

MS-7407 Ver : 1.0

Intel (R) LGA775 Processor (130W)

Intel (R) (GMCH G31) + ICH7 Chipset

CPU:

Intel Core 2 Duo/Extreme/Quad & Pentium D Processor

System Chipset:

Intel G31 (North Bridge) Rev : A2

Intel ICH7 (South Bridge) Rev : A1

On Board Chipset:

CLOCK : ICS9LP505

PCIE LAN 82573L

LPC Super I/O : W83627DHG Ver :

Audio Codec : ALC888 7.1 Channel Ver : A1

BIOS : SPI- 8M

Main Memory:

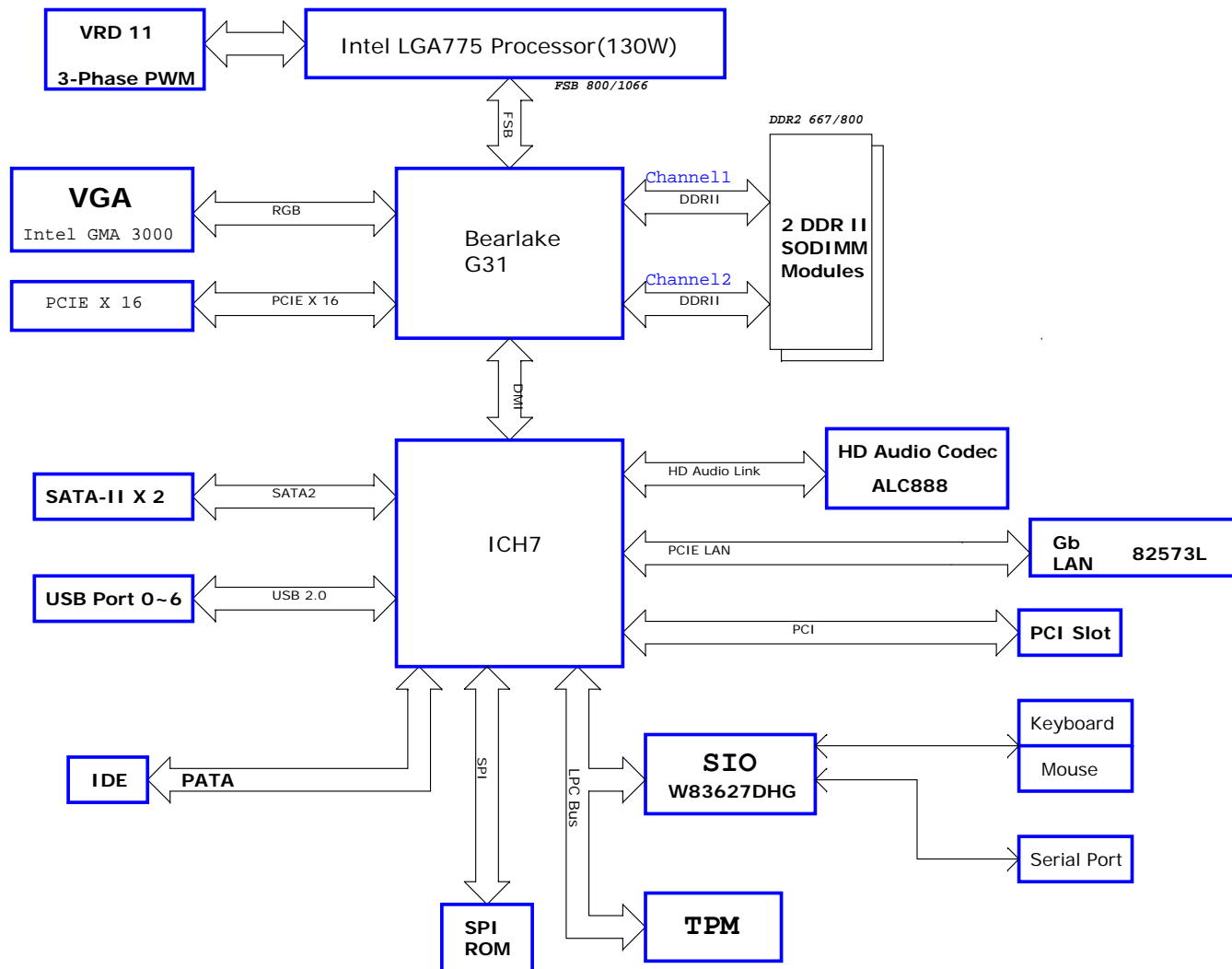
DDR II * 2 (Max 4GB)

Expansion Slots:

PCI X SLOT *1 (FOR PCIE & PCI Riser)

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Block Diagram



ICH7

GPIO	Alt Func	Pin	I/O/NC	Power	PU	SMI	ToI	Default	Signal Name
GPIO[0]	BM_BUSY#	AB18	I/O	Vcc3p3	N	Y	3.3	Input	strapped high
GPIO[1]	PCIREQ[5]#	C8	I/O	V5REF	N	Y	5	Input	PREQ#5
GPIO[2]	PIRQE#	G8	I/OD	V5REF	N	Y	5	Input	PIRQ#E
GPIO[3]	PIRQF#	F7	I/OD	V5REF	N	Y	5	Input	PIRQ#F
GPIO[4]	PIRQG#	F8	I/OD	V5REF	N	Y	5	Input	PIRQ#G
GPIO[5]	PIRQH#	G7	I/OD	V5REF	N	Y	5	Input	PIRQ#H
GPIO[6]	unmuxed	AC21	I/O	Vcc3p3	N	Y	3.3	Input	ATADET0
GPIO[7]	unmuxed	AC18	I/O	Vcc3p3	N	Y	3.3	Input	strapped high
GPIO[8]	unmuxed	E21	I/O	VccSus3p3	N	Y	3.3	Input	SIO_PME#
GPIO[9]	unmuxed	E20	I/O	VccSus3p3	N	Y	3.3	Input	strapped high
GPIO[10]	unmuxed	A20	I/O	VccSus3p3	N	Y	3.3	Input	strapped high
GPIO[11]	SMBALERT#	B23	I/O	VccSus3p3	N	Y	3.3	Input	strapped high
GPIO[12]	unmuxed	F19	I/O	VccSus3p3	N	Y	3.3	Input	strapped high
GPIO[13]	unmuxed	E19	I/O	VccSus3p3	N	Y	3.3	Input	strapped high
GPIO[14]	unmuxed	R4	I/O	VccSus3p3	N	Y	3.3	Input	strapped high
GPIO[15]	unmuxed	E22	I/O	VccSus3p3	N	Y	3.3	Input	strapped high
GPIO[16]	unmuxed	AC22	I/O	Vcc3p3	N	N	3.3	0	NC
GPIO[17]	PCIGNT[5]#	D8	I/O	Vcc3p3	N	N	3.3	N/A	PGNT#5
GPIO[18]	unmuxed	AC20	I/O	Vcc3p3	N	N	3.3	1	SPI_HOLD#
GPIO[19]	SATA1GP	AH18	I/O	Vcc3p3	N	N	3.3	Input	strapped high
GPIO[20]	unmuxed	AF21	I/O	Vcc3p3	N	N	3.3	1	NC
GPIO[21]	SATA0GP	AF19	I/O	Vcc3p3	N	N	3.3	Input	strapped high
GPIO[22]	PCIREQ[4]#	A13	I/O	Vcc3p3	N	N	3.3	Input	PREQ#4
GPIO[23]	LDRQ1#	AA5	I/O	Vcc3p3	N	N	3.3	Input	NC
GPIO[24]	unmuxed	R3	I/O	VccSus3p3	N	N	3.3	No Change	LAN_DIS#
GPIO[25]	unmuxed	D20	I/O	VccSus3p3	Y	N	3.3	1	DMI_MODE
GPIO[26]	unmuxed	A21	I/O	VccSus3p3	N	N	3.3	0	NC
GPIO[27]	unmuxed	B21	I/O	VccSus3p3	N	N	3.3	0	NC
GPIO[28]	unmuxed	E23	I/O	VccSus3p3	N	N	3.3	0	NC
GPIO[29]	OC5#	C3	I/O	VccSus3p3	N	N	3.3	Input	USB_OCP#4
GPIO[30]	OC6#	A2	I/O	VccSus3p3	N	N	3.3	Input	USB_OCP#4
GPIO[31]	OC7#	B3	I/O	VccSus3p3	N	N	3.3	Input	USB_OCP#4
GPIO[32]	unmuxed	AG18	I/O	Vcc3p3	N	N	3.3	1	SPI_WP#
GPIO[33]	unmuxed	AC19	I/O	Vcc3p3	N	N	3.3	1	NC
GPIO[34]	unmuxed	U2	I/O	Vcc3p3	N	N	3.3	0	NC
GPIO[35]	unmuxed	AD21	I/O	Vcc3p3	N	N	3.3	1	NC
GPIO[36]	SATA2GP	AH19	I/O	Vcc3p3	N	N	3.3	Input	strapped high
GPIO[37]	SATA3GP	AE19	I/O	Vcc3p3	N	N	3.3	Input	strapped high
GPIO[38]	unmuxed	AD20	I/O	Vcc3p3	N	N	3.3	Input	strapped high
GPIO[39]	unmuxed	AE20	I/O	Vcc3p3	N	N	3.3	Input	strapped high
GPIO[48]	GNT4#	A14	I/O	Vcc3p3	N	N	3.3	N/A	PGNT#4
GPIO[49]	CPUPWRGD	AG24	I/O	V_CPU_IO	N	N	CPU	N/A	H_PWRGD

Following are the GPIOs that need to be terminated properly if not used:
GPIO[39:36,23:21,19,7:0]: default as inputs and should be pulled up to Vcc3_3 if unused.
GPIO[31:29,15:8]: default as inputs and should be pulled up to VccSus3_3 if unused.

PCI Config.

DEVICE	MCP1 INT Pin	REQ#/GNT#	IDSEL	CLOCK
PCI Slot 1	PIRQ#A PIRQ#B PIRQ#C PIRQ#D	PREQ#0 PGNT#0	AD20	PCI_CLK1
PCI Slot 2	PIRQ#C PIRQ#D PIRQ#A PIRQ#B	PREQ#2 PGNT#2	AD21	PCI_CLK2
1394	PIRQ#B	PREQ#1 PGNT#1	AD19	1394_PCLK

PCI RESET DEVICE

Signals	Target
PCIRST#1	SIO,TPM
PCIRST#2	1394,PCIE X16 SLOT
PCIRST#3	PCI SLOT 1,2
PLTRST#	MS7
HD_RST#	Primary IDE

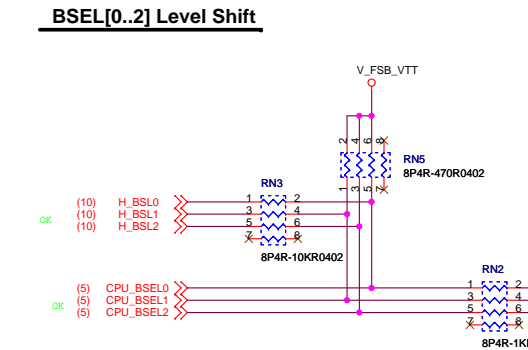
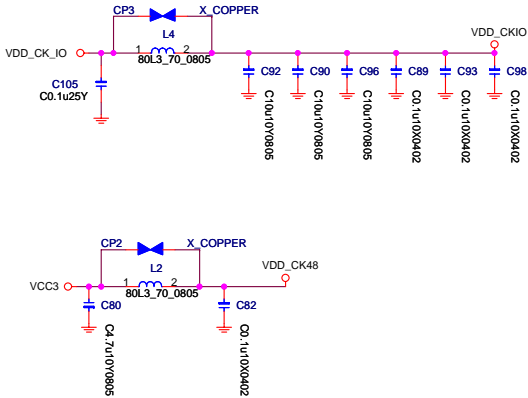
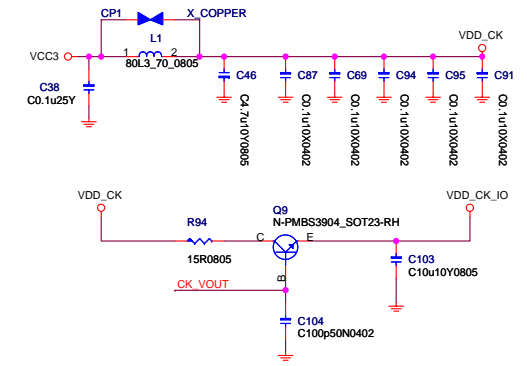
DDRII DIMM Config.

DEVICE	ADDRESS	CLOCK
DIMM 1	A0H	SCLK_A0/SCLK_A#0 SCLK_A1/SCLK_A#1 SCLK_A2/SCLK_A#2
DIMM 2	A2H	SCLK_B0/SCLK_B#0 SCLK_B1/SCLK_B#1 SCLK_B2/SCLK_B#2

JUMPER SETTING

JBAT1	(1-2) NORMAL	(2-3) CLEAR
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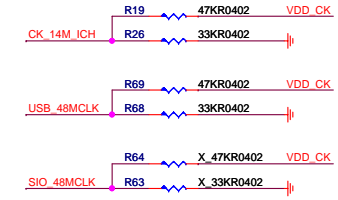
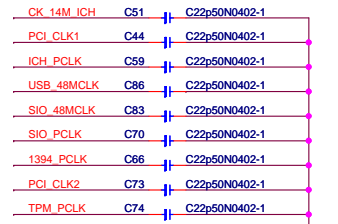
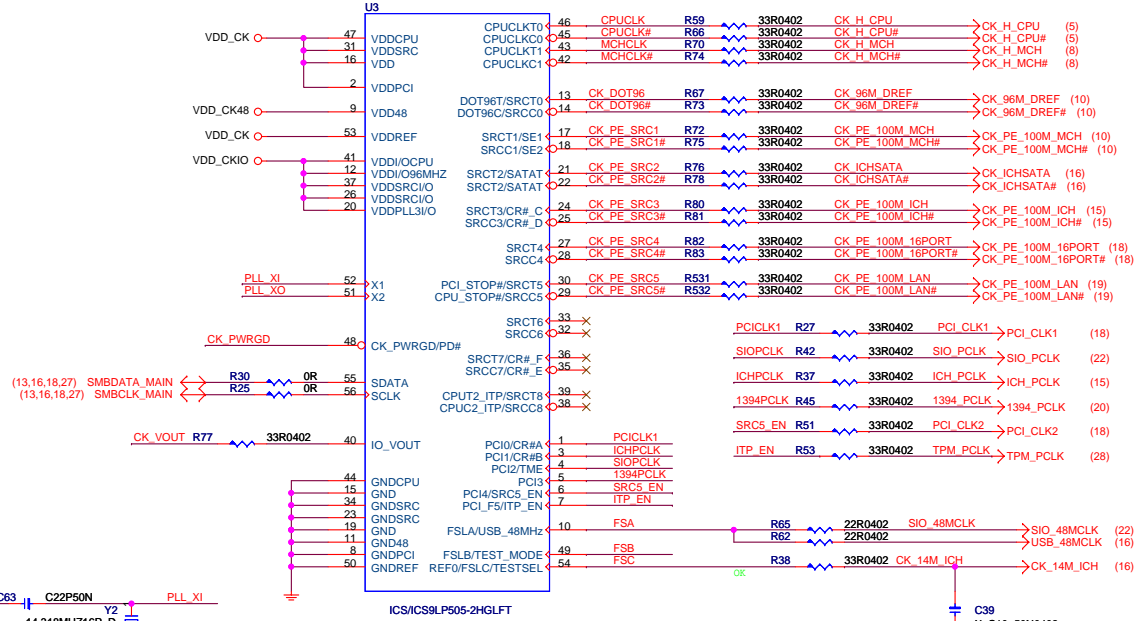
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Title			Rev
GPIO & Jumper Setting			10
Document Number			MS-7407
MICRO-STAR INT'L CO.,LTD. No. 68, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Wednesday, August 15, 2007 Sheet 3 of 35	



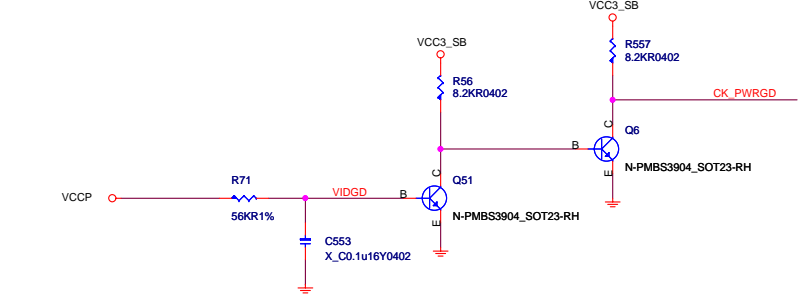
BSEL	TABLE
2 1 0	FSB FREQUENCY
0 0 0	266 MHz (1066)
0 1 0	200 MHz (800)
0 0 1	133 MHz (533)

Clock Generator - ICS9LP505

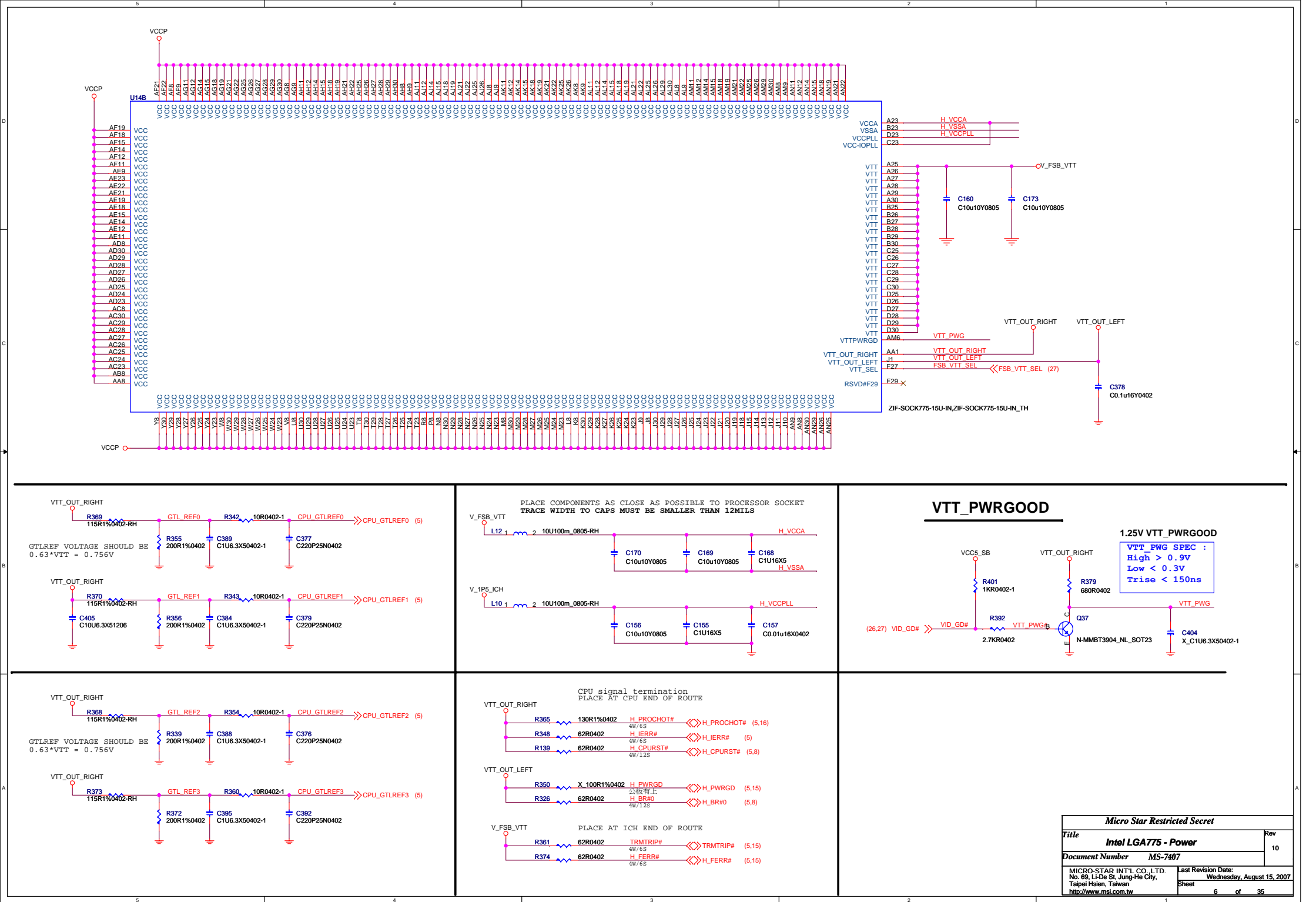
Trace length less than 0.5inches



Clock Generator VTT Power Down Block



SIGNAL	Pull-High	Pull-Low
SIOPCLK	Trusted Mode	Overclocking
SRC5_EN	Enable CPU_STOP#/SRC5#	Enable CPU_STOP#/PCI_STOP#
ITP_EN	CPU_ITPCLK	For SRCCLK8



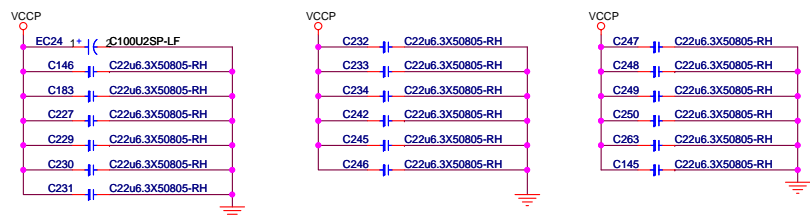
U14C

VTT_OUT_RIGHT

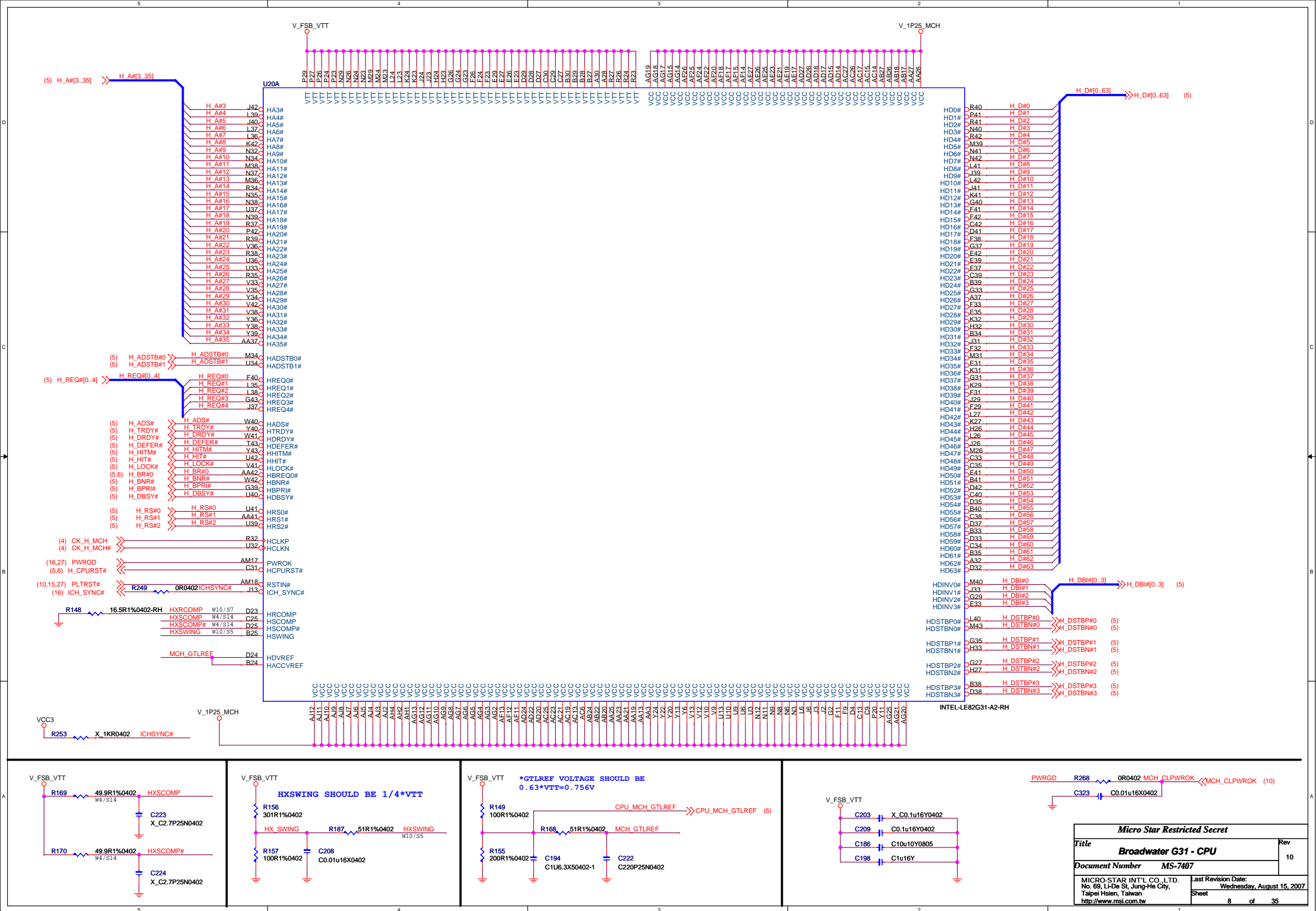
VTT_OUT_LEFT

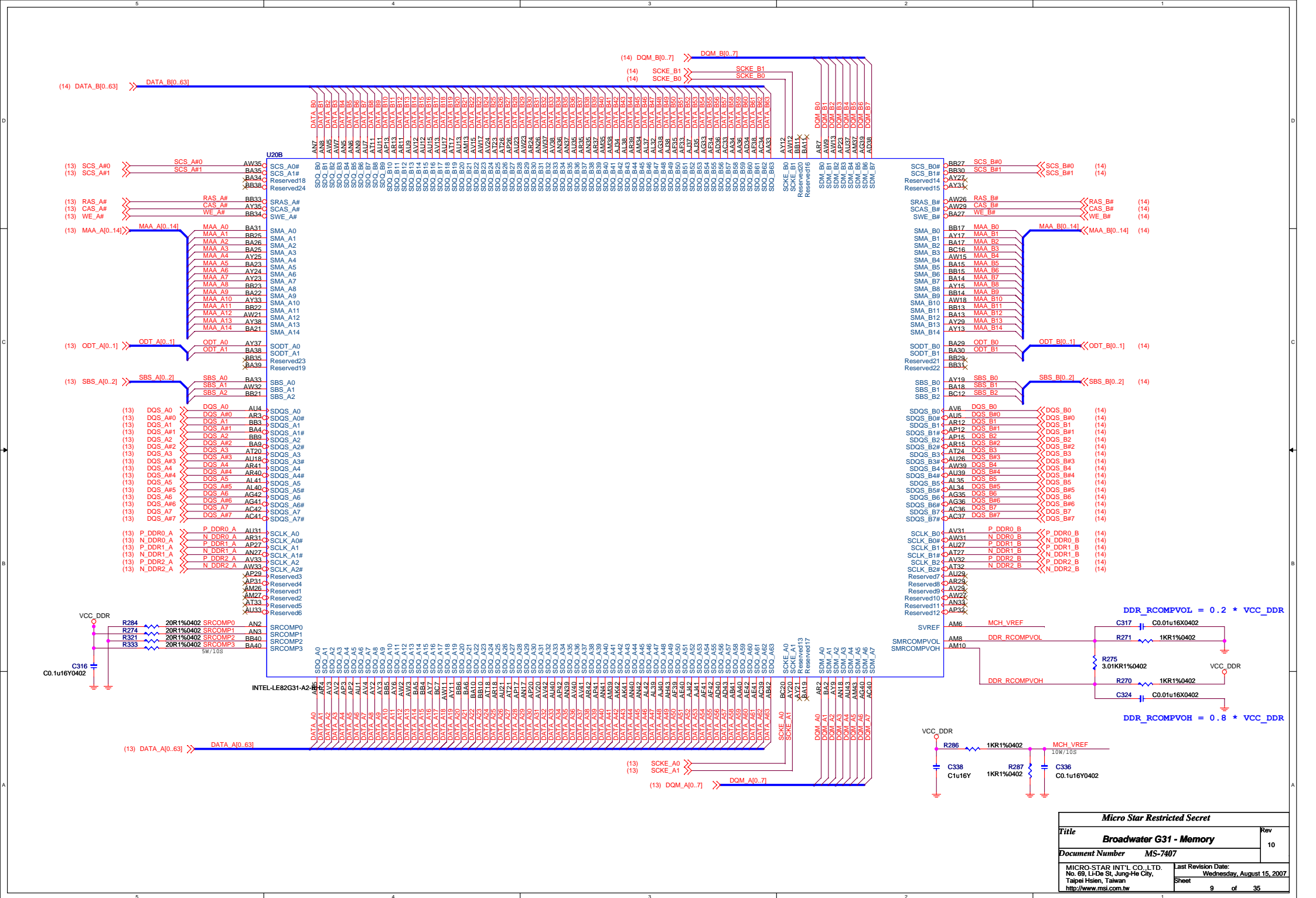
CPU_TP_G1
H_TESTHI_M_U1

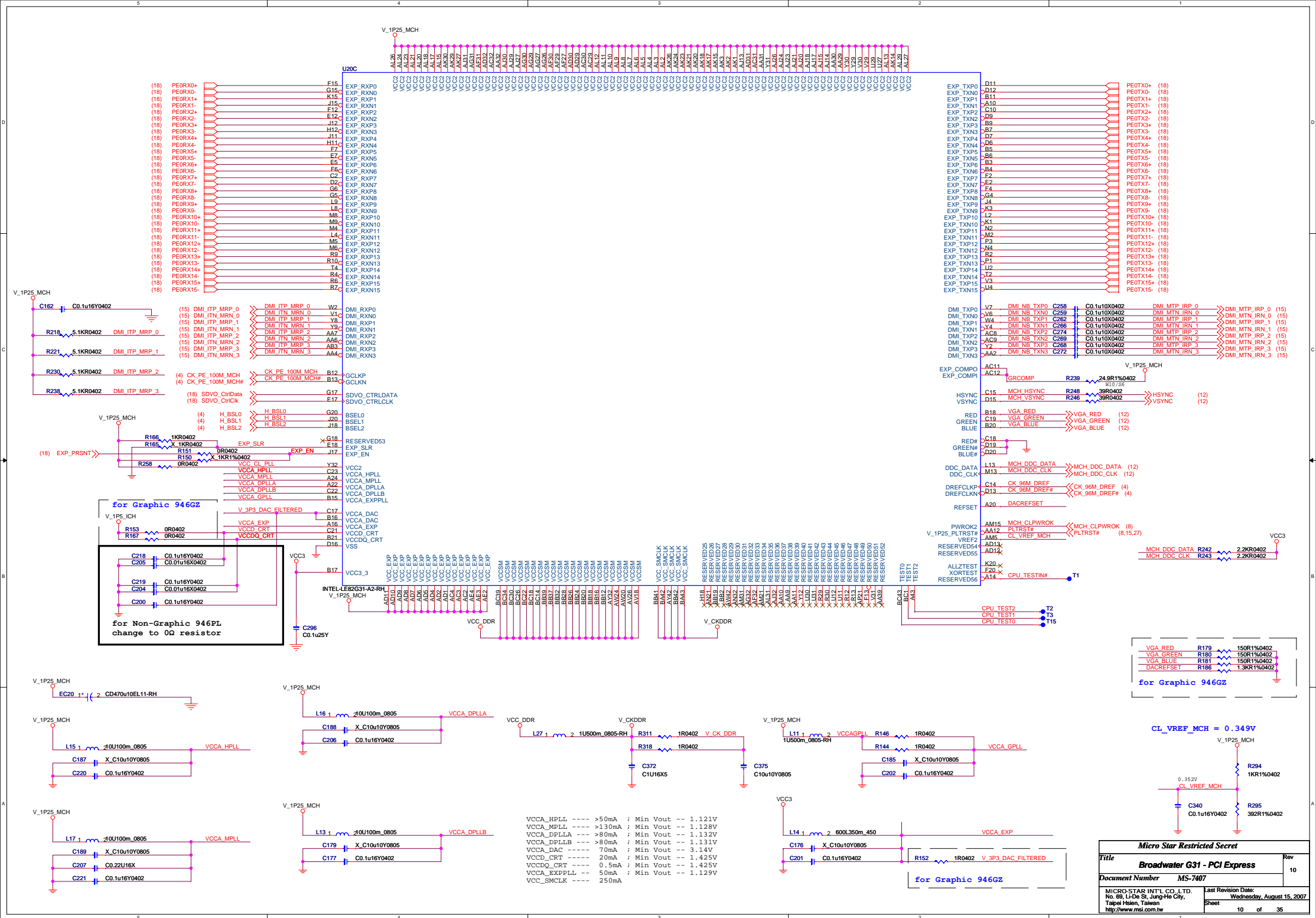
CPU DECOUPLING CAPACITORS



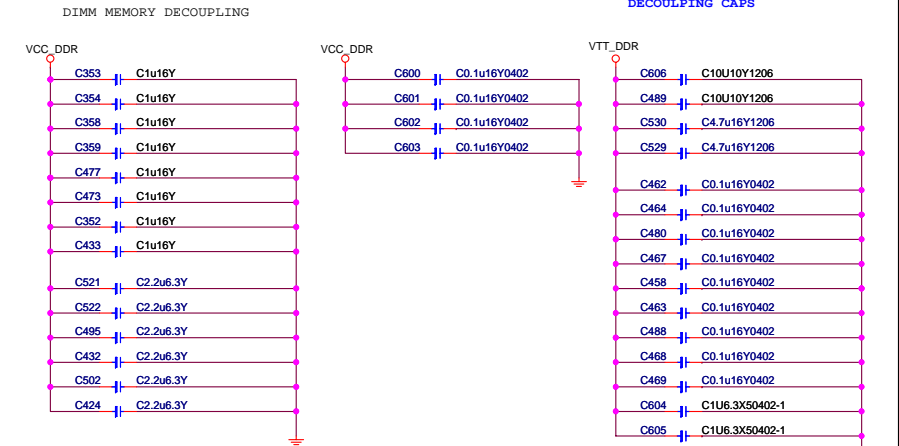
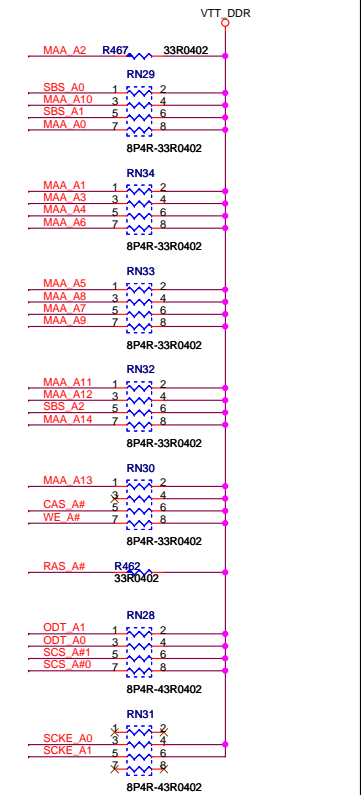
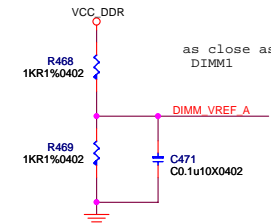
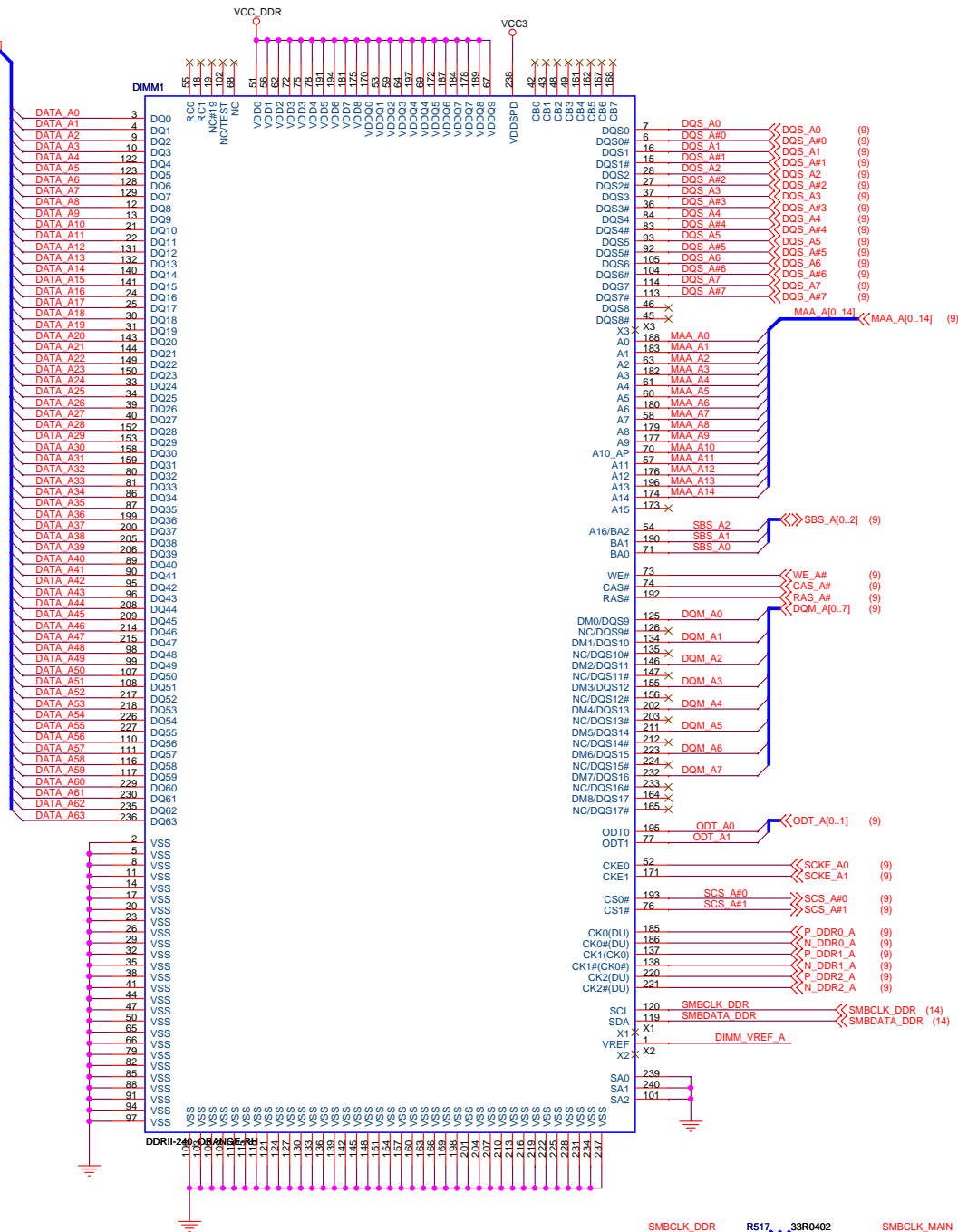
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Title	Intel LGA775 - GND	Rev 10
Document Number	MS-7407	
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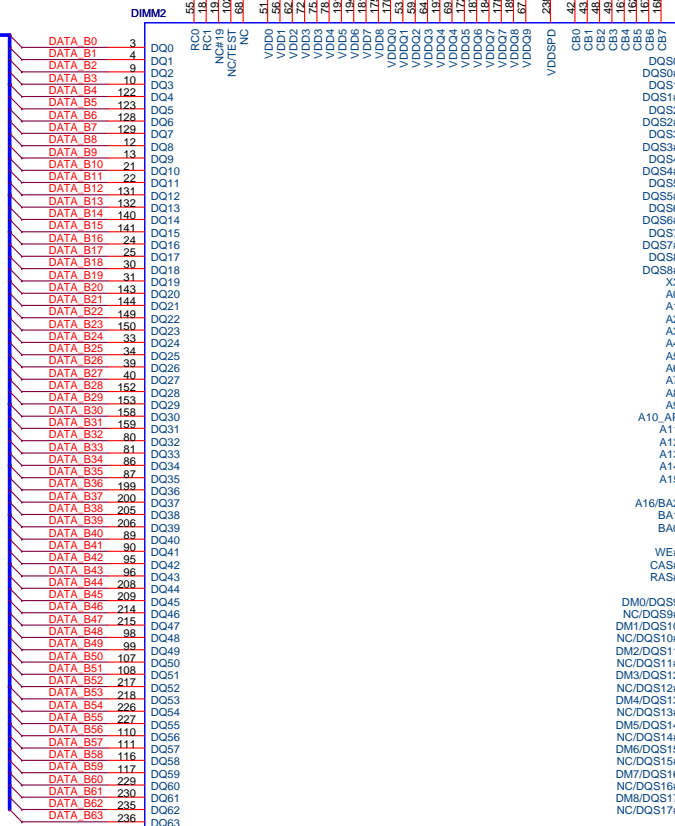


(9) DATA_A[0..63] <<> DATA_A[0..63]

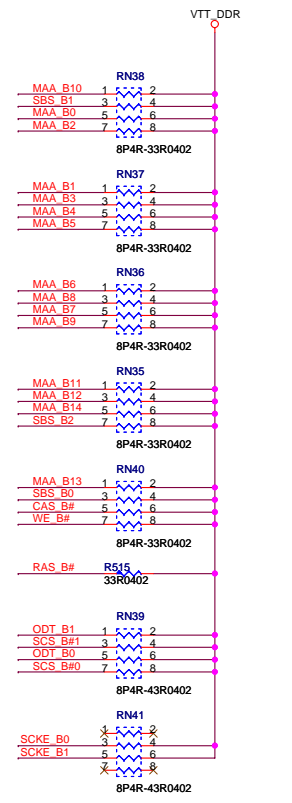
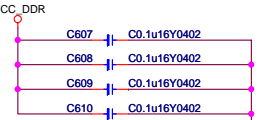
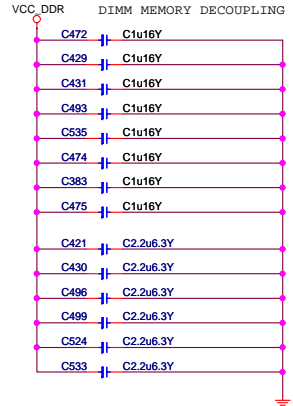
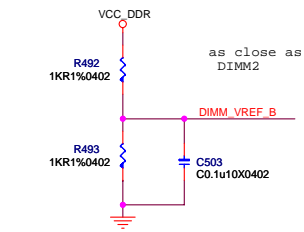
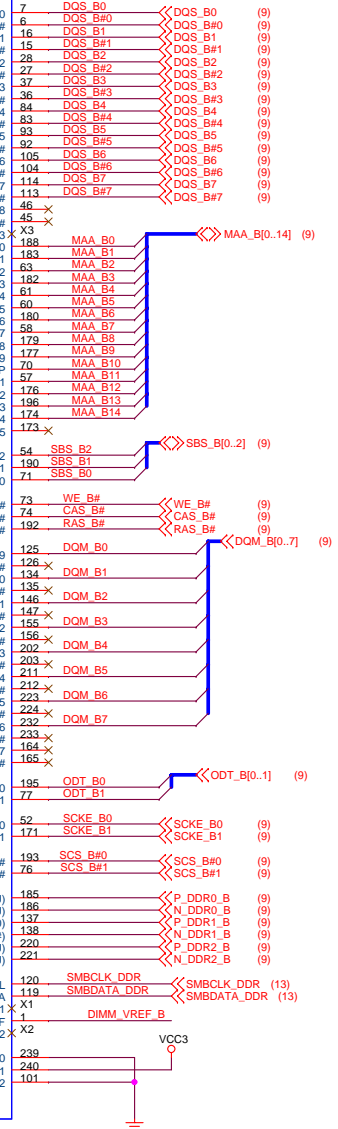


SMBCLK_DDR R517 33R0402 SMBCLK_MAIN <<> SMBCLK_MAIN (4,16,18,27)
SMBDATA_DDR R516 33R0402 SMBDATA_MAIN <<> SMBDATA_MAIN (4,16,18,27)

(9) DATA_B[0..63]

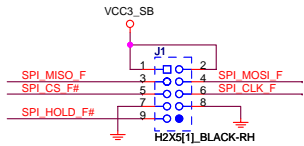


DDR1-240 OPEN BALL

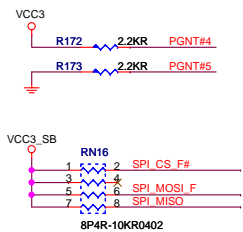


SPI DEBUG PROT

Place close to SPI ROM

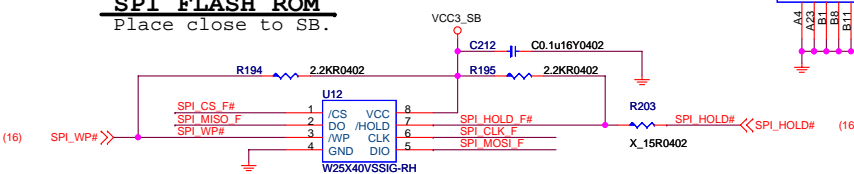


GNT5#	GNT4#	ROUTING
0	1	Flash Cycles Routed to SPI
1	0	Flash Cycles Routed to PCI
1	1	Flash Cycles Routed to LPC



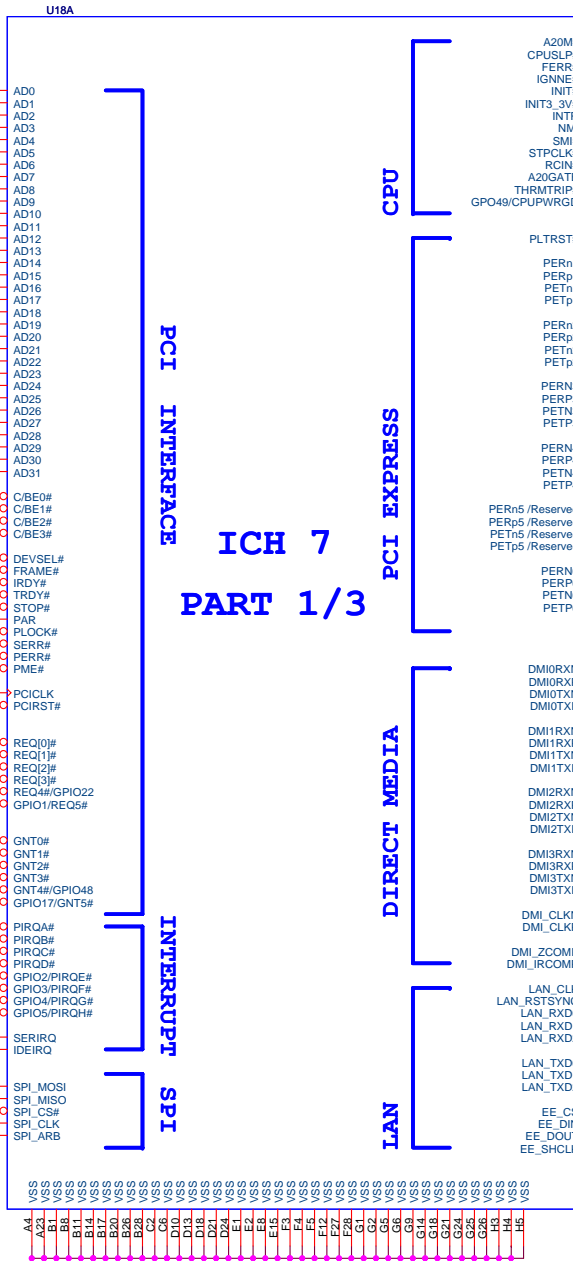
SPI FLASH ROM

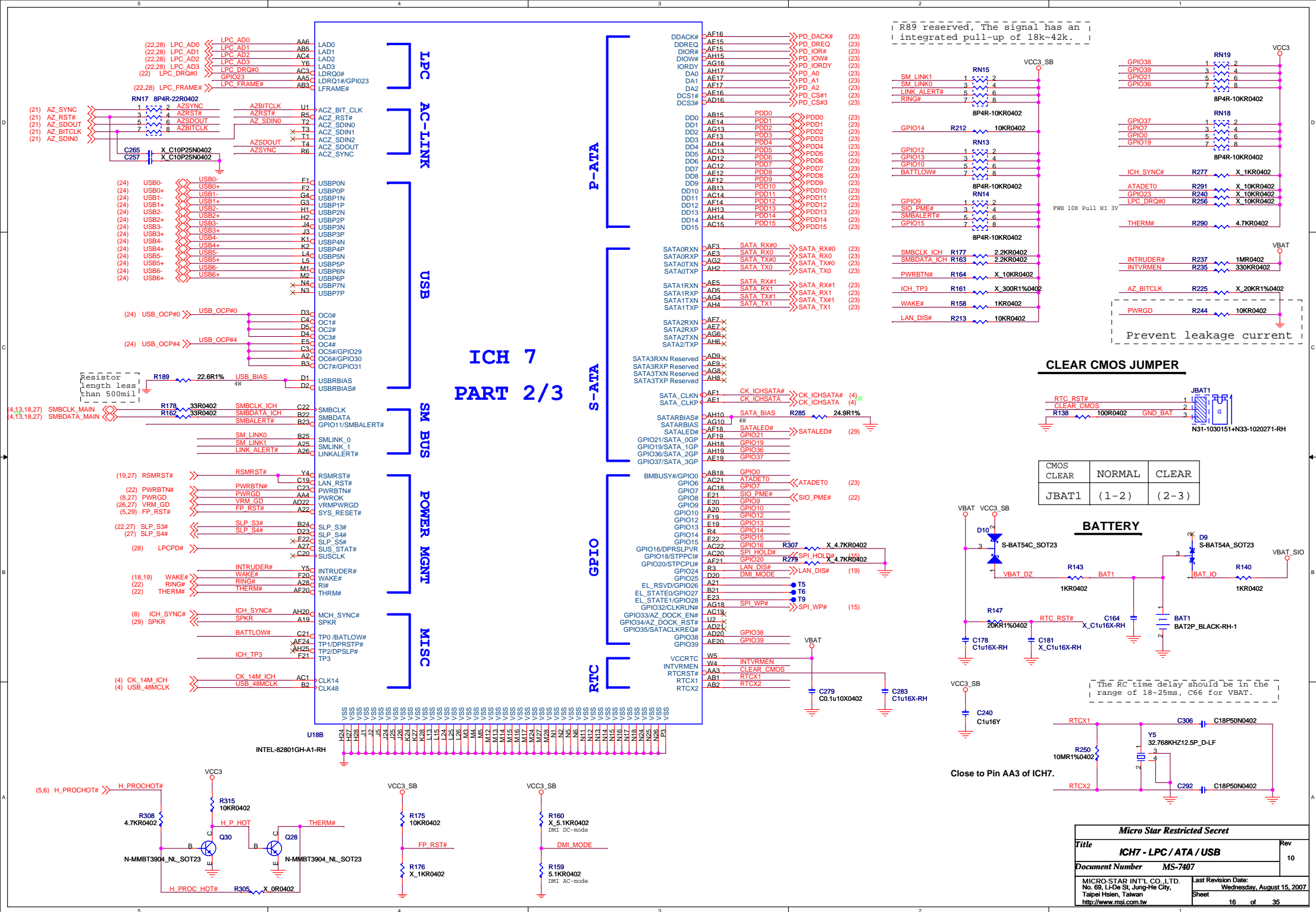
Place close to SB.



Following are the GPIOs that need to be terminated properly if not used:
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GPIO[31:29,15:8]: default as inputs and should be pulled up to VccSus3_3 if unused.

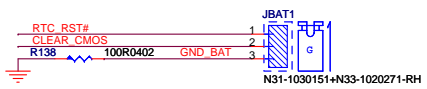
ICH 7 PART 1/3





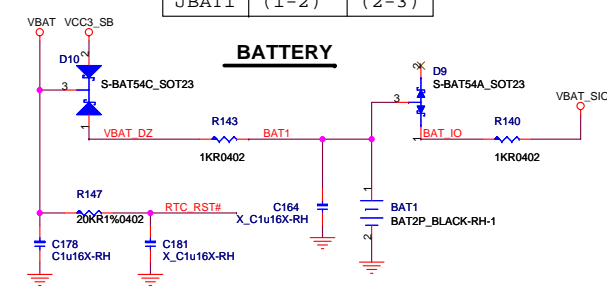
R89 reserved. The signal has an integrated pull-up of 18k-42k.

CLEAR CMOS JUMPER



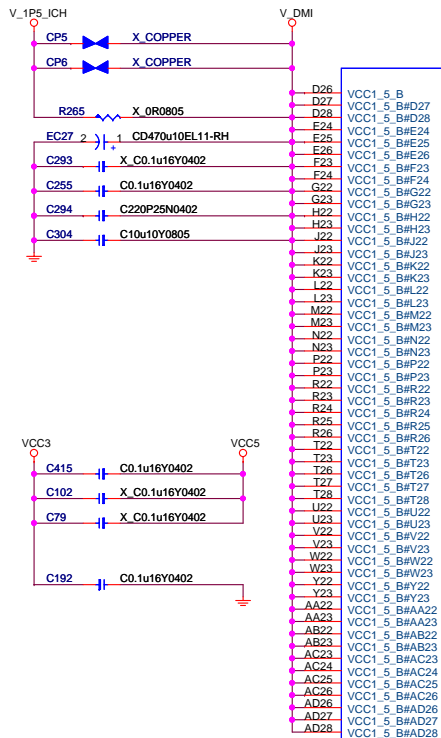
CMOS CLEAR	NORMAL	CLEAR
JBAT1	(1-2)	(2-3)

BATTERY



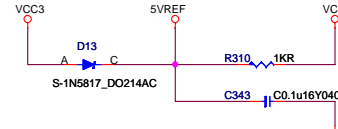
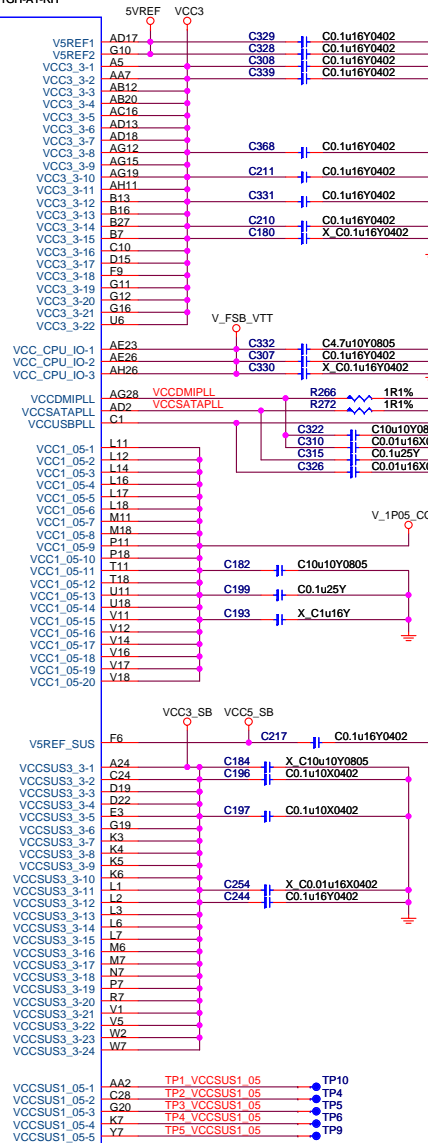
The RC time delay should be in the range of 18-25ms, C66 for VBAT.

Close to Pin AA3 of ICH7.



S0 POWER

S5 POWER



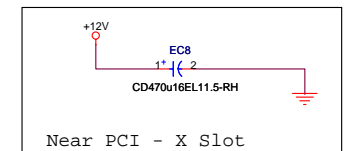
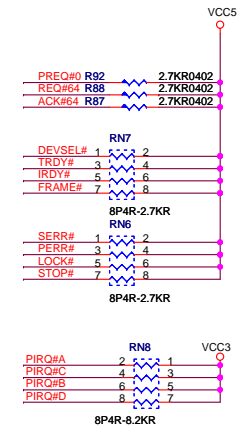
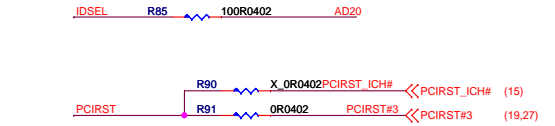
VccDMIPLL	---	50mA
VccUSBPLL	---	50mA
VccSATAPLL	---	10mA
VCC1_05	-----	1.31A
VCC1_5_A	-----	0.97mA
VCC1_5_B	-----	0.74mA
VCC3_3	-----	0.58mA
VCCSUS3_3	-----	0.7A
V5REF	-----	6mA
V5REFSUS	-----	10mA
V_CPU_IO	-----	14mA

PCI 1

IDSEL: AD20
INT: PIRQ# ABCD
REQ: PREQ#0
GNT: PGNT#0
CLK: PCI_CLK1

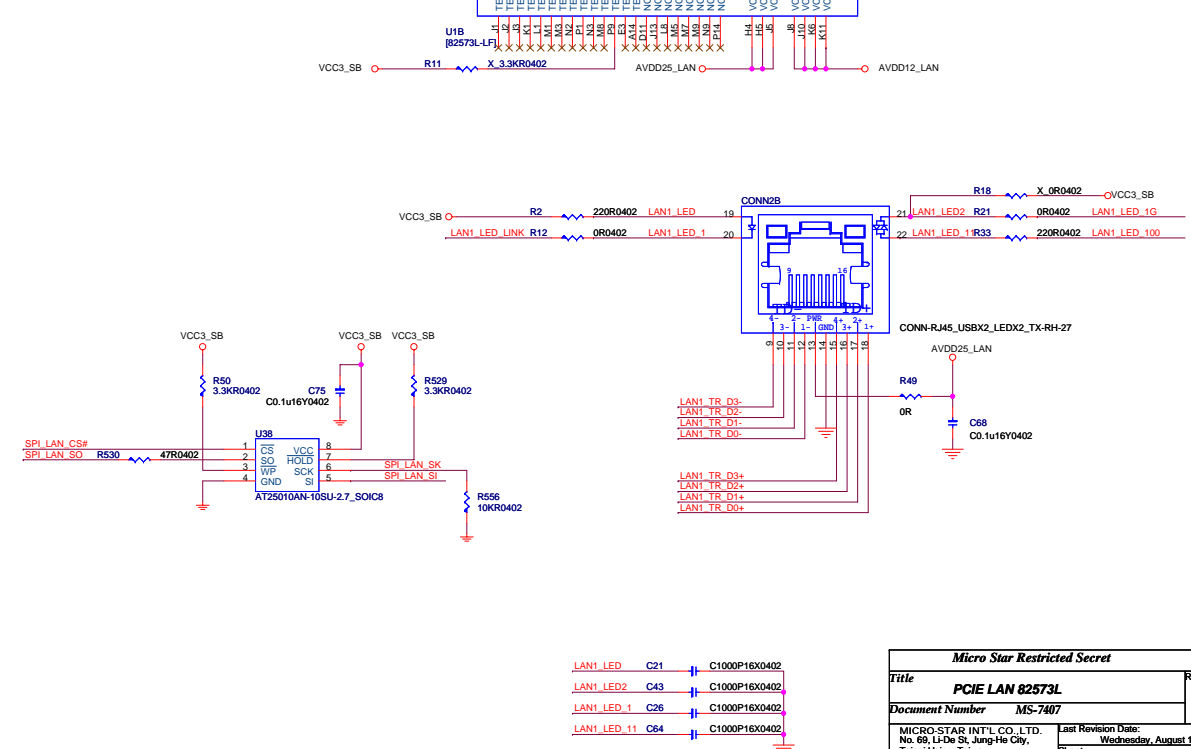
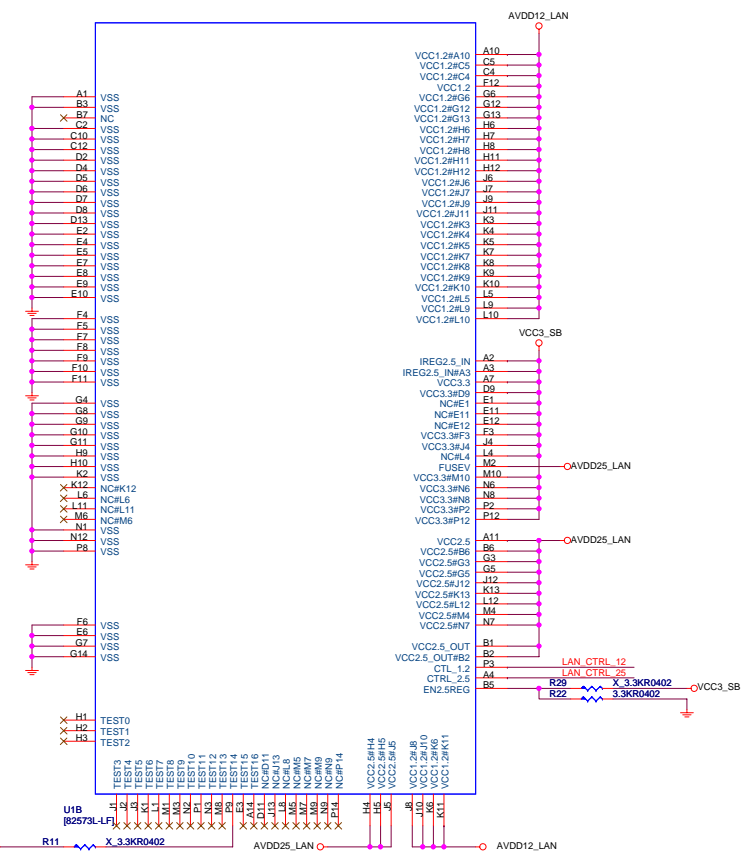
PCI 2

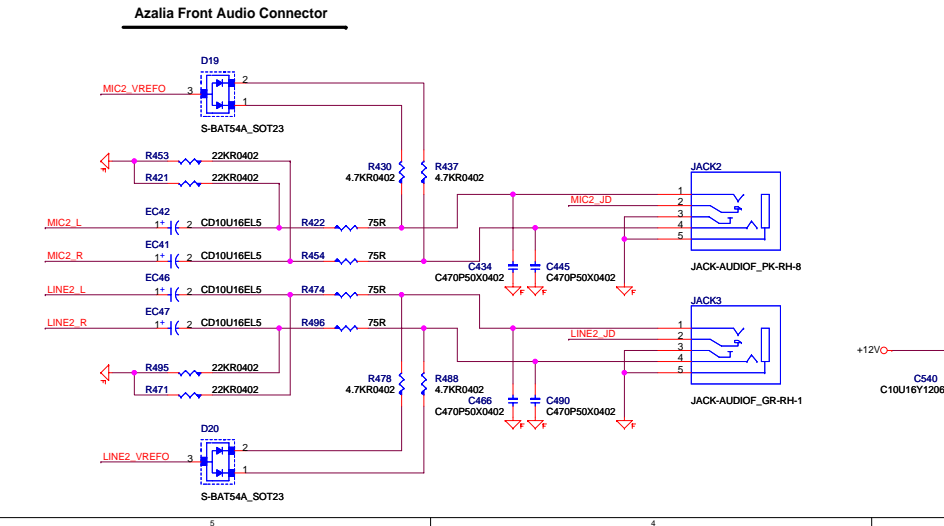
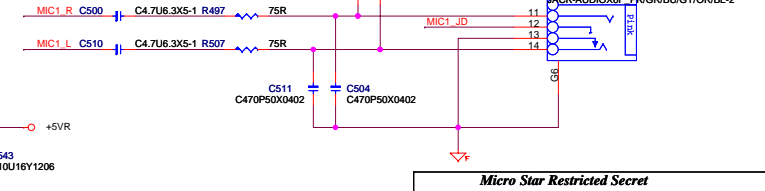
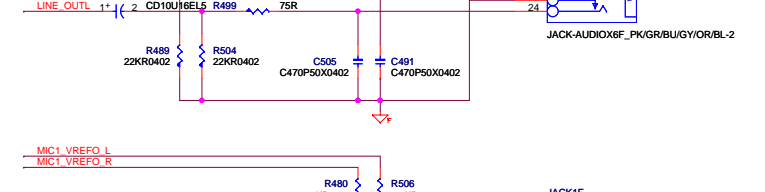
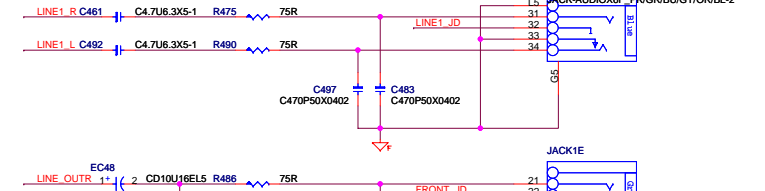
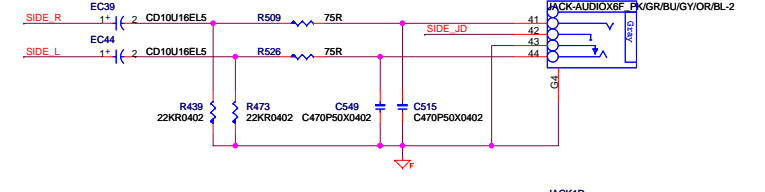
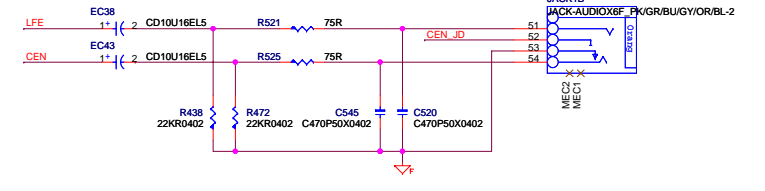
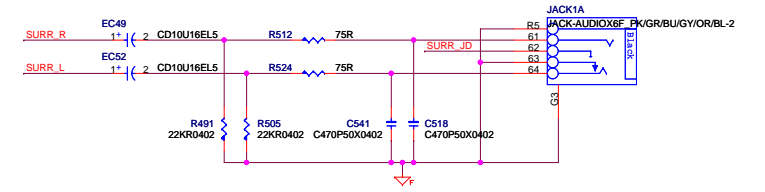
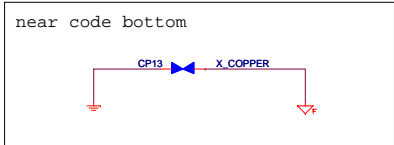
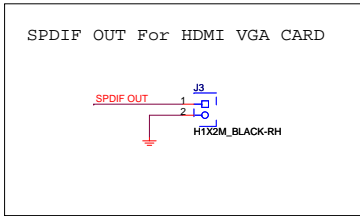
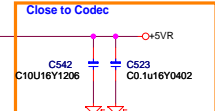
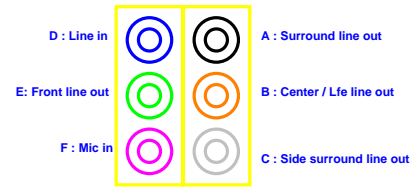
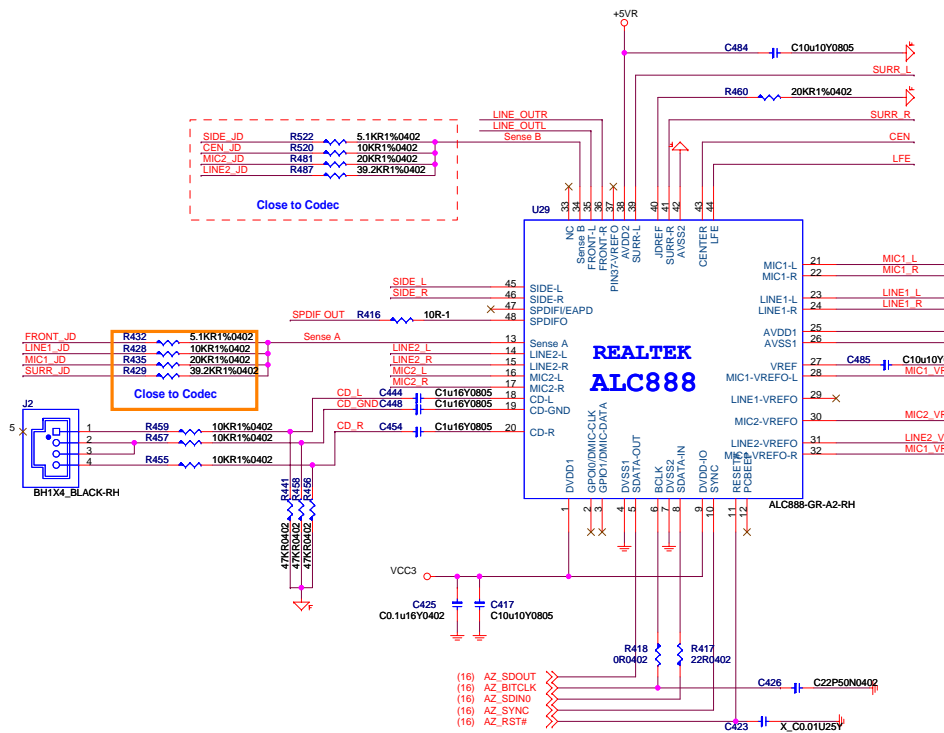
IDSEL: AD21
INT: PIRQ# CDAB
REQ: PREQ#2
GNT: PGNT#2
CLK: PCI_CLK2



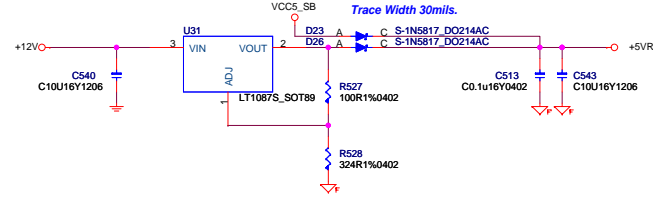
Near PCI - X Slot

Micro Star Restricted Secret		
Title	PCI-X Slot	Rev
Document Number	MS-7407	10
MICRO-STAR INT'L CO., LTD. No. 68, Lida St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Wednesday, August 15, 2007 Sheet 18 of 35

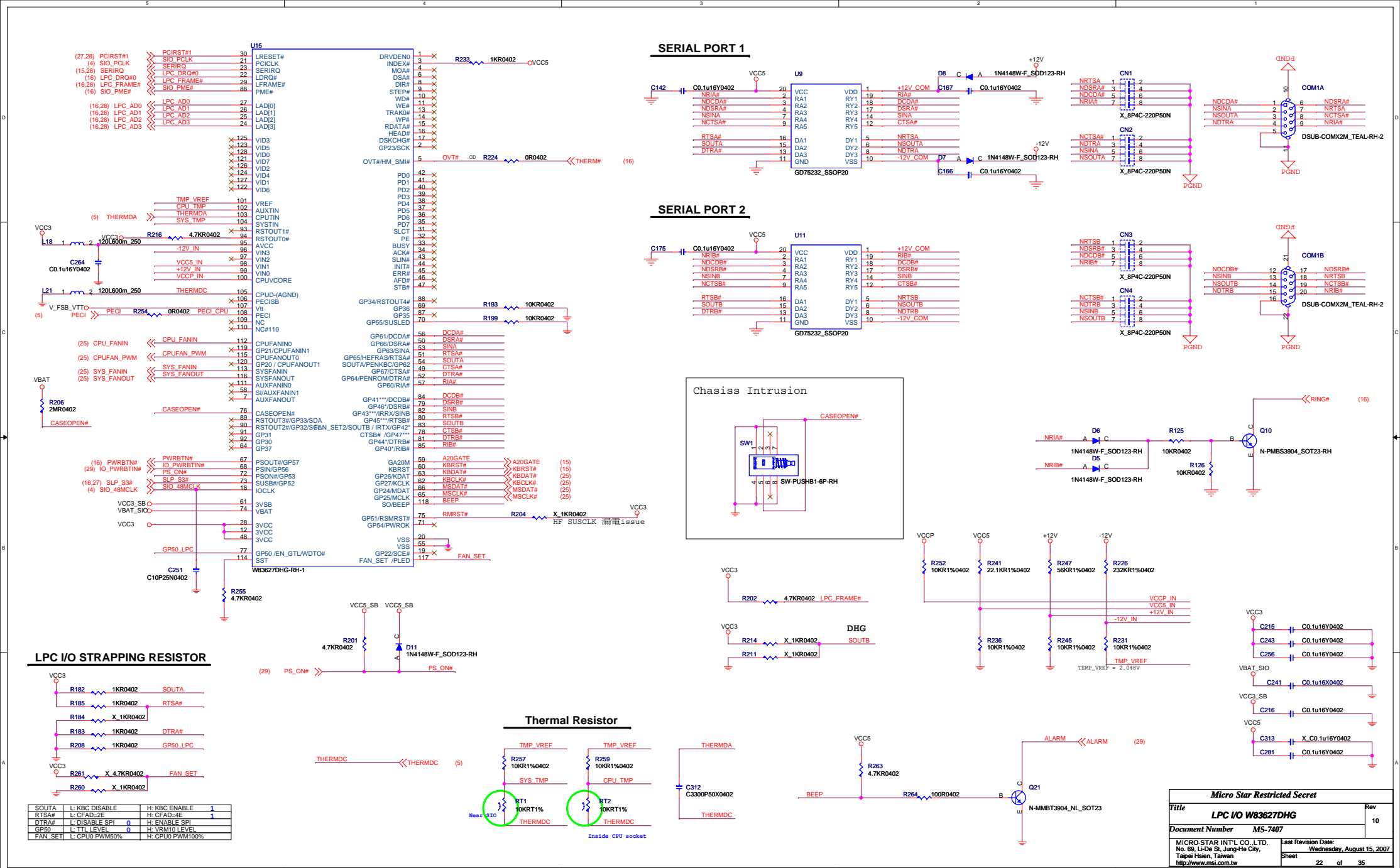




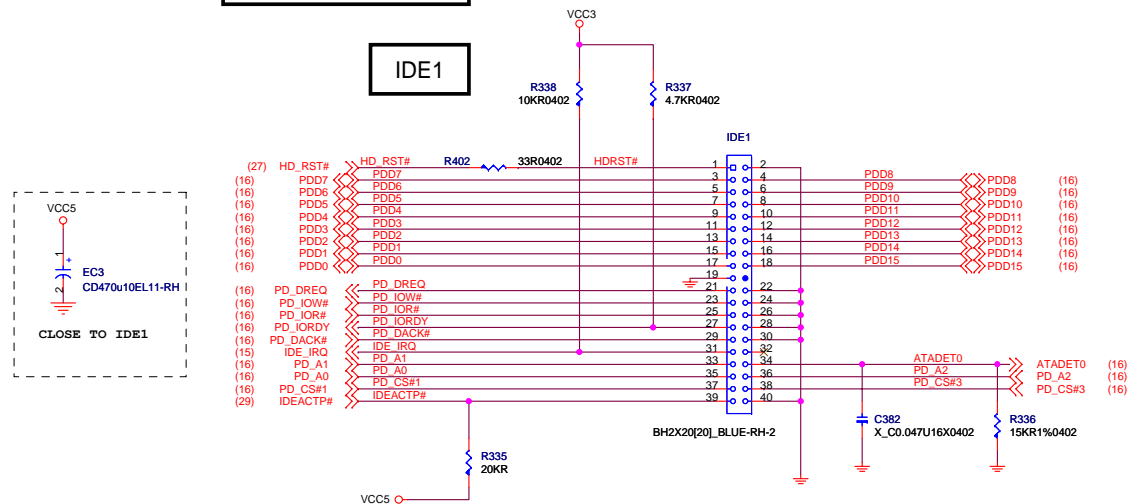
AUDIO CODE REGULATORS



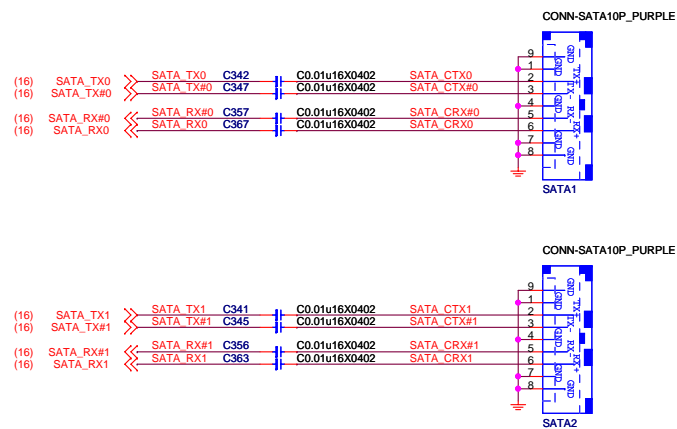
Micro Star Restricted Secret		
Title	Azalia CODEC ALC888	Rev 10
Document Number	MS-7407	
MICRO-STAR INT'L CO.,LTD. No. 68, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Wednesday, August 15, 2007
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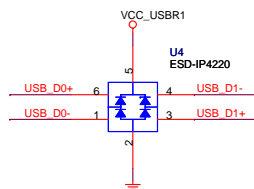
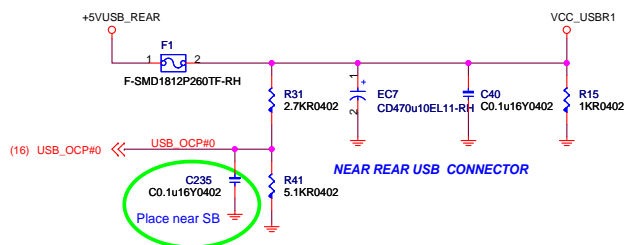
IDE Connector



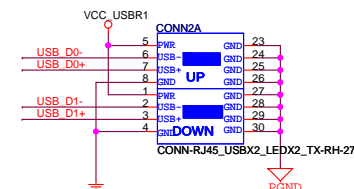
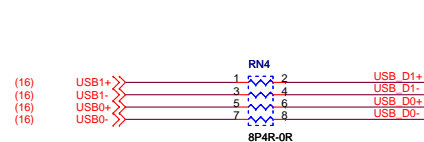
SATA CONNECTOR



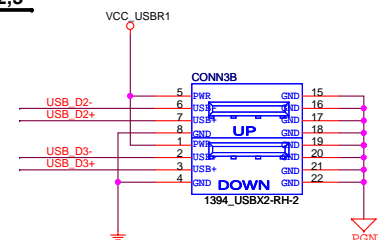
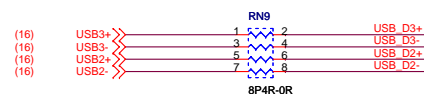
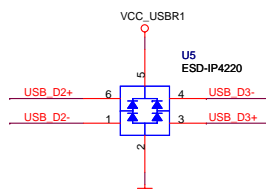
POWER CIRCUIT FOR USB PORT 0,1,2,3



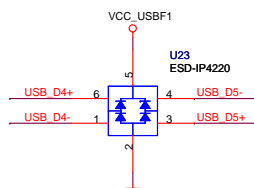
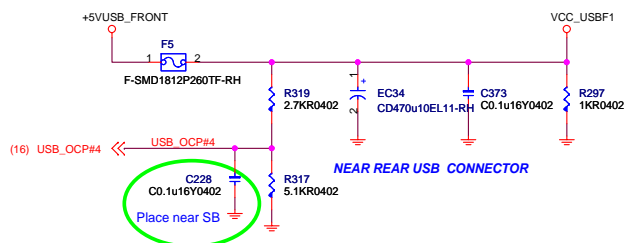
REAR PANEL USB CONNECTOR FOR USB PORT 0,1



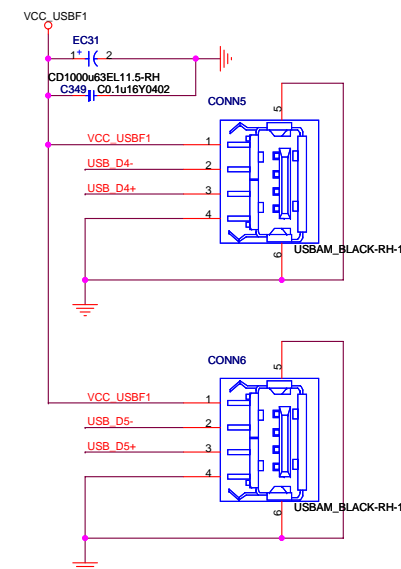
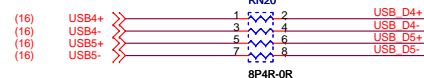
FRONT PANEL USB CONNECTOR FOR USB PORT 2,3



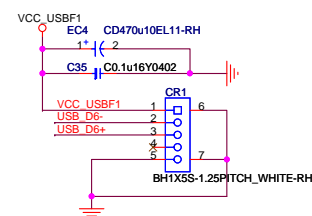
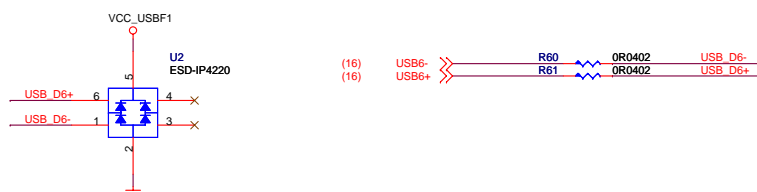
POWER CIRCUIT FOR USB PORT 4,5



FRONT PANEL USB CONNECTOR FOR USB PORT 4,5

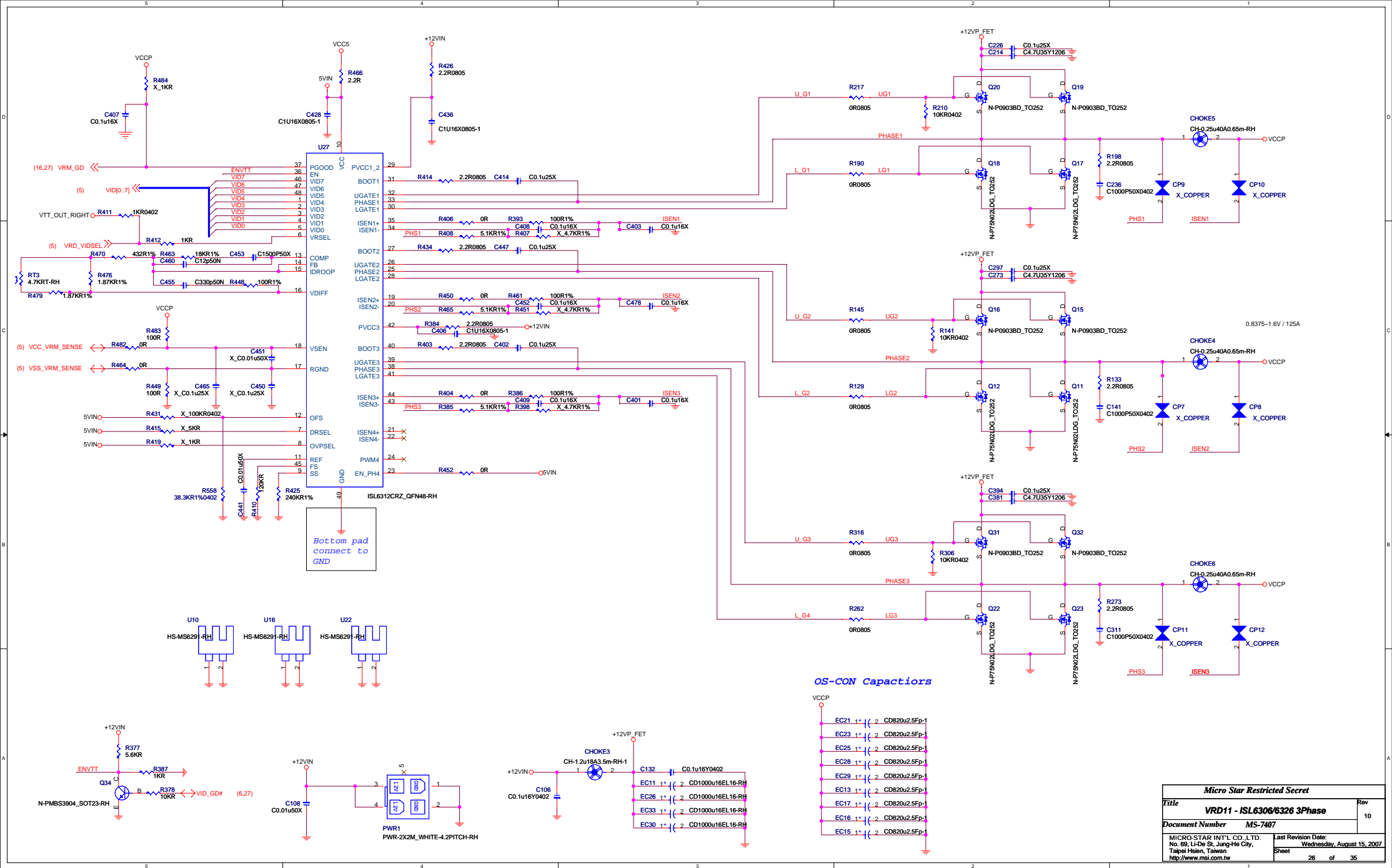


CARD READER USB CONNECTOR FOR USB PORT 6,



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Title	USB Connector		Rev
Document Number	MS-7407		10
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ACPI Controller MS-7

VDIMM LINEAR OR PWM SELECT

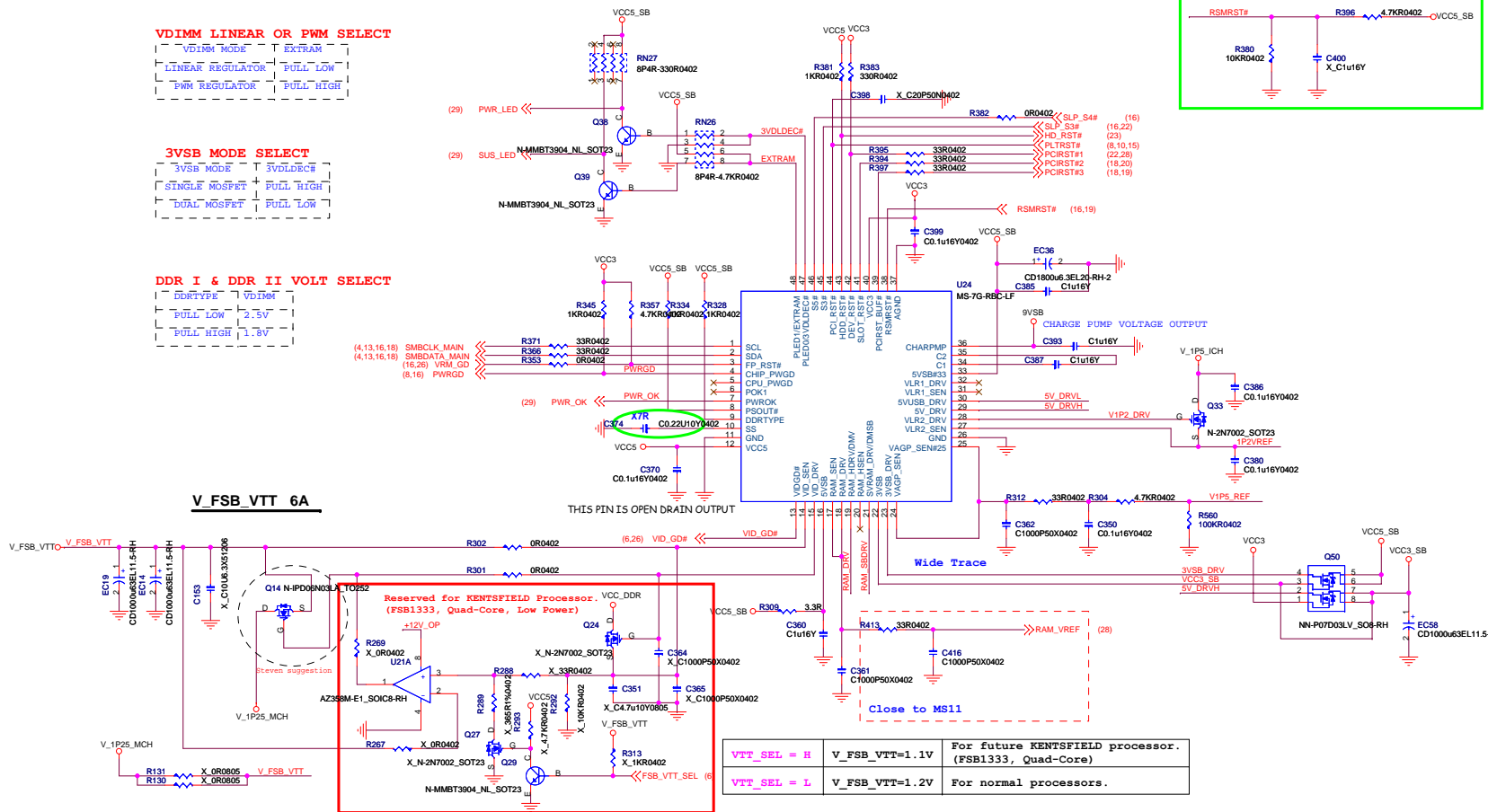
VDIMM MODE	EXTRAM
LINEAR REGULATOR	PULL LOW
PWM REGULATOR	PULL HIGH

3VSB MODE SELECT

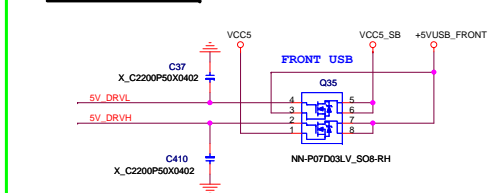
3VSB MODE	3VSDIODE
SINGLE MOSFET	PULL HIGH
DUAL MOSFET	PULL LOW

DDR I & DDR II VOLT SELECT

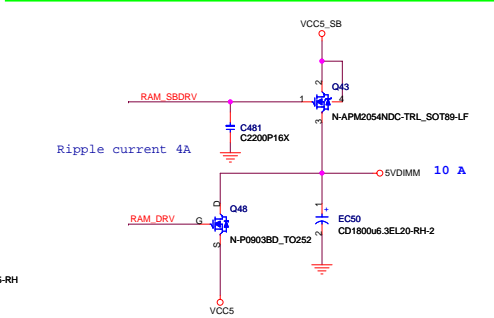
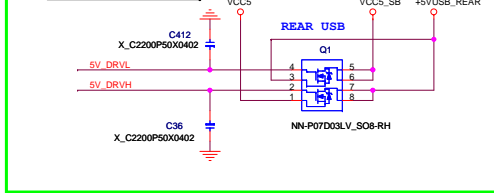
SDRTYPE	VDIREF
PULL LOW	2.5V
PULL HIGH	1.8V



5V DUAL Power 2A



5V DUAL Power 2A

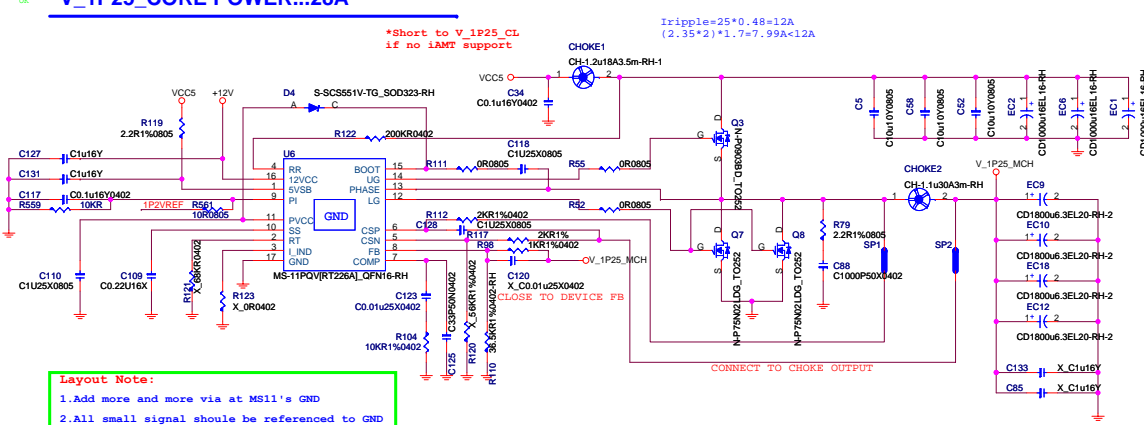


V_1P25_CORE POWER...28A

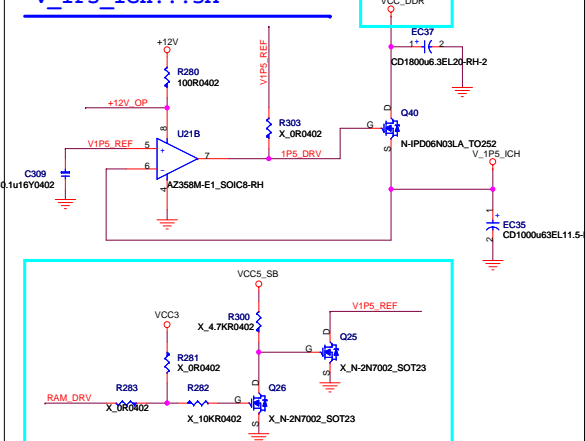
*Short to V_1P25_CL if no iAMT support

Note: Iripple=Iout*[D/N-(D*D)]^(0.5)...D=Vout/Vin

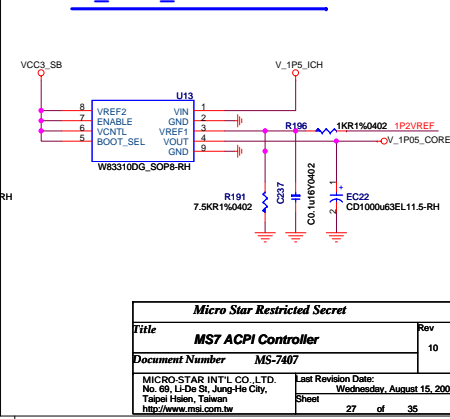
Iripple=25*0.48=12A
(2.35*2)*1.7=7.99A<12A



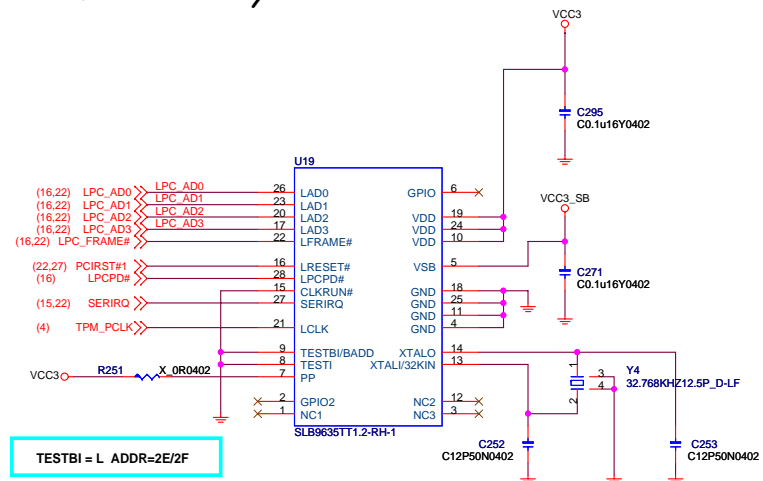
V_1P5_ICH...3A



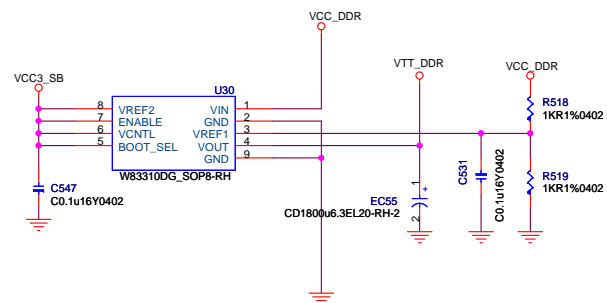
V_1P05_ICH...1.31A



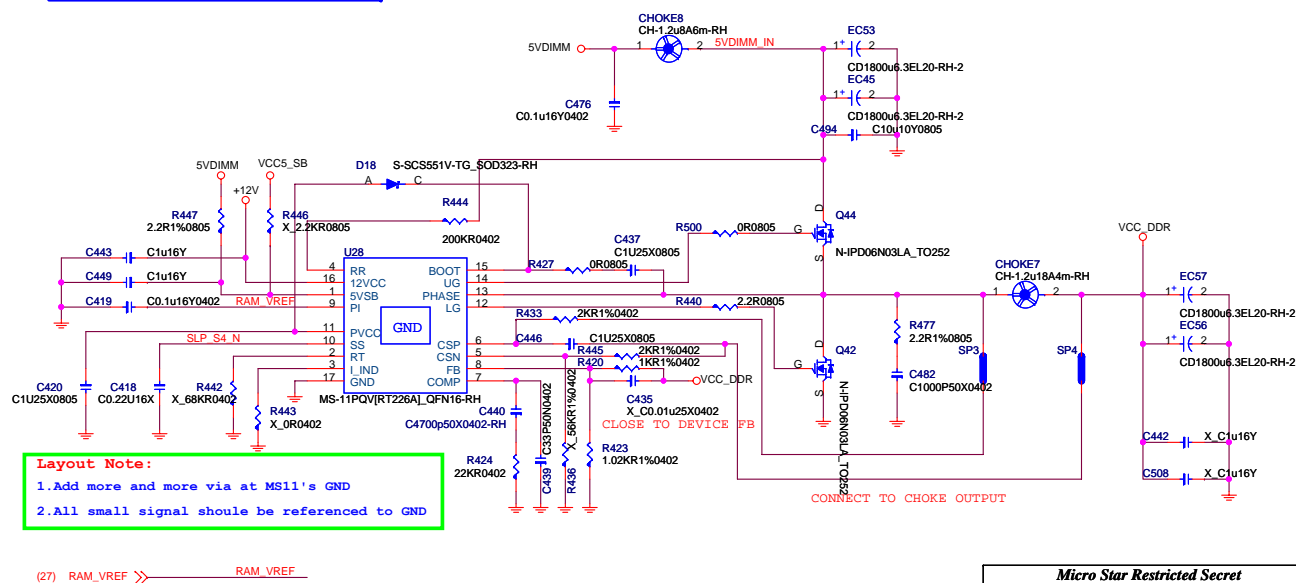
TPM - Security Controller



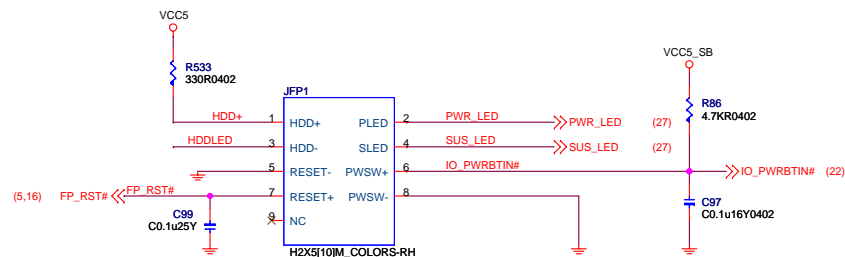
DDR II VTT POWER



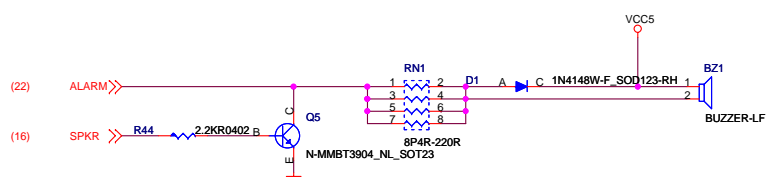
DDR II 1.8V POWER...16A



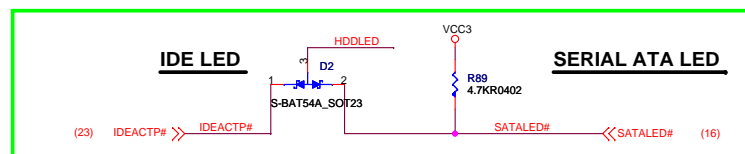
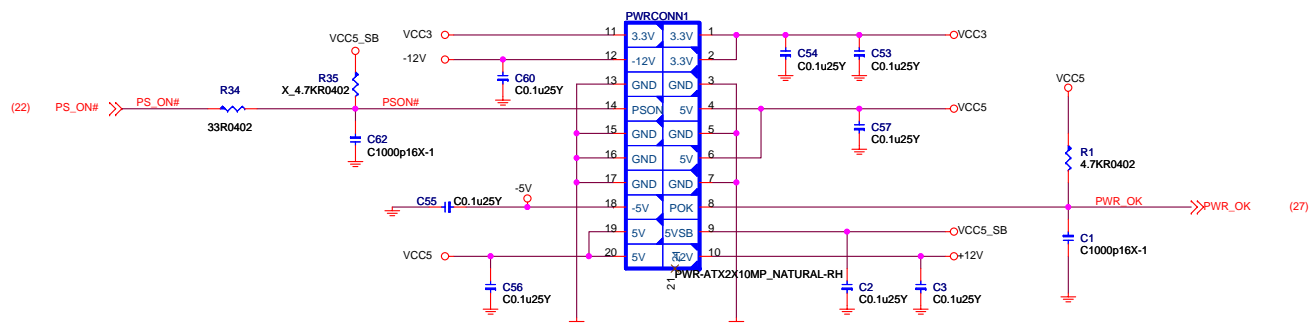
Intel Front Panel



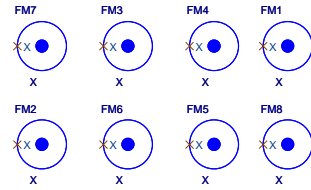
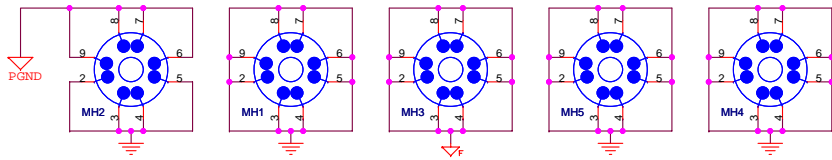
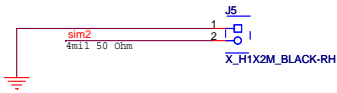
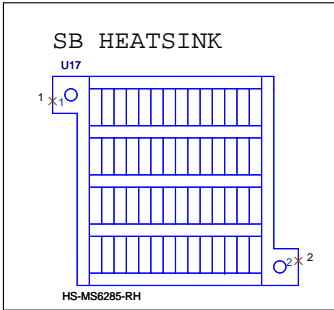
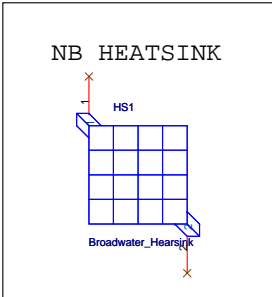
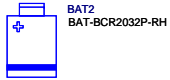
BUZZER



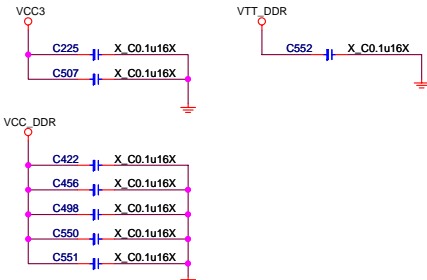
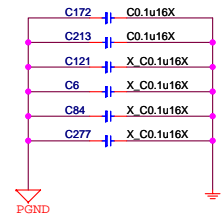
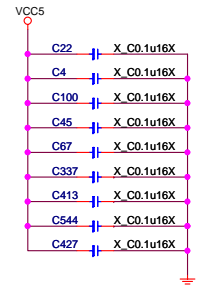
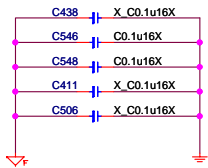
ATX



Micro Star Restricted Secret		
Title	Front ATX & Panel & LED	Rev 10
Document Number	MS-7407	
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: Wednesday, August 15, 2007 Sheet 29 of 35



EMI



Micro Star Restricted Secret		
Title	Manual Parts	Rev
Document Number	MS-7407	10
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MS-7407 bug history list					
1	Remove R128 for 1394 EEPROM	6/27	31		
2	Change Lan chipset to 82573L	6/27	32		
3	Add Q50 and EC58 for VCC3_SB	6/27	33		
4	Change U12 SPI ROM 16M to 8M	7/5	34		
5	Change Y4 to DIP D04-0300121-K11(TPM)	7/20	35		
6	Add CP13 for AGND link GND(Audio)	7/20	36		
7	Change L24,L25,L26 to L01-82CA013-T34(VGA)	7/20	37		
8	Change C344,C348,C355,C366,C369,C371 to C11-33A1812-W08(VGA)	7/20	38		
9	Modify C123 to C11-1032082-W08 10000 pf (Power team)	7/20	39		
10	Modify R104 to R11-0103T12-W08 10Kohm 1% (Power team)	7/20	40		
11	Modify R190,R129,R262 to 0 ohm 1% (Power team)	7/20	41		
12	Modify C440 to C11-4722812-T34 4700pf (Power team)	7/20	42		
13	Add R558 to 38.3K ohm (Power team)	7/20	43		
14	Modify VRM_GD link Circuit between ICH7 and MS-7, Remove R298,install R353	7/20	44		
15	Modify CK_PWRGD Circuit,add Q51,R557,C553	7/20	45		
16	Add R559 link 1P2VREF to GND (Power team)	7/20			
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Micro Star Restricted Secret

Title

Revision History

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MS-7407

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MS-7407 bug history list					
1	Remove R128 for 1394 EEPROM	6/27	31		
2	Change Lan chipset to 82573L	6/27	32		
3	Add Q50 and EC58 for VCC3_SB	6/27	33		
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MS-7407 bug history list					
1	Remove R128 for 1394 EEPROM	6/27	31		
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LGA775 - CPU (65W)		
0.850V-1.3525V Core	-	125A
1.2V FSB VTT	-	5.3A

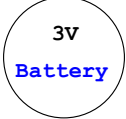
G31		
1.2V FSB_VTT	-	1.0A
1.25V Core	-	18.1A
1.25V DMI/PCI Exp.	-	2.5 A
1.8V VCC_DDR (S0,S1)	-	3.2A
1.8V VCC_SMCLK	-	250mA
3.3V VCCA_DAC	-	65.8mA
3.3V VCC33	-	15.8mA
1.25V Vcc CL	-	3.8A

ICH7		
1.05V Core	-	1.31A
1.5V DMI	-	40 mA
1.2V FSB_VTT	-	14 mA
1.5V_A USB/SATA	-	0.97A
1.5V_B PCI Exp.	-	0.74A
VCCRTC	-	6 uA
3.3V CL	-	12 mA
1.5V GbE LAN	-	74 mA
3.3V 10/100 LAN	-	12 mA
3.3V GbE LAN	-	1 mA
3.3V SusHDA	-	4 mA
3.3V HDA	-	24 mA
3.3V VccSus3_3	-	700mA
3.3V Vcc3_3	-	580mA

HD Audio ALC888		
3.3V AUDIO	-	40mA
5V AUDIO	-	200mA

ICS9LP505		
3.3V VDD_48/PCI/REF	-	TBDA

INTEL 82566DC		
3.3V_SB I/O & LED	-	28mA
1.8V ANALOG	-	440mA
1.0V ANALOG	-	297mA



ISL6312		
VCCP	VRM 11	
0.850V-1.3525V		
3-Phase Switch	125A	

W83310DS		
VTT_DDR		
0.9V Linear	1.2A	

MS11+ Regulator		
VCC_DDR		
1.8V PWM		
4.7A+4.1A+2.5A	12A	

MS11+ Regulator		
V_1P25_MCH		
1.25V PWM		
20.6A+6A	26.6A	

MS7 Regulator		
V_1P25_CL		
V_FSB_VTT		
1.2V Linear	6.3A	
V_1P5_ICH		
1.5V Linear	2A+1A	
V_1P05_ICH		
1.05V Linear	1.31A	
5V DUAL		
5V Switch	4A	
5VSB Switch	500mA	
5VDIMM		
5V Switch	6.2A	
5VSB Switch	500mA	

5VAUD		
5V		
500mA		

1.8V		
440mA		
1.0V		
297mA		

VCC5_SB	VCC5	VCC3_SB	VCC3	+12V
Switch	21.5A	Switch	8.4A	Switch
1A		1.5A		9.5A
ATX POWER CONN				

DDRII x2 & TERMINATOR		
0.9V VTT_DDR	-	1.2A
1.8V VCC_DDR (S0,S1)	-	4.7A
1.8V VCC_DDR (S3)	-	400mA

PCI Express x16 slot		
+12V	-	5.5 A
+3.3Vaux (wake)	-	375mA
+3.3Vaux (no wake)	-	20mA
+3.3V	-	3.0A

PCI slot x1		
+3.3Vaux (wake)	-	375mA
+3.3Vaux (no wake)	-	20mA
+3.3V	-	7.6A
+5V	-	5.0A
+12V	-	0.5A

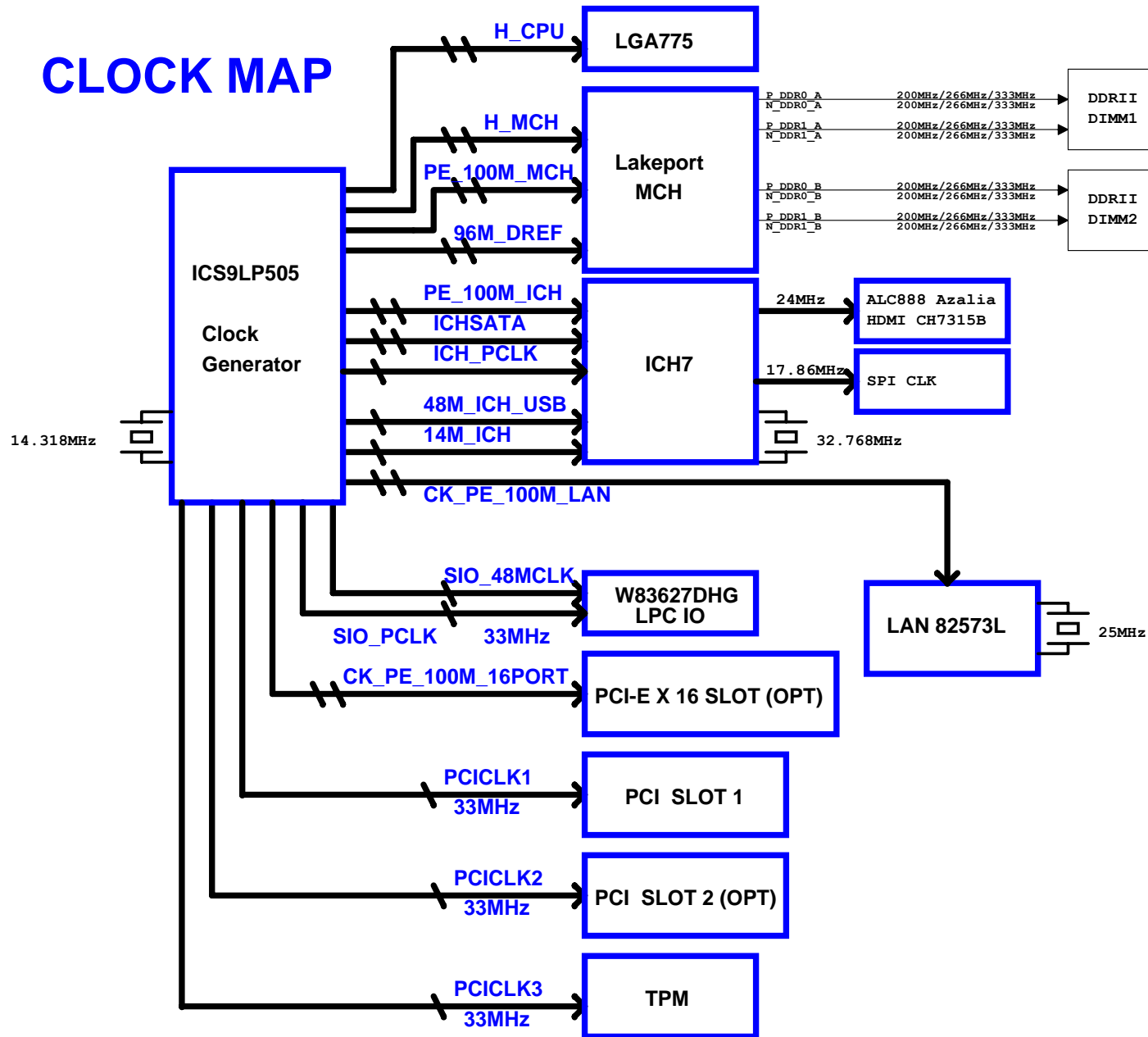
USB x7		
+5V (S0,S1)	-	3.5A
+5V (S3)	-	17.5mA

+12V CPU & SYS FAN		
	-	0.5A

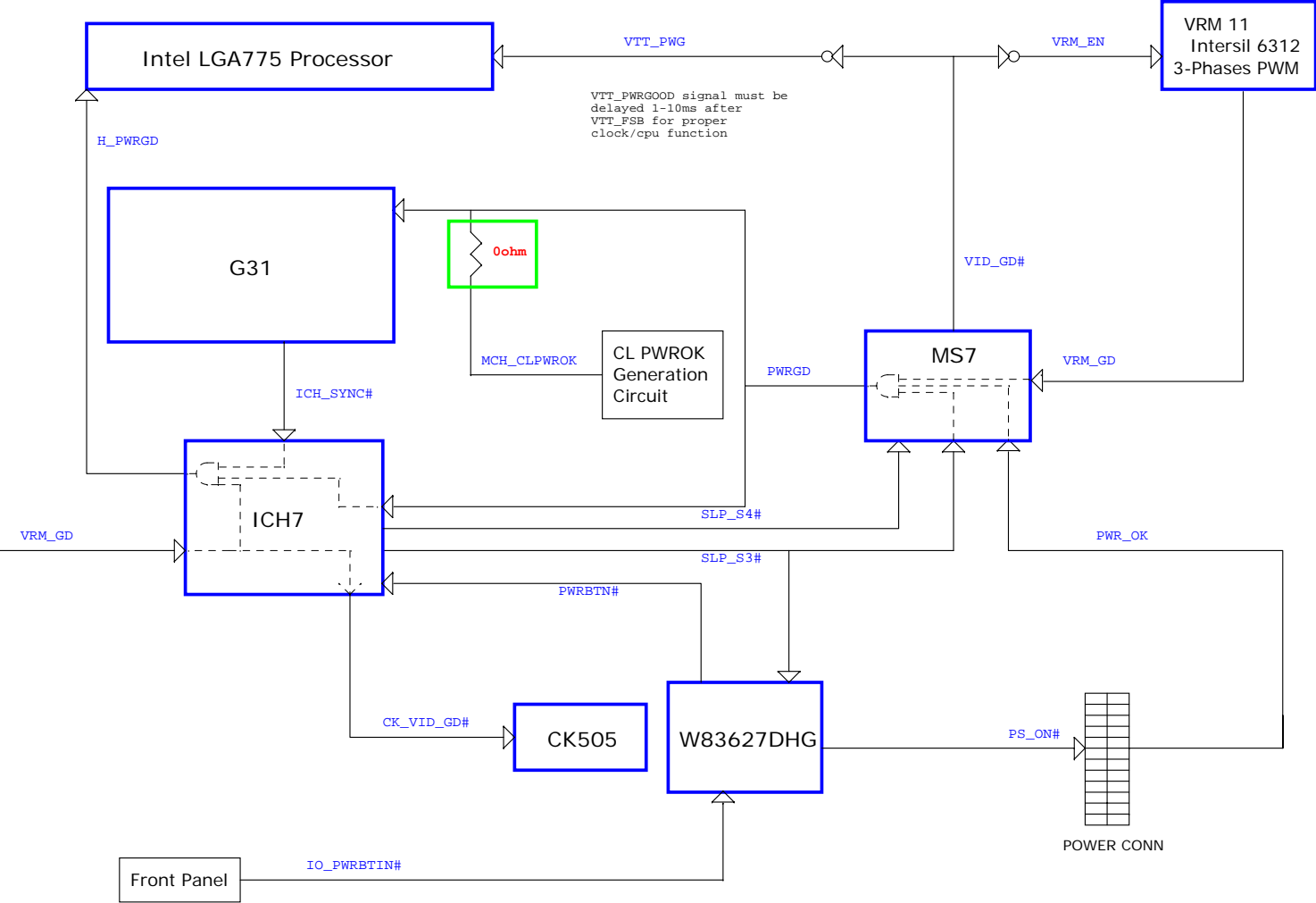
DC 4Pin Output		
+12V		
+5V		

PS/2		
+5V (S0,S1)	-	345mA
+5V (S3)	-	2.0mA

CLOCK MAP



PWROK MAP



RESET MAP

