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6	CPU-Power
7	CPU-GND
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9	DDR III DIMM 3 / DIMM 4
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11	PCH-SATA/HOST/GPIO/DDI/VGA
12	PCH-SMB/LPC/AUDIO/RTC
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## CPU :

**Intel Haswell Processor**

## System Chipset :

**Intel Lynx Point Chipset**

## On Board Chipset :

**VRM 12.5 -- NCP81102+NCP81161 4Phase**  
**Gigabit LAN -- RTL8111GN Co-lay RTL8111F-VB**  
**HDA Codec -- Realtek ALC892 Co-lay ALC662-VD**  
**Super I/O -- NCT5533D**  
**SPI Flash 64Mb+16Mb**


## Main Memory :

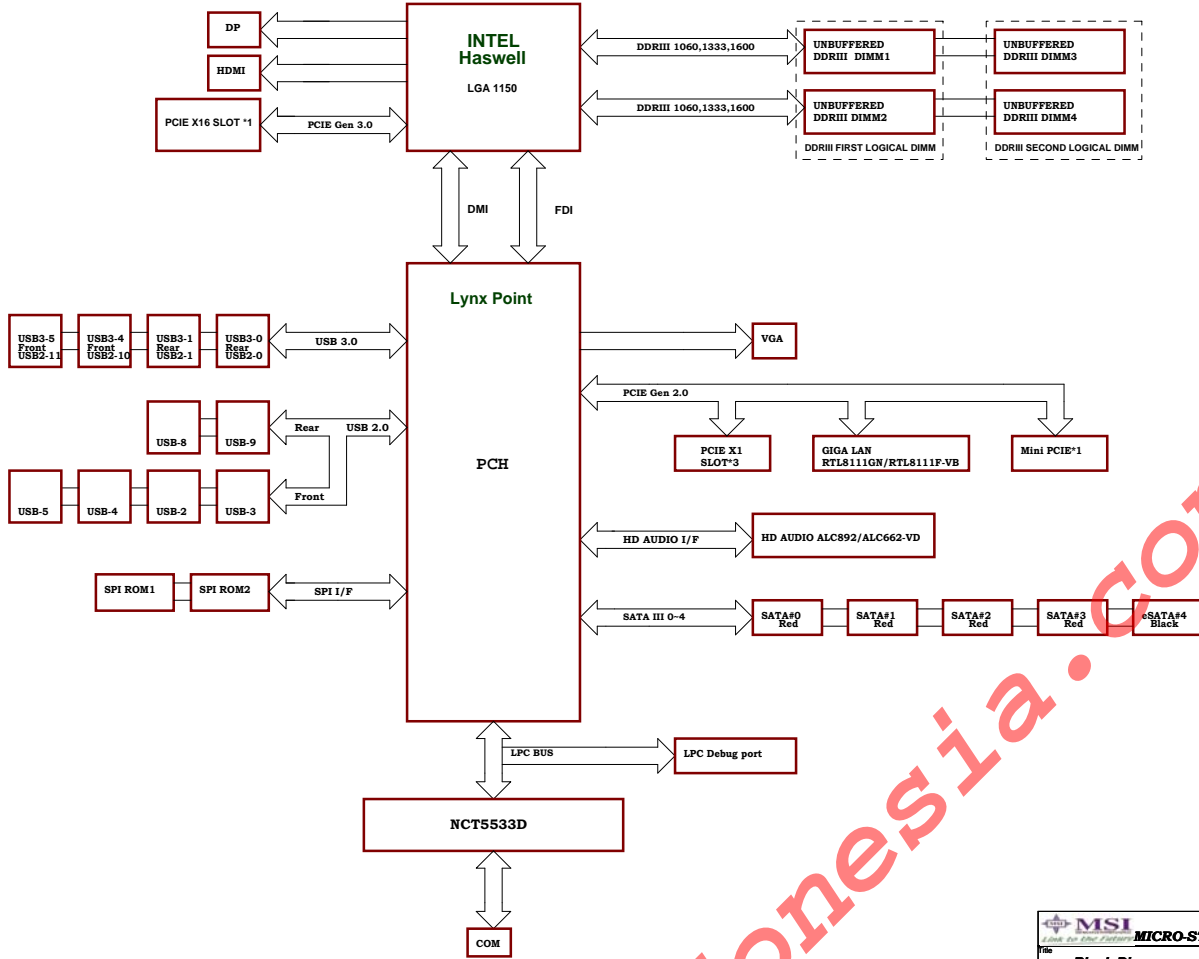
**2 Channel DDR III \* 4 (Max 32GB)**

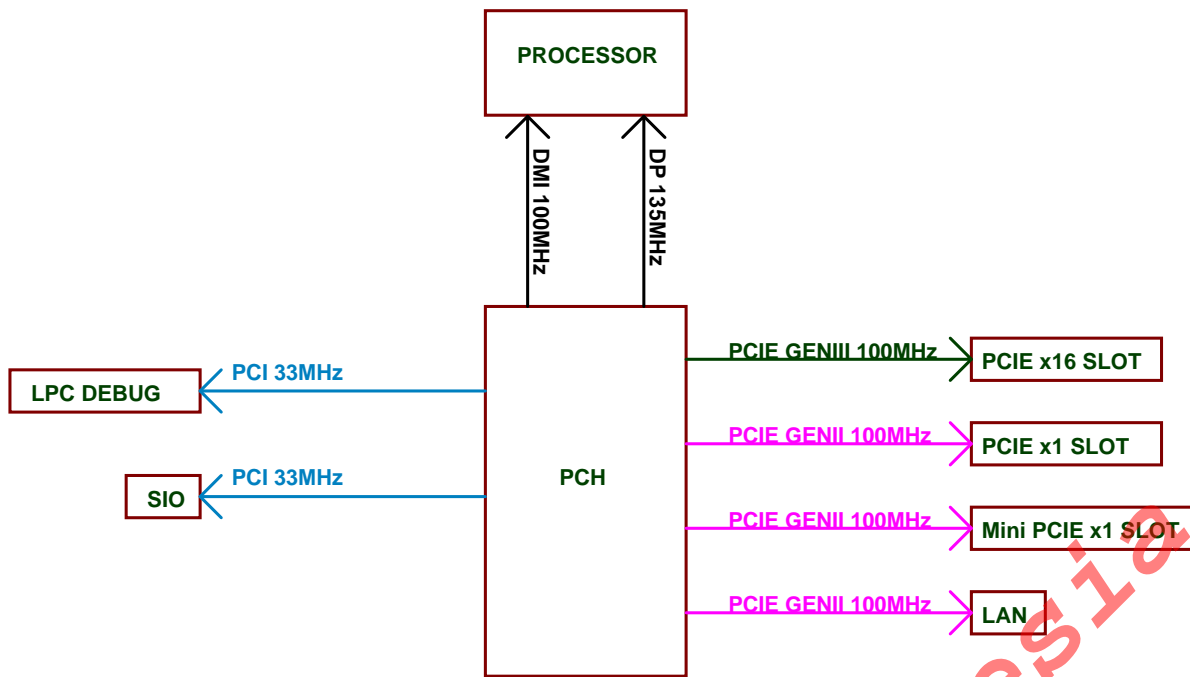
## Expansion Slot :

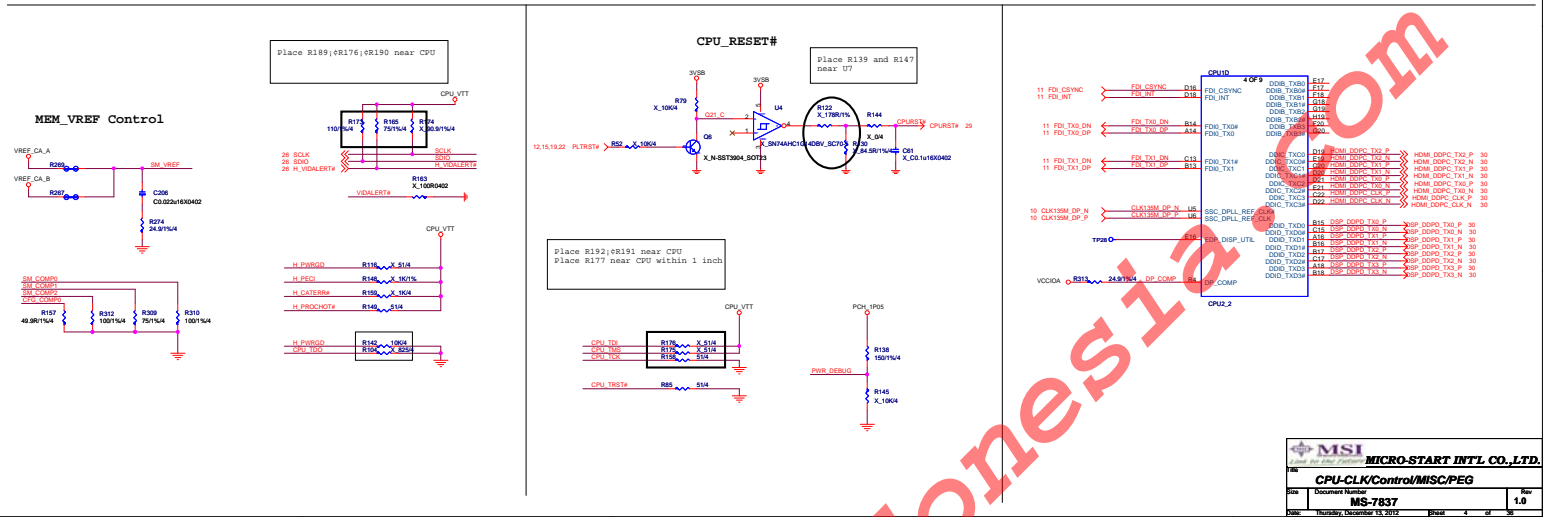
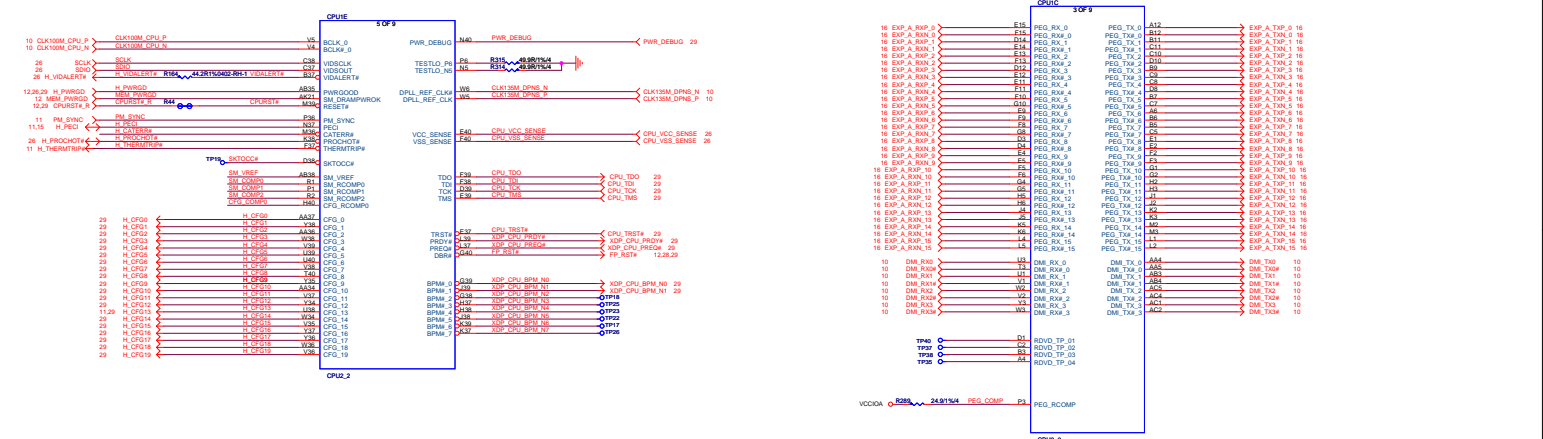
**PCI Express x16 Slot \* 1**  
**PCI Express x1 Slot \* 3**  
**Mini PCIE/Mini SATA Slot \* 1**

# lenovo

 <b>MICRO-START INTL CO.,LTD.</b>	
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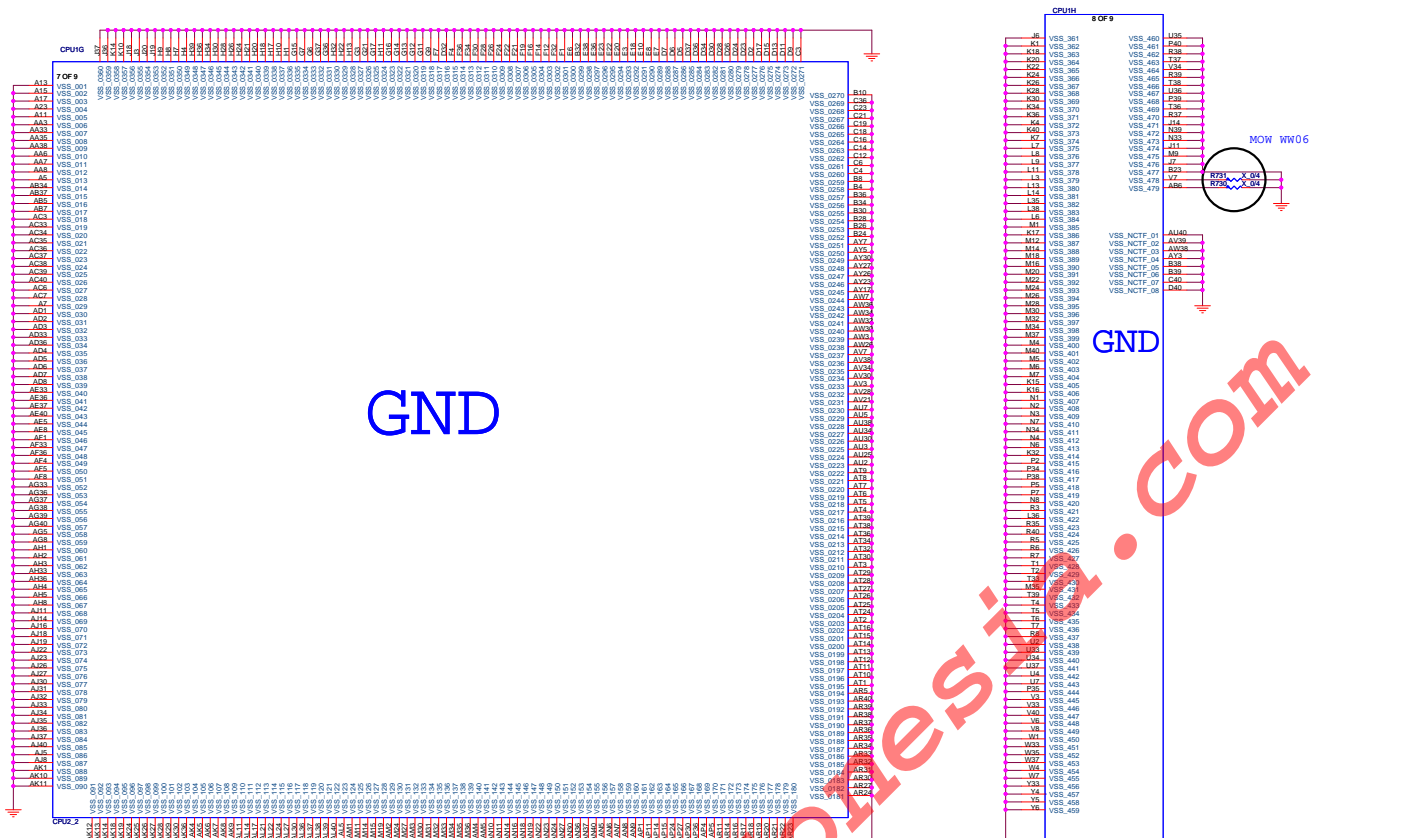




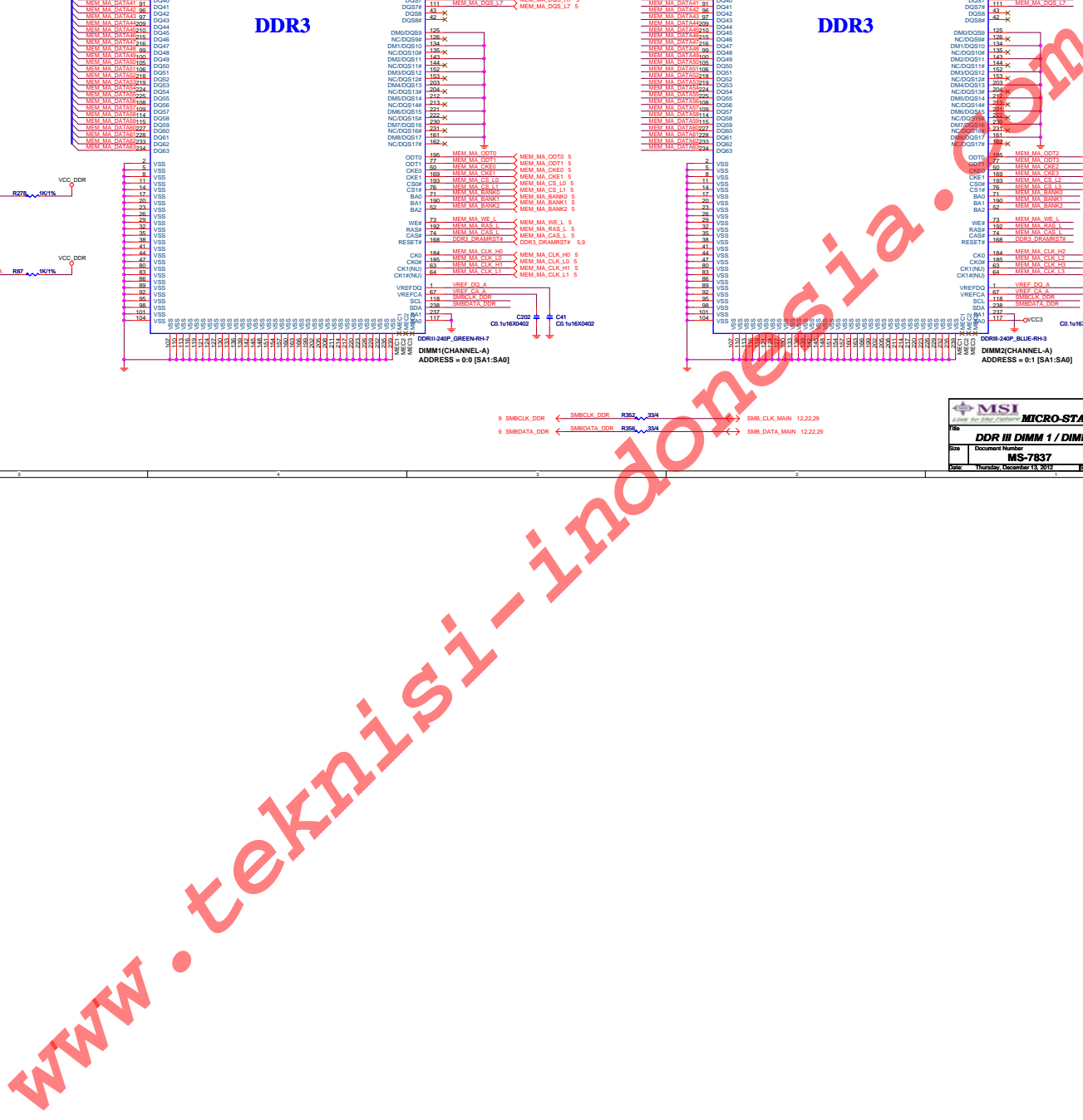
Place Near DIMM Area

Place Near DIMM Area

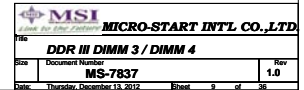




## DDRIII DIMM\_A2





**DDRIII DIMM\_B2**

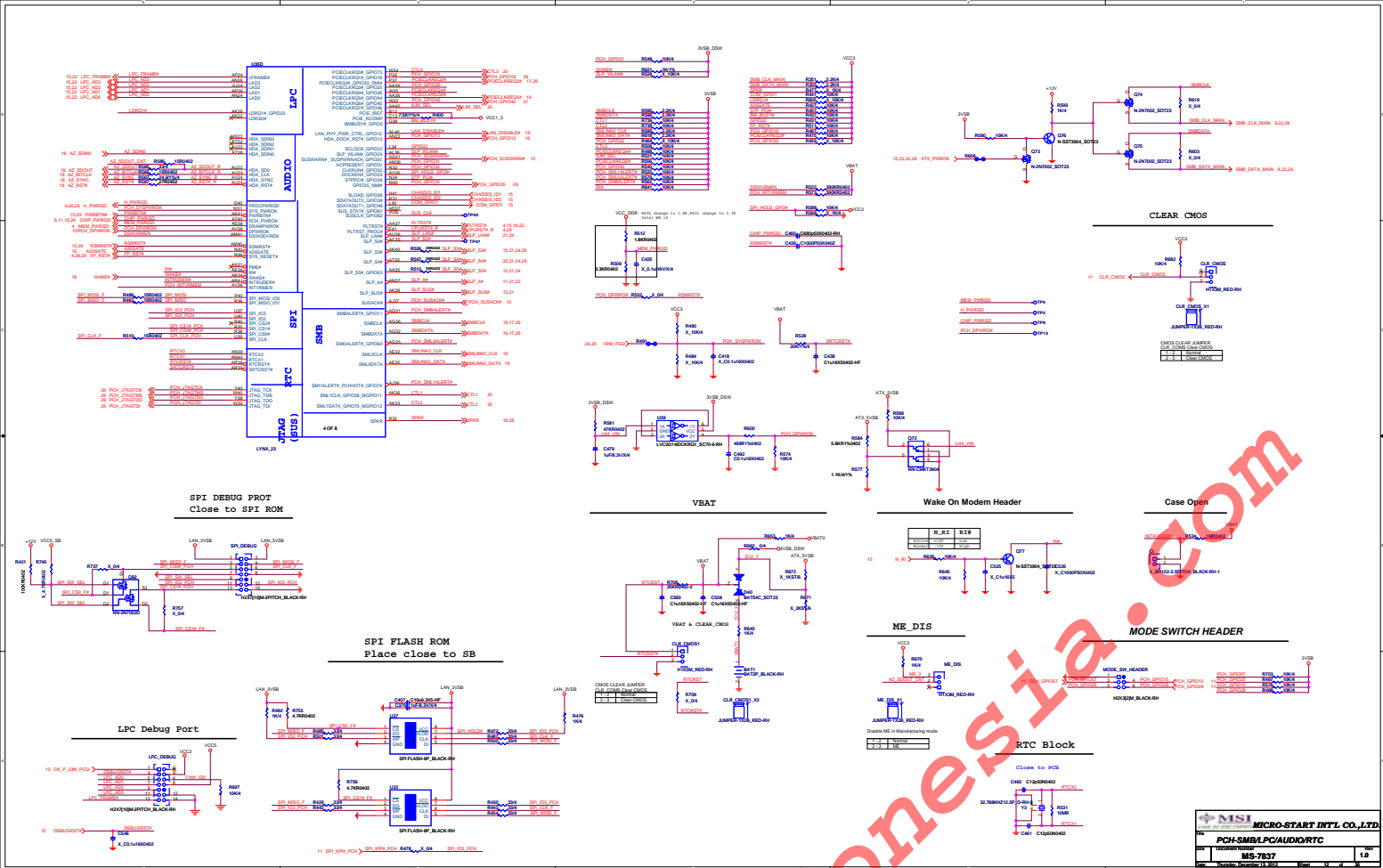


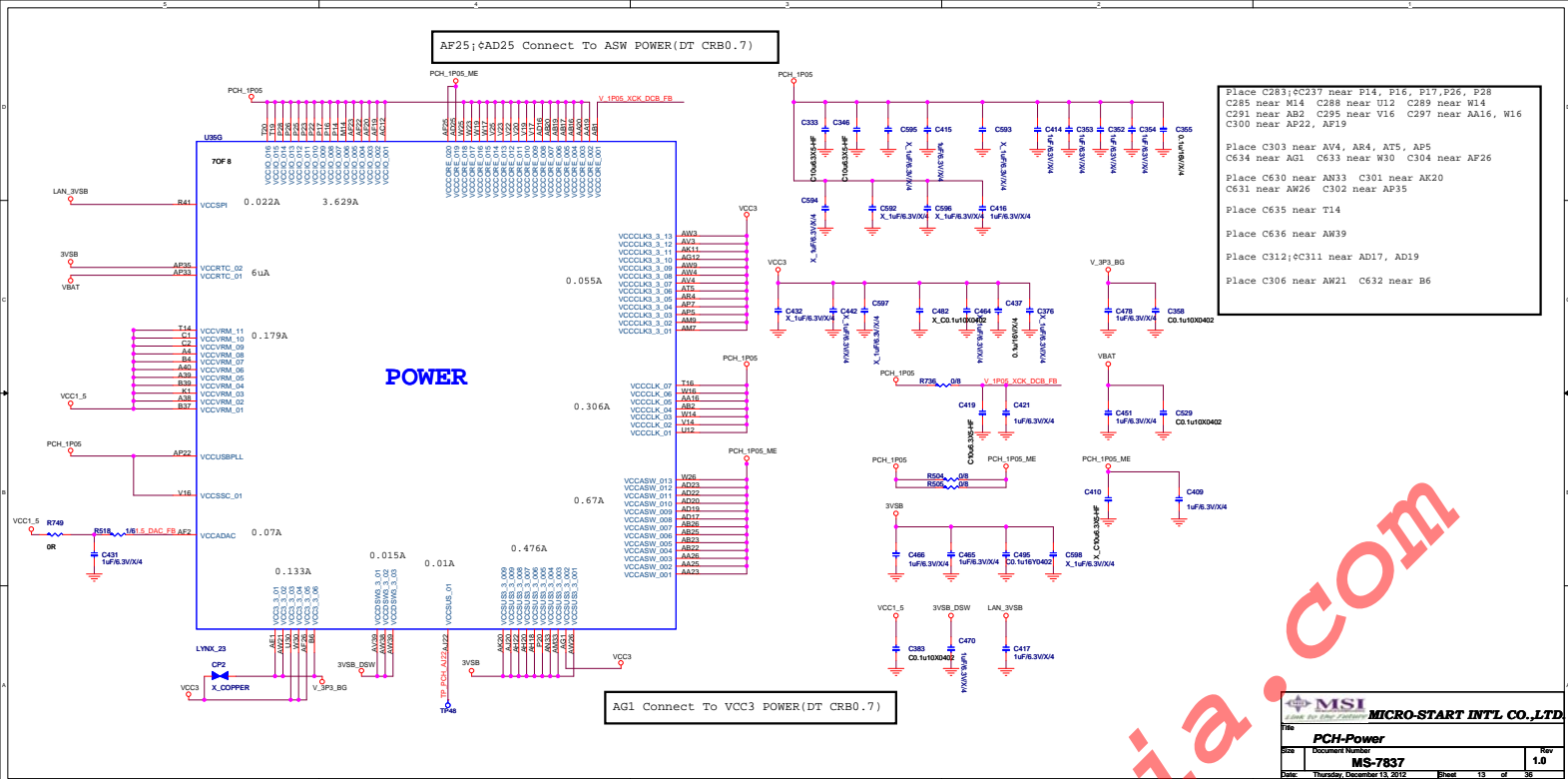
BIOS STARAPS

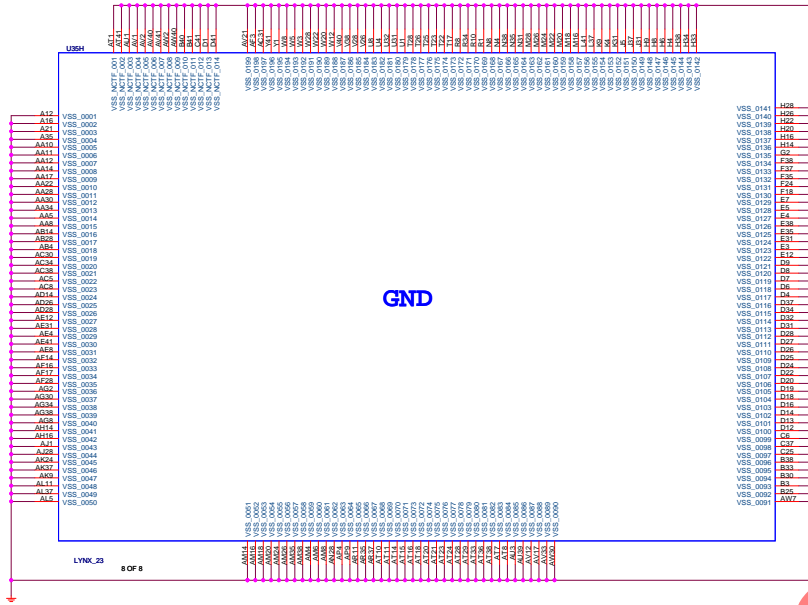
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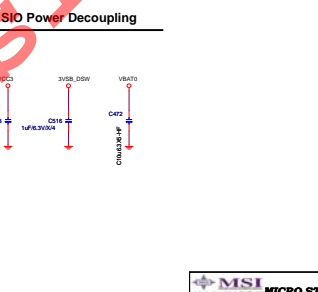
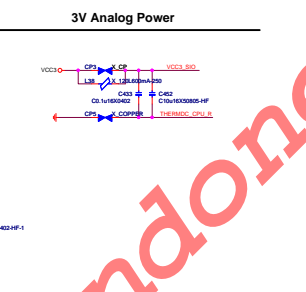
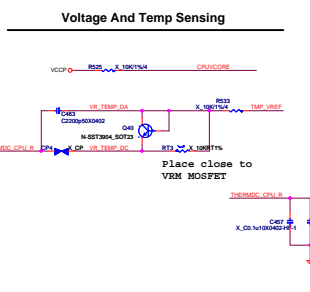
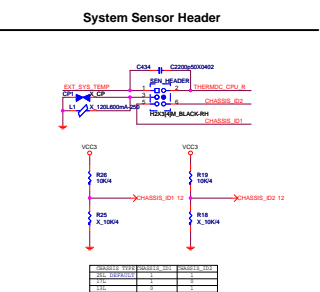
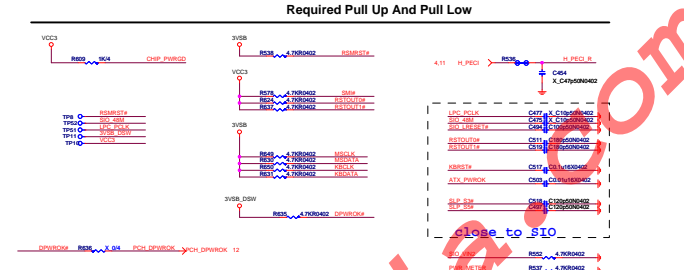
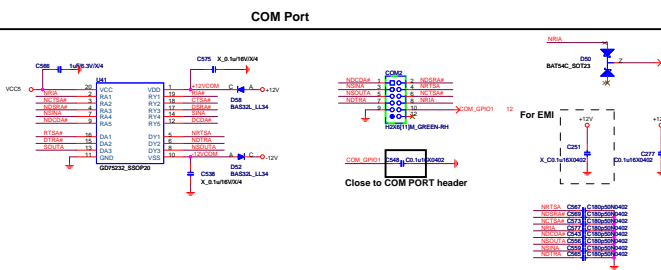
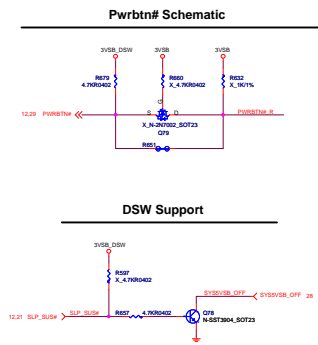
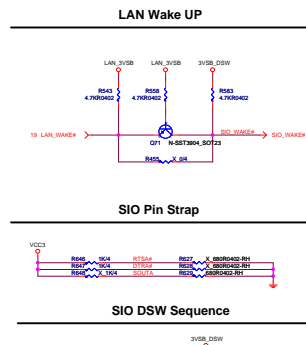
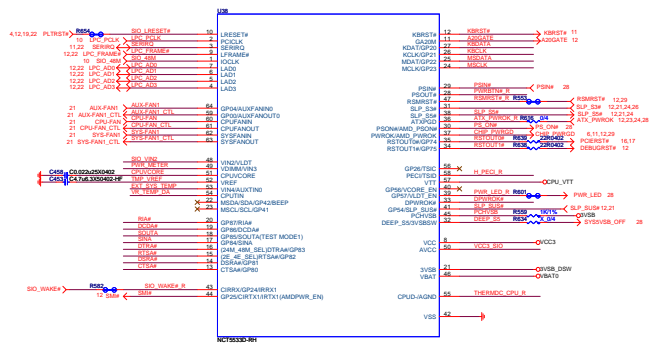
BIOS Device Select

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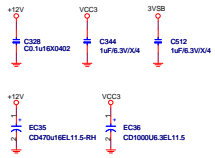
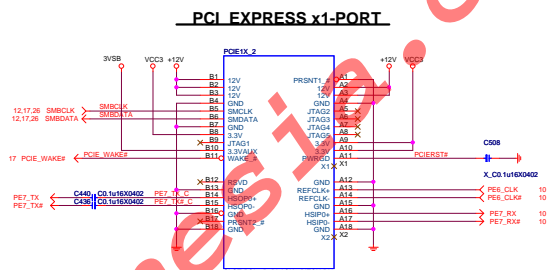
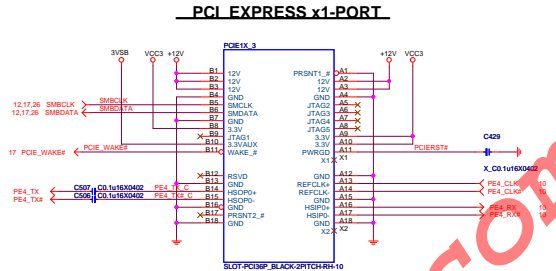
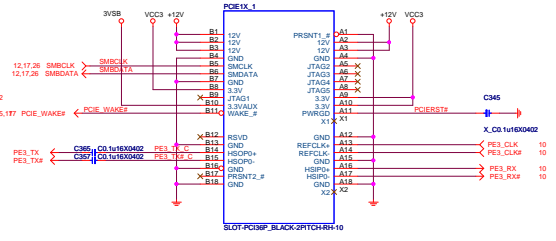




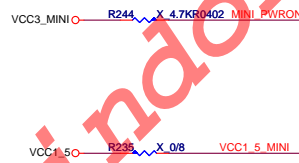
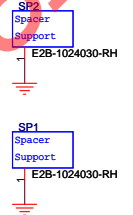
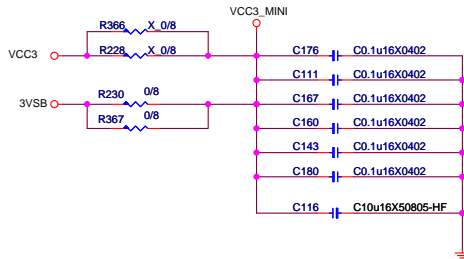


# PCI EXPRESS X16 SLOT

# PCI EXPRESS x1-PORT

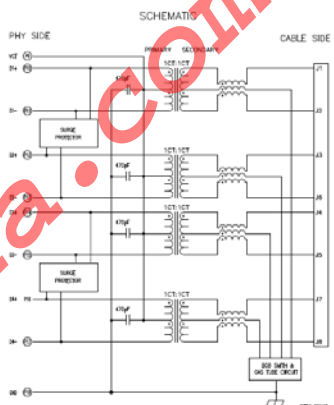
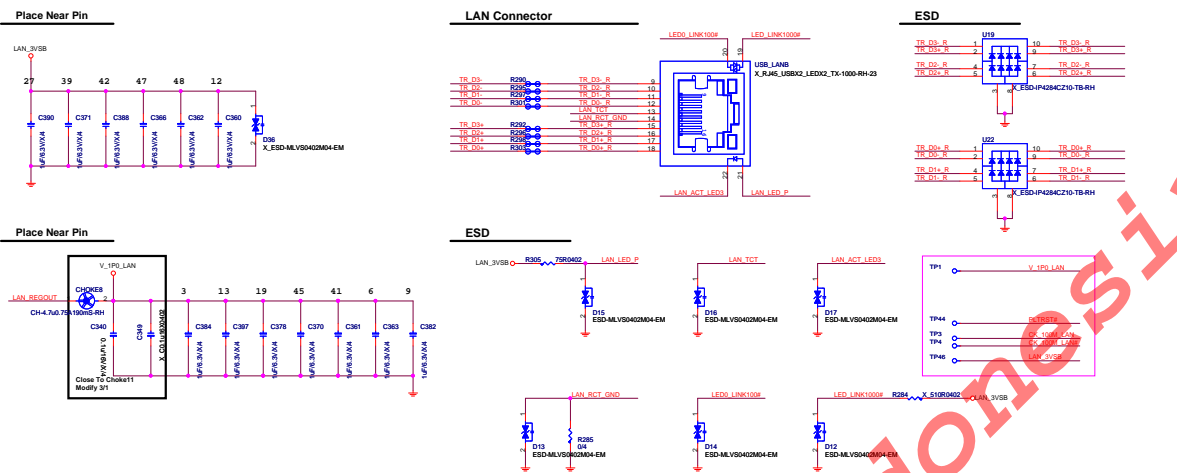
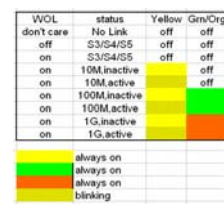




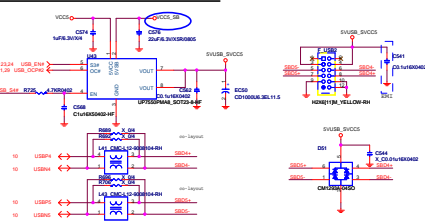




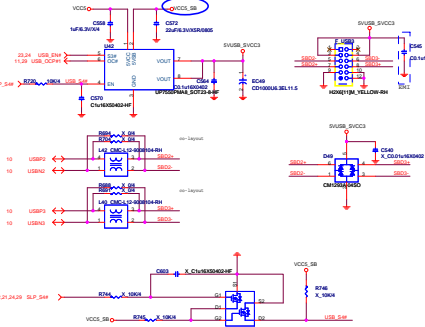
For EMI  
R551 & R544 Please near to lan connector



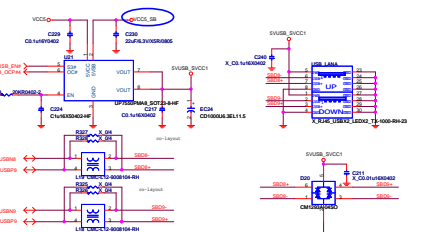
Front Panel USB Connector For USB Port 6 / 7



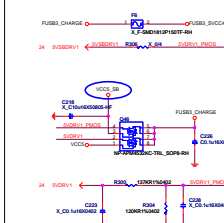
Front Panel USB Connector For USB Port 2 / 3



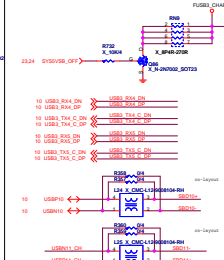
Rear USB Connector For USB Port 8 / 9



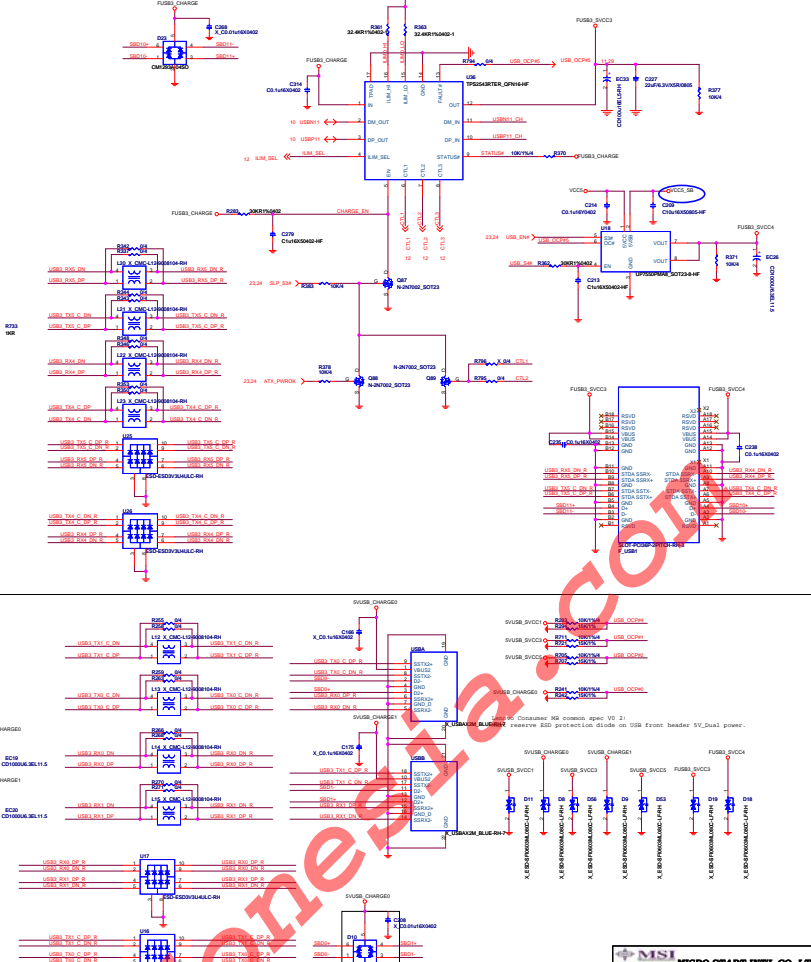
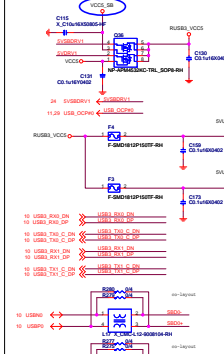
Front Panel USB Connector For USB Port 10 / 11



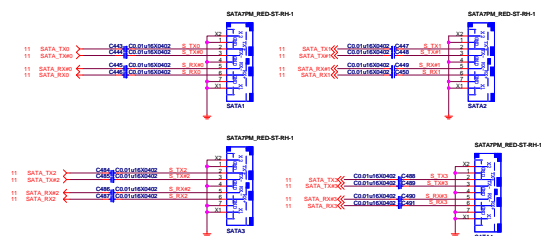
USB charger port power discharge circuit



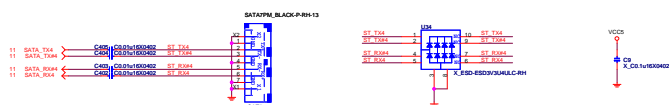
Rear USB Connector For USB Port 0 / 1



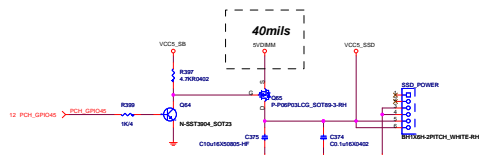
# SATA Connector



# ESATA Connector



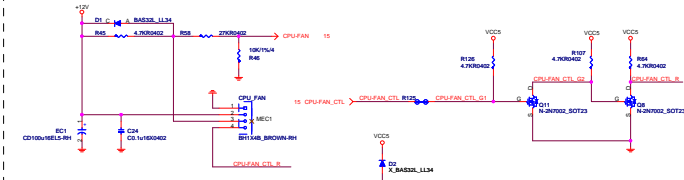
# SSD Power Header (For Turbo Boot)



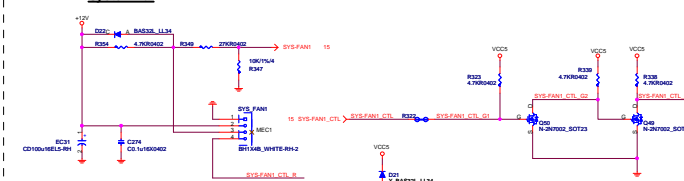
# Reserve For Intel VPRO Test



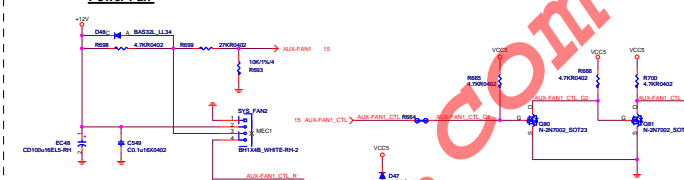
# CPU Fan

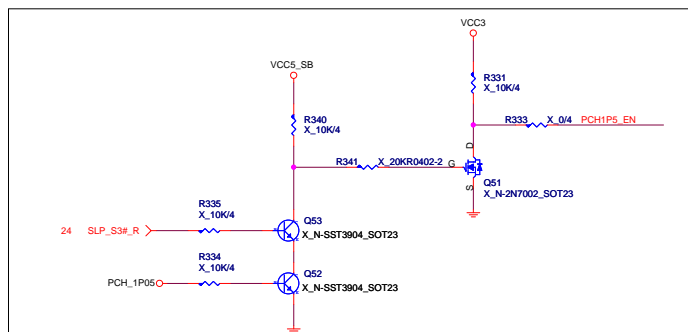


# System Fan



# Power Fan

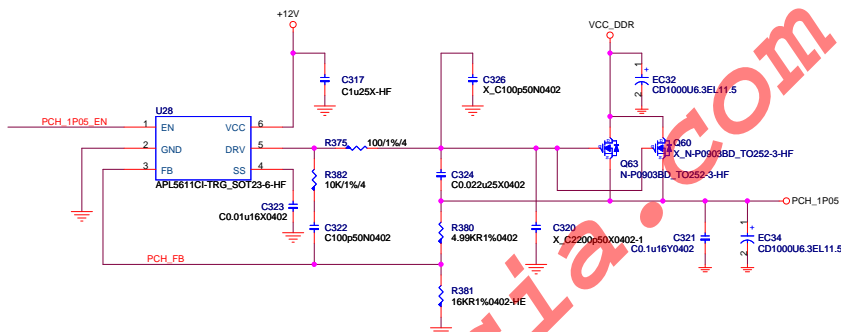
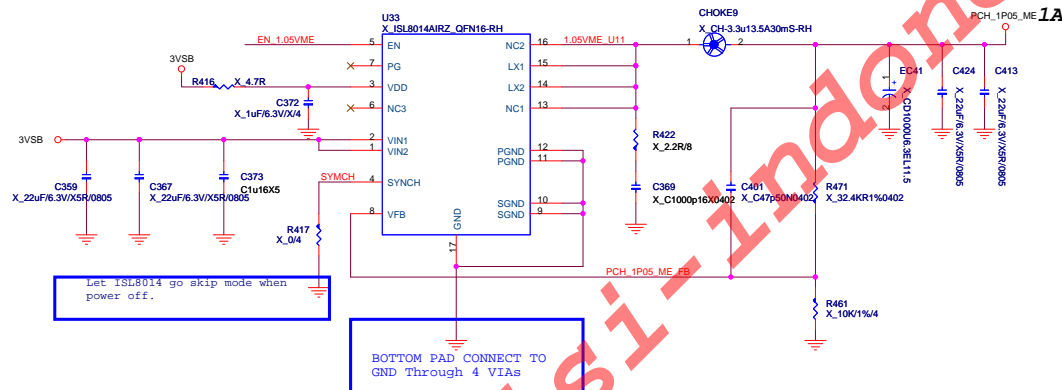


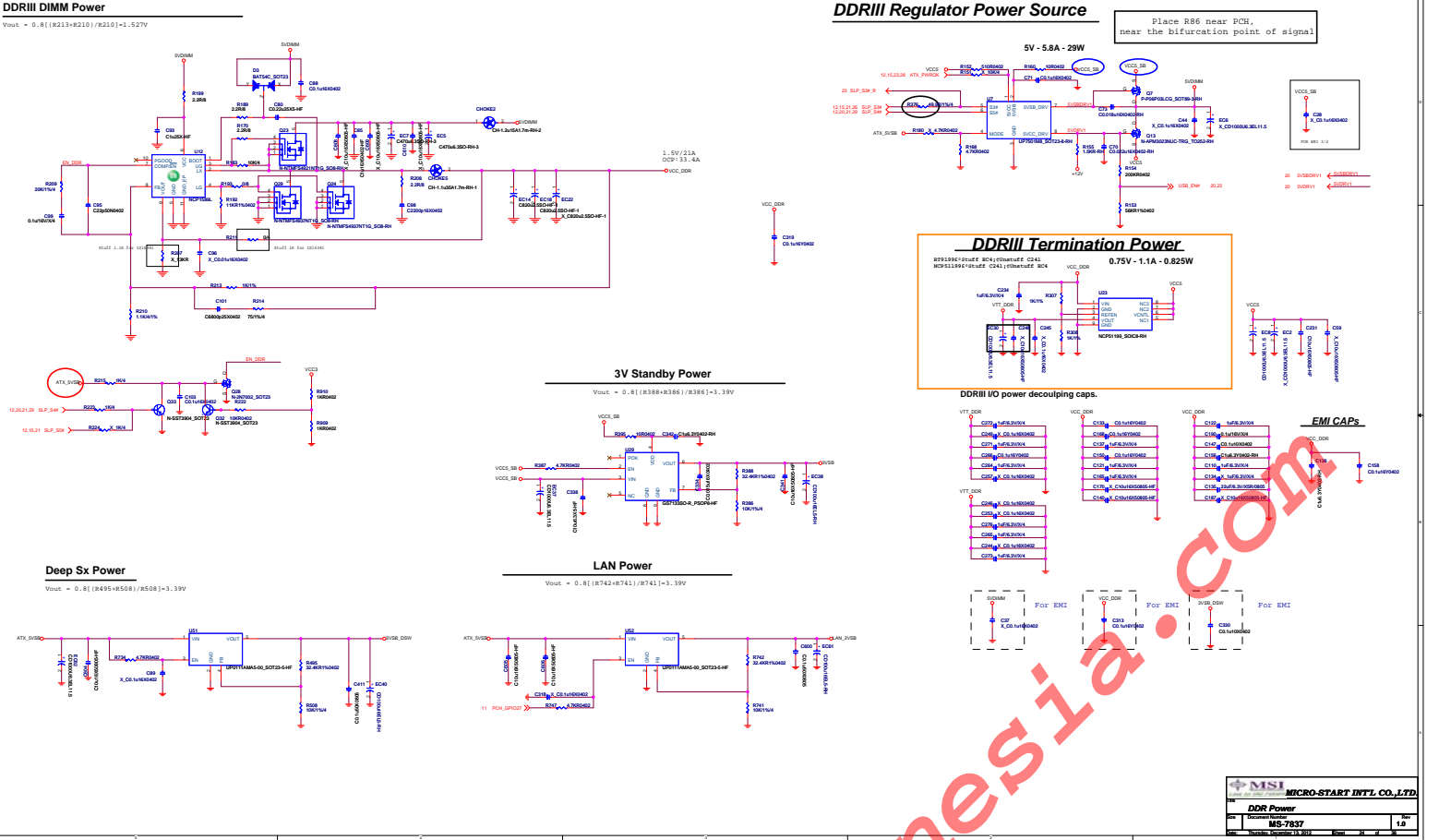
$$V_{out} = 0.8[(R336+R332)/R332]=1.509V$$


**PCH Core Power**

sequence requirement on VCC1\_5 and PCH\_1P05

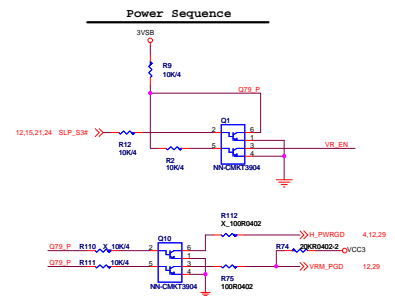
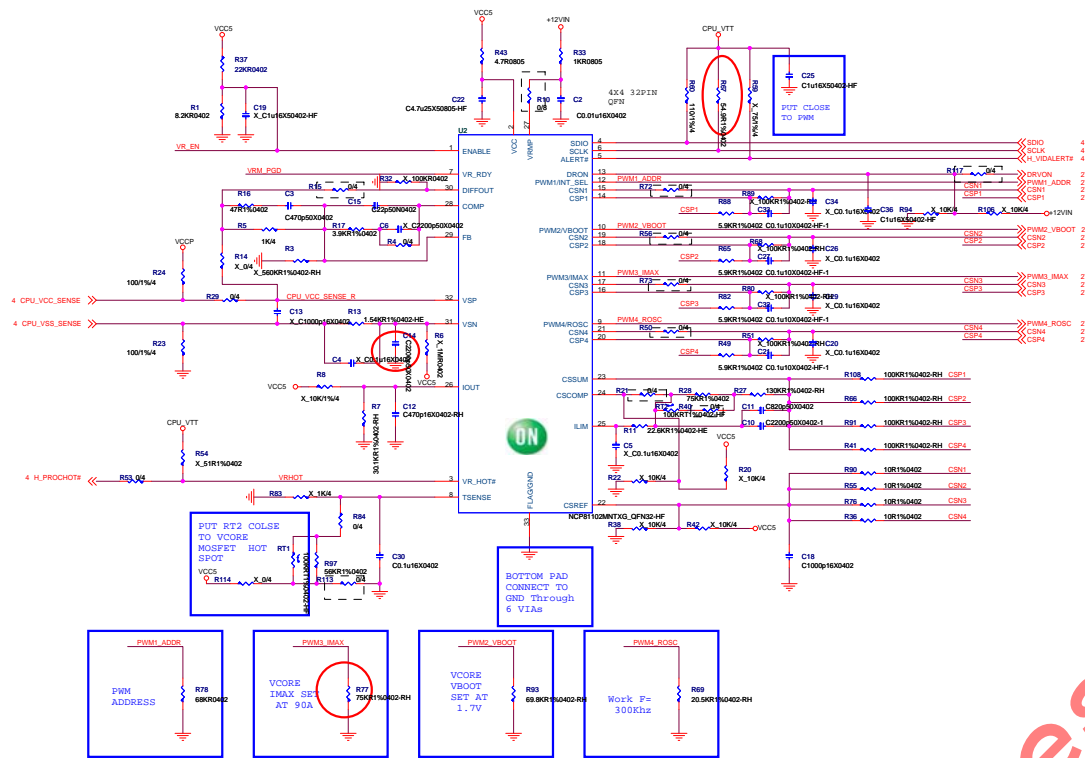
$$V_{out} = 0.8[(R_{380}+R_{381})/R_{381}]=1.0495V$$


$$V_{out} = 0.8[(R_{471}+R_{461})/R_{461}]=1.0495V$$
[illegible]



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## SharkBay VR12.5 Power Circuit - 4 Phase

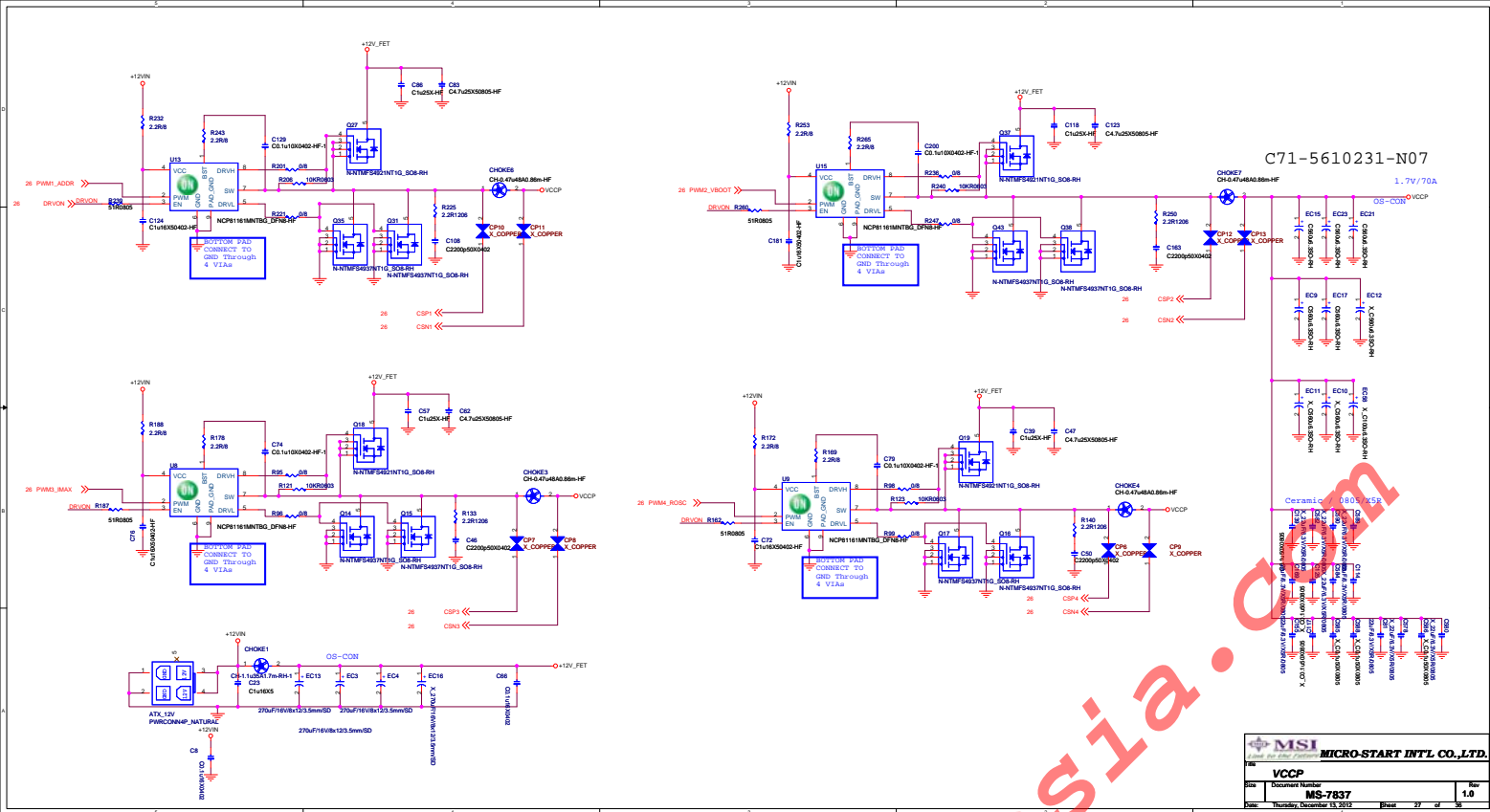


Rosc	Freq.	Rosc	Freq.	Rosc	Freq.	Rosc	Freq.	Rosc	Freq.
10K	250KHz	20.9K	340KHz	61.9K	430KHz	105K	520KHz	165K	610KHz
12K	260KHz	34K	350KHz	64.9K	440KHz	110K	530KHz	174K	620KHz
14K	270KHz	36.5K	360KHz	69.8K	450KHz	115K	540KHz	182K	630KHz
16.2K	280KHz	40.2K	370KHz	73.2K	460KHz	121K	550KHz	191K	640KHz
18.2K	290KHz	43.2K	380KHz	76.7K	470KHz	130K	560KHz	200K	650KHz
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	150K	590KHz		
28K	330KHz	57.6K	420KHz	100K	510KHz	158K	600KHz		

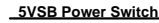
PWM ADDRESS	
RESISTOR VALUE	SVID ADDRESS FOR VOORE RAIL
10K	0000
25K	0010
45K	0100
70K	0110
95K	1000
125K	1010
165K	1100

BOOT VOLTAGE & Phase no.		
RESISTOR VALUE	BOOT VOLTAGE	Phase no.
30.1K	1.5V	1
49.9K	1.63V	2
69.8K	1.75V	1
90K	1.75V	1
130K	1.0V	2
150K	1.0V	2
165K	1.7V	2
Open	1.75V	2

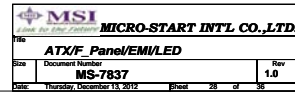
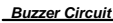




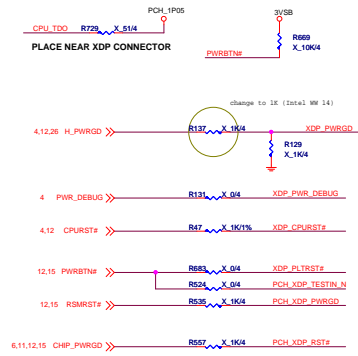
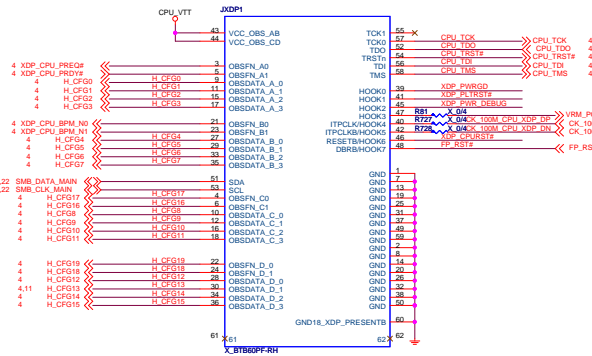
### 24 Pin ATX Power Connector



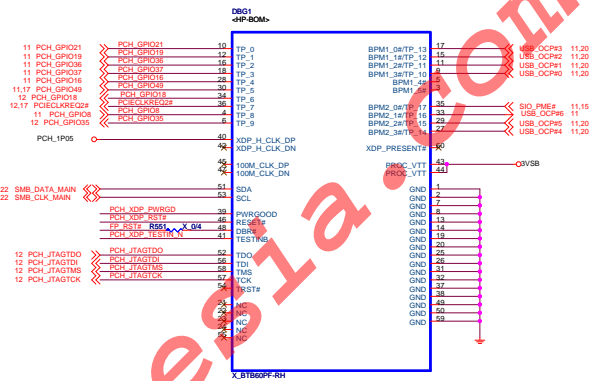
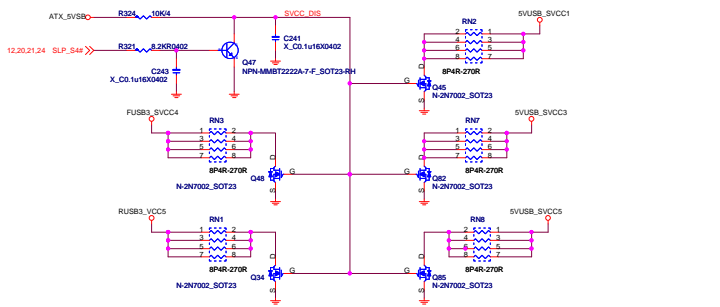
**VCC5\_SB Trace Width 80mils**

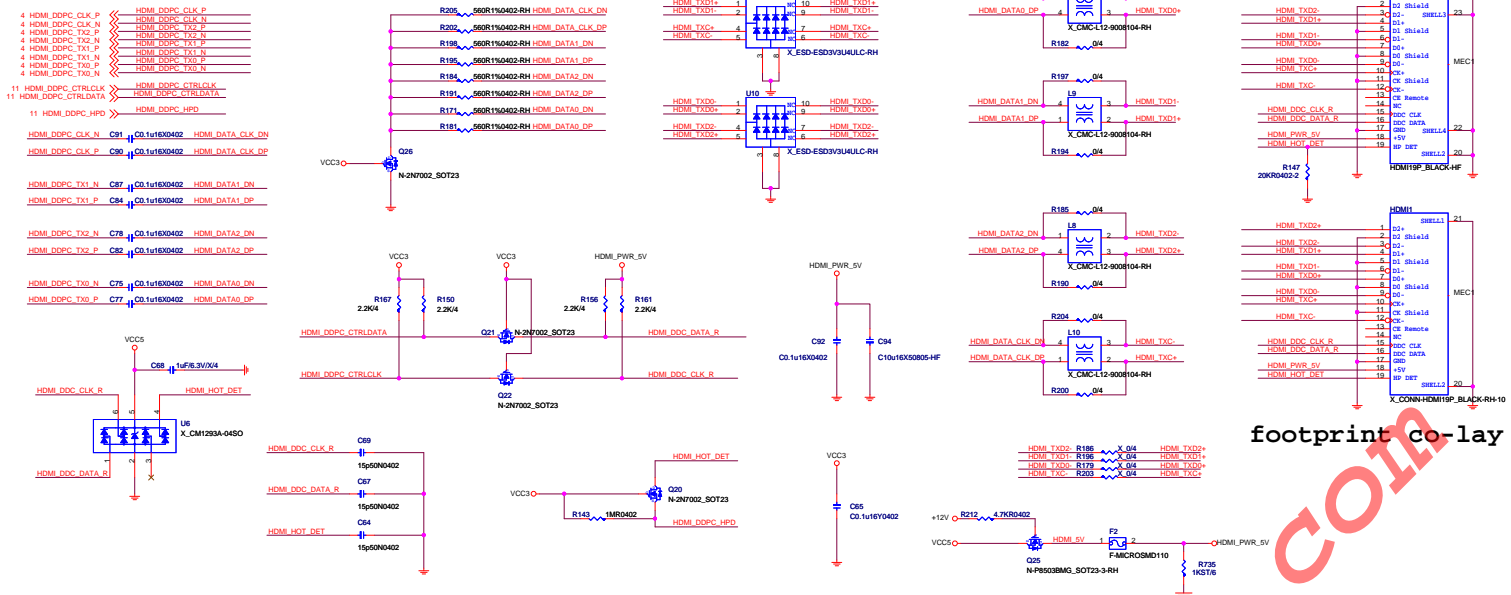


***B power discharge circuit***

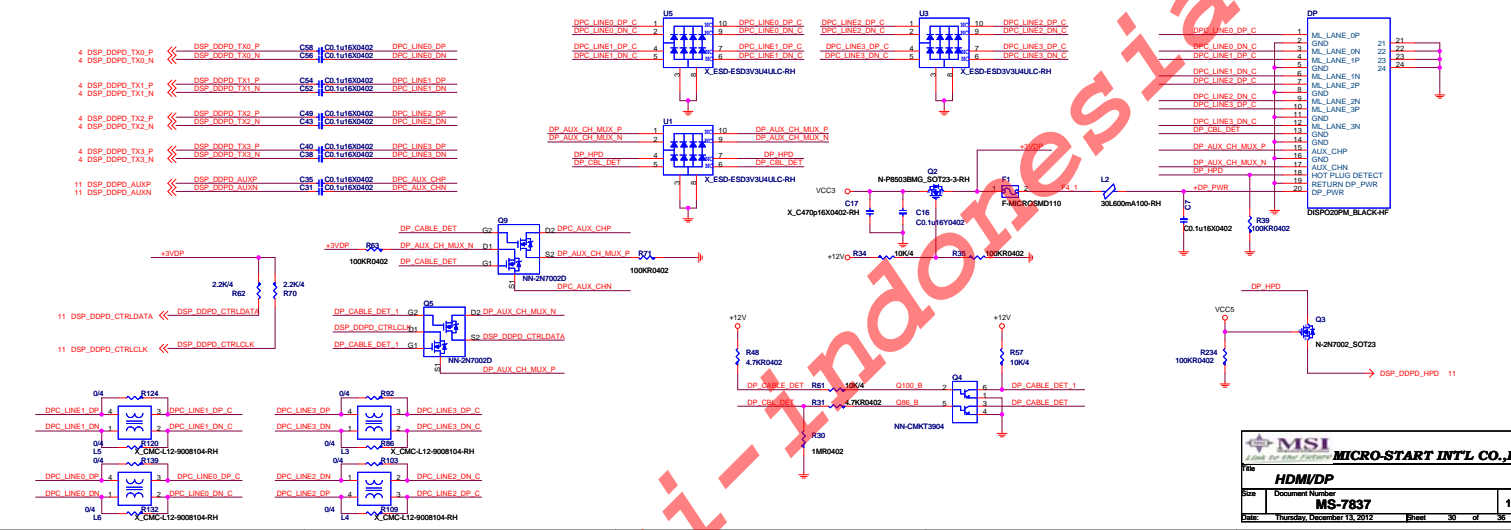


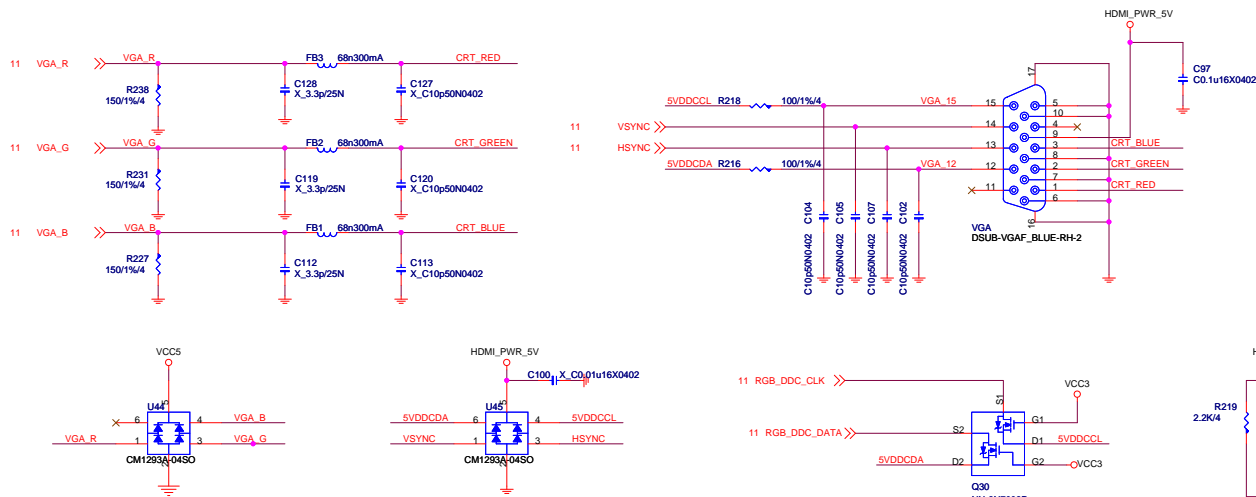
### USB power discharge circuit





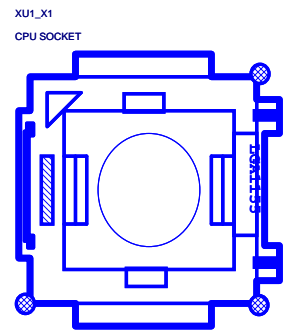
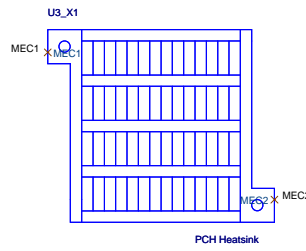
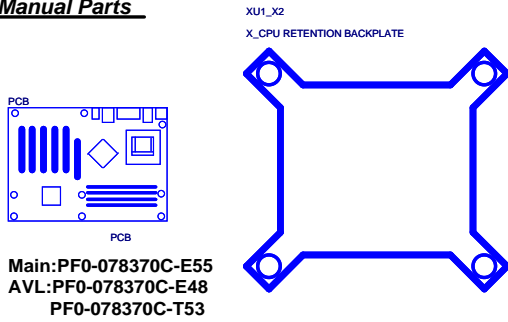
footprint co-lay



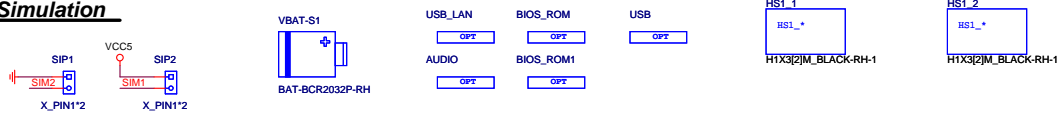


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File		VGA	
Size	Document Number	MS-7837	
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		Rev	1.0

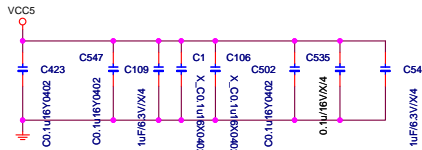
## Manual Parts



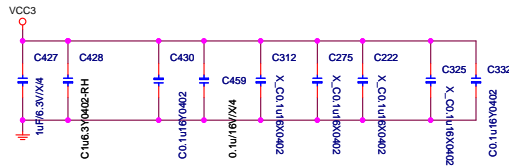
## Simulation



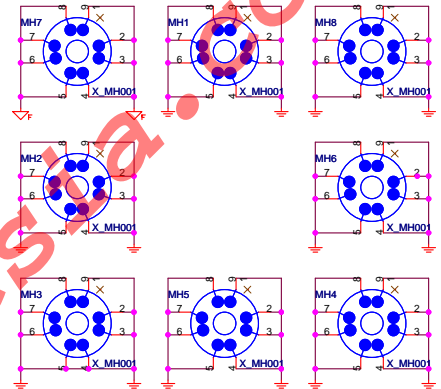
### For EMI



### For Moat CAP

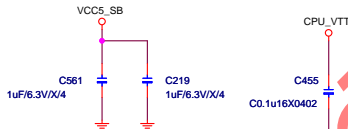


### Mounting Holes



## Optics Orientation Holes

### Optical Fiducial Marks-120



<b>MICRO-START INT'L CO.,LTD</b>		
Title		
Manual & Option Parts		
Size	Document Number	Rev
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Timing diagram for the SPI interface between the Board and the Evaluation Module. The diagram shows signals for CSn, MISO, MOSI, and SCLK over time. The Board's CSn is active-low, MISO is input, MOSI is output, and SCLK is output. The Evaluation Module's CSn is active-low, MISO is output, MOSI is input, and SCLK is input. The diagram includes a legend for CSn, MISO, MOSI, and SCLK, and a note that the SCLK signal is shown for the Board and Evaluation Module.

[illegible]

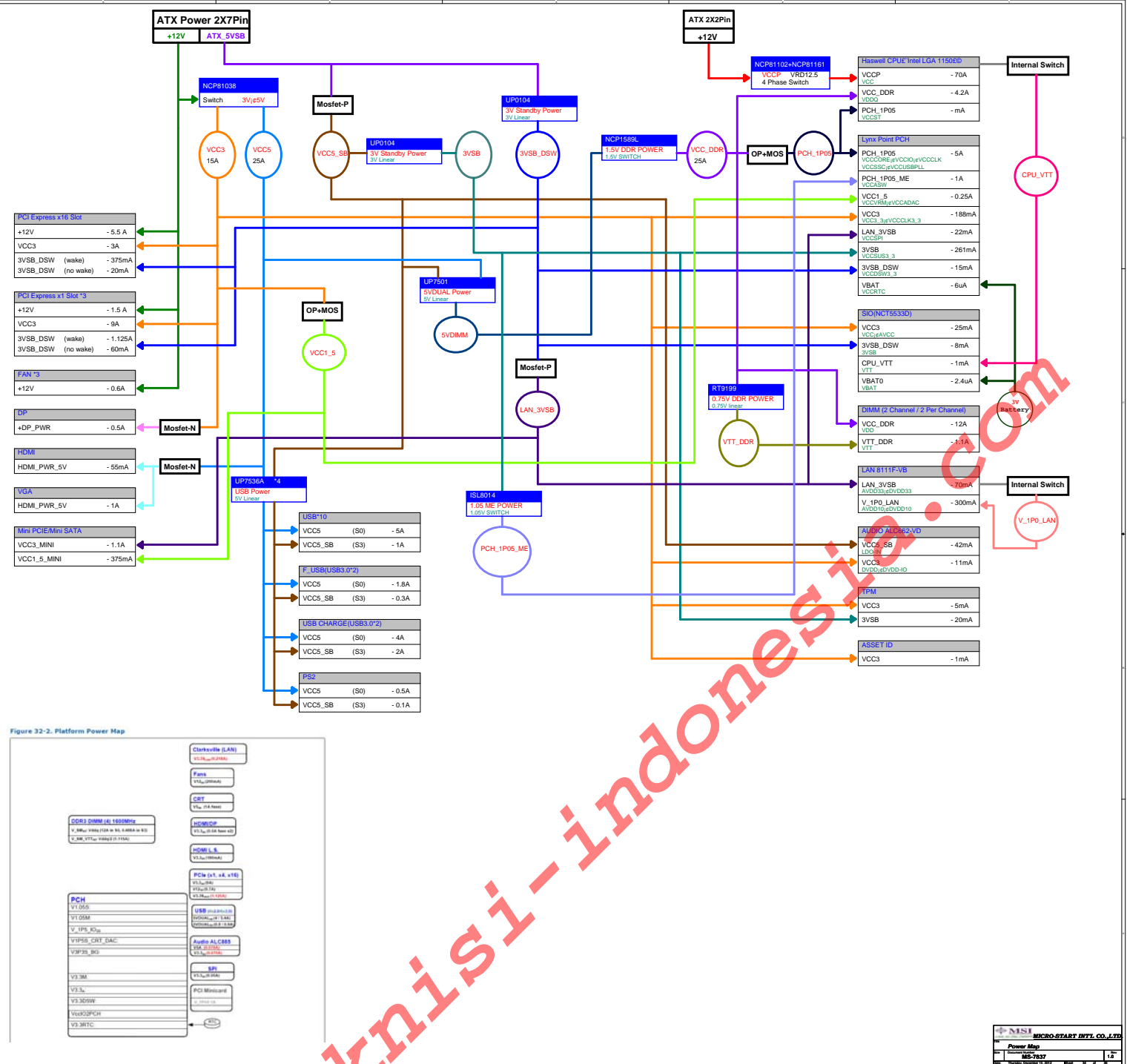
```

graph TD
    Intel[Intel 1150 Processor] <-->|CPU/PCH| PCH[PCH]
    PCH -->|CPU/PCH| ALC[ALC 992 HD Codec]
    PCH -->|CPU/PCH| LAN[LAN 8111F]
    PCH -->|CPU/PCH| RESET[RESET SW]
    PCH -->|CPU/PCH| SuperI[Super I/O NCT5533D]
    SuperI --> PCIE16[PCIE X16 Slot]
    SuperI --> PCIE1[PCIE X1 Slot]
    SuperI --> MPCI[MPIC/IDE/ATA Slot]
  
```

```

12V
5V
3.3V
5VDRV1
VCC1_5REF
DDR_EN
VCC1_5
VCC_DDR
PCH_1P05
CHIP_PWRGD
MEM_PWRGD
H_PWRGD
VCCCP
PCH_SYSPWROK
SUS_STAT#
PLTSTST#

```





SIG(CT67790)			
PIN NAME	USAGE	Input/Output	NOTES
GPIO0	ALUX/FAN1_CTL	Output	Fan speed control
GPIO1	NA	NA	NA
GPIO2	NA	NA	NA
GPIO3	NA	NA	NA
GPIO4	ALUX/FAN1	Input	Fan speed sense
GPIO5	ALUX/ANNG2	Input	Pull low
GPIO6	ALUX/ANNG3	Input	Pull low
GPIO7	NA	NA	NA
GPIO8	RTSB	Input	Com port signal
GPIO11	DSBIB	Input	Com port signal
GPIO12	SCUTB	Output	Com port signal
GPIO13	SNB	Input	Com port signal
GPIO14	DTSB	Output	Com port signal
GPIO15	RTSB	Output	Com port signal
GPIO16	DSBIB	Input	Com port signal
GPIO17	DTSB	Output	Com port signal
GPIO20	CTBTA	Input	Keyboard data in
GPIO21	KSCAL	Input	Keyboard data out
GPIO22	MSDATA	Input	Mouse data in
GPIO23	MSCLK	Output	Mouse clock out

SIO[NC6779D]			
Pin Name	Usage	Input/Output	Notes
GPIO24	SIO_WANEN_RX	Output	Wakeup signal from LAN
GPIO25	AMDPWR_EN	Input	Pin strap which disabled AMD power sequence
GPIO26	NA	NA	NA
GPIO27	MLEDV	Output	Pull high
GPIO30	RESETCONIR	Input	Pull high
GPIO31	SDA_SIO	Output	Reserved GPIO for future use
GPIO32	SCI_SIO	Output	Reserved GPIO for future use
GPIO33	NA	NA	NA
GPIO34	PRSTRM	Output	LPT signal
GPIO35	PRFDIRF	Output	LPT signal
GPIO36	PRERRR	Output	LPT signal
GPIO40	TEST_MODE_EN	Input	Pin strap which disabled test mode
GPIO41	PRINTNR	Output	LPT signal
GPIO42	LPT_SLine	Output	LPT signal
GPIO43	FRACKR	Input	LPT signal
GPIO44	FRACKR	Input	LPT signal
GPIO45	PRPRT	Input	LPT signal
GPIO46	PRRLCT	Input	LPT signal
GPIO47	RESETCONDR	Input	Pull high
GPIO60	SLEWWARNR	Output	DSSW signal

[PINQCT6779D]			
PIN NAME	USAGE	Input/Output	NOTES
GP051	SIO_5V0DMA	Input	D5W signal
GP052	SUBACOR	Output	D5W signal
GP053	NA	NA	NA
GP054	SLP_SU5B	Input	D5W signal
GP055	SY5V5OFF_R	Output	D5W signal
GP056	PS2_DeT8	Input	PS2 detect signal
GP057	PKW_LED_R	Output	Power led
GP060	RND0	IO	LPT signal
GP061	RND1	IO	LPT signal
GP062	RND2	IO	LPT signal
GP063	RND3	IO	LPT signal
GP064	RND4	IO	LPT signal
GP065	RND5	IO	LPT signal
GP066	RND6	IO	LPT signal
GP067	RND7	IO	LPT signal
GP070	CS0_R0B3	Output	Pin which enables D5W
GP071	CS0_GP1	Output	Reserved GPIO for future use
GP072	CS0_GP2	Output	Reserved GPIO for future use
GP073	CS0_GP3	Output	Reserved GPIO for future use
GP074	WST0_OR8	Output	PCIE reset signal

Pin Name	Usage	Input/Output	Notes
GPIO75	RS1TOUT1#	Output	LPC_Debug card reset signal
GPIO76	RS1TOUT2#	Output	TPM reset signal
GPIO80	CTS#A	Input	COM port signal
GPIO81	DSRA#A	Input	COM port signal
GPIO82	RTSA#	Output	COM port signal
GPIO83	DTRA#	Output	COM port signal
GPIO84	SINA	Input	COM port signal
GPIO85	SOUTA	Output	COM port signal
GPIO86	DCDA#	Input	COM port signal
GPIO87	RIA#	Input	COM port signal