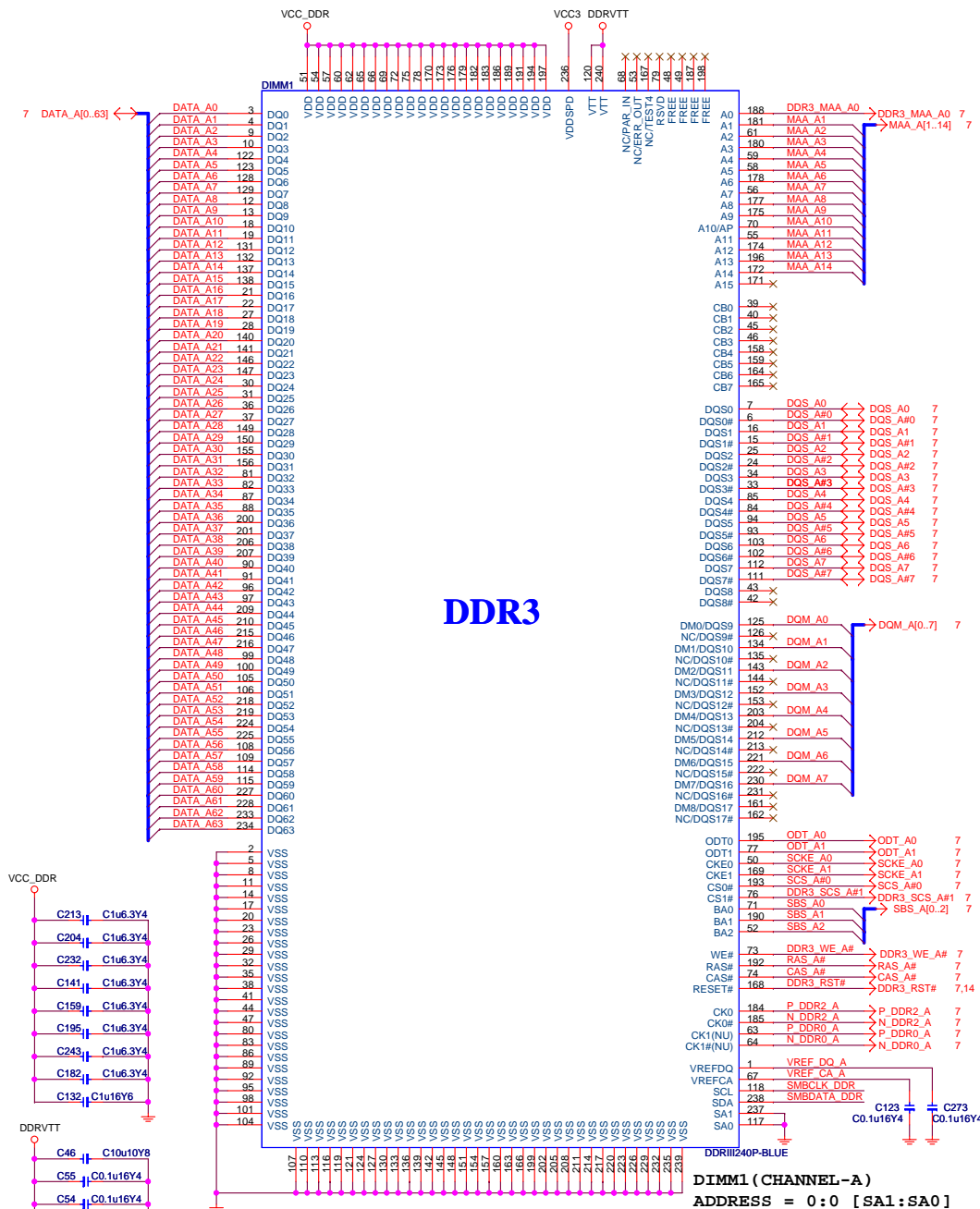
ICH9

AC7, H17 & H18, AD8 spec TBD

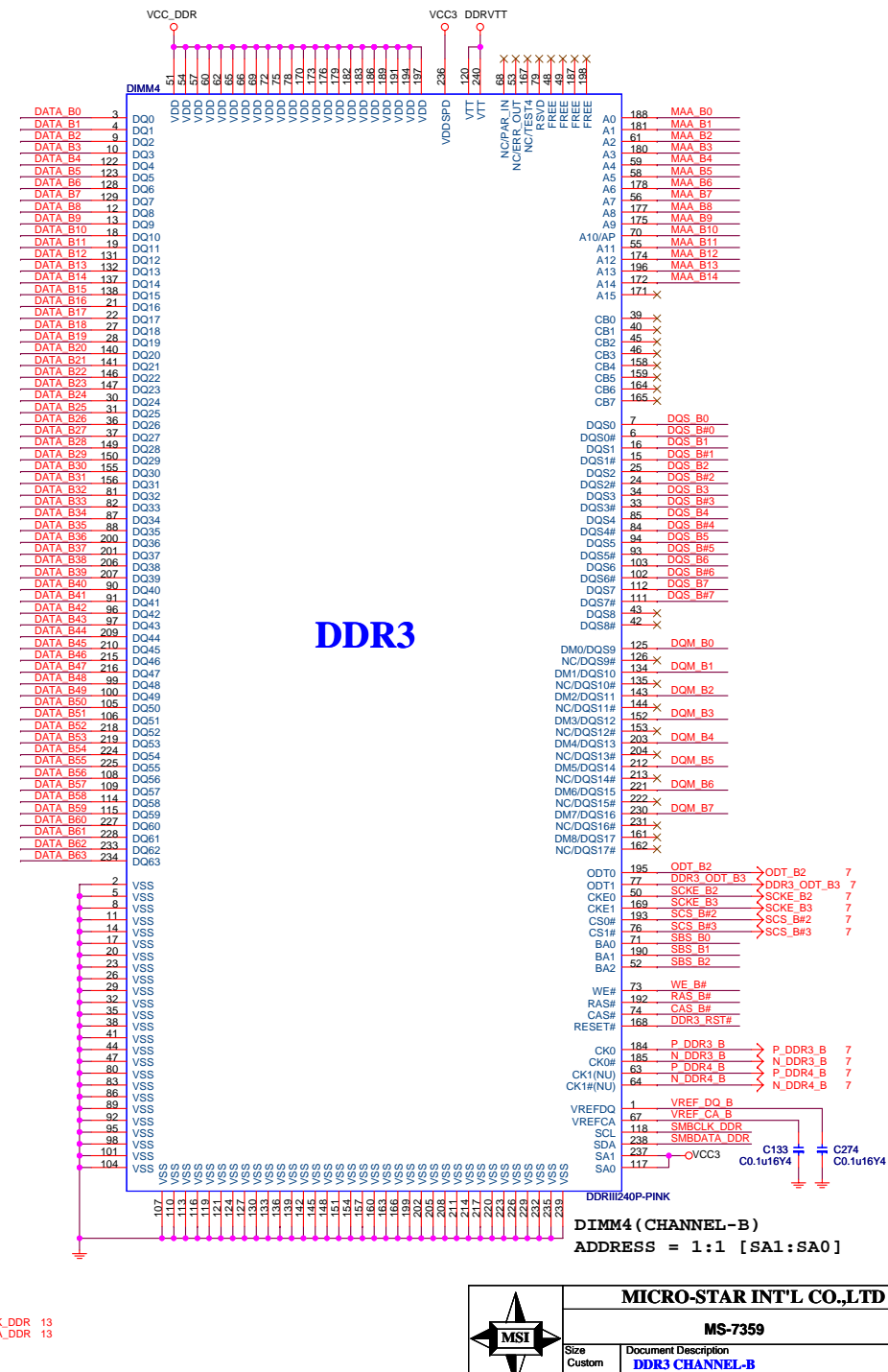
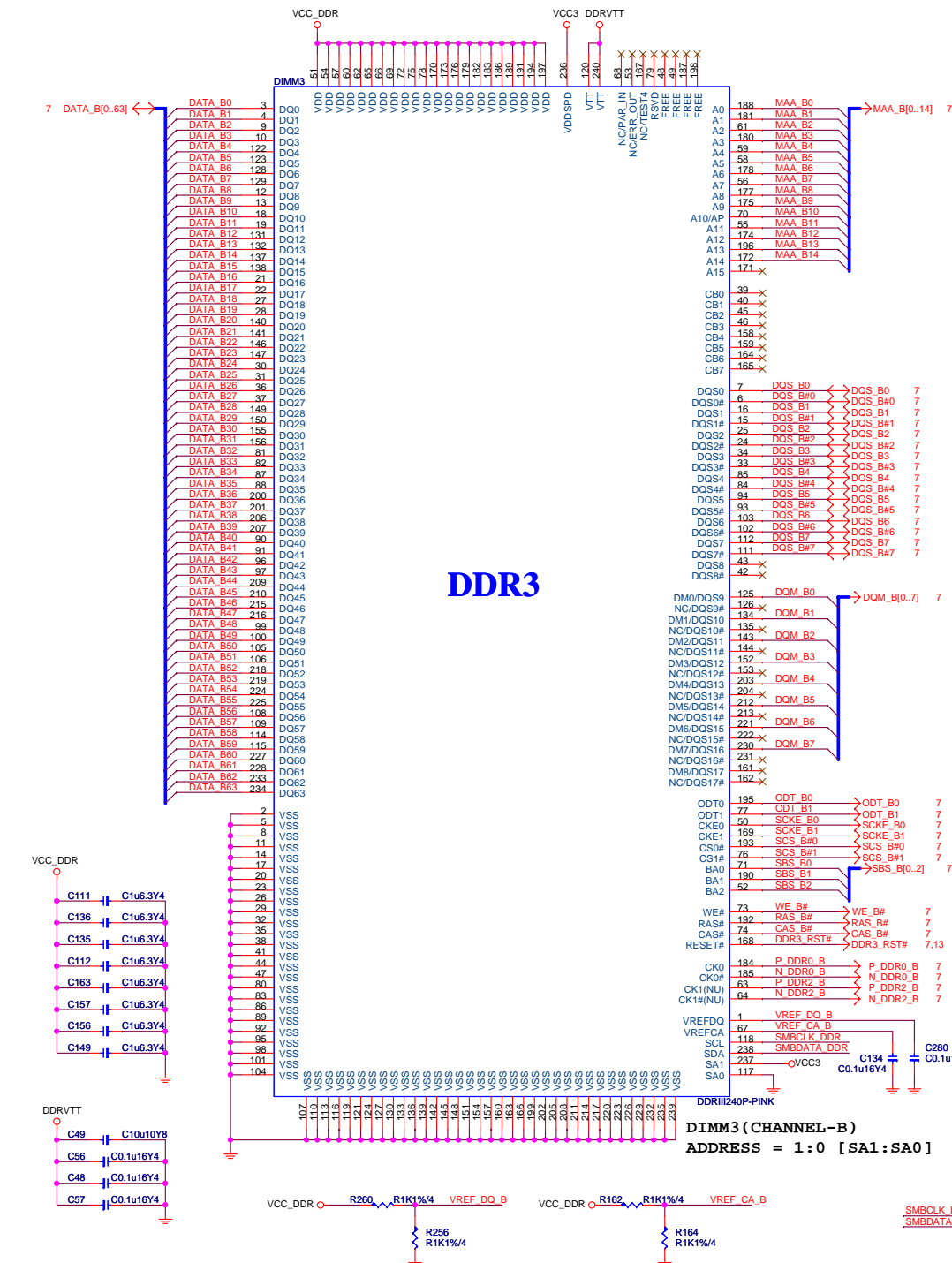


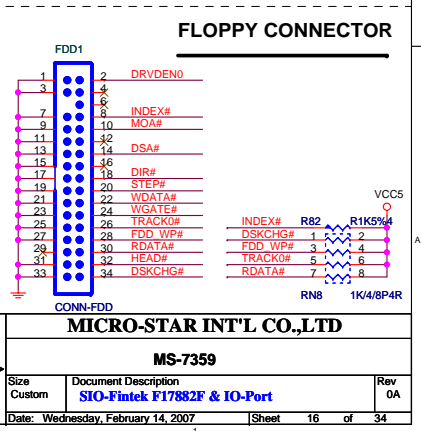
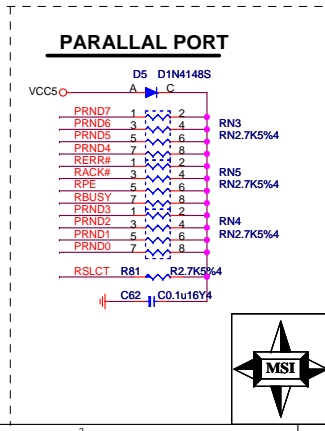
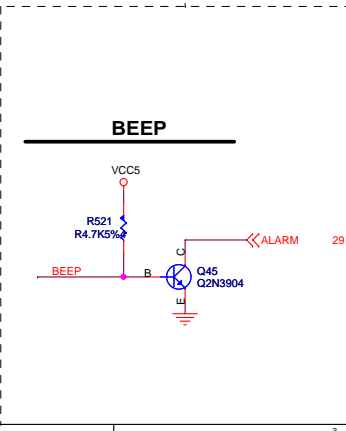
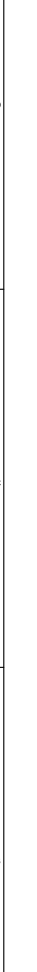
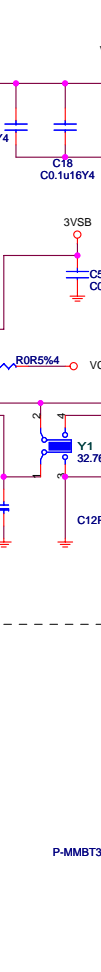
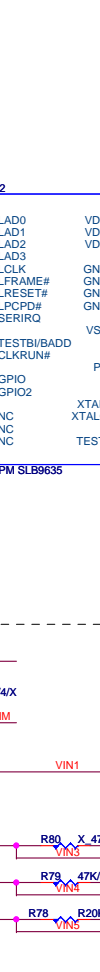
MICRO-STAR INT'L CO.,LTD		
MS-7359		
Size	Document Description	Rev
Custom	ICH9 - Power, GND	0A
Date: Tuesday, February 13, 2007	Sheet 12 of 34	

DDR3 CHANNEL-A

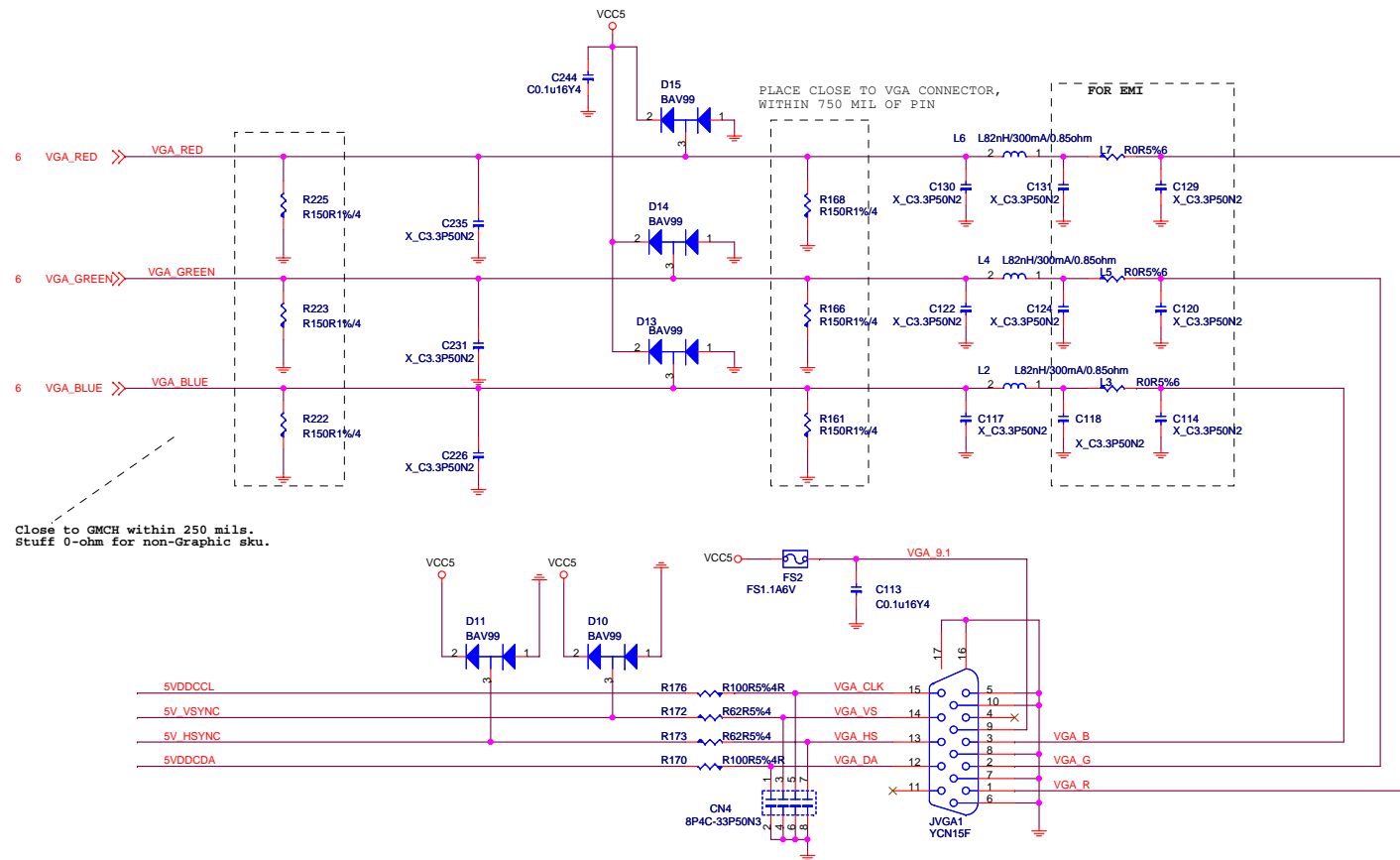


DDR3 CHANNEL-B

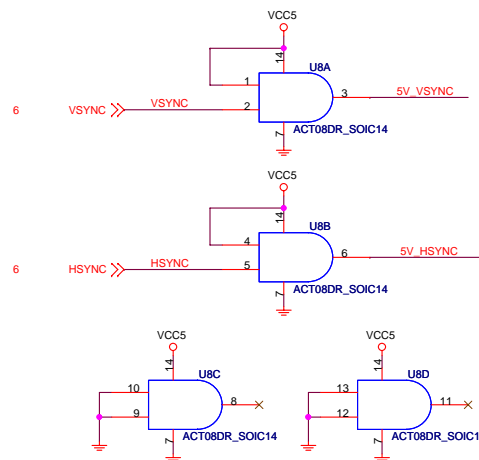
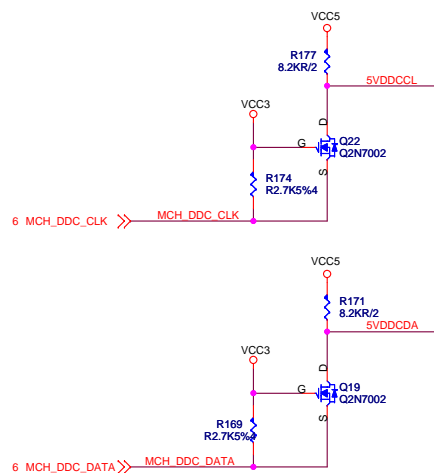




Video Connector



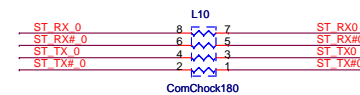
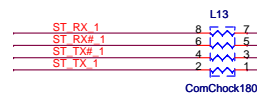
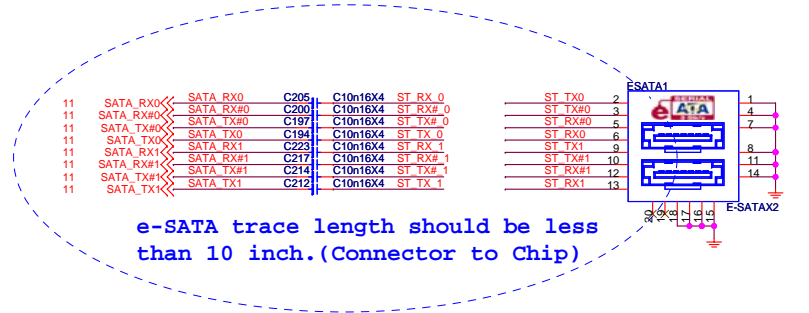
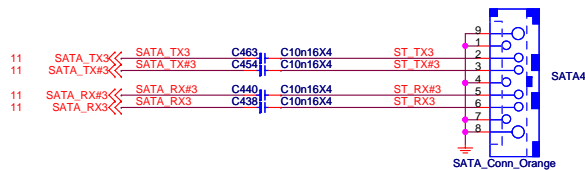
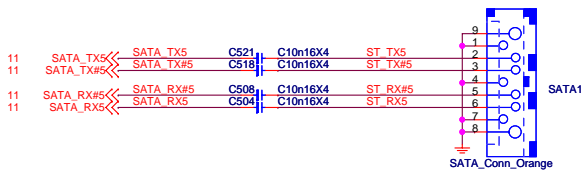
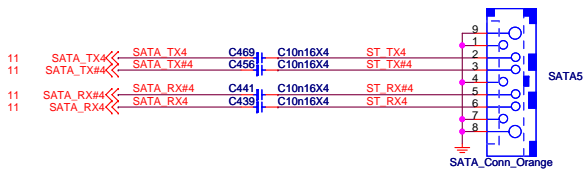
Close to GMCH within 250 mils.
Stuff 0-ohm for non-Graphic sku.



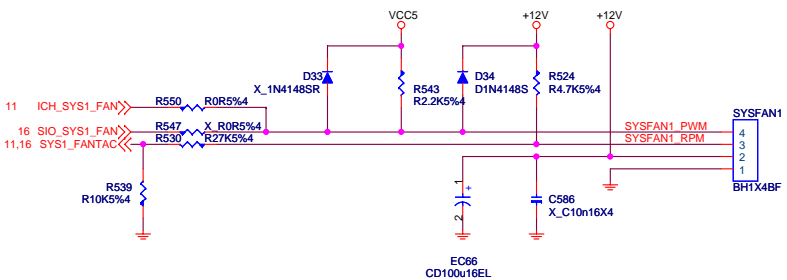
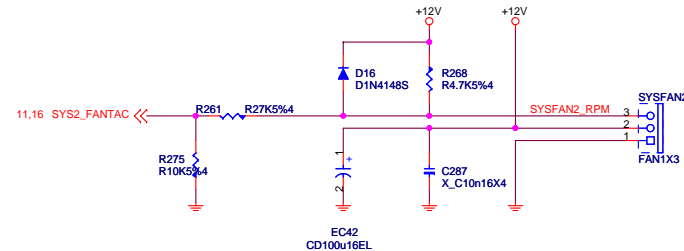
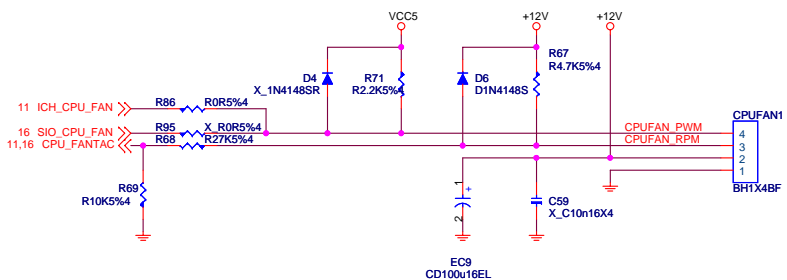
MICRO-STAR INT'L CO.,LTD

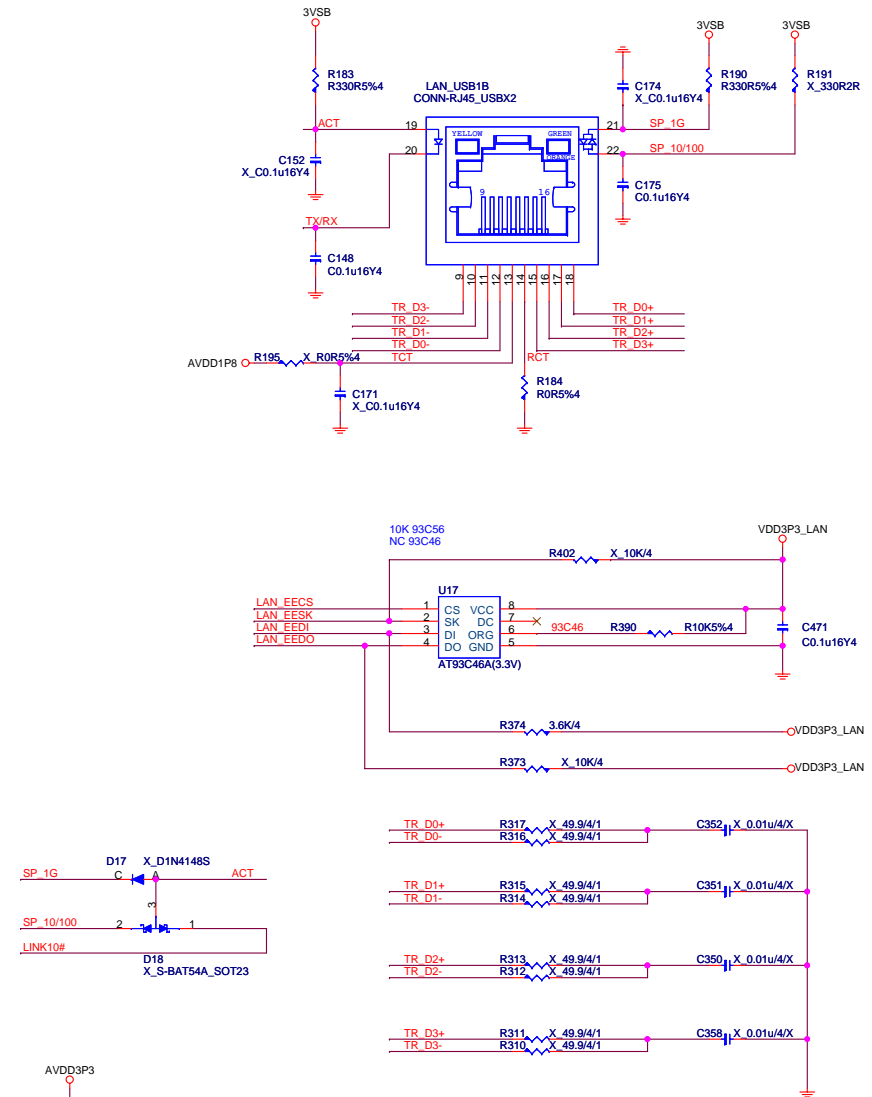
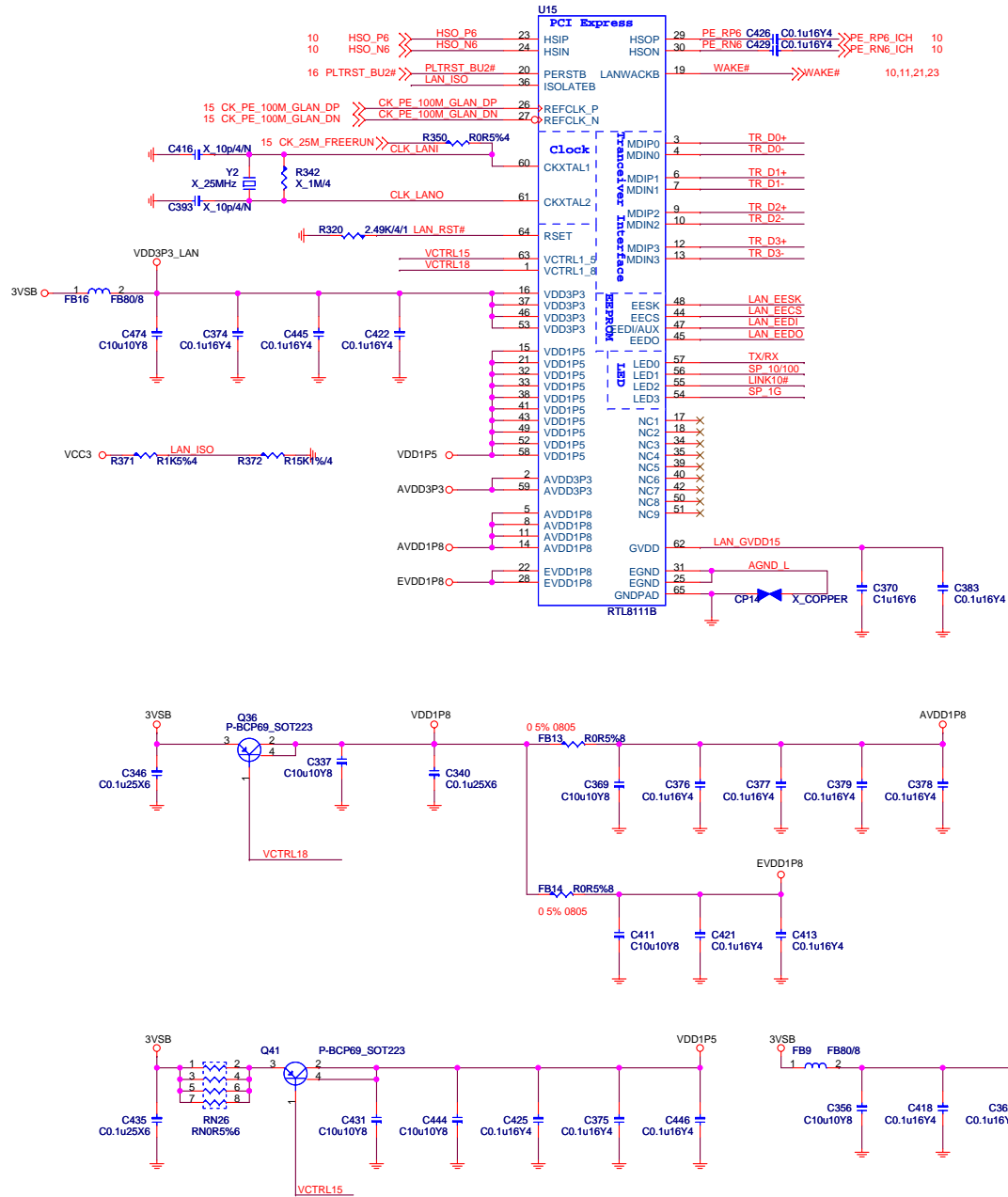
MS-7359

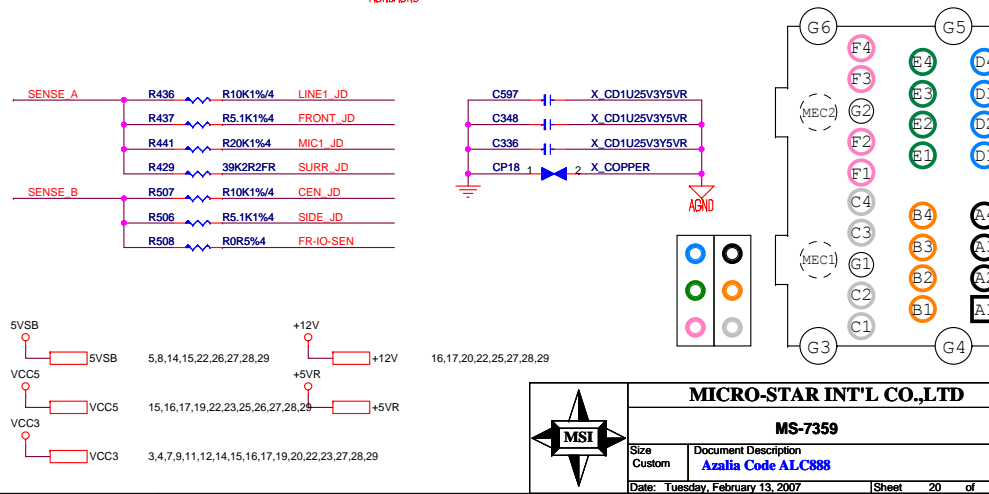
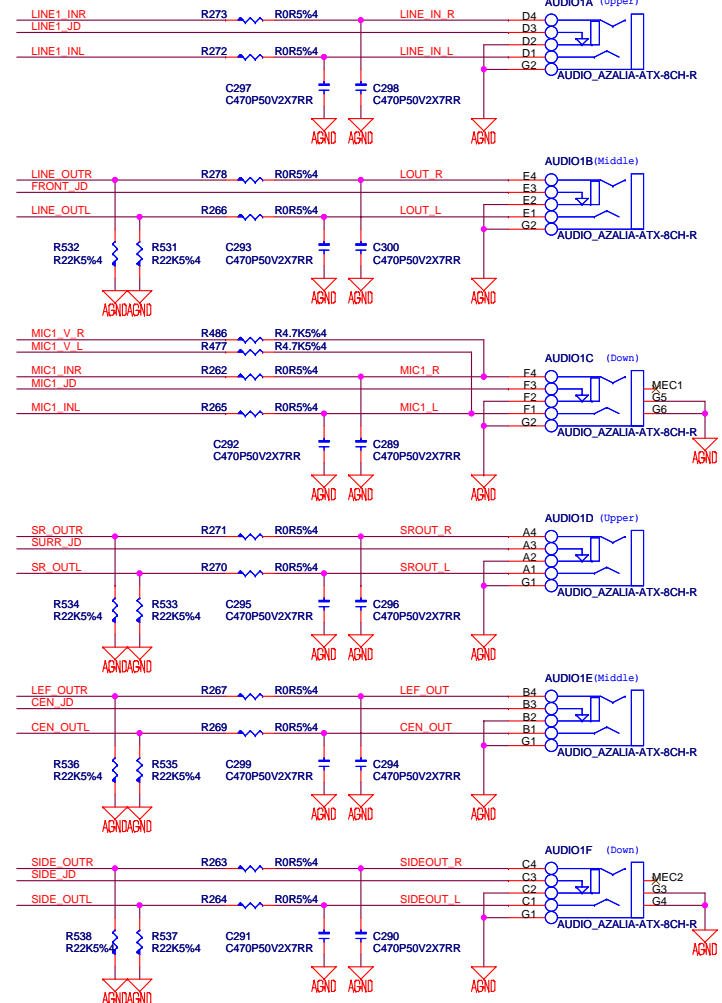
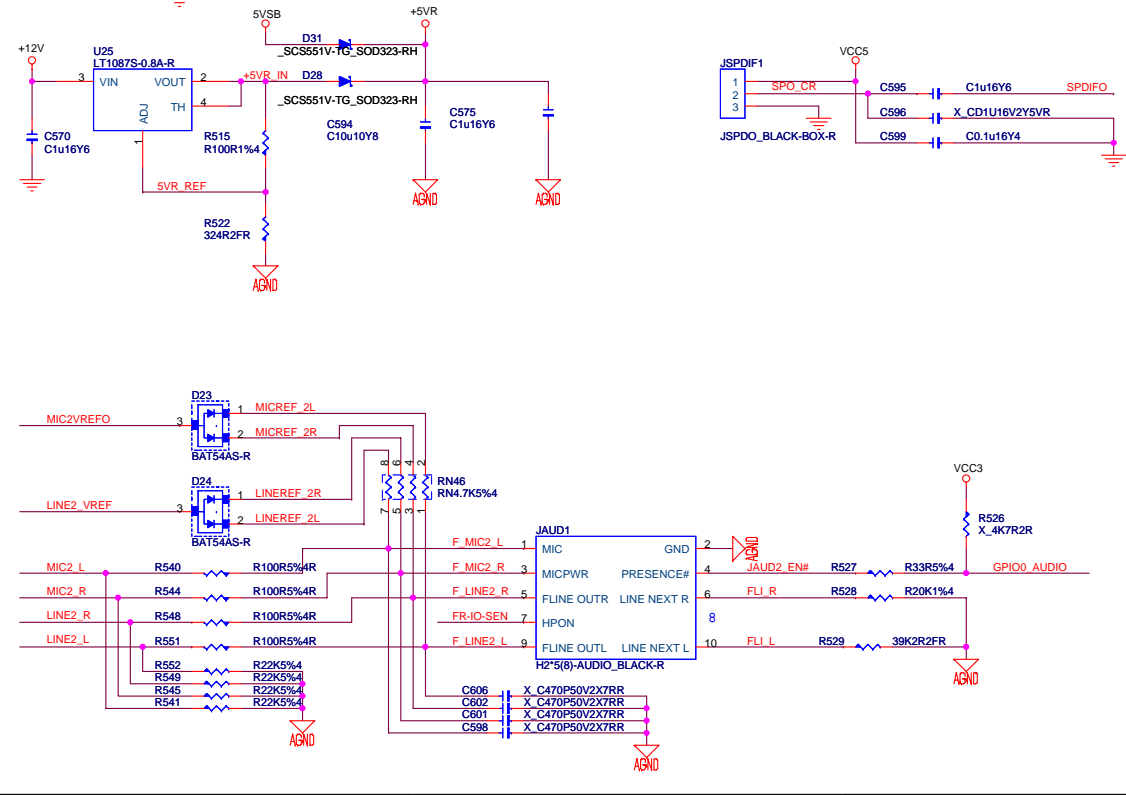
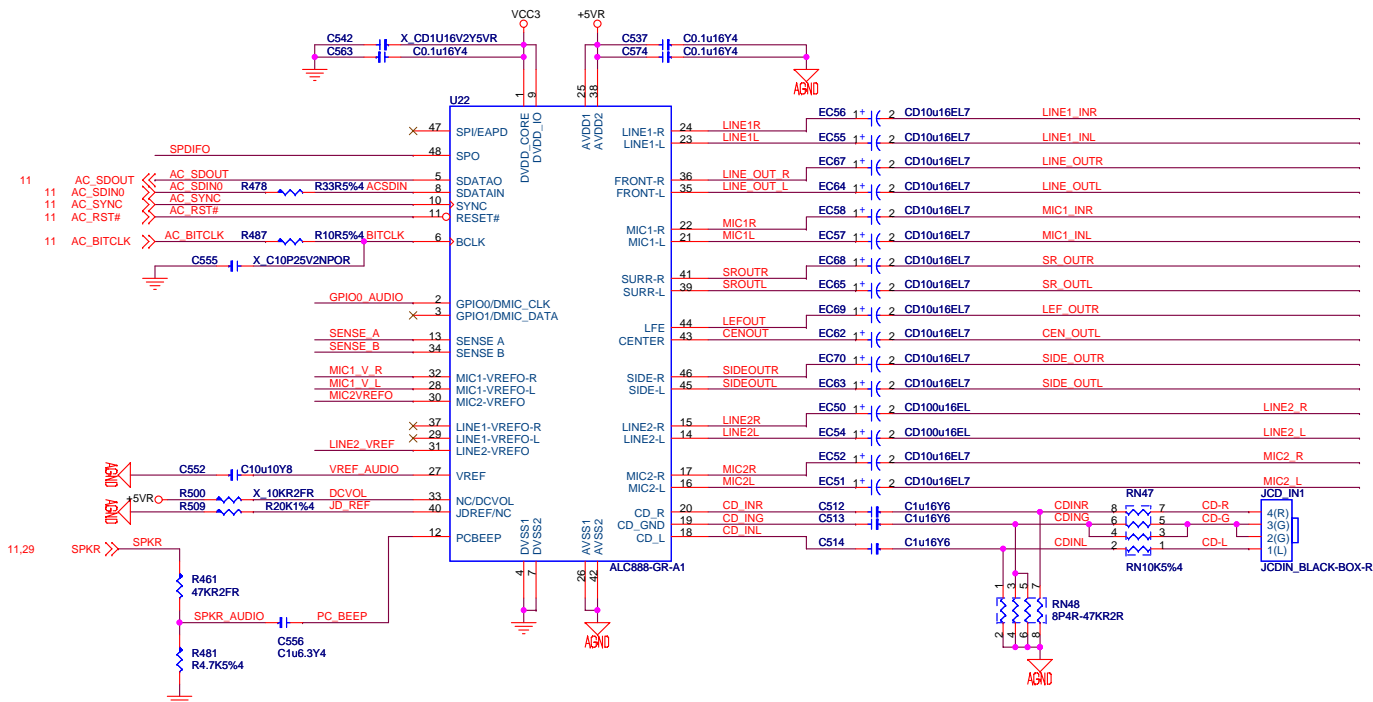
Size	Document Description	Rev
Custom	VGA Connector	0A
Date: Tuesday, February 13, 2007	Sheet 17 of 34	



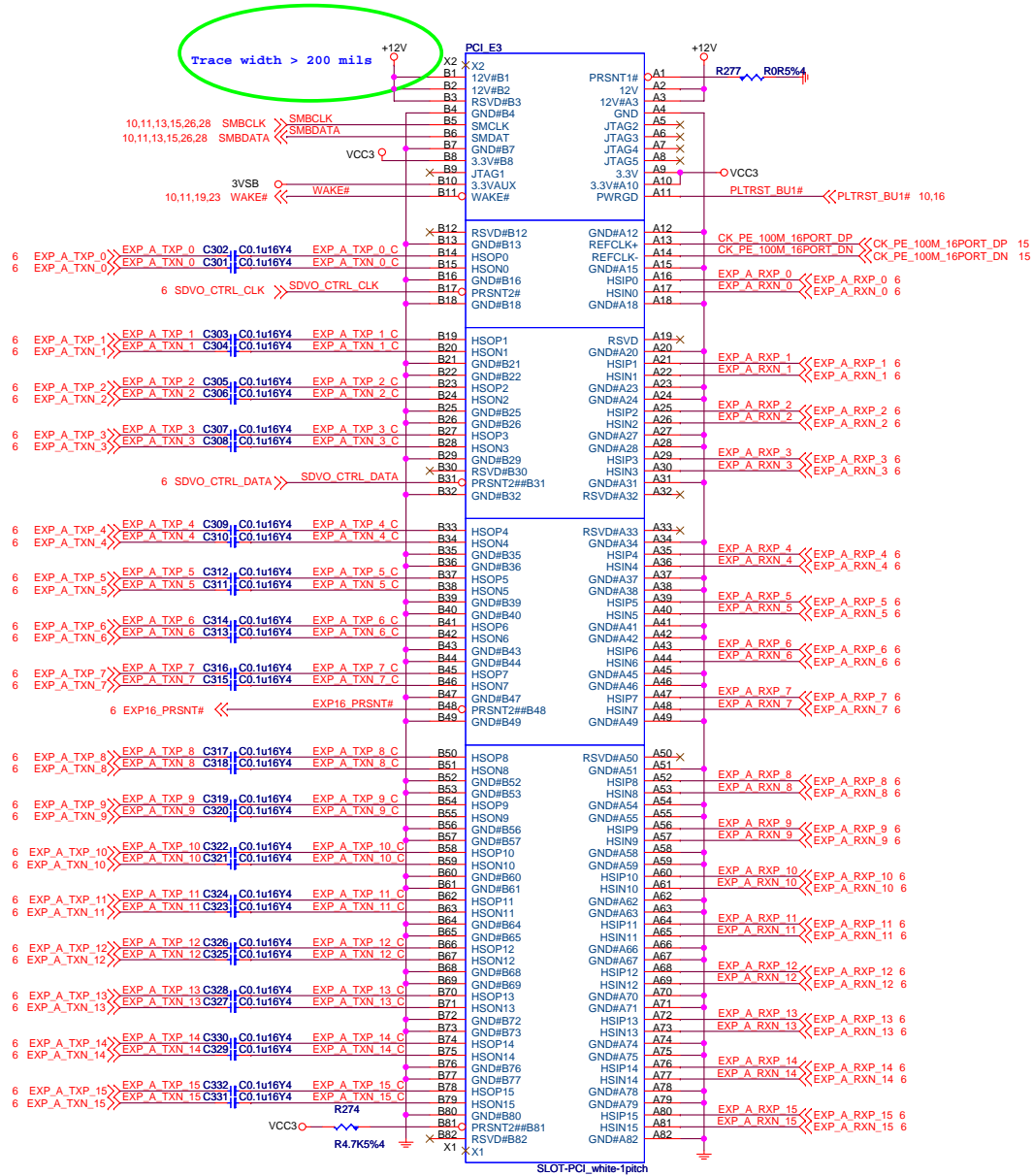
FAN-COUNTROL CIRCUIT



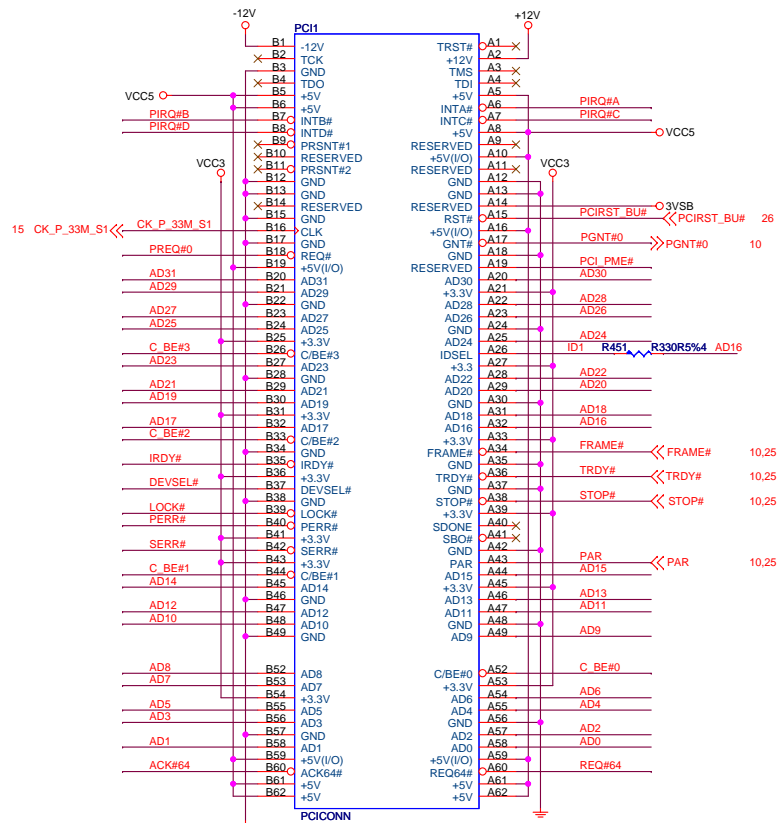




PCI_Express X16 Slot



PCI SLOT 1 (PCI VER: 2.2 COMPLY)



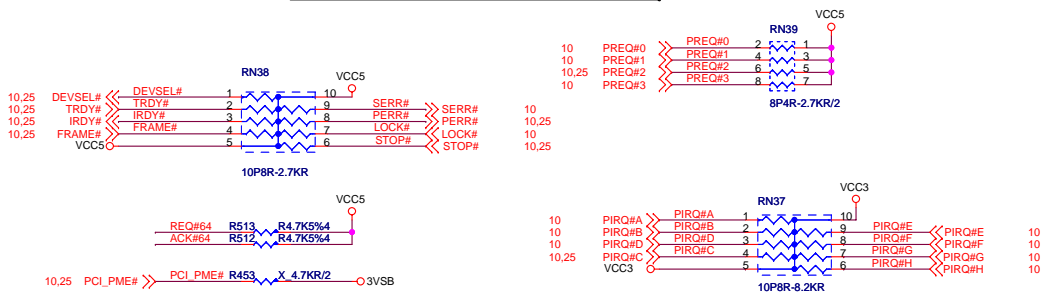
IDSEL = AD16

MASTER = PREQ#0

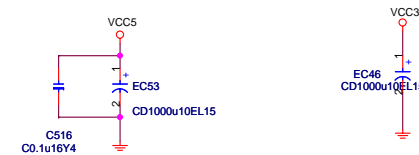
PIRQ#A

10,25 AD[31..0] << AD[31..0]
10,25 C_BE#[3..0] << C_BE#[3..0]

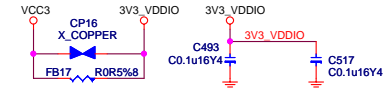
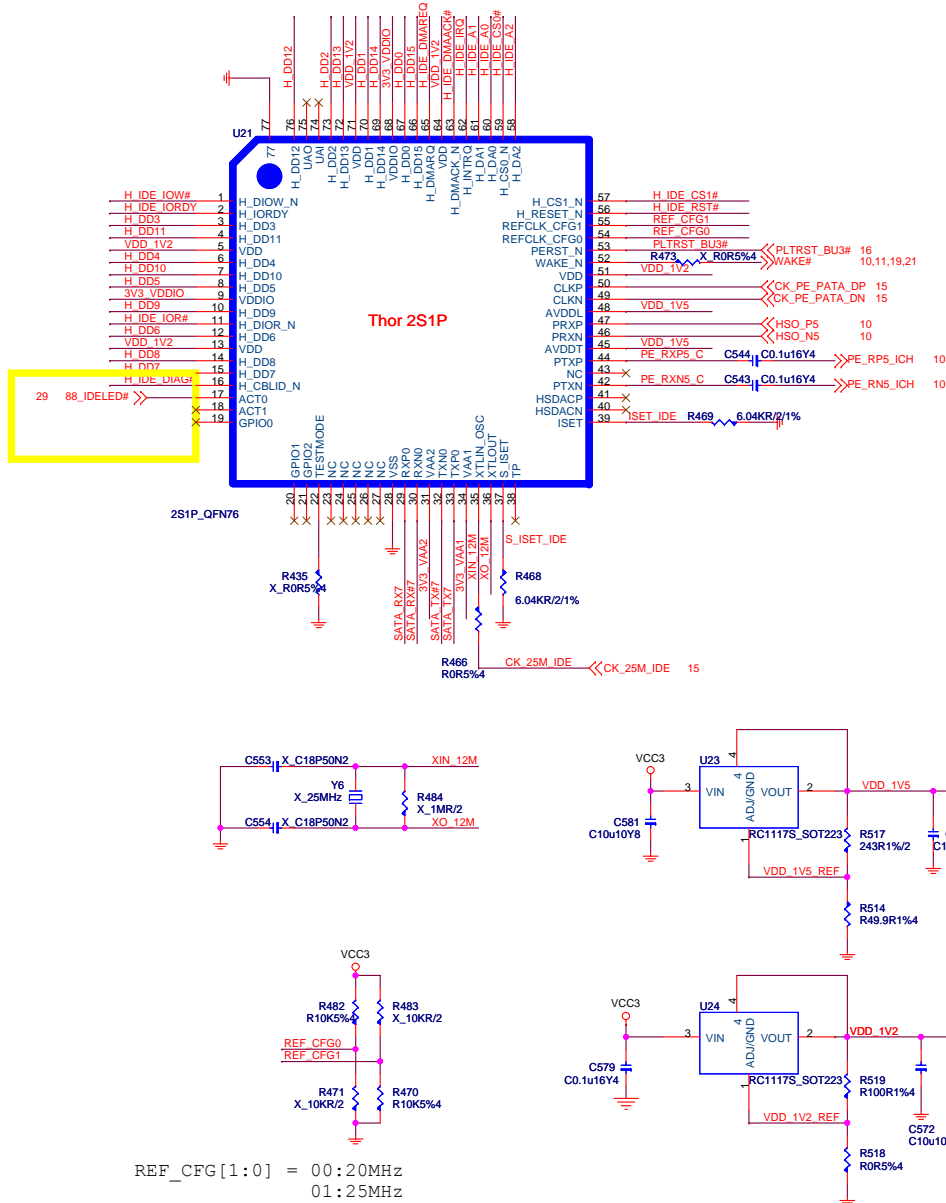
PCI PULL-UP / DOWN RESISTORS



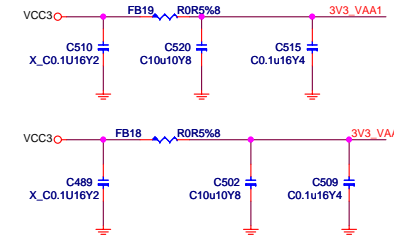
PCI SLOT DECOUPLING CAPACITORS



Hi-Speed PCIE to SATA/PATA Bridge



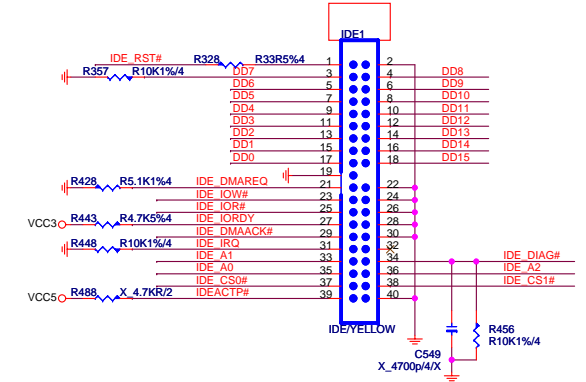
L02-8008074-J07 FOR BEAD



H_DD15	2	1	DD15	RN35
H_DD0	4	3	DD0	RN33R5%4
H_DD14	6	2	DD14	
H_DD1	8	2	DD1	
H_DD11	2	1	DD11	RN33
H_DD4	4	3	DD4	RN33R5%4
H_DD10	6	2	DD10	
H_DD5	8	2	DD5	
H_DD9	2	1	DD9	RN32
H_DD6	4	3	DD6	RN33R5%4
H_DD8	6	2	DD8	
H_DD7	8	2	DD7	
H_DD13	2	1	DD13	RN34
H_DD2	4	3	DD2	
H_DD12	6	2	DD12	RN33R5%4
H_DD3	8	2	DD3	

H_IDE_IOW#	R433	R22R5%4	IDE_IOW#
H_IDE_IORDY	R431	R22R5%4	IDE_IORDY
H_IDE_A2	R479	R22R5%4	IDE_A2
H_IDE_A1	R456	R22R5%4	IDE_A1
H_IDE_A0	R462	R22R5%4	IDE_A0
H_IDE_DMAACK#	R447	R22R5%4	IDE_DMAACK#
H_IDE_CS0#	R474	R22R5%4	IDE_CS0#
H_IDE_CS1#	R485	R22R5%4	IDE_CS1#
H_IDE_RST#	R472	R22R5%4	IDE_RST#

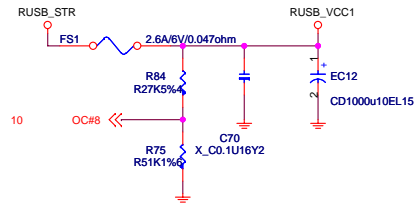
H_IDE_DMAREQ	R446	R82.5R1%4	IDE_DMAREQ
H_IDE_IORDY	R432	R82.5R1%4	IDE_IORDY
H_IDE_IRQ	R460	R82.5R1%4	IDE_IRQ
H_IDE_DIAG#	R434	R82.5R1%4	IDE_DIAG#



Rear USB Connector

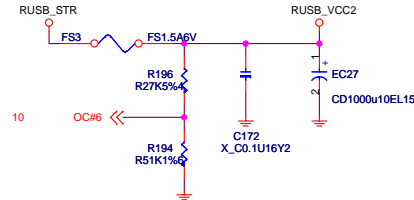
USB POWER FOR PORT 8,9,10,11

NEAR CONNECTOR

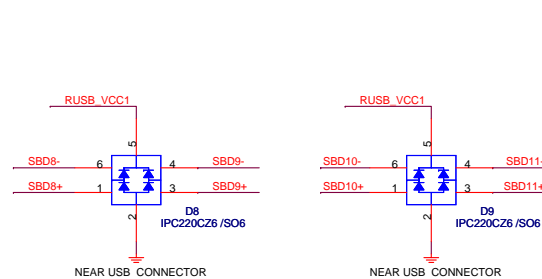
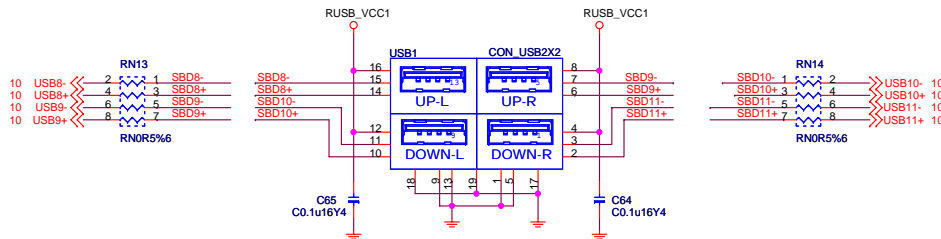


USB POWER FOR PORT 6,7

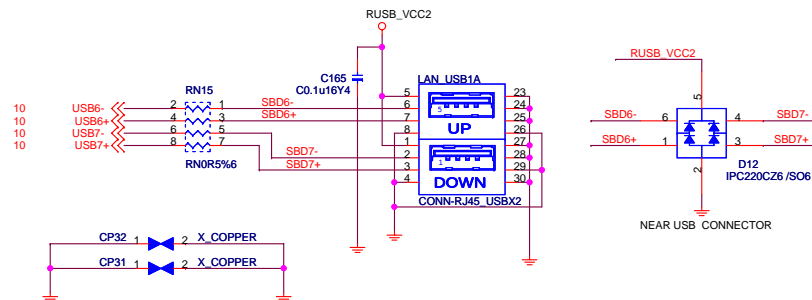
NEAR CONNECTOR



REAR USB PORT 8-11 (2x2)



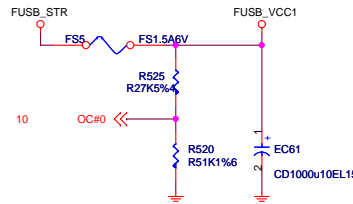
REAR USB PORT 6,7 (With LAN)



Front USB Connector

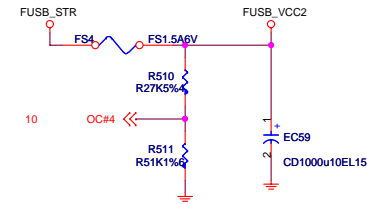
USB POWER FOR PORT 0,1

NEAR CONNECTOR



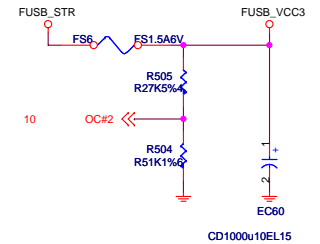
USB POWER FOR PORT 4,5

NEAR CONNECTOR

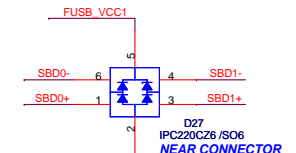
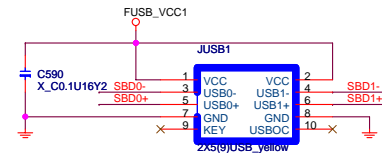


USB POWER FOR PORT 2,3

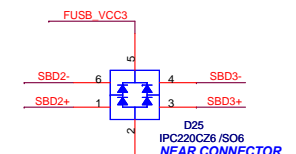
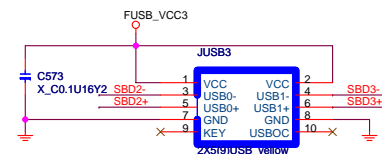
NEAR CONNECTOR



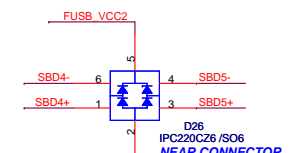
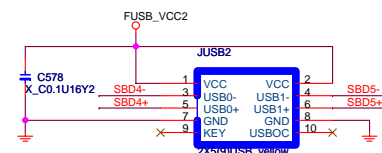
FRONT USB PORT 0,1



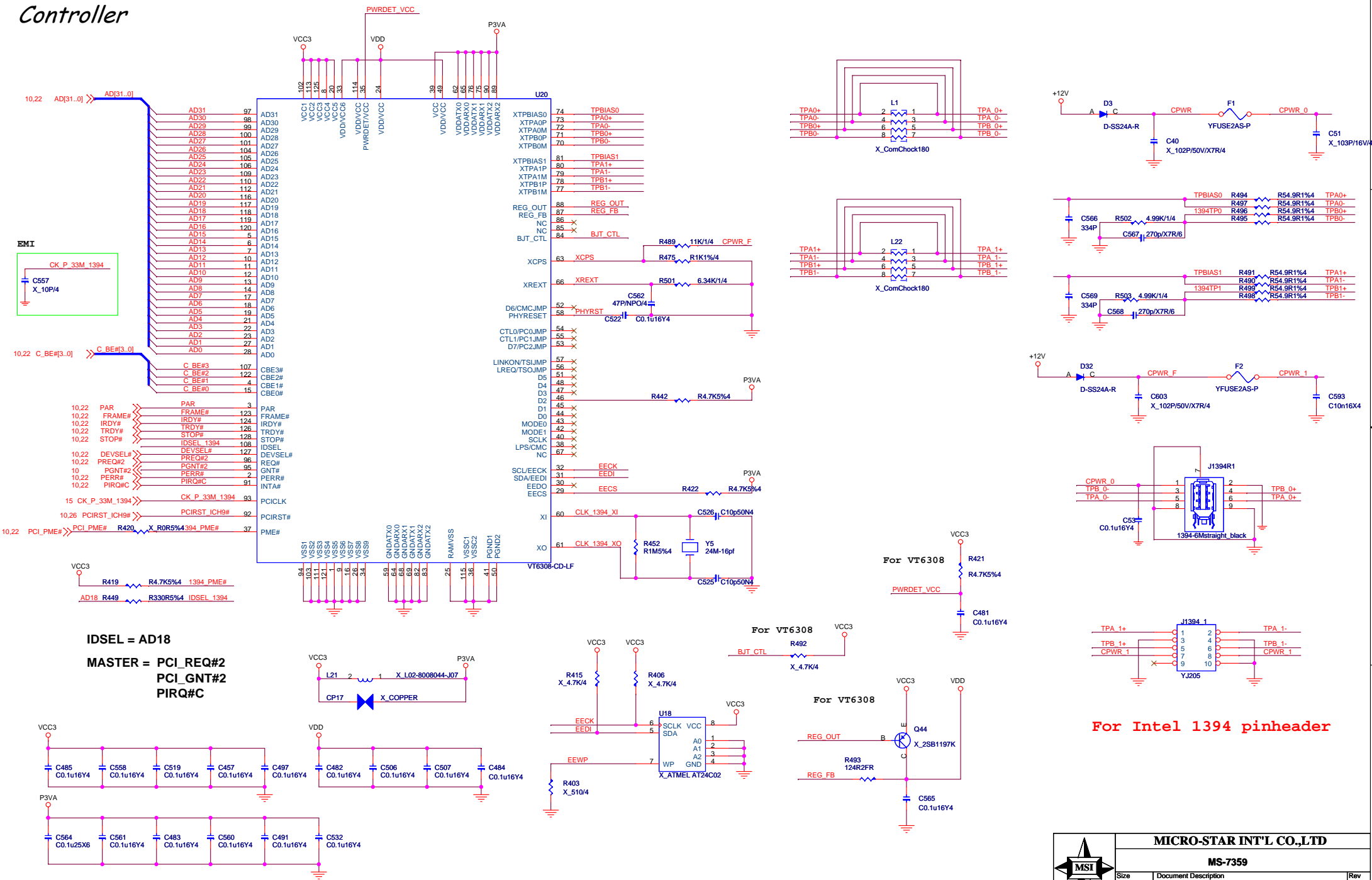
FRONT USB PORT 2,3



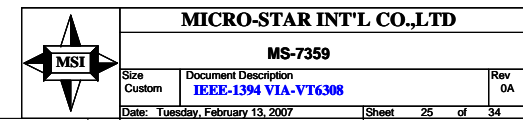
FRONT USB PORT 4,5



1394a OHCI Link Layer Controller



For Intel 1394 pinheader

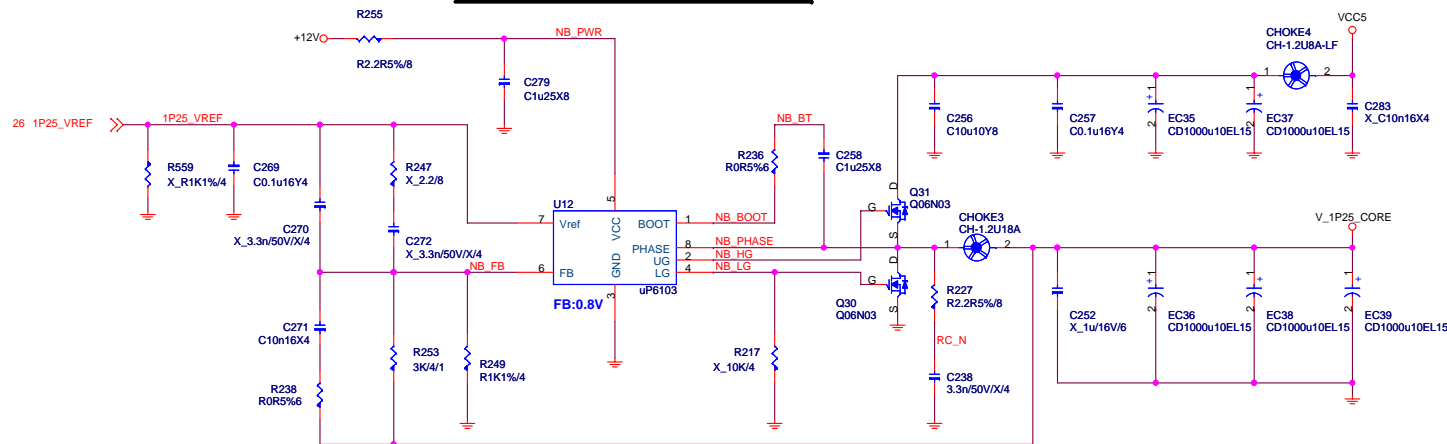


[illegible][illegible]

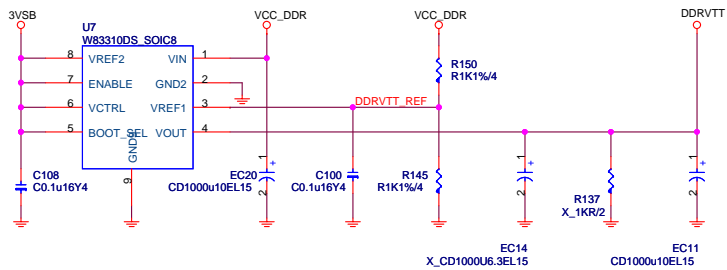
MS-7359

Size Custom	Document Description MS12 & MS13 COLAY & DDR POWER	Rev 0A
Date: Wednesday, February 14, 2007		Sheet 26 of 34

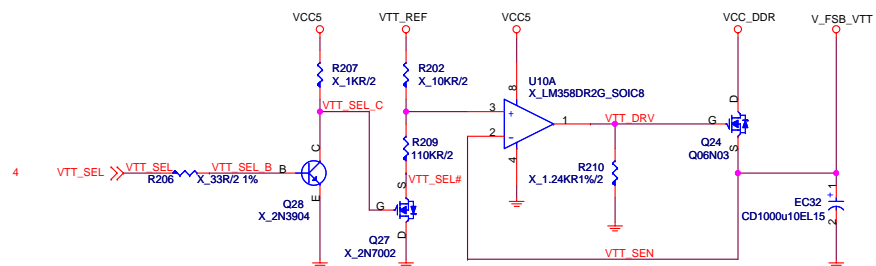
GMCH CORE POWER (1.25V_21.3A)



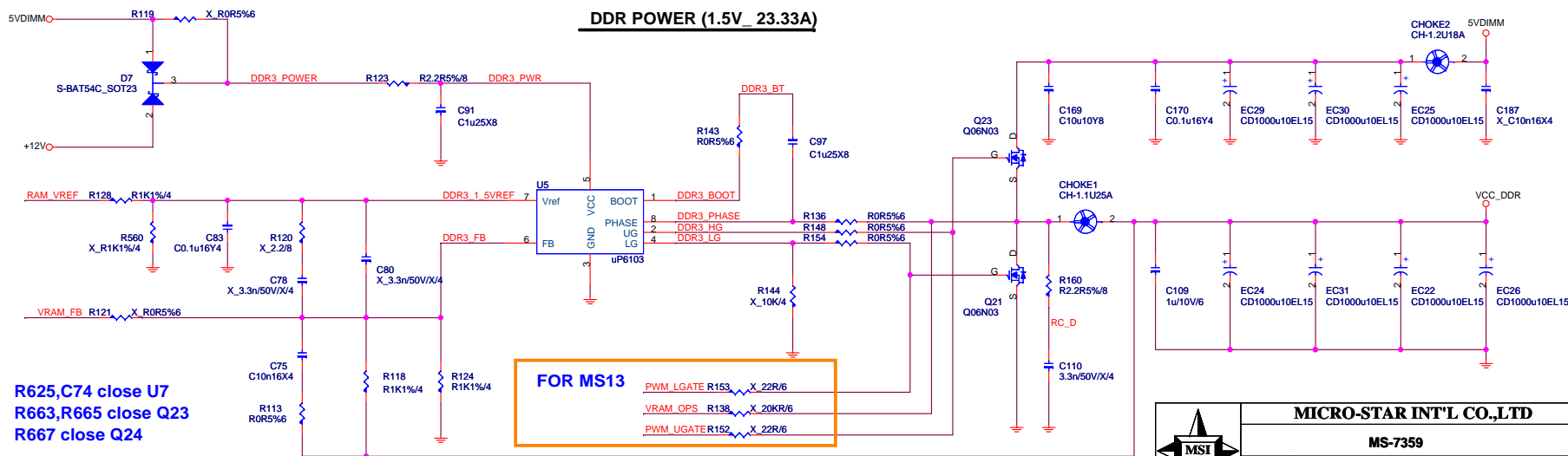
VTT POWER (0.75V_0.83A)



FOR MS13 VTT_REF



DDR POWER (1.5V_23.33A)



R625,C74 close U7
R663,R665 close Q23
R667 close Q24

FOR MS13

PWM_LGATE R153 X_22R/6
VRAM_OPS R138 X_20KR/6
PWM_UGATE R152 X_22R/6

26 PWM_UGATE >>> PWM_UGATE
26 VRAM_OPS >>> VRAM_OPS
26 PWM_LGATE >>> PWM_LGATE
26 RAM_VREF >>> RAM_VREF
26 VRAM_FB >>> VRAM_FB
26 VTT_DRV >>> VTT_DRV
26 VTT_SEN >>> VTT_SEN

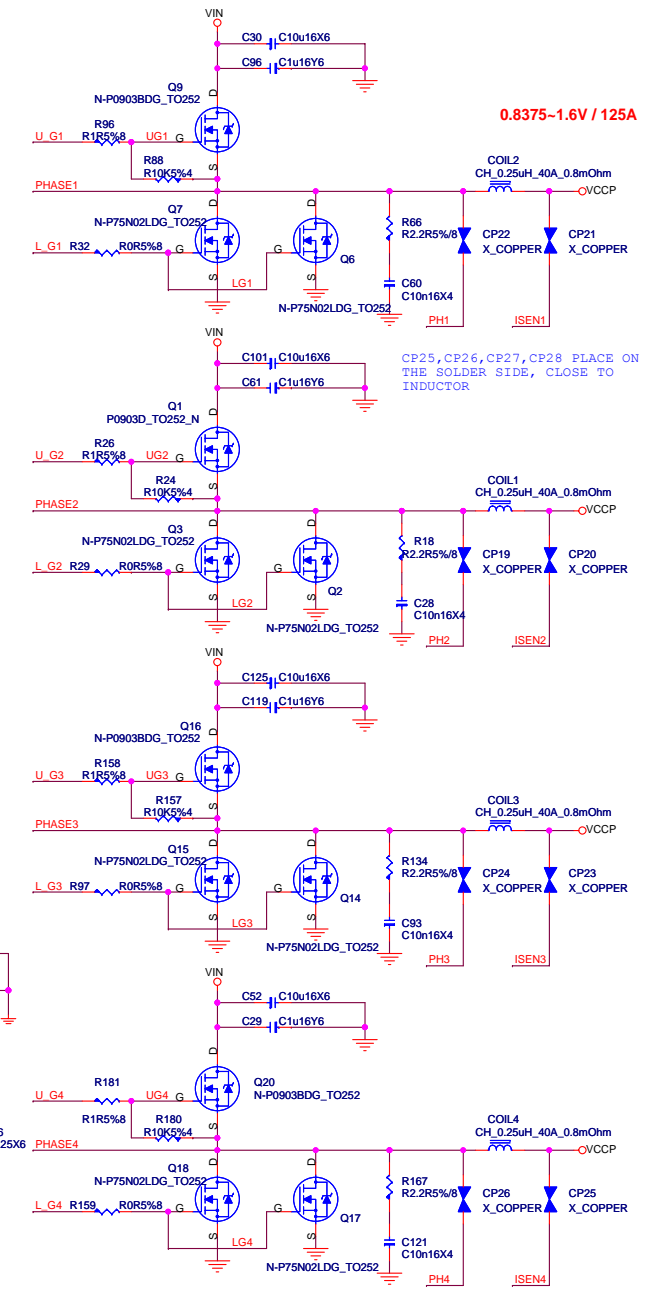
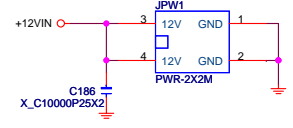
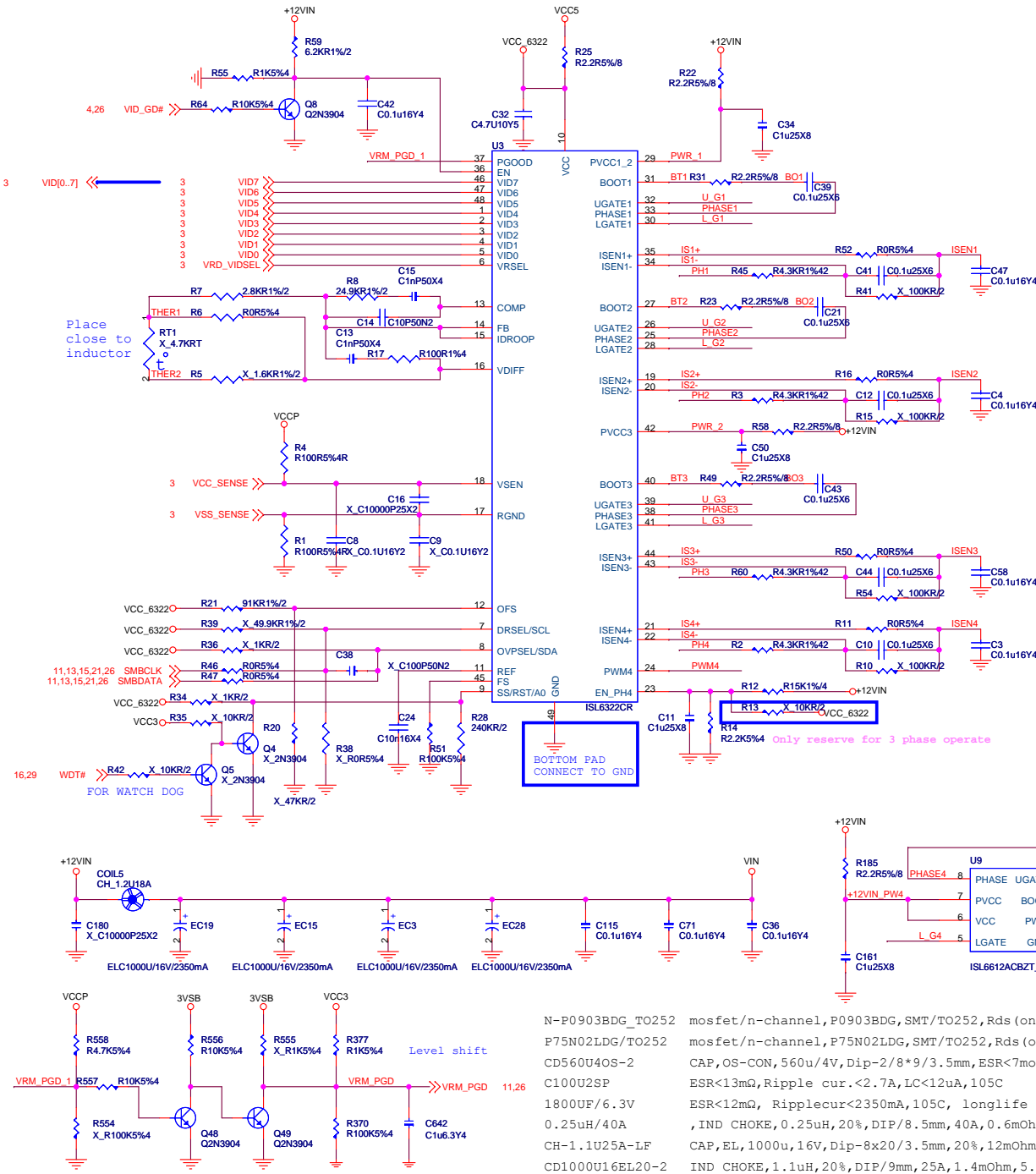


MICRO-STAR INT'L CO.,LTD

MS-7359

Size	Document Description	Rev
Custom	GMCH CORE POWER (1.25V_21.3A)	0A
Date: Wednesday, February 14, 2007	Sheet 27 of 34	

Voltage Regular Module



N-P0903BDG_TO252 mosfet/n-channel, P0903BDG, SMT/TO252, Rds(on)=9.5mΩ(10V/25A), Vgs(on)=1~3V, Id=50A, Ciss=1800pf, Qg=50nC, Vds=25V, Vgs=±20V, RoHS compliance

P75N02LDG/TO252 mosfet/n-channel, P75N02LDG, SMT/TO252, Rds(on)=7mΩ(10V/30A), Vgs(on)=1~3V, Id=75A, Ciss=5000pf, Qg=140nC, Vds=25V, Vgs=±20V, RoHS compliance

CD560U40S-2 CAP, OS-CON, 560u/4V, Dip-2/8*9/3.5mm, ESR<7mohm, Ripple cur.=6100mA, Lc. <500uA, SPEC series, RoHS compliance

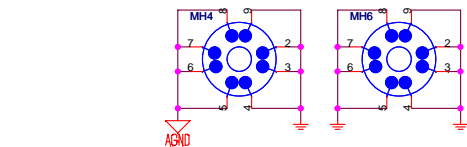
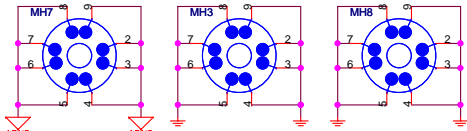
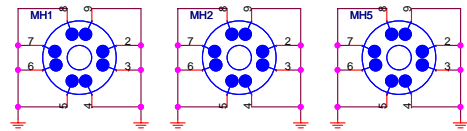
C100U2SP 1800UF/6.3V ESR<12mΩ, Ripple cur.<2350mA, 105C, longlife change from 2000hrs to 3000hrs, K2J series

0.25uH/40A, IND CHOKE, 0.25uH, 20%, DIP/8.5mm, 40A, 0.6mOhm, , PEW, FERRITE, SQUARE, RoHS COMPLIANCE

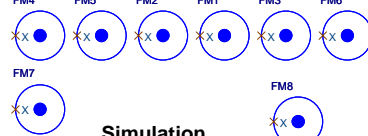
CH-1.1u25A-LF CAP, EL, 1000u, 16V, Dip-8x20/3.5mm, 20%, 12mOhm, 2350mA, 105C, 3000hrs, RoHS COMPLIANCE

IND CHOKE, 1.1uH, 20%, DIP/9mm, 25A, 1.4mOhm, 5.5T, 0.9mmx3, PEW, IRON, , LEAD FREE

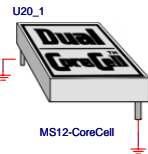
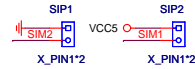
Mounting Holes



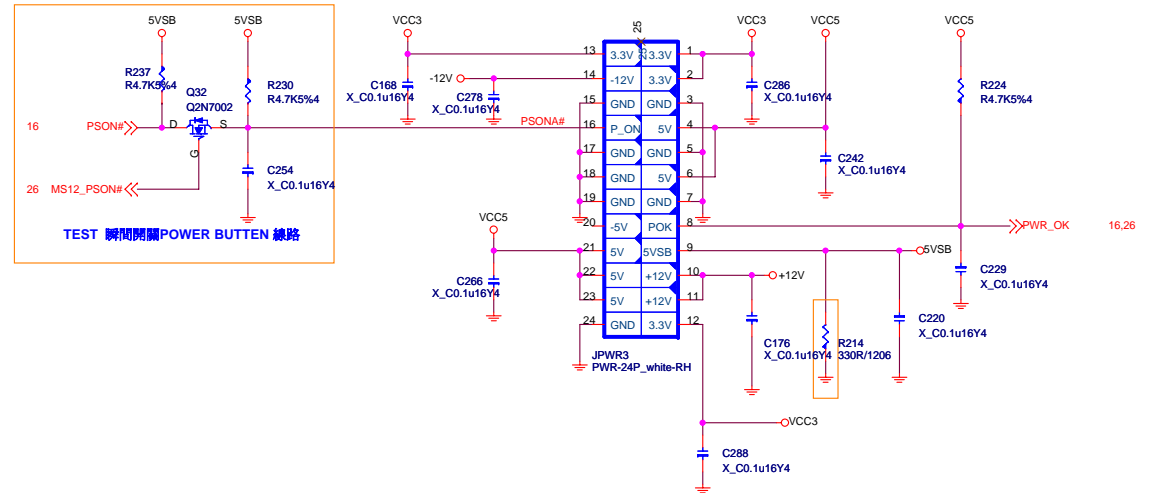
Optical Fiducial Marks-120



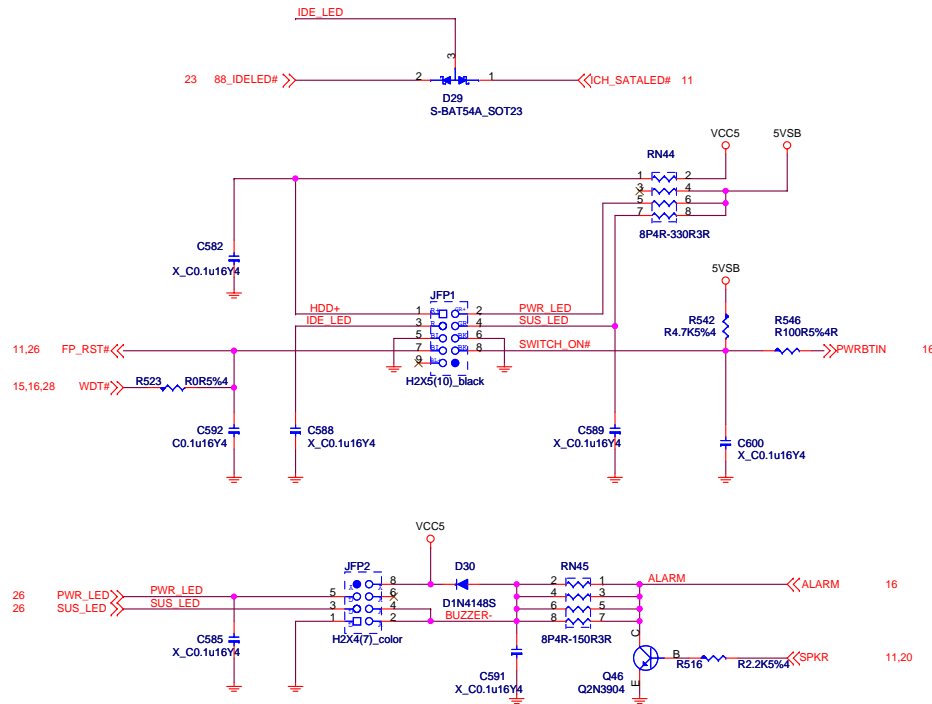
Simulation



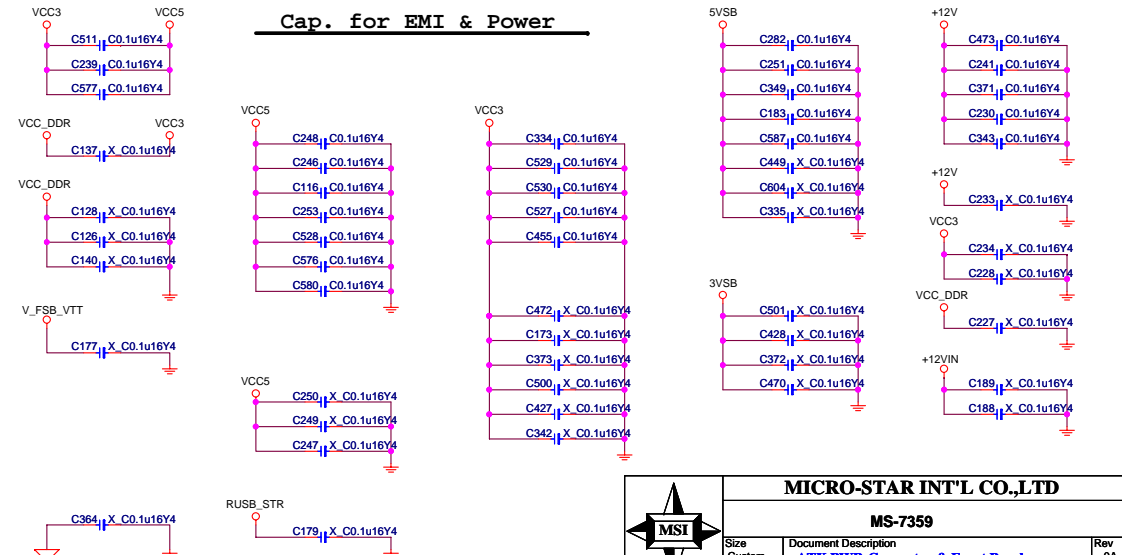
ATX POWER CONNECTOR



FRONT PANNEL



Cap. for EMI & Power



MICRO-STAR INT'L CO.,LTD

MS-7359

Size	Document Description	Rev
Custom	ATX PWR-Connector & Front Panel	0A
Date: Tuesday, February 13, 2007	Sheet 29 of 34	