MS-7529

Version 1.6

CPU:

Intel Conroe (65W Dual core)

System Chipset:

Intel Bearlake - MCH (North Bridge)
Intel ICH7R (South Bridge)

On Board Chipset:

BIOS -- SPI 8M
HD -- ALC888S VC2
LPC Super I/O -- F71882FG
LAN-- REALTEK RTL8111DL Co-lay RTL8103EL
CLOCK -- RTM876-665

Main Memory:

DDR II *2 (Max 4GB)

Expansion Slots:

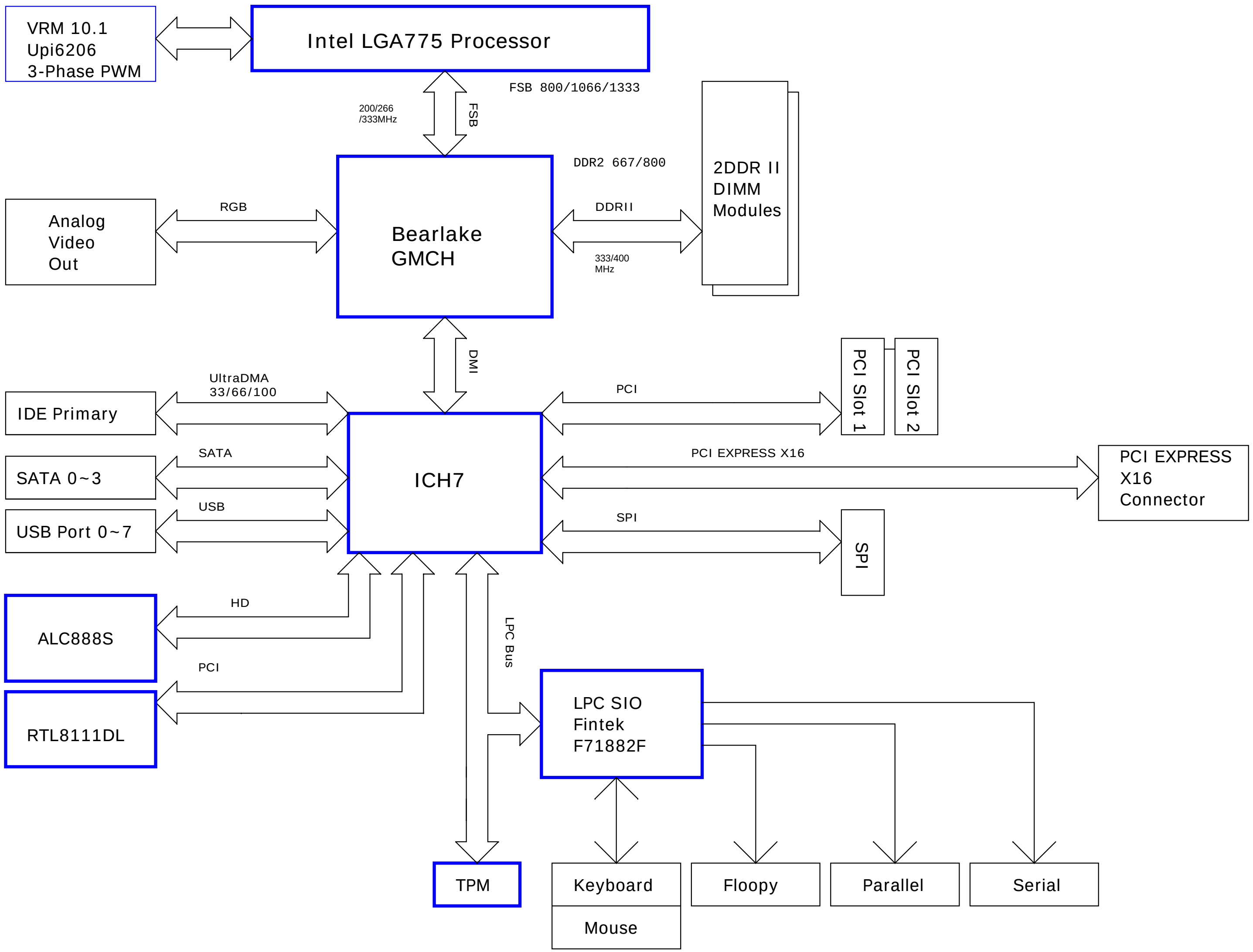
PCI2.3 SLOT * 2

PCI EXPRESS X16 SLOT

ST PWM:

Controller: upi6206 3 PHASES

Block Diagram



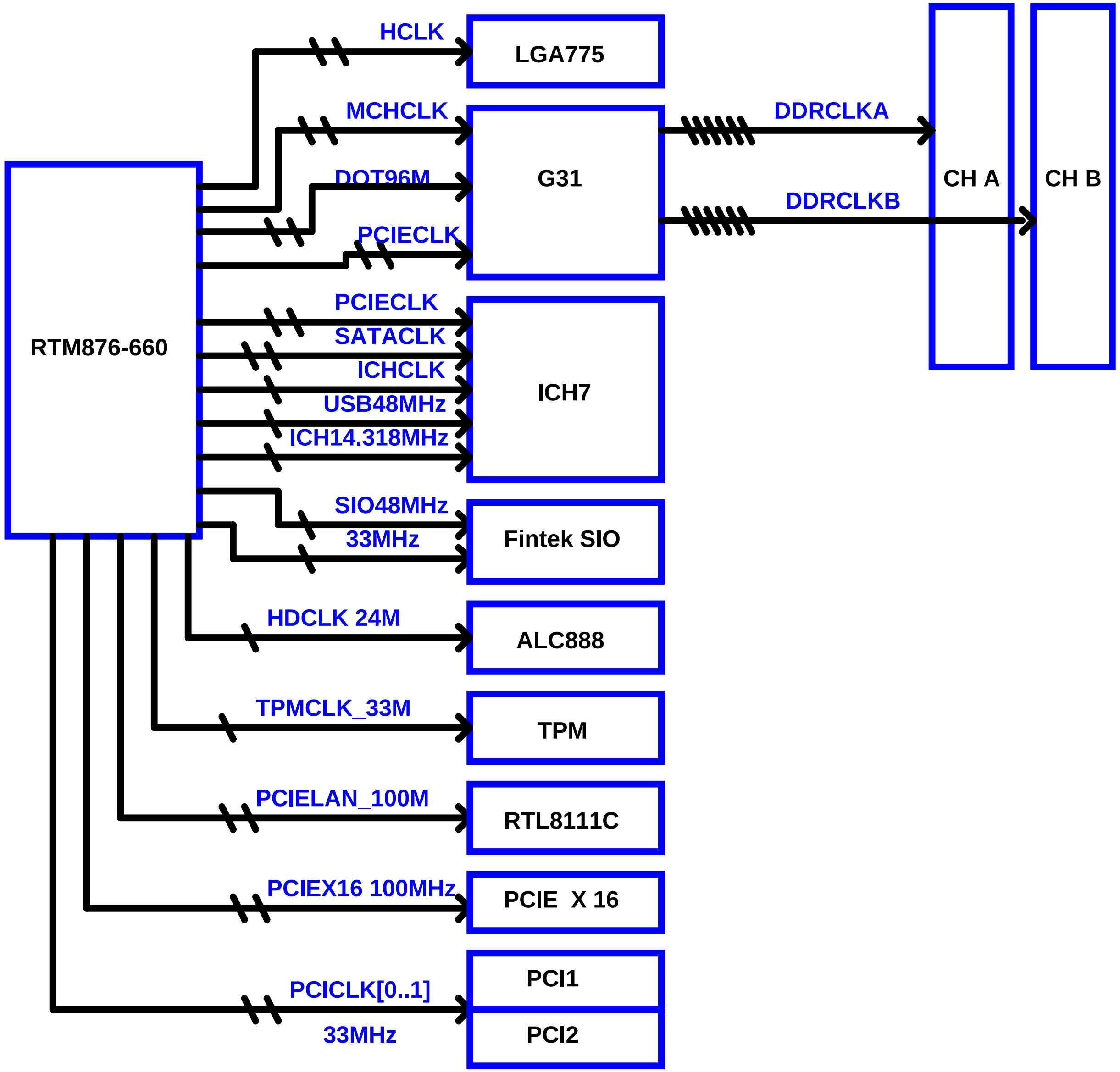
MICRO-STAR INT'L CO.,LTD

MS-7529

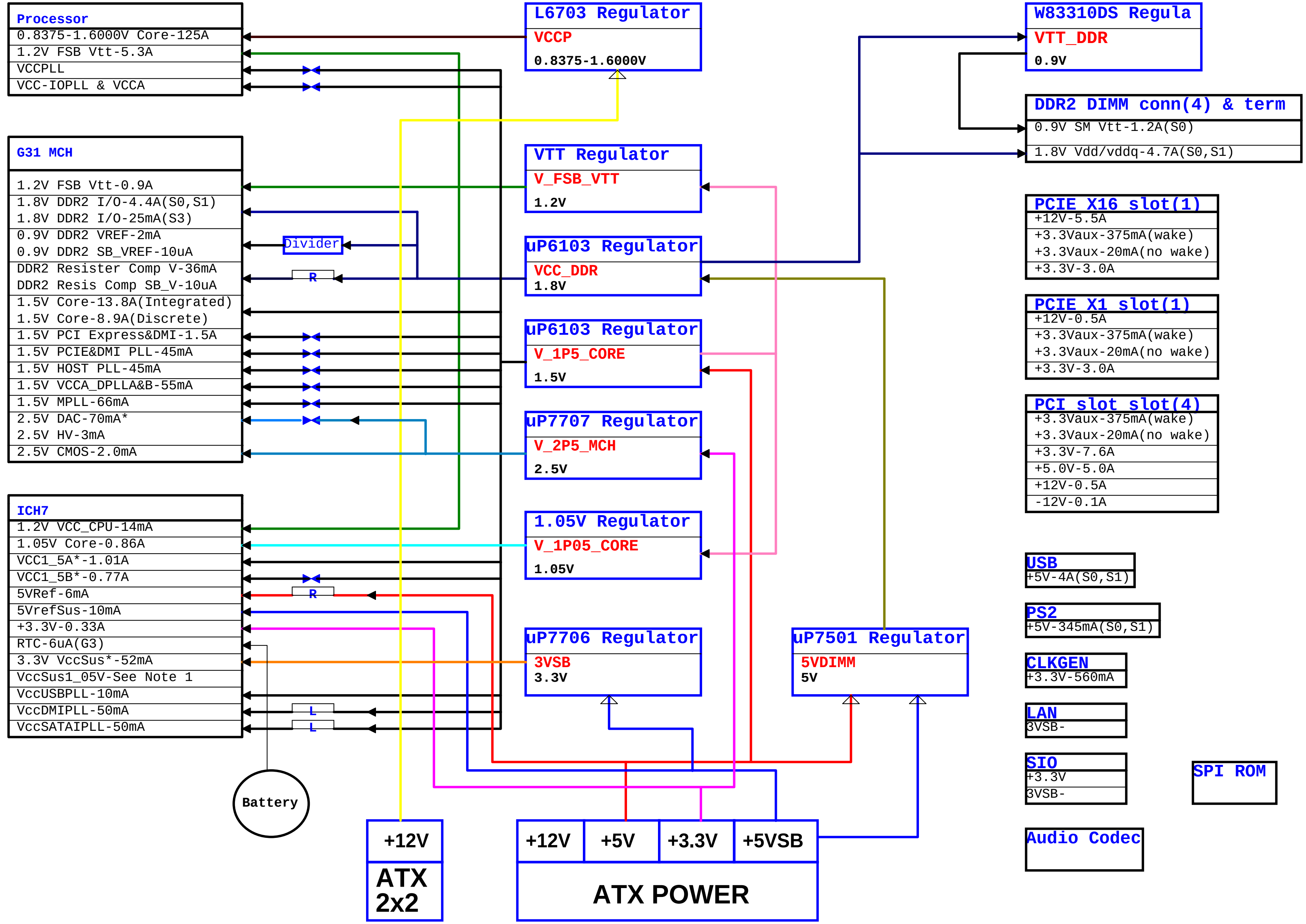
Size	Document Description	Rev
Custom	BLOCK DIAGRAM	1.6

Date: Tuesday, April 14, 2009 Sheet 2 of 33

CLOCK MAP



MICRO-STAR INT'L CO.,LTD		
MS-7529		
Size: Custom	Document Description: CLOCK MAP	Rev: 1.6
Date: Tuesday, March 24, 2009	Sheet 3 of 33	

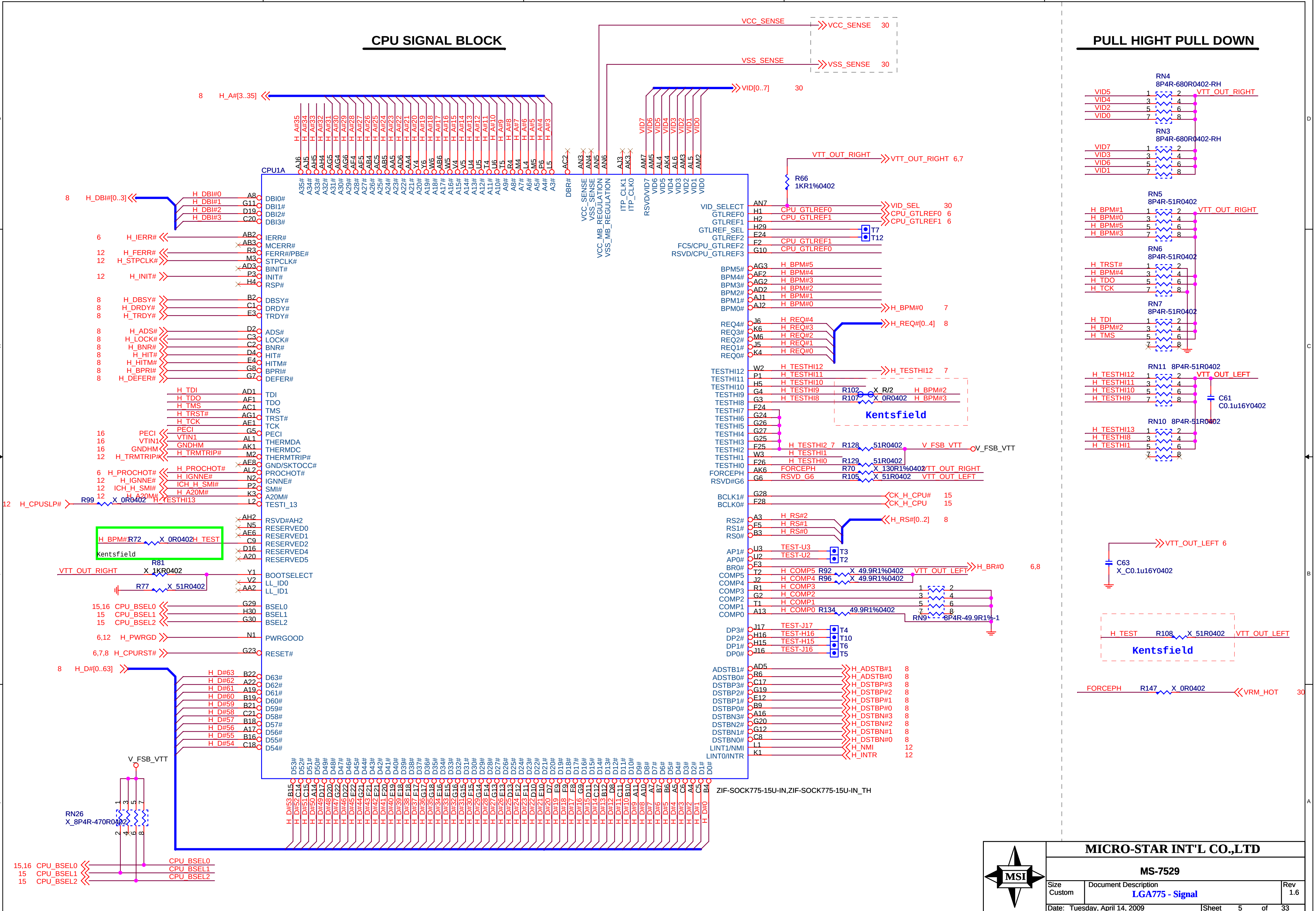


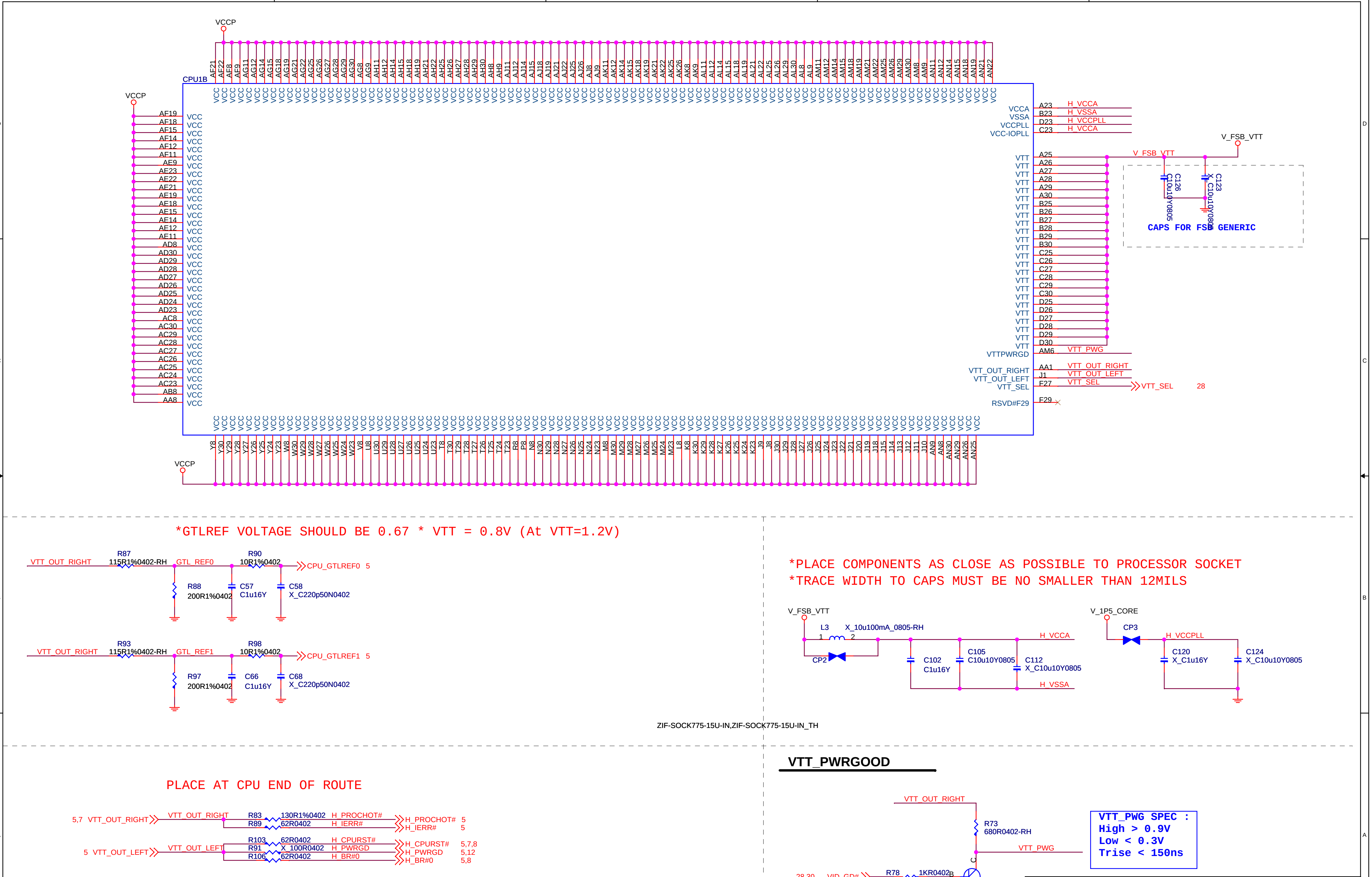
MICRO-STAR INT'L CO.,LTD

MS-7529

Size	Document Description	Rev
Custom	LGA775 - Signal	1.6

Date: Tuesday, April 14, 2009 Sheet 4 of 33


CPU SIGNAL BLOCK
PULL HIGHT PULL DOWN
CPU1A
ZIF-SOCK775-15U-IN,ZIF-SOCK775-15U-IN_TH
H_A#[3..35]
H_DBI#[0..3]
H_D#[0..63]
VID[0..7]
VCC_SENSE
VSS_SENSE
VTT_OUT_RIGHT
VTT_OUT_LEFT
V_FSB_VTT
H_REQ#[0..4]
H_RS#[0..2]
H_BPM#0
H_TESTHI12
H_BR#0
VID_SEL
CPU_GTLREF0
CPU_GTLREF1
CK_H_CPU#
CK_H_CPU
H_ADSTB#1
H_ADSTB#0
H_DSTBP#3
H_DSTBP#2
H_DSTBP#1
H_DSTBP#0
H_DSTBN#3
H_DSTBN#2
H_DSTBN#1
H_DSTBN#0
H_NMI
H_INTR
H_IERR#
H_FERR#
H_STPCLK#
H_INIT#
H_DBSY#
H_DRDY#
H_TRDY#
H_ADS#
H_LOCK#
H_BNR#
H_HIT#
H_HITM#
H_BPRI#
H_DEFER#
PECI
VTIN1
GNDHM
H_TRMTRIP#
H_PROCHOT#
H_IGNNE#
ICH_H_SMI#
H_A20M#
H_CPUSLP#
CPU_BSEL0
CPU_BSEL1
CPU_BSEL2
H_PWRGD
H_CPURST#
Kentsfield
RN4 8P4R-680R0402-RH
RN3 8P4R-680R0402-RH
RN5 8P4R-51R0402
RN6 8P4R-51R0402
RN7 8P4R-51R0402
RN11 8P4R-51R0402
RN10 8P4R-51R0402
RN9 8P4R-49.9R1%-1
RN26 X_8P4R-470R0402
R66 1KR1%0402
C61 C0.1u16Y0402
C63 X_C0.1u16Y0402
R108 X_51R0402
R147 X_0R0402
FORCEPH
VRM_HOT
MICRO-STAR INT'L CO.,LTD
MSI
MS-7529
Size
Custom
Document Description
LGA775 - Signal
Rev
1.6
Date: Tuesday, April 14, 2009
Sheet 5 of 33

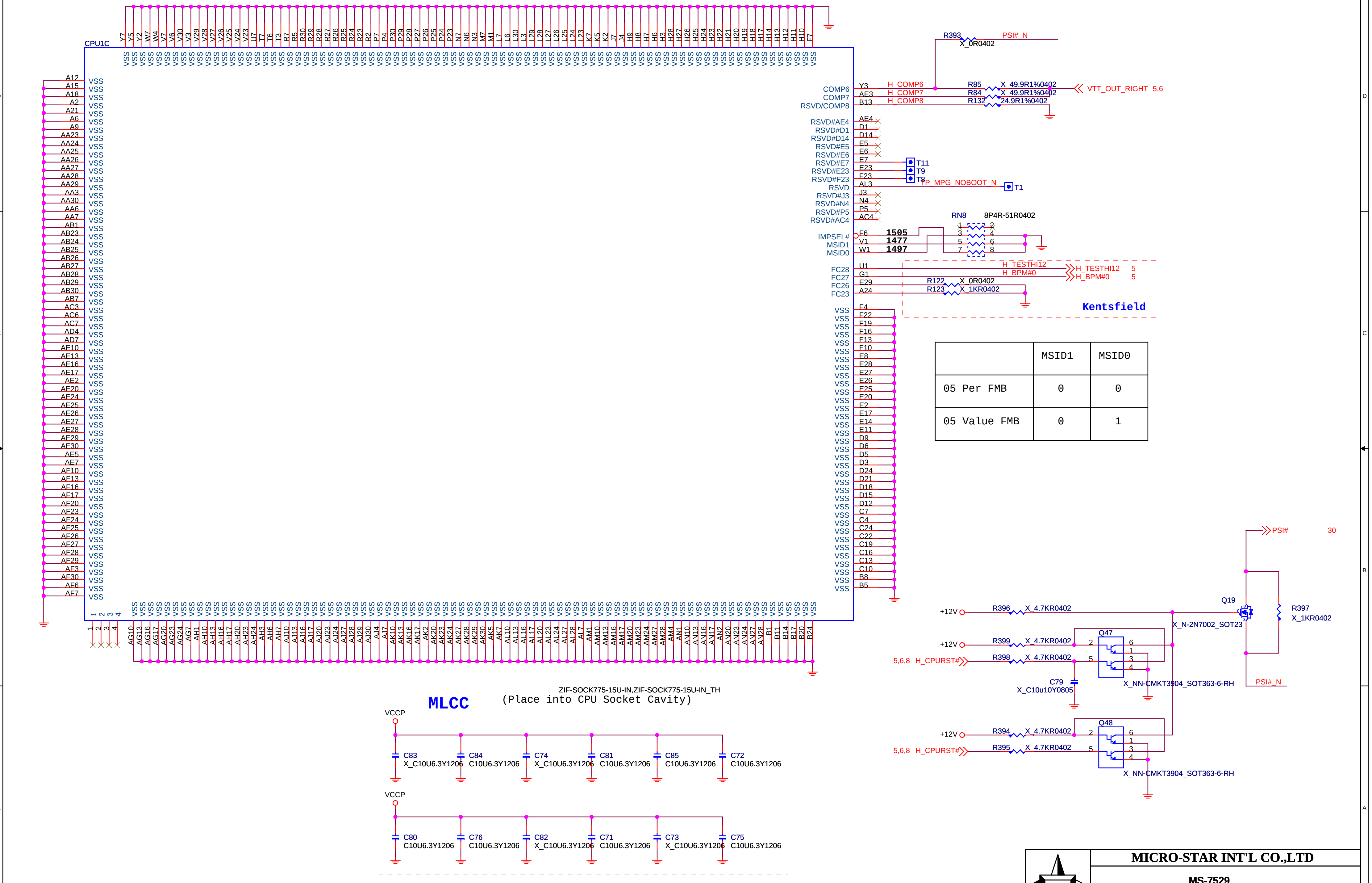


MICRO-STAR INT'L CO.,LTD

MS-7529

Size	Document Description	Rev
Custom	LGA775 - Power	1.6

Date: Tuesday, April 14, 2009 Sheet 6 of 33



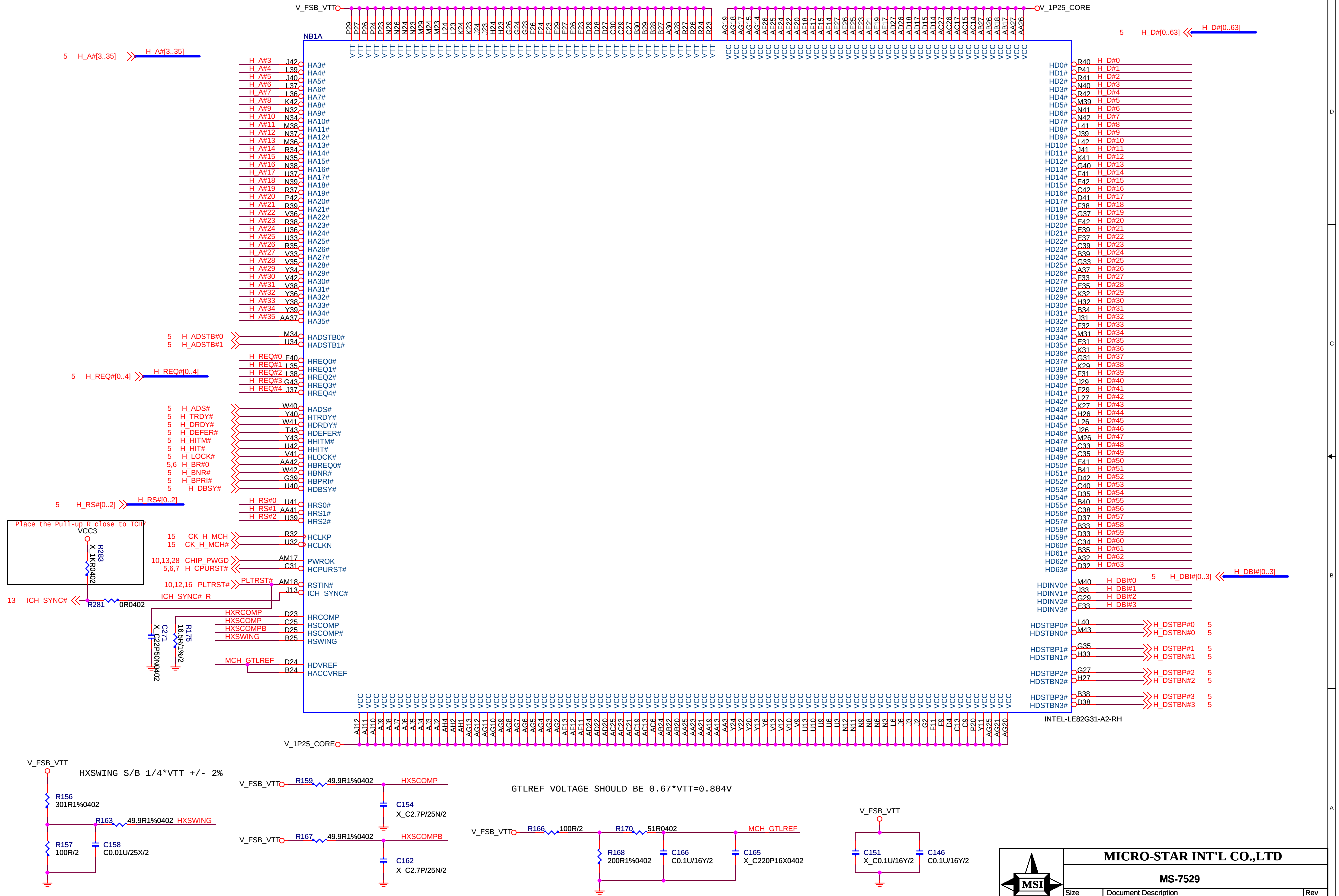
	MSID1	MSID0
05 Per FMB	0	0
05 Value FMB	0	1

MICRO-STAR INT'L CO.,LTD

MS-7529

Size: Custom | Document Description: LGA775 - GND | Rev 1.6

Date: Tuesday, April 14, 2009 | Sheet 7 of 33

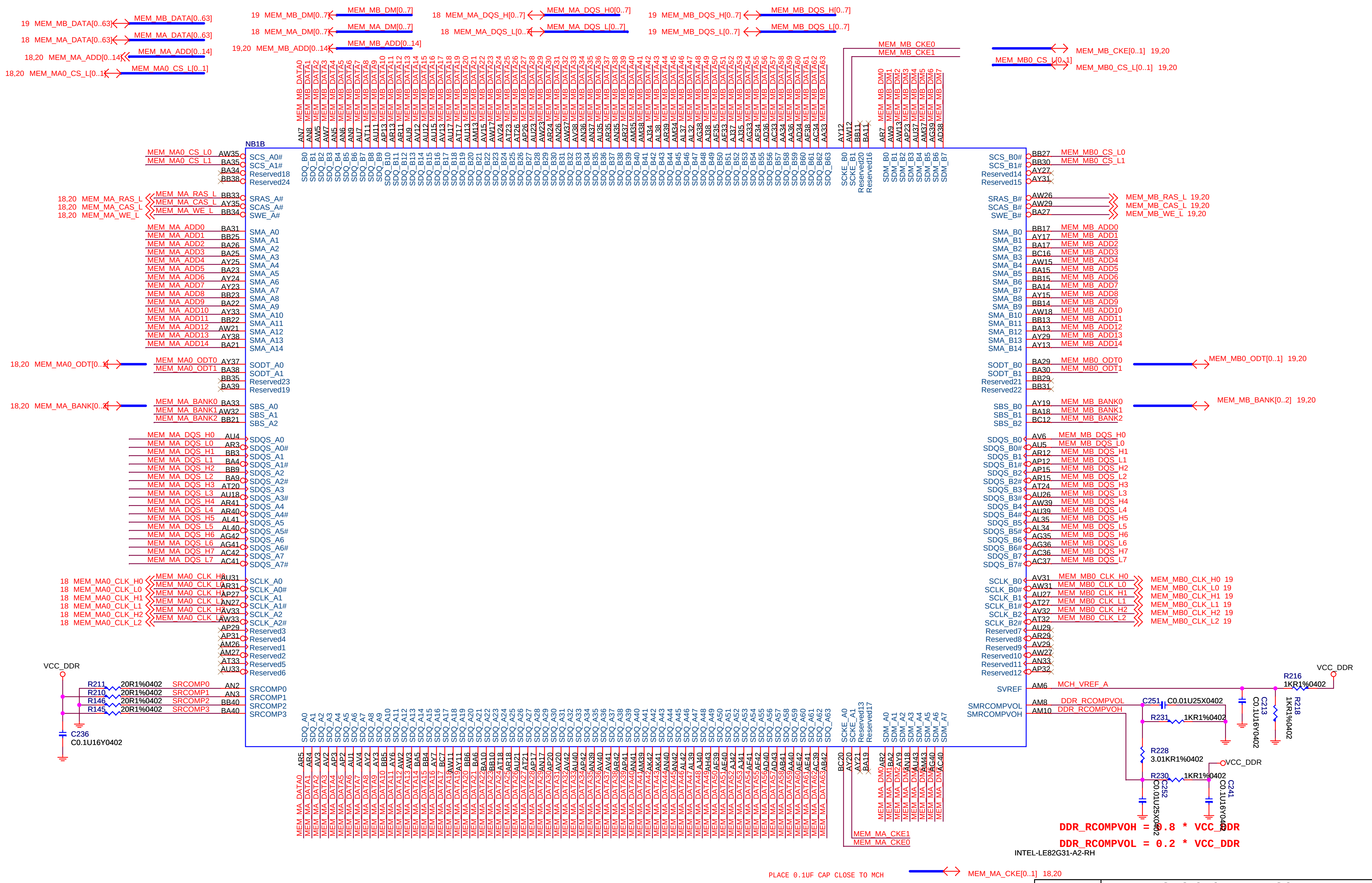


MICRO-STAR INT'L CO.,LTD

MS-7529

Size	Document Description	Rev
Custom	G31 - CPU Signals	1.6

Date: Monday, April 13, 2009 Sheet 8 of 33

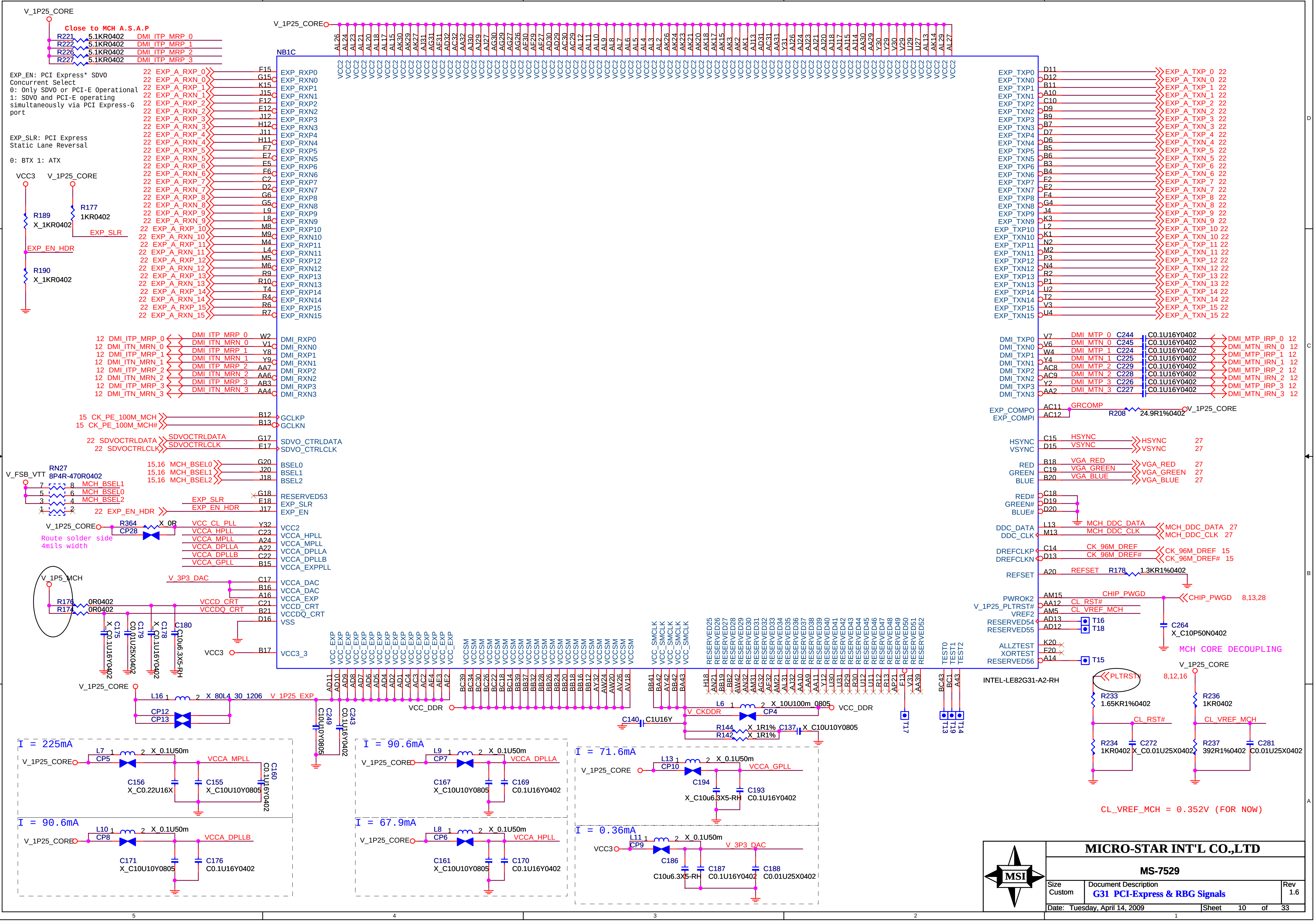


MICRO-STAR INT'L CO.,LTD

MS-7529

Size	Document Description	Rev
Custom	G31 - Memory Signals	1.6

Date: Monday, April 13, 2009 | Sheet 9 of 33

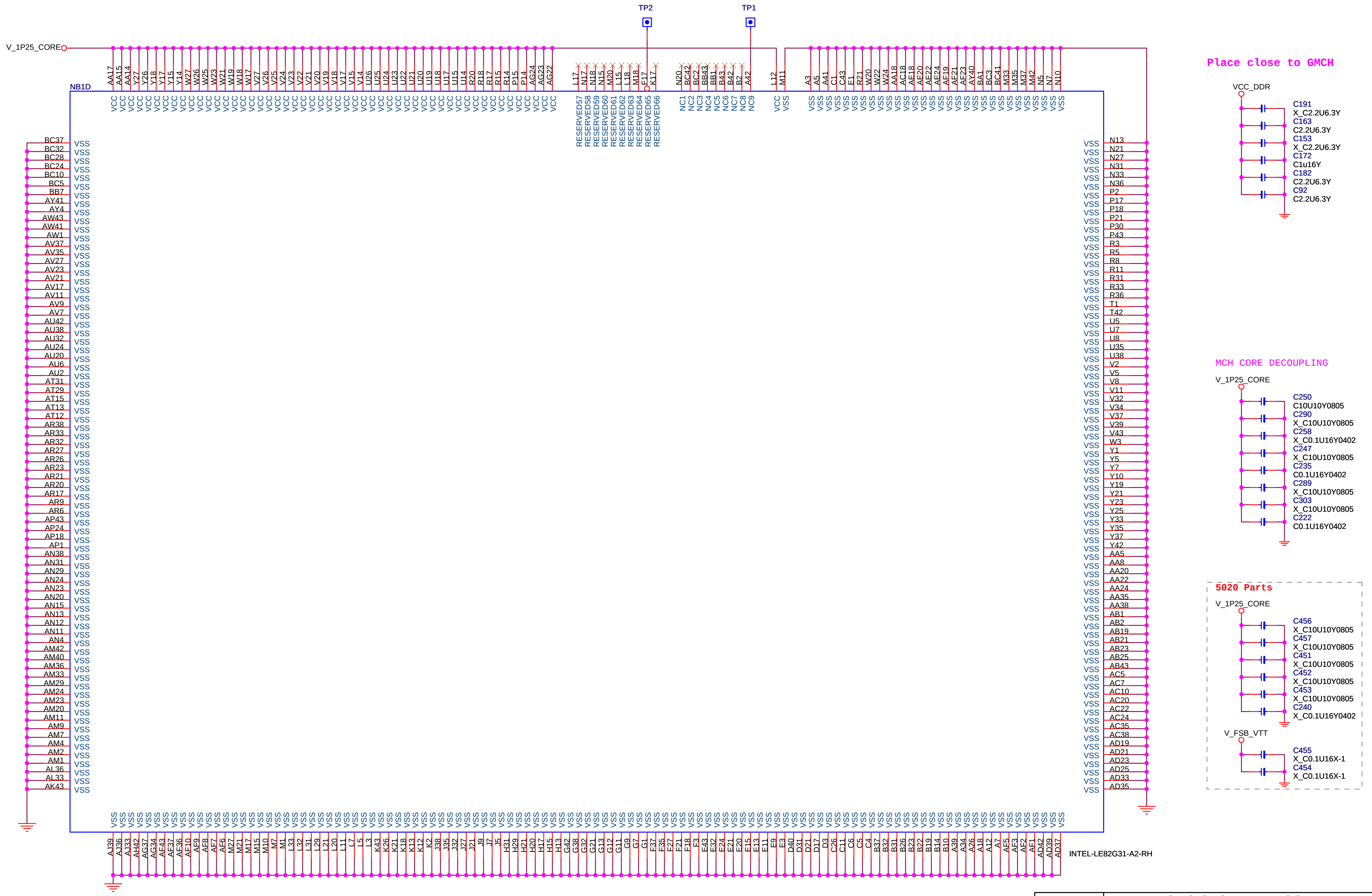


MICRO-STAR INT'L CO.,LTD

MS-7529

Size	Document Description	Rev
Custom	G31 PCI-Express & RBG Signals	1.6

Date: Tuesday, April 14, 2009 Sheet 10 of 33

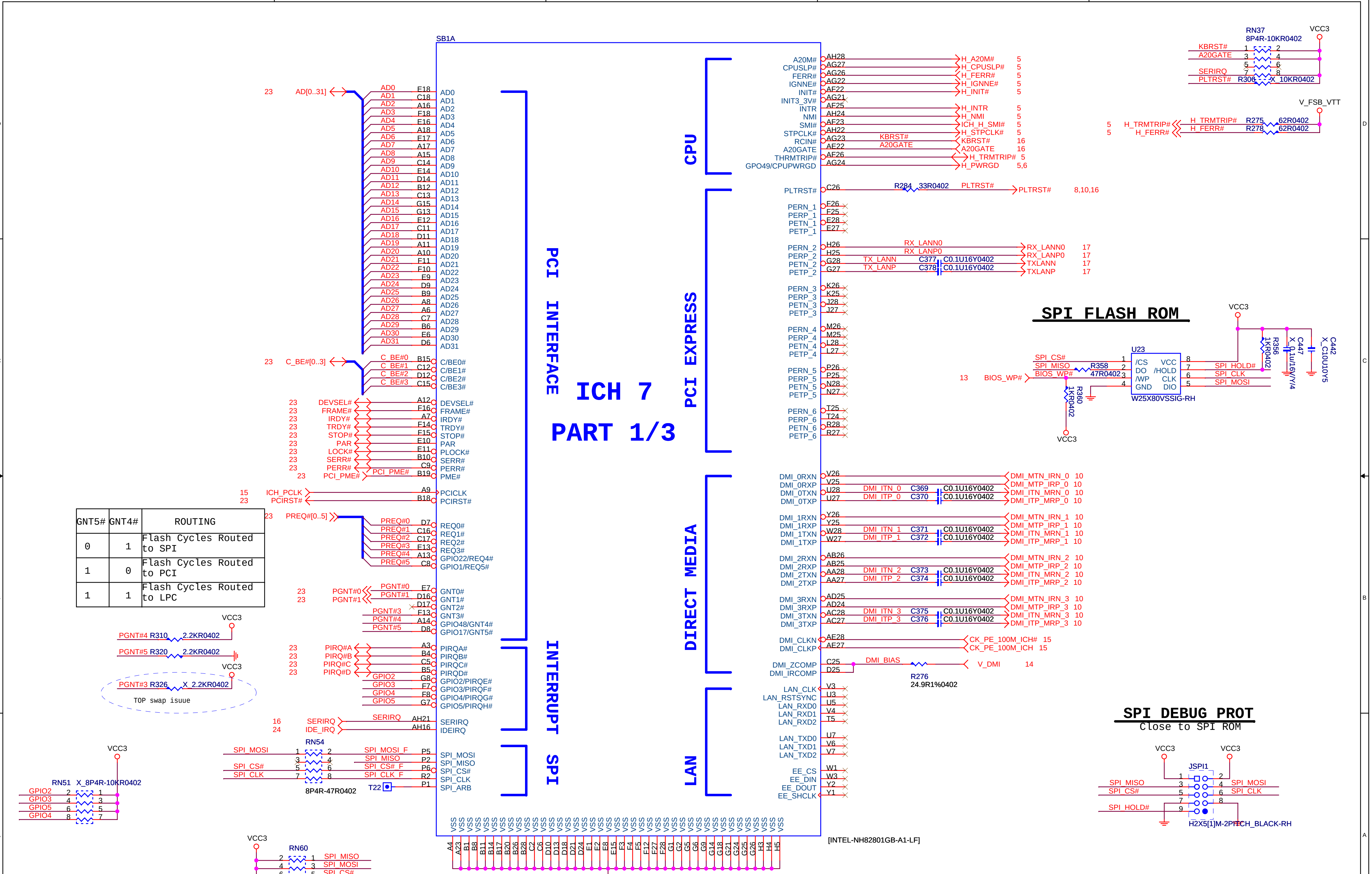


MICRO-STAR INT'L CO.,LTD

MS-7529

Size	Document Description	Rev
Custom	Intel .G31 - GND	1.6

Date: Friday, April 03, 2009 Sheet 11 of 33



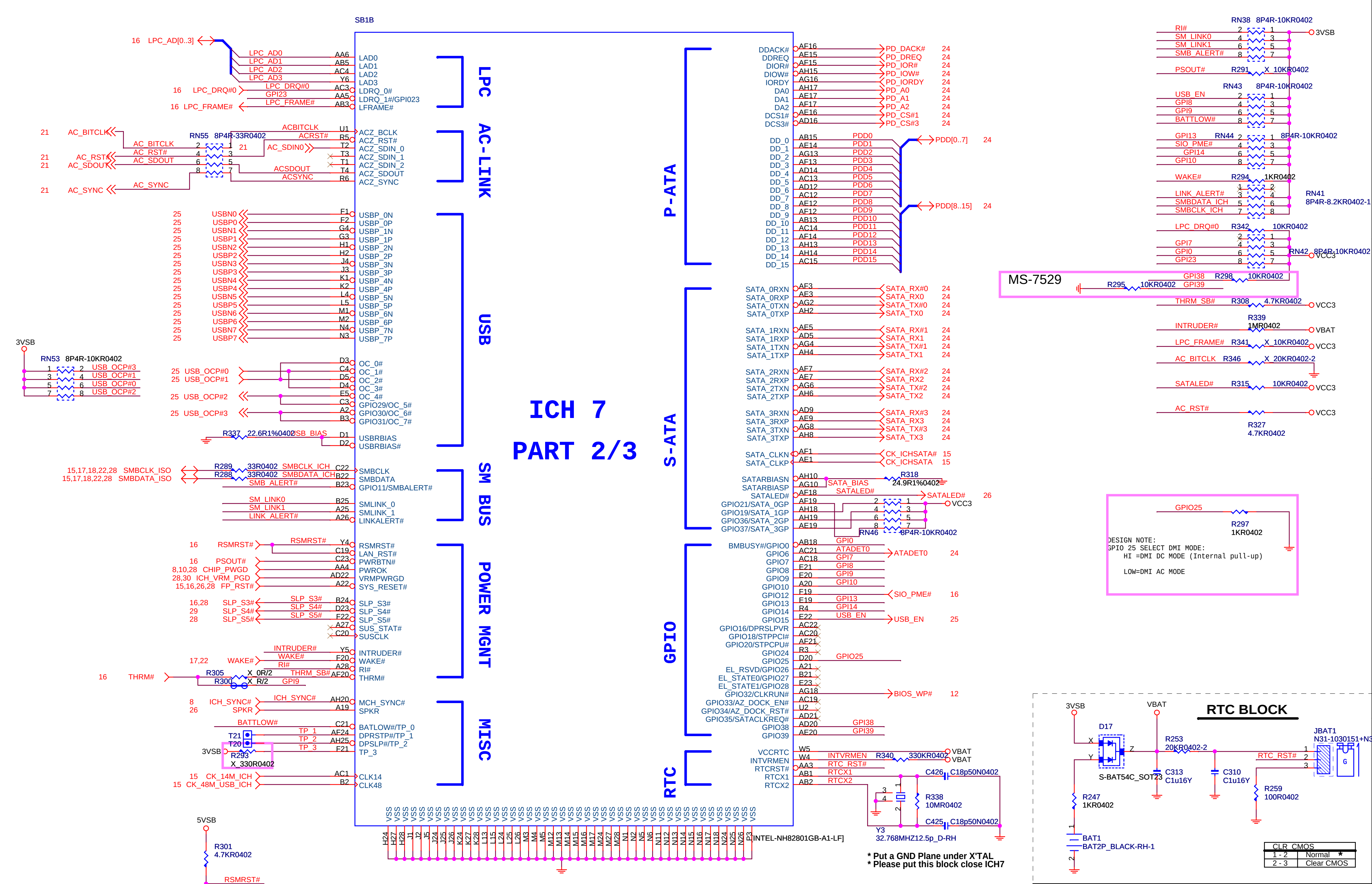
GNT5#	GNT4#	ROUTING
0	1	Flash Cycles Routed to SPI
1	0	Flash Cycles Routed to PCI
1	1	Flash Cycles Routed to LPC

MICRO-STAR INT'L CO.,LTD

MS-7529

Size	Document Description	Rev
Custom	Intel ICH7 - PCI & DMI & CPU & IRQ	1.6

Date: Monday, April 13, 2009 Sheet 12 of 33



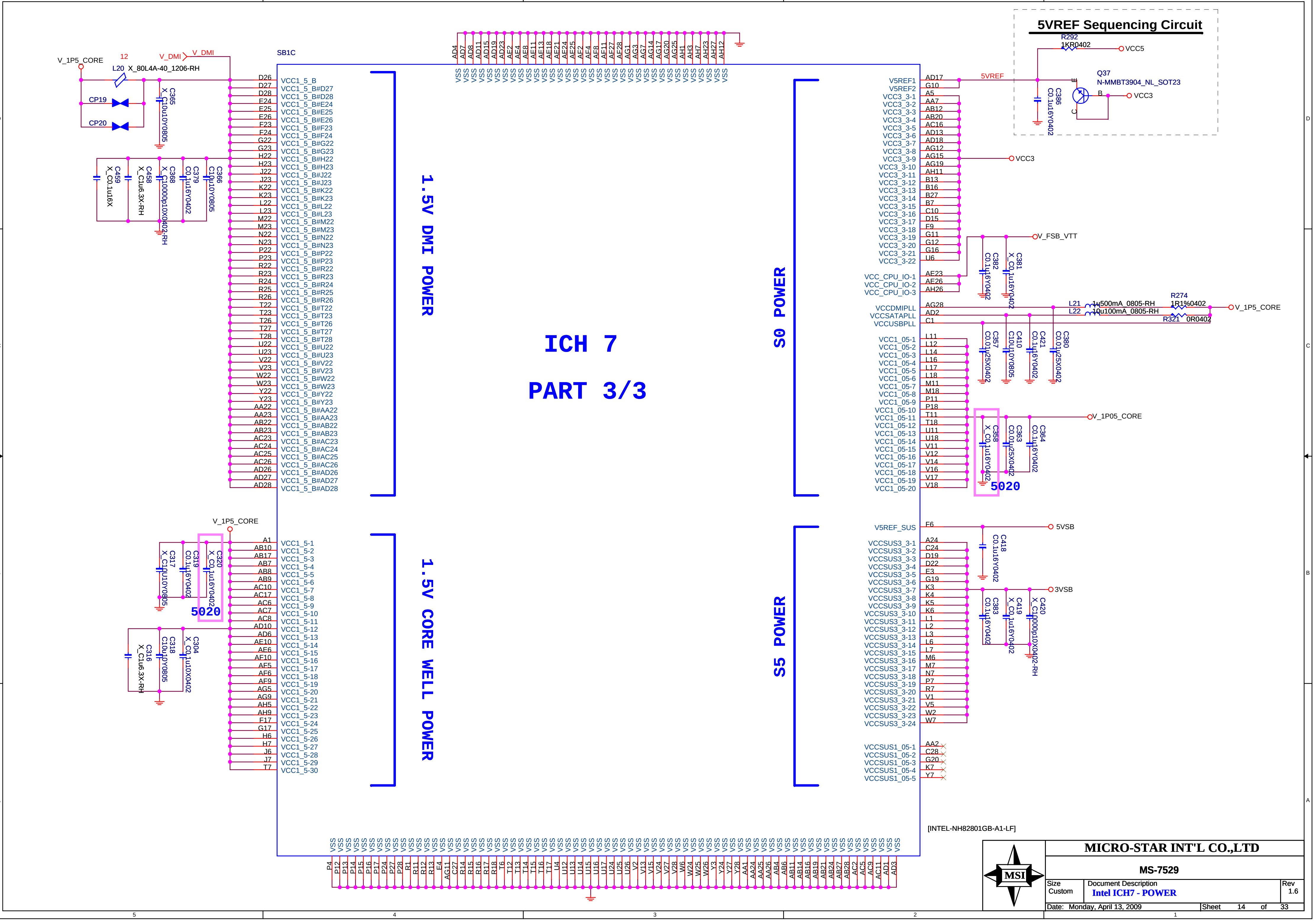
Following are the GPIOs that need to be terminated properly if not used:
GPIO[39:36,23:21,19,7:0]: default as inputs and should be pulled up to Vcc3_3 if unused.
GPIO[31:29,15:8]: default as inputs and should be pulled up to VccSus3_3 if unused.

MICRO-STAR INT'L CO.,LTD

MS-7529

Size	Document Description	Rev
Custom	Intel ICH7 - LPC & ATA & USB & GPIO	1.6

Date: Monday, April 13, 2009 | Sheet 13 of 33



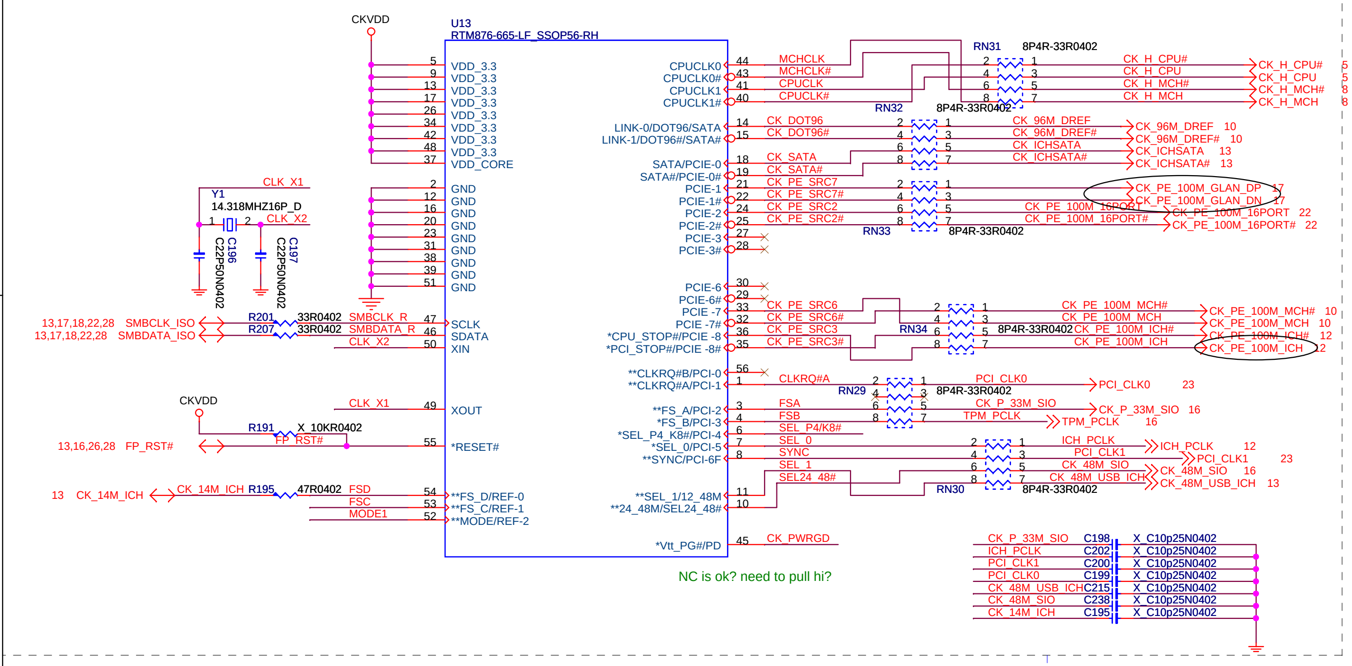
MICRO-STAR INT'L CO.,LTD

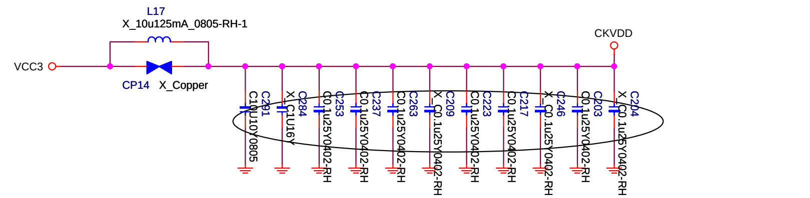
MS-7529

Size	Document Description	Rev
Custom	Intel ICH7 - POWER	1.6

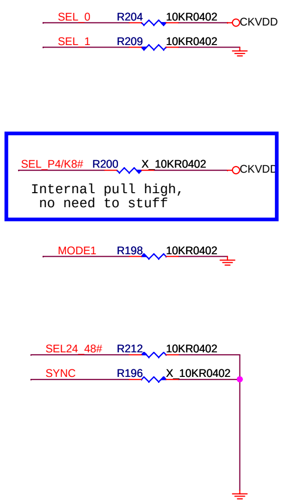
Date: Monday, April 13, 2009 Sheet 14 of 33

Clock Generator - RTM876-665

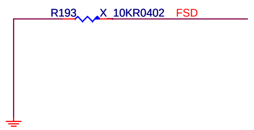




STRAPPING RESISTOR



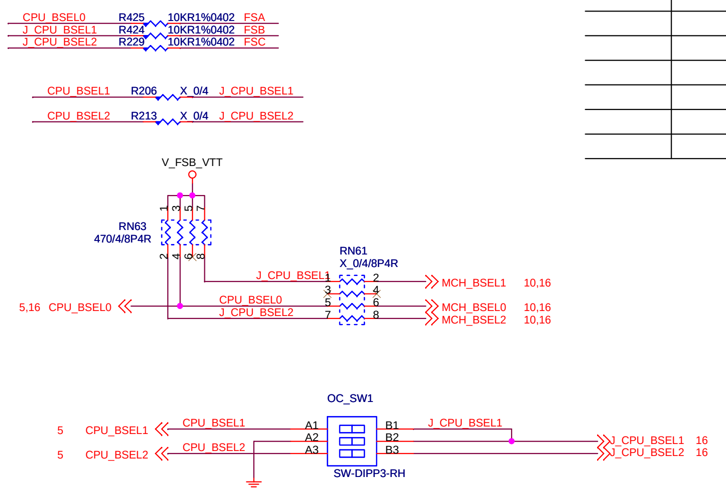
SEL_1	SEL_0	Chipset Support
0	0	SIS
1	0	VIA
0	1	Intel W/GFX
1	1	Intel
SEL_P4/K8#		PIN#40,41,43,44
0		K8 3.3V swing
1		P4 0.8V swing
MODE		PIN#35/36
0		PCIE-8 T/C
1		PCI_STOP#/CPU_STOP#
SEL24_48#		Pin#10
0		48Mhz
1		24Mhz



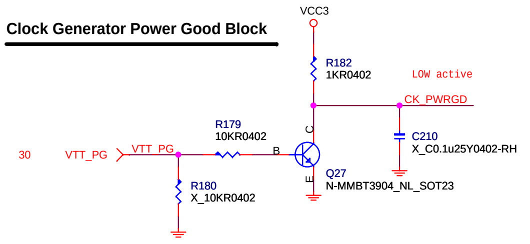
BSEL			TABLE
2	1	0	FSB FREQUENCY
0	0	0	266 MHz (1066)
1	0	0	333 MHz (1333)
0	1	0	200 MHZ (800)
1	1	0	400 MHZ (1600)

OC_SW1

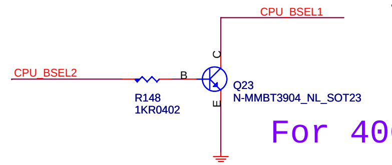
Default	200-->266	200-->333	200-->400
1:ON	1:ON	1:ON	1:OFF/ON
2:OFF	2:OFF	2:ON	2:OFF
3:ON	3:ON	3:OFF	3:OFF
		266-->333	266-->400
		1:ON	1:OFF
		2:OFF	2:OFF
		3:OFF	3:OFF
			333-->400
			1:OFF
			2:OFF
			3:OFF



Clock Generator Power Good Block



FS_C	FS_B	FS_A	CPU
0	0	0	266M
0	0	1	133M
0	1	0	200M
0	1	1	166M
1	0	0	333M
1	0	1	100M
1	1	0	400M
1	1	1	200M



FSB	FS_C	FS_B	FS_A	CPU
800M	0	1	0	200M
1066M	0	0	0	266M
1333M	1	0	0	333M
1600M	1	1	0	400M

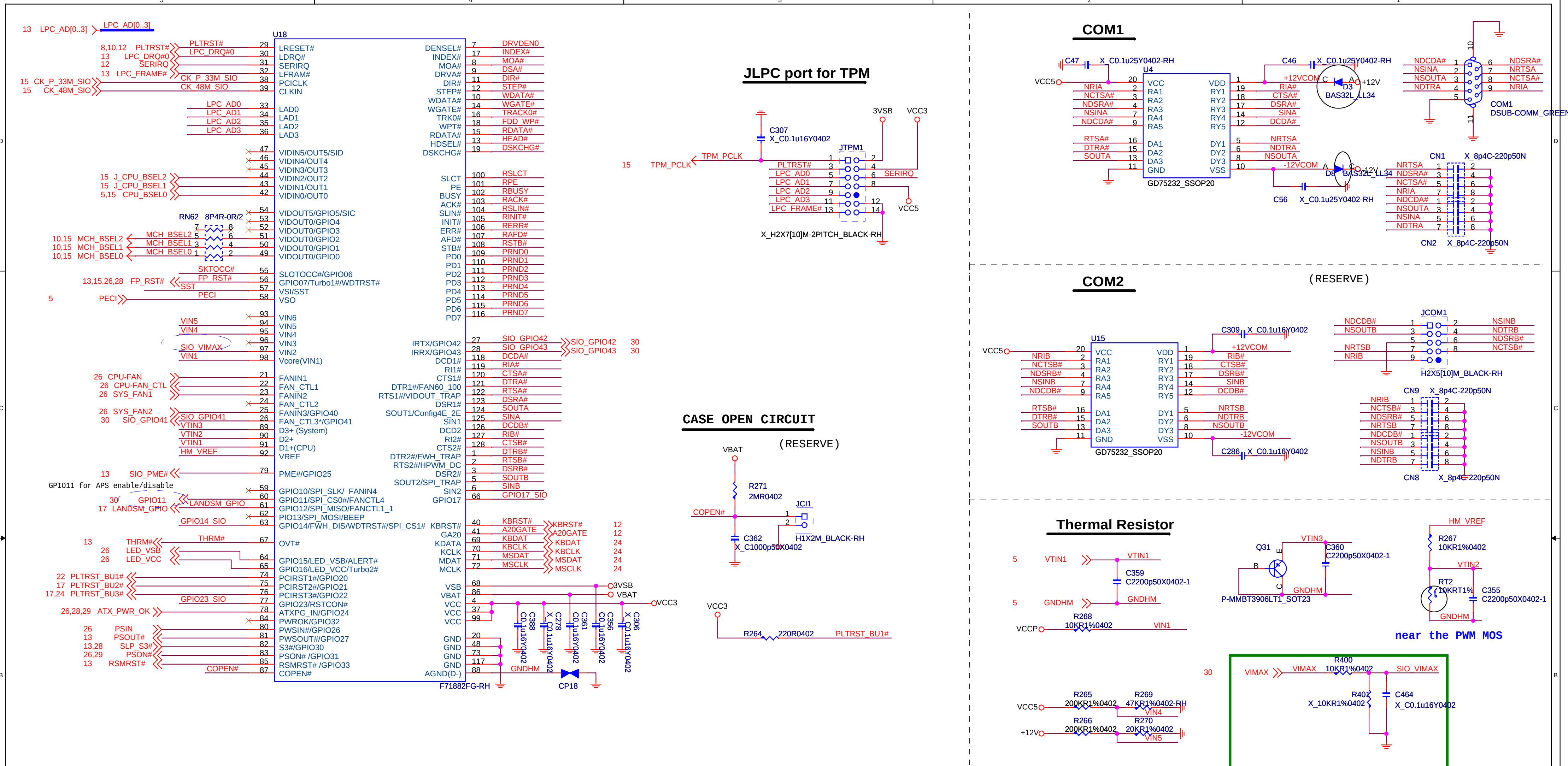
For 400MHz CPU Support

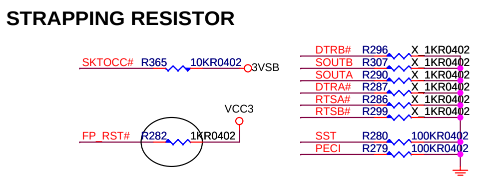
MICRO-STAR INT'L CO.,LTD

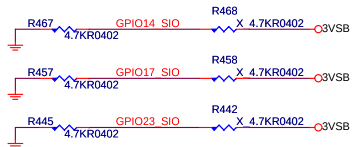
MS-7529

Size: Custom | Document Description: CLK-RTM 876-665 | Rev 1.6

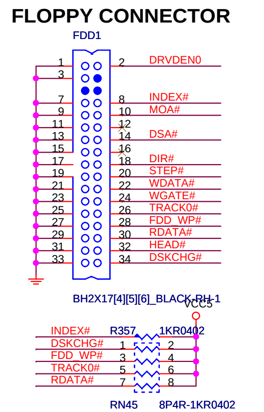
Date: Tuesday, April 14, 2009 | Sheet 15 of 33

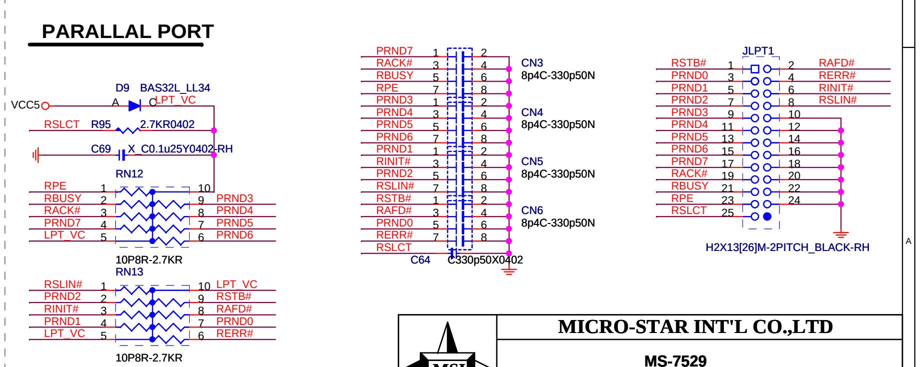






These GPIO reserve BIOS detect function
06S:L for GigaLAN+6port audio
07S:H for 10/100 LAN+3ports audio,w/o oc_sw





	Don't STUFF	STUFF
RTSB#	PWM FAN	LINEAR FAN
RTSA#	PIN49-54=VID_OUT PIN42-47=VIDIN	PIN49-54=GPIO PIN42-47=VIDIN/OUT
SOUTA	4E	2E
DTRB#, SOUTB	SPI_DISABLE	SPI_ENABLE
DTRA#	FAN START DUTY 60%	FAN START DUTY 100%

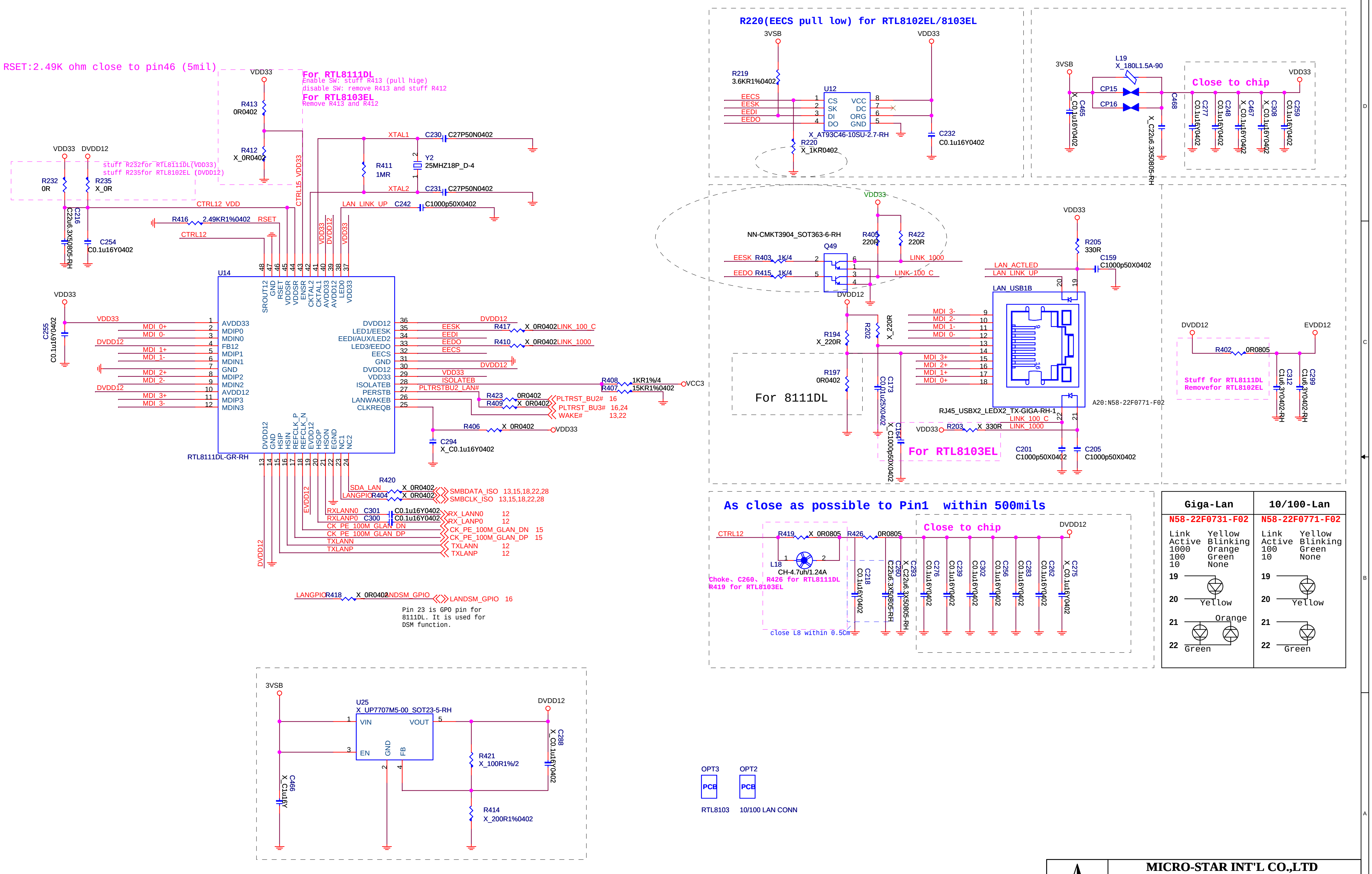
BOM / GPIO	06S	07S				
GPIO14	L	H				
GPIO17	L	L				
GPIO20	L	L				

MICRO-STAR INT'L CO.,LTD

MS-7529

Size	Document Description	Rev
Custom	SIO-Fintek F71882F & IO-Port	1.6

Date: Tuesday, April 14, 2009 | Sheet 16 of 33



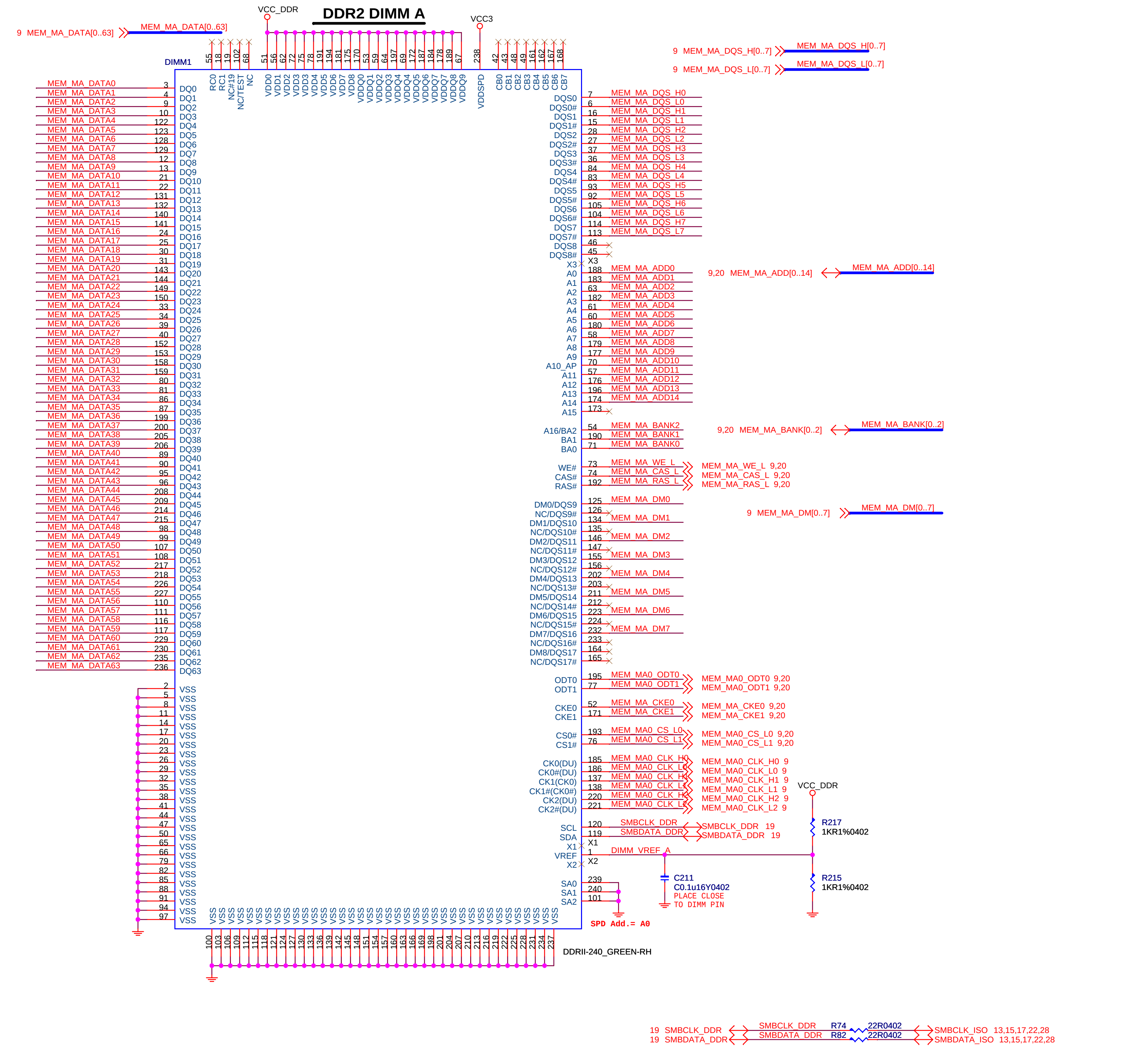
Giga-Lan	10/100-Lan
N58-22F0731-F02	N58-22F0771-F02
Link Yellow Active Blinking 1000 Orange 100 Green 10 None	Link Yellow Active Blinking 100 Green 10 None
19 / 20 Yellow / 21 Orange / 22 Green	19 / 20 Yellow / 21 / 22 Green

MICRO-STAR INT'L CO.,LTD

MS-7529

Size	Document Description	Rev
Custom	RTL8111DL/8103EL	1.6

Date: Tuesday, April 14, 2009 Sheet 17 of 33

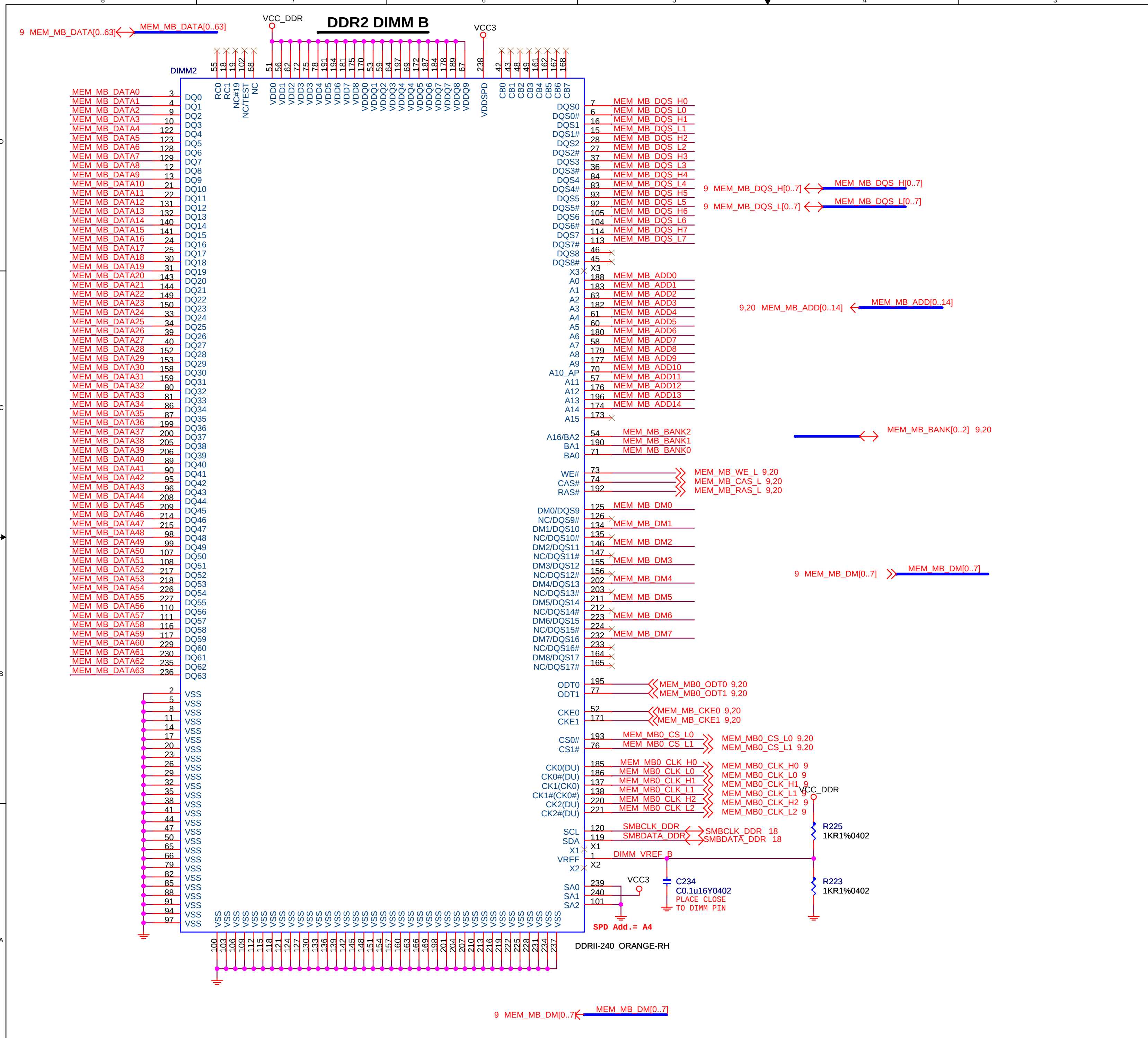


MICRO-STAR INT'L CO.,LTD

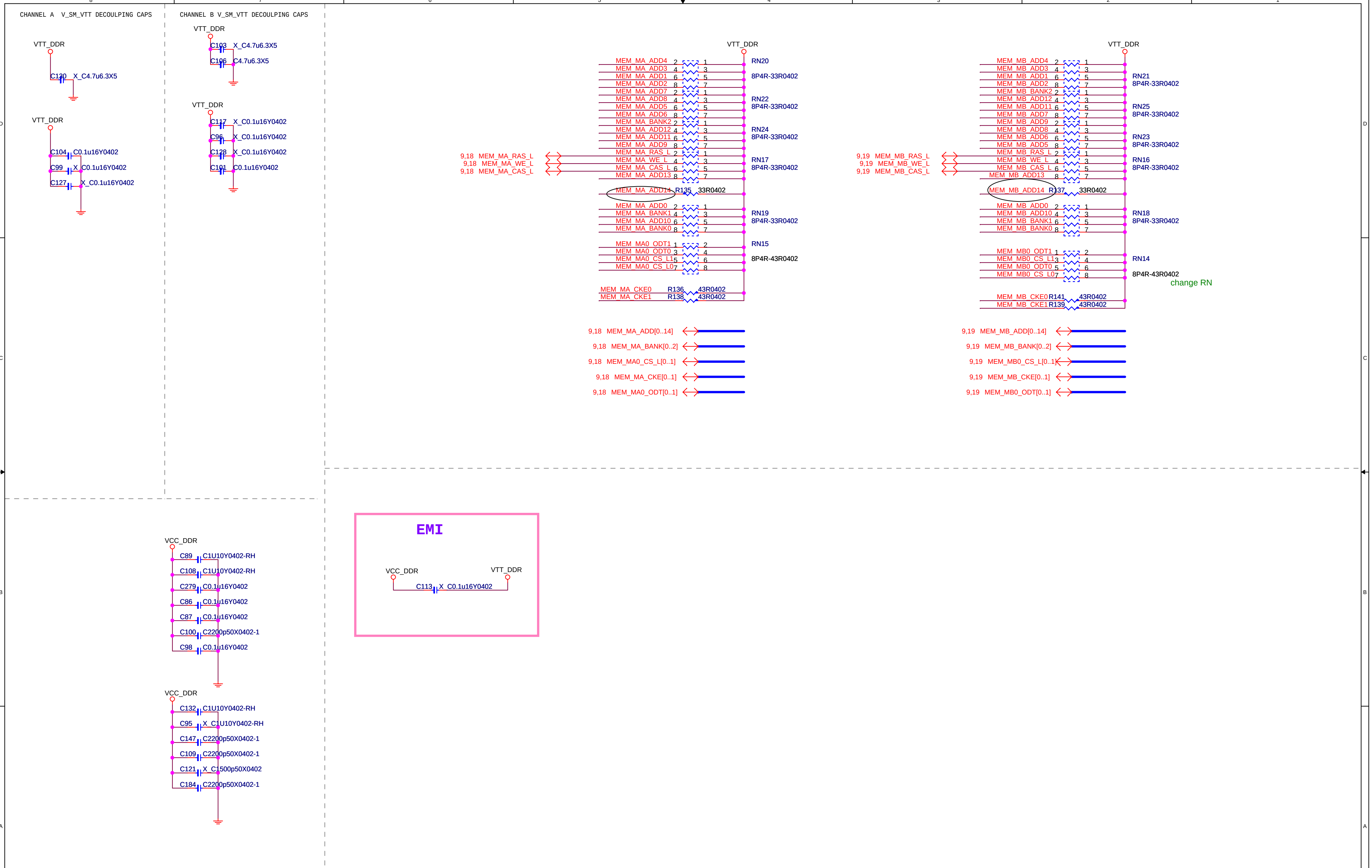
MS-7529

Size	Document Description	Rev
Custom	DDR II DIMM A & B	1.1

Date: Monday, April 13, 2009 Sheet 18 of 33



MICRO-STAR INT'L CO.,LTD		
MS-7529		
Size: Custom	Document Description: DDR II DIMM A & B	Rev: 1.6
Date: Monday, April 13, 2009	Sheet 19 of 33	



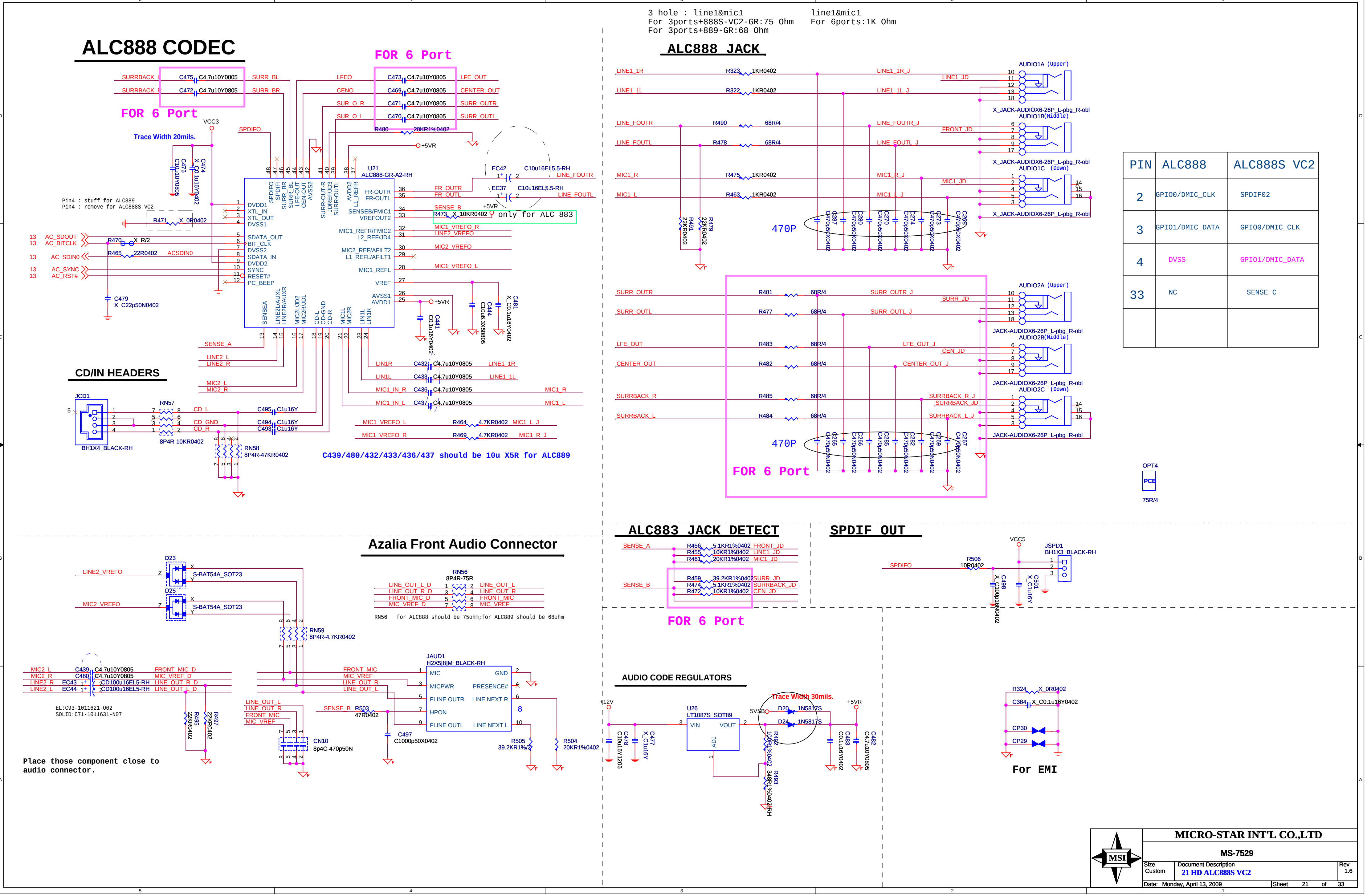
MSI

MICRO-STAR INT'L CO.,LTD

MS-7529

Size	Document Description	Rev
Custom	DDR II VTT DECOUPLING	1.6

Date: Monday, April 13, 2009 | Sheet 20 of 33



PIN	ALC888	ALC888S VC2
2	GPIO0/DMIC_CLK	SPDIF02
3	GPIO1/DMIC_DATA	GPIO0/DMIC_CLK
4	DVSS	GPIO1/DMIC_DATA
33	NC	SENSE C

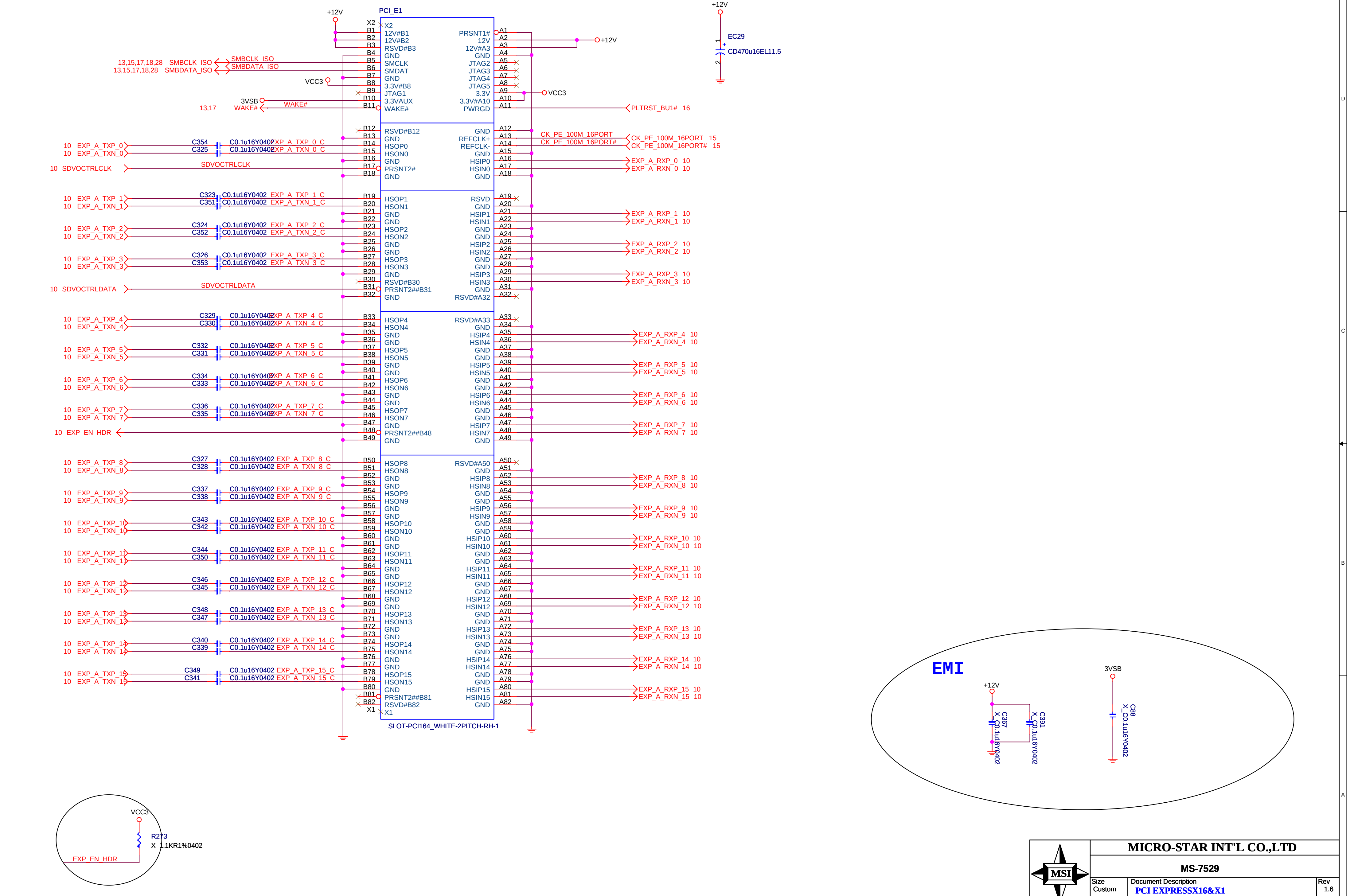
MICRO-STAR INT'L CO.,LTD

MS-7529

Size	Document Description	Rev
Custom	21 HD ALC888S VC2	1.6

Date: Monday, April 13, 2009 Sheet 21 of 33

PCIE X16 PORT



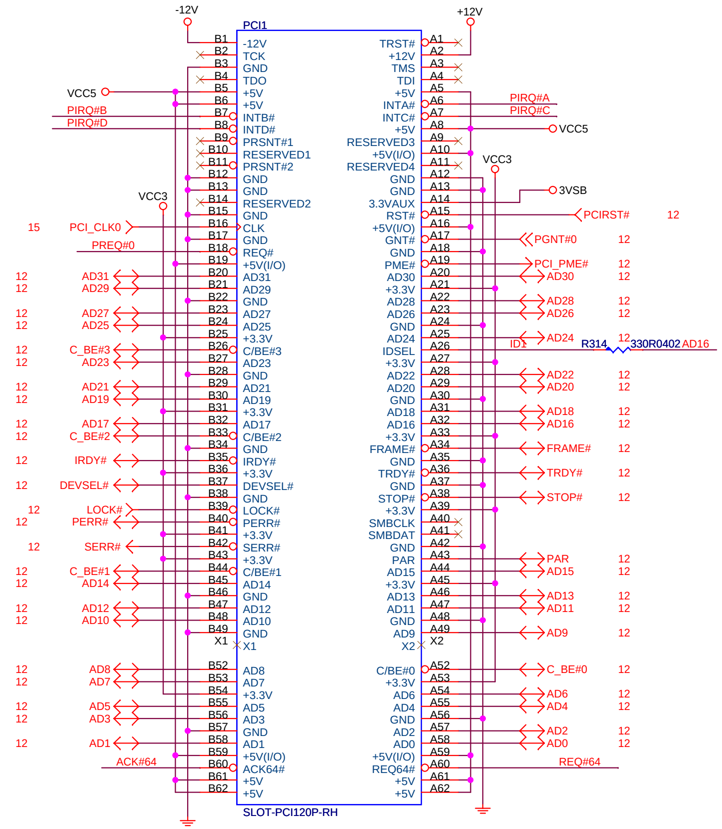
MICRO-STAR INT'L CO.,LTD

MS-7529

Size	Document Description	Rev
Custom	PCI EXPRESSX16&X1	1.6

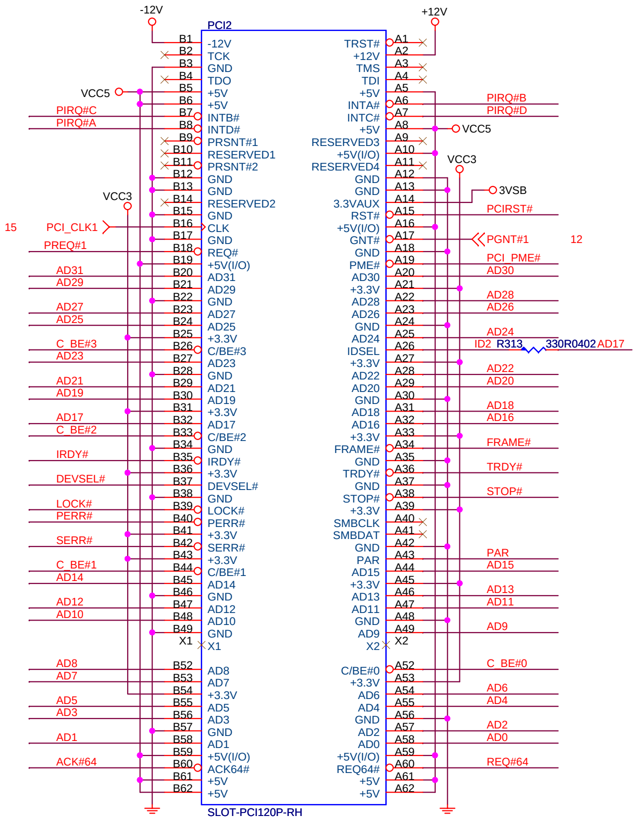
Date: Monday, April 13, 2009 Sheet 22 of 33

PCI SLOT 1 (PCI VER: 2.2 COMPLY)



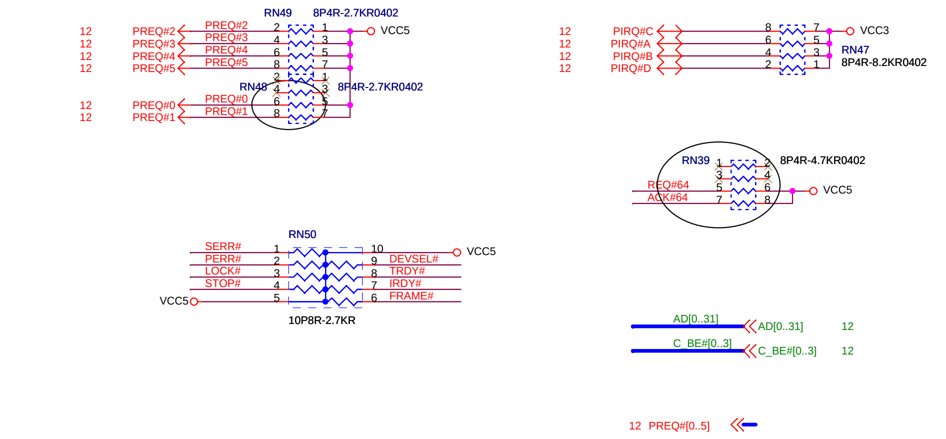
IDSEL = AD16
MASTER = PREQ#0
PIRQ#A

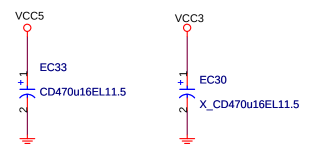
PCI SLOT 2 (PCI VER: 2.2 COMPLY)



IDSEL = AD17
MASTER = PREQ#1
PIRQ#B

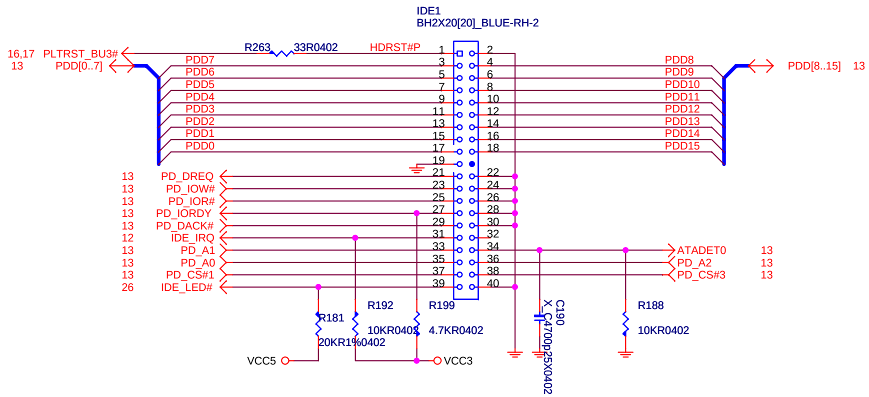
PCI PULL-UP / DOWN RESISTORS



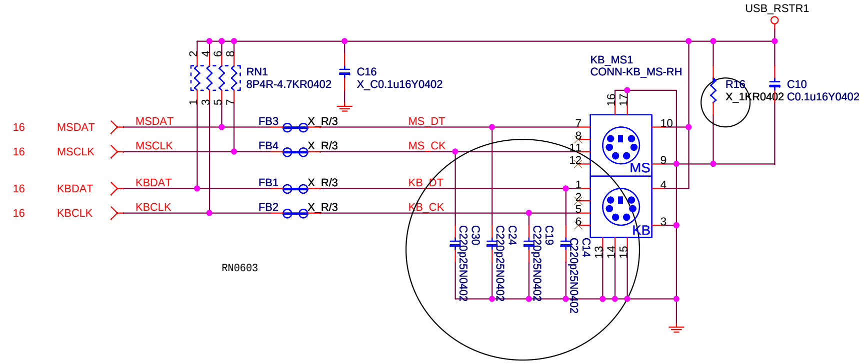


MICRO-STAR INT'L CO.,LTD		
MS-7529		
Size: Custom	Document Description: PCI Slot 1 &2	Rev: 1.6
Date: Monday, April 13, 2009	Sheet 23 of 33	

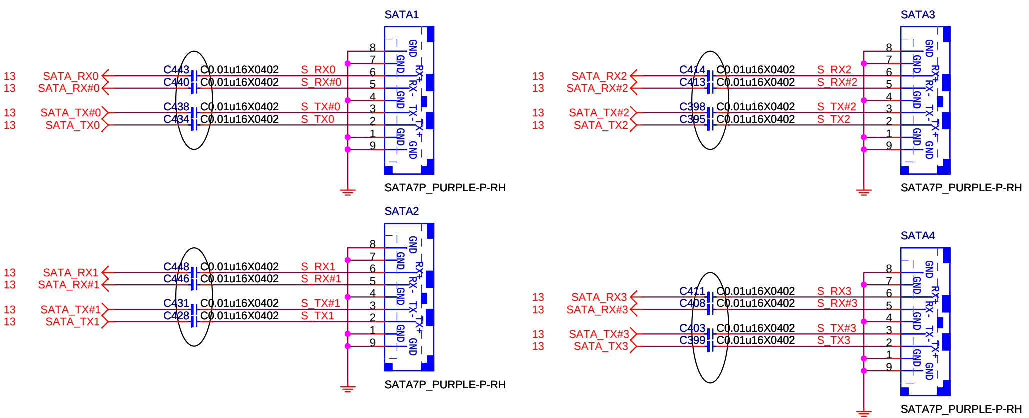
ATA 33/66/100 IDE Connectors



PS2 KEYBOARD & MOUSE CONNECTOR



SERIAL ATA CONNECTOR BLOCK

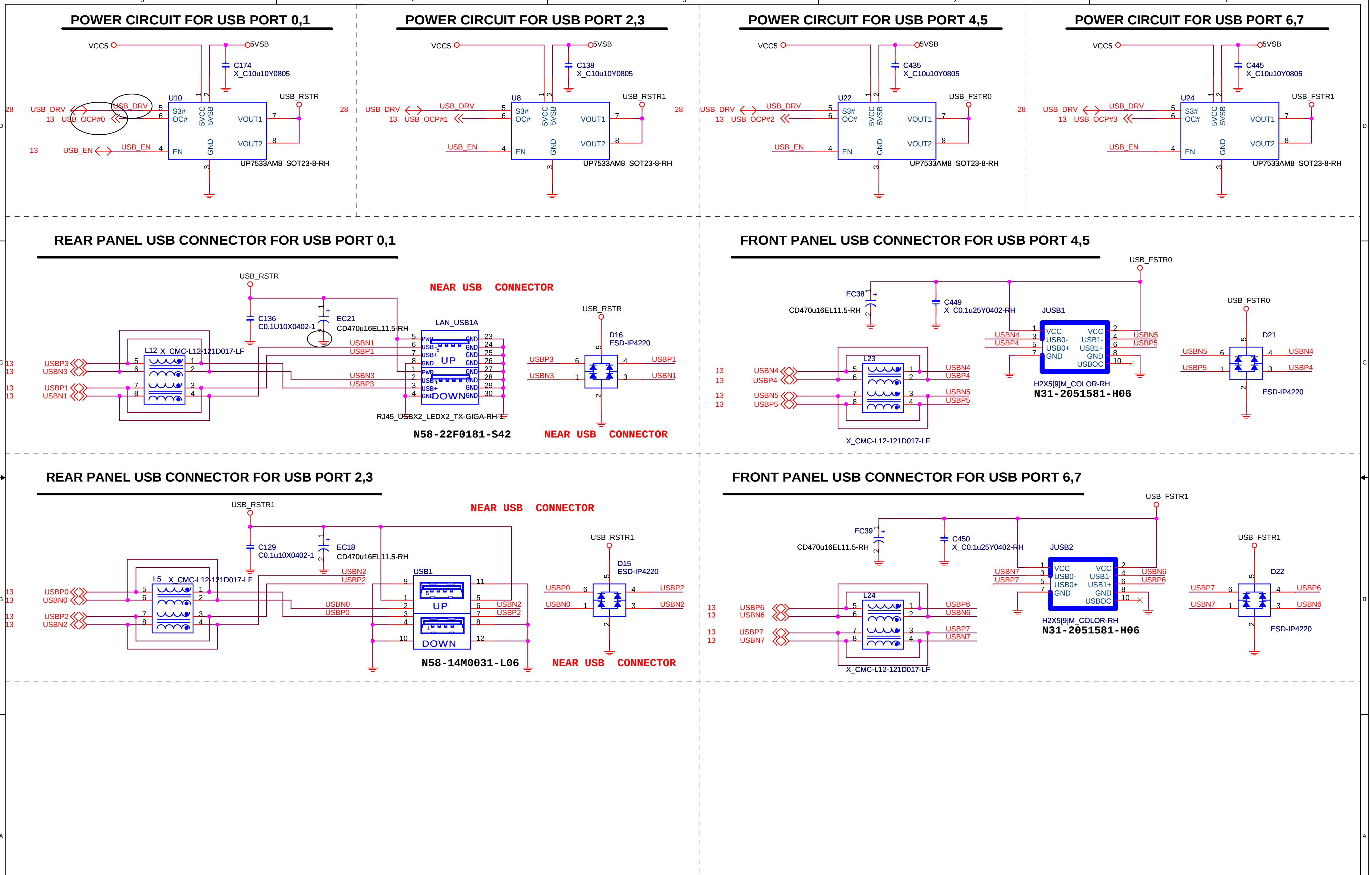


MICRO-STAR INT'L CO.,LTD

MS-7529

Size	Document Description	Rev
Custom	IDE & SATA Connectors	1.6

Date: Tuesday, April 14, 2009 — Sheet 24 of 33

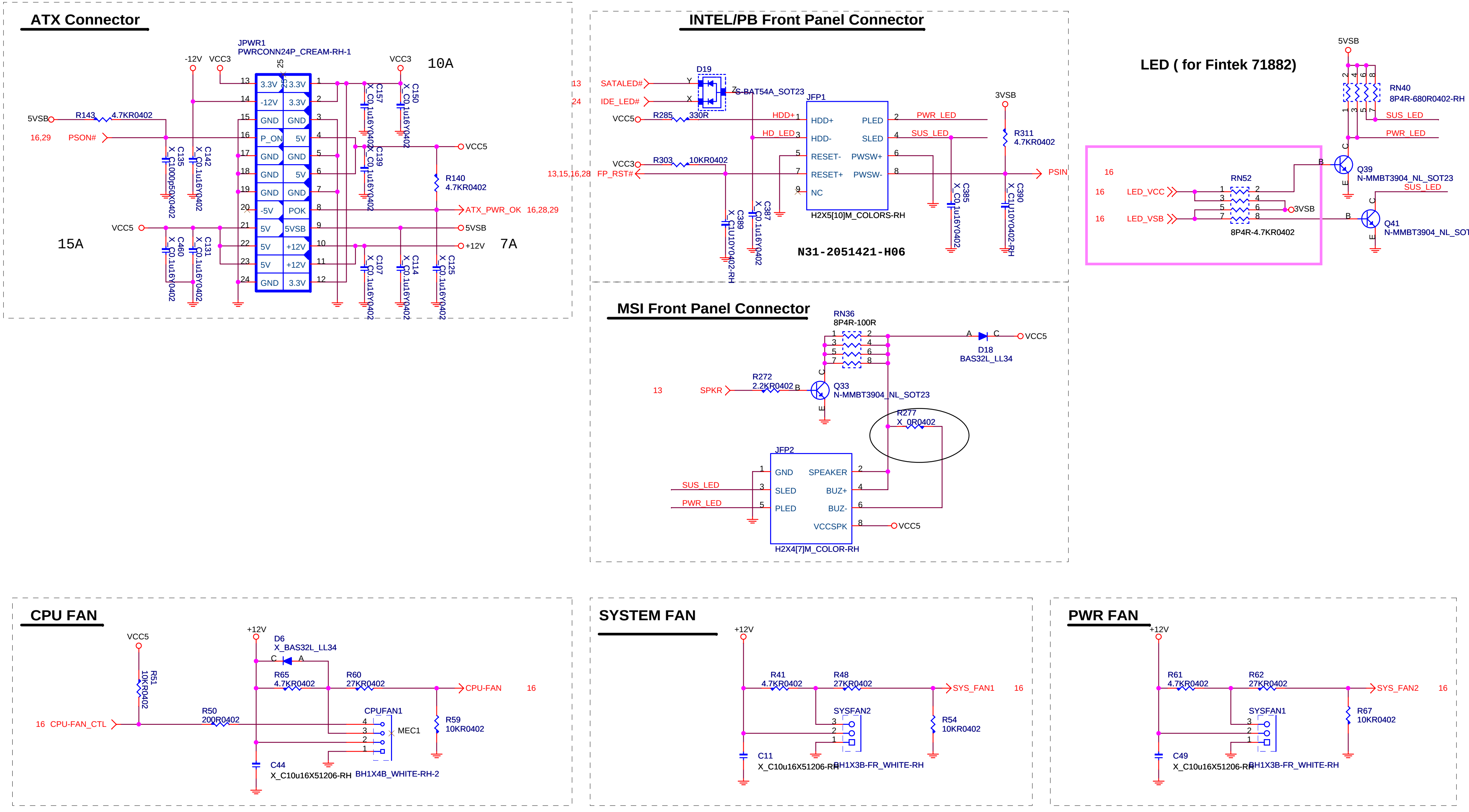


MICRO-STAR INT'L CO.,LTD

MS-7529

Size	Document Description	Rev
Custom	USB CONNECTORS	1.6

Date: Tuesday, April 14, 2009 Sheet 25 of 33



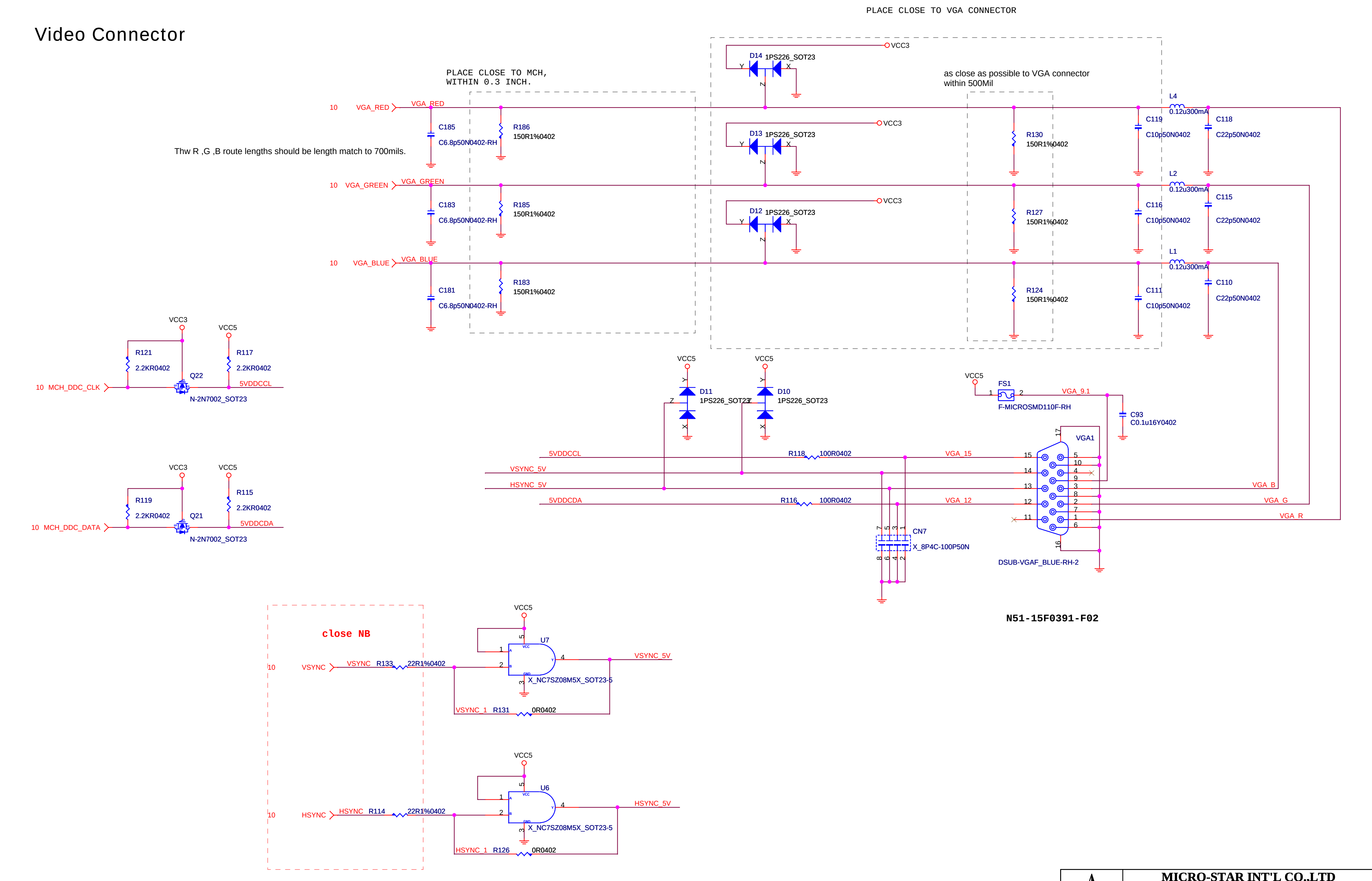
MICRO-STAR INT'L CO.,LTD

MS-7529

Size	Document Description	Rev
Custom	ATX & Front Panel & FAN	1.6

Date: Monday, April 13, 2009 Sheet 26 of 33

Video Connector

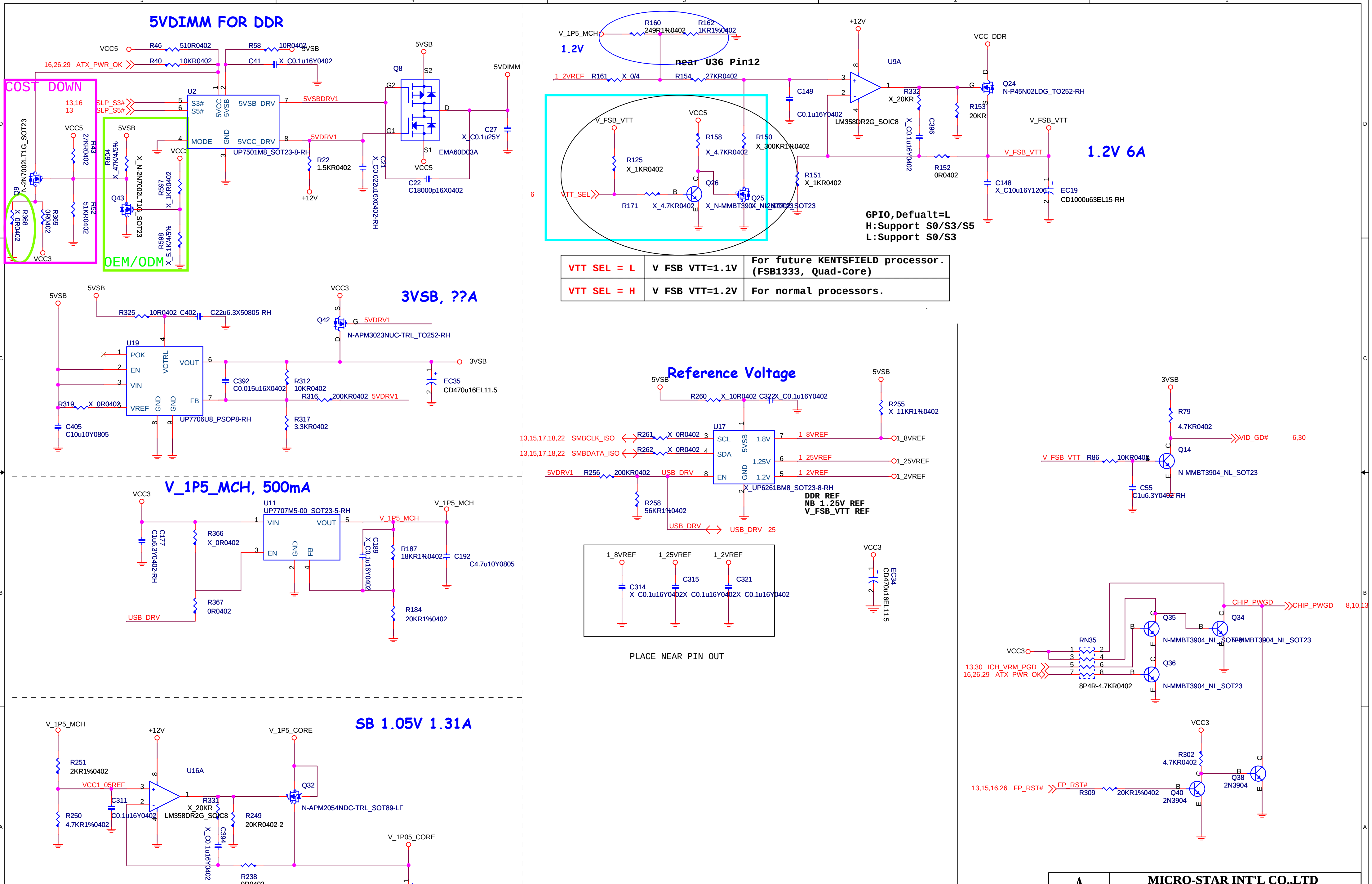


MICRO-STAR INT'L CO.,LTD

MS-7529

Size	Document Description	Rev
Custom	VGA Connector	1.6

Date: Monday, April 13, 2009 | Sheet 27 of 33



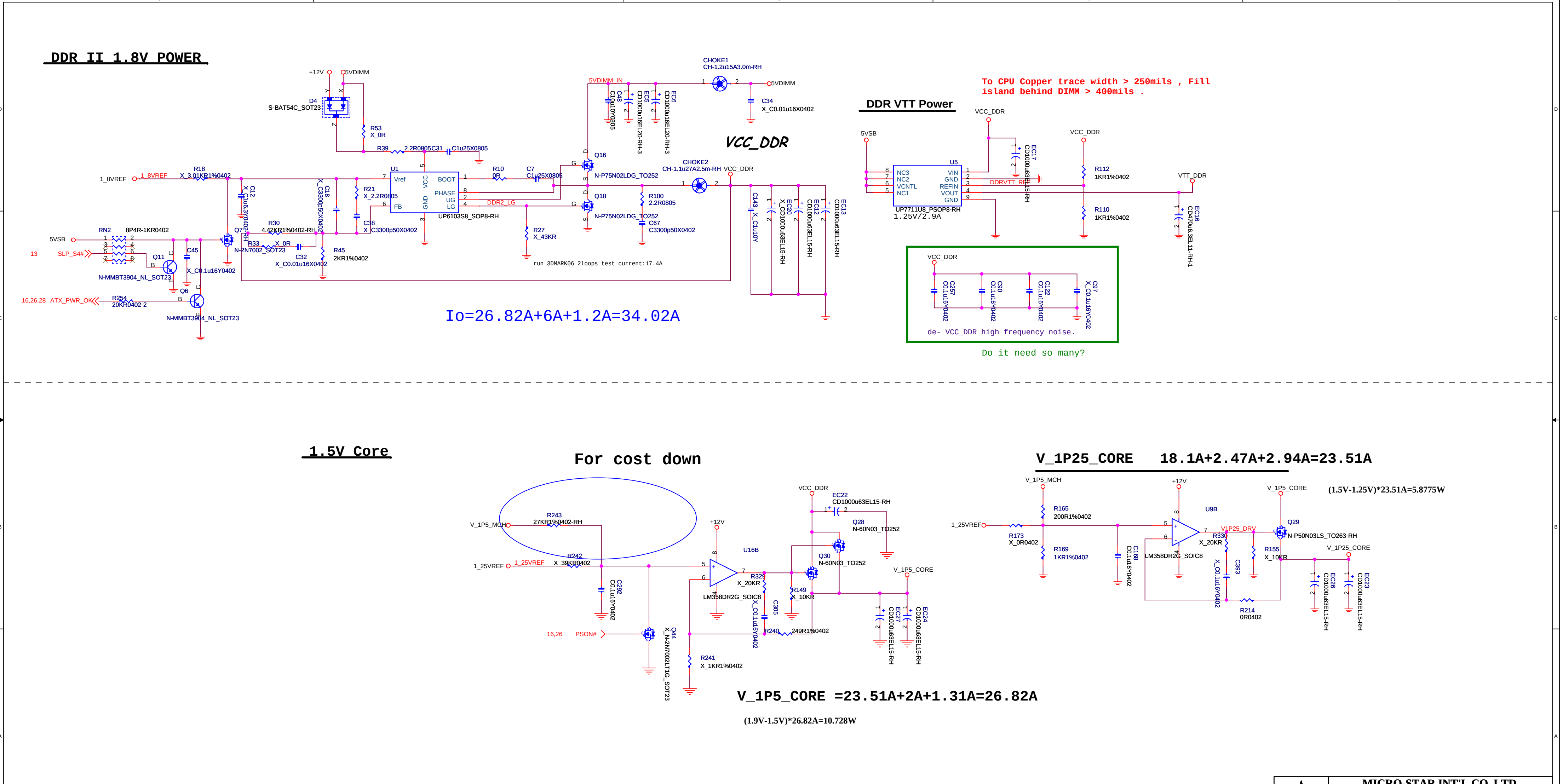
VTT_SEL = L	V_FSB_VTT=1.1V	For future KENTSFIELD processor. (FSB1333, Quad-Core)
VTT_SEL = H	V_FSB_VTT=1.2V	For normal processors.

MICRO-STAR INT'L CO.,LTD

MS-7529

Size: Custom
Document Description: ACPI controller UPI
Rev: 1.6

Date: Tuesday, April 14, 2009 Sheet 28 of 33

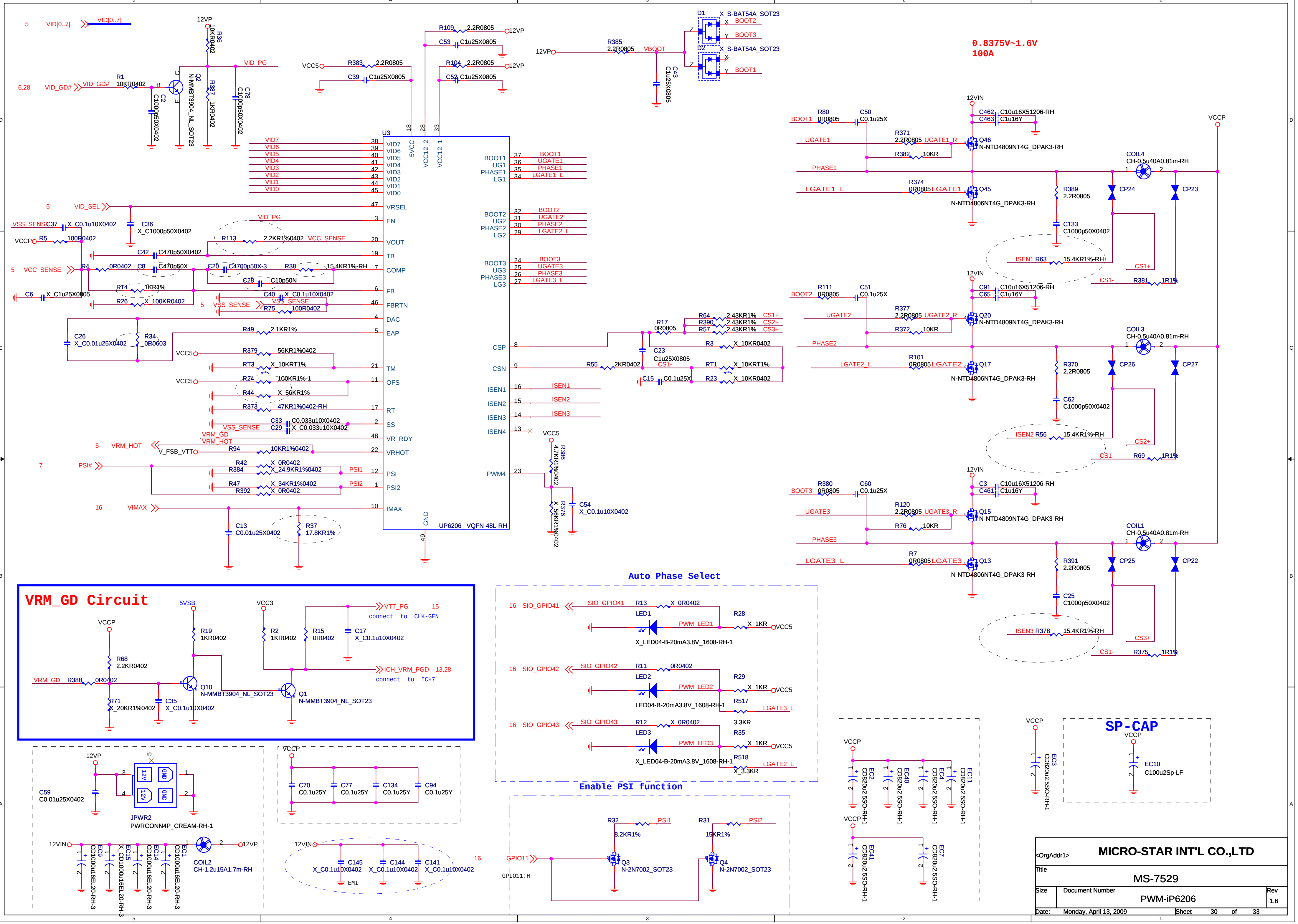


MICRO-STAR INT'L CO.,LTD

MS-7529

Size	Document Description	Rev
Custom	NB Core Power & DDR Power	1.6

Date: Tuesday, April 14, 2009 Sheet 29 of 33



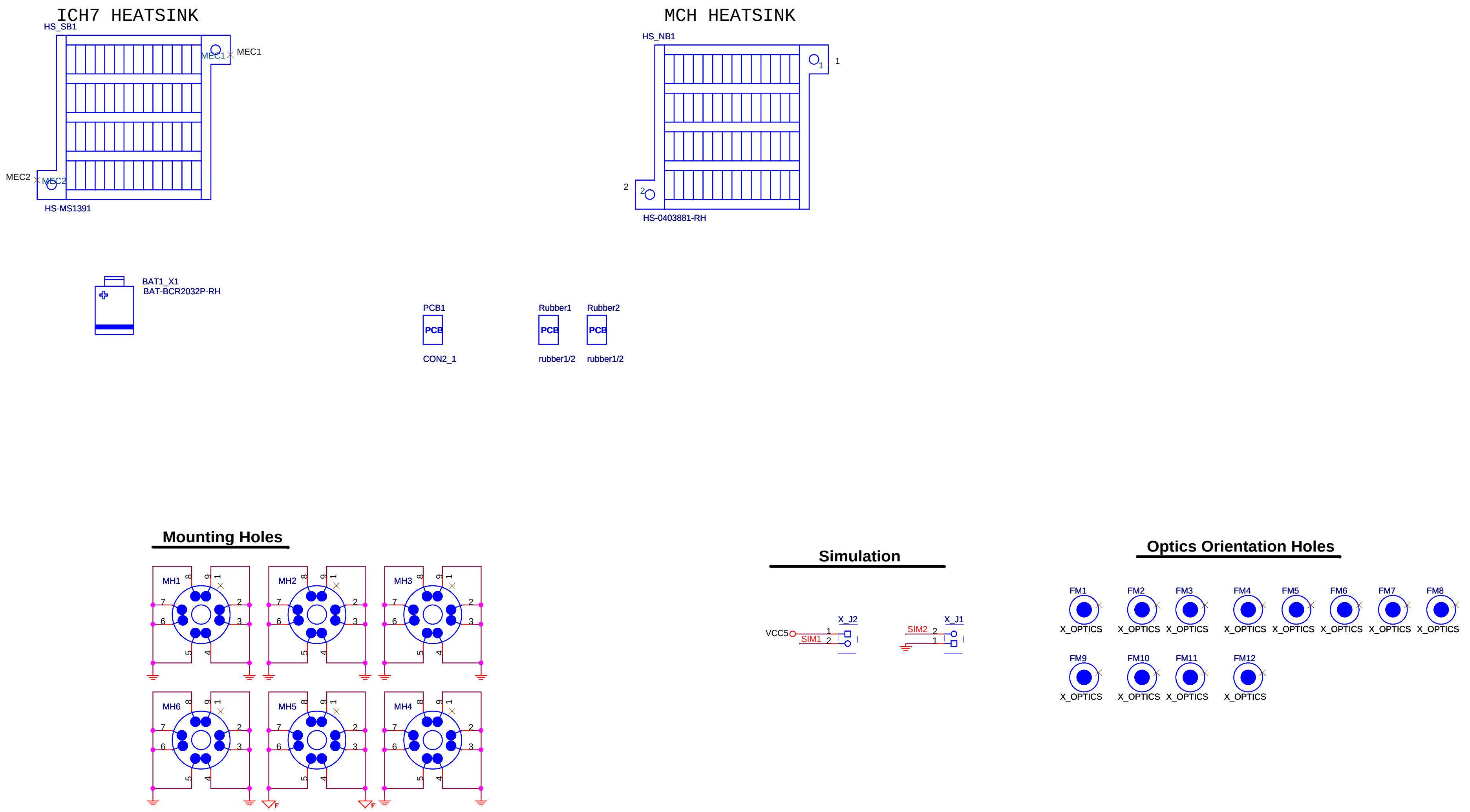
MICRO-STAR INT'L CO.,LTD

<OrgAddr1>

Title: MS-7529

Size | Document Number: PWM-iP6206 | Rev: 1.6

Date: Monday, April 13, 2009 | Sheet 30 of 33



MICRO-STAR INT'L CO.,LTD

MS-7529

Size	Document Description	Rev
Custom	MANUAL PARTS	1.6

Date: Thursday, April 09, 2009 | Sheet 31 of 33

ICH7

GPIO	Alt Func	PIN	I/O/NC	POWER	PU	SMI	TOL	DEFAULT	SIGNAL NAME
GPIO0	Unmultiplexed	AB18	I/O	CORE	N	Y	3.3V	GPI	GPI0(pull high)
GPIO1	REQ5#	C8	I/O	CORE	N	Y	5V	GPI	PREQ#5
GPIO2	PIRQE#	G8	I/OD	CORE	N	Y	5V	GPI	GPIO2(pull high)
GPIO3	PIRQF#	F7	I/OD	CORE	N	Y	5V	GPI	GPIO3(pull high)
GPIO4	PIRQG#	F8	I/OD	CORE	N	Y	5V	GPI	GPIO4(pull high)
GPIO5	PIRQH#	G7	I/OD	CORE	N	Y	5V	GPI	GPIO5(pull high)
GPIO6	Unmultiplexed	AC21	I/O	CORE	N	Y	3.3V	GPI	ATADET0
GPIO7	Unmultiplexed	AC18	I/O	CORE	N	Y	3.3V	GPI	STRAPPED HI
GPIO8	Unmultiplexed	E21	I/O	Resume	N	Y	3.3V	GPI	STRAPPED HI
GPIO9	Unmultiplexed	E20	I/O	Resume	N	Y	3.3V	GPI	STRAPPED HI
GPIO10	Unmultiplexed	A20	I/O	Resume	N	Y	3.3V	GPI	STRAPPED HI
GPIO11	SMBALERT#	B23	I/O	Resume	N	Y	3.3V	Native	STRAPPED HI
GPIO12	Unmultiplexed	F19	I/O	Resume	N	Y	3.3V	GPI	SIO_PME#
GPIO13	Unmultiplexed	E19	I/O	Resume	N	Y	3.3V	GPI	STRAPPED HI
GPIO14	Unmultiplexed	R4	I/O	Resume	N	Y	3.3V	GPI	STRAPPED HI
GPIO15	Unmultiplexed	E22	I/O	Resume	N	Y	3.3V	GPI	STRAPPED HI
GPIO16	Unmultiplexed	AC22	I/O	CORE	N	N	3.3V	GPO	NC
GPIO17	GNT5#	D8	I/O	CORE	N	N	3.3V	GPO	STRAPPED L
GPIO18	Unmultiplexed	AC20	I/O	CORE	N	N	3.3V	GPO	NC
GPIO19	SATA_1GP	AH18	I/O	CORE	N	N	3.3V	GPI	STRAPPED HI
GPIO20	Unmultiplexed	AF21	I/O	CORE	N	N	3.3V	GPO	NC
GPIO21	SATA_0GP	AF19	I/O	CORE	N	N	3.3V	GPI	STRAPPED HI
GPIO22	REQ4#	A13	I/O	CORE	N	N	3.3V	Native	STRAPPED HI
GPIO23	LDRQ_1#	AA5	I/O	CORE	N	N	3.3V	Native	STRAPPED HI
GPIO24	Unmultiplexed	R3	I/O	Resume	N	N	3.3V	GPO	NC
GPIO25	Unmultiplexed	D20	I/O	Resume	Y	N	3.3V	GPO	GPIO25(high 7507,low 7398)
GPIO26	Unmultiplexed	A21	I/O	Resume	N	N	3.3V	GPO	USB_EN
GPIO27	Unmultiplexed	B21	I/O	Resume	N	N	3.3V	GPO	NC
GPIO28	Unmultiplexed	E23	I/O	Resume	N	N	3.3V	GPO	NC
GPIO29	OC5#	C3	I/O	Resume	N	N	3.3V	GPI	USB_OCP#2
GPIO30	OC6#	A2	I/O	Resume	N	N	3.3V	GPI	USB_OCP#3
GPIO31	OC7#	B3	I/O	Resume	N	N	3.3V	GPI	USB_OCP#3
GPIO32	Unmultiplexed	AG18	I/O	CORE	N	N	3.3V	GPO	BIOS_WP#(fill with 1)
GPIO33	Unmultiplexed	AC19	I/O	CORE	N	N	3.3V	GPO	NC
GPIO34	Unmultiplexed	U2	I/O	CORE	N	N	3.3V	GPO	NC
GPIO35	SATACLKREQ#	AD21	I/O	CORE	N	N	3.3V	GPO	NC
GPIO36	SATA2GP	AH19	I/O	CORE	N	N	3.3V	GPI	STRAPPED HI
GPIO37	SATA3GP	AE19	I/O	CORE	N	N	3.3V	GPI	STRAPPED HI
GPIO38	Unmultiplexed	AD20	I/O	CORE	N	N	3.3V	GPI	STRAPPED HI
GPIO39	Unmultiplexed	AE20	I/O	CORE	N	N	3.3V	GPI	STRAPPED HI
GPIO48	GNT4#	A14	I/O	CORE	N	N	3.3V	Native	STRAPPED HI
GPIO49	CPUPWRGD	AG24	I/O	V_CPU_IO	N	N	V_CPU_IO	Native	H_PWRGD

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 VccSus3_3 if unused.

SIO Fintek71882FG(CONTINUE)

GPIO	Alt Func	PIN	Usage	Input/Output	NOTES
GPIO0	VIDOUT0	49	MCH_BSEL0	O12	
GPIO1	VIDOUT1	50	MCH_BSEL1	O12	
GPIO2	VIDOUT2	51	MCH_BSEL2	O12	
GPIO3	VIDOUT3	52	NC	O12	
GPIO4	VIDOUT4	53	NC	O12	
GPIO5	VIDOUT5/SIC	54	NC	I/OOD12t	
GPIO6	SLOTOCC#	55	GPO	I/OOD12t	
GPIO7	Turbo1#/WDTRST#	56	WDTRST#	OD12-5v	
GPIO15	LED_VSB/ALERT#	64	LED_VSB	OD12	
GPIO16	LED_VCC/Turbo2#	65	LED_VCC	OD12	
GPIO20	PCIRST1#	74	PCIRST1#	OD12	
GPIO21	PCIRST2#	75	PCIRST2#	O12	
GPIO22	PCIRST3#	76	PCIRST3#	O12	
GPIO23	RSTCON#	77	RSTCON#	OD12	
GPIO24	ATXPG_IN	78	ATXPG_IN	AIN	
GPIO32	PWROK	84	PWROK	OD12	
GPIO26	PWSIN#	80	PWSIN#	INts5v	
GPIO27	PWSOUT#	80	PWSOUT#	OD12	
GPIO30	S3#	82	S3#	INts5v	
GPIO31	PSON#	83	PSON#	OD12-5v	
GPIO33	RSMRST#	85	RSMRST#	OD12	
GPIO40	FANIN3	25	FANIN3	INts5v	
GPIO41	FAN_CTL3	26	FAN_CTL3(NC)	OD12-5v	
GPIO25	PME#	79	PME#	OD12-5v	
GPIO10	SPI_SLK/FANIN4	59	GPIO10(NC)	I/OOD12t	
GPIO11	SPI_CS0#/FANCTL4	60	GPIO11(NC)	I/OOD12t	
GPIO12	SPI_MISO/FANCTL1_1	61	GPIO12(NC)	I/OOD12t	
GPIO13	SPI_MOSI/BEEP	62	BEEP(NC)	OD24	
GPIO14	FWH_DIS/WDTRST#/SPI_CS1#	63	GPIO14	I/OOD12t	
GPIO42	IRTX	27	IRTX	O12	
GPIO43	IRRX	28	IRRX	INts	
GPIO17		66	NC	I/OOD12t	

PCI Config.

DEVICE	MCP1 INT PIN	REQ#/GNT#	IDSEL	CLOCK
PCI1	PIRQ#A PIRQ#B PIRQ#C PIRQ#D	PREQ#0 PGNT#0	AD16	PCI_CLK0
PCI2	PIRQ#B PIRQ#C PIRQ#D PIRQ#A	PREQ#1 PGNT#1	AD17	PCI_CLK1

DDRII DIMM Config.

DEVICE	ADRRESS	CLOCK
DIMM A	A0H	P_DDR0_A/N_DDR0_A P_DDR1_A/N_DDR1_A P_DDR2_A/N_DDR2_A
DIMM B	A4H	P_DDR0_B/N_DDR0_B P_DDR1_B/N_DDR1_B P_DDR2_B/N_DDR2_B

JCI1	***Chassis Intrusion***
Open	Normal
(1-2)	Chassis Open

JUMPER SETTING

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

Title	BIOS Request Form		
Size C	Document Number MS-7529		Rev 1.6
Date: Tuesday, March 24, 2009		Sheet 32 of 33	

0A Change list:

1. Add DMI Audio net name
2. Change LED Power pull high to 680 Change r20 to 1.5K
3. Change D10 D11 Power pull VCC5, Q20 Pull up VCC3
4. Delet R252 R254 C132 R22 C60,change U5 to I95-7523212-T07
5. Modify footprint : C_P3_5_D8_H9 NC_0402_6 NC_0603_10 C0805MSB C0603MS_BOT
6. Swap RN65 RN61 RN23 RN64 RN63 RN24 RN28 RN25 RN66 ; Delet EC20,
7. Add 5VCC TO 3VCC sequence
8. change TESTPIN30 to TPC20B
9. RENAME ,Swap RN37, X_J1 Change to GND , Change C300 C301 to 0.22UF
10. Modify V_1P25_CORE to G31

1.0 Change list:

1. U11 EN(pin3)change to USB_DRV
2. Add SIO pin55 SKTOCC# pull up to 3vsb
3. Swap RN26
4. add Control UP7501 power seqence

1.6 Change list:

1. PWM Controller change to UPI 6206
2. LAN : GB - 8111DL & 10/100 : 8103EL
3. Audio : 888S VC2 (all solid CAP - reference from MS-7592-10)
4. Add OC switch
5. Add APS (reference from MS-7592-20)
6. exchange PCI_CLK0,CK_P_33M_SIO,TPM_PCLK,PCI_CLK1 for unkown issue
7. Delete RN26 because page15 have one pull high, add R254 for ATX_PWR_OK
8. page16 add some gpio for aps,bios
9. swap 4 pciclk for some FAE issue
10. change ATX1 to JPWR1,change JKBMS1 to KB_MS1,change JVGA1 to VGA1
11. For linear power:add R332 C396 R331 C394 R238 R329 R149 C305 R330 C393 R155 R214
12. for customer issue:reserve R326 for PGNT#3 pull up
13. add RN26
14. by sales request ,Remove Print port connector and change to pin header .
15. update footprint:EC43 EC44 EC1 EC14 EC9 EC15
16. modify 5VDIMM circuit: change Q8 footprint
17. Change C180 C186 C194 footprint
18. add C141 C144 C145 for EMI
19. update footprint: KB_MS1 JTPM1,add C288
20. update COIL2 PN&footprint,modify C402 to debug PSU issue
21. Swap RN56 RN59 CN10 RN63 RN27 CN9
22. add R426
23. modify R229 R424 R425 value