AMD AM4
B550

01	Cover Sheet	36	Audio ALC1200-VD1	67	MCU - LED Control
02	Block Diagram	37	Audio DePop	68	LED - Power / JPIPE
03	FM4 DDR4 I / F	38	USB Power - UP7501	69	LED - JRGB1/2_JRANBOW1/2
04	AM4 PCIE / SATAE	39	Front USB2.0 Header	70	LED - Mystic Light
05	AM4 Display / Audio	40	Front USB3.0 Header	71	BOM Option
06	AM4 SVI / ACPI / GPIO	41	Front USB3.1 Type C / MUX	72	Manual Parts
07	AM4 LPC / SPI / USB / CLK / STRAP	42	Rear USB3.0 + PS2 + F75504A	73	SMB MAP
08-09	AM4 Power / VDDIO_AUDIO Power / GND	43	Rear USB3.1 / Redriver	74	PG MAP
10	RTC / CMOS	44	Rear USB3.1 Type A / redrive	75	GPIO MAP
11-14	DDR4 - POWER / GND	45	Rear USB3.1 Type C / mux	76	Power Sequence
15	Promontory - PCIE / SATA / SATAE	46	GL850G	77	Power Map
16	Promontory - USB / OC	47-48	HDMI / Display	78	History
17	Promontory - CLK / ACPI / GPIO	49	CPU Power ISL RAA229004 10+2		
18-19	Promontory - Power / GND	50	50 CPU PWR ExDriver IC ISL6617A		
20	PCI_E1 (X16)	51	CPU Power Vocre Phase 1-4		
21	PCI_E4 (X4)	52	CPU Power Vcore Phase 5-10		
22	PCI_E2/E3/E5/E6_X1	53	CPU Power NB Phase 1-2		
23	PCIE GEN3 SWITCH	54	XXXXXXXXXXXXXXXXXXXXX		
24	M2_1 PCIE/SATA(KEY_M)	55	CPU power 1.8_S0 / S5		
25	M2_2 PCIE Only(KEY_M)	56	CPU power VDDP - NB503		
26	M2_WiFi1(KEY_E)	57	VRM PWRGD		
27	SIO NCT6687D-R	58	DDR Power - RT8125H		
28	SIO HW Monitor	59	DDR PWR-MP2329G-VPP25 / VTT		
29	FAN TYPE-N CPUFAN1	60	PM - SY8288/PM_1P05/PM_2P5V		
30	FAN TYPE-M PUMPFAN1	61	PM -TPS22976DPUR_VCC33		
31	FAN TYPE-M SYSFAN1/2	62	OV Control - NCT3933		
32	FAN TYPE-M SYSFAN3/4	63	OV 12VIN - RT9553B		
33	FAN TYPE-M SYSFAN5	64	ACPI - 3VSB / 5VDIMM		
34	LAN - RTL8111H	65	ATX Power - FrpntPanel / EMI		
35	LAN - RT8125B	66	LED - EZDEBUG / AMP		

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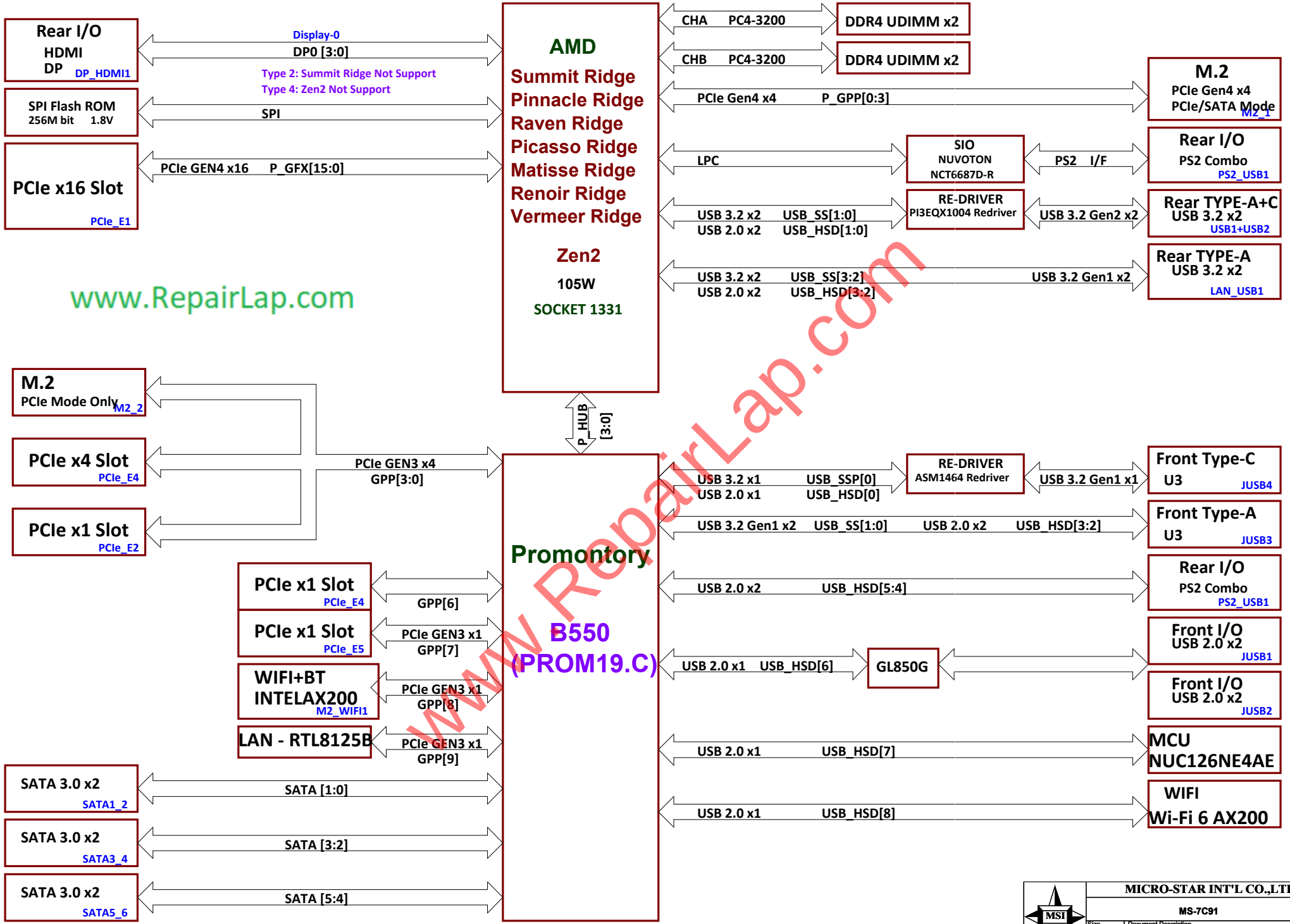
Size	Document Description	Rev
Custom	Cover Sheet	10

Date: Tuesday, April 21, 2020 Sheet 1 of 78



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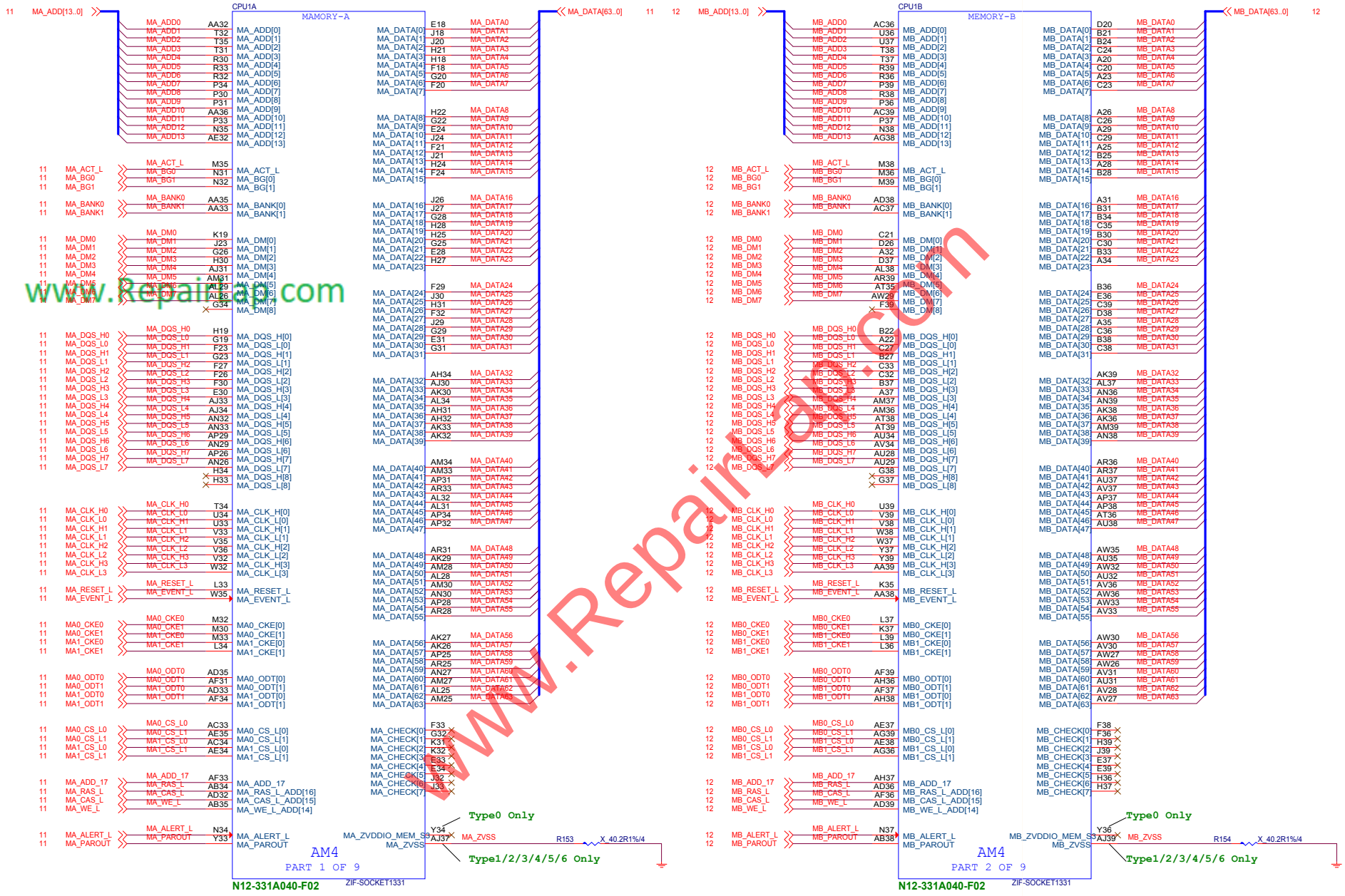
Size	Document Description	Rev
Custom	Block Diagram	10

Date: Tuesday, April 21, 2020 Sheet 2 of 78



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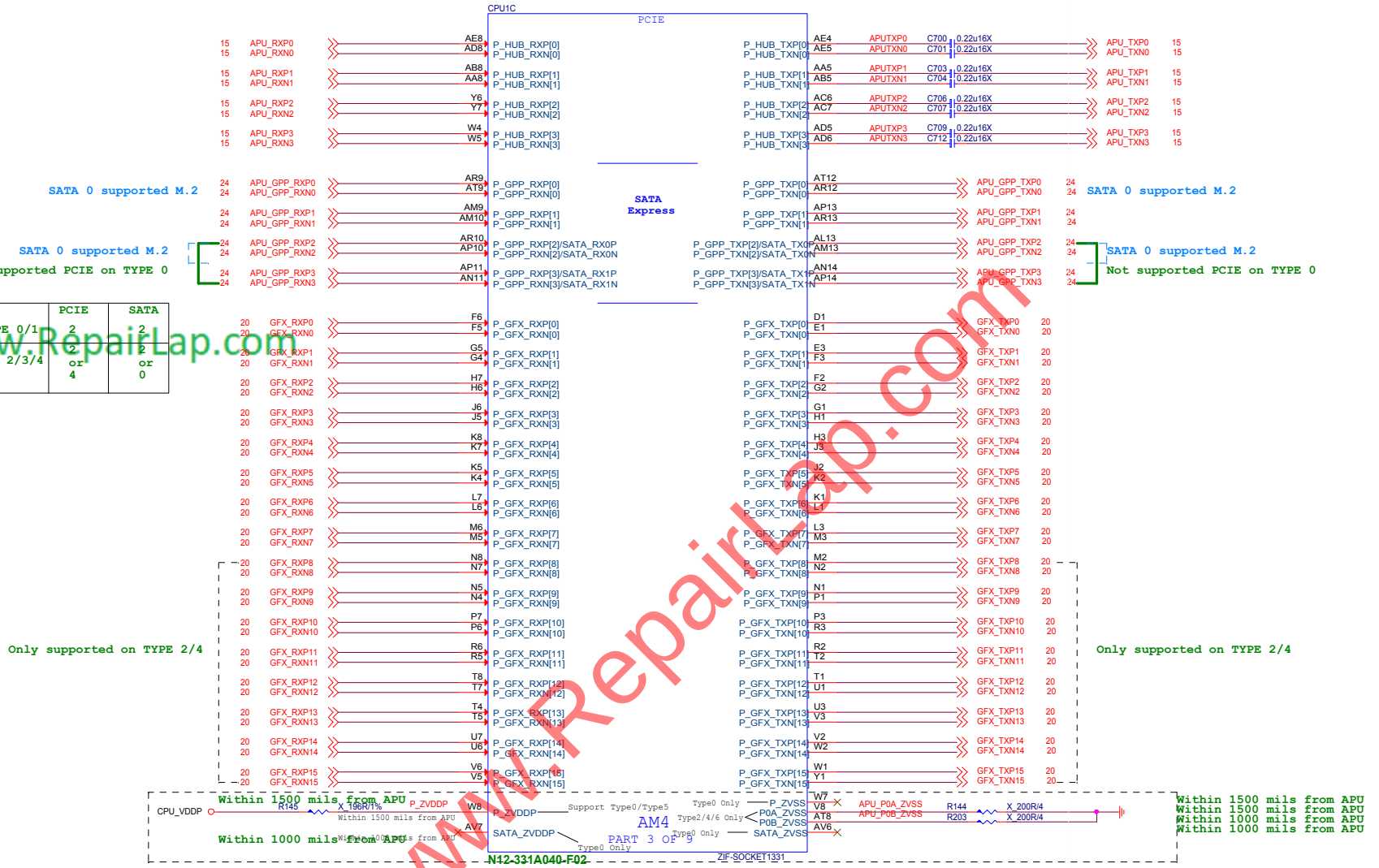
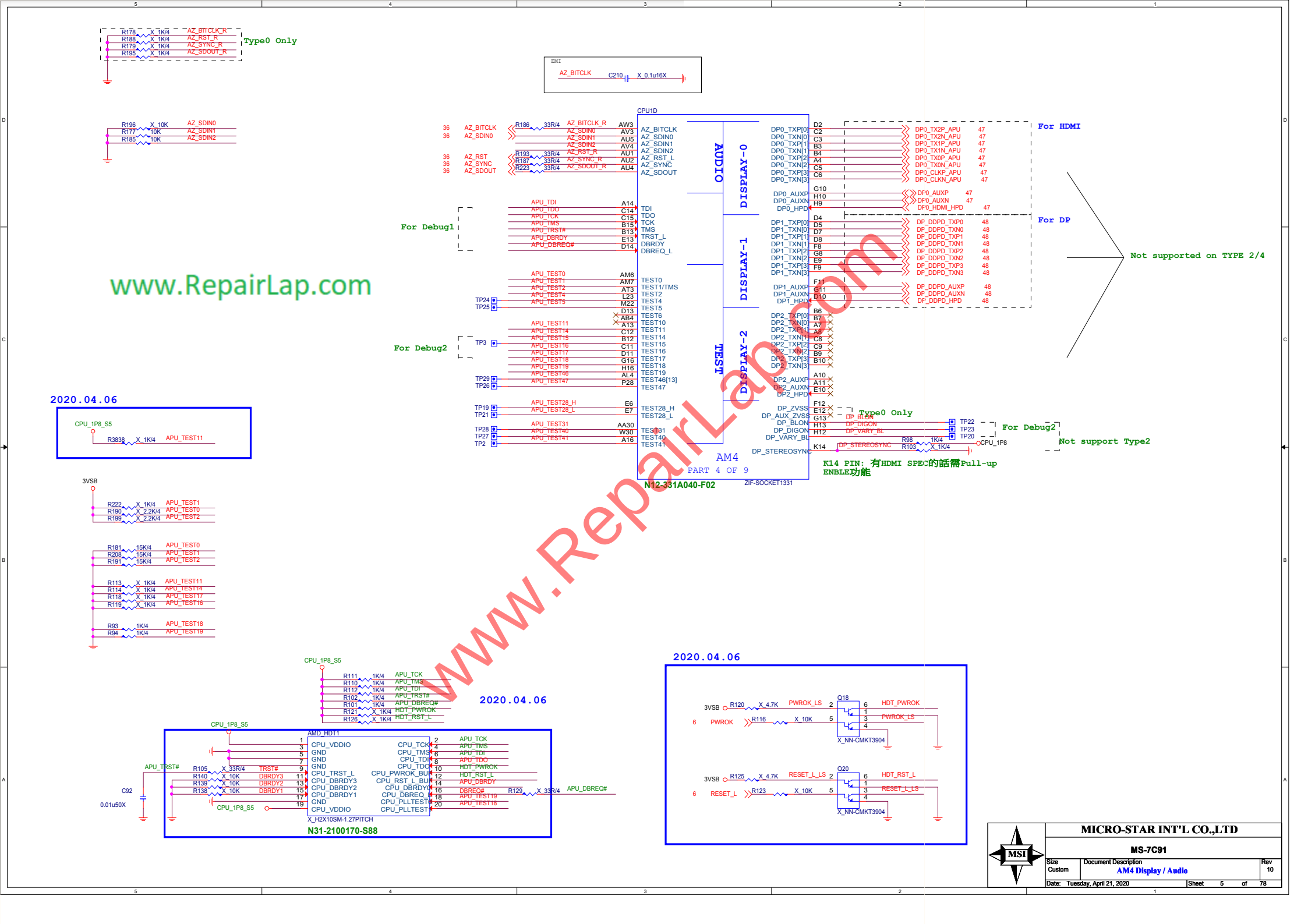
MS-7C91

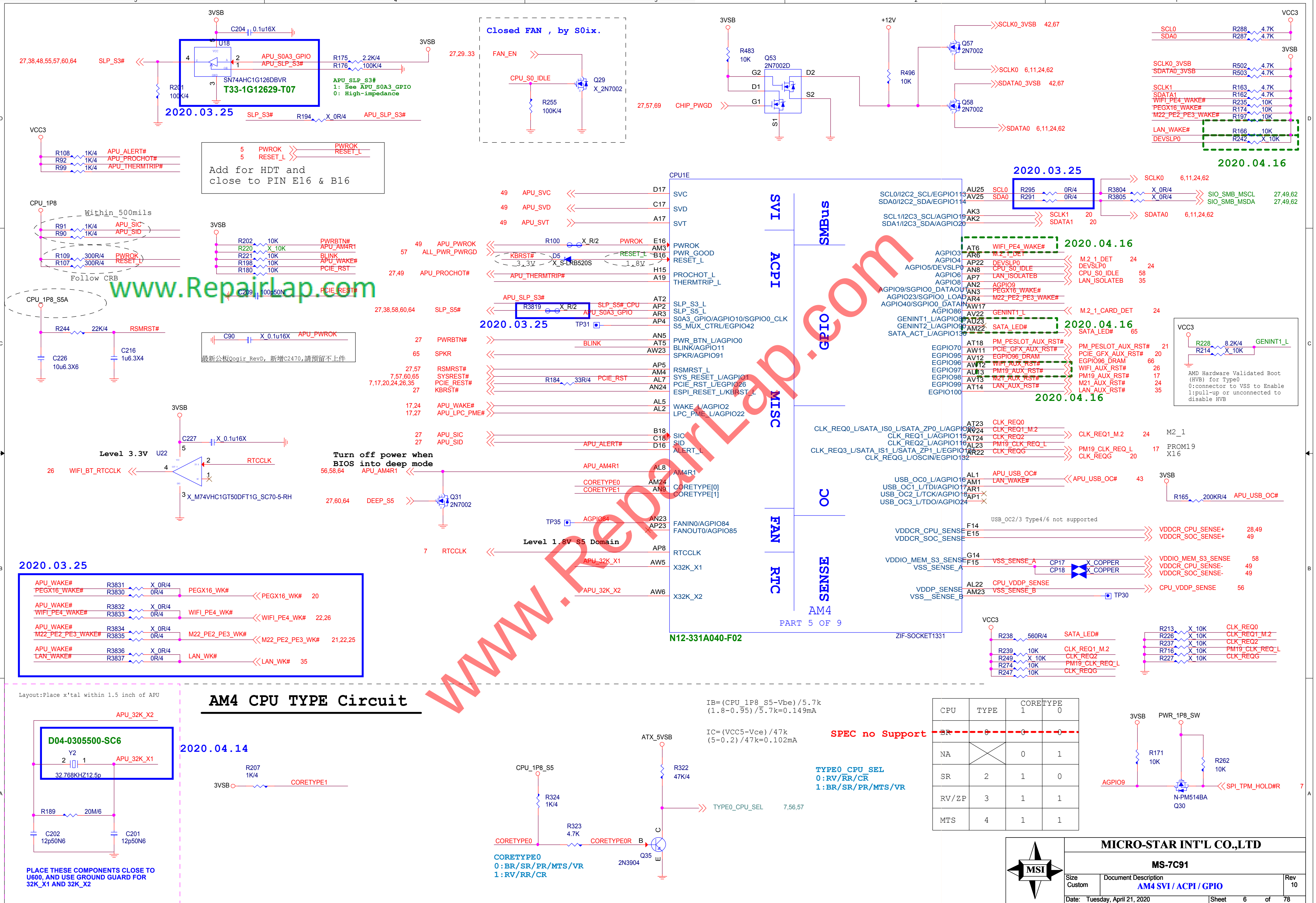
Size	Document Description	Rev
Custom	AM4 DDR4 I/F	10

Date: Tuesday, April 21, 2020 | Sheet 3 of 78



	MICRO-STAR INT'L CO.,LTD		
	MS-7C91		
Size: Custom	Document Description: AM4 PCIE / SATAE		Rev: 10
Date: Tuesday, April 21, 2020	Sheet 4 of 78		




AM4 CPU TYPE Circuit
Closed FAN , by S0ix.
Add for HDT and close to PIN E16 & B16
Within 500mils
Follow CRB
Level 3.3V
Turn off power when BIOS into deep mode
Level 1.8V S5 Domain
CPU1E
SVI
ACPI
SMBus
GPIO
MISC
OC
FAN
RTC
SENSE
AM4
PART 5 OF 9
N12-331A040-F02
ZIF-SOCKET1331
SN74AHC1G126DBVR
T33-1G12629-T07
APU_SLP_S3#
1: See APU_S0A3_GPIO
0: High-impedance
2020.03.25
2020.04.16
2020.04.14
D04-0305500-SC6
32.768KHZ12.5p
Layout:Place x'tal within 1.5 inch of APU
PLACE THESE COMPONENTS CLOSE TO U600, AND USE GROUND GUARD FOR 32K_X1 AND 32K_X2
IB=(CPU_1P8_S5-Vbe)/5.7k
(1.8-0.95)/5.7k=0.149mA
IC=(VCC5-Vce)/47k
(5-0.2)/47k=0.102mA
SPEC no Support
TYPE0_CPU_SEL
0:RV/RR/CR
1:BR/SR/PR/MTS/VR
CORETYPE0
0:BR/SR/PR/MTS/VR
1:RV/RR/CR
USB_OC2/3 Type4/6 not supported
AMD Hardware Validated Boot (HVB) for Type0
0:connector to VSS to Enable
1:pull-up or unconnected to disable HVB
最新公板Qogir RevD, 新增C2470,請預留不上件
M2_1
PROM19
X16

CPU	TYPE	CORETYPE 1	CORETYPE 0
~~SR~~	~~0~~	~~0~~	~~0~~
NA	X	0	1
SR	2	1	0
RV/ZP	3	1	1
MTS	4	1	1

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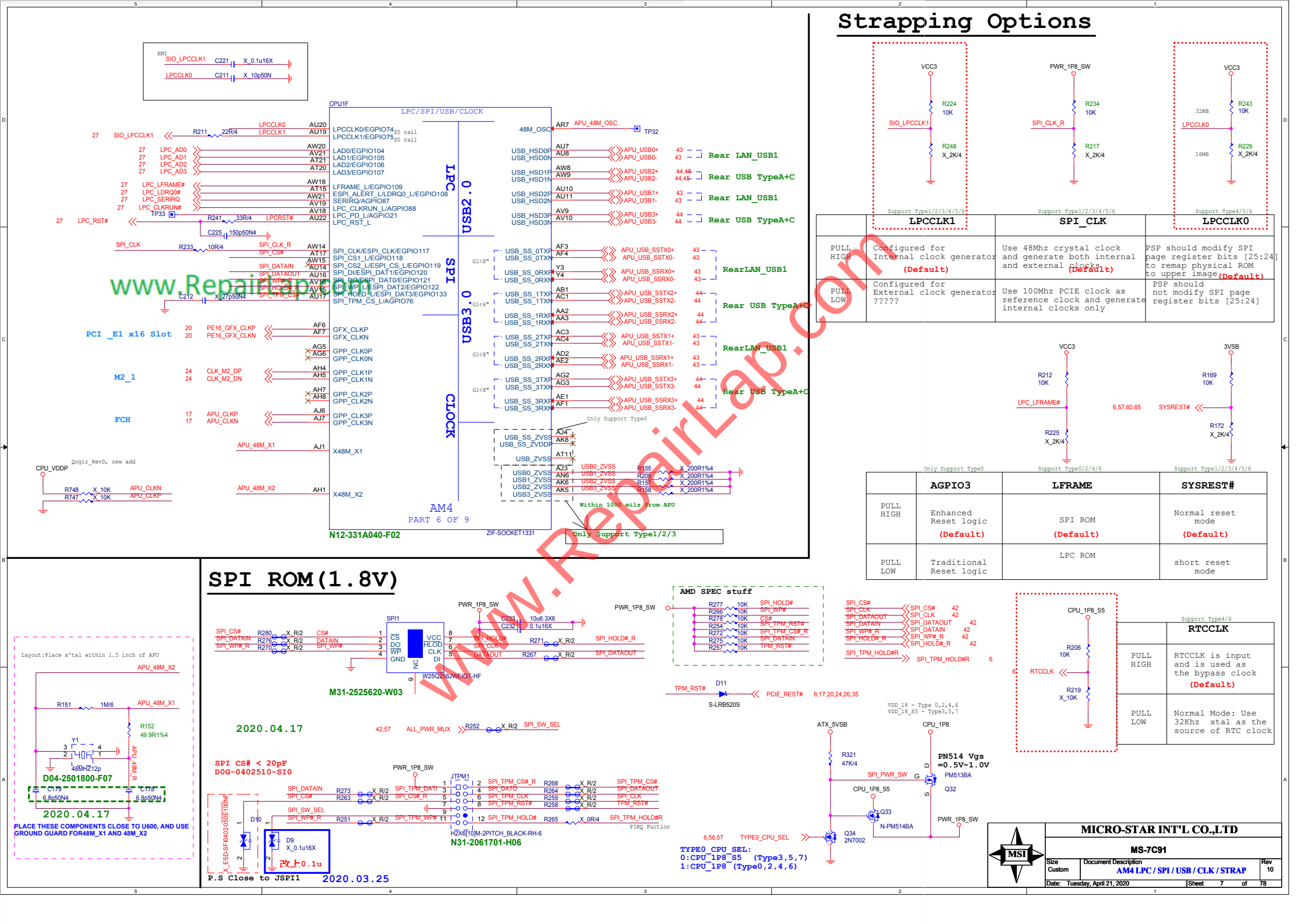
MS-7C91

Size	Document Description	Rev
Custom	AM4 SVI / ACPI / GPIO	10

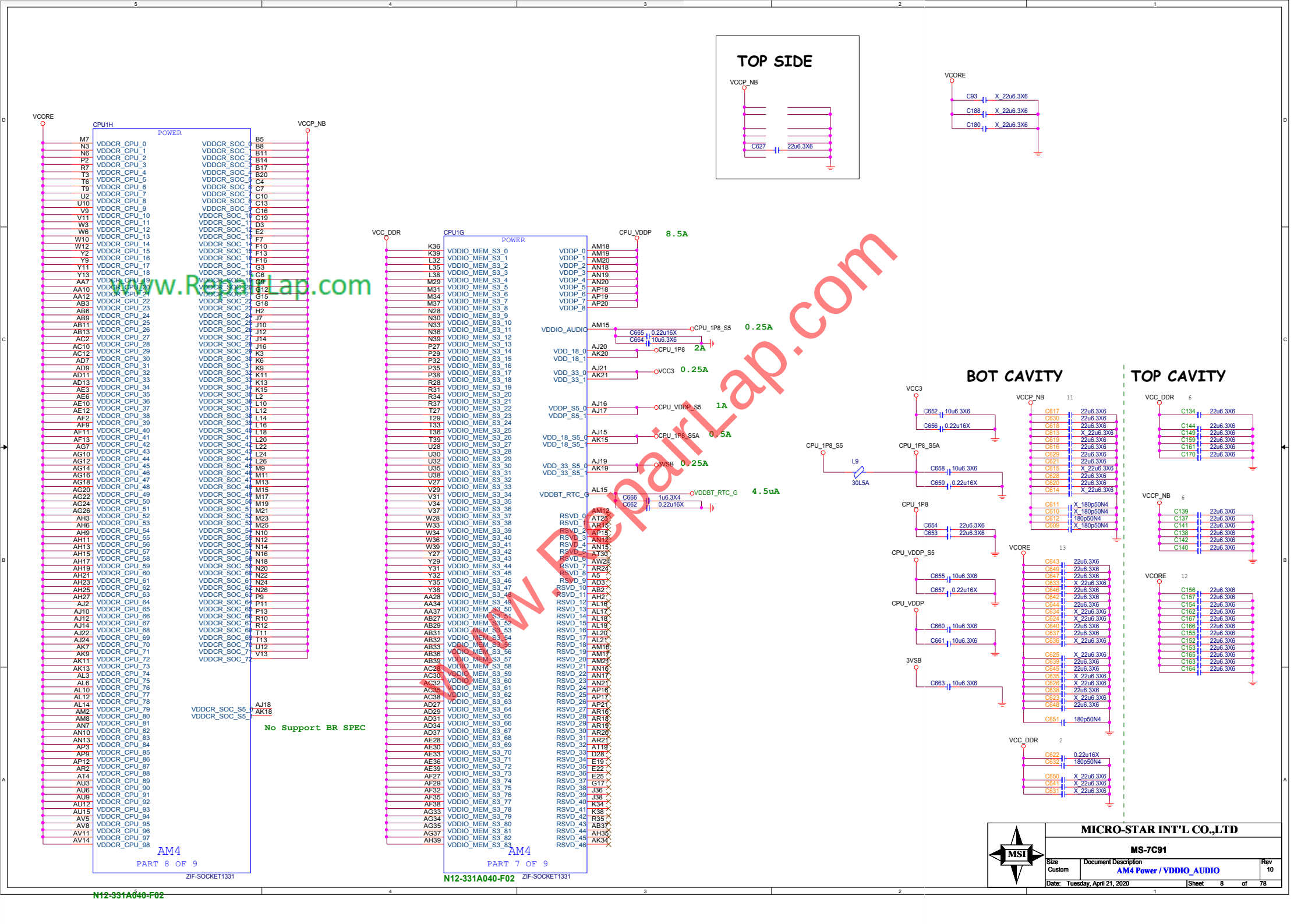
Date: Tuesday, April 21, 2020 Sheet 6 of 78



	LPCCLK1	SPI_CLK	LPCCLK0
PULL HIGH	Configured for Internal clock generator (Default)	Use 48Mhz crystal clock and generate both internal and external clocks (Default)	PSP should modify SPI page register bits [25:24] to remap physical ROM to upper image (Default)
PULL LOW	Configured for External clock generator ?????	Use 100Mhz PCIE clock as reference clock and generate internal clocks only	PSP should not modify SPI page register bits [25:24]

	AGPIO3	LFRAME	SYSREST#
PULL HIGH	Enhanced Reset logic (Default)	SPI ROM (Default)	Normal reset mode (Default)
PULL LOW	Traditional Reset logic	LPC ROM	short reset mode

	RTCCLK
PULL HIGH	RTCCLK is input and is used as the bypass clock (Default)
PULL LOW	Normal Mode: Use 32Khz xtal as the source of RTC clock



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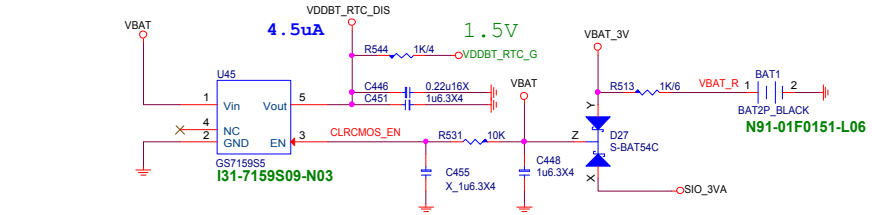
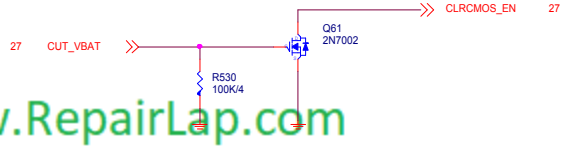
MS-7C91

Size	Document Description	Rev
Custom	AM4 GND	10

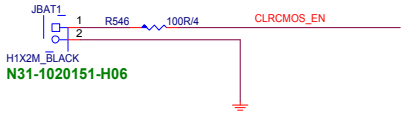
Date: Tuesday, April 21, 2020 Sheet 9 of 78

RTC & Clear CMOS Circuit

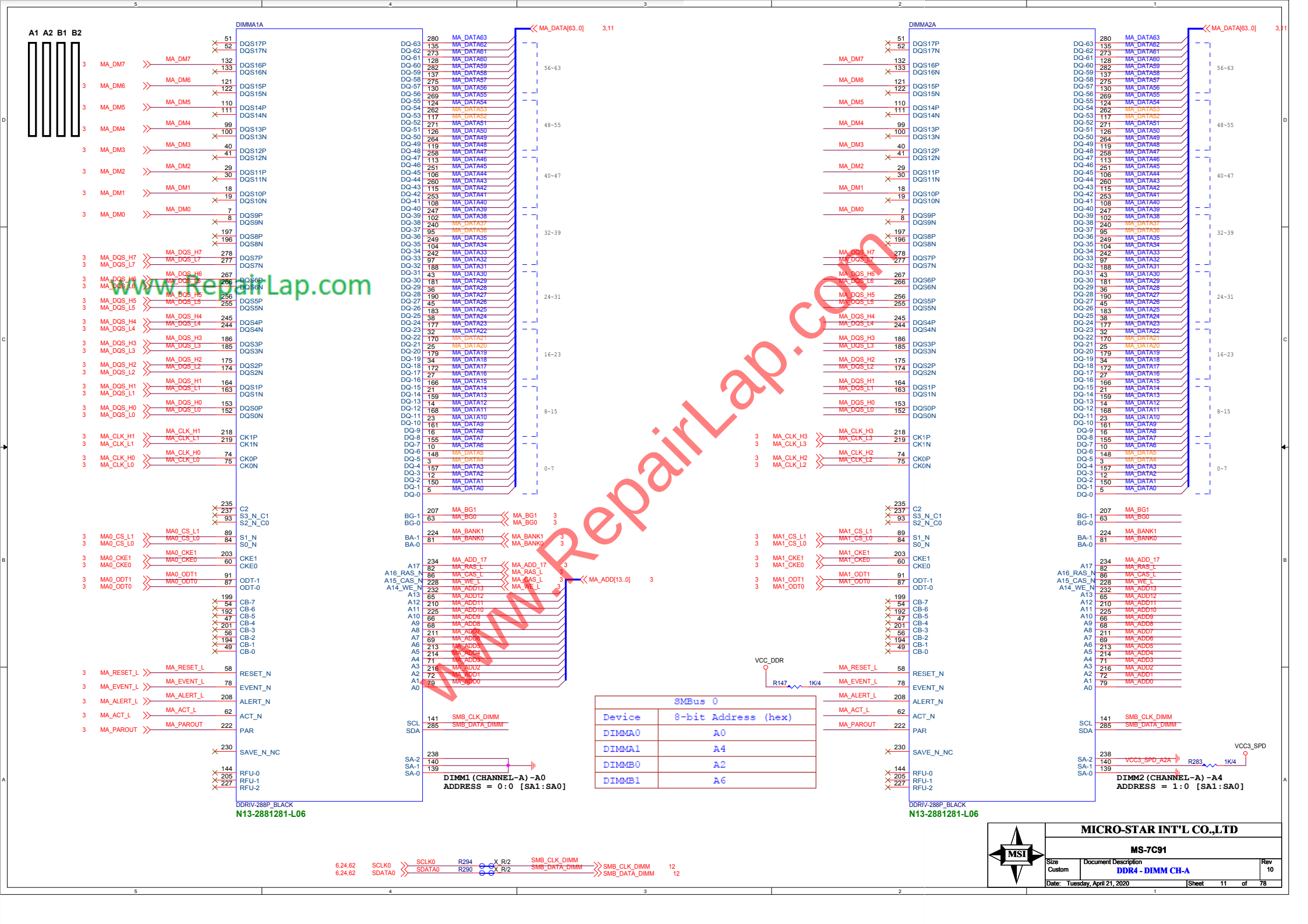




Clear CMOS button



MICRO-STAR INT'L CO.,LTD		
MS-7C91		
Size: Custom	Document Description: RTC / CMOS	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 10 of 78	

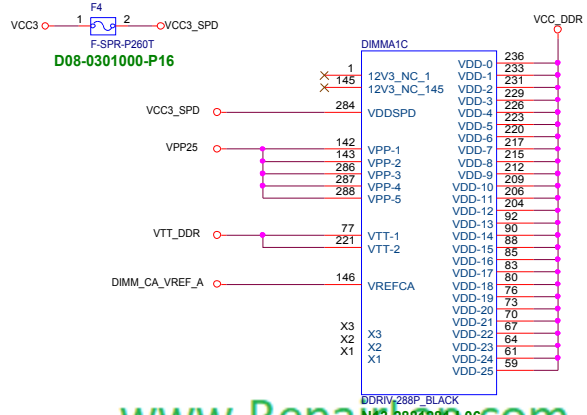


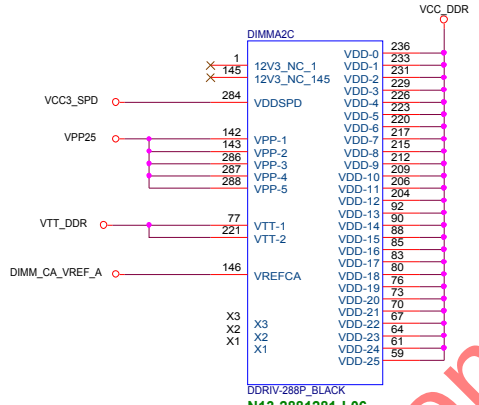
avl:D08-0301100-B07

F4
VCC3 1 2 VCC3_SPD
F-SPR-P260T

D08-0301000-P16

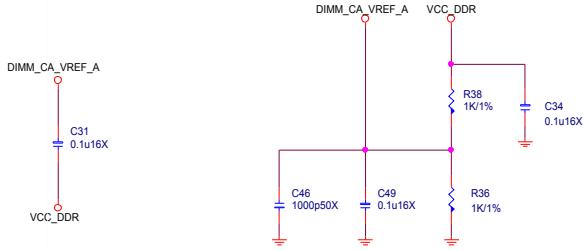
DIMM SLOT PN BY SPEC

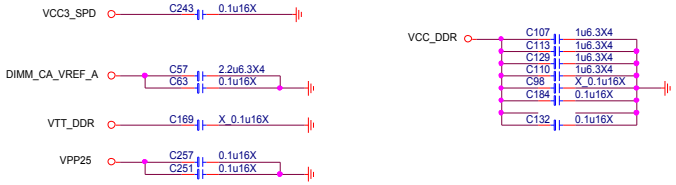


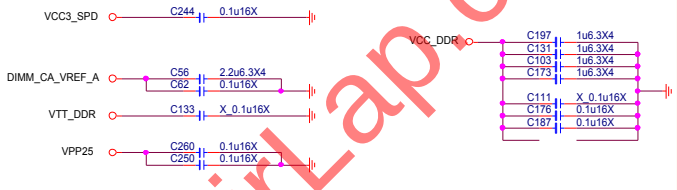


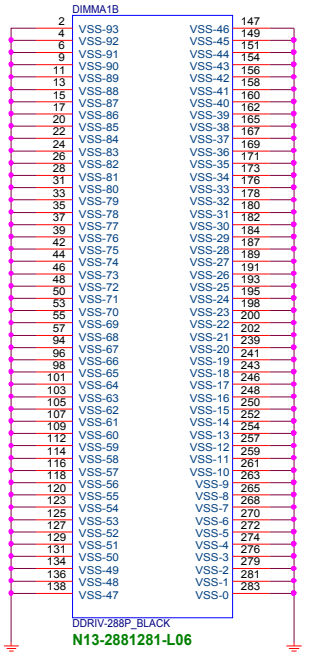
DDR VREF

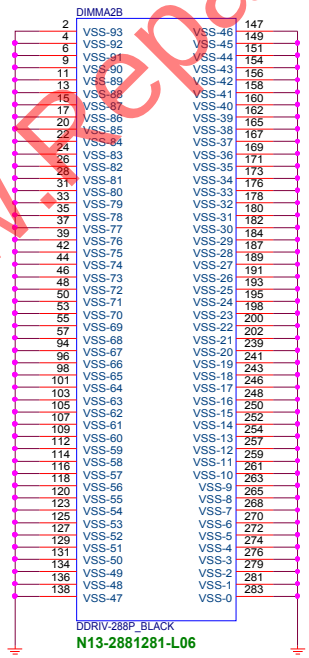
(place resistors close to DIMMs)









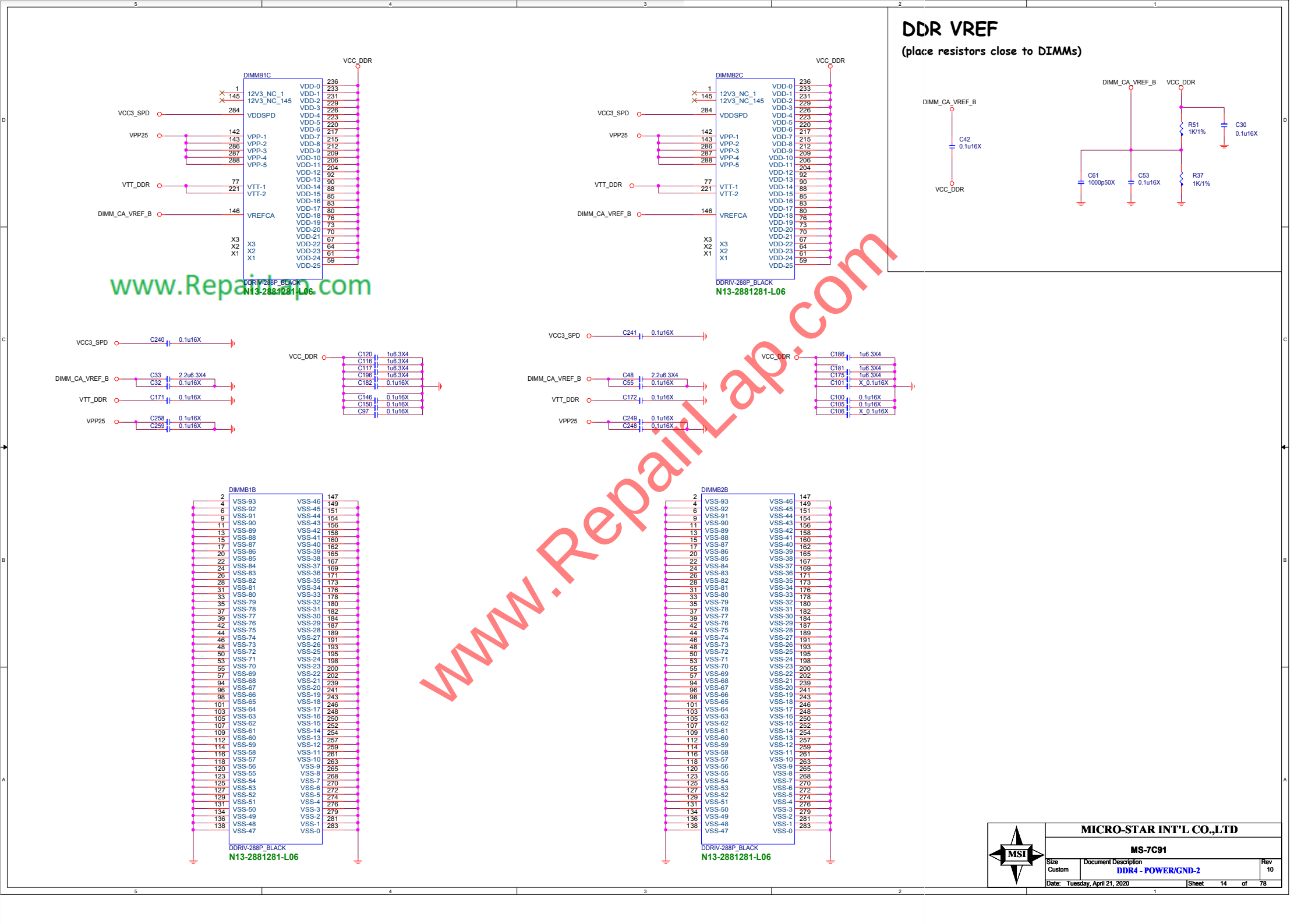


MICRO-STAR INT'L CO.,LTD

MS-7C91

Size	Document Description	Rev
Custom	DDR4 - POWER/GND-1	10

Date: Tuesday, April 21, 2020 Sheet 13 of 78


DDR VREF
(place resistors close to DIMMs)
DIMM_CA_VREF_B
C42
0.1u16X
VCC_DDR
DIMM_CA_VREF_B
VCC_DDR
R51
1K/1%
C30
0.1u16X
C61
1000p50X
C53
0.1u16X
R37
1K/1%
DIMMB1C
DIMMB2C
VCC_DDR
VCC3_SPD
VPP25
VTT_DDR
DIMM_CA_VREF_B
VDDSPD
VPP-1
VPP-2
VPP-3
VPP-4
VPP-5
VTT-1
VTT-2
VREFCA
12V3_NC_1
12V3_NC_145
X3
X2
X1
VDD-0
VDD-1
VDD-2
VDD-3
VDD-4
VDD-5
VDD-6
VDD-7
VDD-8
VDD-9
VDD-10
VDD-11
VDD-12
VDD-13
VDD-14
VDD-15
VDD-16
VDD-17
VDD-18
VDD-19
VDD-20
VDD-21
VDD-22
VDD-23
VDD-24
VDD-25
DDRIV-288P_BLACK
N13-2881281-L06
VCC3_SPD
C240
0.1u16X
DIMM_CA_VREF_B
C33
2.2u6.3X4
C32
0.1u16X
VTT_DDR
C171
0.1u16X
VPP25
C258
0.1u16X
C259
0.1u16X
VCC_DDR
C120
1u6.3X4
C116
1u6.3X4
C117
1u6.3X4
C196
1u6.3X4
C182
0.1u16X
C146
0.1u16X
C150
0.1u16X
C97
0.1u16X
VCC3_SPD
C241
0.1u16X
DIMM_CA_VREF_B
C48
2.2u6.3X4
C55
0.1u16X
VTT_DDR
C172
0.1u16X
VPP25
C249
0.1u16X
C248
0.1u16X
VCC_DDR
C186
1u6.3X4
C181
1u6.3X4
C175
1u6.3X4
C101
X_0.1u16X
C100
0.1u16X
C105
0.1u16X
C106
X_0.1u16X
DIMMB1B
DIMMB2B
VSS-93
VSS-92
VSS-91
VSS-90
VSS-89
VSS-88
VSS-87
VSS-86
VSS-85
VSS-84
VSS-83
VSS-82
VSS-81
VSS-80
VSS-79
VSS-78
VSS-77
VSS-76
VSS-75
VSS-74
VSS-73
VSS-72
VSS-71
VSS-70
VSS-69
VSS-68
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VSS-41
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VSS-12
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VSS-5
VSS-4
VSS-3
VSS-2
VSS-1
VSS-0
DDRIV-288P_BLACK
N13-2881281-L06
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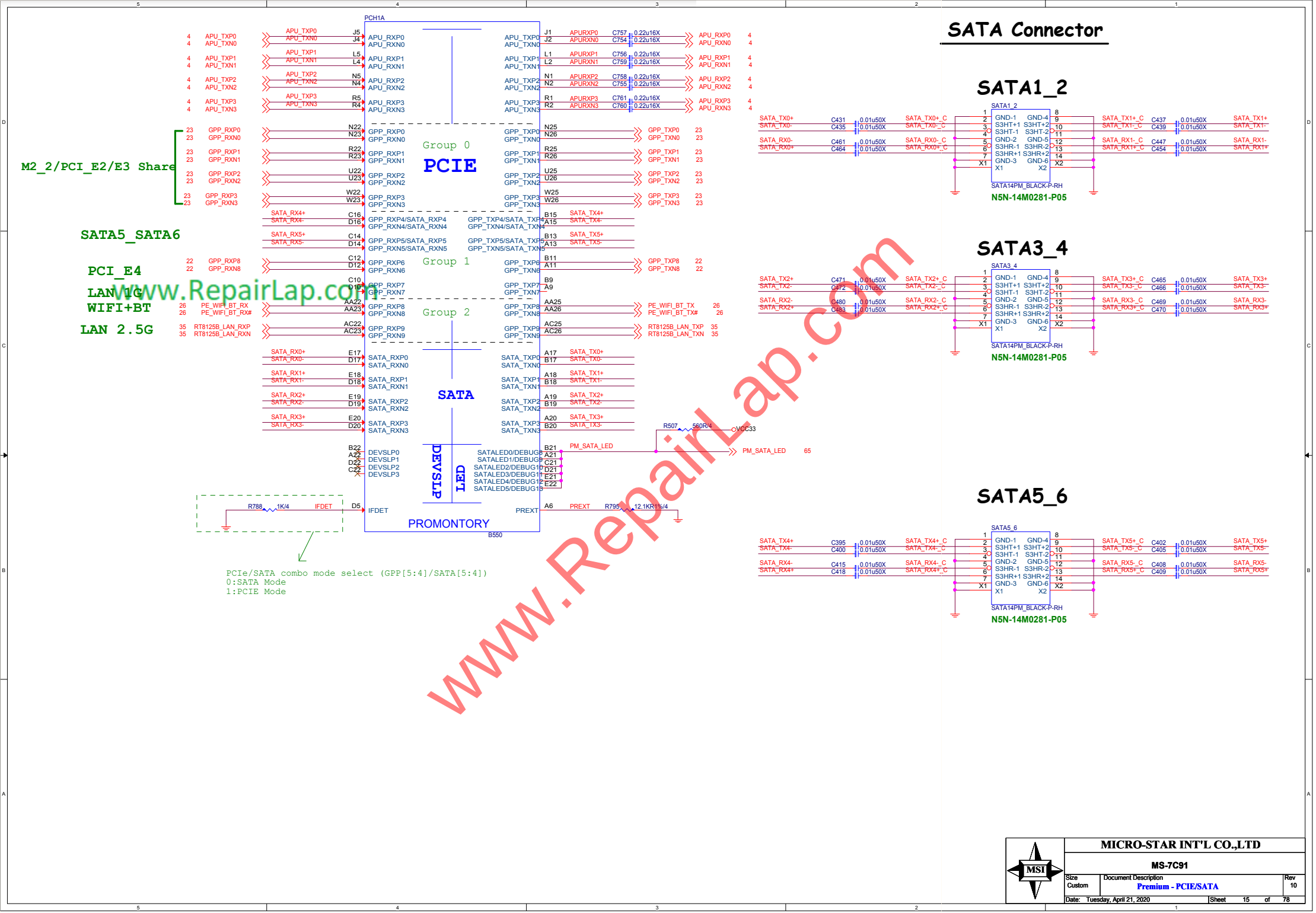
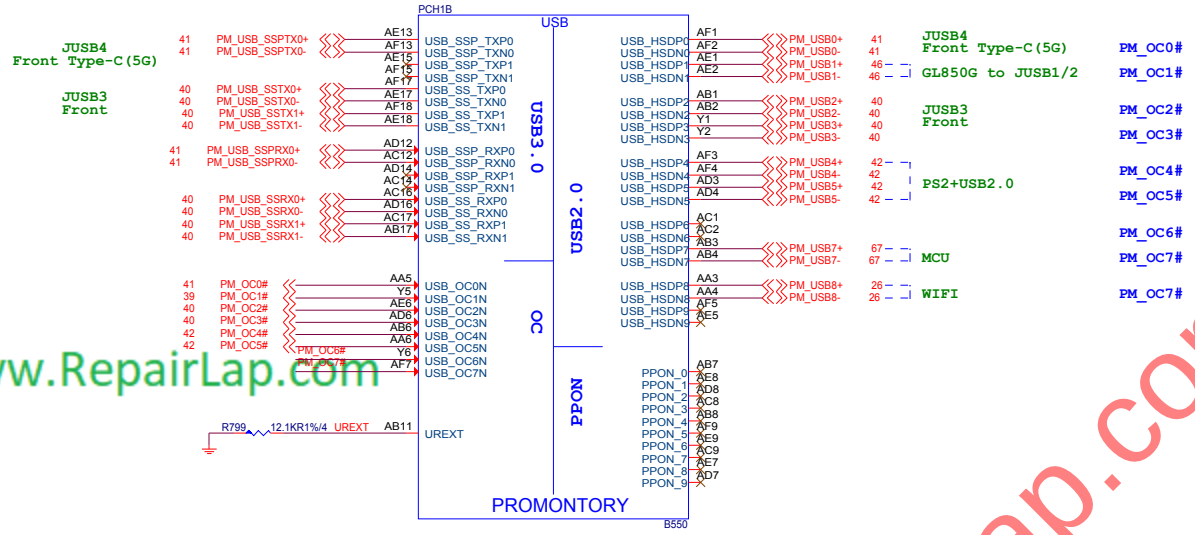
Size
Custom
Document Description
DDR4 - POWER/GND-2
Rev
10
Date: Tuesday, April 21, 2020
Sheet 14 of 78



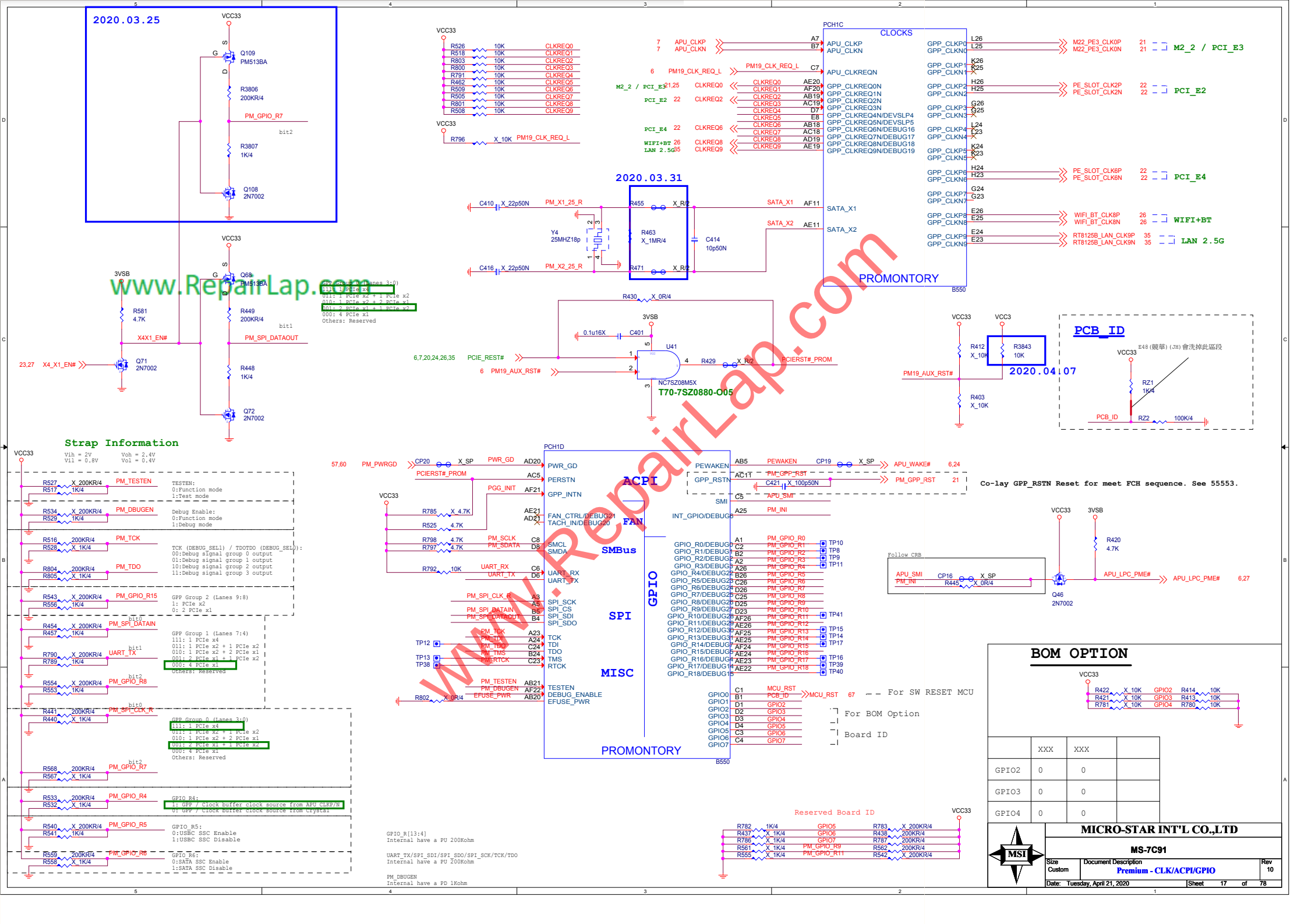
MICRO-STAR INT'L CO.,LTD	
MS-7C91	
Size: Custom	Document Description: Premium - PCIE/SATA
Rev: 10	
Date: Tuesday, April 21, 2020	Sheet 15 of 78

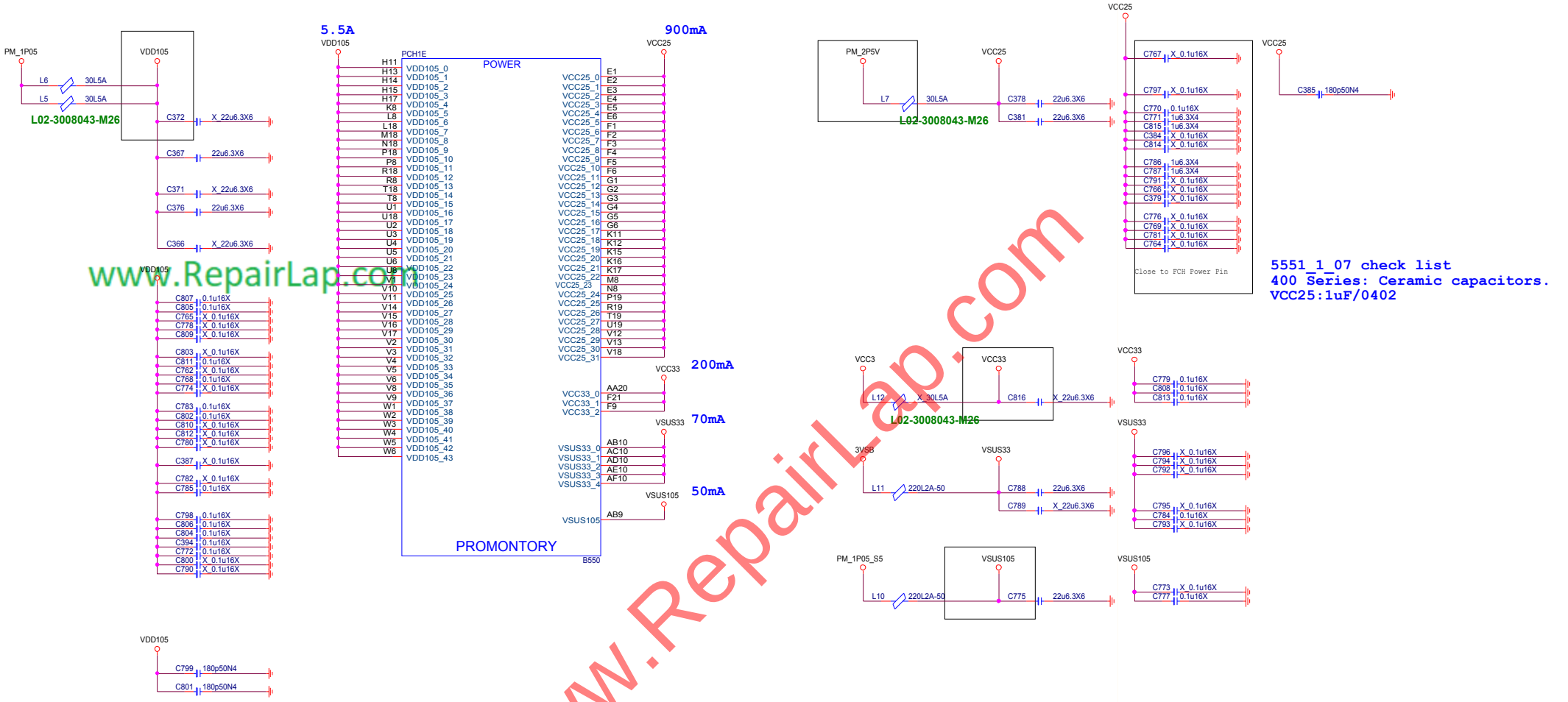


USB mapping

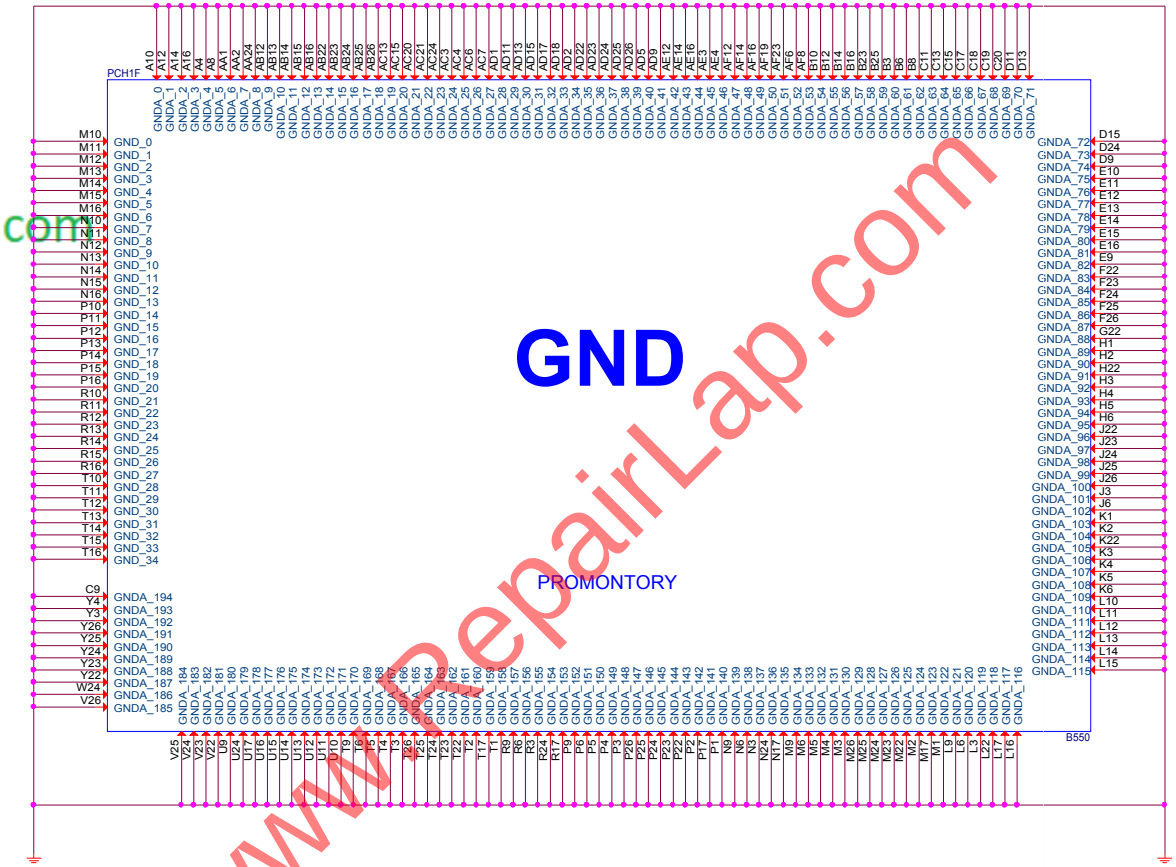
```
USB_SSP_TX/RX[0] + USB_HSDP/N[0] + USB_OC0N
USB_SSP_TX/RX[1] + USB_HSDP/N[1] + USB_OC1N

USB_SS_TX/RX[0] + USB_HSDP/N[2] + USB_OC2N
USB_SS_TX/RX[1] + USB_HSDP/N[3] + USB_OC3N
                  USB_HSDP/N[4] + USB_OC4N
                  USB_HSDP/N[5] + USB_OC5N
                  USB_HSDP/N[6] + USB_OC6N
                  USB_HSDP/N[7] + USB_OC7N
                  USB_HSDP/N[8] + USB_OC7N
                  USB_HSDP/N[9] + USB_OC7N
```


MICRO-STAR INT'L CO.,LTD		
MS-7C91		
Size: Custom	Document Description: Premium - USB/OC	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 16 of 78	


2020.03.25
VCC33
Q109
PM513BA
R3806
200KR/4
PM_GPIO_R7
bit2
R3807
1K/4
Q108
2N7002
VCC33
3VSB
Q68
PM513BA
R581
4.7K
R449
200KR/4
bit1
X4X1_EN#
PM_SPI_DATAOUT
23,27 X4_X1_EN#
Q71
2N7002
R448
1K/4
Q72
2N7002
www.RepairLap.com
GPP Group 1 (Lanes 3:0)
111: 1 PCIe x4
011: 1 PCIe x2 + 1 PCIe x2
010: 1 PCIe x2 + 2 PCIe x1
001: 2 PCIe x1 + 1 PCIe x2
000: 4 PCIe x1
Others: Reserved
VCC33
R526 10K CLKREQ0
R518 10K CLKREQ1
R803 10K CLKREQ2
R800 10K CLKREQ3
R791 10K CLKREQ4
R462 10K CLKREQ5
R509 10K CLKREQ6
R505 10K CLKREQ7
R801 10K CLKREQ8
R508 10K CLKREQ9
VCC33
R796 X_10K PM19_CLK_REQ_L
PCH1C
CLOCKS
7 APU_CLKP
7 APU_CLKN
6 PM19_CLK_REQ_L
M2_2 / PCI_E3 21,25 CLKREQ0
PCI_E2 22 CLKREQ2
PCI_E4 22 CLKREQ6
WIFI+BT 26 CLKREQ8
LAN 2.5G 35 CLKREQ9
APU_CLKP
APU_CLKN
PM19_CLK_REQ_L
APU_CLKREQN
GPP_CLKREQ0N
GPP_CLKREQ1N
GPP_CLKREQ2N
GPP_CLKREQ3N
GPP_CLKREQ4N/DEVSLP4
GPP_CLKREQ5N/DEVSLP5
GPP_CLKREQ6N/DEBUG16
GPP_CLKREQ7N/DEBUG17
GPP_CLKREQ8N/DEBUG18
GPP_CLKREQ9N/DEBUG19
GPP_CLKP0 L26
GPP_CLKN0 L25
GPP_CLKP1 K26
GPP_CLKN1 K25
GPP_CLKP2 H26
GPP_CLKN2 H25
GPP_CLKP3 G26
GPP_CLKN3 G25
GPP_CLKP4 L24
GPP_CLKN4 L23
GPP_CLKP5 K24
GPP_CLKN5 K23
GPP_CLKP6 H24
GPP_CLKN6 H23
GPP_CLKP7 G24
GPP_CLKN7 G23
GPP_CLKP8 E26
GPP_CLKN8 E25
GPP_CLKP9 E24
GPP_CLKN9 E23
M22_PE3_CLK0P 21
M22_PE3_CLK0N 21
M2_2 / PCI_E3
PE_SLOT_CLK2P 22
PE_SLOT_CLK2N 22
PCI_E2
PE_SLOT_CLK6P 22
PE_SLOT_CLK6N 22
PCI_E4
WIFI_BT_CLK8P 26
WIFI_BT_CLK8N 26
WIFI+BT
RT8125B_LAN_CLK9P 35
RT8125B_LAN_CLK9N 35
LAN 2.5G
SATA_X1
SATA_X2
PROMONTORY
B550
2020.03.31
C410 X_22p50N PM_X1_25_R
C416 X_22p50N PM_X2_25_R
Y4
25MHZ18p
R455 X_R/2
R463 X_1MR/4
R471 X_R/2
C414 10p50N
SATA_X1 AF11
SATA_X2 AE11
R430 X_0R/4
3VSB
0.1u16X C401
U41
NC7SZ08M5X
T70-7SZ0880-O05
6,7,20,24,26,35 PCIE_REST#
6 PM19_AUX_RST#
R429 X_R/2
PCIERST#_PROM
VCC33
VCC3
R412 X_10K
R3843 10K
2020.04.07
PM19_AUX_RST#
R403 X_10K
PCB_ID
E48(競華)(JH)會洗掉此區段
VCC33
RZ1 1K/4
PCB_ID
RZ2 100K/4
Strap Information
Vih = 2V Voh = 2.4V
Vil = 0.8V Vol = 0.4V
VCC33
R527 X_200KR/4 PM_TESTEN
R517 1K/4
TESTEN:
0:Function mode
1:Test mode
R534 X_200KR/4 PM_DBUGEN
R529 1K/4
Debug Enable:
0:Function mode
1:Debug mode
R516 200KR/4 PM_TCK
R528 X_1K/4
R804 200KR/4 PM_TDO
R805 X_1K/4
TCK (DEBUG_SEL1) / TDOTDO (DEBUG_SEL0):
00:Debug signal group 0 output
01:Debug signal group 1 output
10:Debug signal group 2 output
11:Debug signal group 3 output
R543 X_200KR/4 PM_GPIO_R15
R556 1K/4
GPP Group 2 (Lanes 9:8)
1: PCIe x2
0: 2 PCIe x1
bit0
R454 X_200KR/4 PM_SPI_DATAIN
R457 1K/4
bit1
R790 X_200KR/4 UART_TX
R789 1K/4
bit2
R554 X_200KR/4 PM_GPIO_R8
R553 1K/4
GPP Group 1 (Lanes 7:4)
111: 1 PCIe x4
011: 1 PCIe x2 + 1 PCIe x2
010: 1 PCIe x2 + 2 PCIe x1
001: 2 PCIe x1 + 1 PCIe x2
000: 4 PCIe x1
Others: Reserved
bit0
R441 200KR/4 PM_SPI_CLK_R
R440 X_1K/4
GPP Group 0 (Lanes 3:0)
111: 1 PCIe x4
011: 1 PCIe x2 + 1 PCIe x2
010: 1 PCIe x2 + 2 PCIe x1
001: 2 PCIe x1 + 1 PCIe x2
000: 4 PCIe x1
Others: Reserved
bit2
R568 200KR/4 PM_GPIO_R7
R567 X_1K/4
R533 200KR/4 PM_GPIO_R4
R532 X_1K/4
GPIO_R4:
1: GPP / Clock buffer clock source from APU CLKP/N
0: GPP / Clock buffer clock source from Crystal
R540 X_200KR/4 PM_GPIO_R5
R541 1K/4
GPIO_R5:
0:USBC SSC Enable
1:USBC SSC Disable
R559 200KR/4 PM_GPIO_R6
R558 X_1K/4
GPIO_R6:
0:SATA SSC Enable
1:SATA SSC Disable
57,60 PM_PWRGD
CP20 X_SP
PCIERST#_PROM
PCH1D
PWR_GD
PERSTN
GPP_INTN
FAN_CTRL/DEBUG21
TACH_IN/DEBUG20
SMCL
SMDA
UART_RX
UART_TX
SPI_SCK
SPI_CS
SPI_SDI
SPI_SDO
TCK
TDI
TDO
TMS
RTCK
TESTEN
DEBUG_ENABLE
EFUSE_PWR
ACPI
FAN
SMBus
SPI
GPIO
MISC
PROMONTORY
B550
PEWAKEN
GPP_RSTN
SMI
INT_GPIO/DEBUG6
CP19 X_SP
APU_WAKE# 6,24
PM_GPP_RST
C421 X_100p50N
PM_GPP_RST 21
APU_SMI
PM_INI
Co-lay GPP_RSTN Reset for meet FCH sequence. See 55553.
Follow CRB
APU_SMI
PM_INI
CP16 X_SP
R445 X_0R/4
Q46
2N7002
R420 4.7K
APU_LPC_PME#
APU_LPC_PME# 6,27
R785 X_4.7K
R525 4.7K
R798 4.7K PM_SCLK
R797 4.7K PM_SDATA
R792 10K UART_RX
UART_TX
PM_SPI_CLK_R
PM_SPI_DATAIN
PM_SPI_DATAOUT
PM_TCK
PM_TDI
PM_TDO
PM_TMS
PM_RTCK
TP12
TP13
TP38
PM_TESTEN
PM_DBUGEN
EFUSE_PWR
R802 X_0R/4
GPIO_R0/DEBUG0 PM_GPIO_R0 TP10
GPIO_R1/DEBUG1 PM_GPIO_R1 TP8
GPIO_R2/DEBUG2 PM_GPIO_R2 TP9
GPIO_R3/DEBUG3 PM_GPIO_R3 TP11
GPIO_R4/DEBUG22 PM_GPIO_R4
GPIO_R5/DEBUG23 PM_GPIO_R5
GPIO_R6/DEBUG24 PM_GPIO_R6
GPIO_R7/DEBUG25 PM_GPIO_R7
GPIO_R8/DEBUG26 PM_GPIO_R8
GPIO_R9/DEBUG27 PM_GPIO_R9
GPIO_R10/DEBUG28 PM_GPIO_R10 TP41
GPIO_R11/DEBUG29 PM_GPIO_R11
GPIO_R12/DEBUG30 PM_GPIO_R12 TP15
GPIO_R13/DEBUG31 PM_GPIO_R13 TP14
GPIO_R14/DEBUG7 PM_GPIO_R14 TP17
GPIO_R15/DEBUG5 PM_GPIO_R15
GPIO_R16/DEBUG4 PM_GPIO_R16
GPIO_R17/DEBUG14 PM_GPIO_R17 TP16 TP39
GPIO_R18/DEBUG15 PM_GPIO_R18 TP40
GPIO0 MCU_RST
GPIO1 PCB_ID
GPIO2 GPIO2
GPIO3 GPIO3
GPIO4 GPIO4
GPIO5 GPIO5
GPIO6 GPIO6
GPIO7 GPIO7
MCU_RST 67
For SW RESET MCU
For BOM Option
Board ID
GPIO_R[13:4]
Internal have a PU 200Kohm
UART_TX/SPI_SDI/SPI_SDO/SPI_SCK/TCK/TDO
Internal have a PU 200Kohm
PM_DBUGEN
Internal have a PD 1Kohm
Reserved Board ID
VCC33
R782 1K/4 GPIO5 R783 X_200KR/4
R437 X_1K/4 GPIO6 R438 200KR/4
R786 X_1K/4 GPIO7 R787 200KR/4
R561 X_1K/4 PM_GPIO_R9 R562 200KR/4
R555 X_1K/4 PM_GPIO_R11 R542 X_200KR/4
BOM OPTION
VCC33
R422 X_10K GPIO2 R414 10K
R421 X_10K GPIO3 R413 10K
R781 X_10K GPIO4 R780 10K
XXX XXX
GPIO2 0 0
GPIO3 0 0
GPIO4 0 0
MICRO-STAR INT'L CO.,LTD
MS-7C91
Size Custom
Document Description Premium - CLK/ACPI/GPIO
Rev 10
Date: Tuesday, April 21, 2020
Sheet 17 of 78



MICRO-STAR INT'L CO.,LTD	
MS-7C91	
Size: Custom	Document Description: Premium - Power
Rev: 10	
Date: Tuesday, April 21, 2020	Sheet 18 of 78



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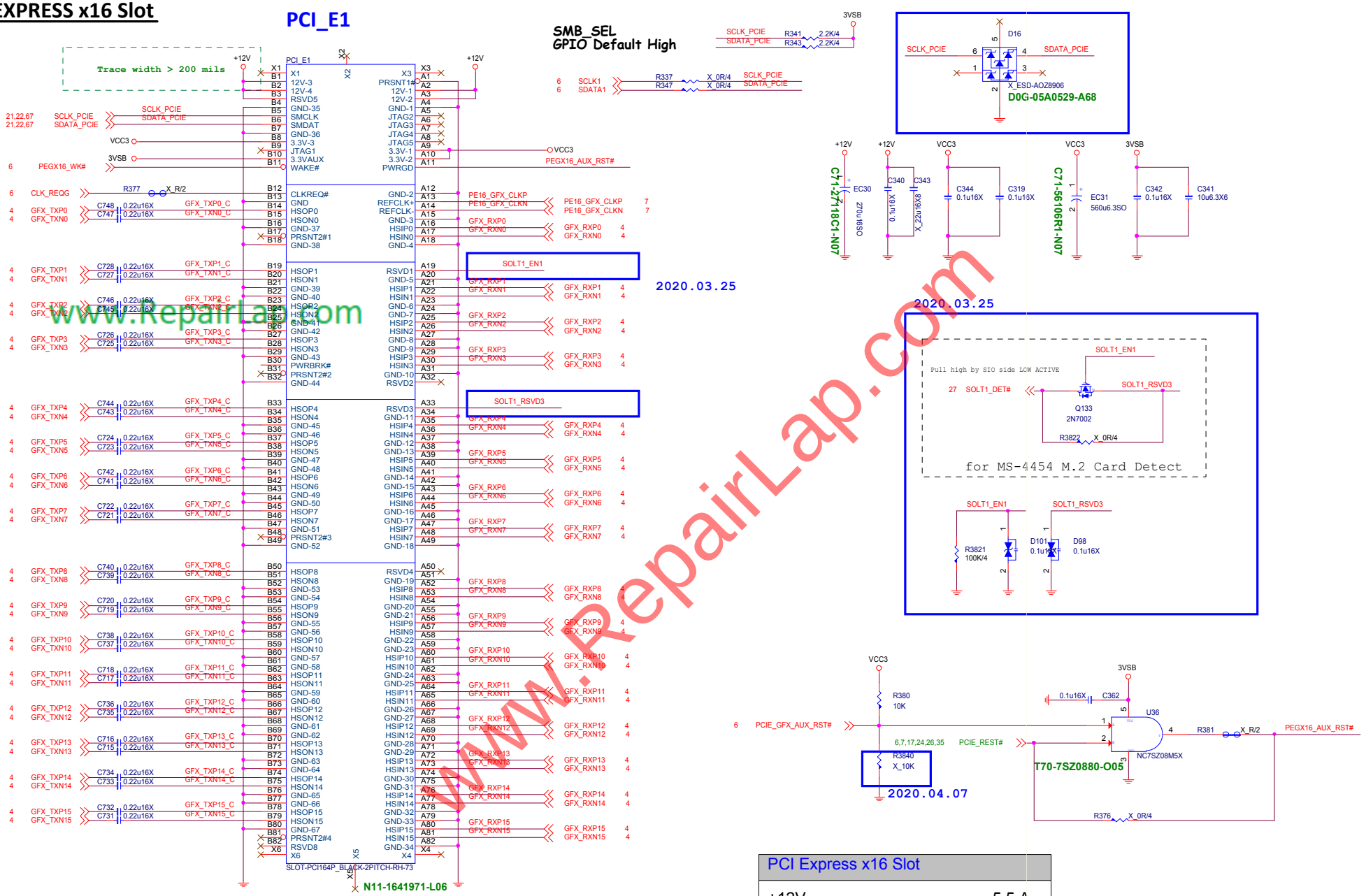
MS-7C91	
Size: Custom	Document Description: Premium - GND
Rev: 10	
Date: Tuesday, April 21, 2020	Sheet 19 of 78

PCI EXPRESS x16 Slot



PCI Express x16 Slot		
+12V		- 5.5 A
+VCC3		- 3A
+3V3_S5	(wake)	- 375mA
+3V3_S5	(no wake)	- 20mA

MICRO-STAR INT'L CO.,LTD

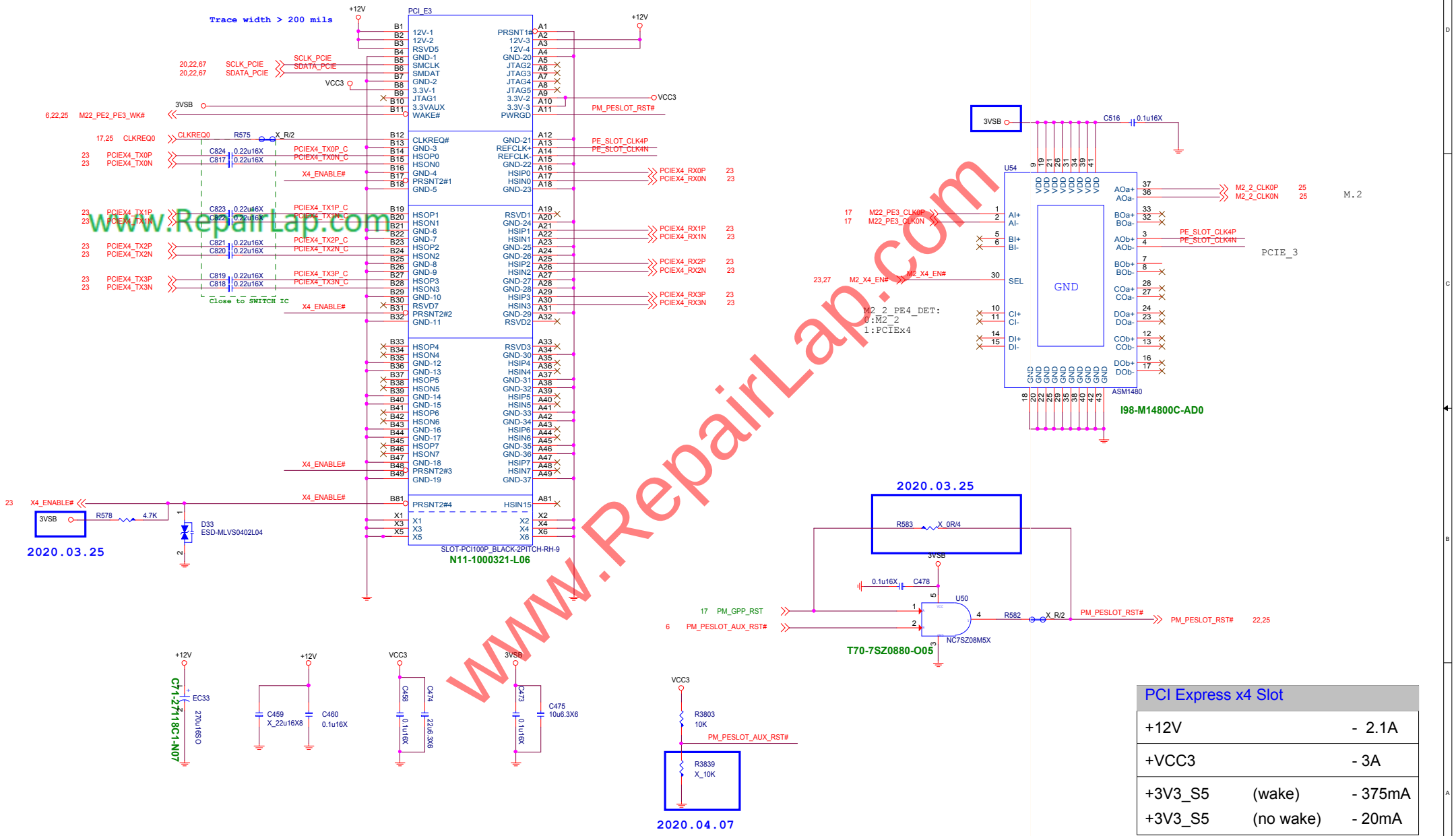
MS-7C91

Size	Document Description	Rev
Custom	PCI_E2 (X16)	10

Date: Tuesday, April 21, 2020 Sheet 20 of 78

PCI EXPRESS x4 SLOT

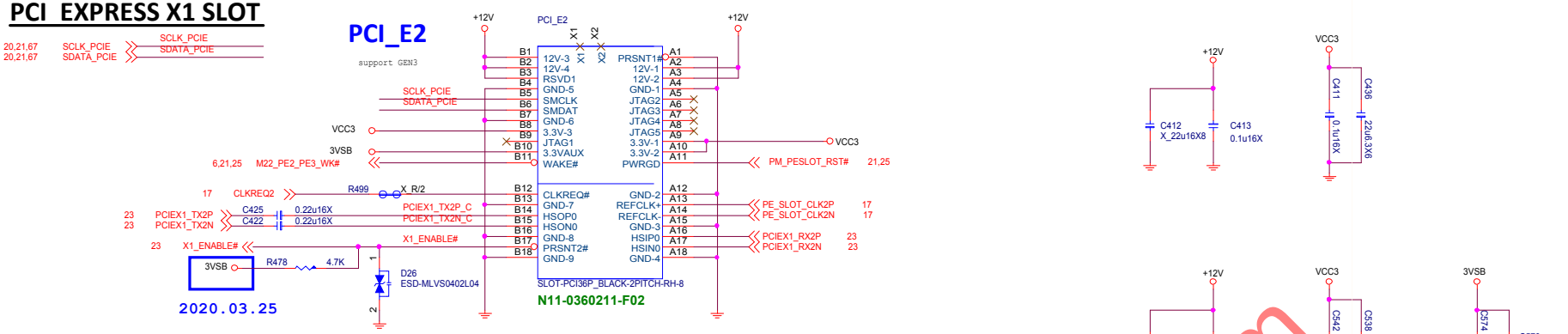
PCI_E3 X4

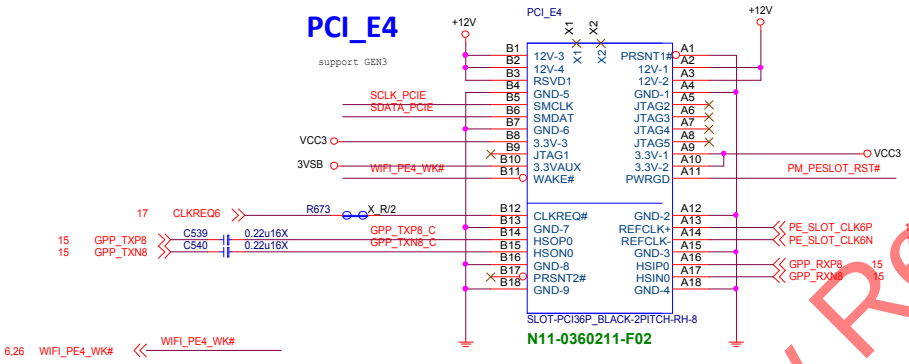


PCI Express x4 Slot		
+12V		- 2.1A
+VCC3		- 3A
+3V3_S5	(wake)	- 375mA
+3V3_S5	(no wake)	- 20mA

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7C91	
Size: Custom	Document Description: PCI_E3 (X4)	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 21 of 78	

PCI_EXPRESS X1 SLOT





PCI Express x1 Slot *3		
+12V		- 1.5 A
+VCC3		- 9A
+3V3_S5	(wake)	- 1.125A
+3V3_S5	(no wake)	- 20mA

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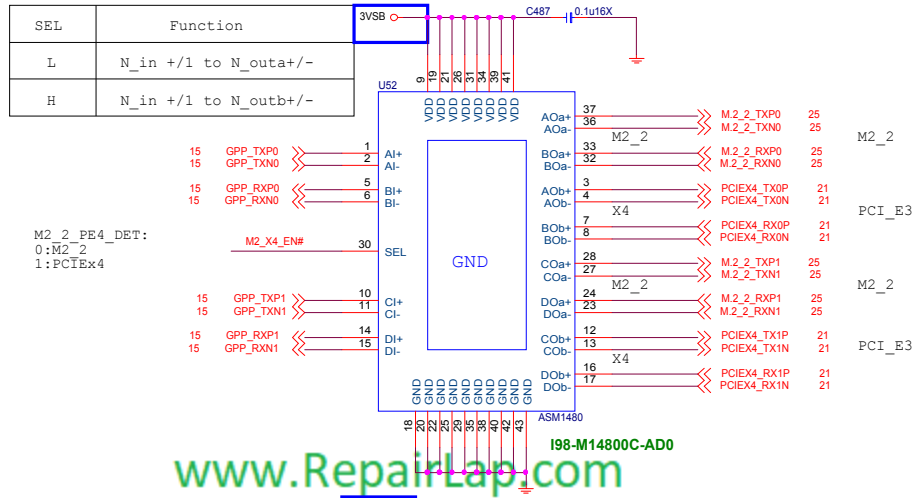
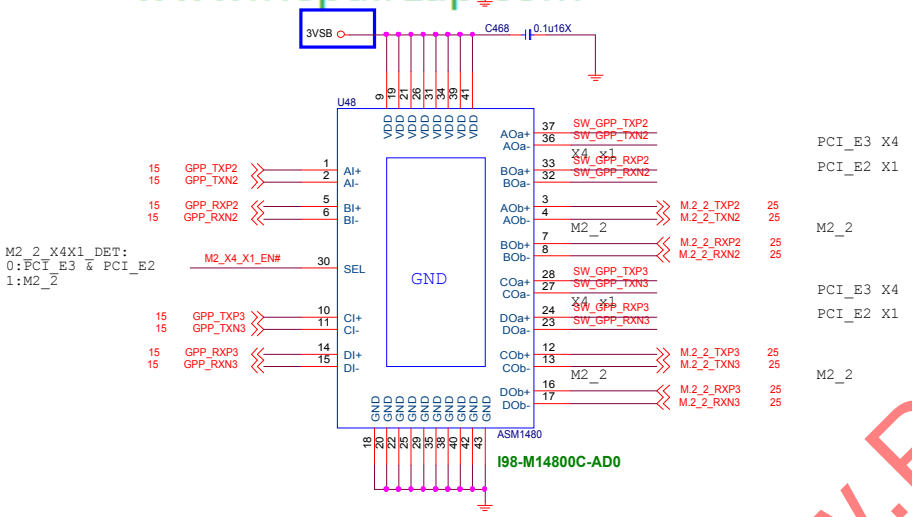
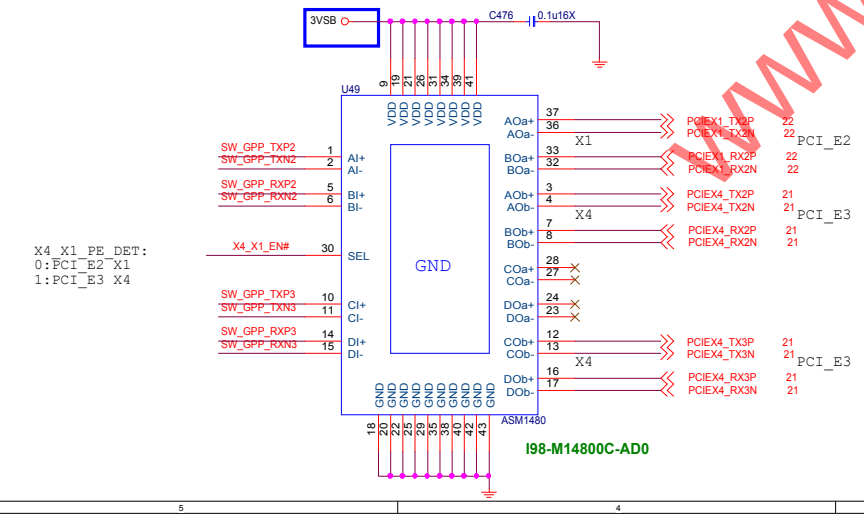
MS-7C91		
Size: Custom	Document Description: PCI_E2/E4_X1	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 22 of 78	

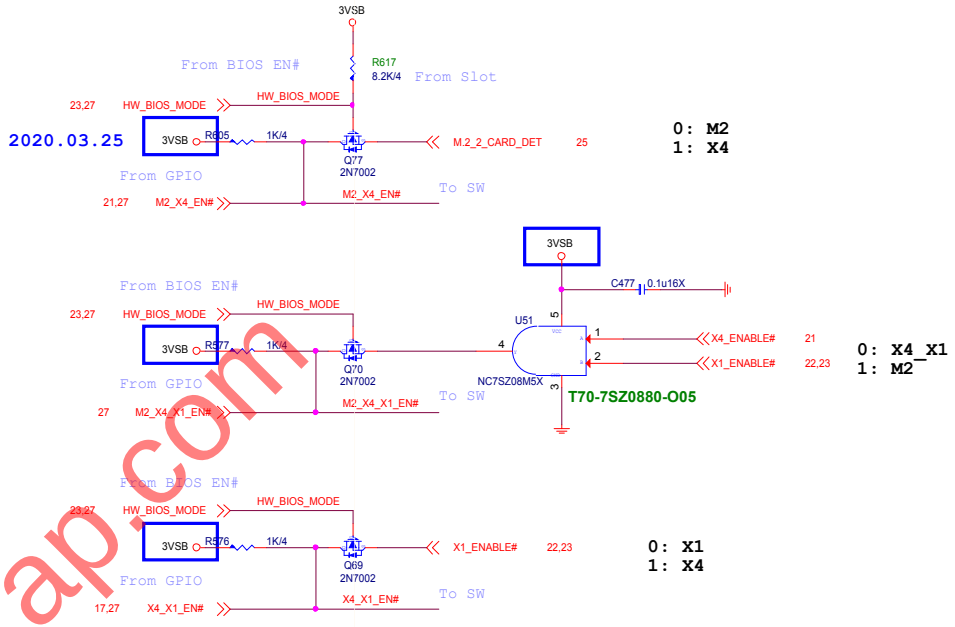
SEL	Function
L	N_in +/1 to N_outa+/-
H	N_in +/1 to N_outb+/-







PCIE Lanes control circuit



HW_BIOS_MODE = High(HW MODE)

DEVICE	M2_2 X4	●(4)	X	X	●(2)	●(2)	X	X	●(2)
	PCI_E3 X4	X	●(4)	X	●(0)	X	●(2)	X	●(0)
	PCI_E2 X1	X	X	●(1)	X	●(1)	●(1)	X	●(1)
DETECT	M.2_2_CARD_DET	O	1	1	O	O	1	1	O
	X1_ENABLE#	1	1	O	1	O	O	1	O
	X4_ENABLE#	1	O	1	O	1	O	1	O

●(X) = availability Lanes number

HW_BIOS_MODE = Low(BIOS MODE)

BIOS GPIO SWITCH	M2_X4_EN#	O	O	O	O	1	1	1	1
	M2_X4_X1_EN#	O	O	1	1	O	O	1	1
	X4_X1_EN#	O	1	O	1	O	1	O	1
DEVICE	M2_2 X4	●(2)	●(2)	●(4)	●(4)	●(0)	●(0)	●(0)	●(0)
	PCI_E3 X4	●(0)	●(0)	●(0)	●(0)	●(2)	●(4)	●(2)	●(2)
	PCI_E2 X1	●(1)	●(0)	●(0)	●(0)	●(1)	●(0)	●(0)	●(0)

MICRO-STAR INT'L CO.,LTD

MS-7C91

Size	Document Description	Rev
Custom	PCIE GEN3 SWITCH	10

Date: Tuesday, April 21, 2020 Sheet 23 of 78

M.2_1 Connector

VCC3 4.25A
Max: 14W

M2下方零件擺放限高要小於0.9mm的零件

2020.03.25

LANE REVERSE TO SUPPORT SATA SSD

Close to PIN2,4

Close to PIN12, 14, 16, 18

Close to PIN70, 72, 74

PIN 69
Low SATA
NC PCIE

M.2_CARD_DET:
0:Have M.2
1:No M.2

KEY M

SLOT-NGFFCARD67P_BLACK-HF-88

PCIE/SATA Mode

PLN#

2020.04.07

2020.03.25 SMBUS Level Shift IC

pull high ESIO SIDE

CPU Side pull high 4.7K

2020.04.16

Footprint: H_R240D173_BR189_PT

E2B-7984020-A89

E2B-7B05010-A89

E2B-7B05010-A89

E2B-7B05010-A89

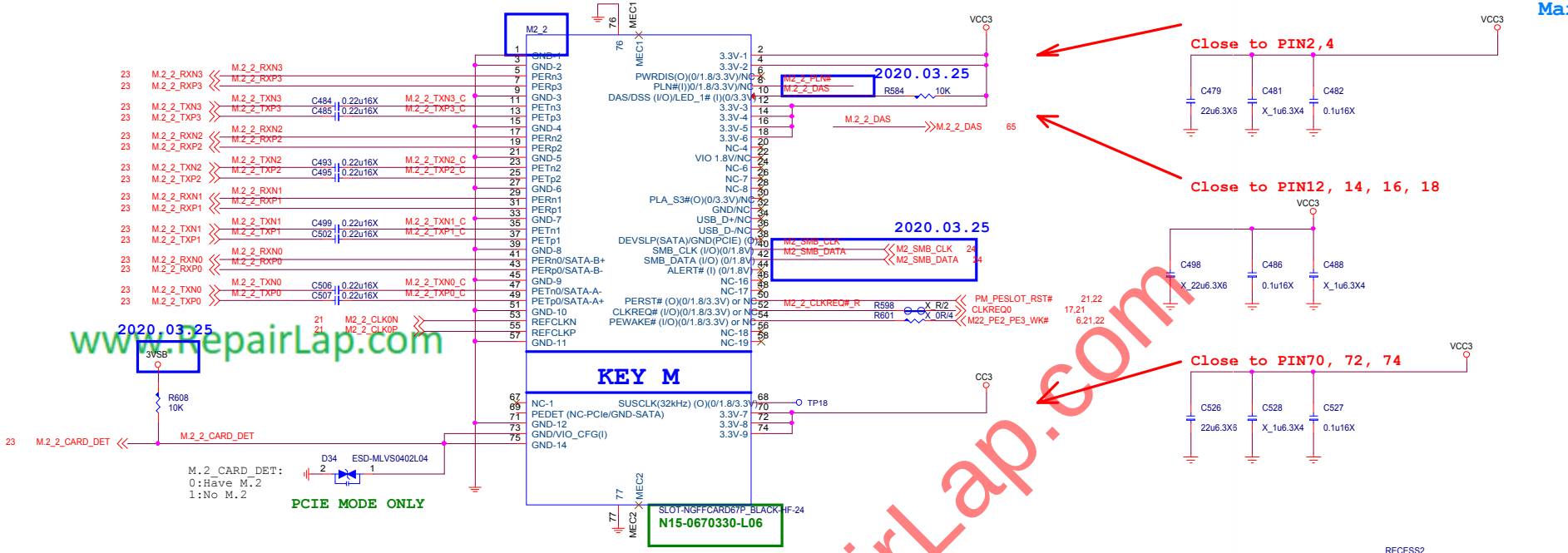
T70-7SZ0880-O05

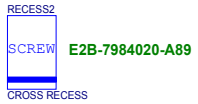
MICRO-STAR INT'L CO.,LTD		
MS-7C91		
Size: Custom	Document Description: M2_1 PCIE/SATA Mode(KEY_M)	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 24 of 78	

M.2_2 Connector

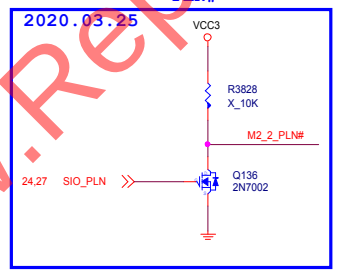
M2下方零件擺放限高要小於0.9mm的零件

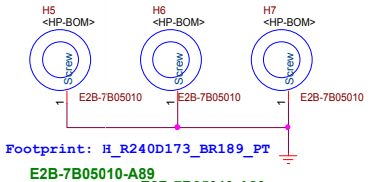
VCC3 4.25A
Max: 14W



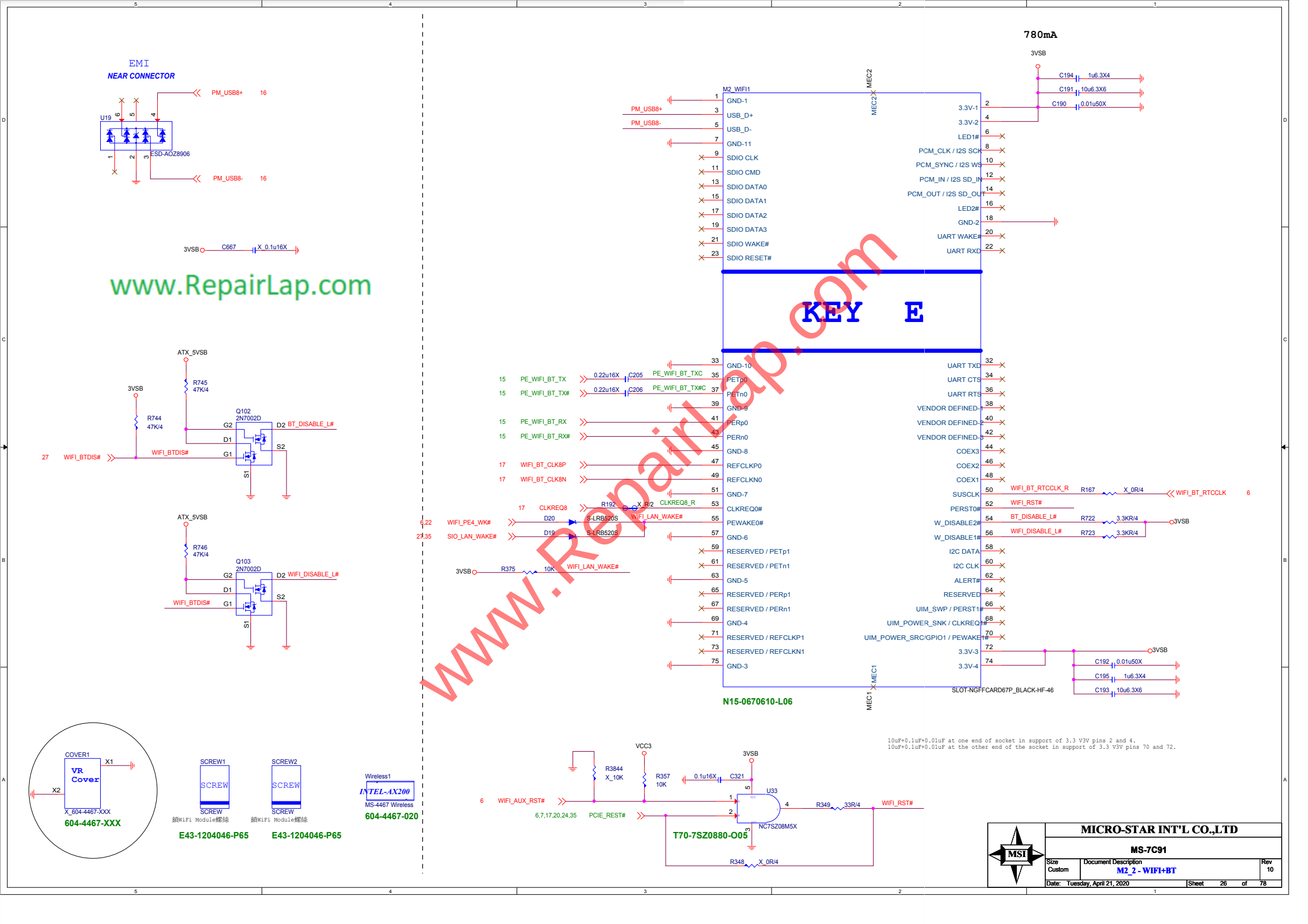


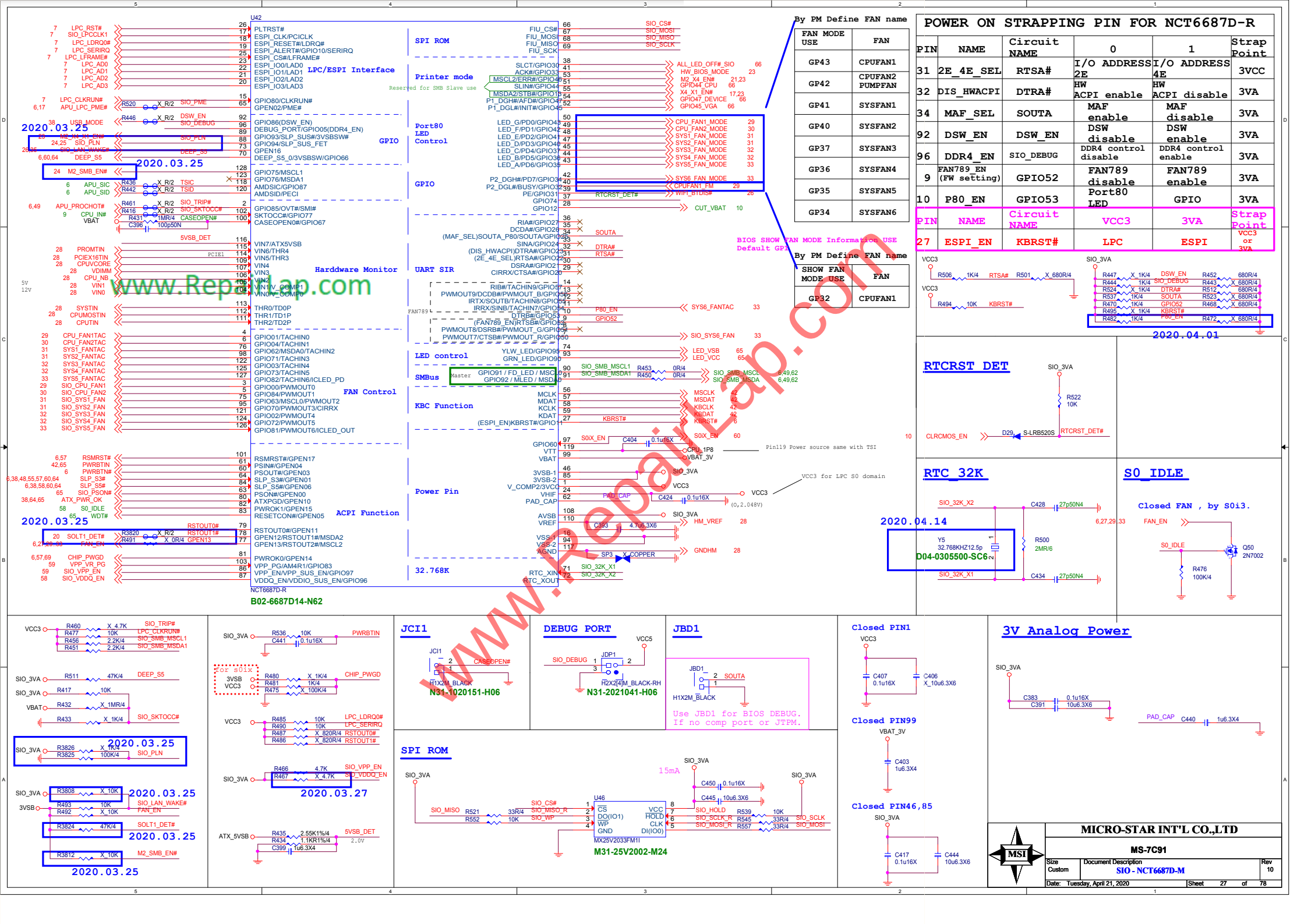
M2_2 use have four-hole footprint
V0A/1.0 BOM : N15-0670330-L06
V2.0 BOM : N15-0671160-F02





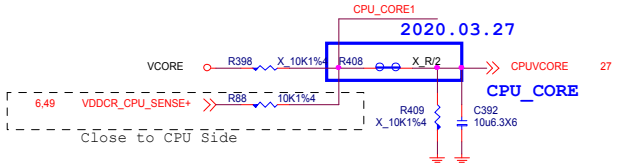
MICRO-STAR INT'L CO.,LTD		
MS-7C91		
Size: Custom	Document Description: M2_2 PCIE Mode(KEY_M)	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 25 of 78	

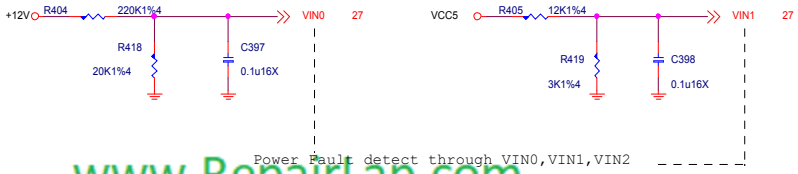

EMI
NEAR CONNECTOR
U19
ESD-AOZ8906
PM_USB8+
PM_USB8-
16
3VSB
C667
X_0.1u16X
www.RepairLap.com
ATX_5VSB
R745
47K/4
R744
47K/4
Q102
2N7002D
G2
D1
G1
S1
D2
S2
BT_DISABLE_L#
WIFI_BTDIS#
27
Q103
R746
WIFI_DISABLE_L#
780mA
M2_WIFI1
MEC2
MEC1
GND-1
USB_D+
USB_D-
GND-11
SDIO CLK
SDIO CMD
SDIO DATA0
SDIO DATA1
SDIO DATA2
SDIO DATA3
SDIO WAKE#
SDIO RESET#
3.3V-1
3.3V-2
LED1#
PCM_CLK / I2S SCK
PCM_SYNC / I2S WS
PCM_IN / I2S SD_IN
PCM_OUT / I2S SD_OUT
LED2#
GND-2
UART WAKE#
UART RXD
KEY E
GND-10
PETp0
PETn0
GND-9
PERp0
PERn0
GND-8
REFCLKP0
REFCLKN0
GND-7
CLKREQ0#
PEWAKE0#
GND-6
RESERVED / PETp1
RESERVED / PETn1
GND-5
RESERVED / PERp1
RESERVED / PERn1
GND-4
RESERVED / REFCLKP1
RESERVED / REFCLKN1
GND-3
UART TXD
UART CTS
UART RTS
VENDOR DEFINED-1
VENDOR DEFINED-2
VENDOR DEFINED-3
COEX3
COEX2
COEX1
SUSCLK
PERST0#
W_DISABLE2#
W_DISABLE1#
I2C DATA
I2C CLK
ALERT#
RESERVED
UIM_SWP / PERST1#
UIM_POWER_SNK / CLKREQ1#
UIM_POWER_SRC/GPIO1 / PEWAKE1#
3.3V-3
3.3V-4
SLOT-NGFFCARD67P_BLACK-HF-46
C194
1u6.3X4
C191
10u6.3X6
C190
0.01u50X
C205
C206
PE_WIFI_BT_TX
PE_WIFI_BT_TX#
PE_WIFI_BT_RX
PE_WIFI_BT_RX#
PE_WIFI_BT_TXC
PE_WIFI_BT_TX#C
WIFI_BT_CLK8P
WIFI_BT_CLK8N
CLKREQ8
CLKREQ8_R
R192
WIFI_LAN_WAKE#
WIFI_PE4_WK#
SIO_LAN_WAKE#
D20
D19
S-LRB520S
R375
10K
WIFI_BT_RTCCLK_R
R167
WIFI_BT_RTCCLK
WIFI_RST#
BT_DISABLE_L#
WIFI_DISABLE_L#
R722
R723
3.3KR/4
C192
C195
C193
N15-0670610-L06
10uF+0.1uF+0.01uF at one end of socket in support of 3.3 V3V pins 2 and 4.
10uF+0.1uF+0.01uF at the other end of the socket in support of 3.3 V3V pins 70 and 72.
VCC3
R3844
X_10K
R357
10K
C321
0.1u16X
U33
NC7SZ08M5X
R349
33R/4
R348
X_0R/4
WIFI_AUX_RST#
PCIE_REST#
6,7,17,20,24,35
T70-7SZ0880-O05
COVER1
VR Cover
X1
X2
X_604-4467-XXX
604-4467-XXX
SCREW1
SCREW2
SCREW
鎖WiFi Module螺絲
E43-1204046-P65
Wireless1
INTEL-AX200
MS-4467 Wireless
604-4467-020
MICRO-STAR INT'L CO.,LTD
MS-7C91
Size
Custom
Document Description
M2_2 - WIFI+BT
Rev
10
Date: Tuesday, April 21, 2020
Sheet 26 of 78

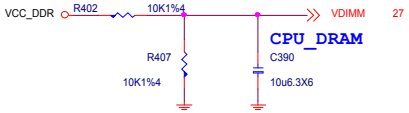


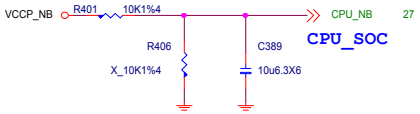
HW Monitor - Voltage

SIO HM Voltage over 2.048V will not detect

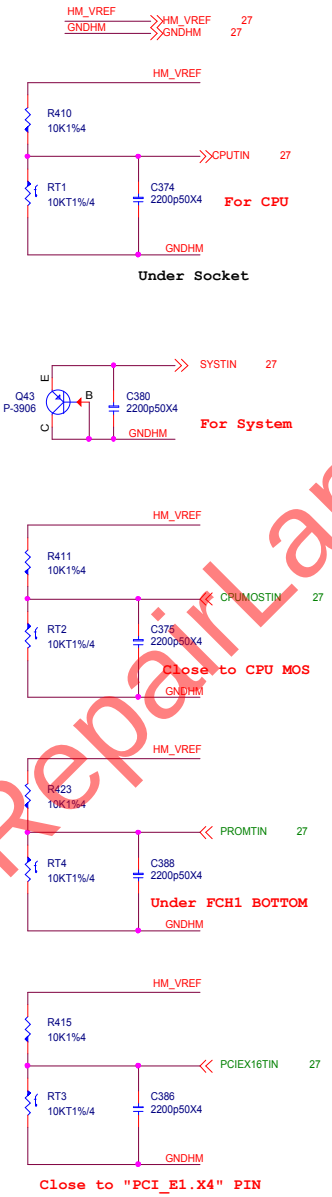








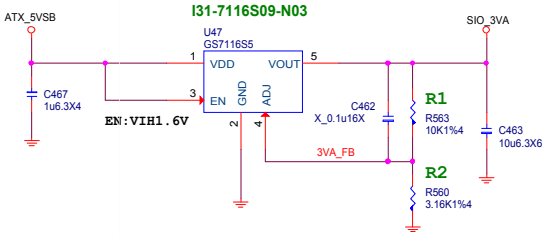
TEMP SENSOR



PM RESET

CPU RESET

SIO_3VA



Vout = Vref * (1 +(R1/R2))
= 0.8 * (1 +(10K/3.16K))
= 3.33V

MICRO-STAR INT'L CO.,LTD

MS-7C91

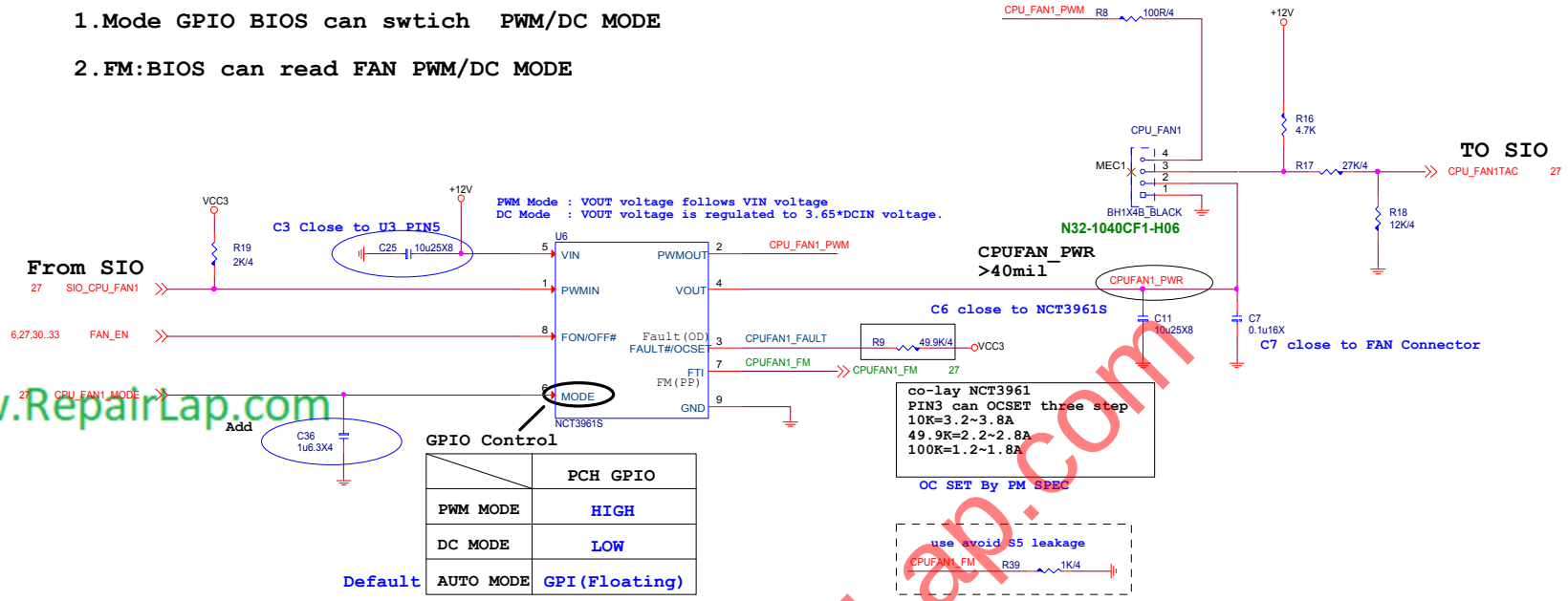
Size	Document Description	Rev
Custom	SIO - HW Monitor	10

Date: Tuesday, April 21, 2020 Sheet 28 of 78

CPUFAN1 TYPE N : 4 PIN CPU FAN USE NCT3961S USE PCH GPIO CONTROL FAN MODE

1.Mode GPIO BIOS can swtich PWM/DC MODE

2.FM:BIOS can read FAN PWM/DC MODE



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

MICRO-STAR INT'L CO.,LTD

MS-7C91

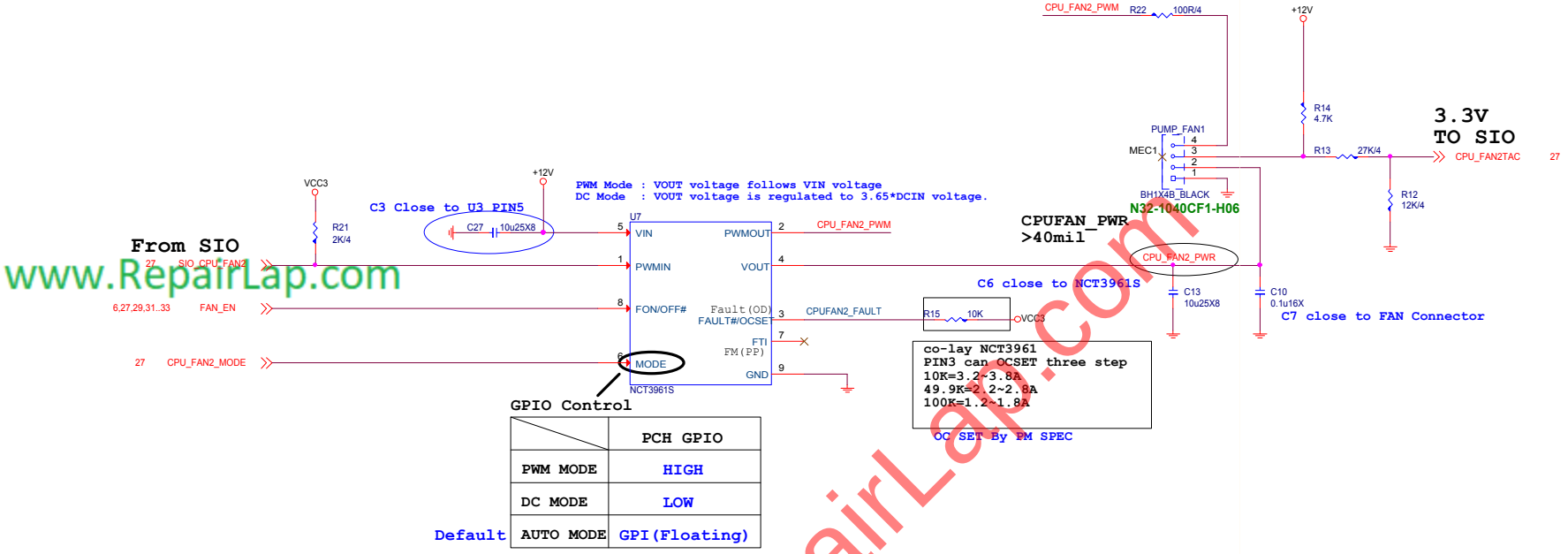
Size: Custom | Document Description: FAN TYPE-L CPUFAN1 | Rev: 10

Date: Tuesday, April 21, 2020 | Sheet 29 of 78

PUMPFAN1

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

1.Mode GPIO BIOS can swtich PWM/DC MODE



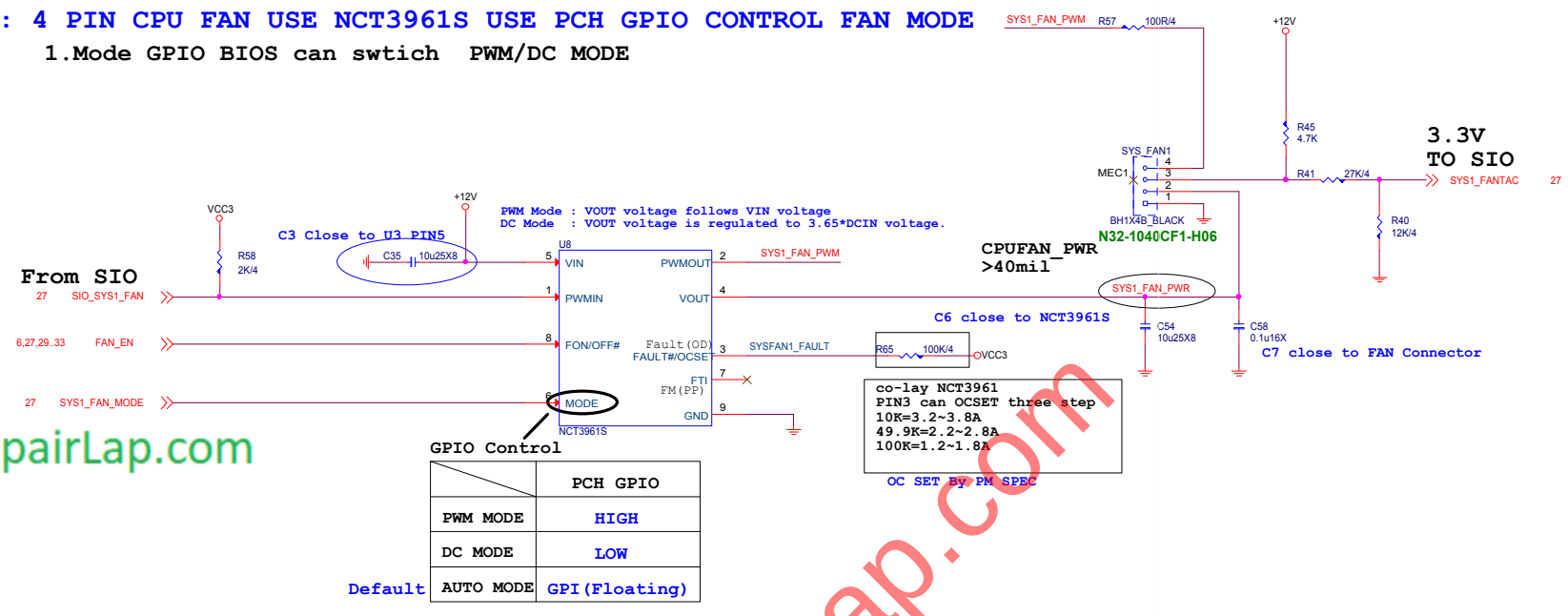
	PCH GPIO
PWM MODE	HIGH
DC MODE	LOW
Default AUTO MODE	GPI(Floating)

MICRO-STAR INT'L CO.,LTD	
MS-7C91	
Size: Custom	Document Description: FAN TYPE-K PUMPFAN1
Rev: 10	
Date: Tuesday, April 21, 2020	Sheet 30 of 78

SYSFAN1

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

1.Mode GPIO BIOS can swtich PWM/DC MODE



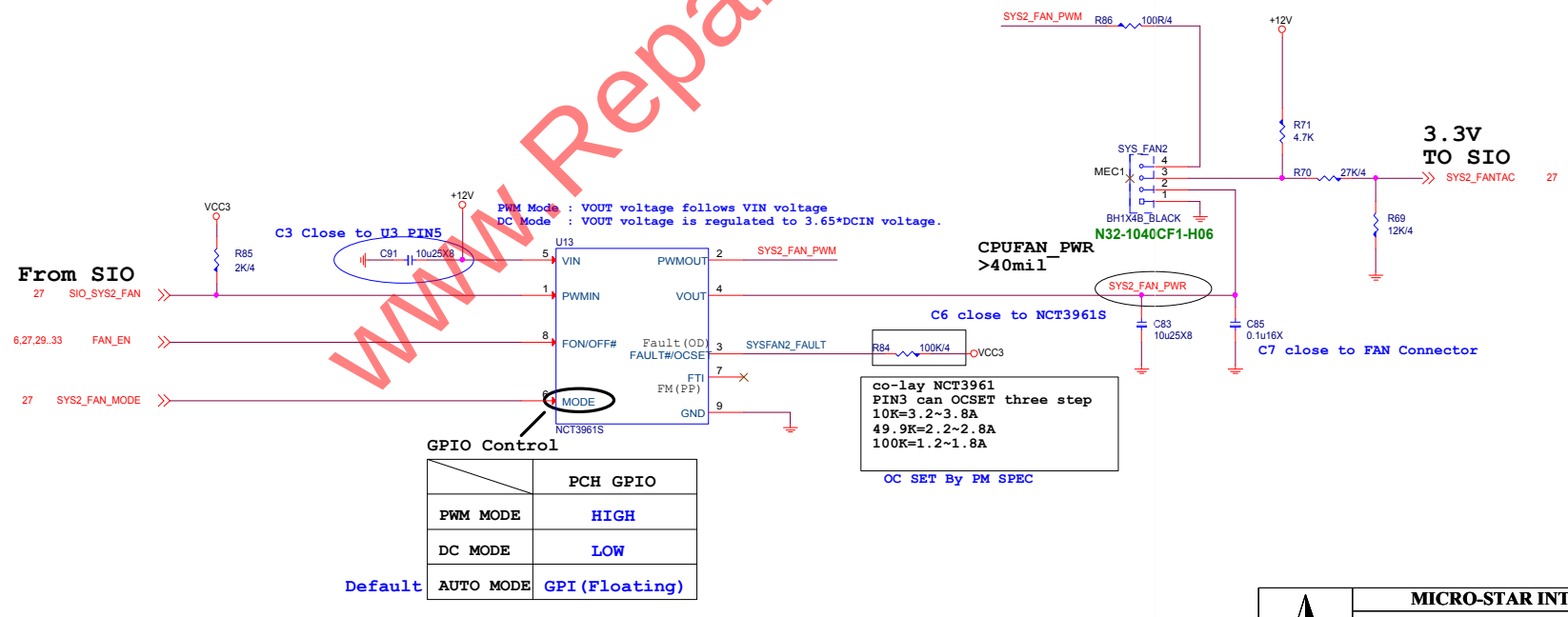
GPIO Control

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

SYSFAN2

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

1.Mode GPIO BIOS can swtich PWM/DC MODE



GPIO Control

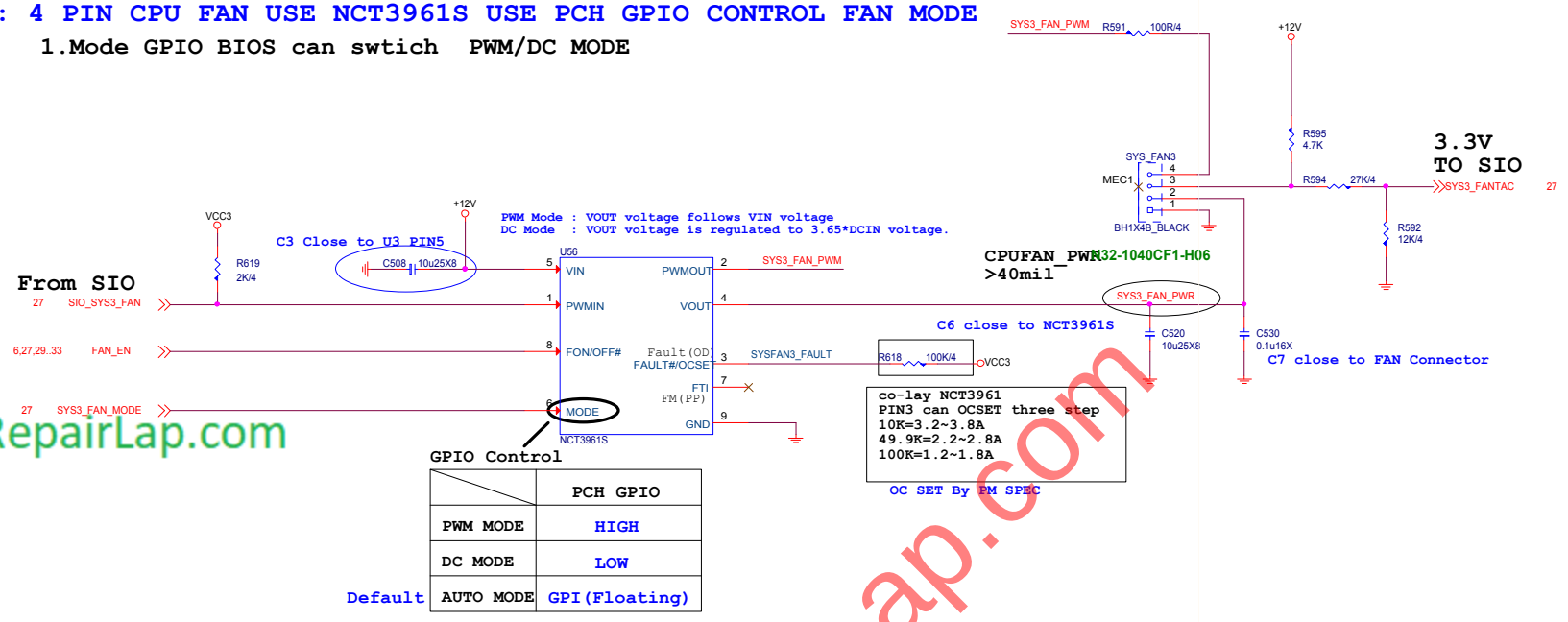
	PCH GPIO
PWM MODE	HIGH
DC MODE	LOW
Default AUTO MODE	GPI(Floating)

MICRO-STAR INT'L CO.,LTD	
MS-7C91	
Size: Custom	Document Description: FAN TYPE-K SYSFAN1/2
Rev: 10	
Date: Tuesday, April 21, 2020	Sheet 31 of 78

SYSFAN3

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

1.Mode GPIO BIOS can swtich PWM/DC MODE

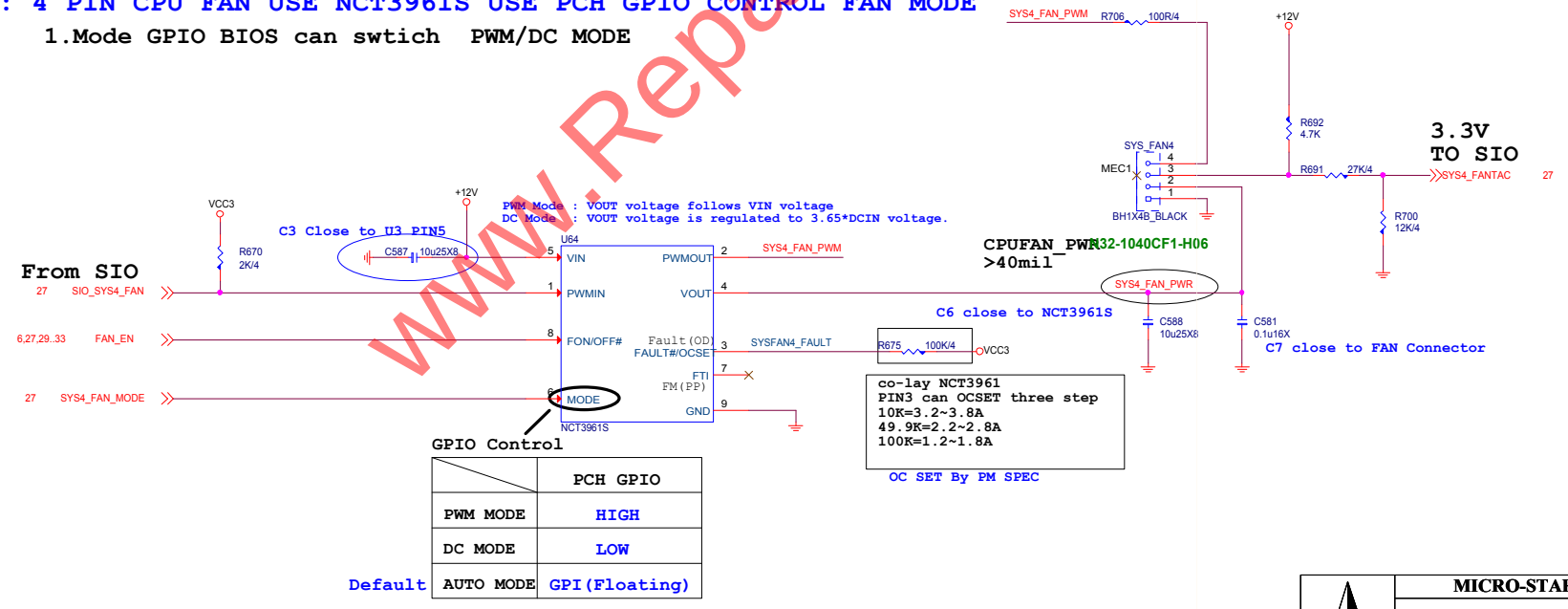


	PCH GPIO
PWM MODE	HIGH
DC MODE	LOW
Default AUTO MODE	GPI(Floating)

SYSFAN4

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

1.Mode GPIO BIOS can swtich PWM/DC MODE

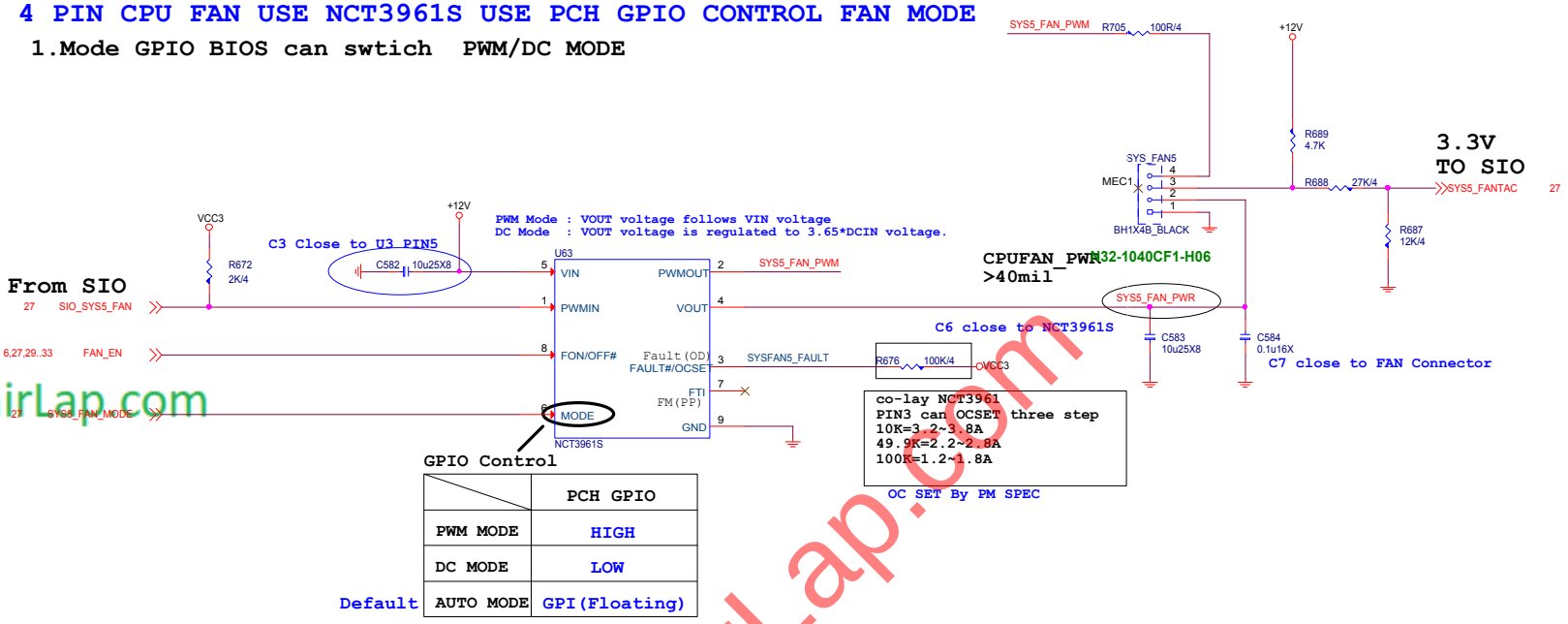


	PCH GPIO
PWM MODE	HIGH
DC MODE	LOW
Default AUTO MODE	GPI(Floating)

MICRO-STAR INT'L CO.,LTD	
MS-7C91	
Size: Custom	Document Description: FAN TYPE-K SYSFAN3/4
Rev: 10	
Date: Tuesday, April 21, 2020	Sheet 32 of 78

SYSFAN5 TYPE M : 4 PIN CPU FAN USE NCT3961S USE PCH GPIO CONTROL FAN MODE

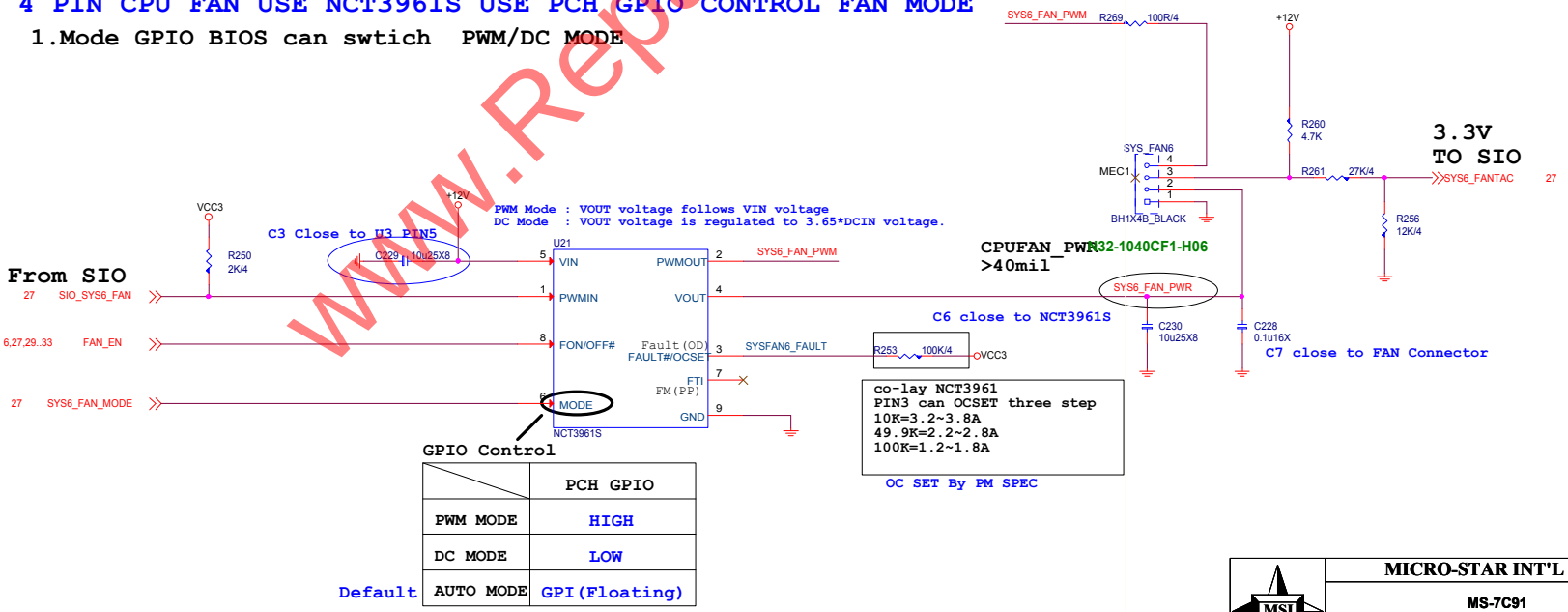
1.Mode GPIO BIOS can swtich PWM/DC MODE



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

SYSFAN6 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)

MICRO-STAR INT'L CO.,LTD

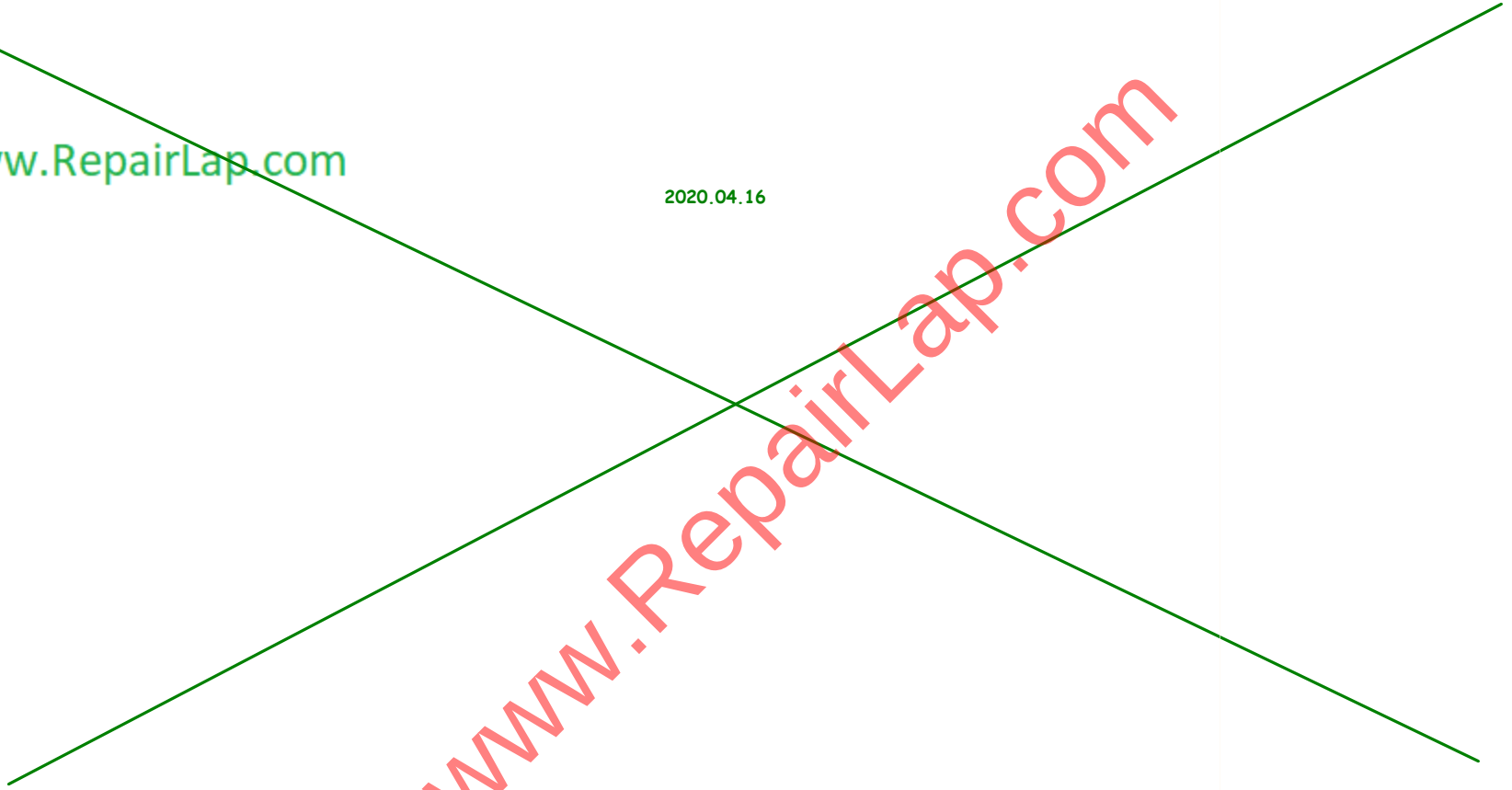
MS-7C91

Size	Document Description	Rev
Custom	FAN TYPE-N SYSFAN5	10

Date: Tuesday, April 21, 2020 Sheet 33 of 78

RTL8111H Giga LAN

2020.04.16



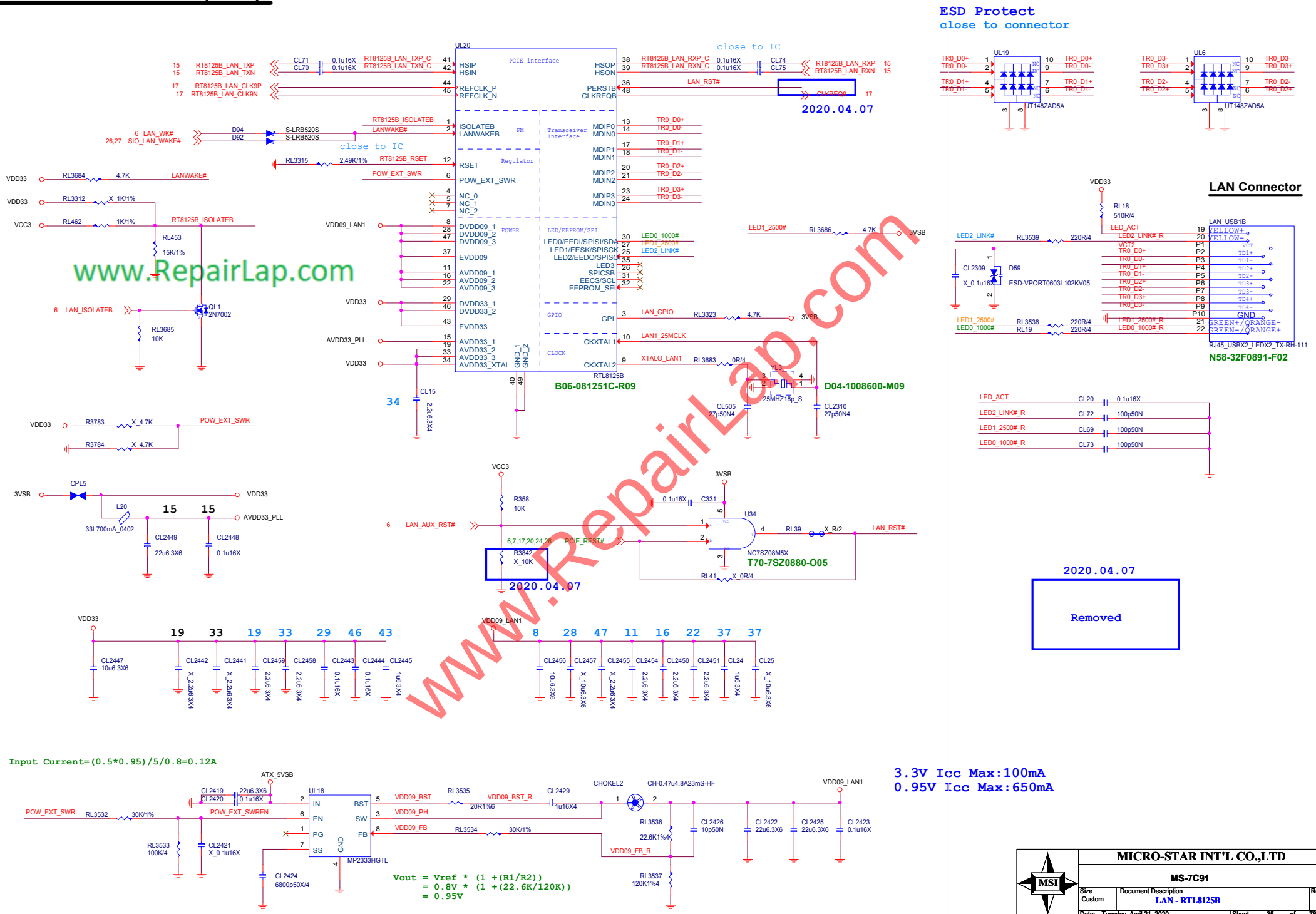
MICRO-STAR INT'L CO.,LTD

MS-7C91

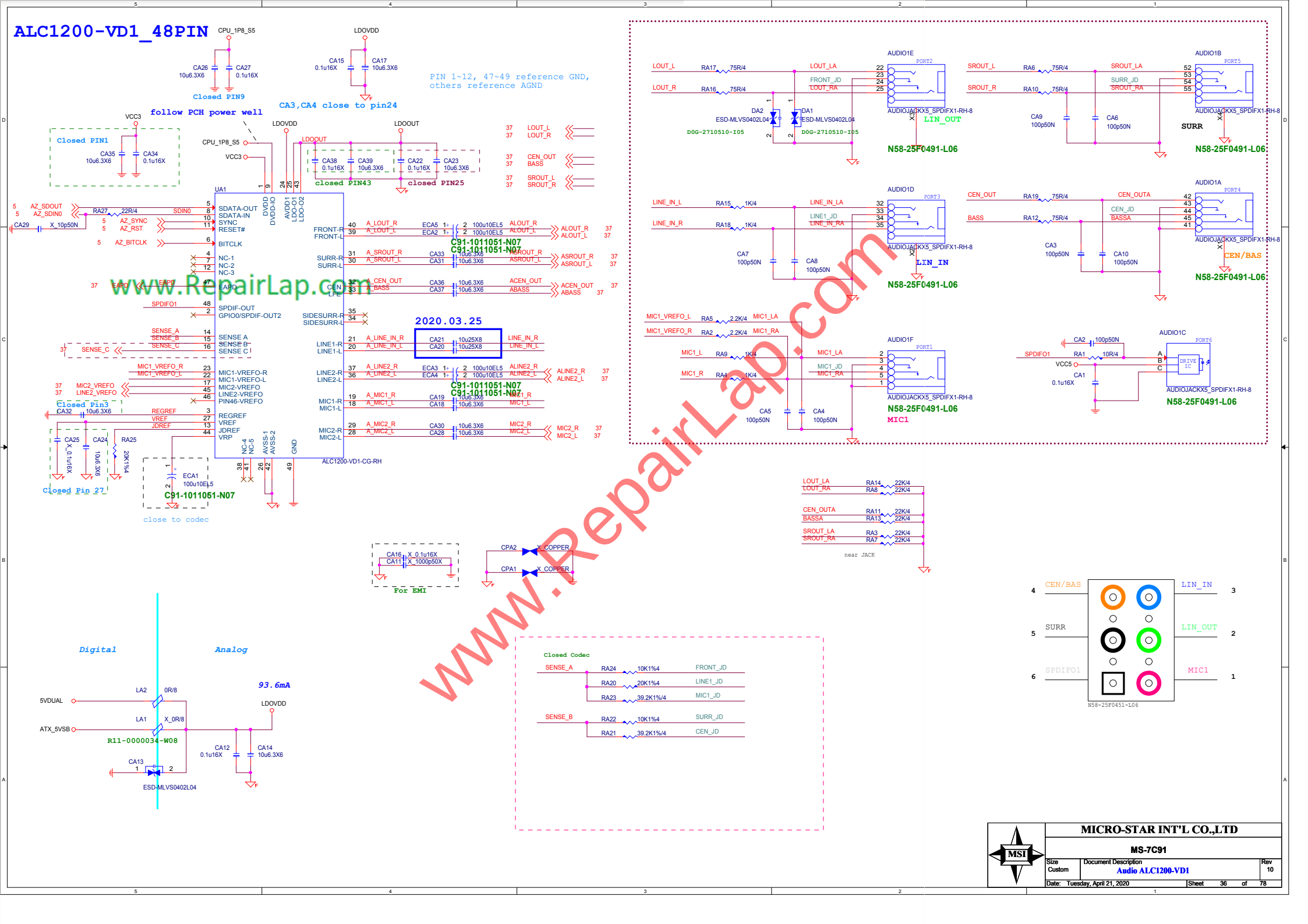
Size	Document Description	Rev
Custom	RTL8111H Giga LAN	10

Date: Tuesday, April 21, 2020 Sheet 34 of 78

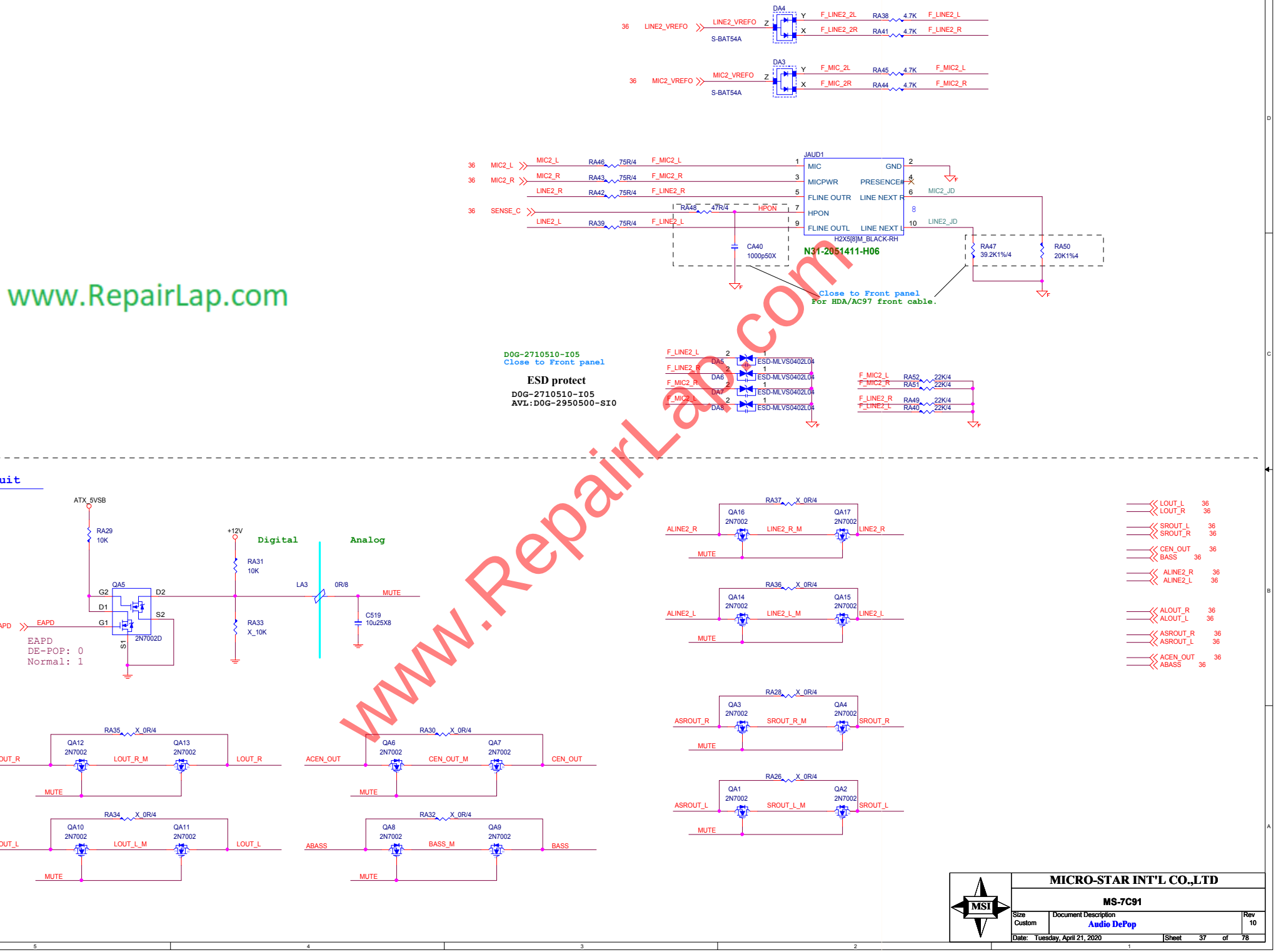
Realtek Lan1-RTL8125B(2.5G)



ALC1200-VD1_48PIN



MICRO-STAR INT'L CO.,LTD		
MS-7C91		
Size: Custom	Document Description: Audio ALC1200-VD1	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 36 of 78	



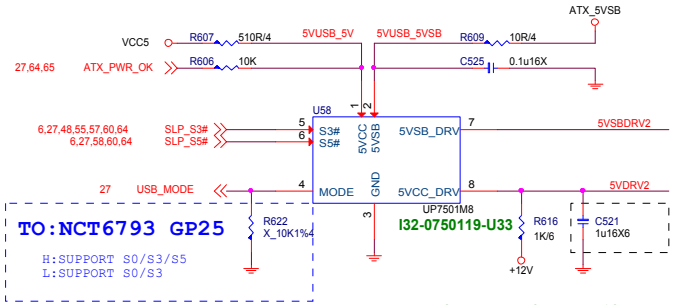
MICRO-STAR INT'L CO.,LTD

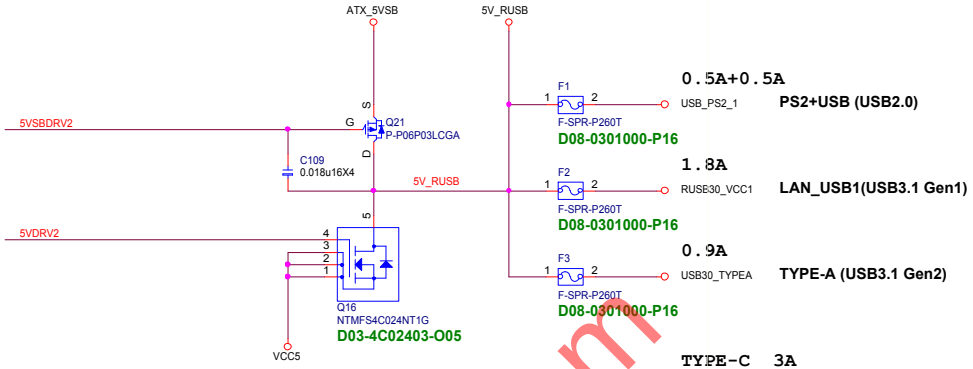
MS-7C91

Size	Document Description	Rev
Custom	Audio DePop	10

Date: Tuesday, April 21, 2020 Sheet 37 of 78

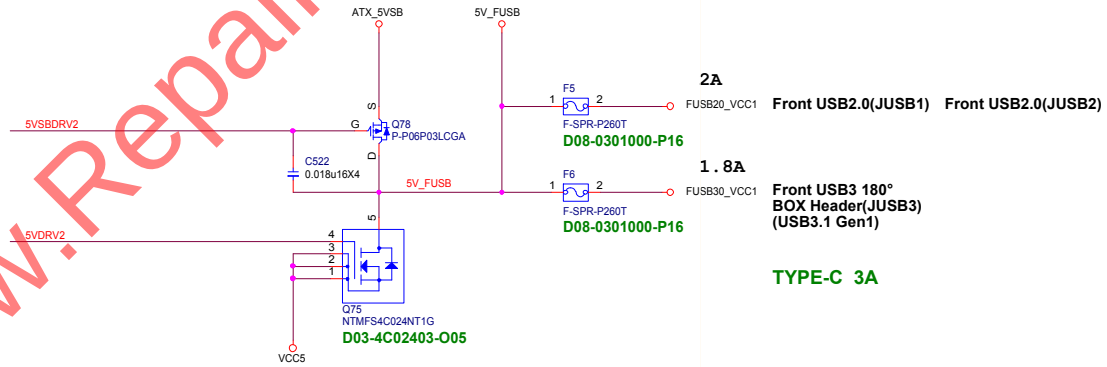
USB Power





Rear (6.7A)

Front (6.8A)

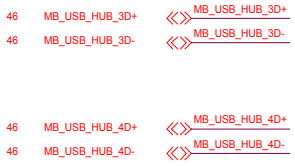


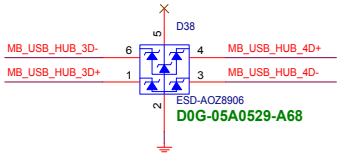
MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7C91	
Size: Custom	Document Description: USB Power - UP7501	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 38 of 78	

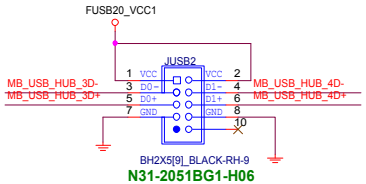
Front USB2.0(JUSB2)

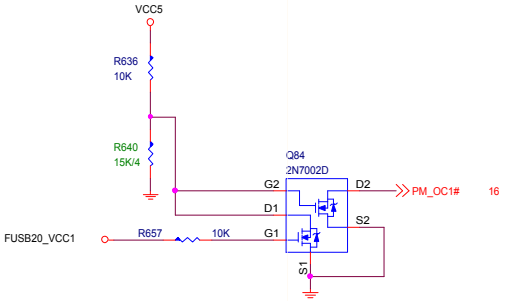
Form GL850G USB2.0 HUB

5V@1A





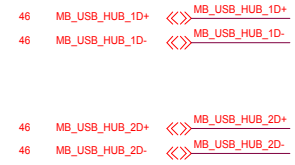


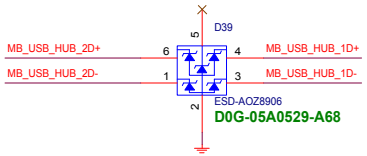


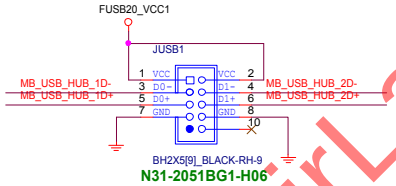
Front USB2.0(JUSB1)

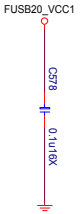
Form GL850G USB2.0 HUB

5V@1A









MICRO-STAR INT'L CO.,LTD			
MS-7C91			
Size: Custom	Document Description: Front USB2.0 Header		Rev: 10
Date: Tuesday, April 21, 2020		Sheet 39 of 78	

Front USB3 180°

BOX Header(JUSB3)

5V@1.8A

16 PM_USB2+ → PM_USB2+
16 PM_USB2- → PM_USB2-

16 PM_USB3+ → PM_USB3+
16 PM_USB3- → PM_USB3-

16 PM_USB_SSTX0+ → C566 0.22u16X → PM_SSTX0+
16 PM_USB_SSTX0- → C567 0.22u16X → PM_SSTX0-

16 PM_USB_SSRX0+ → C570 0.33u6.3X4 → PM_SSRX0+
16 PM_USB_SSRX0- → C571 0.33u6.3X4 → PM_SSRX0-

16 PM_USB_SSTX1+ → C564 0.22u16X → PM_SSTX1+
16 PM_USB_SSTX1- → C565 0.22u16X → PM_SSTX1-

16 PM_USB_SSRX1+ → C568 0.33u6.3X4 → PM_SSRX1+
16 PM_USB_SSRX1- → C569 0.33u6.3X4 → PM_SSRX1-

U65
PM_USB2- / PM_USB2+ (1,2) → (10,9) PM_USB2- / PM_USB2+
PM_USB3- / PM_USB3+ (4,5) → (7,6) PM_USB3- / PM_USB3+
(3,8) NC
UT148ZAD5A
D0G-28B030C-U33

U66
PM_SSTX0- / PM_SSTX0+ (1,2) → (10,9) PM_SSTX0- / PM_SSTX0+
PM_SSTX1- / PM_SSTX1+ (4,5) → (7,6) PM_SSTX1- / PM_SSTX1+
(3,8) NC
UT148ZAD5A
D0G-28B030C-U33

U67
PM_SSRX0- / PM_SSRX0+ (1,2) → (10,9) PM_SSRX0- / PM_SSRX0+
PM_SSRX1- / PM_SSRX1+ (4,5) → (7,6) PM_SSRX1- / PM_SSRX1+
(3,8) NC
UT148ZAD5A
D0G-28B030C-U33

VCC5
R635 10K
R639 15K/4
FUSB30_VCC1
R656 10K
Q83 2N7002D
G2, D1, G1, D2, S2, S1
R644 X_R/2
R658 X_R/2
PM_OC2# 16
PM_OC3# 16

FUSB30_VCC1
EC34 100u16SD
C580 0.1u16X

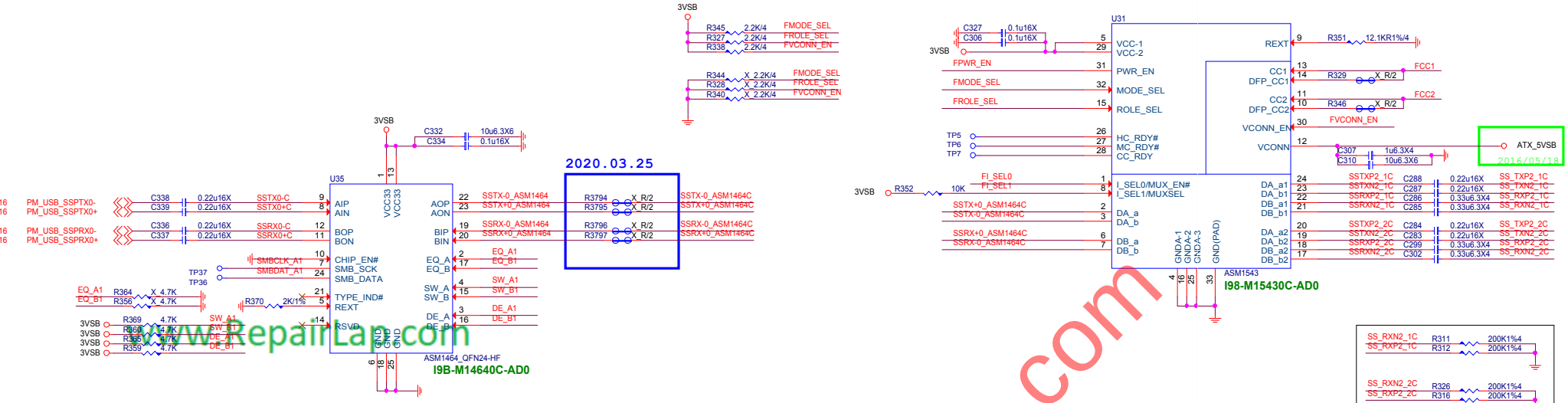
C71-1011761-N07

JUSB3
PM_USB3+ 11 D2+
PM_USB3- 12 D2-
PM_SSTX1+ 14 TX2+
PM_SSTX1- 15 TX2-
PM_SSRX1+ 17 RX2+
PM_SSRX1- 18 RX2-
FUSB30_VCC1 19 VBUS2
16 GND
13 GND
PM_USB2+ 9 D1+
PM_USB2- 8 D1-
PM_SSTX0+ 6 TX1+
PM_SSTX0- 5 TX1-
PM_SSRX0+ 3 RX1+
PM_SSRX0- 2 RX1-
7 GND
FUSB30_VCC1 1 VBUS1
4 GND
10 NC
2X10 CONNECTOR
BH2X10[20]-2PITCH_BLACK-RH-1

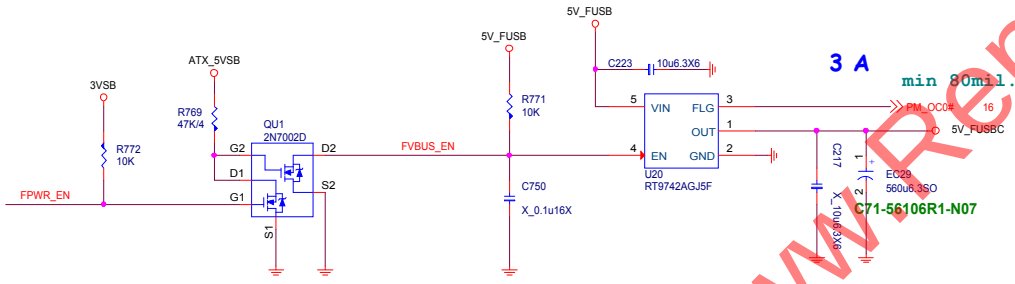
GEN1
1.8A

N32-2101091-H06

MICRO-STAR INT'L CO.,LTD			
MS-7C91			
Size: Custom	Document Description: Front USB3.0 Header		Rev: 10
Date: Tuesday, April 21, 2020		Sheet 40 of 78	

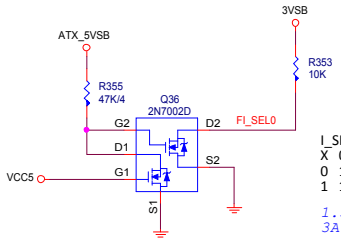


VBUS EN



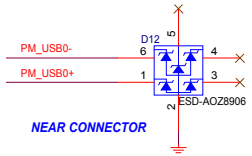
VCOM OC#

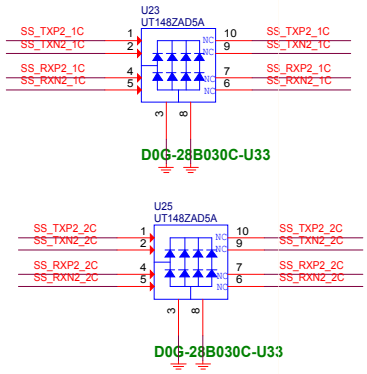
Current Mode

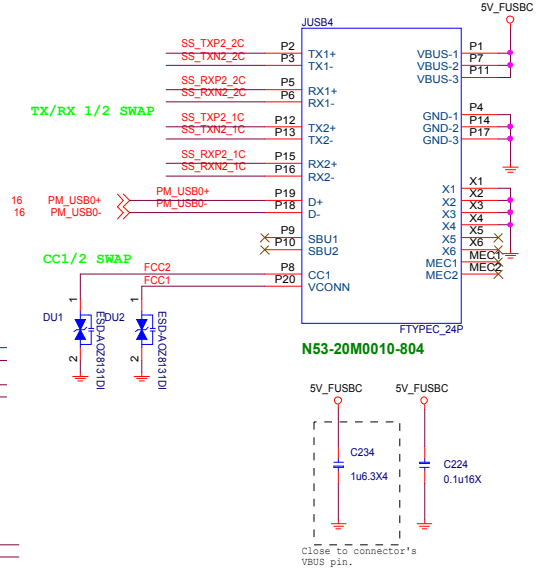


I_SEL0 : I_SEL1
X 0 Default for 900mA
0 1 1.5A @5V
1 1 3A @5V

1.5A under S3 mode
3A under S0 mode





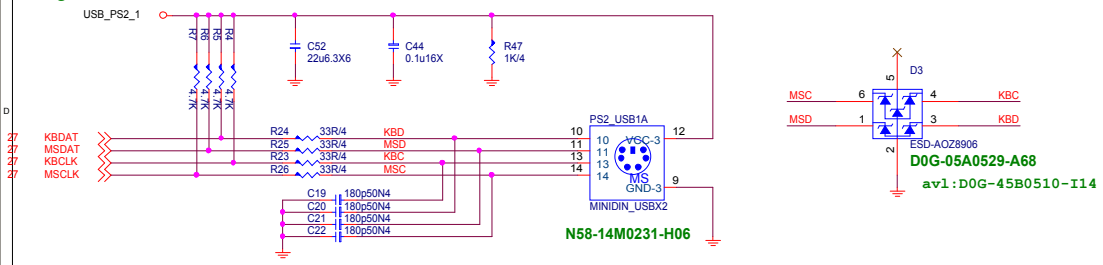


MSI MICRO-STAR INTERNATIONAL Link to the Future MICRO-START INT'L CO.,LTD.			
Title: Front USB3.1 Type C / mux			
Size: Custom	Document Number: MS-7C91		Rev: 10
Date: Tuesday, April 21, 2020		Sheet 41 of 78	

PS2+USB (USB2.0)

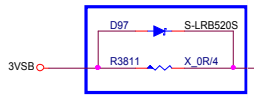
5V@1A

layout note:
C21 must close to TVS pin5
TVS must near KB_MS1 connector and route without branch
Varistor must close to TVS and route without branch



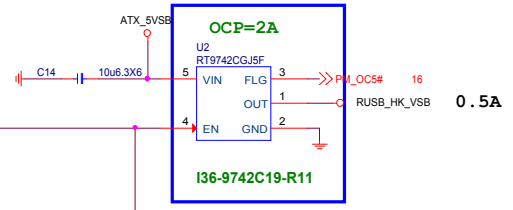
HOTKEY POWER

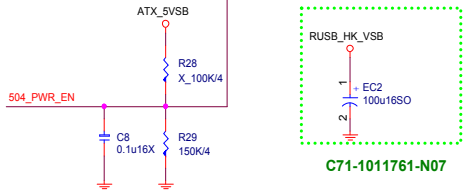
2020.03.25



2020.03.30

OCP=2A

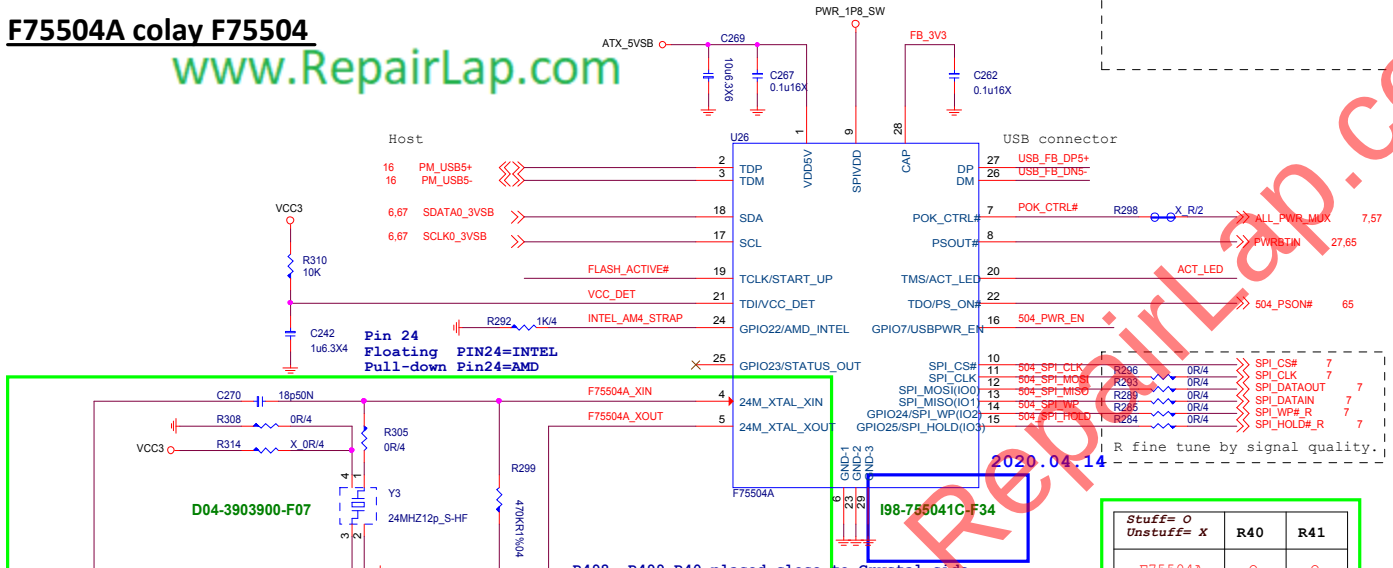




USB Flash BIOS

F75504A colay F75504

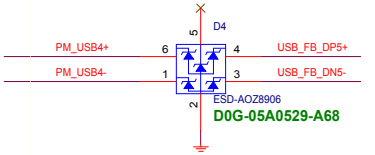
F75504A/F75504 layout placement must meet to spi/usb trace length spec with host.
As for as possible place near to host.

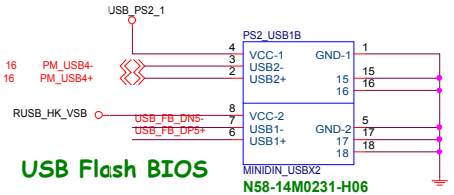


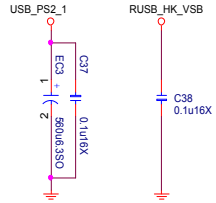
Stuff= O Unstuff= X	R500	R502	R503	R504	C510	R497	R499	R501	Y1
F75504A	O	O	X	X	10pF	0R	X	O	D04-3902700-F07
F75504	X	X	O	O	X	0.1uF	O	X	D05-1100600-F07

Stuff= O Unstuff= X	R40	R41
F75504A	O	O
F75504	X	X

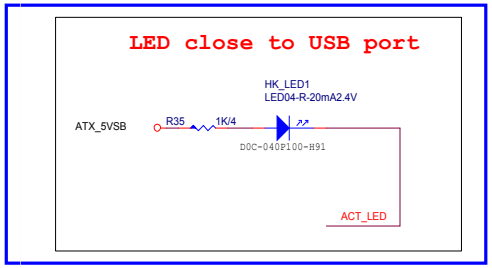
2019/06/17

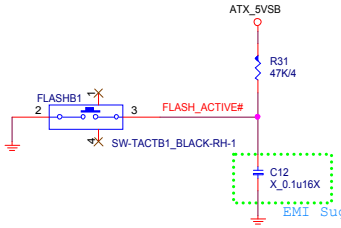


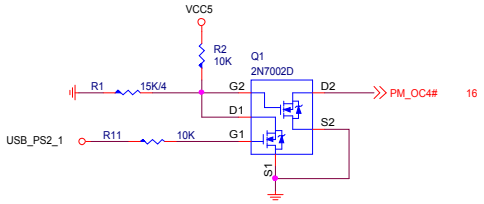




2020.04.14

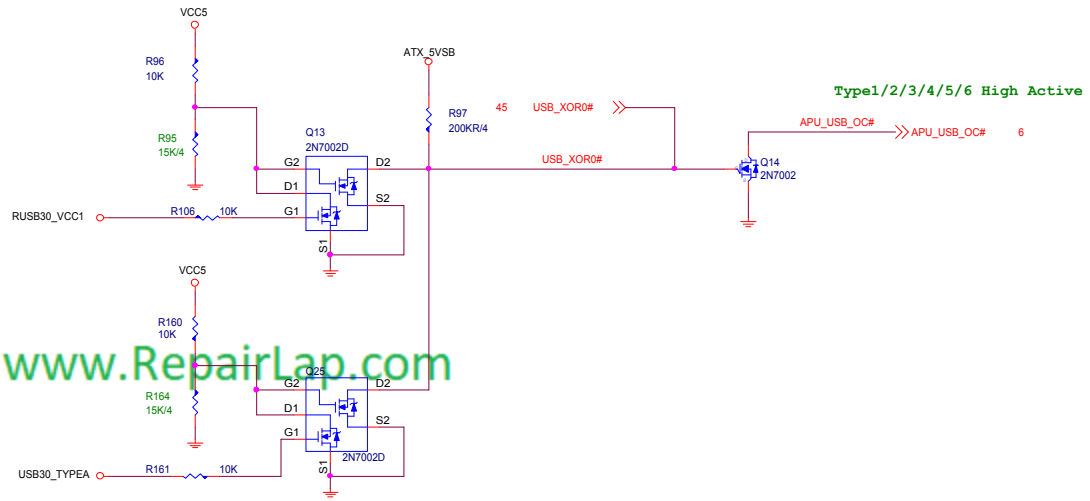






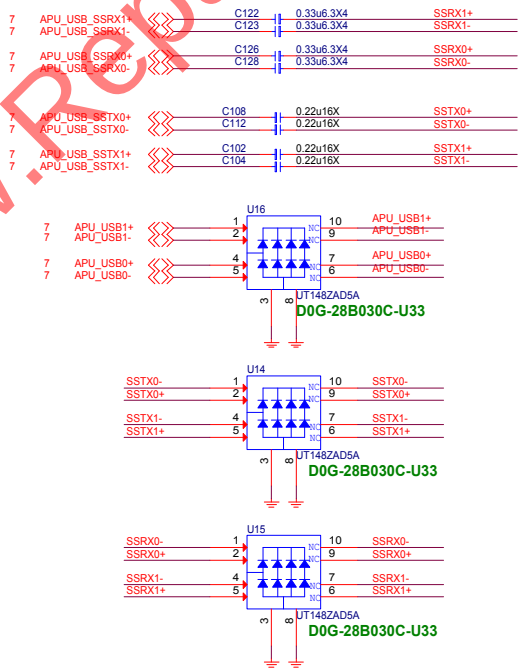
MICRO-STAR INT'L CO.,LTD		
MS-7C91		
Size: Custom	Document Description: Rear USB2.0+PS2+F75504A	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 42 of 78	

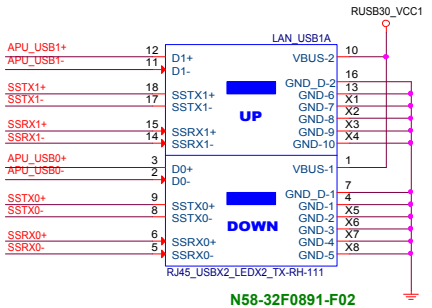
CPU USB_OC



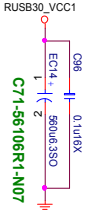
Type1/2/3/4/5/6 High Active

Rear USB3.1 GEN1 5V@1.8A



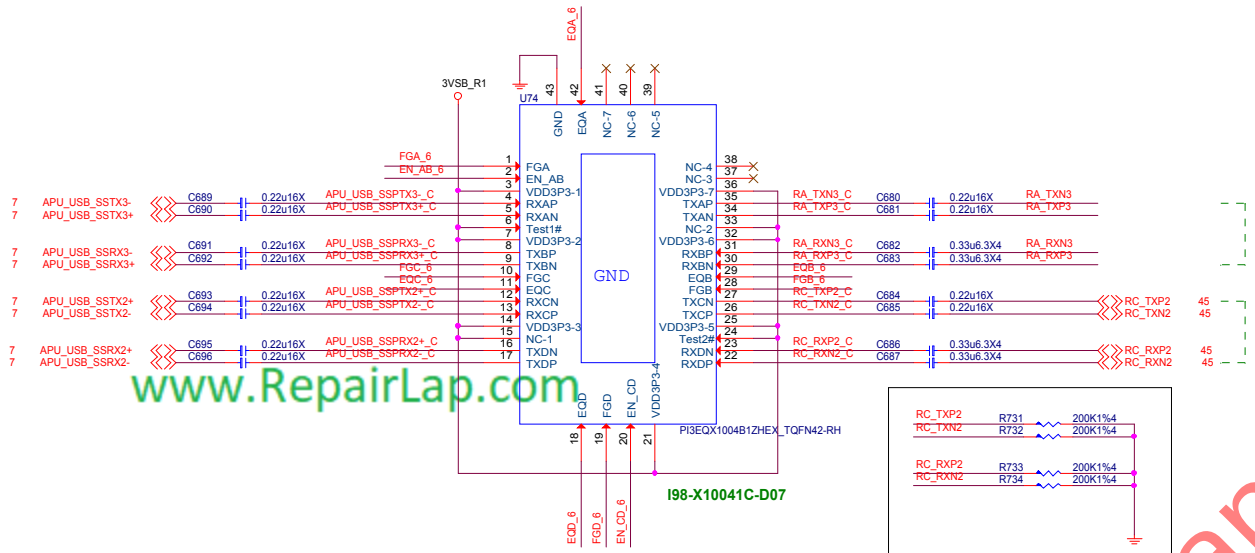


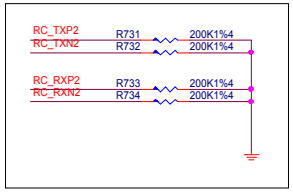
1.8A

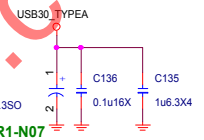


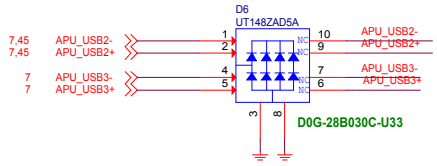
MICRO-STAR INT'L CO.,LTD		
MS-7C91		
Size: Custom	Document Description: Rear USB3.1.	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 43 of 78	

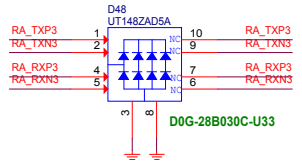
TYPE-A PI3EQX1004 Redriver





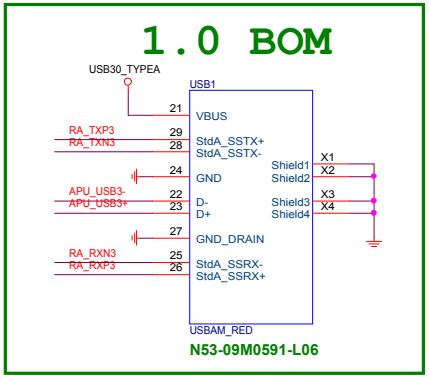


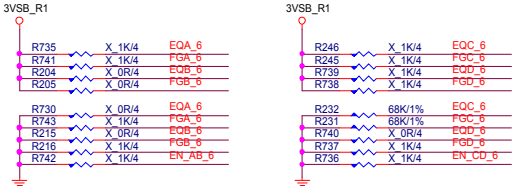


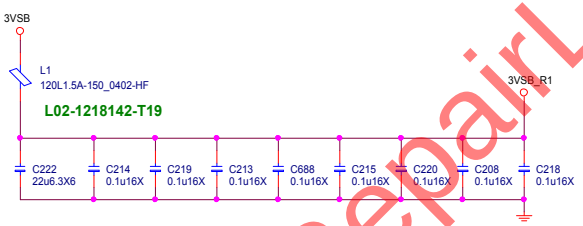


GEN2 0.9A

2020.04.16







EQ	dB	
0	10.9	0 to GND
R	6.7	68K to GND
F	8.9	NC
1	13.1	0 to VDD

		EQ	FG
USB3_TX4	A	R	F
USB3_RX4	B	R	L
USB3_TX3	C	R	F
USB3_RX3	D	R	L

FG	dB	
0	-3	0 to GND
R	-1.5	68K to GND
F	0	NC
1	2	0 to VDD

MICRO-STAR INT'L CO.,LTD

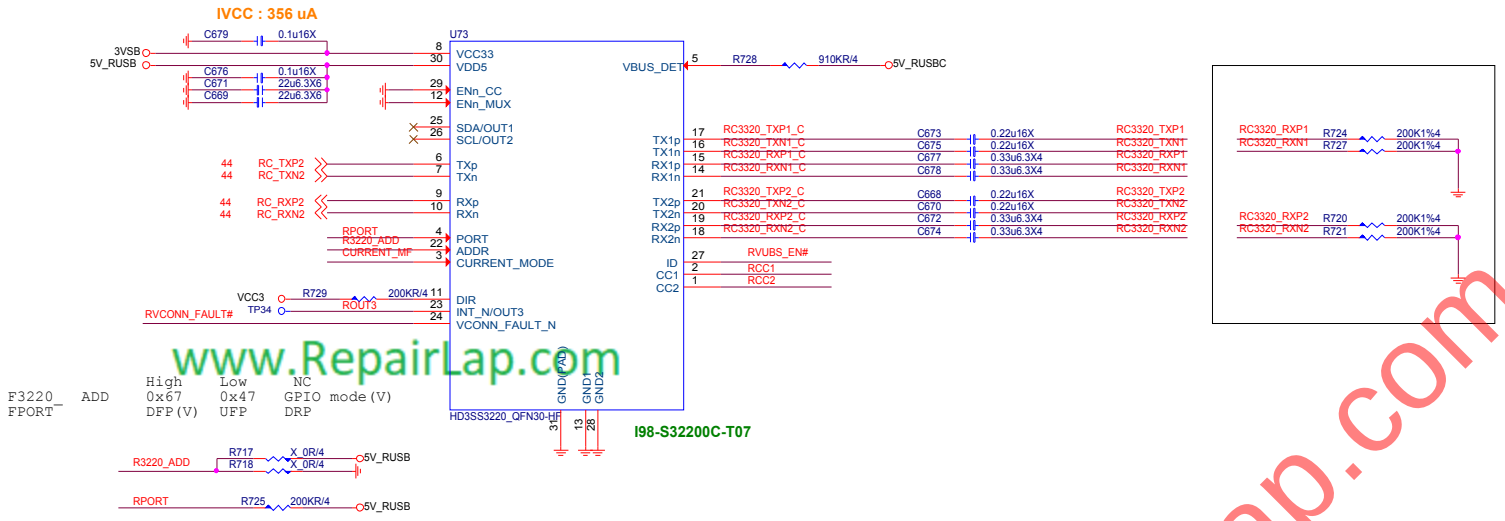
MS-7C91

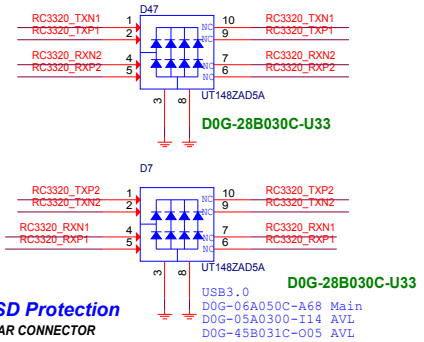
Size	Document Description	Rev
Custom	Rear USB3.1 Type A / Redrive	10

Date: Tuesday, April 21, 2020 Sheet 44 of 78

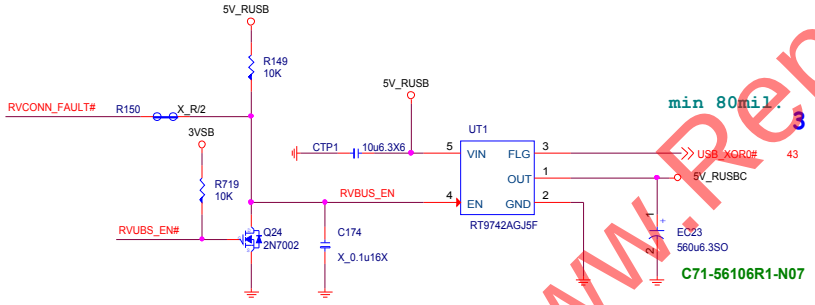
USB 3.1-Type-C

USB Type-C MUX with Configuration Channel (CC)

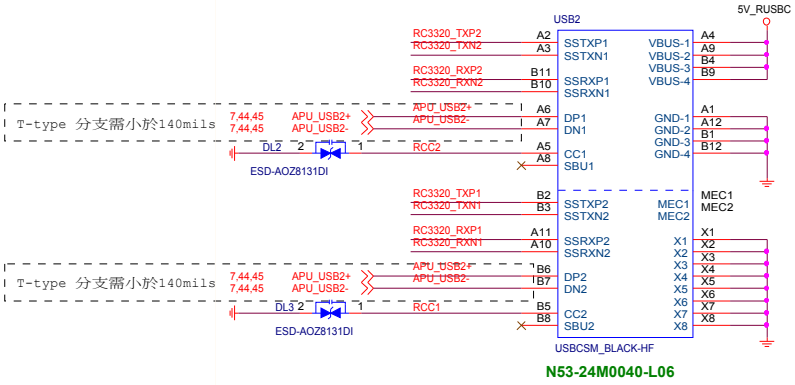




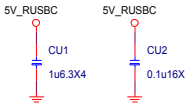
VBUS EN



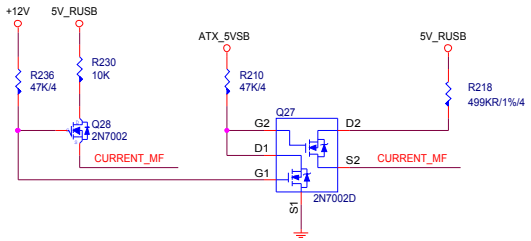
GEN2 3A



close to Type C Connector

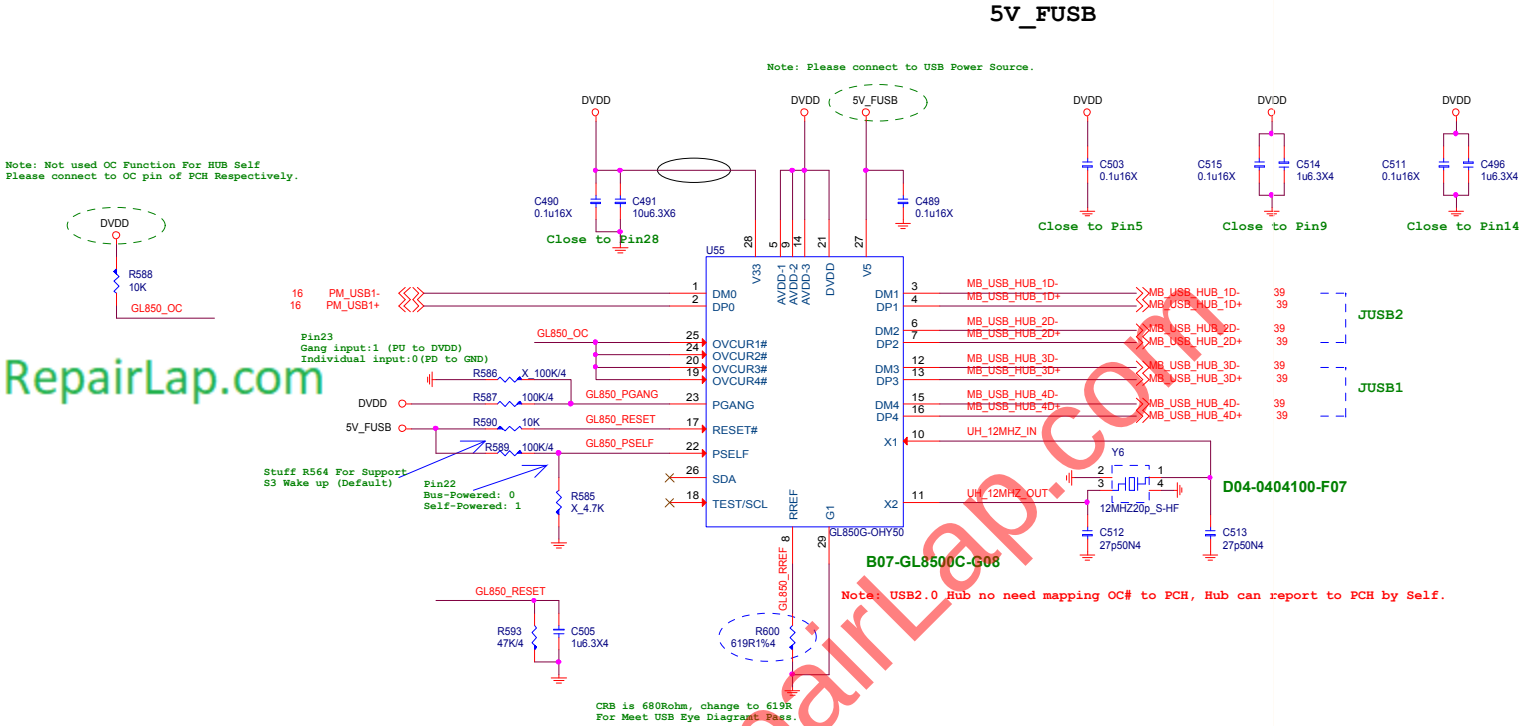


Current Mode



MICRO-STAR INT'L CO.,LTD		
MS-7C91		
Size: Custom	Document Description: Rear USB3.1 Type C / mux	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 45 of 78	

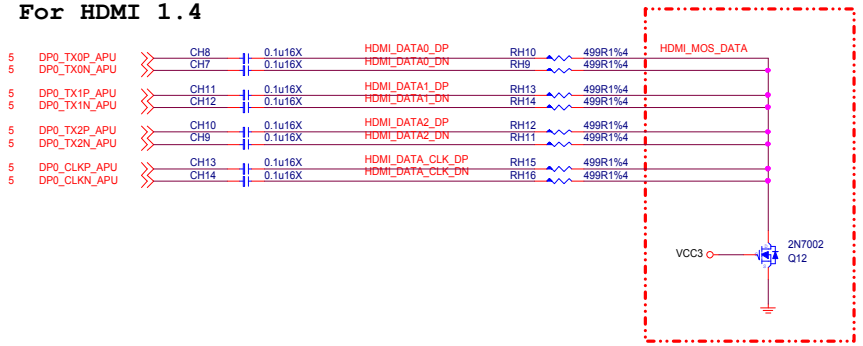
GL850G USB2.0 HUB



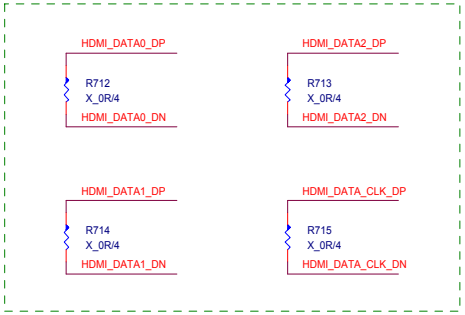
MICRO-STAR INT'L CO.,LTD		
MS-7C91		
Size: Custom	Document Description: GL850G	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 46 of 78	

HDMI CONNECTOR

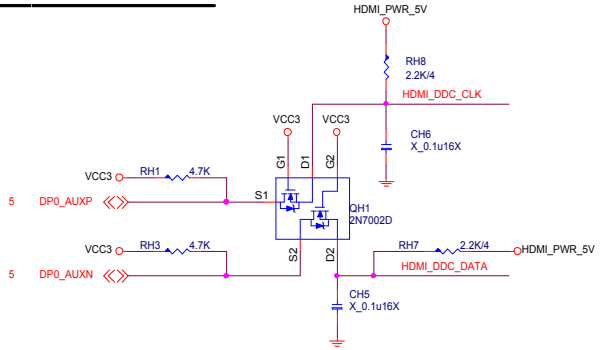
For HDMI 1.4



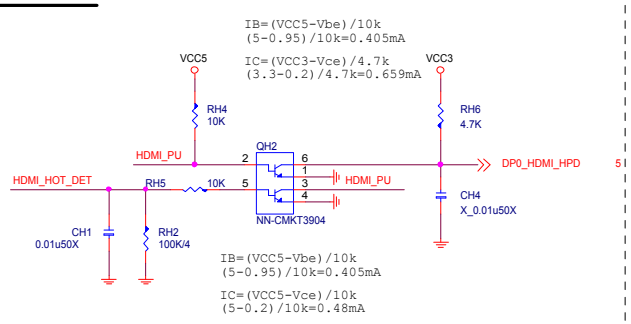
HDMI_MOS_DATA trace length <500mil
other platform please check design guide



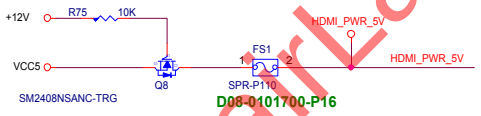
AUX Level Shifter



HPD Circuit



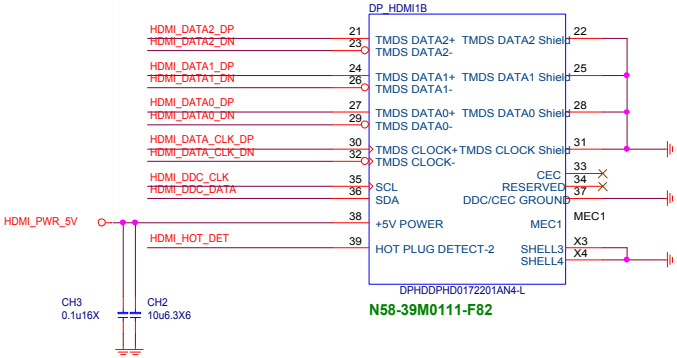
Connector Power



D08-0101700-P16

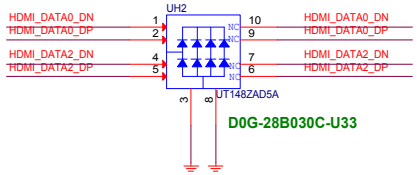
如果用DIODE SA測試電壓會不過

Connector

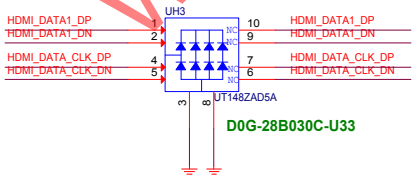


N58-39M0111-F82

For EMI

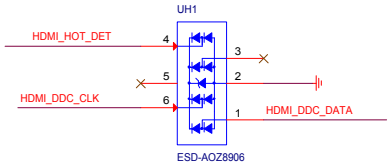


D0G-28B030C-U33



D0G-28B030C-U33

注意:耐壓5v零件

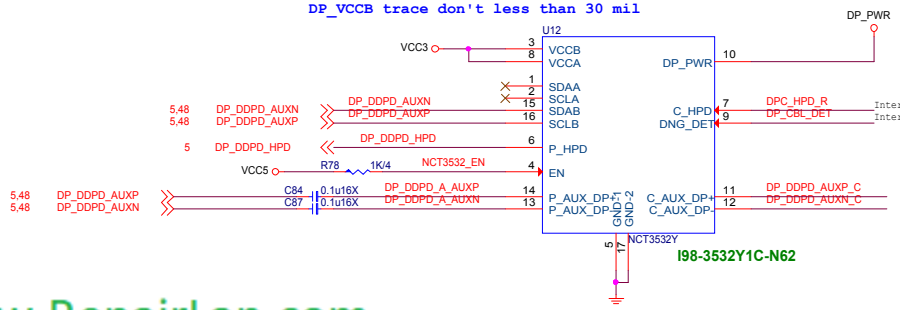


ESD-AOZ8906

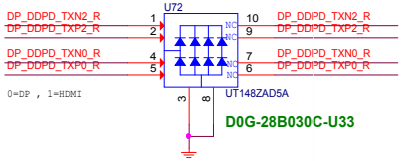
MICRO-STAR INT'L CO.,LTD		
MS-7C91		
Size: Custom	Document Description: HDMI	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 47 of 78	

500mA

DP_VCCB trace don't less than 30 mil



I98-3532Y1C-N62



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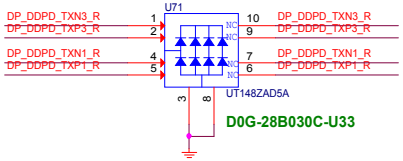

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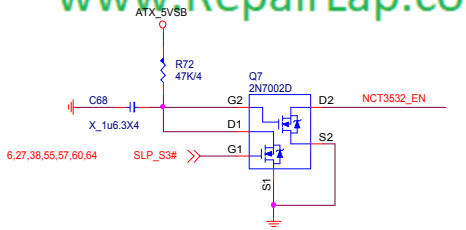
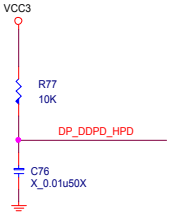
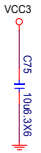
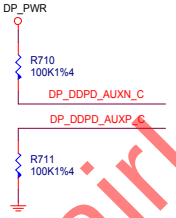
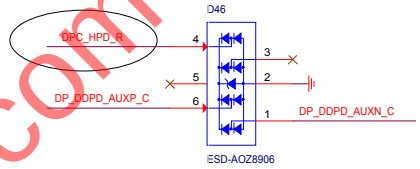
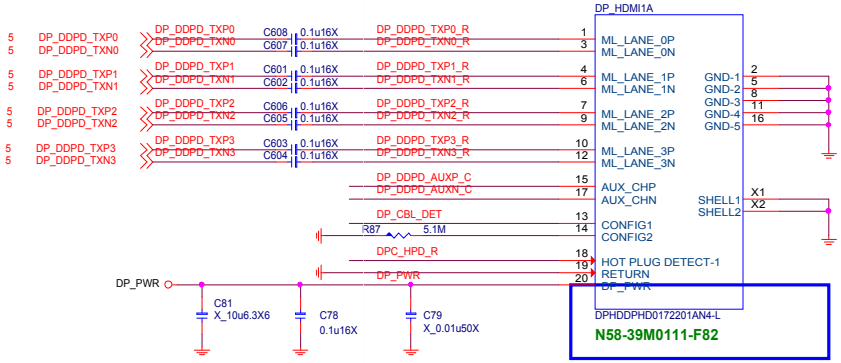












N58-39M0111-F82

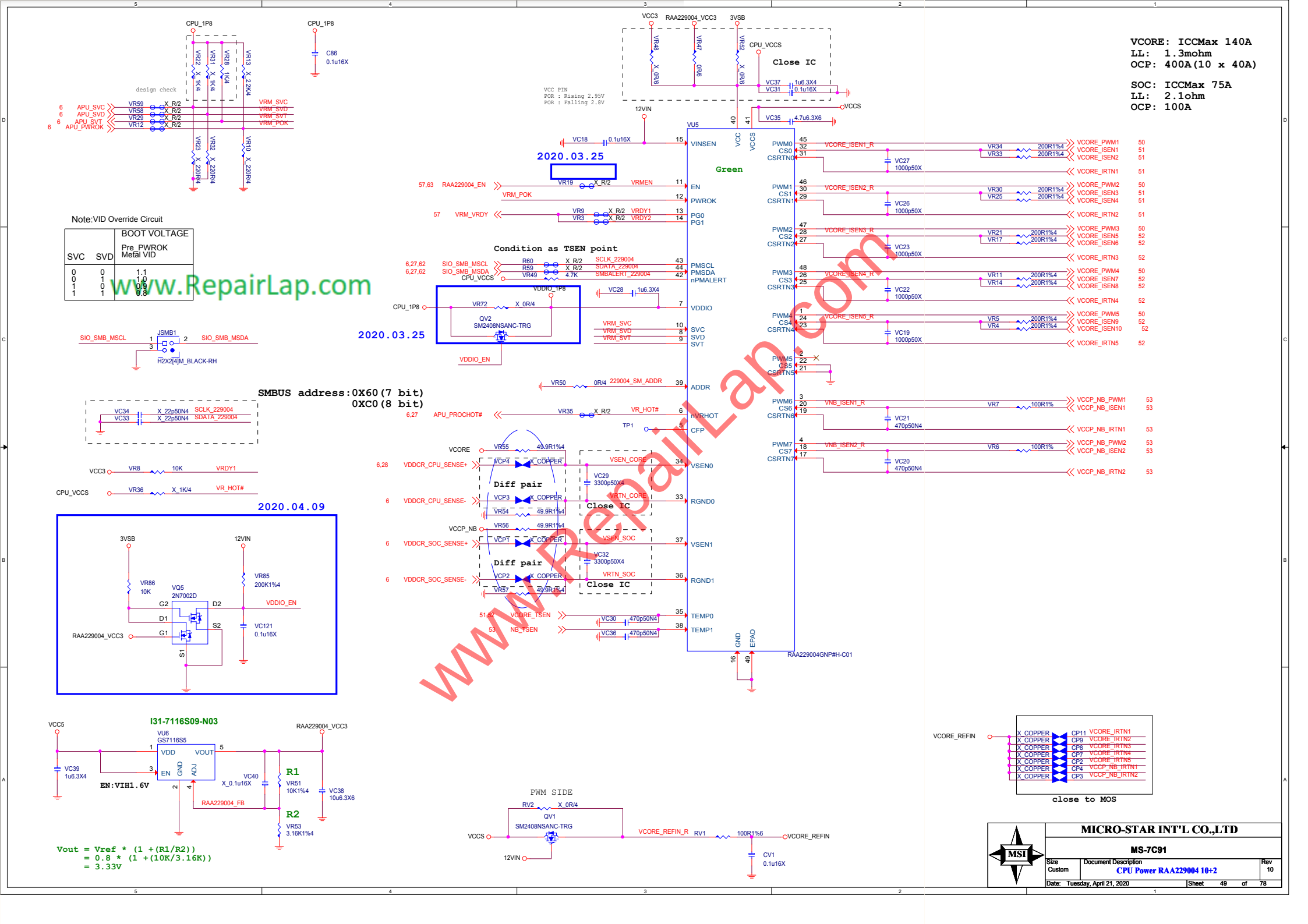
2020.04.13

MICRO-STAR INT'L CO.,LTD

MS-7C91

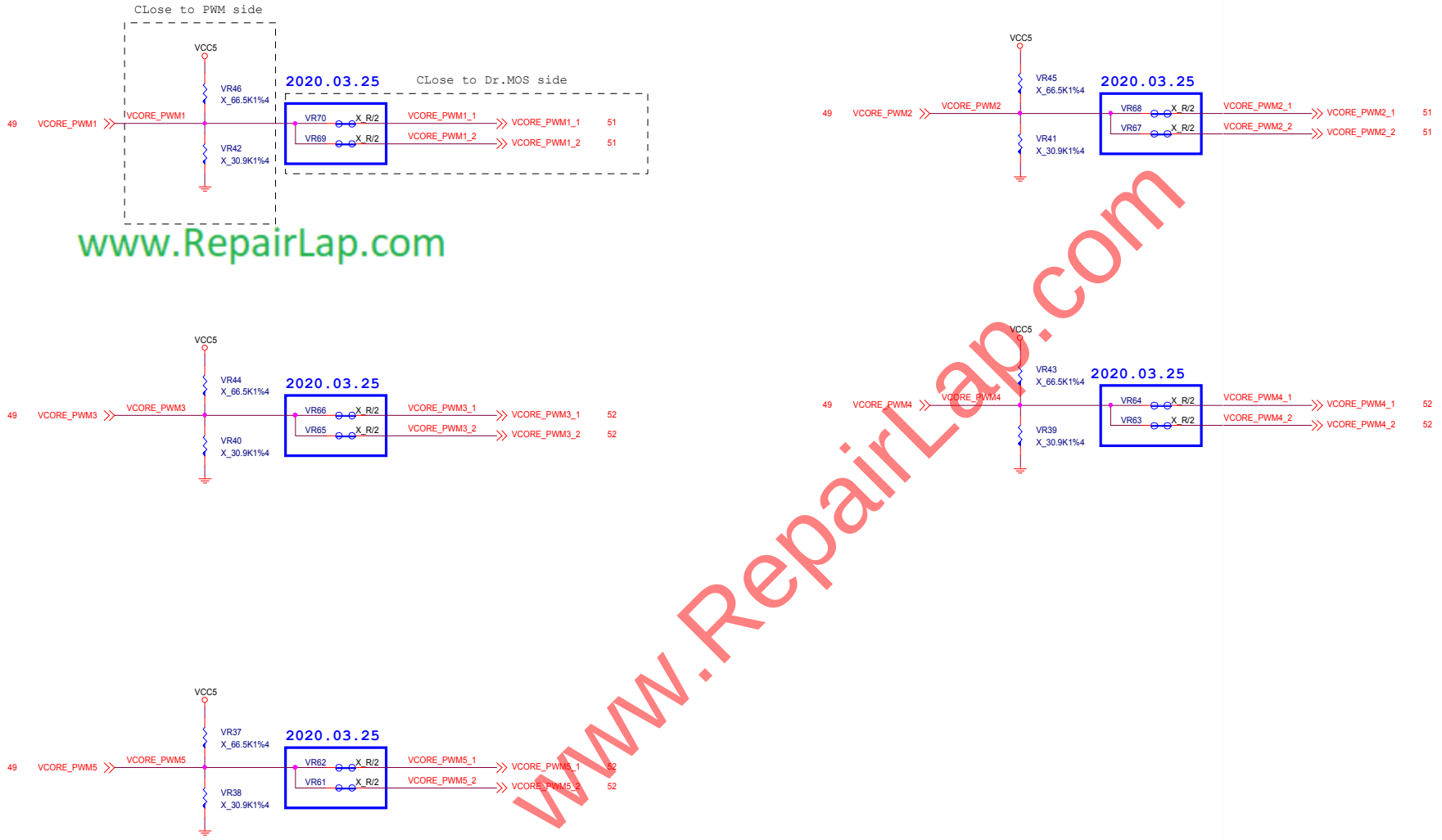
Size	Document Description	Rev
Custom	DP	10

Date: Tuesday, April 21, 2020 Sheet 48 of 78


VCORE: ICCMax 140A
LL: 1.3mohm
OCP: 400A(10 x 40A)
SOC: ICCMax 75A
LL: 2.1ohm
OCP: 100A
Note:VID Override Circuit
SVC SVD BOOT VOLTAGE Pre_PWROK Metal VID
0 0 1.1
0 1 1.0
1 0 0.9
1 1 0.8
SMBUS address:0X60(7 bit)
0XC0(8 bit)
2020.03.25
2020.04.09
Close IC
Diff pair
Condition as TSEN point
Green
I31-7116S09-N03
Vout = Vref * (1 +(R1/R2))
= 0.8 * (1 +(10K/3.16K))
= 3.33V
close to MOS
RAA229004GNP#H-C01
MICRO-STAR INT'L CO.,LTD
MS-7C91
CPU Power RAA229004 10+2
Tuesday, April 21, 2020
www.RepairLap.com

CPU_CORE Driver IC

VCORE Double 10-PHASE

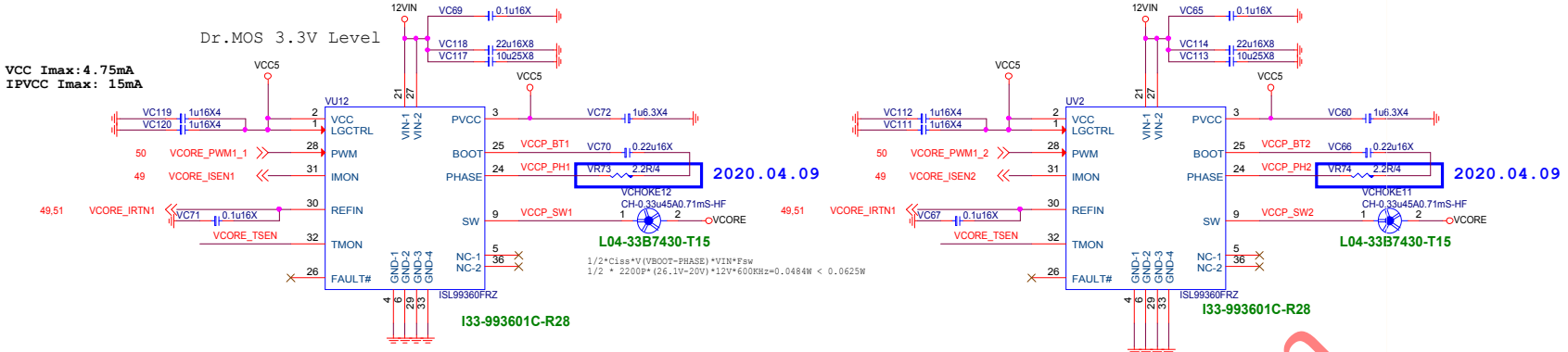


MICRO-STAR INT'L CO.,LTD	
MS-7C91	
Size: Custom	Document Description: CPU Power Phase Double IC SPS
Rev: 10	
Date: Tuesday, April 21, 2020	Sheet 50 of 78

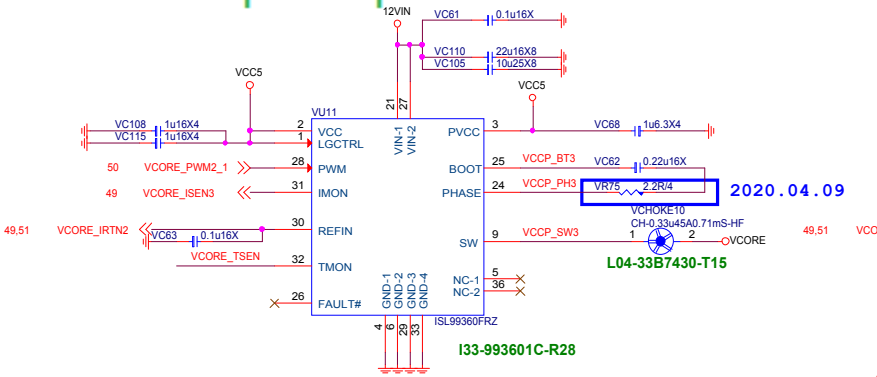
Vcore EDC Max 140A

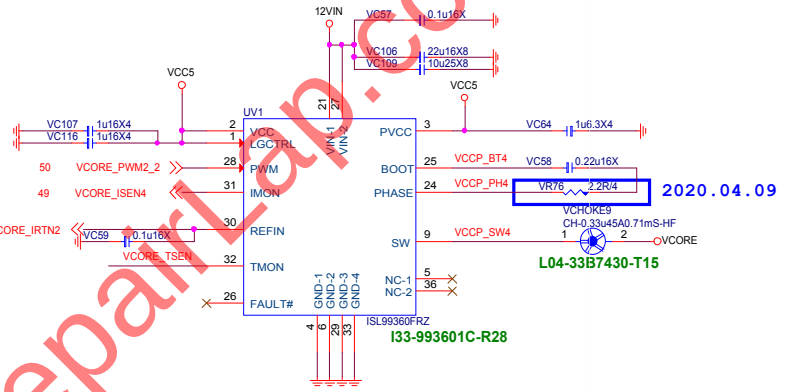
Dr.MOS 3.3V Level

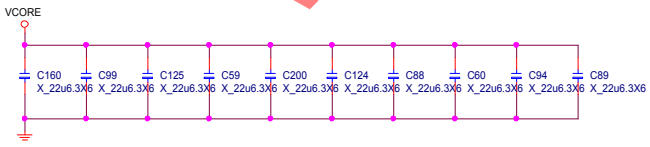
VCC Imax:4.75mA
IPVCC Imax: 15mA

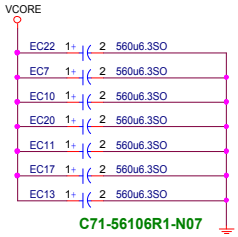


49,52 VCORE_TSEN





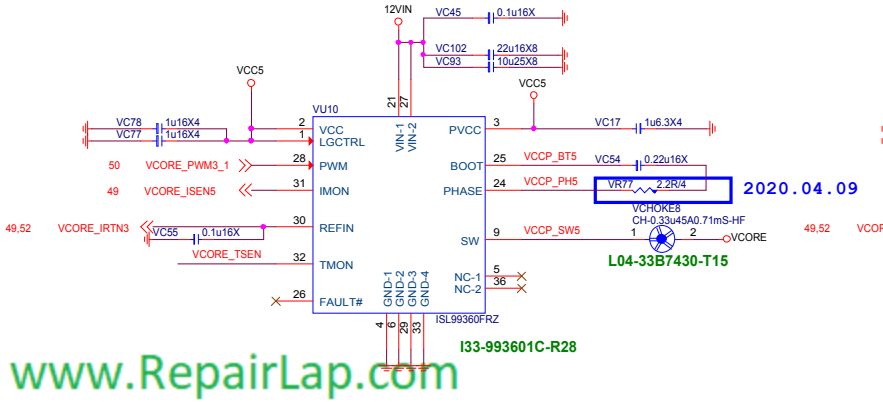




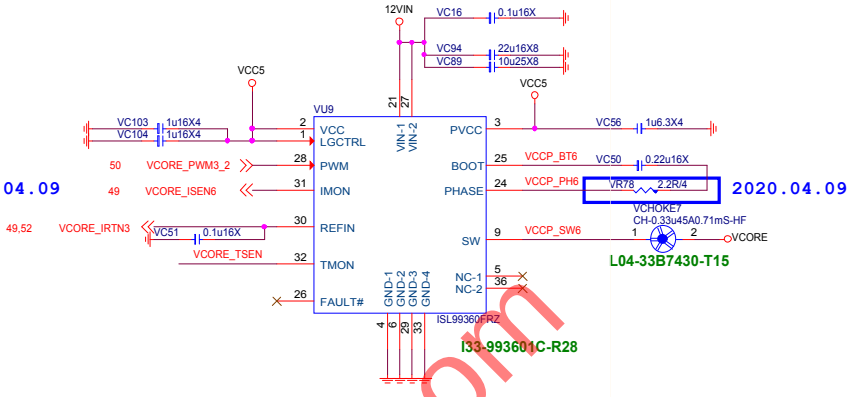
MICRO-STAR INT'L CO.,LTD		
MS-7C91		
Size: Custom	Document Description: CPU Power Vocre Phase 1- 4	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 51 of 78	

Dr.MOS 5V Level

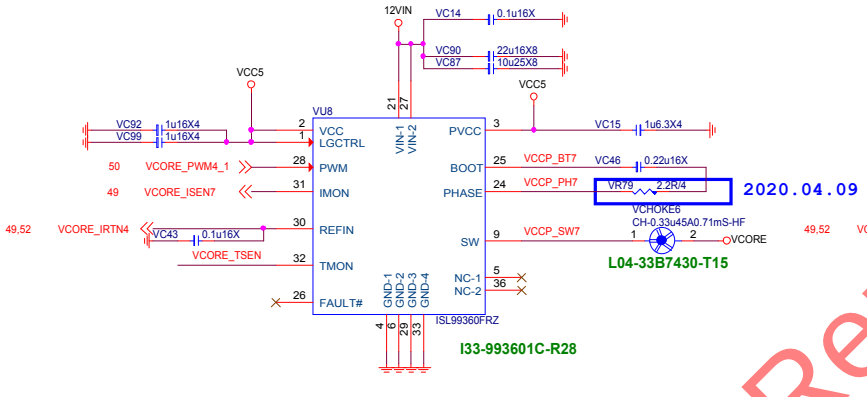
49,51 VCORE_TSEN <<< VCORE_TSEN



2020.04.09



2020.04.09



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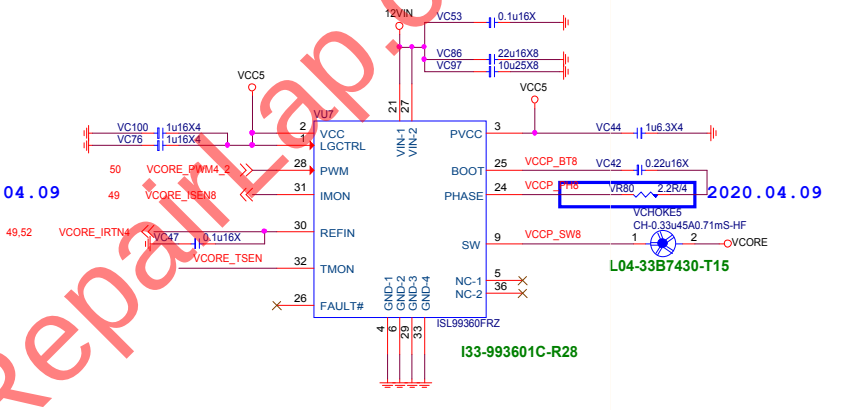
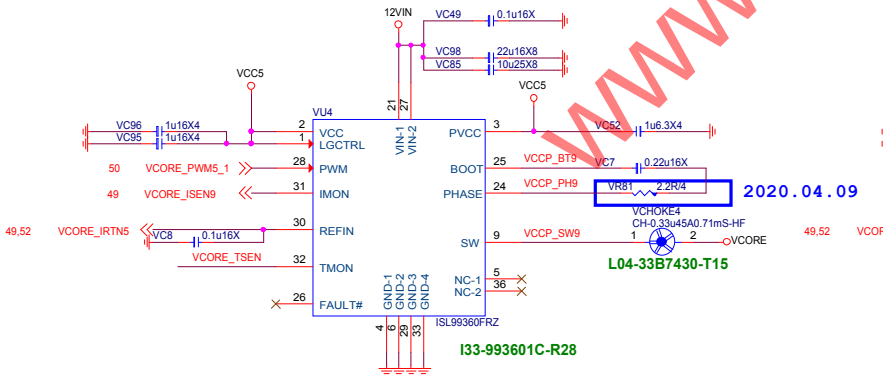
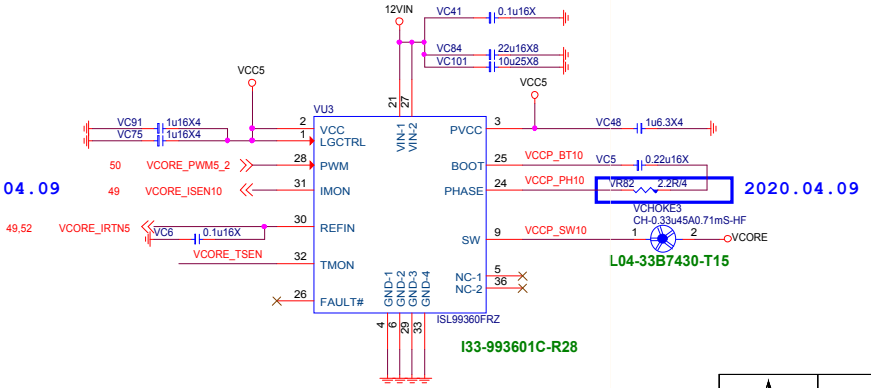


2020.04.09



2020.04.09



2020.04.09

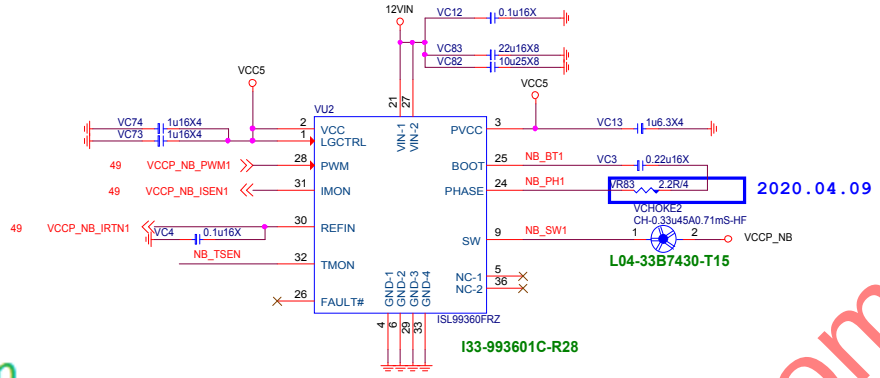
MICRO-STAR INT'L CO.,LTD

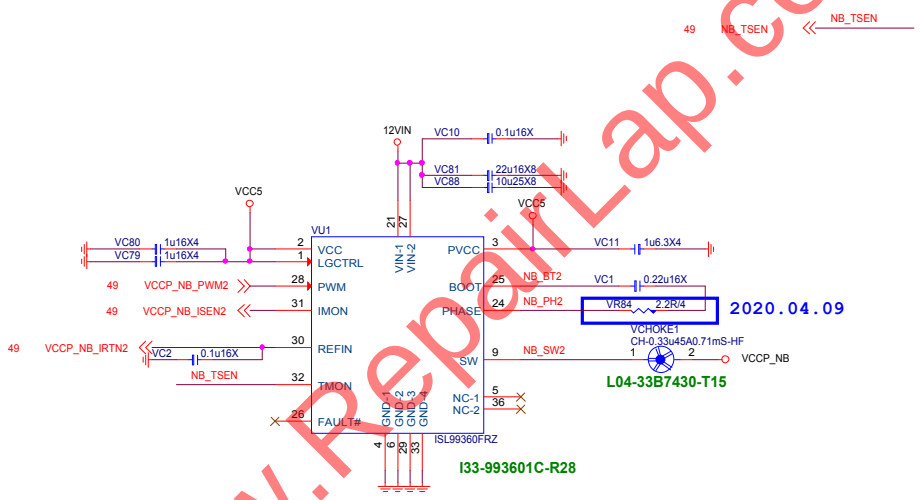
MS-7C91

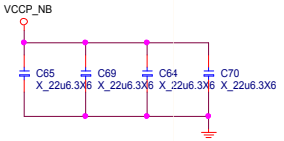
Size	Document Description	Rev
Custom	CPU Power Vocre Phase 6 - 10	10

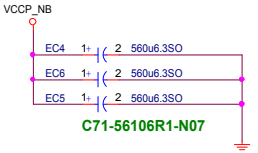
Date: Tuesday, April 21, 2020 Sheet 52 of 78

Dr.MOS 3.3V Level









MICRO-STAR INT'L CO.,LTD		
MS-7C91		
Size: Custom	Document Description: CPU Power NB Phase 1-2	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 53 of 78	

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

Title: CPU Power NB Switch / NCT3933 OV		
Size: Custom	Document Number: MS-7C51	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 54 of 78	

CPU 1.8V S5

CPU 1.8V_S5@0.5A
CPU_VDDP_S5@1A
AUDIO1.8V@0.25A

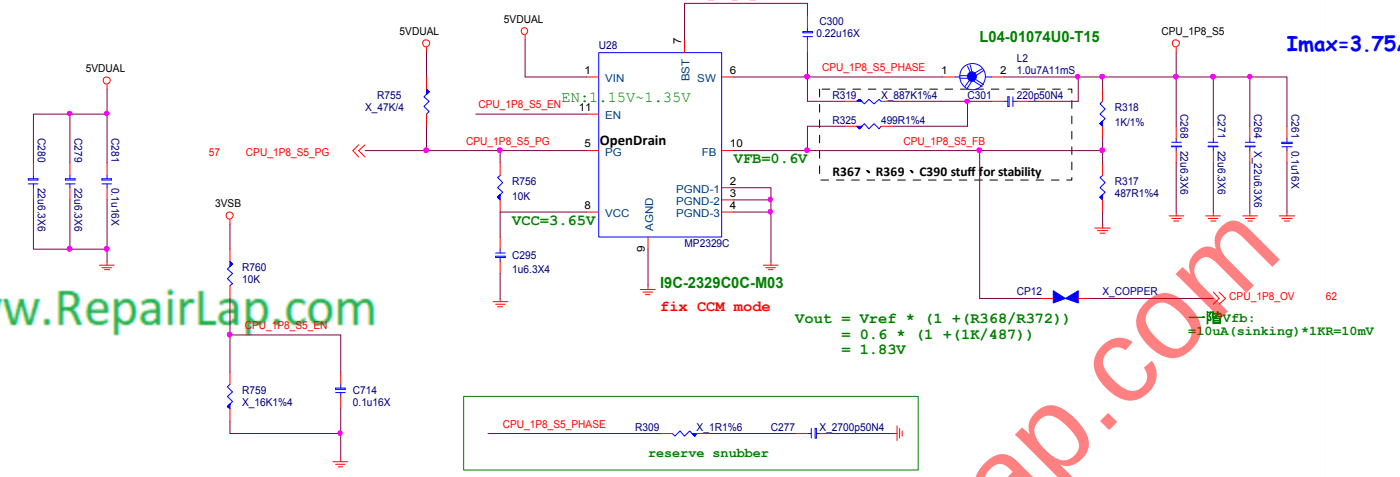
Continuous Conduction Mode (CCM)

Input Current = (6.5A*1.8V)/5V/0.8 = 3A

CPU_1P8_BST、CPU_1P8_BST_R >50 mils.

OCP = 6.5A

Imax=3.75A(S5+S0)



CPU 1.8V S0

CPU 1.8V_S0@2A

Adijustable Rise Time
SR = 0.42*CT+66
SR is the slew rate in (μs/V)
CT is constant value on CT pin (in pF)
The units for the constant 66 is in (μs/V)

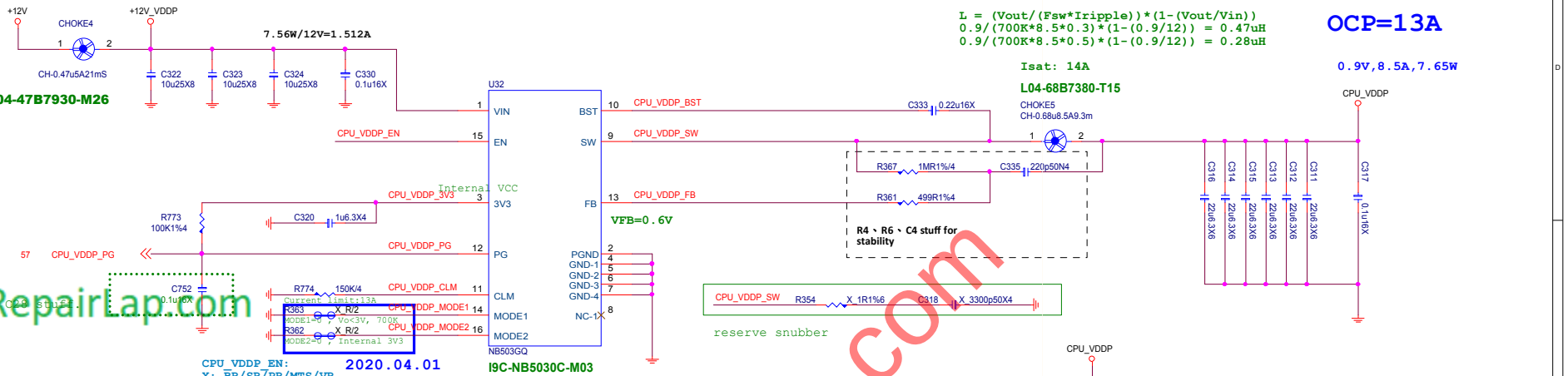
DDR_PWRGD
CPU_VDDP
CPU_1P8
VDD33

MICRO-STAR INT'L CO.,LTD		
MS-7C91		
Size: Custom	Document Description: CPU Power 1.8_S0 / S5	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 55 of 78	

CPU_VDDP_S0

0.9V@S0:8.5A

```
Input Current = (13A*0.9V)/12V/0.8 = 1.22A
Choke Isat = 8A
Irms=Iout*SQRT((Vo/Vi)*(1-(Vo/Vi)))
=13*SQRT((0.9/12)*(1-(0.9/12))) = 3.42A
Choke Irms =5 A
```




```
L = (Vout/(Fsw*Iripple))*(1-(Vout/Vin))
0.9/(700K*8.5*0.3)*(1-(0.9/12)) = 0.47uH
0.9/(700K*8.5*0.5)*(1-(0.9/12)) = 0.28uH
```

OCP=13A

Isat: 14A

L04-68B7380-T15

0.9V,8.5A,7.65W

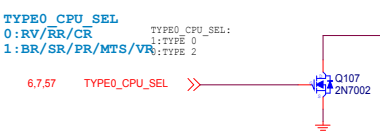
20180822
fix PG glitch when VCCA ramp up, cap stuff.

CPU_VDDP_EN:
X: BR/SR/PR/MTS/VR
O: RV/RR/CR

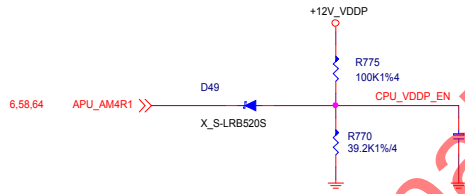
2020.04.01

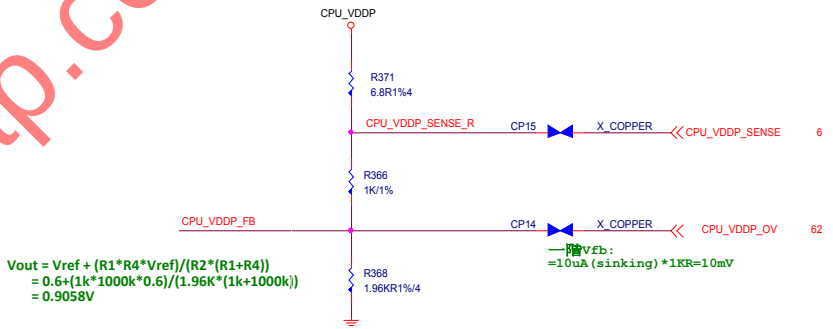
I9C-NB5030C-M03

TYPE0_CPU_SEL
0:RV/RR/CR
1:BR/SR/PR/MTS/VR



CPU	TYPE	TYPE1_CPU_SEL	TYPE0_CPU_SEL
BR	0	0	SPEC no Support
NA	X	0	0
SR	2	CPU VDDP NOT SUPPORT TYPE2	
RV/ZP	3	1	0
MTS	4	CPU VDDP NOT SUPPORT TYPE4	
RR	5	1	0
VM	6	CPU VDDP NOT SUPPORT TYPE6	
CR	7	1	0



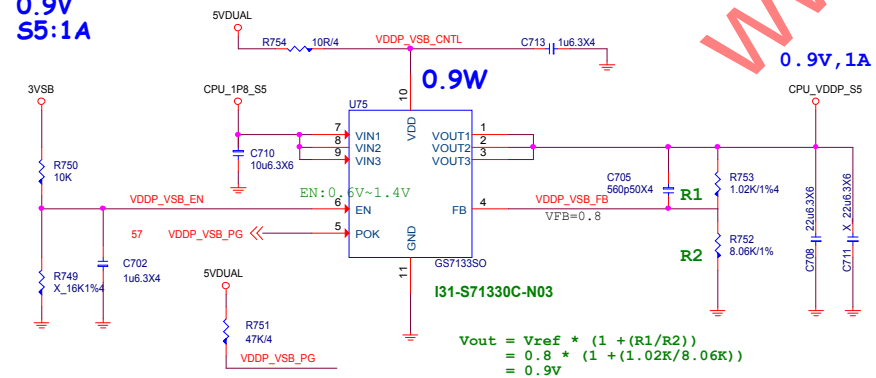



```
Vout = Vref + (R1*R4*Vref)/(R2*(R1+R4))
     = 0.6+(1k*1000k*0.6)/(1.96K*(1k+1000k))
     = 0.9058V
```

CPU_VDDP_S5

0.9V
S5:1A

0.9V,1A




```
Vout = Vref * (1 +(R1/R2))
     = 0.8 * (1 +(1.02K/8.06K))
     = 0.9V
```


MICRO-STAR INT'L CO.,LTD

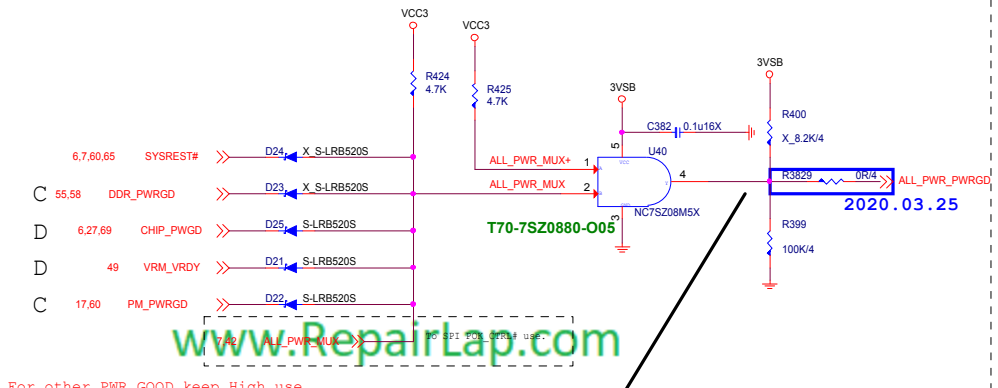
MS-7C91

Size	Document Description	Rev
Custom	CPU Power VDDP - NB503	10

Date: Tuesday, April 21, 2020 Sheet 56 of 78

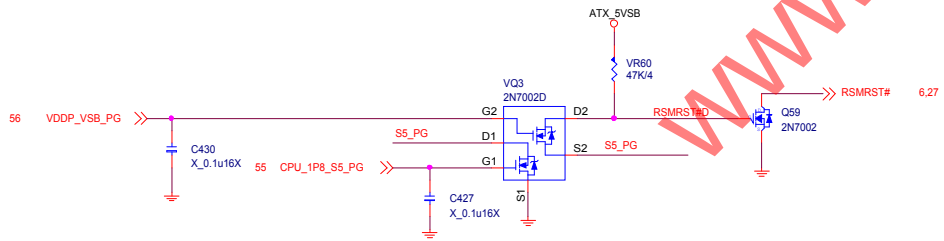
ALL POWER GOOD MUX

S0 PG



When you use external buffer
then you cannot let APU PWR_GOOD pin float
in any sleep state.
If you're buffer use 3.3V_S0 and you need Pull-down 100K
If you're buffer use 3.3V_S5 and you don't need PD.

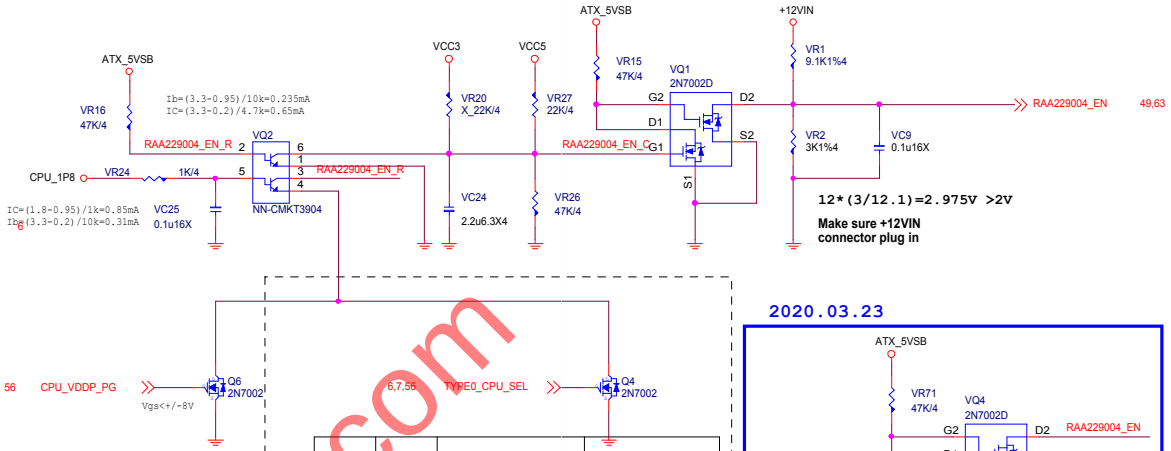
S5 PG

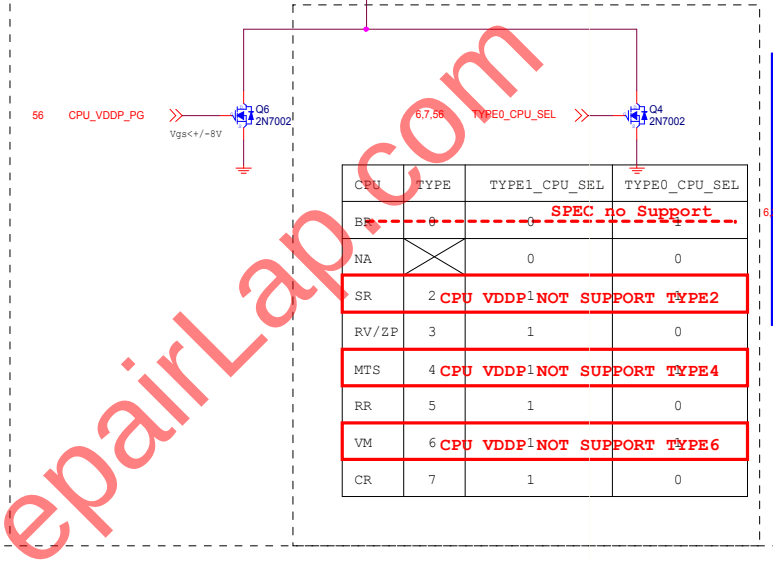


VRM_Enable circuit

2020.03.23

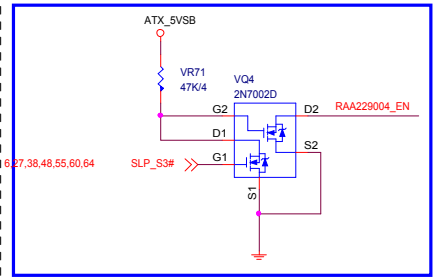
D2 Removed





CPU	TYPE	TYPE1_CPU_SEL	TYPE0_CPU_SEL
BR	0	SPEC no Support	1
NA	X	0	0
SR	2	CPU VDDP1 NOT SUPPORT TYPE2	
RV/ZP	3	1	0
MTS	4	CPU VDDP1 NOT SUPPORT TYPE4	
RR	5	1	0
VM	6	CPU VDDP1 NOT SUPPORT TYPE6	
CR	7	1	0

2020.03.23



MICRO-STAR INT'L CO.,LTD	
MS-7C91	
Size: Custom	Document Description: VRM PWRGD
Rev: 10	
Date: Tuesday, April 21, 2020	Sheet 57 of 78

DDR4_1.2V@28.7A

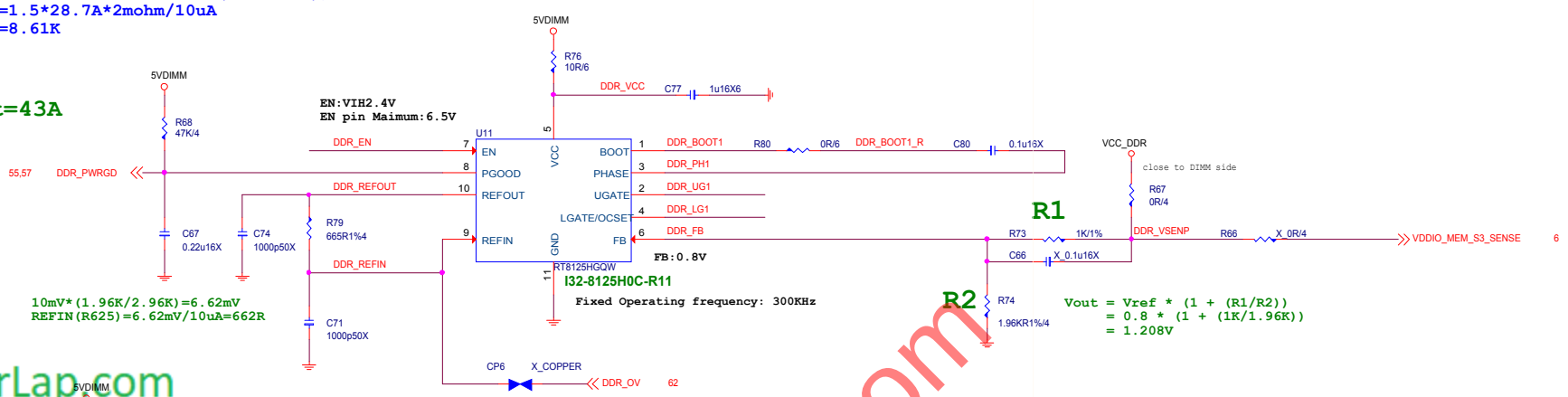
18A FOR CPU
9.5A FOR 4DIMM
1.2A FOR DDR VTT

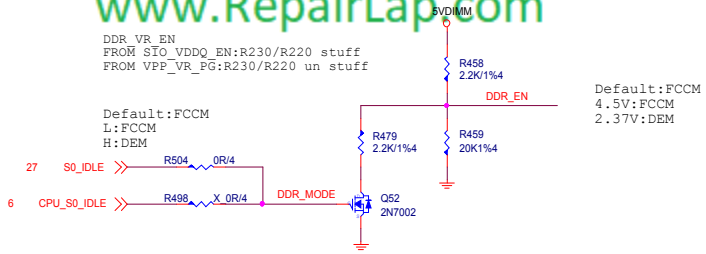
Rocset=1.5*Imax*Rdson(Low side)/Iocset
=1.5*28.7A*2mohm/10uA
=8.61K

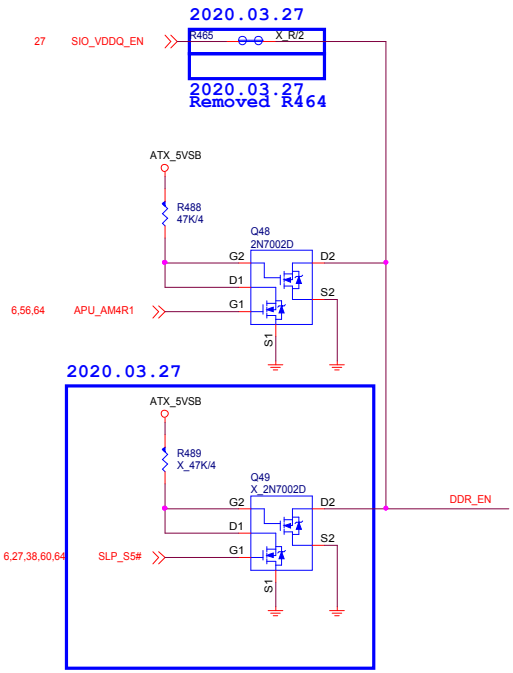
OCP = 43.05A; Choke Isat=43A

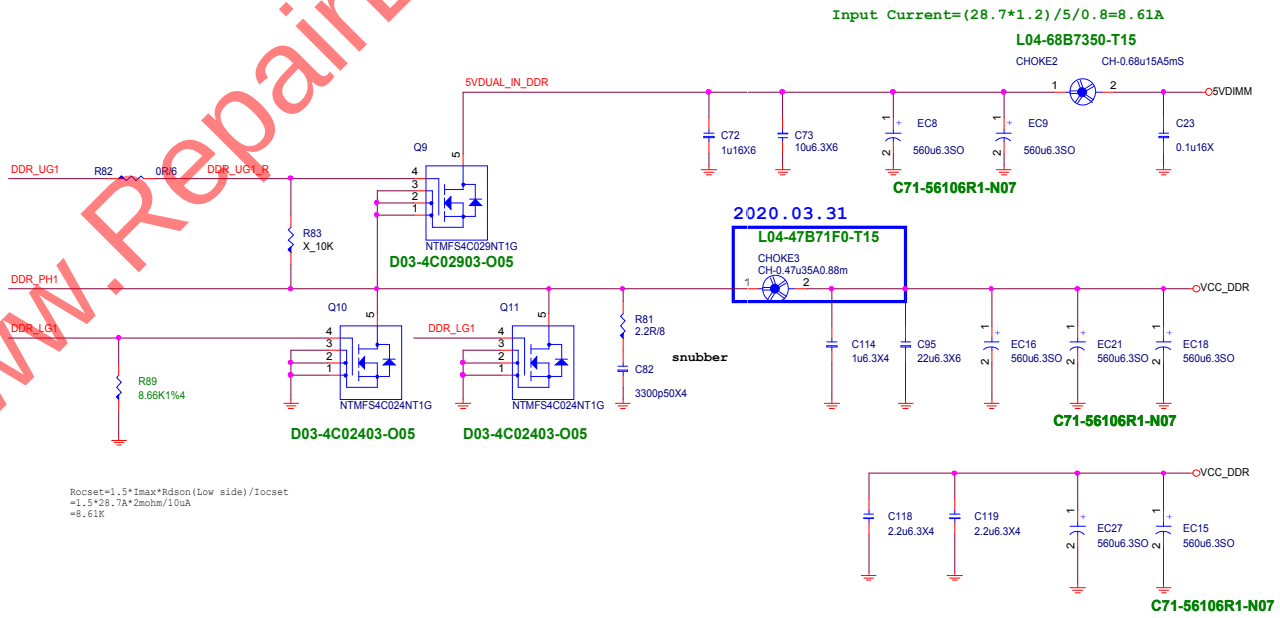
Rocset = 1.5 * Imax * Rdson(low) / Iocset
R639 = 1.5 * 28.7 * 2mohm / 10uA
R639 = 8.61K

Rdson(Low Side) 5V
D03-4C02403-O05:3.3 ~ 4mohm









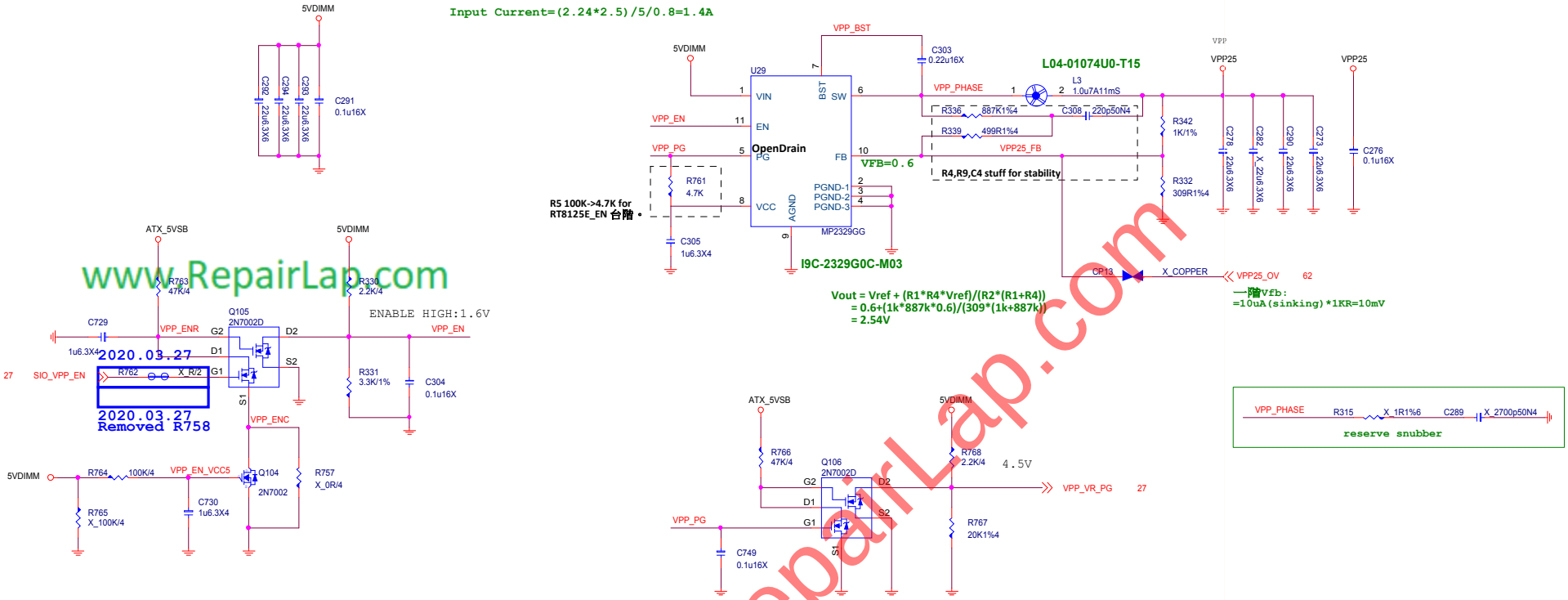
MICRO-STAR INT'L CO.,LTD	
MS-7C91	
Size: Custom	Document Description: DDR Power - 8125H
Rev: 10	
Date: Tuesday, April 21, 2020	Sheet 58 of 78

4DIMM : VPP25

2.5V@2.24A

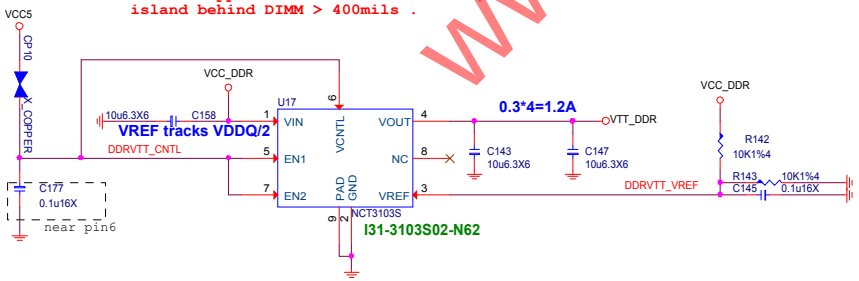
VPP_BST>50 mils.

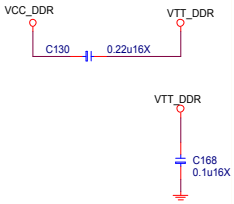
Input Current=(2.24*2.5)/5/0.8=1.4A



DDR VTT Power

To CPU Copper trace width > 250mils . Fill island behind DIMM > 400mils .





MICRO-STAR INT'L CO.,LTD		
MS-7C91		
Size: Custom	Document Description: DDR VPP25 / VTT	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 59 of 78	

FOR Promontory 1.05V_S0

1.05V
S0:5.5A

Input Current= (OCP8A*1.05V)/5V/0.8=2.1A

Width: > 80mil

L04-47B7930-M26

L04-01074U0-T15

OCP=8A
1.05V@5.5A

U38 SY8288

I9C-8288R0C-SZ1

by Silergy FAE Suggestion
please connect pin17 (Vcc)/pin16(NC) and it's good for VCC layout.

Vout = Vref * (1 + (R1/R2))
= 0.6 * (1 + (1K/1.33K))
= 1.051V

ILIMT	OCP
0	8A
floating	12A
1	16A

SLP_S3#
S0iX_EN(as S5#)
VSB_EN
PM_1P05_EN

SLP_S5#
S0iX_EN(as S5#)
VSB_EN
PM_1P05_EN

FOR PROM PM_1P05_S5

1.05V@0.05A

Promontory-2.5V

2.5V@900mA

0.72W

U39 GS7133SO

I31-7133S02-N03

AVL: I31-3730S02-N62

Vout = Vref * (1 +(R1/R2))
= 0.8 * (1 +(10K/4.7K))
= 2.502V

I31-7116S09-N03

U43 GS7116S5

0.11W

EN:VIH1.6V

VFB=0.8

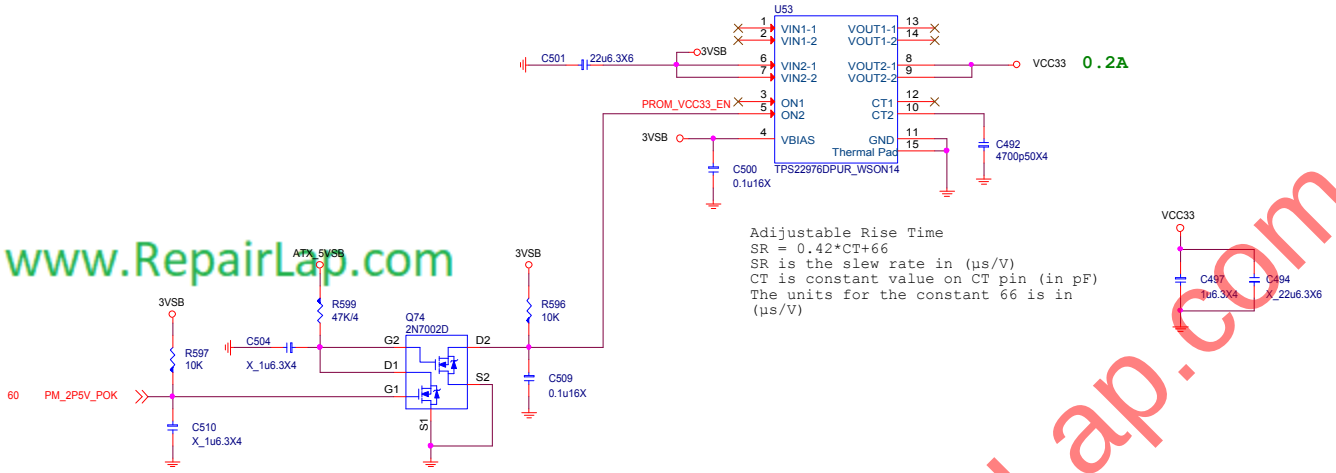
Vout = Vref * (1 +(R1/R2))
= 0.8 * (1 +(1K/3.16K))
= 1.05V

3VSB
PM_1P05_S5
PM_1P05
PM_2P5V
VCC33

MICRO-STAR INT'L CO.,LTD	
MS-7C91	
Size: Custom	Document Description: PM - SY8288/PM_1P05/PM_2P5V
Rev: 10	
Date: Tuesday, April 21, 2020	Sheet 60 of 78

PROM VCC33

VCC33@0.2A



MICRO-STAR INT'L CO.,LTD

MS-7C91

Size	Document Description	Rev
Custom	PM - XXXXXXXX	10

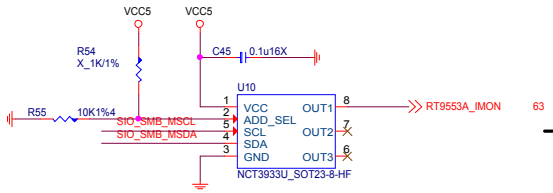
Date: Tuesday, April 21, 2020 Sheet 61 of 78

Over Voltage Control IC

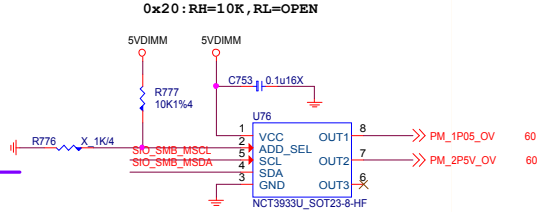
UPI VOLTAGE CONSOLE

ADDRESS	0x2A	0X28	0x26	0x24	0x22	0x20
RH (KOhm)	OPEN	3.9	3	2.2	1.3	10
RL (KOhm)	10	1.3	2.3	3	3.9	OPEN
BUS_SEL	0%	25%	40%	60%	75%	100%

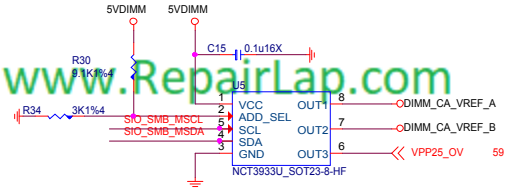
0x2A:RH=OPEN,RL=10K



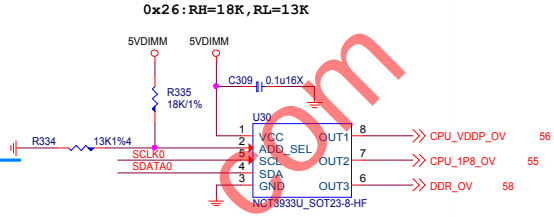
0x20:RH=10K,RL=OPEN



0x28:RH=9.1K,RL=3K



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



6,27,49 SIO_SMB_MSCL — SIO_SMB_MSCL
6,27,49 SIO_SMB_MSDA — SIO_SMB_MSDA

6,11,24 SCLK0 — SCLK0
6,11,24 SDATA0 — SDATA0

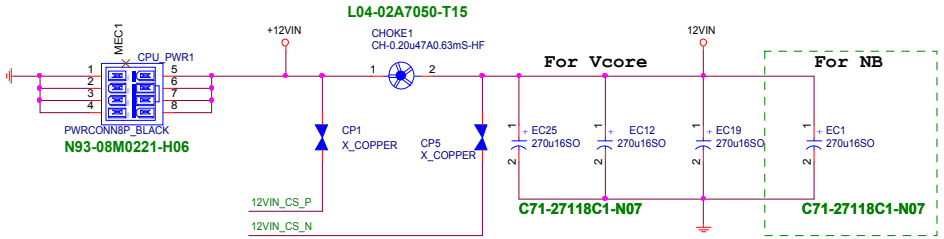
MICRO-STAR INT'L CO.,LTD

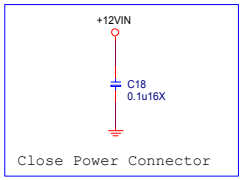
MS-7C91

Size	Document Description	Rev
Custom	OV Control - NCT3933	10

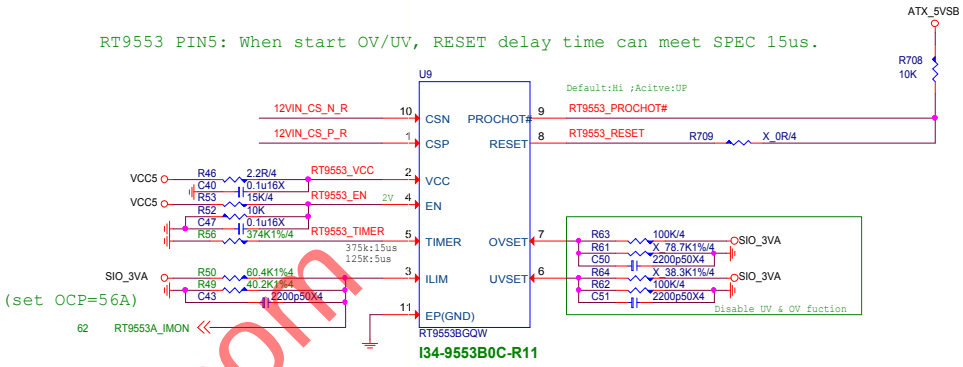
Date: Tuesday, April 21, 2020 Sheet 62 of 78

CPU POWER CONNECTOR





RT9553B CURRENT SENSE

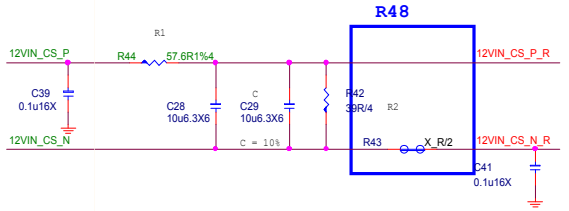


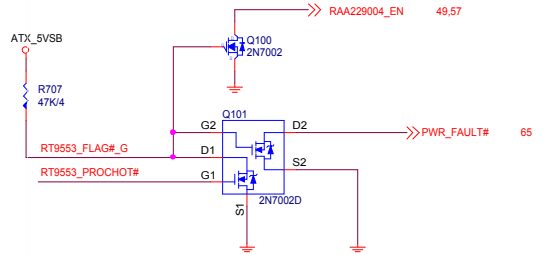
$\Delta VILIM = 10uA * [(60.4K * 40.2K)/(60.4K + 40.2K)] = 226mV$

$Isense = VILIM / 100 * Rsense$

$\Delta Isense = 226mV / 100 * 0.63m = 3.58A$

2020.03.25



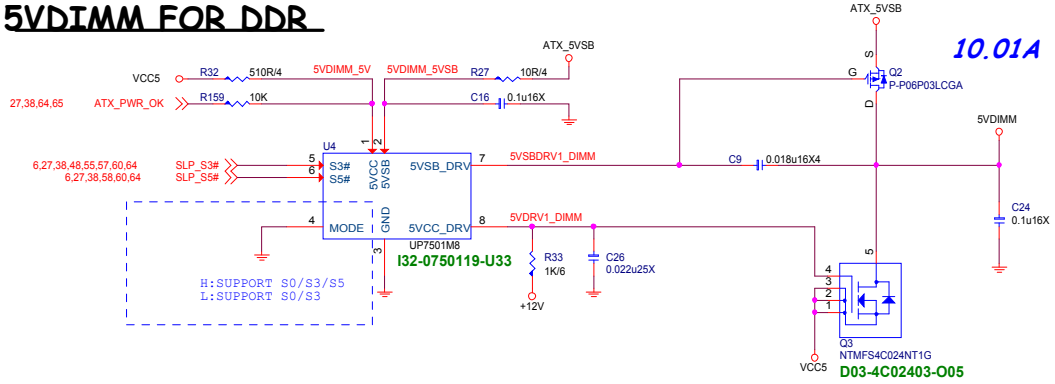


Vcore			
D=Vout/Vin			
Vin	=	12	> input voltage
Vout	=	2	> output Vcore
D	=	0.166667	
I o = Icore(max)*0.8			
I core(max)	=	200	> Vcore current
I avg.	=	160	A
I ripple={ Io*√D*√(1-D)} / Phase			
Phase	=	10	phase
I ripple	=	5.962848	A
How many pcs. Of Cap.			
I ripple(cap)	=	4700	m A
COE TEMP	=	1	
Input Cap.	=	2	pcs.

SOC			
D=Vout/Vin			
Vin	=	12	> input voltage
Vout	=	1.55	> output Vcore
D	=	0.129167	
I o = Icore(max)*0.8			
I core(max)	=	75	> Vcore current
I avg.	=	60	A
I ripple={ Io*√D*√(1-D)} / Phase			
Phase	=	2	phase
I ripple	=	10.06153	A
How many pcs. Of Cap.			
I ripple(cap)	=	4700	m A
COE TEMP	=	1	
Input Cap.	=	3	pcs.

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-7C91	
Size: Custom	Document Description: OCP 12VIN - RT9533B	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 63 of 78	

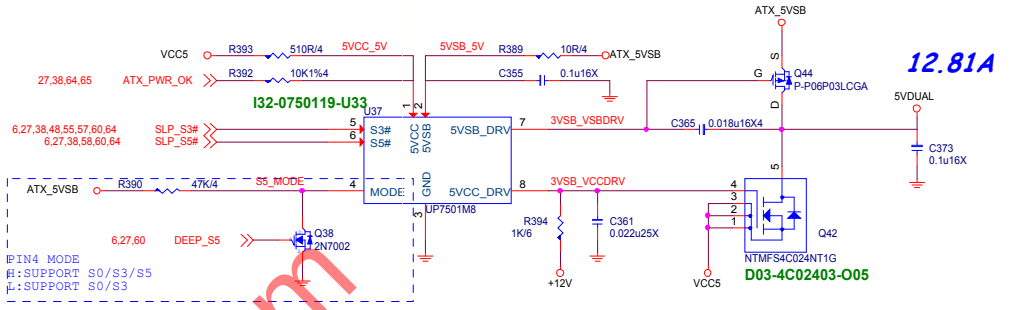
5VDIMM FOR DDR

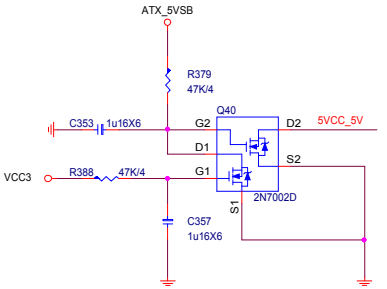


VCC_DDR=8.61A
VPP25=1.4A

5VDUAL For 3VSB/CPU1.8V/VDDP

LDOVDD=93.6mA
CPU_1P8_S5 VIN=3A
PM_1P05 VIN=2.1A
3VSB = 4.71A
LED_VCC5 = 3A



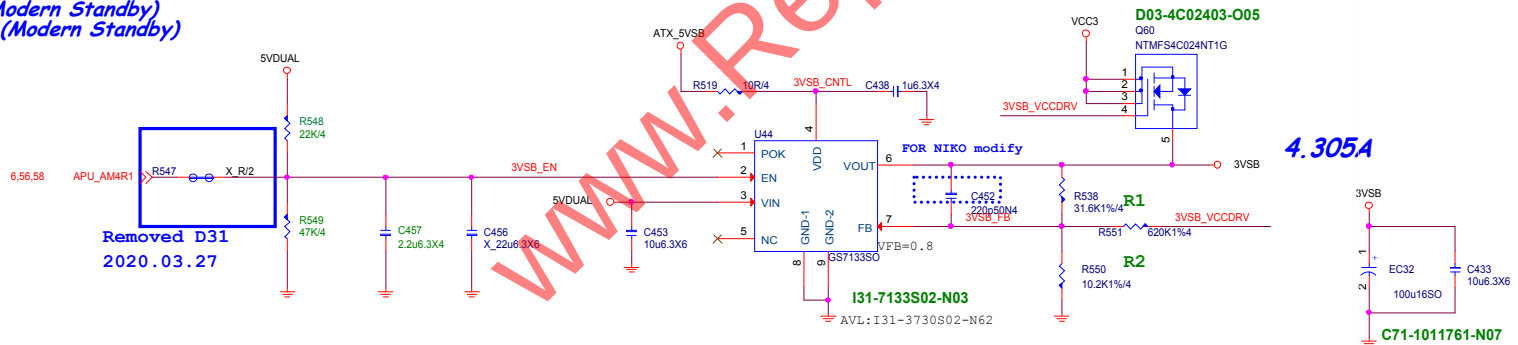


For power 700W solution (only for uP7501+uP7506 for 3VSB solution)
The power supply VCC3 delay 12ms after VCC5 assert.
The chip U7501 5VDRV1 work when the VCC5 ready
(When VCC5 up to 4.2V and the 5VDRV1 delay 6ms assert), but
VCC3 not ready and let the 3VSB sequence fail.

3VSB cost down

3.3V@4.305A

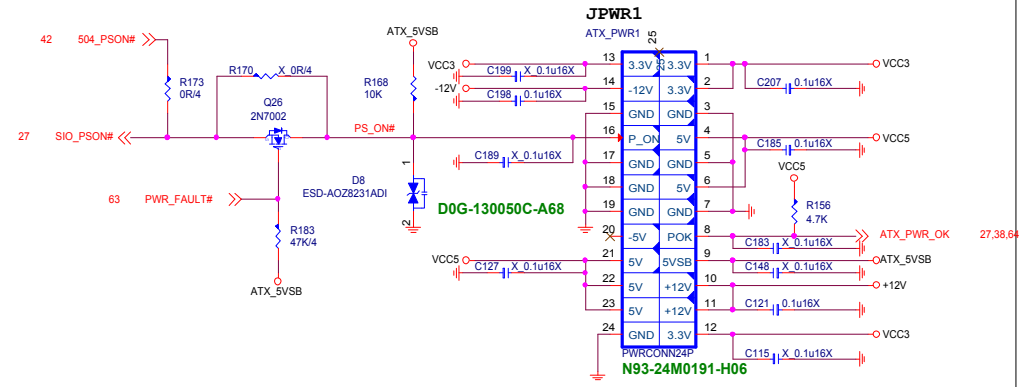
CPU:VDD_33_S5=0.25A
CHIP:VDD_33_S5=0.07A
PCIE=(375mA*5)=1.875A
M.2WIFI= 0.78A
RT8111H LAN=0.18A
PM_1P05_S5 :0.05A
PM_2P5V :0.9A(Modern Standby)
PCH VCC33 :0.2A(Modern Standby)

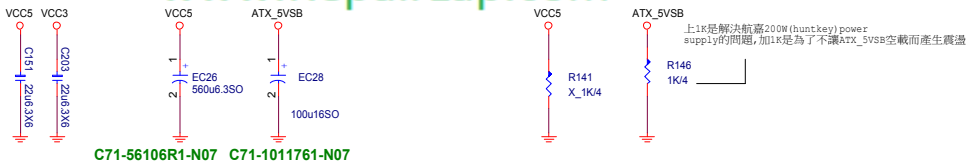


Vout = Vref * (1 +(R1/R2))
= 0.8 * (1 +(31.6K/10.2K))
= 3.328V

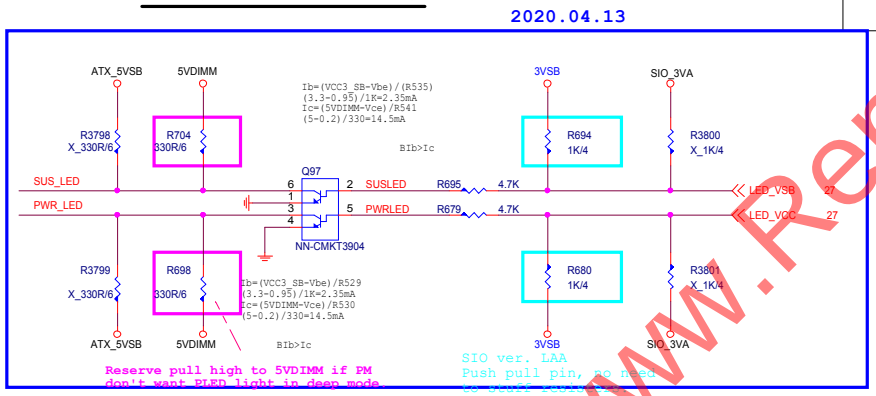
MICRO-STAR INT'L CO.,LTD		
MS-7C91		
Size: Custom	Document Description: ACPI - 5VDIMM / 3VSB	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 64 of 78	

ATX POWER CONNECTOR

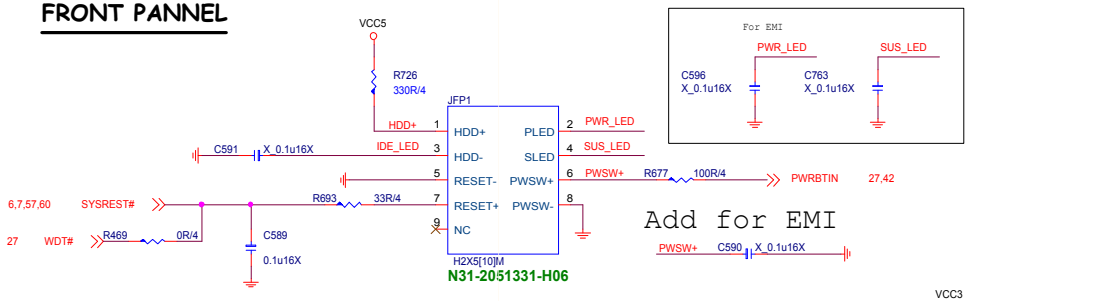


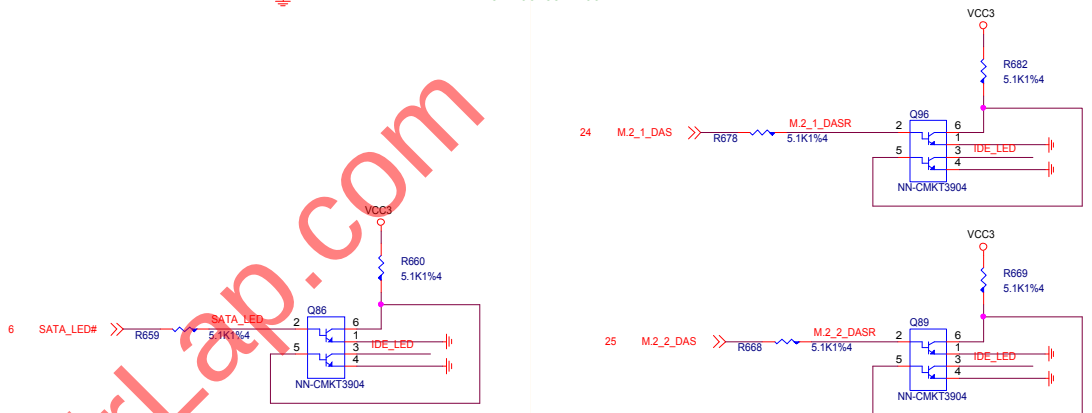


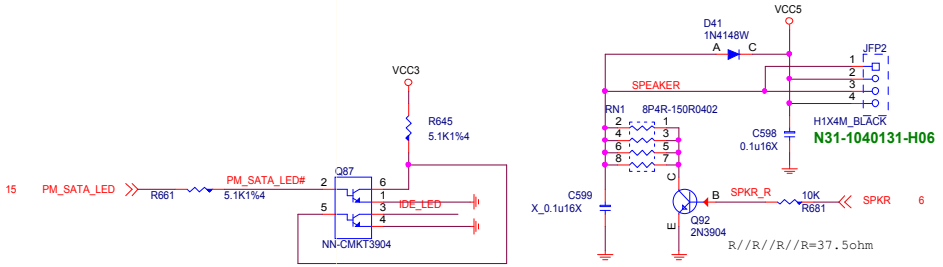
LED (for NCT6687D-R)



FRONT PANNEL







Voltage Mearsure Point

MICRO-STAR INT'L CO.,LTD	
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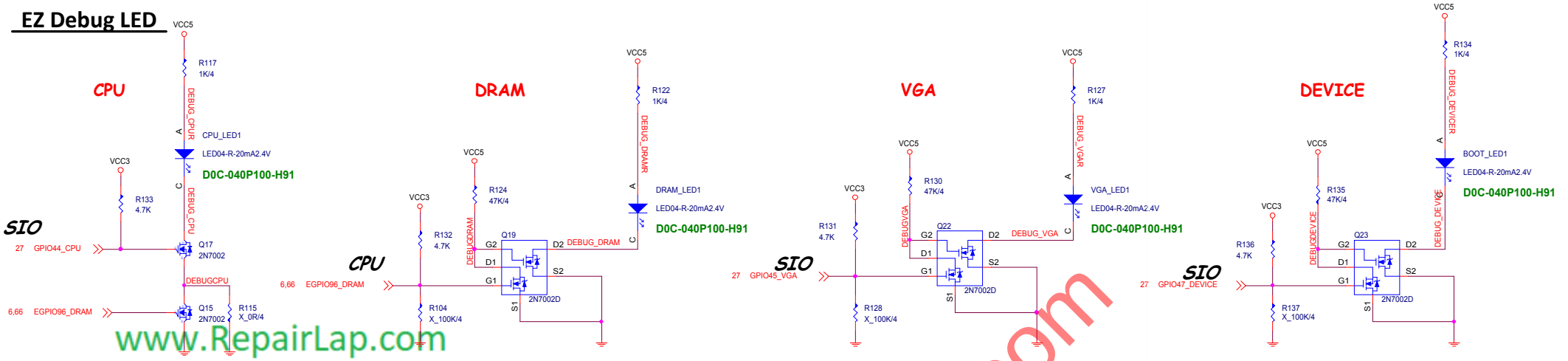
Size: Custom	Document Description: ATX power - FrontPanel / EMI
Rev: 10	
Date: Tuesday, April 21, 2020	Sheet 65 of 78

EZ Debug LED



LED GPIO	GPIO44	EGPIO96	GPIO45	GPIO47
亮	OPEN-Drain	GPO LOW	GPO LOW	GPO LOW
滅	GPO LOW	GPO HIGH	OPEN-Drain	OPEN-Drain

default Input

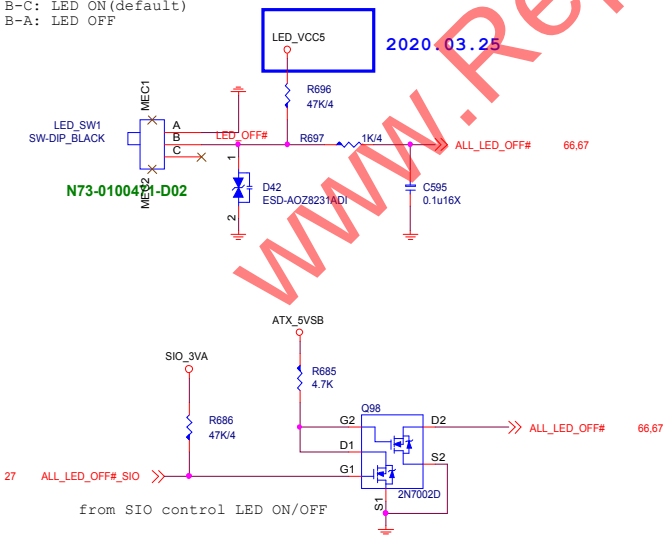
LED亮燈時同時將CPU LED關掉

LED_SW1 FORM SIO

D0C-040P100-H91/D0C-040S500-E07

LED_SW1 for ALL LED OFF

B-C: LED ON(default)
B-A: LED OFF



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MS-7C91

Size	Document Description	Rev
Custom	LED - EZ DEBUG / AMP	10

Date: Tuesday, April 21, 2020 Sheet 66 of 78

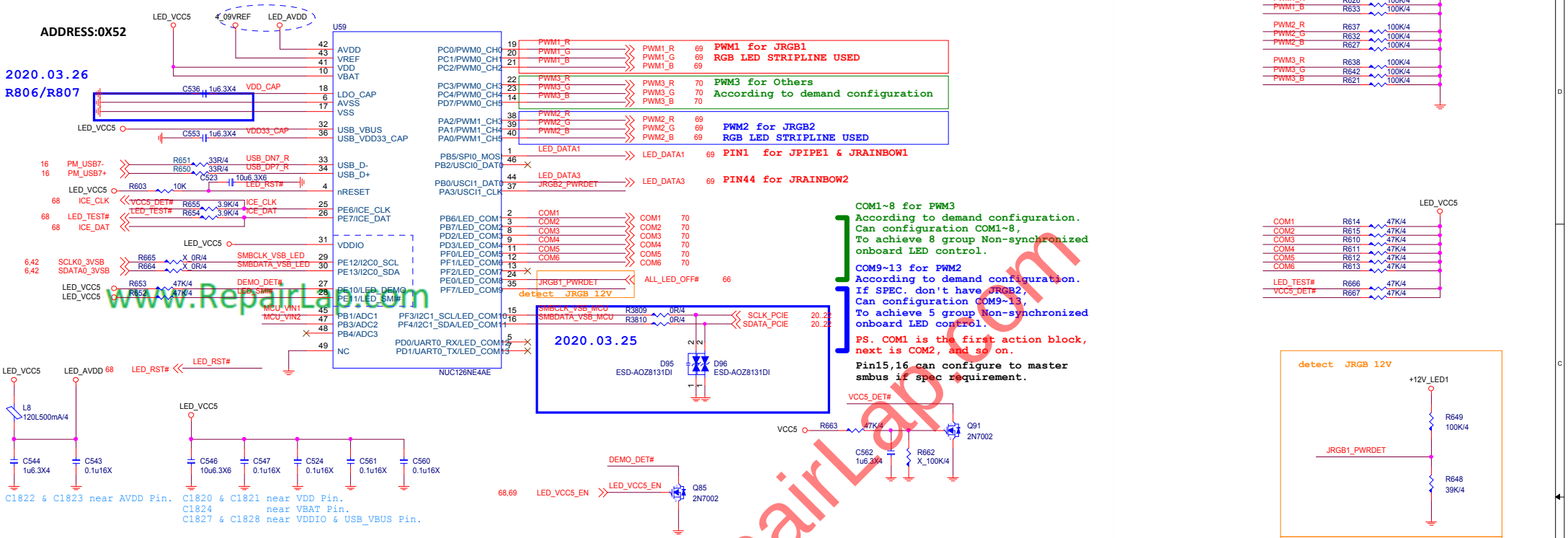
48 PIN LED MCU

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

ADDRESS:0X52

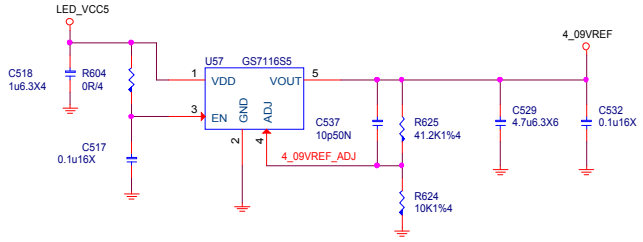
2020.03.26

R806/R807



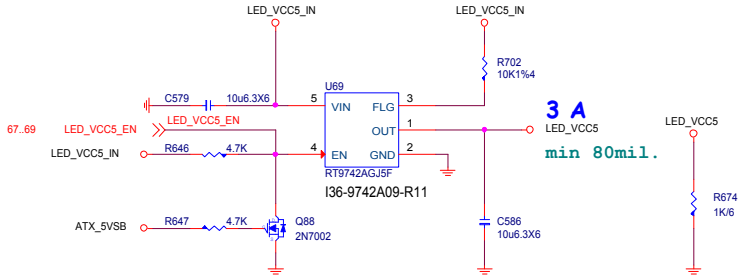
Clear MCU Circuit

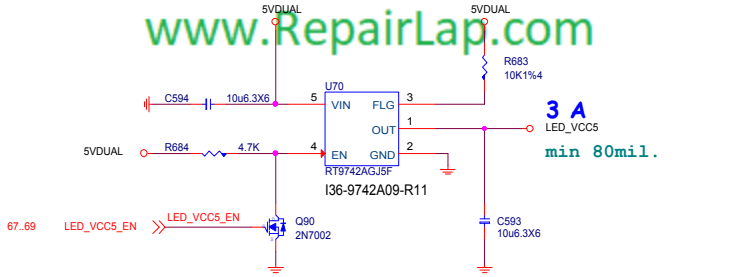
Control	Net Name	PWM USE
PCH	LED_DATA1	No Use
AUDIO Cover	LED_GPIO_01	No Use
MOS/IO cover	LED_GPIO_02	No Use
JRAINBOW1	LED_GPIO_03	No Use
JCORSAIR1	LED_DATA2	No Use
JRGB1/JRGB2	PWM1/ PWM2	PWM1/ PWM2
Board Side LED	COM 1~8	PWM3
Board Side LED	COM 9~13	PWM2



MICRO-STAR INT'L CO.,LTD		
MS-7C91		
Size: Custom	Document Description: MCU - LED Control	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 67 of 78	

EXTERNAL POWER INPUT

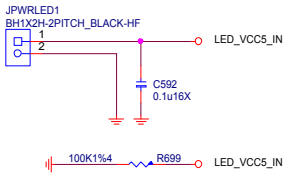




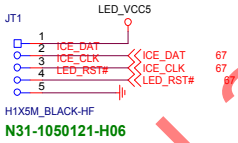
External Power

2A Connector

N32-1020CB1-H06



JT1 for FW update

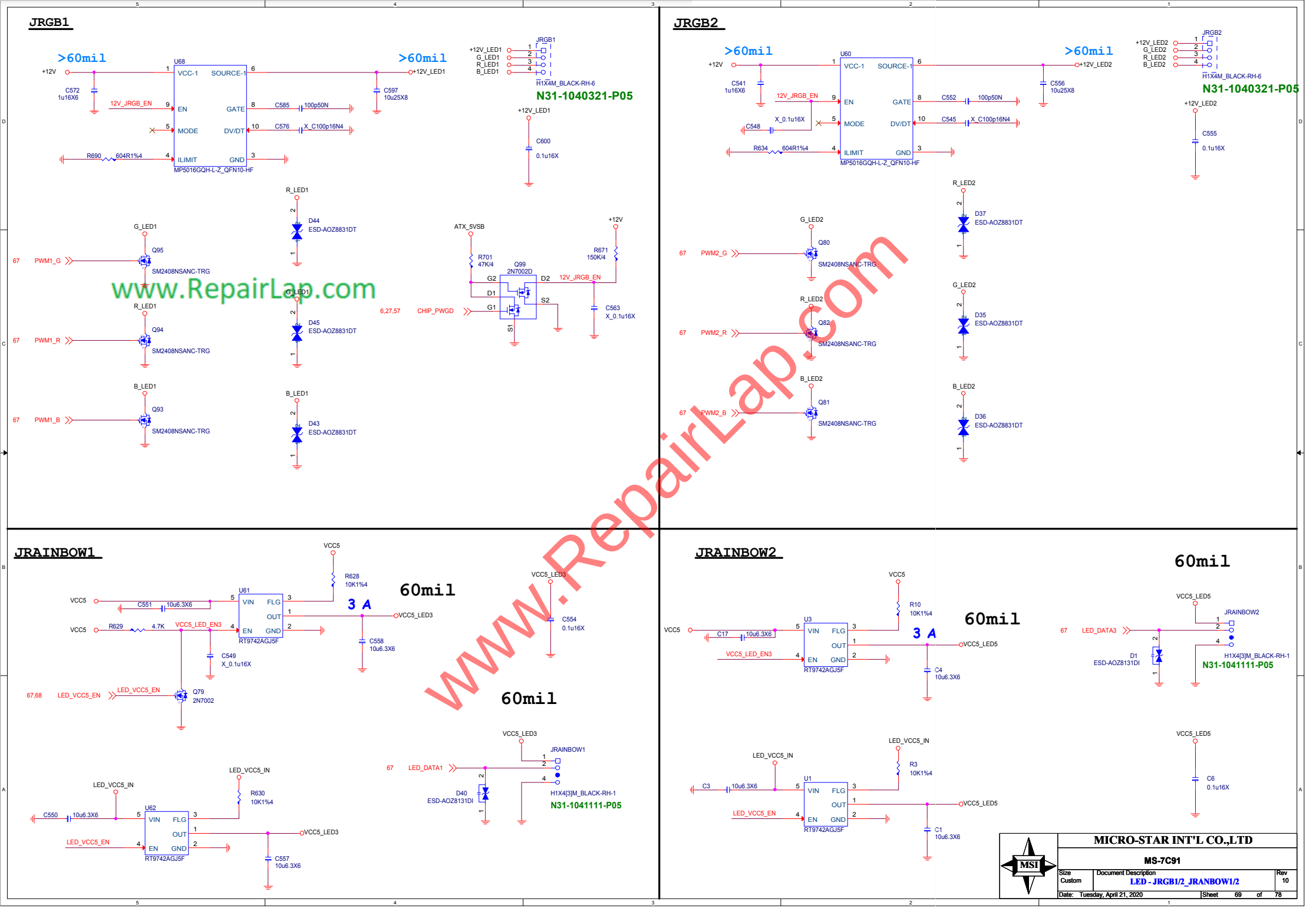


N31-1050121-H06

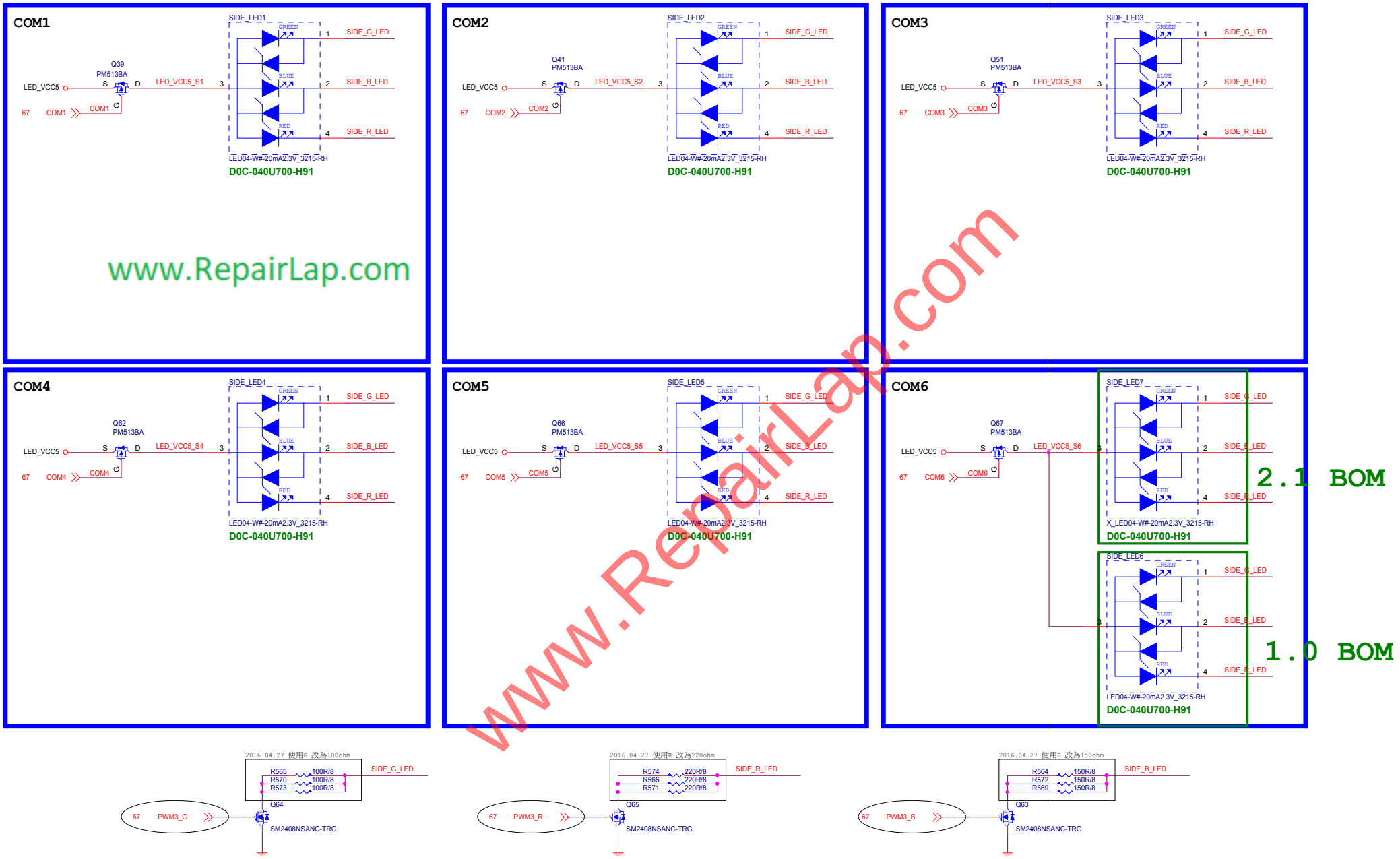
JF1 for Factory test

N31-1020151-H06

MICRO-STAR INT'L CO.,LTD		
MS-7C91		
Size: Custom	Document Description: LED - Power / JPIPE	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 68 of 78	



BOARD SIDE LED *6



MICRO-STAR INT'L CO.,LTD	
MS-7C91	
Size: Custom	Document Description: LED - Mystic Light - 1
Rev: 10	
Date: Tuesday, April 21, 2020	Sheet 70 of 78

MICRO-STAR INT'L CO.,LTD		
MS-7C91		
Size: Custom	Document Description: BOM Option	Rev: 10
Date: Tuesday, April 21, 2020	Sheet 71 of 78	

CPU Socket

CPU2

E95-0000022-A91

E95-0000022-A91

Simulation

X_JS1 SIM1 X_PIN1*2

X_JS2 SIM2 X_PIN1*2

X_JS3 SIM3 X_PIN1*2

Optics Orientation Holes

MH1 MH2 MH3 MH4 MH5 MH6 MH7 MH8 MH9 X_MH001

2020.04.15

C575 0.1u16X

C559 0.1u16X

MANUAL PART

AMI_LAB1 G51-M1SPXXA-A09

G51-M1SPXXA-A09

CFOS1 <MSI-BOM> Y02-MU00170-CFO

Y02-MU00170-CFO

HDMI_LA1 Label HDMI

HDMI LABEL

Y01-RHDMI03-000

MKT_LA1 Label MKT_LABEL

X_MKT LABEL

G51-M1SPP78-Q13

PCB

PCB

PCB1

7C91_21

PD0-07C9121-E48

PD0-07C9121-G37

FM1 FM2 FM3 FM4 FM5 FM6 FM7 FM8 X_FM120

BAT1_X1 BAT-BCR2032P

D06-0100161-F52

D06-0100101-K26

Moat CAP

Reserve for bypass 12VIN noise use

ATX_5VSB C5 C2 X_0.1u16X

Reserve for bypass VCC5/VCC3/3VSB noise use

VCC5 C1658 C1659 X_0.1u16X

VCC3 C1660 C1661 X_0.1u16X

3VSB C1662 X_0.1u16X

2020.04.14

MOS HEATSINK

2020.04.15

N MOS

HS_MOS1 MEC2 MEC1

NHS-KWO GER(0436-3160R)

E31-0506810-K08

W MOS

HS_MOS2 MEC2 MEC1

WHS-KWO GER(0436-3150R)

E31-0506800-K08

PCH HEATSINK

2020.04.15

PM_HS1 MEC1 MEC2

PHS-KWO GER(0436-3161R)

E31-0410550-K08

M2 COVER

IO BRACKET

DDR COVER

20190201 Remove DDR_COVER1

MICRO-STAR INT'L CO.,LTD

MS-7C91

Size: Custom | Document Description: Manual Parts | Rev: 10

Date: Tuesday, April 21, 2020 | Sheet 72 of 78