MS-7D20

mATX
Ver: 10

RKL Platform

CPU:

Comet lake S 35W

System Chipset:

B560 PCH_V

Onboard Chip:

HD Audio Codec : ALC897
LAN : RTL8125B-CG COLAY RT8111K
SIO : NTC6687
Flash ROM: SPI 256 MB X1

VGA Output:

HDMI Port
DVI Port
VGA Port

Main Memory:

*DDRIV (2666MHz) * 2*

PWM:

IMVP8 -NCP81267

ACPI:

LDO

Expansion Slots:

*PCI Express (X16) Slot * 1*
*PCI Express (X1) Slot * 2*
*M.2 Slot * 1*

Other:

*SATA3.0 *6*
*PS2 * 1*
*REAL USB3.1 *2*
REAL USB3.0 LAN_USB
*FRONT USB3.1 *2*
*FRONT USB2.0 *4*

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Size	Document Description	Rev
Custom	Cover Sheet	10

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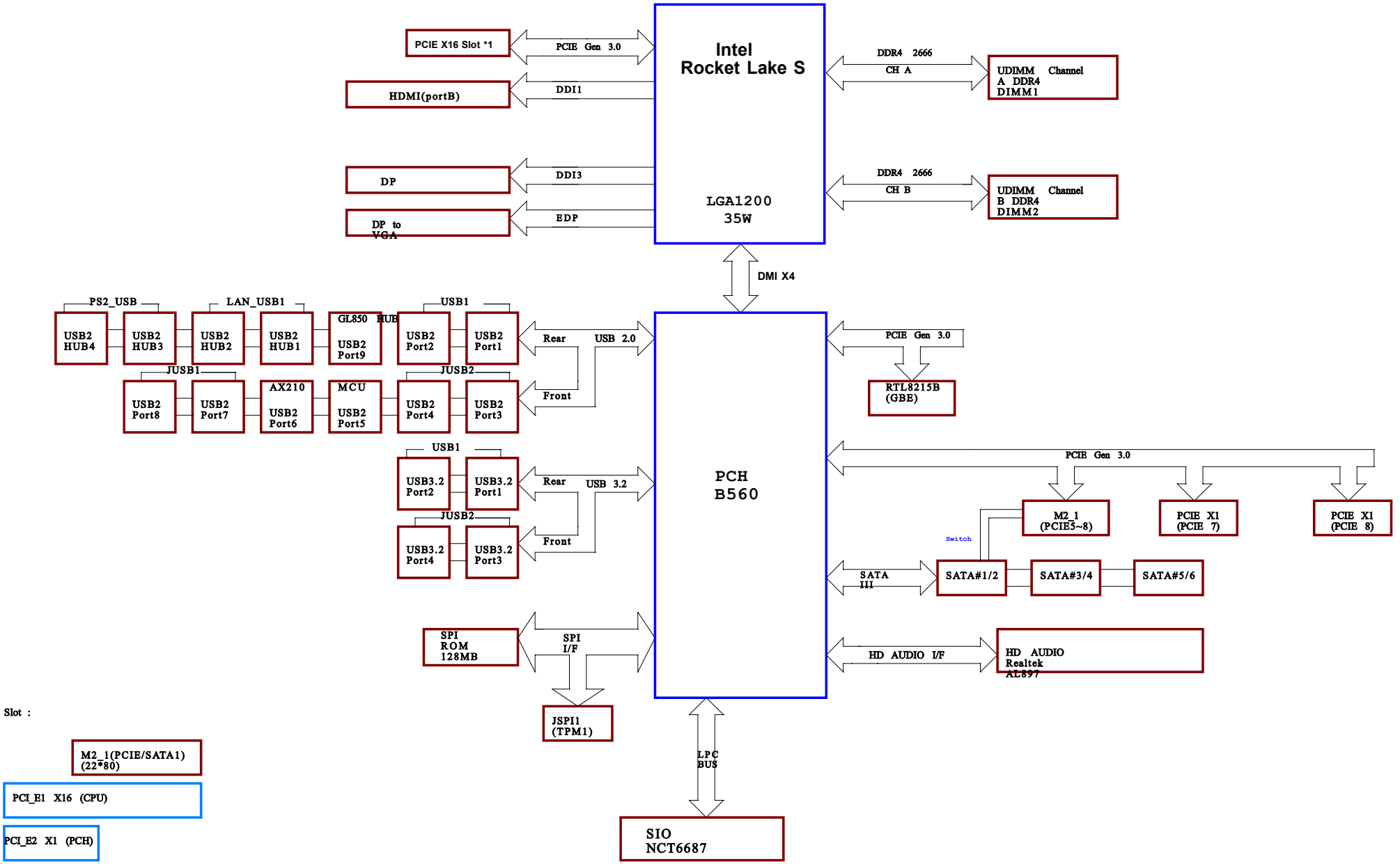
MS-7D20 Block Diagram



Slot :

M2_1(PCIE/SATA1) (22*80)

PCI_E1 X16 (CPU)

PCI_E2 X1 (PCH)

PCI_E3 X1 (PCH)

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Size	Document Description	Rev
Custom	Block Diagram	10

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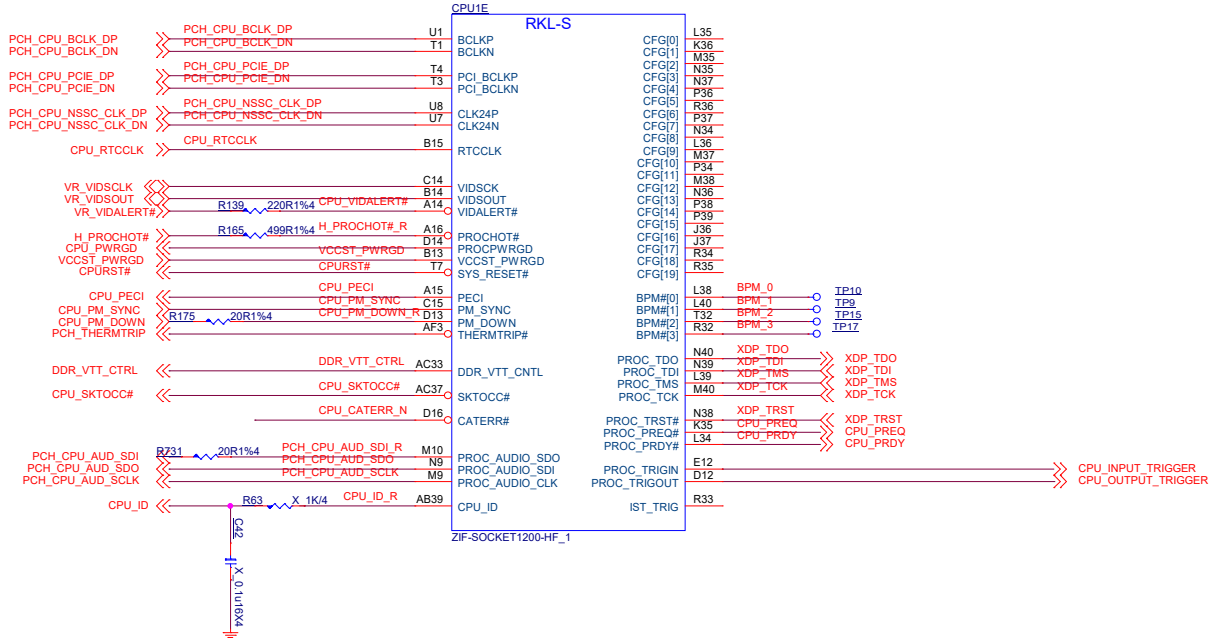


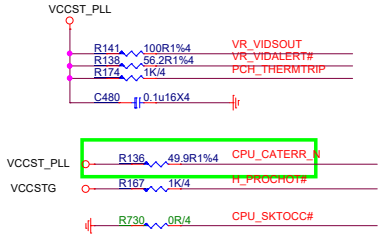
JTAG

PLACE R WITHIN 1.5" OF CPU

XDP_TCK R500 51R/4

PLACE R WITHIN 1.1" OF CPU

XDP_TRST R416 X_51R/4



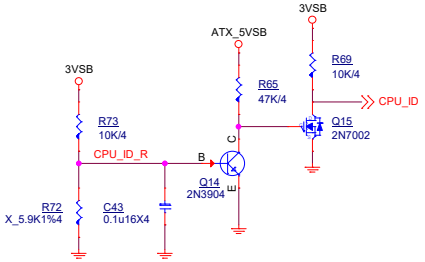
CFG Strap

CFG Table

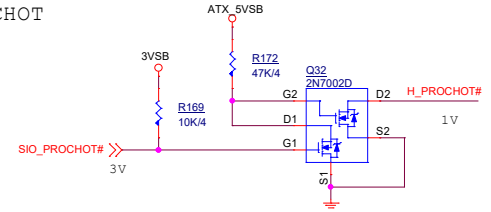
	HIGH	LOW	DESCRIPTION
0	No stall	Stall	PCU PLL lock
1			RSVD
2	NORM	REVERSE	PEG_LANE_REVERSAL
3			RSVD
4	DISABLE	ENABLE	eDP
5			PCIE Bifurcation
6			PCIE Bifurcation
7	Follow RESET#	Wait for BIOS	PEG_TRAINING
8			RSVD
9			RSVD
10			RSVD
11			RSVD
12			RSVD
13			RSVD
14			RSVD
15			RSVD
16			RSVD
17			RSVD
18			RSVD
19			RSVD

CFG5 ENABLE#	CFG6	SLOT	SLOT	SLOT
X8	X4			
0	0	X8	X4	X4
0	1	X8	X8	X0
1	0	RSVD	RSVD	RSVD
1	1	X16	X0	X0

CPU_ID



PROCHOT



MICRO-STAR INT'L CO.,LTD

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Size	Document Description	Rev
Custom	CPU-Control/MISC/CFG	10

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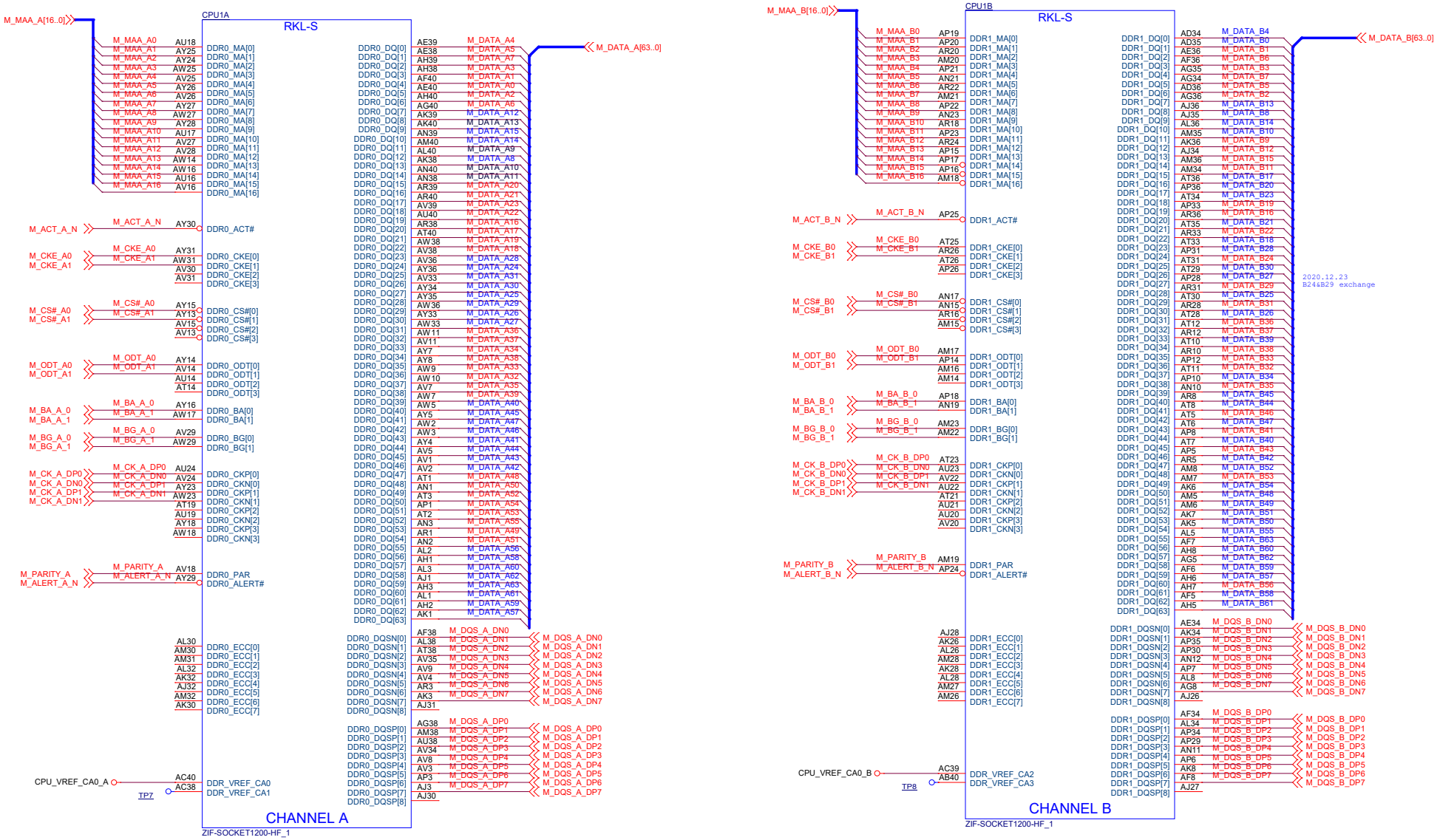

MICRO-STAR INT'L CO.,LTD

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Size	Document Description	Rev
Custom	CPU-Memory	10

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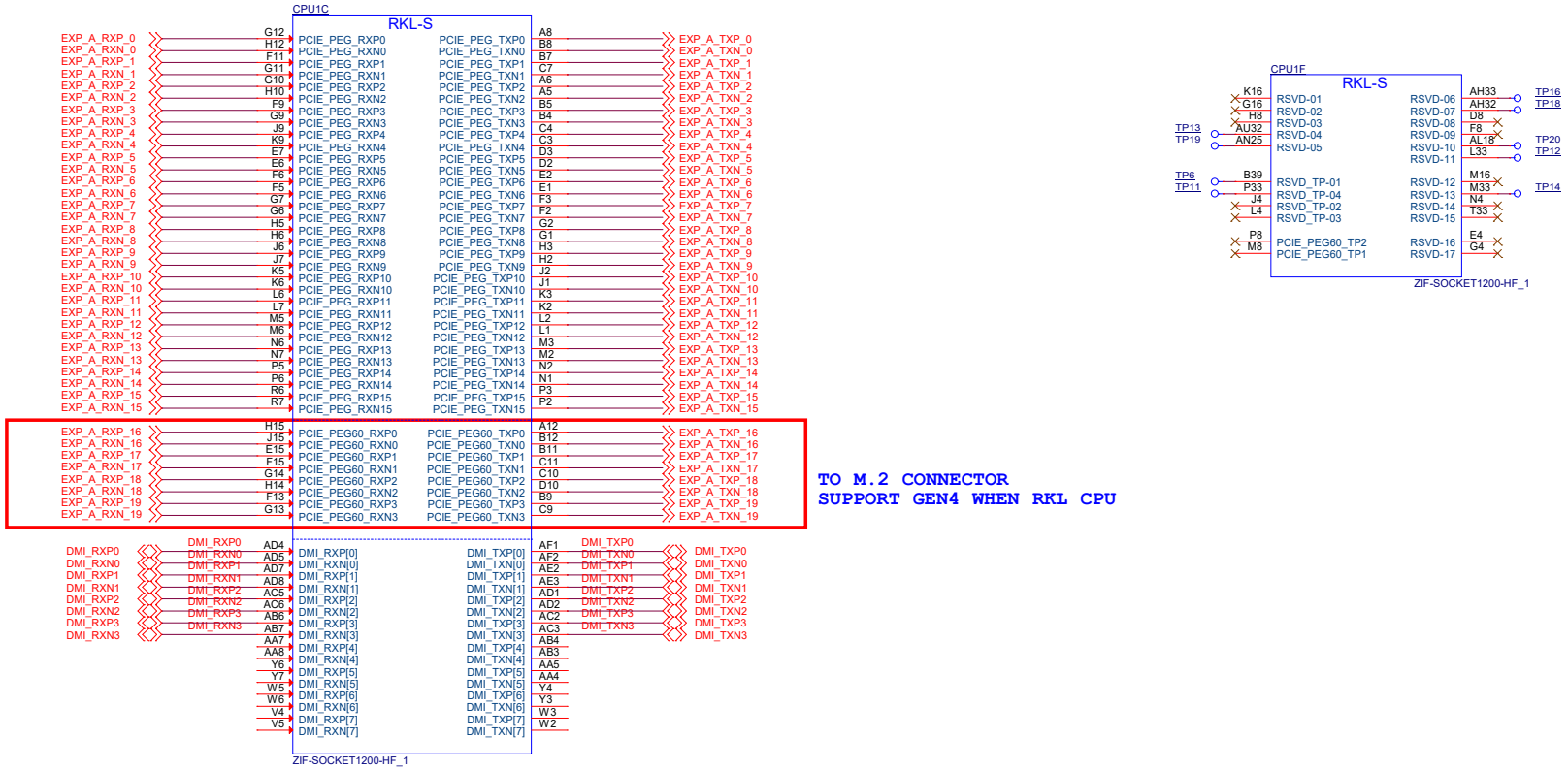
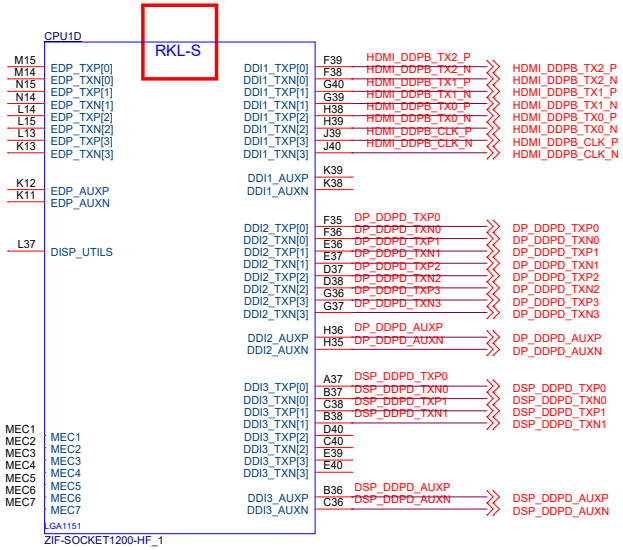


TO M.2 CONNECTOR
SUPPORT GEN4 WHEN RKL CPU



HDMI

DP

DP to VGA

MICRO-STAR INT'L CO.,LTD	
MS-7D20	
Size: Custom	Document Description: CPU-PEG/Display/RSD
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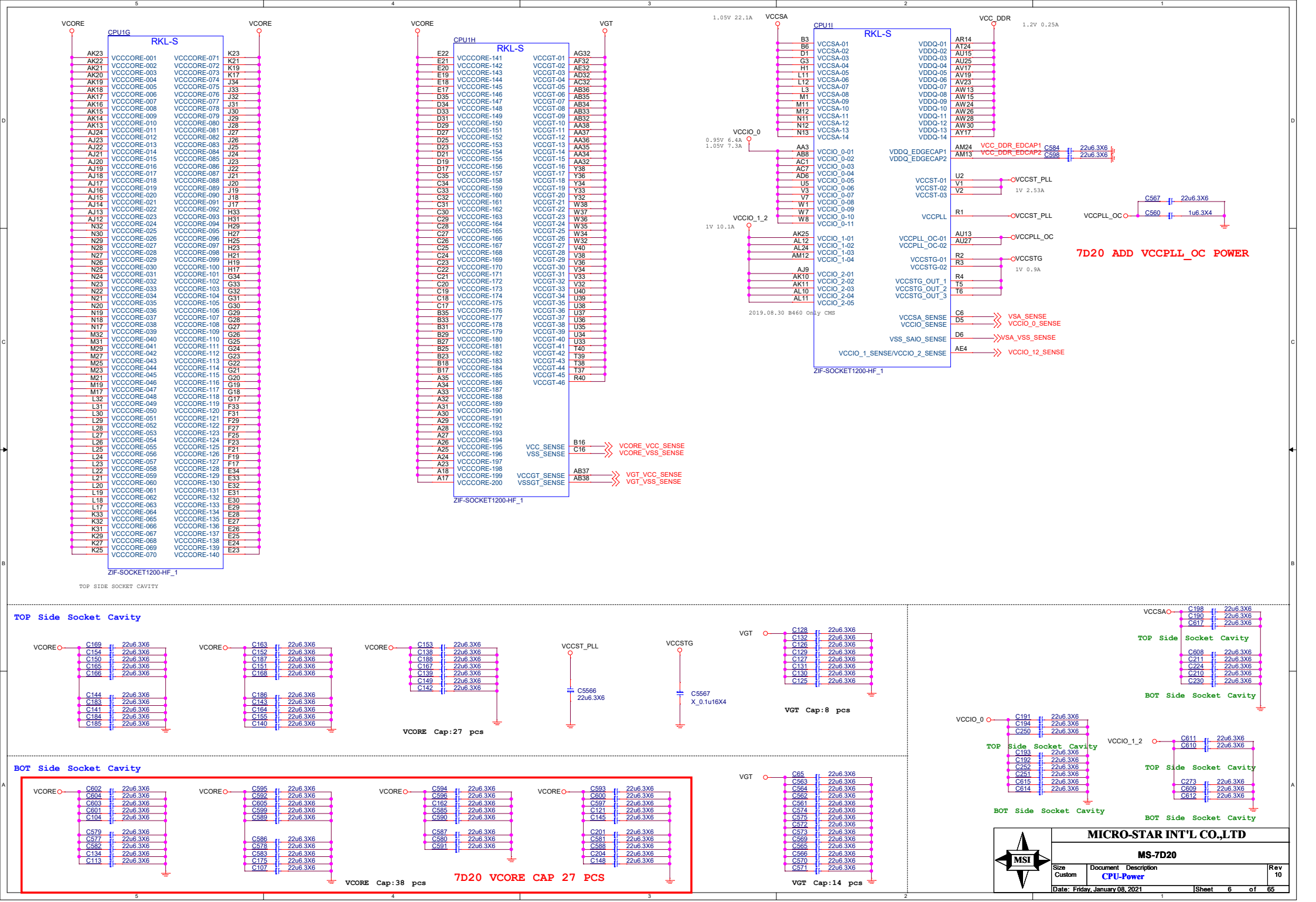
CPU1G
RKL-S
VCORE
VCCCORE-001 VCCCORE-002 VCCCORE-003 VCCCORE-004 VCCCORE-005 VCCCORE-006 VCCCORE-007 VCCCORE-008 VCCCORE-009 VCCCORE-010 VCCCORE-011 VCCCORE-012 VCCCORE-013 VCCCORE-014 VCCCORE-015 VCCCORE-016 VCCCORE-017 VCCCORE-018 VCCCORE-019 VCCCORE-020 VCCCORE-021 VCCCORE-022 VCCCORE-023 VCCCORE-024 VCCCORE-025 VCCCORE-026 VCCCORE-027 VCCCORE-028 VCCCORE-029 VCCCORE-030 VCCCORE-031 VCCCORE-032 VCCCORE-033 VCCCORE-034 VCCCORE-035 VCCCORE-036 VCCCORE-037 VCCCORE-038 VCCCORE-039 VCCCORE-040 VCCCORE-041 VCCCORE-042 VCCCORE-043 VCCCORE-044 VCCCORE-045 VCCCORE-046 VCCCORE-047 VCCCORE-048 VCCCORE-049 VCCCORE-050 VCCCORE-051 VCCCORE-052 VCCCORE-053 VCCCORE-054 VCCCORE-055 VCCCORE-056 VCCCORE-057 VCCCORE-058 VCCCORE-059 VCCCORE-060 VCCCORE-061 VCCCORE-062 VCCCORE-063 VCCCORE-064 VCCCORE-065 VCCCORE-066 VCCCORE-067 VCCCORE-068 VCCCORE-069 VCCCORE-070
VCCCORE-071 VCCCORE-072 VCCCORE-073 VCCCORE-074 VCCCORE-075 VCCCORE-076 VCCCORE-077 VCCCORE-078 VCCCORE-079 VCCCORE-080 VCCCORE-081 VCCCORE-082 VCCCORE-083 VCCCORE-084 VCCCORE-085 VCCCORE-086 VCCCORE-087 VCCCORE-088 VCCCORE-089 VCCCORE-090 VCCCORE-091 VCCCORE-092 VCCCORE-093 VCCCORE-094 VCCCORE-095 VCCCORE-096 VCCCORE-097 VCCCORE-098 VCCCORE-099 VCCCORE-100 VCCCORE-101 VCCCORE-102 VCCCORE-103 VCCCORE-104 VCCCORE-105 VCCCORE-106 VCCCORE-107 VCCCORE-108 VCCCORE-109 VCCCORE-110 VCCCORE-111 VCCCORE-112 VCCCORE-113 VCCCORE-114 VCCCORE-115 VCCCORE-116 VCCCORE-117 VCCCORE-118 VCCCORE-119 VCCCORE-120 VCCCORE-121 VCCCORE-122 VCCCORE-123 VCCCORE-124 VCCCORE-125 VCCCORE-126 VCCCORE-127 VCCCORE-128 VCCCORE-129 VCCCORE-130 VCCCORE-131 VCCCORE-132 VCCCORE-133 VCCCORE-134 VCCCORE-135 VCCCORE-136 VCCCORE-137 VCCCORE-138 VCCCORE-139 VCCCORE-140
ZIF-SOCKET1200-HF_1
TOP SIDE SOCKET CAVITY
CPU1H
RKL-S
VGT
VCCCORE-141 VCCCORE-142 VCCCORE-143 VCCCORE-144 VCCCORE-145 VCCCORE-146 VCCCORE-147 VCCCORE-148 VCCCORE-149 VCCCORE-150 VCCCORE-151 VCCCORE-152 VCCCORE-153 VCCCORE-154 VCCCORE-155 VCCCORE-156 VCCCORE-157 VCCCORE-158 VCCCORE-159 VCCCORE-160 VCCCORE-161 VCCCORE-162 VCCCORE-163 VCCCORE-164 VCCCORE-165 VCCCORE-166 VCCCORE-167 VCCCORE-168 VCCCORE-169 VCCCORE-170 VCCCORE-171 VCCCORE-172 VCCCORE-173 VCCCORE-174 VCCCORE-175 VCCCORE-176 VCCCORE-177 VCCCORE-178 VCCCORE-179 VCCCORE-180 VCCCORE-181 VCCCORE-182 VCCCORE-183 VCCCORE-184 VCCCORE-185 VCCCORE-186 VCCCORE-187 VCCCORE-188 VCCCORE-189 VCCCORE-190 VCCCORE-191 VCCCORE-192 VCCCORE-193 VCCCORE-194 VCCCORE-195 VCCCORE-196 VCCCORE-197 VCCCORE-198 VCCCORE-199 VCCCORE-200
VCCGT-01 VCCGT-02 VCCGT-03 VCCGT-04 VCCGT-05 VCCGT-06 VCCGT-07 VCCGT-08 VCCGT-09 VCCGT-10 VCCGT-11 VCCGT-12 VCCGT-13 VCCGT-14 VCCGT-15 VCCGT-16 VCCGT-17 VCCGT-18 VCCGT-19 VCCGT-20 VCCGT-21 VCCGT-22 VCCGT-23 VCCGT-24 VCCGT-25 VCCGT-26 VCCGT-27 VCCGT-28 VCCGT-29 VCCGT-30 VCCGT-31 VCCGT-32 VCCGT-33 VCCGT-34 VCCGT-35 VCCGT-36 VCCGT-37 VCCGT-38 VCCGT-39 VCCGT-40 VCCGT-41 VCCGT-42 VCCGT-43 VCCGT-44 VCCGT-45 VCCGT-46
VCC_SENSE
VSS_SENSE
VCORE_VCC_SENSE
VCORE_VSS_SENSE
VCCGT_SENSE
VSSGT_SENSE
VGT_VCC_SENSE
VGT_VSS_SENSE
ZIF-SOCKET1200-HF_1
1.05V 22.1A
VCCSA
CPU1I
RKL-S
VCCSA-01 VCCSA-02 VCCSA-03 VCCSA-04 VCCSA-05 VCCSA-06 VCCSA-07 VCCSA-08 VCCSA-09 VCCSA-10 VCCSA-11 VCCSA-12 VCCSA-13 VCCSA-14
VDDQ-01 VDDQ-02 VDDQ-03 VDDQ-04 VDDQ-05 VDDQ-06 VDDQ-07 VDDQ-08 VDDQ-09 VDDQ-10 VDDQ-11 VDDQ-12 VDDQ-13 VDDQ-14
VDDQ_EDGECAP1
VDDQ_EDGECAP2
VCC_DDR_EDCAP1
VCC_DDR_EDCAP2
C584 22u6.3X6
C598 22u6.3X6
VCC_DDR
1.2V 0.25A
VCCIO_0
0.95V 6.4A
1.05V 7.3A
VCCIO_0-01 VCCIO_0-02 VCCIO_0-03 VCCIO_0-04 VCCIO_0-05 VCCIO_0-06 VCCIO_0-07 VCCIO_0-08 VCCIO_0-09 VCCIO_0-10 VCCIO_0-11
VCCST-01 VCCST-02 VCCST-03
VCCST_PLL
1V 2.53A
VCCPLL
VCCPLL_PLL
VCCPLL_OC-01 VCCPLL_OC-02
VCCPLL_OC
C567 22u6.3X6
C560 1u6.3X4
VCCIO_1_2
1V 10.1A
VCCIO_1-01 VCCIO_1-02 VCCIO_1-03 VCCIO_1-04
VCCIO_2-01 VCCIO_2-02 VCCIO_2-03 VCCIO_2-04 VCCIO_2-05
VCCSTG-01 VCCSTG-02
VCCSTG
1V 0.9A
VCCSTG_OUT_1 VCCSTG_OUT_2 VCCSTG_OUT_3
2019.08.30 B460 Only CMS
VCCSA_SENSE
VCCIO_SENSE
VSA_SENSE
VCCIO_0_SENSE
VSS_SAIO_SENSE
VSA_VSS_SENSE
VCCIO_1_SENSE/VCCIO_2_SENSE
VCCIO_12_SENSE
ZIF-SOCKET1200-HF_1
7D20 ADD VCCPLL_OC POWER
TOP Side Socket Cavity
VCORE
C169 C154 C150 C165 C166 C144 C183 C141 C184 C185
C163 C152 C187 C151 C168 C186 C143 C164 C155 C140
C153 C138 C188 C167 C139 C149 C142
22u6.3X6
VCORE Cap:27 pcs
VCCST_PLL
C5566 22u6.3X6
VCCSTG
C5567 X_0.1u16X4
VGT
C128 C132 C126 C129 C127 C131 C130 C125
VGT Cap:8 pcs
VCCSA
C198 C190 C617 C608 C211 C224 C210 C230
VCCIO_0
C191 C194 C250 C193 C192 C252 C251 C615 C614
VCCIO_1_2
C611 C610 C273 C609 C612
BOT Side Socket Cavity
C602 C604 C603 C601 C104 C579 C577 C582 C134 C113
C595 C592 C605 C599 C589 C586 C578 C583 C175 C107
C594 C596 C162 C585 C590 C587 C580 C591
C593 C600 C597 C121 C145 C201 C581 C588 C204 C148
VCORE Cap:38 pcs
7D20 VCORE CAP 27 PCS
C65 C563 C564 C562 C561 C574 C575 C572 C573 C569 C565 C566 C570 C571
VGT Cap:14 pcs
MICRO-STAR INT'L CO.,LTD
MS-7D20
Size Custom
Document Description CPU-Power
Rev 10
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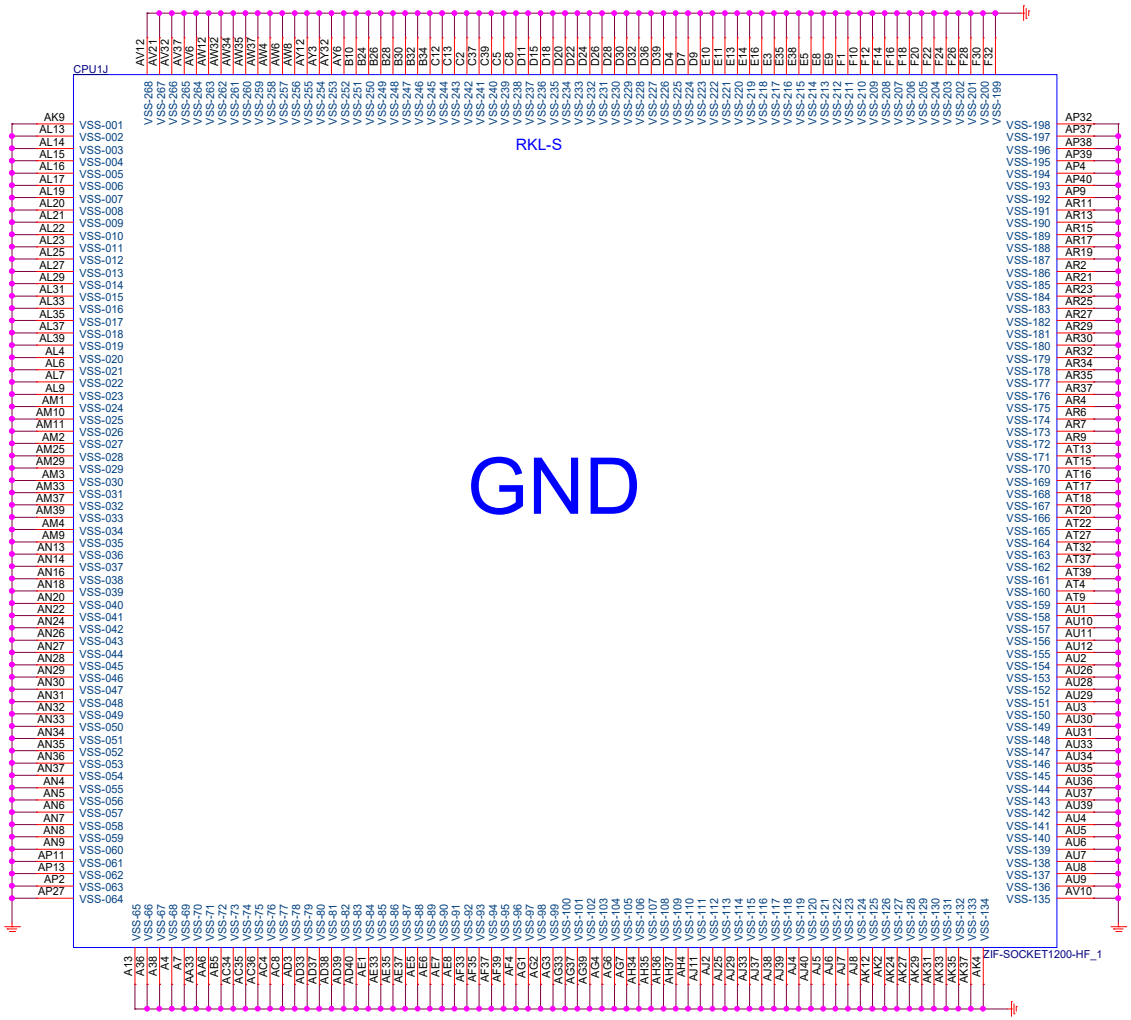

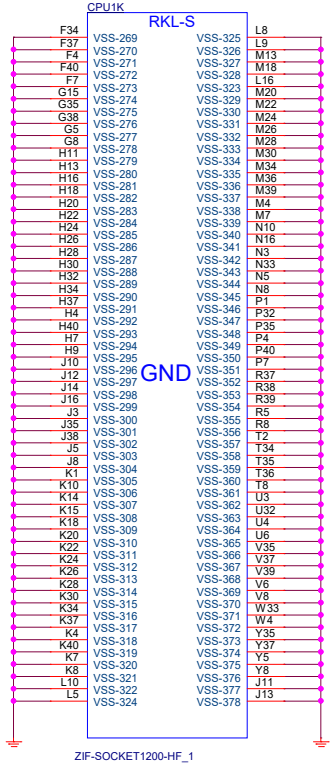

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MS-7D20			
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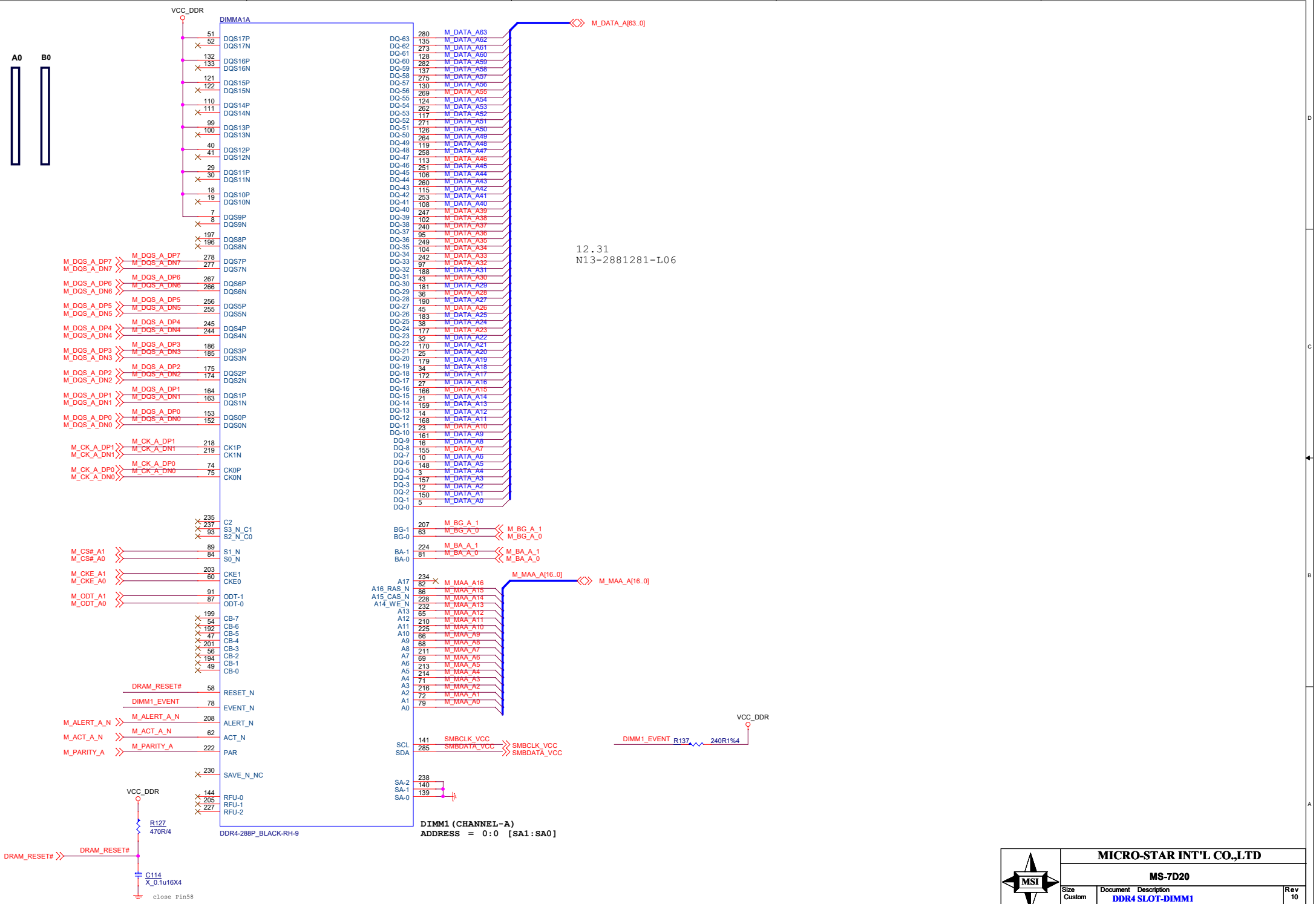
A0
B0
VCC_DDR
DIMMA1A
M_DATA_A[63..0]
12.31
N13-2881281-L06
M_MAA_A[16..0]
M_BG_A_1
M_BG_A_0
M_BA_A_1
M_BA_A_0
SMBCLK_VCC
SMBDATA_VCC
DIMM1_EVENT
R137
240R1%4
R127
470R/4
DRAM_RESET#
C114
X_0.1u16X4
close Pin58
DDR4-288P_BLACK-RH-9
DIMM1(CHANNEL-A)
ADDRESS = 0:0 [SA1:SA0]
MICRO-STAR INT'L CO.,LTD
MS-7D20
Size
Custom
Document Description
DDR4 SLOT-DIMM1
Rev
10
Date: Friday, January 08, 2021
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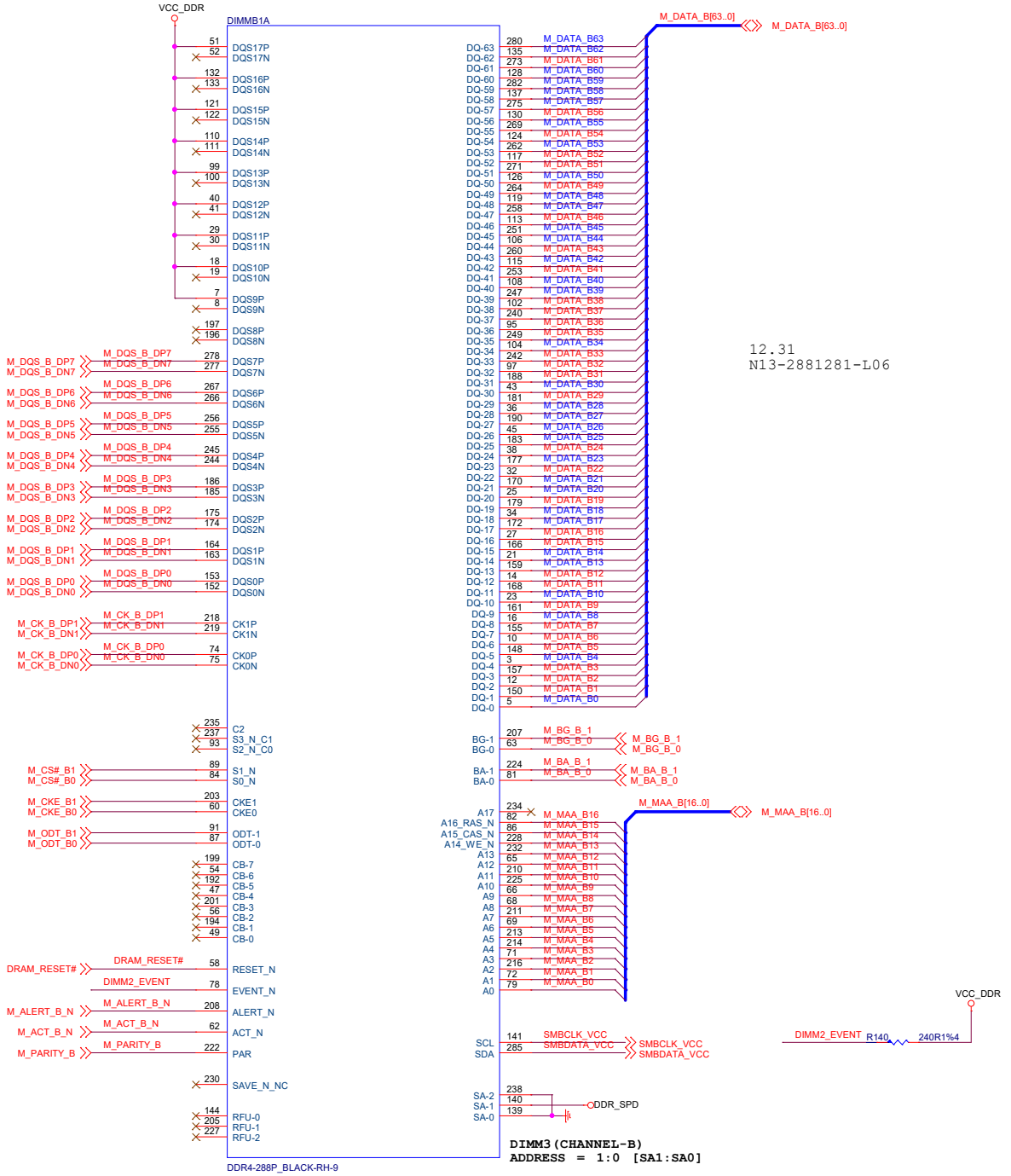

MICRO-STAR INT'L CO.,LTD	
MS-7D20	
Size: Custom	Document Description: DDR4 SLOT-DIMM2
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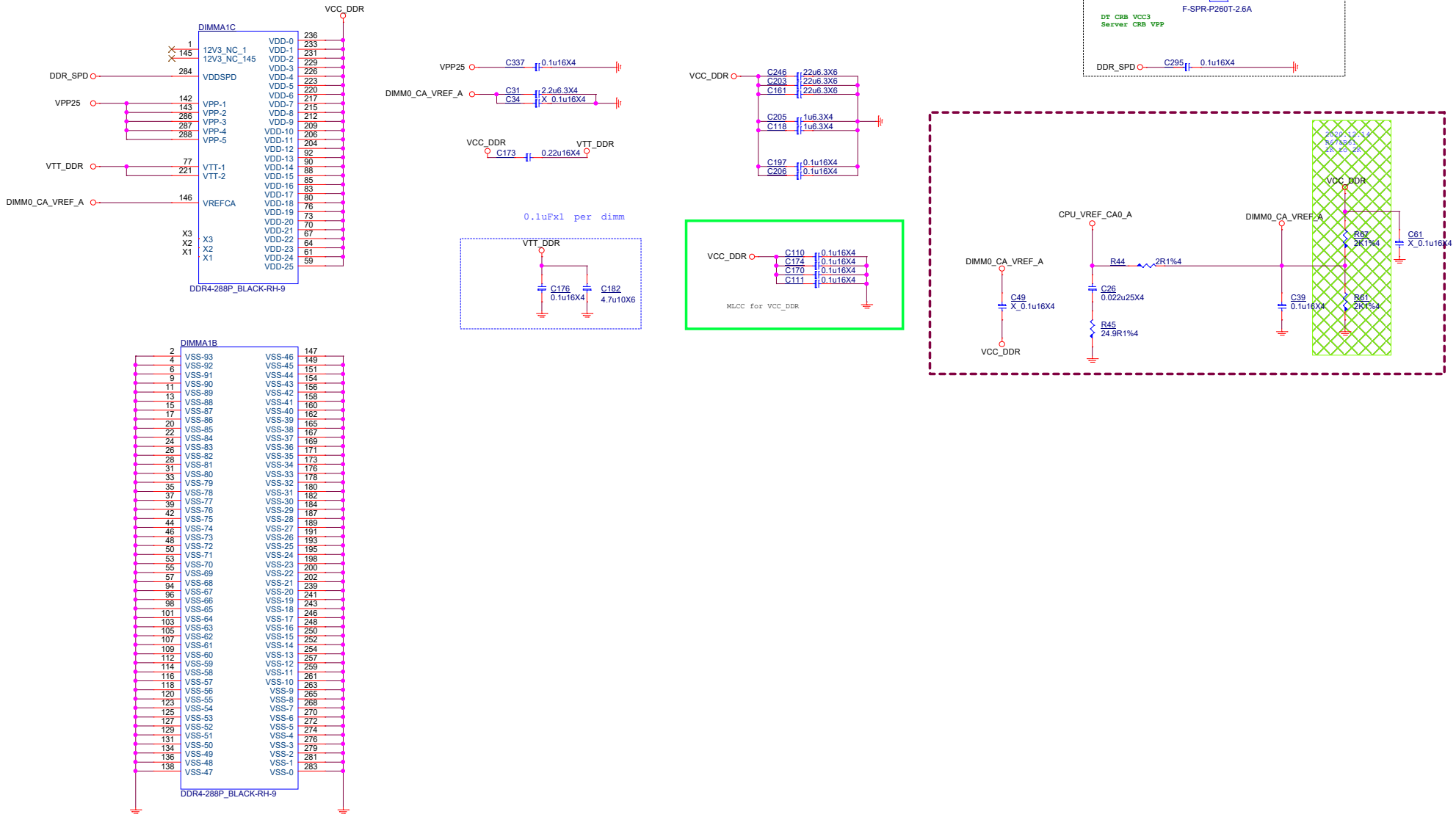

MICRO-STAR INT'L CO.,LTD		
MS-7D20		
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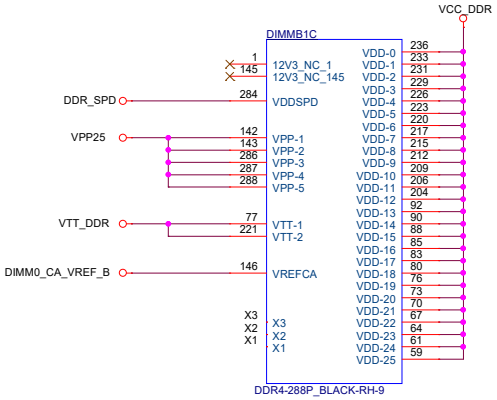
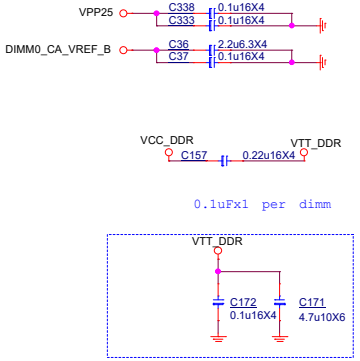
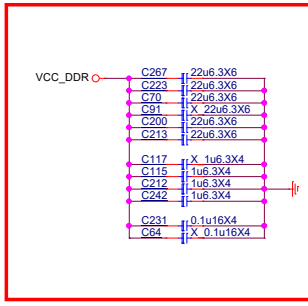
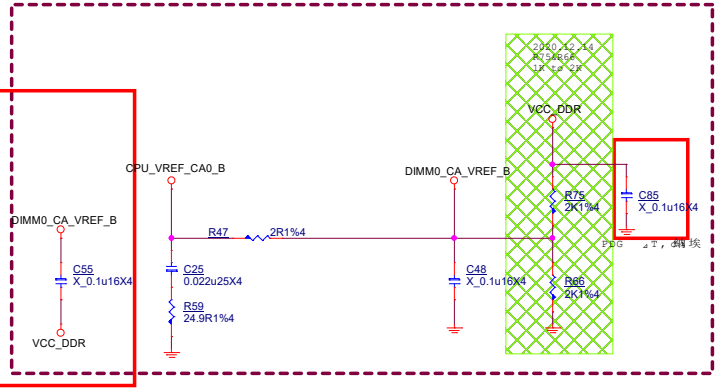
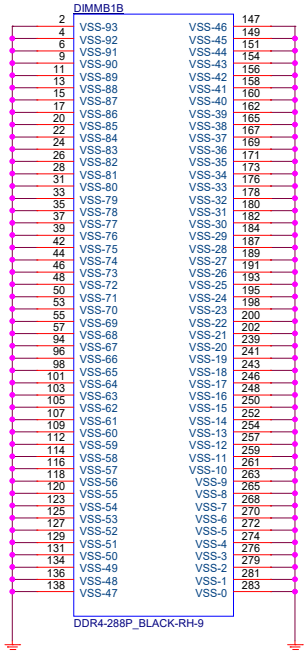








7D20 STUFF CAP COUNT ?



MICRO-STAR INT'L CO.,LTD		
MS-7D20		
Size: Custom	Document Description: DDR4-POWER/GND-2	Rev: 10
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SERIRQ & PIRQA# PDG An external Pull-up is required

LPC : 39R .
ESPI : 33R.(default)

PCH1A

eSPI
Power Management
SMB
VID
SPI
STRAP
JTAG

RKL_PCH_H

PCH LANPHY PWR
Pull Down PCH PHY into low power state.
For No Use intel Lan

close to PCH

CLOSE TO R396

RTC

Chassis Intrusion

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Document Description: PCH-LPC/SPI/SMBUS/MISC
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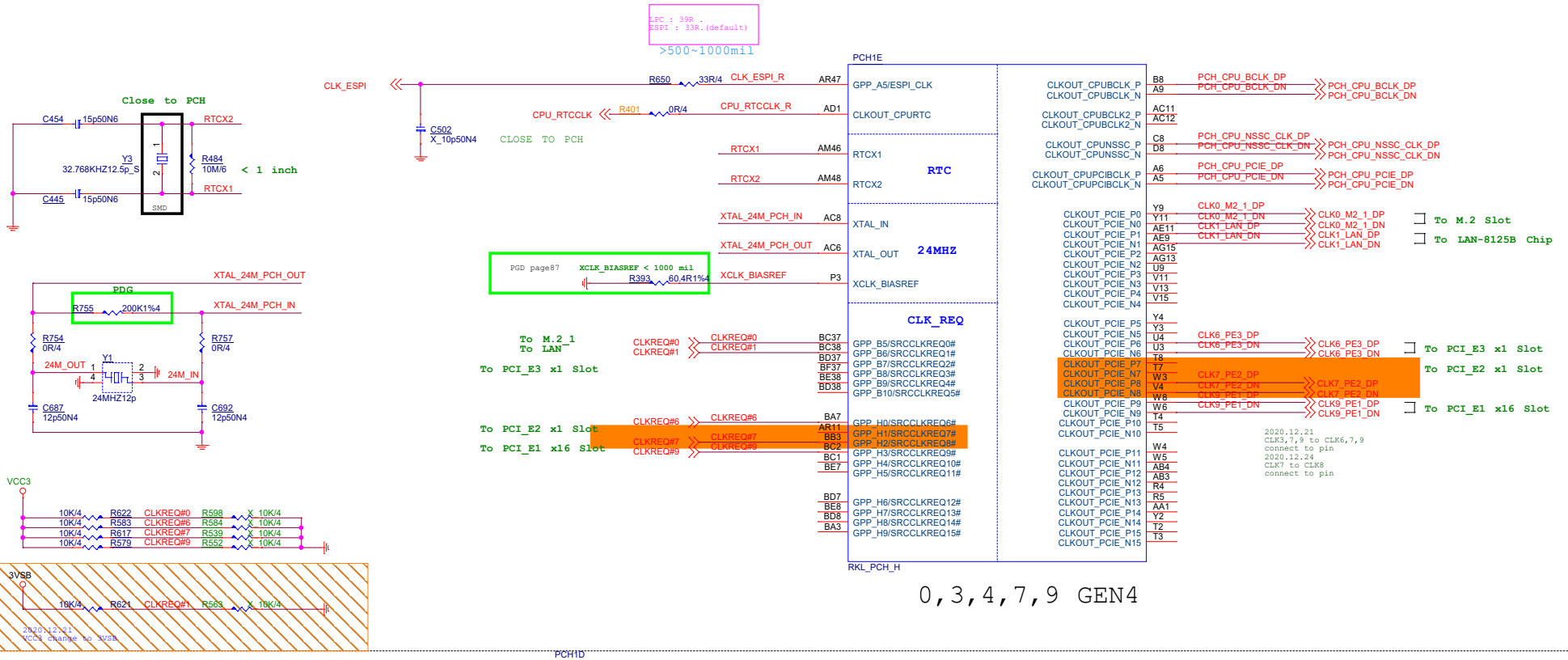
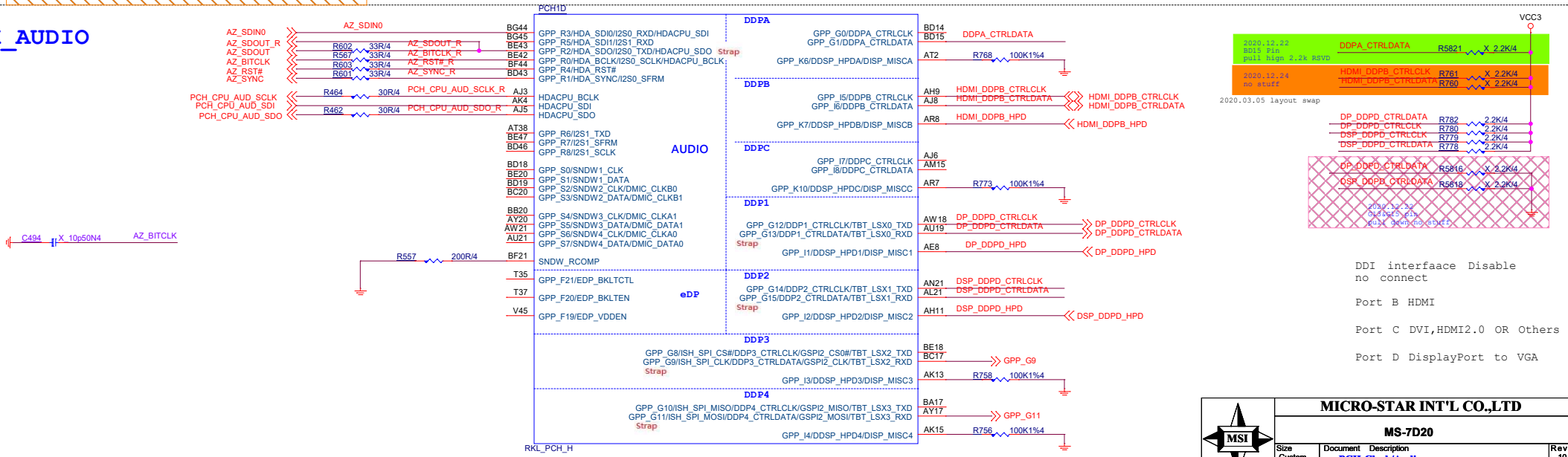
PCH_CLK



PCH_AUDIO



MICRO-STAR INT'L CO.,LTD

MS-7D20

Size	Document Description	Rev
Custom	PCH-Clock/Audio	10

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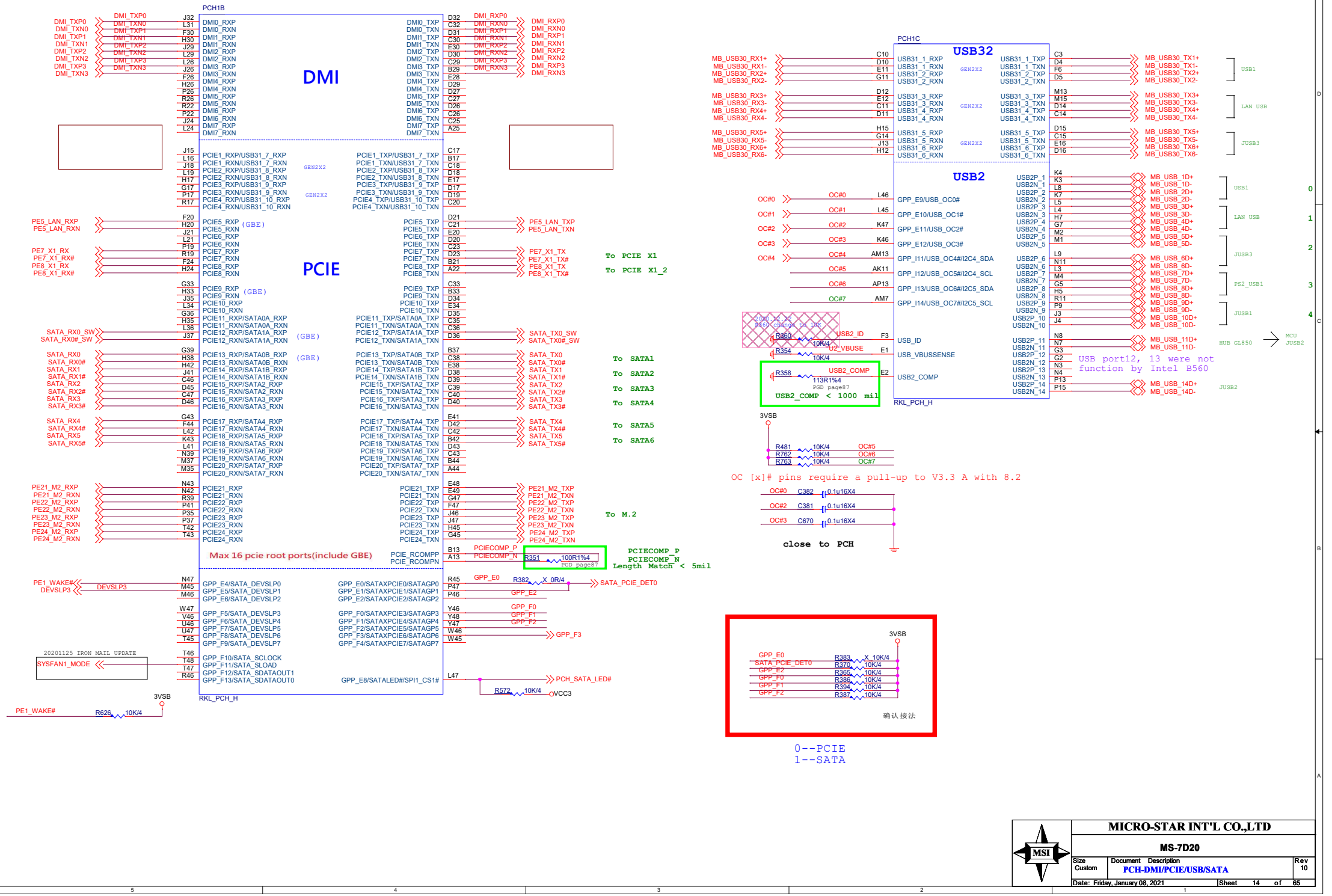
PCH1B
DMI
PCIE
DMI_TXP0
DMI_TXN0
DMI_TXP1
DMI_TXN1
DMI_TXP2
DMI_TXN2
DMI_TXP3
DMI_TXN3
DMI_RXP0
DMI_RXN0
DMI_RXP1
DMI_RXN1
DMI_RXP2
DMI_RXN2
DMI_RXP3
DMI_RXN3
GEN2X2
(GBE)
PE5_LAN_RXP
PE5_LAN_RXN
PE5_LAN_TXP
PE5_LAN_TXN
PE7_X1_RX
PE7_X1_RX#
PE8_X1_RX
PE8_X1_RX#
PE7_X1_TX
PE7_X1_TX#
PE8_X1_TX
PE8_X1_TX#
To PCIE X1
To PCIE X1_2
SATA_RX0_SW
SATA_RX0#_SW
SATA_TX0_SW
SATA_TX0#_SW
SATA_RX0
SATA_RX0#
SATA_RX1
SATA_RX1#
SATA_RX2
SATA_RX2#
SATA_RX3
SATA_RX3#
SATA_TX0
SATA_TX0#
SATA_TX1
SATA_TX1#
SATA_TX2
SATA_TX2#
SATA_TX3
SATA_TX3#
To SATA1
To SATA2
To SATA3
To SATA4
SATA_RX4
SATA_RX4#
SATA_RX5
SATA_RX5#
SATA_TX4
SATA_TX4#
SATA_TX5
SATA_TX5#
To SATA5
To SATA6
PE21_M2_RXP
PE21_M2_RXN
PE22_M2_RXP
PE22_M2_RXN
PE23_M2_RXP
PE23_M2_RXN
PE24_M2_RXP
PE24_M2_RXN
PE21_M2_TXP
PE21_M2_TXN
PE22_M2_TXP
PE22_M2_TXN
PE23_M2_TXP
PE23_M2_TXN
PE24_M2_TXP
PE24_M2_TXN
To M.2
Max 16 pcie root ports(include GBE)
PCIECOMP_P
PCIECOMP_N
R351
100R1%4
PGD_page87
PCIE_RCOMPP
PCIE_RCOMPN
PCIECOMP_P
PCIECOMP_N
Length Match < 5mil
PE1_WAKE#
DEVSLP3
GPP_E4/SATA_DEVSLP0
GPP_E5/SATA_DEVSLP1
GPP_E6/SATA_DEVSLP2
GPP_F5/SATA_DEVSLP3
GPP_F6/SATA_DEVSLP4
GPP_F7/SATA_DEVSLP5
GPP_F8/SATA_DEVSLP6
GPP_F9/SATA_DEVSLP7
GPP_E0/SATAXPCIE0/SATAGP0
GPP_E1/SATAXPCIE1/SATAGP1
GPP_E2/SATAXPCIE2/SATAGP2
GPP_F0/SATAXPCIE3/SATAGP3
GPP_F1/SATAXPCIE4/SATAGP4
GPP_F2/SATAXPCIE5/SATAGP5
GPP_F3/SATAXPCIE6/SATAGP6
GPP_F4/SATAXPCIE7/SATAGP7
GPP_E0
R382
X_0R/4
SATA_PCIE_DET0
GPP_E2
GPP_F0
GPP_F1
GPP_F2
GPP_F3
20201125 IRON MAIL UPDATE
SYSFAN1_MODE
GPP_F10/SATA_SCLOCK
GPP_F11/SATA_SLOAD
GPP_F12/SATA_SDATAOUT1
GPP_F13/SATA_SDATAOUT0
GPP_E8/SATALED#/SPI1_CS1#
PCH_SATA_LED#
R572
10K/4
VCC3
3VSB
PE1_WAKE#
R626
10K/4
RKL_PCH_H
PCH1C
USB32
USB2
MB_USB30_RX1+
MB_USB30_RX1-
MB_USB30_RX2+
MB_USB30_RX2-
MB_USB30_RX3+
MB_USB30_RX3-
MB_USB30_RX4+
MB_USB30_RX4-
MB_USB30_RX5+
MB_USB30_RX5-
MB_USB30_RX6+
MB_USB30_RX6-
MB_USB30_TX1+
MB_USB30_TX1-
MB_USB30_TX2+
MB_USB30_TX2-
MB_USB30_TX3+
MB_USB30_TX3-
MB_USB30_TX4+
MB_USB30_TX4-
MB_USB30_TX5+
MB_USB30_TX5-
MB_USB30_TX6+
MB_USB30_TX6-
USB1
LAN USB
JUSB3
OC#0
OC#1
OC#2
OC#3
OC#4
OC#5
OC#6
OC#7
GPP_E9/USB_OC0#
GPP_E10/USB_OC1#
GPP_E11/USB_OC2#
GPP_E12/USB_OC3#
GPP_I11/USB_OC4#/I2C4_SDA
GPP_I12/USB_OC5#/I2C4_SCL
GPP_I13/USB_OC6#/I2C5_SDA
GPP_I14/USB_OC7#/I2C5_SCL
MB_USB_1D+
MB_USB_1D-
MB_USB_2D+
MB_USB_2D-
MB_USB_3D+
MB_USB_3D-
MB_USB_4D+
MB_USB_4D-
MB_USB_5D+
MB_USB_5D-
MB_USB_6D+
MB_USB_6D-
MB_USB_7D+
MB_USB_7D-
MB_USB_8D+
MB_USB_8D-
MB_USB_9D+
MB_USB_9D-
MB_USB_10D+
MB_USB_10D-
PS2_USB1
USB_ID
USB_VBUSSENSE
USB2_COMP
USB2_ID
U2_VBUSE
R360
R354
R358
113R1%4
USB2_COMP < 1000 mil
MB_USB_11D+
MB_USB_11D-
MB_USB_14D+
MB_USB_14D-
HUB GL850
MCU
JUSB2
USB port12, 13 were not function by Intel B560
R481
R762
R763
OC [x]# pins require a pull-up to V3.3 A with 8.2
C382
C381
C670
0.1u16X4
close to PCH
R383
R370
R365
R386
R394
R387
确认接法
0--PCIE
1--SATA
MICRO-STAR INT'L CO.,LTD
MS-7D20
Size Custom
Document Description
PCH-DMI/PCIE/USB/SATA
Rev 10
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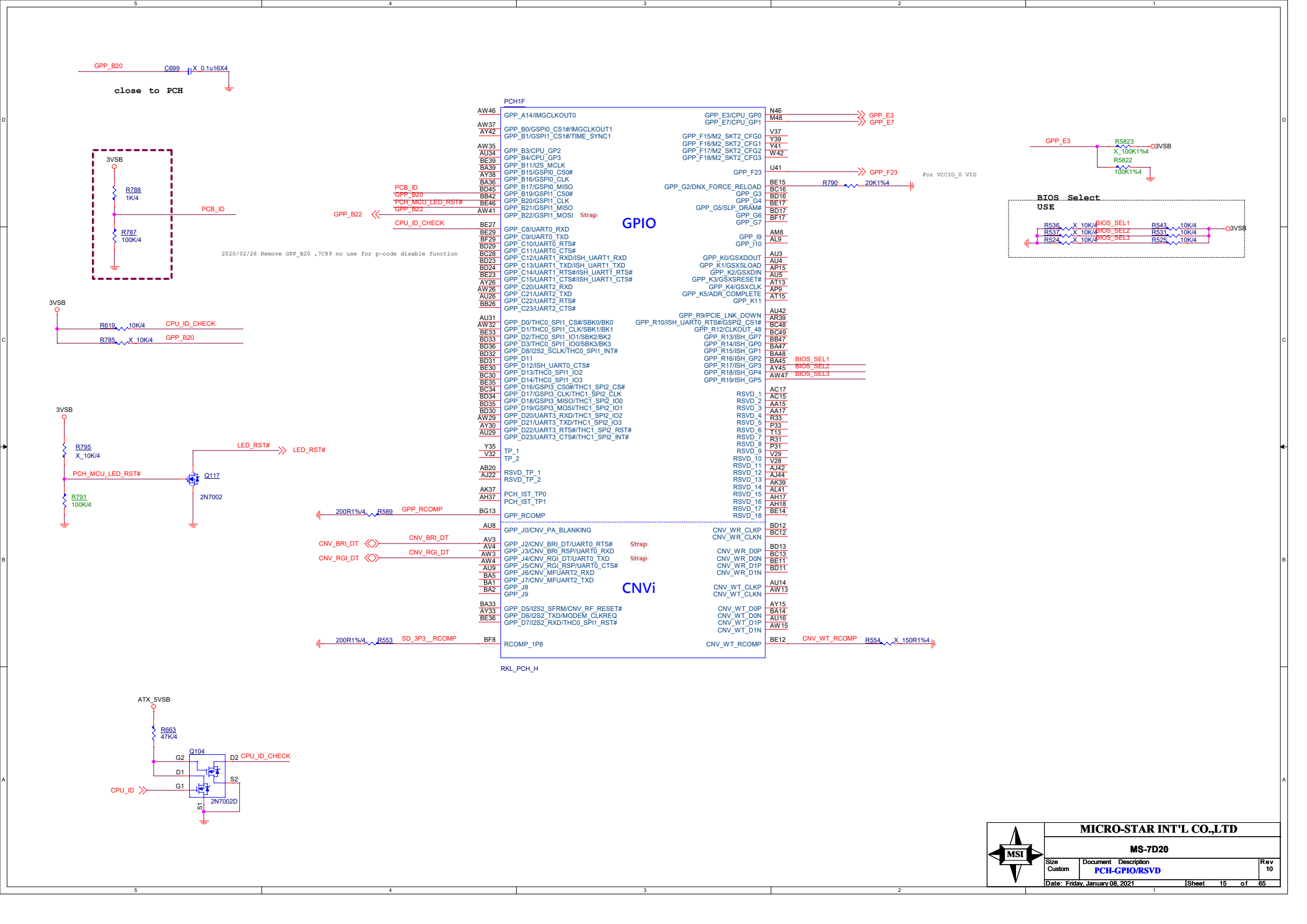
GPP_B20
C699
X_0.1u16X4
close to PCH
3VSB
R788
1K/4
PCB_ID
R787
100K/4
2020/02/26 Remove GPP_B20 ,7C89 no use for p-code disable function
3VSB
R619
10K/4
CPU_ID_CHECK
R785
X_10K/4
GPP_B20
3VSB
R795
X_10K/4
LED_RST#
LED_RST#
PCH_MCU_LED_RST#
Q117
2N7002
R791
100K/4
ATX_5VSB
R663
47K/4
Q104
G2
D2
CPU_ID_CHECK
D1
S2
CPU_ID
G1
2N7002D
S1
PCH1F
GPIO
AW46 GPP_A14/IMGCLKOUT0
AW37 GPP_B0/GSPI0_CS1#/IMGCLKOUT1
AY42 GPP_B1/GSPI1_CS1#/TIME_SYNC1
AW35 GPP_B3/CPU_GP2
AU34 GPP_B4/CPU_GP3
BE39 GPP_B11/I2S_MCLK
BA39 GPP_B15/GSPI0_CS0#
AY38 GPP_B16/GSPI0_CLK
BA36 GPP_B17/GSPI0_MISO
BD45 GPP_B19/GSPI1_CS0#
BB42 GPP_B20/GSPI1_CLK
BE46 GPP_B21/GSPI1_MISO
AW41 GPP_B22/GSPI1_MOSI Strap
BE27 GPP_C8/UART0_RXD
BE29 GPP_C9/UART0_TXD
BF29 GPP_C10/UART0_RTS#
BD29 GPP_C11/UART0_CTS#
BC28 GPP_C12/UART1_RXD/ISH_UART1_RXD
BD23 GPP_C13/UART1_TXD/ISH_UART1_TXD
BD24 GPP_C14/UART1_RTS#/ISH_UART1_RTS#
BE23 GPP_C15/UART1_CTS#/ISH_UART1_CTS#
AY26 GPP_C20/UART2_RXD
AW26 GPP_C21/UART2_TXD
AU26 GPP_C22/UART2_RTS#
BB26 GPP_C23/UART2_CTS#
AU31 GPP_D0/THC0_SPI1_CS#/SBK0/BK0
AW32 GPP_D1/THC0_SPI1_CLK/SBK1/BK1
BE33 GPP_D2/THC0_SPI1_IO1/SBK2/BK2
BD33 GPP_D3/THC0_SPI1_IO0/SBK3/BK3
BD36 GPP_D8/I2S2_SCLK/THC0_SPI1_INT#
BD32 GPP_D11
BD31 GPP_D12/ISH_UART0_CTS#
BE30 GPP_D13/THC0_SPI1_IO2
BC30 GPP_D14/THC0_SPI1_IO3
BE35 GPP_D16/GSPI3_CS0#/THC1_SPI2_CS#
BC34 GPP_D17/GSPI3_CLK/THC1_SPI2_CLK
BD34 GPP_D18/GSPI3_MISO/THC1_SPI2_IO0
BD35 GPP_D19/GSPI3_MOSI/THC1_SPI2_IO1
BD30 GPP_D20/UART3_RXD/THC1_SPI2_IO2
AW29 GPP_D21/UART3_TXD/THC1_SPI2_IO3
AY30 GPP_D22/UART3_RTS#/THC1_SPI2_RST#
AU29 GPP_D23/UART3_CTS#/THC1_SPI2_INT#
Y35 TP_1
V32 TP_2
AB20 RSVD_TP_1
AJ22 RSVD_TP_2
AK37 PCH_IST_TP0
AH37 PCH_IST_TP1
BG13 GPP_RCOMP
AU8 GPP_J0/CNV_PA_BLANKING
AV3 GPP_J2/CNV_BRI_DT/UART0_RTS# Strap
AV4 GPP_J3/CNV_BRI_RSP/UART0_RXD
AW3 GPP_J4/CNV_RGI_DT/UART0_TXD Strap
AW4 GPP_J5/CNV_RGI_RSP/UART0_CTS#
AU9 GPP_J6/CNV_MFUART2_RXD
BA5 GPP_J7/CNV_MFUART2_TXD
BA1 GPP_J8
BA2 GPP_J9
BA33 GPP_D5/I2S2_SFRM/CNV_RF_RESET#
AY33 GPP_D6/I2S2_TXD/MODEM_CLKREQ
BE36 GPP_D7/I2S2_RXD/THC0_SPI1_RST#
BF8 RCOMP_1P8
CNVi
N46 GPP_E3/CPU_GP0
M48 GPP_E7/CPU_GP1
V37 GPP_F15/M2_SKT2_CFG0
Y39 GPP_F16/M2_SKT2_CFG1
Y41 GPP_F17/M2_SKT2_CFG2
W42 GPP_F18/M2_SKT2_CFG3
U41 GPP_F23
BE15 GPP_G2/DNX_FORCE_RELOAD
BC16 GPP_G3
BD16 GPP_G4
BE17 GPP_G5/SLP_DRAM#
BD17 GPP_G6
BF17 GPP_G7
AM8 GPP_I9
AL9 GPP_I10
AU3 GPP_K0/GSXDOUT
AU4 GPP_K1/GSXSLOAD
AP15 GPP_K2/GSXDIN
AU5 GPP_K3/GSXSRESET#
AT13 GPP_K4/GSXCLK
AP9 GPP_K5/ADR_COMPLETE
AT15 GPP_K11
AU42 GPP_R9/PCIE_LNK_DOWN
AR39 GPP_R10/ISH_UART0_RTS#/GSPI2_CS1#
BC48 GPP_R12/CLKOUT_48
BC49 GPP_R13/ISH_GP7
BB47 GPP_R14/ISH_GP0
BA47 GPP_R15/ISH_GP1
BA48 GPP_R16/ISH_GP2
BA45 GPP_R17/ISH_GP3
AY45 GPP_R18/ISH_GP4
AW47 GPP_R19/ISH_GP5
AC17 RSVD_1
AC15 RSVD_2
AA15 RSVD_3
AA17 RSVD_4
R33 RSVD_5
P33 RSVD_6
T13 RSVD_7
R31 RSVD_8
P31 RSVD_9
V29 RSVD_10
V28 RSVD_11
AJ42 RSVD_12
AJ44 RSVD_13
AK39 RSVD_14
AL41 RSVD_15
AH17 RSVD_16
AH18 RSVD_17
BE14 RSVD_18
BD12 CNV_WR_CLKP
BC12 CNV_WR_CLKN
BD13 CNV_WR_D0P
BC13 CNV_WR_D0N
BE11 CNV_WR_D1P
BD11 CNV_WR_D1N
AU14 CNV_WT_CLKP
AW13 CNV_WT_CLKN
AY15 CNV_WT_D0P
BA14 CNV_WT_D0N
AU16 CNV_WT_D1P
AW15 CNV_WT_D1N
BE12 CNV_WT_RCOMP
RKL_PCH_H
PCB_ID
GPP_B20
PCH_MCU_LED_RST#
GPP_B22
CPU_ID_CHECK
200R1%/4
R589
GPP_RCOMP
CNV_BRI_DT
CNV_BRI_DT
CNV_RGI_DT
CNV_RGI_DT
200R1%/4
R553
SD_3P3__RCOMP
GPP_E3
GPP_E7
GPP_F23
For VCCIO_0 VID
R790
20K1%4
BIOS_SEL1
BIOS_SEL2
BIOS_SEL3
CNV_WT_RCOMP
R554
X_150R1%4
GPP_E3
R5823
3VSB
X_100K1%4
R5822
100K1%4
BIOS Select
USE
R536 X_10K/4
R537 X_10K/4
R524 X_10K/4
BIOS_SEL1
BIOS_SEL2
BIOS_SEL3
R543 10K/4
R531 10K/4
R525 10K/4
3VSB
MICRO-STAR INT'L CO.,LTD
MS-7D20
Size Custom
Document Description
PCH-GPIO/RSVD
Rev 10
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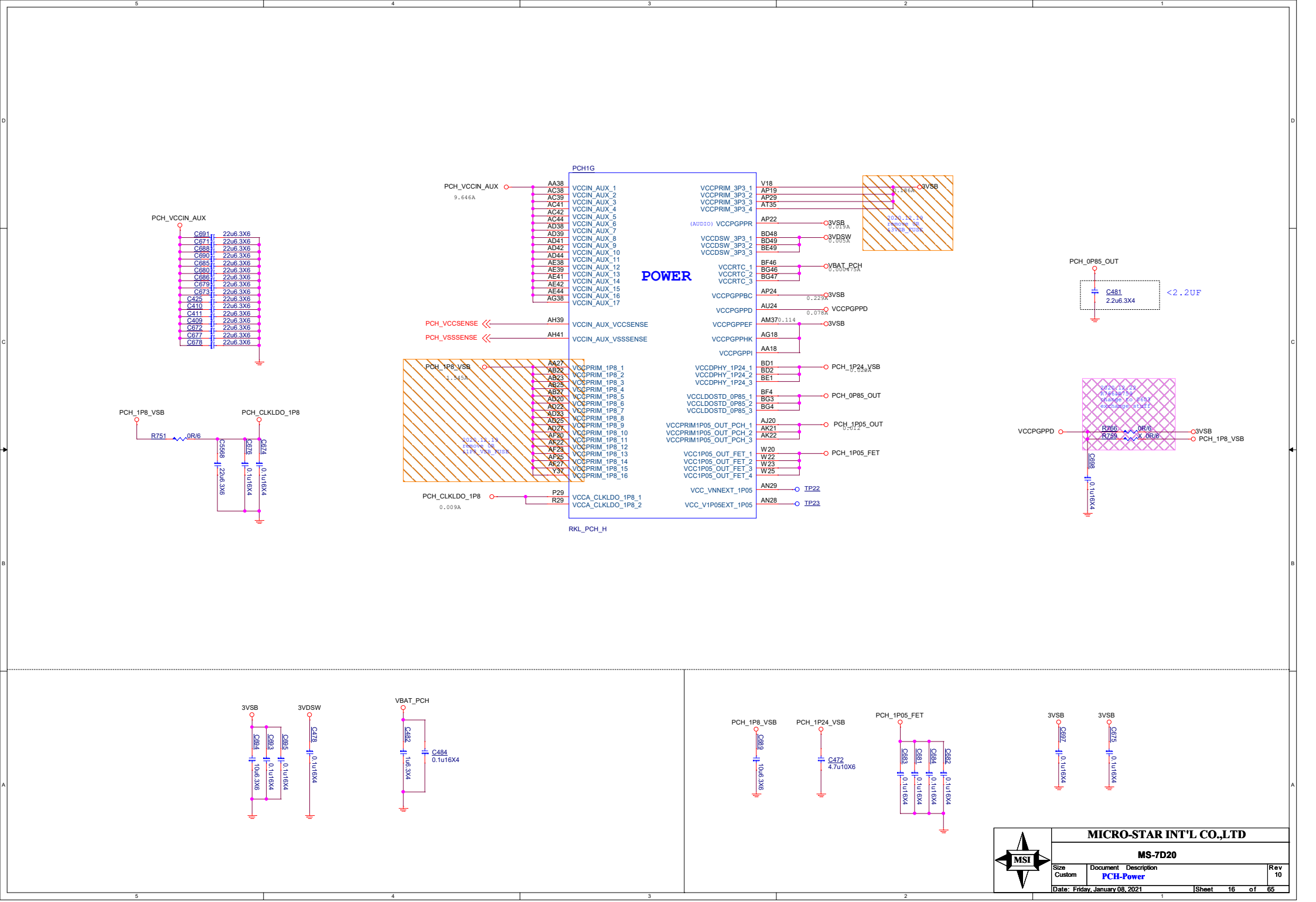
PCH1G
POWER
RKL_PCH_H
PCH_VCCIN_AUX
PCH_VCCSENSE
PCH_VSSSENSE
PCH_1P8_VSB
PCH_CLKLDO_1P8
VCCIN_AUX_1
VCCIN_AUX_2
VCCIN_AUX_3
VCCIN_AUX_4
VCCIN_AUX_5
VCCIN_AUX_6
VCCIN_AUX_7
VCCIN_AUX_8
VCCIN_AUX_9
VCCIN_AUX_10
VCCIN_AUX_11
VCCIN_AUX_12
VCCIN_AUX_13
VCCIN_AUX_14
VCCIN_AUX_15
VCCIN_AUX_16
VCCIN_AUX_17
VCCIN_AUX_VCCSENSE
VCCIN_AUX_VSSSENSE
VCCPRIM_1P8_1
VCCPRIM_1P8_2
VCCPRIM_1P8_3
VCCPRIM_1P8_4
VCCPRIM_1P8_5
VCCPRIM_1P8_6
VCCPRIM_1P8_7
VCCPRIM_1P8_8
VCCPRIM_1P8_9
VCCPRIM_1P8_10
VCCPRIM_1P8_11
VCCPRIM_1P8_12
VCCPRIM_1P8_13
VCCPRIM_1P8_14
VCCPRIM_1P8_15
VCCPRIM_1P8_16
VCCA_CLKLDO_1P8_1
VCCA_CLKLDO_1P8_2
VCCPRIM_3P3_1
VCCPRIM_3P3_2
VCCPRIM_3P3_3
VCCPRIM_3P3_4
(AUDIO) VCCPGPPR
VCCDSW_3P3_1
VCCDSW_3P3_2
VCCDSW_3P3_3
VCCRTC_1
VCCRTC_2
VCCRTC_3
VCCPGPPBC
VCCPGPPD
VCCPGPPEF
VCCPGPPHK
VCCPGPPI
VCCDPHY_1P24_1
VCCDPHY_1P24_2
VCCDPHY_1P24_3
VCCLDOSTD_0P85_1
VCCLDOSTD_0P85_2
VCCLDOSTD_0P85_3
VCCPRIM1P05_OUT_PCH_1
VCCPRIM1P05_OUT_PCH_2
VCCPRIM1P05_OUT_PCH_3
VCC1P05_OUT_FET_1
VCC1P05_OUT_FET_2
VCC1P05_OUT_FET_3
VCC1P05_OUT_FET_4
VCC_VNNEXT_1P05
VCC_V1P05EXT_1P05
3VSB
VBAT_PCH
VCCPGPPD
PCH_1P24_VSB
PCH_0P85_OUT
PCH_1P05_OUT
PCH_1P05_FET
TP22
TP23
PCH_0P85_OUT
C481
2.2u6.3X4
<2.2UF
R751
0R/6
R756
R759
C5568
C676
C674
C698
22u6.3X6
0.1u16X4
MICRO-STAR INT'L CO.,LTD
MS-7D20
PCH-Power
Size
Custom
Document Description
Rev
10
Date: Friday, January 08, 2021
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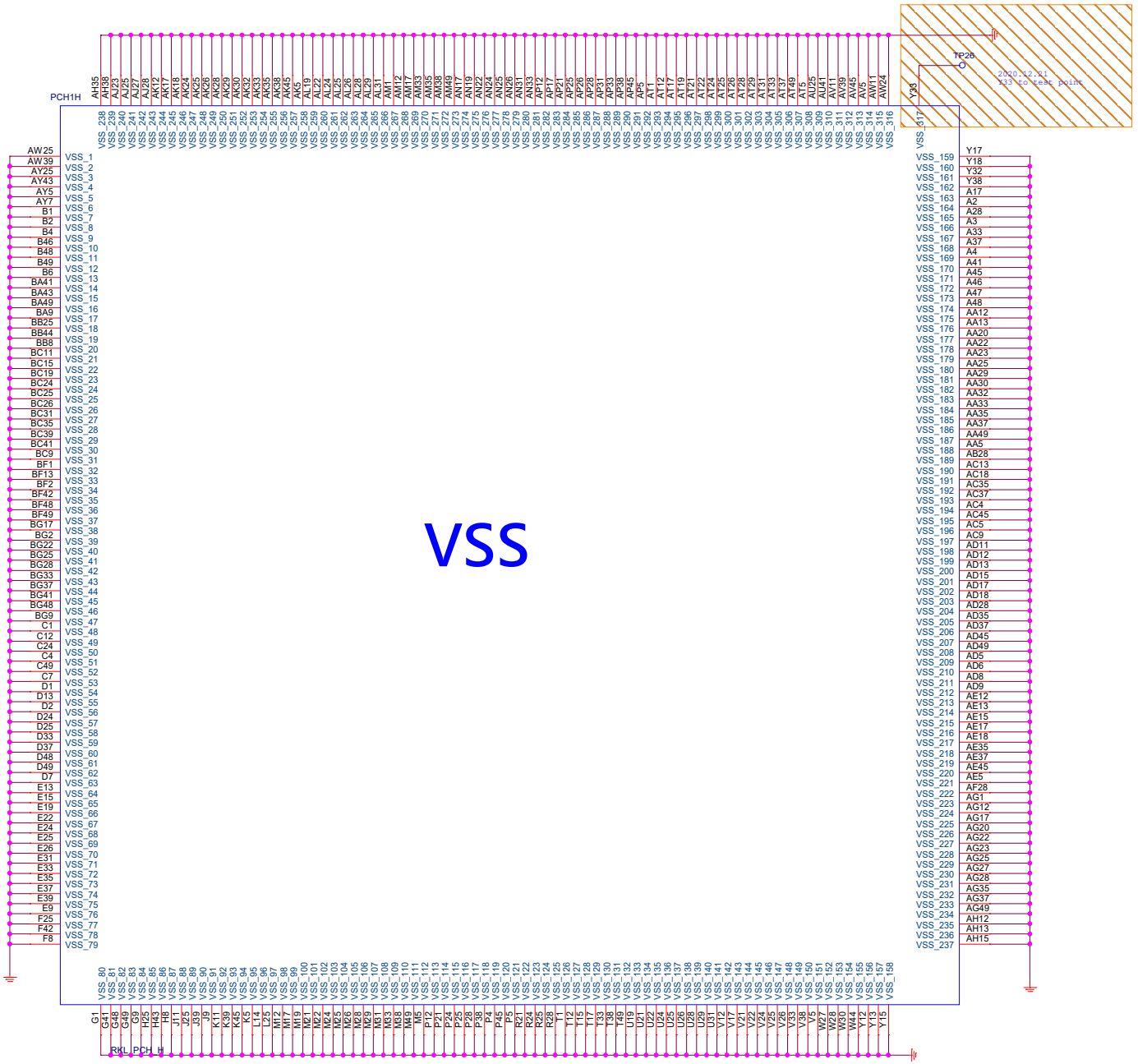
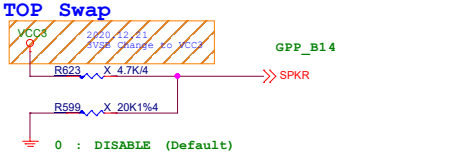


MICRO-STAR INT'L CO.,LTD	
MS-7D20	
Size: Custom	Document Description: PCH-GND
Rev: 10	
Date: Friday, January 08, 2021	Sheet 17 of 65

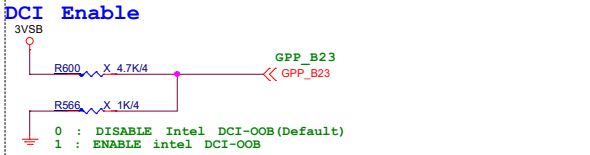
TOP Swap



0 : DISABLE (Default)
1 : ENABLE

Internal Pull-down is disabled after PCH_PWROK is high.

DCI Enable



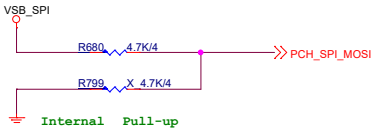
0 : DISABLE Intel DCI-OOB(Default)
1 : ENABLE intel DCI-OOB

Internal Pull-down is disabled after RSMRST# de-assert.

ITP_PMODE

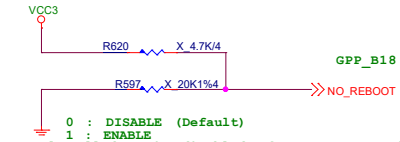
Internal Pull-up

Reserved



Internal Pull-up

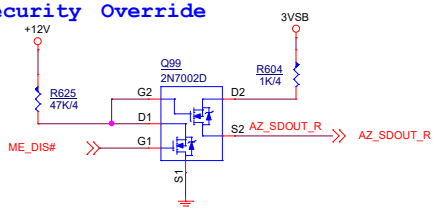
No Reboot



0 : DISABLE (Default)
1 : ENABLE

Internal Pull-down is disabled after PCH_PWROK is high.

Flash Descriptor Security Override



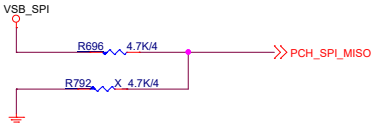
0 : Enable security measures defined in the Flash Descriptor. (Default)
1 : DISABLE:Flash Descritior Decurity(Override).

Internal Pull-down is disabled after PCH_PWROK is high.

Reserved

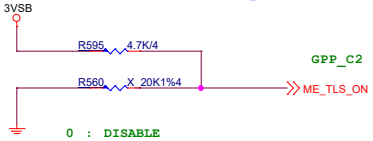
Internal Pull-down

Reserved



Internal Pull-up

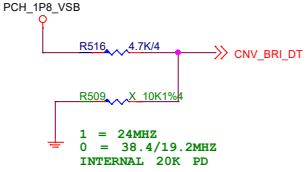
TLS confidentiality



0 : DISABLE
1 : ENABLE (Default)

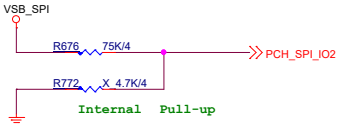
Internal Pull-down is disabled after RSMRST# de-assert.

XTAL SEL1



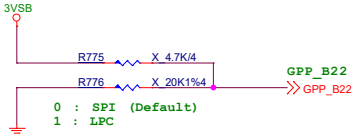
1 = 24MHZ
0 = 38.4/19.2MHZ
INTERNAL 20K PD

Reserved



Internal Pull-up

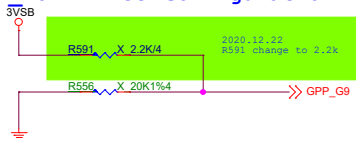
Boot BIOS



0 : SPI (Default)
1 : LPC

Internal Pull-down is disabled after PCH_PWROK is high.

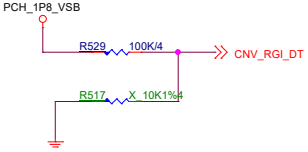
TBT_LSX2 VCC configuration



0 = DDP3 I2C / TBT_LSX2 / BBSB_LS2 pins at 1.8V
1 = DDP3 I2C / TBT_LSX2 / BBSB_LS2_TX pins at 3.3V

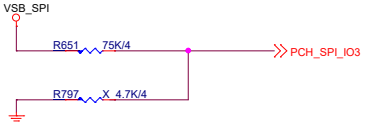
Internal Pull-down is disabled after RSMRST# de-assert.

XTAL SEL2



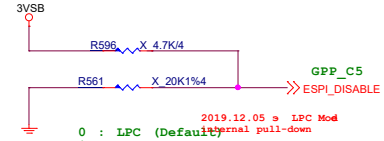
HIGH : DISABLE
LOW : ENABLE

Reserved



Internal Pull-up

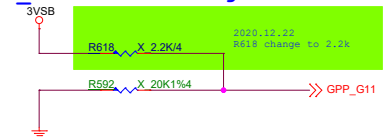
LPC eSPI Mode



0 : LPC (Default)
1 : eSPI

Internal Pull-down is disabled after RSMRST# de-assert.

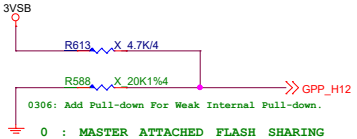
TBT_LSX3 VCC configuration



0 = DDP4 I2C / TBT_LSX3 / BBSB_LS3 pins at 1.8V
1 = DDP4 I2C /TBT_LSX3 / BBSB_LS3 pins at 3.3V

Internal Pull-down is disabled after RSMRST# de-assert.

ESPI FLASH SHARING MODE

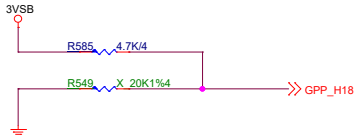


0306: Add Pull-down For Weak Internal Pull-down.

0 : MASTER ATTACHED FLASH SHARING
1 : SLAVE ATTACHED FLASH SHARING

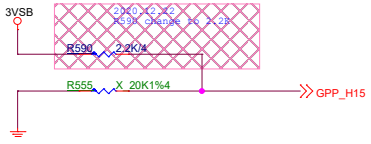
Internal Pull-down is disabled after RSMRST# de-assert.

VCCSPI Voltage Configuration



Internal Pull-down

Reserved



Internal Pull-down

Reserved

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PCI Express X16 Slot

GEN3 OR GEN4?

12V - 5.5A

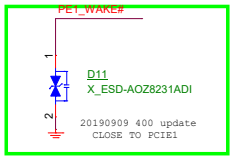
VCC3 - 3A

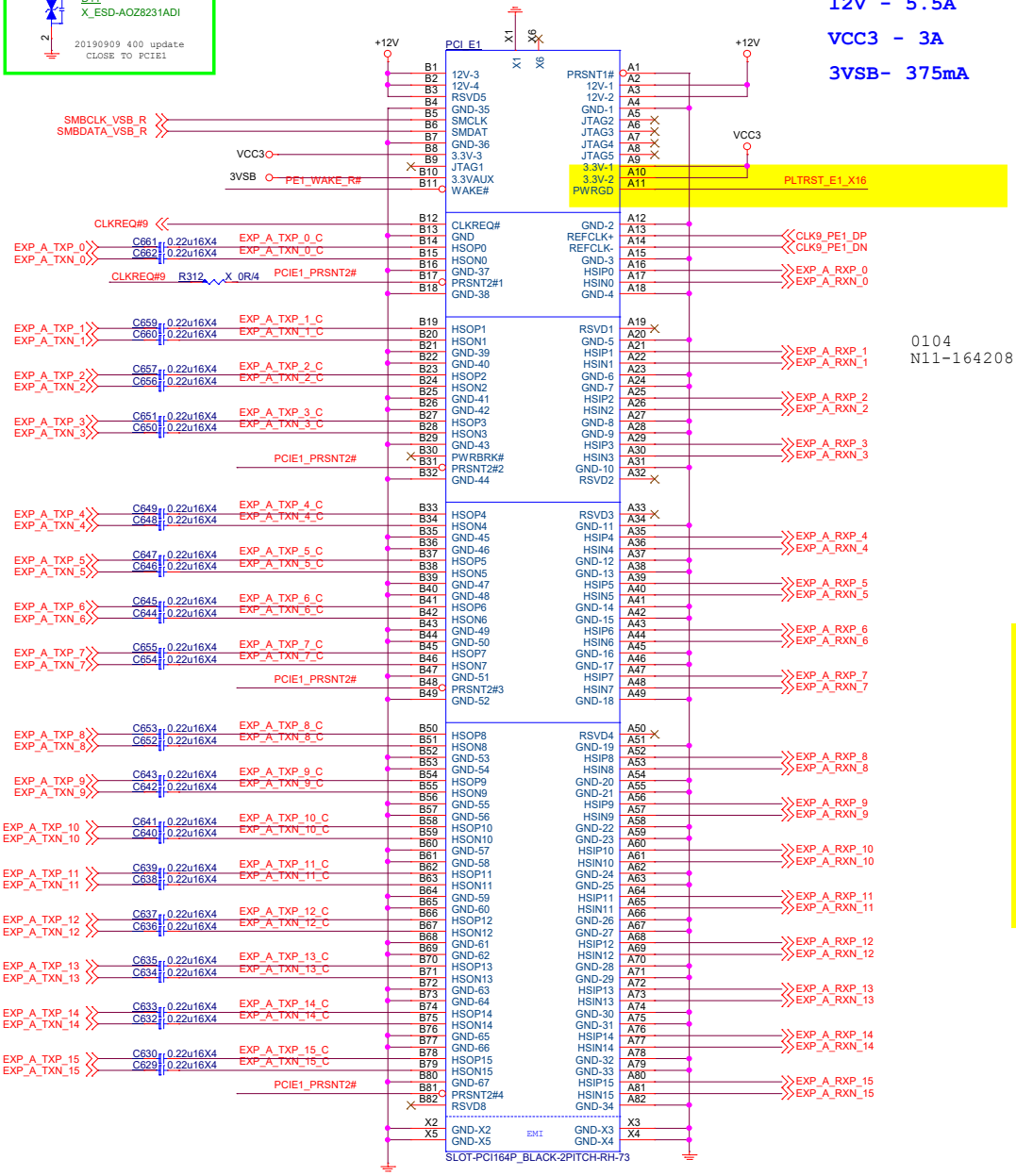
3VSB- 375mA

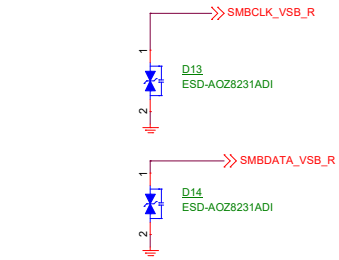
0104

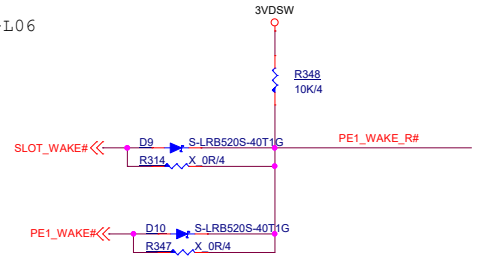
N11-1642081-L06

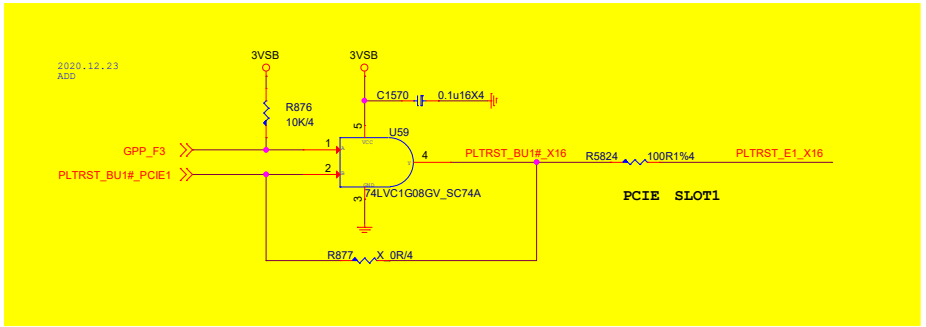
SMBus ESD

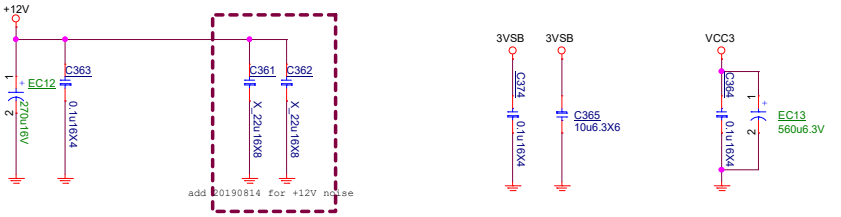












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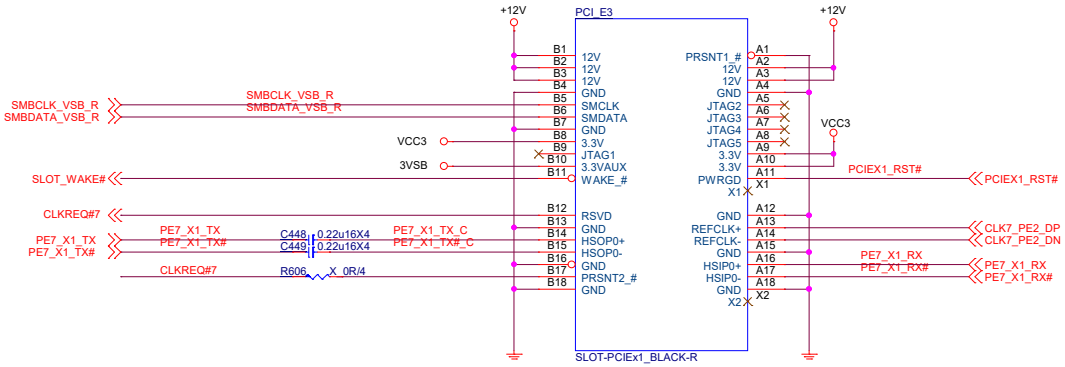
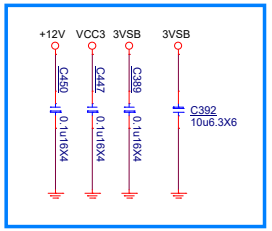
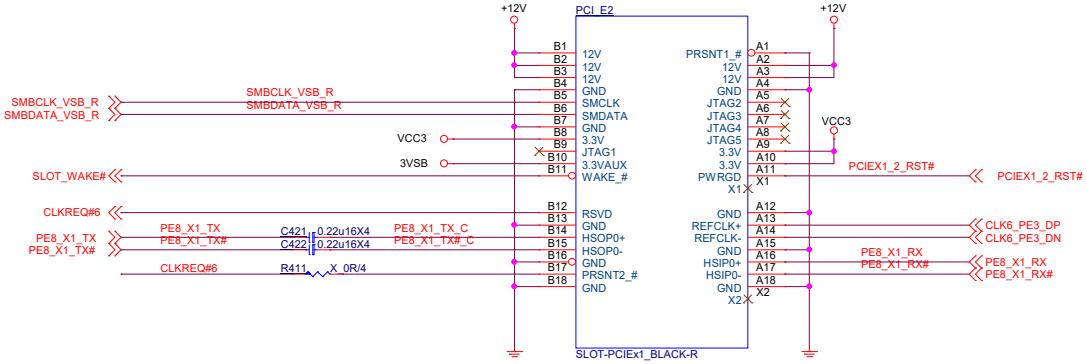
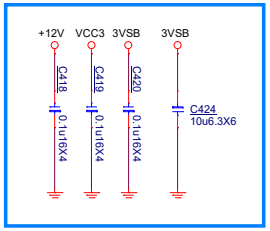
PCIE X1









MICRO-STAR INT'L CO.,LTD

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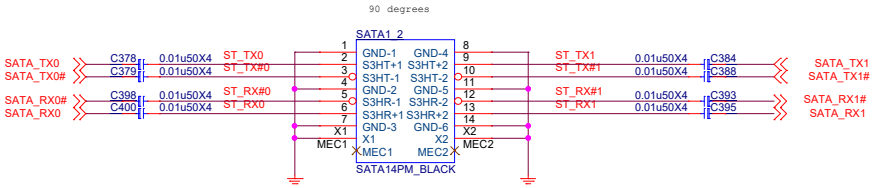
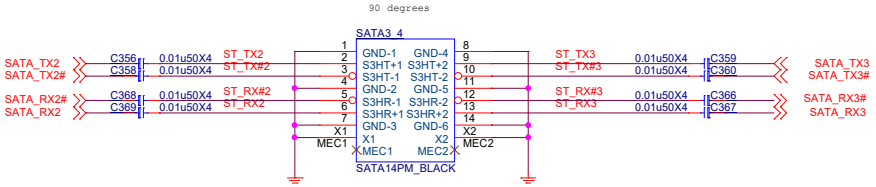
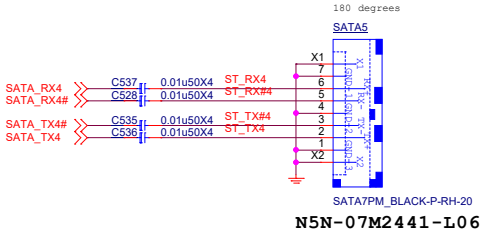
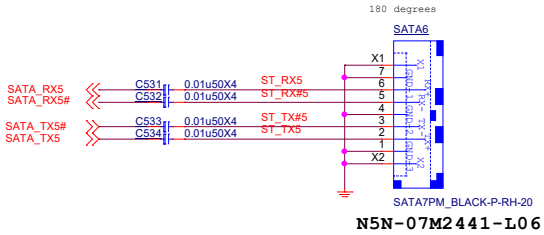
SATA Connector







N5N-07M2441-L06



N5N-07M2441-L06

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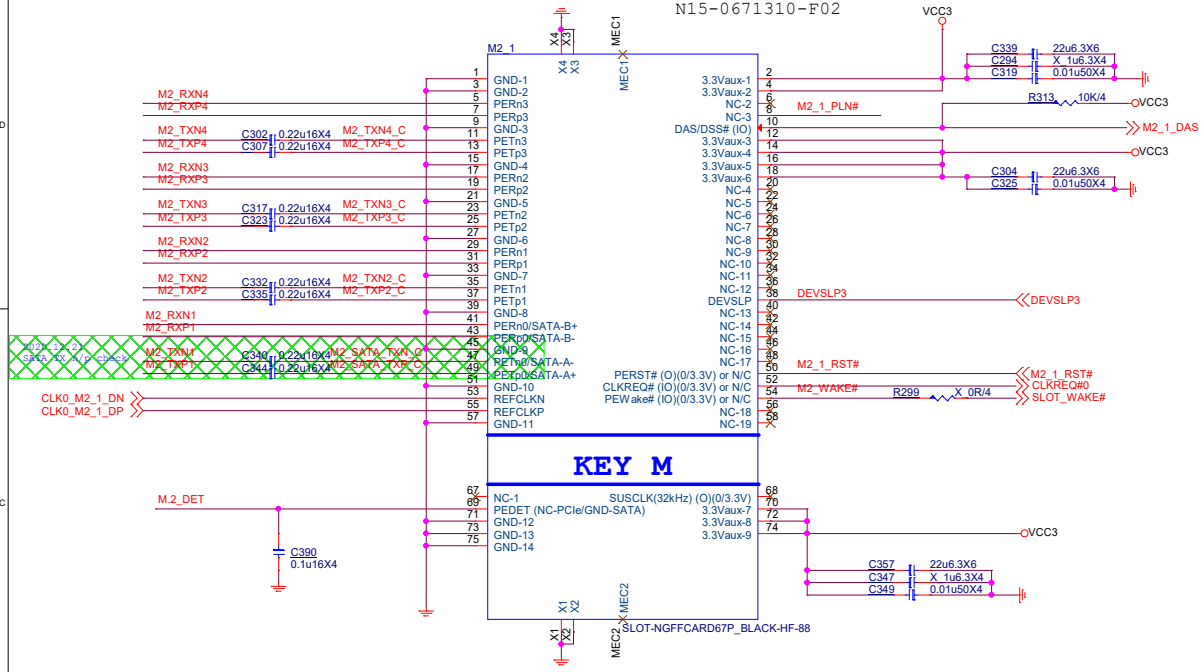
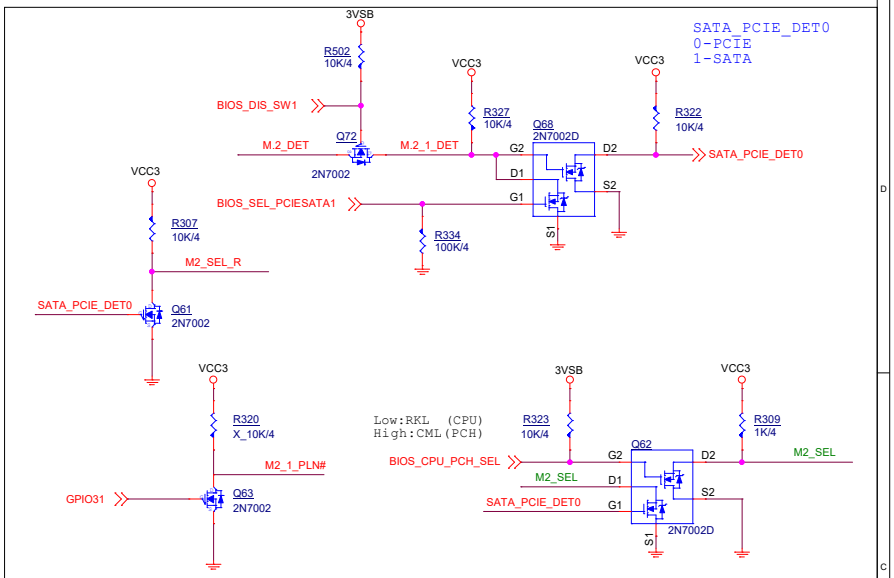
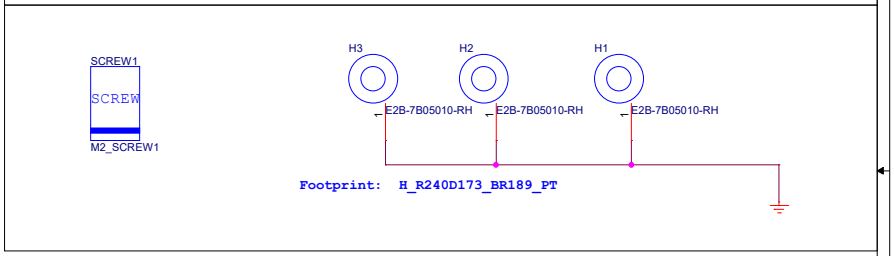
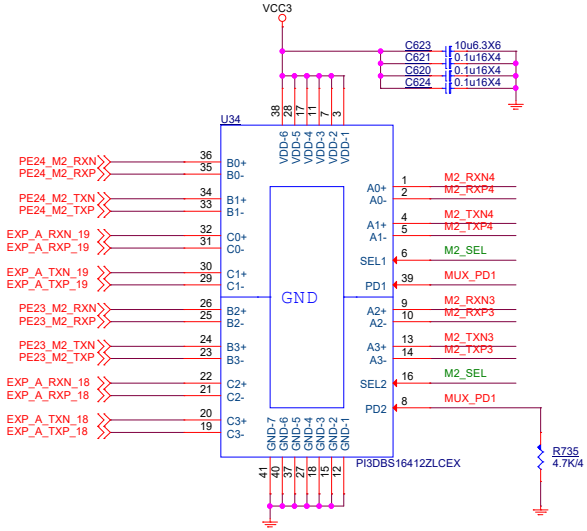
M.2 connector

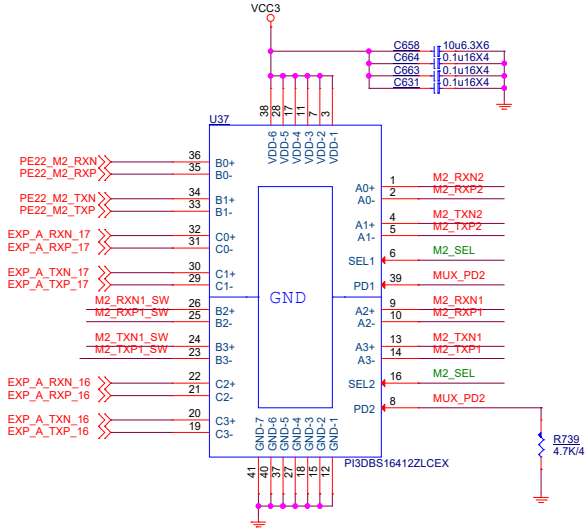
12.31
N15-0671310-F02

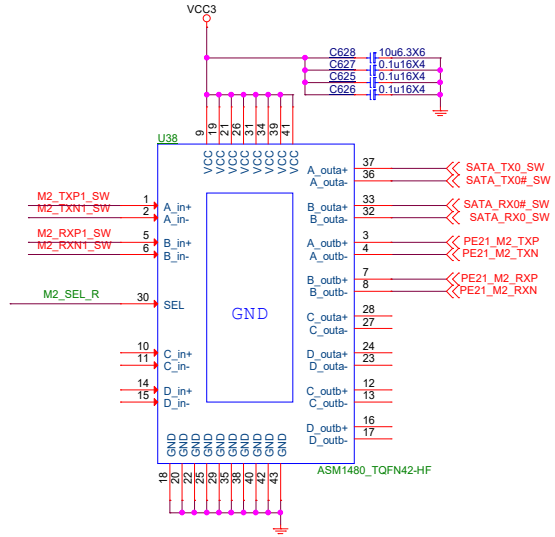












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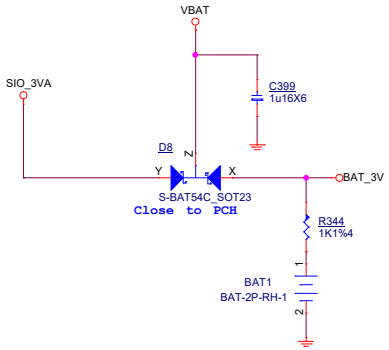
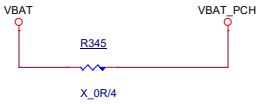
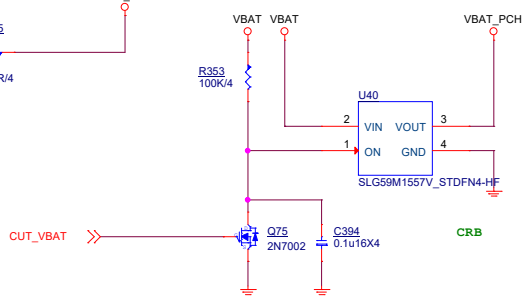
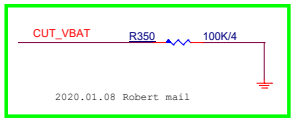
VBAT

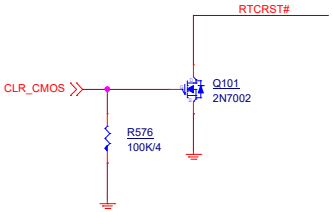


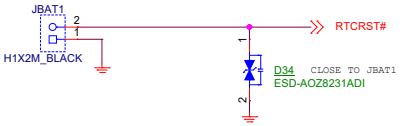






CLEAR CMOS





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POWER ON STRAPPING PIN FOR NCT6687

PIN	NAME	Circuit NAME	0	1	Strap Point
27	ESPI_EN	KBRST#	LPC(VCC3)	ESPI(3VA)	VCC3 3VA
31	2E_4E_SEL	RTSA#	I/O ADDRESS 2E	I/O ADDRESS 4E	3VCC
32	DIS_HWACPI	DTRA#	HW ACPI enable	HW ACPI disable	3VA
34	MAF_SEL	SOUTA	MAF enable	MAF disable	3VA
92	DSW_EN	DSW_EN	DSW disable	DSW enable	3VA
96	DDR_EN	SIO_DEBUG	DDR4 control disable	DDR4 control enable	3VA
9	FAN789_EN (FW setting)	GPIO52	FAN789_EN disable	FAN789_EN enable	3VA

Strapping for LPC.

3V Analog Power

Closed PIN 110

Closed PIN1

Closed PIN99

Closed PIN46,85

SPI ROM

W25X40CLSNIG-HF

WATCH LAYOUT

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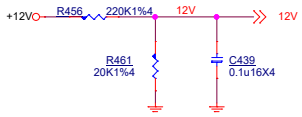
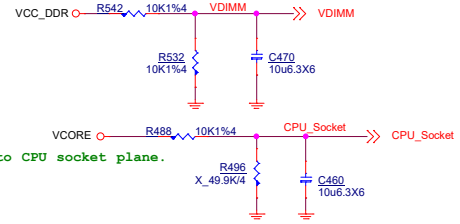
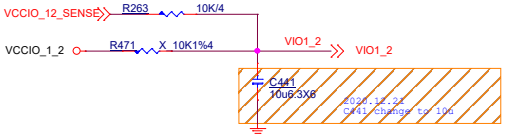
HW Monitor - Voltage

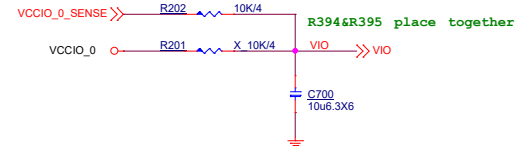
SIO HM Voltage Over 2V will Not Detect

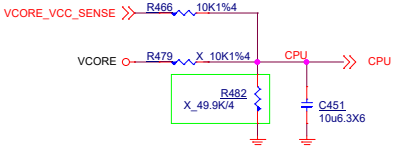


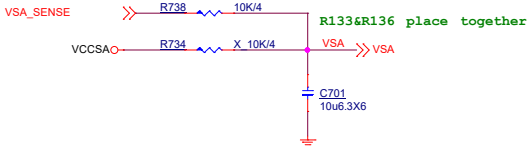


VCORE net need close to CPU socket plane.

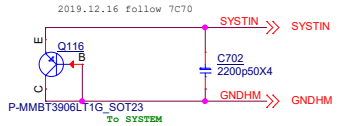


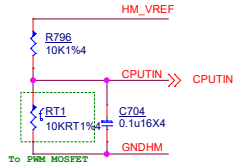


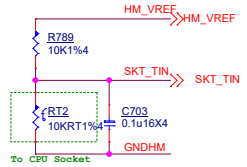




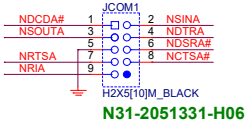
Thermal



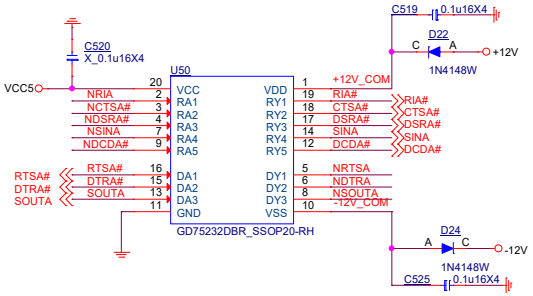


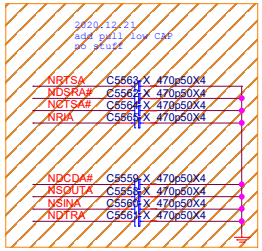


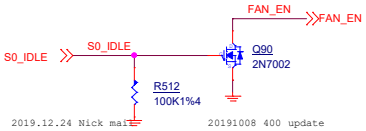
COM Port



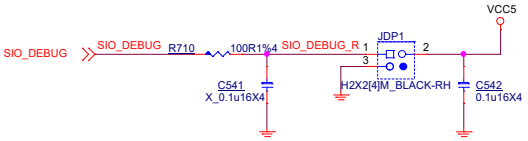
N31-2051331-H06

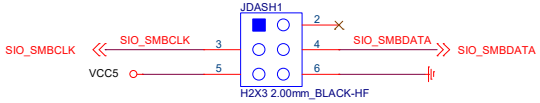






DEBUG PORT





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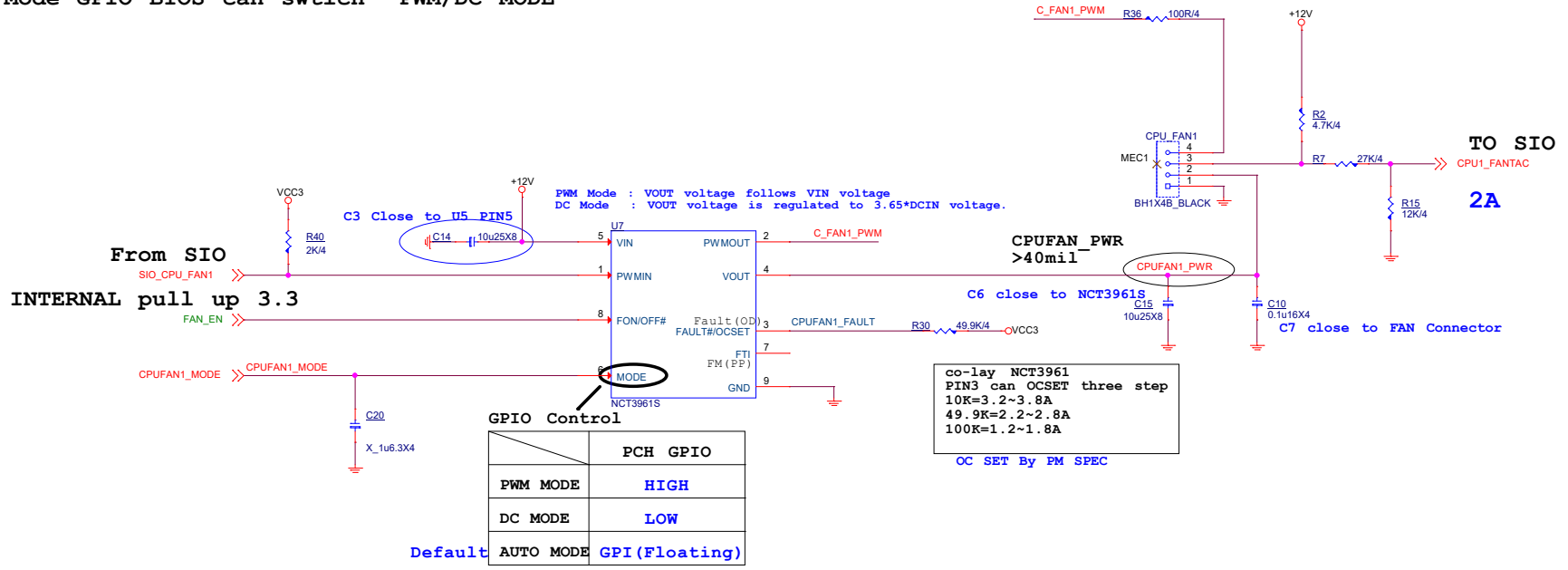
TYPE M : 4 PIN CPU FAN USE NCT3961S USE PCH GPIO CONTROL FAN MODE

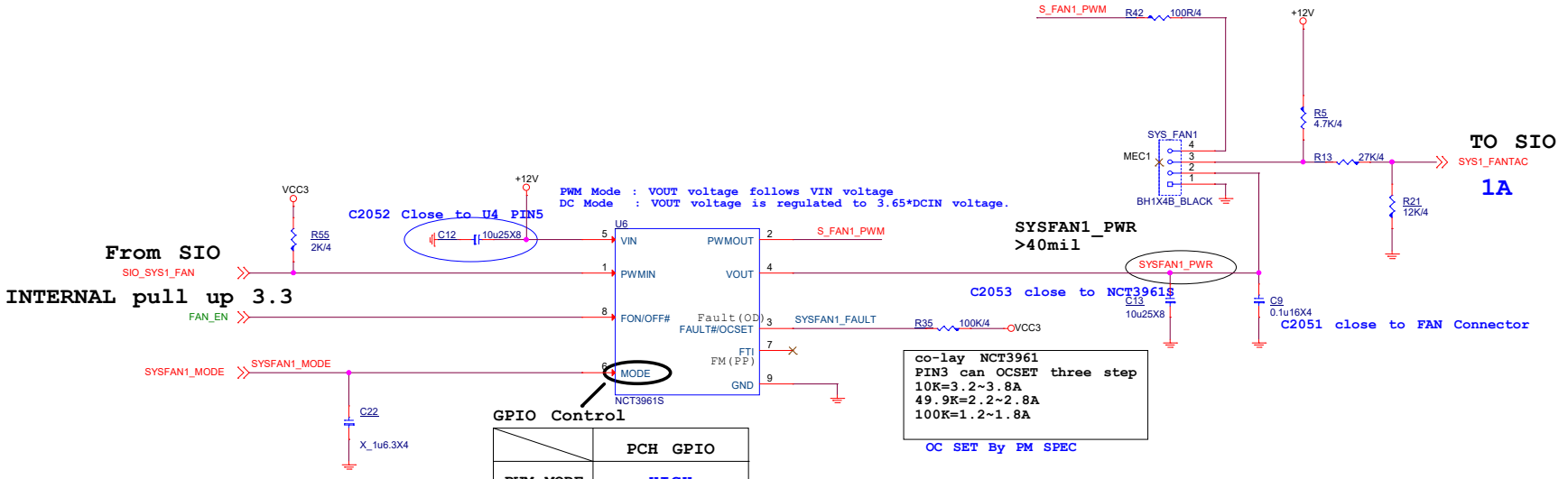
1.Mode GPIO BIOS can swtich PWM/DC MODE



	PCH GPIO
PWM MODE	HIGH
DC MODE	LOW
Default AUTO MODE	GPI(Floating)

TYPE M : 4 PIN CPU FAN USE NCT3961S USE PCH GPIO CONTROL FAN MODE

1.Mode GPIO BIOS can swtich PWM/DC MODE



	PCH GPIO
PWM MODE	HIGH
DC MODE	LOW
Default AUTO MODE	GPI(Floating)

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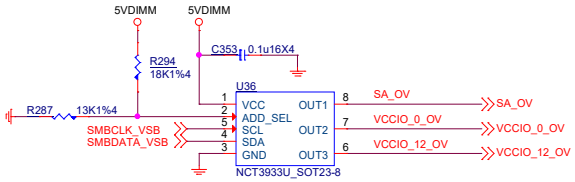
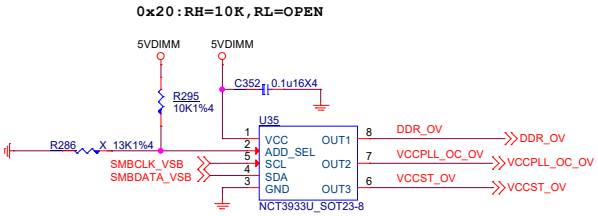
VOLTAGE CONSOLE

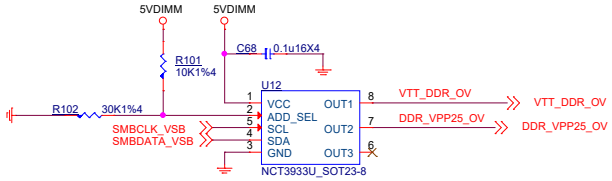
0x26:RH=18K,RL=13K



0x20:RH=10K,RL=OPEN



0x22:RH=10K,RL=30K



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ALC897

follow PCH power well

3VSB

CA20 10u6.3X6 CA22 0.1u16X4

Closed PIN9

UA1

AZ_RST# AZ_BITCLK AZ_SYNC AZ_SDIN0 AZ_SDOUT

RA17 22R/4 SDIN0

RESET# BCLK SYNC SDATA-IN SDATA-OUT SPDIF-OUT GPIO0/DMIC-CLK/SPDIF-OUT2 GPIO1/DMIC-DATA EAPD/SPDIFI DVDD DVDD-IO LDO3-CAP DVSS AVDD1 AVDD2 LDO-OUT1 LDO2-CAP VREF NC-1 NC-2 AVSS1 AVSS2

Digital

Analog

RA21 10K1%4 897_GPIO1 EAPD

CA33 1u6.3X4 VCC3 REGREF LDOVDD AVCC3 VOUT LDO2_CAP VREF_AUDIO VOUT AVSS2

FRONT-R FRONT-L SURR-R SURR-L CENTER LFE SIDE-R SIDE-L LINE1-R LINE1-L LINE2-R LINE2-L MIC1-R MIC1-L MIC2-R MIC2-L MIC1-VREFO-R MIC1-VREFO-L MIC2-VREFO LINE2-VREFO PIN37-VREFO BEEP JD1 JD2 JD3 JD4

A_LOUT_R A_LOUT_L

C91-1011051-N07 ECA1 100u10EL5 ECA3 100u10EL5

ALOUT_R ALOUT_L

A_LINE_IN_R A_LINE_IN_L CA16 CA15 10u6.3X6

LINE_IN_R LINE_IN_L

A_LINE2_R A_LINE2_L C91-1011051-N07 ECA4 100u10EL5 ECA2 100u10EL5

LINE2_R LINE2_L

A_MIC1_R A_MIC1_L CA12 CA13 10u6.3X6

MIC1_R MIC1_L

A_MIC2_R A_MIC2_L CA9 CA10 10u6.3X6

MIC2_R MIC2_L

MIC1_V_R MIC1_V_L

MIC2_VREFO LINE2_VREFO

SENSE_A SENSE_B SENSE_C JDREF

ALC897

ALC897: stuff
ALC892: no stuff

VCC3 LA1 0R/8 AVCC3 CA31 0.1u16X4 LDOVDD 129mA

5VDUAL LA2 0R/8 R11-0000034-W08 DA3 X_S-RB521S30 CA23 CA24 0.1u16X4 10u6.3X6

CA23,CA33 close to pin29

VCC3 CA27 CA28 1u6.3X4 0.1u16X4 Closed pin1

VOUT CA29 4.7u10X6 CA17 0.1u16X4 Closed pin25

ALC897: 4.7uF
ALC892: 22uF

LOUT_L LOUT_R

LIN_OUT

LOUT_R LOUT_L RA4 RA3 75R/4

LOUT_RA LOUT_LA FRONT_JD

AUDIO1B

DA1 DA2 ESD-MLVS0402L04

D0G-2710510-I05

JACK-AUDIOX3F_PK/LIME/LIGHT BU-RH

LIN_IN

LINE_IN_R LINE_IN_L RA5 RA8 75R/4

LINE_IN_RA LINE_IN_LA LINE1_JD

AUDIO1A

CA3 100p50N4 CA4 100p50N4 CA6 0.1u16X4

JACK-AUDIOX3F_PK/LIME/LIGHT BU-RH

D LIN_IN

E LIN_OUT

F MIC1

N54-13F0271-K06

MIC1_V_L MIC1_V_R RA2 RA1 2.2K/4 MIC1_LA MIC1_RA

MIC1

MIC1_R MIC1_L RA6 RA7 75R/4

MIC1_RA MIC1_LA MIC1_JD

AUDIO1C

CA1 CA2 100p50N4 CA5 X_0.1u16X4

JACK-AUDIOX3F_PK/LIME/LIGHT BU-RH

for rear I/O 6port: 887VD/892:1k

for rear I/O 3port: 887VD/892:75R

ALOUT_R ALOUT_L RA10 RA11 22K/4

LINE2_L LINE2_R RA34 RA37 22K/4

LA4 120L1.5A-150_0402-HF

CA8 CA7 X_1000p50X4

For EMI

Closed Codec

AVCC3

R399 R522 R510 R577 100K1%4

SENSE_A SENSE_B SENSE_C JDREF

ALC897: stuff
ALC892: no stuff

SENSE_B RA18 200K1%4 MIC1_JD

ALC897: stuff
ALC892:no stuff

ALC897: NC
ALC892: STUFF

SENSE_A RA14 X_10K1%4 LINE1_JD

RA16 X_20K1%4 MIC1_JD

RA15 200K1%4 FRONT_JD

ALC897: 200K1%
ALC892: 5.1K1%

SENSE_C R499 0R/4 HPON

ALC897: stuff
ALC892:no stuff

ALC897: no stuff
ALC892: stuff

VOUT CA18 X_22u6.3X6 CA30 X_0.1u16X4 Closed pin38

JDREF RA19 X_20K1%4

VREF_AUDIO CA21 X_10u6.3X6

REGREF CA26 X_10u6.3X6

SENSE_B RA39 X_47R/4 HPON

CA35 X_1000p50X4

ALC897: stuff
ALC892: no stuff

AVCC3 CA11 0.1u16X4 CA32 4.7u10X6 Closed pin18

AVSS2 R414 0R/4

LDO2_CAP CA14 4.7u10X6

VREF_AUDIO CA19 2.2u6.3X4

REGREF CA25 1u6.3X4

JDREF RA13 200K1%4 LINE1_JD

VOUT R771 X_1K1%4 897_GPIO1

ALC897-VA1(ES sample): stuff
ALC897-VA2(MP verson): no stuff
ALC892: no stuff

MICRO-STAR INT'L CO.,LTD

MS-7D20

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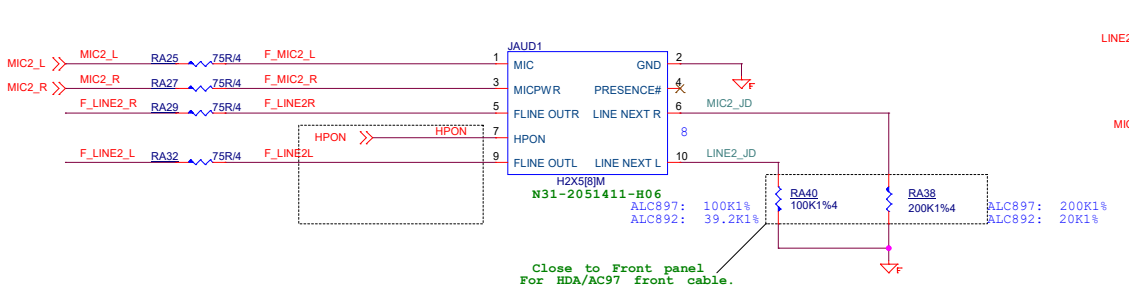
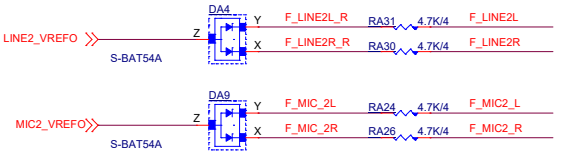
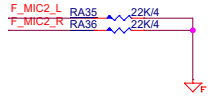
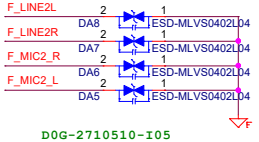






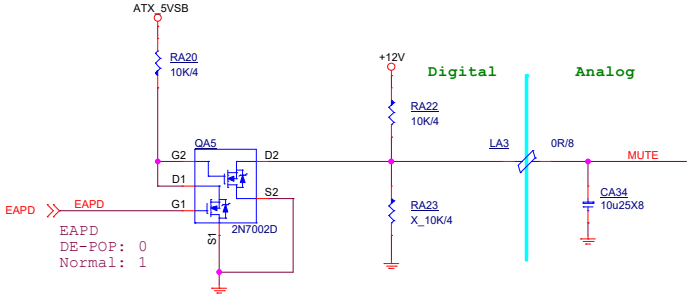


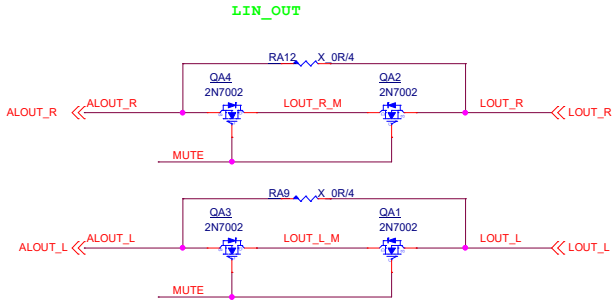
D0G-2710510-I05
Close to Front panel

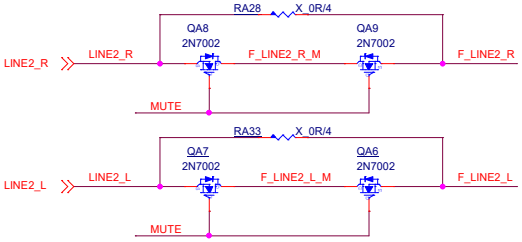
ESD protect

D0G-2710510-I05
AVL:D0G-2950500-SI0

De-POP circuit







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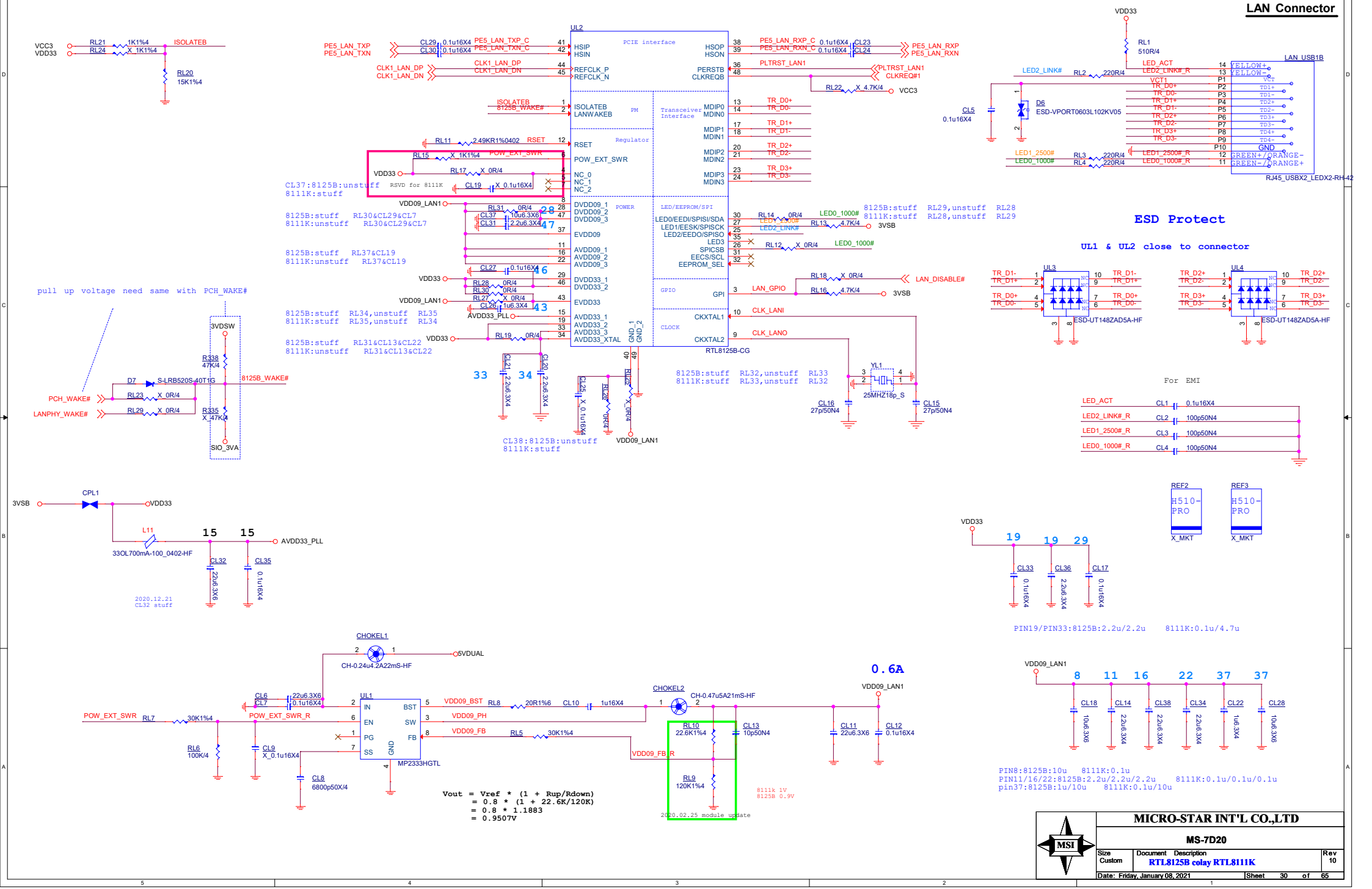
Realtek Lan-RTL8125B/RTL8111K



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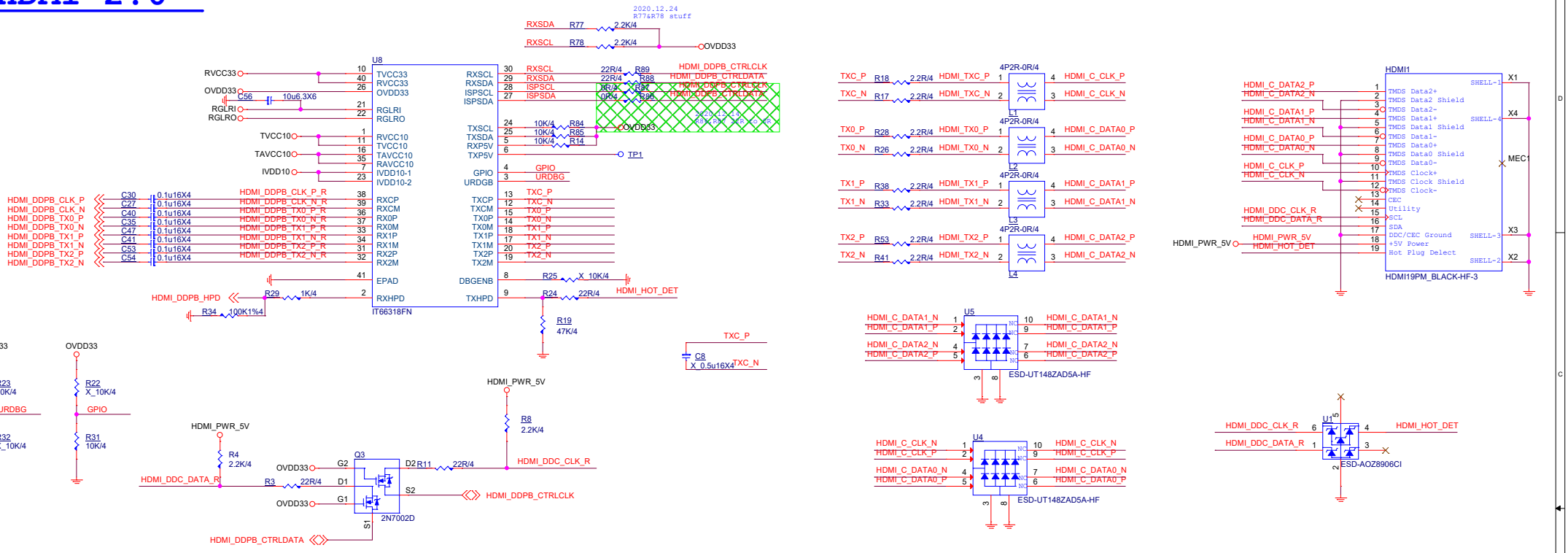
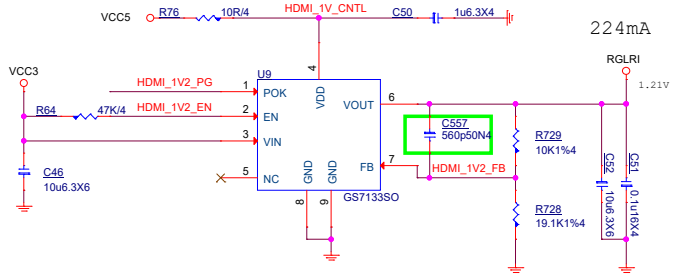
HDMI 2.0

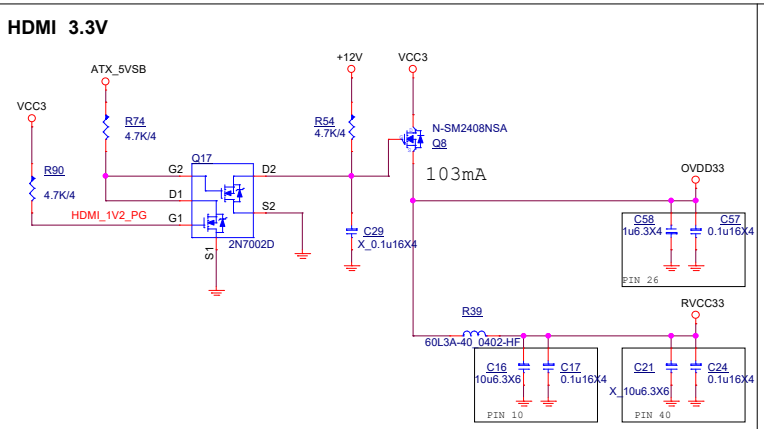
HDMI, DVI : 1920x1200 at 60 Hz (16:10 WUXGA)



HDMI 1.2V

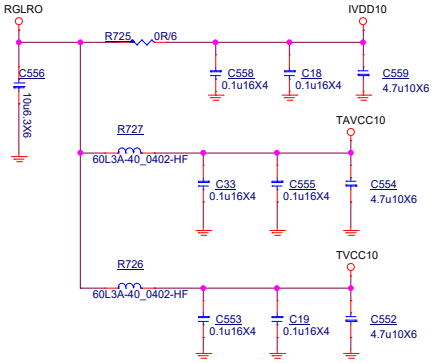


HDMI 3.3V

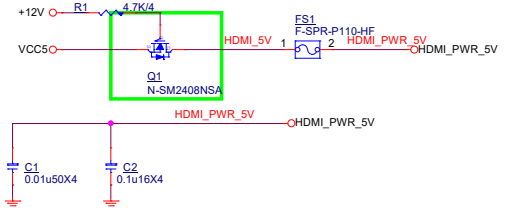


HDMI 1V

224mA



HDMI 5V



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

SMBus 0x68

U14 RTD2166

DSP_DDPD_TXP0 / DSP_DDPD_TXN0 → CV7 / CV5 0.1u16X4 → DP_C_TXP0 / DP_C_TXN0 → LANE0_P / LANE0_N

Differential impedance = 85 ohm

DSP_DDPD_TXP1 / DSP_DDPD_TXN1 → CV4 / CV3 0.1u16X4 → DP_C_TXP1 / DP_C_TXN1 → LANE1_P / LANE1_N

DSP_DDPD_AUXP / DSP_DDPD_AUXN → CV11 / CV10 0.1u16X4 → DP_C_AUXP / DP_C_AUXN → AUX_P / AUX_N

DSP_DDPD_HPD → RV8 100K/4 → HPD

SMBCLK_VCC / SMBDATA_VCC → RV7 / RV6 0R/4 → VGA_SMBCLK / VGA_SMBDATA → SMB_SCL / SMB_SDA

2020.11.27 RV6&RV7 stuff

VDD_DAC_33 → VDD_DAC_33

AVCC33 → AVCC_33

VCC3_2166 → RV4 4.7K/4 → POL2

VCC3_2166 → RV3 4.7K/4 → POL1/SPI_CEB

VCC3_2166 → VCC_33

CV15 0.1u16X4 → PVCC_33

LDO_RSTB

VCC3_2166 → RV5 X_4.7K/4 → EXT_CLK_IN

GND-2 / GND-1

RED_P → RED

GREEN_P → GREEN

BLUE_P → BLUE

HVSYNC_PWR → VCC5

CV6 0.1u16X4, CV2 4.7u10X6

CV9,CV10 close to PIN17

VSYNC → VSYNC

HSYNC → HSYNC

VGA_5V

VGA_SCL → VGADDCCLK → RV13 2.2K/4

VGA_SDA → VGADDCSDA → RV12 2.2K/4

VCC3_2166

SPI_CLK/GPI1 → RV1 4.7K/4

SPI_SI/GPI2 → RV2 X_4.7K/4

SPI_SO/GPI3

EXT1.2V_CTRL

Internal Analog power at 1.2V

AVCC_12 / VCCK_12 → VCCK_V12

CV13 2.2u6.3X4, CV8 0.1u16X4, CV14 0.1u16X4

CV24 must X5R,X7R

CV14 close to PIN4

RTD2166-CG-RH

CV13,CV8 close to PIN25

VCC3 Full Screen current 165mA

VCC3_2166 → LV1 60L2.5A-32_0402-HF → VDD_DAC_33

L02-6008032-M09

CV9 0.1u16X4

CV9 close to PIN20

VCC3_2166 → LV2 60L2.5A-32_0402-HF → AVCC33

L02-6008032-M09

CV12 0.1u16X4

CV12 close to PIN1

2020.12.21 R5808 stuff GS7150 no stuff

VCC3 → R5808 0R/6 → VCC3_2166

VCC5

U72 X_GS7150XST-SOT23-5 (VDD, VOUT, EN, GND, ADJ)

VCC3 → R5797 X_47K/4 → VCC3_2166_EN

C5555 X_1u6.3X4

C5557 X_680p50X4

C5556 X_10u6.3X6

R5798 X_10K1%4

R5800 X_3.09K1%4

R5825 X_0R/4, CV26 X_0.1u16X4

VGA_PWR → R5809 X_0R/4

2020.12.24 add PULL DOWN NO STUFF

Power Loss=(Vin-Vou)*Iout
=(5-3.389)*0.17
=1.611*0.17
=0.274W < 0.4W

RED → RV11 75R1%4 → LV5 10L1A → VGA_RED

GREEN → RV10 75R1%4 → LV4 10L1A → VGA_GREEN

BLUE → RV9 75R1%4 → LV3 10L1A → VGA_BLUE

CV20 3.3p50N4, CV21 3.3p50N4

CV17 3.3p50N4, CV19 3.3p50N4

CV16 3.3p50N4, CV18 3.3p50N4

VGA1 DSUB-VGAF_BLACK-RH-2

VGA_RED / VGA_GREEN / VGA_BLUE

5V_HSYNC → RV14 47R/4 → HSYNC

5V_VSYNC → RV15 47R/4 → VSYNC

VGADDCSDA

VGADDCCLK

CV22 X_10p50N4, CV24 X_2p50N4, CV25 X_2p50N4, CV23 X_10p50N4

VCC5 → DV1 S-1N5817 → VGA_5V → FSV1 F-SPR-P110-HF → DVI_VGA_5V → DVI_VGA_5V

CV1 0.1u16X4 EMI

Main:D08-0100800-P16
Avl:D08-0100200-B07

DV3 ESD-AOZ8906CI: VGADDCSDA, 5V_VSYNC, VGADDCCLK, 5V_HSYNC

DV1 Close to VGA connector
AVL:D0G-45B0510-I14

DV2 ESD-AOZ8906CI: VGA_BLUE, VGA_GREEN, VGA_RED

DV2 Close to VGA connector
AVL:D0G-45B0510-I14

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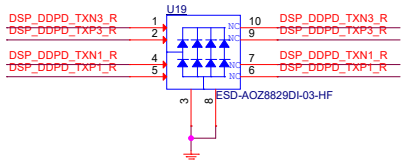
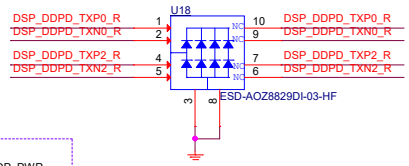
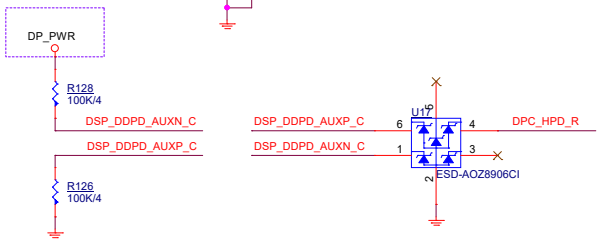
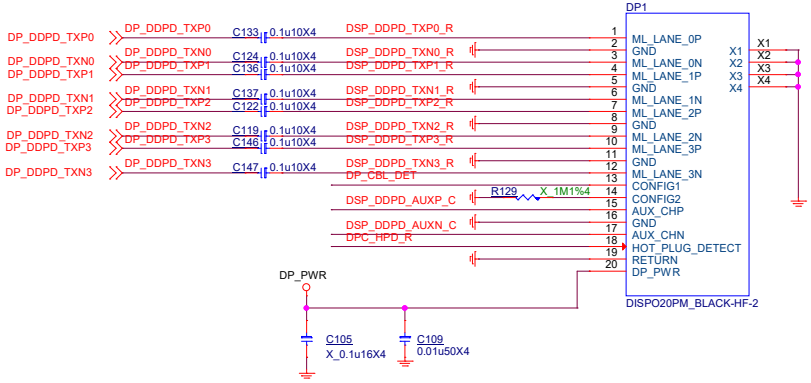
ESD





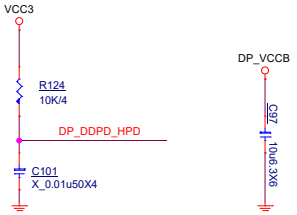


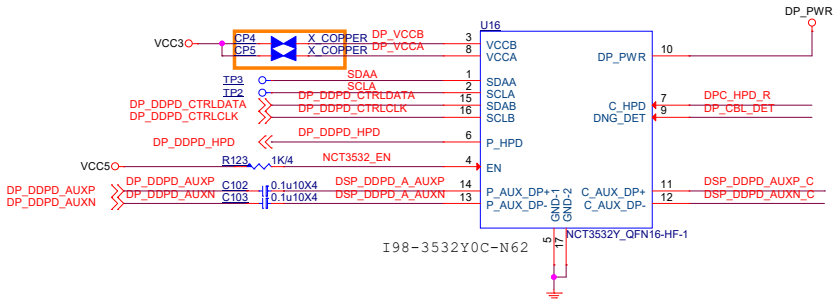
DP



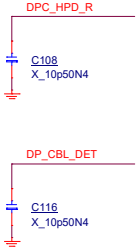
R82 (SharkBay CRB Rev0p70 have the resistor)

DP_VCCB trace don't less than 30 mil





I98-3532Y0C-N62



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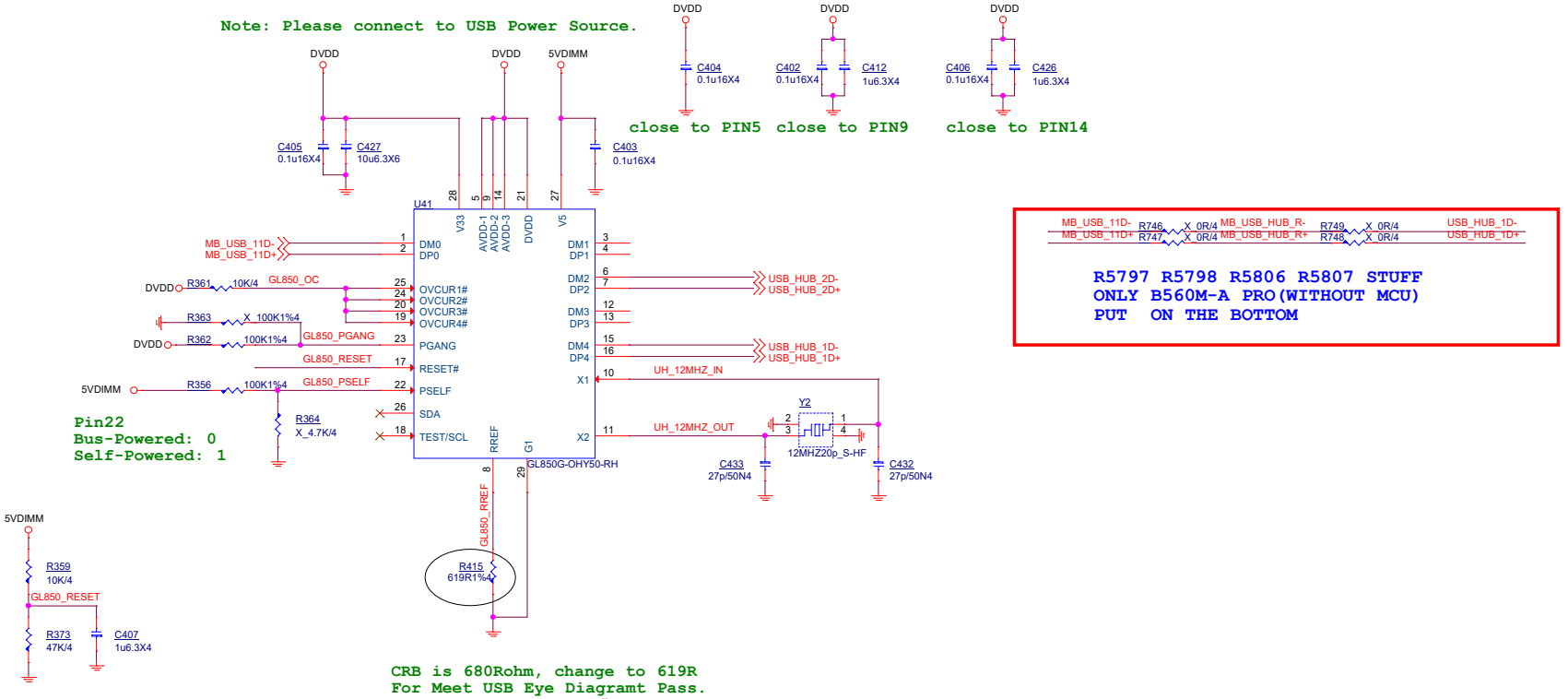
Rear USB2.0 HUB

Note: Please connect to USB Power Source.

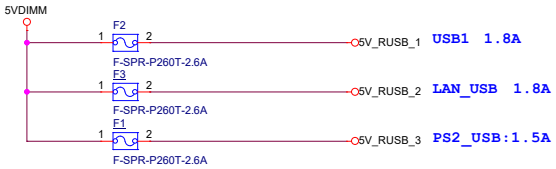


Pin23
Gang input:1
Individual input:0

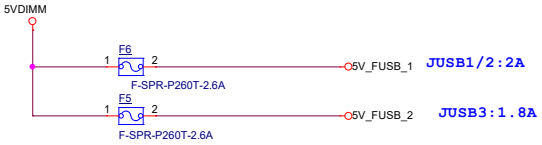
Pin22
Bus-Powered: 0
Self-Powered: 1

CRB is 680Rohm, change to 619R
For Meet USB Eye Diagramt Pass.
Note: USB2.0 Hub no need mapping OC# to PCH, Hub can report to PCH by Self.

REAR USB PORT POWER



FRONT USB PORT POWER



MICRO-STAR INT'L CO.,LTD

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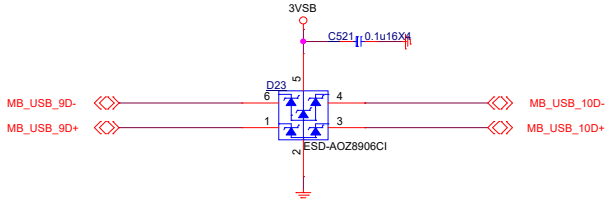
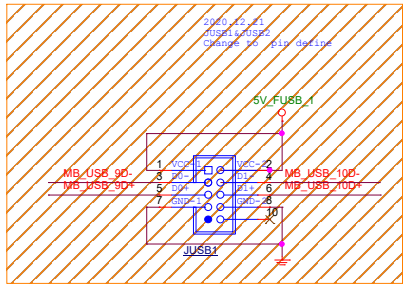
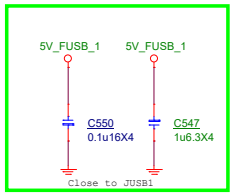
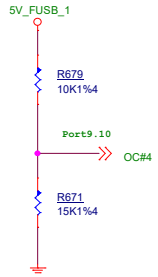
Front USB2.0

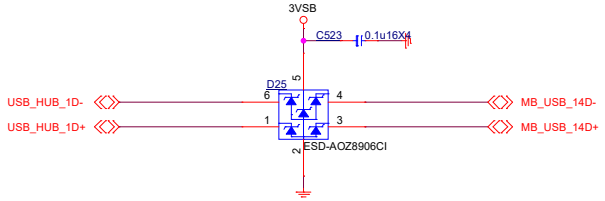
2A

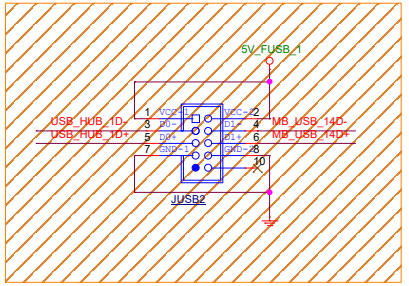


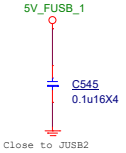












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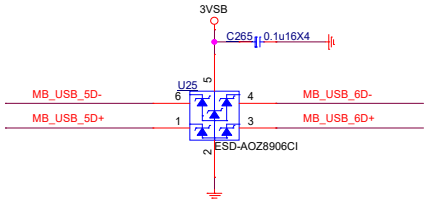
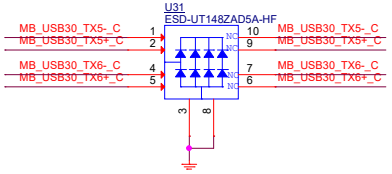
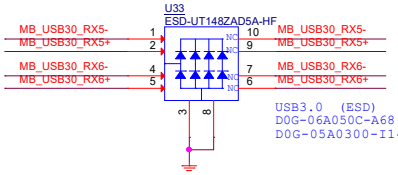
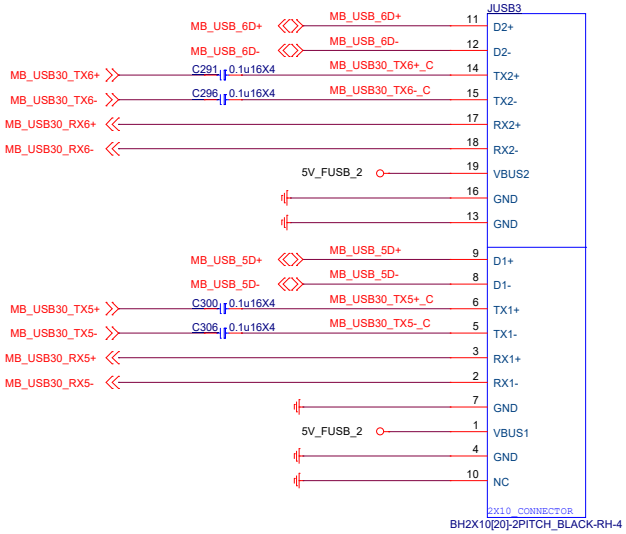
Front JUSB3

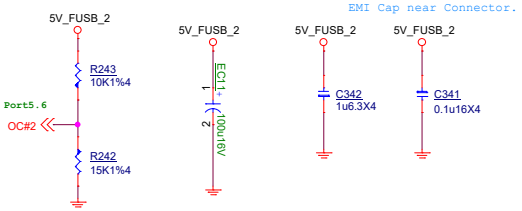
1.8A











MSI	MICRO-STAR INT'L CO.,LTD	
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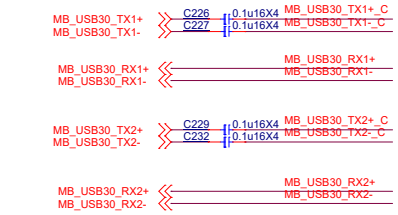
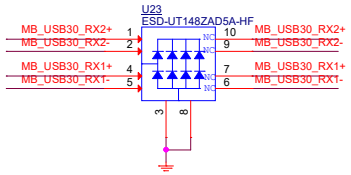
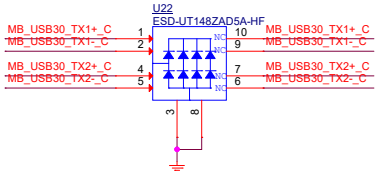
Rear USB3.0

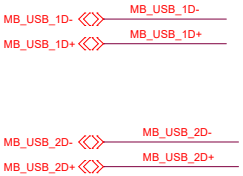
USB3.0 Port1.2
USB2.0 Port1.2

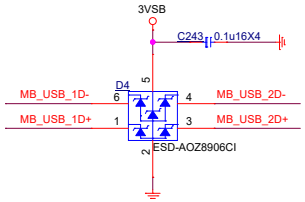
1.8A

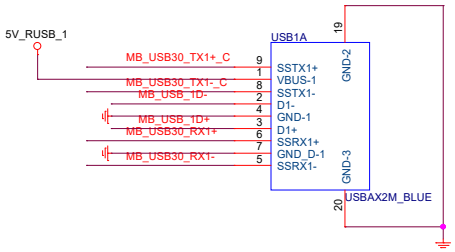


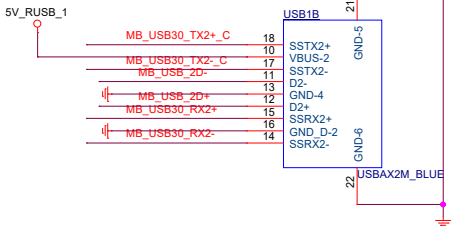


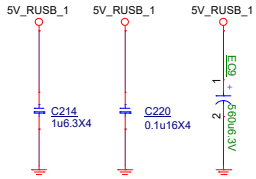


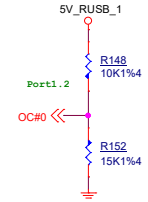












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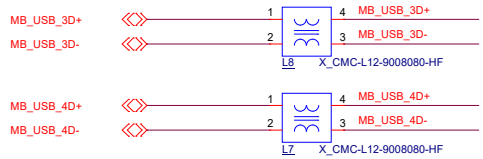
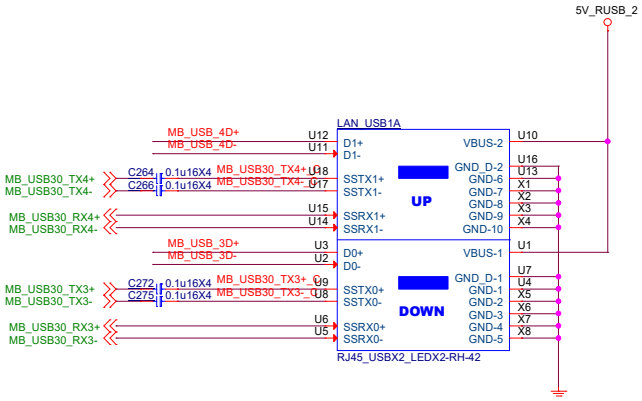
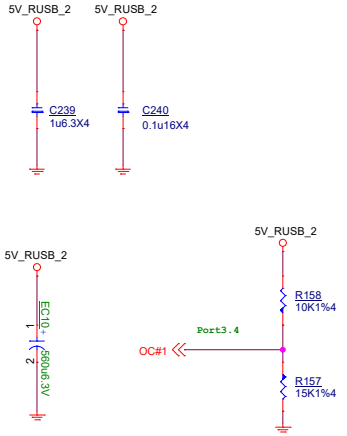
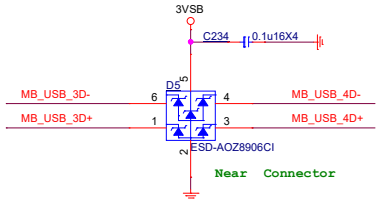
Rear lan USB2.0 1.8A

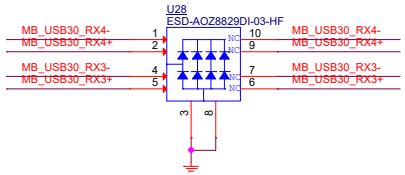
20200721 keep common choke footprint and default short

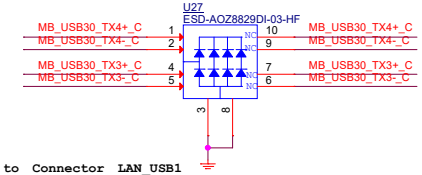












close to Connector LAN_USB1

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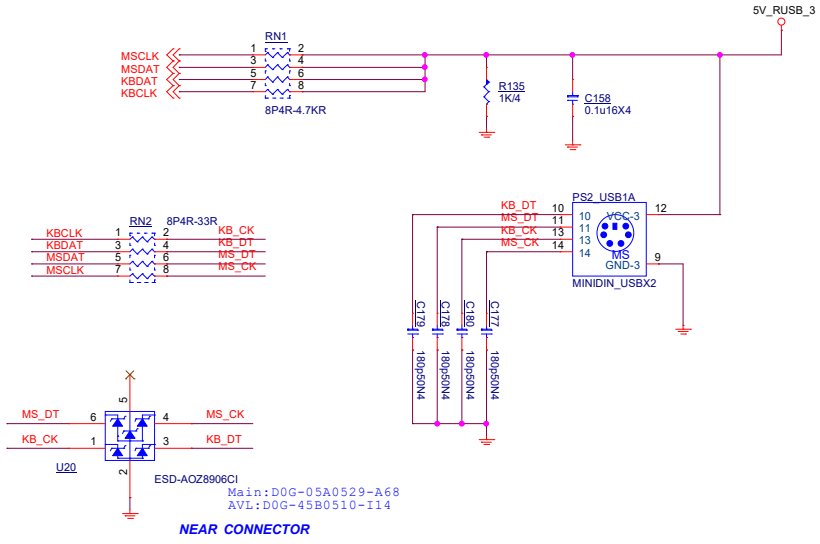
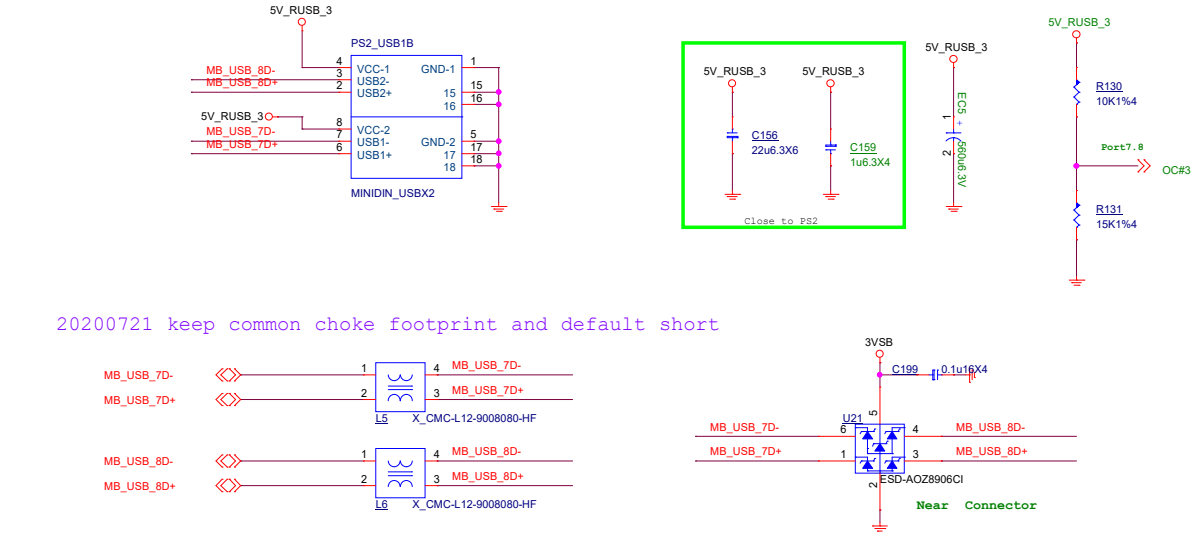
PS2 Connector 0.5A



PS2 USB Connector 1.0A



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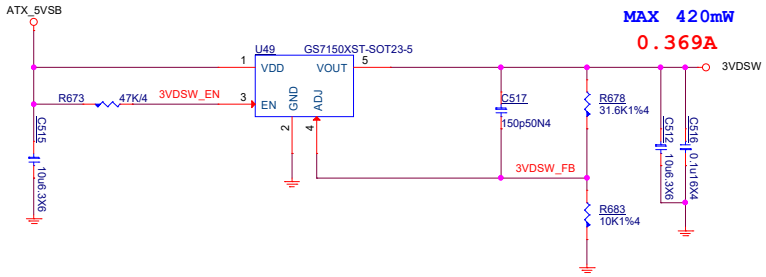
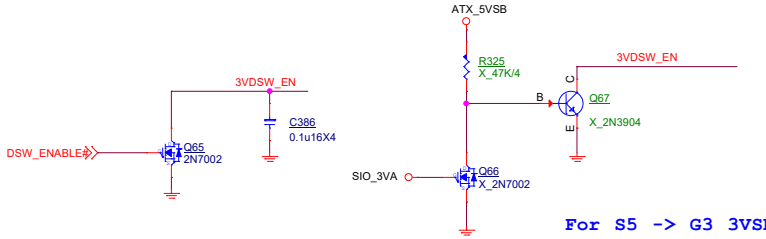
3VDSW

Power Loss=(Vin-Vou)*Iout
=(5-3.3)*0.369
=1.7*0.369
=0.6273W > 0.42W

MAX 420mW
0.369A

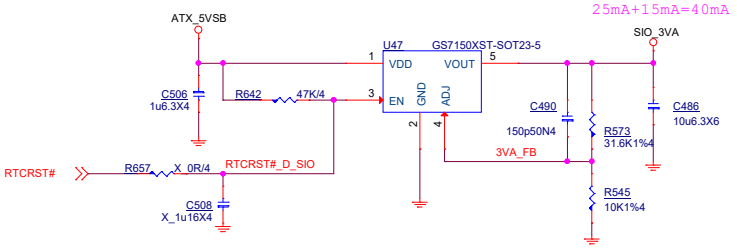




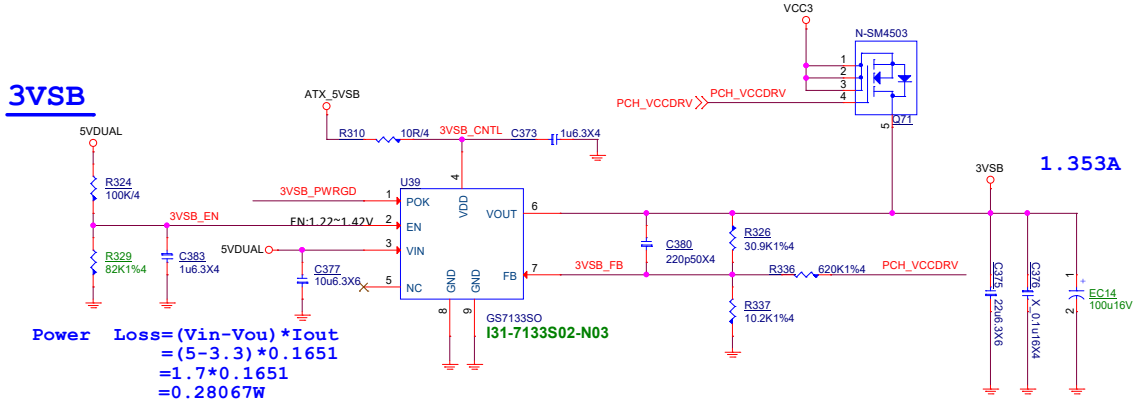
For S5 -> G3 3VSB_EN ISSUE

SIO_3VA

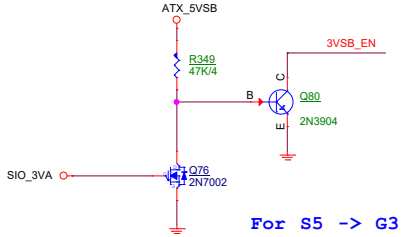
Power Loss=(Vin-Vou)*Iout
=(5-3.3)*0.04
=1.7*0.04
=0.068W



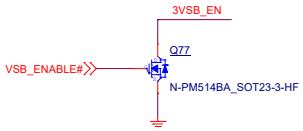
3VSB

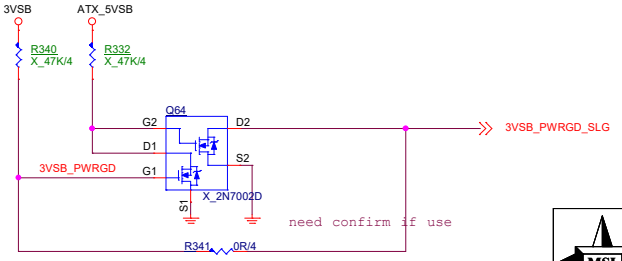


Power Loss=(Vin-Vou)*Iout
=(5-3.3)*0.1651
=1.7*0.1651
=0.28067W



For S5 -> G3 3VSB_EN ISSUE





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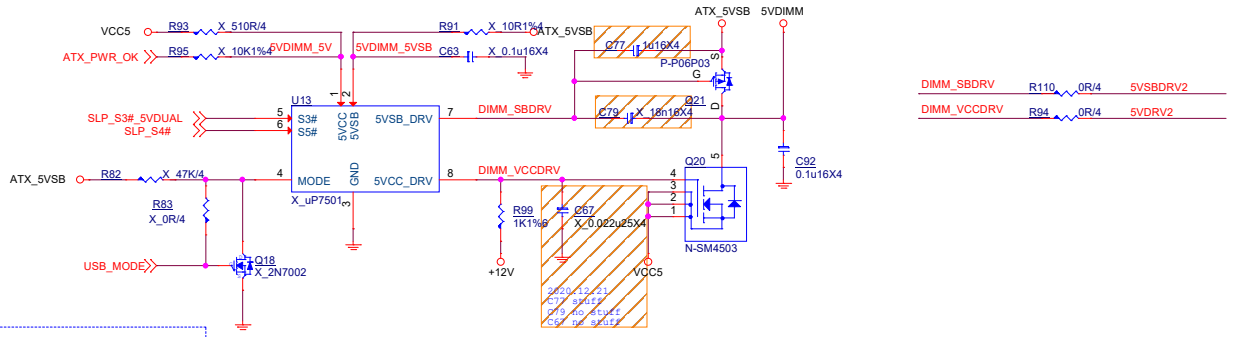
5VDIMM FOR DDR

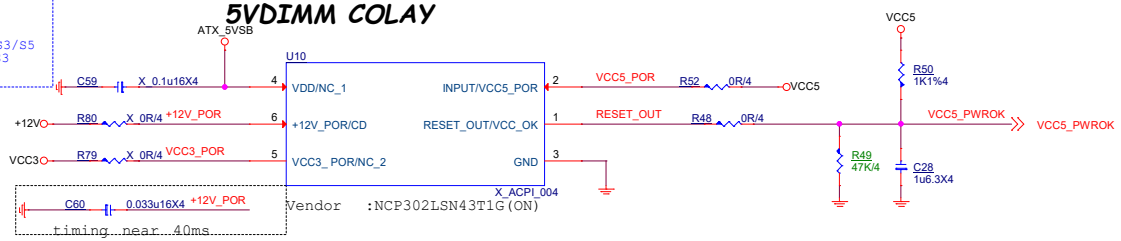
14.36A

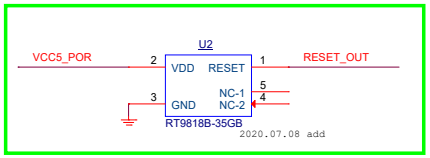


TO:NCT6687 GP86

H:SUPPORT S0/S3/S5
L:SUPPORT S0/S3

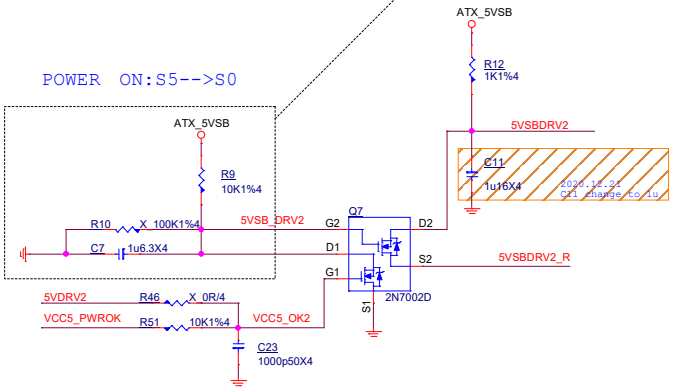
5VDIMM COLAY

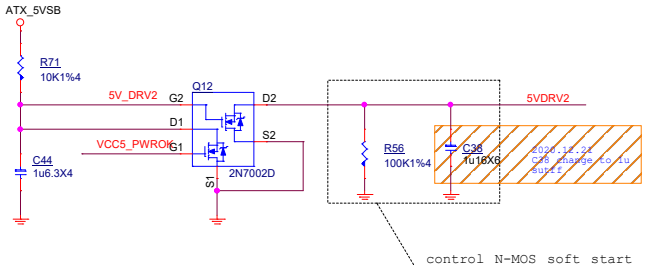


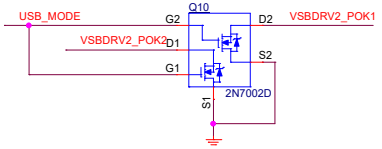


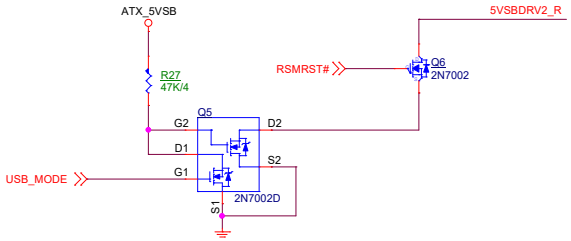
control P-MOS soft start and waiting ATX_5VSB ramp to 100%

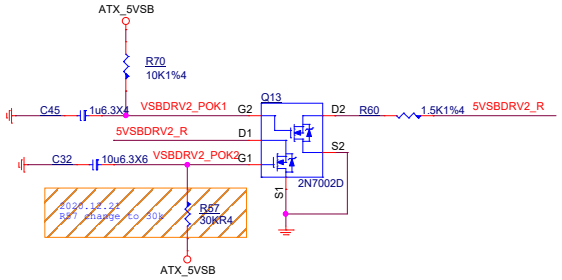
POWER ON:S5-->S0



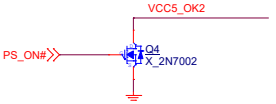








POWER OFF:S0-->S5



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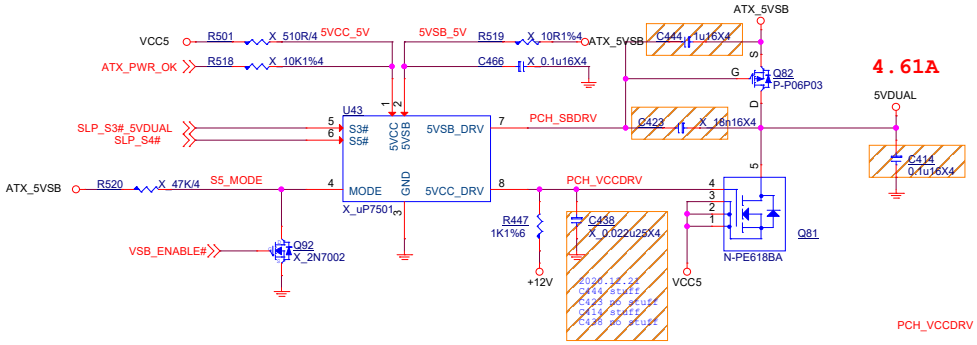
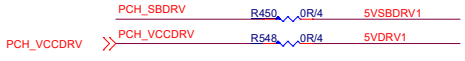
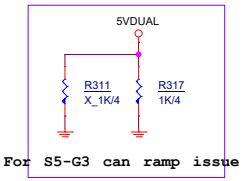
5VDUAL





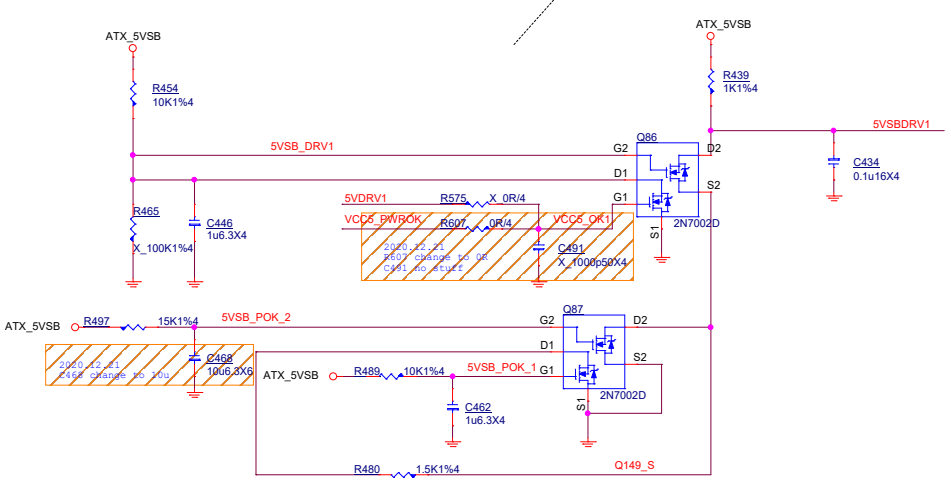


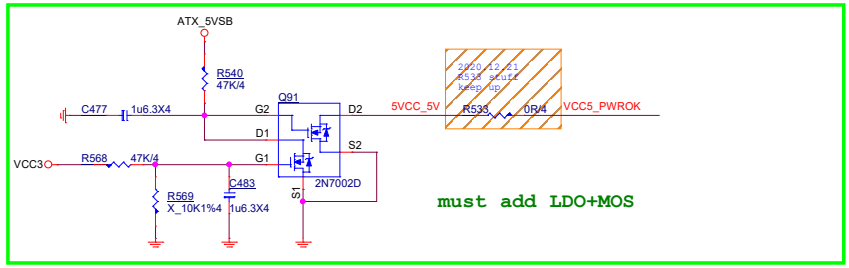
For S5-G3 can ramp issue

20201217 R317 STUFF

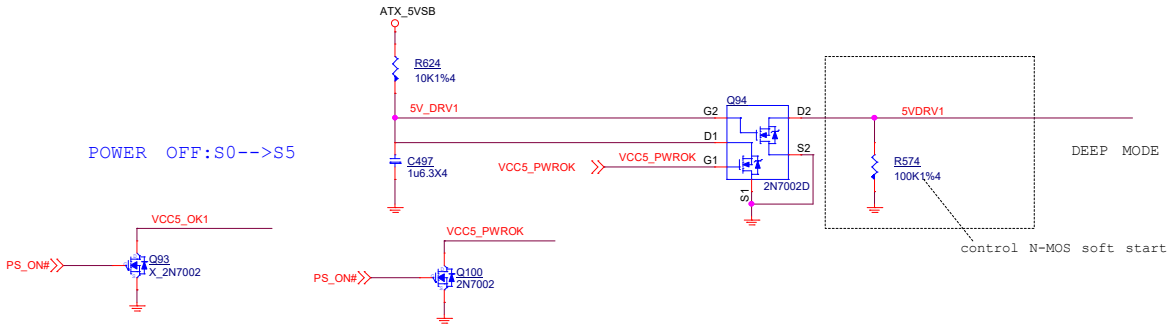
control P-MOS soft start and waiting ATX_5VSB ramp to 100%

POWER ON:S5-->S0

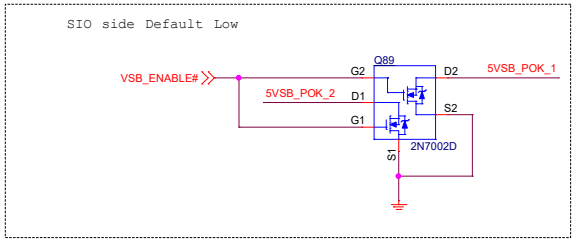




POWER OFF:S0-->S5



control N-MOS soft start



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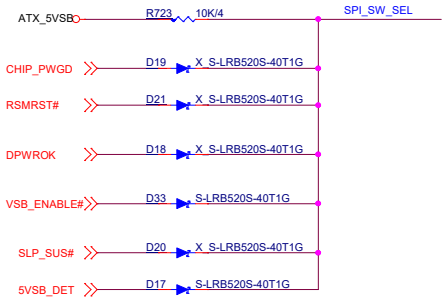
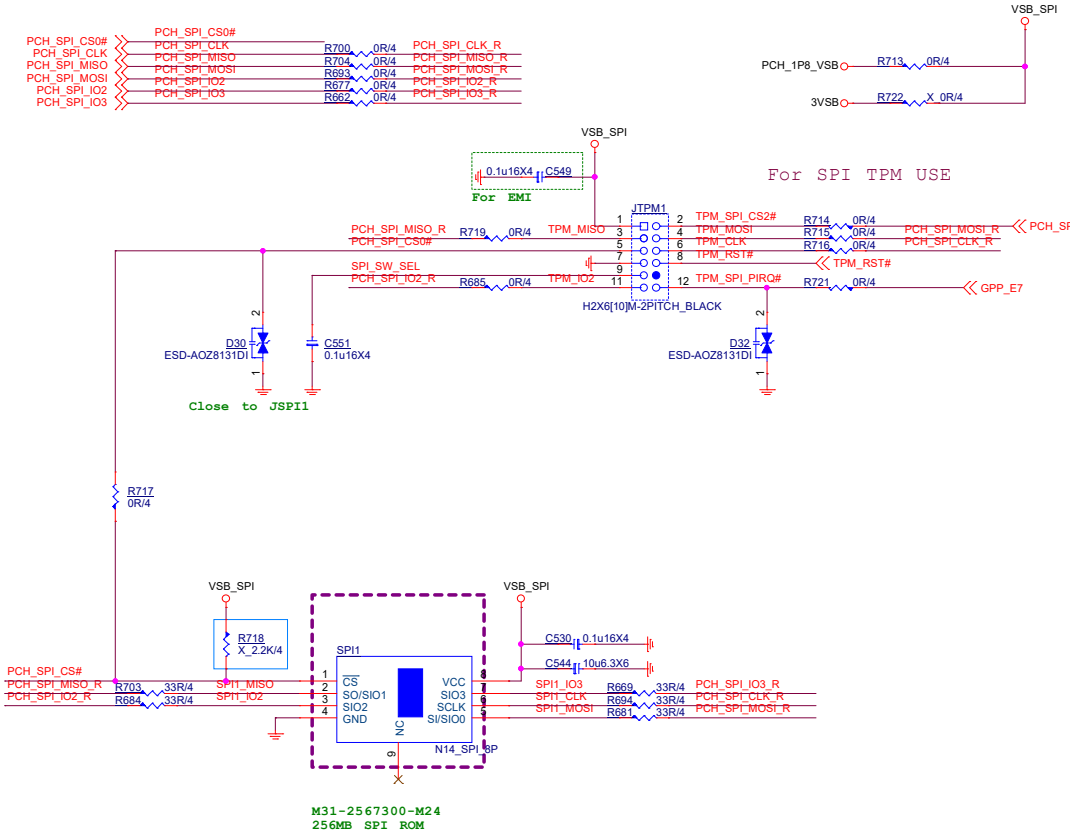
Module Stuff CHIP_PWGD,
But PCH_PWROK may ramp up before CHIP_PWGD.



For TL624-1.
DEEP Mode : Stuff D48/R2517
DSW Mode : Stuff D48/D49/R2517



M31-2567300-M24
256MB SPI ROM

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VCORE Iccmax 140A,TDC 132A, OCP182A.
VGT Iccmax 55A,TDC 46A, OCP76A.

SPEC:output choke CH-0.33u45A0.71mS-HF
RKL-S 8CORE 35W performance spec:
VCORE Iccmax =140A,
Loadline=1.1mohm
VccGT Iccmax=54A,PL2=46A
Loadline=4 mohm

VCCST_PLL
VR_VIDSOUT VR65 X_100R1%4
VR_VIDSCLK VR67 X_45.3R1%4
VR_HOT# VR63 X_301R1%4
VR_VIDALERT# VR66 X_0R/4
VC41 X_1u6.3X4

VCORE_PWM1
VR10 10K/4
VCORE SVID ADDRESS=00h
VGT SVID ADDRESS=01h

VCORE_PWM2
VR9 59KR1%4
VCORE VBOOT=1.05V

VCORE_PWM3
VR4 140KR1%4
VCORE ICCMAX SET 140A

VCORE_PWM4
VR12 10K1%4
I2C ADDRESS=20h

VGT_PWM1
VR11 54.9K/4
VGT ICCMAX SET 55A

VGT_PWM2
VR21 59KR1%4
VGT VBOOT=1.05V

VCC5 12VIN
VR64 2.2R1%6
VR57 1K1%4
VC43 4.7u10X6
VC38 0.01u50X4

U11
VRM_EN → EN
VRM_PGD → VR_RDY
VCC VRMP
SDIO SCLK ALERT → VR_VIDSOUT VR_VIDSCLK VR_VIDALERT#
VR54 10R1%4 VR55 49.9R1%4
VC13 X_1000p50X4

DIFF VR52 47R/4 VC36 330p50N4 VR47 4.7K/4 VC32 4700p50X4 COMP
VR46 1K1%4 VR44 X_560K1%4 VC33 47p50N4 FB
0.6V

DRON PWM1_SV_ADDR CSN1 CSP1 → DRVON VCORE_PWM1 VCORE VCORE_P1
VCORE_CSP1_R VR8 3.3K1%4
PWM2/VBOOT CSN2 CSP2 → VCORE_PWM2 VCORE VCORE_P2
VCORE_CSP2_R VR24 3.3K1%4
PWM3/ICCMAX CSN3 CSP3 → VCORE_PWM3 VCORE VCORE_P3
VCORE_CSP3_R VR33 3.3K1%4
PWM4/SM_ADDR CSN4 CSP4 → VCORE_PWM4 VCORE VCORE_P4
VCORE_CSP4_R VR40 3.3K1%4

VCORE VR53 100R1%4
VCORE_VCC_SENSE VR48 0R/4 VC35 1000p50X4 VSP
VCORE_VSS_SENSE VR51 2.4K/4 VR59 100R1%4 VC39 3300p50X4 VSN
VR61 31.6K1%4 VC37 470p50X4 IOUT

ON

CSSUM CSCOMP → VR43 330KR1%4 VR42 287K1%4 VRT3 100KRT1%4 VC31 33p50N4 VC26 1000p50X4
VR7 VR17 VR34 VR39 100K/4 → VCORE_P1 VCORE_P2 VCORE_P3 VCORE_P4
ILIM → VR41 39.2KR1%4
CSREF → VC18 1000p50X4
VR5 VR14 VR28 VR36 10R1%4 → VCORE

VCORE PORTION

DIFFA COMPA VR87 47R/4 VC67 330p50N4 VR85 2K1%4 VC65 4700p50X4 FBA
VR86 1K1%4 VR84 X_560K1%4 VC66 47p50N4

PWM1A/ICCMAXA CSN1A CSP1A → VGT_PWM1 VGT VGT_P1
VGT_CSP1_R VR35 3.3K1%4
PWM2A/VBOOTA CSN2A CSP2A → VGT_PWM2 VGT VGT_P2
VGT_CSP2_R VR27 3.3K1%4

VGT VR49 100R1%4
VGT_VCC_SENSE VR45 0R/4 VC30 1000p50X4 VSPA
VGT_VSS_SENSE VR50 3K1%4 VR56 100R1%4 VC34 3300p50X4 VSNA
VR60 26.7K1%4 VC40 470p50X4 IOUTA

CSSUMA CSCOMPA → VR37 48.7KR1%4 VR23 330KR1%4 VR18 560K1%4 VRT2 100KRT1%4 VC20 120p50N4 VR26 48.7KR1%4 VC29 470p50X4 → VGT_P1 VGT_P2
ILIMA → VR29 48.7KR1%4
CSREFA → VC28 1000p50X4
VR31 VR19 10R1%4 → VGT

VCCGT PORTION

H_PROCHOT# VR62 X_0R/4 VR_HOT# → VRHOT#
TSENSE_PWM → TSENSE
SM_SDA SM_SCL
EPAD
TSENSEA → TSENSEA_PWM
PSYS VR58 2K1%4 VCC5
NCP81267MNTXG

BOTTOM PAD CONNECT TO GND THROUGH 6 VIAS

SMBDATA_VSB SMBCLK_VSB
VR109 0R/4 VR108 0R/4
SMBDATA_81267 SMBCLK_81267

Fsw default=180Khz,CAN BE program up to 1.17Mhz VIA I2C.

SMBCLK_VSB JSMB1 SMBDATA_VSB
H2X2[4]M_BLACK-RH
2020.12.21 add JSMB1 VR109&VR108

ATX_5VSB
VR1 47K/4
J1 H1X2M-2PITCH
VBOOT_CTRL
D1 ESD-AOZ8231ADI
VQ3 2N7002D
VR6 12K/4 VCORE_PWM2
VR2 12K/4 VGT_PWM2

J1 on VCORE/VGT Vboot=1.05V
J1 off VCORE/VGT Vboot=0V

VCORE_CSP1_R VR15 X_100K/4 VC9 0.1u16X4 VC8 X_0.1u16X4 VCORE
VCORE_CSP2_R VR22 X_100K/4 VC15 0.1u16X4 VC16 X_0.1u16X4 VCORE
VCORE_CSP3_R VR30 X_100K/4 VC22 0.1u16X4 VC21 X_0.1u16X4 VCORE
VCORE_CSP4_R VR38 X_100K/4 VC27 0.1u16X4 VC25 X_0.1u16X4 VCORE

VGT_CSP1_R VR32 X_100K/4 VC24 0.1u16X4 VC23 X_0.1u16X4 VGT
VGT_CSP2_R VR25 X_100K/4 VC19 0.1u16X4 VC12 X_0.1u16X4 VGT

VCORE Default ALERT 106 .

PUT CLOSE TO VCORE HOT SPOT
VRT4 100KRT1%4
VR3 442R1%0402 VC17 0.1u16X4 TSENSE_PWM

PUT CLOSE TO VGT HOT SPOT
VRT1 100KRT1%4
VR13 442R1%0402 VC14 0.1u16X4 TSENSEA_PWM

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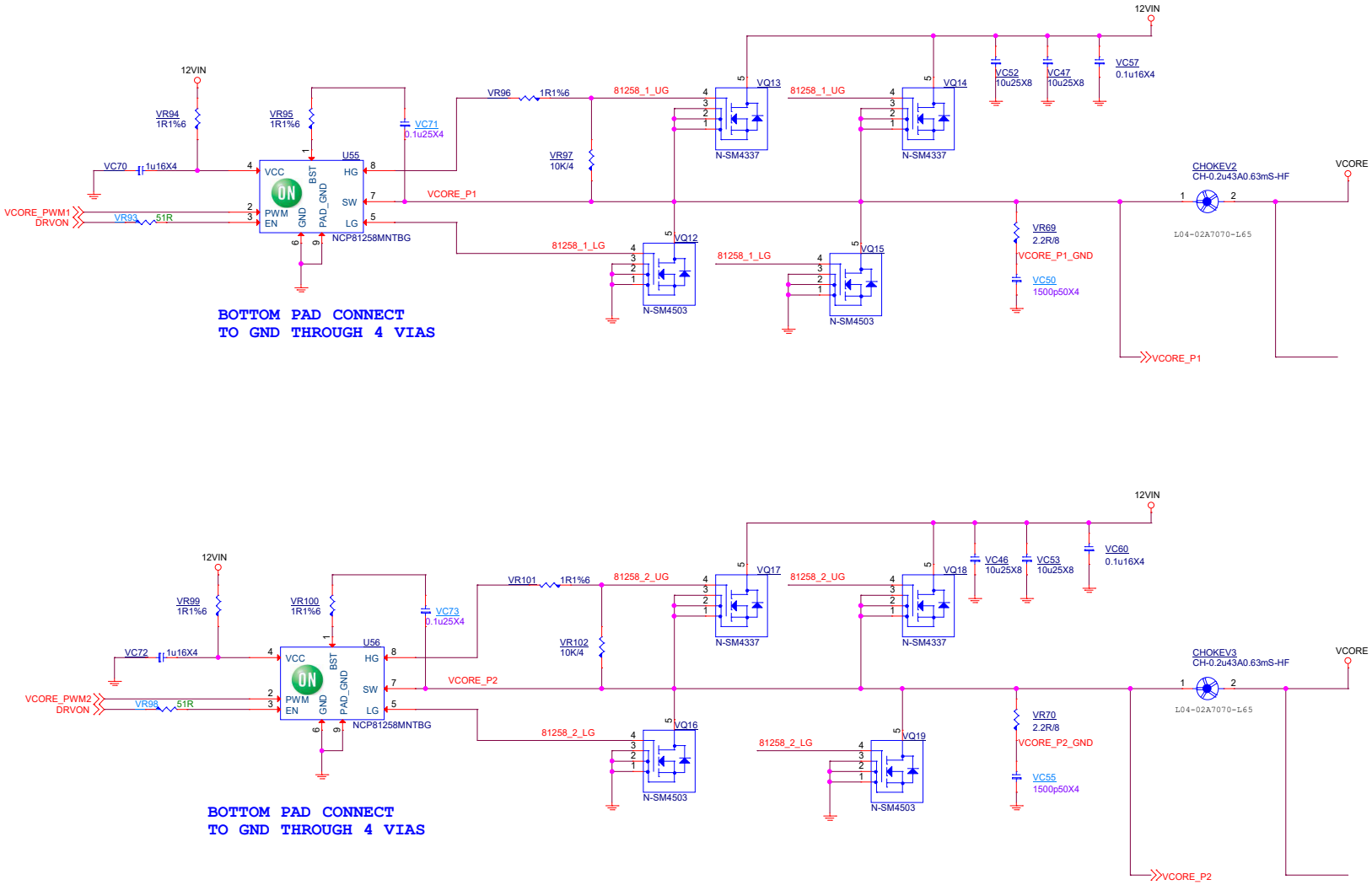

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Size: Custom	Document Description: VCORE MOS-PHASE 1~2	Rev: 10
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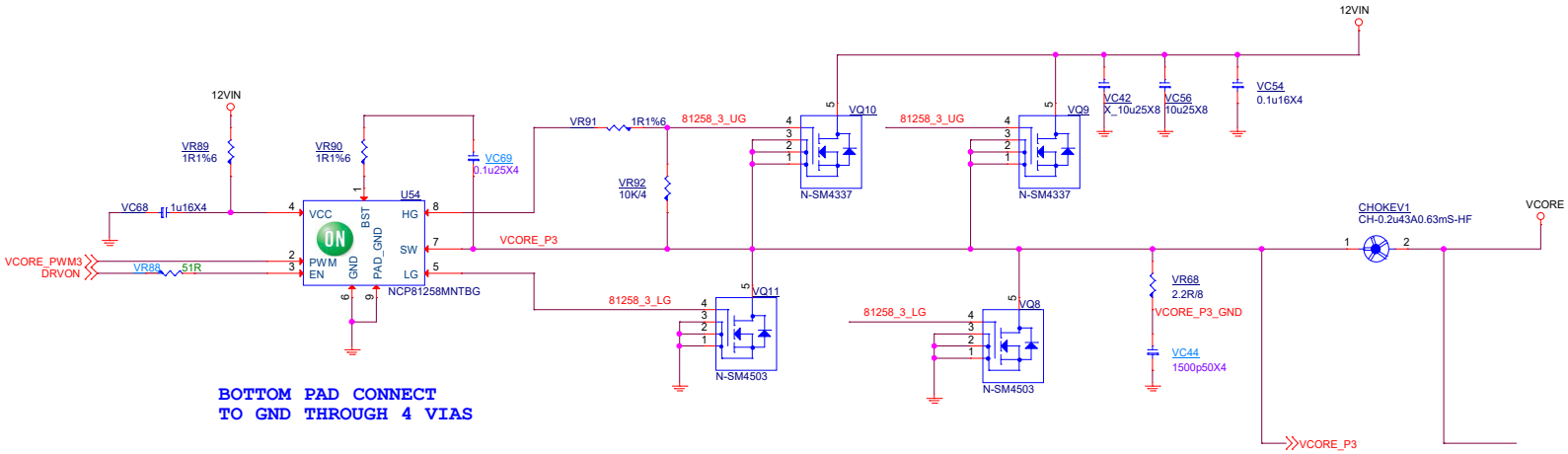
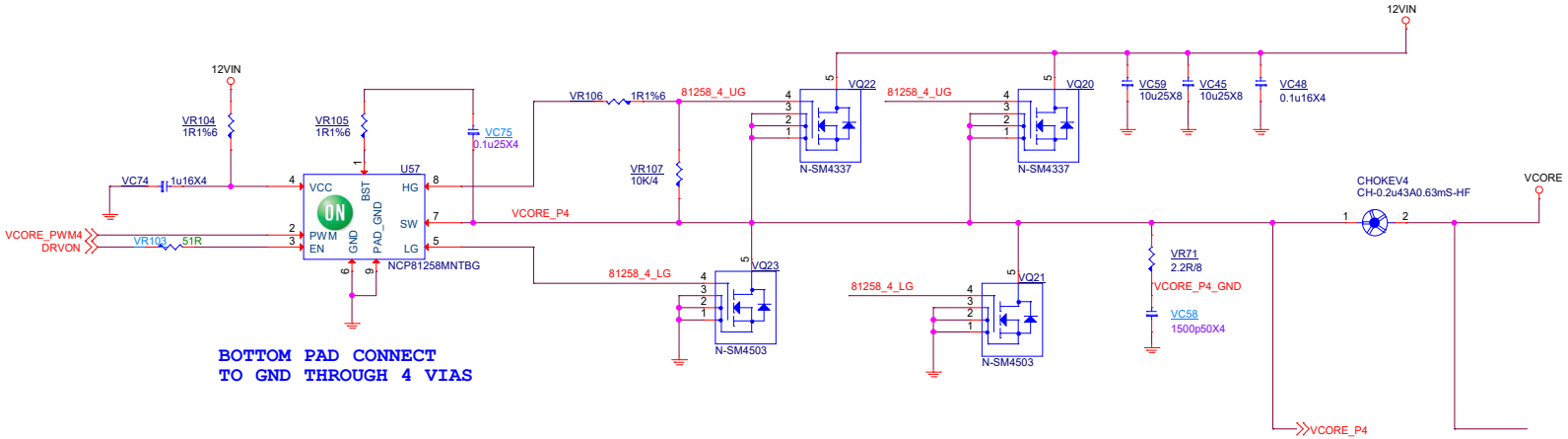


BOTTOM PAD CONNECT TO GND THROUGH 4 VIAS



BOTTOM PAD CONNECT TO GND THROUGH 4 VIAS

MICRO-STAR INT'L CO.,LTD		
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Size: Custom	Document Description: VCORE MOS-PHASE 3-4	Rev: 10
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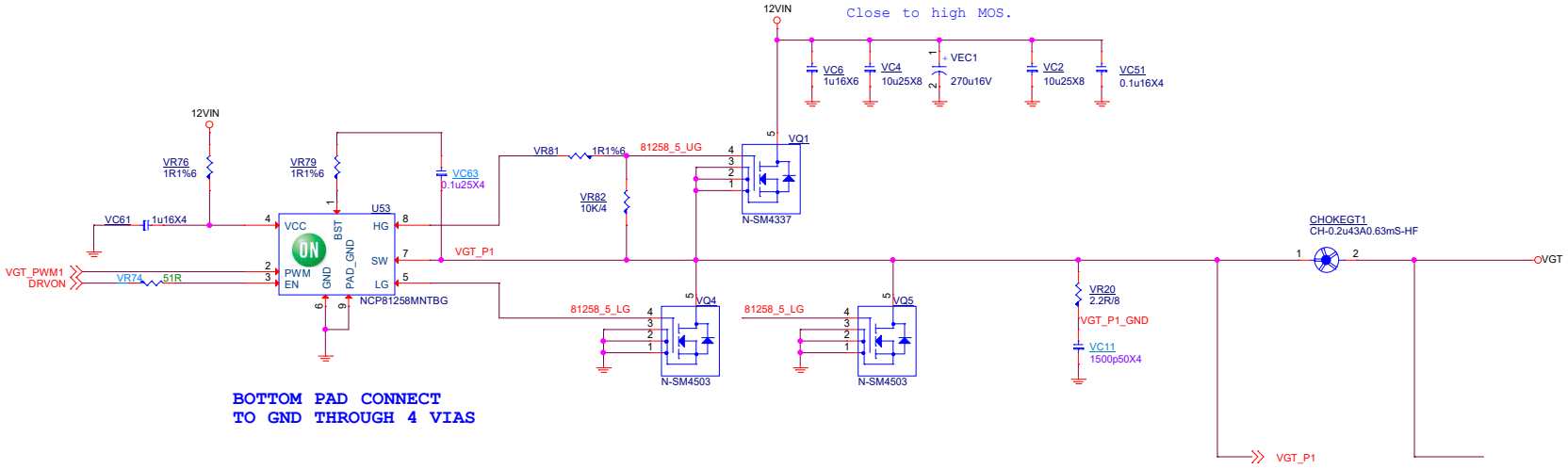
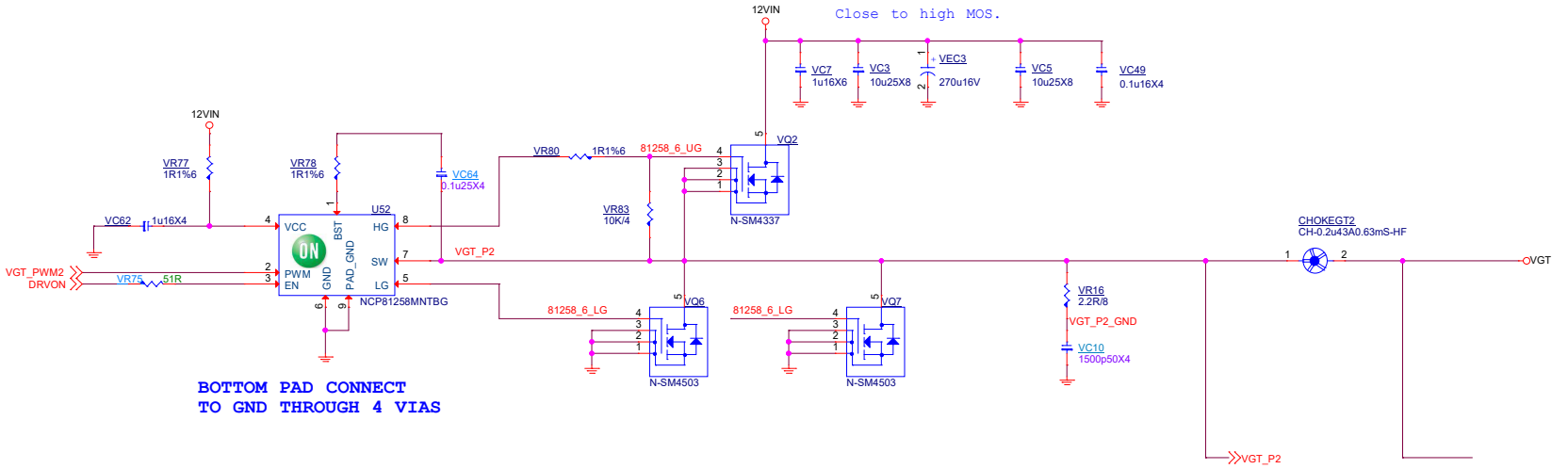
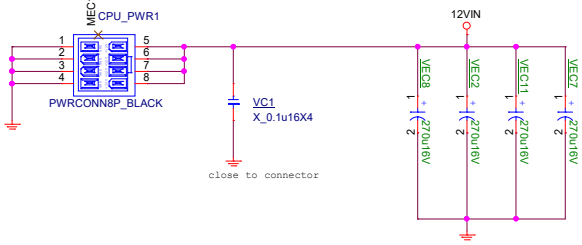
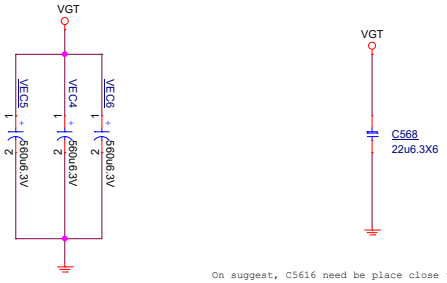




12VIN CONNECTOR





On suggest, C5616 need be place close to output choke to reduce ripple.

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Size: Custom	Document Description: VGT MOS-PHASE 1~2	Rev: 10
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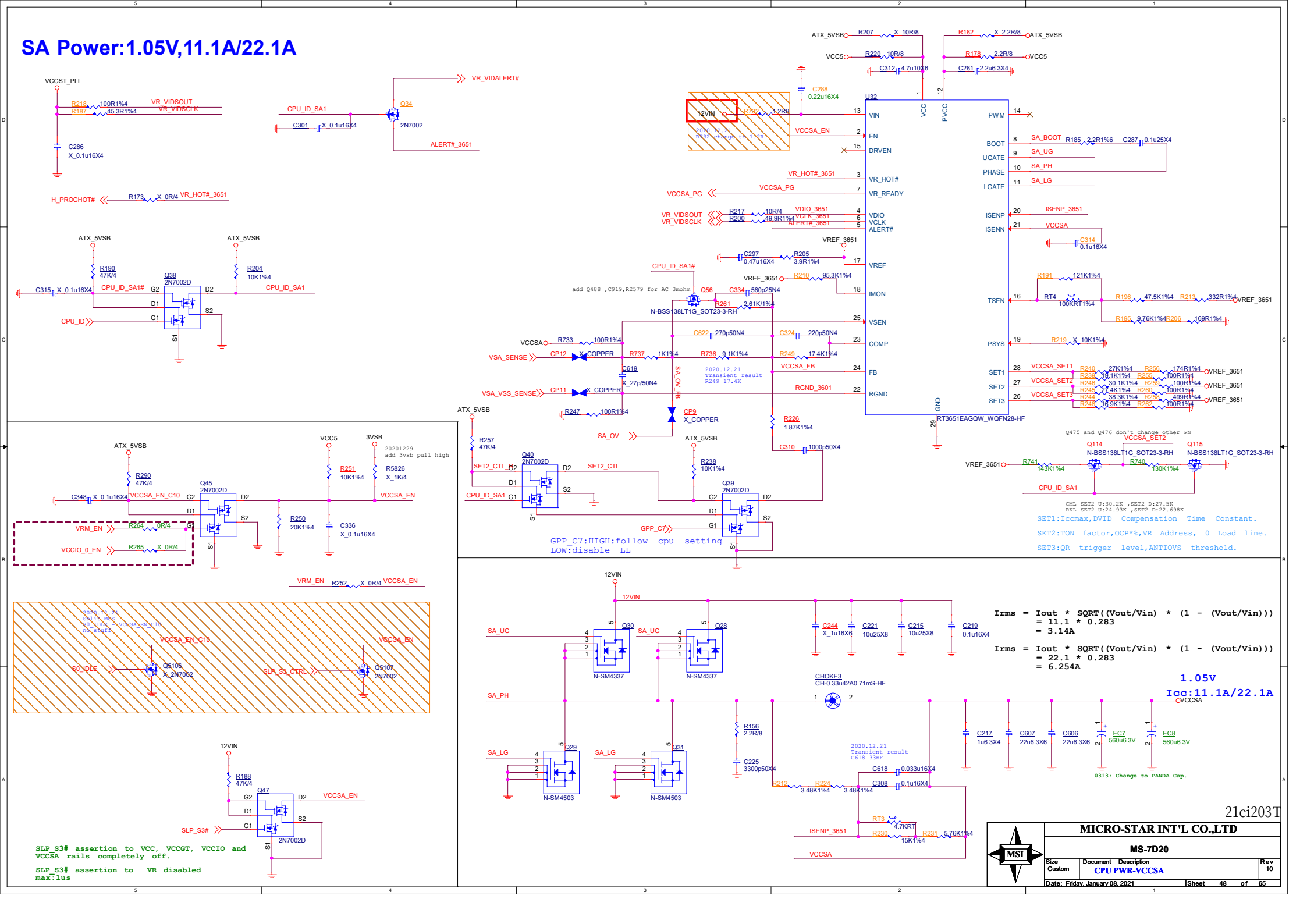
SA Power:1.05V,11.1A/22.1A



VCCIO Power 0.95,6.4A

1.05,9.6A

Irms1 = Iout * SQRT((Vout/Vin) * (1 - (Vout/Vin)))
= 6.4 * 0.27
= 1.728A

1.05V Icc:7.5A RKL-S
0.95V Icc:6.4A CML-S

2020.12.31
AOZ2263
019-7D15002-A68

Irms2 = Iout * SQRT((Vout/Vin) * (1 - (Vout/Vin)))
= 16.5 * 0.283
= 4.67A

0V (CPU_ID = 0)
1V (CPU_ID = 1)

1V Icc:9.6A

information from PDG page686

GPP_F22	GPP_F23	CPU_ID	VCCIO_0
Low	Low	Low	0.95V
Low	Low	High	1.05V
High	Low	High	1.075V
Low	High	High	1.100V
High	High	High	1.125V

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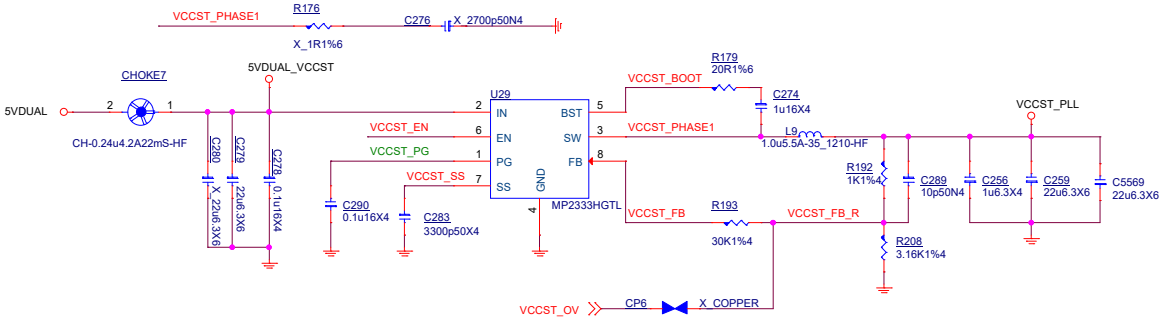
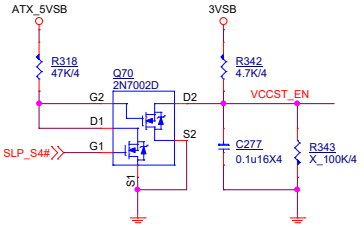
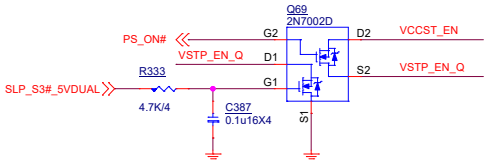
VCCST

1.05V; 0.92A/2.3A





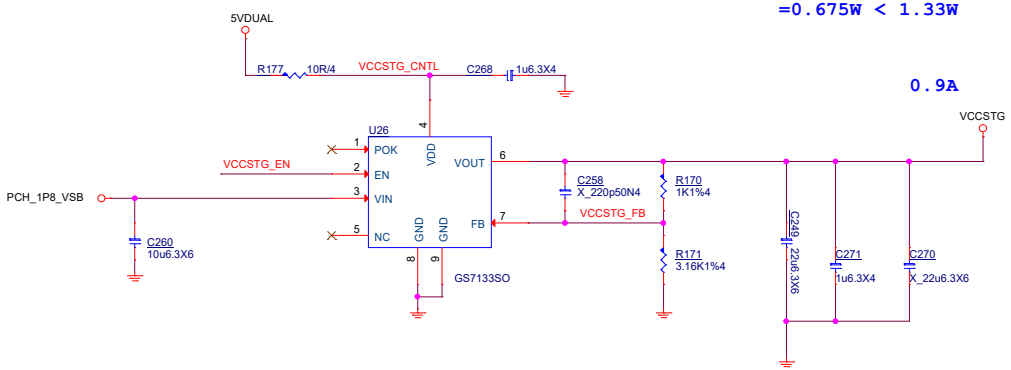


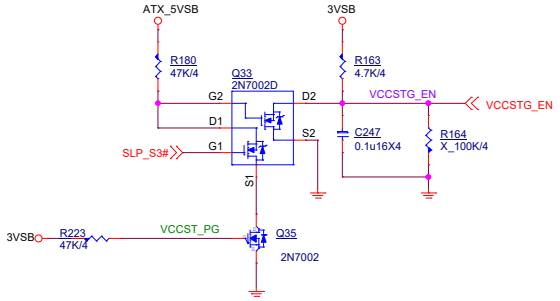
VCCSTG

1.05V; 0.2A/0.9A

Power Loss=(Vin-Vou)*Iout
=(1.8-1.05)*0.9
=0.75*0.9
=0.675W < 1.33W

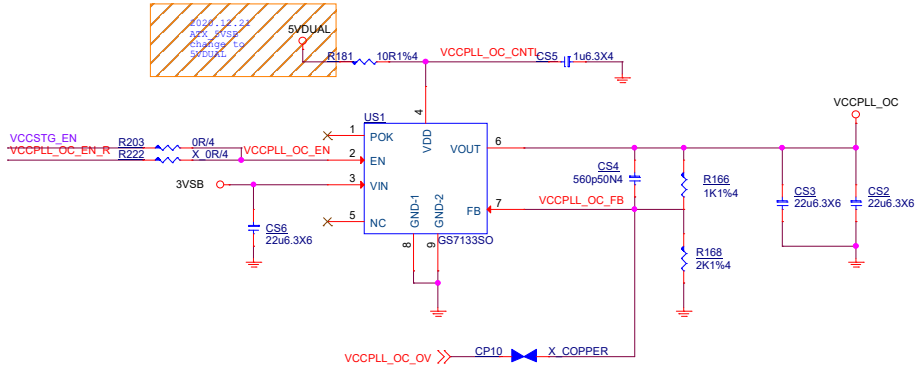
0.9A

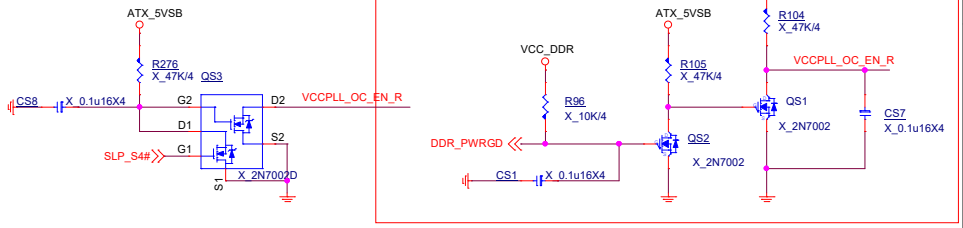




VCCPLL_OC

1.2V; 250mA





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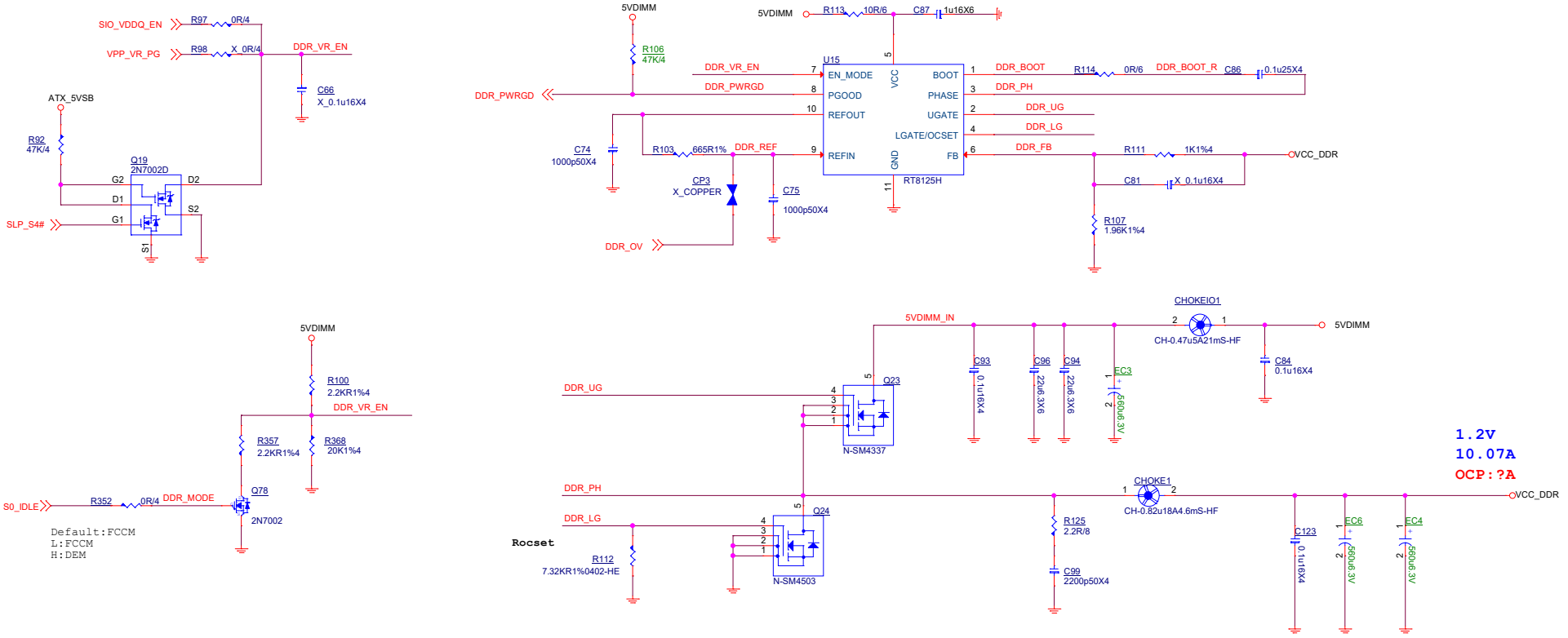
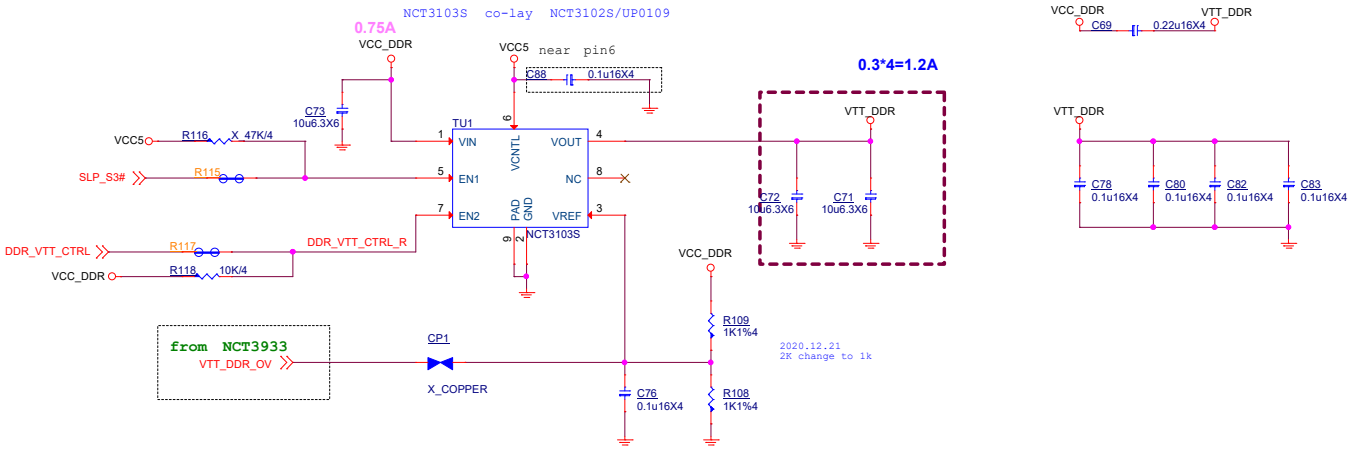
VCC DDR POWER



DDR VTT Power



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VPP2.5V Power:2.5V,3A

IC OCP:4.6

```
Irms = Iout * SQRT((Vout/Vin) * (1 - (Vout/Vin)))
     = 3 * 0.5
     = 1.5A
```

OCP real 3.8A

L=(Vout-(1-Vout/Vin))/(Fsw*Iout*0.4)
=1.66uH

f:1MHz

5VDIMM — CHOKE2 — CH-0.24u4.2A22mS-HF — 5VDIMM_VPP

C236 X_22u6.3X6 | C233 22u6.3X6 | C237 0.1u16X4

U24 SY8113KAIC_TSOT23-8-HF
IN, BS, EN, LX, PG, SS, FB, GND
VIN=4.5~18V
VIH>1.5V
open drain
VPP_EN
VPP_PG
VPP_BOOT — R162 0R/6 — VPP_BOOT_R — C245 0.1u16X4
VPP_PHASE
VPP25_FB

C235 0.01u50X4

CHOKE4 1.0u5.5A-35_1210-HF

VPP25
R160 52.3K1%4
C238 22p50N4
R159 16.5K1%4

C281 22u6.3X6 | C248 22u6.3X6 | C262 X_22u6.3X6 | C345 0.22u16X4

Tss=Css*Vref/Iss
10nF*0.6/4u=1.499ms

Vout=0.6*((R1/R2)+1))
0.6*((52.3/16.5)+1)=2.501

CP2 X_COPPER

DDR_VPP25_OV

VPP_PHASE — R161 X_1R1%6 — C241 X_2700p50N4
reserve snubber

ATX_5VSB — R147 47K/4 — Q26 2N7002D — 1u6.3X4 C208 — G2 D1 G1 D2 S2 S1
SLP_S4# — R145 X_0R/4
SIO_VPP_EN — R146 0R/4

5VDIMM — R150 2.2K/4 — 3V — VPP_EN
R153 3.3K1%4 | C216 0.1u16X4

5V
5VDIMM — R144 100K1%4 — Q25 2N7002
R143 X_100K/4 | C202 1u6.3X4

VPP25 — R155 10K/4 — 2.5V — VPP_PG
C222 0.1u16X4

ATX_5VSB — R149 47K/4 — Q27 2N7002D — G2 D1 G1 D2 S2 S1

5VDIMM — R154 2K1%4 — VPP_VR_PG — 3V — VPP_VR_PG
R151 3K1%4

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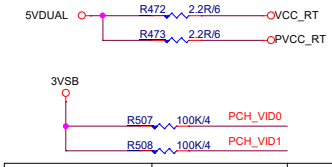
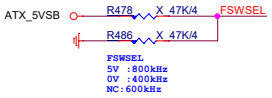
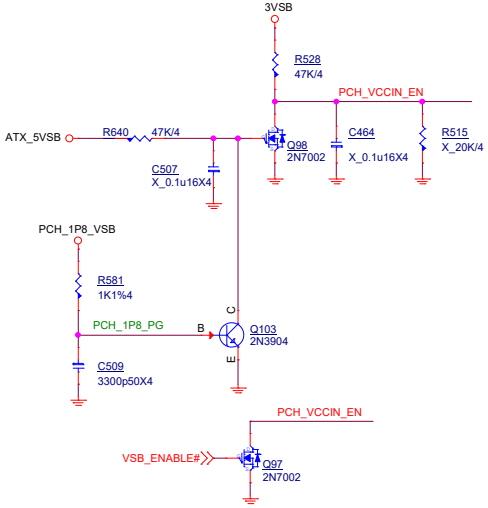
PCH_Power:VCCIN_AUX

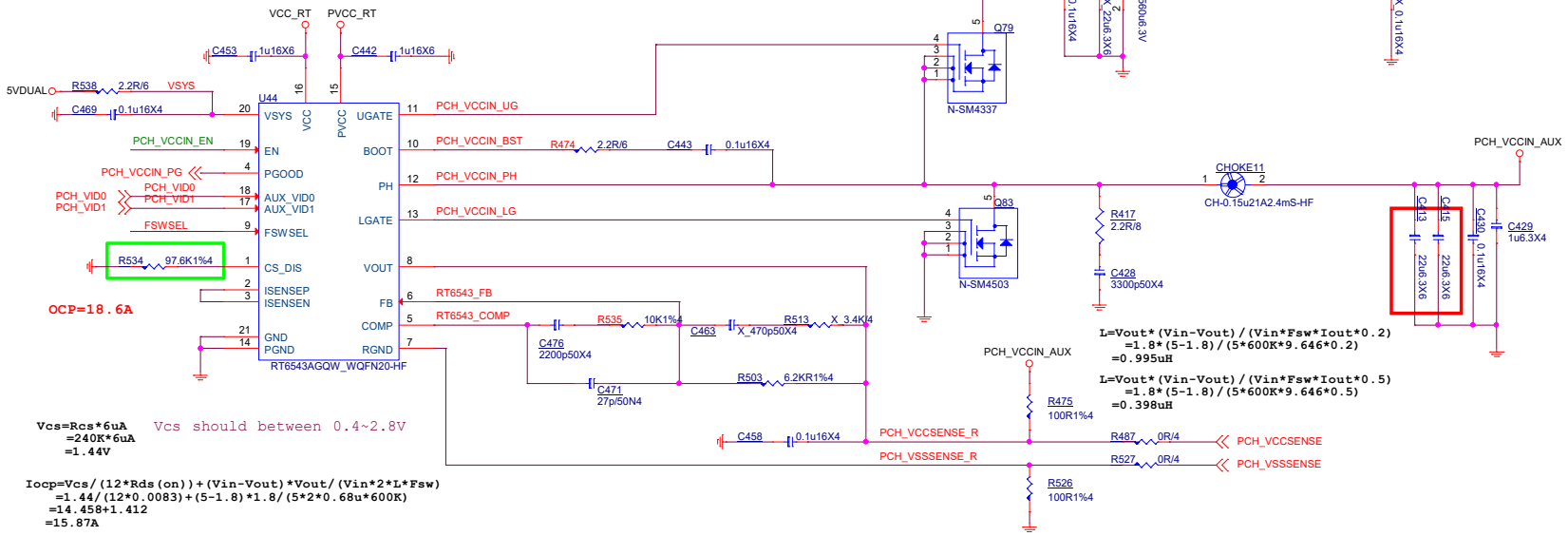
1.8V 9.646A



VID[1]	VID[1]	PCH_VCCIN_AUX_VOLTAGE
0	0	0
0	1	1.1
1	0	1.65
1	1	1.8







Vcs=Rcs*6uA
=240K*6uA
=1.44V

Vcs should between 0.4~2.8V

Iocp=Vcs/(12*Rds(on))+(Vin-Vout)*Vout/(Vin*2*L*Fsw)
=1.44/(12*0.0083)+(5-1.8)*1.8/(5*2*0.68u*600K)
=14.458+1.412
=15.87A

L=Vout*(Vin-Vout)/(Vin*Fsw*Iout*0.2)
=1.8*(5-1.8)/(5*600K*9.646*0.2)
=0.995uH

L=Vout*(Vin-Vout)/(Vin*Fsw*Iout*0.5)
=1.8*(5-1.8)/(5*600K*9.646*0.5)
=0.398uH

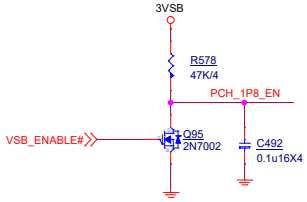
PCH_1P8_VSB

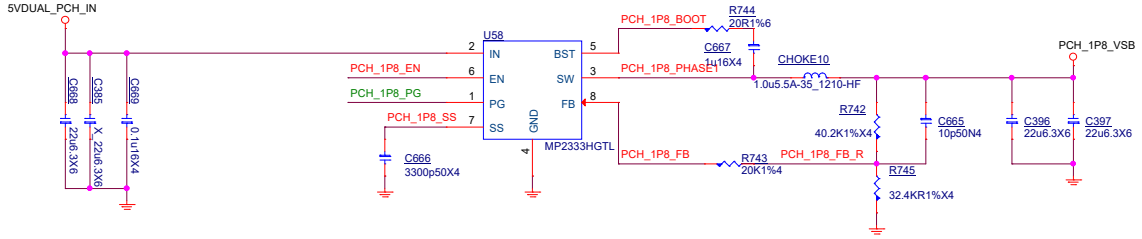
1.8V; 1.545A

Irms = Iout * SQRT((Vout/Vin) * (1 - (Vout/Vin)))
= 2.532 * 0.48
= 1.2154A

Vout = Vref * (1 + R5438/R5436)
= 0.8 * (1 + 40.2K/32.4K)
= 0.8 * 2.2485
= 1.793V

L=Vout(1-Vout/Vin)/(Fsw*Iout*0.4)
=1.8(1-1.8/5)/(1200K*2.532*0.4)
=0.9479uH





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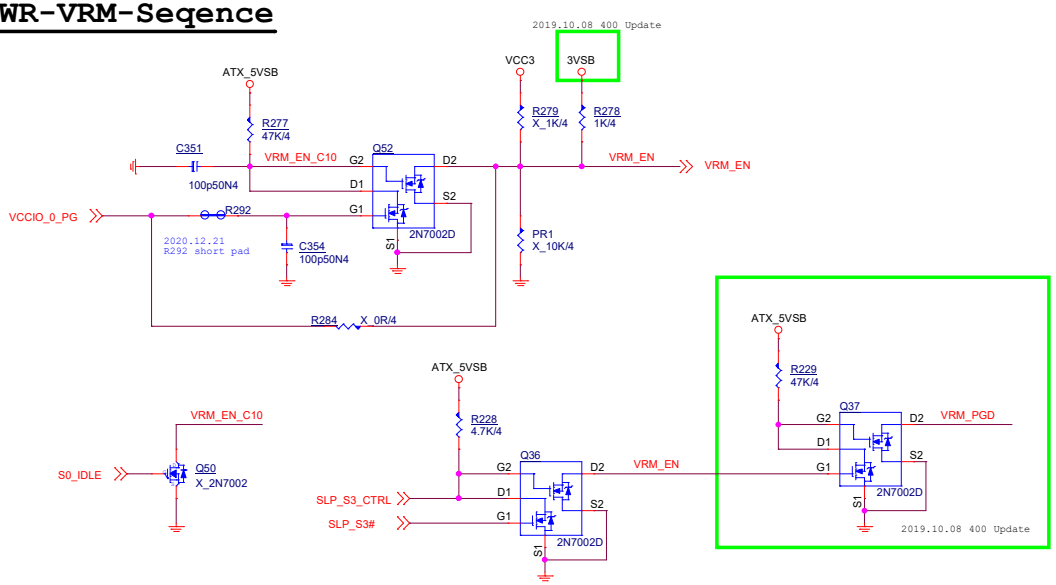
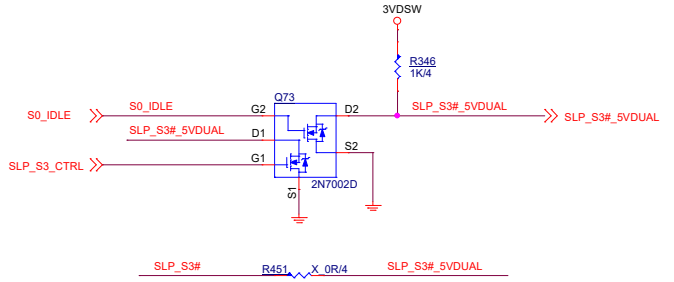
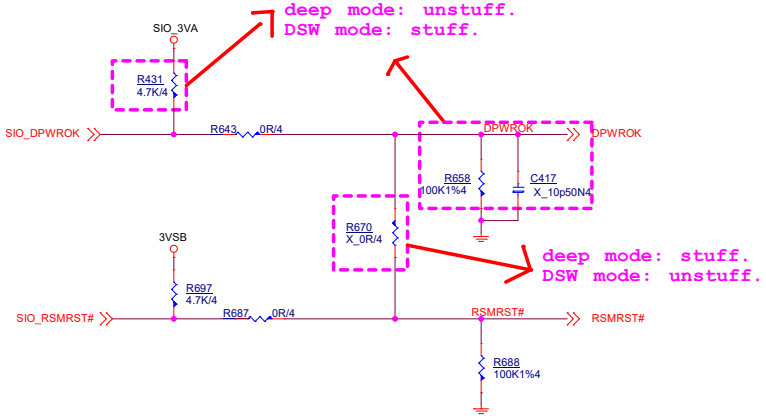
PWR-VRM-Seqence



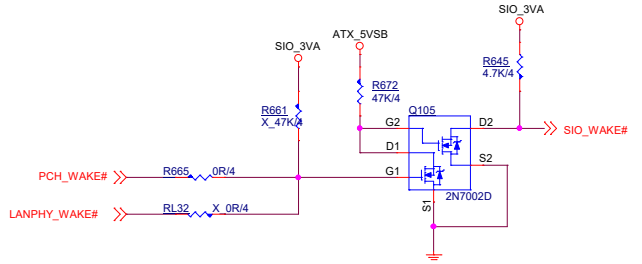
for 5VDIMM and 5VDUAL

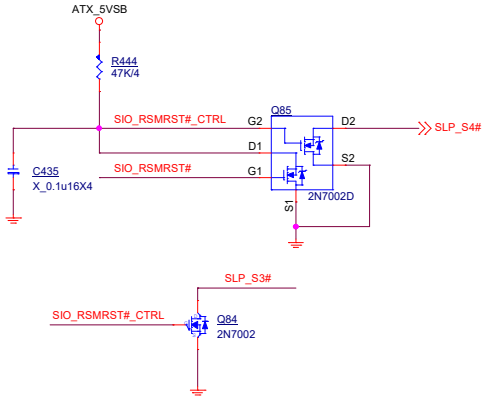
for S0ix

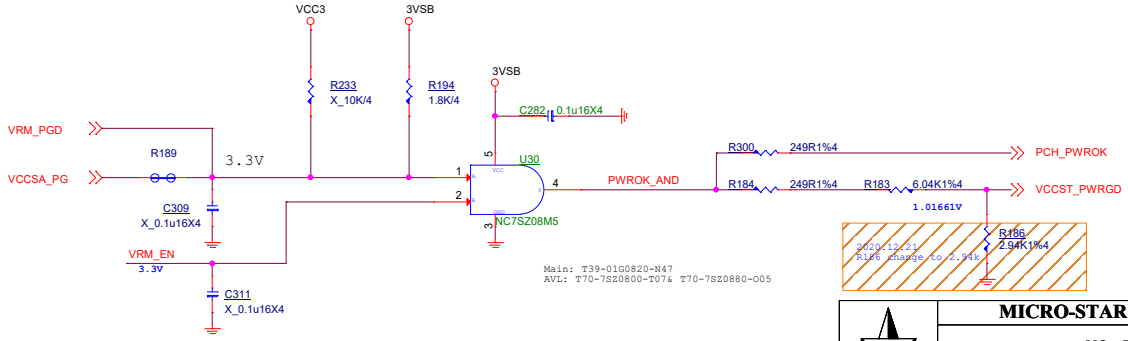




for wake







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FOR RSMRST#/DPWROK/SLP_SUS# INTEL seqence request

	DEEP_MODE_EN
DEEP_MODE	1
S5_MODE	0

for S0ix VCCIO/VCCSTG off

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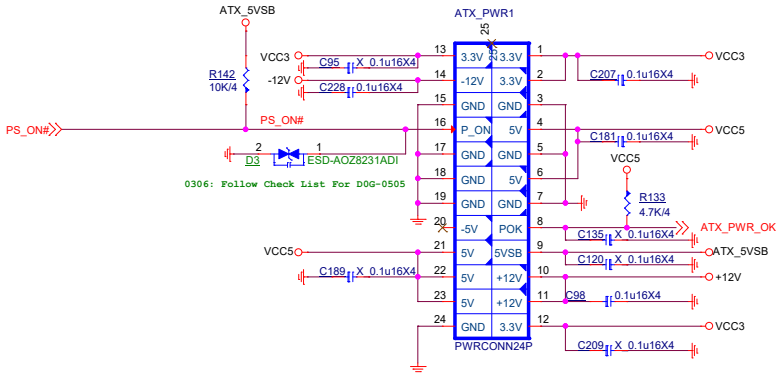
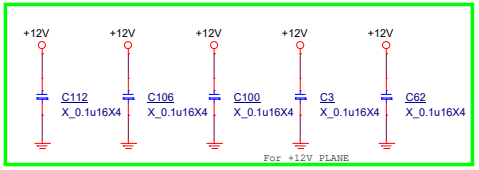
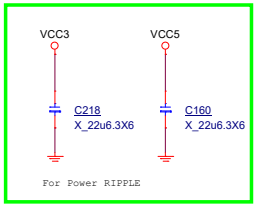
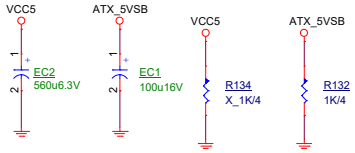
ATX POWER CONNECTOR

JPWR1

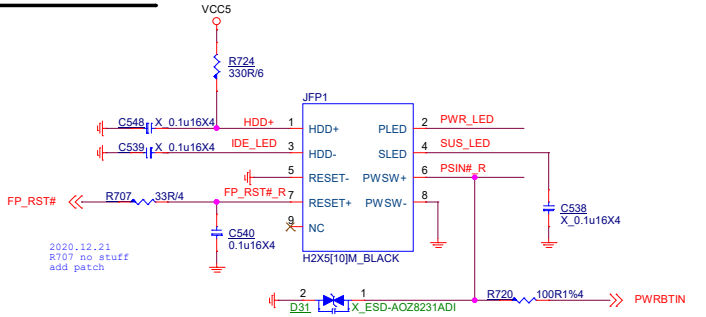


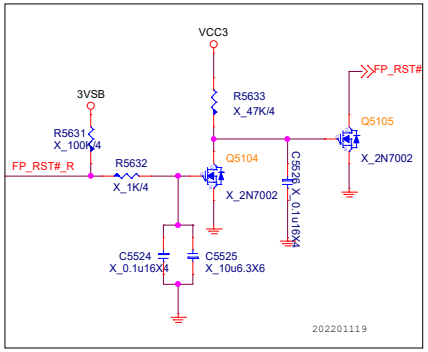


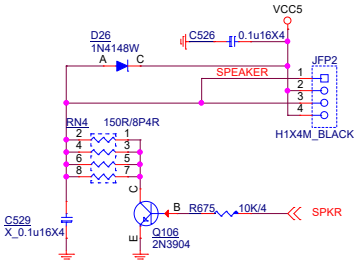




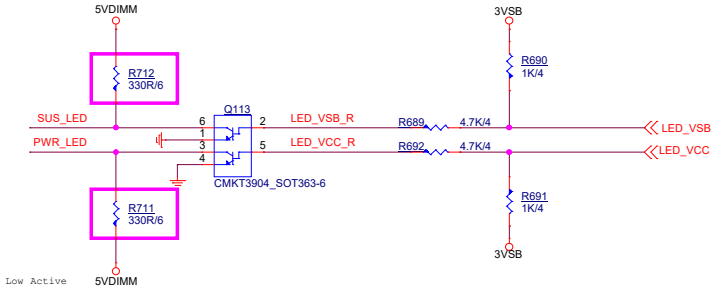
FRONT PANNEL

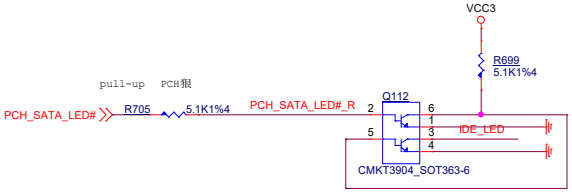


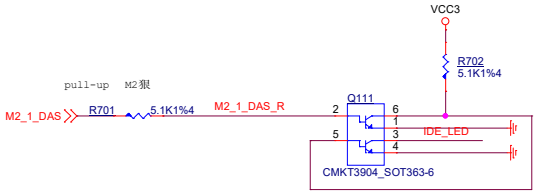




Front Panel LED







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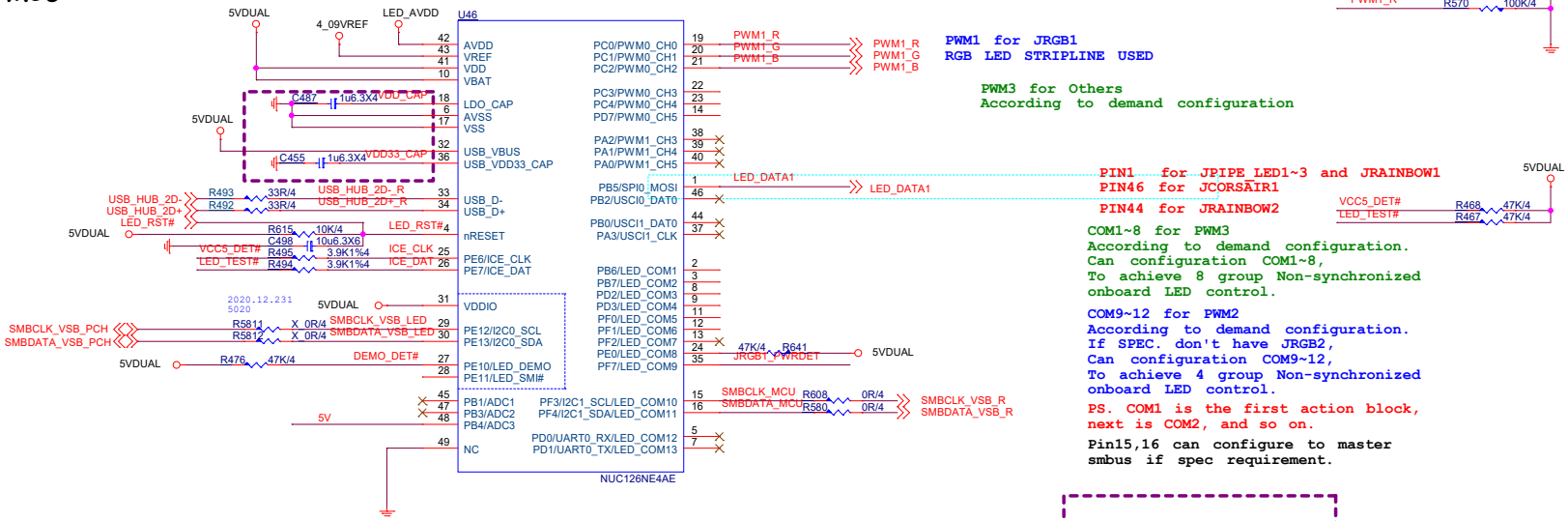
LED MCU

If you use ADC function,need to separate VREF from AVDD and 4_09VREF stuff for VREF.



PWM1 for JRGB1
RGB LED STRIPLINE USED

PWM3 for Others
According to demand configuration

PIN1 for JPIPE_LED1~3 and JRAINBOW1
PIN46 for JCORSAIR1
PIN44 for JRAINBOW2

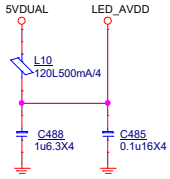
COM1~8 for PWM3
According to demand configuration.
Can configuration COM1~8,
To achieve 8 group Non-synchronized onboard LED control.

COM9~12 for PWM2
According to demand configuration.
If SPEC. don't have JRGB2,
Can configuration COM9~12,
To achieve 4 group Non-synchronized onboard LED control.

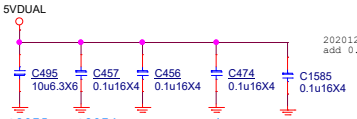
PS. COM1 is the first action block, next is COM2, and so on.

Pin15,16 can configure to master smbus if spec requirement.

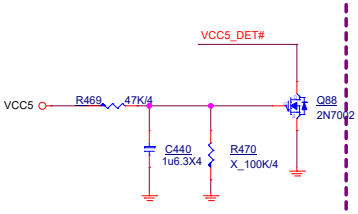
Control	Net Name	PWM USE
PCH	LED_DATA1	No Use
AUDIO Cover	LED_GPIO_01	No Use
MOS/IO cover	LED_GPIO_02	No Use
JRAINBOW1	LED_GPIO_03	No Use
JCORSAIR1	LED_DATA2	No Use
JRGB1/JRGB2	PWM1/ PWM2	PWM1
Board Side LED	COM 1~8	No Use
Board Side LED	COM 9~16	No Use

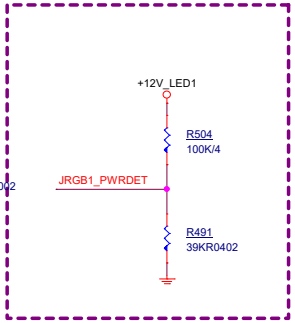


C702 & C2076 near AVDD Pin.

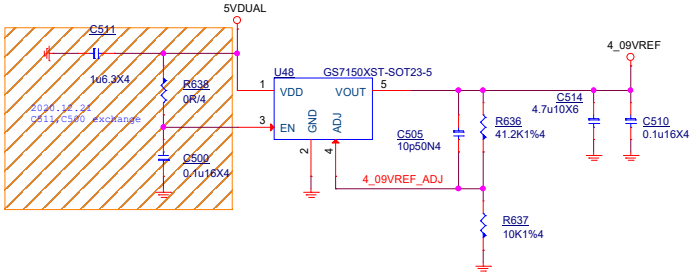


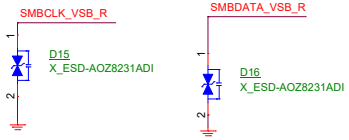
C2075 & C2074 near VDD Pin.
C2073 near VBAT Pin.
C2070 near VDDIO & USB VBUS Pin.



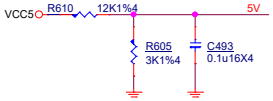


Voltage HW monitor





Closed to JDASH1 pin3/4

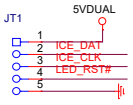


Option spec for voltage monitor require.
VDD1,2,3 is example.

IF no JPWRLED1 & JPIPE_LED spec

MCU can powered by 5VDUAL directly.
LED_VCC5 replace with 5VDUAL.

JT1 for FW update



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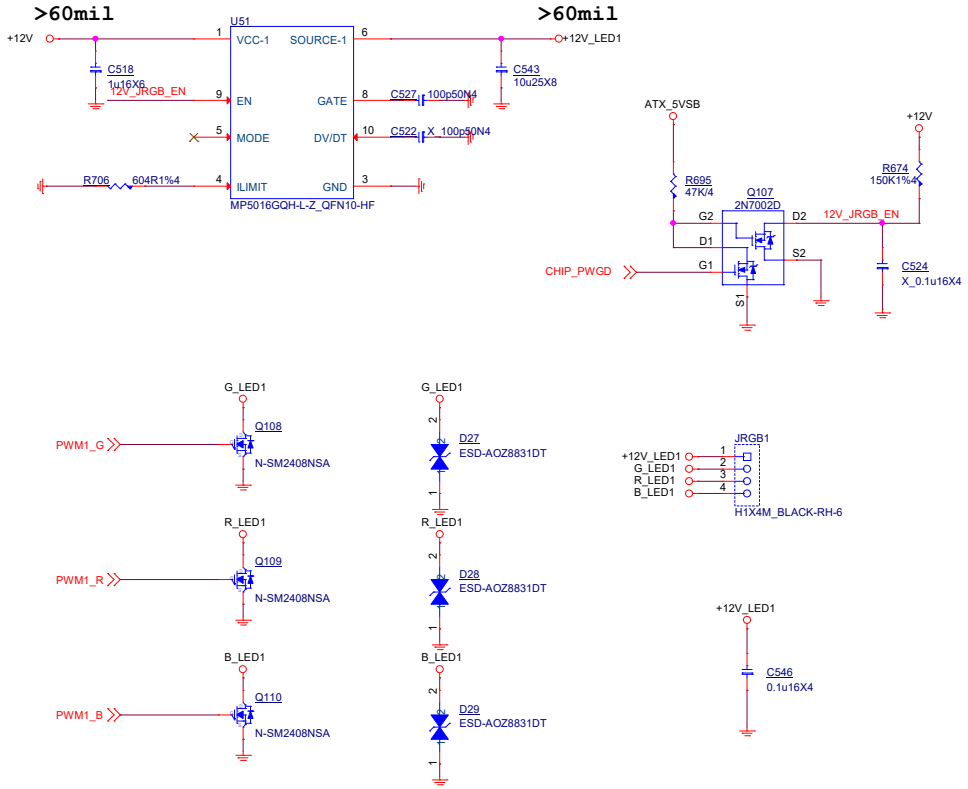
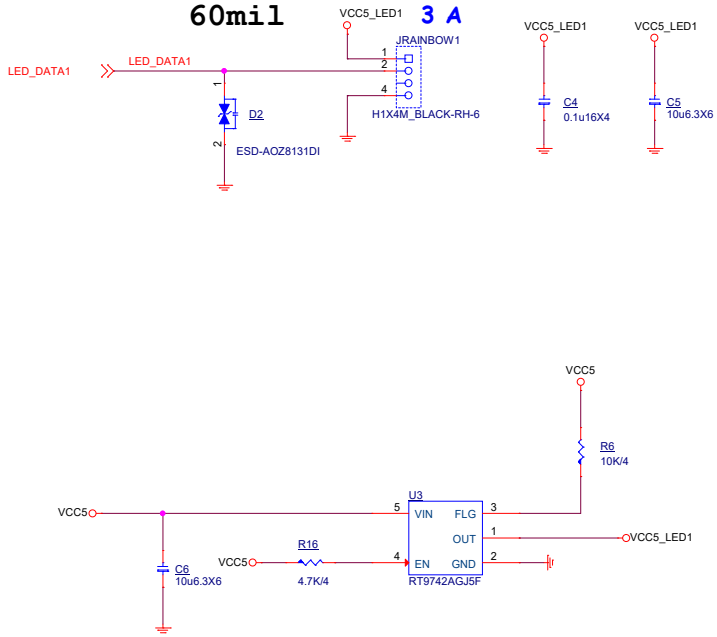
JRGB1



JRAINBOW1 LED



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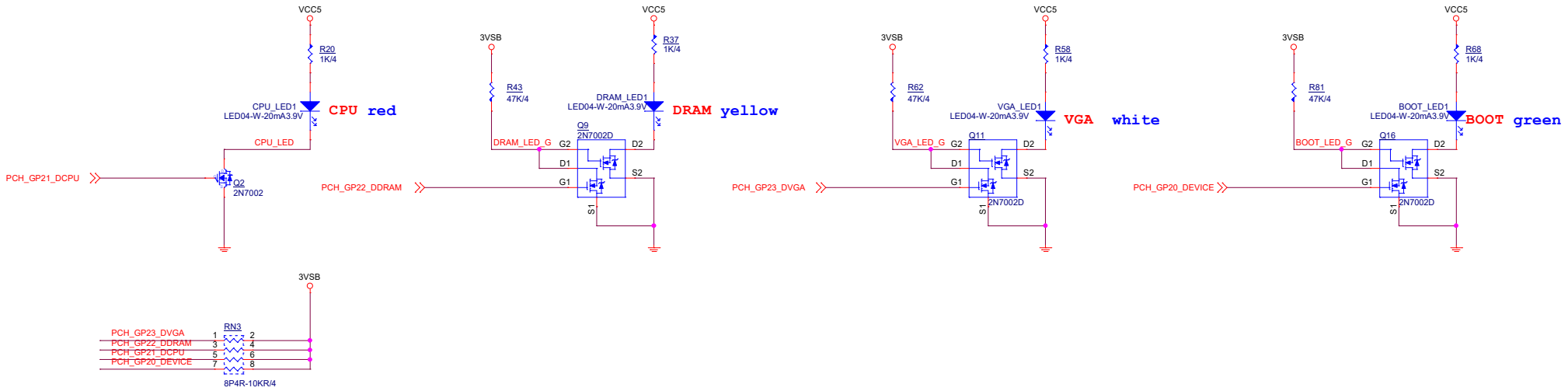
EZ Debug LED



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	MS-7D20	
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Simulation

botton SIM3 SIM3 X_PIN1*2

top SIM1 SIM1 X_PIN1*2

int4 SIM2 SIM2 X_PIN1*2

Mounting Holes

MH1 X_MH001

MH2 X_MH001

MH3 X_MH001

MH5 X_MH001

MH4 X_MH001

MH6 X_MH001

0722 ivy MAIL C513 X_100p50N4

Optical Fiducial Marks-120

FM2 X_FM FM1 X_FM FM4 X_FM FM3 X_FM

FM5 X_FM FM6 X_FM FM8 X_FM FM7 X_FM

Heat Sink

CPU_H1 CPU 臟 献 CPU_H1

HS_PCH1 PCH Shink MCE1 MCE2 E31-0409430-K08

BAT1_X1 BAT-BCR2032P-RH

BIOS_LA1 AMI AMI

HDMI_LA1 HDMI VIRTUAL X_HDMI LABEL

HS_M2 M.2 Cover 0436-3157R

PCB1 7D20-10

CFOS_LA1 CFOS VIRTUAL CFOS LABEL

MKT_LA1 H510-PRO MKT

REF1 H510-PRO X_MKT

MOS HS Holes

HS_H2 X_HS_H

HS_H1 X_HS_H

HS_H3 X_HS_H

HS_H4 X_HS_H

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