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Andromeda-R2 Mini-ITX Ver: A00

CPU:
INTEL-ShakeBay LGA1150

System Chipset:
INTEL-lynx Point H87

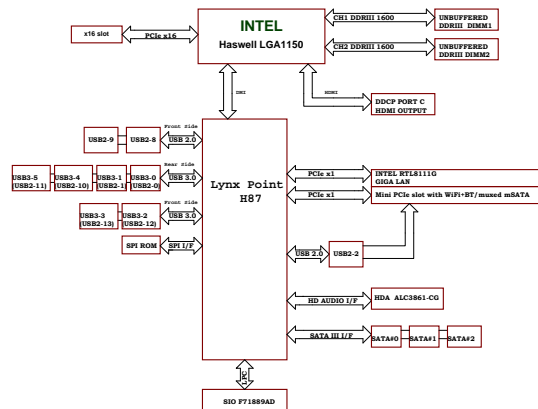
OnBoard Chipset:
HD Audio Codec:ALC3861-CG
LAN-RTL8111G
SIO:Fintek F71889AD
Flash ROM: 64 Mb SPI Quad read

Main Memory:
DDRIII (1333MHz/1600MHz) * 2 (Dual Channel) DDR3/DDR3L @1.5V

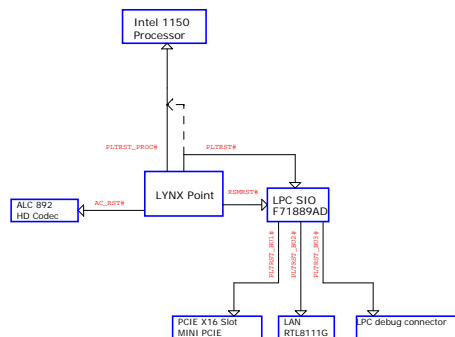
Expansion Slots:
PCI Express (X16) Slot * 1
Mini PCIe(X1) Slot * 1 (SUPPORT mSATA)

PWM:
VRD12.5 - Onsemi 81102 3Phase Dr.MOS

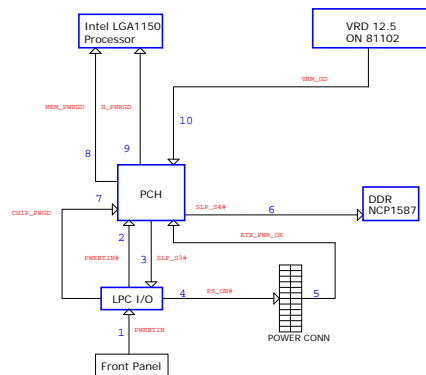
Block Diagram



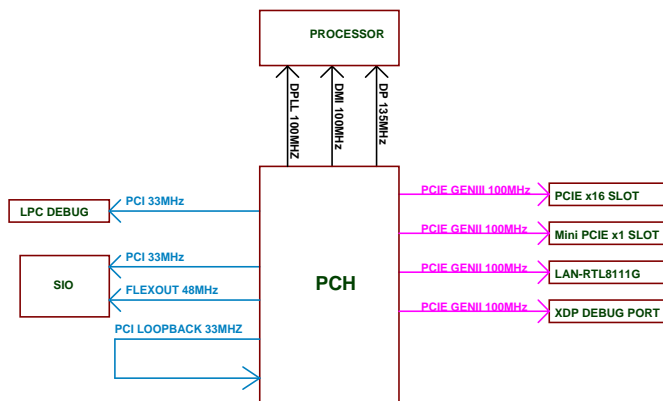
RESET MAP



PWROK MAP



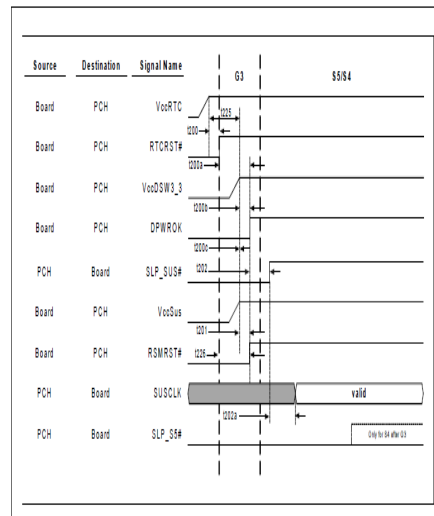
CLK MAP



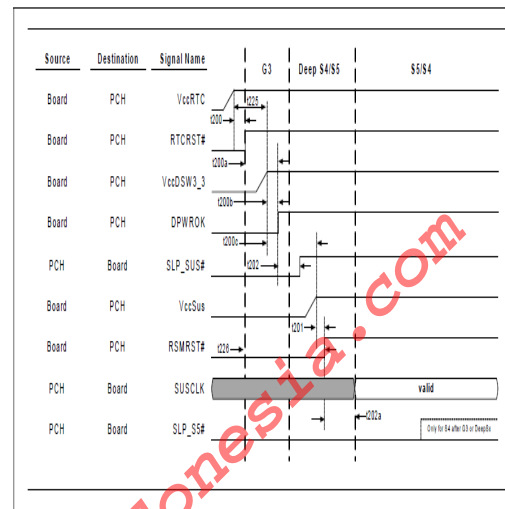
Power ON Sequence

G3-->S5

G3 w/RTC Loss to S4/S5 (Without Deep Sx Support) Timing Diagram



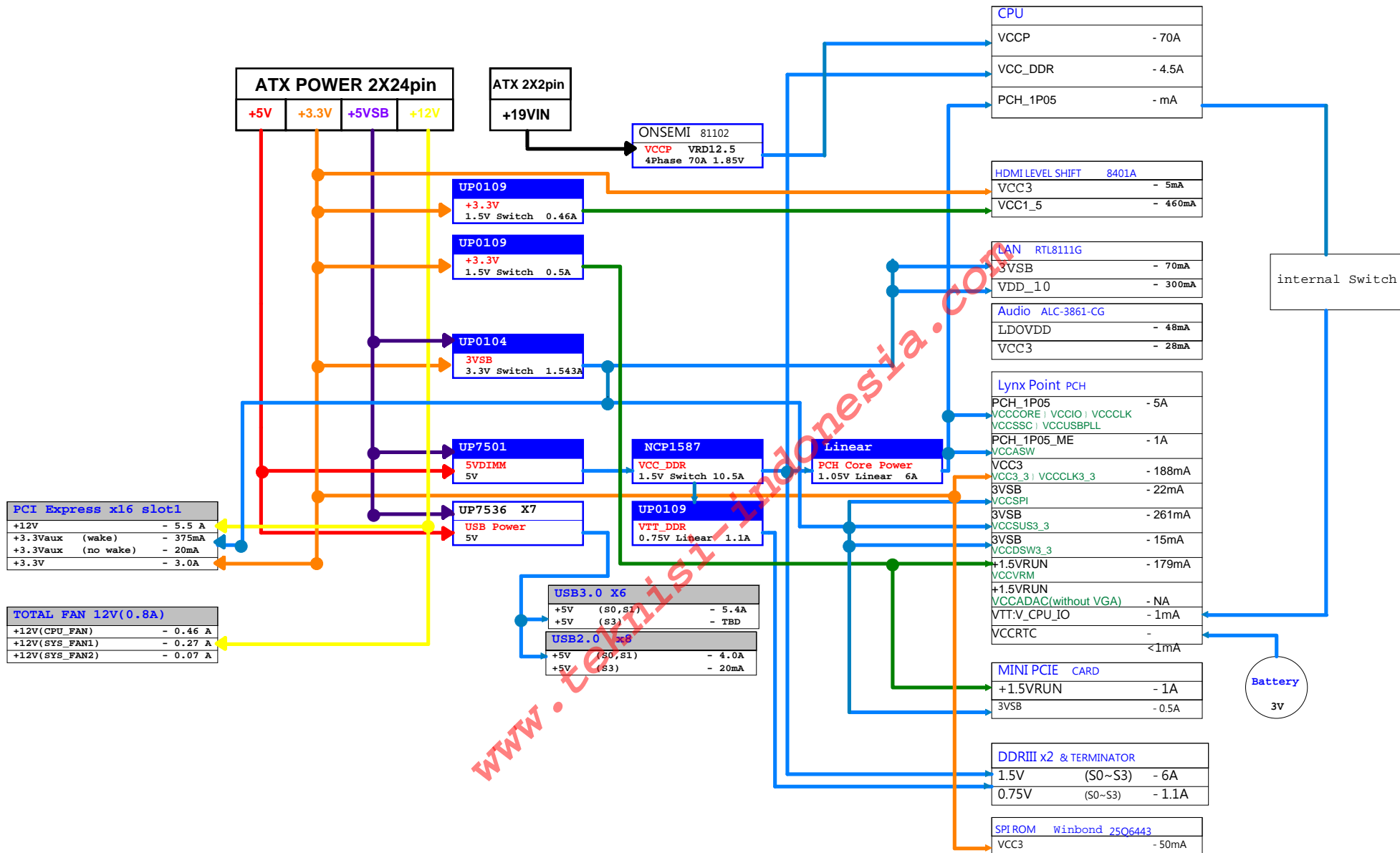
G3 w/RTC Loss to S4/S5 (With Deep Sx Support) Timing Diagram



Power ON Sequence

~~S5-->S0~~





Lynx Point

GPIO	Alt Func	I/O/NC	Power	Tol	Default	Signal Name
GPIO[0]	BMBUSY#	I/O	Core	3.3V	GPI	PULL-UP
GPIO[1]	TACH1	I/O	Core	3.3V	GPI	PULL-UP
GPIO[5:2]	PIRQ[H:E]#	I/OD	Core	5V	GPI	PCI_PIRQ[H:E]
GPIO[7:6]	TACH[3:2]	I/O	Core	3.3V	GPI	PULL-UP
GPIO[8]	unmuxed	I/O	Resume	3.3V	GPO	PULL-UP
GPIO[9]	OC5#	I/O	Resume	3.3V	Native	USB_OCP#5
GPIO[10]	OC6#	I/O	Resume	3.3V	Native	USB_OCP#6
GPIO[11]	SMBALERT#	I/O	Resume	3.3V	Native	PULL-UP
GPIO[12]	LAN_PHY_PWR_CTRL	I/O	Resume	3.3V	Native	PULL-UP
GPIO[13]	unmuxed	I/O	Resume	3.3V	GPI	PULL-UP
GPIO[14]	OC7#	I/O	Resume	3.3V	Native	USB_OCP#7
GPIO[15]	unmuxed	I/O	Resume	3.3V	GPO	PULL-UP
GPIO[16]	SATA4GP	I/O	Core	3.3V	GPI	PULL-UP
GPIO[17]	TACH0	I/O	Core	3.3V	GPI	PULL-UP
GPIO[18]	unmuxed	I/O	Core	3.3V	Native	PULL-UP
GPIO[19]	SATA1GP	I/O	Core	3.3V	GPI	PULL-UP
GPIO[20]	SMT#	I/O	Core	3.3V	Native	PULL-UP
GPIO[21]	SATA0GP	I/O	Core	3.3V	GPI	PULL-UP
GPIO[22]	SCLOCK	I/O	Core	3.3V	GPI	PULL-UP
GPIO[23]	LDRQ1#	I/O	Core	3.3V	Native	PULL-UP
GPIO[24]	unmuxed	I/O	Resume	3.3V	GPO	reserve
GPIO[25]	unmuxed	I/O	Resume	3.3V	GPO	PULL-UP
GPIO[26]	unmuxed	I/O	Resume	3.3V	GPO	PULL-UP
GPIO[27]	unmuxed	I/O	DSW	3.3V	GPI	PULL-UP
GPIO[28]	unmuxed	I/O	Resume	3.3V	GPO	PULL-UP
GPIO[29]	SLP_LAN#	I/O	DSW	3.3V	GPI	PULL-UP
GPIO[30]	SUS_PWR_DN_ACK	I/O	Resume	3.3V	Native	PULL-UP
GPIO[31]	unmuxed	I/O	DSW	3.3V	GPI	PULL-UP
GPIO[32]	unmuxed	I/O	Core	3.3V	GPO	SPI_WP#
GPIO[33]	unmuxed	I/O	Core	3.3V	GPO	PULL-UP
GPIO[34]	unmuxed	I/O	Core	3.3V	GPI	PULL-UP
GPIO[35]	NMI#	I/O	Core	3.3V	GPO	PULL-UP
GPIO[36]	SATA2GP	I/O	Core	3.3V	GPI	PULL-UP
GPIO[37]	SATA3GP	I/O	Core	3.3V	GPI	PULL-UP
GPIO[38]	SLOAD	I/O	Core	3.3V	GPI	SPI_HOLD_GPO#
GPIO[39]	SDATAOUT0	I/O	Core	3.3V	GPI	PULL-UP
GPIO[43:40]	OC[4:1]#	I/O	Resume	3.3V	Native	USB_OCP#[1:4]
GPIO[44]	unmuxed	I/O	Resume	3.3V	Native	PULL-UP
GPIO[45]	unmuxed	I/O	Resume	3.3V	Native	PULL-UP
GPIO[46]	unmuxed	I/O	Resume	3.3V	Native	PULL-UP
GPIO[47]	unmuxed	I/O	Resume	3.3V	Native	NC(NO AVAILABLE)
GPIO[48]	SDATAOUT1	I/O	Core	3.3V	GPI	PULL-UP
GPIO[49]	SATA5GP	I/O	Core	3.3V	GPI	muxed mSATA
GPIO[50]	unmuxed	I/O	Core	3.3V	GPI	PULL-UP
GPIO[51]	GNT1#/GSXDOUT	I/O	Core	3.3V	GPO	BIOS BOOT
GPIO[52]	unmuxed	I/O	Core	3.3V	GPI	PULL-UP
GPIO[53]	GNT2#/GSXDIN	I/O	Core	3.3V	GPO	DMI MODE
GPIO[54]	unmuxed	I/O	Core	3.3V	GPI	PULL-UP
GPIO[55]	GNT3#	I/O	Core	3.3V	GPO	PULL-UP
GPIO[56]	unmuxed	I/O	Resume	3.3V	Native	NC(NO AVAILABLE)
GPIO[57]	unmuxed	I/O	Resume	3.3V	GPI	PULL-UP
GPIO[58]	SML1CLK	I/O	Resume	3.3V	Native	PULL-UP
GPIO[59]	OC#0	I/O	Resume	3.3V	Native	USB_OCP#0
GPIO[60]	SML0ALERT#	I/O	Resume	3.3V	Native	PULL-UP
GPIO[61]	SUS_STAT#	I/O	Resume	3.3V	Native	NC
GPIO[62]	SUSCLK	I/O	Resume	3.3V	Native	NC
GPIO[63]	SLP_S5#	I/O	Resume	3.3V	Native	SLP_S5#
GPIO[64]	unmuxed	I/O	Core	3.3V	Native	NC
GPIO[65]	unmuxed	I/O	Core	3.3V	Native	NC
GPIO[66]	unmuxed	I/O	Core	3.3V	Native	NC
GPIO[67]	unmuxed	I/O	Core	3.3V	Native	SIO_48MHZ_OUT
GPIO[71:68]	TACH[7:4]	I/O	Core	3.3V	GPI	PULL-UP
GPIO[72]	unmuxed	I/O	Resume	3.3V	Native	PULL-UP
GPIO[73]	unmuxed	I/O	Resume	3.3V	Native	PULL-UP
GPIO[74]	SML1ALERT#	I/O	Resume	3.3V	Native	PULL-UP
GPIO[75]	SML1DATA	I/O	Resume	3.3V	Native	PULL-UP

DDR-III DIMM Config.

DEVICE ADDRESS CLOCK

DIMM 1	00	MEM_MA_CLK_H0/L0 MEM_MA_CLK_H1/L1
DIMM 2	10	MEM_MB_CLK_H0/L0 MEM_MB_CLK_H1/L1

SIO(F71889AD)

GPIO	Alt Function	TYPE	Singal Name
GPIO00	ERP_CTRL2#	I/O OD	NC
GPIO01	SUS_ACK#	I/O OD	SUS_ACK#
GPIO02	DPWROK	I/OD	DPWROK
GPIO03	SLOT0CC#	I/O OD	SKTOCC#
GPIO04	LED_VSB	I/O OD	LED_VSB
GPIO05	LED_VCC	I/O OD	LED_VCC
GPIO06	SUSC#/BEEP/ALERT#	I/O OD	USB_MODE
GPIO10	FANIN3/IRRX1	I/O OD	SYS_FAN2
GPIO11	FANCTL3/IRTX1	I/O OD	SYS_FAN2_CTL
GPIO12	CIR_LED#/WDTRST#	I/O OD	WDT#
GPIO13	CIRTX/TSI_CLK/IBX_CLK	I/O OD	F_AUDIO_DET#
GPIO14	CIRWB#/TSI_DAT/IBX_SDA	I/O OD	NC
GPIO15	TSI_CLK/IBX_CLK	I/O OD	SST_CTL
GPIO16	PECI/TSI_DAT/IBX_SDA	I/O OD	H_PECI
GPIO25	CIRRX#	I/O OD	PAS_DET#
CPIO26	SLP_SUS#	I/O OD	SLP_SUS#
GPIO27	SUS_WARN#	I/O OD	SUS_WARN#
GPIO30	DCD2#/SEGG	I/O OD	PULL-UP (reserve)
GPIO31	RI2#/SEGF	I/O OD	PULL-UP (reserve)
GPIO32	CTS2#/SEGA	I/O OD	PULL-UP (reserve)
GPIO33	DTR2#/SEGD	I/O OD	PULL-UP (reserve)
GPIO34	RTS2#/SEGC/PWM_DC	I/O OD	PULL-UP (reserve)
GPIO35	DSR2#/IL#	I/O OD	PULL-UP (reserve)
GPIO36	SOUT2/SEGB/OVP_STRAP	I/O OD	PULL-UP (reserve)
GPIO37	SIN2/SEGE	I/O OD	PULL-UP (reserve)
GPIO40	CIR_LED#	OD	NC
GPIO41	ME flash locked	OD	PULL-UP
GPIO42	disable RJ45 LAN function	OD	PULL-UP
GPIO43	Adpater low trigger-950ms	OD	PULL-UP
GPIO44	HDMI cable detect(active high)	OD	PULL-UP
GPIO45	disable WLAN function	OD	PULL-UP
GPIO46		OD	NC
GPIO47	CPU Fan speed control	OD	NC(default)
GPIO50		OD	card_detect#
GPIO51		OD	mSATA_detect#
GPIO52		OD	Combo_card_detect#
GPIO53		OD	PULL-UP
GPIO54		OD	PULL-UP
GPIO60	SLCT	I/O OD	PULL-UP
GPIO61	PE	I/O OD	PULL-UP
GPIO62	BUSY	I/O OD	PULL-UP
GPIO63	ACK#	I/O OD	PULL-UP
GPIO64	INIT#	I/O OD	NC
GPIO65	ERR#	I/O OD	PULL-UP
GPIO66	AFD#	I/O OD	NC
GPIO67	STB#	I/O OD	NC
GPIO[70:77]	IPDO:PD0#	I/O OD	NC

Power On Strapping Table form SIO

Default: Internal Pull-up

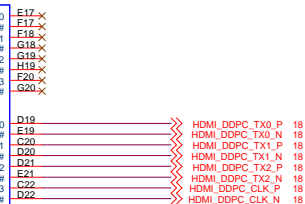
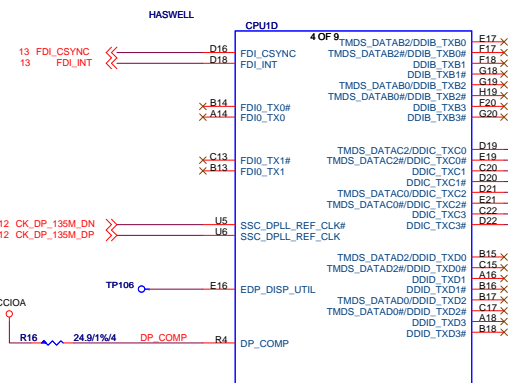
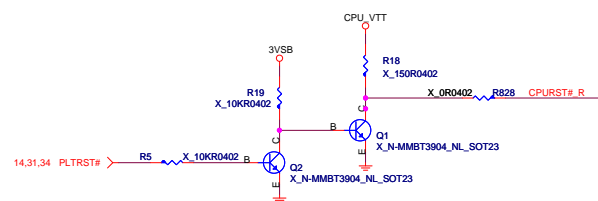
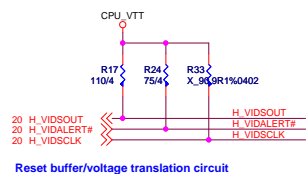
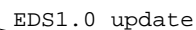
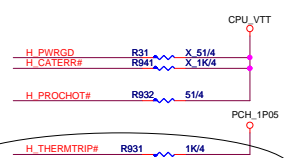
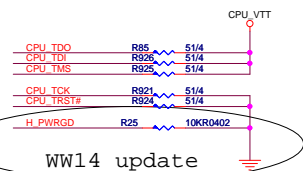
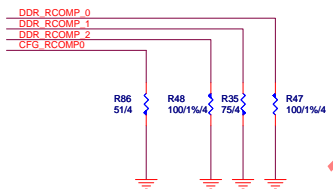
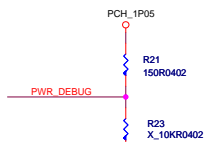
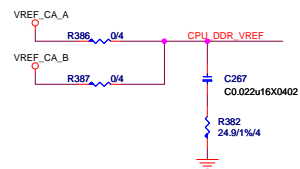
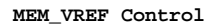
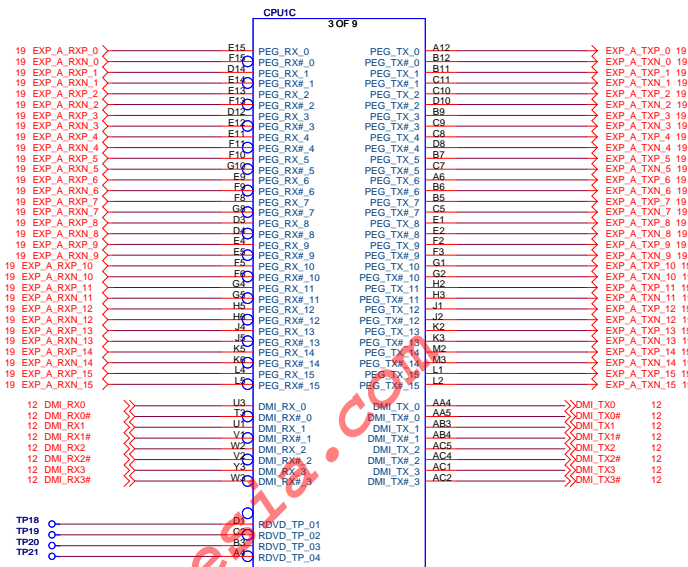
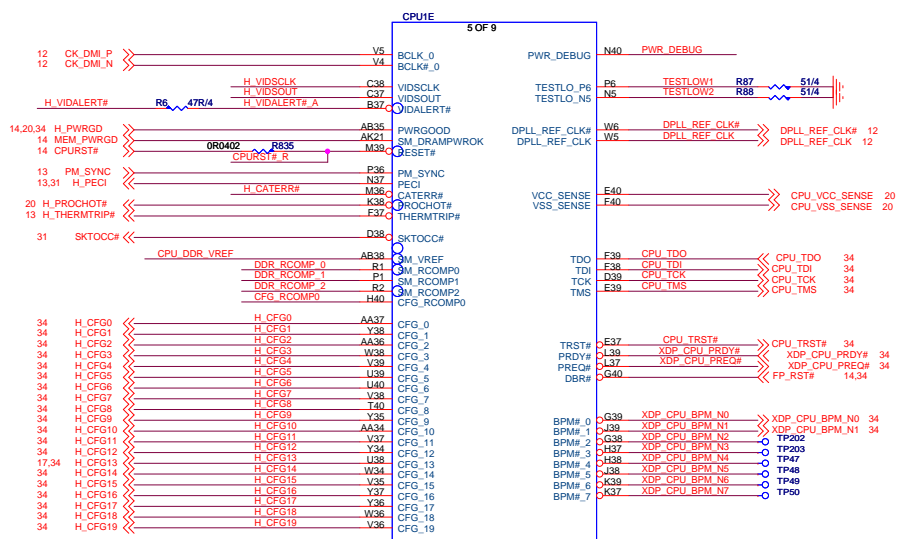
Symbol	Value	Description
DTRB#	1	Pin S1-S6 are GPIO pins
	0	Pin S1-S6 are Bus Interface functions
RTSB#	1	Fan control mode: PWM mode.
	0	Fan control mode: DAC mode.
SLIN#	PU-1k	Pin 100-116 as LPT interfaces
	PU-20k	Pin 100-116 as PVID Controller
	PD-1k	Pin 102/103/111/112 as SVID Controller
	PD-47k	Pin 100-103 and pin 105-116 as GPIO pins
DTRA#	1	Fan full duty is 60%.
	0	Fan full duty is 100%.
RTSA#	1	Enable the 80 port function.
	0	Disable the 80 port function.
SOUTA	1	Configuration Register I/O port is 4EAF.
	0	Configuration Register I/O port is 2E2F.
SOUT2	1	OVP warning mode
	0	OVP force mode

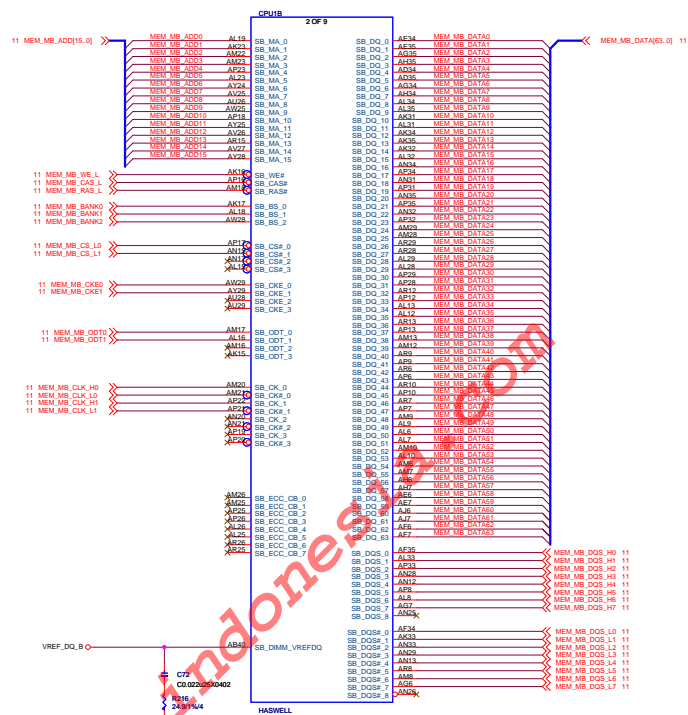
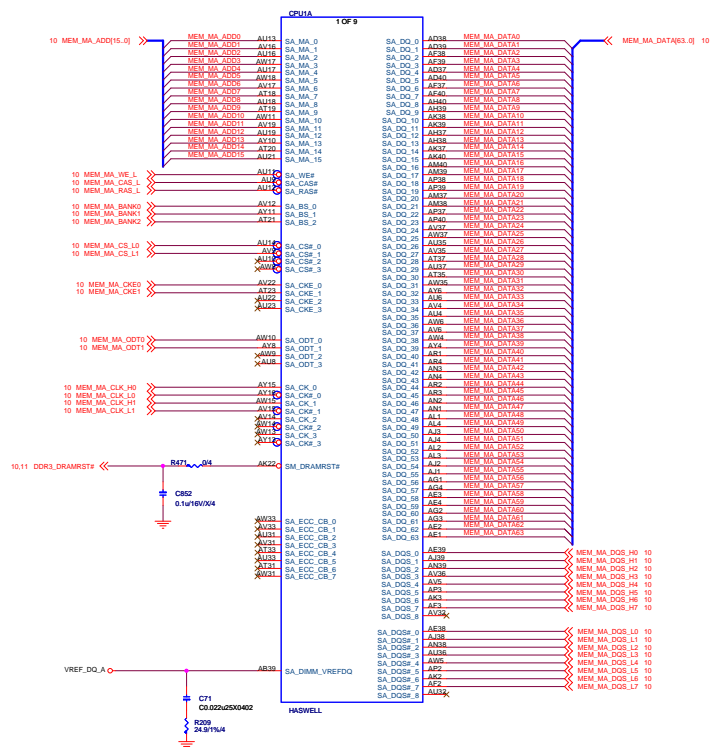


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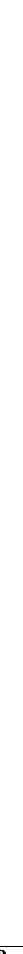
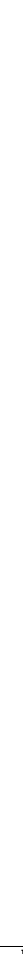
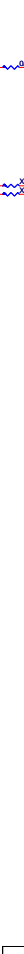
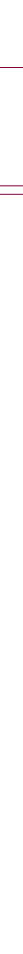
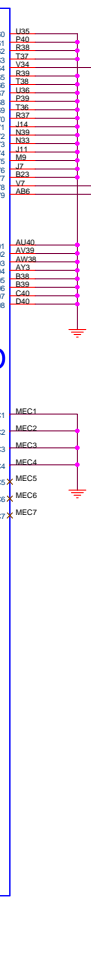
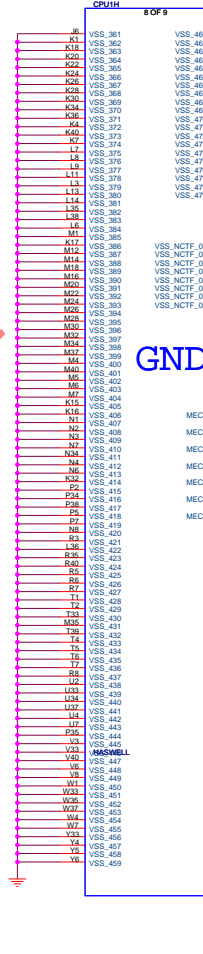
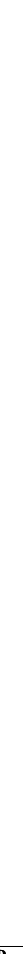
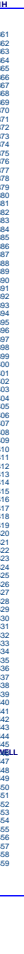
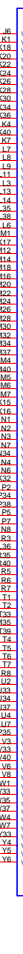
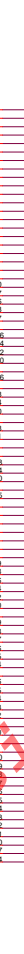
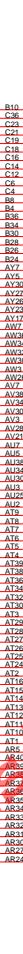
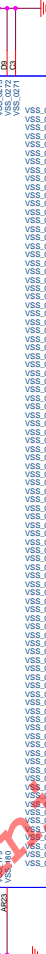
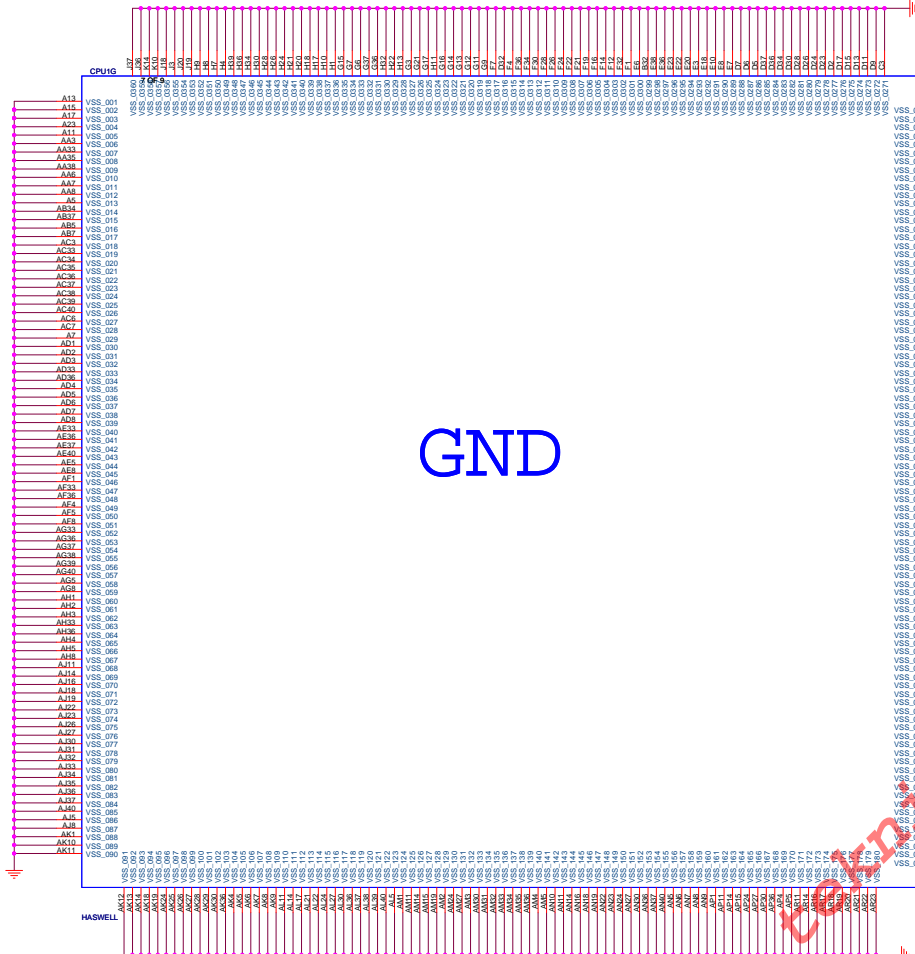
Andromeda-R2

Size Custom Document Description PCH & SIO GPIO setting Rev A00
Date: Friday, March 01, 2013 1 Sheet 6 of 35

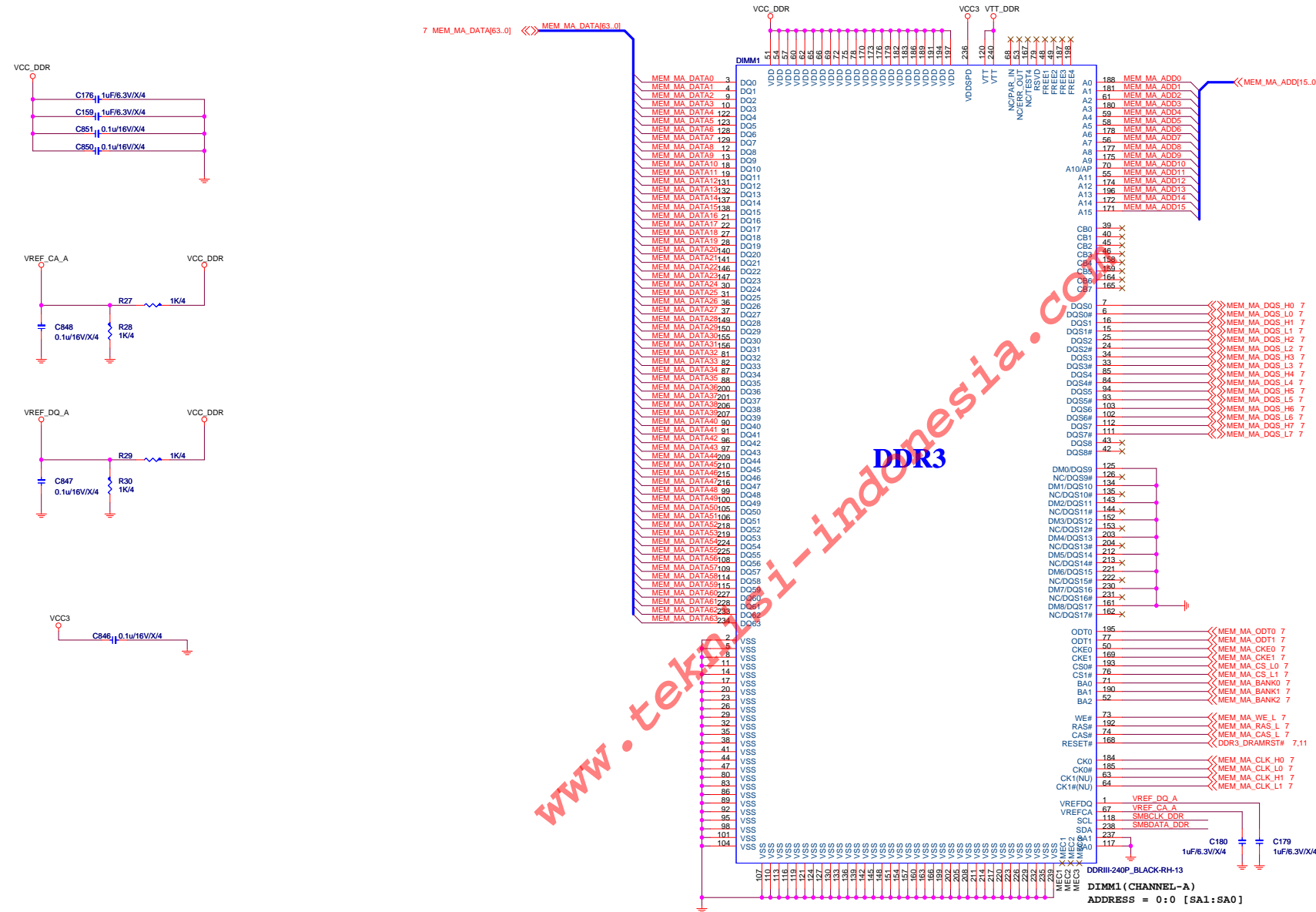




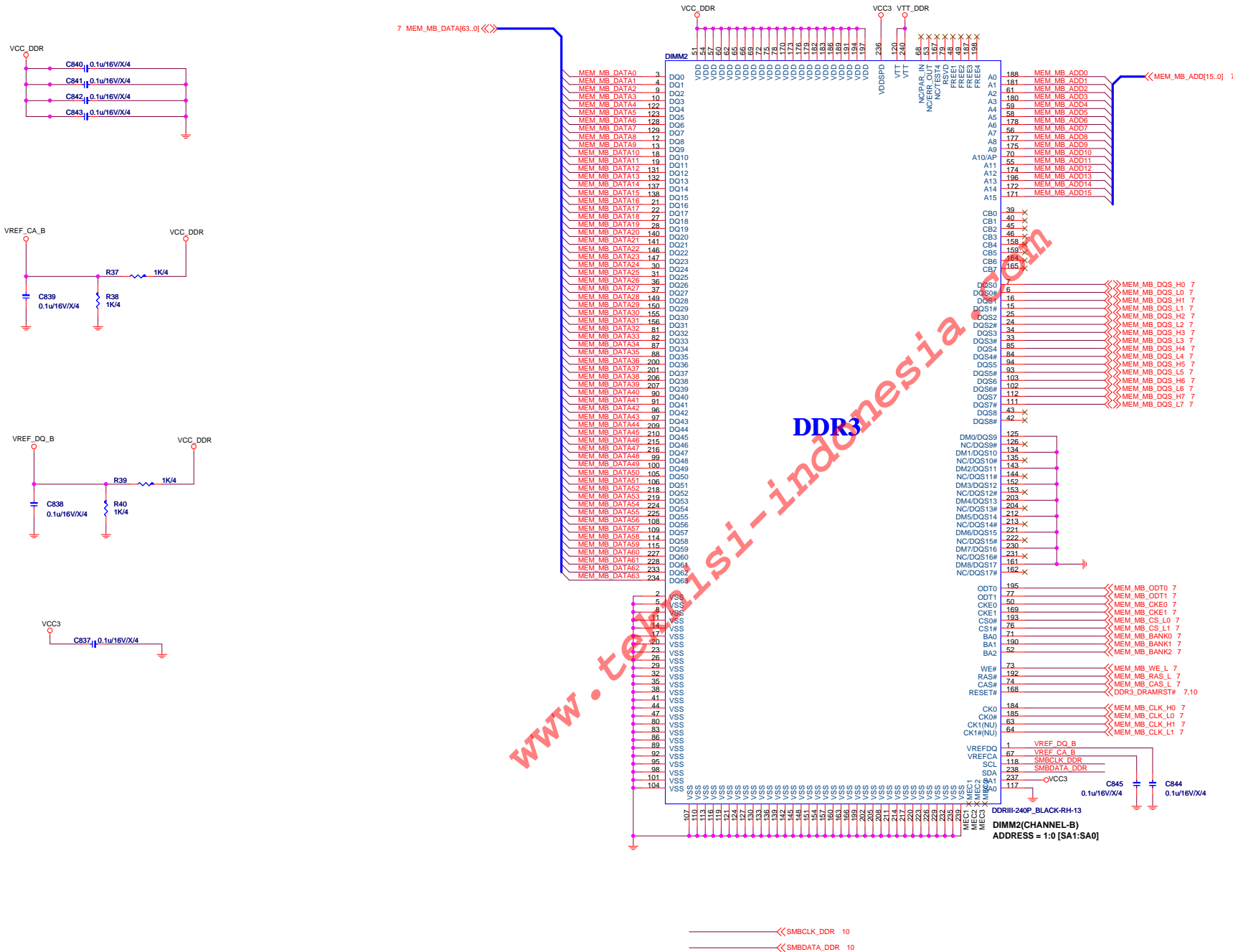
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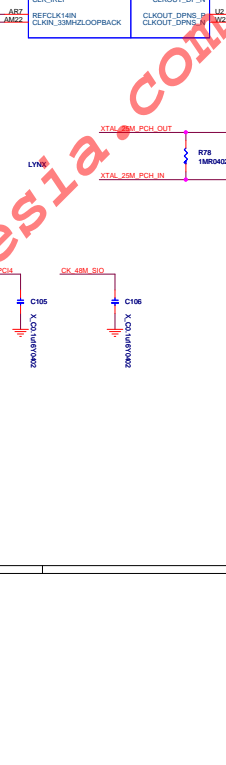
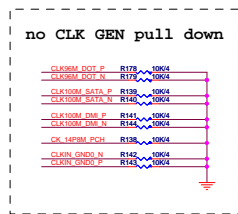


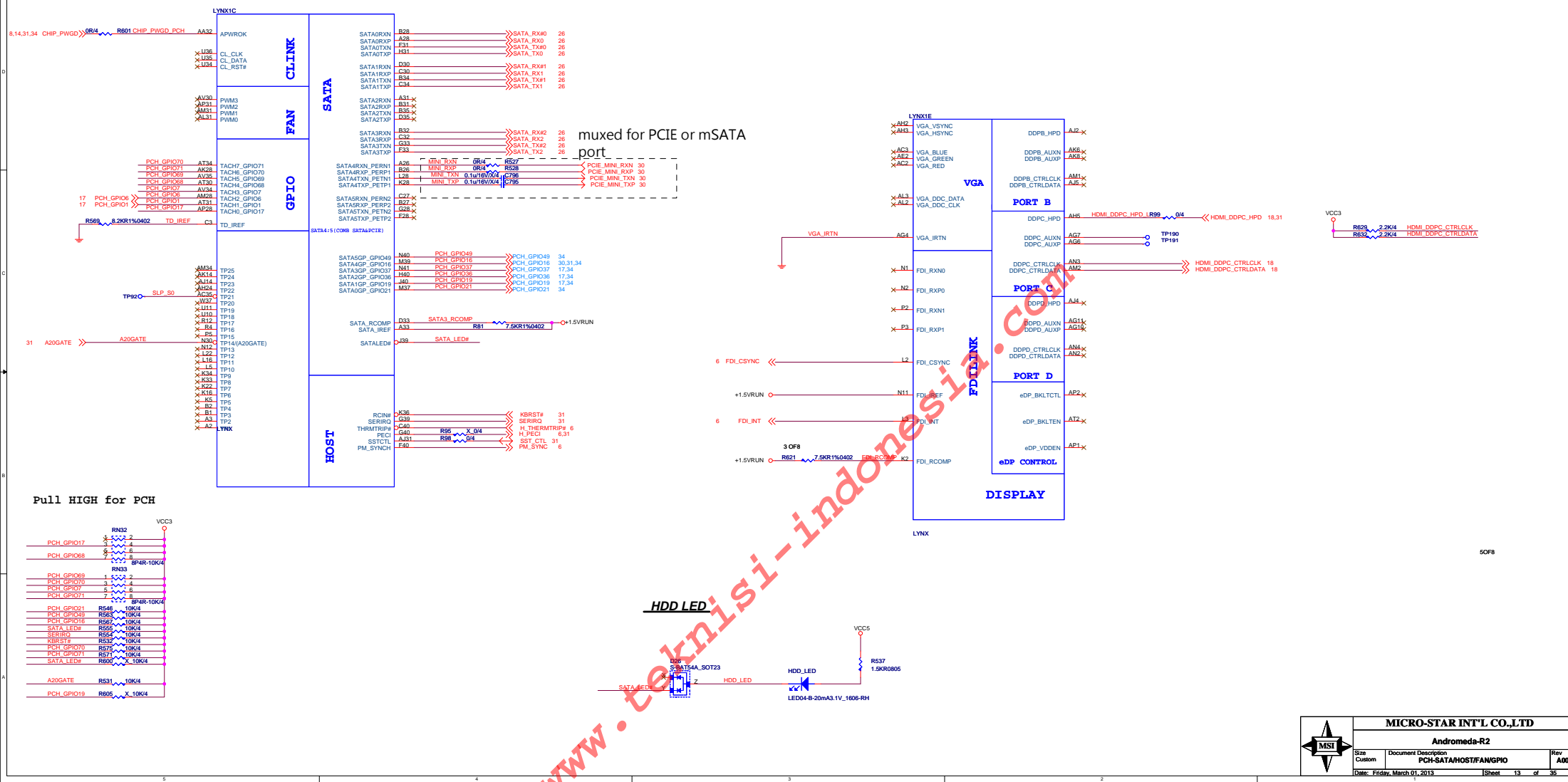
DDR3 DIMM1_A0

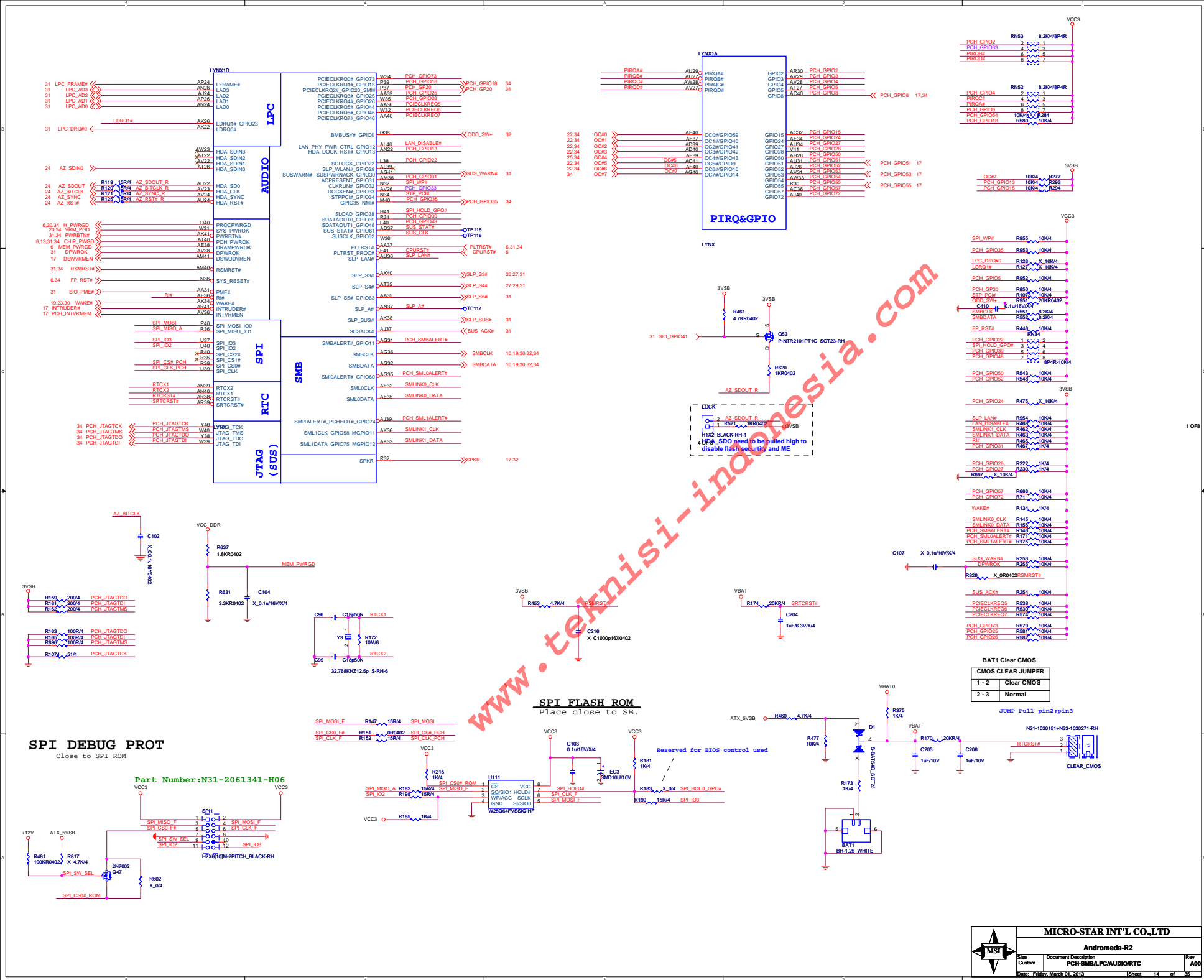


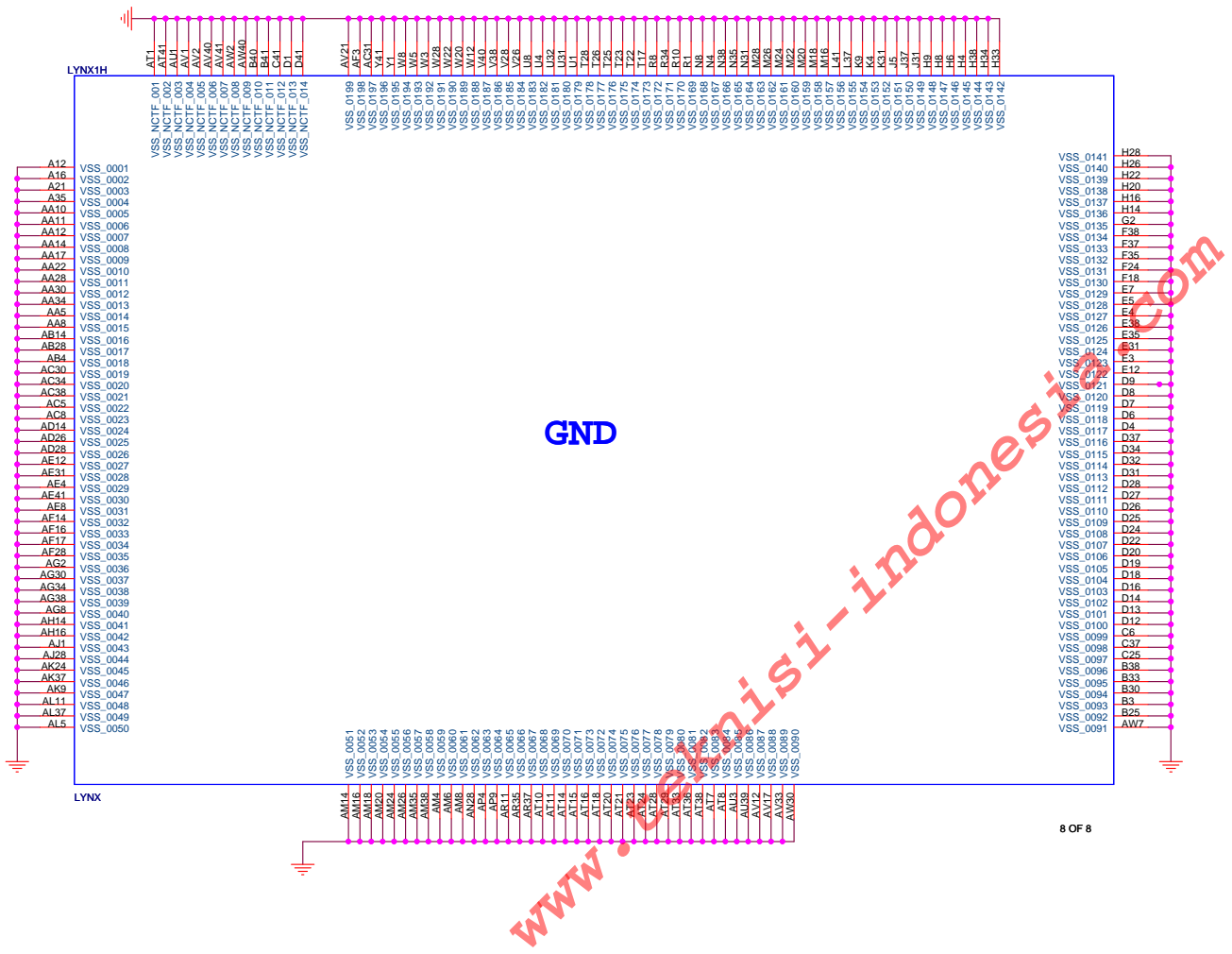
DDR3 DIMM2_B0



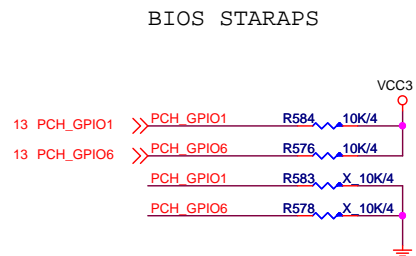
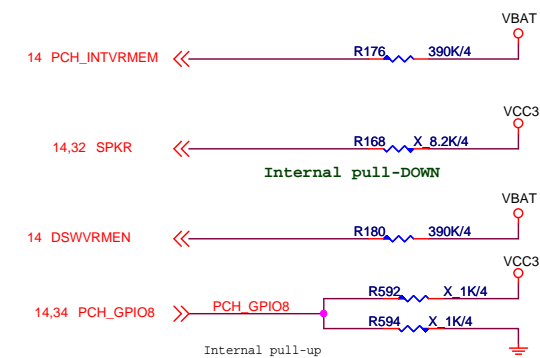




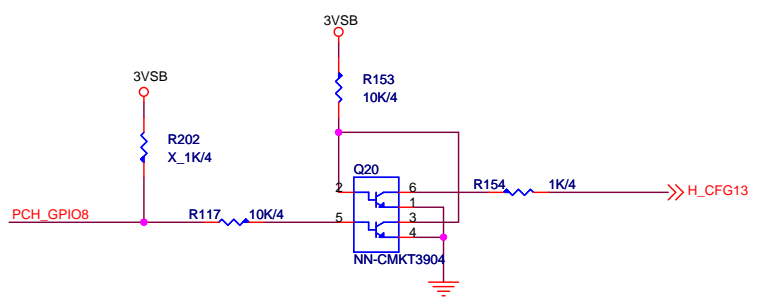




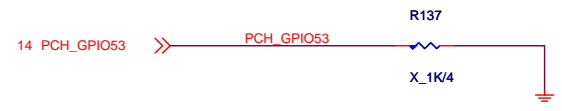
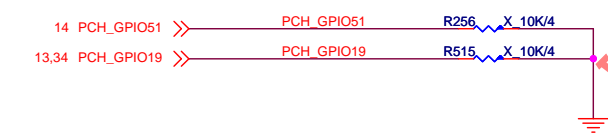
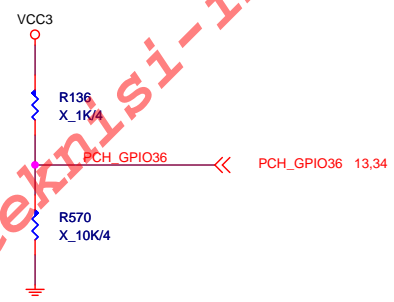
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BIOS STARAPS	GPIO1	GPIO6
0A	1	1
NA	0	0



BOOT DEVICE	GPIO51	GPIO19
LPC	0	0
SPI	1	1



DMI AC COUPLING
FULL VOLTAGE MODE WHEN SAMPLE LOW

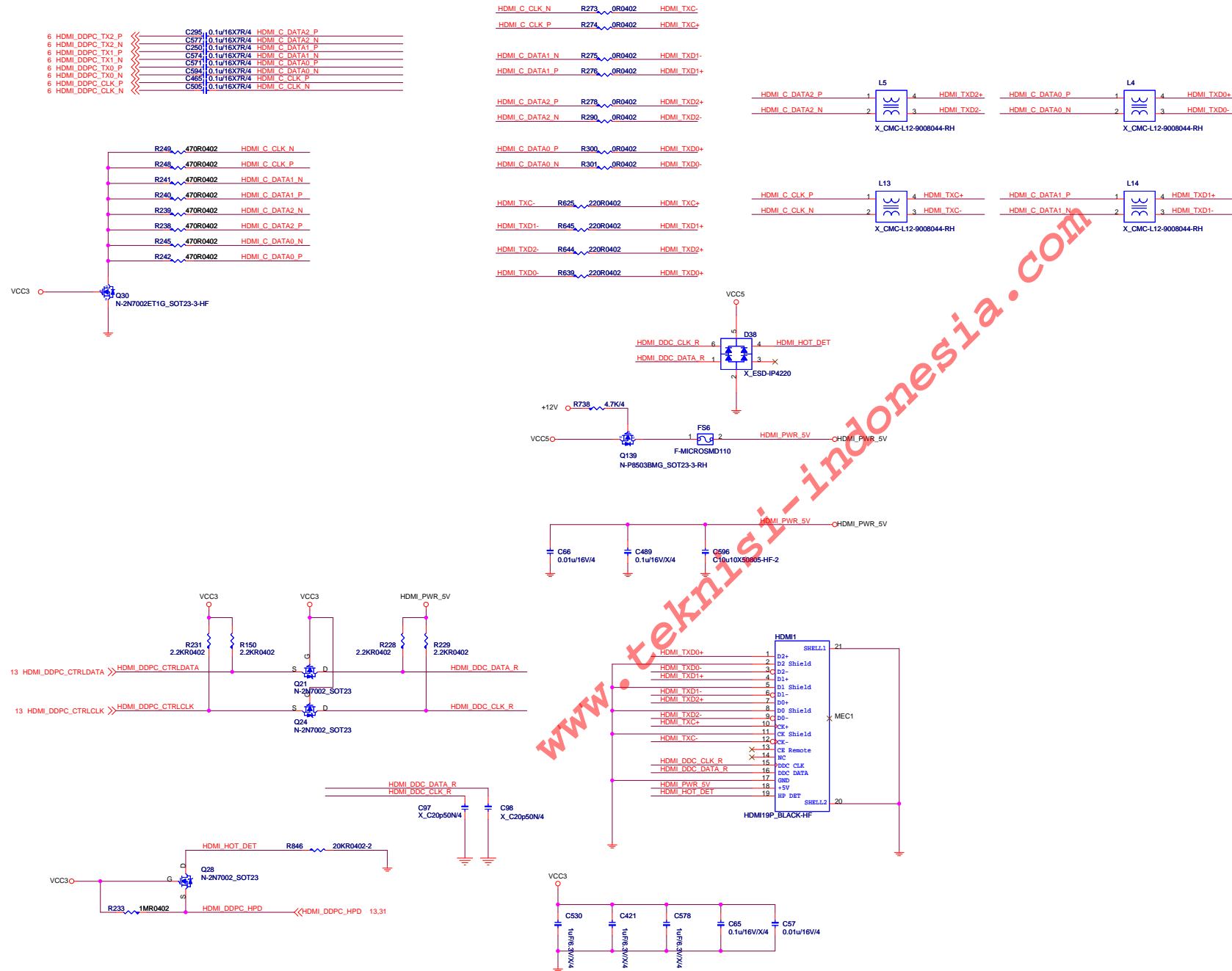
A16 SWAP OVERRIDE
OVERRIDE I FSAMPLE LOW

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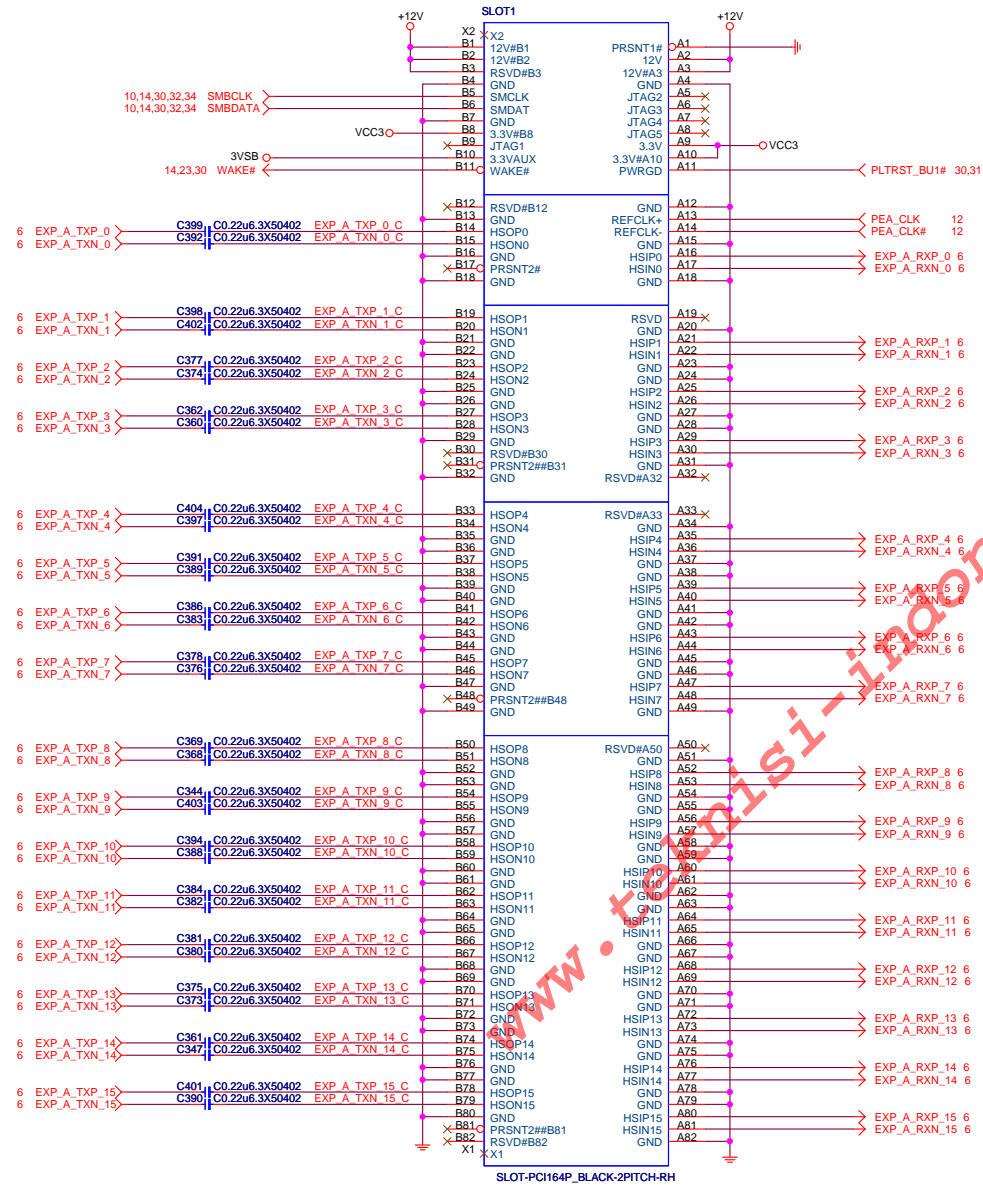
Andromeda-R2

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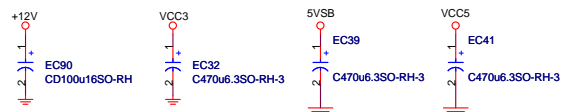
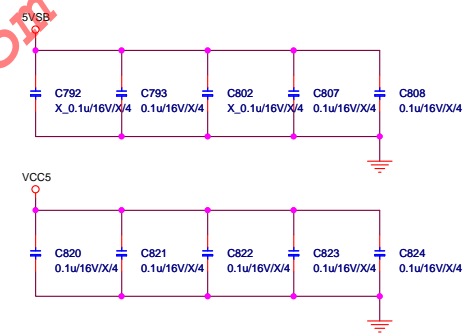
Cost reduced level shifter



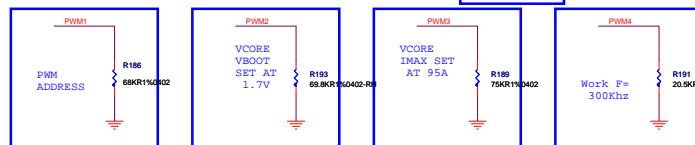
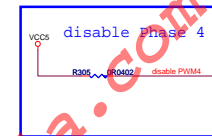
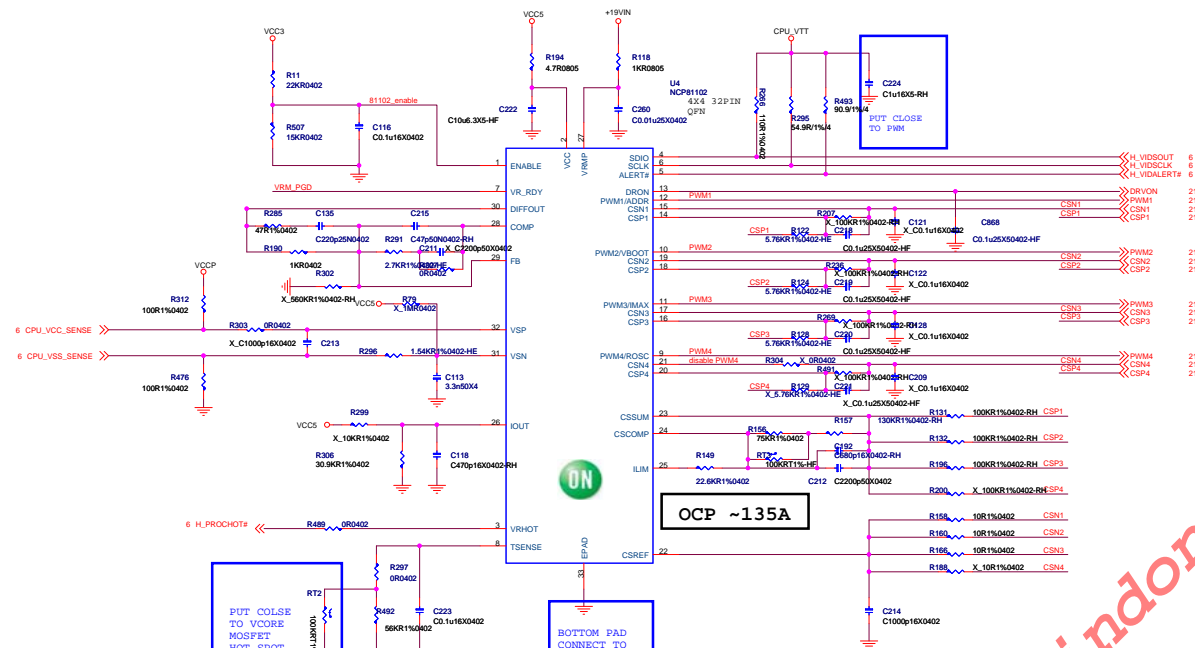
PCI EXPRESS X16 SLOT



EMI solution



VOLTAGE REGULATOR MODULE (VRD12.5)

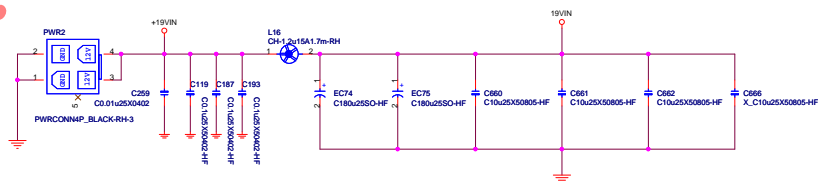
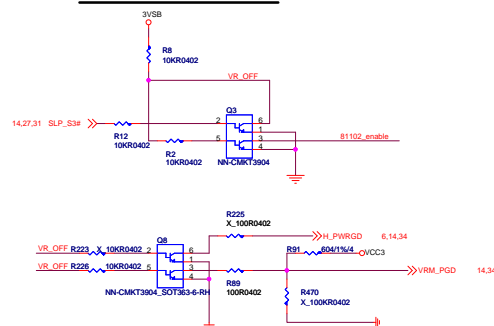


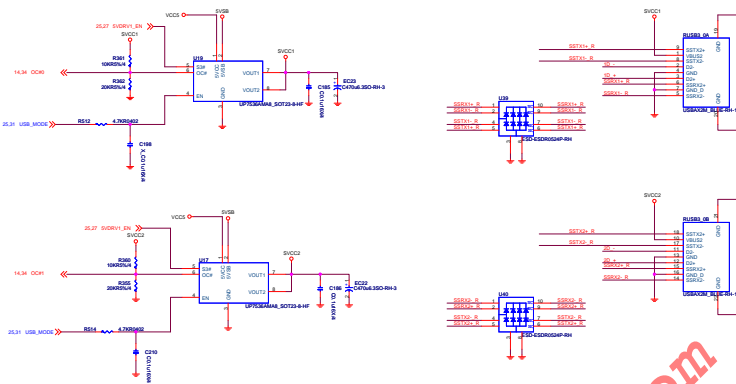
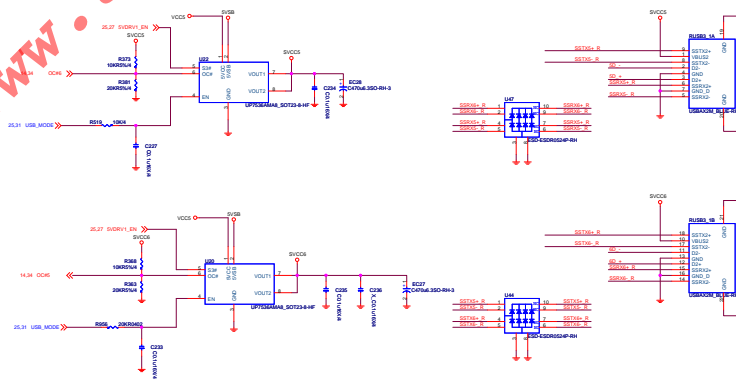
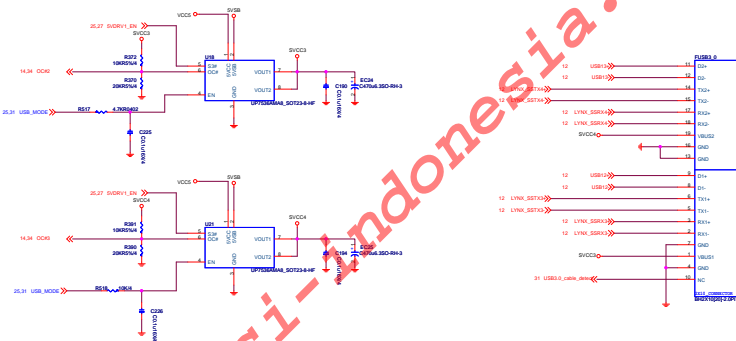
PWM ADDRESS	
RESISTOR VALUE	SVIO ADDRESS FOR VCORE RAIL
10K	0000
25K	0010
45K	0100
70K	0110
95K	1000
125K	1010
165K	1100

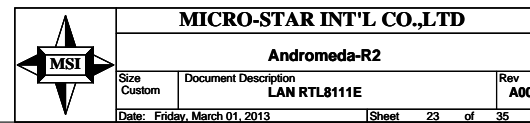
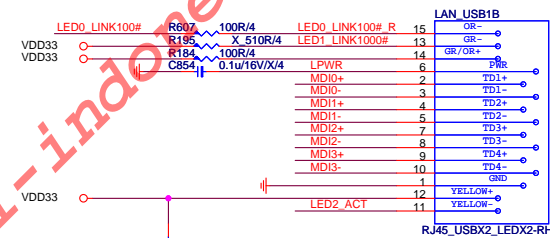
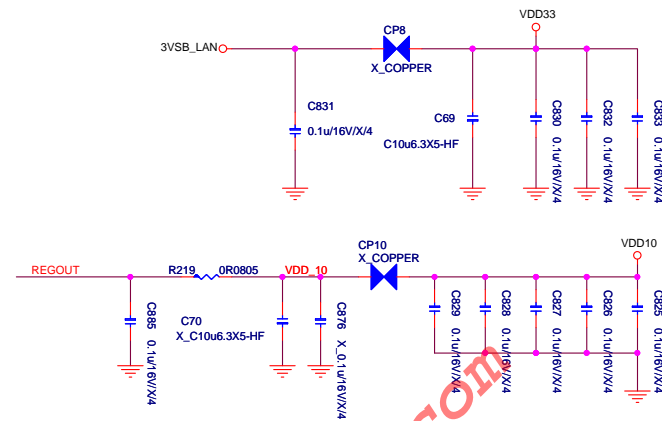
BOOT VOLTAGE & Phase no.		
RESISTOR VALUE	BOOT VOLTAGE	Phase no in PSL
30.1K	1.0V	1
49.9K	1.65V	1
69.8K	1.7V	1
90K	1.75V	1
130K	1.0V	2
150K	1.65V	2
169K	1.7V	2
open	1.75V	2

Rosc	Freq.	Rosc	Freq.	Rosc	Freq.	Rosc	Freq.
10K	250kHz	30.9K	340kHz	61.9K	430kHz	105K	520 kHz
12K	260kHz	34K	350kHz	64.9K	440kHz	110K	530kHz
14K	270kHz	36.5K	360kHz	69.8K	450kHz	115K	540kHz
16.2K	280kHz	40.2K	370kHz	73.2K	460kHz	121K	550kHz
18.2K	290kHz	43.2K	380kHz	78.7K	470kHz	130K	560kHz
20.5K	300kHz	46.4K	390kHz	82.5K	480kHz	137K	570kHz
23.2K	310kHz	49.9K	400kHz	88.7K	490kHz	143K	580kHz
25.5K	320kHz	53.6K	410kHz	93.1K	500kHz	150 K	590kHz
28K	330kHz	57.6K	420kHz	100K	510kHz	158 K	600kHz

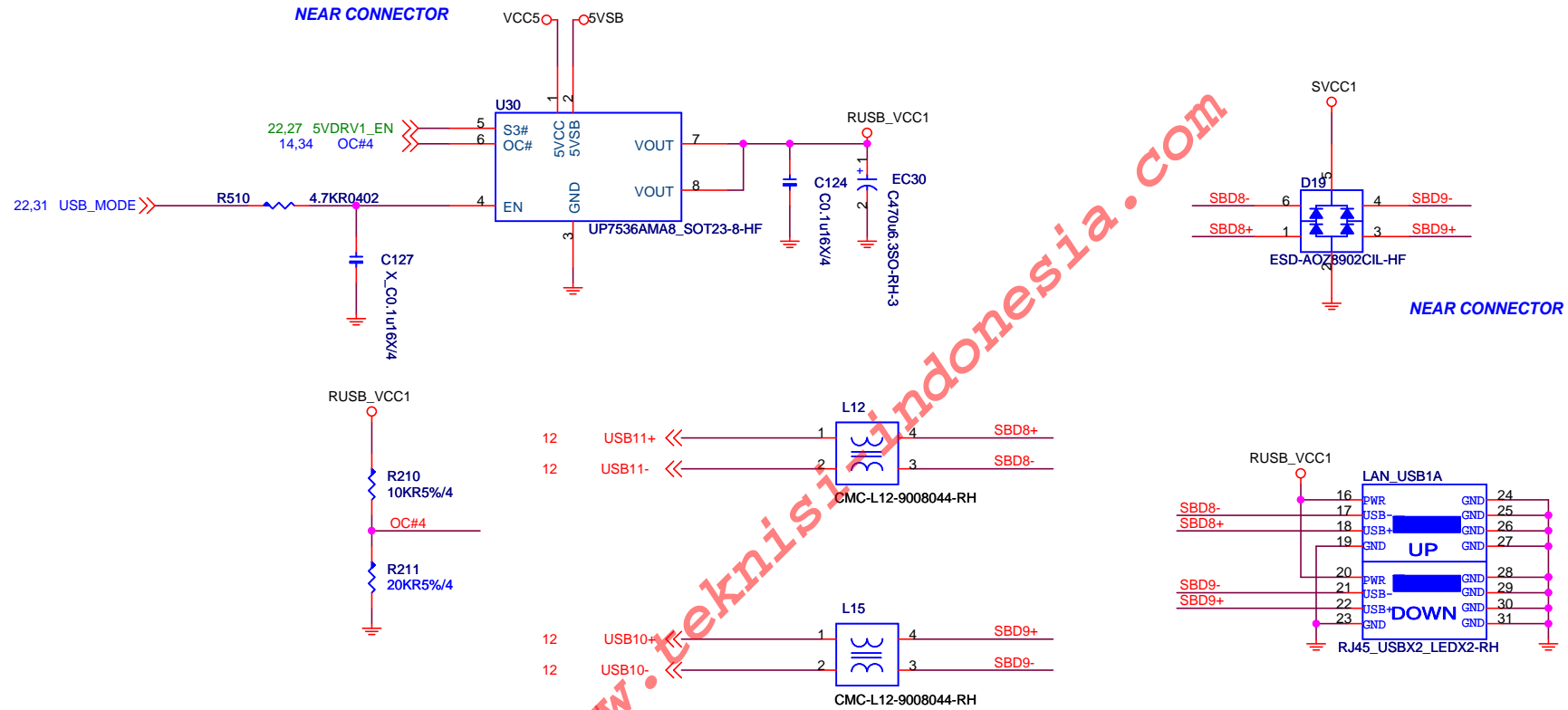
Power Sequence




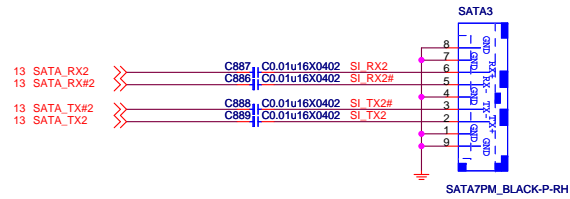
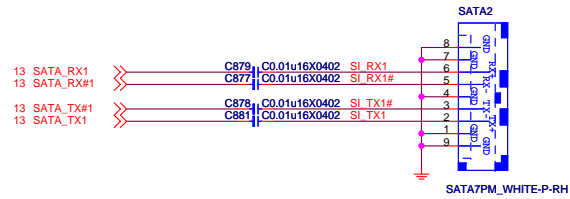
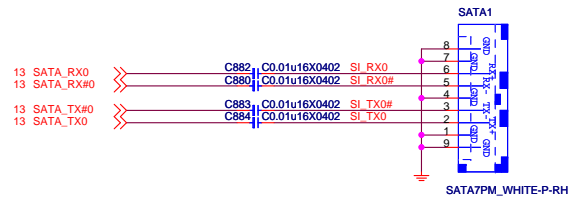
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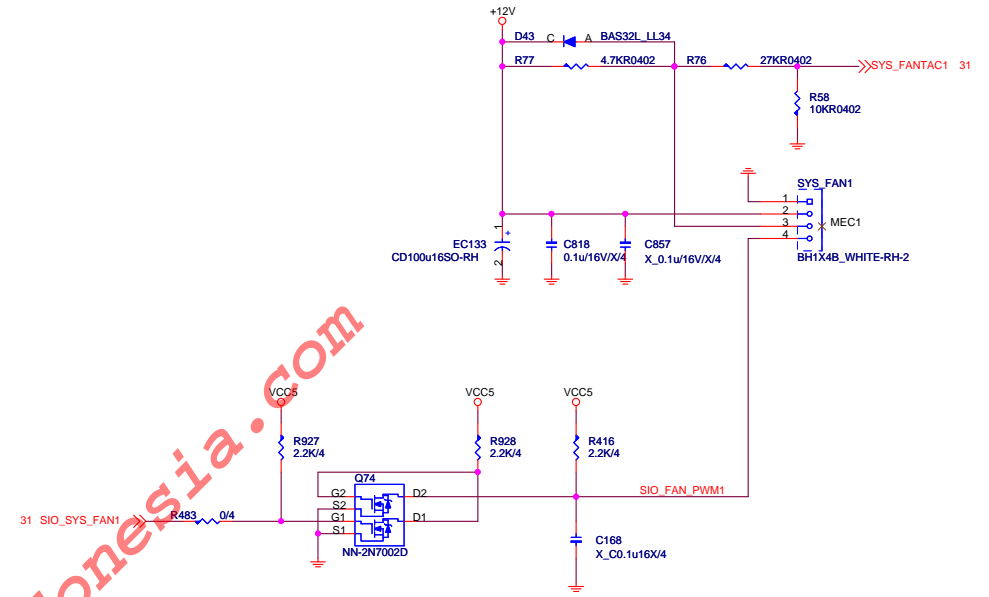
REAR USB PORT8,9



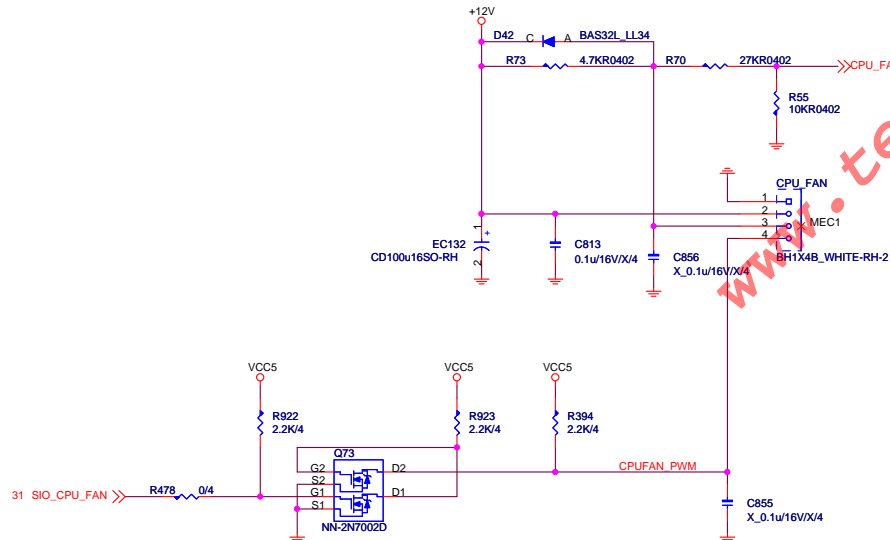
	MICRO-STAR INT'L CO.,LTD		
	Andromeda-R2		
	Size Custom	Document Description USB Connector	Rev A00
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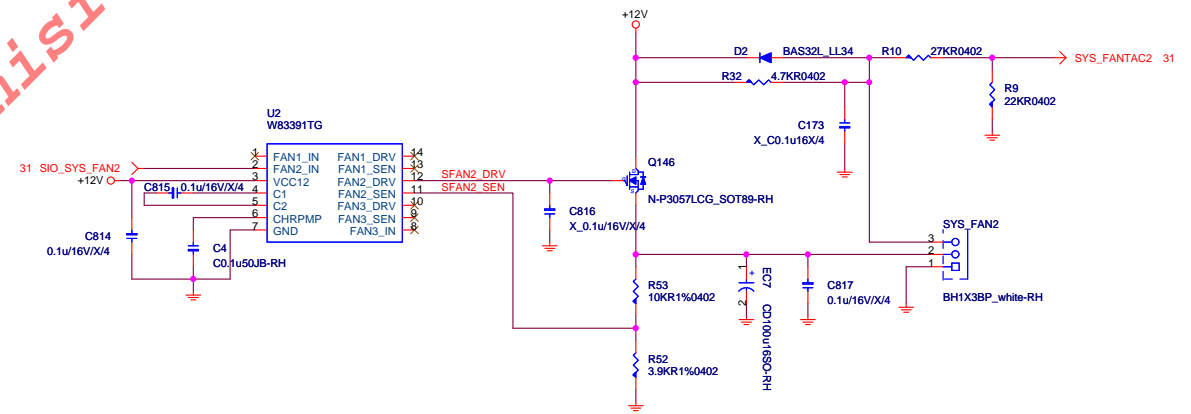
SYS Fan 1



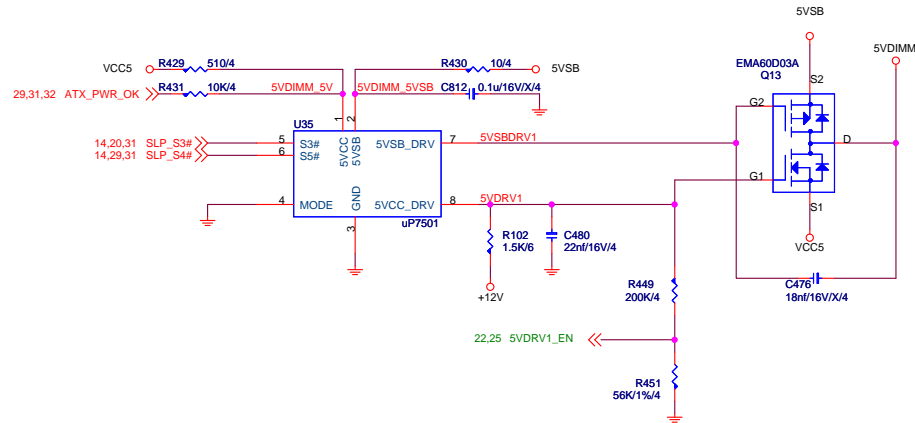
CPU Fan



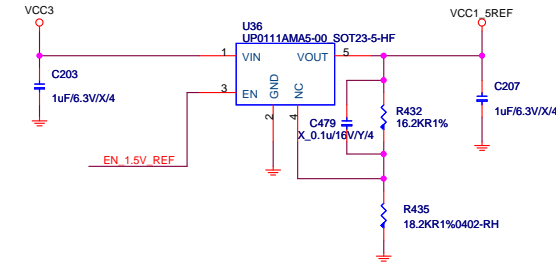
SYS Fan 2



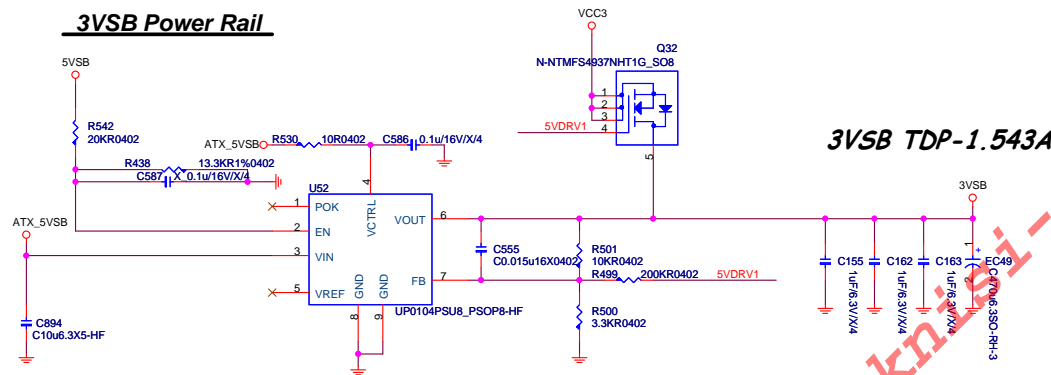
5VDIMM FOR DDR



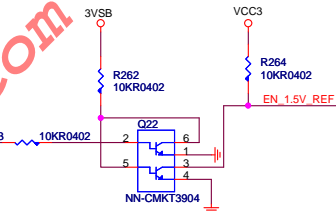
VCC1_5REF



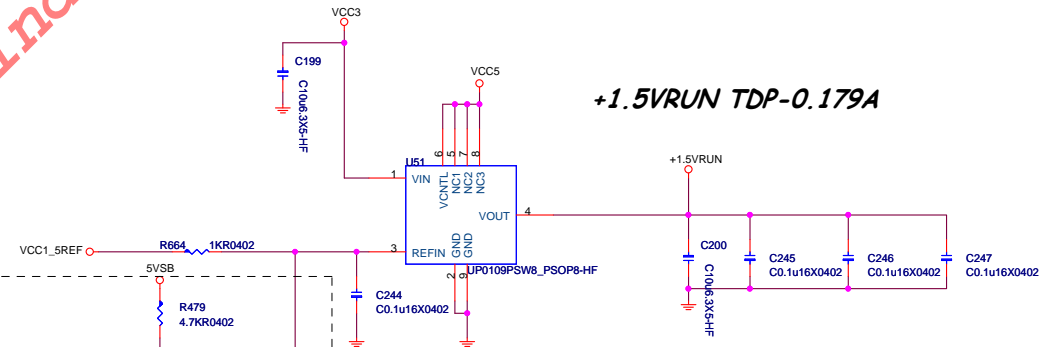
3VSB Power Rail



3VSB TDP-1.543A



+1.5VRUN TDP-0.179A



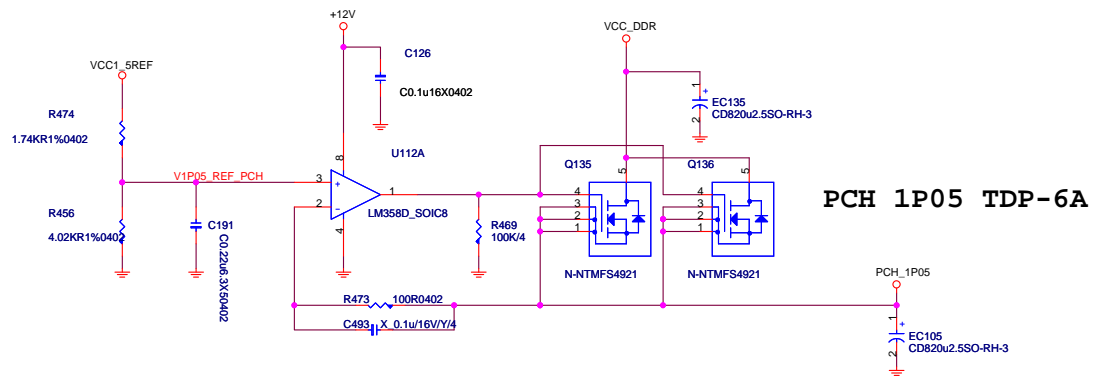
follow Intel power on & down sequences.



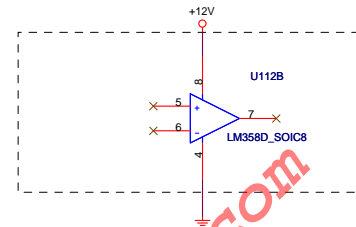
MICRO-STAR INT'L CO.,LTD

Andromeda-R2

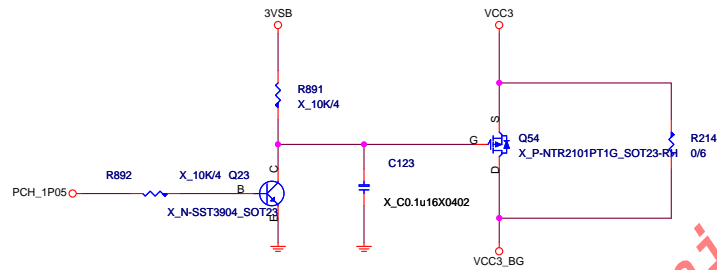
Size	Document Description	Rev
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NO use OP input/output pin.

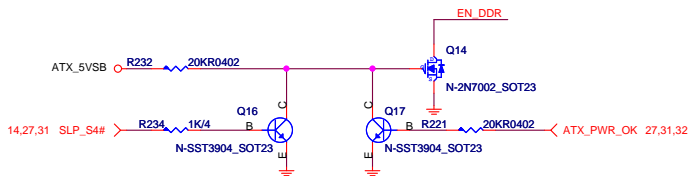
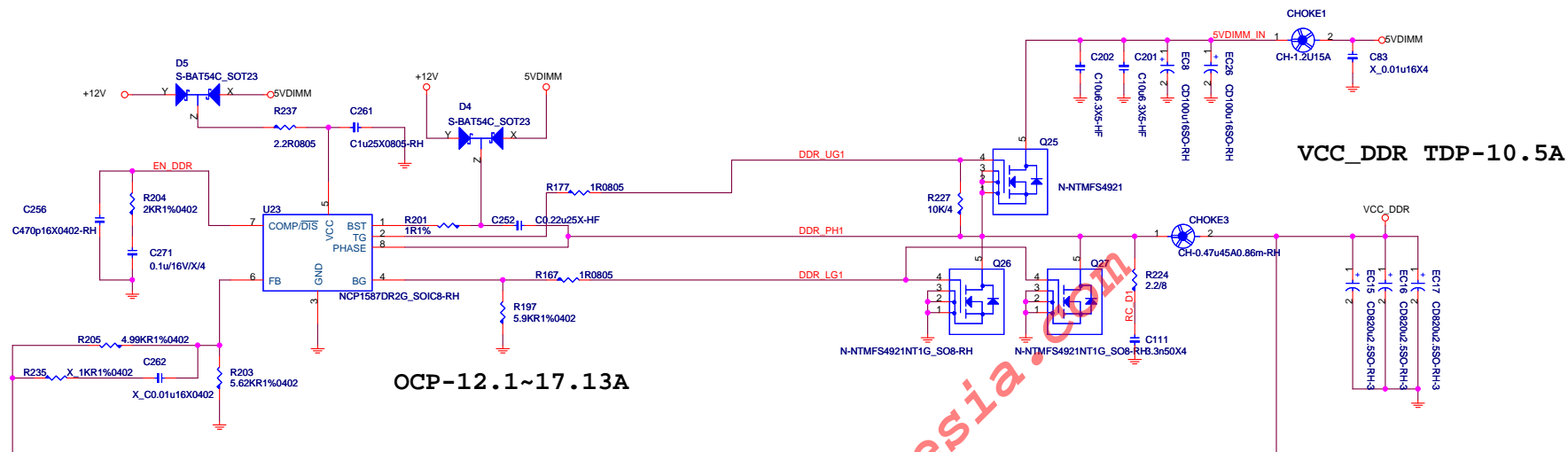


VCC3_BG have a sequencing requirement



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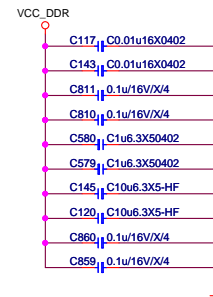
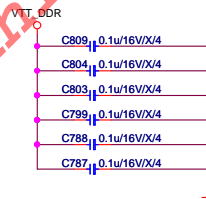
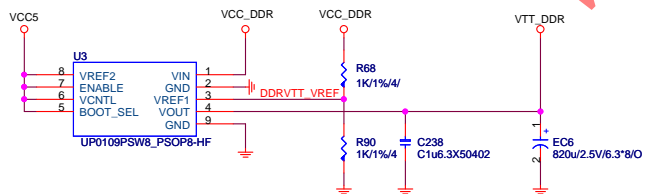
DDR III 1.5V POWER



VTT DDR Power

VTT DDR TDP-1.1A

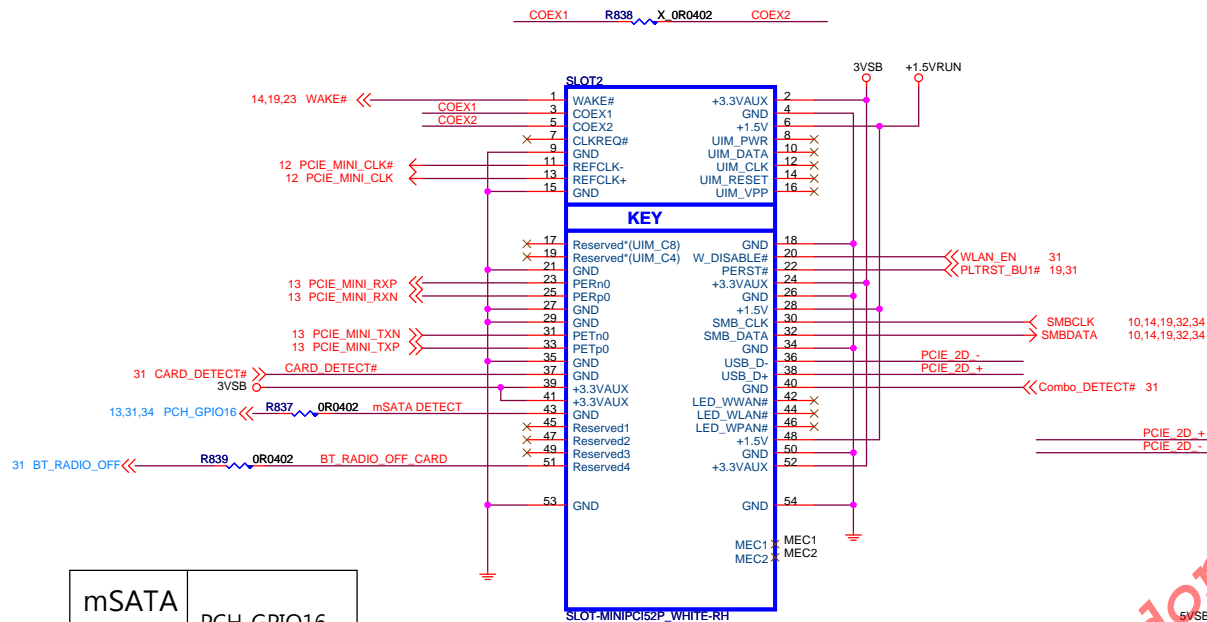
To CPU Copper trace width > 250mils , Fill island behind DIMM > 400mils .



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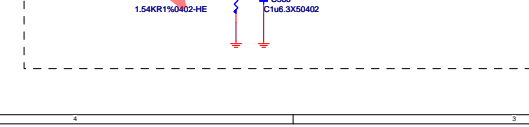
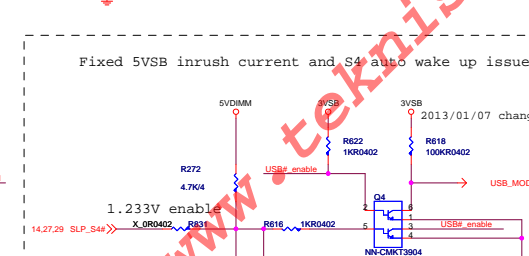
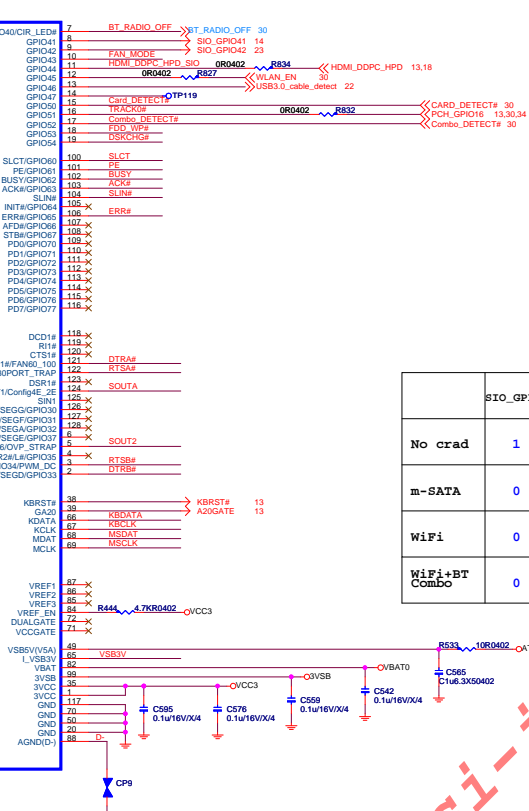
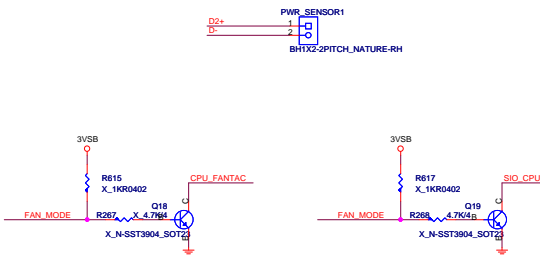
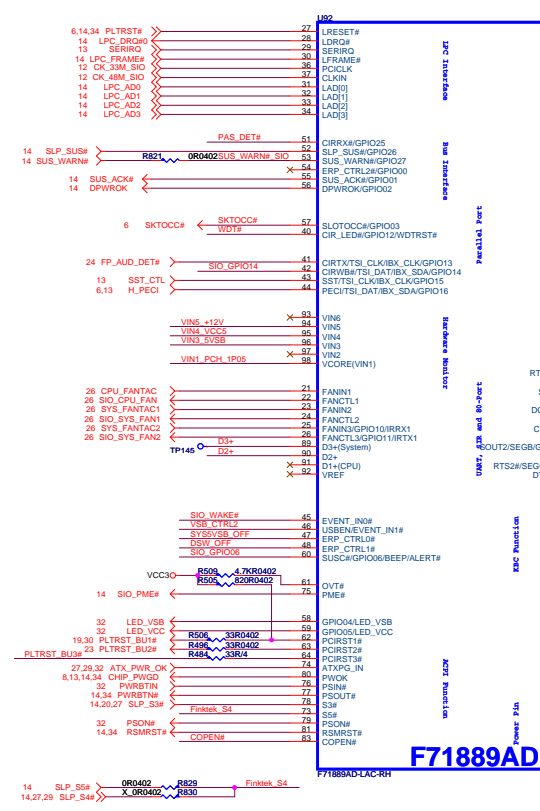
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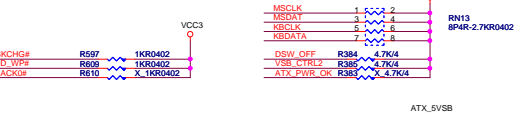
MICRO-STAR INT'L CO.,LTD

Andromeda-R2

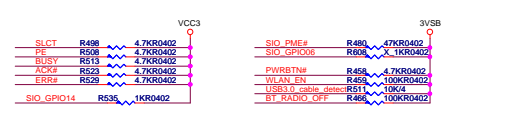
Size Custom	Document Description Mini slot	Rev A00
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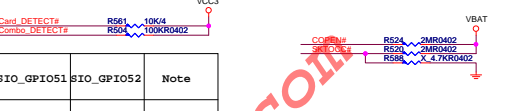
FLOPPY CONNECTOR



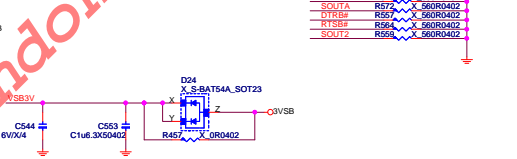
LPT CONNECTOR



MINIPICIE-CARD

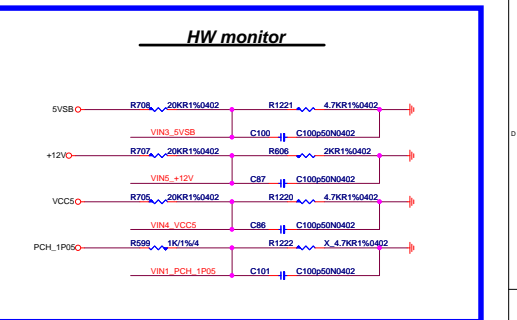


	SIO_GPIO50	SIO_GPIO51	SIO_GPIO52	Note
No crad	1	X	X	
m-SATA	0	1	X	
WiFi	0	0	1	
WiFi+BT Combo	0	0		

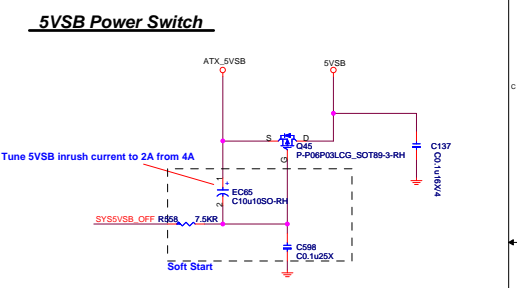


Power On Strapping Table

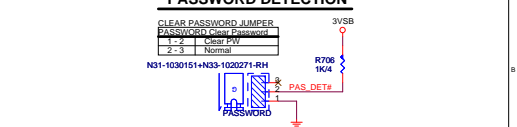
Symbol	Value	Description
DTRB#	1	Pin 51-56 are GPIO pins
DTRB#	0	Pin 51-56 are Bus Interface functions
RTSB#	1	Fan control mode: PWM mode.
RTSB#	0	Fan control mode: DAC mode.
SLIN#	PU-1k	Pin 100-116 as LPT interfaces
SLIN#	PU-20k	Pin 100-116 as PVID Controller
SLIN#	PD-1k	Pin 102/103/111/112 as SVID Controller
SLIN#	PD-47k	Pin 100-103 and pin 105-116 as GPIO pins
DTRA#	1	Fan full duty is 60%.
DTRA#	0	Fan full duty is 100%.
RTSA#	1	Enable the 80 port function.
RTSA#	0	Disable the 80 port function.
SOUTA	1	Configuration Register I/O port is 4E4F.
SOUTA	0	Configuration Register I/O port is 2E2F.
SOUT2	1	OVP warning mode
SOUT2	0	OVP force mode



5VSB Power Switch

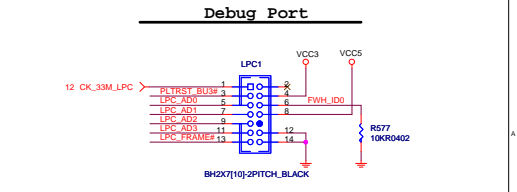


PASSWORD DETECTION



PAS_DET#
H: Did not reset password
L: Reset password

Debug Port



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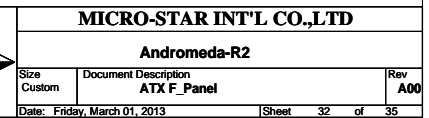
Front Panel

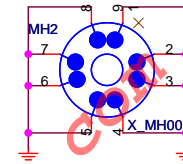
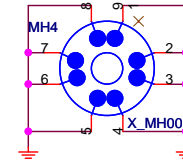
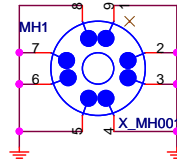
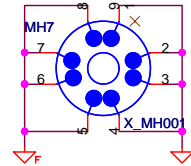
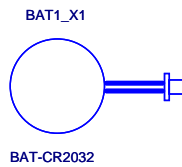
The diagram shows the front panel connector (H2XS10JM_COLORS-RH) with the following connections:

- Pin 1 (HDD+):** Connected to R213 (560R/402) and the ODD_SW+ signal.
- Pin 2 (PLED):** Connected to the PWR_LED signal.
- Pin 3 (HDD-):** Connected to the ODD_SW- signal.
- Pin 4 (SLED):** Connected to the SUS_LED signal.
- Pin 5 (RESET-):** Connected to the PWSW+ signal.
- Pin 6 (PWSW+):** Connected to the PWSW+ signal.
- Pin 7 (RESET+):** Connected to the PWSW- signal.
- Pin 8 (PWSW-):** Connected to the PWSW- signal.
- Pin 9 (NC):** Not connected.

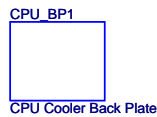
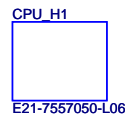
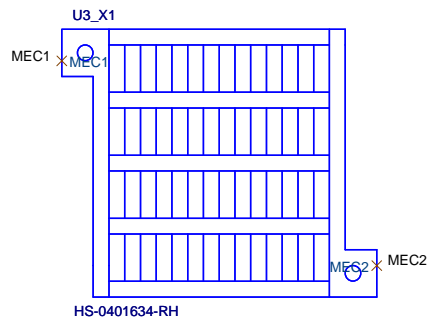
Additional components and connections shown:

- C166:** X_C0.1u16X/4 capacitor connected to ground.
- F1:** F-MICROSMD110 fuse connected in series with the PWSW+ signal.
- R583:** 10K/4 resistor connected between ATX_5VSB and PWR_SW+.
- R591:** 100R/402 resistor connected between PWR_SW+ and PWRBTN.
- C766:** 0.1u16V/X/4 capacitor connected to ground.

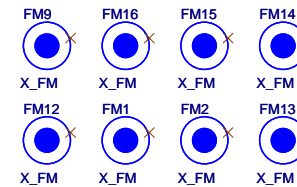




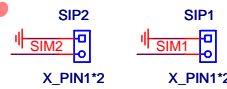
Mounting Holes



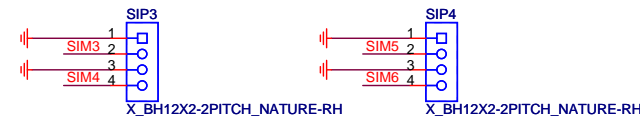
Optical Fiducial Marks-120




Simulation-1



Simulation-2



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