MS-7024

IBM
Wellfleet

Version 130

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

CPU:

Intel Northwood/Prescott - 3.0G & Above

System Chipset:

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

On Board Chipset:

BIOS -- FWH EEPROM
AC'97 Codec -- AD1981B
LPC Super I/O -- LPC47M233
LAN -- I82562EZ(10/100) / I82541EI(Giga)
CLOCK -- Cypress CY28405

Main Memory:

DDR * 2 (Max 2GB)

PCI Slots:

PCI2.3 SLOT * 1

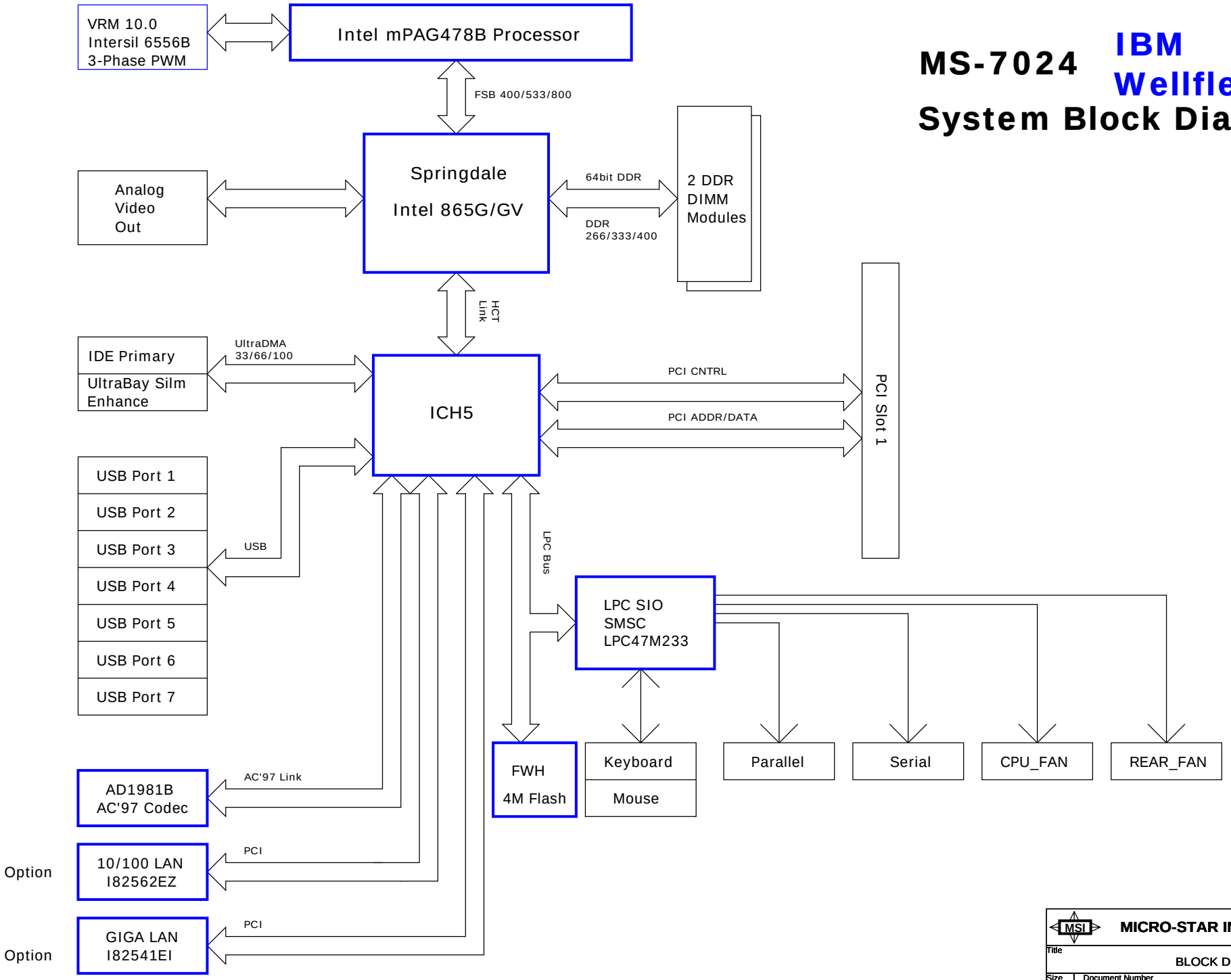
Intersil PWM:

Controller: HIP6556B (HIP6565)
Driver: HIP6602B *1 / HIP6601B * 1

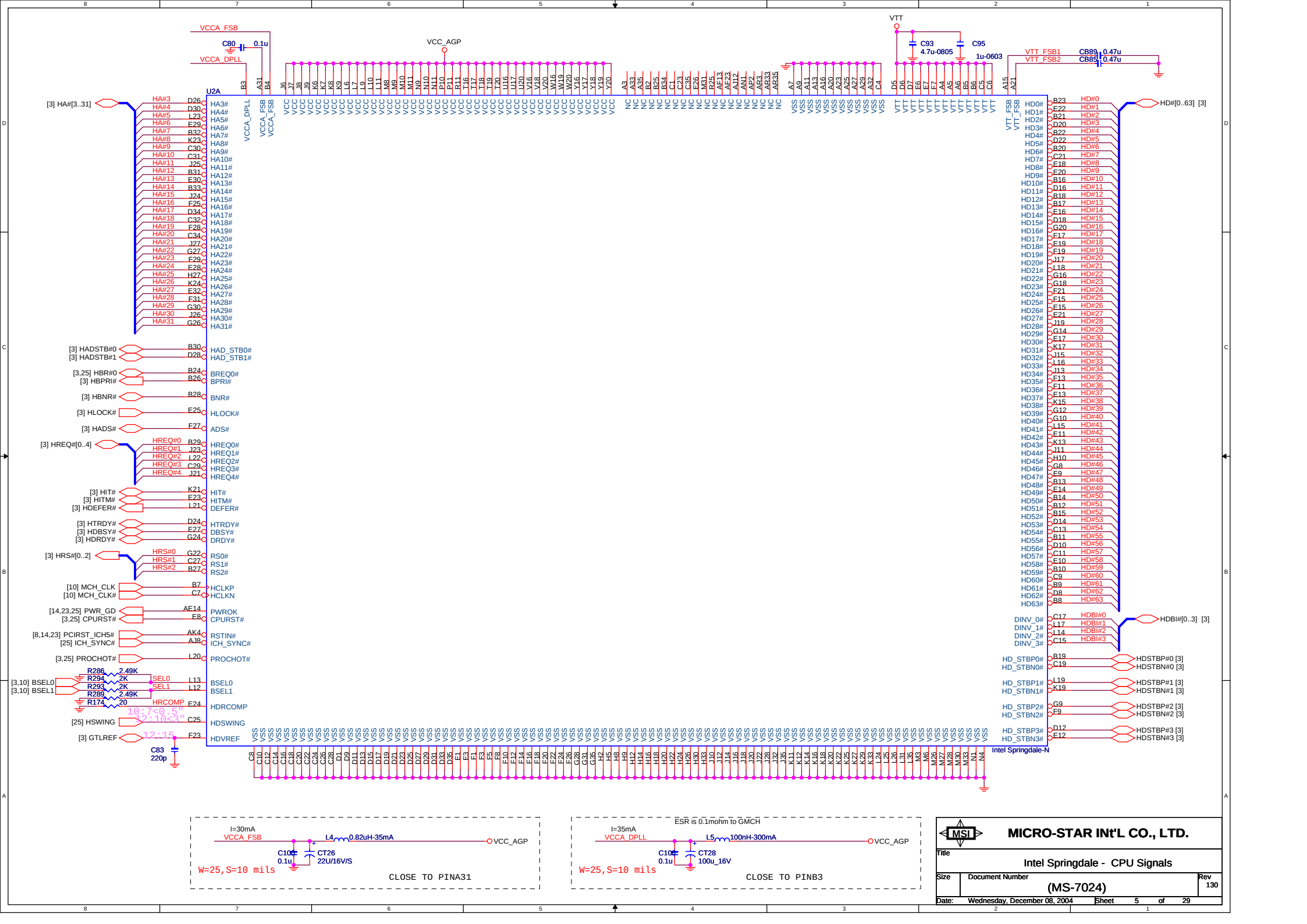
MSI **MICRO-STAR INt'L CO., LTD.**

Title	COVER SHEET	
Size	Document Number (MS-7024)	Rev 130
Date: Wednesday, December 08, 2004	Sheet 1 of 29	

MS-7024 IBM Wellfleet
System Block Diagram



MSI	MICRO-STAR INt'L CO., LTD.	
Title	BLOCK DIAGRAM	
Size	Document Number (MS-7024)	Rev 130
Date: Wednesday, December 08, 2004	Sheet 2 of 29	


VCCA_FSB
C80 0.1u
VCCA_DPLL
VCC_AGP
VTT
C93 4.7u-0805
C95 1u-0603
VTT_FSB1
VTT_FSB2
CB89 0.47u
CB85 0.47u
U2A
Intel Springdale-N
C83 220p
I=30mA
VCCA_FSB
L4 0.82uH-35mA
VCC_AGP
C100 0.1u
CT26 22U/16V/S
W=25,S=10 mils
CLOSE TO PINA31
ESR is 0.1mohm to GMCH
I=35mA
VCCA_DPLL
L5 100nH-300mA
VCC_AGP
C102 0.1u
CT28 100u_16V
W=25,S=10 mils
CLOSE TO PINB3
MICRO-STAR INt'L CO., LTD.
Intel Springdale - CPU Signals
(MS-7024)
Wednesday, December 08, 2004
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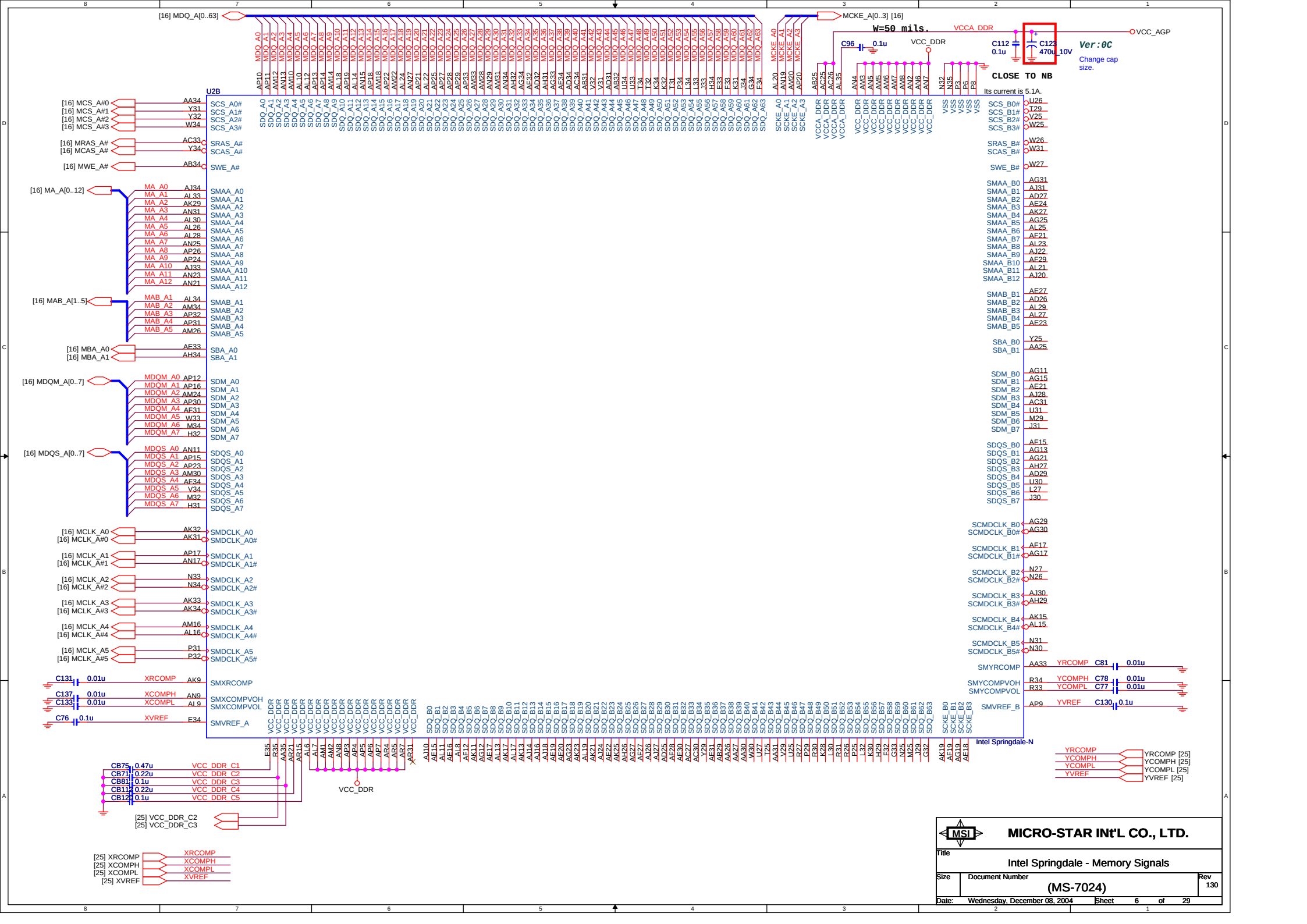

MSI	MICRO-STAR INt'L CO., LTD.	
Title	Intel Springdale - Memory Signals	
Size	Document Number (MS-7024)	Rev 130
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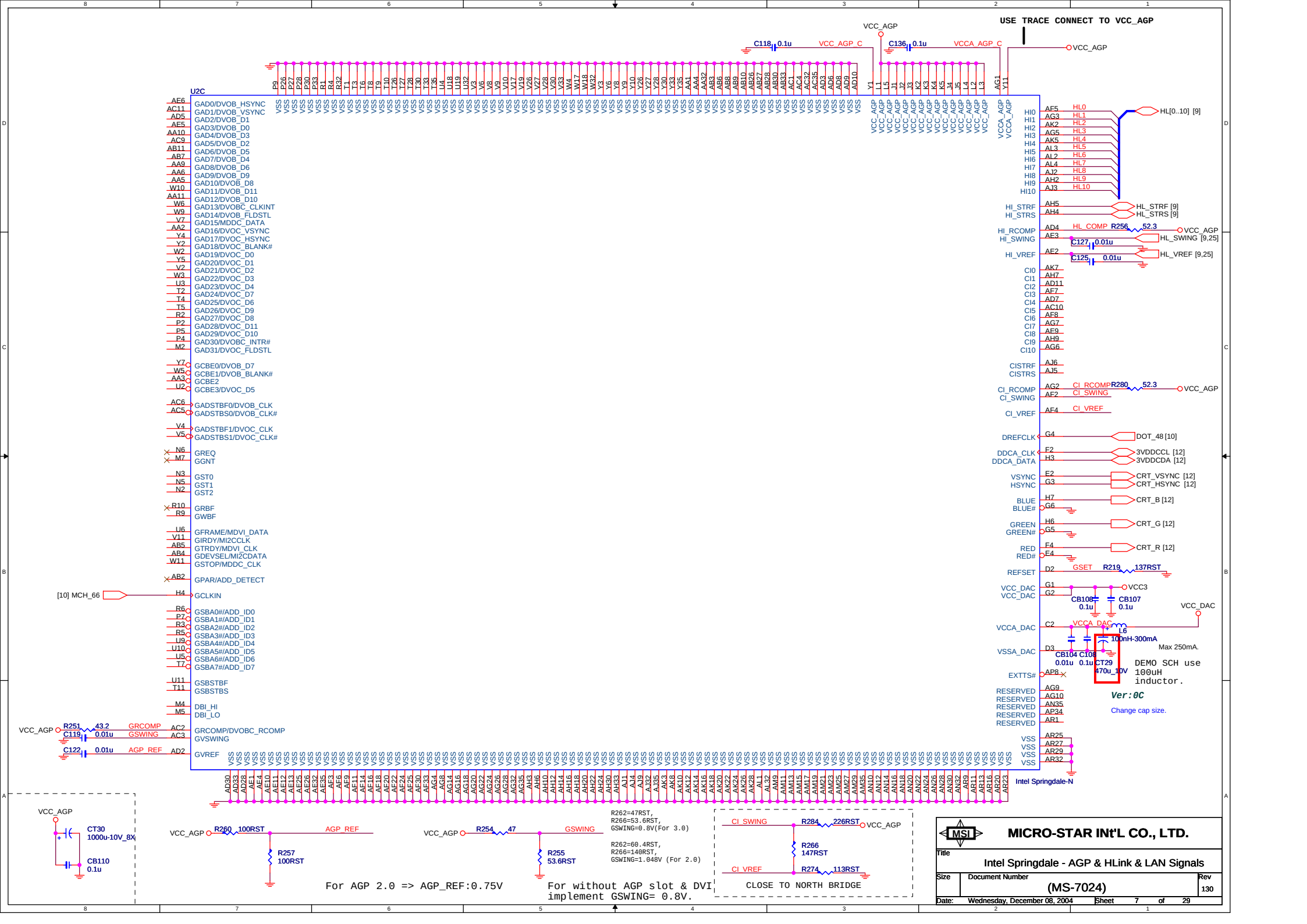
USE TRACE CONNECT TO VCC_AGP
U2C
GAD0/DVOB_HSYNC
GAD1/DVOB_VSYNC
GAD2/DVOB_D1
GAD3/DVOB_D0
GAD4/DVOB_D3
GAD5/DVOB_D2
GAD6/DVOB_D5
GAD7/DVOB_D4
GAD8/DVOB_D6
GAD9/DVOB_D9
GAD10/DVOB_D8
GAD11/DVOB_D11
GAD12/DVOB_D10
GAD13/DVOBC_CLKINT
GAD14/DVOB_FLDSTL
GAD15/MDDC_DATA
GAD16/DVOC_VSYNC
GAD17/DVOC_HSYNC
GAD18/DVOC_BLANK#
GAD19/DVOC_D0
GAD20/DVOC_D1
GAD21/DVOC_D2
GAD22/DVOC_D3
GAD23/DVOC_D4
GAD24/DVOC_D7
GAD25/DVOC_D6
GAD26/DVOC_D9
GAD27/DVOC_D8
GAD28/DVOC_D11
GAD29/DVOC_D10
GAD30/DVOBC_INTR#
GAD31/DVOC_FLDSTL
GCBE0/DVOB_D7
GCBE1/DVOB_BLANK#
GCBE2
GCBE3/DVOC_D5
GADSTBF0/DVOB_CLK
GADSTBS0/DVOB_CLK#
GADSTBF1/DVOC_CLK
GADSTBS1/DVOC_CLK#
GREQ
GGNT
GST0
GST1
GST2
GRBF
GWBF
GFRAME/MDVI_DATA
GIRDY/MI2CCLK
GTRDY/MDVI_CLK
GDEVSEL/MI2CDATA
GSTOP/MDDC_CLK
GPAR/ADD_DETECT
GCLKIN
GSBA0#/ADD_ID0
GSBA1#/ADD_ID1
GSBA2#/ADD_ID2
GSBA3#/ADD_ID3
GSBA4#/ADD_ID4
GSBA5#/ADD_ID5
GSBA6#/ADD_ID6
GSBA7#/ADD_ID7
GSBSTBF
GSBSTBS
DBI_HI
DBI_LO
GRCOMP/DVOBC_RCOMP
GVSWING
GVREF
[10] MCH_66
VCC_AGP
R251 43.2 GRCOMP
C119 0.01u GSWING
C122 0.01u AGP_REF
C118 0.1u
VCC_AGP_C
C136 0.1u
VCCA_AGP_C
HI0
HI1
HI2
HI3
HI4
HI5
HI6
HI7
HI8
HI9
HI10
HL0
HL1
HL2
HL3
HL4
HL5
HL6
HL7
HL8
HL9
HL10
HL[0..10] [9]
HI_STRF
HI_STRS
HL_STRF [9]
HL_STRS [9]
HI_RCOMP
HI_SWING
HL_COMP R256 52.3
C127 0.01u
HL_SWING [9,25]
HI_VREF
C125 0.01u
HL_VREF [9,25]
CI0
CI1
CI2
CI3
CI4
CI5
CI6
CI7
CI8
CI9
CI10
CISTRF
CISTRS
CI_RCOMP
CI_SWING
R280 52.3
CI_VREF
DREFCLK
DOT_48 [10]
DDCA_CLK
DDCA_DATA
3VDDCCL [12]
3VDDCDA [12]
VSYNC
HSYNC
CRT_VSYNC [12]
CRT_HSYNC [12]
BLUE
BLUE#
CRT_B [12]
GREEN
GREEN#
CRT_G [12]
RED
RED#
CRT_R [12]
REFSET
GSET R219 137RST
VCC_DAC
VCC3
CB108 0.1u
CB107 0.1u
VCCA_DAC
L6 100nH-300mA
Max 250mA.
VSSA_DAC
CB104 0.01u
C108 0.1u
CT29 470u_10V
DEMO SCH use 100uH inductor.
EXTTS#
RESERVED
VSS
Intel Springdale-N
Ver:0C
Change cap size.
CT30 1000u-10V_8X
CB110 0.1u
R260 100RST
R257 100RST
AGP_REF
R254 47
R255 53.6RST
GSWING
R262=47RST,
R266=53.6RST,
GSWING=0.8V(For 3.0)
R262=60.4RST,
R266=140RST,
GSWING=1.048V (For 2.0)
CI_SWING
R284 226RST
R266 147RST
CI_VREF
R274 113RST
CLOSE TO NORTH BRIDGE
For AGP 2.0 => AGP_REF:0.75V
For without AGP slot & DVI implement GSWING= 0.8V.
MICRO-STAR INt'L CO., LTD.
Title
Intel Springdale - AGP & HLink & LAN Signals
Size
Document Number
(MS-7024)
Rev
130
Date: Wednesday, December 08, 2004
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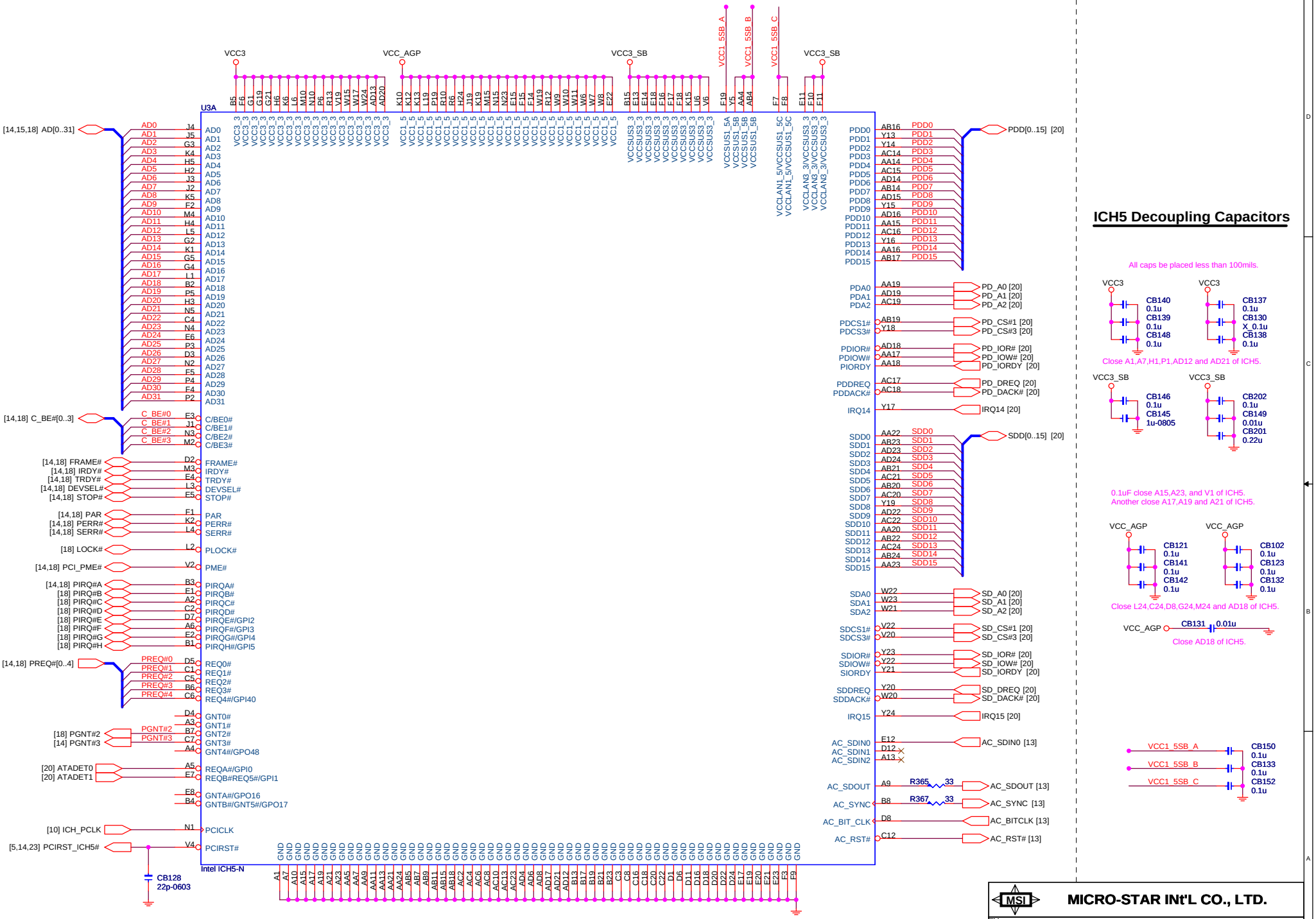
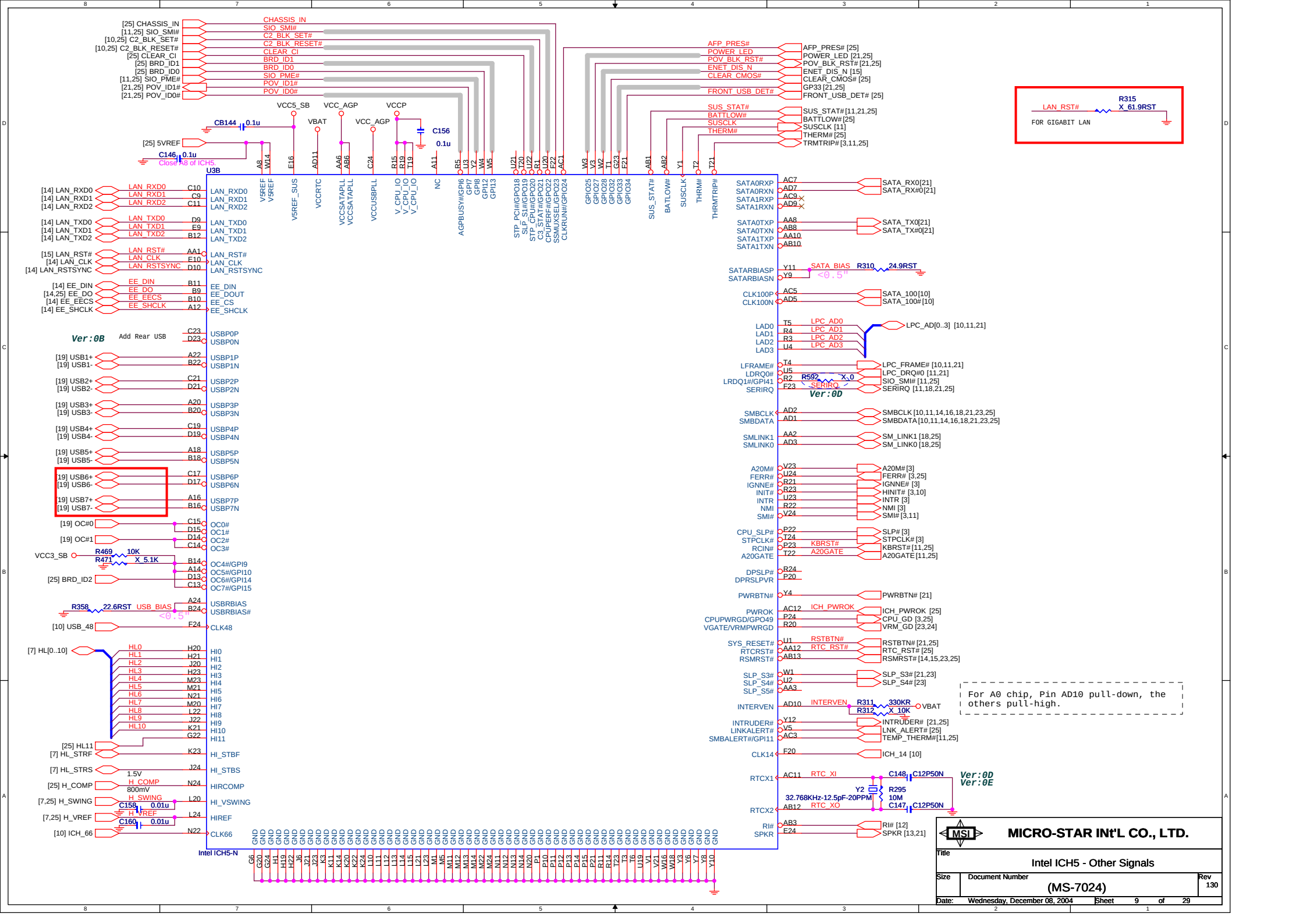


ICH5 Decoupling Capacitors

MICRO-STAR INt'L CO., LTD.		
Title: Intel ICH5 - PCI & IDE & AC97 Signals		
Size	Document Number: (MS-7024)	Rev: 130
Date: Wednesday, December 08, 2004	Sheet 8 of 29	


[25] CHASSIS_IN
[11,25] SIO_SMI#
[10,25] C2_BLK_SET#
[10,25] C2_BLK_RESET#
[25] CLEAR_CI
[25] BRD_ID1
[25] BRD_ID0
[11,25] SIO_PME#
[21,25] POV_ID1#
[21,25] POV_ID0#
CHASSIS_IN
SIO_SMI#
C2_BLK_SET#
C2_BLK_RESET#
CLEAR_CI
BRD_ID1
BRD_ID0
SIO_PME#
POV_ID1#
POV_ID0#
AFP_PRES# [25]
POWER_LED [21,25]
POV_BLK_RST# [21,25]
ENET_DIS_N [15]
CLEAR_CMOS# [25]
GP33 [21,25]
FRONT_USB_DET# [25]
SUS_STAT#[11,21,25]
BATTLOW#[25]
SUSCLK [11]
THERM# [25]
TRMTRIP# [3,11,25]
VCC5_SB
VCC_AGP
VCCP
VBAT
CB144 0.1u
C156 0.1u
[25] 5VREF
C146 0.1u
Close A8 of ICH5
U3B
LAN_RXD0
LAN_RXD1
LAN_RXD2
LAN_TXD0
LAN_TXD1
LAN_TXD2
LAN_RST#
LAN_CLK
LAN_RSTSYNC
EE_DIN
EE_DO
EE_EECS
EE_SHCLK
Ver:0B
Add Rear USB
USBP0P
USBP0N
USBP1P
USBP1N
USBP2P
USBP2N
USBP3P
USBP3N
USBP4P
USBP4N
USBP5P
USBP5N
USBP6P
USBP6N
USBP7P
USBP7N
OC0#
OC1#
OC2#
OC3#
OC4#/GPI9
OC5#/GPI10
OC6#/GPI14
OC7#/GPI15
R469 10K
R471 X_5.1K
R358 22.6RST
USB_BIAS
<0.5"
USBRBIAS
USBRBIAS#
CLK48
HL0
HL1
HL2
HL3
HL4
HL5
HL6
HL7
HL8
HL9
HL10
HI0
HI1
HI2
HI3
HI4
HI5
HI6
HI7
HI8
HI9
HI10
HI11
HI_STBF
HI_STBS
HIRCOMP
HI_VSWING
HIREF
CLK66
1.5V
H_COMP
800mV
H_SWING
H_VREF
C158 0.01u
C160 0.01u
Intel ICH5-N
SATA0RXP
SATA0RXN
SATA1RXP
SATA1RXN
SATA0TXP
SATA0TXN
SATA1TXP
SATA1TXN
SATA_RX0[21]
SATA_RX#0[21]
SATA_TX0[21]
SATA_TX#0[21]
SATARBIASP
SATARBIASN
SATA_BIAS
R310 24.9RST
<0.5"
CLK100P
CLK100N
SATA_100[10]
SATA_100#[10]
LAD0
LAD1
LAD2
LAD3
LPC_AD0
LPC_AD1
LPC_AD2
LPC_AD3
LPC_AD[0..3] [10,11,21]
LFRAME#
LDRQ0#
LRDQ1#/GPI41
SERIRQ
R592 X_0
Ver:0D
LPC_FRAME# [10,11,21]
LPC_DRQ#0 [11,21]
SIO_SMI# [11,25]
SERIRQ [11,18,21,25]
SMBCLK
SMBDATA
SMBCLK [10,11,14,16,18,21,23,25]
SMBDATA [10,11,14,16,18,21,23,25]
SMLINK1
SMLINK0
SM_LINK1 [18,25]
SM_LINK0 [18,25]
A20M#
FERR#
IGNNE#
INIT#
INTR
NMI
SMI#
A20M# [3]
FERR# [3,25]
IGNNE# [3]
HINIT# [3,10]
INTR [3]
NMI [3]
SMI# [3,11]
CPU_SLP#
STPCLK#
RCIN#
A20GATE
KBRST#
SLP# [3]
STPCLK# [3]
KBRST# [11,25]
A20GATE [11,25]
DPSLP#
DPRSLPVR
PWRBTN#
PWRBTN# [21]
PWROK
CPUPWRGD/GPO49
VGATE/VRMPWRGD
ICH_PWROK
ICH_PWROK [25]
CPU_GD [3,25]
VRM_GD [23,24]
SYS_RESET#
RTCRST#
RSMRST#
RSTBTN#
RTC_RST#
RSTBTN# [21,25]
RTC_RST# [25]
RSMRST# [14,15,23,25]
SLP_S3#
SLP_S4#
SLP_S5#
SLP_S3# [21,23]
SLP_S4# [23]
INTERVEN
R311 330KR
R312 X_10K
VBAT
For A0 chip, Pin AD10 pull-down, the others pull-high.
INTRUDER#
LINKALERT#
SMBALERT#/GPI11
INTRUDER# [21,25]
LNK_ALERT# [25]
TEMP_THERM#[11,25]
CLK14
ICH_14 [10]
RTCX1
RTCX2
RTC_XI
RTC_XO
C148 C12P50N
C147 C12P50N
Y2 32.768KHz-12.5pF-20PPM
R295 10M
Ver:0D
Ver:0E
RI#
SPKR
RI# [12]
SPKR [13,21]
LAN_RST#
R315 X_61.9RST
FOR GIGABIT LAN
MICRO-STAR INt'L CO., LTD.
Title
Intel ICH5 - Other Signals
Size
Document Number
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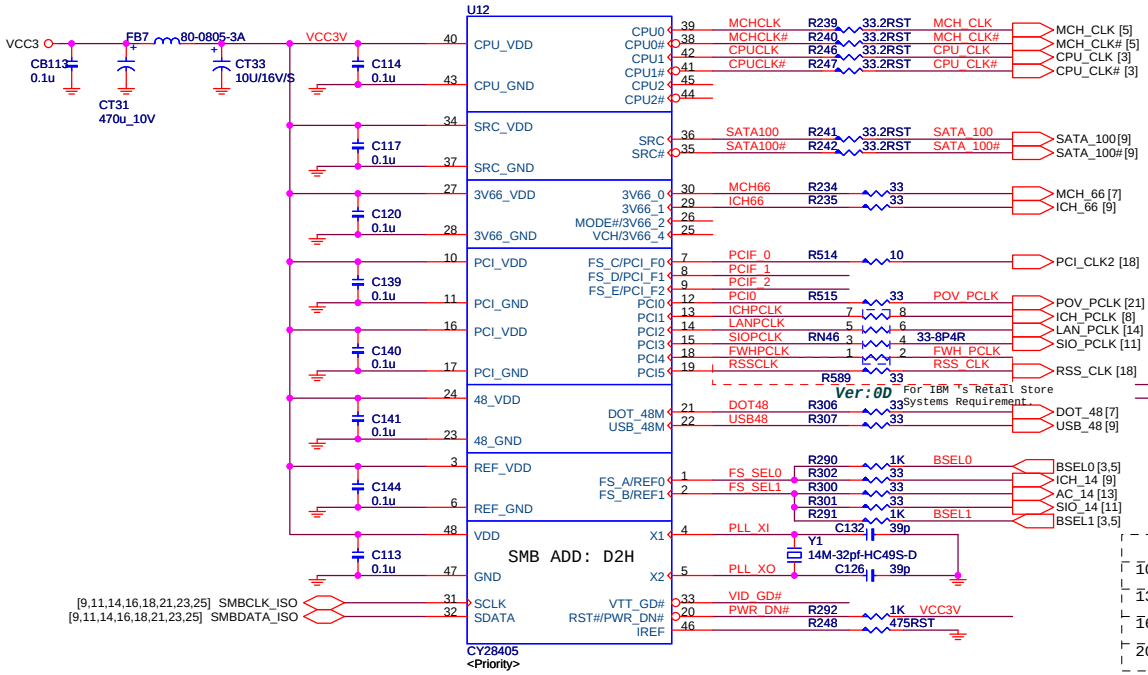
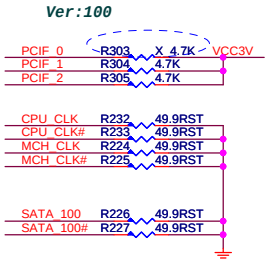
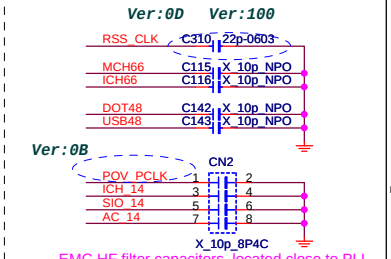
CLOCK GENERATOR



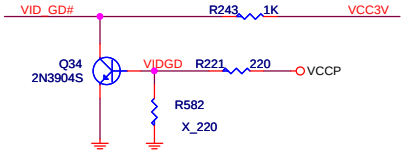
	BSEL1	BSEL0
100MHz	0	0
133MHz	0	1
166MHz	1	1
200MHz	1	0



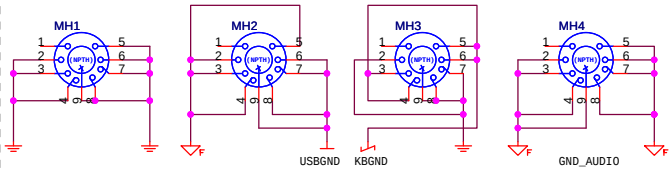


EMC HF filter capacitors, located close to PLL

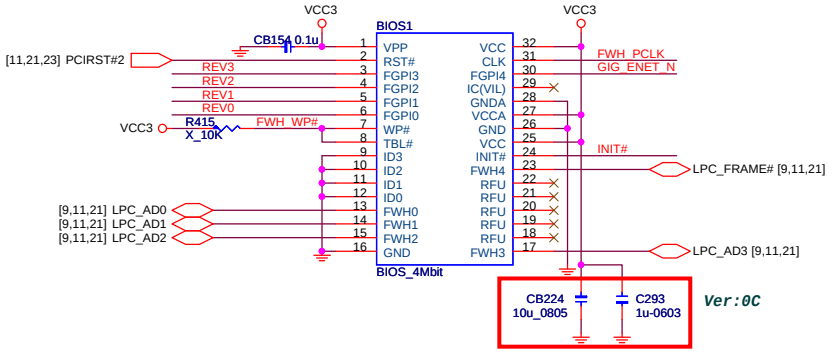
CLOCK GENERATOR VTT POWER DOWN BLOCK



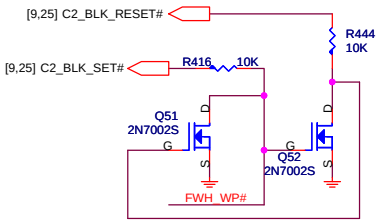
Mounting Holes



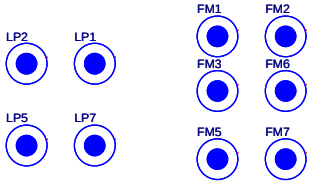
FIRMWARE HUB (FWH)



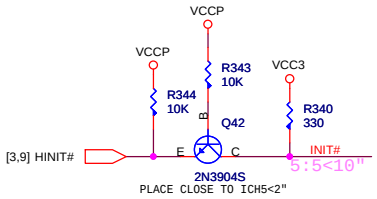
FWH WRITE PROTECT CIRCUIT



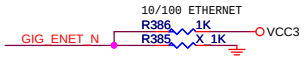
Optics Orientation Holes



FWH INIT Signal Voltage Translation

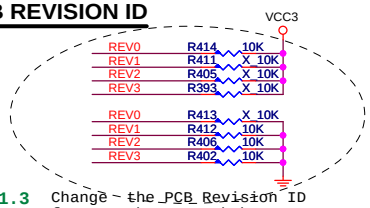


ETHERNET STRAPPING RESISTORS



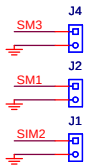
10/100 ETHERNET:H
GIGABIT ETHERNET: L

PCB REVISION ID



Ver:1.3 Change the PCB Revision ID from 0000b to 0001b by pulling REV0 up (R414) instead of down (R413).

Simulation



MICRO-STAR INt'L CO., LTD.

Title: CY28405 & FWH

Size | Document Number: (MS-7024) | Rev: 130

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LPC SUPER I/O LPC47M233

U19

[10,21,23] PCIRST#2 — PCI_RESET#
[10] SIO_PCLK — PCI_CLK
[9,18,21,25] SERIRQ — SER_IRQ
[9,21] LPC_DRQ#0 — LDRQ#
[9,10,21] LPC_FRAME# — LFRAME#
VCC3 — R418 4.7K — R419 X_0 — LPC_PD#
[9,21,25] SUS_STAT#
[9,10,21] LPC_AD[0..3] — LPC_AD0 LPC_AD1 LPC_AD2 LPC_AD3 — LAD0 LAD1 LAD2 LAD3

[20] BAY_ATTACH#
[20] BAY_IS_HDD

Ver:0B For Ultrabay Slim and Ultrabay Enhanced IDE

[3,9] SMI# — R450 X_0 — IO_SMI#
[9,25] SIO_SMI# — R454 X_0

GP10 GP11 GP12 GP13 GP14 GP15 GP16 GP17 GP20/P17 GP25 GP26

[20] PWM_REAR — FAN_CTL1/GP33
[20] PWM_CPU — FAN_CTL2/GP32
[20] REAR_FAN — FAN_SEN1/GP31
[20] CPU_FAN — FAN_SEN2/GP30

[15] GIGA_DIS — GIGA_DIS — LED1/GP60
LED2/GP61
SYSOPT/GP24
SIO_ADDR — IO_SMI# — IO_SMI#/GP27
[25] IO_SMI# — IO_PME#/GP42
[9,25] SIO_PME# — DDRC/GP43

[9] SUSCLK — SUSCLK
[10] SIO_14 — CLK_14M

VCC5 — R435 X_0 — NC
VCC3 — VCC
VCC
VCC
CB193 0.1u CB183 0.1u CB194 0.1u
GND GND GND GND NC
R432 X_0
VCC3_SB — CB165 0.1u — VTR
MSCLK# — MSCLK
MSDAT# — MSDATA
KBCLK# — KBCLK
KBDAT# — KBDATA
[9,25] KBRST# — KBRST#/GP36
[9,25] A20GATE — GA20/GP37

[20] SYS_FAN — FAN_SEN3
[20] PWM_SYS — FAN_CTL3

Ver:1.3

SIO_THERMDP# — D0+
SIO_THERMDN# — D0-
New function for LM47233
SIO_THERMDP# — D1+
D1-
SIO_THERMDN# — C188 2200P
D2+
D2-
P103 — THERM#/XNOR_OUT
Ver:0D

PCRIST_OUT1#
PCRIST_OUT2#
PCRIST_OUT3#
PCRIST_OUT4#

DRVDEN0/GP40
DRVDEN1/GP41
INDEX#
MTR#0
DS#1/GP21/P16
DS#0
MTR#1/GP22/P12
DIR#
STEP#
WDATA#
WGATE#
TRACK0#
WP#
RDATA#
HEAD#
DSKCHG#

PD0/INDEX# — PRD0
PD1/TRK0# — PRD1
PD2/WRTPRT# — PRD2
PD3/RDATA# — PRD3
PD4/SDKCHG# — PRD4
PD5 — PRD5
PD6/MTR0# — PRD6
PD7 — PRD7
SLCT/WGATE# — RSLCT
PE/WDATA# — RPE
BUSY/MTR1# — RBUSY
ACK#/DS1# — RACK#
SLCTIN#/STEP# — RSLIN#
INIT#/DIR# — RINIT#
ERR#/HDSEL# — RERR#
ALF#/DRVDEN0# — RAFD#
STB#/DS0# — RSTB#

IRRX2/GP34
IRTX2/GP35

RI#1 — RIA# — RIA# [12]
RXD1 — SINA — SINA [12]
CTS#1 — CTSA# — CTSA# [12]
DCD#1 — DCDA# — DCDA# [12]
DSR#1 — DSRA# — DSRA# [12]
TXD1 — SOUTA — SOUTA [12]
RTS#1 — RTSA# — RTSA# [12]
DTR#1 — DTRA# — DTRA# [12]

RI2#/GP50
RXD2/GP52/IRRX
CTS#2/GP56
DCD#2/GP51
DSR#2/GP54
TXD2/GP53/IRTX
RTS#2/GP55
DTR2#/GP57

HW_VCC — CB188 0.1u — VCC3
HW_GND
HW_GND
VTR — VCC3_SB
GND — C185 0.1u
VID0
VID1
VID2
VID3
VID4
VID5
+1.5V_IN — VCC_AGP
C300 0.1u
Ver:0D

SMSC LPC47M233

Eliminate excessive voltage drop caused by devices that draw excessive amounts of current from the control lines.

PARALLAL PORT

PRD3 PRD4 PRD5 PRD6 — RN66 33-8P4R — PRND3 PRND4 PRND5 PRND6
PRD1 PRD7 PRD2 PRD0 — RN65 33-8P4R — PRND1 PRND7 PRND2 PRND0

Ver:0D

RN64 0-8P4R
RINIT# RSLCT RBUSY RPE — PINIT# SLCT BUSY PE
RERR# RAFD# RSLIN# RSTB# — ERR# AFD# SLIN# STB#
RN67 0-8P4R
RACK# — R496 0 — ACK#

VCC5 — D15 1N4148S — C203 0.1u
PRND6 PRND5 PRND4 PRND3 PE BUSY ACK# PRND7 — RN68 2.7K-10P8R — D4
SLIN# PRND2 PINIT# PRND1 STB# PRND0 AFD# ERR# — RN69 2.7K-10P8R
SLCT — R497 2.7K

PRND7 ACK# BUSY PE — CN6 180p_8P4C
PRND3 PRND4 PRND5 PRND6 — CN8 180p_8P4C
PRND1 PINIT# PRND2 SLIN# — CN7 180p_8P4C
STB# PRND0 AFD# ERR# — CN9 180p_8P4C
SLCT — C214 220p

STB# PRND0 PRND1 PRND2 PRND3 PRND4 PRND5 PRND6 PRND7 ACK# BUSY PE SLCT — AFD# ERR# PINIT# SLIN#
51 52 KBGND1
LPT1A
LPT-D25-BK-BI

CP4 X_COPPER
FB18 X_120-600mA
KBGND1

PS2 KEYBOARD & MOUSE CONNECTOR

L1
RN62 4.7K-8P4R
C223 0.1u — R500 1K
JKBMS1
MSDAT# — FB11 120-600mA — MS_DT
MSCLK# — FB12 120-600mA — MS_CK
KBDAT# — FB14 120-600mA — KB_DT
KBCLK# — FB13 120-600mA — KB_CK
CN10 180p_8P4C
MS
KB
YMD12P-1
KBGND

C209 0.1u
FS4 1.1A-microSMD110 POLY SWITCH
USB_STR

CP5 X_COPPER
FB19 X_120-600mA
KBGND

ADI 1032 TEMPERATURE SENSOR

Ver:0D

SIO_THERMDP# — R593 0
SIO_THERMDN# — R594 0

NEW PART NUMBER

VCC3_SB
[3] THERMDP# — THERMDP# — R595 X_0
[3] THERMDN# — THERMDN# — R596 X_0
[9,25] TEMP_THERM# — R67 0 — P103
[3,9,25] TRMTRIP# — R66 X_0

U4
VDD D+ D- T_CRIT_A# — GND ALERT# SMD SMC — X_LM86_MSOP8
R575 X_0 TEMP_THERM#
SMBDATA — SMBDATA [9,10,14,16,18,21,23,25]
SMBCLK — SMBCLK [9,10,14,16,18,21,23,25]

Ver:0D

CPU's thermal diode signals "THERMDP" & "THERMDM" can only connect either to LPC47M233 or LM86.

THERMDP#
THERMDN# — C18 2200P Close to AD1032

REMOTE TEMPERATURE SENSOR

D1+ — CB166 2200p — Q5 2N3904S — D1-
LOCATED NEAR THE FRONT OF THE BOARD BETWEEN THE EDGE OF THE BOARD AND THE CPU.

D2+ — CB171 2200p — Q26 2N3904S — D2-
LOCATED NEAR VRM MOSFET

STRAPPING RESISTOR

SIO_ADDR — R447 X_4.7K — R443 4.7K — VCC3

SIO_ADDR
H: 0x04E
L: 0x02E (DEFAULT)

MSI MICRO-STAR INt'L CO., LTD.

Title: LPC SUPER I/O & CONNECTORS

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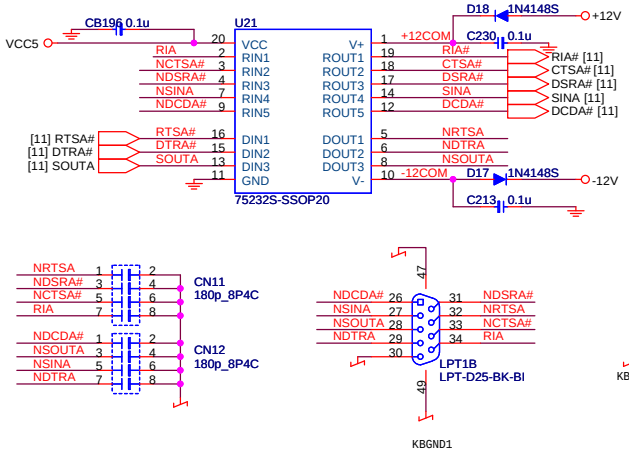
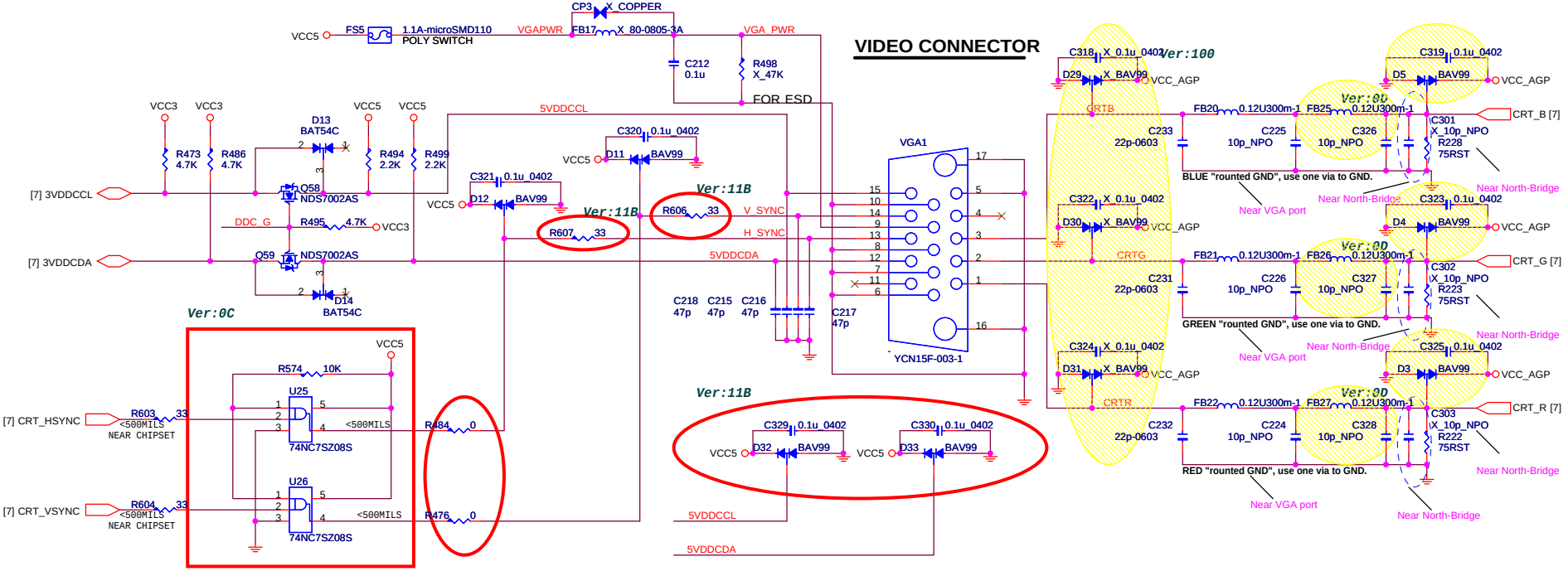
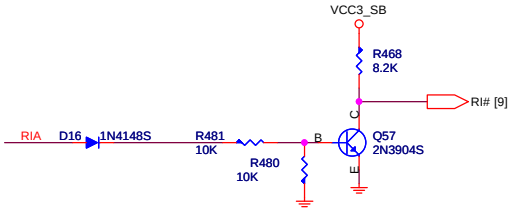
SERIAL PORT 1



VIDEO CONNECTOR



Wake On Ring



MSI	MICRO-STAR INt'L CO., LTD.	
Title	COM PORT & VGA CONNECTORS	
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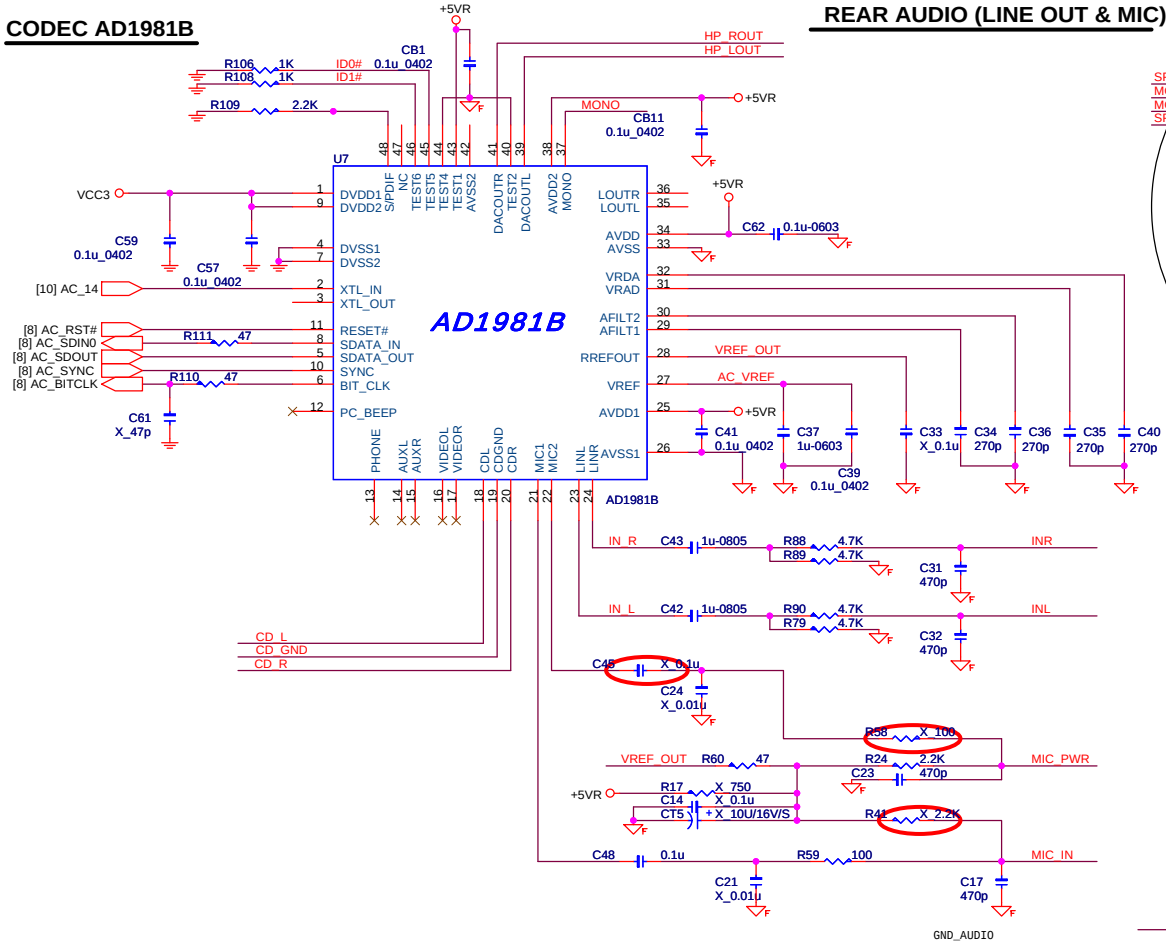
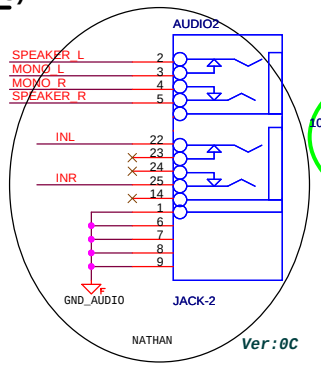
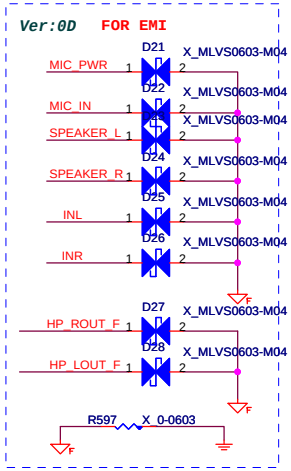
Date: Wednesday, December 08, 2004	Sheet 12 of 29	

CODEC AD1981B

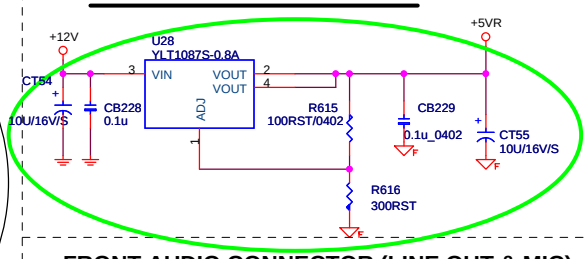


REAR AUDIO (LINE OUT & MIC)

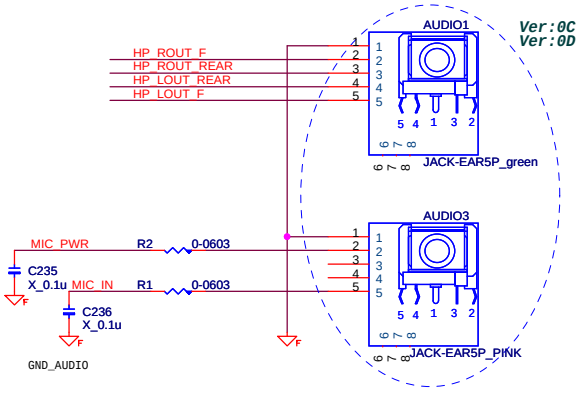


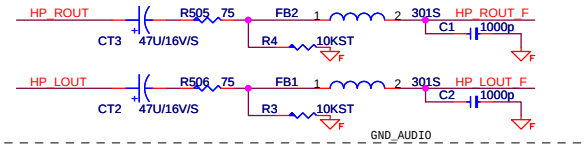


AUDIO CODE REGULATORS

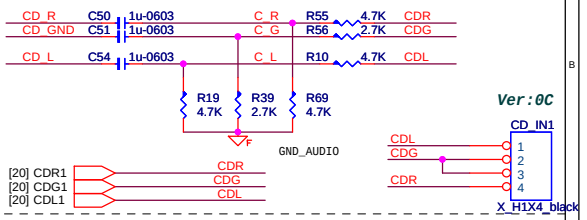


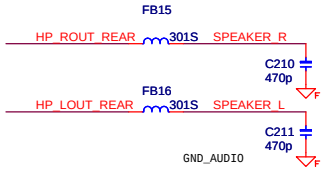
FRONT AUDIO CONNECTOR (LINE OUT & MIC)



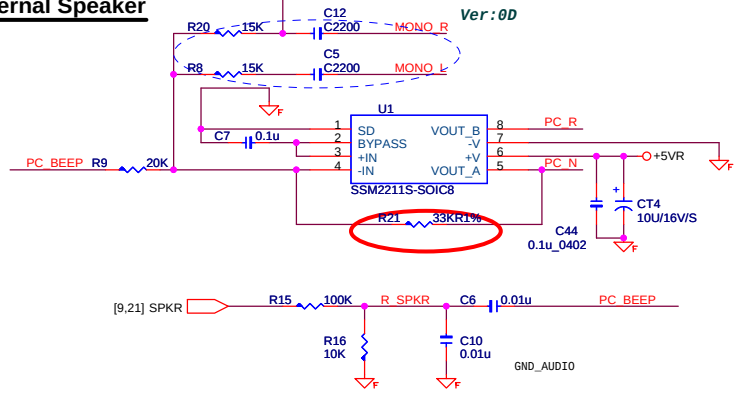


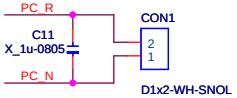
CD IN



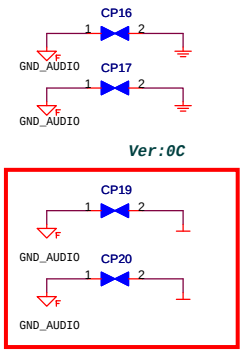


Internal Speaker

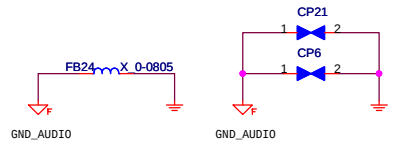




EMI COPPER



COPPER



MSI **MICRO-STAR INt'L CO., LTD.**

Title	AC97 AUDIO - AD1981A/B	
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B06-562EZ05-I06
Controller,LAN,INTEL/Kinnereth-R,BGA-196pin, 10/100 MBPS Ethernet Controller
B06-8254115-I06
CHIP,LAN,INTEL/82541EI,BGA-196,1.2V/1.8V/3.3V, 10/100/1000 MBPS Gigabit Ethernet Controller

Reference Document:

1. 82540EP/82541GI(EI) & 82562EZ(EX) Dual Footprint Design Guide. (AP-444)
2. 82541PI/EI/GI - 82551ER - 82562EZ Reference Design Rev2.1 (1/2
3. 82547EI -82562EX Reference Design Rev2.1. (10/16/03)
4. ICHx Integrated LAN Controller Function Disable and Power Control for Fast Ethernet. (AP-417)

82541EI/82562EZ VCC3.3V Decoupling CAPS

FOR 82562EZ

FOR 82541EI

1.8V RAIL ONLY REQUIRED WITH 82541EI CONTROLLER. NOT CONNECTED WITH 82562EZ

1.2V RAIL ONLY REQUIRED WITH 82541EI CONTROLLER

U17

R452=549 ohm for 82562EZ, 2.49K ohm for 82540EM, No stuff for 82541EI.

R448= 619 ohm 1% for 82562EZ , No stuff for 82541EI

TCK= "1" to Disable 82562EZ LAN

If the PCI bus segment is not capable of >33Mhz operation the M66EN signal should be pulled to a logic low by the NIC or planar.

Install if using Microwire protocol EEPROM devices. Do not Install if using SPI EEPROM devices.

Install pull-down resistor if CLKRUN# is not used.

<OrgAddr> MICRO-STAR INT'L CO., LTD.

Title: LAN Intel 82562EZ(10/100) / 82541EI(Giga)

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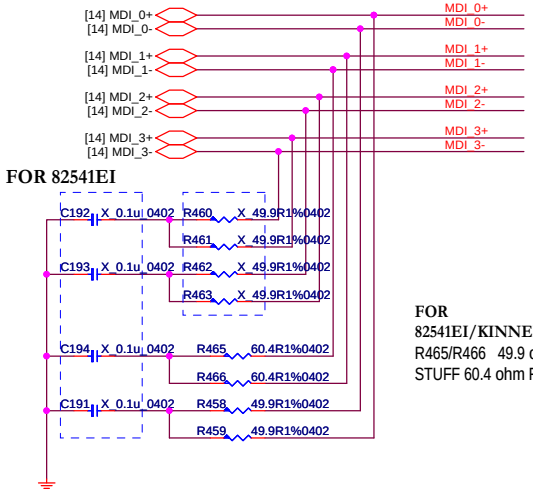
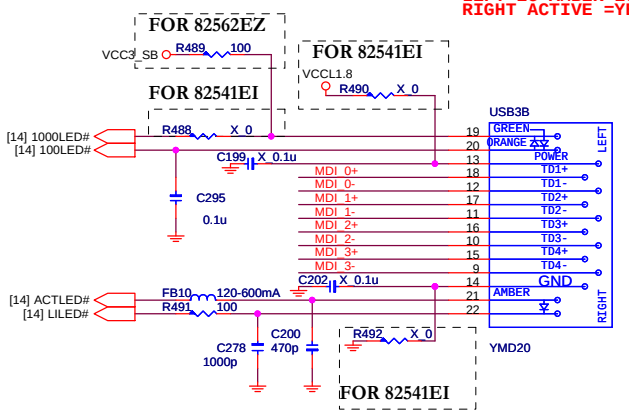


FOR
82541EI/KINNERETH-R
R465/R466 49.9 ohm FOR 82541EI.
STUFF 60.4 ohm FOR 82562EZ

LEFT 1G=AMBER 100=GREEN
RIGHT ACTIVE =YELLOW



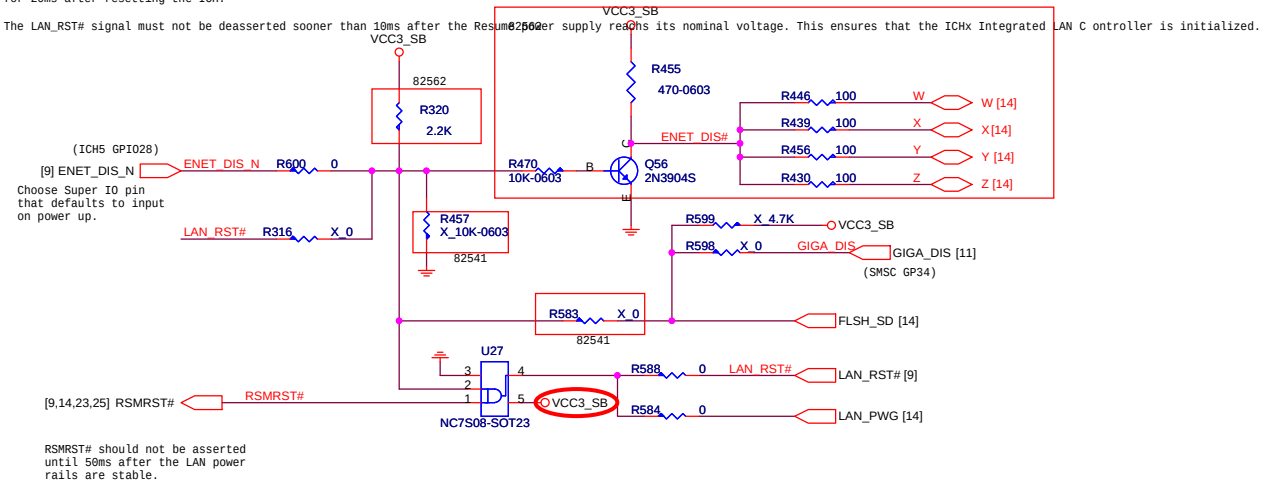
Ver:0D Ver:0E

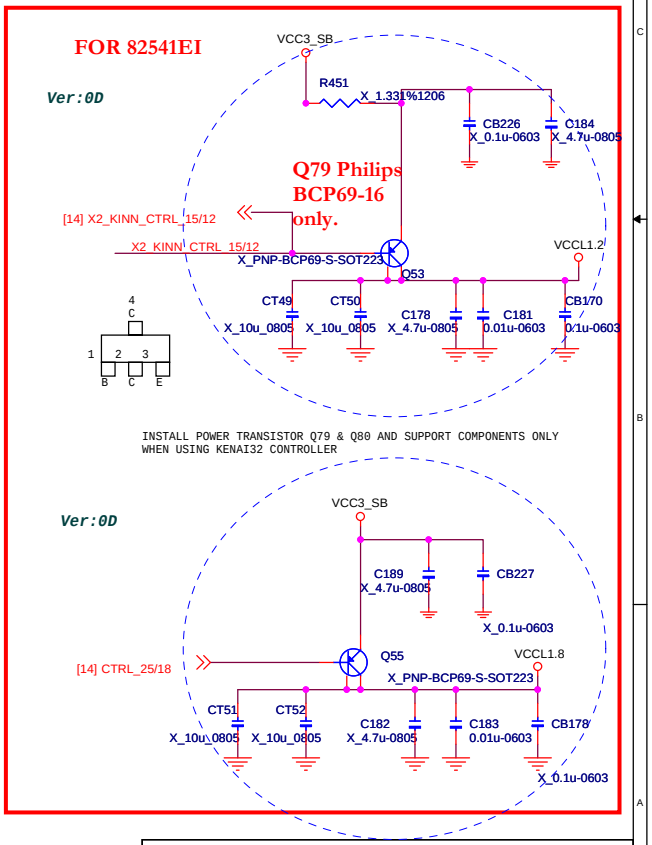
ICHx Integrated LAN Controller Function Disable and Power Control

(Intel AP-417)
(Intel AP-434)
(Intel AP-444)

For the 82562EZ the BIOS must delay driving LAN_RST# for 20ms after resetting the ICH.

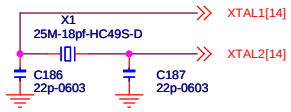
The LAN_RST# signal must not be deasserted sooner than 10ms after the Resume 82562 power supply reaches its nominal voltage. This ensures that the ICHx Integrated LAN C ontroller is initialized.





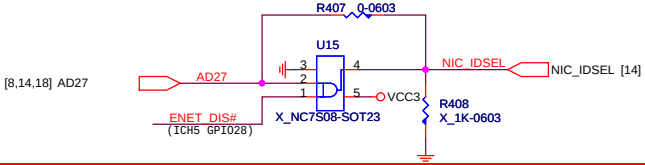
LAN Crystal

THIS DEVICE SHOULD BE PLACED AS CLOSE AS POSSIBLE TO THE CRYSTAL INPUT PINS OF THE ETHERNET CONTROLLER USED. KEEP TRACES SHORT AS POSSIBLE.



Ver:0D

Giga LAN Disable Circuit



<OrgAddr1> MICRO-STAR INT'L CO., LTD.		
Title: LAN CONTROLLER		
Size	Document Number (MS-7024)	Rev 130
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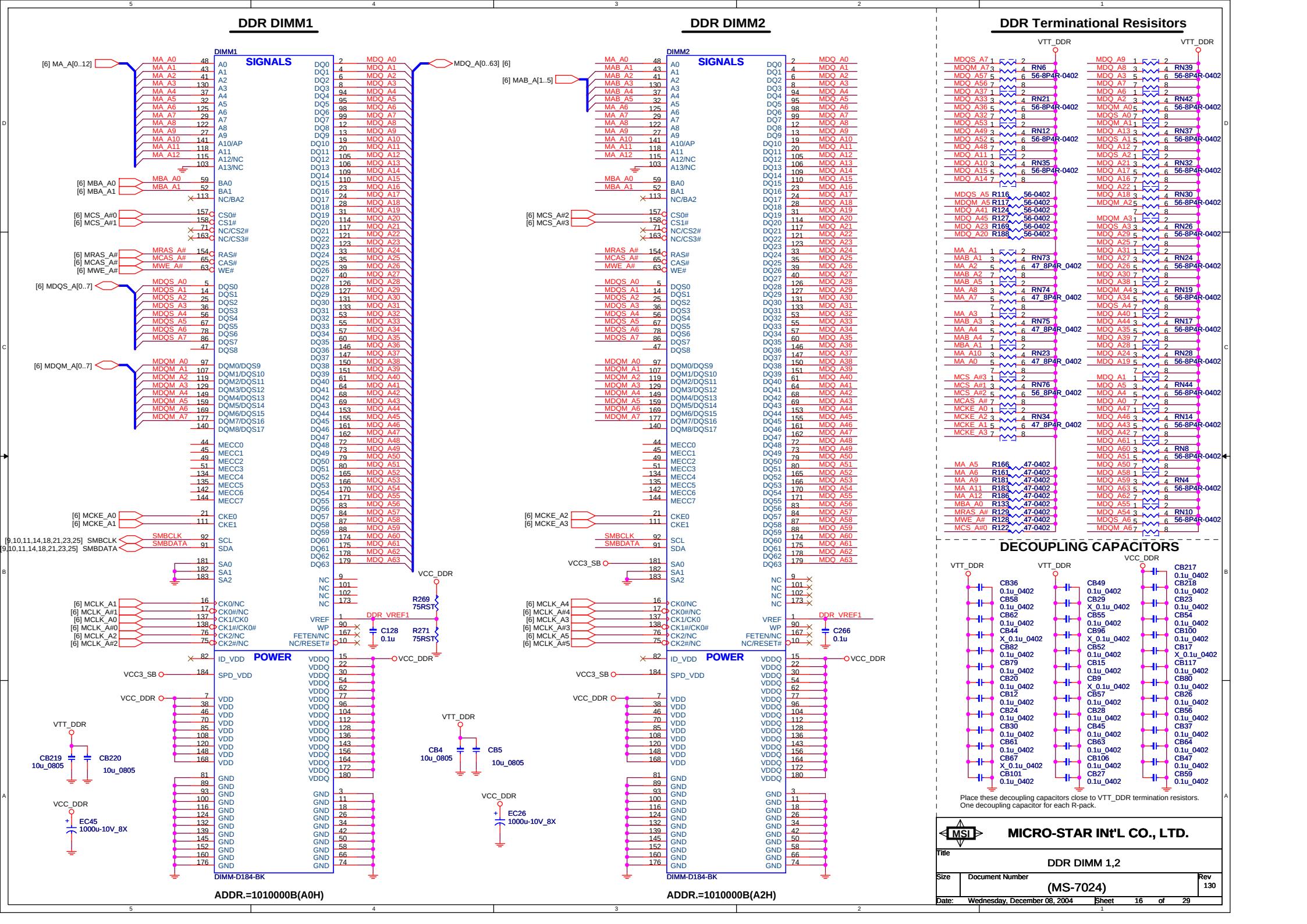
DDR DIMM1
DDR DIMM2
DDR Terminational Resisitors
DECOUPLING CAPACITORS
SIGNALS
POWER
DIMM1
DIMM2
DIMM-D184-BK
ADDR.=1010000B(A0H)
ADDR.=1010000B(A2H)
VTT_DDR
VCC_DDR
VCC3_SB
DDR_VREF1
R269 75RST
R271 75RST
C128 0.1u
C266 0.1u
CB219 10u_0805
CB220 10u_0805
CB4 10u_0805
CB5 10u_0805
EC45 1000u-10V_8X
EC26 1000u-10V_8X
Place these decoupling capacitors close to VTT_DDR termination resistors.
One decoupling capacitor for each R-pack.
MICRO-STAR INt'L CO., LTD.
Title
DDR DIMM 1,2
Size
Document Number
(MS-7024)
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130
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MICRO-STAR INt'L CO., LTD.

Title: BLANK

Size | Document Number: (MS-7024) | Rev: 130

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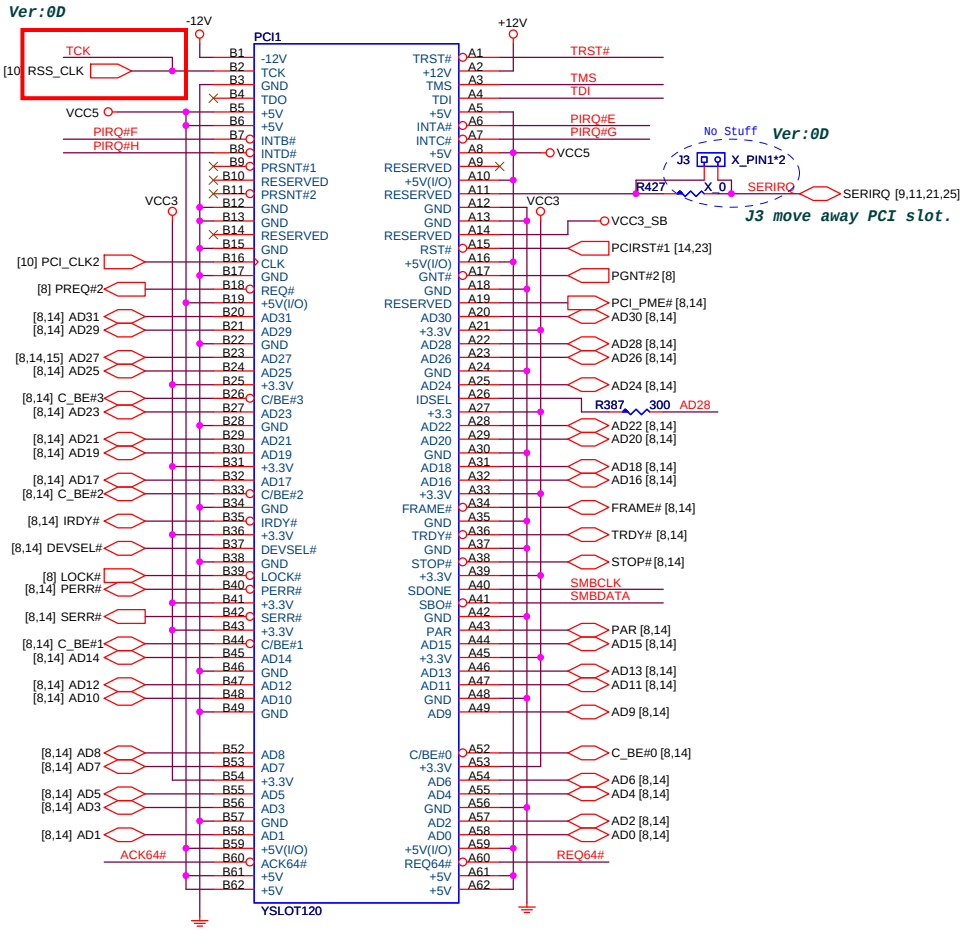
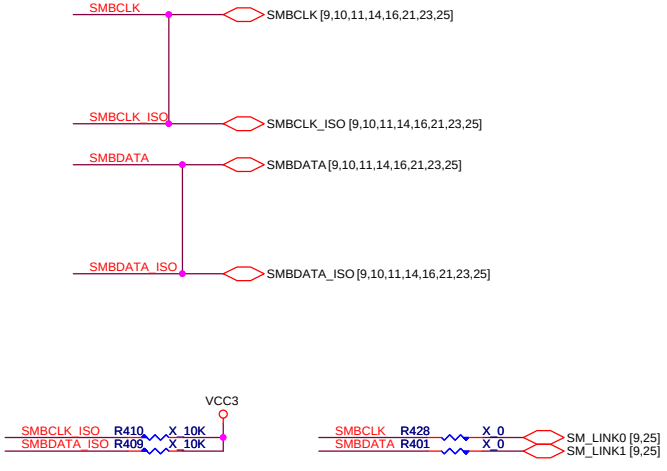
PCI RISER SLOT (PCI VER: 2.2 COMPLY)

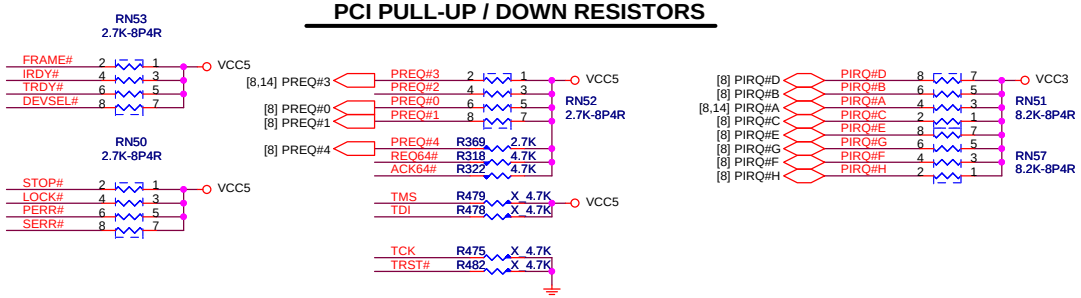


IDSEL = AD28
MASTER = PREQ#2
PIRQ#E

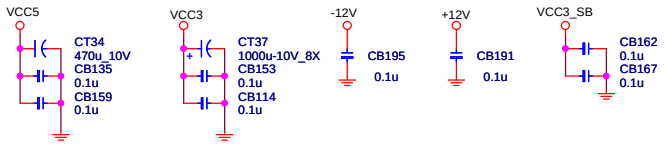
SMBus Isolation



PCI PULL-UP / DOWN RESISTORS



PCI SLOT DECOUPLING CAPACITORS



MICRO-STAR INt'L CO., LTD.

Title	PCI Slot	
Size	Document Number (MS-7024)	Rev 130
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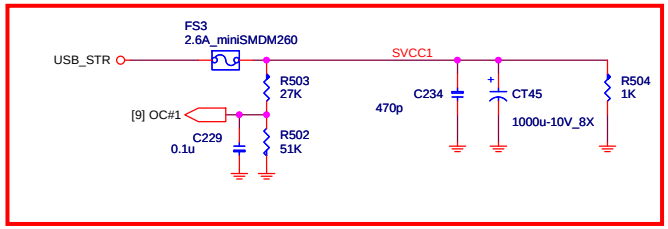
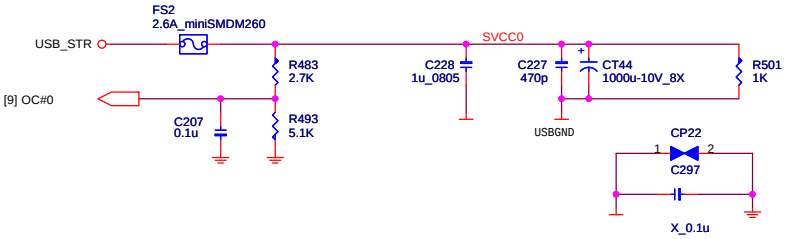
POWER CIRCUIT FOR USB PORT 4,5,6,7

Ver:0B

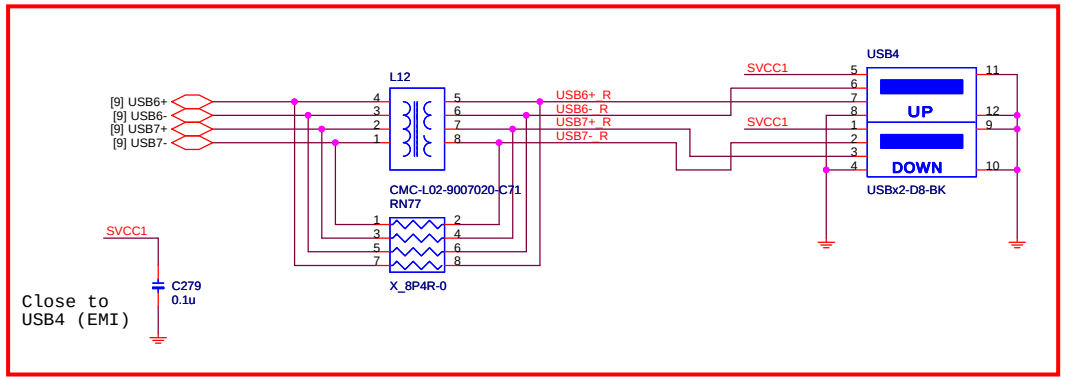


POWER CIRCUIT FOR USB PORT 0,1,2,3

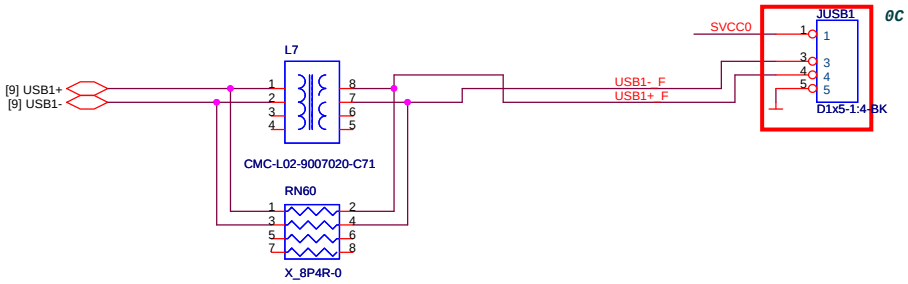


REAR PANEL USB CONNECTOR FOR USB PORT 6,7

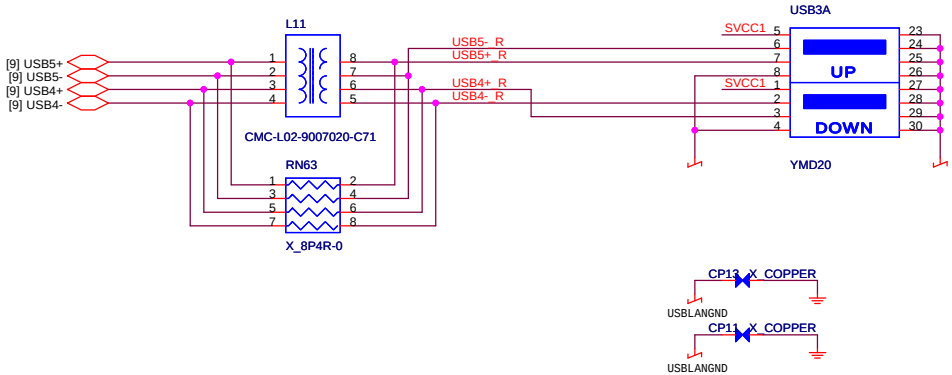
0B



FRONT PANEL USB CONNECTOR FOR USB PORT 0,1

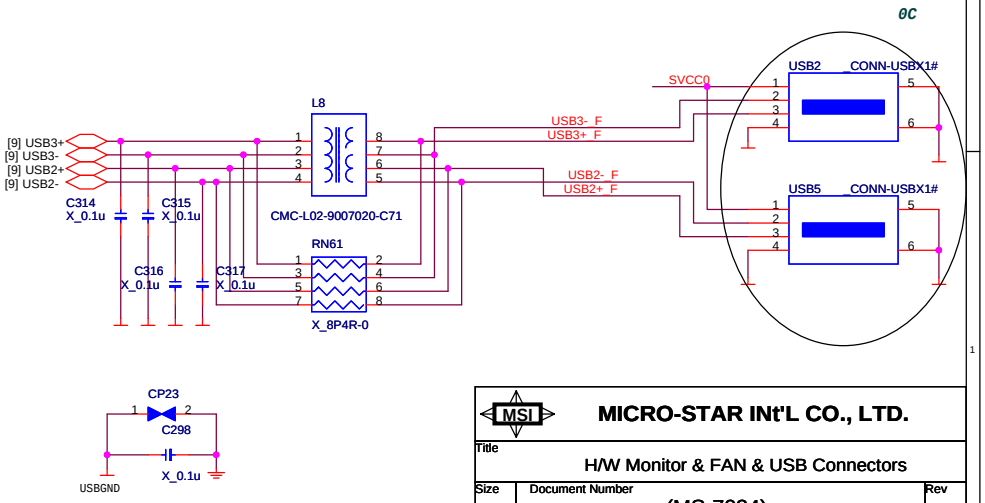


REAR PANEL USB CONNECTOR FOR USB PORT 4,5



FRONT PANEL USB CONNECTOR FOR USB PORT 2,3

0C



MSI	MICRO-STAR INt'L CO., LTD.	
Title	H/W Monitor & FAN & USB Connectors	
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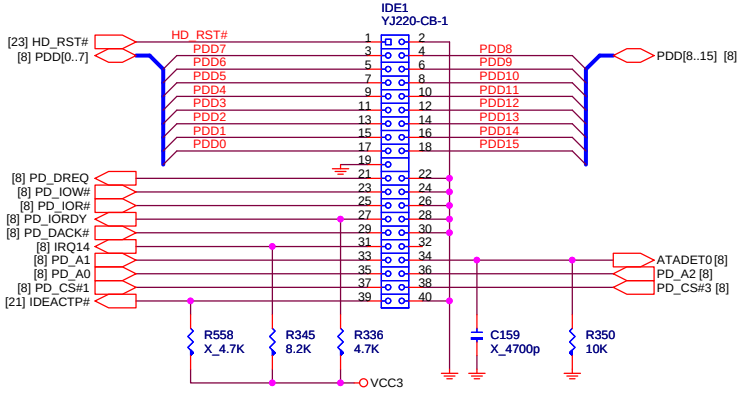
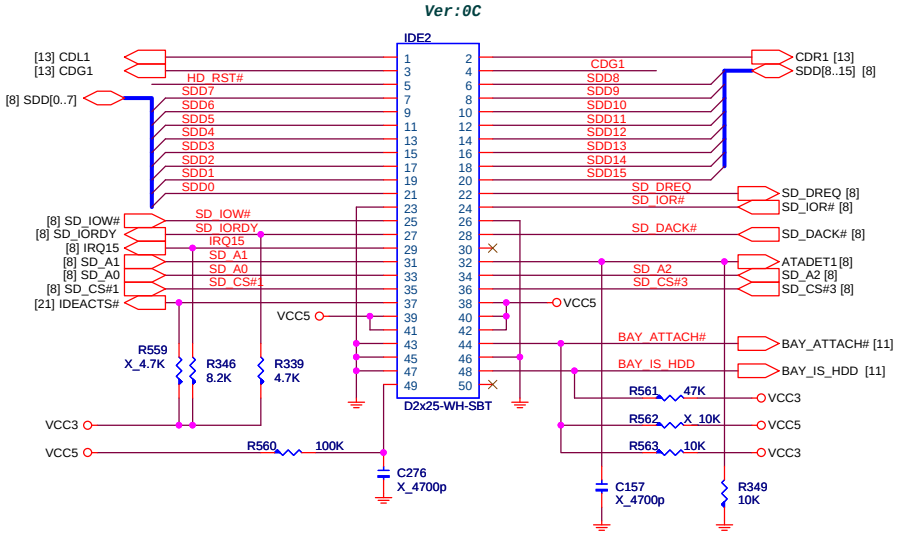
PRIMARY IDE BLOCK

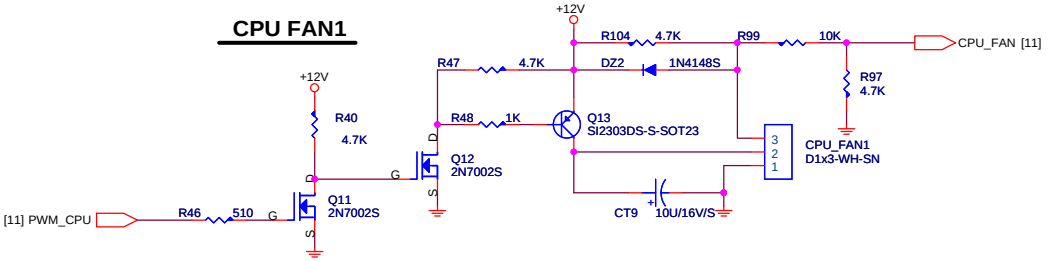


SECONDARY SLIME IDE

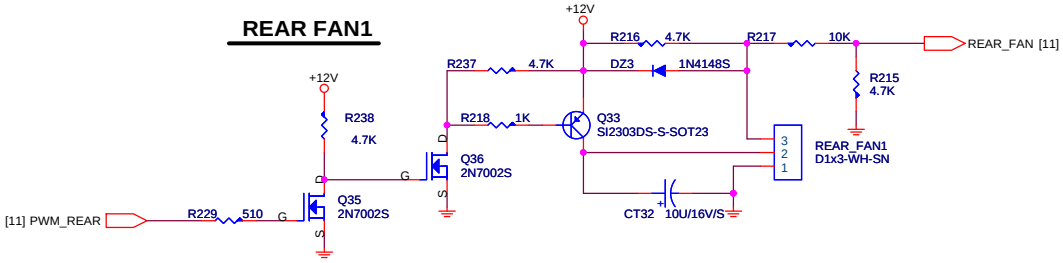
IBM Ultrabay Slim and Ultrabay Enhanced



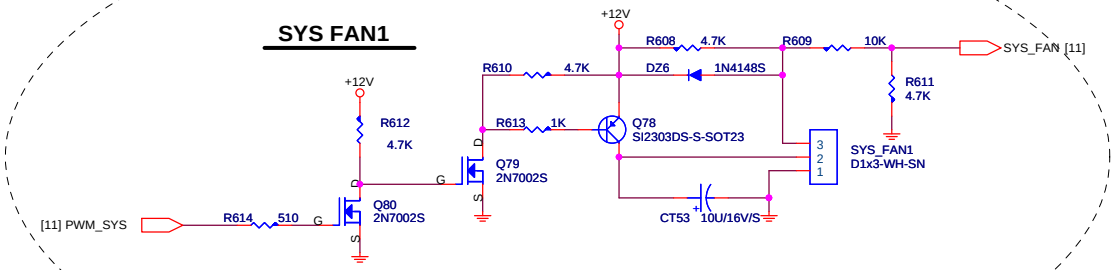
CPU FAN1



REAR FAN1



SYS FAN1



Ver:1.3

MSI	MICRO-STAR INt'L CO., LTD.	
Title	ATA IDE & FAN CONNECTORS	
Size	Document Number (MS-7024)	Rev 130
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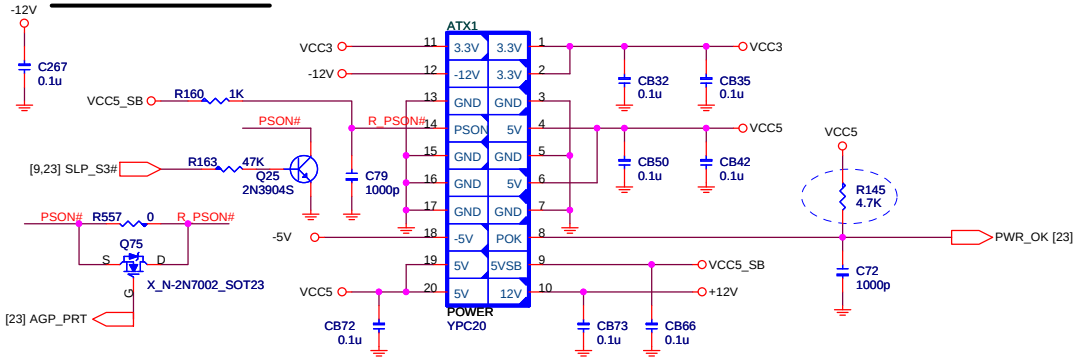
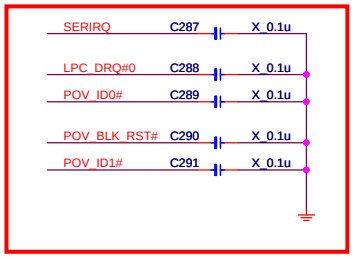
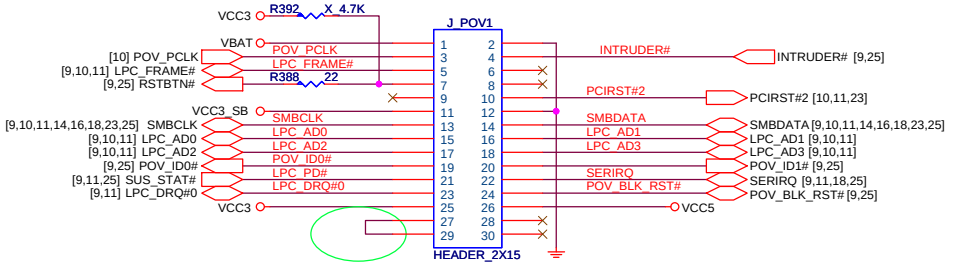
ATX CONNECTOR



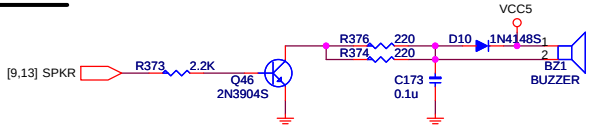
EMI Reserve



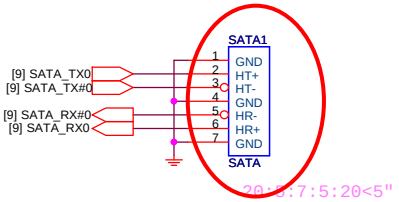
POV3 CONNECTOR



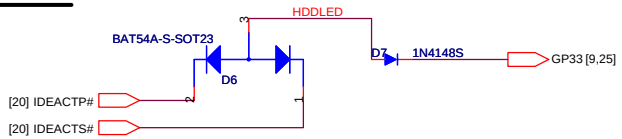
BUZZER



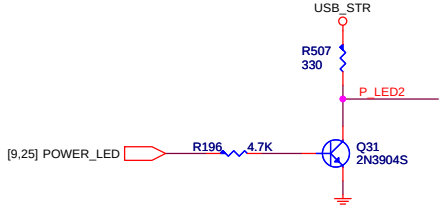
SERIAL ATA CONNECTOR BLOCK



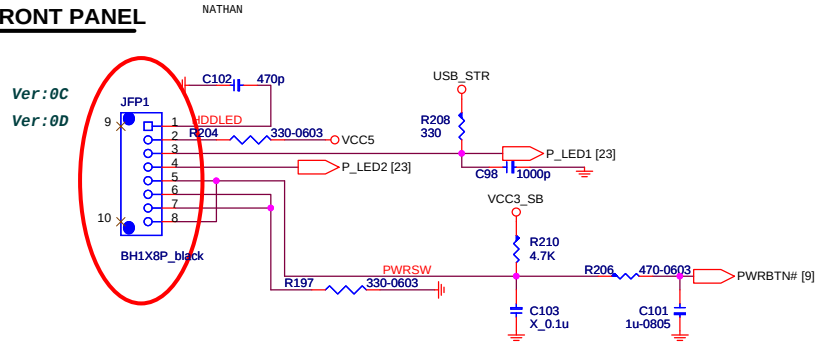
IDE LED



POWER LED



FRONT PANEL



MSI	MICRO-STAR INt'L CO., LTD.	
Title	ATX & FRONT PANEL & POV3	
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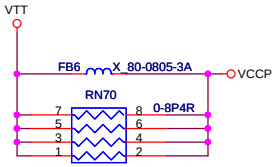
Date: Wednesday, December 08, 2004	Sheet 21 of 29	

GMCH_VTT ON/OFF CIRCUIT

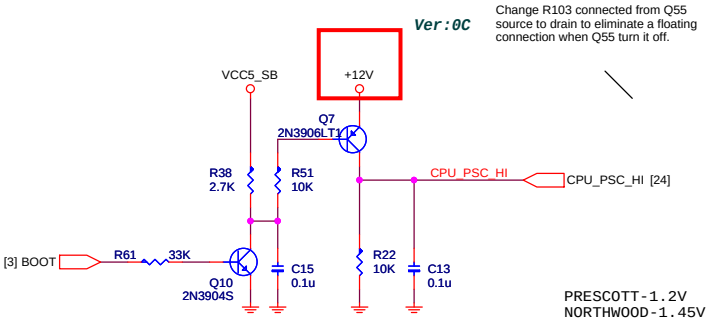
GMCH VCC_DAC Voltage Supplier

Intel reference GMCH VTT power cirucit

GMCH VTT Generator

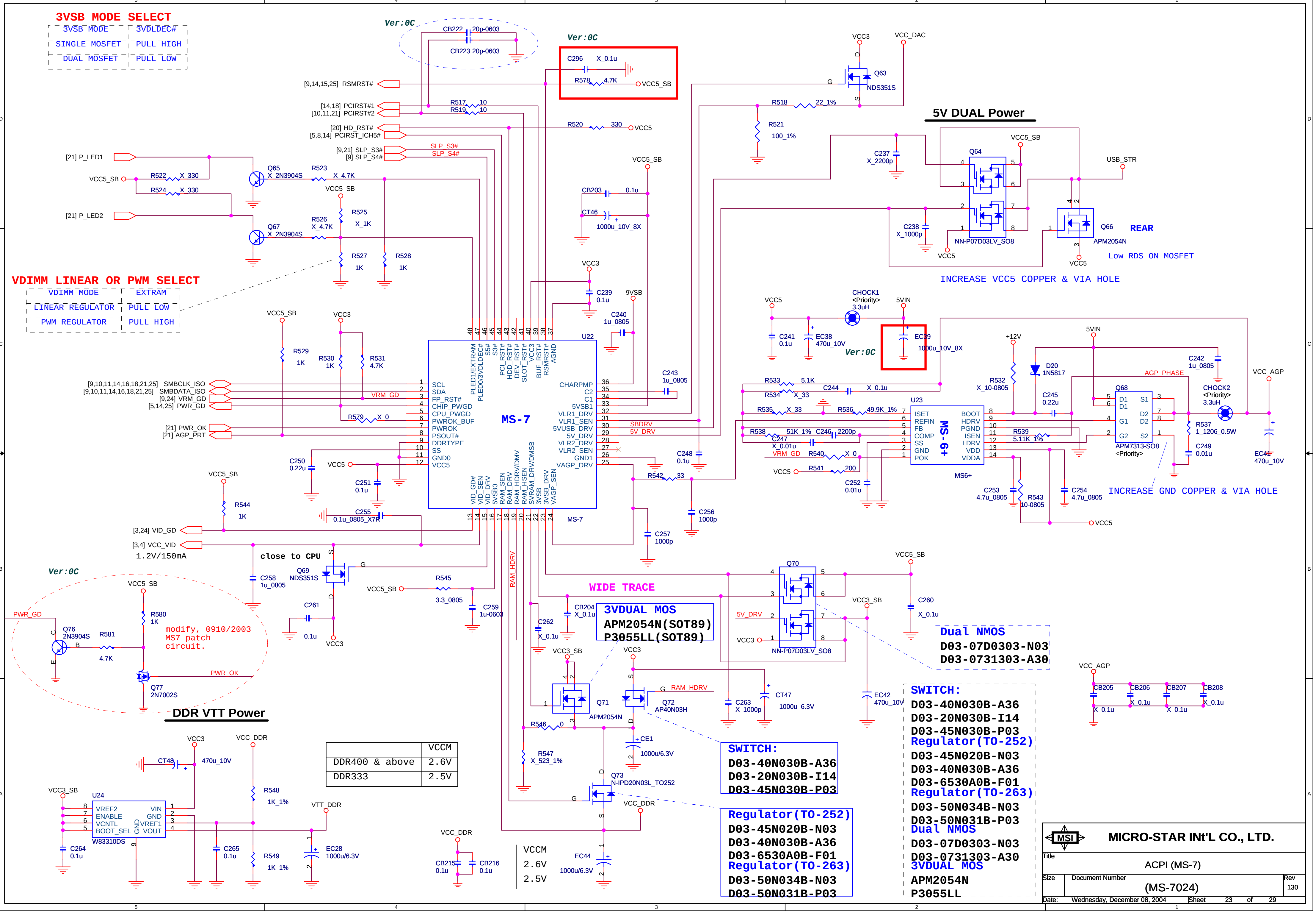


NW/ PSC Load Line Selection



MSI **MICRO-STAR INt'L CO., LTD.**

Title	VTT & load line selection	
Size	Document Number (MS-7024)	Rev 130
Date: Wednesday, December 08, 2004	Sheet 22 of 29	



3VSB MODE SELECT

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

VDIMM LINEAR OR PWM SELECT

VDIMM MODE	EXTRAM
LINEAR REGULATOR	PULL LOW
PWM REGULATOR	PULL HIGH

	VCCM
DDR400 & above	2.6V
DDR333	2.5V

MICRO-STAR INt'L CO., LTD.

Title: ACPI (MS-7)

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Date: Wednesday, December 08, 2004 | Sheet 23 of 29

VID Pull-Up Resistor

RN3 1K_8P4R

[3] VID1 VID1 1 2
[3] VID2 VID2 3 4
[3] VID3 VID3 5 6
[3] VID4 VID4 7 8
[3] VID0 VID0 R94 1K
[3] VID5 VID5 R86 1K

VCC3
C46 0.1u

NORTHWOOD/PRESCOTT LOAD LINE SELECTOR

FB
R57 15K
[22] CPU_PSC_HI
Q8 2N7002S
PRESCOTT: H
VDIFF

Ver:0D R57, Q8:Can be NC, if customer don't care northwood loadline. (Currently, Intel only measure PSC loadline.)

U6 Intersil 6556B

[3] VID[0..5]
VID0 7
VID1 6
VID2 5
VID3 4
VID4 3
VID5 8
VID12.5
[9,23] VRM_GD
VCC3 R105 X_1K
PGOOD 2
C49 0.1u
VCC5 R80 976KR1%
R82 X_174K
DIS 27
EN
OFS 9
Ver:0B
R103 154K_1%
FS 28
OVP 1
C26 0.01u
REF 11
R74 2K_1%
DAC 10
R68 30K_1%
COP
C19 5600p
COMP 13
C22 X_15P_0603
FB 12
Ver:0C R64 3.4KR1%
R73 X_1K
VDIFF 14
R53 X_2K_1%
VCCP
CHECK THIS! CONNECT TO BULK CAPACITOR

VCC 26
GND 17
PWM1 22
ISEN1 23
PWM2 21
ISEN2 20
PWM3 18
ISEN3 19
PWM4 25
ISEN4 24
VSEN 15
RGND 16

Ver:0D
VCC5
CB16 4.7u-0805
Ver:0B
R96 2.2K
R95 2.2K
R91 2.2K
VCC5

R84 0
R81 X_0
VCORE_SENSE-
[3] VSS_SENSE
C29 X_0.1u
[3] VCC_SENSE
R70 X_0
VCORE_SENSE+
VCCP
R65 0
CHECK THIS! CONNECT TO BULK CAPACITOR
Die sense: R81,R70--> 0ohm; R84,R65 -->100ohm
Socket sense: R81,R70--> NC ; R84,R65 -->0ohm

+12VP
R11 5.6K
R12 1K
CB221 X_0.1u-0603
Q4 2N3904S
R23 4.7K
VID_GD [3,23]

+12VP
R131 4.7_0805
12VP2
C66 1u_0805
C67 0.1u

+12VP
CB77 0.01u
JPW2000 D2x2
12V GND 3 1
12V GND 4 2

+12VP_FET
CT12 820u_25V
COIL4 1.2uH_18A
+12VP
C60 1u_0805
CB86 X_4.7u_1206

+12VP R92 4.7_0805 12VP1
C38 0.1u
U5A HIP6602B
VCC U_G1 BOOT1 GND PHASE1 PWM1 L_G1
U_G1 R62 10 BOOT1 C30 0.1u PHASE1
R107 2-0805 UG1
Q17 IPD06N03LA-TO252
L_G1
Q16 IPD06N03LA-TO252
Q15 IPD06N03LA-TO252
COIL1 CH-0.9U25A VCCP
R83 1_1206_0.5W
C25 0.01u

+12VP_FET
CT17 820u_25V
C65 1u_0805
12VP1 C20 1u_0805
U5B HIP6602B
PVCC U_G2 BOOT2 PHASE2 PGND PWM2 L_G2
U_G2 R54 10 BOOT2 C16 0.1u PHASE2
R130 2-0805 UG2
Q21 IPD06N03LA-TO252
L_G2
Q19 IPD06N03LA-TO252
Q20 IPD06N03LA-TO252
COIL2 CH-0.9U25A VCCP
R113 1_1206_0.5W
C63 0.01u

+12VP_FET
CT24 820u_25V
C75 1u_0805
BOOT3 R143 10
12VP2
U8 HIP6601B
BOOT PVCC VCC PWM GND UGATE PHASE LGATE
U_G3 BOOT3 C71 0.1u PHASE3
R150 2-0805 UG3
Q24 IPD06N03LA-TO252
L_G3
Q23 IPD06N03LA-TO252
Q22 IPD06N03LA-TO252
COIL3 CH-0.9U25A VCCP
R140 1_1206_0.5W
C68 0.01u

VCCP
Add
CT8 1500u_6.3V
CT18 1500u_6.3V
CT14 1500u_6.3V
CT13 1500u_6.3V
CT6 1500u_6.3V
CT19 1500u_6.3V
CT10 1500u_6.3V
CT15 1500u_6.3V
CT20 1500u_6.3V
Add

HEAT SINK

Q60 MOS-HEATSINK
Q61 MOS-HEATSINK
Q62 MOS-HEATSINK

MSI MICRO-STAR INt'L CO., LTD.

Title	VRM 10 - Intersil 6556B	
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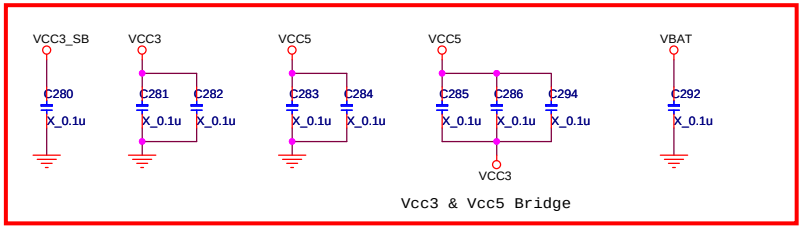
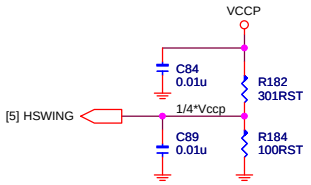
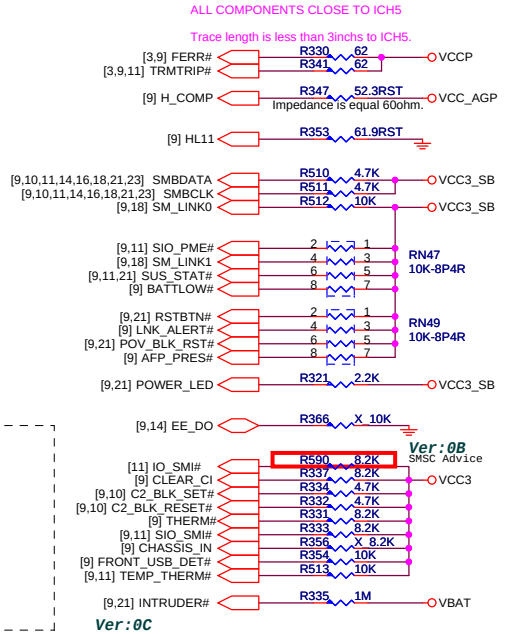
EMI Decoupling CAP

Ver:0B, 0C



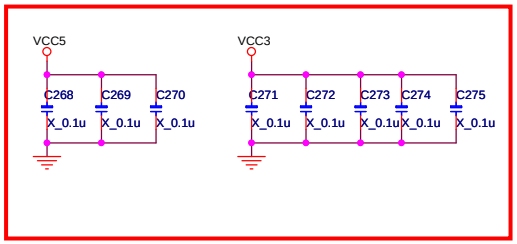


ICH5 STRAPPING RESISTORS

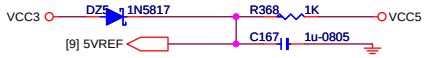


Decoupling CAP

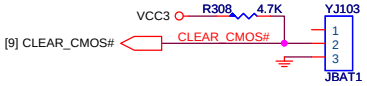
Ver:0B



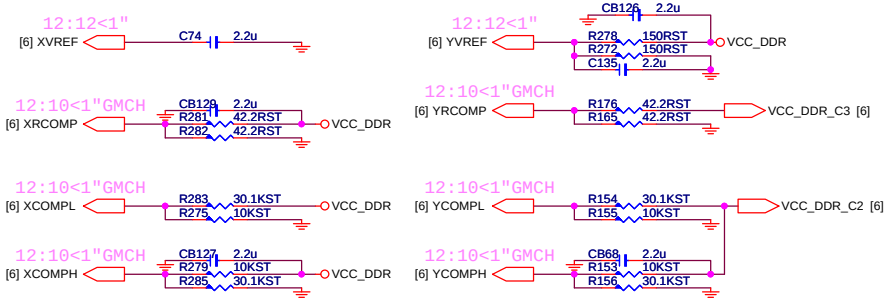
5VREF Sequencing Circuit

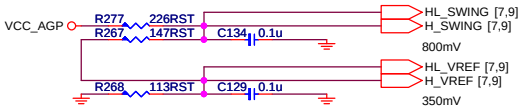


CLEAR CMOS JUMPER

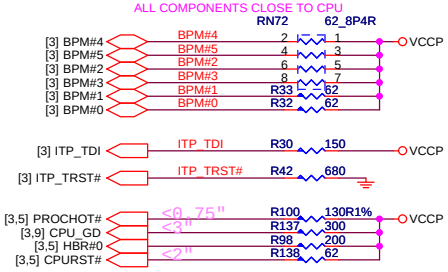


CMOS CLEAR	NORMAL	CLEAR
JBAT1	(1-2)	(2-3)

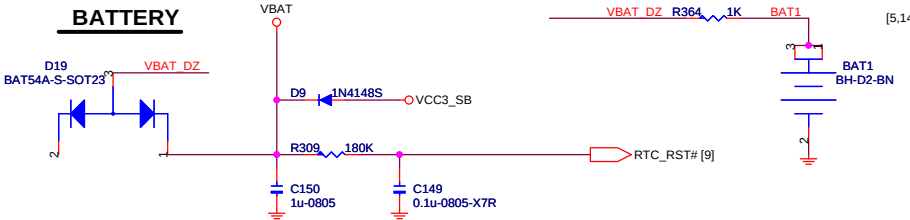




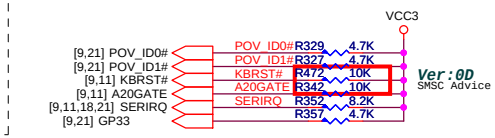
CPU STRAPPING RESISTORS

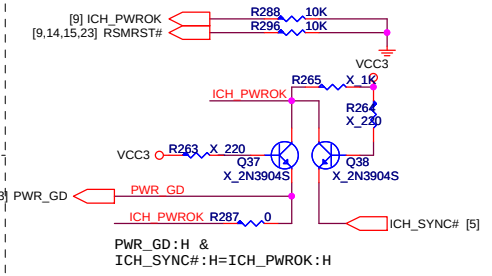


BATTERY



Close PinAD11 of ICH5.





MSI **MICRO-STAR INt'L CO., LTD.**

Title: CPU & GMCH & ICH5 PULL UP / DOWN RESISTORS

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ICH5

GPIO Pin	Type	Function
GPIO 0	I	ATADET0 (multifunction pin)
GPIO 1	I	Unused (multifunction pin)
GPIO 2	I	PCI_IRQ#E (multifunction pin)
GPIO 3	I	PCI_IRQ#F (multifunction pin)
GPIO 4	I	PCI_IRQ#G (multifunction pin)
GPIO 5	I	PCI_IRQ#H (multifunction pin)
GPIO 6	I	POV_ID0# (multifunction pin)
GPIO 7	I	POV_ID1# (multifunction pin)
GPIO 8	I	SIO_PME# (multifunction pin)
GPIO 9	I	USB_OC2# (multifunction pin)
GPIO 10	I	USB_OC2# (multifunction pin)
GPIO 11	I	TEMP_THERM# (multifunction pin)
GPIO 12	I	BRD_ID0 (multifunction pin)
GPIO 13	I	BRD_ID1 (multifunction pin)
GPIO 14	I	BRD_ID2 (multifunction pin)
GPIO 15	I	USB_OC3# (multifunction pin)
GPIO 16	O	Unused (multifunction pin)
GPIO 17	O	Unused (multifunction pin)
GPIO 18	O	Unused (multifunction pin)
GPIO 19	O	CLEAR_CI (multifunction pin)
GPIO 20	O	C2_BLK_RESET# (multifunction pin)
GPIO 21	O	C2_BLK_SET# (multifunction pin)
GPIO 22	O(OD)	SIO_SMI# (multifunction pin)
GPIO 23	O	CHASSIS_IN (multifuntion pin)
GPIO 24	I/O	Unused (multifunction pin)
GPIO 25	I/O	POWER_LED (multifuntion pin)
GPIO 27	I/O	POV_BLK_RST# (multifunction pin)
GPIO 28	I/O	ENET_DIS_N (multifunction pin)
GPIO 32	I/O	CLEAR_CMOS# (multifunction pin)
GPIO 33	I/O	Unused (multifunction pin)
GPIO 34	I/O	Unused (multifunction pin)
GPIO 40	I	PREQ#4 (multifuntion pin)
GPIO 41	I	Unused (multifunction pin)
GPIO 48	O	PGNT#4 (multifuntion pin)
GPIO 49	O	CPU_GD (multifunction pin)

Flash ROM(PCB REVISION ID)

GPIO Pin	Type	0A	0B	0C	
GPI 0	I	0	1	0	
GPI 1	I	0	0	1	
GPI 2	I	0	0	0	
GPI 3	I	0	0	0	
GPI 4	I	H:10/100 ETHERNET L:GIGABIT ETHERNET LAN			

PCI Config.

DEVICE	MCP1 INT Pin	REQ#/GNT#	IDSEL	CLOCK	CLK GEN PIN OUT
PCI Riser Slot	PIRQE	PCI_REQ#2	AD28	PCICLK2	7 (PCI_CLK2)
	PIRQF	PCI_GNT#2			
	PIRQG	PCI_REQ#4		PCICLK1	8 (PCI_CLK1)
	PIRQH	PCI_GNT#4			

LPC Super I/O

GPIO Pin	Type	Function
GPIO 10	I	BAY_ATTACH#
GPIO 11	I	BAY_IS_HDD
GPIO 12	I	Unused
GPIO 13	I	Unused
GPIO 14	I	Unused
GPIO 15	I	Unused
GPIO 16	I/O	Unused
GPIO 17	I/O	Unused
GPIO 20	I/O	Unused
GPIO 21	I/O	DSB#
GPIO 22	I/O	MOB#
GPIO 24	I/O	SIO_ADDR
GPIO 25	I/O	Unused
GPIO 26	I	Unused
GPIO 27	I	IO_SMI#
GPIO 30	O	CPU_FAN1
GPIO 31	O	REAR_FAN1
GPIO 32	I/O	PWM_CPU
GPIO 33	I/O	PWM_REAR
GPIO 34	O	Unused
GPIO 35	I/O	Unused
GPIO 36	O	KBRST#
GPIO 37	O	A20GATE
GPIO 40	O	DRVDEN0
GPIO 41	I/O	DRVDEN1
GPIO 42	O	SIO_PME#
GPIO 43	I	DDRC_LOCK_DIS
GPIO 50	I/O	RIB#
GPIO 51	I/O	DCDB#
GPIO 52	I	SINB
GPIO 53	I/O	SOUTB
GPIO 54	I/O	DSRB#
GPIO 55	I/O	RTSB#
GPIO 56	I/O	CTSB#
GPIO 57	I/O	DTRB#
GPIO 60	I/O	Unused
GPIO 61	I/O	Unused

DDR DIMM Config.

DEVICE	ADDRESS	CLOCK
DIMM 1	A0H	MCLK_A0/MCLK_A#0 MCLK_A1/MCLK_A#1 MCLK_A2/MCLK_A#2
DIMM 2	A2H	MCLK_B0/MCLK_B#0 MCLK_B1/MCLK_B#1 MCLK_B2/MCLK_B#2

PCI RESET DEVICE

Signals	Target
PCIRST#1	PCI slot, LAN
PCIRST#2	Super I/O, FWH, POV3
PCIRST_ICH5#	Northbridge , MS-5
HDDRST#	Primary IDE

JUMPER SETTING

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

MSI **MICRO-STAR INt'L CO., LTD.**

Title: General Purpose Spec & JUMPER SETTING

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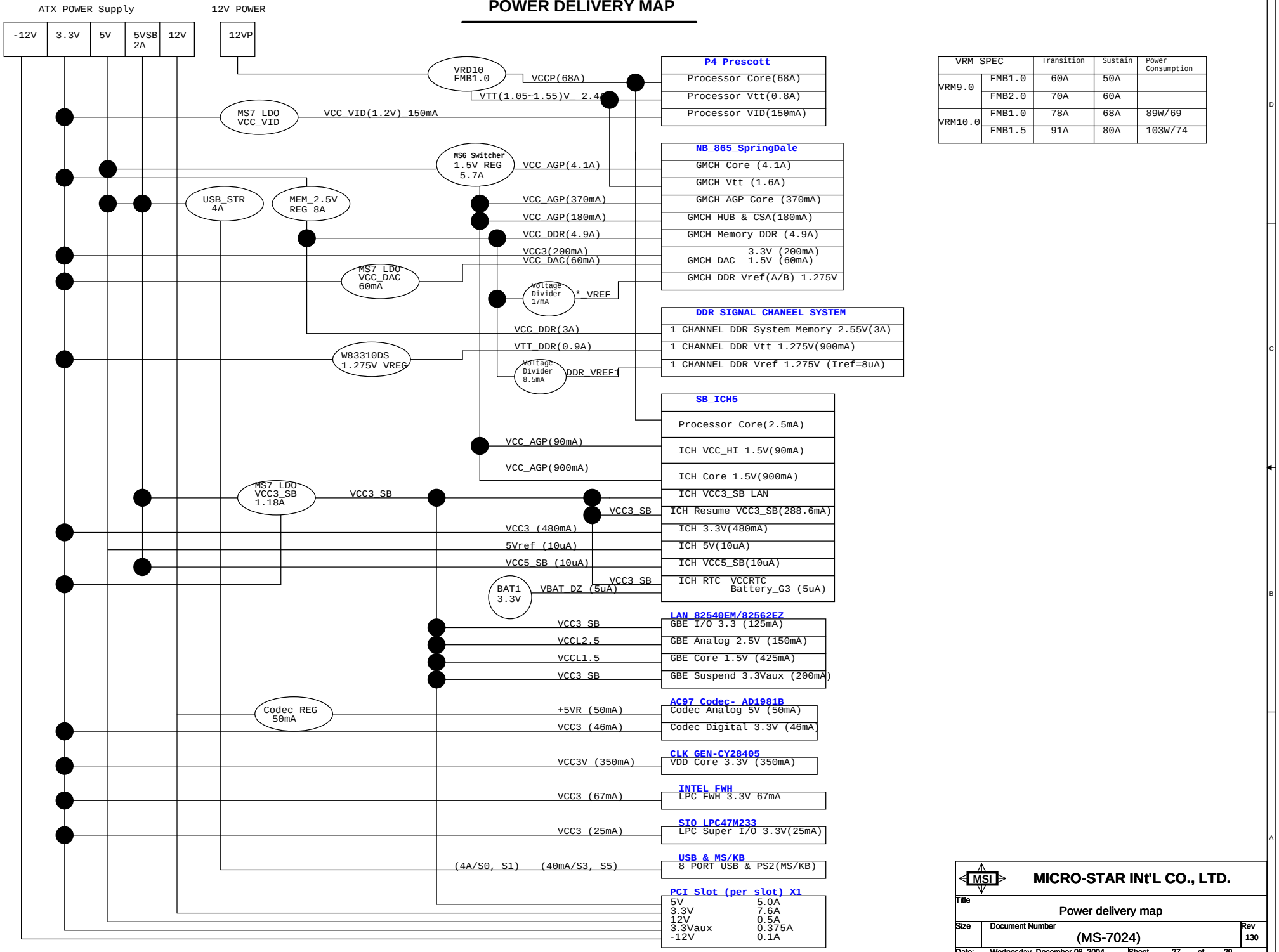
POWER DELIVERY MAP



VRM SPEC		Transition	Sustain	Power Consumption
VRM9.0	FMB1.0	60A	50A	
	FMB2.0	70A	60A	
VRM10.0	FMB1.0	78A	68A	89W/69
	FMB1.5	91A	80A	103W/74

MICRO-STAR INt'L CO., LTD.

Title: Power delivery map

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MS-7024 Revision History List

Ver.	DATE	Schematic Change List	Page
0A	2003.09.24	1. Create MS-7024 Project for IBM (Wellfleet) design.	
0B	2004.02.13	1. Front 4 port USB change to 2 port USB.	P.19
		2. Add JUSB1 pin header (1x5) for card reader..	P.19
		3. Add Rear 2 port USB connector.	P.19
		4. Secondary Silm IDE change to IBM Ultrabay Slim and Ultrabay Enhanced spec.	P.19
	2004.02.20	5. Add Front_FAN1 for thermal issue reserve.	P.20
		6. EMI coupling cap reserve.	P.21 P.25
		7. Intel LAN Kinnereth / Kenai 2 EMI issue update.	P.14
0C	2004.02.13	1. Front panel spec update: Line-Out, MIC, USB, USB	Layout
		2. Rear panel spec update: Line-Out, Line-In.	P.13
		3. IBM Wellfleet broad ID circuit update.	Layout
		4. IBM Wellfleet Logo location update.	Layout
		5. POV3 card mechanical issue with C128, JBAT1.	P.12
		6. Video sink buffers circuit added in.	
		7. IEEE 10/100/1000 LAN solution update.	
0D	2004.03.31	1. Change LAN chipset for 82540EM to 82541EI.	P.14 P.15
		2. Parallel port proposal from IBM suggestion change 33ohm to 0ohm.	P.11
		3. Add RSS_CLK for IBM Retail Store Systems (RSS) group requirement.	P.10
		4. Change H-sync and V-sync resistor value form 47ohm to 33ohm for EMI issue.	P.12
		5. Add C301, C302, C303 cap at North-Bridge side for EMI concern.	P.12
0E	2004.04.30	1. Update 82541EI LAN Enable/Disable circuit.	P.15
		2. Update component RSL0005 for IBM request.	P.11 P.15
		3. Reserve SIO/GPIO pin for LAN enable/disable function used.	P.21
		4. Change SATA connector with housing spec.	
100	2004.05.20	1. Change R21 to 27Kohm for internal speaker small volume issue.	P.13
110	2004.06.25	1. Update mounting hole for EMI concern.	P.19
		2. Reserve C314, C315, C316, C317 for USB EMI concern.	
		3. Change R8, R20 to 15Kohm, R21 to 33Kohm for internal speaker small olume issue.	
11A	2004.07.21	1. Add RGB signal protection diode for No display issue.	P.12
		2. Add L-C filter for RGB signal (Reference Intel Grantsdale suggestion).	
11B	2004.07.23	1. Add DDCCL, DDCDA signal protection diode for No display issue.	P.12
		2. Add serier resistor (R607, R606))on H-sync, Vsync signal at VGA connector and buffer side.	
120	2004.08.27	1. Change to Ver.120	

Ver.	DATE	Schematic Change List
1.3	2004.11.12	1. Modify J_POV1 schematic (Slove password issue when using POV3), short pin 27 & 29
		2. Change board ID (Just change the PCB Revision ID from 0000b to 0001b by pulling REV0 up (R414) instead of down (R413).
		3. Add system FAN
1.3	2004.12.02	1. Change LM78L05-SOT89 to YLT1087S-0.8A for AUDIO regulator on page 13.

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Title: REVISION HISTORY

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