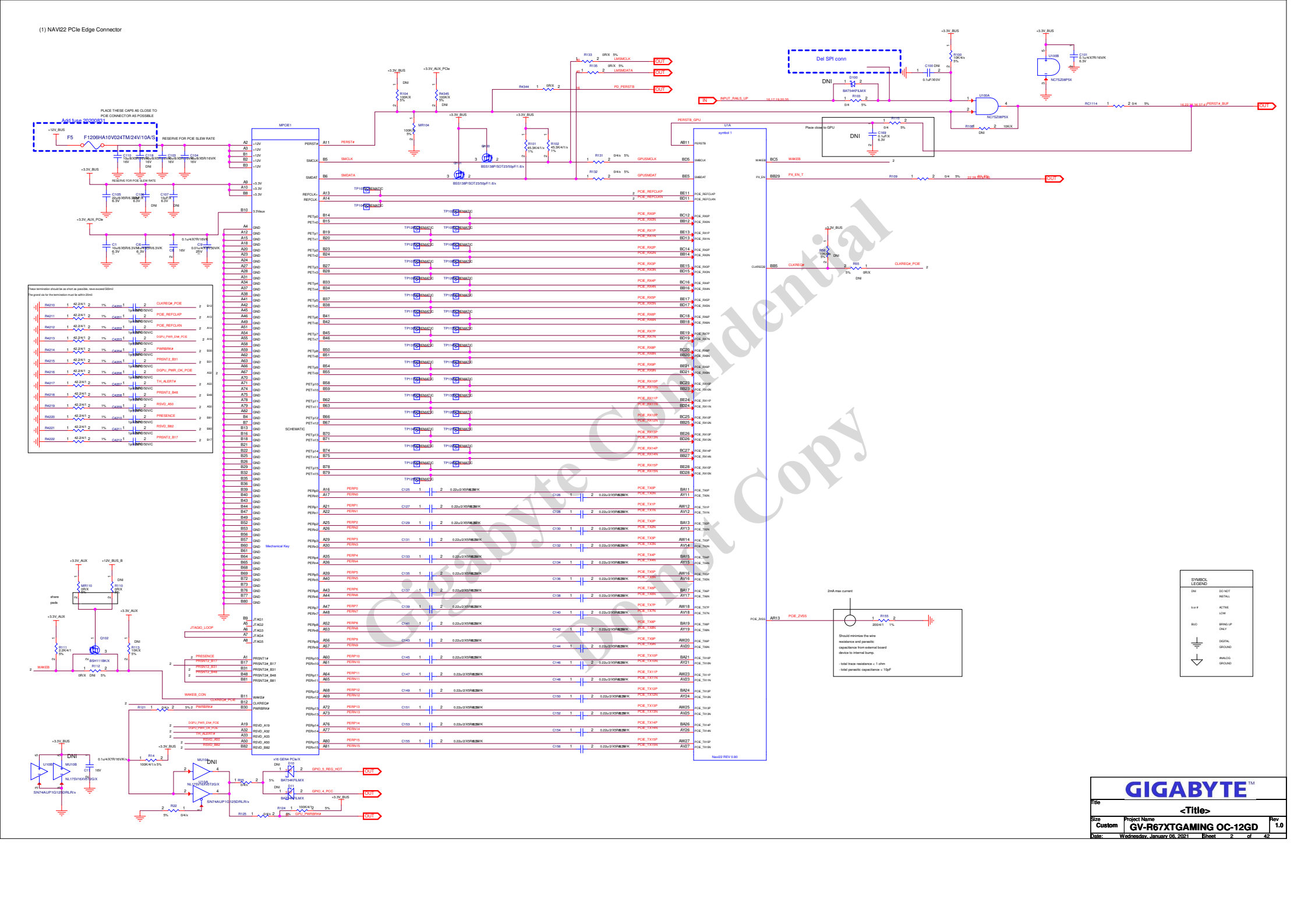
TABLE OF CONTENTS

GIGABYTE™

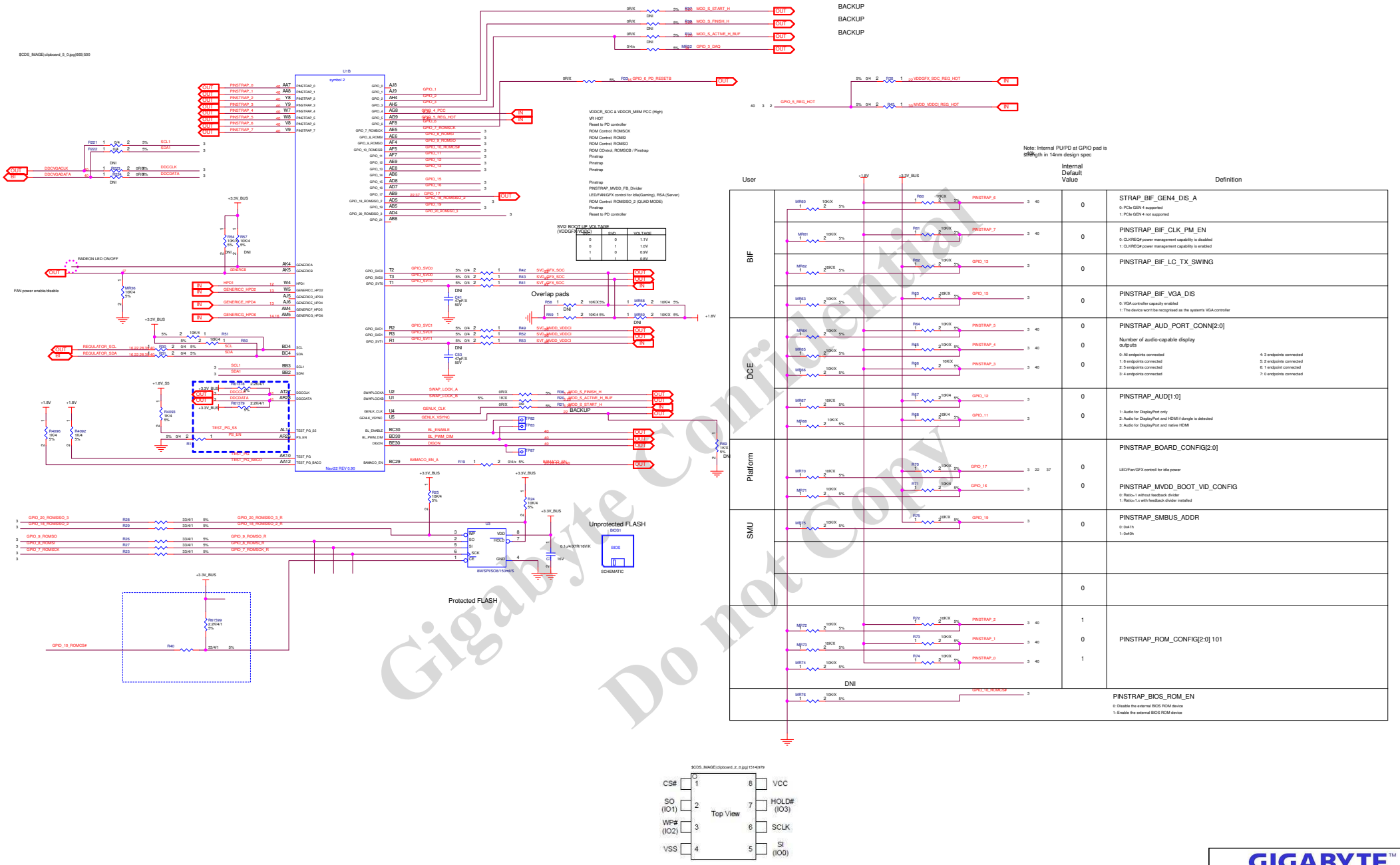
Title: <Title>

Size: Custom | Project Name: GV-R67XTGAMING OC-12GD | Rev: 1.0

Date: Wednesday, January 06, 2021 | Sheet 1 of 42



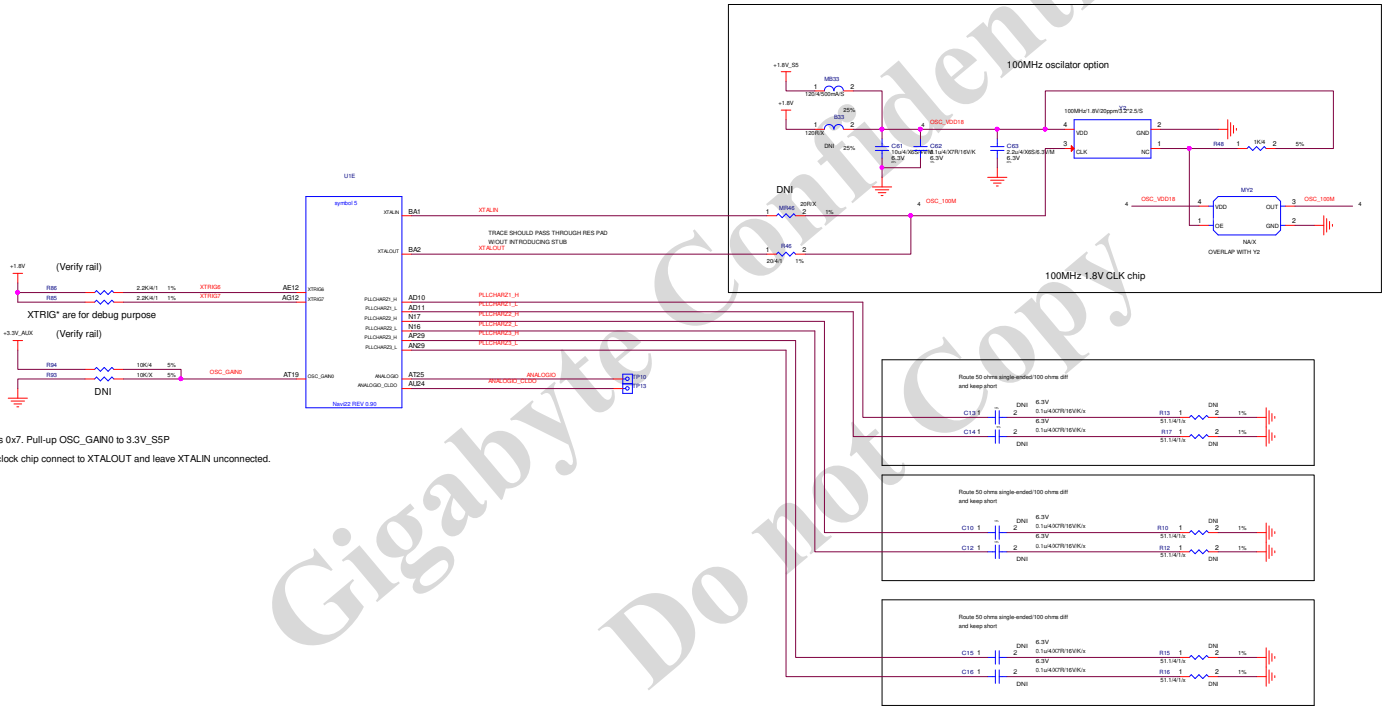
Title	<Title>
Size	Custom
Project Name	GV-R67XTGAMING OC-12GD
Rev	1.0
Date:	Wednesday, January 06, 2021
Sheet	2 of 42



Note: Internal PU/PD at GPIO pad is strength in 14nm design spec

		Internal Default Value	Definition
BIF	MR60	0	STRAP_BIF_GEN4_DIS_A 0: PCIe GEN 4 supported 1: PCIe GEN 4 not supported
	MR61	0	PINSTRAP_BIF_CLK_PM_EN 0: CLKREQ# power management capability is disabled 1: CLKREQ# power management capability is enabled
	MR62	0	PINSTRAP_BIF_LC_TX_SWING
	MR63	0	PINSTRAP_BIF_VGA_DIS 0: VGA controller capacity enabled 1: The device won't be recognised as the system's VGA controller
DCE	MR64	0	PINSTRAP_AUD_PORT_CONN[2:0] Number of audio-capable display outputs 0: All endpoints connected 1: 6 endpoints connected 2: 5 endpoints connected 3: 4 endpoints connected 4: 3 endpoints connected 5: 2 endpoints connected 6: 1 endpoint connected 7: 0 endpoints connected
	MR65	0	
	MR66	0	
	MR67	0	PINSTRAP_AUD[1:0] 1: Audio for DisplayPort only 2: Audio for DisplayPort and HDMI if dongle is detected 3: Audio for DisplayPort and native HDMI
	MR68	0	
Platform	MR70	0	PINSTRAP_BOARD_CONFIG[2:0] LED/Fan/GFX controll for idle power
	MR71	0	PINSTRAP_MVDD_BOOT_VID_CONFIG 0: Ratio=1 without feedback divider 1: Ratio=1.x with feedback divider installed
SMU	MR75	0	PINSTRAP_SMBUS_ADDR 0: 0x41h 1: 0x40h
		0	
	MR72	1	PINSTRAP_ROM_CONFIG[2:0] 101
	MR73	0	
	MR74	1	
	MR76		PINSTRAP_BIOS_ROM_EN 0: Disable the external BIOS ROM device 1: Enable the external BIOS ROM device

GIGABYTE		
Title	<Title>	
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 3 of 42	



Default OSC_GAIN is 0x7. Pull-up OSC_GAIN0 to 3.3V_S5P

When 0x7, external clock chip connect to XTALOUT and leave XTALIN unconnected.

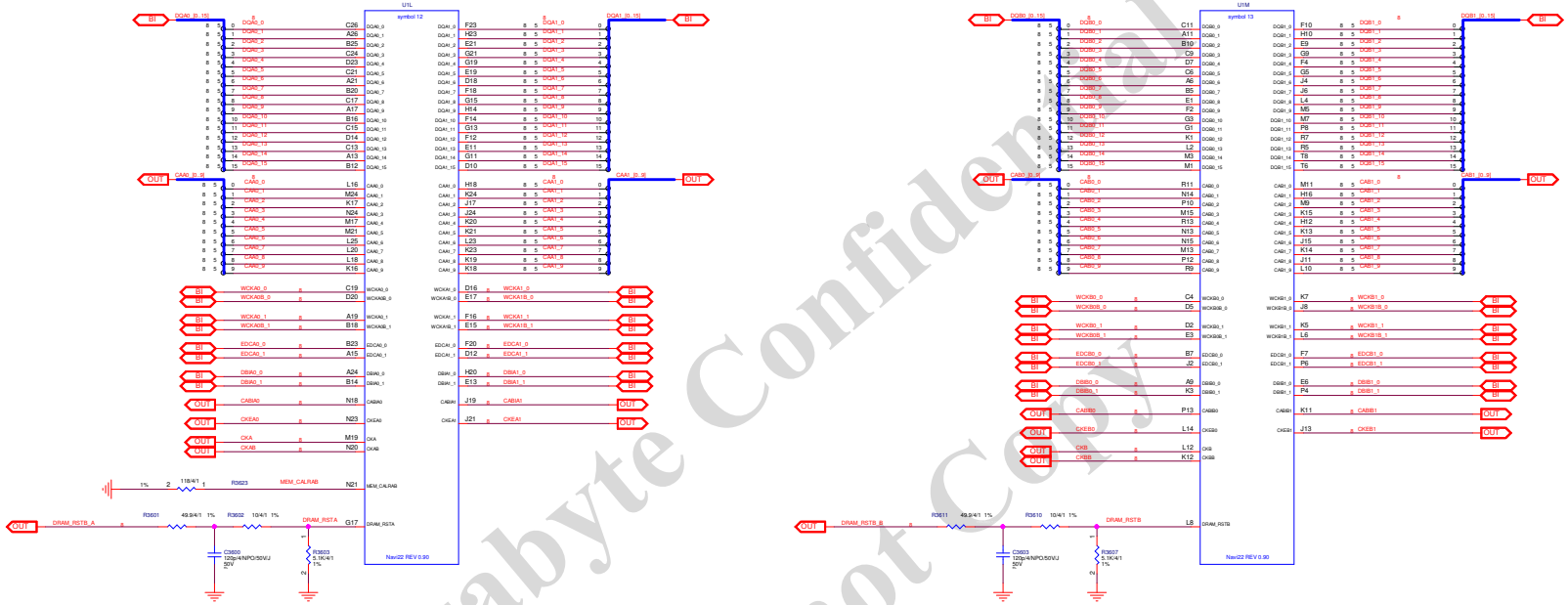
GIGABYTE™

Title: <Title>

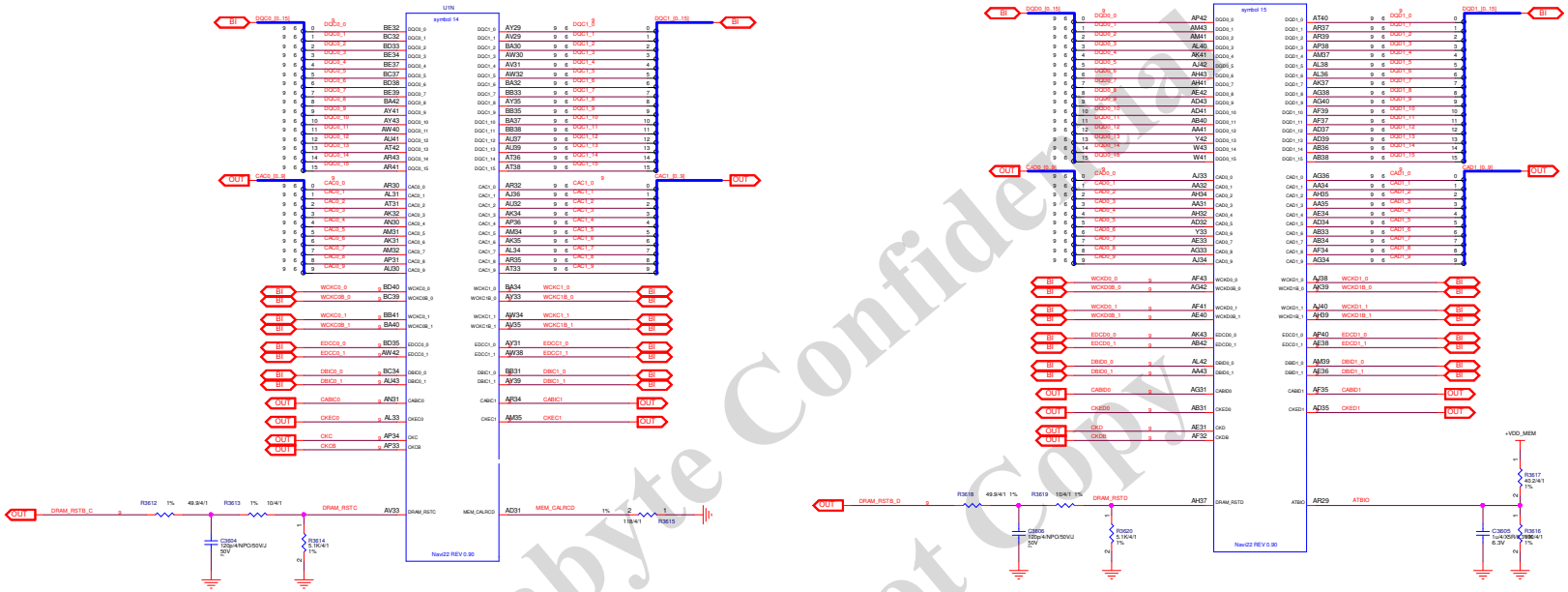
Size	Project Name	Rev
Custom	GV-R67XTGAMING OC-12GD	1.0

Date: Wednesday, January 06, 2021 Sheet 4 of 42

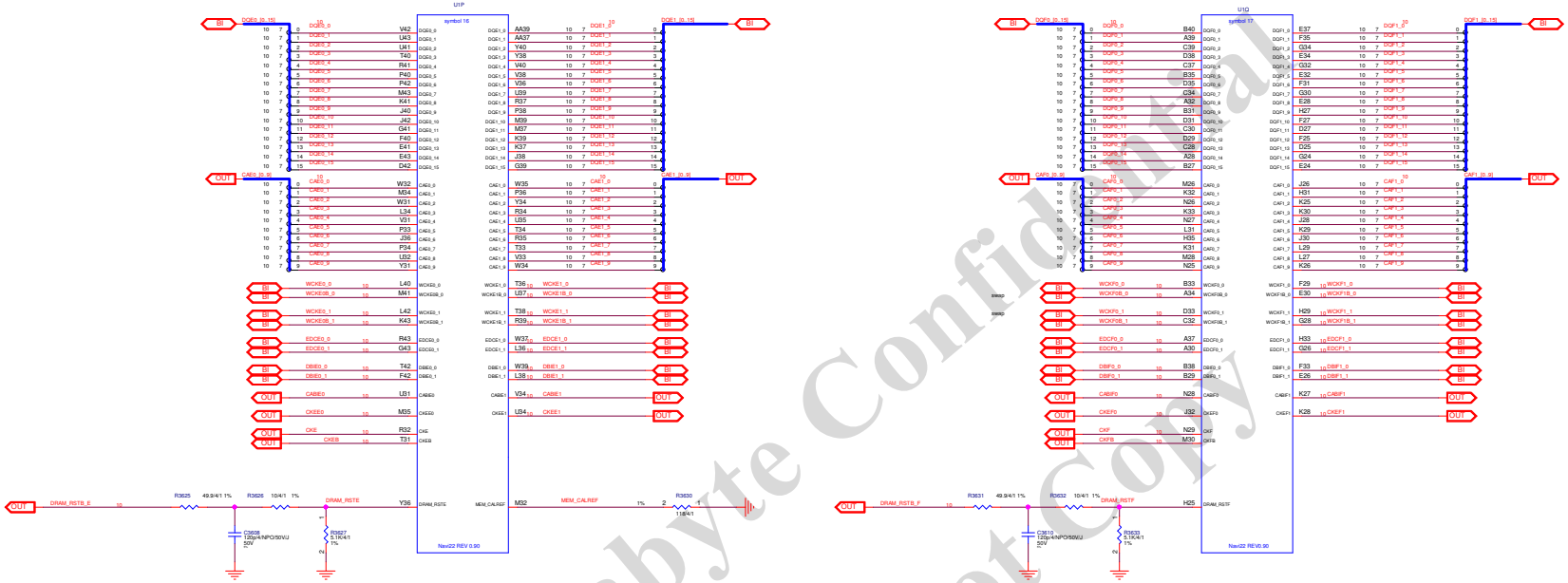
NAVI 22 MEM INTERFACE CH A/B



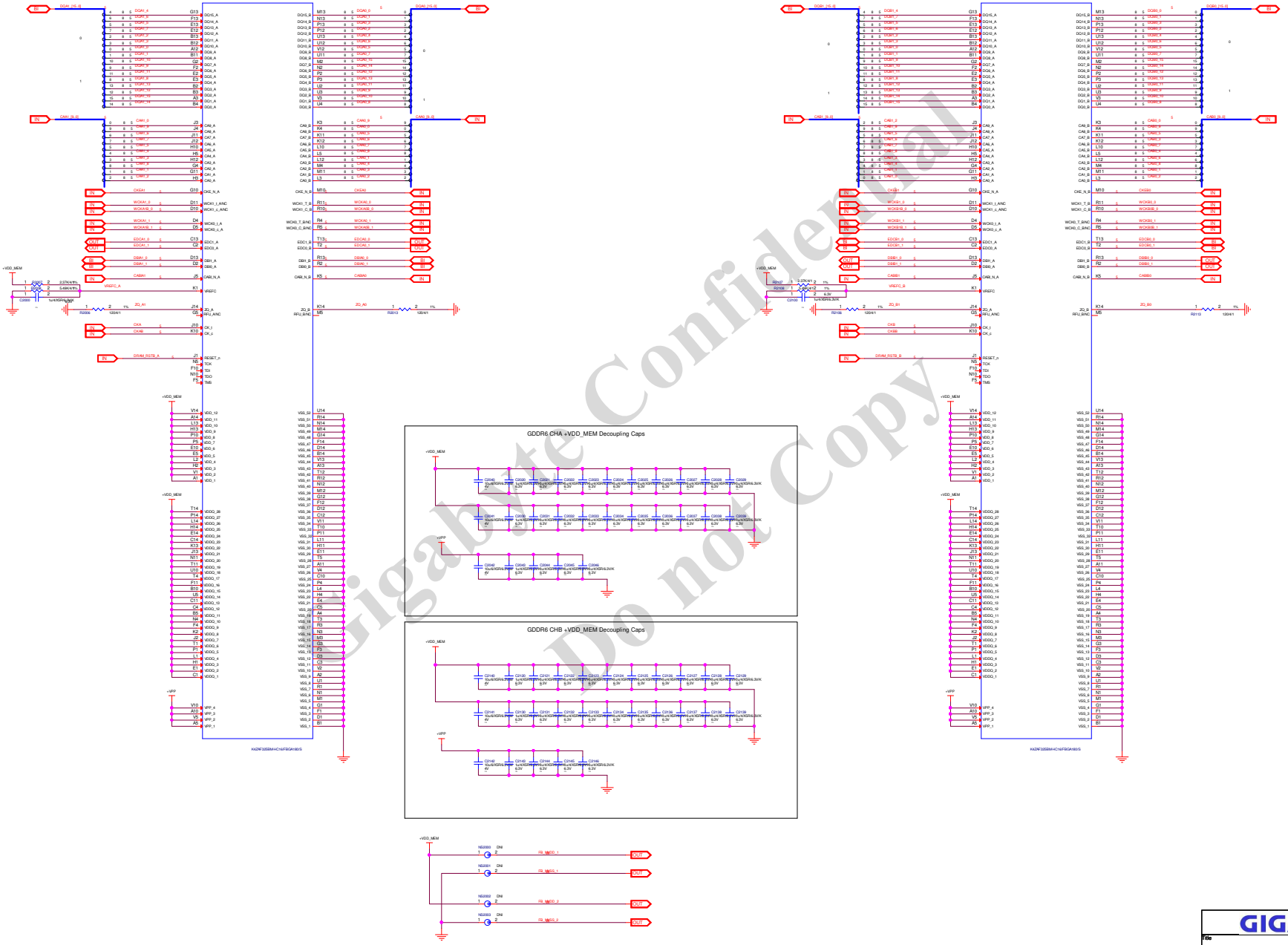
GIGABYTE™			
Title	<Title>		
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD		Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 5 of 42		



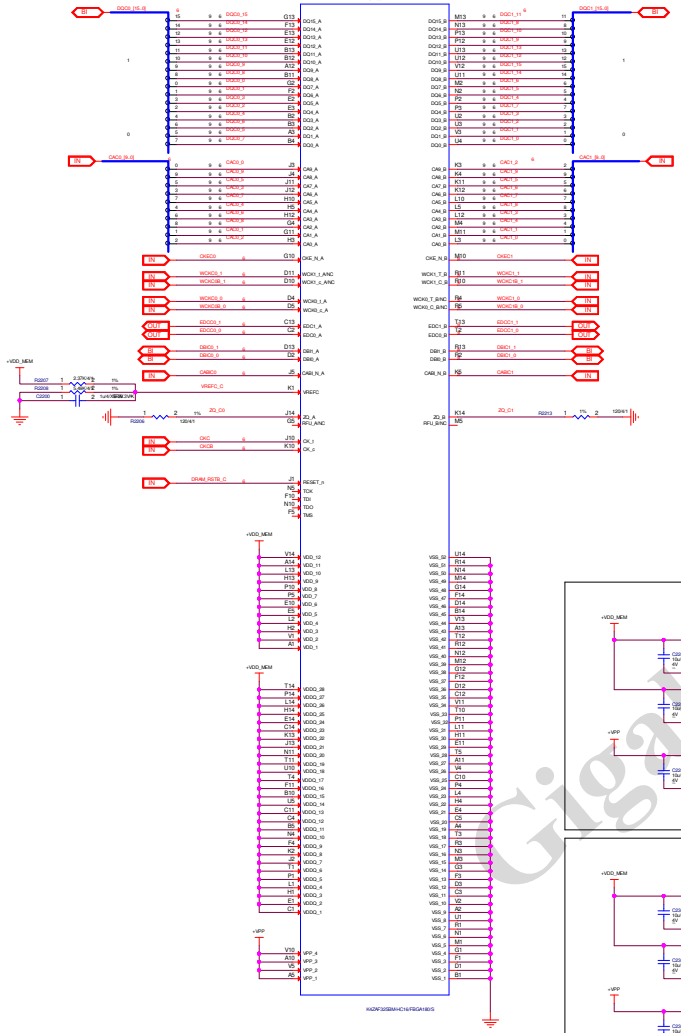
GIGABYTE™			
Title: <Title>			
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD		Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 6 of 42		

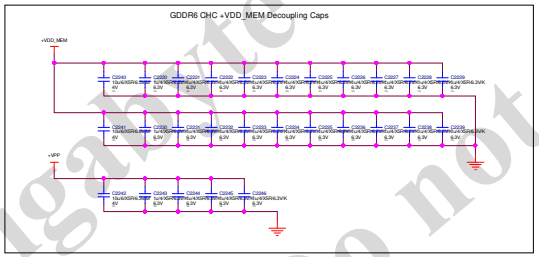


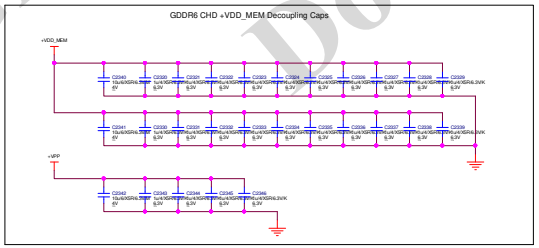
GIGABYTE™			
Title: <Title>			
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD		Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 7 of 42		

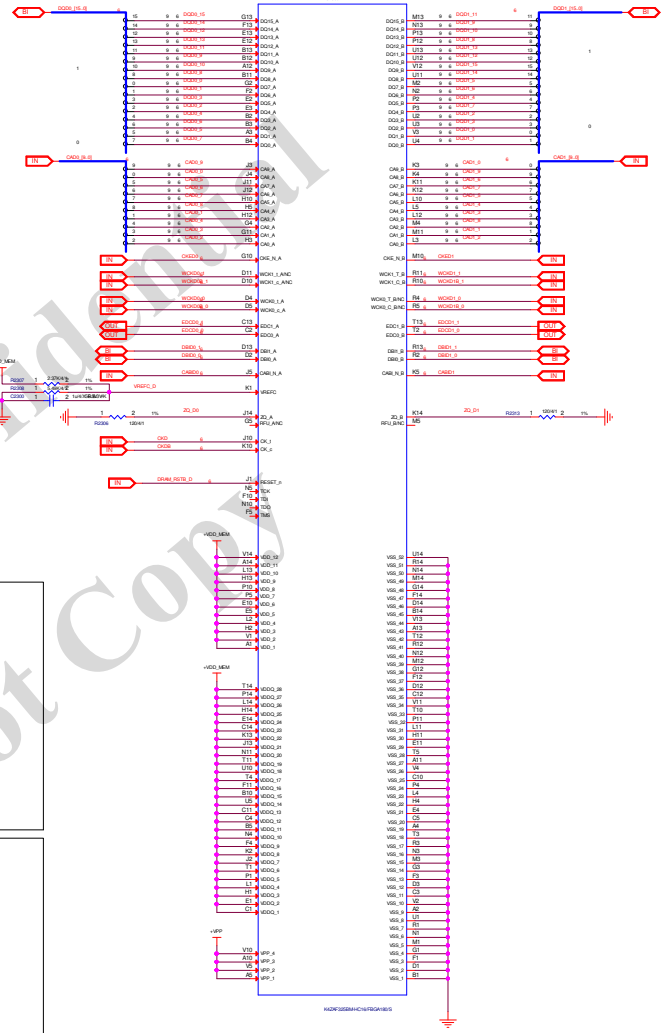


GIGABYTE			
Title	<Title>		
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD		Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 8 of 42		

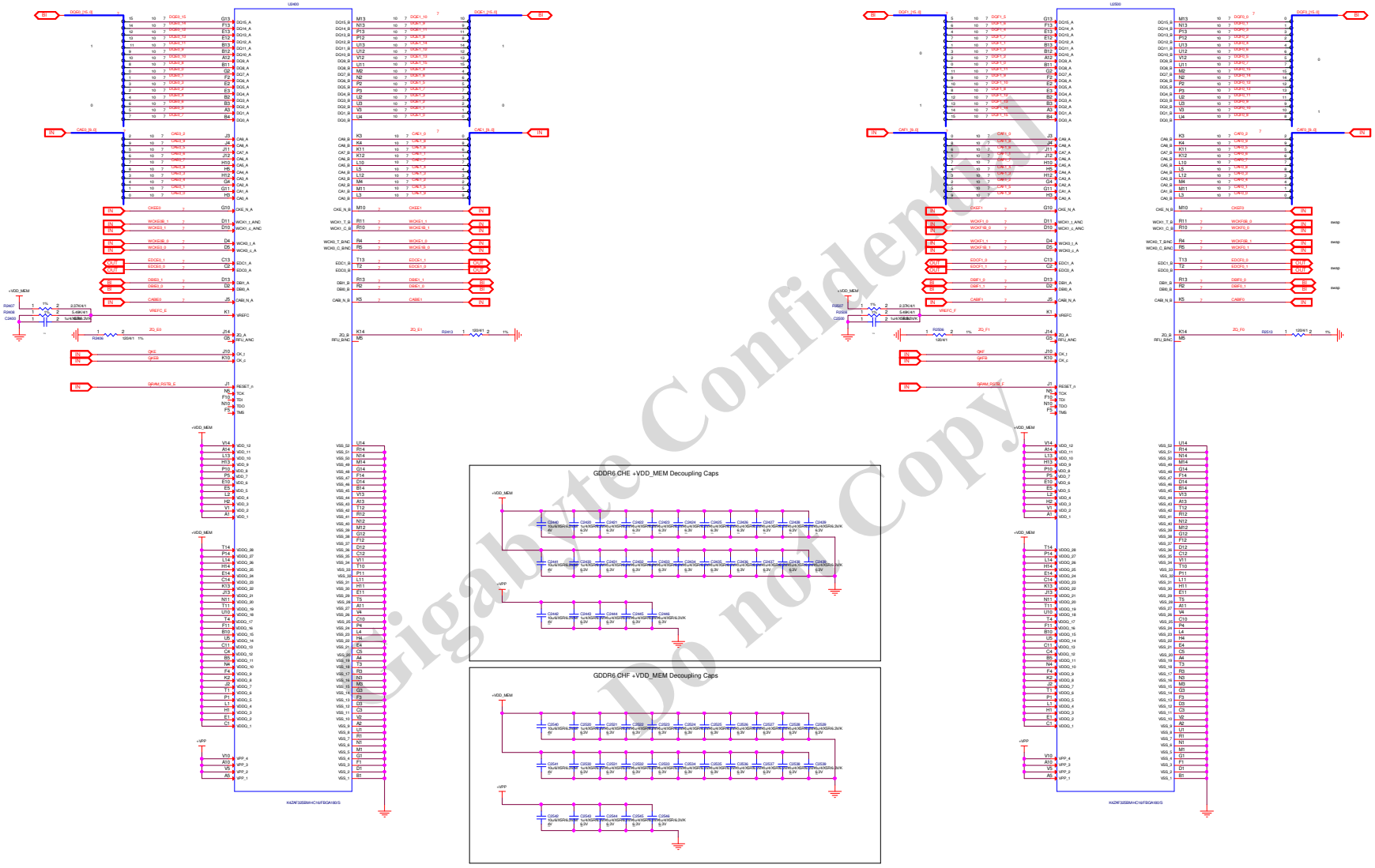






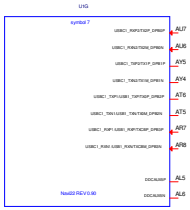


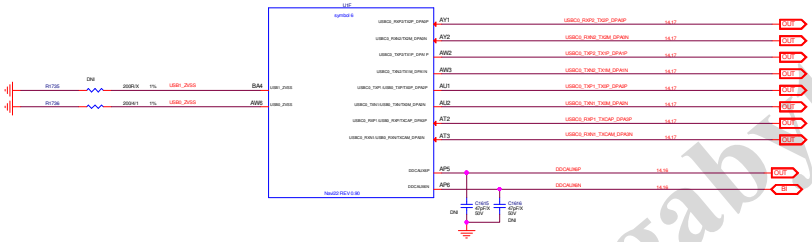
GIGABYTE		
Title	<Title>	
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 9 of 42	



Title	<Title>		
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD		Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 10 of 42		

NAVI22 TMDP A/B

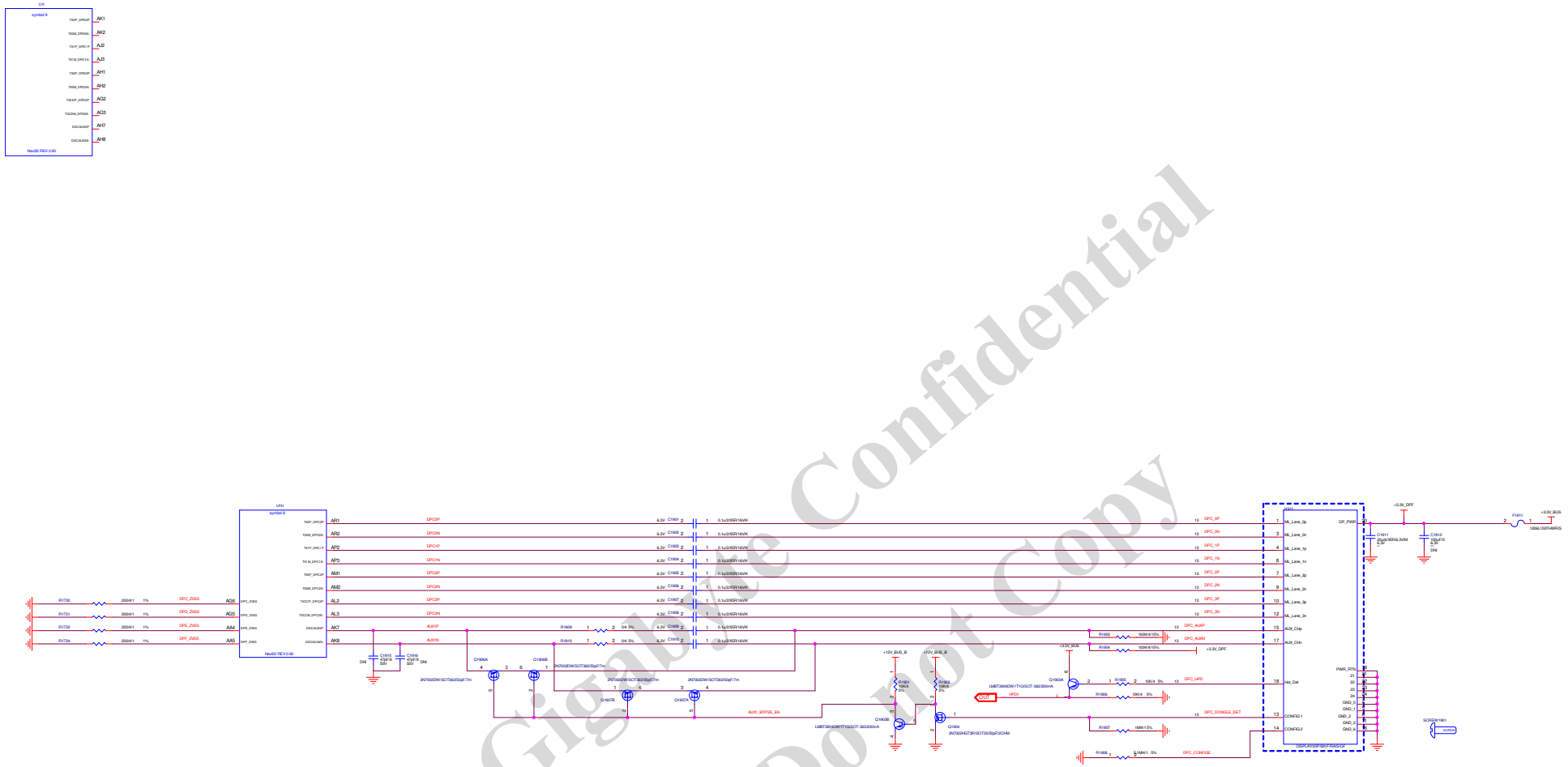




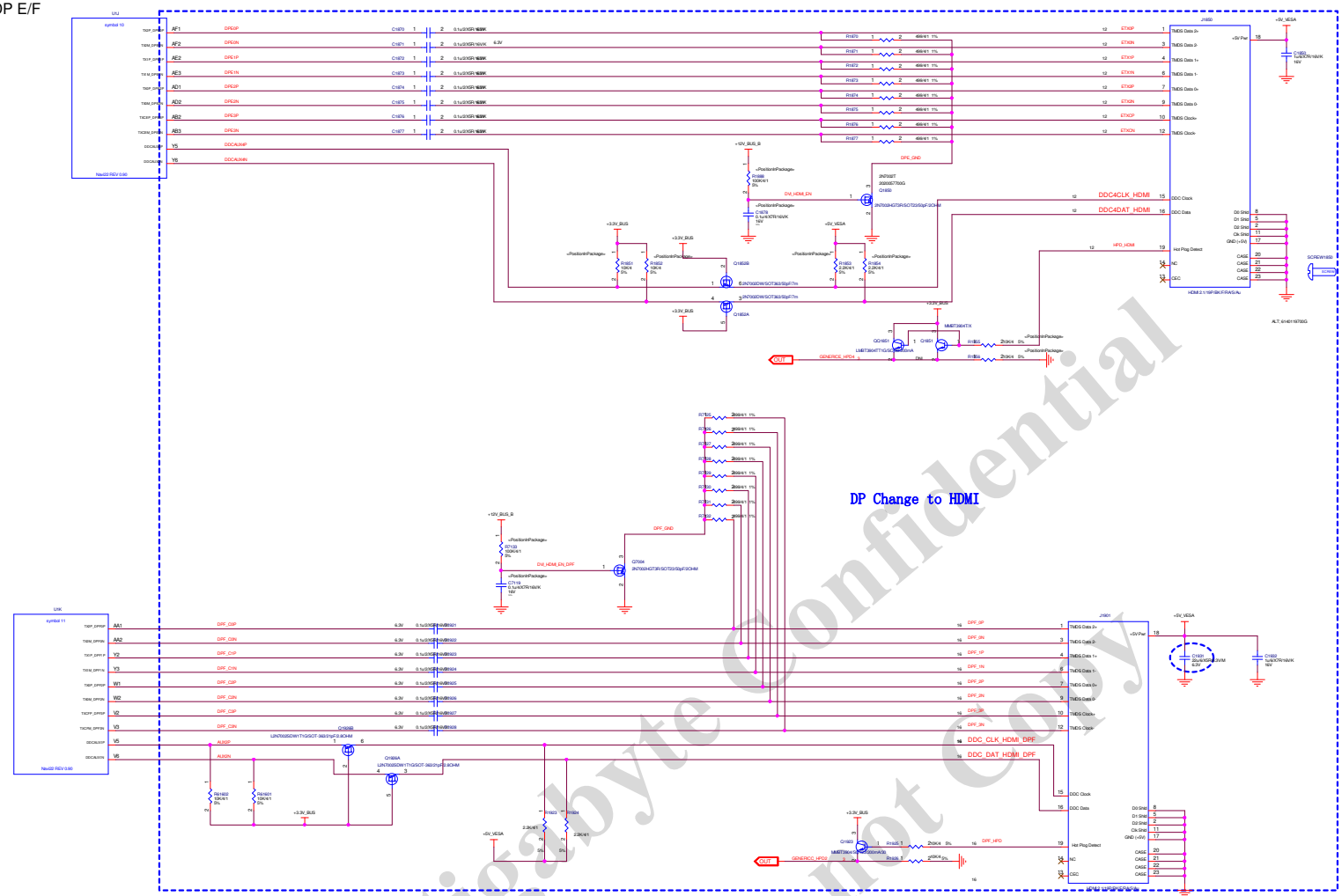
GIGABYTE™

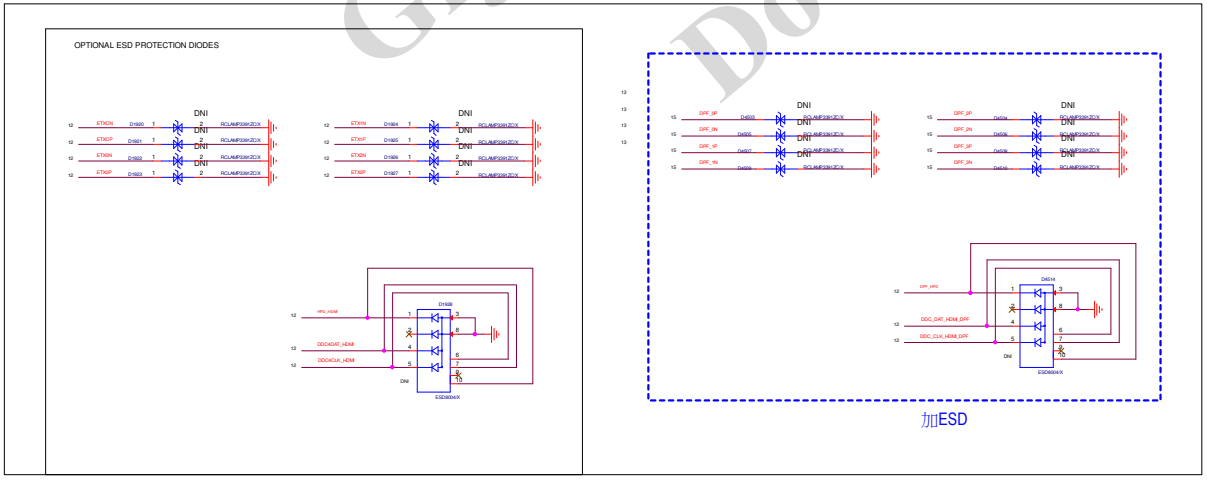
Title	<Title>	
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 11 of 42	

NAVI22 TMDP C/D



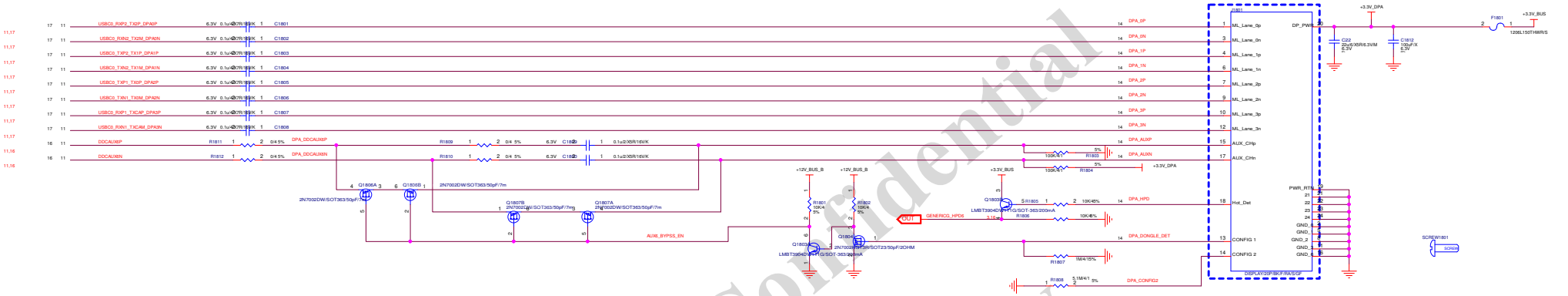
Title	<Title>		
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD		Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 12 of 42		



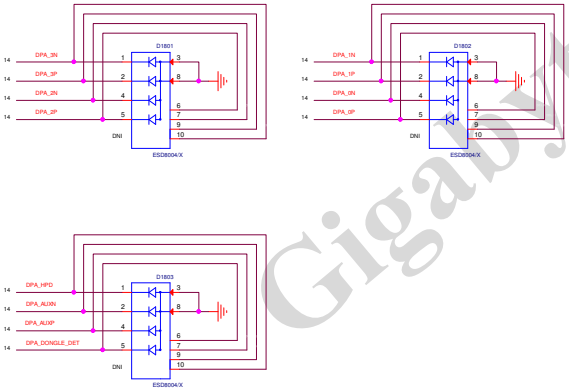


加ESD

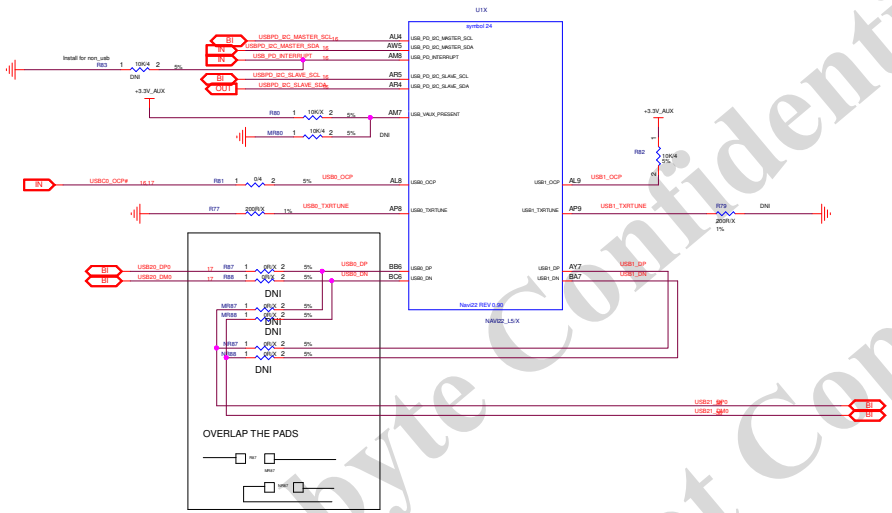
GIGABYTE		
Title	<Title>	
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 13 of 42	



Overlap with USBC

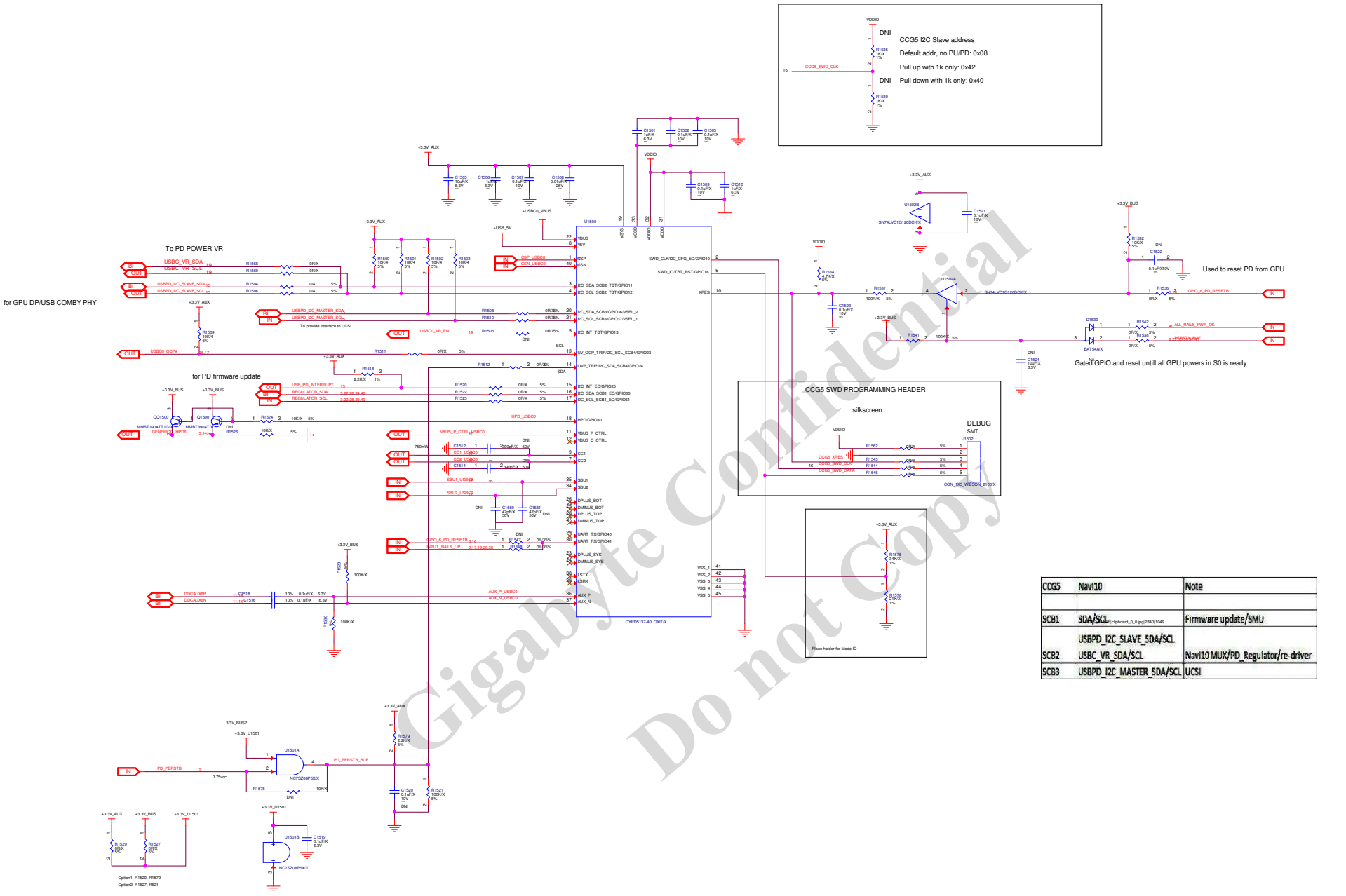


GIGABYTE™		
Title	<Title>	
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 14 of 42	



GIGABYTE™

Title	<Title>	
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 15 of 42	



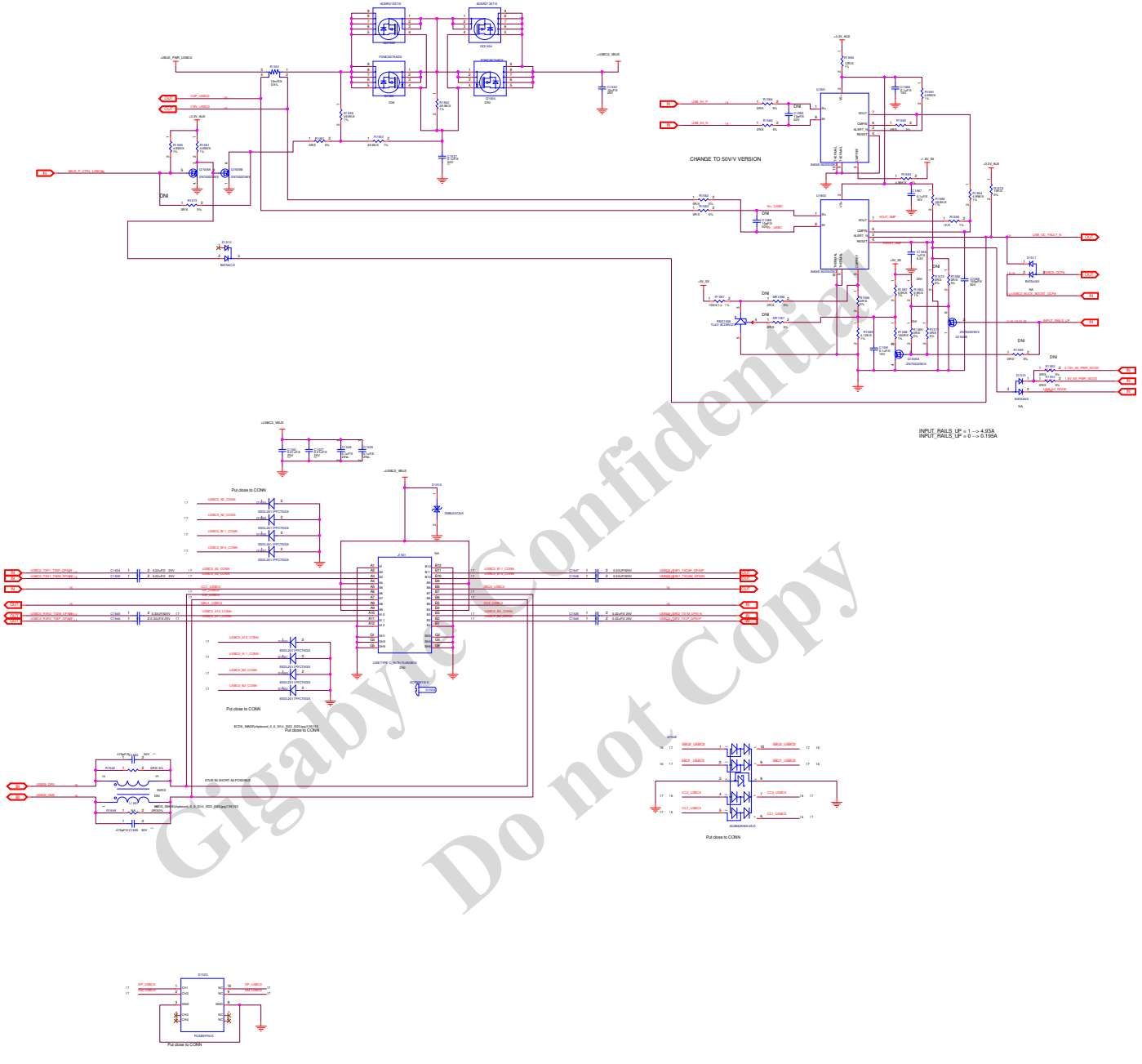
CCG5	Navi10	Note
SCB1	SDA/SCL	Firmware update/SMU
SCB2	USBPD_I2C_SLAVE_SDA/SCL USBC_VR_SDA/SCL	Navi10 MUX/PD_Regulator/re-driver
SCB3	USBPD_I2C_MASTER_SDA/SCL	UCSI

GIGABYTE™

Title: <Title>

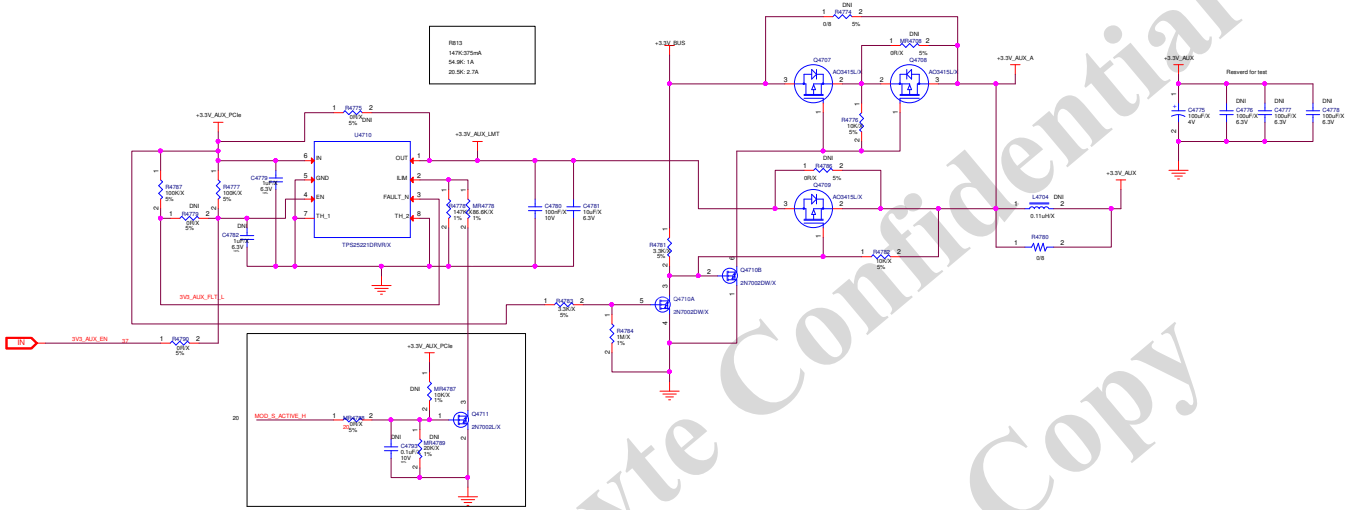
Size	Project Name	Rev
Custom	GV-R67XTGAMING OC-12GD	1.0

Date: Wednesday, January 06, 2021 Sheet 16 of 42



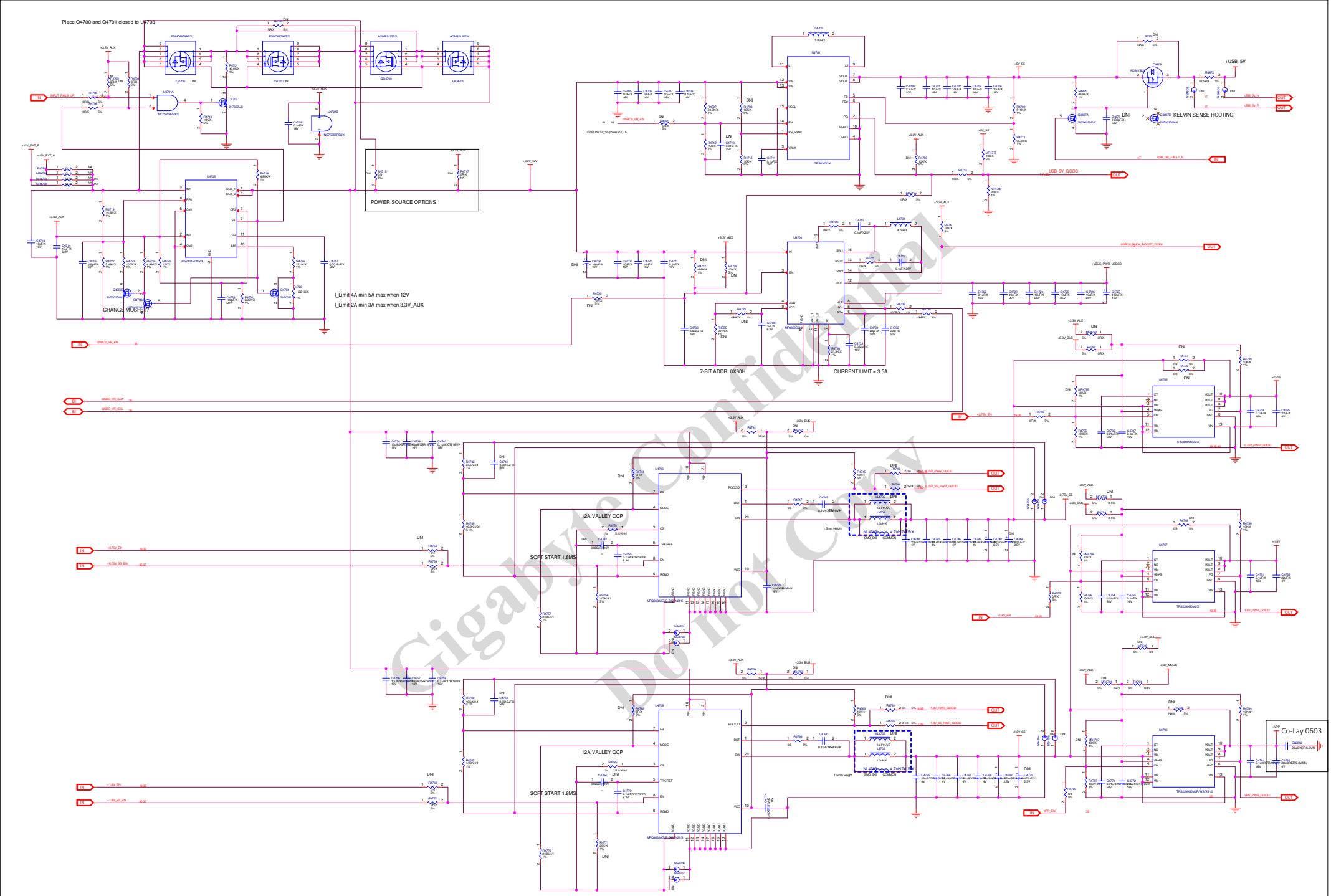
GIGABYTE

File	<Title>		
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD		Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 17 of 42		

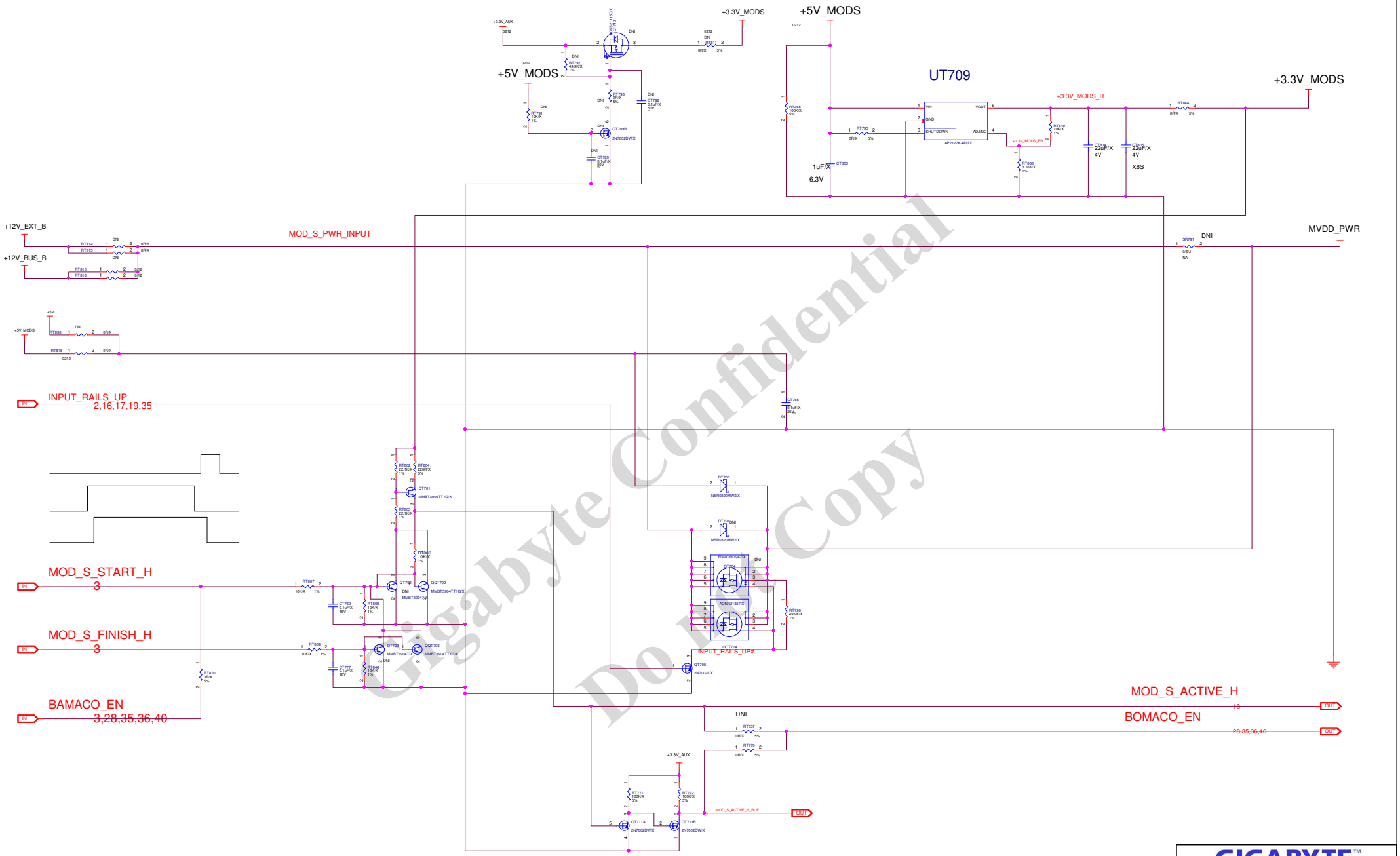


GIGABYTE™

Title	<Title>	
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 18 of 42	

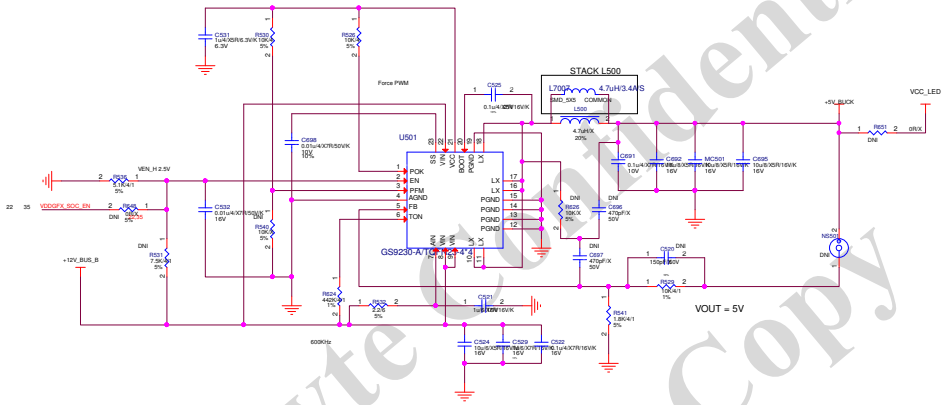


Title	<Title>	
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 19 of 42	



GIGABYTE™

Title	<Title>	
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 20 of 42	

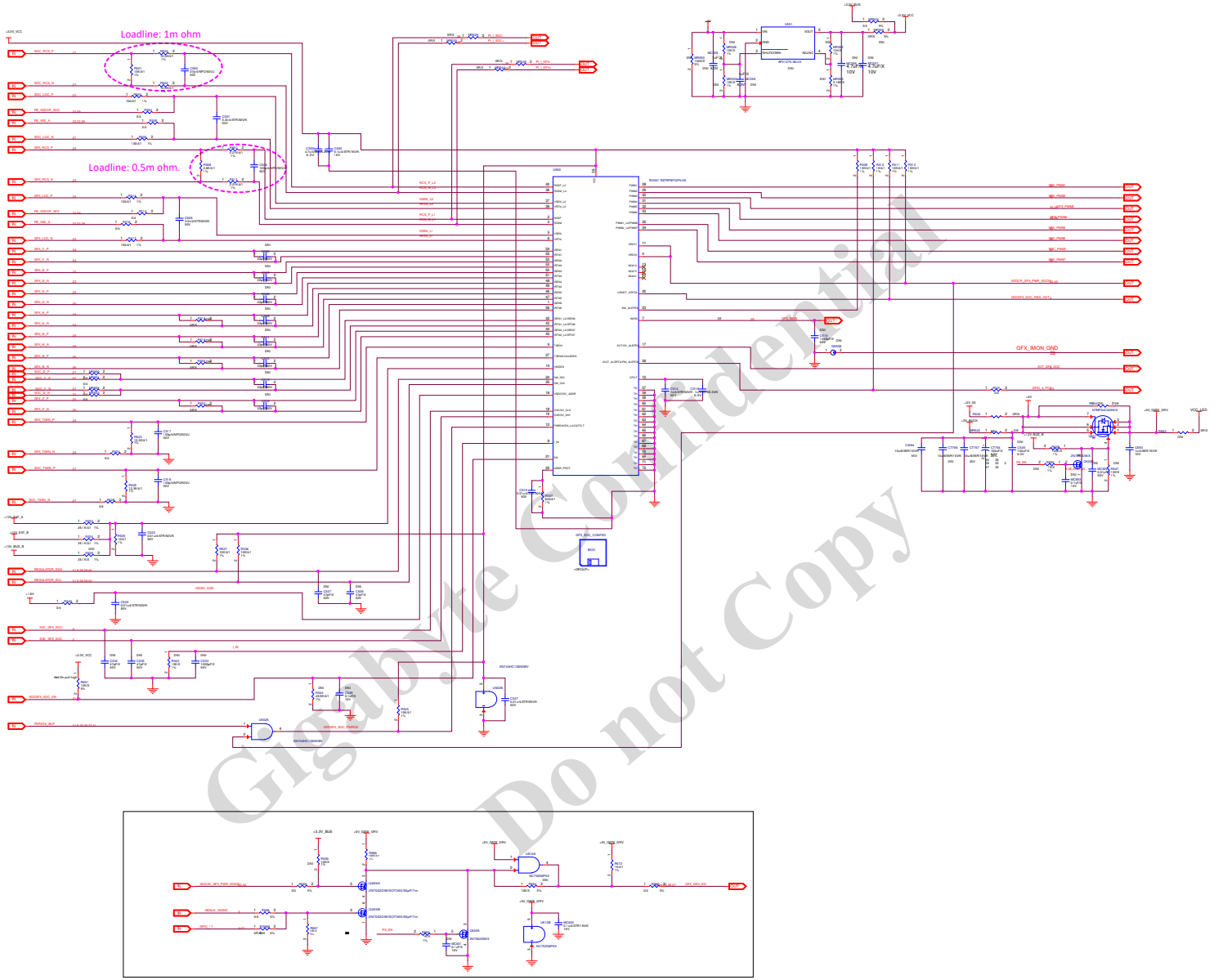


GIGABYTE™

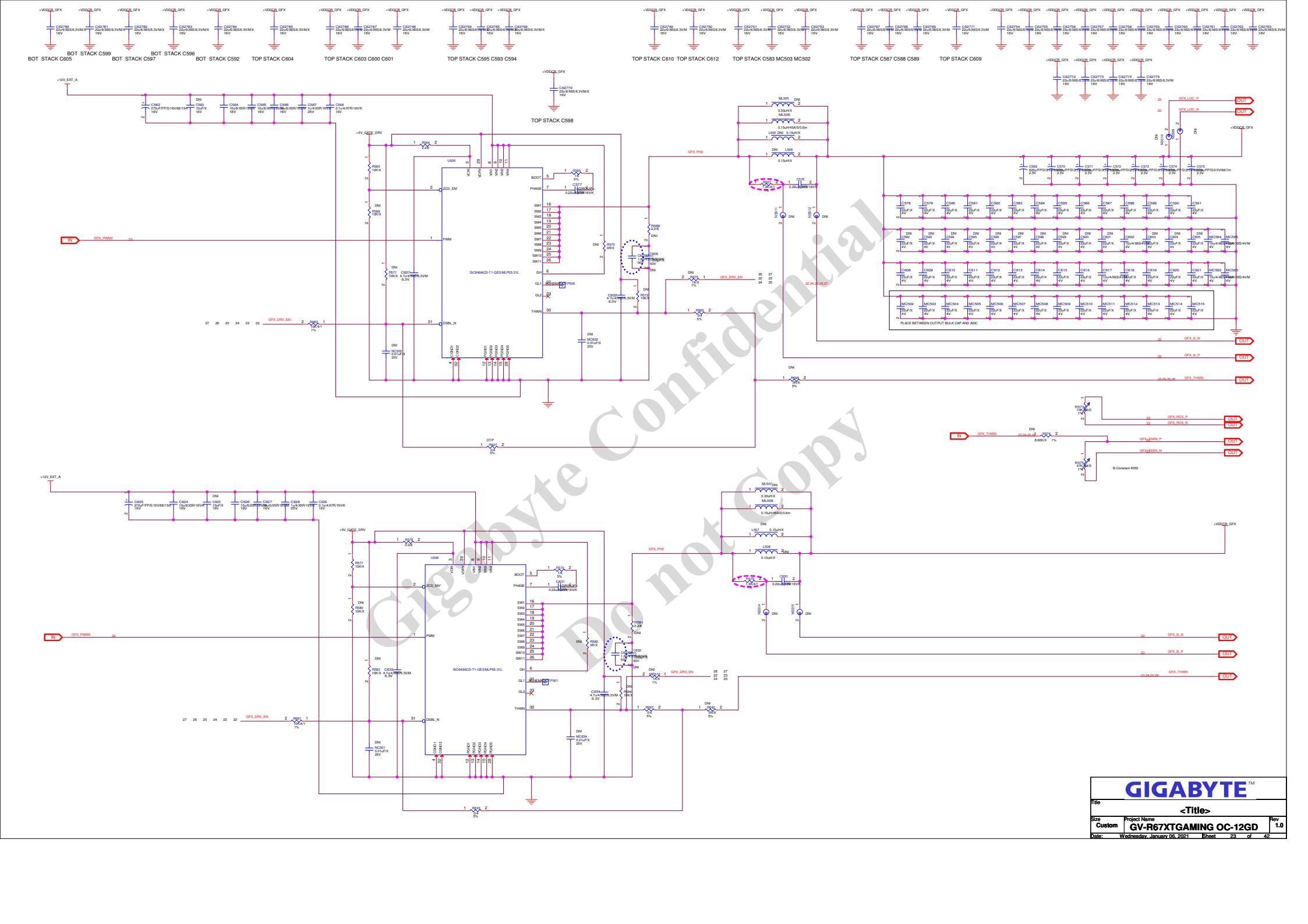
Title: <Title>

Size	Project Name	Rev
Custom	GV-R67XTGAMING OC-12GD	1.0

Date: Wednesday, January 06, 2021 Sheet 21 of 42

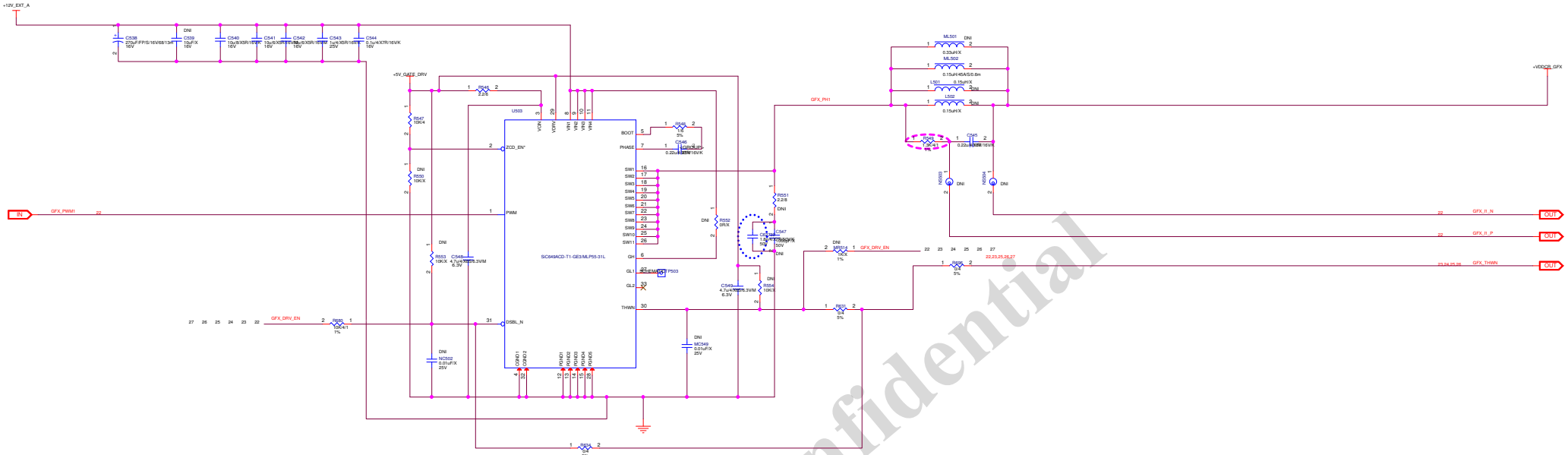


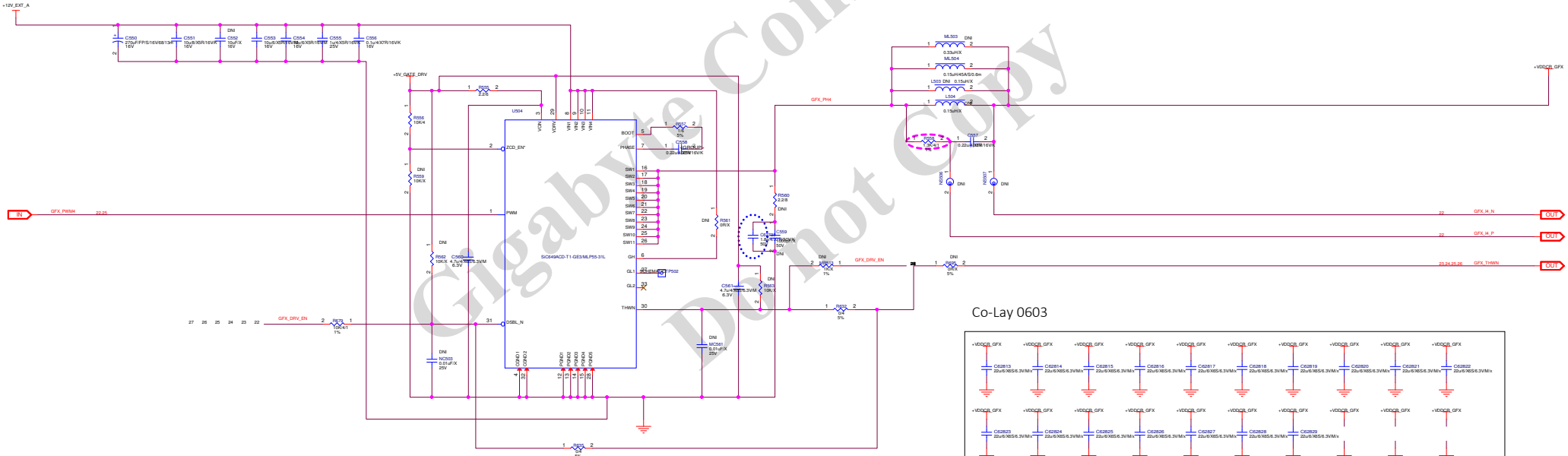
Title	<Title>		
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD		Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 22 of 42		



GIGABYTE™

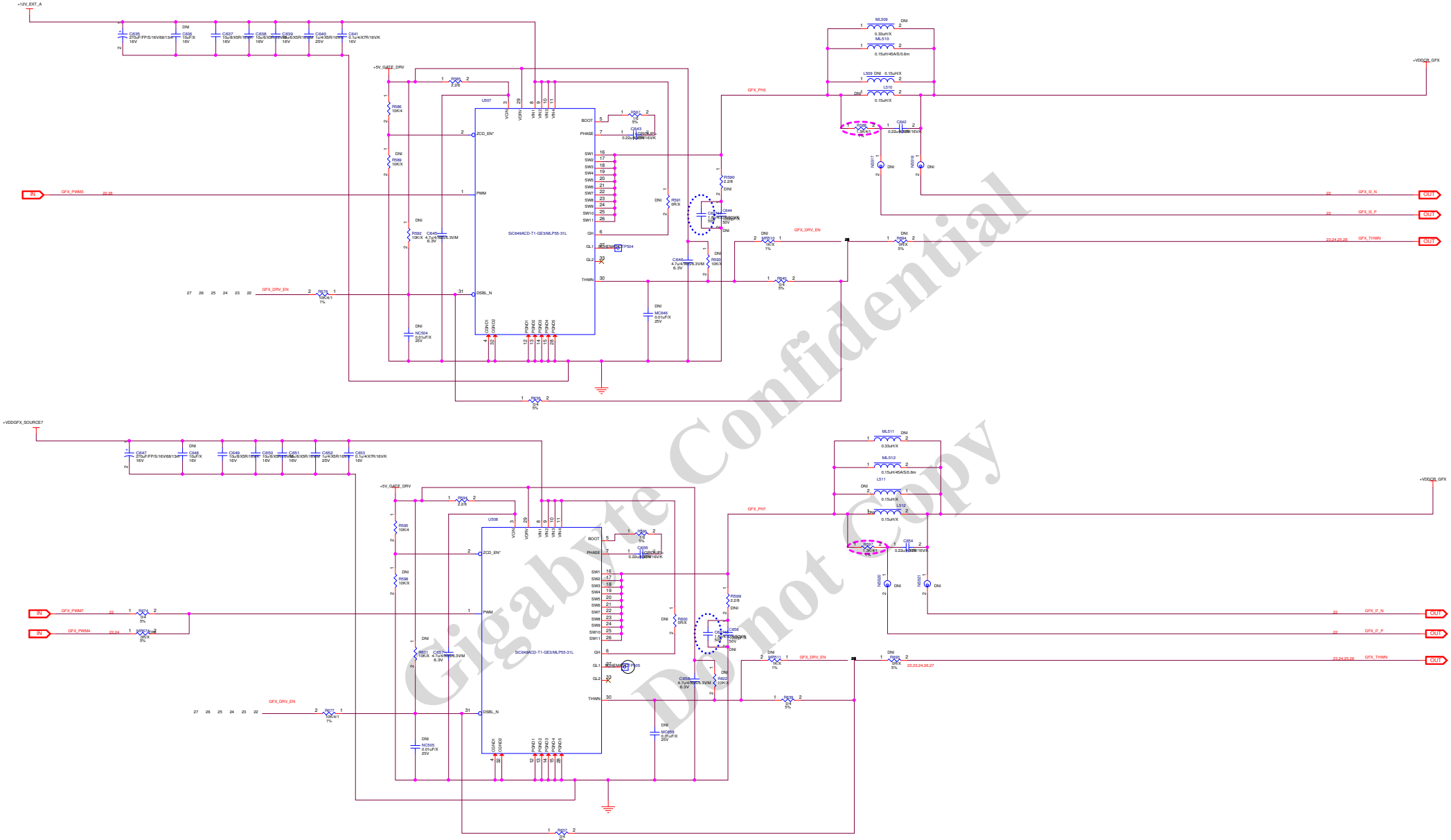
Title	<Title>	
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 23 of 42	





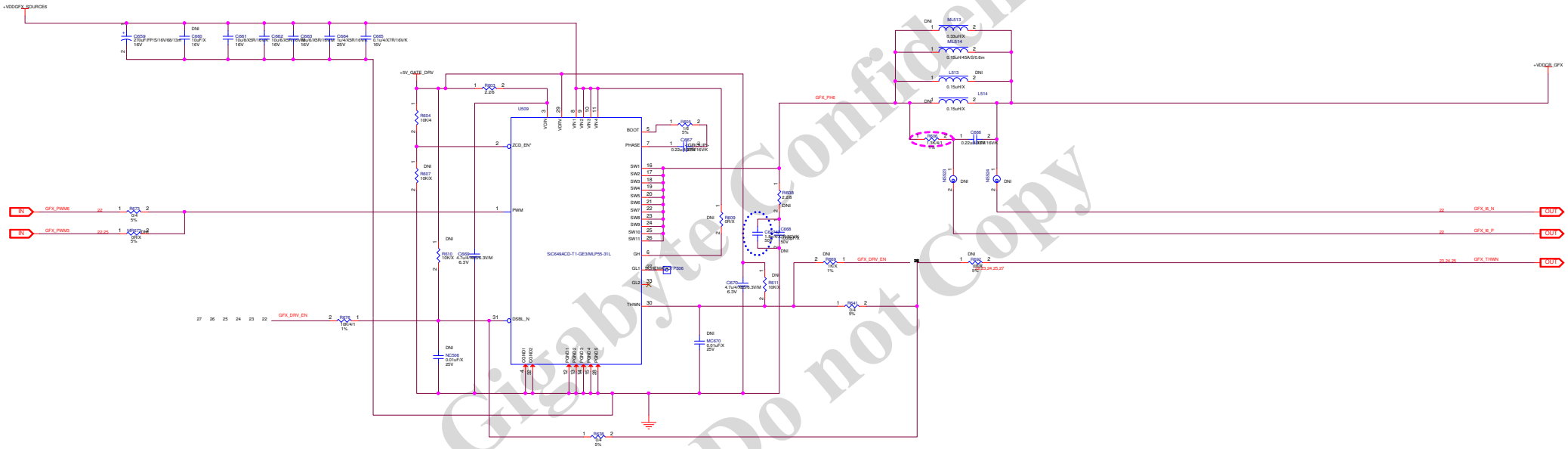
Co-Lay 0603

GIGABYTE™		
Title	<Title>	
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 24 of 42	

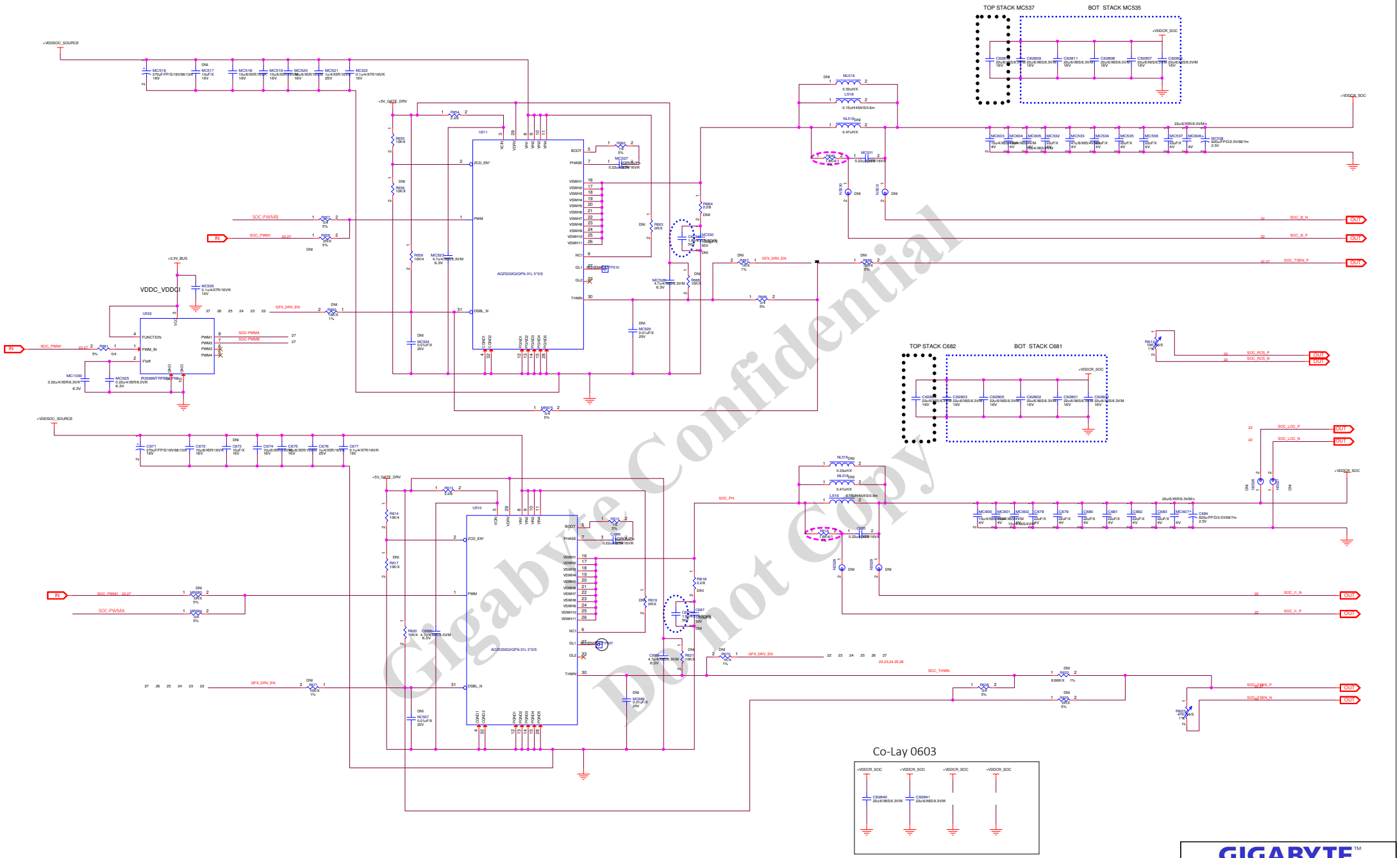


GIGABYTE™

Title	<Title>	
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 25 of 42	

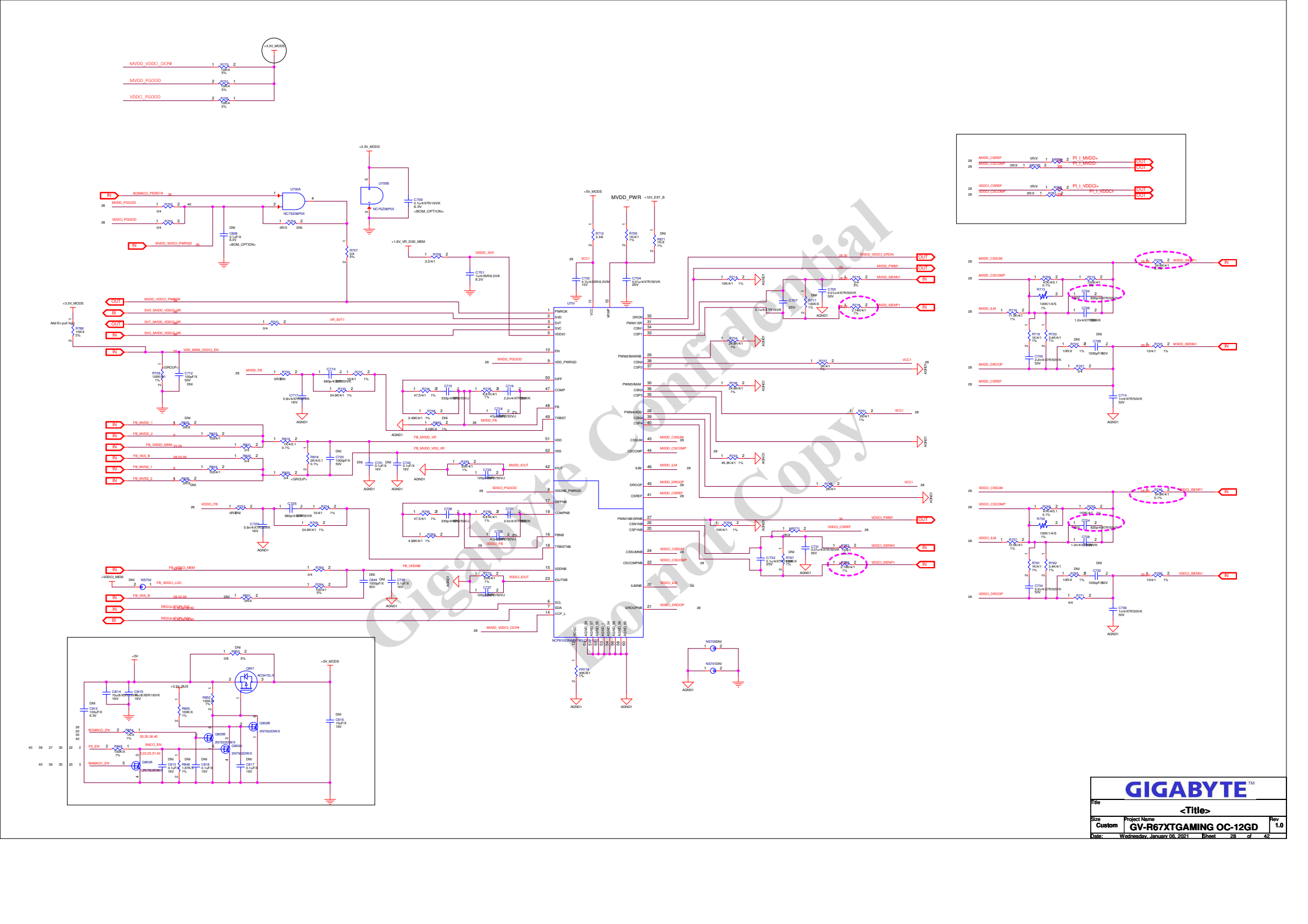


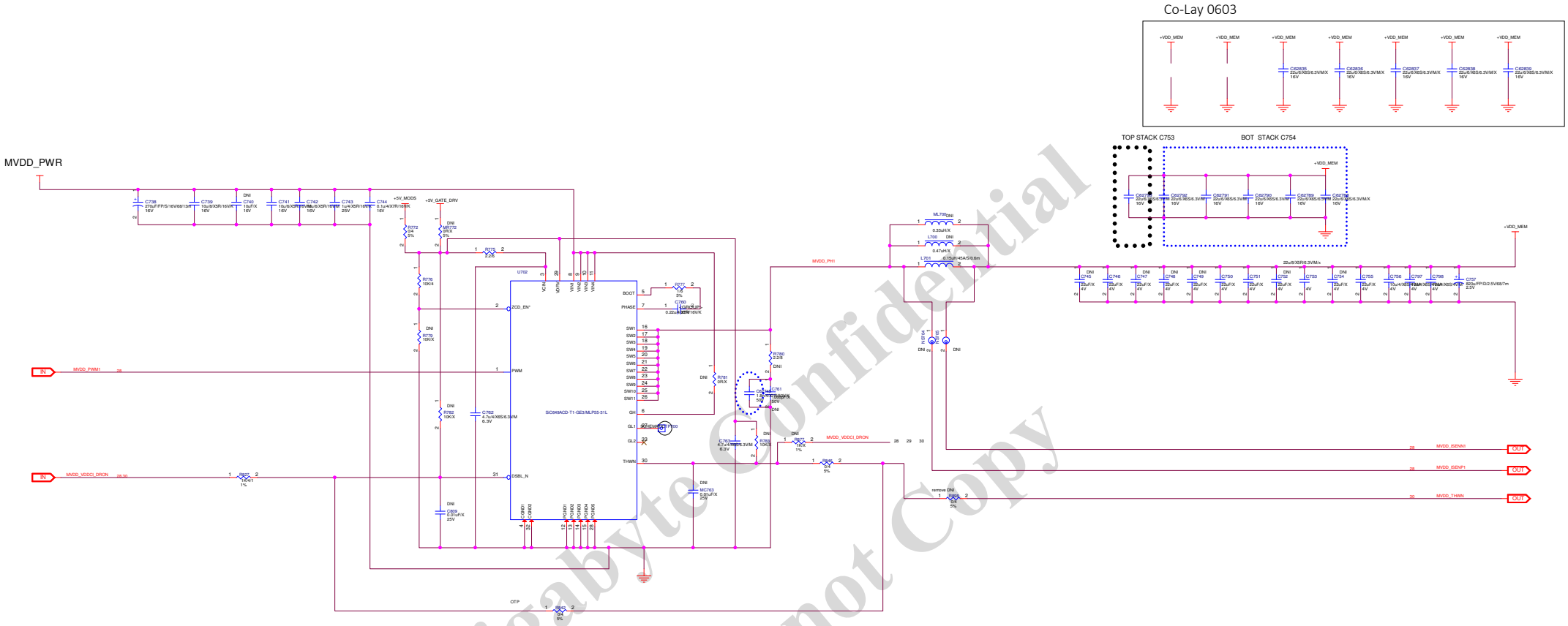
GIGABYTE™		
Title: <Title>		
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 26 of 42	



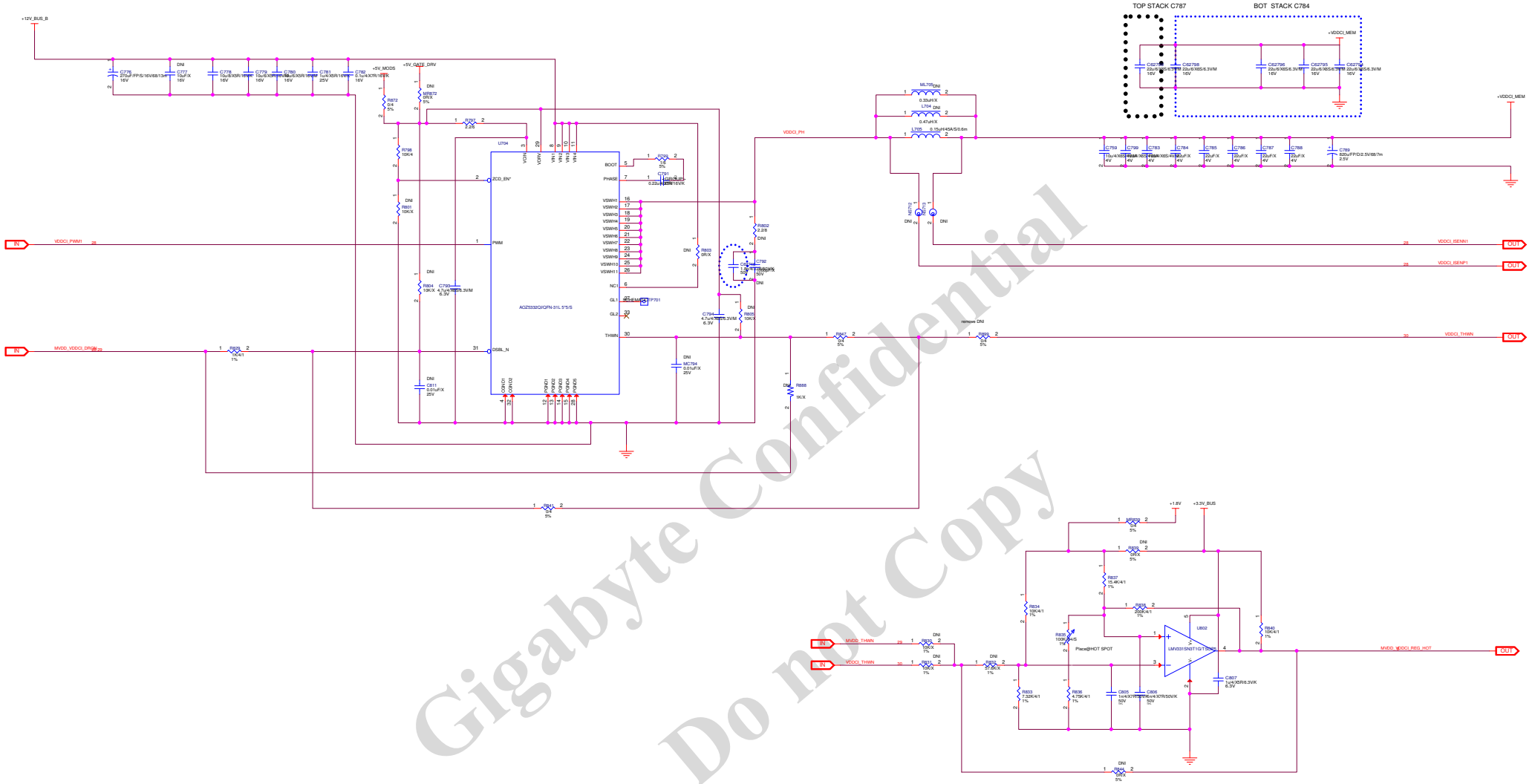
GIGABYTE™

Title	<Title>
Size	Custom
Project Name	GV-R67XTGAMING OC-12GD
Rev	1.0
Date:	Wednesday, January 06, 2021
Sheet	27 of 42


MVDD_PWR
NCP81022MNTXG
NC7SZ08P5X
Gigabyte Confidential
Do not Copy
GIGABYTE
<Title>
Custom
GV-R67XTGAMING OC-12GD
1.0
Wednesday, January 06, 2021
28
42



GIGABYTE™		
Title	<Title>	
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 29 of 42	



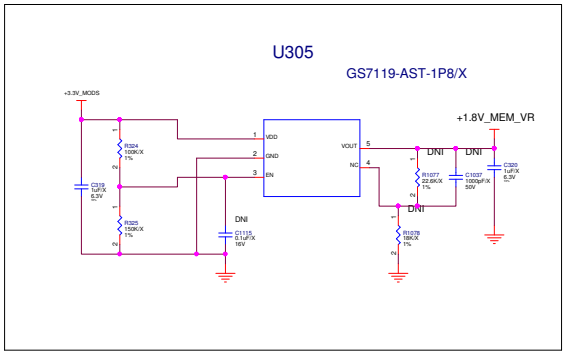
GIGABYTE™

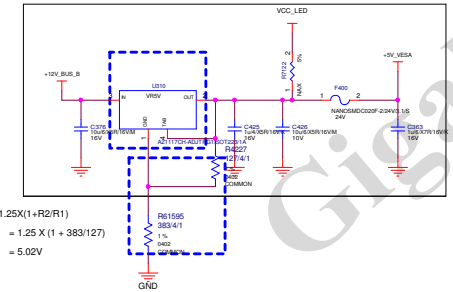
Title: <Title>

Size	Project Name	Rev
Custom	GV-R67XTGAMING OC-12GD	1.0

Date: Wednesday, January 06, 2021 Sheet 30 of 42

+1.8V FOR BOMACO





VOUT = 1.25X(1+R2/R1)

= 1.25 X (1 + 383/127)

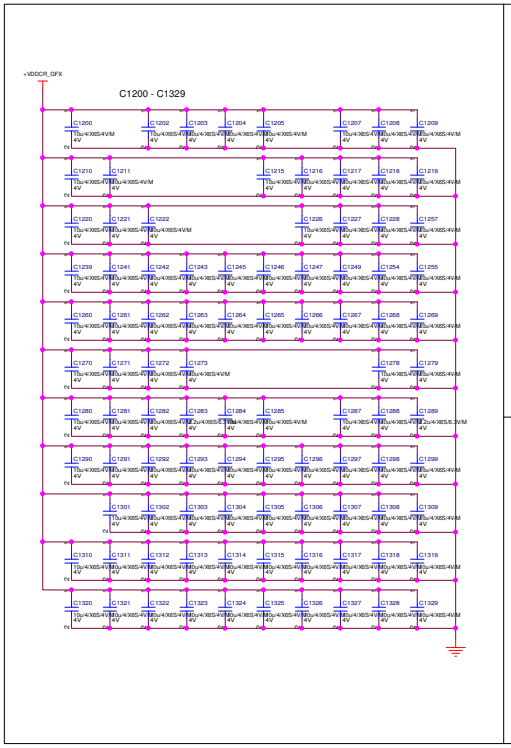
= 5.02V

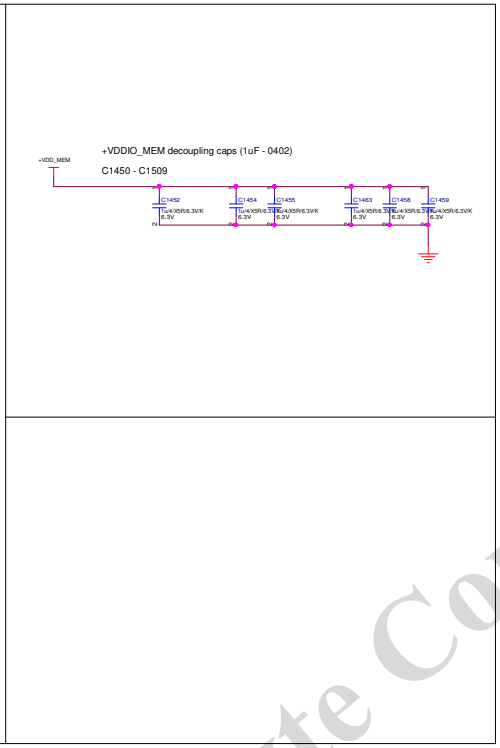
GIGABYTE™

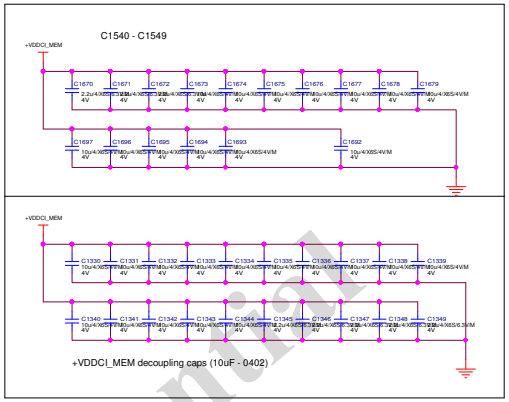
Title: <Title>

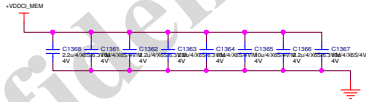
Size: Custom | Project Name: GV-R67XTGAMING OC-12GD | Rev: 1.0

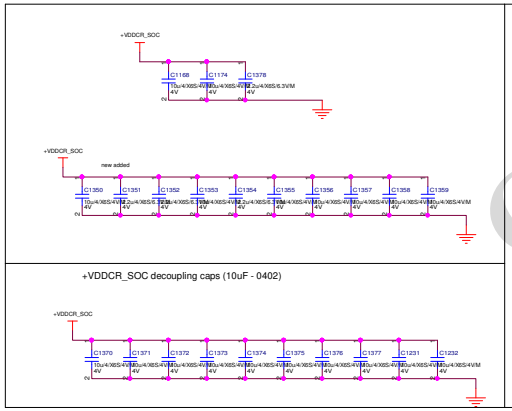
Date: Wednesday, January 06, 2021 | Sheet 31 of 42

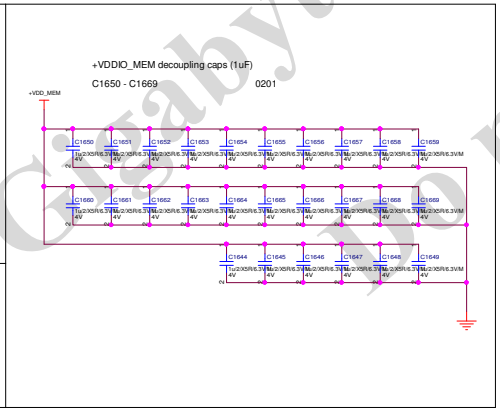


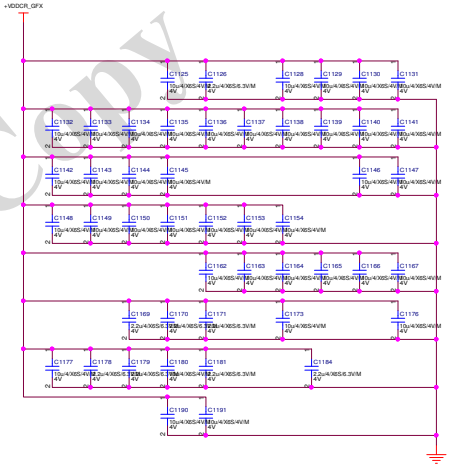


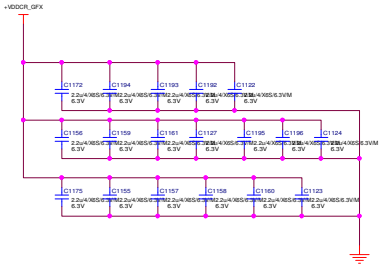




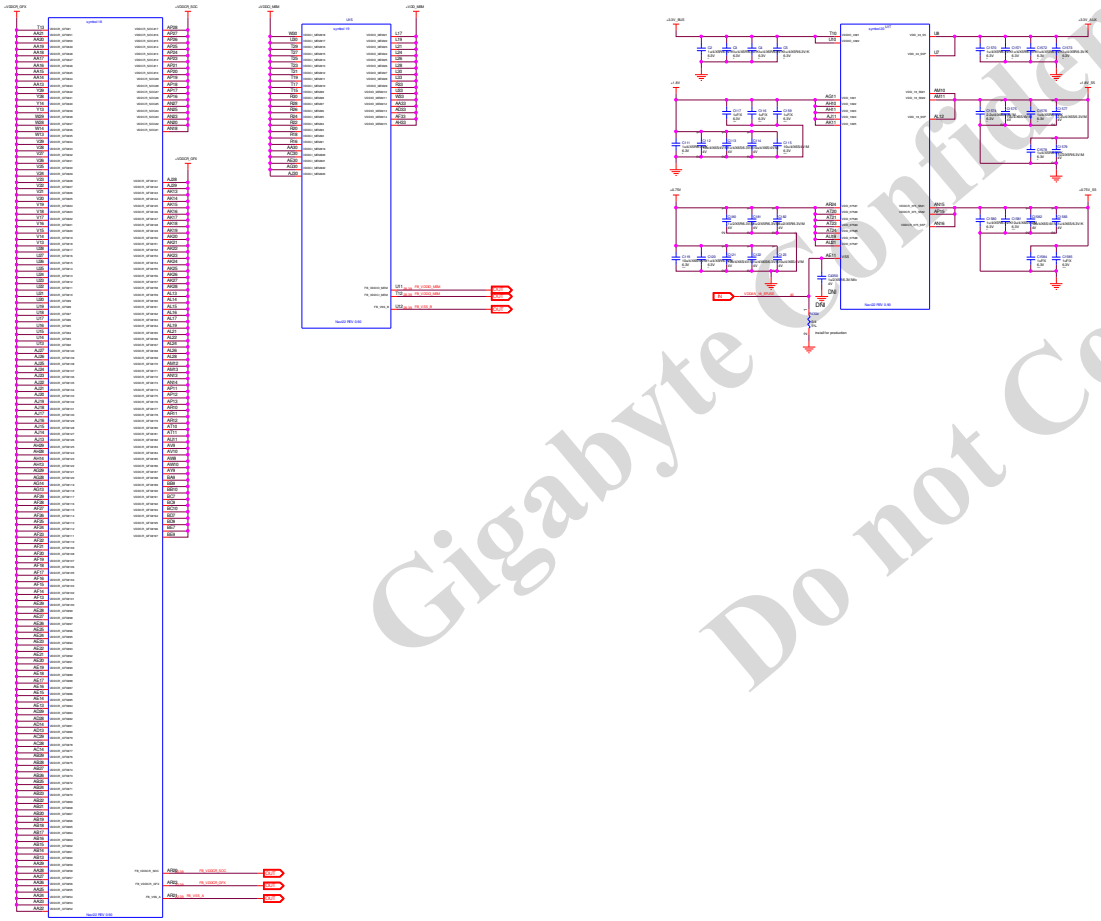




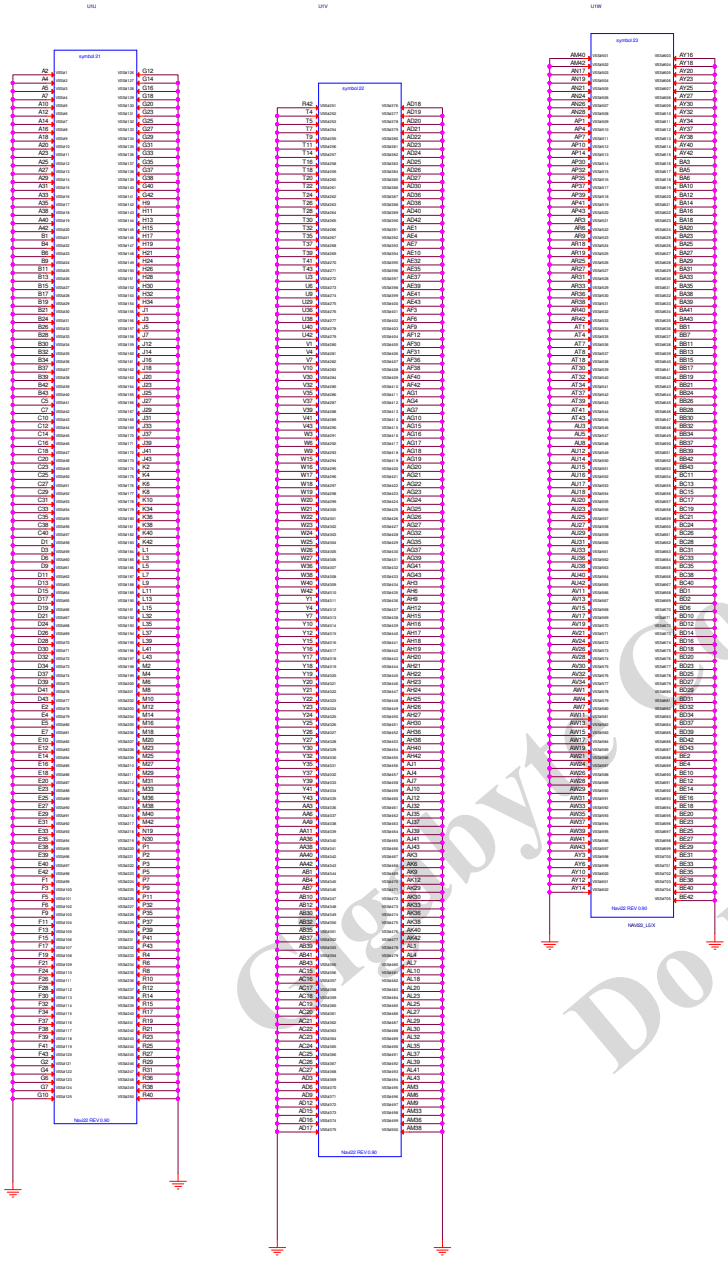




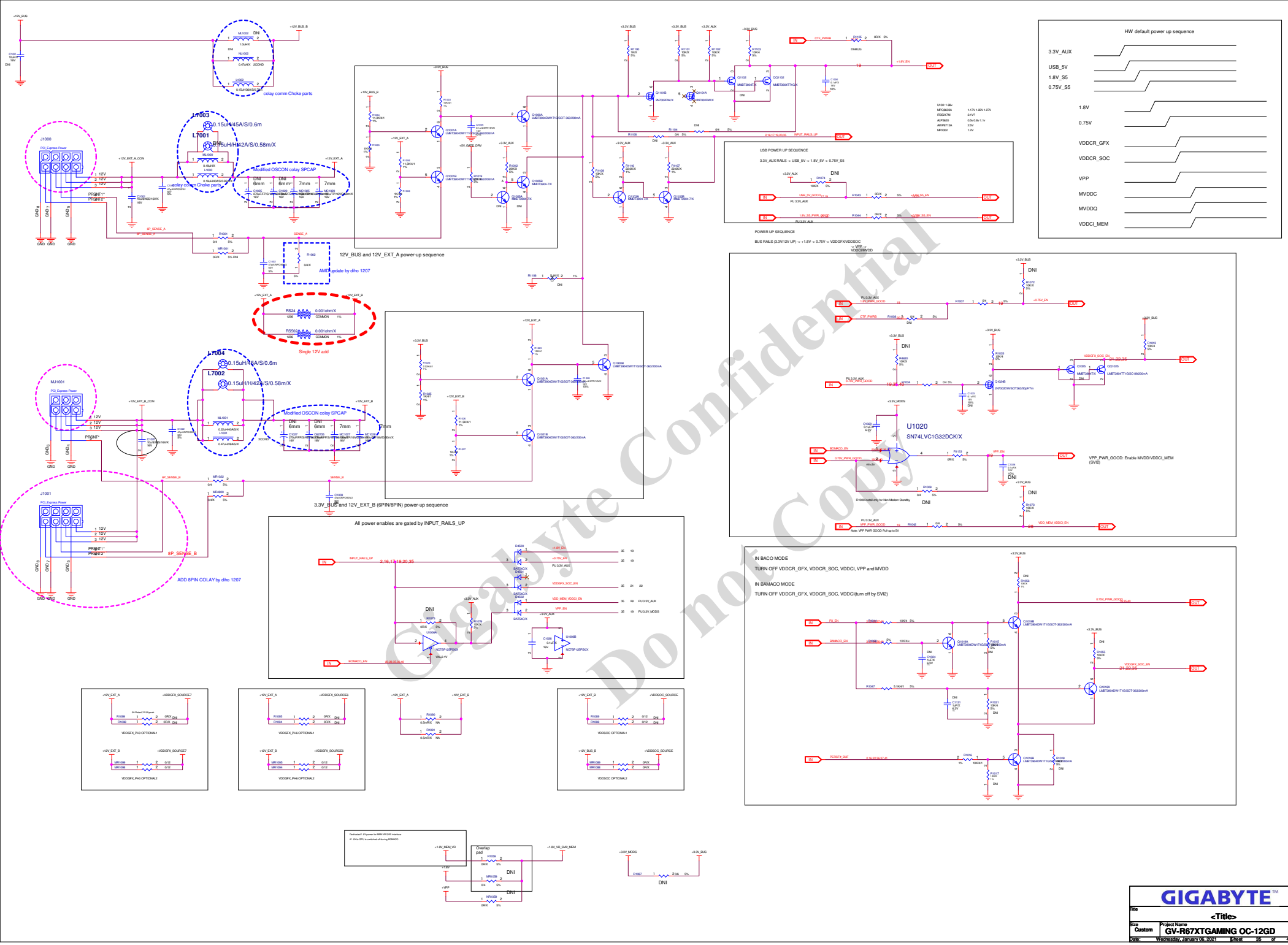
GIGABYTE™		
Title: <Title>		
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 32 of 42	



File	<Title>		
Size	Project Name		Rev
Custom	GV-R67XTGAMING OC-12GD		1.0
Date:	Wednesday, January 06, 2021	Sheet 33 of 42	



GIGABYTE™		
Title	<Title>	
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 34 of 42	


colay comm Choke parts
L7003
0.15uH/45A/S/0.6m
L7001
0.15uH/H42A/S/0.58m/X
Modified OSCON colay SPCAP
colay comm Choke parts
12V_BUS and 12V_EXT_A power-up sequence
AMD update by dlho 1207
Single 12V add
L7004
0.15uH/45A/S/0.6m
L7002
0.15uH/H42A/S/0.58m/X
Modified OSCON colay SPCAP
3.3V_BUS and 12V_EXT_B (6PIN/8PIN) power-up sequence
ADD 8PIN COLAY by dlho 1207
All power enables are gated by INPUT_RAILS_UP
HW default power up sequence
3.3V_AUX
USB_5V
1.8V_S5
0.75V_S5
1.8V
0.75V
VDDCR_GFX
VDDCR_SOC
VPP
MVDDC
MVDDQ
VDDCI_MEM
USB POWER UP SEQUENCE
3.3V_AUX RAILS -> USB_5V -> 1.8V_S5 -> 0.75V_S5
POWER UP SEQUENCE
BUS RAILS (3.3V/12V UP) -> +1.8V -> 0.75V -> VDDGFX/VDDSOC -> VPP -> VDDCI/MVDD
U1020
SN74LVC1G32DCK/X
VPP_PWR_GOOD: Enable MVDD/VDDCI_MEM (SVI2)
IN BACO MODE
TURN OFF VDDCR_GFX, VDDCR_SOC, VDDCI, VPP and MVDD
IN BAMACO MODE
TURN OFF VDDCR_GFX, VDDCR_SOC, VDDCI(turn off by SVI2)
Overlap pad
GIGABYTE
<Title>
GV-R67XTGAMING OC-12GD
Wednesday, January 06, 2021
Sheet 35 of 42
Rev 1.0
Gigabyte Confidential
Do not Copy

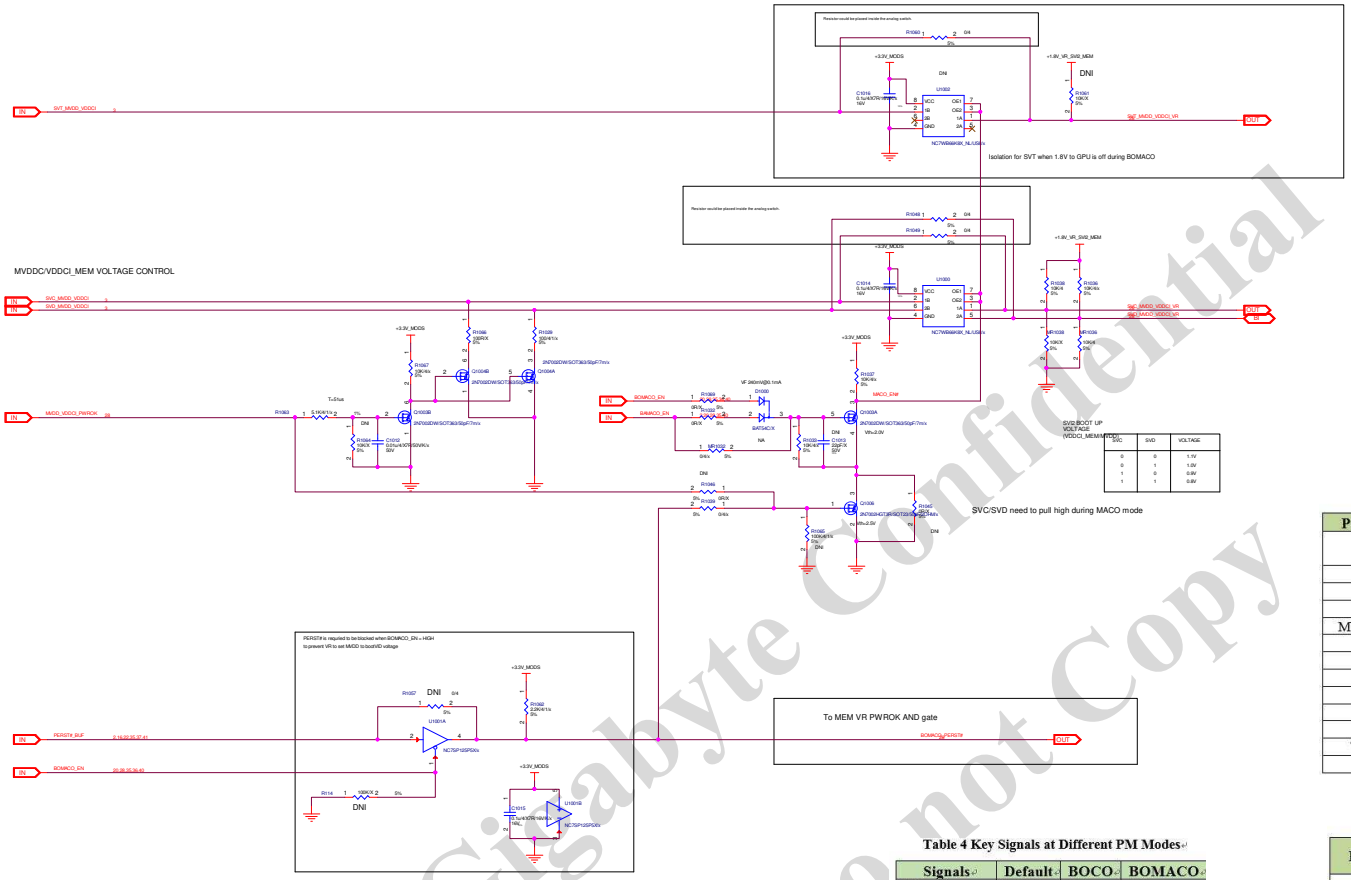


Table 3 Power Rails Status at BAMACO Mode

Power Rail at ASIC	Used logic	ON/OFF Status
VDDCR_GFX	GFX IP, SDMA, GFXCLK CLKIP	OFF
VDDCR_SOC	SYS IPs	OFF
VDDCI_MEM	MEM PHY	OFF
VDDIO_MEM	MEM PHY	ON
MVDDC/MVDDQ/VPP	DRAM	ON
VDDCR_BACO	NBIO/THM/MP1/USB	ON
VDDIO_PCIE	PCIe PHY	ON
VDDAN_C	PHY	ON
VDDAN_18	PLL, PHY, etc	ON
VDDIO_18	1.8V GPIO, I2C, etc	ON
VDDIO_33	3.3V GPIO	ON
VDDAN_*_EFUSE	EFUSE	ON
VDDCR_S5*	USB	ON

Table 4 Key Signals at Different PM Modes

Signals	Default	BOCO	BOMACO
PX_EN	LOW	N/A	N/A
MACO_EN	N/A	N/A	N/A
PERSTb	HIGH	1->0->1	1->0->1
PWR_EN	HIGH	LOW	LOW
BOMACO_EN	LOW	LOW	HIGH

Table 5 Platform to Support BOMACO

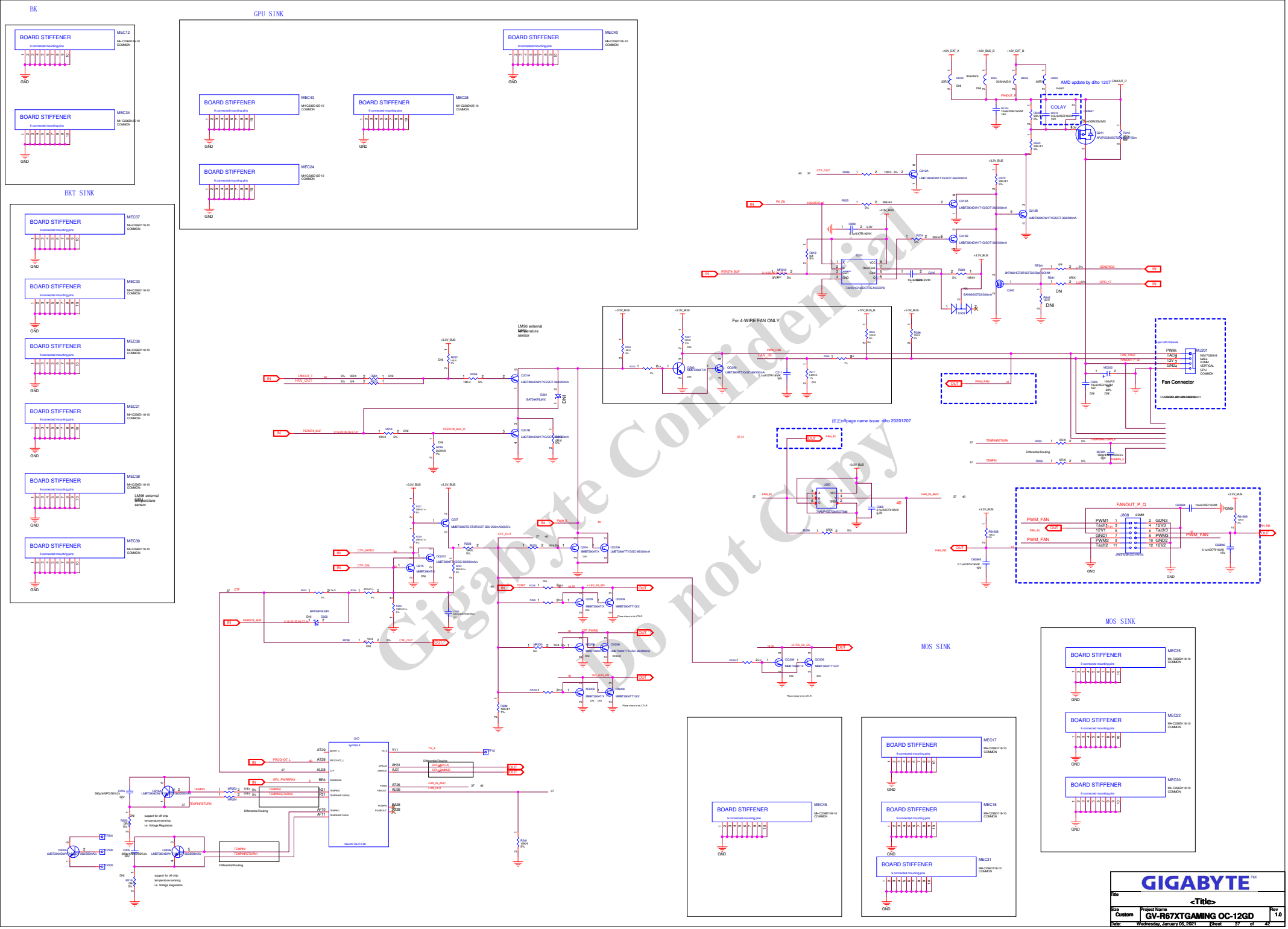
BOMACO_EN	SVC PU/PD	SVD PU/PD
HIGH	PU	PU
LOW	bootVID	bootVID

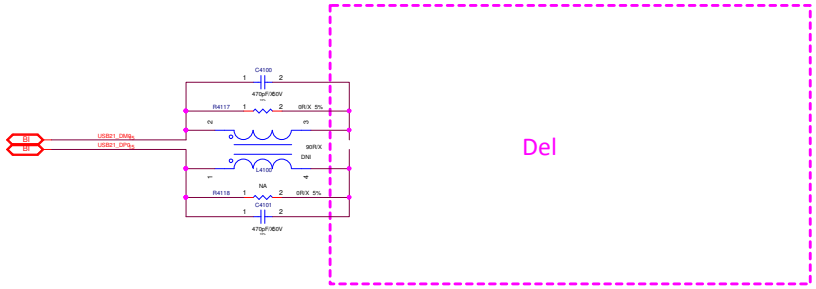
Table 3 Power Rails Status at BOMACO Mode

Power Rail at ASIC	Used logic	ON/OFF Status for BOMACO-A
VDDCR_GFX	GFX IP, SDMA, GFXCLK CLKIP	OFF
VDDCR_SOC	SYS IPs	OFF
VDDCI_MEM	MEM PHY	OFF
VDDIO_MEM	MEM PHY	ON
MVDDC/MVDDQ/VPP	DRAM	ON
VDDCR_BACO	NBIO/THM/MP1/USB	OFF
VDDIO_PCIE	PCIe PHY	OFF
VDDAN_C	PHY	OFF
VDDAN_18	PLL, PHY, etc	OFF
VDDIO_18	1.8V GPIO, I2C, etc	OFF
VDDIO_33	3.3V GPIO	OFF
VDDAN_*_EFUSE	EFUSE	OFF
VDDCR_S5*	USB	ON

GIGABYTE

Title	<Title>	
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 36 of 42	





RADEON Lightbar header

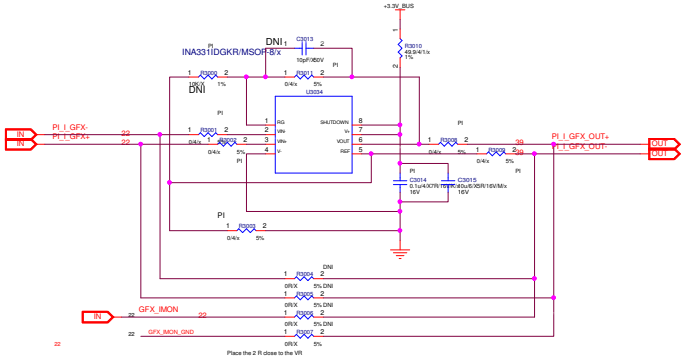
Del

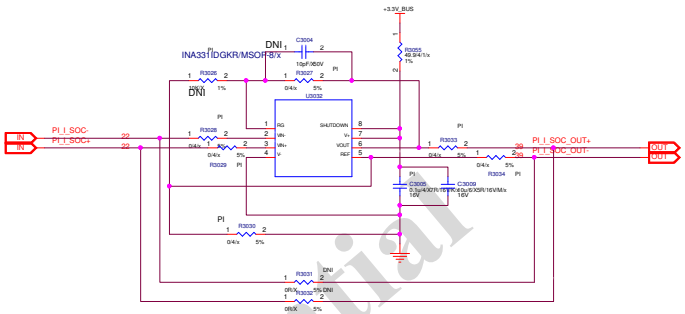
GIGABYTE™

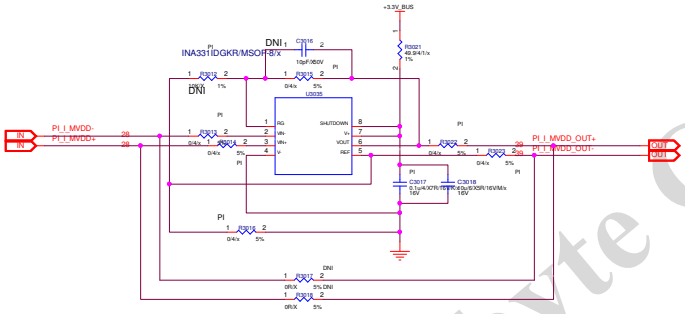
Title: <Title>

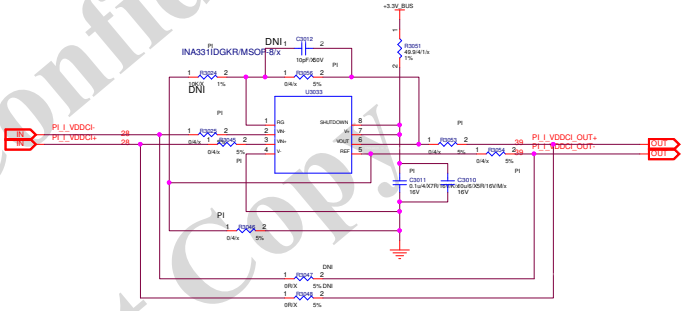
Size	Project Name	Rev
Custom	GV-R67XTGAMING OC-12GD	1.0

Date: Wednesday, January 06, 2021 Sheet 38 of 42

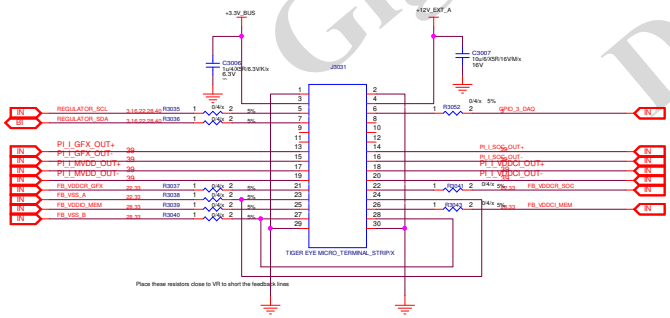






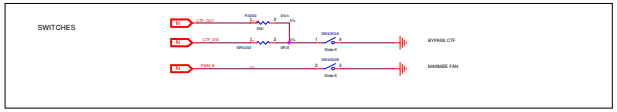


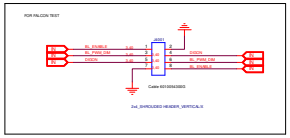
FOR PI DAUGHTER CARD

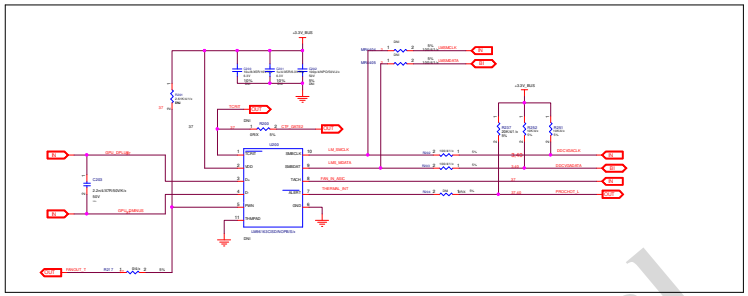


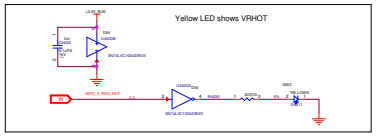
GIGABYTE™

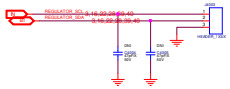
Title	<Title>	
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 39 of 42	

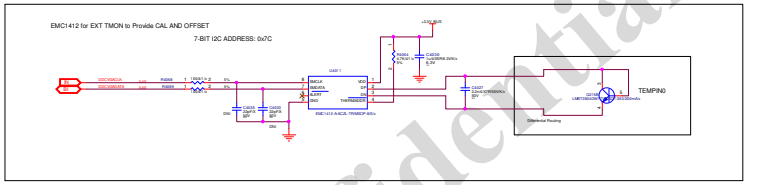


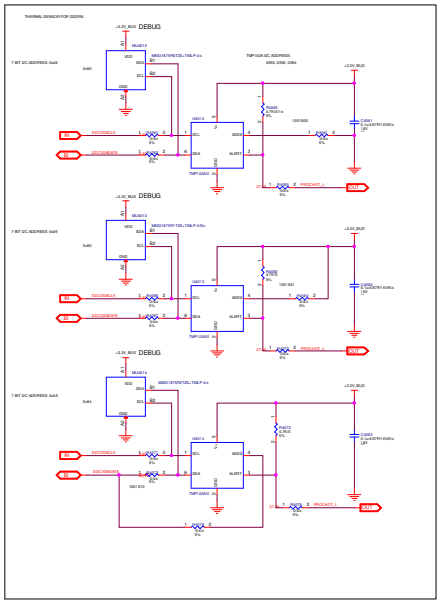


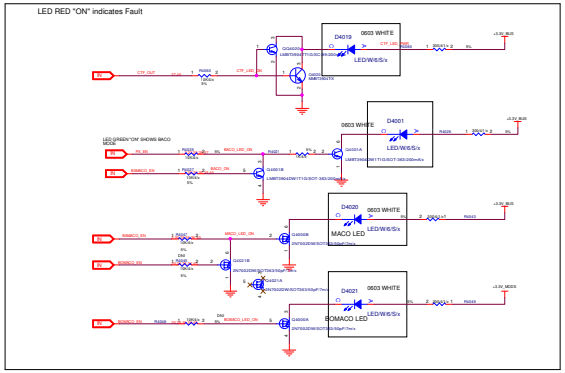


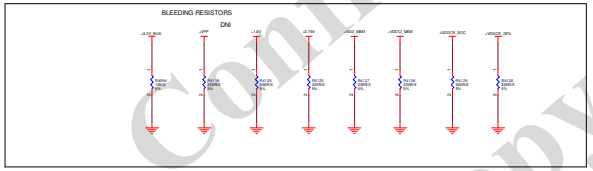


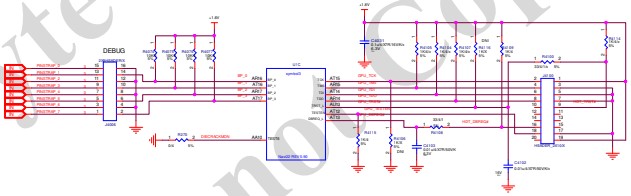


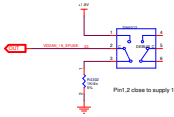


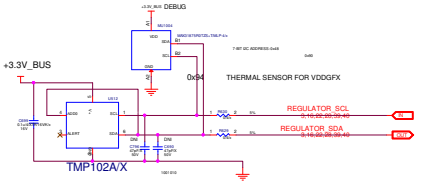


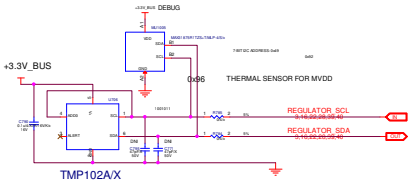


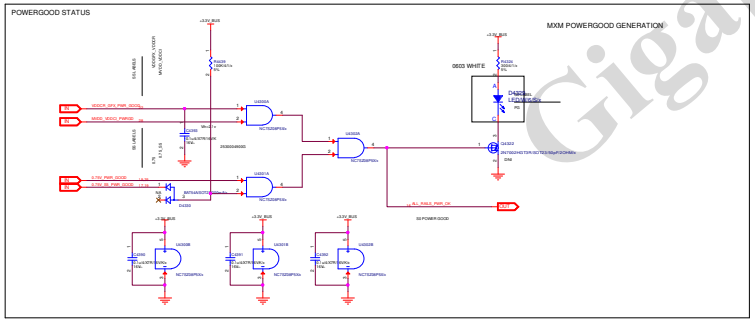








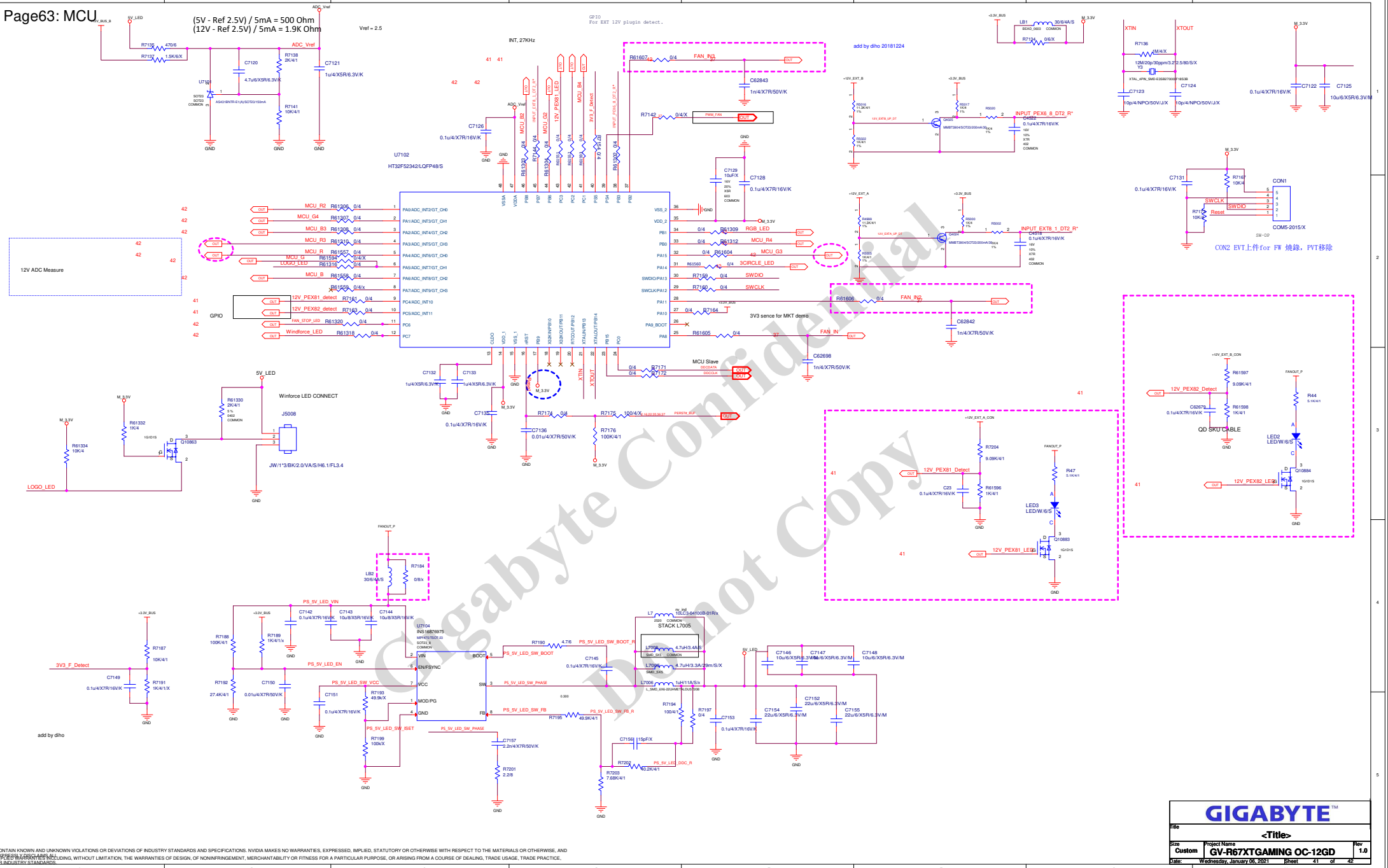




GIGABYTE

File	<Title>	
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 40 of 42	

Page63: MCU

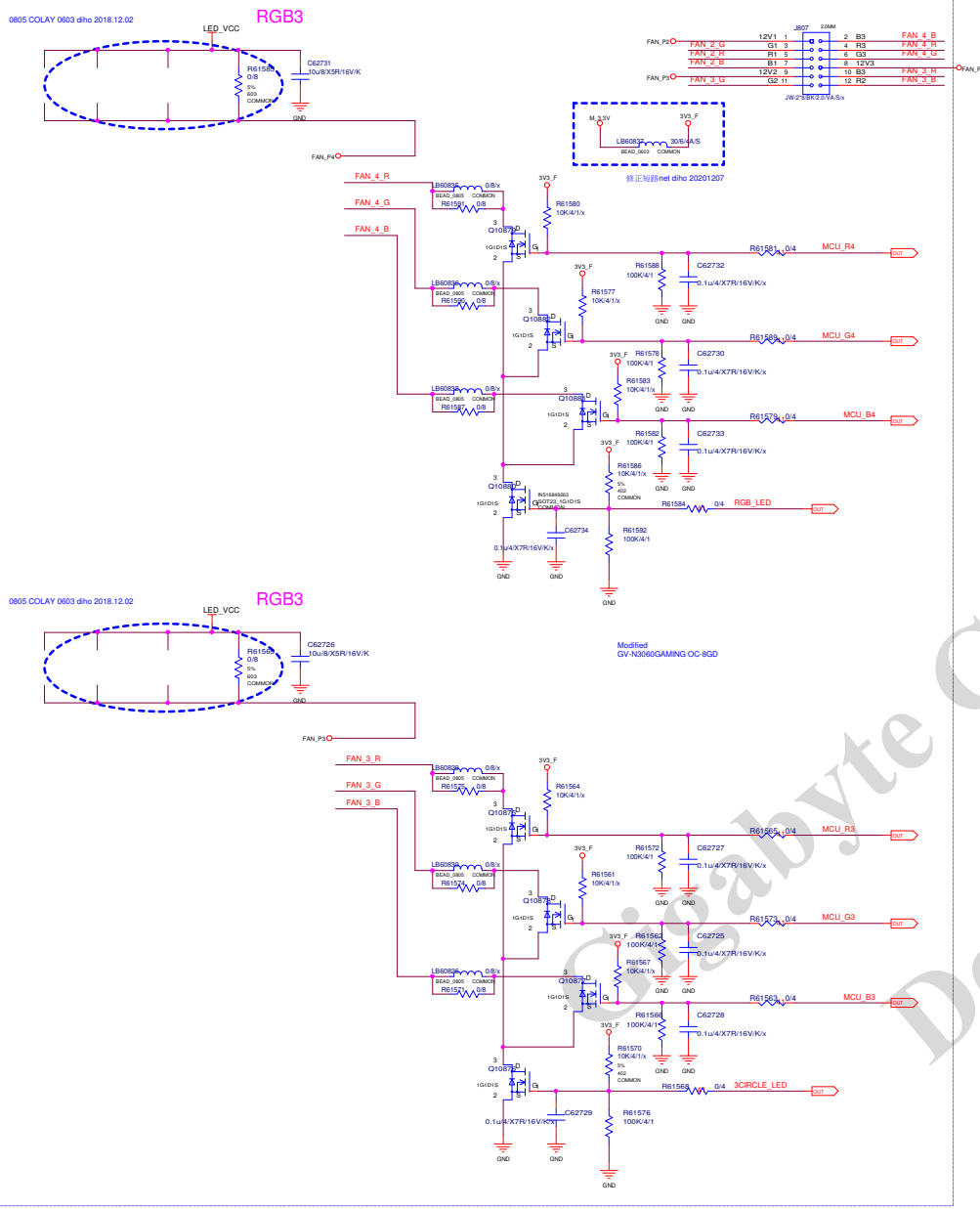


CONTAIN KNOWN AND UNKNOWN VIOLATIONS OR DEVIATIONS OF INDUSTRY STANDARDS AND SPECIFICATIONS. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS OR OTHERWISE, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF DESIGN, OF NONINFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

GIGABYTE™

Title	<Title>	
Size: Custom	Project Name: GV-R67XTGAMING OC-12GD	Rev: 1.0
Date: Wednesday, January 06, 2021	Sheet 41 of 42	

Page40: LED_LED



ASSEMBLY
PAGE DETAIL
<ASSEMBLY_DESCRIPTION>
MECH

GIGABYTE™

Title: <Title>

Size	Project Name	Rev
Custom	GV-R67XTGAMING OC-12GD	1.0
Date: Wednesday, January 06, 2021	Sheet 42 of 42	