

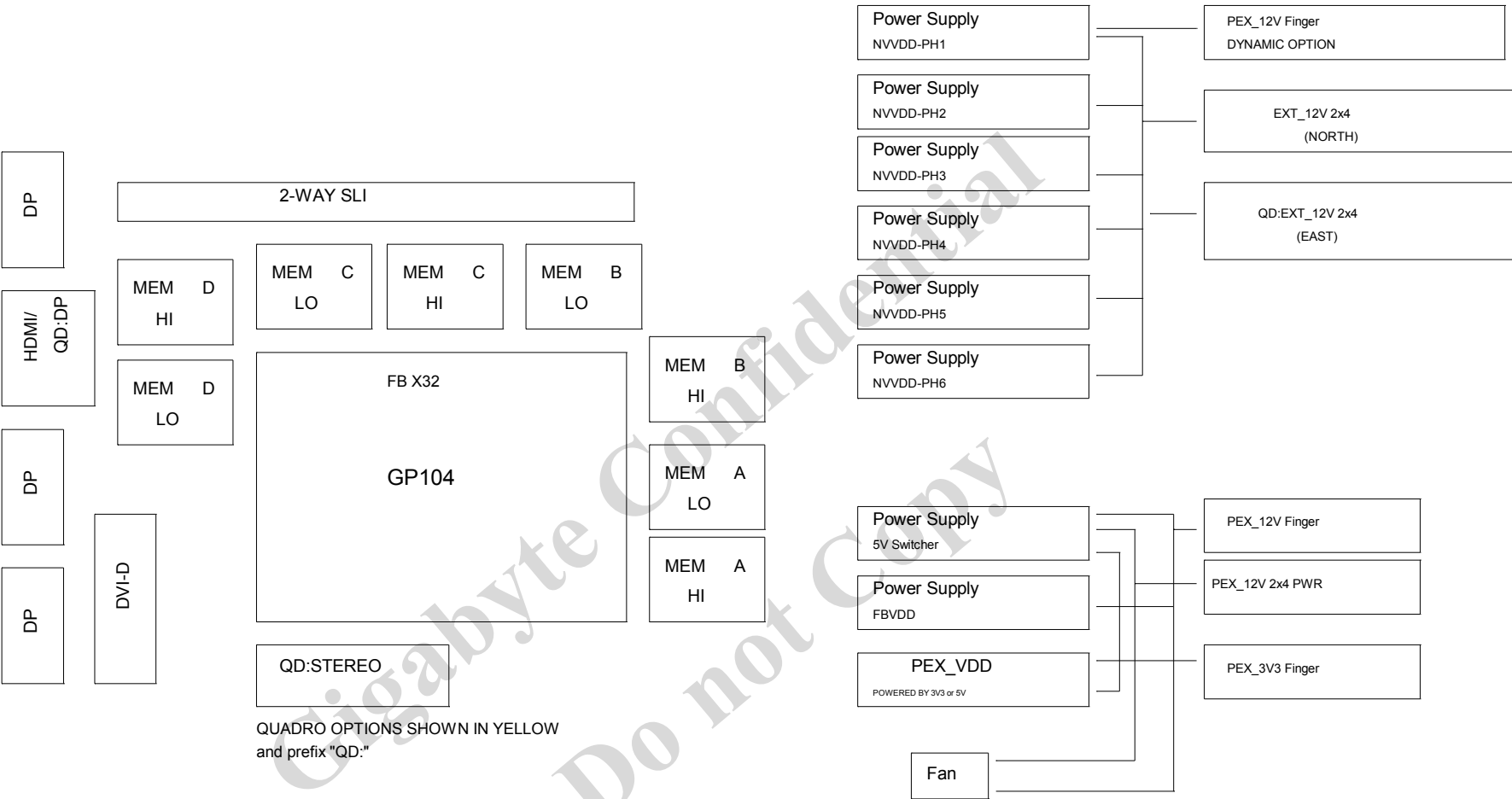
PG411 A01

GP104 - 8GB GDDR5, 256b, 256Mx32
Tall DVI-D + DP + DP + DP/HDMI + DP

TABLE OF CONTENTS

Page	Description	Page	Description
1	Table of Contents	26	PS: FBVDD
2	Block Diagram	27	PS: NVVDD_OVR8
3	PCI Express	28	PS: Blank Page
4	MEMORY: GPU Partition A/B	29	PS: NVVDD Phase 1-4
5	MEMORY: FBA[31:0]	30	PS: NVVDD Phase 5 & 6
6	MEMORY: FBA[63:32]	31	PS: Blank Page
7	MEMORY: FBB[31:0]	32	PS: Dynamic Power Balance Phases
8	MEMORY: FBB[63:32]	33	PS: Dynamic Power Balance Logic
9	MEMORY: GPU Partition C/D	34	PS: NV3V3, NV12V
10	MEMORY: FBC[31:0]	35	PS: Inputs, Filtering, and Monitoring
11	MEMORY: FBC[63:32]	36	PS: Shutdown and Sequencing
12	MEMORY: FBD[31:0]	37	PS: 12V Current Steering PSI Control and LED
13	MEMORY: FBD[63:32]	38	MECH: Bracket/Thermal
14	GPU PWR and GND		
15	GPU Decoupling		
16	IFPAB DVI-D-DL		
17	IFPE DP		
18	IFPEF DP		
19	IFPC HDMI 2.0/DP		
20	IFPD DP		
21	MIOA/B Interface and Frame Lock		
22	MISC1: Fan, Thermal, JTAG, GPIO, Stereo		
23	MISC2: ROM, XTAL, Straps		
24	PS: 1V8, 1V8_AON		
25	PS: 5V, PEX_VDD		

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS OR INFORMATION (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS." THE MATERIALS MAY 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 NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.



ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS OR INFORMATION (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS." THE MATERIALS MAY 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 NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

ASSEMBLY
PAGE DETAIL

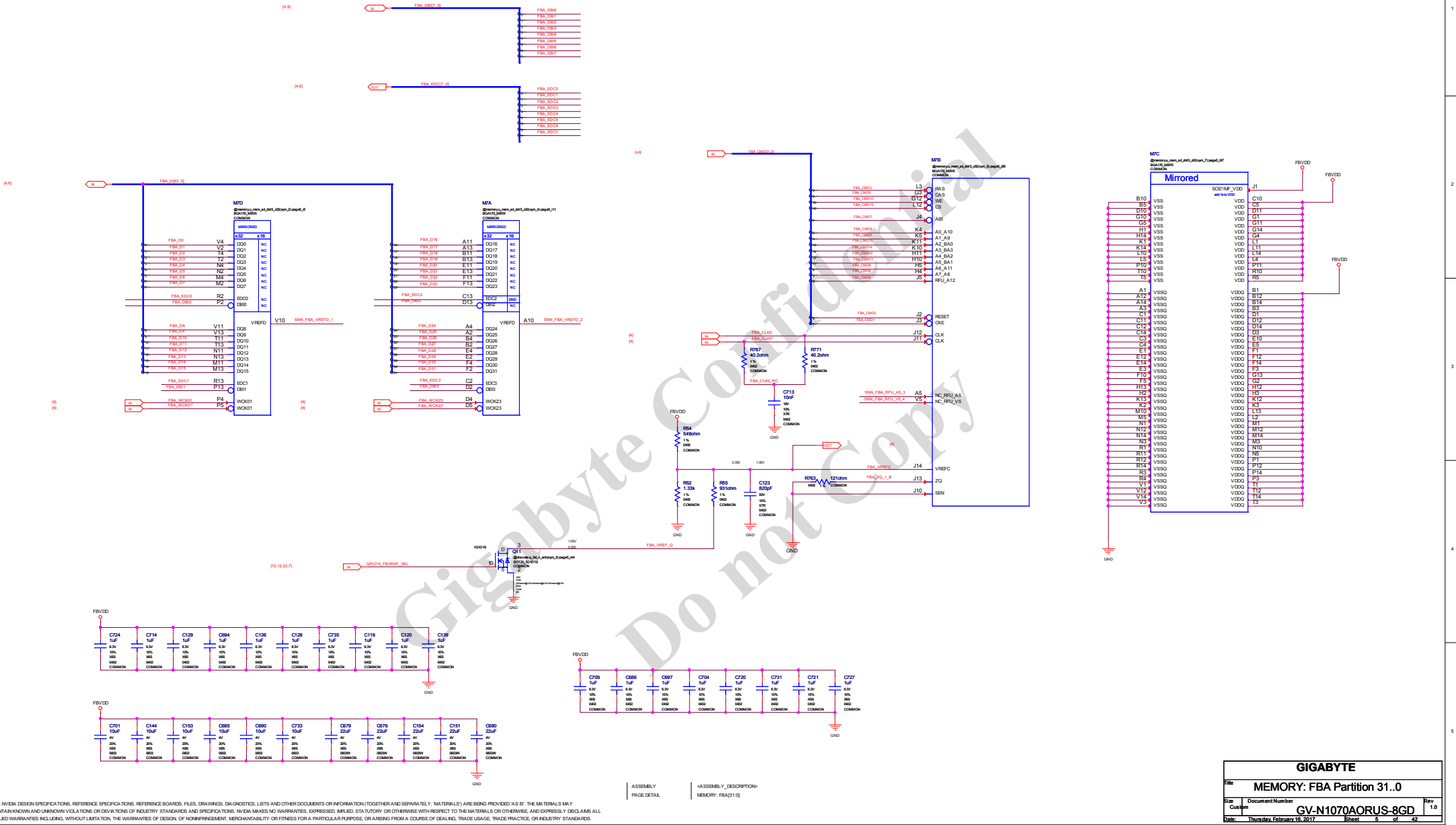
<ASSEMBLY DESCRIPTION>
Block Diagram

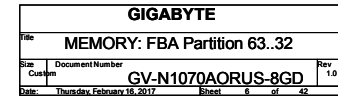
GIGABYTE			
Block Diagram			
Size	Document Number	Rev	
Custom	GV-N1070AORUS-8GD	1.0	
Date	Thursday, February 16, 2017	Sheet	2 of 42

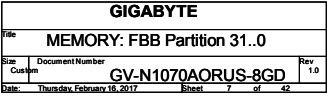


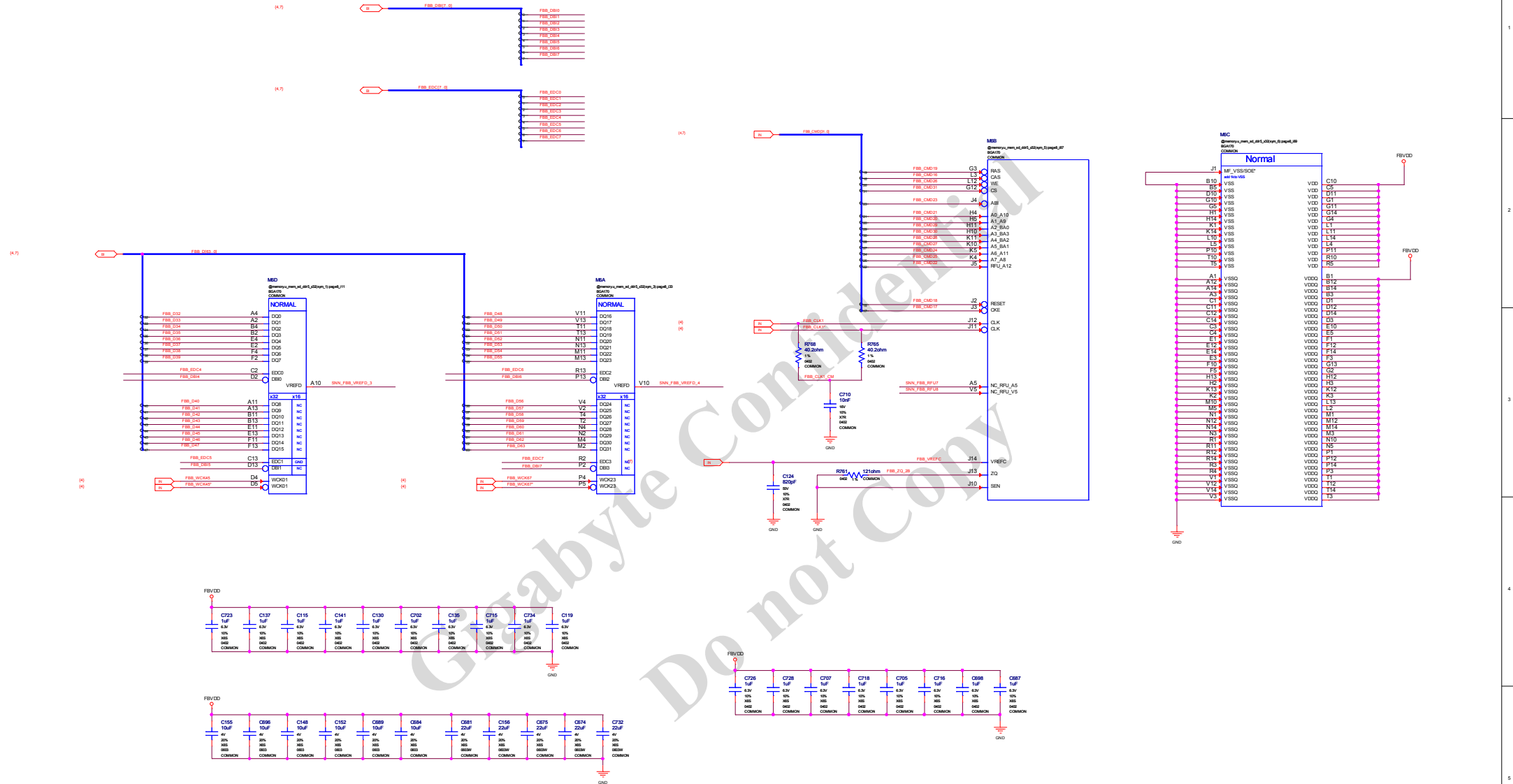
ASSEMBLY	<ASSEMBLY_DESCRIPTION>
PAGE DETAIL	PCI Express





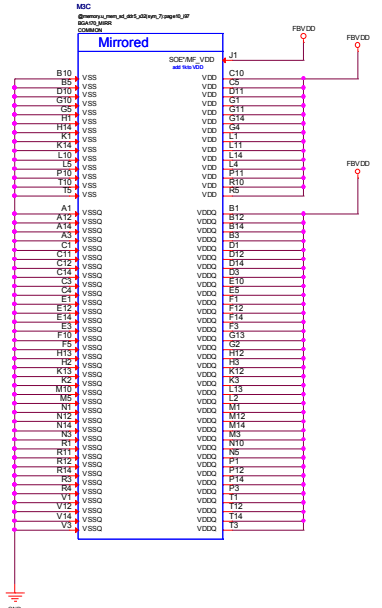




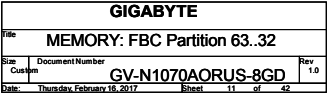


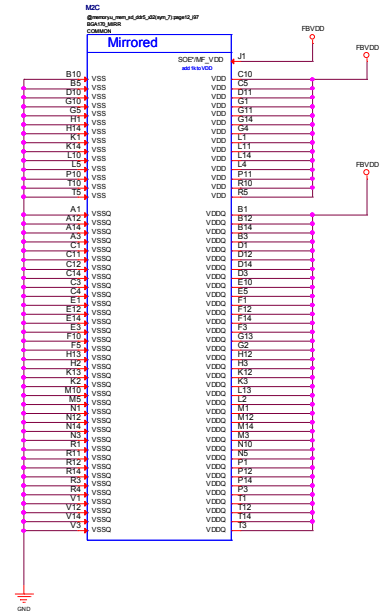
ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS OR INFORMATION (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS." THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VIOLATIONS OR DEVIATIONS OF INDUSTRY STANDARDS 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 NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.



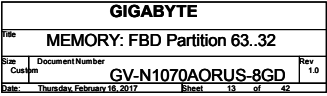


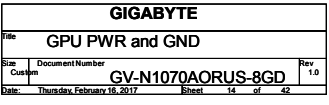
GIGABYTE			
Title: MEMORY: FBC Partition 31..0			
Size	Document Number	GV-N1070AORUS-8GD	Rev
Custom			1.0
Date: Thursday, February 16, 2017		Sheet	10 of 42

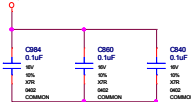




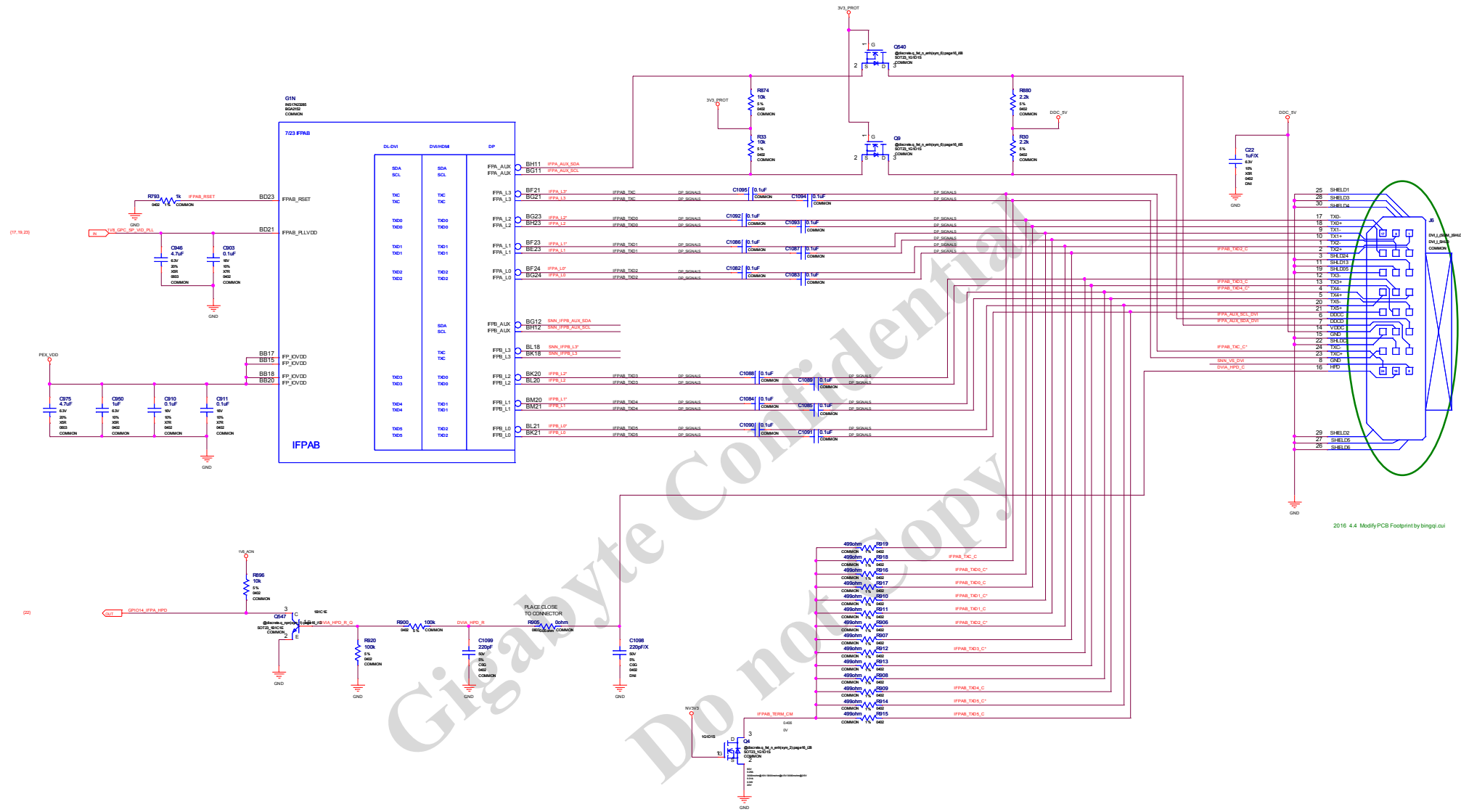
GIGABYTE			
File MEMORY: FBD Partition 31..0			
Size	Document Number		Rev
Custom	GV-N1070AORUS-8GD		1.0
Date:	Thursday, February 16, 2017	Sheet	12 of 42







ASSEMBLY	<ASSEMBLY_DESCRIPTION>
PAGE DETAIL	GPU Decoupling



ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS OR INFORMATION (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS." THE MATERIALS MAY 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 NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

ASSEMBLY
PAGE DETAIL

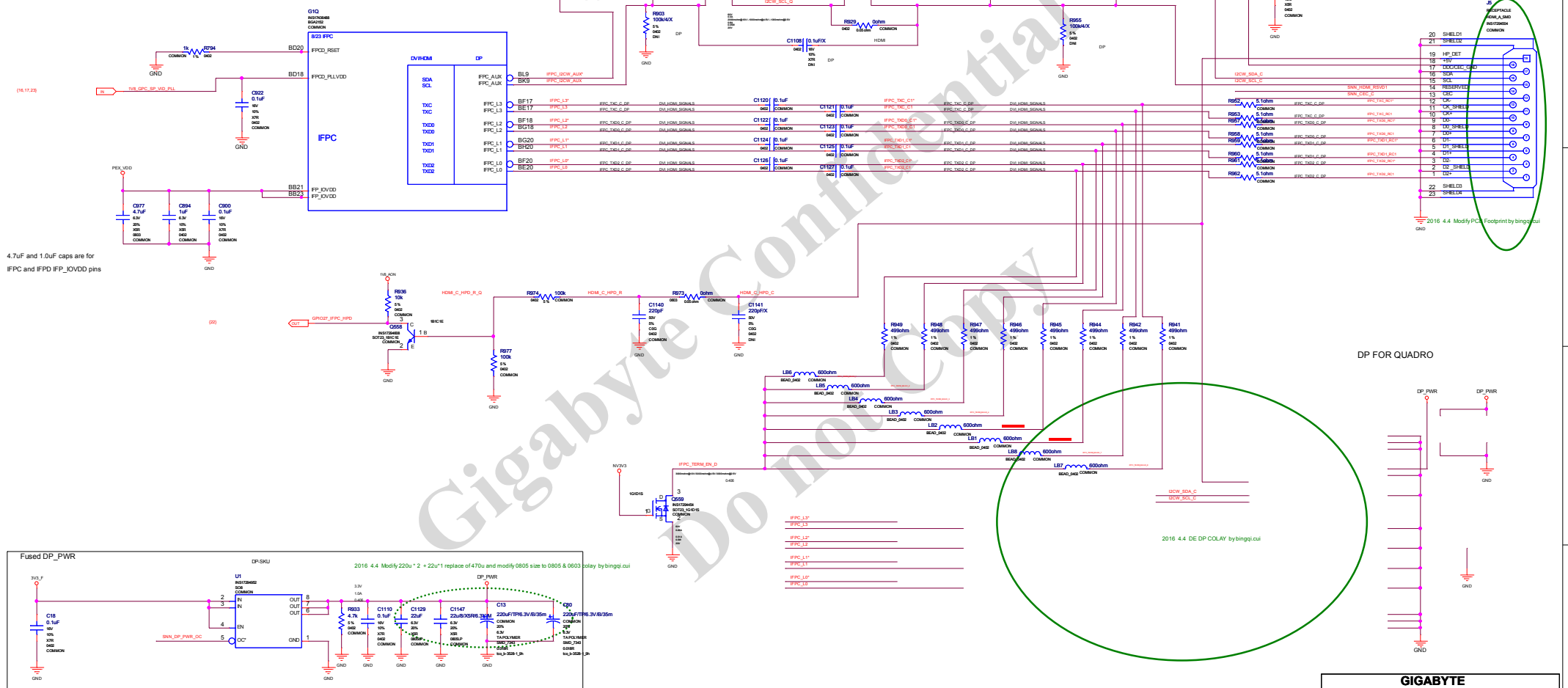
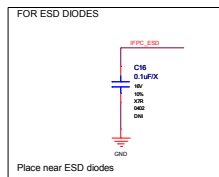
ASSEMBLY DESCRIPTION
IFPAB DVI-D-DL

GIGABYTE			
File			
IFPAB DVI-D-DL			
Size	Document Number	Rev	
Custom	GV-N1070AORUS-8GD	1.0	
Date	Thursday, February 16, 2017	Sheet	16 of 42

[illegible]

GIGABYTE			
Title IFPE DP			
Size	Document Number		Rev
Custom	GV-N1070AORUS-8GD		1.0
Date:	Thursday, February 16, 2017	Sheet	17 of 42

* Q2 to D0C level switching



1. DP AUX to DP connector: AUX AC coupled
2. DP AUX to DP-DVI dongle: AUX pass through

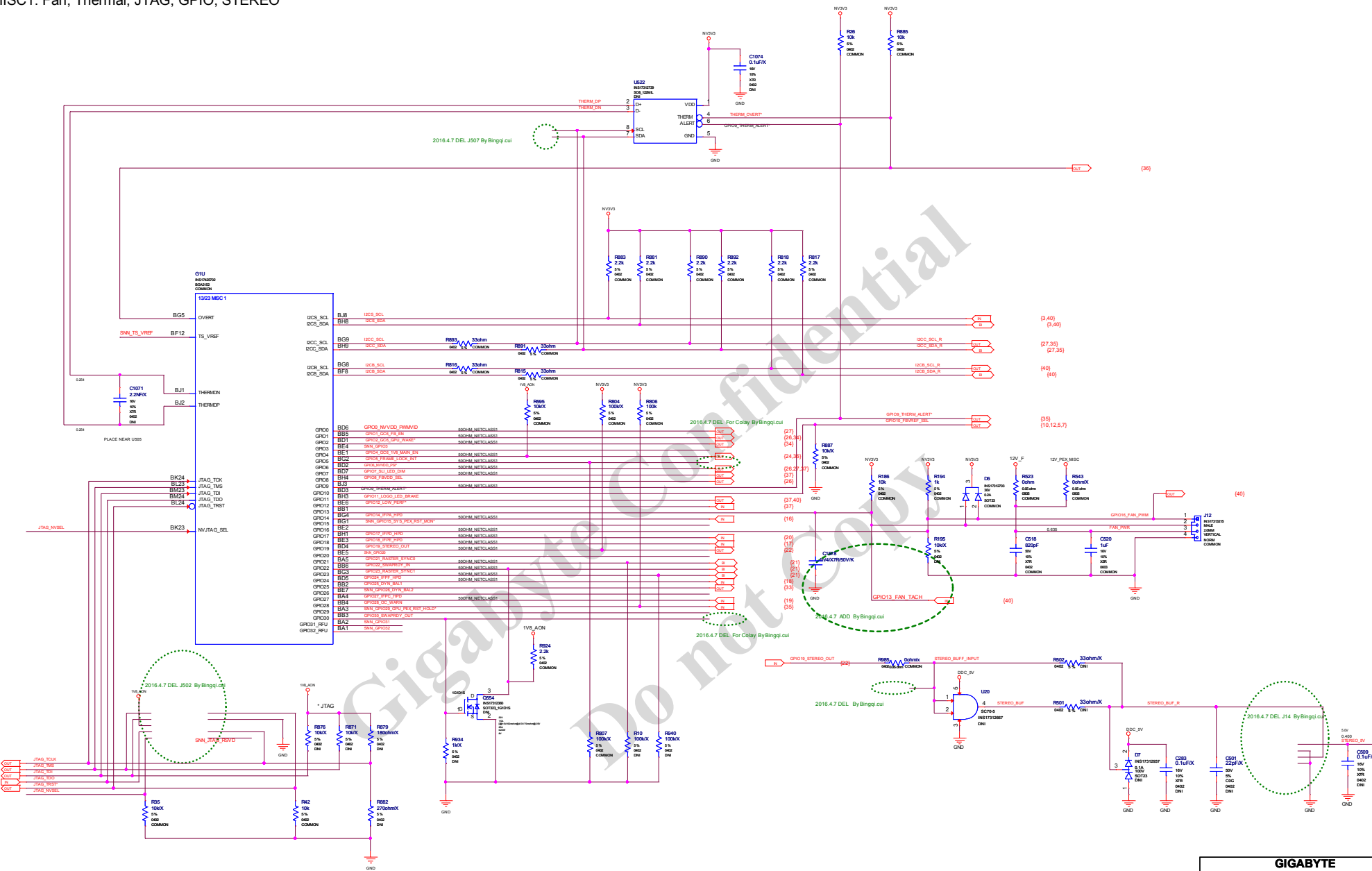


ASSEMBLY	<ASSEMBLY_DESCRIPTION>
PAGE DETAIL	IFPD CP

A	B	C	D	E	F	G	H
---	---	---	---	---	---	---	---



1
2
3
4
5



ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS." THE MATERIALS MAY 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 MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

ASSEMBLY
PAGE DETAIL

«ASSEMBLY DESCRIPTION»
MISC1: Fan, Thermal, JTAG, GPIO, Stereo

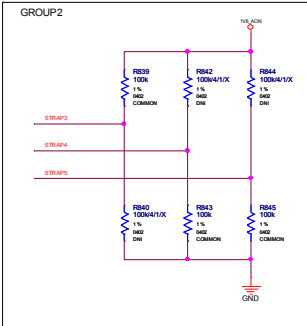
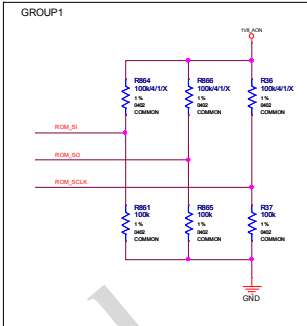
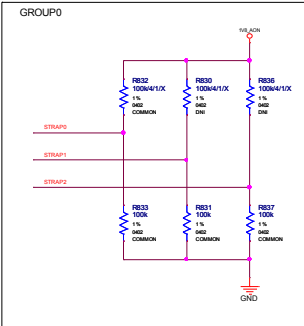
GIGABYTE			
File	MISC1: Fan, Thermal, JTAG, GPIO, STEREO		
Size	Document Number	Rev	
Customer	GV-N1070AORUS-8GD	1.0	
Date:	Thursday, February 18, 2017	Sheet	22 of 42

STRAP2	STRAP1	STRAP0	RAMCFG[4:0]
L	L	L	00000
L	H	L	00010
L	H	H	00011
H	H	L	00110
H	H	H	00111
ROM_SO	ROM_SI	ROM_SCLK	SOR_EXPOSED[3:0] 1:ENABLE 0:DISABLE
L	L	L	1111 DEFAULT SOR0/1/2/3 ENABLE
L	L	H	1110
L	H	L	1101
L	H	H	1100
H	L	L	1011
H	L	H	1010
H	H	L	1001
H	H	H	1000
L	L	M	0111
L	M	L	0110
L	M	H	0101
L	H	M	0100
H	L	M	0011
H	M	L	0010
H	M	H	0001
H	H	M	0000

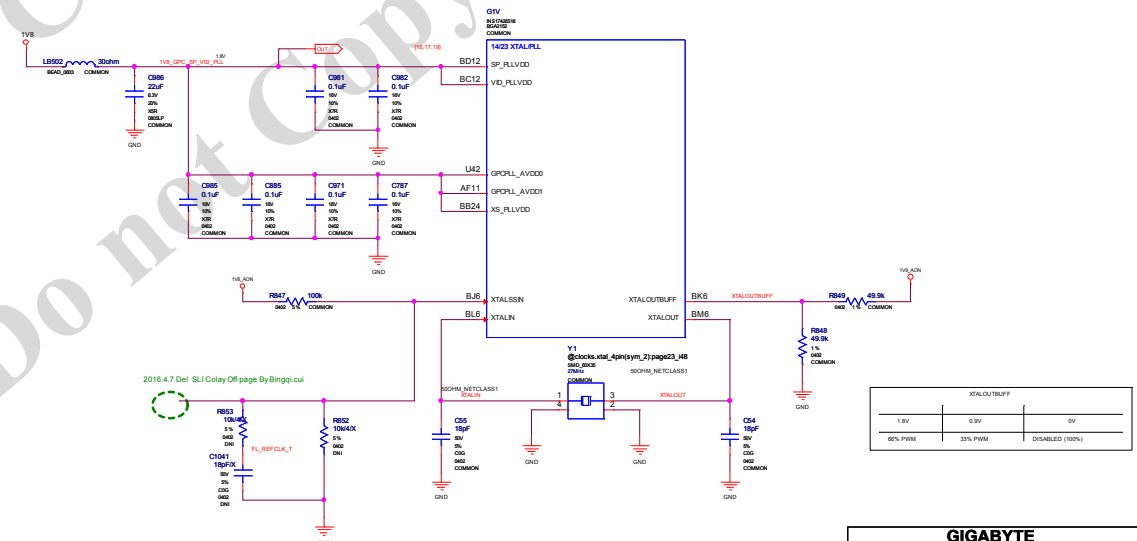
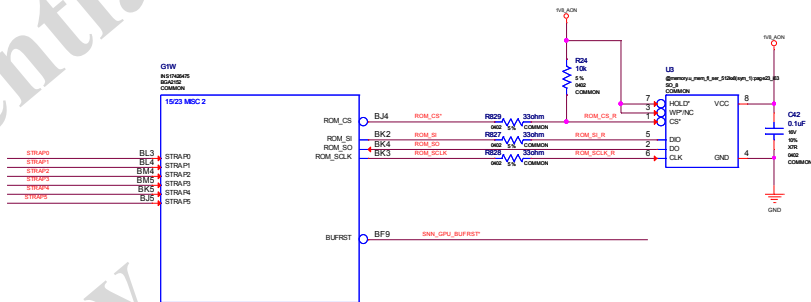
STRAP5	STRAP4	STRAP3	SMB_ALT_ADDR	DEVID_SEL	PCIE_CFG	VGA_DEVICE
M	H	H	1	1	1	1
M	H	L	1	1	1	0
M	L	H	1	1	0	1
M	L	L	1	1	0	0
L	H	M	1	0	1	1
L	M	H	1	0	1	0
L	M	L	1	0	0	1
L	L	M	1	0	0	0
H	H	H	0	1	1	1
H	H	L	0	1	1	0
H	L	H	0	1	0	1
H	L	L	0	1	0	0
L	H	H	0	0	1	1
L	H	L	0	0	1	0
L	L	H	0	0	0	1
L	L	L	0	0	0	0

H=High :Tied to 1.8V
M=Middle:Tied to 0.9V
L=Low :Tied to 0V

1:SMB_ALT_ADDR ENABLE
0:SMB_ALT_ADDR DISABLE
1:DEVID_SEL REBRAND
0:DEVID_SEL ORIGINAL
1:PCIE_CFG LOW POWER
0:PCIE_CFG HIGH POWER
1:VGA_DEVICE ENABLE
0:VGA_DEVICE DISABLE



CFG[3:0]	Config	Width	Vendor
0000	256Mx32 256-bit Samsung		
0001	256Mx32 256-bit Micron		
0010	256Mx32 256-bit Hynix		
0011	Reserved		
0100	Reserved		
0101	Reserved		
0110	Reserved		
0111	Reserved		



XTALOUTBUFF		
1.8V	0.9V	0V
85% PWM	33% PWM	DISABLED (100%)

GIGABYTE

file

MISC2: ROM, XTAL, Straps

Size

Document Number

GV-N1070AORUS-8GD

Date

Thursday, February 16, 2017

Sheet

23

of

42

Rev 1.0

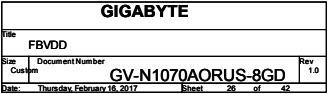
ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS OR INFORMATION (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS". THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VIOLATIONS OR DEVIATIONS OF INDUSTRY STANDARDS 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 NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

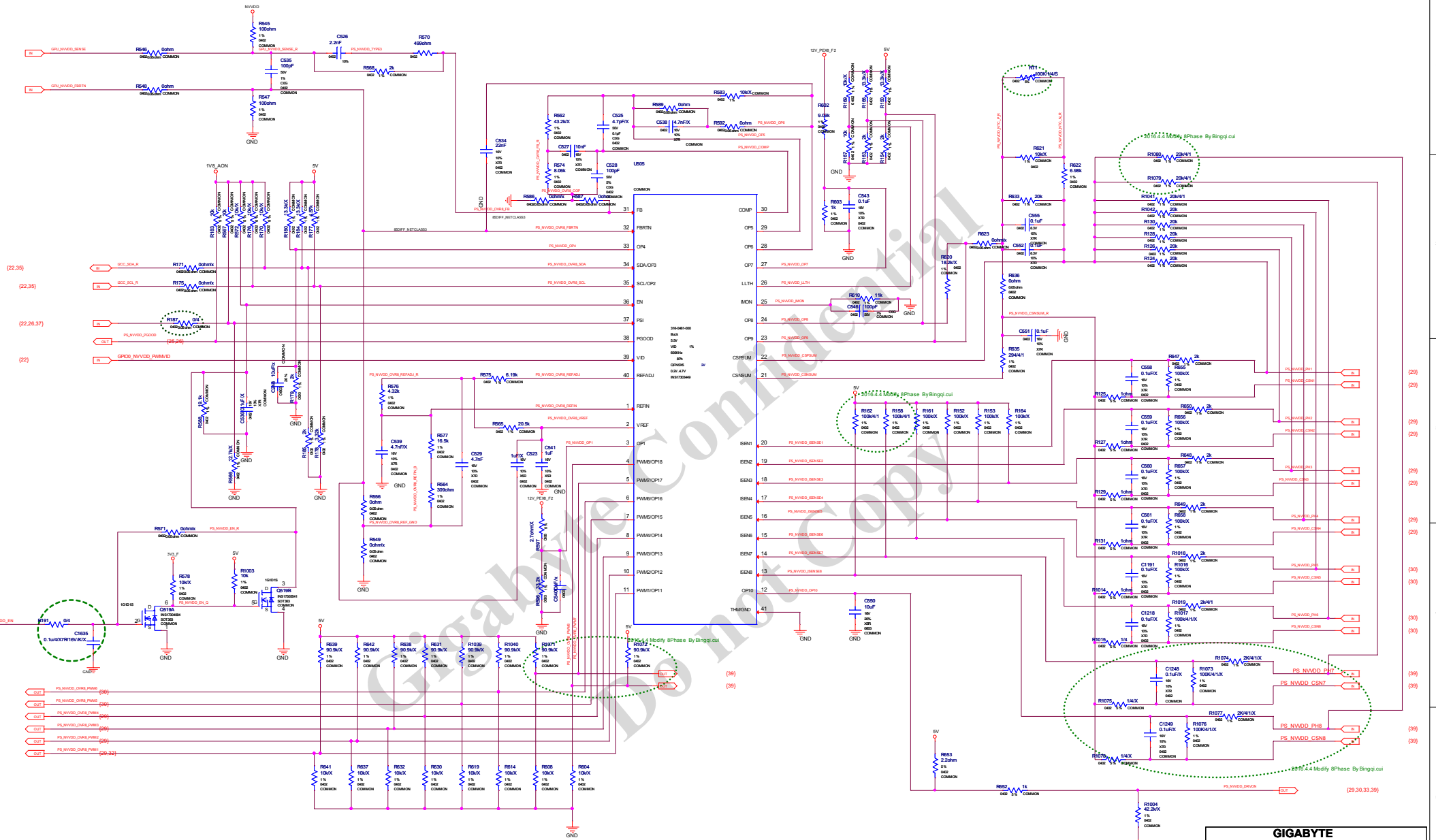


GIGABYTE			
Title 1V8, 1V8_AON			
Size Custom	Document Number GV-N1070AORUS-8GD		Rev 1.0
Date: Thursday, February 16, 2017	Sheet	24 of 42	

GIGABYTE

Title 5V, PEX_VDD			
Size Custom	Document Number GV-N1070AORUS-8GD		Rev 1.0
Date: Thursday, February 16, 2017	Sheet	25 of 42	





ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS." THE MATERIALS MAY 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 MERCHANTABILITY, OF FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

ASSEMBLY
PAGE DETAIL

ASSEMBLY DESCRIPTION
PS: NVVDD_OVR8

GIGABYTE

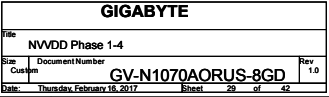
File	NVVDD_OVR8		
Size	Document Number	GV-N1070AORUS-8GD	Rev 1.0
Comp	Sheet	27	of 42
Date	Thursday, February 16, 2017		

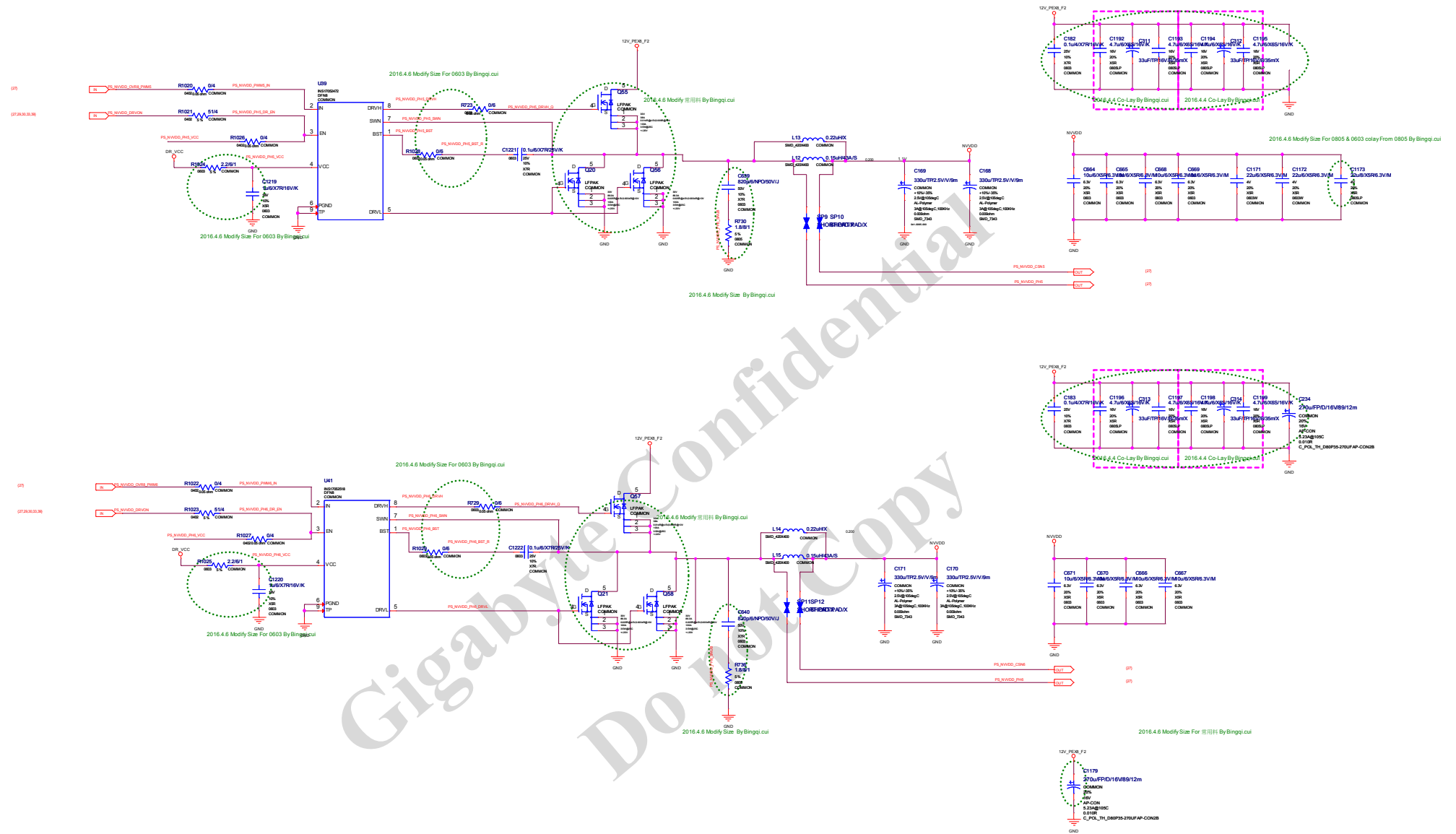
Gigabyte Confidential
Do not Copy

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS OR INFORMATION (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS". THE MATERIALS MAY 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 NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

ASSEMBLY PAGE DETAIL<ASSEMBLY DESCRIPTION>PS: Blank Page

GIGABYTE			
File Blank Page			
Size	Document Number		Rev
Custom	GV-N1070AORUS-8GD		1.0
Date	Thursday, February 16, 2017		Sheet 28 of 42



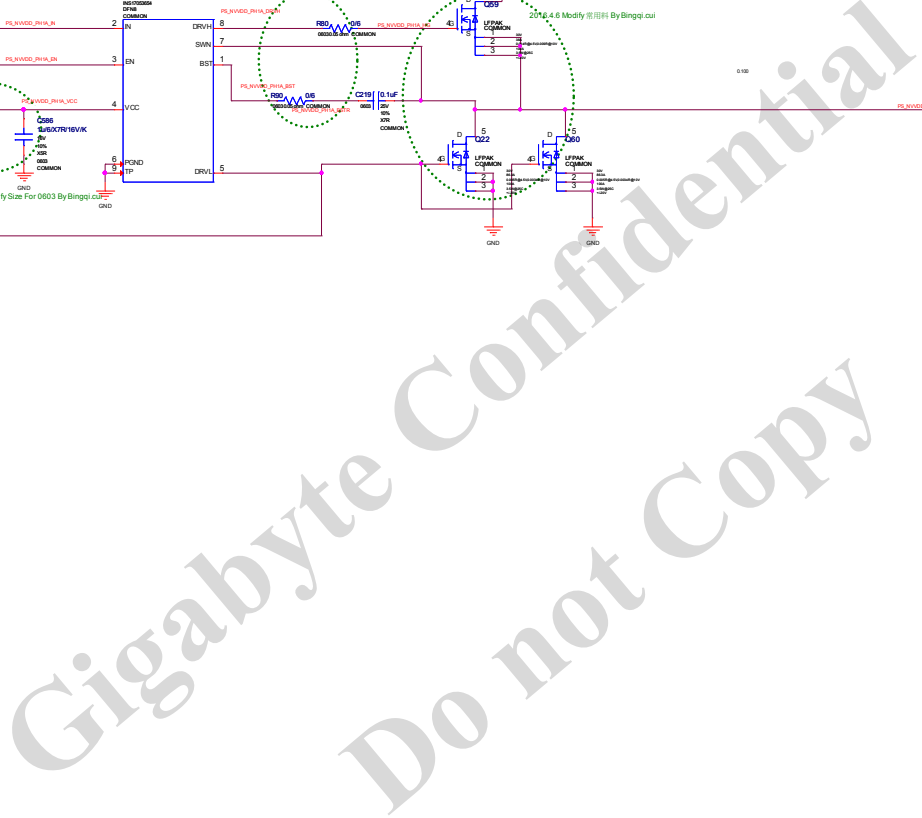


Gigabyte Confidential
Do not Copy

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS OR INFORMATION (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS". THE MATERIALS MAY 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 NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

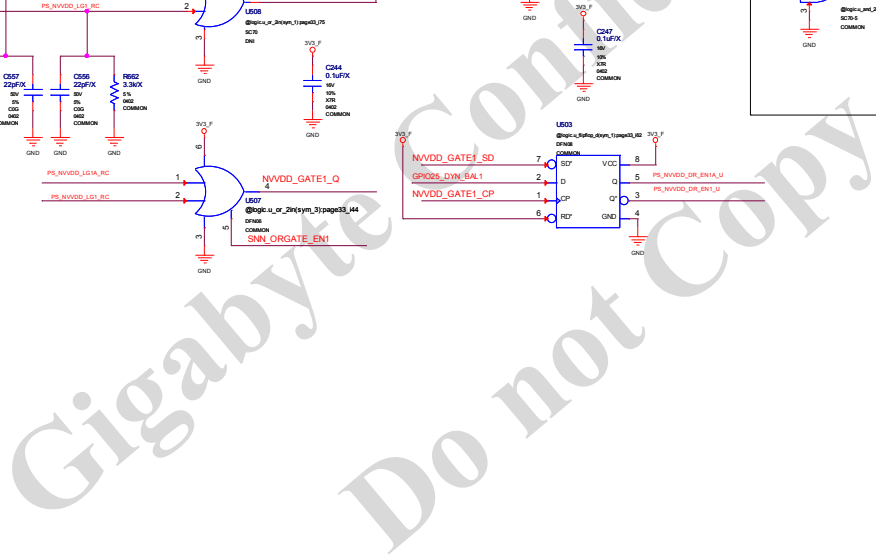
ASSEMBLY PAGE DETAIL<ASSEMBLY DESCRIPTION>PS: Blank Page

GIGABYTE			
File Blank Page			
Size	Document Number		Rev
Custom	GV-N1070AORUS-8GD		1.0
Date	Thursday, February 16, 2017		Sheet 31 of 42

[illegible]

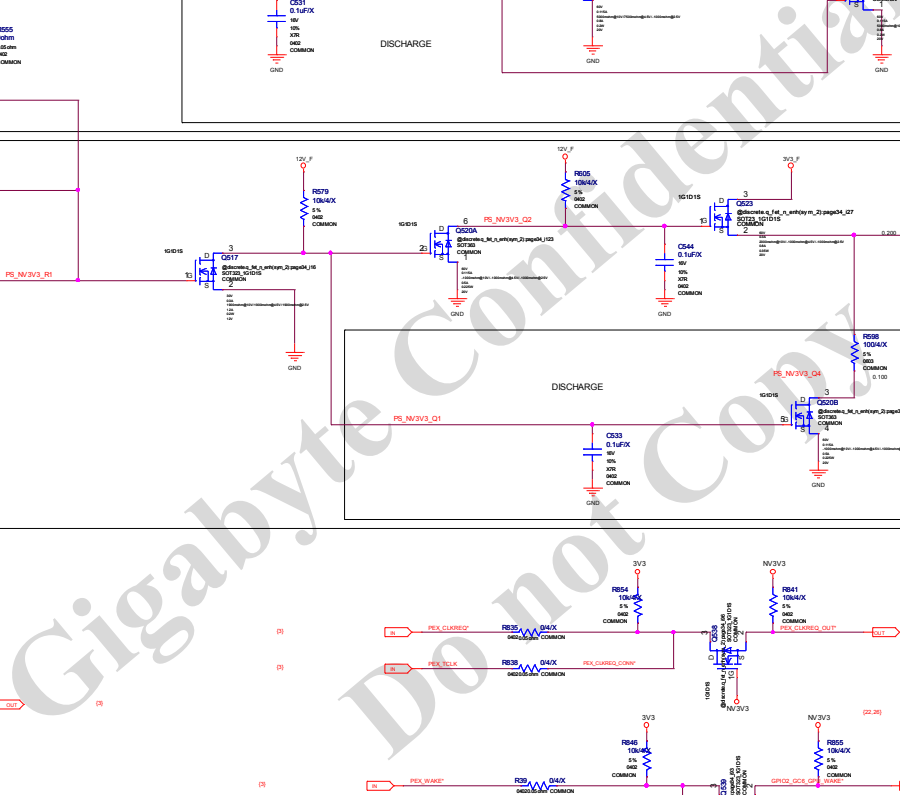
GIGABYTE			
Title Dynamic Power Balance Phases			
Size Custom	Document Number GV-N1070AORUS-8GD		Rev 1.0
Date: Thursday, February 16, 2017		Sheet 32 of 42	

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS OR INFORMATION (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS". THE MATERIALS MAY 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 NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE OR INDUSTRY STANDARDS.



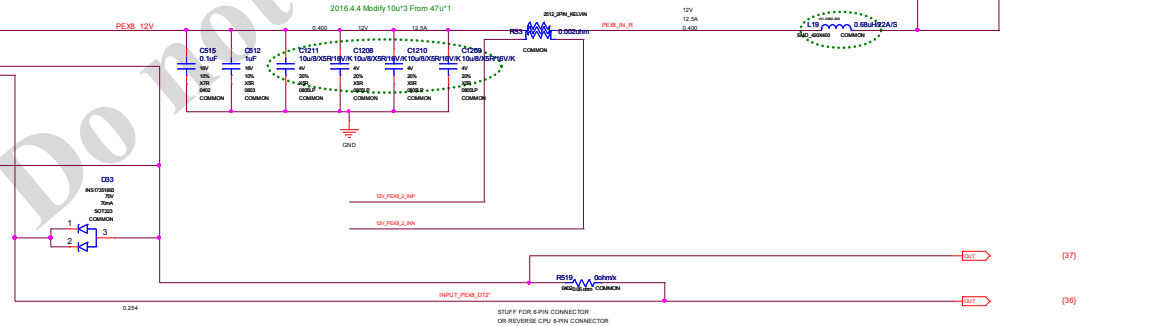
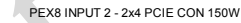
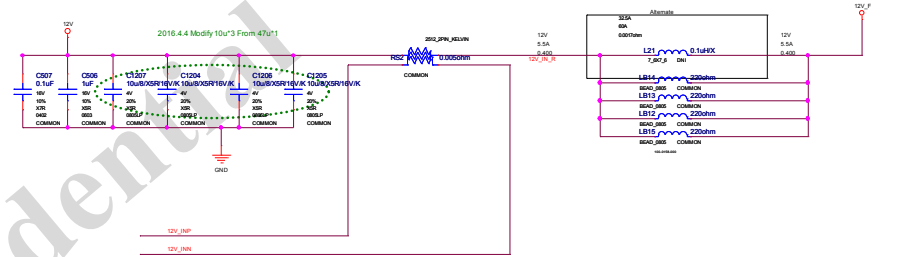
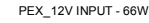
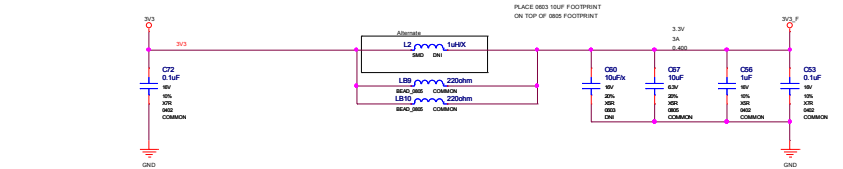
Title			
Dynamic Power Balance Logic			
Size	Document Number	Rev	
Custom	GV-N1070AORUS-8GD	1.0	
Date:	Thursday, February 16, 2017	Sheet	33 of 42

ASSEMBLY	<ASSEMBLY_DESCRIPTION>
PAGE DETAIL	PS: Dynamic Power Balance Logic

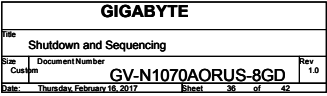


ASSEMBLY	<ASSEMBLY_DESCRIPTION>
PAGE DETAIL	PS: NV3V3, NV12V

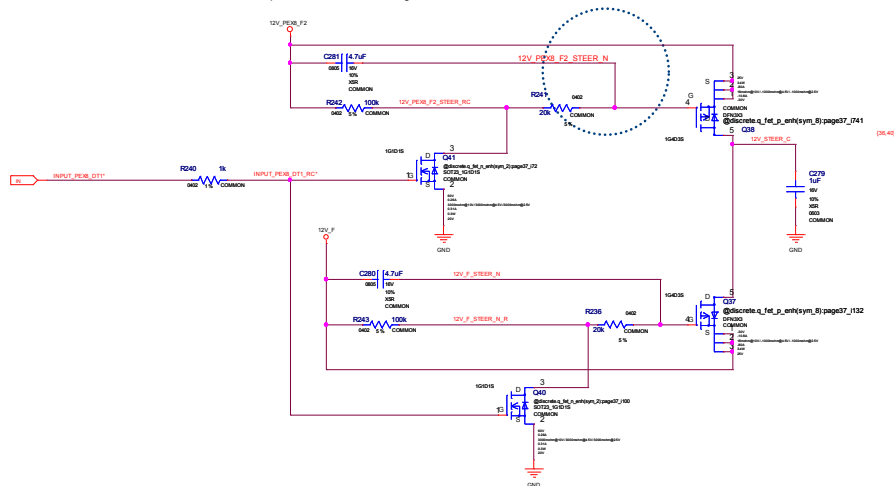
GIGABYTE			
Title NV3V3, NV12V			
Size	Document Number	Rev	
Custom	GV-N1070AORUS-8GD	1.0	
Date:	Thursday, February 16, 2017	Sheet	34 of 42



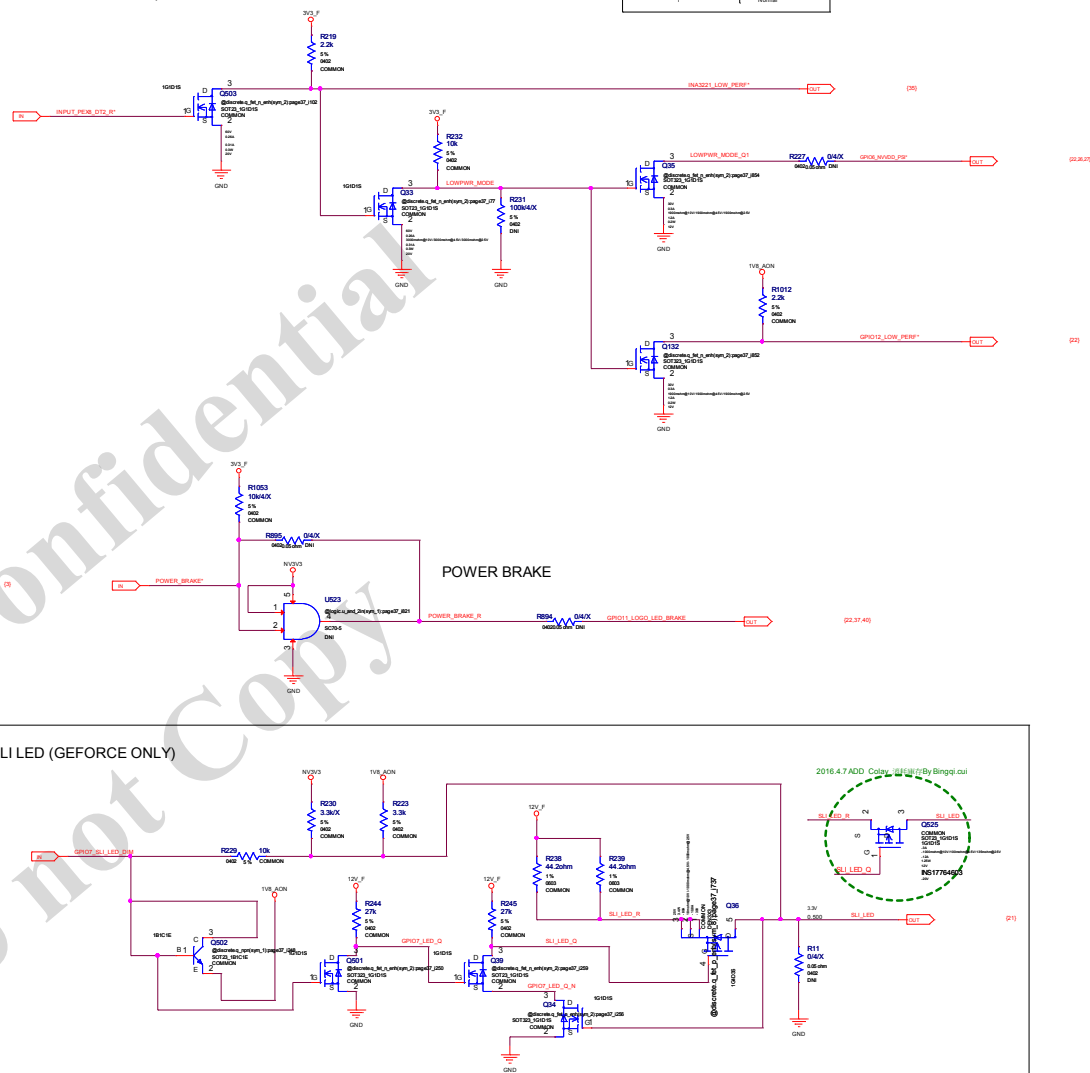
GIGABYTE			
Title Inputs, Filtering, and Monitoring			
Size Custom	Document Number GV-N1070AORUS-8GD		Rev 1.0
Date:	Thursday, February 16, 2017	Sheet 35 of 42	



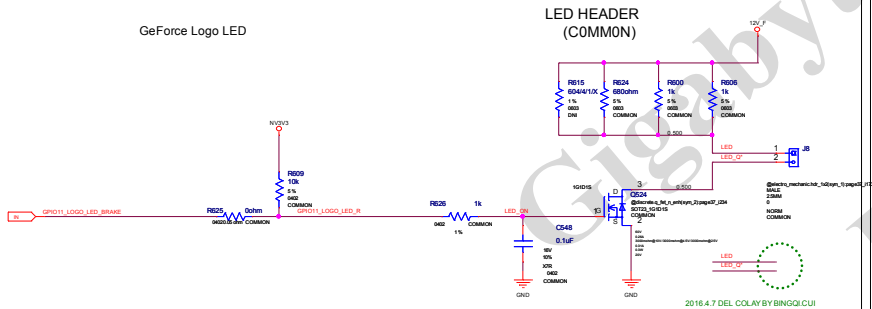
ED

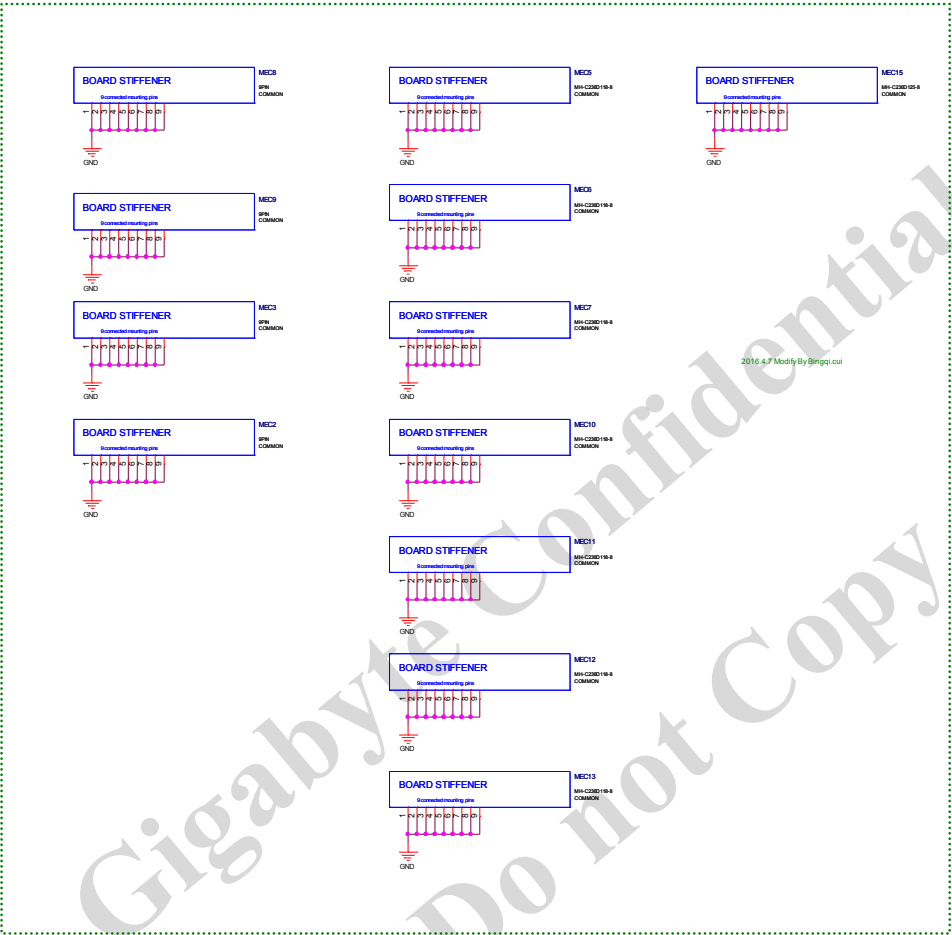


PRICE ONLY)



LED HEADER
(COMMON)



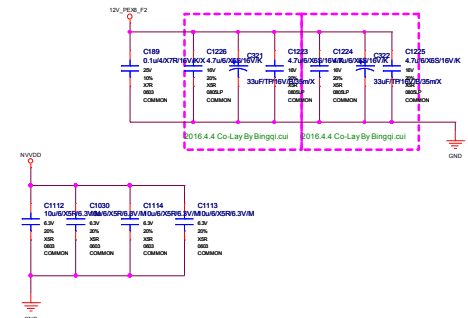
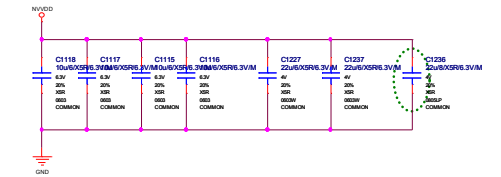
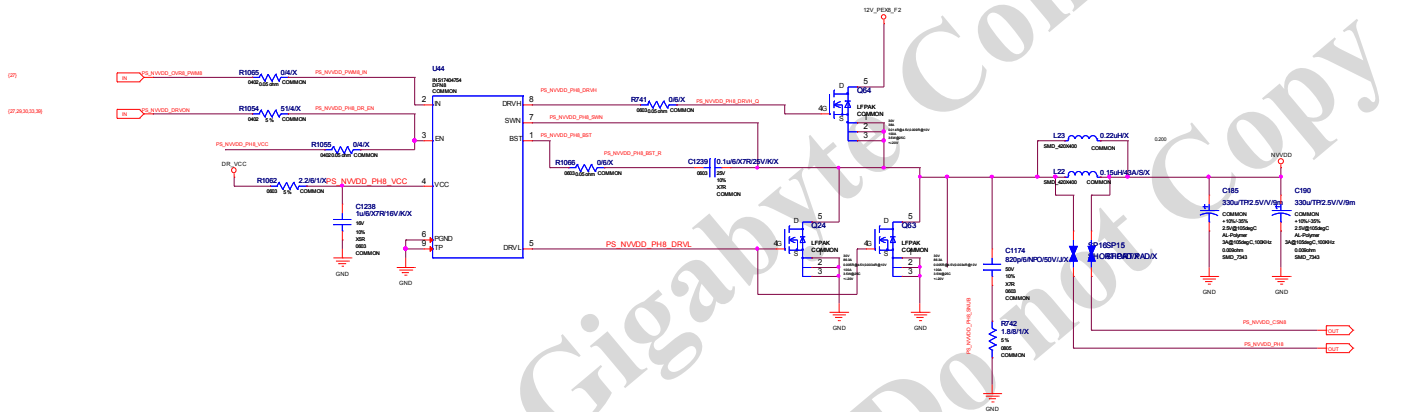
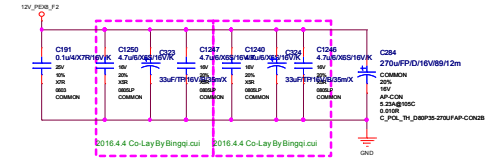
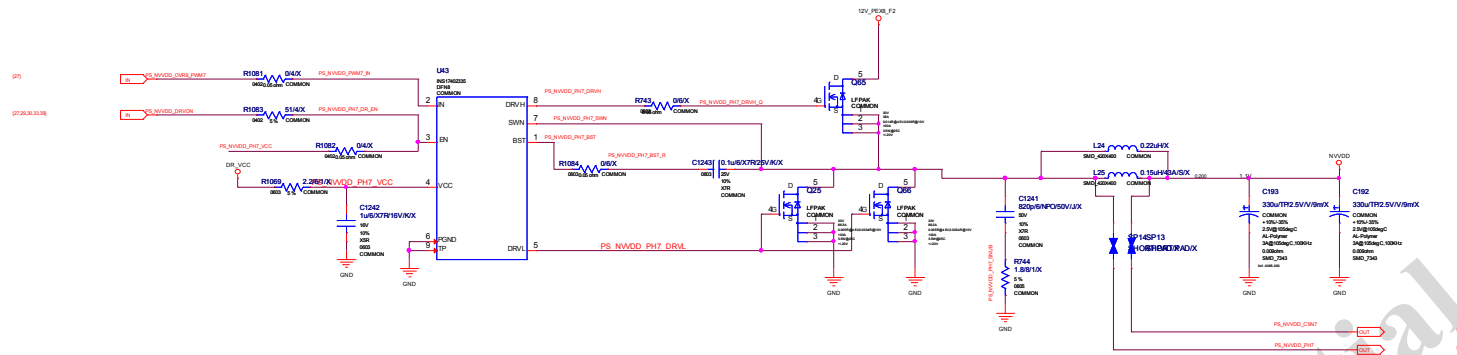


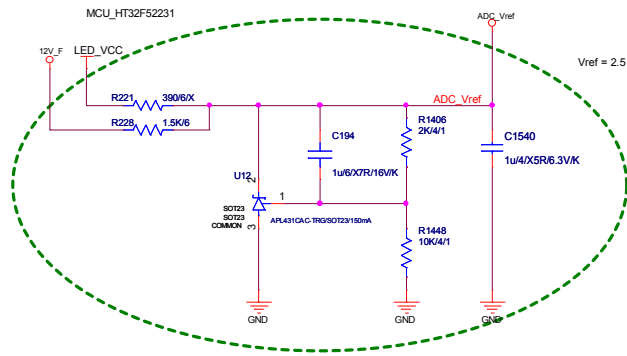
ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS OR INFORMATION (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS." THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VIOLATIONS OR DEVIATIONS OF INDUSTRY STANDARDS 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 NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

ASSEMBLY
PAGE DETAIL

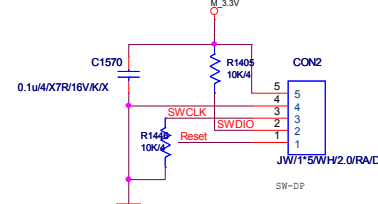
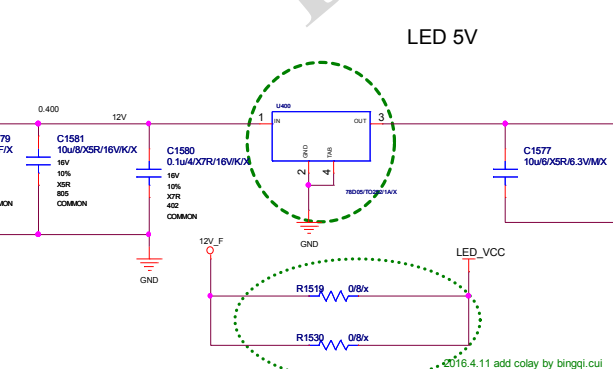
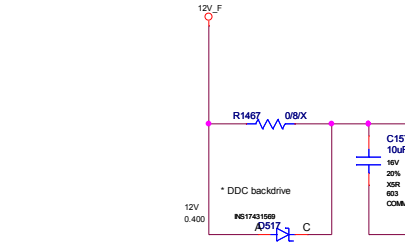
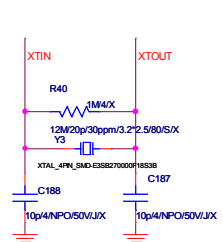
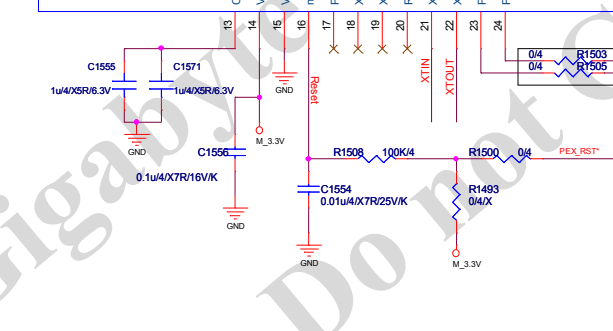
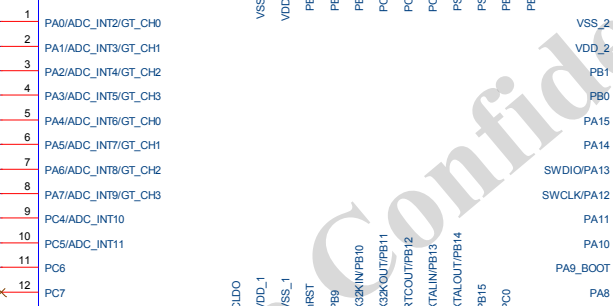
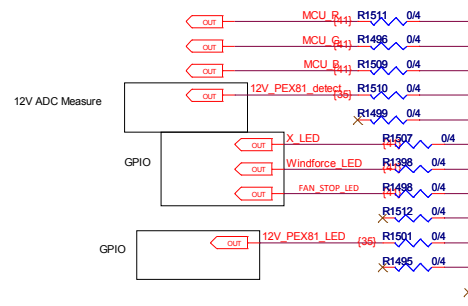
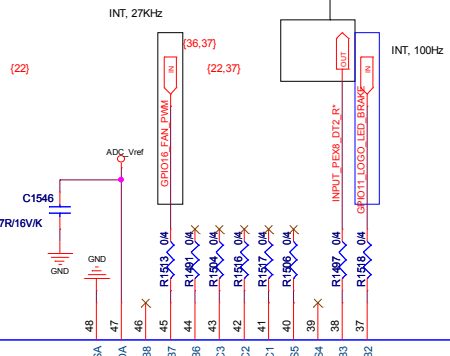
«ASSEMBLY DESCRIPTION»
MECH Bracket/Thermal

GIGABYTE			
File		Bracket/Thermal Solution	
Size	Document Number	GV-N1070AORUS-8GD	
Custom		Rev 1.0	
Date: Thursday, February 16, 2017		Sheet	38 of 42





U547
HT32F52241



GIGABYTE™			
File			
GV-N1070AORUS-8GD			
Size			
Document Number			
MCU_HT32F52231			
Rev			
1.0			
Date			
Thursday, February 16, 2017			
Sheet			
40 of 42			

