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MS(6772)

Version 0A

Intel (R) Springdale (GMCH) + ICH5 Chipset
Intel Northwood & Prescott mPGA478B Processor

CPU:

Intel Northwood/Prescott

System Chipset:

Intel Springdale - GMCH (North Bridge)
Intel ICH5 (South Bridge)

On Board Chipset:

BIOS -- FWH EEPROM
AC'97 Codec -- SigmaTel 9752/9766/ALC203
LPC Super I/O -- SMSC 47M192
LAN --Broadcom BCM4401/5705
CLOCK -- Cypress CY28404

Main Memory:

DDR * 4 (Max 4GB)

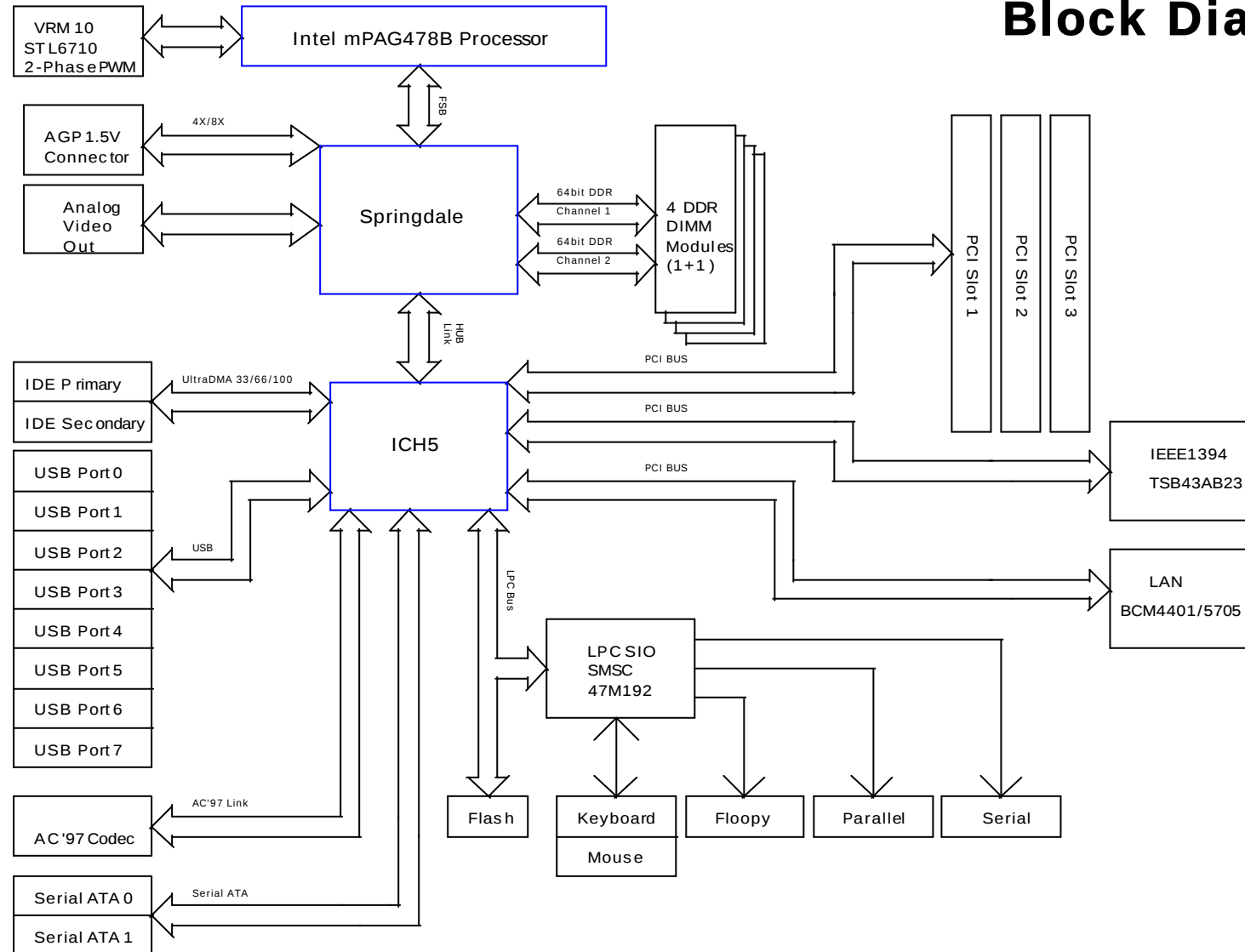
Expansion Slots:

PCI2.3 SLOT * 3

ST PWM:

Controller: ST L6710

Block Diagram



ICH5

GPIO Pin	Type	Function	Power well
GPIO 0	I	ISA_REQ#	MAIN
GPIO 1	I	PREQ#5	MAIN
GPIO 2	I	PIRQ#E	MAIN
GPIO 3	I	PIRQ#F	MAIN
GPIO 4	I	PIRQ#G	MAIN
GPIO 5	I	PIRQ#H	MAIN
GPIO 6	I	SIO_SMI#	MAIN
GPIO 7	I	RECOVER#	MAIN
GPIO 8	I	8051_WAKE#	RESUME
GPIO 9	I	OC4#	RESUME
GPIO 10	I	OC5#	RESUME
GPIO 11	I	IR_WAKE#	RESUME
GPIO 12	I	GPI12	RESUME
GPIO 13	I	SIO_PME#	RESUME
GPIO 14	I	OC#6	RESUME
GPIO 15	I	OC#7	RESUME
GPIO 16	O	ISA_GNT#	MAIN
GPIO 17	O	PGNT#5	MAIN
GPIO 18	O	8051_PWR	MAIN
GPIO 19	O	GPO19	MAIN
GPIO 20	O	GPO20	MAIN
GPIO 21	O	IR_PWR	MAIN
GPIO 22	OD	GPO22	MAIN
GPIO 23	O	GPO23	MAIN
GPIO 24	I/O	GPIO24	RESUME
GPIO 25	I/O	GPIO25	RESUME
GPIO 27	I/O	ISA_NOGO	RESUME
* GPIO 28	I/O	GPIO28	RESUME
GPIO 32	I/O	BIOS_WP#	MAIN
GPIO 33	I/O	SATA_LED	MAIN
GPIO 34	I/O	GPIO34	MAIN
GPIO 40	I	PREQ#4	MAIN
GPIO 41	I	GPI41	MAIN
GPIO 48	O	PGNT#4	MAIN
GPIO 49	OD	CPUPWRGD	MAIN

default output
default output
default output
default output
default output

FWH

GPIO Pin	Type	Function
GPIO	I	PD_DET
GPI1	I	SD_DET
* GPI2	I	Pull down through 1K ohms (unused)
GPI3	I	Pull down through 1K ohms (unused)
GPI4	I	MODEL Select

SIO

GPIO Pin	Type	Function
GP12	O	DLED1
GP13	O	DLED2
GP14	O	DLED3
GP15	O	DLED4
GP26	I	VID5
GP43	I	VID4

PCI Config.

DEVICE	MCP1 INT Pin	REQ# / GNT#	IDSEL	CLOCK	CLK GEN PIN OUT
PCI Slot 1	INTA# INTB# INTC# INTD#	PCI_REQ#0 PCI_GNT#0	AD16	PCICLK0	13 (PCI_CLK0)
PCI Slot 2	INTB# INTC# INTD# INTA#	PCI_REQ#1 PCI_GNT#1	AD17	PCICLK1	14 (PCI_CLK1)
PCI Slot 3	INTC# INTD# INTA# INTB#	PCI_REQ#2 PCI_GNT#2	AD18	PCICLK2	15 (PCI_CLK2)

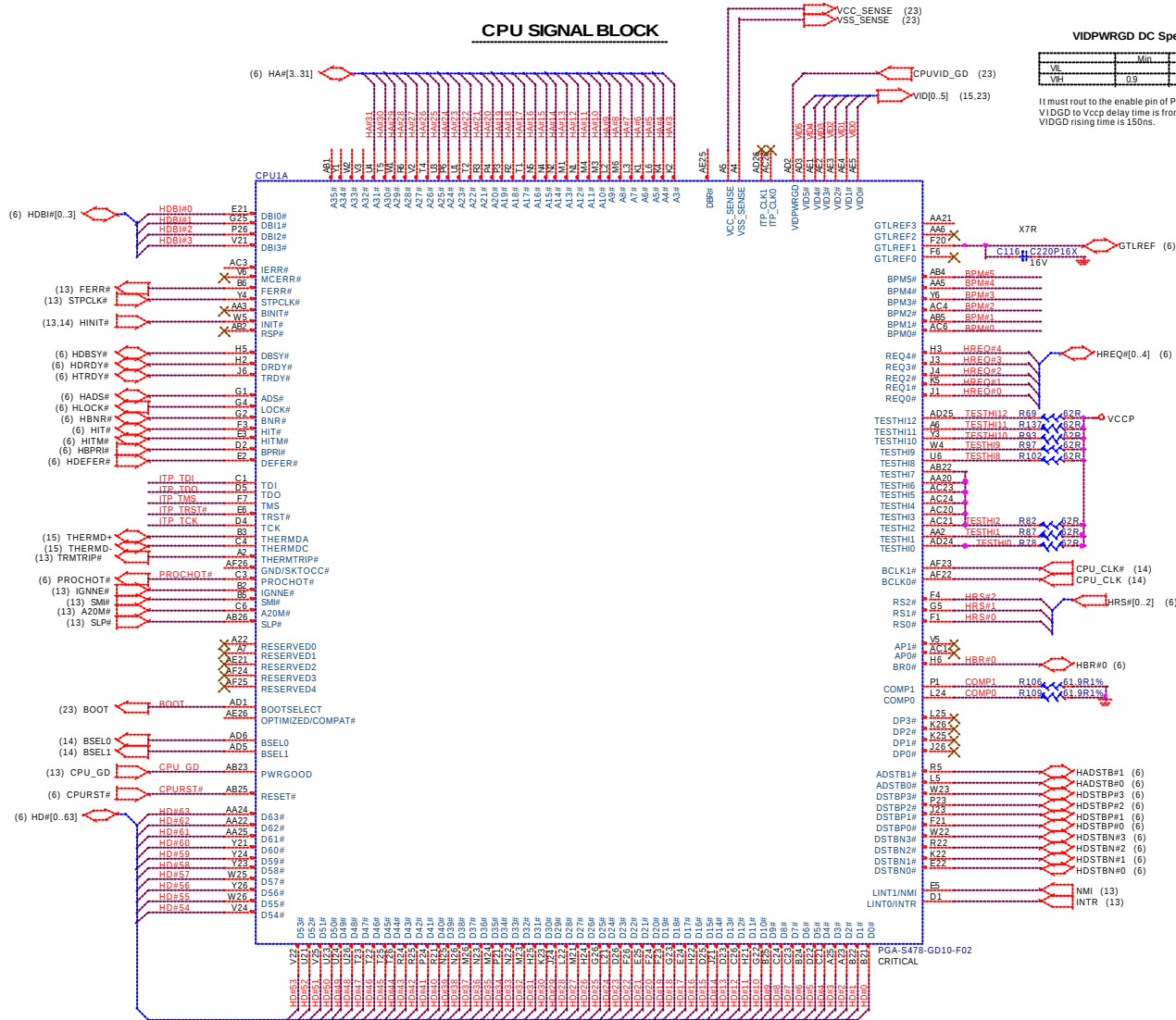
DDR DIMM Config.

DEVICE	ADDRESS	CLOCK
DIMM 1	1010000B	MCLK_A0/MCLK_A0# MCLK_A1/MCLK_A1# MCLK_A2/MCLK_A2#
DIMM 2	1010001B	MCLK_A3/MCLK_A3# MCLK_A3/MCLK_A3# MCLK_A4/MCLK_A4#
DIMM 3	1010010B	MCLK_B0/MCLK_B0# MCLK_B1/MCLK_B1# MCLK_B2/MCLK_B2#
DIMM 4	1010011B	MCLK_B3/MCLK_B3# MCLK_B4/MCLK_B4# MCLK_B5/MCLK_B5#

PCI RESET DEVICE

Signals	Target
PCIRST#	ICH5
PCIRST#1	AGP slot,FWH, MS5,
PCIRST#2	Springdale,LAN, Super I/O,1394,TPM
PCIRST#2	PCI slot 1-3_ext PCI slot
HD_RST#	Primary, Scondary IDE

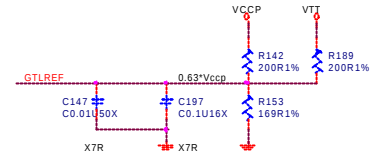
CPU SIGNAL BLOCK



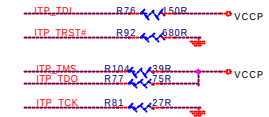
VIDPWRGD DC Specifications			
VL	Min	Typ	Max
VH	0.9		0.9

It must route to the enable pin of PWM and CK-409.
VIDGD to Vccp delay time is from 1ms to 10ms.
VIDGD rising time is 150ns.

CPU GTL REFERENCE VOLTAGE BLOCK



CPU ITP BLOCK



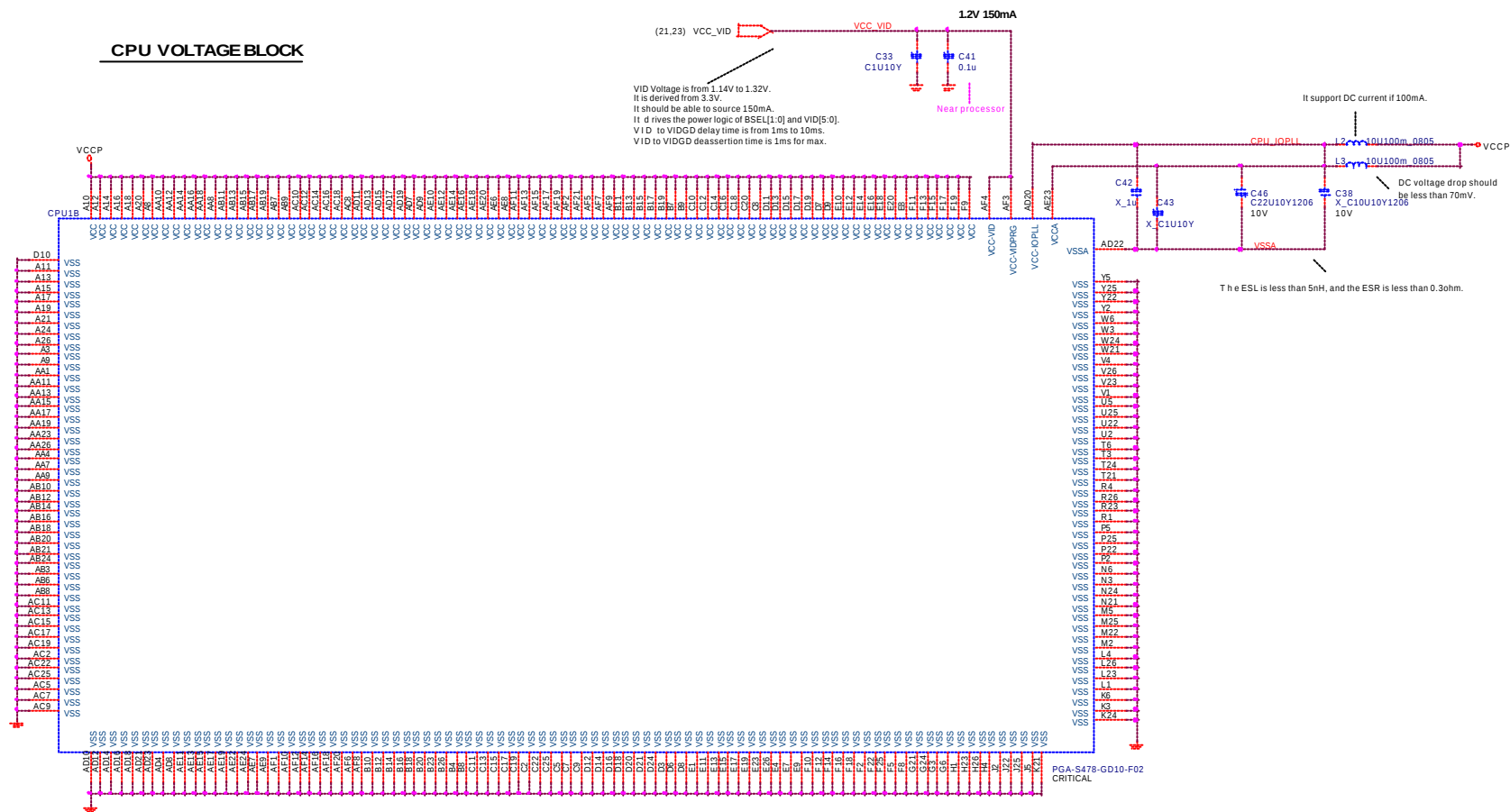
CPU STRAPPING RESISTORS



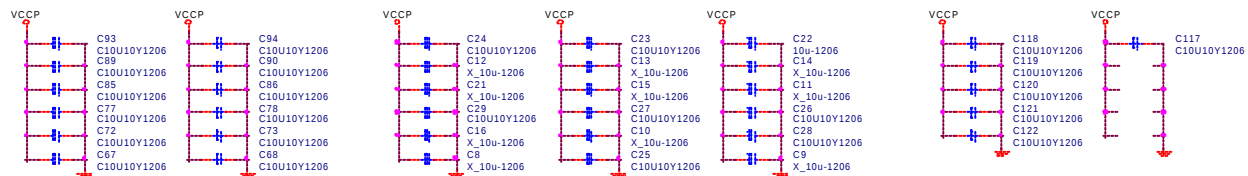
ALL COMPONENTS CLOSE TO CPU



CPU VOLTAGE BLOCK



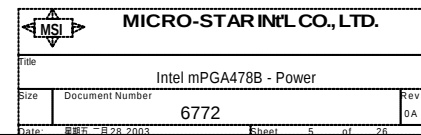
CPU DECOUPLING CAPACITORS

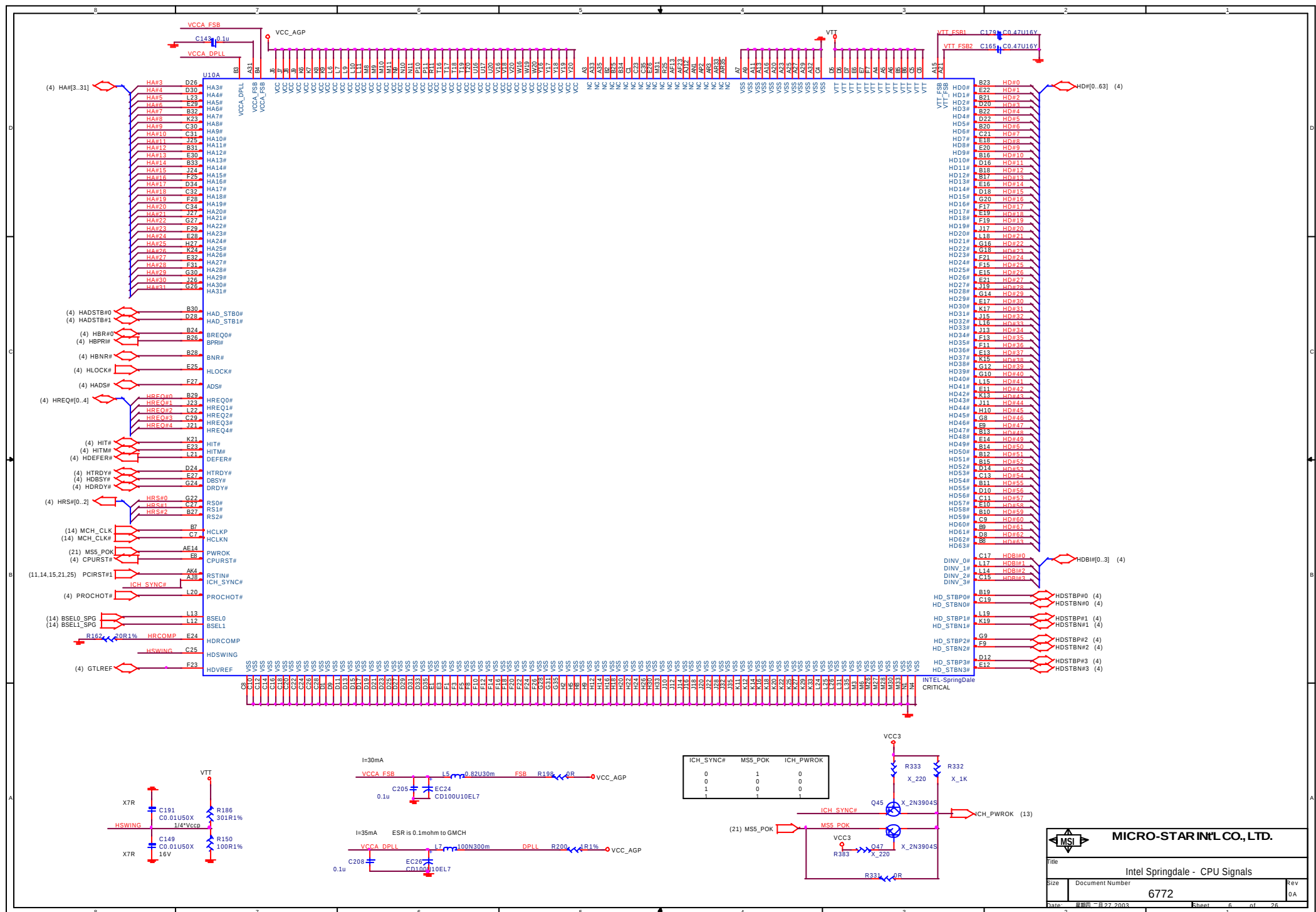


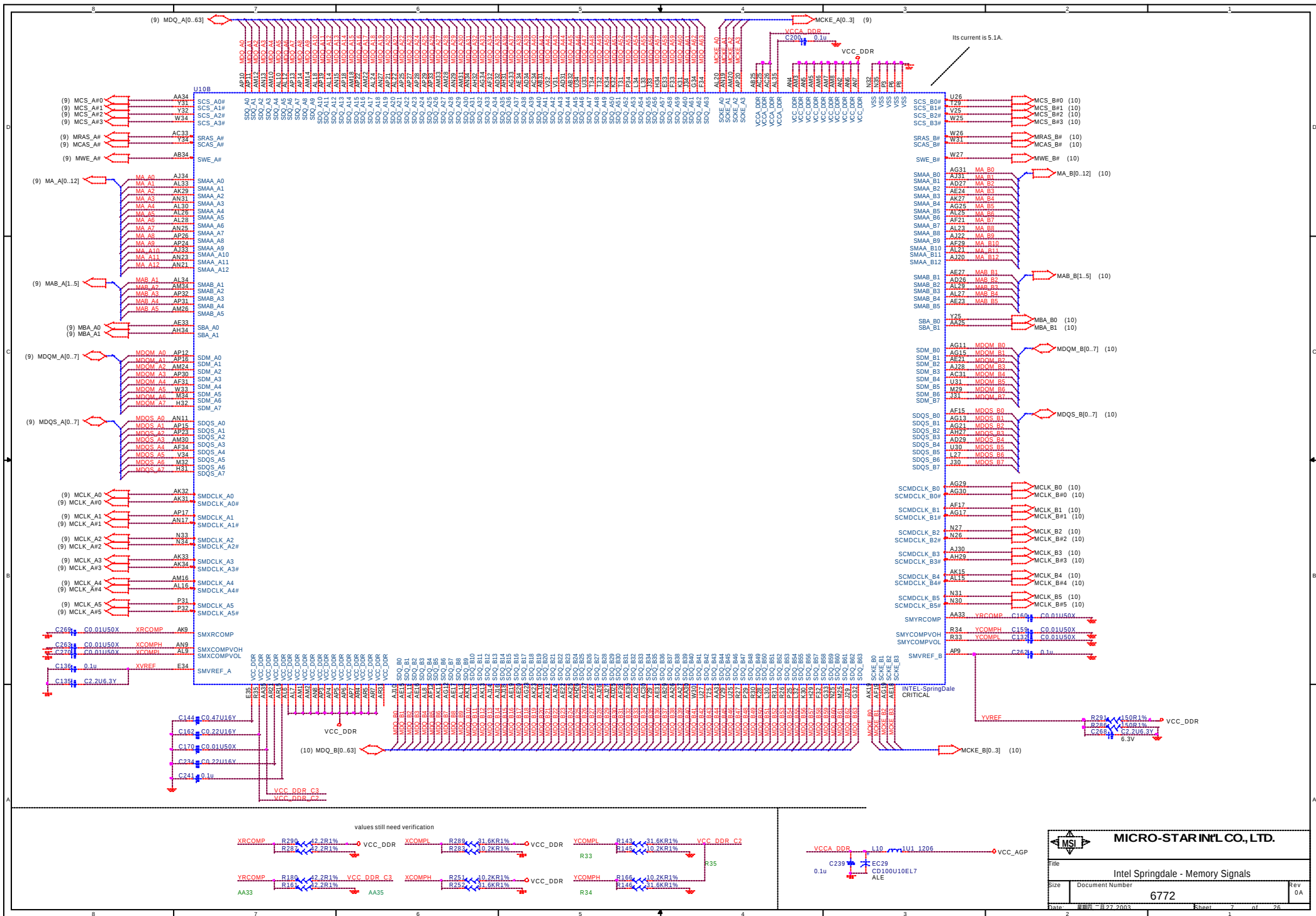
Place these caps within socket cavity

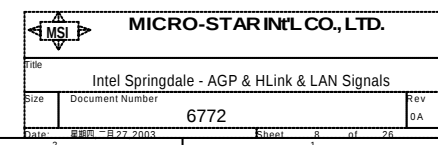
Place these caps within north side of processor

Place these caps within south side of processor





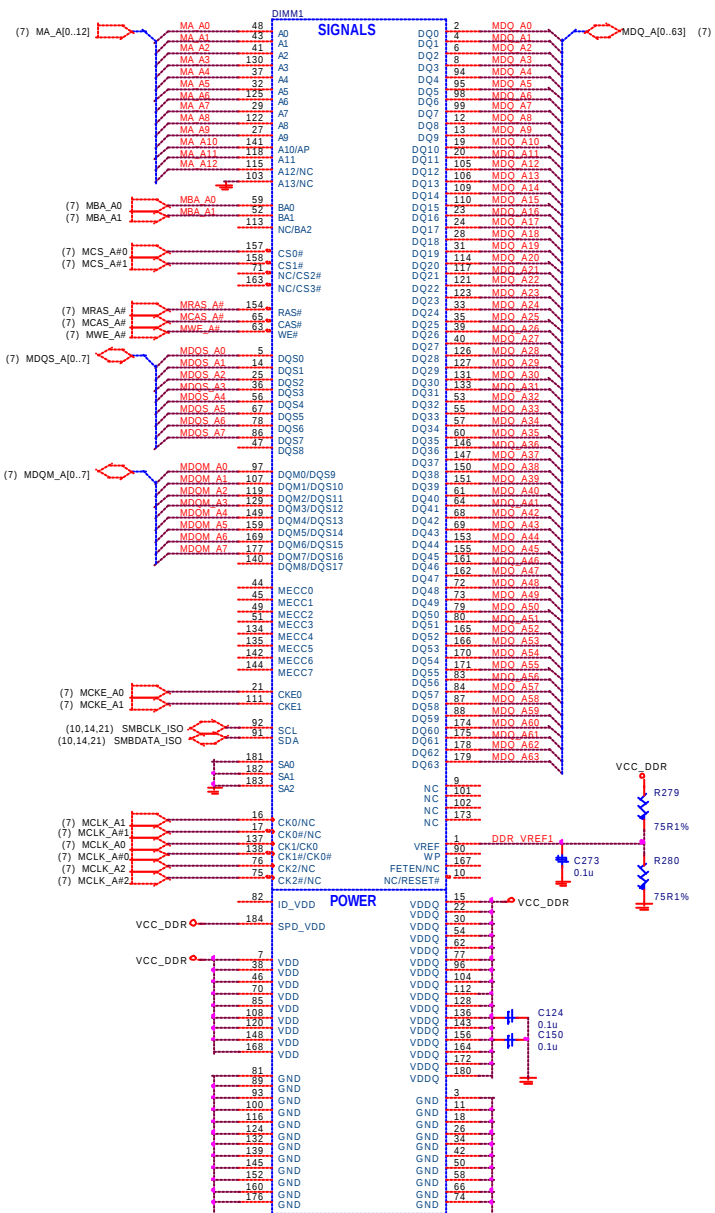




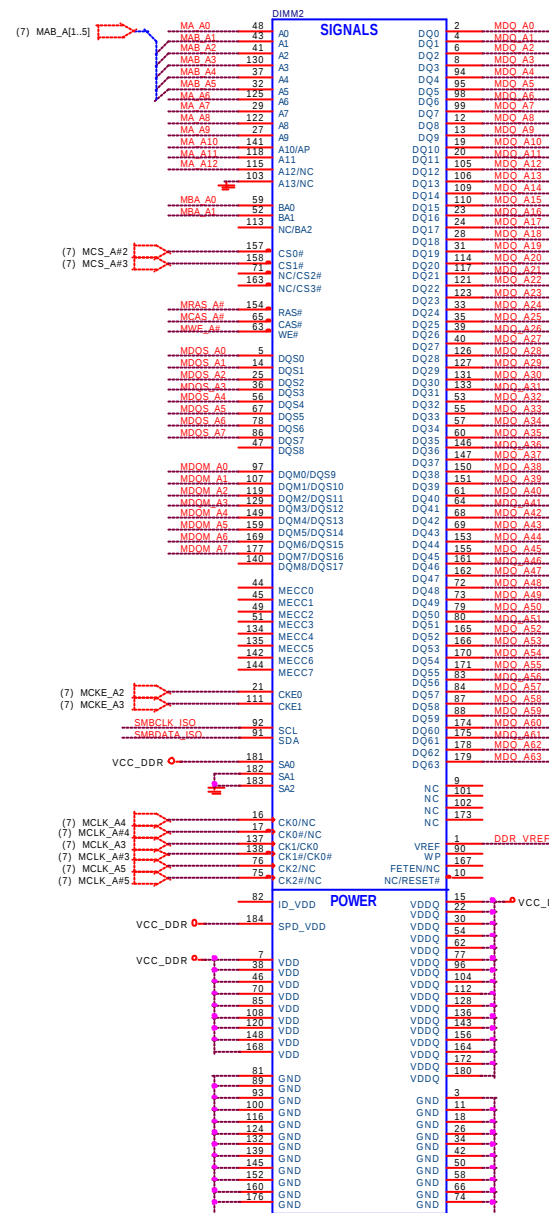
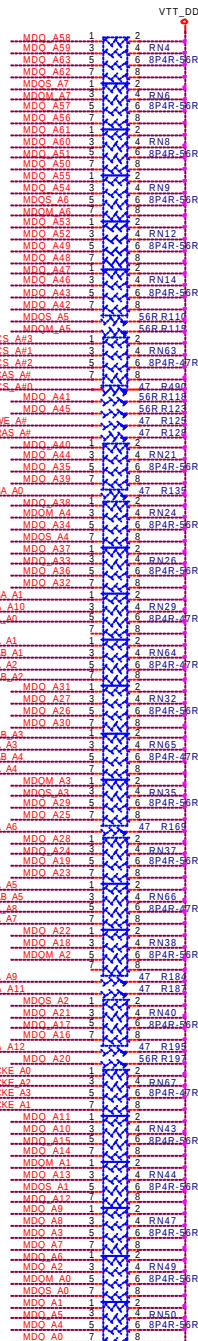
DDR DIMM1

DDR Terminational Resistor

DDR DIMM2



ADDR=1010000B



ADDR=1010001B



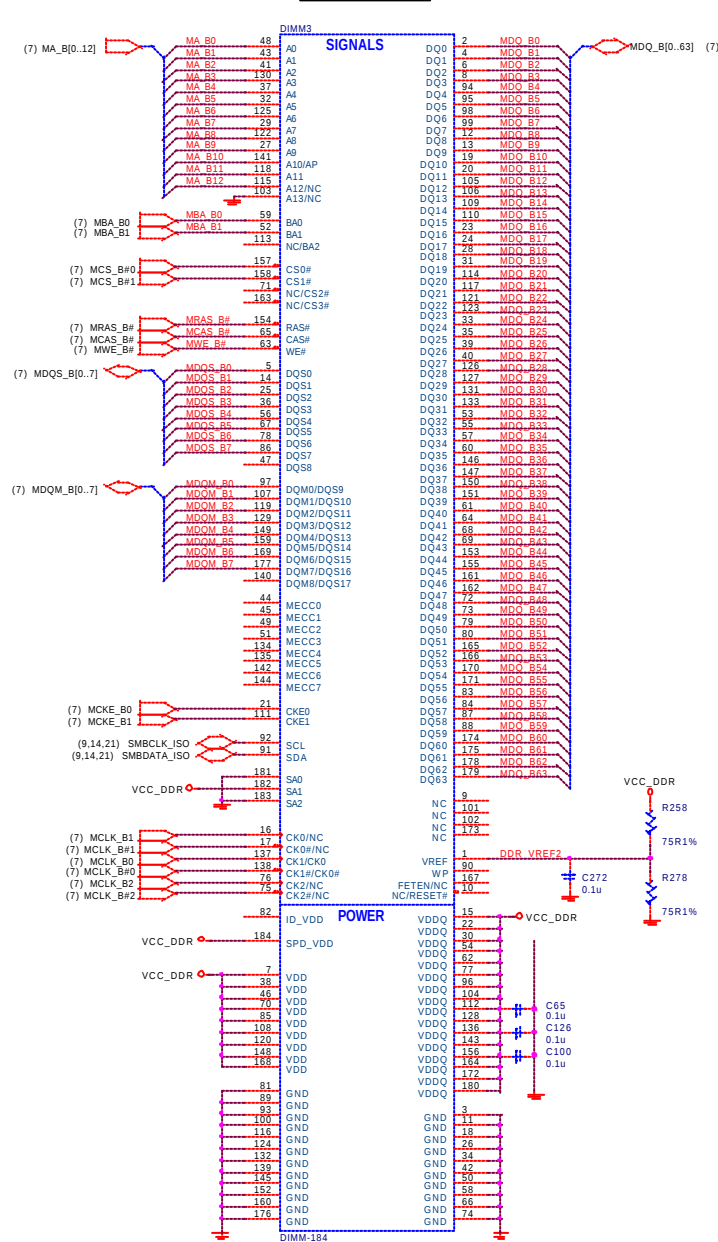
MICRO-STAR INT'L CO., LTD.

File			DDR DIMM 1 & 2
Size	Document Number	6772	
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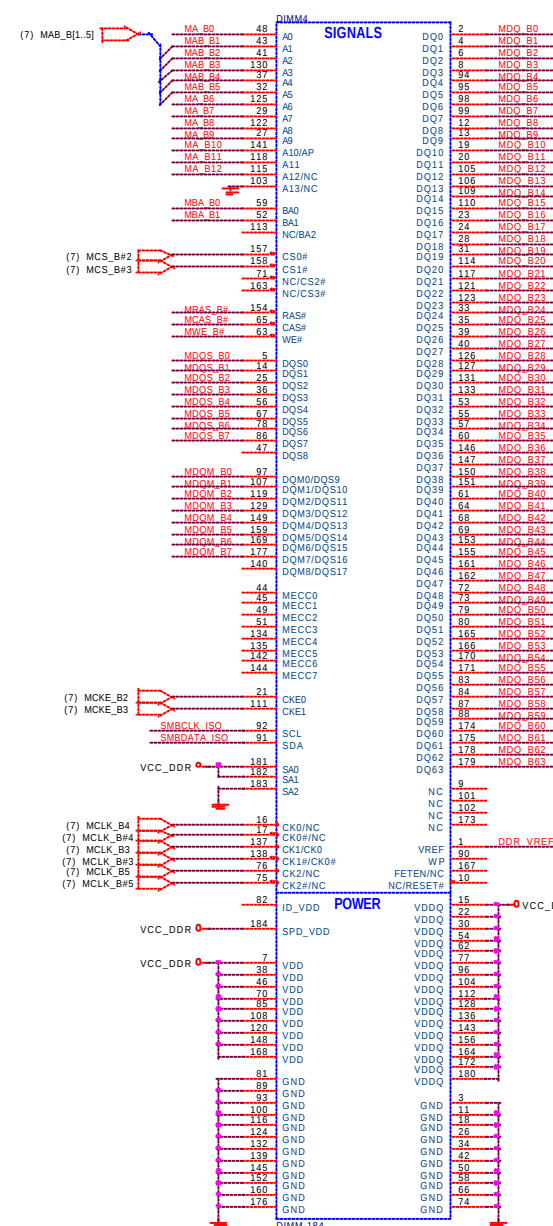
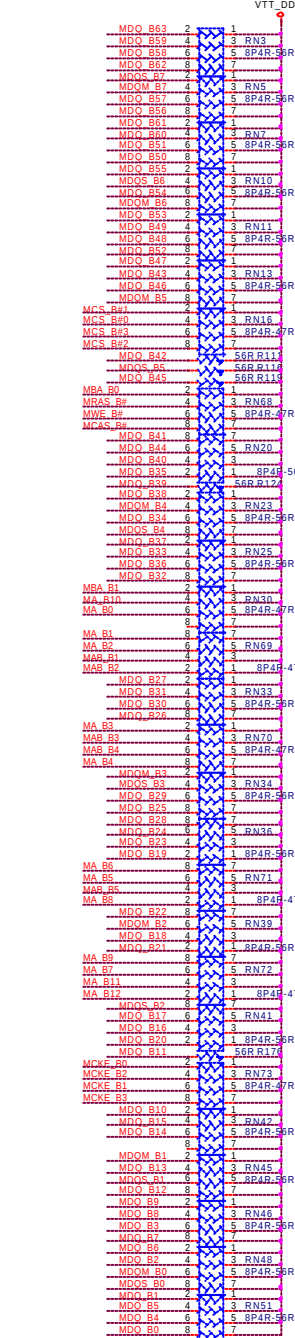
DDR DIMM3

DDR Terminational Resistors

DDR DIMM4



ADDR.=1010010B

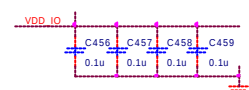


ADDR.=1010011B

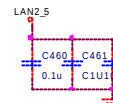
MSI		MICRO-STAR INT'L CO., LTD.	
File: DIMM 3,4			
Size	Document Number	6772	Rev 0A
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Gigabit Ethernet MAC-PHY

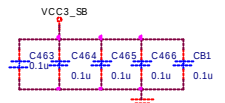
4401:VCC3_SB
5702/5705:VCC3



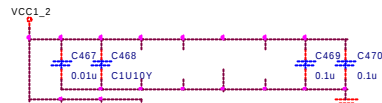
PLACE CAPACITORS AS CLOSE TO POWER PINS AS POSSIBLE



PLACE CAPACITORS AS CLOSE TO POWER PINS AS POSSIBLE

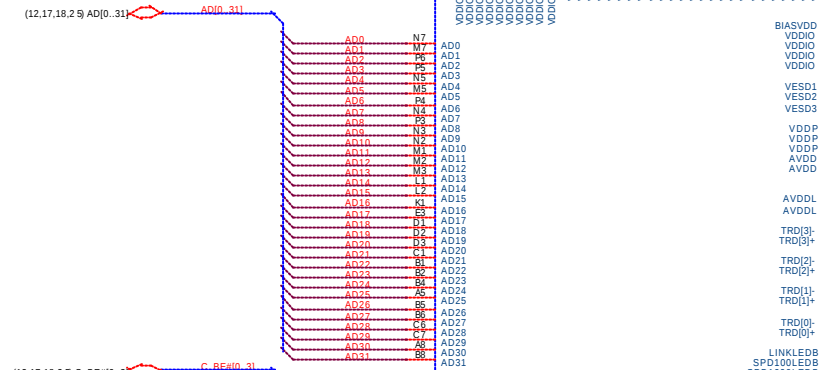


PLACE CAPACITORS AS CLOSE TO POWER PINS AS POSSIBLE



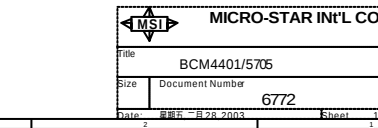
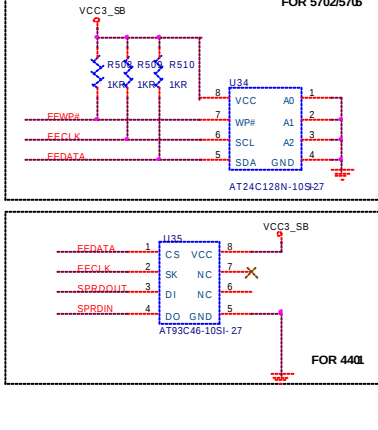
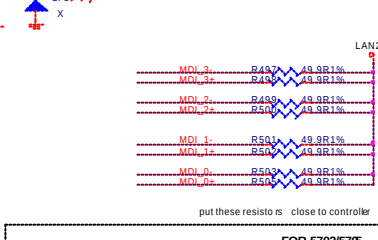
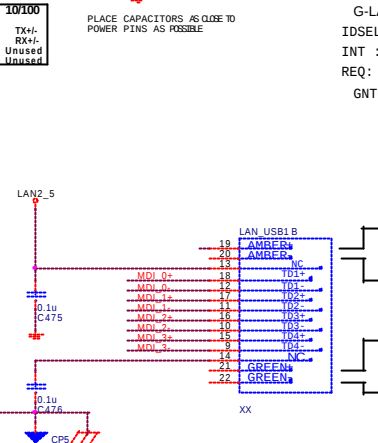
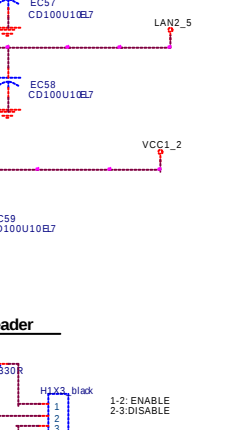
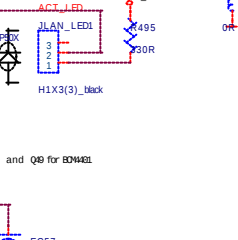
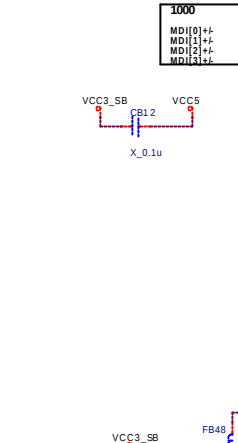
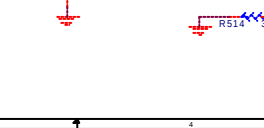
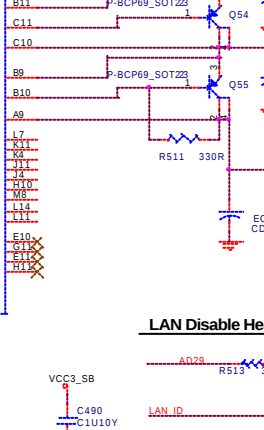
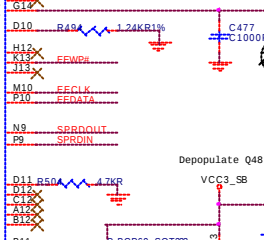
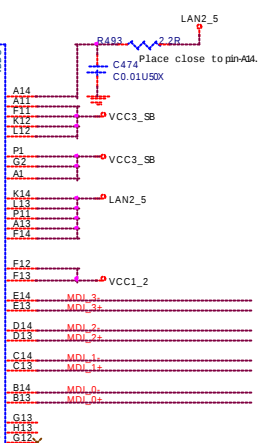
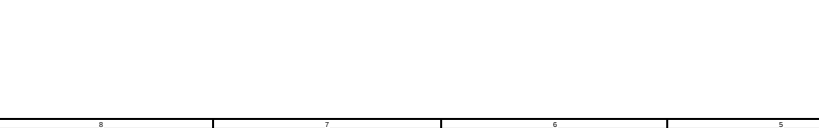
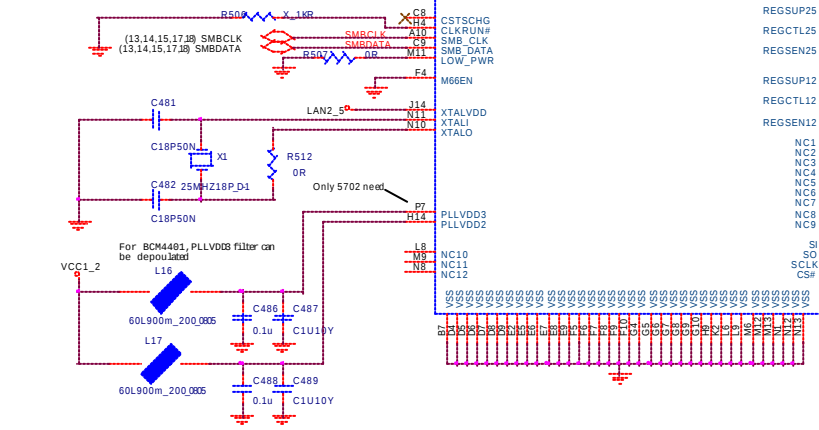
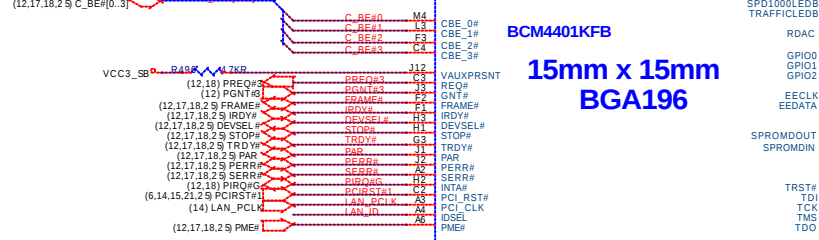
PLACE CAPACITORS AS CLOSE TO POWER PINS AS POSSIBLE

G-LAN
IDSEL: AD29
INT: PIRQG
REQ: PREQ#3
GNT: PGNT#3

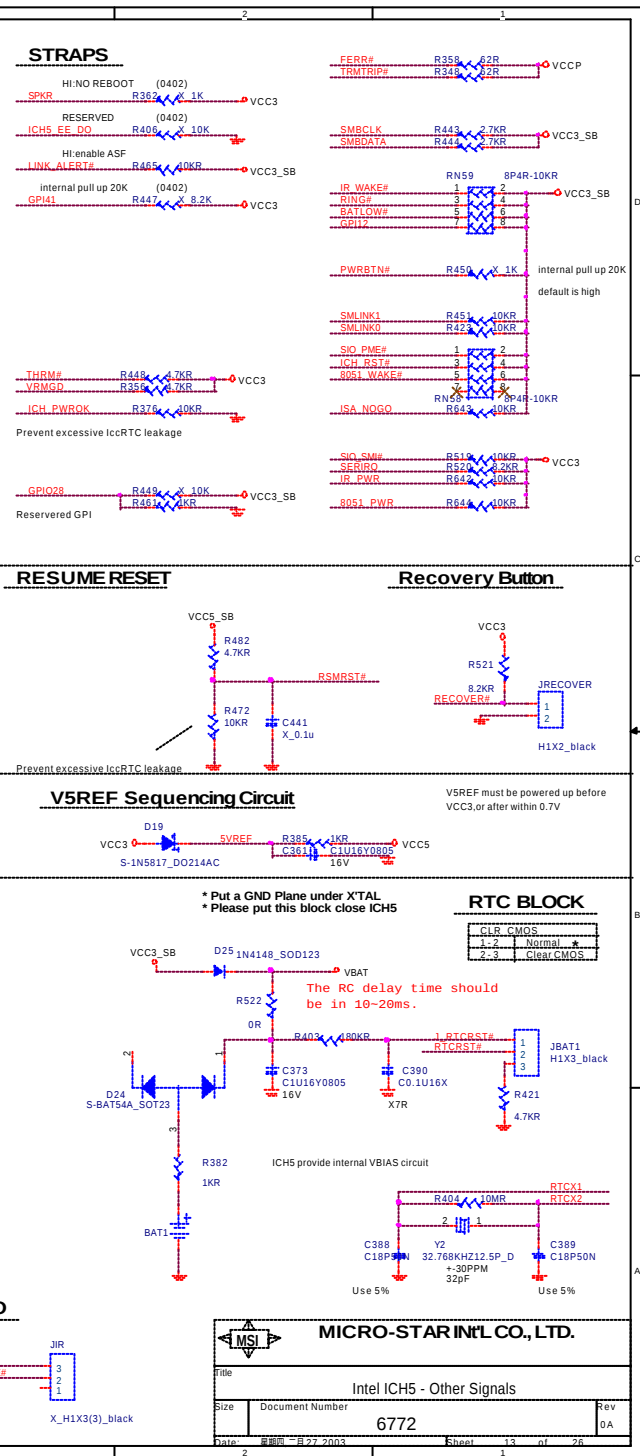
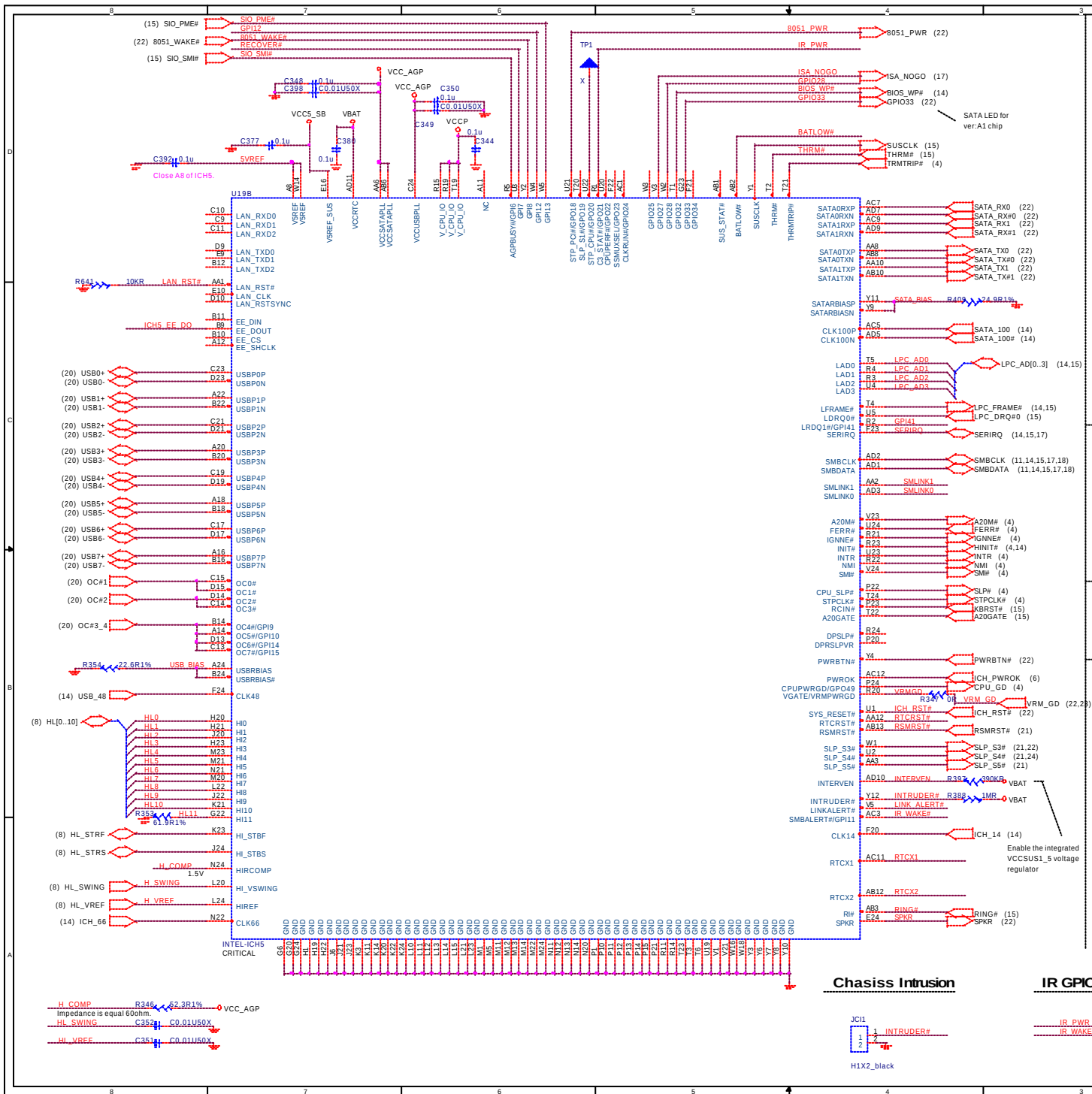


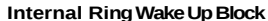
BCM4401KFB

15mm x 15mm
BGA196

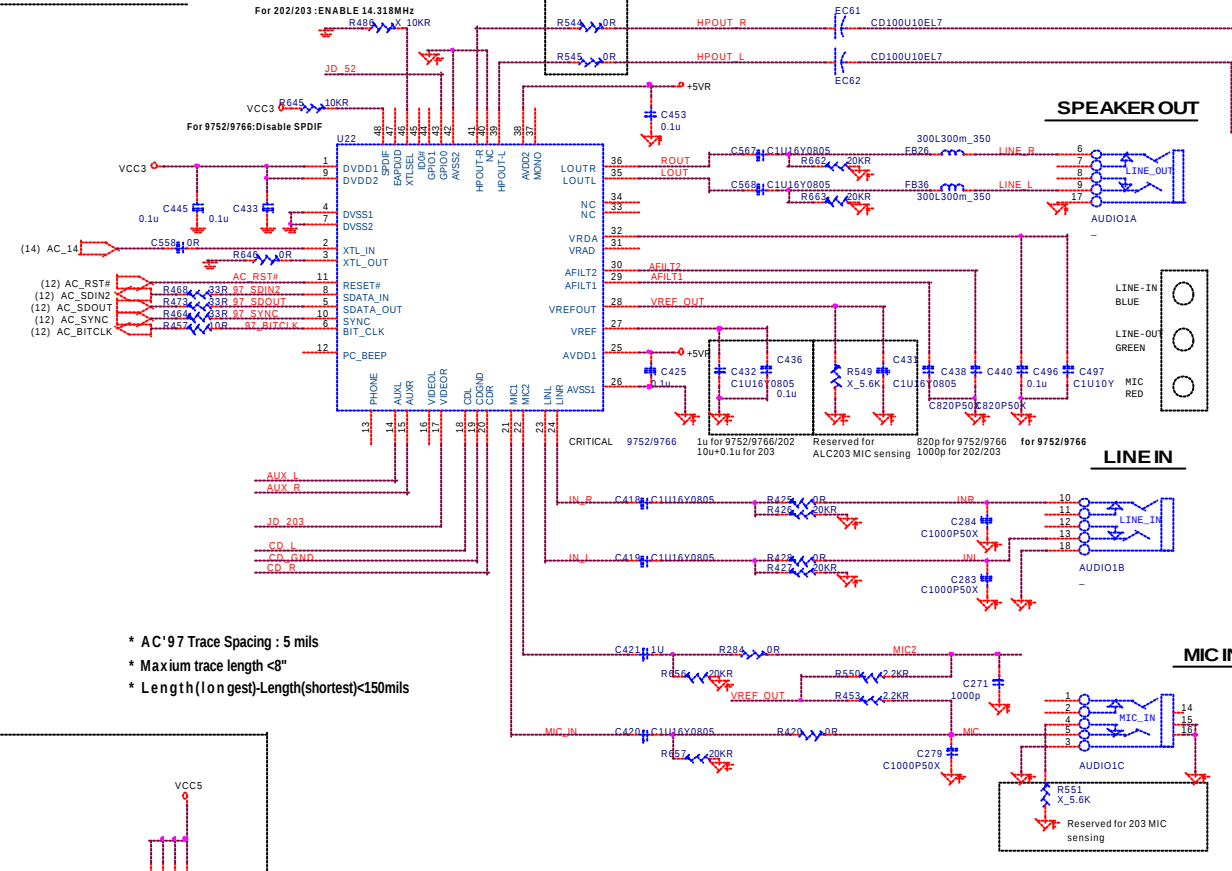


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Title	BCM4401/5705
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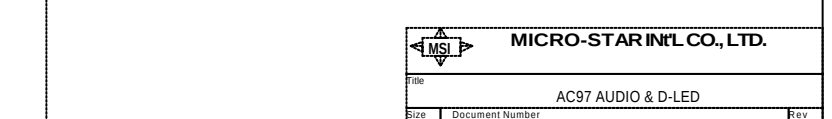
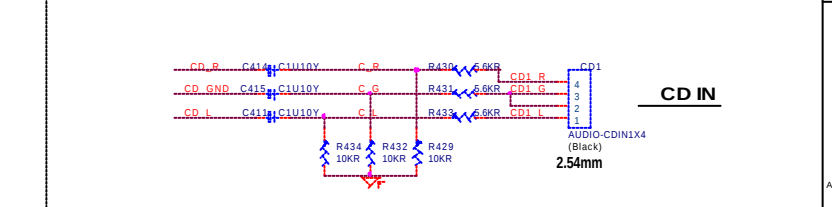
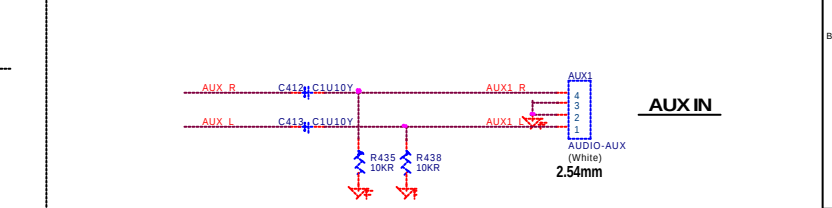
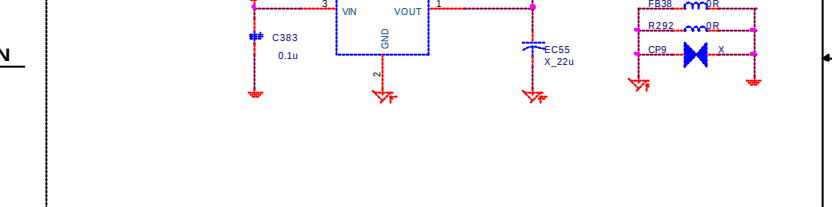
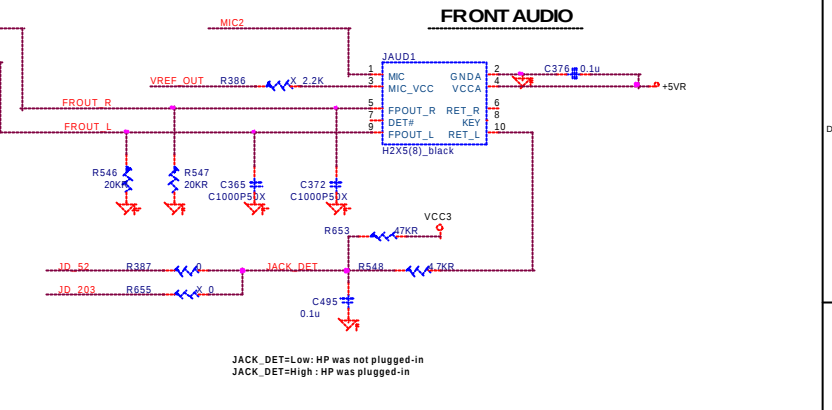
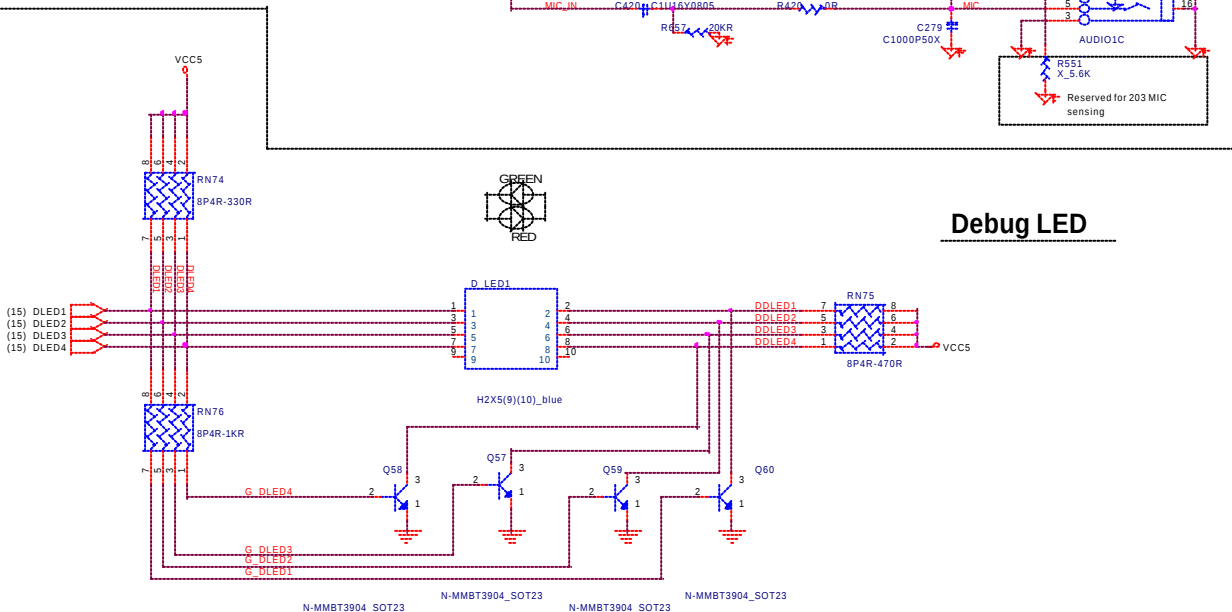




SigmaTel9752/9766 Realtek ALC202/203



- * AC'97 Trace Spacing : 5 mils
- * Maximum trace length <8"
- * Length (longest)-Length(shortest)<150mils

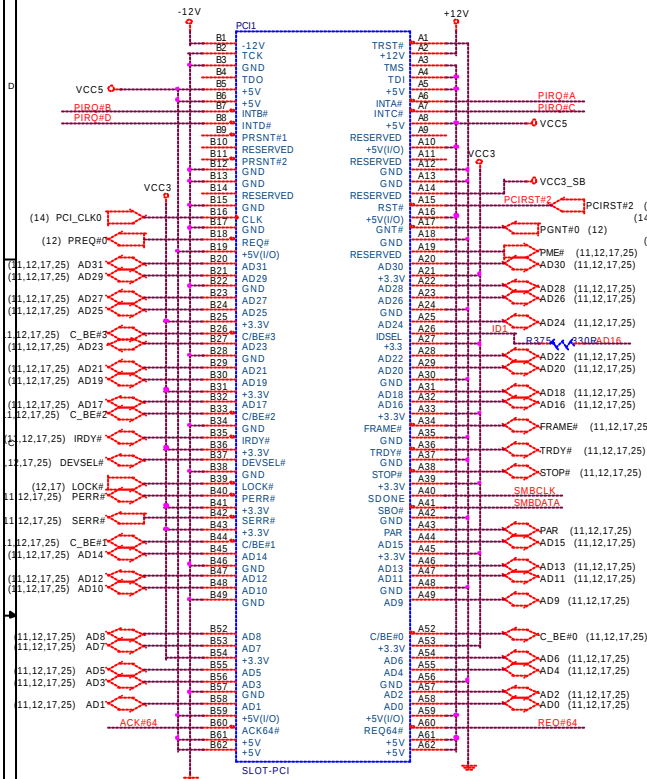


MSI MICRO-STAR INT'L CO., LTD.			
File AC97 AUDIO & D-LED			
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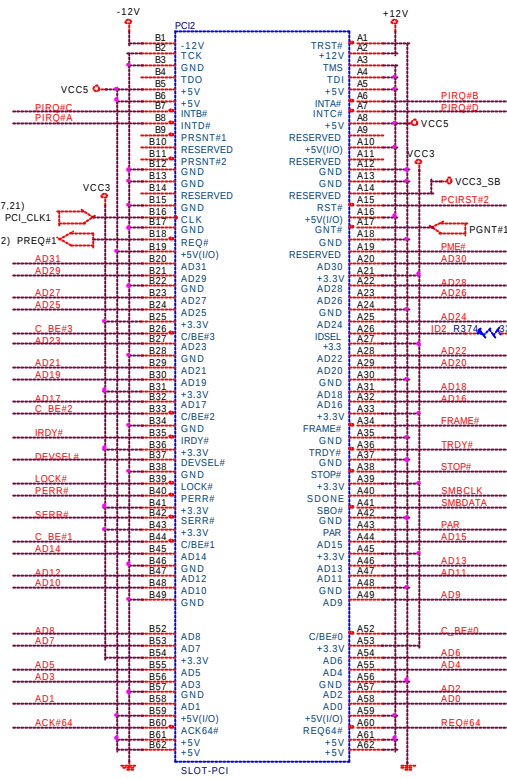
PCI SLOT 1 (PCIVER: 2.2 COMPLY)

PCI SLOT 2 (PCIVER: 2.2 COMPLY)

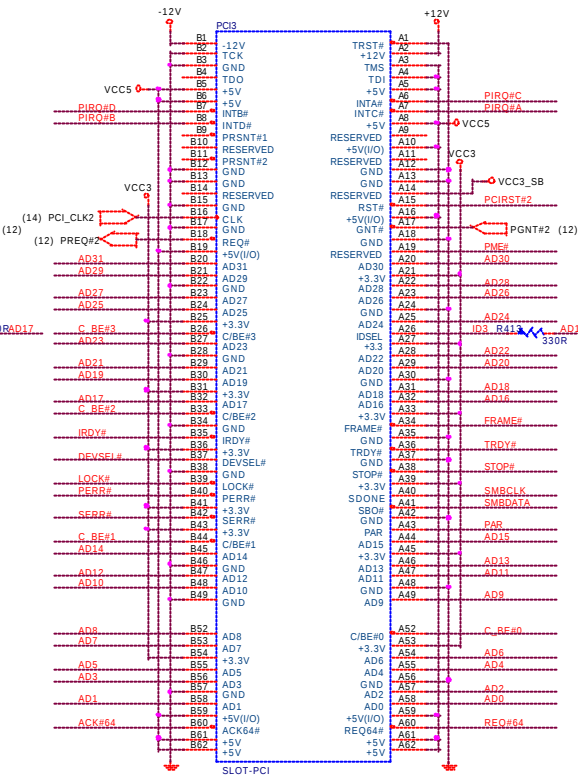
PCI SLOT 3 (PCIVER: 2.2 COMPLY)



IDSEL = AD16
MASTER = PREQ#0
PIRQ#A

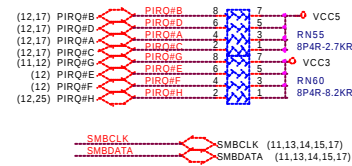
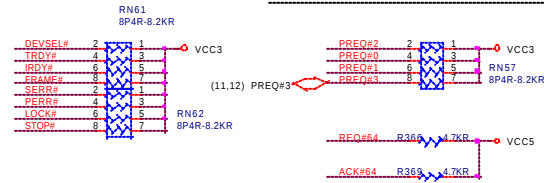


IDSEL = AD17
MASTER = PREQ#1
PIRQ#D

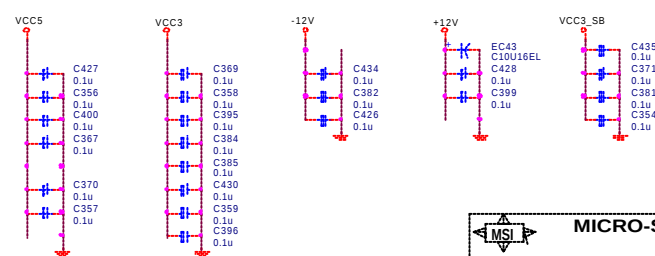


IDSEL = AD18
MASTER = PREQ#2
PIRQ#C

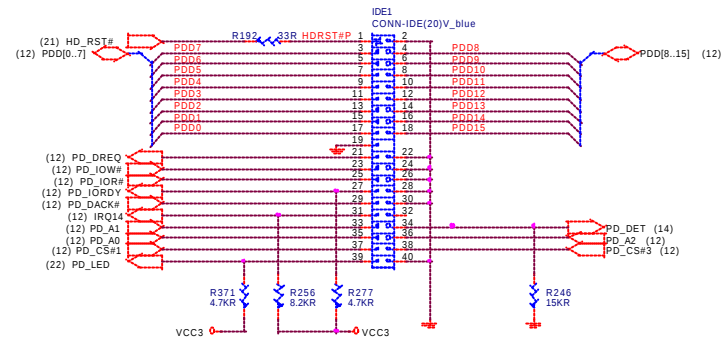
PCI PULL-UP / DOWN RESISTORS



PCI SLOT DECOUPLING CAPACITORS

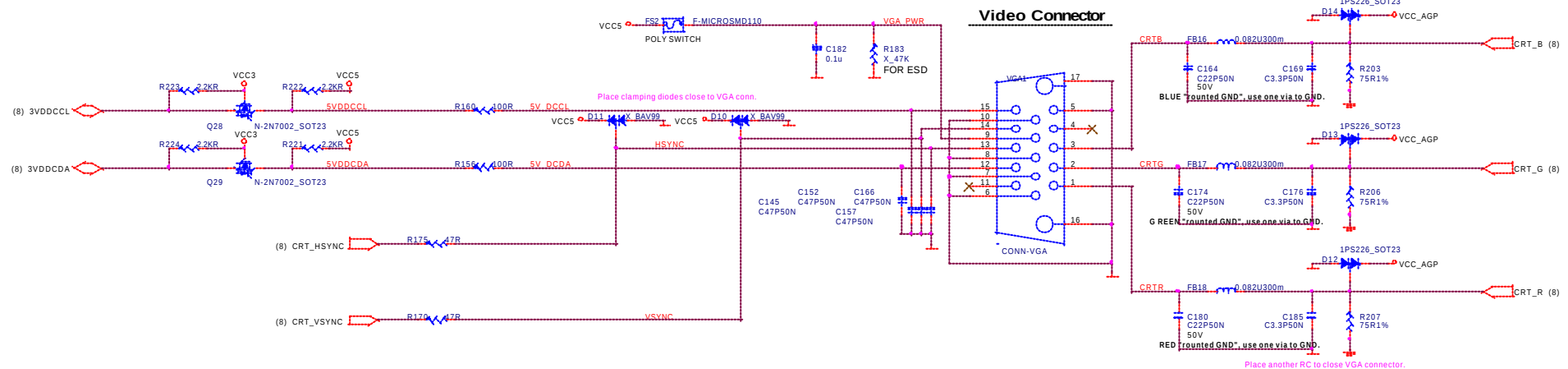
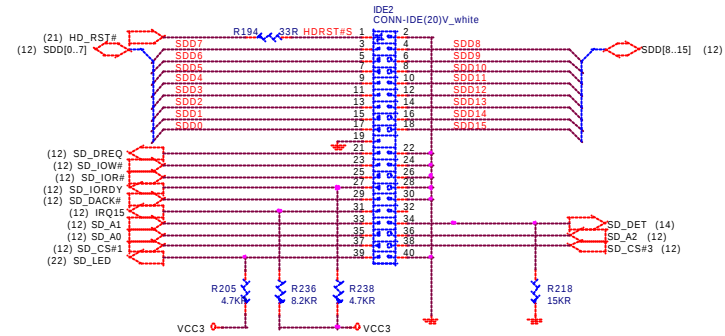


PRIMARY IDE BLOCK

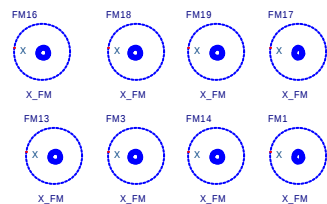


ATA 33/66/100 IDE Connectors

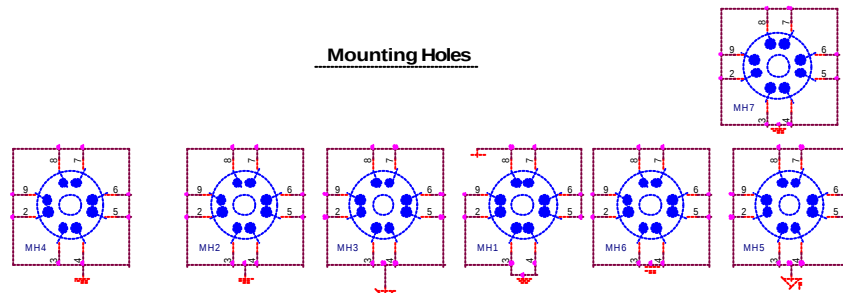
SECONDARY IDE BLOCK



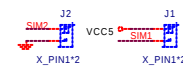
Optics Orientation Holes



Mounting Holes

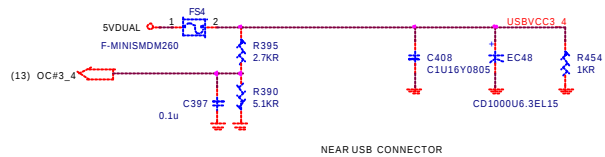


Simulation

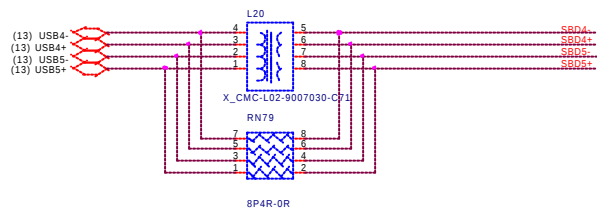


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ATA33/66/100 IDE & VIDEO Connectors		
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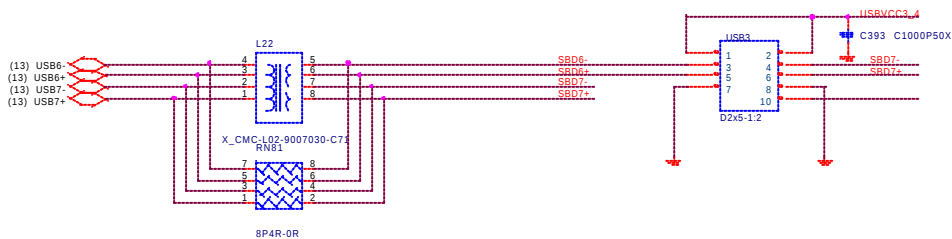
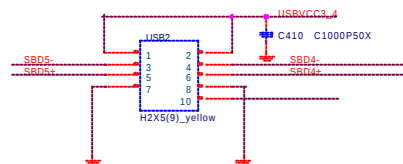
POWER CIRCUIT FOR USB PORT 0,1,2,3



REAR PANEL USB CONNECTOR FOR USB PORT 0,1,2,3



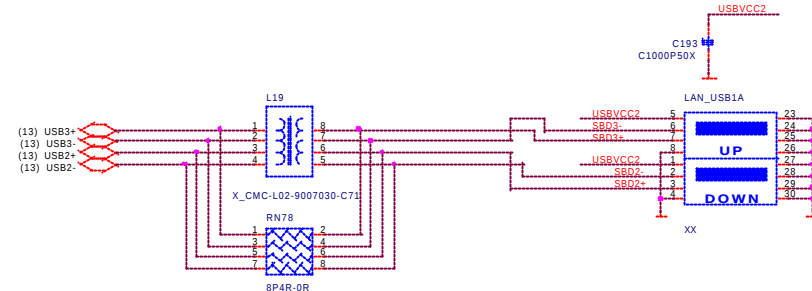
NEAR USB CONNECTOR



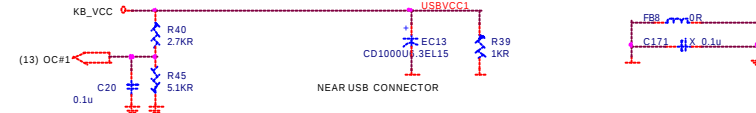
POWER CIRCUIT FOR USB PORT 4,5



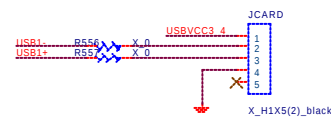
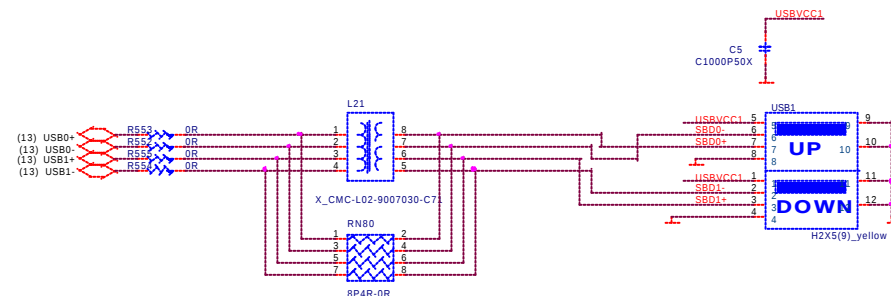
REAR PANEL USB CONNECTOR FOR USB PORT 4,5



POWER CIRCUIT FOR USB PORT 6,7



REAR PANEL USB CONNECTOR FOR USB PORT 6,7



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Title			
USB Connectors			
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Power	S0	S3	S5
VCC3_SB	Main	Standby	Standby
VCC5_STR	Main	Standby	0V
MEM_STR	Main	Standby	0V

SEL0	5VUSB
H	2 MOSFET
L	1 MOSFET

**S50# pin function(Hi level = 5V)
same as 5VUSB(Hi level = 12V)
5VUSB USE 2 MOSFET

5V DUAL Power

**INPUT 2 AND 3 MUST BE HI LEVEL WHEN USE
OUTPUT 1 AND 2 FOR GPIO FUNCTION

Near 302D

DDR VTT Power

1.25V/2.1A

VTT_DDR

EC12

CD1000U6.3EL15

EC28

Q6

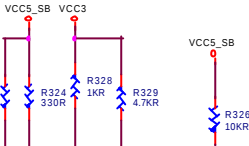
XX

FOR 3VSB OR 3VSTR
SETTING BY SEL1

Pin 15 19 22 32 Must
reserve capacitor.

ICH5 300mA
PCI 375+20+20= 415mA
VCC3_SB 715mA

** SETTING 3VSTR THEN VRAM_2.5
BECOME TO 1.25 VREF



1.7V Voltage Regulation

Q81

NN-P07D03LV_S0R

VCC5

DDR_SVDUAL

EC54

CD1000U6.3EL15

VCC3

VCC_DAC G2

Q32

N-2N7002_S0T23

1.7V/60mA

VCC_DAC

VCC_DAC_FB

R276

OR

C238

0.1u

Near Pin 21

VCC5

EC32

CD1000U6.3EL15

VCC5_SB

EC30

CD1000U6.3EL15

Near Pin 21

VCC5

EC32

CD1000U6.3EL15

Near Pin 21

VCC5

EC32

CD1000U6.3EL15

Near Pin 21

VCC5

EC32

CD1000U6.3EL15

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Near Pin 21

VCC5

EC32

CD1000U6.3EL15

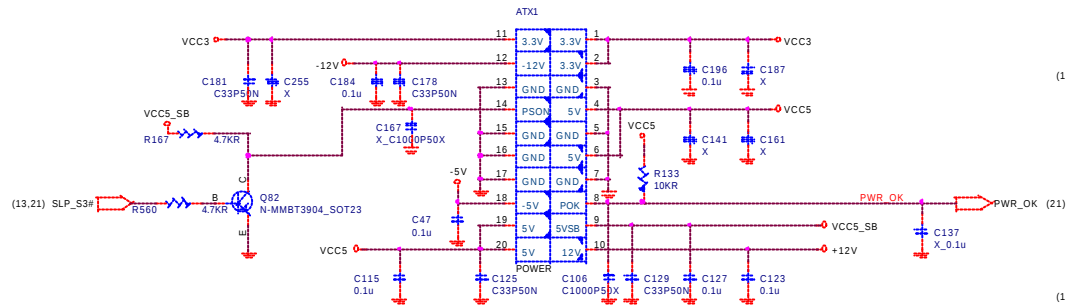
Near Pin 21

VCC5

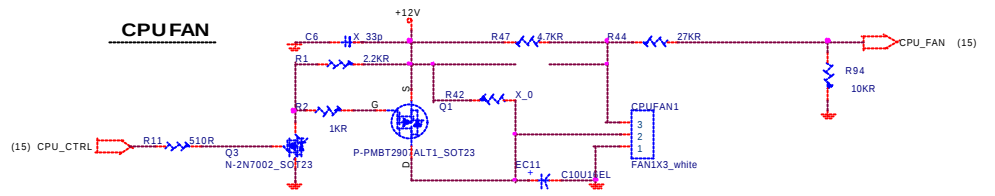
EC32

CD1000U6.3EL15

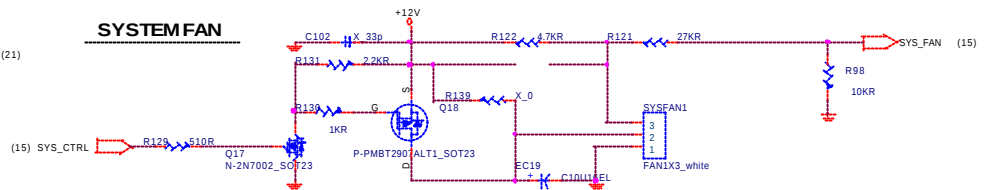
ATX Connector



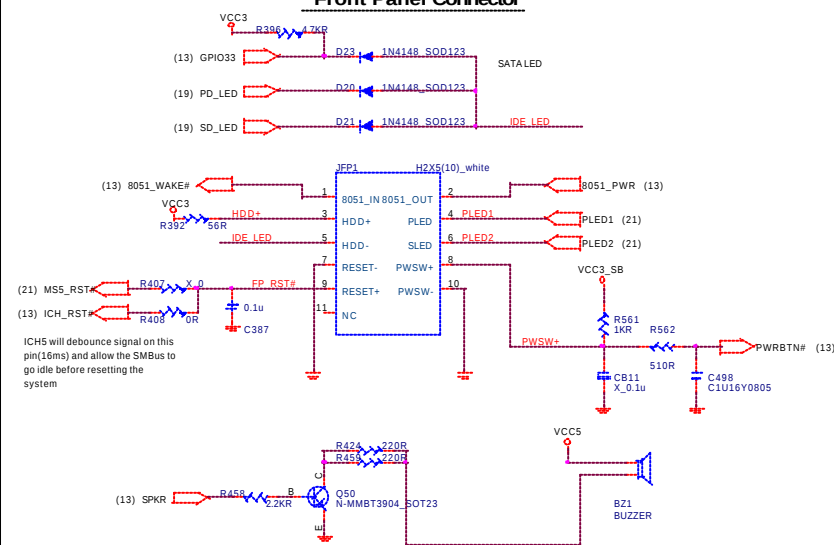
CPUFAN



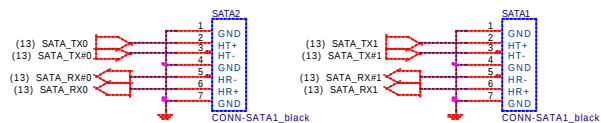
SYSTEMFAN



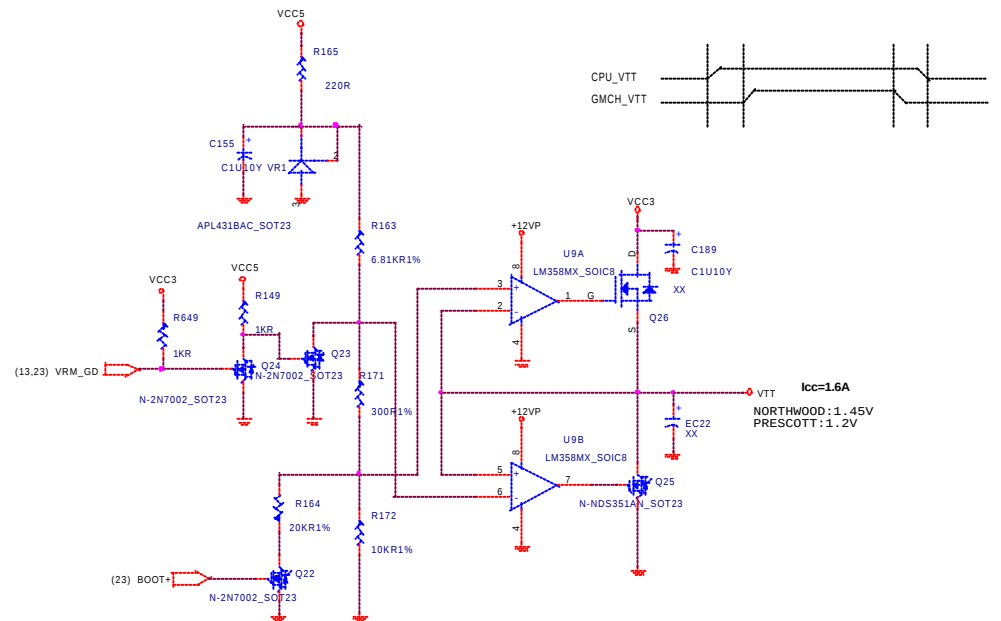
Front Panel Connector



SERIAL ATA CONNECTOR BLOCK

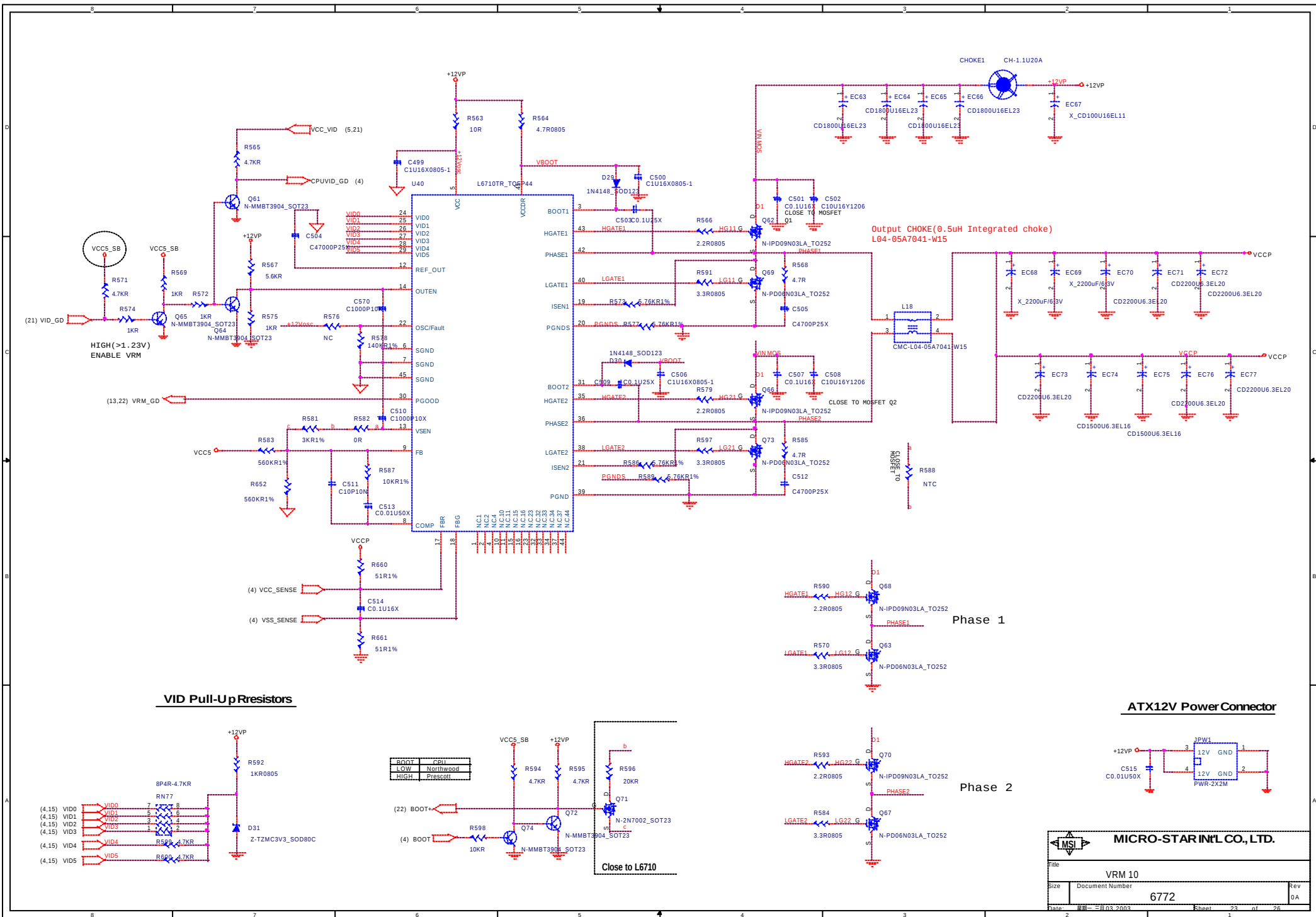


Intel reference GMCH_VTT power circuit

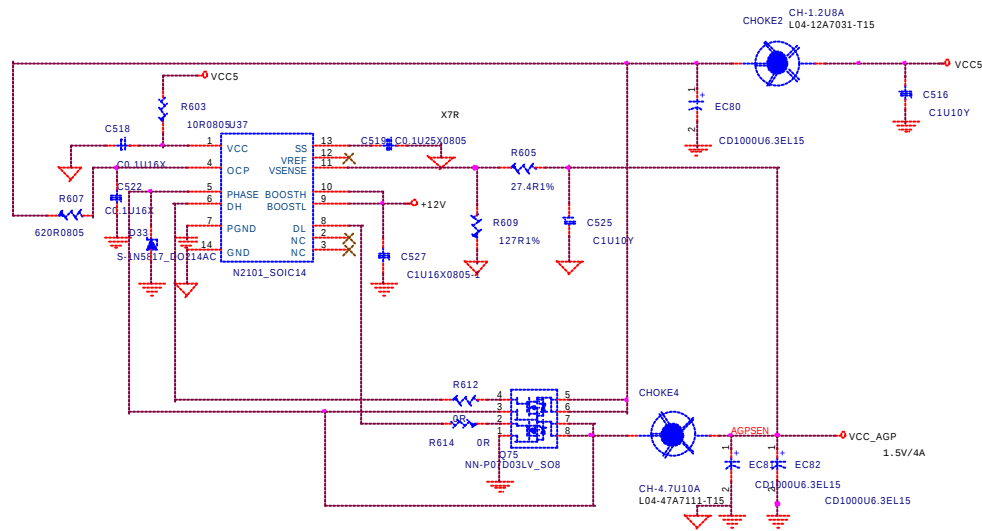


Root	CPU	Voltage
LOW	Northwood	1.45V
HIGH	Prescott	1.225V

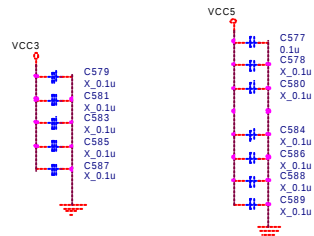
MSI		MICRO-STAR INT'L CO., LTD.	
File			
Front Panel/Fan/VTT			
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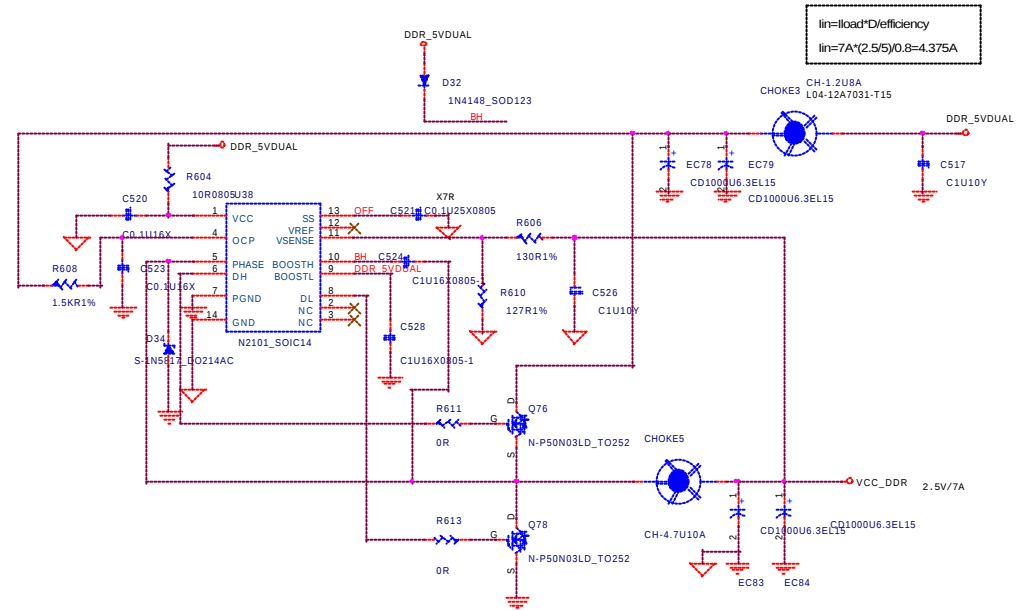
1.5V POWER



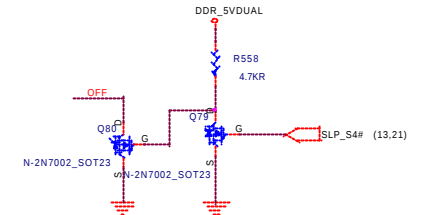
First source:
P07D03LV(NIKO):D03-07D0303-N03
Second source:
7313(ANPEC):D03-0731303-A30

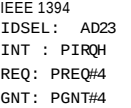


2.5V POWER



First source:
P50N03LD(NIKO):D03-50N033B-N03
Second source:
P55N02LD(NIKO):D03-55N021B-N03
IPD12N03L(Infineon):D03-12N030B-I14





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