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# NEC:Rodem-MA Rodem-VS

## MSI:MS-7402N1

Version: 0A



**CPU:** Conroe family processors in LGA775 Package.

**System Chipset:**

NVIDIA MCP73PV single-chip

**On Board Device:**

BIOS -- SPI Flash 4M

LAN -- Broadcom 5787M

Super I/O -- SMSC5017

AUDIO -- Realtek HD ALC262

**Main Memory:**

signal-channel DDR-II \* 2 (667MHZ)


**Expansion Slots:**

Mini PCIE

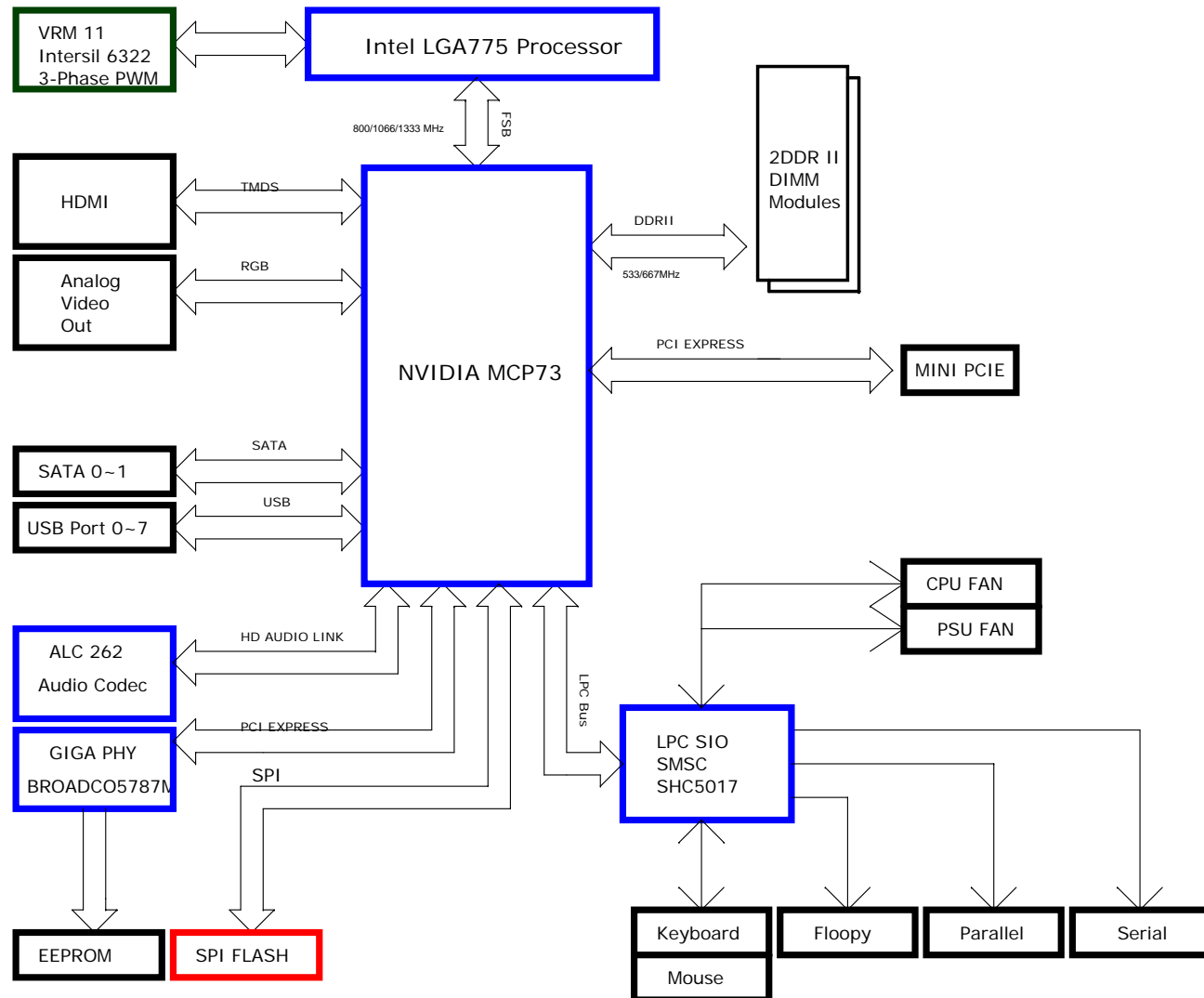
**Intersil PWM:**

Controller: Intersil ISL6312 (3 Phases)

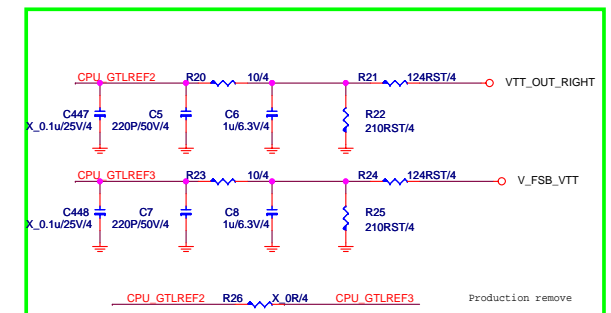
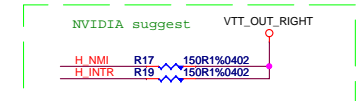
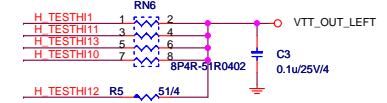
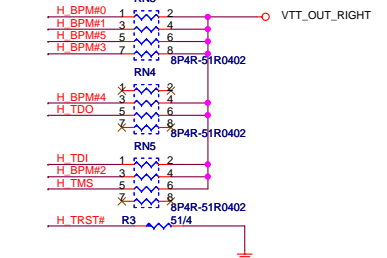
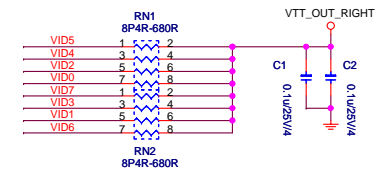
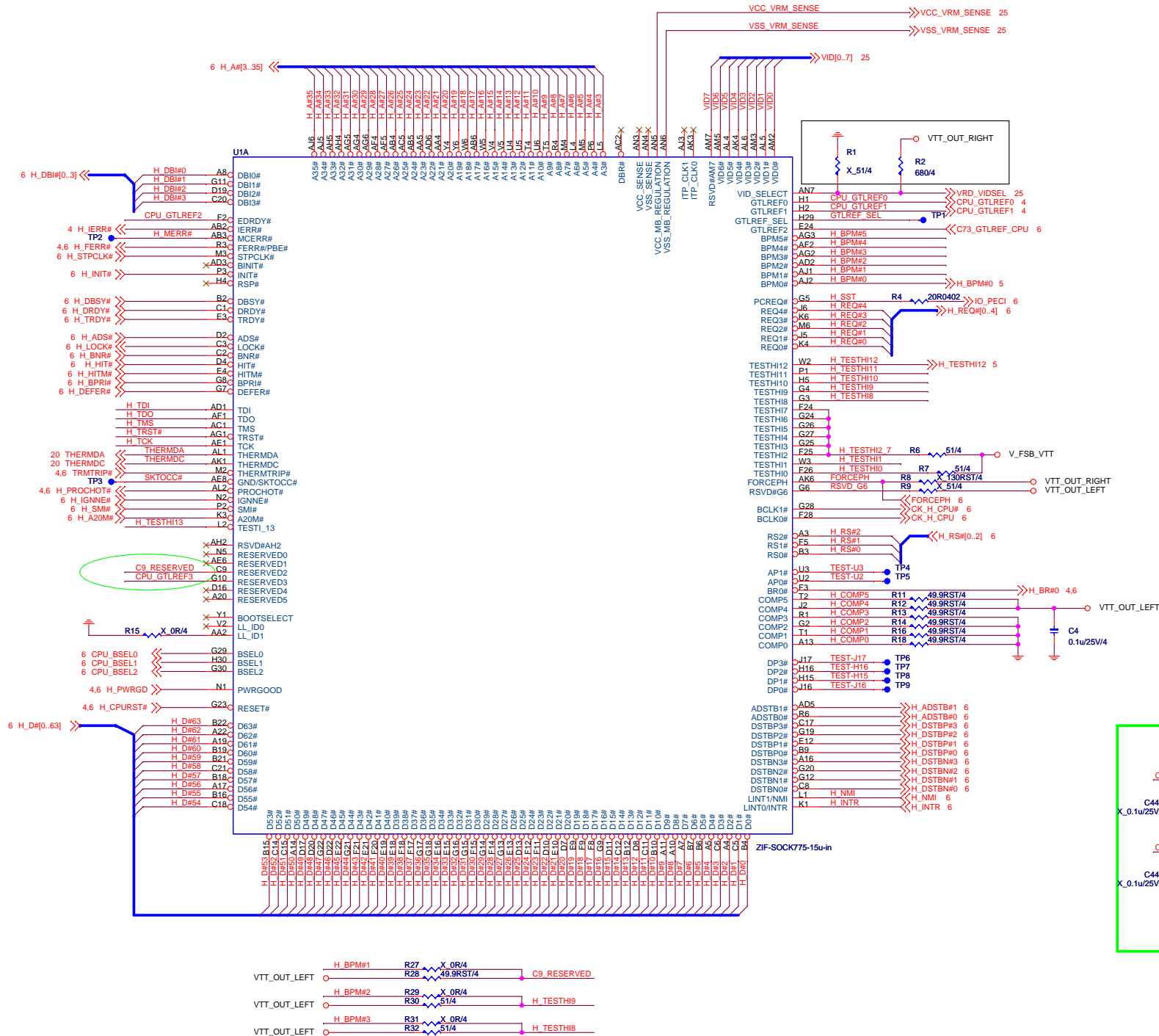
	ERP NUMBER		Orcad Configure	BOM
0A	706-6460N1-01S		Cfg-7402-MA	
0A	706-6460N1-01S		Cfg-7402-VS	

 <b>MICRO-START INTL CO.,LTD.</b>			
Title: COVER SHEET			
Size	Document Number	Rev	
	MS-7402	0A	
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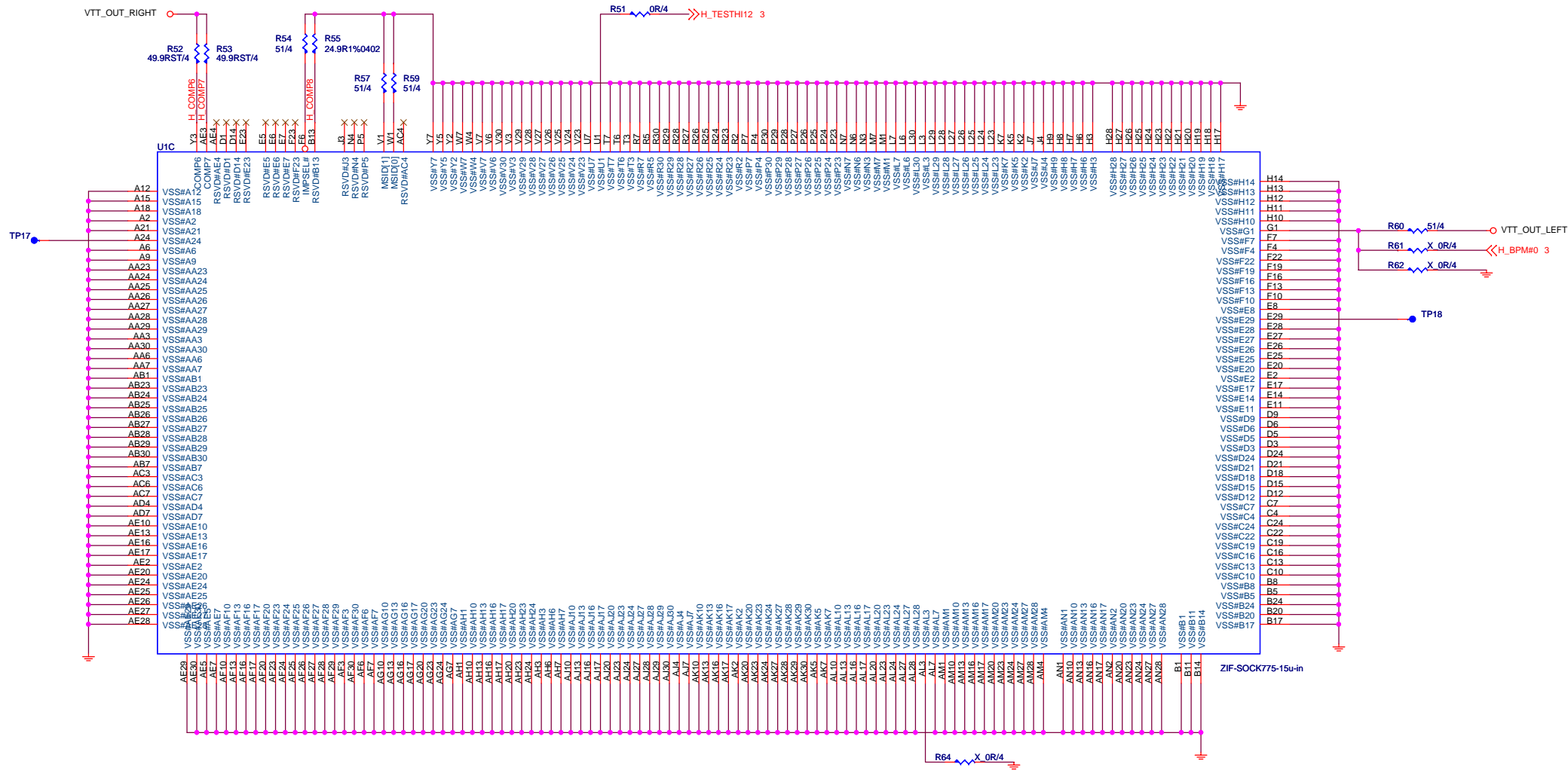
# Block Diagram



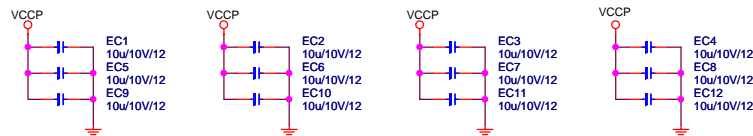
### CPU SIGNAL BLOCK



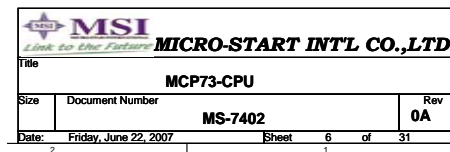


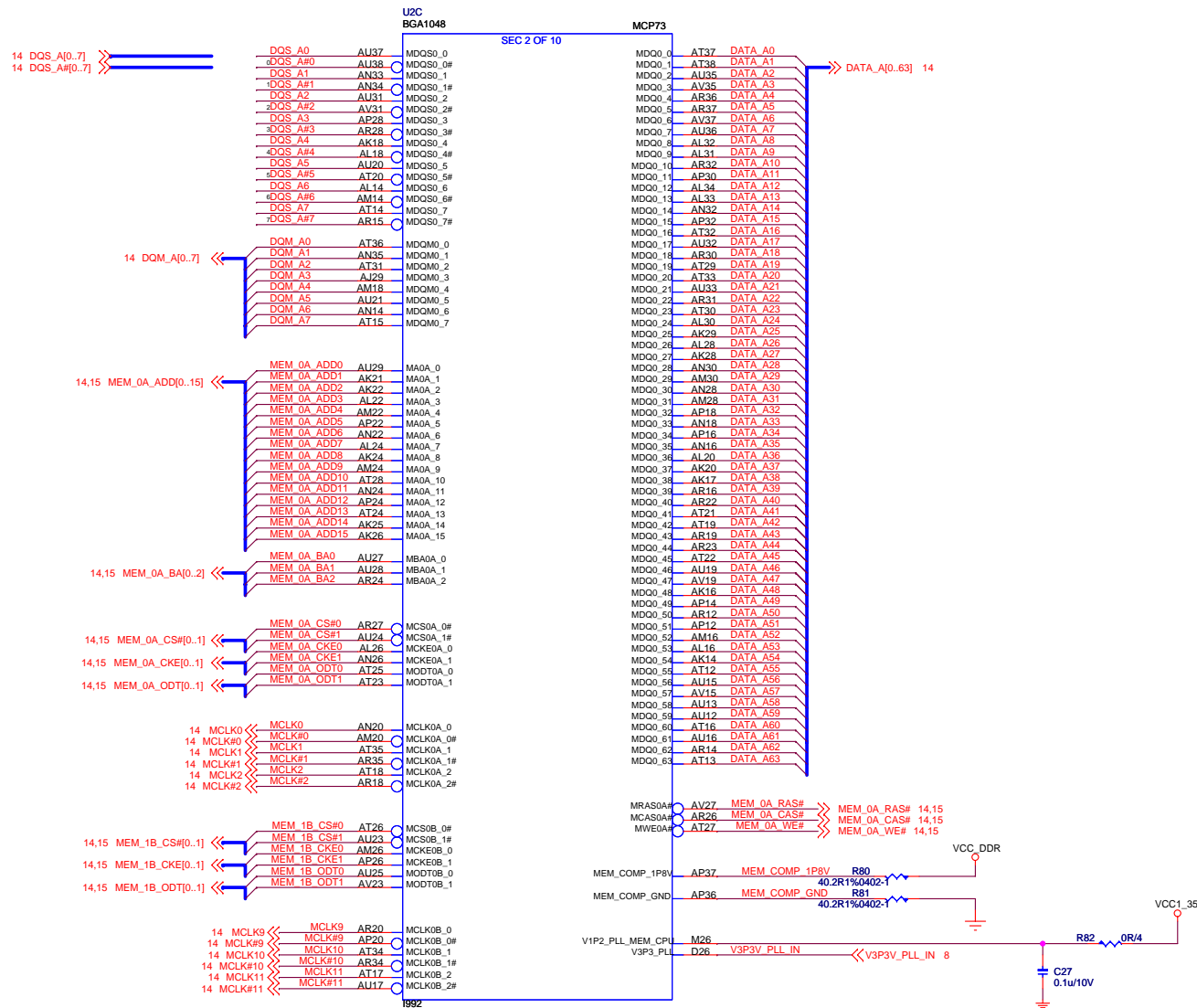


### CPU DECOUPLING CAPACITORS



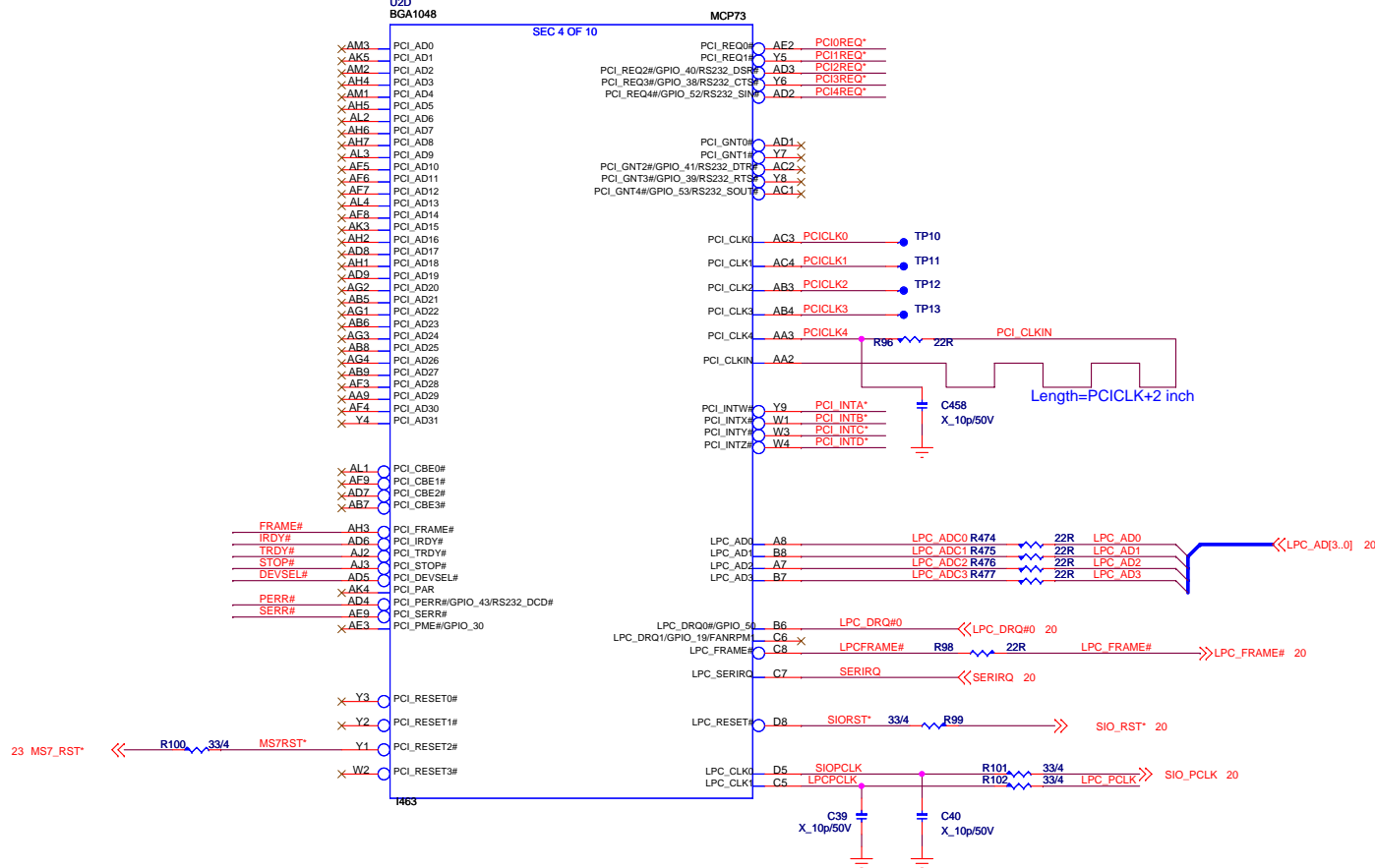
Place these caps within socket cavity



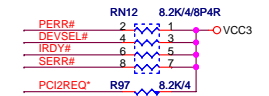
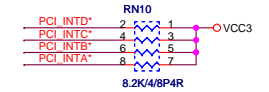




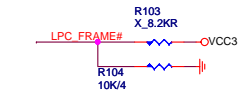




## PCI PULLUP resistor

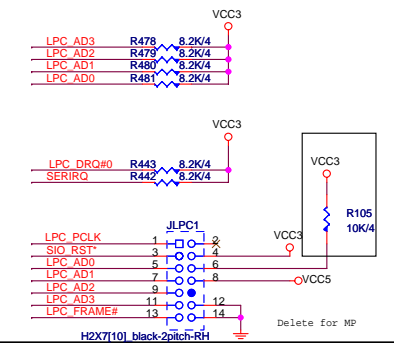


## ROM mode strapping



T0A_SD000* LPC_FRAME#		
0	0	=LPC
1	0	=PCI
1	1	=SP1
1	1	=RESERVED

## LPC DEBUG PORT



MSI  
Link to the Future

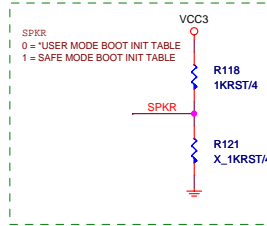
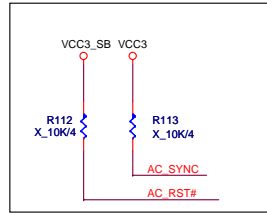
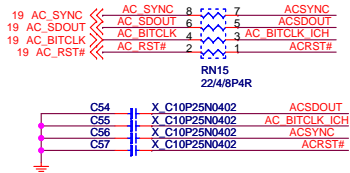
MICRO-START INT'L CO.,LTD.

Title		
MCP73-PCI/LPC		
Size	Document Number	Rev
	MS-7402	0A
Date:	Friday, June 22, 2007	Sheet 9 of 31

# SERIAL ATA CONNECTOR BLOCK



## Codec damping resistor/EMI caps



19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

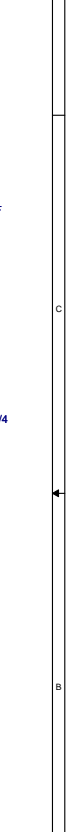
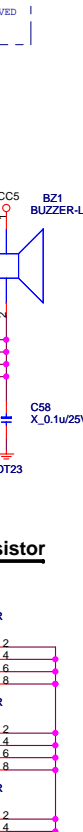
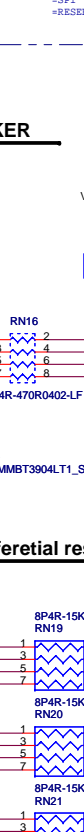
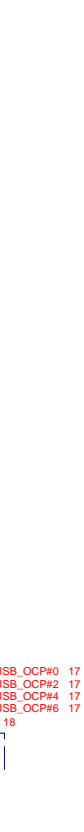
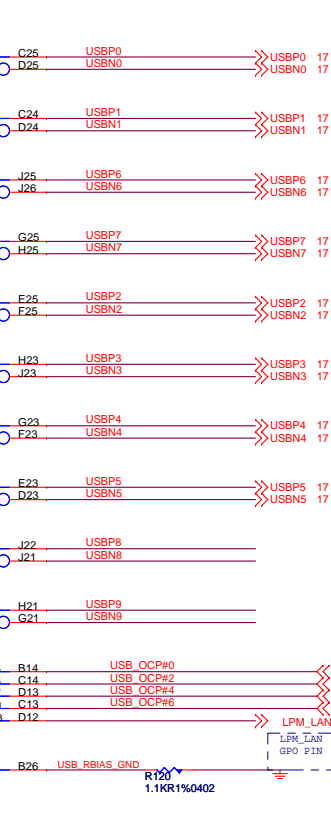
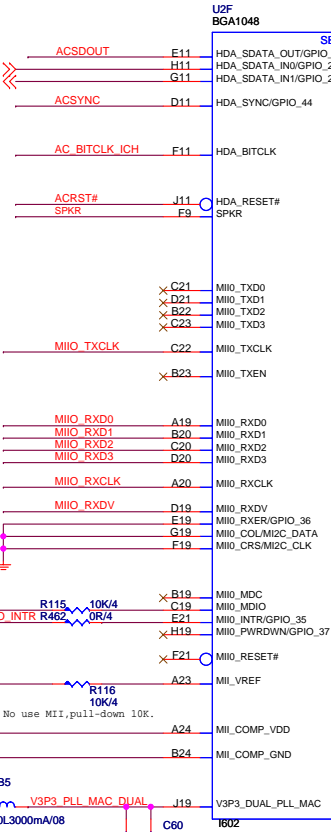
19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

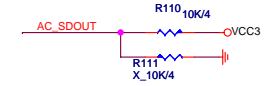
19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

19 AC\_SYNC  
19 AC\_SDOOUT  
19 AC\_BITCLK  
19 AC\_RST#

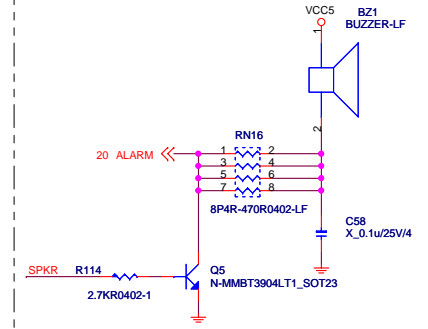


## ROM mode strapping

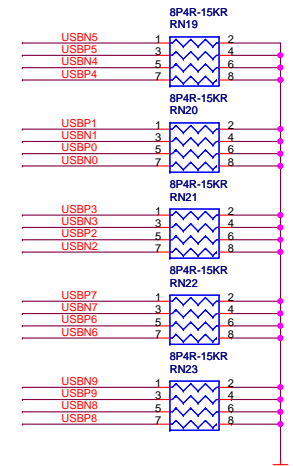


HDA_SDOOUT	LPC_FRAME#	
0	0	=LPC
0	1	=PCI
1	0	=SPI
1	1	=RESERVED

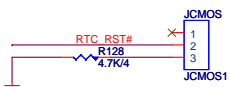
## SPEAKER



## For USB differential resistor

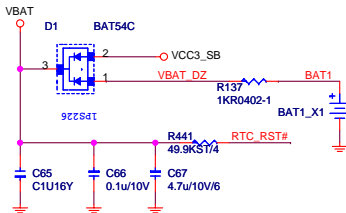


## CLEAR CMOS JUMPER



CMOS CLEAR	NORMAL	CLEAR
JBAT1	(1-2)	(2-3)

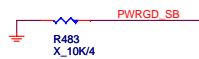
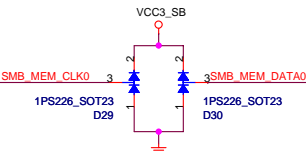
## BATTERY



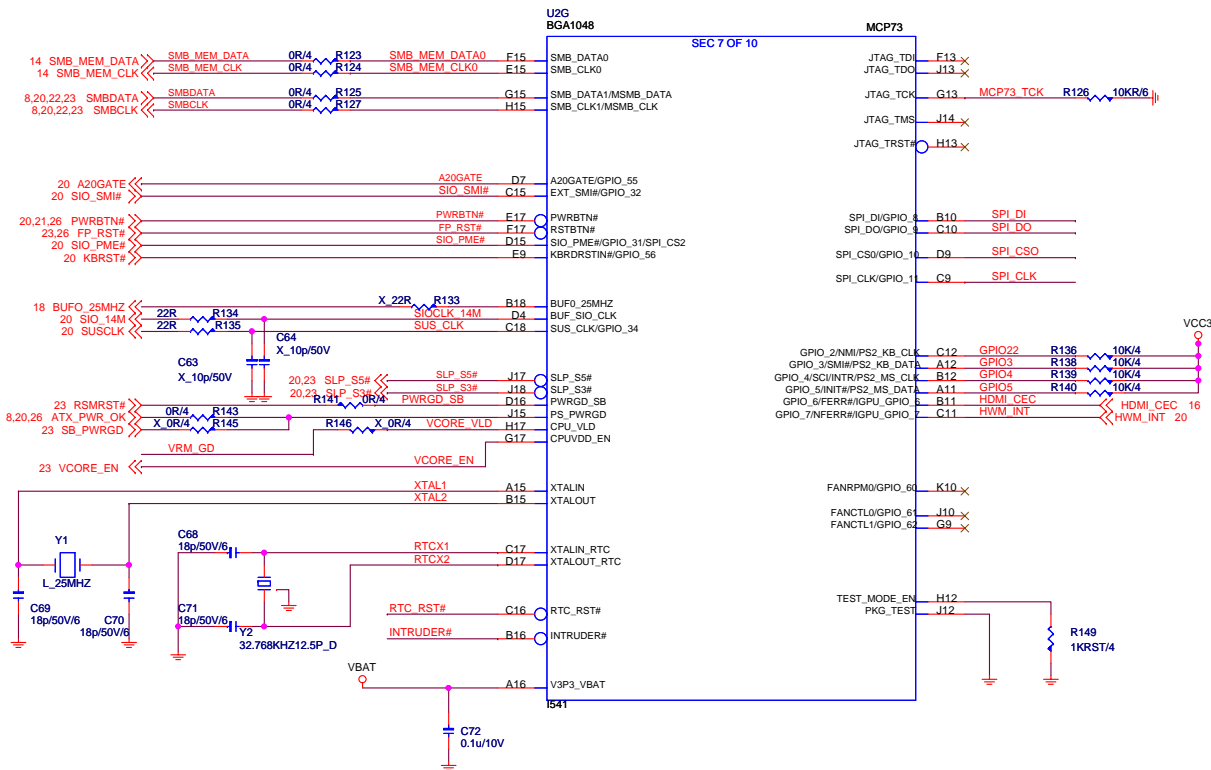
## INTRUDER



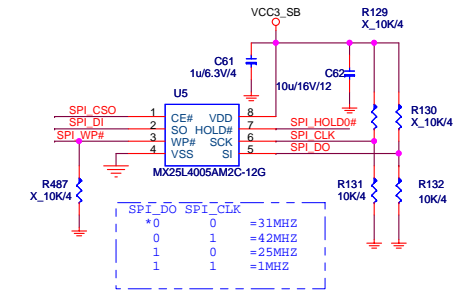
## SMB ESD Protection Diodes



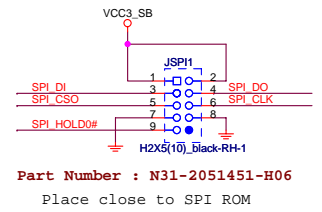
## NVIDIA AP NOTICE



## SPI FLASH ROM

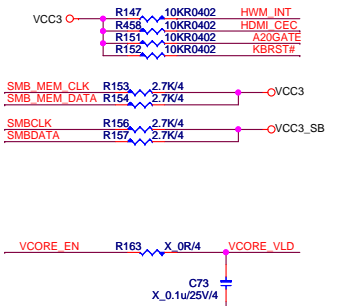
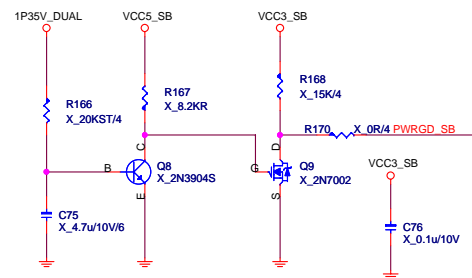
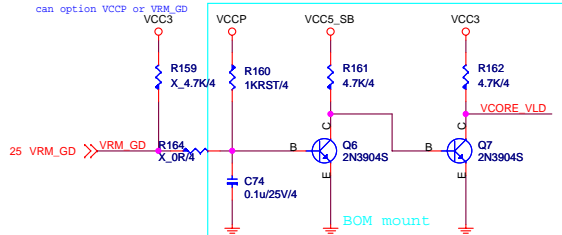


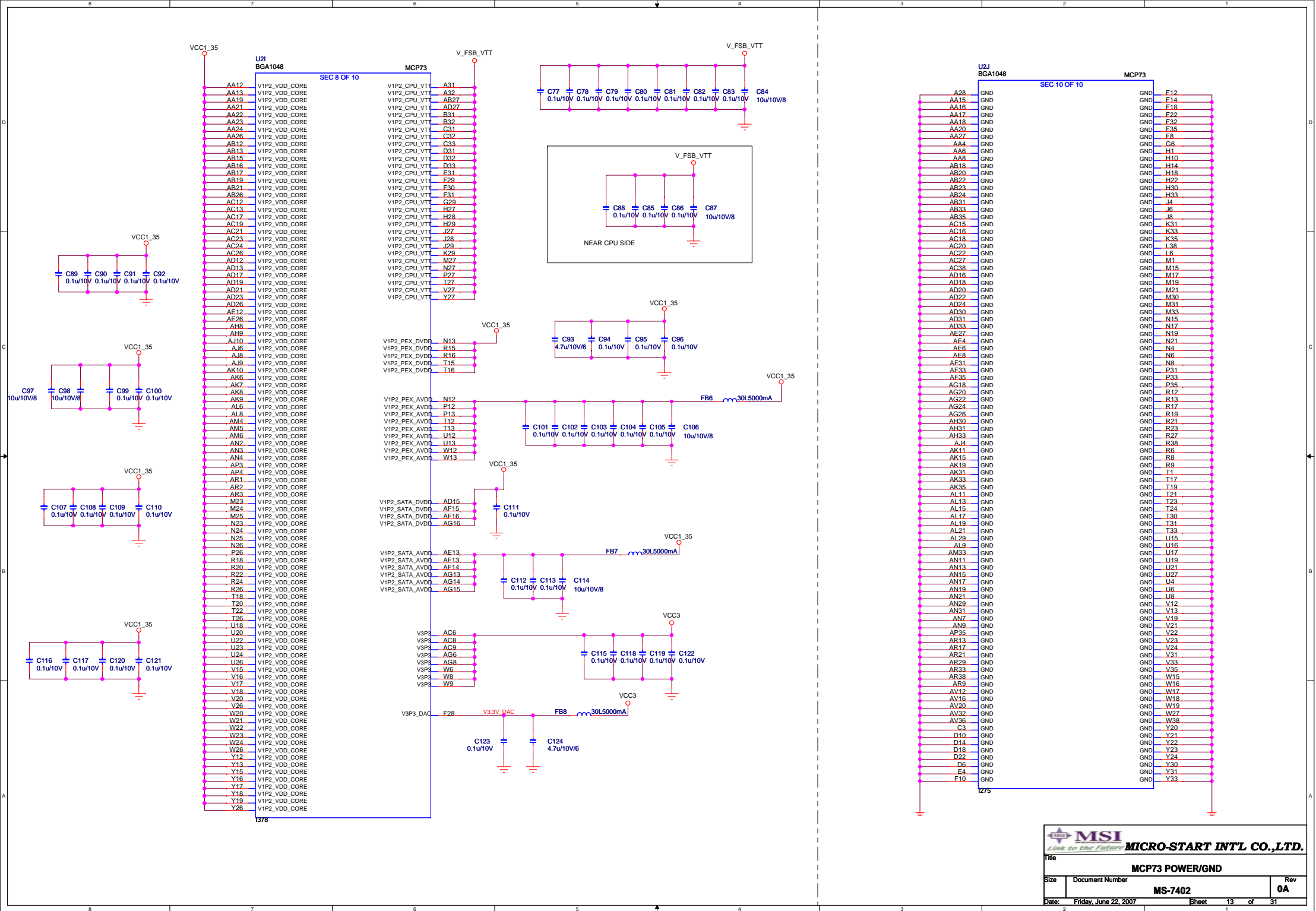
## SPI DEBUG PORT

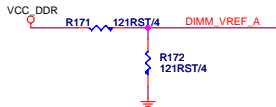


Part Number : N31-2051451-H06  
Place close to SPI ROM

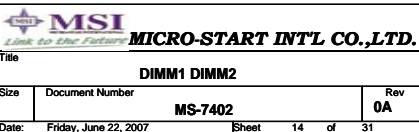
## Vcore power-on sequence control circuit







**ADDRESS: 000  
0xA0**



**ADDRESS: 0010xA2**

8 7 6 5 4 3 2 1

**DIMM1/DIMM2 VDD to VTT decoupling**

Place near ADDR/CTRL traces

**DIMM1/DIMM2 VTT decoupling**

**DIMM1 decoupling**

**DIMM2 decoupling**

**Terminator**

**U2H BGA1048**

**MCP73**

1P35V\_DUAL

VCC3\_SB

SEC 9 OF 10

8 7 6 5 4 3 2 1

MSI  
Link to the Future  
MICRO-START INTL CO.,LTD.

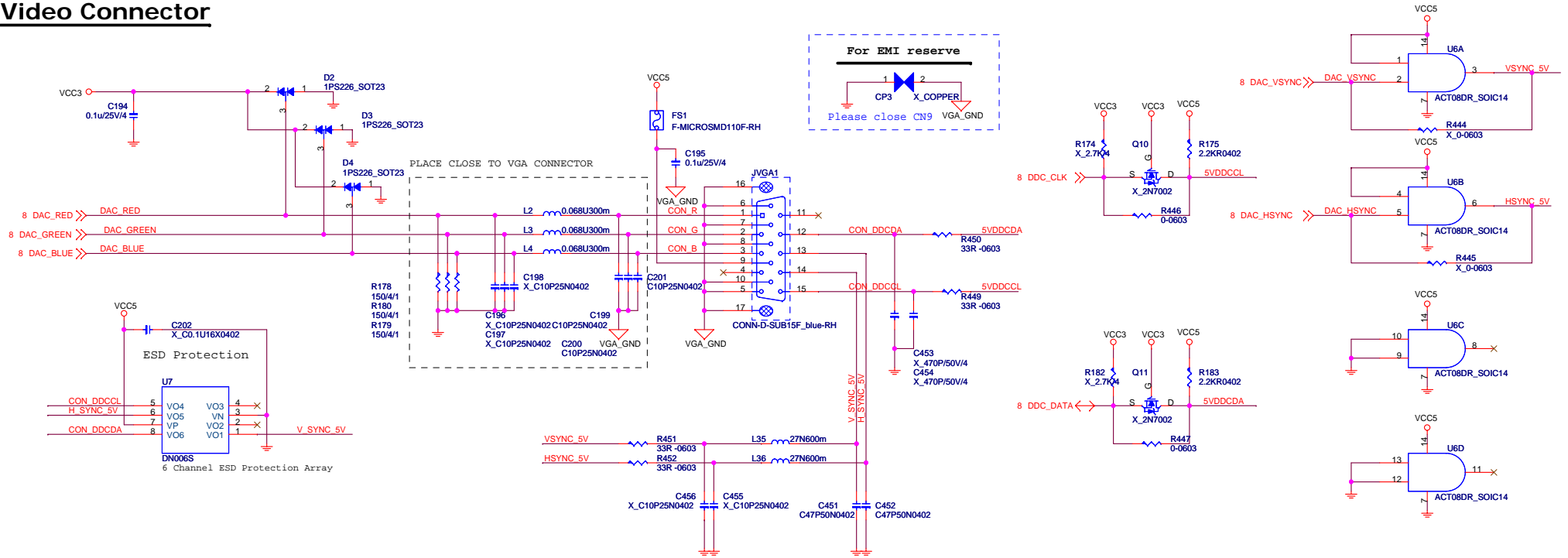
**DIMM TERMINATION & POWER**

MS-7402

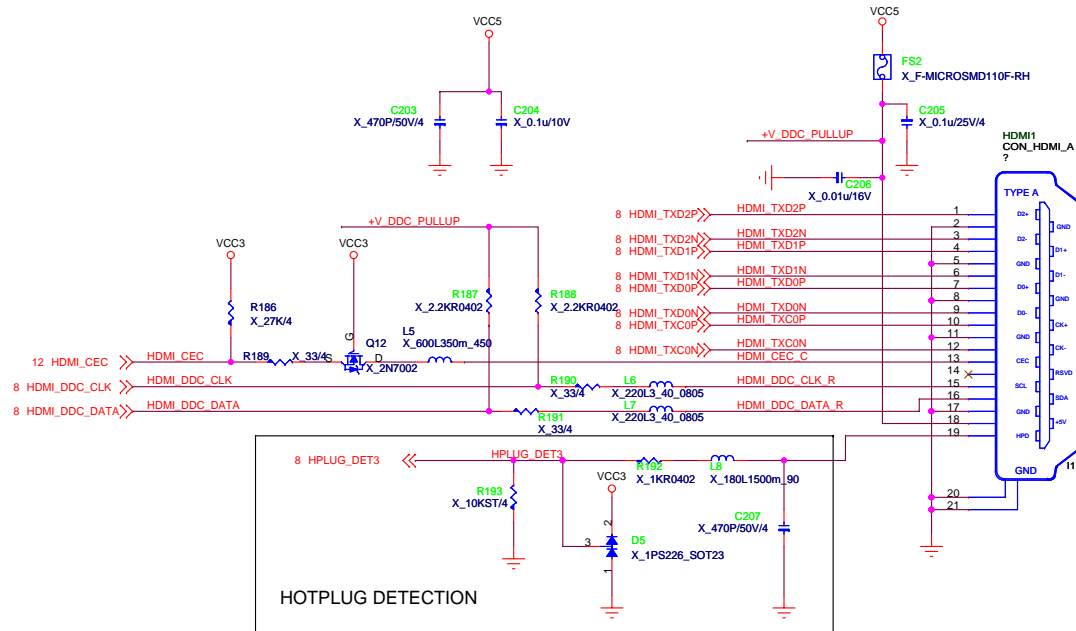
Size Document Number Rev 0A

Date: Friday, June 22, 2007 Sheet 15 of 31

## Video Connector

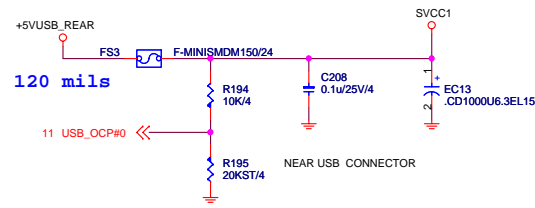


## HDMI Connector

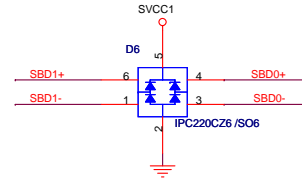




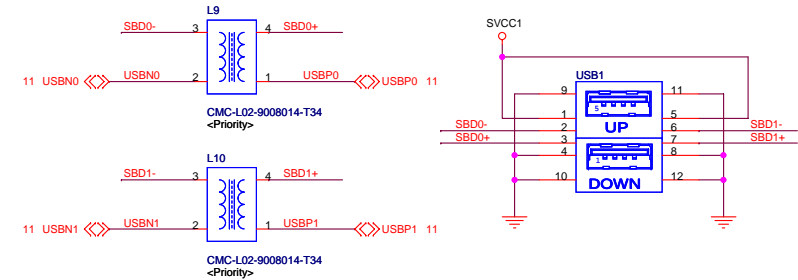
### POWER CIRCUIT FOR USB PORT 0,1



### ESD Protection



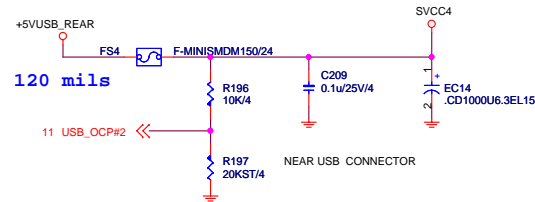
### REAR PANEL USB CONNECTOR FOR USB PORT 0,1



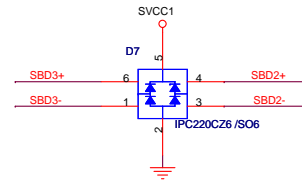
### NEAR USB CONNECTOR

N53-08M0011-F02

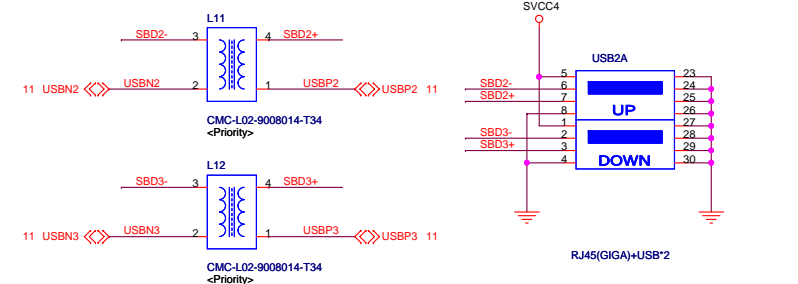
### POWER CIRCUIT FOR USB PORT 2,3



### ESD Protection



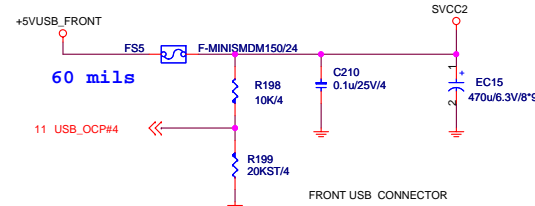
### REAR PANEL USB CONNECTOR FOR USB PORT 2,3



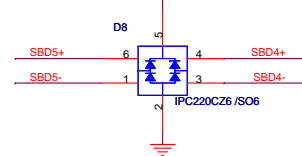
### NEAR USB CONNECTOR

RJ45(GIGA)+USB\*2

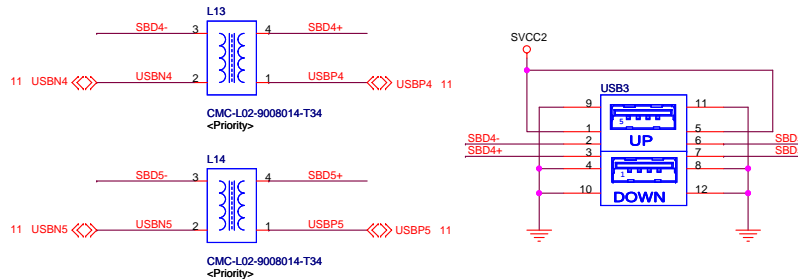
### POWER CIRCUIT FOR USB PORT 4,5



### ESD Protection

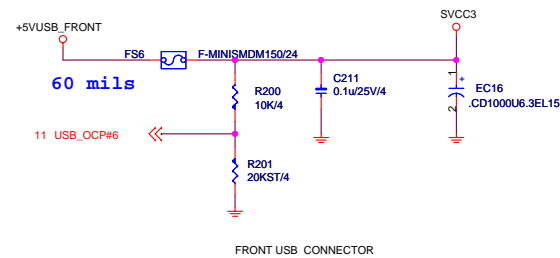


### FRONT PANEL USB CONNECTOR FOR USB PORT 4,5

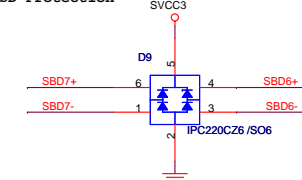


### NEAR USB CONNECTOR

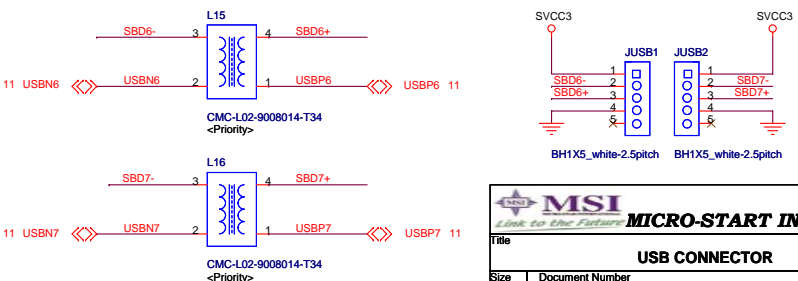
### POWER CIRCUIT FOR USB PORT 6,7




### ESD Protection



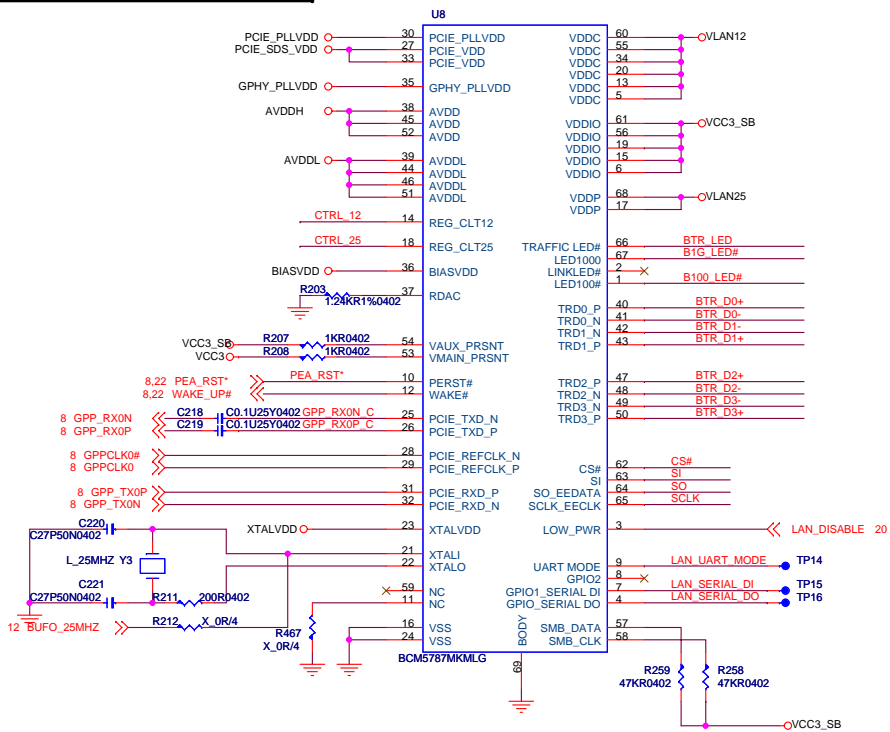
### Memory card reader USB CONNECTOR FOR USB PORT 6,7



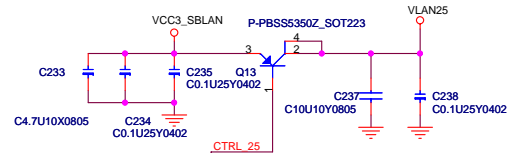
### NEAR USB CONNECTOR

 <b>MICRO-START INT'L CO.,LTD.</b>		
Title		
USB CONNECTOR		
Size	Document Number	Rev
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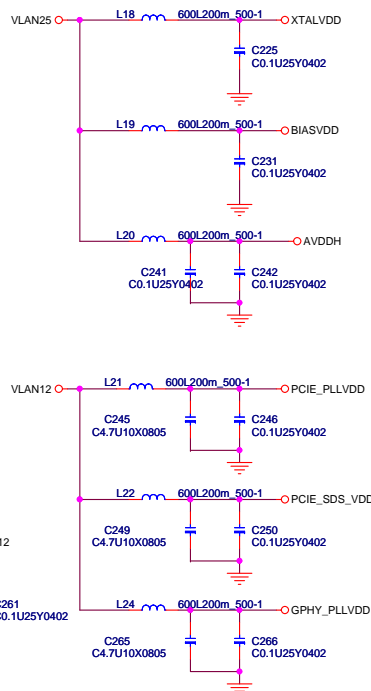
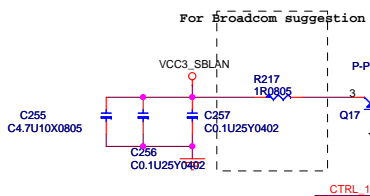
# BCM5787M LAN CHIP



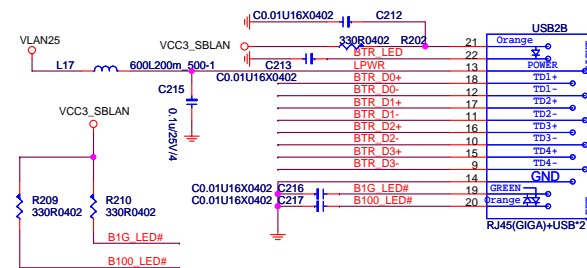
**LAN 2.5 POWER**  
( 235mA )



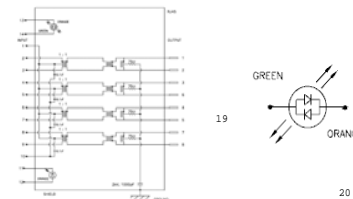
**LAN 1.2 POWER**  
( 590mA )



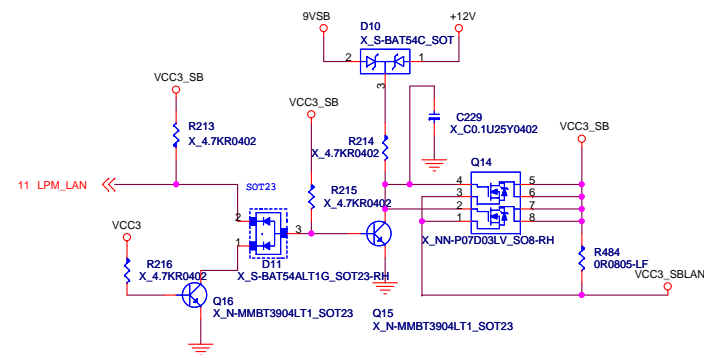
## LAN Connector



## USB1 structure

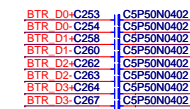
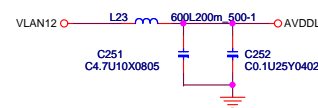


## Power control for power consumption

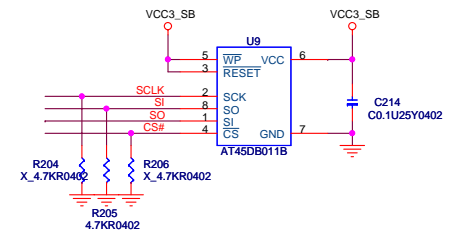


**EMI SUGGESTION**

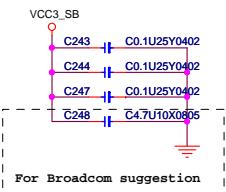
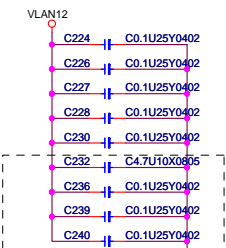
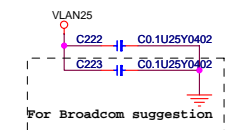
## EMI SUGGESTION



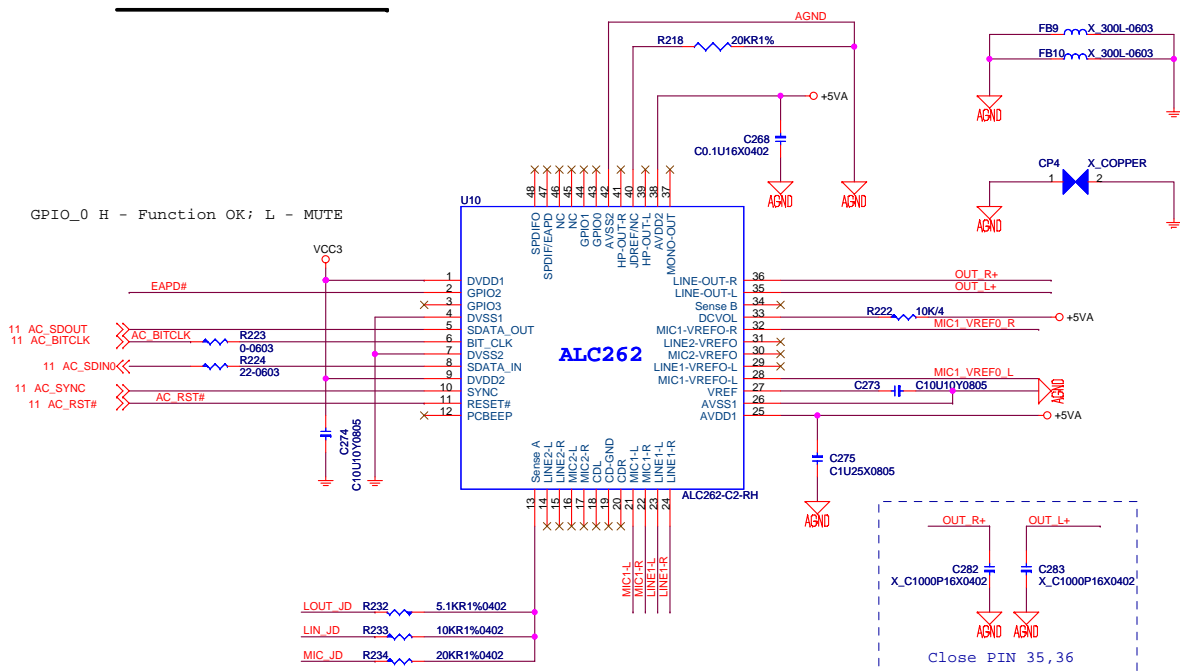
## LAN EEPROM



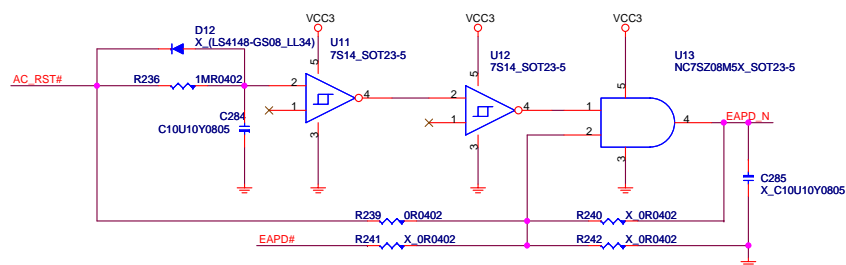
## Bypass CAPs



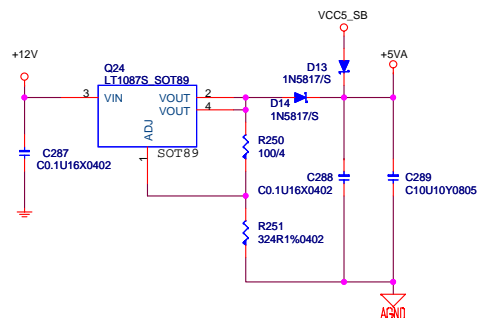
## Reltek HD ALC262



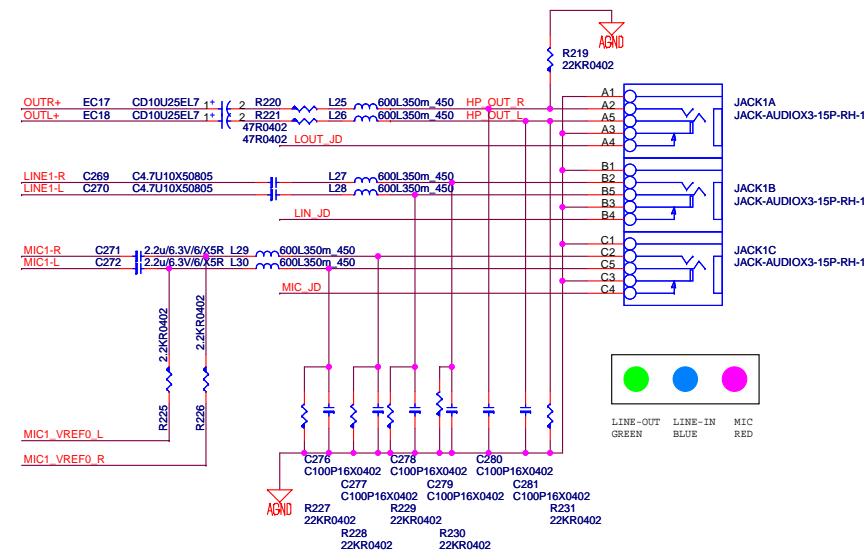
### POP noise circuit



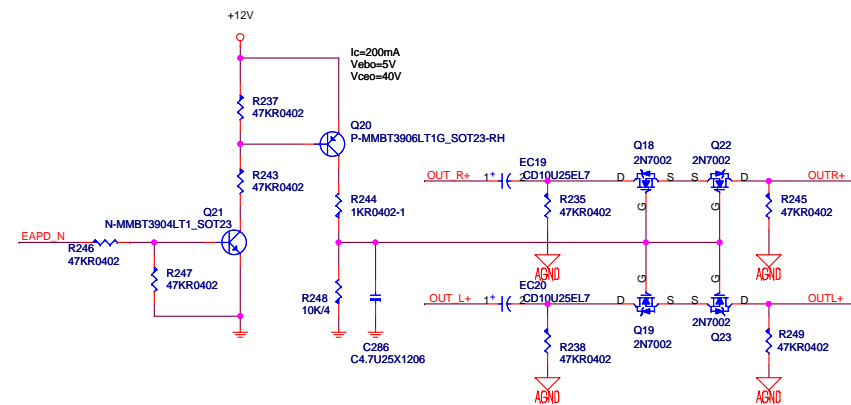
## AUDIO CODE REGULATORS



PHONE JACK.

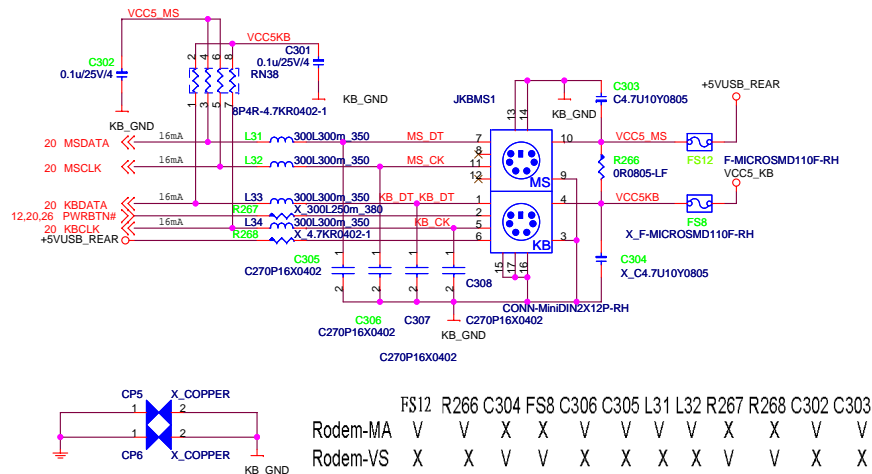


### Smooth pop noise circuit for Line-out

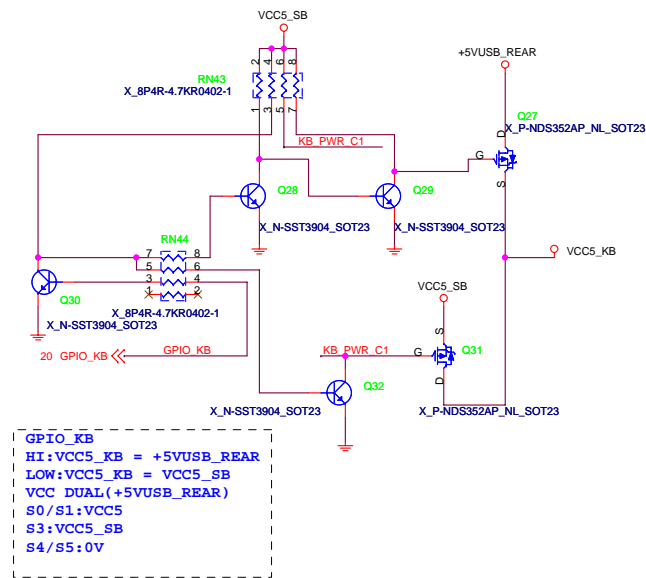




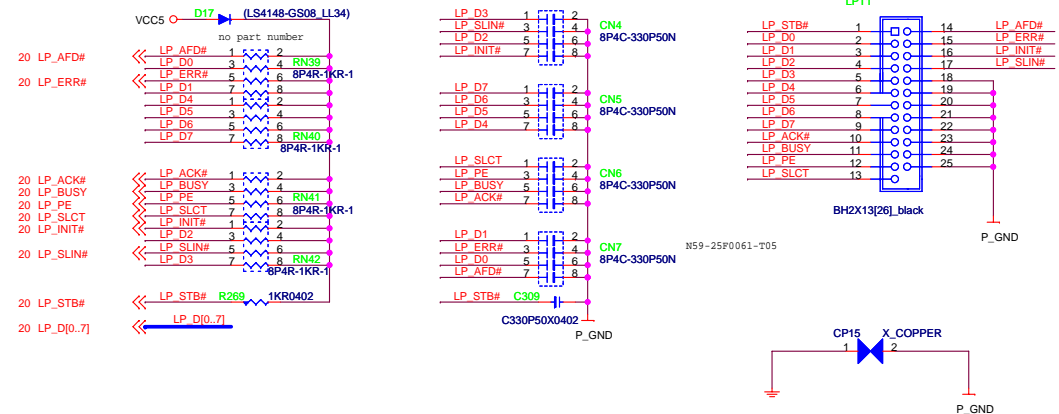
## PS2 KEYBOARD & MOUSE CONNECTOR



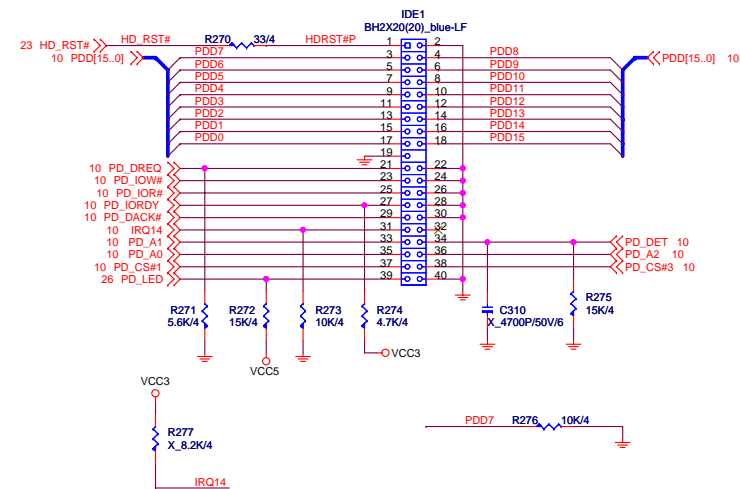
## K/B Power supply function for Rodem-VS



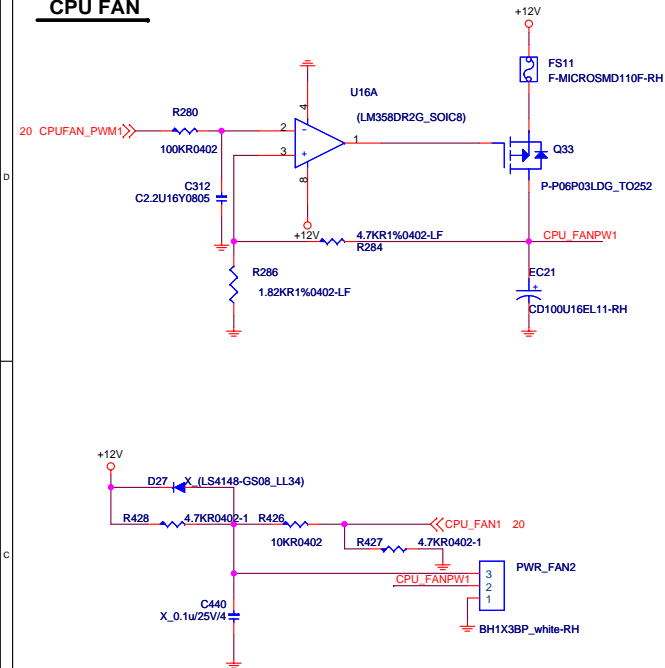
## PARALLAL PORT



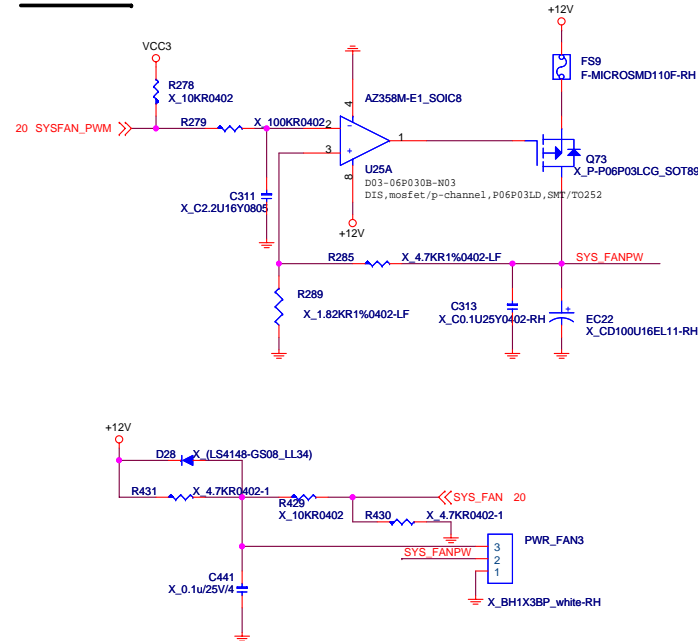
## ATA-133 IDE connector



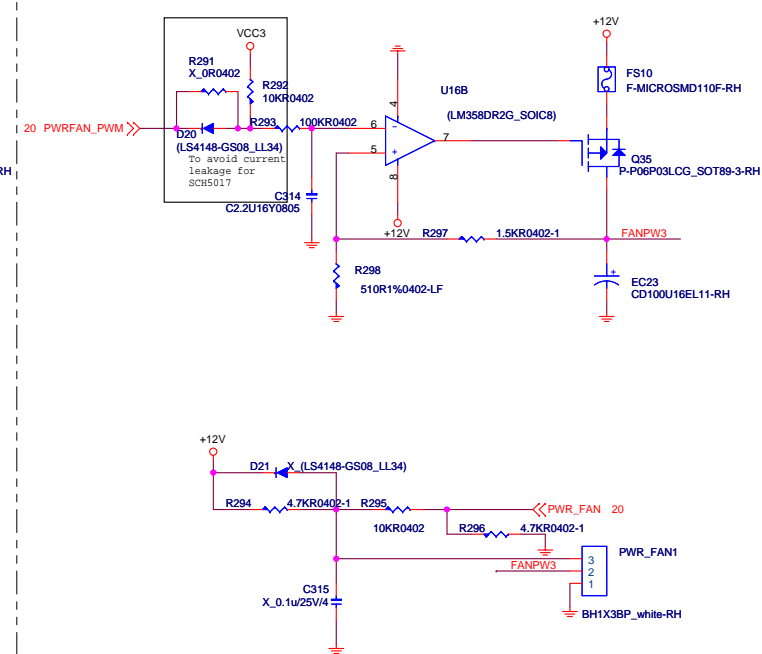
## CPU FAN



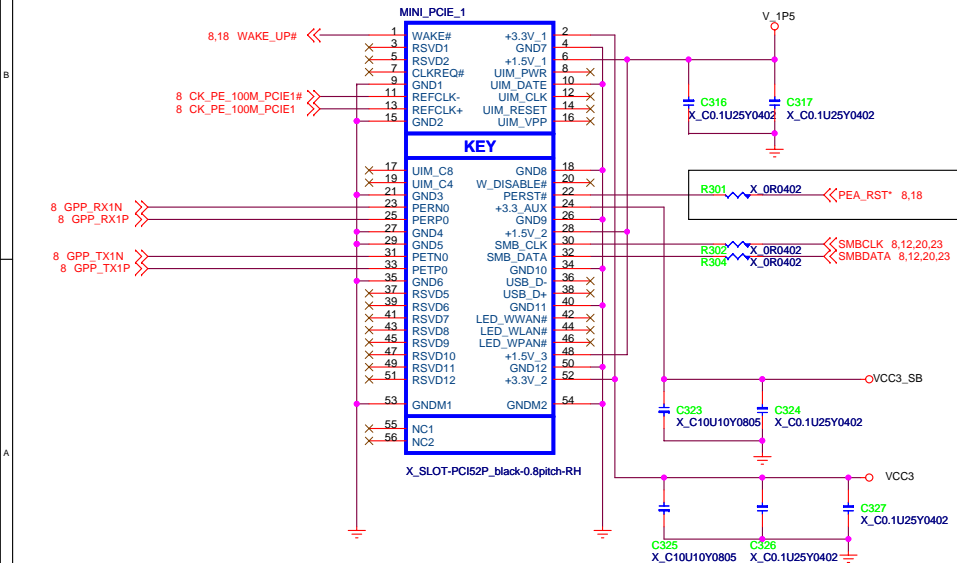
## SYS FAN



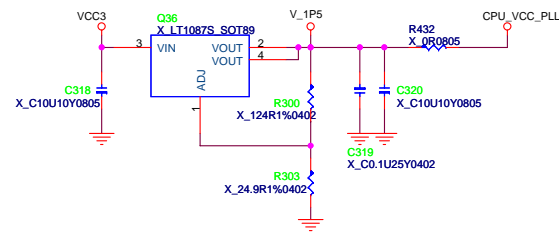
## PWR FAN



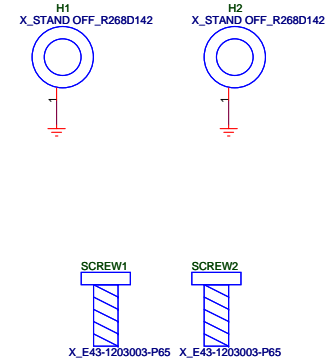
## Mini PCIE



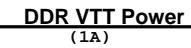
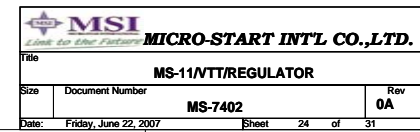
## MINI PCIESLOT V\_1P5 POWER



## MINI PCIESLOT SCREW

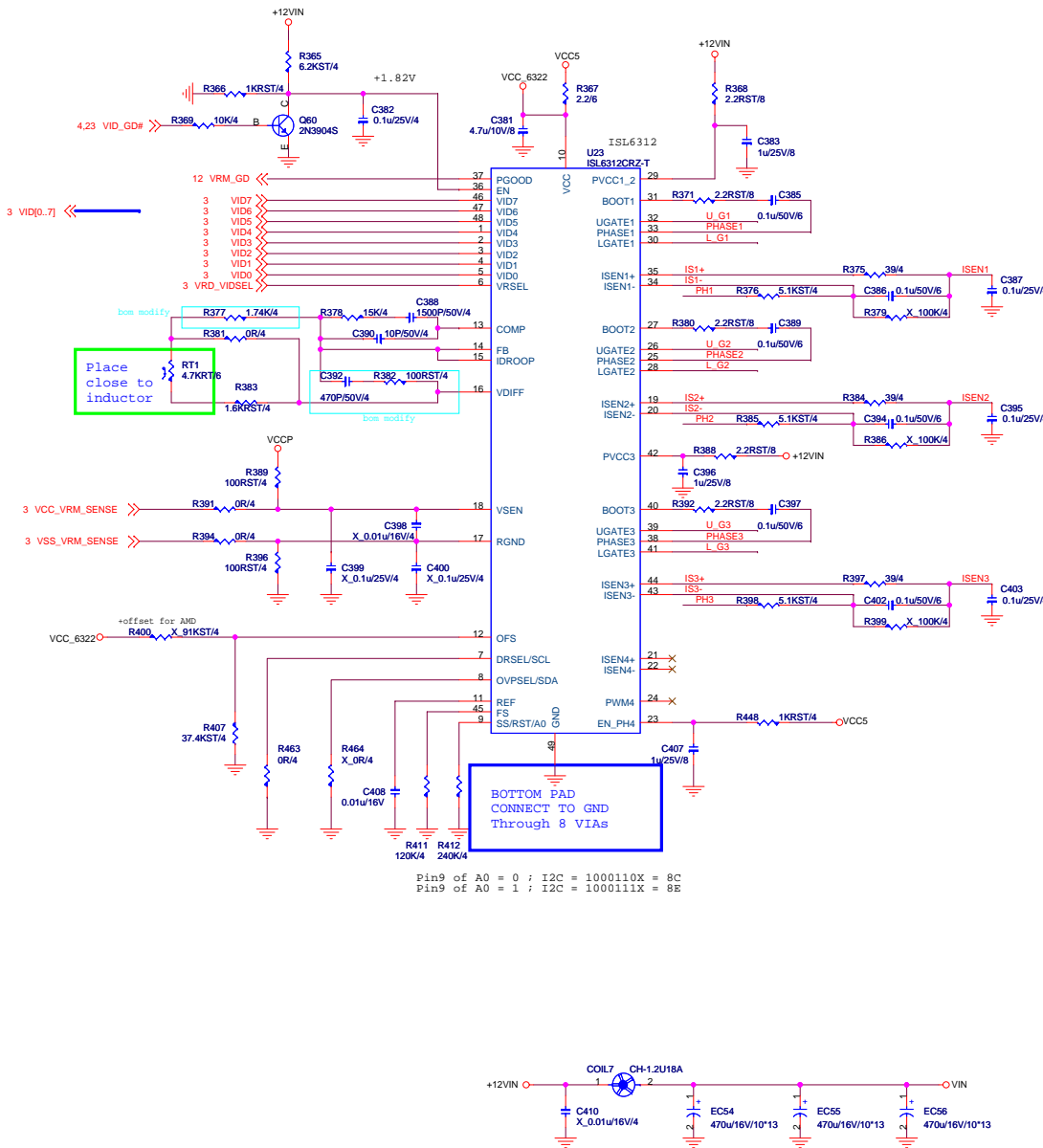




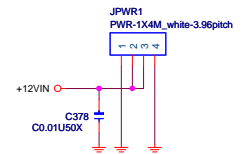
$$(15A) > 8.615A$$

$$(20A) > 17.9A$$




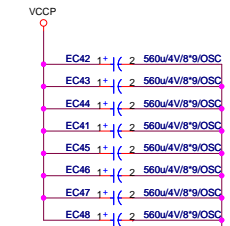
# Voltage Regular Module



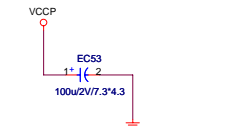
## ATX12V Power Connector



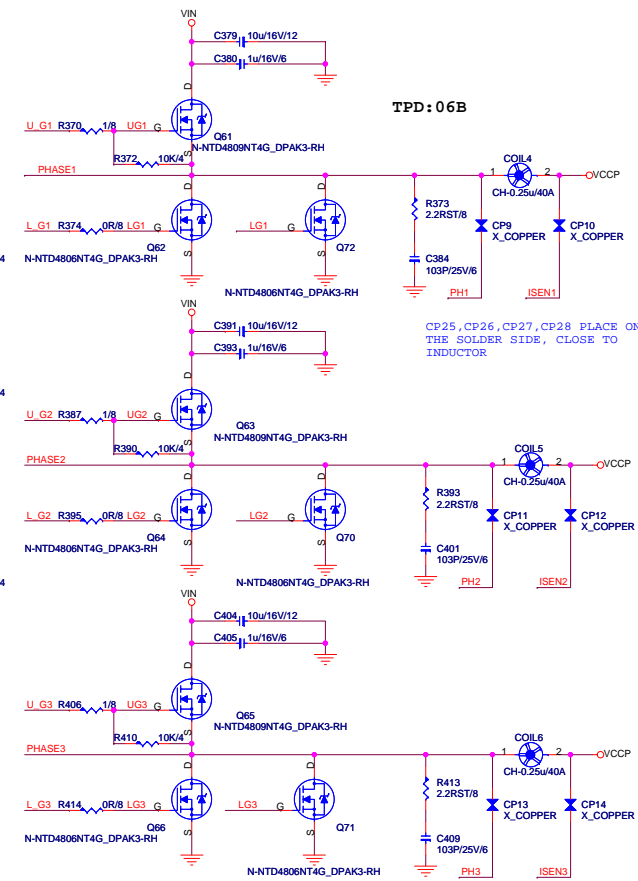
## OS-CON Capacitors



## SP Capacitors



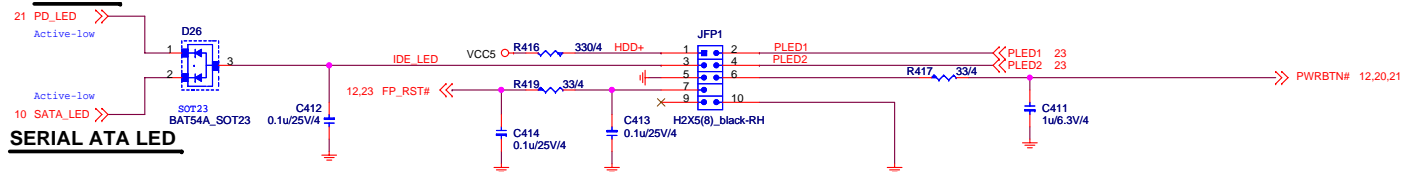
## TPD:06B



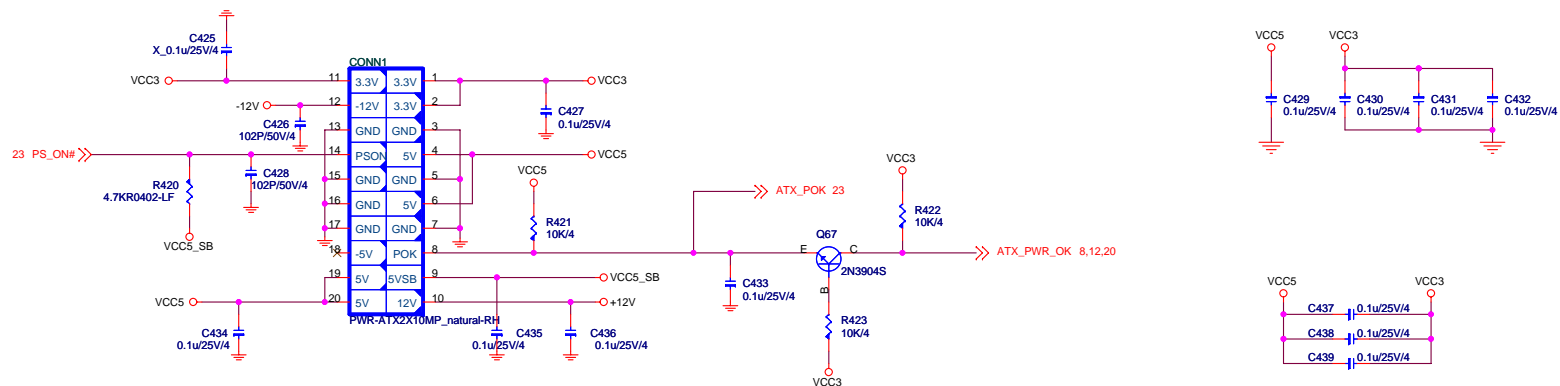
# ATX connector / Front Panel

## Front Panel

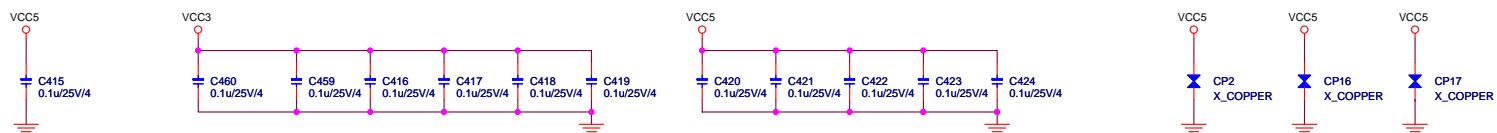
### IDE LED



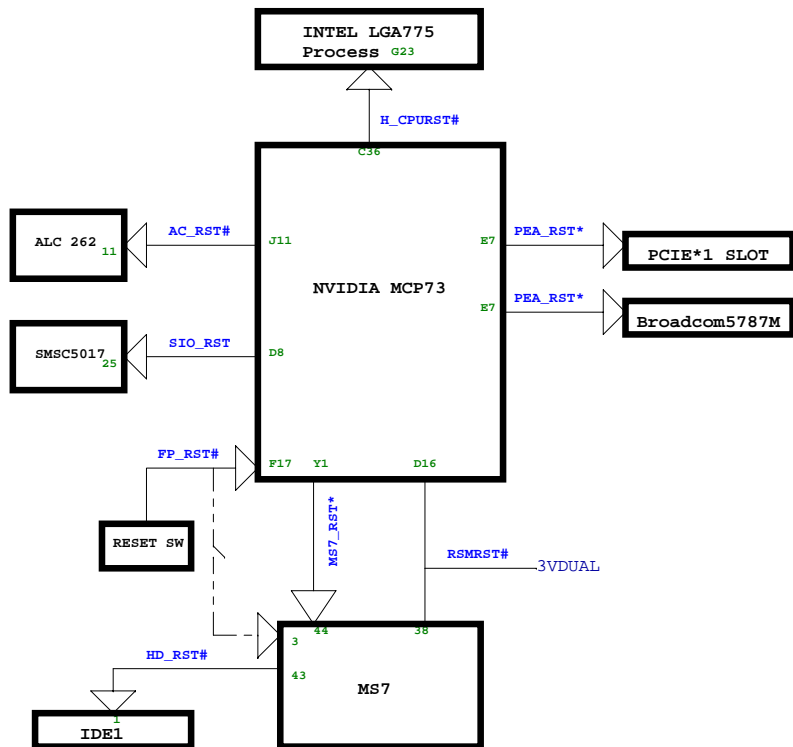
## ATX Connector



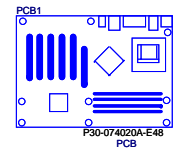
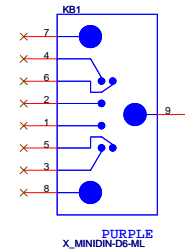
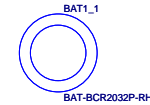
## For EMI reserve



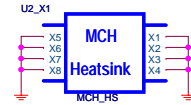
## RESET MAP



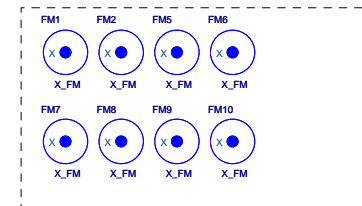
## MANUAL PARTS



wait for 7402 parts number



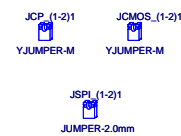
### Optics Orientation Holes



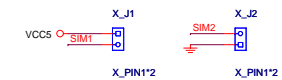
For power cable holder and FP:  
HOLES315D189



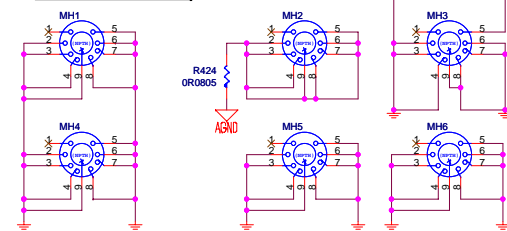
### Jumper setting



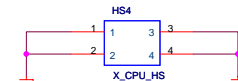
### Simulation



### Mounting Holes

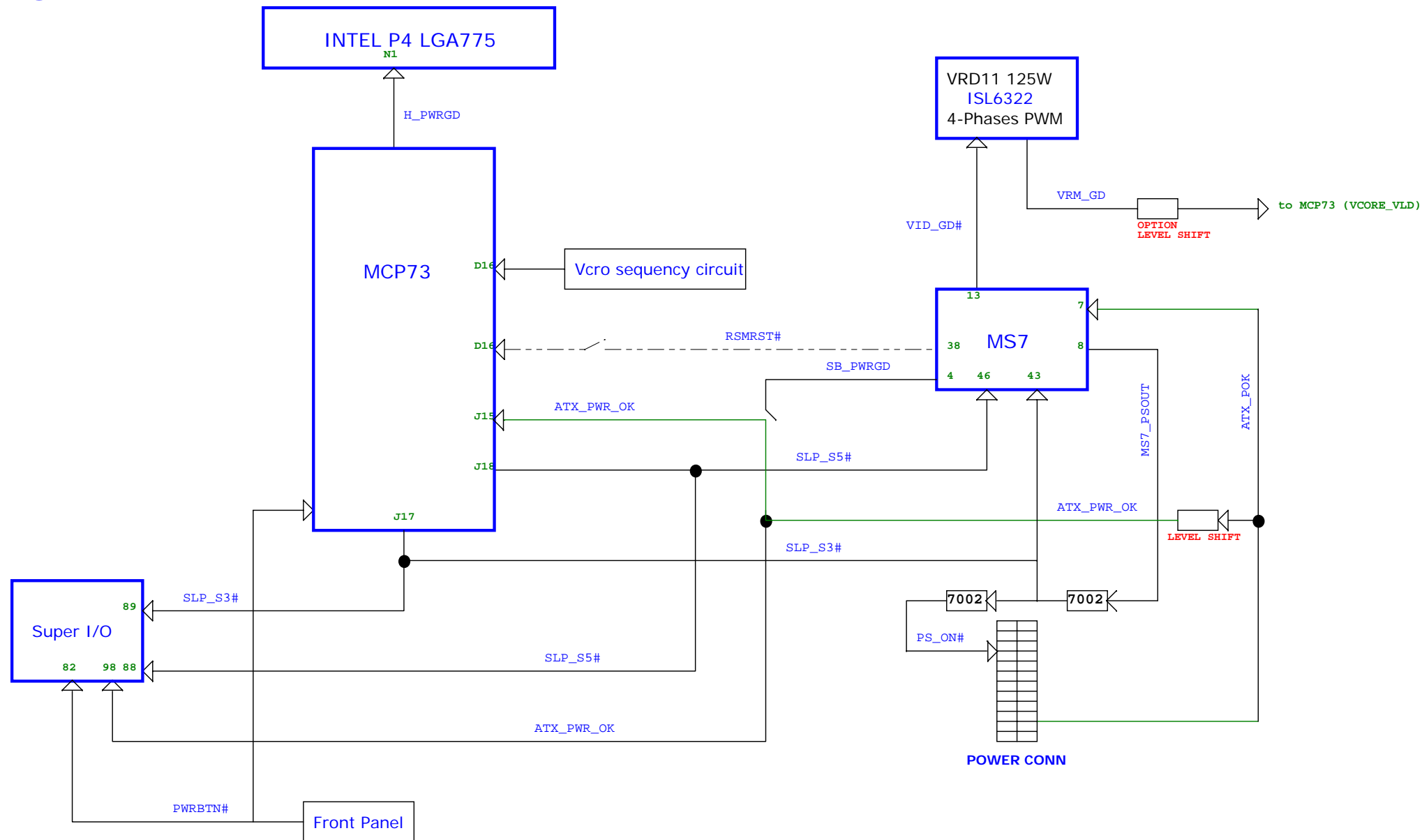


### CPU Cooling Holes



<b>MICRO-START INT'L CO.,LTD.</b>			
<b>RESET MAP &amp; MANUAL PARTS</b>			
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# PWROK MAP



NVIDIA MCP73

GPIO Pin	Default States	Function	Change default	Pin-out
GPIO 2	GPIO INPUT	Pull-up to VCC3 with 10K		C1
GPIO 3	GPIO INPUT	Pull-up to VCC3 with 10K		C2
GPIO 4	GPIO INPUT	Pull-up to VCC3 with 10K		C3
GPIO 5	GPIO INPUT	Pull-up to VCC3 with 10K		C4
GPIO 6	GPIO INPUT	HDMI_CEC,Pull-up to VCC3 with 10K		C5
GPIO 7	GPIO INPUT	SIO HWM_INT,pull_up VCC3 with 10K		C6
GPIO 8	TER FUNCT.	SPI_DI		C7
GPIO 9	TER FUNCT.	SPI_DO		C8
GPIO 10	TER FUNCT.	SPI_DCS0		C9
GPIO 11	TER FUNCT.	SPI_CLK		CA
GPIO 19	GPIO INPUT	NC		D2
GPIO 20	PRI FUNCT.	H_PROCHOT#,pull-up to VTT_OUT_RIHGHT with 10K		D3
GPIO 21	PRI FUNCT.	WAKE_UP#		D4
GPIO 22	PRI FUNCT.	AC_SDINO		D5
GPIO 23	PRI FUNCT.	Pull-up to VCC3_SB with 10K directly	SEC Function,GPIO OUTPUT	D6
GPIO 24	PRI FUNCT.	NC		D7
GPIO 25	PRI FUNCT.	OC#0 connect to USB connector		D8
GPIO 26	PRI FUNCT.	OC#2 connect to USB connector		D9
GPIO 27	PRI FUNCT.	OC#4 connect to USB connector		DA
GPIO 28	PRI FUNCT.	OC#6 connect to USB connector		DB
GPIO 29	PRI FUNCT.	LPM_LAN,pull_up 3VDUAL with 10K	SEC Function,GPIO OUTPUT	DC
GPIO 30	PRI FUNCT.	PME#,Pull-up to 3VDUAL with 8.2K		DD
GPIO 31	PRI FUNCT.	SIO_PME#,Internal pull-up to 3VDUAL		DE
GPIO 32	PRI FUNCT.	SIO_SMI#,Internall pull-up to 3VDUAL		DF
GPIO 34	PRI FUNCT.	SUS_CLK		E1
GPIO 35	PRI FUNCT.	Pull-low to GND with 10K	SEC Function,GPIO OUTPUT	E2
GPIO 36	PRI FUNCT.	Connect to GND		E3
GPIO 37	PRI FUNCT.	NC		E4
GPIO 38	GPIO INPUT	PCI3REQ#,Pull-up to VCC3 with 8.2K		E5
GPIO 39	GPIO OUTPUT	NC		E6
GPIO 40	GPIO INPUT	PCI2REQ#,Pull-up to VCC3 with 8.2K		E7
GPIO 41	GPIO OUTPUT	NC		E8
GPIO 42	PRI FUNCT.	PCICLKRUN#		E9
GPIO 43	GPIO INPUT	PERR#,Pull-up to VCC3 with 8.2K		EA
GPIO 44	PRI FUNCT.	ACSYNC		EB
GPIO 45	PRI FUNCT.	ACSDOUT,Pull-up to VCC3 with 8.2K		EC
GPIO 50	PRI FUNCT.	LPC_DRO#0,Pull-up to VCC3 with 10K		F1
GPIO 52	GPIO INPUT	PCI4REQ#,Pull-up to VCC3 with 8.2K		F3
GPIO 53	GPIO OUTPUT	SPI_WP#	SEC Function,GPIO OUTPUT	F4
GPIO 55	PRI FUNCT.	A2OGATE,Pull-up to VCC3 with 8.2K		F6
GPIO 56	PRI FUNCT.	KBRST#,Pull-up to VCC3 with 8.2K		F7
GPIO 57	PRI FUNCT.	SATA_LED,Pull-up to VCC3 with 8.2K		F8 .
GPIO 58	PRI FUNCT.	Thermtrip#		F9
GPIO 59	PRI FUNCT.	Therm#		FA
GPIO 60	PRI FUNCT.	NC		FB
GPIO 61	PRI FUNCT.	NC		FC
GPIO 62	PRI FUNCT.	NC		FD
GPIO 63	PRI FUNCT.	PD_DET,Pull-down to GND with 15K		FE

PRI FUNCT.:Primary Function  
SEC FUNCT.:Second Function  
TER FUNCT.:Tertiary Function

PCI Configuration

DEVICE	MCP1 INT Pin	REQ#/GNT#	IDSEL	CLOCK
EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
EMPTY	EMPTY	EMPTY	EMPTY	EMPTY

DDRII DIMM Config.

DEVICE	ADDRESS	CLOCK
DIMM 1	0A0H	MCLK_A0/MCLK_A0# MCLK_A1/MCLK_A1# MCLK_A2/MCLK_A2#
DIMM 2	0A2H	MCLK_A9/MCLK_A9# MCLK_A10/MCLK_A10# MCLK_A11/MCLK_A11#

SIO SCH5017


PIN NAME	PIN#	USAGE	Input/Output
GP12	96	GPIO_KB	OUTPUT
GP27	36	SIO_SMI#	OUTPUT
GP42	90	SIO_PME#	OUTPUT
INTRD_IN~	33	CLEAR_PASSWORD	INPUT

SMBus DISTRIBUTION

SMBus	Power	Load
SMBCLK	3VDUAL	MCP73, SIO,LAN,MiniPCIE,MS7,PWM
SMB_MEM_CLK	VCC3	DIMM

JUMPER SETTING

JBAT1	(1-2)Normal	(2-3)Clear
JCP1	(1-2 ) open clear	(1-2)short Normal
JCMOS	(1-2 ) Normal	(2-3 ) Clear

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

Title			GPIO & JUMPER SETTING		
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INTEL 775		
0.8375V - 1.6000V Core	-	84A
1.2V FSB Vtt	-	5.3A

MCP73		
V1P2_CPU_VTT	-	800mA
H_VCCPLL	-	200 mA
V1P2_SATA_PLL	-	75mA
V1P2_VDD_CORE	-	5.7A
V1P2_PEX_DVDD	-	450mA
V1P2_PEX_AVDD	-	1.8A
V1P2_VDD_AUXC	-	25mA
3P3_DUAL_RMGT	-	35mA
V3P3_DUAL	-	50mA
3P3_DUAL_USB	-	75mA
V3P3_BAT	-	3mA
V1P2_PLL_MEM_CPU	-	60mA
V1P2_PEX0/1_PLL	-	170mA
V1P2_SATA_DVDD	-	95mA
V1P2_SATA_AVDD	-	380mA
V3P3	-	340mA
V3P3_DAC	-	130mA
V3P3_HDMI_IO	-	60mA

Audio		
3.3V AUDIO	-	40mA
5V AUDIO	-	200mA

SPI		
+3.3V (S0,S1)	-	30mA

3V  
Battery

5VAudio  
+5VR  
500mA

+12V  
ATX  
2x2

+12V +5V +3.3V +5VSB  
ATX POWER

ISL6322  
VCCP VRM 11  
0.8375V-1.6000V 84A  
3-Phase Switch

W83310DS  
VTT\_DDR  
0.9V Linear 1A

MS7 Regulator  
V\_FSB\_VTT  
1.2V Linear 10A  
CPU\_VCC\_PLL  
3.3V Linear 300mA  
3VDUAL  
3.3V Linear 1.5A  
5VUSB\_REAR/FRONT  
5V Linear 2A / 2A  
5VSB 500mA  
5VDIMM  
5V 11.24A  
5VSB 700mA

W83310DS  
1P2V\_DUAL  
0.9V Linear 850mA

MS11 Regulator  
VCC1\_3  
1.2V Switch 15A

MS11 Regulator  
VCC\_DDR  
1.8V Switch 20A

DDR DIMM & TERMINATOR		
0.9V VTT_DDR	-	1A
1.8V VCC_DDR (S0,S1)	-	9.4A
1.8V VCC_DDR (S3)	-	400mA
MCP73		
V3P3_HDMI_PLL	-	10mA
V3P3_PLL	-	30mA
V1P8_MEM_VDDP	-	2.4A
V1P2_PEX0/1_PLL	-	45mA
V1P2_PLL_SREF_SP	-	10mA
V3P3_PLL_COREPLL	-	5mA
V3P3_VPLL	-	5mA
V3P3_XREF0/1_XS0/1	-	21mA
V3P3_PLL_SREF_SP	-	15mA
V3P3_DUAL_PLL_MAC	-	5mA

PCI Express x1 slot(MiniPCIE)		
V_1P5	-	TBD
+3.3V	-	TBD


PCI Express x1 slot(BCM5787M)		
VLAN12	-	590mA
VLAN25	-	235mA
VDD	-	7mA

USB		
+5V (S0,S1)	-	4.0A
+5V (S3)	-	20mA

PS2		
+5V (S0,S1)	-	345mA
+5V (S3)	-	2.0mA

SIO		
3VDUAL	-	10mA

5	4	3	2	1
D				D
C				C
B				B
A				A
5	4	3	2	1

 <b>MSI</b> <i>Link to the Future</i>		<b>MICRO-START INTL CO.,LTD.</b>	
Title			
<b>HISTORY</b>			
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	<b>MS-7402</b>		<b>0A</b>
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