MS-7364 Ver:0A

CPU:

Intel Prescott LGA775 -Mainstream CPU

System Chipset:

North Bridge : VIA P4M890
South Bridge : VIA VT8237R Plus

On Board Chipset:

LPC Super I/O -- W83627EHG
LAN(PHY) --- Realtek 8201CL
AC'97 Codec --Realtek ALC655
BIOS --SPI+LPC FLASH ROM

CLOCK Chip :

CLOCK Generator -- ICS9LPR700EGLFT

Main Memory:

DDRII * 1 +DDRI * 1

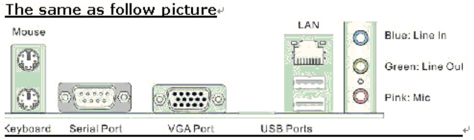
Expansion Slots:

PCI SLOT * 1

PWM:

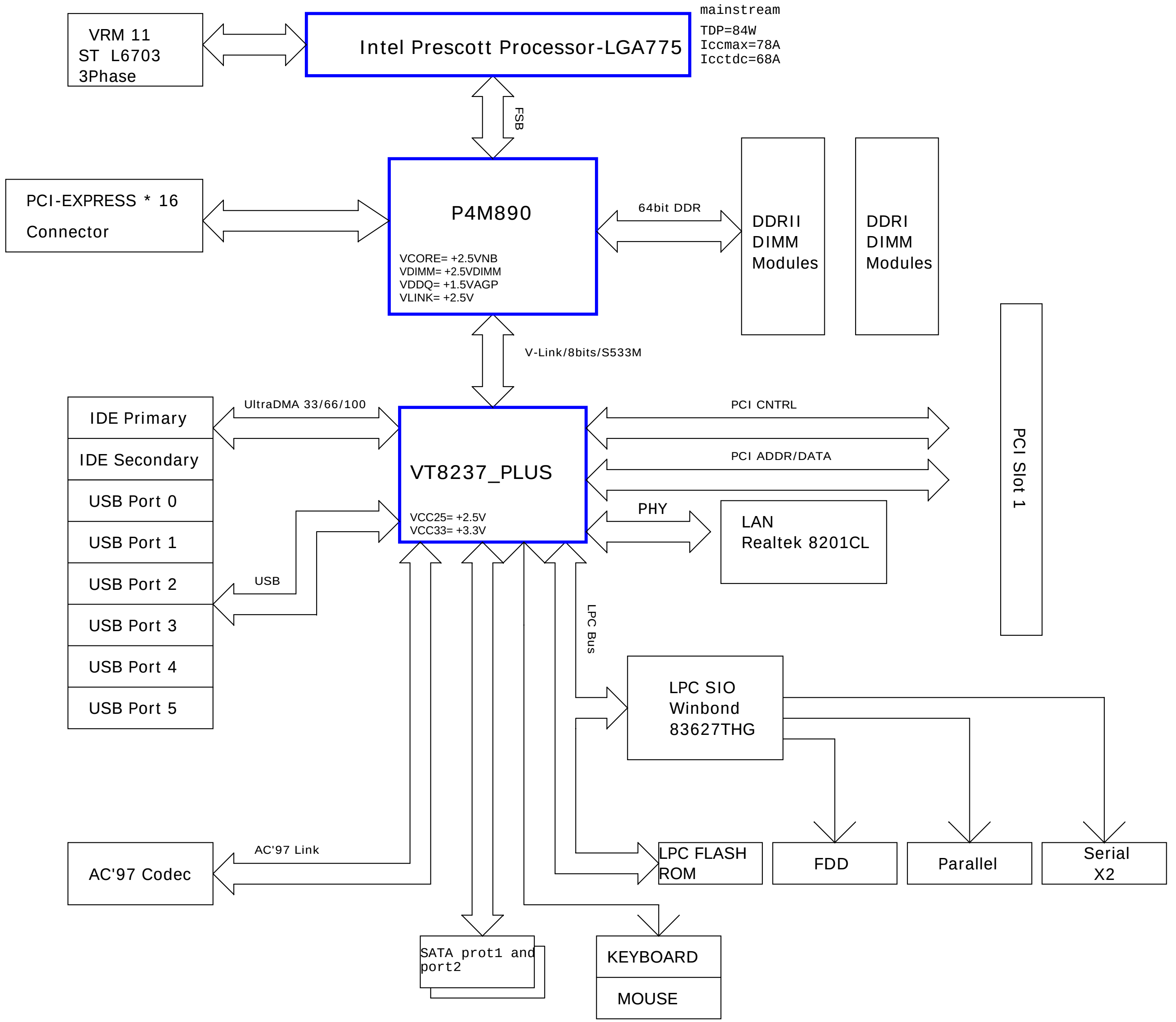
VRM11 ST L6703 3Phase

Rear I/O
The same as follow picture



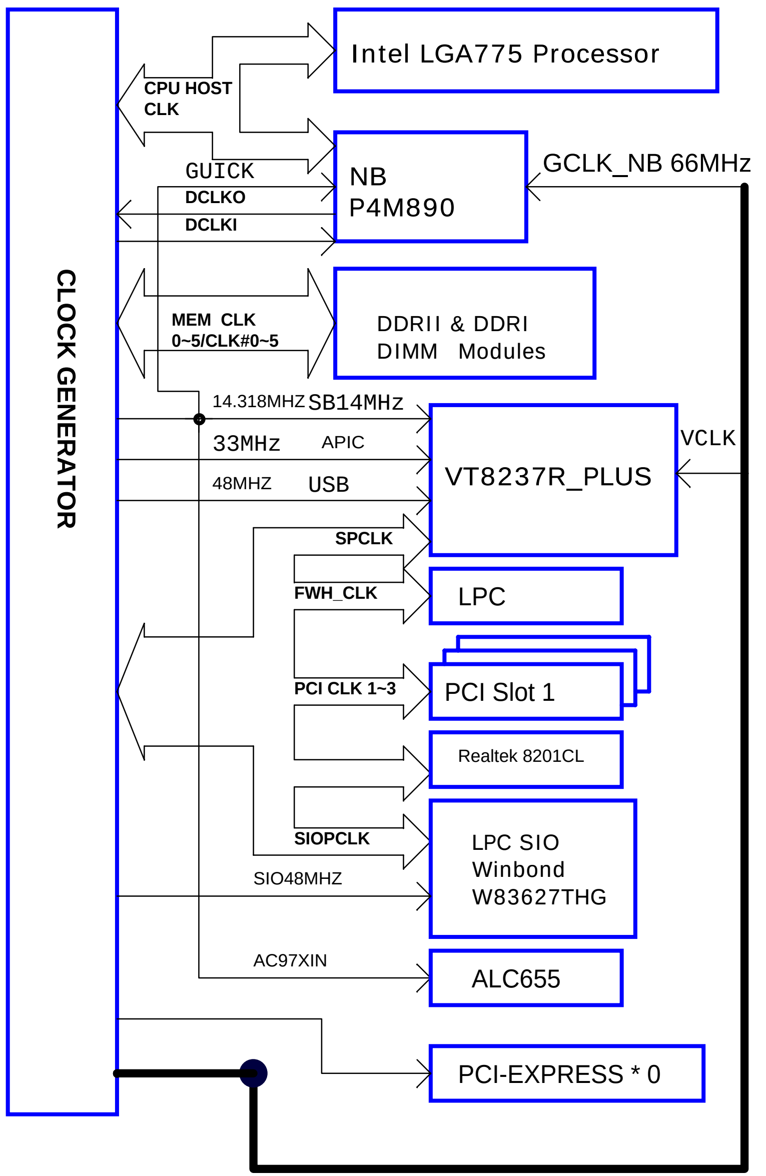
CHIPSET P4M890_Pro + VT8237R_PLUS

Block Diagram

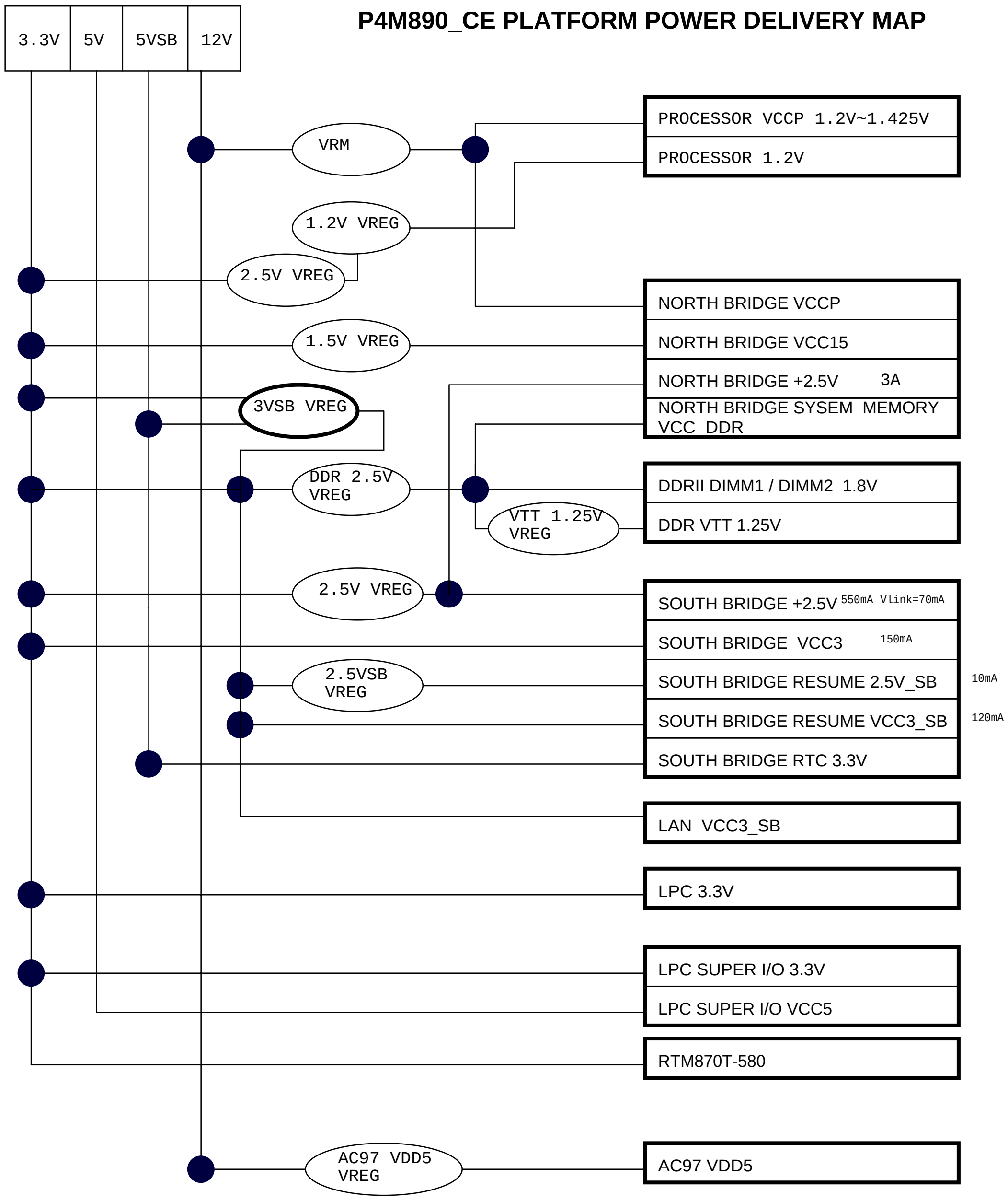


MSI MICRO-START INT'L CO.,LTD.		
Title: BLOCK DIAGRAM		
Size: Custom	Document Number: MS-7364-V0A-0207-G	Rev: 3.1
Date: Wednesday, February 07, 2007	Sheet 2 of 31	

P4M890 PLATFORM CLOCK GENERATOR MAP



P4M890_CE PLATFORM POWER DELIVERY MAP



+12V : 0.1U 25V X 5
+12V_MOS: 4.7U 35V X 1
1U 16V X 2
1000U 16V X 4

MSI Link to the Future	MICRO-START INT'L CO.,LTD.		
Title	PWR And CLOCK Map		
Size: Custom	Document Number: MS-7364-V0A-0207-G		Rev: 3.1
Date: Wednesday, February 07, 2007	Sheet 3	of 31	

VT8237R_PLUS GPIO Function Define

PIN NAME	Default Function	Function define
GPO0 (VDDS)	GPO0	4.7K ohm Pull up to VCC3_SB
GPO1(VDDS)	GPO1	4.7K ohm Pull up to VCC3_SB
GPO2/SUSA# (VDDS)	SUSA#	4.7K ohm Pull up to VCC3_SB
GPO3/SUSST#(VDDS)	SUSST#	4.7K ohm Pull up to VCC3_SB
GPO4/SUSCLK(VDDS)	SUSCLK	4.7K ohm Pull up to VCC3_SB
GPO5/CPUSTP#	CPUSTP#	4.7K ohm Pull up to VCC3
GPO6/PCISTP#	PCISTP#	4.7K ohm Pull up to VCC3
GPO7/GNT5	GPO7	8.2K ohm Pull up to VCC3
GPO8/GPI8/VGATE	GPO8	2.7K ohm Pull up to VCC3
GPO9/UDPWREN	UDPWREN	NC
GPO10/GPI10/PICD0	GPO10	1K ohm Pull up to VCC3
GPO11/GPI11/PICD1	GPO11	1K ohm Pull up to VCC3
GPO12/GPI12/INTE#	GPO12	8.2K ohm Pull up to VCC3
GPO13/GPI13/INTF#	GPO13	8.2K ohm Pull up to VCC3
GPO14/GPI14/INTG#	GPO14	8.2K ohm Pull up to VCC3
GPO15/GPI15/INTH#	GPO15	8.2K ohm Pull up to VCC3
GPO20/GPI20 /ACSDIN2/PCS0#	GPI20/ACSDIN2	4.7K ohm Pull down
GPO21/GPI21/ACSDIN3 /PCS1#/SLPBTN#	GPI21/ACSDIN3	4.7K ohm Pull down
GPO22/GPI22/GHI#	GPI22	4.7K ohm Pull up to VCC3
GPO23/GPI23/DPSLP	GPI23	4.7K ohm Pull up to VCC3
GPO24/GPI24/GPIOA	GPIOA	2.2K ohm Pull up to VCC3 SEL Vlink Manual mode
GPO25/GPI25/GPIOB	GPIOB	2.2K ohm Pull down SEL IOQ Depth=8 Level
GPO26/GPI26/SMBDT2 (VDDS)	SMBDT2	2.7K ohm Pull up to VCC3_SB
GPO27/GPI27/SMBCK2 (VDDS)	SMBCK2	2.7K ohm Pull up to VCC3_SB
GPO28/GPI28/VIDSEL	GPO28 /VIDSEL	SATA_LED
GPO29/GPI29/VRDSLP	GPO29 /VRDSLP	4.7K ohm Pull down
GPO30/GPI30/GPIOC	GPIOC	2.2K ohm Pull up to VCC3 SEL Host Clock=Auto mode
GPO31/GPI31/GPIOD	GPIOD	2.2K ohm Pull down SEL GTL pull up=Enable

PIN NAME	Default Function	Function define
GPI0 (VBAT)	GPI0	1M ohm Pull up to VBAT
GPI1 (VSUS3)	GPI1	ATADET0=>Detect IDE1 ATA100/66
GPI2/EXTSMI# (VSUS3)	EXTSMI#	4.7K ohm Pull up to VCC3_SB
GPI3/RING# (VSUS3)	RING#	RING# 4.7K ohm Pull up to VCC3_SB
GPI4/LID# (VSUS3)	LID#	ATADET1=>Detect IDE2 ATA100/66
GPI5/BATLOW# (VDDS)	BATLOW#	4.7K ohm Pull up to VCC3_SB
GPI6/AGPBZ	AGPBZ	4.7K ohm Pull up to VCC3
GPI7/REQ5	GPI7	8.2K ohm Pull up to VCC3
GPI9/UDPWREN	UDPWR	10K ohm Pull down
GPI16/INTRUDER# (VBAT)	INTRUDER#	1M ohm Pull up to VBAT
GPI17/CPUMISS	CPUMISS	4.7K ohm Pull up to VCC3_SB
GPI18/AOLGP1/THRM#	THERM#	4.7K ohm Pull up to VCC3_SB
GPI19/APICCLK	APICCLK	APICCLK

USB

	Port	DATA +/-	OC#
Rear	USB1	USB1- USB1+ USB0- USB0+	OC#1 (OC#0~3)
	LAN_USB1	USB2- USB2+ USB3- USB3+	
Front	JUSB2	USB4- USB4+ USB6- USB6+	OC#4 (OC#4~7)
	JUSB1	USB5- USB5+ USB7- USB7+	

DDR DIMM Config.

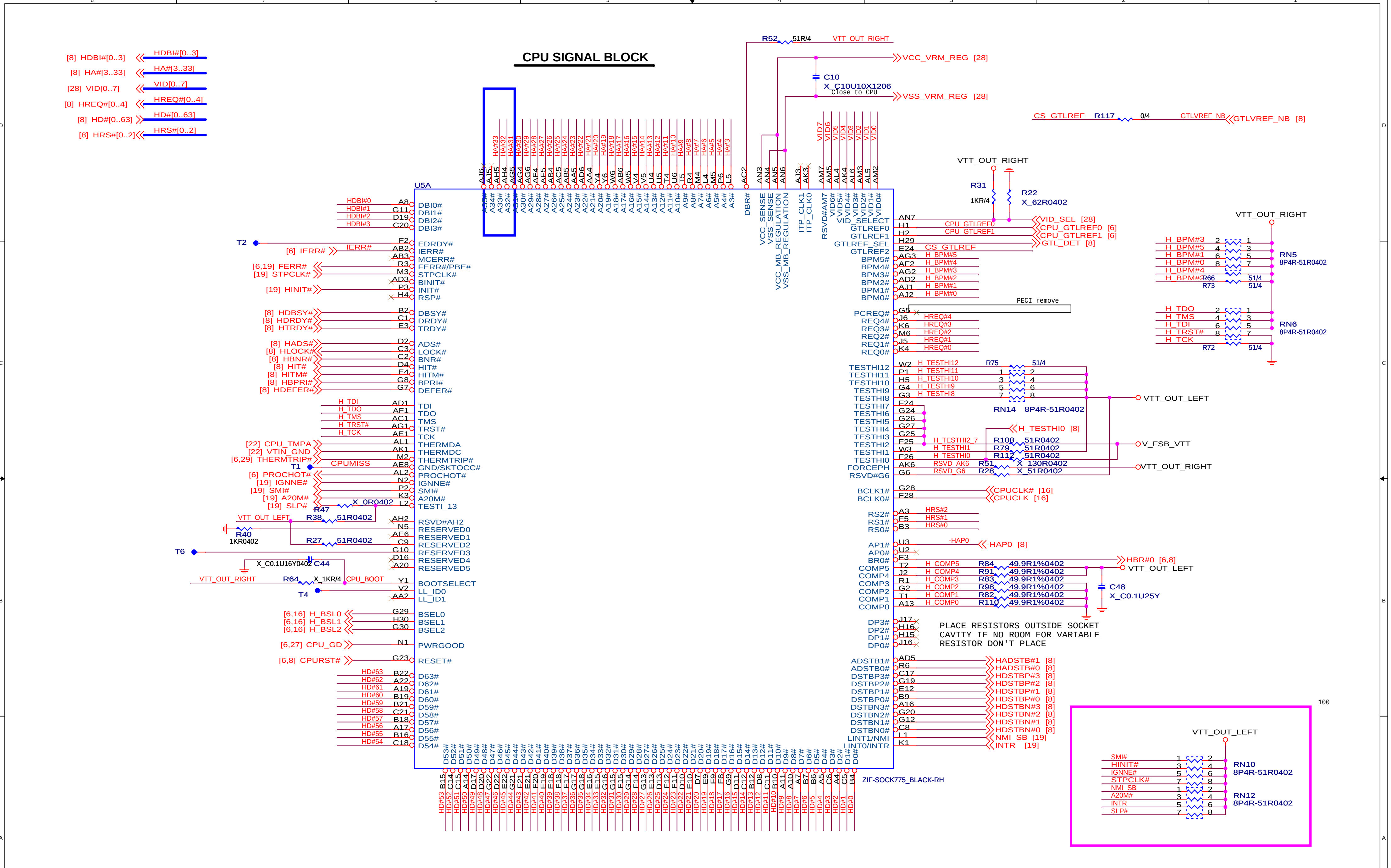
DEVICE	ADDRESS	CLOCK
DIMM 1	1010000B	DCLKA0/MDCLKA#0 DCLKA1/MDCLKA#1 DCLKA2/MDCLKA#2
DIMM 2	1010001B	DCLKA3/MDCLKA#3 DCLKA4/MDCLKA#4 DCLKA5/MDCLKA#5

PCI RESET DEVICE

Signals	Target
PCIRST#1	PCI slot 1-3
PCIRST#2	NB , Super I/O
PCIRST#3	LPC
HD_RST#	Primary, Scondary IDE

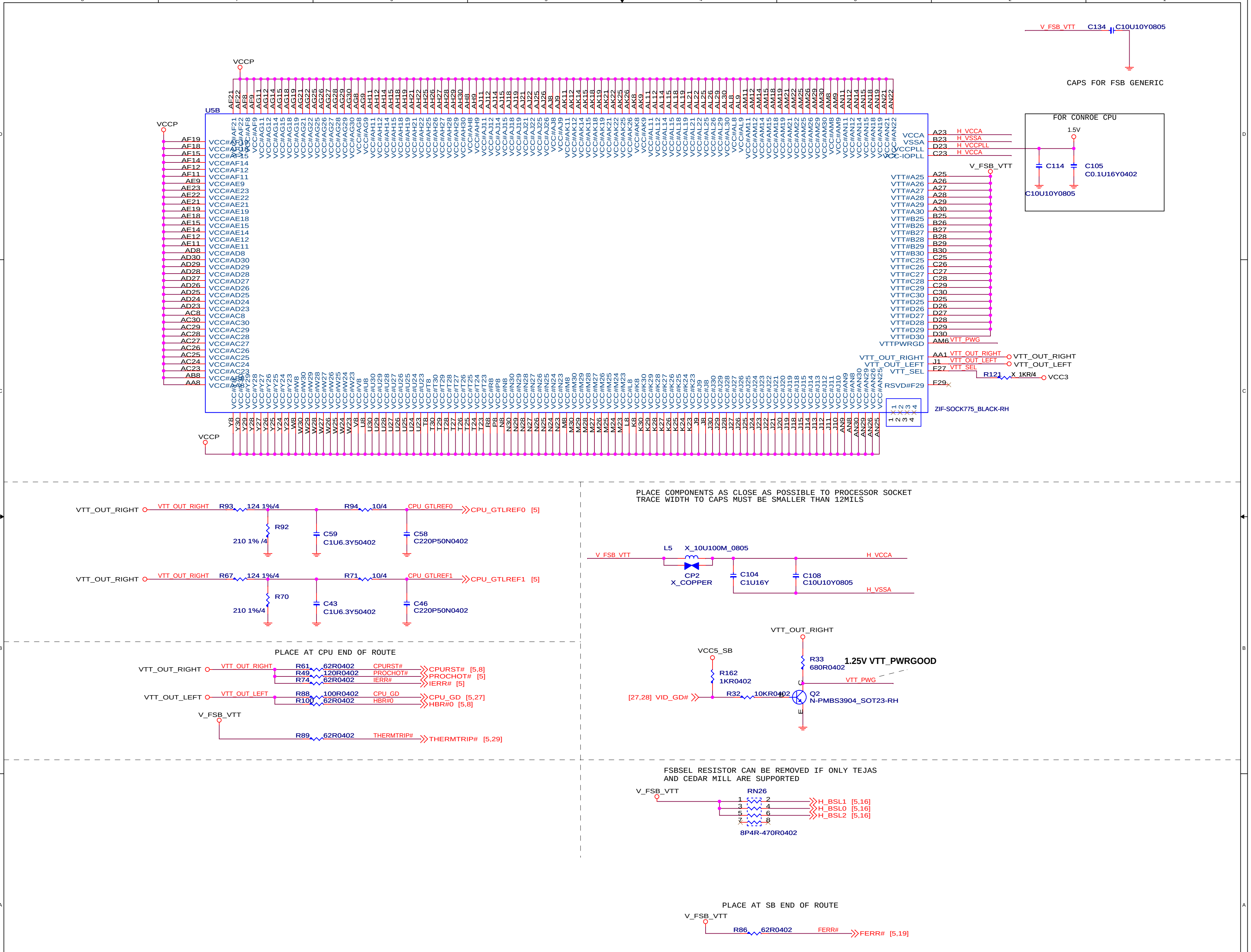
PCI Config.

DEVICE	MCP1 INT Pin	REQ# / GNT#	IDSEL	CLOCK	CLK GEN PIN OUT
PCI Slot 1	PIRQ#A PIRQ#D PIRQ#C PIRQ#B	PCIREQ#0 PCIGNT#0	AD19	PCI_CLK1	1
PCI Slot 2	PIRQ#B PIRQ#C PIRQ#D PIRQ#A	PCIREQ#1 PCIGNT#1	AD20	PCI_CLK2	2
PCI Slot 3	PIRQ#C PIRQ#D PIRQ#A PIRQ#B	PCIREQ#2 PCIGNT#2	AD21	PCI_CLK3	5



MICRO-STAR INT'L CO.,LTD.

Title	INTEL LGA775 - SIGNALS	
Size: Custom	Document Number: MS-7364-V0A-0207-G	Rev: 3.1
Date: Wednesday, February 07, 2007	Sheet 5 of 31	



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MICRO-START INT'L CO.,LTD.

Title	INTEL LGA775 - POWER
Size	Custom
Document Number	MS-7364-V0A-0207-G
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Date:	Wednesday, February 07, 2007
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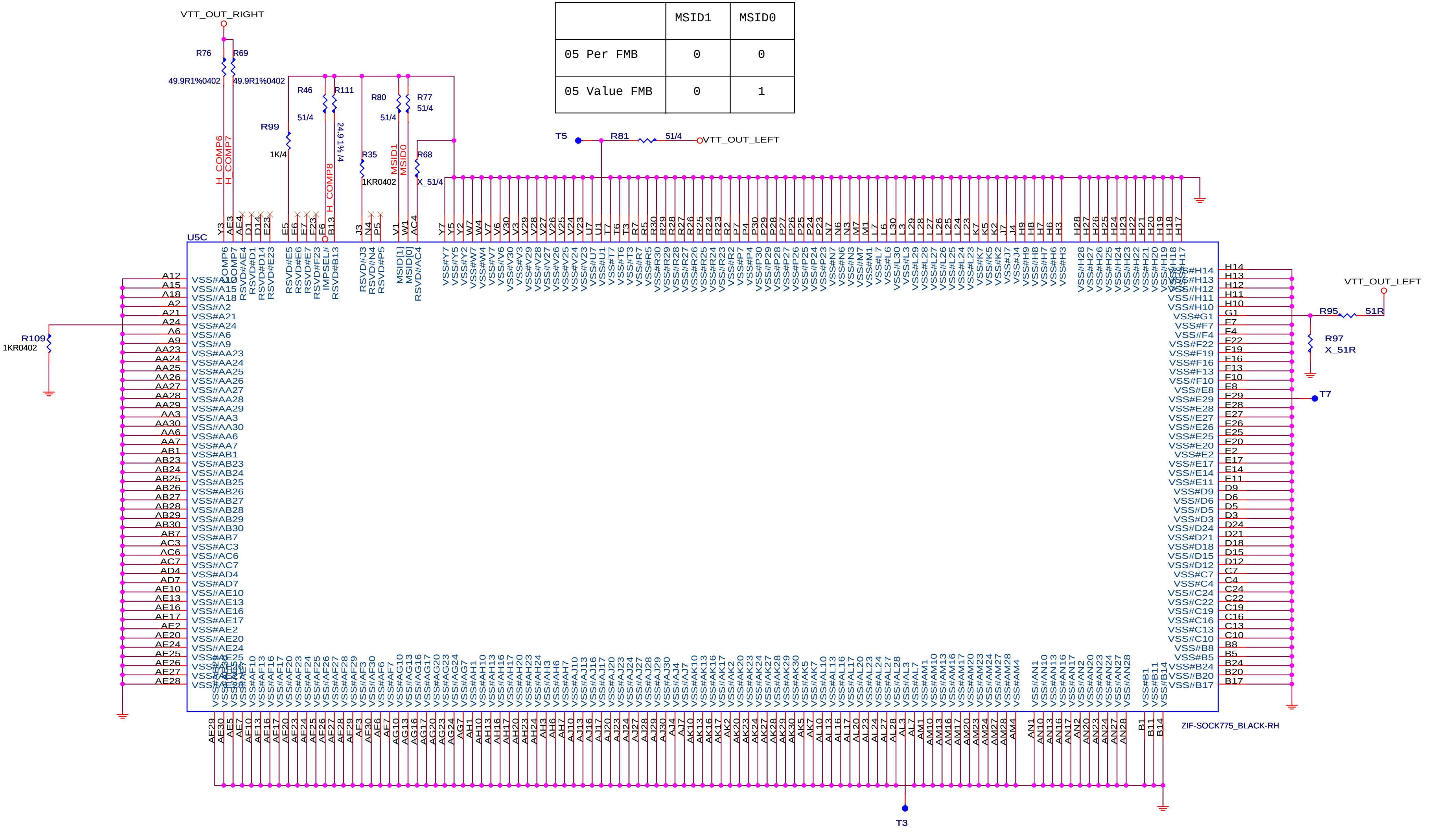
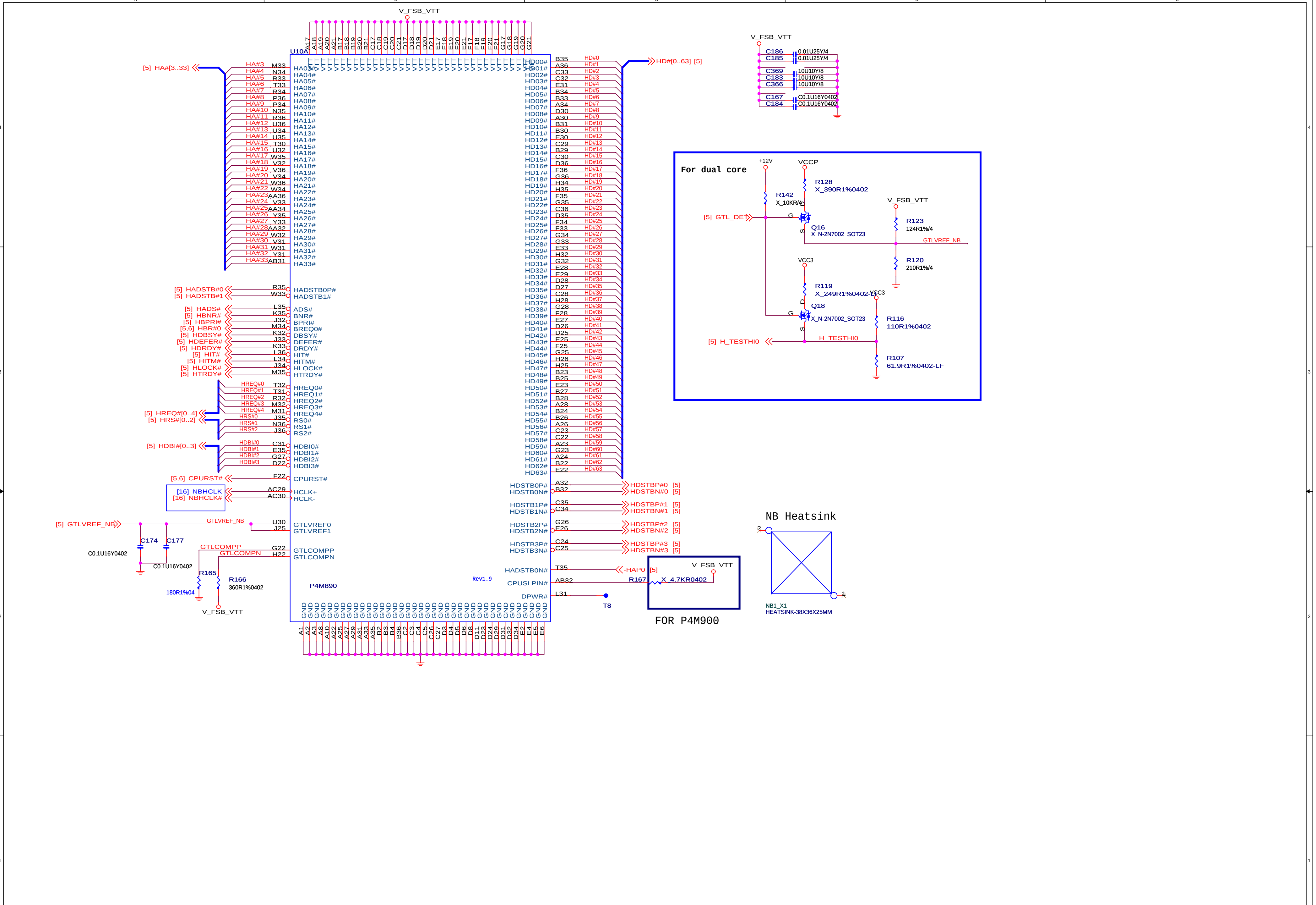
	MSID1	MSID0
05 Per FMB	0	0
05 Value FMB	0	1



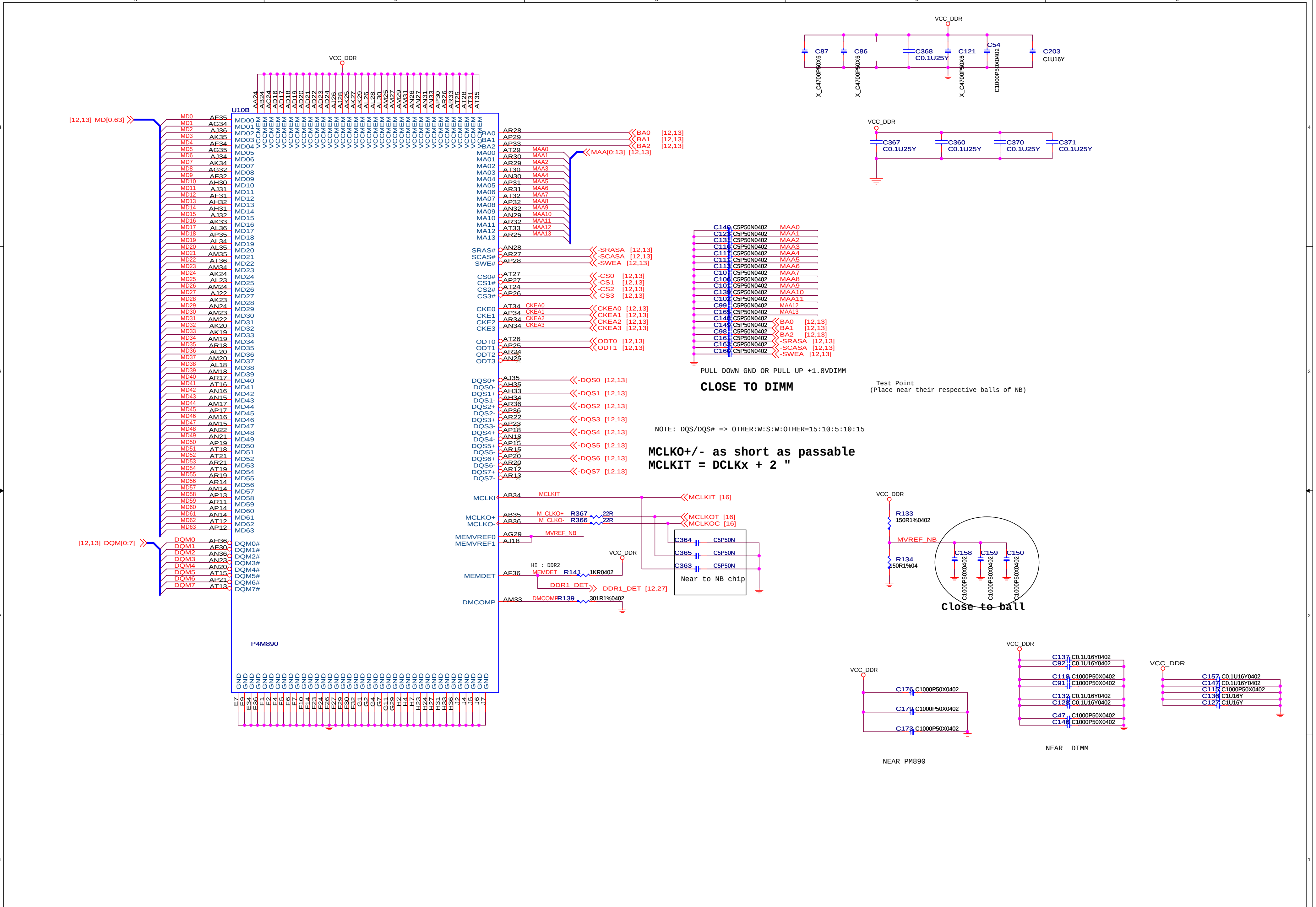
MICRO-STAR INT'L CO.,LTD.

Title	INTEL LGA775 - GND		
Size A3	Document Number MS-7364-V0A-0207-G		Rev 3.1
Date: Wednesday, February 07, 2007	Sheet 7	of 31	



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

Title	P4M890-1 (HOST)	
Size C	Document Number MS-7364-V0A-0207-G	Rev 3.1
Date: Wednesday, February 07, 2007	Sheet 8 of 31	

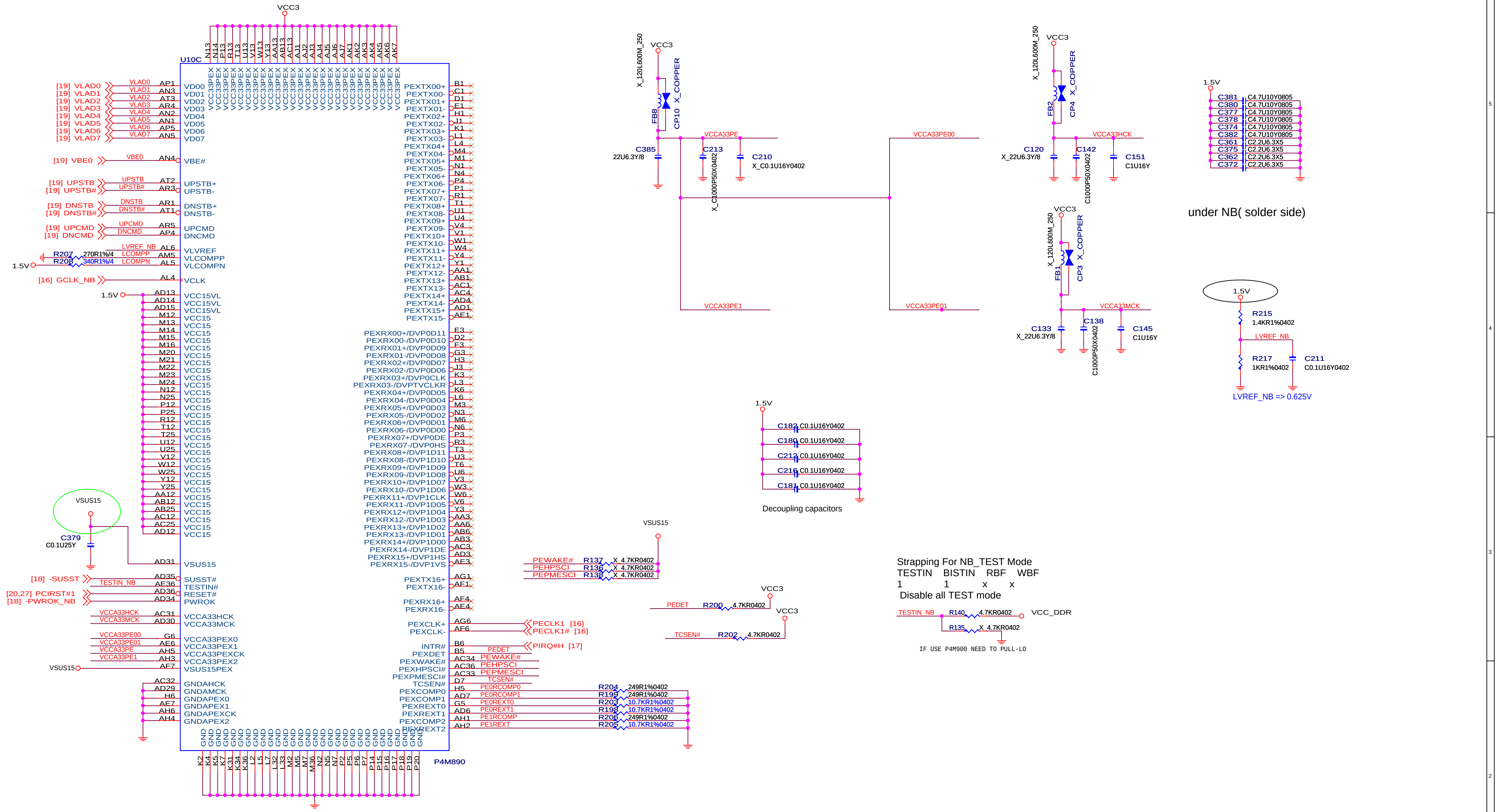


MSI MICRO-START INT'L CO.,LTD.

Title: P4M890-2(MEM)

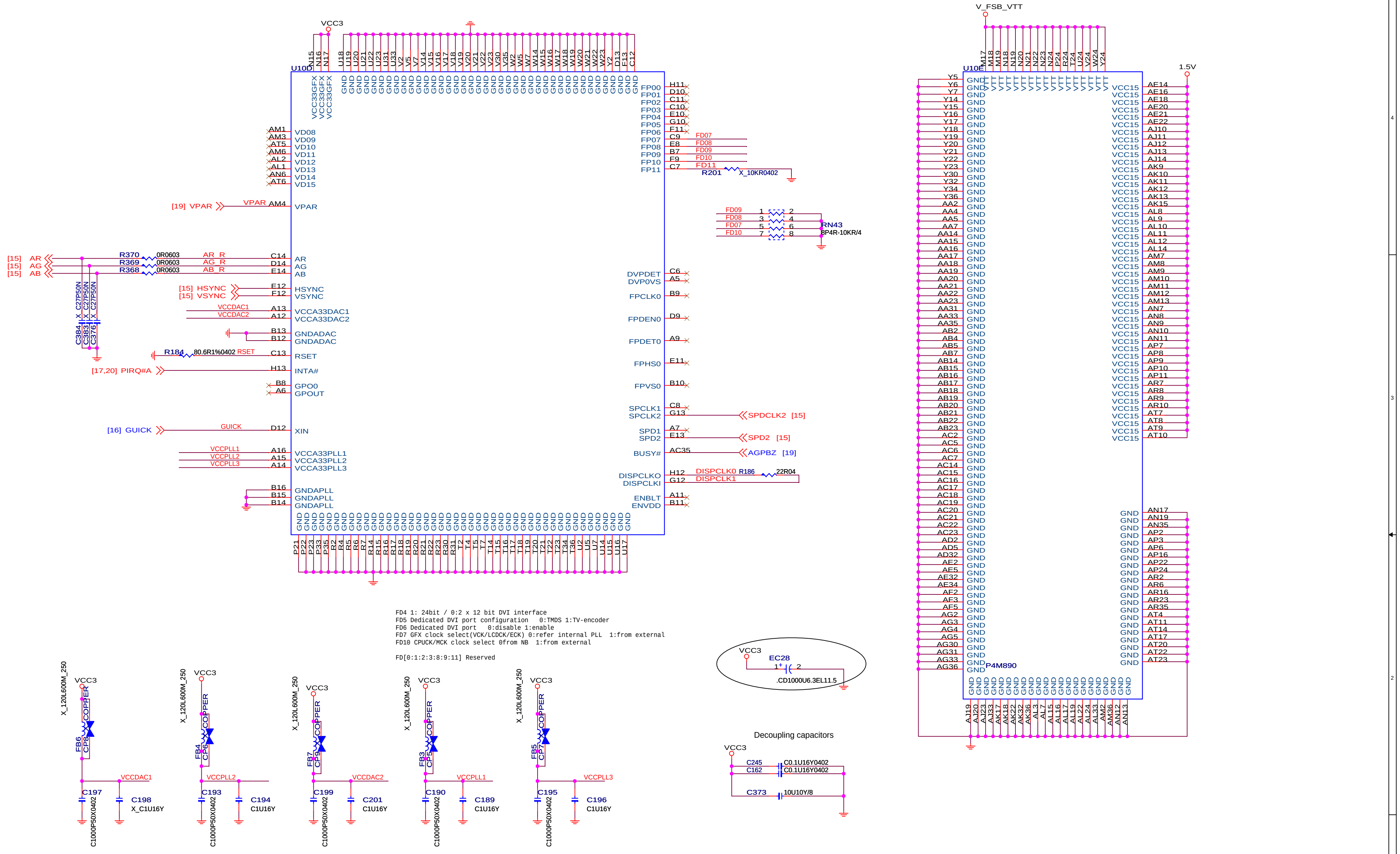
Size	Document Number	Rev
C	MS-7364-V0A-0207-G	3.1

Date: Wednesday, February 07, 2007 Sheet 9 of 31



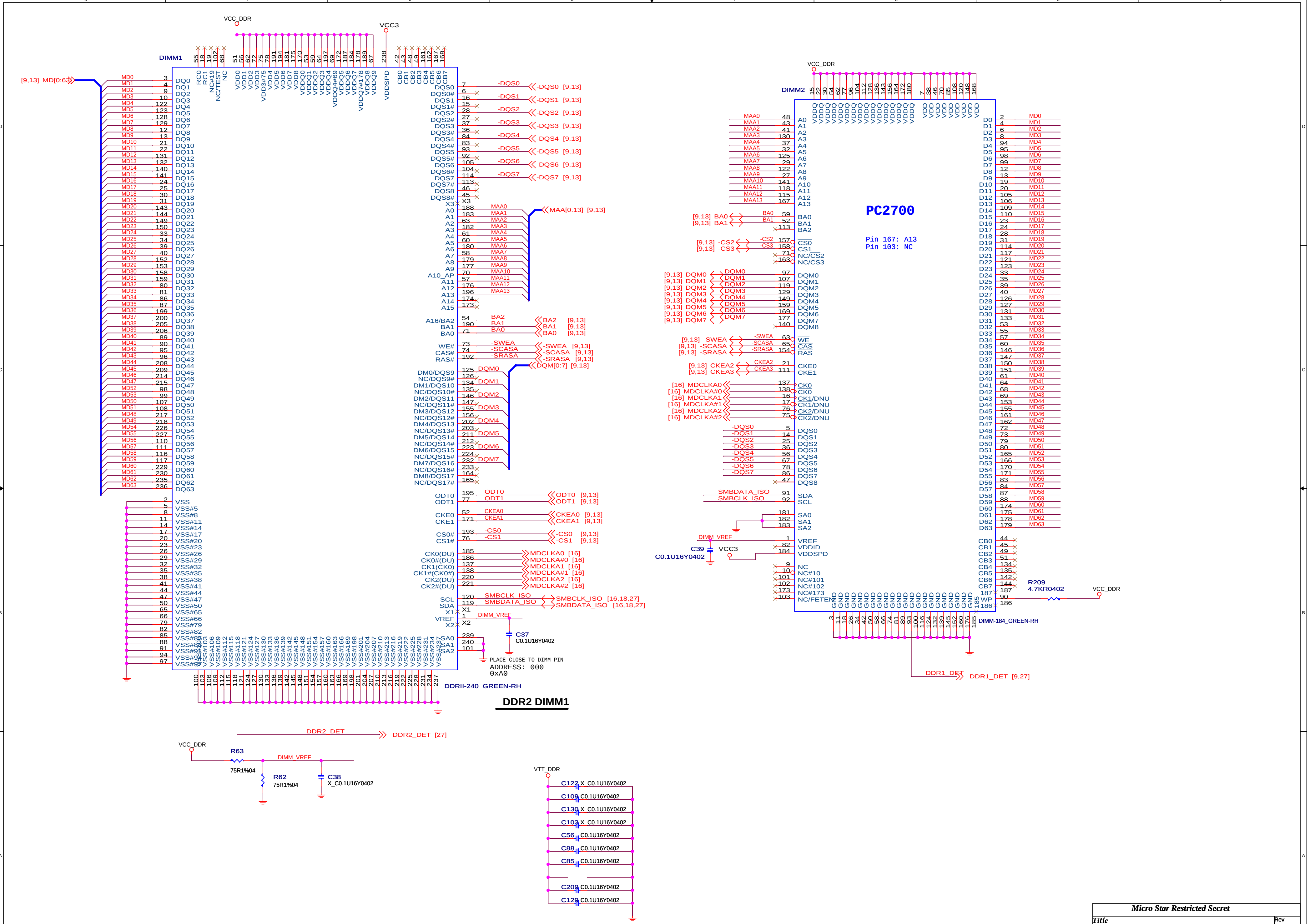
MSI MICRO-START INT'L CO.,LTD.

Title	P4M890-3(GFX)	
Size C	Document Number MS-7364-V0A-0207-G	Rev 3.1
Date: Wednesday, February 07, 2007	Sheet 10 of 31	



FD4 1: 24bit / 0:2 x 12 bit DVI interface
FD5 Dedicated DVI port configuration 0:TMDS 1:TV-encoder
FD6 Dedicated DVI port 0:disable 1:enable
FD7 GFX clock select(VCK/LCDCK/ECK) 0:refer internal PLL 1:from external
FD10 CPUCK/MCK clock select 0from NB 1:from external

FD[0:1:2:3:8:9:11] Reserved

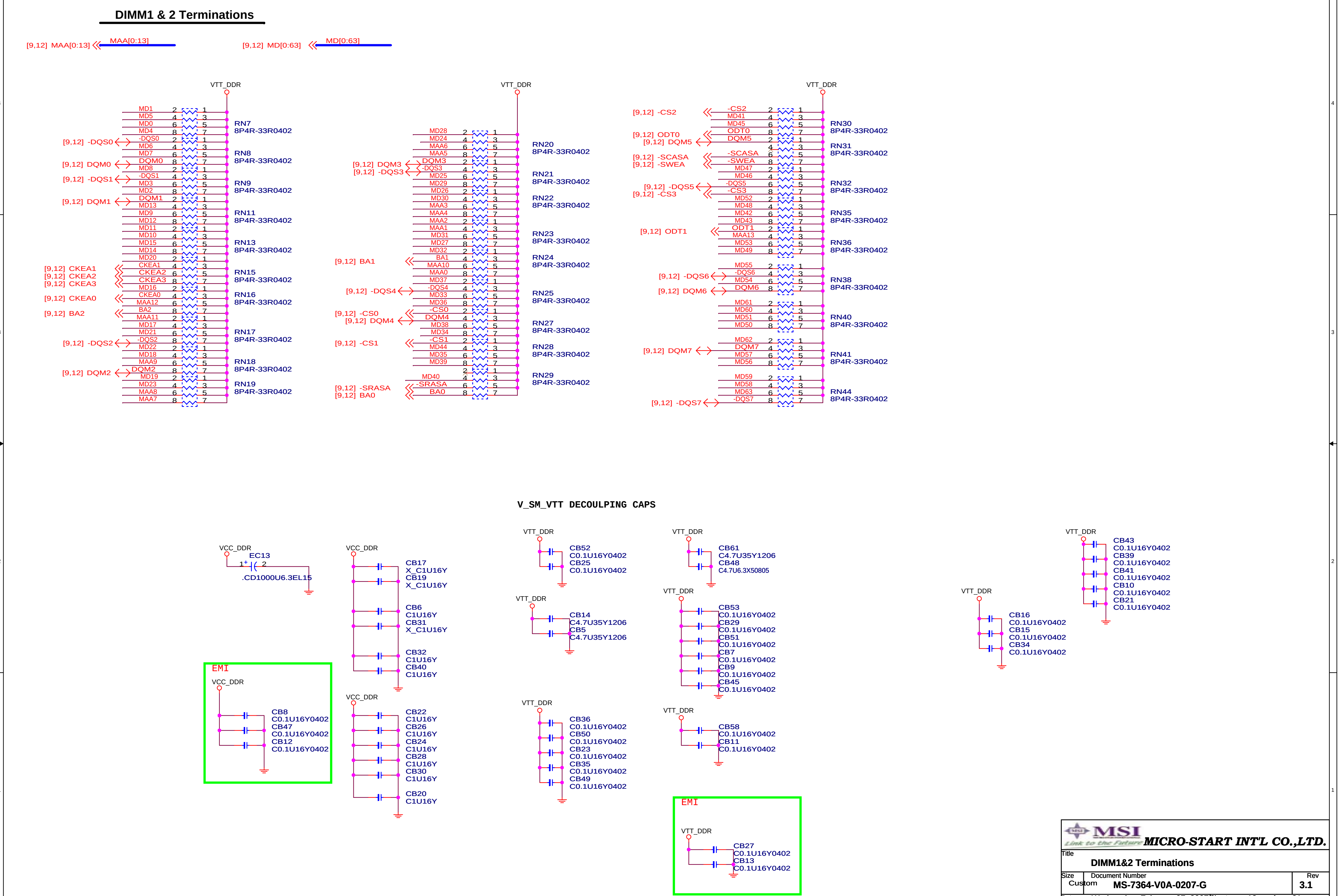


Micro Star Restricted Secret

Title	MEM-DDRII
Rev	3.1
Document Number	MS-7364-V0A-0207-G
Last Revision Date:	Wednesday, February 07, 2007
Sheet	12 of 31

MICRO-STAR INT'L CO.,LTD.
No. 69, Li-De St, Jung-He City,
Taipei Hsien, Taiwan
http://www.msi.com.tw

DIMM1 & 2 Terminations



MSI Link to the Future **MICRO-START INT'L CO.,LTD.**

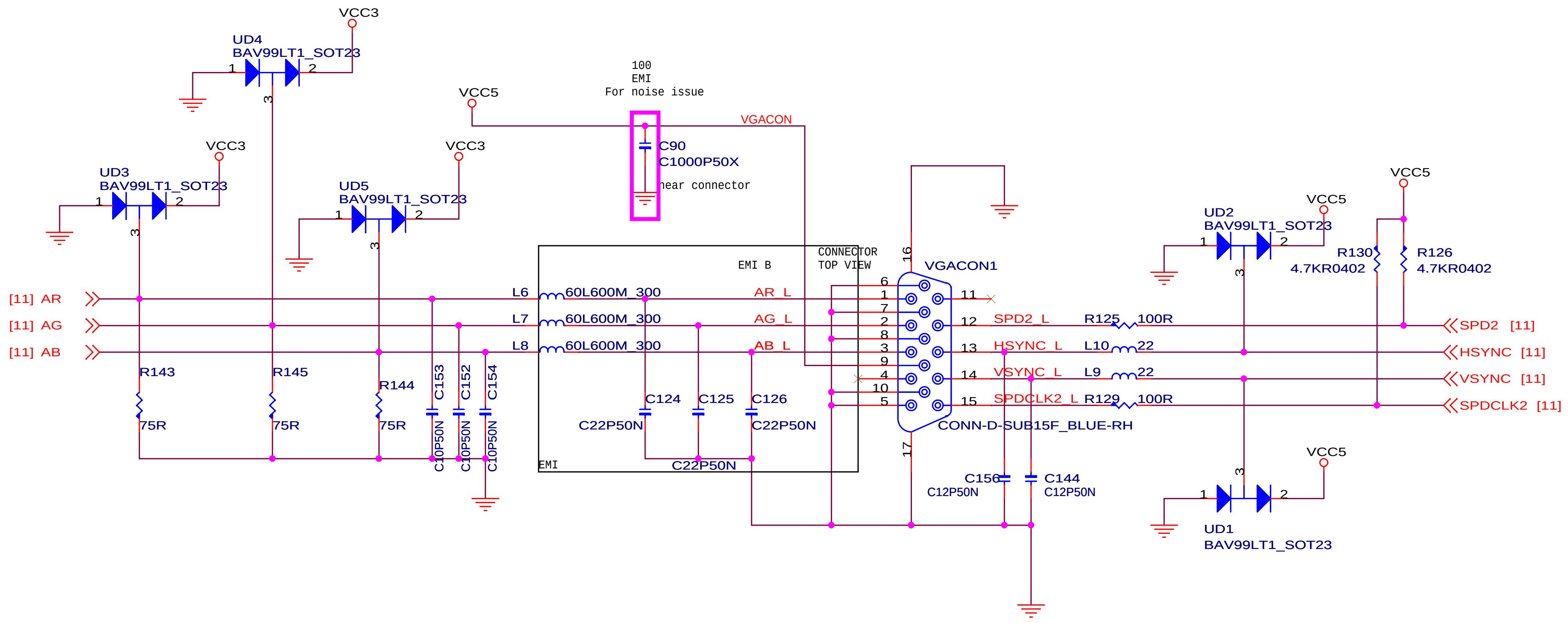
Title: DIMM1&2 Terminations

Size	Document Number	Rev
Custom	MS-7364-V0A-0207-G	3.1

Date: Wednesday, February 07, 2007 Sheet 13 of 31

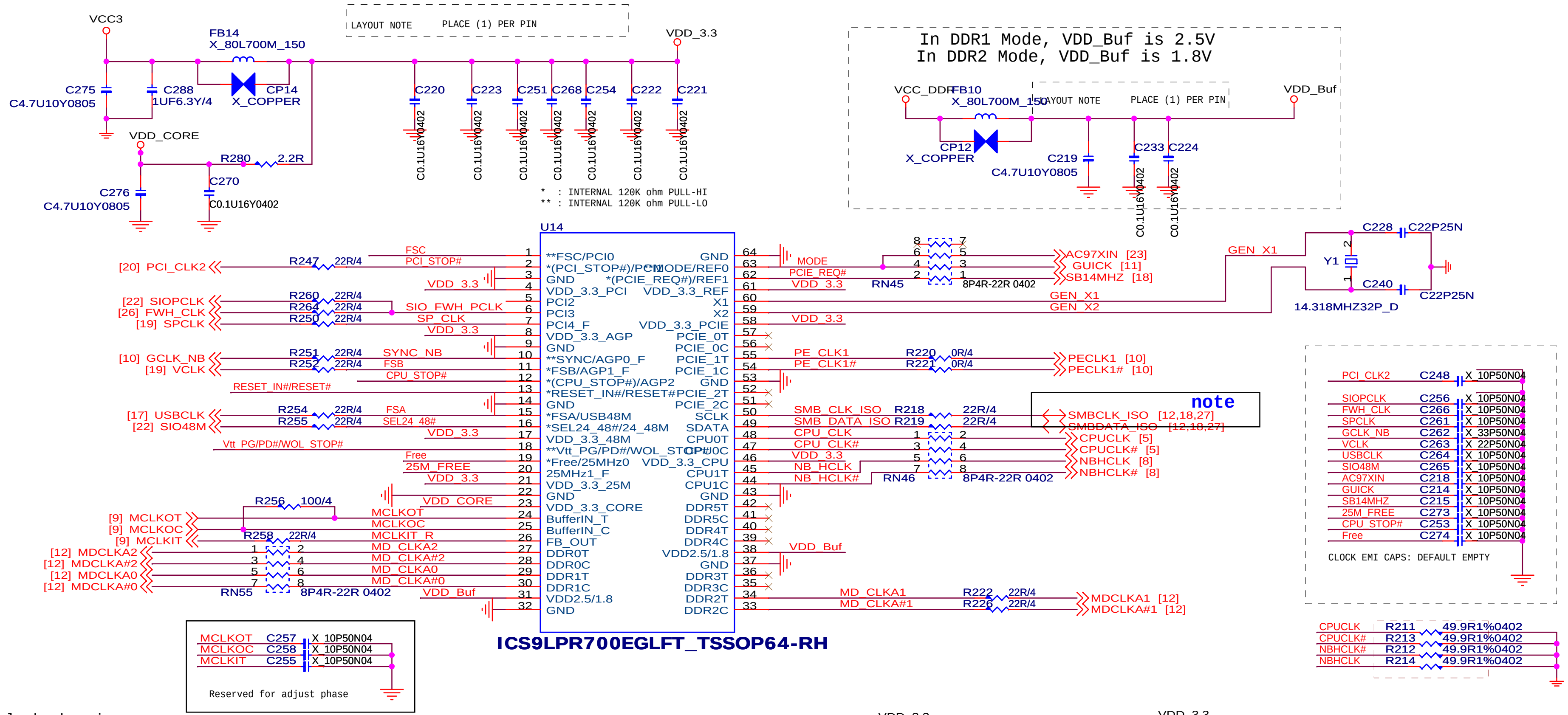
12V ===> 5.5A for x16 slot ,75 Watt
3.3V===> 3A
3.3Vaux==>375mA

VGA CONNECTOR



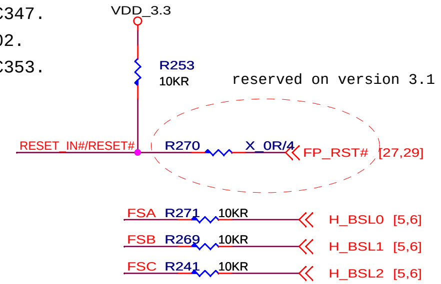
MSI Link to the Future — **MICRO-START INT'L CO.,LTD.**

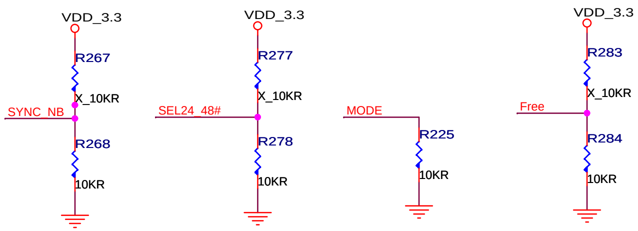
Title: **VGA Connector**		
Size: Custom	Document Number: **MS-7364-V0A-0207-G**	Rev: **3.1**
Date: Wednesday, February 07, 2007	Sheet 15 of 31	

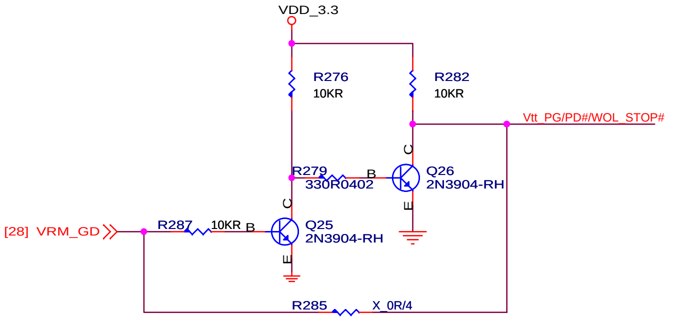


Modify clock skew issue.

1. R322 change to 0 ohm 0402.
2. Add a 22pf 0402 cap on C347.
3. R316 change to 33ohm 0402.
4. Add a 33pf 0402 cap on C353.







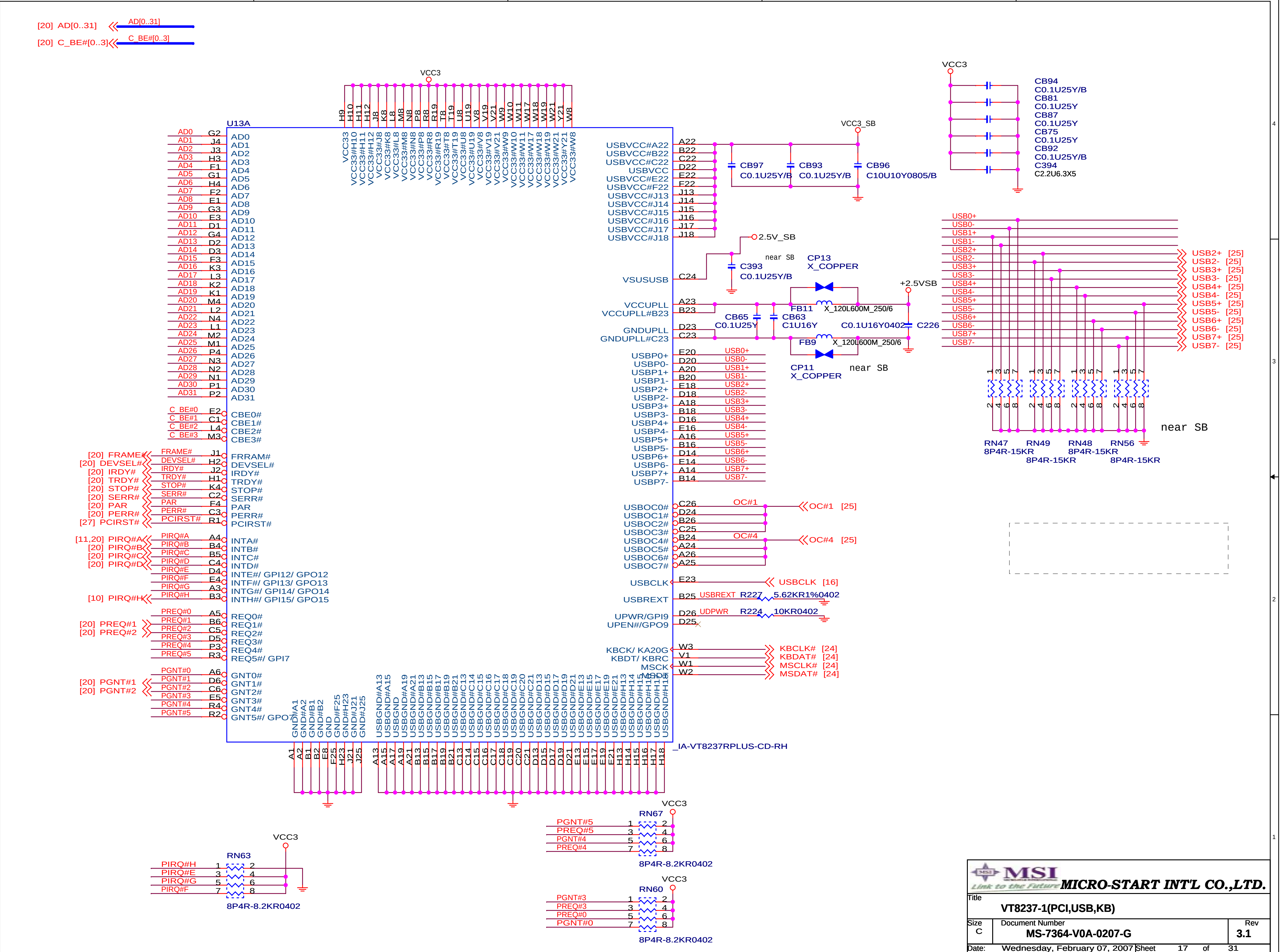
	1 (Pull High)	0 (Pull Low)
SYNC	PCIEX clocks are synchronous with CPU.	PCIEX clocks are asynchronous with CPU.
SEL24_48#	Pin16 = 24MHz	Pin16 = 48MHz
MODE	Notebook mode	Desktop mode
Free	25Mhz-0 is free running	25Mhz-0 is stoppable

Intel P4(775) Table

FS4	FS3	FS2	H_BSL1	H_BSL0	CPU
0	0	0	0	0	266
			0	1	133
			1	0	200
			1	1	166

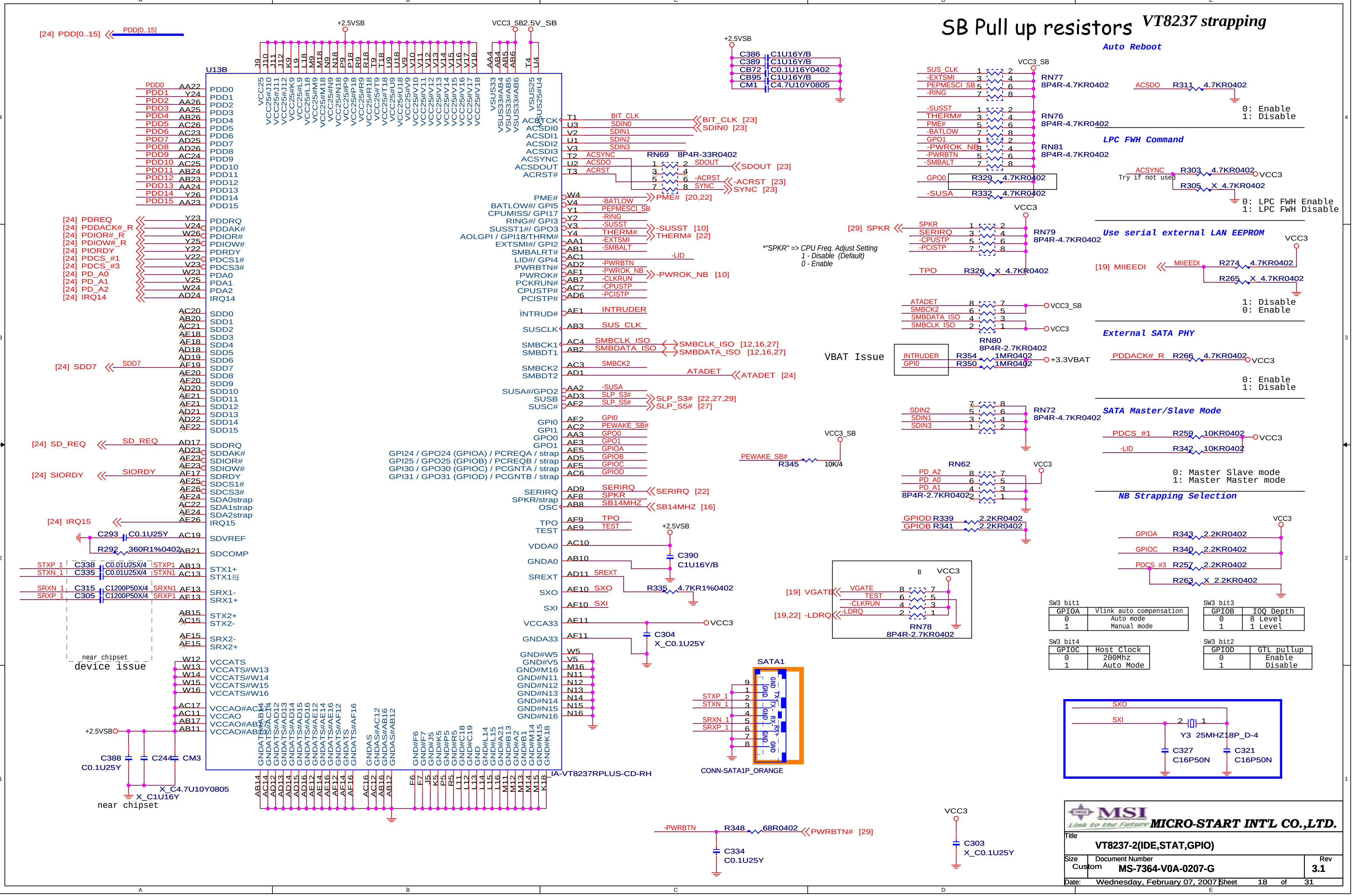
MICRO-START INT'L CO.,LTD.

Title	Clock Generator RTM870T-580	
Size: Custom	Document Number: MS-7364-V0A-0207-G	Rev: 3.1
Date: Wednesday, February 07, 2007	Sheet 16 of 31	

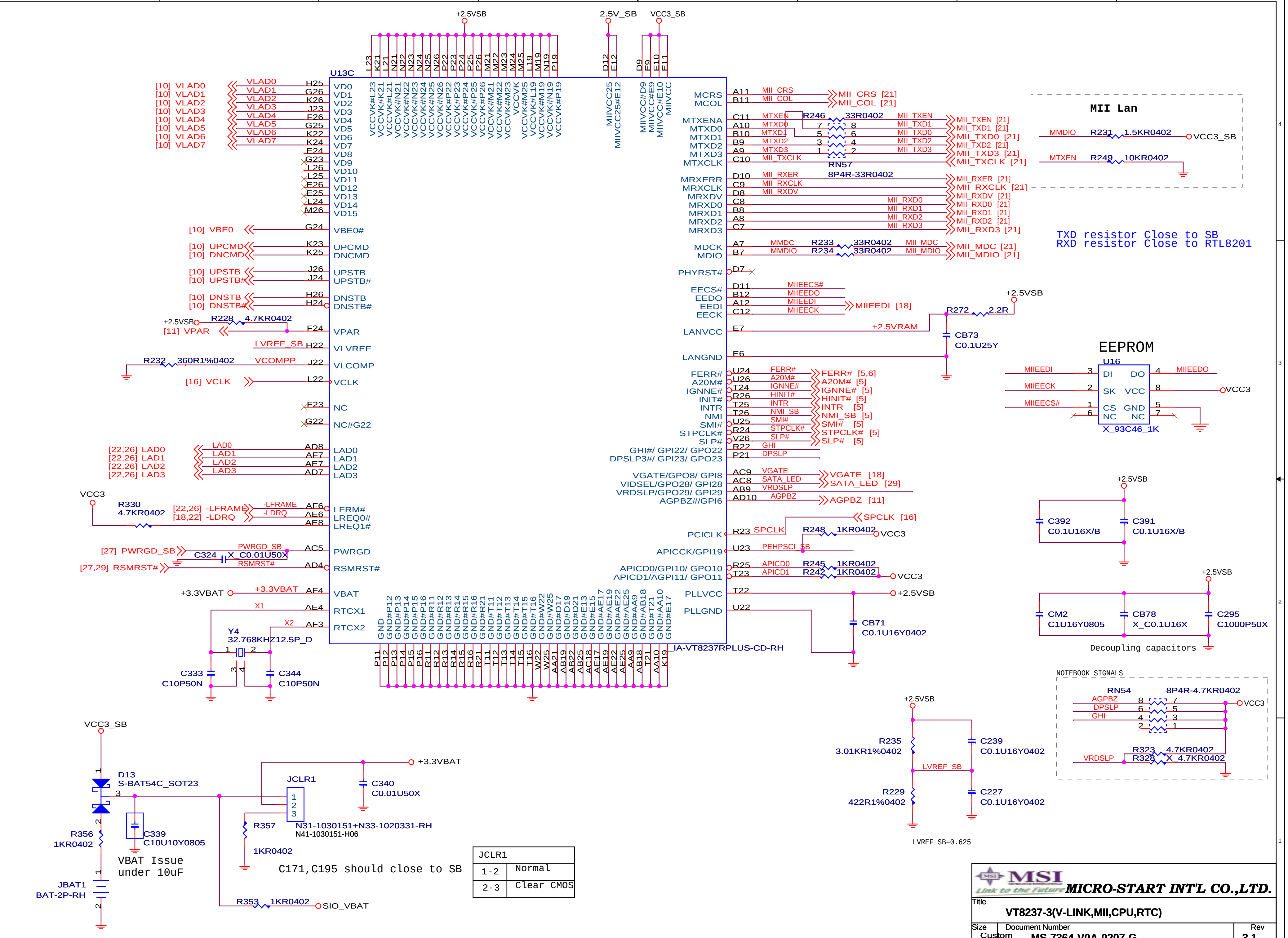


MSI Link to the Future **MICRO-STAR INT'L CO.,LTD.**

Title		
VT8237-1(PCI,USB,KB)		
Size: C	Document Number: MS-7364-V0A-0207-G	Rev: 3.1
Date: Wednesday, February 07, 2007	Sheet 17 of 31	


SB Pull up resistors
VT8237 strapping
Auto Reboot
0: Enable
1: Disable
LPC FWH Command
Try if not used
0: LPC FWH Enable
1: LPC FWH Disable
Use serial external LAN EEPROM
1: Disable
0: Enable
External SATA PHY
0: Enable
1: Disable
SATA Master/Slave Mode
0: Master Slave mode
1: Master Master mode
NB Strapping Selection
"SPKR" => CPU Freq. Adjust Setting
1 - Disable (Default)
0 - Enable
VBAT Issue
device issue
near chipset
U13B
IA-VT8237RPLUS-CD-RH
SATA1
CONN-SATA1P_ORANGE
Y3 25MHZ18P_D-4
SW3 bit1
GPIOA | Vlink auto compensation
0 | Auto mode
1 | Manual mode
SW3 bit3
GPIOB | IOQ Depth
0 | 8 Level
1 | 1 Level
SW3 bit4
GPIOC | Host Clock
0 | 200Mhz
1 | Auto Mode
SW3 bit2
GPIOD | GTL pullup
0 | Enable
1 | Disable
MSI
MICRO-START INT'L CO.,LTD.
Title
VT8237-2(IDE,STAT,GPIO)
Size Custom
Document Number MS-7364-V0A-0207-G
Rev 3.1
Date: Wednesday, February 07, 2007
Sheet 18 of 31

1 - Enable



JCLR1	
1-2	Normal
2-3	Clear CMOS

MSI Link to the Future
MICRO-START INT'L CO.,LTD.

Title: VT8237-3(V-LINK,MII,CPU,RTC)

Size	Document Number	Rev
Custom	MS-7364-V0A-0207-G	3.1

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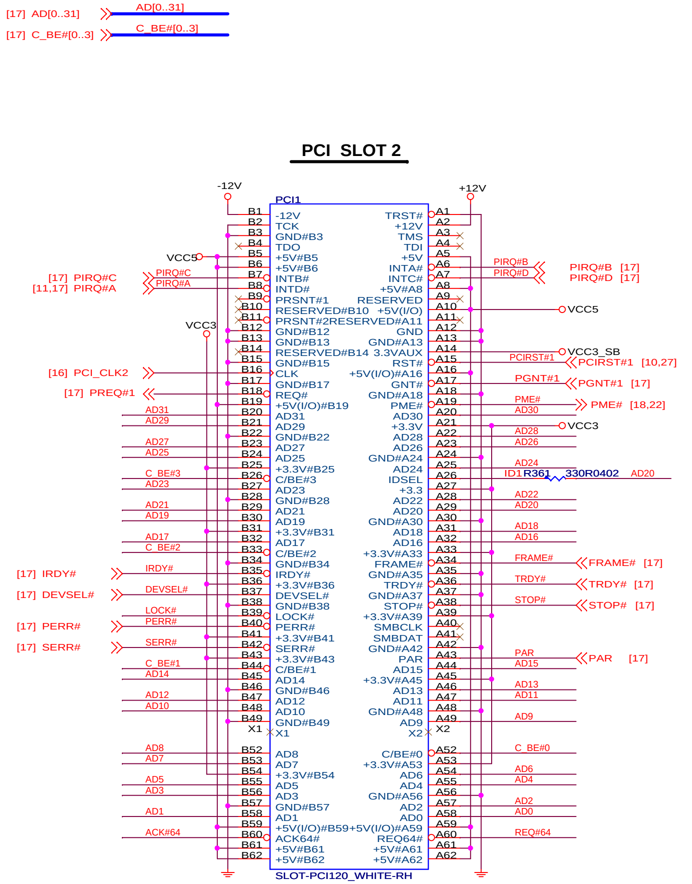
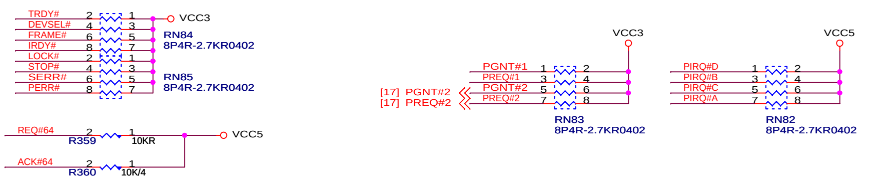
PCI SLOT 2

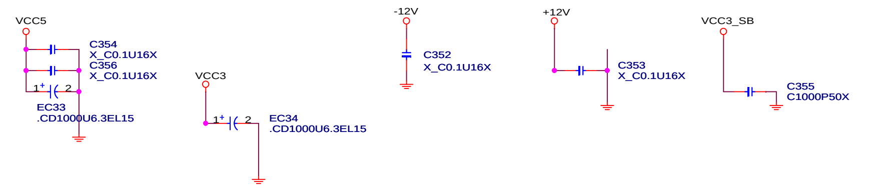


IDSEL = AD20
MASTER = PREQ#1
PIRQ#B

PCI PULL-UP / DOWN RESISTORS

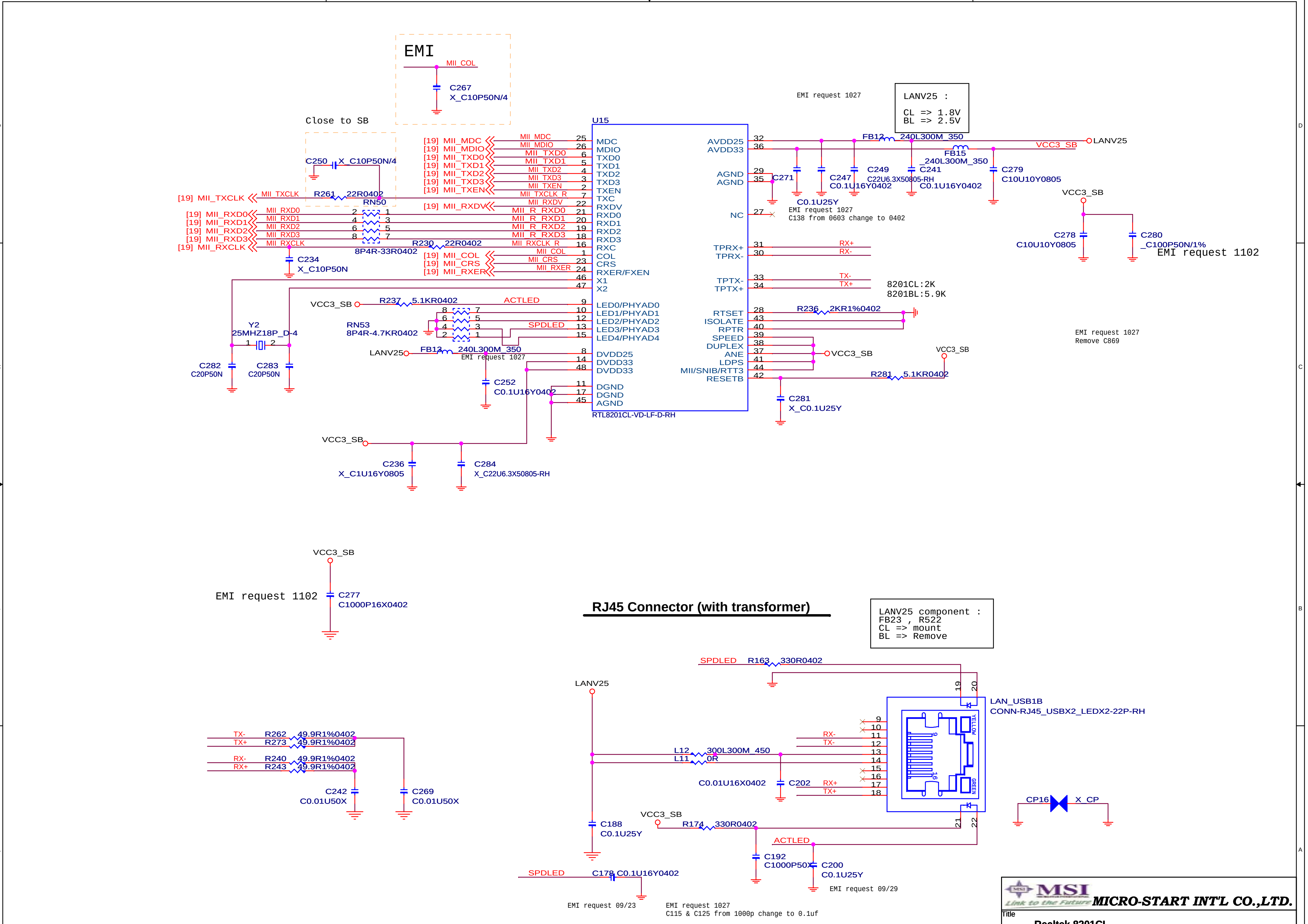


PCI SLOT DECOUPLING CAPACITORS



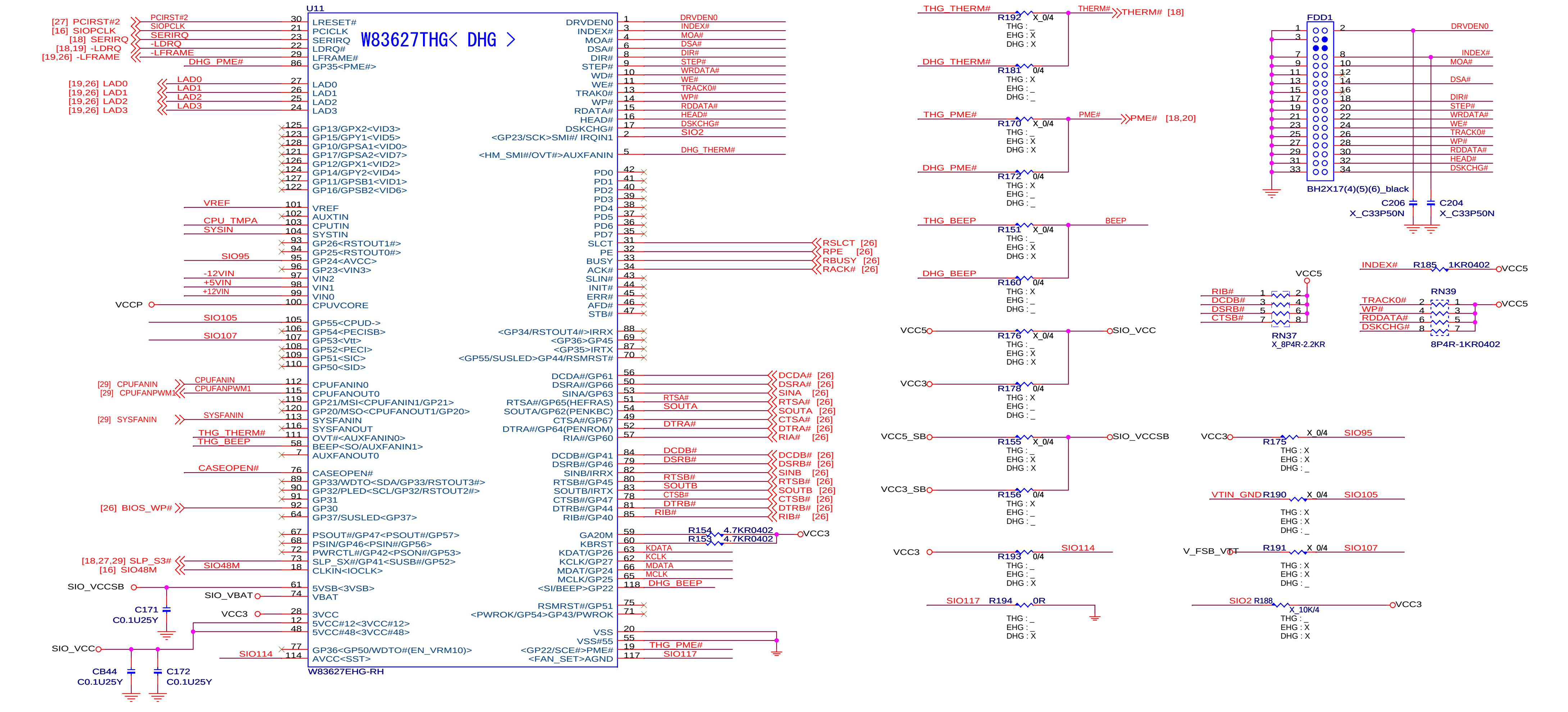
MSI MICRO-STAR INT'L CO.,LTD.

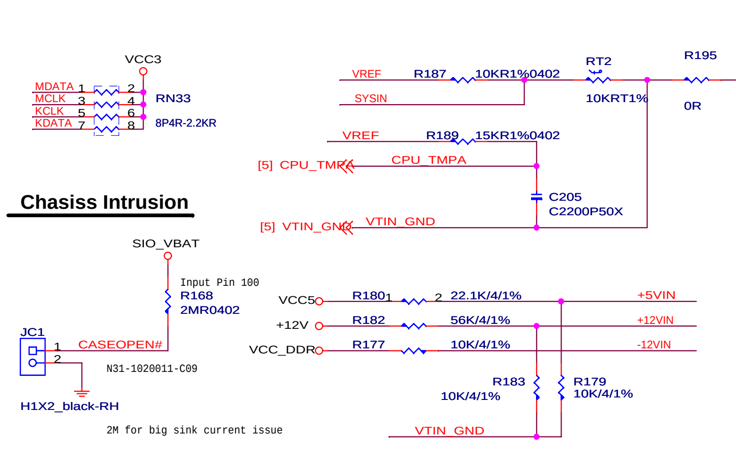
Title	PCI Slot 1 & 2 & 3	
Size: Custom	Document Number: MS-7364-V0A-0207-G	Rev: 3.1
Date: Wednesday, February 07, 2007	Sheet 20 of 31	

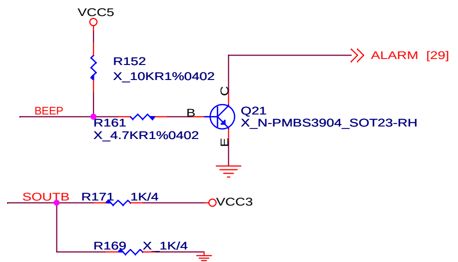


MSI
Link to the Future
MICRO-STAR INT'L CO.,LTD.

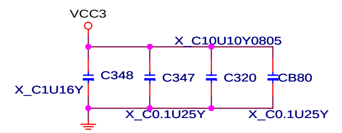
Title	Realtek 8201CL		
Size Custom	Document Number MS-7364-V0A-0207-G		Rev 3.1
Date: Wednesday, February 07, 2007	Sheet 21	of	31







FWH DECOUPLING CAPACITORS



Place Cap. as Close to FWH< 350 mil

Straps W83627DHG

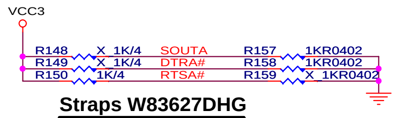
SOUTB	L:1K R466	PWMOUT 50%	FOR CPUFANOUT 1
	H:1K R465	PWMOUT100%	

Straps W83627THG

SOUTB	L:1K R466	24MHz	For CLKIN(pin 18)
	H:1K R465	48MHz	

Straps W83627THG

RTSA#	L: CFAD=2E *	H: CFAD=4E
SOUTA	L: KBC DISABLE *	H: KBC ENABLE
DTRA#	L: DISABLE Logical Device	H: ENABLE Logical Device *

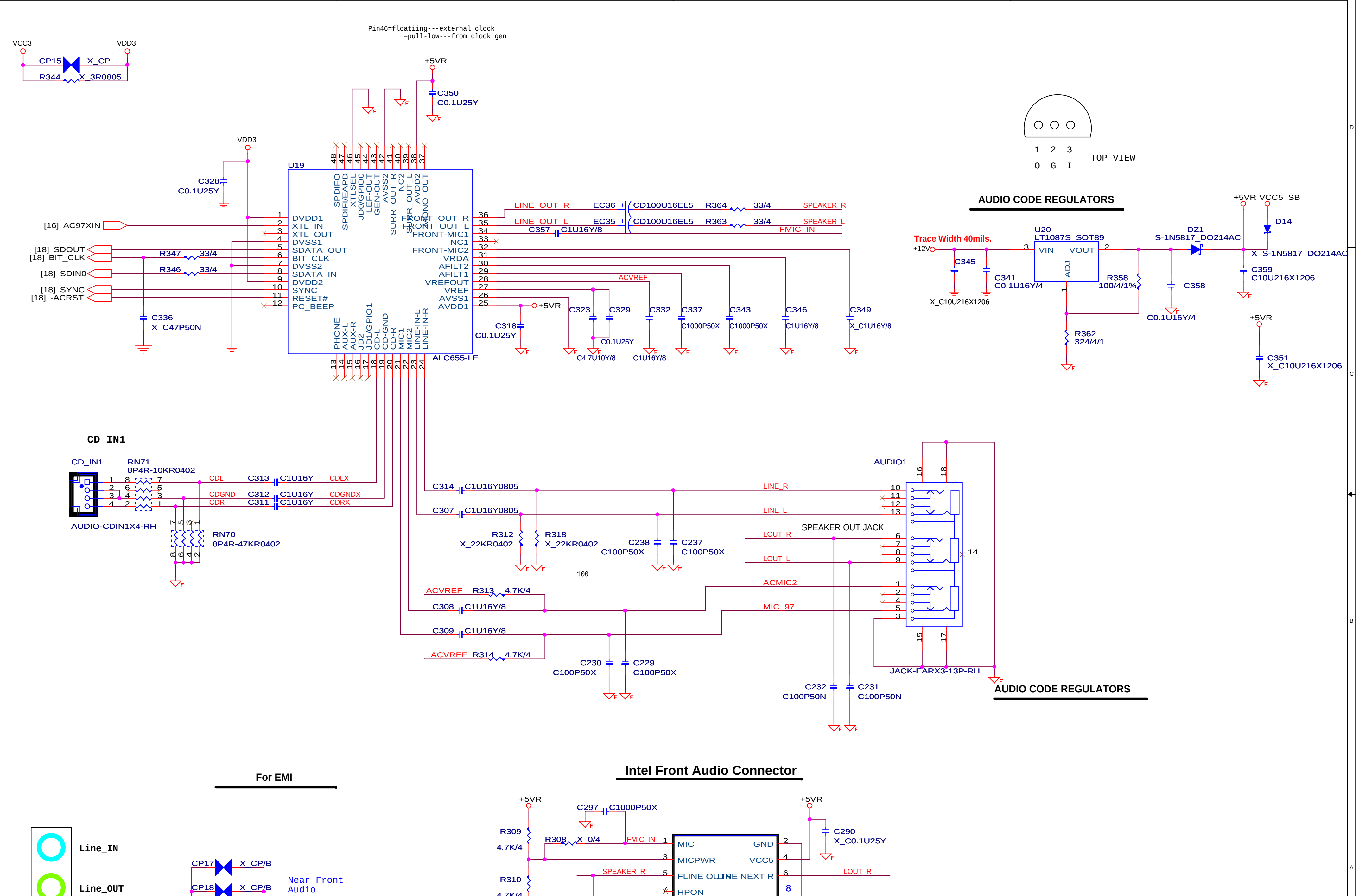


Straps W83627DHG

RTSA#	L: CFAD=2E *	H: CFAD=4E
GP50	L: TTL LEVEL	H: VRM10 LEVEL
SOUTA	L: KBC DISABLE *	H: KBC ENABLE
DTRA#	L: DISABLE SPI *	H: ENABLE SPI

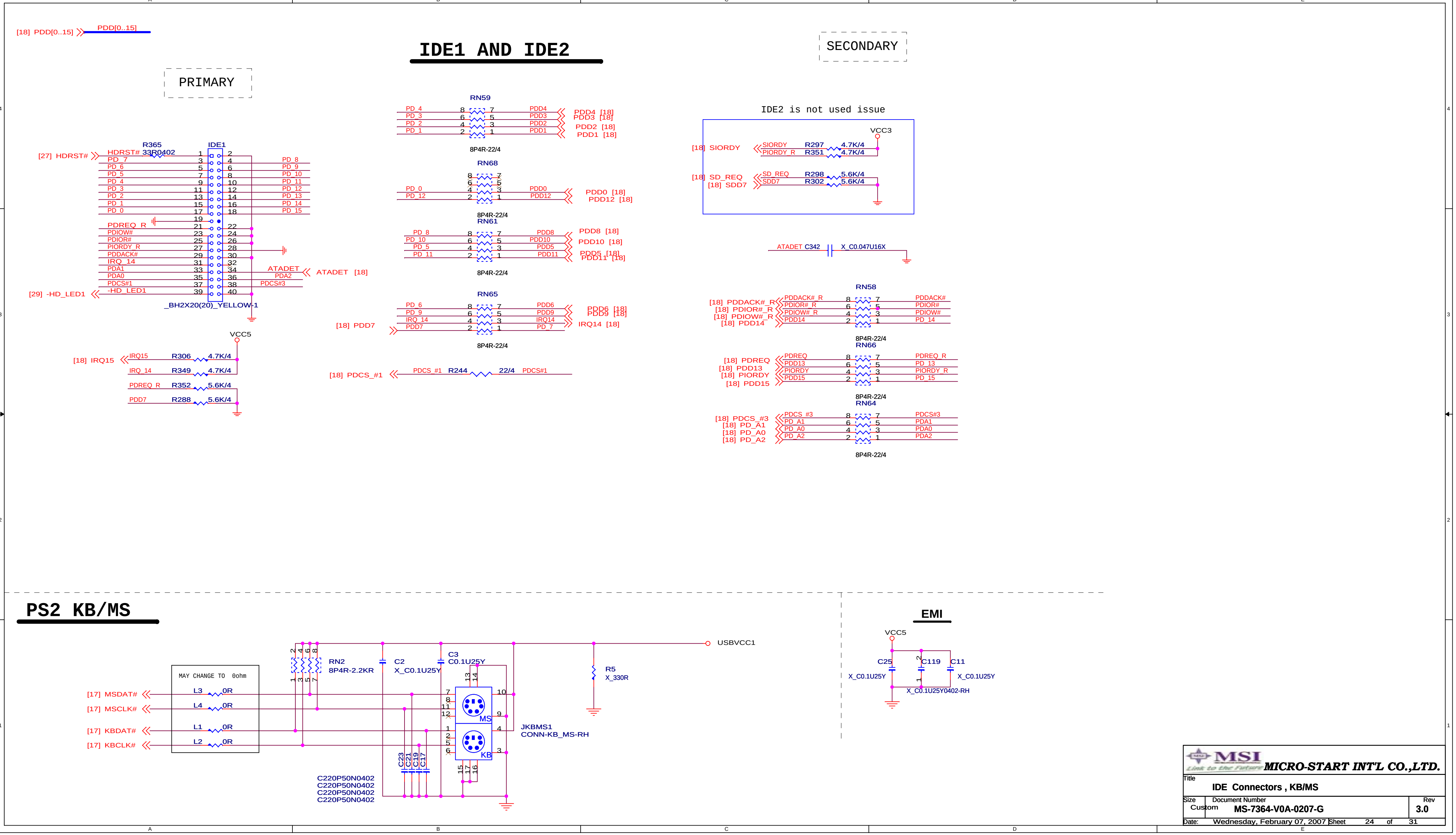
MSI Link to the Future MICRO-START INT'L CO.,LTD.

Title	Super I/O & FAN 83627EHG	
Size: Custom	Document Number: MS-7364-V0A-0207-G	Rev: 3.0
Date: Wednesday, February 07, 2007	Sheet 22 of 31	



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

Title	AC97 Realtek ALC655
Size	Custom
Document Number	MS-7364-V0A-0207-G
Rev	3.1
Date:	Wednesday, February 07, 2007
Sheet	23 of 31

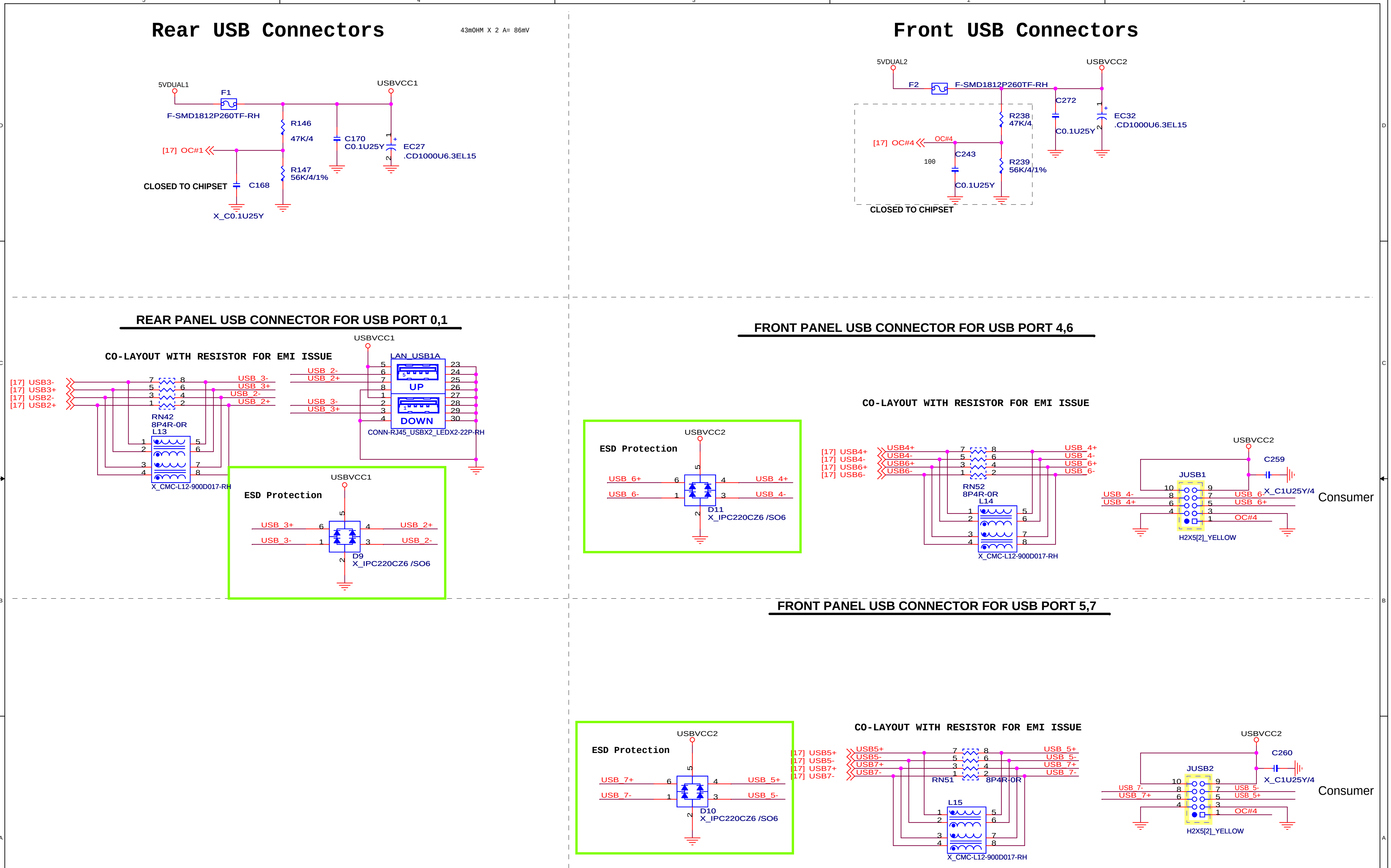


MSI MICRO-START INT'L CO.,LTD.

Title: IDE Connectors , KB/MS

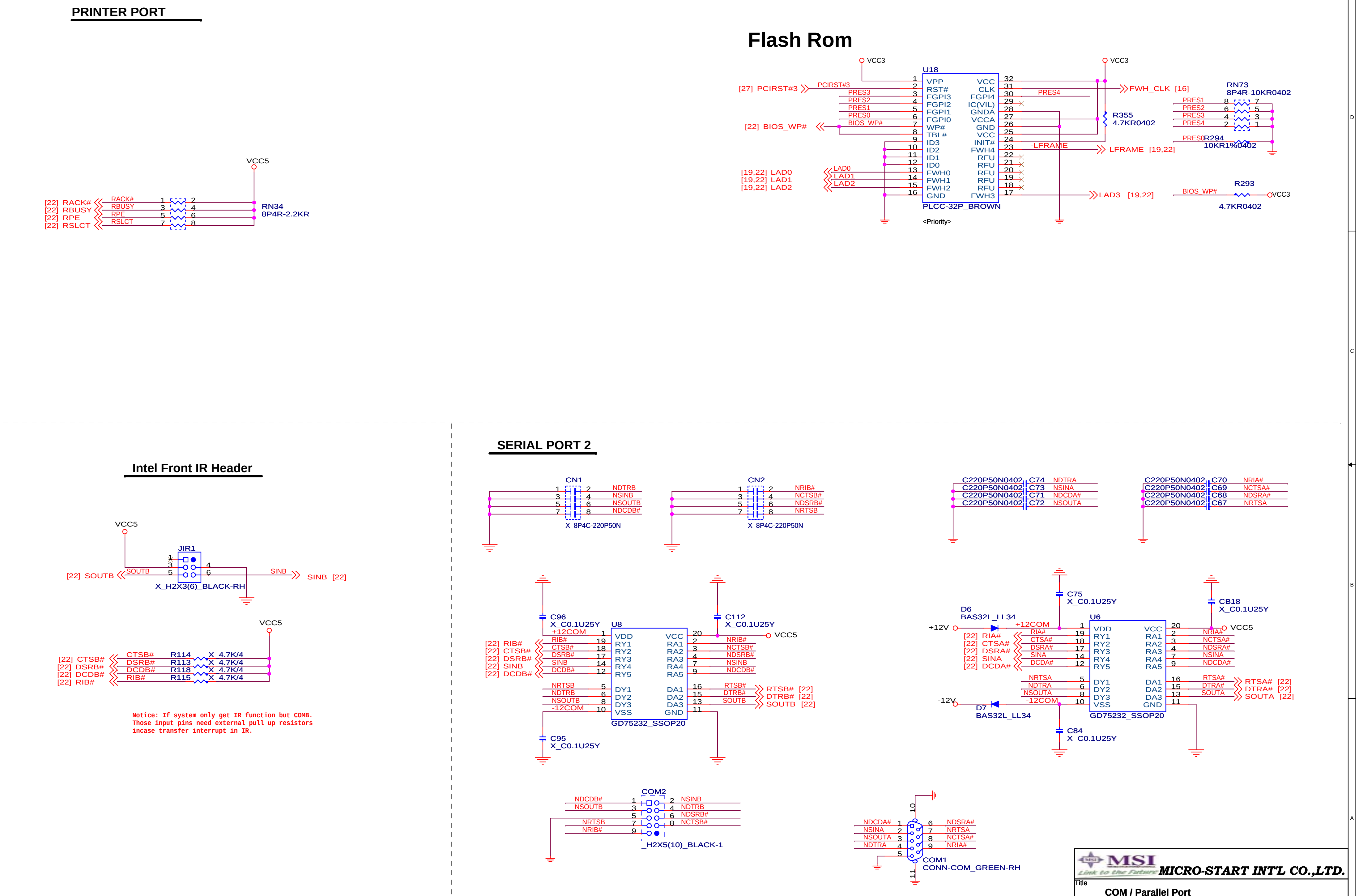
Size	Document Number	Rev
Custom	MS-7364-V0A-0207-G	3.0

Date: Wednesday, February 07, 2007 Sheet 24 of 31



MSI Link to the Future MICRO-START INT'L CO.,LTD.

Title	USB Connectors	
Size: Custom	Document Number: MS-7364-V0A-0207-G	Rev: 3.1
Date: Wednesday, February 07, 2007	Sheet 25 of 31	



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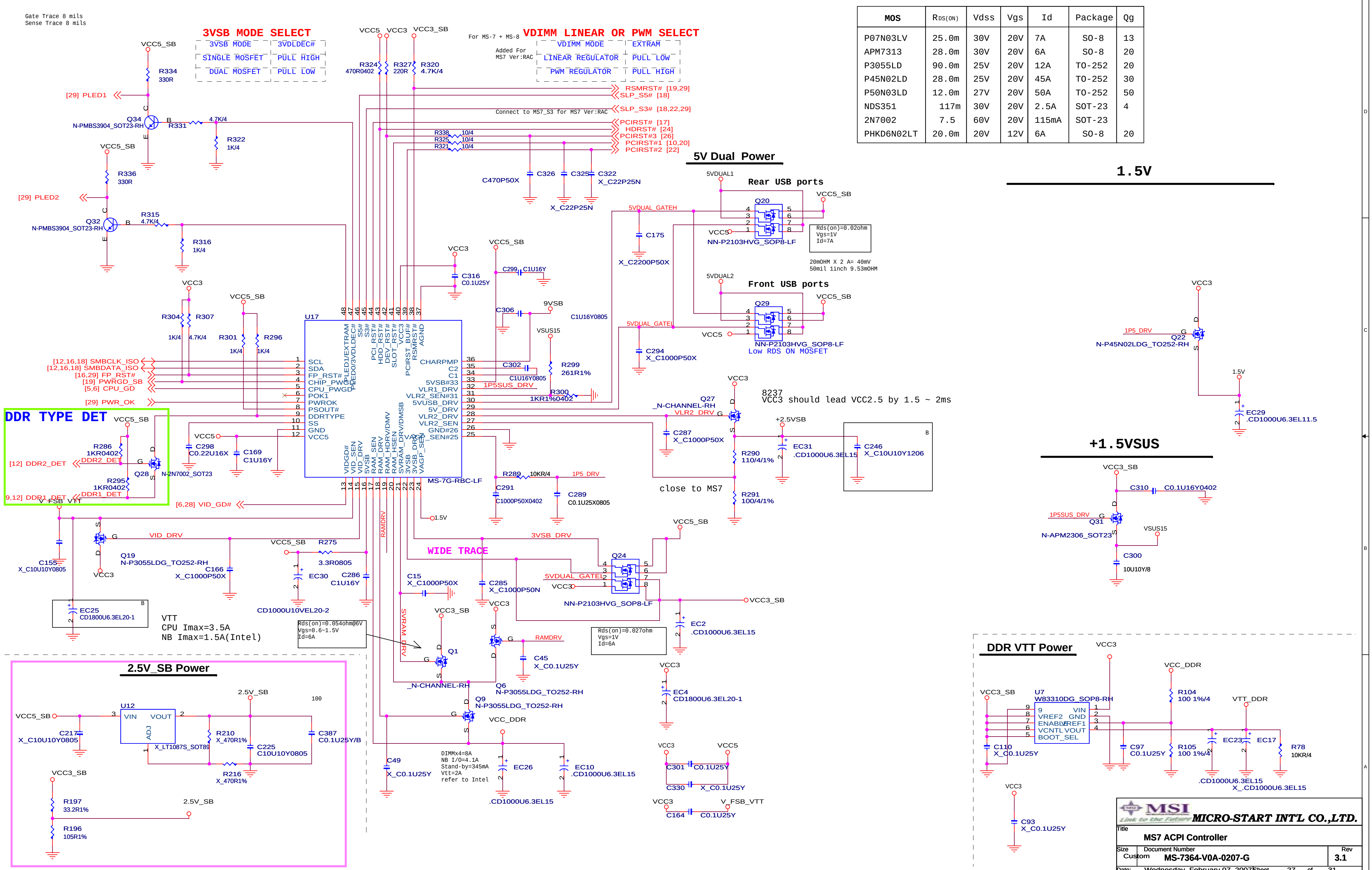
Title	COM / Parallel Port	
Size: Custom	Document Number: MS-7364-V0A-0207-G	Rev: 3.0
Date: Wednesday, February 07, 2007	Sheet 26 of 31	



MOS	$R_{DS(ON)}$	Vdss	Vgs	Id	Package	Qg
P07N03LV	25.0m	30V	20V	7A	SO-8	13
APM7313	28.0m	30V	20V	6A	SO-8	20
P3055LD	90.0m	25V	20V	12A	TO-252	20
P45N02LD	28.0m	25V	20V	45A	TO-252	30
P50N03LD	12.0m	27V	20V	50A	TO-252	50
NDS351	117m	30V	20V	2.5A	SOT-23	4
2N7002	7.5	60V	20V	115mA	SOT-23	
PHKD6N02LT	20.0m	20V	12V	6A	SO-8	20

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

Title: MS7 ACPI Controller

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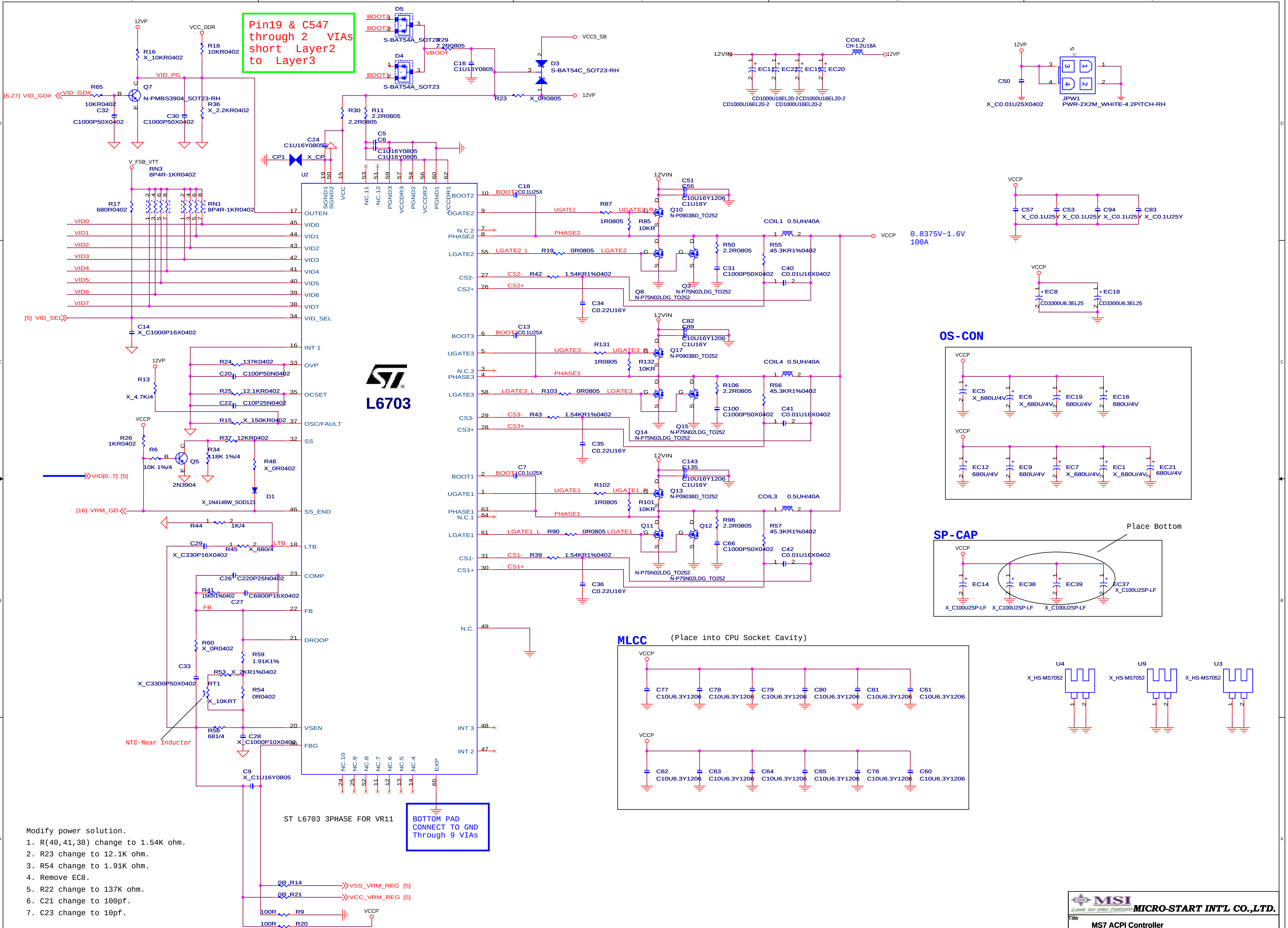

Modify power solution.

1. R(40,41,38) change to 1.54K ohm.
2. R23 change to 12.1K ohm.
3. R54 change to 1.91K ohm.
4. Remove EC8.
5. R22 change to 137K ohm.
6. C21 change to 100pf.
7. C23 change to 10pf.

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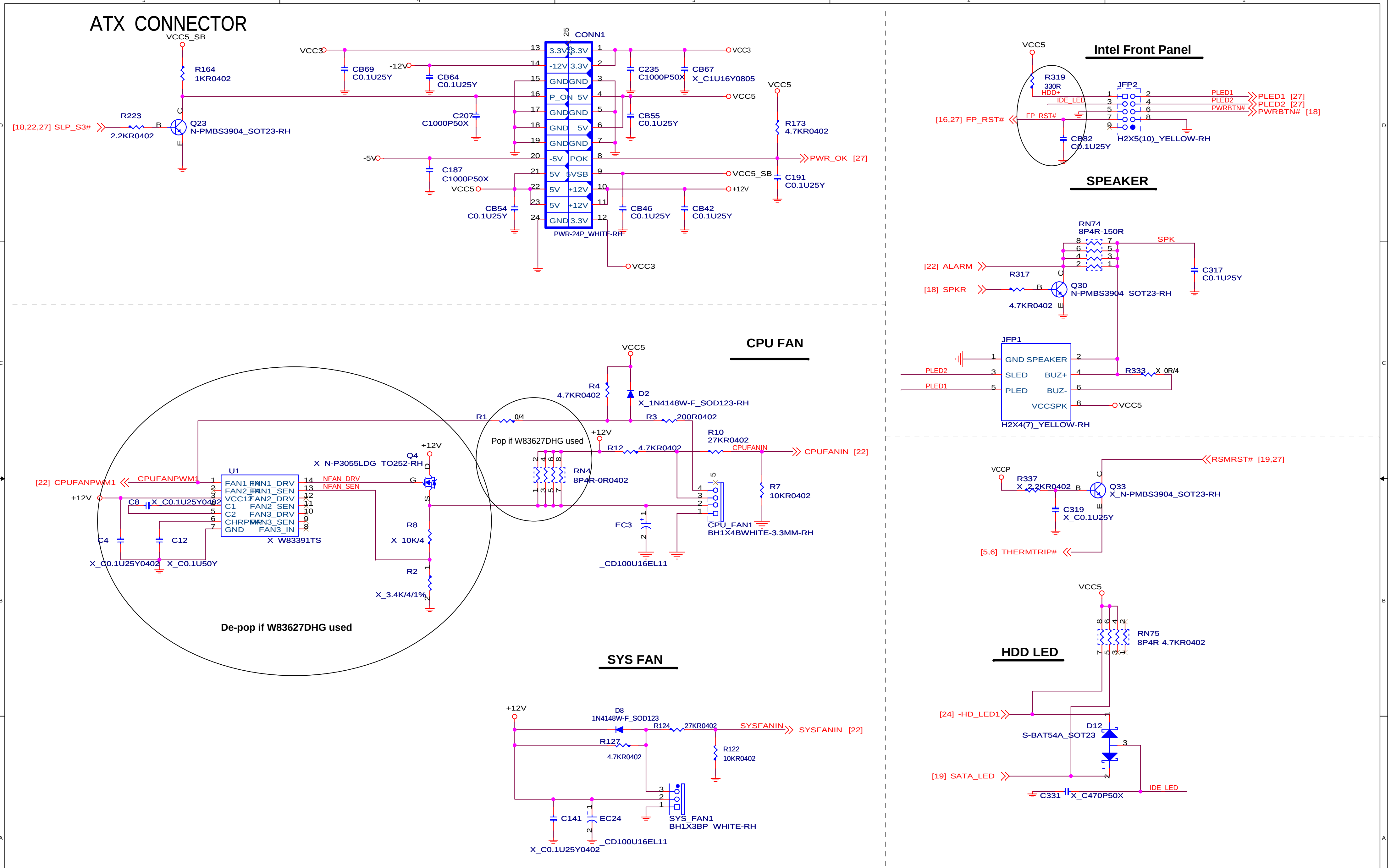
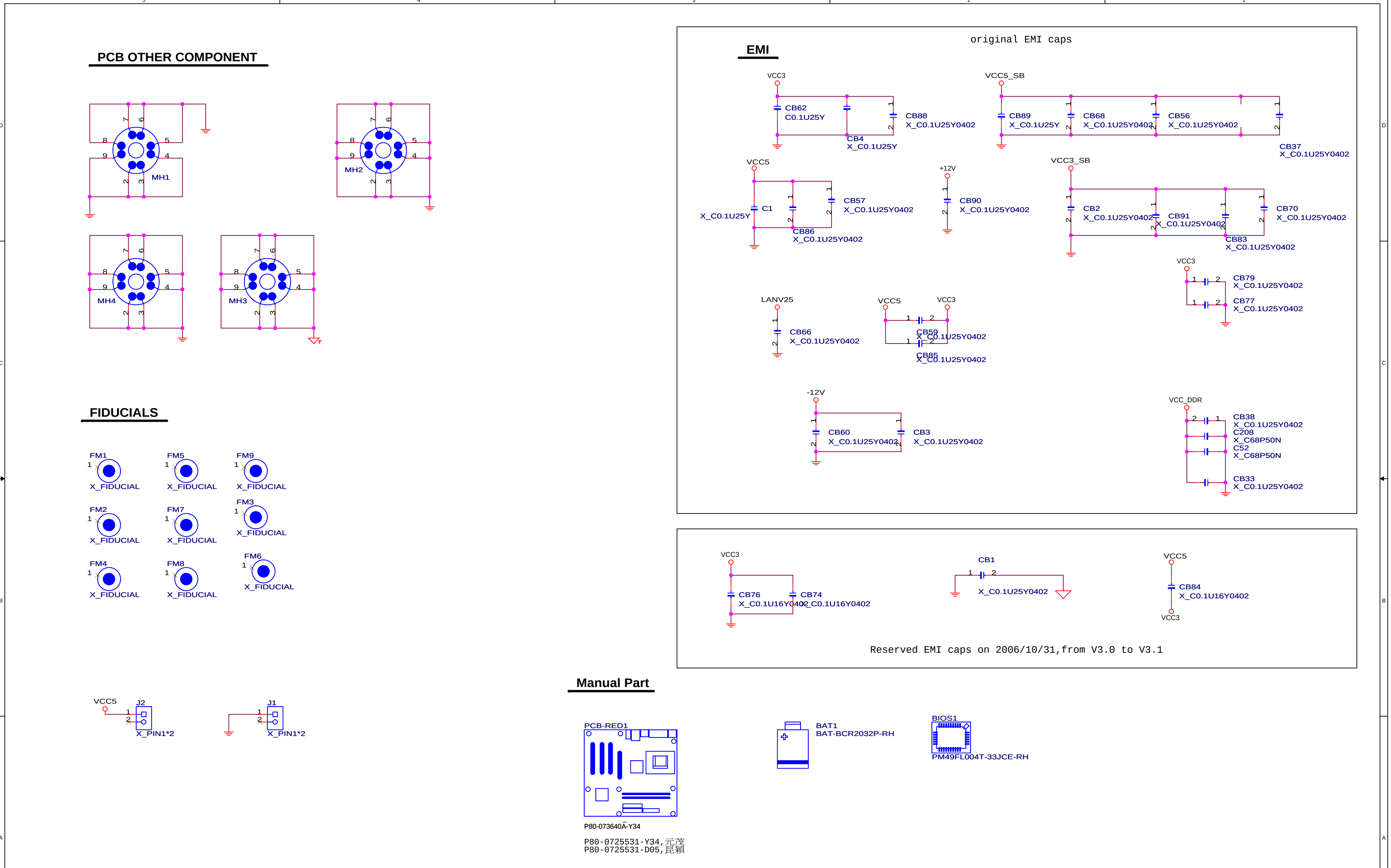
Title	MS7 ACPI Controller	
Size: Custom	Document Number: MS-7364-V0A-0207-G	Rev: 3.1
Date: Wednesday, February 07, 2007	Sheet 28 of 31	



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

Title	ATX & F_Panel & BIOS	
Size: Custom	Document Number: MS-7364-V0A-0207-G	Rev: 3.1
Date: Wednesday, February 07, 2007	Sheet 29 of 31	



MSI Link to the Future **MICRO-START INT'L CO.,LTD.**

Title: PCB Components & EMI & Manual Part		
Size: Custom	Document Number: MS-7364-V0A-0207-G	Rev: 3.1
Date: Wednesday, February 07, 2007	Sheet 30 of 31	

3.0 change to 3.1

Page12 :
1). Connect SMBUS to DDR & PCI-express slot.

Page14 :
1). Connect SMBUS to DDR & PCI-express slot.

Page16 :
1). R258 short, change net name "MCLKIT" to MCLKIT_R between R258 and clock generator.Change R258 to 0 ohm.
2). Reserve a 0 ohm resistor between "FP_RST#" and "RESET_IN#/RESET#".
3). Swap RN47 pin6 & pin8 (NBHCLK & NBHCLK#)
4). Uninstall R303 & 299,49.9 ohm pull-lo resistors are build in clock generator.
5). Swap net "H_BSL1" & "H_BSL2".
6). Change net name "SYNC" to SYNC_NB. Because the net name "SYNC" as same as AC'97 net "SYNC"

Page19 :
1). Reserved a EEPROM for LAN mac ID, reserved a pull-lo resistor on "MIIEEDI" to enable EEPROM.

Page22 :
1). Add case open function.
2). Modify SPI power to VCC3.
3). Modify RN26 power to VCC5.
4). Reserved a cap for VREF.
5). Uninstall SPI flash rom, use LPC flash rom to boot up system.

Page24 :
1). Swap IDE1 & IDE2 location.

Page29 :
1). Uninstall system fan control function.

Page30 :
1). Reserved EMI caps.

Page28 :
1). Add a cooper to connect digital GND and analog GND, place near C25.
2). Modify output choke's footprint to CHK_PMC109_R60M_M1 and change choke value to 0.5uH.
3). Uninstall one lo-side MosFET to keep 6*MosFET per phase.

2006/11/23 MS-7255 version3.1 ECN modify

Page22 :
1). Remove PLCC socket.
2). W83627DHC change to C version.

Page16 :
1). Modify clock skew issue.
2). Remove SMBUS damping resistors.

Page28 :
1). Modify power solution.