Q470/H470 Version : 1.2

CPU :

Intel Comet Lake-S

System Chipset :

Intel Comet Lake-H Chipset

On Board Chipset :

IMVP8 -- NCP81220 4+1 Phase
Gigabit LAN -- INTEL-I219LM Co-LAY RTL8111K
HDA Codec -- Realtek ALC623
Super I/O --NCT6686D-L
SPI Flash 256Mb

Main Memory :

2 Channel DDR 4 * 4 (Max 128GB)

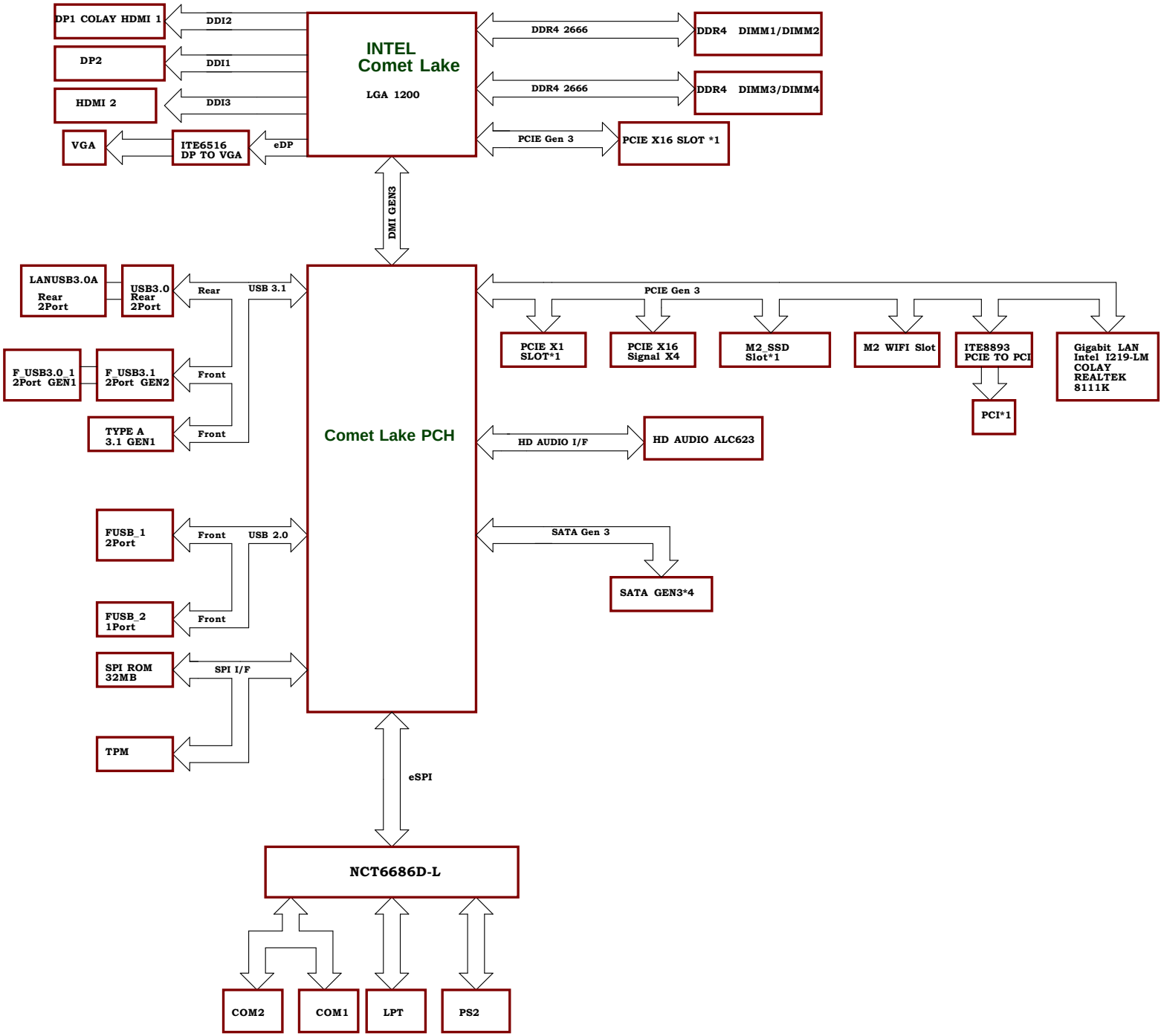
Expansion Slot :

PCI Express x16 Slot * 1
PCI Express x4 Slot * 1
PCI Express x1 Slot * 1
PCI SLOT * 1

lenovo

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

Title: Cover Sheet		
Size	Document Number: Q470/H470	Rev: 3.1
Date: Tuesday, October 08, 2019	Sheet 1 of 44	



Slot Sequence:

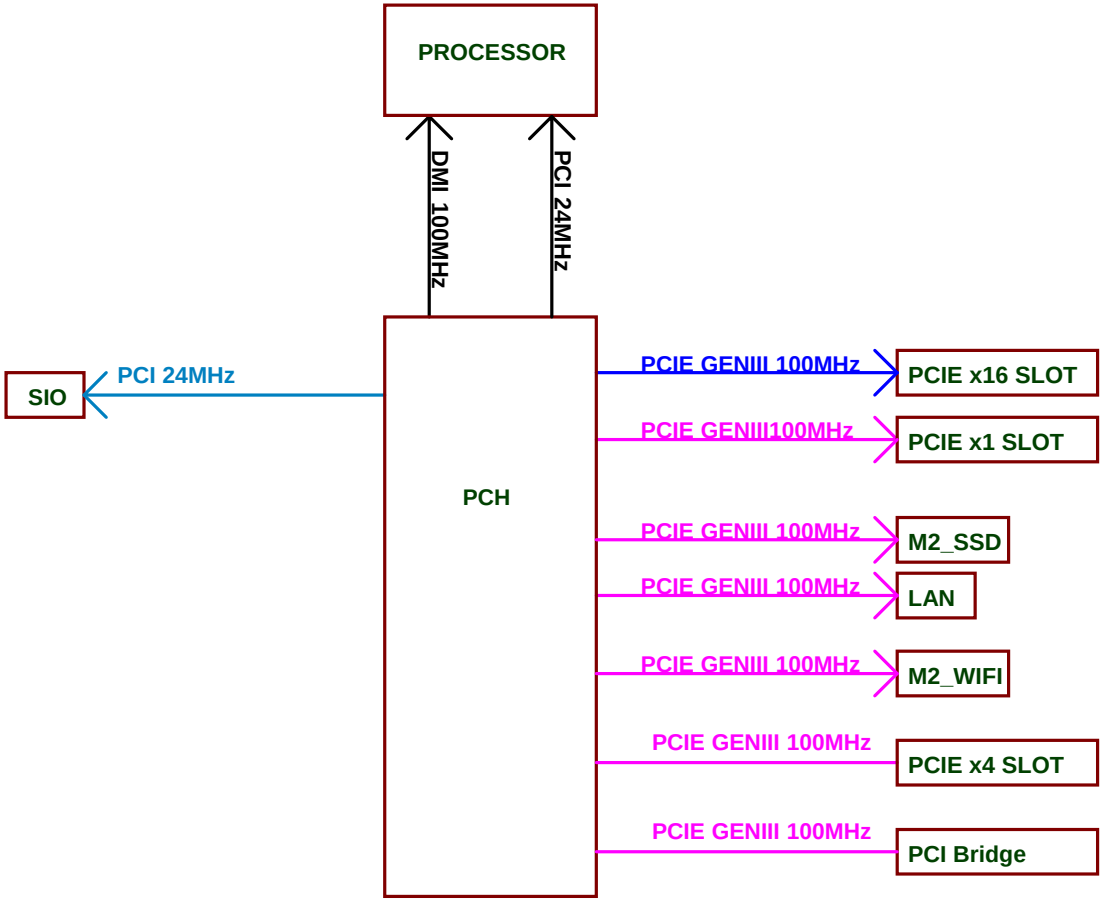
- PCIE X16
- PCIE X1
- PCIE X16(signal x4)
- PCI SLOT

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

Title: **Block Diagram**

Size	Document Number	Rev
	Q470/H470	1.1

Date: Tuesday, August 27, 2019 Sheet 2 of 44

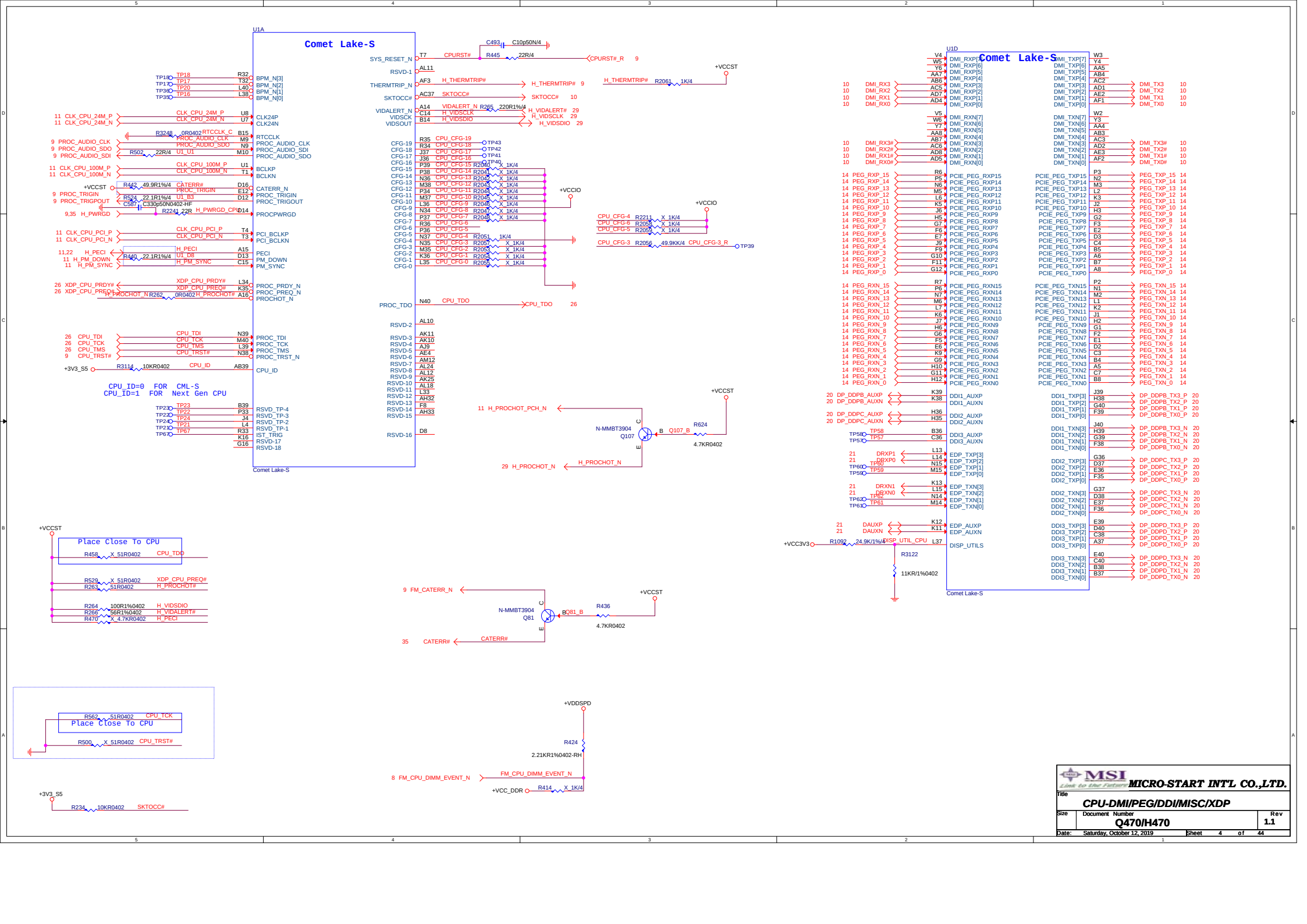


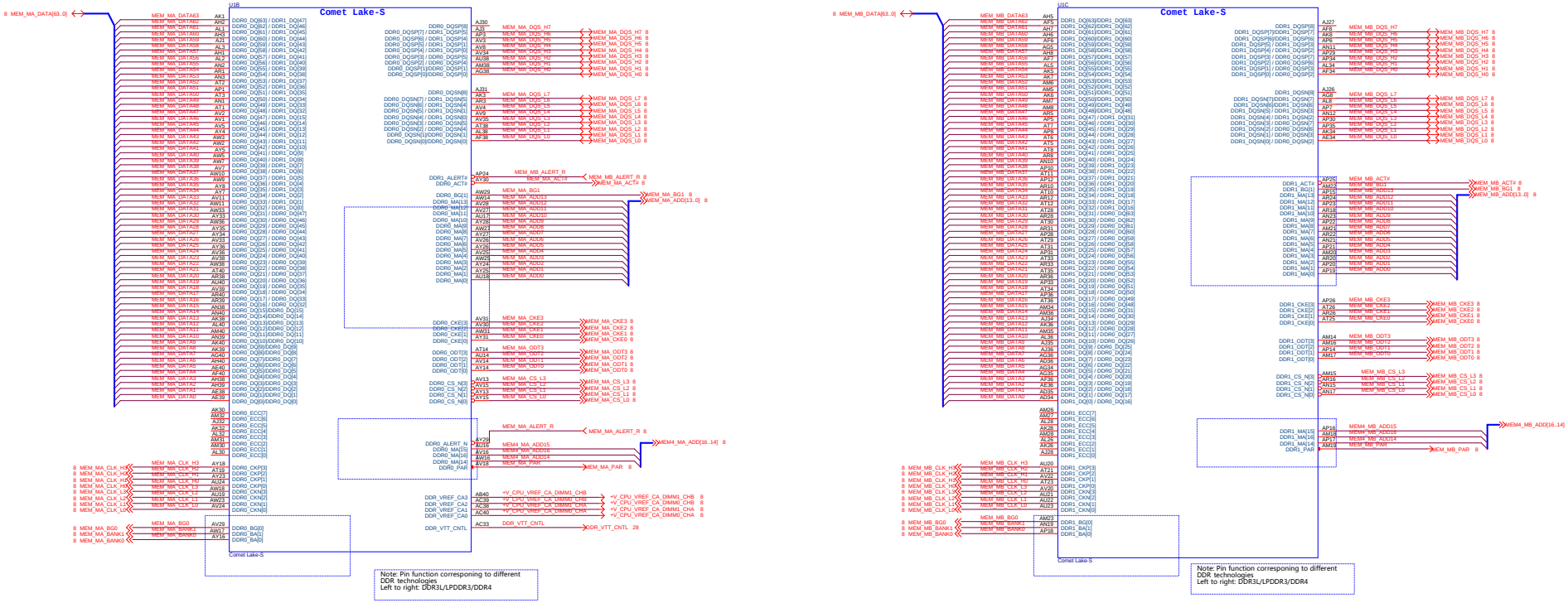
MICRO-START INT'L CO.,LTD.

Title: Clock Distribution

Size	Document Number	Rev
	Q470/H470	1.1

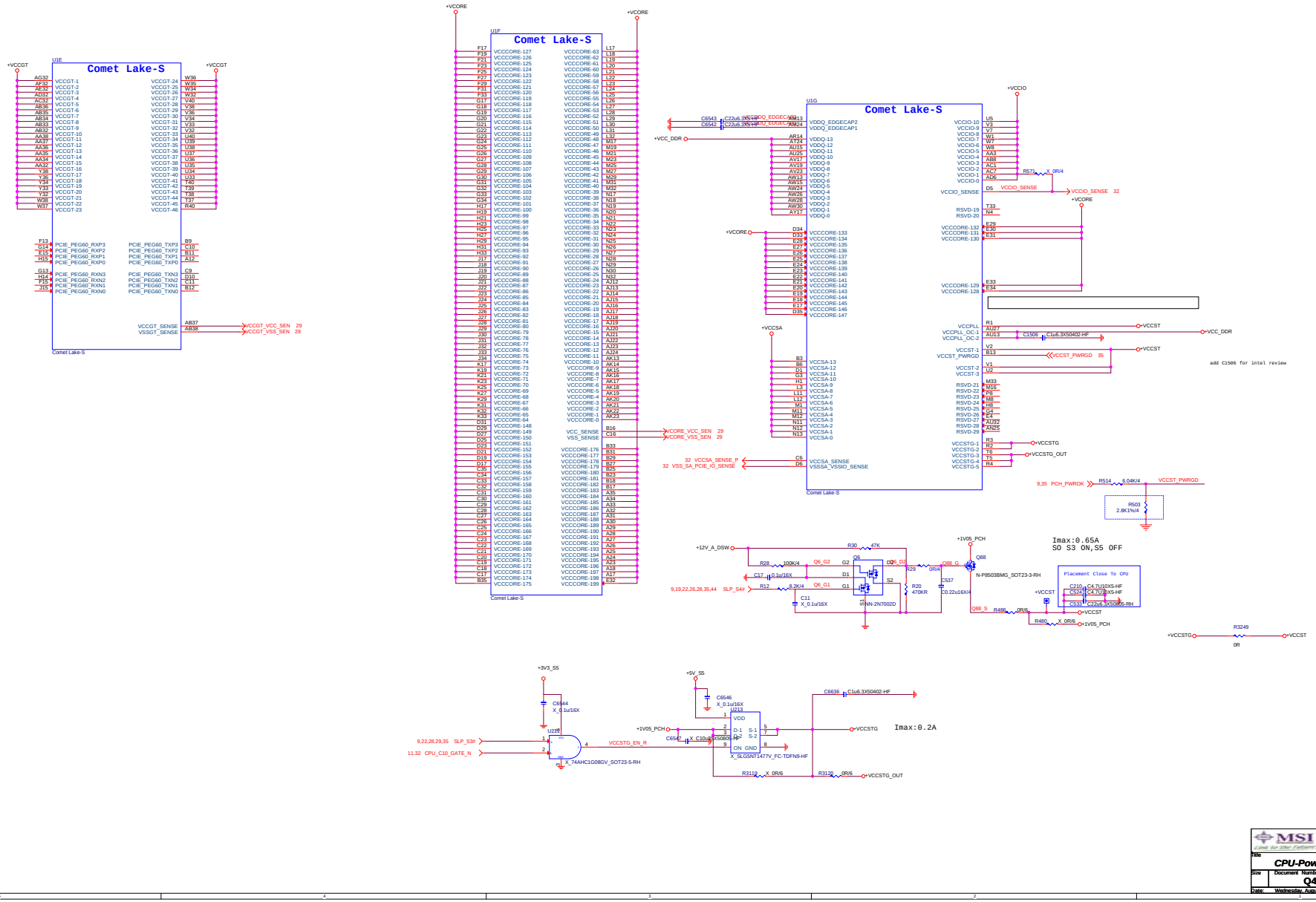
Date: Friday, August 23, 2019 Sheet 3 of 44


U1A
Comet Lake-S
BPM_N[3]
BPM_N[2]
BPM_N[1]
BPM_N[0]
CLK24P
CLK24N
RTCCLK
PROC_AUDIO_CLK
PROC_AUDIO_SDI
PROC_AUDIO_SDO
BCLKP
BCLKN
CATERR_N
PROC_TRIGIN
PROC_TRIGOUT
PROCPWRGD
PCI_BCLKP
PCI_BCLKN
PECI
PM_DOWN
PM_SYNC
PROC_PRDY_N
PROC_PREQ_N
PROCHOT_N
PROC_TDI
PROC_TCK
PROC_TMS
PROC_TRST_N
CPU_ID
RSVD_TP-4
RSVD_TP-3
RSVD_TP-2
RSVD_TP-1
IST_TRIG
RSVD-17
RSVD-18
Comet Lake-S
SYS_RESET_N
RSVD-1
THERMTRIP_N
SKTOCC#
VIDALERT_N
VIDSCK
VIDSOUT
PROC_TDO
RSVD-2
RSVD-3
RSVD-4
RSVD-5
RSVD-6
RSVD-7
RSVD-8
RSVD-9
RSVD-10
RSVD-11
RSVD-12
RSVD-13
RSVD-14
RSVD-15
RSVD-16
CFG-19
CFG-18
CFG-17
CFG-16
CFG-15
CFG-14
CFG-13
CFG-12
CFG-11
CFG-10
CFG-9
CFG-8
CFG-7
CFG-6
CFG-5
CFG-4
CFG-3
CFG-2
CFG-1
CFG-0
CPU_ID=0 FOR CML-S
CPU_ID=1 FOR Next Gen CPU
Place Close To CPU
Place Close To CPU
U1D
Comet Lake-S
DMI_RXP[7:0]
DMI_RXN[7:0]
DMI_TXP[7:0]
DMI_TXN[7:0]
PCIE_PEG_RXP15
PCIE_PEG_RXP14
PCIE_PEG_RXP13
PCIE_PEG_RXP12
PCIE_PEG_RXP11
PCIE_PEG_RXP10
PCIE_PEG_RXP9
PCIE_PEG_RXP8
PCIE_PEG_RXP7
PCIE_PEG_RXP6
PCIE_PEG_RXP5
PCIE_PEG_RXP4
PCIE_PEG_RXP3
PCIE_PEG_RXP2
PCIE_PEG_RXP1
PCIE_PEG_RXP0
PCIE_PEG_RXN15
PCIE_PEG_RXN14
PCIE_PEG_RXN13
PCIE_PEG_RXN12
PCIE_PEG_RXN11
PCIE_PEG_RXN10
PCIE_PEG_RXN9
PCIE_PEG_RXN8
PCIE_PEG_RXN7
PCIE_PEG_RXN6
PCIE_PEG_RXN5
PCIE_PEG_RXN4
PCIE_PEG_RXN3
PCIE_PEG_RXN2
PCIE_PEG_RXN1
PCIE_PEG_RXN0
PCIE_PEG_TXP15
PCIE_PEG_TXP14
PCIE_PEG_TXP13
PCIE_PEG_TXP12
PCIE_PEG_TXP11
PCIE_PEG_TXP10
PCIE_PEG_TXP9
PCIE_PEG_TXP8
PCIE_PEG_TXP7
PCIE_PEG_TXP6
PCIE_PEG_TXP5
PCIE_PEG_TXP4
PCIE_PEG_TXP3
PCIE_PEG_TXP2
PCIE_PEG_TXP1
PCIE_PEG_TXP0
PCIE_PEG_TXN15
PCIE_PEG_TXN14
PCIE_PEG_TXN13
PCIE_PEG_TXN12
PCIE_PEG_TXN11
PCIE_PEG_TXN10
PCIE_PEG_TXN9
PCIE_PEG_TXN8
PCIE_PEG_TXN7
PCIE_PEG_TXN6
PCIE_PEG_TXN5
PCIE_PEG_TXN4
PCIE_PEG_TXN3
PCIE_PEG_TXN2
PCIE_PEG_TXN1
PCIE_PEG_TXN0
DDI1_AUXP
DDI1_AUXN
DDI2_AUXP
DDI2_AUXN
DDI3_AUXP
DDI3_AUXN
EDP_TXP[3]
EDP_TXP[2]
EDP_TXP[1]
EDP_TXP[0]
EDP_TXN[3]
EDP_TXN[2]
EDP_TXN[1]
EDP_TXN[0]
EDP_AUXP
EDP_AUXN
DISP_UTILS
DDI1_TXP[3]
DDI1_TXP[2]
DDI1_TXP[1]
DDI1_TXP[0]
DDI1_TXN[3]
DDI1_TXN[2]
DDI1_TXN[1]
DDI1_TXN[0]
DDI2_TXP[3]
DDI2_TXP[2]
DDI2_TXP[1]
DDI2_TXP[0]
DDI2_TXN[3]
DDI2_TXN[2]
DDI2_TXN[1]
DDI2_TXN[0]
DDI3_TXP[3]
DDI3_TXP[2]
DDI3_TXP[1]
DDI3_TXP[0]
DDI3_TXN[3]
DDI3_TXN[2]
DDI3_TXN[1]
DDI3_TXN[0]
Comet Lake-S
MSI
MICRO-STAR INT'L CO.,LTD.
Title
CPU-DMI/PEG/DDI/MISC/XDP
Size
Document Number
Q470/H470
Rev
1.1
Date: Saturday, October 12, 2019
Sheet 4 of 44



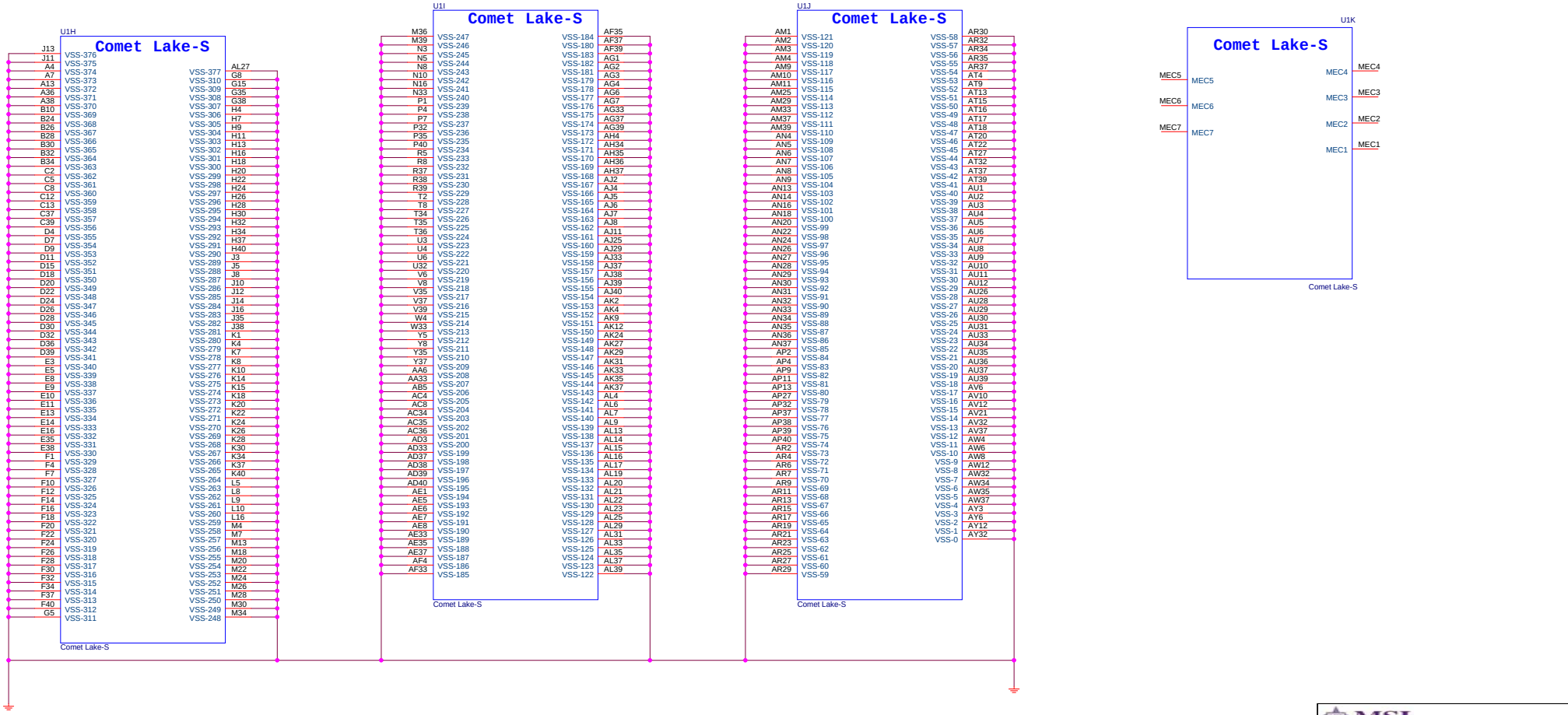
MICRO-START INT'L CO.,LTD.

Title	CPU-Memory	
Size	Document Number	Rev
	Q470/H470	1.1
Date:	Wednesday, August 28, 2019	Sheet 5 of 44



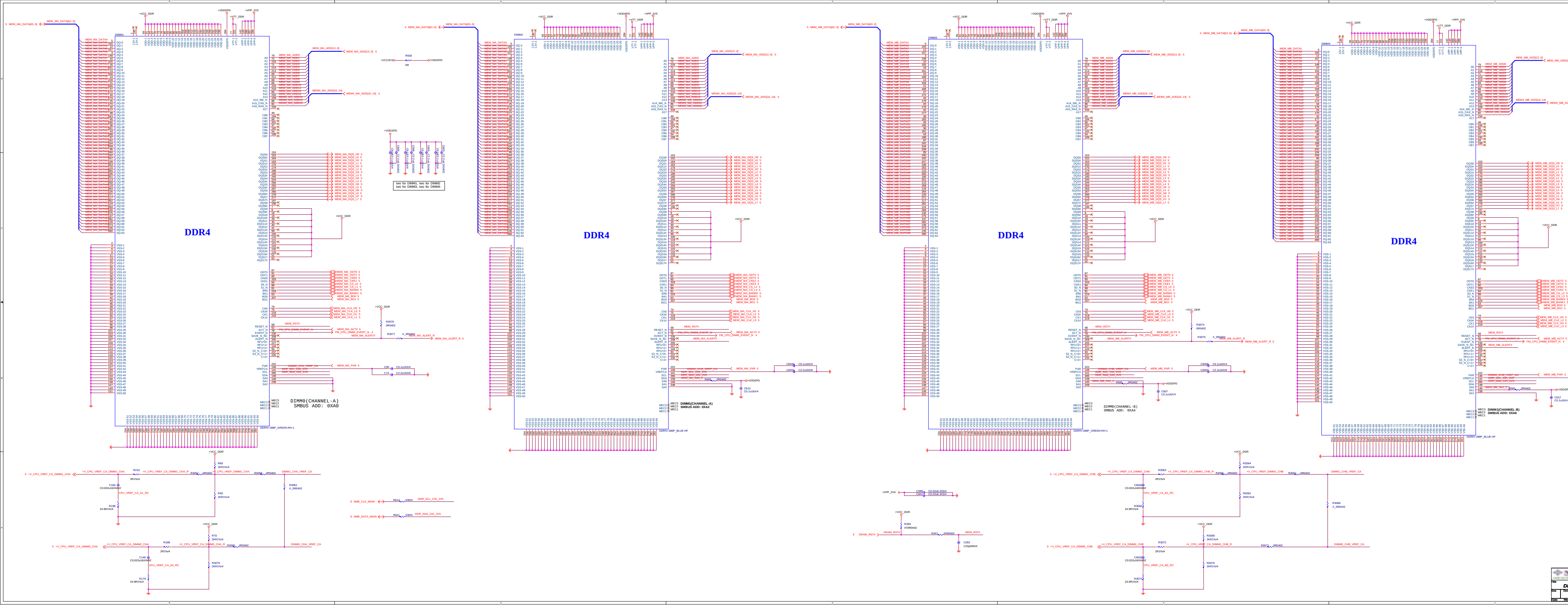
MSI — MICRO-START INTL CO.,LTD.

Title	CPU-Power	
Size	Document Number: Q470/H470	Rev: 1.1
Date: Wednesday, August 28, 2019	Sheet 6 of 44	



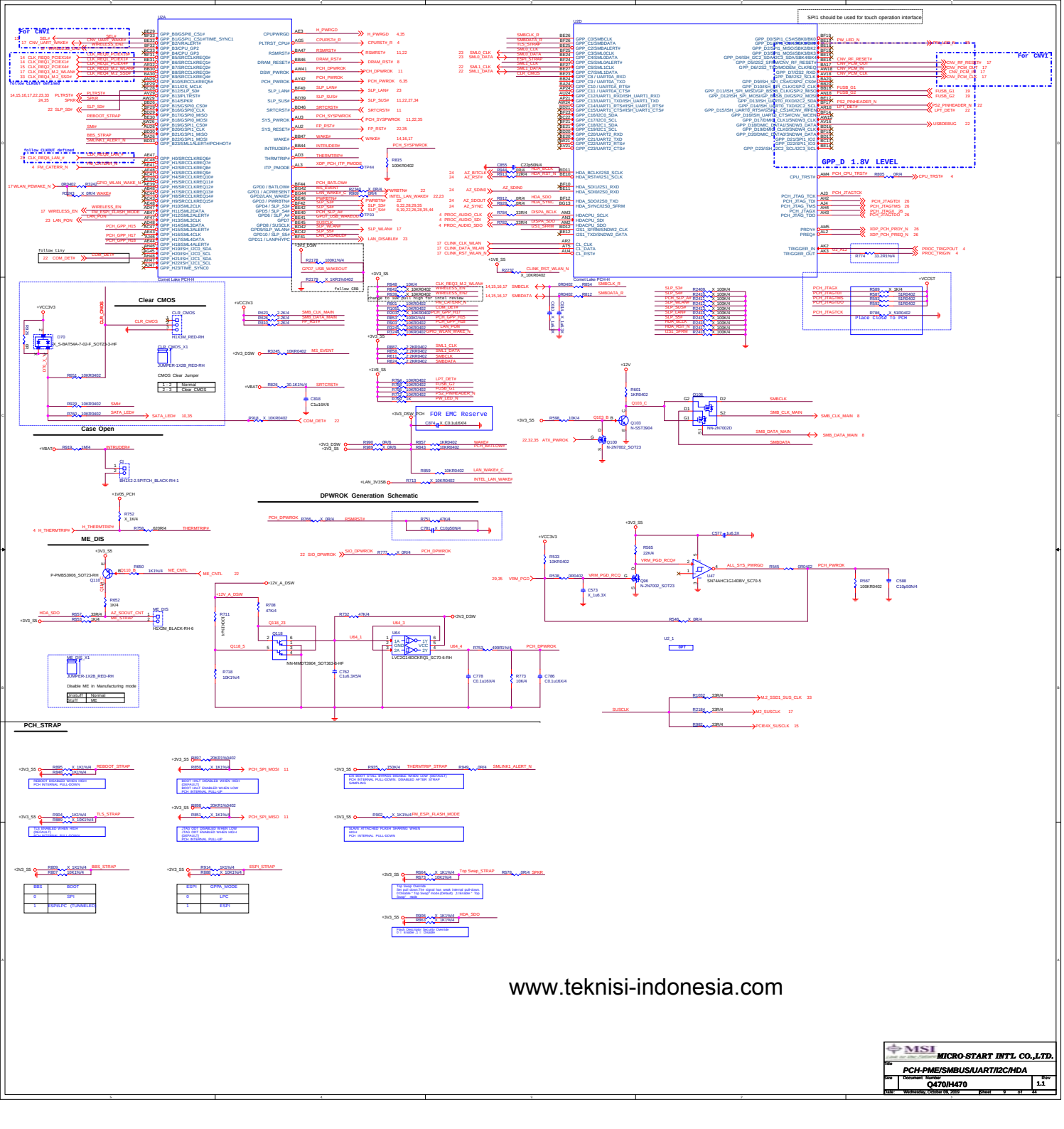
MSI Link to the Future MICRO-START INT'L CO.,LTD.

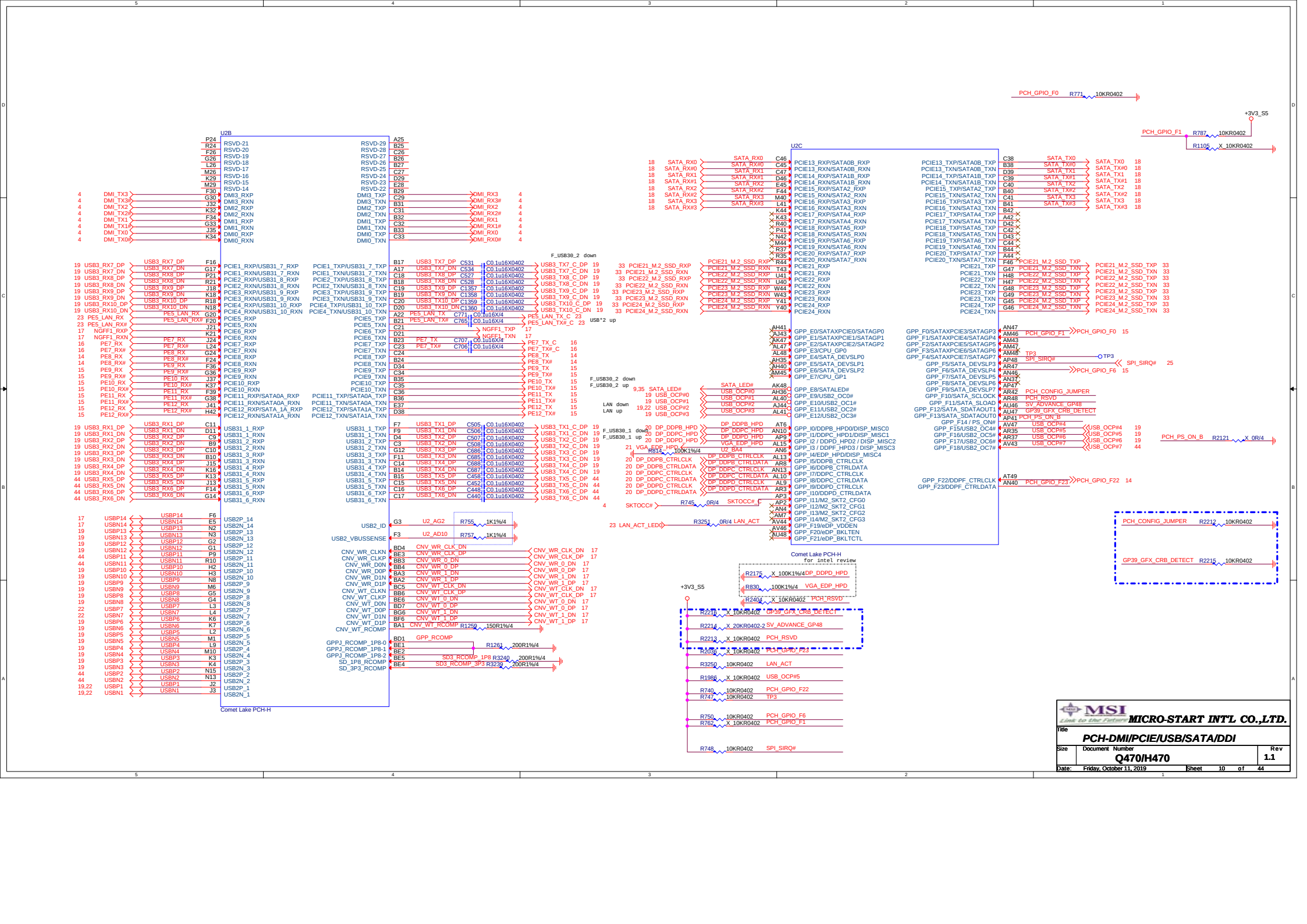
Title	CPU-GND	
Size	Document Number Q470/H470	Rev 1.1
Date: Wednesday, August 28, 2019	Sheet 7 of 44	

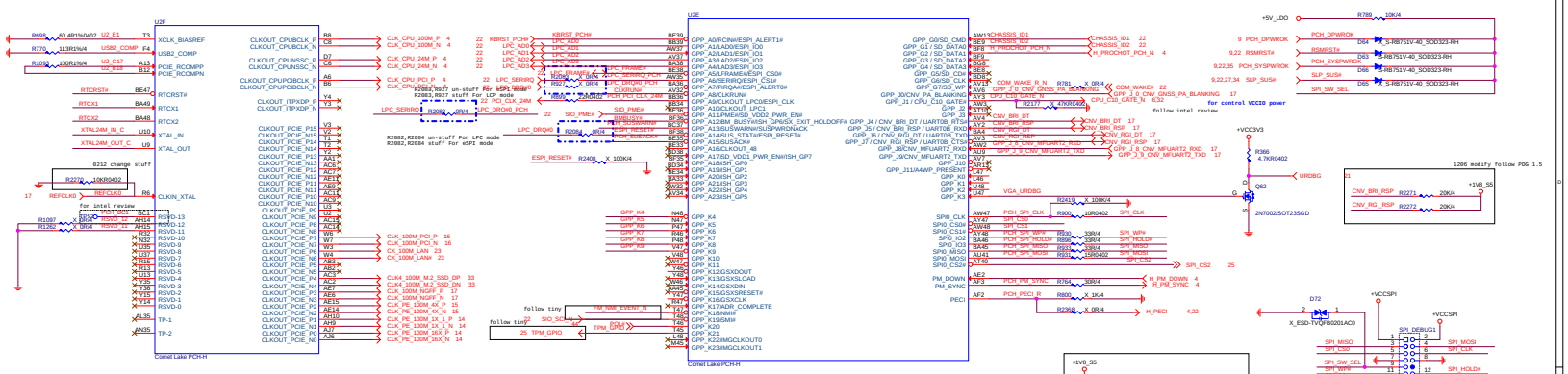


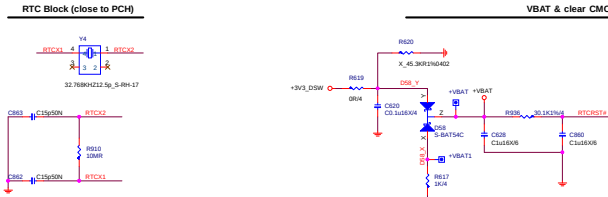
MICRO-START INT'L CO.,LTD.

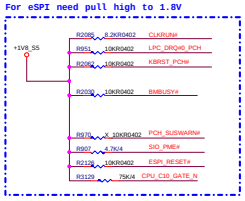
Title		
DDR4-DIMM1/DIMM2/DIMM3/DIMM4		
Size	Document Number: Q470/H470	Rev: 1.1
Date: Wednesday, August 28, 2019	Sheet 8 of 44	

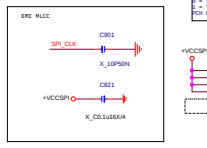


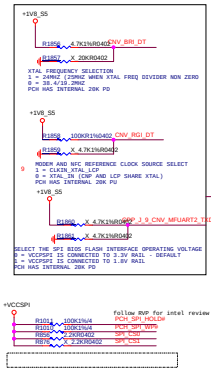

U2B
Comet Lake PCH-H
U2C
Comet Lake PCH-H
for intel review
F_USB30_2 down
USB*2 up
F_USB30_2 down
F_USB30_2 up
LAN down
LAN up
F_USB30_1 down
F_USB30_1 up
+3V3_S5
PCH_GPIO_F0
PCH_GPIO_F1
PCH_CONFIG_JUMPER
GP39_GFX_CRB_DETECT
PCH_PS_ON_B
MSI
Link to the Future
MICRO-START INT'L CO.,LTD.
PCH-DMI/PCIE/USB/SATA/DDI
Q470/H470
1.1
Friday, October 11, 2019
10
44

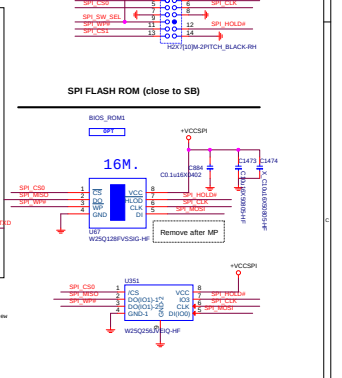












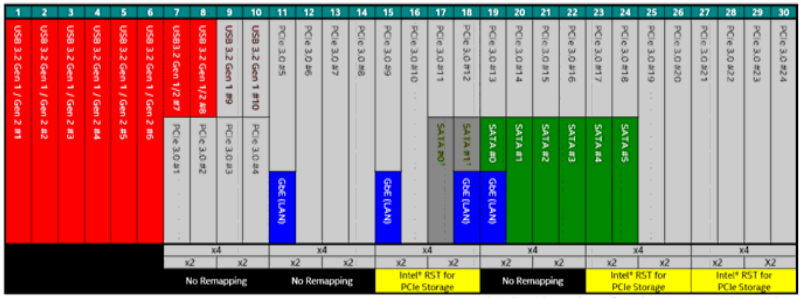
Bom Option

Bom Option Configuration

GPP_K9	GPP_K8	GPP_K7	GPP_K6	GPP_K5	GPP_K4	Project	BOM Opt
0	0	0	1	0	0	TCM M80t ROW(Q470)	
0	0	0	1	0	1	TCM M80s ROW(Q470)	
0	0	0	1	1	1	M80t/s PRC/ M630 QT(Q470)	
0	0	0	1	1	0	NEC ME(Q470)	
1	0	0	1	1	1	QT M437	
1	0	0	1	0	0	Think ROW M70s/M70t(H470)	
1	0	0	1	0	1	NEC MB/LV(H470)	
1	0	0	1	1	0	NEC ML(H470)	

GPIO	Board ID
GPP_K4	BRD_ID0
GPP_K5	BRD_ID1
GPP_K6	BRD_ID2
GPP_K7	BRD_ID3
GPP_K8	BRD_ID4
GPP_K9	BRD_ID5

Intel® 400 Series (CML PCH-H) Chipset HSIO Assignments



SKU

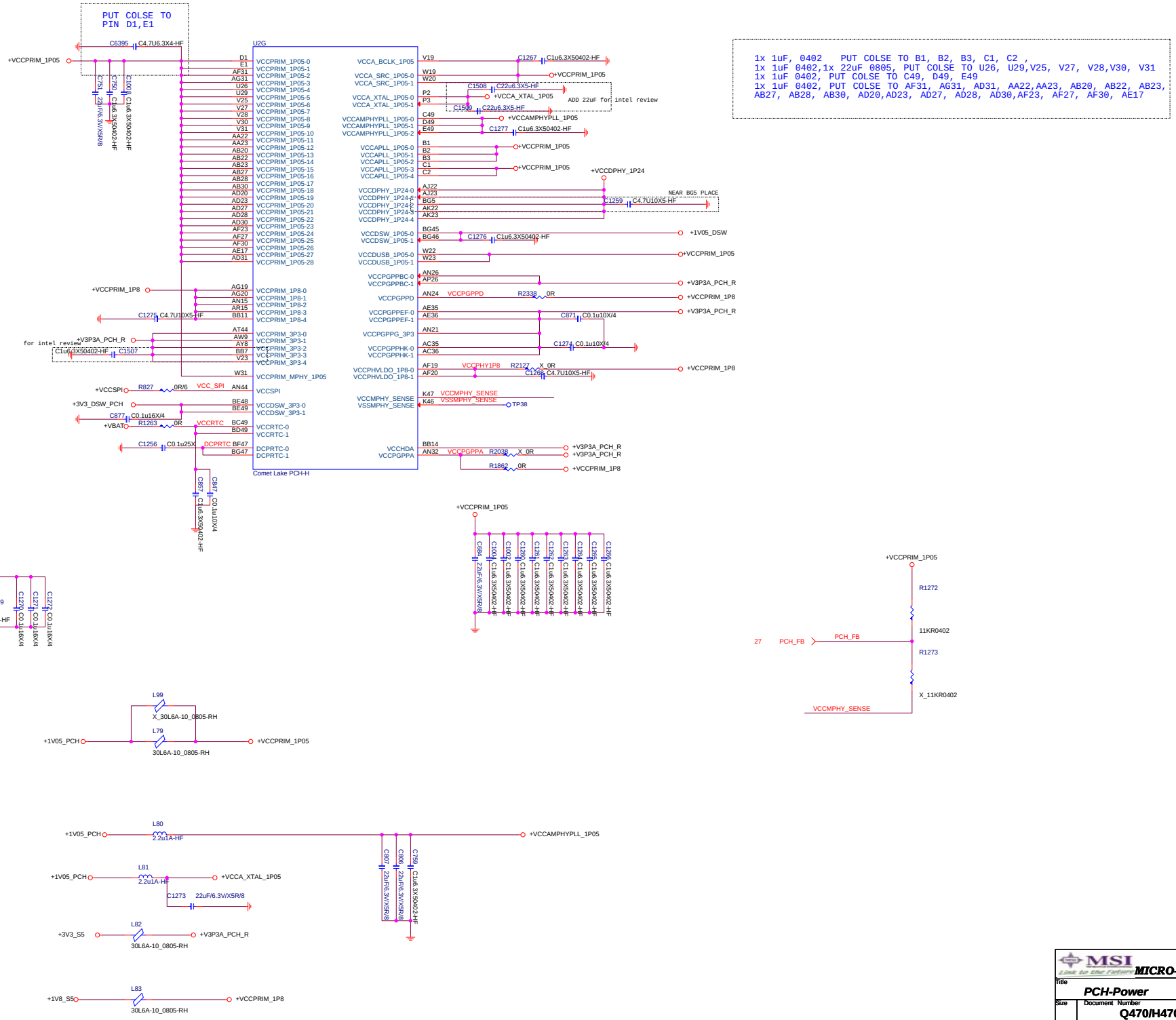
1) SATA #0/#1 can be configured to PCIe* Ports 11/12 or 13/14.

	USB3.2 Gen 1 / Gen 2	USB3.2 Gen 1 / Gen 2	USB3.2 Gen 1 / Gen 2	USB3.2 Gen 1 / Gen 2	USB3.2 Gen 1	USB3.2 Gen 1	USB3.2 Gen 1	PCIe	PCIe	PCIe LAN	PCIe	PCIe	PCIe	PCIe LAN	PCIe	PCIe SATA	PCIe SATA LAN	PCIe SATA LAN	PCIe SATA	PCIe SATA	SATA	SATA	PCIe	PCIe	PCIe	PCIe	PCIe	PCIe
H470																												
Z490																												
Q470																												
W480																												

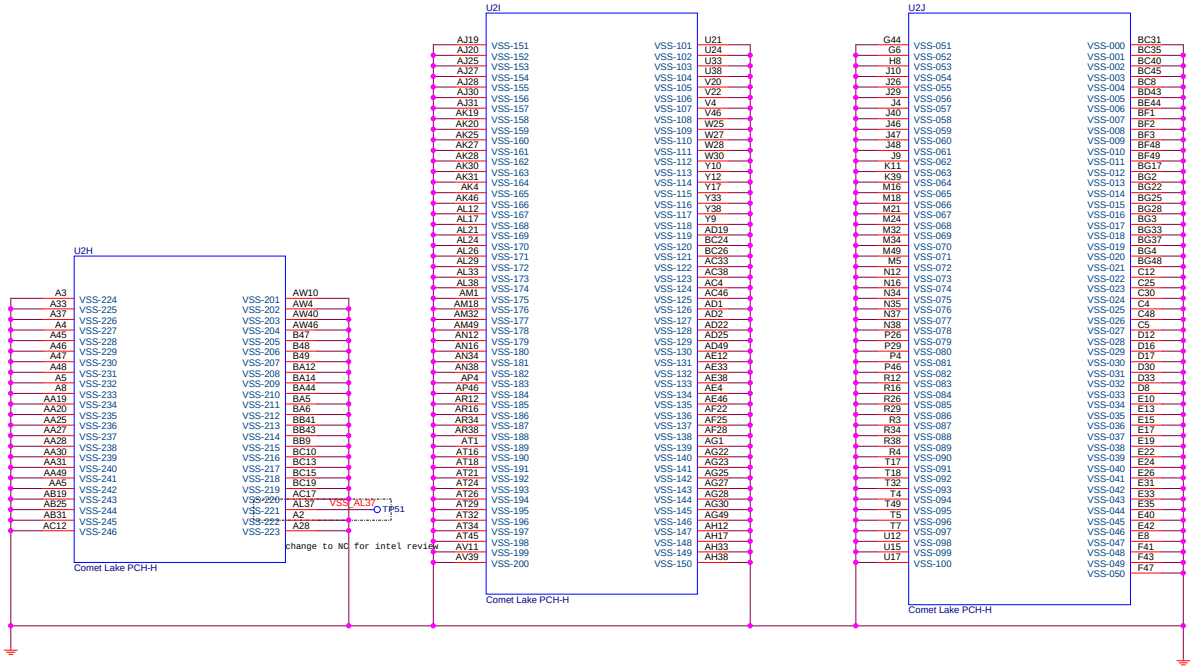
Intel® RST for PCIe Storage port configurable as x2/x4 M.2

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

Title	PCH-Clock/LPC/FAN/SPI/PECI		
Size	Document Number		Rev
	Q470/H470		1.1
Date:	Tuesday, October 01, 2019	Sheet 11 of 44	



MSI Link to the Future	MICRO-START INT'L CO.,LTD.		
Title	PCH-Power		
Size	Document Number Q470/H470		Rev 1.1
Date: Wednesday, August 28, 2019	Sheet 12 of 44		



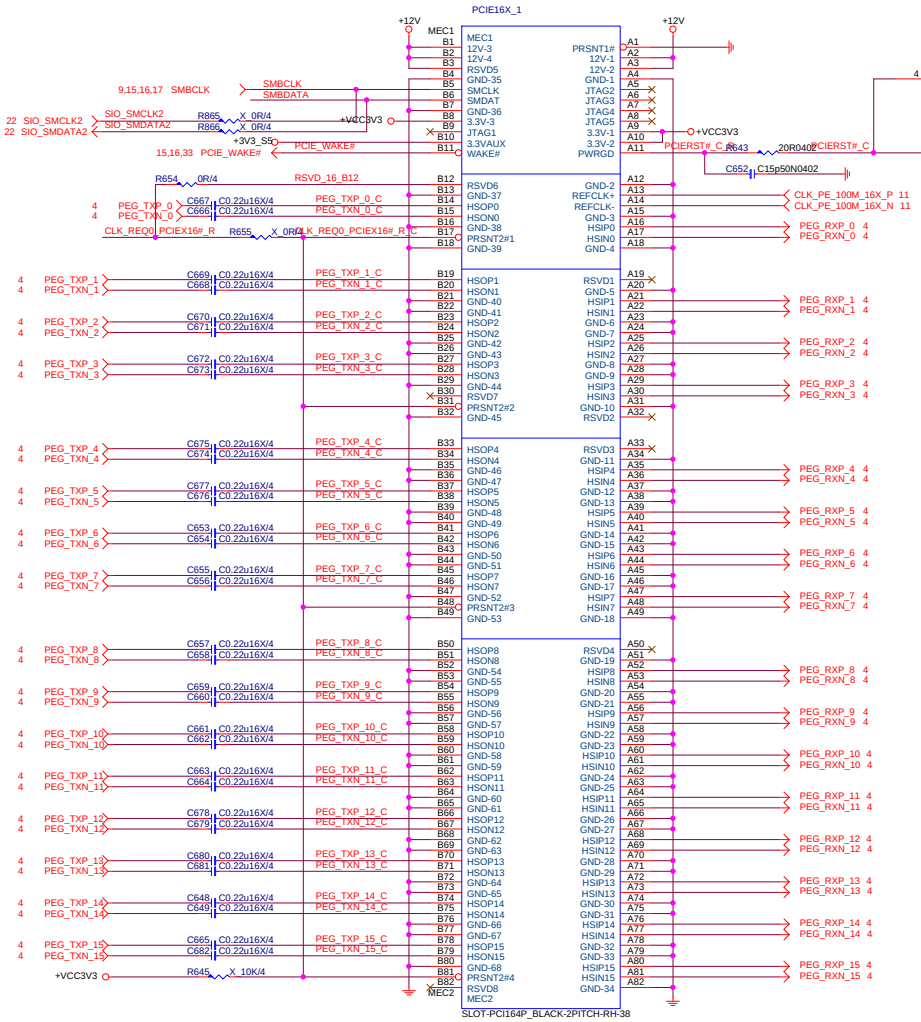
MICRO-START INT'L CO.,LTD.

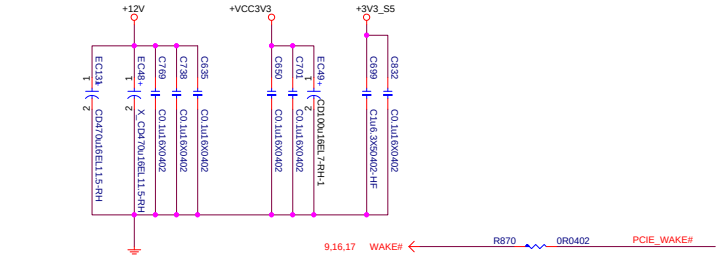
Title: PCH-GND

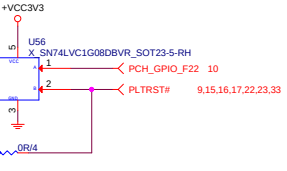
Size | Document Number: Q470/H470 | Rev: 1.1

Date: Wednesday, August 28, 2019 | Sheet 13 of 44

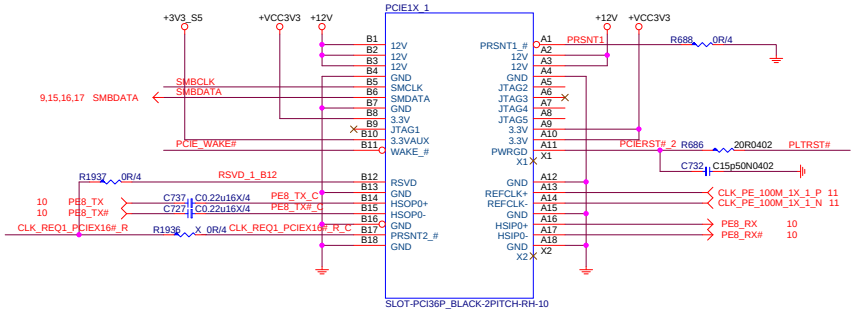
PCI EXPRESS X16 SLOT

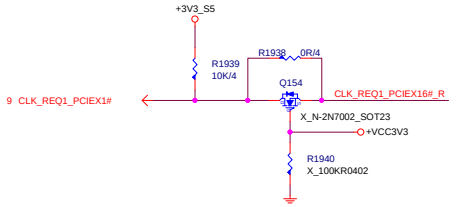


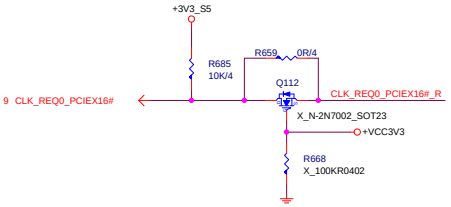




PCI EXPRESS x1-PORT

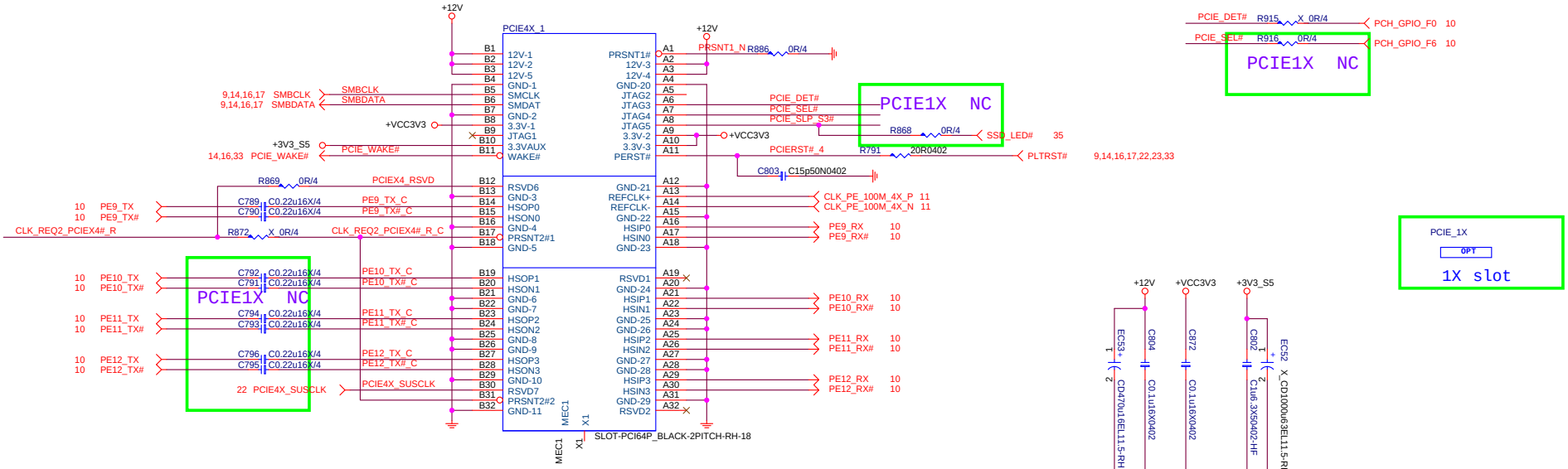




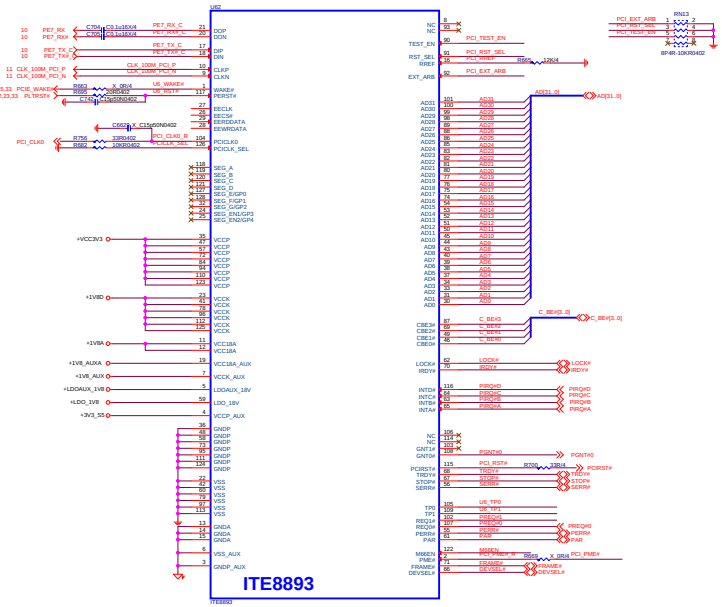


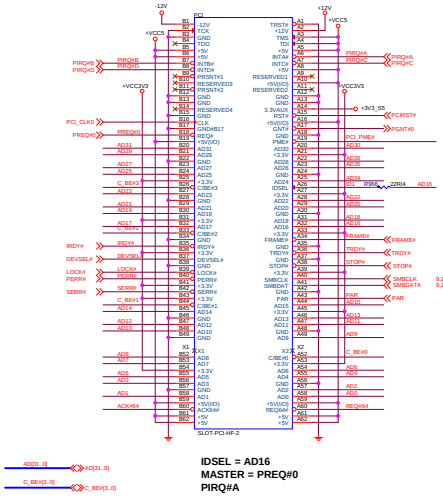
MSI Link to the Future	MICRO-START INT'L CO.,LTD.		
Title	PCIE x16/x1 slot		
Size	Document Number Q470/H470		Rev 1.1
Date: Wednesday, August 28, 2019	Sheet 14 of 44		

PCI_EXPRESS X4 SLOT



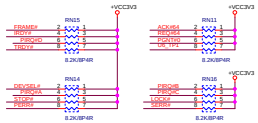
MSI MICRO-START INT'L CO.,LTD.			
Title: PCIE 4X			
Size	Document Number: Q470/H470		Rev: 1.1
Date: Wednesday, August 28, 2019	Sheet 15 of 44		



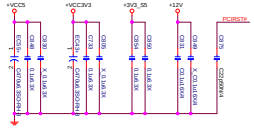


IDSEL = AD16
MASTER = PREQ#0
PIRQ#A

PCI PULL-UP / DOWN RESISTORS

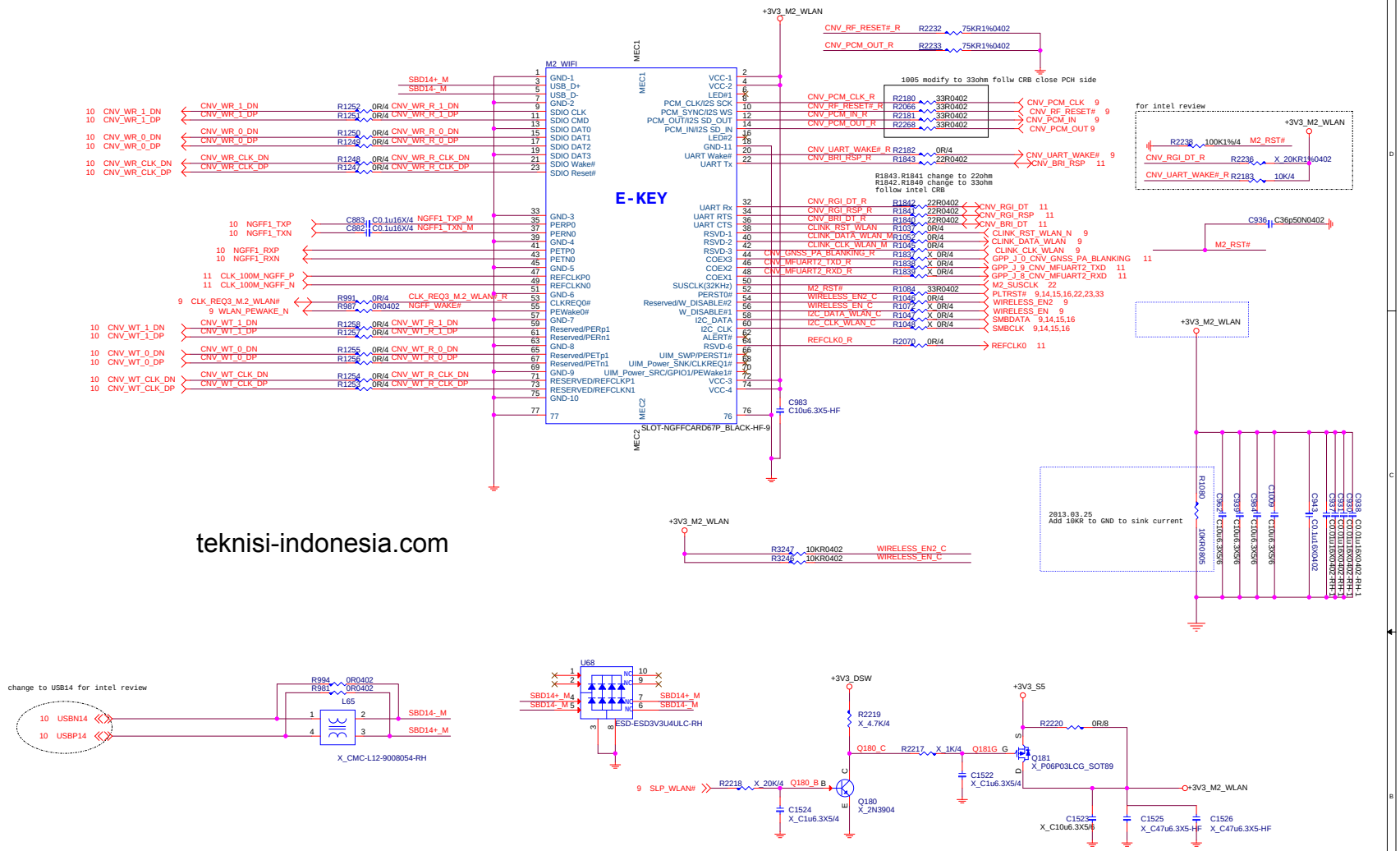


PCI slot	
+3VSB (wake)	- 375mA
+3VSB (no wake)	- 20mA
+3.3V	- 7.6A
+5V	- 5A
+12V	- 0.5A

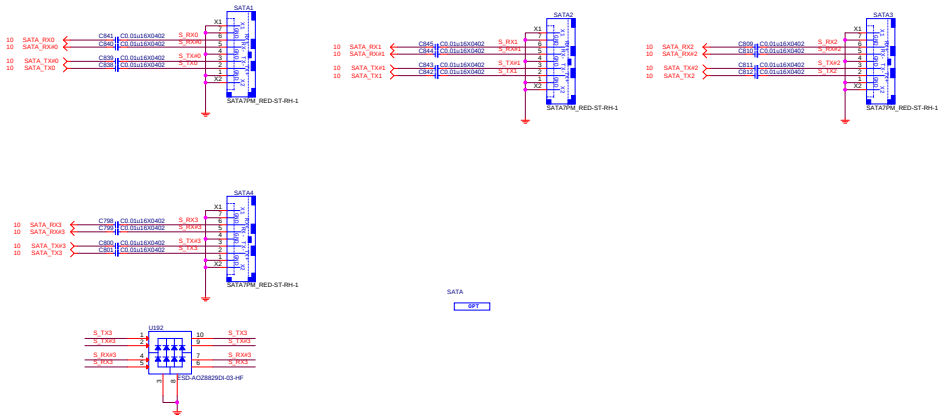


MICRO-START INTL CO.,LTD.

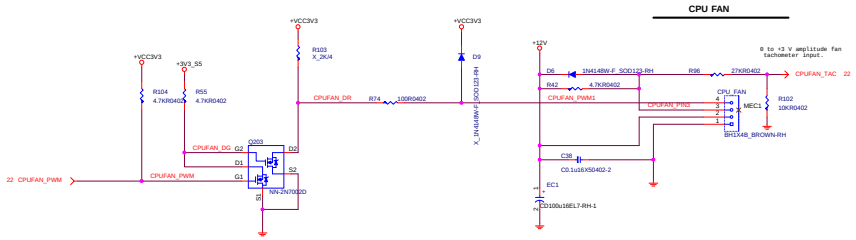
Title	PCI Slot		
Size	Document Number		Rev
	Q470/H470		1.1
Date:	Wednesday, August 29, 2007	Sheet	18 of 44

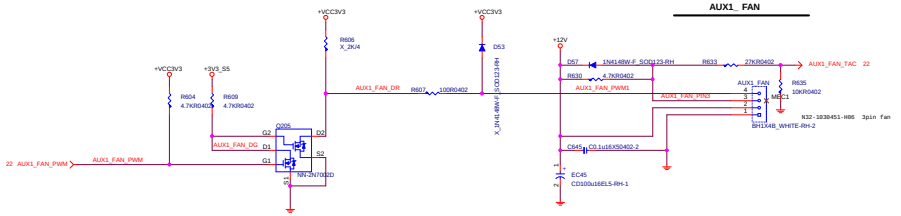


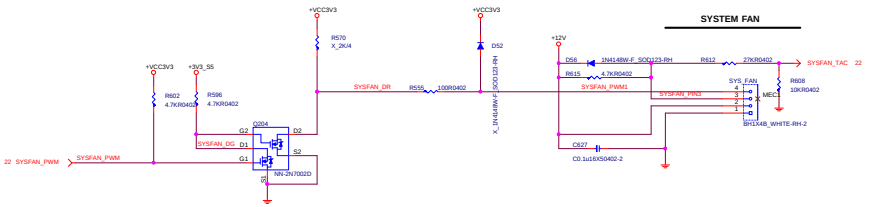
MSI Link to the Future	MICRO-START INT'L CO.,LTD.		
Title	M2 Connector		
Size	Document Number	Q470/H470	Rev 1.1
Date:	Wednesday, August 28, 2019	Sheet 17 of 44	

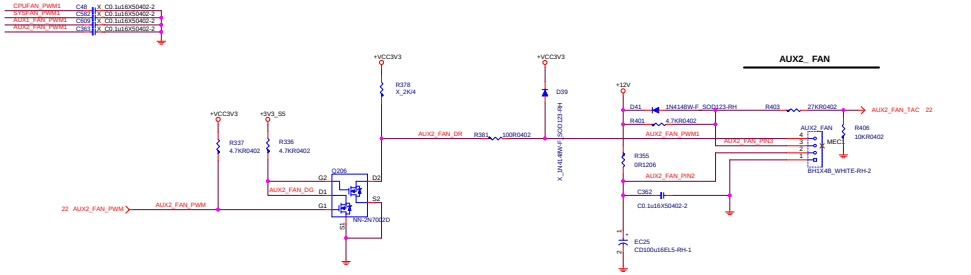


CPU FAN /SYSTEM FAN /POWER FAN





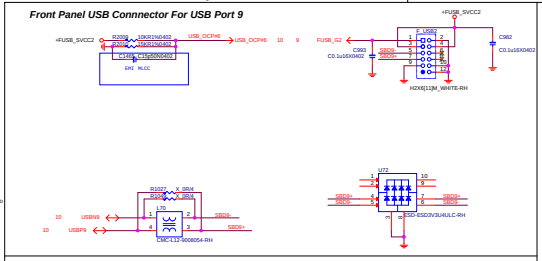




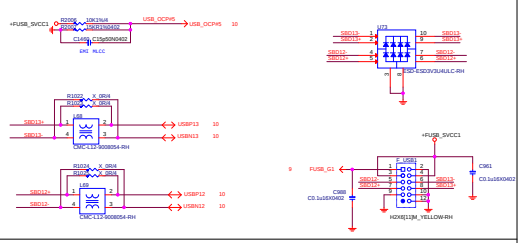
MICRO-START INT'L CO.,LTD.

Title	SATA/FAN	
Size	Document Number: Q470/H470	Rev: 1.1
Date: Wednesday, August 28, 2019	Sheet 18 of 44	

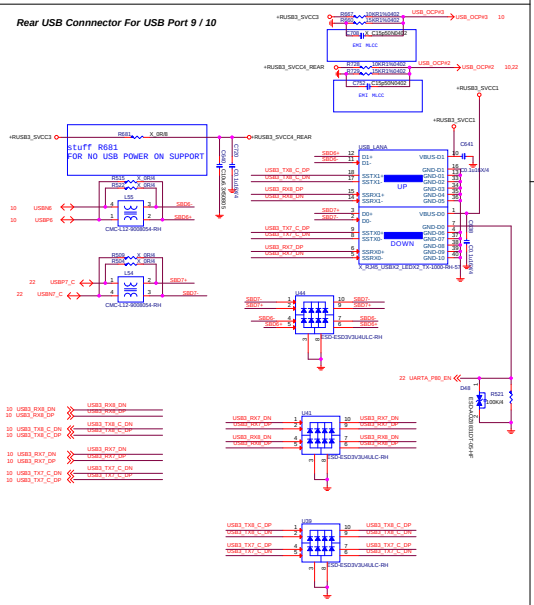
Front Panel USB Connnector For USB Port 9



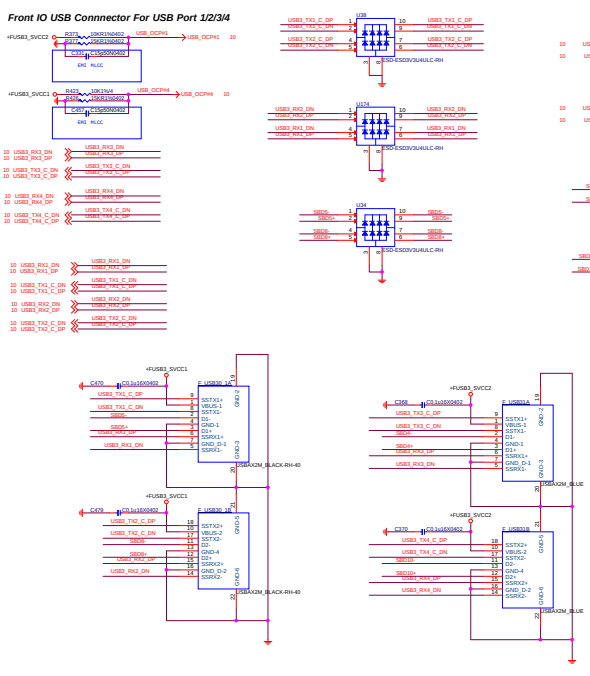
Front Panel USB Connnector For USB Port 12 / 13



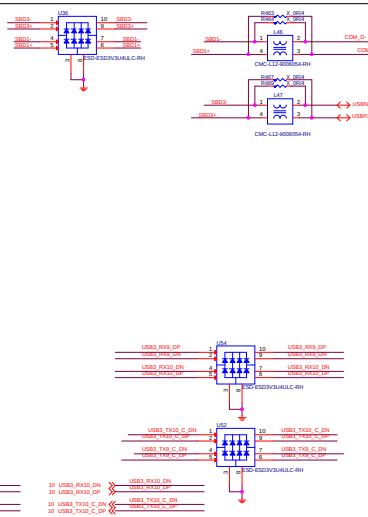
Rear USB Connnector For USB Port 9 / 10



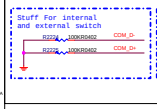
Front IO USB Connnector For USB Port 1/2/3/4



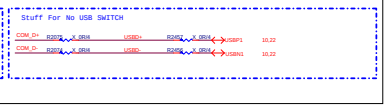
Rear IO USB Connnector For USB Port 7/8

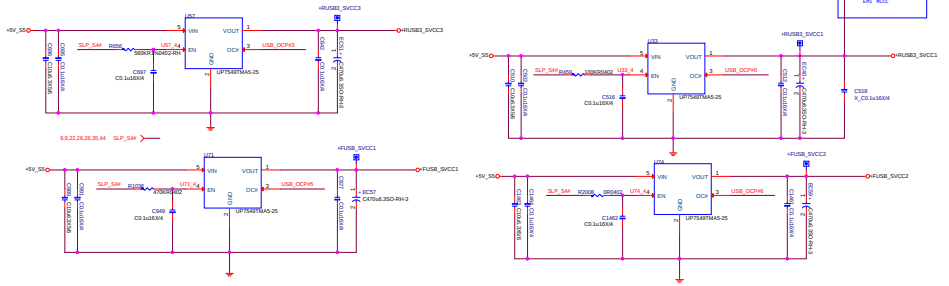


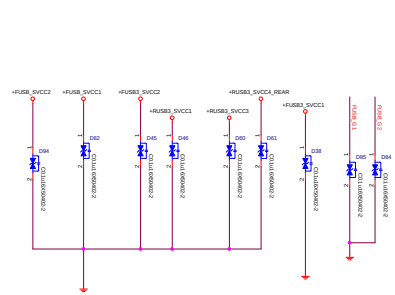
Stuff For internal and external switch



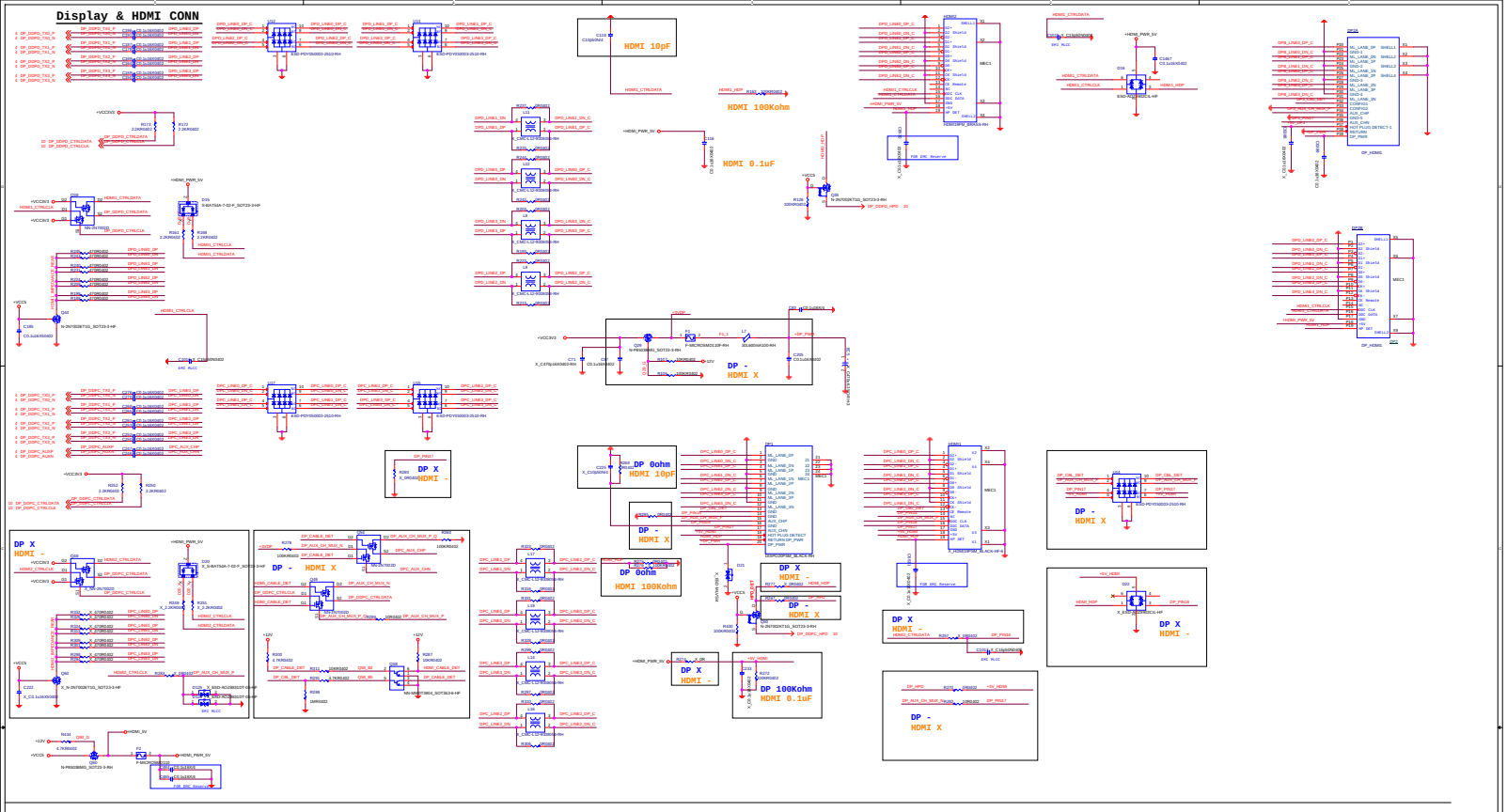
Stuff For No USB SWITCH

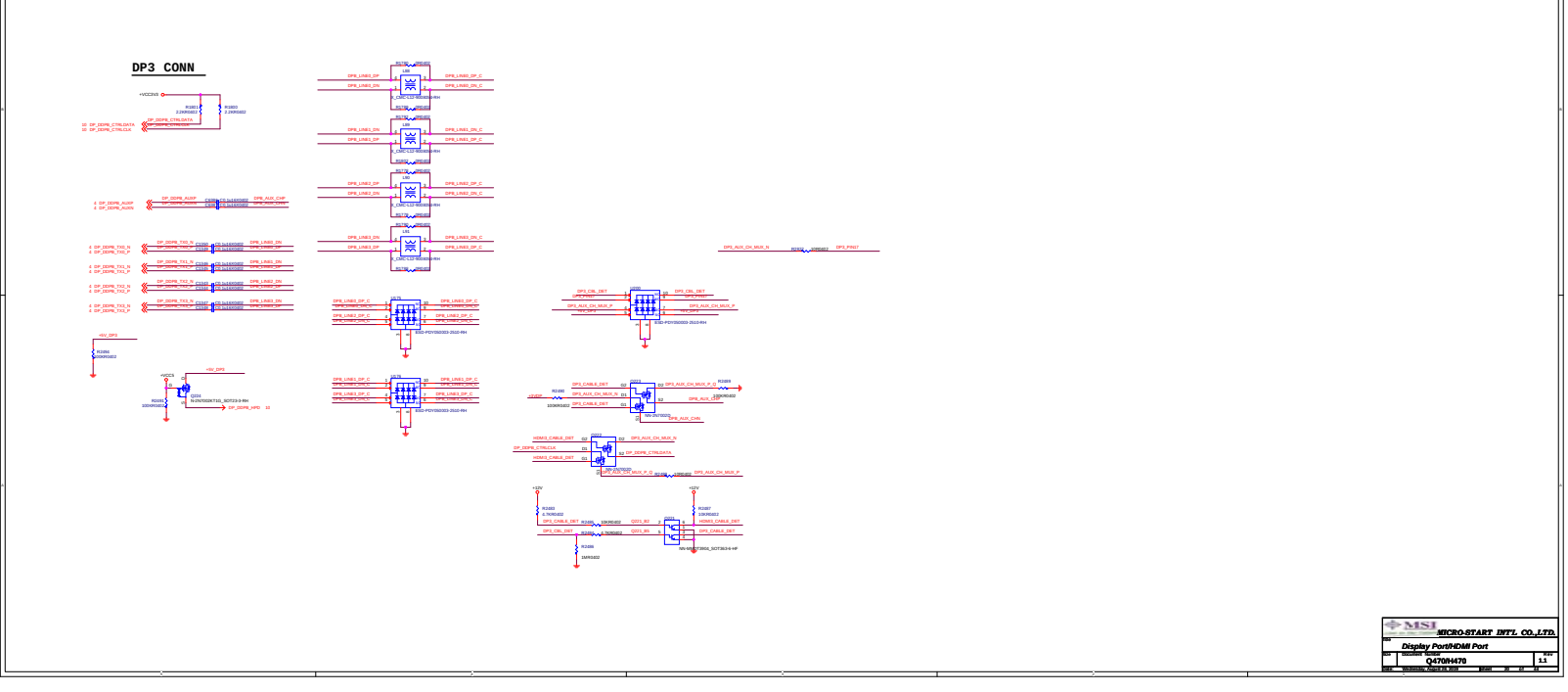




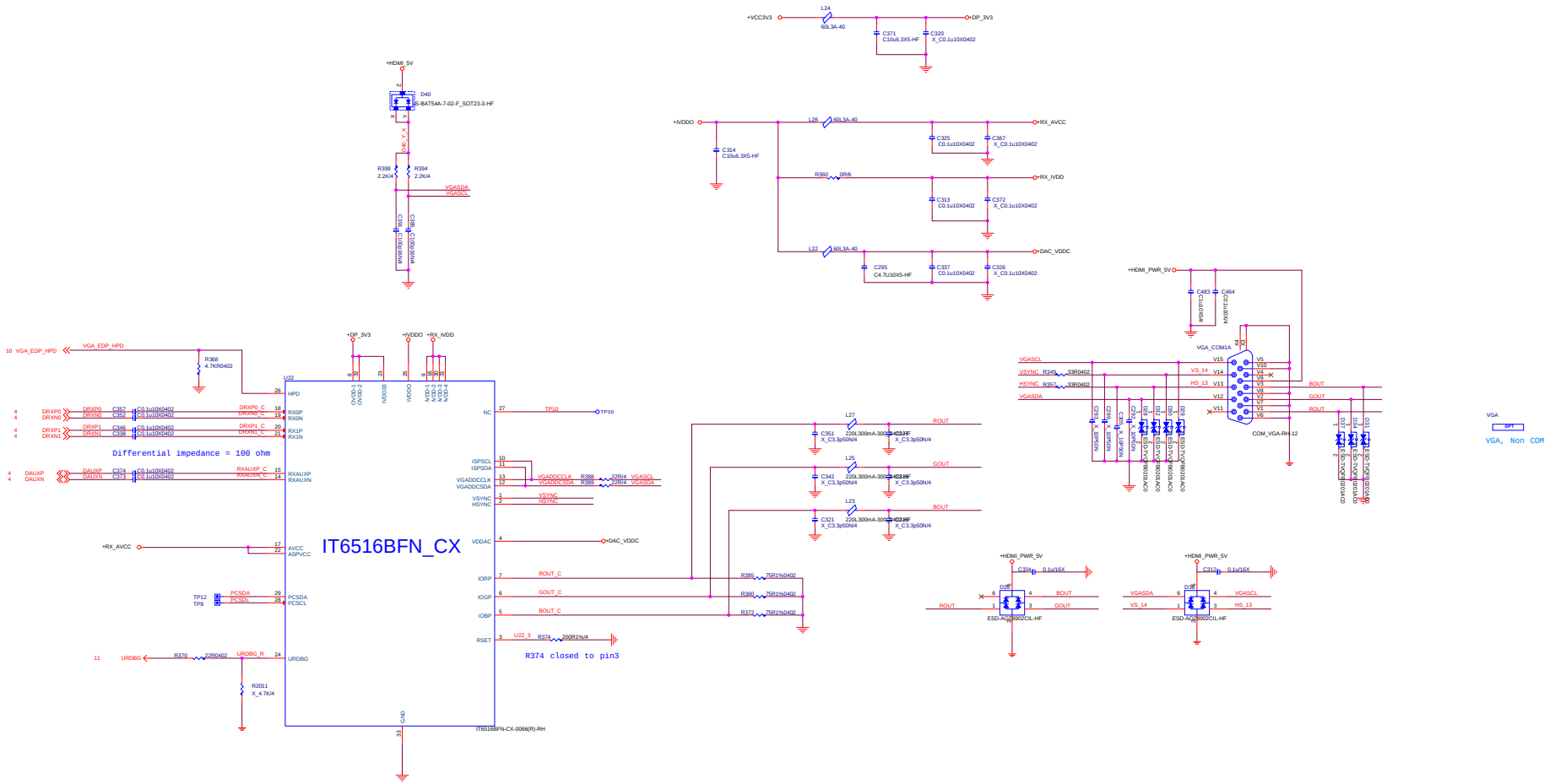


MSI	MICRO-STAR INTL CO.,LTD.		
Title	Front / Rear USB Connectors		
Size	Document Number		Rev
	Q470M1470		1.1
Date:	Wednesday, August 28, 2019	Sheet	39 of 44

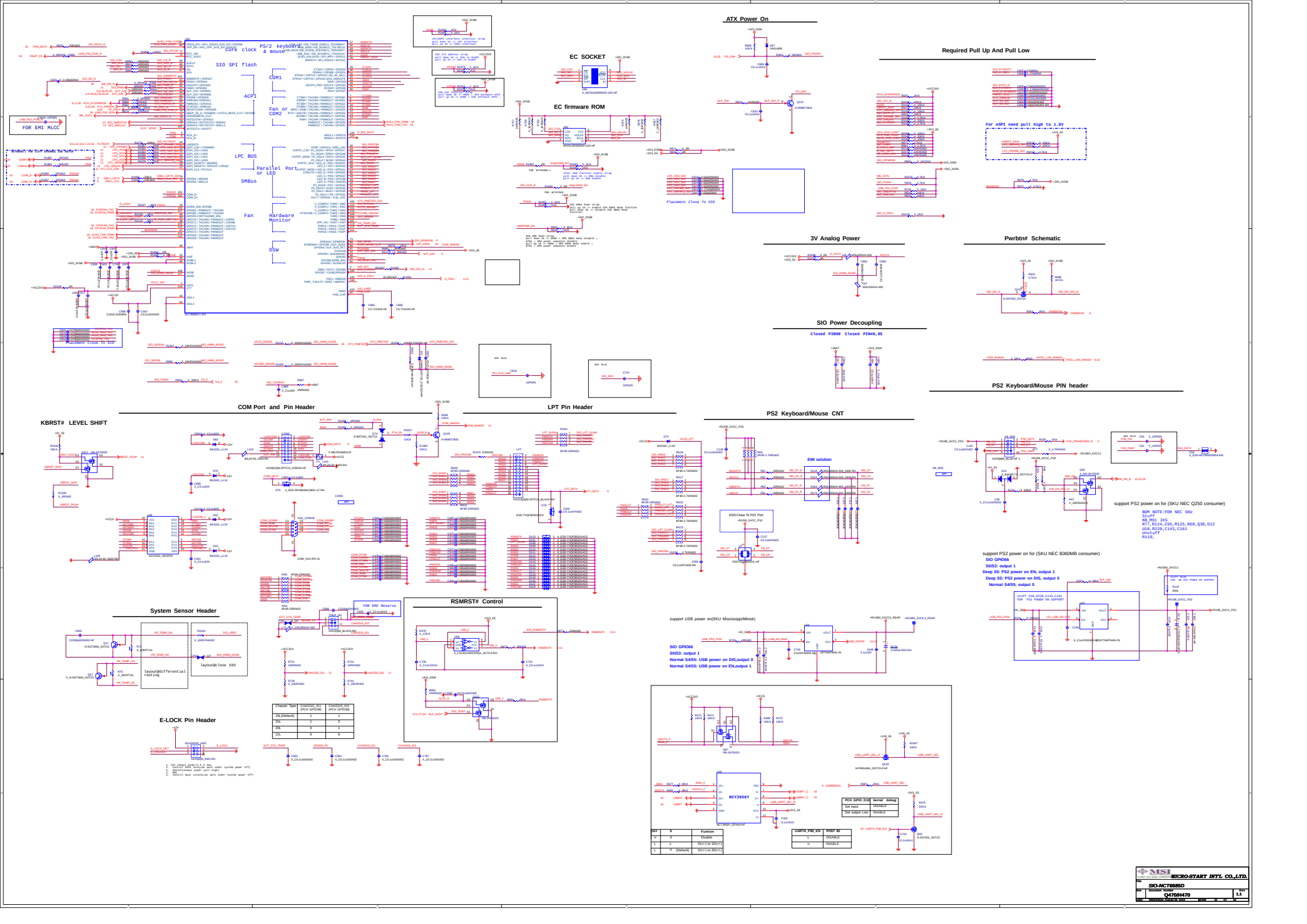




MSI	MICRO-START INT'L CO.,LTD.		
Title	Display Port/HDMI Port		
Size	Document Number		Rev
	Q470H470		1.1
Date:	Wednesday, March 04, 2020	Sheet	38 of 54



MSI MICRO-START INT'L CO.,LTD.		
Title: VGA		
Size	Document Number: Q470/H470	Rev: 1.1
Date: Wednesday, August 28, 2019	Sheet 21 of 44	


ATX Power On
EC SOCKET
EC firmware ROM
Required Pull Up And Pull Low
3V Analog Power
Pwrbtn# Schematic
SIO Power Decoupling
PS2 Keyboard/Mouse PIN header
KBRST# LEVEL SHIFT
COM Port and Pin Header
LPT Pin Header
PS2 Keyboard/Mouse CNT
System Sensor Header
RSMRST# Control
E-LOCK Pin Header
SIO SPI flash
PS/2 keyboard & mouse
Core clock
COM1
COM2
ACPI
Fan or
LPC BUS
Parallel Port or LED
SMBus
Fan
Hardware Monitor
DSW
FOR EMI MLCC
Placement Close to SIO
EMI solution
support PS2 power on for (SKU NEC Q250 consumer)
support PS2 power on for (SKU NEC B360MB consumer)
SIO GPIO66
S0/S3: output 1
Deep S5: PS2 power on EN, output 1
Deep S5: PS2 power on DIS, output 0
Normal S4/S5: output 0
support USB power on(SKU Mississippi/Minsk)
SIO GPIO66
S0/S3: output 1
Normal S4/S5: USB power on DIS,output 0
Normal S4/S5: USB power on EN,output 1
For eSPI need pull high to 1.8V
Closed PIN99 Closed PIN46,85
MICRO-START INTL CO.,LTD.
SIO-NCT6685D
Q470/H470
1.1

INTEL-I219LM Co-LAY RTL8111K

WGI219V
OB6-7B60001-IY6

WGI219V
OB6-7B60001-IY6

LAN Power
3.3V - 1.2A - 4W

Reserve R714,R703 for Schematic Checklists
LAN_DISABLE# must be connected to PCH's LAN_PHY_PWR_CTRL

NC for 8111k

500mA

NC for 8111k

NC for 8111k

I219LM Co-lay RTL8111K Option

RTL for EEPROM
if Un-user EEPROM, All components for RTL can be n/c

INTEL From PCH
RTL From GP10

STUFF for 8111k

ESD

EMI solution: can be unmounted if LAN connector has surge protect

single LED NC

D50 NC for 8111k

D55 NC for 8111k

RTL 8111K

STUFF for 8111k

ENSWREG L : Disable
H : Enable

Connector

C570.C581 R549 NC for 8111k

single LED NC

STUFF for 8111k

NC for 8111k

STUFF for 8111k

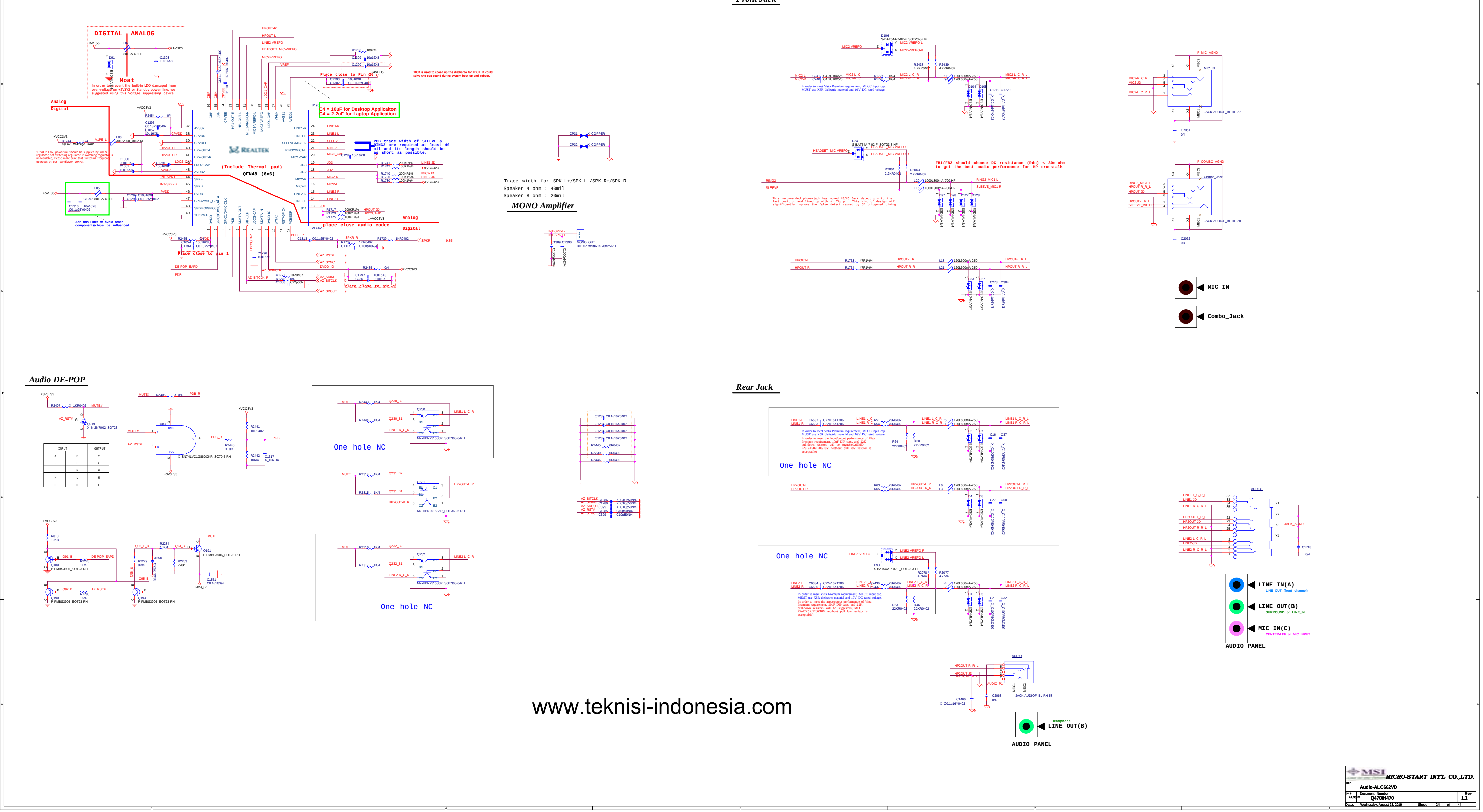
C606.C621 NC for 8111k

23	MDI_PLUS[3]	MDIP3	
24	MDI_MINUS[3]	MDIN3	
47	VDD0P9	NC	
48	CLK_REQ_N	CLKREQB	

MICRO-START INT'L CO.,LTD.

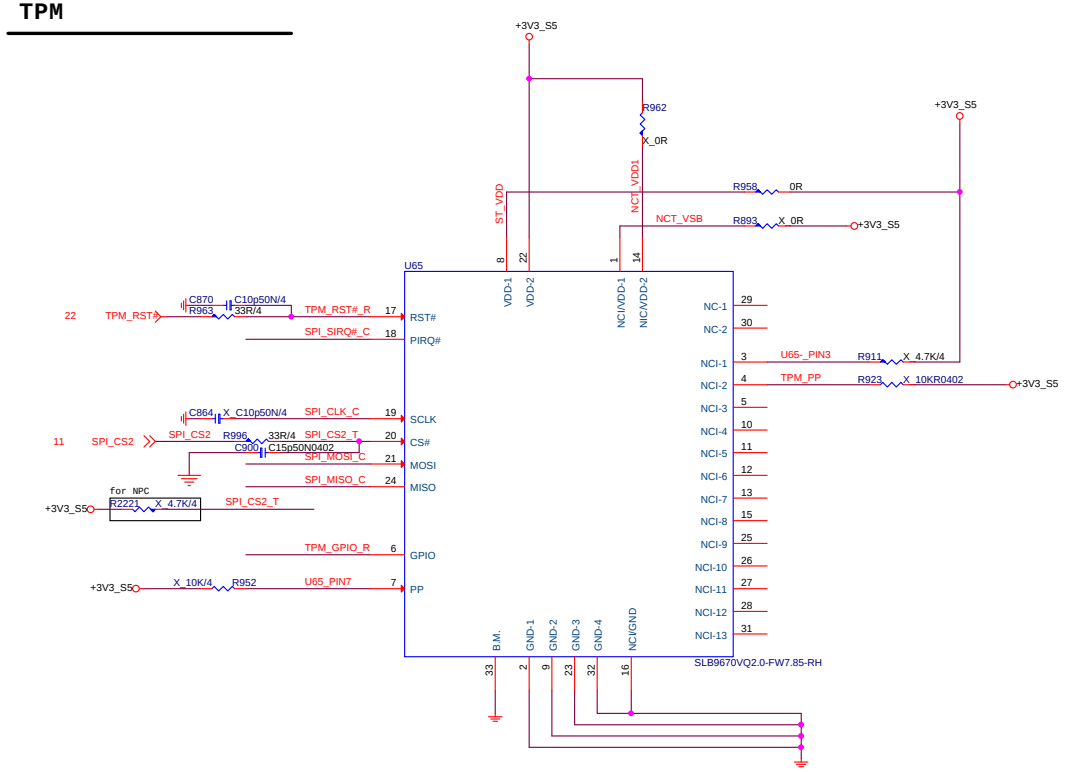
Title	LAN-I219-LM	
Size	Document Number Q470/H470	Rev 1.1
Date: Friday, October 11, 2019	Sheet 23 of 45	

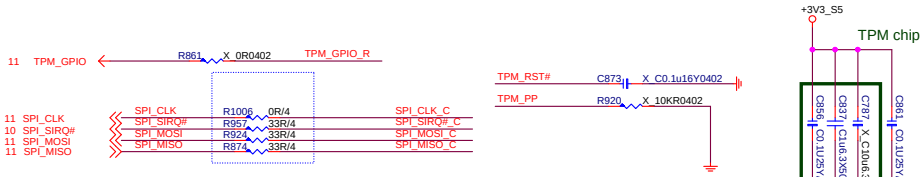
Azalia Codec - ALC623

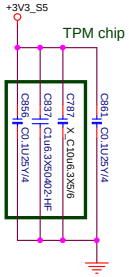


Azalia Codec - ALC623
Front Jack
MONO Amplifier
Audio DE-POP
Rear Jack
DIGITAL ANALOG
Moat
(Include Thermal pad)
QFN48 (6x6)
C4 = 10uF for Desktop Applicaiton
C4 = 2.2uF for Laptop Application
Place close to Pin 28
Place close audio codec
Place close to pin 1
Place close to pin 9
Add this Filter to avoid other components/chips be influenced
Trace width for SPK-L+/SPK-L-/SPK-R+/SPK-R-
Speaker 4 ohm : 40mil
Speaker 8 ohm : 20mil
FB1/FB2 should choose DC resistance (Rdc) < 30m-ohm to get the best audio performance for HP crosstalk
One hole NC
One hole NC
One hole NC
One hole NC
One hole NC
MIC_IN
Combo_Jack
LINE IN(A)
LINE OUT(B)
MIC IN(C)
AUDIO PANEL
LINE OUT(B)
AUDIO PANEL
www.teknisi-indonesia.com
MICRO-STAR INT'L CO.,LTD.
Audio-ALC662VD
Q470/H470
1.1

TPM







	R893	R911	R923	R920	R952	R958	R962	R861
ST----ST33HTPH2E32AHB4(SPI)	X	X	X	X	X	X	X	X
NPC----NPCT750 SPI)	V	X	X	X	X	V	V	X
Infineon SLB 9670VQ2.0 (SPI)	X	X	X	X	X	V	X	X

MICRO-START INT'L CO.,LTD.

Title: TPM & Asset ID

Size | Document Number: Q470/H470 | Rev: 1.1

Date: Wednesday, August 28, 2019 | Sheet 25 of 44

XDP_CPU_PREQ# — XDP_CPU_PREQ# 4
XDP_CPU_PRDY# — XDP_CPU_PRDY# 4

CPU_TCK — CPU_TCK 4
CPU_TDO — CPU_TDO 4

CPU_TDI — CPU_TDI 4
CPU_TMS — CPU_TMS 4

CPU_TCK	R563	0/4	PCH_JTAGX	PCH_JTAGX 9
CPU_TDI	R505	0/4	PCH_JTAGTDI	PCH_JTAGTDI 9
CPU_TMS	R506	0/4	PCH_JTAGTMS	PCH_JTAGTMS 9
CPU_TDO	R498	0/4	PCH_JTAGTDO	PCH_JTAGTDO 9
XDP_CPU_PRDY#	R554	0/4	XDP_PCH_PRDY_N	XDP_PCH_PRDY_N 9
XDP_CPU_PREQ#	R553	0/4	XDP_PCH_PREQ_N	XDP_PCH_PREQ_N 9

USB power discharge circuit

+3V3_DSW — R672 10KR0402 — SVCC_DIS
6,9,19,22,28,35,44 SLP_S4# — R82 8.2KR0402 — Q33_B
Q33 NPN-MMBT2222A-7-F_SOT23-RH
C96 X_C0.1u16X0402
C67 X_C0.1u16X0402

NO USB and PS2 POWER ON SUPPORT:
unstuff Q116,R677,R694

+3V3_DSW — R677 10KR0402 — SVCC_DIS1
22 USB_PS2_PON — R694 49.9KR1%0402 — Q116_B
Q116 NPN-MMBT2222A-7-F_SOT23-RH
C734 X_C0.1u16X0402
C725 X_C0.1u16X0402

+RUSB3_SVCC4_REAR
RN9 8P4R-270R
Q113_D — Q113 2N7002LT1G_SOT23-RH — G

NO USB POWER ON SUPPORT:
unstuff RN9,Q113

+RUSB_SVCC_PS2
RN2 X_8P4R-270R
Q47_D — Q47 X_N-2N7002LT1G_SOT23-RH — G
Q47_G — R246 X_0/4 — SVCC_DIS
R254 X_0/4 — SVCC_DIS1

stuff RN2,Q47,R254
FOR PS2 POWER ON SUPPORT

+FUSB3_SVCC2
RN6 8P4R-270R
Q73_D — Q73 N-2N7002LT1G_SOT23-RH — G

+RUSB3_SVCC1
RN7 8P4R-270R
Q83_D — Q83 N-2N7002LT1G_SOT23-RH — G

+RUSB3_SVCC3
RN8 8P4R-270R
Q111_D — Q111 N-2N7002LT1G_SOT23-RH — G

+FUSB_SVCC2
RN29 8P4R-270R
Q131_D — Q131 N-2N7002LT1G_SOT23-RH — G

+FUSB_SVCC1
RN19 8P4R-270R
Q125_D — Q125 N-2N7002LT1G_SOT23-RH — G

+FUSB3_SVCC1
RN3 8P4R-270R
Q69_D — Q69 N-2N7002LT1G_SOT23-RH — G

+FUSB3_SVCC3
RN30 8P4R-270R
Q158_D — Q158 N-2N7002LT1G_SOT23-RH — G

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

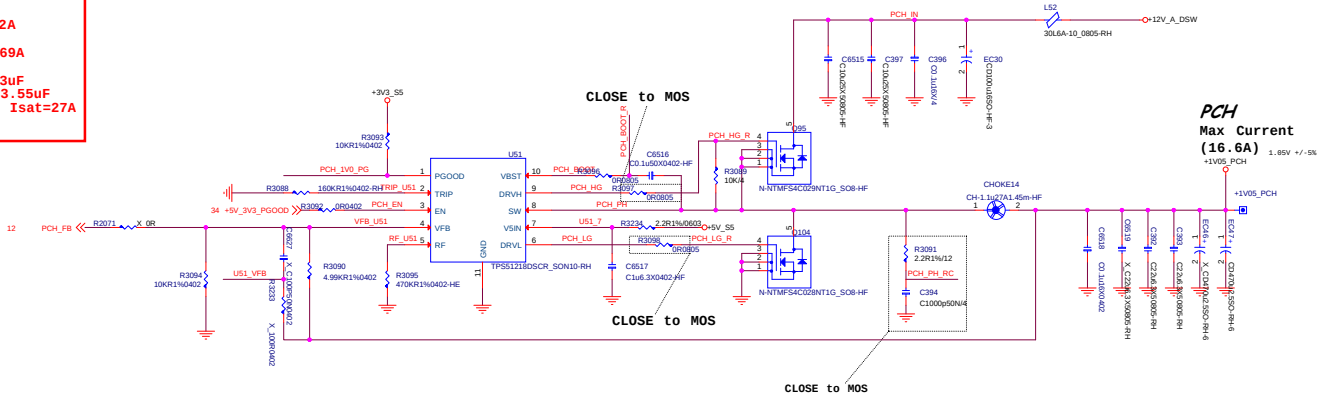
Title: XDP/USB Power Dischage

Size	Document Number	Rev
	Q470/H470	1.1

Date: Monday, September 02, 2019 Sheet 26 of 44

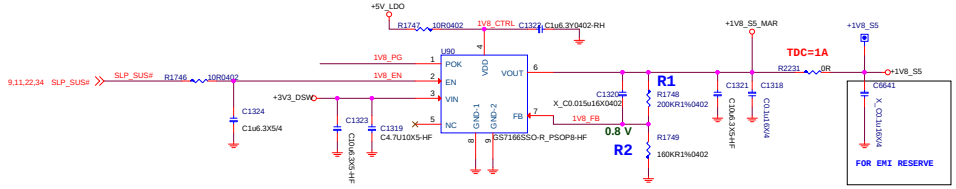
PCH

Vo=1.05V
Vin=12V
FS=300KHz
OCP=24.9~33.2A
Iout=16.6A
Vin Irms =4.69A
LIR=17%
Cin CAP=14.73uF
Cout CAP=1553.55uF
Choke=1.1uH/ Isat=27A

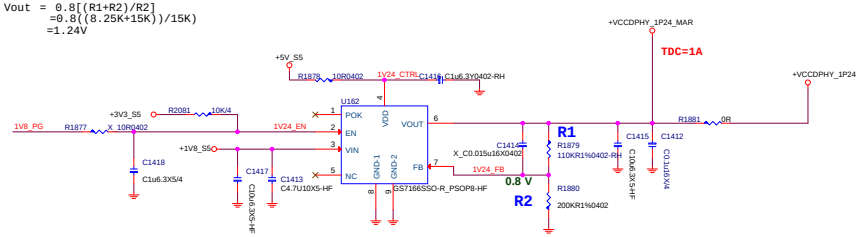


+1V8_S5

Vout = 0.8[(R1+R2)/R2]
=0.8((15K+12K))/12K)
=1.8V

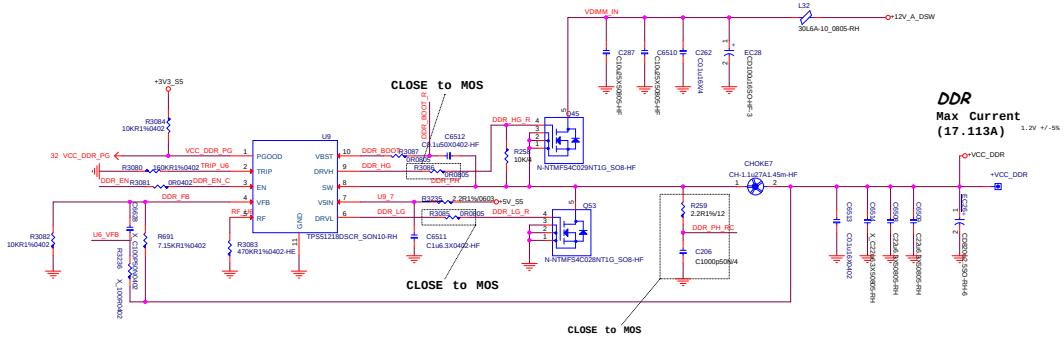


Vout = 0.8[(R1+R2)/R2]
=0.8((8.25K+15K))/15K)
=1.24V



MSI	MICRO-STAR INTL CO.,LTD.		
Title	PCH Core Power		
Size	Document Number	Q470/H470	Rev 1.1
Date:	Wednesday, October 09, 2019	Sheet 27 of 44	

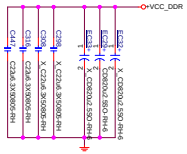
DDR4

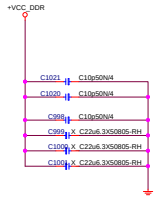


DDR
Max Current
(17.113A)

```
Vo=1.2V
Vin=12V
FS=300KHz
OCP=25.67~34.23A
Iout=17.113A
Vin Irms =5.13A
LIR=19%
Cin  CAP=17.113uF
Cout  CAP=1467.51uF
Choke=1.1uH/  Isat=27A
```

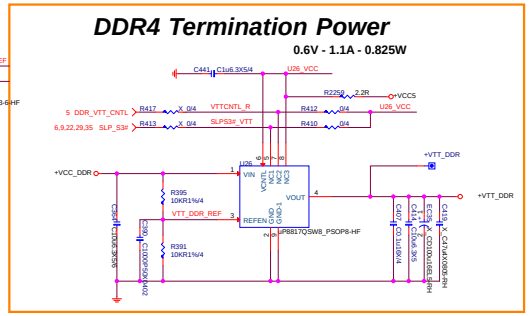
DDRIII I/O power decoulping caps.





DDR4 Termination Power

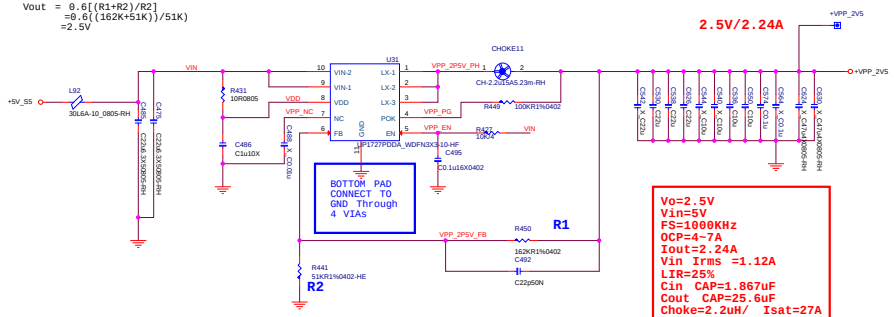
0.6V - 1.1A - 0.825W



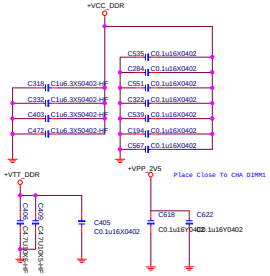
VPP_2.5V

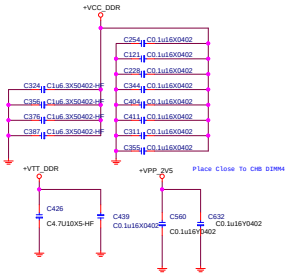
Vout = 0.6[(R1+R2)/R2]
=0.6((162K+51K))/51K)
=2.5V

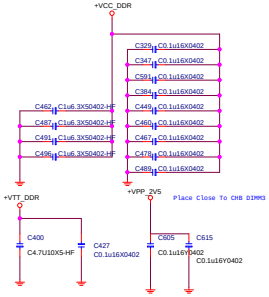
2.5V/2.24A

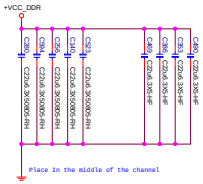


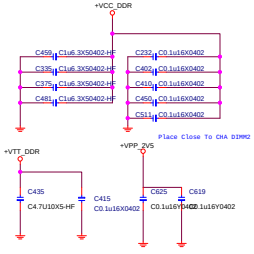

```
Vo=2.5V
Vin=5V
FS=1000KHz
OCP=4~7A
Iout=2.24A
Vin Irms =1.12A
LIR=25%
Cin  CAP=1.867uF
Cout  CAP=25.6uF
Choke=2.2uH/  Isat=27A
```

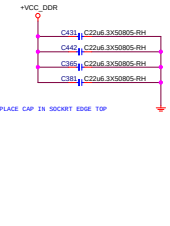


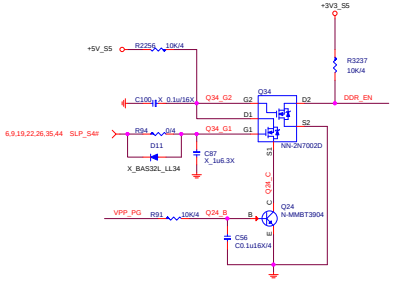


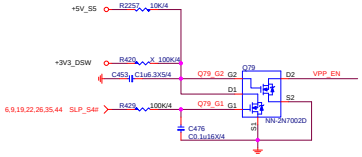










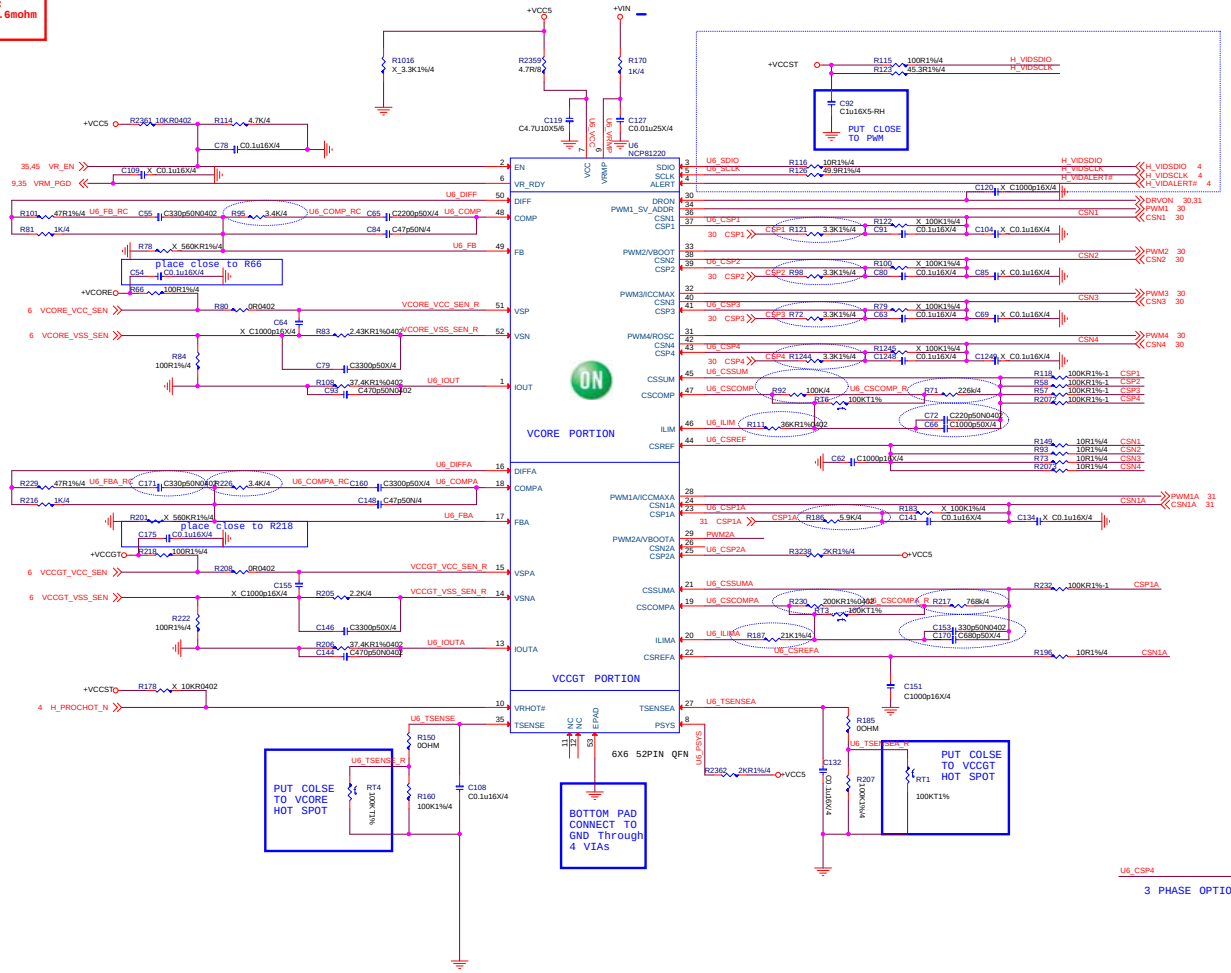


MSI MICRO-START INTL CO.,LTD.			
Title: DDR4 Power			
Size: A4	Document Number: Q470/H470		Rev: 1.1
Date: Wednesday, October 09, 2019	Sheet: 28	of: 44	

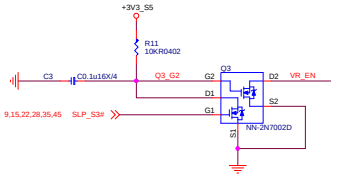
CometLake S62 65W
Vcore Iccmax=140A, PL2=100A,L/L=1.7m ohm
VccGT Iccmax=35A, PL2=28A, L/L=4mohm

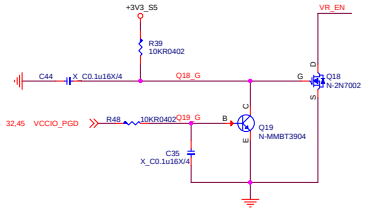
O/P Choke:
0.18uH/ 0.6mohm

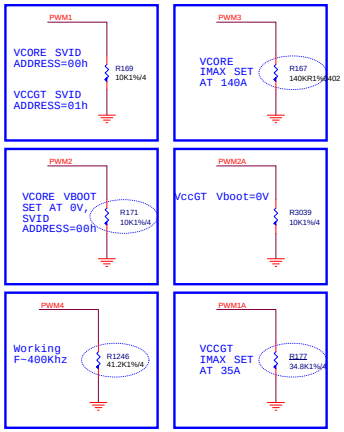
Intel CML-S 6C_65W - 4+1 PHASE



Power Sequence

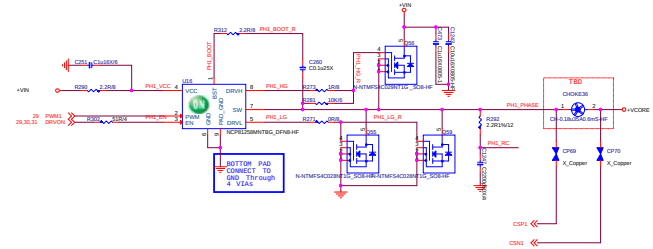


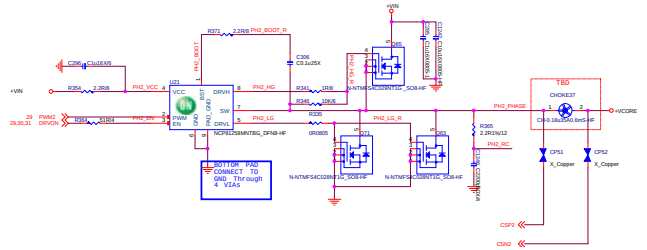


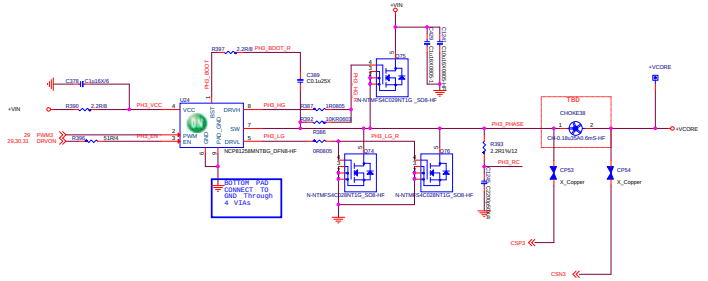


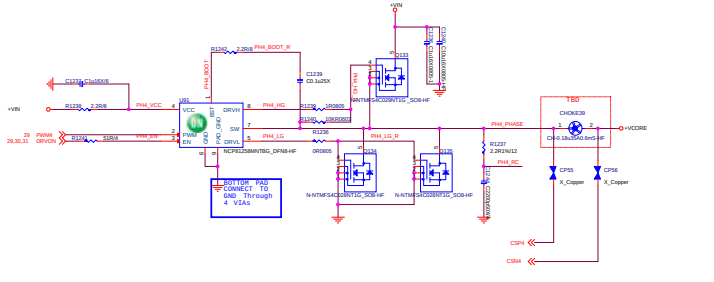
MSI / MICRO-START INTL CO.,LTD.			
Title: IMVP8-NCP81220 5 Phase			
Size	Document Number: Q470/H470		Rev: 1.1
Date: Wednesday, October 09, 2019	Sheet 29 of 44		

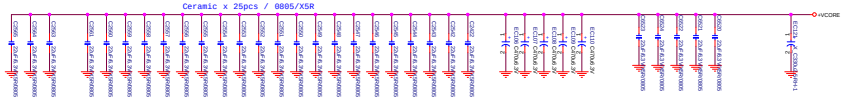
VCORE POWER Phase 1~4



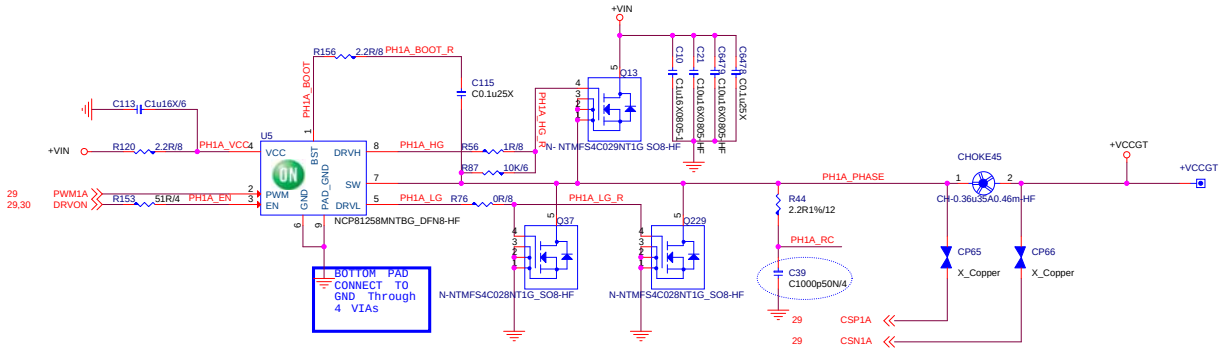




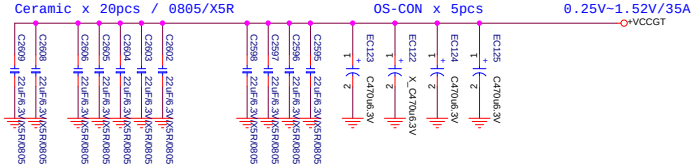


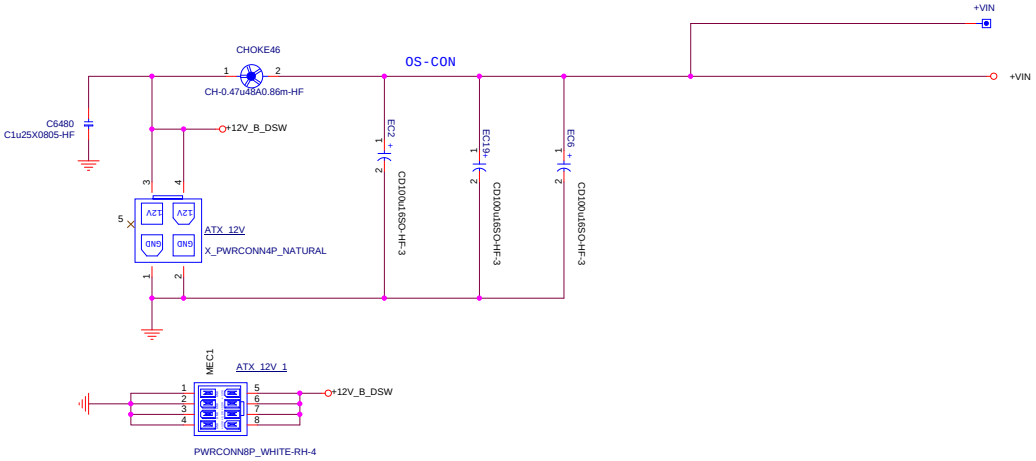


MSI	MICRO-START INT'L CO.,LTD.		
Title	VCORE OUTPUT STAGE		
Size	Document Number		Rev
	Q470/H470		1.1
Date: Wednesday, August 26, 2009	Sheet 35 of 56		



CML-S VCCGT
10C 65W baseline: TDC=28A,Iccmax=35A
LL=4.0mohm
6C 65W performance:
TDC=28A, Iccmax=35A
LL=4.0mohm

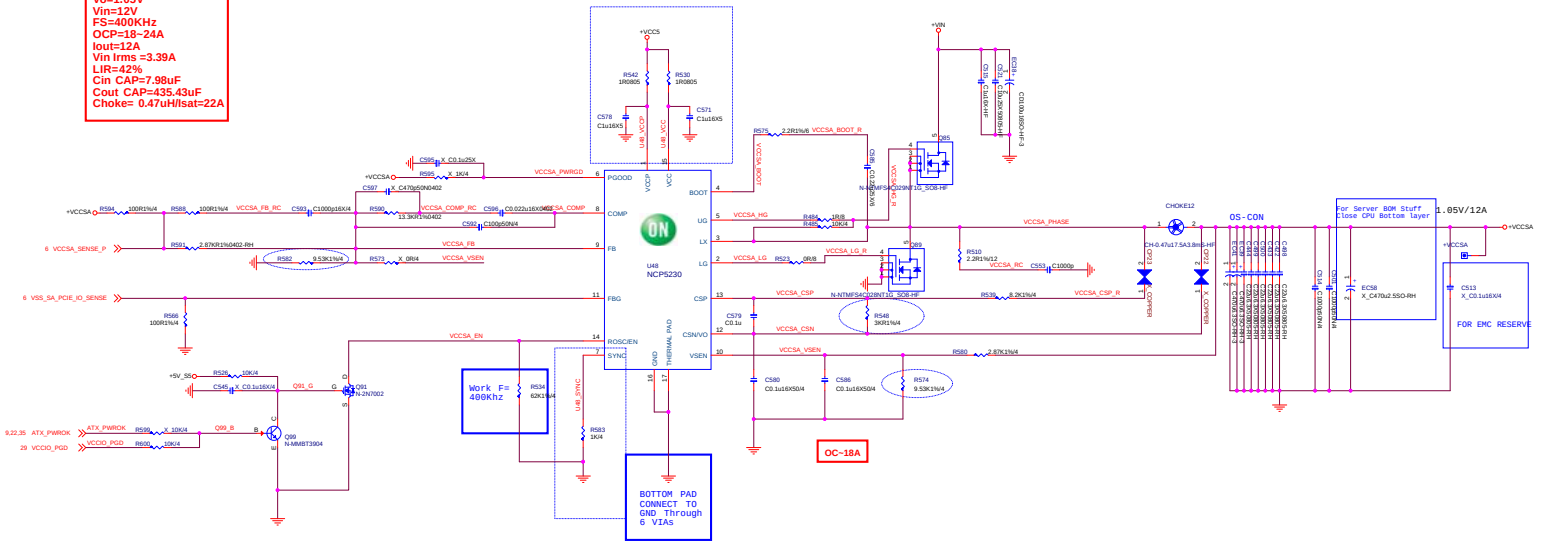




MSI Link to the Future	MICRO-START INT'L CO.,LTD.	
Title	VCCGT OUTPUT STAGE	
Size	Document Number Q470/H470	Rev 1.1
Date: Wednesday, October 09, 2019	Sheet 31 of 44	

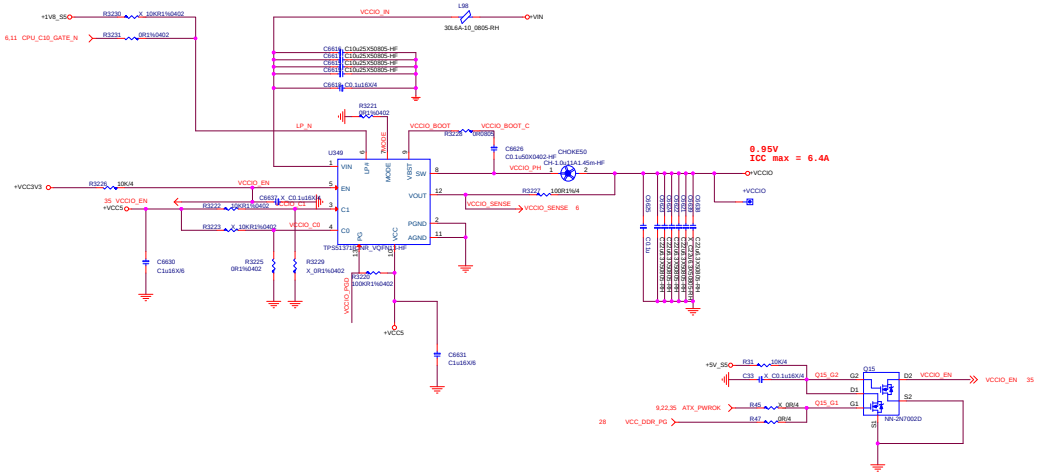
VCCSA

Vo=1.05V
Vin=12V
FS=400KHz
OCP=18~24A
Iout=12A
Vin Irms =3.39A
LIR=42%
Cin CAP=7.98uF
Cout CAP=435.43uF
Choke= 0.47uH/Isat=22A



VCCIO

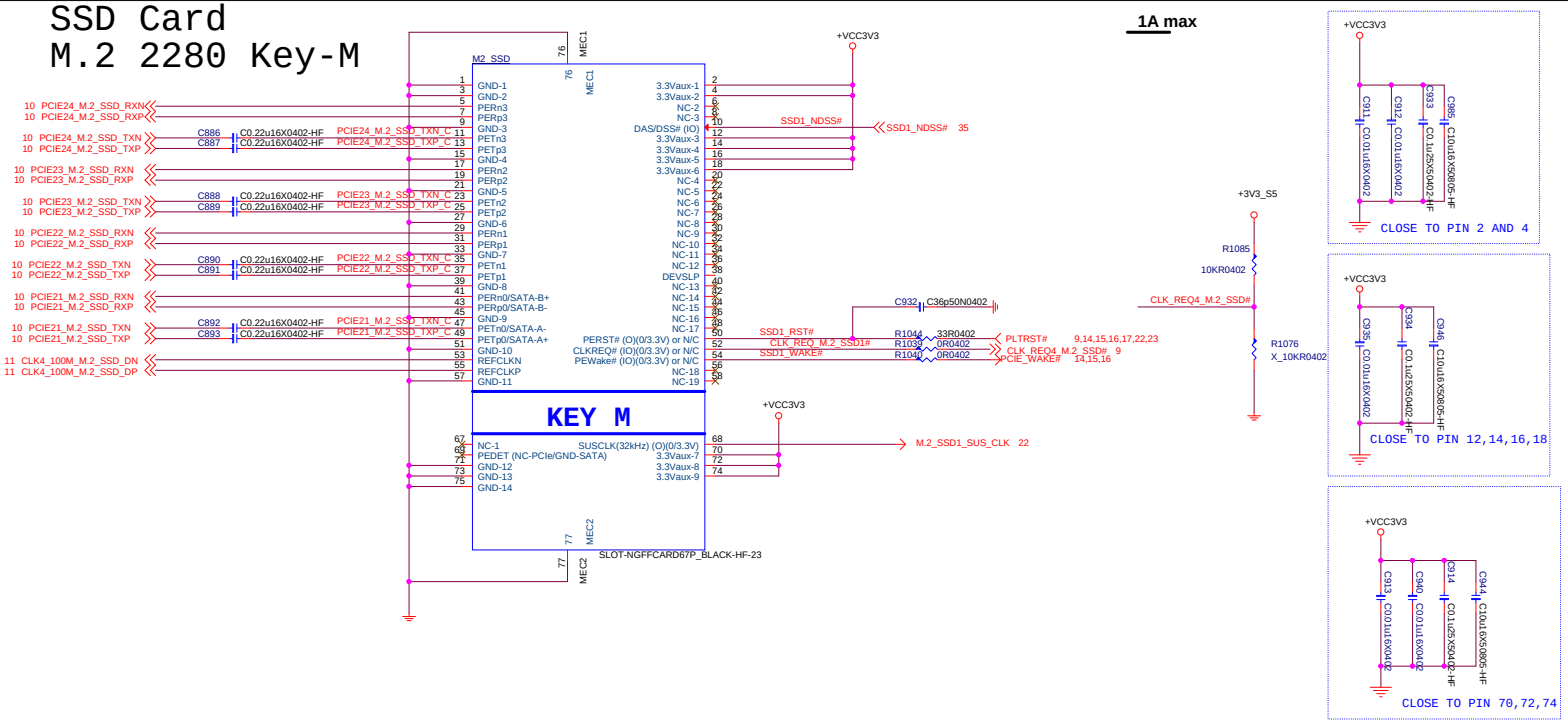
Vo=0.95V
Vin=12V
FS=600KHz
OCP=6.7~8.9A
Iout=6.4A
Vin Irms =1.73A
LIR=23%
Cin CAP=2.59uF
Cout CAP=244.01uF
Choke=1uH/ Isat=22A



MICRO-START INTL CO.,LTD.

File	VccSA/VccIO		
Size	Document Number	Q470/H470	Rev 1.1
Date: Wednesday, August 28, 2013	Sheet 32 of 44		

SSD Card
M.2 2280 Key-M



MSI Link to the Future	MICRO-START INT'L CO.,LTD.	
Title: Nothing		
Size	Document Number: Q470/H470	Rev: 1.1
Date: Wednesday, August 28, 2019	Sheet 33 of 44	

VCC3&VCC5 Power

Vo=5V
Vin=12V
FS=300KHz
OCP=30~40A
Iout=20A
Vin Irms =9.86A
LIR=22%
Cin CAP=54.01uF
Cout CAP=989.66uF
Choke=2.2uH/Isat=44A

Vo=3.3V
Vin=12V
FS=355KHz
OCP=30~40A
Iout=20A
Vin Irms =8.93A
LIR=31%
Cin CAP=37.44uF
Cout CAP=811.32uF
Choke=1.1uH/Isat=27A

OCP 38.2A
OCP 35.2A

support NEC Consumer PS2 power on
SIO GPIO40 output
Deep S5: PS2 power on EN, output 0
Deep S5: PS2 power on DIS, output 1

DC IN: VCC5/12A

VCC3&VCC5 Power Output Connector

Company	MICRO-START INTL CO.,LTD.
Title	VCC3/VCC5/3VSB/5VSB
Size	
Document Number	Q470/H470
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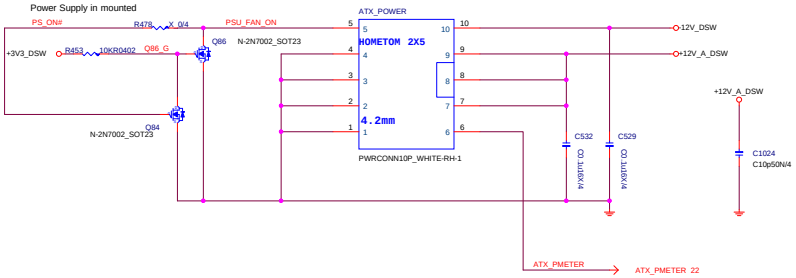
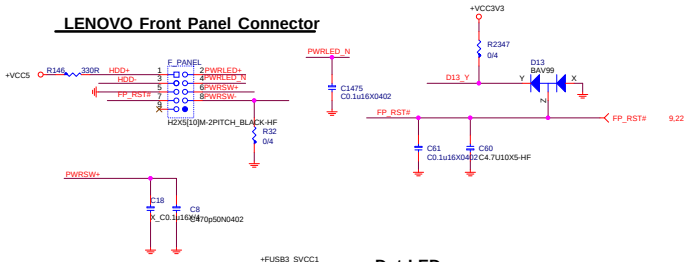
ATX Power Connector / Front Panel / LED/DSW

8 Pin ATX Power Connector

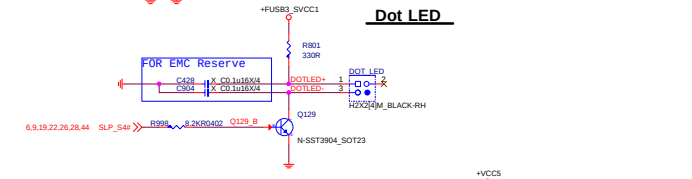
Power Supply in mounted

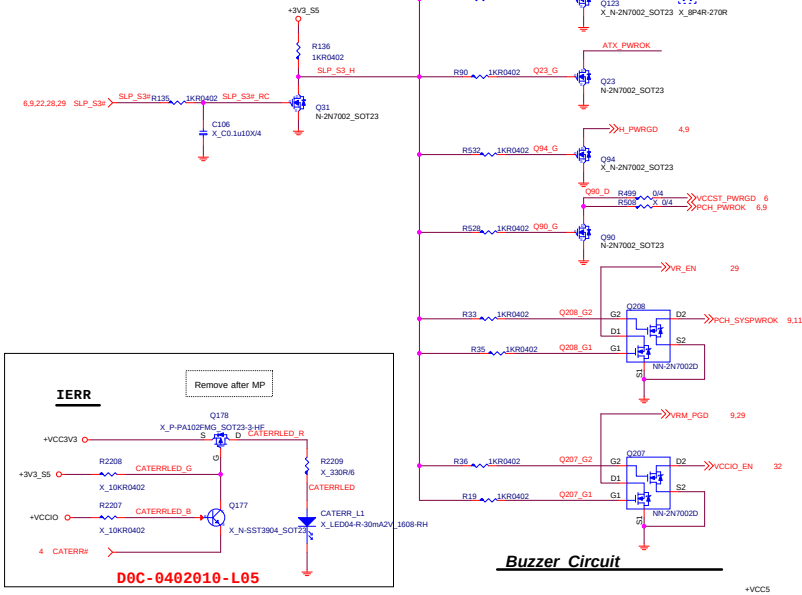


LENOVO Front Panel Connector

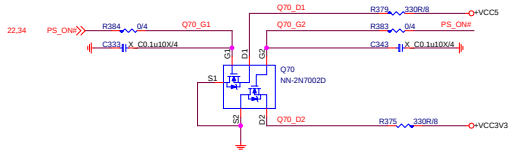


Dot LED

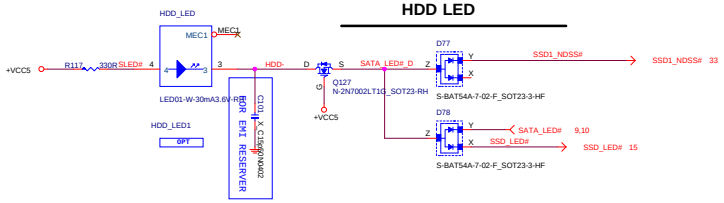




VCC3/VCC5 Discharge

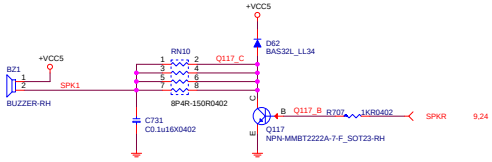


HDD LED

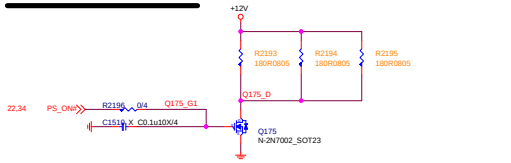


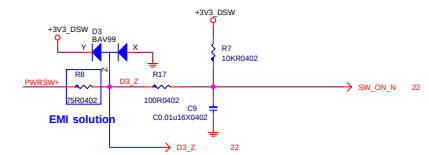
IERR

Buzzer Circuit

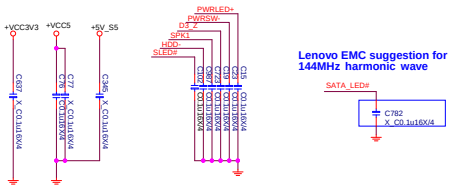


12V Discharge

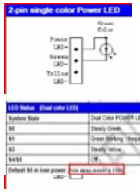




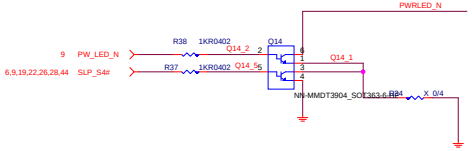
Cap For EMI



Lenovo EMC suggestion for 144MHz harmonic wave



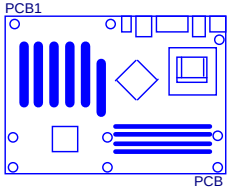
Power LED



MSI	MICRO-START INTL CO.,LTD.	
Title	ATX/F_Panel/EMI/LED	
Size	Document Number: Q470/H470	Rev: 1.1
Date: Wednesday, October 09, 2019	Sheet 35 of 44	

Manual Parts

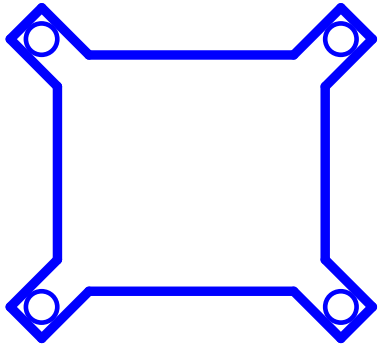
PCB1



PCB

PF0-07B6021-E48

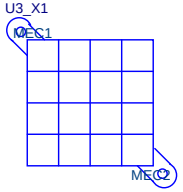
XU1_X2



X_CPU Backplate

U3_X1

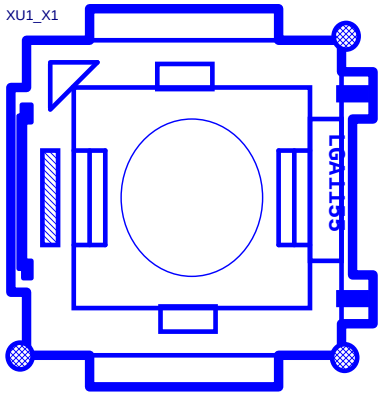
MEC1



MEC2

X_HS-0406830-RH

XU1_X1



CPU SOCKET

USB_LAN5

OPT

Q470LC

6KV

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

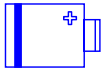
USB_LAN2

OPT

Q470LI

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

VBAT-S1



BAT-BCR2032P-RH

USB_LAN

OPT

LABEL1 OPT

HDMI_LABEL OPT

HDMI_LABEL1 OPT

WIN8KEY1 OPT

WIN8KEY2 OPT

AMI_KEY1 OPT

USB_LAN4

OPT

NEC Q470

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

USB_LAN6

OPT

without surge +USB2.0 X2 connector: N58-23F0131-F02

USB_LAN3

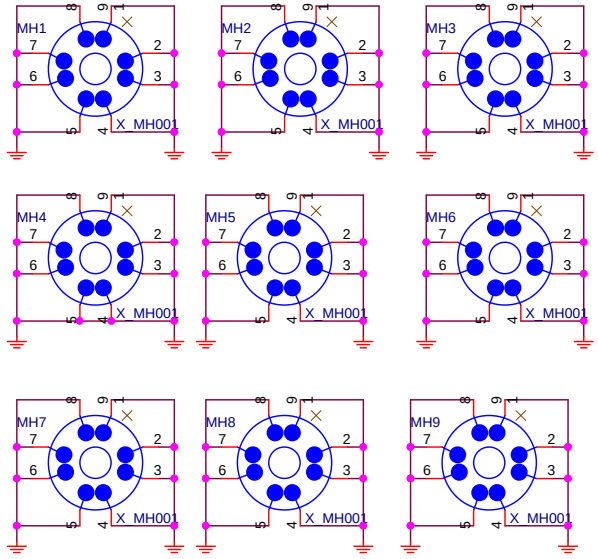
OPT

6KV

Cosumer B360
N58-21F0021-U30
N58-21F0031-S42
N58-21F0041-F02

with surge single LED +USB2.0 X2 connector: N58-21F0041-F02

MH1 MH2 MH3 MH4 MH5 MH6 MH7 MH8 MH9



For EMI For Moat CAP

+VCC5 — C125 C0.1u16X0402

+VCC3V3 — C647 X_C0.1u16X0402 — +1V05_PCH

+VCC3V3 — C644 X_C0.1u16X0402 — +1V05_PCH

+5V_S5 — C166 X_C0.1u16X0402

+12V — C698 X_C0.1u16X0402

Optics Orientation Holes

Optical Fiducial Marks-120

FM7 FM6 FM2 FM5 FM3 FM8 FM1 FM4

X_FM

PCH Chipset

H470

OPT

PCH_C246

OPT

+3V3_S5 — C46 X_C0.1u16X0402

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

Link to the Future

Title: Manual & Option Parts

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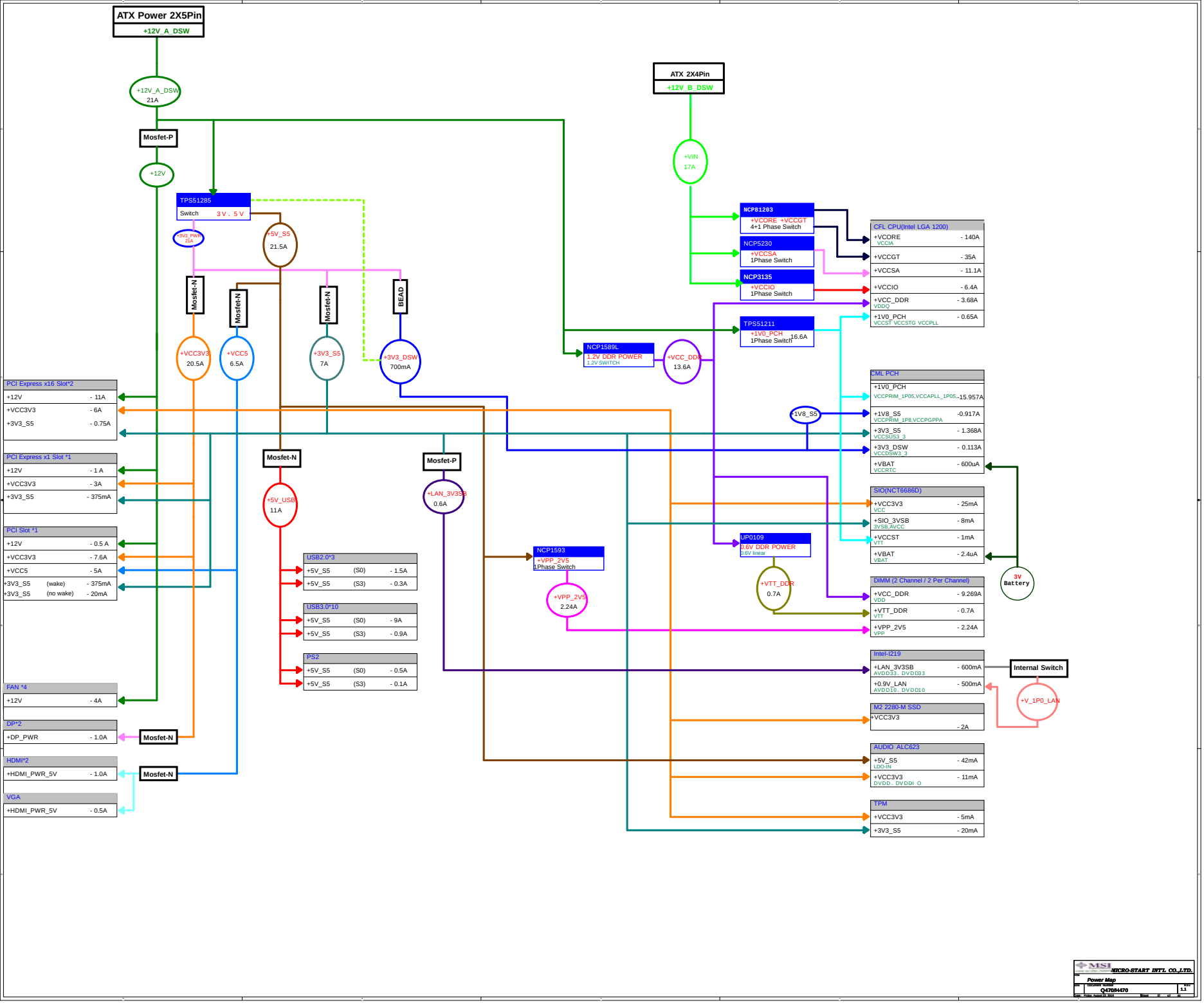
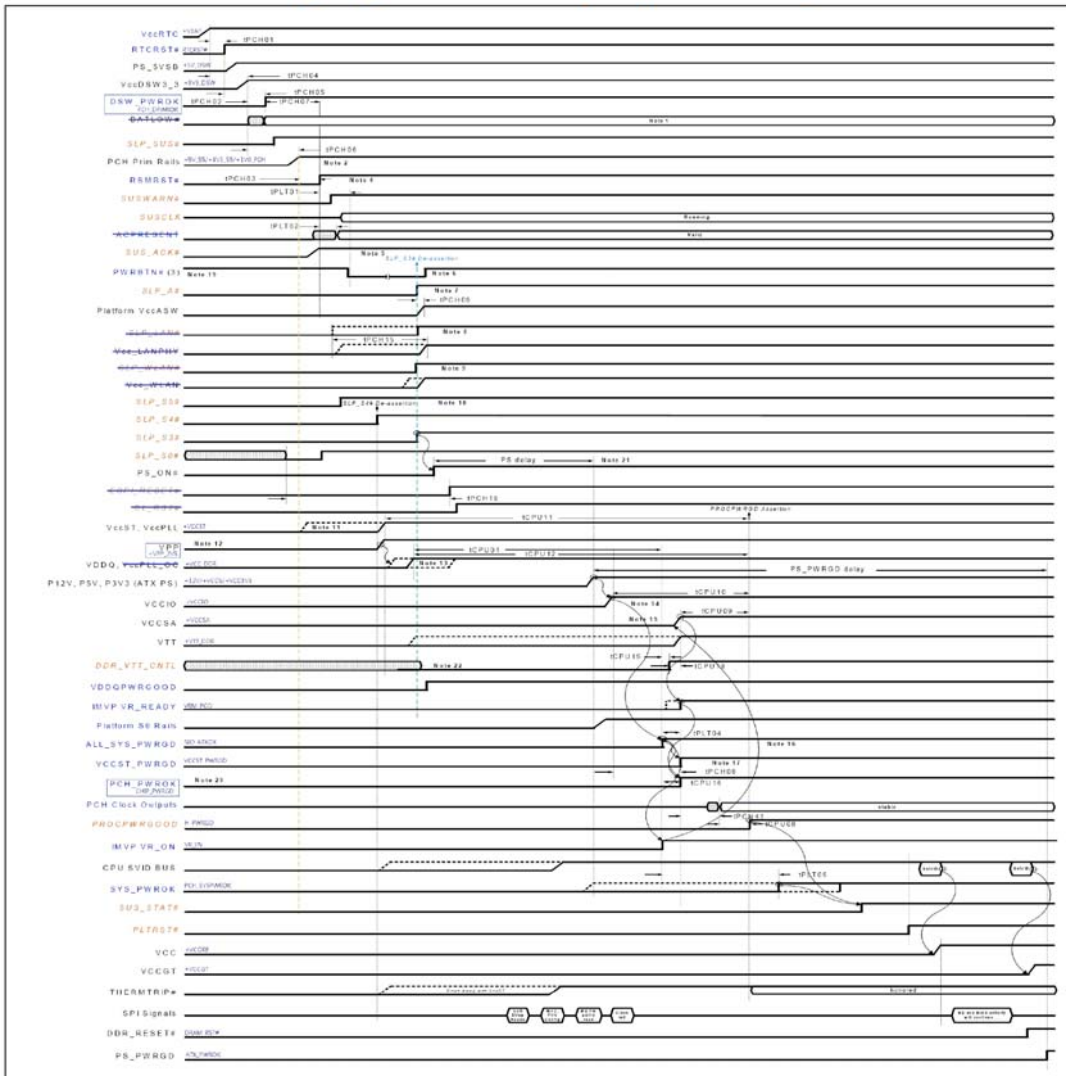

ATX Power 2X5Pin
+12V_A_DSW
+12V_A_DSW
21A
Mosfet-P
+12V
TPS51285
Switch 3 V 、5 V
+3V3_PWR
2A
+5V_S5
21.5A
Mosfet-N
Mosfet-N
Mosfet-N
BEAD
+VCC3V3
20.5A
+VCC5
6.5A
+3V3_S5
7A
+3V3_DSW
700mA
PCI Express x16 Slot*2
+12V - 11A
+VCC3V3 - 6A
+3V3_S5 - 0.75A
PCI Express x1 Slot *1
+12V - 1 A
+VCC3V3 - 3A
+3V3_S5 - 375mA
PCI Slot *1
+12V - 0.5 A
+VCC3V3 - 7.6A
+VCC5 - 5A
+3V3_S5 (wake) - 375mA
+3V3_S5 (no wake) - 20mA
FAN *4
+12V - 4A
DP*2
+DP_PWR - 1.0A
Mosfet-N
HDMI*2
+HDMI_PWR_5V - 1.0A
Mosfet-N
VGA
+HDMI_PWR_5V - 0.5A
Mosfet-N
+5V_USB
11A
USB2.0*3
+5V_S5 (S0) - 1.5A
+5V_S5 (S3) - 0.3A
USB3.0*10
+5V_S5 (S0) - 9A
+5V_S5 (S3) - 0.9A
PS2
+5V_S5 (S0) - 0.5A
+5V_S5 (S3) - 0.1A
Mosfet-P
+LAN_3V3SB
0.6A
NCP1593
+VPP_2V5
1Phase Switch
+VPP_2V5
2.24A
ATX 2X4Pin
+12V_B_DSW
+VIN
17A
NCP81203
+VCORE +VCCGT
4+1 Phase Switch
NCP5230
+VCCSA
1Phase Switch
NCP3135
+VCCIO
1Phase Switch
TPS51211
+1V0_PCH
1Phase Switch
16.6A
NCP1589L
1.2V DDR POWER
1.2V SWITCH
+VCC_DDR
13.6A
UP0109
0.6V DDR POWER
0.6V linear
+VTT_DDR
0.7A
CFL CPU(Intel LGA 1200)
+VCORE VCCIA - 140A
+VCCGT - 35A
+VCCSA - 11.1A
+VCCIO - 6.4A
+VCC_DDR VDDQ - 3.68A
+1V0_PCH VCCST VCCSTG VCCPLL - 0.65A
CML PCH
+1V0_PCH VCCPRIM_1P05,VCCAPLL_1P05 - 15.957A
+1V8_S5
+1V8_S5 VCCPRIM_1P8,VCCPGPPA - 0.917A
+3V3_S5 VCCSUS3_3 - 1.368A
+3V3_DSW VCCDSW3_3 - 0.113A
+VBAT VCCRTC - 600uA
3V Battery
SIO(NCT6686D)
+VCC3V3 VCC - 25mA
+SIO_3VSB 3VSB,AVCC - 8mA
+VCCST VTT - 1mA
+VBAT VBAT - 2.4uA
DIMM (2 Channel / 2 Per Channel)
+VCC_DDR VDD - 9.269A
+VTT_DDR VTT - 0.7A
+VPP_2V5 VPP - 2.24A
Intel-I219
+LAN_3V3SB AVDD33、DVDD33 - 600mA
+0.9V_LAN AVDD10、DVDD10 - 500mA
Internal Switch
+V_1P0_LAN
M2 2280-M SSD
+VCC3V3 - 2A
AUDIO ALC623
+5V_S5 LDO-IN - 42mA
+VCC3V3 DVDD、DVDDIO - 11mA
TPM
+VCC3V3 - 5mA
+3V3_S5 - 20mA
MSI MICRO-STAR INTL CO.,LTD.
Power Map
Q470IH470
1.1

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



with Deep Sx support

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#			

MSI MICRO-STAR INTL CO.,LTD.

Title: Power Sequence1

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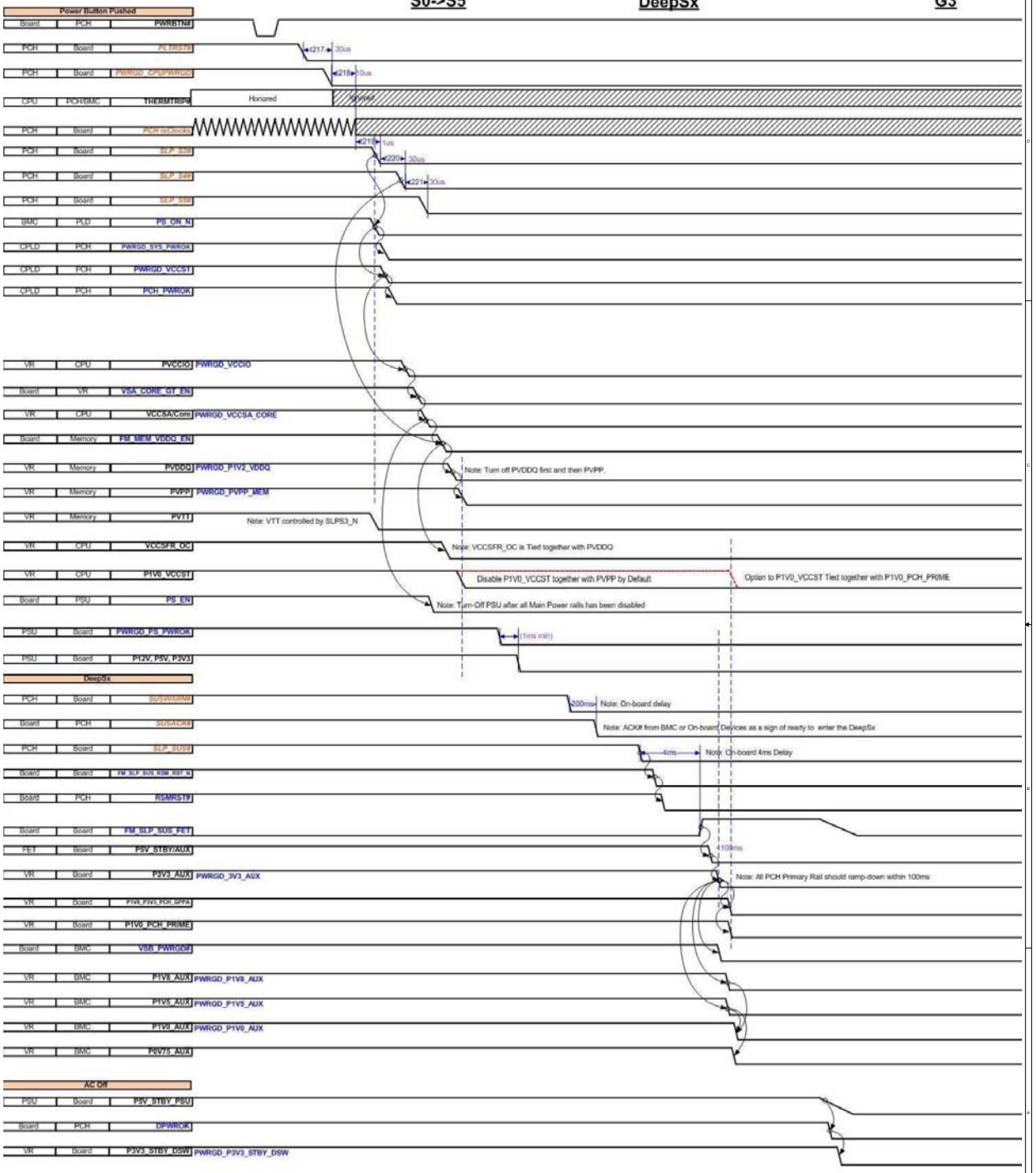

MSI MICRO-STAR INT'L CO.,LTD.

Title	Power Sequence2	
Size	Document Number Q470/H470	Rev 1.1
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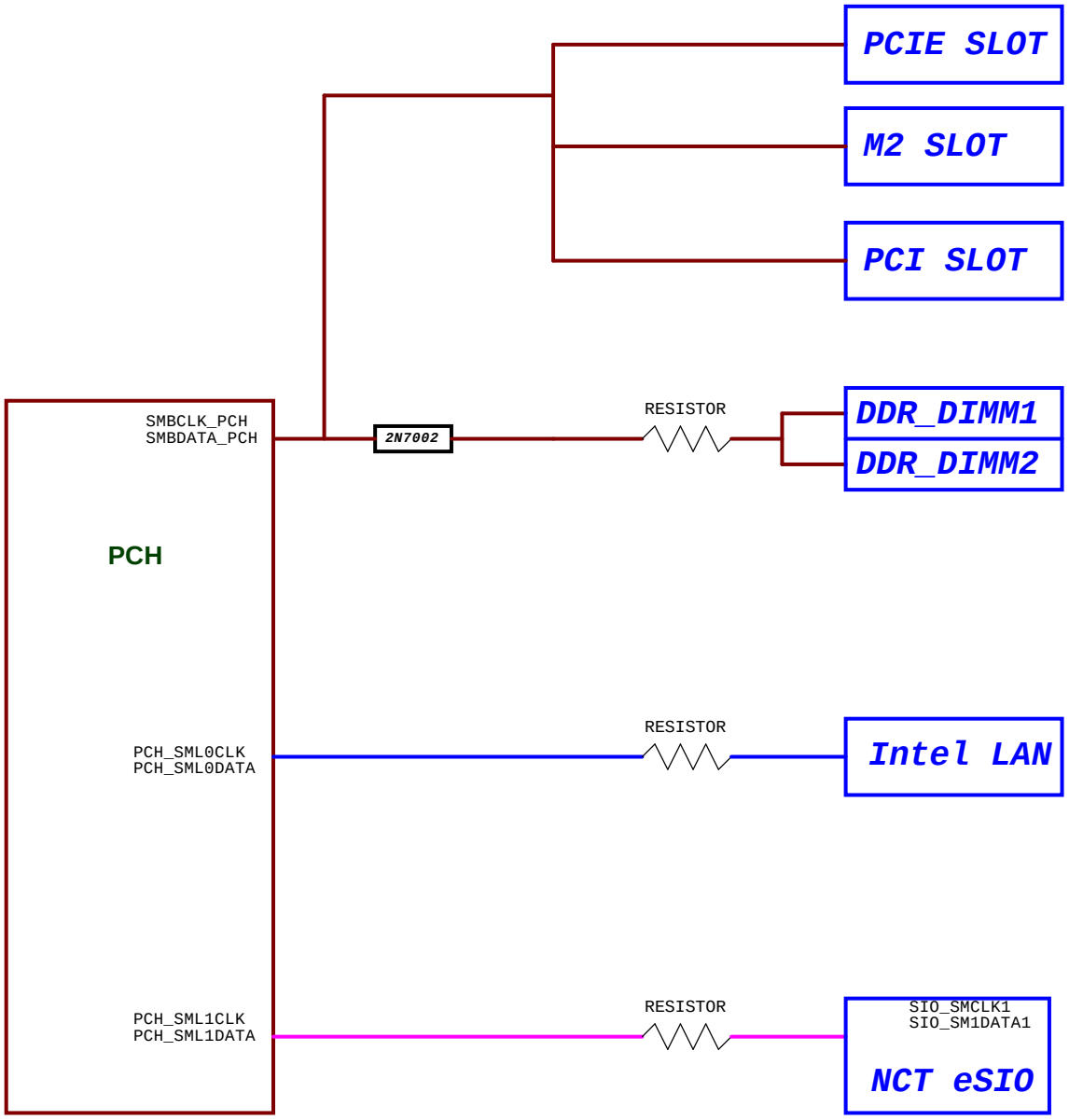

MSI Link to the Future MICRO-START INT'L CO.,LTD.

Title: SMBUS Block Diagram		
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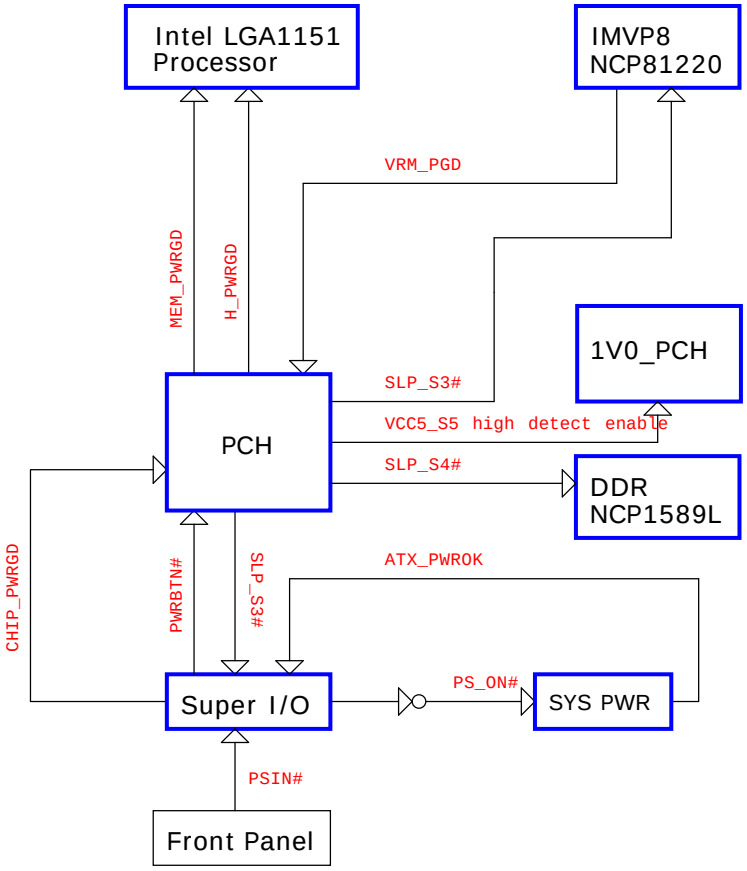
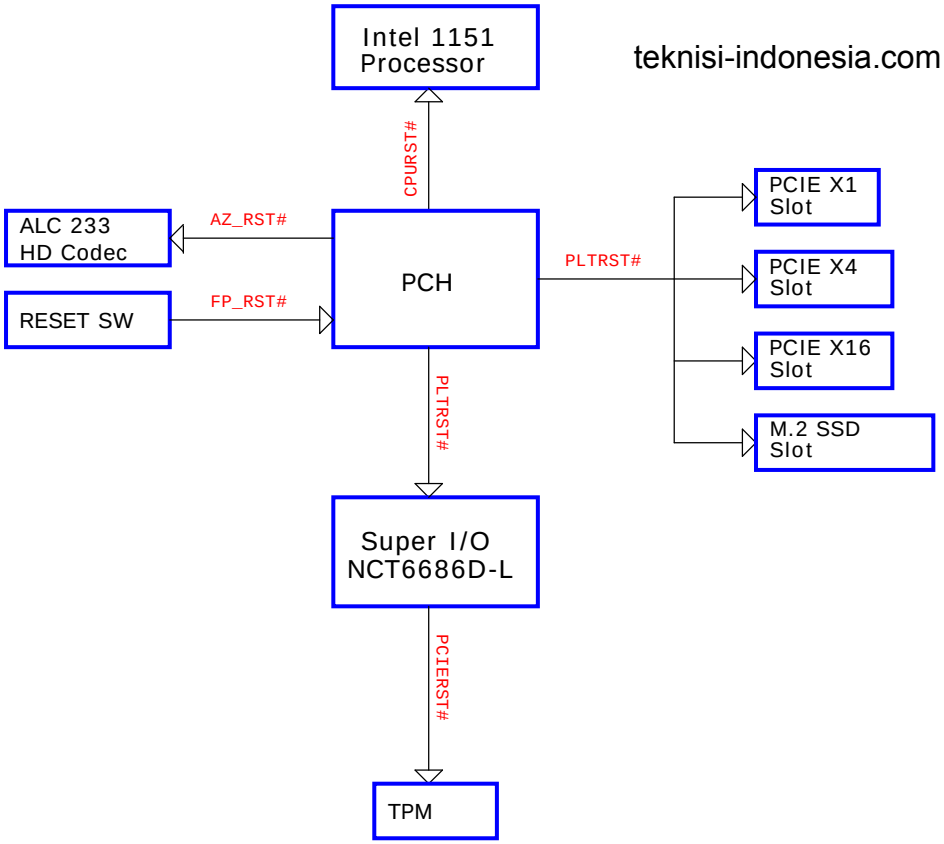
PWROK MAP



RESET MAP



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Title: Power & Reset Map		
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GPIO	Signal Name	Power Well	IN/OUT	Usage
GPP_A0	GPP_A0_RCIN_N_ESPI_ALERT1_N	SB3V	Native	KBRST#
GPP_A1	GPP_A1_LAD0_ESPI_IO0	SB3V	Native	LPC_AD0
GPP_A2	GPP_A2_LAD1_ESPI_IO1	SB3V	Native	LPC_AD1
GPP_A3	GPP_A3_LAD2_ESPI_IO2	SB3V	Native	LPC_AD2
GPP_A4	GPP_A4_LAD3_ESPI_IO3	SB3V	Native	LPC_AD3
GPP_A5	GPP_A5_LFRAME_N_ESPI_CS_N	SB3V	Native	LPC_FRAME#
GPP_A6	GPP_A6_SERIRQ	SB3V	Native	LPC_SERIRQ
GPP_A7	GPP_A7_PIRQA_N_ESPI_ALERT0_N	SB3V	Native	LPC_DRQ#0
GPP_A8	GPP_A8_CLKRUN_N	SB3V	Native	CLKRUN#
GPP_A9	GPP_A9_CLKOUT_LPC0_ESPI_CLK	SB3V	Native	LEO_CHIP_CLK
GPP_A10	GPP_A10_CLKOUT_LPC1	SB3V	Native	PCI_CLK_24M
GPP_A11	GPP_A11_PME_N	SB3V	Native	SIO_PME#
GPP_A12	GPP_A12_BM3USY_N	SB3V	Native	BM3USY#
GPP_A13	GPP_A13_SUSWARN_N_SUSPWRDNACK	SB3V	Native	PCH_SUSWARN#
GPP_A14	GPP_A14_SUS_STAT_N_ESPI_RST_N	SB3V	Native	SUS_STAT#
GPP_A15	GPP_A15_SUSACK_N	SB3V	Native	PCH_SUSACK#
GPP_A16	GPP_A16_CLKOUT_48	SB3V	Native	N.C
GPP_A17	GPP_A17_ISH_GP7	SB3V	OUT	BT_DISABLE_N
GPP_A18	GPP_A18_ISH_GP0	SB3V	IN	OE#
GPP_A19	GPP_A19_ISH_GP1	SB3V	Native	N.C
GPP_A20	GPP_A20_ISH_GP2	SB3V	OUT	SEL#
GPP_A21	GPP_A21_ISH_GP3	SB3V	IN	WLAN_DETECT_N
GPP_A22	GPP_A22_ISH_GP4	SB3V	IN	COM_GPIO1
GPP_A23	GPP_A23_ISH_GP5	SB3V	IN	LEO_CHIP_GPIO
GPP_B0	GPP_B0	SB3V	Native	N.C
GPP_B1	GPP_B1	SB3V	Native	N.C
GPP_B2	GPP_B2_VRALERT_N	SB3V	Native	PCH_VRALERT#
GPP_B3	GPP_B3_CPU_GP2	SB3V	Native	N.C
GPP_B4	GPP_B4_CPU_GP3	SB3V	Native	N.C
GPP_B5	GPP_B5_SRCCLKREQ0_N	SB3V	IN	PCIEX16_PRSNT2_R2_N
GPP_B6	GPP_B6_SRCCLKREQ1_N	SB3V	Native	PCIECLKREQ1#
GPP_B7	GPP_B7_SRCCLKREQ2_N	SB3V	IN	PCIEX4_SLOT3_PRSNT2_R_N
GPP_B8	GPP_B8_SRCCLKREQ3_N	SB3V	IN	CLK_REQ1_M.2_WLAN_N
GPP_B9	GPP_B9_SRCCLKREQ4_N	SB3V	Native	CLK_REQ1_M.2_SSD#
GPP_B10	GPP_B10_SRCCLKREQ5_N	SB3V	Native	N.C
GPP_B11	GPP_B11	SB3V	Native	N.C
GPP_B12	GPP_B12_SLP_S0_N	SB3V	Native	SLP_S0#
GPP_B13	GPP_B13_PLTRST_N	SB3V	Native	PLTRST#
GPP_B14	GPP_B14_SPKR	SB3V	Native	SPKR
GPP_B15	GPP_B15_GSPI0_CS_N	SB3V	Native	N.C
GPP_B16	GPP_B16_GSPI0_CLK	SB3V	Native	N.C
GPP_B17	GPP_B17_GSPI0_MISO	SB3V	Native	N.C
GPP_B18	GPP_B18_GSPI0_MOSI	SB3V	Native	REBOOT_STRAP
GPP_B19	GPP_B19_GSPI1_CS_N	SB3V	Native	N.C
GPP_B20	GPP_B20_GSPI1_CLK	SB3V	IN	SMI#
GPP_B21	GPP_B21_GSPI1_MISO	SB3V	Native	N.C
GPP_B22	GPP_B22_GSPI1_MOSI	SB3V	IN	BBS_STRAP
GPP_B23	GPP_B23_SML1ALERT_N_PCHHOT_N	SB3V	IN	SMLINK1_ALERT_N
GPP_C0	GPP_C0_SMBCLK	SB3V	Native	SMBCLK_R
GPP_C1	GPP_C1_SMBDATA	SB3V	Native	SMBDATA_R
GPP_C2	GPP_C2_SMBALERT_N	SB3V	Native	TLS_STRAP
GPP_C3	GPP_C3_SML0CLK	SB3V	Native	SML0_CLK
GPP_C4	GPP_C4_SML0DATA	SB3V	Native	SML0_DATA
GPP_C5	GPP_C5_SML0ALERT_N	SB3V	Native	ESPI_STRAP
GPP_C6	GPP_C6_SML1CLK	SB3V	Native	SML1_CLK
GPP_C7	GPP_C7_SML1DATA	SB3V	Native	SML1_DATA
GPP_C8	GPP_C8_UART0_RXD	SB3V	IN	CLR_CMOS
GPP_C9	GPP_C9_UART0_TXD	SB3V	Native	N.C
GPP_C10	GPP_C10_UART0_RTS	SB3V	Native	IBUTTON
GPP_C11	GPP_C11_UART0_CTS_N	SB3V	Native	N.C
GPP_C12	GPP_C12_UART1_RXD_ISH_UART1_RXD	SB3V	IN	PCH_GPIO22
GPP_C13	GPP_C13_UART1_TXD_ISH_UART1_TXD	SB3V	IN	PCH_GPIO23
GPP_C14	GPP_C14_UART1_RTS_N_ISH_UART1_RTS_	SB3V	IN	PCH_GPIO21
GPP_C15	GPP_C15_UART1_CTS_N_ISH_UART1_CTS_	SB3V	OUT	WLAN_DISABLE_N
GPP_C16	GPP_C16_I2C0_SDA	SB3V	Native	N.C
GPP_C17	GPP_C17_I2C0_SCL	SB3V	Native	N.C
GPP_C18	GPP_C18_I2C1_SDA	SB3V	Native	N.C
GPP_C19	GPP_C19_I2C1_SCL	SB3V	Native	N.C
GPP_C20	GPP_C20_UART2_RXD	SB3V	Native	N.C
GPP_C21	GPP_C21_UART2_TXD	SB3V	Native	N.C
GPP_C22	GPP_C22_UART2_RTS_N	SB3V	Native	N.C
GPP_C23	GPP_C23_UART2_CTS_N	SB3V	Native	N.C

GPIO	Signal Name	Power Well	IN/OUT	Usage
GPP_D0	GPP_D0_SPI1_CS_N	SB3V	Native	N.C
GPP_D1	GPP_D1_SPI1_CLK	SB3V	OUT	PW_LED_N
GPP_D2	GPP_D2_SPI1_MISO	SB3V	IN	PD_PCH_GPP_D_2
GPP_D3	GPP_D3__SPI1_MOSI	SB3V	IN	PD_PCH_GPP_D_3
GPP_D4	GPP_D4_ISH_I2C2_SDA	SB3V	OUT	SUS_LED_N
GPP_D5	GPP_D5_SSP0_SFRM	SB3V	Native	N.C
GPP_D6	GPP_D6_SSP0_TXD	SB3V	Native	N.C
GPP_D7	GPP_D7_SSP0_RXD	SB3V	Native	N.C
GPP_D8	GPP_D8_SSP0_SCLK	SB3V	Native	N.C
GPP_D9	GPP_D9_ISH_SPI_CS_N	SB3V	Native	N.C
GPP_D10	GPP_D10_ISH_SPI_CLK	SB3V	Native	N.C
GPP_D11	GPP_D11_ISH_SPI_MISO	SB3V	IN	FUSB_G1
GPP_D12	GPP_D12_ISH_SPI_MOSI	SB3V	IN	FUSB_G2
GPP_D13	GPP_D13_ISH_UART0_RXD	SB3V	IN	FUSB_G3
GPP_D14	GPP_D14_ISH_UART0_TXD	SB3V	IN	PS2_PINHEADER_N
GPP_D15	GPP_D15_ISH_UART0_RTS_N	SB3V	IN	LPT_DET#
GPP_D16	GPP_D16_ISH_UART0_CTS_N	SB3V	Native	N.C
GPP_D17	GPP_D17_DMIC_CLK1	SB3V	Native	COM_WAKE#
GPP_D18	GPP_D18_DMIC_DATA1	SB3V	IN	PCH_GPIO_D18
GPP_D19	GPP_D19_DMIC_CLK0	SB3V	Native	N.C
GPP_D20	GPP_D20_DMIC_DATA0	SB3V	Native	N.C
GPP_D21	GPP_D21_SPI1_IO2	SB3V	Native	N.C
GPP_D22	GPP_D22_SPI1_IO3	SB3V	Native	N.C
GPP_D23	GPP_D23_ISH_I2C2_SCL	SB3V	Native	N.C
GPP_E0	GPP_E0_SATAXPCIE0_SATAGP	SB3V	Native	N.C
GPP_E1	GPP_E1_SATAXPCIE1_SATAGP1	SB3V	Native	N.C
GPP_E2	GPP_E2_SATAXPCIE2_SATAGP2	SB3V	Native	N.C
GPP_E3	GPP_E3_CPU_GP0	SB3V	Native	BMC_PCH_SCI_N
GPP_E4	GPP_E4_DEVSLP0	SB3V	Native	BMC_FORCE_SMI_N
GPP_E5	GPP_E5_DEVSLP1	SB3V	Native	N.C
GPP_E6	GPP_E6_DEVSLP2	SB3V	Native	N.C
GPP_E7	GPP_E7_CPU_GP1	SB3V	Native	N.C
GPP_E8	GPP_E8_SATALED_N	SB3V	OUT	SATA_LED#
GPP_E9	GPP_E9_USB2_OC0_N	SB3V	Native	USB_OCP#0
GPP_E10	GPP_E10_USB2_OC1_N	SB3V	Native	USB_OCP#1
GPP_E11	GPP_E11_USB2_OC2_N	SB3V	Native	USB_OCP#2
GPP_E12	GPP_E12_USB2_OC3_N	SB3V	Native	USB_OCP#3
GPP_F0	GPP_F17_USB2_OCB_8	SB3V	Native	PCH_GPIO_F1
GPP_F1	GPP_F1_SATAXPCIE4_SATAGP4	SB3V	IN	M.2_SSD1_PEDET#
GPP_F2	GPP_F2_SATAXPCIE5_SATAGP5	SB3V	Native	PCH_GPIO_F2
GPP_F3	GPP_F3_SATAXPCIE6_SATAGP6	SB3V	Native	N.C
GPP_F4	GPP_F4_SATAXPCIE7_SATAGP7	SB3V	Native	TP20
GPP_F5	GPP_F5_DEVSLP3	SB3V	IN	SPI_SIRQ#
GPP_F6	GPP_F6_DEVSLP4	SB3V	Native	PCH_GPIO_F6
GPP_F7	GPP_F7_DEVSLP5	SB3V	Native	SSD1_SATA_DEVSLP
GPP_F8	GPP_F8_DEVSLP6	SB3V	Native	N.C
GPP_F9	GPP_F9_DEVSLP7	SB3V	Native	USB_DISABLE#
GPP_F10	GPP_F10_SCLOCK	SB3V	OUT	N.C
GPP_F11	GPP_F11_SLOAD	SB3V	OUT	N.C
GPP_F12	GPP_F12_SDATAOUT1	SB3V	OUT	N.C
GPP_F13	GPP_F13_SDATAOUT0	SB3V	OUT	N.C
GPP_F14	GPP_F14	SB3V	IN	SKTOCC#
GPP_F15	GPP_F15_USB2_OCB_4	SB3V	Native	USB_OCP#4
GPP_F16	GPP_F16_USB2_OCB_5	SB3V	Native	USB_OCP#5
GPP_F17	GPP_F17_USB2_OCB_6	SB3V	Native	USB_OCP#6
GPP_F18	GPP_F18_USB2_OCB_7	SB3V	Native	USB_OCP#7
GPP_F19	GPP_F19_EDP_VDDEN	SB3V	Native	N.C
GPP_F20	GPP_F20_EDP_BKLTEN	SB3V	Native	N.C
GPP_F21	GPP_F21_EDP_BKLTCTL	SB3V	Native	N.C
GPP_F22	GPP_F22	SB3V	OUT	PCH_GPIO_F22
GPP_F23	GPP_F23	SB3V	Native	N.C
GPD0	GPD0_BATLOW_N	SB3V_DSW	Native	PCH_BATLOW#
GPD1	GPD1_ACPRESENT	SB3V_DSW	OUT	SUS_LED_N
GPD2	GPD2_LAN_WAKE_N	SB3V_DSW	Native	LAN_WAKE#_C
GPD3	GPD3_PWRBTN_N	SB3V_DSW	Native	PWRBTN#
GPD4	GPD4_SLP_S3_N	SB3V_DSW	Native	SLP_S3#
GPD5	GPD5_SLP_S4_N	SB3V_DSW	Native	SLP_S4#
GPD6	GPD5_SLP_A_	SB3V_DSW	Native	PCH_SLP_A#
GPD7	GPD7_USB2_WAKEOUT_N	SB3V_DSW	Native	N.C
GPD8	GPD8_SUSCL	SB3V_DSW	Native	SUSCLK
GPD9	GPD9_SLP_WLAN_N	SB3V_DSW	Native	N.C
GPD10	GPD10_SLP_S5_N	SB3V_DSW	Native	SLP_S5#
GPD11	GPD11_LANPHYPC	SB3V_DSW	Native	LAN_DISABLE#

GPIO	Signal Name	Power Well	IN/OUT	Usage
GPP_G0	GPP_G0_FAN_TACH_0	SB3V	IN	CHASSIS_ID1
GPP_G1	GPP_G1_FAN_TACH_1	SB3V	IN	CHASSIS_ID2
GPP_G2	GPP_G2_FAN_TACH_2	SB3V	IN	H_PROCHOT_PCH_N
GPP_G3	GPP_G3_FAN_TACH_3	SB3V	Native	PCH_BMC_FOURCE_INT_N
GPP_G4	GPP_G4_FAN_TACH_4	SB3V	Native	N.C
GPP_G5	GPP_G5_FAN_TACH_5	SB3V	Native	N.C
GPP_G6	GPP_G6_FAN_TACH_6	SB3V	Native	N.C
GPP_G7	GPP_G7_FAN_TACH_7	SB3V	Native	N.C
GPP_G8	GPP_G8_FAN_PWM_0	SB3V	Native	N.C
GPP_G9	GPP_G9_FAN_PWM_1	SB3V	Native	N.C
GPP_G10	GPP_G10_FAN_PWM_2	SB3V	Native	N.C
GPP_G11	GPP_G11_FAN_PWM_3	SB3V	IN	BMC_THROTTLE_N
GPP_G12	GPP_G12_GSXDOUT	SB3V	IN	GPP_G0
GPP_G13	GPP_G13_GSXSLOAD	SB3V	IN	GPP_G1
GPP_G14	GPP_G14_GSXDIN	SB3V	IN	GPP_G2
GPP_G15	GPP_G15_GSXSRESET_N	SB3V	IN	GPP_G3
GPP_G16	GPP_G16_GSXCLK	SB3V	IN	GPP_G4
GPP_G17	GPP_G17_ADR_COMPLETE	SB3V	IN	GPP_G5
GPP_G18	GPP_G18_NMI_N	SB3V	Native	FM_NMI_EVENT_N
GPP_G19	GPP_G19_SMI_N	SB3V	IN	SIO_SCI_N
GPP_G20	GPP_G20	SB3V	Native	BMC_READY
GPP_G21	GPP_G21	SB3V	IN	PCH_GPIO20
GPP_G22	GPP_G22	SB3V	Native	BMC_CARD_DET_R_N
GPP_G23	GPP_G23	SB3V	OUT	VGA_URDBG
GPP_H0	GPP_H0_SRCCLKREQ6_N	SB3V	Native	FM_MEM_THERM_EVENT_LVT3_N
GPP_H1	GPP_H1_SRCCLKREQ7_N	SB3V	Native	FM_NM_THROTTLE_N
GPP_H2	GPP_H2_SRCCLKREQ8_N	SB3V	OUT	FM_CATERR_N
GPP_H3	GPP_H3_SRCCLKREQ9_N	SB3V	Native	PCH_BMC_ALERT
GPP_H4	GPP_H4_SRCCLKREQ10_N	SB3V	Native	N.C
GPP_H5	GPP_H5_SRCCLKREQ11_N	SB3V	Native	N.C
GPP_H6	GPP_H6_SRCCLKREQ12_N	SB3V	Native	N.C
GPP_H7	GPP_H7_SRCCLKREQ13_N	SB3V	Native	N.C
GPP_H8	GPP_H8_SRCCLKREQ14_N	SB3V	Native	N.C
GPP_H9	GPP_H9_SRCCLKREQ15_N	SB3V	Native	N.C
GPP_H10	GPP_H10_SML2CLK	SB3V	OUT	WIRELESS_EN2
GPP_H11	GPP_H11_SML2DATA	SB3V	OUT	WIRELESS_EN
GPP_H12	GPP_H12_SML2ALERT_N	SB3V	Native	FM_ESPI_FLASH_MODE
GPP_H13	GPP_H13_SML3CLK	SB3V	Native	N.C
GPP_H14	GPP_H14_SML3DATA	SB3V	Native	N.C
GPP_H15	GPP_H15_SML3ALERT_N	SB3V	Native	PCH_GPP_H15
GPP_H16	GPP_H16_SML4CLK	SB3V	Native	N.C
GPP_H17	GPP_H17_SML4DATA	SB3V	Native	N.C
GPP_H18	GPP_H18_SML4ALERT_N	SB3V	Native	PCH_GPP_H18
GPP_H19	GPP_H19_ISH_I2C0_SDA	SB3V	Native	N.C
GPP_H20	GPP_H20_ISH_I2C0_SCL	SB3V	Native	N.C
GPP_H21	GPP_H21_ISH_I2C1_SDA	SB3V	Native	N.C
GPP_H22	GPP_H22_ISH_I2C1_SCL	SB3V	Native	N.C
GPP_H23	GPP_H23	SB3V	Native	N.C
GPP_I0	GPP_I0_DDPB_HPD0	SB3V	IN	VGA_DDI3_HPD
GPP_I1	GPP_I1_DDPC_HPD1	SB3V	IN	DP_DDPC_HPD
GPP_I2	GPP_I2_DDPD_HPD2	SB3V	IN	DP_DDPD_HPD
GPP_I3	GPP_I3_DDPE_HPD3	SB3V	IN	U2_BA4
GPP_I4	GPP_I4_EDP_HPD	SB3V	IN	U3_BD7
GPP_I5	GPP_I5_DDPB_CTRLCLK	SB3V	Native	TP30
GPP_I6	GPP_I6_DDPB_CTRLDATA	SB3V	Native	DDPD_CTRLDATA
GPP_I7	GPP_I7_DDPC_CTRLCLK	SB3V	Native	DP_DDPC_CTRLCLK
GPP_I8	GPP_I8_DDPC_CTRLDATA	SB3V	Native	DP_DDPC_CTRLDATA
GPP_I9	GPP_I9_DDPD_CTRLCLK	SB3V	Native	DP_DDPD_CTRLCLK
GPP_I10	GPP_I10_DDPD_CTRLDATA	SB3V	Native	DP_DDPD_CTRLDATA

SIO GPIO (NCT6685D)

GPIO	Signal Name	PIN	ower We	In/Out	Usage
GPIO00	PWMOUT/TACHIN/GPIO00	3	SB3V	IN	FM_CATERR_N
GPIO95	GPIO95/8KFD_OUT	74	SB3V	OUT	ME_CNTL
GPIO85	SMI#/OVT#/GPIO85	2	SB3V	----	SIO_SCI_N
GPIO74	GPIO74 / TACHIN / PWMOUT	37	SB3V	OD	BMC_THROTTLE_N
GPIO77	SKTOCC# / GPIO77	102	SB3V	IN	IS1XXM_BOARDID
GPIO66	P_55_0 / 3V5BSW / LATCH_8KFD_CUT / GP	70	SB3V	OUT	USB_PS2_PON
GPIO93	3V5BSW#/GPIO93/SLP_SUS#	89	5V_DSW	OUT	SIO_GP93
GPIO94	GPIO94/SLP_SUS_FET	88	5V_DSW	IN	COM_WAKE#

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Title: GPIO Table

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Title: *History*		
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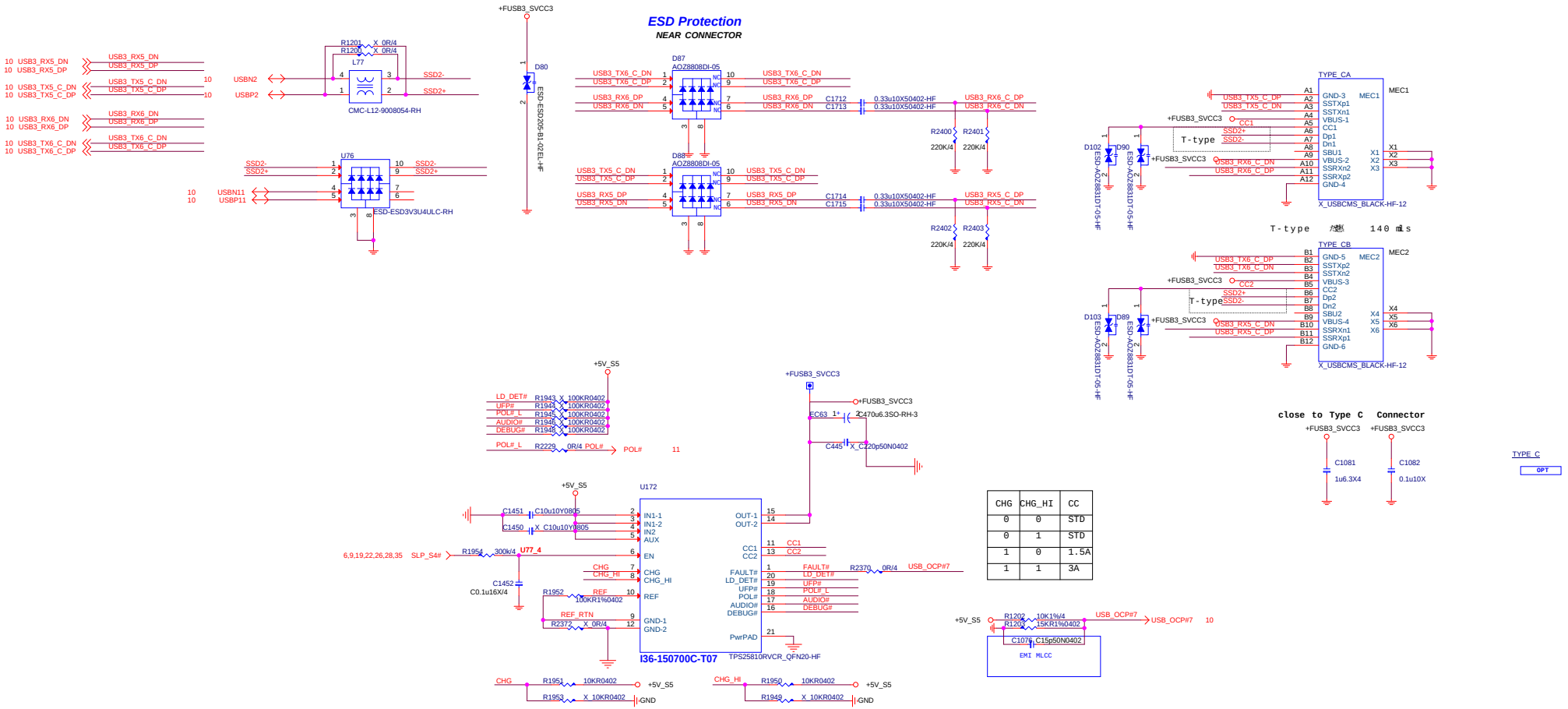

CHG	CHG_HI	CC
0	0	STD
0	1	STD
1	0	1.5A
1	1	3A

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

Title: History

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