



MS-7409 VER:2.0

CPU:

AMD M2 Athlon 64

System Chipset:

ATI RS690

ATI SB600

On Board Chipset:

WINBOND Super I/O -- W83627DHG

LAN*1 -- Realtek 8111B/8111C

HD Codec --ALC888

BIOS -- SPI ROM 8Mbit

Main Memory:

DDR * 1 (Max 2GB)

Expansion Slots:

MINI PCI-E*1

PCIE_X1 Slot X 1

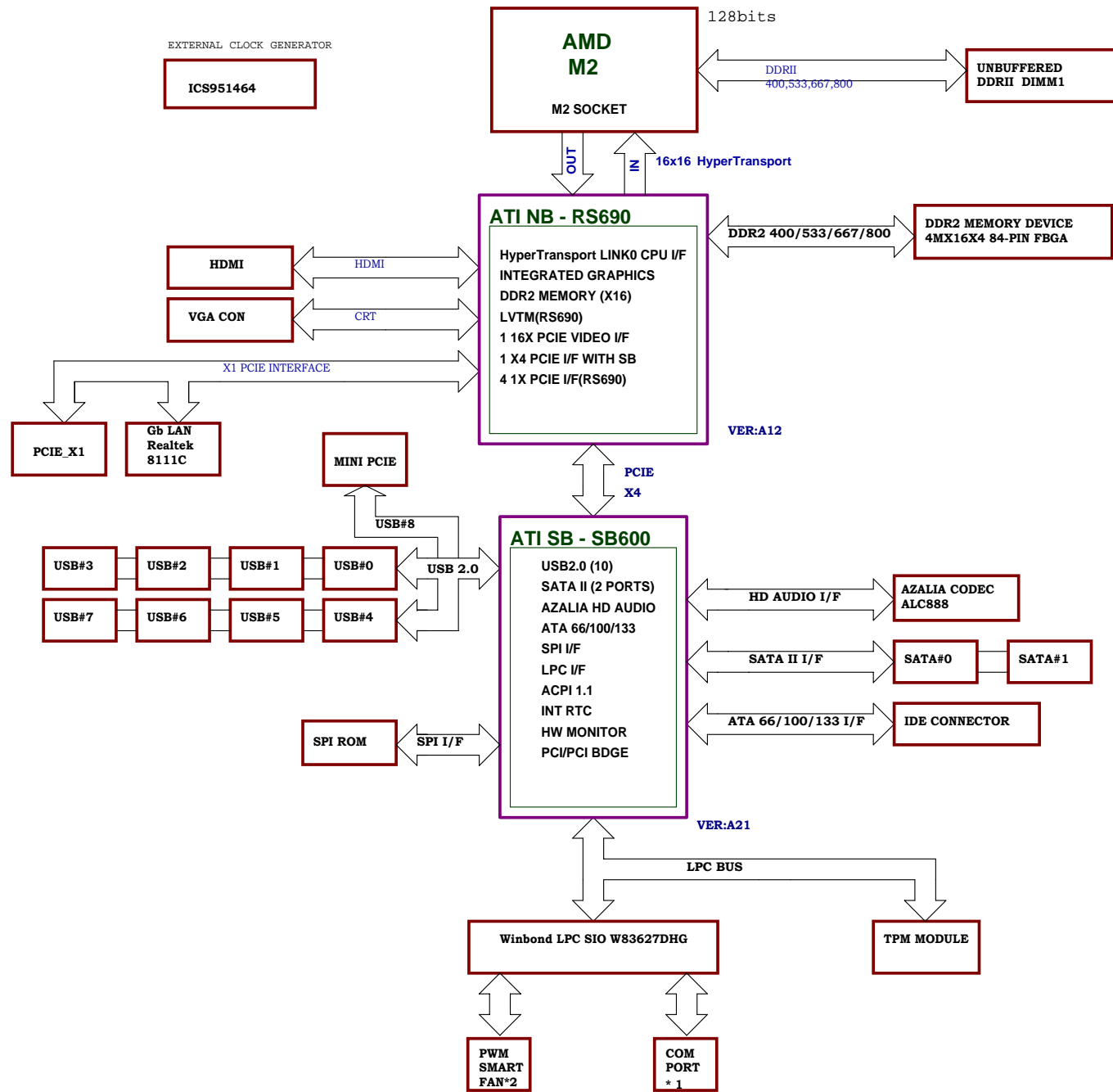
PWM:

Controller--Intersil ISL6312CR 3 Phase

Clock Generator:

Controller--ICS951464AGLFT

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Micro Star Restricted Secret		
Title	Block Diagram	Rev 1.0
Document Number	MS-7409	
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SB600 GPIO Config.

GPIO Pin	Type	Default	Power	Function
SSMUXSEL/SATA_IS3#/GPIO0	I/OD(3.3V)	Output (Low)	Main	NC
ROM_CS#/GPIO1	I/O(3.3V)	by Strapping	Main	NC
SPKR/GPIO2	I/O(3.3V)	Input (TS)	Main	NC
FANOUT0/ GPIO3	I/O(3.3V)	Input (PU)	Main	NC
SMARTVOLT/SATA_IS2#/GPIO4	I/O(3.3V)	Input (TS)	Main	NC
SHUTDOWN#/ GPIO5	I/O(3.3V)	Input (TS)	Main	NC
GHI#/SATA_IS1#/GPIO6	I/OD(3.3V)	Output (TS)	Main	GHI#
WD_PWRGD/ GPIO7	I/O(3.3V)	by Strapping	Main	NC
DDC1_SDA/ GPIO8	I/O(3.3V)	Input (TS)	Main	NC (Not Default)
DDC1_SCL/GPIO9	I/O(3.3V)	Input (TS)	Main	PD_DET (Not Default)
SATA_IS0#/GPIO10	I/O(3.3V)	Input (TS)	Main	NC (Not Default)
SPI_DO/GPIO11	I/O(S5_3.3V)	Output (PD)	Standby	SPI_DATAOUT
SPI_DI/GPIO12	I/O(S5_3.3V)	Output (PD)	Standby	SPI_DATAIN
LAN_RST#/GPIO13	O(3.3V)	Output (Low)	Main	LAN_RST#
ROM_RST#/GPIO14	I/O(3.3V)	Output (Low)	Main	NC
IDE_D[0..15]/GPIO[15..30]	I/O(3.3V)	Output (High)	Main	IDE_D[0..15]
SPI_HOLD#/GPIO31	I/O(S5_3.3V)	Input (PU)	Standby	SPI_HOLD#
SPI_CS#/GPIO32	I/O(S5_3.3V)	Input (PU)	Standby	SPI_CS#
INTE#/GPIO33	I/O(3.3V)	Input (PU)	Main	INTE#
INTF#/GPIO34	I/O(3.3V)	Input (PU)	Main	INTF#
INTG#/GPIO35	I/O(3.3V)	Input (PU)	Main	INTG#
INTH#/GPIO36	I/O(3.3V)	Input (PU)	Main	INTH#
DPSLP_OD#/GPIO37	I/O(3.3V)	Input (TS)	Main	TP16
AC_BITCLK/GPIO38	I/O(3.3V)	Input (PD)	Main	NC
AC_SDOUT/GPIO39	I/O(3.3V)	Output (Low)	Main	AC_SDATA_OUT
AC_SYNC/GPIO40	I/O(3.3V)	Output (Low)	Main	NC
SPDIF_OUT/PCICKL7/GPIO41	I/O(3.3V)	Output (Low)	Main	NC
ACZ_SDIN0/GPIO42	I/O(S5_3.3V)	Input (PD)	Standby	AZ_SDIN0
ACZ_SDIN1/GPIO43	I/O(S5_3.3V)	Input (PD)	Standby	NC
ACZ_SDIN2/GPIO44	I/O(S5_3.3V)	Input (PD)	Standby	NC
AC_RST#/GPIO45	I/O(S5_3.3V)	Output (Low)	Standby	NC
AC_SDIN3/GPIO46	I/O(S5_3.3V)	Input (PD)	Standby	GPIO46
SPI_CLK/GPIO47	I/O(S5_3.3V)	Input (PD)	Standby	SPI_CLK
FANOUT1/ GPIO48	I/O(3.3V)	Input (PU)	Main	NC (Program to Output)
FANOUT2/ GPIO49	I/O(3.3V)	Input (PU)	Main	NC (Program to Output)
FANINO/GPIO50	I/O(3.3V)	Input (TS)	Main	NC (Program to Output)
FANIN1/GPIO51	I/O(3.3V)	Input (TS)	Main	NC (Program to Output)
FANIN2/GPIO52	I/O(3.3V)	Input (TS)	Main	NC (Program to Output)
VIN[0..7]/GPIO[53..60]	I/O(3.3V)	Input (TS)	Main	NC (Program to Output)
TEMPINO/GPIO61	I/O(3.3V)	Input (TS)	Main	NC (Program to Output)
TEMPIN1/GPIO62	I/O(3.3V)	Input (TS)	Main	NC (Program to Output)
TEMPIN2/GPIO63	I/O(3.3V)	Input (TS)	Main	NC (Program to Output)
TEMPIN3/TALERT#/ GPIO64	I/O(3.3V)	Input (TS)	Main	TALERT# (Not Default)
BMREQ#/REQ5#/GPIO65	I/O(3.3V)	Input (TS)	Main	BMREQ# (Not Default)
LLB#/GPIO66	I/O(S5_3.3V)	Input (PU)	Standby	NC
SATA_ACT#/ GPIO67	OD(3.3V)	Output (TS)	Main	SATA_ACT#
LDRQ1#/GNT5#/ GPIO68	I/O(3.3V)	Input (PU)	Main	NC
RTC_IRQ#/GPIO69	I/O(S5_3.3V)/VBAT	Input (PU)	Standby	AUTO_ON#
REQ3#/GPIO70	I/O(3.3V)	Input (PU)	Main	NC
REQ4#/GPIO71	I/O(3.3V)	Input (PU)	Main	NC
GNT3#/GPIO72	I/O(3.3V)	Output (TS)	Main	NC
GNT4#/GPIO73	I/O(3.3V)	Output (TS)	Main	NC

SB600 GPM Config.

GPM Pin	Type	Default	Power	Function
USB_OC0#/ GPM#0	I/O(S5_3.3V)	Input (PU)	Standby	USB OverCurrent for PORT0,1,2,3 (Not Default)
USB_OC1#/ GPM#1	I/O(S5_3.3V)	Input (PU)	Standby	USB OverCurrent for PORT4,5,6,7 (Not Default)
USB_OC2#/ GPM#2	I/O(S5_3.3V)	Input (PU)	Standby	
USB_OC3#/ GPM#3	I/O(S5_3.3V)	Input (PU)	Standby	NC
USB_OC4#/ GPM#4	I/O(S5_3.3V)	Output (Low)	Standby	NC
USB_OC5#/DDR3_RST#/GPM#5	I/O/OD(S5_3.3V)	Input (PU)	Standby	WLAN_PWRON (Not Default)
BLINK/ GPM#6	I/O(S5_3.3V)	Input (PU)	Standby	GPM6#
SYS_RESET#/GPM#7	I/O(S5_3.3V)	Input (PU)	Standby	SYS_RESET# (Not Default)
USB_OC8#/AZ_DOCK_RST#/ GPM#8	I/O(S5_3.3V)	Input (PU)	Standby	NC
USB_OC9#/SLP_S2#/ GPM#9	I/O(S5_3.3V)	Input (PD)	Standby	NC

SB600 GPOC Config.

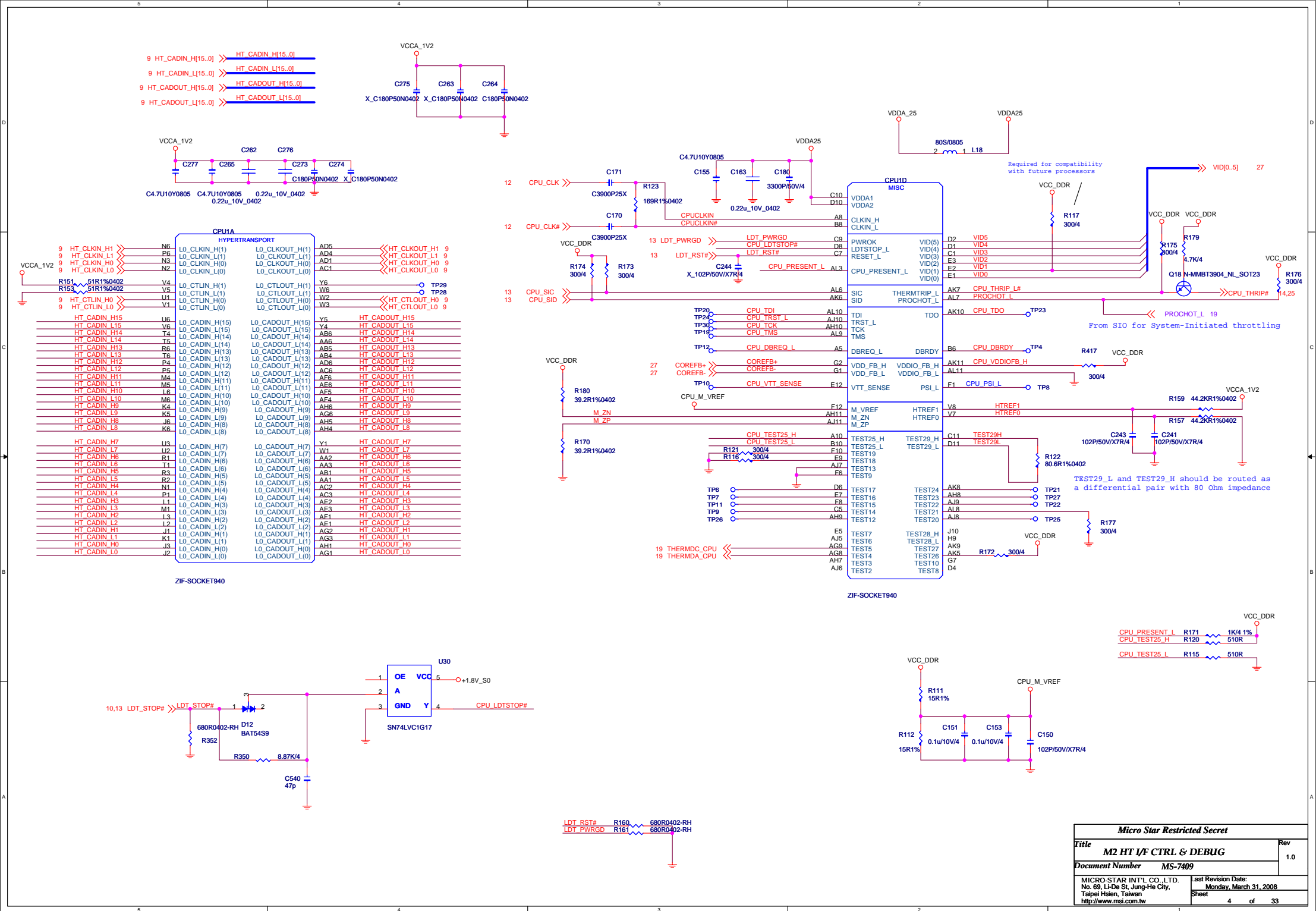
GPOC Pin	Type	Default	Power	Function
SCL0/GPOC0#	I/O(3.3V)	Input (TS)	Main	SMBUS1 (Not Default)
SDA0/GPOC1#	I/O(3.3V)	Input (TS)	Main	SMBUS1 (Not Default)
SCL1/GPOC2#	I/O(S5_3.3V)	Input (TS)	Standby	SMBUS2 (Not Default)
SDA1/GPOC3#	I/O(S5_3.3V)	Input (TS)	Standby	SMBUS2 (Not Default)

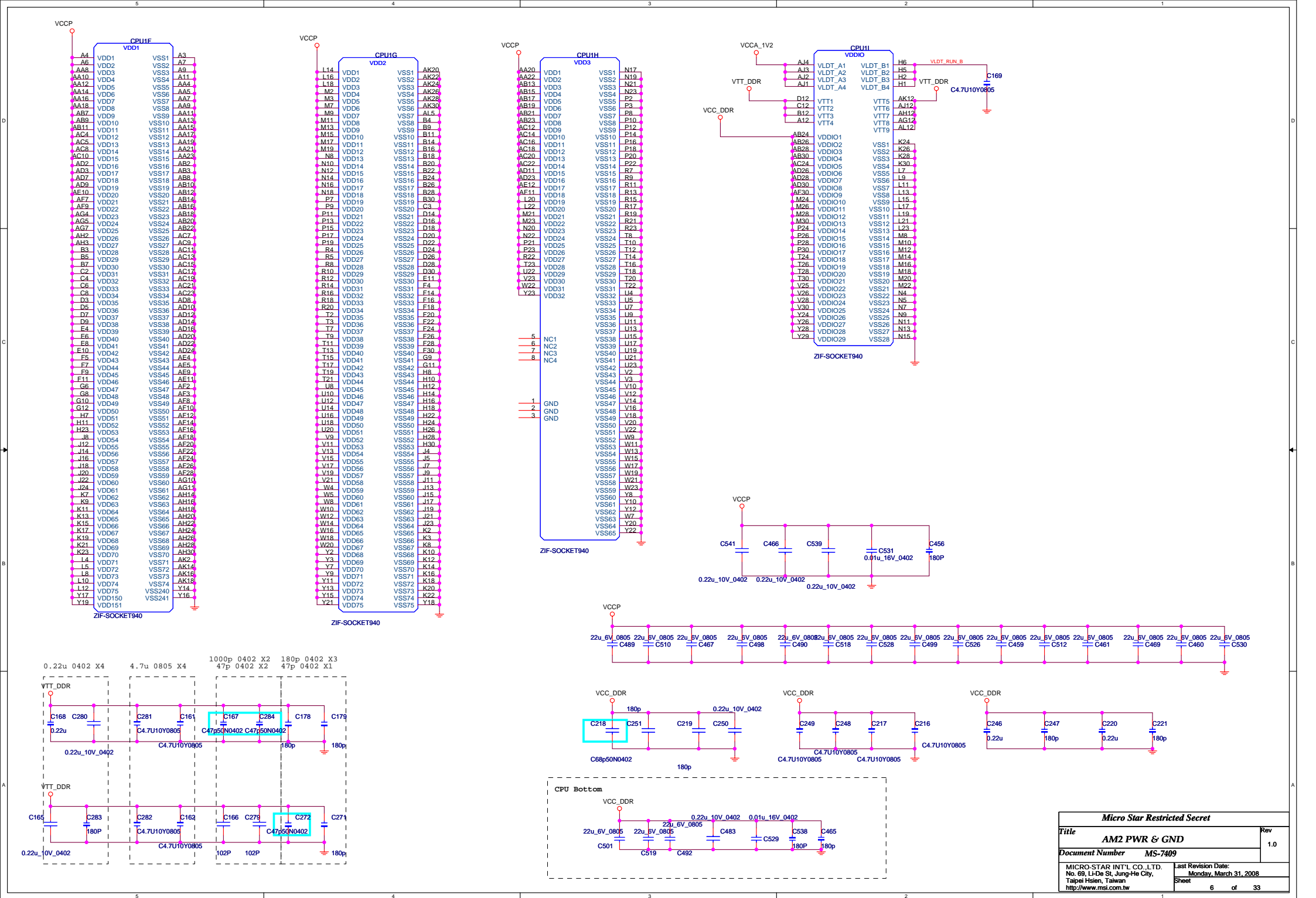
SB600 EXTEVENT & GEVENT Config.

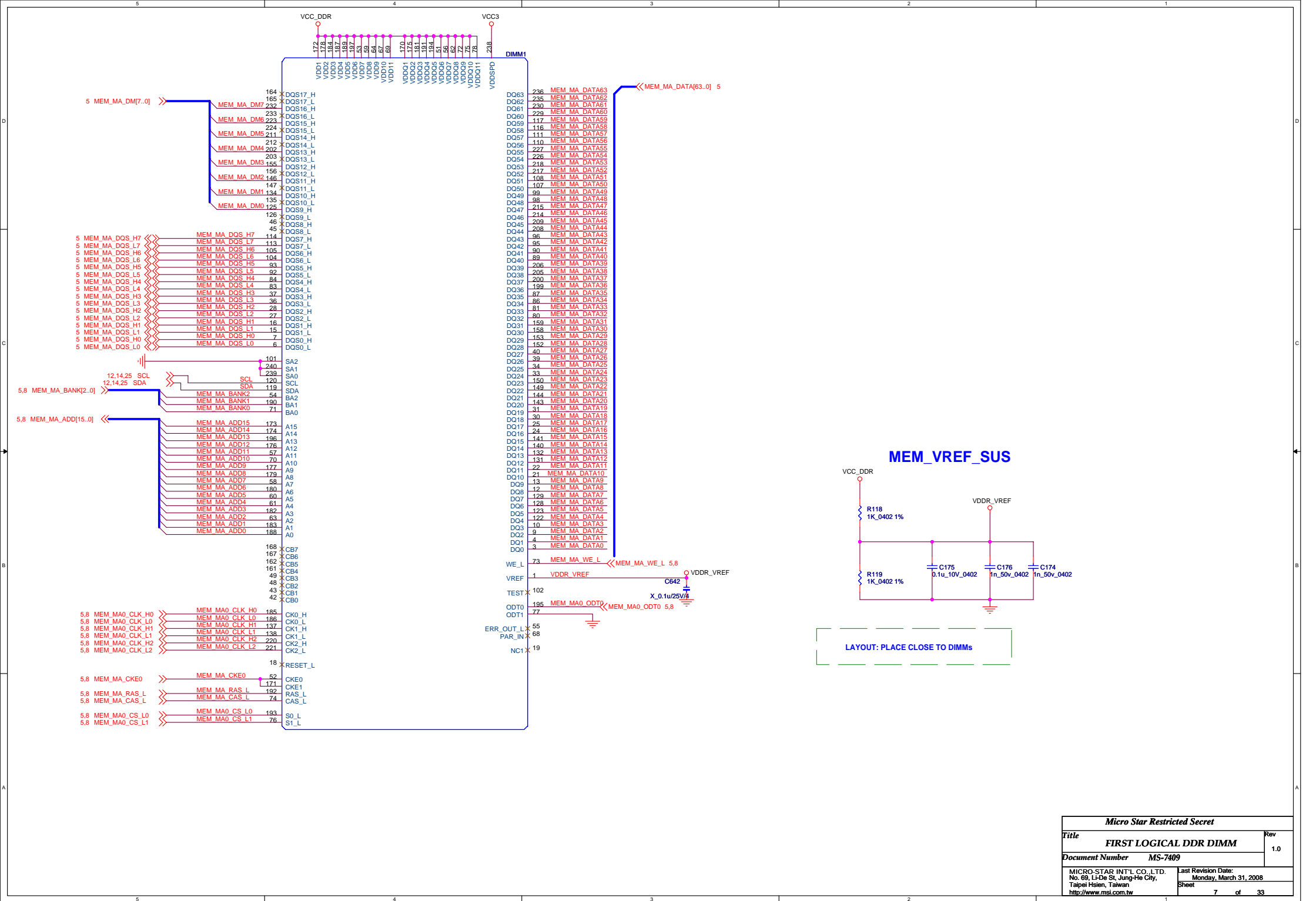
GPM Pin	Type	Default	Power	Function
RI#/ EXTEVENT0#	I/O(S5_3.3V)	Input (PU)	Standby	NC
LPC_SMI#/ EXTEVENT1#	I/O(3.3V)	Input (PU)	Main	NC
SMBALERT#/ THRMTRIP#GEVENT2#	I/O(S5_3.3V)	Input (PU)	Standby	THRMTRIP# (Reserved)
LPC_PME#/ GEVENT3#	I/O(S5_3.3V)	Input (PU)	Standby	LPC_PME# (Not Default)
PCI_PME#/ GEVENT4#	I/O(S5_3.3V)	Input (PU)	Standby	PCI_PME# (Not Default)
S3_STATE/GEVENT5#	I/O(S5_3.3V)	by Strapping	Standby	NC
USB_OC6#/ GEVENT6#	I/O(S5_3.3V)	Input (PU)	Standby	NC
USB_OC7#/ GEVENT7#	I/O(S5_3.3V)	Input (PU)	Standby	NC
WAKE#/ GEVENT8#	I/O(S5_3.3V)	Input (PU)	Standby	PCIE_WAKE# (Not Default)

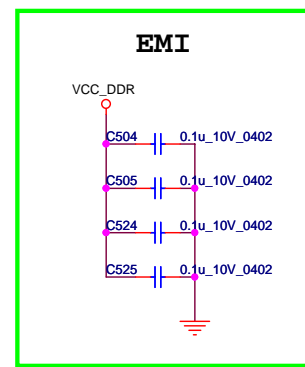
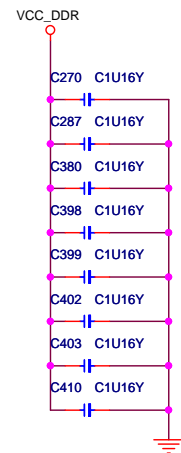
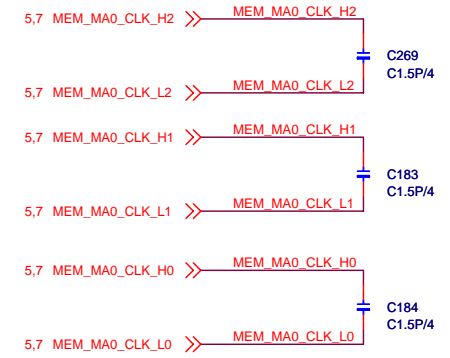
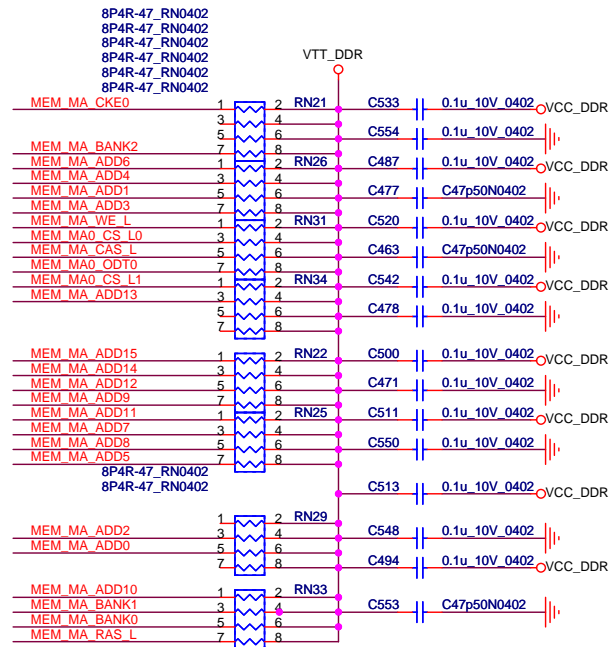
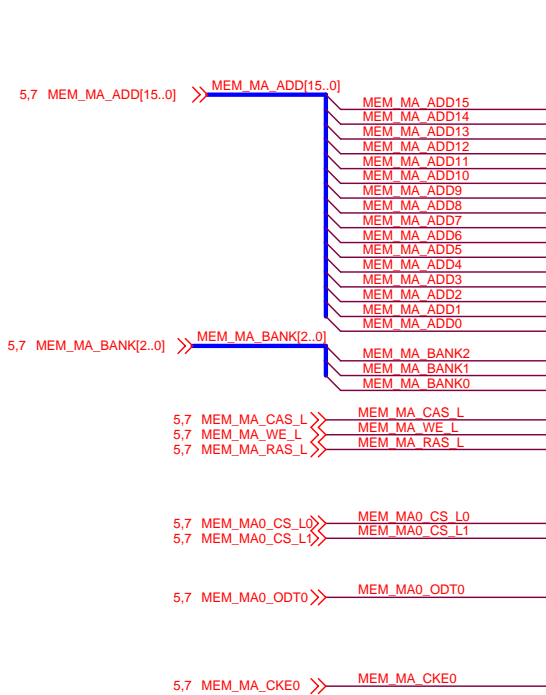
PCI Config.

	CLOCK	REQ#	GNT#	IDSEL	INTA#	INTB#	INTC#	INTD#
IEEE 1394								
GIGA LAN								
PCI1								
PCI2								
Super I/O								



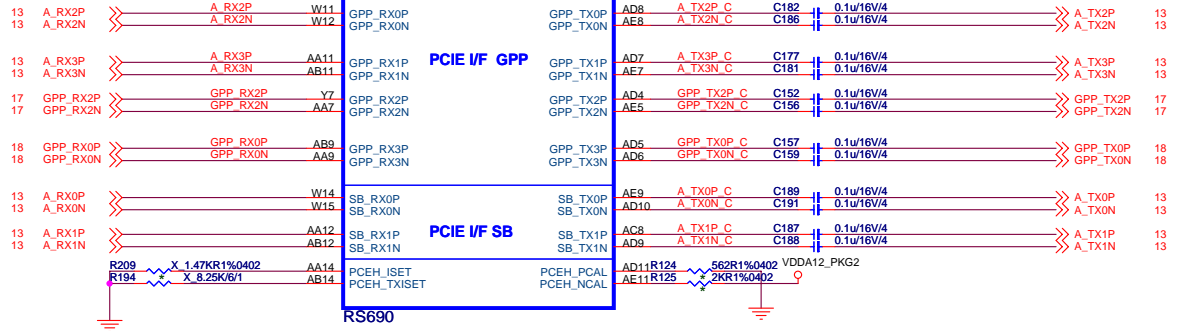
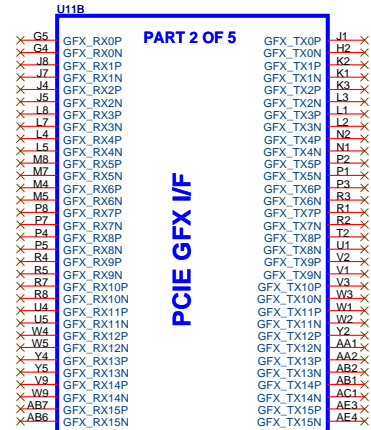
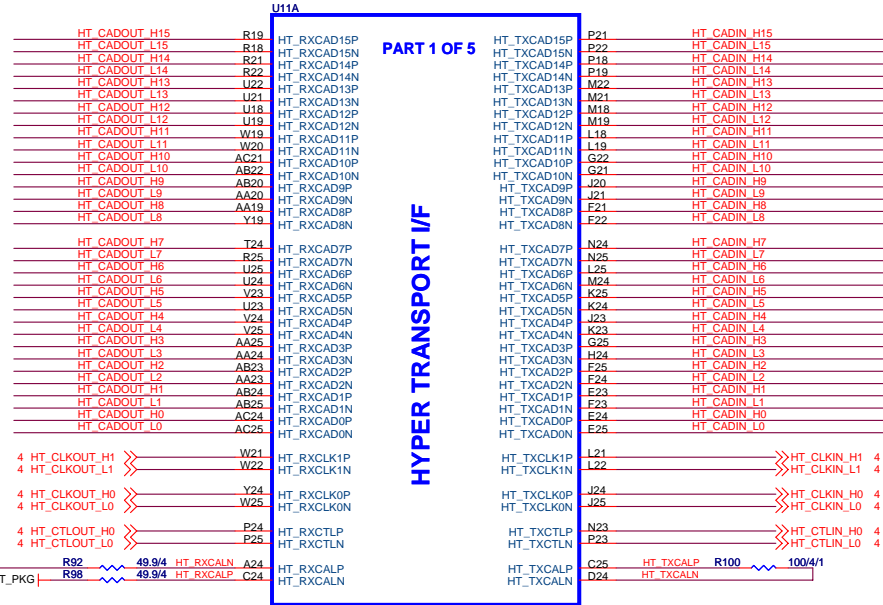


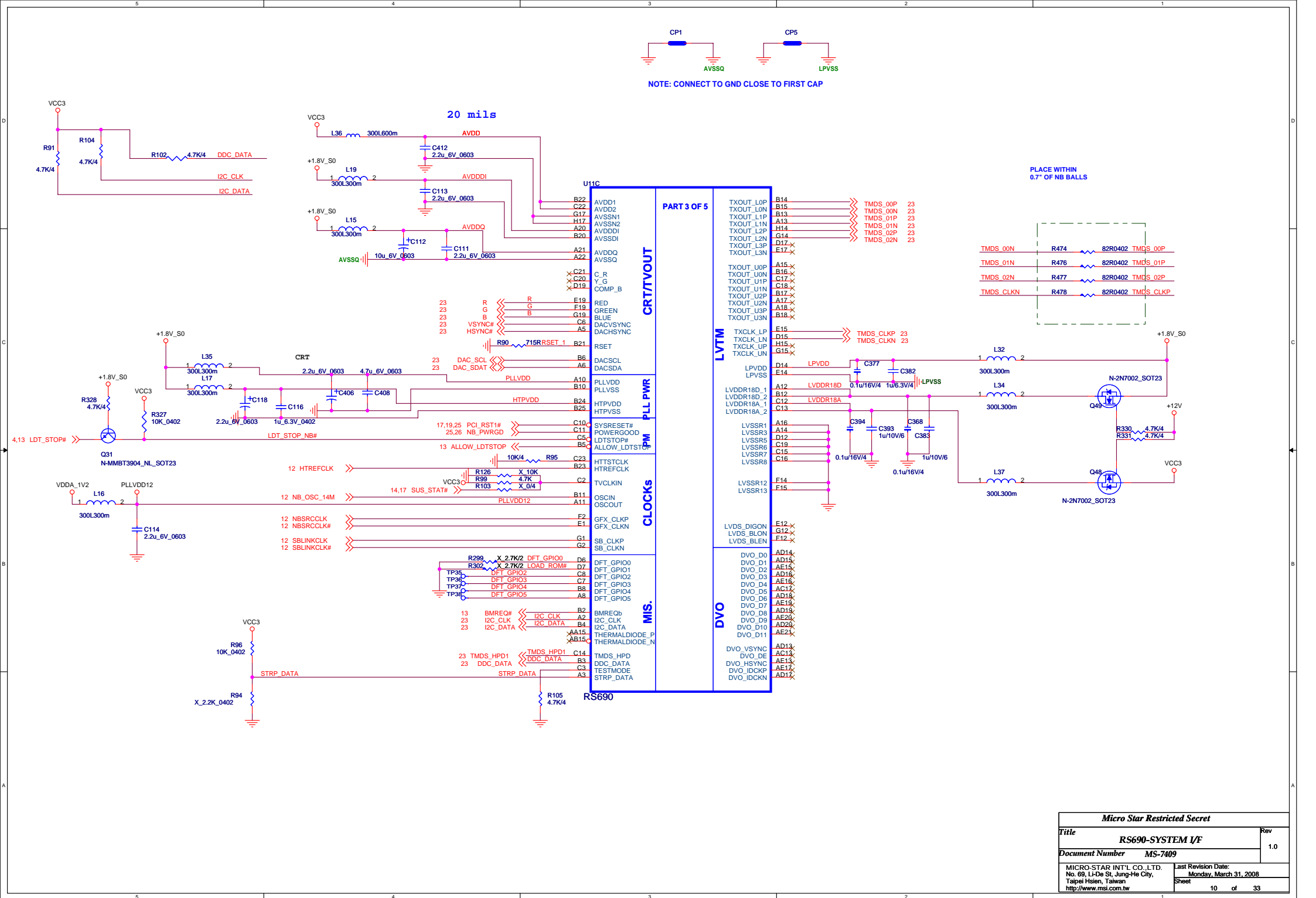


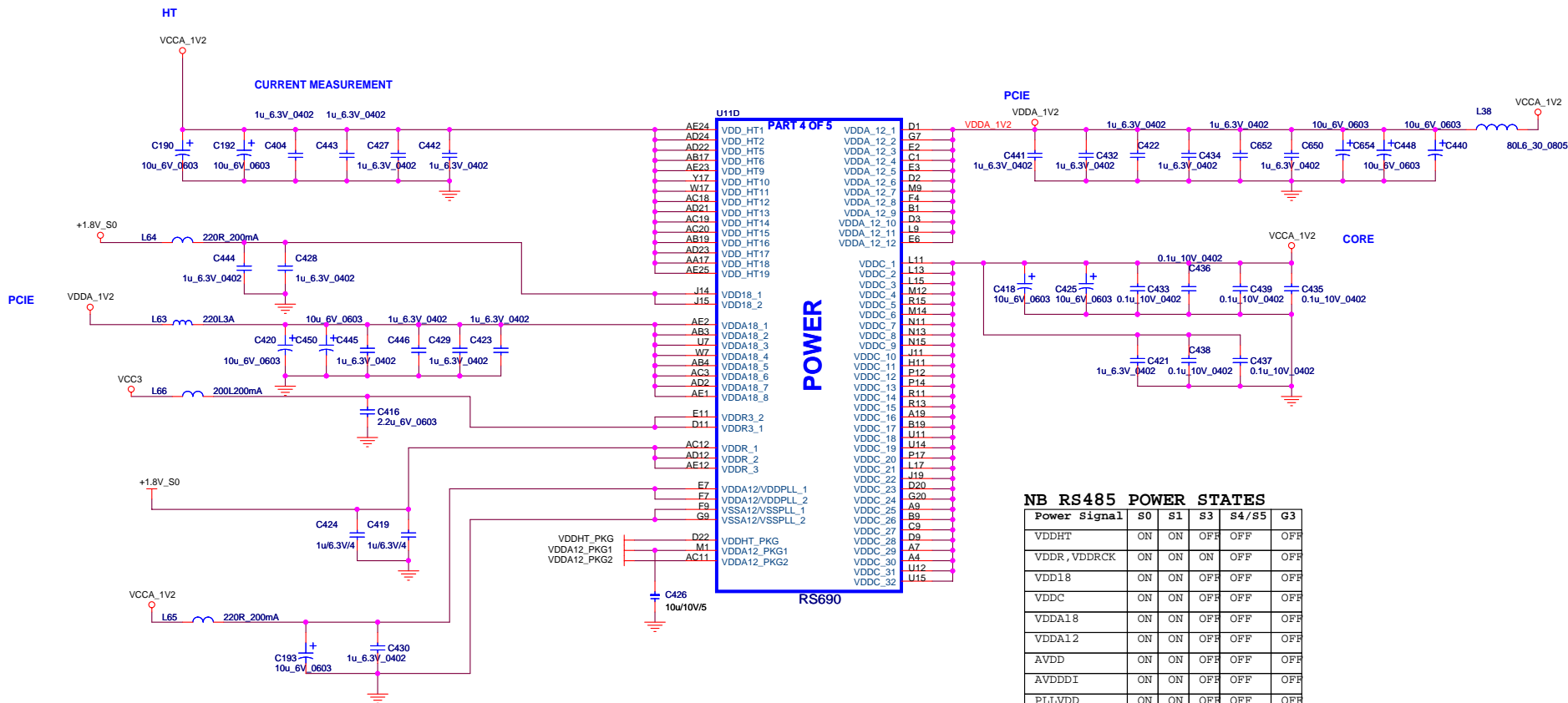


Micro Star Restricted Secret		
Title	DDR2 Termination	Rev 1.0
Document Number	MS-7409	
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4 HT_CADIN_H[15..0] >> HT_CADIN_H[15..0]
4 HT_CADIN_L[15..0] >> HT_CADIN_L[15..0]
4 HT_CADOUT_H[15..0] >> HT_CADOUT_H[15..0]
4 HT_CADOUT_L[15..0] >> HT_CADOUT_L[15..0]

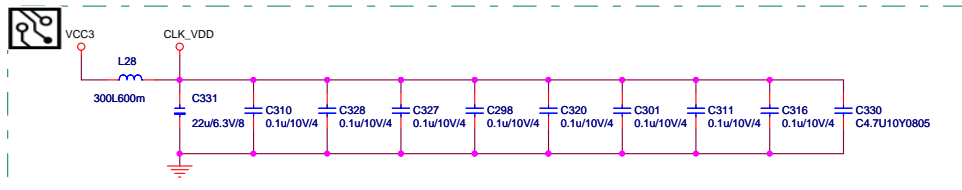




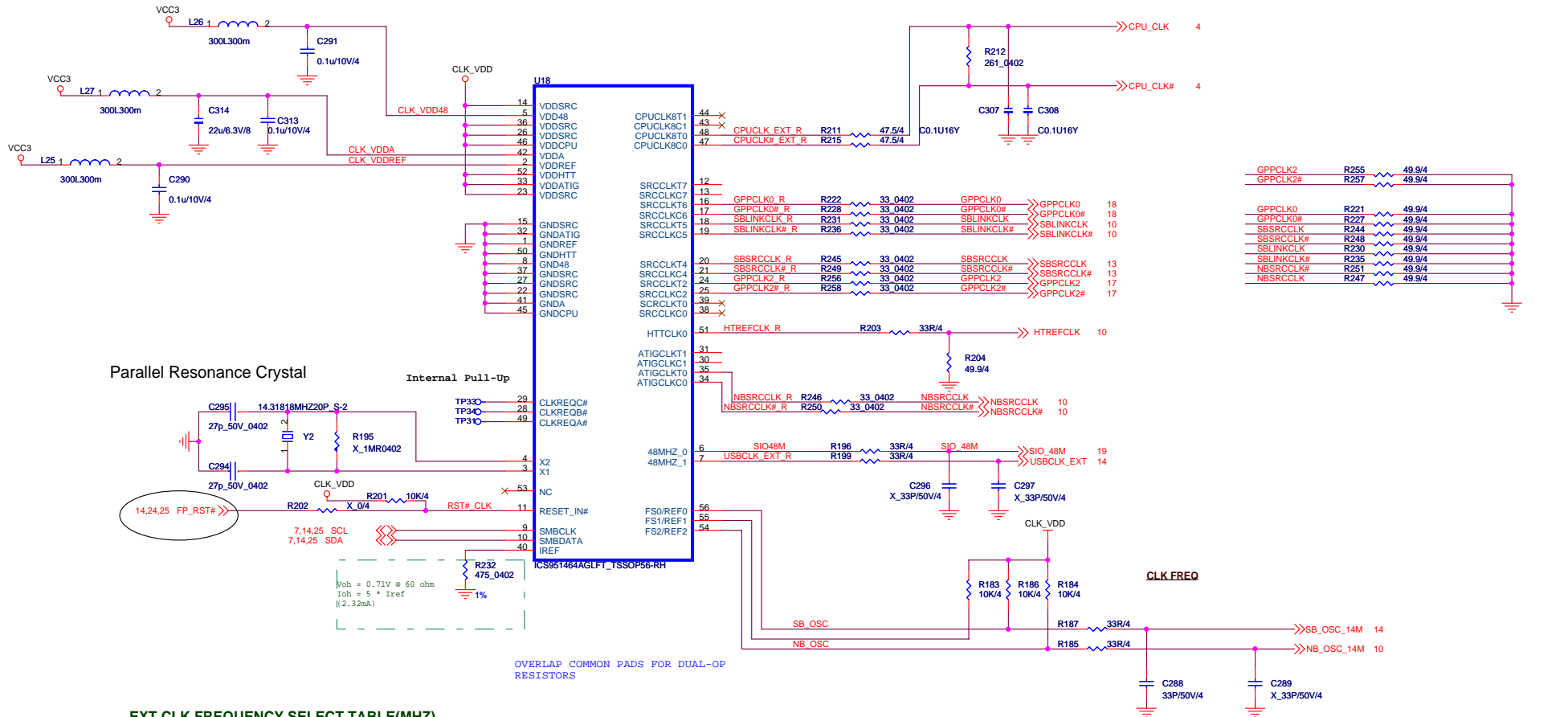


NB RS485 POWER STATES

Power Signal	S0	S1	S3	S4/S5	G3
VDDHT	ON	ON	OFF	OFF	OFF
VDDR, VDDRCK	ON	ON	ON	OFF	OFF
VDD18	ON	ON	OFF	OFF	OFF
VDDC	ON	ON	OFF	OFF	OFF
VDDA18	ON	ON	OFF	OFF	OFF
VDDA12	ON	ON	OFF	OFF	OFF
AVDD	ON	ON	OFF	OFF	OFF
AVDDDI	ON	ON	OFF	OFF	OFF
PLLVD	ON	ON	OFF	OFF	OFF
HTPVDD	ON	ON	OFF	OFF	OFF
VDDR3	ON	ON	OFF	OFF	OFF
LPVDD	ON	ON	OFF	OFF	OFF
LVDDR18D	ON	ON	OFF	OFF	OFF
LVDDR18A	ON	ON	OFF	OFF	OFF

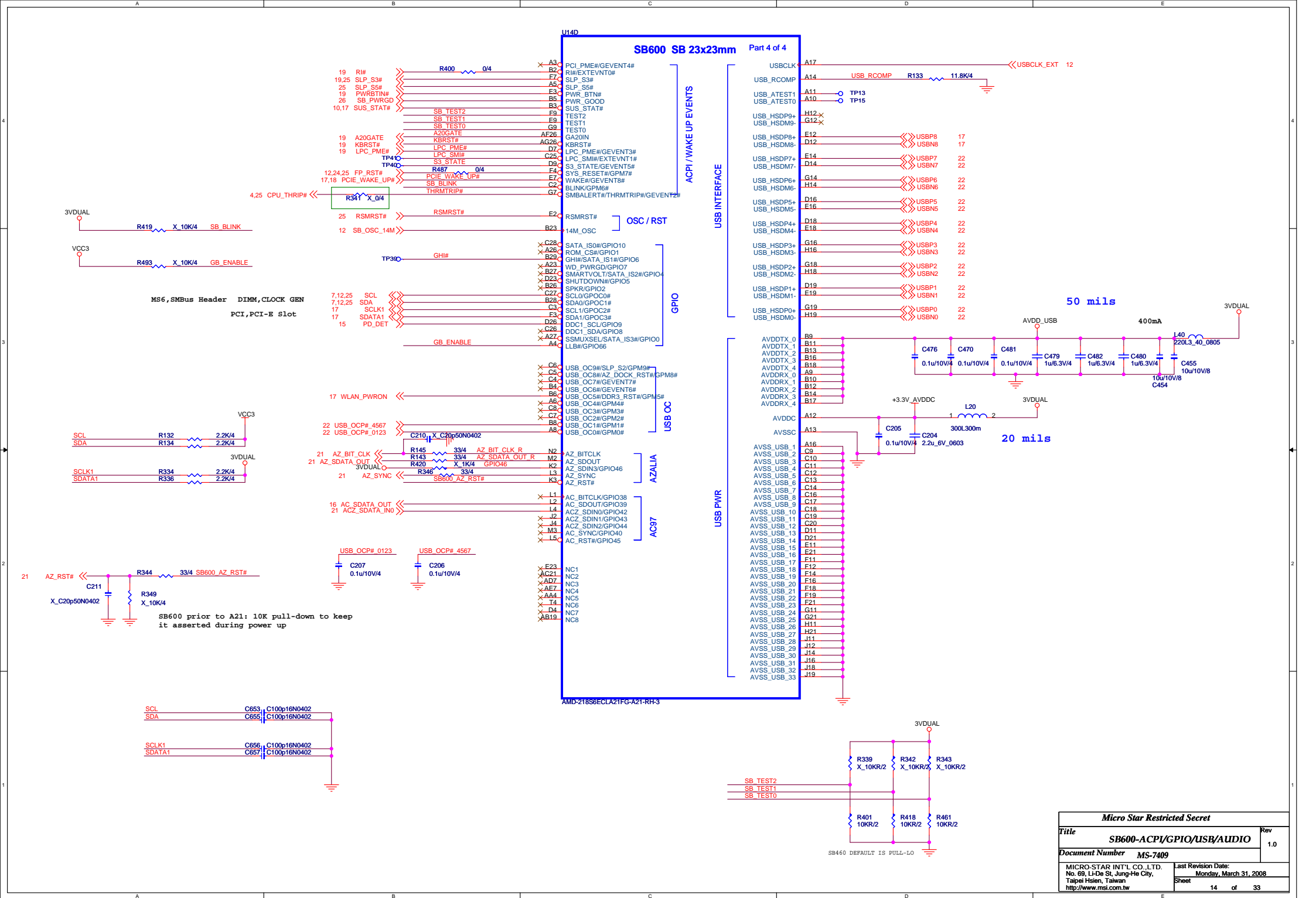


- 1- PLACE ALL THE SERIES TERMINATION RESISTORS AS CLOSE AS U300 AS POSSIBLE
- 2- ROUTE ALL CPUCLK/#, NBSRCCLK/#, GPCLK/# AS DIFFERENT PAIR RULE
- 3- PUT DECOUPLING CAPS CLOSE TO U300 POWER PIN

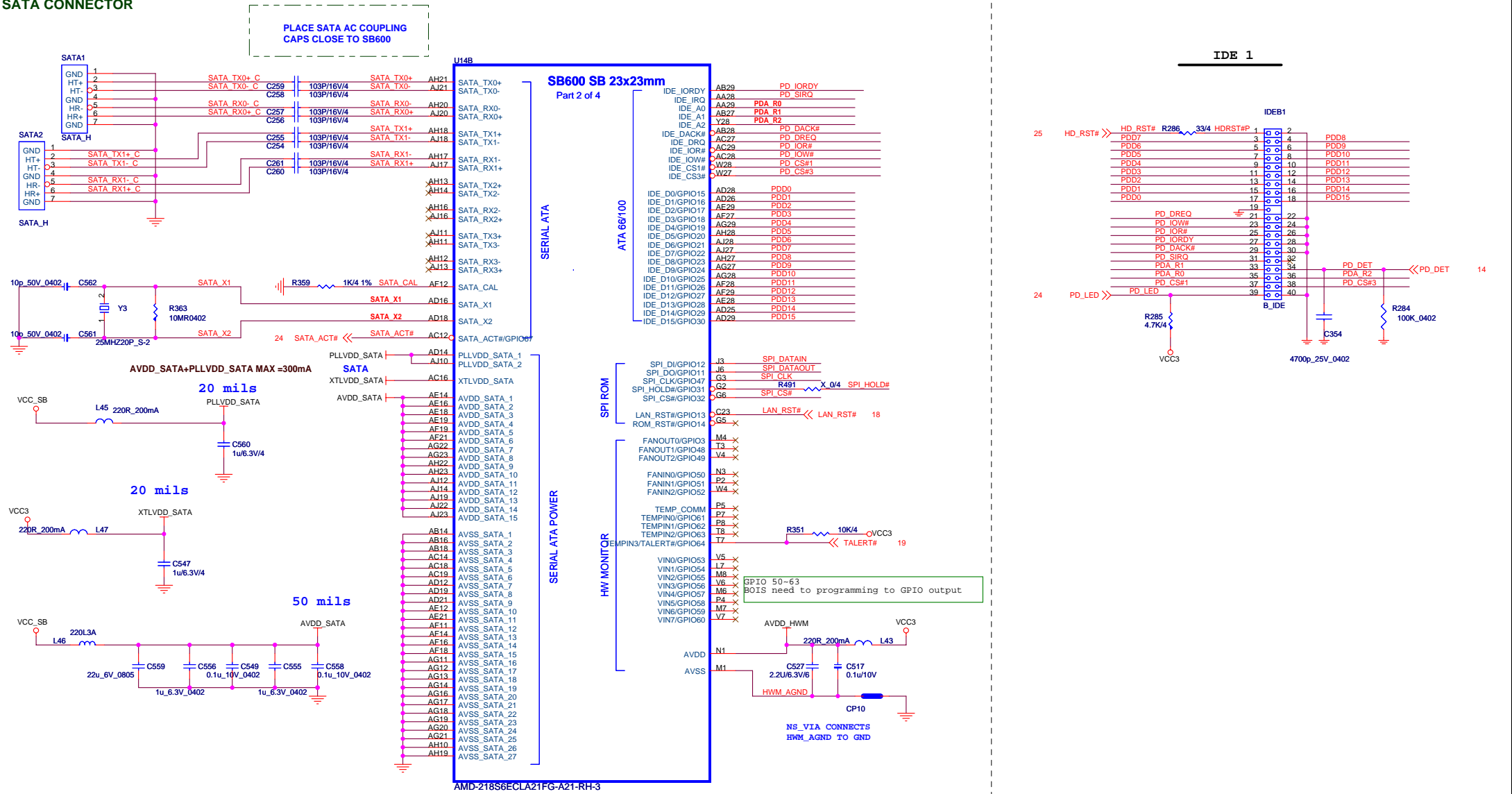


EXT CLK FREQUENCY SELECT TABLE(MHZ)

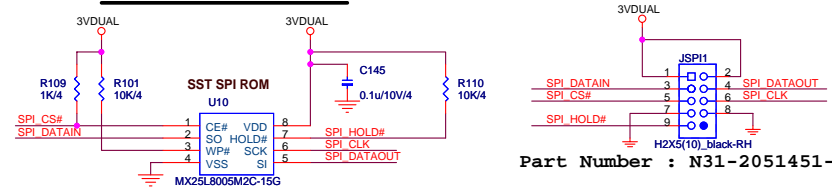
FS2	FS1	FS0	CPU	SRCLK [2:1]	HTT	PCI	USB	COMMENT
0	0	0	Hi-Z	100.00	Hi-Z	Hi-Z	48.00	Reserved
0	0	1	X	100.00	X/3	X/6	48.00	Reserved
0	1	0	180.00	100.00	60.00	30.00	48.00	Reserved
0	1	1	220.00	100.00	36.56	73.12	48.00	Reserved
1	0	0	100.00	100.00	66.66	33.33	48.00	Reserved
1	0	1	133.33	100.00	66.66	33.33	48.00	Reserved
1	1	1	200.00	100.00	66.66	33.33	48.00	Normal HAMMER operation



SATA CONNECTOR



SPI DEBUG PORT
Place close to SPI ROM

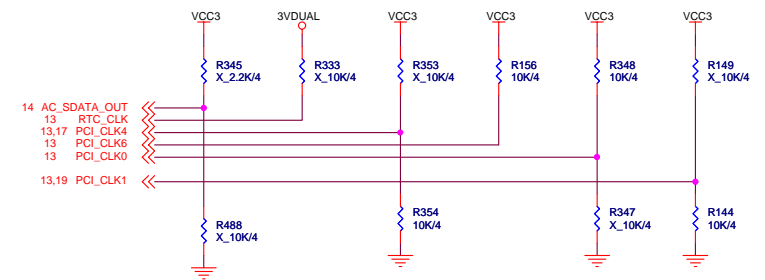
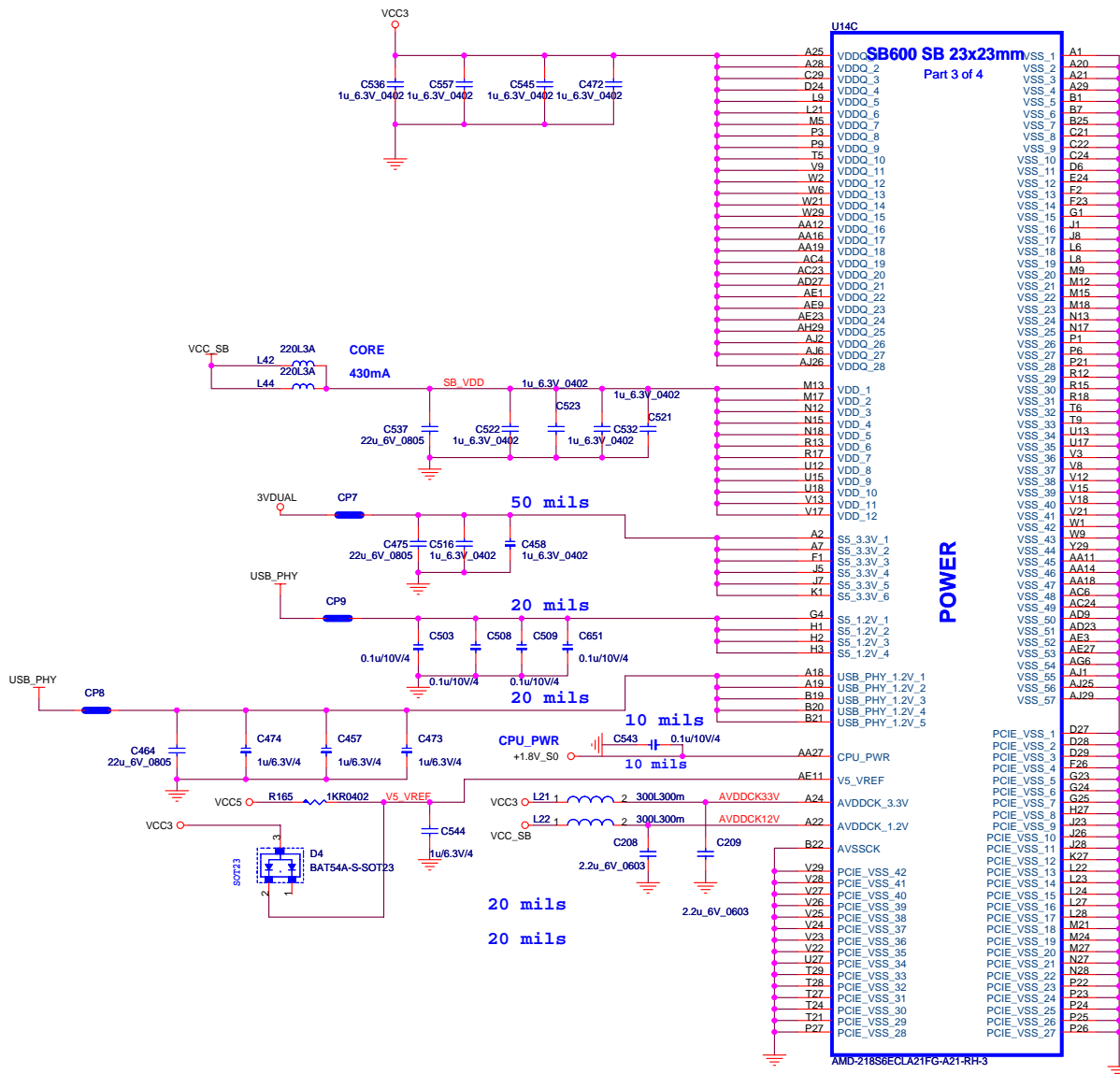


Part Number : N31-2051451-H06

<i>Micro Star Restricted Secret</i>			
Title	SB600-SATA/IDE/SPI		Rev
Document Number	MS-7409		1.0
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-Hsue City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Monday, March 31, 2008 Sheet <div style="text-align: right;">15 of 33</div>	

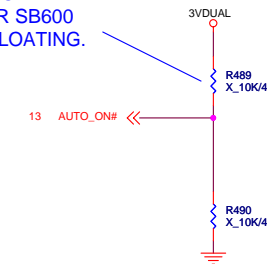


REQUIRED STRAPS



	AC_SDOUT	RTC_CLK	PCI_CLK4	PCI_CLK6	PCI_CLK0	PCI_CLK1
PULL HIGH	USE DEBUG STRAPS	INTERNAL RTC	USE INT. PLL48	CPU IF=K8	ROM TYPE: H, H = PCI ROM H, L = SPI ROM L, H = LPC ROM L, L = FWH ROM	
PULL LOW	IGNORE DEBUG STRAPS	EXTERNAL RTC	USE EXT. 48MHZ	CPU IF=P4	DEFAULT	

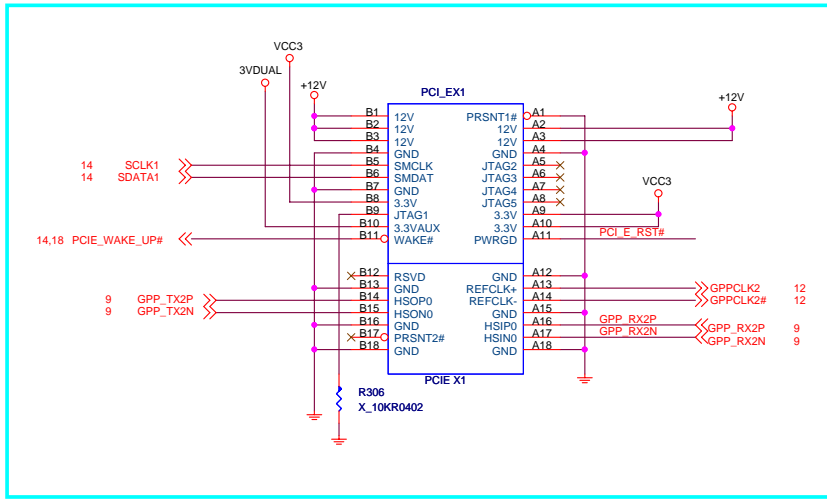
NOTE: R489 PU RESISTOR FOR RTC_IRQ# IS REQUIRED FOR SB600 TO KEEP THE INPUT FROM FLOATING.



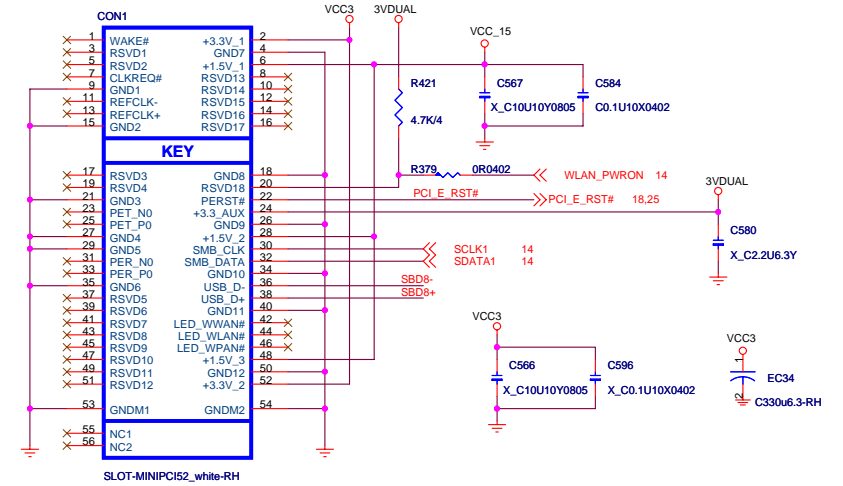
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Title	SB600-POWER & DECOUPLING	Rev	1.0
Document Number	MS-7409		
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-He City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Monday, March 31, 2008 Sheet 16 of 33	

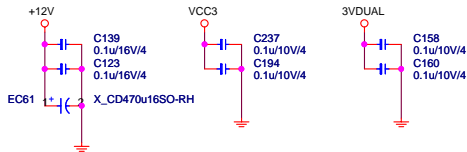
PCI-Express x1 SLOT 1



H1
Mini-PCI-E Stand Off
Mini-PCI-E Stand off
E2B-1034010-L63

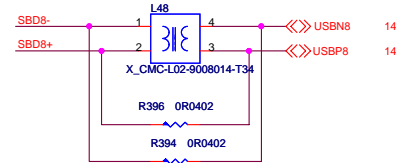
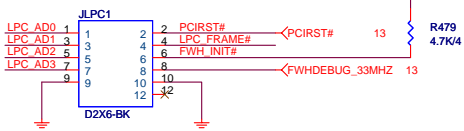


PCIE SLOT DECOUPLING CAPACITORS



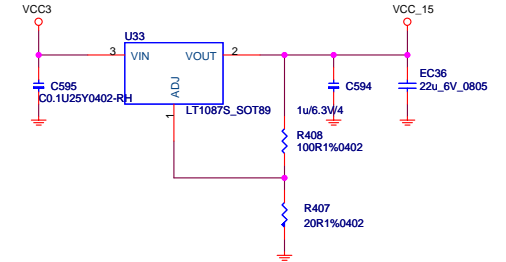
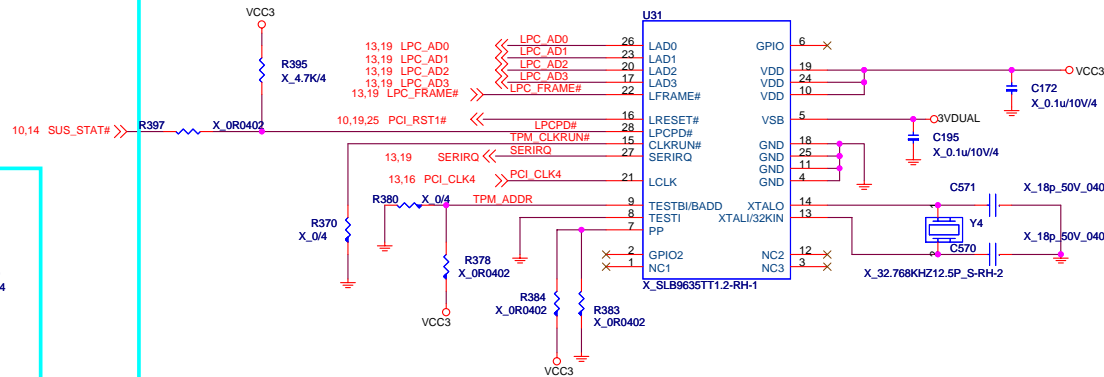
Placement Between at PCIE_X1

LPC Debug Port



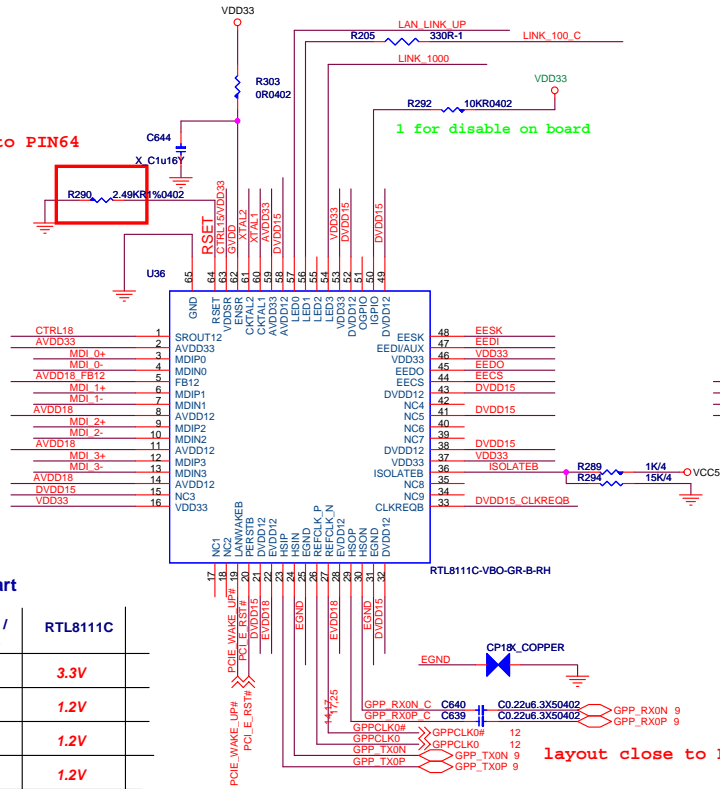
TPM 1.2

IO Address: 0x02E



Micro Star Restricted Secret		
Title	PCIE_X1/Mini-PCI-E/TPM	Rev
Document Number	MS-7409	1.0
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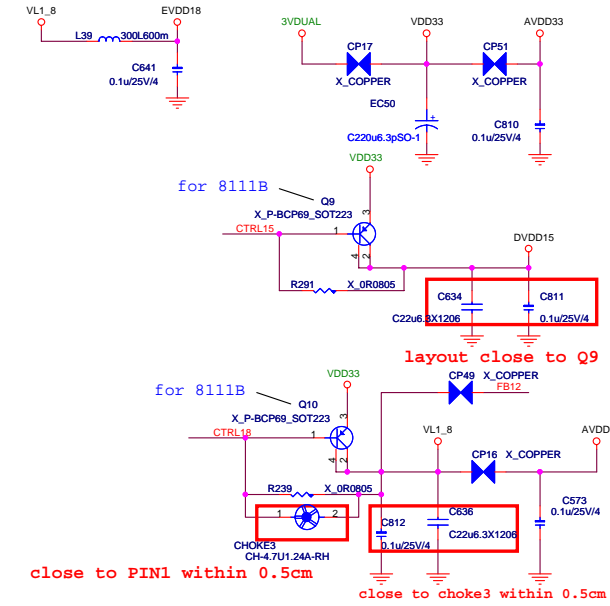
layout close to PIN64



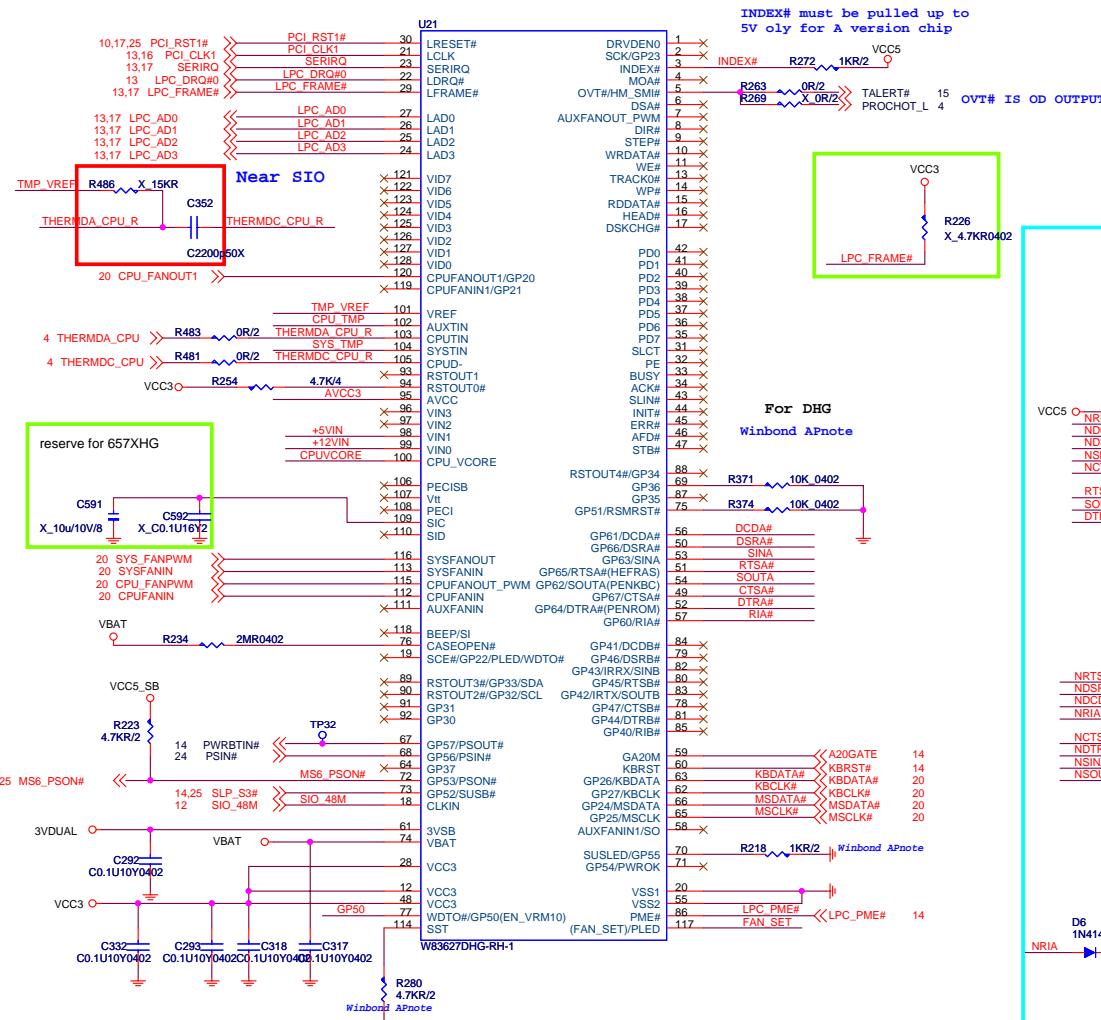
Power domain chart

	RTL8111B / RTL8101E	RTL8111C
AVDD33	3.3V	3.3V
AVDD18	1.8V	1.2V
EVDD18	1.8V	1.2V
DVDD15	1.5V	1.2V

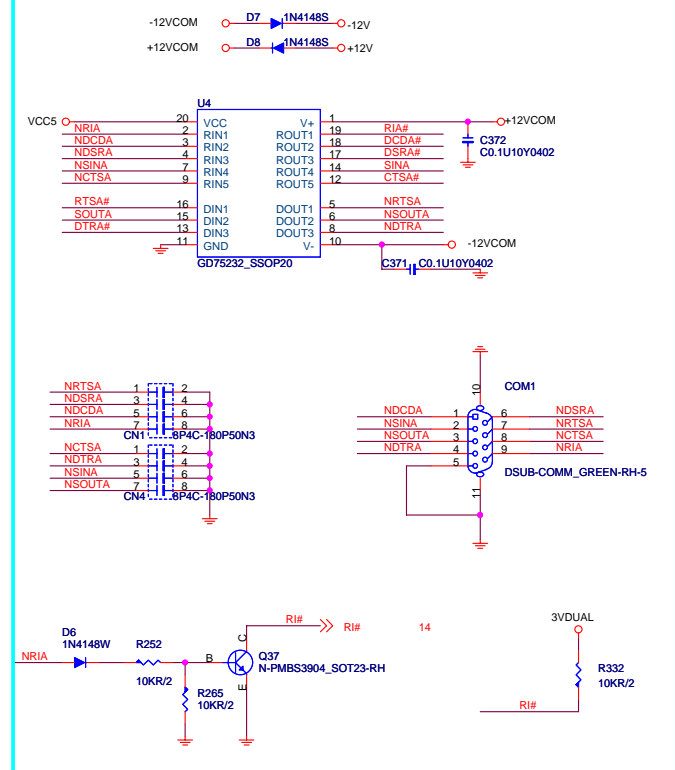
	Q9	Q10
RTL8111B	Need	Need
RTL8111C	N/A	N/A



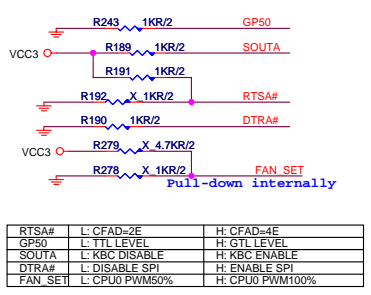
Power consumption			Giga-Lan	10/100-Lan
	1G	100M	N58-22F0181-S42	N58-22F0061-S42
3.3V	103mA	TBD	Link Yellow	Link Yellow
1.5V	367mA	TBD	Active Blinking 1000	Active Blinking 100
1.8V	198mA	TBD	Orange	Orange
			100 Green	10 Green
			10 None	10 None
			19 Yellow	19 Yellow
			21 Orange	21 Orange
			22 Green	22 Green



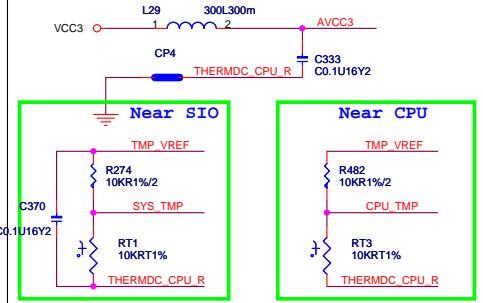
COM PORT



LPC I/O STRAPPING RESISTOR



Hardware Monitor



MICRO-STAR INT'L CO., LTD.

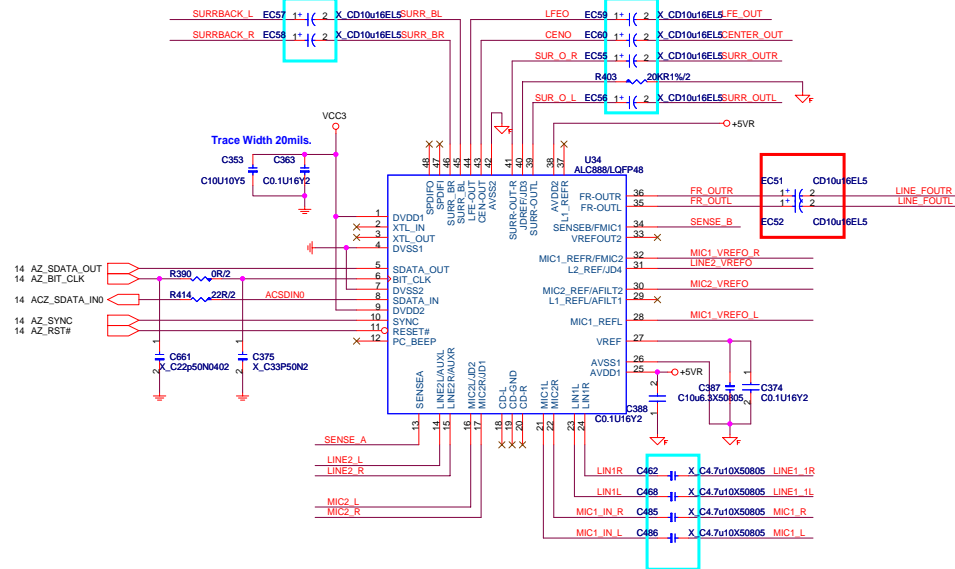
Title: LPC SUPER I/O & LPC & CONNECTORS		
Size: MS-7409	Document Number: MS-7409	Rev: 1.0
Date: Monday, March 31, 2008	Sheet: 19	of 33

[illegible]

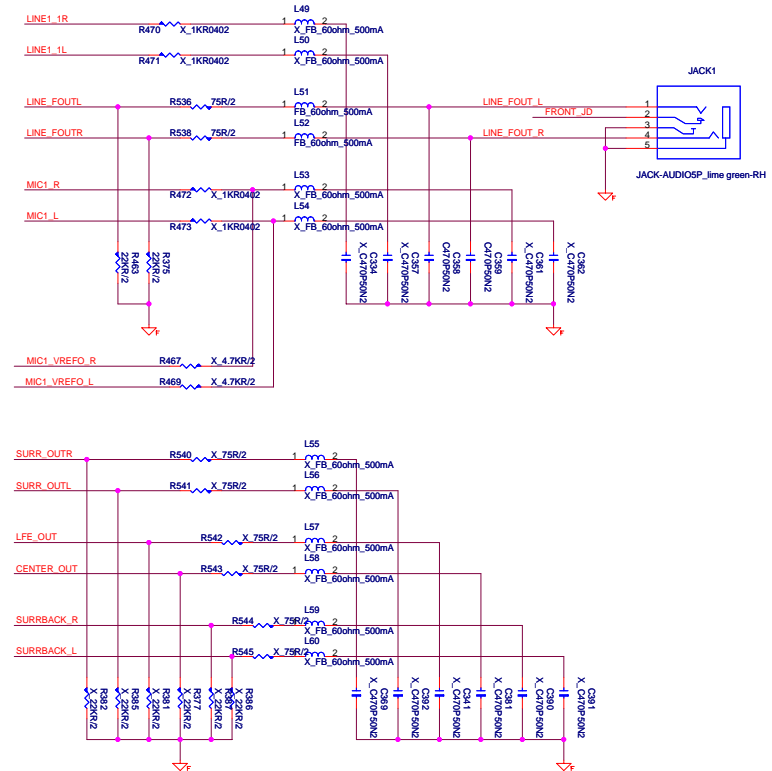
The schematic shows a fan speed control circuit. The input signal, labeled "19 SYS_FANPWM", is connected through resistor R412 (10KR0402) to the base of NPN transistor Q36 (NPN-3904LT1-S-SOT23). Resistor R413 (1KR0402) connects the base to ground. The emitter of Q36 is grounded. The collector of Q36 is connected to the gate of MOSFET Q35 (SI2303DS_SOT23). The drain of Q35 is connected to the +12V supply through resistor R415 (4.7KR0402) and diode D15 (1N4148S). A capacitor C590 (X_C0.1U16V0402) is connected between the +12V supply and the drain of Q35. The source of Q35 is connected to ground through resistor R409 (1KR0402) and capacitor EC37 (10U16V1206). The drain of Q35 is also connected to the fan motor (SYSFAN1, FAN1X3_white) through resistor R416 (27K_0402). The fan motor is connected to ground through resistor R411 (10KR0402). The fan's other terminal is connected to the +12V supply through diode DZ3 (1N5817) and resistor R410 (100/4/1).

Micro Star Restricted Secret		
Title	FAN/KB&MS	Rev
Document Number	MS-7409	1.0
MICRO STAR INT'L CO. LTD. No. 68, Li-De St, Jung-Hsie City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Monday, March 31, 2008 Sheet
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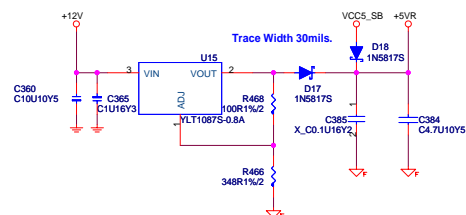
ALC888 CODEC



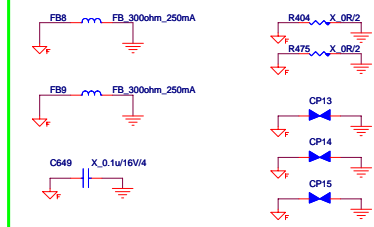
ALC888 JACK



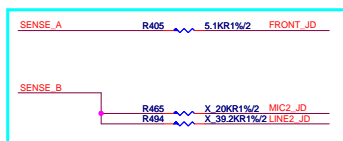
AUDIO CODE REGULATORS



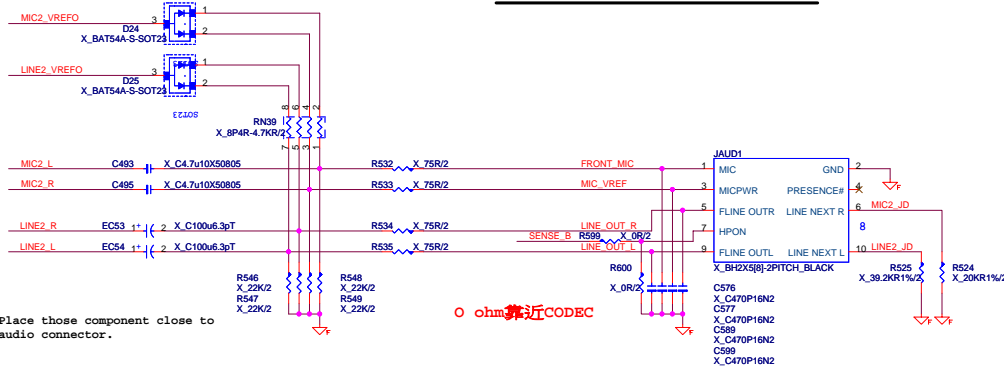
For EMI



ALC888 JACK DETECT



Azalia Front Audio Connector

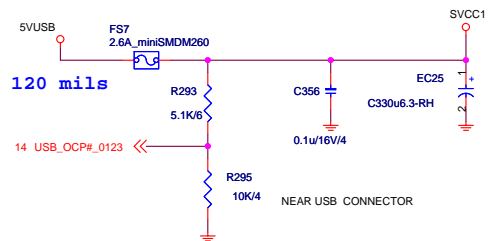


Place those component close to audio connector.

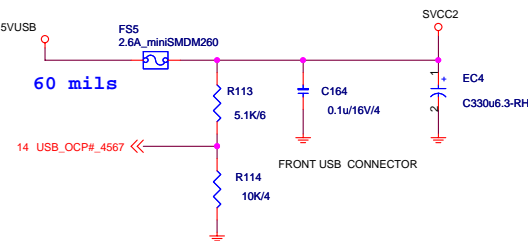
0 ohm 靠近CODEC

Micro Star Restricted Secret		
Title	Azalia ALC888	Rev 1.0
Document Number	MS-7409	
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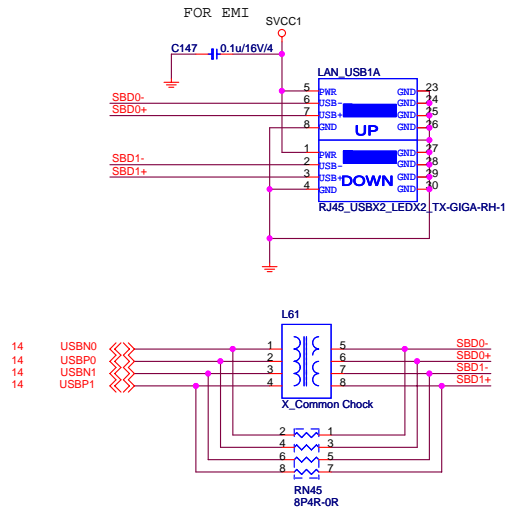
POWER CIRCUIT FOR USB PORT 0,1,2,3



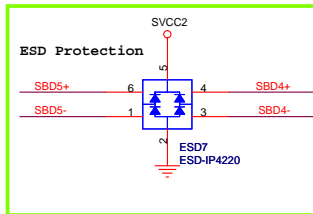
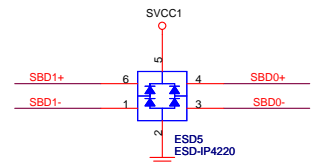
POWER CIRCUIT FOR USB PORT 4,5,6,7



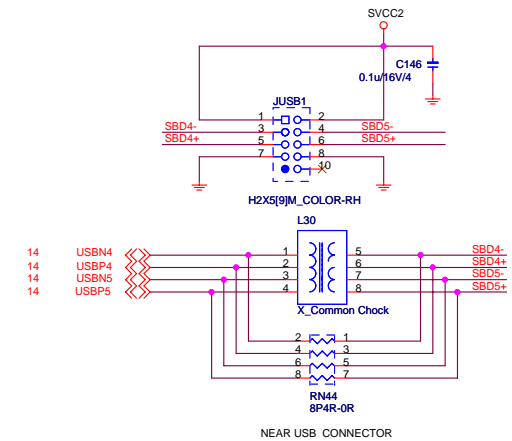
REAR PANEL USB CONNECTOR FOR USB PORT 0,1



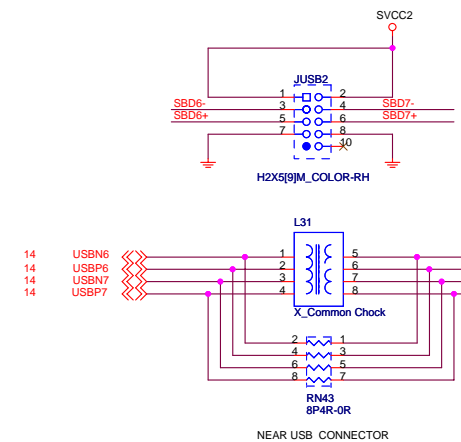
ESD Protection



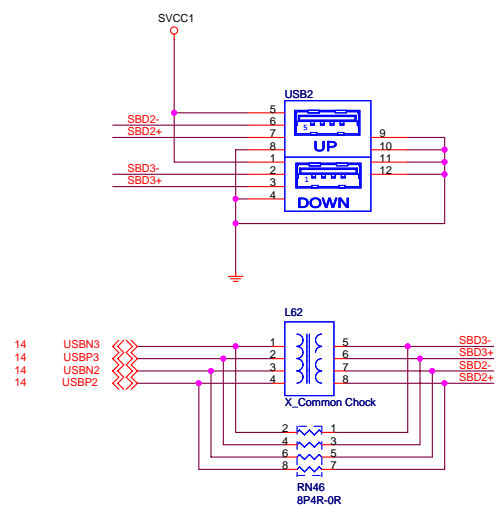
FRONT PANEL USB CONNECTOR FOR USB PORT 4,5



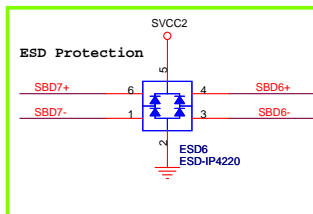
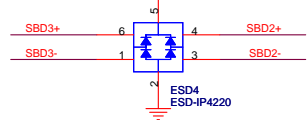
FRONT PANEL USB CONNECTOR FOR USB PORT 6,7



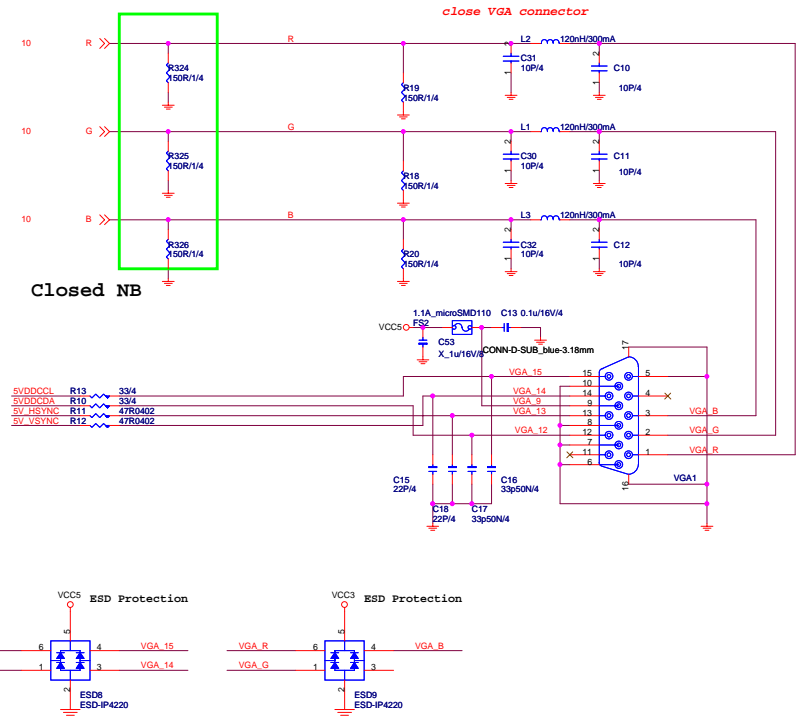
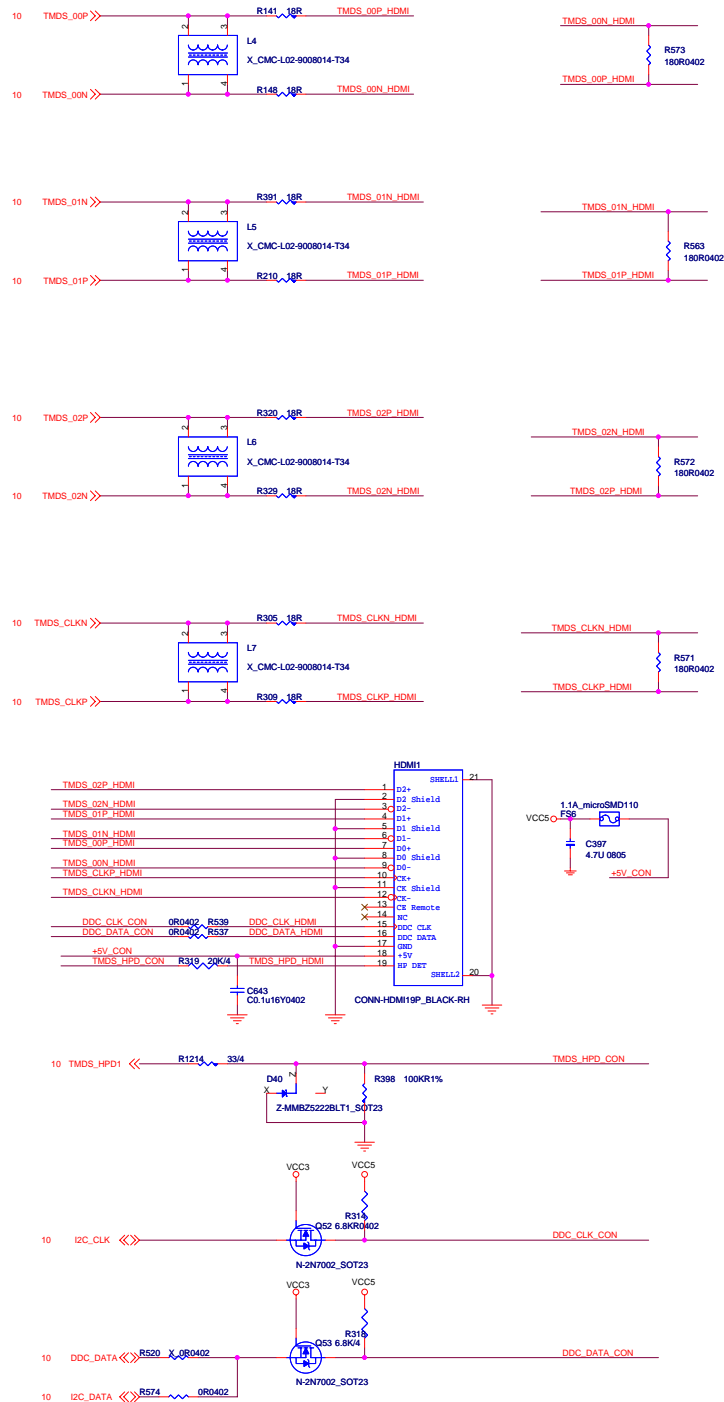
REAR PANEL USB CONNECTOR FOR USB PORT 2,3



ESD Protection

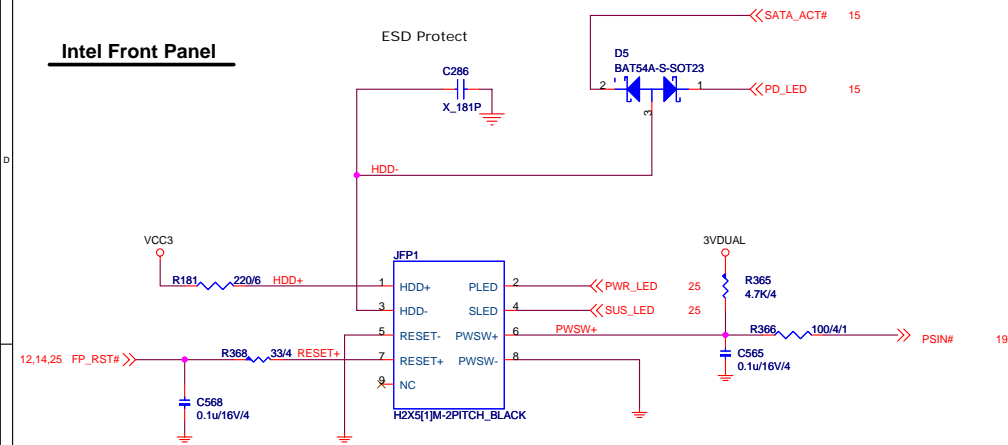


HDMI

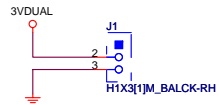


<i>Micro Star Restricted Secret</i>		
Title	VGA & HDMI CONNECTOR	Rev
Document Number	MS-7409	1.0
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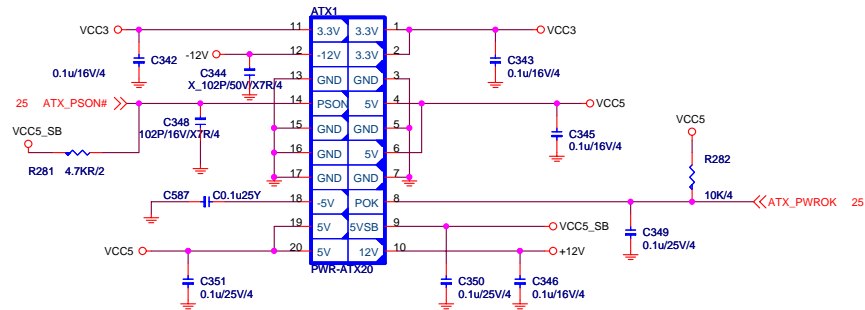
Intel Front Panel



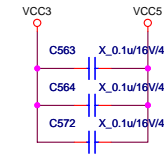
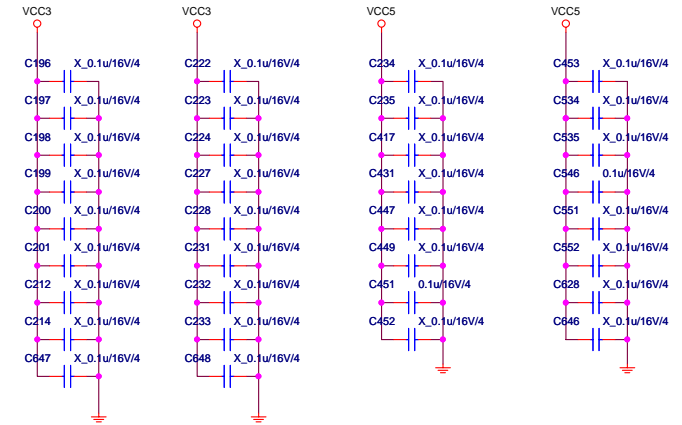
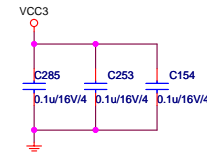
For Touch Bottom VDD



ATX Connector

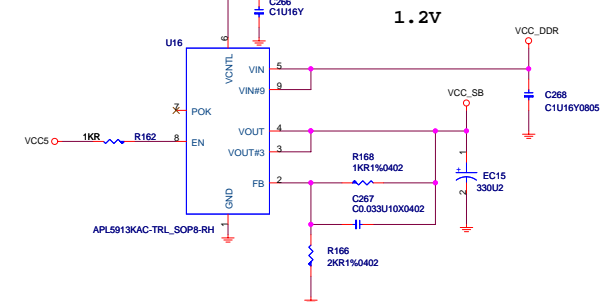
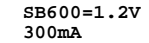


EMI solution



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Document Number	MS-7409		1.0
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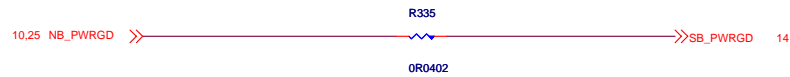
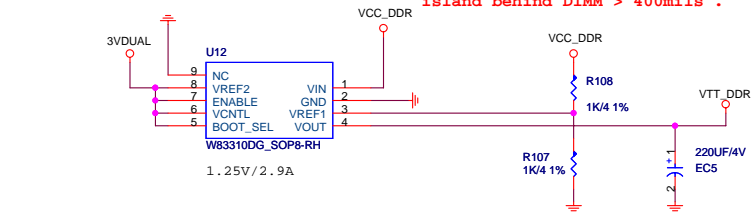
THESE OUTPUT AND INPUT PIN MUST
BE PULL HIGH



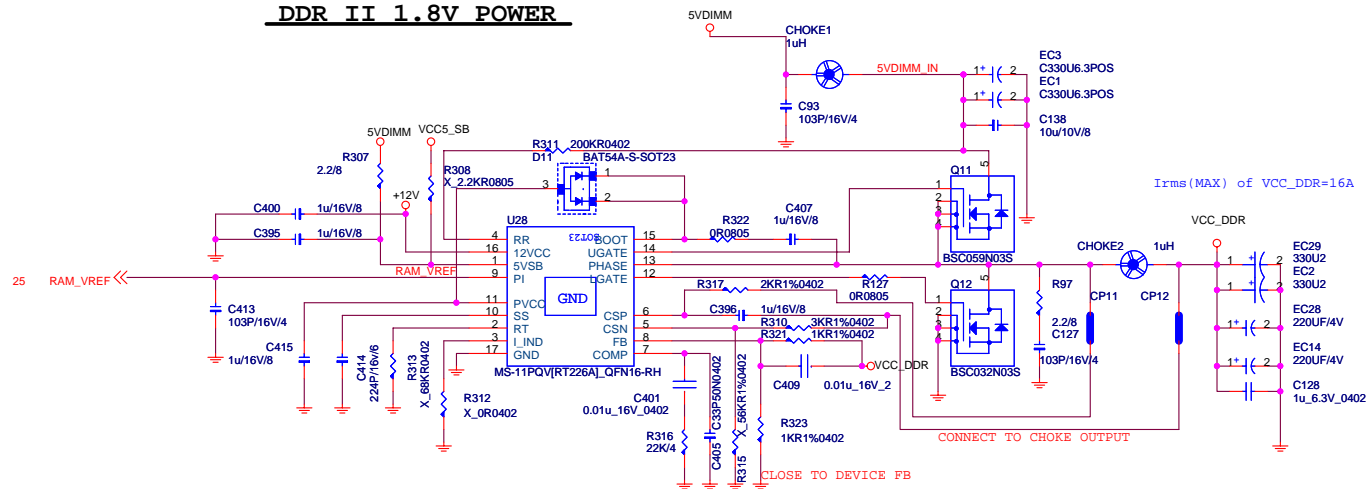
Micro Star Restricted Secret		
Title	MS-6 ACPI Controller	Rev
Document Number	MS-7409	1.0
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DDR VTT Power

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

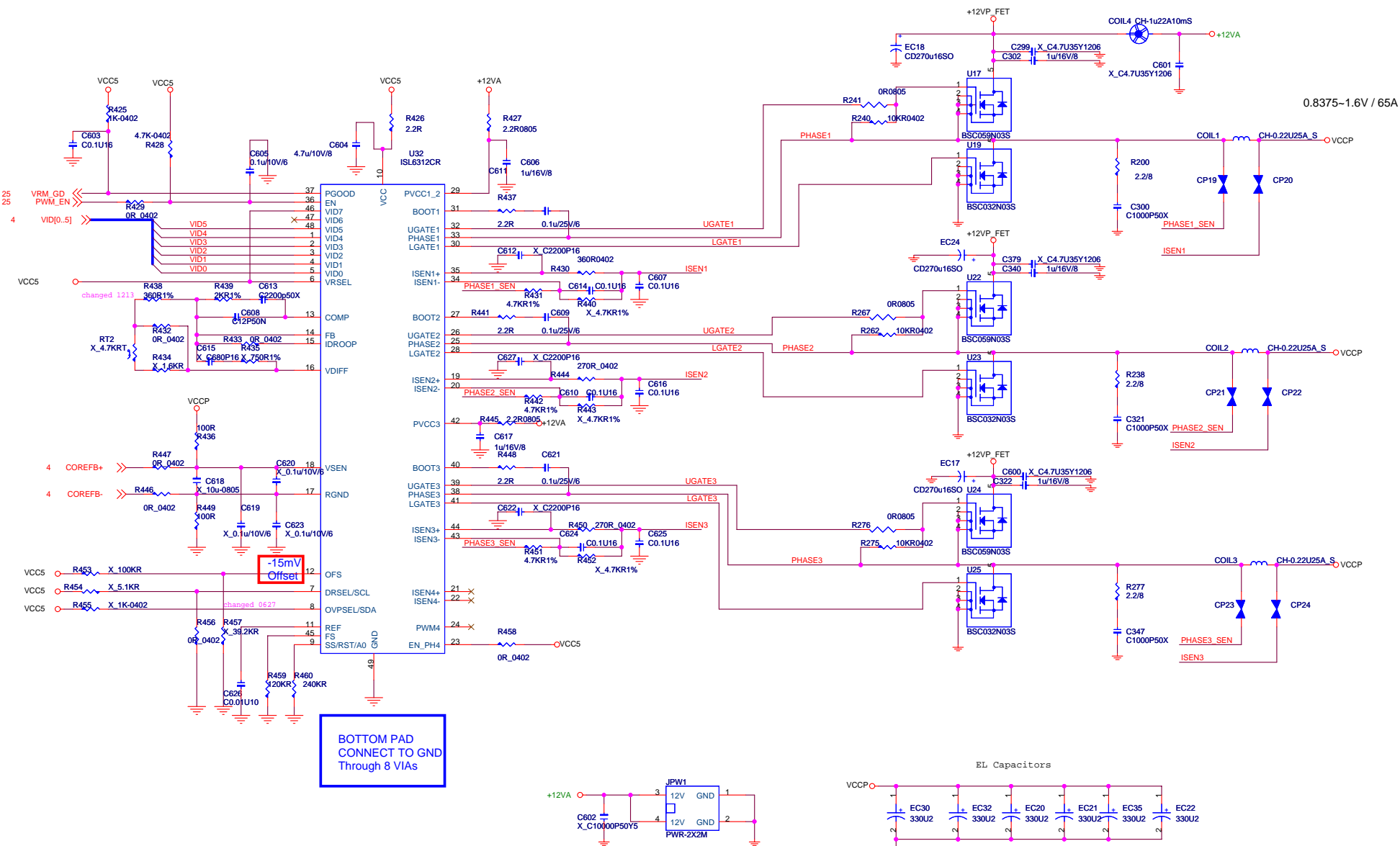

$$I_{ripple} = 16 \times 0.6 \times 0.8 / 1 = 7.68A$$
$$7.68\text{A}/1.7=4.5\text{A}$$

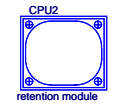
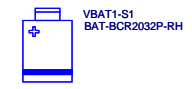
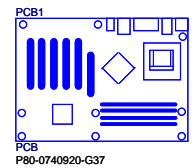
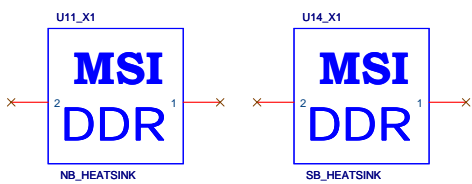
DDR II 1.8V POWER



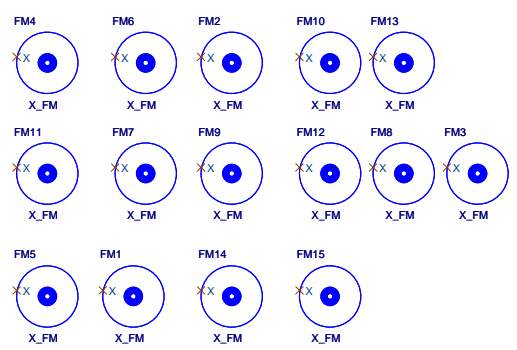
<i>Micro Star Restricted Secret</i>		
Title	MS-11 DDR2 POWER	Rev
Document Number	MS-7409	1.0
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Voltage Regular Module





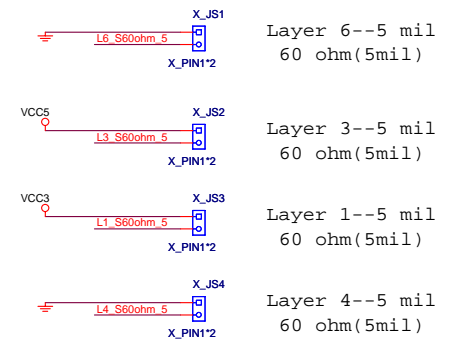
Optics Orientation Holes



Mounting Holes



Simulation



Micro Star Restricted Secret		
Title	MANUAL PARTS	Rev
Document Number	MS-7409	1.0
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