# MS-7610

**Version 2.1**

**CPU:**

**Intel Conroe (95W Dual core)**

**System Chipset:**

**Intel G41 - MCH (North Bridge)**
**Intel ICH7 (South Bridge)**

**On Board Chipset:**

**BIOS -- SPI**
**HD -- RTL889**
**LPC Super I/O -- F71889G**
**LAN - 8111DL**
**CLOCK -- RTM875-605**

**Main Memory:**

**DDR III *2 (Max 4GB)**

**Expansion Slots:**

**PCI2.3 SLOT * 3**
**PCI EXPRESS X1 SLOT *2**
**PCI EXPRESS X16 SLOT *1**

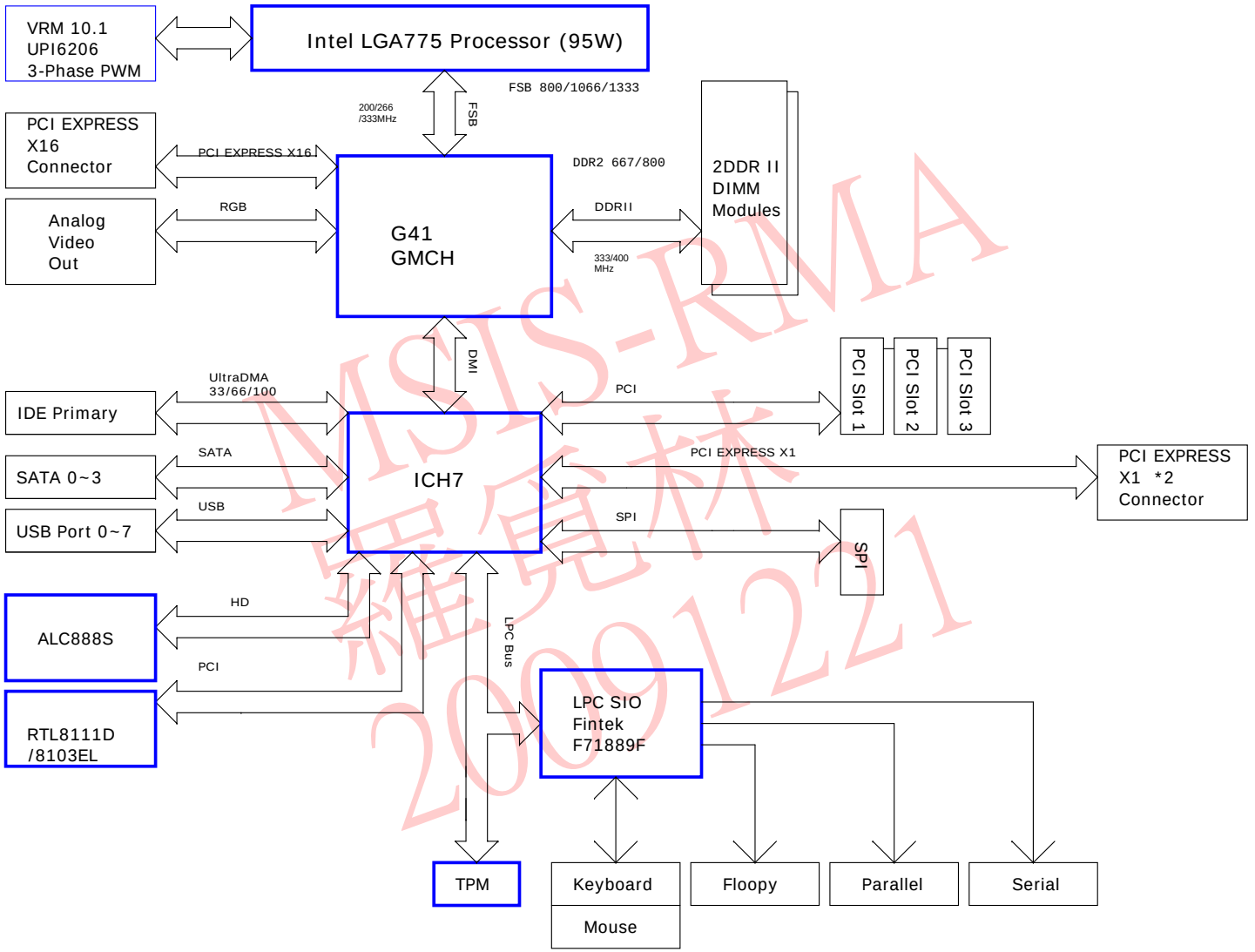
**UPI PWM:**

**Controller: 3 PHASES + APS**



| | | |
|---|---|---|
| MSI | MICRO-STAR INT'L CO.,LTD | |
| | MS-7610 | |
| Size: Custom | Document Description: Cover Sheet | Rev: 2.1 |
| Date: Thursday, December 03, 2009 | Sheet 1 of 33 | |

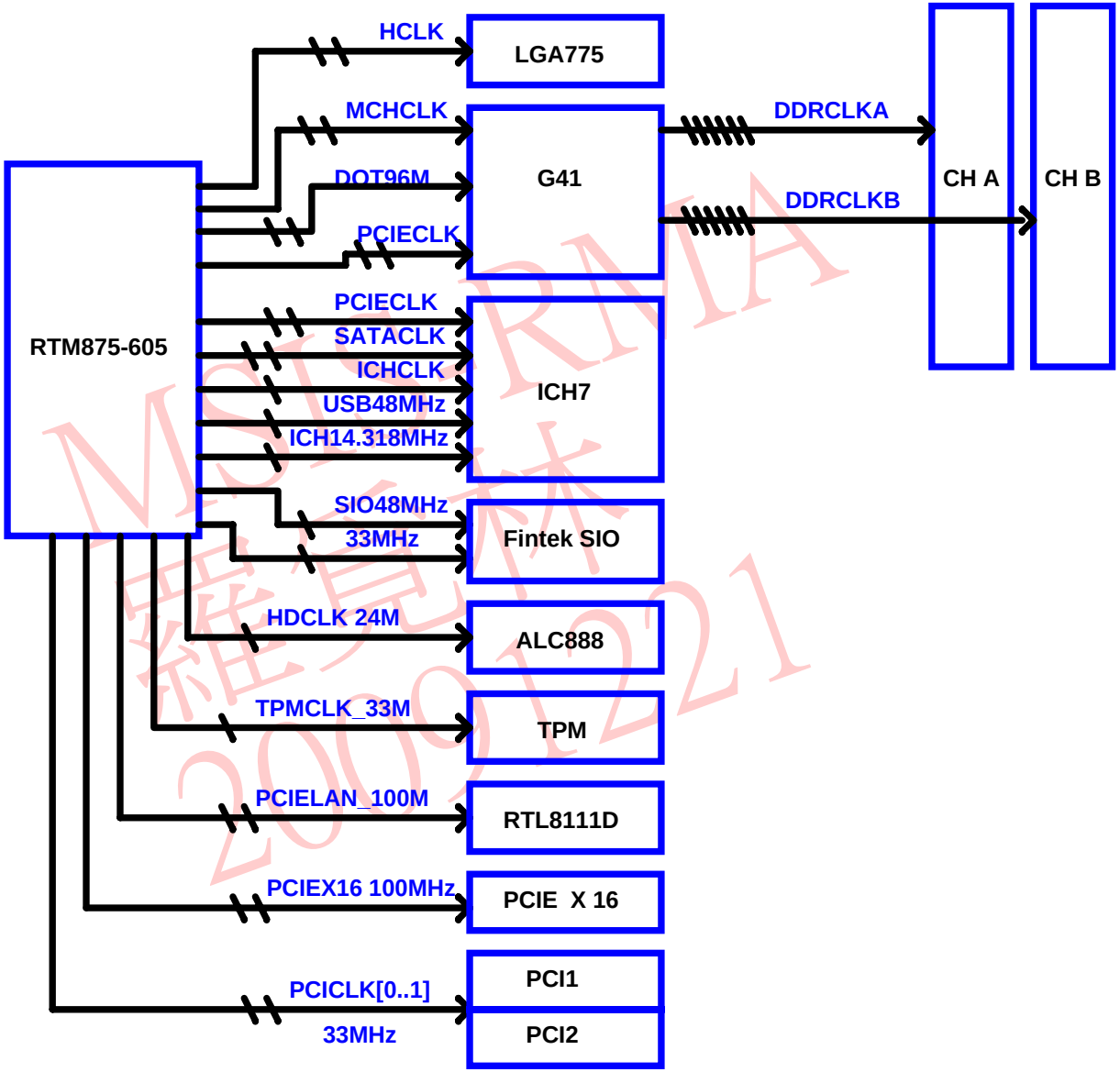
# Block Diagram





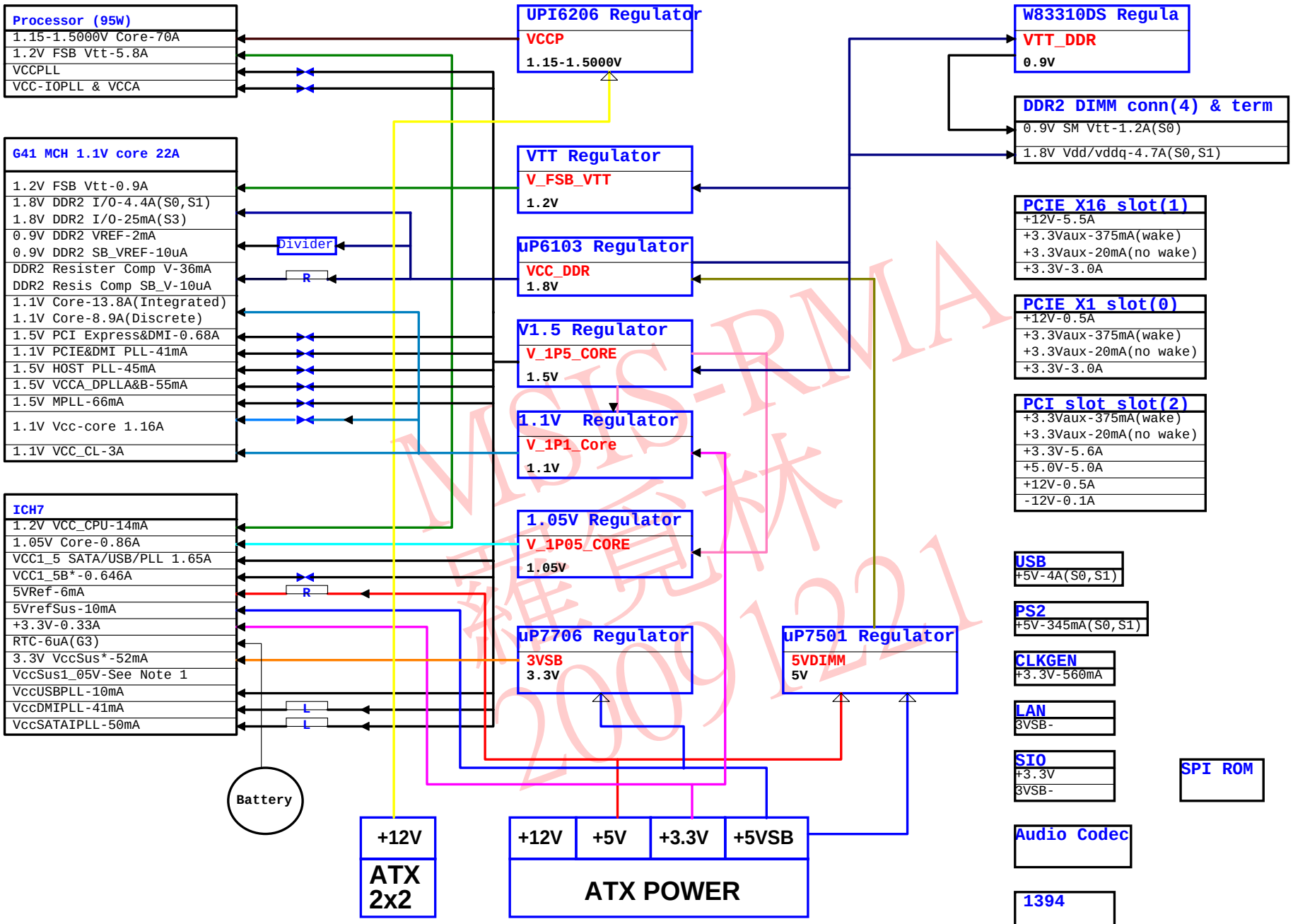

| | | |
|---|---|---|
| MSI | MICRO-STAR INT'L CO.,LTD | |
| | MS-7610 | |
| Size: Custom | Document Description: BLOCK DIAGRAM | Rev: 2.1 |
| Date: Thursday, December 03, 2009 | Sheet 2 of 33 | |

# CLOCK MAP



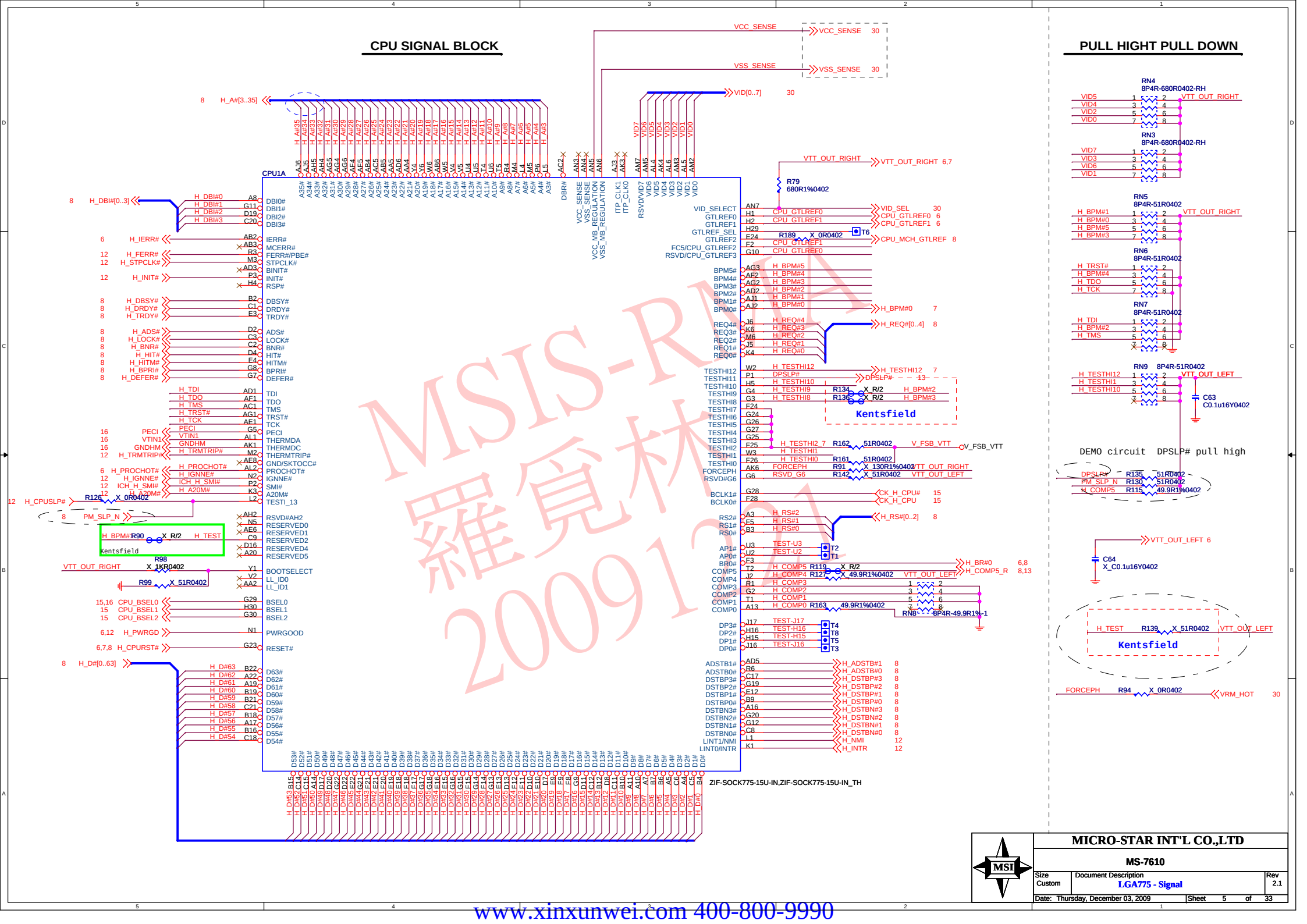



| | | |
|---|---|---|
| MICRO-STAR INT'L CO.,LTD | | |
| MS-7610 | | |
| Size: Custom | Document Description: CLOCK MAP | Rev: 2.1 |
| Date: Thursday, December 03, 2009 | Sheet 3 of 33 | |

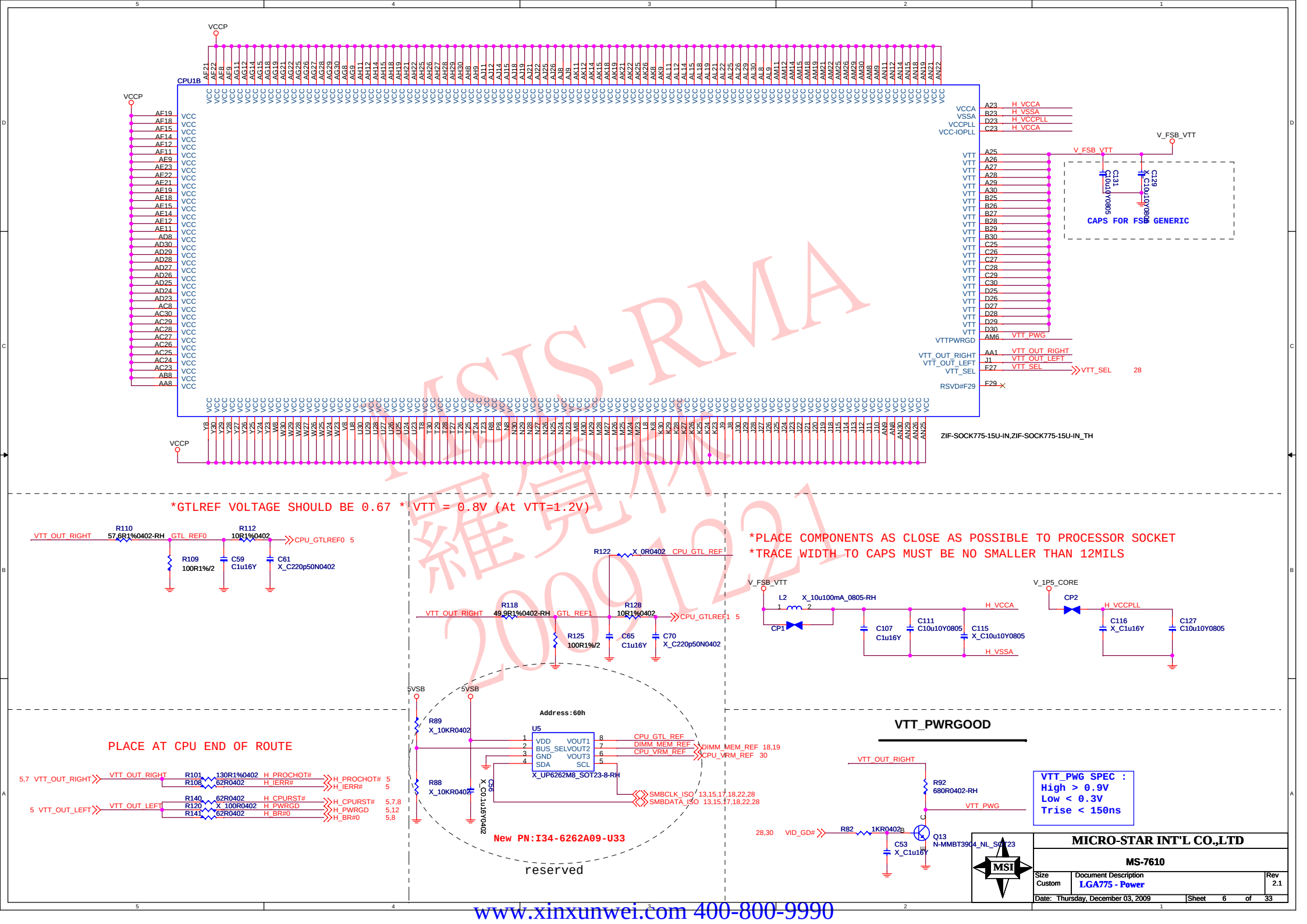


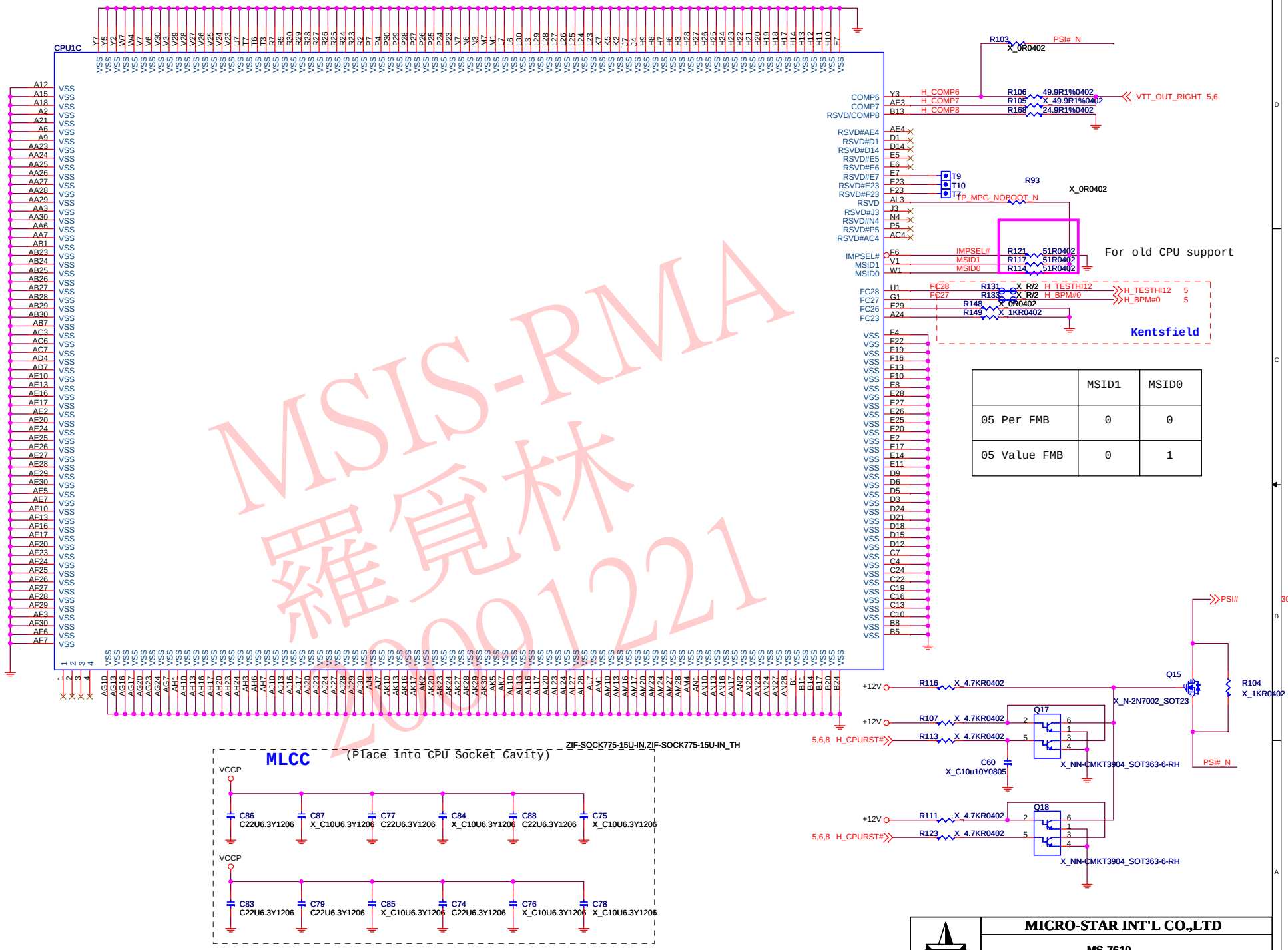



| | |
|---|---|
| MICRO-STAR INT'L CO.,LTD | |
| MS-7610 | |
| Size: Custom | Document Description: LGA775 - Signal |
| Rev: 2.1 | |
| Date: Thursday, December 03, 2009 | Sheet 4 of 33 |




| | |
|---|---|
| MICRO-STAR INT'L CO.,LTD | |
| MS-7610 | |
| Size: Custom | Document Description: LGA775 - Signal |
| Rev: 2.1 | |
| Date: Thursday, December 03, 2009 | Sheet 5 of 33 |






| | MSID1 | MSID0 |
|---|---|---|
| 05 Per FMB | 0 | 0 |
| 05 Value FMB | 0 | 1 |

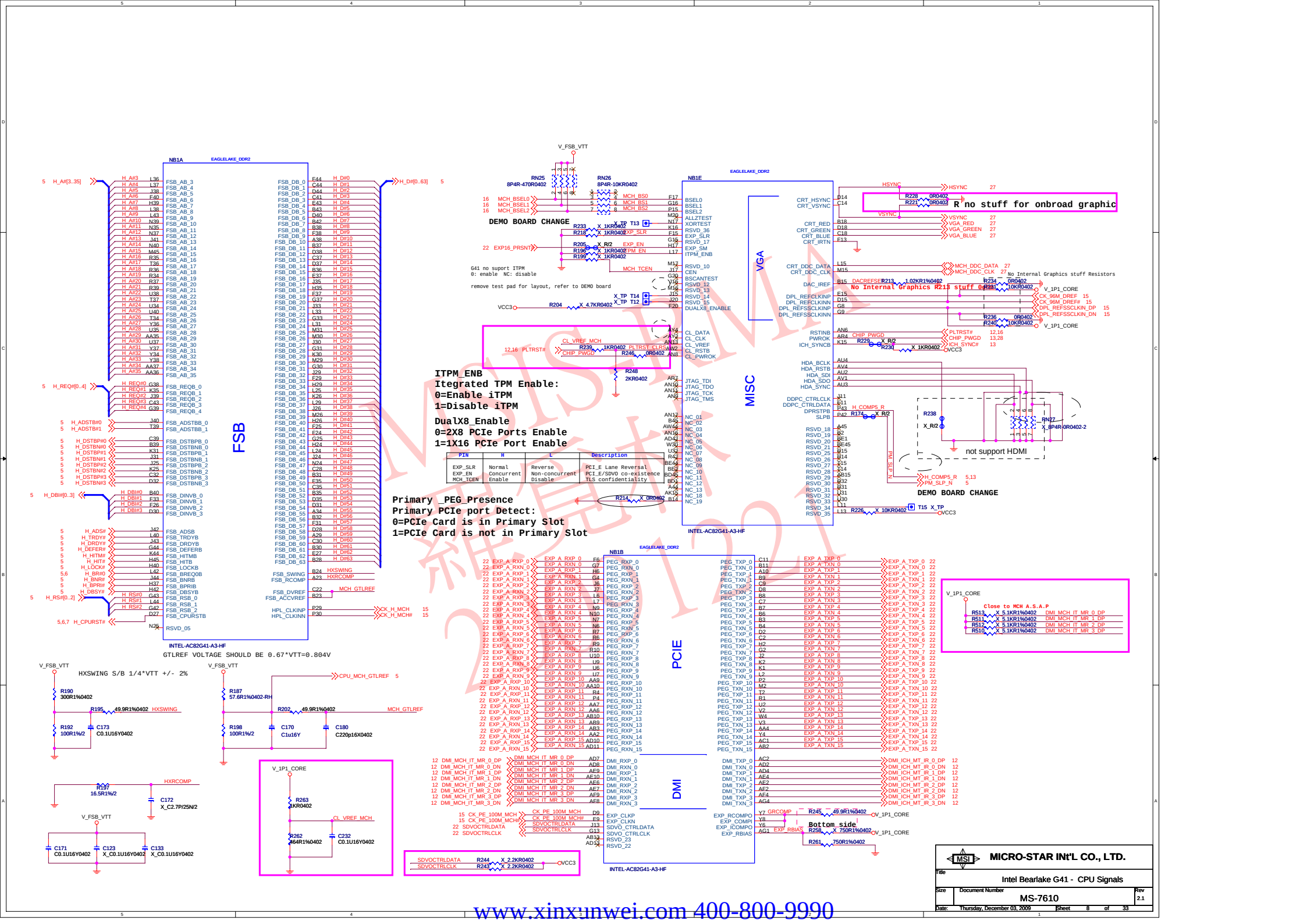


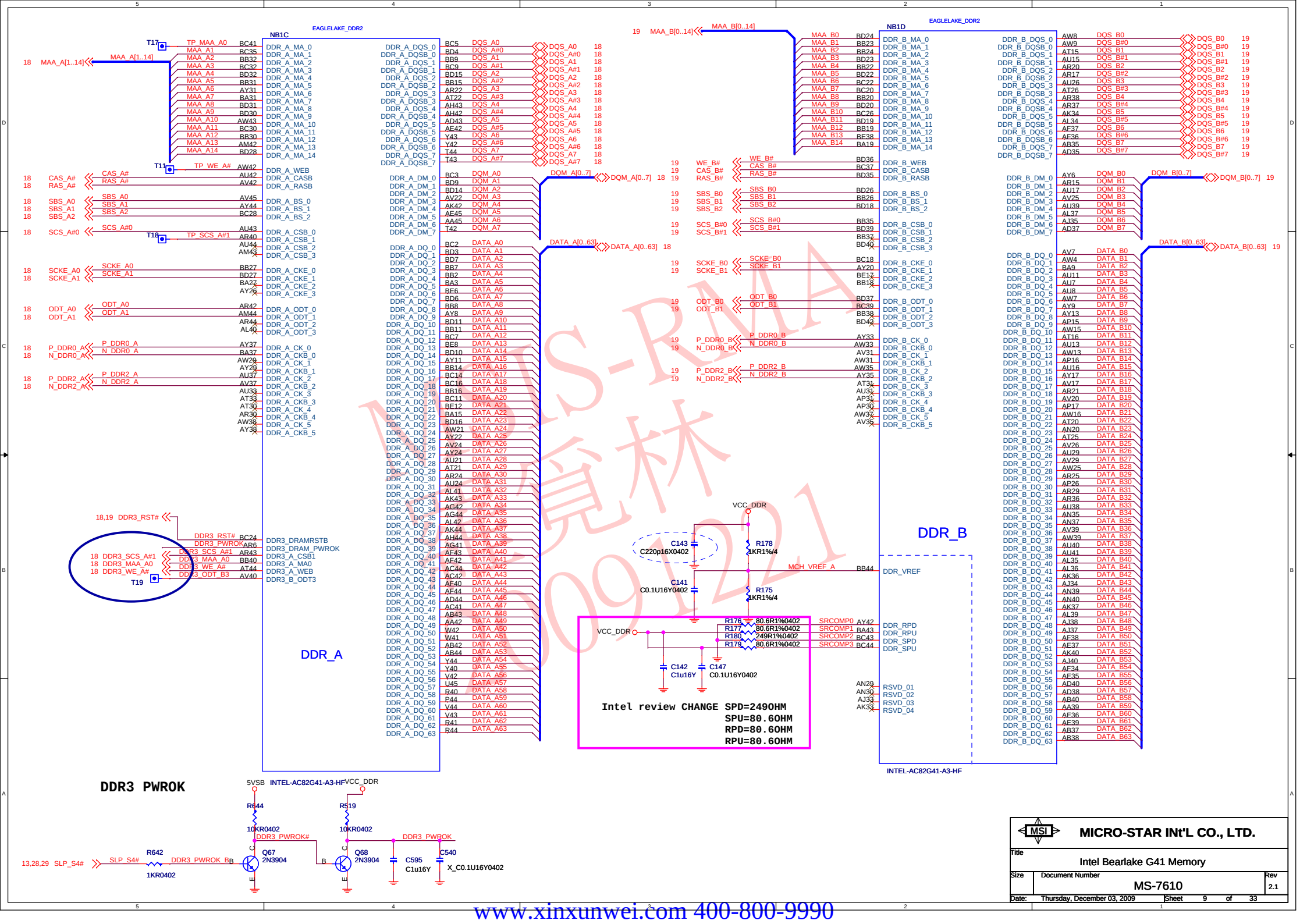
MICRO-STAR INT'L CO.,LTD

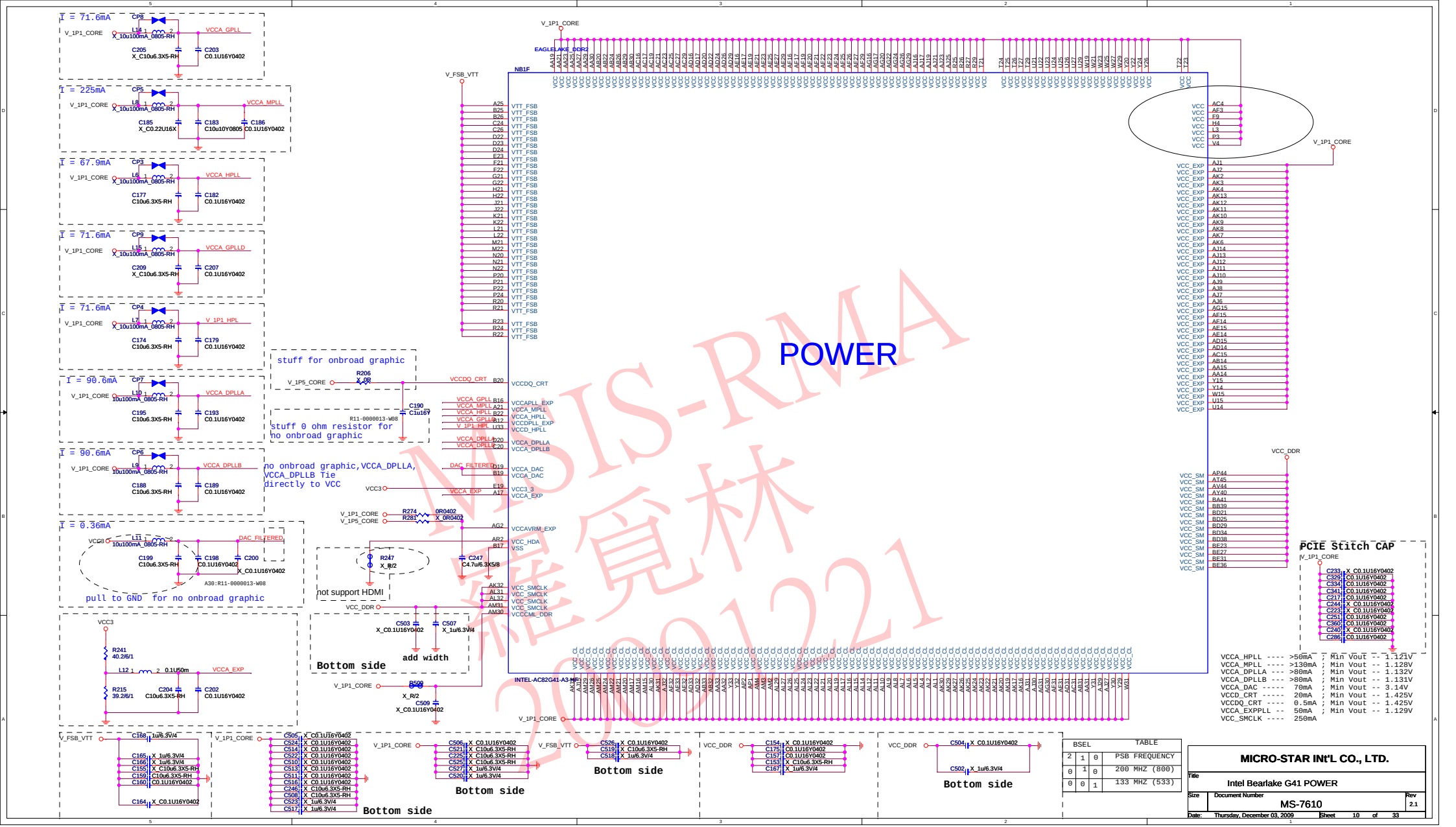
MS-7610

| Size | Document Description | Rev |
|---|---|---|
| Custom | LGA775 - GND | 2.1 |

Date: Thursday, December 03, 2009 Sheet 7 of 33

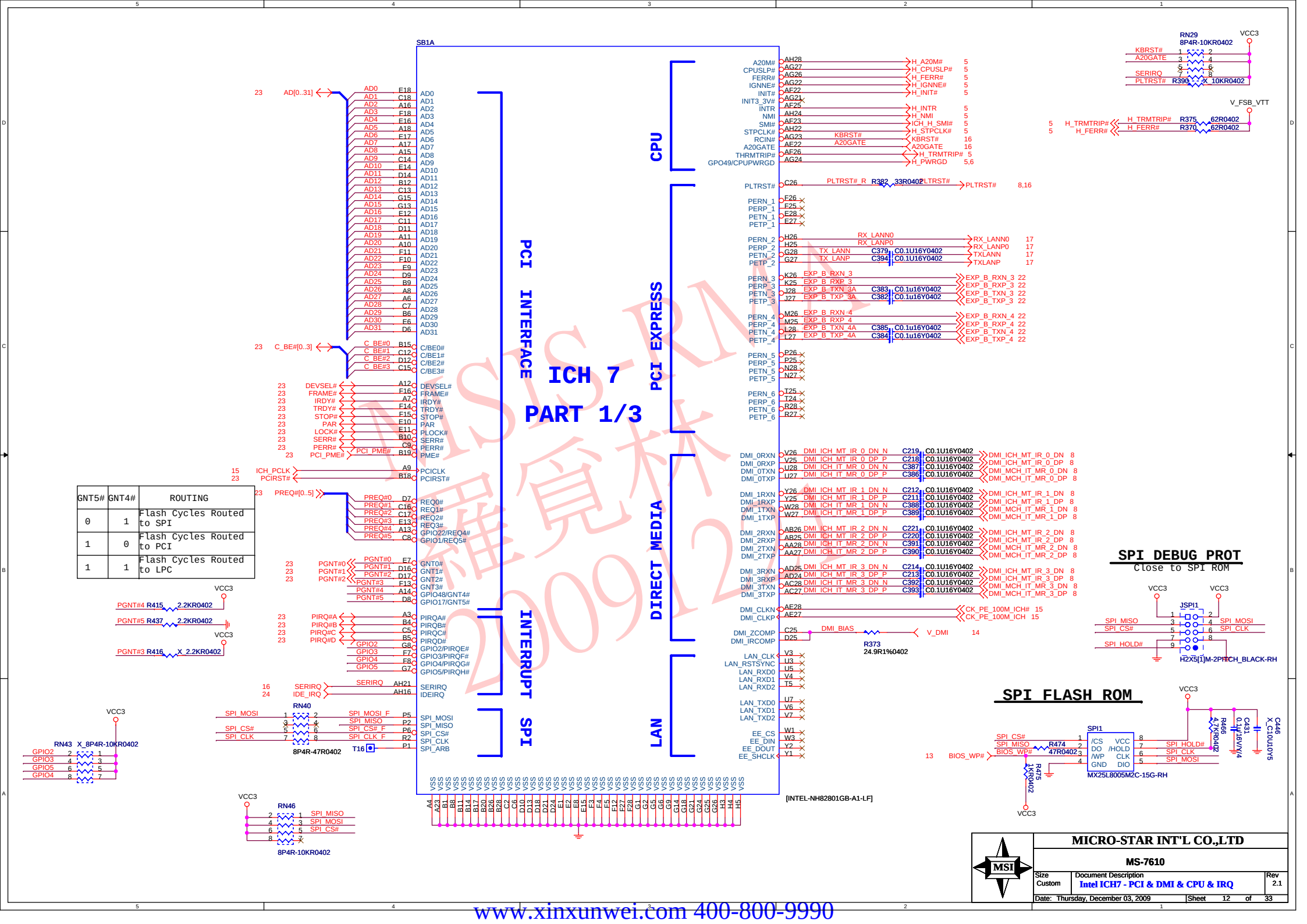

NB1A
EAGLELAKE_DDR2
FSB
INTEL-AC82G41-A3-HF
GTLREF VOLTAGE SHOULD BE 0.67*VTT=0.804V
HXSWING S/B 1/4*VTT +/- 2%
DEMO BOARD CHANGE
ITPM_ENB
Itegrated TPM Enable:
0=Enable iTPM
1=Disable iTPM
DualX8_Enable
0=2X8 PCIe Ports Enable
1=1X16 PCIe Port Enable
Primary _PEG_Presence
Primary PCIe port Detect:
0=PCIe Card is in Primary Slot
1=PCIe Card is not in Primary Slot
NB1E
MISC
VGA
R no stuff for onbroad graphic
No Internal Graphics stuff Resistors
No Internal Graphics R213 stuff 0ohm
not support HDMI
NB1B
PCIE
DMI
Bottom side
Close to MCH A.S.A.P
MICRO-STAR INt'L CO., LTD.
Intel Bearlake G41 - CPU Signals
MS-7610
Thursday, December 03, 2009
www.xinxunwei.com 400-800-9990

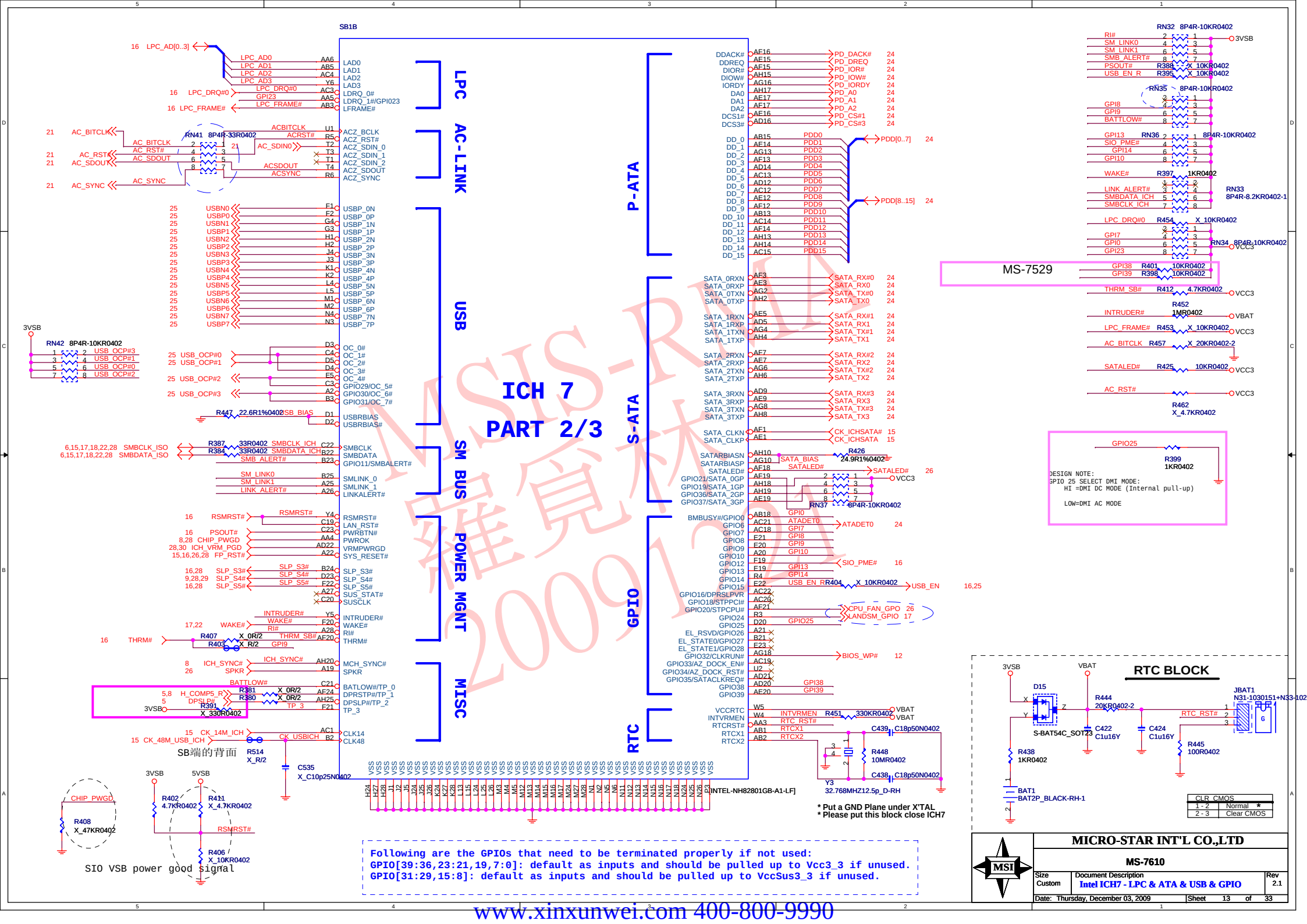

EAGLELAKE_DDR2
NB1C
DDR_A
EAGLELAKE_DDR2
NB1D
DDR_B
INTEL-AC82G41-A3-HF
DDR3 PWROK
Intel review CHANGE SPD=249OHM
SPU=80.6OHM
RPD=80.6OHM
RPU=80.6OHM
MICRO-STAR INt'L CO., LTD.
Intel Bearlake G41 Memory
MS-7610
Thursday, December 03, 2009
www.xinxunwei.com 400-800-9990

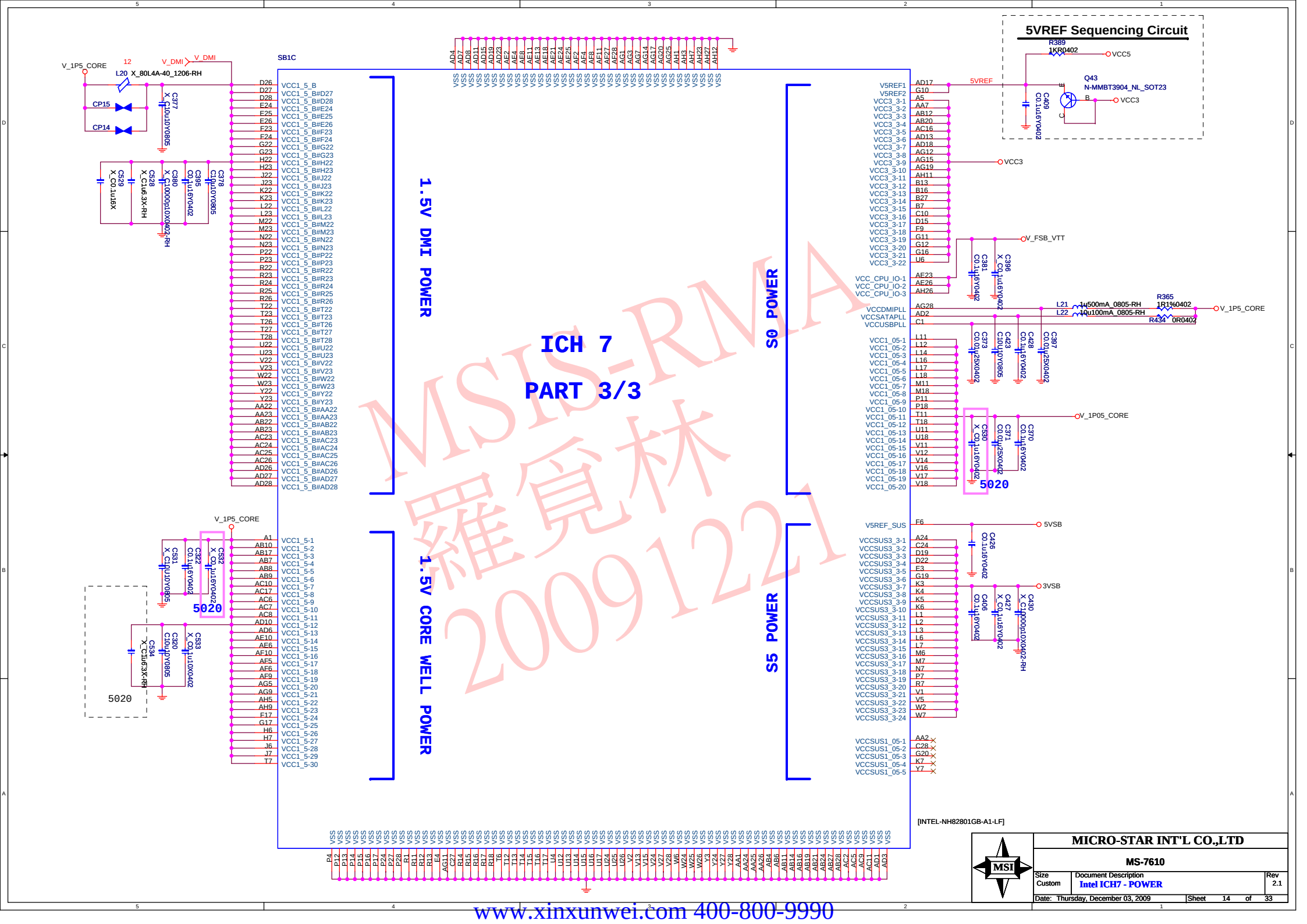




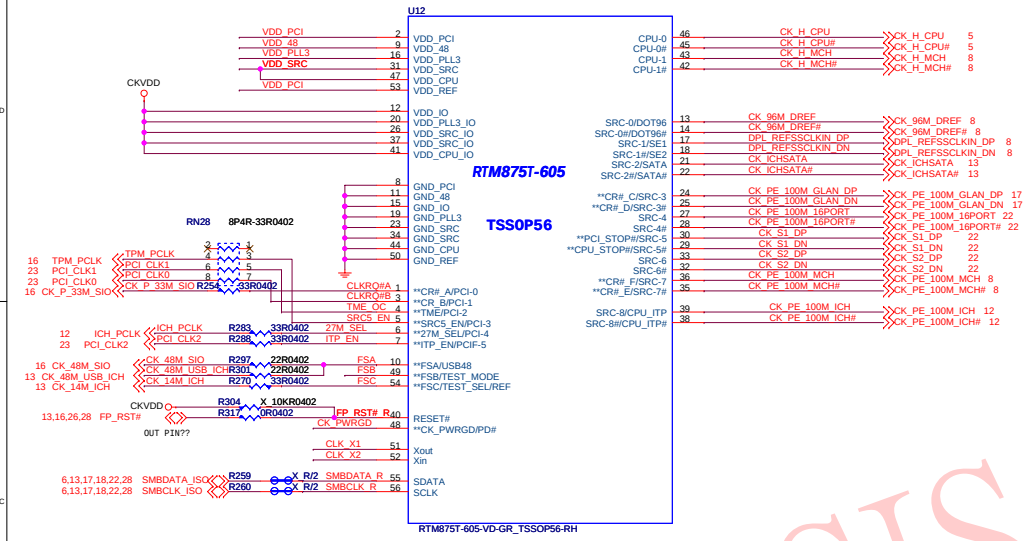

| | | |
|---|---|---|
| MSI | MICRO-STAR INt'L CO., LTD. | |
| Title | Intel Bearlake G41 GND | |
| Size | Document Number: MS-7610 | Rev: 2.1 |
| Date: Thursday, December 03, 2009 | Sheet 11 of 33 | |


SB1A
ICH 7
PART 1/3
CPU
PCI EXPRESS
DIRECT MEDIA
LAN
PCI INTERFACE
INTERRUPT
SPI
[INTEL-NH82801GB-A1-LF]
SPI DEBUG PROT
Close to SPI ROM
SPI FLASH ROM
MX25L8005M2C-15G-RH
H2X5[1]M-2PITCH_BLACK-RH
8P4R-47R0402
8P4R-10KR0402
GNT5# GNT4# ROUTING
0 1 Flash Cycles Routed to SPI
1 0 Flash Cycles Routed to PCI
1 1 Flash Cycles Routed to LPC
MICRO-STAR INT'L CO.,LTD
MS-7610
Size Custom
Document Description Intel ICH7 - PCI & DMI & CPU & IRQ
Rev 2.1
Date: Thursday, December 03, 2009
Sheet 12 of 33
www.xinxunwei.com 400-800-9990

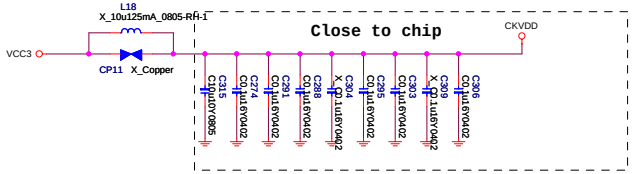

SB1B
ICH 7
PART 2/3
LPC
AC-LINK
USB
SM BUS
POWER MGNT
MISC
P-ATA
S-SATA
GPIO
RTC
LPC_AD[0..3]
LPC_AD0
LPC_AD1
LPC_AD2
LPC_AD3
LPC_DRQ#0
GPI23
LPC_FRAME#
LAD0
LAD1
LAD2
LAD3
LDRQ_0#
LDRQ_1#/GPIO23
LFRAME#
AC_BITCLK
AC_RST#
AC_SDOUT
AC_SYNC
ACBITCLK
ACRST#
AC_SDIN0
ACSDOUT
ACSYNC
ACZ_BCLK
ACZ_RST#
ACZ_SDIN_0
ACZ_SDIN_1
ACZ_SDIN_2
ACZ_SDOUT
ACZ_SYNC
RN41 8P4R-33R0402
USBN0
USBP0
USBN1
USBP1
USBN2
USBP2
USBN3
USBP3
USBN4
USBP4
USBN5
USBP5
USBN6
USBP6
USBN7
USBP7
USBP_0N
USBP_0P
USBP_1N
USBP_1P
USBP_2N
USBP_2P
USBP_3N
USBP_3P
USBP_4N
USBP_4P
USBP_5N
USBP_5P
USBP_6N
USBP_6P
USBP_7N
USBP_7P
3VSB
RN42 8P4R-10KR0402
USB_OCP#3
USB_OCP#1
USB_OCP#0
USB_OCP#2
USB_OCP#0
USB_OCP#1
USB_OCP#2
USB_OCP#3
OC_0#
OC_1#
OC_2#
OC_3#
OC_4#
GPIO29/OC_5#
GPIO30/OC_6#
GPIO31/OC_7#
R447 22.6R1%0402
USB_BIAS
USBRBIAS
USBRBIAS#
SMBCLK_ISO
SMBDATA_ISO
R387 33R0402 SMBCLK_ICH
R384 33R0402 SMBDATA_ICH
SMB_ALERT#
SMBCLK
SMBDATA
GPIO11/SMBALERT#
SM_LINK0
SM_LINK1
LINK_ALERT#
SMLINK_0
SMLINK_1
LINKALERT#
RSMRST#
PSOUT#
CHIP_PWGD
ICH_VRM_PGD
FP_RST#
PWRBTN#
LAN_RST#
PWROK
VRMPWRGD
SYS_RESET#
SLP_S3#
SLP_S4#
SLP_S5#
SUS_STAT#
SUSCLK
INTRUDER#
WAKE#
RI#
THRM#
R407 X_0R/2
R403 X_R/2
THRM_SB#
GPI9
ICH_SYNC#
SPKR
MCH_SYNC#
BATLOW#
H_COMP5_R
DPSLP#
R381 X_0R/2
R380 X_0R/2
TP_3
BATLOW#/TP_0
DPRSTP#/TP_1
DPSLP#/TP_2
TP_3
CK_14M_ICH
CK_48M_USB_ICH
CK_USBICH
CLK14
CLK48
R514 X_R/2
C535 X_C10p25N0402
SB端的背面
CHIP_PWGD
R408 X_47KR0402
R402 4.7KR0402
R411 X_4.7KR0402
R406 X_10KR0402
SIO VSB power good signal
DDACK#
DDREQ
DIOR#
DIOW#
IORDY
DA0
DA1
DA2
DCS1#
DCS3#
PD_DACK#
PD_DREQ
PD_IOR#
PD_IOW#
PD_IORDY
PD_A0
PD_A1
PD_A2
PD_CS#1
PD_CS#3
DD_0
DD_1
DD_2
DD_3
DD_4
DD_5
DD_6
DD_7
DD_8
DD_9
DD_10
DD_11
DD_12
DD_13
DD_14
DD_15
PDD0
PDD1
PDD2
PDD3
PDD4
PDD5
PDD6
PDD7
PDD8
PDD9
PDD10
PDD11
PDD12
PDD13
PDD14
PDD15
PDD[0..7]
PDD[8..15]
SATA_0RXN
SATA_0RXP
SATA_0TXN
SATA_0TXP
SATA_1RXN
SATA_1RXP
SATA_1TXN
SATA_1TXP
SATA_2RXN
SATA_2RXP
SATA_2TXN
SATA_2TXP
SATA_3RXN
SATA_3RXP
SATA_3TXN
SATA_3TXP
SATA_RX#0
SATA_RX0
SATA_TX#0
SATA_TX0
SATA_RX#1
SATA_RX1
SATA_TX#1
SATA_TX1
SATA_RX#2
SATA_RX2
SATA_TX#2
SATA_TX2
SATA_RX#3
SATA_RX3
SATA_TX#3
SATA_TX3
SATA_CLKN
SATA_CLKP
CK_ICHSATA#
CK_ICHSATA
SATARBIASN
SATARBIASP
SATALED#
SATA_BIAS
R426 24.9R1%0402
RN37 8P4R-10KR0402
GPIO21/SATA_0GP
GPIO19/SATA_1GP
GPIO36/SATA_2GP
GPIO37/SATA_3GP
BMBUSY#/GPIO0
GPIO6
GPIO7
GPIO8
GPIO9
GPIO10
GPIO12
GPIO13
GPIO14
GPIO15
GPIO16/DPRSLPVR
GPIO18/STPPCI#
GPIO20/STPCPU#
GPIO24
GPIO25
EL_RSVD/GPIO26
EL_STATE0/GPIO27
EL_STATE1/GPIO28
GPIO32/CLKRUN#
GPIO33/AZ_DOCK_EN#
GPIO34/AZ_DOCK_RST#
GPIO35/SATACLKREQ#
GPIO38
GPIO39
GPIO0
ATADET0
GPI7
GPI8
GPI9
GPI10
GPI13
GPI14
SIO_PME#
USB_EN_R
R404 X_10KR0402
USB_EN
CPU_FAN_GPO
LANDSM_GPIO
BIOS_WP#
GPI38
GPI39
VCCRTC
INTVRMEN
RTCRST#
RTCX1
RTCX2
R451 330KR0402
RTC_RST#
C439 C18p50N0402
R448 10MR0402
C438 C18p50N0402
Y3 32.768MHZ12.5p_D-RH
INTEL-NH82801GB-A1-LF]
* Put a GND Plane under X'TAL
* Please put this block close ICH7
RN32 8P4R-10KR0402
RI#
SM_LINK0
SM_LINK1
SMB_ALERT#
PSOUT#
USB_EN_R
R388 X_10KR0402
R395 X_10KR0402
RN35 8P4R-10KR0402
GPI8
GPI9
BATTLOW#
RN36 8P4R-10KR0402
GPI13
SIO_PME#
GPI14
GPI10
WAKE#
R397 1KR0402
RN33 8P4R-8.2KR0402-1
LINK_ALERT#
SMBDATA_ICH
SMBCLK_ICH
LPC_DRQ#0
R454 X_10KR0402
GPI7
GPI0
GPI23
RN34 8P4R-10KR0402
MS-7529
GPI38
GPI39
R401 10KR0402
R398 10KR0402
THRM_SB#
R412 4.7KR0402
R452 1MR0402
INTRUDER#
LPC_FRAME#
R453 X_10KR0402
AC_BITCLK
R457 X_20KR0402-2
SATALED#
R425 10KR0402
AC_RST#
R462 X_4.7KR0402
GPIO25
R399 1KR0402
DESIGN NOTE:
GPIO 25 SELECT DMI MODE:
HI =DMI DC MODE (Internal pull-up)
LOW=DMI AC MODE
RTC BLOCK
D15
S-BAT54C_SOT23
R444 20KR0402-2
C422 C1u16Y
C424 C1u16Y
R445 100R0402
R438 1KR0402
JBAT1 N31-1030151+N33-102
BAT1 BAT2P_BLACK-RH-1
CLR_CMOS
1 - 2 Normal *
2 - 3 Clear CMOS
Following are the GPIOs that need to be terminated properly if not used:
GPIO[39:36,23:21,19,7:0]: default as inputs and should be pulled up to Vcc3_3 if unused.
GPIO[31:29,15:8]: default as inputs and should be pulled up to VccSus3_3 if unused.
MICRO-STAR INT'L CO.,LTD
MS-7610
Size Custom
Document Description
Intel ICH7 - LPC & ATA & USB & GPIO
Rev 2.1
Date: Thursday, December 03, 2009
Sheet 13 of 33
www.xinxunwei.com 400-800-9990


ICH 7
PART 3/3
1.5V DMI POWER
1.5V CORE WELL POWER
S0 POWER
S5 POWER
SB1C
5VREF Sequencing Circuit
[INTEL-NH82801GB-A1-LF]
MICRO-STAR INT'L CO.,LTD
MS-7610
Intel ICH7 - POWER
Date: Thursday, December 03, 2009
Sheet 14 of 33
www.xinxunwei.com 400-800-9990

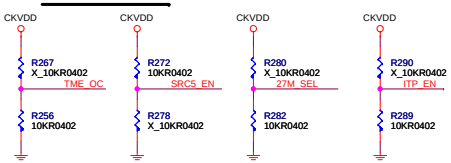
## Clock Generator - RTM875T-605




## Close to chip



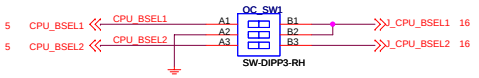

## STRAPPING RESISTOR

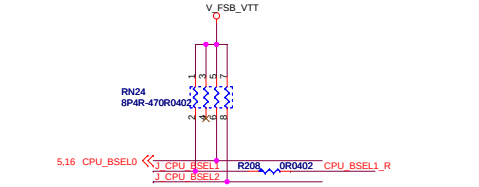


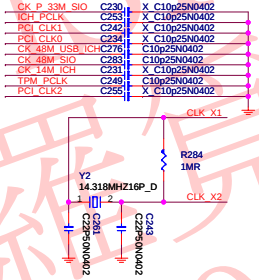

| | 0 | 1 |
|---|---|---|
| TME_OC | Normal Run | No Overclocking |
| SRC5_EN | Pin29/30 is PCI STOP/CPU STOP | Pin29/30 is SRC 5 |
| 27M_SEL | Pin17/18 is SRC 1 | Pin17/18 is 27MHz |
| ITP_EN | Pin38/39 is SRC 8 | Pin38/39 is CPUITP |

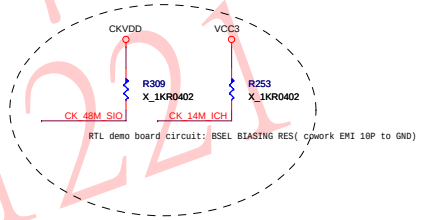
## OC_SW1

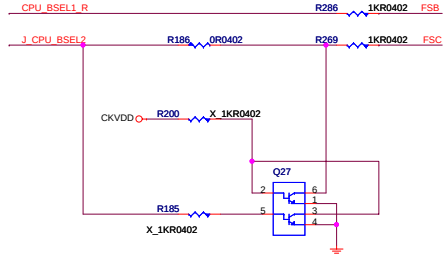
| | | | |
|---|---|---|---|
| Default | 200-->266 | 200-->333 | 200-->400 |
| 1:ON | 1:ON | 1:ON | 1:OFF/ON |
| 2:OFF | 2:ON | 2:ON | 2:OFF |
| 3:ON | 3:ON | 3:OFF | 3:OFF |
| | | 266-->333 | 266-->400 |
| | | 1:ON | 1:OFF |
| | | 2:OFF | 2:OFF |
| | | 3:OFF | 3:OFF |
| | | | 333-->400 |
| | | | 1:OFF |
| | | | 2:OFF |
| | | | 3:OFF |

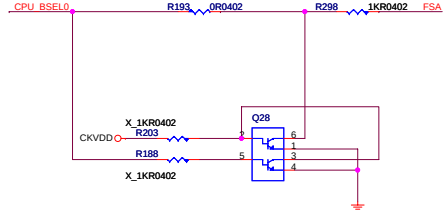


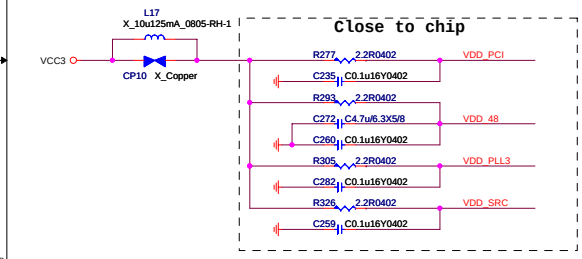



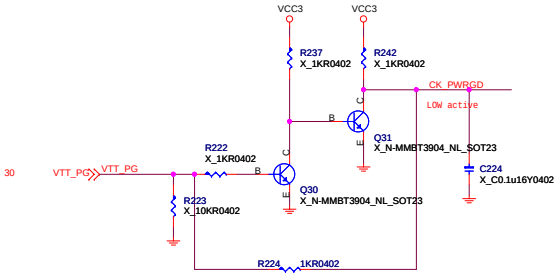



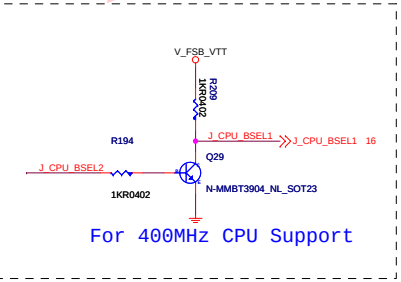




## Close to chip




## Clock Generator Power Good Block



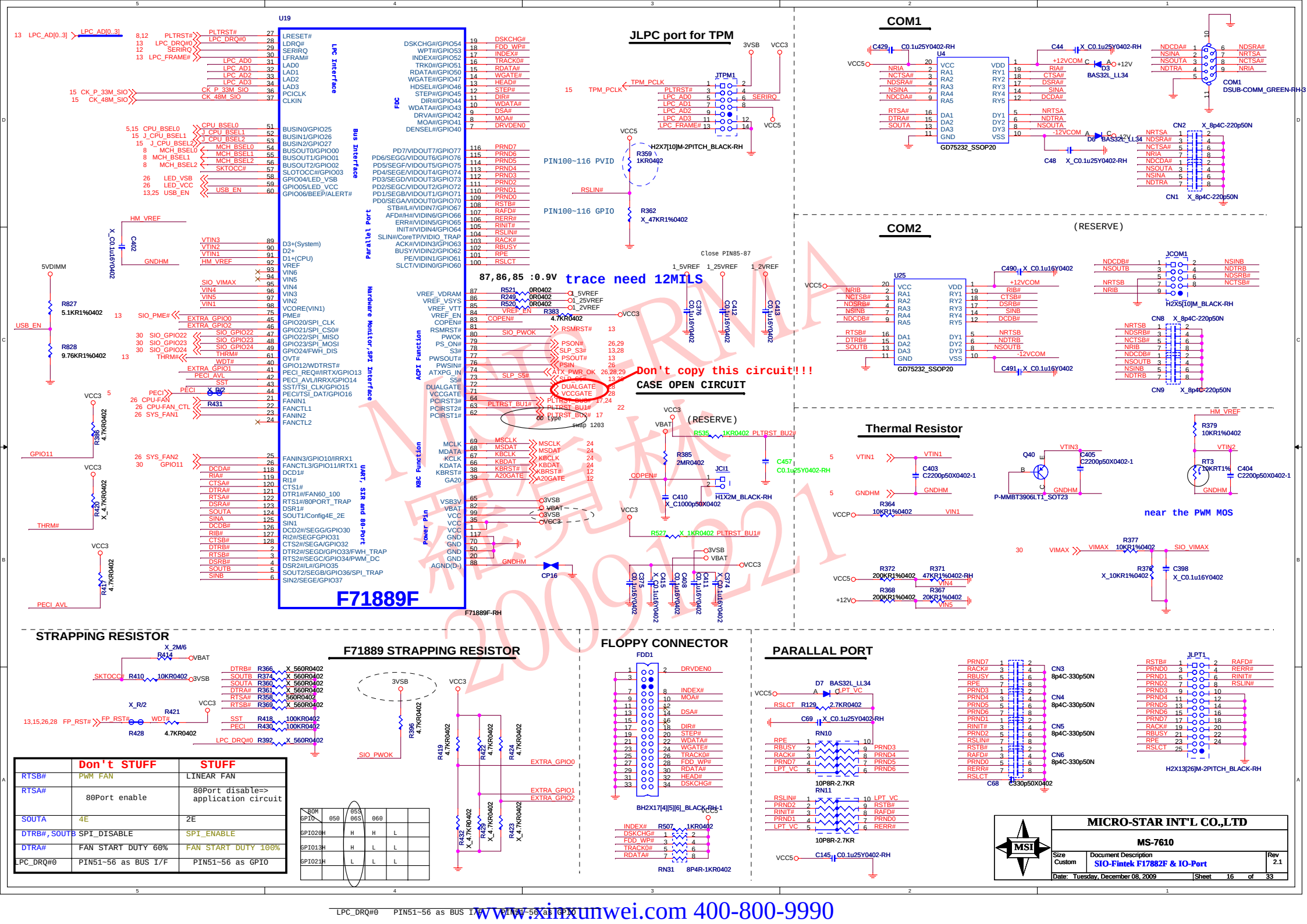




## CPU Frequency Selection

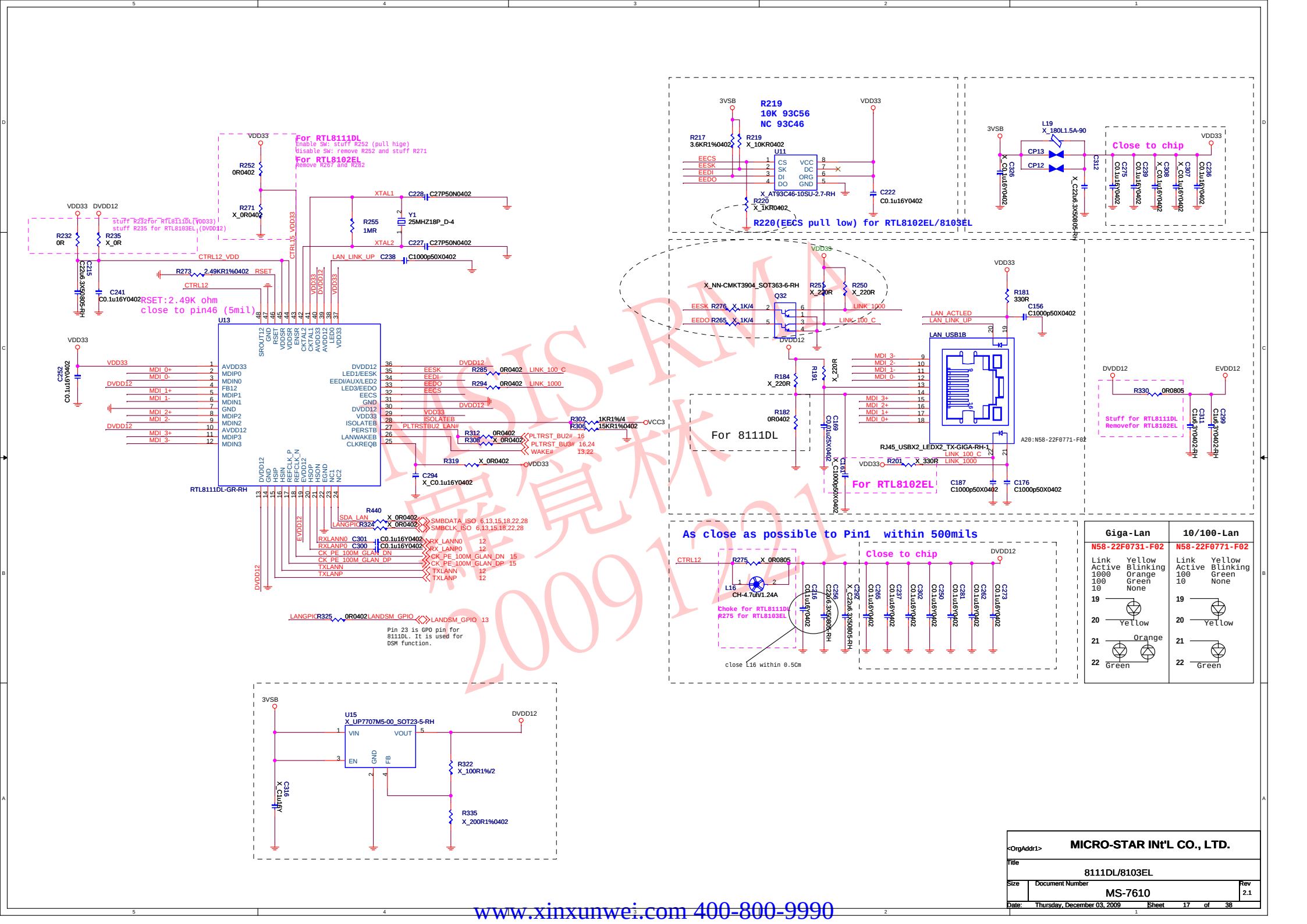
| FS_C | FS_B | FS_A | CPU |
|---|---|---|---|
| 0 | 0 | 1 | 133M |
| 0 | 1 | 0 | 200M |
| 0 | 0 | 0 | 266M |
| 1 | 0 | 0 | 333M |
| 1 | 1 | 0 | 400M |

Only the selection in the table is valid

| | |
|---|---|
| MICRO-STAR INT'L CO.,LTD | |
| MS-7610 | |
| Size: Custom | Document Description: CLK-RTM 875T-605 |
| Rev: 2.1 | |
| Date: Thursday, December 03, 2009 | Sheet 15 of 33 |



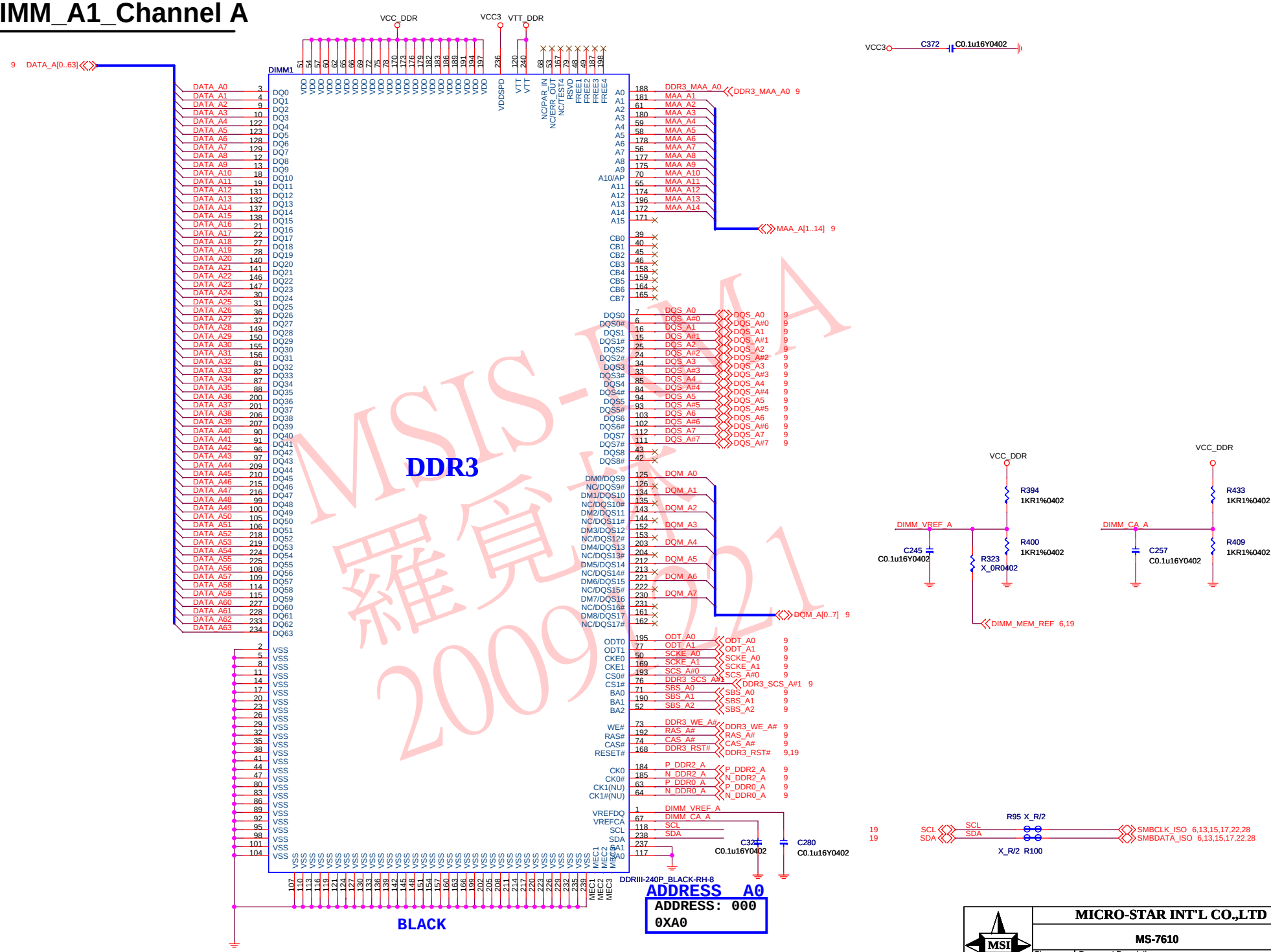

| | Don't STUFF | STUFF |
|---|---|---|
| RTSB# | PWM FAN | LINEAR FAN |
| RTSA# | 80Port enable | 80Port disable=> application circuit |
| SOUTA | 4E | 2E |
| DTRB#, SOUTB | SPI_DISABLE | SPI_ENABLE |
| DTRA# | FAN START DUTY 60% | FAN START DUTY 100% |
| LPC_DRQ#0 | PIN51~56 as BUS I/F | PIN51~56 as GPIO |






| | |
|---|---|
| <OrgAddr1> | MICRO-STAR INt'L CO., LTD. |
| Title | 8111DL/8103EL |
| Size | Document Number: MS-7610 |
| Rev | 2.1 |
| Date: | Thursday, December 03, 2009 |
| Sheet | 17 of 38 |

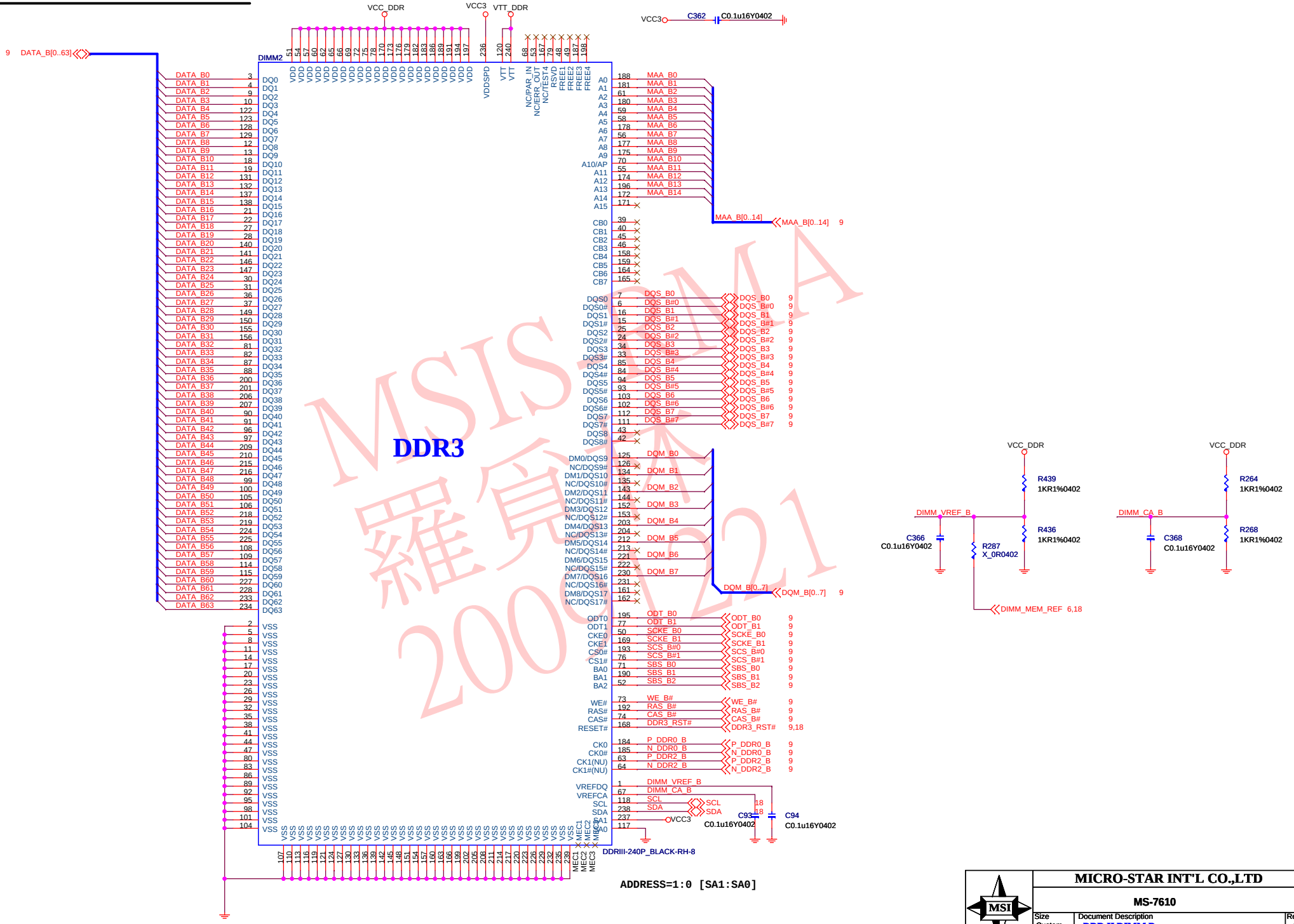
# DDRII DIMM_A1_Channel A






| | | | |
|---|---|---|---|
| MICRO-STAR INT'L CO.,LTD | | | |
| MS-7610 | | | |
| Size: Custom | Document Description: DDR II DIMM A | | Rev: 2.1 |
| Date: Thursday, December 03, 2009 | Sheet 18 of 33 | | |

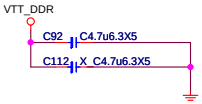
# DDRII DIMM_B1_Channel B

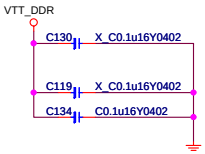





| | |
|---|---|
| MICRO-STAR INT'L CO.,LTD | |
| MS-7610 | |
| Size: Custom | Document Description: DDR II DIMM B |
| Rev: 2.1 | |
| Date: Thursday, December 03, 2009 | Sheet 19 of 33 |

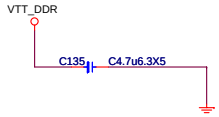
CHANNEL A V_SM_VTT DECOULPING CAPS

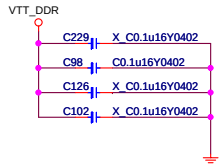


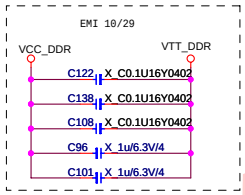



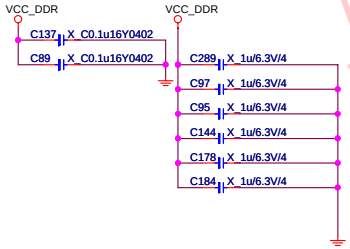


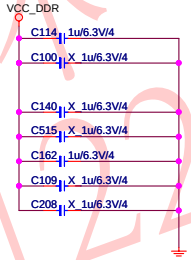
CHANNEL B V_SM_VTT DECOULPING CAPS






| | | |
|---|---|---|
| MICRO-STAR INT'L CO.,LTD | | |
| MS-7610 | | |
| Size: Custom | Document Description: DDR II VTT DECOUPLING | Rev: 2.1 |
| Date: Thursday, December 03, 2009 | Sheet 20 of 33 | |

# ALC889 CODEC

FOR 6 Port

FOR 6 Port

Trace Width 20mils.

Pin4 : stuff for ALC889
Pin4 : remove for ALC888S-VC2

888S-VC2-GR stuff 4.7u X5R
889 stuff 10u X5R

## CD/IN HEADERS

# ALC888 JACK

3 hole : line1/Mic1 change to 75 ohm

ALC889:68OHM

470P

FOR 6 Port

| PIN | ALC888 | ALC888S VC2 |
|---|---|---|
| 2 | GPIO0/DMIC_CLK | SPDIF02 |
| 3 | GPIO1/DMIC_DATA | GPIO0/DMIC_CLK |
| 4 | DVSS | GPIO1/DMIC_DATA |
| 33 | NC | SENSE C |
| | | |

# Azalia Front Audio Connector

888S-VC2-GR stuff 4.7u X5R
889 stuff 10u X5R

888S-VC2-GR stuff 75 Ohm
889 stuff 68 Ohm

Place those component close to audio connector.

# ALC883 JACK DETECT

NEAR CODEC

# SPDIF OUT

## AUDIO CODE REGULATORS

Trace Width 30mils.

For EMI

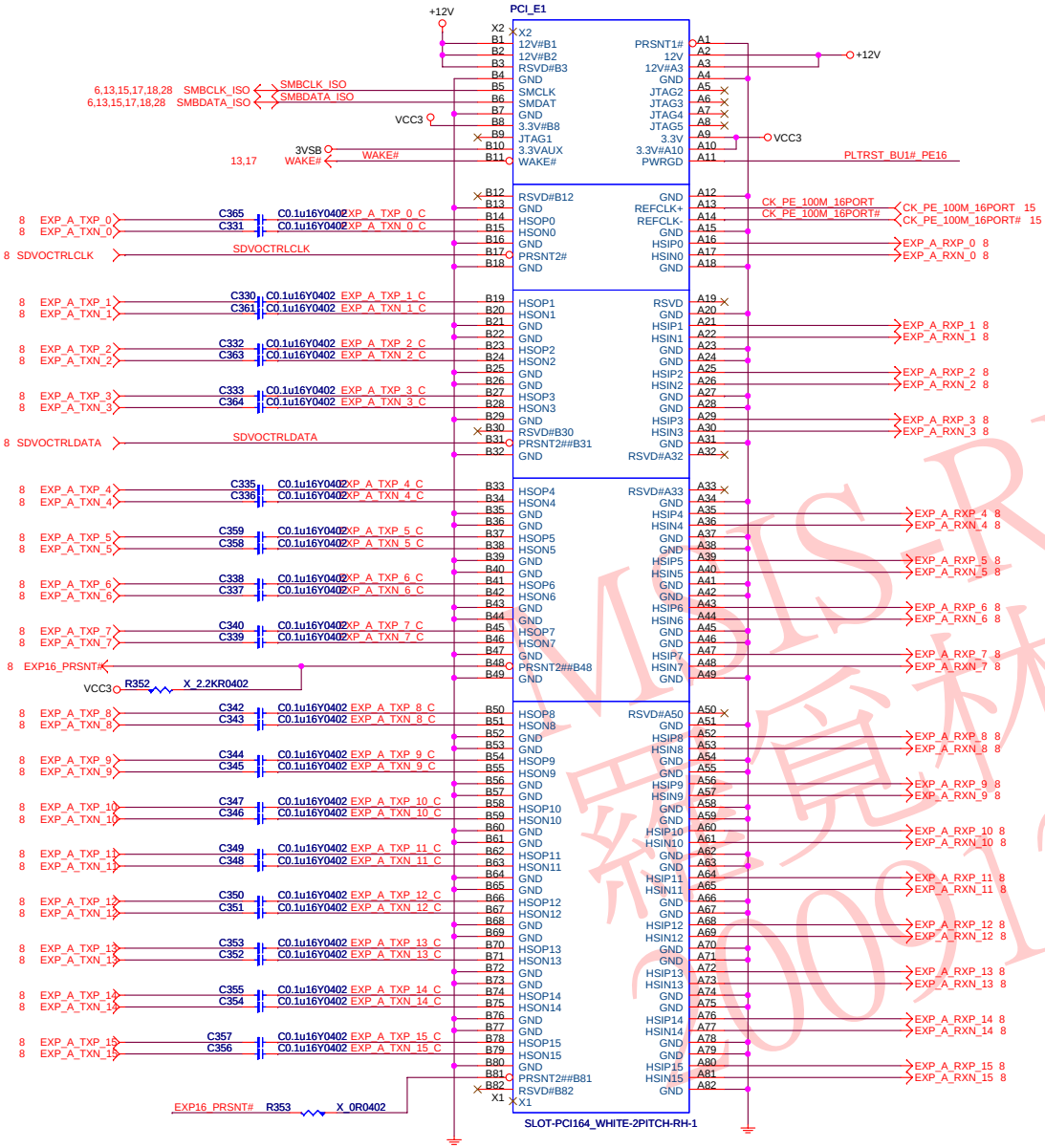
MICRO-STAR INT'L CO.,LTD

MS-7610

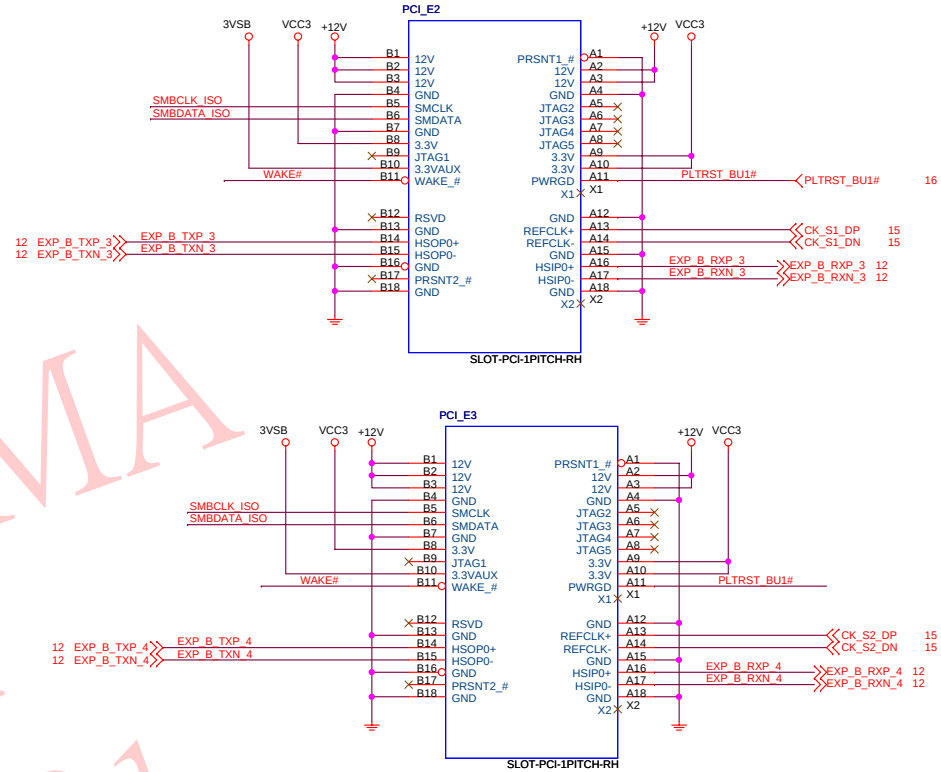
Size: Custom | Document Description: 21 HD ALC888 | Rev: 2.1

Date: Friday, December 04, 2009 | Sheet 21 of 33

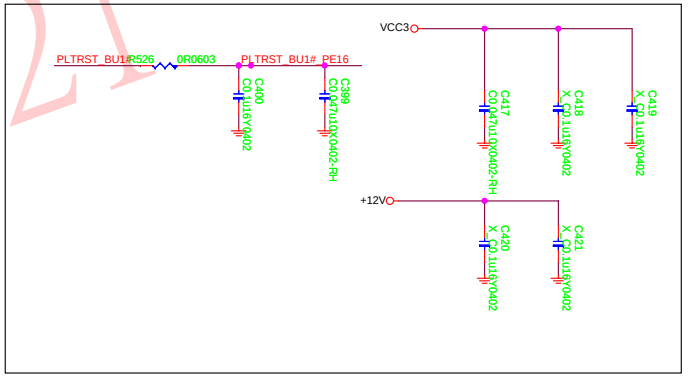
# PCIE X16 PORT




# PCIE X1 PORT

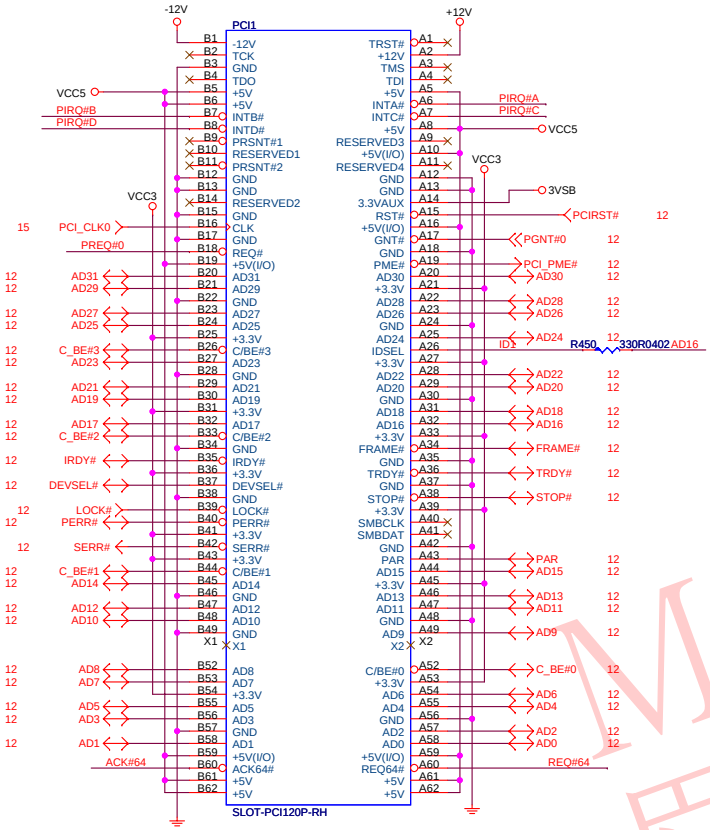



## NEAR PCIE X16 SLOT



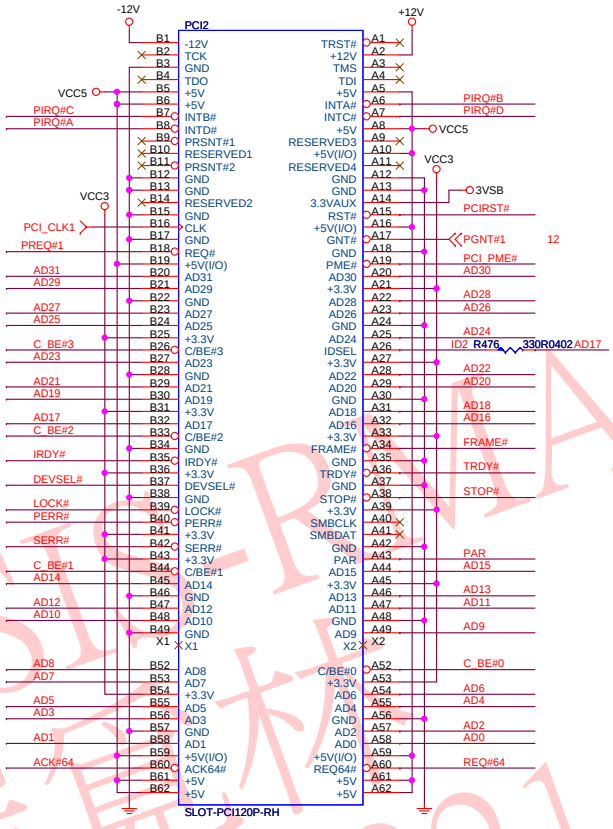

| | | |
|---|---|---|
| MICRO-STAR INT'L CO.,LTD | | |
| MS-7610 | | |
| Size: Custom | Document Description: PCI EXPRESSX16&X1 | Rev: 2.1 |
| Date: Friday, December 04, 2009 | Sheet 22 of 33 | |

## PCI SLOT 1 (PCI VER: 2.2 COMPLY)



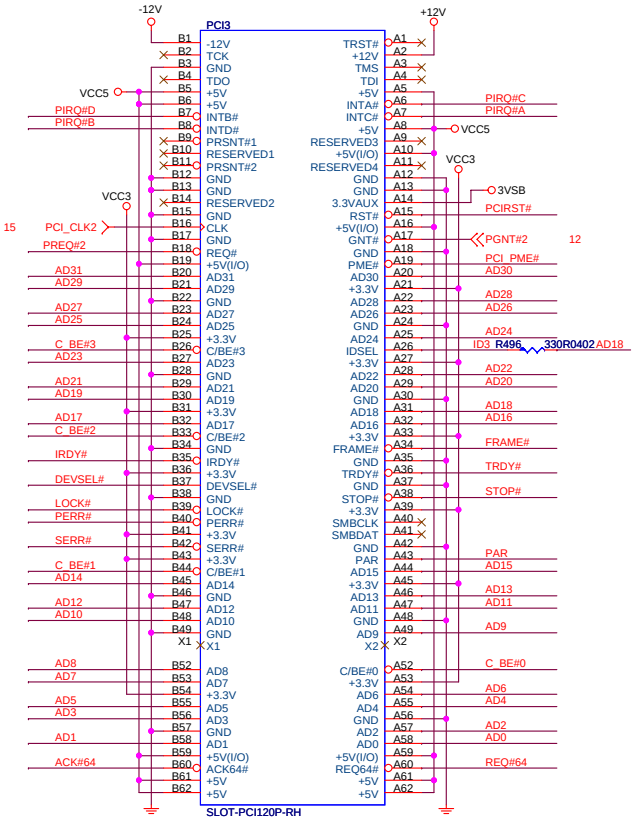

**IDSEL = AD16**
**MASTER = PREQ#0**
**PIRQ#A**

## PCI SLOT 2 (PCI VER: 2.2 COMPLY)




**IDSEL = AD17**
**MASTER = PREQ#1**
**PIRQ#B**

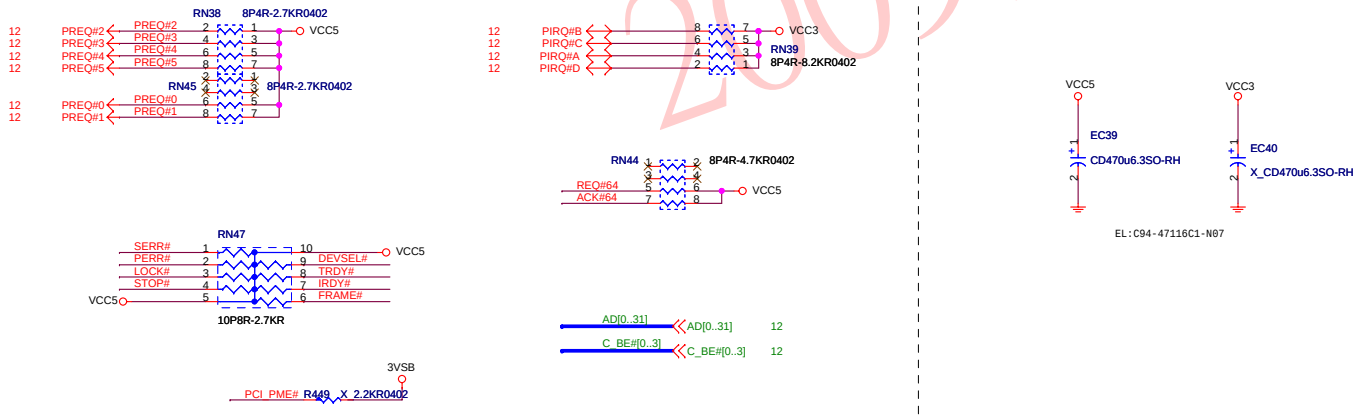
## PCI SLOT3 (PCI VER: 2.2 COMPLY)




**IDSEL = AD18**
**MASTER = PREQ#2**

**PIRQ#C**

## PCI PULL-UP / DOWN RESISTORS

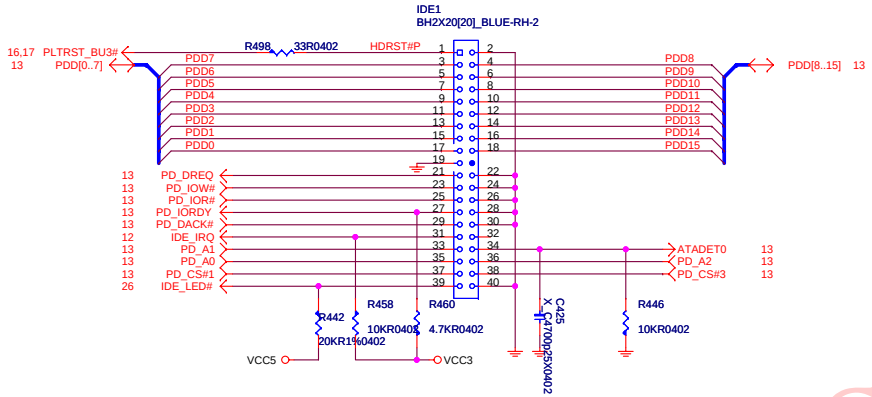




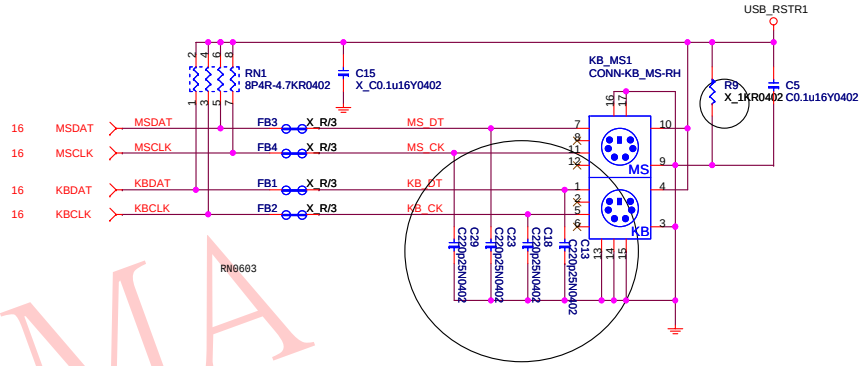


| | | |
|---|---|---|
| MICRO-STAR INT'L CO.,LTD | | |
| MS-7610 | | |
| Size: Custom | Document Description: PCI Slot 1 &2 | Rev: 2.1 |
| Date: Friday, December 04, 2009 | Sheet 23 of 33 | |

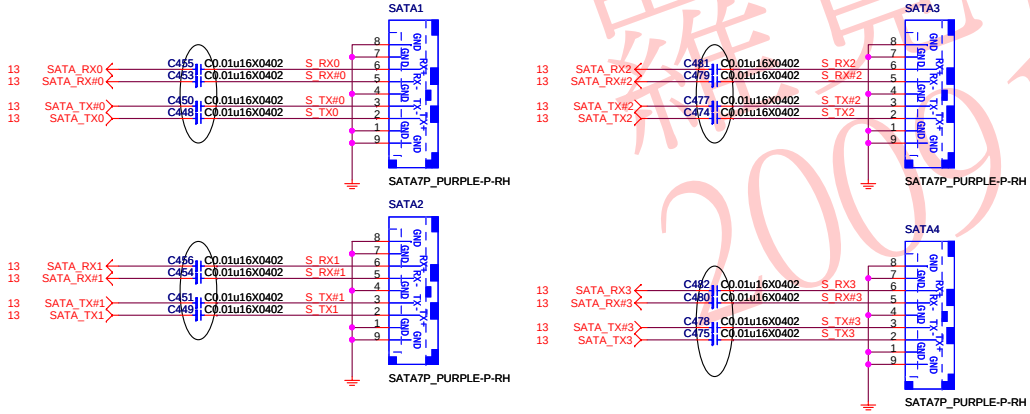
## ATA 33/66/100 IDE Connectors




## PS2 KEYBOARD & MOUSE CONNECTOR




## SERIAL ATA CONNECTOR BLOCK





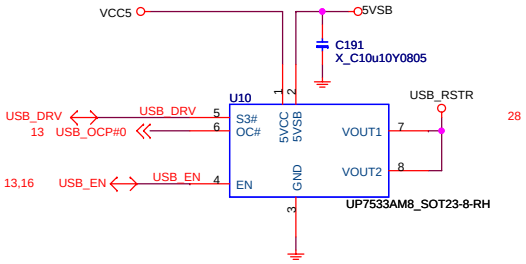

MICRO-STAR INT'L CO.,LTD

MS-7610

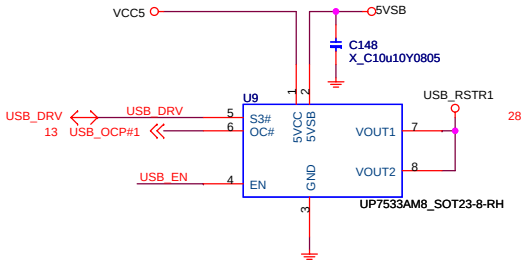
| Size | Document Description | Rev |
|---|---|---|
| Custom | IDE & SATA Connectors | 2.1 |

Date: Thursday, December 03, 2009 Sheet 24 of 33

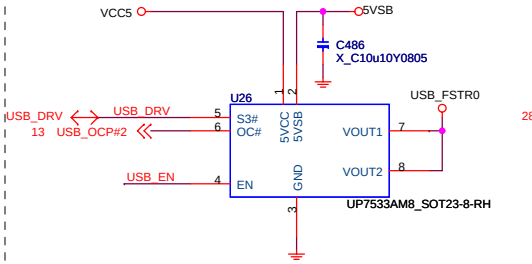
## POWER CIRCUIT FOR USB PORT 0,1



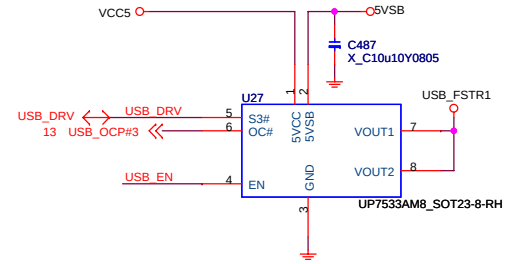

## POWER CIRCUIT FOR USB PORT 2,3



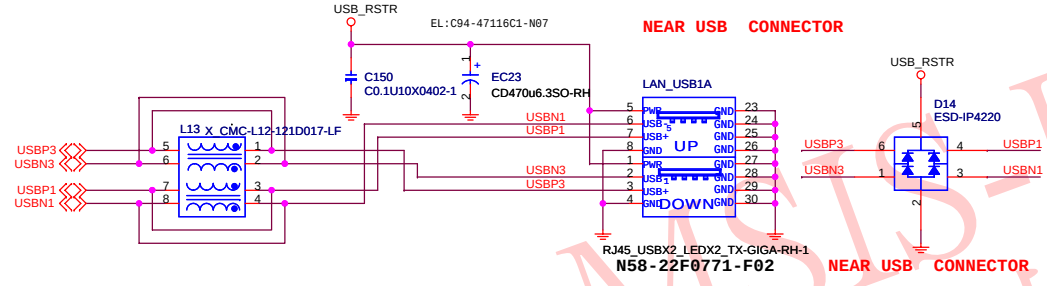

## POWER CIRCUIT FOR USB PORT 4,5



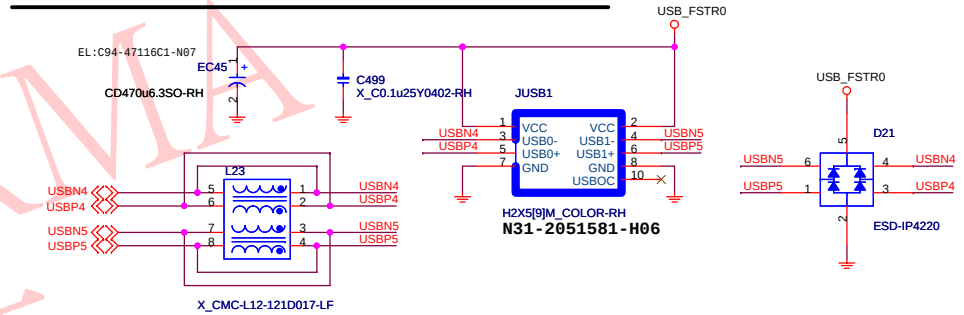

## POWER CIRCUIT FOR USB PORT 6,7



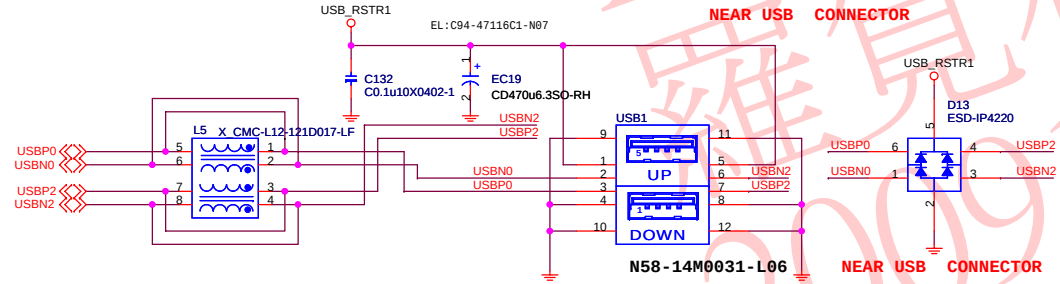

## REAR PANEL USB CONNECTOR FOR USB PORT 0,1



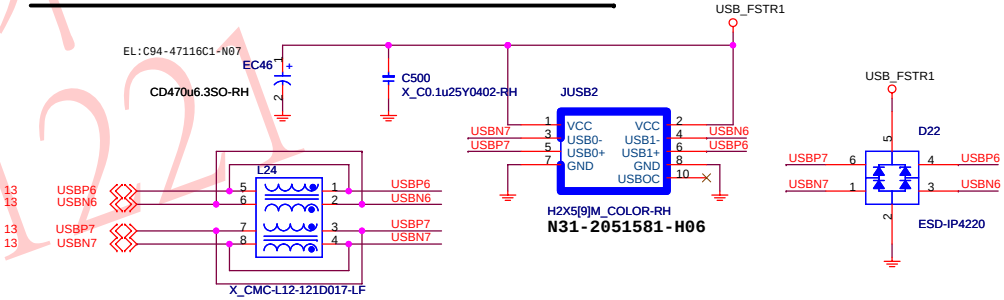

## FRONT PANEL USB CONNECTOR FOR USB PORT 4,5




## REAR PANEL USB CONNECTOR FOR USB PORT 2,3



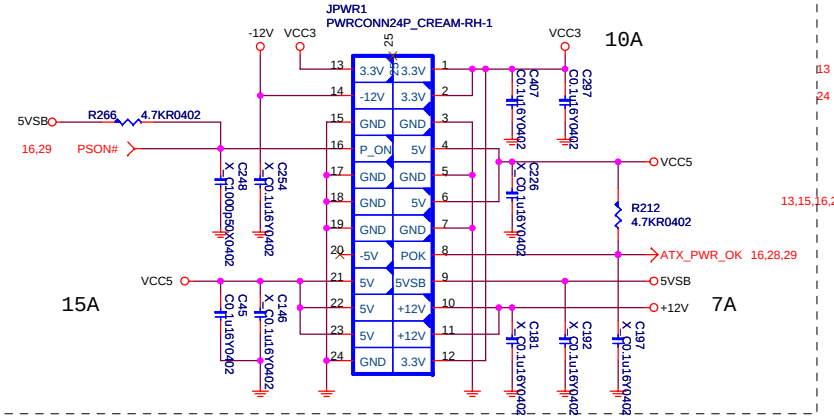

## FRONT PANEL USB CONNECTOR FOR USB PORT 6,7

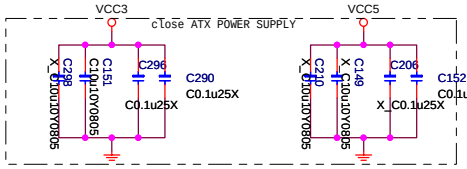





| MICRO-STAR INT'L CO.,LTD | | |
|---|---|---|
| MS-7610 | | |
| Size: Custom | Document Description: USB CONNECTORS | Rev: 2.1 |
| Date: Friday, December 04, 2009 | Sheet 25 of 33 | |

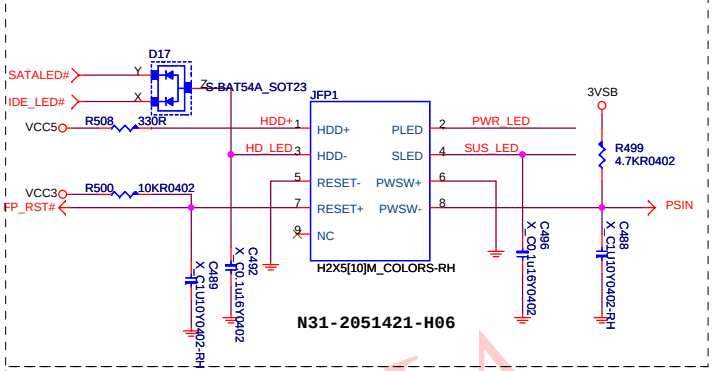
## ATX Connector



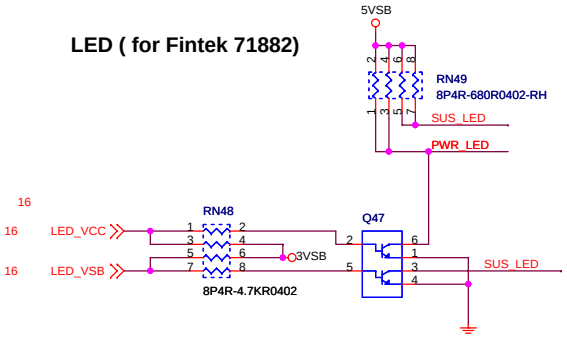




For power supply with mini current(use resistor)

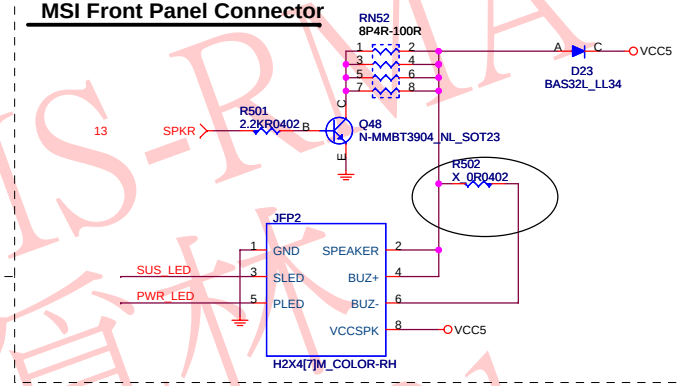
## INTEL/PB Front Panel Connector




## LED ( for Fintek 71882)

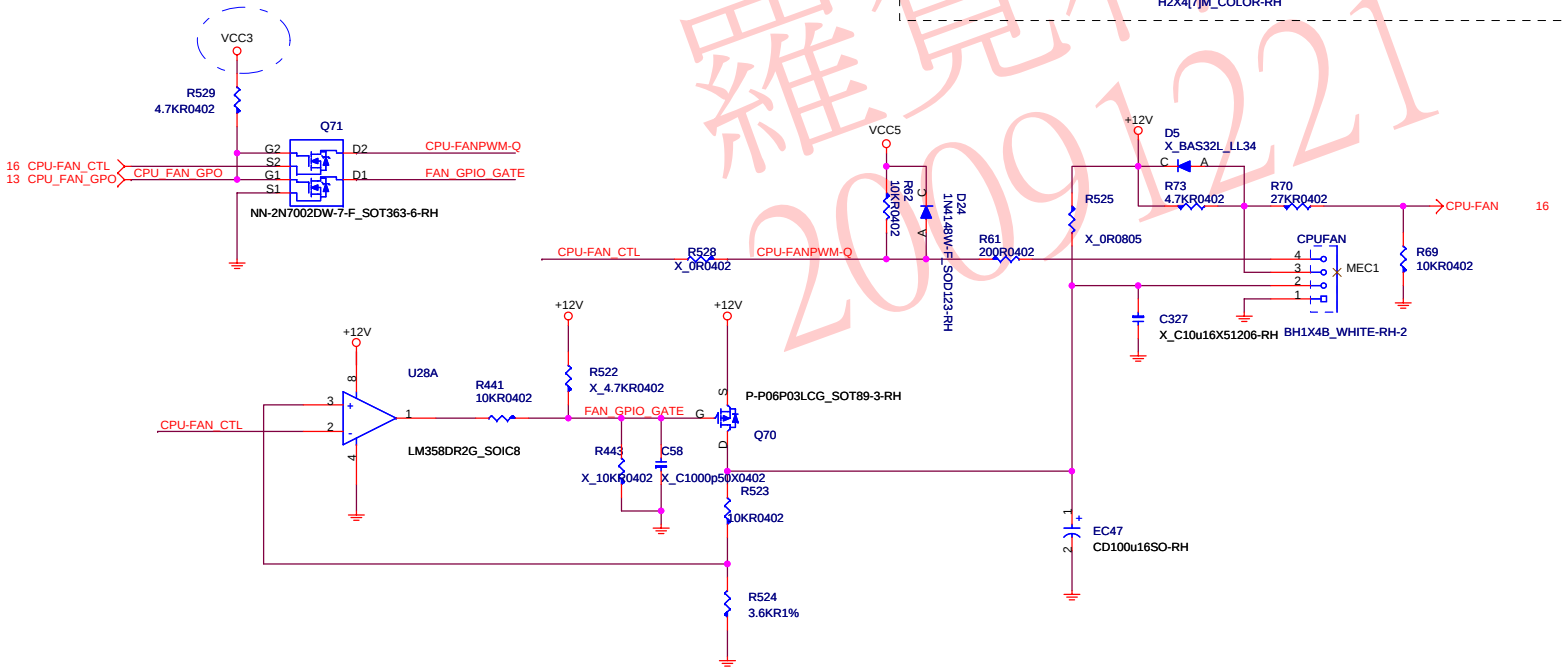



## MSI Front Panel Connector

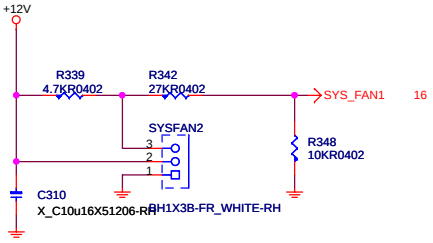



## CPU FAN

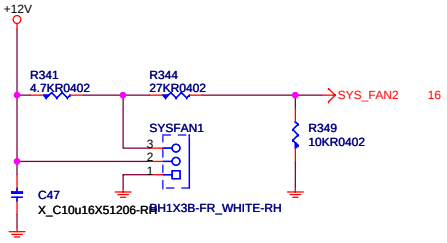
If using 4 pin fan, The GPIO must drive to high.
If using 3 pin fan, The GPIO must drive to low.




## SYSTEM FAN



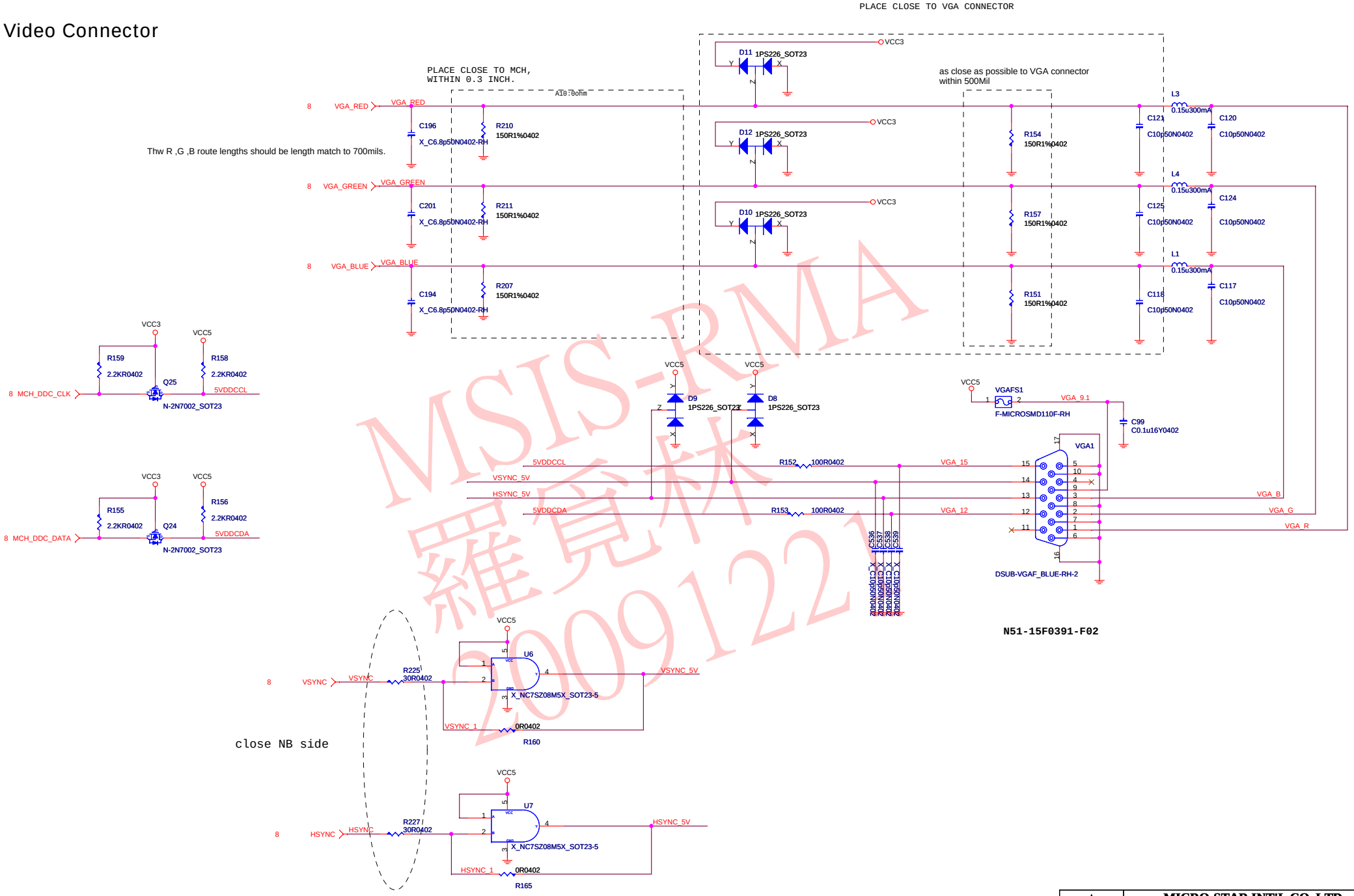

## PWR FAN





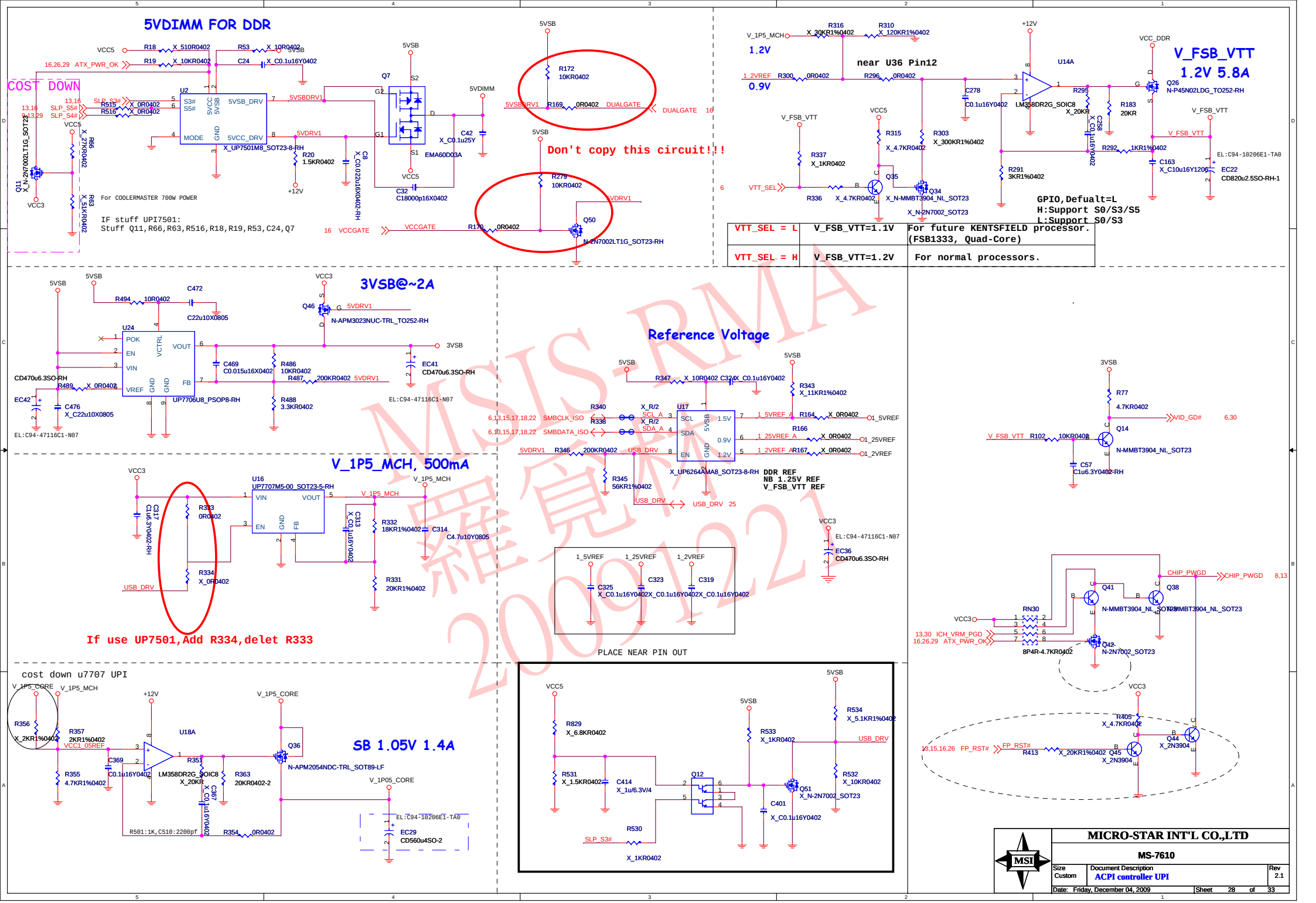

| | | |
|---|---|---|
| MICRO-STAR INT'L CO.,LTD | | |
| MS-7610 | | |
| Size: Custom | Document Description: ATX & Front Panel & FAN | Rev: 2.1 |
| Date: Tuesday, December 15, 2009 | Sheet 26 of 33 | |

# Video Connector



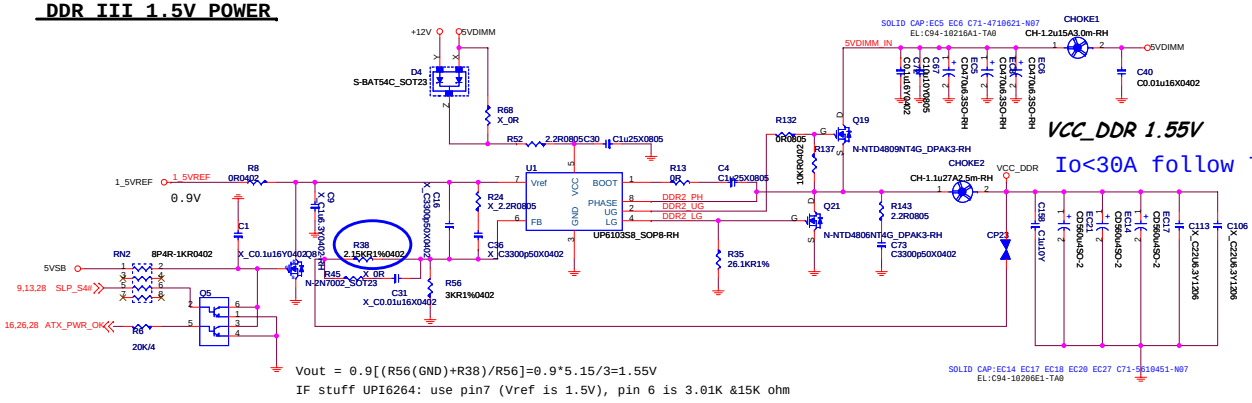



| | | |
|---|---|---|
| MICRO-STAR INT'L CO.,LTD | | |
| MS-7610 | | |
| Size: Custom | Document Description: VGA Connector | Rev: 2.1 |
| Date: Thursday, December 03, 2009 | Sheet 27 of 33 | |



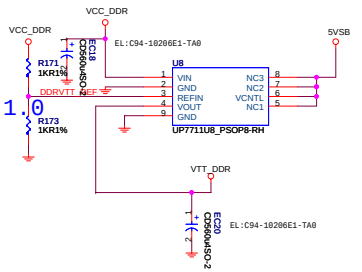

| | | |
|---|---|---|
| MICRO-STAR INT'L CO.,LTD | | |
| MS-7610 | | |
| Size: Custom | Document Description: ACPI controller UPI | Rev: 2.1 |
| Date: Friday, December 04, 2009 | Sheet 28 of 33 | |

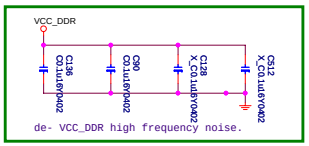
## DDR III 1.5V POWER



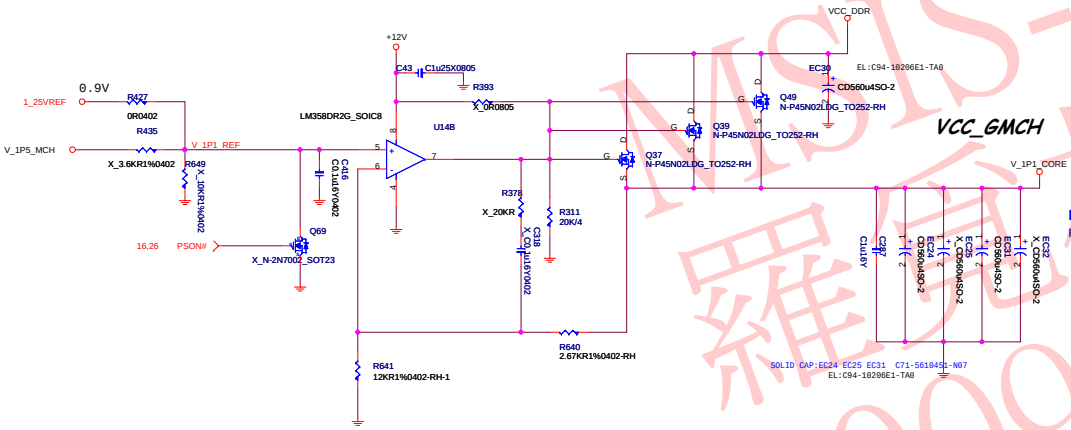

## DDR VTT Power

To CPU Copper trace width > 250mils , Fill island behind DIMM > 400mils .

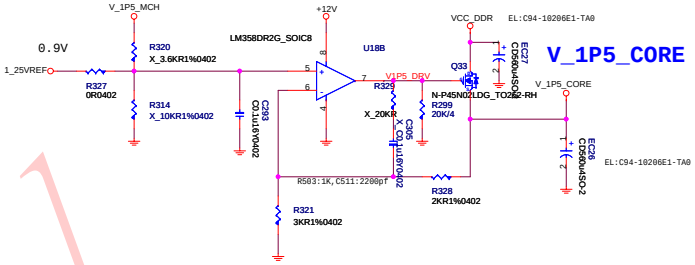



## MCH-G41 1.1V Core Power

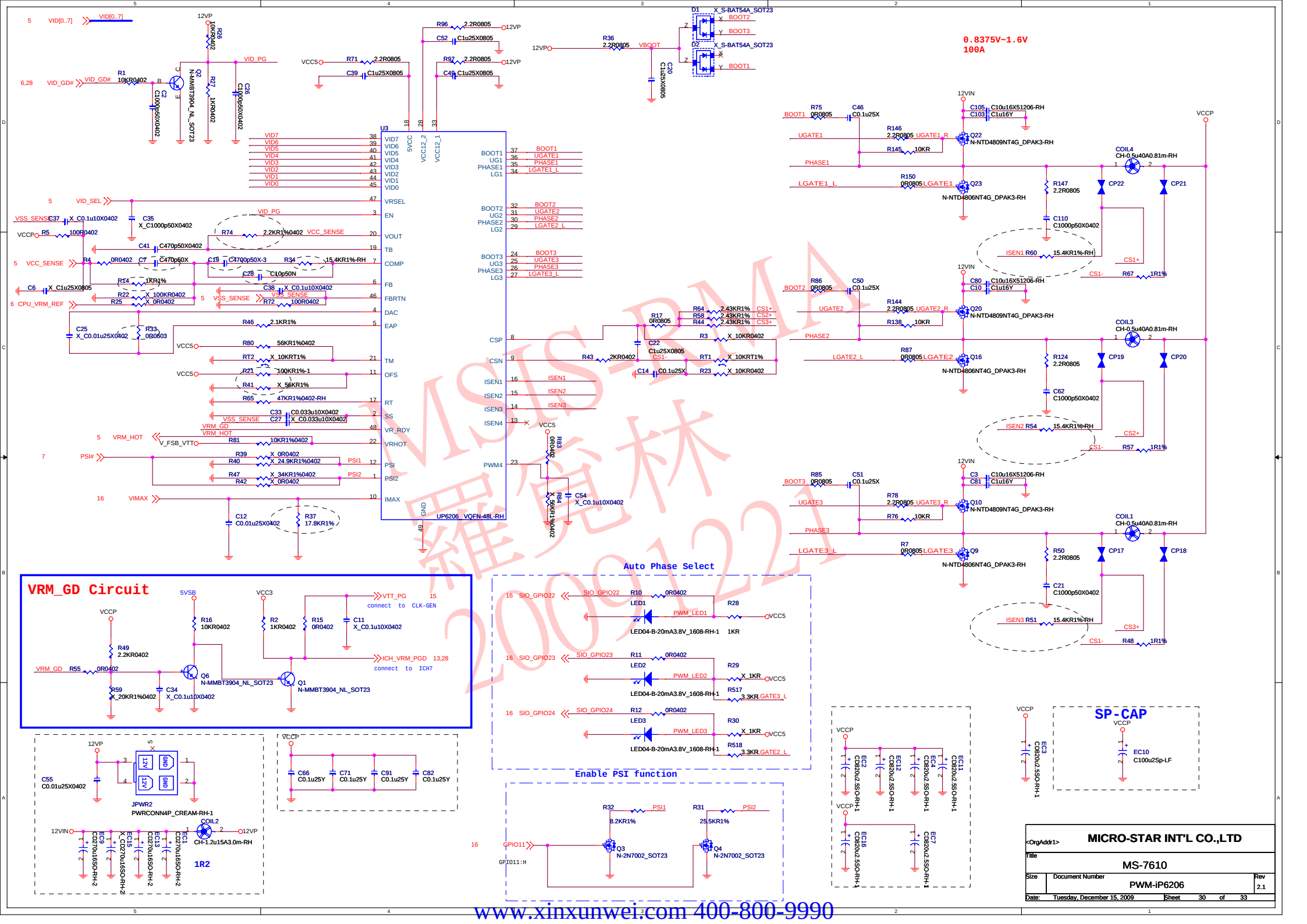



## V_1P5_CORE

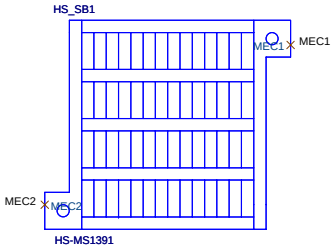




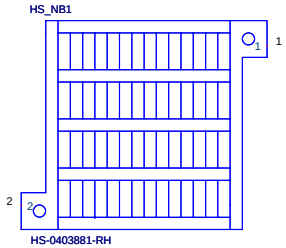

| | |
|---|---|
| MICRO-STAR INT'L CO.,LTD | |
| MS-7610 | |
| Size: Custom | Document Description: NB Core Power & DDR Power |
| Rev: 2.1 | |
| Date: Friday, December 04, 2009 | Sheet 29 of 33 |

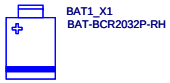

0.8375V~1.6V
100A
U3
UP6206_VQFN-48L-RH
VRM_GD Circuit
Auto Phase Select
Enable PSI function
SP-CAP
MICRO-STAR INT'L CO.,LTD
MS-7610
PWM-iP6206
Tuesday, December 15, 2009
www.xinxunwei.com 400-800-9990

## ICH7 HEATSINK



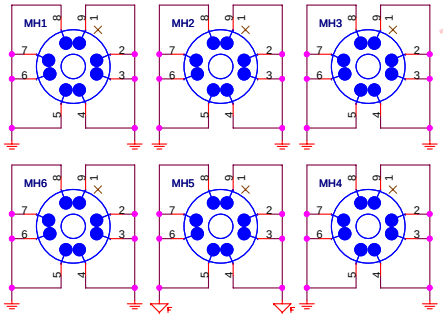

## MCH HEATSINK



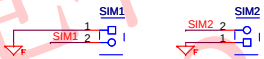




| LABEL | PCB1 | Rubber1 | Rubber2 | OPT1 | OPT2 | OPT8 | OPT3 | OPT5 | OPT6 | OPT7 | OPT9 | OPT10 | OPT14 | OPT18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PCB | PCB | PCB | PCB | PCB | PCB | PCB | PCB | PCB | PCB | PCB | PCB | PCB | PCB | PCB |
| P41-C31 | PCB | rubber1/2 | rubber1/2 | 0R0402 | 10/100 LAN CONN | RJ45_USBX2_LEDX2_TYPE3-SAR8152M | | 0R0603 | CD470u16EL11.5-RH-5 | CD1000u16EL20 | CD1000u6.3EL11.5-RH-1 | CD100u25EL11-RH-2 | heatpipe | HEATSINK HS-0404690-RH |

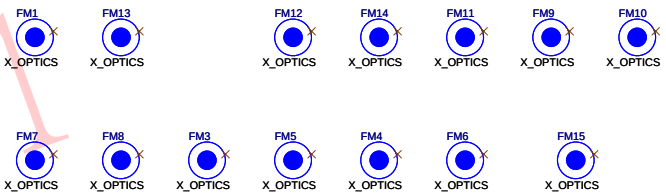
### Mounting Holes




### Simulation




### Optics Orientation Holes






| MICRO-STAR INT'L CO.,LTD | | |
|---|---|---|
| MS-7610 | | |
| Size: Custom | Document Description: MANUAL PARTS | Rev: 2.1 |
| Date: Monday, December 14, 2009 | Sheet 31 of 33 | |

## ICH7

| GPIO | Alt Func | PIN | I/O/NC | POWER | PU | SMI | TOL | DEFAULT | SIGNAL NAME |
|---|---|---|---|---|---|---|---|---|---|
| GPIO0 | Unmultiplexed | AB18 | I/O | CORE | N | Y | 3.3V | GPI | GPI0(pull high) |
| GPIO1 | REQ5# | C8 | I/O | CORE | N | Y | 5V | GPI | PREQ#5 |
| GPIO2 | PIRQE# | G8 | I/OD | CORE | N | Y | 5V | GPI | GPIO2(pull high) |
| GPIO3 | PIRQF# | F7 | I/OD | CORE | N | Y | 5V | GPI | GPIO3(pull high) |
| GPIO4 | PIRQG# | F8 | I/OD | CORE | N | Y | 5V | GPI | GPIO4(pull high) |
| GPIO5 | PIRQH# | G7 | I/OD | CORE | N | Y | 5V | GPI | GPIO5(pull high) |
| GPIO6 | Unmultiplexed | AC21 | I/O | CORE | N | Y | 3.3V | GPI | ATADET0 |
| GPIO7 | Unmultiplexed | AC18 | I/O | CORE | N | Y | 3.3V | GPI | STRAPPED HI |
| GPIO8 | Unmultiplexed | E21 | I/O | Resume | N | Y | 3.3V | GPI | STRAPPED HI |
| GPIO9 | Unmultiplexed | E20 | I/O | Resume | N | Y | 3.3V | GPI | STRAPPED HI |
| GPIO10 | Unmultiplexed | A20 | I/O | Resume | N | Y | 3.3V | GPI | STRAPPED HI |
| GPIO11 | SMBALERT# | B23 | I/O | Resume | N | Y | 3.3V | Native | STRAPPED HI |
| GPIO12 | Unmultiplexed | F19 | I/O | Resume | N | Y | 3.3V | GPI | SIO_PME# |
| GPIO13 | Unmultiplexed | E19 | I/O | Resume | N | Y | 3.3V | GPI | STRAPPED HI |
| GPIO14 | Unmultiplexed | R4 | I/O | Resume | N | Y | 3.3V | GPI | STRAPPED HI |
| GPIO15 | Unmultiplexed | E22 | I/O | Resume | N | Y | 3.3V | GPI | STRAPPED HI |
| GPIO16 | Unmultiplexed | AC22 | I/O | CORE | N | N | 3.3V | GPO | NC |
| GPIO17 | GNT5# | D8 | I/O | CORE | N | N | 3.3V | GPO | STRAPPED L |
| GPIO18 | Unmultiplexed | AC20 | I/O | CORE | N | N | 3.3V | GPO | NC |
| GPIO19 | SATA_1GP | AH18 | I/O | CORE | N | N | 3.3V | GPI | STRAPPED HI |
| GPIO20 | Unmultiplexed | AF21 | I/O | CORE | N | N | 3.3V | GPO | NC |
| GPIO21 | SATA_0GP | AF19 | I/O | CORE | N | N | 3.3V | GPI | STRAPPED HI |
| GPIO22 | REQ4# | A13 | I/O | CORE | N | N | 3.3V | Native | STRAPPED HI |
| GPIO23 | LDRQ_1# | AA5 | I/O | CORE | N | N | 3.3V | Native | STRAPPED HI |
| GPIO24 | Unmultiplexed | R3 | I/O | Resume | N | N | 3.3V | GPO | NC |
| GPIO25 | Unmultiplexed | D20 | I/O | Resume | Y | N | 3.3V | GPO | GPIO25(high 7507,low 7398) |
| GPIO26 | Unmultiplexed | A21 | I/O | Resume | N | N | 3.3V | GPO | USB_EN |
| GPIO27 | Unmultiplexed | B21 | I/O | Resume | N | N | 3.3V | GPO | NC |
| GPIO28 | Unmultiplexed | E23 | I/O | Resume | N | N | 3.3V | GPO | NC |
| GPIO29 | OC5# | C3 | I/O | Resume | N | N | 3.3V | GPI | USB_OCP#2 |
| GPIO30 | OC6# | A2 | I/O | Resume | N | N | 3.3V | GPI | USB_OCP#3 |
| GPIO31 | OC7# | B3 | I/O | Resume | N | N | 3.3V | GPI | USB_OCP#3 |
| GPIO32 | Unmultiplexed | AG18 | I/O | CORE | N | N | 3.3V | GPO | BIOS_WP#(fill with 1) |
| GPIO33 | Unmultiplexed | AC19 | I/O | CORE | N | N | 3.3V | GPO | NC |
| GPIO34 | Unmultiplexed | U2 | I/O | CORE | N | N | 3.3V | GPO | NC |
| GPIO35 | SATACLKREQ# | AD21 | I/O | CORE | N | N | 3.3V | GPO | NC |
| GPIO36 | SATA2GP | AH19 | I/O | CORE | N | N | 3.3V | GPI | STRAPPED HI |
| GPIO37 | SATA3GP | AE19 | I/O | CORE | N | N | 3.3V | GPI | STRAPPED HI |
| GPIO38 | Unmultiplexed | AD20 | I/O | CORE | N | N | 3.3V | GPI | STRAPPED HI |
| GPIO39 | Unmultiplexed | AE20 | I/O | CORE | N | N | 3.3V | GPI | STRAPPED HI |
| GPIO48 | GNT4# | A14 | I/O | CORE | N | N | 3.3V | Native | STRAPPED HI |
| GPIO49 | CPUPWRGD | AG24 | I/O | V_CPU_IO | N | N | V_CPU_IO | Native | H_PWRGD |

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

## SIO Fintek71882FG(CONTINUE)

| GPIO | Alt Func | PIN | Usage | Input/Output | NOTES |
|---|---|---|---|---|---|
| GPIO0 | VIDOUT0 | 49 | MCH_BSEL0 | O12 | |
| GPIO1 | VIDOUT1 | 50 | MCH_BSEL1 | O12 | |
| GPIO2 | VIDOUT2 | 51 | MCH_BSEL2 | O12 | |
| GPIO3 | VIDOUT3 | 52 | NC | O12 | |
| GPIO4 | VIDOUT4 | 53 | NC | O12 | |
| GPIO5 | VIDOUT5/SIC | 54 | NC | I/OOD12t | |
| GPIO6 | SLOTOCC# | 55 | GPO | I/OOD12t | |
| GPIO7 | Turbo1#/WDTRST# | 56 | WDTRST# | OD12-5v | |
| GPIO15 | LED_VSB/ALERT# | 64 | LED_VSB | OD12 | |
| GPIO16 | LED_VCC/Turbo2# | 65 | LED_VCC | OD12 | |
| GPIO20 | PCIRST1# | 74 | PCIRST1# | OD12 | |
| GPIO21 | PCIRST2# | 75 | PCIRST2# | O12 | |
| GPIO22 | PCIRST3# | 76 | PCIRST3# | O12 | |
| GPIO23 | RSTCON# | 77 | RSTCON# | OD12 | |
| GPIO24 | ATXPG_IN | 78 | ATXPG_IN | AIN | |
| GPIO32 | PWROK | 84 | PWROK | OD12 | |
| GPIO26 | PWSIN# | 80 | PWSIN# | INts5v | |
| GPIO27 | PWSOUT# | 80 | PWSOUT# | OD12 | |
| GPIO30 | S3# | 82 | S3# | INts5v | |
| GPIO31 | PSON# | 83 | PSON# | OD12-5v | |
| GPIO33 | RSMRST# | 85 | RSMRST# | OD12 | |
| GPIO40 | FANIN3 | 25 | FANIN3 | INts5v | |
| GPIO41 | FAN_CTL3 | 26 | FAN_CTL3(NC) | OD12-5v | |
| GPIO25 | PME# | 79 | PME# | OD12-5v | |
| GPIO10 | SPI_SLK/FANIN4 | 59 | GPIO10(NC) | I/OOD12t | |
| GPIO11 | SPI_CS0#/FANCTL4 | 60 | GPIO11(NC) | I/OOD12t | |
| GPIO12 | SPI_MISO/FANCTL1_1 | 61 | GPIO12(NC) | I/OOD12t | |
| GPIO13 | SPI_MOSI/BEEP | 62 | BEEP(NC) | OD24 | |
| GPIO14 | FWH_DIS/WDTRST#/SPI_CS1# | 63 | GPIO14 | I/OOD12t | |
| GPIO42 | IRTX | 27 | IRTX | O12 | |
| GPIO43 | IRRX | 28 | IRRX | INts | |
| GPIO17 | | 66 | NC | I/OOD12t | |

## PCI Config.

| DEVICE | MCP1 INT PIN | REQ#/GNT# | IDSEL | CLOCK |
|---|---|---|---|---|
| PCI1 | PIRQ#A<br>PIRQ#B<br>PIRQ#C<br>PIRQ#D | PREQ#0<br>PGNT#0 | AD16 | PCI_CLK0 |
| PCI2 | PIRQ#B<br>PIRQ#C<br>PIRQ#D<br>PIRQ#A | PREQ#1<br>PGNT#1 | AD17 | PCI_CLK1 |

## DDRII DIMM Config.

| DEVICE | ADRRESS | CLOCK |
|---|---|---|
| DIMM A | A0H | P_DDR0_A/N_DDR0_A<br>P_DDR1_A/N_DDR1_A<br>P_DDR2_A/N_DDR2_A |
| DIMM B | A4H | P_DDR0_B/N_DDR0_B<br>P_DDR1_B/N_DDR1_B<br>P_DDR2_B/N_DDR2_B |

| *JCI1* | *Chassis Intrusion* |
|---|---|
| Open | Normal |
| (1-2) | Chassis Open |

| JUMPER SETTING | | |
|---|---|---|
| *JBAT1* | (1-2)NORMAL | (2-3)CLEAR |

| | | | |
|---|---|---|---|
| Title: BIOS Request Form | | | |
| Size: C | Document Number: MS-7610 | | Rev: 2.1 |
| Date: Thursday, December 03, 2009 | Sheet 32 of 33 | | |

## 0A Change list:

1. Add pcie x1 *2,add one pci slot
2. change 1P1_core power mode
3. add APS function
4. modify Audio ALC888S circuit for realtek suggestion
5. add OC_SW1
6. add C14 C56 C61 C505 C506 C504 C370 for power supply with mini current(use resistor)
7. Update TO252 footprint to DPAKSGD
8. Add PLTRST#_R,EXP_RBIAS,SCL_A,SDA_A,SDA_LAN net name
9. add Q34 Q37 R315
10. For power:add C536 C509 C510 C511 R504 R315 R501 R591 R500 R503 R502 EC47

## 1.0 Change list:

1. switch CPU_BSEL0 to J_CPU_BSEL2
2. load power solution
3. add R515 R516 and update new solution for 5VDIMM
4. delete CN7 add C536-539
5. add R517 R518, follow msi-newheader_0216,change JPWR1 JPWR2 JCD1 KB_MS1
6. change EC20 footprint

## 2.0 Change list:

1. change print port to pinheader(page 16)
2. change DD2 to DDR3,add DRAMPWROK circuit(Page 09)
3. change GPIO06 function for USB_EN,GPIO21 for BOM
4. Add SIO Vref circuit(page 16)
5. Delete LANDSM_GPIO(page17)
6. Reserve R404 R395 for usb_en from SB(page 13)
7. add D2 for CPUFANCTL
8. Change NB POWER MODE
9. change Y3 footprint to OSCC_MS
10. add VCCGATE & DUALGATE circuit for 5VDIMM
11. change LAN chip to athros
12. Change audio chip to via,and add audio_gpio from ich7
13. Reserve R688,C806

## 2.1 Change list:

1. P16 ADD C400 C399 R526 R527 TO AVOID NV9600GSO VGA CARD RUN 3D FAIL.
2. P28 RESERVE PATCH 5VDIMM DROP CICUIT.
3. P21 UPDATE CIS ABOUT JSP1
4. P16 SWAP PLTRST_BU2# AND PLTRST_BU1#.



| | | |
|---|---|---|
| Title: History | | |
| Size: Custom | Document Number: MS-7610 | Rev: 2.1 |
| Date: Thursday, December 03, 2009 | Sheet 33 of 33 | |