Centauri

ATX Ver:A00

CPU:

INTEL HSW-E LGA2011-3

System Chipset:

INTEL - Wellsbug

OnBoard Chipset:

HD Audio Codec:Creative Malcolm
LAN-Killer E2205 x1
eSIO: NCT6683D-T
Flash ROM: 64 Mb SPI Quad Read

Main Memory:

DDR4 (2133MHz) * 4 (Qual Channel) @1.2V

Expansion Slots:

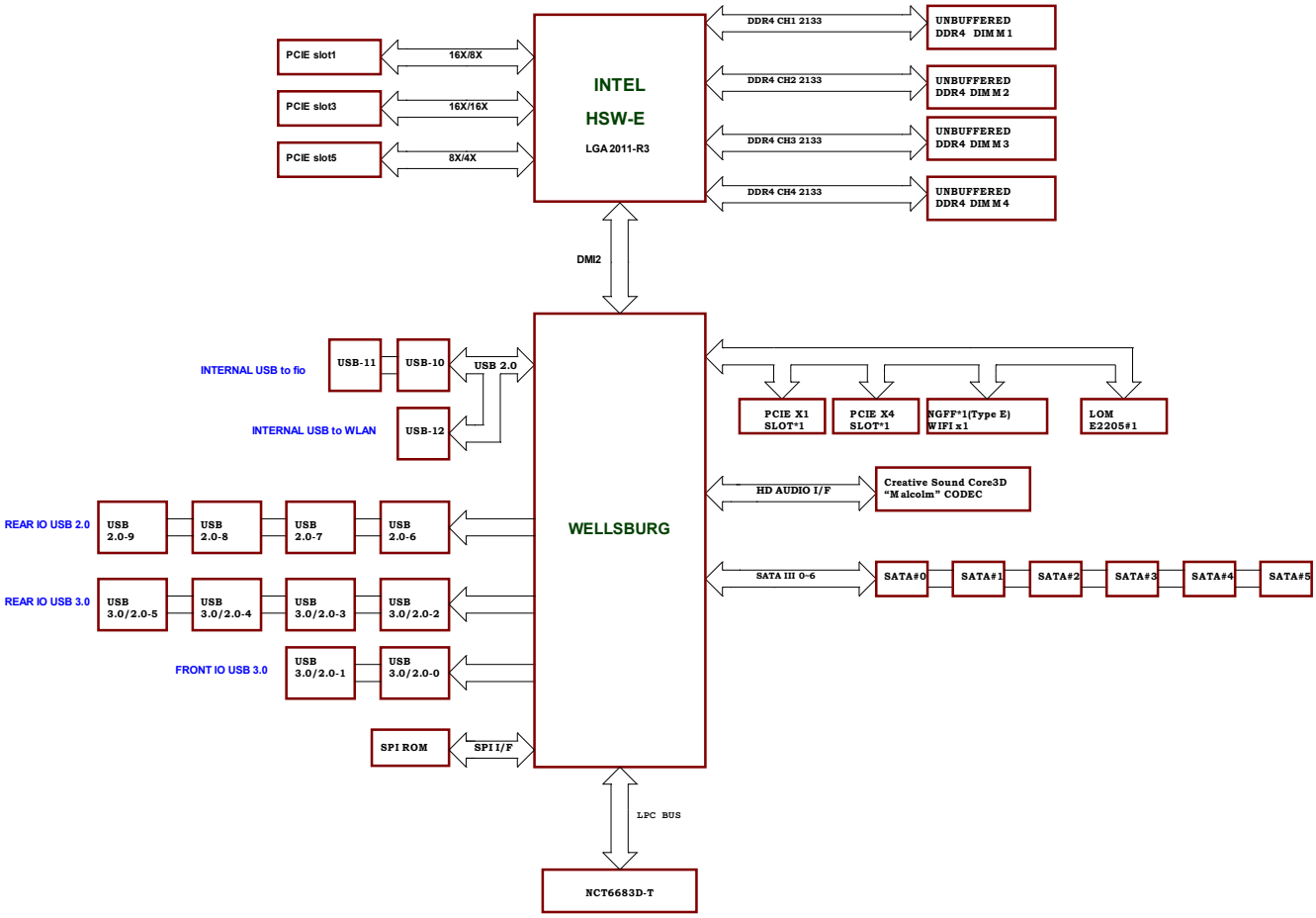
PCI Express (X16) Slot * 3
PCIe(X1) Slot * 1
PCIe(X4) Slot * 1
NGFF_S1(WLAN) * 1

PWM:

VRD12.5 - ISL6376 Extend to10-Phase Dr.MOS

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

Title: Cover Sheet		
Size	Document Number: Centauri	Rev: A00
Date: Friday, June 06, 2014	Sheet 1 of 50	



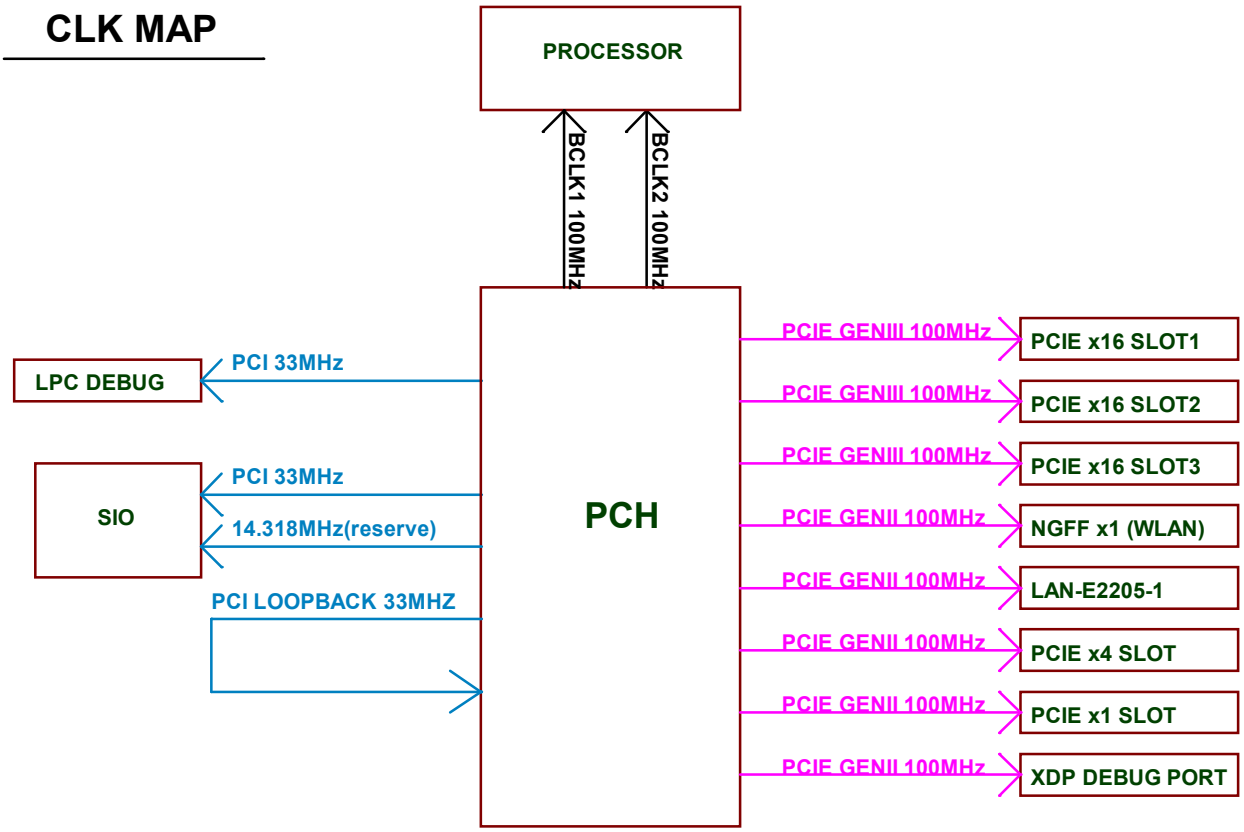
MSI Micro-Star International
Link to the Future
MICRO-START INT'L CO.,LTD.

Title: Block Diagram

Size	Document Number	Rev
	Centauri	A00

Date: Friday, June 06, 2014 Sheet 2 of 50

CLK MAP



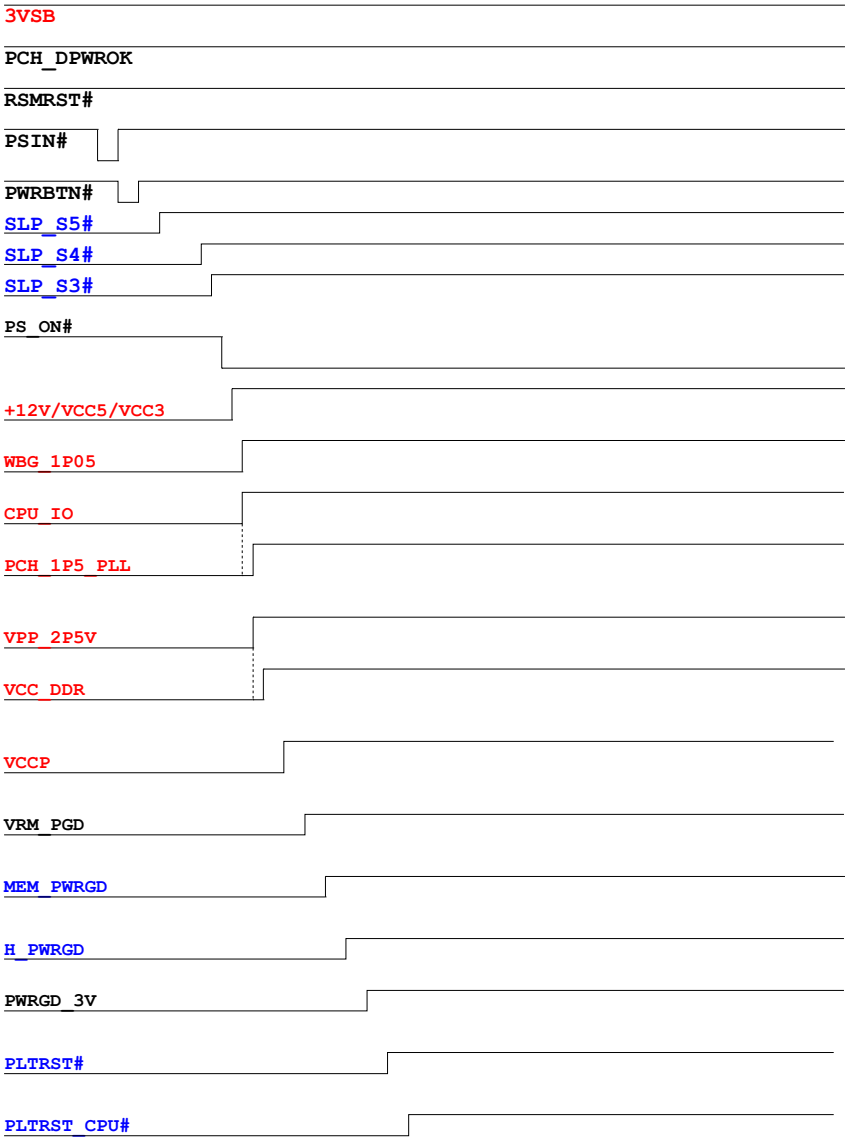
MSI MICRO-START INT'L CO.,LTD.

Title: Clock Map

Size	Document Number	Rev
	Centauri	A00

Date: Friday, June 06, 2014 Sheet 3 of 50

G3-->S5-->S0



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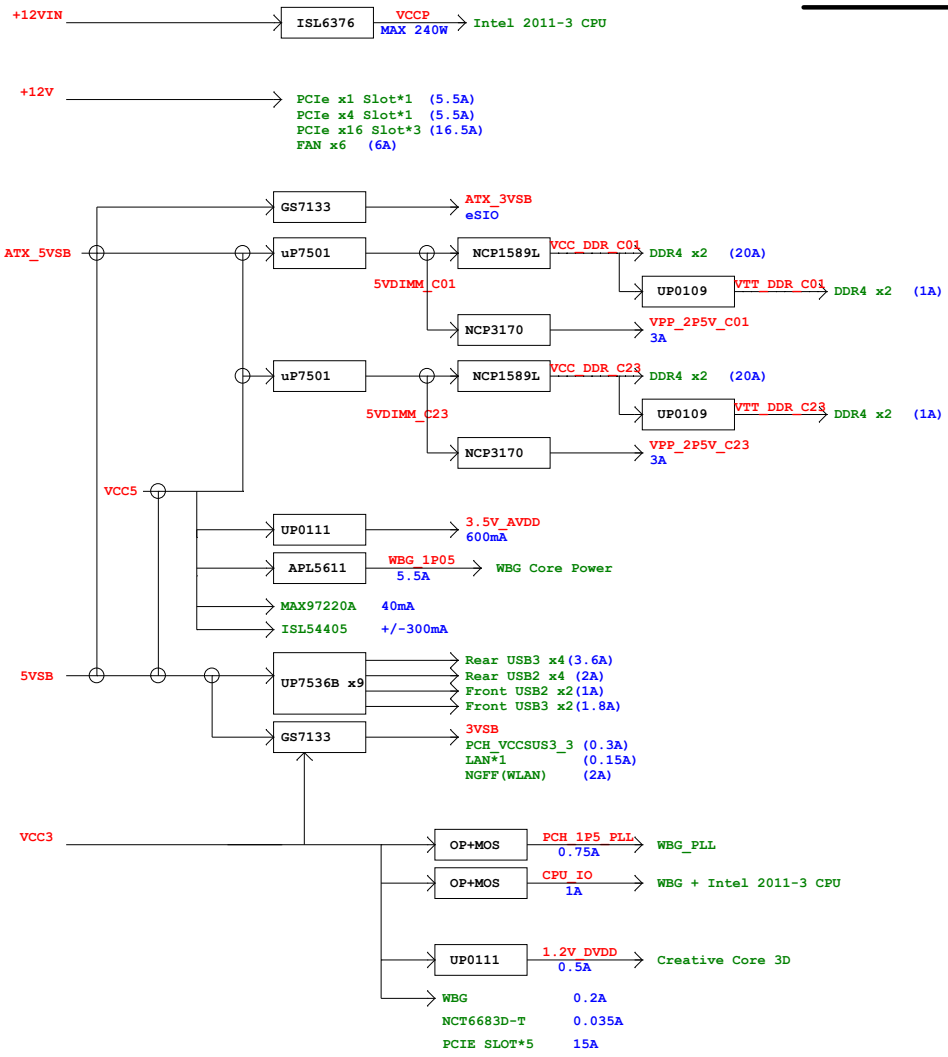
Title: Power Sequence		
Size	Document Number: Centauri	Rev: A00
Date: Friday, June 06, 2014	Sheet 4 of 50	

Power Delivery

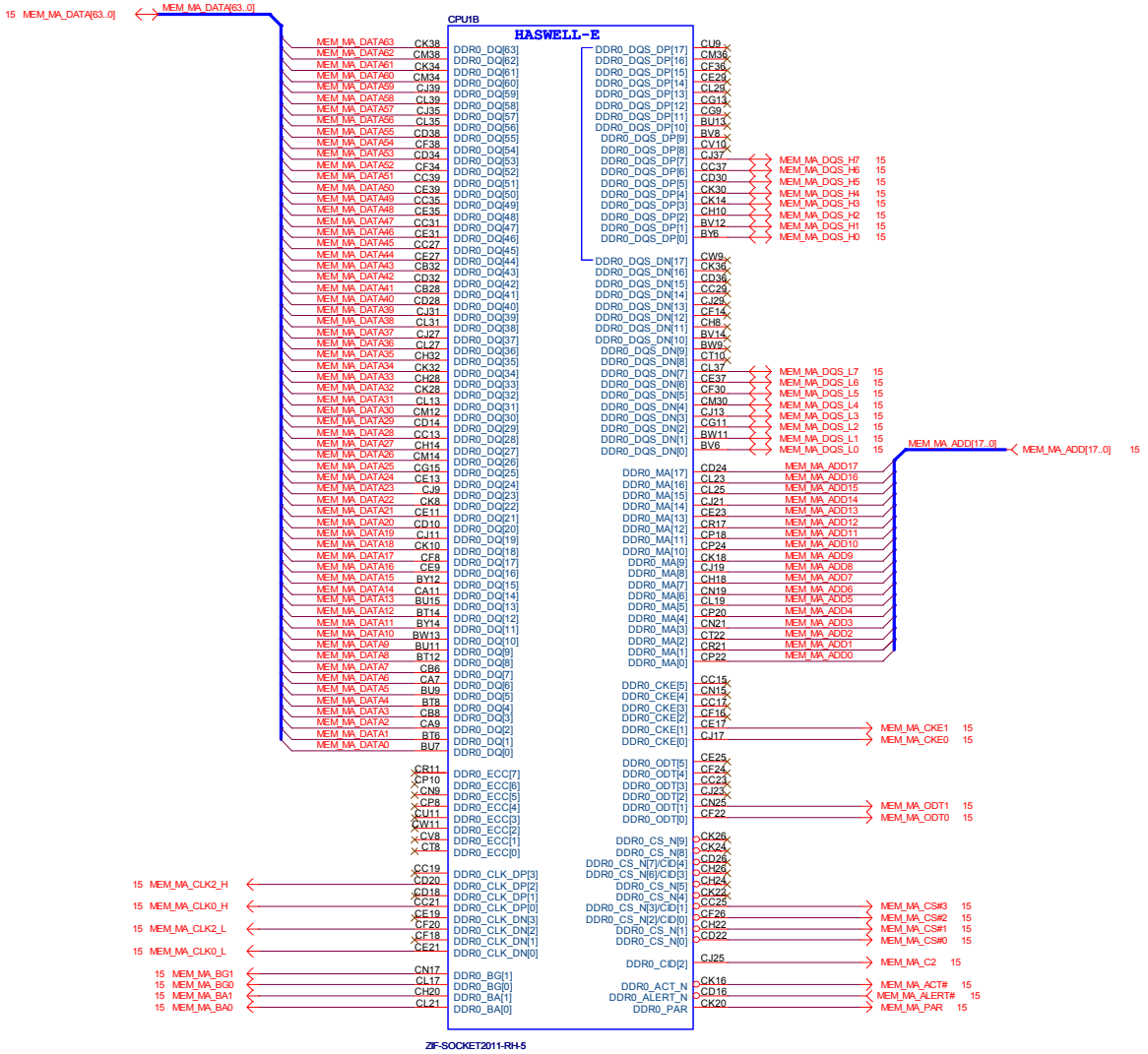


MSI MICRO-START INT'L CO.,LTD.

Title: Power Delivery

Size | Document Number: Centauri | Rev: A00

Date: Friday, June 06, 2014 Sheet 5 of 59

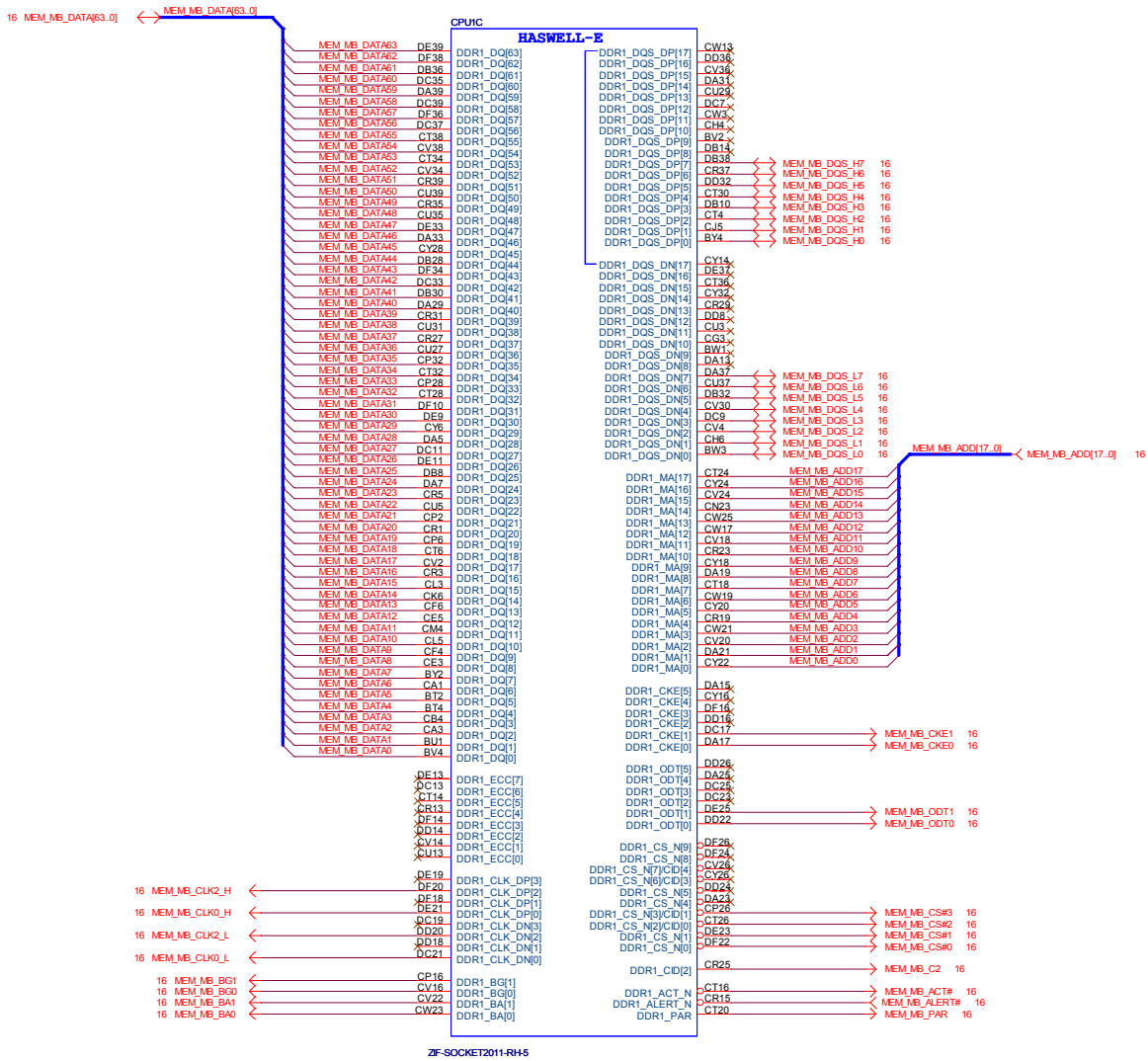


MICRO-START INTL CO.,LTD.

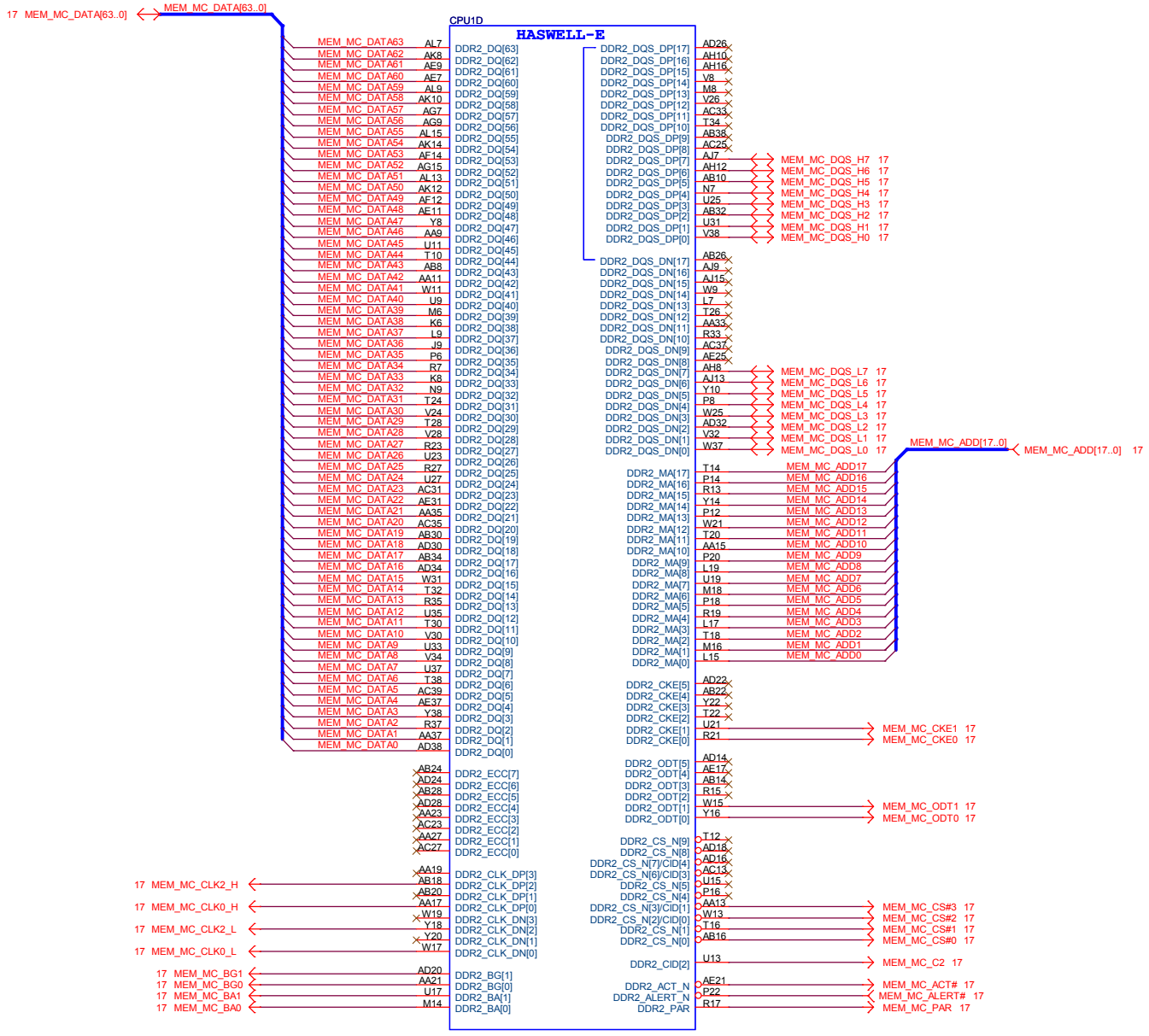
Title: HSW-E MEMORY 1

Size: Document Number: Centauri — Rev: A00

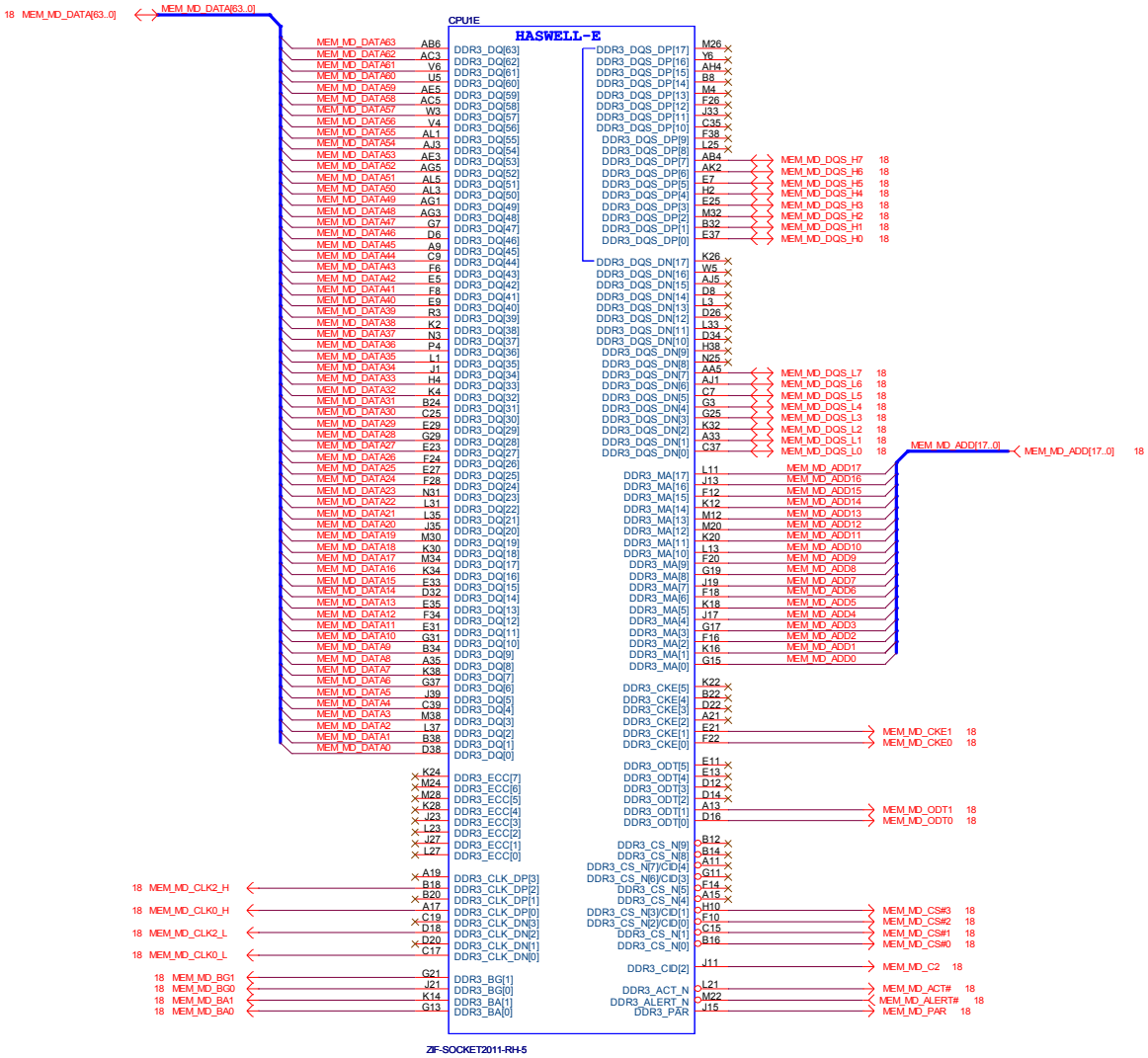
Date: Friday, June 06, 2014 — Sheet 6 of 50



MSI MICRO-STAR INTL CO.,LTD.		
Title: HSW-E MEMORY 2		
Size	Document Number: Centauri	Rev: A00
Date: Friday, June 06, 2014	Sheet 7 of 50	



MICRO-START INT'L CO.,LTD.		
Title: HSW-E MEMORY 3		
Size	Document Number: Centauri	Rev: A00
Date: Friday, June 06, 2014	Sheet 8 of 50	

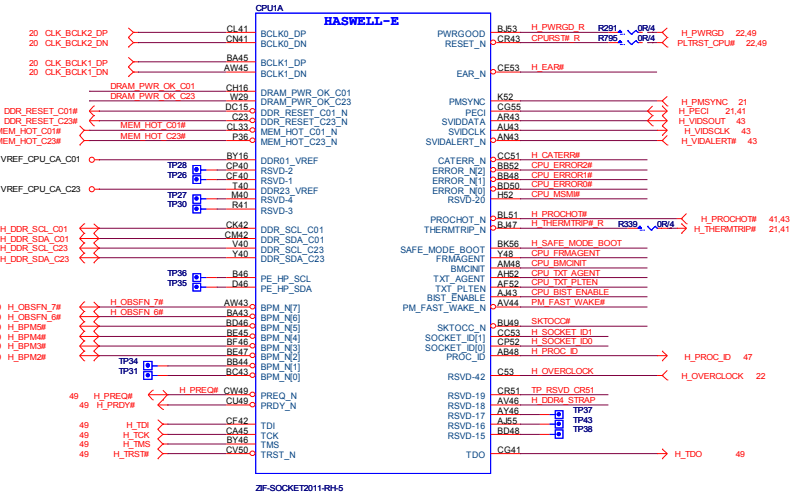


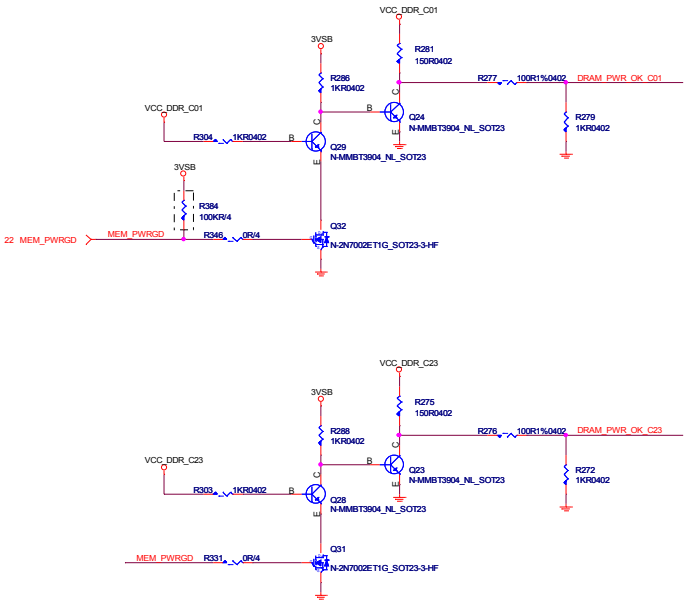
MICRO-START INTL CO.,LTD.

Title: HSW-E MEMORY 4

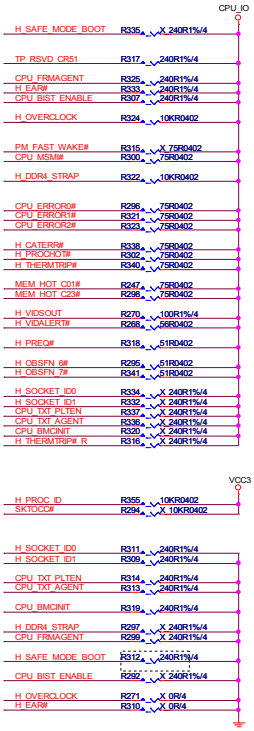
Size: Centauri | Document Number | Rev: A00

Date: Friday, June 06, 2014 | Sheet 9 of 50



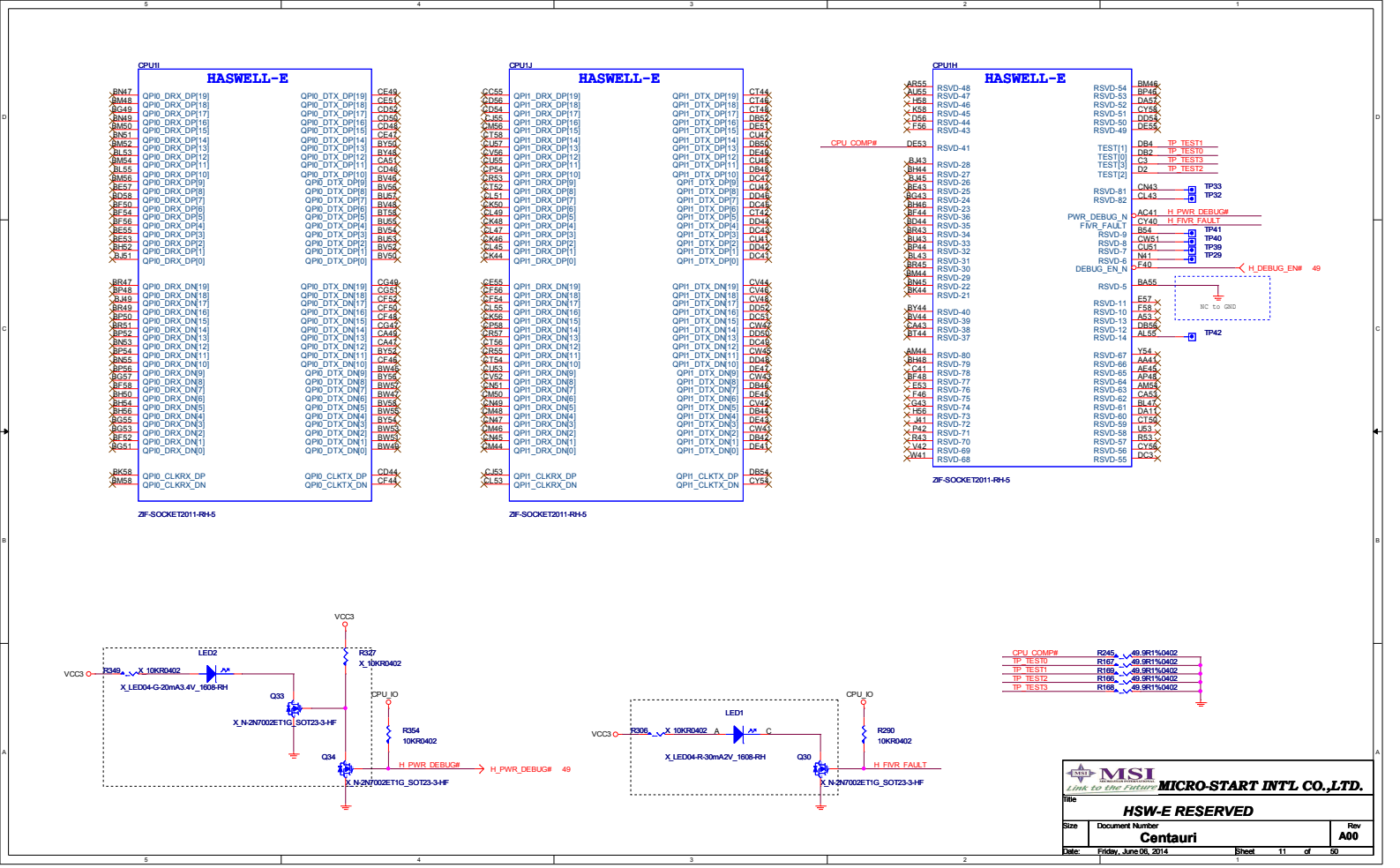


PROC_ID	VOUT
0	0.95V
1	1.05V



Title	HSW-E MISC
Size	Document Number: Centauri
Rev	A00
Date:	Friday, June 06, 2014
Sheet	10 of 50

MICRO-START INT'L CO.,LTD.


CPU1I
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QPI0_DRX_DP[19]
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QPI0_DRX_DP[15]
QPI0_DRX_DP[14]
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QPI0_DRX_DP[12]
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QPI0_DRX_DP[10]
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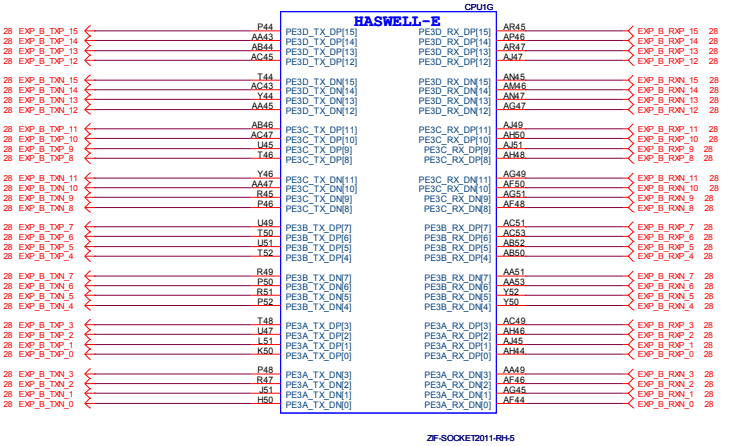
ZIF-SOCKET2011-RH-5
CPU1H
HASWELL-E
CPU_COMP#
RSVD-48
RSVD-47
RSVD-46
RSVD-45
RSVD-44
RSVD-43
RSVD-41
RSVD-28
RSVD-27
RSVD-26
RSVD-25
RSVD-24
RSVD-23
RSVD-36
RSVD-35
RSVD-34
RSVD-33
RSVD-32
RSVD-31
RSVD-30
RSVD-29
RSVD-22
RSVD-21
RSVD-40
RSVD-39
RSVD-38
RSVD-37
RSVD-80
RSVD-79
RSVD-78
RSVD-77
RSVD-76
RSVD-75
RSVD-74
RSVD-73
RSVD-72
RSVD-71
RSVD-70
RSVD-69
RSVD-68
RSVD-54
RSVD-53
RSVD-52
RSVD-51
RSVD-50
RSVD-49
TEST[1]
TEST[0]
TEST[3]
TEST[2]
RSVD-81
RSVD-82
PWR_DEBUG_N
F/IVR_FAULT
RSVD-9
RSVD-8
RSVD-7
RSVD-6
DEBUG_EN_N
RSVD-5
RSVD-11
RSVD-10
RSVD-13
RSVD-12
RSVD-14
RSVD-67
RSVD-66
RSVD-65
RSVD-64
RSVD-63
RSVD-62
RSVD-61
RSVD-60
RSVD-59
RSVD-58
RSVD-57
RSVD-56
RSVD-55
TP_TEST1
TP_TEST0
TP_TEST3
TP_TEST2
TP33
TP32
H_PWR_DEBUG#
H_F/VR_FAULT
TP41
TP40
TP39
TP29
H_DEBUG_EN#
NC to GND
TP42
ZIF-SOCKET2011-RH-5
VCC3
LED2
R327
X_10KR0402
R349
X_LED04-G-20mA3.4V_1608-RH
Q33
X_N-2N7002ET1G_SOT23-3-HF
CPU_IO
R354
10KR0402
Q34
H_PWR_DEBUG#
49
LED1
R306
A
C
Q30
R290
H_F/VR_FAULT
R245
R167
R169
R168
49.9R1%0402
MSI
MICRO-START INT'L CO.,LTD.
Link to the Future
HSW-E RESERVED
Centauri
A00
Friday, June 06, 2014
11
50



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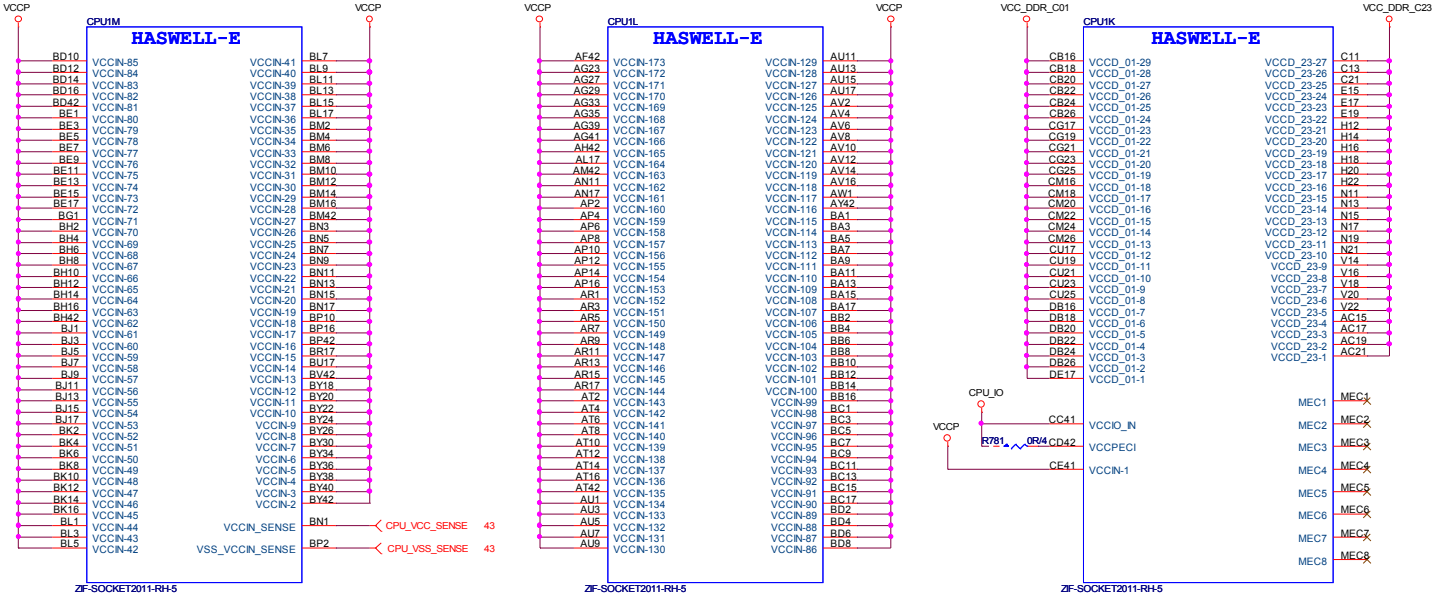
Title: HSW-E PCIE/DMI

Size | Document Number: Centauri | Rev: A00

Date: Friday, June 06, 2014 | Sheet 12 of 50

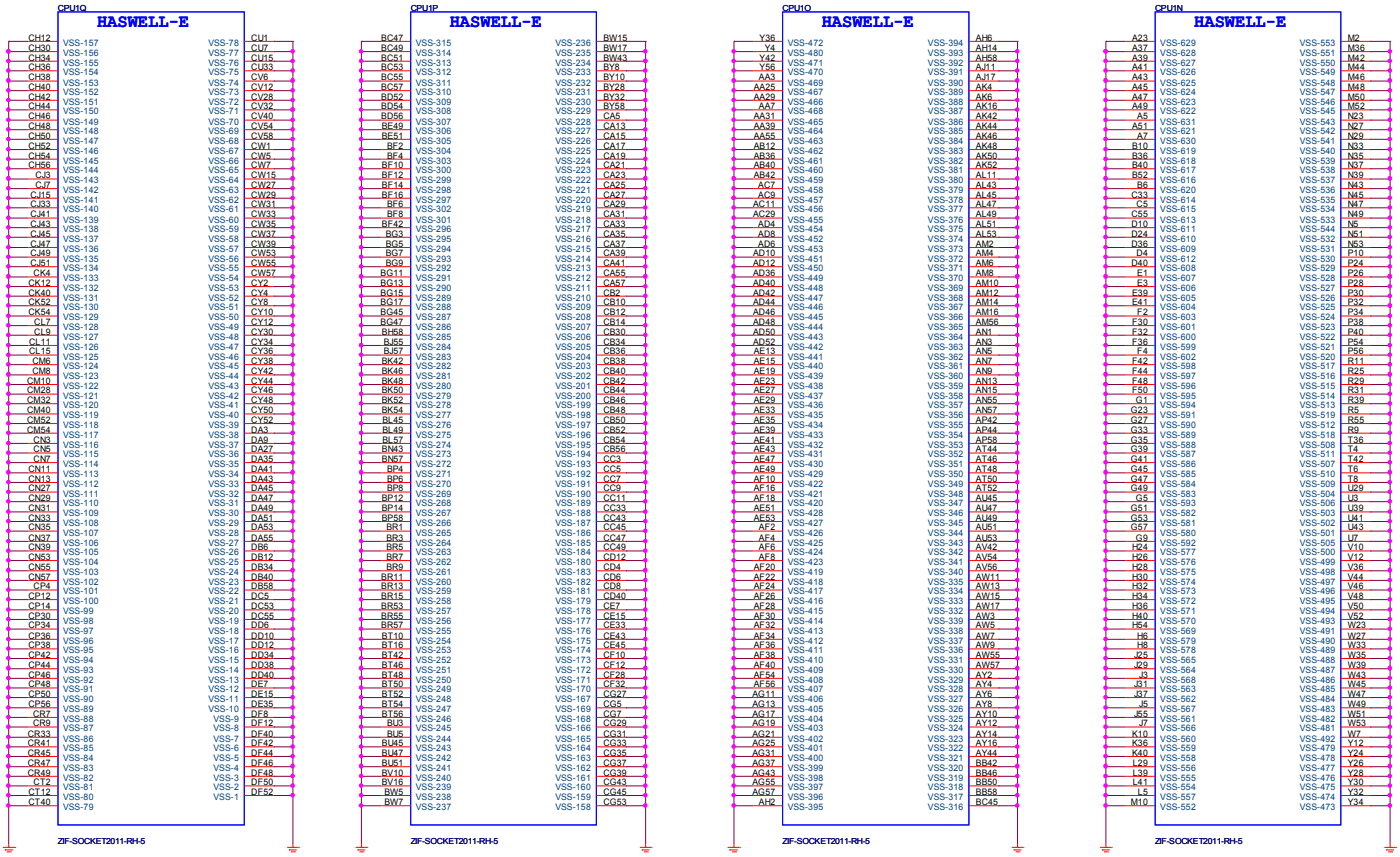


MICRO-START INTL CO.,LTD.

Title: HSW-E POWER

Size	Document Number	Rev
	Centauri	A00

Date: Friday, June 06, 2014 Sheet 13 of 50

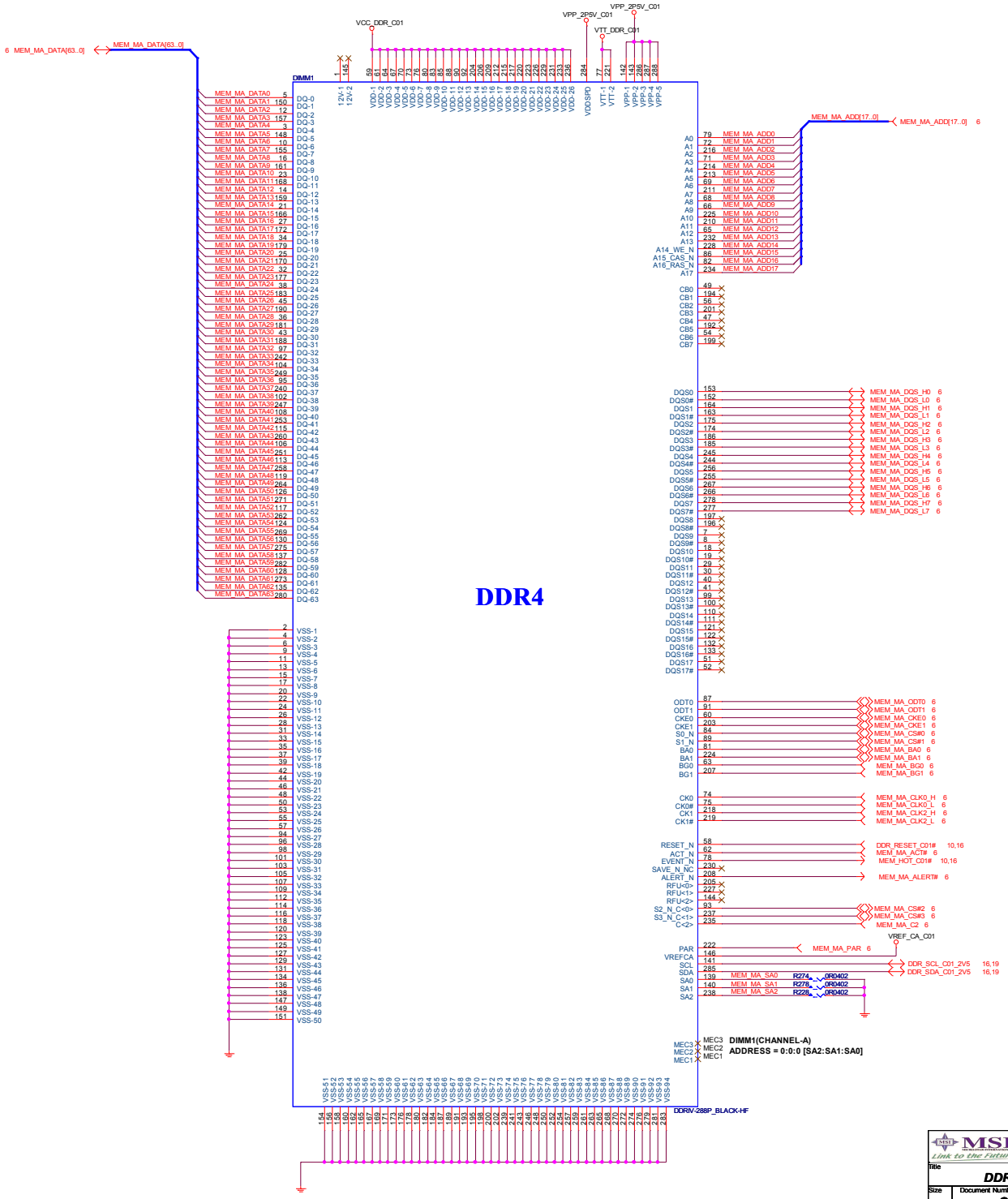


MSI MICRO-STAR INT'L CO.,LTD.

Title: HSW-E GND

Size	Document Number	Rev
	Centauri	A00

Date: Friday, June 06, 2014 Sheet 14 of 50



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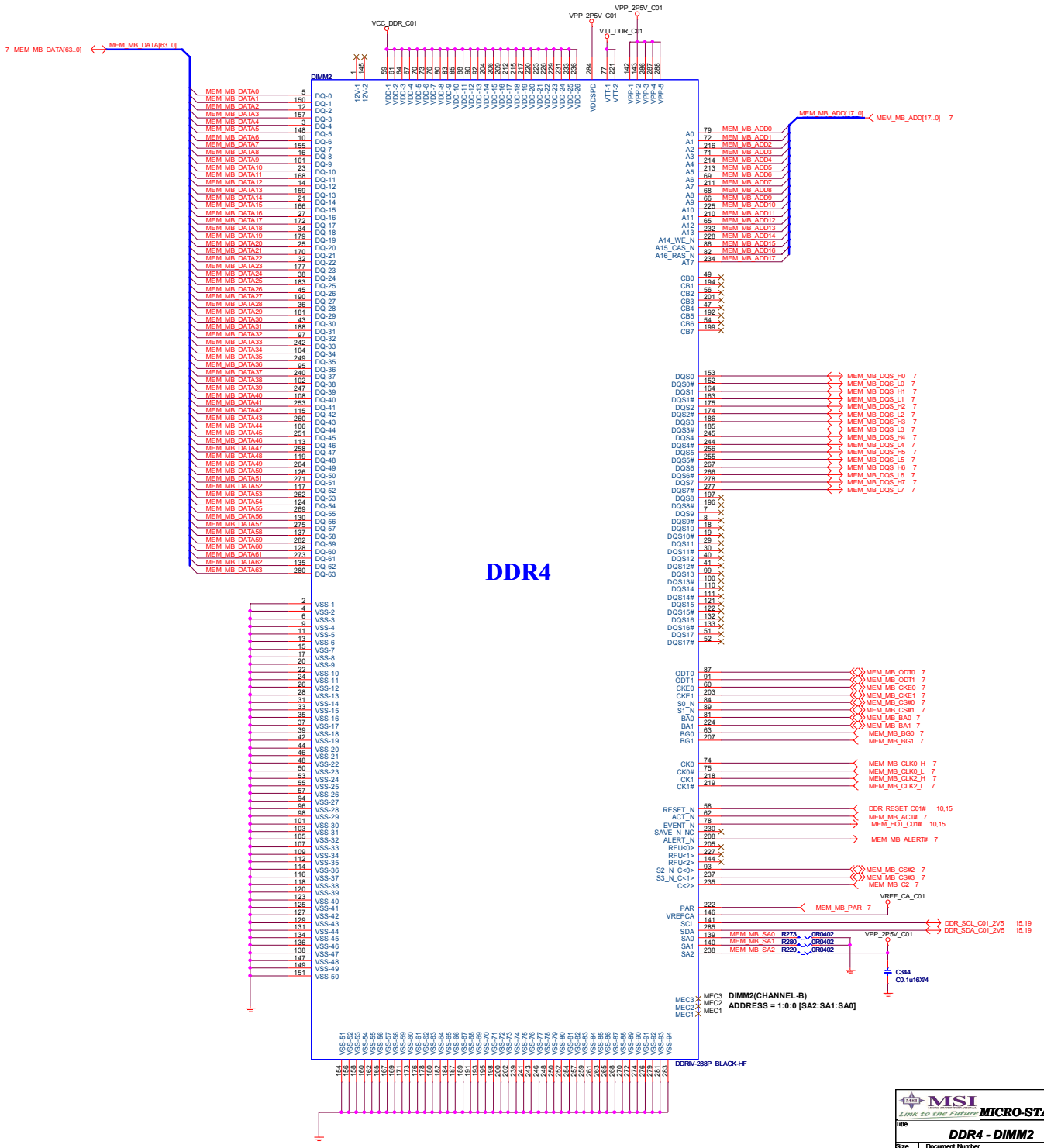
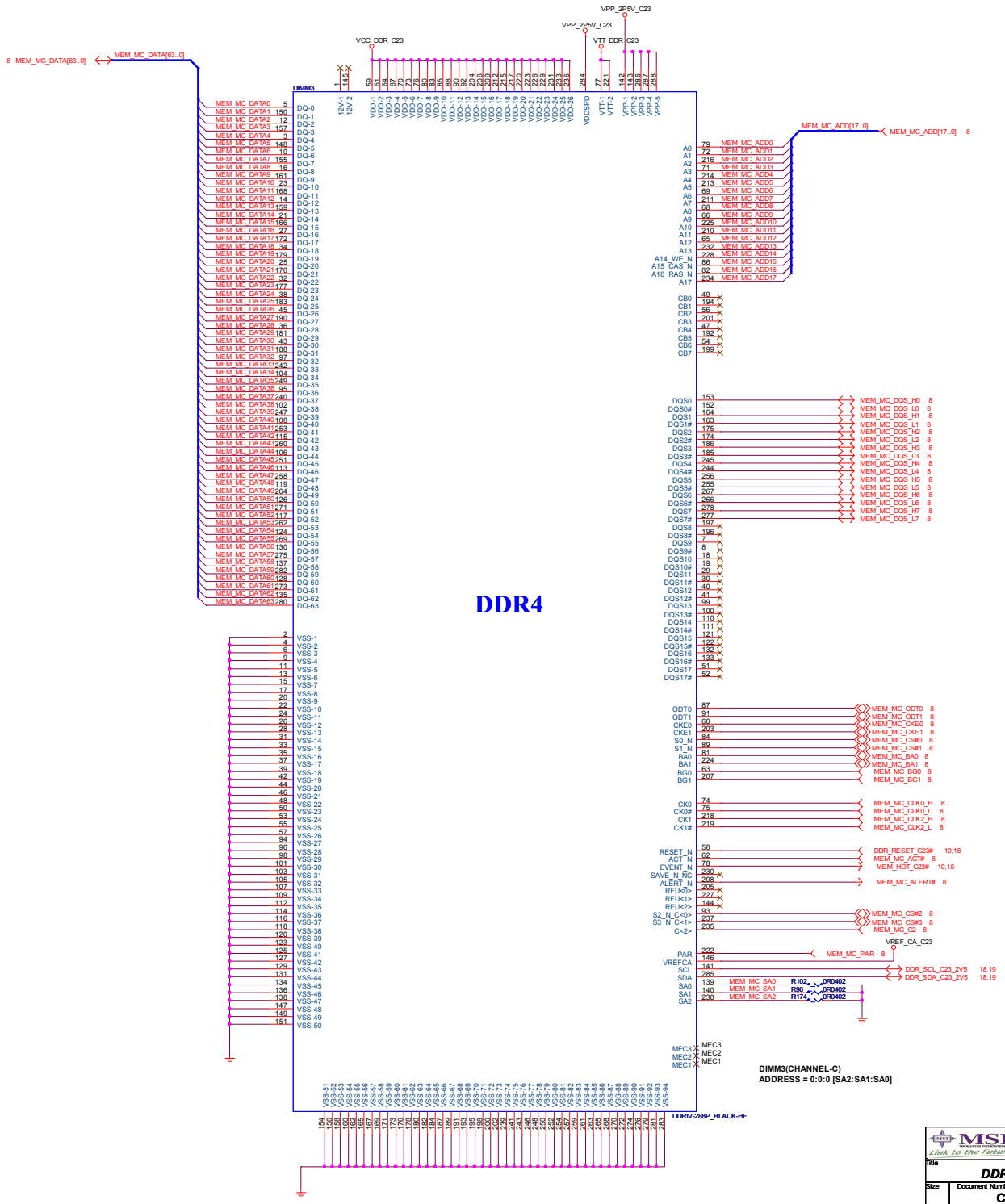
Link to the Future

Title	DDR4 - DIMM1	
Size	Document Number: Centauri	Rev: A00
Date: Friday, June 06, 2014	Sheet 15 of 50	



MICRO-START INT'L CO.,LTD.	
Title	DDR4 - DIMM2
Size	Document Number: Centauri
Rev	A00
Date:	Friday, June 06, 2014
Sheet	16 of 50

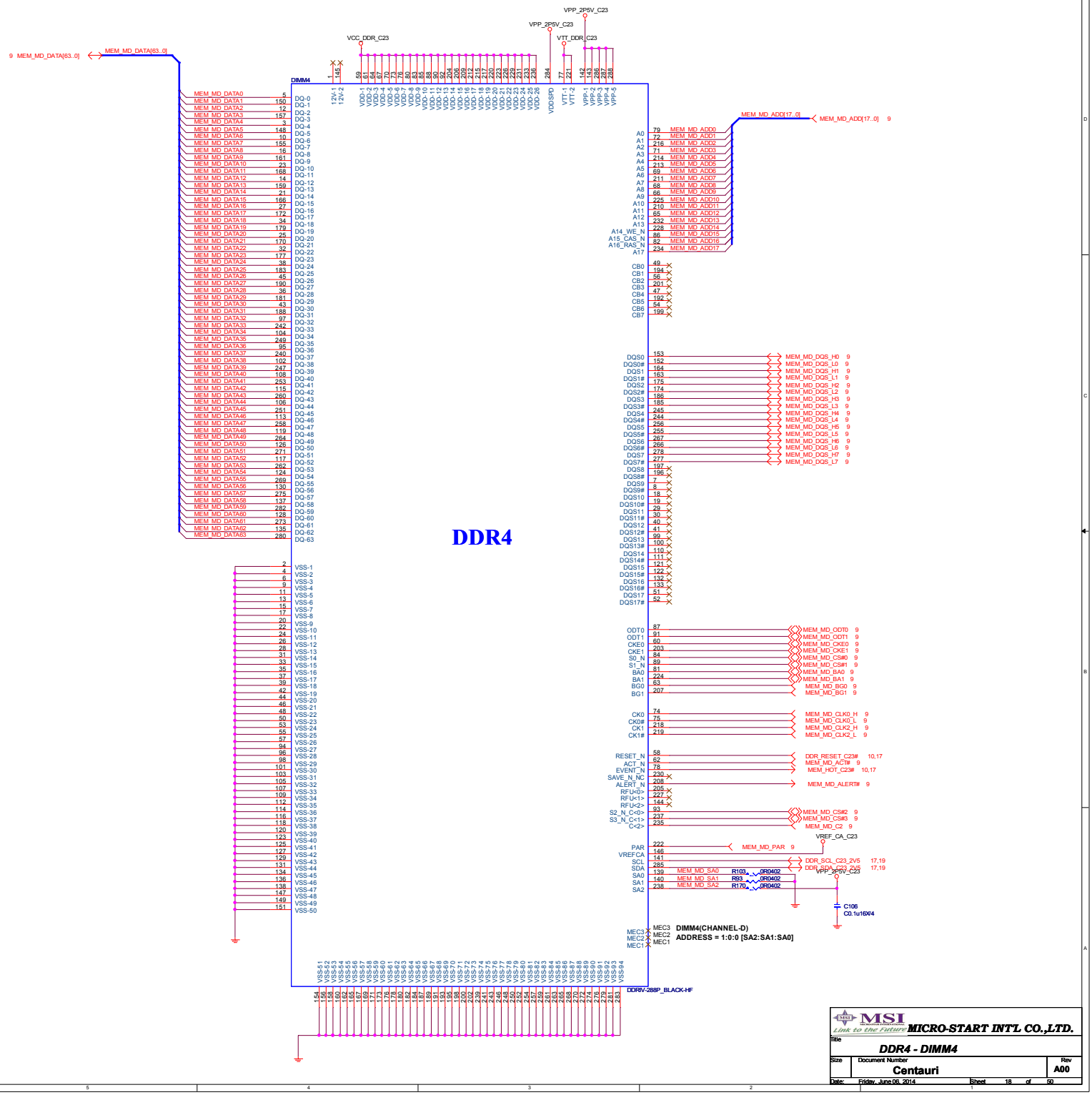


MICRO-START INT'L CO.,LTD.

Title: DDR4 - DIMM3

Size: | Document Number: Centauri | Rev: A00

Date: Friday, June 06, 2014 | Sheet 17 of 50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DIMM4
MEM_MD_DATA[63..0]
9 MEM_MD_DATA[63..0]
VCC_DDR_C23
VPP_2P5V_C23
VTT_DDR_C23
MEM_MD_ADD[17..0]
9 MEM_MD_ADD[17..0]
DDR4V-288P_BLACK-HF
MEC3 DIMM4(CHANNEL-D)
MEC2 ADDRESS = 1:0:0 [SA2:SA1:SA0]
MEC1
MICRO-START INT'L CO.,LTD.
DDR4 - DIMM4
Centauri
A00
Friday, June 06, 2014
18 of 50

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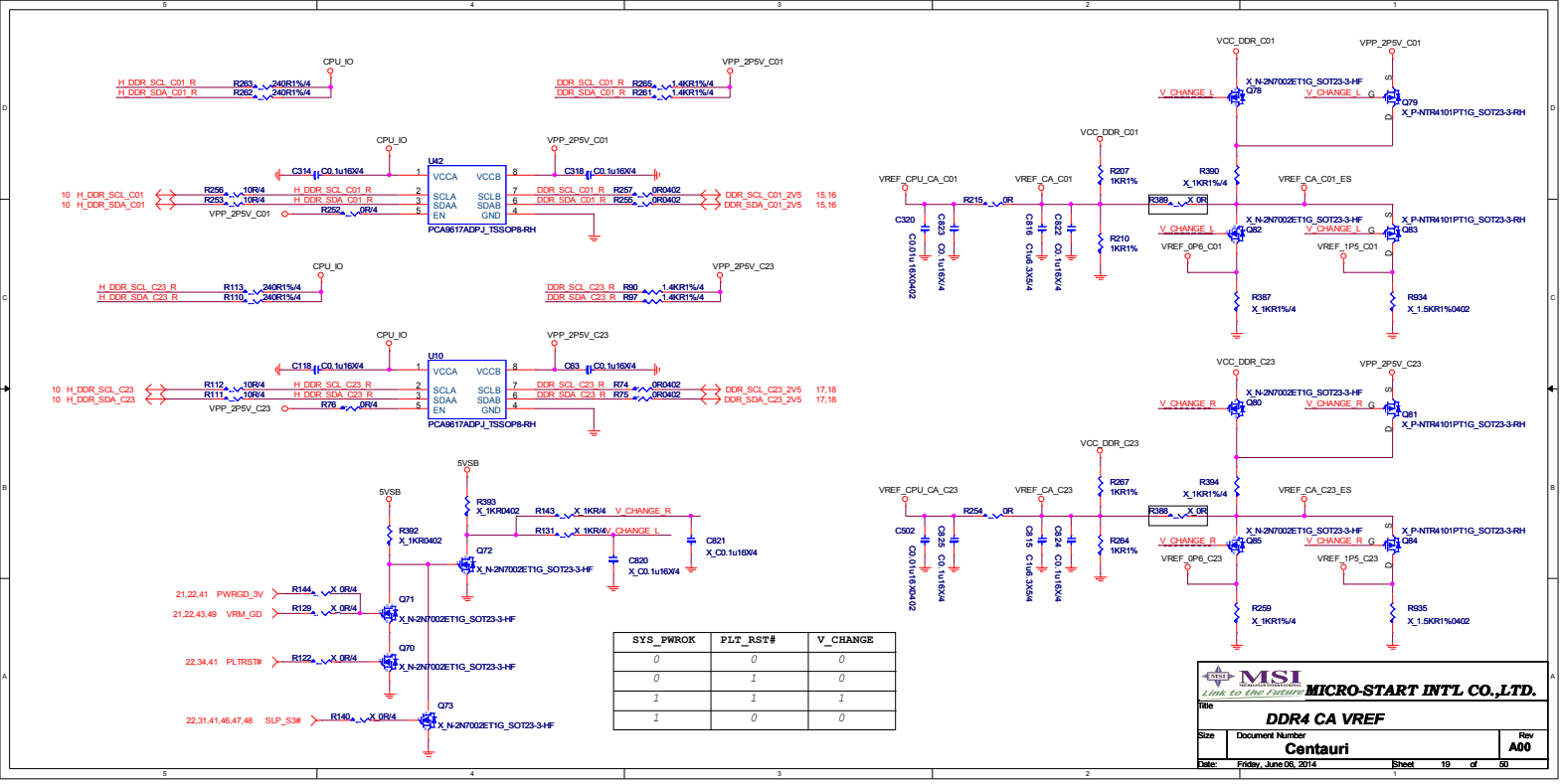
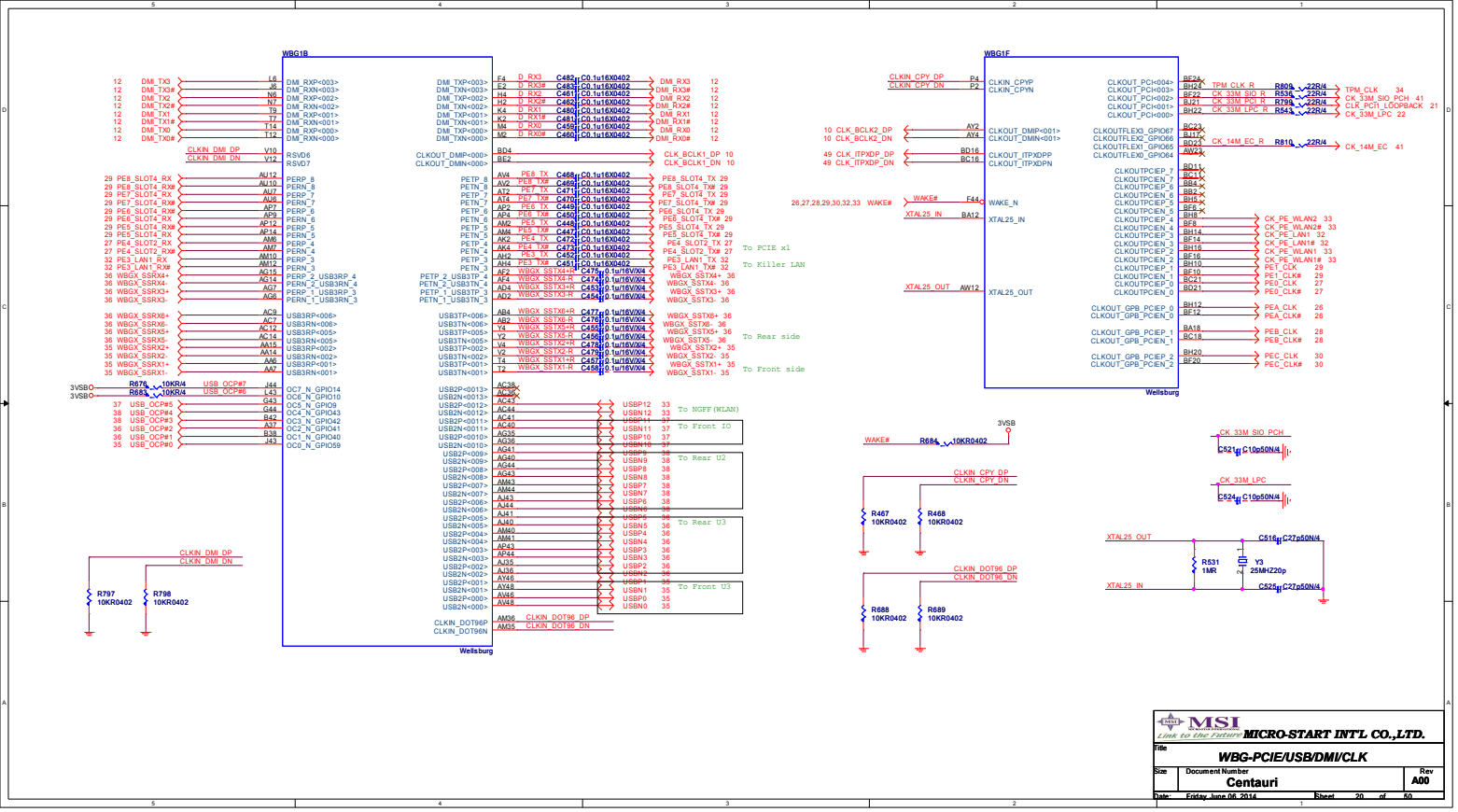


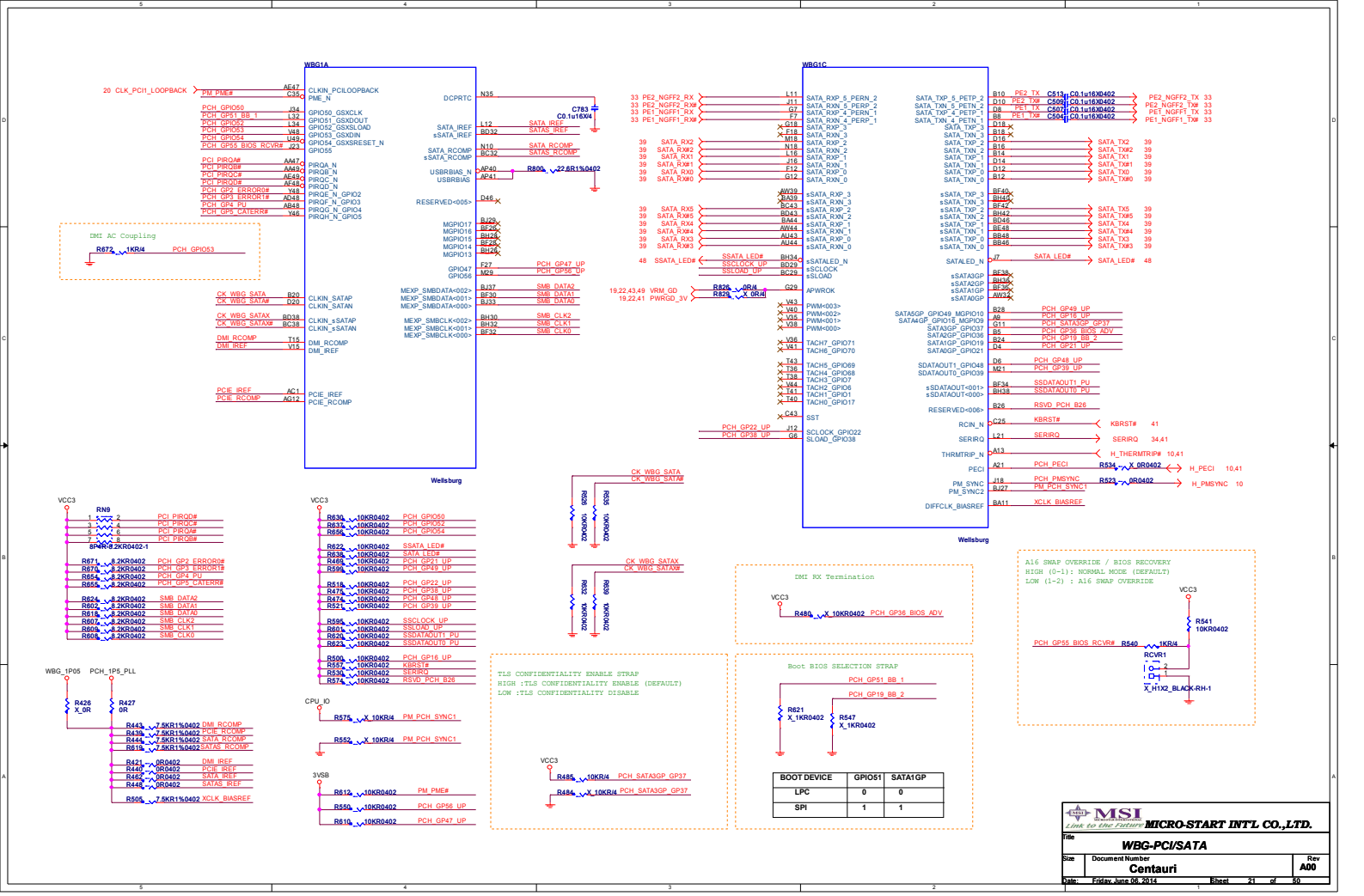
MICRO-START INT'L CO.,LTD.

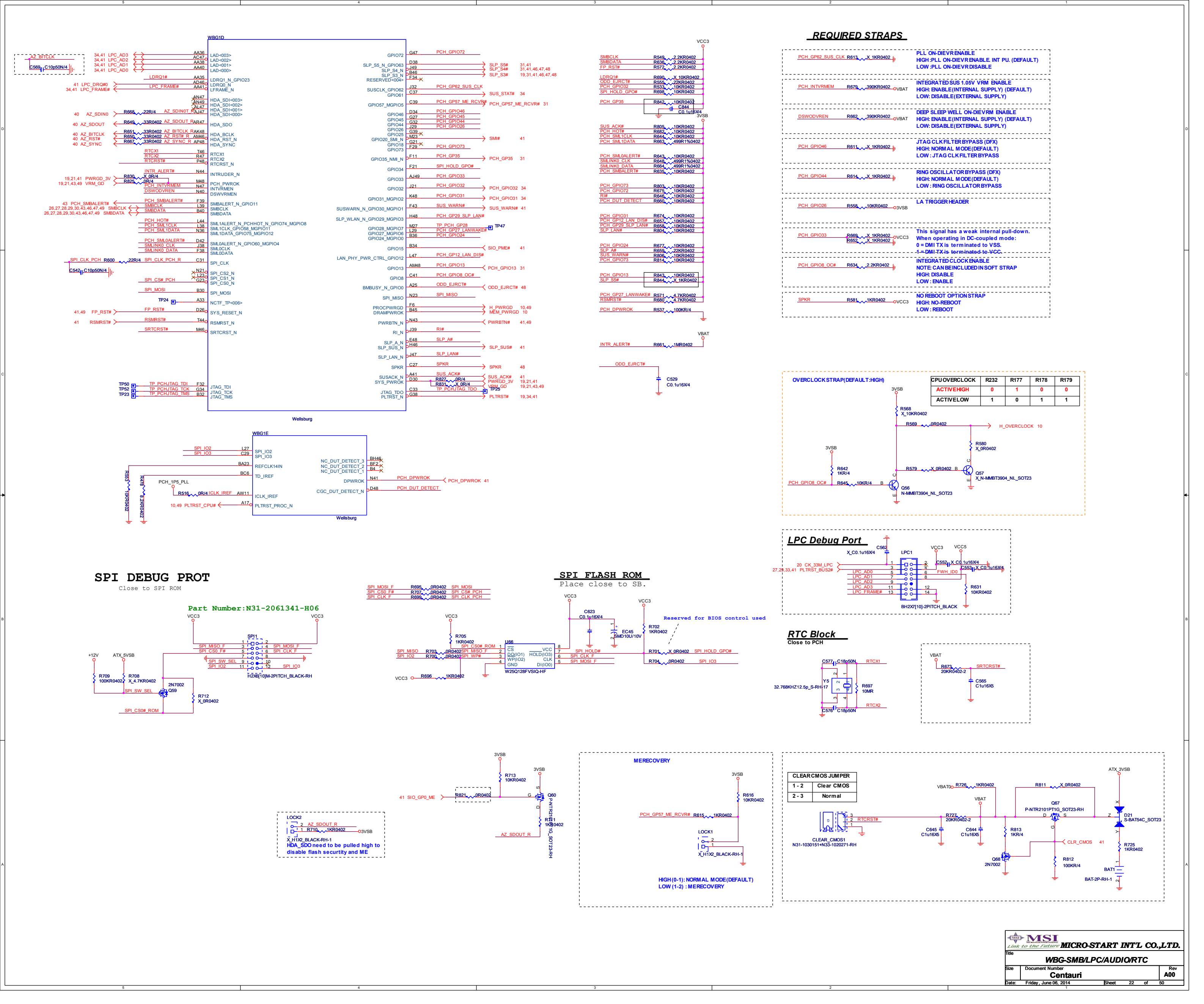
Title: DDR4 CA VREF

Size | Document Number: Centauri | Rev: A00

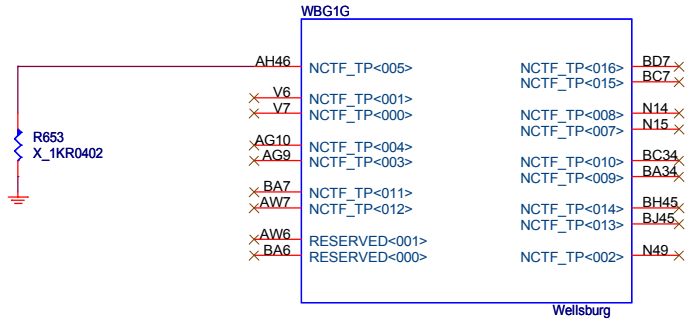
Date: Friday, June 06, 2014 | Sheet 19 of 50


WBG1B
WBG1F
Wellsburg
Wellsburg
MSI
Link to the Future
MICRO-START INT'L CO.,LTD.
Title
WBG-PCIE/USB/DMI/CLK
Size
Document Number
Centauri
Rev
A00
Date: Friday, June 06, 2014
Sheet 20 of 50


WBG1A
WBG1C
Wellsburg
Wellsburg
DMI AC Coupling
R672 1KR/4 PCH_GPIO53
RN9
8P4R-8.2KR0402-1
TLS CONFIDENTIALITY ENABLE STRAP
HIGH :TLS CONFIDENTIALITY ENABLE (DEFAULT)
LOW :TLS CONFIDENTIALITY DISABLE
DMI RX Termination
Boot BIOS SELECTION STRAP
A16 SWAP OVERRIDE / BIOS RECOVERY
HIGH (0-1): NORMAL MODE (DEFAULT)
LOW (1-2) : A16 SWAP OVERRIDE
RCVR1
X_H1X2_BLACK-RH-1
BOOT DEVICE | GPIO51 | SATA1GP
LPC | 0 | 0
SPI | 1 | 1
MICRO-START INTL CO.,LTD.
Title
WBG-PCI/SATA
Size
Document Number
Centauri
Rev
A00
Date: Friday, June 06, 2014
Sheet 21 of 50



REQUIRED STRAPS
OVERCLOCK STRAP(DEFAULT:HIGH)
LPC Debug Port
SPI DEBUG PROT
Close to SPI ROM
Part Number:N31-2061341-H06
SPI FLASH ROM
Place close to SB.
RTC Block
Close to PCH
MERECOVERY
HIGH (0-1): NORMAL MODE(DEFAULT)
LOW (1-2) : MERECOVERY
CLEAR CMOS JUMPER
HDA_SDO need to be pulled high to disable flash securtity and ME
Wellsburg
MICRO-STAR INT'L CO.,LTD.
WBG-SMB/LPC/AUDIO/RTC
Centauri
A00
Friday, June 06, 2014
Sheet 22 of 50



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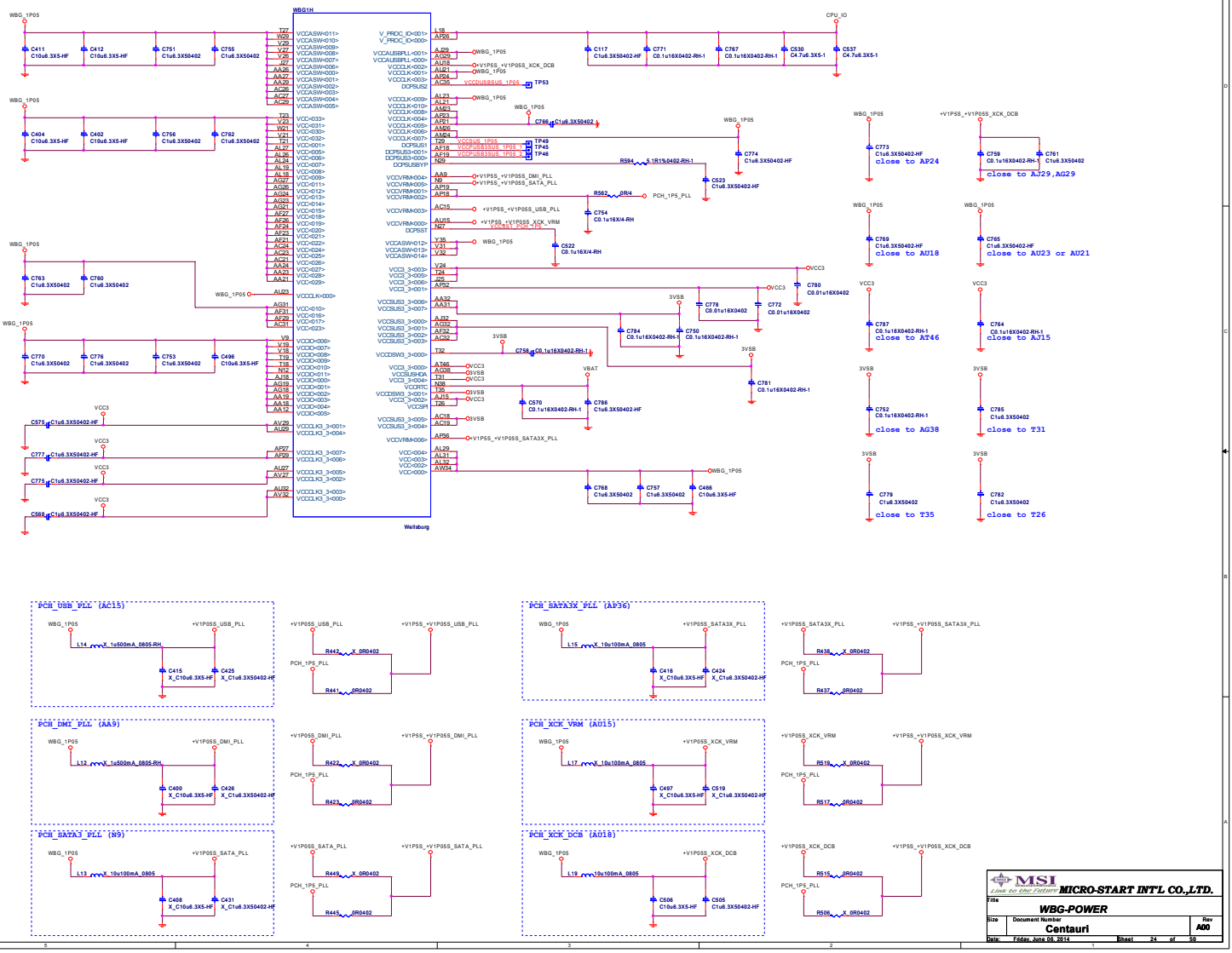
MICRO-START INT'L CO.,LTD.

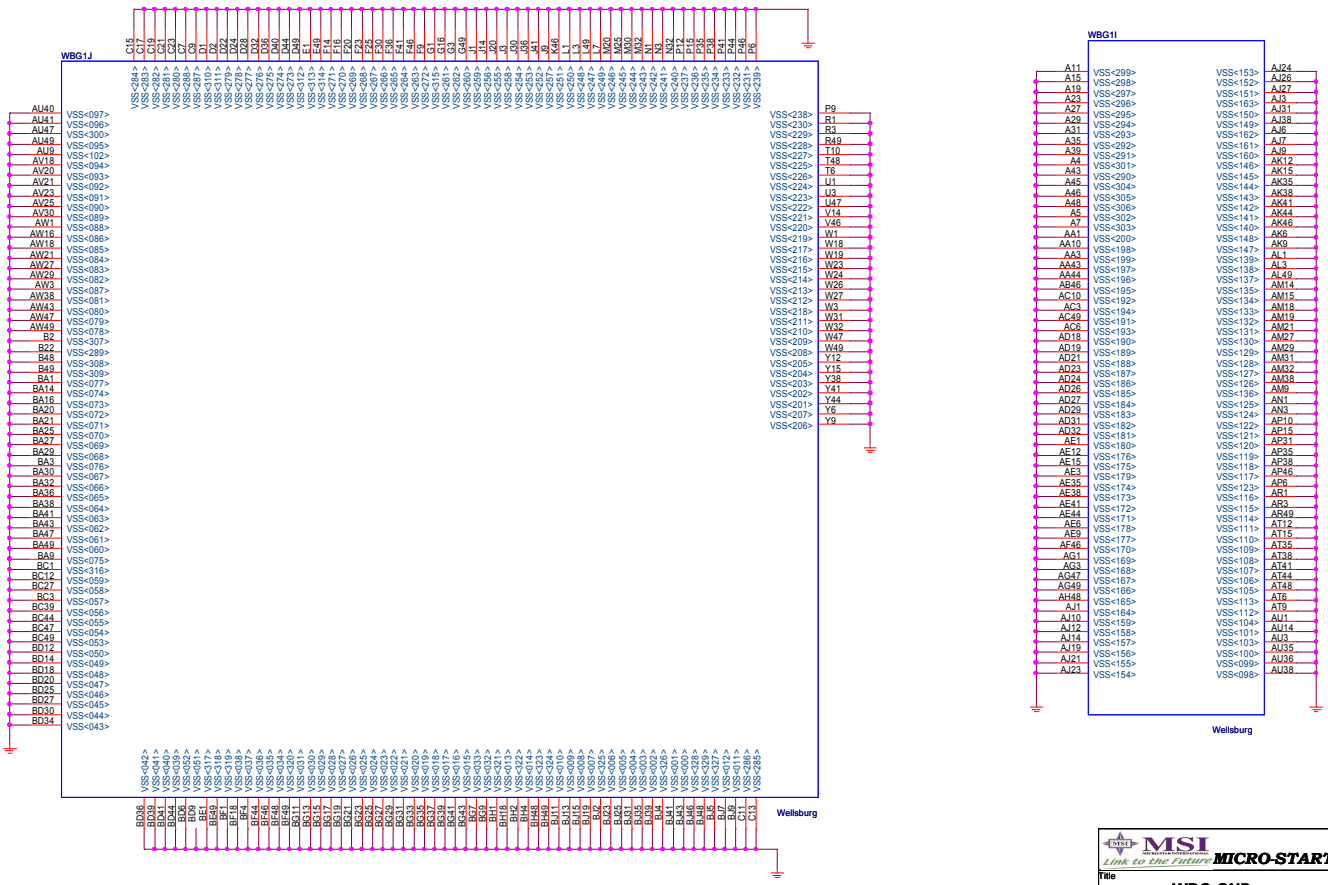
Title	**WBG-NVRM**	
Size	Document Number: **Centauri**	Rev: **A00**
Date: Friday, June 06, 2014	Sheet 23 of 50	



Title: WBG-POWER

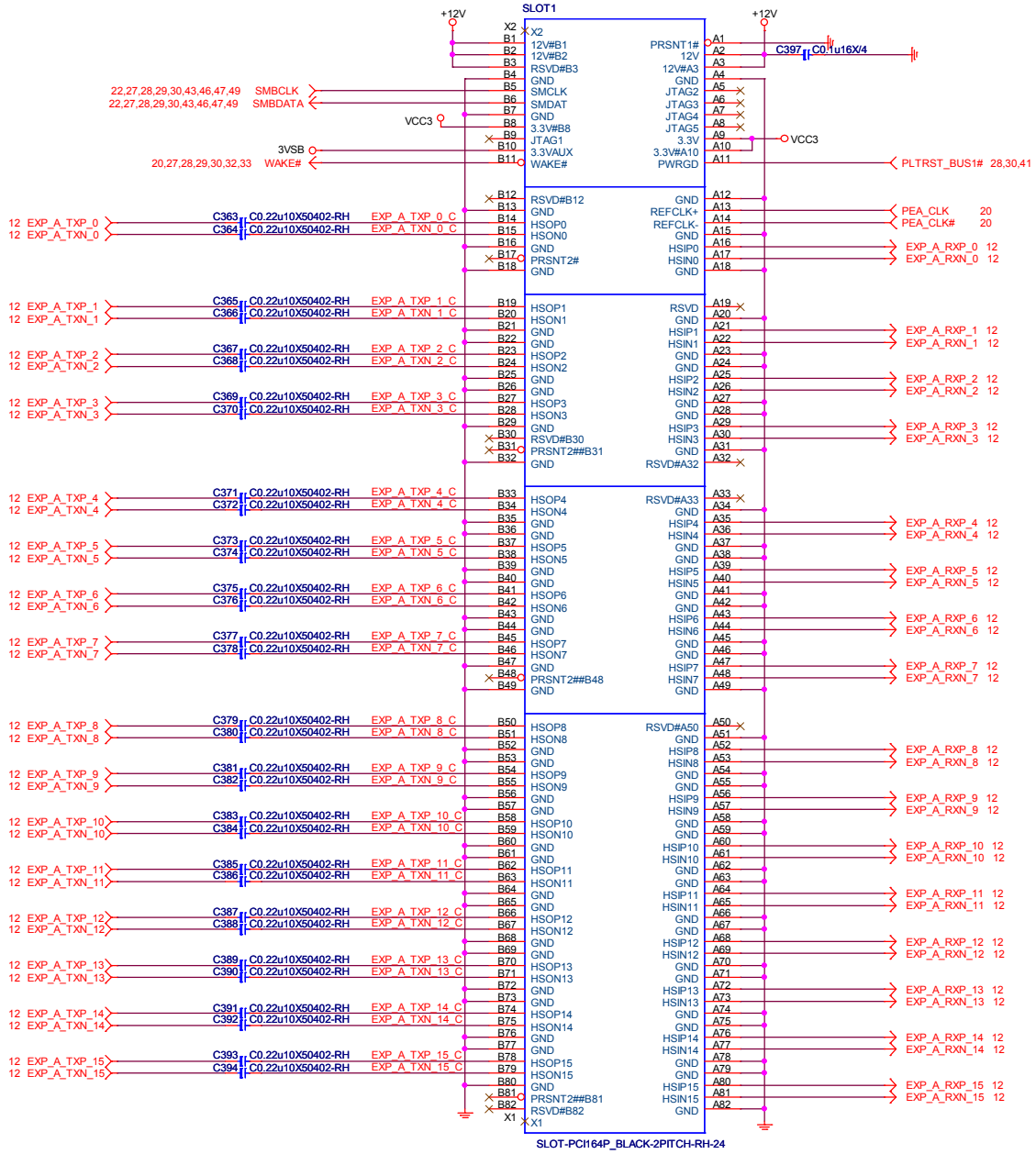
Size	Document Number	Rev
	Centauri	A00

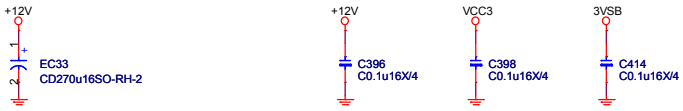
Date: Friday, June 06, 2014 Sheet 24 of 59



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

Title	WBG-GND	
Size	Document Number: Centauri	Rev: A00
Date: Friday, June 06, 2014	Sheet 25 of 50	

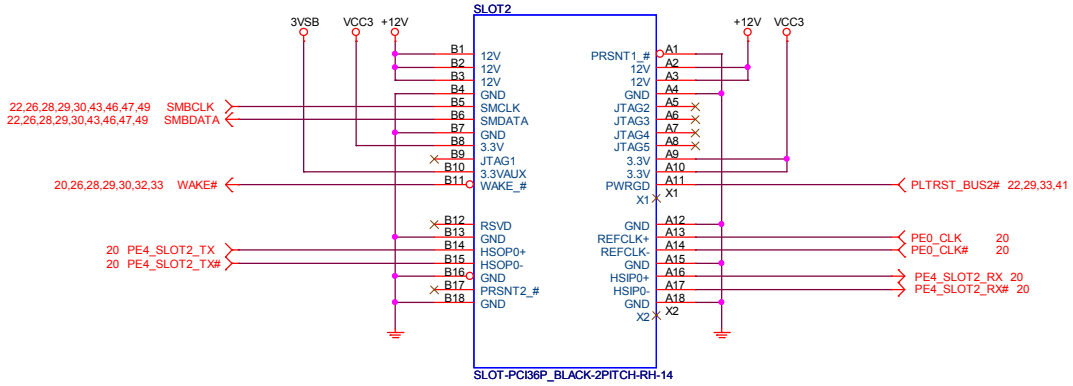


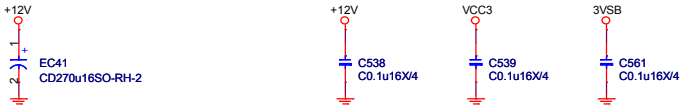


MSI MICRO-STAR INT'L CO.,LTD.
Link to the Future

Title	PCIE X16 Slot1	
Size	Document Number: Centauri	Rev: A00
Date: Friday, June 06, 2014	Sheet 26 of 50	

PCI EXPRESS X1 SLOT





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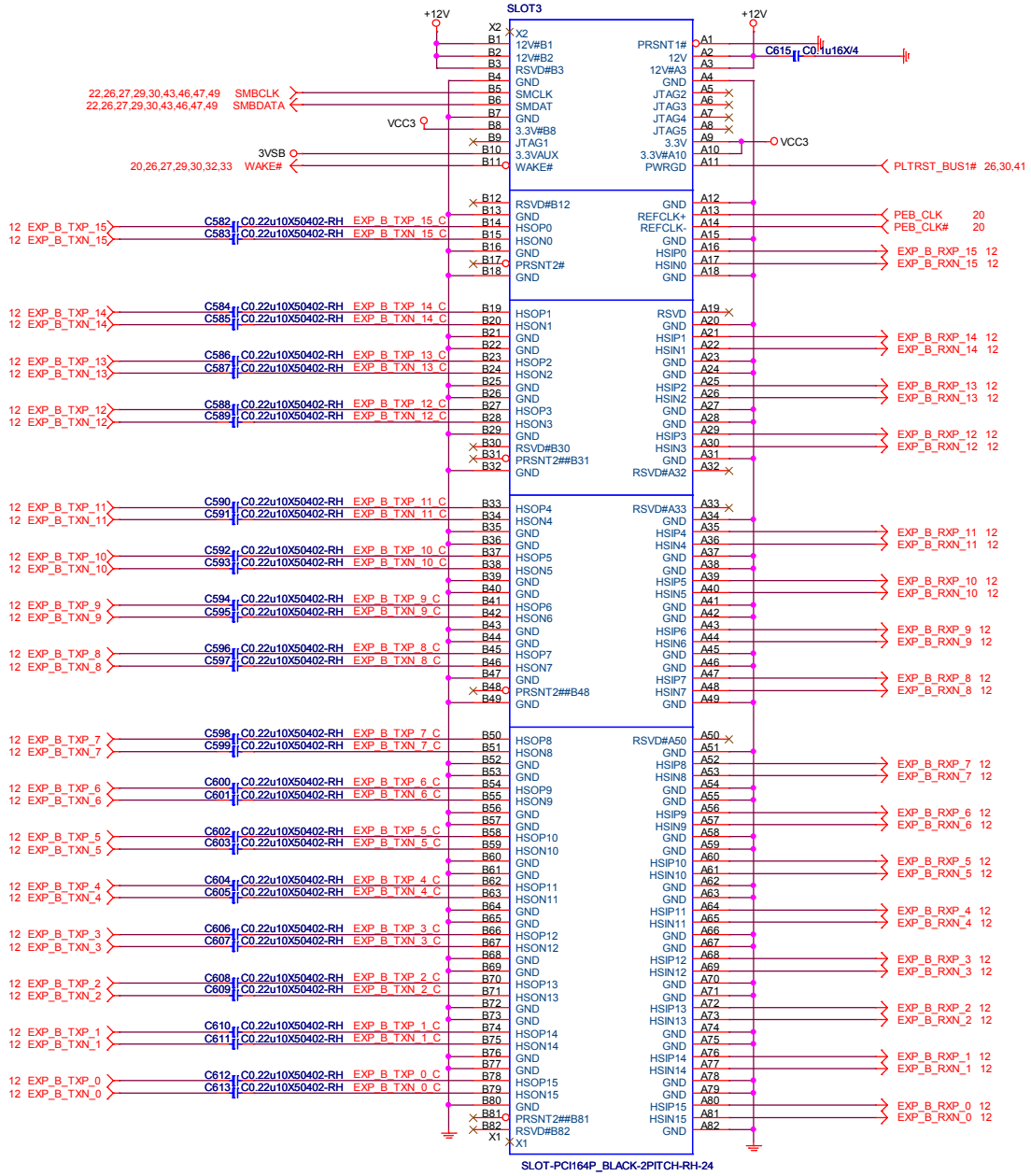
Link to the Future
MICRO-START INT'L CO.,LTD.

Title: PCIE X1 Slot2		
Size	Document Number: Centauri	Rev: A00
Date: Friday, June 06, 2014	Sheet 27 of 50	

PCI EXPRESS X16 SLOT



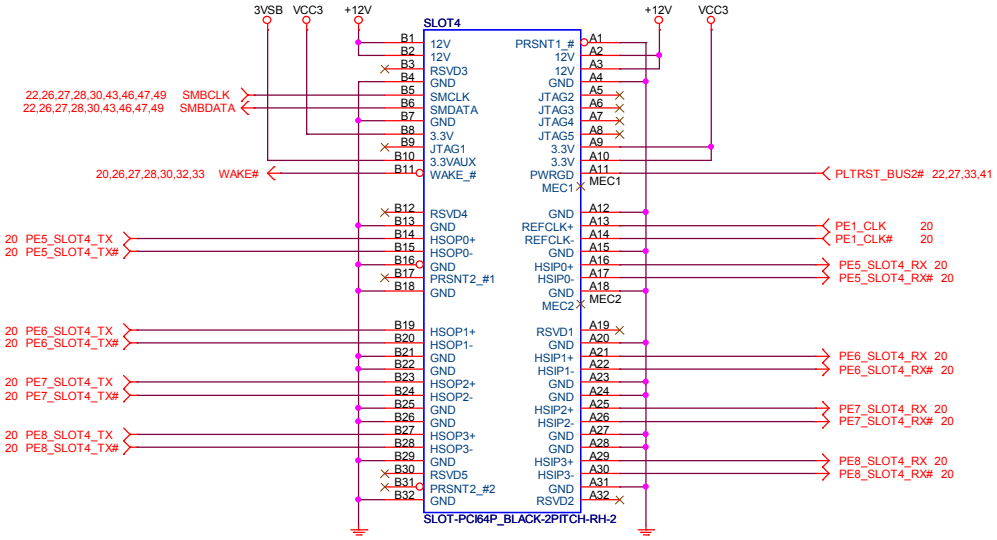
MICRO-START INT'L CO.,LTD.

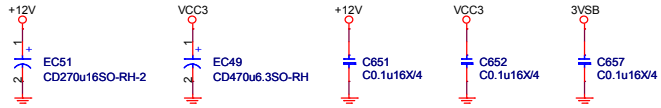
Title: PCIE X16 Slot3

Size	Document Number	Rev
	Centauri	A00

Date: Friday, June 06, 2014 Sheet 28 of 50

PCI EXPRESS X4 SLOT



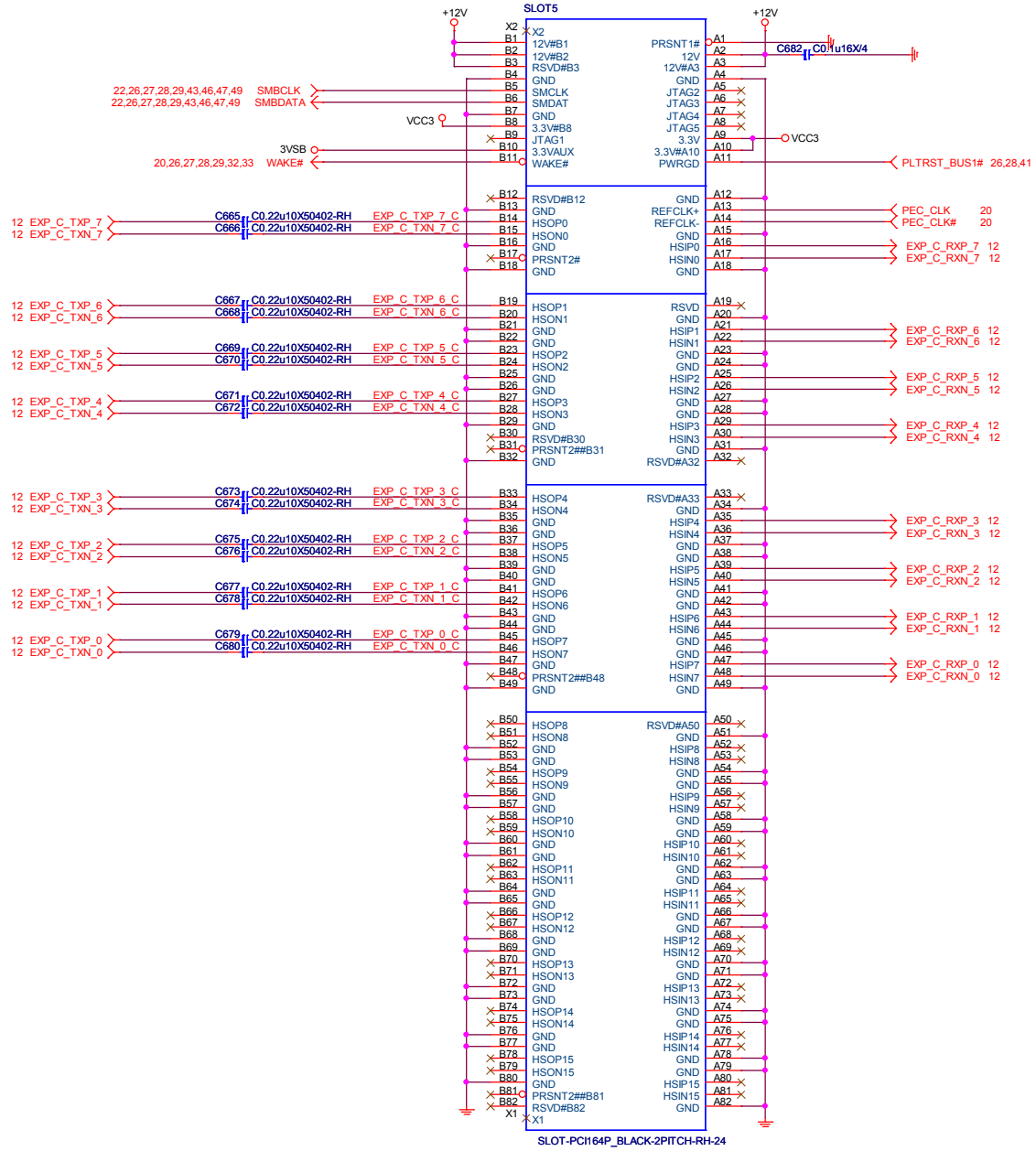


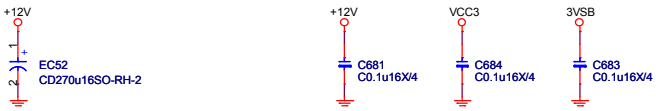
MICRO-START INT'L CO.,LTD.

Title: PCIE X4 slot4

Size	Document Number	Rev
	Centauri	A00

Date: Friday, June 06, 2014 Sheet 29 of 50



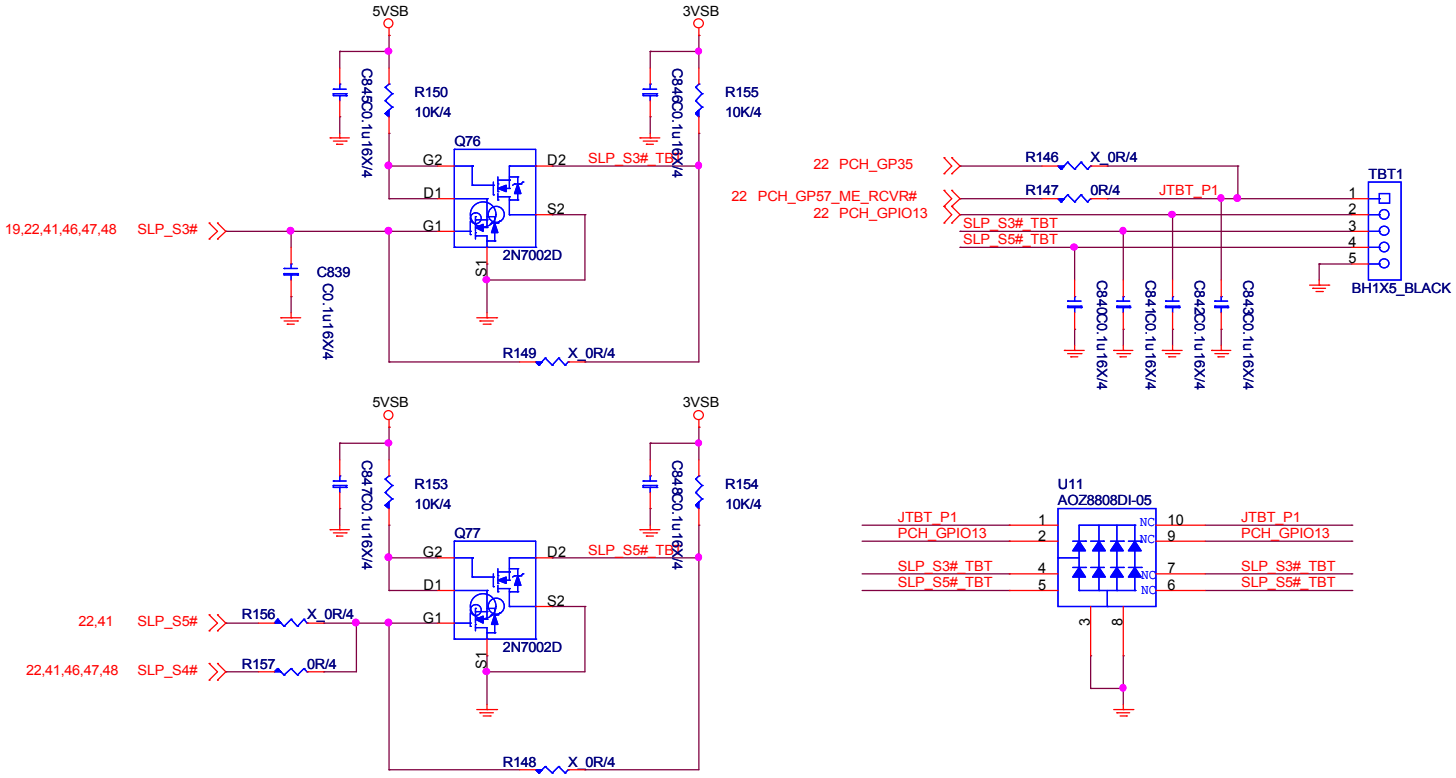


MICRO-START INT'L CO.,LTD.

Title: PCIE X16 Slot5

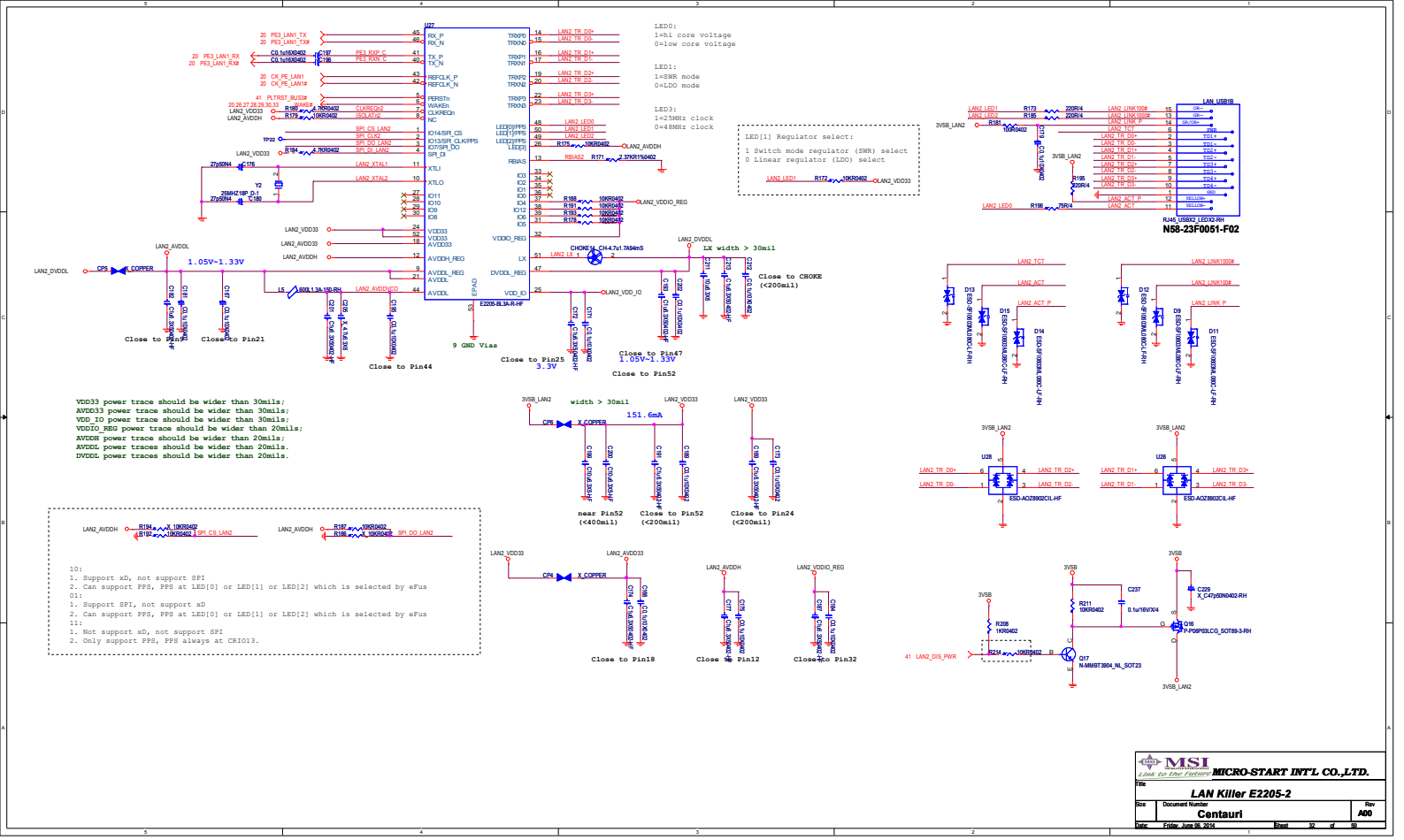
Size	Document Number	Rev
	Centauri	A00

Date: Friday, June 06, 2014 Sheet 30 of 50



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

Title	**TBT header**	
Size	Document Number: **Centauri**	Rev: **A00**
Date: Friday, June 06, 2014	Sheet 31 of 50	

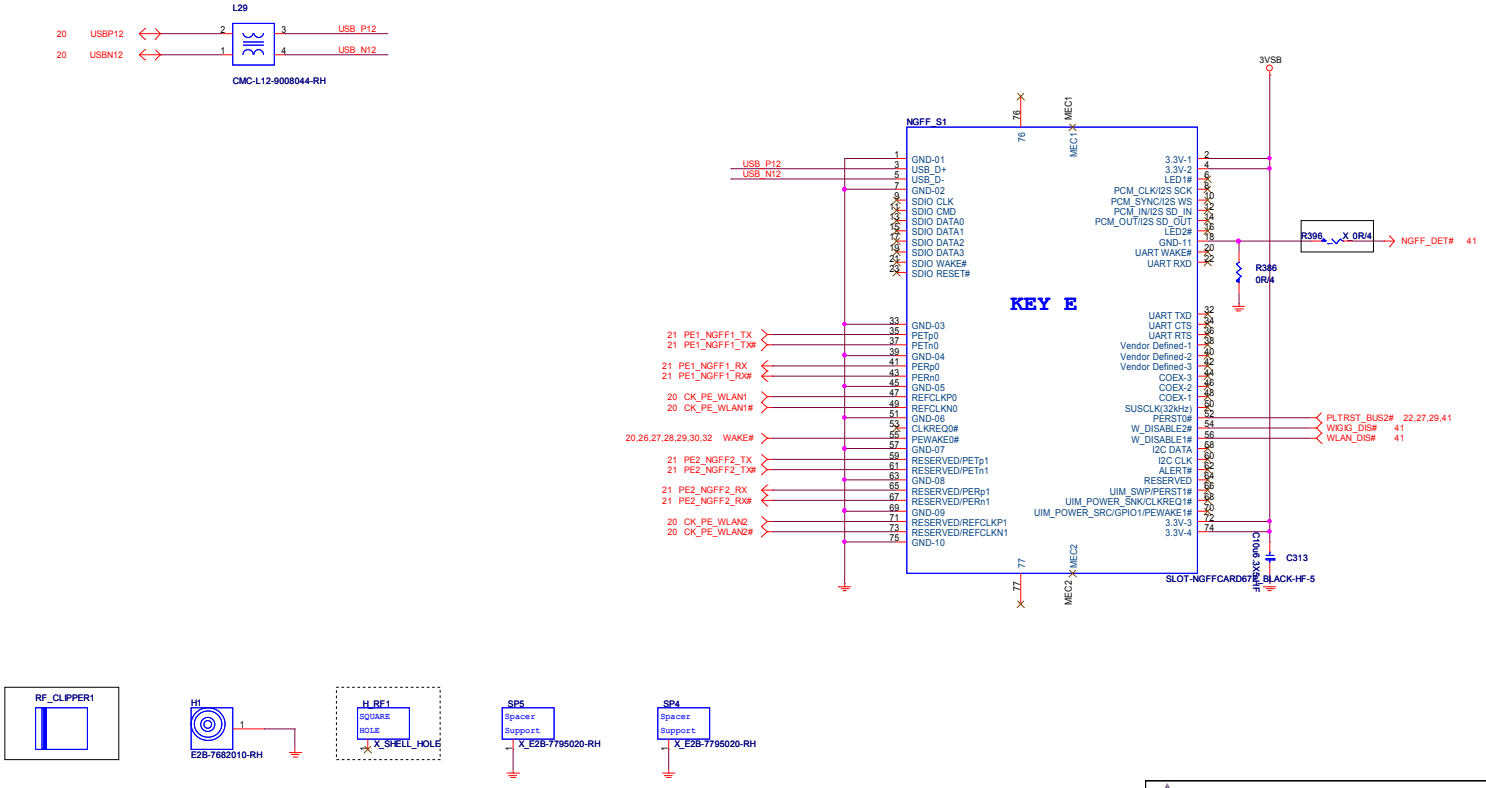


MICRO-START INT'L CO.,LTD.

Title: LAN Killer E2205-2

Size | Document Number: Centauri | Rev: A00

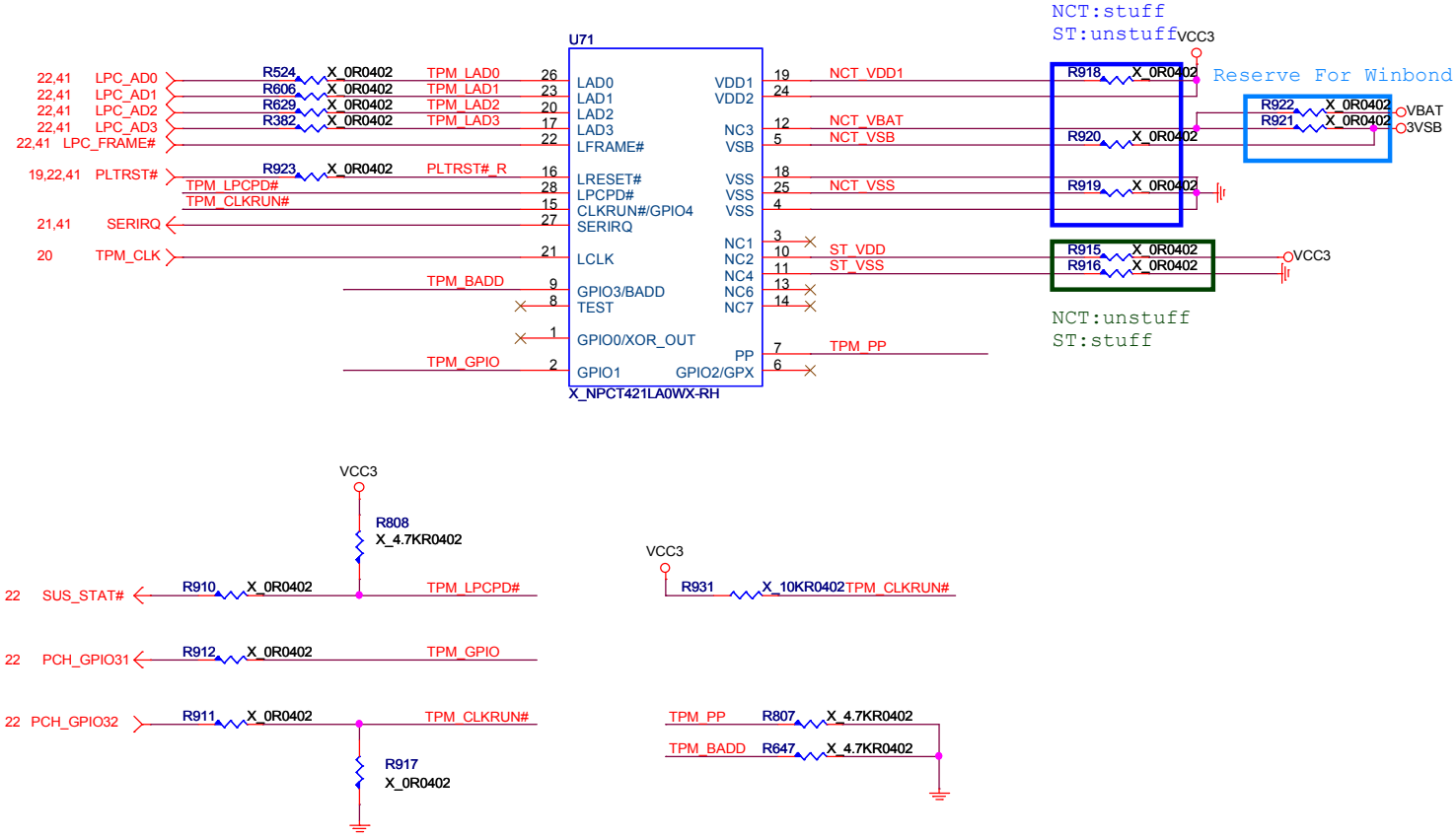
Date: Friday, June 06, 2014 | Sheet 32 of 50



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

Link to the Future

Title	NGFF Key E (WLAN)	
Size	Document Number: Centauri	Rev: A00
Date: Friday, June 06, 2014	Sheet 33 of 50	



MICRO-START INT'L CO.,LTD.

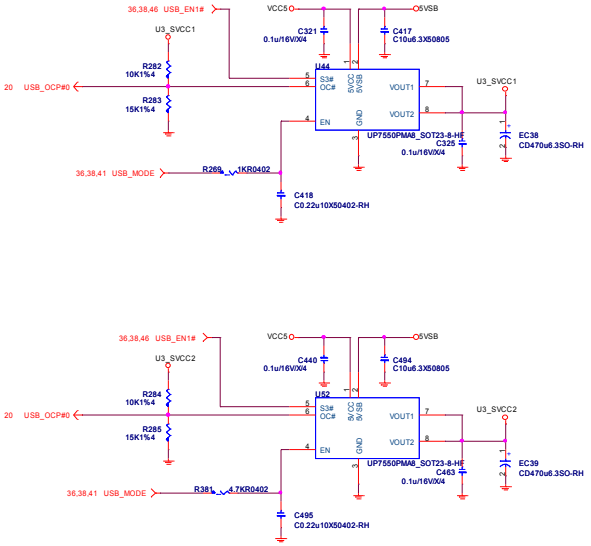
Link to the Future

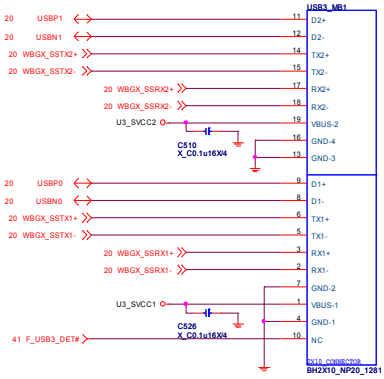
Title: TPM(reserved)

Size | Document Number: Centauri | Rev: A00

Date: Friday, June 06, 2014 | Sheet 34 of 50

Front USB3.0 Port





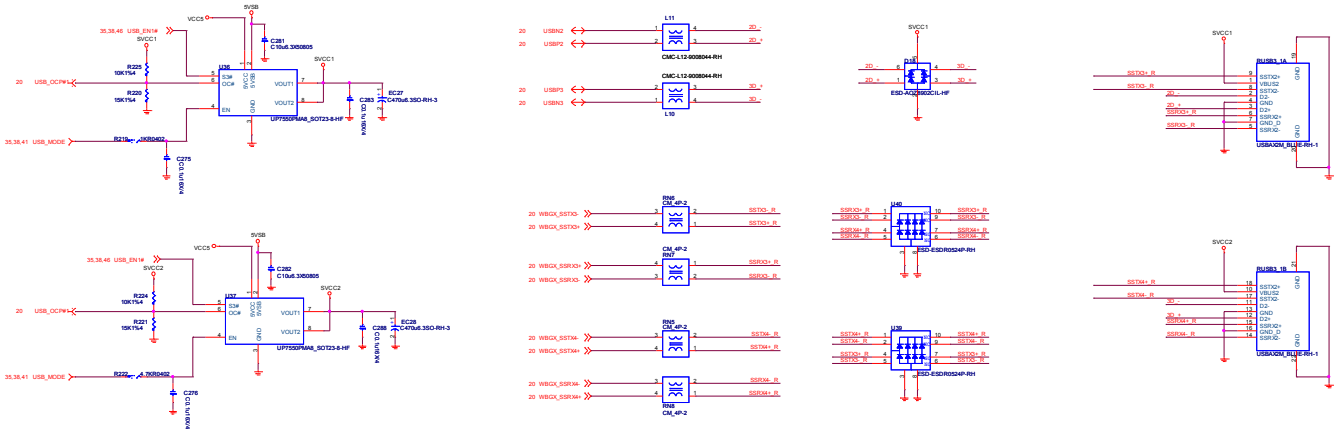
MICRO-START INT'L CO.,LTD.

Title: Front USB3.0

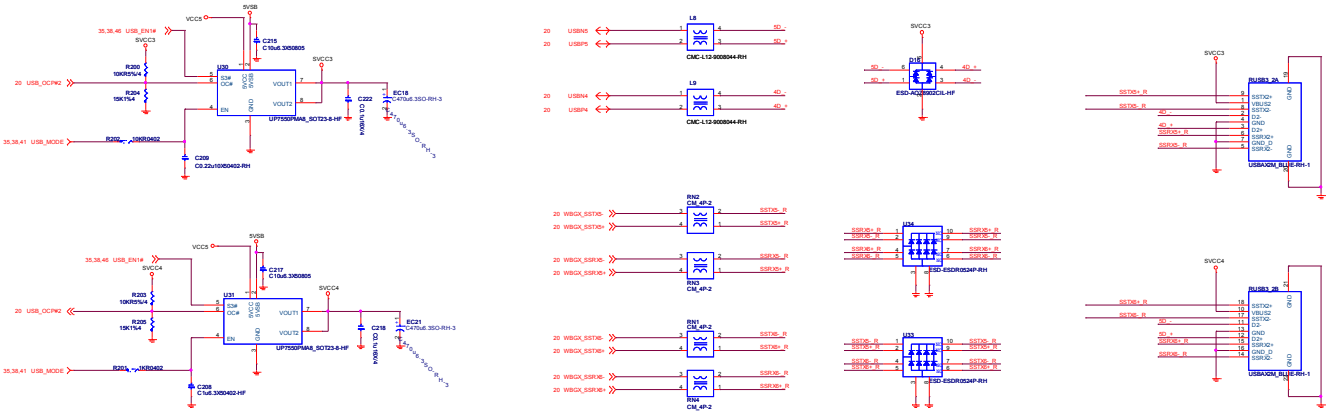
Size	Document Number	Rev
	Centauri	A00

Date: Friday, June 06, 2014 Sheet 36 of 50

Rear USB3.0 Port 2 / 3

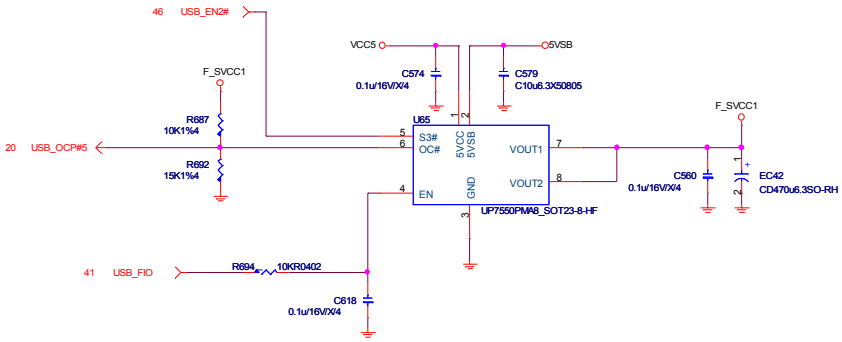


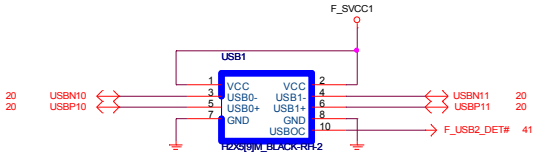
Rear USB3.0 Port 4 / 5



MSI Live to the Fullest	MICRO-STAR INT'L CO.,LTD.		
Title	Rear USB3.0 x4		
Size	Document Number: Centauri		Rev: A00
Date: Friday, June 06, 2014	Sheet 36 of 50		

Front USB2.0 Port 11/12

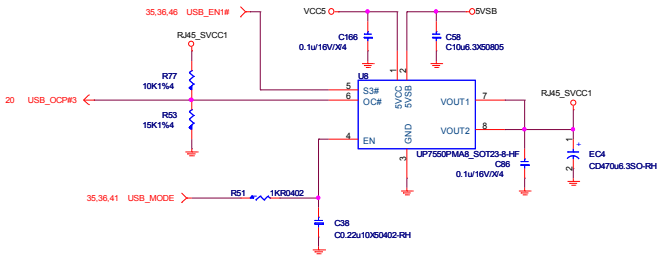


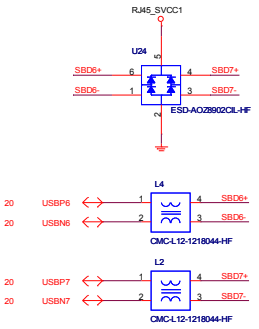


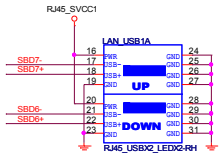
MSI MICRO-STAR INTERNATIONAL
Link to the Future **MICRO-START INTL CO.,LTD.**

Title	**Front USB2.0 x2**	
Size	Document Number: **Centauri**	Rev: **A00**
Date: Friday, June 06, 2014	Sheet 37 of 50	

Rear USB2.0 Port 7 / 8

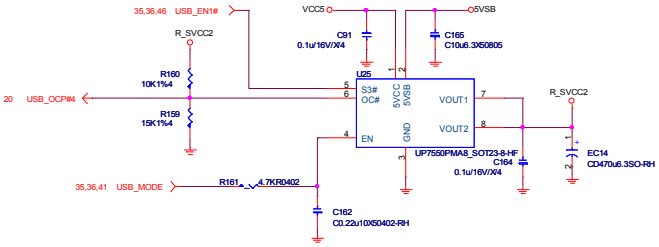


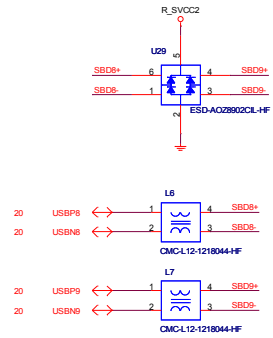


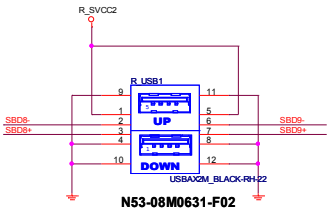


N58-23F0051-F02

Rear USB2.0 Port 9 / 10







N53-08M0631-F02

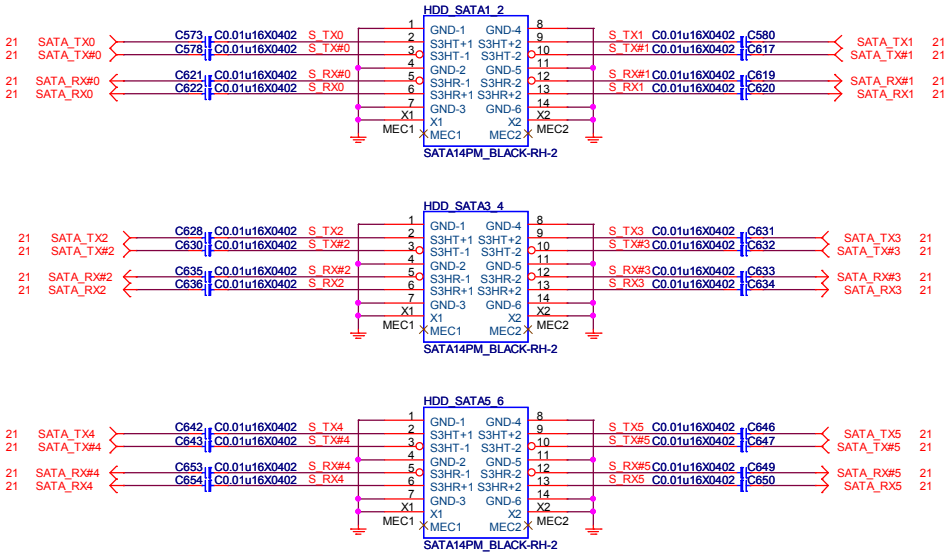
MSI MICRO-STAR INT'L CO.,LTD.

Title: Rear USB2.0 x2

Size	Document Number	Rev
	Centauri	A00

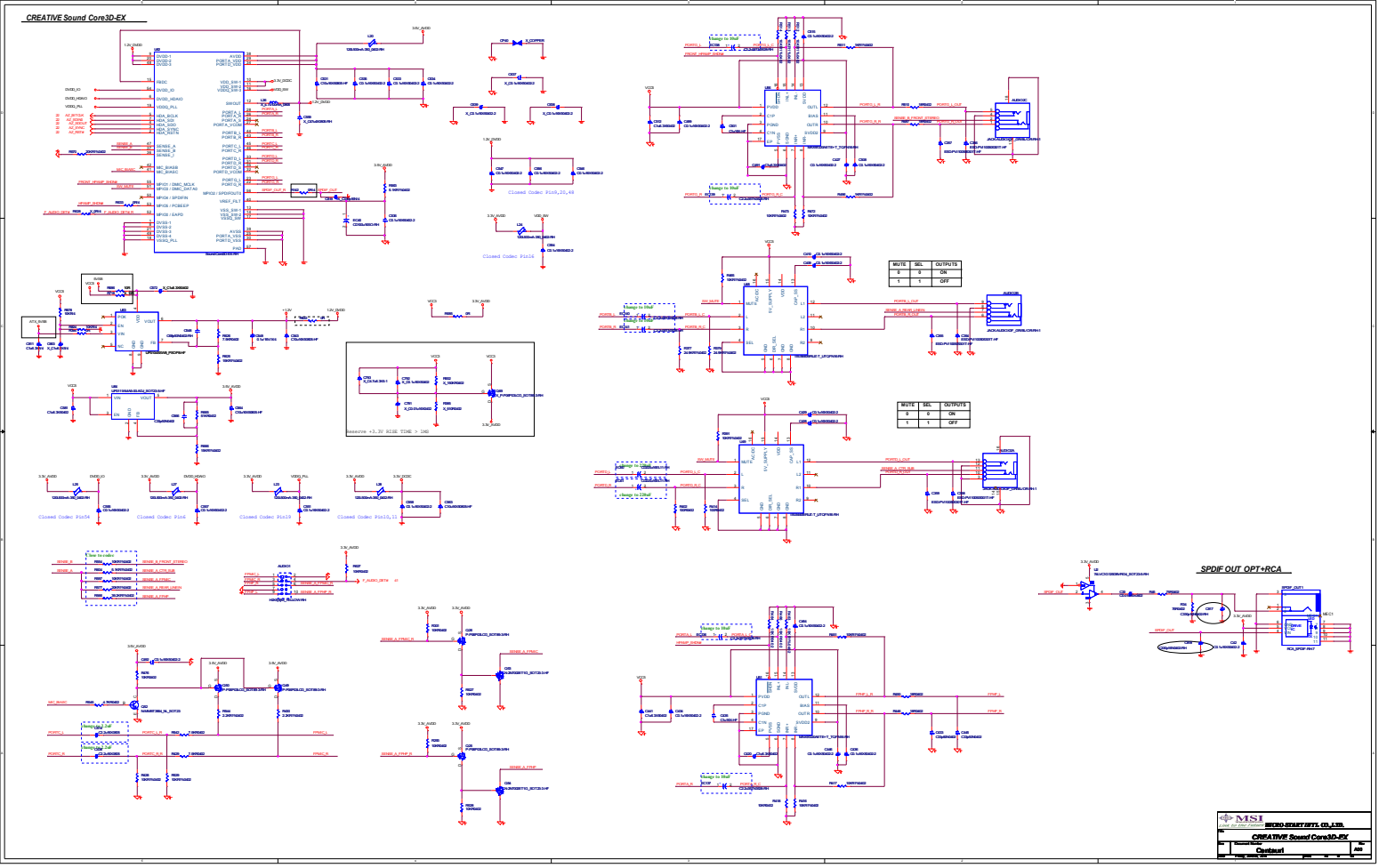
Date: Friday, June 06, 2014 Sheet 38 of 50

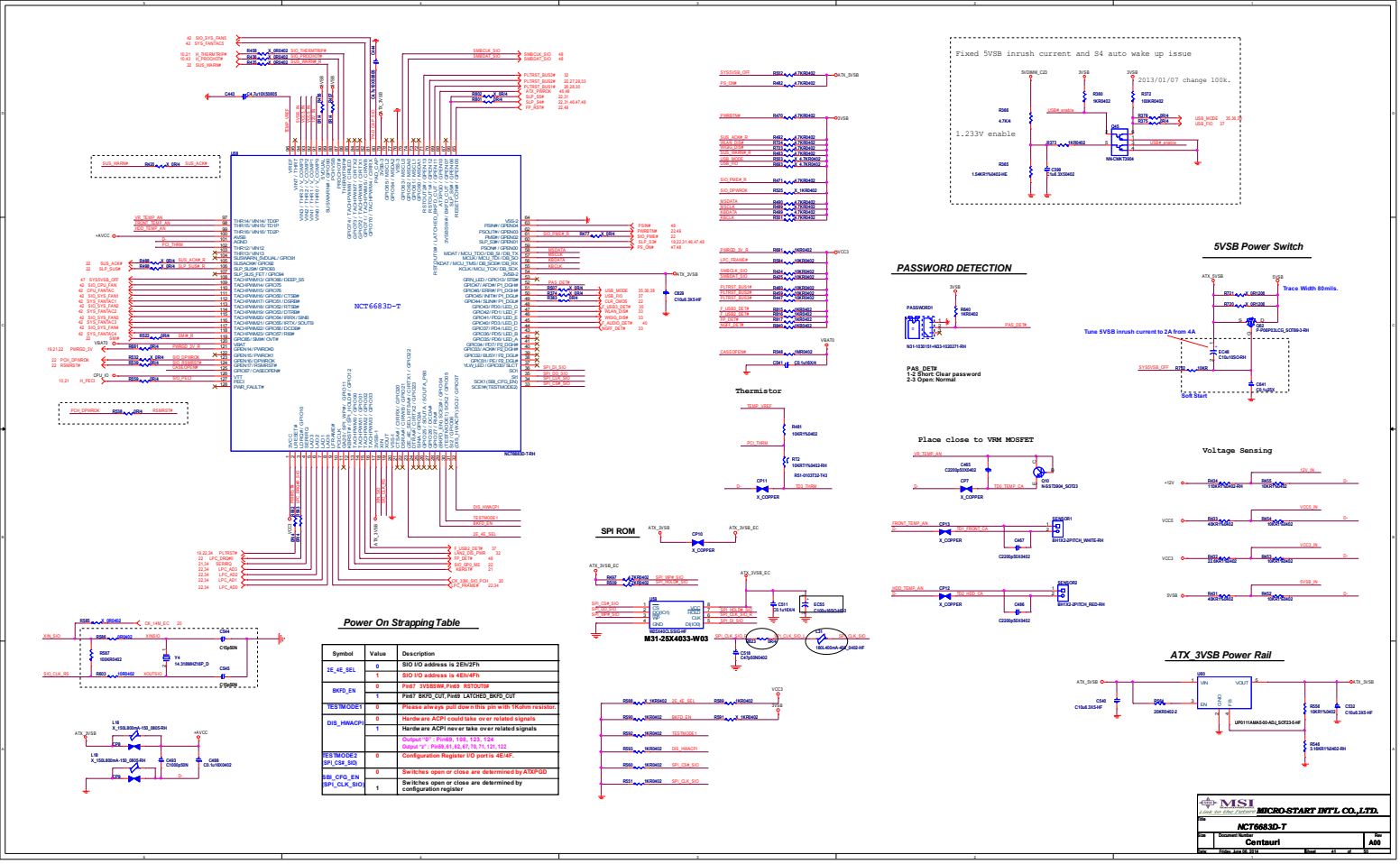
SATA 3.0 Connector

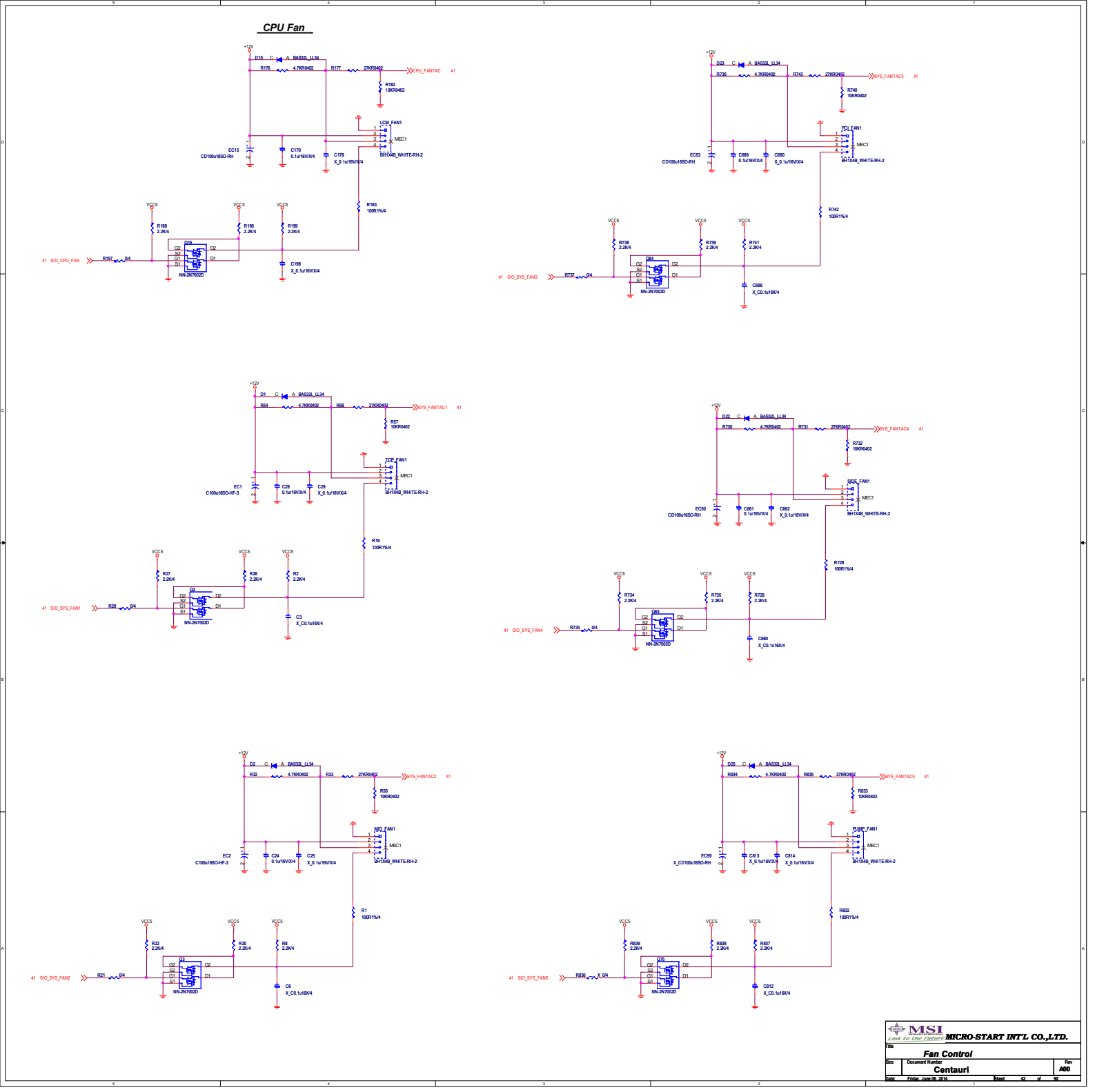


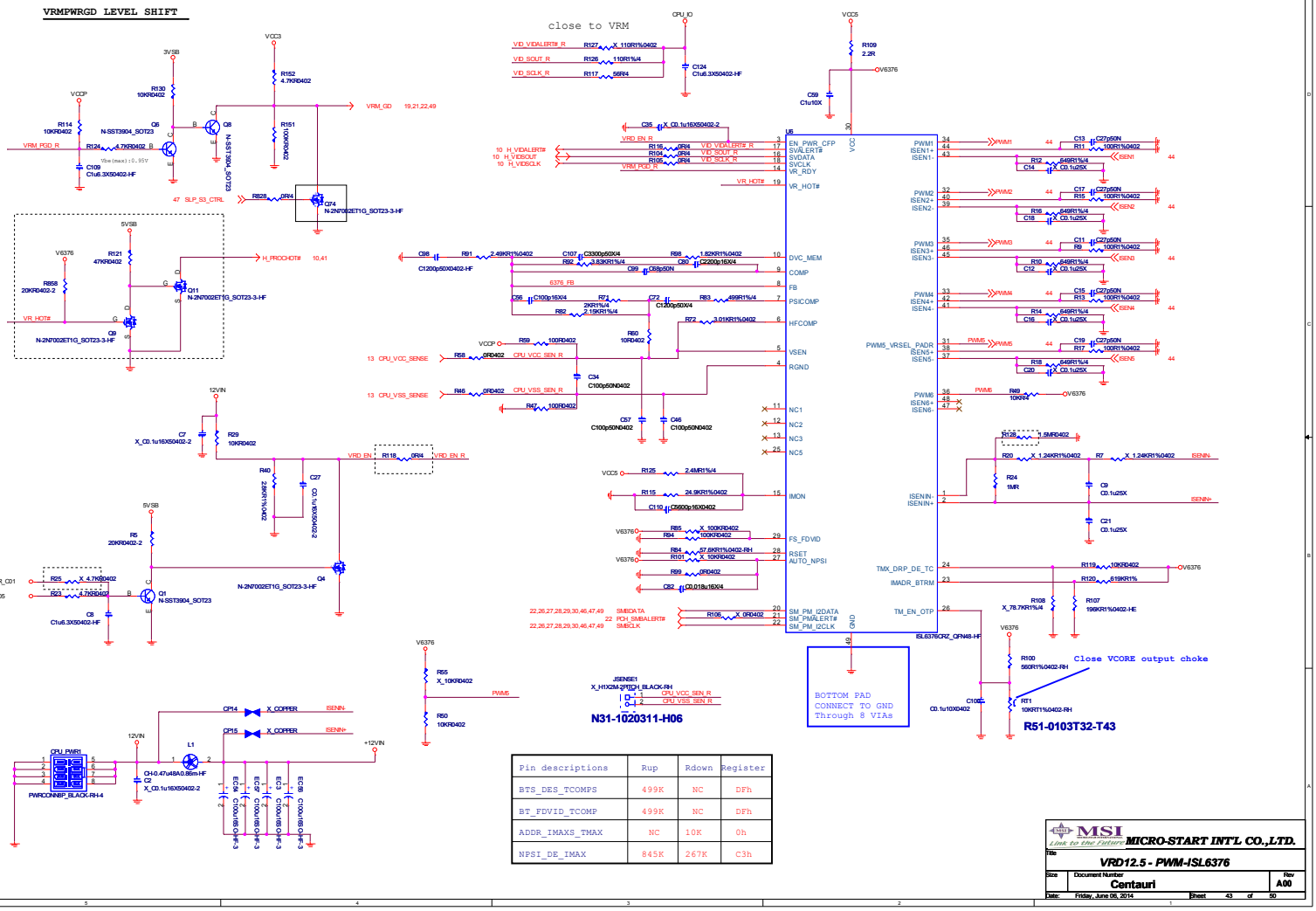
MSI Link to the Future MICRO-START INT'L CO.,LTD.

Title: SATA PORT		
Size	Document Number: Centauri	Rev: A00
Date: Friday, June 06, 2014	Sheet 39 of 50	


CREATIVE Sound Core3D-EX
SPDIF OUT OPT+RCA
MSI
MICRO-STAR INT'L CO.,LTD.
CREATIVE Sound Core3D-FX
Centaur1
MUTE
SEL
OUTPUTS
ON
OFF


NCT6683D-T
Power On Strapping Table
Symbol
Value
Description
2E_4E_SEL
0
SIO I/O address is 2Eh/2Fh
1
SIO I/O address is 4Eh/4Fh
BKFD_EN
0
Pin67 3VSBSW9_Pin69 RSTOUT#
1
Pin67 BKFD_CUT, Pin69 LATCHED_BKFD_CUT
TESTMODE1
0
Please always pull down this pin with 1Kohm resistor.
DIS_HWACPI
0
Hardware ACPI could take over related signals
1
Hardware ACPI never take over related signals
Output "0" : Pin69, 108, 123, 124
Output "z" : Pin68, 81, 82, 87, 70, 71, 121, 122
TESTMODE2
SPI_CS#_SIO
0
Configuration Register I/O port is 4E/4F.
SBI_CFG_EN
SPI_CLK_SIO
0
Switches open or close are determined by ATXPGD
1
Switches open or close are determined by configuration register
Fixed 5VSB inrush current and S4 auto wake up issue
1.233V enable
2013/01/07 change 100k.
PASSWORD DETECTION
PAS_DET#
1-2 Short: Clear password
2-3 Open: Normal
Thermistor
Place close to VRM MOSFET
5VSB Power Switch
Trace Width 80mils.
Tune 5VSB inrush current to 2A from 4A
Soft Start
Voltage Sensing
SPI ROM
M31-25X4033-W03
ATX_3VSB Power Rail
MICRO-START INT'L CO.,LTD.
NCT6683D-T
Centauri
A00


CPU Fan
+12V
D10
BAS32L_LL34
R176
4.7KR0402
R177
27KR0402
CPU_FANTAC
41
R182
10KR0402
LCM_FAN1
MEC1
BH1X4B_WHITE-RH-2
EC15
CD100u16SO-RH
C170
0.1u/16V/X/4
C178
X_0.1u/16V/X/4
VCC5
R198
2.2K/4
R190
2.2K/4
R199
2.2K/4
R183
100R1%/4
Q35
NN-2N7002D
41 SIO_CPU_FAN
R197
0/4
C198
X_0.1u/16V/X/4
D23
R736
R743
SYS_FANTAC3
R740
10KR0402
PCI_FAN1
EC53
CD100u16SO-RH
C689
0.1u/16V/X/4
C690
X_0.1u/16V/X/4
R742
100R1%/4
R738
2.2K/4
R739
2.2K/4
R741
2.2K/4
Q64
41 SIO_SYS_FAN3
R737
0/4
C688
X_C0.1u/16X/4
D1
R54
R88
SYS_FANTAC1
R57
10KR0402
TOP_FAN1
EC1
C100u16SO-HF-3
C28
0.1u/16V/X/4
C29
X_0.1u/16V/X/4
R19
100R1%/4
R27
2.2K/4
R26
2.2K/4
R2
2.2K/4
Q2
41 SIO_SYS_FAN1
R28
0/4
C3
X_C0.1u/16X/4
D22
R730
R731
SYS_FANTAC4
R732
10KR0402
SIDE_FAN1
EC50
CD100u16SO-RH
C661
0.1u/16V/X/4
C662
X_0.1u/16V/X/4
R728
100R1%/4
R734
2.2K/4
R735
2.2K/4
R729
2.2K/4
Q63
41 SIO_SYS_FAN4
R733
0/4
C660
X_C0.1u/16X/4
D2
R32
R33
SYS_FANTAC2
R56
10KR0402
MID_FAN1
EC2
C100u16SO-HF-3
C24
0.1u/16V/X/4
C25
X_0.1u/16V/X/4
R1
100R1%/4
R22
2.2K/4
R30
2.2K/4
R8
2.2K/4
Q3
41 SIO_SYS_FAN2
R21
0/4
C6
X_C0.1u/16X/4
D25
R834
R835
SYS_FANTAC5
R833
10KR0402
PUMP_FAN1
EC59
X_CD100u16SO-RH
C813
X_0.1u/16V/X/4
C814
X_0.1u/16V/X/4
R832
100R1%/4
R839
2.2K/4
R838
2.2K/4
R837
2.2K/4
Q75
41 SIO_SYS_FAN5
R836
X_0/4
C812
X_C0.1u/16X/4
MICRO-STAR INT'L CO.,LTD.
Fan Control
Centauri
A00
Friday, June 06, 2014
42
50



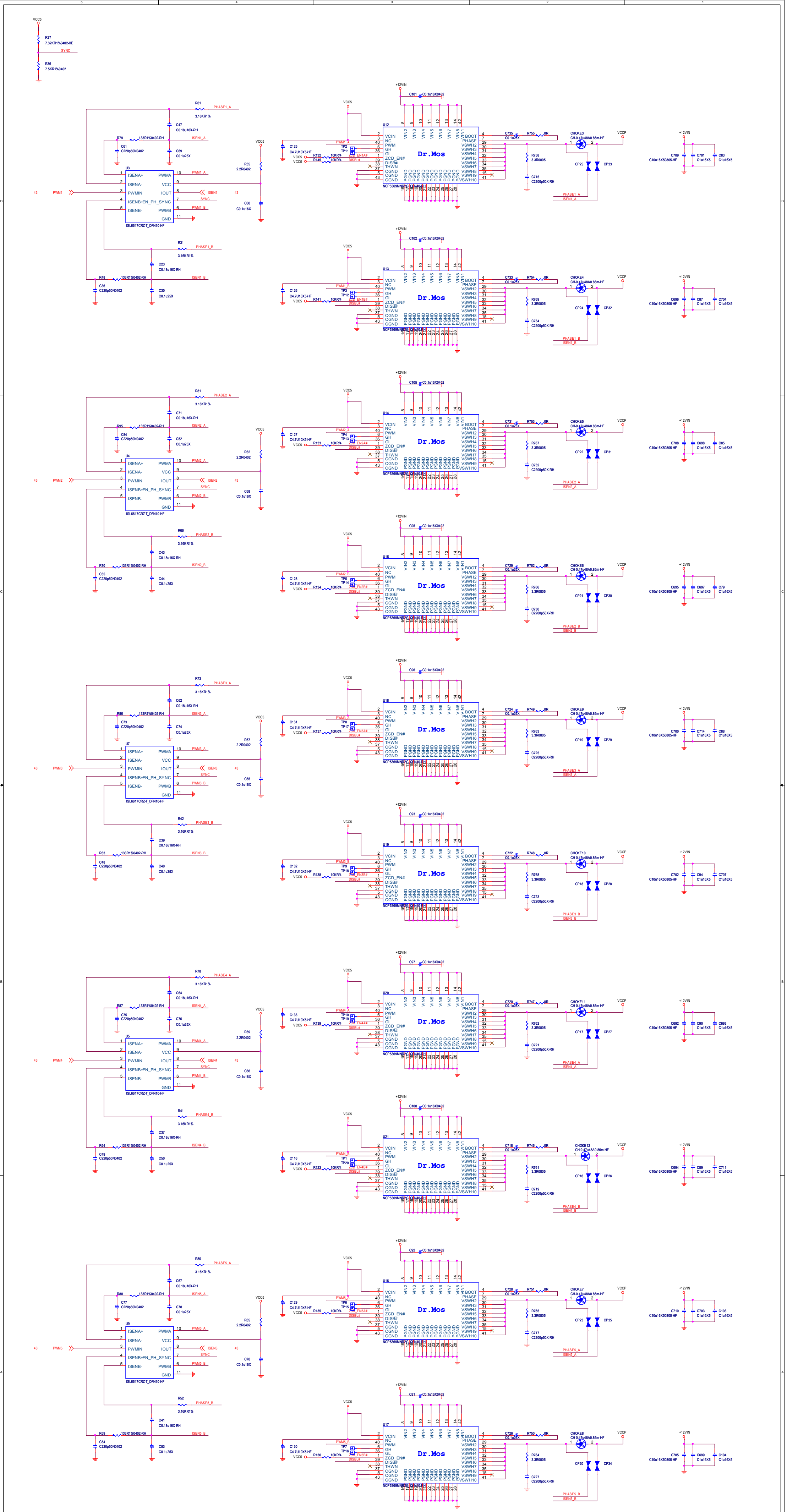
Pin descriptions	Rup	Rdown	Register
BTS_DES_TCOMPS	499K	NC	DFh
BT_FDVID_TCOMP	499K	NC	DFh
ADDR_IMAXS_TMAX	NC	10K	0h
NPSI_DE_IMAX	845K	267K	C3h

MSI MICRO-STAR INTL CO.,LTD.

Title: VRD12.5 - PWM-ISL6376

Size: Centauri | Document Number | Rev: A00

Date: Friday, June 06, 2014 | Sheet 43 of 50



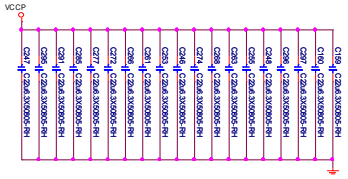
MSI MICRO-START INT'L CO.,LTD.

Title: VCORE(Dr.MOS) PHASE1~10

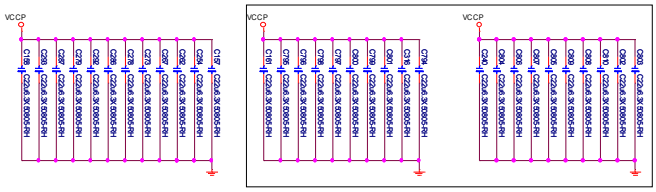
Size | Document Number: Centauri | Rev: A00

Date: Friday, June 06, 2014 | Sheet 44 of 50

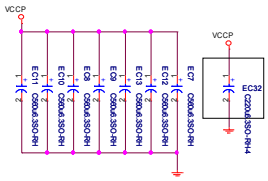
+CPU_VCCP-Decoupling



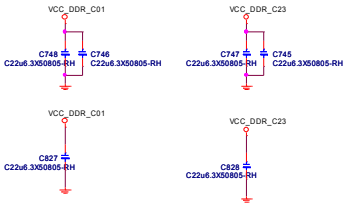
PLACE 0805 CAPS INSIDE CPU SOCKET CAVITY



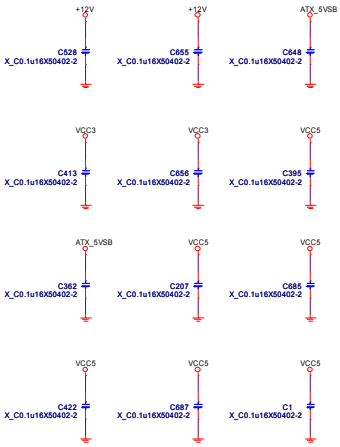
PLACE 0805CAPS Bottom CPU SOCKET edge



CPU VCC DDR Decoupling



EMI



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

Title	CPU Decoupling Caps	
Size	Document Number: Centauri	Rev: A00
Date: Friday, June 06, 2014	Sheet 45 of 50	

DDR III 1.2V POWER

Switch 1 Phase 1.2V 20A

input current 5.7A x2=11.4A > 7.8A (default)

DDR4=1.2V
ICC MAX=22A
OCP=36A

DDR4 Termination Power

VTT=1/2*VDDQ

DDR III 1.2V POWER

Switch 1 Phase 1.2V 20A

input current 5.7A x2=11.4A > 7.8A (default)

DDR4=1.2V
ICC MAX=22A
OCP=36A

DDR4 Regulator Power Source

VPP_2.5V

TDC=3A

VPP_2P5V_C01

TDC=3A

VPP_2P5V_C23

UPI VOLTAGE CONSOLE

ADDRESS	0x2A	0x28	0x26	0x24	0x22	0x20
RH (KOhm)	OPEN	3.9	3	2.2	1.3	10
RL (KOhm)	10	1.3	2.3	3	3.9	OPEN
BUS_SEL	0%	25%	40%	60%	75%	100%

UPI VOLTAGE CONSOLE

ADDRESS	0x2A	0x28	0x26	0x24	0x22	0x20
RH (KOhm)	OPEN	3.9	3	2.2	1.3	10
RL (KOhm)	10	1.3	2.3	3	3.9	OPEN
BUS_SEL	0%	25%	40%	60%	75%	100%

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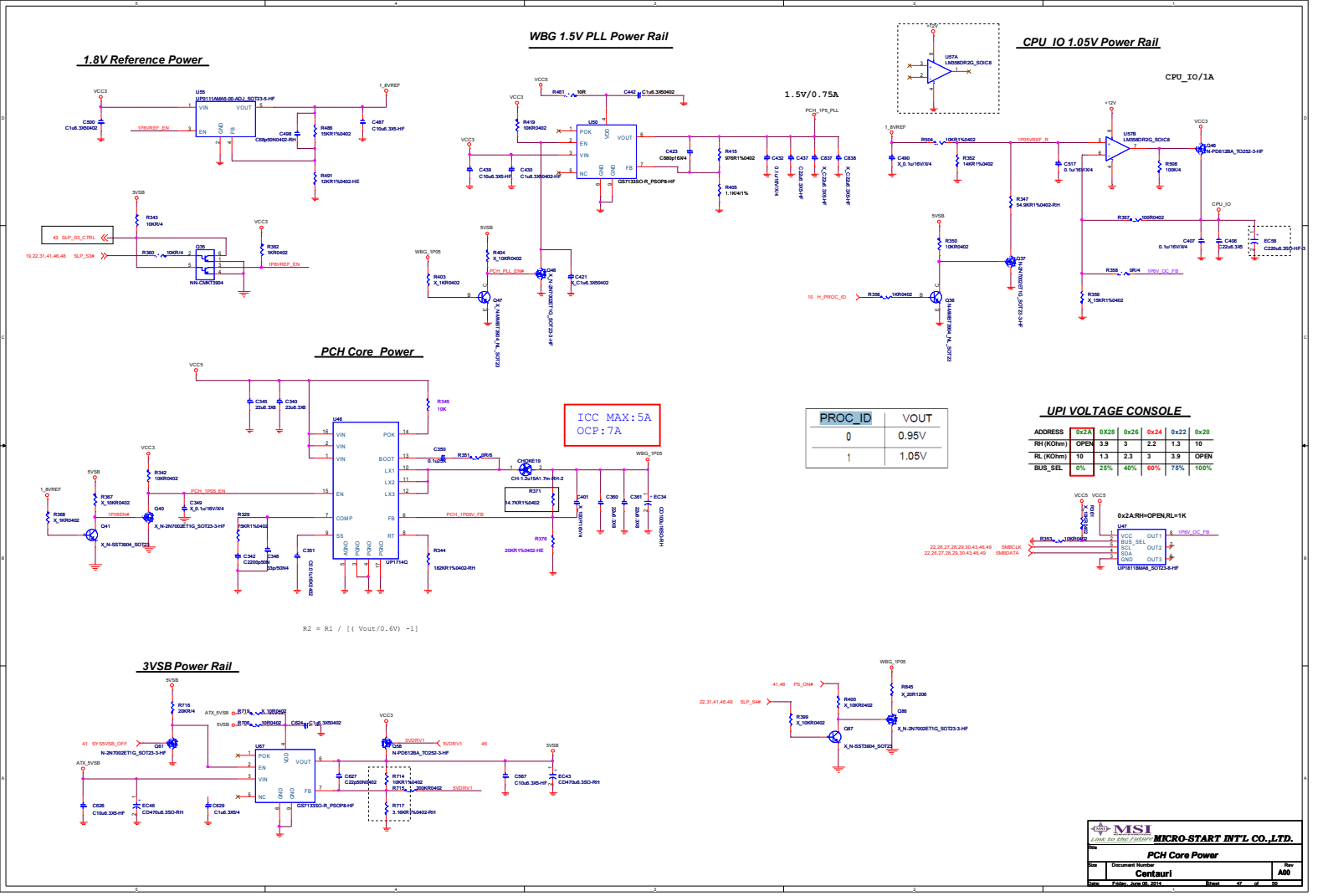
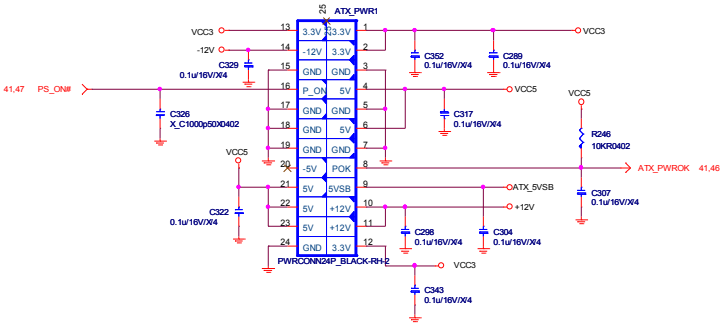
DDR Power

Centauri

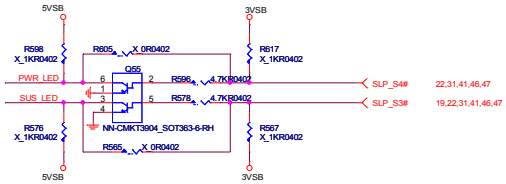
A00


1.8V Reference Power
WBG 1.5V PLL Power Rail
1.5V/0.75A
CPU_IO 1.05V Power Rail
CPU_IO/1A
PCH Core Power
ICC MAX:5A
OCP:7A
PROC_ID
VOUT
0
0.95V
1
1.05V
UPI VOLTAGE CONSOLE
ADDRESS
0x2A
0x28
0x26
0x24
0x22
0x20
RH (KOhm)
OPEN
3.9
3
2.2
1.3
10
RL (KOhm)
10
1.3
2.3
3
3.9
OPEN
BUS_SEL
0%
26%
40%
60%
75%
100%
0x2A:RH=OPEN,RL=1K
R2 = R1 / [(Vout/0.6V) -1]
3VSB Power Rail
MSI
MICRO-START INT'L CO.,LTD.
PCH Core Power
Centauri
A00
Friday, June 06, 2014

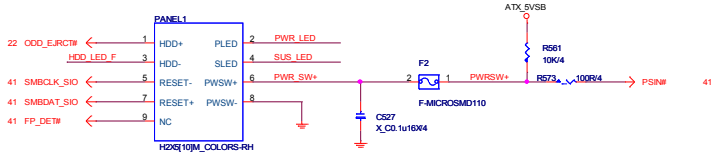
24 Pin ATX Power Connector



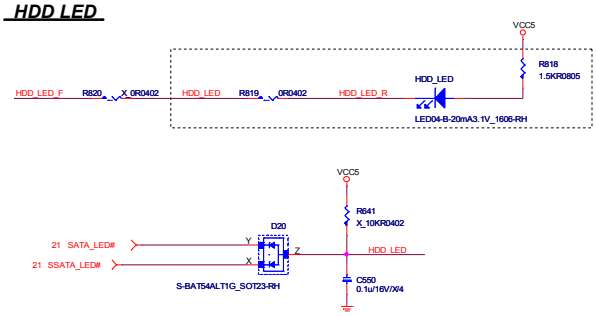
Power LED



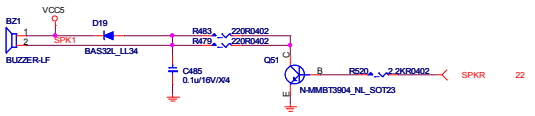
Front Panel



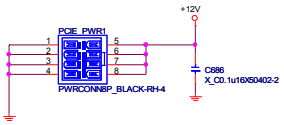
HDD LED



Buzzer Circuit



GFX Power



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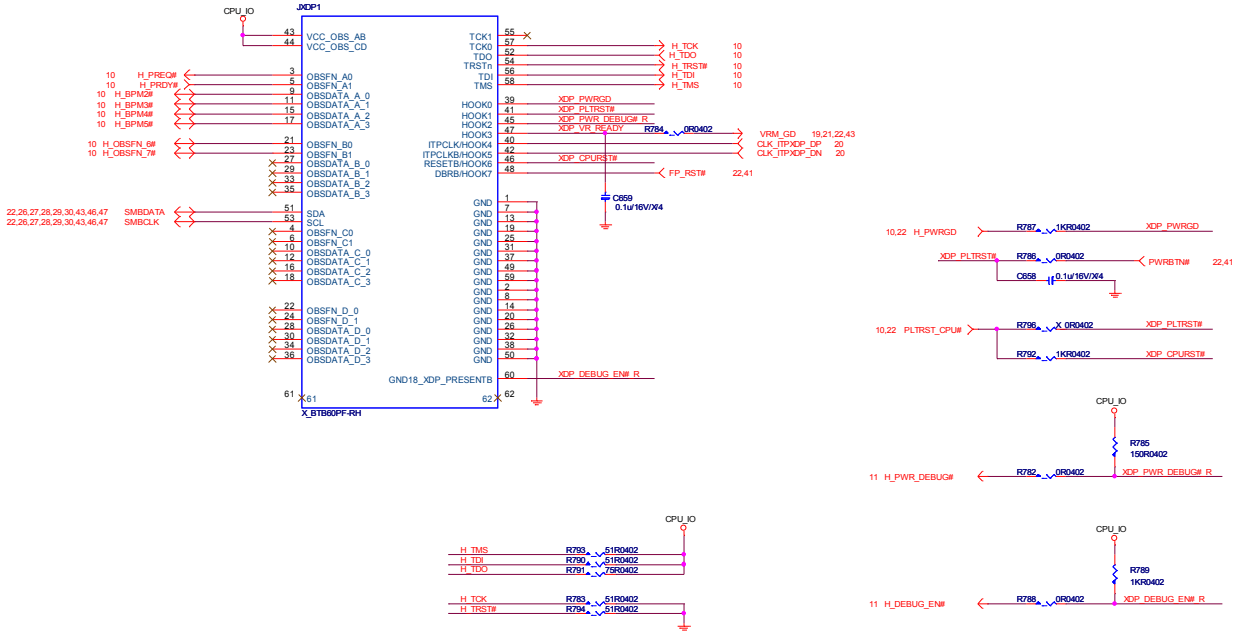
Title: ATX/F_Panel/LED

Size | Document Number: Centauri | Rev: A00

Date: Friday, June 06, 2014 | Sheet 48 of 50

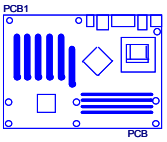
CPU XDP PORT



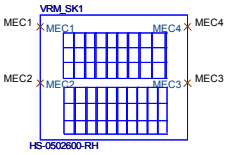
MSI Link to the Future MICRO-START INT'L CO.,LTD.

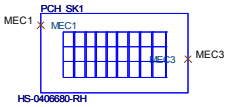
Title: CPU XDP		
Size	Document Number: Centauri	Rev: A00
Date: Friday, June 06, 2014	Sheet 49 of 50	

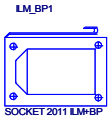
Manual Parts



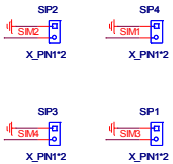
PF0-0786210-ZX4

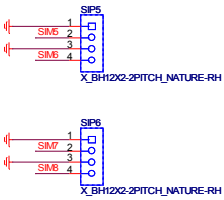


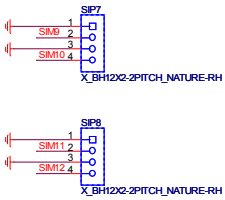




Simulation

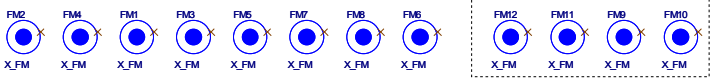






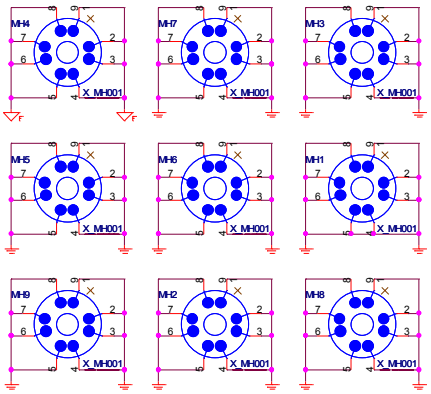
Optics Orientation Holes

Optical Fiducial Marks-120



PCB Mounting Holes

Mounting Holes



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Title: Manual Parts Parts		
Size	Document Number: Centauri	Rev: A00
Date: Friday, June 06, 2014	Sheet 50 of 50	