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NEC:LunarEagle

MSI:MS-7419N1

Version:0A



CPU: Conroe family processors /WolfDale/Yorkfield in LGA775 Package.

System Chipset:

Intel EagleLake-Q+Intel ICH10-DO

On Board Device:

BIOS -- SPI Flash 32M
 LAN --INTEL 82567LM Boazman
 Super I/O -- SMSC5617
 AUDIO -- Realtek HD ALC262
 Clock GEN-IDTCV184-2
 TPM-SLB 9635 TT1.2

Expansion Slots:

PCI-E(X16) Slot *1
 Riser Slot :(PCIx1/PCI-E(x1)x1)


Main Memory:

Due-channel DDR-III * 2 (1066MHZ)

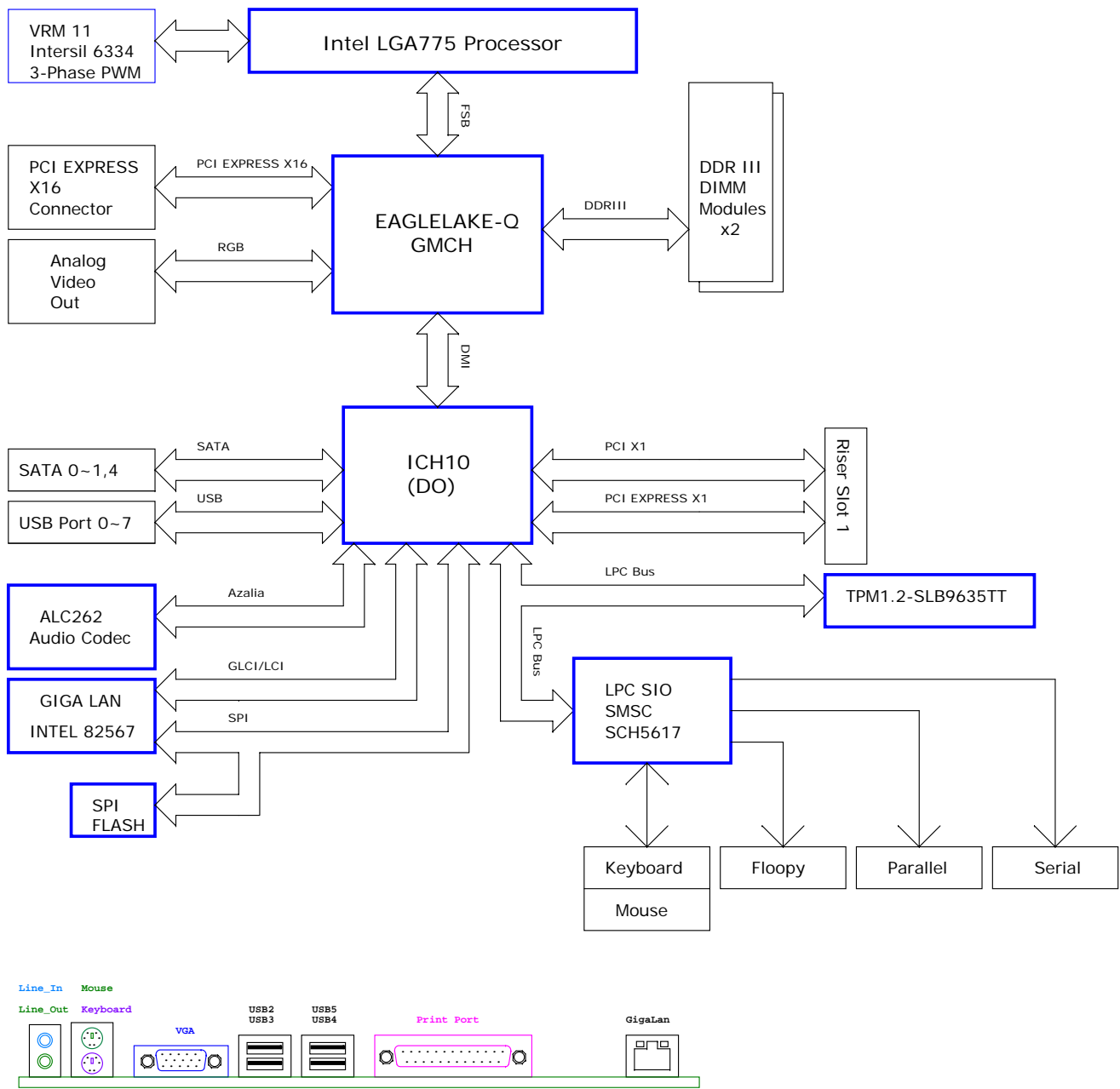
Intersil PWM:

Controller: Intersil ISL6334 (3 Phases)

MS-6497N1	ERP Number	Function
MS-7419-0A	601-7419-A10	Mainboard
MS-4046-2A	604-4046-020	Power Button/LED board
MS-4085-10	604-4085-020	Front Audio Board
MS-4048-3A	604-4048-040	Front USB Board
MS-4121-10	604-4121-010	Riser Card

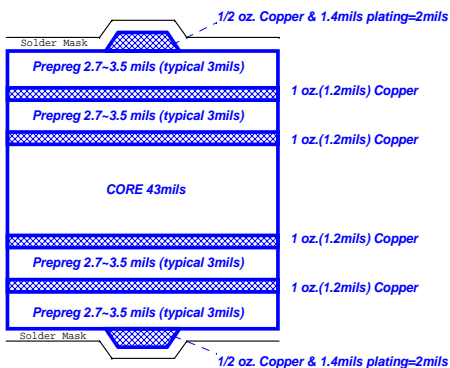
 MICRO-START INT'L CO.,LTD.		
Title: COVER SHEET		
Size:	Document Number: MS-7419	Rev: 0A
Date: Thursday, January 17, 2008	Sheet: 1	of 34

Block Diagram



Board Stack-up (6 layers)

(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
Differential Clock : 18/4/10/4/18

Example Fab Drawing Note (1080 Prepreg PCB)


Trace Width (mils)	Differential Spacing (mils)	Target Impedance	Tolerance
4.0	NA	50-ohm, single-ended	15%
6.5	NA	40-ohm, single-ended	15%
7.5	NA	37-ohm, single-ended	15%
9.5	NA	32-ohm, single-ended	15%
3.9	8.1	95-ohm, differential	20% reference only
4.5	7.5	90-ohm, differential	20% reference only

Eaglelake(GMCH) Impedance Requirements by Interface


Interface	Impedance Required
FSB(All)	4x signals 42-ohm, others 50-ohm, single-ended
Controller Link	50-ohm, single-ended
DDR2(DQ, DQS, DM, CLK, CLK#)	40-ohm, single-ended
DDR2(Control)	43-ohm, single-ended
DDR2(Command)	33-ohm, single-ended
DDR3(CLK, CLK#)	36-ohm, single-ended
DDR3(DQ, DQS, DM)	50/37-ohm, single-ended
DDR3(Control)	36-ohm, single-ended
DDR3(Command)	32-ohm, single-ended
PCI Express, DMI	95-ohm, differential
VGA	87-ohm, single-ended at WCH breakout, then 50-ohm, single-ended to VGA connector

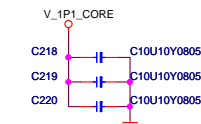
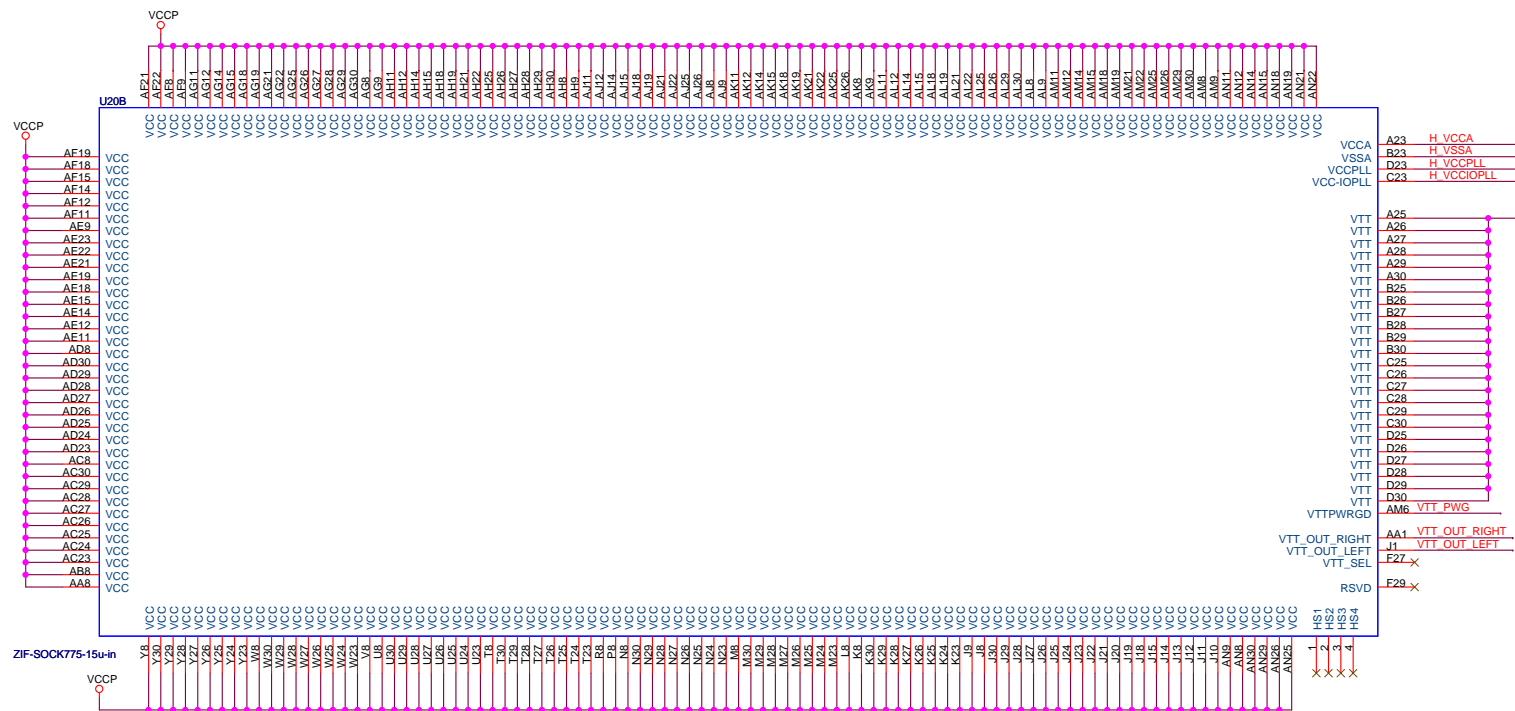
ICH10 Impedance Requirements by Interface

Interface	Impedance Required
PCI	50-ohm, single-ended
Controller Link	50-ohm, single-ended
Miscellaneous	50-ohm, single-ended
PCI Express, DMI	95-ohm, differential
SATA	95-ohm, differential
USB	90-ohm, differential

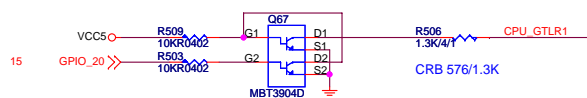
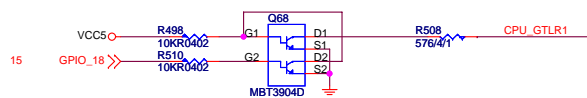
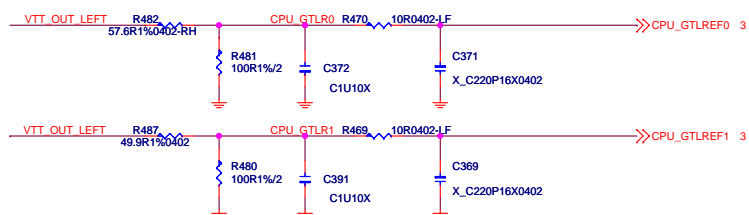
 MICRO-START INTL CO., LTD.		
Title: BLOCK DIAGRAM		
Size	Document Number: MS-7419	Rev: 0A
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BSEL			TABLE
2	1	0	FSB FREQUENCY
0	0	0	267 MHZ (1067)
0	1	0	200 MHZ (800)
0	0	1	133 MHZ (533)
1	0	0	333 MHZ (1333)

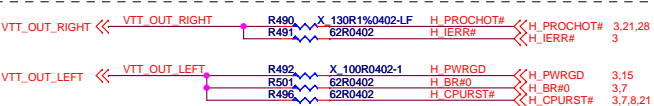
 MSI <i>Link to the Future</i>				MICRO-START INT'L CO.,LTD.			
Title INTEL LGA775 CPU SIGNAL							
Size		Document Number MS-7419				Rev 0A	
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CAPS FOR FSB GENERIC

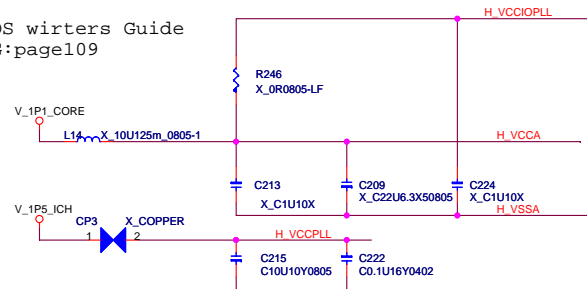


PLACE AT CPU END OF ROUTE

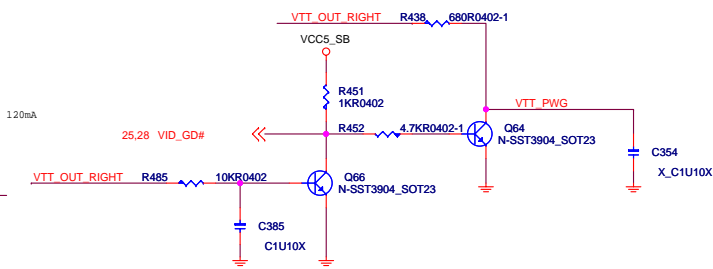


PLACE COMPONENTS AS CLOSE AS POSSIBLE TO PROCESSOR SOCKET
TRACE WIDTH TO CAPS MUST BE SMALLER THAN 12MILS

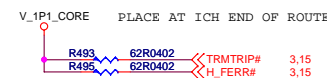
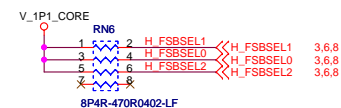
BIOS writers Guide
PDG:page109



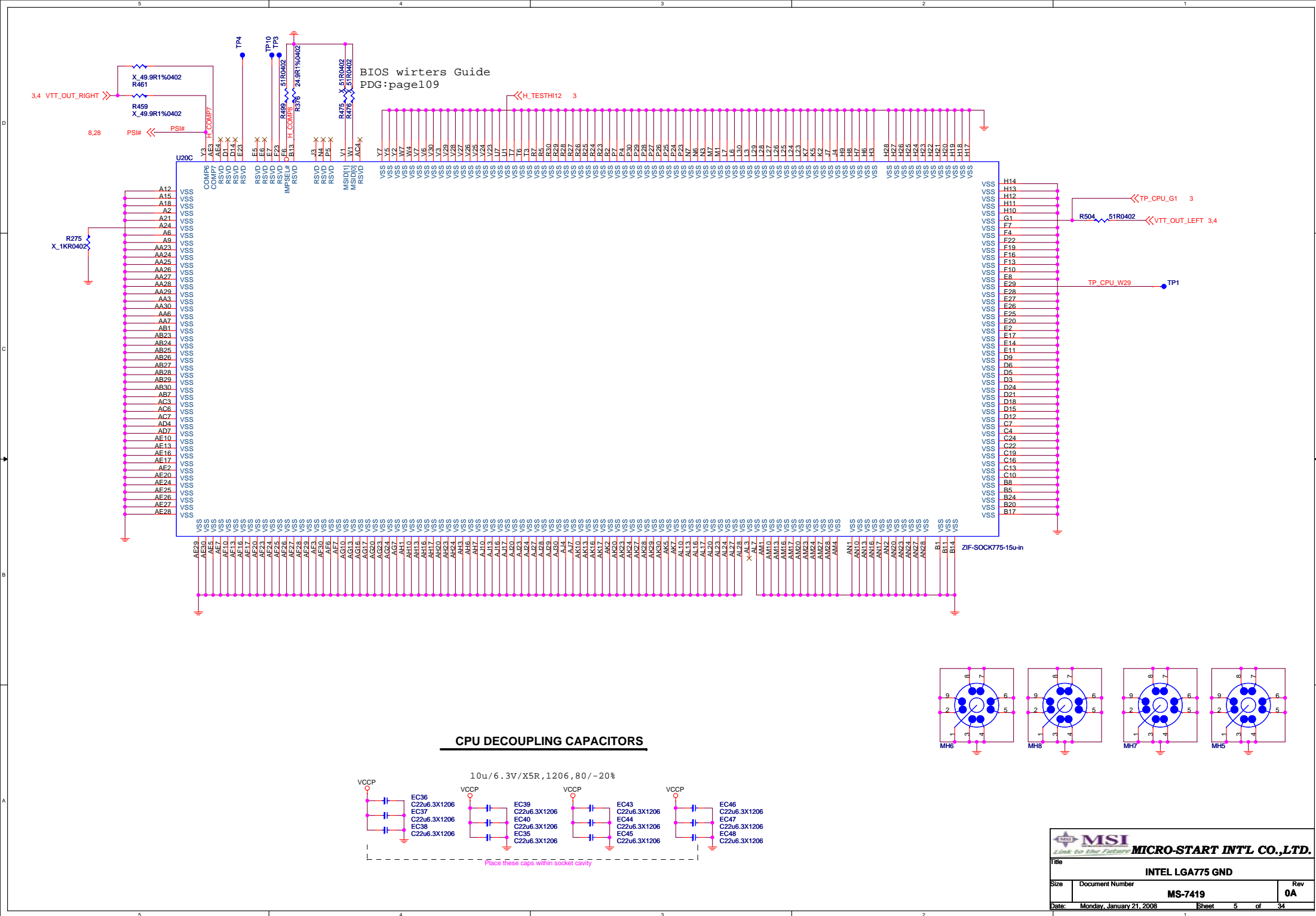
VTT_PWG SPEC :
High > 0.9V
Low < 0.3V
Trise < 150ns



FSBSEL RESISTOR CAN BE REMOVED IF ONLY TEJAS
AND CEDAR MILL ARE SUPPORTED



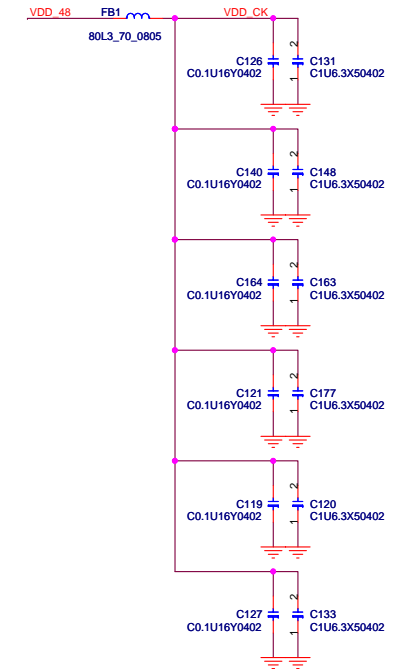
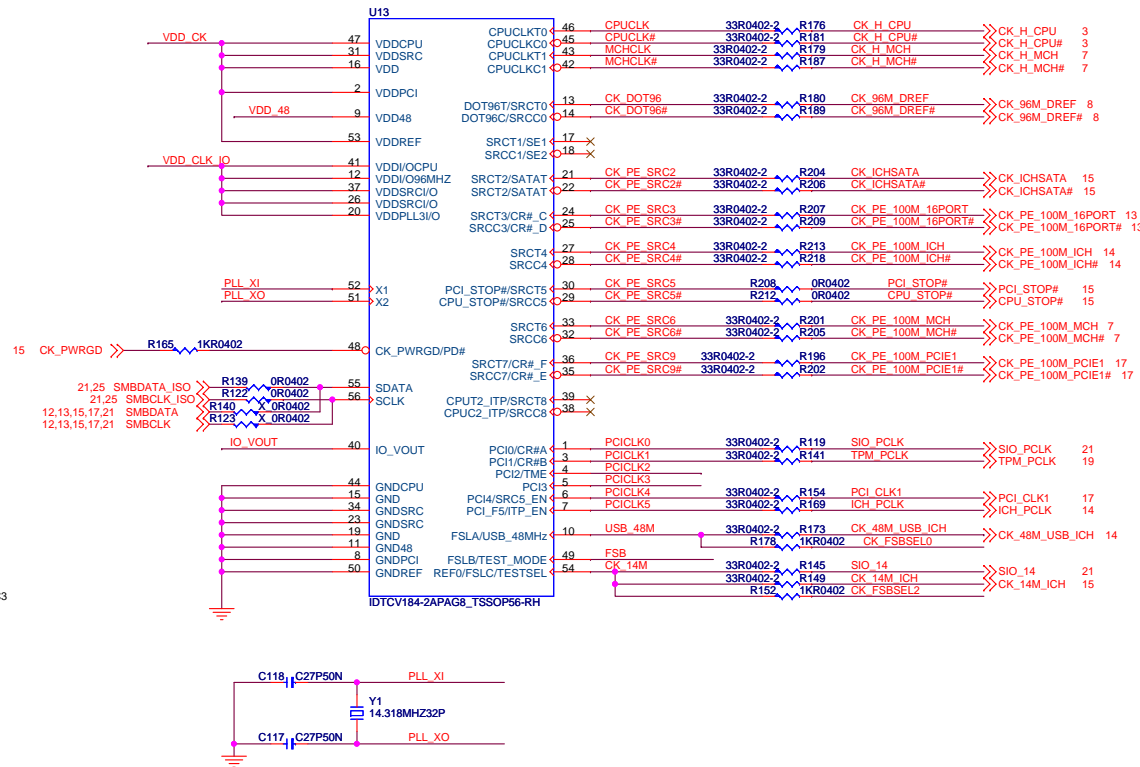
MICRO-START INTL CO.,LTD.		
INTEL LGA775 POWER		
Size	Document Number	Rev
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Date:	Monday, January 21, 2008	Sheet 4 of 34



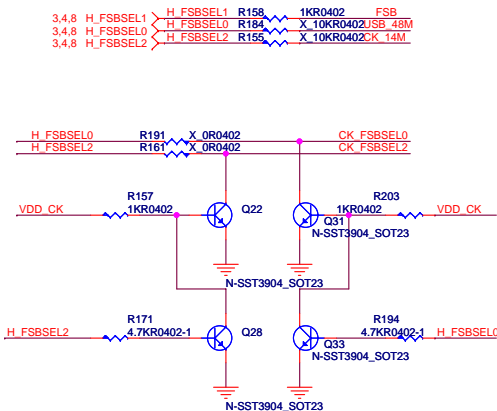
CLOCK Generator - IDTCV184-2

VDD_CK Decoupling

Place near each VDD_CK Pins

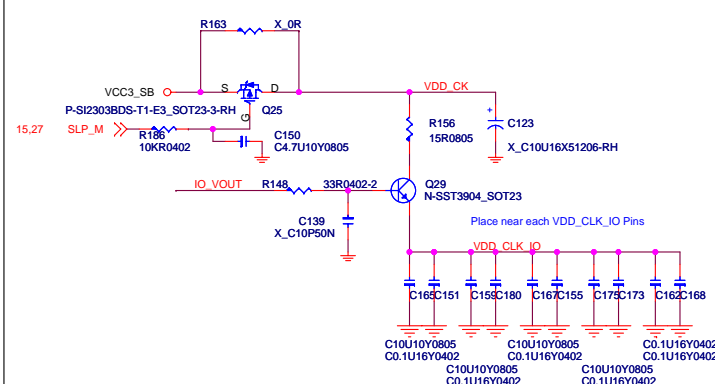


CPU Frequency select

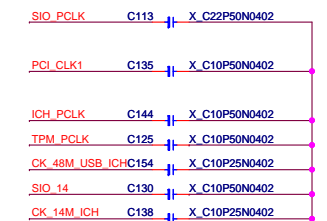


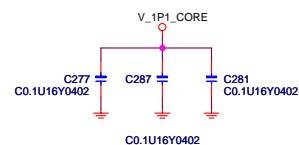
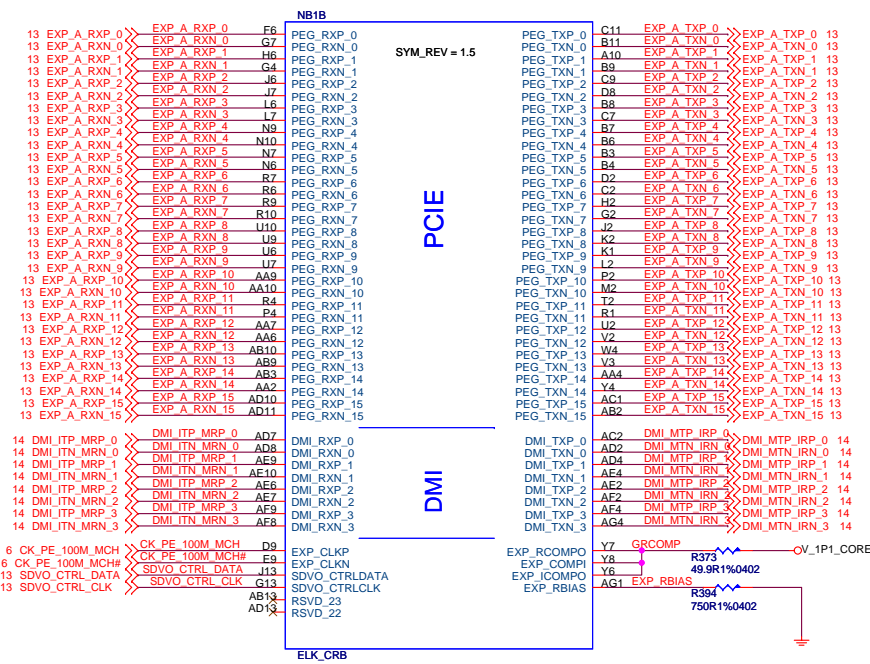
FS _b C ¹ B0b7	FS _b B ¹ B0b6	FS _a A ² B0b5	CPU MHz
0	0	0	265.66
0	0	1	133.33
0	1	0	200.00
0	1	1	166.66
1	0	0	333.33
1	0	1	100.00
1	1	0	400.00
1	1	1	Reserved

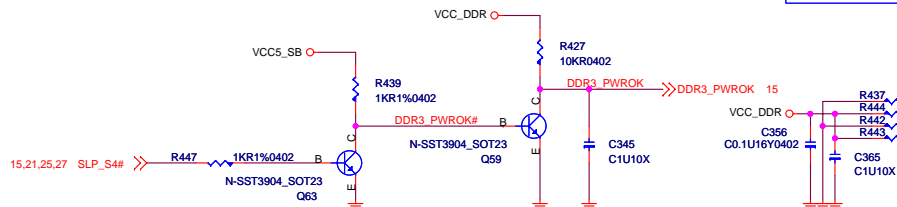
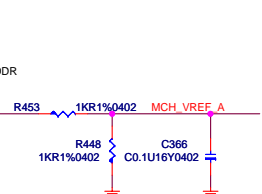
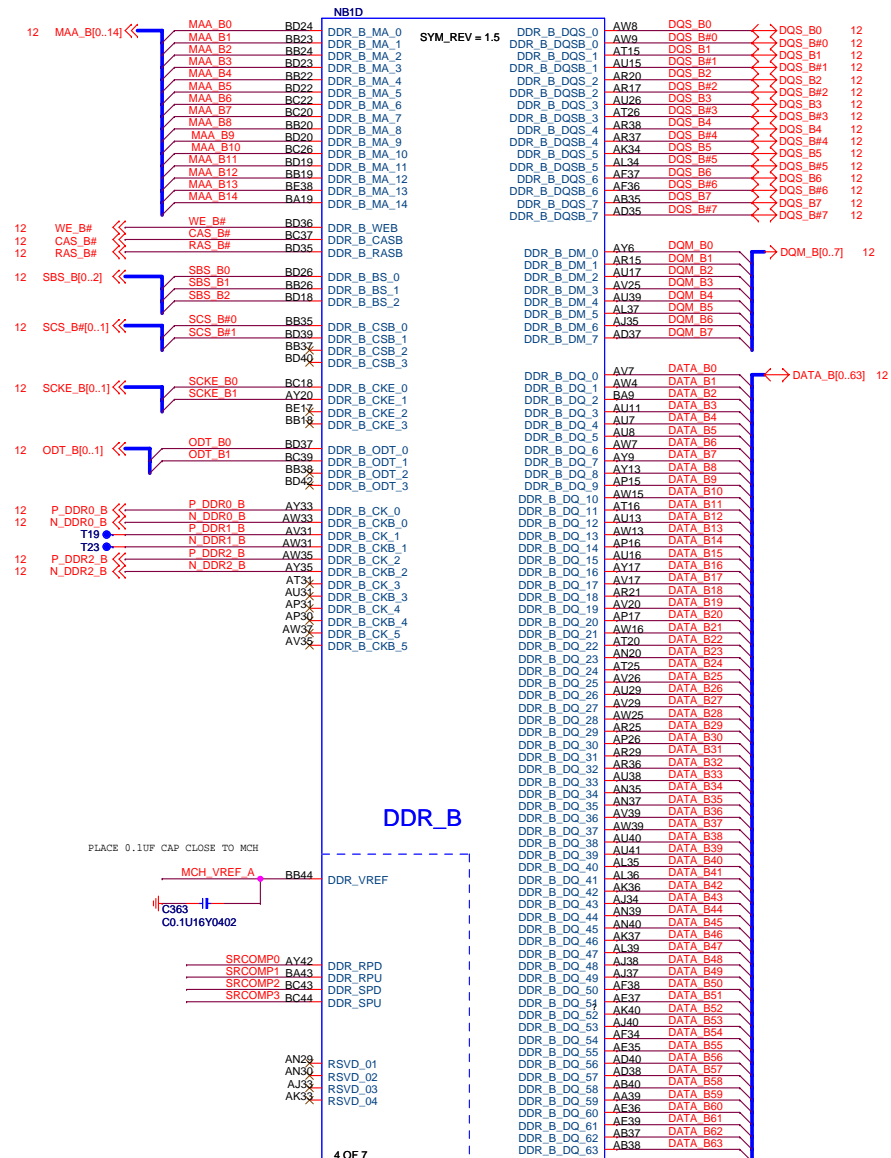
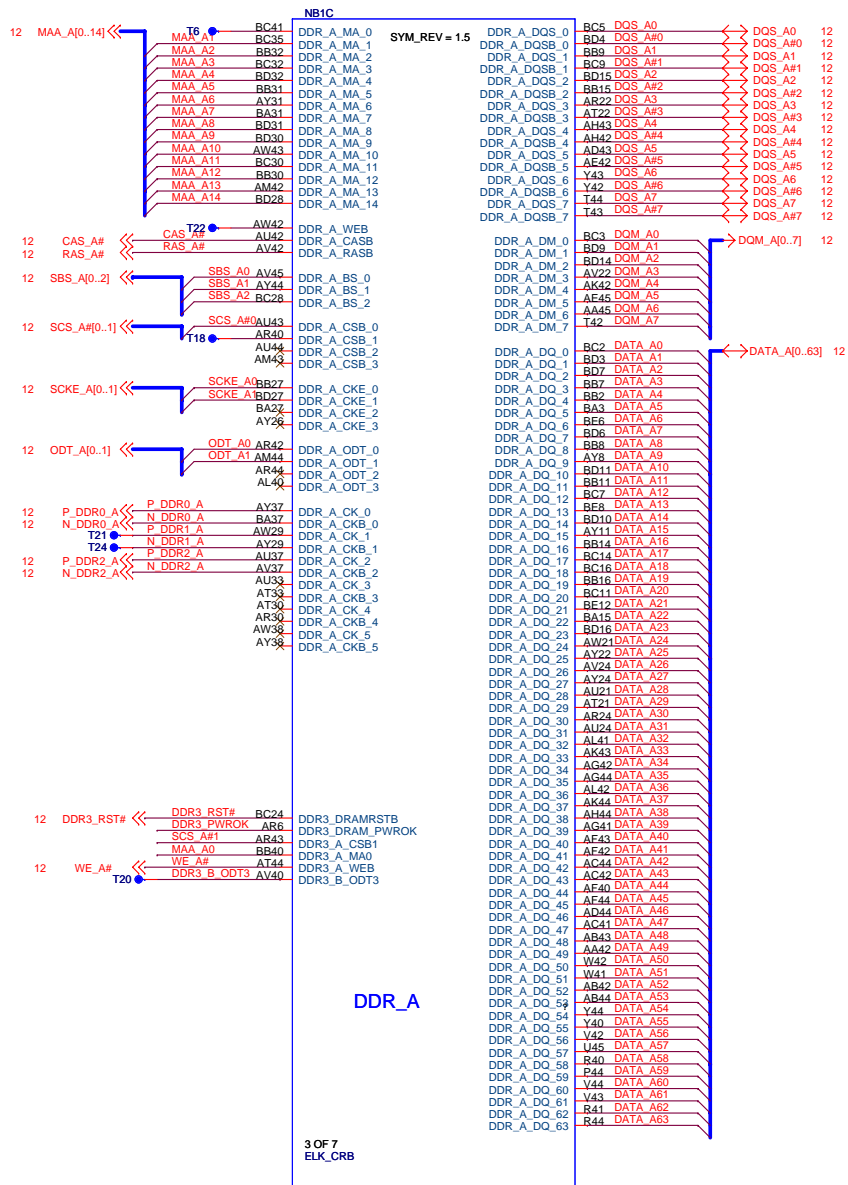
VDD_CK & VDD_CLK_IO Power



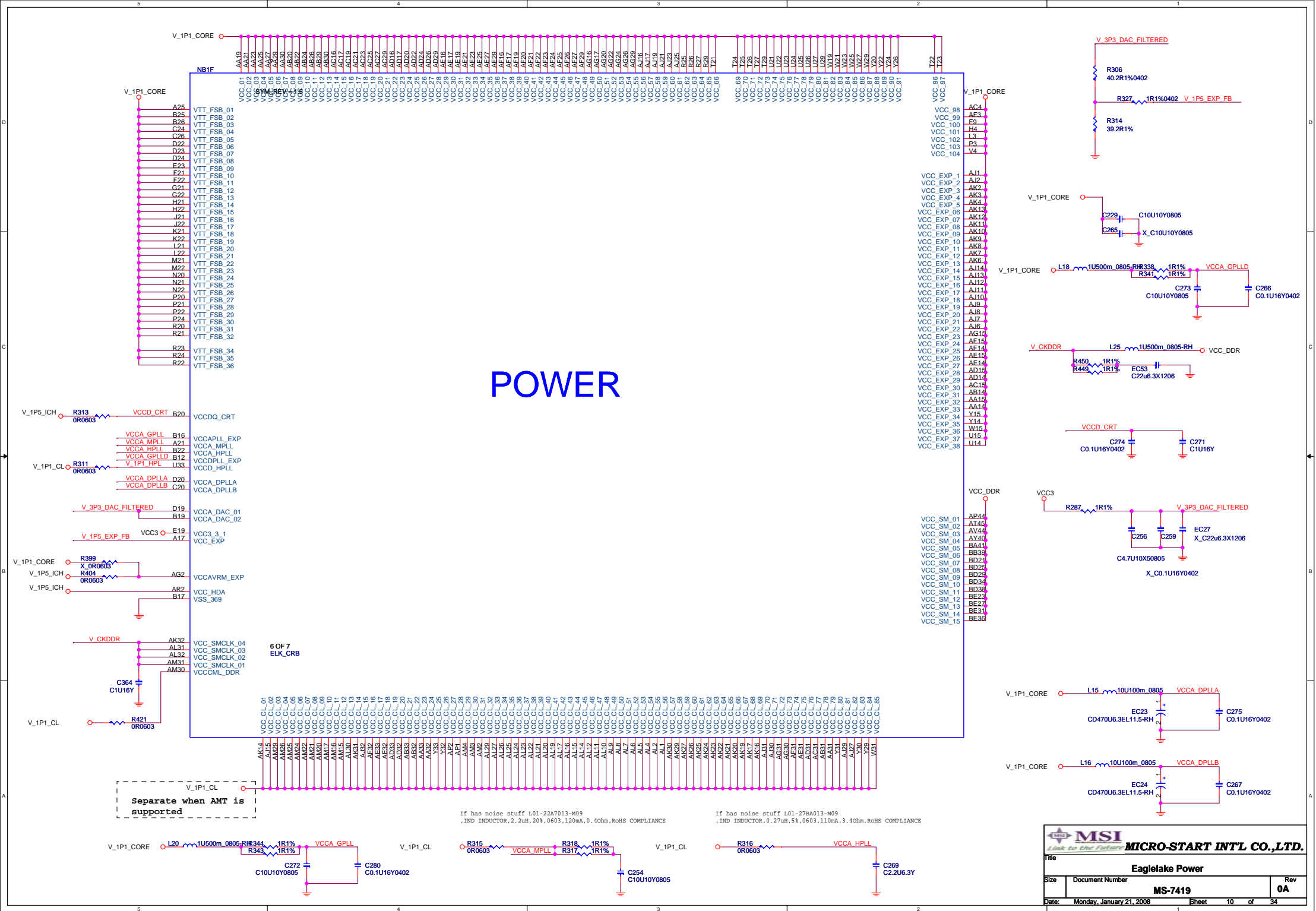
For EMI reserver

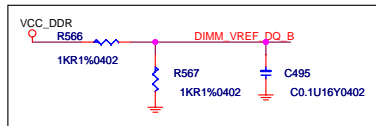
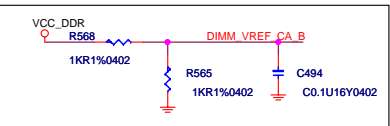
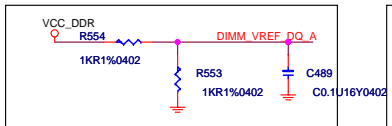
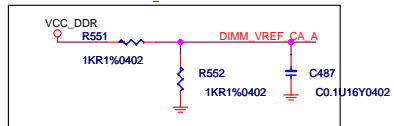
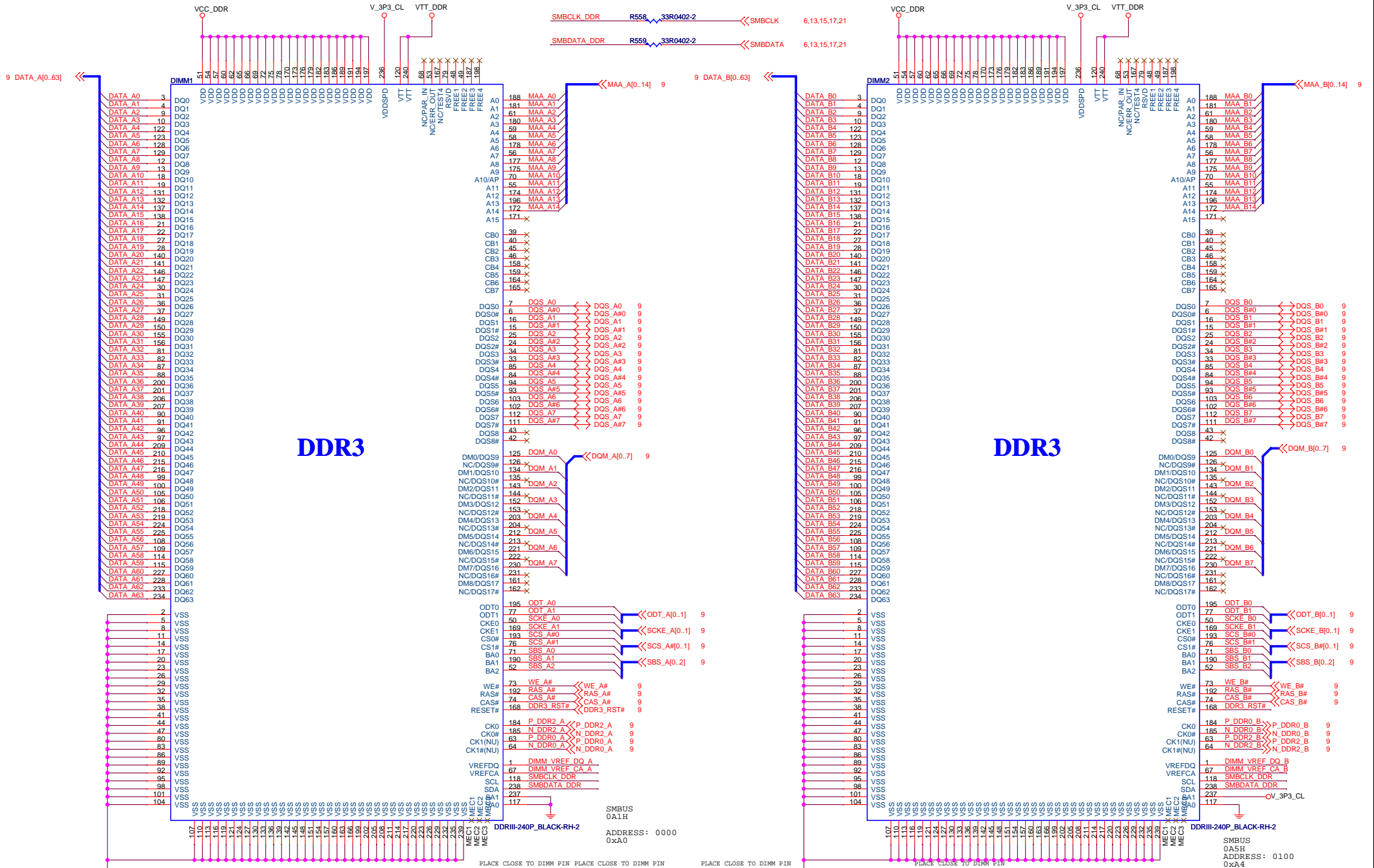






POWER





MSI MICRO-START INTL CO.,LTD.

Link to the Future

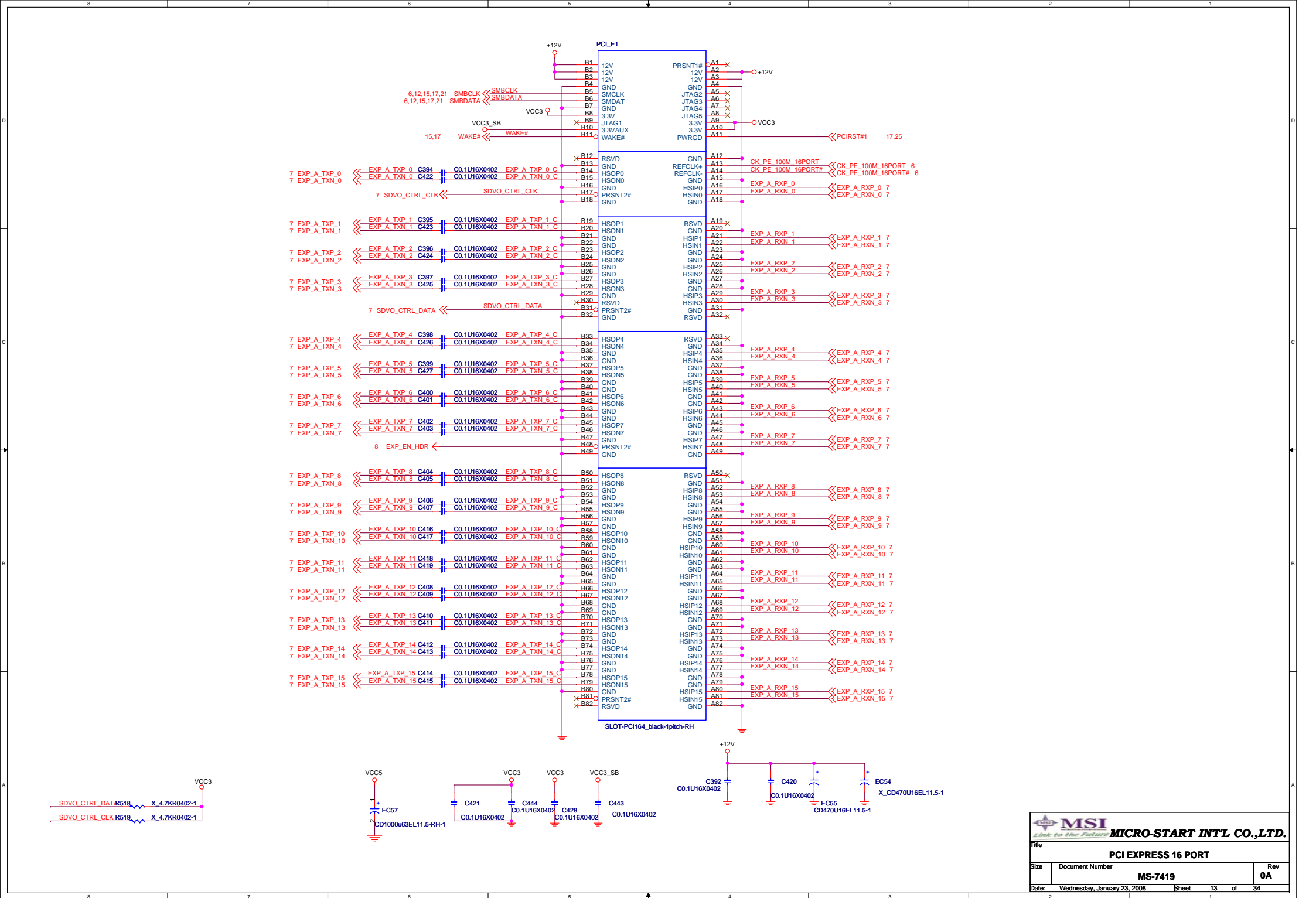
DDR3 DIMM 1 & 2

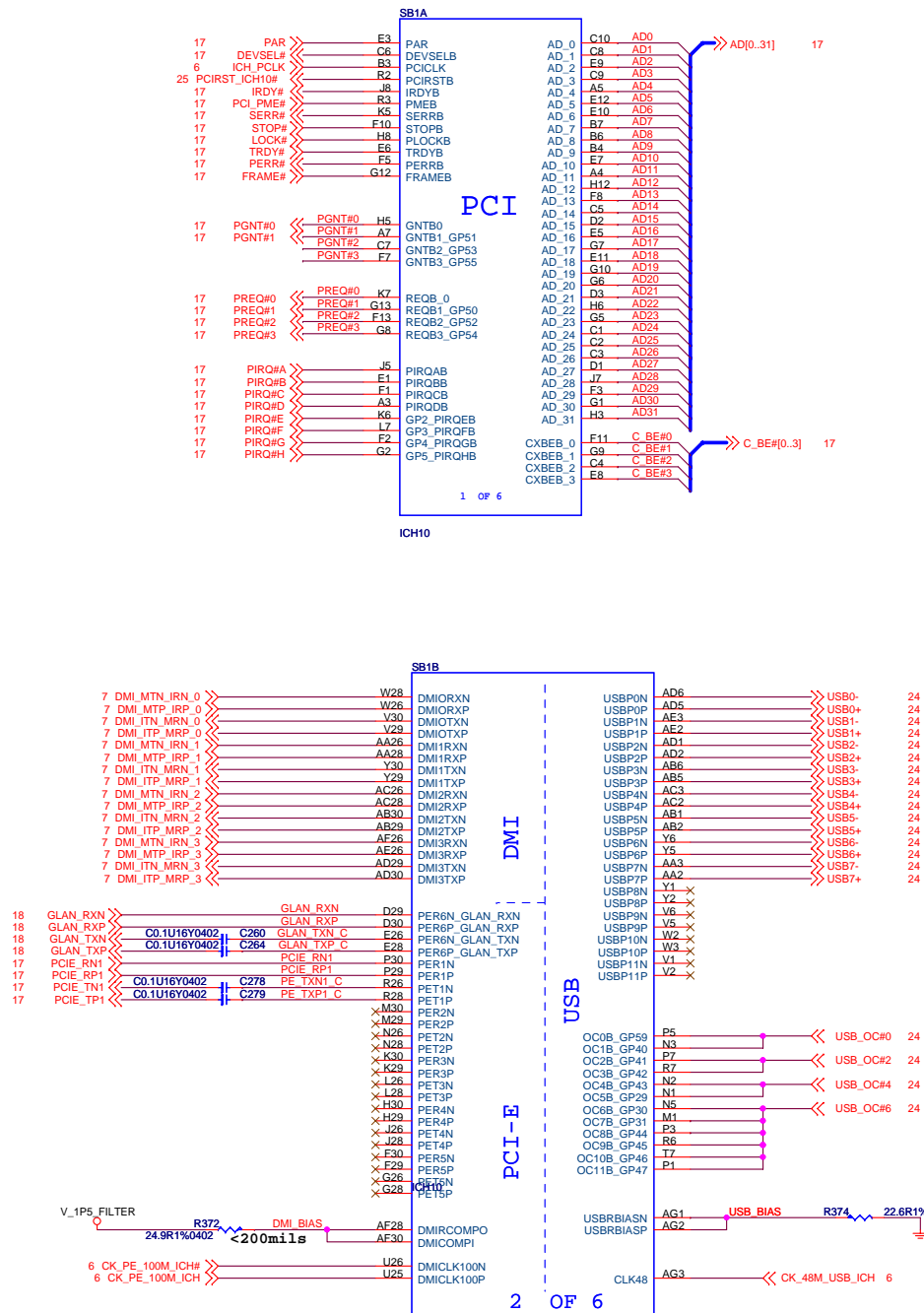
MS-7419

0A

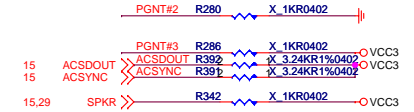
Size Document Number Rev

Date: Monday, January 21, 2008 Sheet 12 of 34

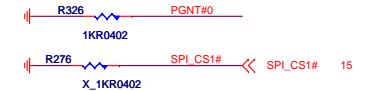




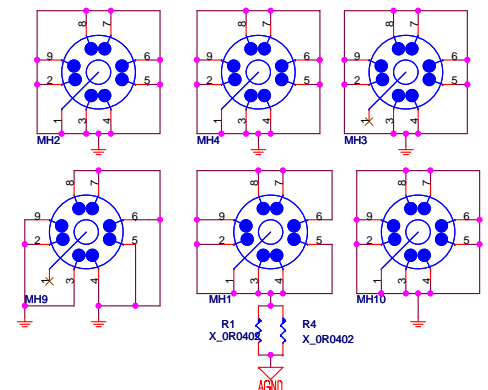
ICH10 H/W STRAPS				
SIGNAL	H	L	DES.	
SPKR	DIS	EN	REBOOT	
GNT3	DIS	EN	A16 OVERRIDE	
INTVRMEN	EN	DIS	INT VRM	
SATALED	NORM	REVERSE	PCIE 0-3 ORDER	
HDA_SDOUT	DFX/PCIE	N/A	XOR MODE/PCIE PORT CONFIG BIT 1	
HDA_SYNC	SET BIT	N/A	PCIE PORT CONFIG BIT 0 (1-4)	
GNT2	N/A	SET BIT	PCIE PORT CONFIG 2 BIT 0 (5-6)	



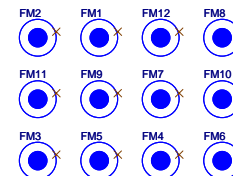
BOOT SELECT STRAPS			
BOOT DEVICE	GNT#0	SPI_CS1#	
FWH	1	1	
SPI	0	X	(Default)
PCI	1	0	



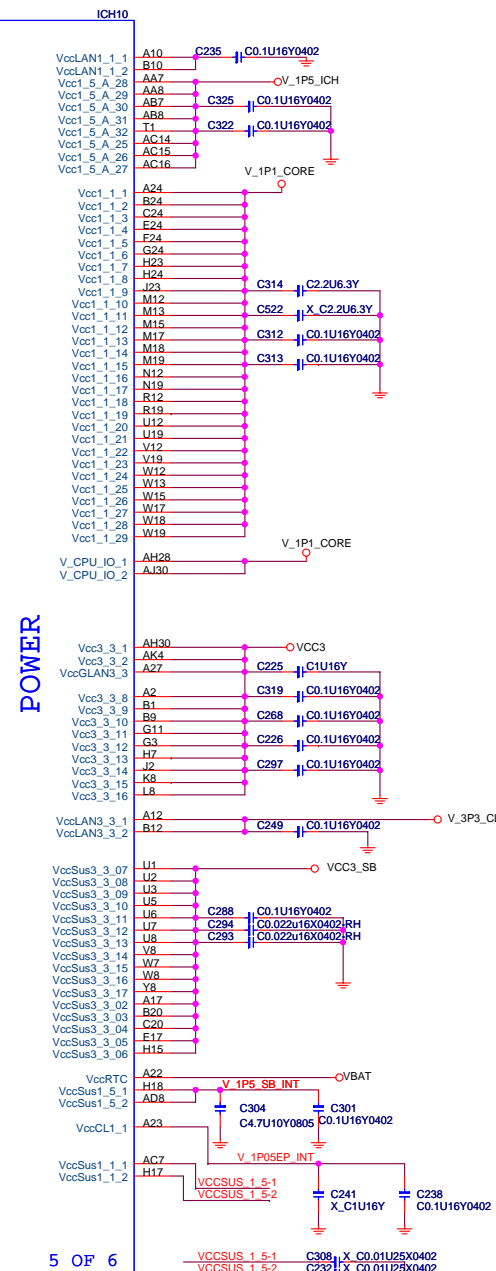
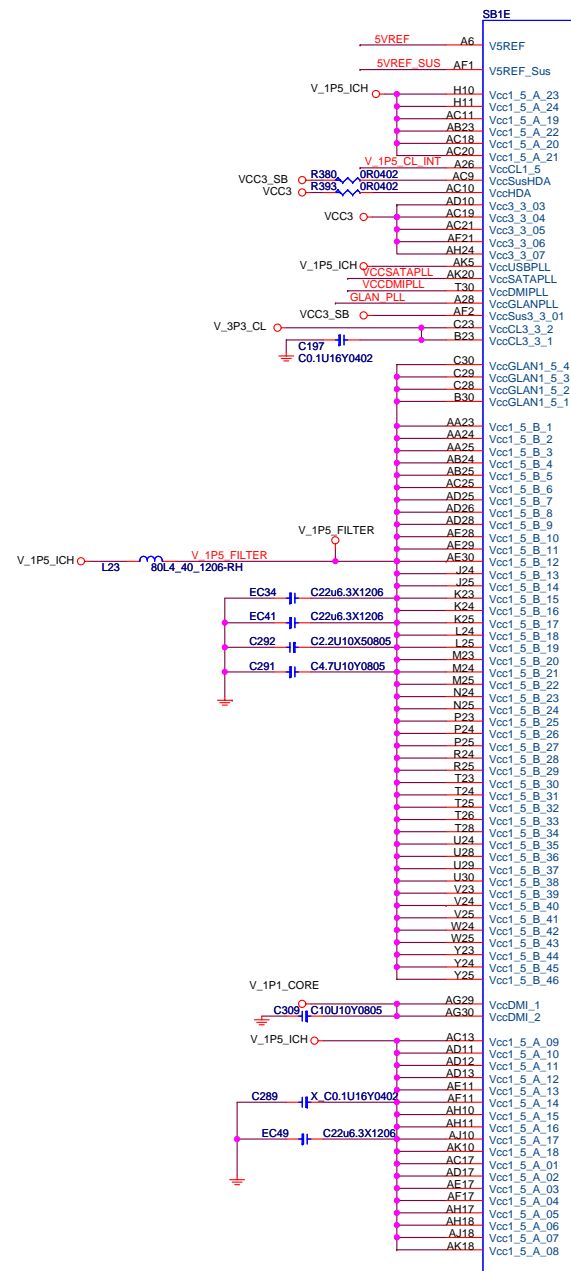
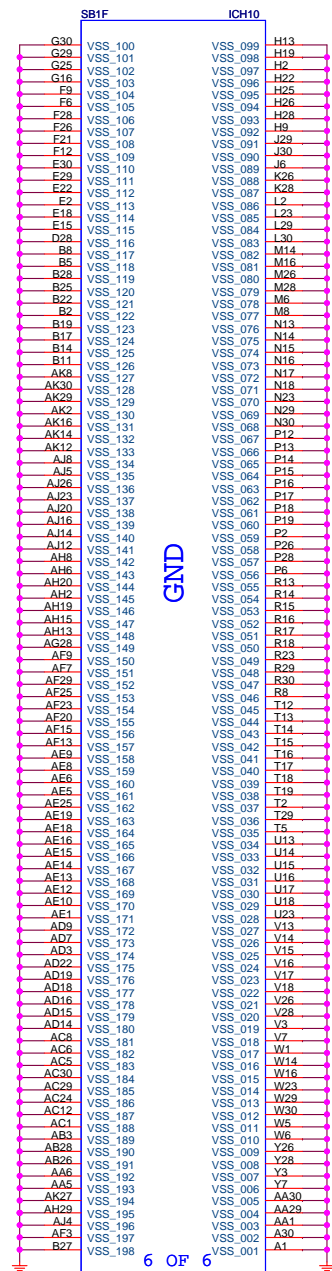
Mounting Holes



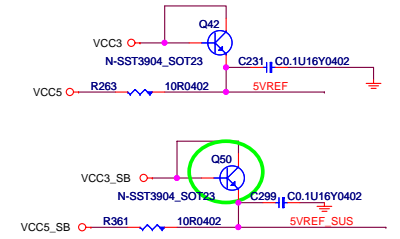
Optics Orientation Holes



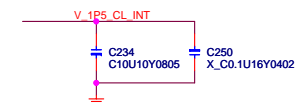
MICRO-START INT'L CO.,LTD.			
Title INTEL ICH10 PART1			
Size	Document Number	Rev	
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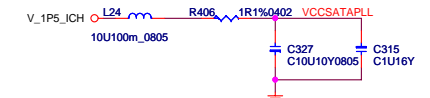
5VREF & 5VREF_SUS Sequencing Circuit



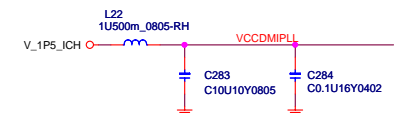
V_1P5_CL decoupling



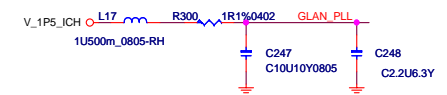
VCCSATAPLL



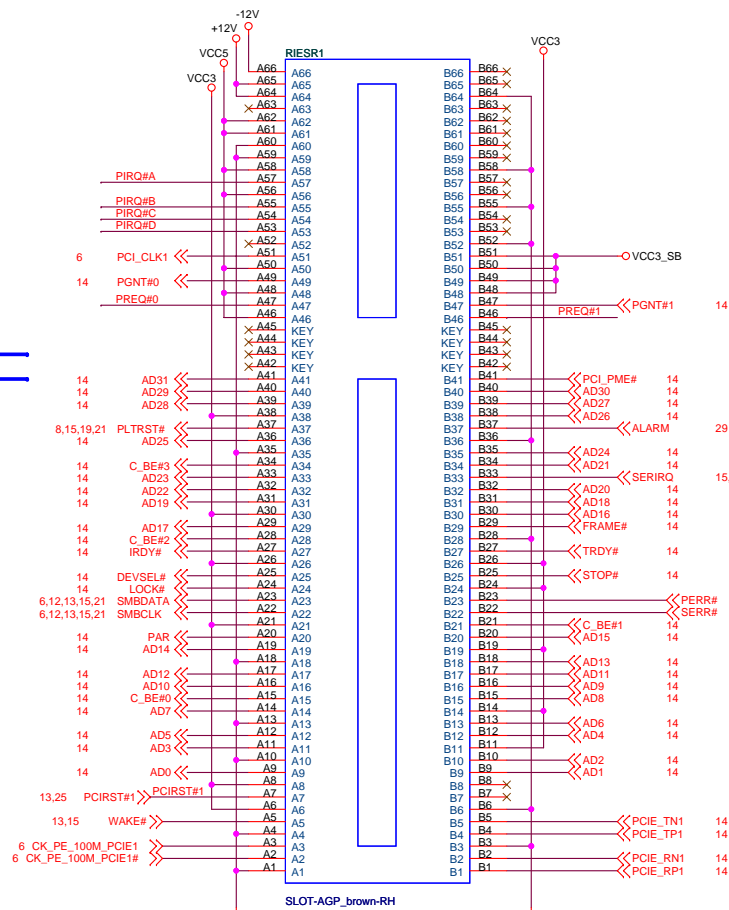
VCCDMIPLL



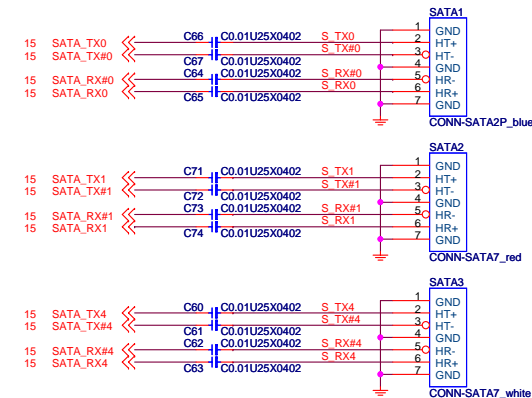
GLAN_PLL



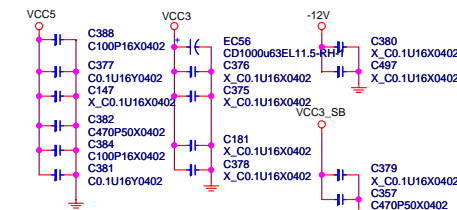
LB&HK4BXriser card interface



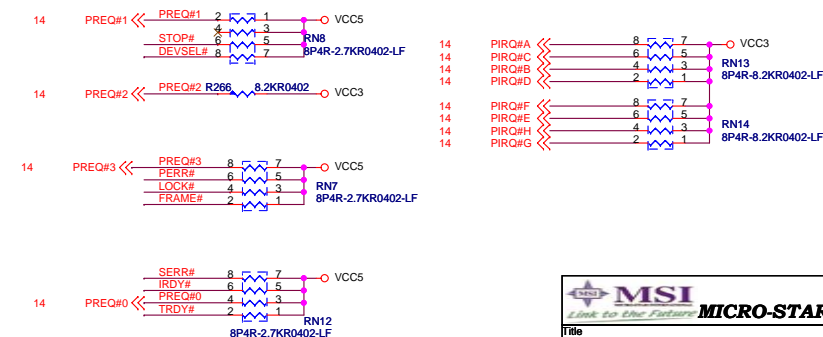
SERIAL ATA CONNECTOR BLOCK



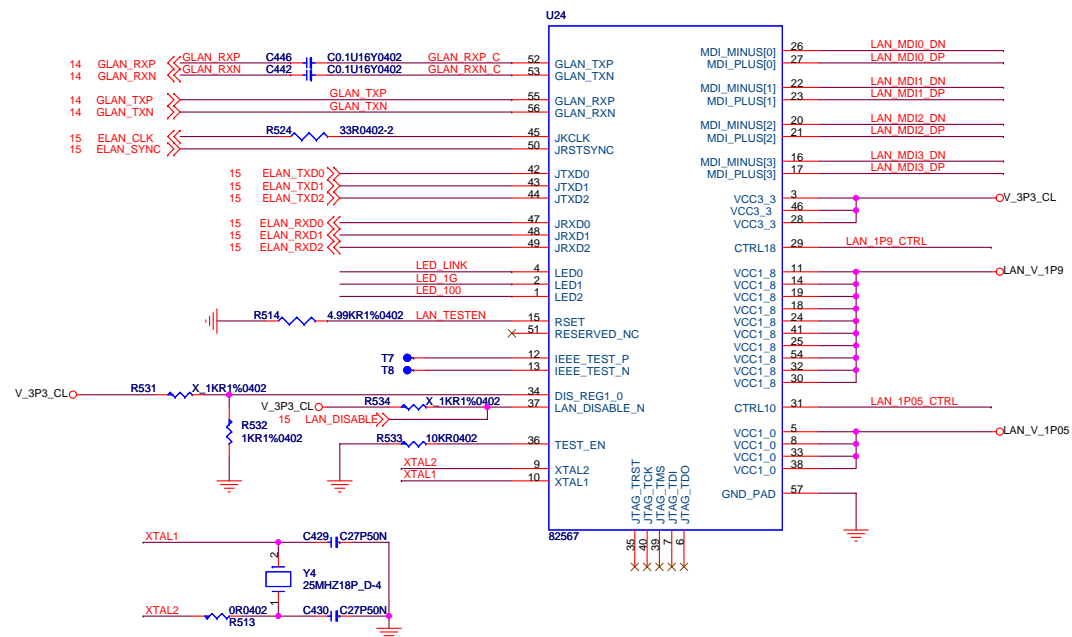
PCI SLOT DECOUPLING CAPACITORS



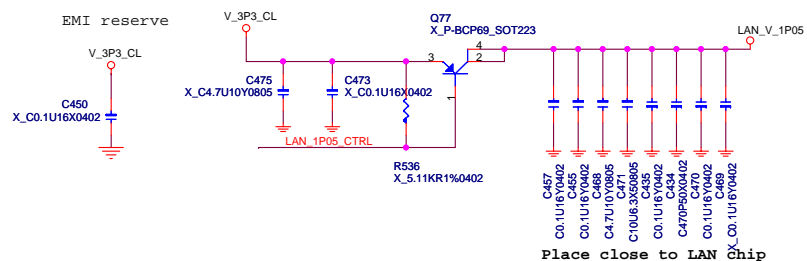
PCI PULL-UP / DOWN RESISTORS



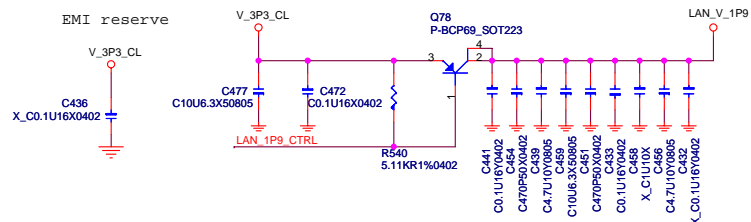
INTEL 82567(Boanman)



LAN 1P0 POWER
(277.2mA)

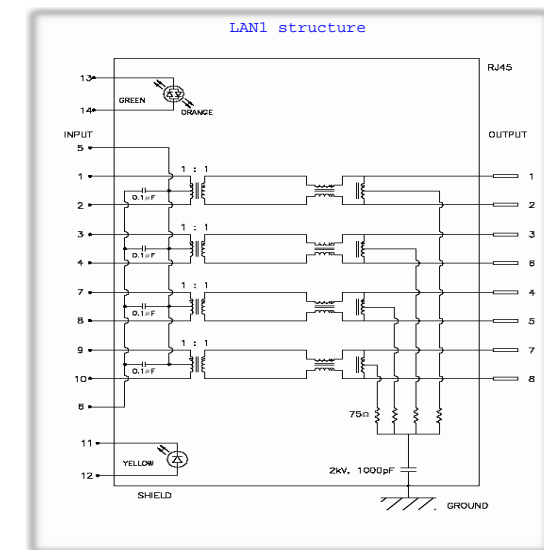
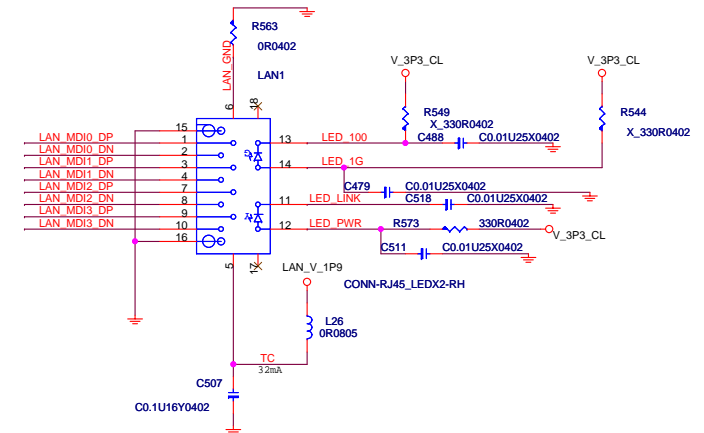


LAN 1P8 POWER
(418.2mA)



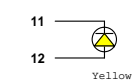
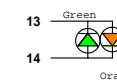
Place close to LAN chip

LAN CONNECTOR

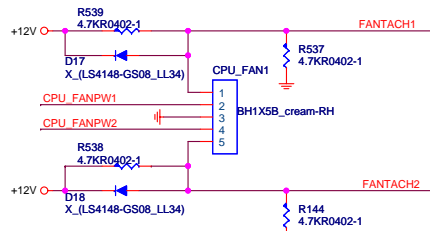
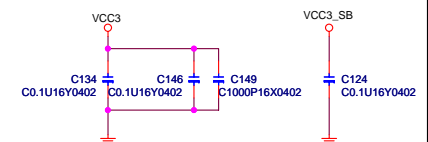


```
Speed LED Type
1000Mbps : Orange
100Mbps  : Green
10Mbps   : LED off
```

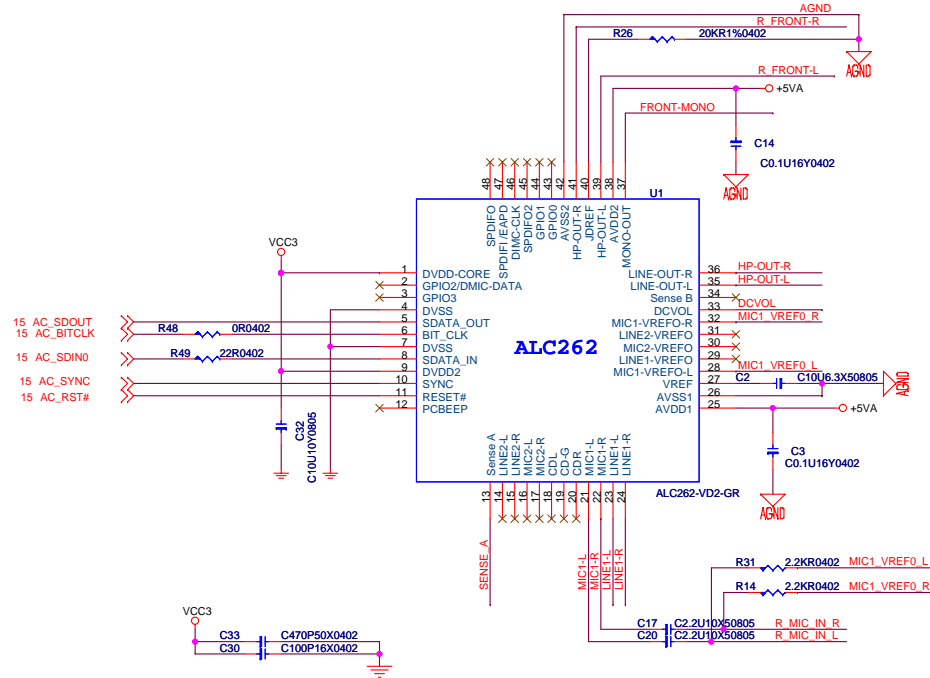
For Active/Link:
Yellow



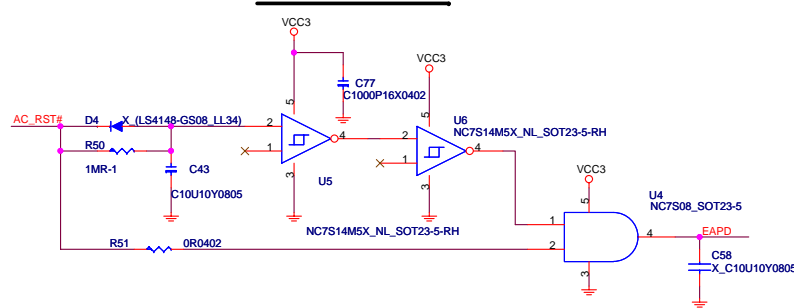
CPU FAN2

[illegible][illegible][illegible]

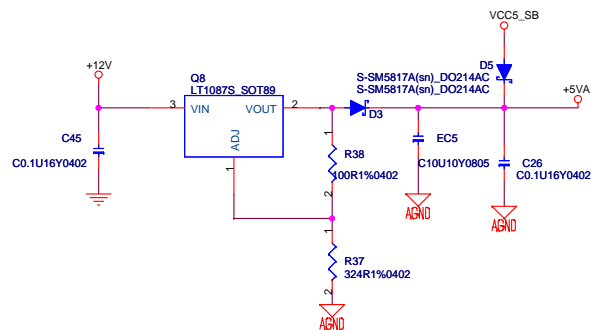
RELTEK HD ALC262VD2



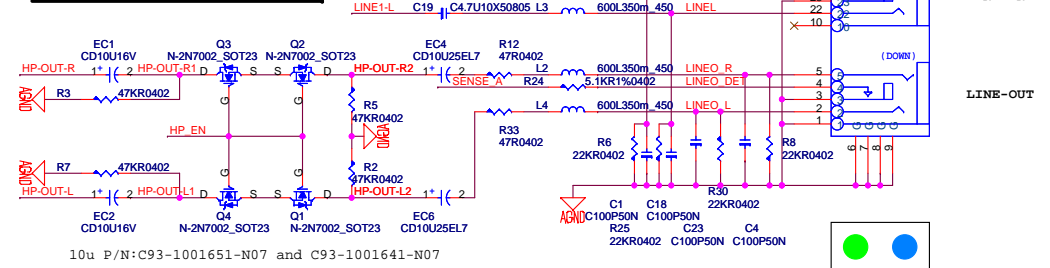
POP noise circuit



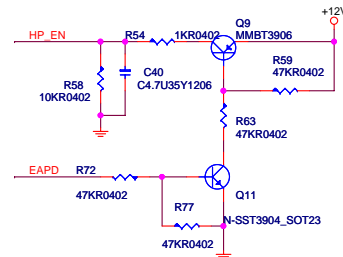
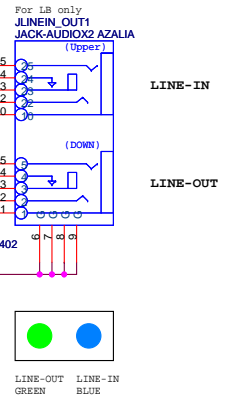
Audio CODEC REGULATOR



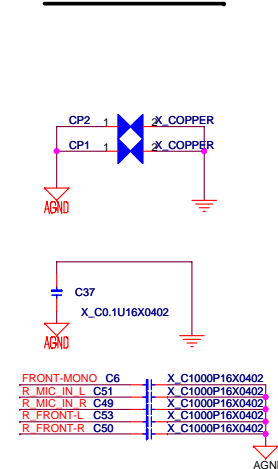
Smooth POP noise circuit



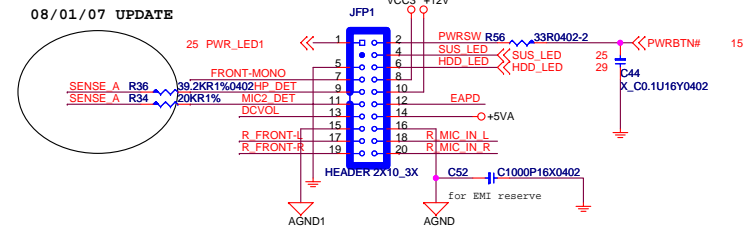
PHONE JACK



For EMI reserve



For Front Panel



JFP1

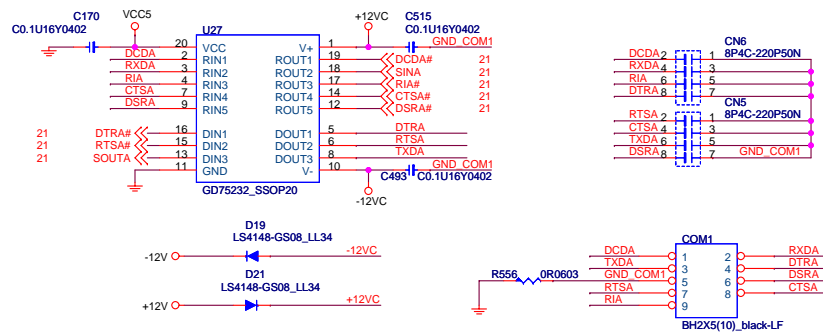
1	PWR_LED	POW_SW	2
3	NC	SLP_LED	4
5	GND	HDD_LED	6
7	Mono	VCC3	8
9	HP_DET	+12V	10
11	MIC_DET	EAPD	12
13	DCVOL	+5VA	14
15	AGND1	AGND	16
17	FRONT_L	MIC_L	18
19	FRONT_R	MIC_R	20

08/01/10 UPDATE



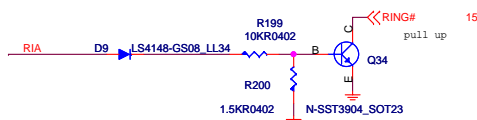
SERIAL PORT 1

For LB only



Wake On Modem Header

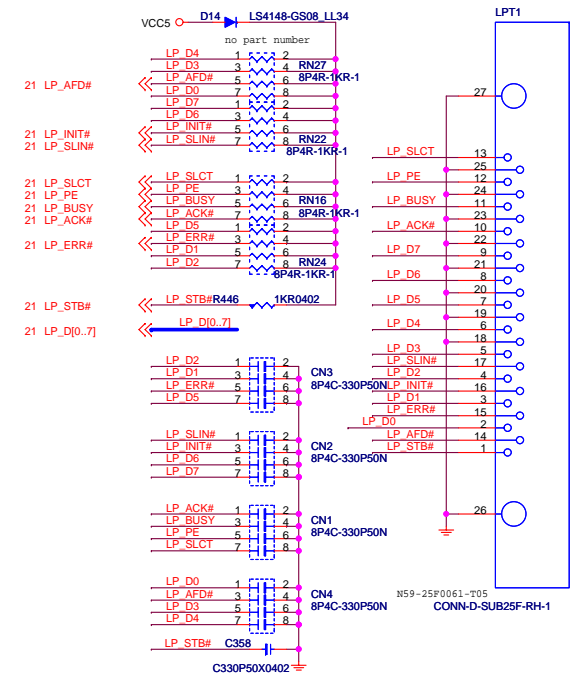
For LB only



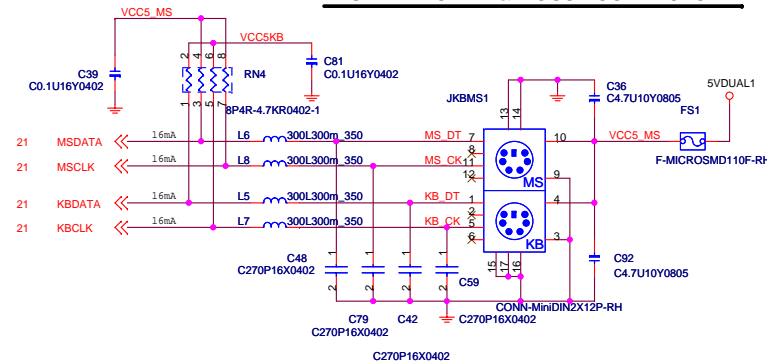
EMI RESERVE

PARALLAL PORT

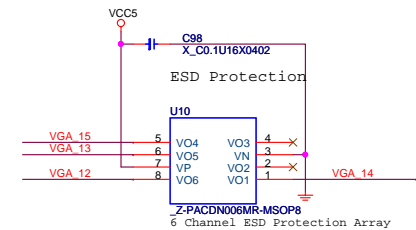
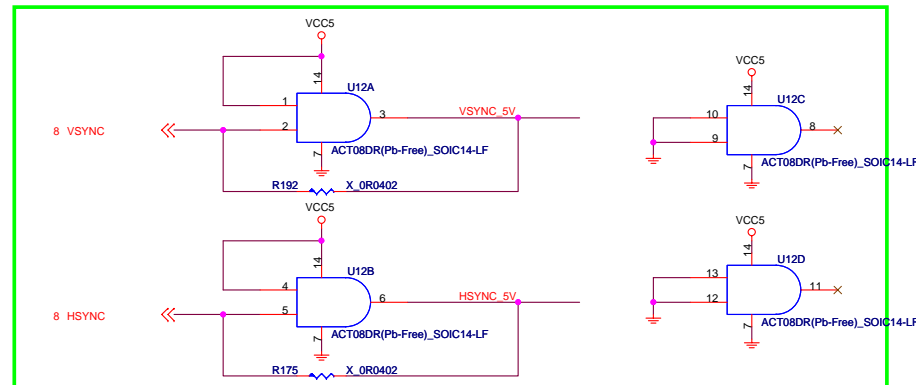
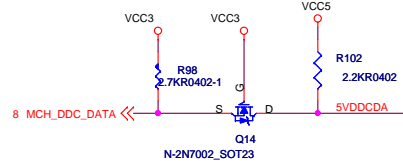
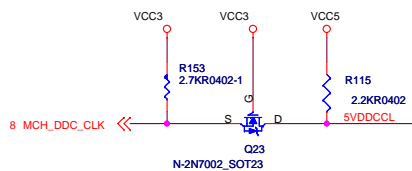
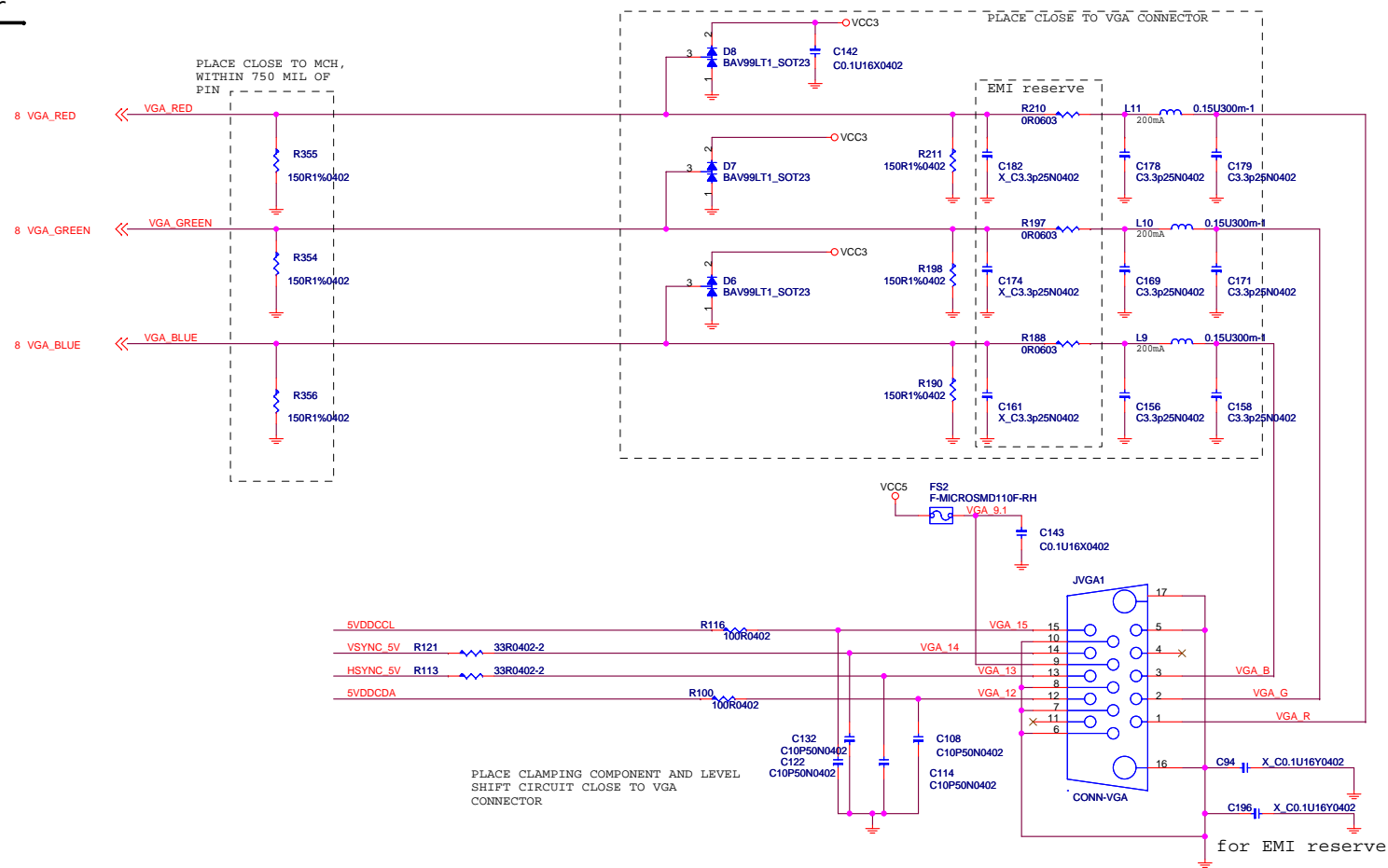
For LB only



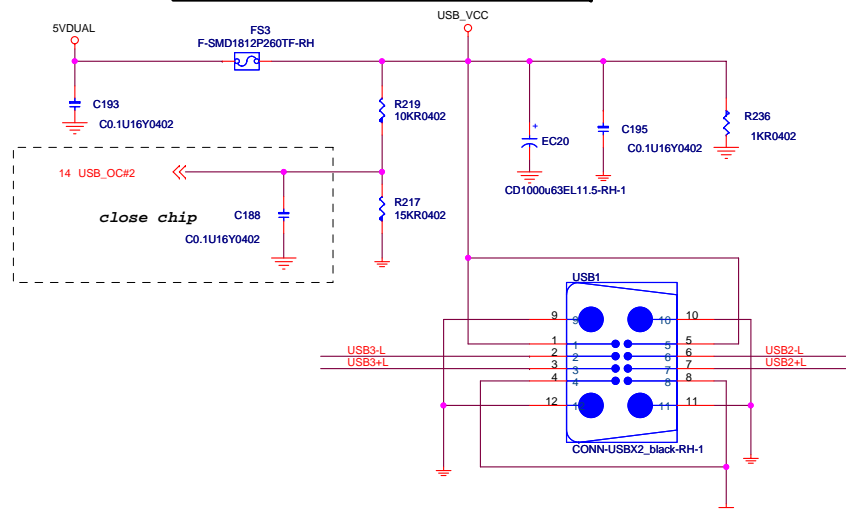
PS2 KEYBOARD & MOUSE CONNECTOR



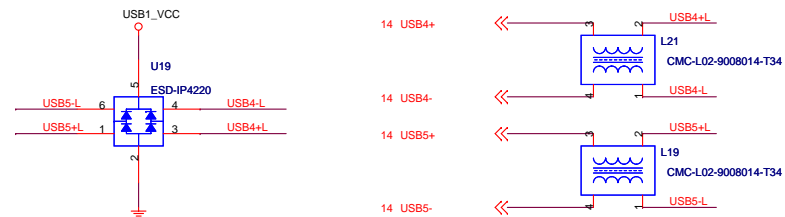
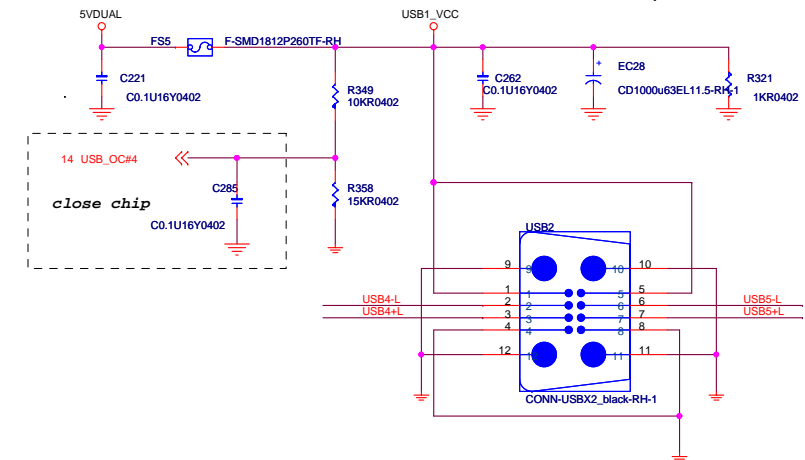
Video Connector



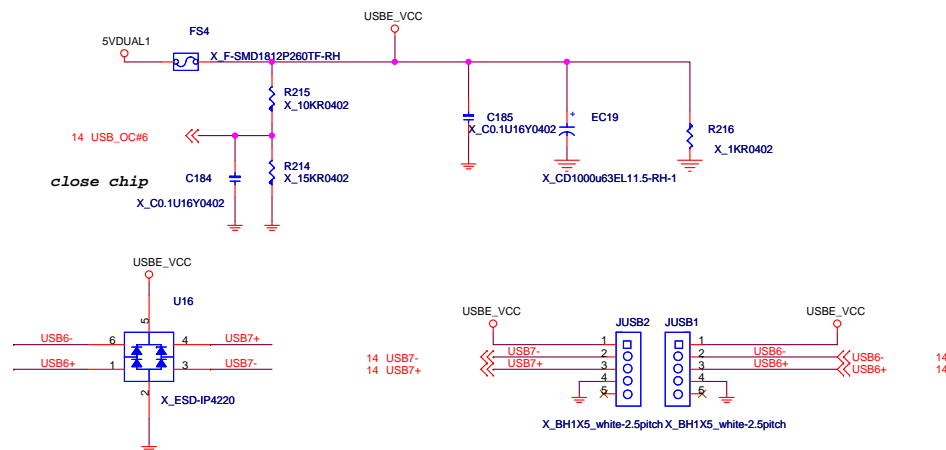
REAR PANEL USB PORT 2,3 CONNECTOR



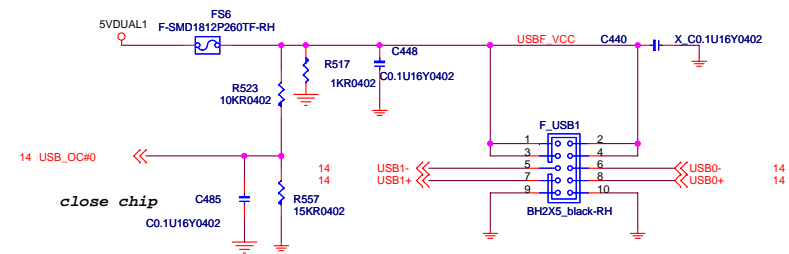
REAR PANEL USB PORT 4,5 CONNECTOR



RESERVE EXTERNAL USB PORT 6,7



FRONT PANEL USB PORT 0,1 CONNECTOR



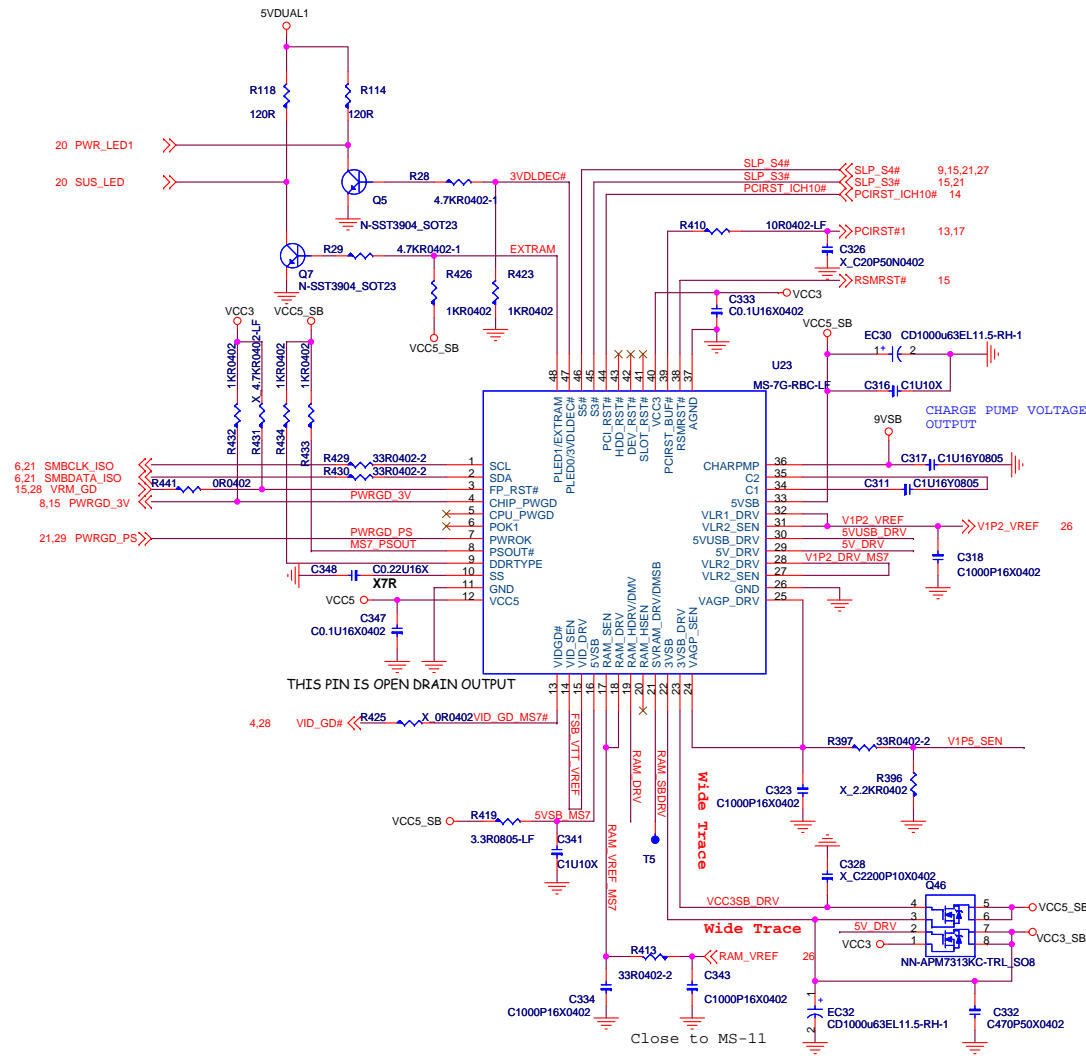
ACPI Controller

VDIMM LINEAR OR PWM SELECT

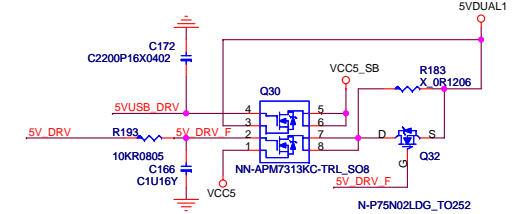
VDIMM MODE	EXTRAM
LINEAR REGULATOR	PULL LOW
PWM REGULATOR	PULL HIGH

3VSB MODE SELECT

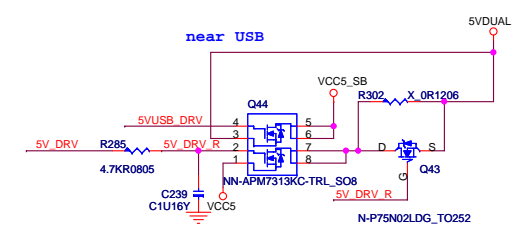
3VSB MODE	BVDLDEC#
SINGLE MOSFET	PULL HIGH
DUAL MOSFET	PULL LOW



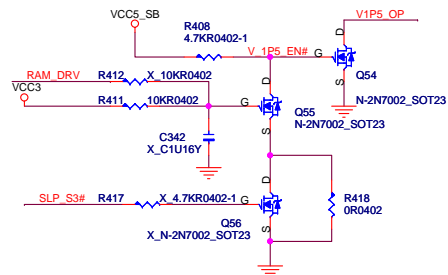
5V DUAL Front Power (2A)



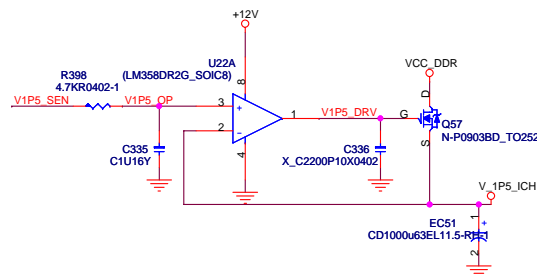
5V DUAL Rear Power (2A)



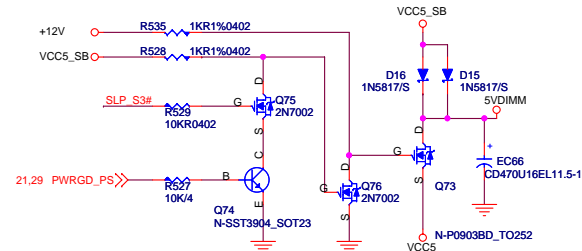
V1P5 SEN S3 power sequency



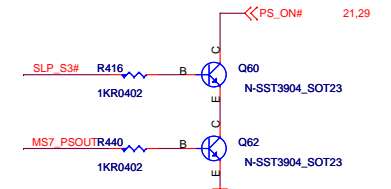
ICH10 1.5V POWER (2.385A)



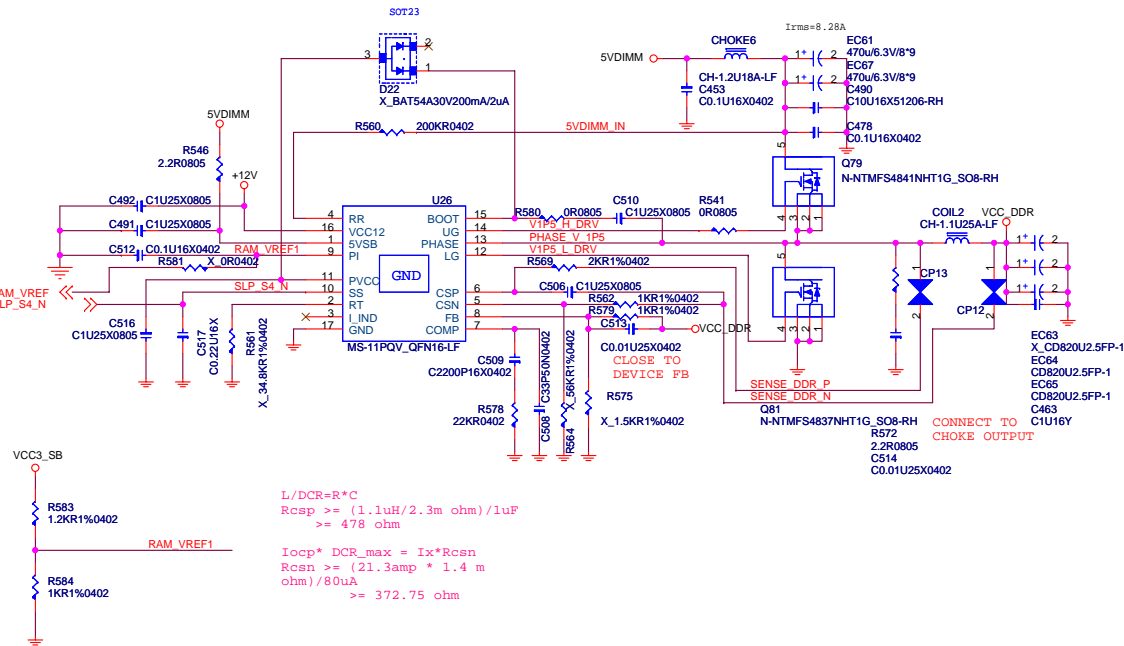
5VDIMM



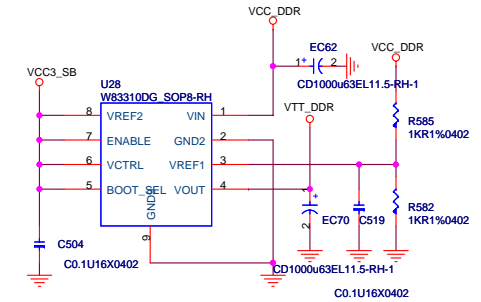
PSON#



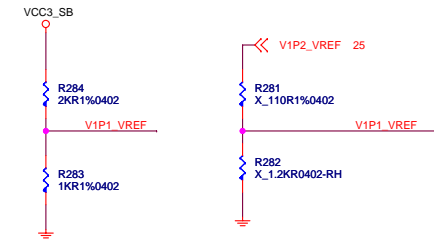
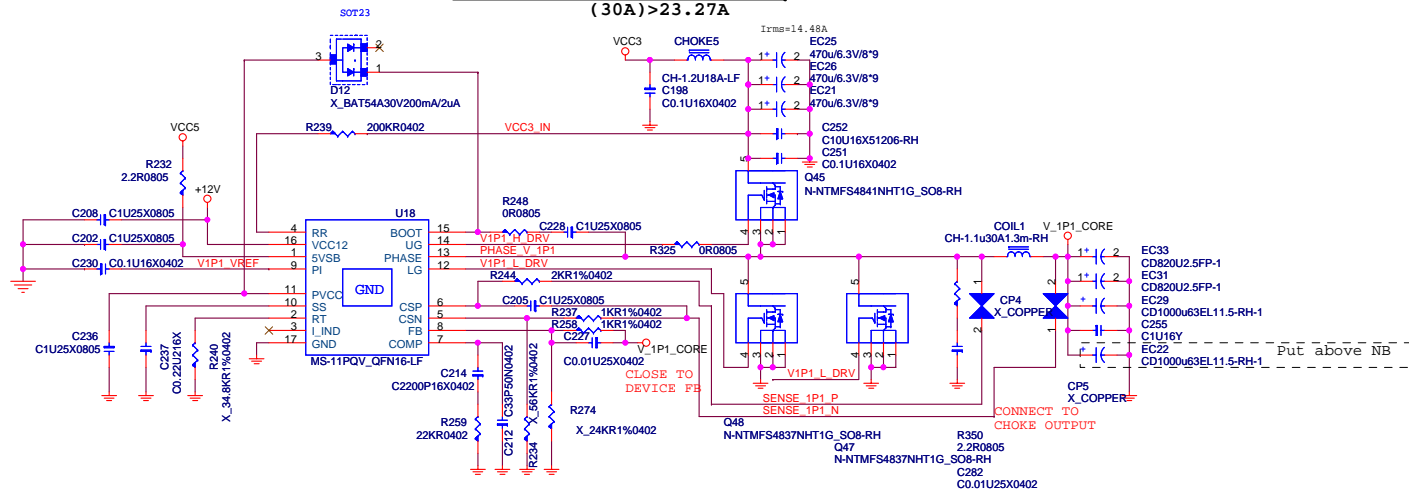
DDRIII 1.5V POWER
(18A) > 13.86A

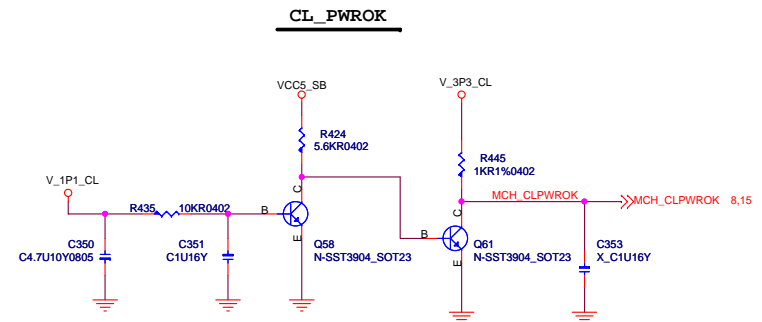
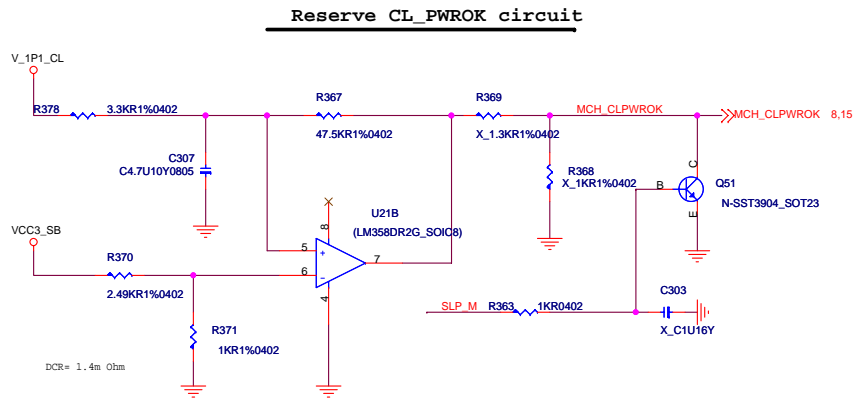
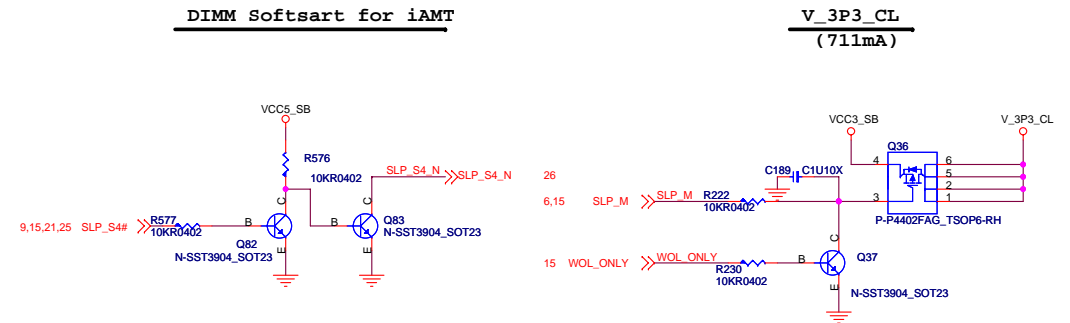
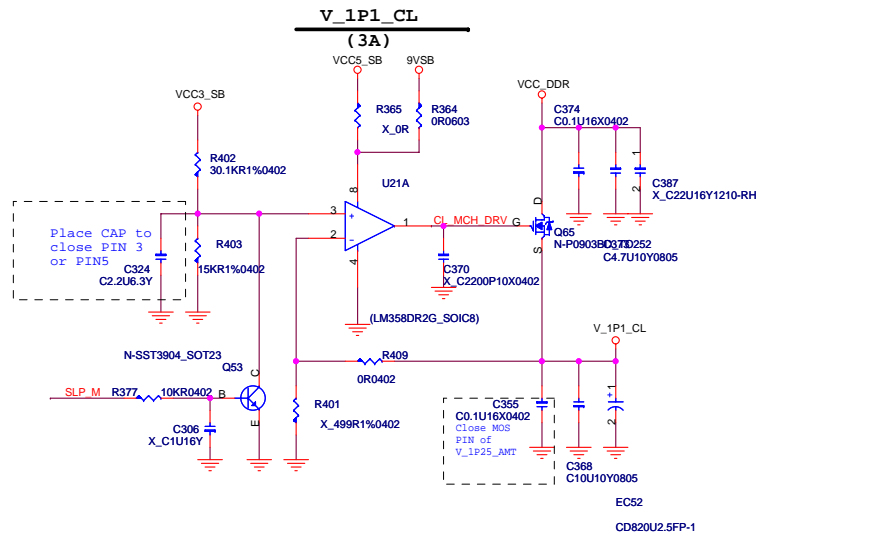


DDR VTT Power
(0.83A)



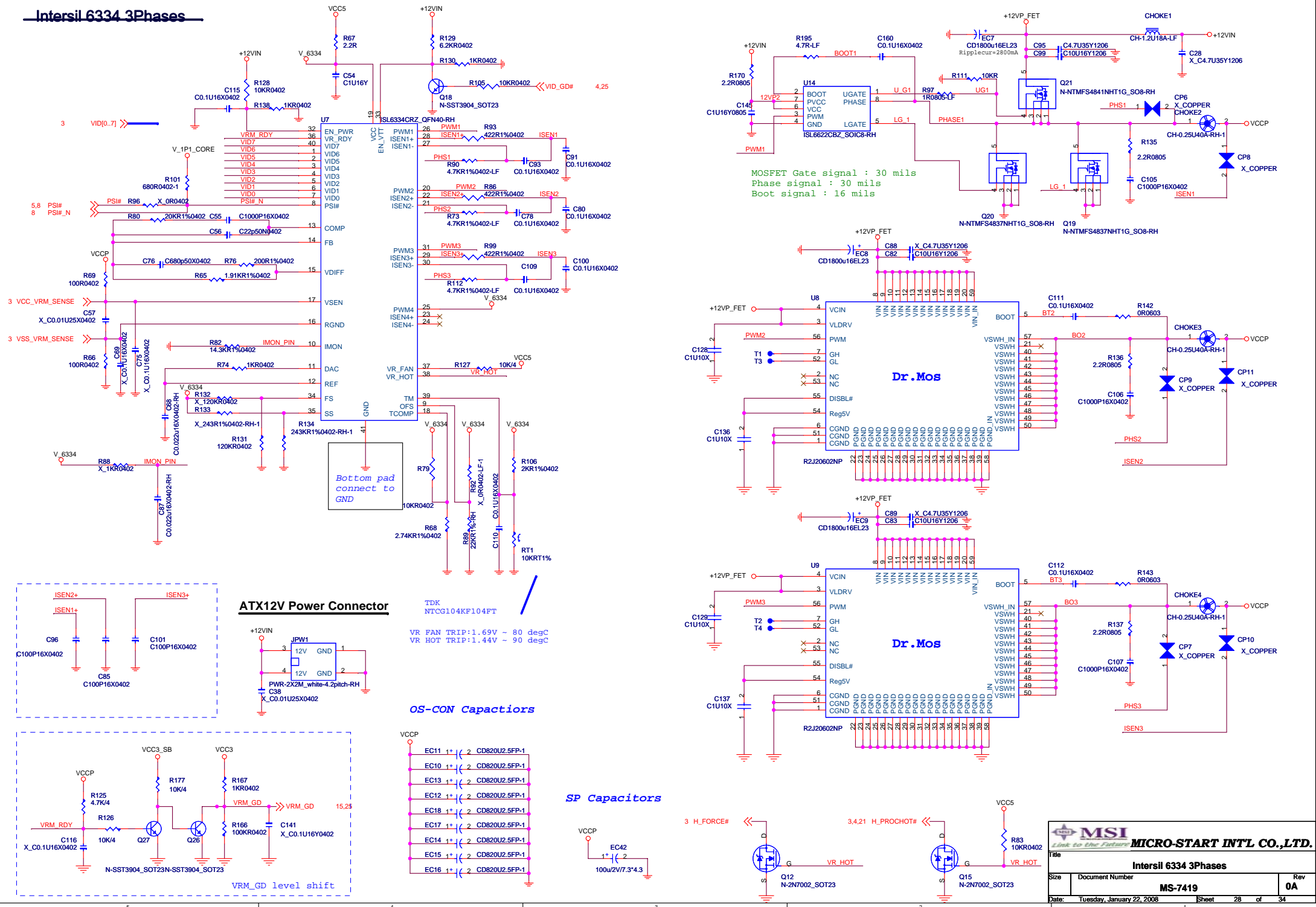
GMCH/ICH10 1.1V POWER
(30A)>23.27A



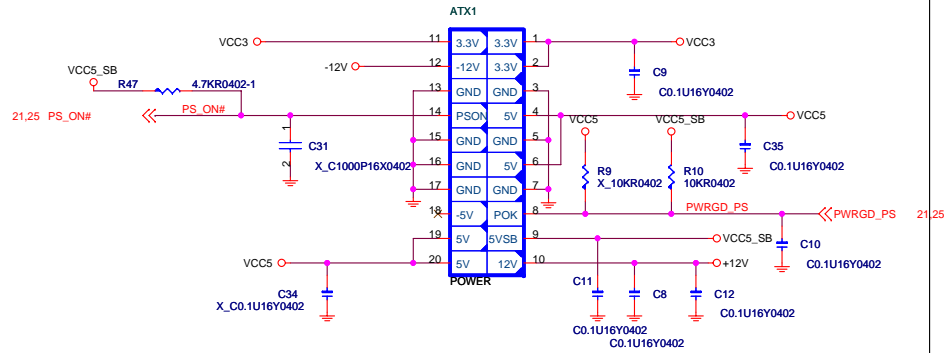


Note:
SLP_S4#
AMT Disable-->indicate ACPI S4 state,DRAM power off.
AMT Enable-->not be asserted ACPI S4 state,DRAM power ON
SLP_M#
AMT Enable SLP_M#-->Control the overall power to Intel AMT during ACPI S3-S5.
S4_SATE#
AMT Enable-->indication of ACPI S4 state

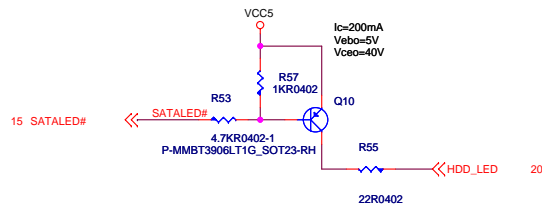
Intersil 6334 3Phases



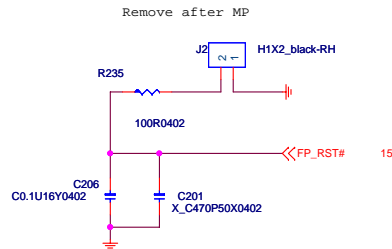
ATX Connector



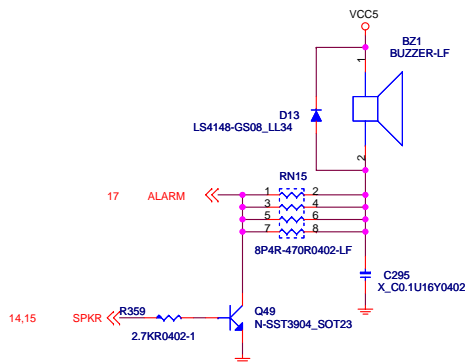
SATA LED



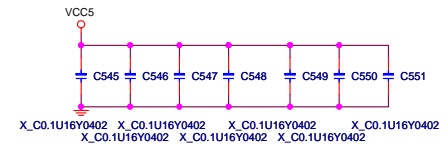
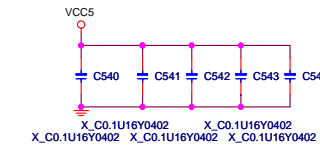
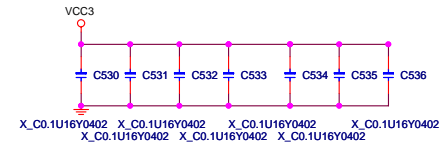
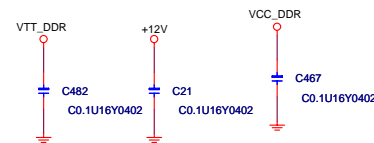
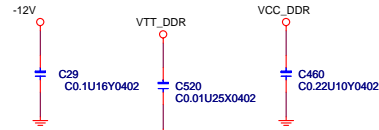
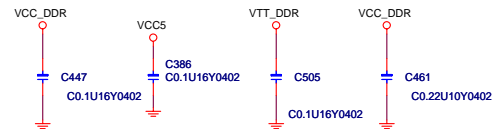
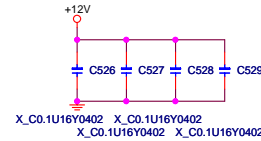
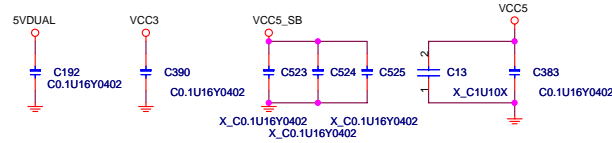
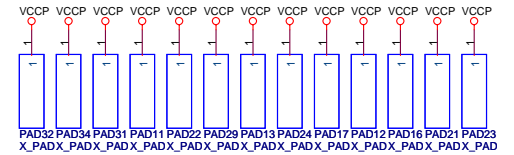
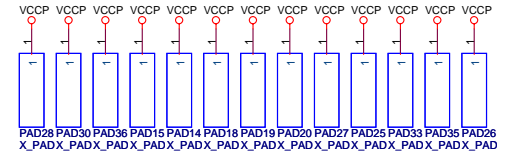
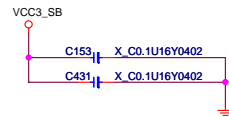
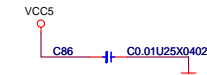
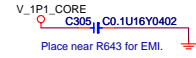
FOR DEBUG



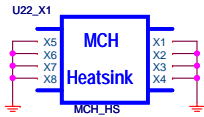
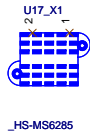
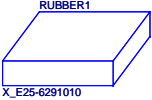
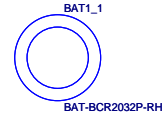
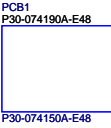
SPEAKER



For EMI CAPS



Auto-BOM Manual Parts



ICH10

GPIO Pin	Type	Default	Function	Power	MUXED / UNMUXED	Pin-out
GPIO 0	I/O	GPI	BMBUSY# function, Pull-up to VCC3 with 10K	VCC3	MUXED	N7
GPIO 1	I/O	GPI	Pull-up to VCC3 with 10K	VCC3	MUXED	AK21
GPIO 2	I/O	GPI	PIRQ#E pull-up to VCC3 with 8.2K	VCC3		K6
GPIO 3	I/O	GPI	PIRQ#F pull-up to VCC3 with 8.2K	VCC3		L7
GPIO 4	I/O	GPI	PIRQ#G pull-up to VCC3 with 8.2K	VCC3		F2
GPIO 5	I/O	GPI	PIRQ#H pull-up to VCC3 with 8.2K	VCC3		G2
GPIO 6	I/O	GPI	Pull-up to VCC3 with 10K	VCC3	MUXED	AH22
GPIO 7	I/O	GPI	Pull-up to VCC3 with 10K	VCC3	MUXED	AK23
GPIO 8	I/O	GPI		VCC3_SB	UNMUXED	A20
GPIO 9	I/O	GPO/WOL	WOL_ENABLE/GPIO9, pull-down with 100K	VCC3_SB	MUXED	A18
GPIO 10	I/O	GPI	Detect AUDIO Devices, Pull-up to VCC3_SB with 10K	VCC3_SB	MUXED	C17
GPIO 11	I/O	SMBALERT#	SMB_ALERT# pull-up to VCC3_SB with 10K	VCC3_SB		C16
GPIO 12	I/O	GPO	NC	VCC3_SB	UNMUXED	A8
GPIO 13	I/O	GPI	SIO_PME# connect to SIO, pull_up VCC3_SB with 10k	VCC3_SB	UNMUXED	A19
GPIO 14	I/O	GPI	Pull-up to VCC3_SB with 10K directly	VCC3_SB	MUXED	A9
GPIO 15	I/O	GPO	PCI_STOP# for CK505(Not Use)	VCC3_SB	MUXED	C15
GPIO 16	I/O	GPO	FAN switch, pull_up VCC3 with 10K.	VCC3	UNMUXED	M2
GPIO 17	I/O	GPI	Pull-up to VCC3 with 10K directly	VCC3	MUXED	AH21
GPIO 18	I/O	GPO	GTLREF GPO , Pull-up to VCC3 with 10K directly	VCC3	UNMUXED	K1
GPIO 19	I/O	GPI	Pull-up to VCC3 with 10K	VCC3		AE20
GPIO 20	I/O	GPO	GTLREF GPO	VCC3	UNMUXED	AF5
GPIO 21	I/O	GPI	Pull-up to VCC3 with 10K	VCC3		AK25
GPIO 22	I/O	GPI	Pull-up to VCC3 with 10K	VCC3	MUXED	AJ24
GPIO 23	I/O	LDRQ1#	LDRQ_1# pull_up VCC3 with 10K(Not Use)	VCC3	MUXED	J3
GPIO 24	I/O	GPO	NC	3.3V_SB	MUXED	A14
GPIO 25	I/O	GPO	CPU_STOP# for CK505(Not Use)	3.3V_SB	UNMUXED	B18
GPIO 26	I/O	GPO	S4 STATE#	3.3V_SB		C11
GPIO 27	I/O	GPO	NC	3.3V_SB		A11
GPIO 28	I/O	GPO	NC	3.3V_SB		G18
GPIO 29	I/O	OC5#	OC#4 connect to USB connector	3.3V_SB		N1
GPIO 30	I/O	OC6#	OC#6 connect to USB connector	3.3V_SB		N5
GPIO 31	I/O	OC7#	OC#6 connect to USB connector	3.3V_SB		M1
GPIO 32	I/O	GPO	NC	VCC3	UNMUXED	K2
GPIO 33	I/O	GPO	Pull-up to VCC3 with 4.7K through JC11 Jumper. (Default)	VCC3	UNMUXED	AF6
GPIO 34	I/O	GPO	NC	VCC3	UNMUXED	AH5
GPIO 35	I/O	GPO	Clear password	VCC3		L1
GPIO 36	I/O	GPI	Pull-up to VCC3 with 10K directly	VCC3		AE21
GPIO 37	I/O	GPI	Pull-up to VCC3 with 10K directly	VCC3		AE22
GPIO 38	I/O	GPI	Pull-up to VCC3 with 10K directly	VCC3		AK24
GPIO 39	I/O	GPI	Pull-up to VCC3 with 10K directly	VCC3		AH23
GPIO 40	I/O	OC1#	OC#0 connect to USB connector	3.3V_SB		N3
GPIO 41	I/O	OC2#	OC#2 connect to USB connector	3.3V_SB		P7
GPIO 42	I/O	OC3#	OC#2 connect to USB connector	3.3V_SB		R7
GPIO 43	I/O	OC4#	OC#4 connect to USB connector	3.3V_SB		N2
GPIO 44/45	I/O	OC8/9#	OC#6 connect to USB connector	3.3V_SB		P3/R6
GPIO 46/47	I/O	OC10/11#	OC#6 connect to USB connector	3.3V_SB		T7/P1
GPIO 48	I/O	GPI	Pull-up to VCC3 with 10K directly	VCC3		AD20
GPIO 49	I/O	GPO	DMI strapping , pull-down 2.2K to GND	VCC3		AJ25
GPIO 50	I/O	REQ1#	REQ1 pull-up to VCC5 with 2.7K	VCC5	MUXED	G13
GPIO 51	I/O	GNT1#	GNT1#	VCC3	MUXED	A7
GPIO 52	I/O	REQ2#	REQ2 pull-up to VCC5 with 8.2K	VCC5	MUXED	F13
GPIO 53	I/O	GNT2#	GNT2#	VCC3	MUXED	C7
GPIO 54	I/O	REQ3#	REQ3 pull-up to VCC5 with 2.7K	VCC5	MUXED	G8
GPIO 55	I/O	GNT3#	GNT3#(Not Use)	VCC3	MUXED	F7
GPIO 56	I/O	GPI	Clear password, pull-up to VCC3_SB with 10K.	3.3V_SB	MUXED	F16
GPIO 57	I/O	GPI	Pull-up to VCC3_SB with 10K directly for ME	3.3V_SB	MUXED	C12
GPIO 58	I/O	SPI_CS1	SPI_CS#(Not Use) , SPI_CS1_F#(Not Use)	3.3V_SB	MUXED	F23
GPIO 59	I/O	OC0#	OC#0 connect to USB connector	3.3V_SB		P5
GPIO 60	I/O	LINKALERT	LINKALERT# pull-up to VCC3_SB with 10K	3.3V_SB		F18

PCI Configuration

DEVICE	MCP1 INT Pin	REQ#/GNT#	IDSEL	CLOCK
Riser slot (PCI1)	PIRQ#B PIRQ#C PIRQ#D PIRQ#A	PREQ#1 PGNT#1	AD17	PCI_CLK1

DDR2 DIMM Configuration

DEVICE	ADDRESS	CLOCK
DIMM 1	0A0H	SCLK_A0/SCLK_A0# SCLK_A2/SCLK_A2#
DIMM 2	0A4H	SCLK_B0/SCLK_B0# SCLK_B2/SCLK_B2#

SIO - SMSC-5617C Configuration

PIN NAME	PIN#	USAGE	Input/Output
GP41	77	SIO_PME#	OUTPUT

SMBus Distribution

SMBus	Power	Load
SMBCLK	VCC3_SB	SIO, ICH10, PCI EXPRESS[X16][X1]
SMBCLK_ISO	VCC3	DIMM, CLK GEN, MS7

Jumper Setting

JBAT1	(1-2)Normal	(2-3)Clear CMOS
JCI1	(1-2)Normal	(2-3)ME Disable for FPROG
J1	(1-2)short: Normal	(1-2)Open: Clear PW

LGA775-CPU		
0.8375V - 1.6000V Core	-	84A
1.1V FSB Vtt	-	4.6A

Eaglelake (GMCH)		
1.1V FSB_VTT	-	1.2 A
1.1V Core TBD (USE LB)	-	13.8A
1.1V DMI/PCI Exp.	-	2.47 A
1.5V VCC_DDR	-	3.33A
1.5V VCC_SMCLK	-	350mA
3.3V VCCA_DAC	-	66 mA
3.3V VCC33	-	15.8mA
1.1V Vcc CL	-	4.3A

ICH10		
1.1V DMI	-	41 mA
1.1V Core	-	1.16A
1.5V_A USB/SATA/PLL	-	1.652A
1.5V_B PCI Exp.	-	0.646A
VCCRTC	-	6 uA
3.3V CL	-	19 mA
1.5V GbE LAN	-	87 mA
3.3V VccSus3_3	-	200mA
3.3V Vcc3_3	-	308mA
3.3V 10/100 LAN	-	19 mA
3.3V GbE LAN	-	1 mA
3.3V HDA	-	32 mA
3.3V SusHDA	-	33 mA

HD Audio ALC262VD		
3.3V AUDIO	-	40mA
5V AUDIO	-	200mA

IDTCV184-2		
3.3V VDD_48/PCI/REF	-	250mA
0.3V-1V CPU/SRC/DOT/PLL	-	80mA

Boazman GbE		
3.3V_SB I/O & LED	-	15.5mA
1.8V AVDD	-	418.2mA
1.0V Core	-	277.2mA

ISL6334		
VCCP VRD11.1	-	0.8375V-1.6000V
3-Phase Switch	-	

W83310DS		
VTT_DDR	-	0.75V Linear 0.83A

MS11+ SW-Power		
VCC_DDR	-	1.5V PWM 13.86A

MS11+ SW-Power		
V_1P1_CORE	-	1.1V PWM 23.27A

MS7 Controller		
V_1P1_CL	-	1.1V Linear 3A

V_1P5_ICH		
1.5V Linear	-	2.385A

VCC3_SB		
3.3V Linear	-	3.96A

5VDUAL1		
5V Switch	-	4.367A

5VDIMM		
5V Switch	-	8.29A

DDRIII x2 & TERMINATOR		
0.75V VTT_DDR	-	1.2A
1.5V VCC_DDR (S0,S1)	-	3.6A
1.5V VCC_DDR (S3)	-	TBDmA

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

AGP Extender riser slot		
	Luner Eagle	
+12V	-	1A
+5V	-	5.0A
+3.3Vaux	-	750mA
+3.3V	-	10.6A

PCI_E x1 slot		
+12V	-	0.5A
+3.3Vaux	-	375mA
+3.3V	-	3.0A

PCI slot		
+12V	-	0.5A
+3.3Vaux	-	375mA
+3.3V	-	7.6A
+5V	-	5.0A

USB x 8		
+5V (S0,S1)	-	4A
+5V (S3)	-	20mA

PS2		
+5V (S0,S1)	-	345mA
+5V (S3)	-	2.0mA

5VAudio
+5VR
500mA

3V
Battery

+12V
ATX
2x2

+5V +3.3V +5VSB +12V
ATX POWER

PWROK MAP

