BQ0

MS-7429

Version 1.0

CPU:
Intel Conroe/Conroe-L/
YorkField/Wolfdale - 65W CPU
(FSB1333/1066/800/533)

System Chipset:
Intel BearlakeQ35 - GMCH (North Bridge)
Intel ICH9 DO (South Bridge W/ AMT)

On Board Chipset:
BIOS - SPI FLASH
HD Audio - Realtek ALC262 C2
LPC Super I/O : SMSC SCH5617
Gigabit LAN - Intel Nineveh 82566
Clock GEN - ICS9LP505-1
TPM - SLB 9635 TT1.2

Main Memory:
DDR II(800/667)*2 (Up to 4GByte)

Intersil PWM:
Controller - Intersil 6326 3Phase

Expansion Slots:
PCI-E[X16] Slot *1
Riser Slot : (PCI*1/PCI-E[X1]*1)

MS-6617 N1	ERP Number	Functiom
MS-7429-1.0	601-7429-01S	Mainboard
MS-4046-2A	604-4046-020	Power Buttom/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

Model option table

Model type	Function	BOM Config	ERP BOM No	BOM Opt.
MS-7429N1-1.0	Bearlake Q35+ICH9 DO+Nineveh82566	L2B	XXX-XXXX-XXX	L2B

MSI Link to the Future **MICRO-START INT'L CO.,LTD.**

Title: COVER SHEET

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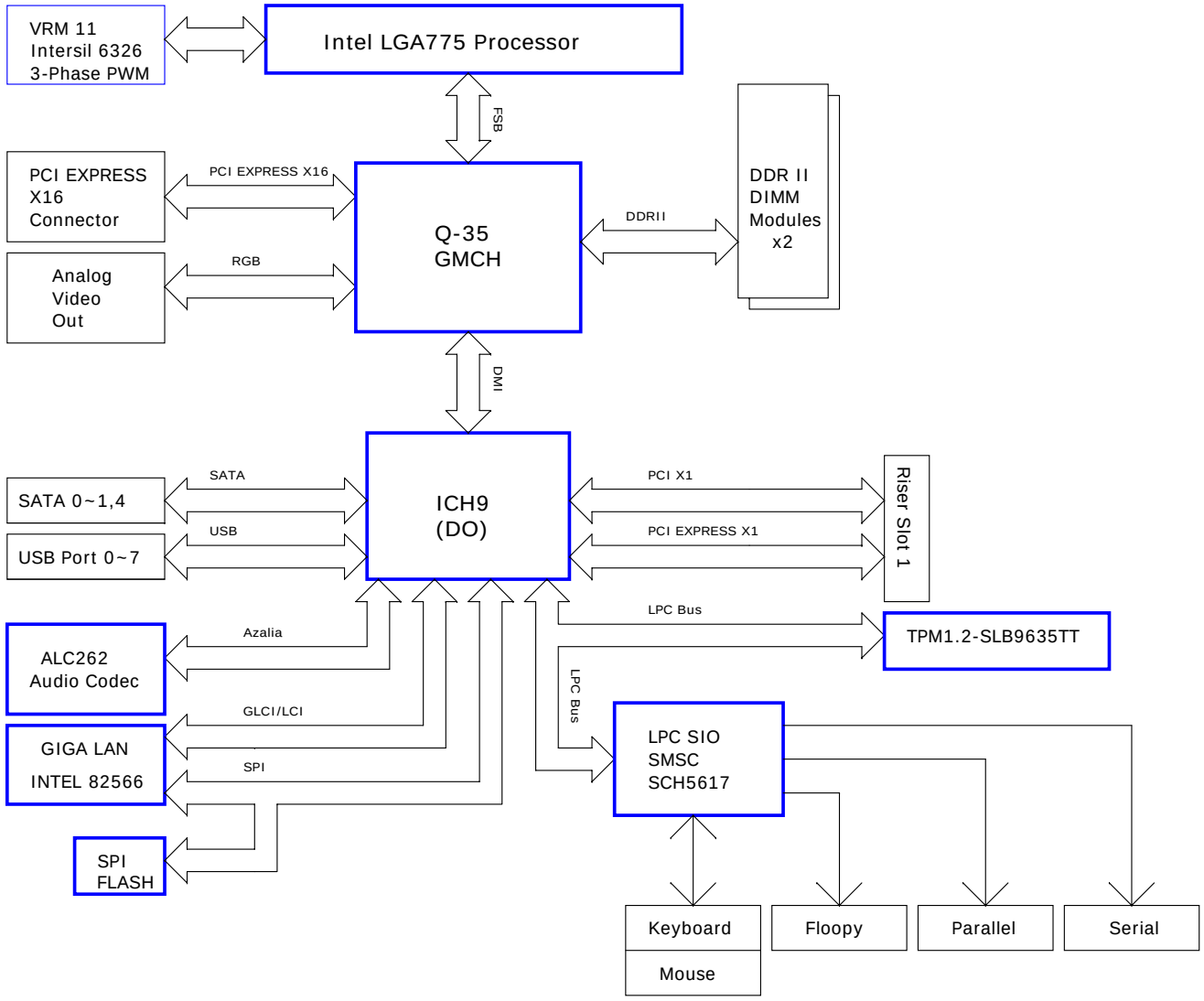
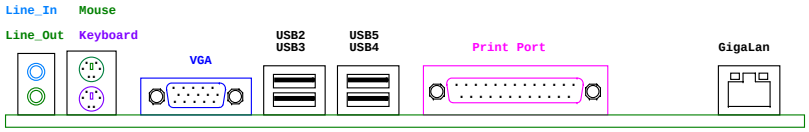
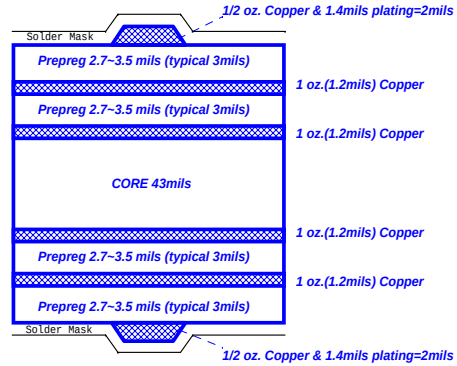
Block Diagram





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
Differencial 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

Bearlake(GMCH) Impedance Requirements by Interface

Interface	Impedance Required
FSB(All)	4x signals 42-ohm,others 50-hom,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	37-ohm,single-ended at MCH breakout,then 50-ohm,single-ended to VGA connector

ICH9 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

MSI Link to the Future MICRO-START INT'L CO.,LTD.

Title: BLOCK DIAGRAM		
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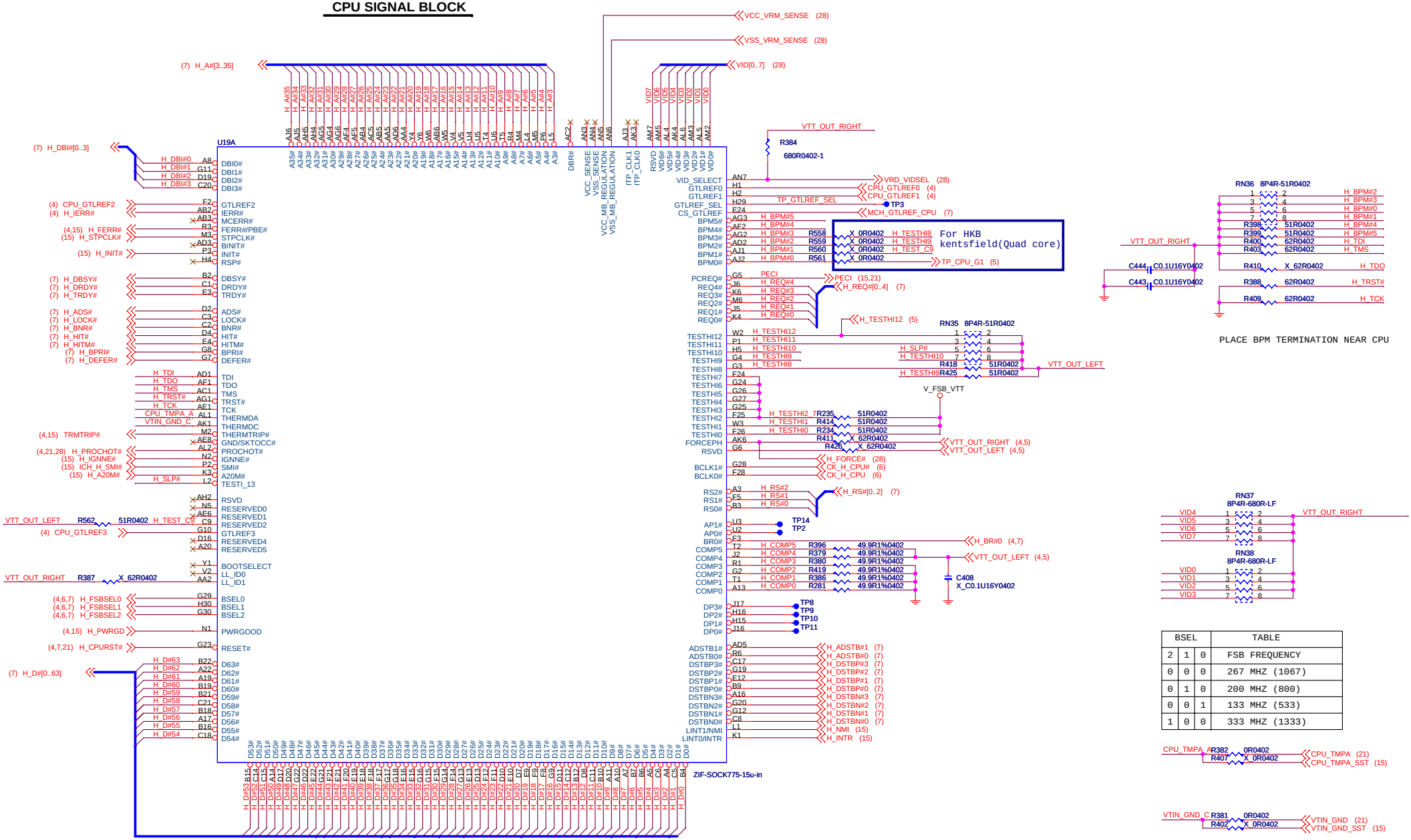
CPU SIGNAL BLOCK



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 Link to the Future **MICRO-START INT'L CO.,LTD.**

Title: **INTEL LGA775 CPU SIGNAL**

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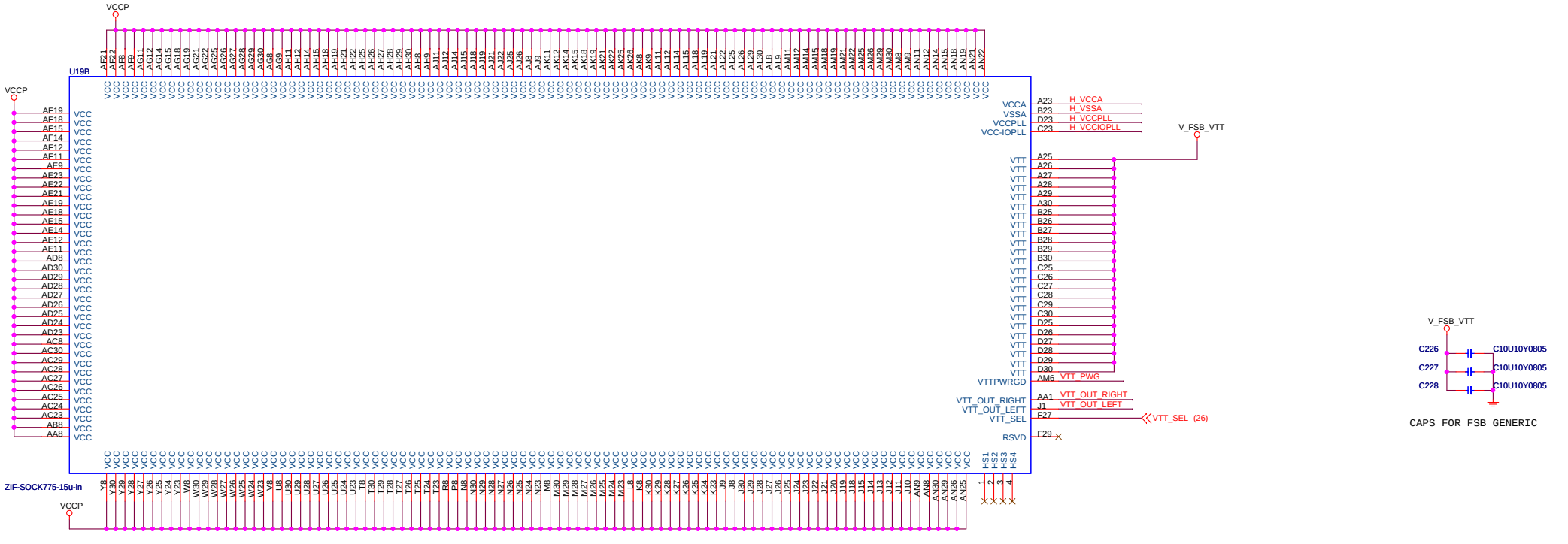
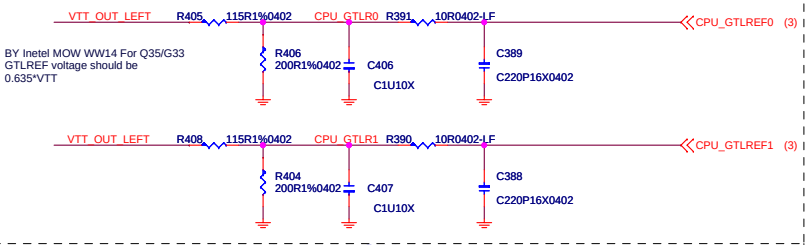
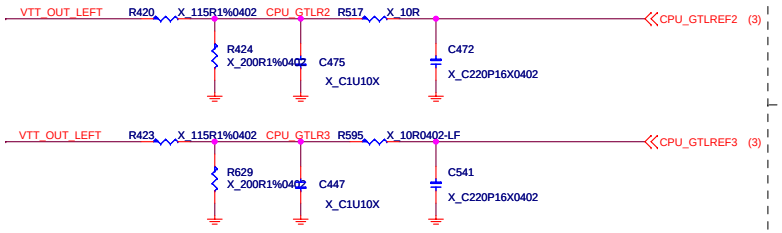


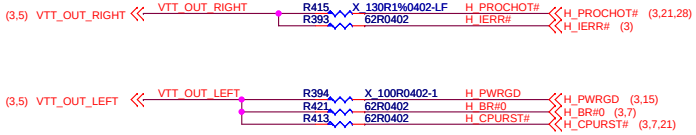
CAPS FOR FSB GENERIC



For HKB kentsfield(Quad core)

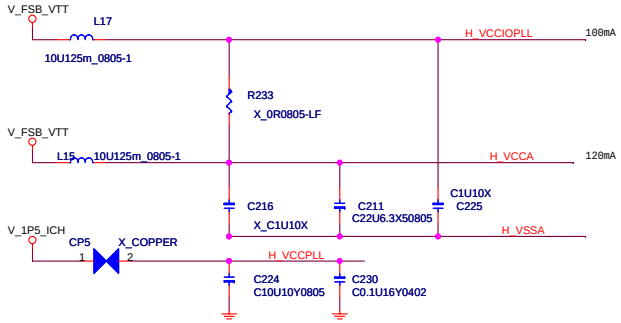


PLACE AT CPU END OF ROUTE



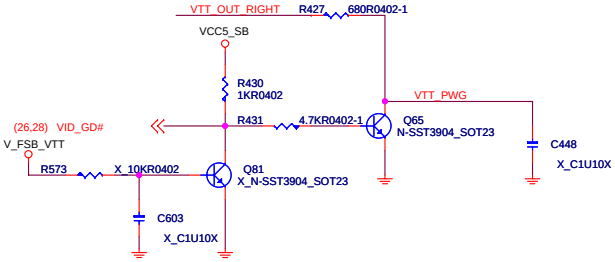
PLACE COMPONENTS AS CLOSE AS POSSIBLE TO PROCESSOR SOCKET

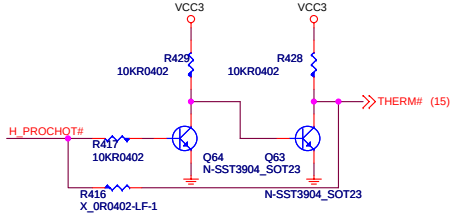
TRACE WIDTH TO CAPS MUST BE SMALLER THAN 12MILS



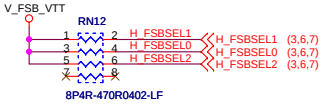
VTT_PWG SPEC :
High > 0.9V
Low < 0.3V
Trise < 150ns

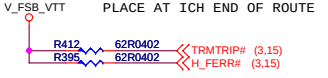
Kinesfiled for
HK4B
,Q81,R537,C603
Mount





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





MSI MICRO-START INT'L CO.,LTD.

Title: INTEL LGA775 POWER

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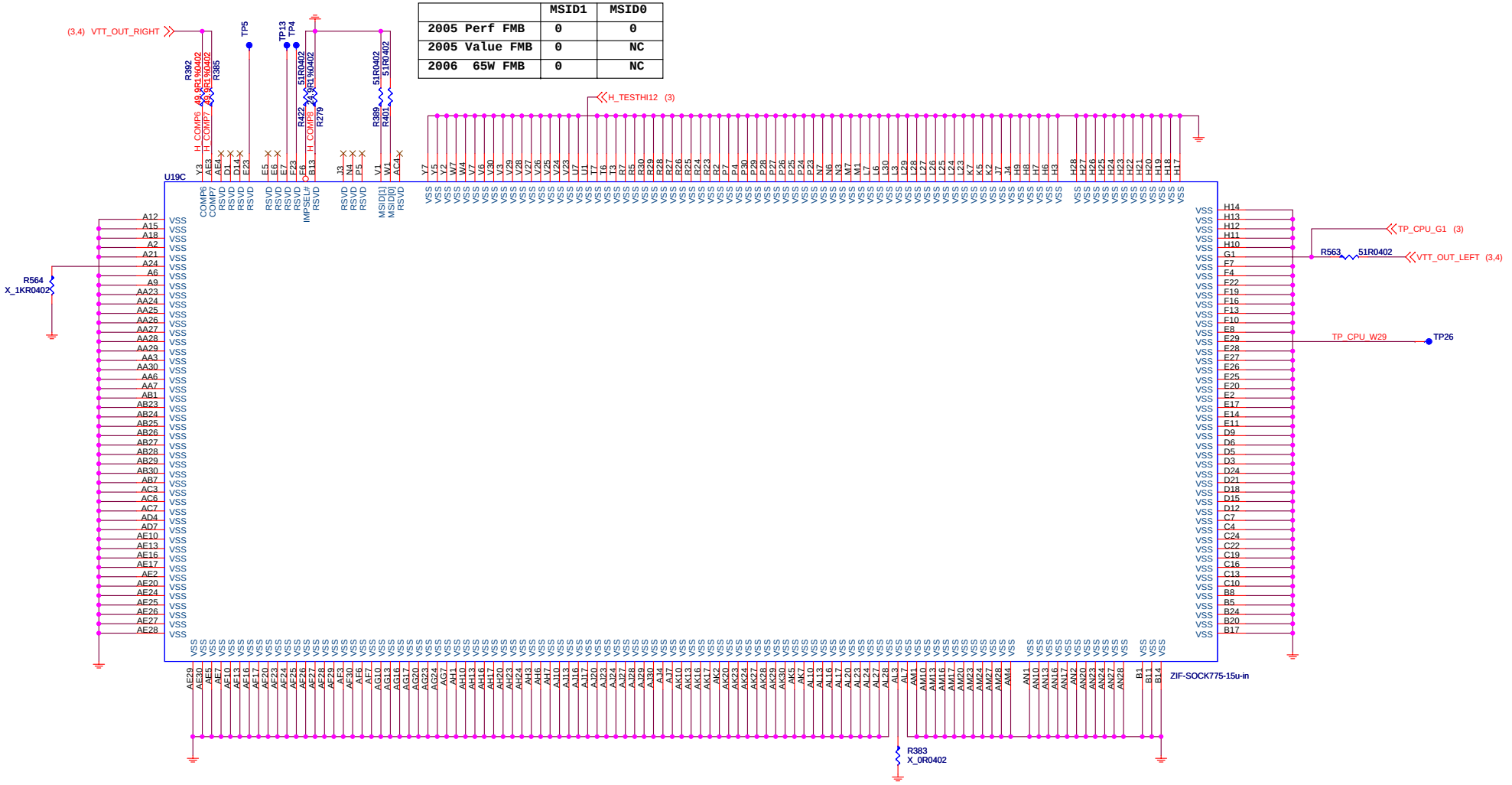
	MSID1	MSID0
2005 Perf FMB	0	0
2005 Value FMB	0	NC
2006 65W FMB	0	NC



Title	INTEL LGA775 GND
Size	Document Number: MS-7429
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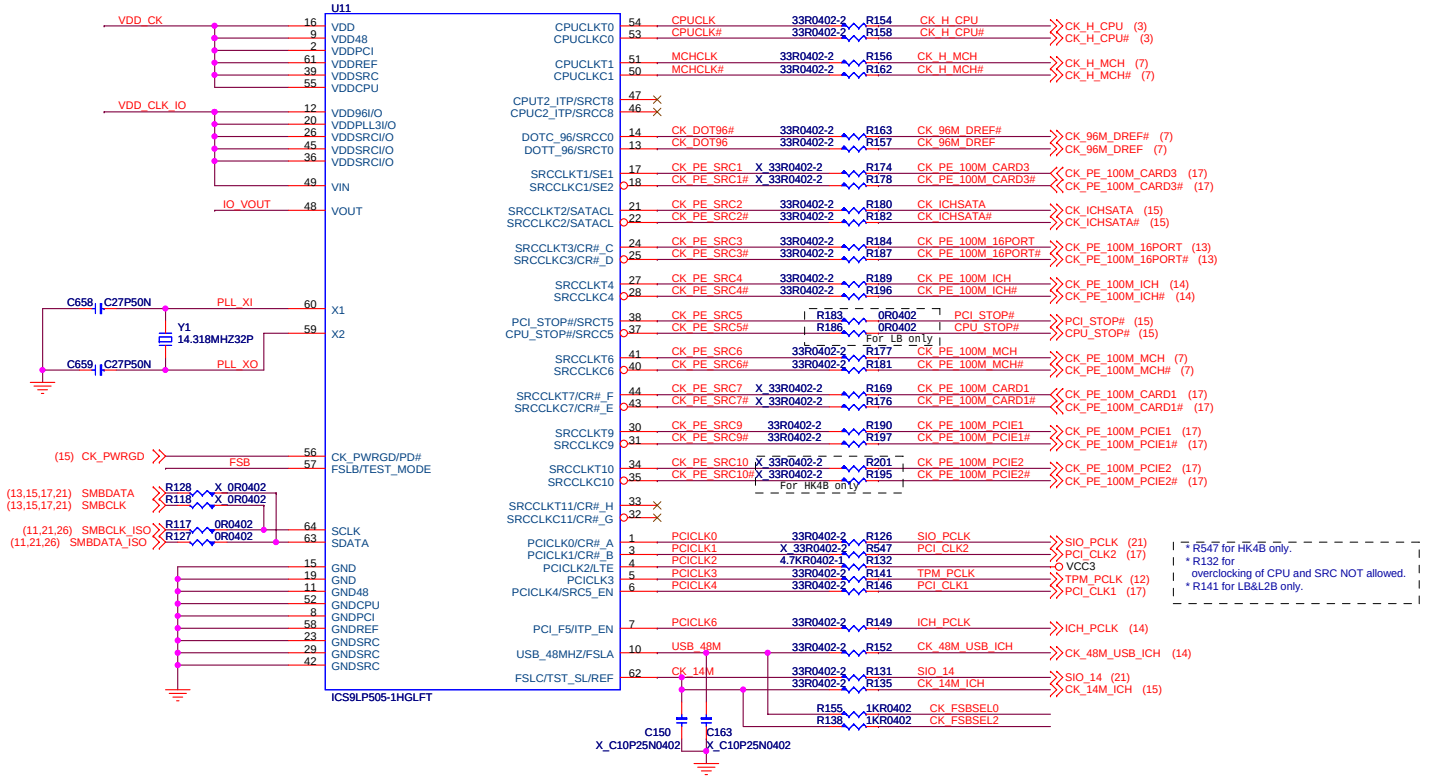
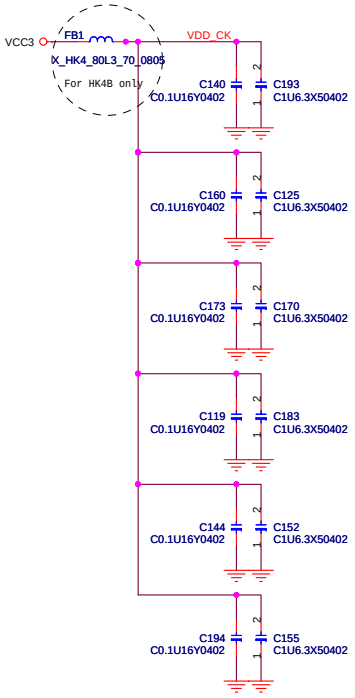
MICRO-START INT'L CO.,LTD.

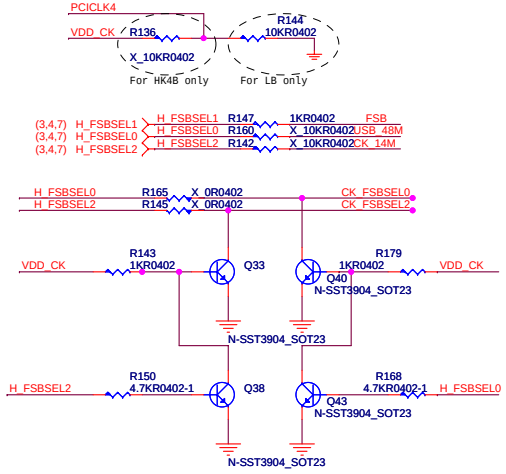
CLOCK Generator - ICS9LP505-1HGLFT

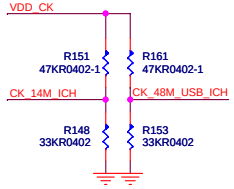


VDD_CK Decoupling

Place near each VDD_CK Pins

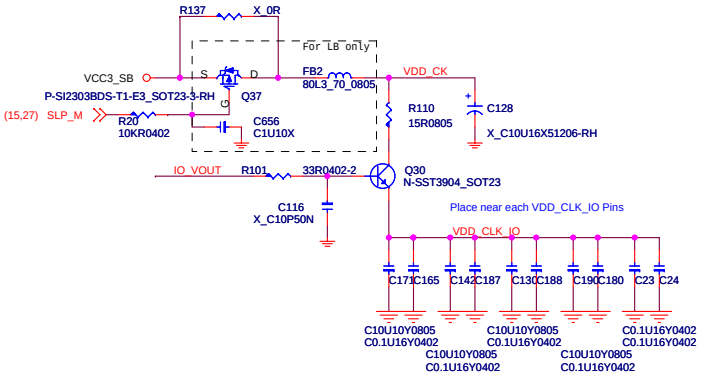




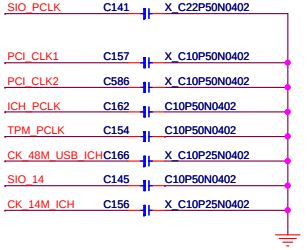


FSC Bit7	FSB Bit6	FSA Bit5	CPU MHz
0	0	0	266.66
0	0	1	133.33
0	1	0	200.00
0	1	1	166.66
1	0	0	333.33
1	0	1	100.00
1	1	0	400.00

VDD_CK & VDD_CLK_IO Power



For EMI reserver



MICRO-START INTL CO.,LTD.

Title	CLOCK Generator-CY505YC64CT	
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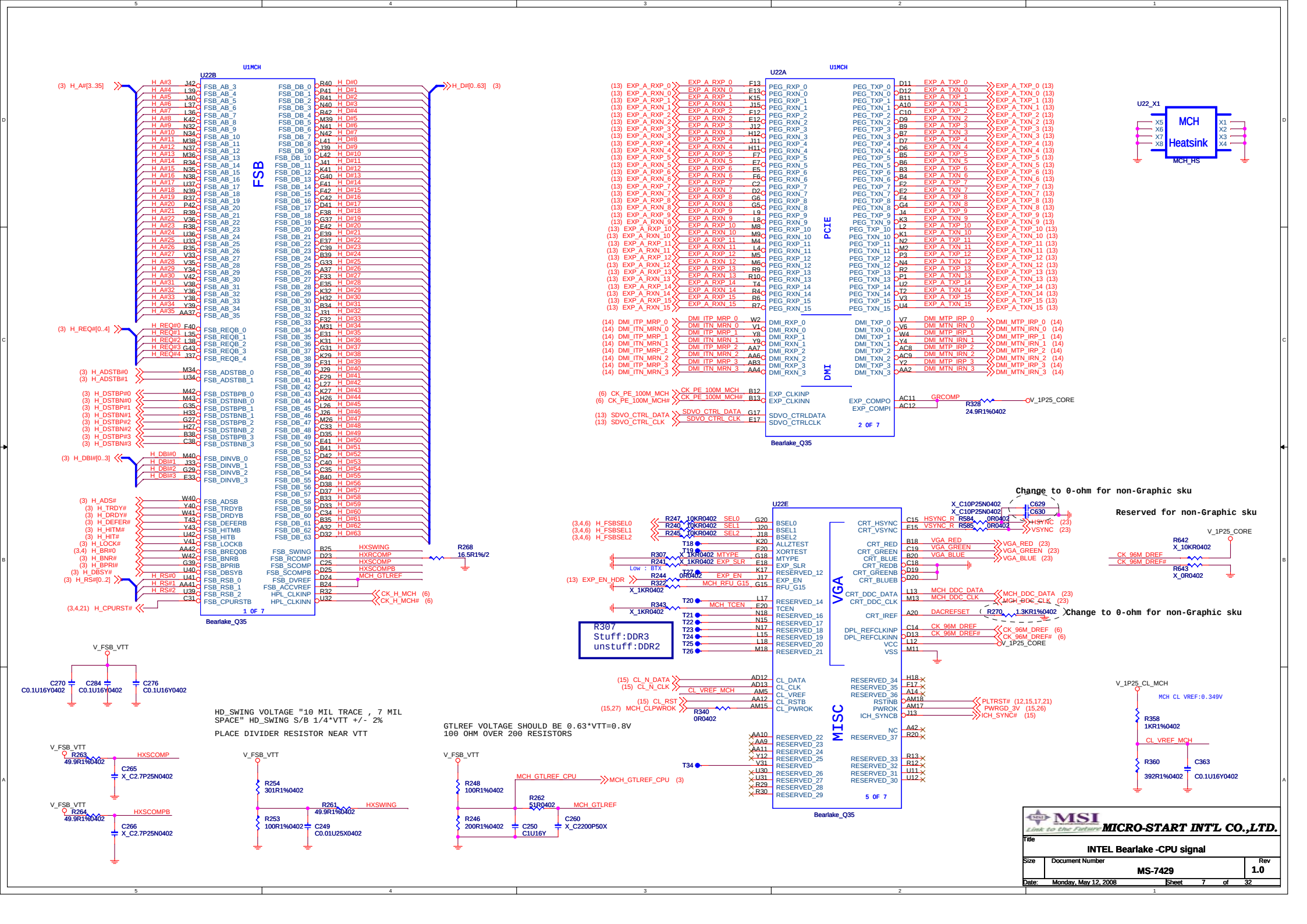
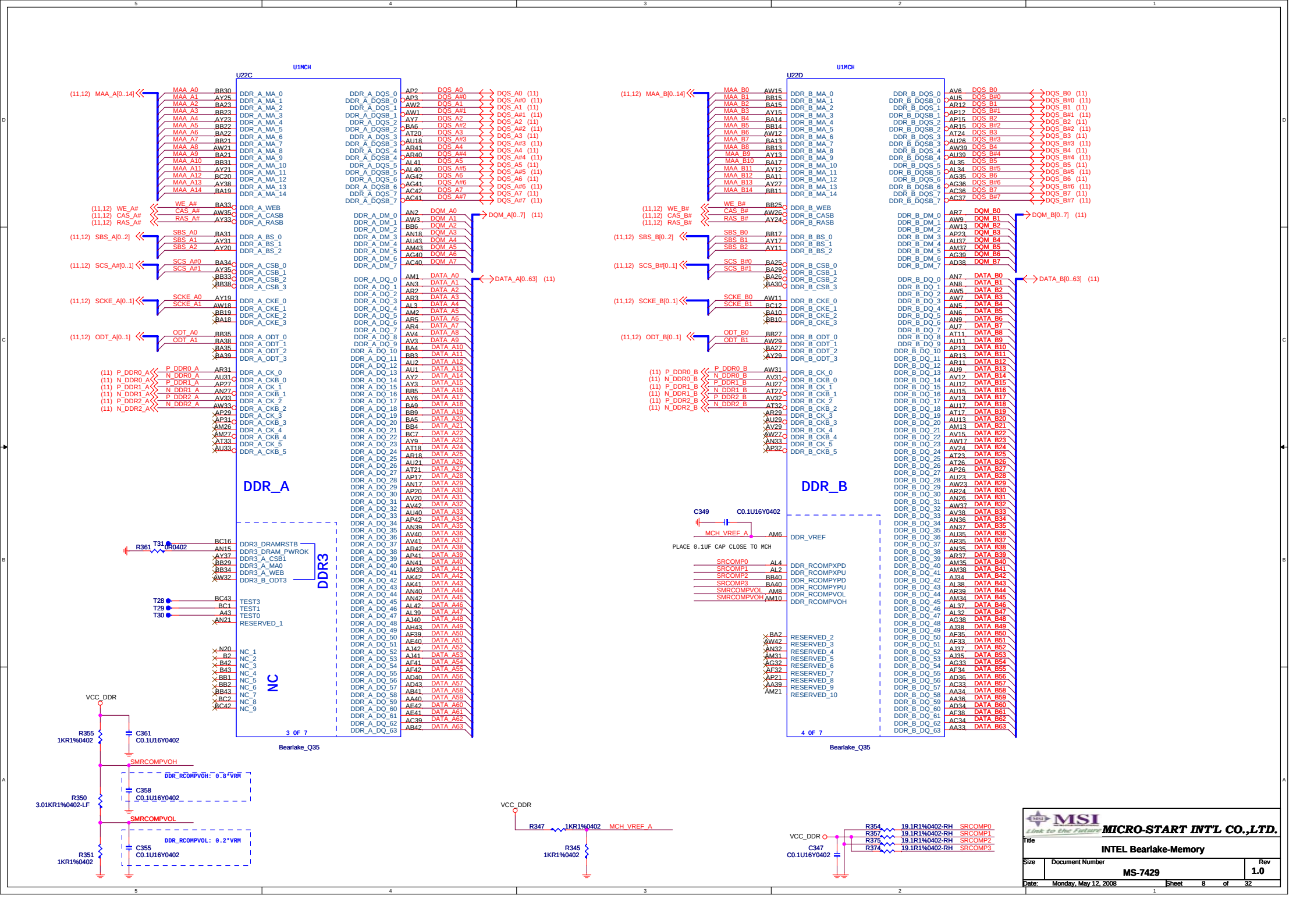

U1MCH
U22B
FSB
Bearlake_Q35
U1MCH
U22A
PCIE
DMI
2 OF 7
Bearlake_Q35
U22_X1
MCH
Heatsink
MCH_HS
U22E
VGA
MISC
5 OF 7
Bearlake_Q35
Change to 0-ohm for non-Graphic sku
Reserved for non-Graphic sku
Change to 0-ohm for non-Graphic sku
R307
Stuff:DDR3
unstuff:DDR2
HD_SWING VOLTAGE "10 MIL TRACE , 7 MIL
SPACE" HD_SWING S/B 1/4*VTT +/- 2%
PLACE DIVIDER RESISTOR NEAR VTT
GTLREF VOLTAGE SHOULD BE 0.63*VTT=0.8V
100 OHM OVER 200 RESISTORS
MICRO-START INT'L CO.,LTD.
INTEL Bearlake -CPU signal
MS-7429
1.0
Monday, May 12, 2008
7
32


U1MCH
U22C
DDR_A
DDR3
NC
3 OF 7
Bearlake_Q35
U1MCH
U22D
DDR_B
4 OF 7
Bearlake_Q35
PLACE 0.1UF CAP CLOSE TO MCH
DDR_RCOMPVOH: 0.8*VRM
DDR_RCOMPVOL: 0.2*VRM
MICRO-START INTL CO.,LTD.
INTEL Bearlake-Memory
MS-7429
1.0
Monday, May 12, 2008
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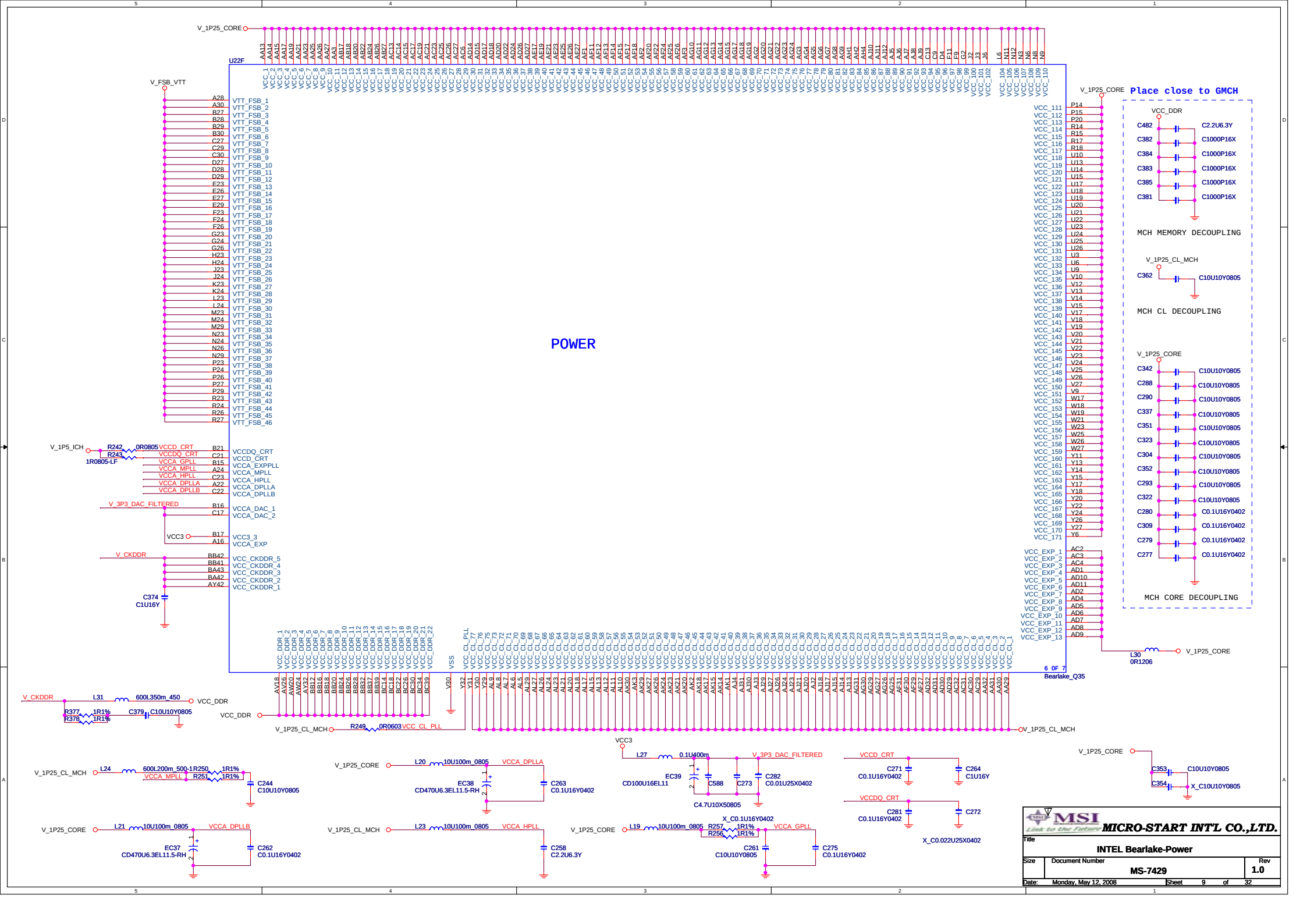

MICRO-START INT'L CO.,LTD.

Title: INTEL Bearlake-Power

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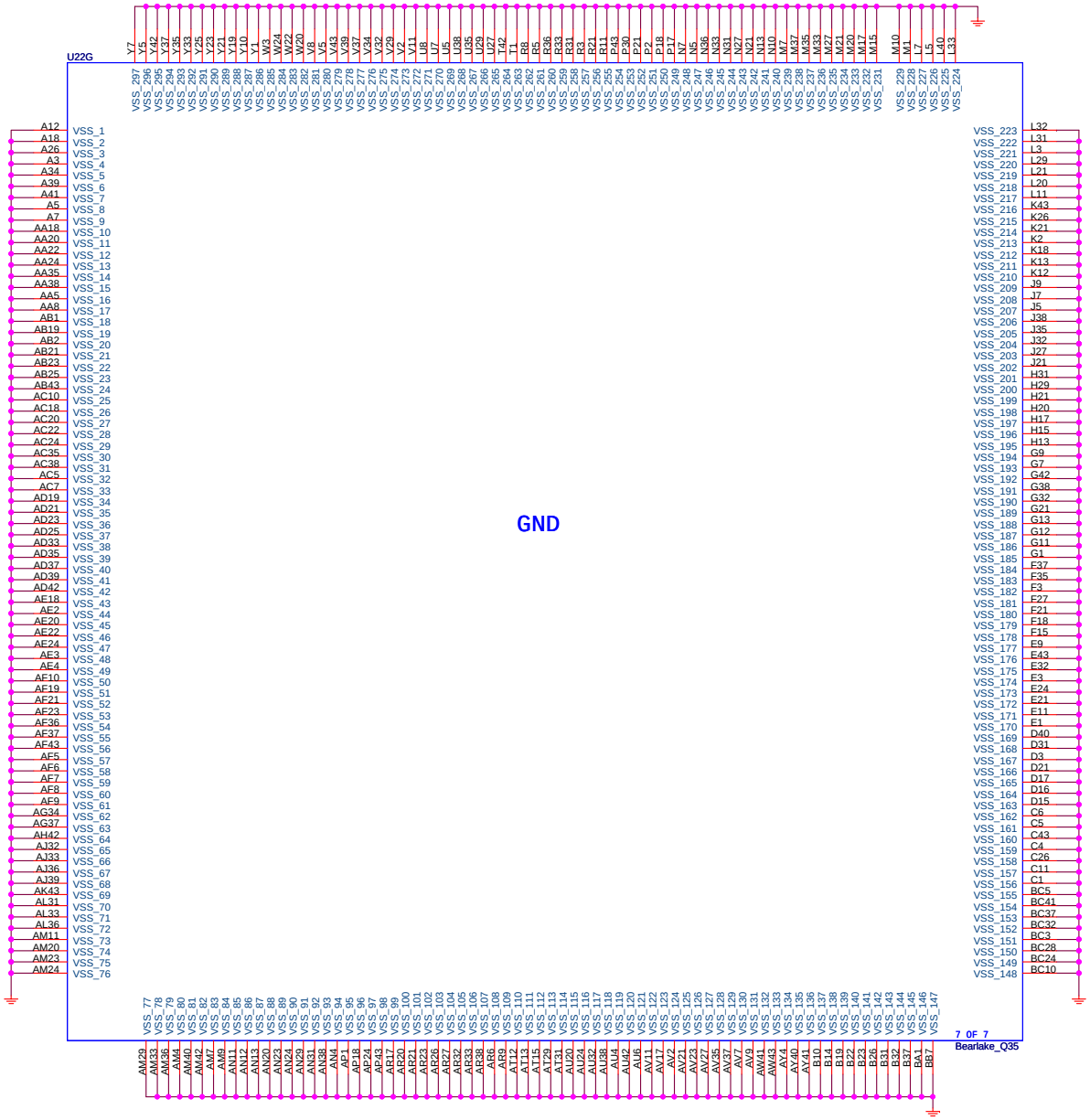

MSI MICRO-START INT'L CO.,LTD.		
Title	INTEL Bearlake-GND	
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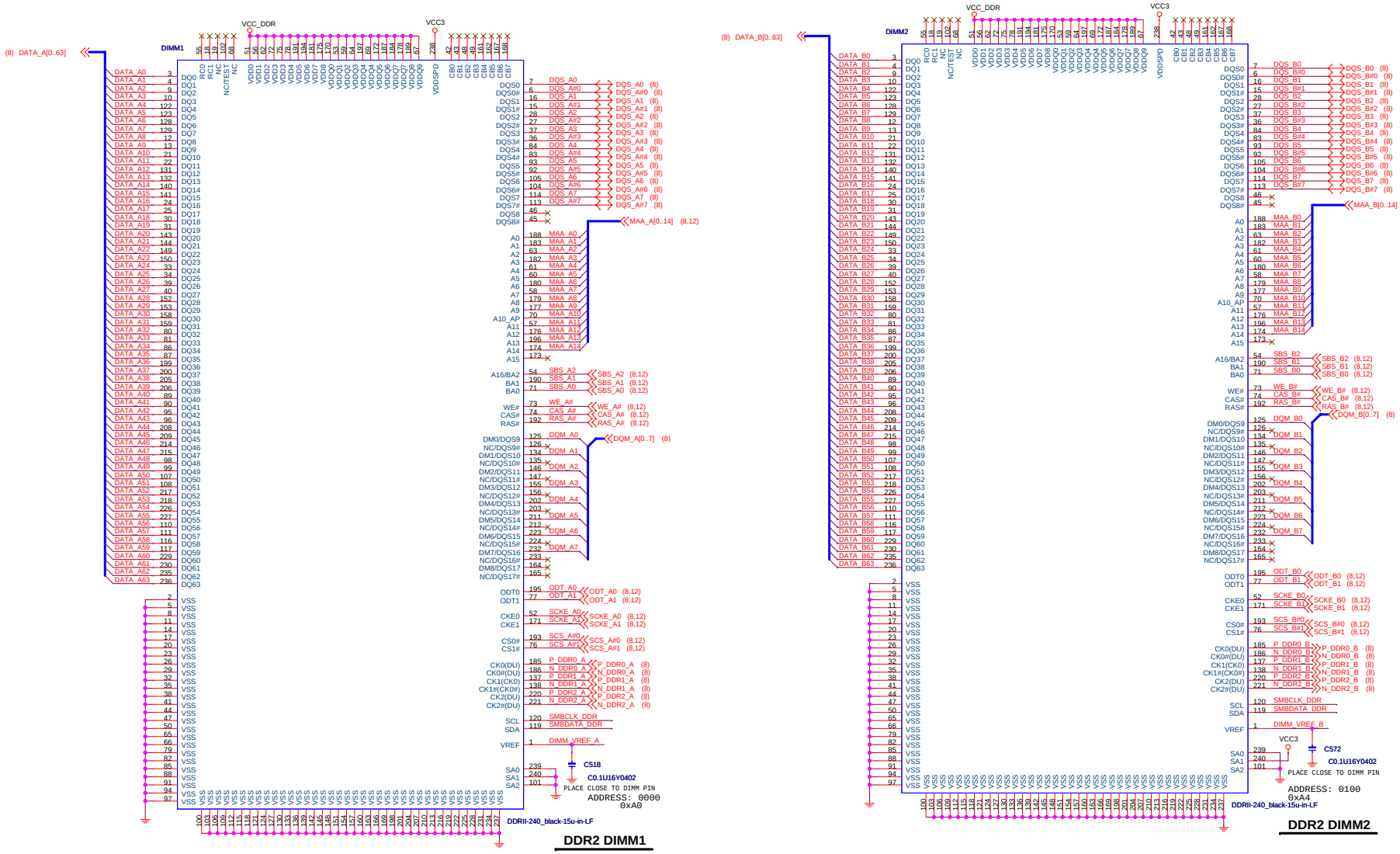

MSI Link to the Future	MICRO-START INT'L CO.,LTD.		
Title	DDR2 DIMM 1 & 2		
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CHANNEL A V_SM_VTT DECOULPING CAPS

VTT_DDR
C513 C0.1U16Y0402
C507 C0.1U16Y0402

VTT_DDR
C517 C4.7U10Y0805
C512 C10U10Y0805

VTT_DDR
C515 C0.1U16Y0402
C516 C0.1U16Y0402
C508 C0.1U16Y0402
C519 C0.1U16Y0402
C510 C0.1U16Y0402

CHANNEL B V_SM_VTT DECOULPING CAPS

VTT_DDR
C570 C4.7U10Y0805
C557 X_C4.7U10Y0805

VTT_DDR
C567 C0.1U16Y0402
C559 C0.1U16Y0402
C560 C0.1U16Y0402
C561 C0.1U16Y0402
C562 C0.1U16Y0402
C563 C0.1U16Y0402

VTT_DDR
C564 C0.1U16Y0402
C549 C0.1U16Y0402
C558 C0.1U16Y0402
C571 C0.1U16Y0402

VTT_DDR

MAA_A4 MAA_A3 MAA_A2 MAA_A1 MAA_A9 MAA_A5 MAA_A8 MAA_A6 — RN43, RN40, RN45, RN41, RN39, RN42 (8P4R-33R0402-1)
SBS_A2 MAA_A12 MAA_A11 MAA_A7 MAA_A13 R473 RAS_A# WE_A# CAS_A# MAA_A0 SBS_A1 MAA_A10 SBS_A0 — 33R0402-2
(8,11) RAS_A#
(8,11) WE_A#
(8,11) CAS_A#
MAA_A14 R474 33R0402-2
ODT_A1 R472 43R0402
SCKE_A1 SCKE_A0 — RN44 (8P4R-43R0402-RH)
SCS_A#0 SCS_A#1 ODT_A0 — RN42 (8P4R-43R0402-RH)

(8,11) MAA_A[0..14]
(8,11) SBS_A[0..2]
(8,11) SCS_A#[0..1]
(8,11) SCKE_A[0..1]
(8,11) ODT_A[0..1]

VTT_DDR

MAA_B1 MAA_B2 MAA_B3 MAA_B4 MAA_B9 MAA_B8 MAA_B5 MAA_B6 SBS_B2 MAA_B12 MAA_B11 MAA_B7 MAA_B0 SBS_B1 SBS_B0 MAA_B10 — RN50, RN49, RN48, RN51 (8P4R-33R0402-1)
RAS_B# WE_B# CAS_B# — RN52 (8P4R-33R0402-1)
(8,11) RAS_B#
(8,11) WE_B#
(8,11) CAS_B#
MAA_B13 R501 33R0402-2
MAA_B14 R500 33R0402-2
SCS_B#0 SCS_B#1 ODT_B0 — RN46 (8P4R-43R0402-RH)
SCKE_B1 SCKE_B0 — RN47 (8P4R-43R0402-RH)
ODT_B1 R502 43R0402

(8,11) MAA_B[0..14]
(8,11) SBS_B[0..2]
(8,11) SCS_B#[0..1]
(8,11) SCKE_B[0..1]
(8,11) ODT_B[0..1]

VCC_DDR
EC72 CD1000U6.3EL15
EC70 X_CD1000U6.3EL15

VCC_DDR
C532 C1U10X
C530 C1U10X
C489 C1U10X

VCC_DDR
C505 C1U10X
C484 C1U10X
C485 C1U10X
C552 C1U10X
C386 C1U10X
C488 C1U10X

VCC_DDR
C569 C0.01U25X0402
C525 X_C0.1U16Y0402
C568 C0.01U25X0402
C566 C0.01U25X0402
C509 X_C0.1U16Y0402
C565 C0.01U25X0402
C551 X_C0.1U16Y0402
C527 X_C0.1U16Y0402

VTT_DDR

TPM 1.2 (For LB only)

IO Address:0x02E

U8

(15,21) LPC_AD0 — LPC_AD0
(15,21) LPC_AD1 — LPC_AD1
(15,21) LPC_AD2 — LPC_AD2
(15,21) LPC_AD3 — LPC_AD3
(15,21) LPC_FRAME# — LPC_FRAME#
(7,15,17,21) PLTRST#
(15,21) LPCPD#
TPM_CLKRUN#
(15,17,21) SERIRQ — SERIRQ
(6) TPM_PCLK — TPM_PCLK
R170 0R0402 TPM_ADDR
R129 0R0402
R171 X_0R0402
R172 X_0R0402
R173 X_0R0402

LAD0 LAD1 LAD2 LAD3 LFRAME# LRESET# LPCPD# CLKRUN# SERIRQ LCLK TESTBI/BADD TESTI PP NC3 NC4
GPIO 3V_1 3V_2 3V_3 3VSB GND1 GND2 GND3 GND4 XTALO XTALI/32KIN NC1 NC2

VCC3
VCC3_SB
Y2 32.768KHZ12.5P_D-LF
C189 C12P50N0402
C186 C12P50N0402

SLB9635TT1.2-FW1.02

VCC3
C139 C0.1U16Y0402
C137 C0.1U16Y0402
C176 C1000P16X0402

VCC3_SB
C177 C0.1U16Y0402

MSI Link to the Future MICRO-START INT'L CO.,LTD.

Title	DDR II VTT DECOUPLING & TPM1.2	
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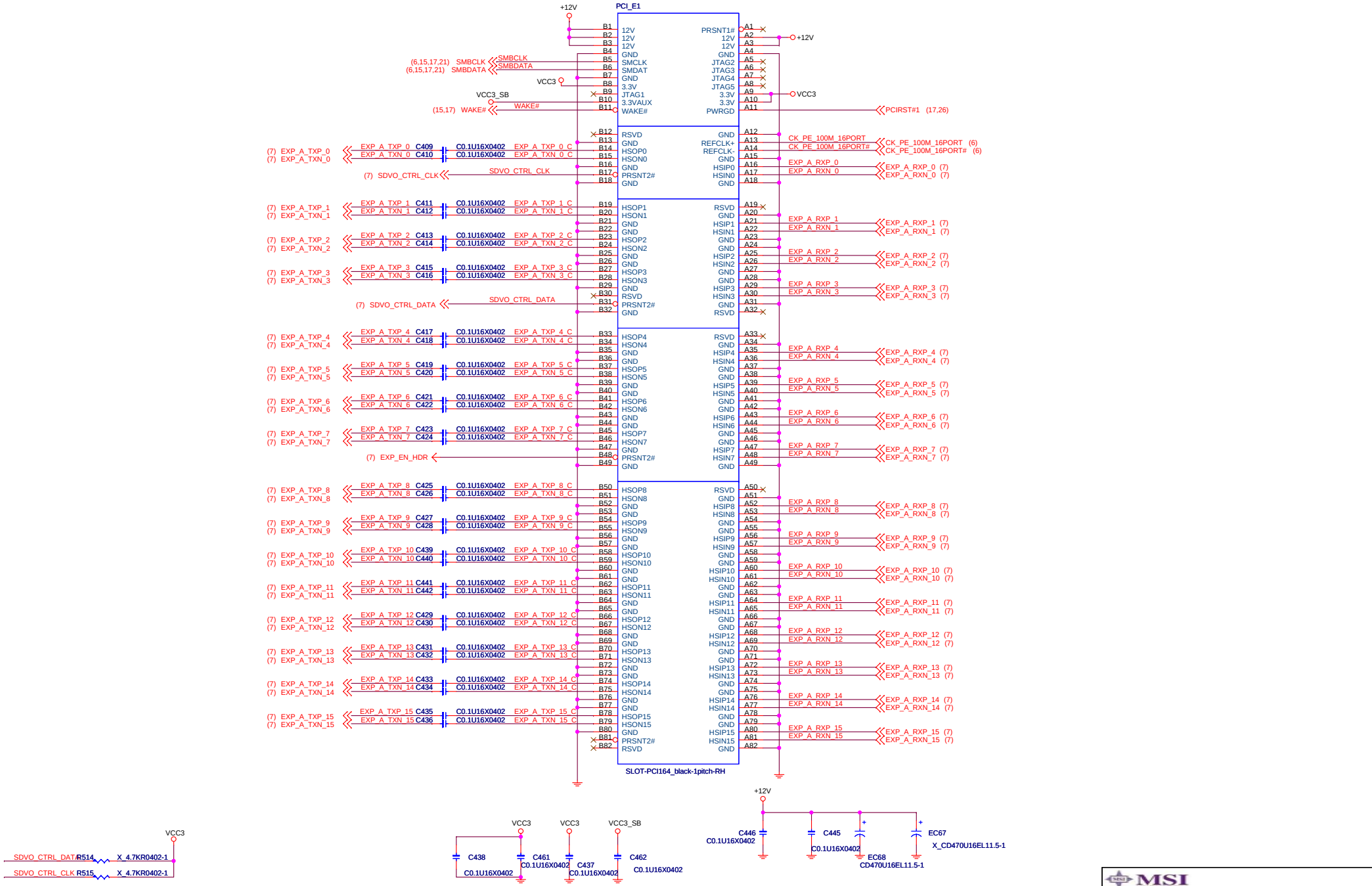

MICRO-START INT'L CO.,LTD.

Title: PCI EXPRESS 16 PORT

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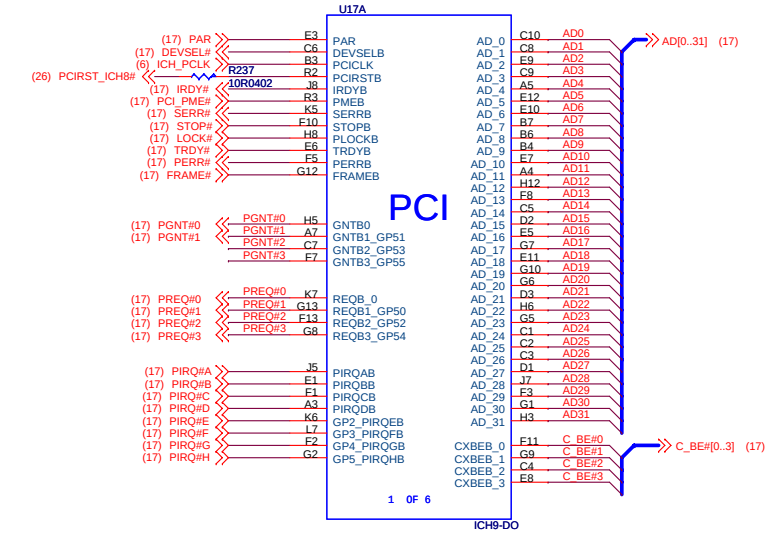
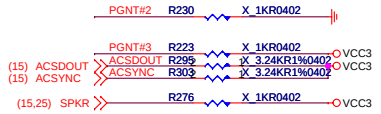
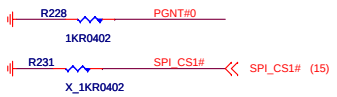
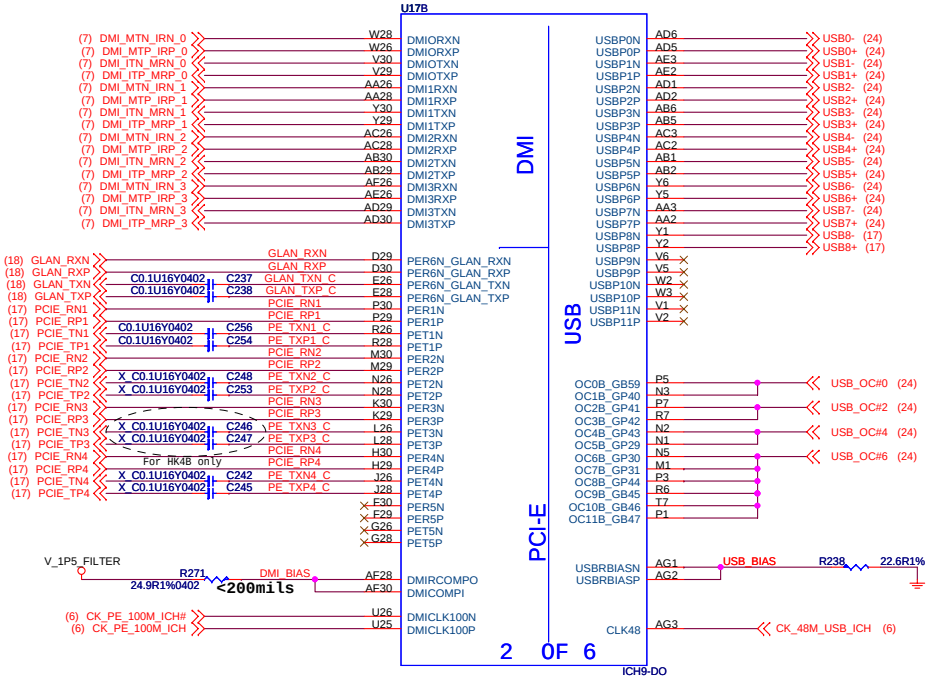


ICH9 H/W STRAPS			
SIGNAL	H	L	DES.
SPKR	DIS	EN	REBOOT
GNT3	DIS	EN	A16 OVERIDE
INTVRMEN	EN	DIS	INT VRM
SATALED	NORM	REVERSE	PCIE 0-3 ORDER
HDA_SDOUT	DFX/ PCIE	N/A	XOR MODE/PCIE PORT CONFIG BIT 1
HDA_SYNC	SET BIT	N/A	PCIE PORT CONFIG BIT 0 (1-4)
GNT2	N/A	SET BIT	PCIE PORT CONFIG 2 BIT 0 (5-6)

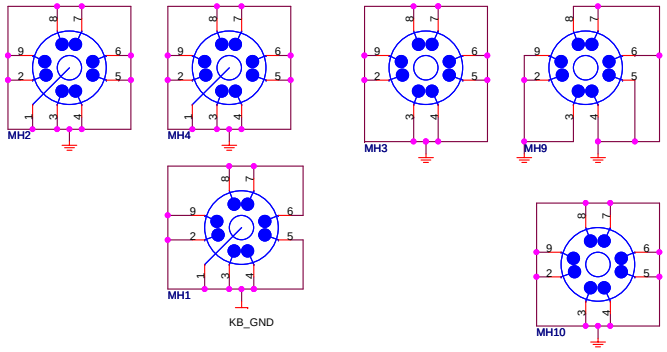


BOOT SELECT STRAPS			
BOOT DEVICE	GNT#0	SPI_CS1#	
FWH	1	1	
SPI	0	X	(Default)
PCI	1	0	

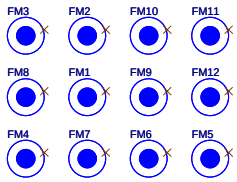




Mounting Holes



Optics Orientation Holes



MSI Link to the Future **MICRO-START INT'L CO.,LTD.**

Title	INTEL ICH9 PART1	
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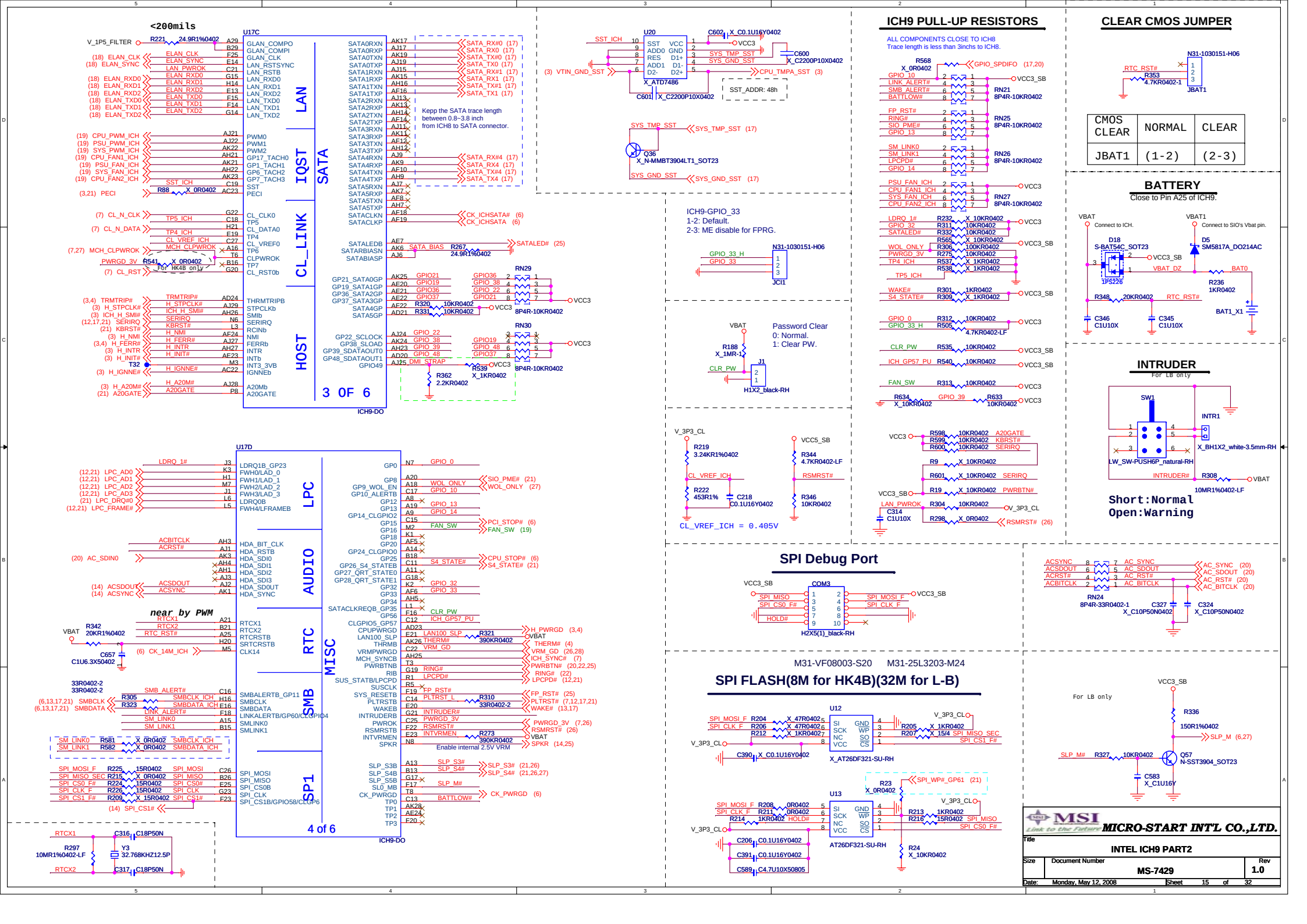
<200mils
U17C
LAN
IQST
SATA
CL_LINK
HOST
3 OF 6
ICH9-DO
U17D
LPC
AUDIO
RTC
MISC
SMB
SPI
near by PWM
4 of 6
ICH9-DO
U20
X_ATD7486
SST_ADDR: 48h
Kepp the SATA trace length
between 0.8~3.8 inch
from ICH8 to SATA connector.
ICH9-GPIO_33
1-2: Default.
2-3: ME disable for FPRG.
Password Clear
0: Normal.
1: Clear PW.
CL_VREF_ICH = 0.405V
ICH9 PULL-UP RESISTORS
ALL COMPONENTS CLOSE TO ICH8
Trace length is less than 3inchs to ICH8.
CLEAR CMOS JUMPER
CMOS CLEAR | NORMAL | CLEAR
JBAT1 | (1-2) | (2-3)
BATTERY
Close to Pin A25 of ICH9.
INTRUDER
For LB only
Short:Normal
Open:Warning
SPI Debug Port
M31-VF08003-S20 M31-25L3203-M24
SPI FLASH(8M for HK4B)(32M for L-B)
For LB only
MICRO-START INT'L CO.,LTD.
INTEL ICH9 PART2
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1.0
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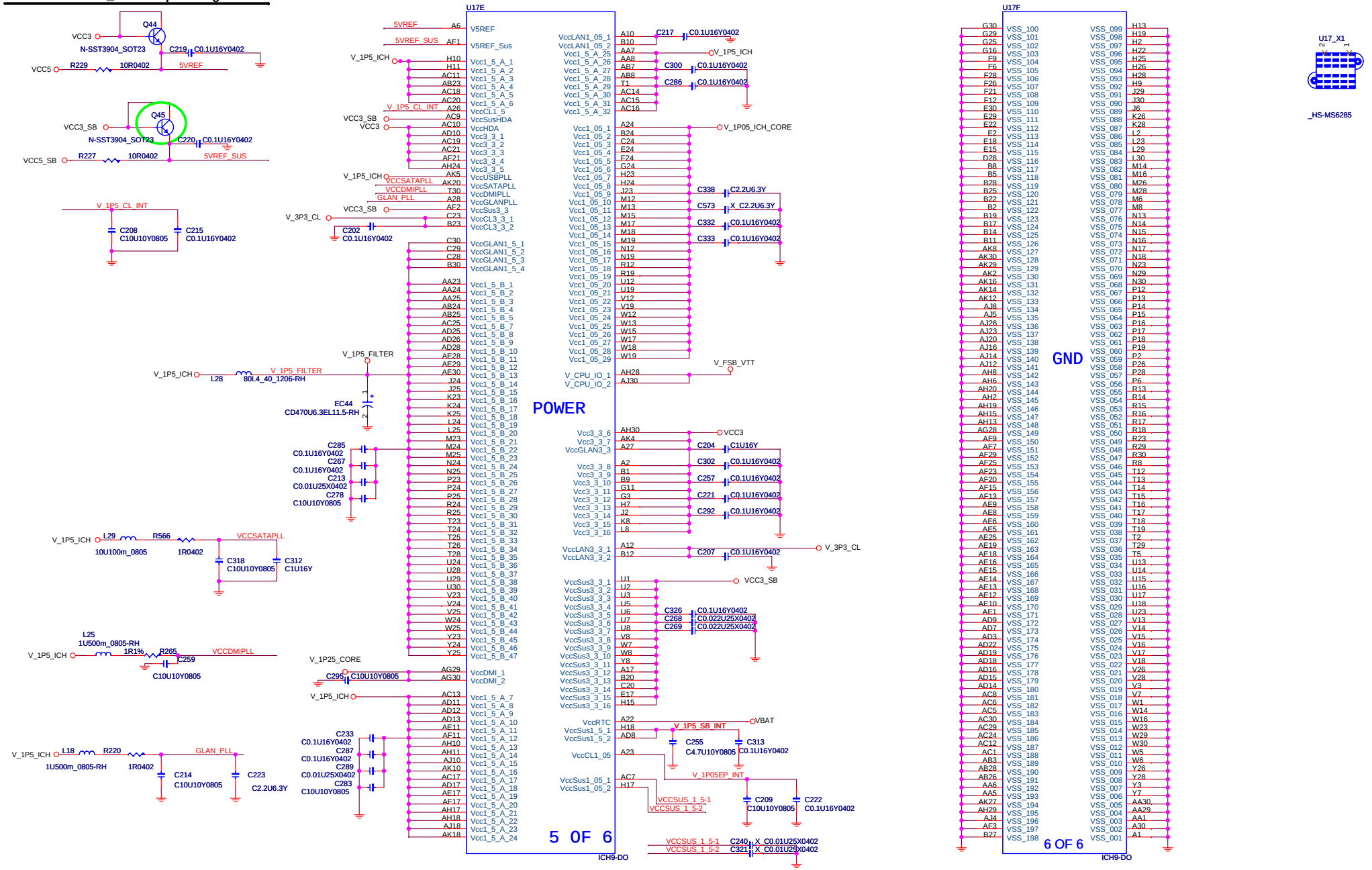
5VREF & 5VREF_SUS Sequencing Circuit



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

Title: INTEL ICH9 POWER

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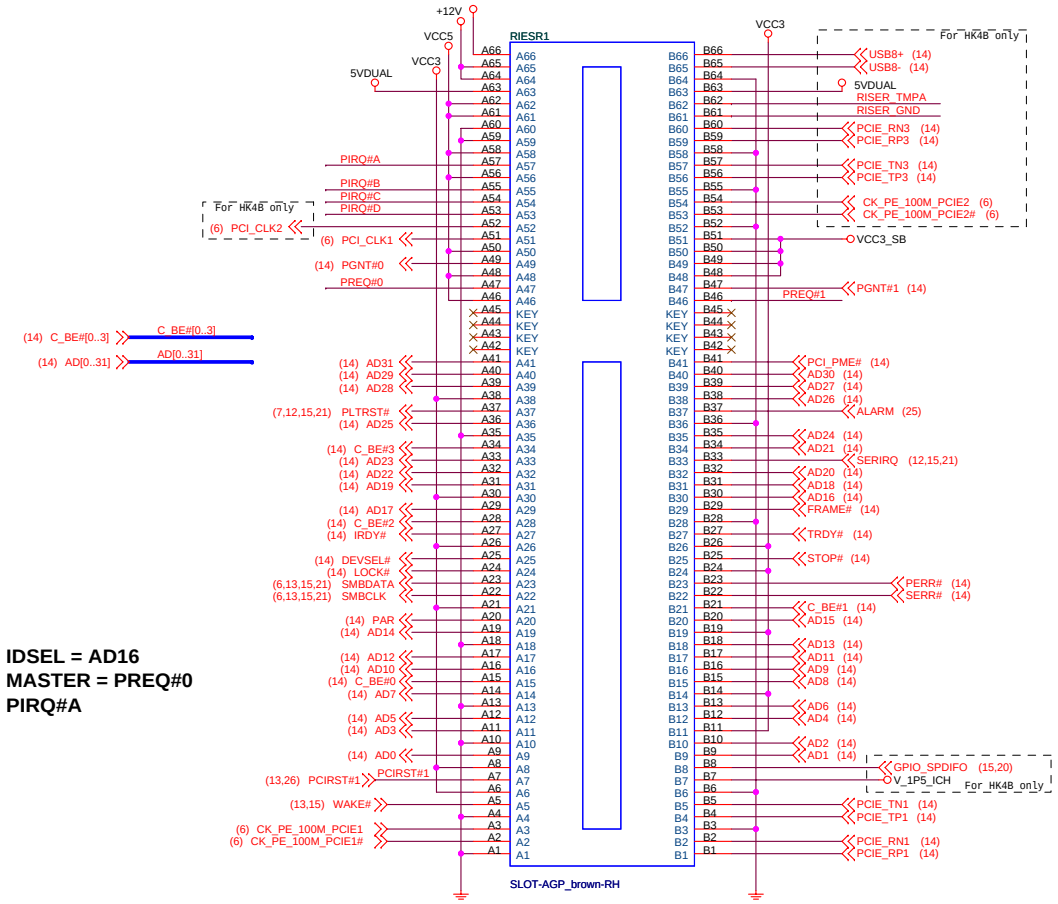
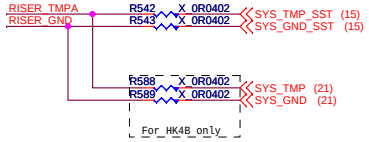
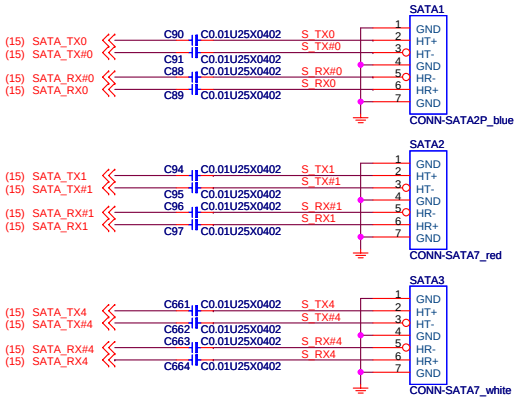
LB&HK4B riser card interface



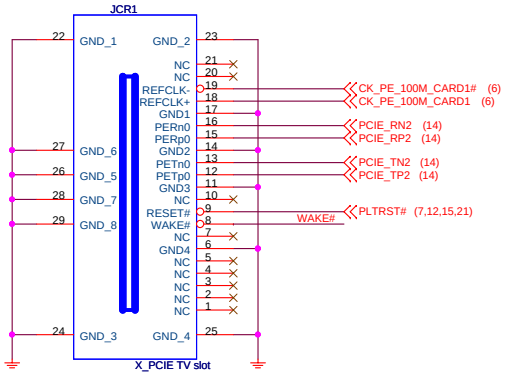


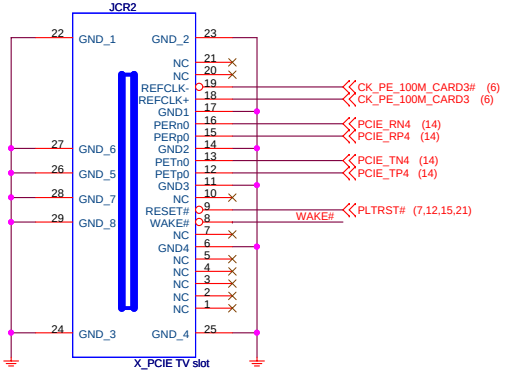
SERIAL ATA CONNECTOR BLOCK



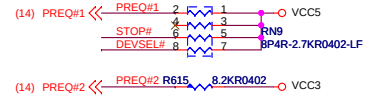
IDSEL = AD16
MASTER = PREQ#0
PIRQ#A

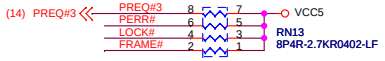
Lunar Bear not mount : JCR1, JCR2 & JCR5
HK4B : populate JCR1, reserve JCR2 & JCR5

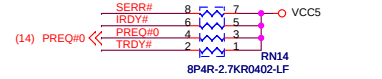


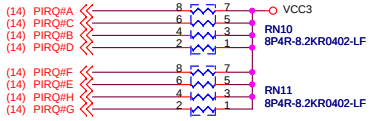


PCI PULL-UP / DOWN RESISTORS

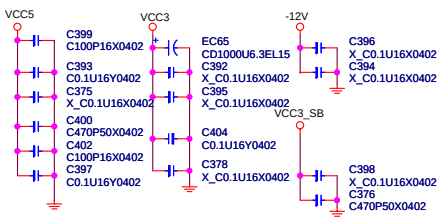


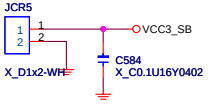






PCI SLOT DECOUPLING CAPACITORS





MSI Link to the Future **MICRO-START INT'L CO.,LTD.**

Title: **RISER & JCR& SATA Slots**

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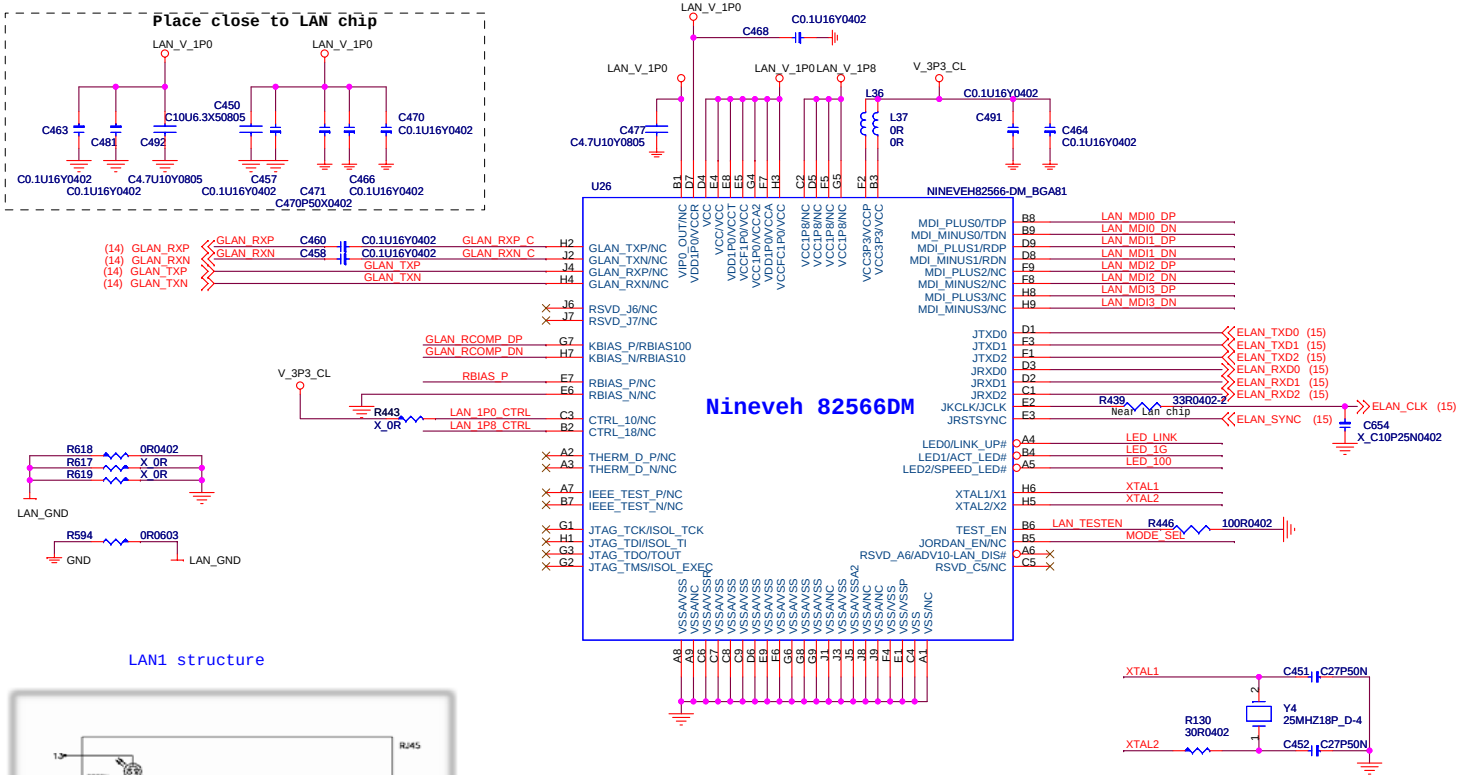
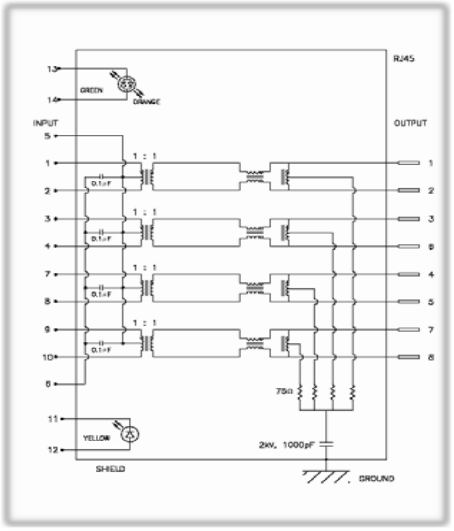
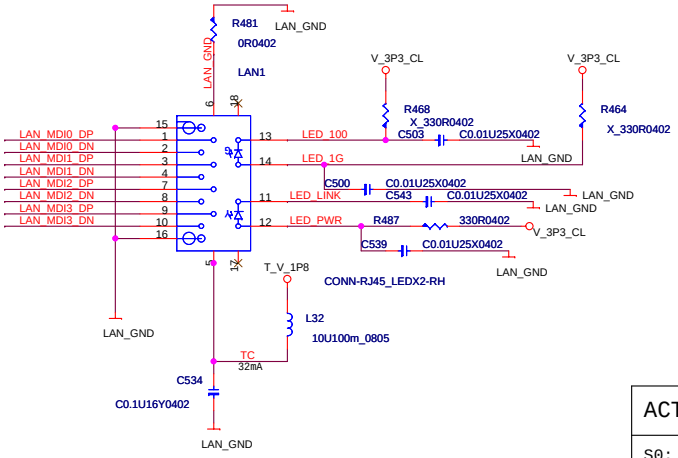
LAN - NINEVEH



LAN1 structure

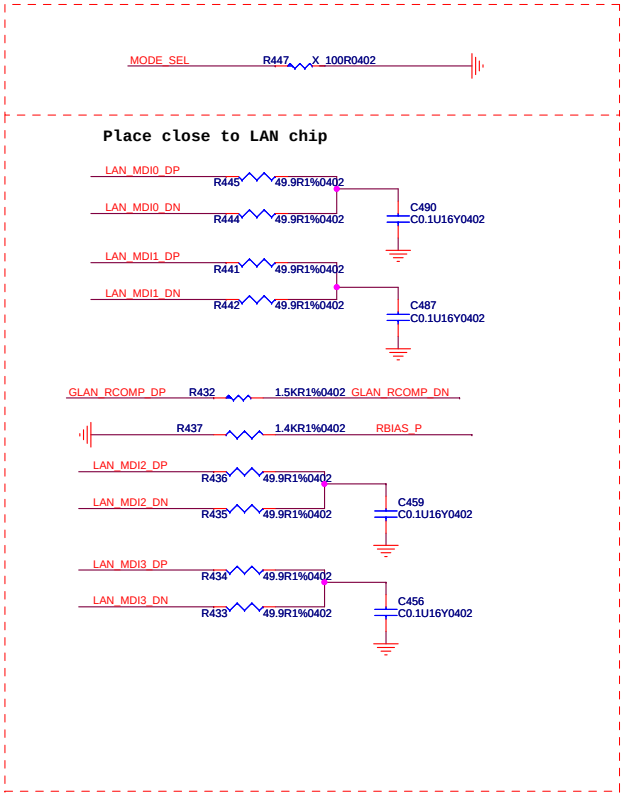


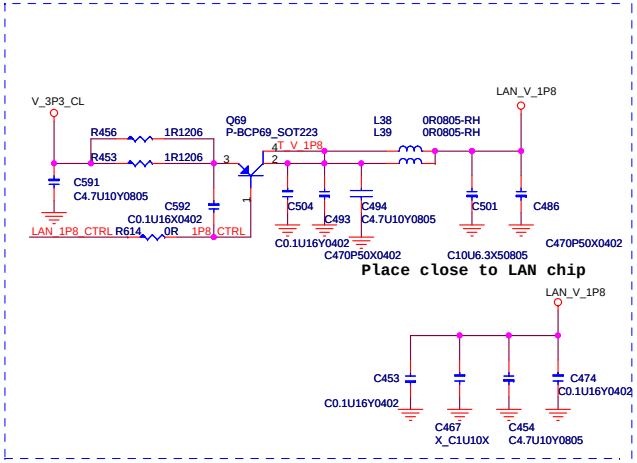
LAN CONNECTOR



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

For Active/Link:
Yellow





ACT_LED	Link_LED
S0: LOW	S0: LOW
S1/S3/S4/S5: HIGH	S5: HIGH
	S1/S3/S4: WOL EN-->LOW
	WOL DIS-->HIGH

MICRO-START INT'L CO.,LTD.

Title	LAN-NINEVEH 82566	
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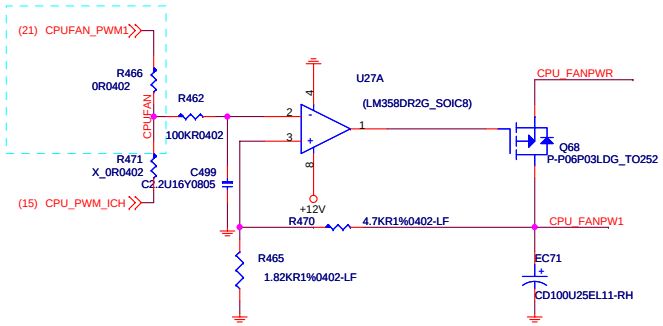
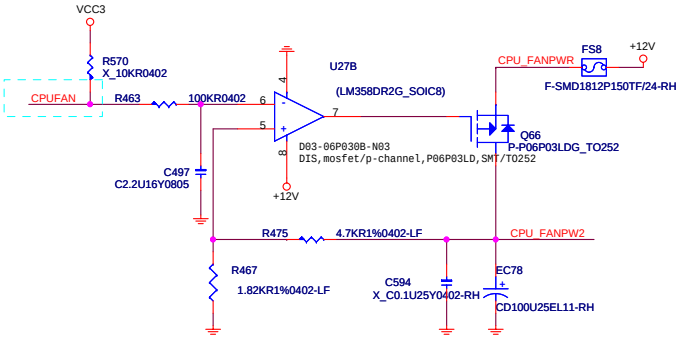
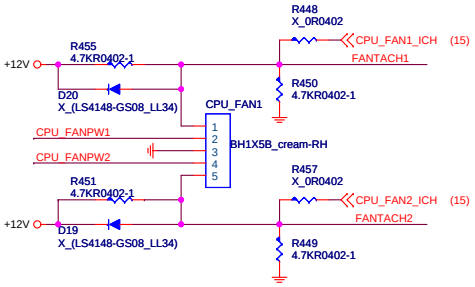
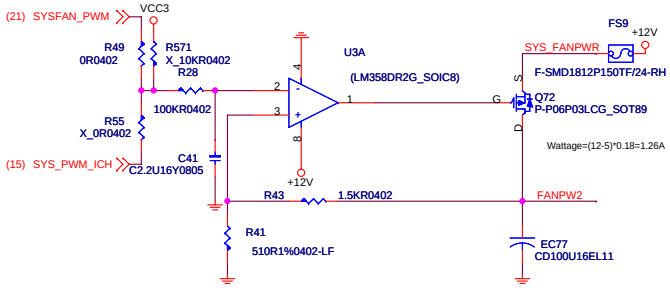


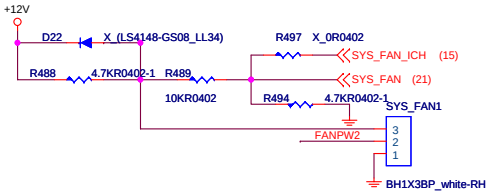


CPU FAN

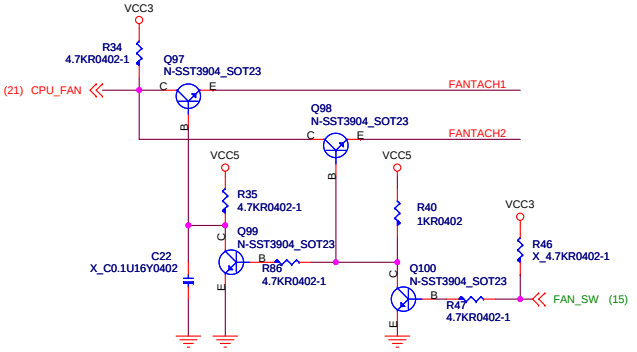


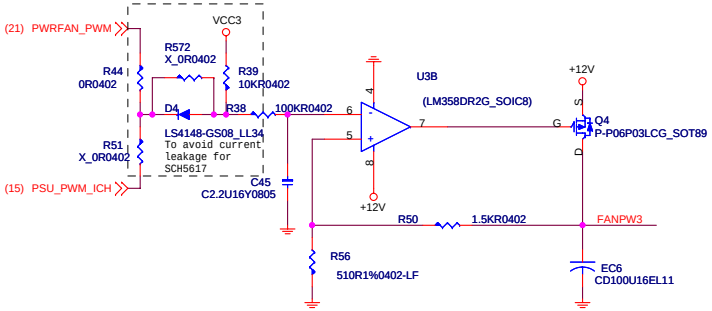


SYS FAN

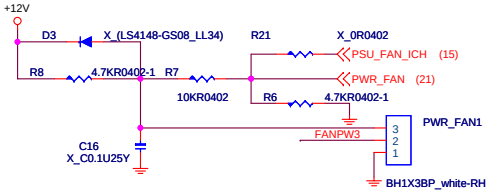


Switch circuit for CPU FAN1&FAN2 detection





PWR FAN



MICRO-START INT'L CO.,LTD.

Title	FAN control/detect	
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GPIO_2 H - Function OK; L - MUTE

PHONE JACKER

LINE-IN

LINE-OUT

ALC262

ALC262-C2-RH

for EMI reserve

for EMI reserve

For HK4B only

JFP1

1	PWR_LED	POW_SW	2
	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

For Front Panel

For LB only

20pin:LunarWater,Blues
6pin:HK4

Title	AUDIO-ALC262 & Front Panel
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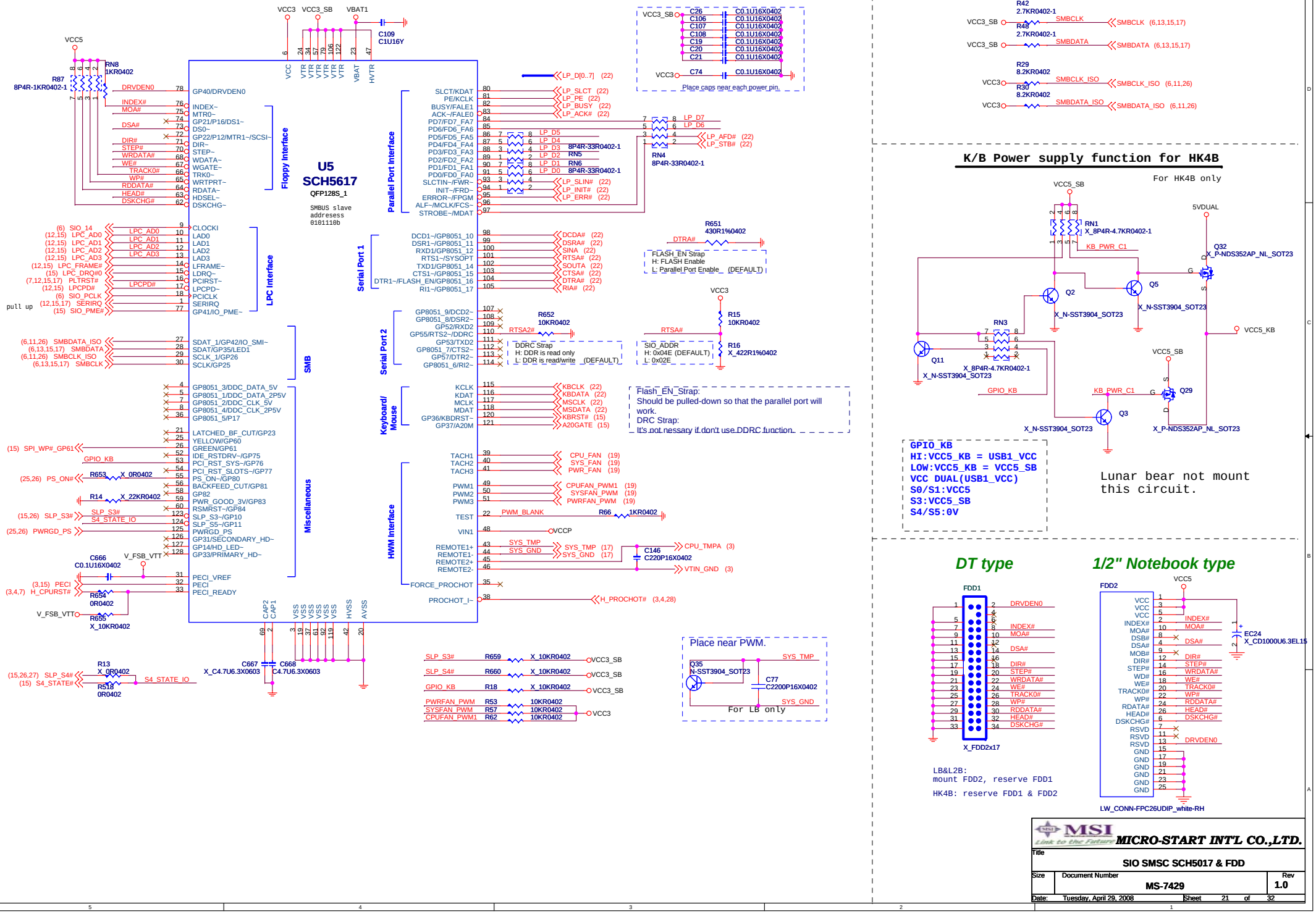
MICRO-START INT'L CO.,LTD.


U5
SCH5617
QFP128S_1
SMBUS slave addresess 0101110b
Floppy Interface
Parallel Port Interface
Serial Port 1
Serial Port 2
LPC Interface
SMB
Keyboard/ Mouse
Miscellaneous
HWM Interface
Flash_EN_Strap:
Should be pulled-down so that the parallel port will work.
DRC Strap:
It's not nessary if don't use DDRC function.
Place caps near each power pin.
Place near PWM.
For LB only
K/B Power supply function for HK4B
For HK4B only
GPIO_KB
HI:VCC5_KB = USB1_VCC
LOW:VCC5_KB = VCC5_SB
VCC DUAL(USB1_VCC)
S0/S1:VCC5
S3:VCC5_SB
S4/S5:0V
Lunar bear not mount this circuit.
DT type
1/2" Notebook type
LB&L2B:
mount FDD2, reserve FDD1
HK4B: reserve FDD1 & FDD2
LW_CONN-FPC26UDIP_white-RH
MICRO-START INT'L CO.,LTD.
SIO SMSC SCH5017 & FDD
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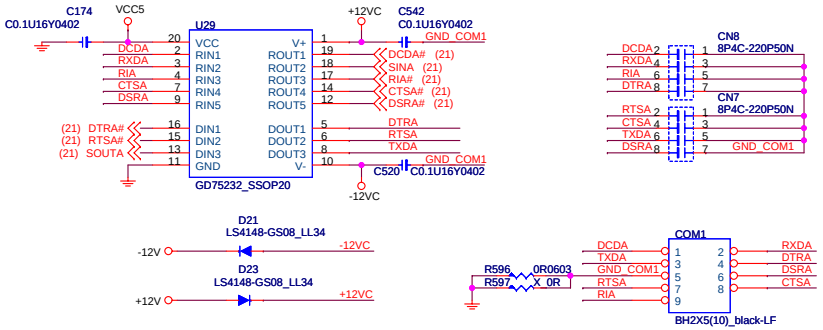
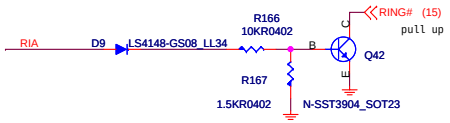
SERIAL PORT 1

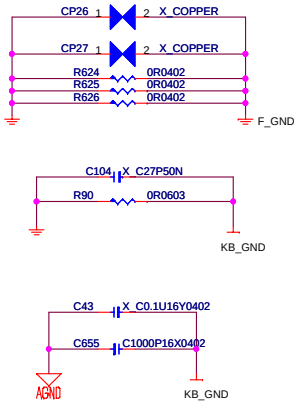
For LB only



Wake On Modem Header

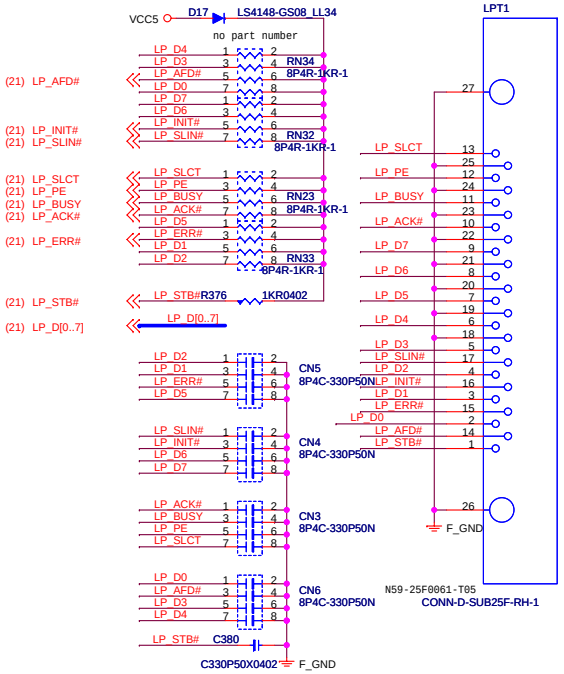
For LB only



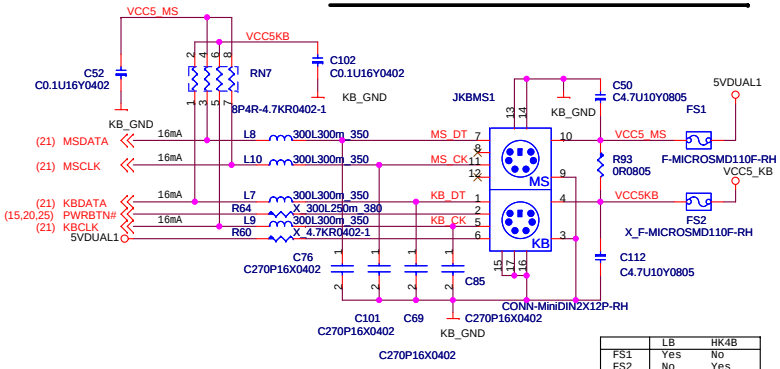


PARALLAL PORT

For LB only



PS2 KEYBOARD & MOUSE CONNECTOR



	LB	HK4B
FS1	Yes	No
FS2	No	Yes
R93	Yes	No
R60	No	Yes
R64	No	Yes
L8	Yes	No
L10	Yes	No
C76	Yes	No
C101	Yes	No

MSI Link to the Future **MICRO-START INT'L CO.,LTD.**

Title	KB/MS/LPT/COM Port/FAN	
Size	Document Number: MS-7429	Rev: 1.0
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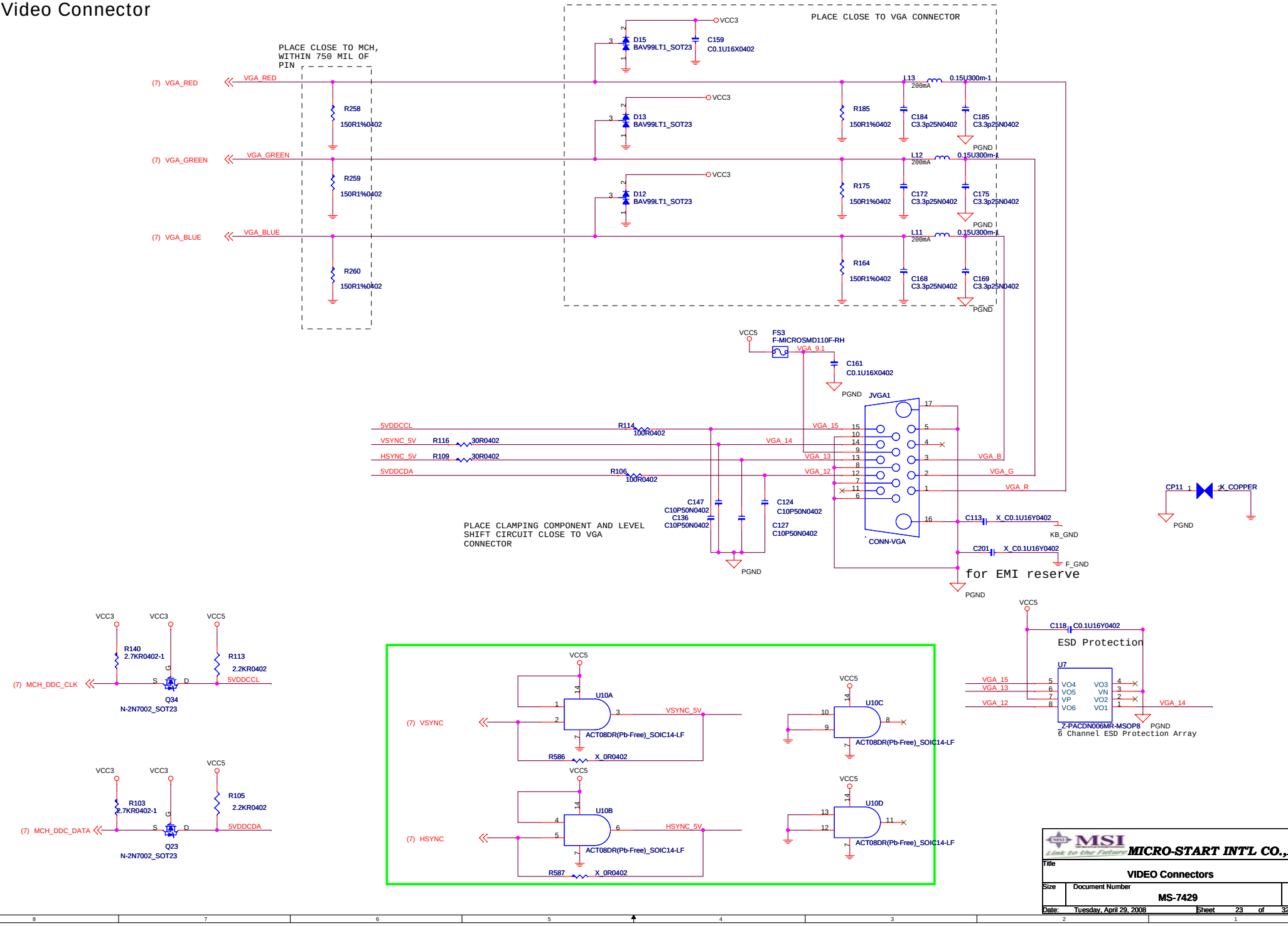
Video Connector



MSI Link to the Future	MICRO-START INT'L CO.,LTD.	
Title	VIDEO Connectors	
Size	Document Number MS-7429	Rev 1.0
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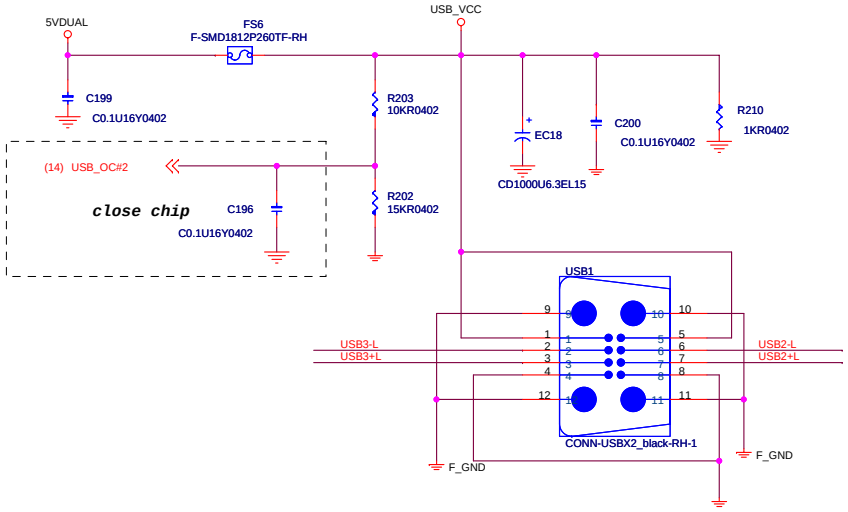
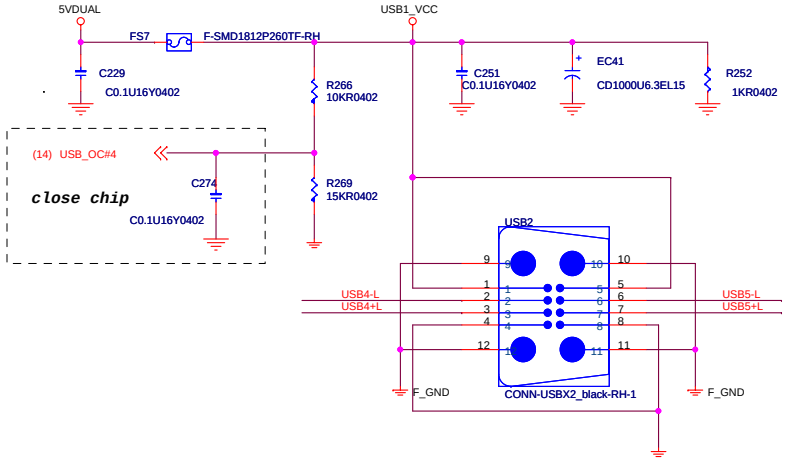
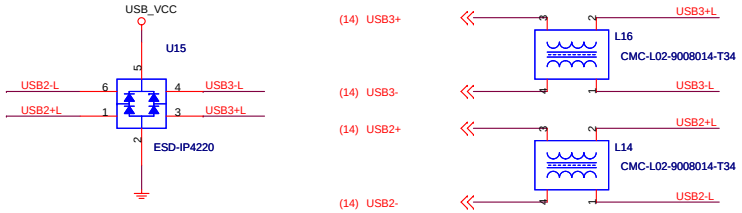
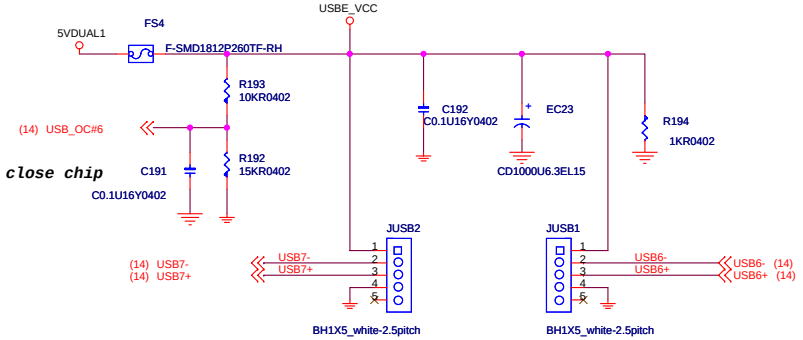
REAR USB PORT

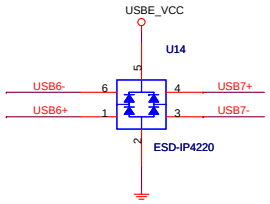




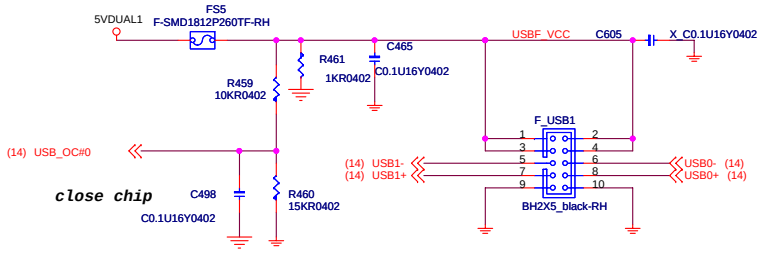


EXTERNAL USB PORT 0,1





FRONT PANEL USB PORT 6,7 CONNECTOR



MSI Link to the Future MICRO-START INT'L CO.,LTD.		
Title: USB Connectors		
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ATX connector / IR

VCC5
Ic=200mA
Vebo=5V
Vceo=40V
R71
1KR0402
R65
Q13
(15) SATALED#
IDE_LED
4.7KR0402-1
P-MMBT3906LT1G_SOT23-RH
R69
HDD_LED (20)
22R0402

For Debug
Remove after MP

J2
H1X2_black-RH
R438
100R0402
FP_RST# (15)
C469
C0.1U16Y0402
C473
X_C470P50X0402

IR Connector

C623
X_C0.1U16Y0402
F_GND
(15,20,22) PWRBTN#
R583
X_0R
IR_PWR1
VCC5_SB
VCC3
R506
X_10KR0402
(26) PWRGD_IR
R627
X_0R0402
X_YJ104-GR
C643
X_C100P16X0402

SPEAKER

VCC5
BZ1
BUZZER-LF
RN15
(17) ALARM
8P4R-470R0402-LF
C291
C0.1U16Y0402
(14,15) SPKR
R274
2.7KR0402-1
Q52
N-SST3904_SOT23

JFP1-1
(20,26) PWR_LED1
PWRSW (20)
SUS_LED (20,26)
HDD_LED (20)
X_H2X3(3)_black-RH

EMI CAPs for L2B

C32 C0.1U16Y0402
Place near CK_48M_USB_ICH for EMI.
V_1P25_CORE
C36 C0.1U16Y0402
Place near R643 for EMI.
5VDUAL1
C38 X_C0.1U16Y0402
Place near C21 for EMI.
VCC5_SB
C49 X_C0.1U16Y0402
Place near IR_PWR1 for EMI.
C606 C0.1U16Y0402
Place near LPT for EMI.
VCC3
C71 X_C0.1U16Y0402
Place near RN4 for EMI.
VCC3
C115 C0.1U16Y0402
Place near JCI1 for EMI.
-12V
C628 C0.1U16Y0402
C143 C0.1U16Y0402
PGND

for EMI reserve

VCCP ×14
PAD40 PAD42 PAD48 PAD28 PAD26 PAD24 PAD27 PAD23 PAD39 PAD37 PAD45 PAD47 PAD38
X_PAD

VCC5_SB
C607 X_C0.1U16Y0402
C372 X_C0.1U16Y0402
C365 X_C0.1U16Y0402
C243 X_C0.1U16Y0402
C522 X_C0.1U16Y0402
C84 X_C0.1U16Y0402
C618 X_C0.1U16Y0402
C619 X_C0.1U16Y0402
C620 X_C0.1U16Y0402

VCCP ×14
PAD44 PAD46 PAD43 PAD29 PAD34 PAD41 PAD32 PAD36 PAD30 PAD33 PAD31 PAD25 PAD35
X_PAD

VCC3
C608 X_C0.1U16Y0402
C609 X_C0.1U16Y0402
C610 X_C0.1U16Y0402
C53 X_C0.1U16Y0402

VCC5
C195 C0.01U25X0402
C478 X_C0.1U16Y0402
C181 C100P16X0402
c373 C0.1U16Y0402
C59 X_C0.1U16Y0402

VCC3_SB
C164 X_C0.1U16Y0402
C449 X_C0.1U16Y0402

VCC5
C14 X_C1U10X
C401 C0.1U16Y0402
VCC5
C13 X_C0.01U25X0402
VCC5
C235 X_C0.1U16Y0402
VCC5
C377 C0.1U16Y0402
C545 X_C0.1U16Y0402
C75 X_C0.1U16Y0402
C120 X_C0.1U16Y0402

VCC_DDR
C611 X_C0.1U16Y0402
C612 X_C0.1U16Y0402
C613 X_C0.1U16Y0402
C614 X_C0.1U16Y0402
C616 X_C0.1U16Y0402

+12V
C637 X_C100P16X0402
C638 X_C100P16X0402
C639 X_C100P16X0402
VCC5
C640 X_C100P16X0402
C641 X_C100P16X0402
C642 C0.1U16Y0402

for EMI reserve

VCC_DDR
C529 C0.1U16Y0402
VCC3
C405 C0.1U16Y0402
5VDUAL
C198 C0.1U16Y0402

ATX Connector

ATX1
VCC3
-12V
VCC5_SB
R58
4.7KR0402-1
(21,26) PS_ON#
PS_ON#
C57
X_C1000P16X0402
-5V
C58
X_C0.1U16Y0402
VCC5
C62
X_C0.1U16Y0402

13	3.3V	3.3V	1
14	-12V	3.3V	2
15	GND	GND	3
16	P_ON	5V	4
17	GND	GND	5
18	GND	5V	6
19	GND	GND	7
20	-5V	POK	8
21	5V	5VSB	9
22	5V	+12V	10
23	5V	+12V	11
24	GND	DET	12

2X12 POWER
X_PWR-2X12M_white-4.2pitch-LF

VCC3
C9
C0.1U16Y0402
VCC5
C61
C0.1U16Y0402
VCC5
R2
10KR0402
PWRGD_PS
PWRGD_PS (21,26)
VCC5_SB
C10
C0.1U16Y0402
+12V
C11
C0.1U16Y0402
C8
C12
C0.1U16Y0402
C0.1U16Y0402

11,12,23,24pin:reserve

ATX1-1
VCC3
-12V
PS_ON#
-5V
VCC5
POWER

11	3.3V	3.3V	1
12	-12V	3.3V	2
13	GND	GND	3
14	PSON	5V	4
15	GND	5V	5
16	GND	5V	6
17	GND	GND	7
18	-5V	POK	8
19	5V	5VSB	9
20	5V	12V	10

VCC3
VCC5
VCC5
PWRGD_PS
VCC5_SB
+12V

VTT_DDR
C514
X_C0.1U16Y0402
VTT_DDR
C556
C0.01U25X0402
VCC_DDR
C480 C483 C524 C236 C210
X_C4.7U10Y0805 X_C4.7U10Y0805 C0.22U10Y0402 X_C0.1U16Y0402 X_C0.1U16Y0402
-12V
C56 C55 C54
X_C0.1U16Y0402 X_C0.1U16Y0402 C0.1U16Y0402
VTT_DDR
C511
C0.1U16Y0402
+12V
C30
C0.1U16Y0402
VCC_DDR
C531
X_C0.1U16Y0402
VCC_DDR
C528
X_C0.1U16Y0402
VCC_DDR
C526
C0.1U16Y0402
VCC3
C158 C121 C7
C0.1U16Y0402
X_C0.1U16Y0402 X_C0.1U16Y0402

+12V
C371
X_C0.1U16Y0402
C596
X_C0.1U25Y0402-RH
C595
X_C0.1U25Y0402-RH
C621
X_C0.1U25Y0402-RH
C597
X_C0.1U25Y0402-RH
C622
X_C0.1U25Y0402-RH
VTT_DDR
C555
C0.1U16Y0402
VCC_DDR
C533
C0.22U10Y0402

MSI Link to the Future MICRO-START INT'L CO.,LTD.

Title	ATX connector / IR	
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VDIMM LINEAR OR PWM SELECT

VDIMM MODE	EXTRAM
LINEAR REGULATOR	PULL LOW
PWM REGULATOR	PULL HIGH

3VSB MODE SELECT

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

ACPI Controller

1.2V POWER (5.8A)

THIS PIN IS OPEN DRAIN OUTPUT

ICH9 1.5V POWER (2.75A)

ICH9 1.05V POWER (2A)

5VDIMM

5V DUAL Power

5VDIMM for iAMT

Ripplecur=2350mA

Kinesfiled VTT SEL for HK4B

Remove R509,R510,R547
Stuff R575,R511,C604,U31,R513,Q77,R512,Q91,R637,R638,R639

ALL DRV and Gate Pin should be more than 8 Mils Routing

Close to MS-11

Wide Trace

Wide Trace

near USB

Reserved for VIDGD test.

Title	ACPI CONTROLLER MS7
Size	Document Number: MS-7429
Rev	1.0
Date:	Tuesday, April 29, 2008
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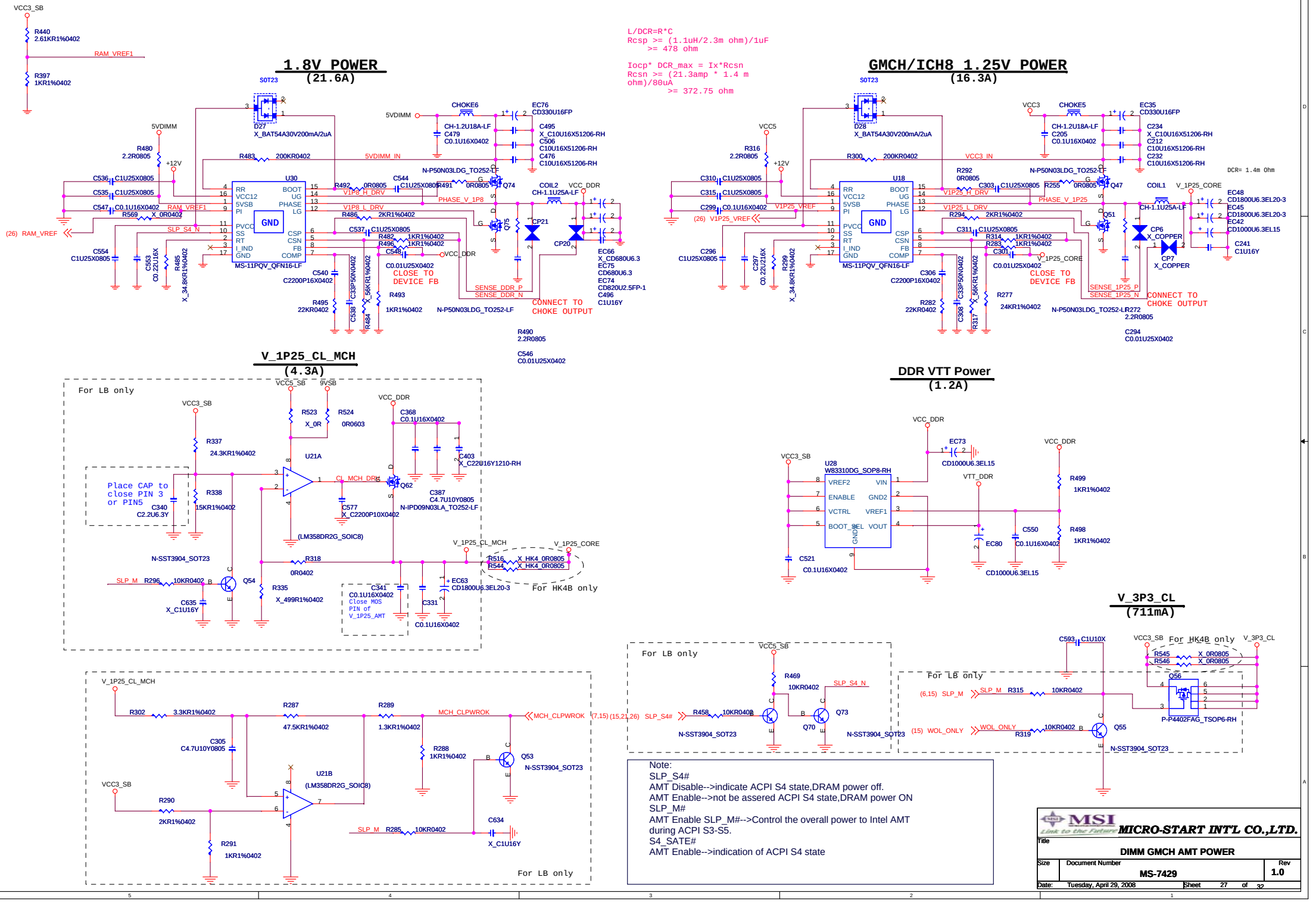
MSI Link to the Future MICRO-START INT'L CO.,LTD.


1.8V POWER
(21.6A)
GMCH/ICH8 1.25V POWER
(16.3A)
V_1P25_CL_MCH
(4.3A)
DDR VTT Power
(1.2A)
V_3P3_CL
(711mA)
L/DCR=R*C
Rcsp >= (1.1uH/2.3m ohm)/1uF
>= 478 ohm
Iocp* DCR_max = Ix*Rcsn
Rcsn >= (21.3amp * 1.4 m ohm)/80uA
>= 372.75 ohm
U30
MS-11PQV_QFN16-LF
U18
MS-11PQV_QFN16-LF
U21A
(LM358DR2G_SOIC8)
U21B
(LM358DR2G_SOIC8)
U28
W83310DG_SOP8-RH
CONNECT TO CHOKE OUTPUT
CLOSE TO DEVICE FB
For LB only
For HK4B only
Note:
SLP_S4#
AMT Disable-->indicate ACPI S4 state,DRAM power off.
AMT Enable-->not be assered 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
MICRO-START INT'L CO.,LTD.
DIMM GMCH AMT POWER
MS-7429
1.0
Tuesday, April 29, 2008
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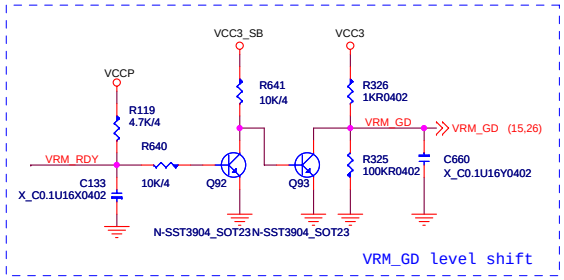
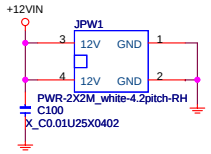
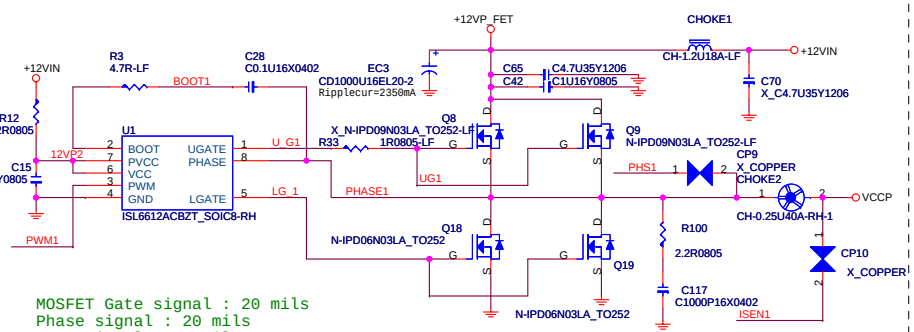
ATX12V Power Connector

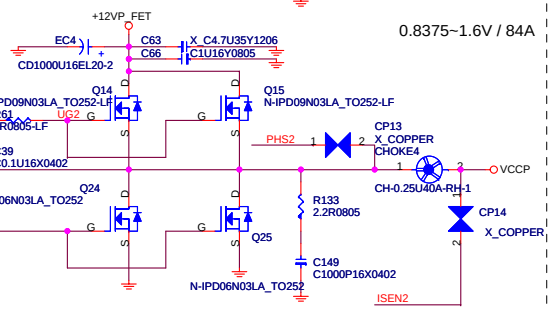




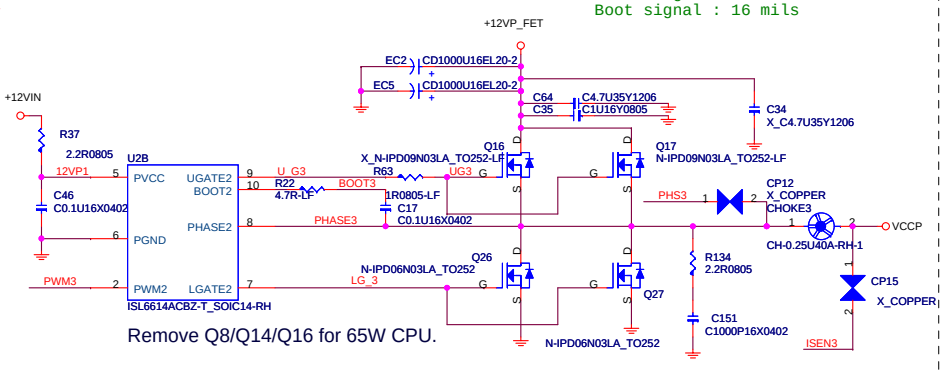


MOSFET Gate signal : 20 mils
Phase signal : 20 mils
Boot signal : 16 mils

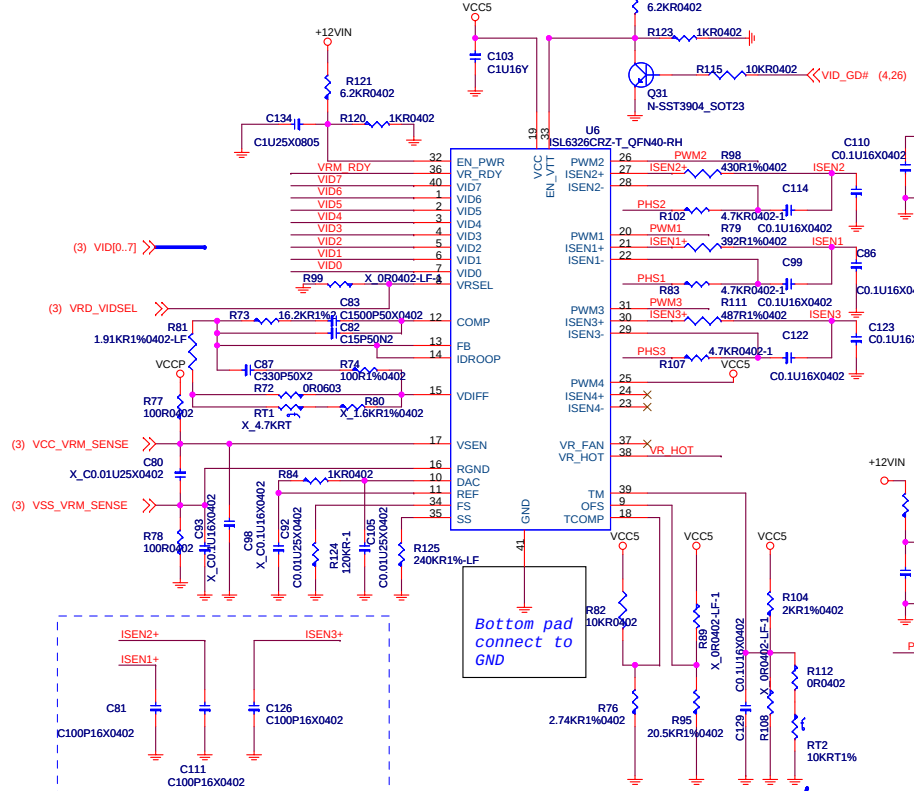
0.8375~1.6V / 84A



MOSFET Gate signal : 20 mils
Phase signal : 20 mils
Boot signal : 16 mils

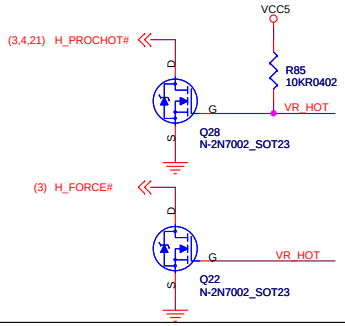


Remove Q8/Q14/Q16 for 65W CPU.



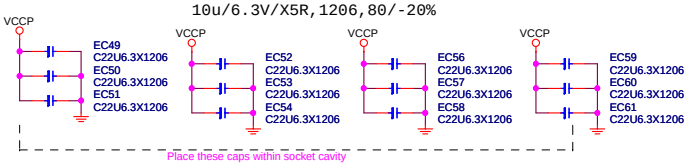
TDK NTCG104KF104FT

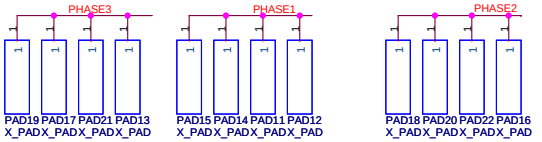
VR FAN TRIP:1.69V ~ 80 degC
VR HOT TRIP:1.44V ~ 90 degC

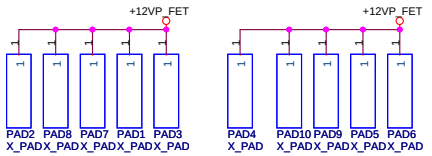


CPU DECOUPLING CAPACITORS

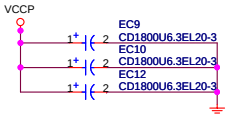
10u/6.3V/X5R,1206,80/-20%



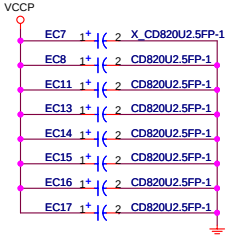




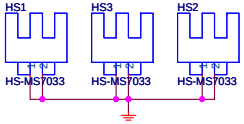
EL Capacitors



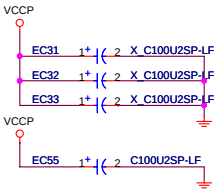
OS-CON Capactiors



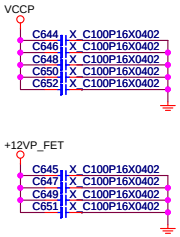
MOSFET Heatsinks



SP Capacitors



for EMI reserve



MSI Link to the Future MICRO-START INT'L CO.,LTD.

Title	VRM 11 - Intersil 6326 3 Phases	
Size	Document Number: MS-7429	Rev: 1.0
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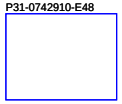
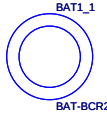
Auto-BOM Manual Parts

PCB1
P31-0742910-E48



BAT1_1



BAT-BCR2032P-RH

U22_A1
HS_HOOK1X3(2)_black-LF-1

U22_B1
HS_HOOK1X3(2)_black-LF-1

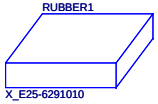
U22_C1
HS_HOOK1X3(2)_black-LF-1

U22_D1
HS_HOOK1X3(2)_black-LF-1

U13_L1

BIOS_LABEL

RUBBER1



X_E25-6291010

J1(1-2)
_JUMPER-1X2B_black-RH

JBAT1(1-2)
_JUMPER-1X2B_black-RH

JCI1(1-2)
_JUMPER-1X2B_black-RH

JFP1

1	PWR_LED	POW_SW	2
	NC	SLP_LED	4
5	GND	HDD_LED	6

For HK4B

MSI Link to the Future **MICRO-START INT'L CO.,LTD.**

Title: AutoBOM		
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ICH9

GPIO Pin	Type	Default	Function	Power	MUXED/ UNMUXED	Pin-out
GPIO 0	I/O	GPI	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	SIO_PME# connect to SIO,pull_up VCC3_SB with 10k	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	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	NC	VCC3	UNMUXED	K1
GPIO 19	I/O	GPI	Pull-up to VCC3 with 10K	VCC3		AE20
GPIO 20	I/O	GPO	NC	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	Pull up VCC3 with 10k	VCC3	UNMUXED	K2
GPIO 33	I/O	GPO	Pull-up to VCC3 with 4.7K through JCI1 jumper.(Default)	VCC3	UNMUXED	AF6
GPIO 34	I/O	GPO	NC	VCC3	UNMUXED	AH5
GPIO 35	I/O	GPO	NC	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-down to GND 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-dowm 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 passwork, 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	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
Riser slot (CARD1)	PIRQ#C PIRQ#D PIRQ#A PIRQ#B	PREQ#0 PGNT#0	AD18	PCI_CLK2

DDR2 DIMM Configuration

DEVICE	ADDRESS	CLOCK
DIMM 1	0A0H	SCLK_A0/SCLK_A0# SCLK_A1/SCLK_A1# SCLK_A2/SCLK_A2#
DIMM 2	0A4H	SCLK_B0/SCLK_B0# SCLK_B1/SCLK_B1# SCLK_B2/SCLK_B2#

SIO - SMSC-5617 Configuration

PIN NAME	PIN#	USAGE	Input/Output
GP76	53	GPIO_KB	OUTPUT
GP41	77	SIO_PME#	OUTPUT

SMBus Distribution

SMBus	Power	Load
SMBCLK	VCC3_SB	SIO, ICH9, 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

MSI Link to the Future **MICRO-START INT'L CO.,LTD.**

Title: **GPIO PIN definition**

Size | Document Number: **MS-7429** | Rev: **1.0**

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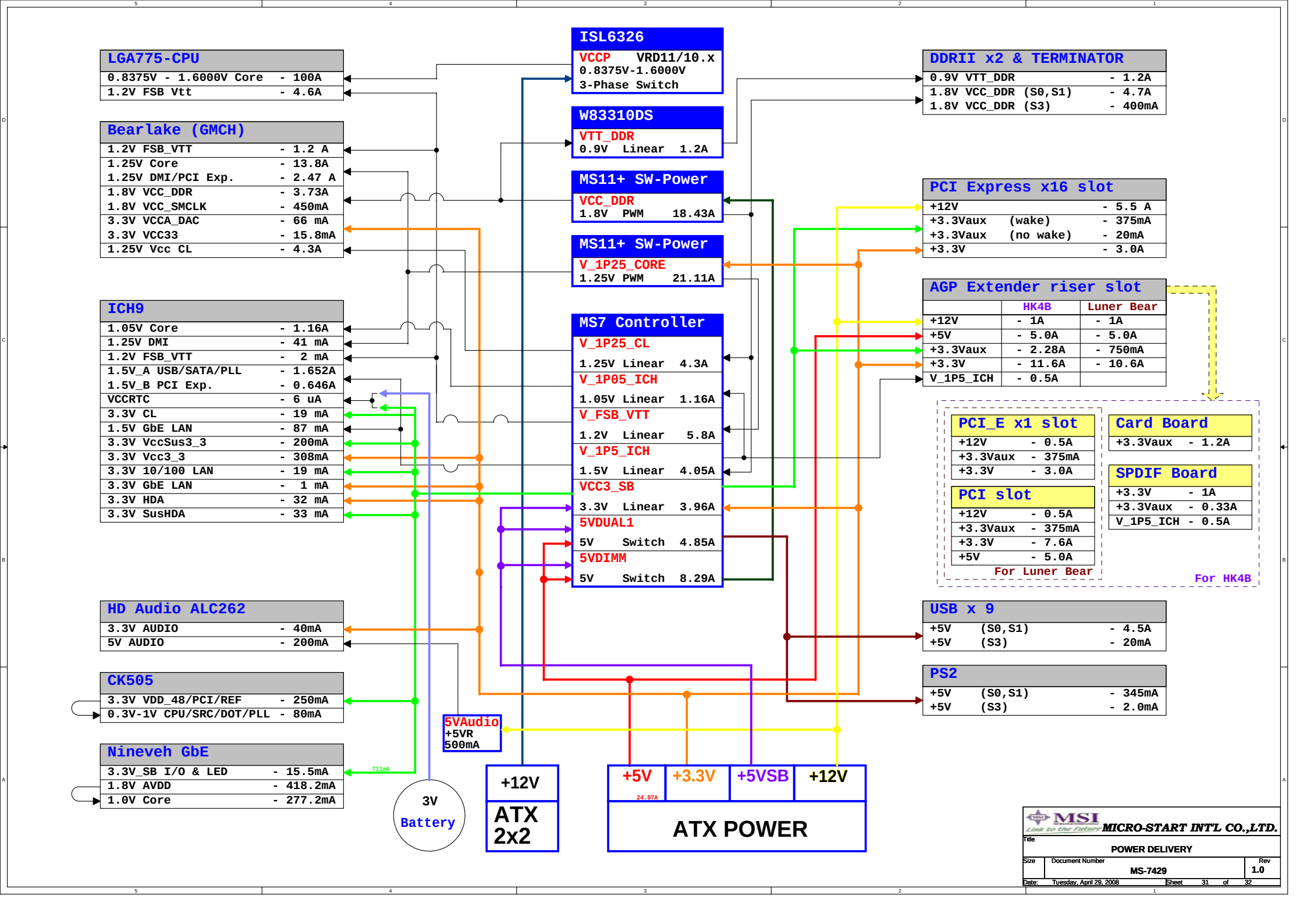
LGA775-CPU
0.8375V - 1.6000V Core - 100A
1.2V FSB Vtt - 4.6A
Bearlake (GMCH)
1.2V FSB_VTT - 1.2 A
1.25V Core - 13.8A
1.25V DMI/PCI Exp. - 2.47 A
1.8V VCC_DDR - 3.73A
1.8V VCC_SMCLK - 450mA
3.3V VCCA_DAC - 66 mA
3.3V VCC33 - 15.8mA
1.25V Vcc CL - 4.3A
ICH9
1.05V Core - 1.16A
1.25V DMI - 41 mA
1.2V FSB_VTT - 2 mA
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 ALC262
3.3V AUDIO - 40mA
5V AUDIO - 200mA
CK505
3.3V VDD_48/PCI/REF - 250mA
0.3V-1V CPU/SRC/DOT/PLL - 80mA
Nineveh GbE
3.3V_SB I/O & LED - 15.5mA
1.8V AVDD - 418.2mA
1.0V Core - 277.2mA
711mA
3V
Battery
ISL6326
VCCP VRD11/10.x
0.8375V-1.6000V
3-Phase Switch
W83310DS
VTT_DDR
0.9V Linear 1.2A
MS11+ SW-Power
VCC_DDR
1.8V PWM 18.43A
MS11+ SW-Power
V_1P25_CORE
1.25V PWM 21.11A
MS7 Controller
V_1P25_CL
1.25V Linear 4.3A
V_1P05_ICH
1.05V Linear 1.16A
V_FSB_VTT
1.2V Linear 5.8A
V_1P5_ICH
1.5V Linear 4.05A
VCC3_SB
3.3V Linear 3.96A
5VDUAL1
5V Switch 4.85A
5VDIMM
5V Switch 8.29A
5VAudio
+5VR
500mA
+12V
ATX
2x2
+5V
24.97A
+3.3V
+5VSB
+12V
ATX POWER
DDRII x2 & TERMINATOR
0.9V VTT_DDR - 1.2A
1.8V VCC_DDR (S0,S1) - 4.7A
1.8V VCC_DDR (S3) - 400mA
PCI Express x16 slot
+12V - 5.5 A
+3.3Vaux (wake) - 375mA
+3.3Vaux (no wake) - 20mA
+3.3V - 3.0A
AGP Extender riser slot
HK4B
Luner Bear
+12V - 1A - 1A
+5V - 5.0A - 5.0A
+3.3Vaux - 2.28A - 750mA
+3.3V - 11.6A - 10.6A
V_1P5_ICH - 0.5A
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
For Luner Bear
Card Board
+3.3Vaux - 1.2A
SPDIF Board
+3.3V - 1A
+3.3Vaux - 0.33A
V_1P5_ICH - 0.5A
For HK4B
USB x 9
+5V (S0,S1) - 4.5A
+5V (S3) - 20mA
PS2
+5V (S0,S1) - 345mA
+5V (S3) - 2.0mA
MSI
Link to the Future
MICRO-START INT'L CO.,LTD.
Title
POWER DELIVERY
Size
Document Number
MS-7429
Rev
1.0
Date: Tuesday, April 29, 2008
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