



MS-7409 Ver:0A

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 8M

Main Memory:

DDR * 1 (Max 2GB)

Expansion Slots:

MINI PCI-E*1

PCI 2.2 Slot X 1

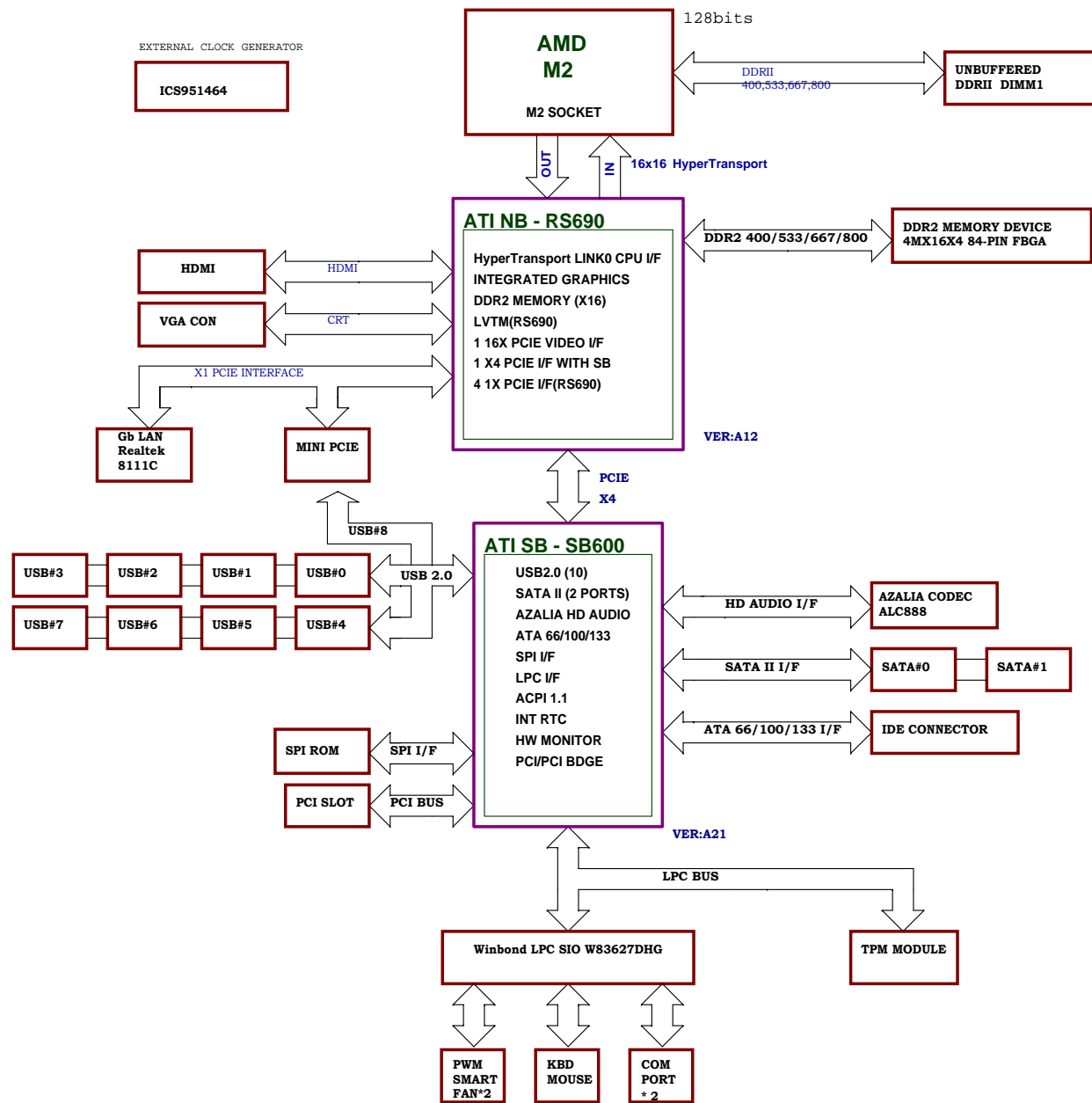
PWM:

Controller--Intersil ISL6312CR 3 Phase

Clock Generator:

Controller--ICS951464AGLFT

Title	Page
Cover Sheet	1
Block Diagram	2
SB600 GPIO Config	3
AMD M2 940	4,5,6
SYSTEM Memory	7
DDR Terminations	8
ATI RS690	9-11
CLOCK Generator ICS 951464	12
ATI SB600	13-16
PCI-Express X 1,PCI SLOT1	17
LAN*1 Realtek 8111B/8111C	18
LPC SUPER I/O& COM PORT	19
FAN/KB&MS	20
HD Audio - ALC888	21
USB connectors	22
HDMI & VGA Connector	23
ATX Connector / Front Panel /EMI	24
MS-6 ACPI Controller & MS-6+	25
MS- 11 DDR2 1.8V POWER	26
PWM - ISL6312CR	27
RESERVE	28
MANUAL PARTS	29
GPIO&JUMPER/Option Part	30
POWER OK MAP	31
POWER MAP	32
RESET MAP	33
History	34



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Title	Block Diagram	Rev 0A
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_ISO#/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 /PCICLK7/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)
FANIN0/ 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)
TEMPIN0/ 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)

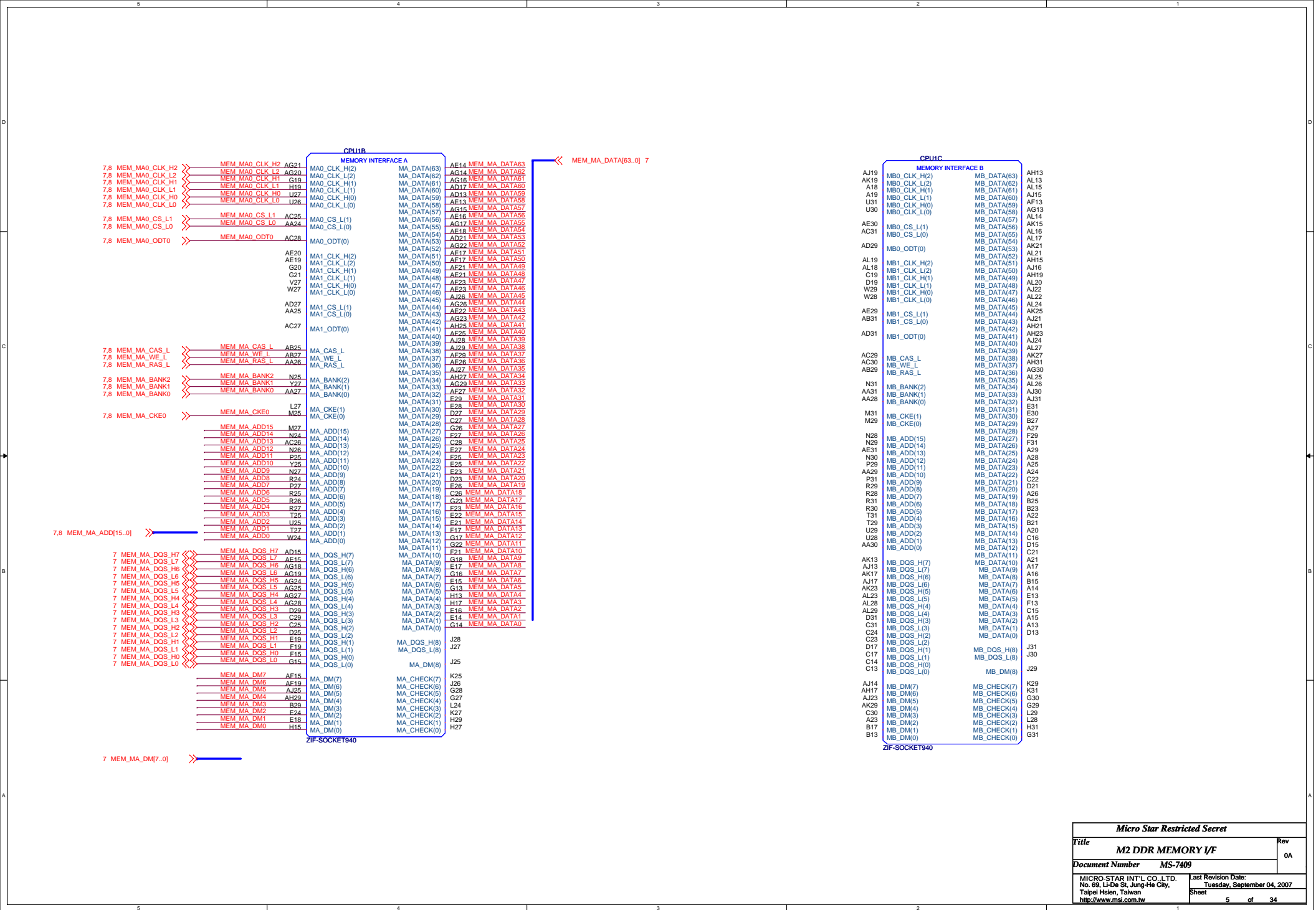
PCI Config.

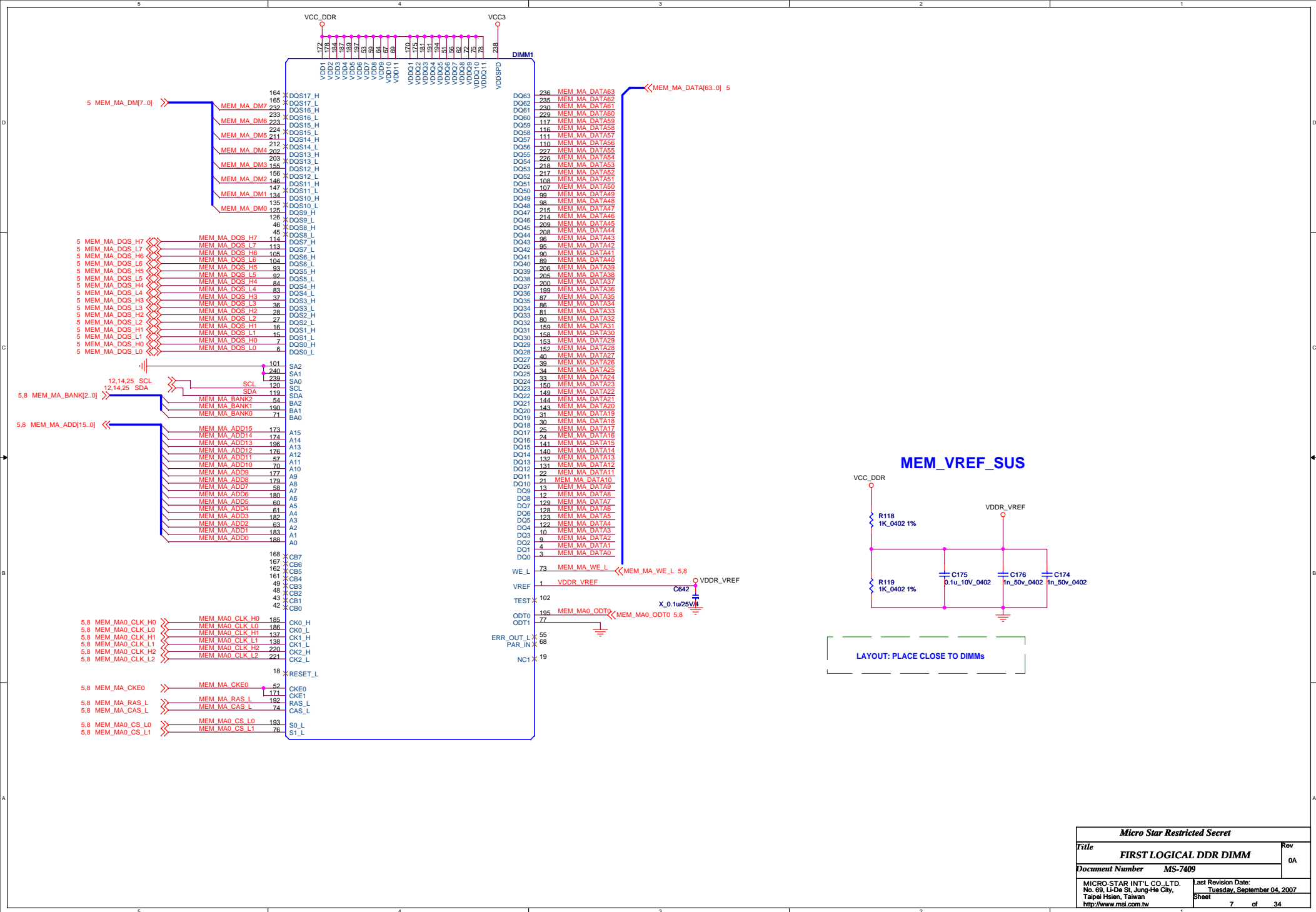
	CLOCK	REQ#	GNT#	IDSEL	INTA#	INTB#	INTC#	INTD#
IEEE 1394								
GIGA LAN								
PCI1								
PCI2								
Super I/O								

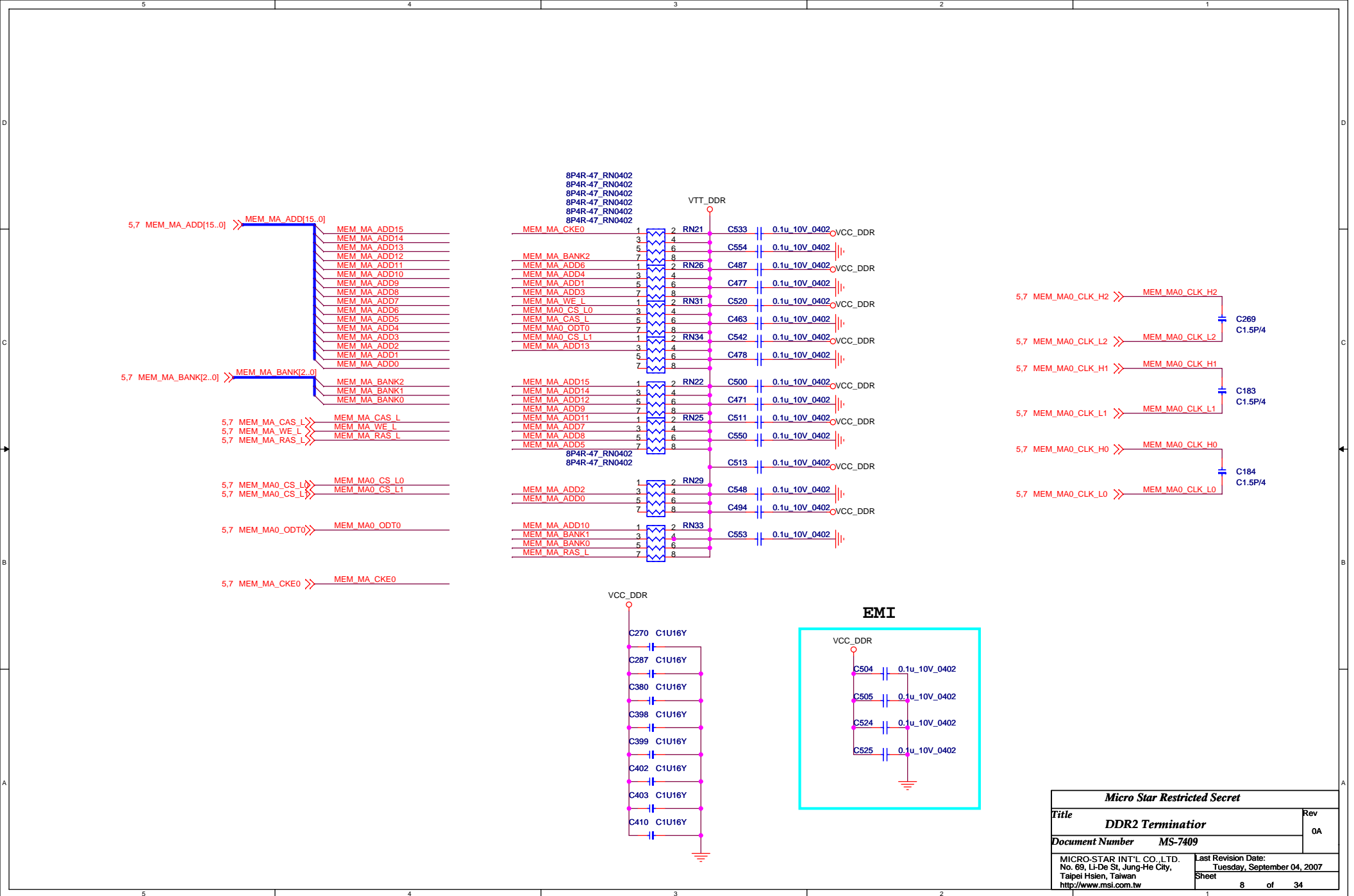
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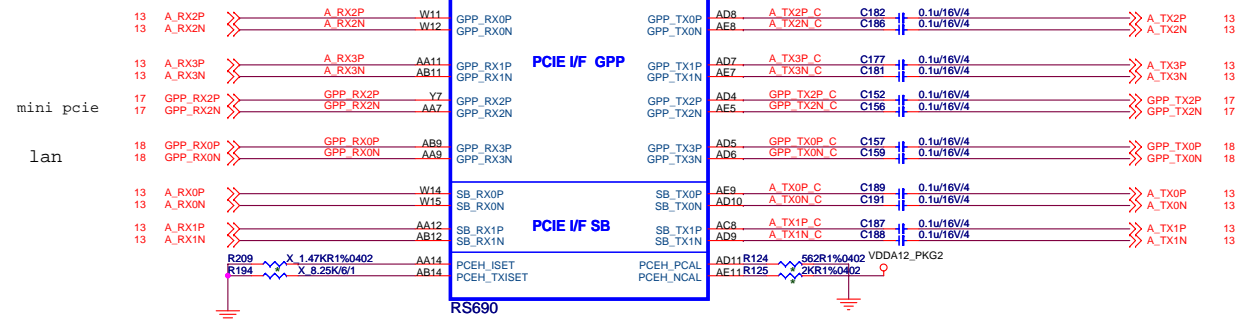
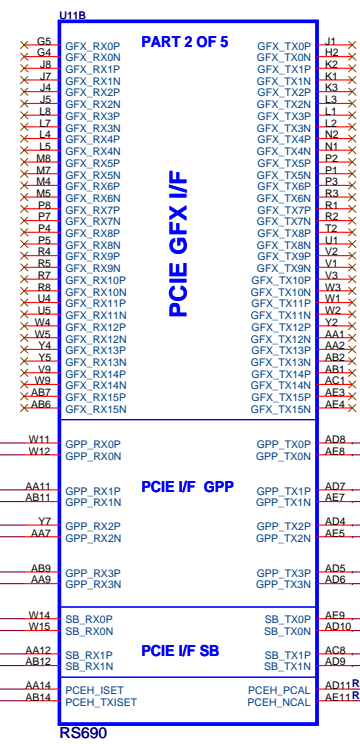
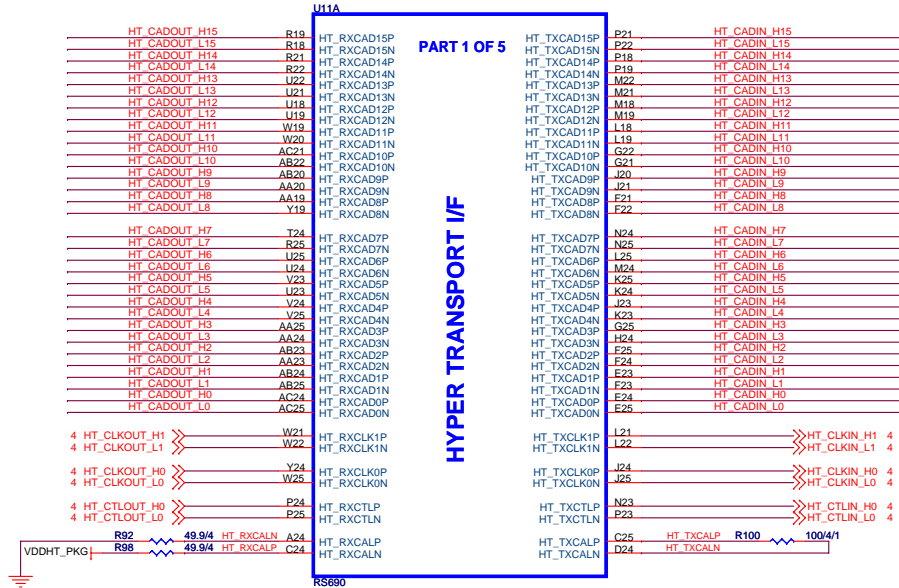
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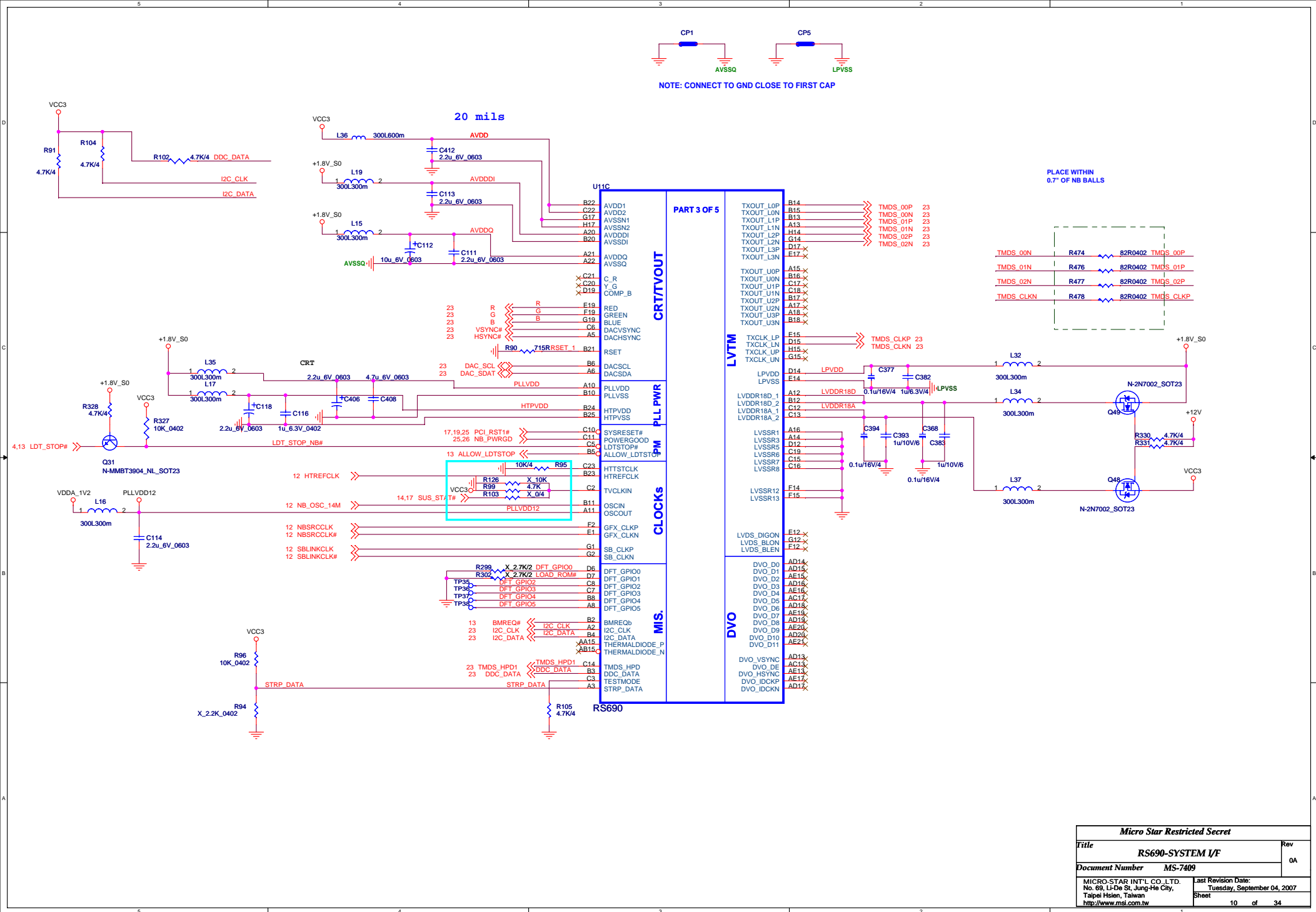


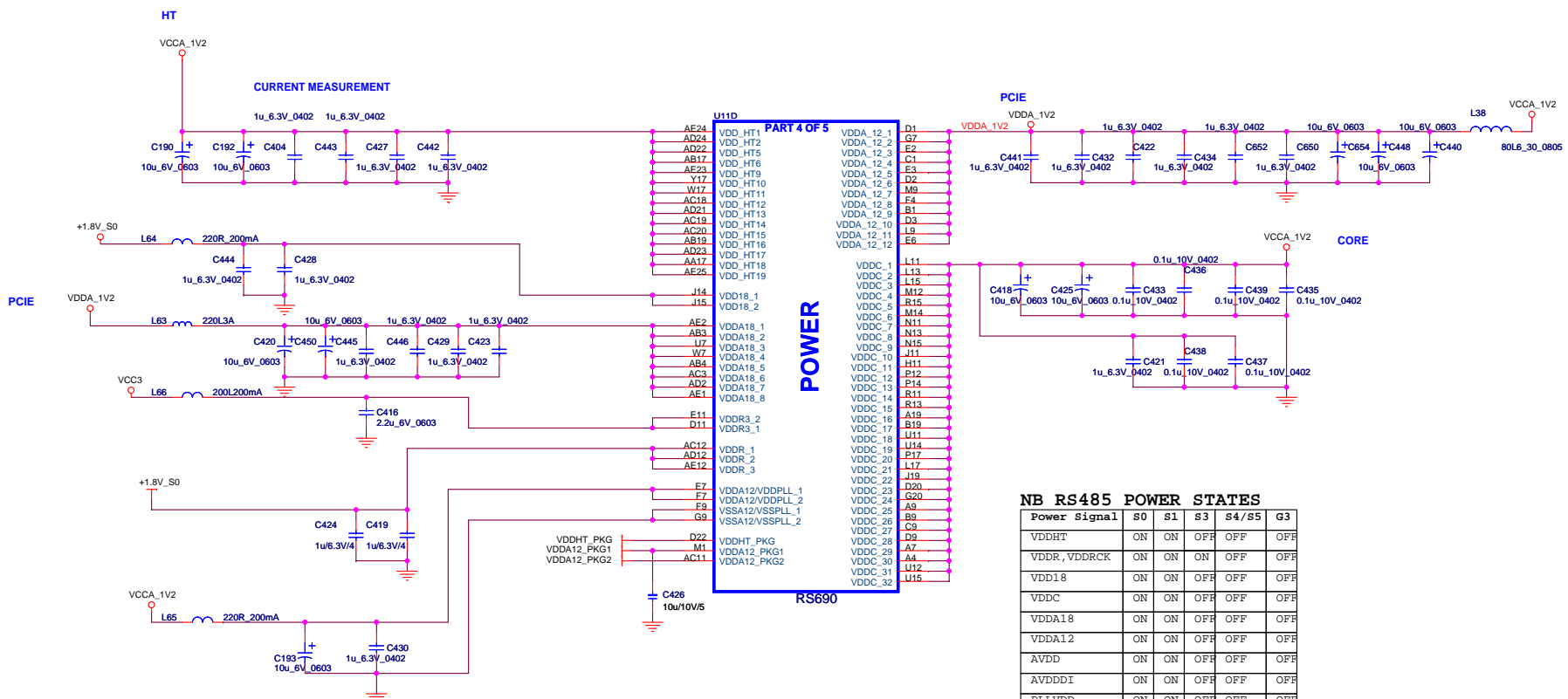




4 HT_CADIN_H[15..0] >>> HT_CADIN_H[15..0]
4 HT_CADIN_L[15..0] >>> HT_CADIN_L[15..0]
4 HT_CADOUT_H[15..0] >>> HT_CADOUT_H[15..0]
4 HT_CADOUT_L[15..0] >>> HT_CADOUT_L[15..0]

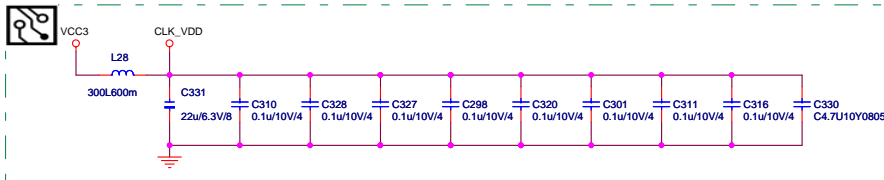




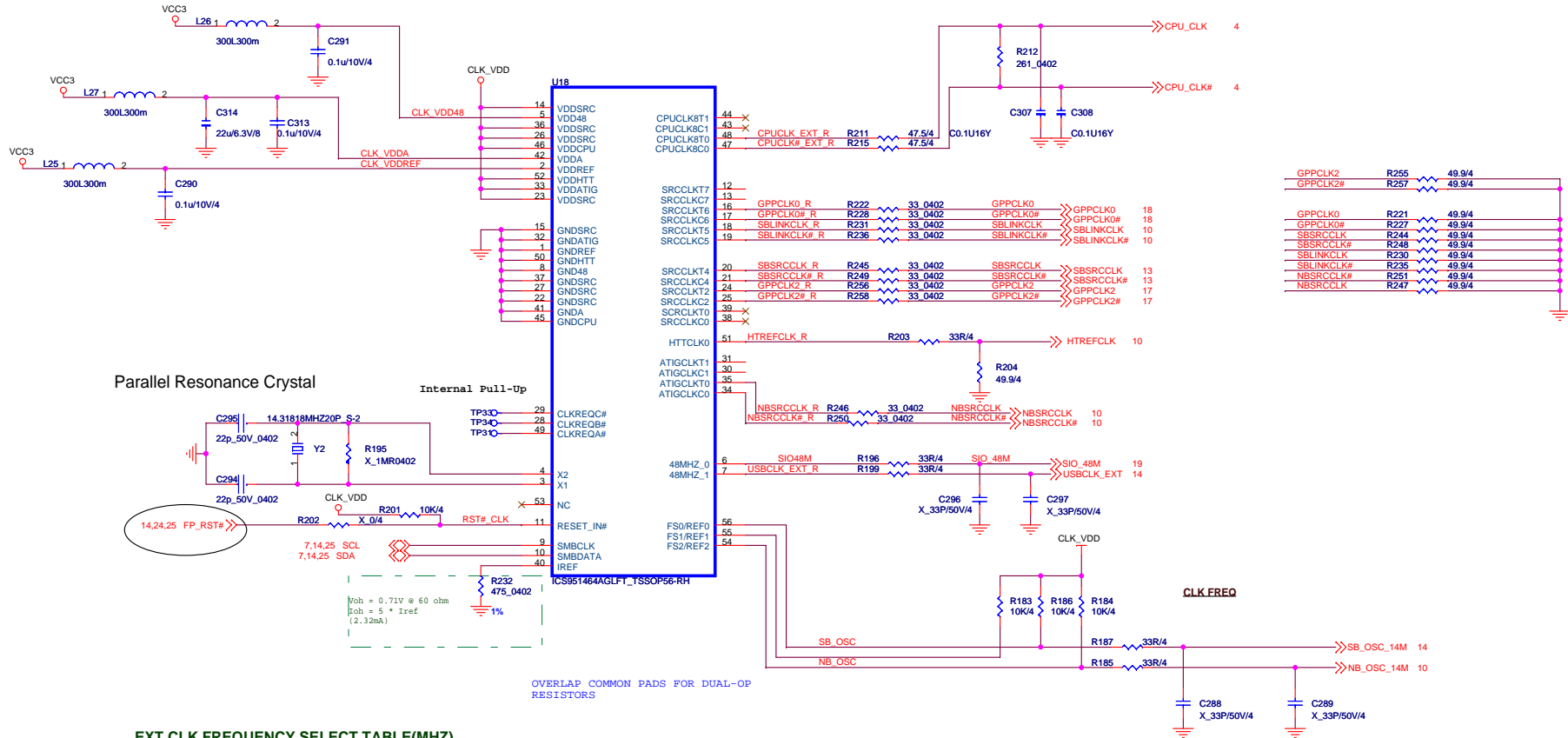


NB RS485 POWER STATES					
Power Signal	S0	S1	S3	S4/S5	G3
VDDHT	ON	ON	OFF	OFF	OFF
VDDR, VDDRCK	ON	ON	OFF	OFF	OFF
VDD18	ON	ON	OFF	OFF	OFF
VDDC	ON	ON	OFF	OFF	OFF
VDDA18	ON	ON	OFF	OFF	OFF
VDDA12	ON	ON	OFF	OFF	OFF
AVDD	ON	ON	OFF	OFF	OFF
AVDDDI	ON	ON	OFF	OFF	OFF
PLLVD	ON	ON	OFF	OFF	OFF
HTPVDD	ON	ON	OFF	OFF	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

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Sheet		11 of 34

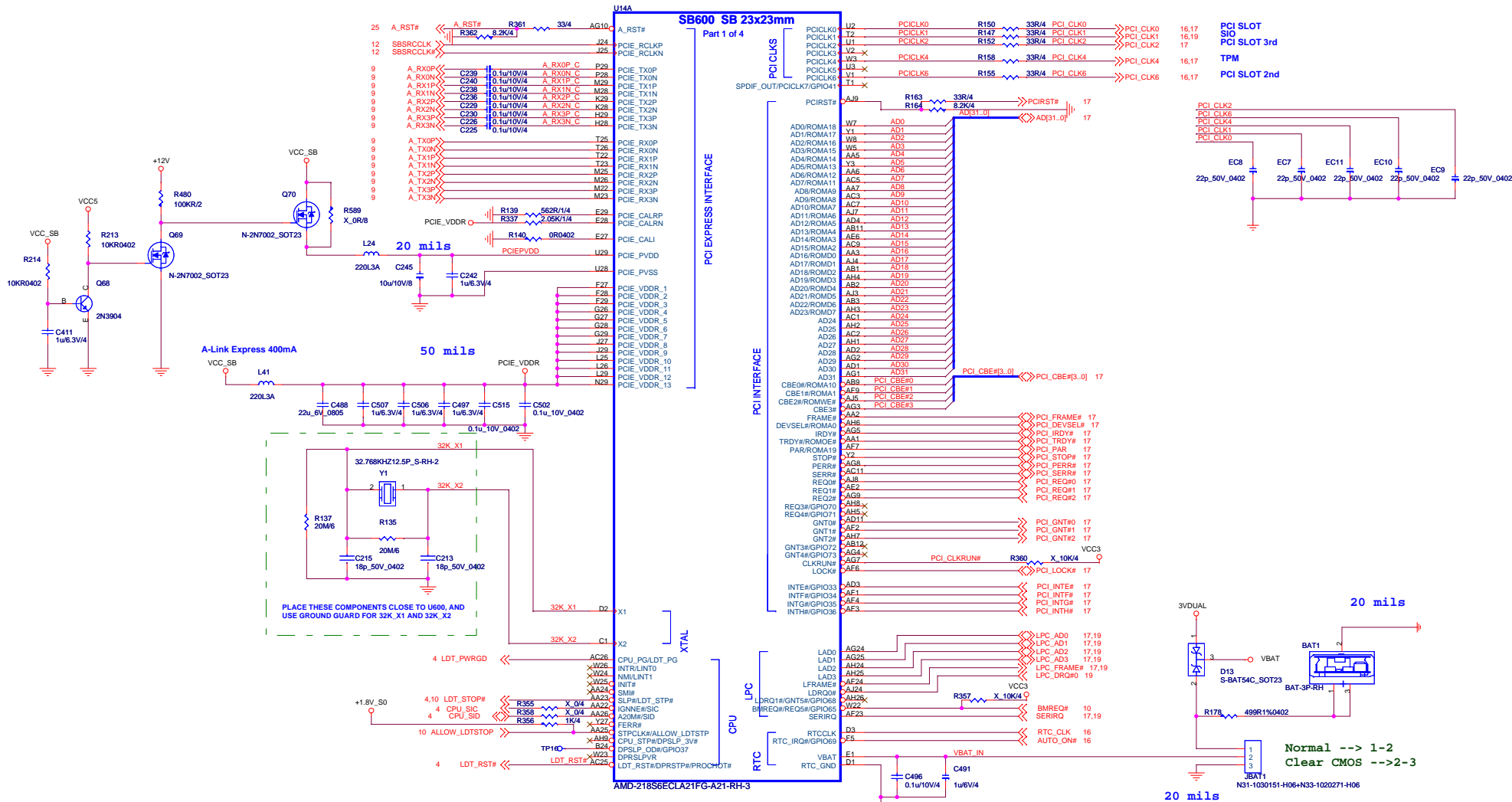


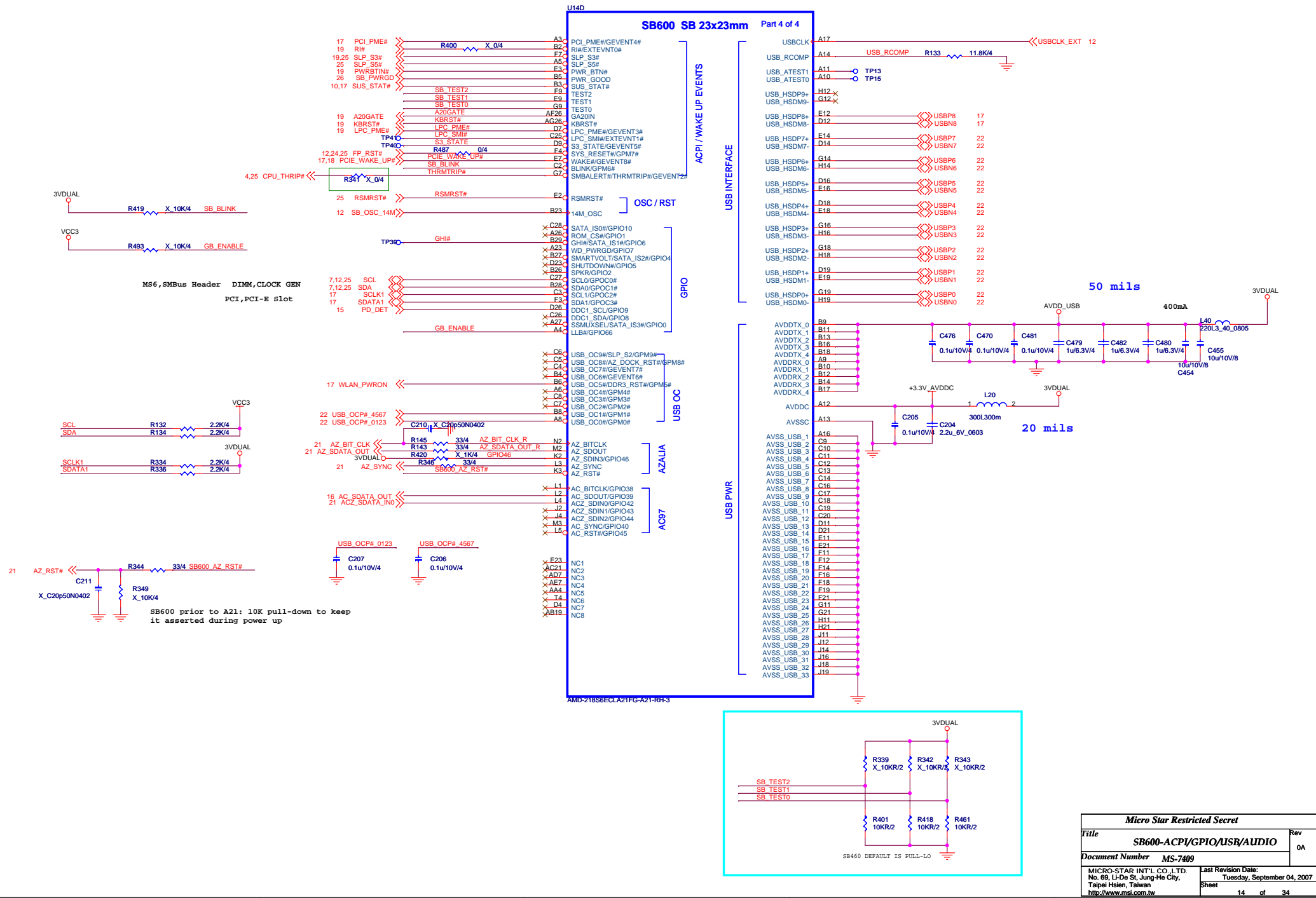
- 1- PLACE ALL THE SERIES TERMINATION RESISTORS AS CLOSE AS U300 AS POSSIBLE
- 2- ROUTE ALL CPUCCLK/#, NBSRCCLK/#, GPPCLK/# AS DIFFERENT PAIR RULE
- 3- PUT DECOUPLING CAPS CLOSE TO U300 POWER PIN



EXT CLK FREQUENCY SELECT TABLE(MHZ)

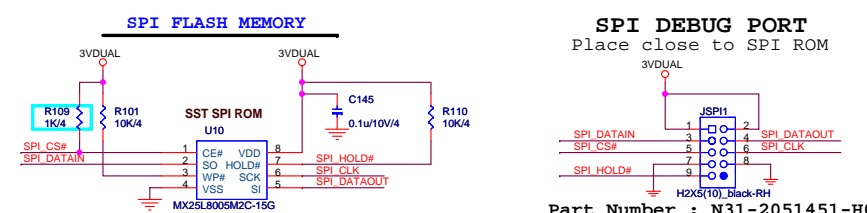
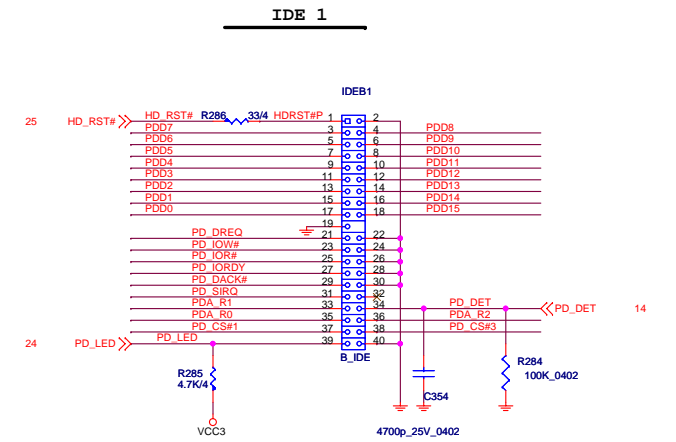
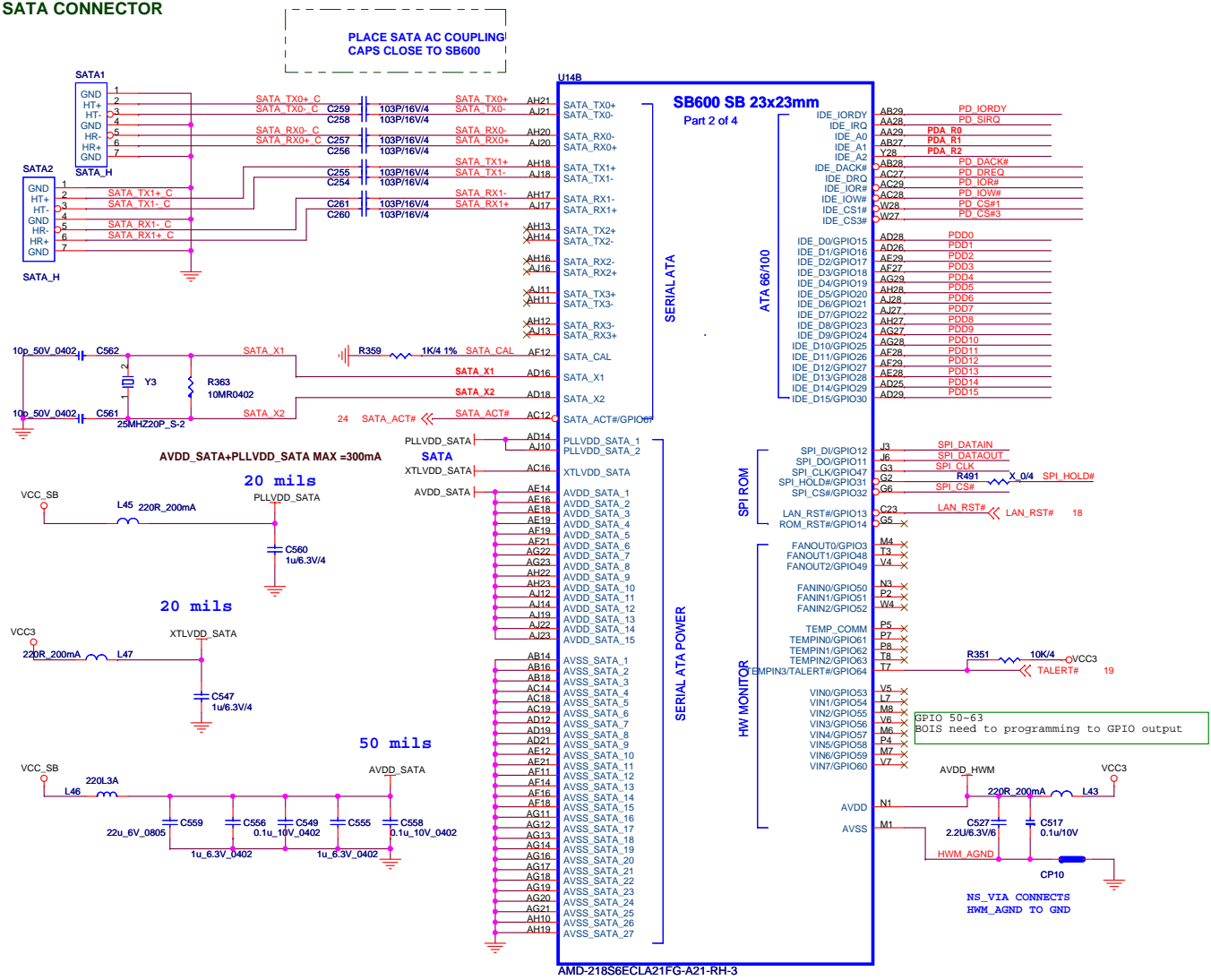
FS2	FS1	FS0	CPU	SRCLK [2:1]	HTT	PCI	USB	COMMENT
0	0	0	Hi-Z	100.00	Hi-Z	Hi-Z	48.00	Reserved
0	0	1	X	100.00	X/3	X/6	48.00	Reserved
0	1	0	180.00	100.00	60.00	30.00	48.00	Reserved
0	1	1	220.00	100.00	36.56	73.12	48.00	Reserved
1	0	0	100.00	100.00	66.66	33.33	48.00	Reserved
1	0	1	133.33	100.00	66.66	33.33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



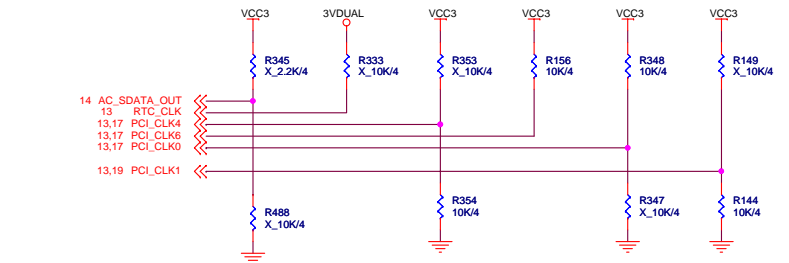


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SATA CONNECTOR

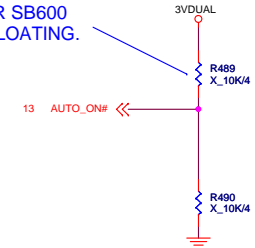


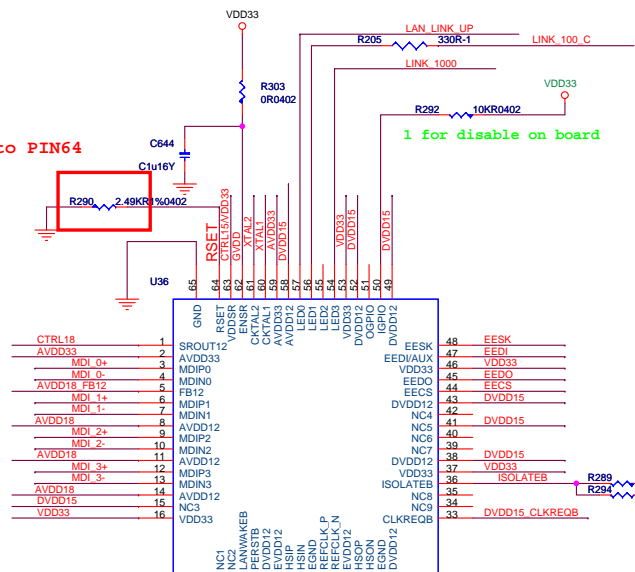
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	AC_SDOUT	RTC_CLK	PCI_CLK4	PCI_CLK6	PCI_CLK0	PCI_CLK1
PULL HIGH	USE DEBUG STRAPS	INTERNAL RTC DEFAULT	USE INT. PLL48	CPU IF=K8 DEFAULT	ROM TYPE: H, H = PCI ROM H, L = SPI ROM DEFAULT L, H = LPC ROM L, L = FWH ROM	
PULL LOW	IGNORE DEBUG STRAPS DEFAULT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

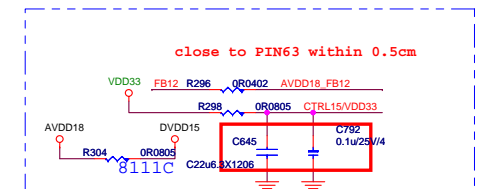
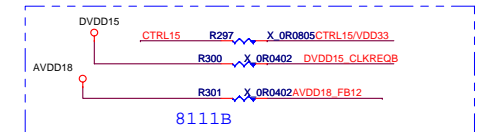
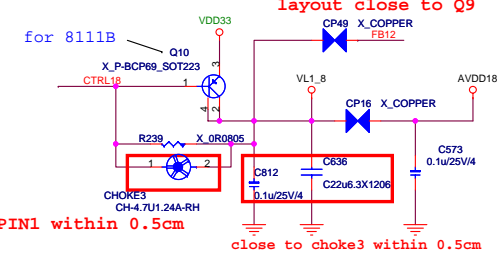
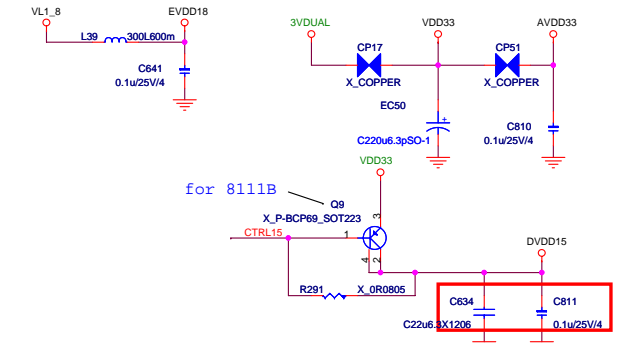
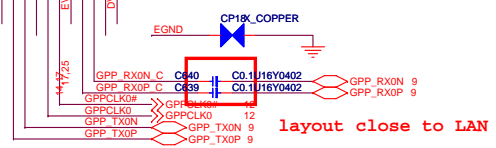
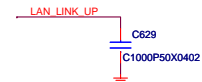
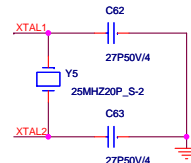
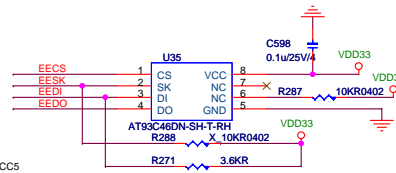
NOTE: R489 PU RESISTOR FOR
RTC_IRQ# IS REQUIRED FOR SB600
TO KEEP THE INPUT FROM FLOATING.











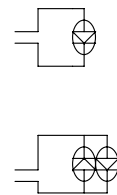
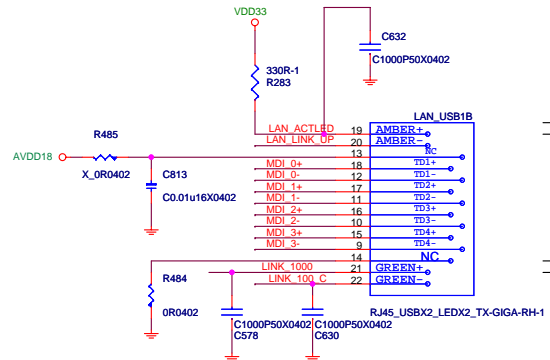
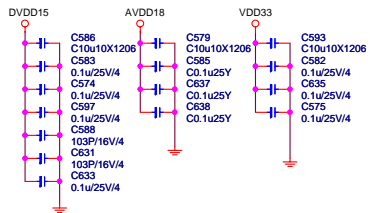


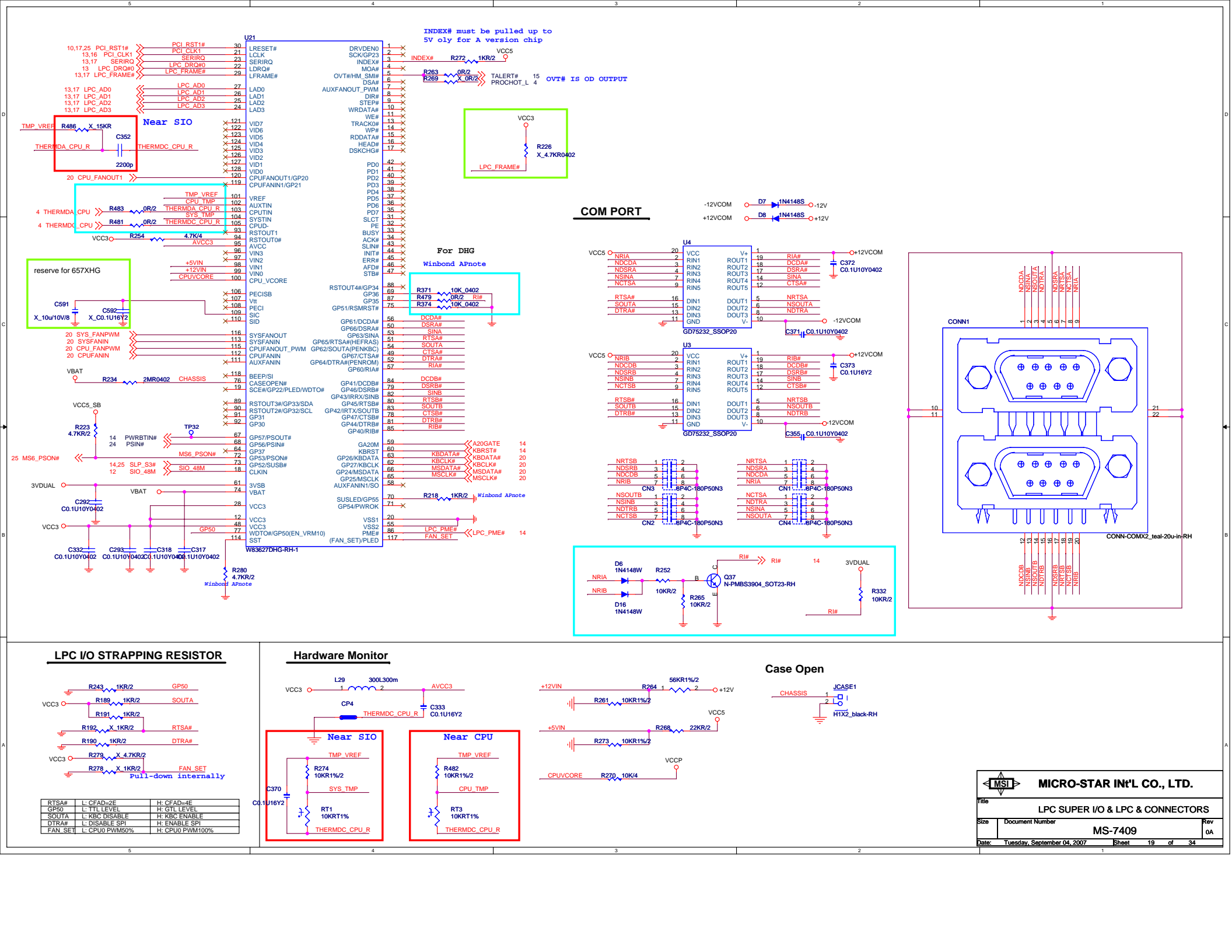
	RTL8111B / RTL8101E	RTL8111C	
AVDD33	3.3V	3.3V	
AVDD18	1.8V	1.2V	
EVDD18	1.8V	1.2V	
DVDD15	1.5V	1.2V	

	Q9	Q10
RTL8111B	<i>Need</i>	<i>Need</i>
RTL8111C	<i>N/A</i>	<i>N/A</i>



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 Green		Active Blinking 100 Green	
1.8V	198mA	TBD	100 Orange		10 None	
			10 None			
			19 		19 	
			20 		20 	
			21 	Orange	21 	
			22 	Green	22 	



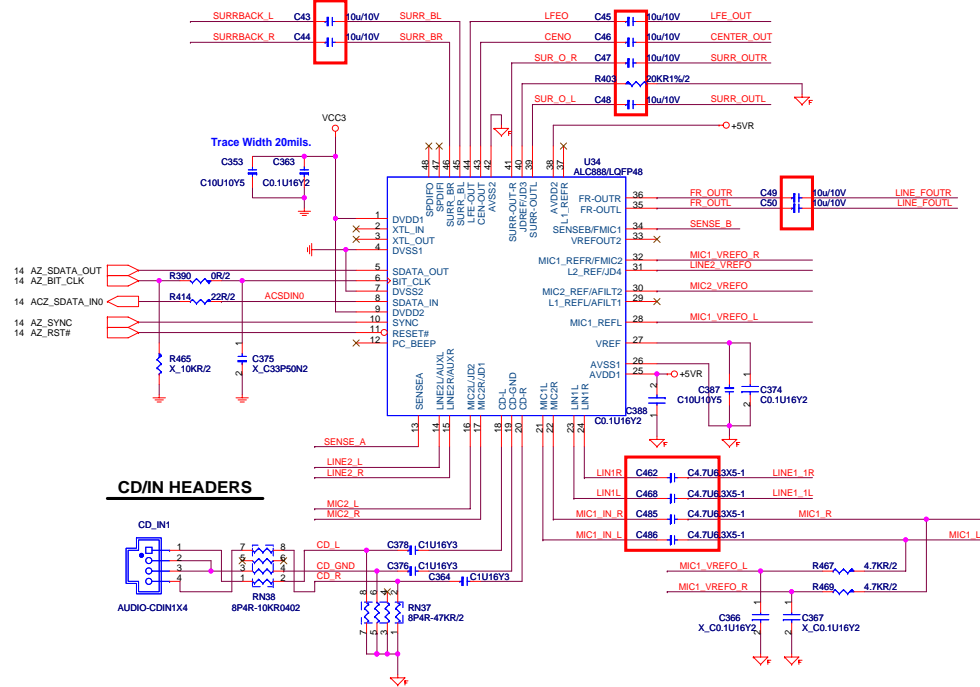


The schematic diagram illustrates the CPU Fan Driver circuit. It features two input signals: CPU_FANOUT1 and CPU_FANPWM. The circuit includes several resistors (R373, R369, R367, R372, R423, R389, R388), capacitors (C569, EC33), diodes (D14, D22), and transistors (Q32, Q33). A MOSFET (Q32) drives the fan motor (MEC1) through a relay (BH1X4B_WHITE-RH-2). A Zener diode (D22) provides overvoltage protection. The circuit is powered by VCC5 and +12V.

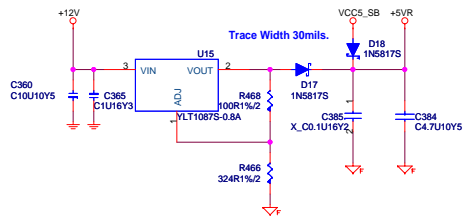
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Title	FAN/KB&MS	Rev
Document Number	MS-7409	0A
MICRO STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-Hue City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Tuesday, September 04, 2007 Sheet
		20 of 34

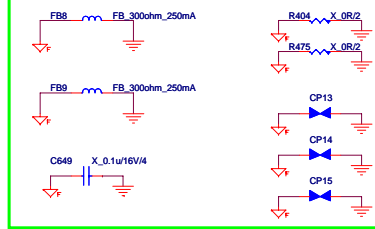
ALC888 CODEC



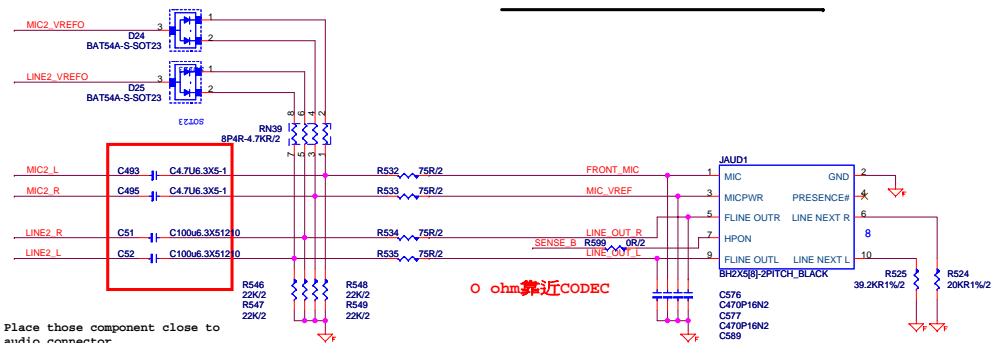
AUDIO CODE REGULATORS



For EMI

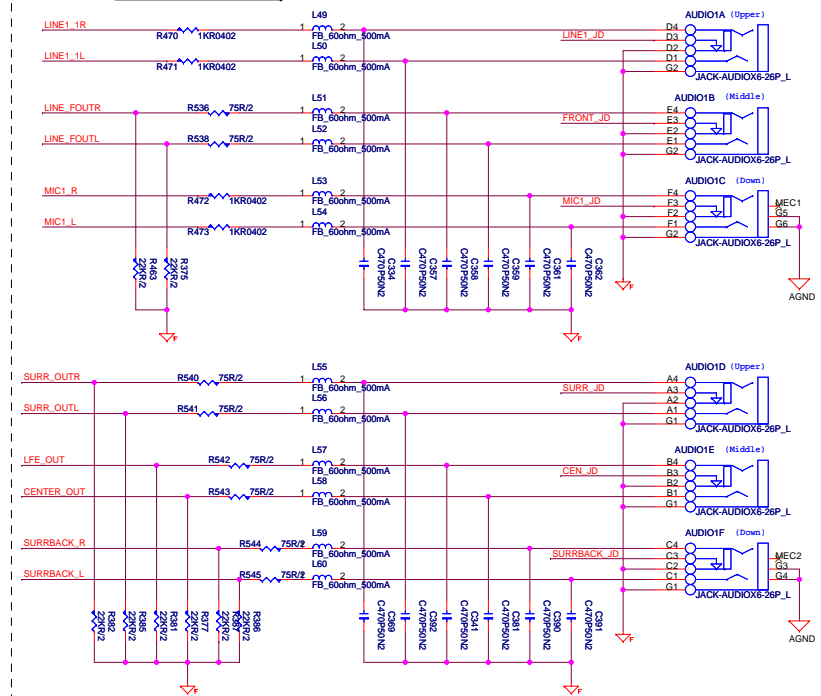


Azalia Front Audio Connector

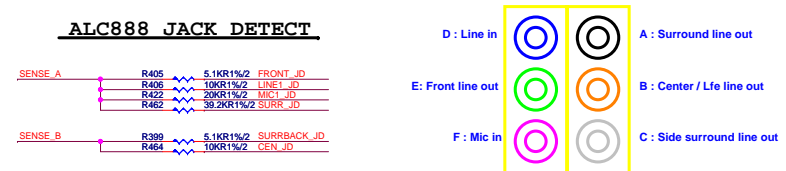


Place those component close to
audio connector.

ALC888 JACK

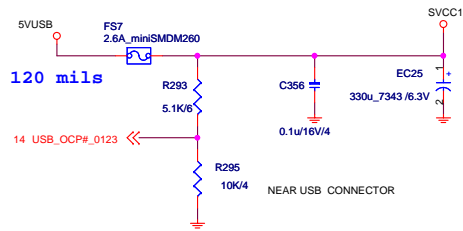


ALC888 JACK DETECT

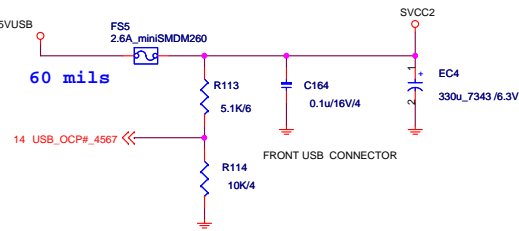


Micro Star Restricted Secret		
Title	Azalia ALC888	Rev
Document Number	MS-7409	1.0
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Tuesday, September 04, 2007 Sheet 21 of 34

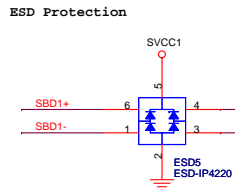
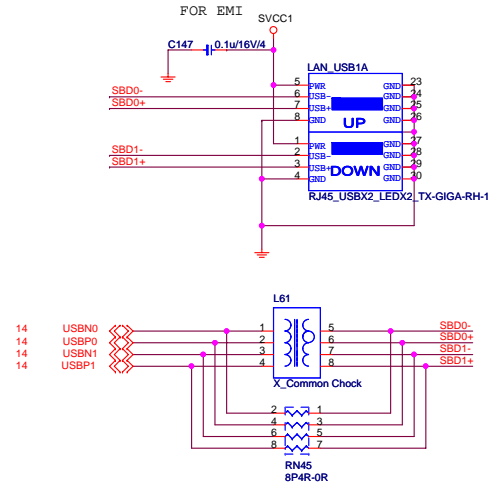
POWER CIRCUIT FOR USB PORT 0,1,2,3



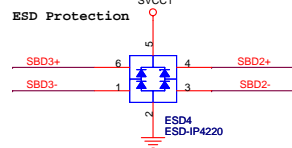
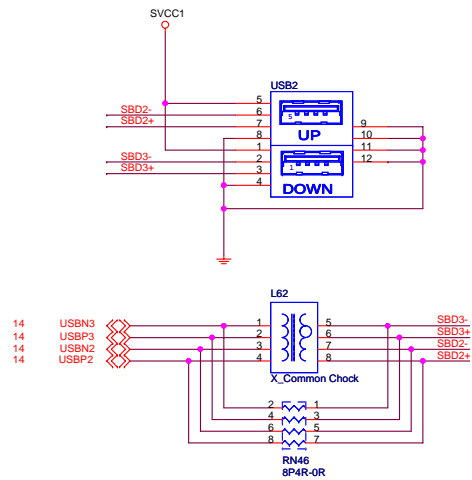
POWER CIRCUIT FOR USB PORT 4,5,6,7



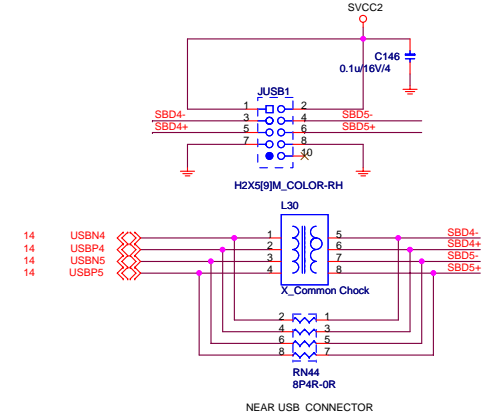
REAR PANEL USB CONNECTOR FOR USB PORT 0,1



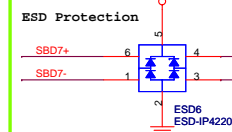
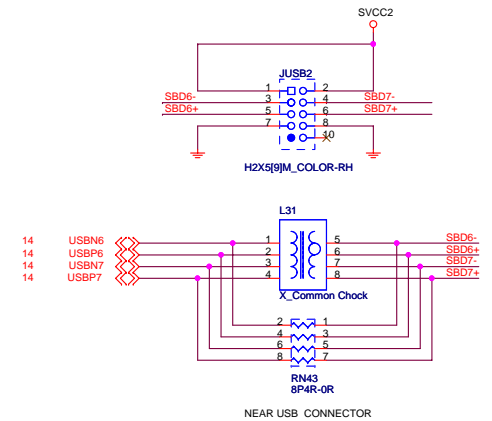
REAR PANEL USB CONNECTOR FOR USB PORT 2,3

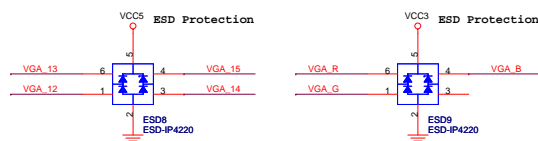
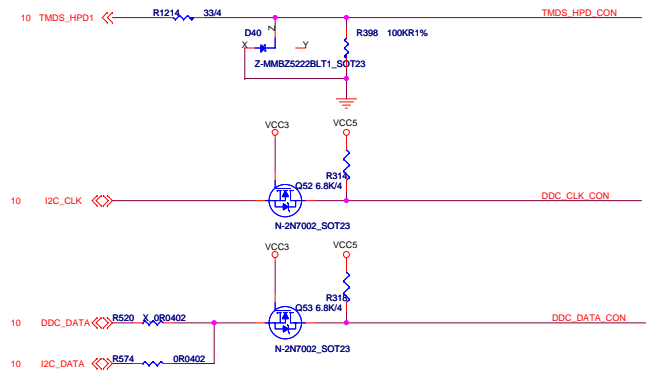


FRONT PANEL USB CONNECTOR FOR USB PORT 4,5

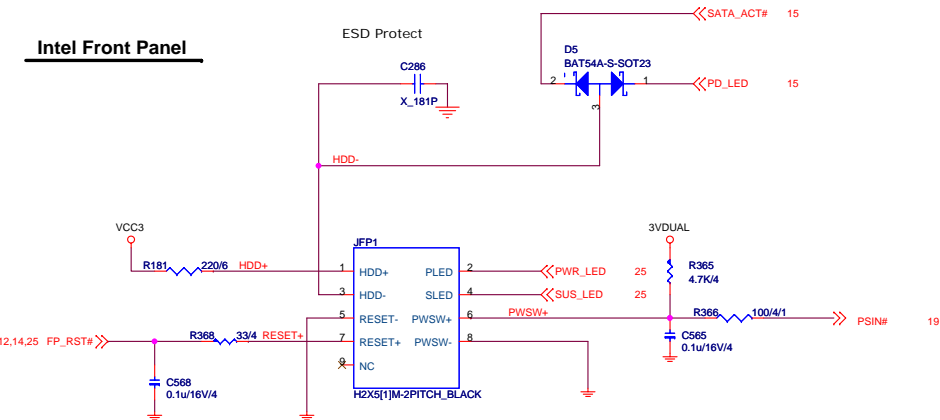


FRONT PANEL USB CONNECTOR FOR USB PORT 6,7

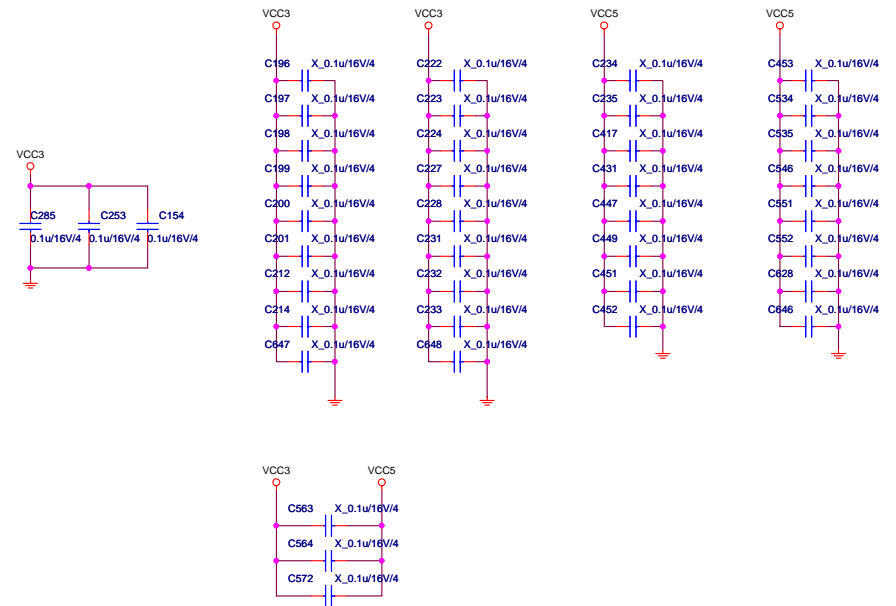




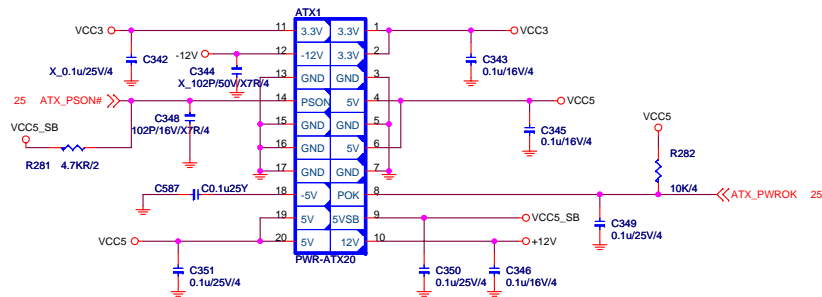
Intel Front Panel



EMI solution

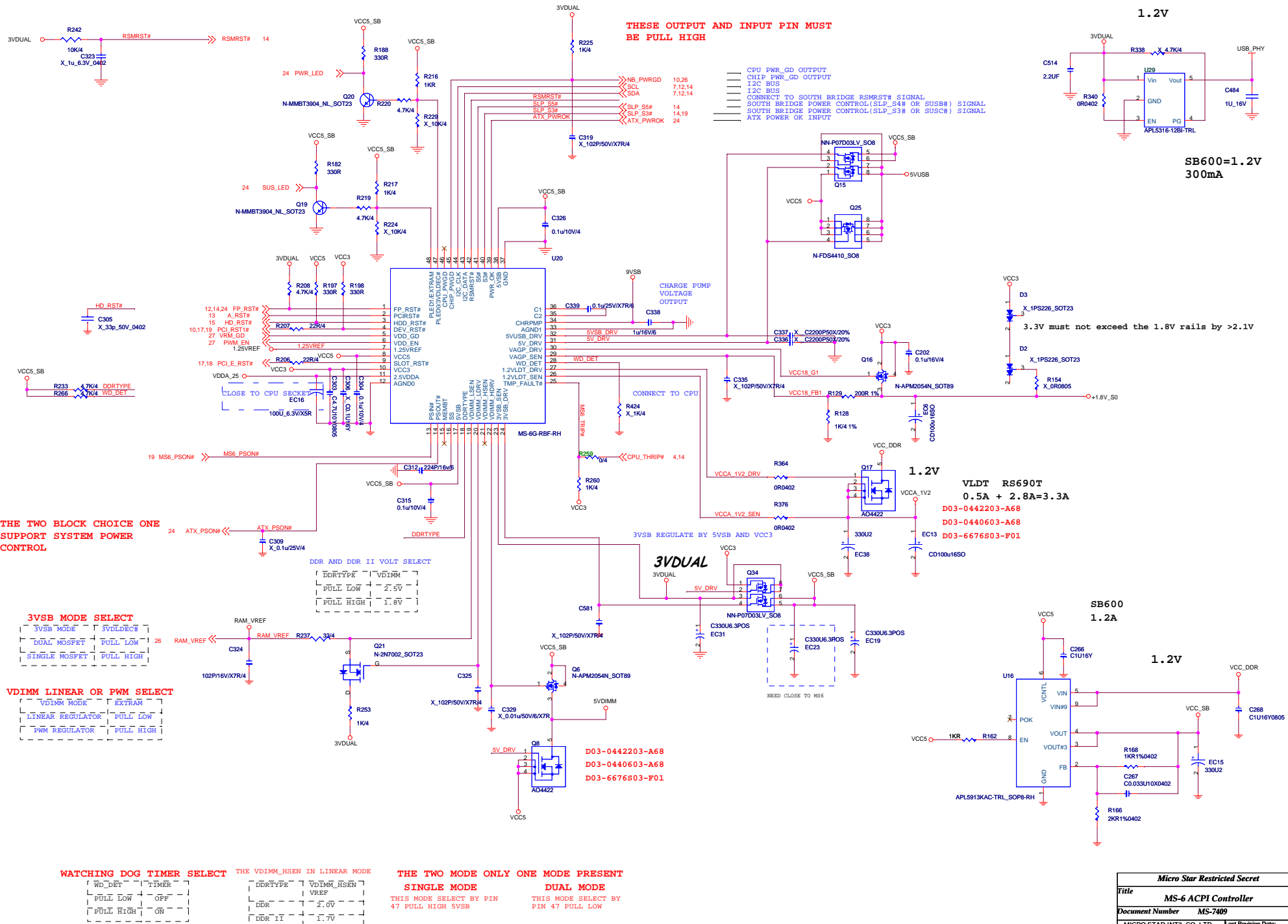


ATX Connector

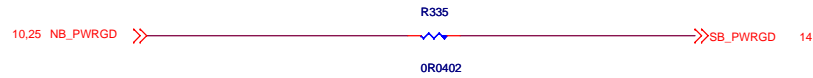
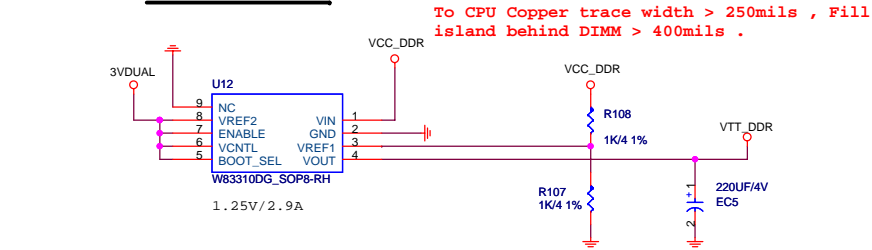


Micro Star Restricted Secret		
Title	ATX connector / Front Panel / EMI	Rev
Document Number	MS-7409	QA
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St., Jung-Hsi City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Tuesday, September 04, 2007 Sheet 24 of 34

PWM MODE



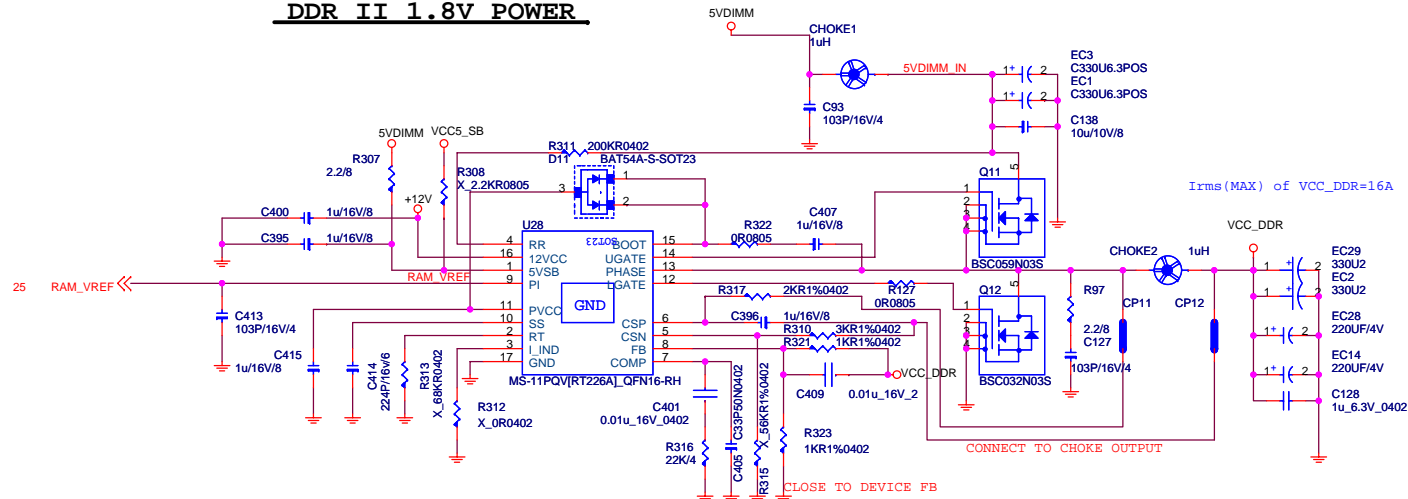
DDR VTT Power



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

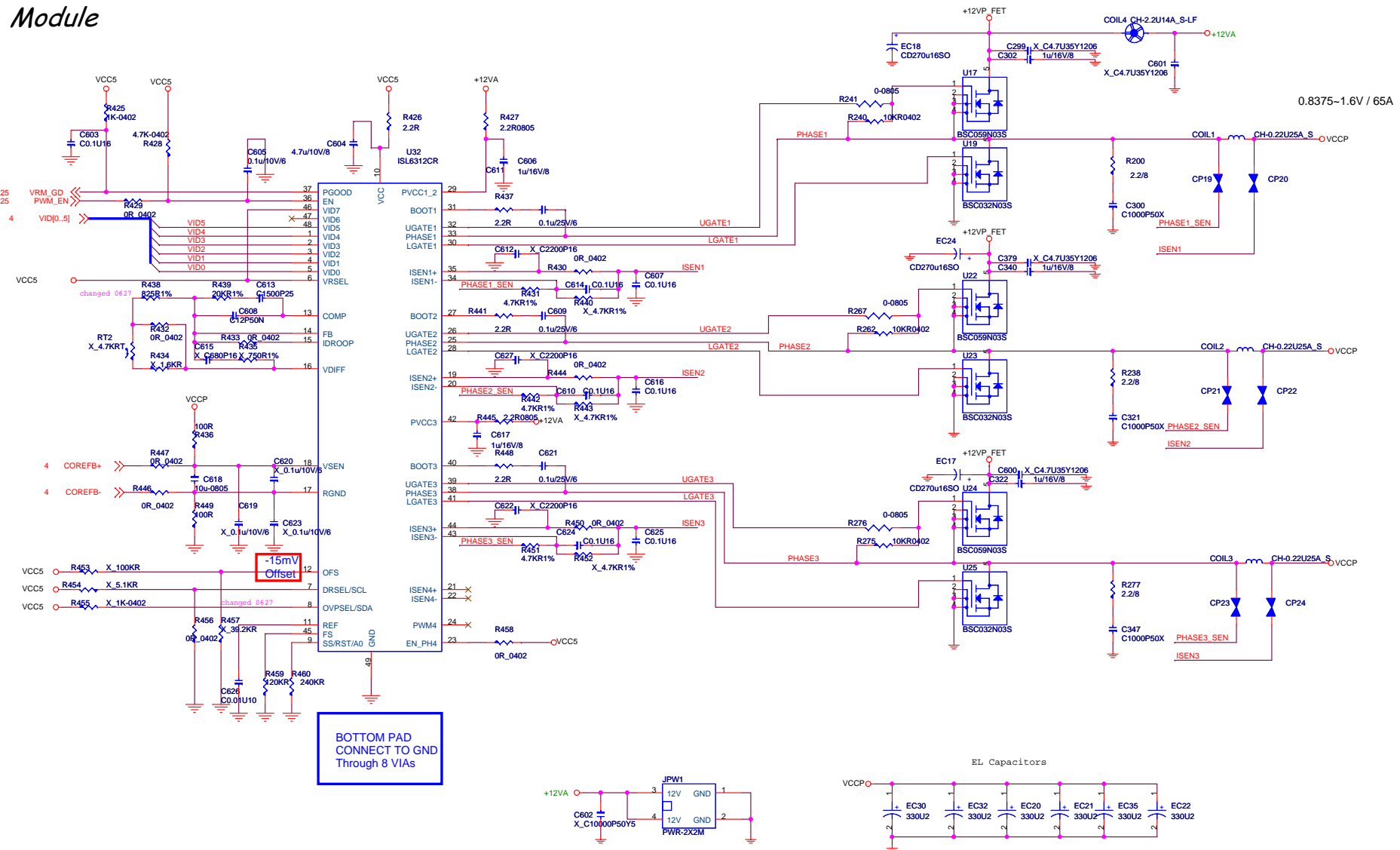
$$7.68A / 1.7 = 4.5A$$

DDR II 1.8V POWER



Micro Star Restricted Secret		
Title	MS-11 DDR2 POWER	Rev 0A
Document Number	MS-7409	
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Tuesday, September 04, 2007 Sheet 26 of 34

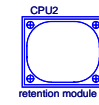
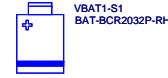
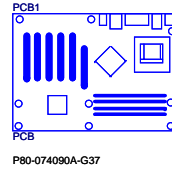
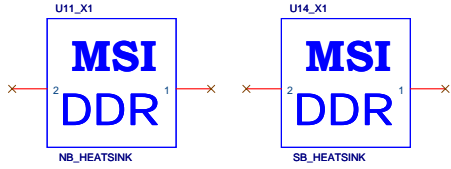
Voltage Regular Module



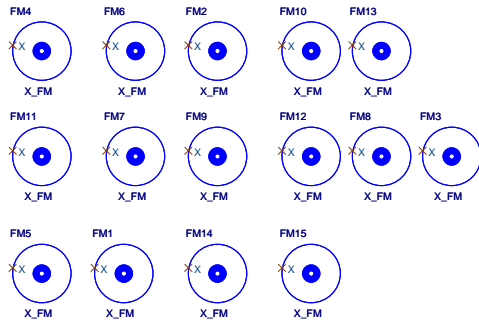
Micro Star Restricted Secret		
Title	Intersil 6312CR 3Phase	Rev
Document Number	MS-7409	0A
MICRO-STAR INT'L CO. LTD. No. 66, Li-De St., Jung-Hsi City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Tuesday, September 04, 2007 Sheet 27 of 34

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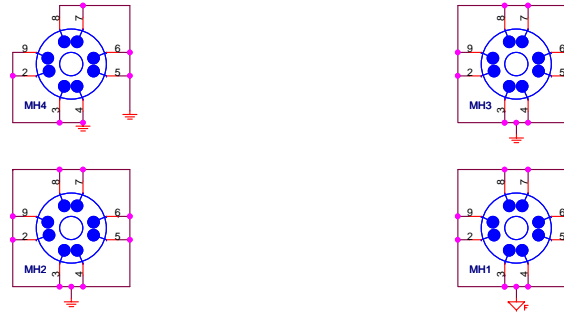
Micro Star Restricted Secret		
Title	REVERSE	Rev
Document Number	MS-7409	0A
MICRO-STAR INT'L CO.,LTD. No. 69, Li-De St, Jung-Ho City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Tuesday, September 04, 2007
Sheet		28 of 34



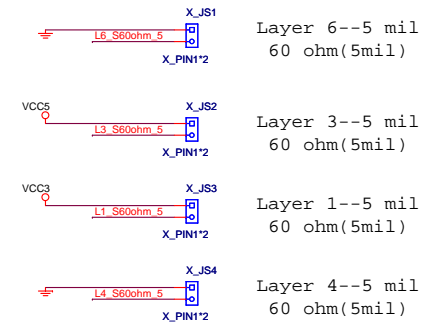
Optics Orientation Holes



Mounting Holes



Simulation



Micro Star Restricted Secret		
Title	MANUAL PARTS	Rev
Document Number	MS-7409	0A
MICRO-STAR INT'L CO., LTD. No. 69, Li-De St., Jung-Hsi City, Taipei Hsien, Taiwan http://www.msi.com.tw		Last Revision Date: Tuesday, September 04, 2007 Sheet 29 of 34