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MS-7514 ATX Version: 3.0

CPU: Intel Core 2 Extreme/Quad/Duo, Pentium Dual-Core& Celeron Dual-Core Processors in the LGA775.

System Chipset:

Intel Eaglelake - P45/P43(North Bridge)
ICH10/ICH10R(South Bridge)

On Board Device:

CLOCK Gen -- ICS 9LPRS113
LPC Super I/O -- Fintek F71882FG
LAN -- Realtek 8111C (PCIE)
HD Audio Codec -- ALC888
1394 Controller -- Jmicron JMB381
PCIE to PATA/SATA Bridge -- JMB363

Main Memory:

Dual-channel DDR-III * 4

Expansion Slots:

PCI EXPRESS X16 SLOT *1
PCI EXPRESS X1 SLOT * 1
PCI SLOT * 4

PWM: ISL6334

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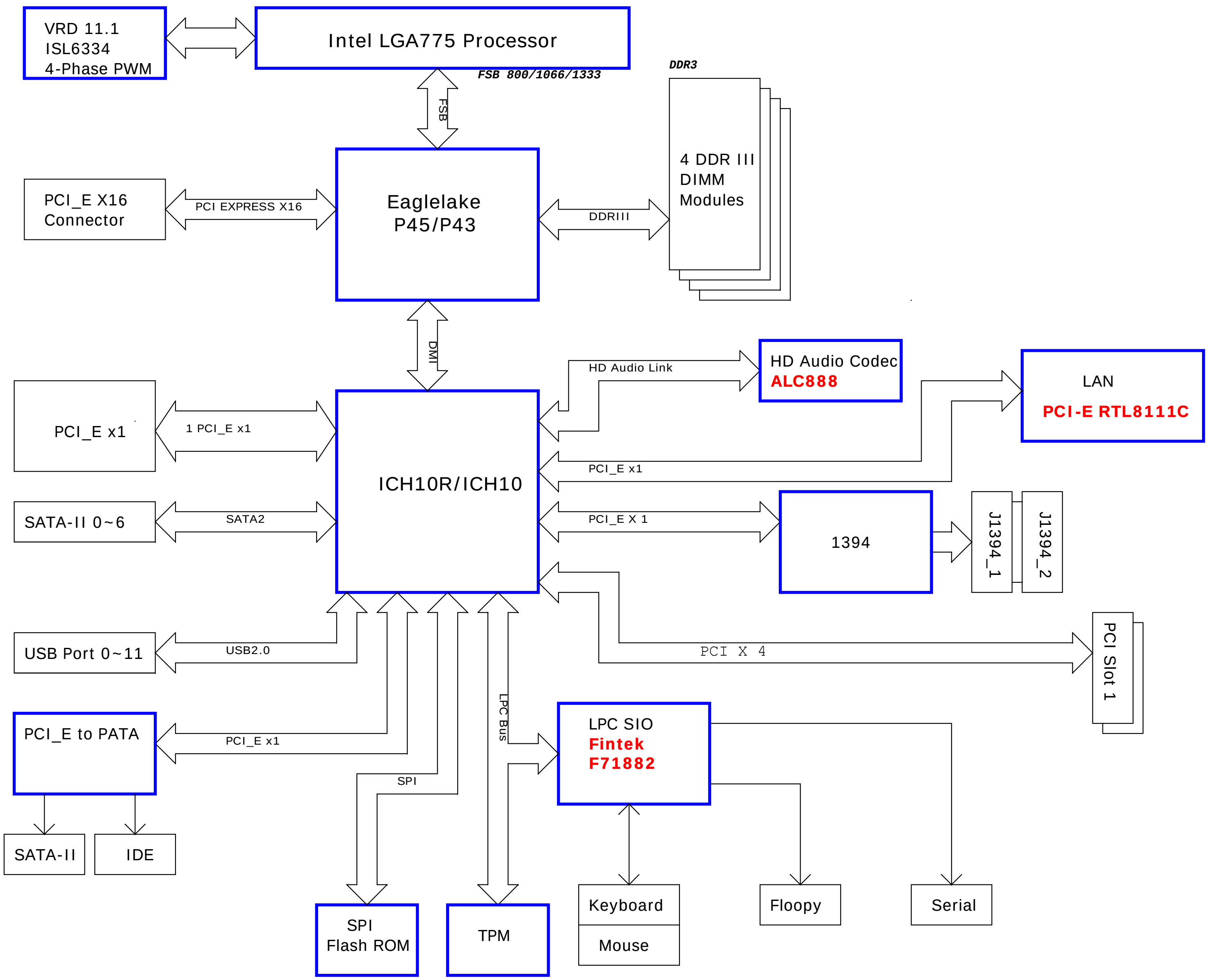
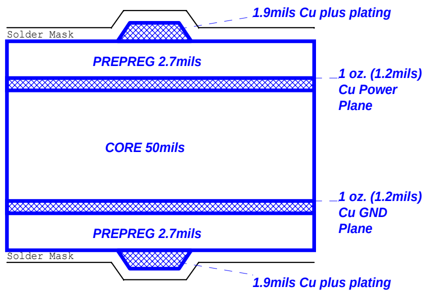
Block Diagram



Board Stack-up

(1080 Prepreg Considerations)



Single End 50ohm Top/Bottom : 4mils
USB2.0 - 90ohm : 15/4.5/7.5/4.5/15
SATA - 95ohm : 15/4/8/4/15
LAN - 100ohm : 15/4/8/4/15
PCIE - 95ohm : 15/4/8/4/15
IEEE1394 - 110ohm : 15/4/9/4/15
IDE : 15/4/8/4/15

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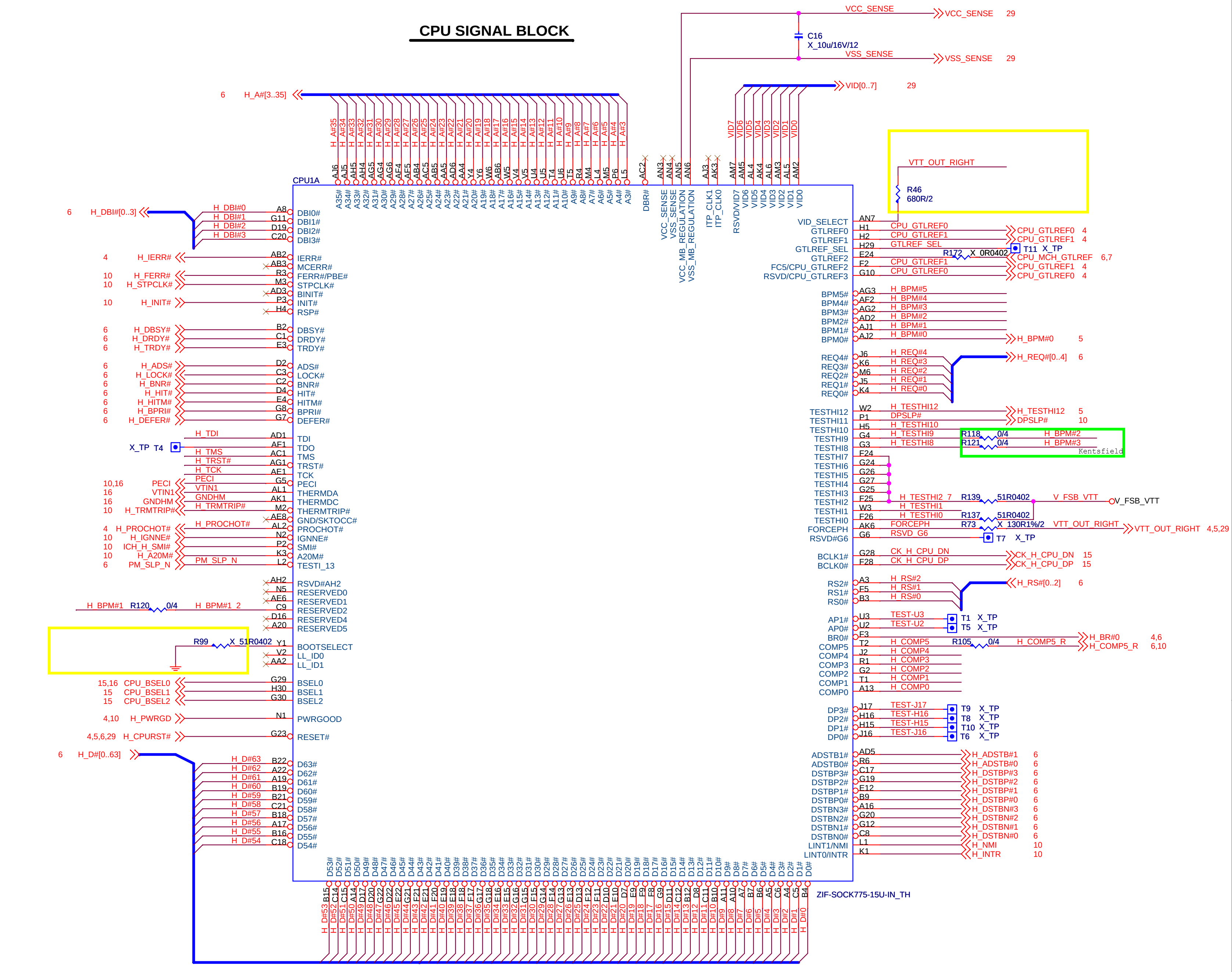
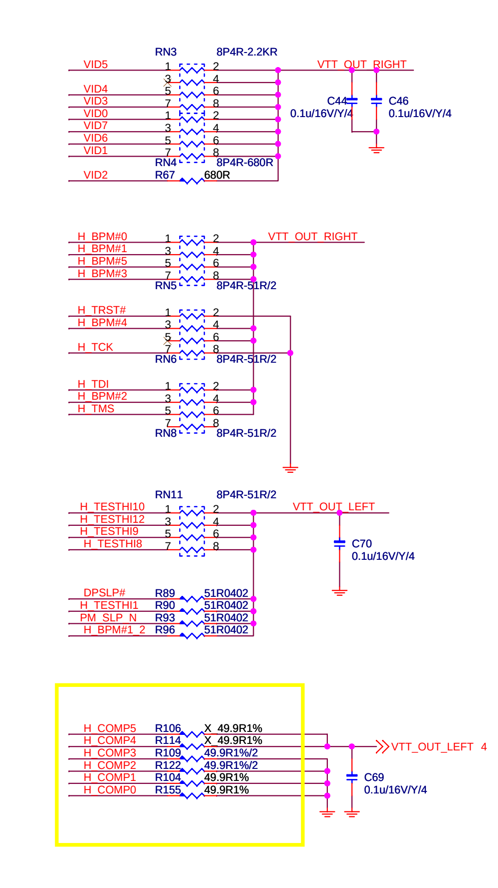
CPU SIGNAL BLOCK



PULL HIGHT PULL DOWN



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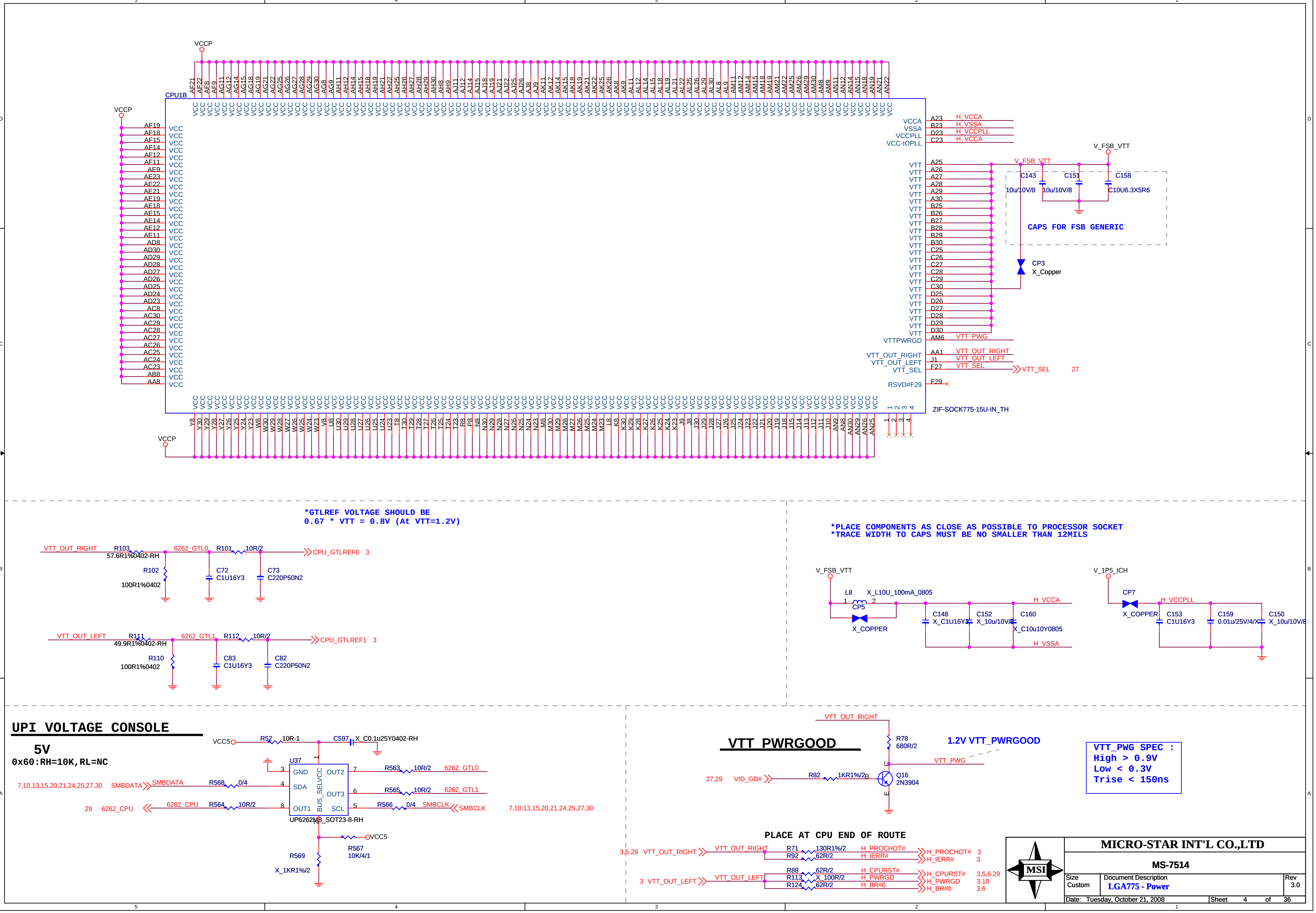

CPU1B
ZIF-SOCK775-15U-IN_TH
VCCP
VCCA
VSSA
VCCPLL
VCC-IOPLL
H_VCCA
H_VSSA
H_VCCPLL
VTT
VTTPWRGD
VTT_OUT_RIGHT
VTT_OUT_LEFT
VTT_SEL
RSVD#F29
VTT_PWG
VTT_SEL 27
V_FSB_VTT
C143 10u/10V/8
C151 10u/10V/8
C158 C10U6.3X5R6
CAPS FOR FSB GENERIC
CP3 X_Copper
*GTLREF VOLTAGE SHOULD BE
0.67 * VTT = 0.8V (At VTT=1.2V)
VTT_OUT_RIGHT
R103 57.6R1%0402-RH
6262_GTL0
R101 10R/2
CPU_GTLREF0 3
R102 100R1%0402
C72 C1U16Y3
C73 C220P50N2
VTT_OUT_LEFT
R111 49.9R1%0402-RH
6262_GTL1
R112 10R/2
CPU_GTLREF1 3
R110 100R1%0402
C83 C1U16Y3
C82 C220P50N2
*PLACE COMPONENTS AS CLOSE AS POSSIBLE TO PROCESSOR SOCKET
*TRACE WIDTH TO CAPS MUST BE NO SMALLER THAN 12MILS
V_FSB_VTT
L8 X_L10U_100mA_0805
CP5 X_COPPER
C148 X_C1U16Y3
C152 X_10u/10V/8
C160 X_C10u10Y0805
H_VCCA
H_VSSA
V_1P5_ICH
CP7 X_COPPER
H_VCCPLL
C153 C1U16Y3
C159 0.01u/25V/4/X
C150 X_10u/10V/8
UPI VOLTAGE CONSOLE
5V
0x60:RH=10K,RL=NC
VCC5
R52 10R-1
C597 X_C0.1u25Y0402-RH
U37
GND
SDA
OUT1
BUS_SELVCC
OUT2
OUT3
SCL
UP6262MB_SOT23-8-RH
7,10,13,15,20,21,24,25,27,30 SMBDATA
SMBDATA
R568 0/4
29 6262_CPU
6262_CPU
R564 10R/2
R563 10R/2 6262_GTL0
R565 10R/2 6262_GTL1
R566 0/4 SMBCLK
SMBCLK 7,10,13,15,20,21,24,25,27,30
R567 10K/4/1
VCC5
R569 X_1KR1%/2
VTT_PWRGOOD
VTT_OUT_RIGHT
R78 680R/2
1.2V VTT_PWRGOOD
VTT_PWG
27,29 VID_GD#
R82 1KR1%/2
Q16 2N3904
VTT_PWG SPEC :
High > 0.9V
Low < 0.3V
Trise < 150ns
PLACE AT CPU END OF ROUTE
3,5,29 VTT_OUT_RIGHT
VTT_OUT_RIGHT
R71 130R1%/2 H_PROCHOT# 3
R92 62R/2 H_IERR# 3
3 VTT_OUT_LEFT
VTT_OUT_LEFT
R88 62R/2 H_CPURST# 3,5,6,29
R113 X_100R/2 H_PWRGD 3,10
R124 62R/2 H_BR#0 3,6
MSI
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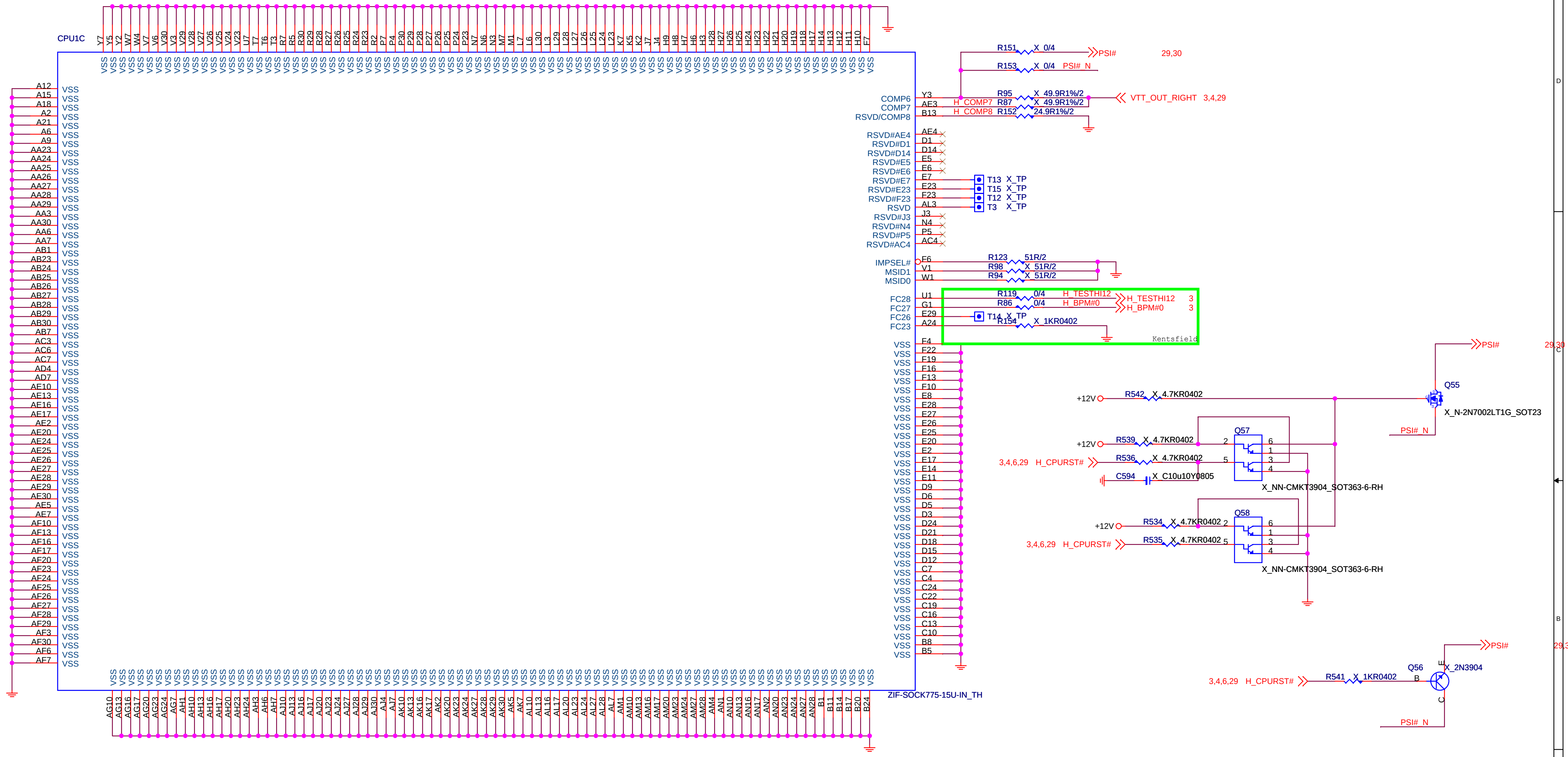

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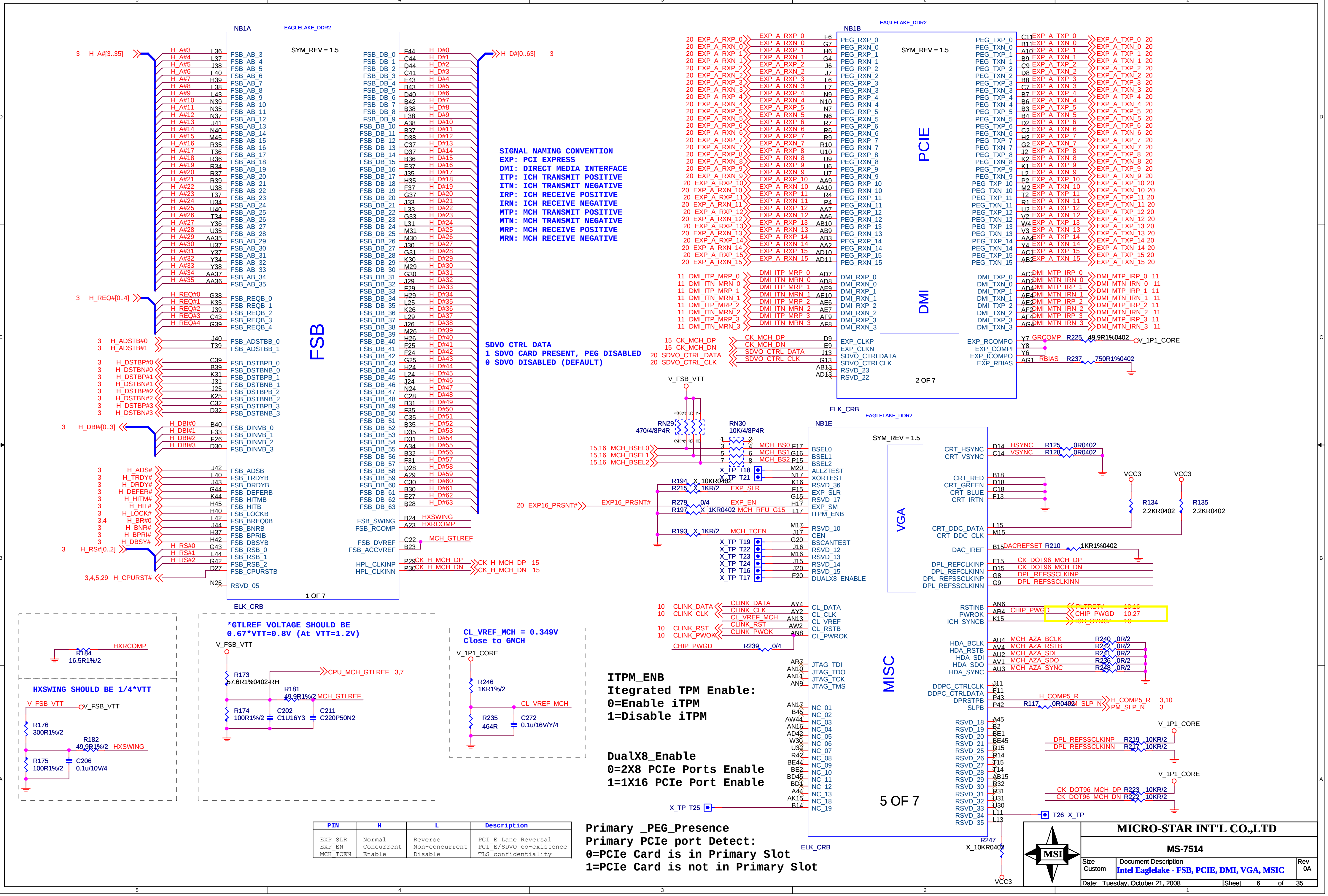

SIGNAL NAMING CONVENTION
EXP: PCI EXPRESS
DMI: DIRECT MEDIA INTERFACE
ITP: ICH TRANSMIT POSITIVE
ITN: ICH TRANSMIT NEGATIVE
IRP: ICH RECEIVE POSITIVE
IRN: ICH RECEIVE NEGATIVE
MTP: MCH TRANSMIT POSITIVE
MTN: MCH TRANSMIT NEGATIVE
MRP: MCH RECEIVE POSITIVE
MRN: MCH RECEIVE NEGATIVE

SDVO CTRL DATA
1 SDVO CARD PRESENT, PEG DISABLED
0 SDVO DISABLED (DEFAULT)

HXSWING SHOULD BE 1/4*VTT

*GTLREF VOLTAGE SHOULD BE
0.67*VTT=0.8V (At VTT=1.2V)

CL_VREF_MCH = 0.349V
Close to GMCH

ITPM_ENB
Itegrated TPM Enable:
0=Enable iTPM
1=Disable iTPM

DualX8_Enable
0=2X8 PCIe Ports Enable
1=1X16 PCIe Port Enable

PIN	H	L	Description
EXP_SLR	Normal	Reverse	PCI_E Lane Reversal
EXP_EN	Concurrent	Non-concurrent	PCI_E/SDVO co-existence
MCH_TCEN	Enable	Disable	TLS confidentiality

Primary _PEG_Presence
Primary PCIe port Detect:
0=PCIe Card is in Primary Slot
1=PCIe Card is not in Primary Slot

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Size: Custom
Document Description: Intel Eaglelake - FSB, PCIE, DMI, VGA, MSIC
Rev: 0A
Date: Tuesday, October 21, 2008
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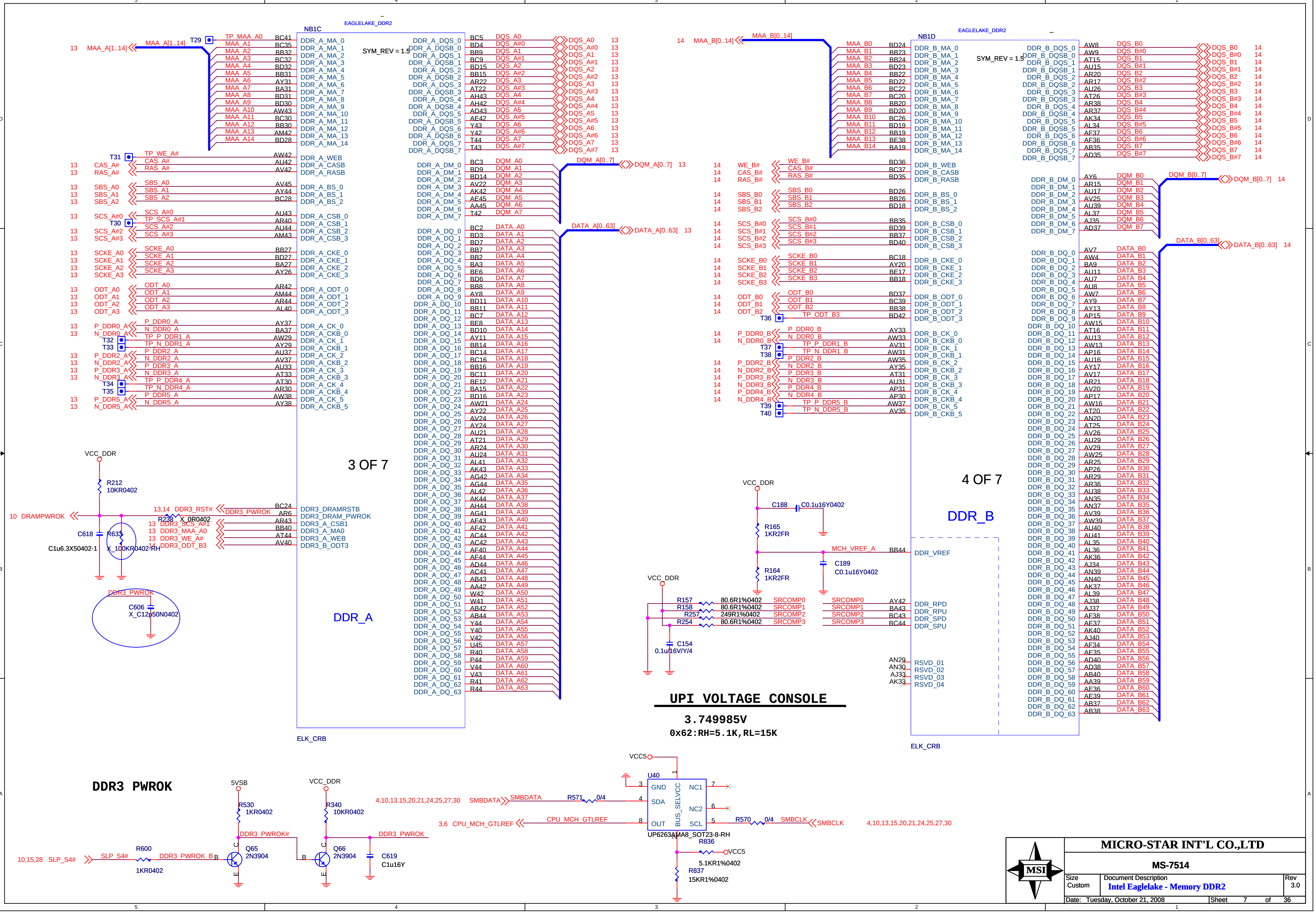

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Size	Document Description	Rev
Custom	Intel Eaglelake - Memory DDR2	3.0

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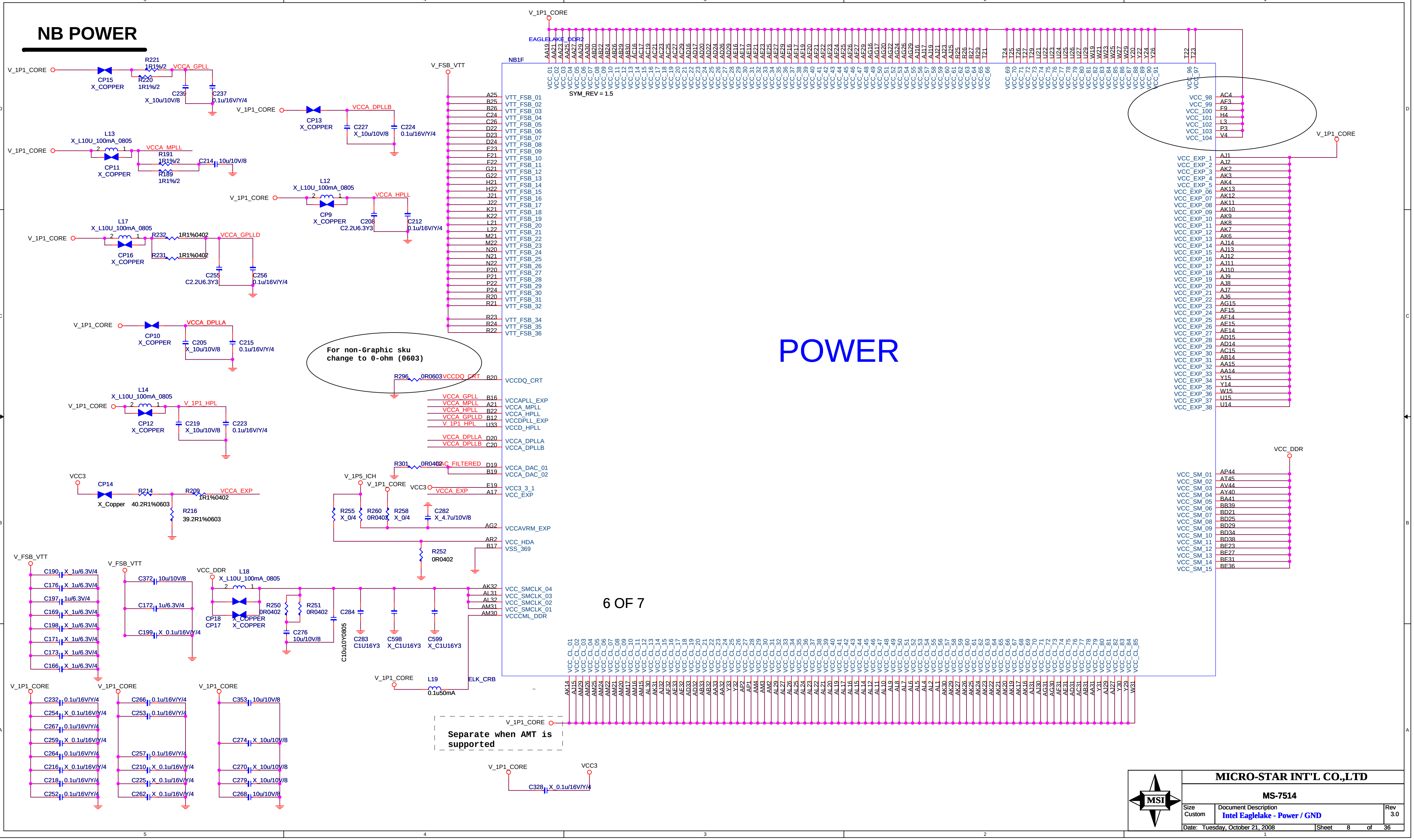
NB POWER
POWER
6 OF 7
NB1F
SYM_REV = 1.5
EAGLELAKE_DDR2
For non-Graphic sku
change to 0-ohm (0603)
Separate when AMT is
supported
V_1P1_CORE
V_FSB_VTT
VCC_DDR
VCC3
V_1P5_ICH
VCCA_GPLL
VCCA_DPLLB
VCCA_MPLL
VCCA_HPLL
VCCA_GPLLD
VCCA_DPLLA
V_1P1_HPL
VCCA_EXP
VCCDQ_CRT
DAC_FILTERED
ELK_CRB
VTT_FSB_01 … VTT_FSB_36
VCCDQ_CRT
VCCAPLL_EXP
VCCA_MPLL
VCCA_HPLL
VCCDPLL_EXP
VCCD_HPLL
VCCA_DPLLA
VCCA_DPLLB
VCCA_DAC_01
VCCA_DAC_02
VCC3_3_1
VCC_EXP
VCCAVRM_EXP
VCC_HDA
VSS_369
VCC_SMCLK_04
VCC_SMCLK_03
VCC_SMCLK_02
VCC_SMCLK_01
VCCCML_DDR
VCC_98 … VCC_104
VCC_EXP_1 … VCC_EXP_38
VCC_SM_01 … VCC_SM_15
VCC_CL_01 … VCC_CL_85
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Custom
Document Description
Intel Eaglelake - Power / GND
Rev
3.0
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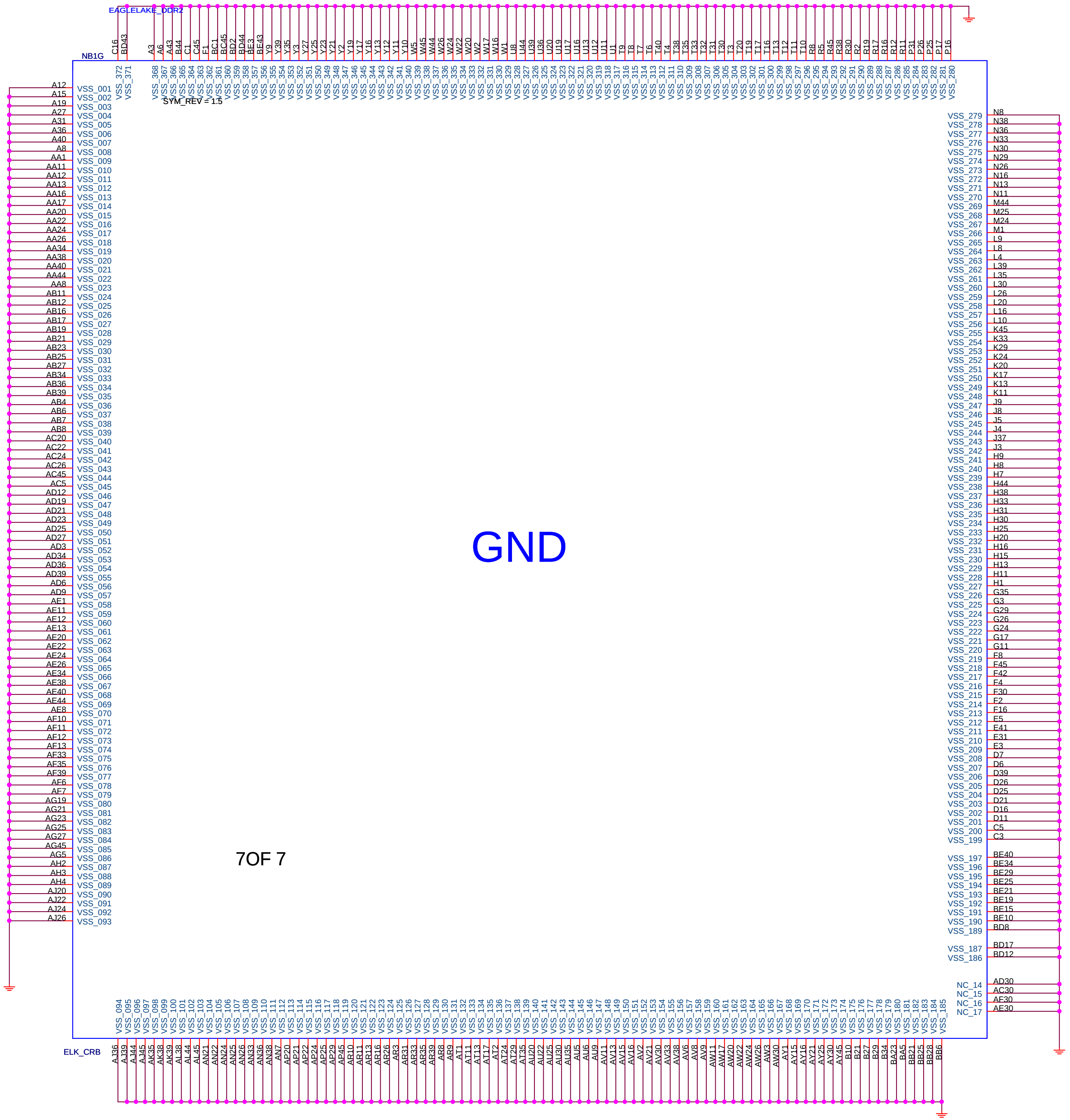

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Custom	COVER SHEET	3.0

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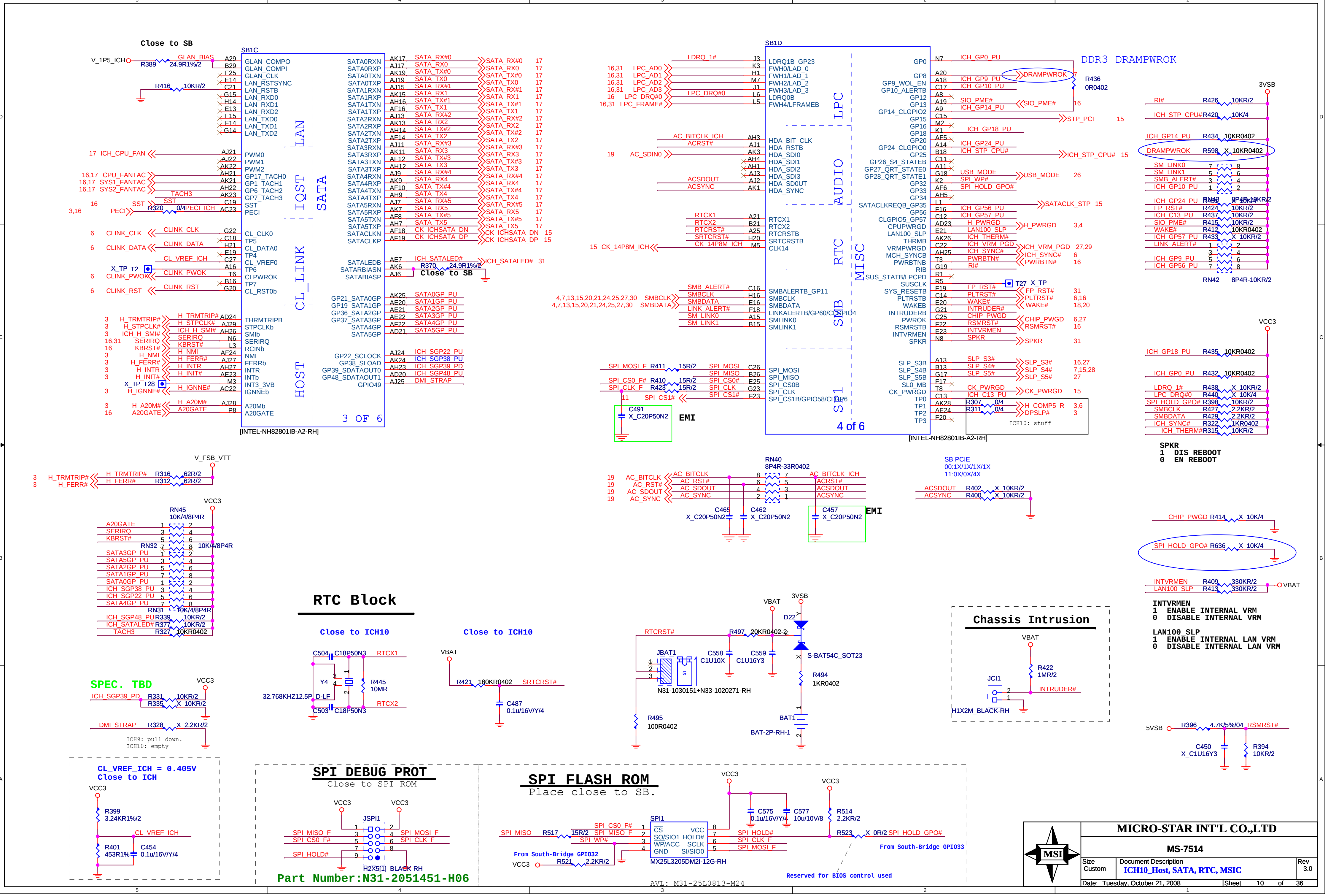

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Size	Document Description	Rev
Custom	ICH10_Host, SATA, RTC, MSIC	3.0

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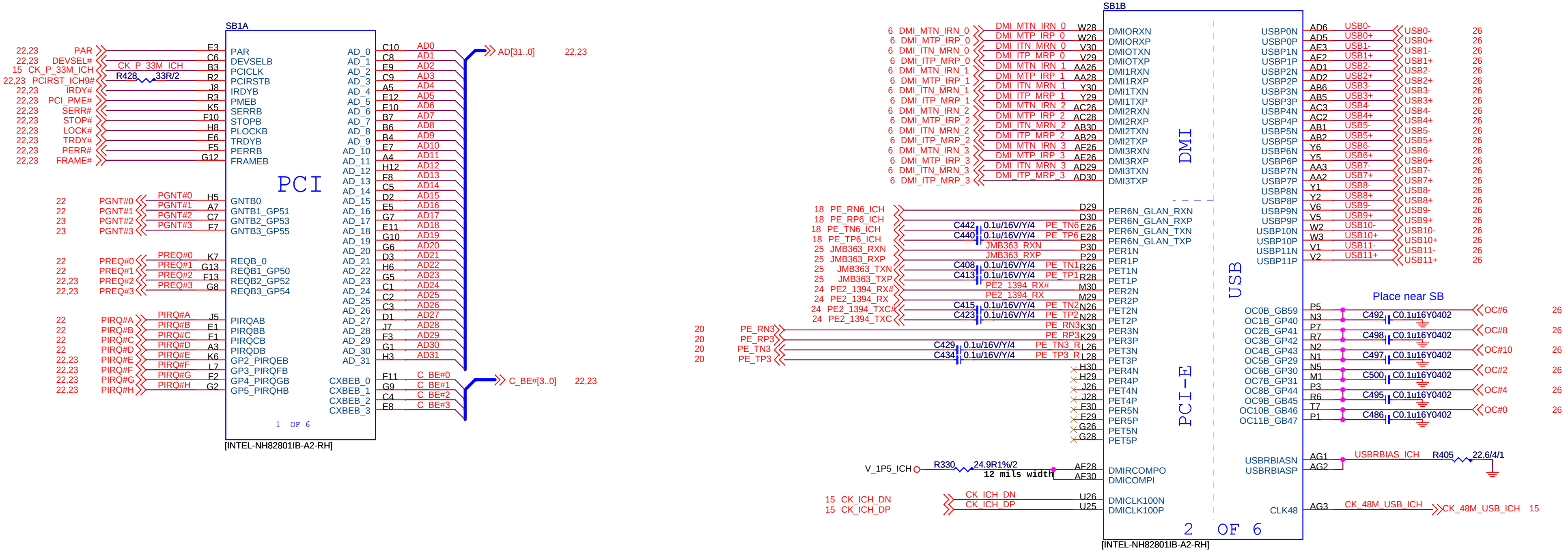
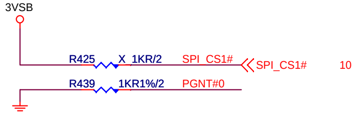


SB STRAPPING RESISTOR



BOOT SELECT STRAPS		
BOOT DEVICE	GNT#0	SPI_CS1#
FWH	1	1
SPI	0	1
PCI	1	0

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Size	Document Description	Rev
Custom	ICH10_PCI, USB, DMI, PCIEx1	3.0

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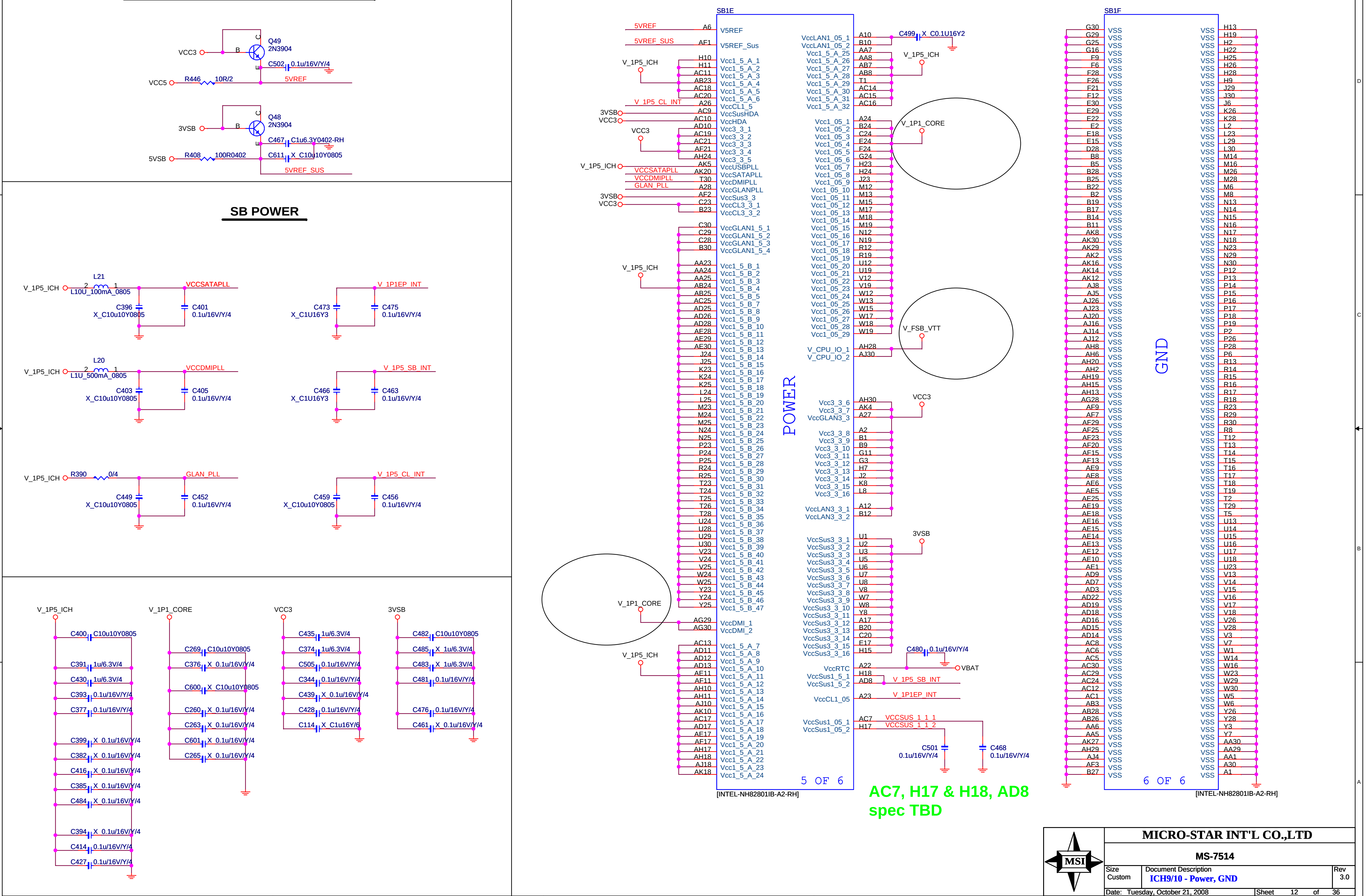
5VREF & 5VREF_SUS Sequencing Circuit

SB POWER



AC7, H17 & H18, AD8
spec TBD

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Size: Custom	Document Description: ICH9/10 - Power, GND	Rev: 3.0
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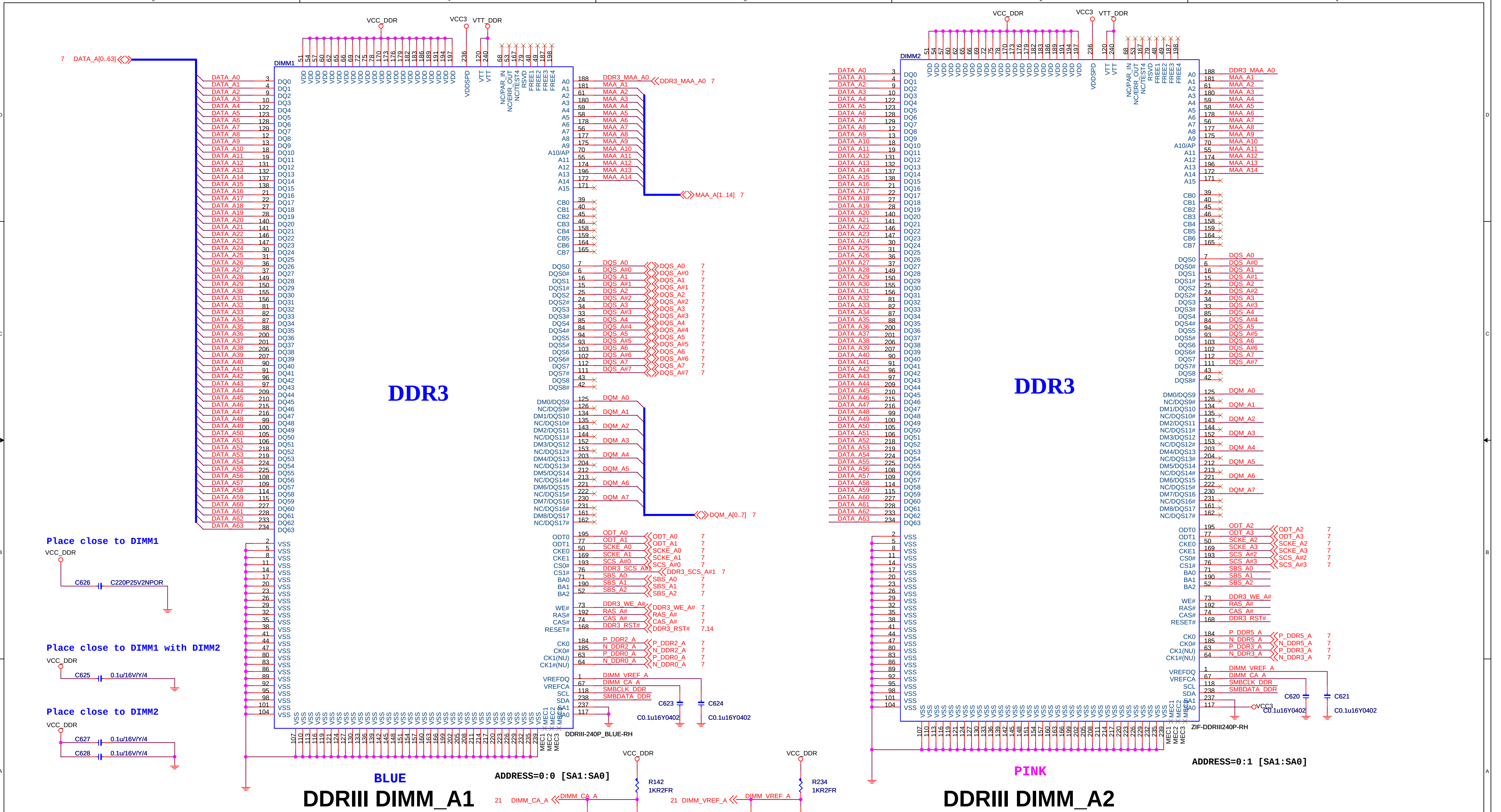

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Size	Document Description	Rev
Custom	DDR3 Chanel-A / Chanel-B	3.0

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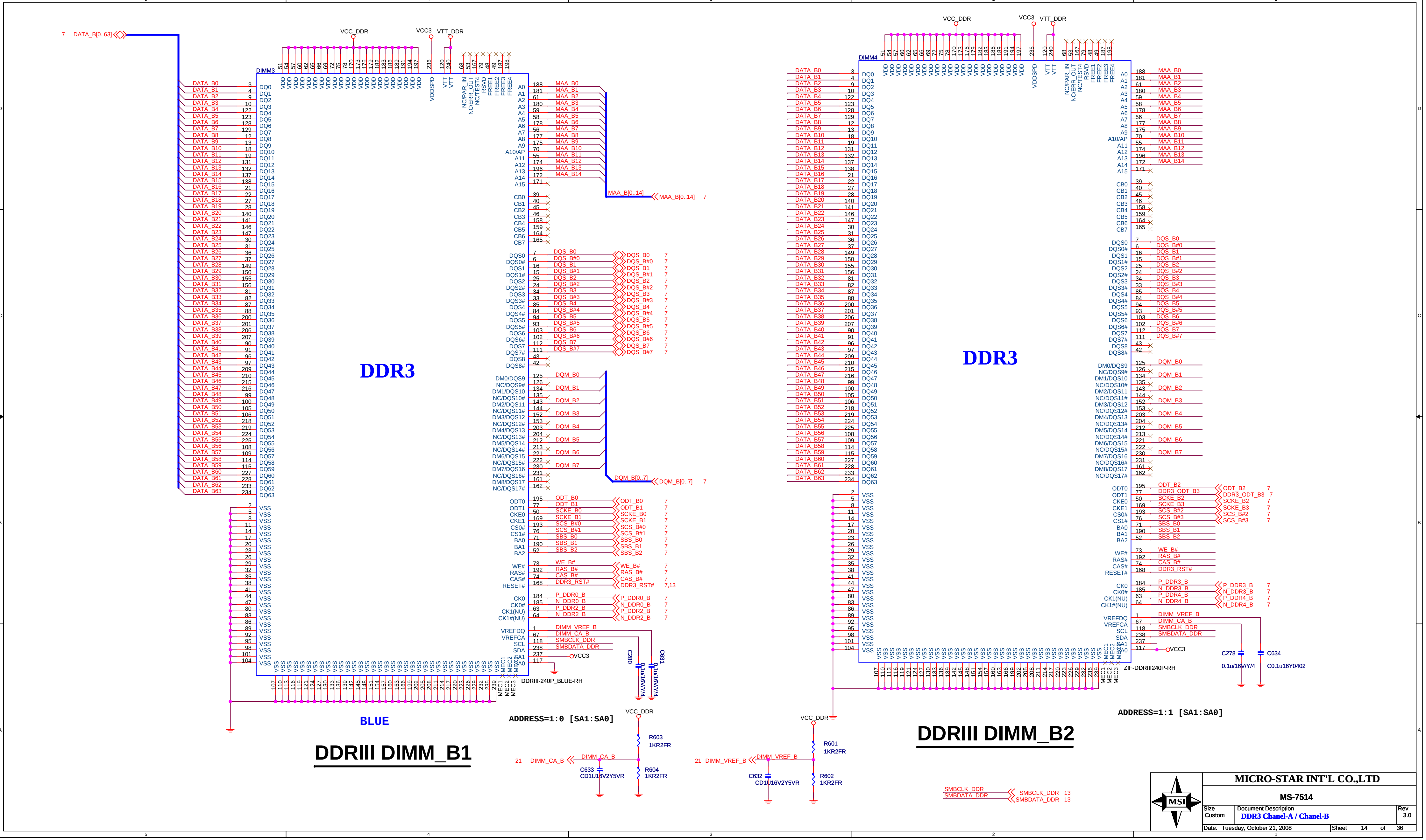

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Size	Document Description	Rev
Custom	DDR3 Chanel-A / Chanel-B	3.0

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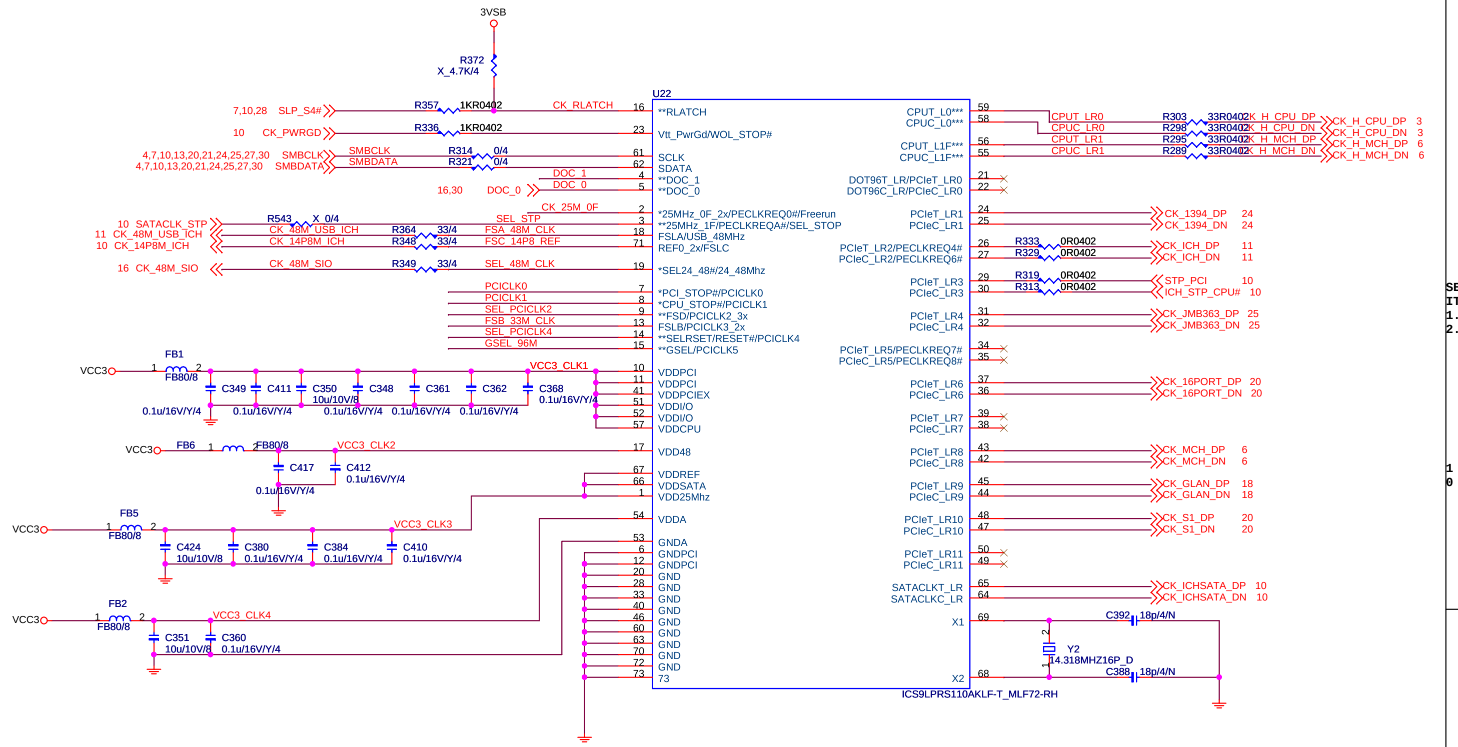
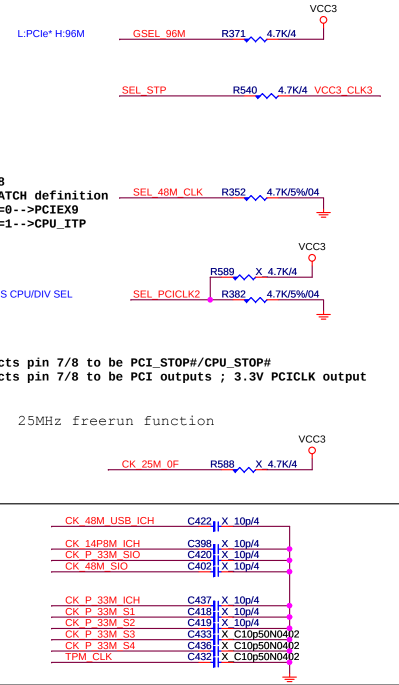
CLOCK GEN STRAPING



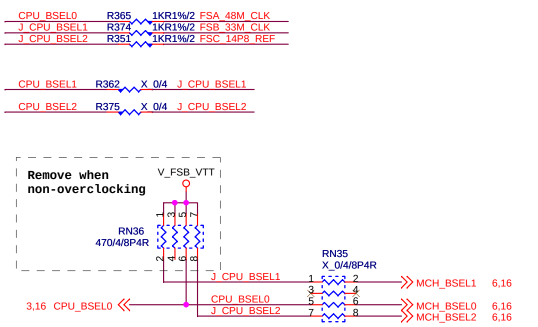


SEL_24_48
ITP_EN LATCH definition
1.ITP_EN=0-->PCIEX9
2.ITP_EN=1-->CPU_ITP

1 = Selects pin 7/8 to be PCI_STOP#/CPU_STOP#
0 = Selects pin 7/8 to be PCI outputs ; 3.3V PCICLK output

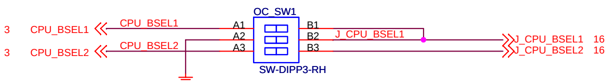
25MHz freerun function

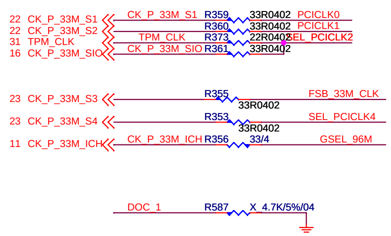
BSEL			TABLE
2	1	0	FSB FREQUENCY
0	0	0	266 MHz (1066)
1	0	0	333 MHZ (1333)
0	1	0	200 MHZ (800)
1	1	0	400 MHZ (1600)

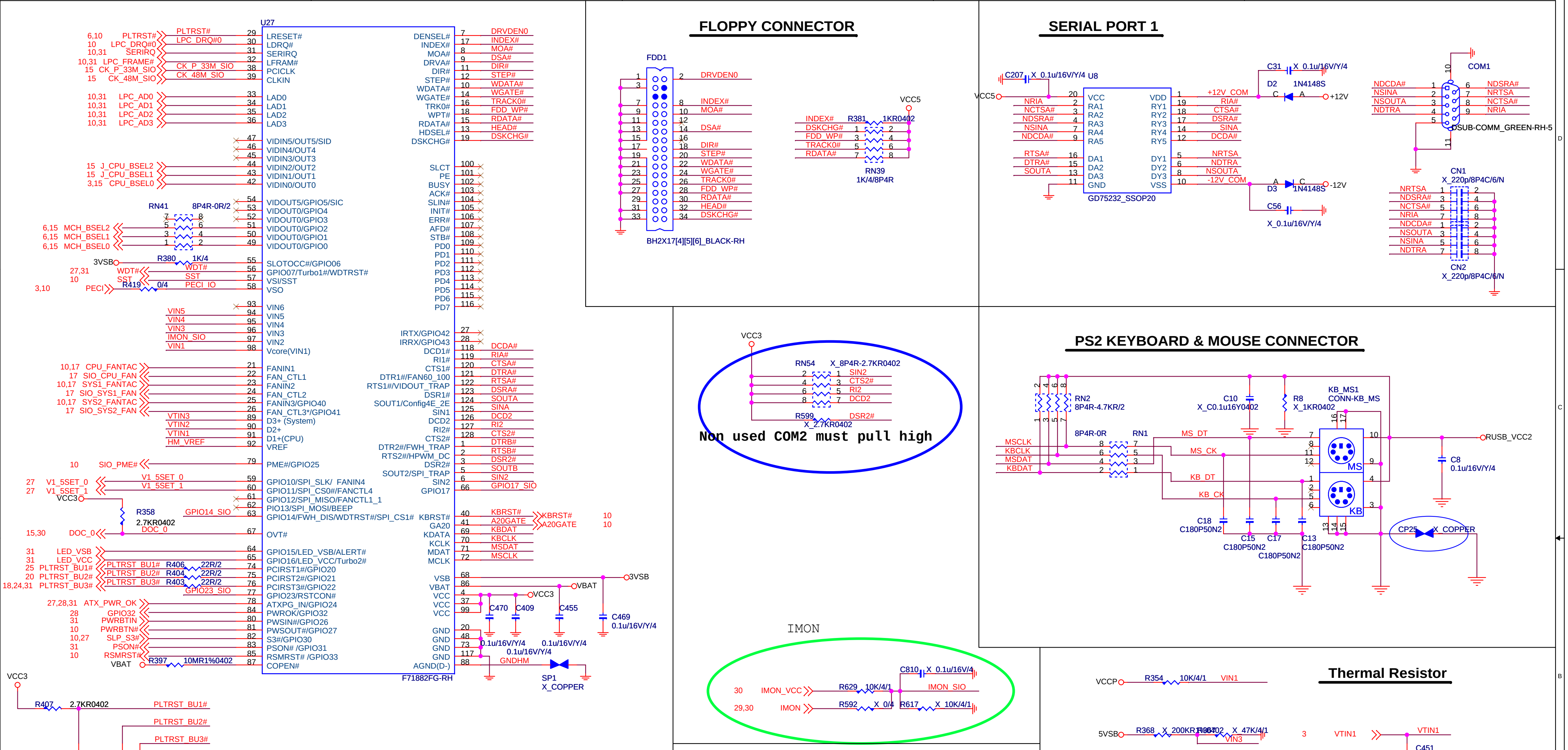


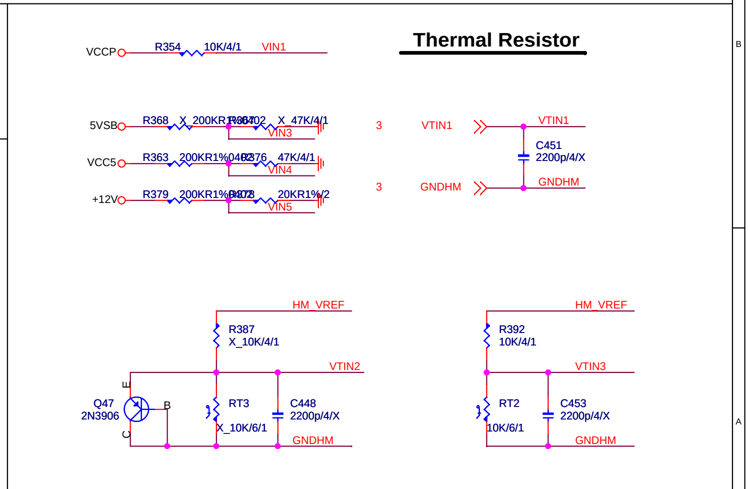
OC_SW1

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



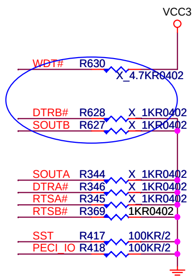






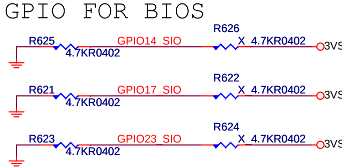
LPC I/O STRAPPING RESISTOR

STRAP	Don't STUFF	STUFF
SOUTA	4E(default)	2E
DTRA#	FAN START DUTY 60%	FAN START DUTY 100%
RTSA#	PIN49~54 = VID_OUT PIN42~47 = VID_IN	PIN49~54 = GPIO PIN42~47 = VIDIN/OUT
SOUTB	SPI_DISABLE	SPI_ENABLE
DTRB#	SPI_Backup	SPI_Primary
RTSB#	PWM FAN	LINEAR FAN



	GPIO23	GPIO17	GPIO14	Maketing Name
0	0	0	0	P45D3 Neo3-FR
1	0	0	1	P43D3 Neo3-FI
2	0	1	0	P45D3 Neo3-FI
3	0	1	1	P43D3 Neo3-FR

GPIO FOR BIOS



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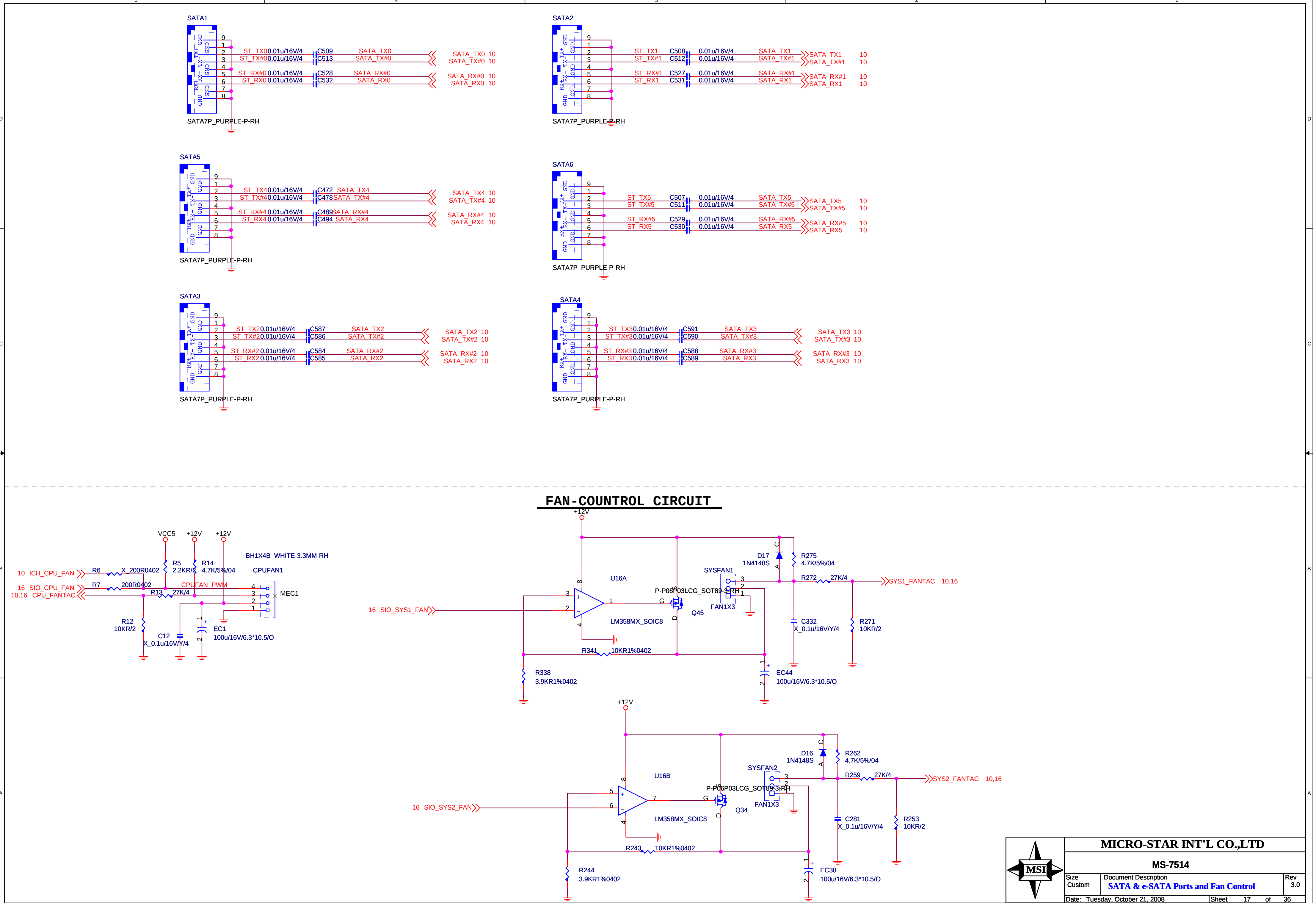

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Size	Document Description	Rev
Custom	SATA & e-SATA Ports and Fan Control	3.0

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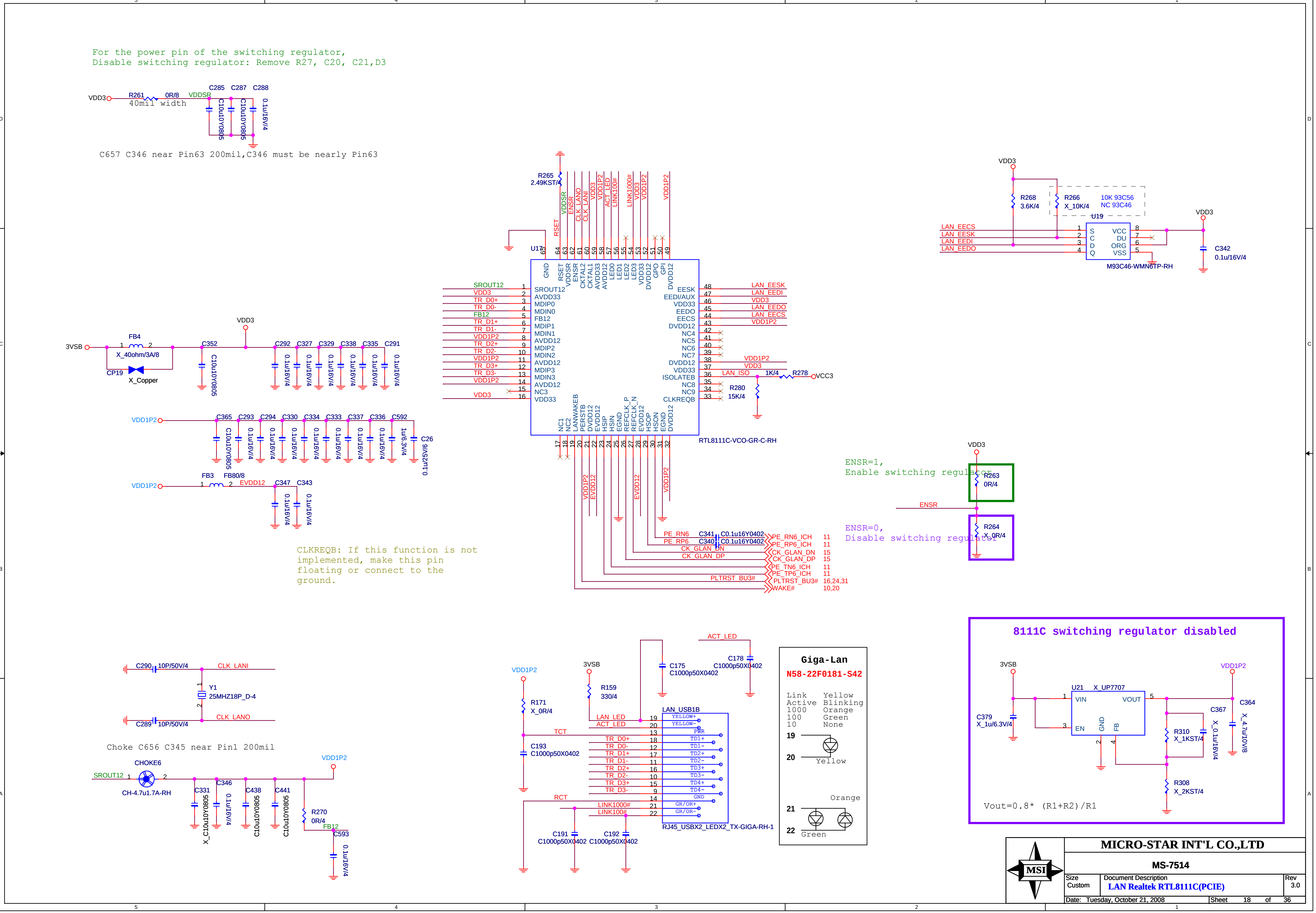
For the power pin of the switching regulator,
Disable switching regulator: Remove R27, C20, C21,D3
VDD3 R261 0R/8 VDDSR 40mil width
C285 C287 C288
C10u10Y0805 C10u10Y0805 0.1u/16V/4
C657 C346 near Pin63 200mil,C346 must be nearly Pin63
R265 2.49KST/4
U17
RTL8111C-VCO-GR-C-RH
SROUT12 AVDD33 MDIP0 MDIN0 FB12 MDIP1 MDIN1 AVDD12 MDIP2 MDIN2 AVDD12 MDIP3 MDIN3 AVDD12 NC3 VDD33
EESK EEDI/AUX VDD33 EEDO EECS DVDD12 NC4 NC5 NC6 NC7 DVDD12 VDD33 ISOLATEB NC8 NC9 CLKREQB
R278 1K/4 VCC3
R280 15K/4
3VSB FB4 X_40ohm/3A/8 CP19 X_Copper
VDD3 C352 C10u10Y0805
C292 C327 C329 C338 C335 C291 0.1u/16V/4
VDD1P2 C365 C293 C294 C330 C334 C333 C337 C336 C592 C26
C10u10Y0805 0.1u/16V/4 1u/6.3V/4 0.1u/25V/6
VDD1P2 FB3 FB80/8 EVDD12 C347 C343 0.1u/16V/4
CLKREQB: If this function is not implemented, make this pin floating or connect to the ground.
PE_RN6 C341 C0.1u16Y0402 PE_RN6_ICH 11
PE_RP6 C340 C0.1u16Y0402 PE_RP6_ICH 11
CK_GLAN_DN 15
CK_GLAN_DP 15
PE_TN6_ICH 11
PE_TP6_ICH 11
PLTRST_BU3# 16,24,31
WAKE# 10,20
VDD3 R268 3.6K/4 R266 X_10K/4 10K 93C56 NC 93C46
U19 M93C46-WMN6TP-RH
LAN_EECS LAN_EESK LAN_EEDI LAN_EEDO
C342 0.1u/16V/4
ENSR=1,
Enable switching regulator
R263 0R/4
ENSR
ENSR=0,
Disable switching regulator
R264 X_0R/4
8111C switching regulator disabled
3VSB VDD1P2
U21 X_UP7707
VIN VOUT EN GND FB
C379 X_1u/6.3V/4
C367 X_0.1u/16V/4
C364 X_4.7u/10V/8
R310 X_1KST/4
R308 X_2KST/4
Vout=0.8* (R1+R2)/R1
C290 10P/50V/4 CLK_LANI
Y1 25MHZ18P_D-4
C289 10P/50V/4 CLK_LANO
Choke C656 C345 near Pin1 200mil
CHOKE6 CH-4.7u1.7A-RH SROUT12
C331 C346 C438 C441
X_C10u10Y0805 0.1u/16V/4 C10u10Y0805 C10u10Y0805
R270 0R/4 FB12 C593 0.1u/16V/4
VDD1P2 R171 X_0R/4 C193 C1000p50X0402
3VSB R159 330/4
C175 C1000p50X0402
ACT_LED C178 C1000p50X0402
LAN_USB1B
RJ45_USBX2_LEDX2_TX-GIGA-RH-1
C191 C1000p50X0402 C192 C1000p50X0402
Giga-Lan
N58-22F0181-S42
Link Yellow
Active Blinking
1000 Orange
100 Green
10 None
19 20 Yellow
21 22 Orange Green
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MS-7514
Size Custom
Document Description
LAN Realtek RTL8111C(PCIE)
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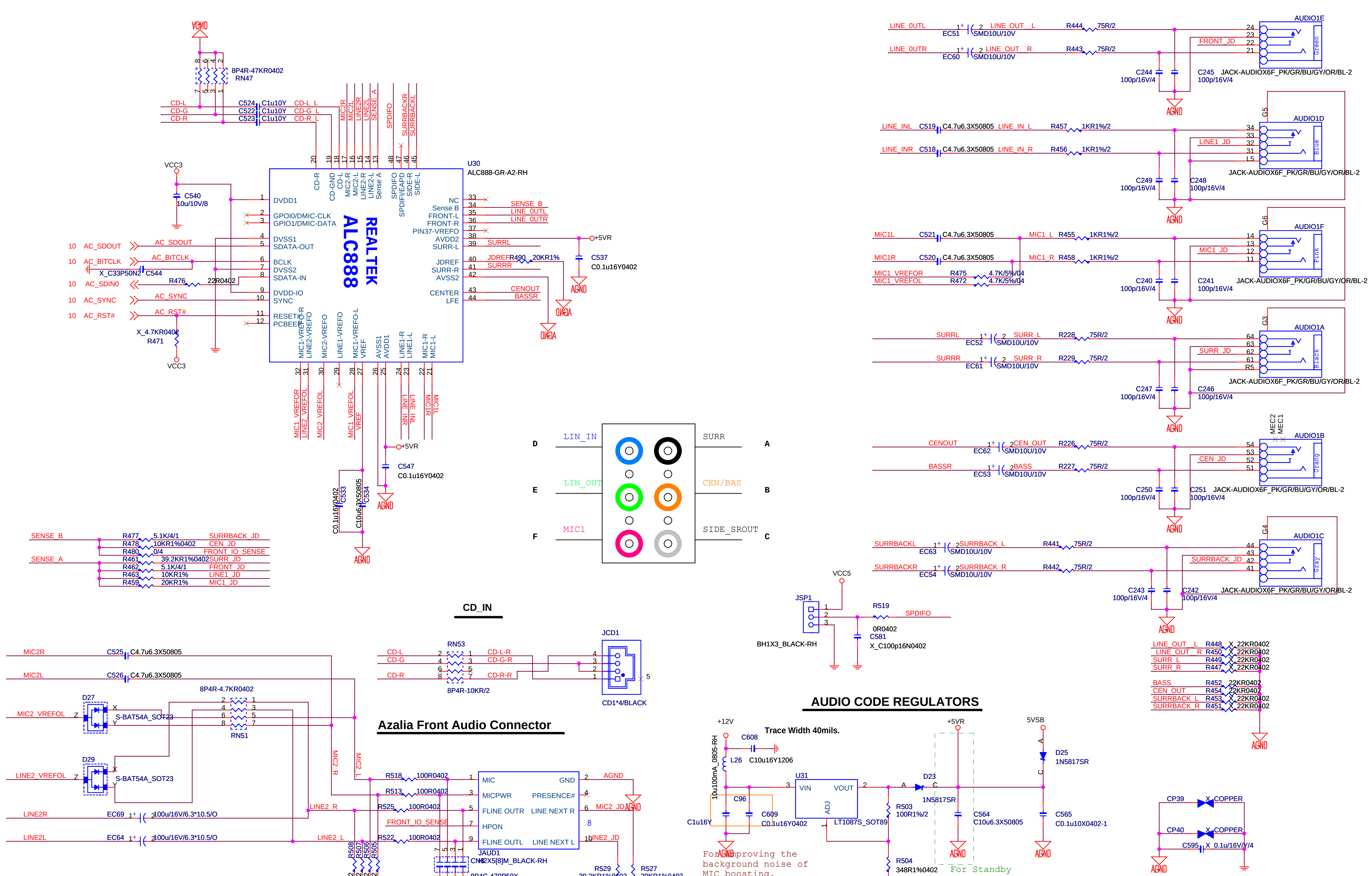

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Custom	realtek888T/888	3.0

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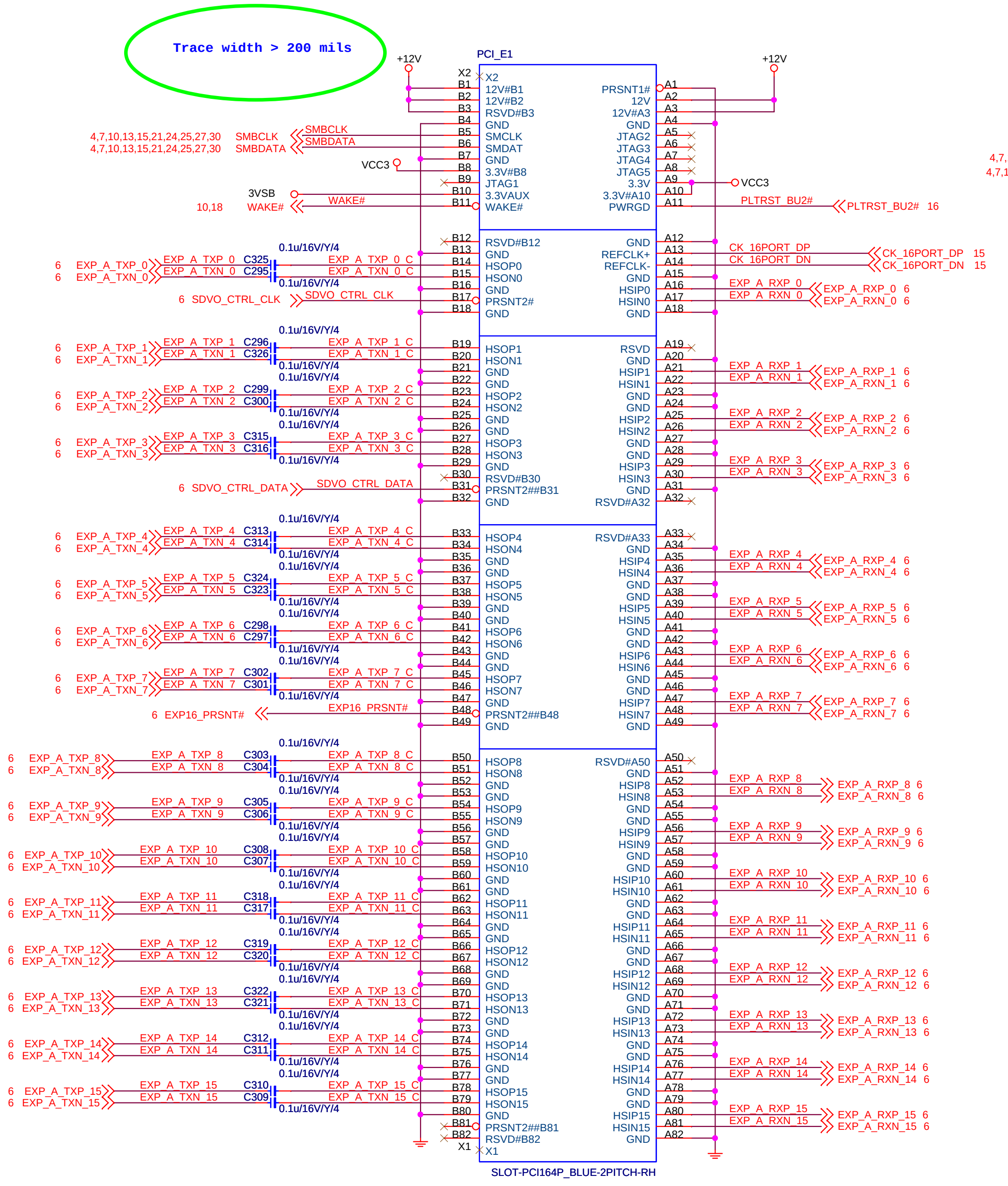
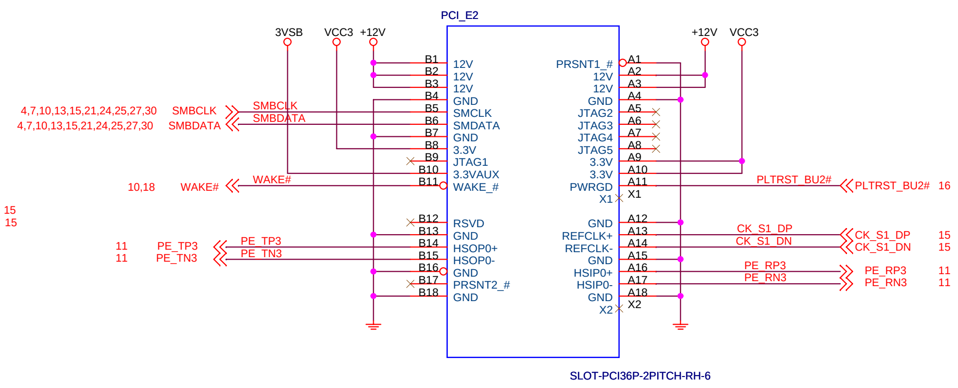
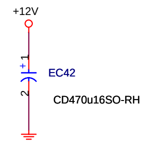
PCI_Express X16 Slot



PCI_EXPRESS x1-PORT





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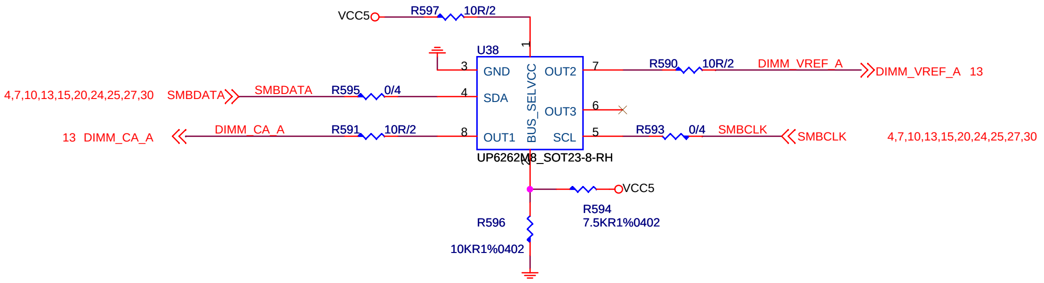
DDRIII UPI VOLTAGE CONSOLE

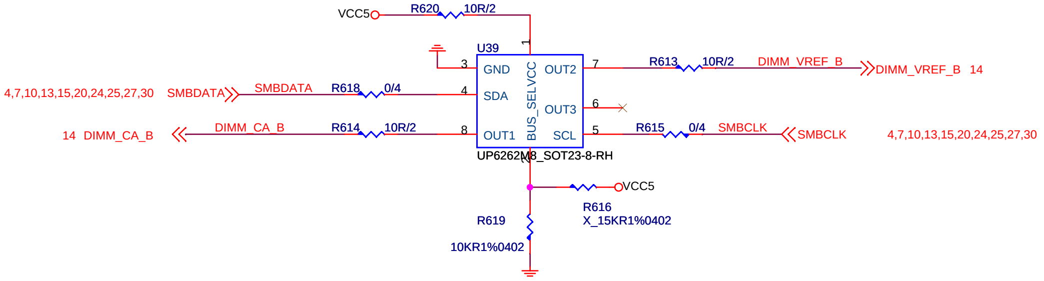
5V

0x64:RH=7.5K,RL=10K DIMM1/DIMM2



5V

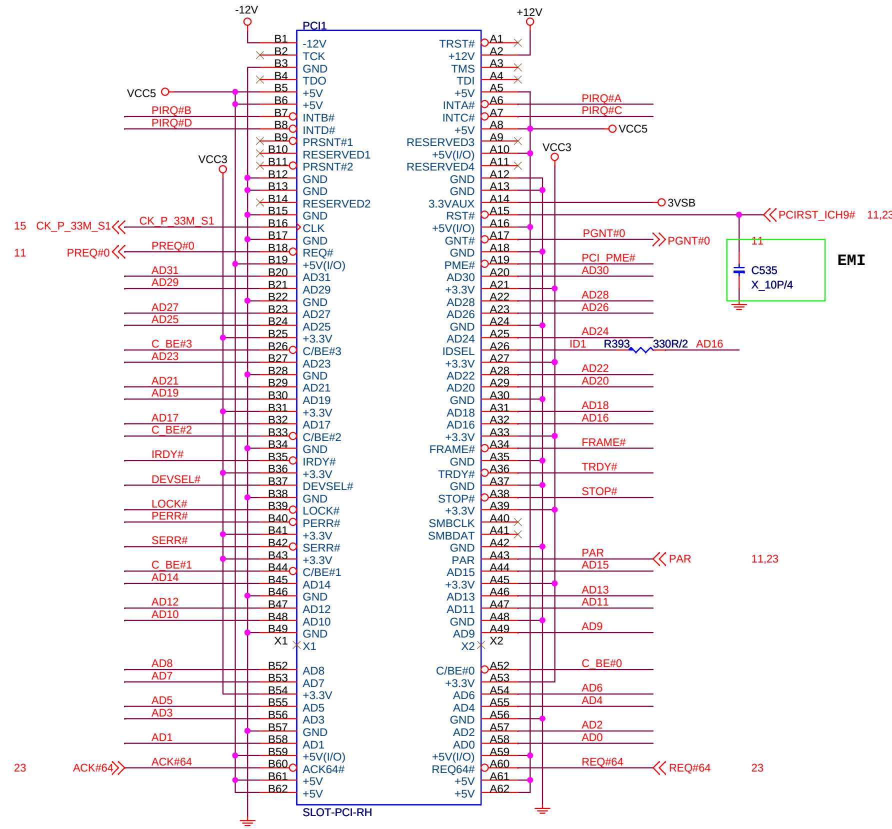
0x6A:RH=NC,RL=10K DIMM3/DIMM4



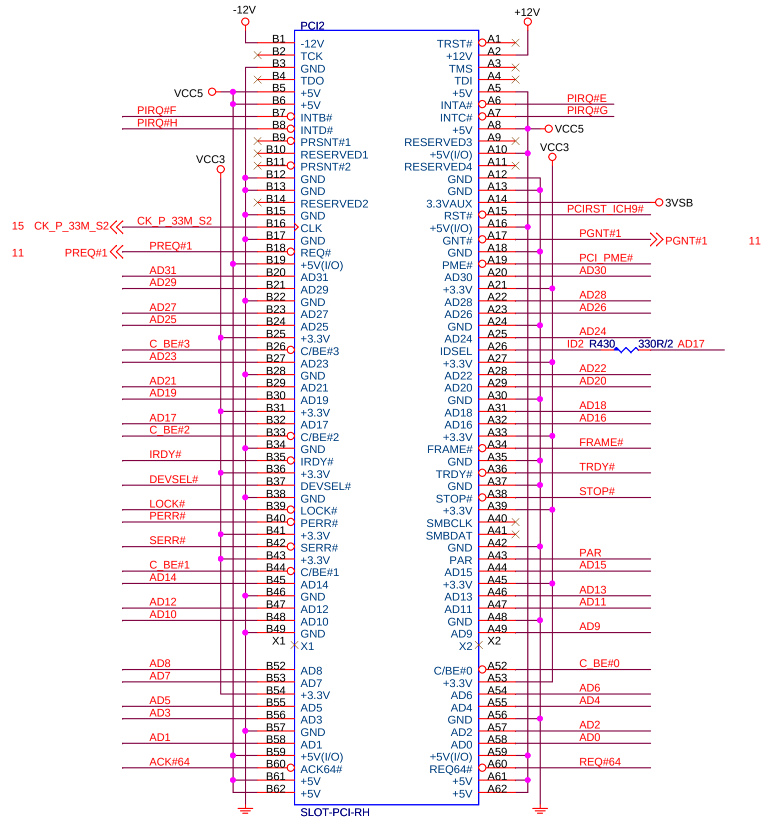
Recommended Address Programming

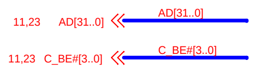
Address	0x6A	0x68	0x66	0x64	0x62	0x60
R1 (kΩ)	open	3.9	3.0	2.2	1.3	10
R2 (kΩ)	10	1.3	2.3	3.0	3.9	open
BUS_SEL Voltage (% of VCC)	0	25	40	60	75	100

PCI SLOT 1 (PCI VER: 2.2 COMPLY)



PCI SLOT 2 (PCI VER: 2.2 COMPLY)

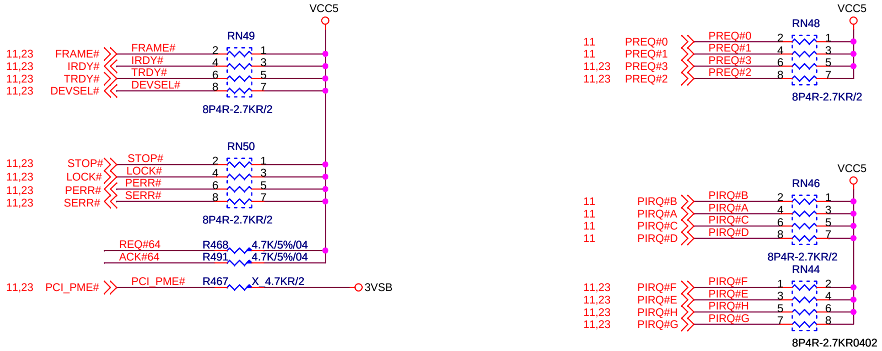




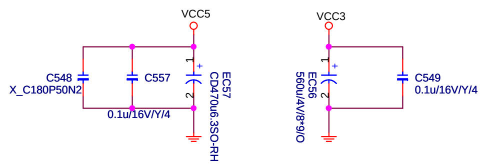
IDSEL = AD16
MASTER = PREQ#0
PIRQ#A

IDSEL = AD17
MASTER = PREQ#1
PIRQ#E

PCI PULL-UP / DOWN RESISTORS



PCI SLOT DECOUPLING CAPACITORS



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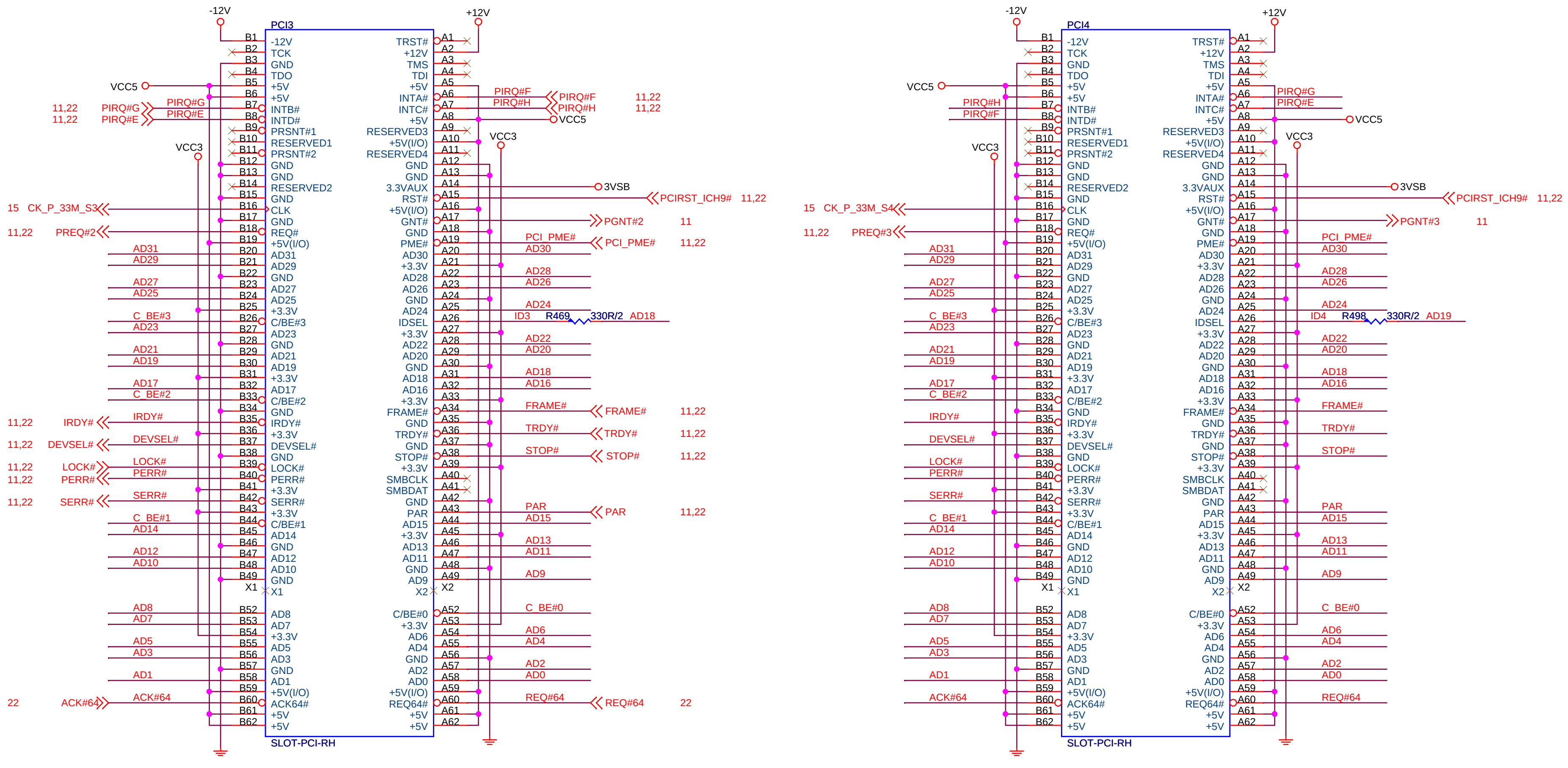
PCI SLOT 3 (PCI VER: 2.2 COMPLY)

PCI SLOT 4(PCI VER: 2.2 COMPLY)



IDSEL = AD18
MASTER = PREQ#2
PIRQ#F

IDSEL = AD19
MASTER = PREQ#3
PIRQ#G

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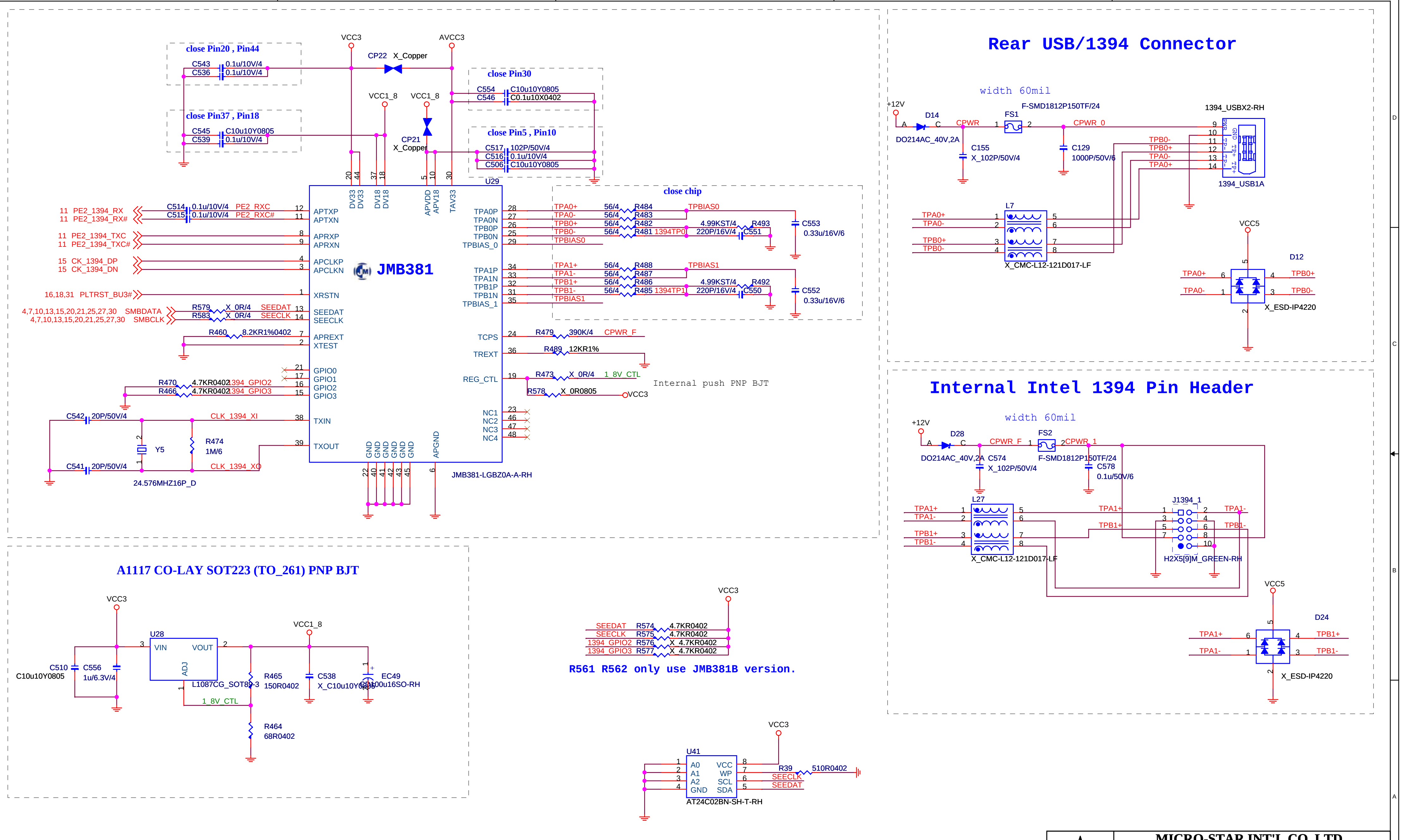

MSI	MICRO-STAR INT'L CO.,LTD		
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Size: Custom	Document Description: 1394 Controller - JMB381		Rev: 3.0
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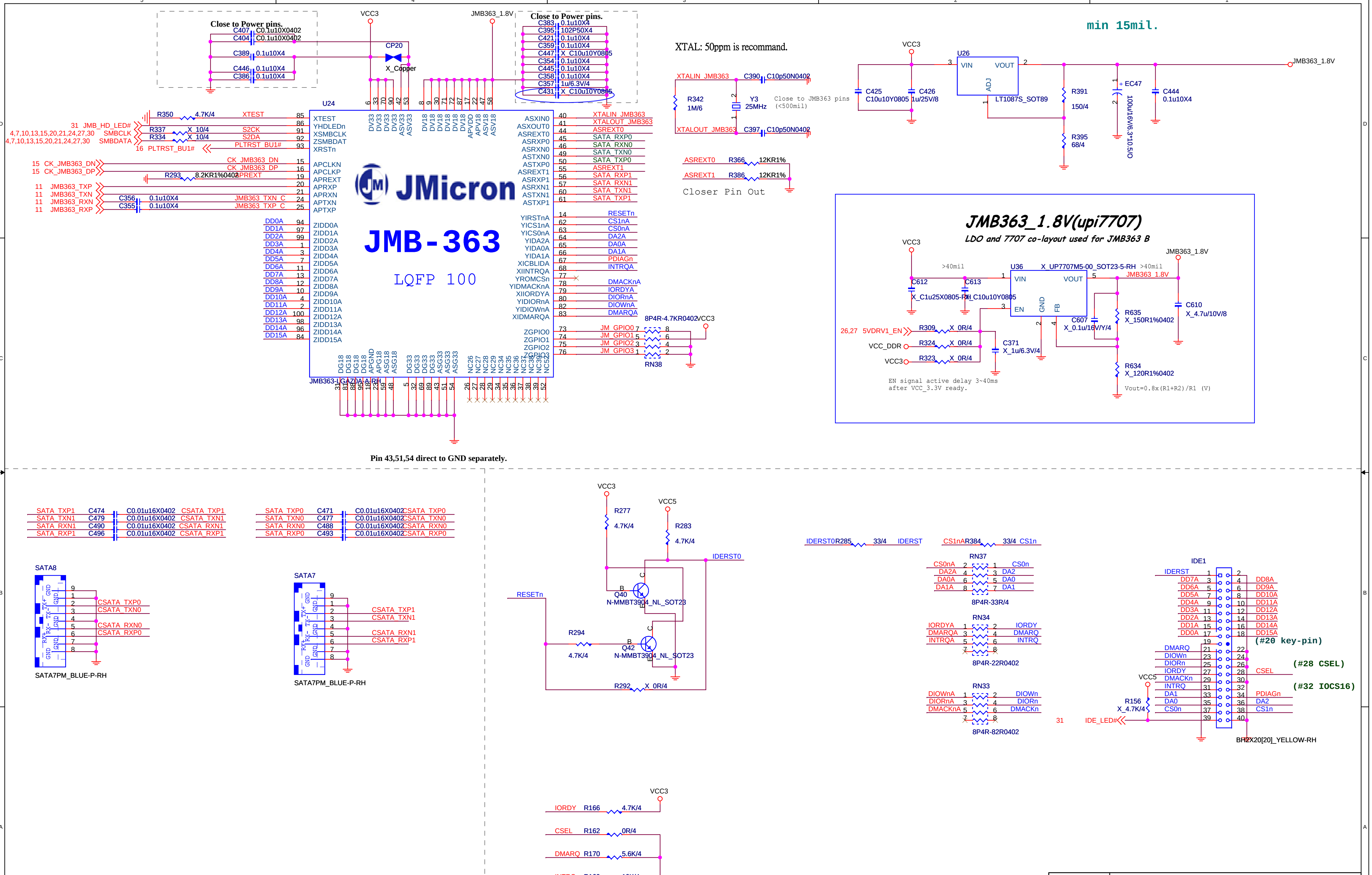

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Size	Document Description	Rev
Custom	JMB-363 e-SATA X2/ IDE X1	3.0

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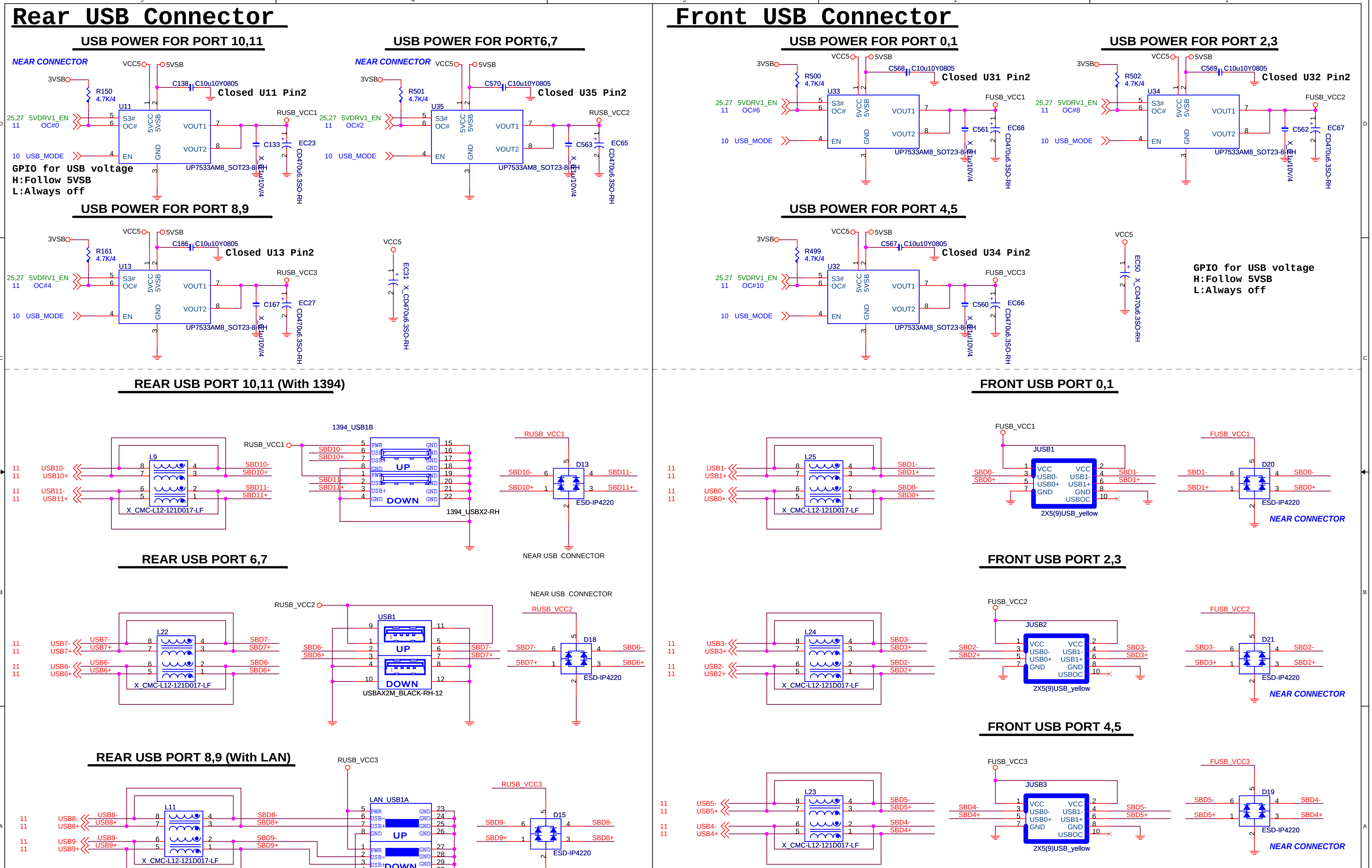

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Size	Document Description	Rev
Custom	USB Connectors	3.0

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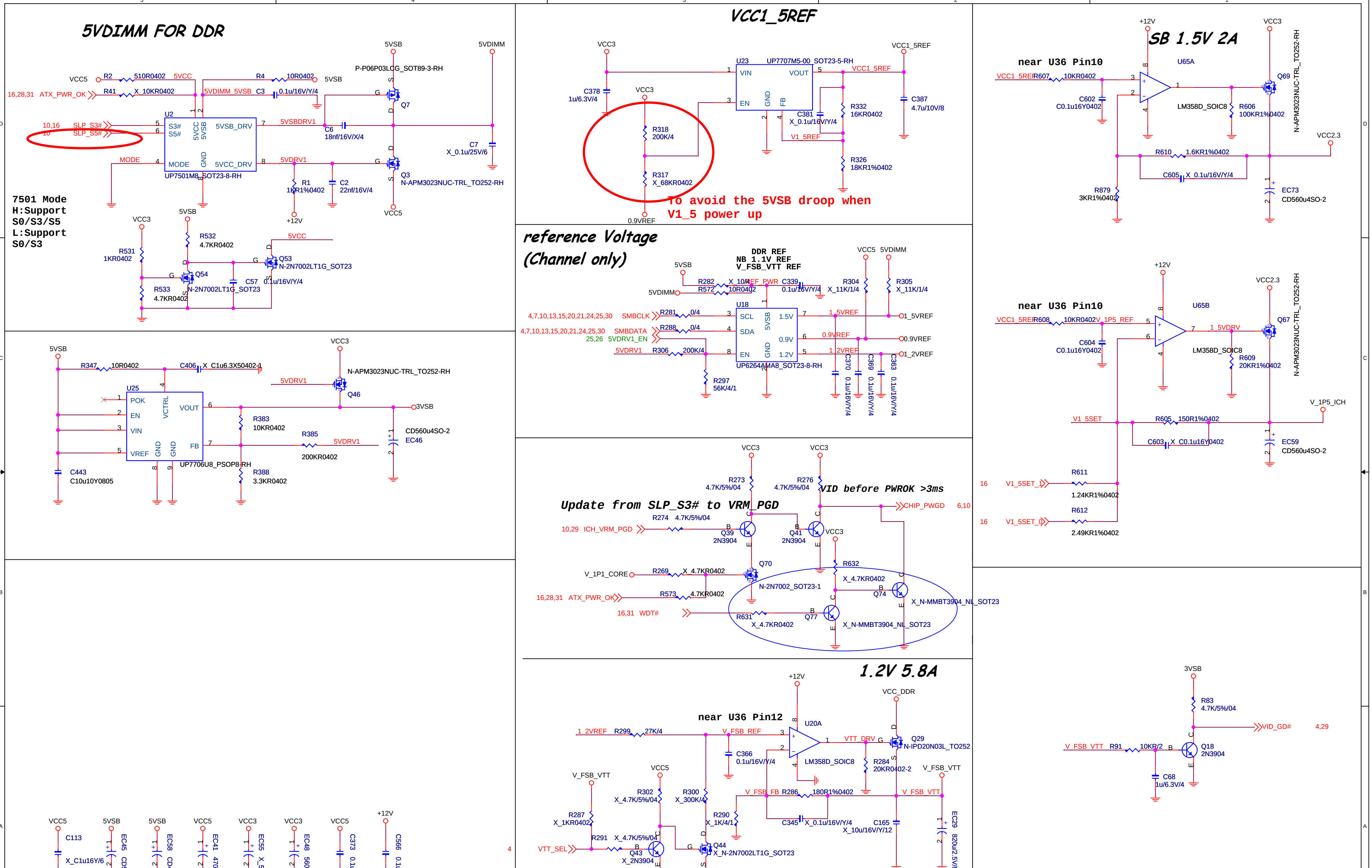

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Size	Document Description	Rev
Custom	ACPI controller UPI	3.0

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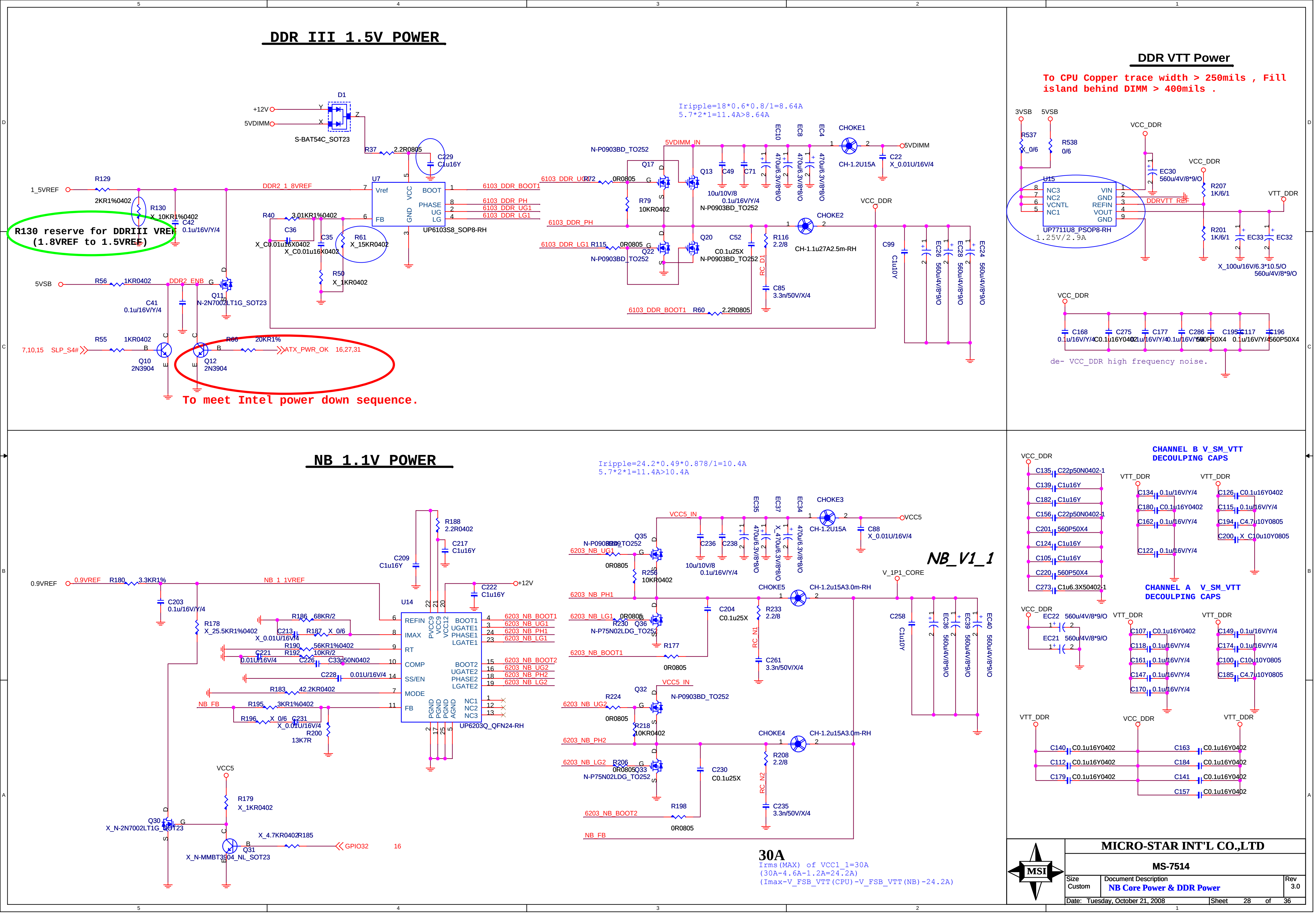
DDR III 1.5V POWER
R130 reserve for DDRIII VREF (1.8VREF to 1.5VREF)
To meet Intel power down sequence.
Iripple=18*0.6*0.8/1=8.64A
5.7*2*1=11.4A>8.64A
UP6103S8_SOP8-RH
CH-1.2U15A
CH-1.1u27A2.5m-RH
DDR VTT Power
To CPU Copper trace width > 250mils , Fill island behind DIMM > 400mils .
UP7711U8_PSOP8-RH
1.25V/2.9A
de- VCC_DDR high frequency noise.
NB 1.1V POWER
Iripple=24.2*0.49*0.878/1=10.4A
5.7*2*1=11.4A>10.4A
NB_V1_1
UP6203Q_QFN24-RH
CH-1.2u15A3.0m-RH
CHANNEL B V_SM_VTT DECOUPLING CAPS
CHANNEL A V_SM_VTT DECOUPLING CAPS
30A
Irms(MAX) of VCC1_1=30A
(30A-4.6A-1.2A=24.2A)
(Imax-V_FSB_VTT(CPU)-V_FSB_VTT(NB)-24.2A)
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Size Custom
Document Description
NB Core Power & DDR Power
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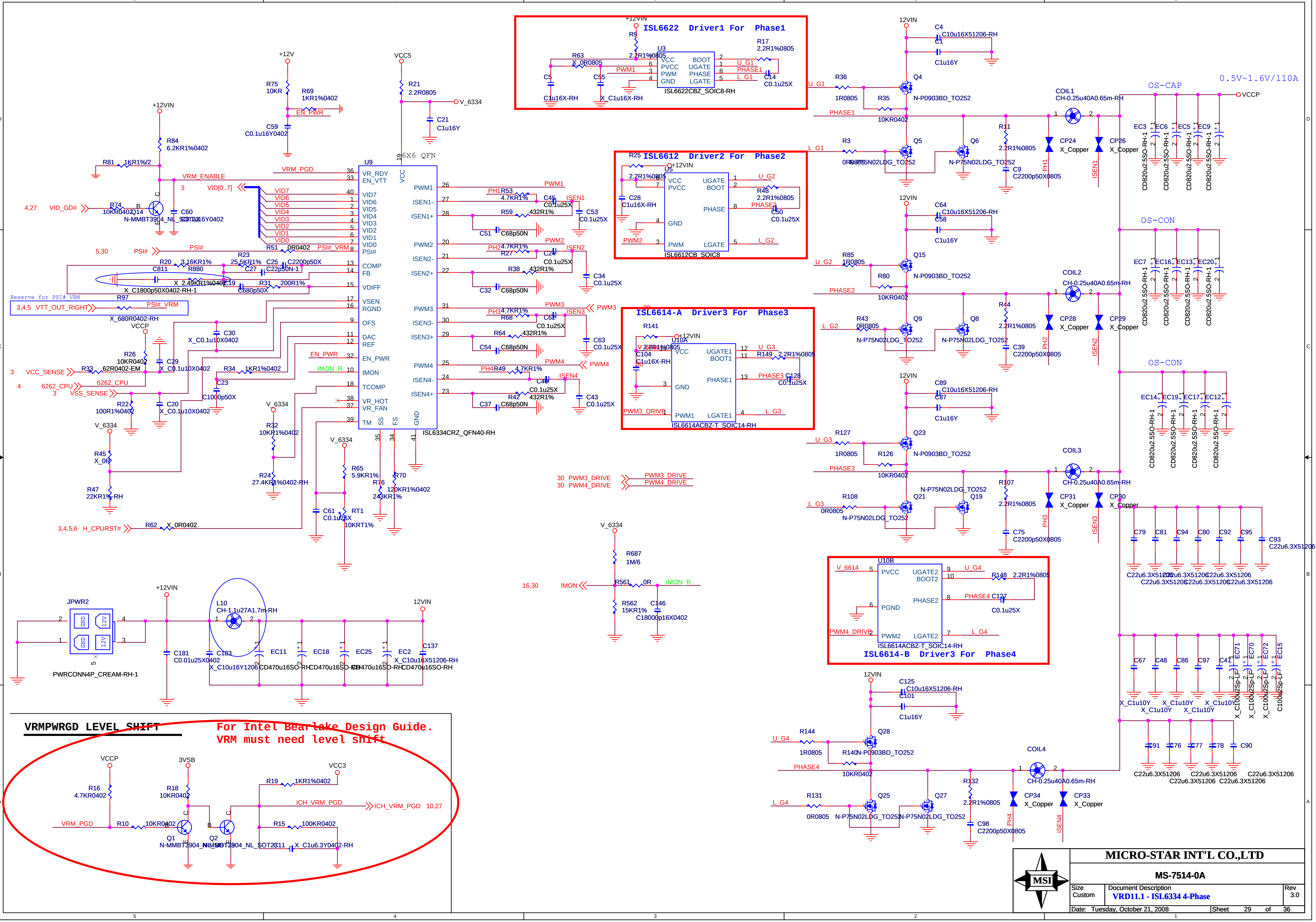

ISL6622 Driver1 For Phase1
ISL6612 Driver2 For Phase2
ISL6614-A Driver3 For Phase3
ISL6614-B Driver3 For Phase4
ISL6334CRZ_QFN40-RH
6X6 QFN
0.5V~1.6V/110A
OS-CAP
OS-CON
VCCP
Reserve for PSI# VRM
PWRCONN4P_CREAM-RH-1
VRMPWRGD LEVEL SHIFT
For Intel Bearlake Design Guide.
VRM must need level shift
ICH_VRM_PGD
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MS-7514-0A
Size Custom
Document Description
VRD11.1 - ISL6334 4-Phase
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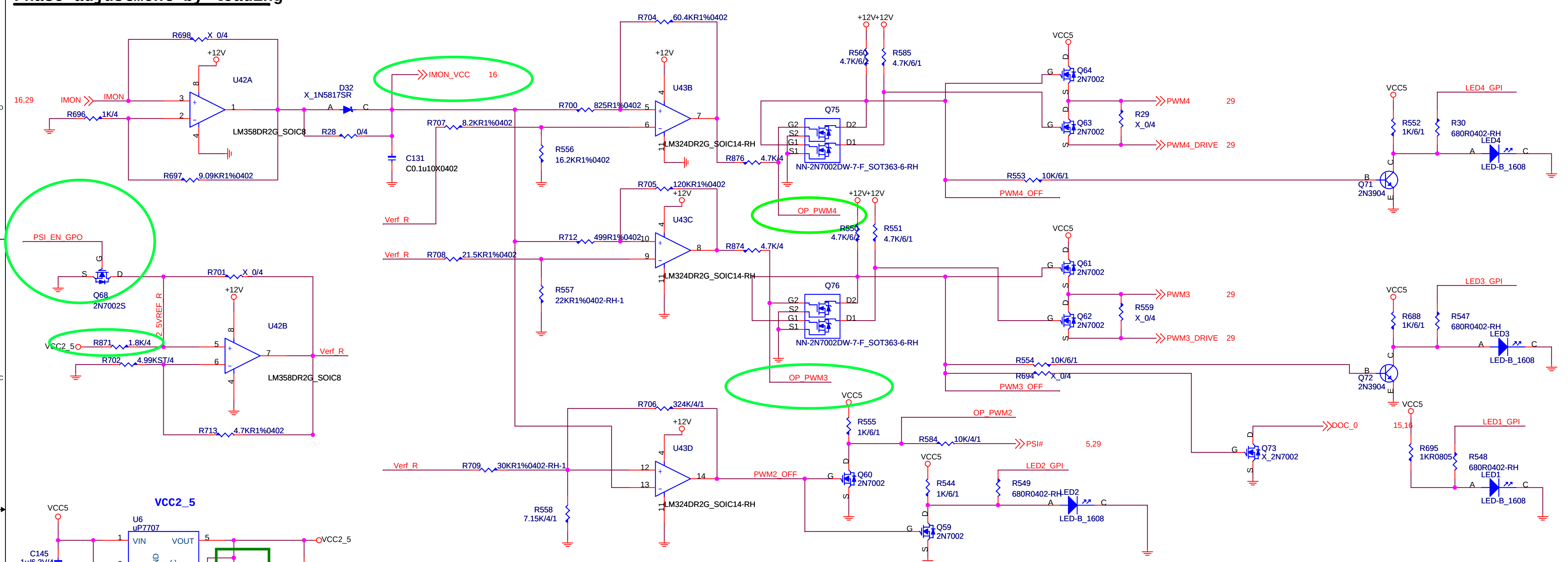
Phase adjustment by loading



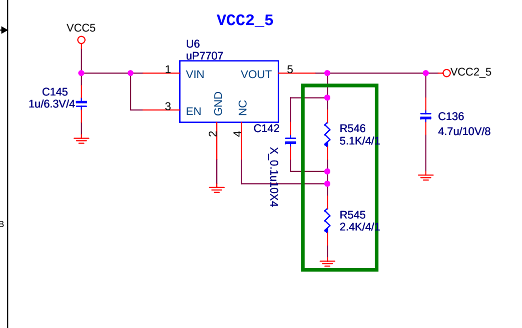
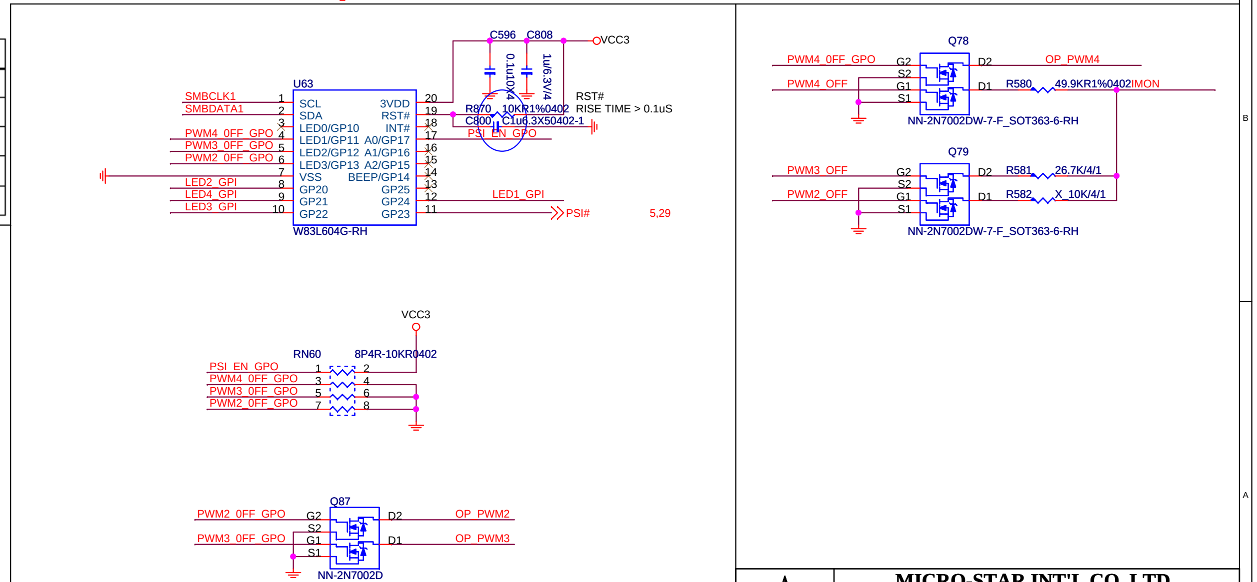
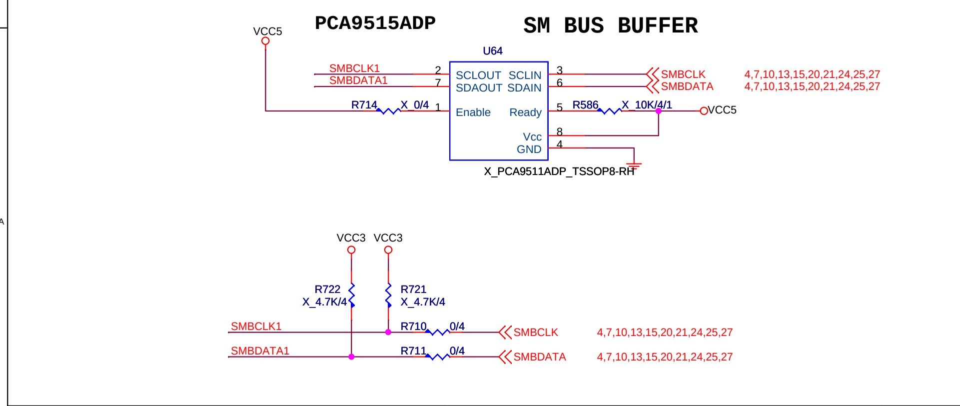


TABLE 1. PHASE DROPPING BEHAVIOR

	PSI#	FS	SS
Non-CI or (n-1)-CI Drops to 1-Phase	0	0	0
Non-CI or (n-2)-CI Drops to 2-Phase	0	0	1
2-Phase CI Drops to 1-Phase	0	1	0
2-Phase CI Drops to 2-Phase	0	1	1
Normal	1	x	x





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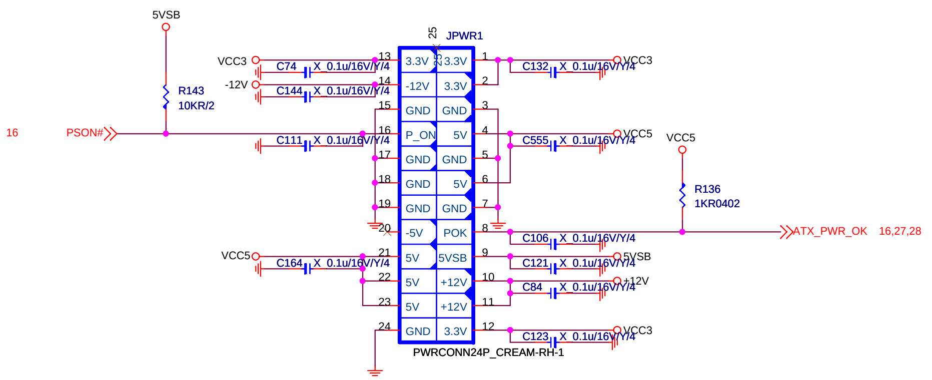
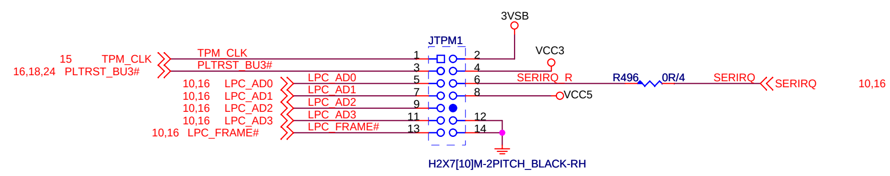
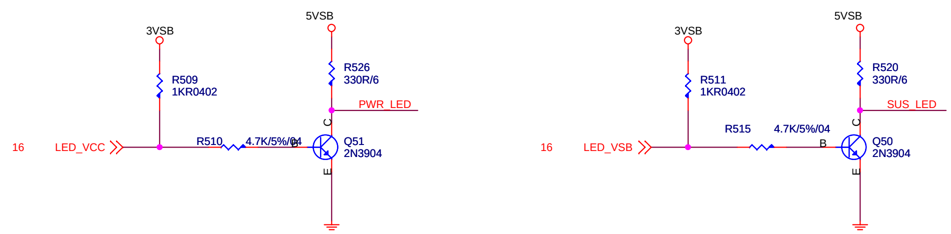
ATX POWER CONNECTOR

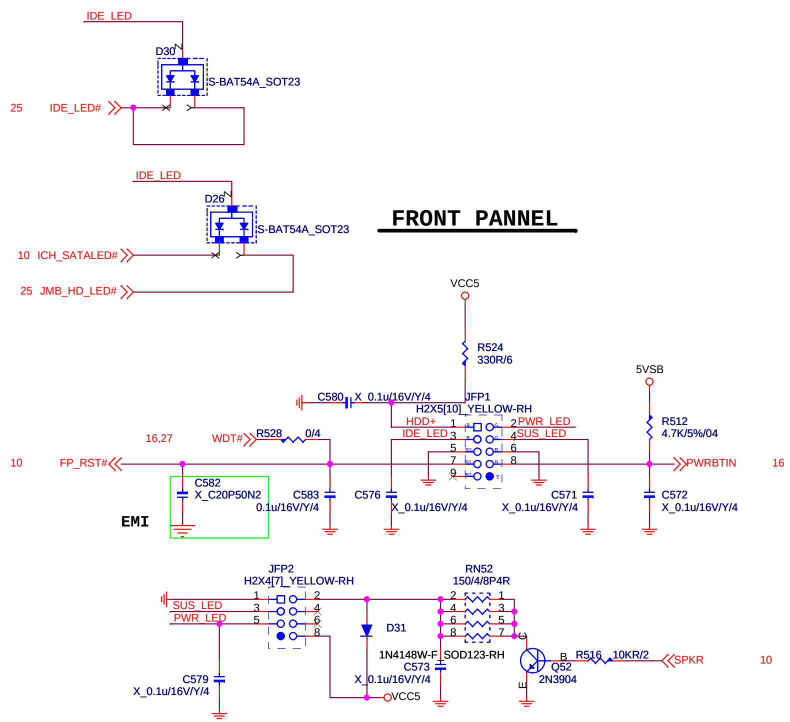


TPM



LED (for Fintek 71882)





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Size: Custom	Document Description: **ATX PWR-Connector & Front Panel & EMI**	Rev: 3.0
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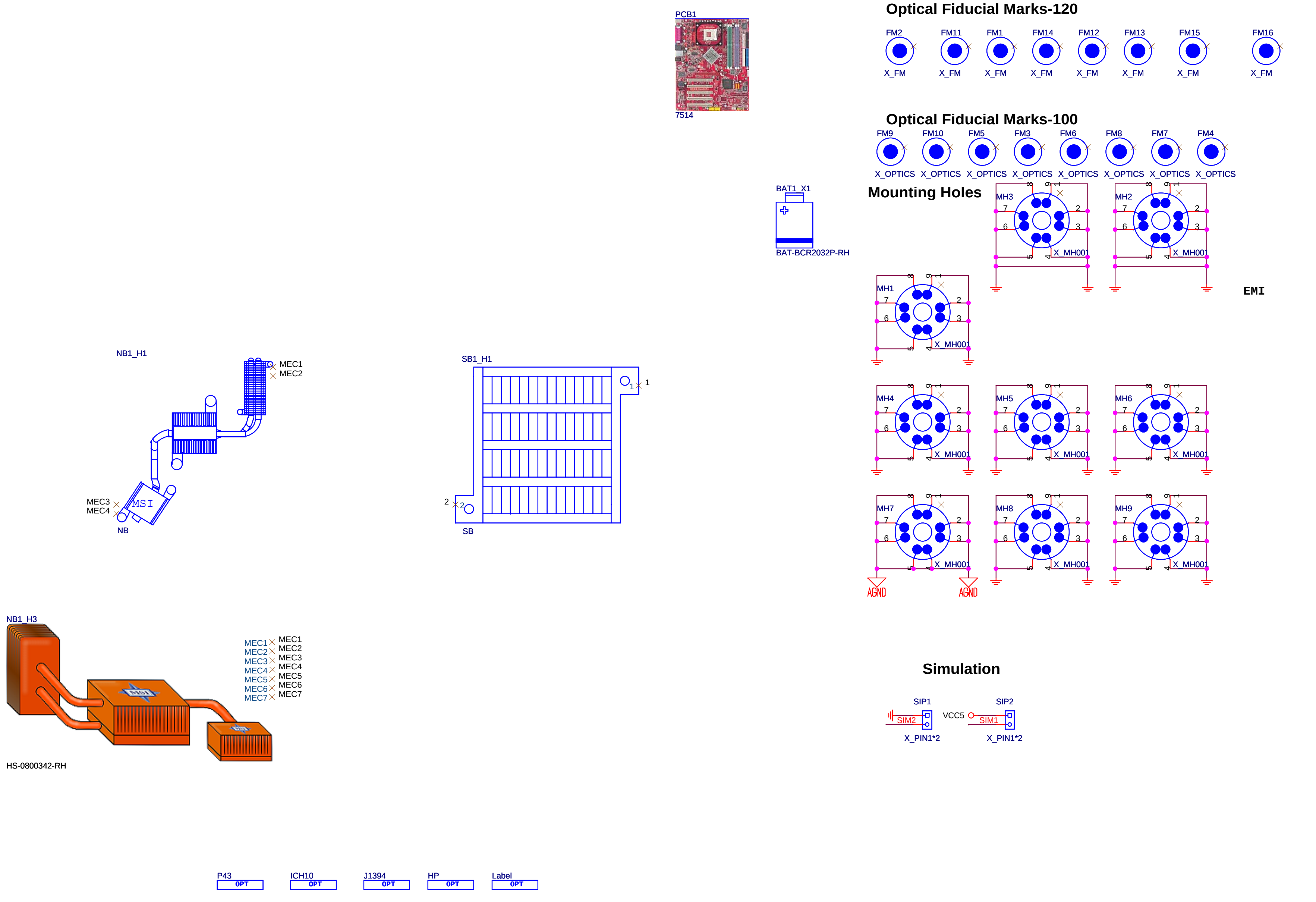

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Custom	Manual Parts & Option Parts	3.0

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