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# MS-96C4

Version 2.0

**CPU: Diamondville 1.66G**

**System Chipset:**

**Intel 945GC (North Bridge)  
Intel ICH7 (South Bridge)**

**On Board Chipset:**

**BIOS -- SPI**

**LPC I/O - W83627EHG-H  
LAN - Intel 82574L \*4  
CLOCK -- RTM876-665**

**Main Memory:**


**DDR II \*2 (Max 2GB)**

**Expansion Slots:**

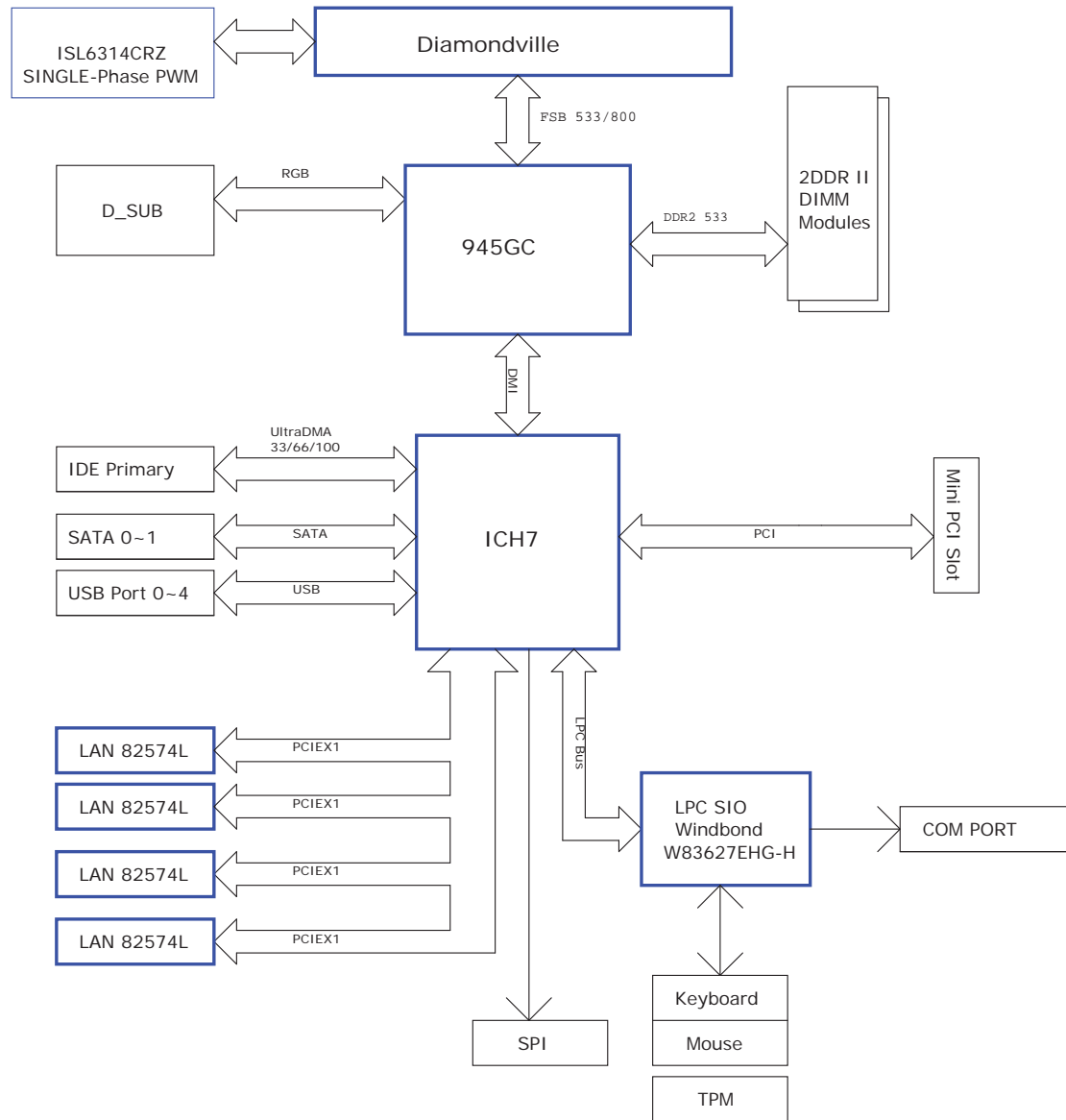
**MINIPCI2.3 SLOT \* 1**

**PWM:**

**ISL6261CRZ SINGLE PHASES**

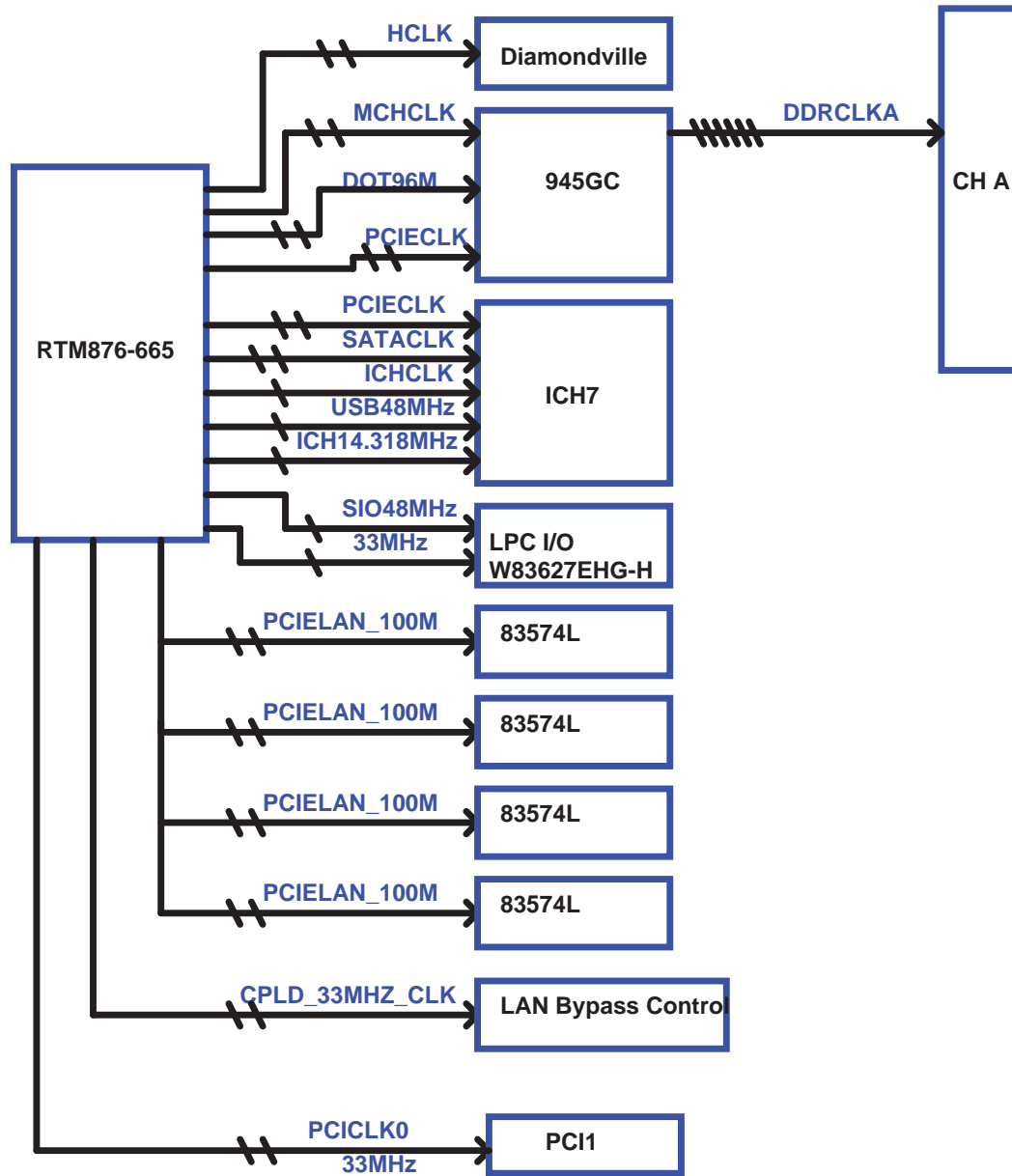
			<b>MICRO-STAR INT'L CO.,LTD</b>	
			<b>MS-96C4</b>	
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# Block Diagram



<b>MICRO-STAR INT'L CO.,LTD</b>		
<b>MS-96C4</b>		
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# CLOCK MAP

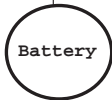


<b>MICRO-STAR INT'L CO.,LTD</b>		
<b>MS-96C4</b>		
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<b>Processor</b>
Vcore=1.1V/3.5A
V_FSB_VTT=1.1V/2.5A
VCCA=1.5V /130mA

<b>945GC</b>
1.1V FSB Vtt-0.9A
1.8V DDR2 I/O-4.4A(S0,S1)
0.9V DDR2 VREF-2mA
0.9V DDR2 SB_VREF-10uA
DDR2 Resister Comp V-36mA
DDR2 Resis Comp SB_V-10uA
1.5V Core-13.8A(Integrated)
1.5V Core-8.9A(Discrete)
1.5V PCI Express&DMI-1.5A
1.5V PCIE&DMI PLL-45mA
1.5V HOST PLL-45mA
1.5V VCCA_DPLLA&B-55mA
1.5V MPLL-66mA
2.5V DAC-70mA*
2.5V HV-3mA
2.5V CMOS-2.0mA

<b>ICH7</b>
1.1V VCC_CPU-14mA
1.05V Core-2A
VCC1_5A*-1.01A
VCC1_5B*-0.77A
5VRef-6mA
5VrefSus-10mA
+3.3V-0.33A
RTC-6uA(G3)
3.3V VccSus*-52mA
VccSus1_05V-See Note 1
VccUSBPLL-10mA
VccDMIPLL-50mA
VccSATAIPLL-50mA



<b>ISL6314</b>
<b>VCCP</b>
1.1V 3.5A

<b>VTT Regulator</b>
<b>V_FSB_VTT</b>
1.1V 3.54A

<b>uP6103 Regulator</b>
<b>VCC_DDR</b>
1.8V 10.48A

<b>Linear</b>
<b>V_1P5_CORE</b>
1.5V 20.42A

<b>uP7707 Regulator</b>
<b>V_2P5_MCH</b>
2.5V 0.75A

<b>1.05V Regulator</b>
<b>V_1P05_CORE</b>
1.05V 2A

<b>uP7706 Regulator</b>
<b>3VSB</b>
3.3V 0.52A

<b>+12V</b>	<b>+5V</b>	<b>+3.3V</b>	<b>+5VSB</b>
<b>ATX POWER</b>			

<b>W83310DS Regula</b>
<b>VTT_DDR</b>
0.9V 1.2A

<b>DDR2 DIMM conn(2) &amp; term</b>
0.9V SM Vtt-1.2A(S0)
1.8V Vdd/vddq-4.7A(S0,S1)

<b>PCI slot</b>
+3.3Vaux-375mA(wake)
+3.3Vaux-20mA(no wake)
+3.3V-7.6A
+5.0V-5.0A
+12V-0.5A
-12V-0.1A

<b>USB</b>
+5V-4A(S0,S1)

<b>PS2</b>
+5V-345mA(S0,S1)

<b>LAN</b>
3VSB-2A

<b>CLKGEN</b>
+3.3V-560mA

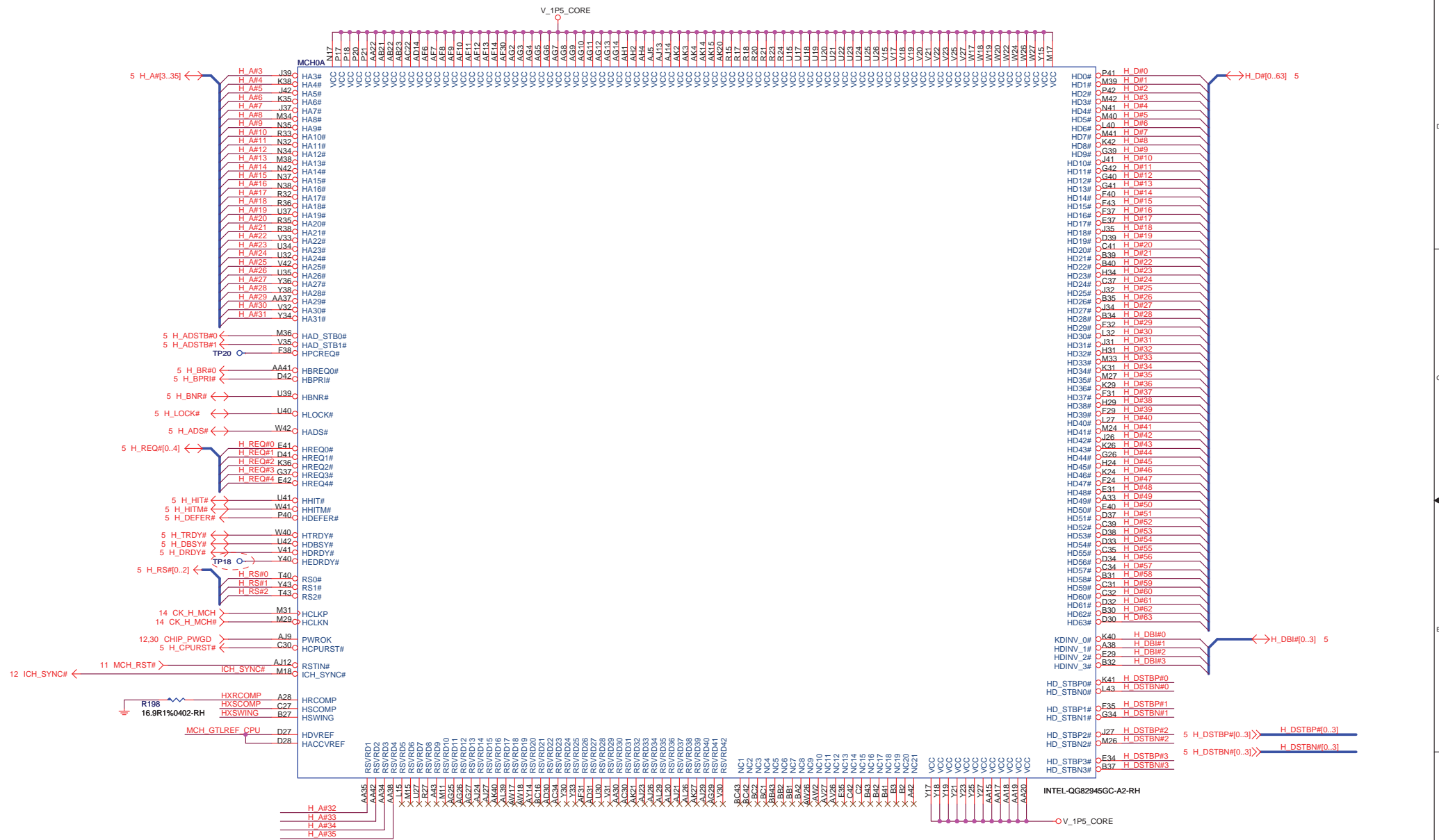
<b>SIO</b>
+3.3V
3VSB-

<b>SPI ROM</b>
----------------

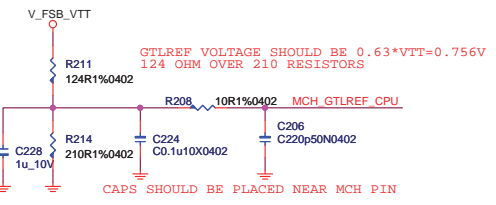
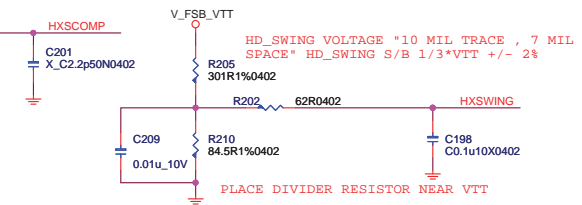








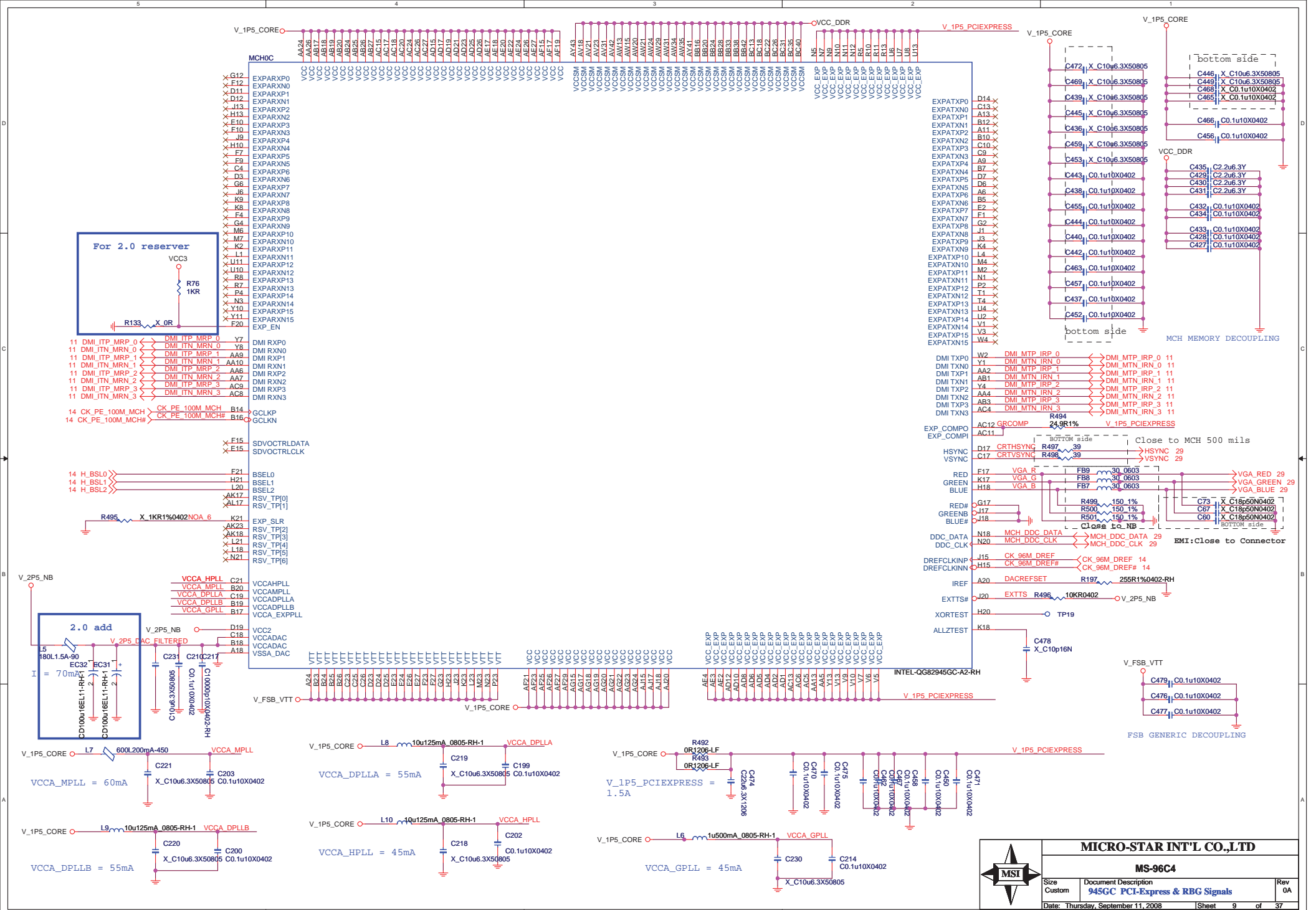
V\_FSB\_VTT R198  
 .60.4R1%-1  
 2.0 change



<b>MICRO-STAR INT'L CO.,LTD</b>		
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<b>MSI</b>		
<b>MICRO-STAR INT'L CO.,LTD</b>		
<b>MS-96C4</b>		
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LPC AC-LINK

USB

SM BUS

POWER MGMT

MISC

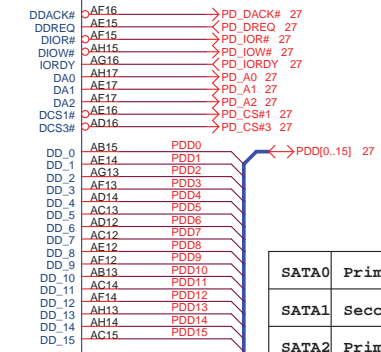
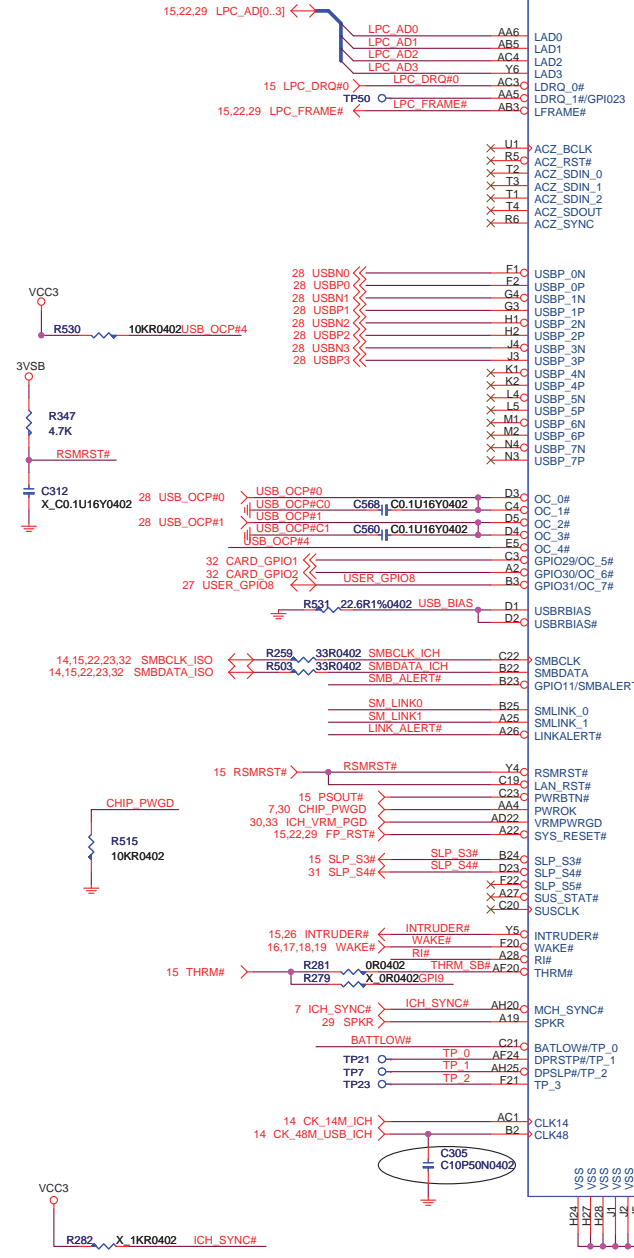
ICH 7 PART 2/3

P-ATA

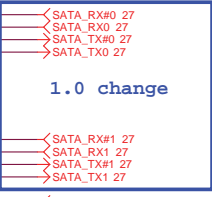
S-ATA

GPIO

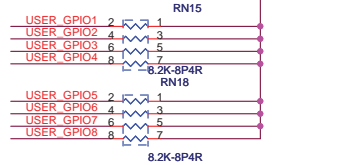
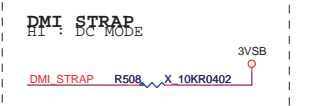
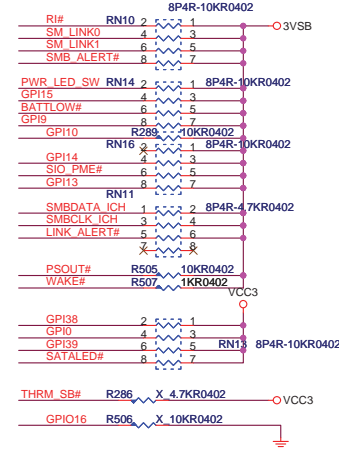
RTC



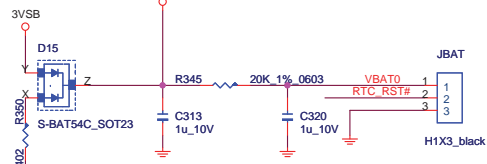
SATA0	Primary	Master
SATA1	Secondary	Master
SATA2	Primary	Slave
SATA3	Secondary	Slave



1.0 change



RTC BLOCK



CMOS CLEAR	NORMAL	CLEAR
JBAT	(1-2)	(2-3)

When INTRVREN high, enable integrated VccSus1\_05 VRM

\* Put a GND Plane under X'TAL  
\* Please put this block close ICH7

Following are the GPIOs that need to be terminated properly if not used:  
GPIO[39:36,23:21,19,7:0]: default as inputs and should be pulled up to Vcc3\_3 if unused.  
GPIO[31:29,15:8]: default as inputs and should be pulled up to VccSus\_3\_3 if unused.

**MICRO-STAR INT'L CO.,LTD**

**MS-96C4**

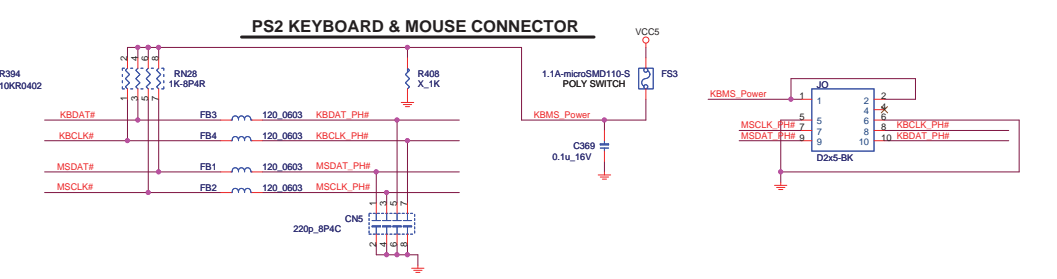
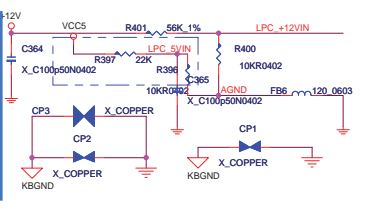
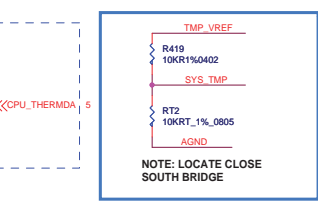
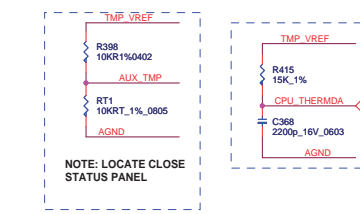
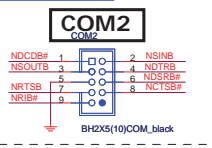
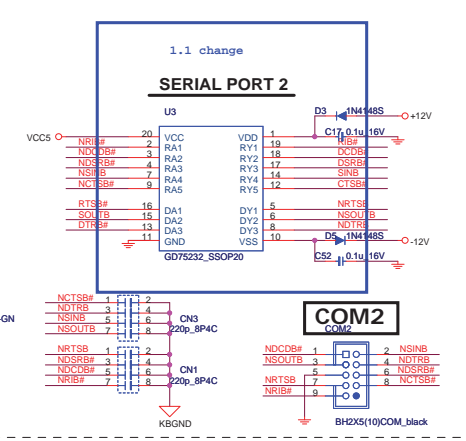
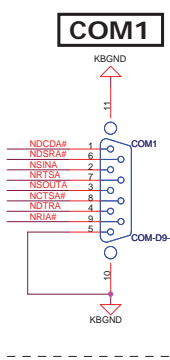
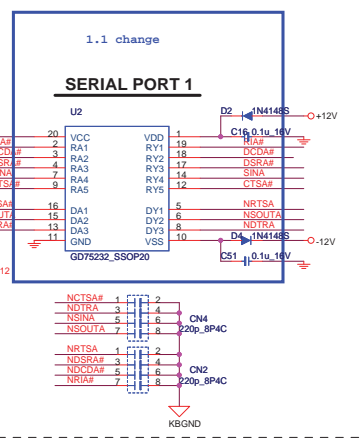
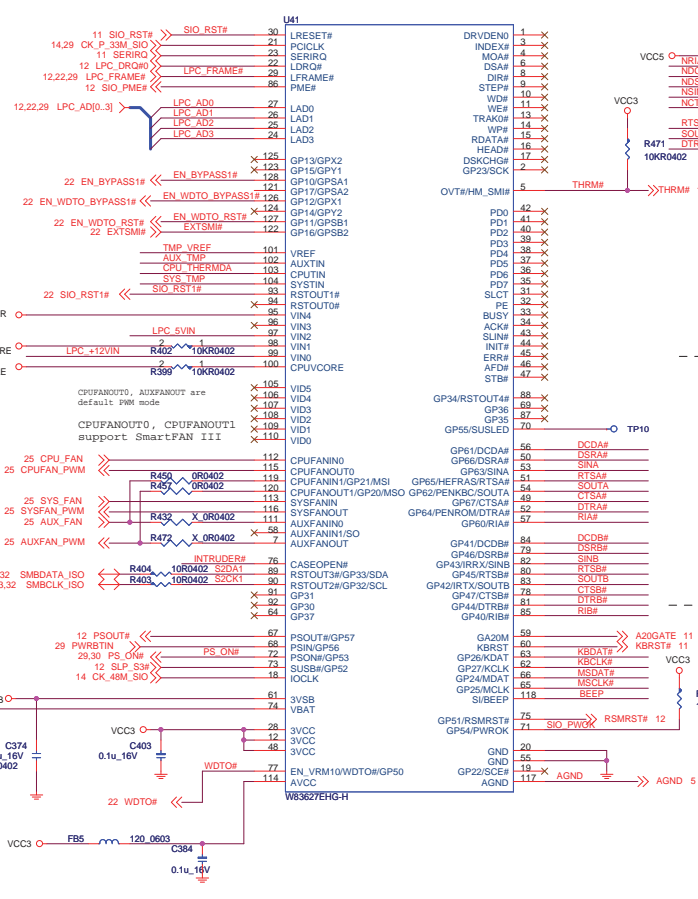
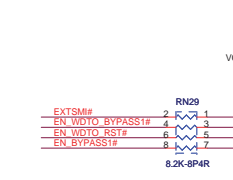
Size	Custom	Document Description	Intel ICH7 - LPC & ATA & USB & GPIO	Rev	0A
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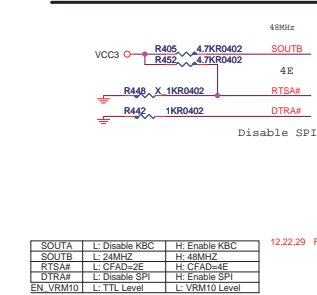




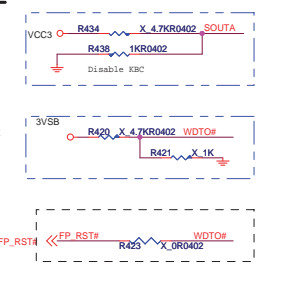
**GPIO PULL-UP RESISTOR**



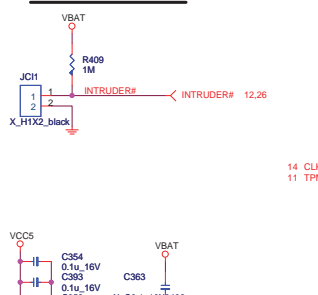
**LPC I/O STRAPPING RESISTOR**



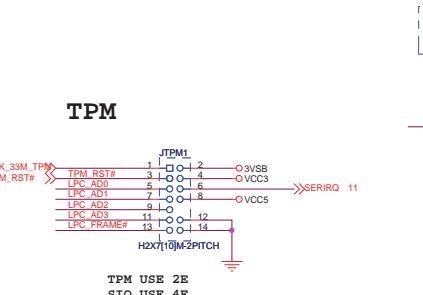
**Chassis Intrusion**



**TPM**



**SMBus Conn**



SOUTA	L: Disable KBC	H: Enable KBC
SOUTB	L: 24MHZ	H: 48MHZ
RTSA#	L: CPAD-ize	H: CPAD-ize
DTRAP#	L: Disable SPI	H: Enable SPI
EN_VRM10	L: TTL Level	H: VRM10 Level

TPM USE 2E
SIO USE 4E

Ver C: POP R59, Q10, R76, R61  
 NOPOP R72  
 Ver G, H: POP R61, R72  
 NOPOP R69, Q10, R76

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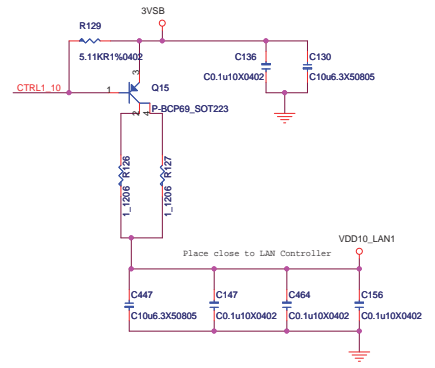
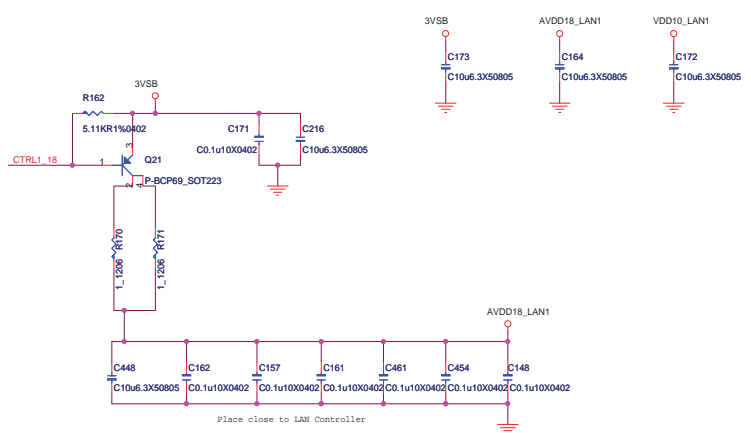
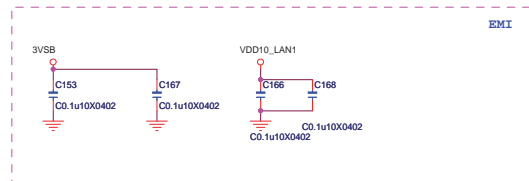
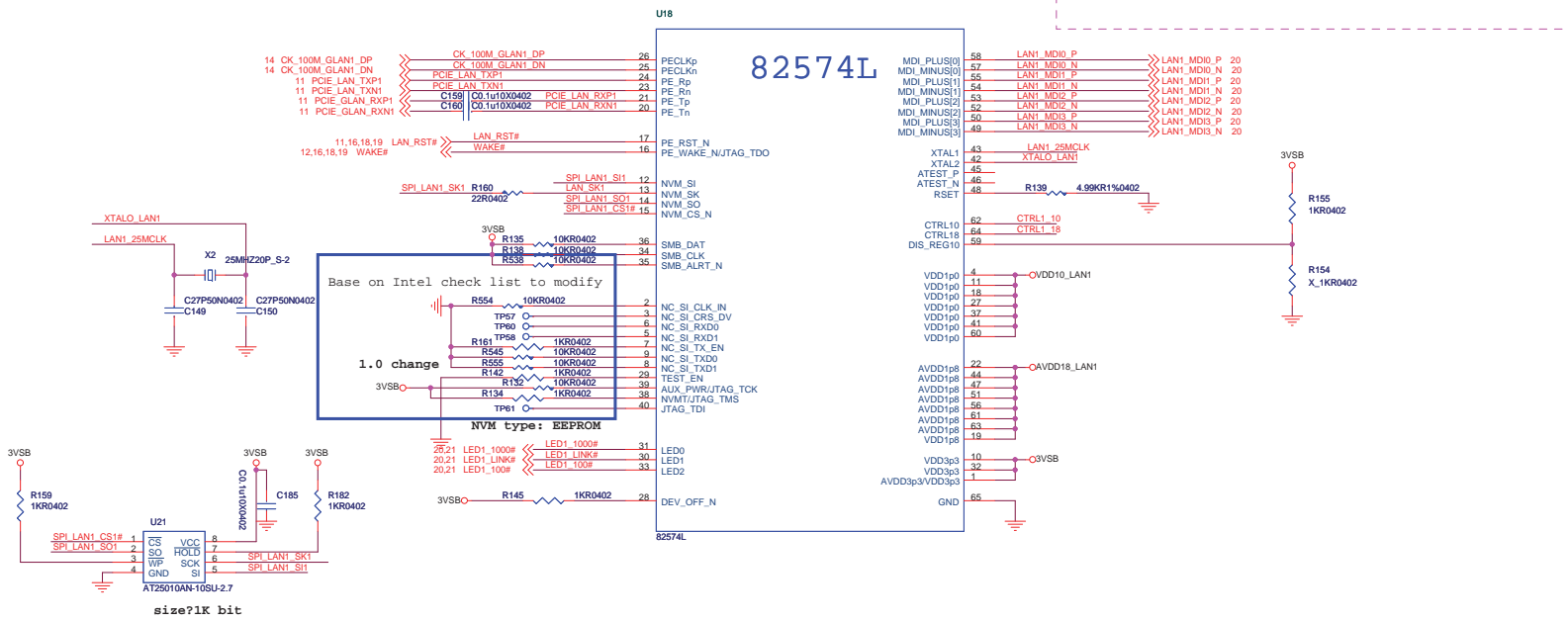
**MS-96C4**

Size C Document Description **LPC I/O - W3627EHG-H** Rev 0A

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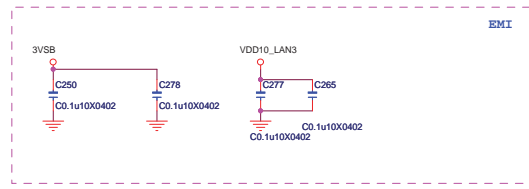
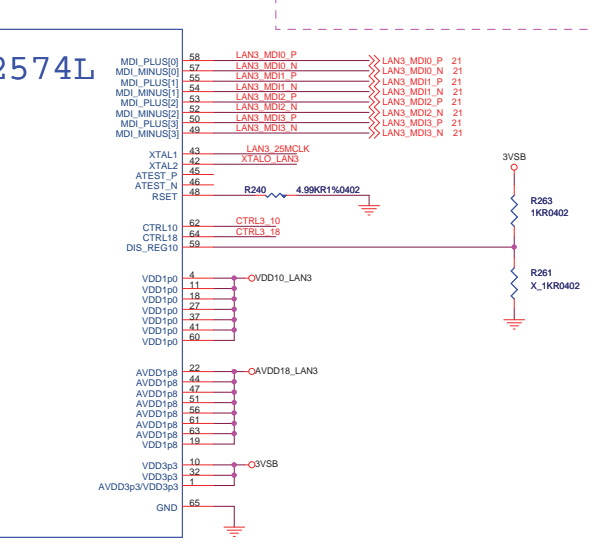
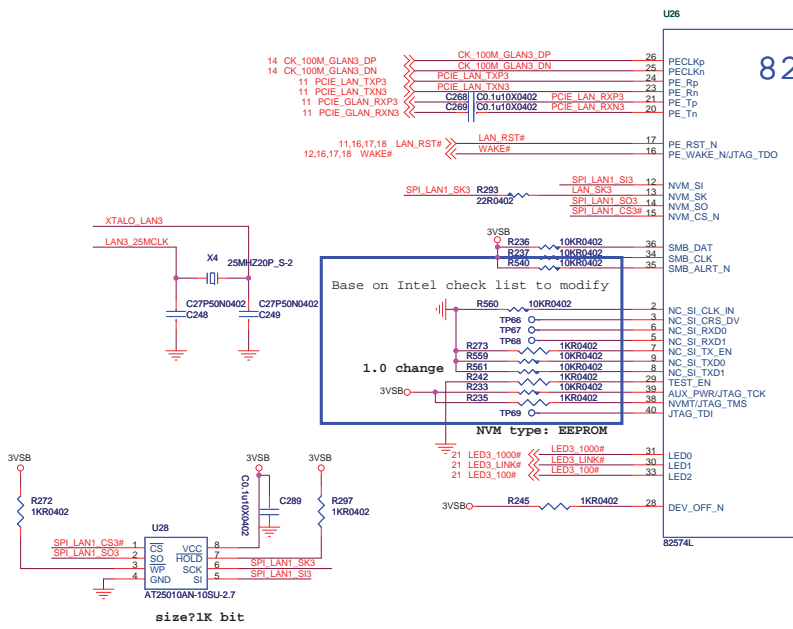






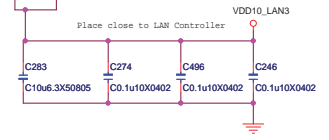
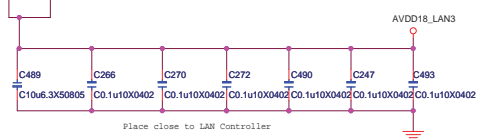
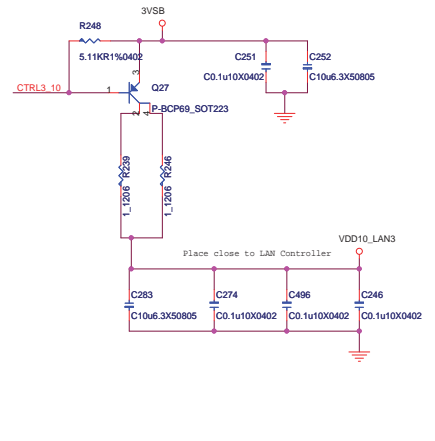
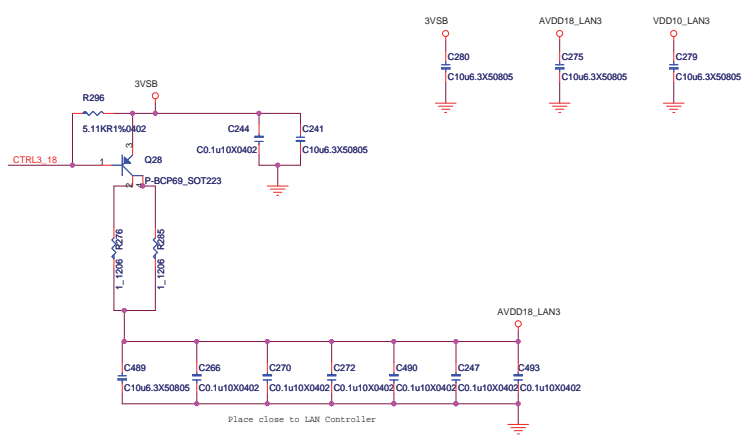
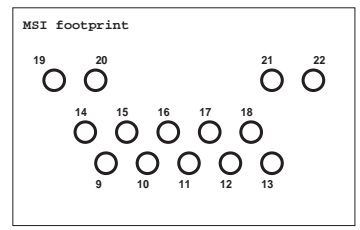
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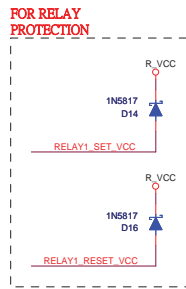




Giga-Lan	
N58-22F0221-842	
Link	Yellow
Active	Blinking
1000	Orange
100	Green
10	None
19	
20	Yellow
21	
22	Orange
	Green

LED0# = Link 1000# (0111)  
 LED1# = Link/ACT# (0100)  
 LED2# = Link 100# (0110)





Intel chipset has internal termination, so do not require.

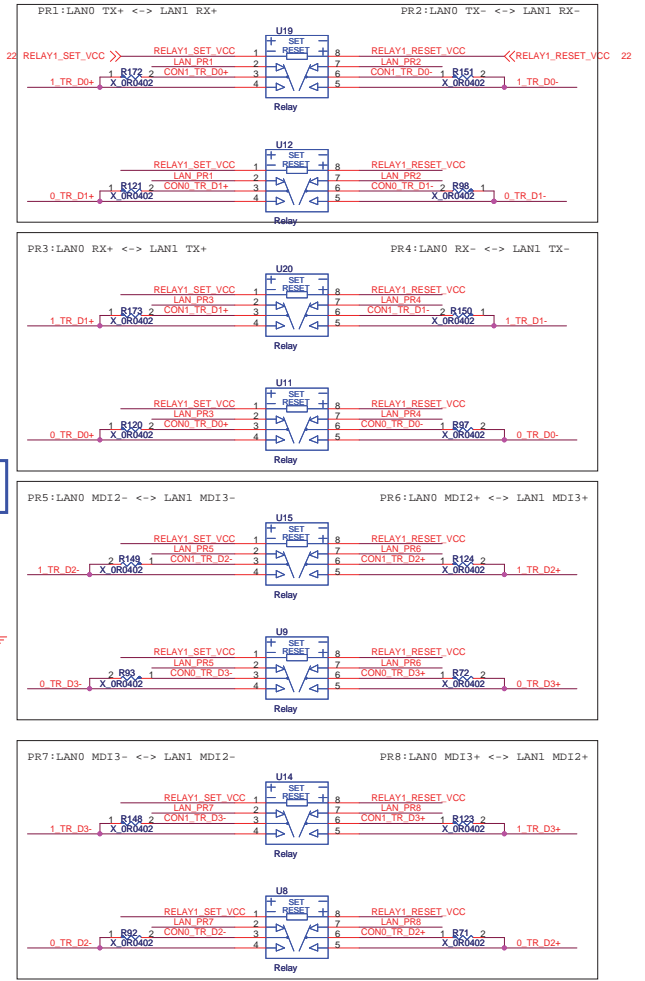
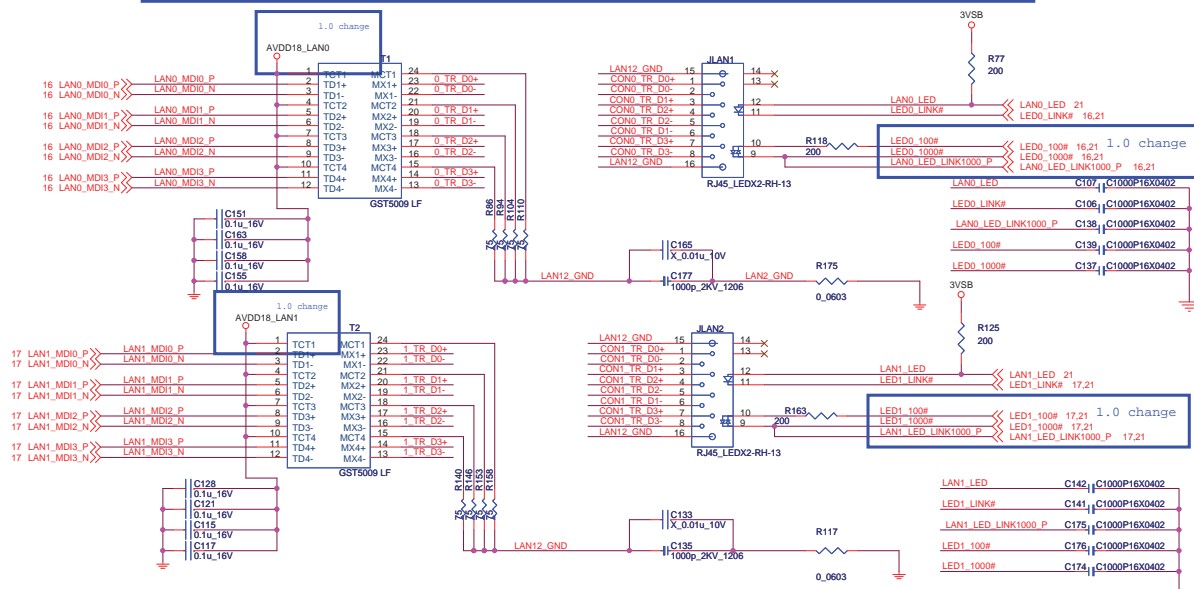
**Place these components near 82574L-LAN1**

C473	X 0.1u 16V	R157	X 49.9 1%	LAN1 MDIO_P
R156	X 49.9 1%	LAN1 MDIO_N		
C460	X 0.1u 16V	R152	X 49.9 1%	LAN1 MDI1_P
R147	X 49.9 1%	LAN1 MDI1_N		
C451	X 0.1u 16V	R144	X 49.9 1%	LAN1 MDI2_P
R141	X 49.9 1%	LAN1 MDI2_N		
C441	X 0.1u 16V	R137	X 49.9 1%	LAN1 MDI3_P
R130	X 49.9 1%	LAN1 MDI3_N		

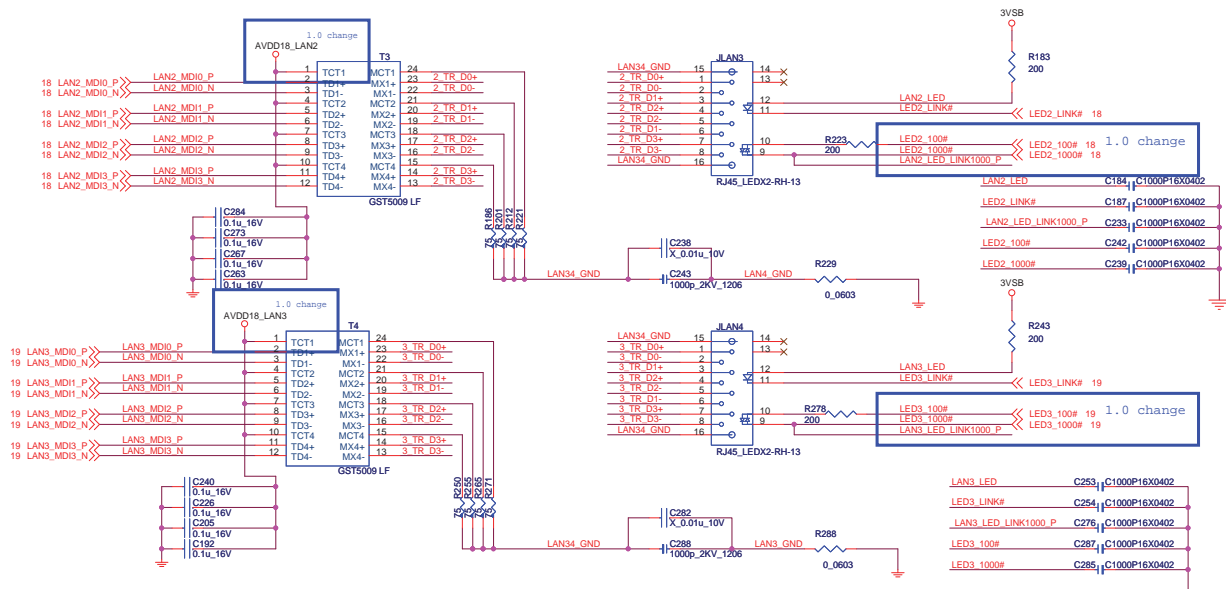
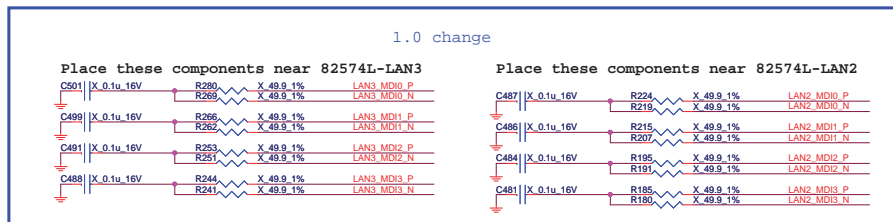
**Place these components near 82574L-LAN0**

C426	X 0.1u 16V	R109	X 49.9 1%	LAN0 MDIO_P
R106	X 49.9 1%	LAN0 MDIO_N		
C424	X 0.1u 16V	R101	X 49.9 1%	LAN0 MDI1_P
R95	X 49.9 1%	LAN0 MDI1_N		
C421	X 0.1u 16V	R90	X 49.9 1%	LAN0 MDI2_P
R87	X 49.9 1%	LAN0 MDI2_N		
C417	X 0.1u 16V	R83	X 49.9 1%	LAN0 MDI3_P
R80	X 49.9 1%	LAN0 MDI3_N		

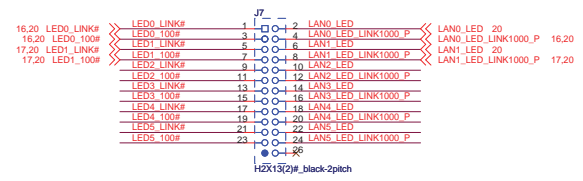
1.0 change



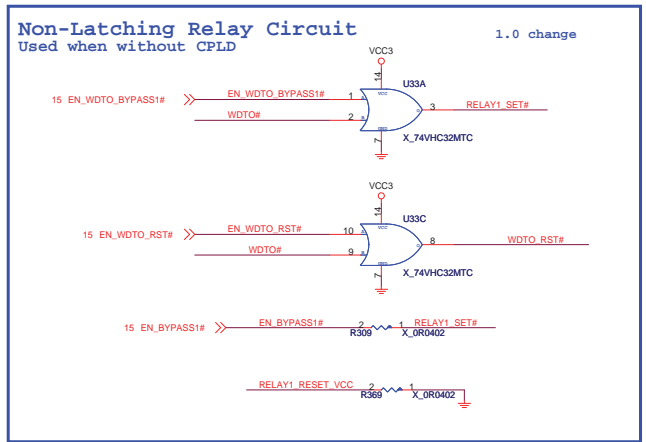
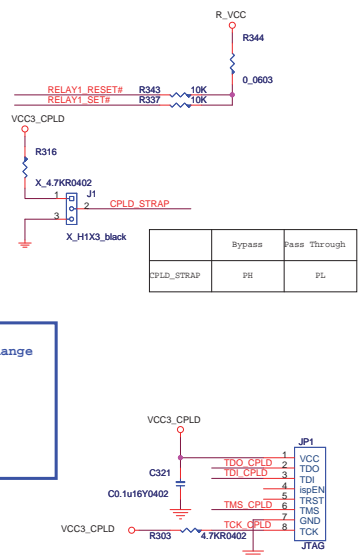
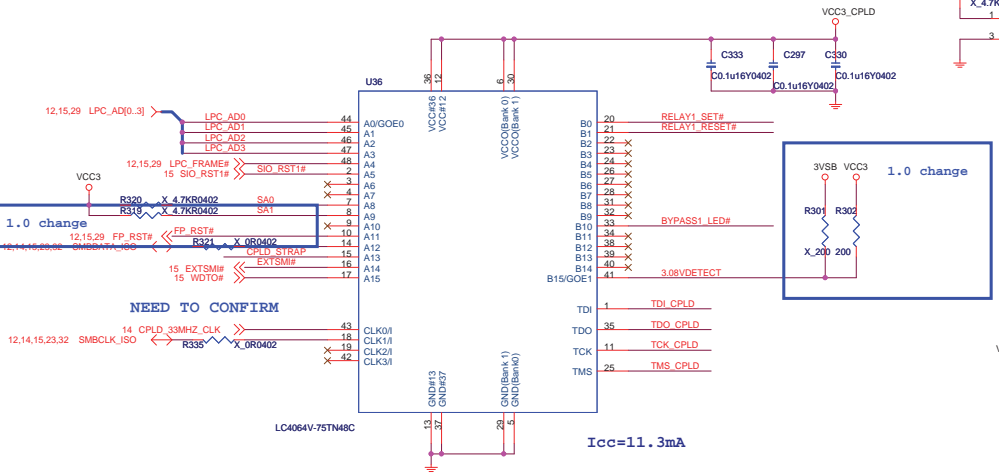
Skv -  
 2 LAN - No change  
 4 LAN - No change  
 6 LAN - No change



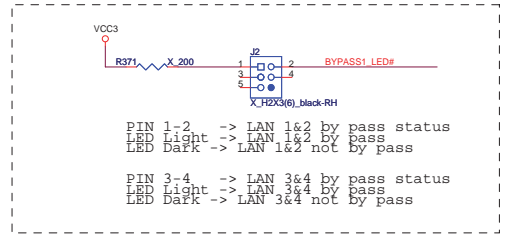
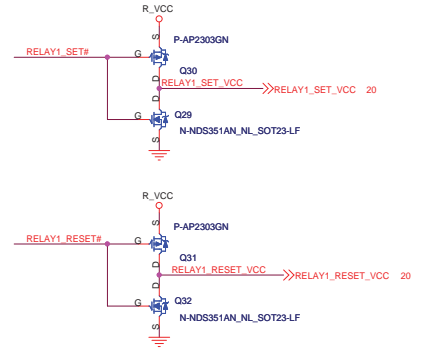
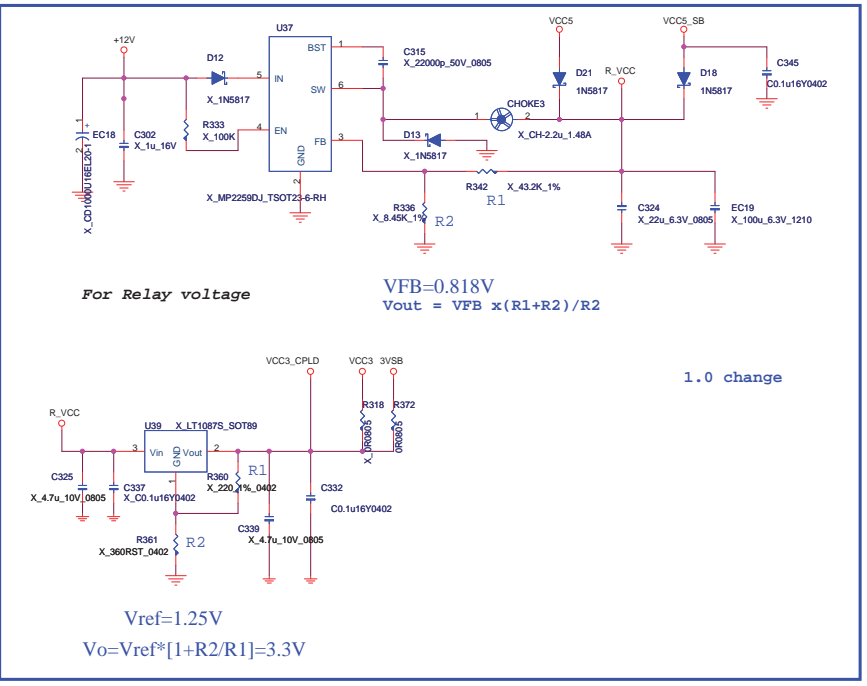
**LAN LED for REAR**

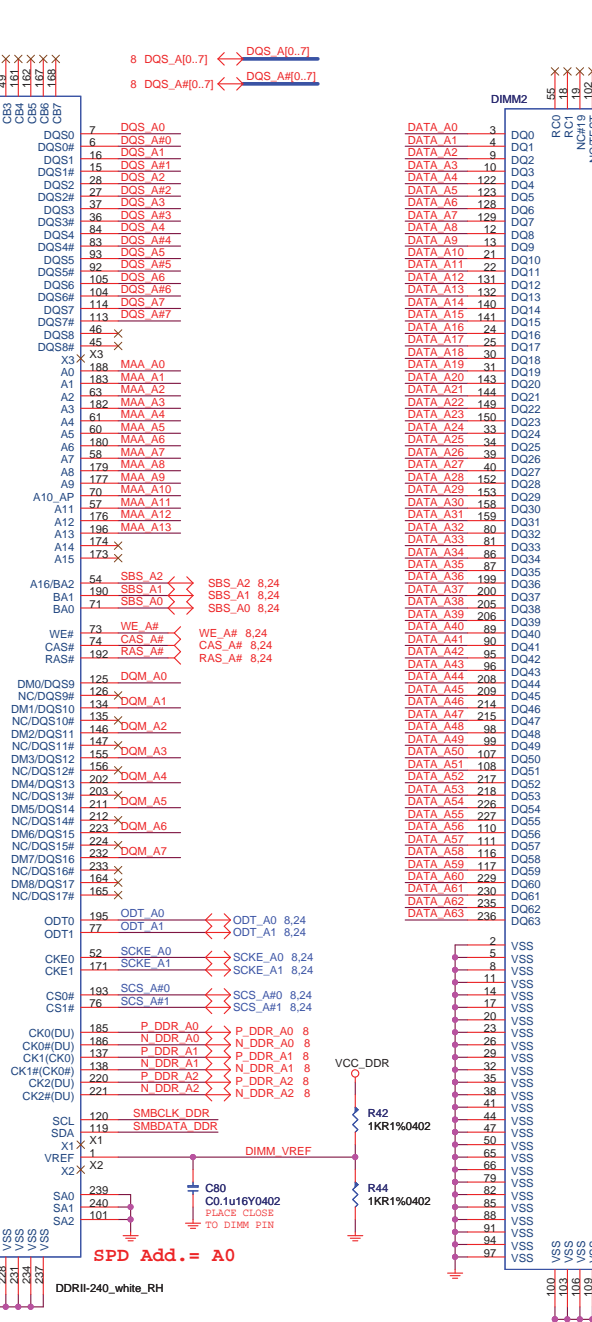
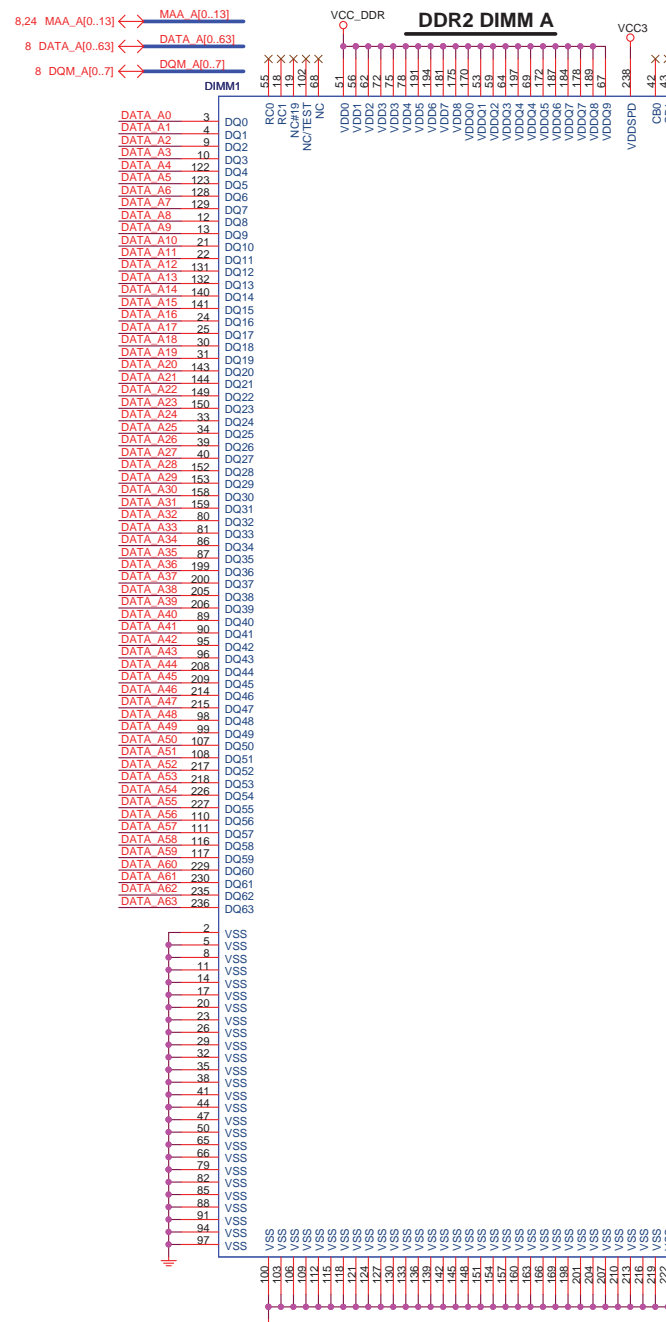


Function	Fly-wire Cable	1x8 Connector
Vcc1	Red	1
TDO/SDO	Brown	2
TDI/SDI	Orange	3
ispEN/Enable/PROGRAMN	Yellow	4
TRSTP	Green	5
TMS/MODE	Purple	6
GND	Black	7
TCK/SCLK	White	8



	BYPASS	PASS THROUGH
RELAY_SET#	H	L
RELAY_RESET#	L	H





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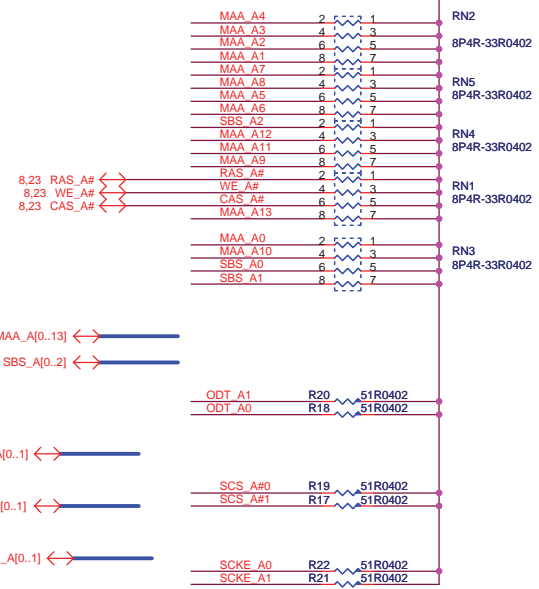
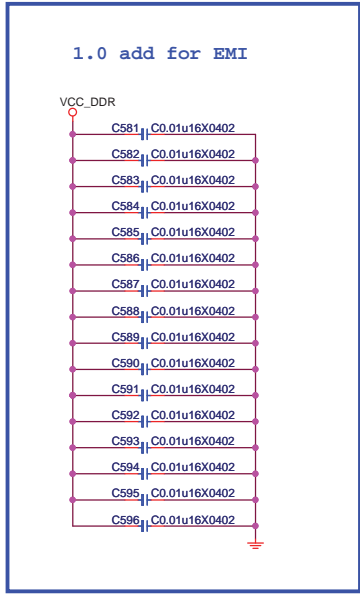
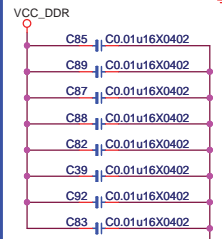
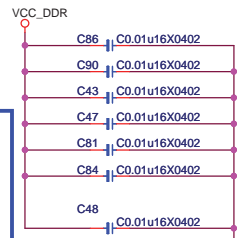
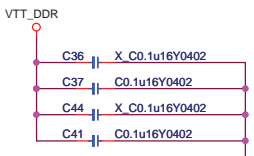
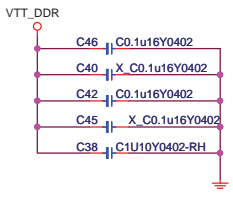
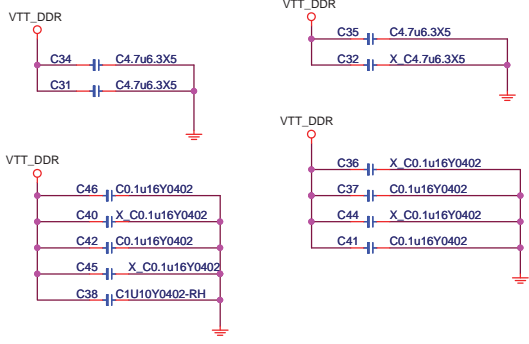
**MS-96C4**

Size Custom Document Description  
**DDR II DIMM 1-2**

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Rev 0A

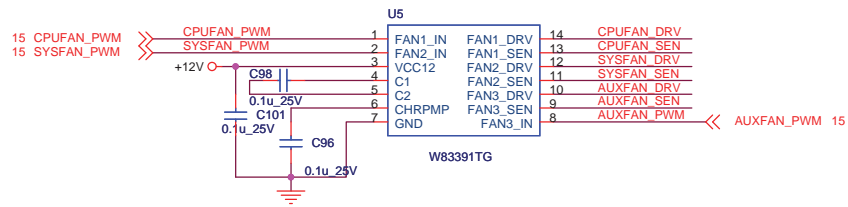
CHANNEL A V\_SM\_VTT DECOUPLING CAPS      CHANNEL B V\_SM\_VTT DECOUPLING CAPS



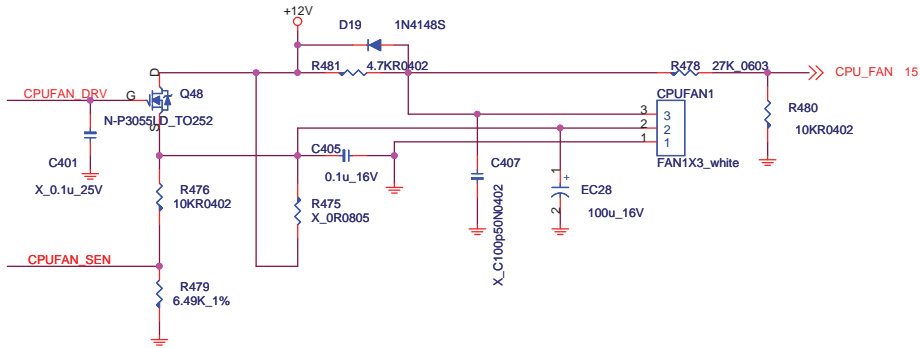
<b>MICRO-STAR INT'L CO.,LTD</b>		
<b>MS-96C4</b>		
Size Custom	Document Description <b>DDR II VTT DECOUPLING</b>	Rev 0A
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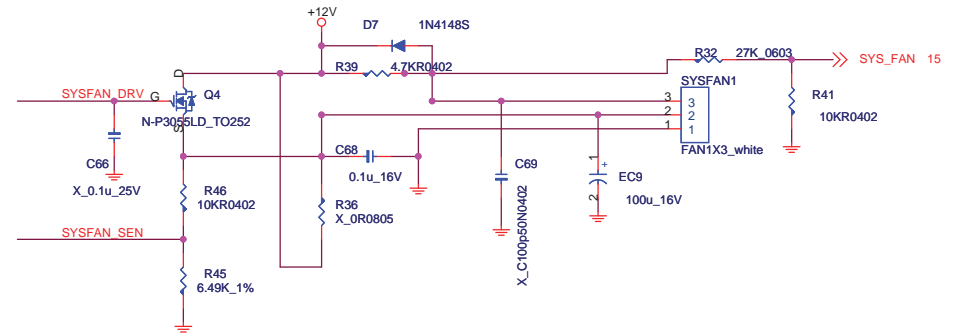
# FAN CONTROL



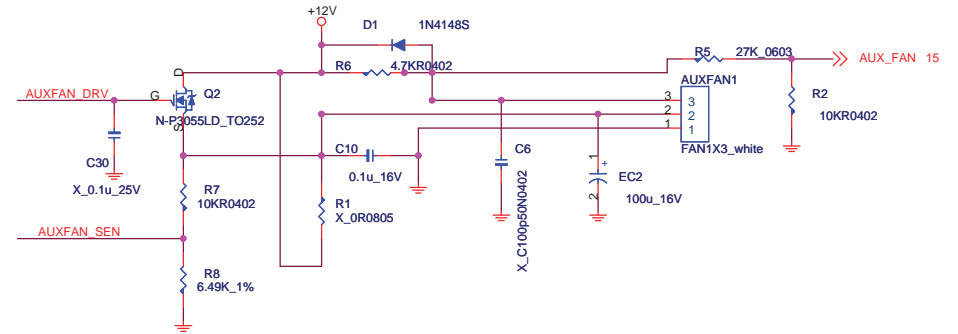
## CPU FAN



## SYSTEM FAN



## AUX FAN

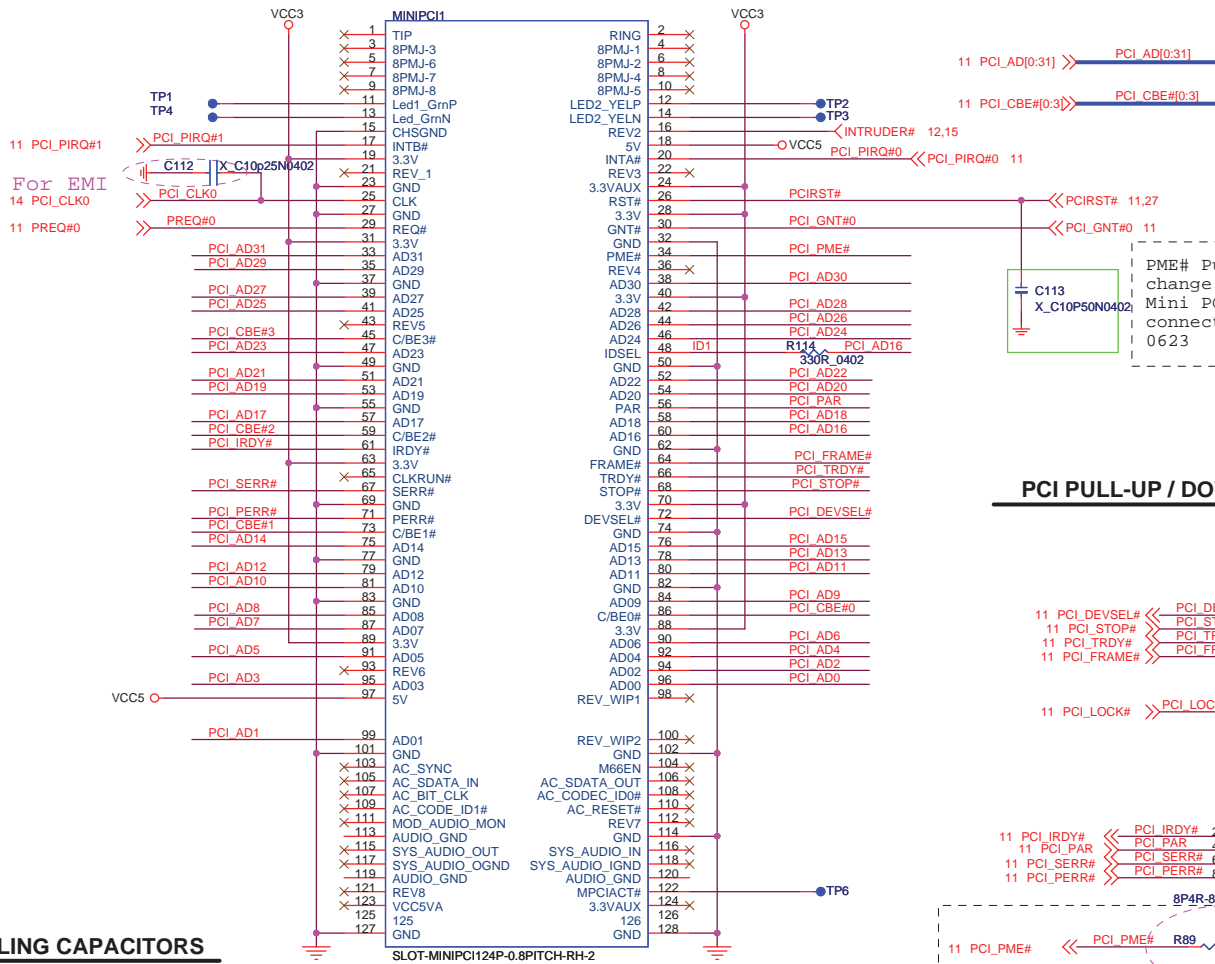


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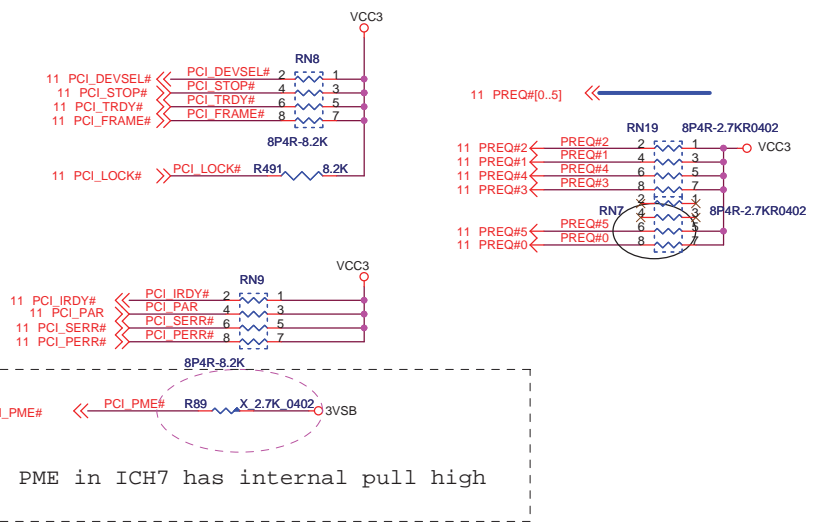
Size B	Document Description <b>FAN connector</b>	Rev 0A
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# Mini PCI SOCKET

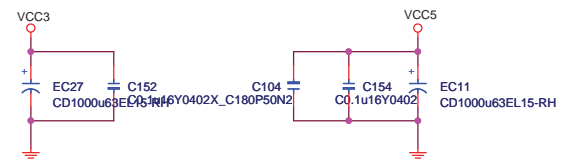


PME# Pull high from VCC3  
change to VCC3\_SB  
Mini PCI PME# did not  
connect to other PME#  
0623

## PCI PULL-UP / DOWN RESISTORS



## PCI SLOT DECOUPLING CAPACITORS

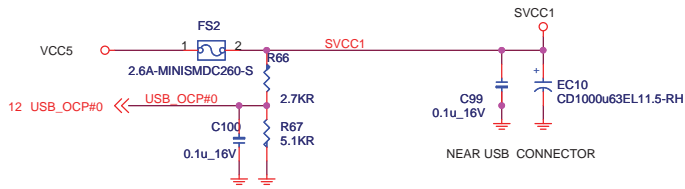


**IDSEL = PCI\_AD16**  
**MASTER = PCI\_REQ#0**  
**PCI\_PIRQ#0**

	<b>MICRO-STAR INT'L CO.,LTD</b>	
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	Size B	Document Description <b>PCI Slot 1</b>
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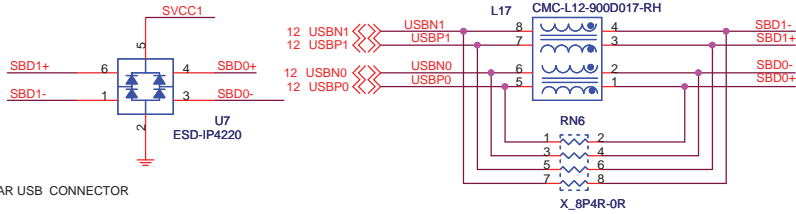


### POWER CIRCUIT FOR USB PORT 0,1



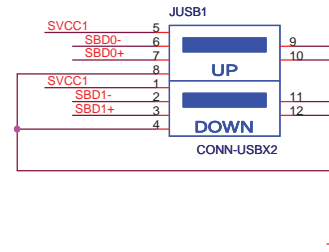
#### USB Interface

Diff. Trace width 7.5 mils & 7.5 mils space.  
 Diff. & other space 20 mils.  
 Length matching: < 150 mils  
 Ttrace length 0" to 17"



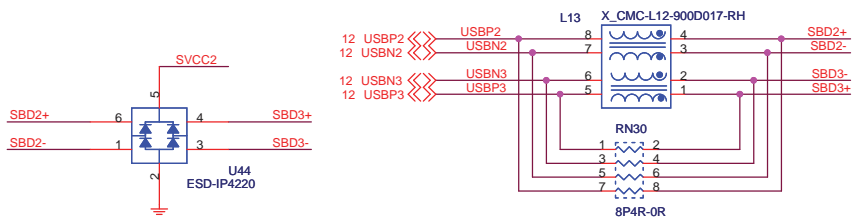
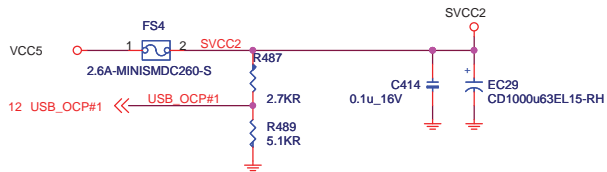
### FRONT PANEL USB CONNECTOR FOR USB PORT 0,1

USB Connector for Front Panel



Copy from 9628

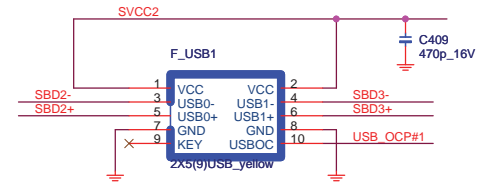
### POWER CIRCUIT FOR USB PORT 2,3



#### USB Interface

Diff. Trace width 7.5 mils & 7.5 mils space.  
 Diff. & other space 20 mils.  
 Length matching: < 150 mils  
 Ttrace length 0" to 17"

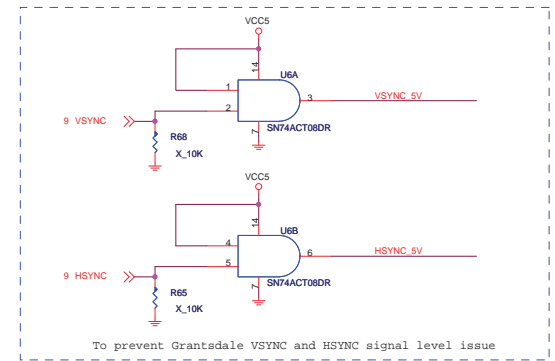
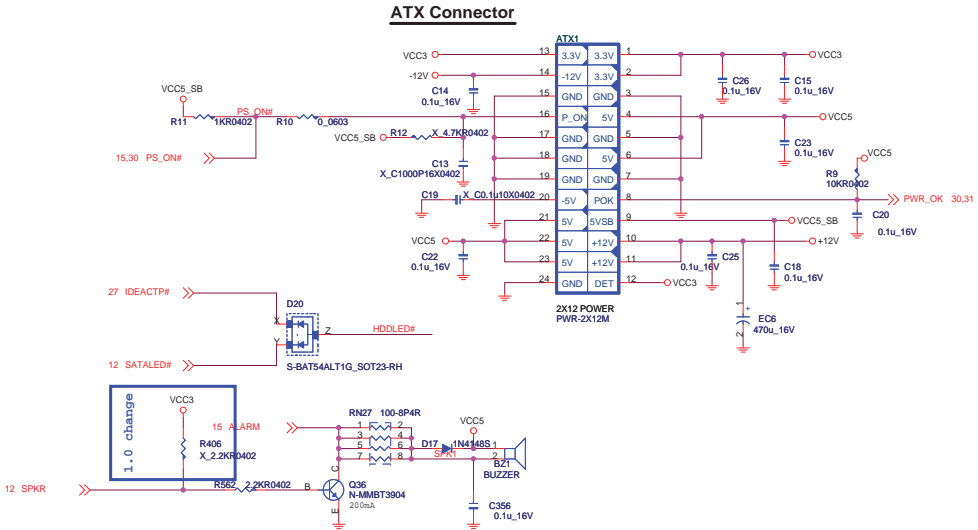
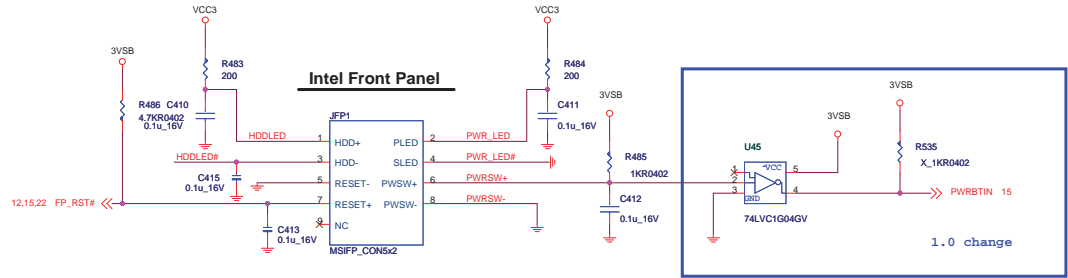
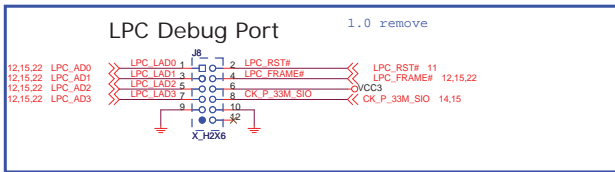
### REAR PANEL USB CONNECTOR FOR USB PORT 2,3



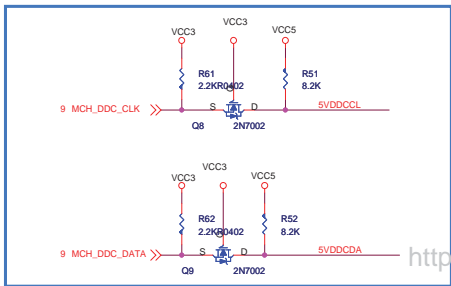
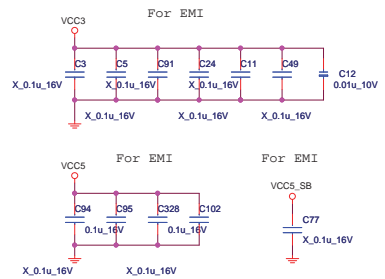
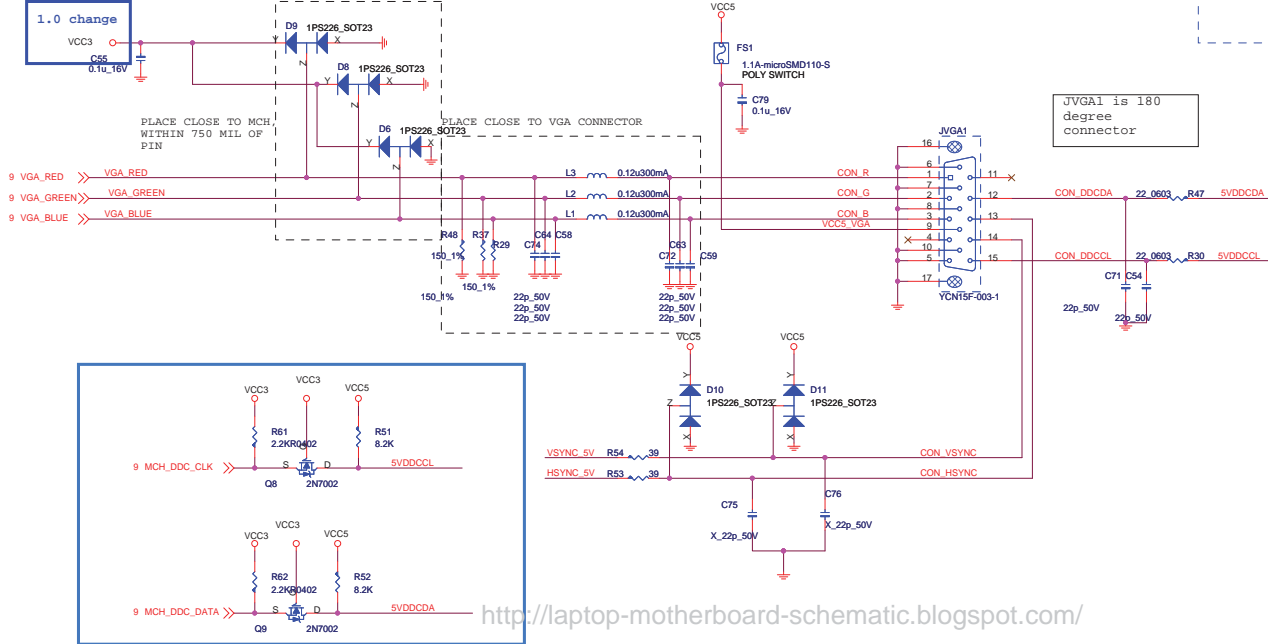
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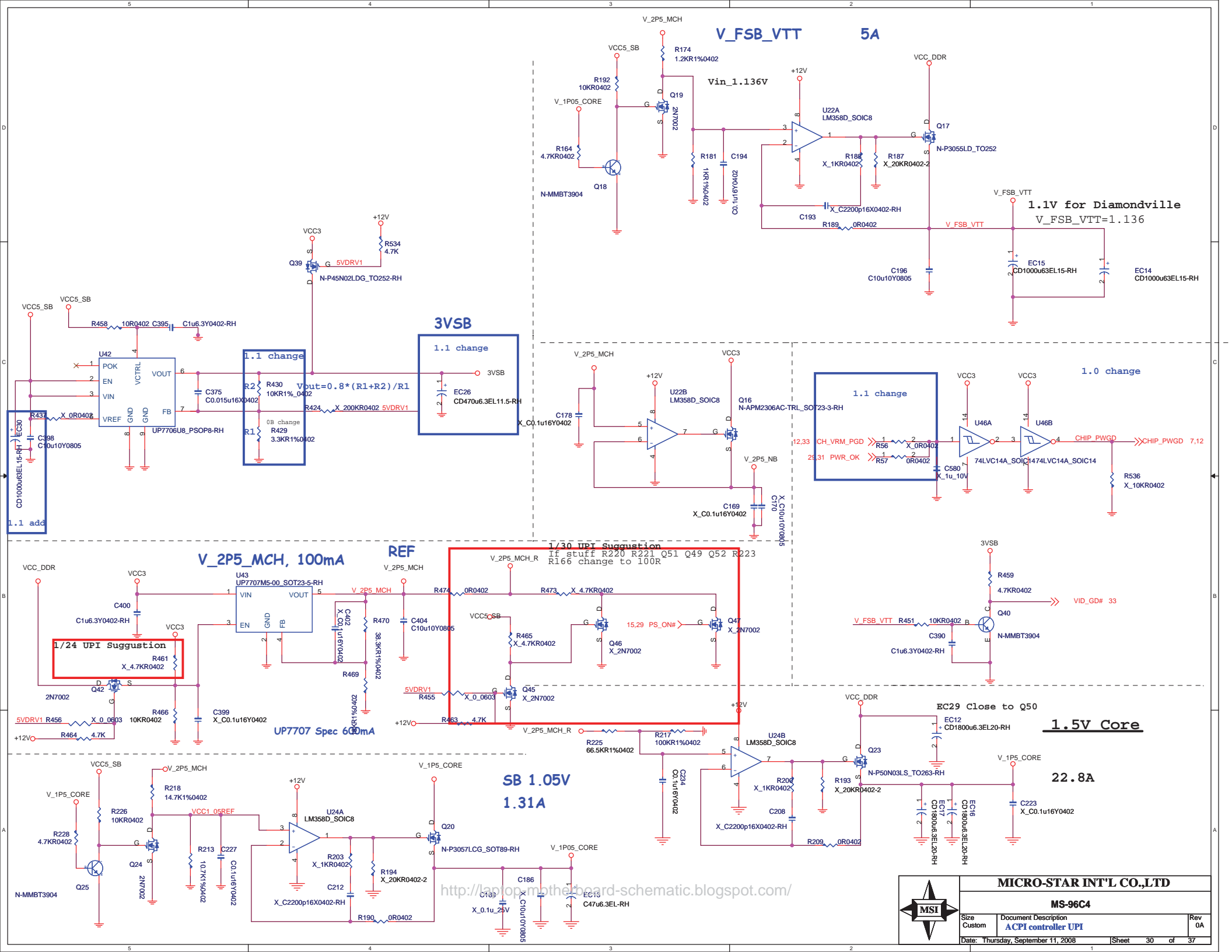
Size B	Document Description <b>USB CONNECTORS</b>	Rev 0A
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### Video Connector



<http://laptop-motherboard-schematic.blogspot.com/>



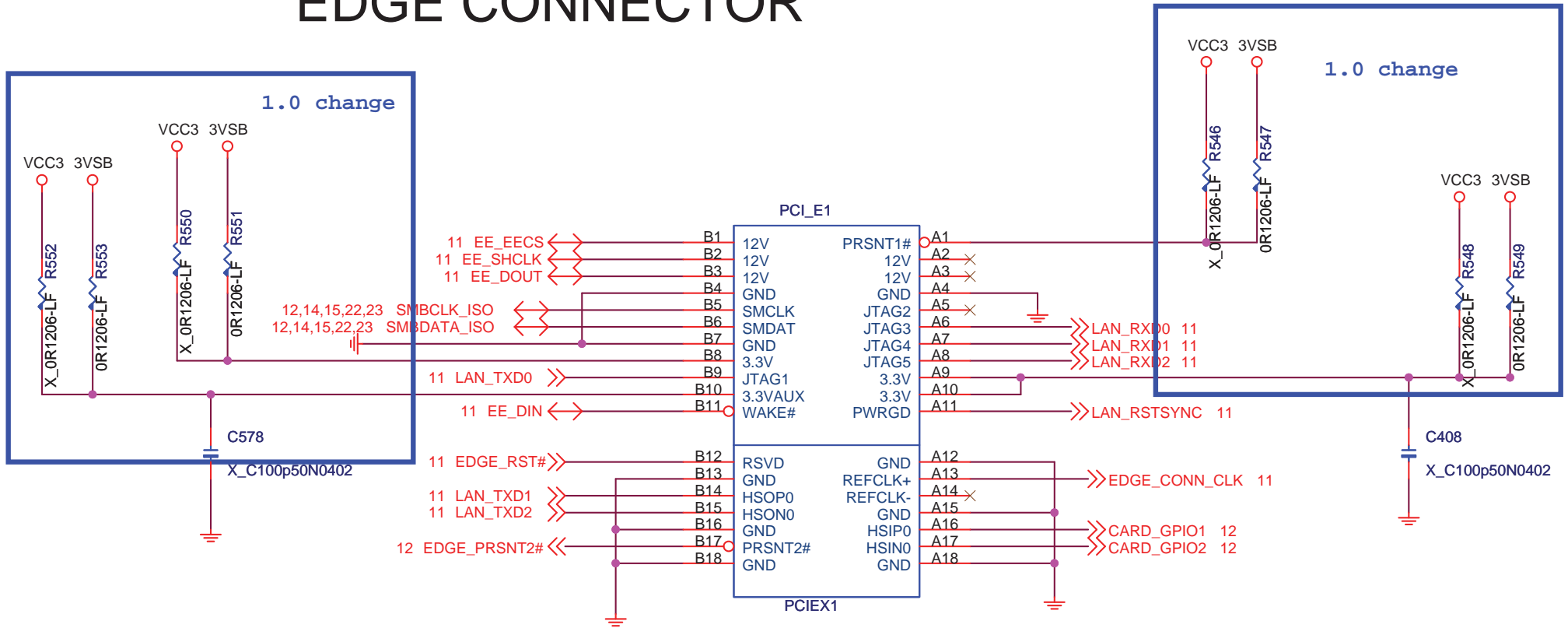
<http://slaptopmotherboard-schematic.blogspot.com/>



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<b>MS-96C4</b>		
Size Custom	Document Description <b>ACPI controller UPI</b>	Rev 0A
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# EDGE CONNECTOR



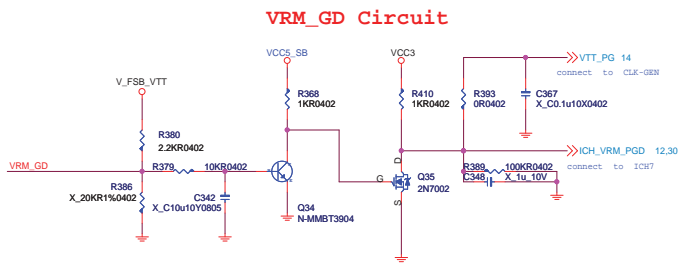
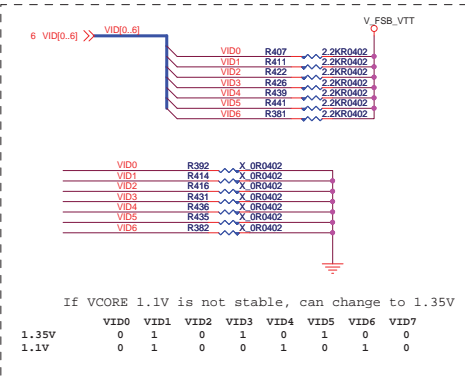
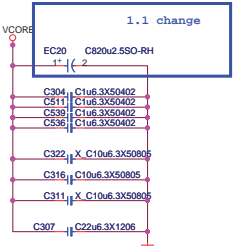
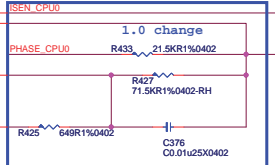
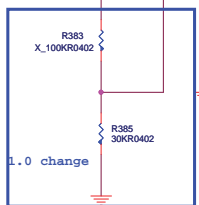
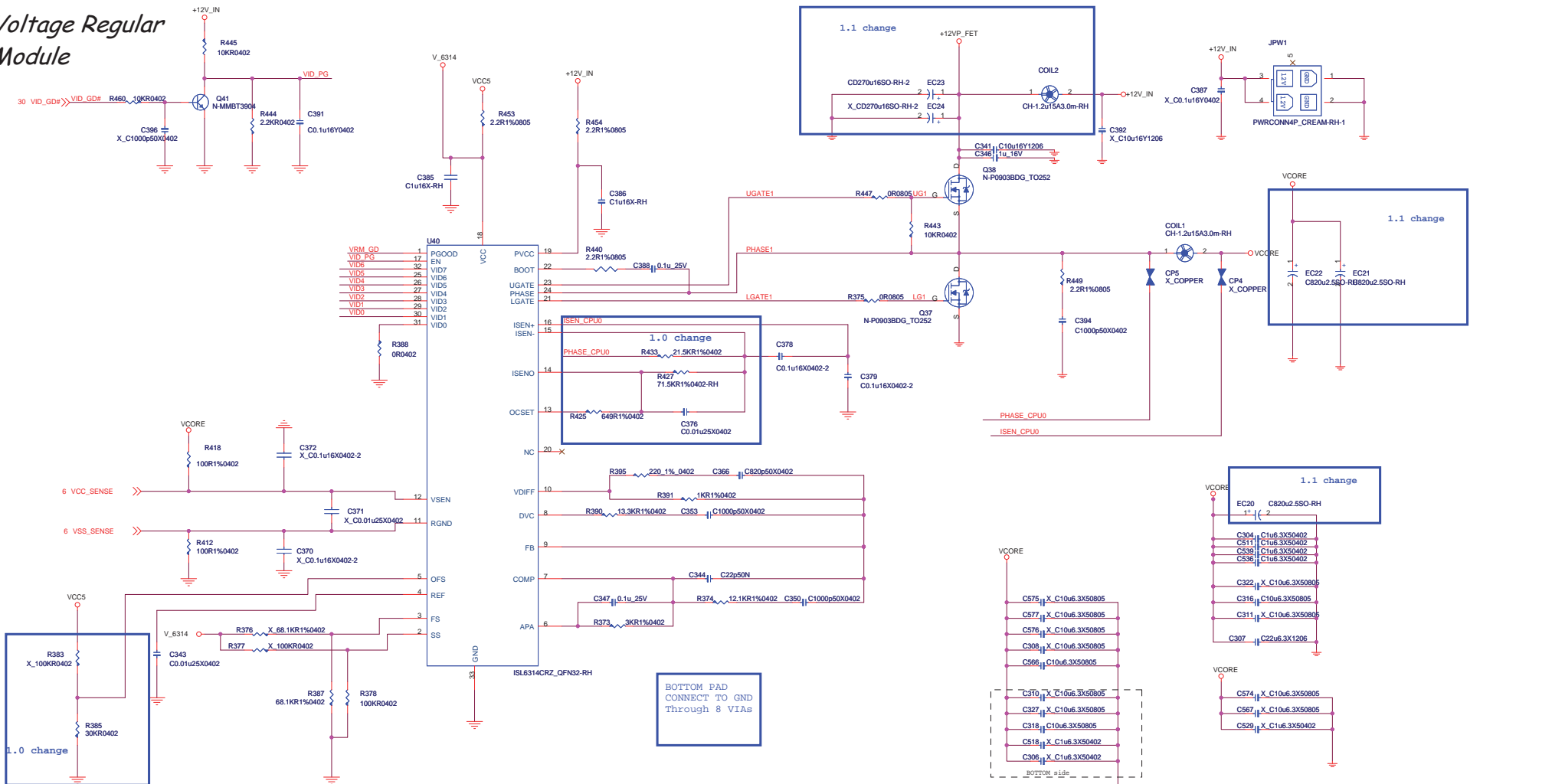
MICRO-STAR INT'L CO.,LTD

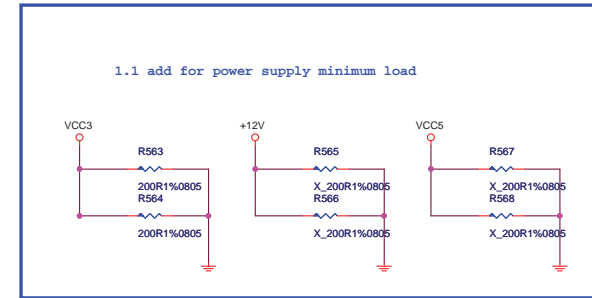
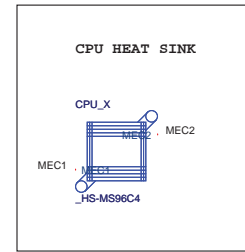
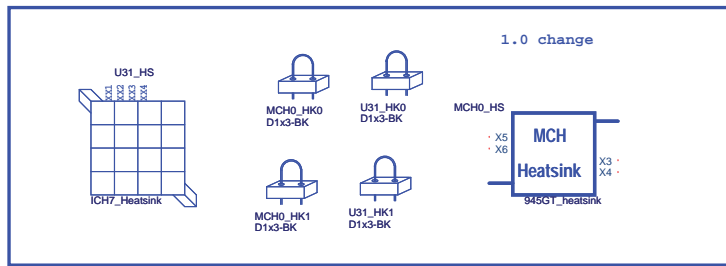
MS-96C4

Size A	Document Description <b>Golden Finger</b>	Rev 0A
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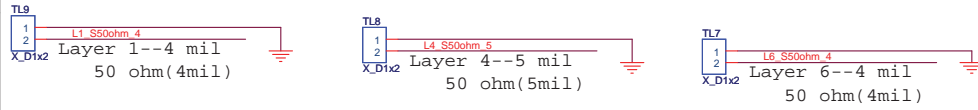


# Voltage Regular Module

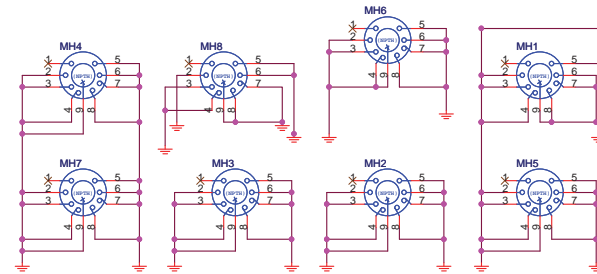
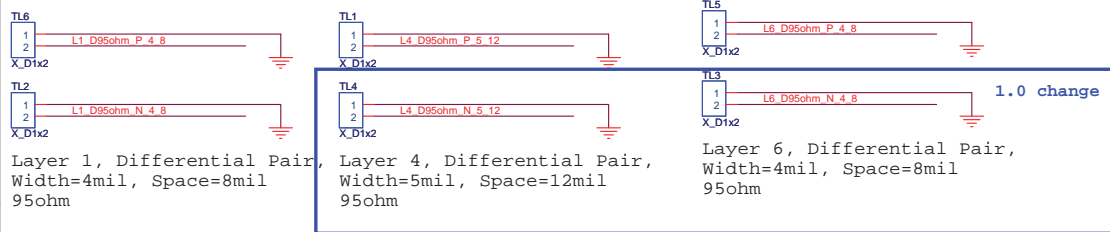




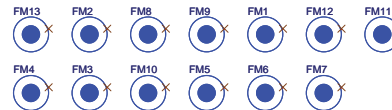
**Impedance Test Port: Signal-50ohm**



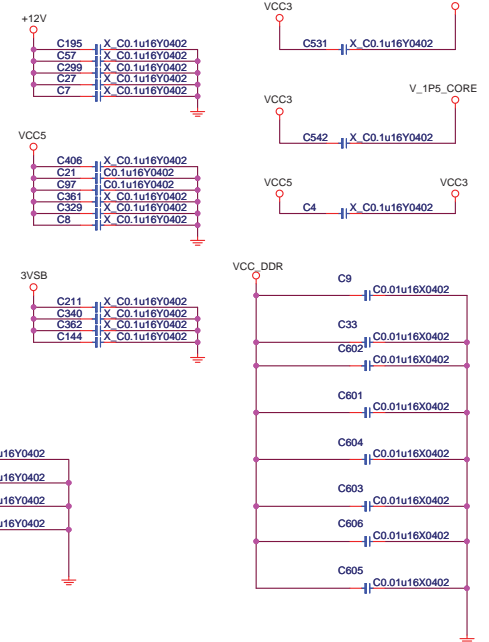
**Impedance Test Port: Differential-95ohm**



**Optics Orientation Holes**



**EMI**



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<b>MS-96C4</b>		
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