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5	CPU-Memory
6	CPU-Power
7	CPU-GND
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10	PCH-DMI/PCIE/USB/SATA/DDI
11	PCH-CLK/LPC/FAN/SPI/PECI
12	PCH-Power
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Q270/Q250 Version : 2.4

CPU :

Intel Kabylake-S

System Chipset :

Intel Kabylake-H Chipset

On Board Chipset :

IMVP8 -- NCP81203+NCP5230 6Phase

Gigabit LAN -- I219-LM

HDA Codec -- Realtek ALC662VD

Super I/O --NCT6685D

SPI Flash 128Mb

Main Memory :

2 Channel DDR 4 * 4 (Max 64GB)

Expansion Slot :

PCI Express x16 Slot * 1


PCI Express x4 Slot * 1

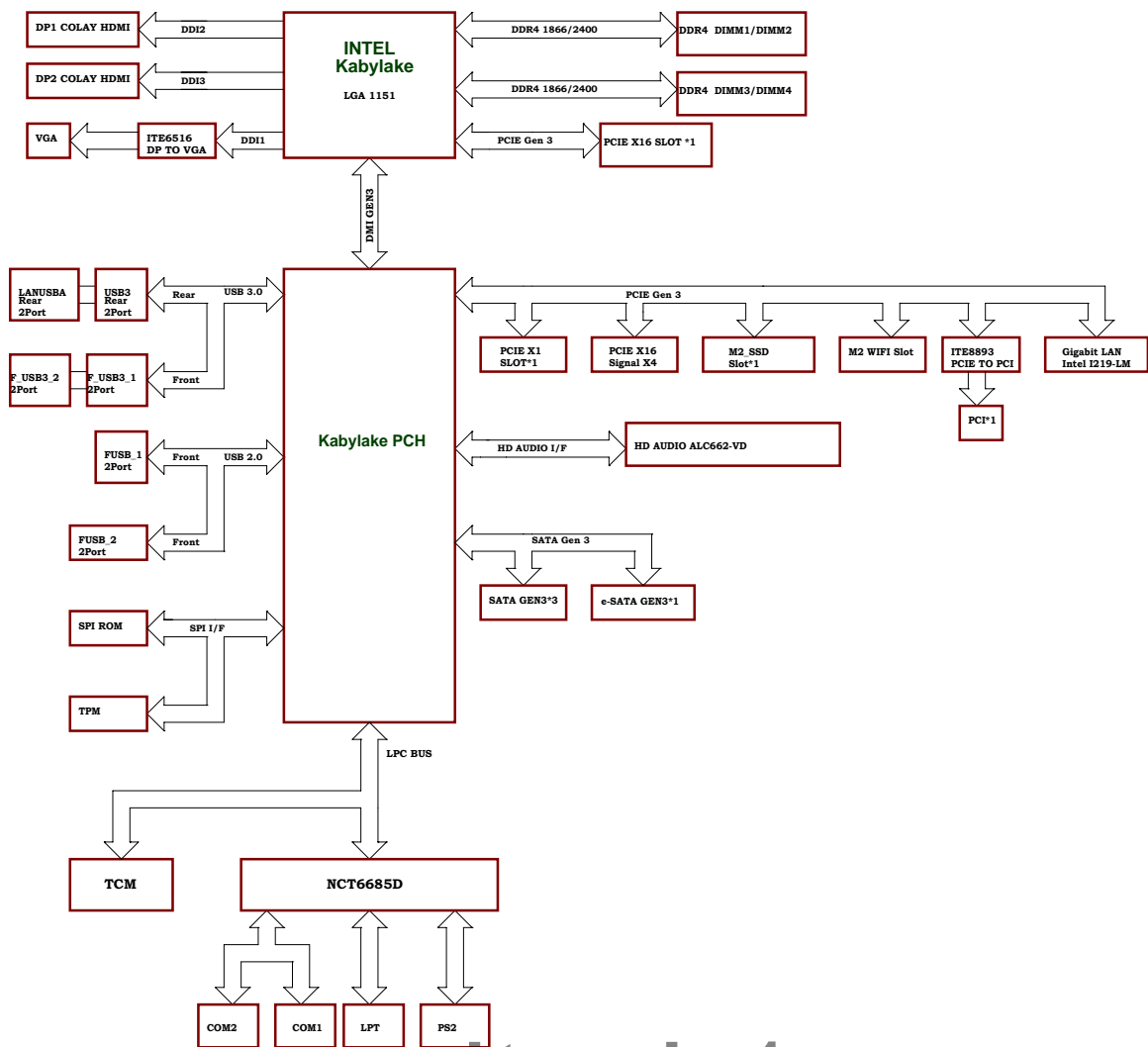
PCI Express x1 Slot * 1

PCI SLOT * 1

lenovo

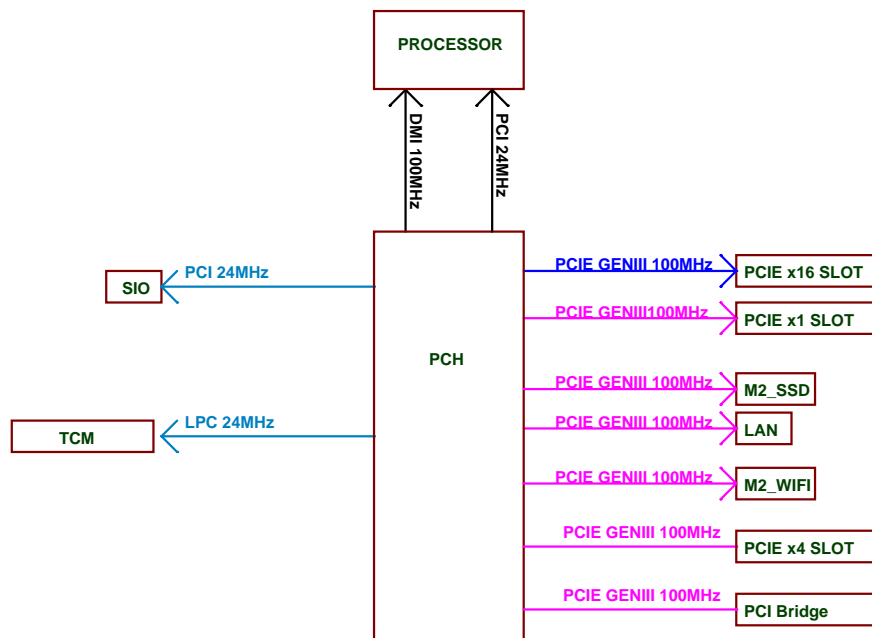
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 MICRO-START INT'L CO.,LTD.		
Title Cover Sheet		
Size	Document Number	Rev
	Q270/Q250	2.4
Date	Monday, October 31, 2016	Sheet 1 of 43

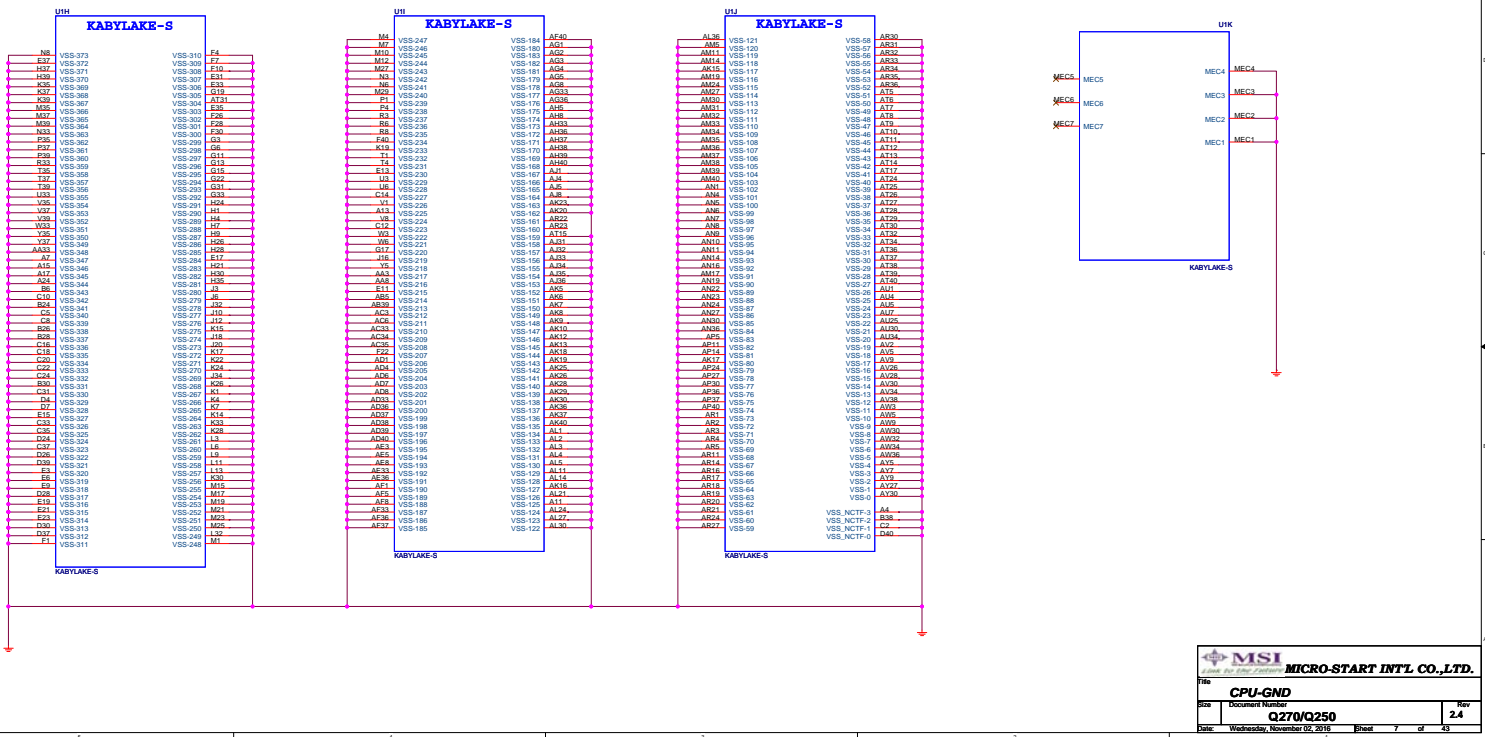


Slot Sequence:
 PCIE X16
 PCIE X1
 PCIE X16(signal x4)
 PCI SLOT

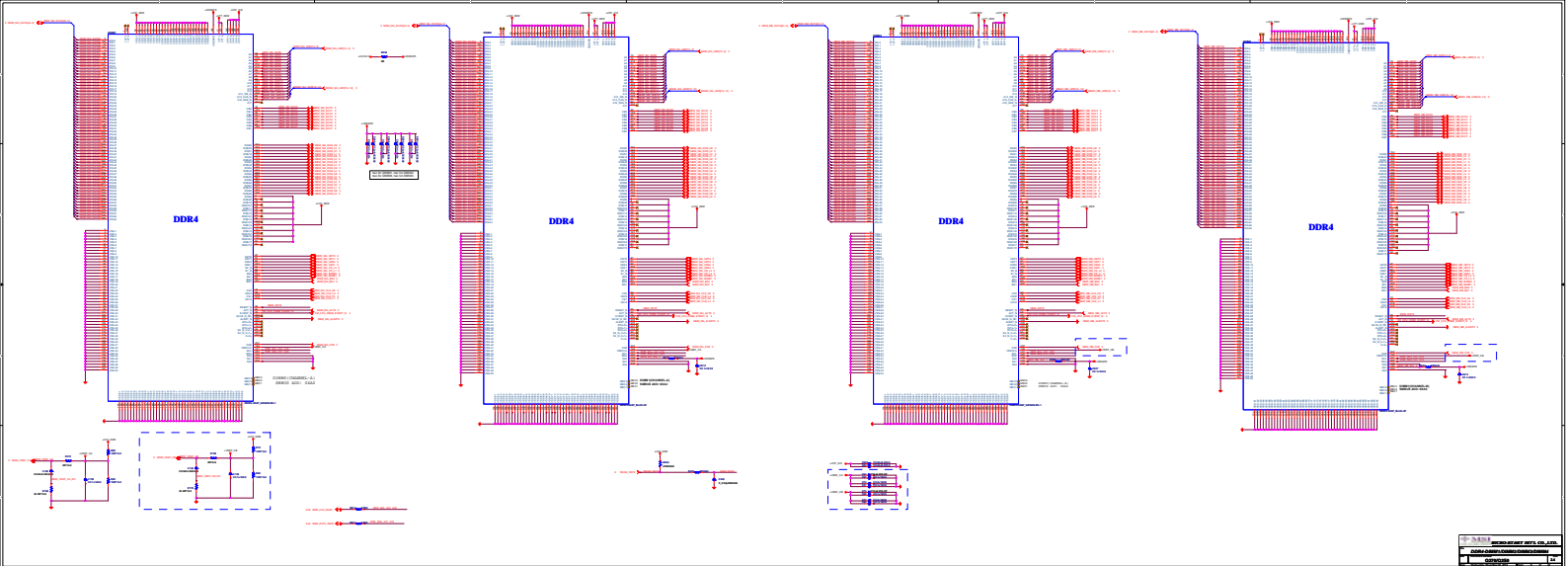
www.aitech1.ru



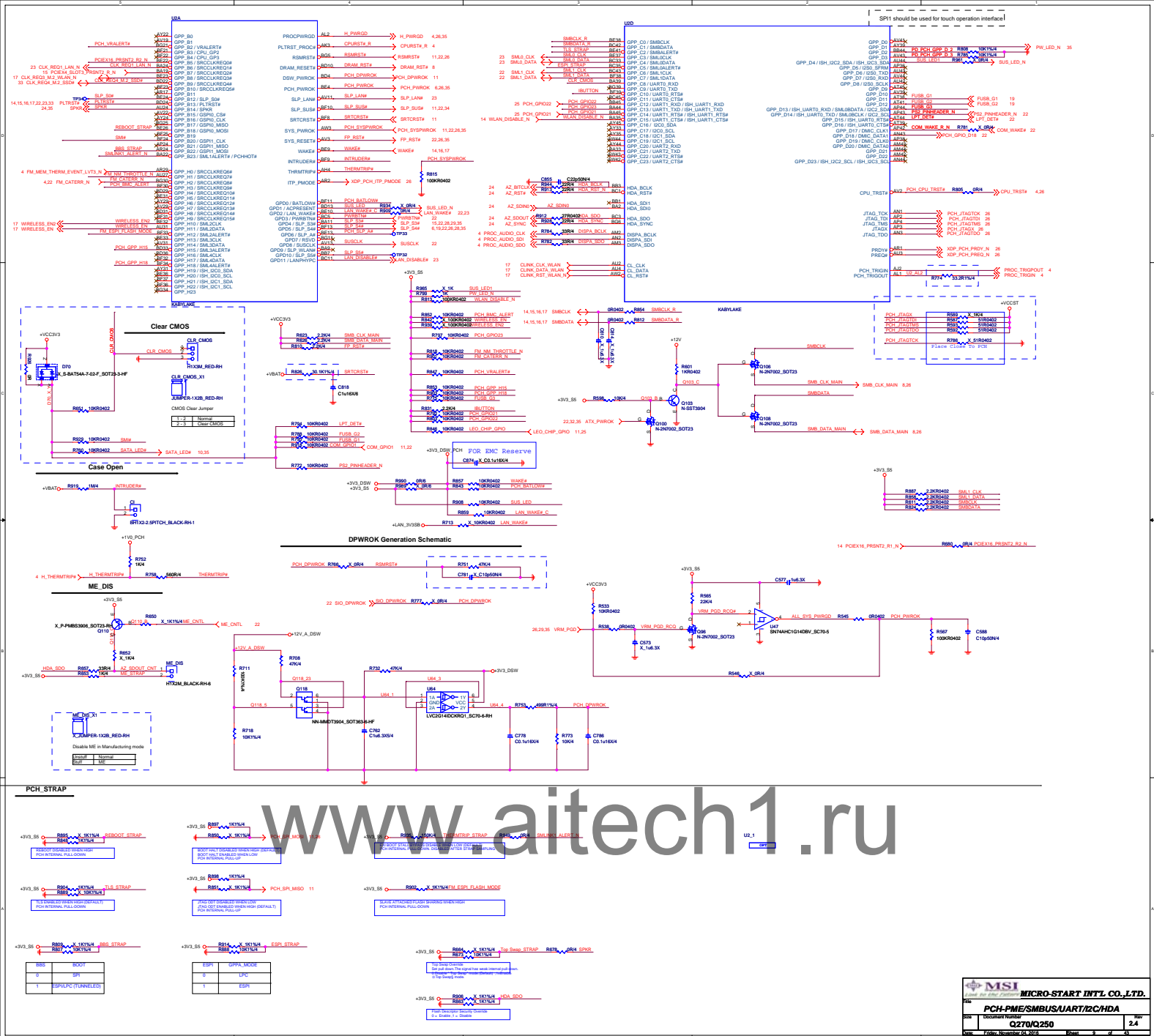
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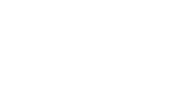
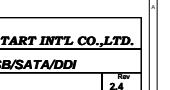
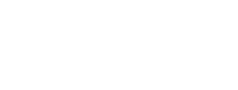
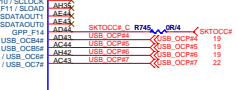
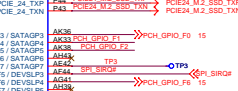
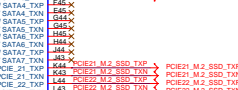
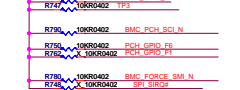
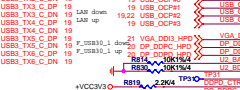
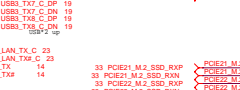
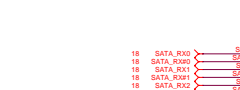
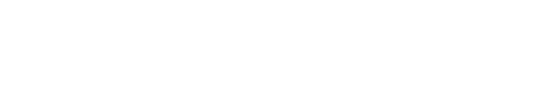
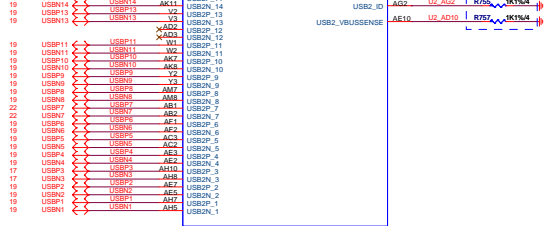
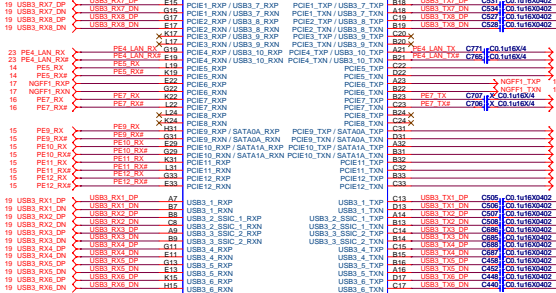
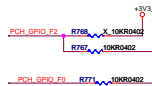


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Except these ports that has annotation, all rest are PCIe port

D7/Q270 & Tiny soft-snap



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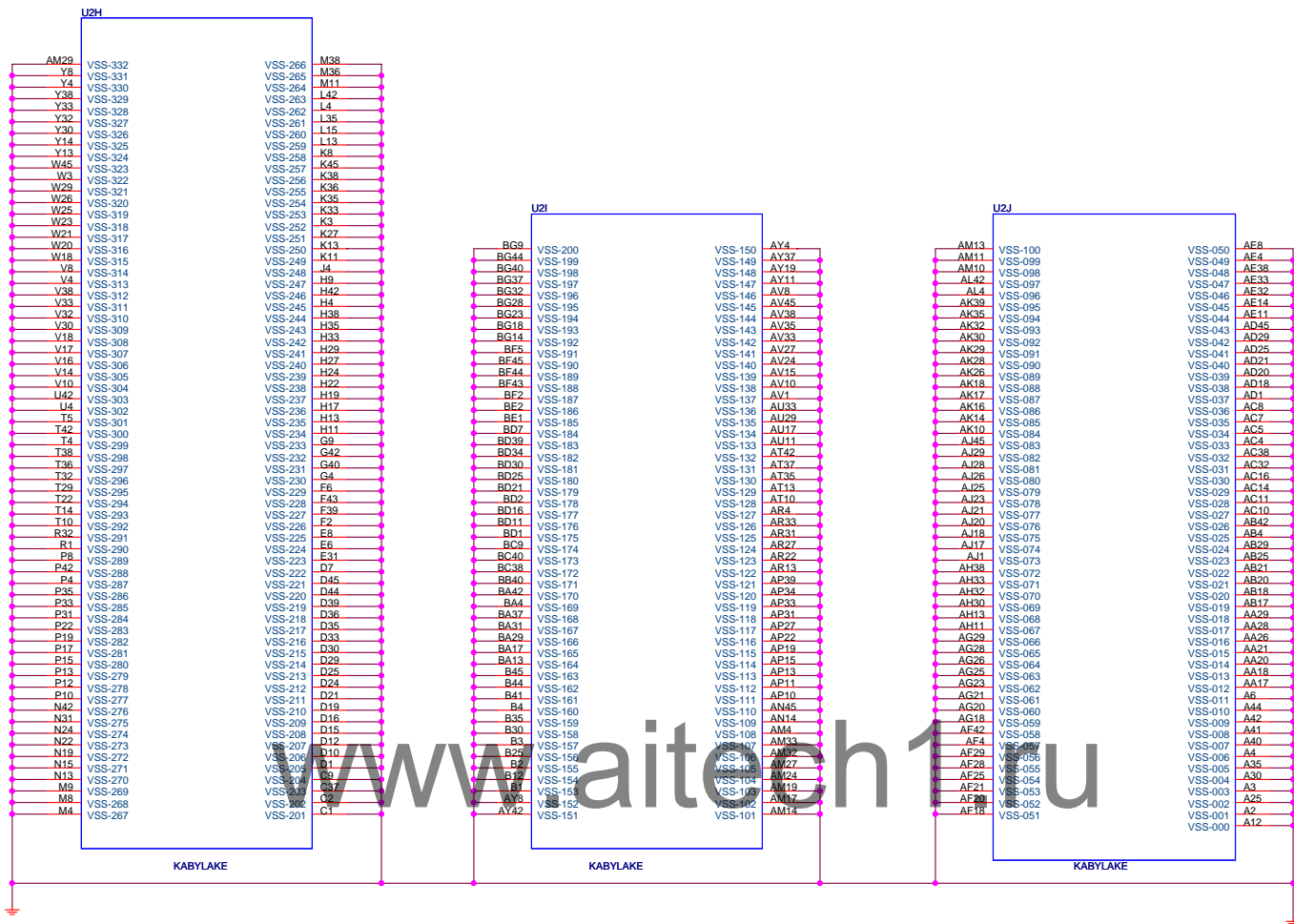
MSI MICRO-START INTL CO., LTD.

Doc: PCH-DMI/PCIE/USB/SATA/DDI

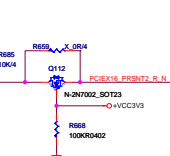
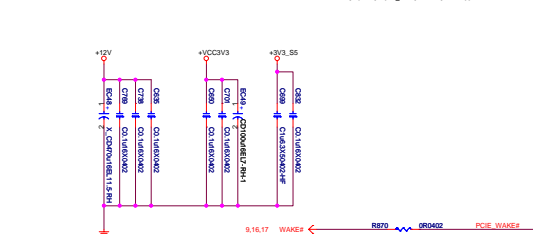
Rev: 2.4

Q270/Q250

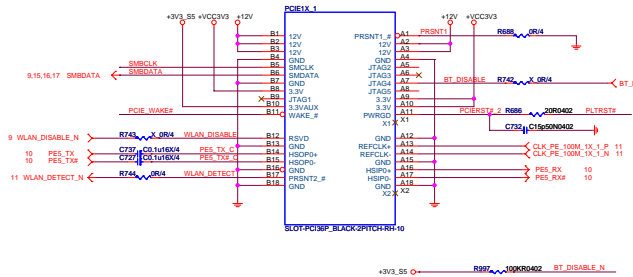
Date: Friday, November 04, 2016 Sheet: 10 of 41



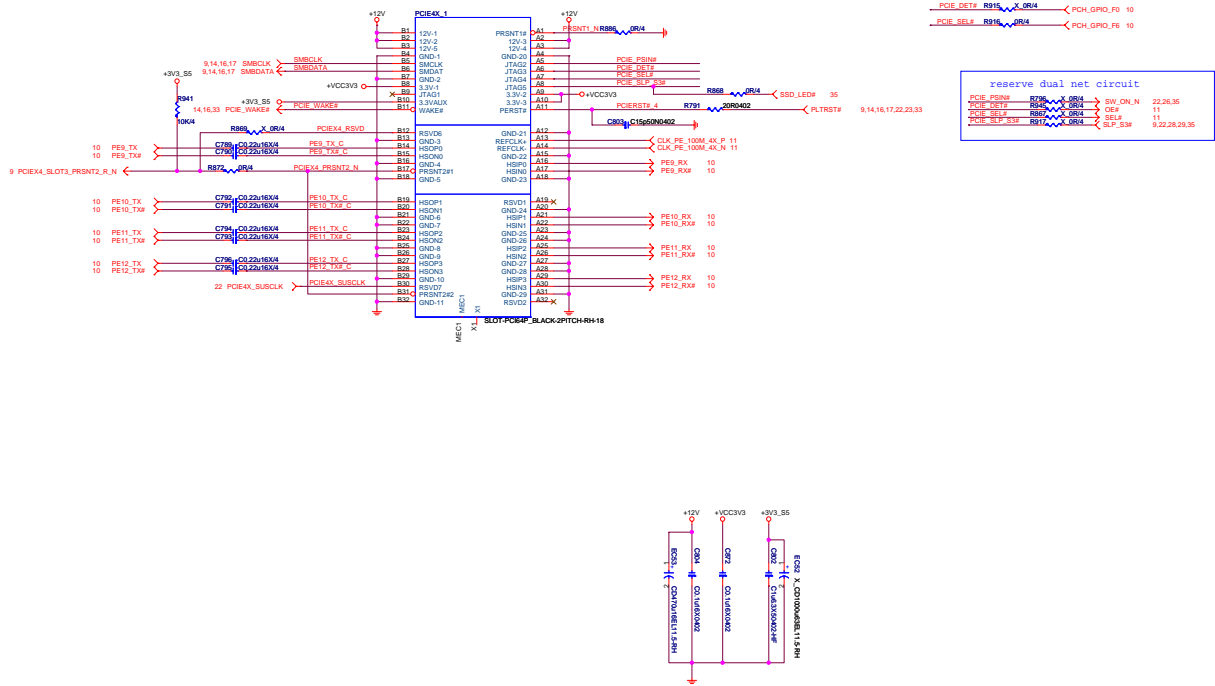
PCIE16X_1



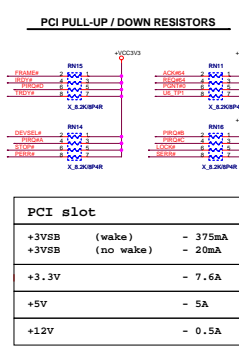
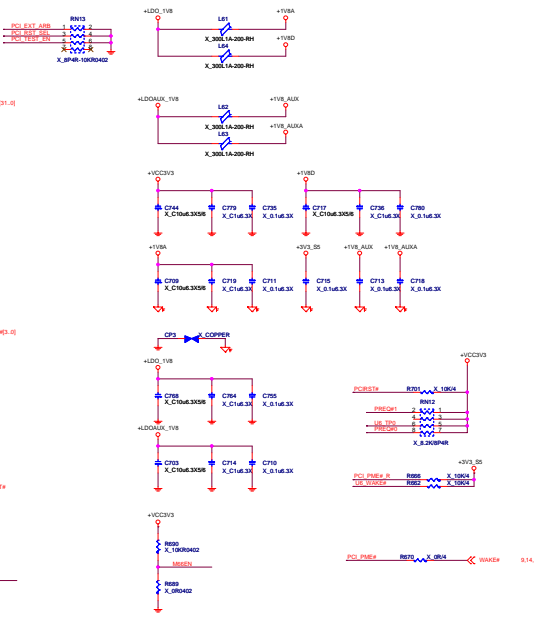
DISCUSSION



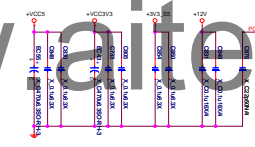
PCI EXPRESS X4 SLOT



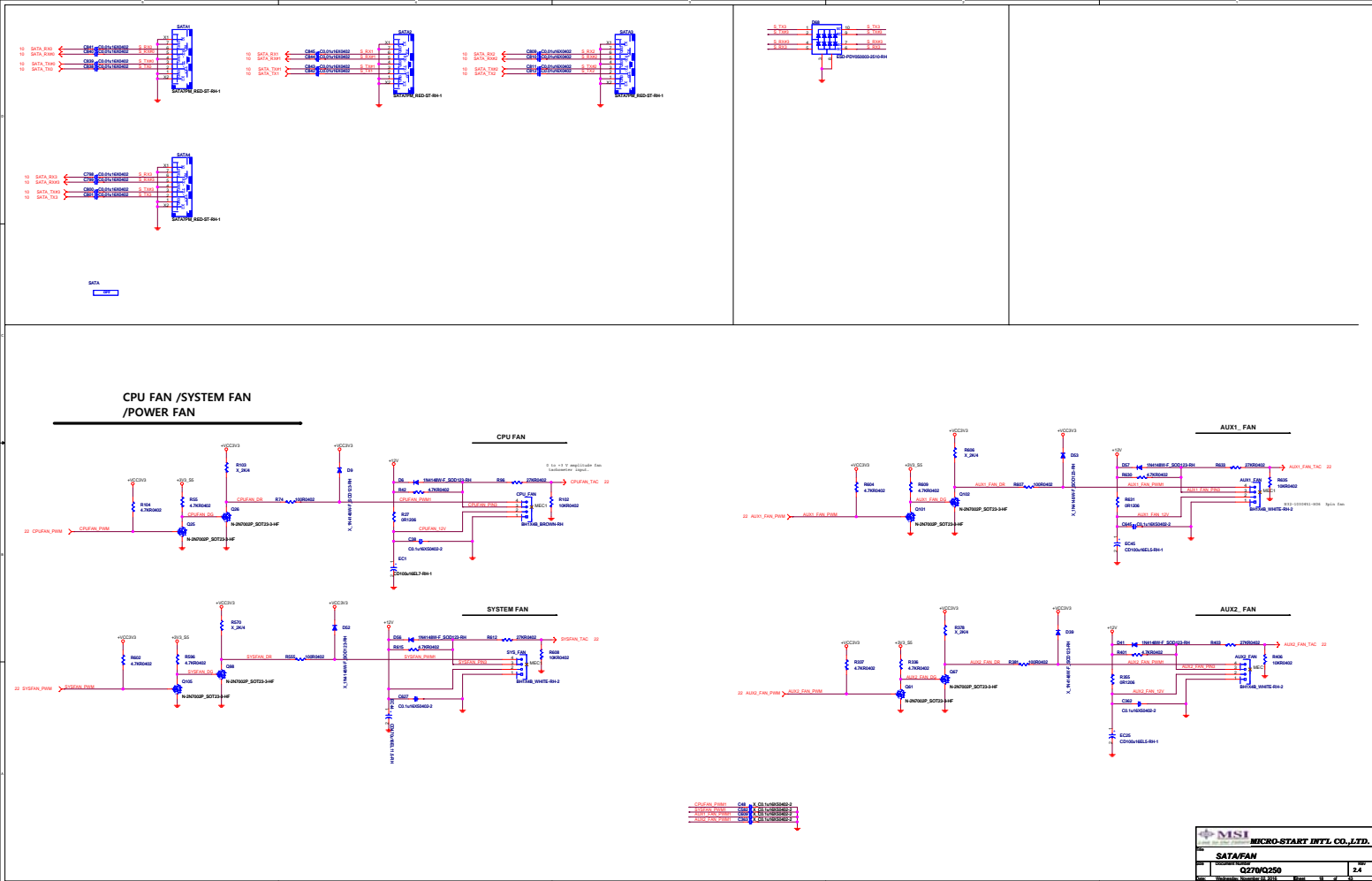
www.aitech1.ru



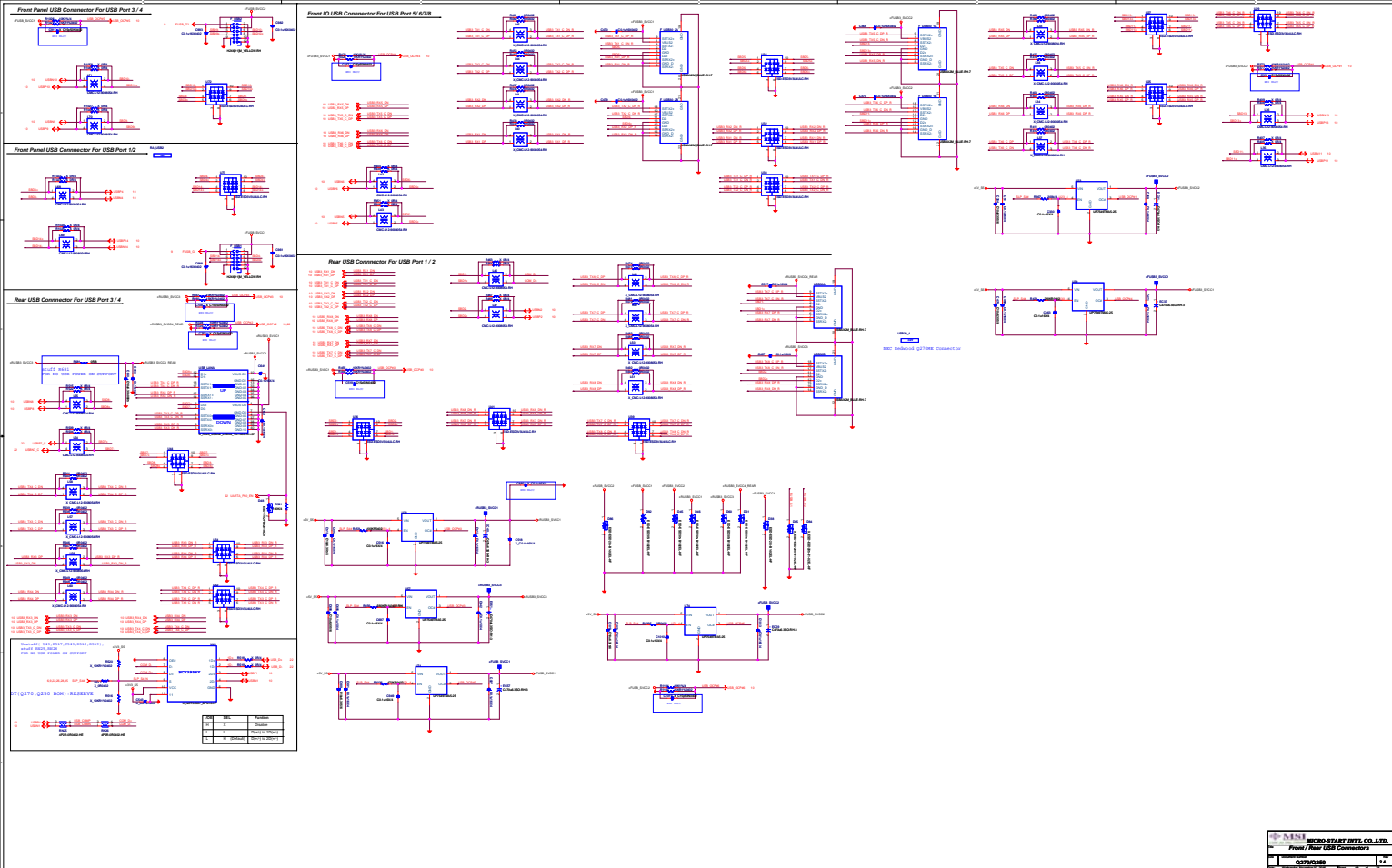
PCI slot		
+3VSB	(wake)	- 375mA
+3VSB	(no wake)	- 20mA
+3.3V		- 7.6A
+5V		- 5A
+12V		- 0.5A



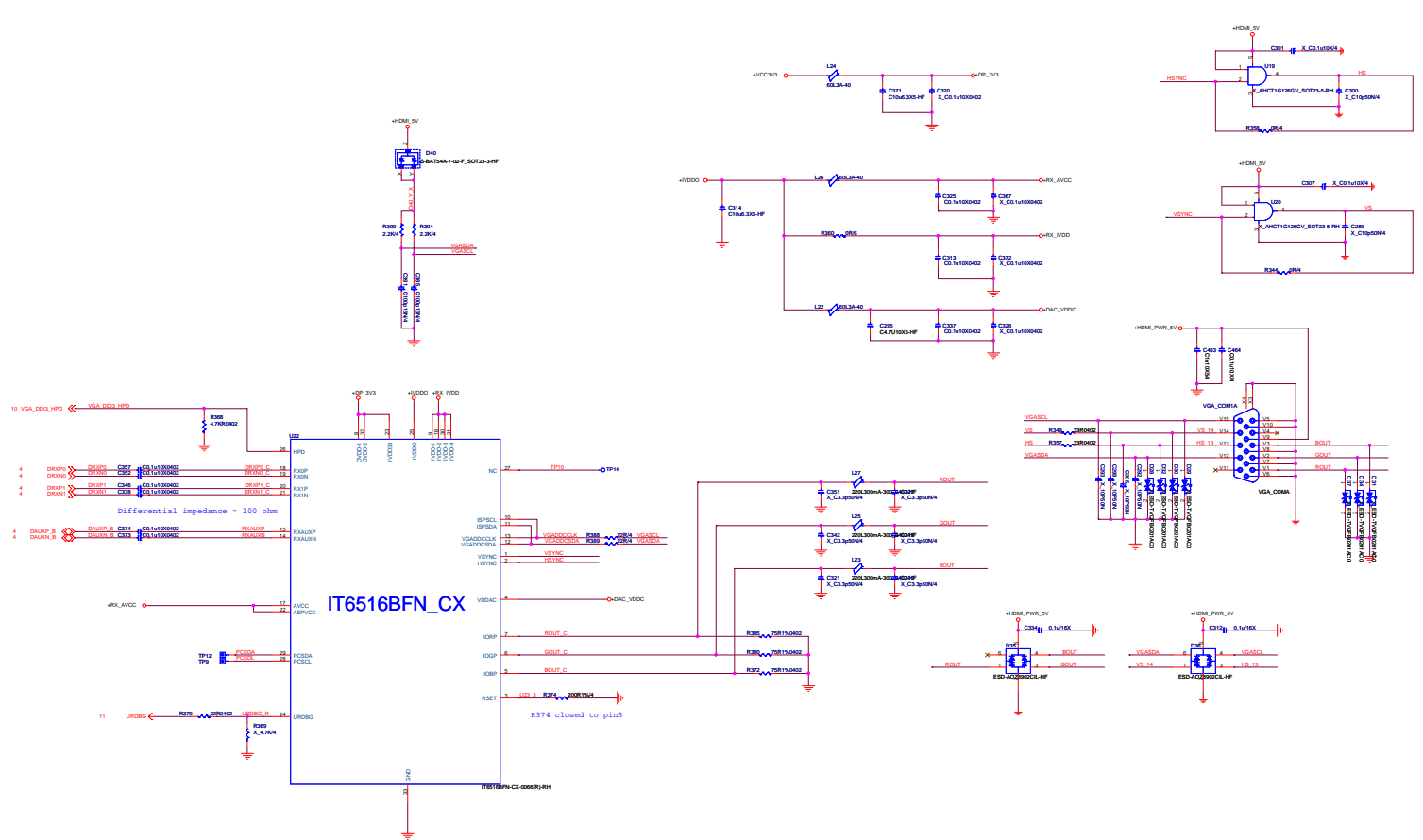
```
IDSEL = AD16
MASTER = PREQ#
PIRQ#A
```

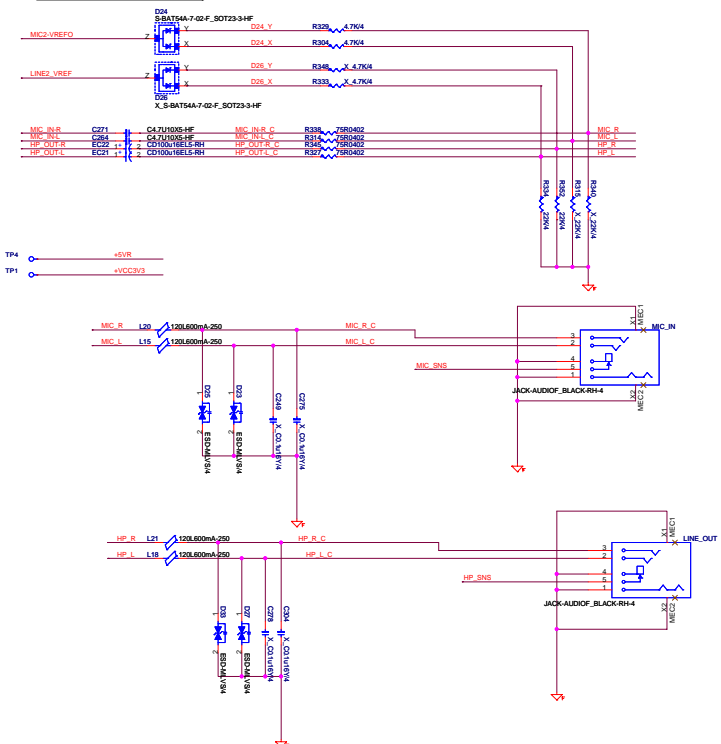
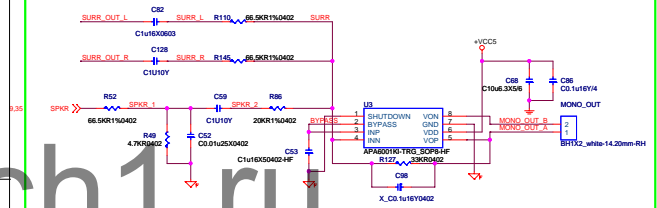
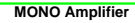
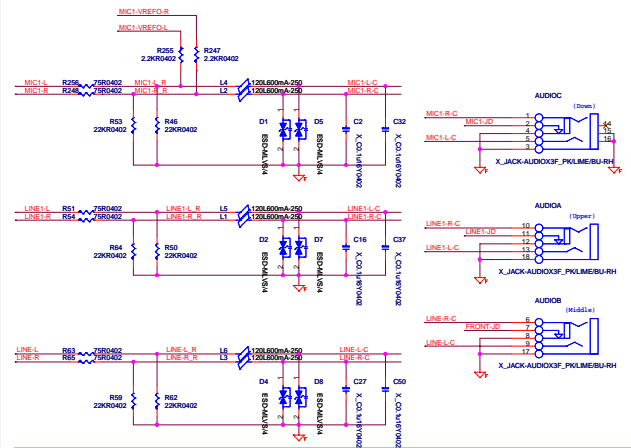
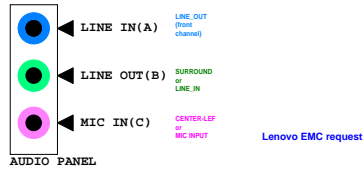
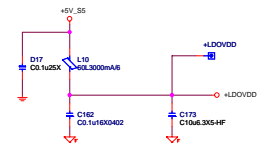
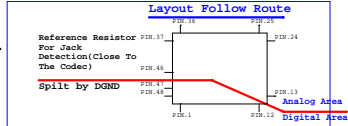
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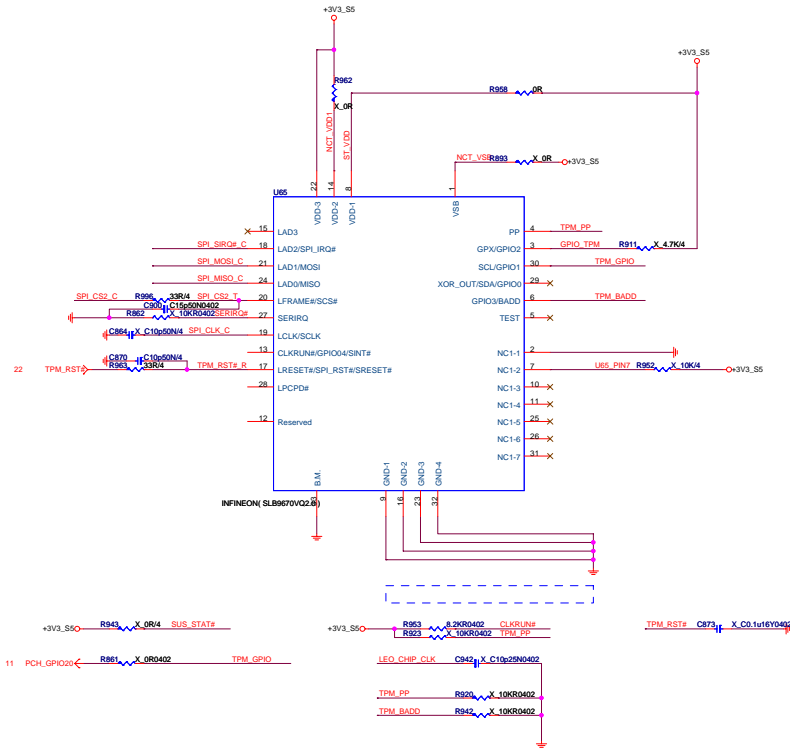
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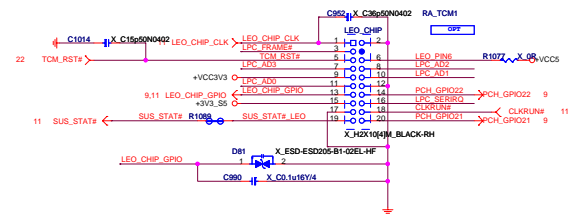


TPM

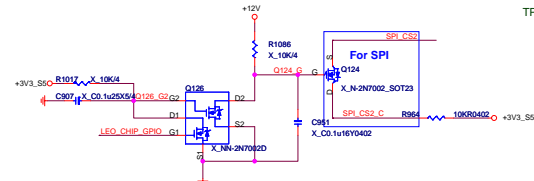


	R893	R911	R923	R920	R942	R952	R958	R862	R962	R861
ST---ST33HITPH2E32AAB6 (SPI)	X	X	X	X	X	X	X	X	X	X
NPC---NPCT650LBAYX (SPI)	V	X	X	X	X	X	X	V	V	X
Infineon SLB 9670VQ2.0 (SPI)	X	X	X	X	X	X	X	X	X	X

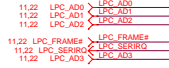
TCM Header



TPM disable circuit



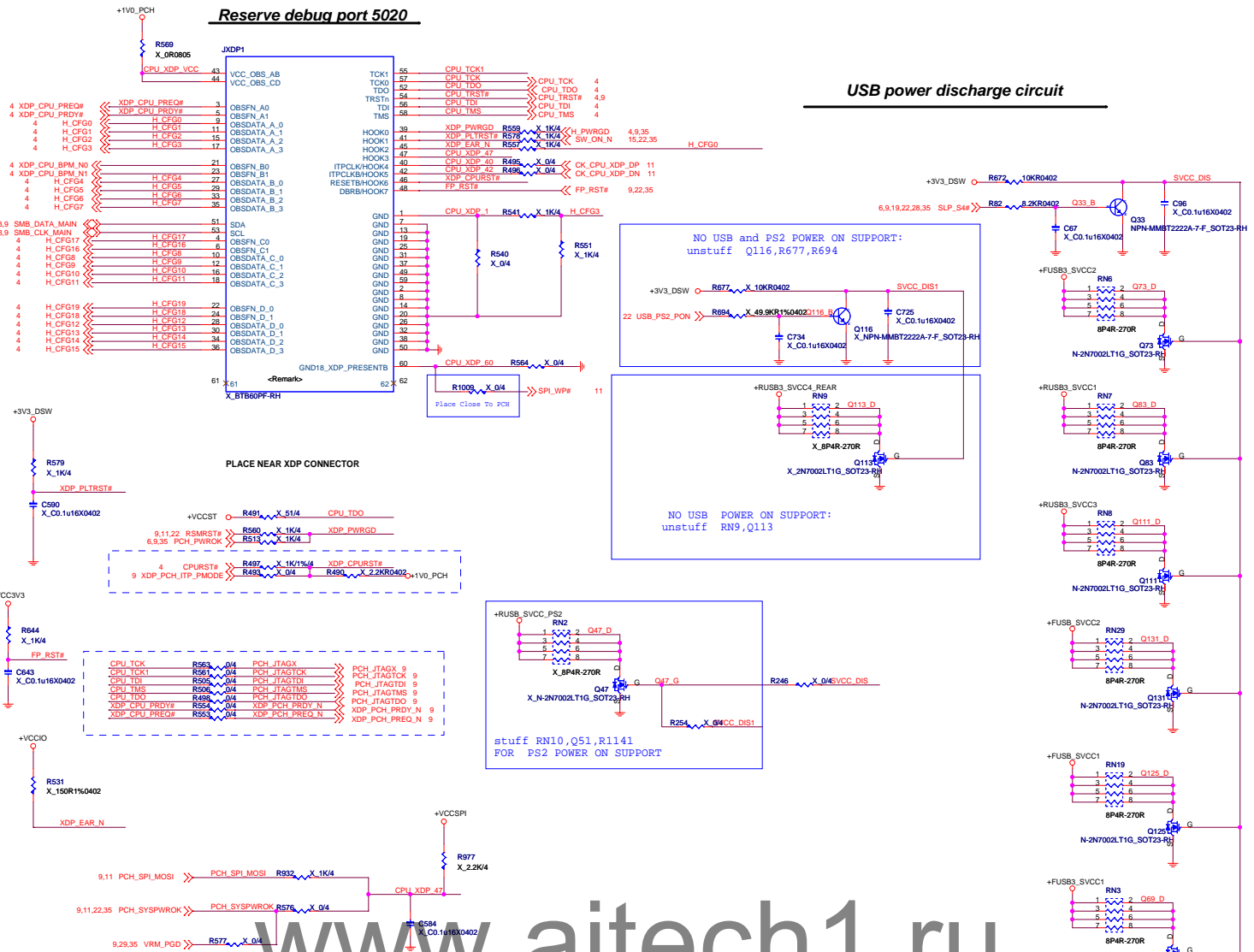
LEO_CHIP_GPIO	HIGH	LOW
TPM	ENABLE	DISABLE

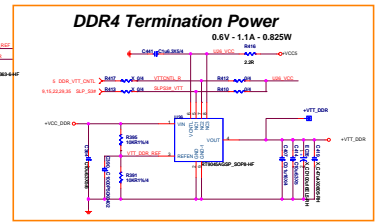
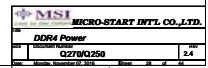
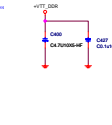
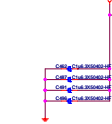
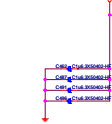
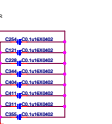
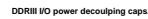


Q270LI : TPM

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Reserve debug port 5020

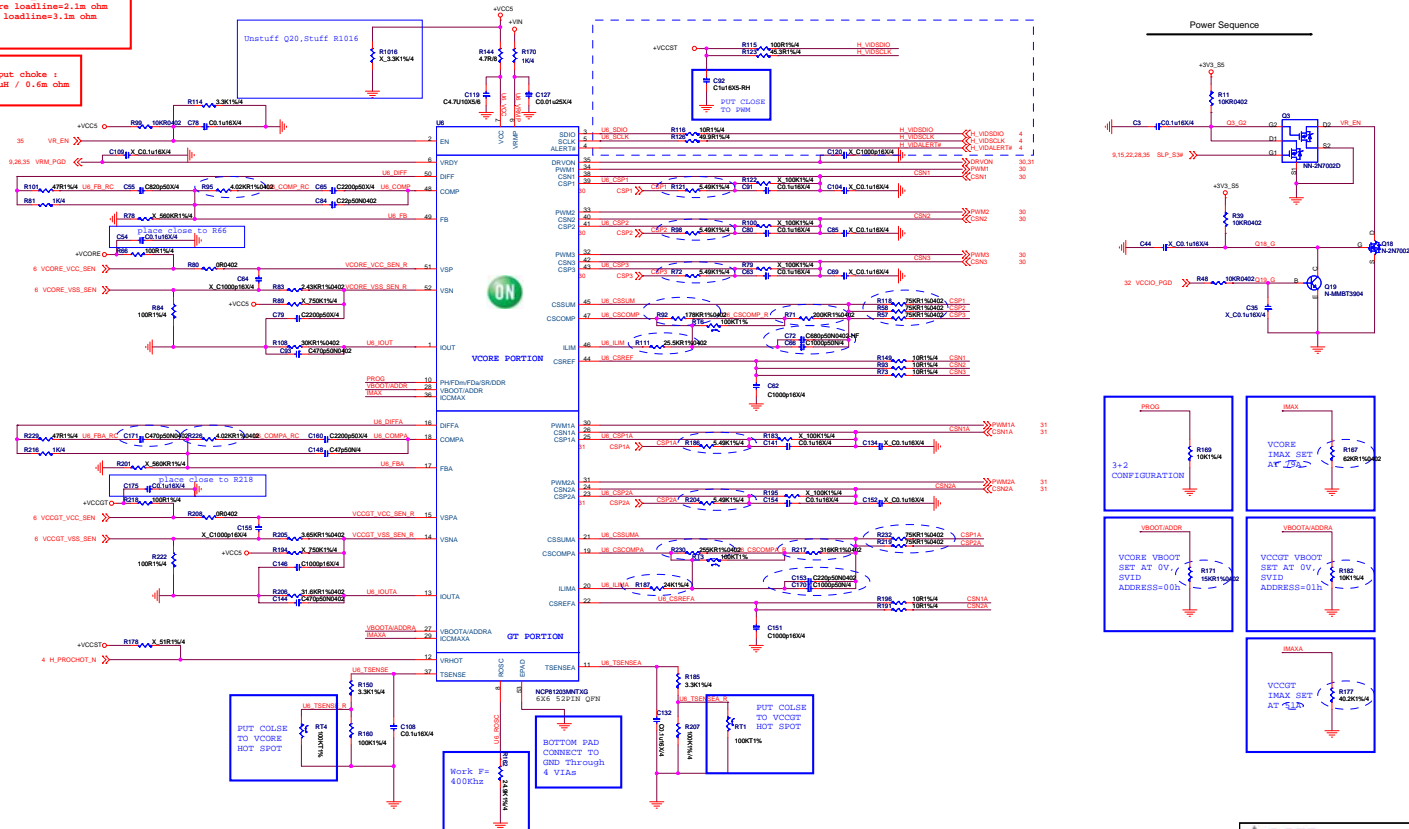



$$\begin{aligned} V_{out} &= 0.8[(R1+R2)/R2] \\ &= 0.8[(1K+2K)]/2K \\ &= 1.2V \end{aligned}$$

$$\begin{aligned} V_{out} &= 0.6[(R1+R2)/R2] \\ &= 0.6((162K+51K))/51K \\ &= 2.5V \end{aligned}$$


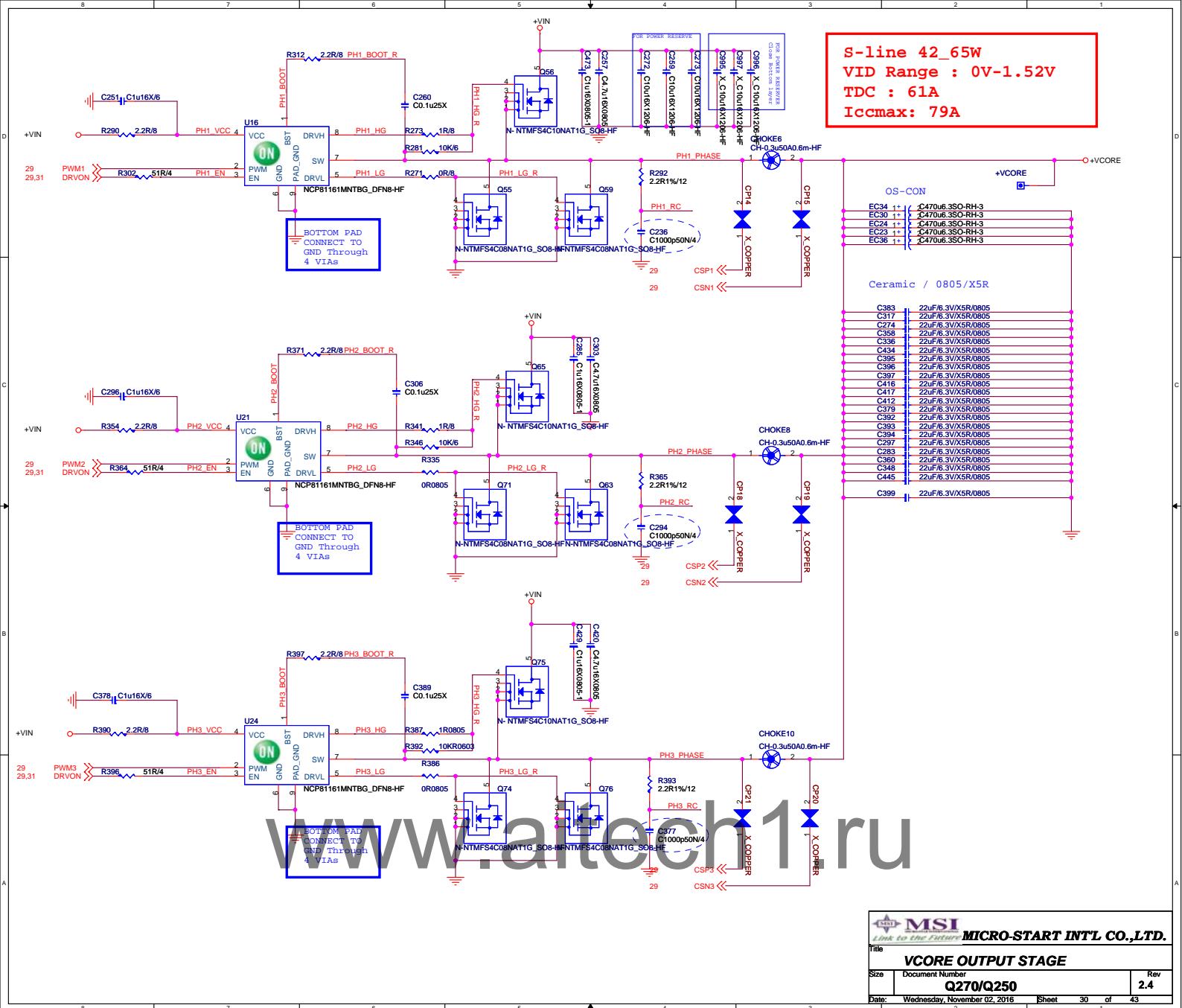
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```
S-line 42_65W
Vcore loadline=2.1m ohm
VGT loadline=3.1m ohm
```

output choke :
0.3uH / 0.6m ohm

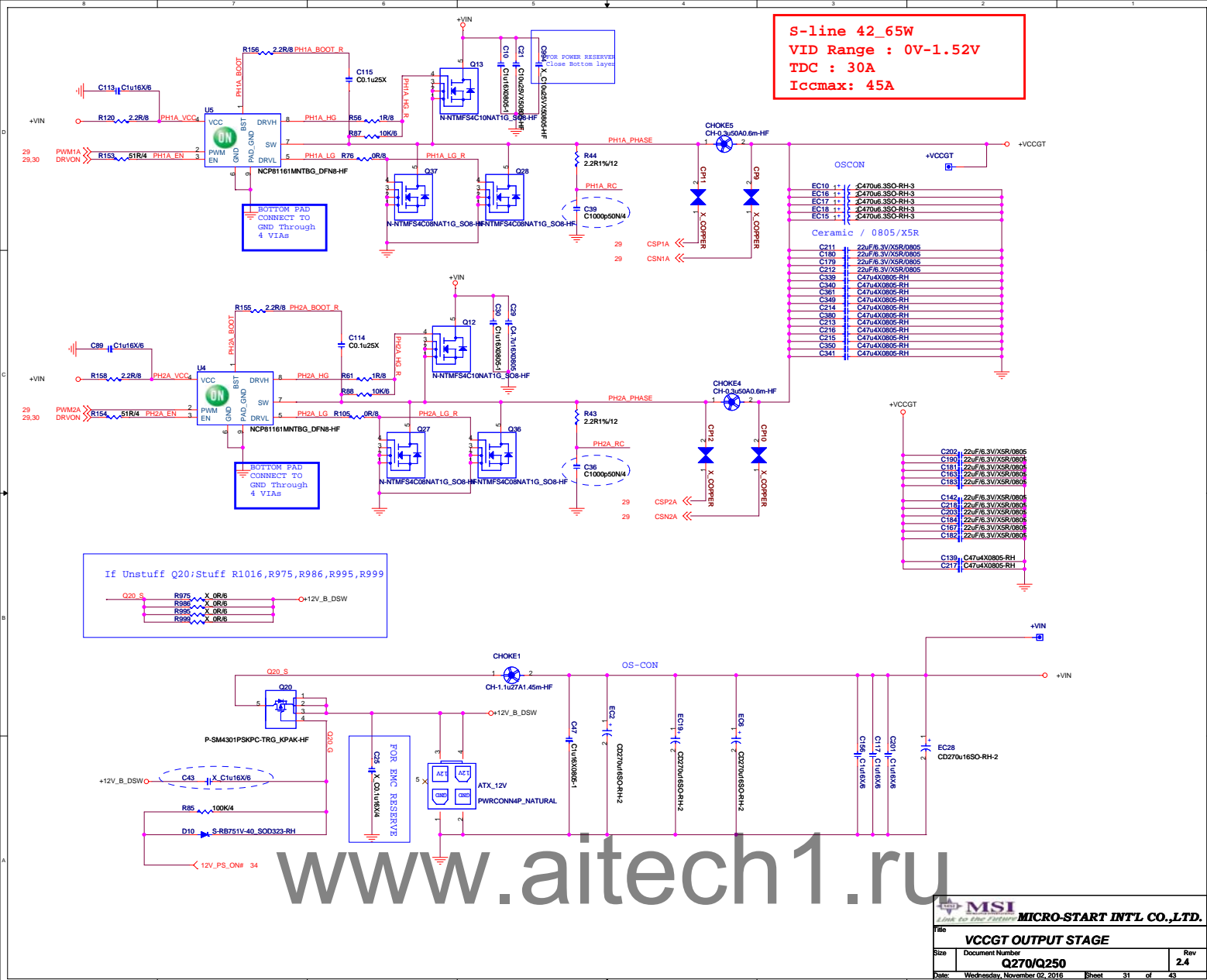


 MICRO-START INT'L CO., LTD.	
IMVP8-NCP81203 5 Phase	
Q270/Q250	2.4

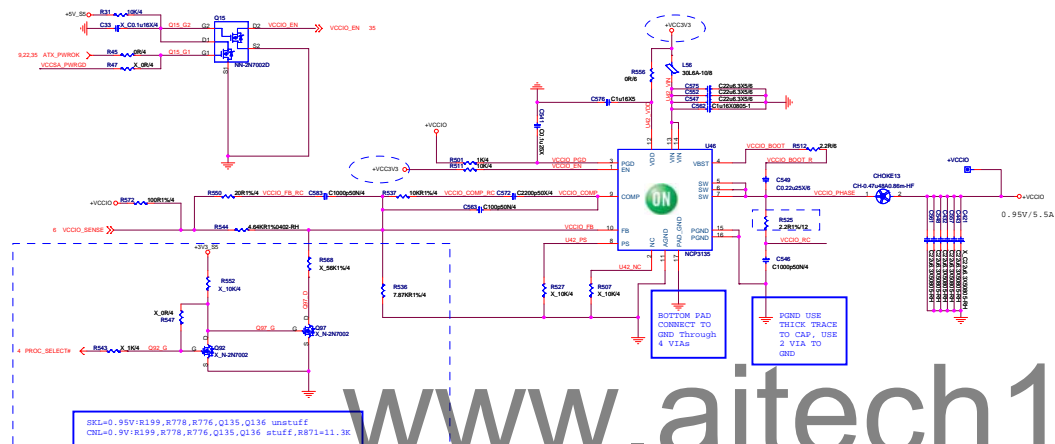


MSI MICRO-START INT'L CO.,LTD.
 Link to the Future

Title		
Vcore OUTPUT STAGE		
Size	Document Number	Rev
	Q270/Q250	2.4
Date:	Wednesday, November 02, 2016	Sheet 30 of 43

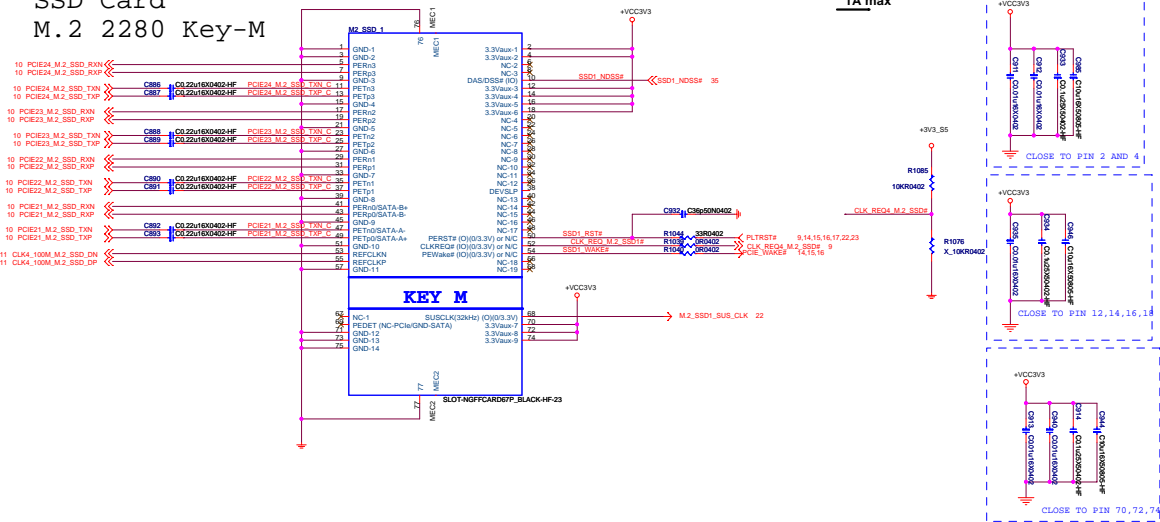


VCCIO



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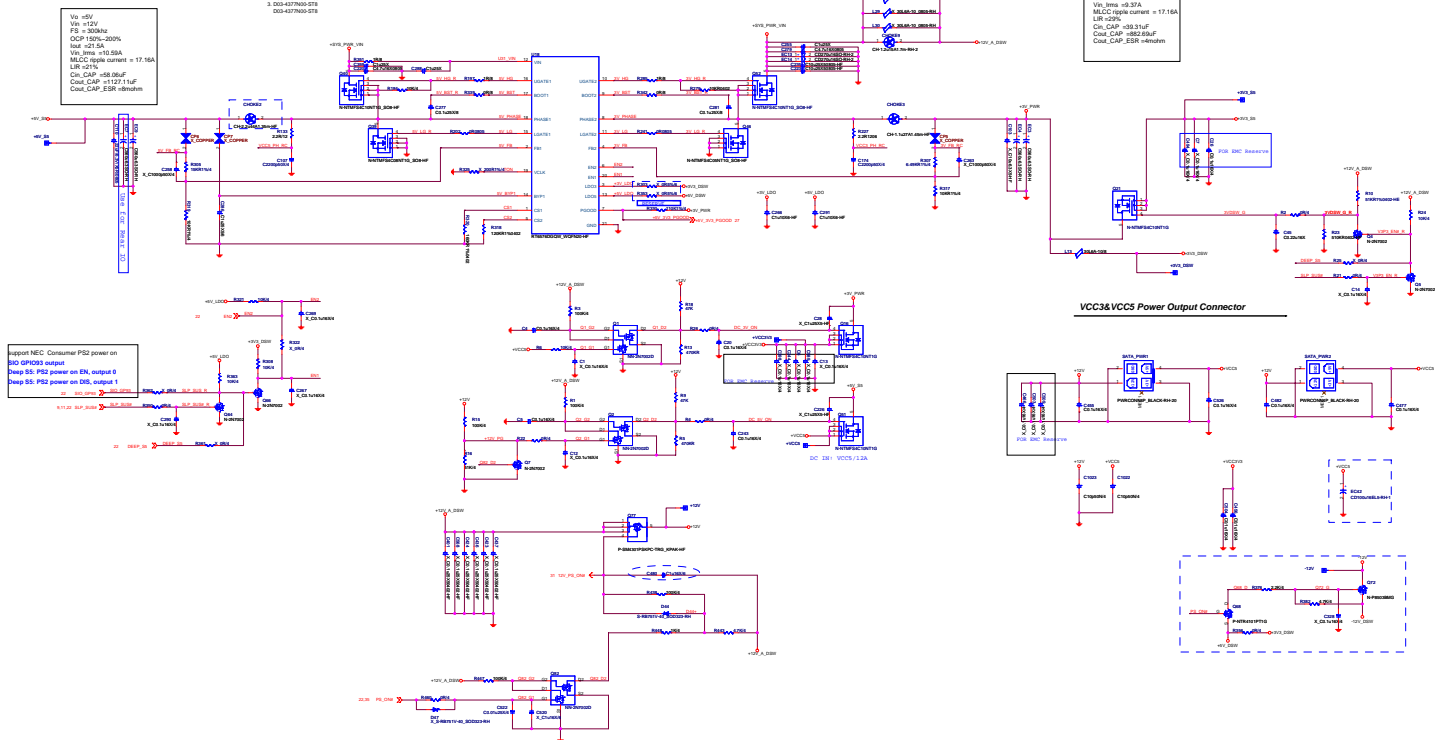
M.2 2280 Key-M



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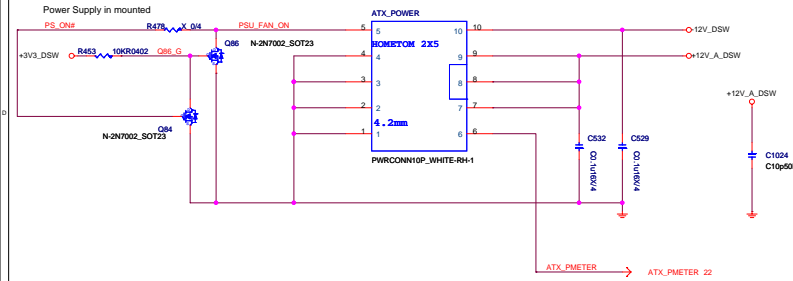
MOS 915
 1. D03-4C10M03-D05
 2. D03-4C10M03-D05
 3. D03-4C10M03-D05
 4. D03-4C10M03-D05
 5. D03-4C10M03-D05
 6. D03-4C10M03-D05

V_{in} = 3.3V
 V_{in} = 1.2V
 P_S = 300mW
 OCP 150%-200%
 I_{sc} = 2A
 V_{in} = 0.9V
 MLC ripple current = 17.16A
 L_{ESR} = 20mH
 C_{in}, C_{AP} = 48.33uF
 C_{out}, C_{AP} = 48.33uF
 C_{out}, C_{AP}, ESR = random

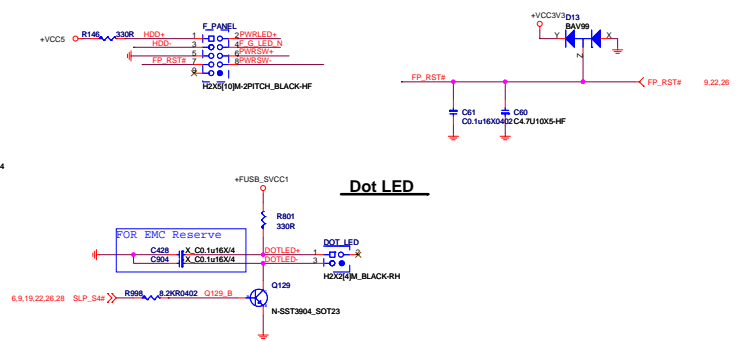


8 Pin ATX Power Connector

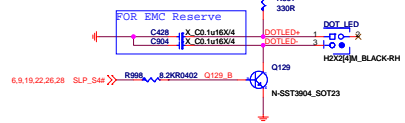
Power Supply in mounted



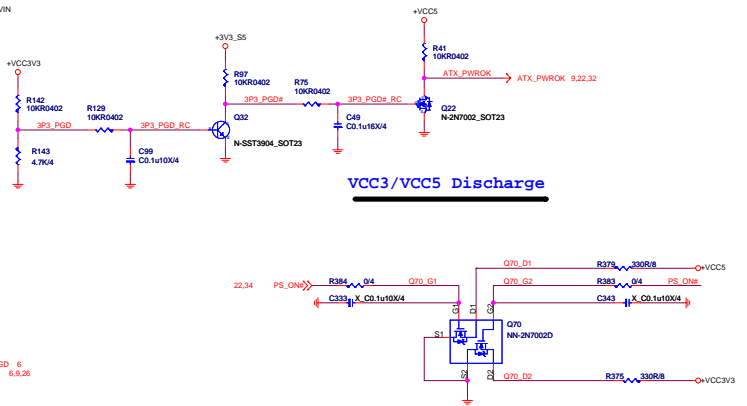
LENOVO Front Panel Connector



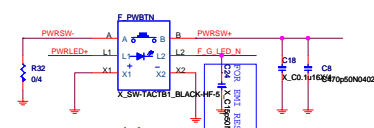
Dot LED



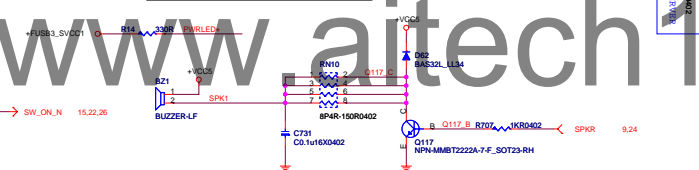
VCC3/VCC5 Discharge



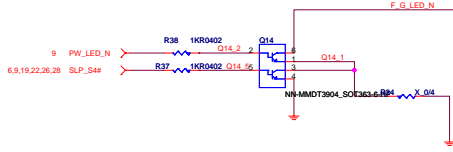
Power Button



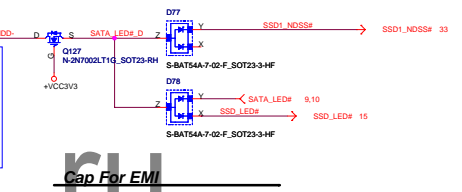
Buzzer Circuit



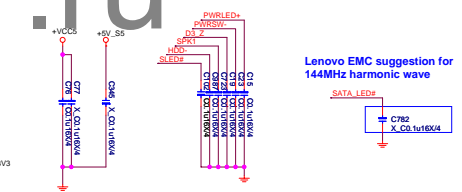
Power LED



HDD LED

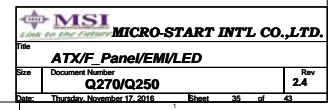


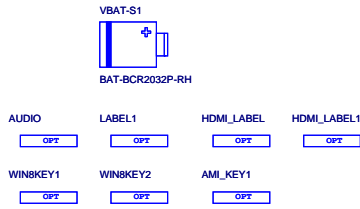
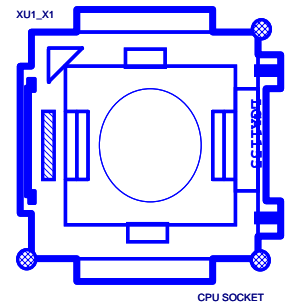
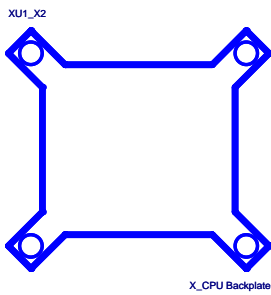
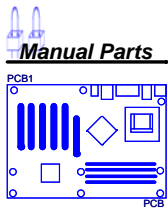
Cap For EMI



Lenovo EMC suggestion for
144MHz harmonic wave

HD (IDE Hard Disk Active LED)		Pin 1:LED anode(+) Pin 8:LED cathode(-)
Power LED	Pin 3:LED cathode(-) (green) Pin 2:LED cathode(-) (yellow)	
Power Switch	Open:Normal Operation Close:Power on /OFF	





USB_LAN5
Q270LC
6KV

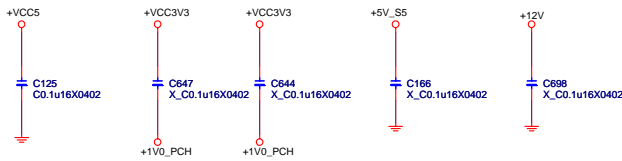
with surge single LED +USB3.0 X2 connector: N58-30F0151-F02

USB_LAN2
Q270LI

without surge +USB3.0 X2 connector: N58-32F0531-S42

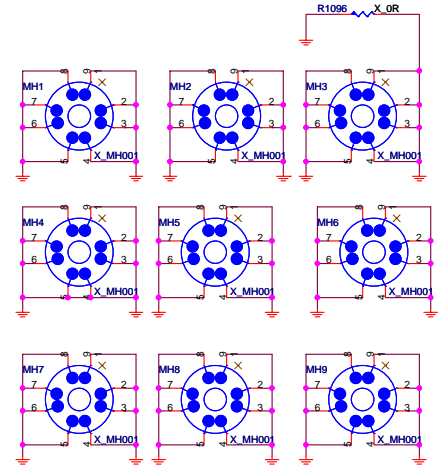
USB_LAN4
Q270
without surge +USB3.0 X2 connector: N58-32F0221-F02

For EMI For Moat CAP



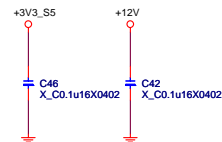
PCH Chipset

Q270LC
Q270



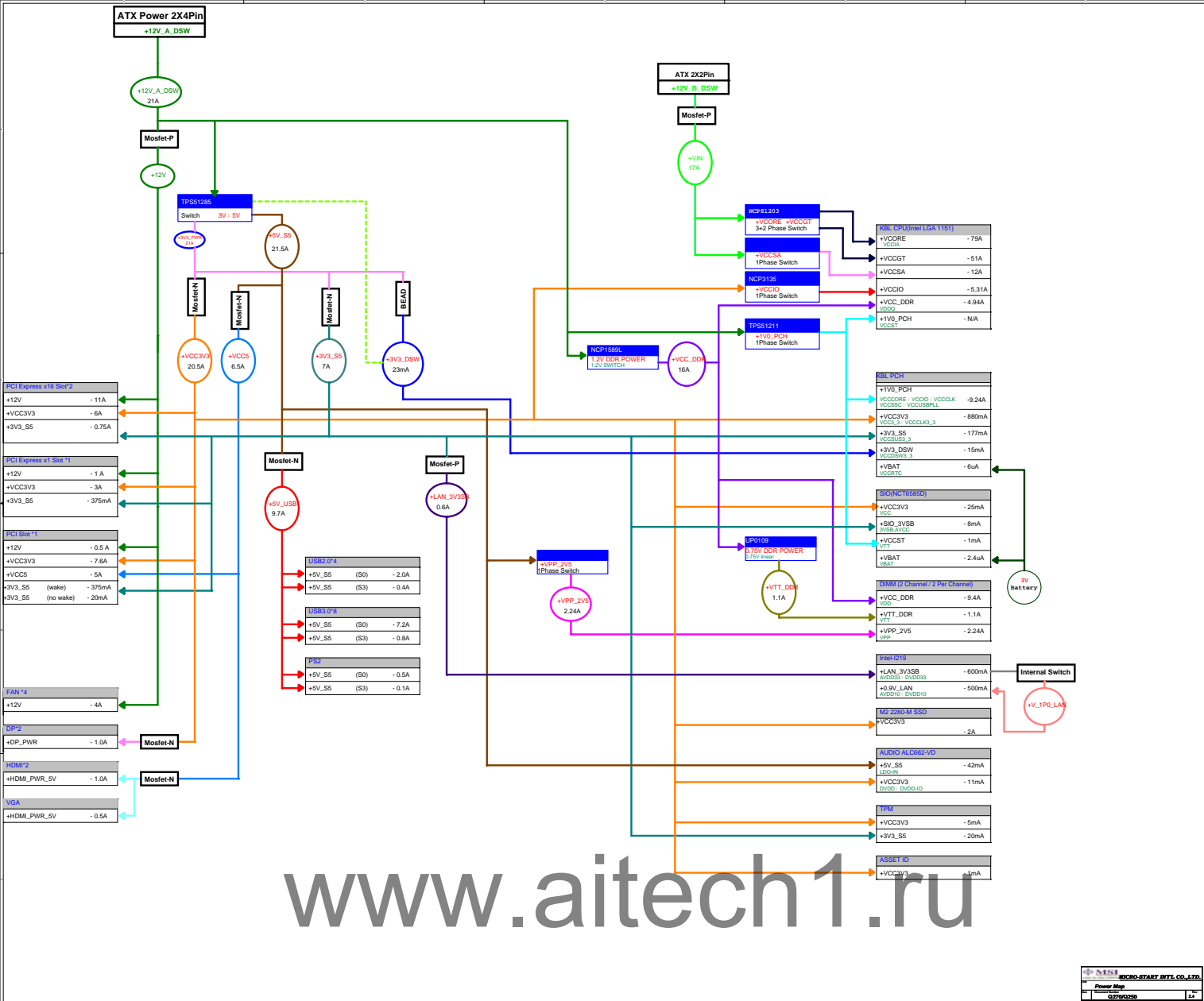
Optics Orientation Holes

Optical Fiducial Marks-120

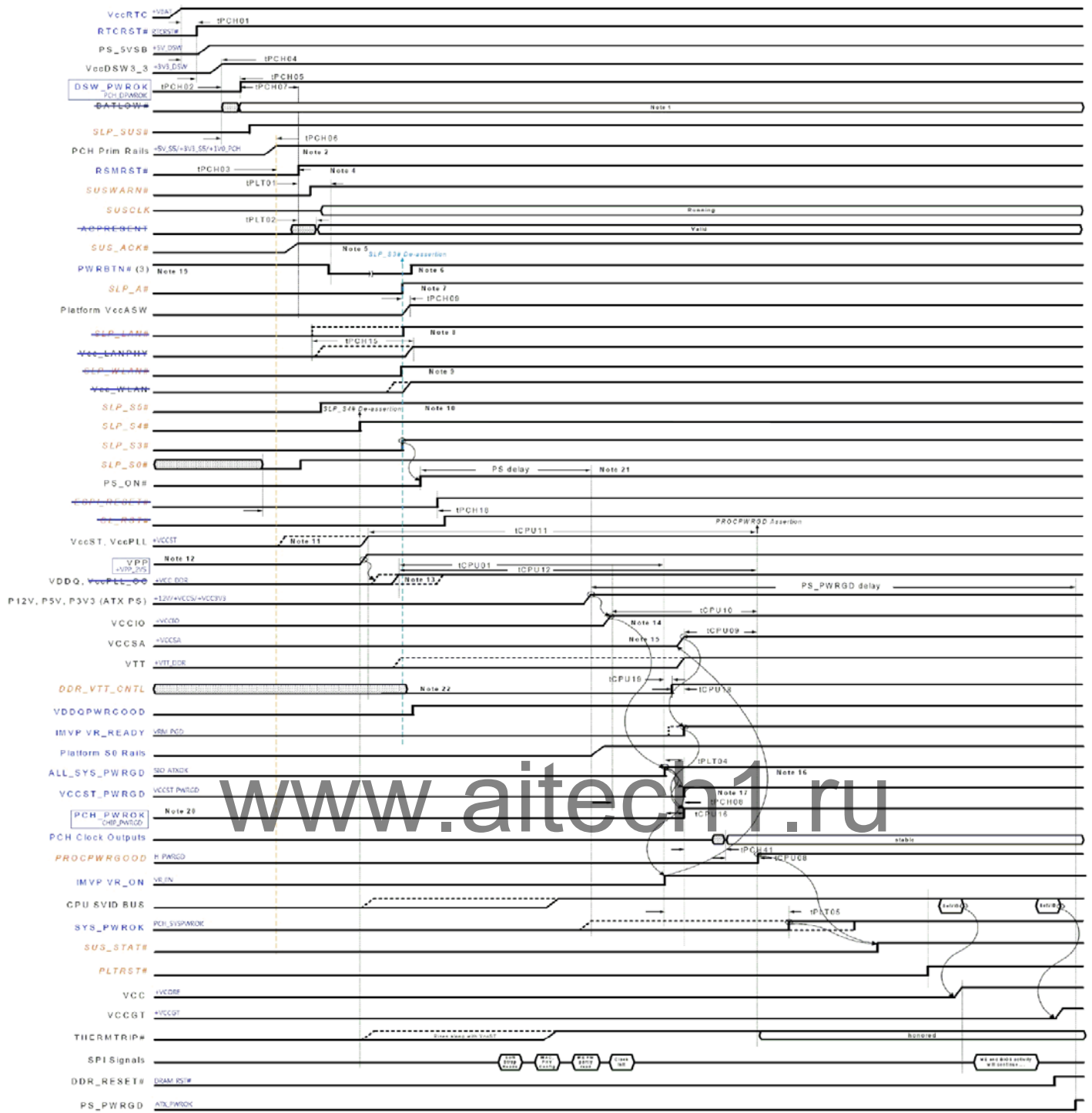


MSI Link to the Future		
MICRO-START INT'L CO.,LTD.		
Title		
Manual & Option Parts		
Size	Document Number	Rev
	Q270/Q250	2.4
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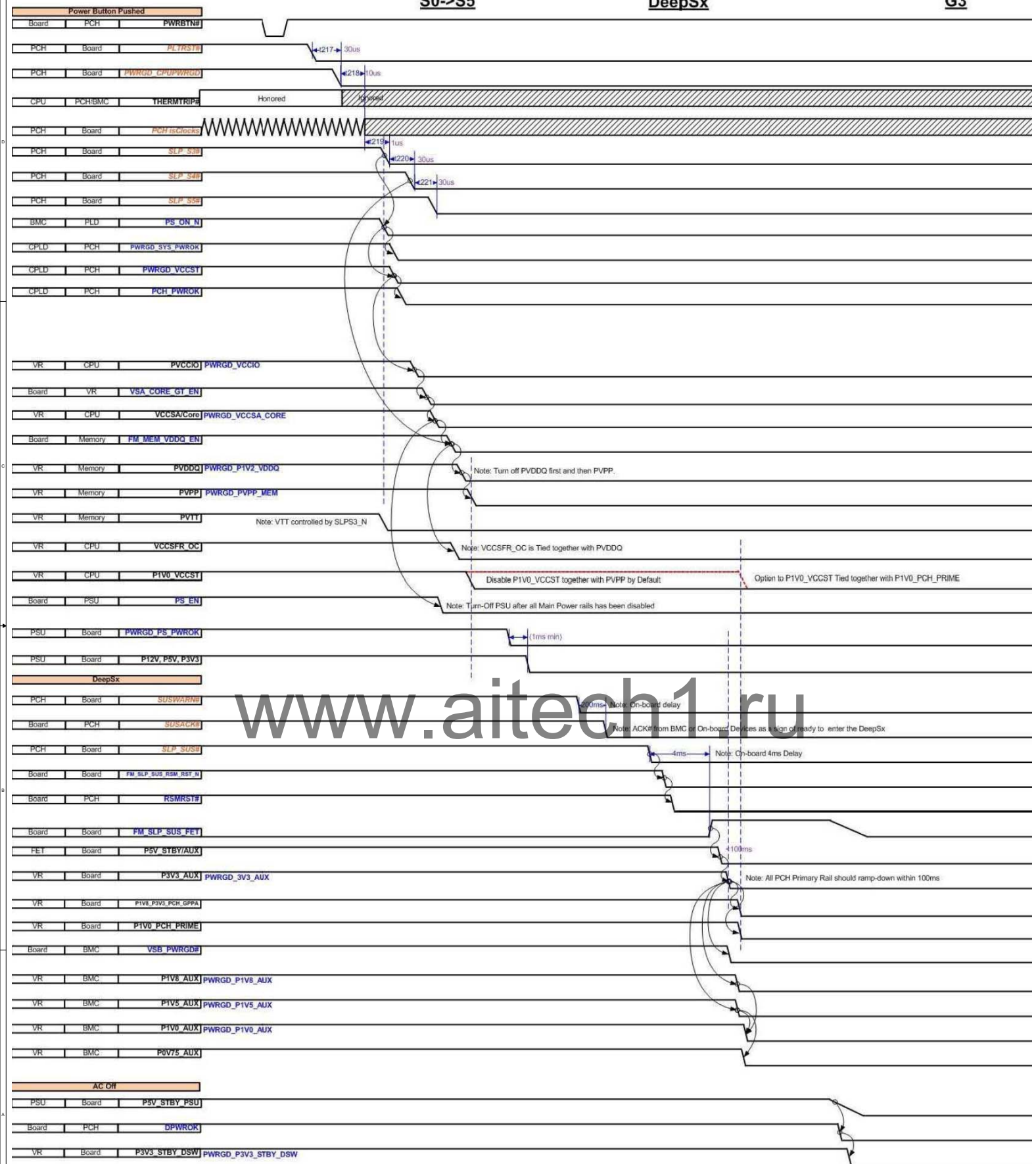
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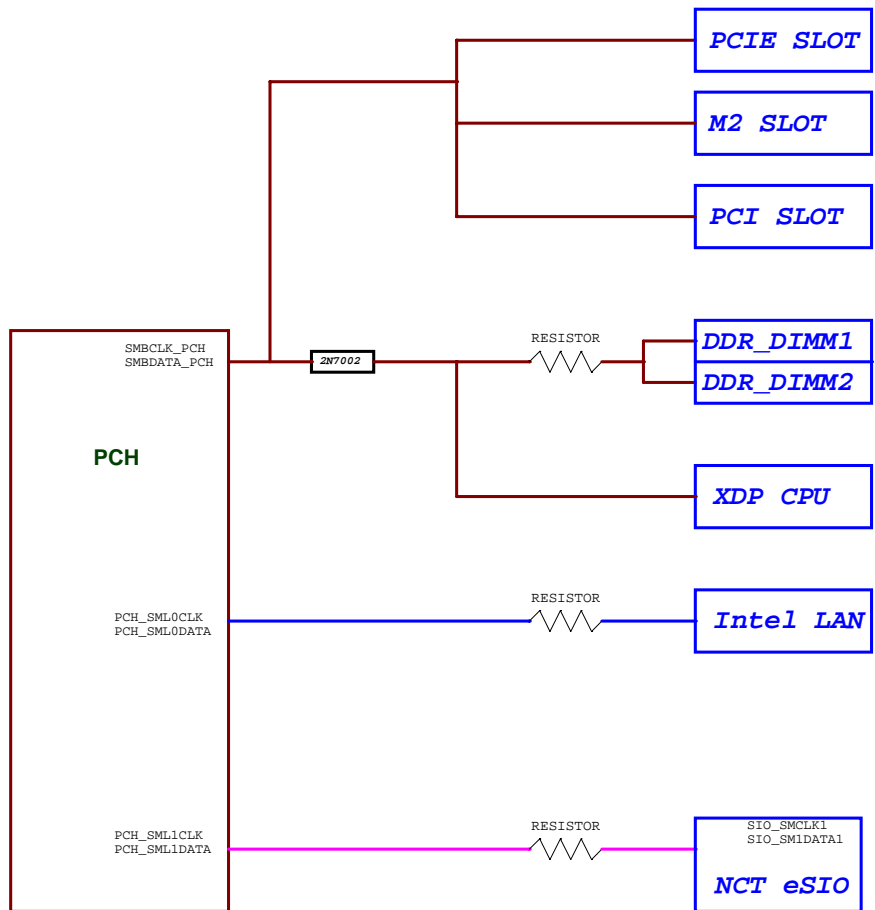


SKL-S Timing Diagram for G3 to S0 [Deep Sx Platform]




source	destination		G3	DEEP S5	S0
board	PCH	VBAT			
board	PCH	RTCRST#			
PSU	board	+5VSB_DSW			
board	PCH	+3VSB_DSW			
board	PCH	PCH_DPWROK			
PCH	SIO	PCH_SUSWARN#			
SIO	PCH	PCH_SUSACK#			
PCH	SIO	SLP_SUS#			
board	board	+5V_S5			
board	PCH	+3V3_S5			
board	PCH	+1V0_PCH			
SIO	PCH	RSMRST#			

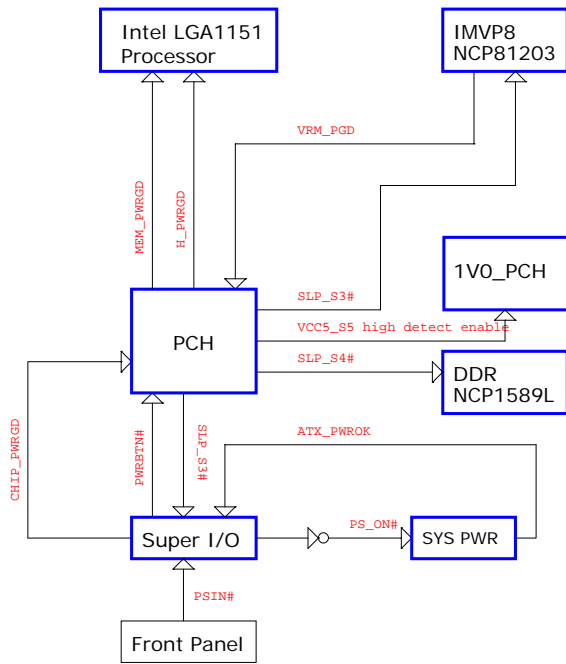




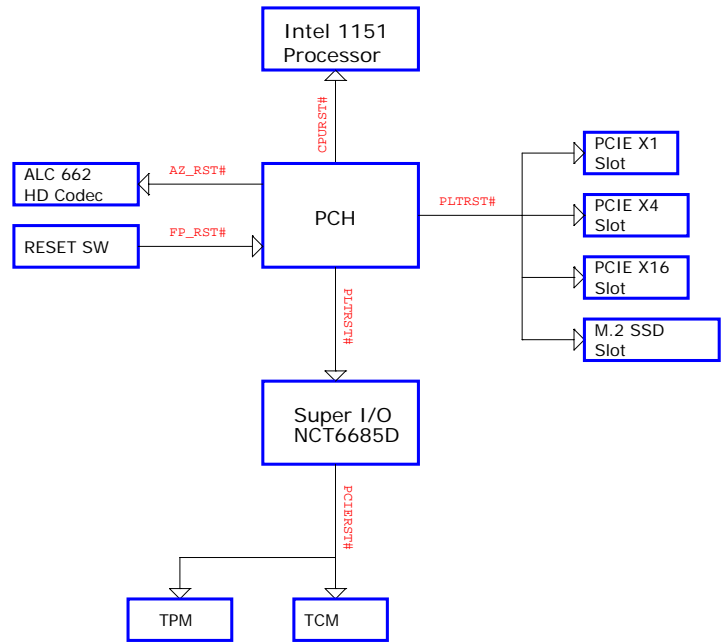
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PWROK MAP




RESET MAP



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SIO	GPIO	(NCT6685D)	Pin	Power	Signal	Comment
GPIO0	GPIO0	GPIO0	1	5V	GPIO0	GPIO0
GPIO1	GPIO1	GPIO1	2	5V	GPIO1	GPIO1
GPIO2	GPIO2	GPIO2	3	5V	GPIO2	GPIO2
GPIO3	GPIO3	GPIO3	4	5V	GPIO3	GPIO3
GPIO4	GPIO4	GPIO4	5	5V	GPIO4	GPIO4
GPIO5	GPIO5	GPIO5	6	5V	GPIO5	GPIO5
GPIO6	GPIO6	GPIO6	7	5V	GPIO6	GPIO6
GPIO7	GPIO7	GPIO7	8	5V	GPIO7	GPIO7
GPIO8	GPIO8	GPIO8	9	5V	GPIO8	GPIO8
GPIO9	GPIO9	GPIO9	10	5V	GPIO9	GPIO9
GPIO10	GPIO10	GPIO10	11	5V	GPIO10	GPIO10
GPIO11	GPIO11	GPIO11	12	5V	GPIO11	GPIO11
GPIO12	GPIO12	GPIO12	13	5V	GPIO12	GPIO12
GPIO13	GPIO13	GPIO13	14	5V	GPIO13	GPIO13
GPIO14	GPIO14	GPIO14	15	5V	GPIO14	GPIO14
GPIO15	GPIO15	GPIO15	16	5V	GPIO15	GPIO15
GPIO16	GPIO16	GPIO16	17	5V	GPIO16	GPIO16
GPIO17	GPIO17	GPIO17	18	5V	GPIO17	GPIO17
GPIO18	GPIO18	GPIO18	19	5V	GPIO18	GPIO18
GPIO19	GPIO19	GPIO19	20	5V	GPIO19	GPIO19
GPIO20	GPIO20	GPIO20	21	5V	GPIO20	GPIO20
GPIO21	GPIO21	GPIO21	22	5V	GPIO21	GPIO21
GPIO22	GPIO22	GPIO22	23	5V	GPIO22	GPIO22
GPIO23	GPIO23	GPIO23	24	5V	GPIO23	GPIO23
GPIO24	GPIO24	GPIO24	25	5V	GPIO24	GPIO24
GPIO25	GPIO25	GPIO25	26	5V	GPIO25	GPIO25
GPIO26	GPIO26	GPIO26	27	5V	GPIO26	GPIO26
GPIO27	GPIO27	GPIO27	28	5V	GPIO27	GPIO27
GPIO28	GPIO28	GPIO28	29	5V	GPIO28	GPIO28
GPIO29	GPIO29	GPIO29	30	5V	GPIO29	GPIO29
GPIO30	GPIO30	GPIO30	31	5V	GPIO30	GPIO30
GPIO31	GPIO31	GPIO31	32	5V	GPIO31	GPIO31
GPIO32	GPIO32	GPIO32	33	5V	GPIO32	GPIO32
GPIO33	GPIO33	GPIO33	34	5V	GPIO33	GPIO33
GPIO34	GPIO34	GPIO34	35	5V	GPIO34	GPIO34
GPIO35	GPIO35	GPIO35	36	5V	GPIO35	GPIO35
GPIO36	GPIO36	GPIO36	37	5V	GPIO36	GPIO36
GPIO37	GPIO37	GPIO37	38	5V	GPIO37	GPIO37
GPIO38	GPIO38	GPIO38	39	5V	GPIO38	GPIO38
GPIO39	GPIO39	GPIO39	40	5V	GPIO39	GPIO39
GPIO40	GPIO40	GPIO40	41	5V	GPIO40	GPIO40
GPIO41	GPIO41	GPIO41	42	5V	GPIO41	GPIO41
GPIO42	GPIO42	GPIO42	43	5V	GPIO42	GPIO42
GPIO43	GPIO43	GPIO43	44	5V	GPIO43	GPIO43
GPIO44	GPIO44	GPIO44	45	5V	GPIO44	GPIO44
GPIO45	GPIO45	GPIO45	46	5V	GPIO45	GPIO45
GPIO46	GPIO46	GPIO46	47	5V	GPIO46	GPIO46
GPIO47	GPIO47	GPIO47	48	5V	GPIO47	GPIO47
GPIO48	GPIO48	GPIO48	49	5V	GPIO48	GPIO48
GPIO49	GPIO49	GPIO49	50	5V	GPIO49	GPIO49
GPIO50	GPIO50	GPIO50	51	5V	GPIO50	GPIO50
GPIO51	GPIO51	GPIO51	52	5V	GPIO51	GPIO51
GPIO52	GPIO52	GPIO52	53	5V	GPIO52	GPIO52
GPIO53	GPIO53	GPIO53	54	5V	GPIO53	GPIO53
GPIO54	GPIO54	GPIO54	55	5V	GPIO54	GPIO54
GPIO55	GPIO55	GPIO55	56	5V	GPIO55	GPIO55
GPIO56	GPIO56	GPIO56	57	5V	GPIO56	GPIO56
GPIO57	GPIO57	GPIO57	58	5V	GPIO57	GPIO57
GPIO58	GPIO58	GPIO58	59	5V	GPIO58	GPIO58
GPIO59	GPIO59	GPIO59	60	5V	GPIO59	GPIO59

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