MS-7693

VER:3.1

CPU

AMD M3 Phenom/Athlon 64 FX AM3/AM3R2

System Chipset

AMD RX980

ATI SB950

On Board Chip

FINTEK Super I/O -- F71878AD
LAN -- RTL8111EL
HD Codec --ALC887
ASM1042 USB3.0
BIOS -- SPI ROM 32M

Main Memory

DDR III X 4 (Max32GB)

Expansion Slots

PCI-E X 16*1

PCI-E X 4 *1

PCI-E X 1 *2

PCI 2.2 Slot X 2

PWM

Controller--IUPI1601 4+1 Phase
Vcore 4 Phase (MOS HIGHX2 LOWX2)
Vnb 1 Phase (MOS HIGHX1 LOWX2)

Clock Generator

Controller--RTM880N-793

Title	Cover Sheet
Rev	3.1
Document Number	MS-7693

MICRO-STAR INT'L CO.,LTD.
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Last Revision Date: Monday, December 03, 2012

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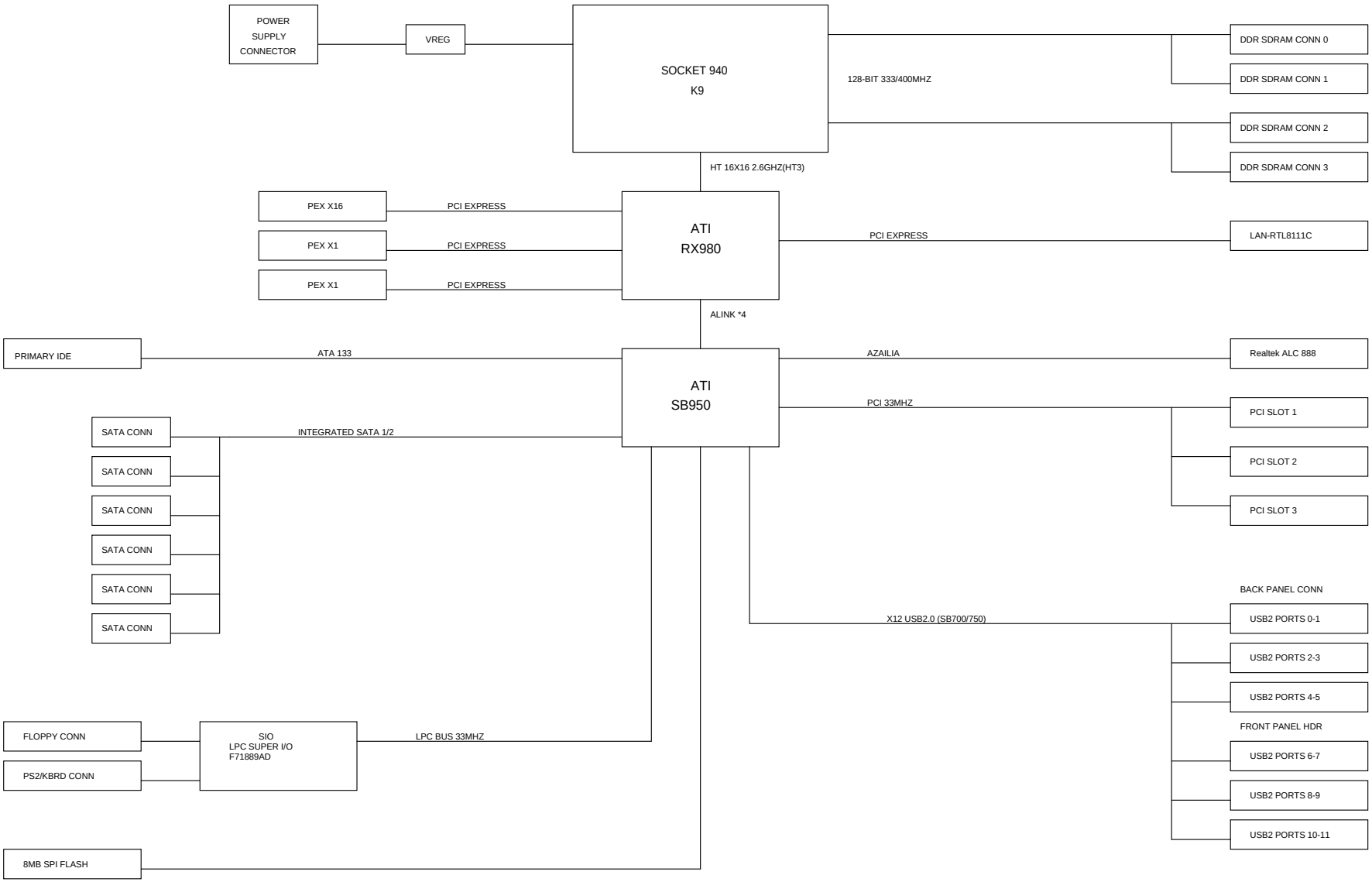
BLOCK DIAGRAM



Micro Star Restricted Secret		
Title	***Block Diagram***	Rev 3.0
Document Number	***MS-7693***	
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Thursday, October 11, 2012	
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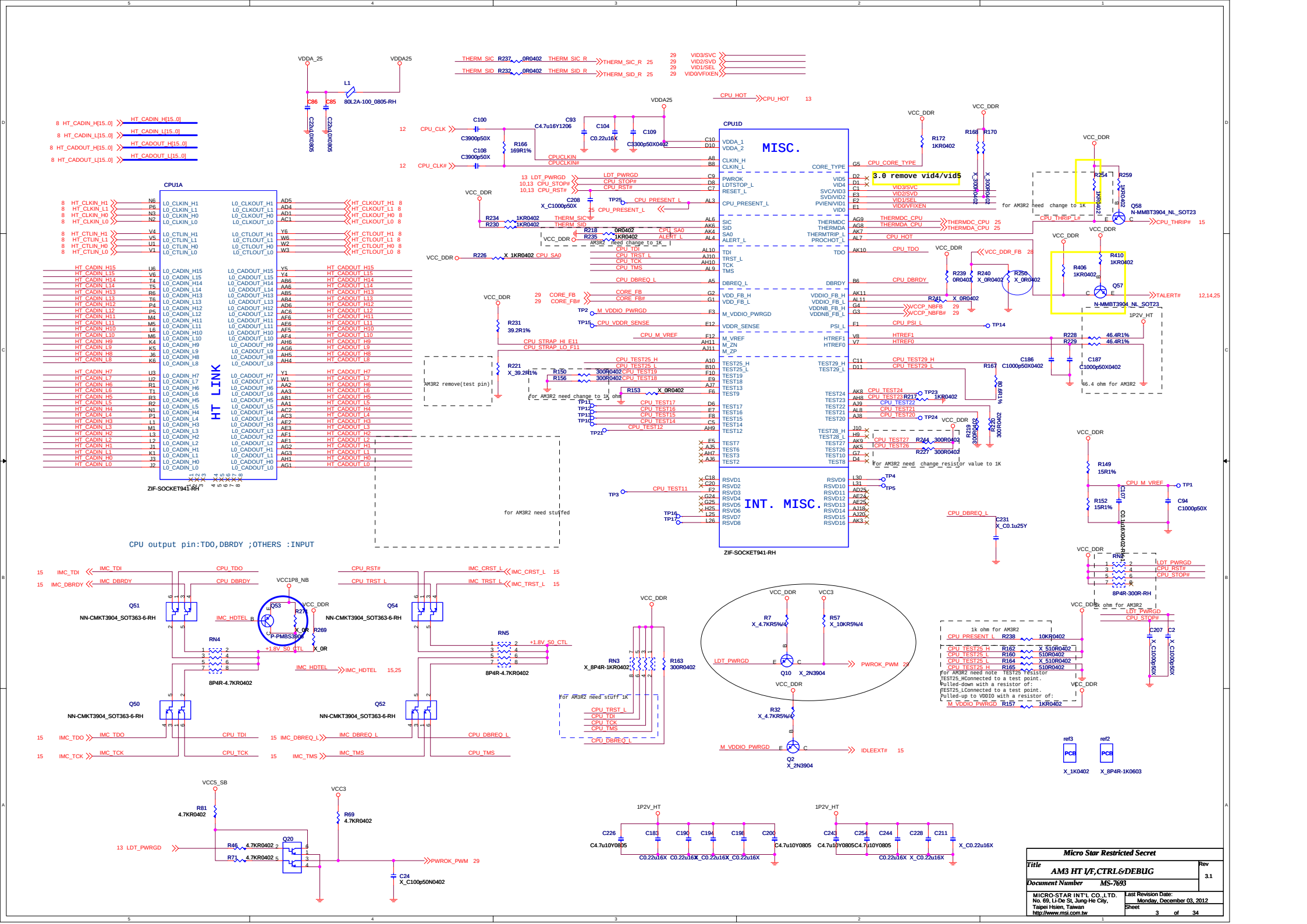
CPU1A
HT LINK
ZIF-SOCKET941-RH
CPU1D
MISC.
INT. MISC.
ZIF-SOCKET941-RH
3.0 remove vid4/vid5
CPU output pin:TDO,DBRDY ;OTHERS :INPUT
Micro Star Restricted Secret
AM3 HT I/F,CTRL&DEBUG
MS-7693
MICRO-STAR INT'L CO.,LTD.
No. 69, Li-De St, Jung-He City,
Taipei Hsien, Taiwan
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Monday, December 03, 2012
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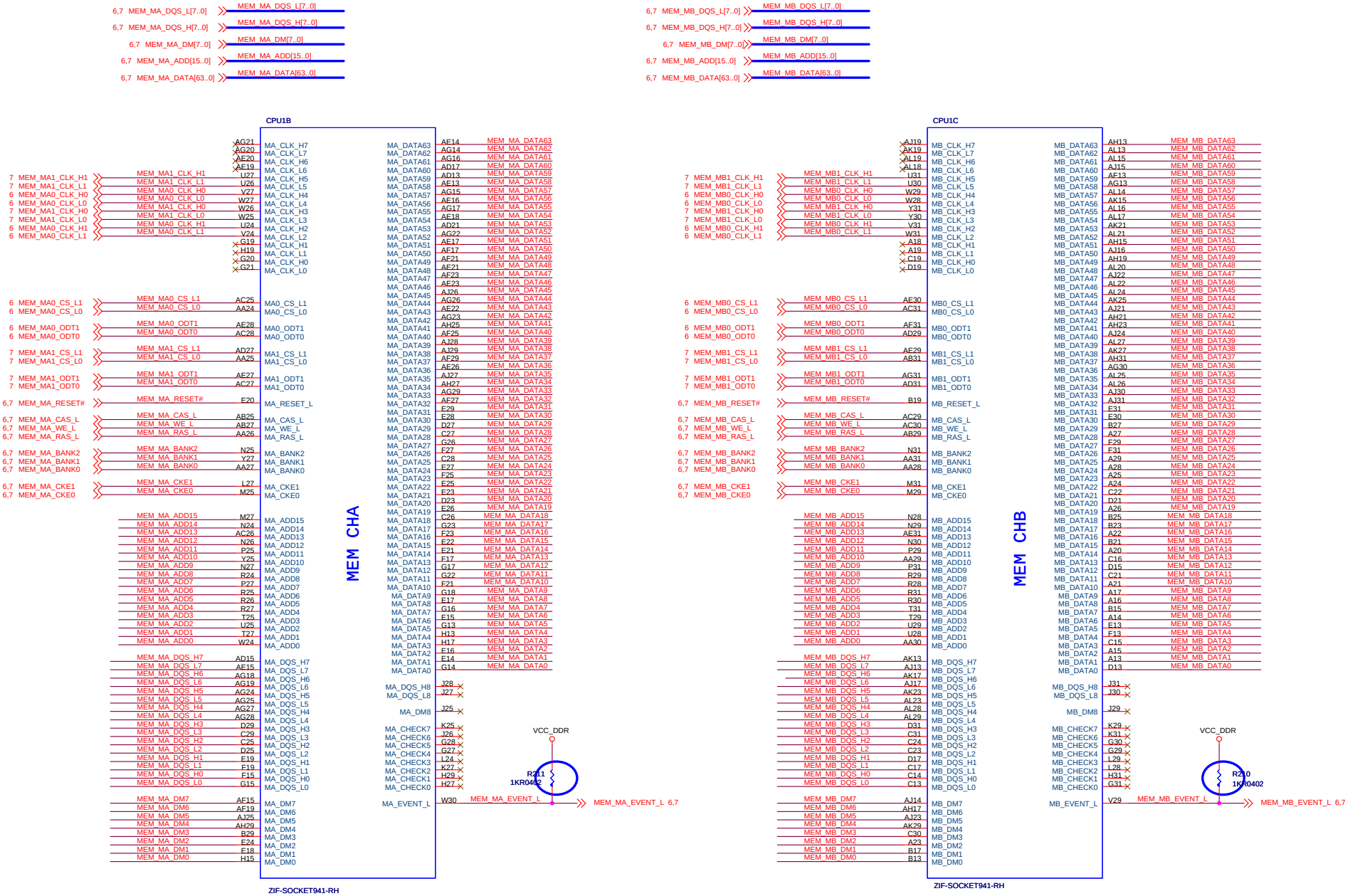

Micro Star Restricted Secret	
Title: AM3 DDR MEMORY I/F	Rev: 3.1
Document Number: MS-7693	
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Monday, December 03, 2012
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VCCP:110A
VCCNB:20A
1P2V_HT:2.5A
CPU_VDDR:4A
VCC_DDR:5A

CPU1E
ZIF-SOCKET941-RH
POWER/GND1

CPU1F
ZIF-SOCKET941-RH
POWER/GND2

CPU1G
ZIF-SOCKET941-RH
POWER/GND3

CPU1H
ZIF-SOCKET941-RH
POWER/GND4

FOR EMI

VCCP_NB CAP

CPU_VDDR CAP
near VDDR 5pin
near VDDR 4pin

VCC_DDR CAP

VCCP CAP
3.0 cost down :47uF/0805 change to 22uF

Micro Star Restricted Secret	
Title: AM3 PWR & GND	Rev: 3.1
Document Number: MS-7693	
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Monday, December 03, 2012
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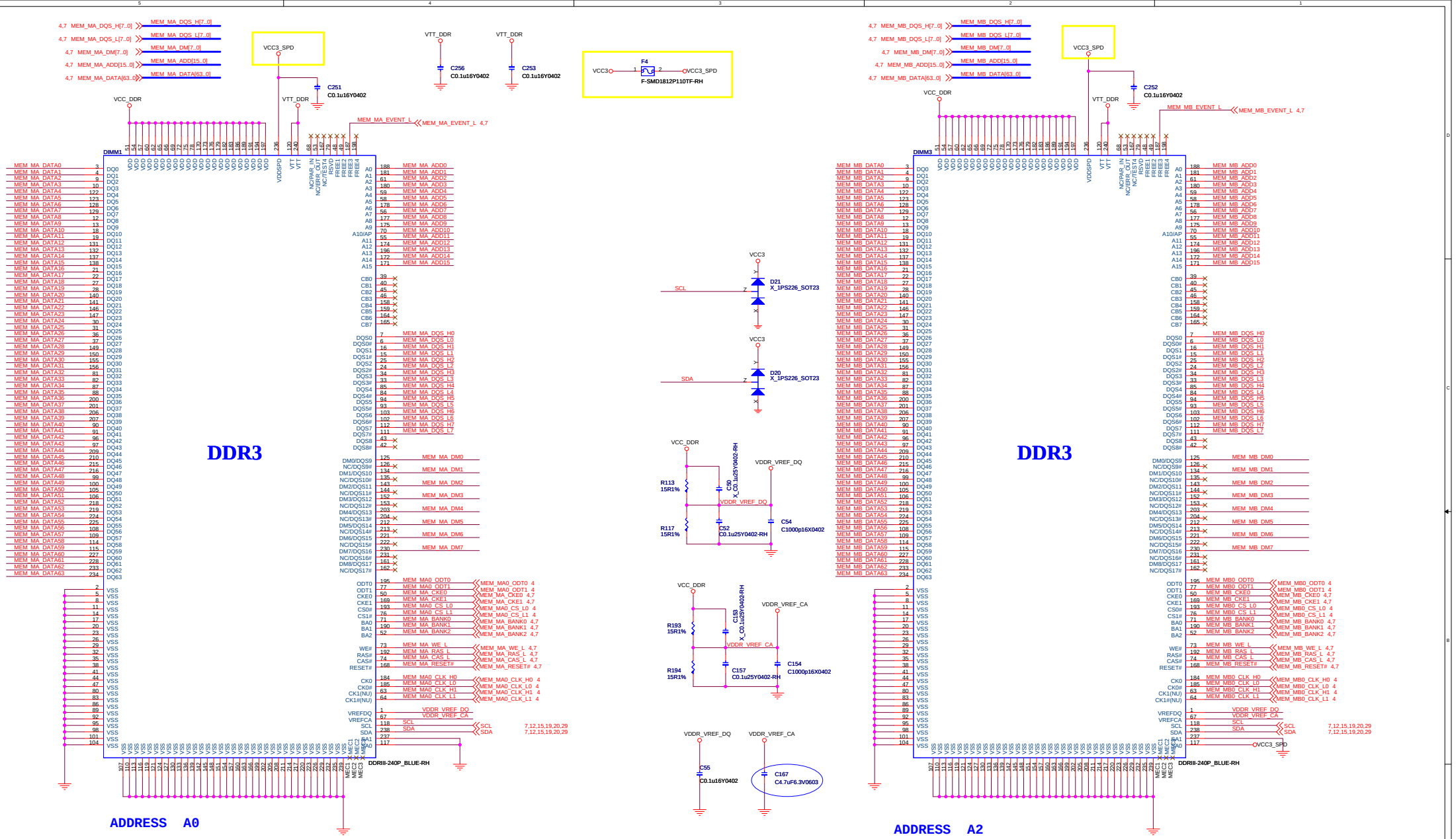
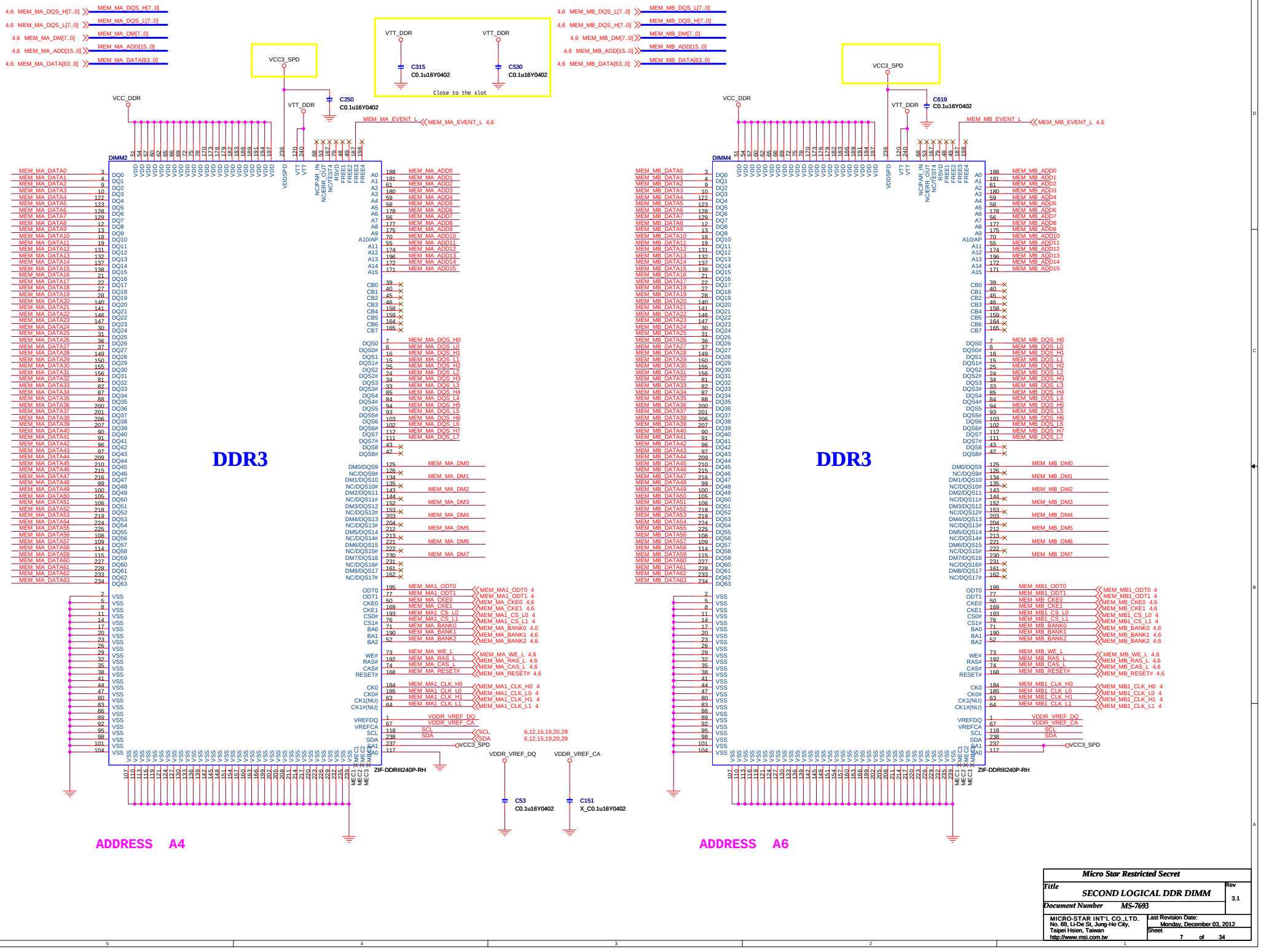


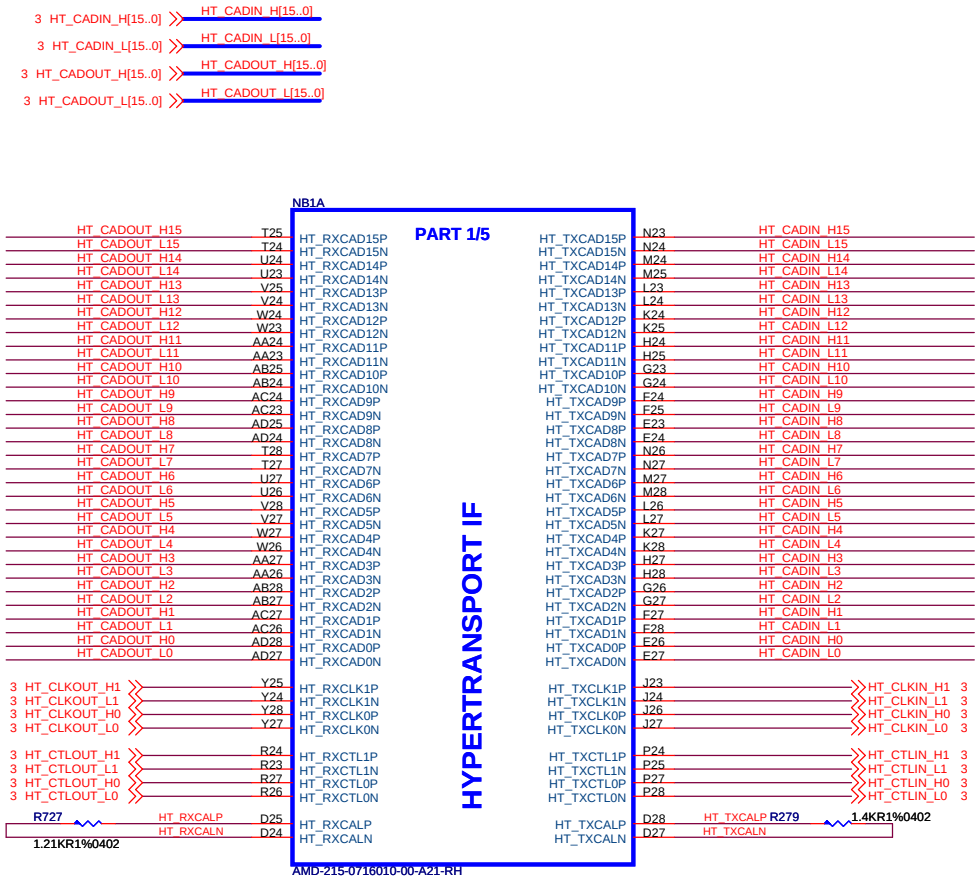
SMBus Addressing

SMBus 0	
Device	8-bit Address (hex)
DIMMA0	A0
DIMMB0	A2
DIMMA1	A4
DIMMB1	A6

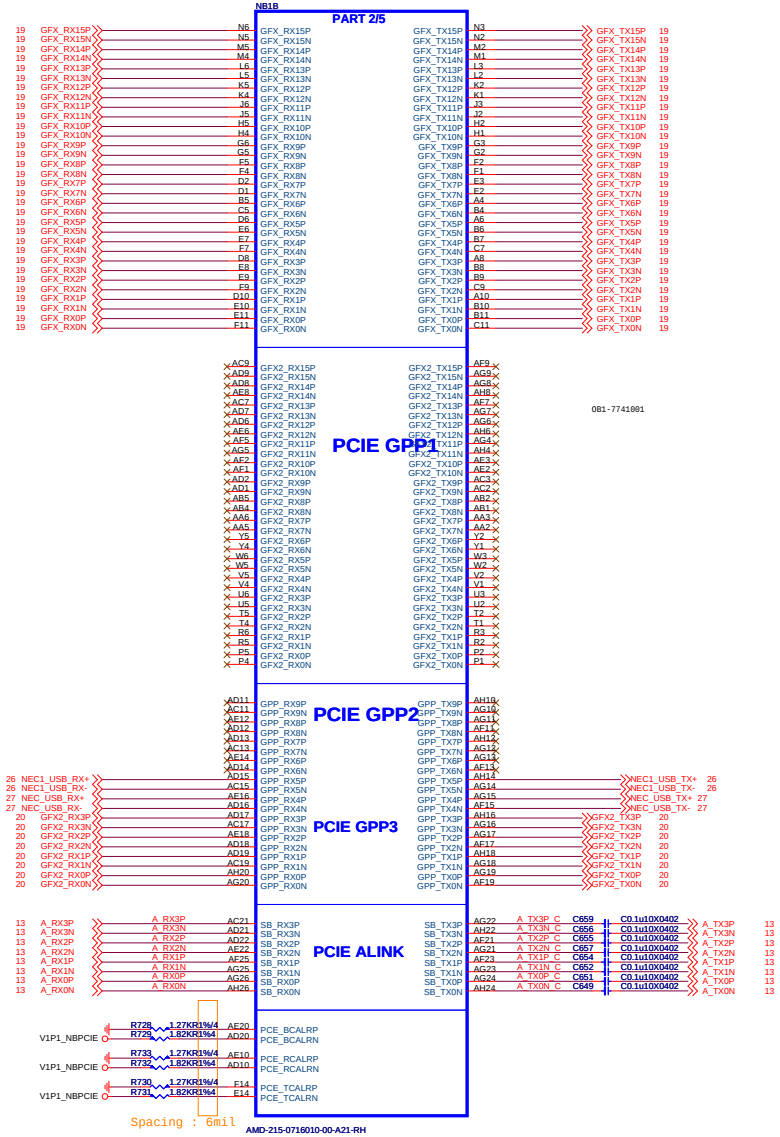
Micro Star Restricted Secret		
Title	*FIRST LOGICAL DDR DIMM*	Rev 3.1
Document Number	*MS-7693*	
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Monday, December 03, 2012	Sheet 6 of 34



Micro Star Restricted Secret	
Title	SECOND LOGICAL DDR DIMM
Rev	3.1
Document Number	MS-7693
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Monday, December 03, 2012
	Sheet 7 of 34



Micro Star Restricted Secret		
Title *RD780-HT LINK I/F*		Rev 3.1
Document Number *MS-7963*		
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Monday, December 03, 2012	
	Sheet 8 of 34	



Micro Star Restricted Secret

Title	RD780-PCIE I/F	Rev 3.1
Document Number	MS-7693	

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Last Revision Date: Monday, December 03, 2012

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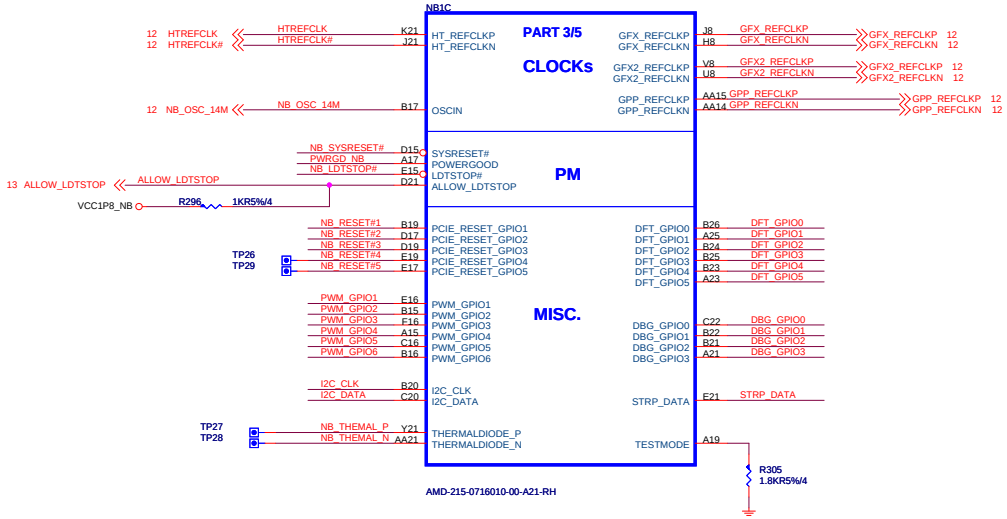
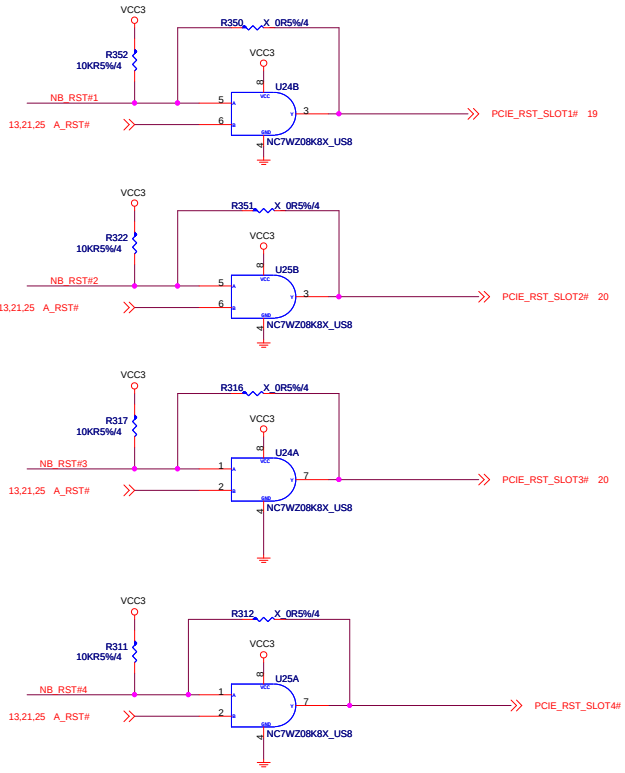
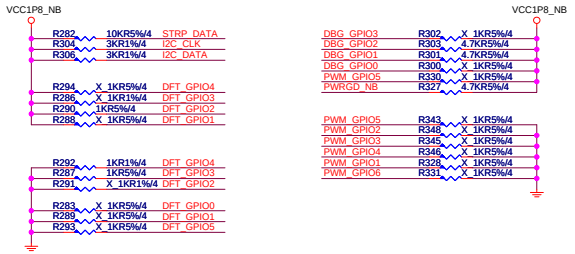
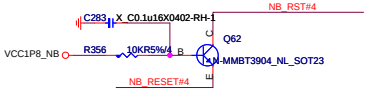


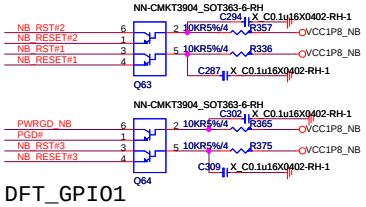


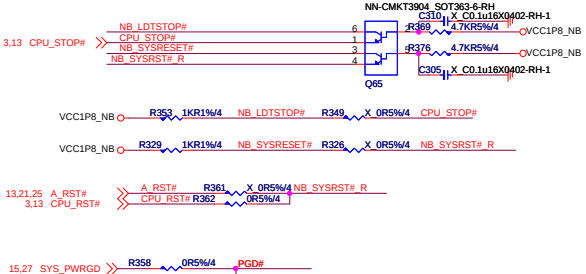




DFT_GPIO[4:2]
STRAP_PCIE_GPP_CFG

111:	1-1-1-1-1-1	Mode L
110:	1-1-1-1-1-1	Mode L
101:	2-0-2-0-2-0	Mode C2
100:	2-0-2-0-1-1	Mode K
011:	2-0-1-1-1-1	Mode E
010:	1-1-1-1-1-1	Mode L
001:	4-0-0-0-1-1	Mode C default
000:	4-0-0-0-2-0	Mode B





PWM_GPIO[5:2]
Reserved.
Make provision for an external pull-down resistor on each of the pins, but do not install a resistor.

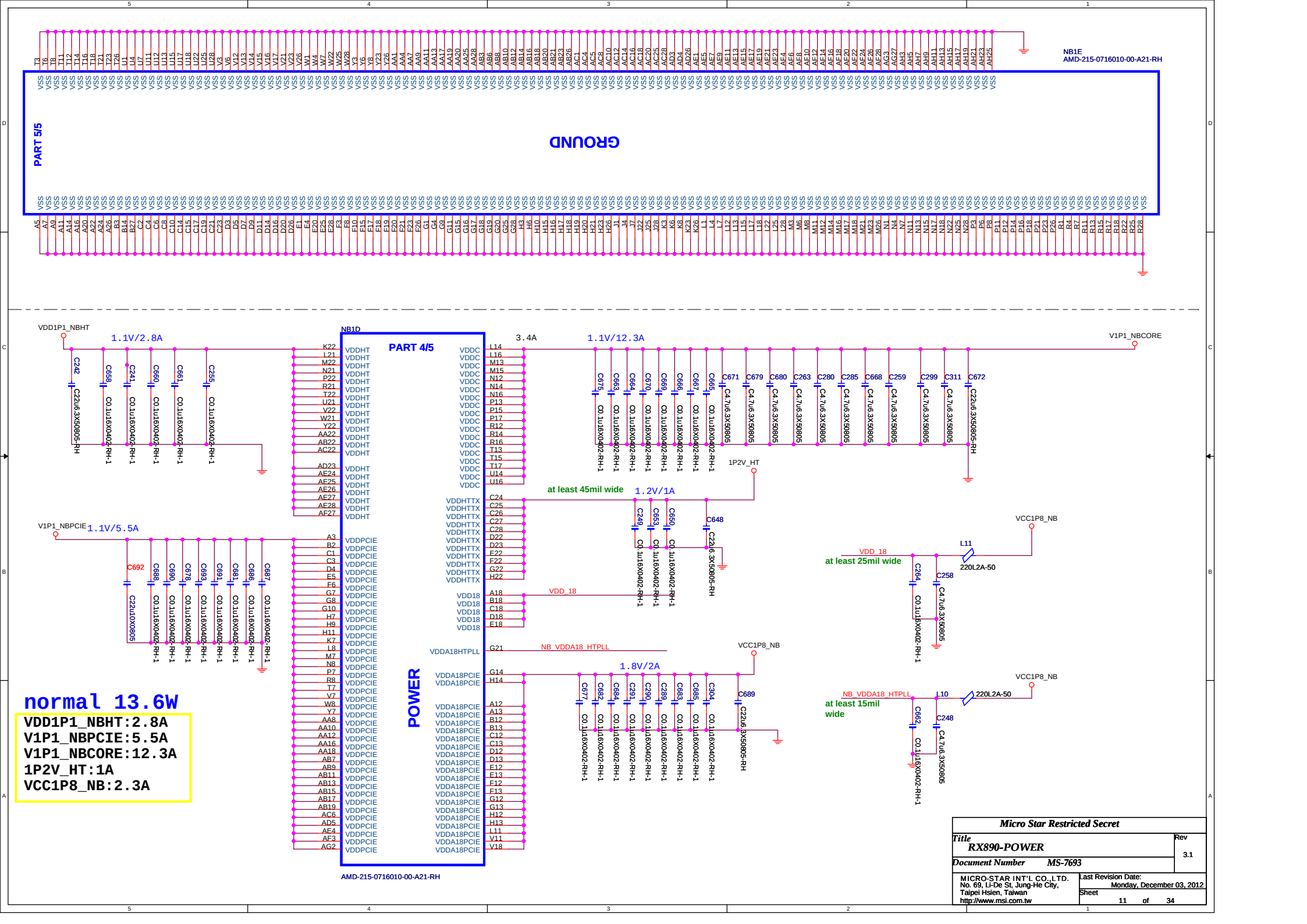
DFT_GPIO0
Reserved. Make provision for an external pull-down resistor on this pin, but do not install a resistor.

DFT_GPIO1
Selects loading of strap values from EEPROM
0: I2C master can load strap values from EEPROM if connected, or use hardware default values if not connected
1: Use hardware default values (Default)

DFT_GPIO5
Reserved. Make provision for an external pull-down resistor on this pin, but do not install a resistor.

Micro Star Restricted Secret

Title: RD780-SYSTEM I/F	Rev: 3.1
Document Number: MS-7693	
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Monday, December 03, 2012
	Sheet 10 of 34


PART 5/5
GROUND
NB1E
AMD-215-0716010-00-A21-RH
NB1D
PART 4/5
POWER
AMD-215-0716010-00-A21-RH
VDD1P1_NBHT
1.1V/2.8A
V1P1_NBPCIE
1.1V/5.5A
3.4A
1.1V/12.3A
V1P1_NBCORE
1P2V_HT
at least 45mil wide
1.2V/1A
VDD_18
at least 25mil wide
L11
220L2A-50
VCC1P8_NB
NB_VDDA18_HTPLL
at least 15mil wide
L10
1.8V/2A
normal 13.6W
VDD1P1_NBHT:2.8A
V1P1_NBPCIE:5.5A
V1P1_NBCORE:12.3A
1P2V_HT:1A
VCC1P8_NB:2.3A
Micro Star Restricted Secret
Title
RX890-POWER
Rev
3.1
Document Number
MS-7693
MICRO-STAR INT'L CO., LTD.
No. 69, Li-De St, Jung-He City,
Taipei Hsien, Taiwan
http://www.msi.com.tw
Last Revision Date:
Monday, December 03, 2012
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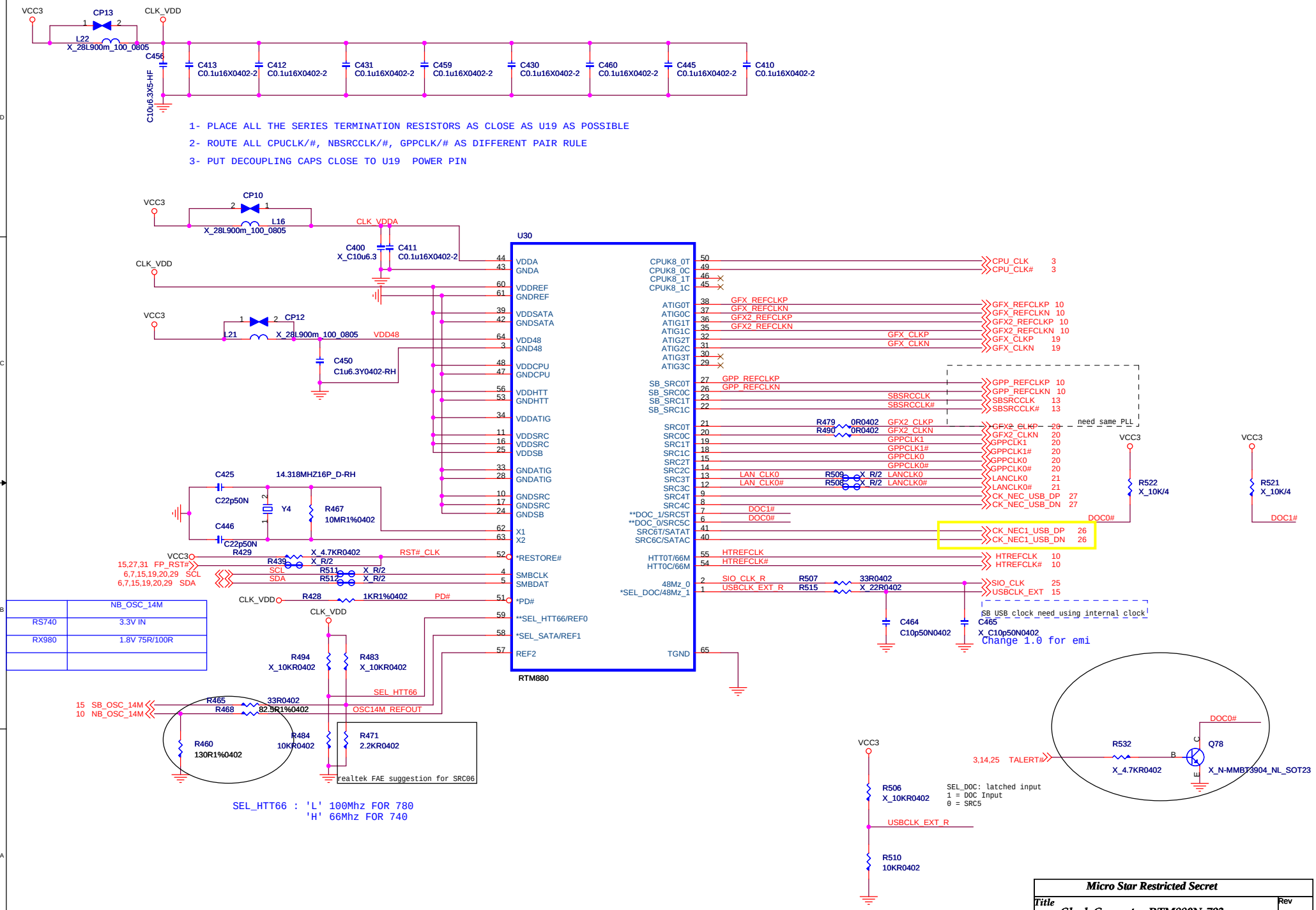
VCC3
CP13
CLK_VDD
L22
X_28L900m_100_0805
C456
C10u6.3X5-HF
C413 C0.1u16X0402-2
C412 C0.1u16X0402-2
C431 C0.1u16X0402-2
C459 C0.1u16X0402-2
C430 C0.1u16X0402-2
C460 C0.1u16X0402-2
C445 C0.1u16X0402-2
C410 C0.1u16X0402-2
1- PLACE ALL THE SERIES TERMINATION RESISTORS AS CLOSE AS U19 AS POSSIBLE
2- ROUTE ALL CPUCLK/#, NBSRCCLK/#, GPPCLK/# AS DIFFERENT PAIR RULE
3- PUT DECOUPLING CAPS CLOSE TO U19 POWER PIN
CP10
L16
X_28L900m_100_0805
CLK_VDDA
C400 X_C10u6.3
C411 C0.1u16X0402-2
CP12
L21
VDD48
C450 C1u6.3Y0402-RH
U30
VDDA
GNDA
VDDREF
GNDREF
VDDSATA
GNDSATA
VDD48
GND48
VDDCPU
GNDCPU
VDDHTT
GNDHTT
VDDATIG
VDDSRC
VDDSRC
VDDSB
GNDATIG
GNDATIG
GNDSRC
GNDSRC
GNDSB
X1
X2
*RESTORE#
SMBCLK
SMBDAT
*PD#
**SEL_HTT66/REF0
*SEL_SATA/REF1
REF2
TGND
RTM880
CPUK8_0T
CPUK8_0C
CPUK8_1T
CPUK8_1C
ATIG0T
ATIG0C
ATIG1T
ATIG1C
ATIG2T
ATIG2C
ATIG3T
ATIG3C
SB_SRC0T
SB_SRC0C
SB_SRC1T
SB_SRC1C
SRC0T
SRC0C
SRC1T
SRC1C
SRC2T
SRC2C
SRC3T
SRC3C
SRC4T
SRC4C
**DOC_1/SRC5T
**DOC_0/SRC5C
SRC6T/SATAT
SRC6C/SATAC
HTT0T/66M
HTT0C/66M
48Mz_0
*SEL_DOC/48Mz_1
TGND
CPU_CLK 3
CPU_CLK# 3
GFX_REFCLKP
GFX_REFCLKN
GFX2_REFCLKP
GFX2_REFCLKN
GFX_CLKP
GFX_CLKN
GPP_REFCLKP
GPP_REFCLKN
SBSRCCLK
SBSRCCLK#
R479 0R0402 GFX2_CLKP
R490 0R0402 GFX2_CLKN
GPPCLK1
GPPCLK1#
GPPCLK0
GPPCLK0#
LAN_CLK0
LAN_CLK0#
R509 X_R/2
R508 X_R/2
LANCLK0
LANCLK0#
CK_NEC_USB_DP 27
CK_NEC_USB_DN 27
DOC1#
DOC0#
CK_NEC1_USB_DP 26
CK_NEC1_USB_DN 26
HTREFCLK
HTREFCLK#
SIO_CLK_R
USBCLK_EXT_R
R507 33R0402
R515 X_22R0402
SIO_CLK 25
USBCLK_EXT 15
need same PLL
SB USB clock need using internal clock
C464 C10p50N0402
C465 X_C10p50N0402
Change 1.0 for emi
R522 X_10K/4
R521 X_10K/4
C425
14.318MHZ16P_D-RH
C22p50N
Y4
R467 10MR1%0402
C446
C22p50N
R429 X_4.7KR0402
RST#_CLK
15,27,31 FP_RST#
6,7,15,19,20,29 SCL
6,7,15,19,20,29 SDA
R439 X_R/2
R511 X_R/2
R512 X_R/2
R428 1KR1%0402
PD#
CLK_VDD
R494 X_10KR0402
R483 X_10KR0402
SEL_HTT66
OSC14M_REFOUT
15 SB_OSC_14M
10 NB_OSC_14M
R465 33R0402
R468 82.5R1%0402
R460 130R1%0402
R484 10KR0402
R471 2.2KR0402
realtek FAE suggestion for SRC06
NB_OSC_14M
RS740 3.3V IN
RX980 1.8V 75R/100R
SEL_HTT66 : 'L' 100Mhz FOR 780
'H' 66Mhz FOR 740
R506 X_10KR0402
SEL_DOC: latched input
1 = DOC Input
0 = SRC5
USBCLK_EXT_R
R510 10KR0402
3,14,25 TALERT#
R532 X_4.7KR0402
Q78
X_N-MMBT3904_NL_SOT23
Micro Star Restricted Secret
Title
Clock Generator RTM880N-793
Rev 3.1
Document Number MS-7693
MICRO-STAR INT'L CO., LTD.
No. 69, Li-De St, Jung-He City,
Taipei Hsien, Taiwan
http://www.msi.com.tw
Last Revision Date: Monday, December 03, 2012
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For EMI

SB850 Part 1 of 5

SB1A

PCI CLKS

PCI EXPRESS INTERFACES

PCI INTERFACE

LPC

CLOCK GENERATOR

CPU

RTC

PLACE PCIE CAPS CLOSE TO U13

outed with 85ohm ±15% differential impedance

length need under 8 inch GEN2, under 12 inch GEN1

length should under 12 inche and over1 inch

Adding some 0.1 uF stitching capacitors for crossing a split when these signals change different reference layer.

P=3.3*3.3/510=0.02135W

update cap value as checklist 1.04 suggestion

C579 and C519 change to 0603

PLACE THESE COMPONENTS CLOSE TO U600, AND USE GROUND GUARD FOR 32K_X1 AND 32K_X2

length need under 1.5inch

B01-SB70035-A08

AMD-218-0697002-00-A12-RH

Micro Star Restricted Secret	
Title: SB700-PCIE/PCI/CPU/LPC	Rev: 3.1
Document Number: MS-7693	
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Monday, December 03, 2012
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Gen3: Signal length from the Southbridge to connector ≒ 2.5".

SATA_TX[5:0]P/N: Routed with 90-ohm ㊣ 10% differential impedance.
SATA_RX[5:0]P/N: Routed with 90-ohm ㊣ 10% differential impedance.

SATA1
SATA7P_BLACK-P-RH
SATA_TX0+_C
SATA_TX0-_C
SATA_RX0-_C
SATA_RX0+_C

SATA2
SATA7P_BLACK-P-RH
SATA_TX1+_C
SATA_TX1-_C
SATA_RX1-_C
SATA_RX1+_C

SB1B
SB850
Part 2 of 5
AMD-218-0697002-00-A12-RH

SERIAL ATA
SATA_TX0+_C C544 0.01u/16v/X7/4 SATA_TX0+ AH9 SATA_TX0P
SATA_TX0-_C C545 0.01u/16v/X7/4 SATA_TX0- AJ9 SATA_TX0N
SATA_RX0-_C C549 0.01u/16v/X7/4 SATA_RX0- AJ8 SATA_RX0N
SATA_RX0+_C C542 0.01u/16v/X7/4 SATA_RX0+ AH8 SATA_RX0P
SATA_TX1+_C C548 0.01u/16v/X7/4 SATA_TX1+ AH10 SATA_TX1P
SATA_TX1-_C C543 0.01u/16v/X7/4 SATA_TX1- AJ10 SATA_TX1N
SATA_RX1-_C C546 0.01u/16v/X7/4 SATA_RX1- AG10 SATA_RX1N
SATA_RX1+_C C547 0.01u/16v/X7/4 SATA_RX1+ AF10 SATA_RX1P
SATA_TX2+_C C509 0.01u/16v/X7/4 SATA_TX2+ AG12 SATA_TX2P
SATA_TX2-_C C510 0.01u/16v/X7/4 SATA_TX2- AF12 SATA_TX2N
SATA_RX2-_C C511 0.01u/16v/X7/4 SATA_RX2- AJ12 SATA_RX2N
SATA_RX2+_C C512 0.01u/16v/X7/4 SATA_RX2+ AH12 SATA_RX2P
SATA_TX3+_C C513 0.01u/16v/X7/4 SATA_TX3+ AH14 SATA_TX3P
SATA_TX3-_C C514 0.01u/16v/X7/4 SATA_TX3- AJ14 SATA_TX3N
SATA_RX3-_C C515 0.01u/16v/X7/4 SATA_RX3- AG14 SATA_RX3N
SATA_RX3+_C C516 0.01u/16v/X7/4 SATA_RX3+ AF14 SATA_RX3P
SATA_TX4+_C C478 0.01u/16v/X7/4 SATA_TX4+ AG17 SATA_TX4P
SATA_TX4-_C C481 0.01u/16v/X7/4 SATA_TX4- AF17 SATA_TX4N
SATA_RX4-_C C482 0.01u/16v/X7/4 SATA_RX4- AJ17 SATA_RX4N
SATA_RX4+_C C483 0.01u/16v/X7/4 SATA_RX4+ AH17 SATA_RX4P
SATA_TX5+_C C484 0.01u/16v/X7/4 SATA_TX5+ AJ18 SATA_TX5P
SATA_TX5-_C C485 0.01u/16v/X7/4 SATA_TX5- AH18 SATA_TX5N
SATA_RX5-_C C479 0.01u/16v/X7/4 SATA_RX5- AH19 SATA_RX5N
SATA_RX5+_C C480 0.01u/16v/X7/4 SATA_RX5+ AJ19 SATA_RX5P

VDDAN_11_SATA
R737 1K/4/1% SATA_CALRP AB14 SATA_CALRP
R738 931R1%0402 SATA_CALRN AA14 SATA_CALRN

31 SATA_LED AD11 SATA_ACT#/GPIO67

C457 X_C22p50N0402 SATA_X1 SATA_X1 AD16 SATA_X1
Y5 X_25MHZ/18pf/HC49S R504 X_1MR1%0402
C458 X_C22p50N0402 SATA_X2 SATA_X2 AC16 SATA_X2
no further than 1.5
reference 7640-1.0 bom

SPI_CLK
C566 X_10p/50v/N/4

SPI ROM
SPI_DATAIN J5 SPI_DI/GPIO164
SPI_DATAOUT E2 SPI_DO/GPIO163
SPI_CLK K4 SPI_CLK/GPIO162
SPI_CS# K9 SPI_CS1#/GPIO165
TP42 G2 ROM_RST#/GPIO161

GPIOD
FC_CLK AH28
FC_FBCLKOUT AG28
FC_FBCLKIN AE26
FC_OE#/GPIOD145 AE28
FC_AVD#/GPIOD146 AG29
FC_WE#/GPIOD148 AG26
FC_CE1#/GPIOD149 AF27
FC_CE2#/GPIOD150 AE29
FC_INT1/GPIOD144 AF29
FC_INT2/GPIOD147 AH27
FC_ADQ0/GPIOD128 AJ27
FC_ADQ1/GPIOD129 AJ26
FC_ADQ2/GPIOD130 AH25
FC_ADQ3/GPIOD131 AH24
FC_ADQ4/GPIOD132 AG23
FC_ADQ5/GPIOD133 AH23
FC_ADQ6/GPIOD134 AJ22
FC_ADQ7/GPIOD135 AG21
FC_ADQ8/GPIOD136 AF21
FC_ADQ9/GPIOD137 AH22
FC_ADQ10/GPIOD138 AJ23
FC_ADQ11/GPIOD139 AF23
FC_ADQ12/GPIOD140 AJ24
FC_ADQ13/GPIOD141 AJ25
FC_ADQ14/GPIOD142 AG25
FC_ADQ15/GPIOD143 AH26

HW MONITOR
FANOUT0/GPIO52 W5
FANOUT1/GPIO53 W6
FANOUT2/GPIO54 Y9
FANIN0/GPIO56 W7
FANIN1/GPIO57 V9
FANIN2/GPIO58 W8
TEMPIN0/GPIO171 B6 SB_GPIO171
TEMPIN1/GPIO172 A6 SB_GPIO172
TEMPIN2/GPIO173 A5 SB_GPIO173
TEMPIN3/TALERT#/GPIO174 B5
TEMP_COMM C7 R541 0R0402
R554 10K/4 3VDUAL
TALERT# 3,12,25
VIN0/GPIO175 A3 SB_GPIO175
VIN1/GPIO176 B4 SB_GPIO176
VIN2/GPIO177 A4 SB_GPIO177
VIN3/GPIO178 C5 SB_GPIO178
VIN4/GPIO179 A7 SB_GPIO179
VIN5/GPIO180 B7 SB_GPIO180
VIN6/GBE_STAT3/GPIO181 B8 SB_GPIO181
VIN7/GBE_LED3/GPIO182 A8 SB_GPIO182

NC1 G27
NC2 Y2

SB_GPIO171 R556 10K/4
SB_GPIO172 R547 10K/4
SB_GPIO173 R561 10K/4

RN10
SB_GPIO178 SB_GPIO177 SB_GPIO176 SB_GPIO175 8P4R-10K/4
RN9
SB_GPIO182 SB_GPIO181 SB_GPIO180 SB_GPIO179 8P4R-10K/4

all the VIN pin need config as GPIO mode

SATA3_4
SATA14PM_BEIGE-ST-RH
SATA_TX2+_C SATA_TX2-_C SATA_RX2-_C SATA_RX2+_C
SATA_TX3+_C SATA_TX3-_C SATA_RX3-_C SATA_RX3+_C

SATA5_6
SATA14PM_BEIGE-ST-RH
SATA_TX4+_C SATA_TX4-_C SATA_RX4-_C SATA_RX4+_C
SATA_TX5+_C SATA_TX5-_C SATA_RX5-_C SATA_RX5+_C

3.0 change to connector with 90 degree

SPI FLASH MEMORY

SPI DEBUG PORT

Place close to SPI ROM

3VDUAL
SPI_WP# R682 10K/4
SPI_HOLD# R673 10K/4
SPI_CS# R686 1KR0402

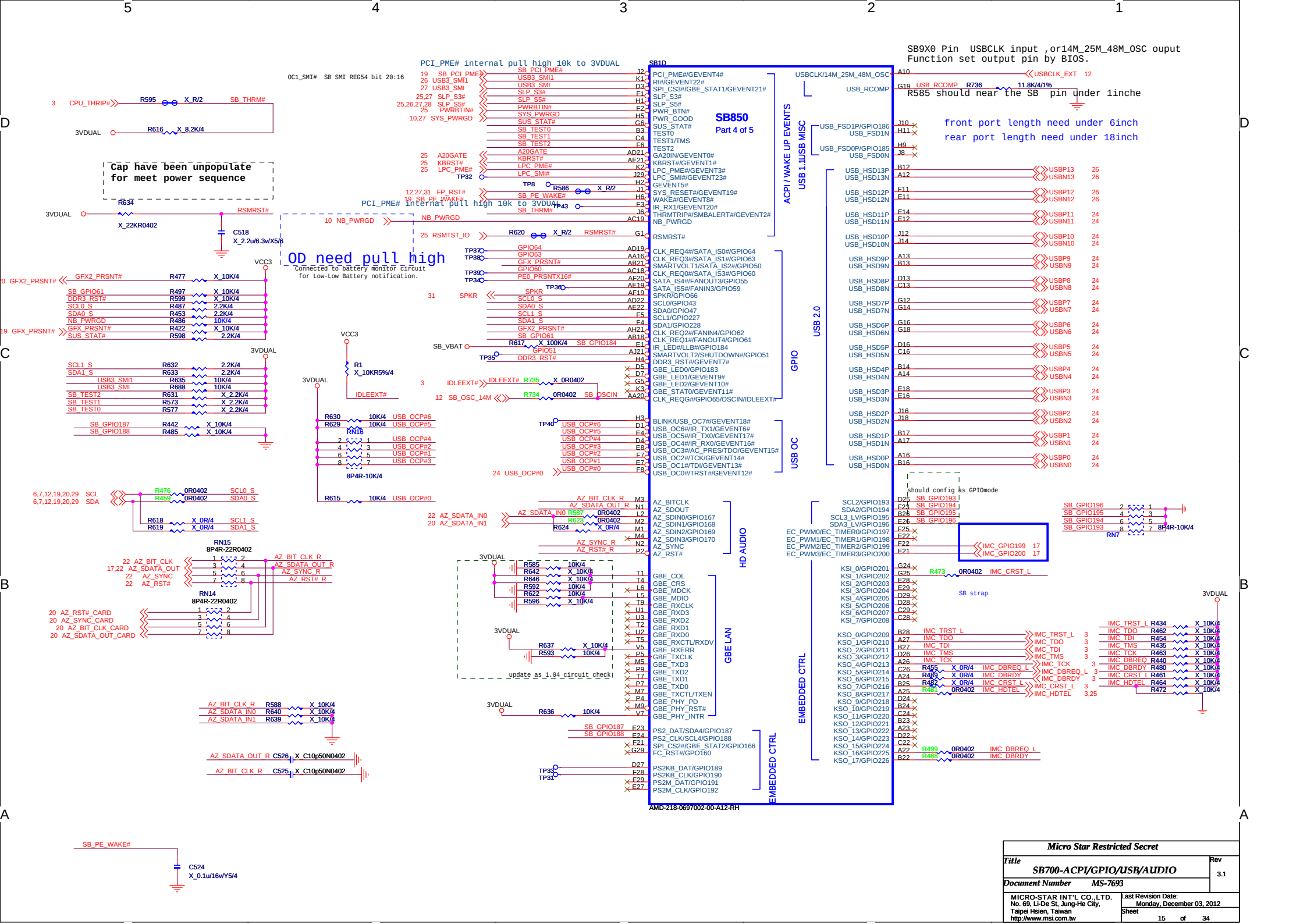
JSPI1
SPI_DATAIN SPI_DATAOUT SPI_CS# SPI_CLK SPI_HOLD#
H2X5[1]M-2mm_Black

Part Number : N31-2051451-H06

3VDUAL
C555 C22U6.3X50805-RH
C559 0.1u/25v/Y5/4

SPI1
SPI_CS# SPI_DATAIN SPI_WP#
CS VCC DO(IO1) HOLD(IO3) WP(IO2) CLK GND DI(IO0)
SPI_HOLD# SPI_CLK SPI_DATAOUT
W25Q64BVSSIG-RH

Micro Star Restricted Secret		
Title: SB700-SATA/IDE/HWM/SPI		Rev: 3.1
Document Number: MS-7693		
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Monday, December 03, 2012	Sheet 14 of 34


SB9X0 Pin USBCLK input ,or14M_25M_48M_OSC ouput
Function set output pin by BIOS.
R585 should near the SB pin under 1inche
front port length need under 6inch
rear port length need under 18inch
PCI_PME# internal pull high 10k to 3VDUAL
Cap have been unpopulate
for meet power sequence
OD need pull high
Connected to battery monitor circuit
for Low-Low Battery notification.
should config as GPIOmode
SB strap
update as_1.04_circuit check
SB850
Part 4 of 5
ACPI / WAKE UP EVENTS
USB 1.1/USB MISC
USB 2.0
GPIO
USB OC
HD AUDIO
GBE LAN
EMBEDDED CTRL
EMBEDDED CTRL
AMD-218-0697002-00-A12-RH
Micro Star Restricted Secret
SB700-ACPI/GPIO/USB/AUDIO
3.1
MS-7693
MICRO-STAR INT'L CO.,LTD.
No. 69, Li-De St, Jung-He City,
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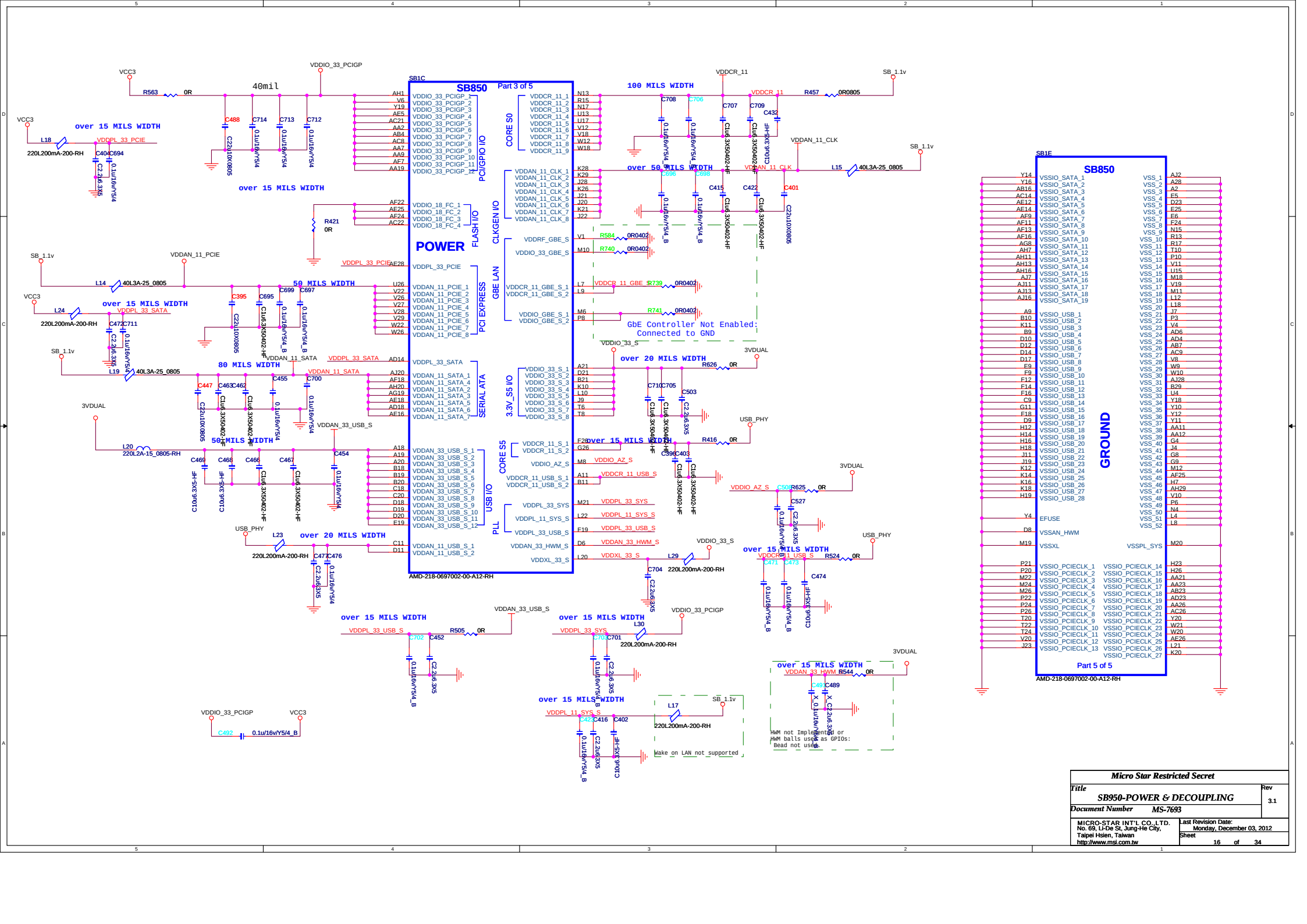
SB850
Part 3 of 5
POWER
GROUND
Part 5 of 5
GbE Controller Not Enabled:
Connected to GND
HWM not Implemented or
HWM balls used as GPIOs:
Bead not used.
Wake on LAN not supported
AMD-218-0697002-00-A12-RH
Micro Star Restricted Secret
SB950-POWER & DECOUPLING
MS-7693
3.1
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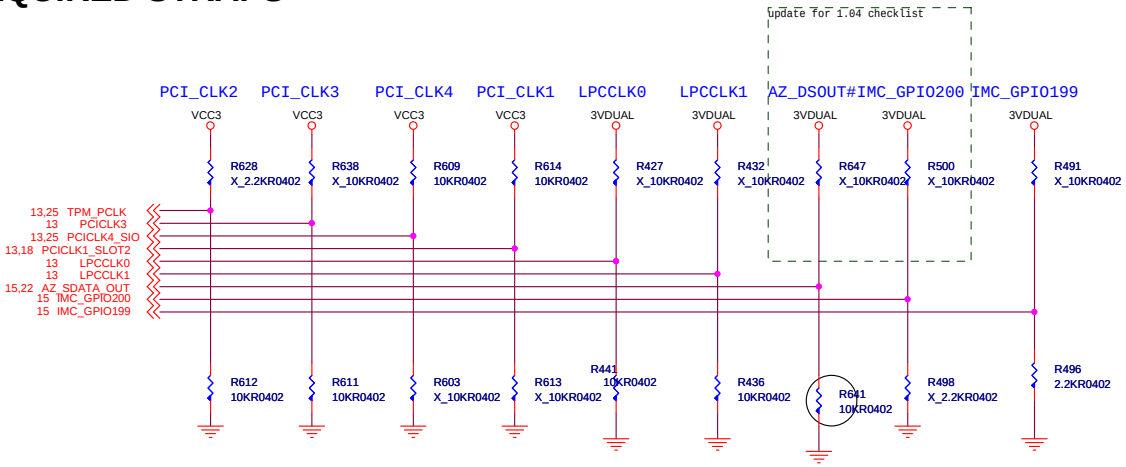
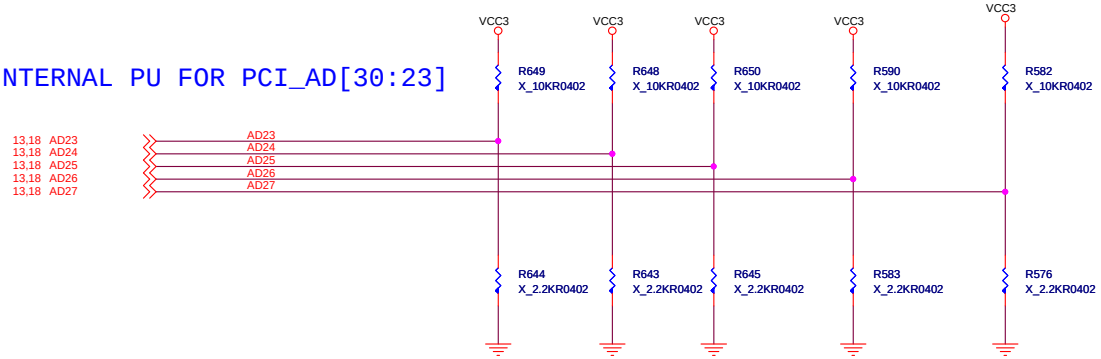
REQUIRED STRAPS

NOTE: SB700 HAS INTERNAL 15K PULL UP RESISTOR FOR RTC_CLK



	PCI_CLK1	PCI_CLK2	PCI_CLK3	PCI_CLK4	LPC_CLK0	LPC_CLK1	AZ_DOUT#	IMC_GPIO200 IMC_GPIO199
PULL HIGH	ALLOW PCIE GEN2 DEFAULT	WATCHDOG TIMER ON NB_PWRGD ENABLED	USE DEBUG STRAPS	NON-FUSION CPU CLOCK MODE DEFAULT	EC ENABLE	CLKGEN ENABLED		ROM TYPE: H, H = Reserved H, L = SPI ROM DEFAULT
PULL LOW	FORCE PCIE GEN1	WATCHDOG TIMER ON NB_PWRGD DISABLED DEFAULT	IGNORE DEBUG STRAPS DEFAULT	FUSION CPU CLOCK MODE	DISABLE EC DEFAULT	CLKGEN DISABLED DEFAULT	PERFORMANCE MODE DEFAULT	L, H = LPC ROM L, L = FWH ROM

SB800 HAS 15K INTERNAL PU FOR PCI_AD[30:23]



DEBUG STRAPS

	PCI_AD27	PCI_AD26	PCI_AD25	PCI_AD24	PCI_AD23
PULL HIGH	USE PCI PLL DEFAULT	DISABLE ILA AUTORUN DEFAULT	USE FC PLL DEFAULT	USE DEFAULT PCIE STRAPS DEFAULT	DISABLE PCI MEM BOOT DEFAULT
PULL LOW	BYPASS PCI PLL	ENABLE ILA AUTORUN	BYPASS FC PLL	USE EEPROM PCIE STRAPS	ENABLE PCI MEM BOOT

Title: SB950-STRAPS

Rev: 3.1

Document Number: MS-7693

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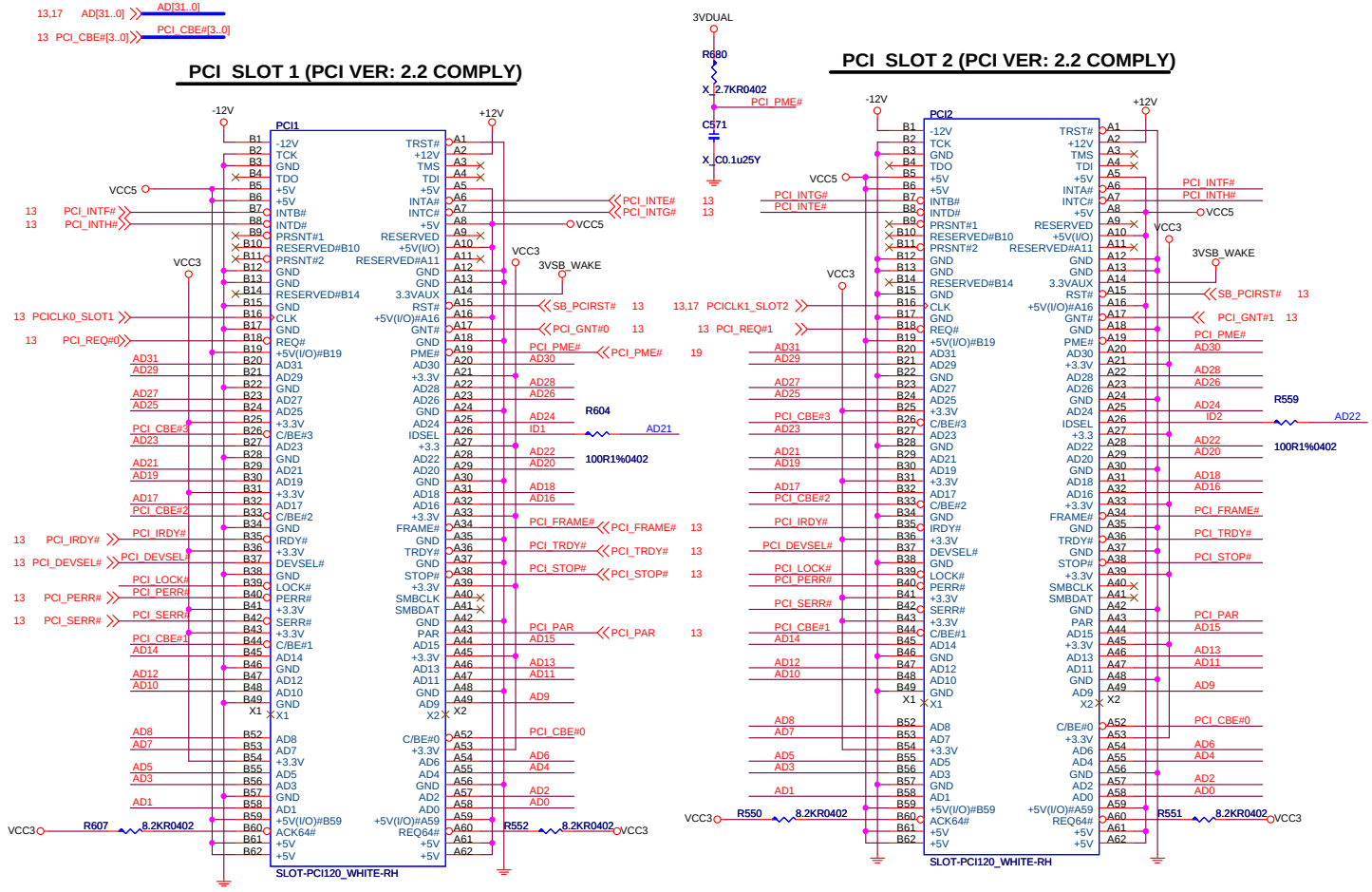

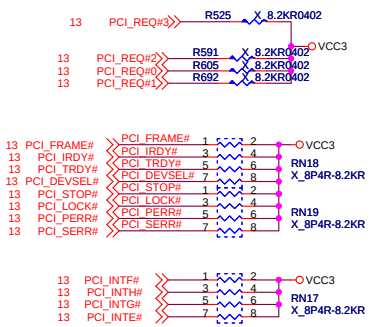

Micro Star Restricted Secret	
Title: PCI Slot 1,2 ,3& PCI Extender	Rev: 3.1
Document Number: MS-7693	
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Monday, December 03, 2012
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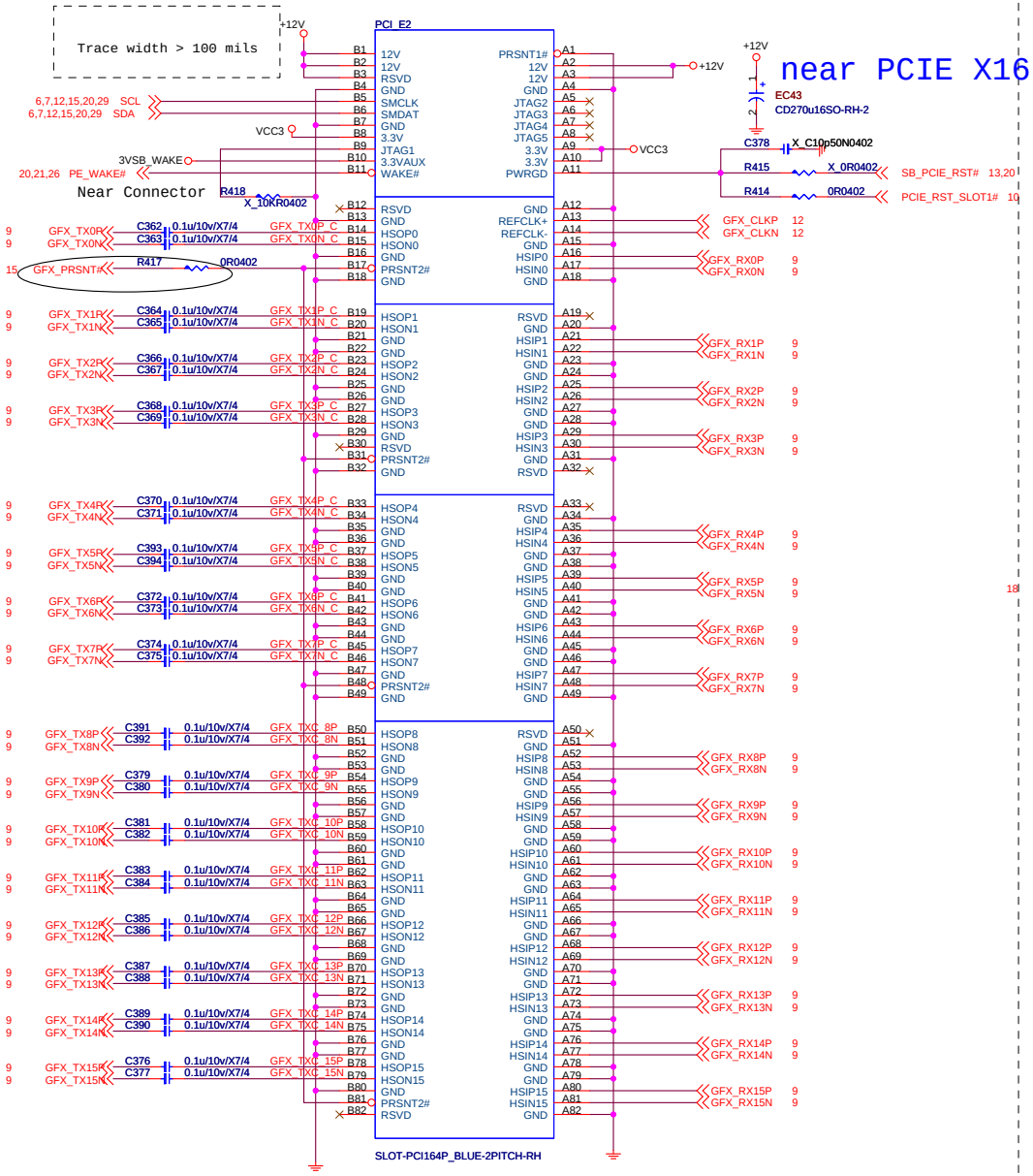
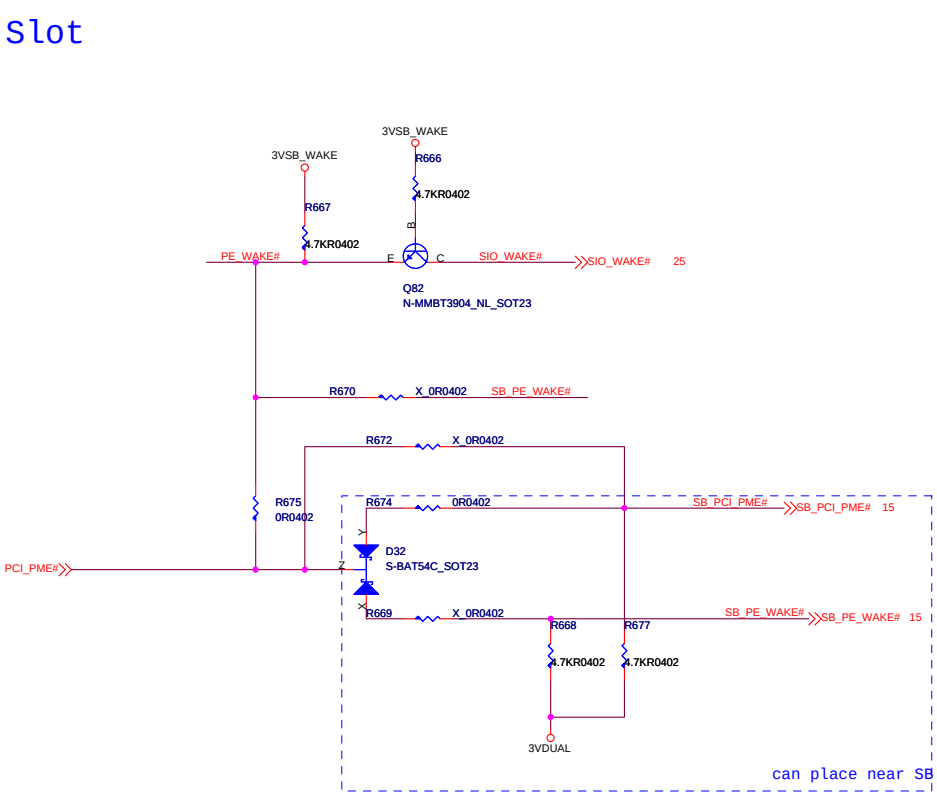
PCI EXPRESS_16



near PCIE X16 Slot



Digital Switch SEL pin — **SLI function**

SEL (X8_X8#)	Output	X8_SW	PCI-E_Slot 1/2
Low	Oa	Low	X8 / X8
Hi	Ob	Hi	X16 / 0

Micro Star Restricted Secret

Title	PCI-E X16 , X1 Slot
Document Number	MS-7693
Rev	3.1

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No. 69, Li-De St, Jung-He City,
Taipei Hsien, Taiwan
http://www.msi.com.tw

Last Revision Date: Monday, December 03, 2012

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PCI EXPRESS X4

near PCIE X3

+12V
EC51
CD270u16SO-RH-2

Trace width > 100 mils

PCI_E4

SLOT-PCI164P_BLUE-2PITCH-RH-2

within 500mil

PCI-Express x1 SLOT 1

PCI_E1

PCIE X1

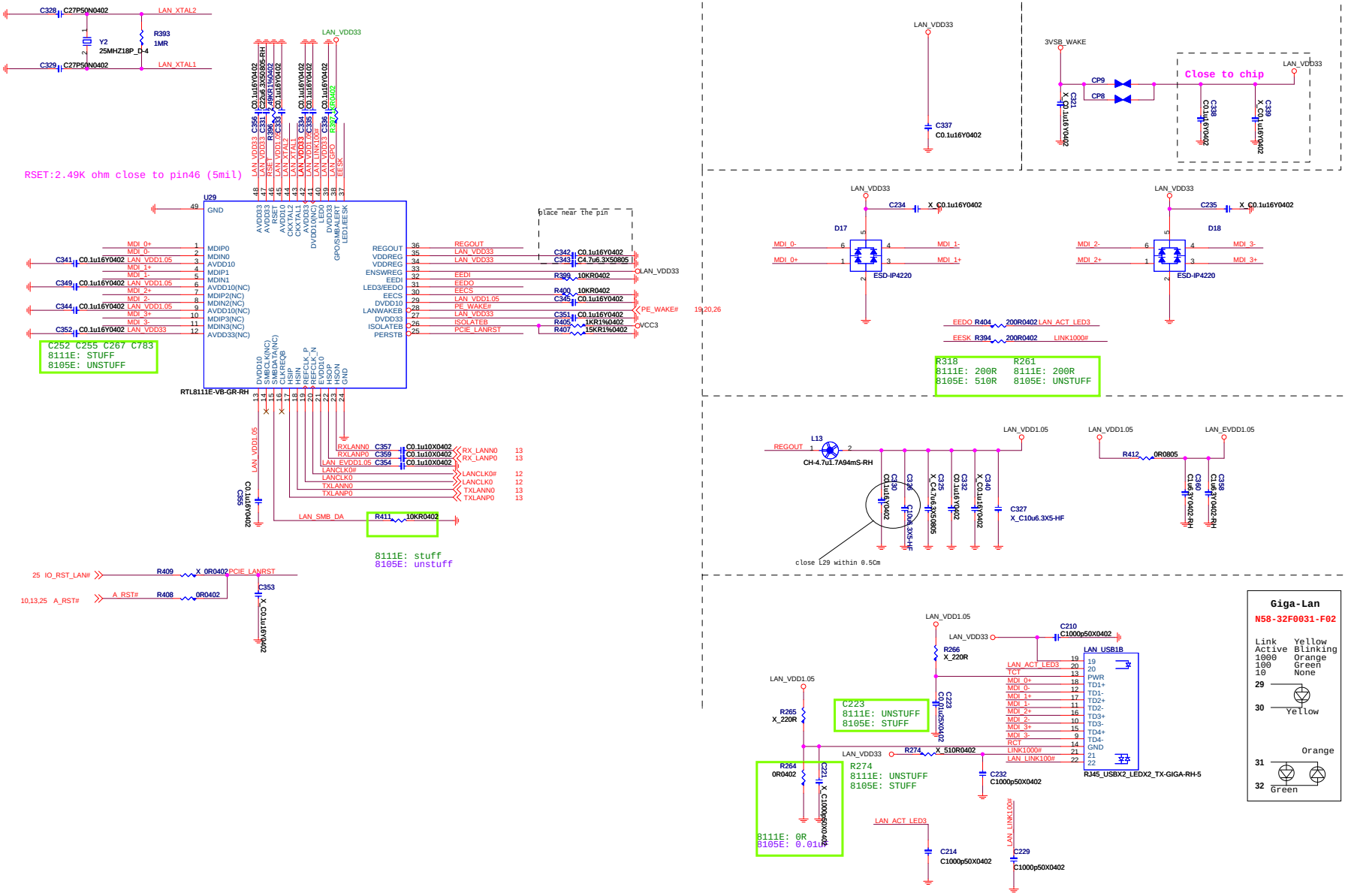
EC56
CD470u6.3SO-RH

PCI-Express x1 SLOT 1

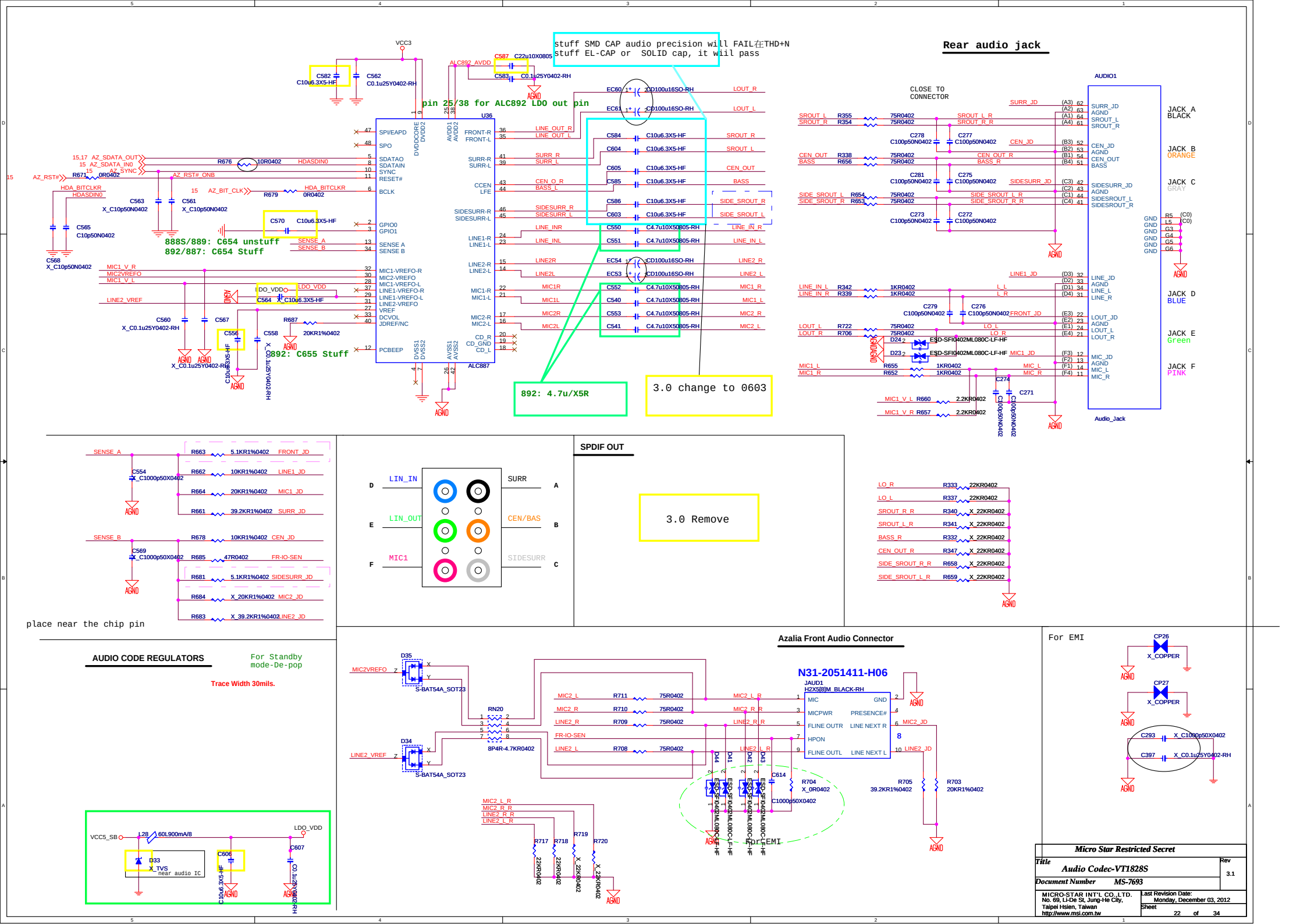
PCI_E3

PCIE X1

Micro Star Restricted Secret	
Title: PCIE X1 Slot 1 , 2	Rev: 3.1
Document Number: MS-7693	
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Monday, December 03, 2012
	Sheet 20 of 34



Micro Star Restricted Secret	
Title	LAN - Realtek 8111DL
Rev	3.1
Document Number	MS-7693
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Monday, December 03, 2012
	Sheet 21 of 33


stuff SMD CAP audio precision will FAIL在THD+N
stuff EL-CAP or SOLID cap, it will pass
pin 25/38 for ALC892 LDO out pin
888S/889: C654 unstuff
892/887: C654 Stuff
892: C655 Stuff
892: 4.7u/X5R
3.0 change to 0603
Rear audio jack
CLOSE TO CONNECTOR
JACK A BLACK
JACK B ORANGE
JACK C GRAY
JACK D BLUE
JACK E Green
JACK F PINK
Audio_Jack
SPDIF OUT
3.0 Remove
place near the chip pin
AUDIO CODE REGULATORS
For Standby mode-De-pop
Trace Width 30mils.
Azalia Front Audio Connector
N31-2051411-H06
For EMI
Micro Star Restricted Secret
Audio Codec-VT1828S
MS-7693
MICRO-STAR INT'L CO.,LTD.
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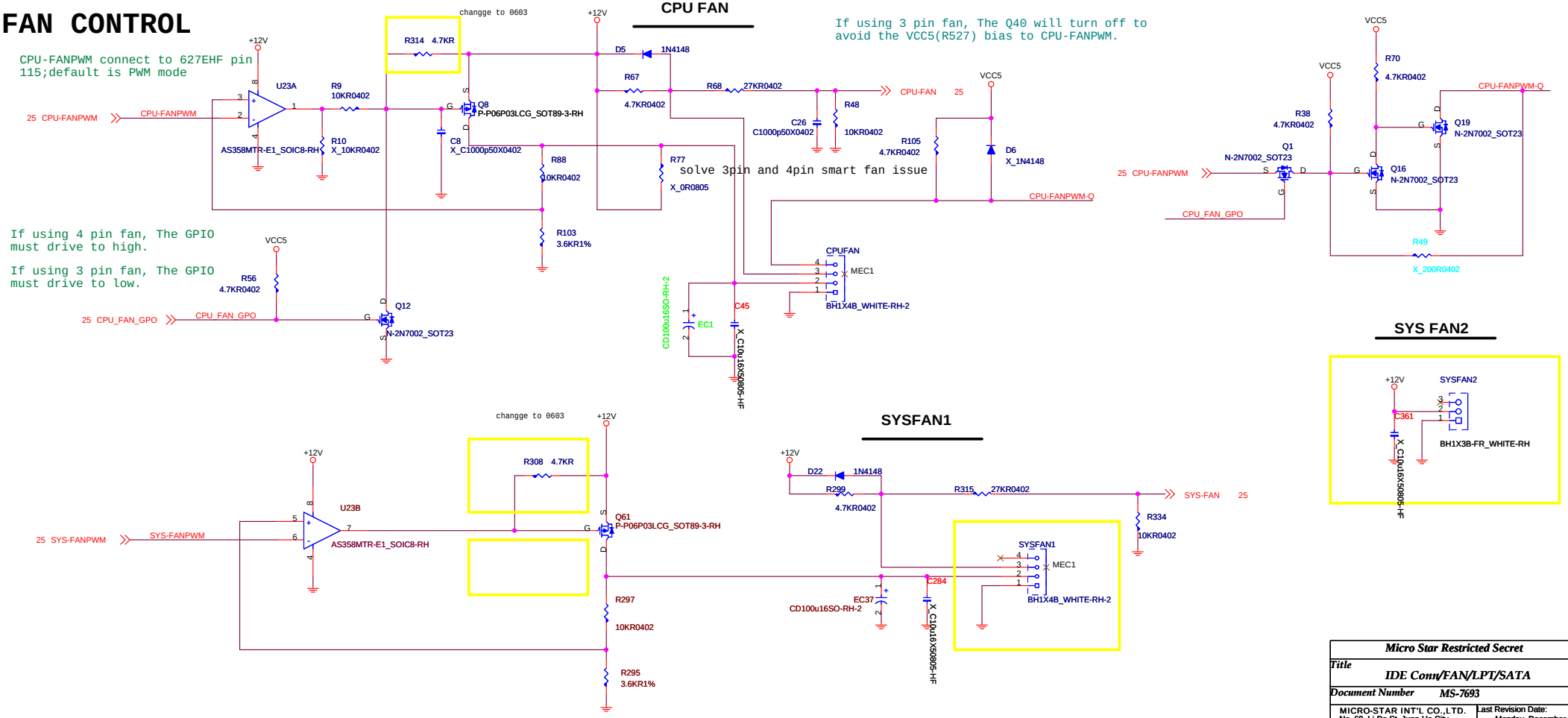
3.0 Remove APS LED

FAN CONTROL



Micro Star Restricted Secret	
Title: IDE Conn/FAN/LPT/SATA	Rev: 3.1
Document Number: MS-7693	
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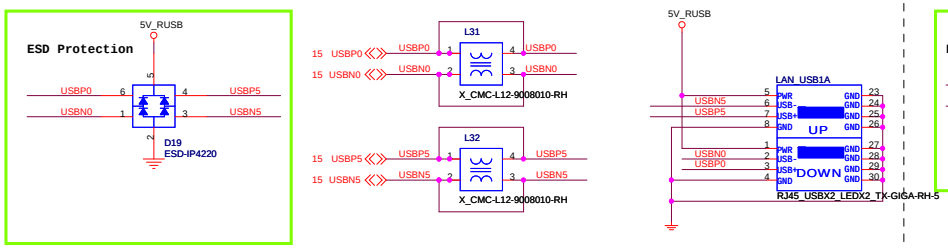
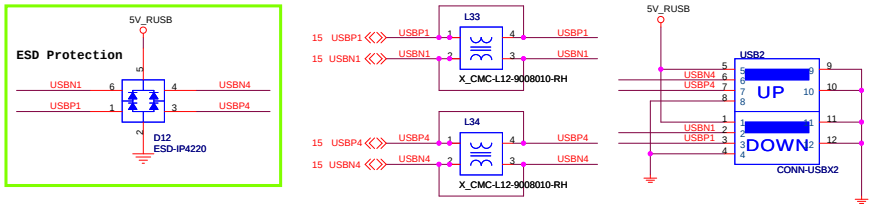
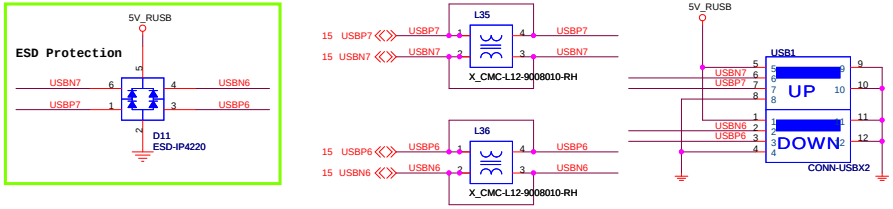
REAR PANEL USB CONNECTOR FOR USB PORT 0,1

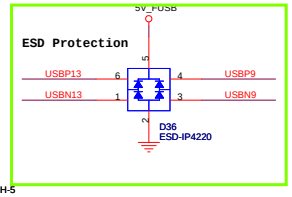


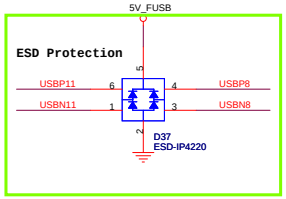
REAR PANEL USB CONNECTOR FOR USB PORT 2,3

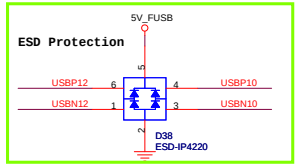


REAR PANEL USB CONNECTOR FOR USB PORT 4,5



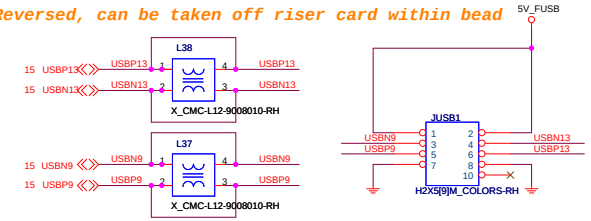




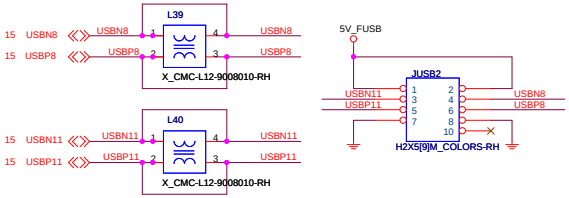


FRONT PANEL USB CONNECTOR FOR USB PORT 6,7

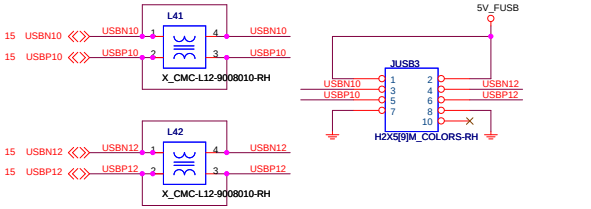
Reversed, can be taken off riser card within bead

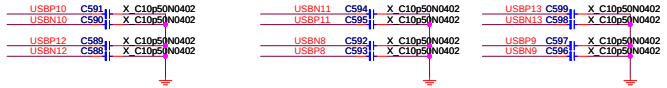


FRONT PANEL USB CONNECTOR FOR USB PORT 8,9

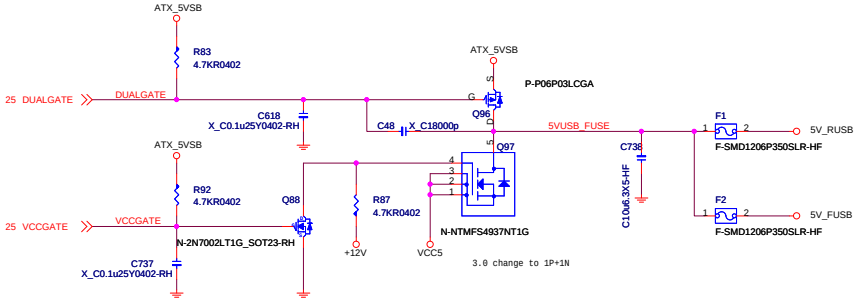


FRONT PANEL USB CONNECTOR FOR USB PORT10,11





Type B: MOS+Fuse



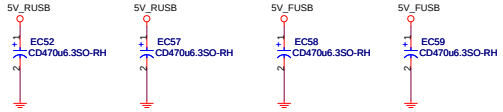
USB2.0 POWER Control			
MODE	S5	S0	S3
DUALGATE	0/1	1	0
VCCGATE	1	0	1

*In S5# DUALGATE pin status is Tri-state, and can be programmed Low level.

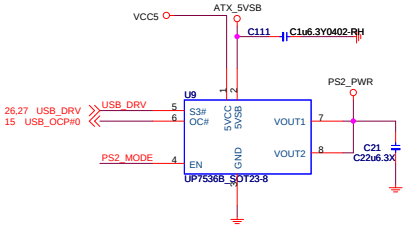
*DUALGATE and VCCGATE can't setting to low together, avoid leakage voltage issue

NEAR USB REAR CONNECTOR

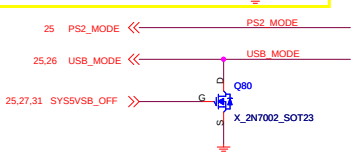
NEAR USB Front CONNECTOR



POWER CIRCUIT FOR PS2



close to the ESD or to the USB connector



Micro Star Restricted Secret		
Title: USB CONNECTORS		Rev: 3.1
Document Number: MS-7693		
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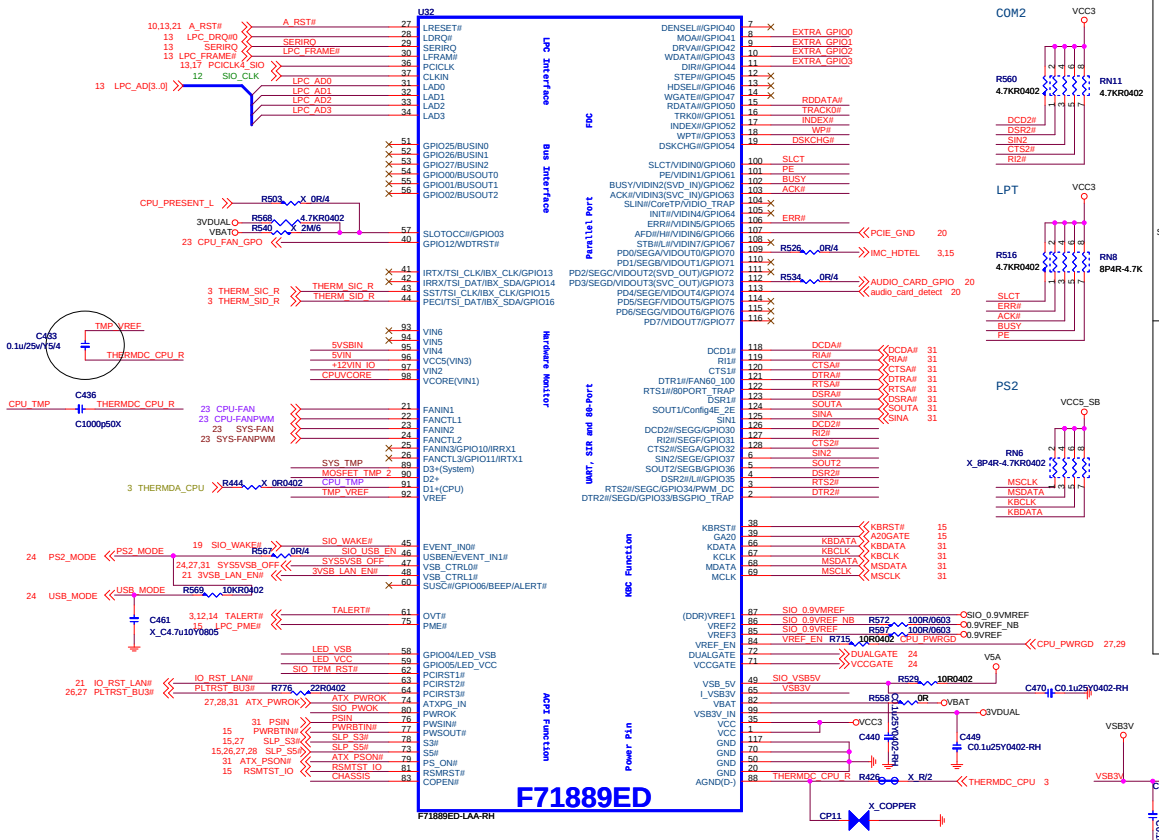
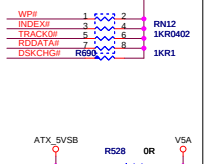
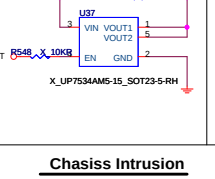
Super I/O

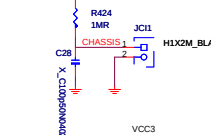
LPC SUPER I/O F71889ED

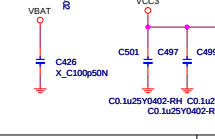
	audio_card_detect	PCIE_GND
OnBo_Audio	1	1
PCIE_Audio	1	0

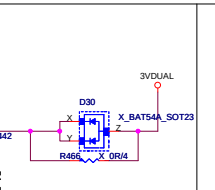


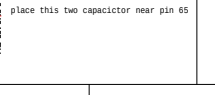


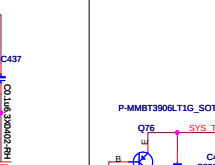






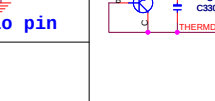


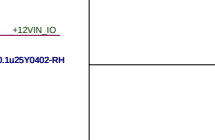




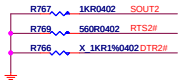
close to the sio pin

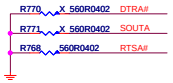
near the SIO pin





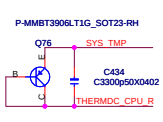
LPC I/O STRAPPING RESISTOR

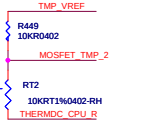


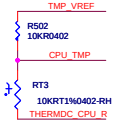


	Don't STUFF	STUFF
RTS2#	PWM FAN	LINEAR FAN
RTSA#	80Port enable	80Port disable
SOUTA	4E	2E
DTRA#	FAN START DUTY 60%	FAN START DUTY 100%
SOUT2	OVP warning mode	OVP force mode

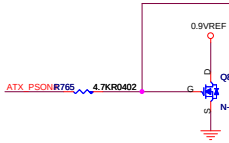
Thermal Resistor



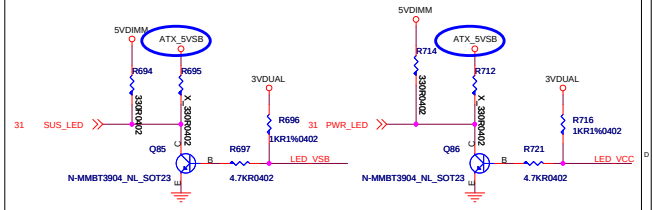




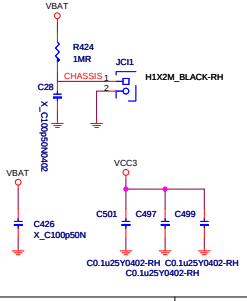
NOTE: LOCATE CLOSE S VRM mosfet ,for VRM mosfet temperature detect only



FLOOPY

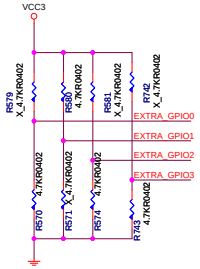


Chassis Intrusion

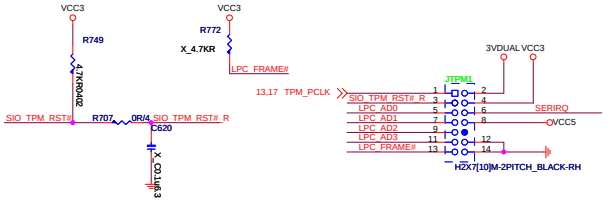


BOM Option

EXTRA_GPIO 0, 1, 2	000	001	100	101
GPIO 41,42,43	000	001	100	101
BOM				



TPM



Title	LPC SUPER I/O & LPC & CONNECTORS
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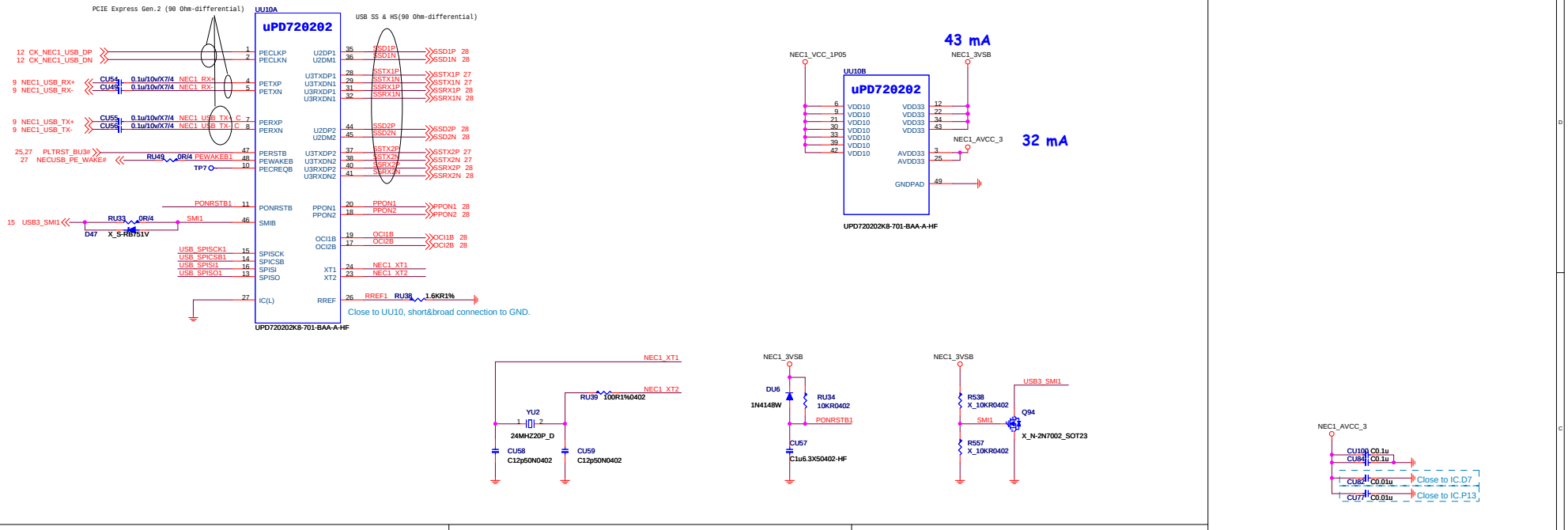
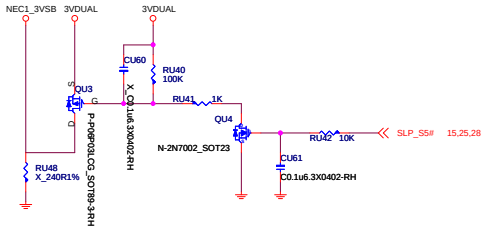
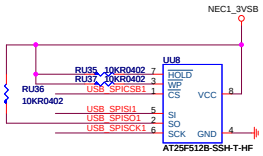


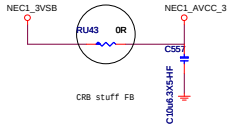
3V_Dual Circuit



EEPROM

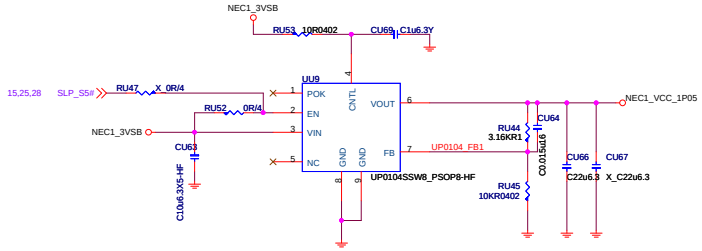


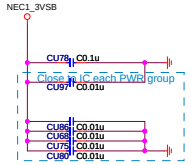
AVCC3 STB Power

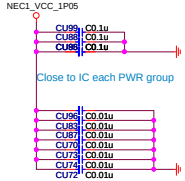


uPD720201 core Power

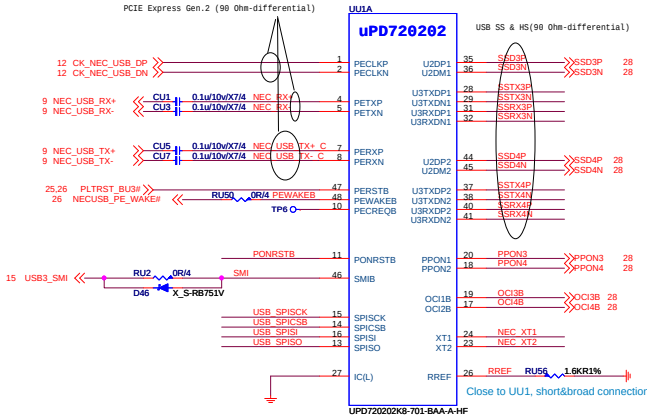
450 mA
min 40mil.

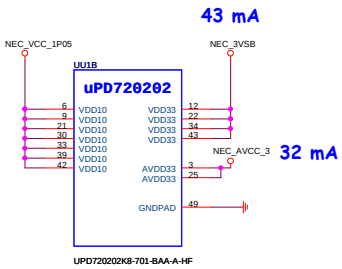


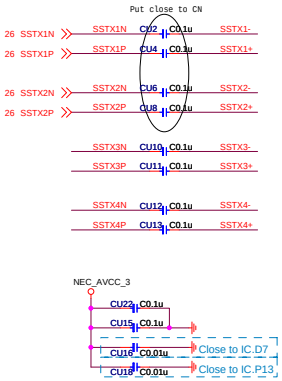


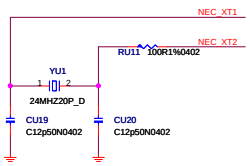


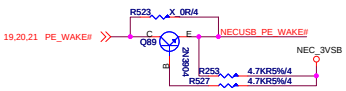
Micro Star Restricted Secret		
Title: uPD720200F1R		Rev: 3.1
Document Number: MS-7693		
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Monday, December 03, 2012	Sheet 26 of 34

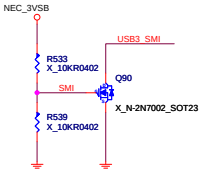


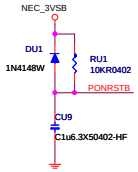


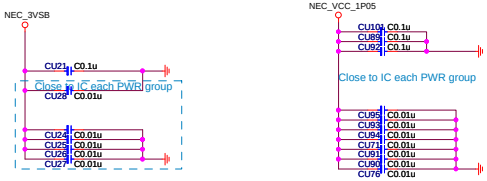




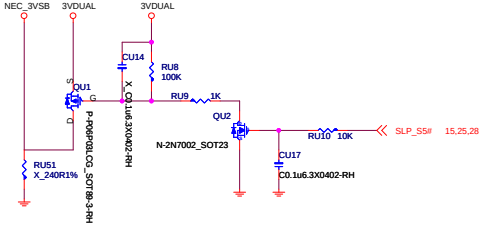




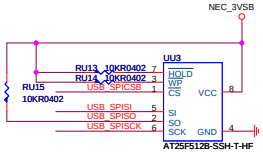




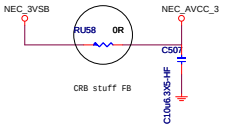
3V_Dual Circuit



EEPROM

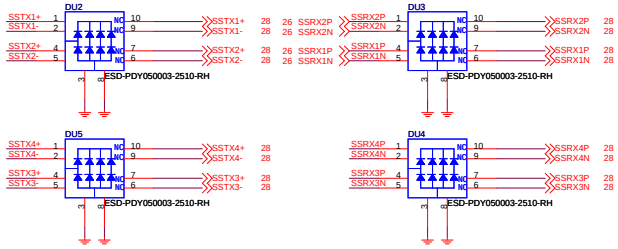


AVCC3 STB Power



ESD Protection

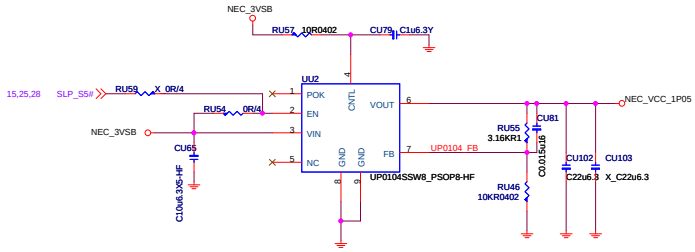
NEAR CONNECTOR



uPD720201 core Power

450 mA

min 40mil.



Micro Star Restricted Secret	
Title ***uPD720200F1F***	Rev 3.1
Document Number ***MS-7693***	
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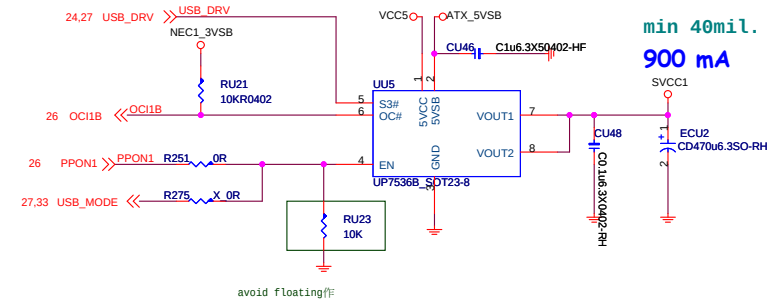
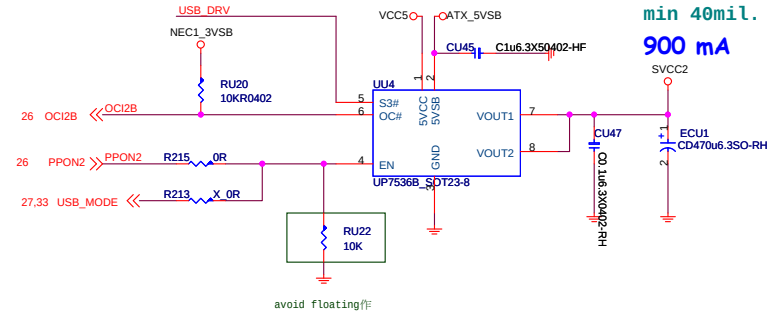
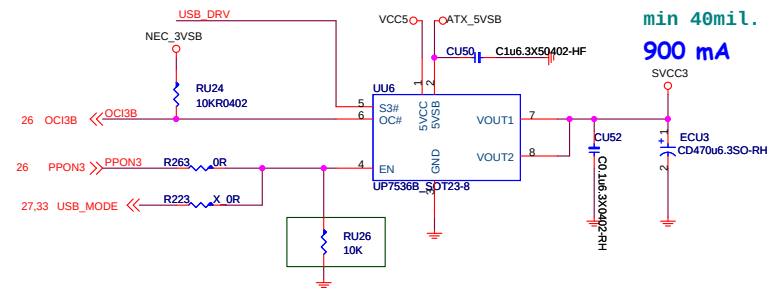
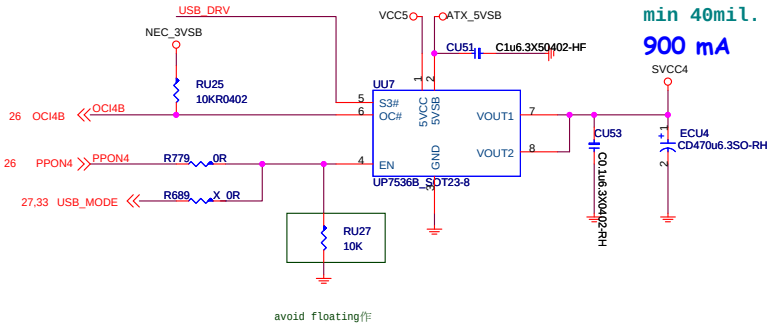
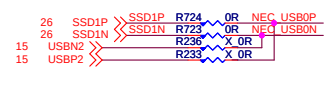


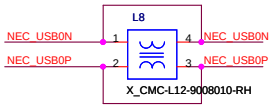


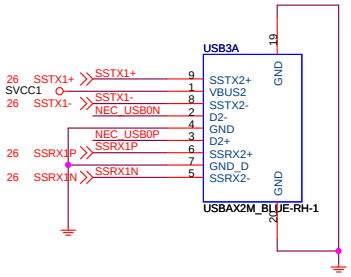


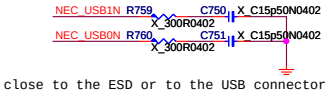


Rear USB3 CONN

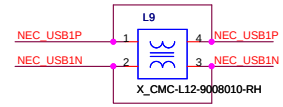


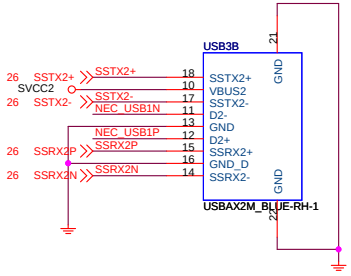




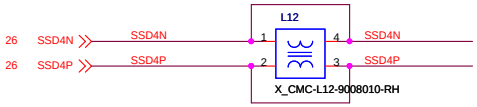


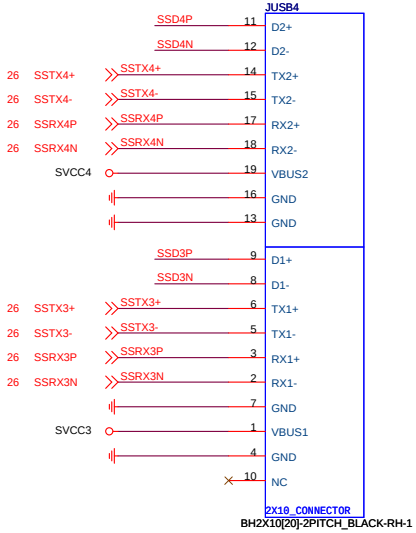
close to the ESD or to the USB connector

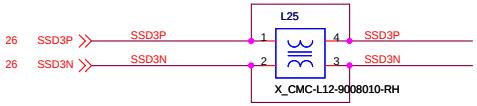




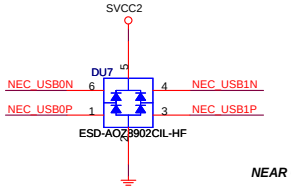
Front USB3 CONN

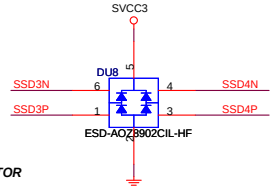






ESD Protection





NEAR CONNECTOR

Important~~
If USB3.0 signal conect to front pin header,
please must less than 2 inch,1.5 inch is better.
USB3.0 test will fail in factory if you aren't follow this rule.

Micro Star Restricted Secret		
Title	MANUAL PARTS	Rev 3.1
Document Number	MS-7693	
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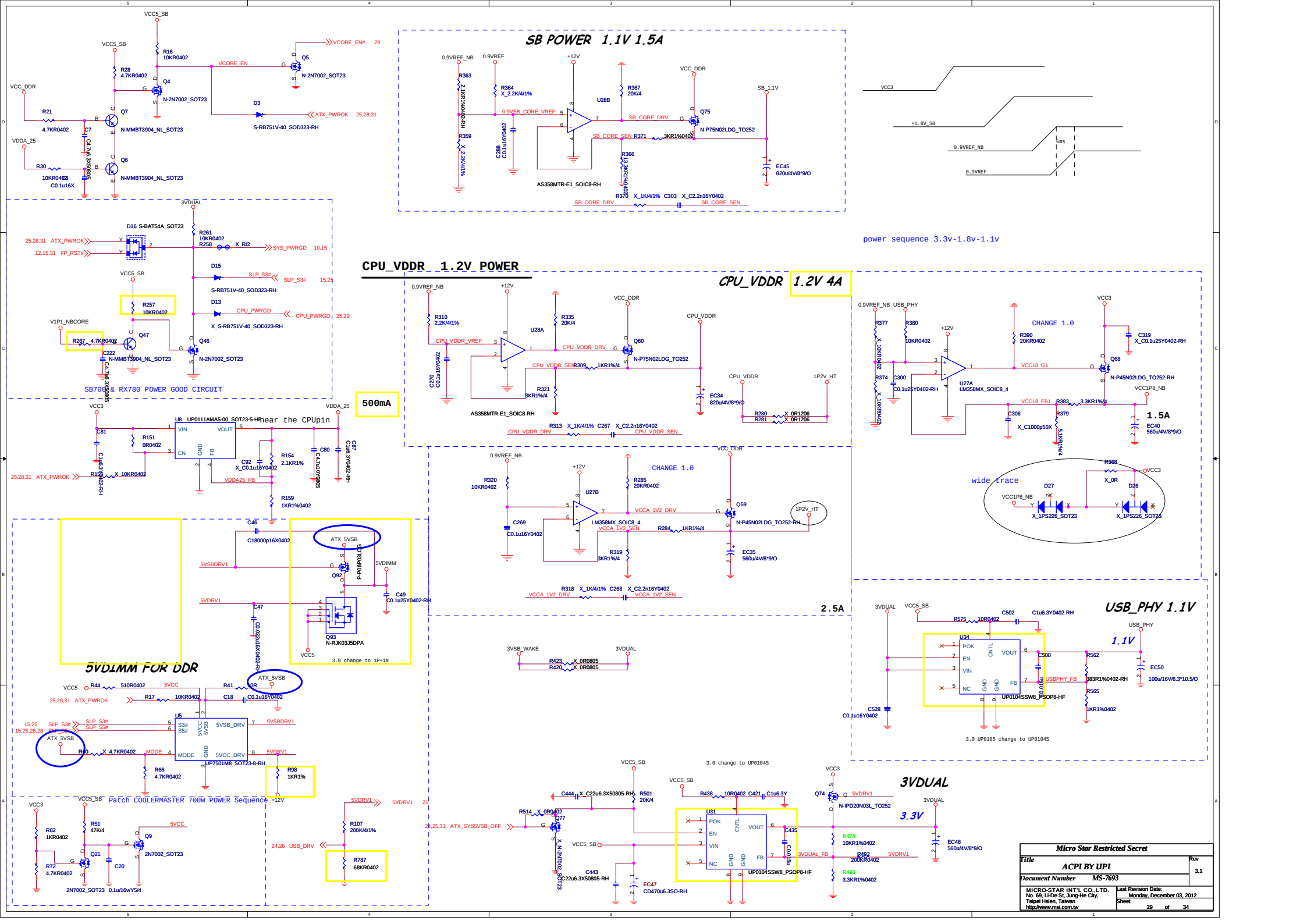
SB POWER 1.1V 1.5A
CPU_VDDR 1.2V POWER
CPU_VDDR 1.2V 4A
5VDIMM FOR DDR
USB_PHY 1.1V
3VDUAL
SB7000 & RX780 POWER GOOD CIRCUIT
Patch COOLERMASTER 700W POWER Sequence
power sequence 3.3v-1.8v-1.1v
VCC3
+1.8V_S0
0.9VREF_NB
0.9VREF
5ms
500mA
2.5A
1.5A
1.1V
3.3V
CHANGE 1.0
wide trace
near the CPUpin
3.0 change to 1P+1N
3.0 change to UP0104S
3.0 UP0105 change to UP0104S
Micro Star Restricted Secret
Title
ACPI BY UPI
Rev
3.1
Document Number
MS-7693
MICRO-STAR INT'L CO.,LTD.
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RX780 power up sequence

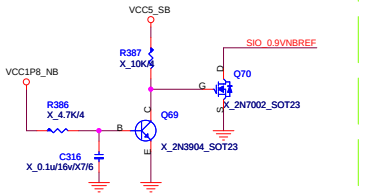
VCC3

VCC1.8_S0

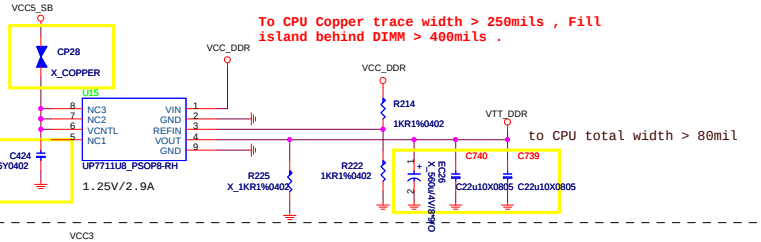
1P2V_HT

VCC1_1

Reserve for RX980 POS

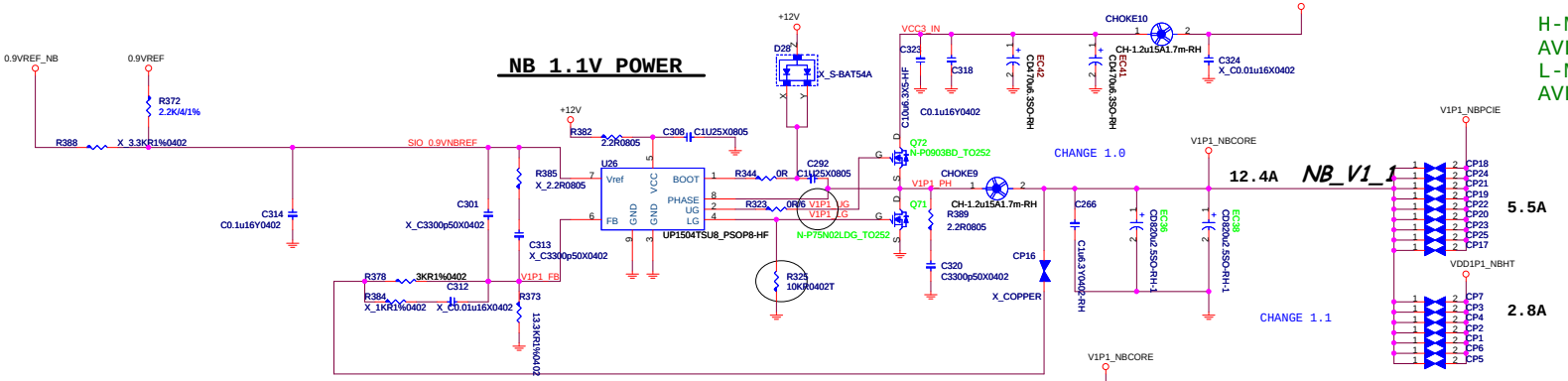


DDR VTT Power

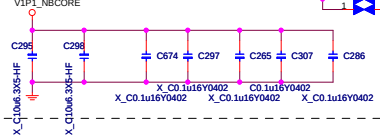


To CPU Copper trace width > 250mils , Fill island behind DIMM > 400mils .

NB 1.1V POWER

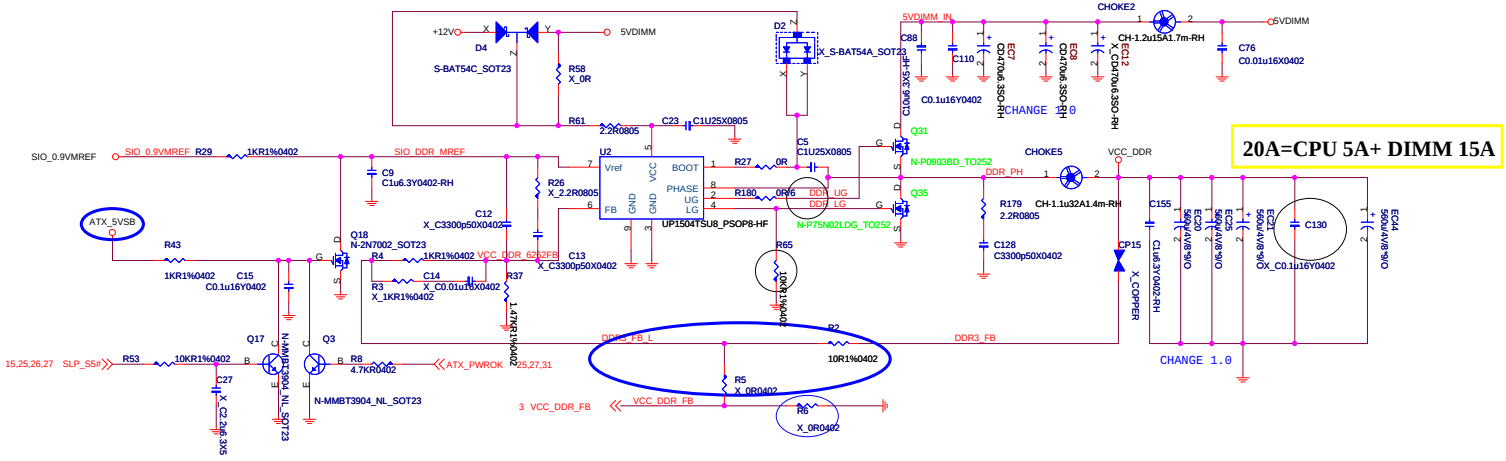


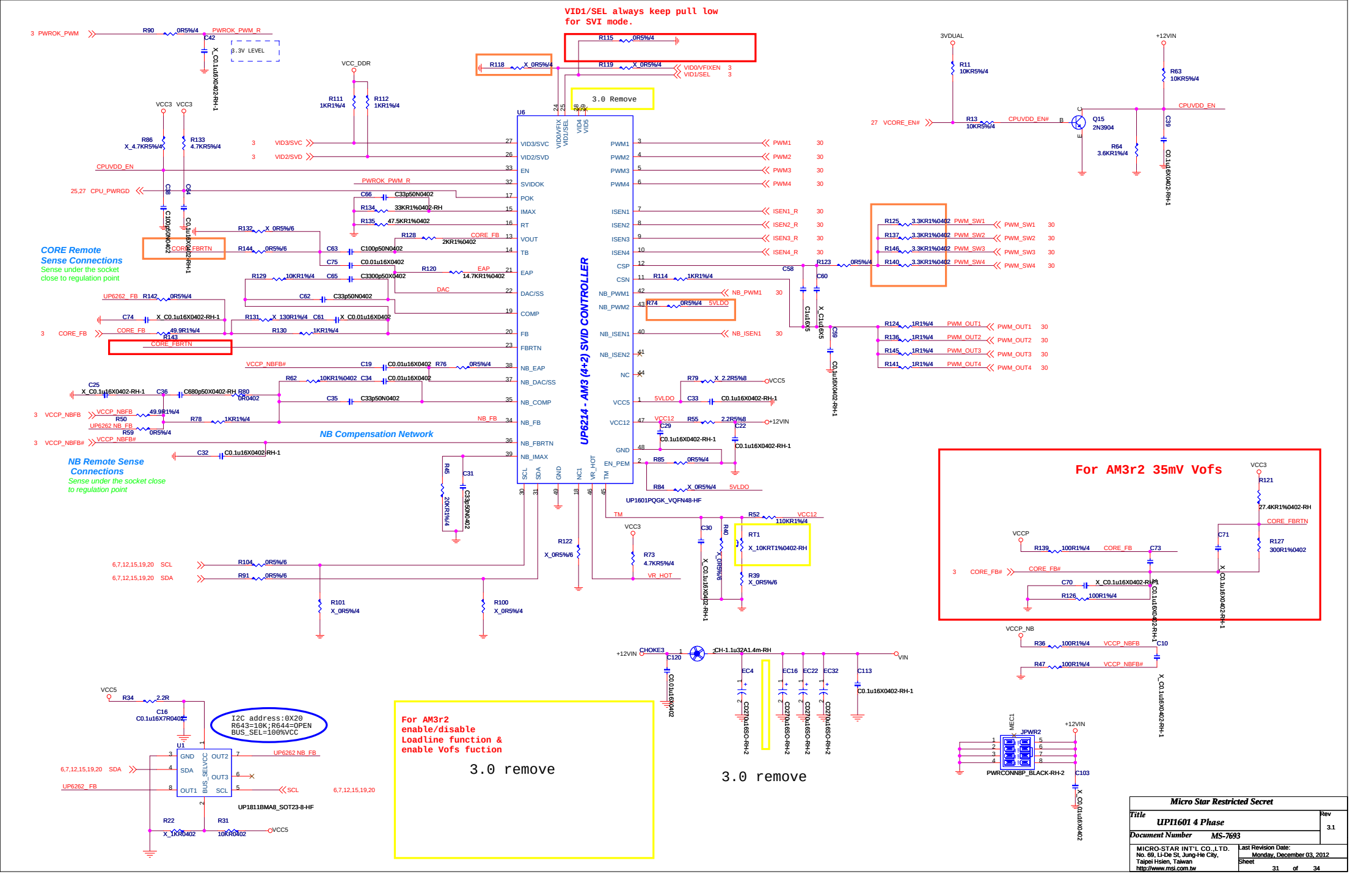
H-MOS: D03-0903BDB-N03
AVL: D03-0480900-O05
L-MOS: D03-75N022B-N03
AVL: D03-0480600-O05



VCC_DDR

DDR III 1.5V POWER




VID1/SEL always keep pull low for SVI mode.
UP6214 - AM3 (4+2) SVID CONTROLLER
UP1601PQGK_VQFN48-HF
CORE Remote Sense Connections
Sense under the socket close to regulation point
NB Compensation Network
NB Remote Sense Connections
Sense under the socket close to regulation point
For AM3r2 35mV Vofs
For AM3r2 enable/disable Loadline function & enable Vofs fuction
3.0 remove
3.0 remove
I2C address:0X20
R643=10K;R644=OPEN
BUS_SEL=100%VCC
UP1811BMA8_SOT23-8-HF
PWRCONN8P_BLACK-RH-2
Micro Star Restricted Secret
Title
UPI1601 4 Phase
Rev
3.1
Document Number
MS-7693
MICRO-STAR INT'L CO.,LTD.
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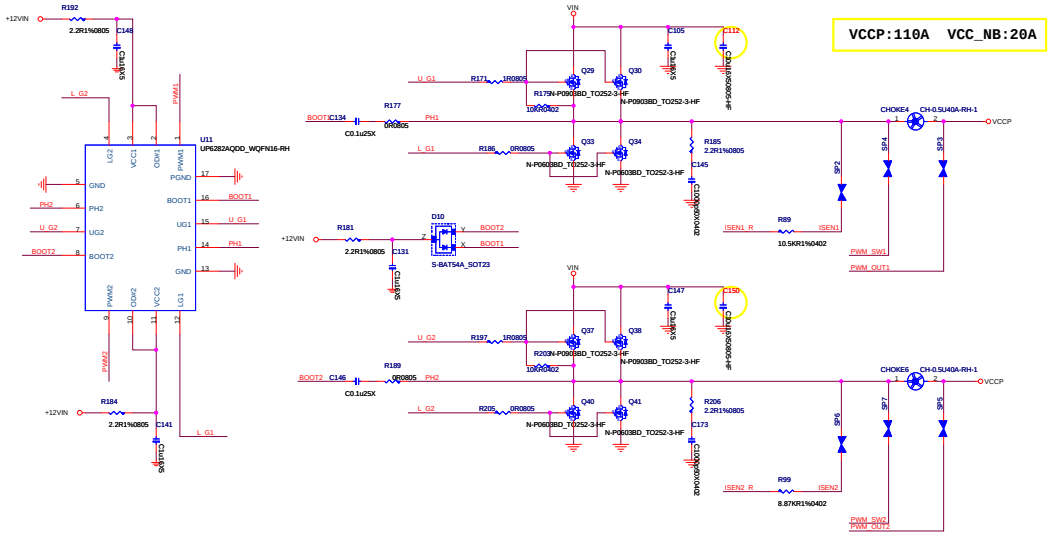
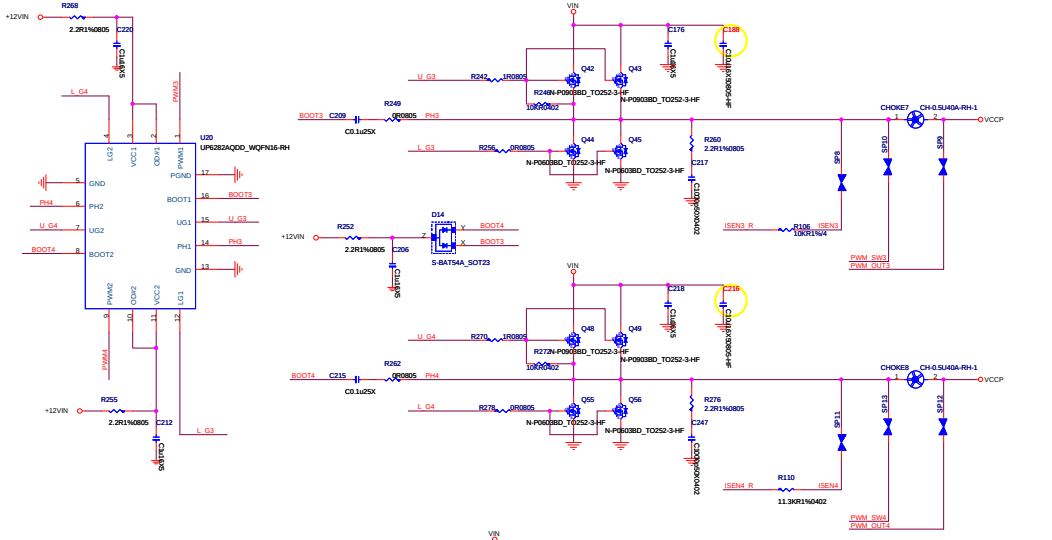
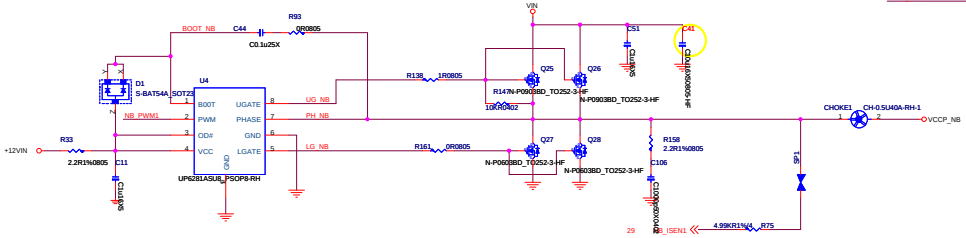
3.0 cost down :VCCP/VCCP_NB 10uF/1206 Input MLCC change to 0805

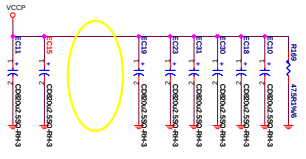
VCCP:110A VCC_NB:20A

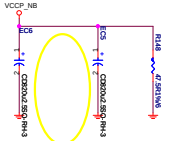






3.0 cost down remove





ISEN1_R	ISEN1_R	29
ISEN2_R	ISEN2_R	29
ISEN3_R	ISEN3_R	29
ISEN4_R	ISEN4_R	29
PWM1	PWM1	29
PWM2	PWM2	29
PWM3	PWM3	29
PWM4	PWM4	29
NB_PWM1	NB_PWM1	29
PWM_SW1	PWM_SW1	29
PWM_SW2	PWM_SW2	29
PWM_SW3	PWM_SW3	29
PWM_SW4	PWM_SW4	29
PWM_OUT1	PWM_OUT1	29
PWM_OUT2	PWM_OUT2	29
PWM_OUT3	PWM_OUT3	29
PWM_OUT4	PWM_OUT4	29

Micro Star Restricted Secret		
Title: VRM UP16282 drive		Rev: 3.1
Document Number: MS-7693		
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St. Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Monday, December 03, 2012	
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ATX connector / Front Panel

Intel Front Panel

ESD Protect

For MSI / Intel Front Panel

CHANGE 1.0

follow latest technology suggestion

PS2 KEYBOARD & MOUSE CONNECTOR

SERIAL PORT 1

ATX Connector

5VSB Power Switch

Trace Width 80mils.

Option ..... for Normal State

use DIP CAP 10uF or 22uF

change to 0603 10K ohm

use X7R or X5R

Tune 5VSB inrush current to 2A from 4A

Micro Star Restricted Secret	
Title: ATX connector / Front Panel/KB	Rev: 3.1
Document Number: MS-7693	
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Monday, December 03, 2012
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MK1

G51-M1SPD29-Q13

HS_SB1

MEC1

MEC2

HS-040163A-RH

HS_NB1

MEC1

MEC2

HS-0405370-RH

PCB1

PK0-0769331-G37

PCB

VBAT1-S1

BAT-BCR2032P-RH

CPU1_1

E93-0000094-C22

LA1

AMI_BIOS LABLE

BIOS_LABLE

Rubber1

PCB

rubber1/2

Rubber2

PCB

rubber1/2

Optics Orientation Holes

FM10 FM8 FM4 FM2 FM3

FM7 FM13 FM6 FM12 FM11 FM1

FM5 FM9

X_FM

Mounting Holes

MH3 MH4 MH5

MH6 MH1 MH2

X_MH001

AGND

Simulation

X_JS1

SIM2

X_PIN1*2

VCC5

X_JS2

SIM1

X_PIN1*2

HS_PWM

MEC2

MEC1

X_HS-0501740-RH

Micro Star Restricted Secret		
Title	*MANUAL PARTS*	Rev 3.1
Document Number	*MS-7693*	
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Monday, December 03, 2012	
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