MS-G019 Ver: 10 mini-ITX : 192 * 180 mm

SOC:

Intel - Braswell M/D

OnBoard Chipset:

AUDIO:REALTEK/ALC662-VD0

LAN:REALTEK/RTL8111G-CG

SIO:NUVOTON/NCT6793D

Flash ROM: 64Mb SPI (SOC)

Main Memory:

DDRIIIL SO-DIMM(1066/1333MHz) * 2 (Dual Channel)

Expansion Slots:

PCI Express (X16) Slot*1
Mini-PCIE connector*1

PWM:

VCCP:ON Semiconductor/NCP81201MNTXG
VGG:ON Semiconductor/NCP81201MNTXG
VNN:TI/TPS51211DSCR
DDR:TI/TPS51216RUKR
STSTEM:TI/TPS51225CRUKR

Other:

SATA2.0 x2
USB2.0 RearX4 Front X2
USB3.0 RearX4
DP to D-SUB*1/HDMI*1
LPT Header *1
Rear COMPORT *1
Front COMPORT *1

Model type	Function Options	BOM Config	ERP BOM No.	BOM Opt.
	Mini-ITX Intel Braswell N3700 QS,2DDR3L SO-DIMM, PCI_E*16*1,Mini-PCI_E*1,ALC662-VD, Lan RTL8111G-CG, SATA3.0*2, HDMI*1,D_Sub*1	CFG-G019-010	601-G019-	
	Mini-ITX Intel Braswell N3150 QS,2DDR3L SO-DIMM, PCI_E*16*1,Mini-PCI_E*1,ALC662-VD, Lan RTL8111G-CG, SATA3.0*2, HDMI*1,D_Sub*1	CFG-G019-020	601-G019-	A

MICRO-STAR INT'L CO.,LTD.

Title: MS-G019

Size | Document Number: Cover Sheet | Rev: 10

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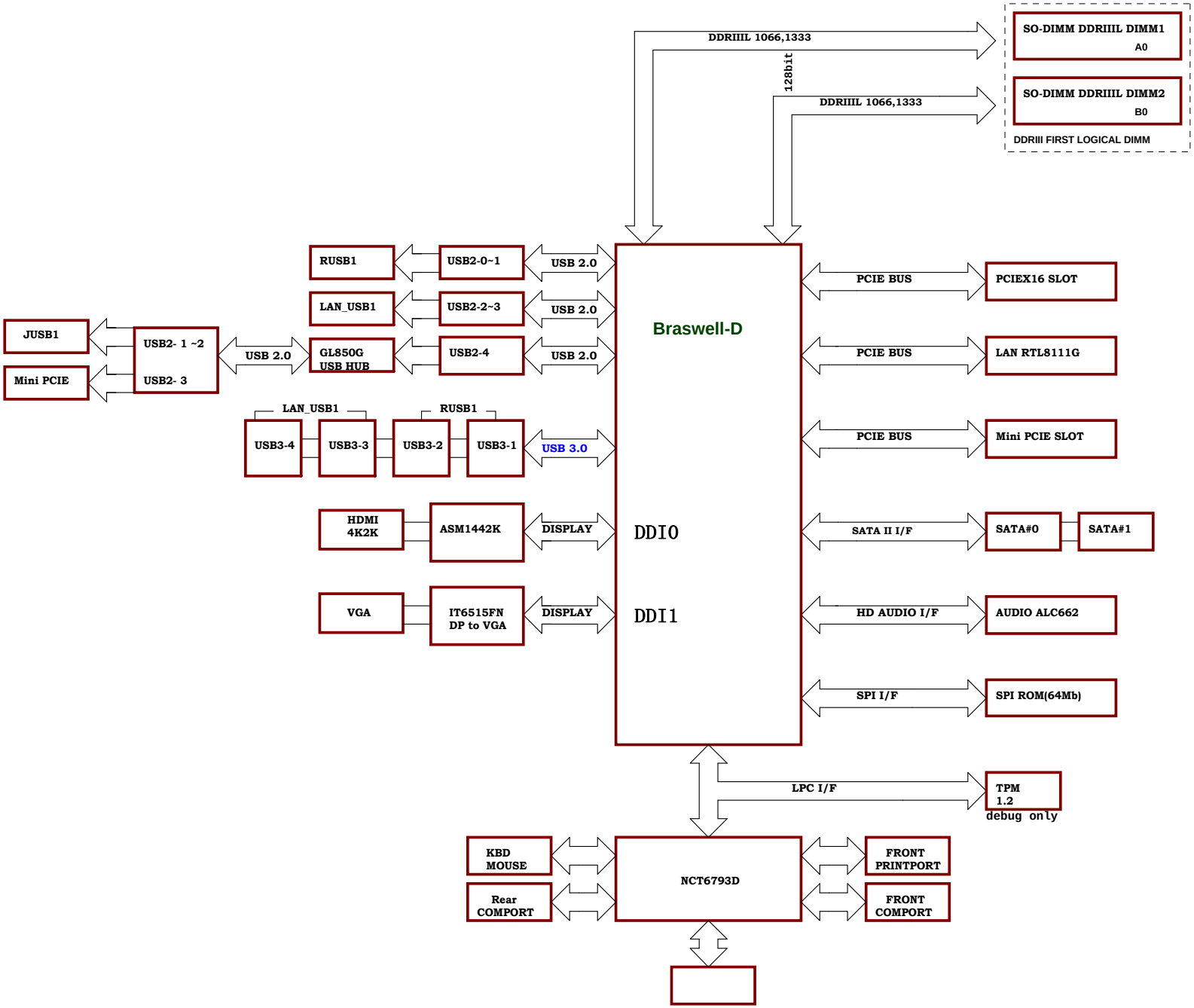

MICRO-STAR INT'L CO.,LTD.		
Title: MS-G019		
Size	Document Number: Block Diagram	Rev: 10
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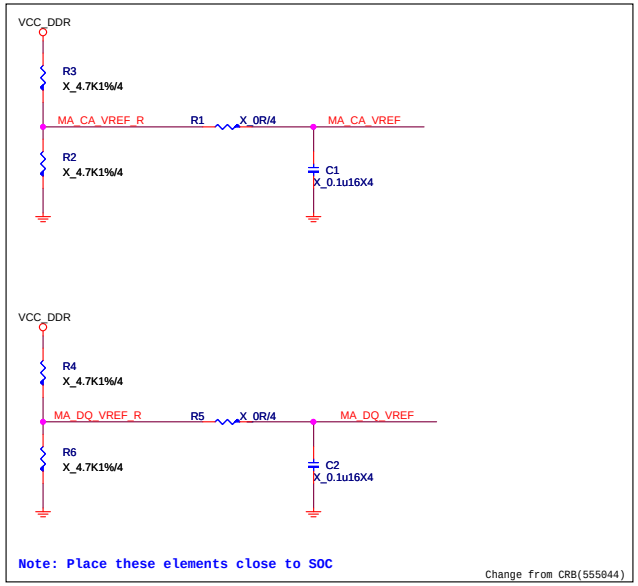

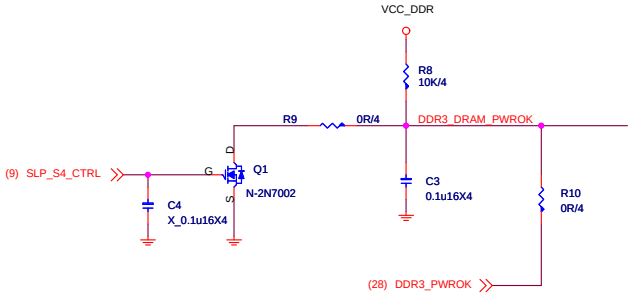

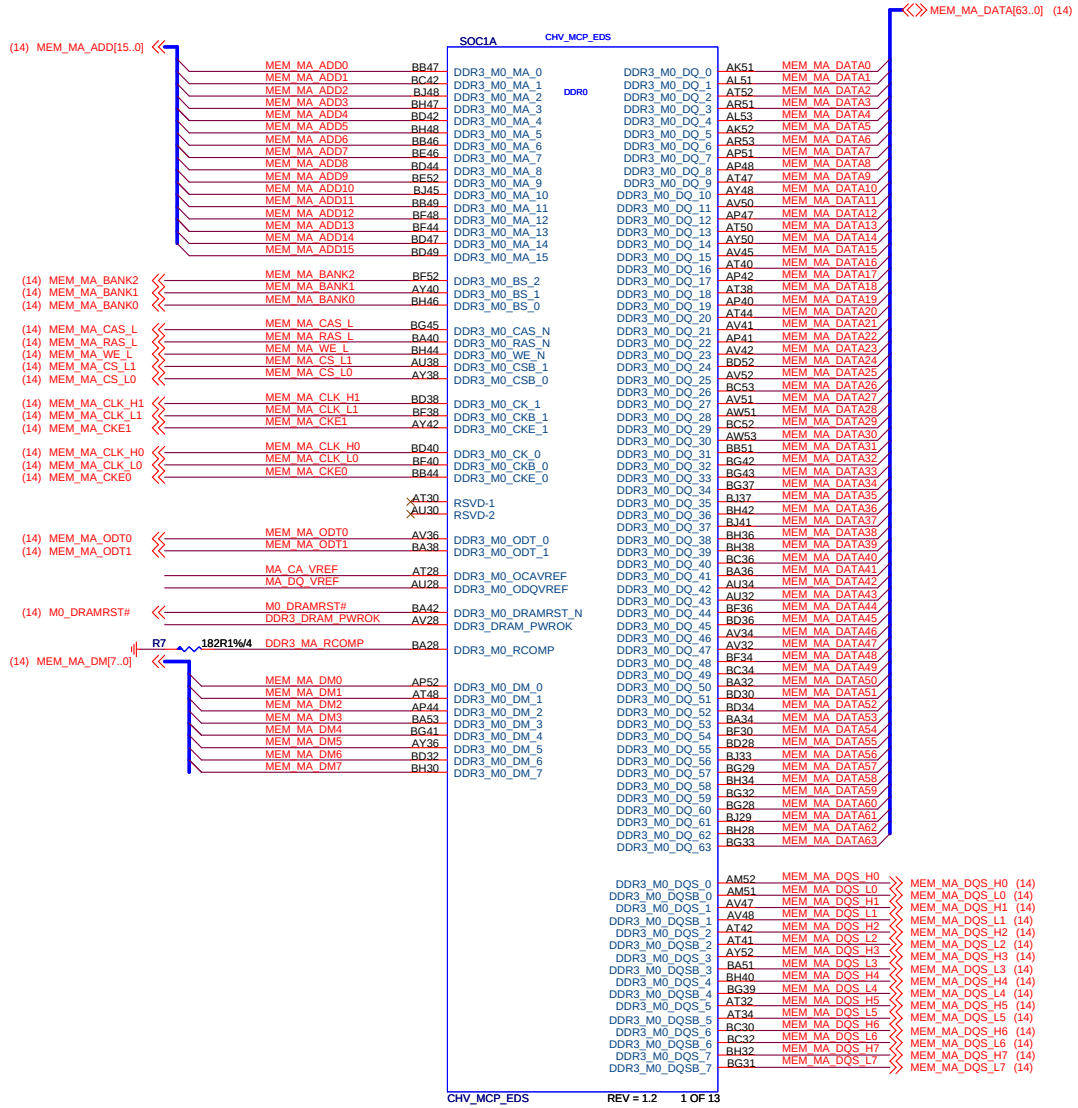

MICRO-STAR INT'L CO.,LTD.

Title: MS-G019

Size | Document Number: SOC-1 DDR Channel A | Rev: 10

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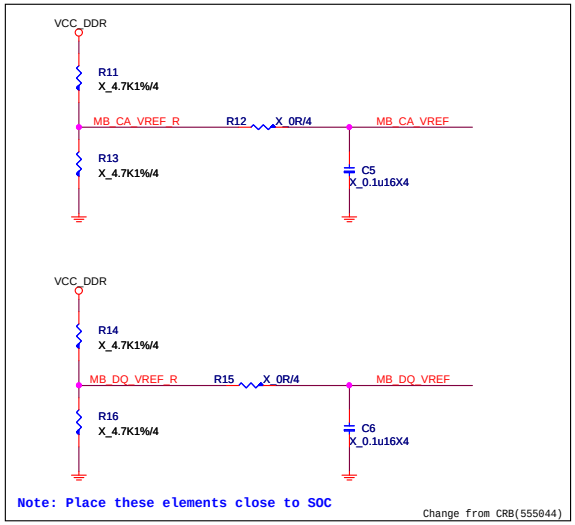

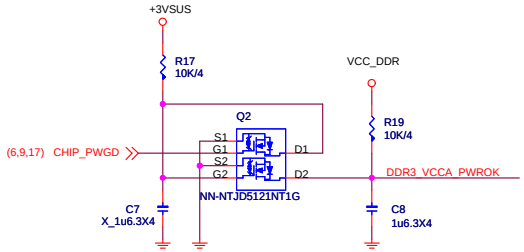

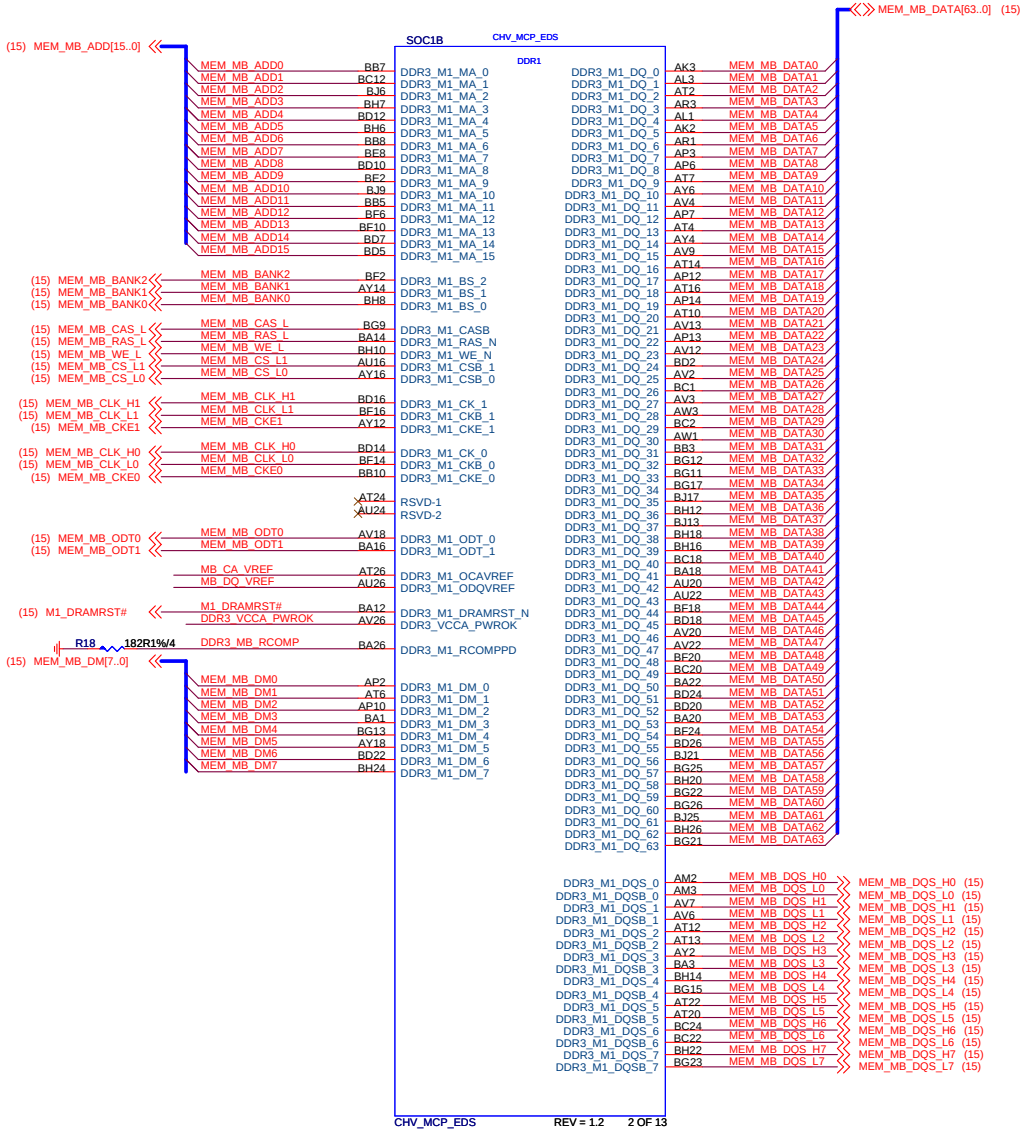

MICRO-STAR INT'L CO.,LTD.

Title: MS-G019

Size | Document Number: SOC-2 DDR Channel B | Rev: 10

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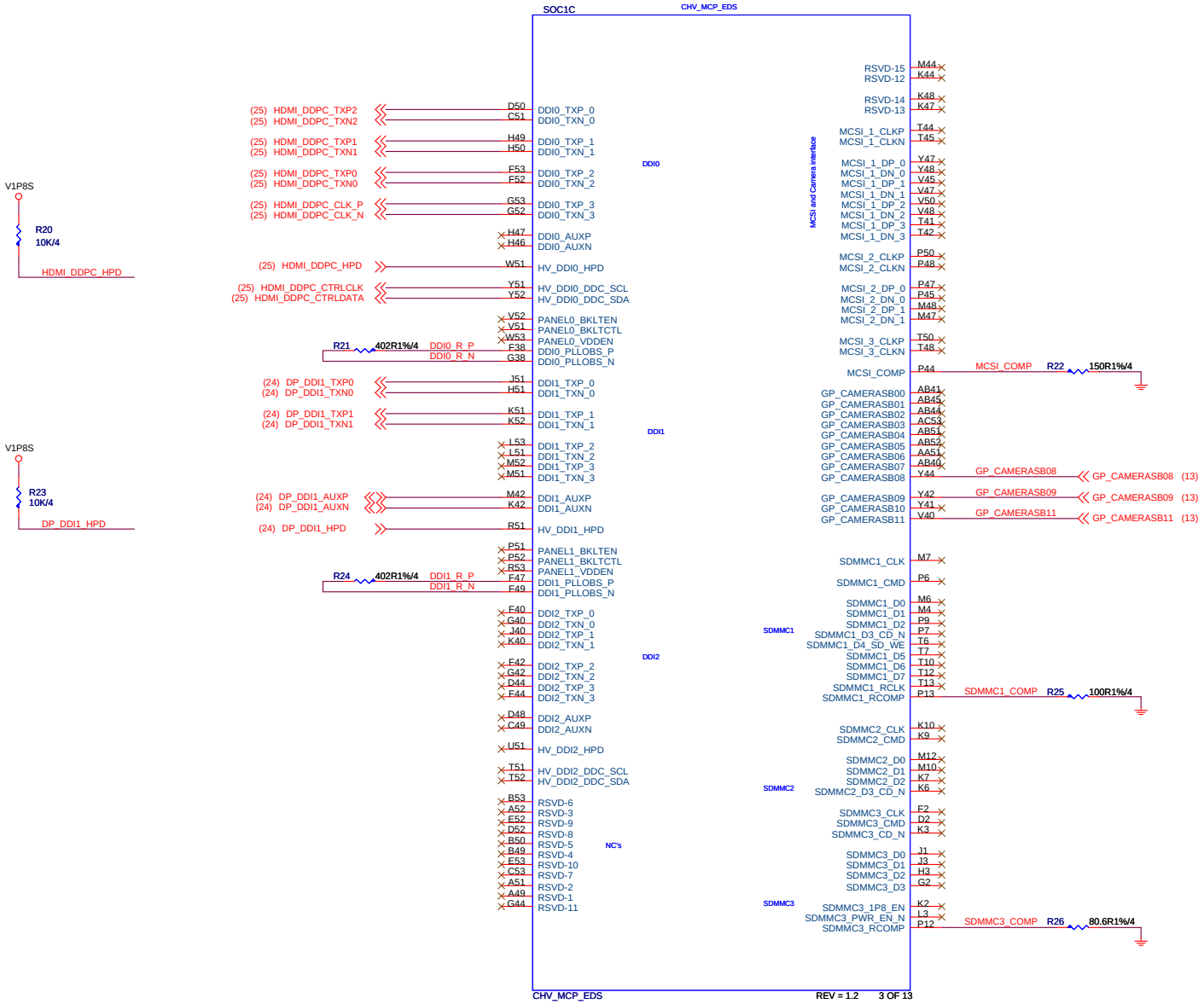

MICRO-STAR INT'L CO.,LTD.		
Title: MS-G019		
Size	Document Number: SOC-3 Display/eMMC/SDMMC	Rev: 10
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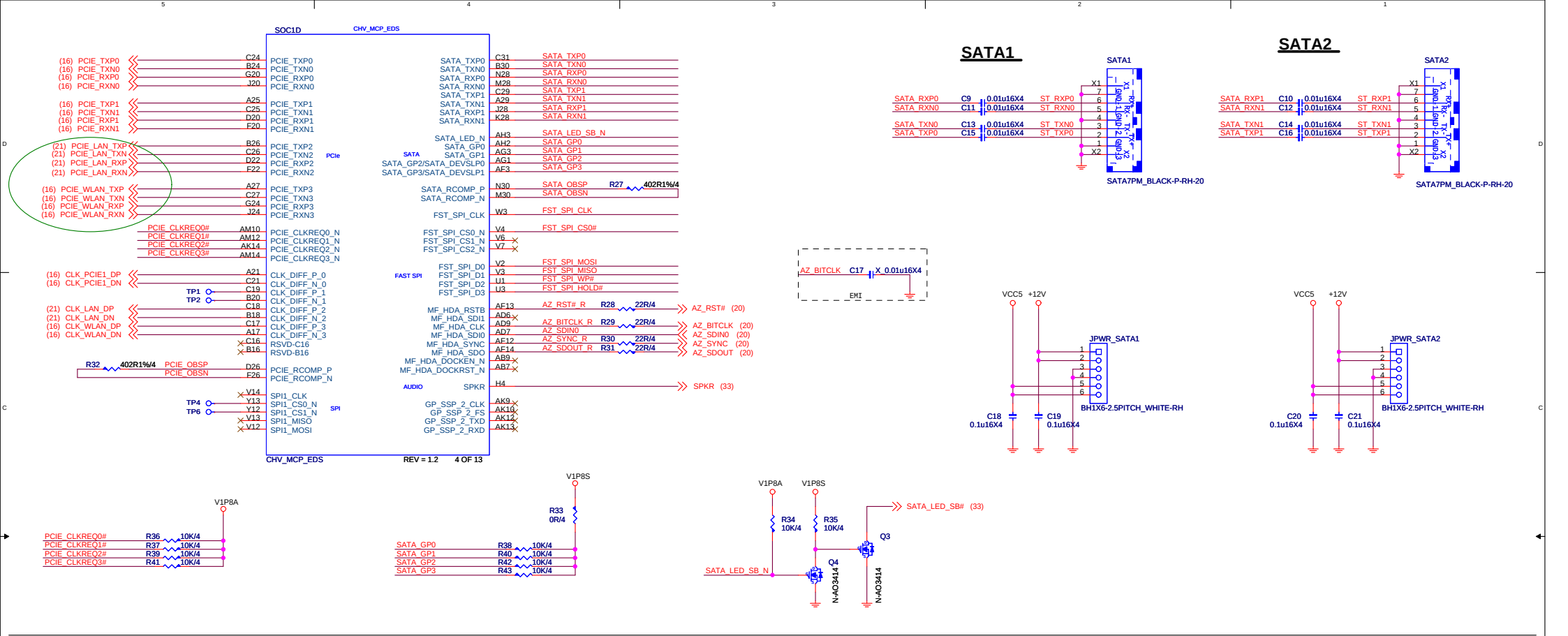
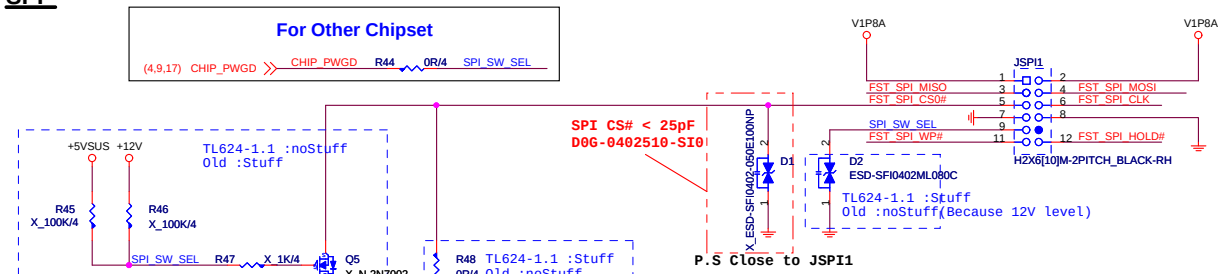


SATA1

SATA2

SPI



MICRO-STAR INT'L CO.,LTD.		
Title	MS-G019	
Size	Document Number: SOC-4 PCIE/SATA/SPI/HDA	Rev: 10
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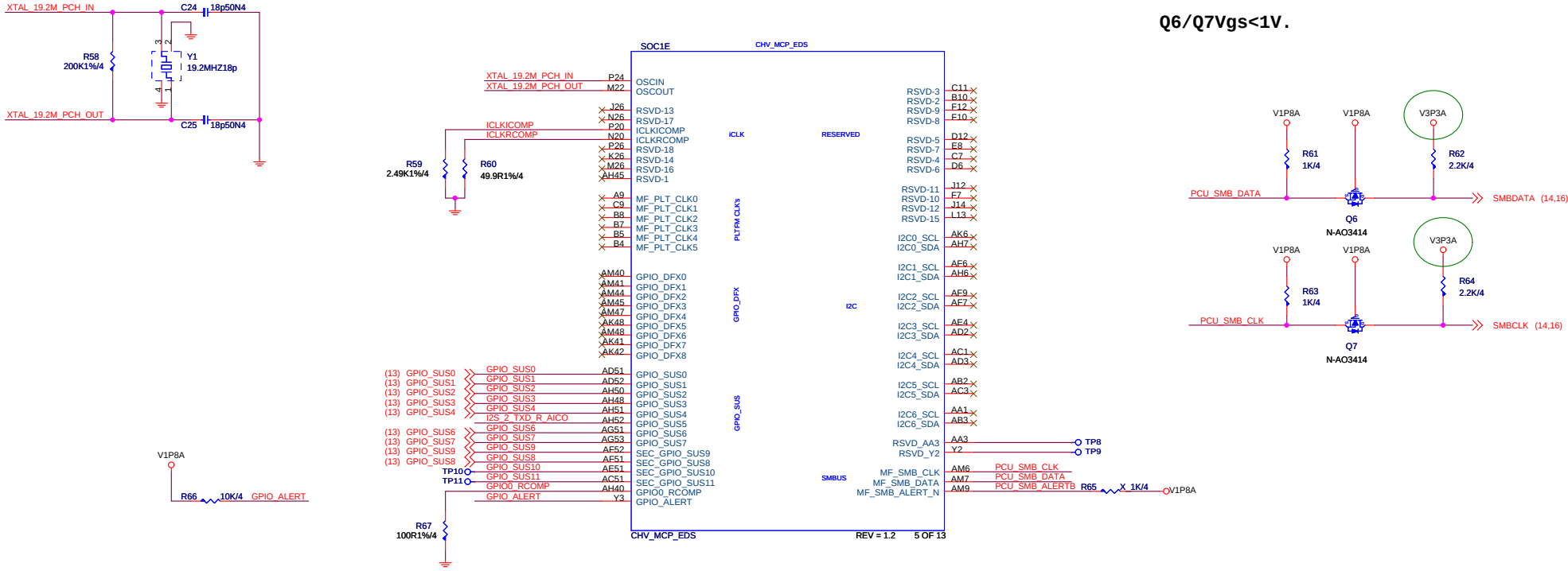
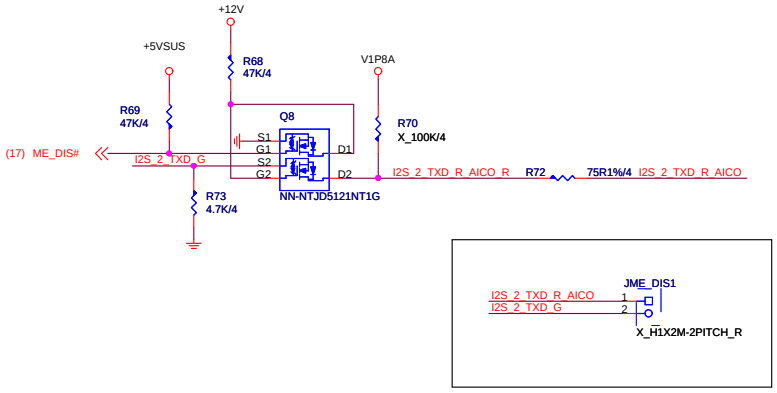
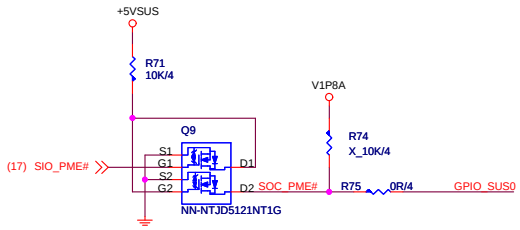
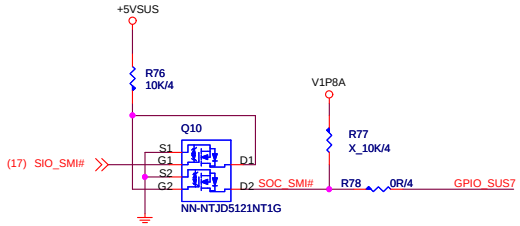
Q6/Q7Vgs<1V.



PMC Level shift







MICRO-STAR INT'L CO.,LTD.

Title: MS-G019

Size | Document Number: SOC-5 Clock/GPIO/I2C/SMBus | Rev: 10

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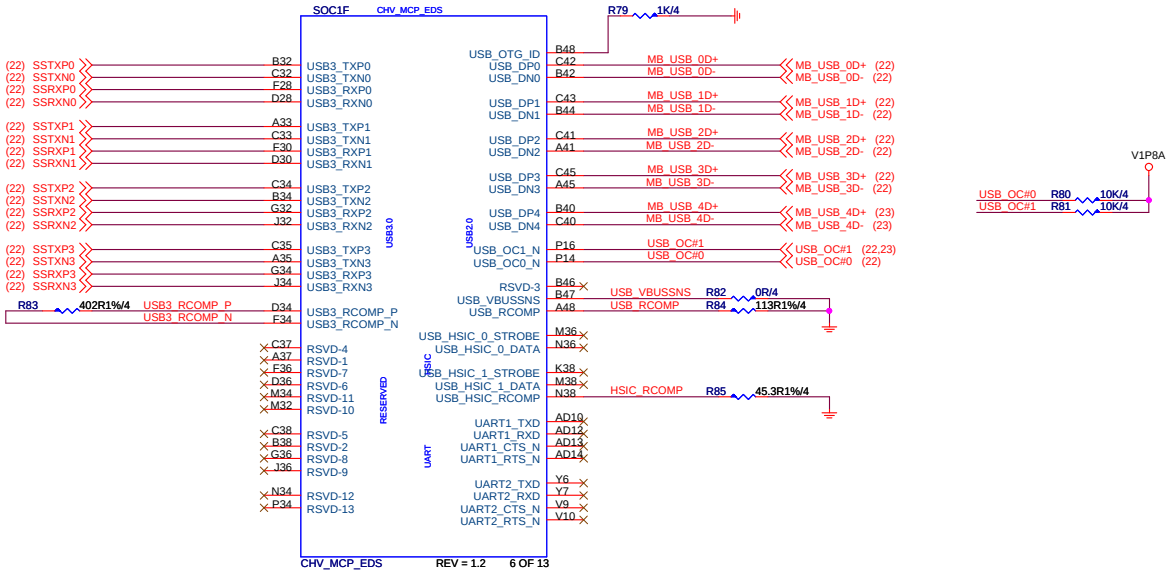

MICRO-STAR INT'L CO.,LTD.		
Title: MS-G019		
Size	Document Number: SOC-6 USB/UART	Rev: 10
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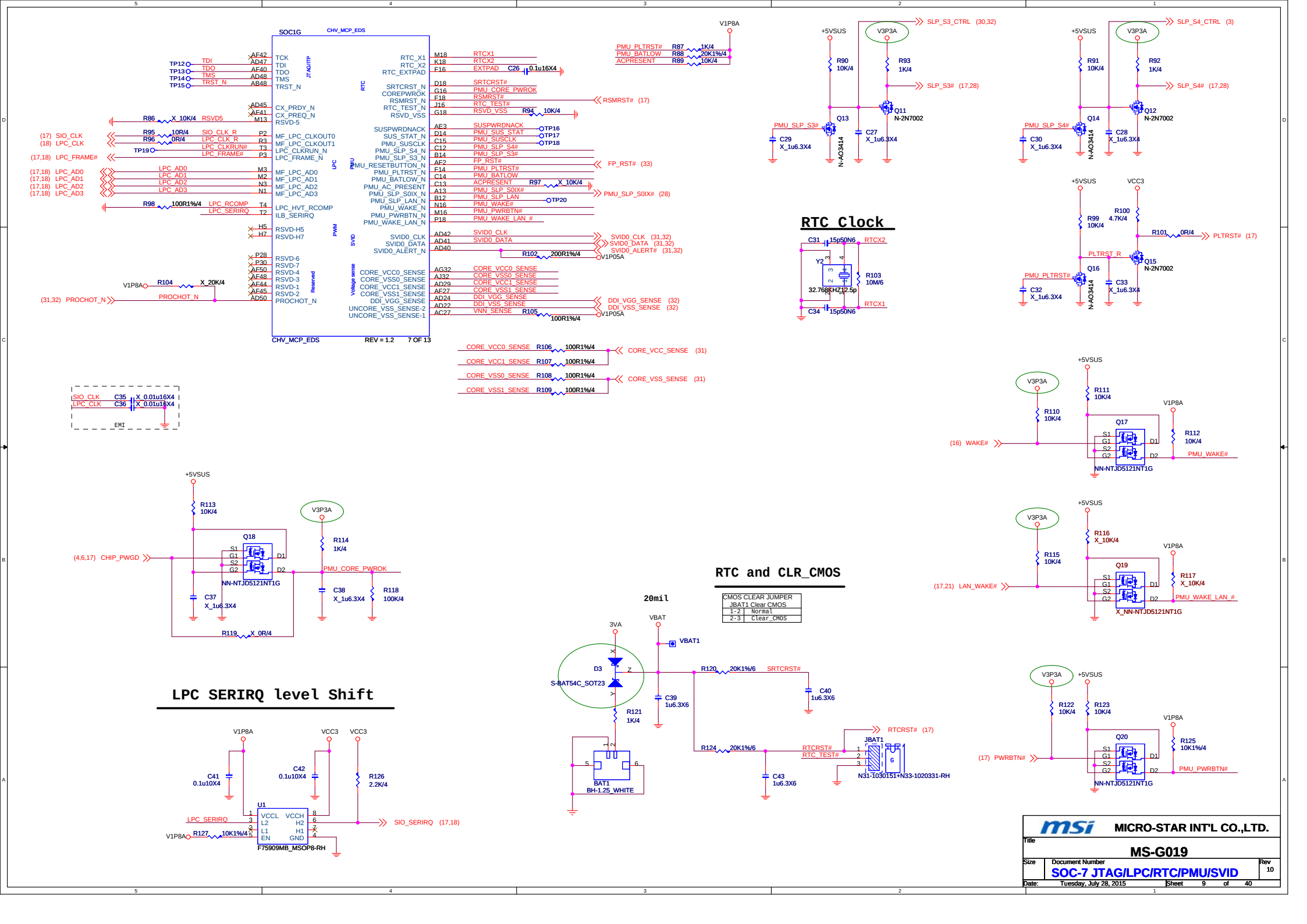
SOC1G
CHV_MCP_EDS
JTAG/ITP
RTC
LPC
PMU
SVID
PWM
Reserved
Voltage sense
TCK
TDI
TDO
TMS
TRST_N
CX_PRDY_N
CX_PREQ_N
RSVD-5
MF_LPC_CLKOUT0
MF_LPC_CLKOUT1
LPC_CLKRUN_N
LPC_FRAME_N
MF_LPC_AD0
MF_LPC_AD1
MF_LPC_AD2
MF_LPC_AD3
LPC_HVT_RCOMP
ILB_SERIRQ
RSVD-H5
RSVD-H7
RSVD-6
RSVD-7
RSVD-4
RSVD-3
RSVD-1
RSVD-2
PROCHOT_N
RTC_X1
RTC_X2
RTC_EXTPAD
SRTCRST_N
COREPWROK
RSMRST_N
RTC_TEST_N
RSVD_VSS
SUSPWRDNACK
SUS_STAT_N
PMU_SUSCLK
PMU_SLP_S4_N
PMU_SLP_S3_N
PMU_RESETBUTTON_N
PMU_PLTRST_N
PMU_BATLOW_N
PMU_AC_PRESENT
PMU_SLP_S0IX_N
PMU_SLP_LAN_N
PMU_WAKE_N
PMU_PWRBTN_N
PMU_WAKE_LAN_N
SVID0_CLK
SVID0_DATA
SVID0_ALERT_N
CORE_VCC0_SENSE
CORE_VSS0_SENSE
CORE_VCC1_SENSE
CORE_VSS1_SENSE
DDI_VGG_SENSE
DDI_VSS_SENSE
VNN_SENSE
UNCORE_VSS_SENSE-2
UNCORE_VSS_SENSE-1
CHV_MCP_EDS
REV = 1.2
7 OF 13
RTC Clock
LPC SERIRQ level Shift
RTC and CLR_CMOS
CMOS CLEAR JUMPER
JBAT1 Clear CMOS
1-2 Normal
2-3 Clear_CMOS
20mil
EMI
F75909MB_MSOP8-RH
S-BAT54C_SOT23
BAT1
BH-1.25_WHITE
N31-1030151+N33-1020331-RH
NN-NTJD5121NT1G
N-AO3414
32.768KHZ12.5p
MICRO-STAR INT'L CO.,LTD.
MS-G019
SOC-7 JTAG/LPC/RTC/PMU/SVID
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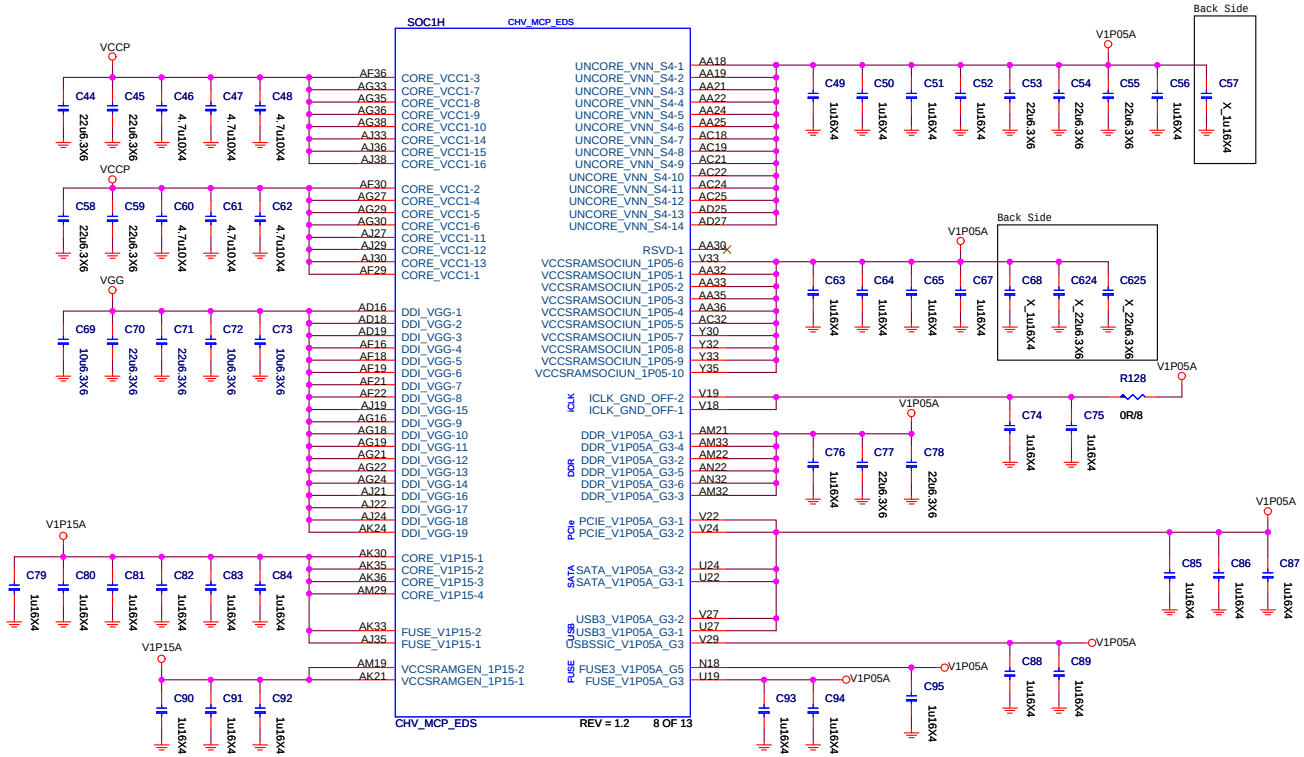

MICRO-STAR INT'L CO.,LTD.		
Title	MS-G019	
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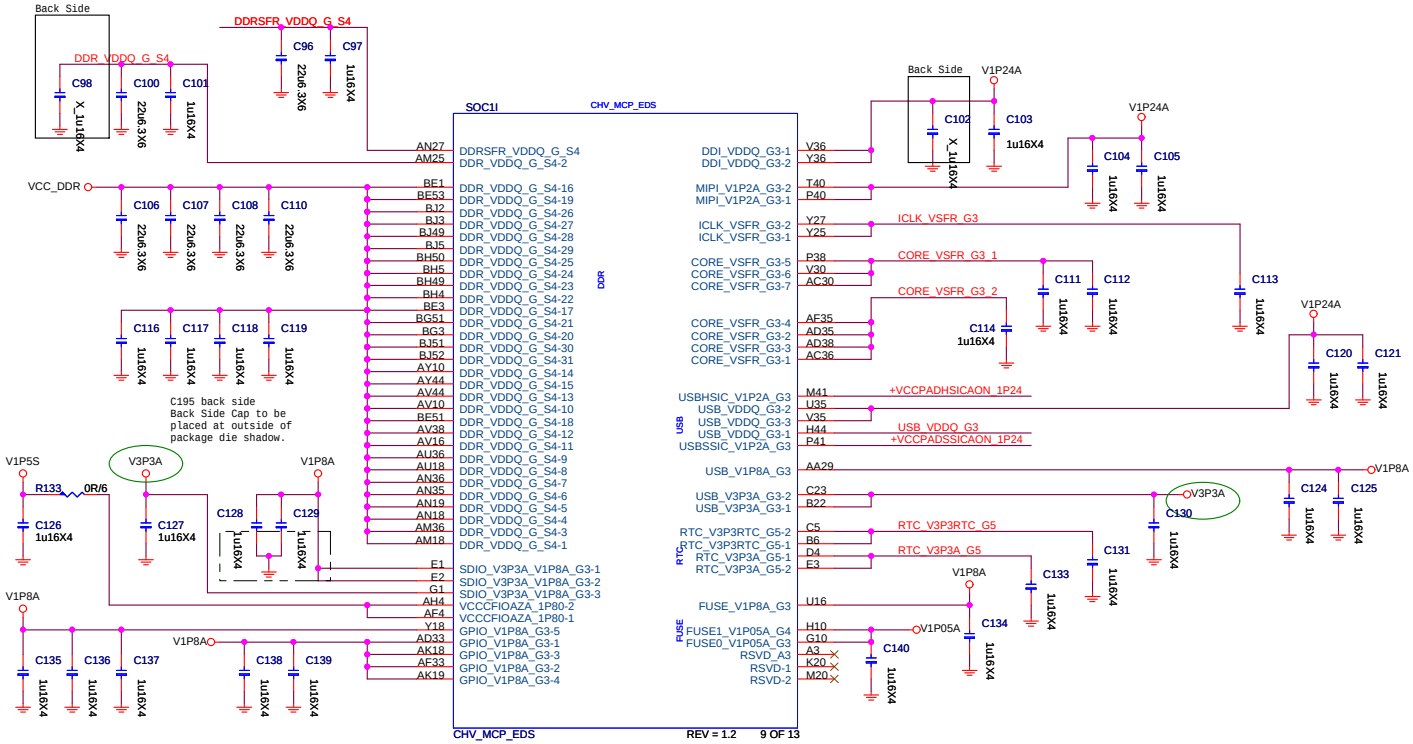
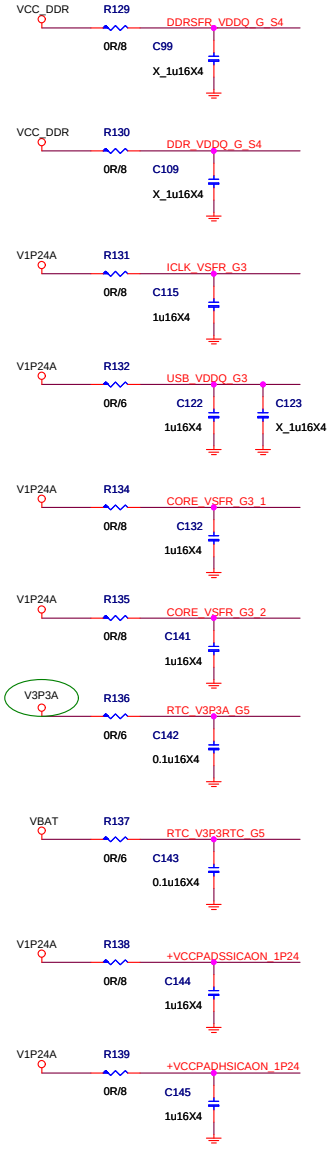


Power Filter



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Title: MS-G019

Size | Document Number: SOC-9 POWER-2 | Rev: 10

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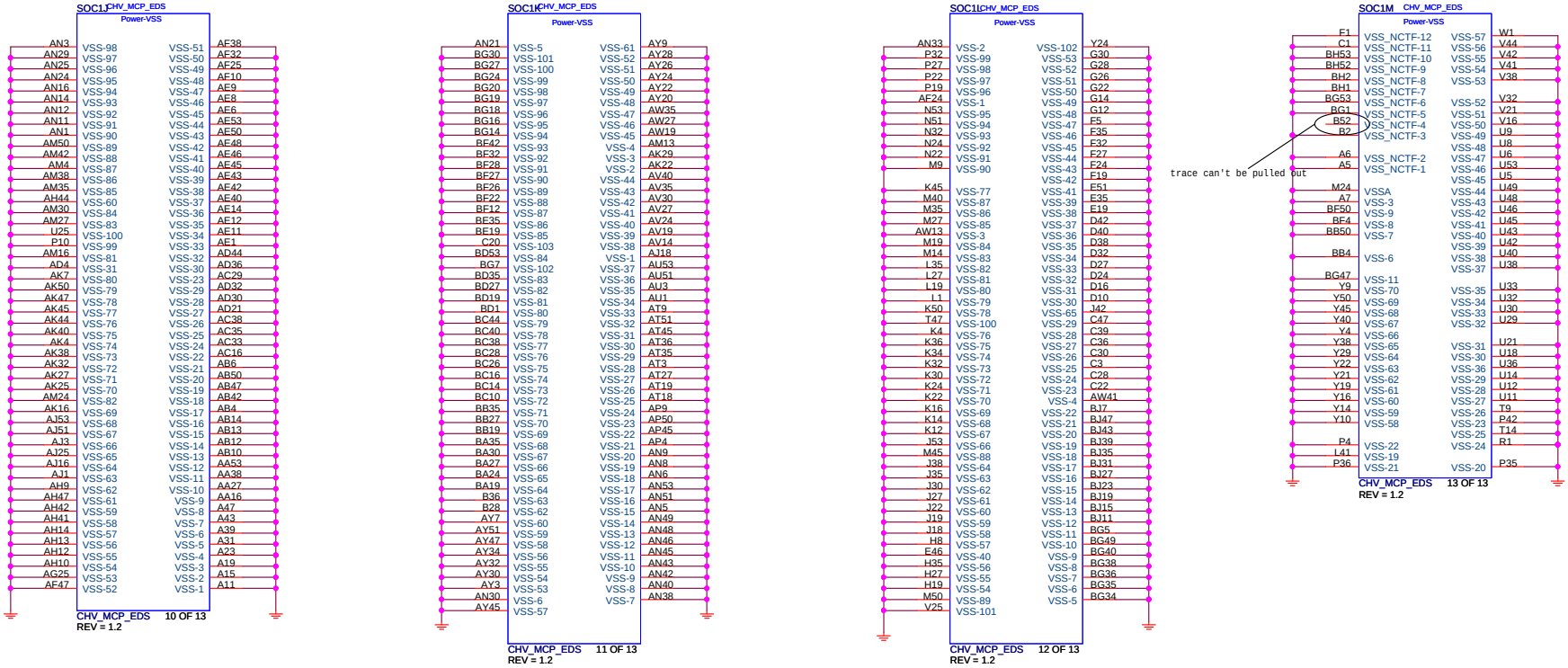

MICRO-STAR INT'L CO.,LTD.		
Title: MS-G019		
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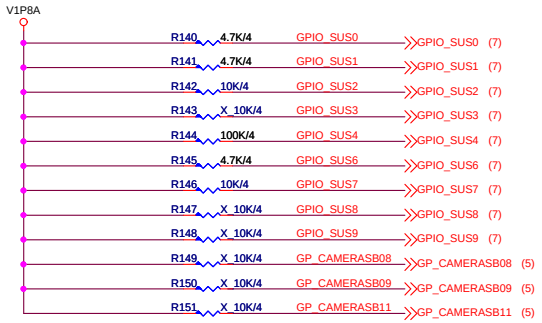

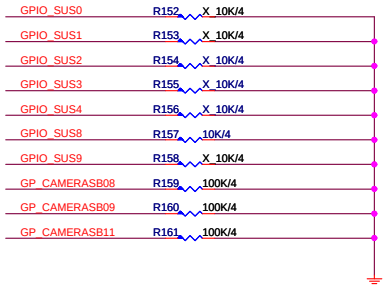

Table 24-1. Digital Display Ports Enable and Disable Guidelines

Port	Strap	How to Enable Port	How to Disable Port
DDI0	GPIO_SUS0	Pull-up to V1P8A with 4.7-KΩ ±5% resistor	N/A, Weak internal pull-down
DDI1	GPIO_SUS1	Pull-up to V1P8A with 4.7-KΩ ±5% resistor	N/A, Weak internal pull-down
Note: DDI2 is always enabled an no Hard Strap is needed.			

Table 2-26. Hard Strap Description and Functionality (Sheet 1 of 2)

Signal Name	Purpose	Pull-Up/Pull-Down	Strap Description
GPIO_SUS[0]	DDI0 Detect	Weak internal (20k PD)	0 = DDI0 not detected 1 = DDI0 detected
GPIO_SUS[1]	DDI1 Detect	Weak internal (20k PD)	0 = DDI1 not detected 1 = DDI1 detected
GPIO_SUS[2]	Top Swap (A16) override	Weak internal (20k PU)	0 = Change Boot Loader address 1 = Normal Operation
GPIO_SUS[3]	MIPI-DSI Display Detect	Weak internal (20k PD)	0 = DSI Port not detected 1= DSI Port detected **Note:** DSI is not POR for BSW. This strap will not enable DSI on BSW. Leave the pin floating if GPIO functionality is not used.
GPIO_SUS[4]	Boot BIOS Strap (BBS)	Weak internal (20k PU)	0 = No SPI (Default) 1 = SPI
GPIO_SUS[5]	Flash Descriptor Security Override	Weak internal (20k PU)	0 = Not supported 1 = Normal Operation
GPIO_SUS[6]	Halt Boot Strap	Weak internal (20k PU)	1= Normal Operation **Note:** This strap **MUST** be High at RSMRST_N de-assert to ensure proper platform operation and use of GPIO_DFX[8:0]
GPIO_SUS[8]	PLLs, ICLK, USB2, DDI SFR Supply Select	Weak internal (20k PU)	0 = Supply is 1.25V 1 = Supply is 1.35V
GPIO_SUS[9]	ICLK, USB2, DDI SFR Bypass	Weak internal (20k PD)	0 = No bypass 1 = Bypass with 1.05V

Table 2-26. Hard Strap Description and Functionality (Sheet 2 of 2)

Signal Name	Purpose	Pull-Up/Pull-Down	Strap Description
GPIO_CAMERASB08	ICLK Xtal OSC Bypass	Weak internal (20k PD)	0 = No Bypass (Default) 1 = Bypass
GPIO_CAMERASB09	CCU SUS RO Bypass	Weak internal (20k PD)	0 = No Bypass (Default) 1 = Bypass
GPIO_CAMERASB11	RTC OSC Bypass	Weak internal (20k PD)	0 = No Bypass (Default) 1 = Bypass

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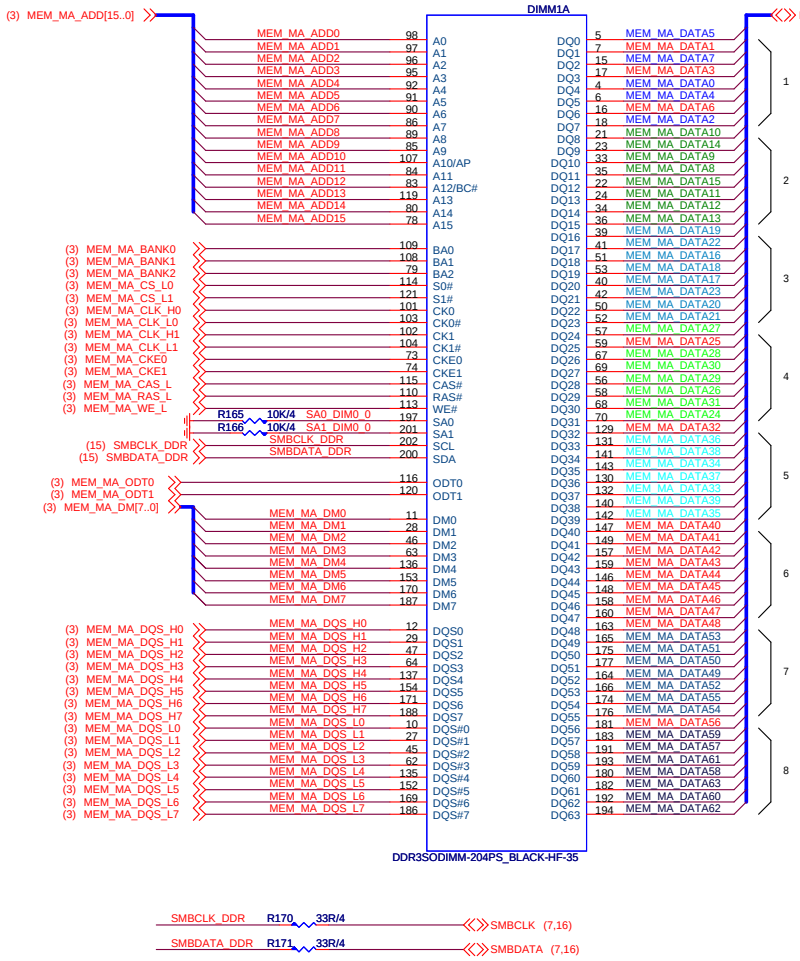
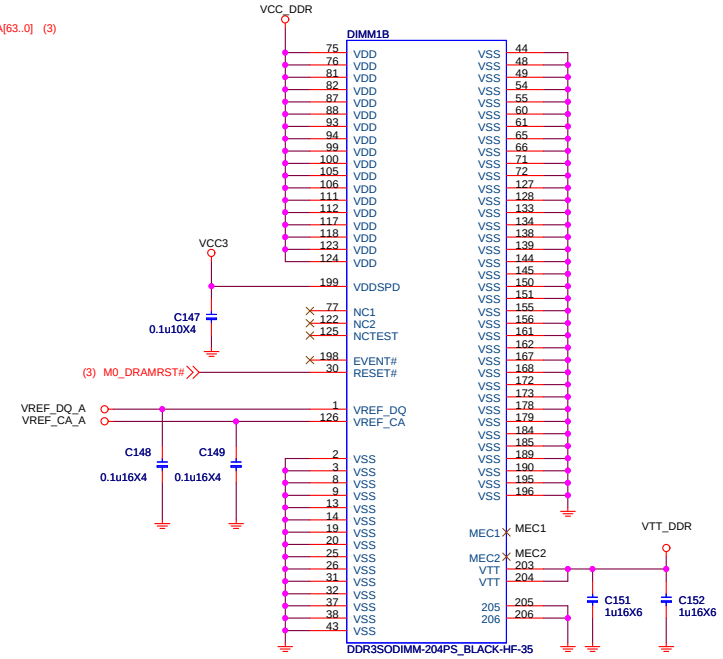
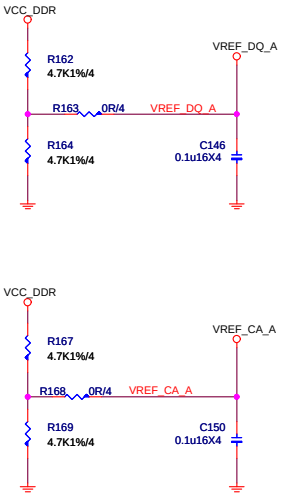
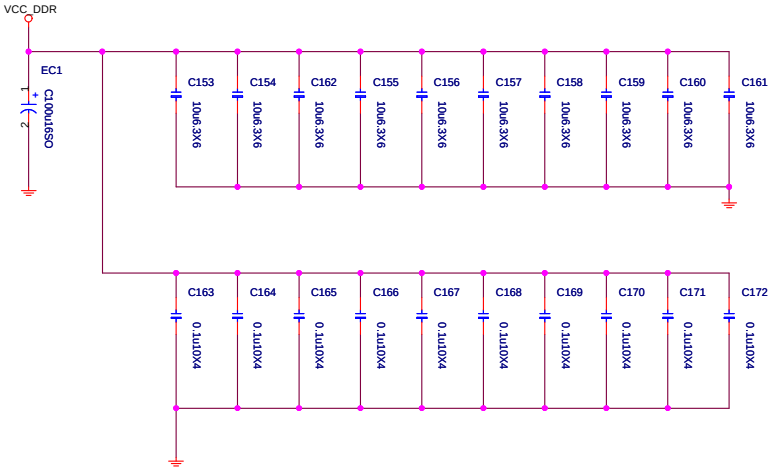
SODIMM #A0 (STD) N13-2040930-CK3 9.2H





Pin 205/Pin 206 PAD





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Size | Document Number: DDR III SO-DIMM1 | Rev: 10

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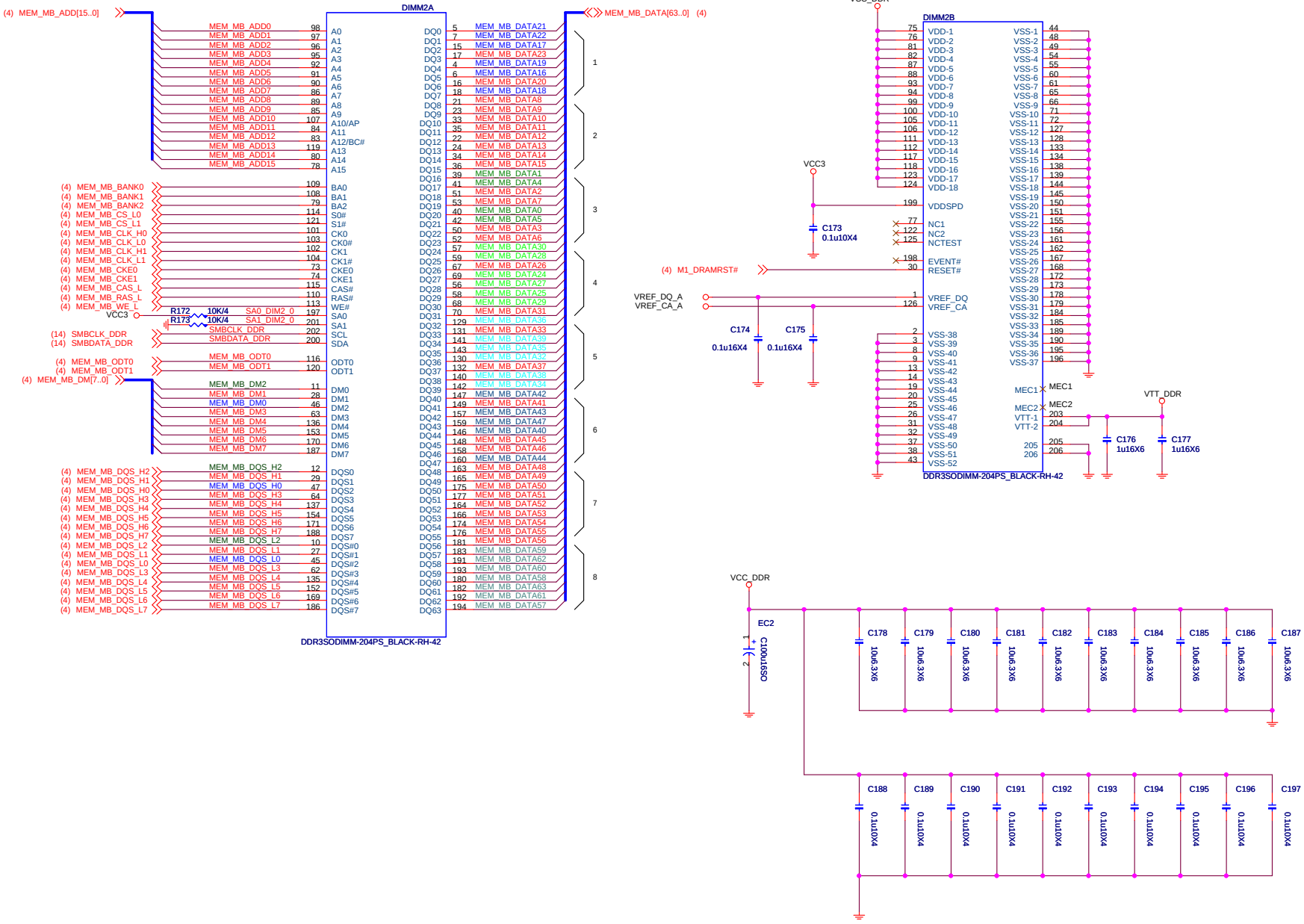
N13-2041200-CK3 9.2H

SODIMM #B0



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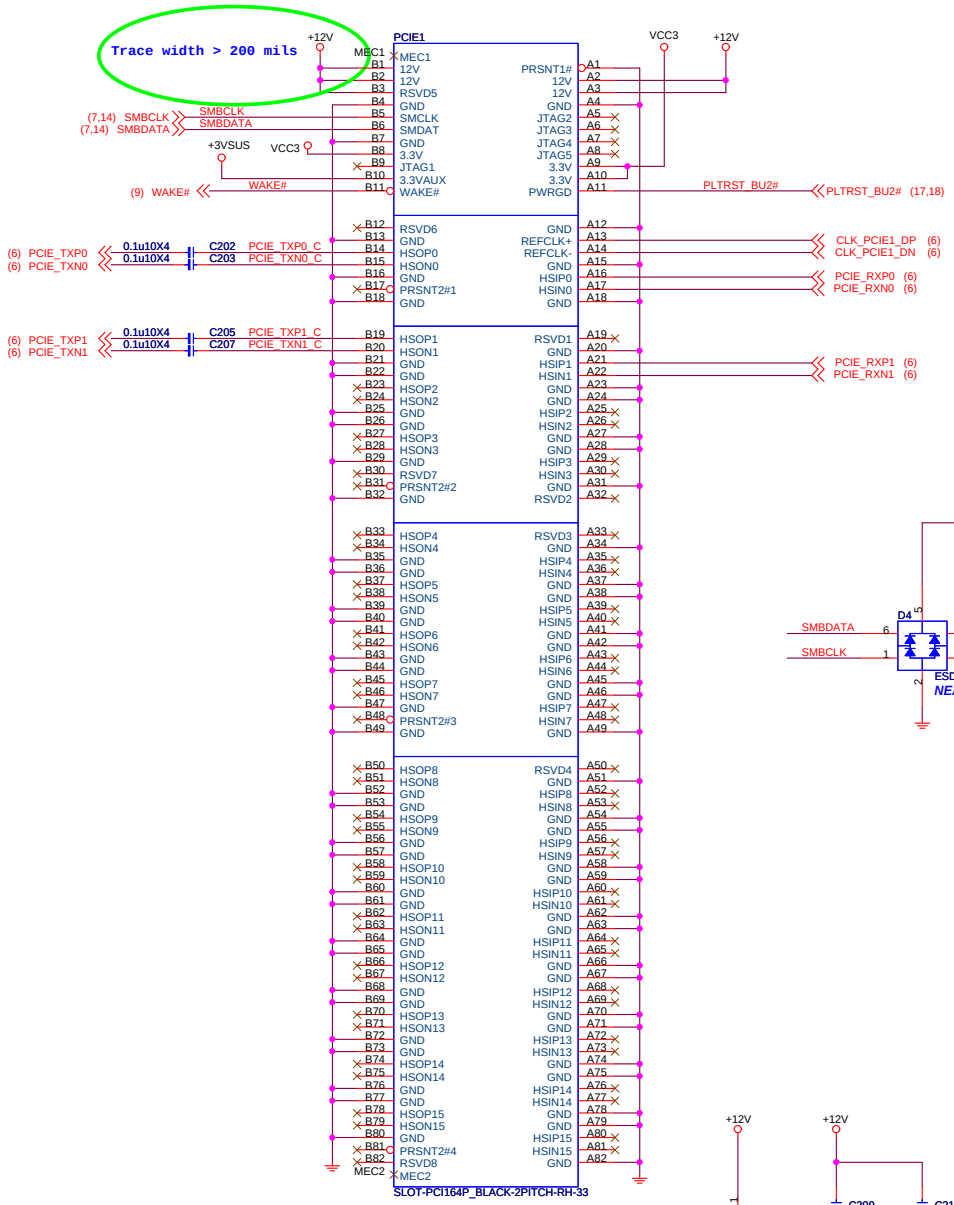
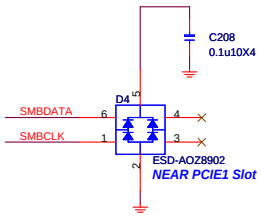
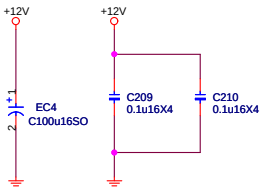
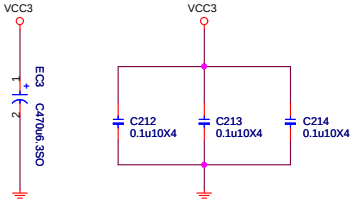
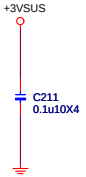
PCI Express X16 Slot



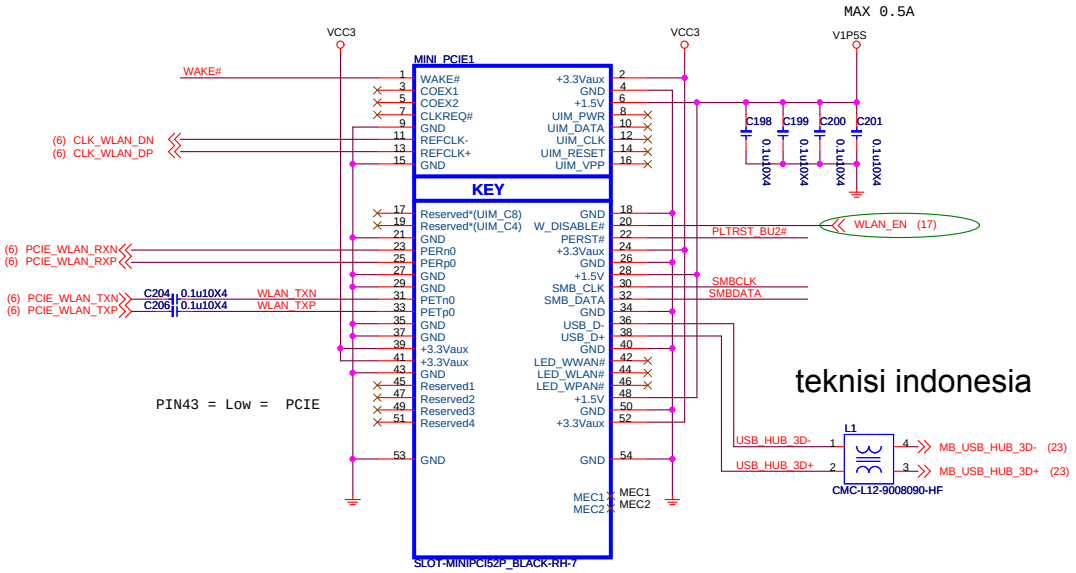




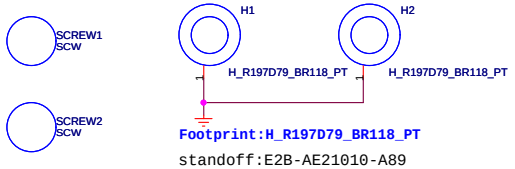




Mini-PCIEX1



teknisi indonesia



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Title: MS-G019		
Size	Document Number: PCIEX16/MiniPCIE	Rev: 10
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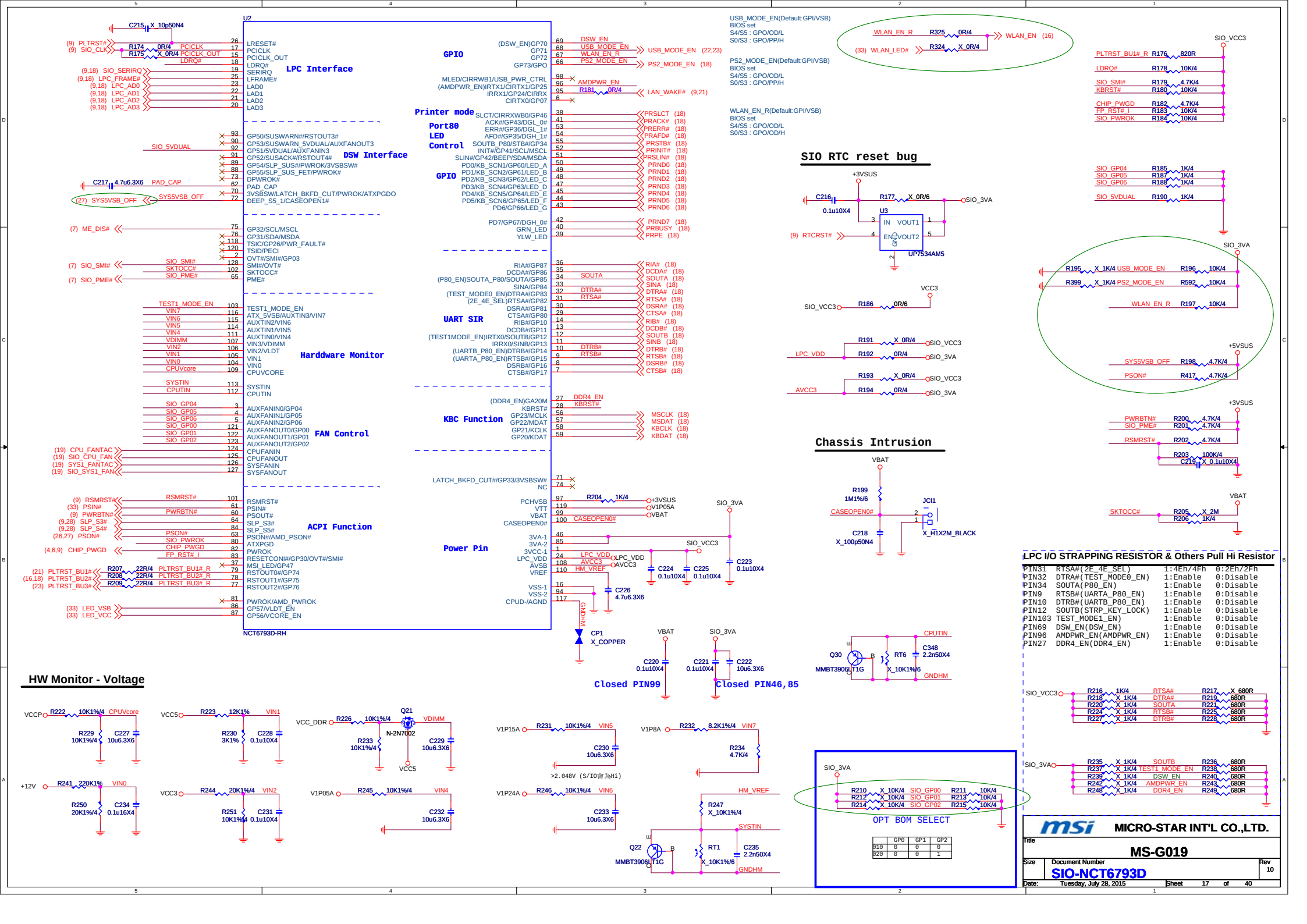
U2
NCT6793D-RH
LPC Interface
DSW Interface
Harddware Monitor
FAN Control
ACPI Function
GPIO
Printer mode
Port80
LED
Control
GPIO
UART SIR
KBC Function
Power Pin
USB_MODE_EN(Default:GPI/VSB)
BIOS set
S4/S5 : GPO/OD/L
S0/S3 : GPO/PP/H
PS2_MODE_EN(Default:GPI/VSB)
BIOS set
S4/S5 : GPO/OD/L
S0/S3 : GPO/PP/H
WLAN_EN_R(Default:GPI/VSB)
BIOS set
S4/S5 : GPO/OD/L
S0/S3 : GPO/OD/H
SIO RTC reset bug
Chassis Intrusion
HW Monitor - Voltage
Closed PIN99
Closed PIN46,85
OPT BOM SELECT
LPC I/O STRAPPING RESISTOR & Others Pull Hi Resistor
PIN31 RTSA#(2E_4E_SEL) 1:4Eh/4Fh 0:2Eh/2Fh
PIN32 DTRA#(TEST_MODE0_EN) 1:Enable 0:Disable
PIN34 SOUTA(P80_EN) 1:Enable 0:Disable
PIN9 RTSB#(UARTA_P80_EN) 1:Enable 0:Disable
PIN10 DTRB#(UARTB_P80_EN) 1:Enable 0:Disable
PIN12 SOUTB(STRP_KEY_LOCK) 1:Enable 0:Disable
PIN103 TEST_MODE1_EN) 1:Enable 0:Disable
PIN69 DSW_EN(DSW_EN) 1:Enable 0:Disable
PIN96 AMDPWR_EN(AMDPWR_EN) 1:Enable 0:Disable
PIN27 DDR4_EN(DDR4_EN) 1:Enable 0:Disable
MSI
MICRO-STAR INT'L CO.,LTD.
Title
MS-G019
Size
Document Number
SIO-NCT6793D
Rev
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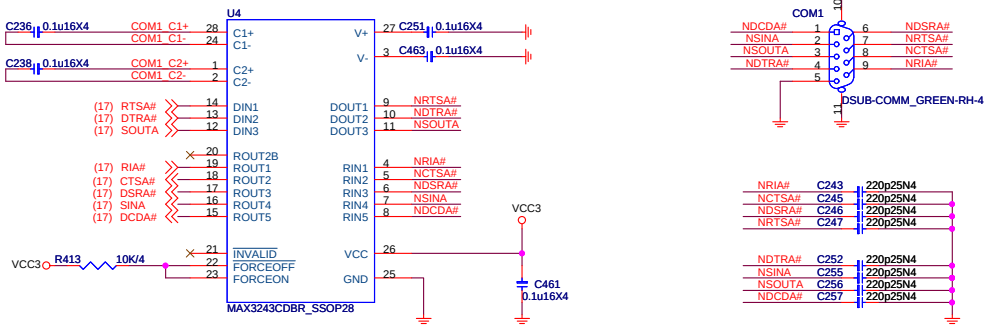
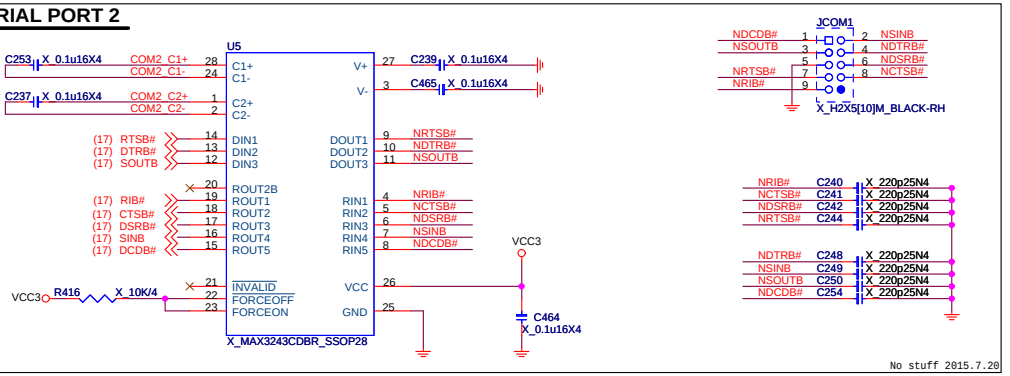
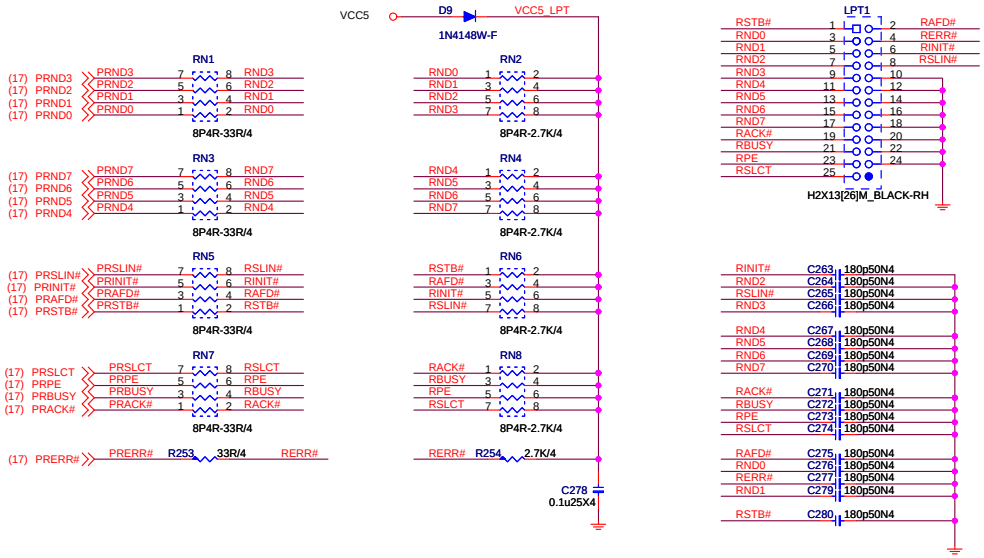
SERIAL PORT 1



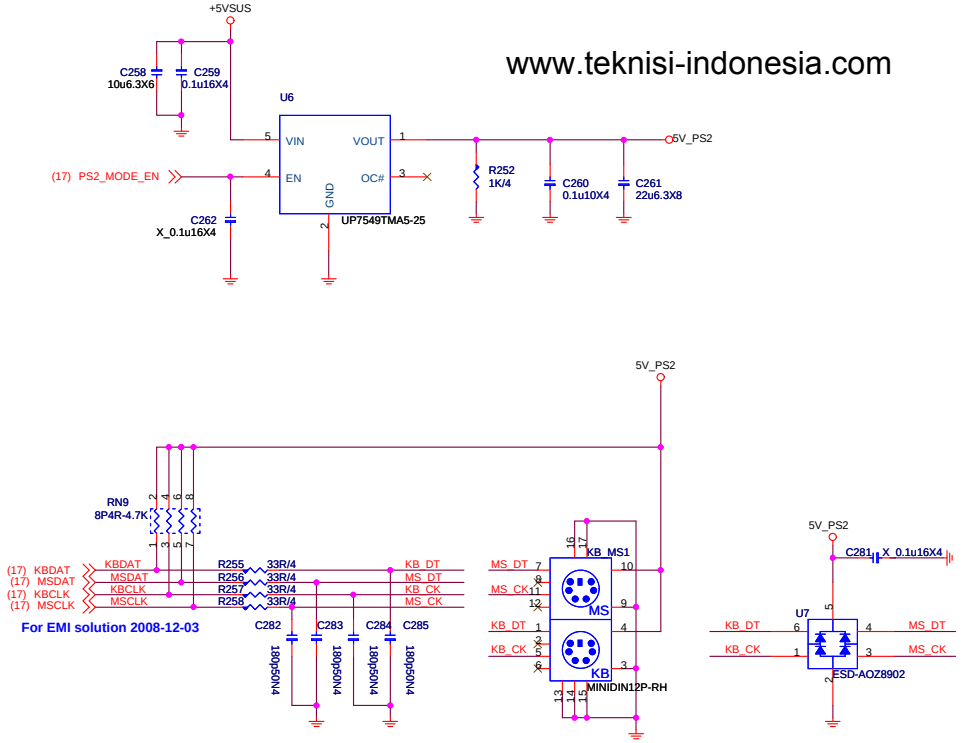
SERIAL PORT 2



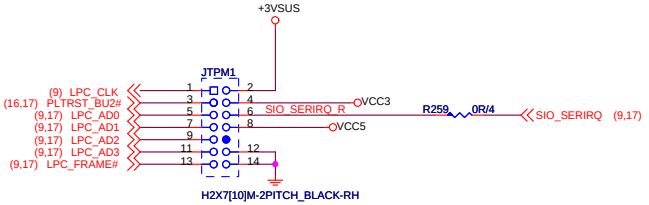
PARALLAL PORT



PS2 KEYBOARD & MOUSE CONNECTOR



TPM/JLPC



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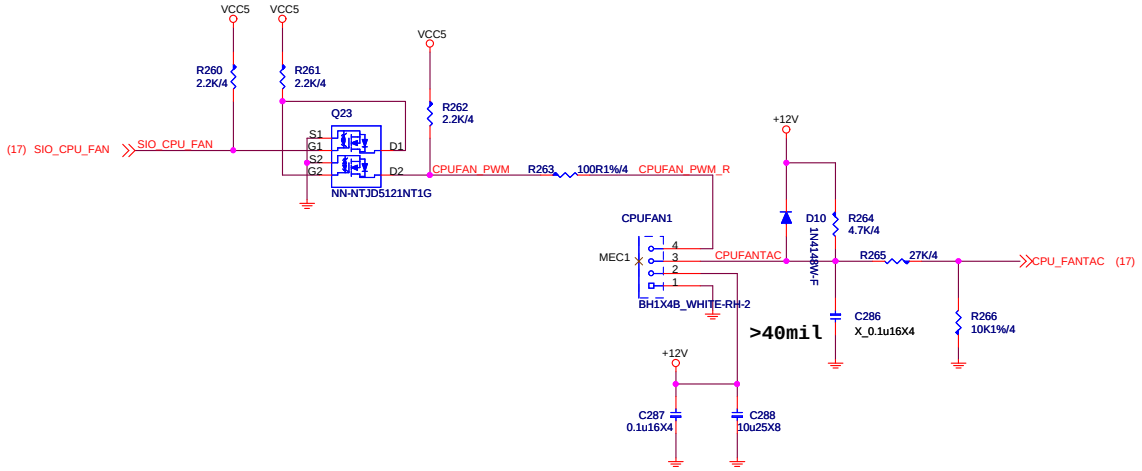
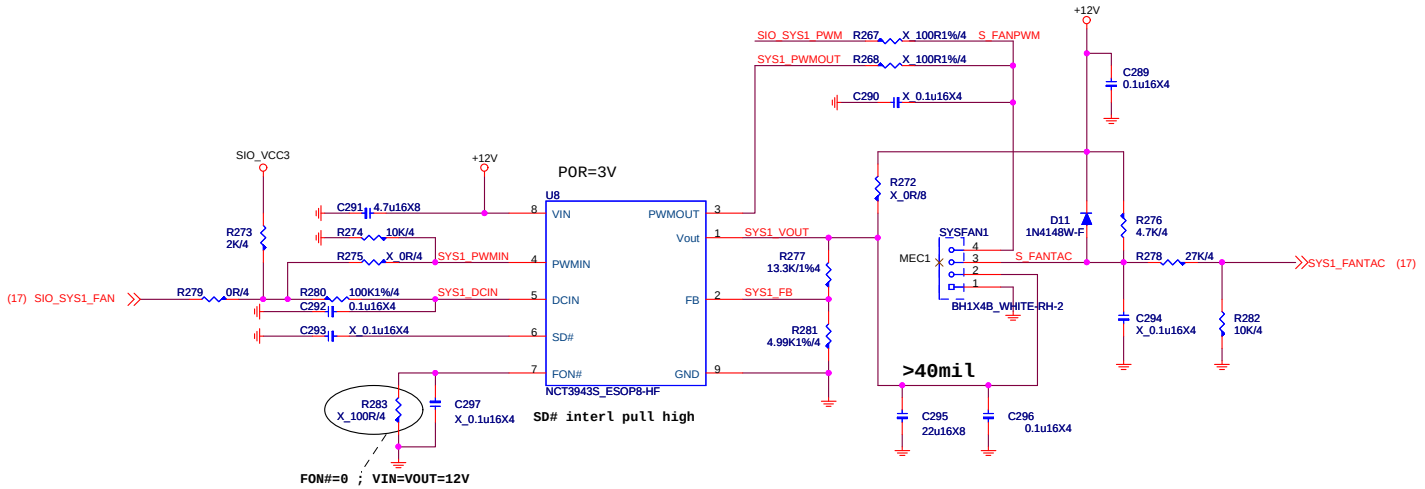
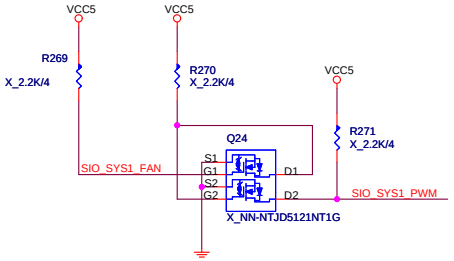
CPUFAN



SYSFAN





SYSFAN_PWR_OFF
SIO control
Close SIO_SYS1_FAN Vout=0

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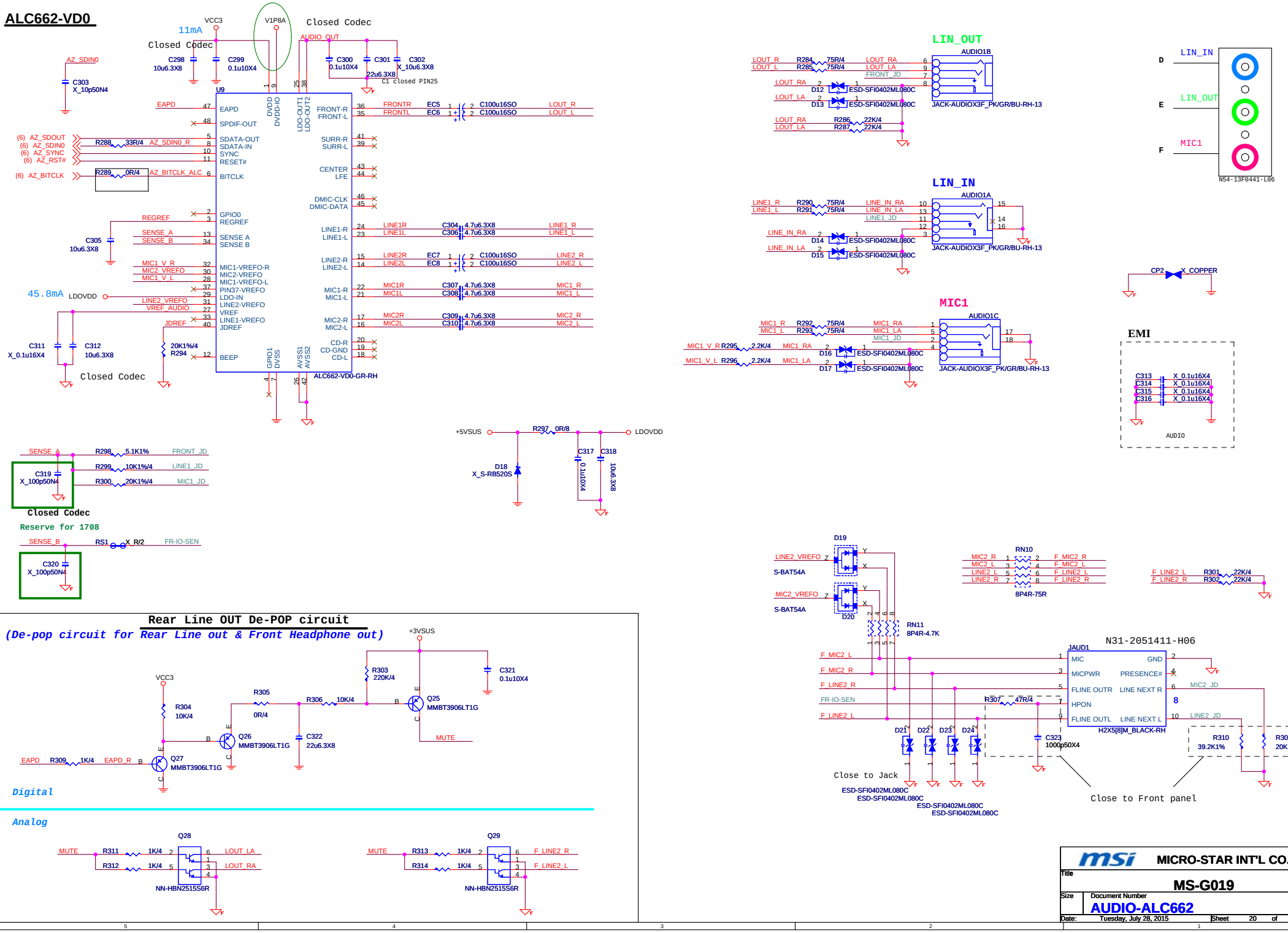
ALC662-VD0



Rear Line OUT De-POP circuit

(De-pop circuit for Rear Line out & Front Headphone out)

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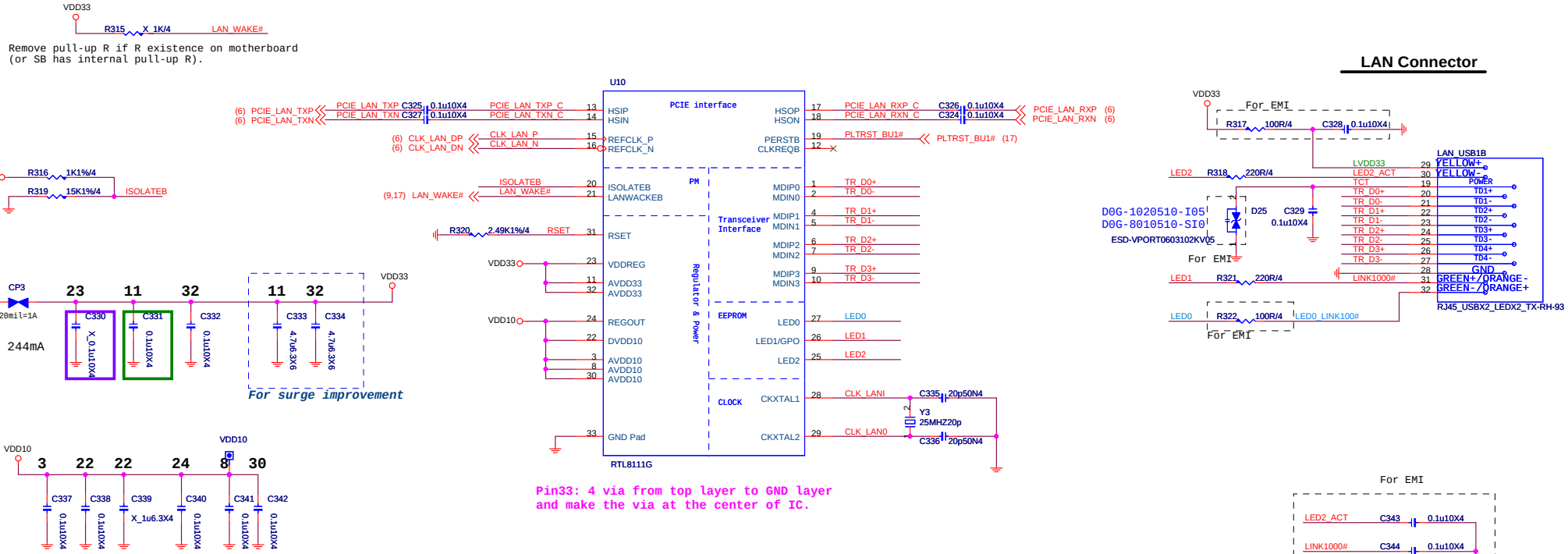
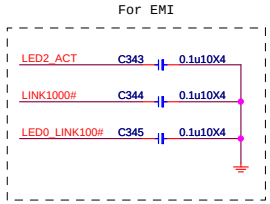
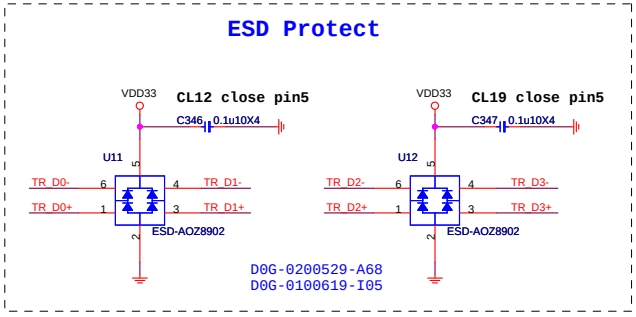


LAN Connector





8111G POWER Consumption

	3.3V @ mA	mW
10 M Idle/TxRx	17.15/116.7	56.6/385.1
100 M Idle/TxRx	71.45/129.5	235.8/427.4
Giga Idle/TxRx	179.1/243.9	591/804.9
ALDPS	6.41	21.15

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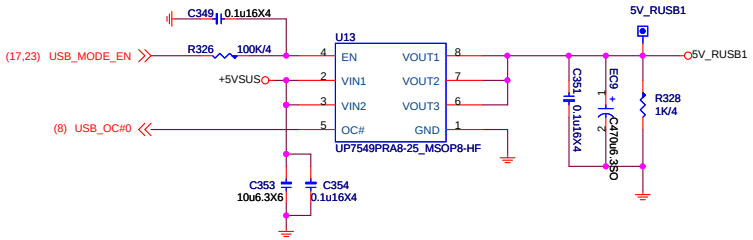
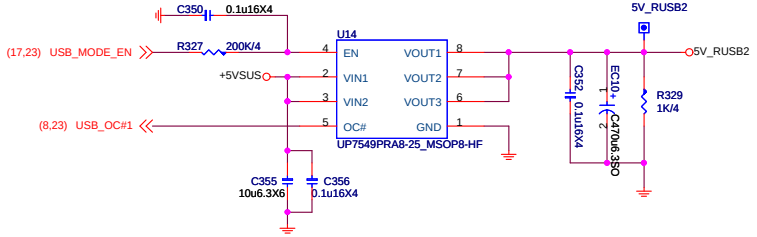
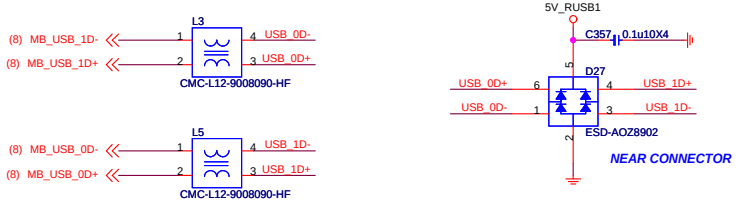
USB POWER: UP7549PRA8-25

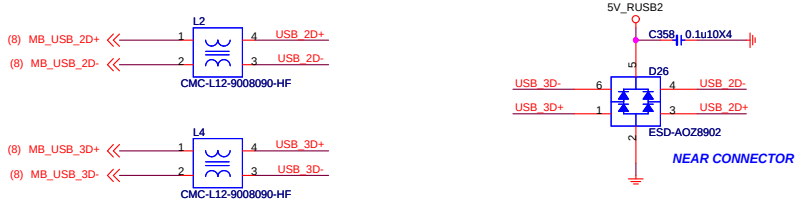


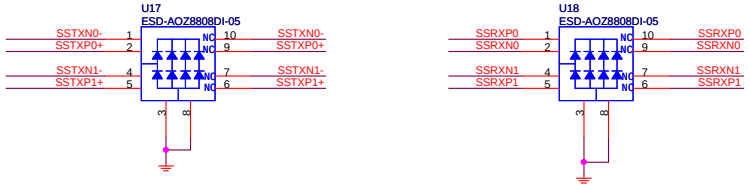


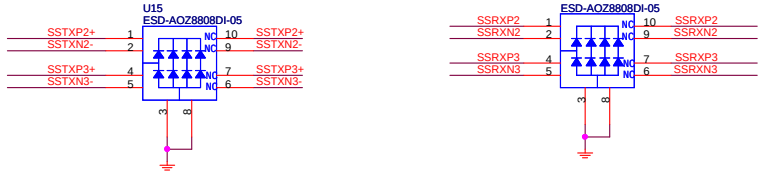
Rear USB PORT 0,1

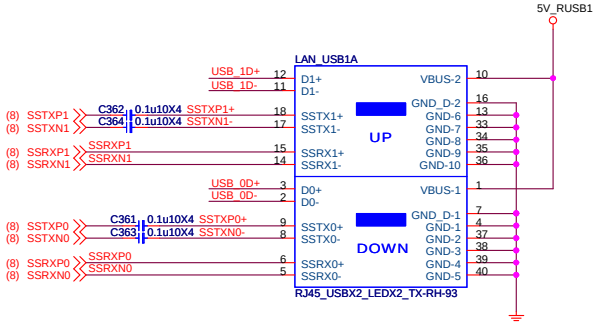


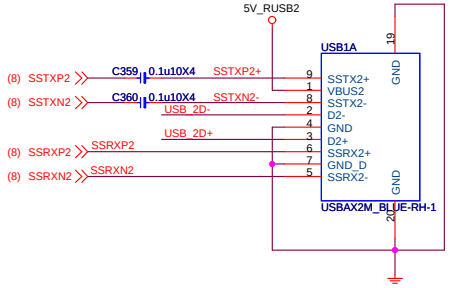
Rear USB PORT 2,3

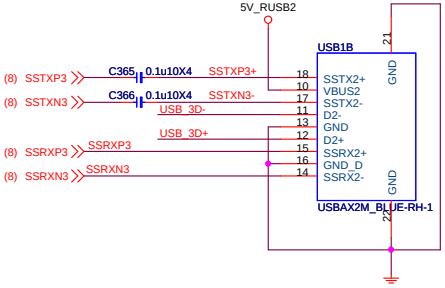












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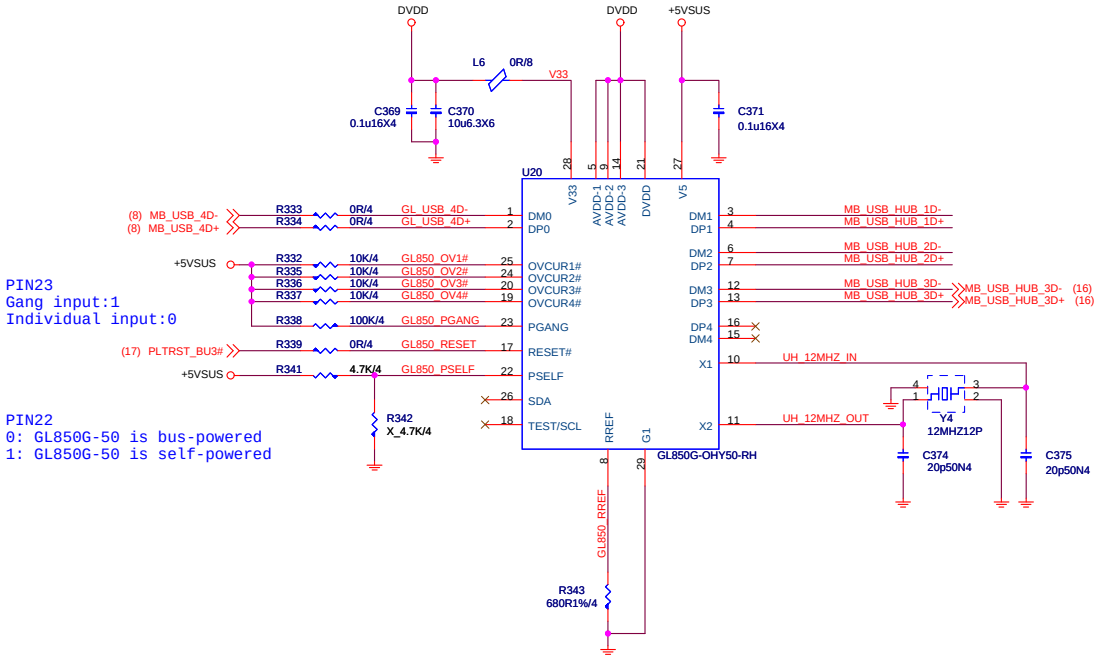
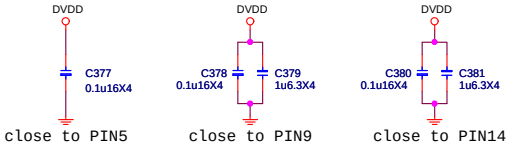
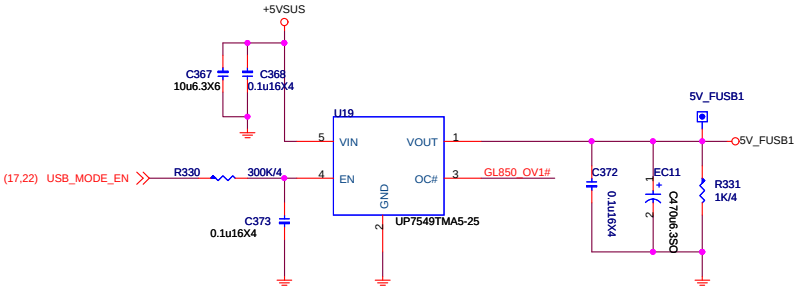
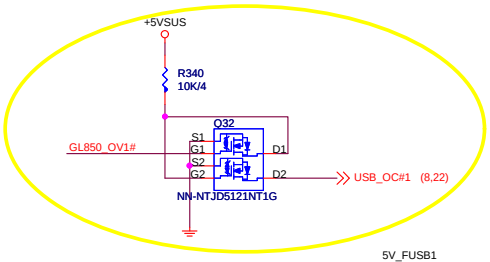
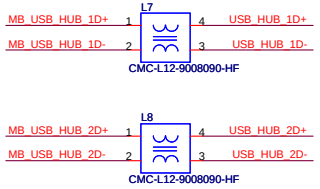
USB HUB

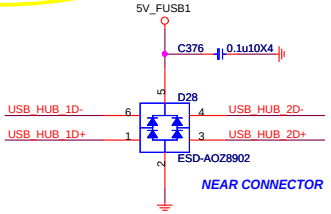


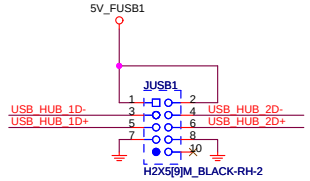












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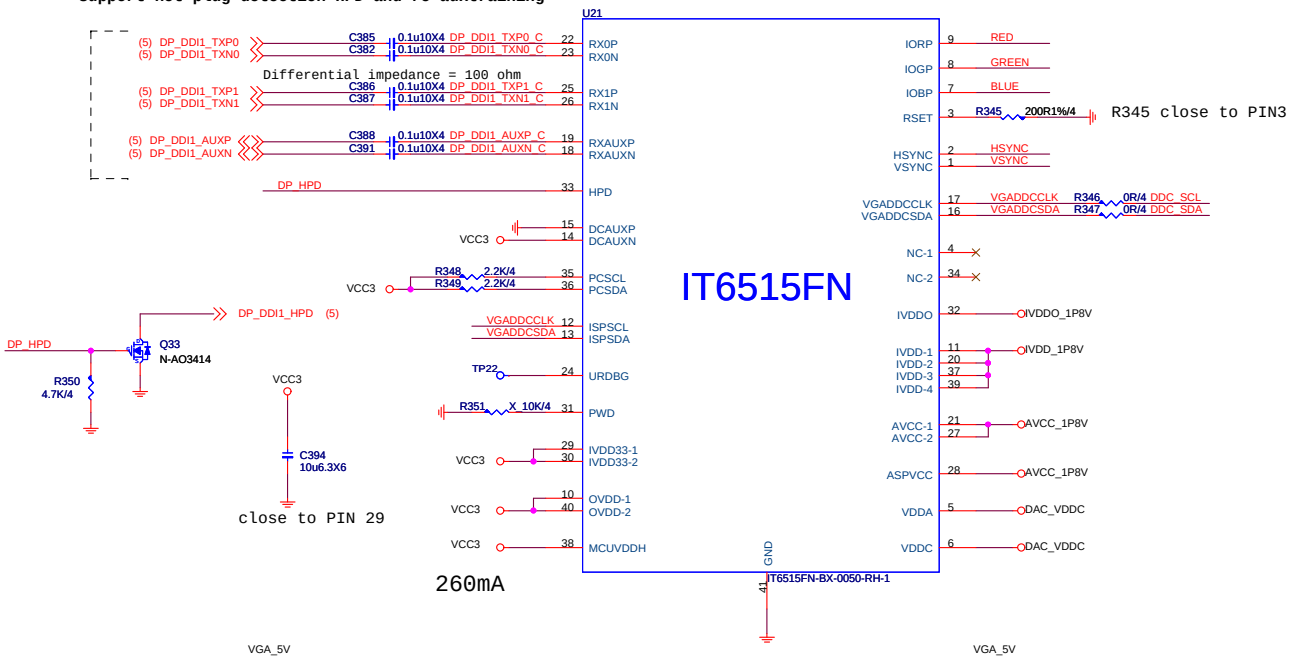
D-Sub

Note:

If connect to eDP port,must confirm whether it support hot plug detection HPD and re-auxtraining

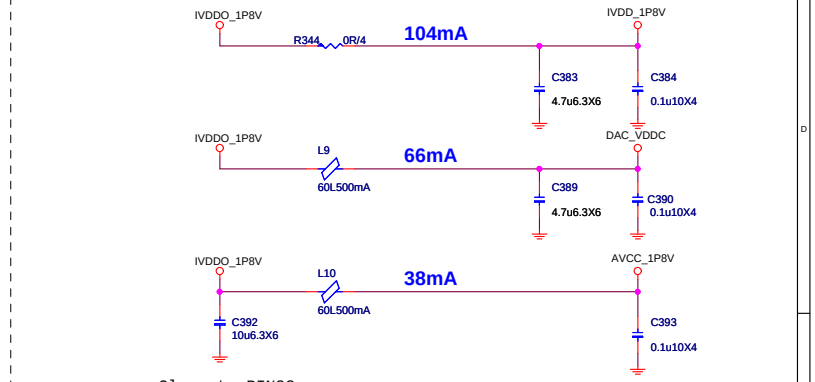
B0B-6515F2C-I15



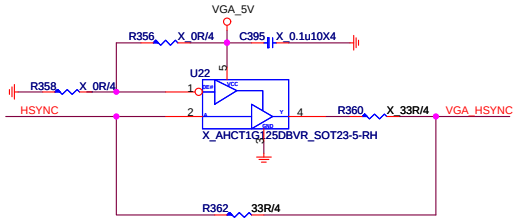
R345 close to PIN3

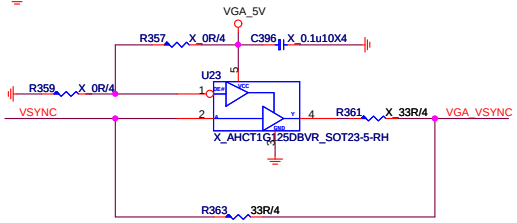
close to PIN 29

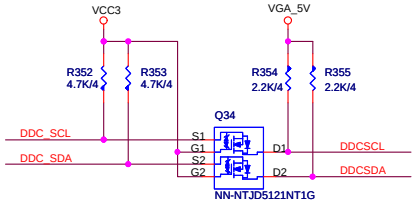
260mA

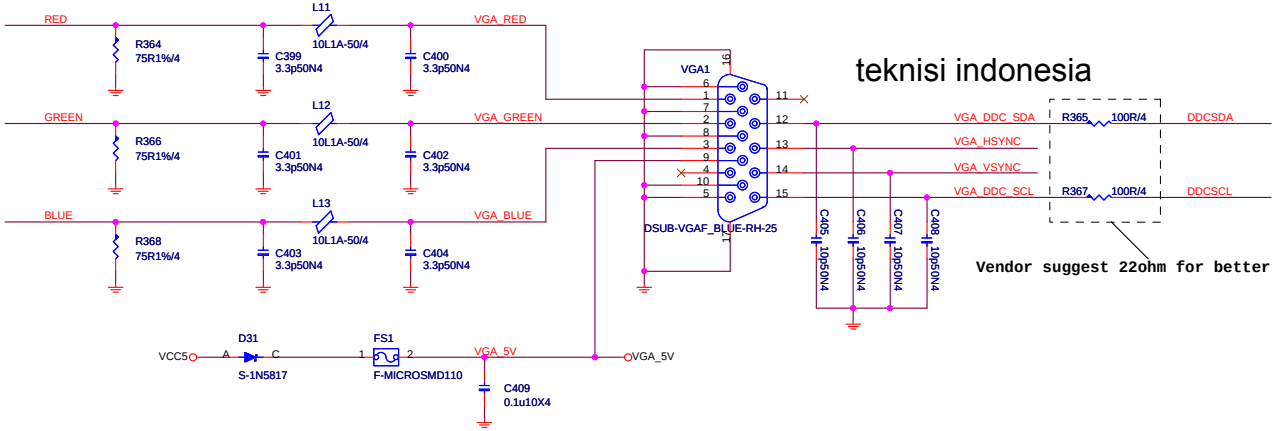


Close to PIN32



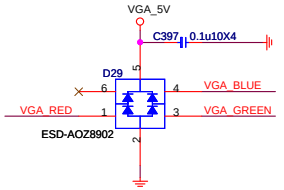


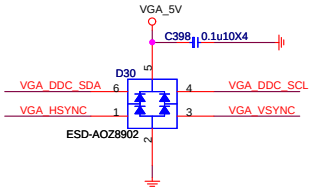




teknisi indonesia

Vendor suggest 22ohm for better I2C quality





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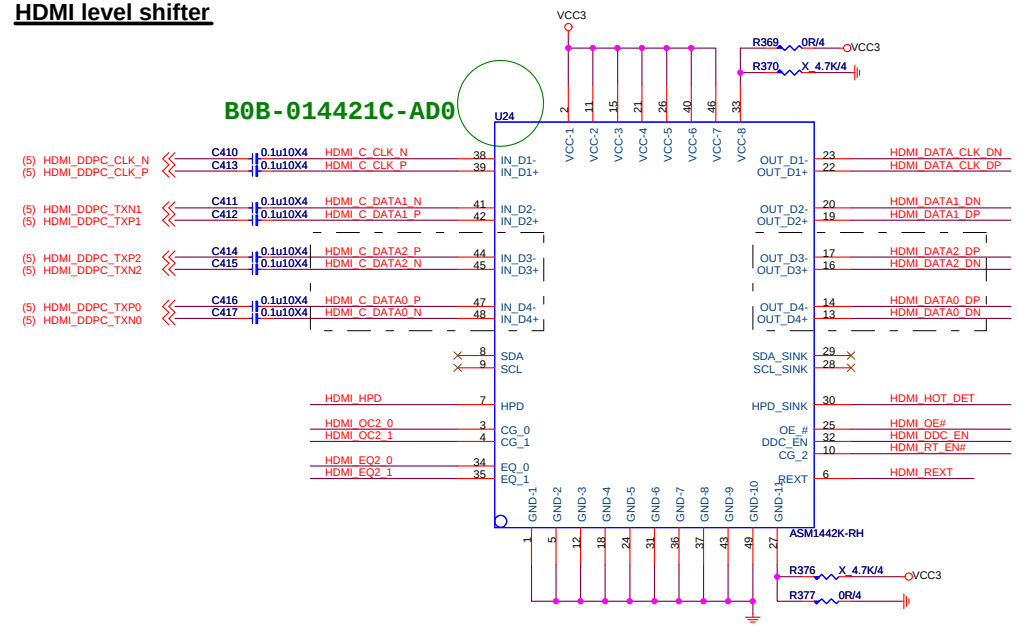
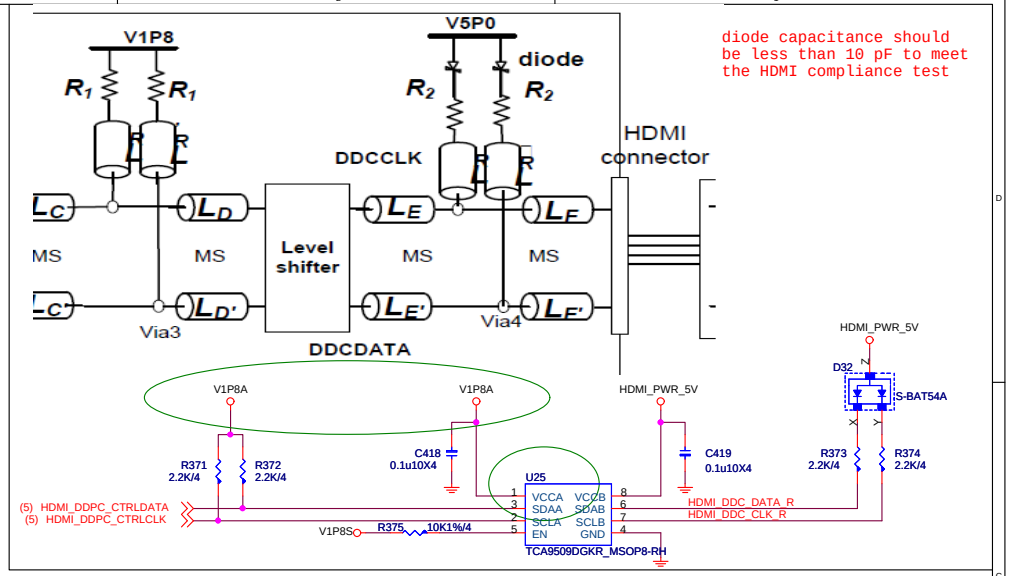
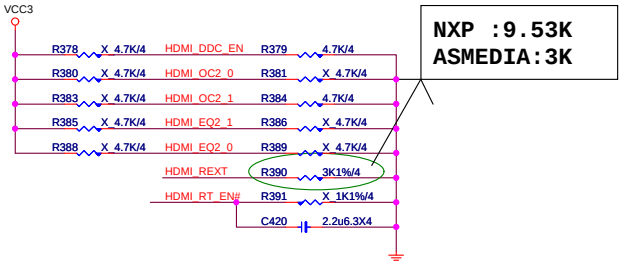
HDMI level shifter



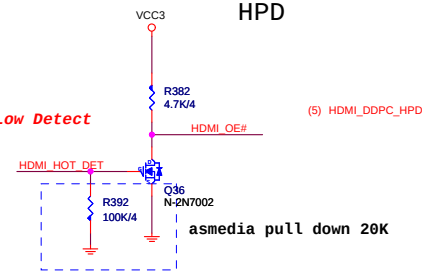


diode capacitance should be less than 10 pF to meet the HDMI compliance test



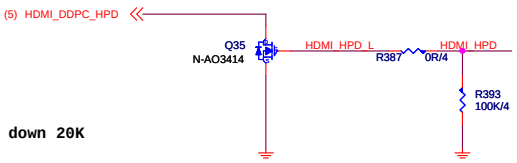
NXP :9.53K
ASMEDIA:3K

HPD

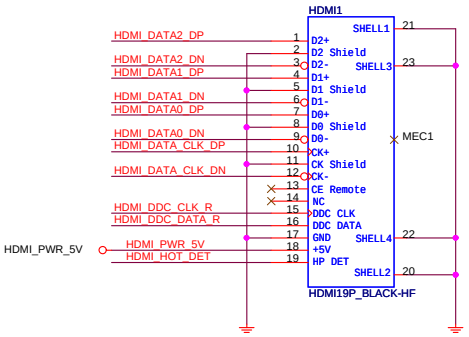


注意High/Low Detect

asmedia pull down 20K



I9B-9509D12-T07

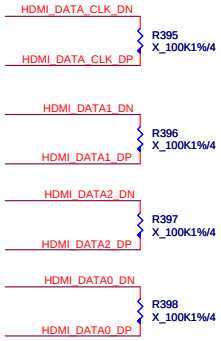


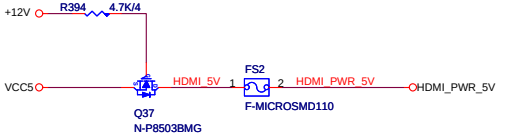
	"0"	"1"	note
DDC_EN	DDC level shifter disable	DDC level shifter enable	internal pull-up at ~500K ohm. internal pull-down at ~500K ohm.
RT_EN#	Input 50 ohm termination resistor enable	the input termination ; resistors are set to high impedances	
OE#	enable	the chip is power down and input termination resistors will be at high impedance.	internal pull-down at ~500K ohm.
HPD_SINK	disable	enable	internal pull-down at ~200K ohm; 5V tolerant.
DDCBUF_EN	For DDC level shifting configuration, please refer to Table.		internal pull-down at ~500K ohm.
REXT			analog current generation.

[DDC_EN, DDCBUF_EN, OE#]	DDC Passive Switch	DDC Active Buffer
1, 0, X	On	Off
1, 1, 0	Off	On
1, 1, 1	Off	Off
0, X, X	Off	Off

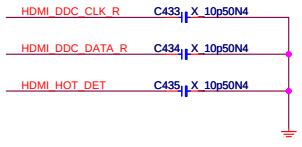
PC1, PC0		note
00	8 dB	internal pull-down at ~500K ohm.
01	4 dB	
10	12 dB	
11	0 dB	

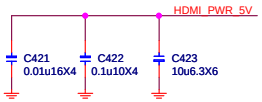
EMI

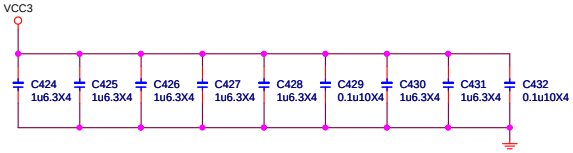




EMI cap.







MICRO-STAR INT'L CO.,LTD.

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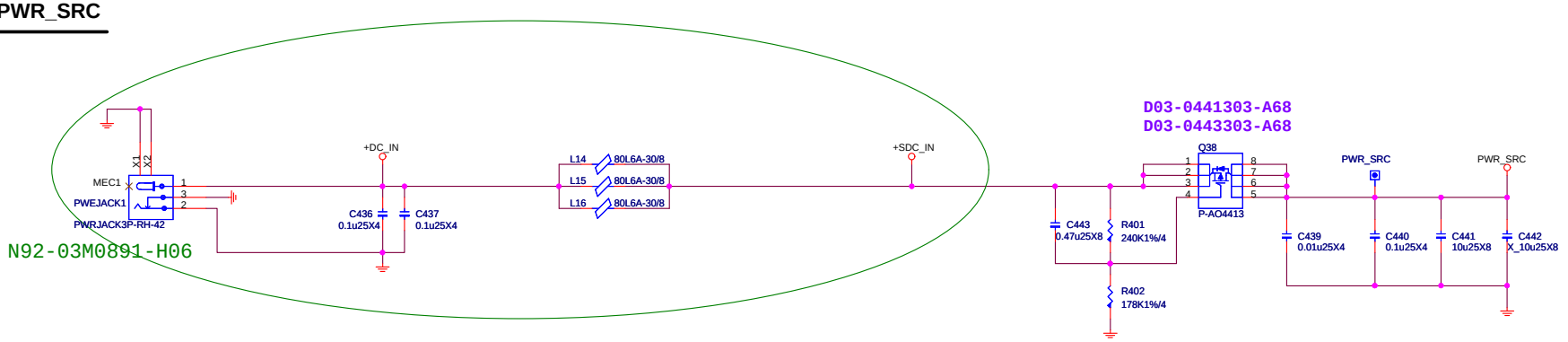
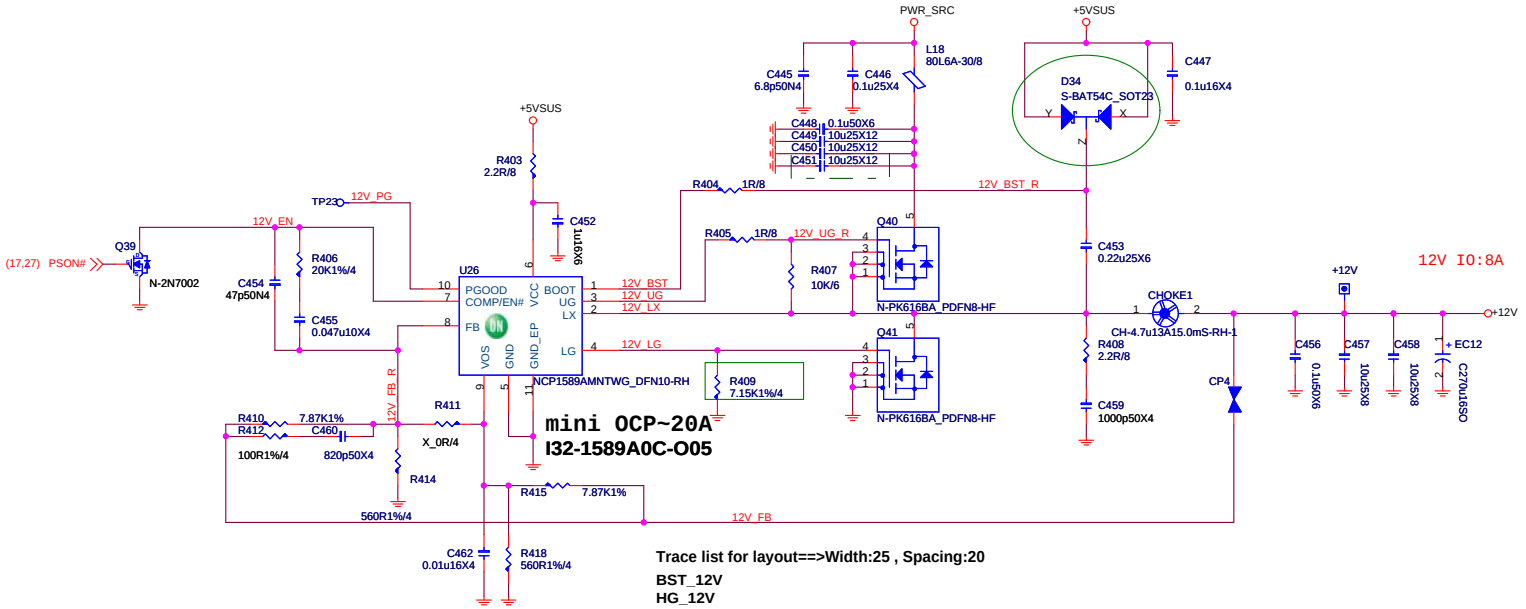
PWR_JACK & PWR_SRC



+12V POWER



Trace list for layout==>Width:25 , Spacing:20

BST_12V
HG_12V
PHASE_R_12V

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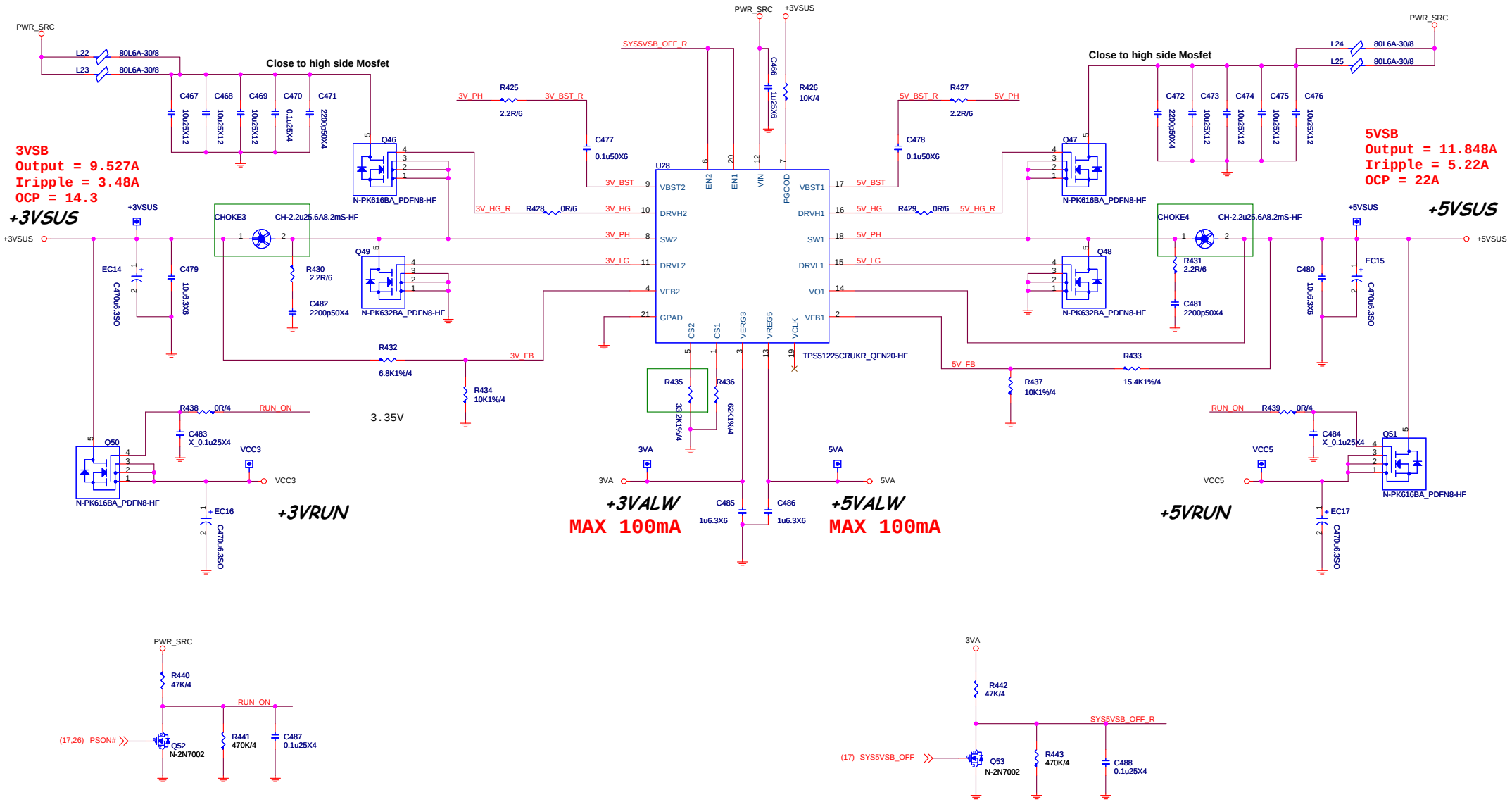
SYSTEM POWER

+5VSUS/+3VSUS/VCC5/VCC3

Table 4. Enabling/PGOOD State (TPS51225C)

EN1	EN2	VREG5	VREG3	CH1 (5Vout)	CH2 (3.3Vout)	VCLK	PGOOD
OFF	OFF	ON	ON	OFF	OFF	OFF	Low
ON	OFF	ON	ON	ON	OFF	ON	Low
OFF	ON	ON	ON	OFF	ON	OFF	Low
ON	ON	ON	ON	ON	ON	ON	High



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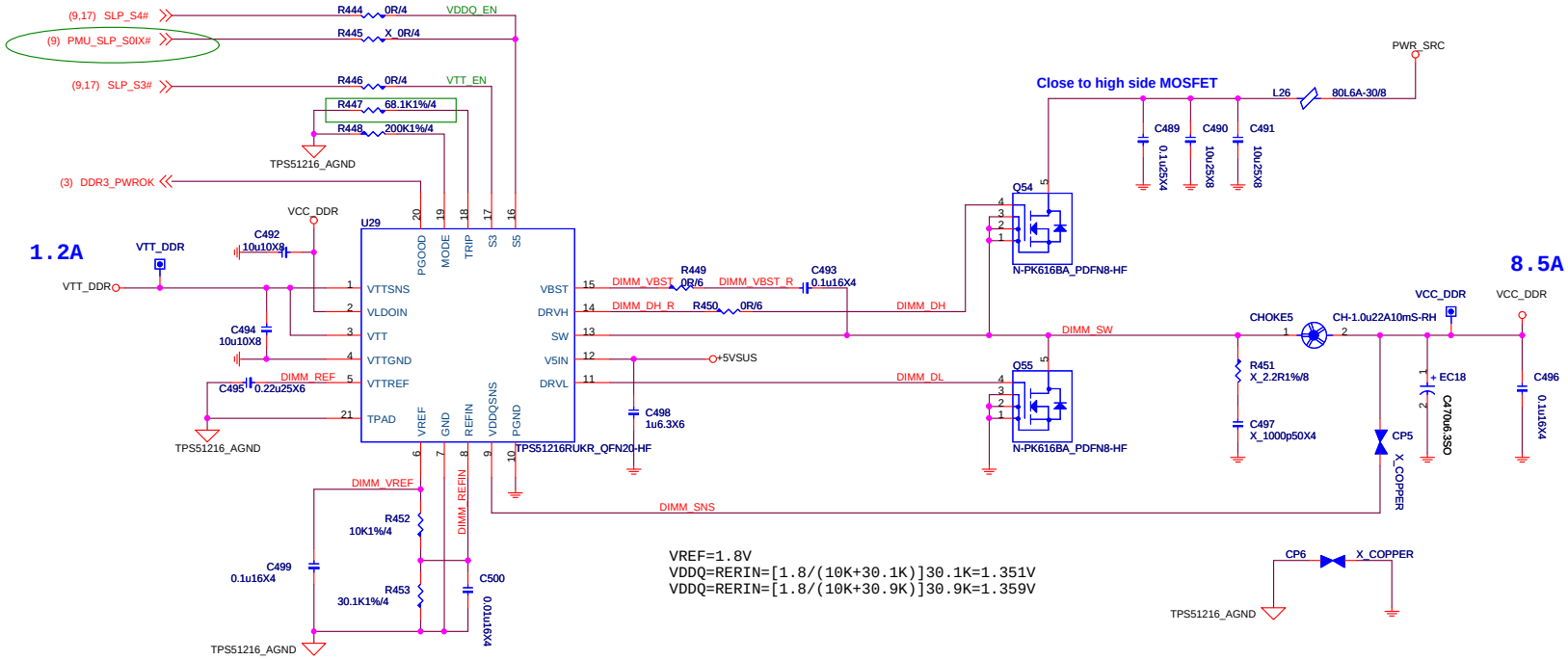
VCC_DDR/VTT_DDR POWER

S3/S5 Power State Control

STATE	S3	S5	VREF	VDDQ	VTTREF	VTT
S0	HI	HI	ON	ON	ON	ON
S3	LO	HI	ON	ON	ON	OFF(High-Z)
S4/S5	LO	LO	OFF	OFF(Discharge)	OFF(Discharge)	OFF(Discharge)



VREF=1.8V
VDDQ=RERIN=[1.8/(10K+30.1K)]30.1K=1.351V
VDDQ=RERIN=[1.8/(10K+30.9K)]30.9K=1.359V

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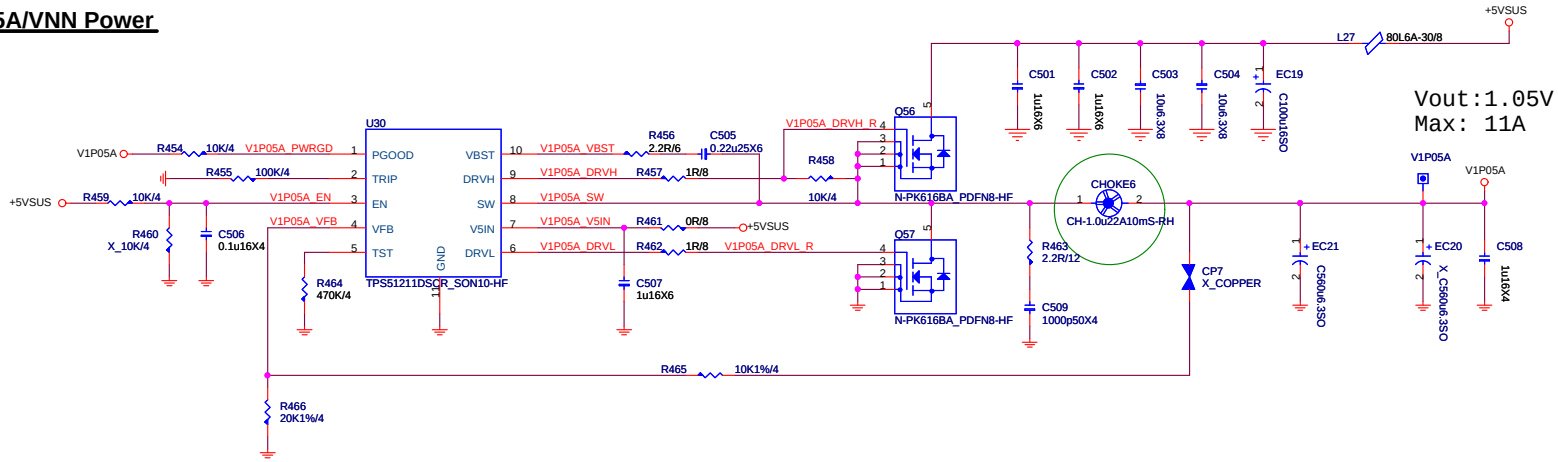
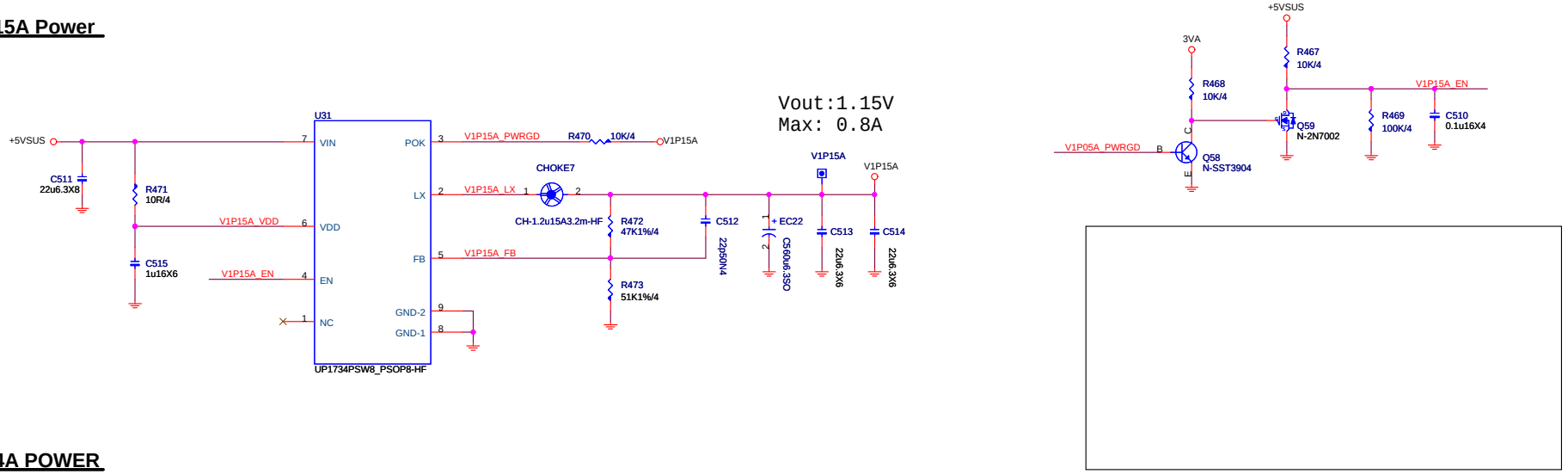
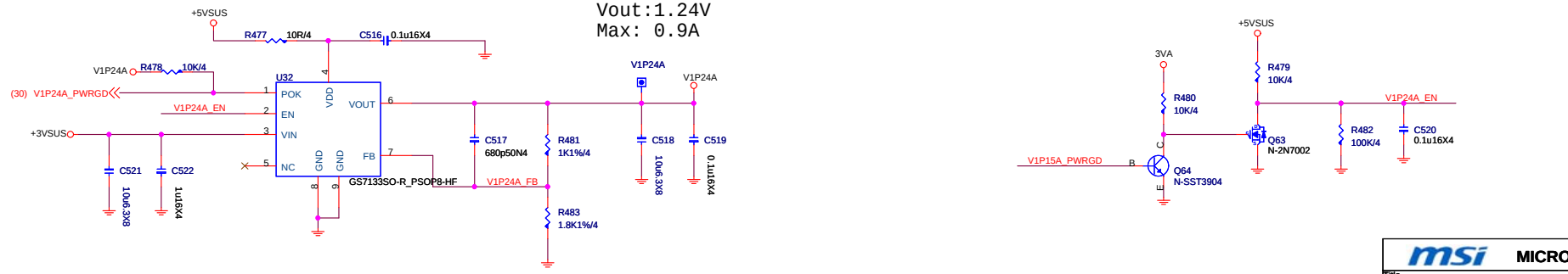
V1P05A/VNN Power



V1P15A Power



V1P24A POWER



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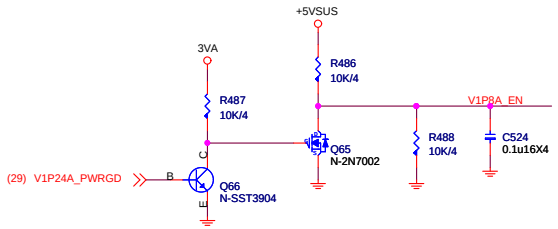
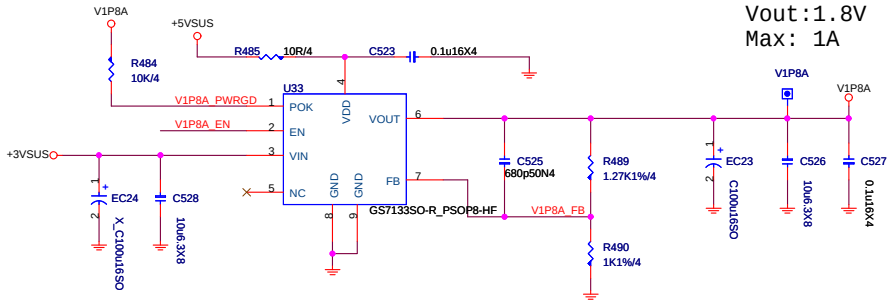
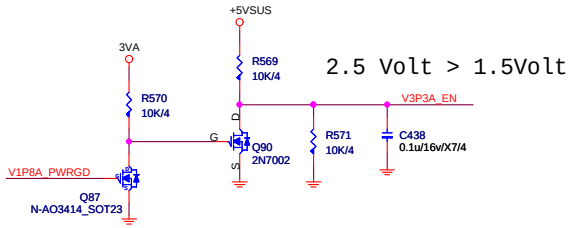
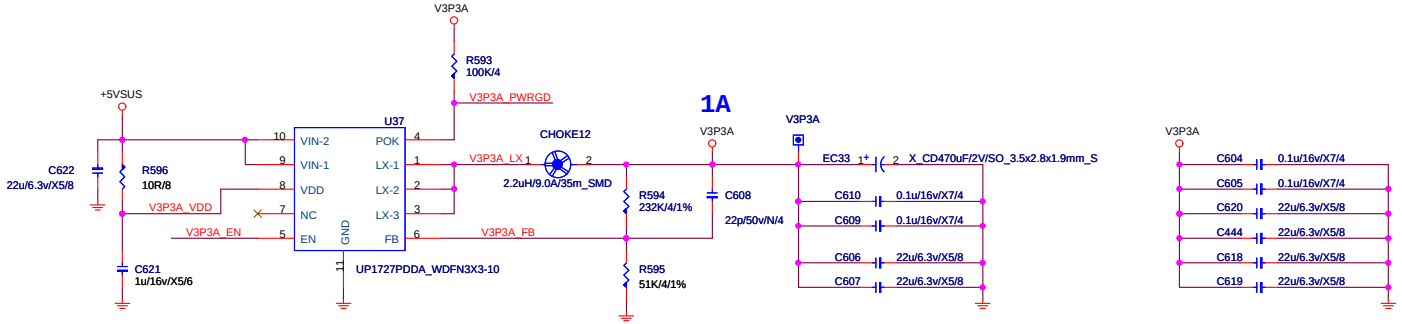
V1P8A POWER





V3P3A POWER





V1P5S Power

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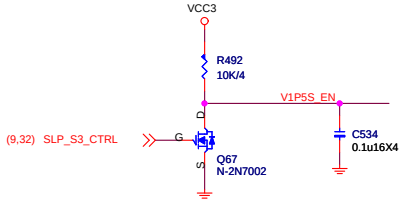
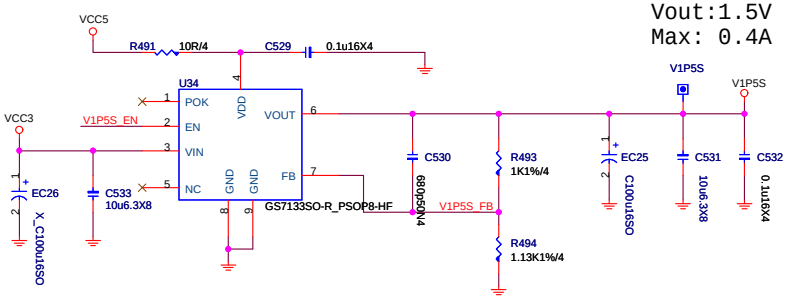
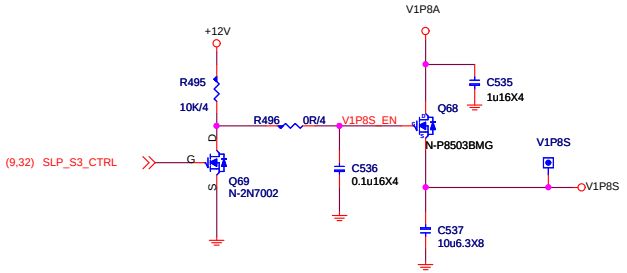




V1P8S Power



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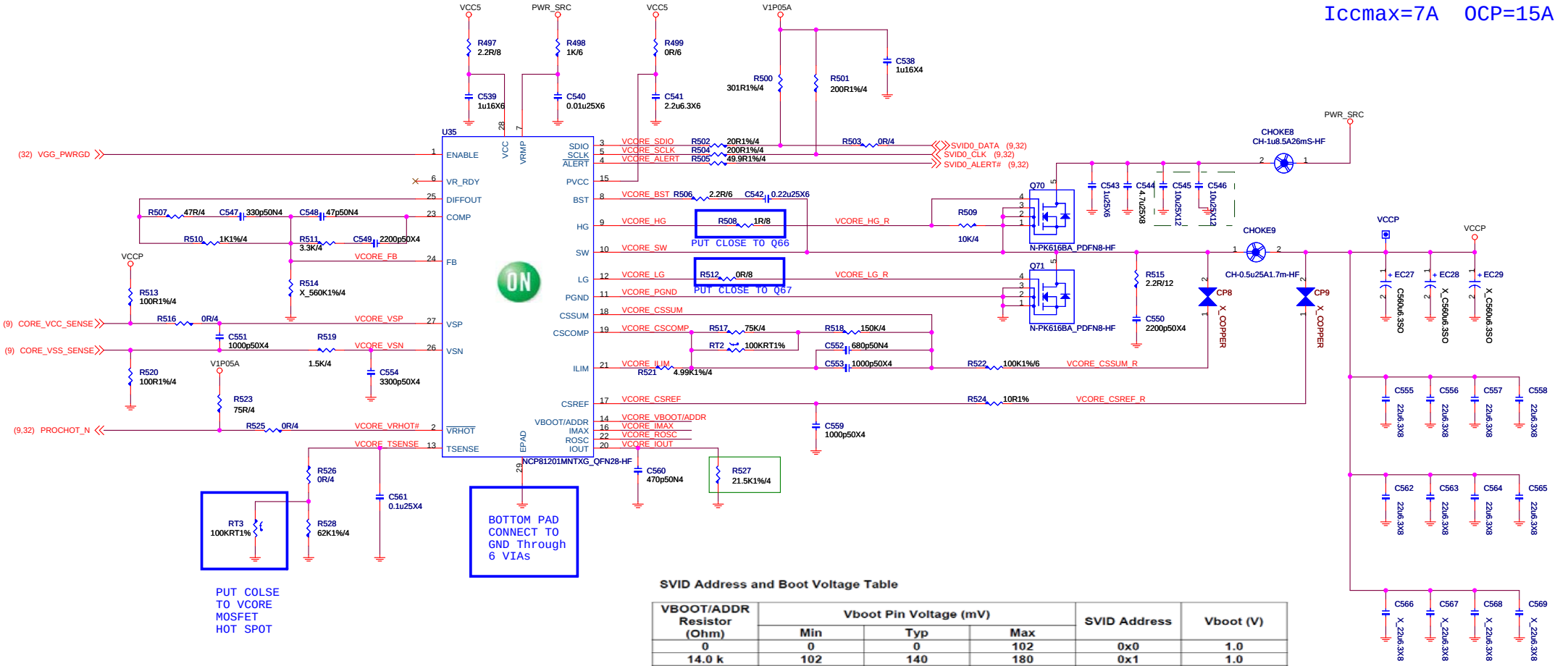
VCCP Power

BRASWELL - VCORE (SVID ADDRESS-00h)

Iccmax=7A OCP=15A



SVID Address and Boot Voltage Table

VBOOT/ADDR Resistor (Ohm)	Vboot Pin Voltage (mV)			SVID Address	Vboot (V)
	Min	Typ	Max		
0	0	0	102	0x0	1.0
14.0 k	102	140	180	0x1	1.0
22.1 k	180	219	258	0x2	1.0
30.1 k	258	301	344	0x3	1.0
39.2 k	344	391	438	0x4	1.0
48.7 k	438	484	531	0x5	1.0
57.6 k	531	578	625	0x6	1.0
68.1 k	625	676	727	0x7	1.0
78.7 k	727	781	836	0x8	1.1
88.7 k	836	894	953	0x0	1.1
100 k	953	1007	1062	0x1	1.1
113 k	1062	1125	1188	0x2	1.1
124 k	1188	1250	1312	0x3	1.1
137 k	1312	1378	1445	0x4	1.1
150 k	1445	1511	1578	0x5	1.1
165 k	1578	1648	1719	0x6	1.1
178 k	1719	1789	1859	0x7	1.1
196 k	1859	1950	-	0x8	1.1

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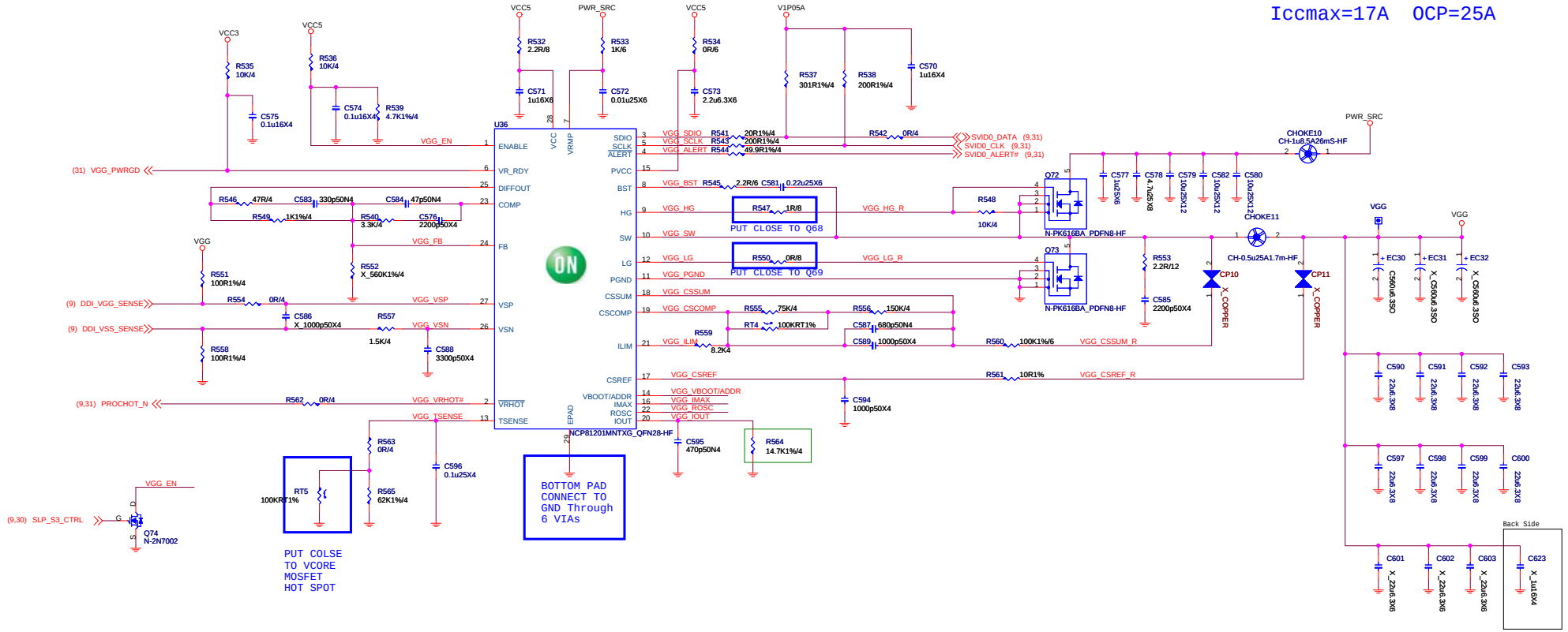
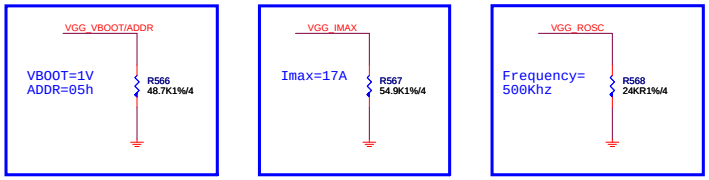
VGG Power

BRASWELL - VGG (SVID ADDRESS-05h)

Iccmax=17A OCP=25A





SVID Address and Boot Voltage Table

VBOOT/ADDR Resistor (Ohm)	Vboot Pin Voltage (mV)			SVID Address	Vboot (V)
	Min	Typ	Max		
0	0	0	102	0x0	1.0
14.0 k	102	140	180	0x1	1.0
22.1 k	180	219	258	0x2	1.0
30.1 k	258	301	344	0x3	1.0
39.2 k	344	391	438	0x4	1.0
48.7 k	438	484	531	0x5	1.0
57.6 k	531	578	625	0x6	1.0
68.1 k	625	676	727	0x7	1.0
78.7 k	727	781	836	0x8	1.1
88.7 k	836	894	953	0x0	1.1
100 k	953	1007	1062	0x1	1.1
113 k	1062	1125	1188	0x2	1.1
124 k	1188	1250	1312	0x3	1.1
137 k	1312	1378	1445	0x4	1.1
150 k	1445	1511	1578	0x5	1.1
165 k	1578	1648	1719	0x6	1.1
178 k	1719	1789	1859	0x7	1.1
196 k	1859	1950	-	0x8	1.1

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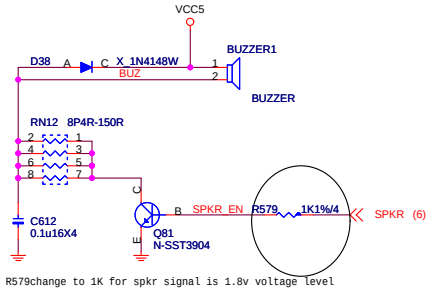
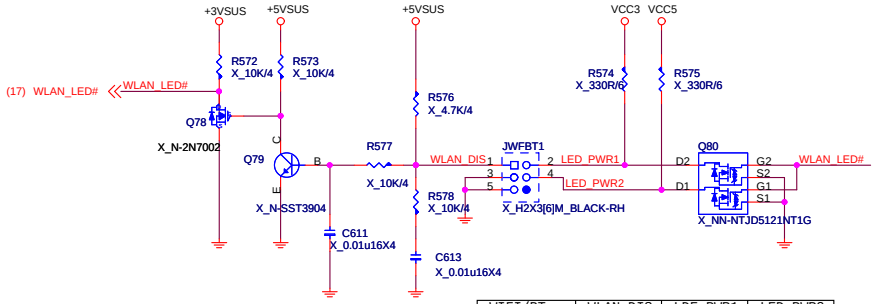
Speaker Pin Header



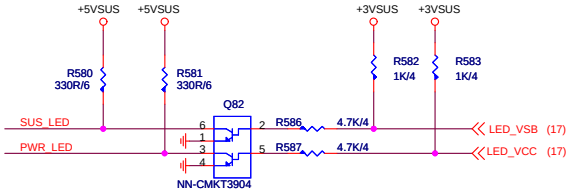
R579change to 1K for spkr signal is 1.8v voltage level

WIFI & BT LED

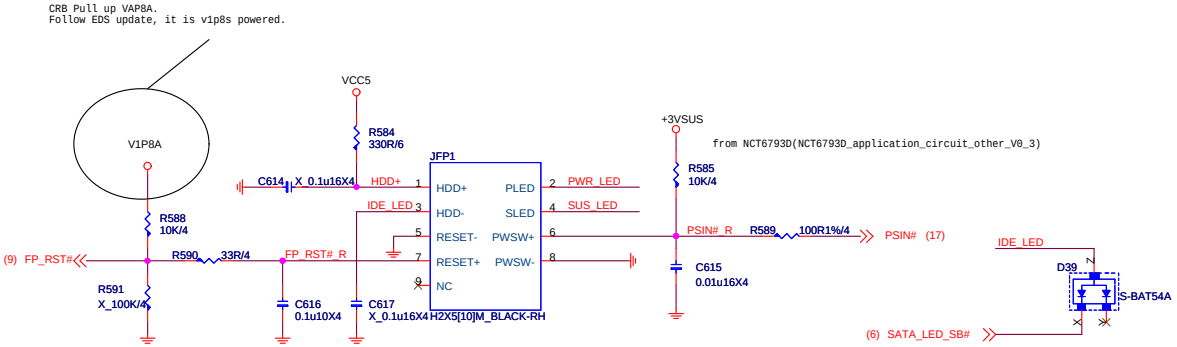


WIFI/BT	WLAN_DIS	LDE_PWR1	LED_PWR2
Enable	H	L	L
Disable	L	H	H

Power LED



FRONT PANNEL



EMI

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LABLE1

BIOS_LABLE

LABLE2

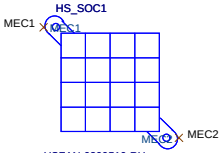
HDMI LABEL

CPU1

SOC-OPT

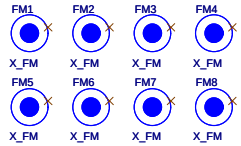
Simulation

SOC



HSFAN-0800510-RH

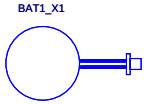
Optical Fiducial Marks-120



PCB1

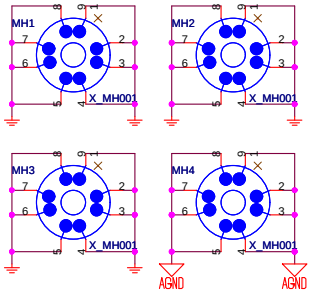
G019-0A

BAT1_X1



BAT-CR2032

Mounting Holes



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