



# MS-7388 Ver:3.1

## CPU

AMD M2 Athlon 64/Athlon 64 FX AM2R2

## System Chipset

AMD RX780

ATI SB700/750

## On Board Chip

FINTEK Super I/O -- F71882

LAN -- RTL8111C

HD Codec --ALC888

BIOS -- SPI ROM 8M

## Main Memory

DDR II X 4 (Max 8GB)

## Expansion Slots

PCI-E X 16 \*1

PCI-E X 1 \*2

PCI 2.2 Slot X 3

## PWM

Controller--Intersil ISL6323 4+1 Phase

Vcore 4 Phase (MOS HIGHX2 LOWX2)

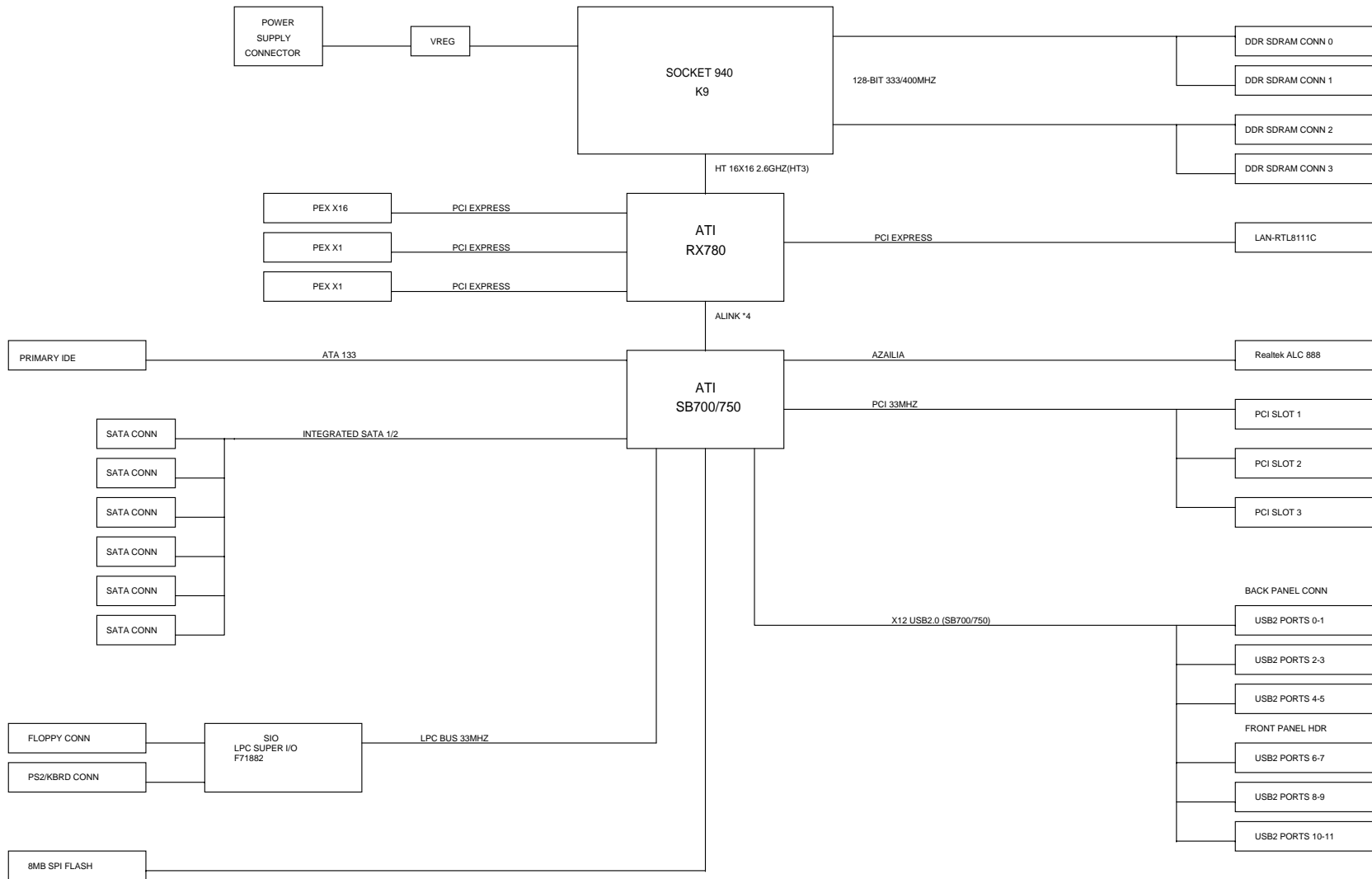
Vnb 1 Phase (MOS HIGHX1 LOWX2)

## Clock Generator

Controller--RTM880N-793

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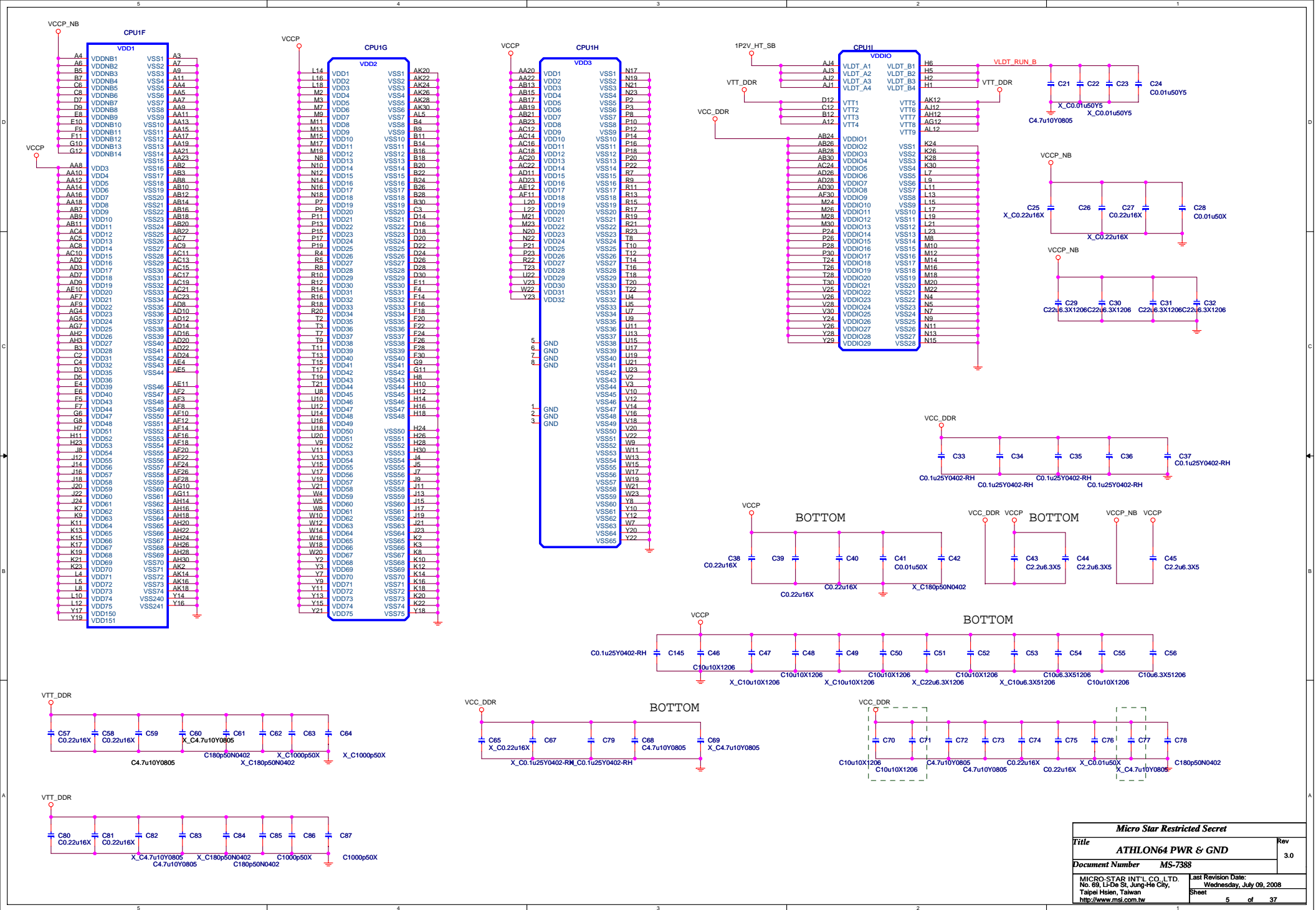
# BLOCK DIAGRAM

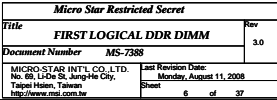


Micro Star Restricted Secret		
Title	Block Diagram	Rev 3.0
Document Number	MS-7388	
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan <a href="http://www.msi.com.tw">http://www.msi.com.tw</a>		Last Revision Date: Wednesday, July 09, 2008
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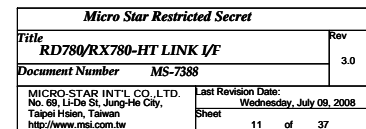












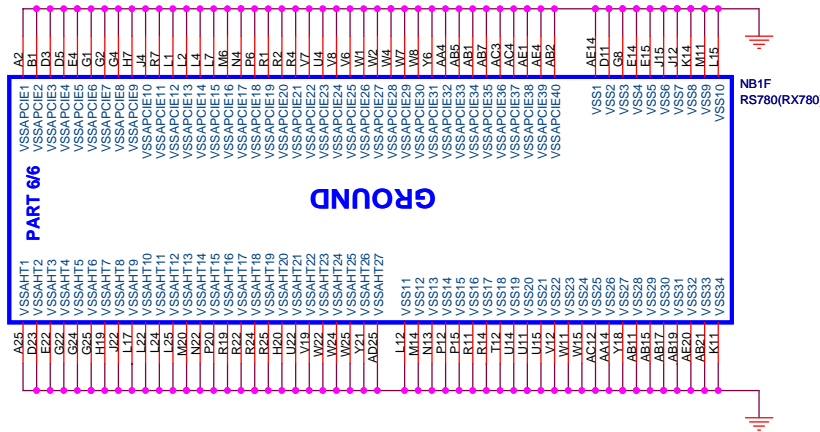
NB1D		PAR 4 OF 6	
AB12	MEM_A0(NC)	MEM_DQ0/DVO_VSYNC(NC)	AA18
AE16	MEM_A1(NC)	MEM_DQ1/DVO_HSYNC(NC)	AA20
V11	MEM_A2(NC)	MEM_DQ2/DVO_DE(NC)	AA19
AE15	MEM_A3(NC)	MEM_DQ3/DVO_D0(NC)	Y19
AA12	MEM_A4(NC)	MEM_DQ4(NC)	V17
AB16	MEM_A5(NC)	MEM_DQ5/DVO_D1(NC)	AA17
AB14	MEM_A6(NC)	MEM_DQ6/DVO_D2(NC)	AA15
AD14	MEM_A7(NC)	MEM_DQ7/DVO_D4(NC)	Y15
AD13	MEM_A8(NC)	MEM_DQ8/DVO_D3(NC)	AC20
AD15	MEM_A9(NC)	MEM_DQ9/DVO_D5(NC)	AD19
AC16	MEM_A10(NC)	MEM_DQ10/DVO_D6(NC)	AE22
AE13	MEM_A11(NC)	MEM_DQ11/DVO_D7(NC)	AC18
AC14	MEM_A12(NC)	MEM_DQ12(NC)	AB20
V14	MEM_A13(NC)	MEM_DQ13/DVO_D9(NC)	AD22
AD16	MEM_BA0(NC)	MEM_DQ14/DVO_D10(NC)	AC22
AE17	MEM_BA1(NC)	MEM_DQ15/DVO_D11(NC)	AD21
AD17	MEM_BA2(NC)	MEM_DQS0P/DVO_IDCKP(NC)	Y17
		MEM_DQS0N/DVO_IDCKN(NC)	W18
W12	MEM_RASb(NC)	MEM_DQS1P(NC)	AD20
Y12	MEM_CASb(NC)	MEM_DQS1N(NC)	AE21
AD18	MEM_WEB(NC)		
AB13	MEM_CSb(NC)	MEM_DM0(NC)	W17
AB18	MEM_CKE(NC)	MEM_DM1/DVO_D8(NC)	AE19
V14	MEM_ODT(NC)		
V15	MEM_CKP(NC)	IOPLLVD18(NC)	AE23
W14	MEM_CKN(NC)	IOPLLVD(NC)	AE24
		IOPLLVS(NC)	AD23
AE12	MEM_COMPP(NC)		
AD12	MEM_COMPN(NC)	MEM_VREF(NC)	AE18
RS780(RX780)			

**Note:** If the Side-port memory interface is **not** used, make sure that:

- The memory interface IO power (VDD\_MEM) is connected to 1.5 V for DDR3 or 1.8 V for DDR2.
- The memory interface IO transform power (VDD18\_MEM) is connected to 1.8 V.
- The voltage divider for memory interface reference voltage MEM\_VREF is connected to 1.5 V for DDR3 or 1.8 V for DDR2.
- The memory interface PLL power IOPLLVD18 is connected to 1.8 V and IOPLLVD is connected to 1.2 V for the RS740 and to 1.1 V for the RS780.
- The memory interface enable strap DFT\_GPIO0 is **not** connected to the GND.

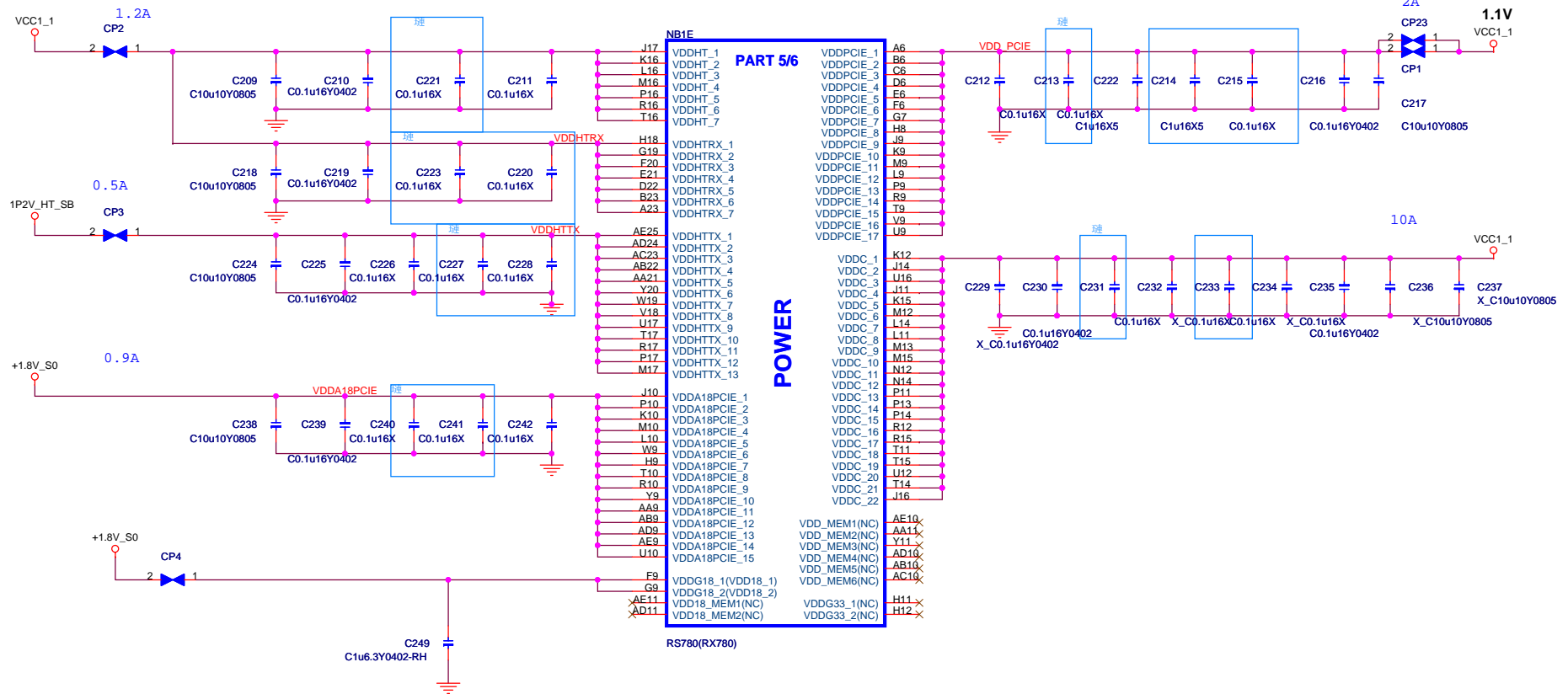
**Micro Star Restricted Secret**

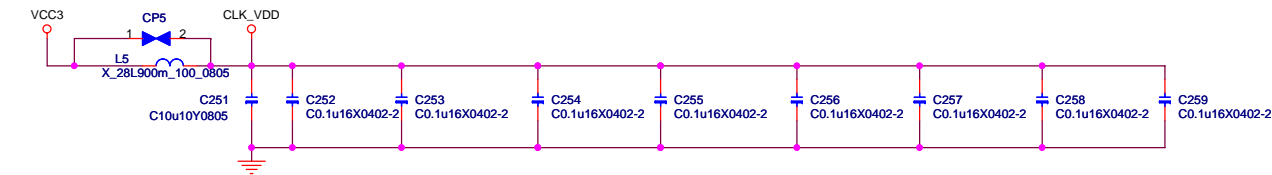
Title		Rev
RD780/RX780-HT LINK I/F		3.0
Document Number		MS-7388
MICRO-STAR INT'L CO., LTD. No. 66, Li-De St, Jung-Hsi City, Taipei Hsien, Taiwan <a href="http://www.msi.com.tw">http://www.msi.com.tw</a>		Last Revision Date: Wednesday, July 09, 2008
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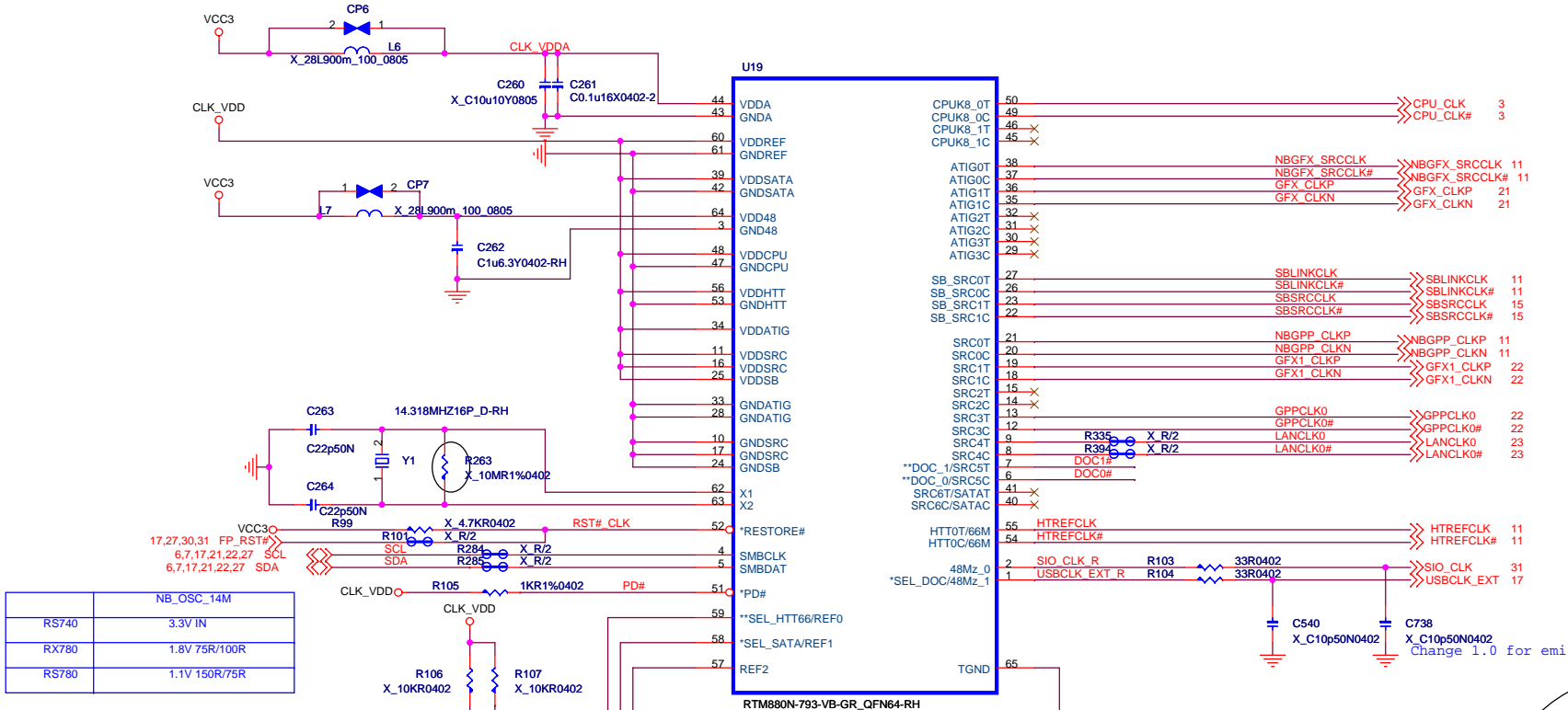
RS740/RX780/RS780 POWER DIFFERENCE TABLE

PIN NAME	RS740	RX780	RS780	PIN NAME	RS740	RX780	RS780
VDDHT	NC	+1.1V	+1.1V	IOPLLVD	+1.2V	NC	+1.1V
VDDHTRX	NC	+1.1V	+1.1V	AVDD	+3.3V	NC	+3.3V
VDDHTTX	+1.2V	+1.2V	+1.2V	AVDDDI	+1.8V	NC	+1.8V
VDDA18PCIE	NC	+1.8V	+1.8V	AVDDQ	+1.8V	NC	+1.8V
VDD18	+1.8V	+1.8V	+1.8V	PLLVD	+1.2V	NC	+1.1V
VDD18_MEM	NC	NC	+1.8V	PLLVD18	+1.8V	NC	+1.8V
VDDPCIE	+1.2V	+1.1V	+1.1V	VDDA18PCIEPLL	+1.2V	+1.8V	+1.8V
VDDC	+1.2V	+1.1V	+1.1V	VDDA18HTPLL	+1.8V	+1.8V	+1.8V
VDD_MEM	+1.8V/1.5V	NC	+1.8V/1.5V	VDDLTP18	+1.8V	NC	+1.8V
VDD33	+3.3V	NC	+3.3V	VDDL18	+1.8V	NC	+1.8V
IOPLLVD18	+1.8V	NC	+1.8V	VDDL33	+3.3V	NC	NC

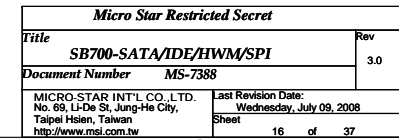


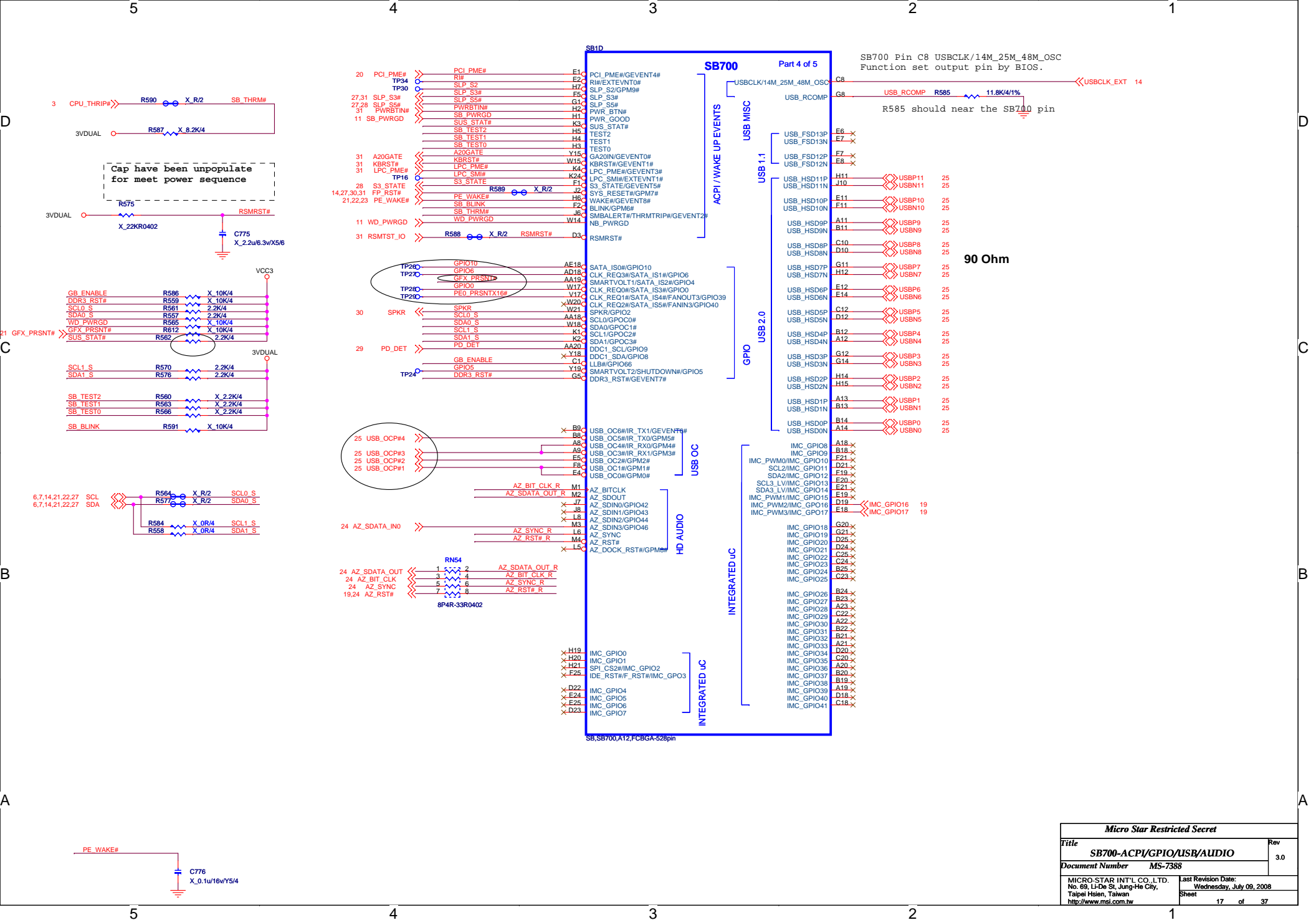


- 1- PLACE ALL THE SERIES TERMINATION RESISTORS AS CLOSE AS U41 AS POSSIBLE
- 2- ROUTE ALL CPUCCLK/#, NBSRCCLK/#, GPPCLK/# AS DIFFERENT PAIR RULE
- 3- PUT DECOUPLING CAPS CLOSE TO U41 POWER PIN





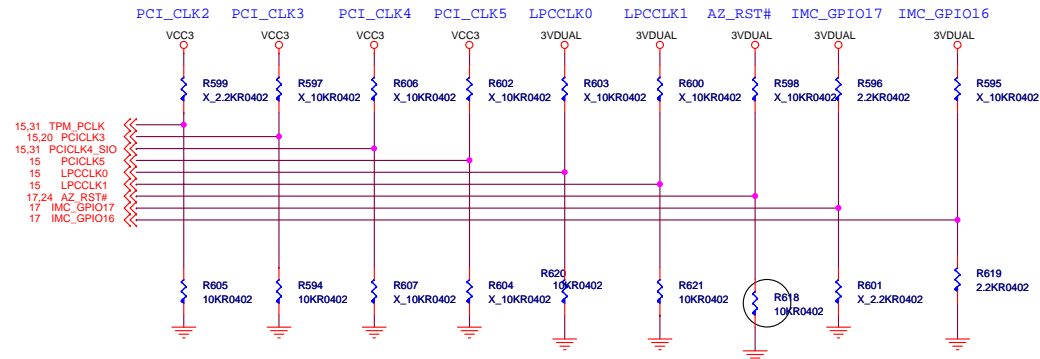






## REQUIRED STRAPS

NOTE: SB700 HAS INTERNAL 15K PULL UP RESISTOR FOR RTC\_CLK



	PCI_CLK2	PCI_CLK3	PCI_CLK4	PCI_CLK5	LPC_CLK0	LPC_CLK1	AZ_RST#	IMC_GPIO17	IMC_GPIO16
PULL HIGH	WATCHDOG TIMER ON NB_PWRGD ENABLED	USE DEBUG STRAPS	RESERVED	RESERVED	ENABLE PCI MEM BOOT	CLKGEN ENABLED	IMC ENABLED	ROM TYPE: H, H = Reserved H, L = SPI ROM	
PULL LOW	WATCHDOG TIMER ON NB_PWRGD DISABLED DEFAULT	IGNORE DEBUG STRAPS DEFAULT			DISABLE PCI MEM BOOT DEFAULT	CLKGEN DISABLED DEFAULT	IMC DISABLED DEFAULT	L, H = LPC ROM L, L = FWH ROM DEFAULT	

## DEBUG STRAPS

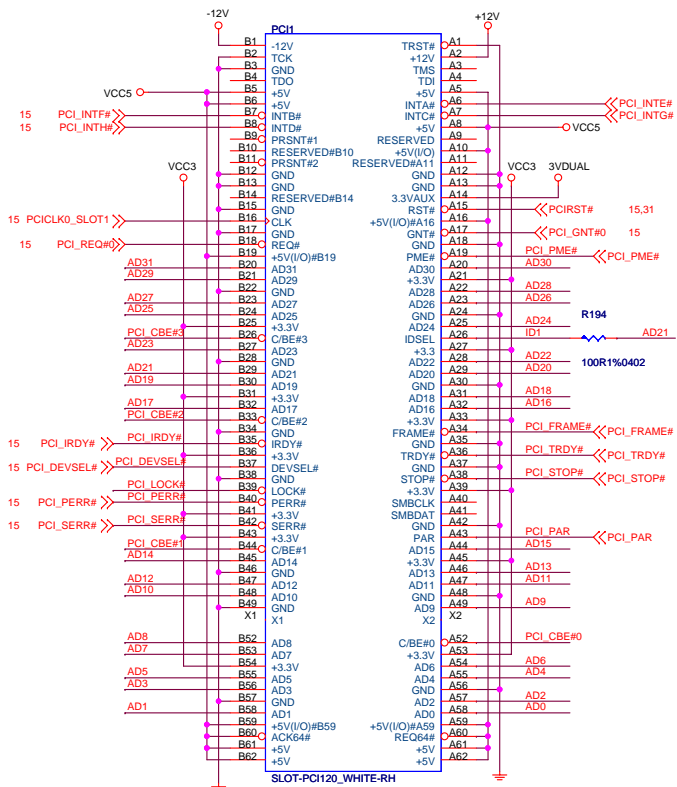
SB700 HAS 15K INTERNAL PU FOR PCI\_AD[30:23]

	PCI_AD28	PCI_AD27	PCI_AD26	PCI_AD25	PCI_AD24	PCI_AD23
PULL HIGH	USE LONG RESET DEFAULT	USE PCI PLL DEFAULT	USE ACPI BCLK DEFAULT	USE IDE PLL DEFAULT	USE DEFAULT PCIE STRAPS DEFAULT	RESERVED
PULL LOW	USE SHORT RESET	BYPASS PCI PLL	BYPASS ACPI BCLK	BYPASS IDE PLL	USE EEPROM PCIE STRAPS	

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Title	SB700-STRAPS	Rev 3.0
Document Number	MS-7388	
MICRO-STAR INT'L CO., LTD. No. 68, Li-De St, Jung-He City, Taipei Hsien, Taiwan <a href="http://www.msi.com.tw">http://www.msi.com.tw</a>		Last Revision Date: Wednesday, July 09, 2008 Sheet 19 of 37

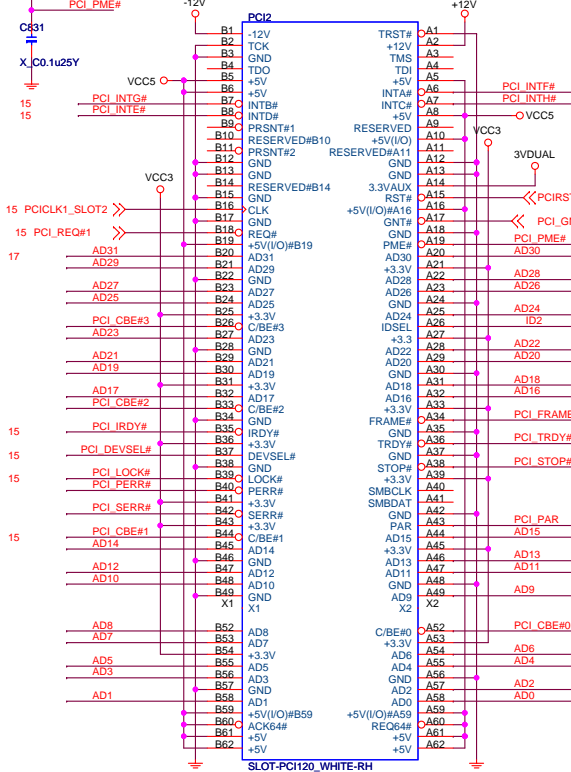
15 AD[31..0] >> AD[31..0]  
15 PCI\_CBE#[3..0] >> PCI\_CBE#[3..0]

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



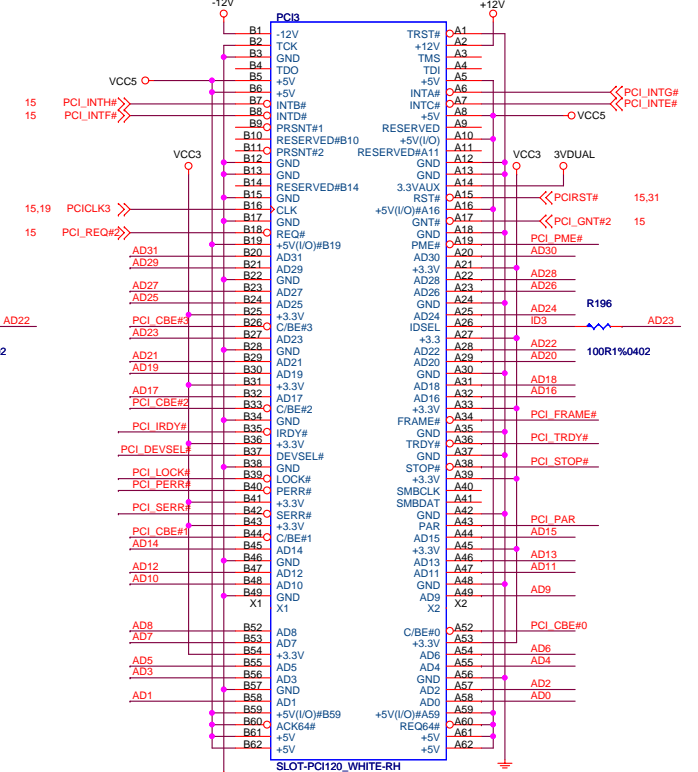
ISDEL = AD21  
MASTER = PCI\_REQ#0  
PCI\_GNT#0

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



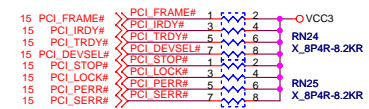
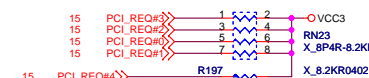
ISDEL = AD22  
MASTER = PCI\_REQ#1  
PCI\_GNT#1

### PCI SLOT 3 (PCI VER: 2.2 COMPLY)

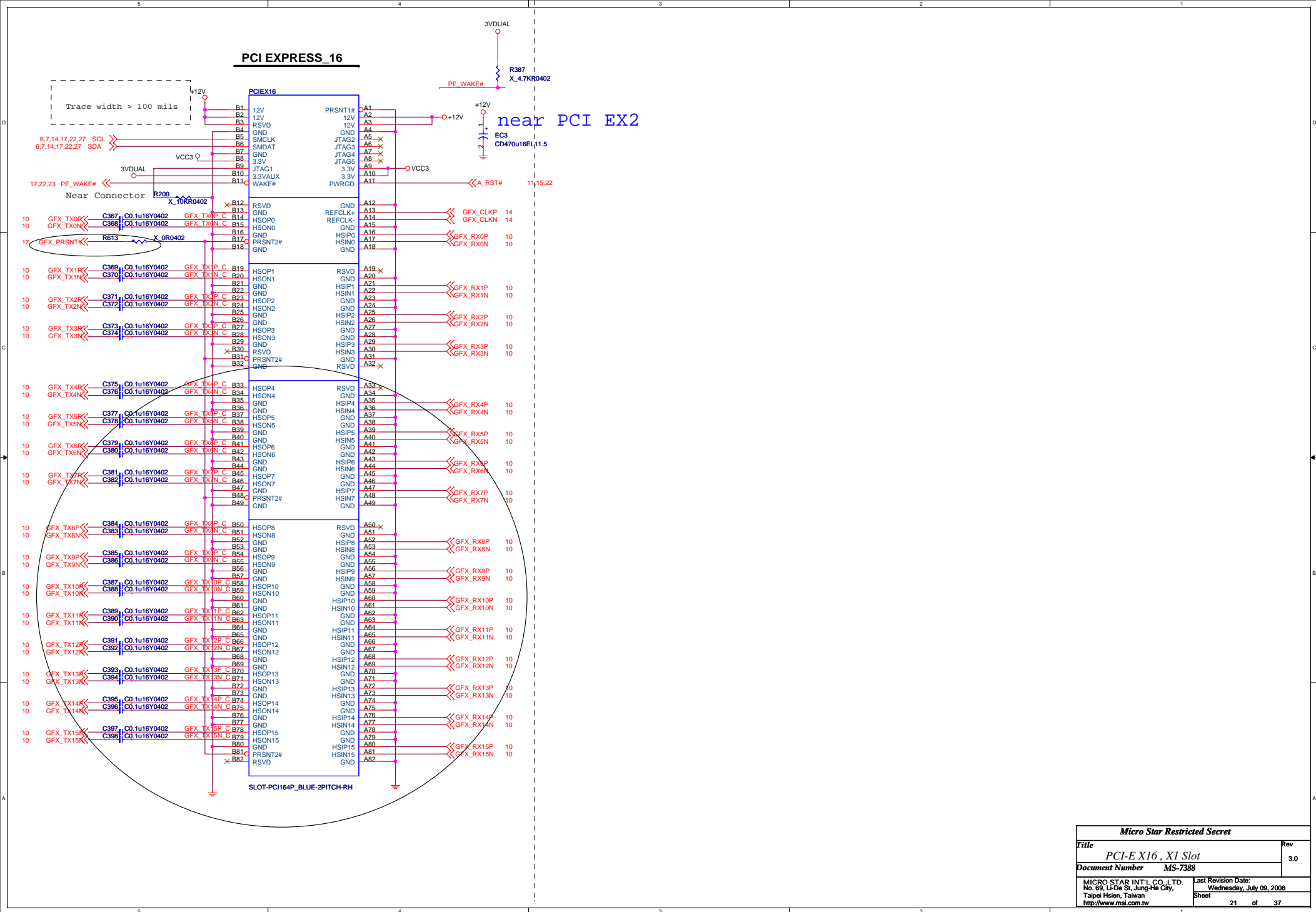


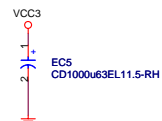
ISDEL = AD23  
MASTER = PCI\_REQ#2  
PCI\_GNT#2

### PCI PULL-UP / DOWN RESISTORS

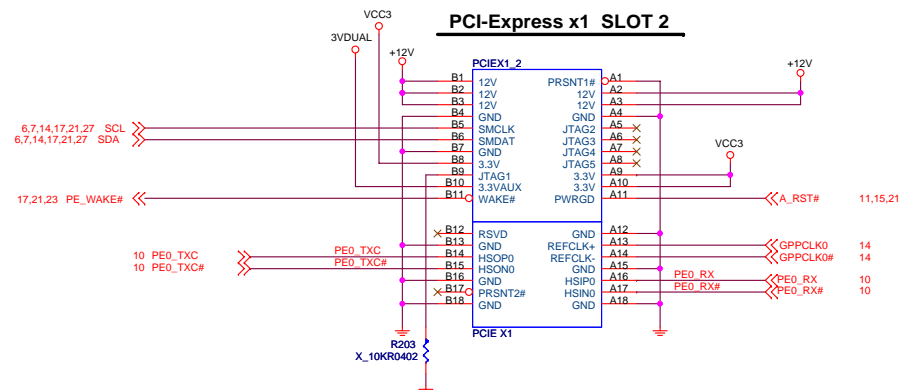


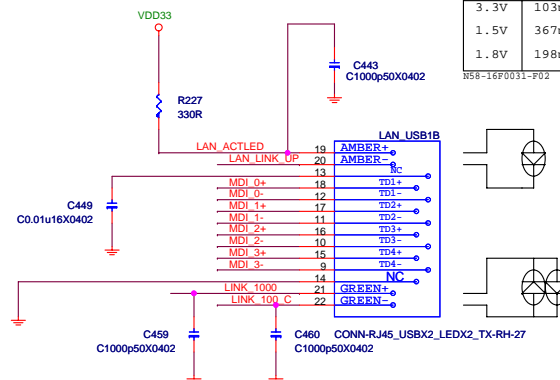
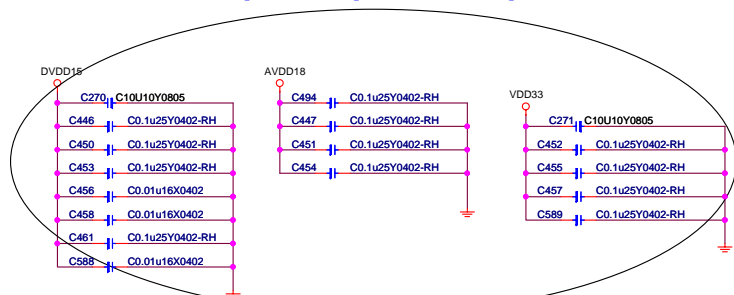
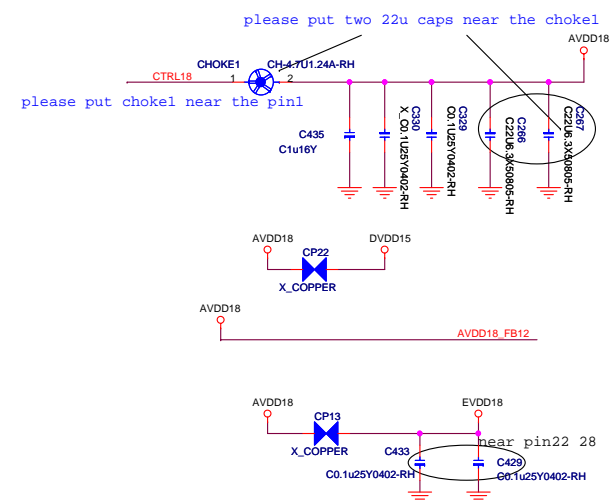
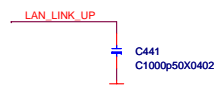
Micro Star Restricted Secret		
Title	PCI Slot 1,2,3& PCI Extender	Rev 3.0
Document Number	MS-7388	
MICRO-STAR INT'L CO., LTD. No. 69, Lihue St., Junghe City, Taipai Hsien, Taiwan		Last Revision Date: Wednesday, July 09, 2008
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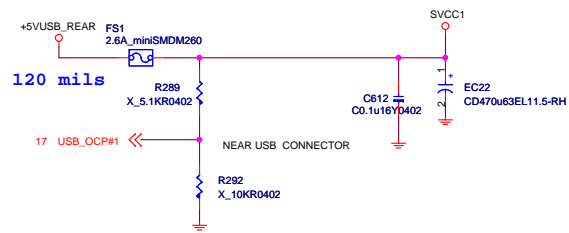
**PCI-Express x1 SLOTT 2**



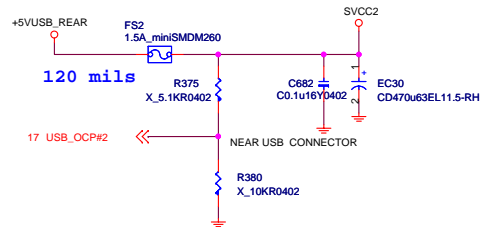




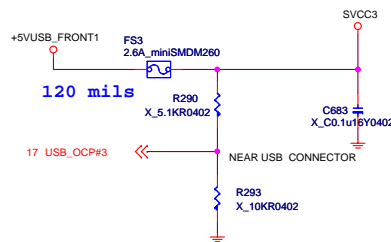
## POWER CIRCUIT FOR USB PORT 0,1,2,3



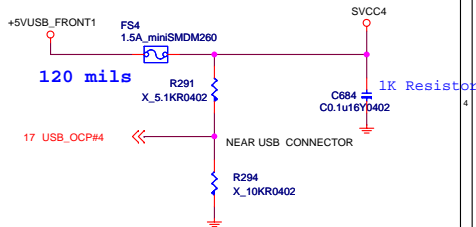
## POWER CIRCUIT FOR USB PORT 4,5



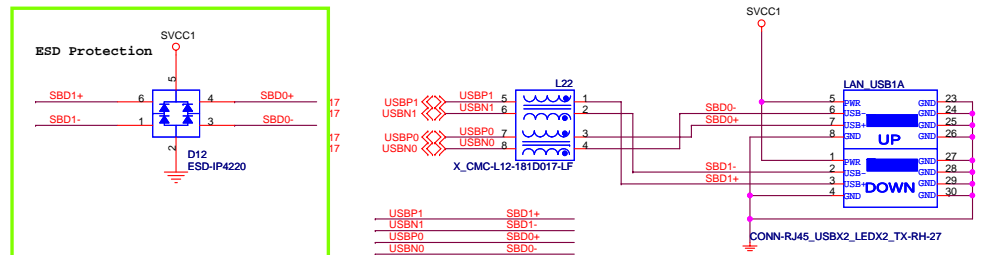
## POWER CIRCUIT FOR USB PORT 6,7,8,9



## POWER CIRCUIT FOR USB PORT 10,11

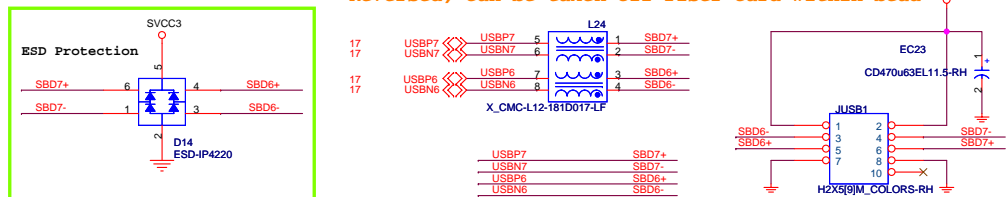


## REAR PANEL USB CONNECTOR FOR USB PORT 0,1

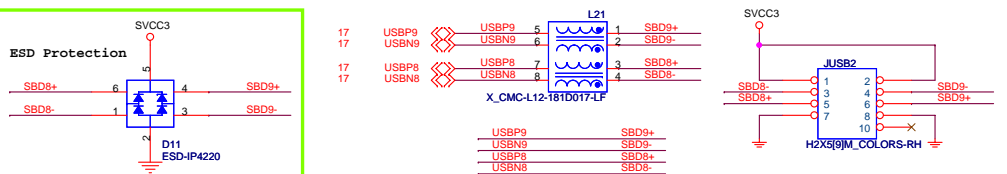


## FRONT PANEL USB CONNECTOR FOR USB PORT 6,7

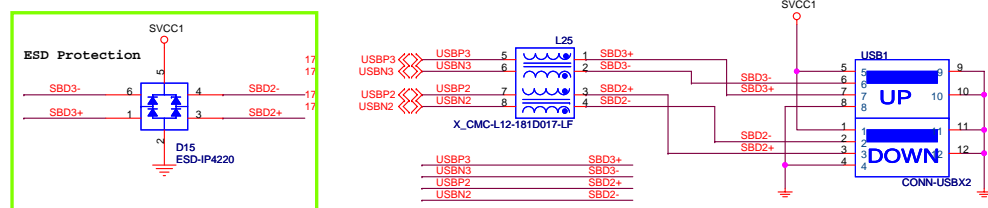
Reversed, can be taken off riser card within bead



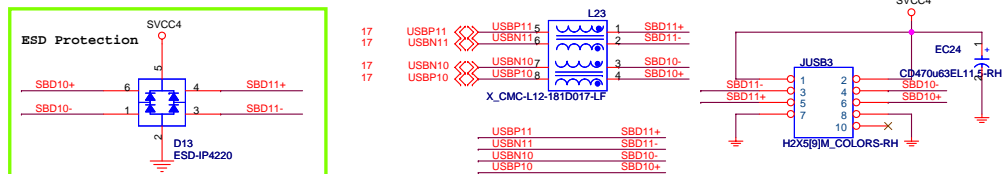
## FRONT PANEL USB CONNECTOR FOR USB PORT 8,9



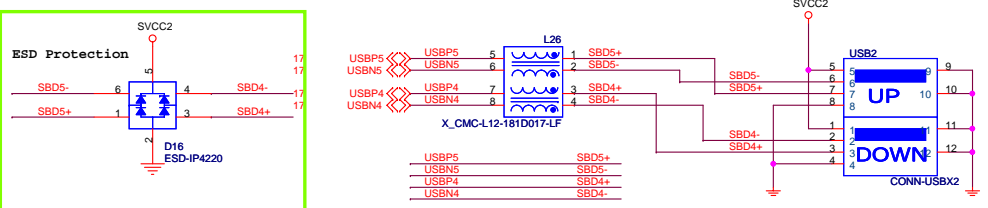
## REAR PANEL USB CONNECTOR FOR USB PORT 2,3



## FRONT PANEL USB CONNECTOR FOR USB PORT 10,11



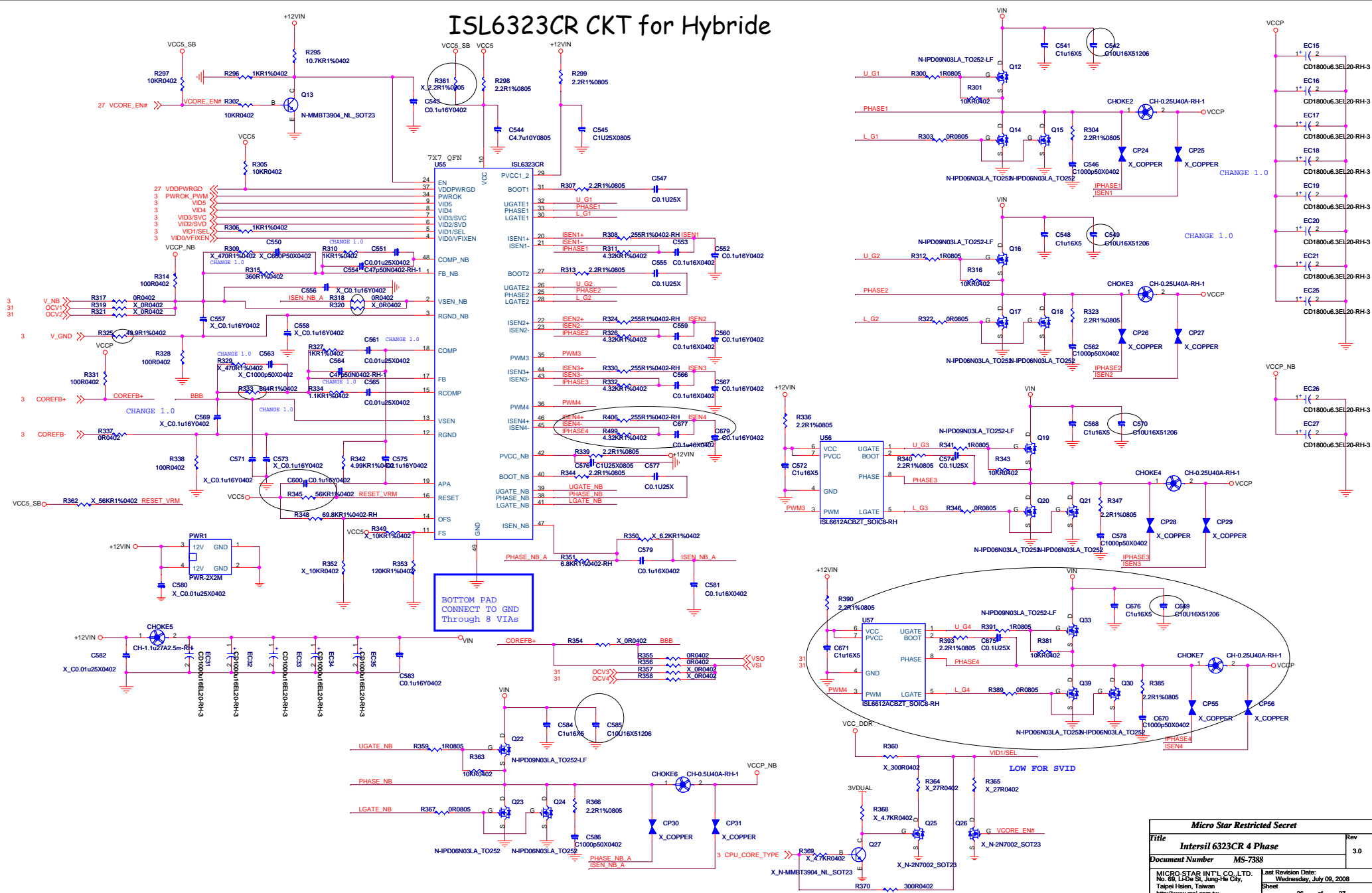
## REAR PANEL USB CONNECTOR FOR USB PORT 4,5



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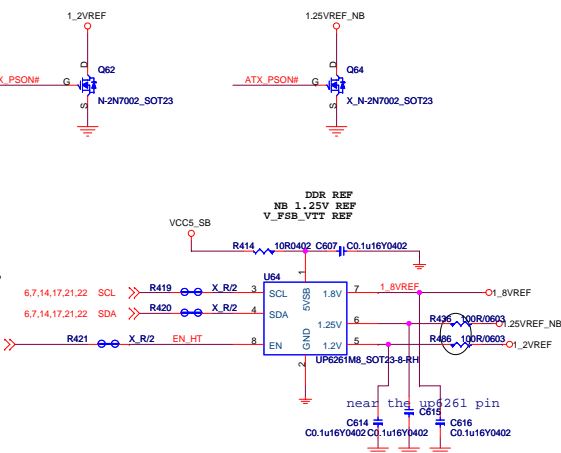
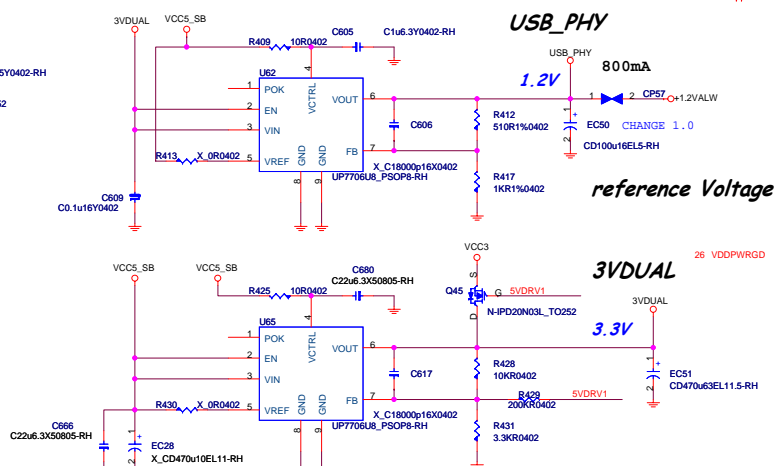
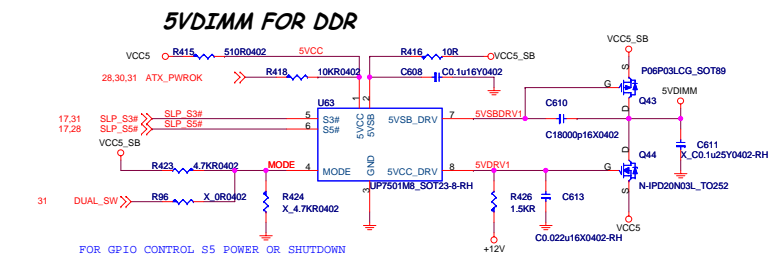
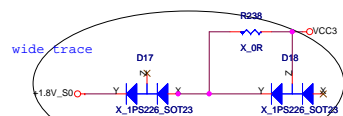
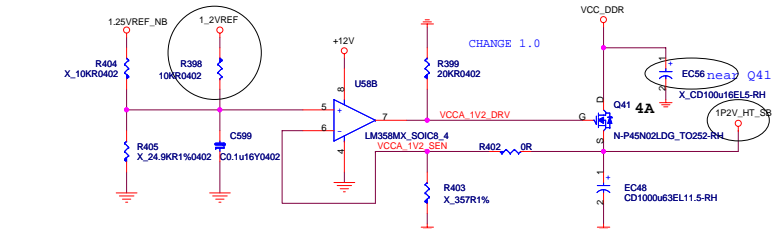
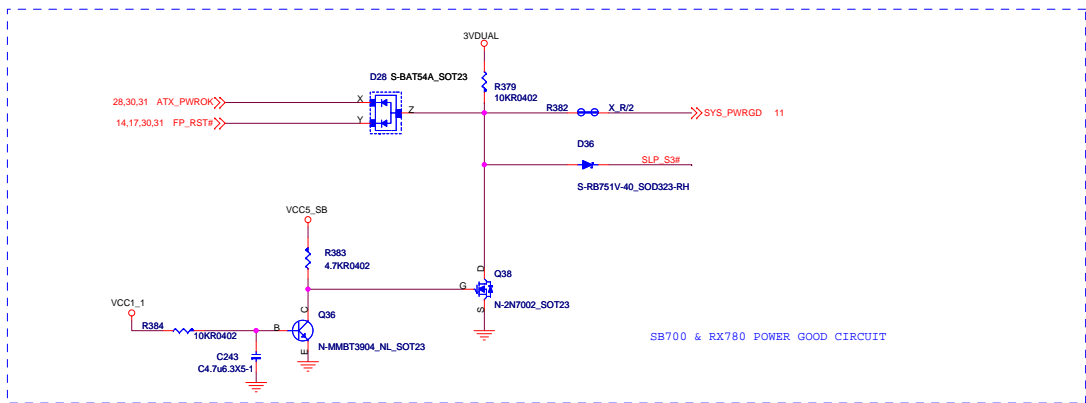
Title	Rev
USB CONNECTORS	3.0
Document Number	MS-7388
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw	Last Revision Date: Monday, September 01, 2008
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## ISL6323CR CKT for Hybride

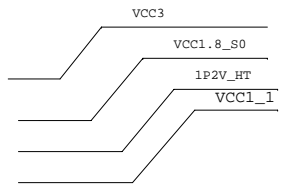


**Micro Star Restricted Secret**

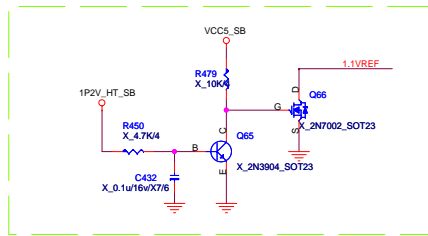
<b>Title</b> <i>Intersil 6323CR 4 Phase</i>		<b>Rev</b> 3.0
<b>Document Number</b> MS-7388		
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan <a href="http://www.msi.com.tw">http://www.msi.com.tw</a>		Last Revision Date: Wednesday, July 09, 2008 Sheet 26 of 37



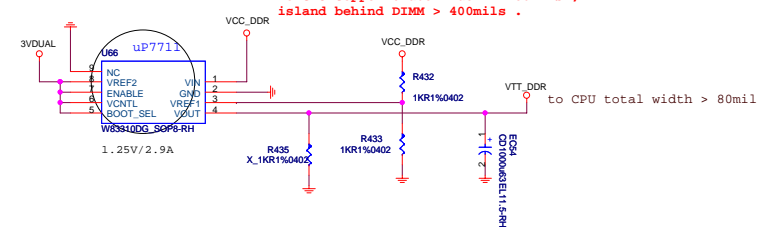
## RX780 power up sequence



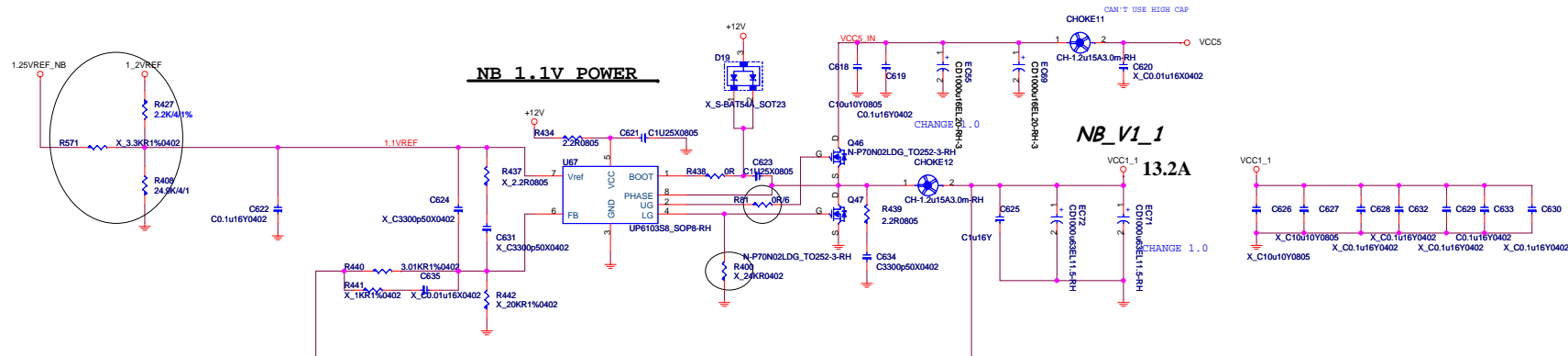
## Reserve for RX780 POS



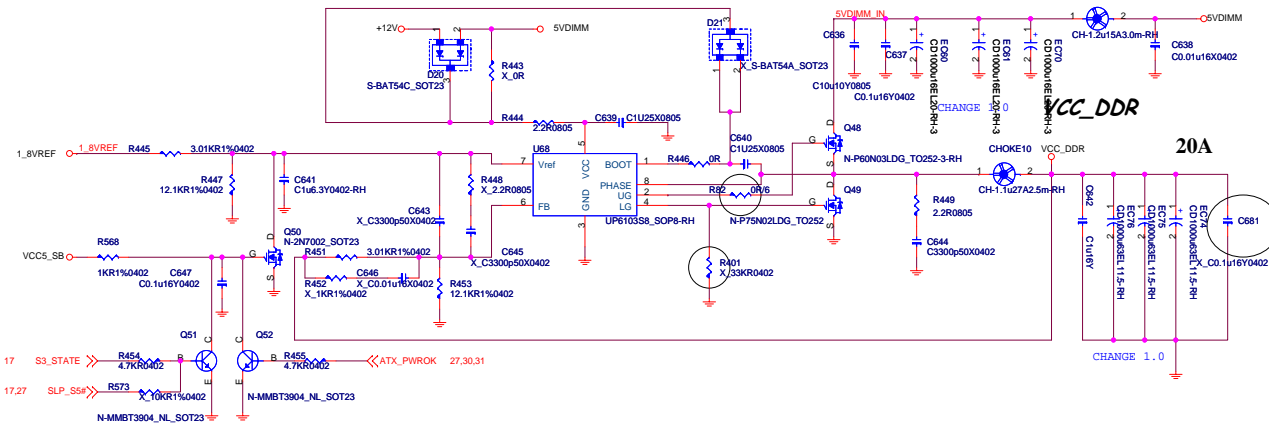
## DDR VTT Power



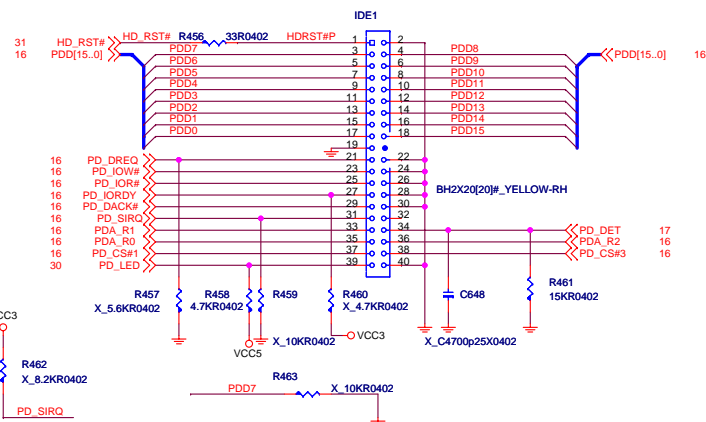
## NB 1.1V POWER



## DDR II 1.8V POWER



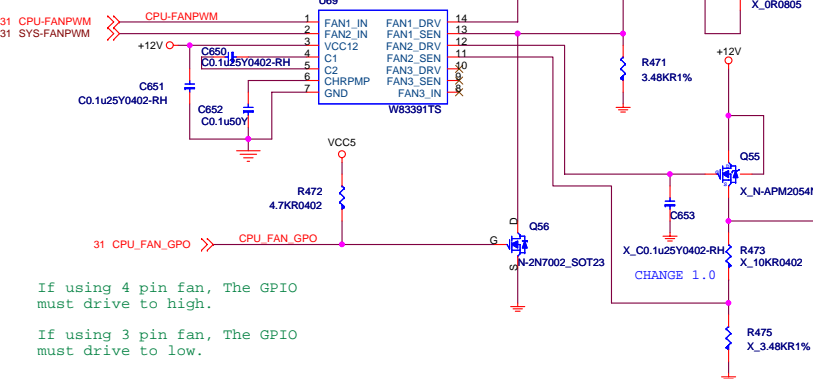
Micro Star Restricted Secret		
Title	VCC_DDR&VCC1.1	Rev 3.0
Document Number	MS-7388	
MICRO-STAR INT'L CO., LTD. No. 60, Li-On St, Jung-Ho City, Taipei, Taiwan, Taiwan		Last Revision Date: Monday, July 21, 2008
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## FAN CONTROL

### CPU FAN

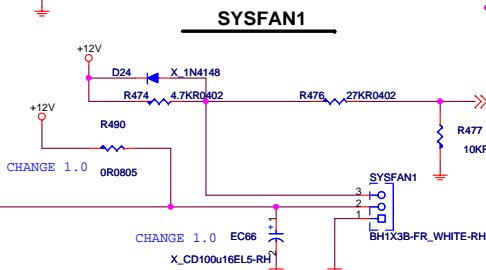
CPU-FANPWM connect to 627EHF pin 115; default is PWM mode



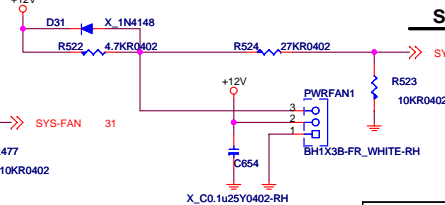
If using 3 pin fan, The Q49 will turn off to avoid the VCC5(R458) bias to CPU-FANPWM.

If using 3 pin fan, The Q50 will turn off to avoid the VCC5(R417) bias to CPU-FANPWM.

### SYSFAN1

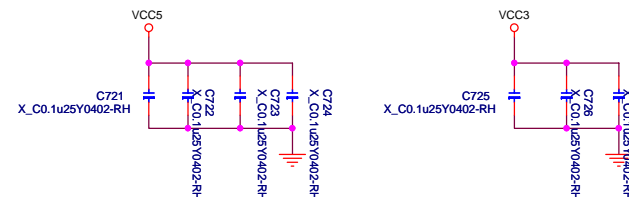
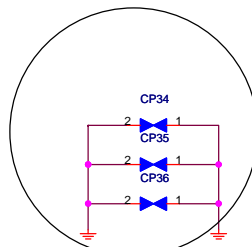
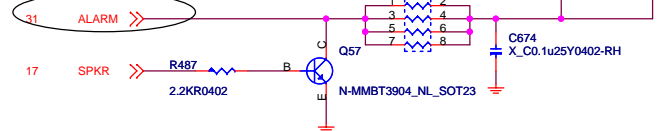


### SYS FAN



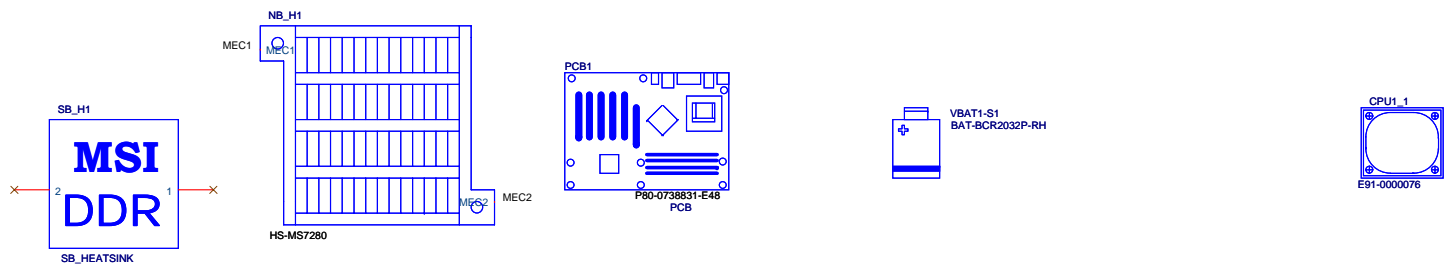
Micro Star Restricted Secret		
Title	IDE Conn/FAN/LPT/SATA	Rev 3.0
Document Number	MS-7388	
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## Intel Front Panel

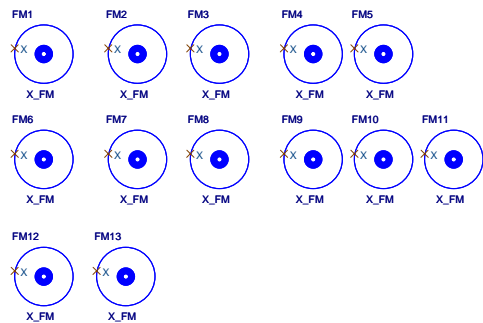


<b><i>Micro Star Restricted Secret</i></b>			
<b><i>Title</i></b>	<b><i>ATX connector / Front Panel/KB</i></b>		<b><i>Rev</i></b>
<b><i>Document Number</i></b>	<b><i>MS-7388</i></b>		<b><i>3.0</i></b>
MICRO-STAR INT'L CO. LTD. No. 69, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan <a href="http://www.msi.com.tw">http://www.msi.com.tw</a>		Last Revision Date: <b><i>Thursday, July 17, 2008</i></b>	
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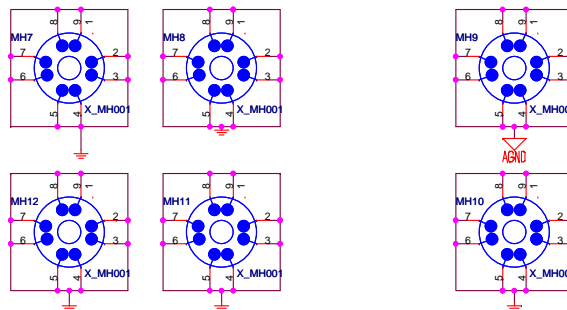




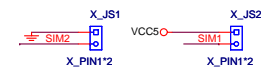
### Optics Orientation Holes



### Mounting Holes



### Simulation



Micro Star Restricted Secret		
Title	MANUAL PARTS	Rev 3.0
Document Number	MS-7388	
MICRO-STAR INT'L CO., LTD. No. 69, Lida St., Jung-Hsi City, Taipei Hsien, Taiwan <a href="http://www.msi.com.tw">http://www.msi.com.tw</a>		Last Revision Date: Monday, August 11, 2008 Sheet 32 of 37