

PG174-A01

TU117, 128b GDDR5 x32, 75W
DVI-D DL/DUAL DP + HDMI


TABLE OF CONTENTS

Page	Description
1	Table of Contents
2	Block Diagram
3	PCI Express
4	MEMORY: GPU Partition A/B
5	MEMORY: FBA[31:0]
6	MEMORY: FBA[63:32]
7	MEMORY: FBB[31:0]
8	MEMORY: FBB[63:32]
9	GPU FBVDDQ & 1V8 Decoupling
10	GPU NVVDD DECOUPLING
11	IFPAB DVI-DL
12	IFPA DP
13	IFPB DP
14	IFPC
15	IFPC HDMI
16	IFPDEF UNUSED
17	MISC1: Fan, Thermal, JTAG, GPIO
18	MISC2: ROM, XTAL, Straps
19	Power Inputs and Filtering
20	SEQ: 5V, 1V8, NV3V3 ENABLE
21	SEQ: NV, PEX, FB ENABLE
22	SEQ: VOLTAGE MONITOR
23	SEQ: DISCHARGE
24	SEQ: MISC
25	PS: Pre-filter

Page	Description
26	PS: 5V
27	PS: 1V8
28	PS: PEXVDD
29	PS: FBVDDQ
30	PS: NVVDD OVR2+1
31	PS: NVVDD Phase 1,2
32	MECH: Bracket/Thermal

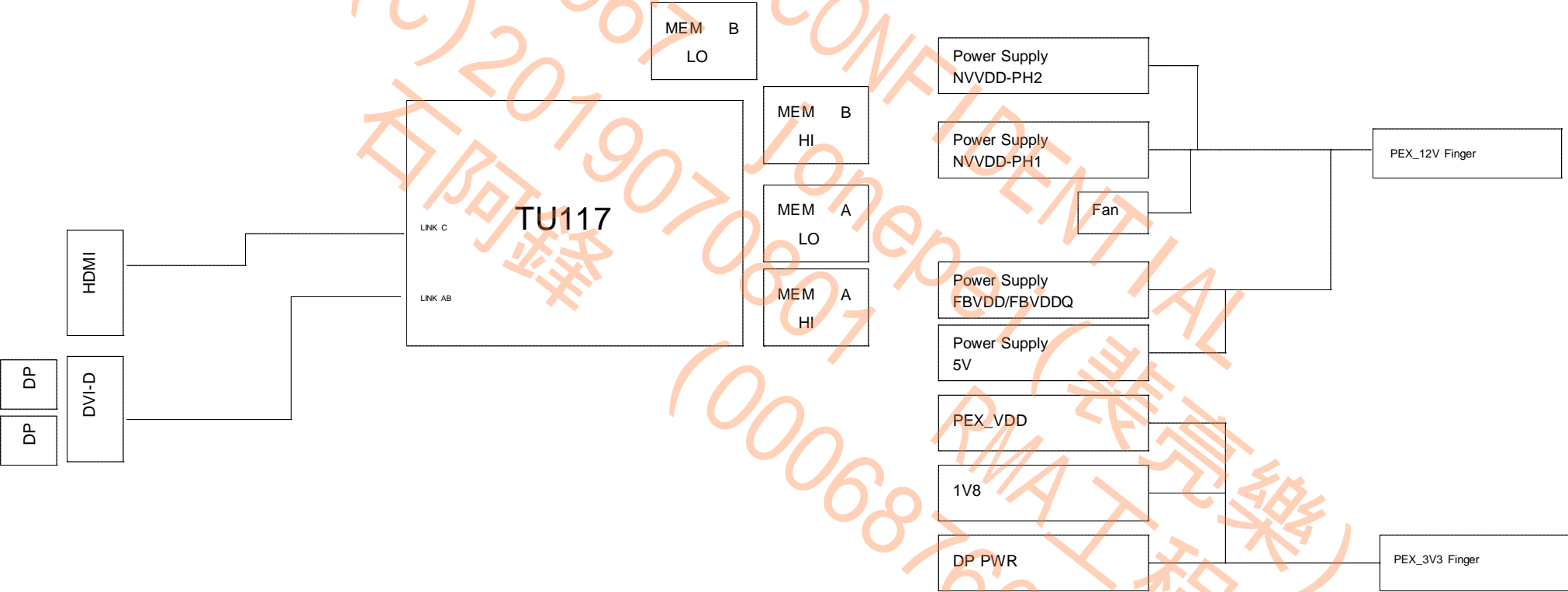
ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS OR INFORMATION (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS". THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VIOLATIONS OR DEVIATIONS OF INDUSTRY STANDARDS 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.

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA



NV_PN	600-1G174-BASE-A01		
PCR REV	PG174-A01	TRGE	1 OF 32
BCM REV	A	DATE	10-DEC-2018

Block Diagram

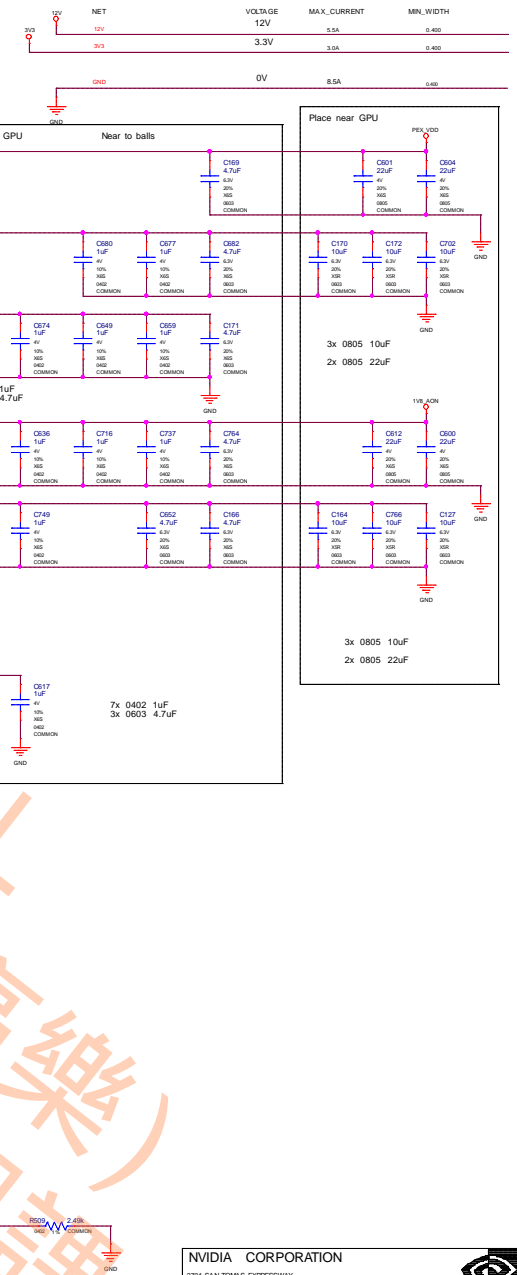
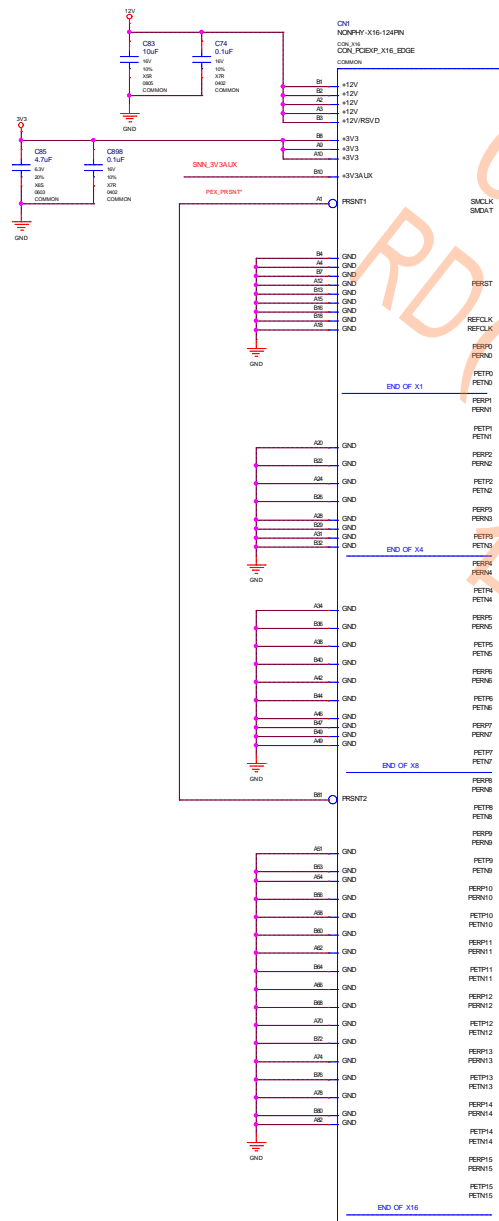


ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS OR INFORMATION (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS". THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VIOLATIONS OR DEVIATIONS OF INDUSTRY STANDARDS 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	ASSEMBLY DESCRIPTION
FRGE DETAIL	Block Diagram

NVIDIA CORPORATION			
2701 SAN TOMAS EXPRESSWAY			
SANTA CLARA, CA 95050, USA			
NV_PN	600-1G174-BASE-A01	FIG#	2 OF 32
PCB REV	PG174-A01	DATE	10-DEC-2018
BCM REV	A		

PCI Express



ASSEMBLY	ASSEMBLY DESCRIPTION	SANTA CLARA, CA 95050, USA	
PCB DETAIL	PCB Express	600-1G174-BASE-A01	
MVT		REV	3 OF 32
ISSUANCE ALL		PCB REV	DATE
STANDARD		A	10-DEC-2018

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 KNOWLEDGE AND/OR UNLAWFUL 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 CUSTOMS.

MEMORY: GPU Partition A/B

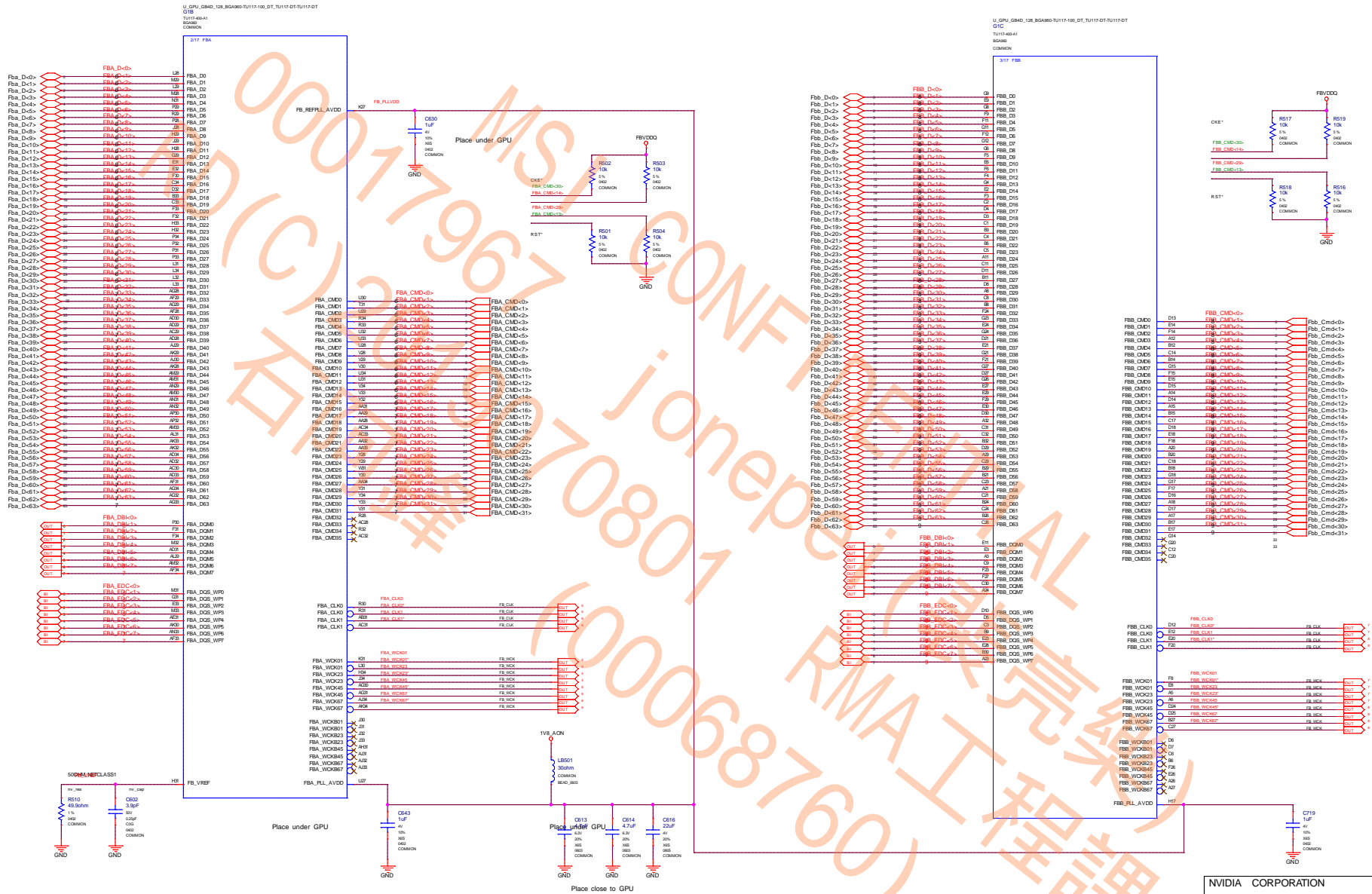
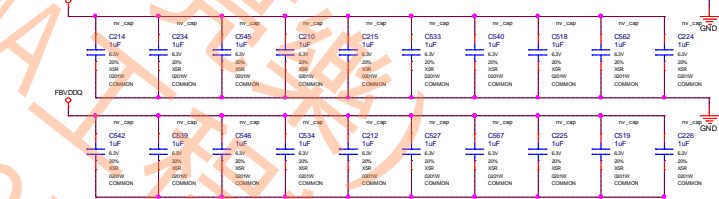
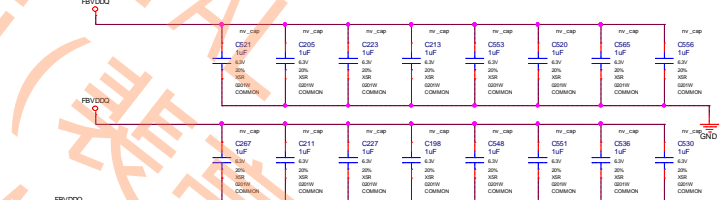
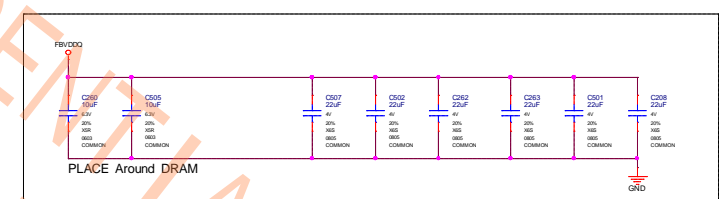
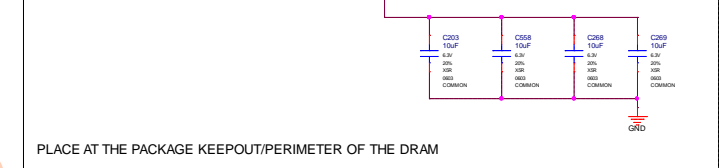
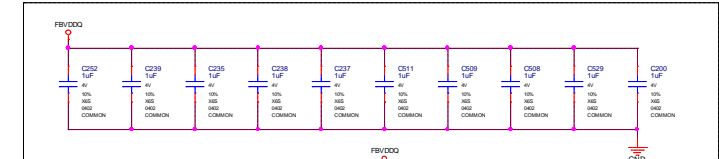
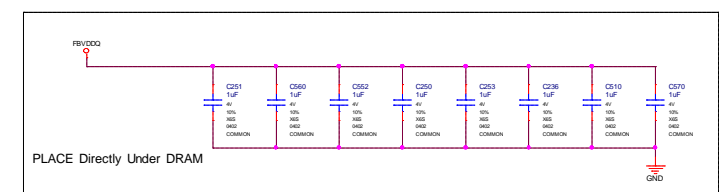
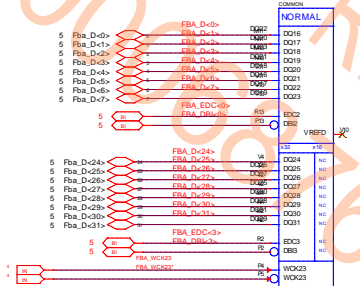
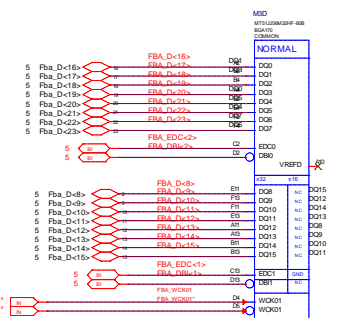
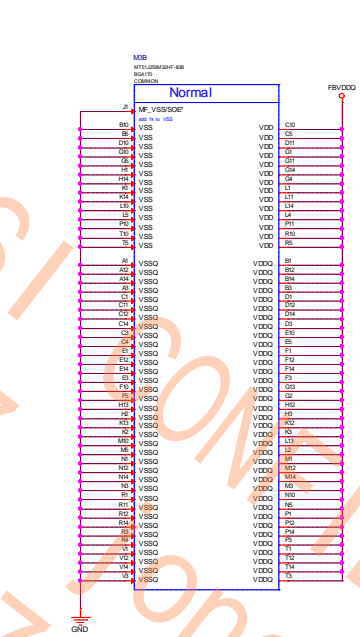
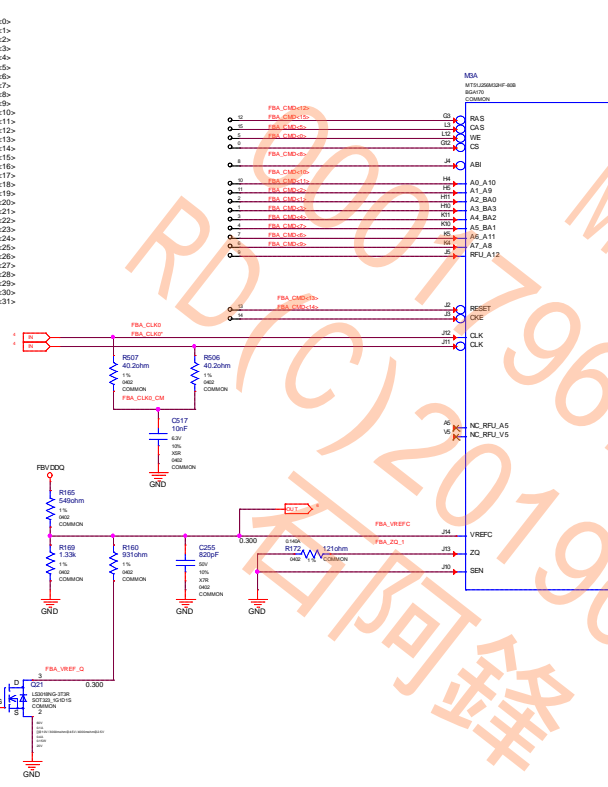
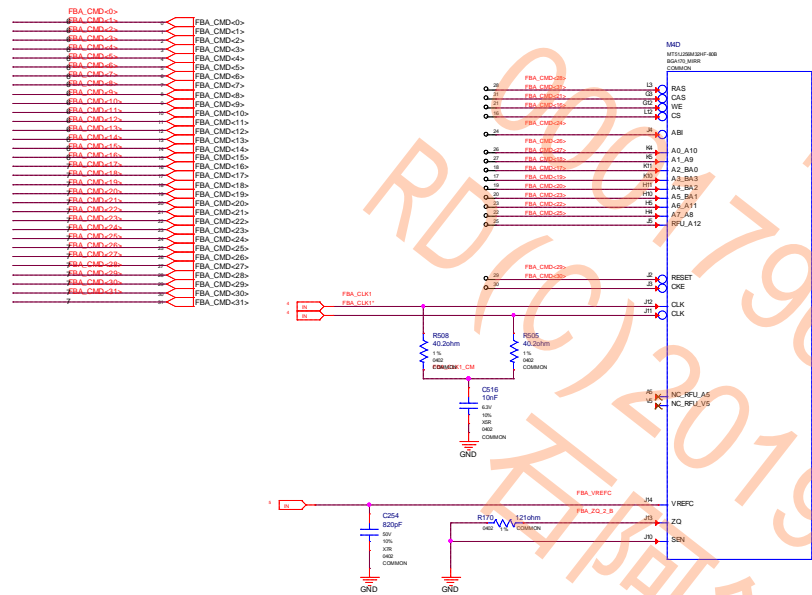


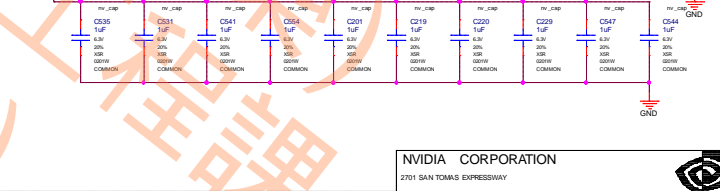
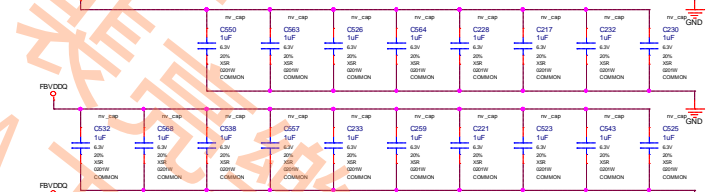
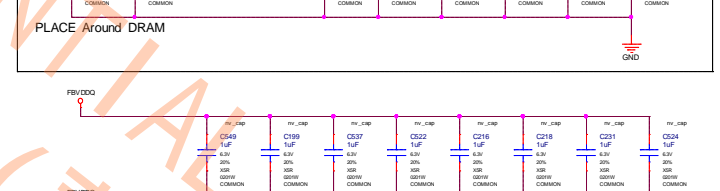
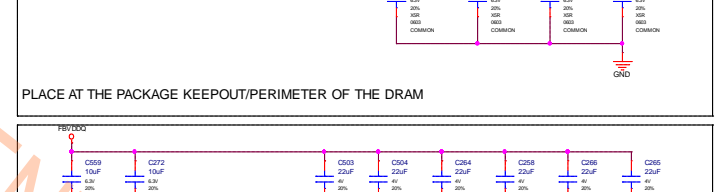
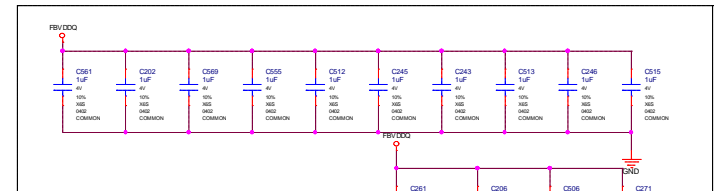
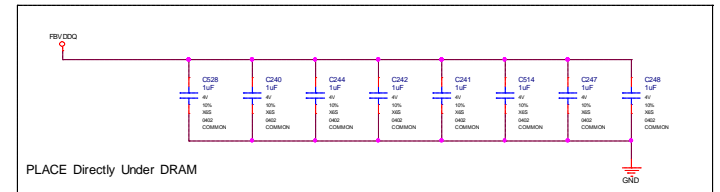
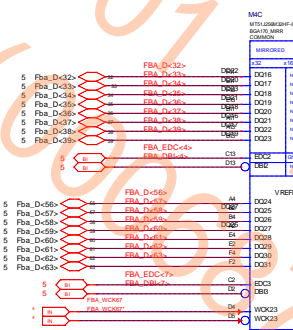
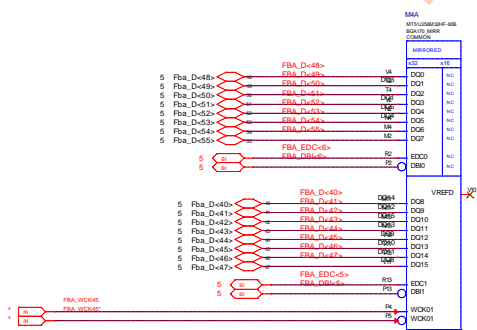
Figure 1: Schematic representation of the FBA model. The diagram shows a metabolic map with red lines representing reactions. On the left, reactions are labeled FBA_CMO-00 through FBA_CMO-21. On the right, reactions are labeled FBA_000 through FBA_020. A central column of red lines connects these two sets of reactions, representing the metabolic pathways. The reactions are arranged in a grid-like fashion, with some reactions having multiple connections to others.

CMD	0.31	32.63
CMD0	CS*	
CMD1	A3, BA3	
CMD2	A2, BA2	
CMD3	A4, BA4	
CMD4	A5, BA1	
CMD5	WE*	
CMD6	A7, A8	
CMD7	AL, A11	
CMD8	AB*	
CMD9	A12, RFU	
CMD10	AO, A10	
CMD11	A1, A9	
CMD12	RA*	
CMD13	RS*	
CMD14	QK*	
CMD15	CAS*	
CMD16		CS*
CMD17		A3, BA3
CMD18		A2, BA2
CMD19		A4, BA4
CMD20		A5, BA1
CMD21		WE*
CMD22		A7, A8
CMD23		AL, A11
CMD24		AB*
CMD25		A12, RFU
CMD26		AO, A10
CMD27		A1, A9
CMD28		RA*
CMD29		RS*
CMD30		QK*
CMD31		CAS*





CMD	0..31	32..63
CMD0	CS*	
CMD1	A3, BA3	
CMD2	A2, BA2	
CMD3	A4, BA2	
CMD4	A2, BA1	
CMD5	WE*	
CMD6	AT, A8	
CMD7	AE, A11	
CMD8	AB*	
CMD9	A12, RFU	
CMD10	A0, A10	
CMD11	A1, A9	
CMD12	RA*	
CMD13	RS*	
CMD14	OE*	
CMD15	CA*	
CMD16		CS*
CMD17		A3, BA3
CMD18		A2, BA2
CMD19		A4, BA2
CMD20		A2, BA1
CMD21		WE*
CMD22		AT, A8
CMD23		AE, A11
CMD24		AB*
CMD25		A12, RFU
CMD26		A0, A10
CMD27		A1, A9
CMD28		RA*
CMD29		RS*
CMD30		OE*
CMD31		CA*



ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARD, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS OR INFORMATION (TOGETHER AND SEPARATELY, "MATERIALS") ARE HEREBY PROVIDED "AS IS" THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VARIATIONS 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: <ASSEMBLY_DESCRIPTION>
PAGE DETAIL: MEMORY: FBA(63..32)

NV_PN 600-1G174-BASE-A01

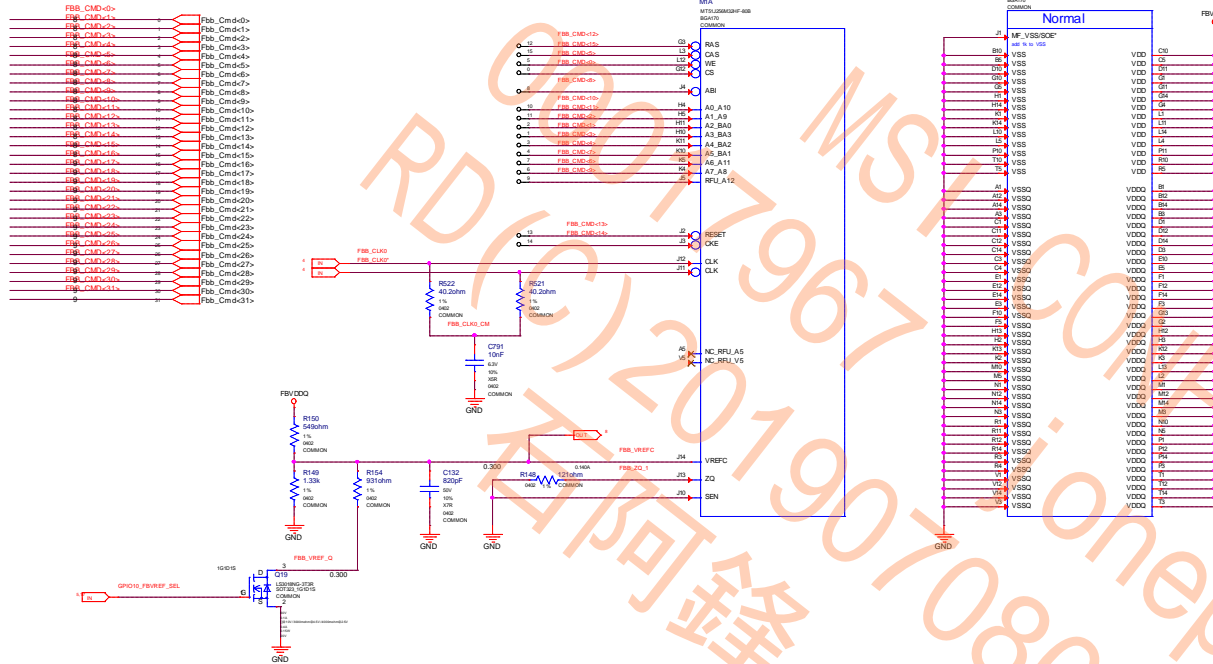
PCB REV PD174-A01

ROM REV A

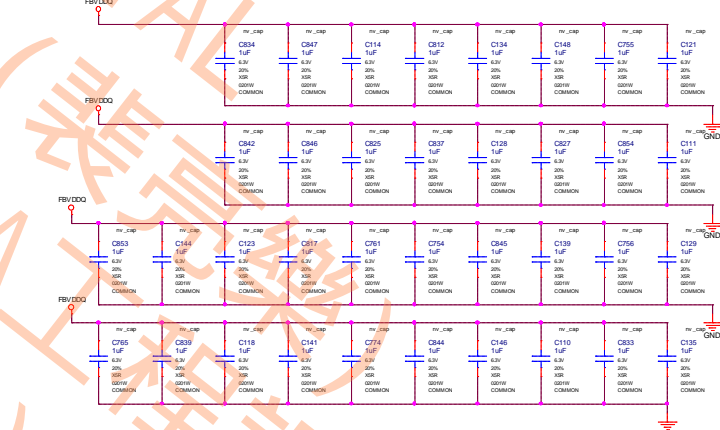
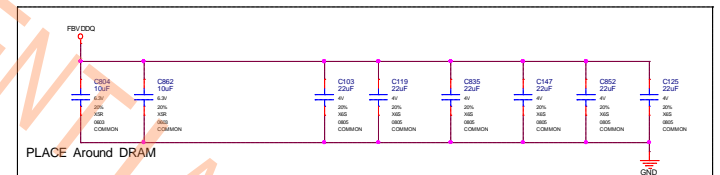
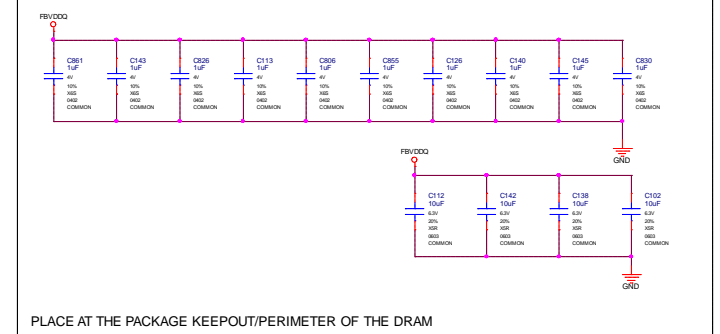
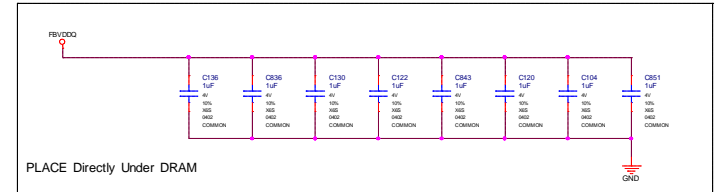
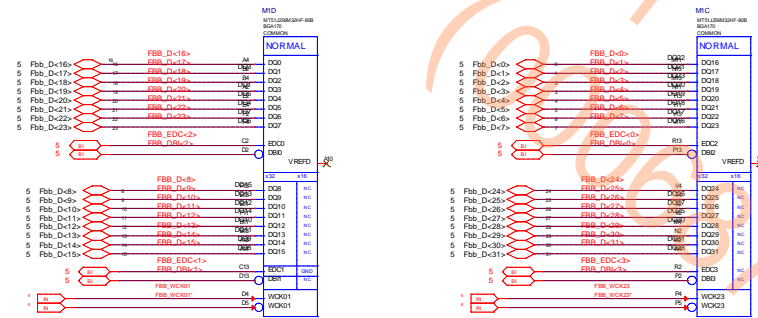
PRGE 6 OF 32

DATE 10-DEC-2018

MEMORY: FBB Partition 31..0



CMD	0..31	32..63
CMD0	CS*	
CMD1	A3, BA3	
CMD2	A2, BA2	
CMD3	A4, BA2	
CMD4	A5, BA1	
CMD5	WE*	
CMD6	A7, A8	
CMD7	A6, A11	
CMD8	AB*	
CMD9	A12, RPU	
CMD10	A1, A10	
CMD11	RAS*	
CMD12	CK*	
CMD13	RST*	
CMD14	CK*	
CMD15	CAS*	
CMD16		CS*
CMD17		A3, BA3
CMD18		A2, BA2
CMD19		A4, BA2
CMD20		A5, BA1
CMD21		WE*
CMD22		A7, A8
CMD23		A6, A11
CMD24		AB*
CMD25		A12, RPU
CMD26		A1, A10
CMD27		RAS*
CMD28		CK*
CMD29		RST*
CMD30		CK*
CMD31		CAS*



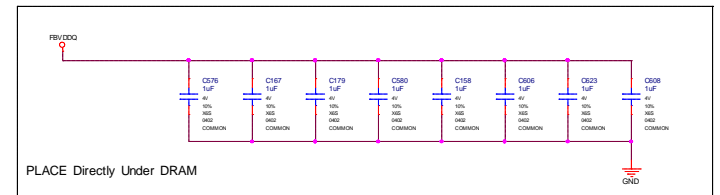
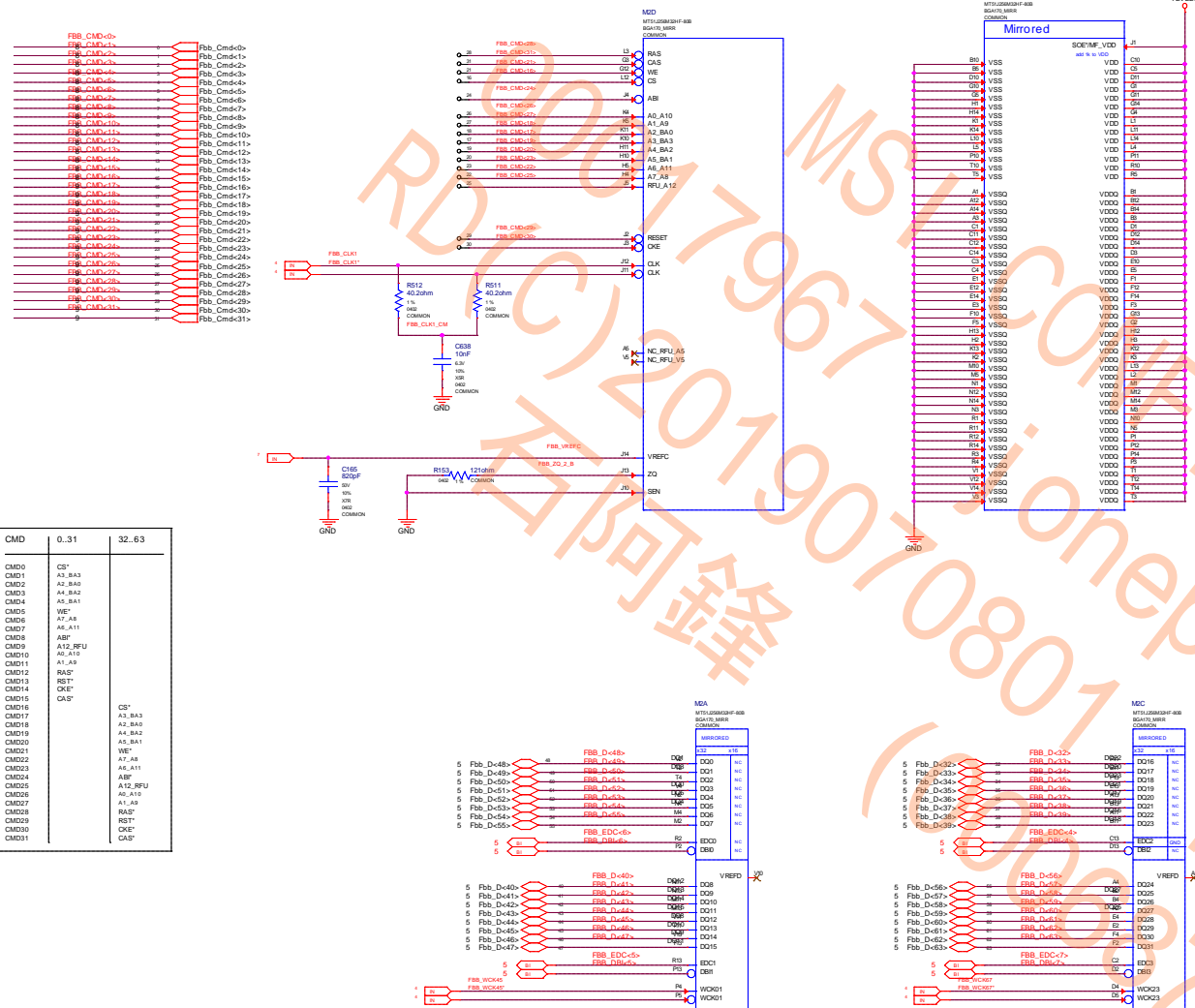
NVIDIA CORPORATION
 2701 SAN TOMAS EXPRESSWAY
 SANTA CLARA, CA 95050, USA
 NV_PN 600-1G174-BASE-A01
 PCB REV PG174-A01
 BOM REV A
 DATE 10-DEC-2018

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 VARIATIONS OR DEVIATIONS OF INDUSTRY STANDARDS AND SPECIFICATIONS. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE, WITH RESPECT TO THE MATERIALS 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	ASSEMBLY DESCRIPTION
PCB DETAIL	MEMORY: FBB[31:0]



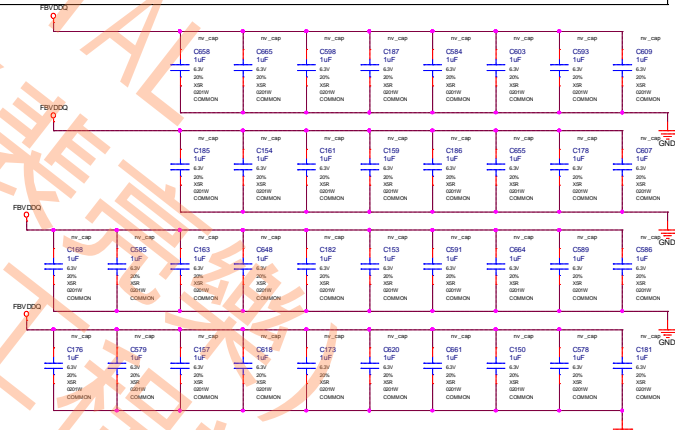
CMD	0.31	32.63
CMD0	CS*	
CMD1	A3, BA3	
CMD2	A2, BA2	
CMD3	A4, BA4	
CMD4	A4, BA2	
CMD5	WE*	
CMD6	AT, AB	
CMD7	AC, A11	
CMD8	AB*	
CMD9	A12, RFU	
CMD10	AC, A10	
CMD11	A1, A3	
CMD12	RA*	
CMD13	RS††	
CMD14	OK*	
CMD15	CA*	
CMD16		CS*
CMD17		A3, BA3
CMD18		A2, BA2
CMD19		A4, BA2
CMD20		AB, BA1
CMD21		WE*
CMD22		AT, AB
CMD23		AC, A11
CMD24		AB*
CMD25		A12, RFU
CMD26		A1, A3
CMD27		RA*
CMD28		RS††
CMD29		OK*
CMD31		CA*

[illegible]

The diagram illustrates a 16-bit bus system with 8 DRAM chips. The bus is labeled "PLACE Around DRAM". The chips are connected to the bus as follows:

- C184: 10uF, 20V, 000, 000, COMMON
- C156: 10uF, 20V, 000, 000, COMMON
- C183: 220Ω, 20V, 000, 000, COMMON
- C581: 220Ω, 20V, 000, 000, COMMON
- C174: 220Ω, 20V, 000, 000, COMMON
- C596: 220Ω, 20V, 000, 000, COMMON
- C151: 220Ω, 20V, 000, 000, COMMON
- C595: 220Ω, 20V, 000, 000, COMMON

The bus is terminated at both ends with 220Ω resistors. The ground connection is labeled "GND".



19ci203

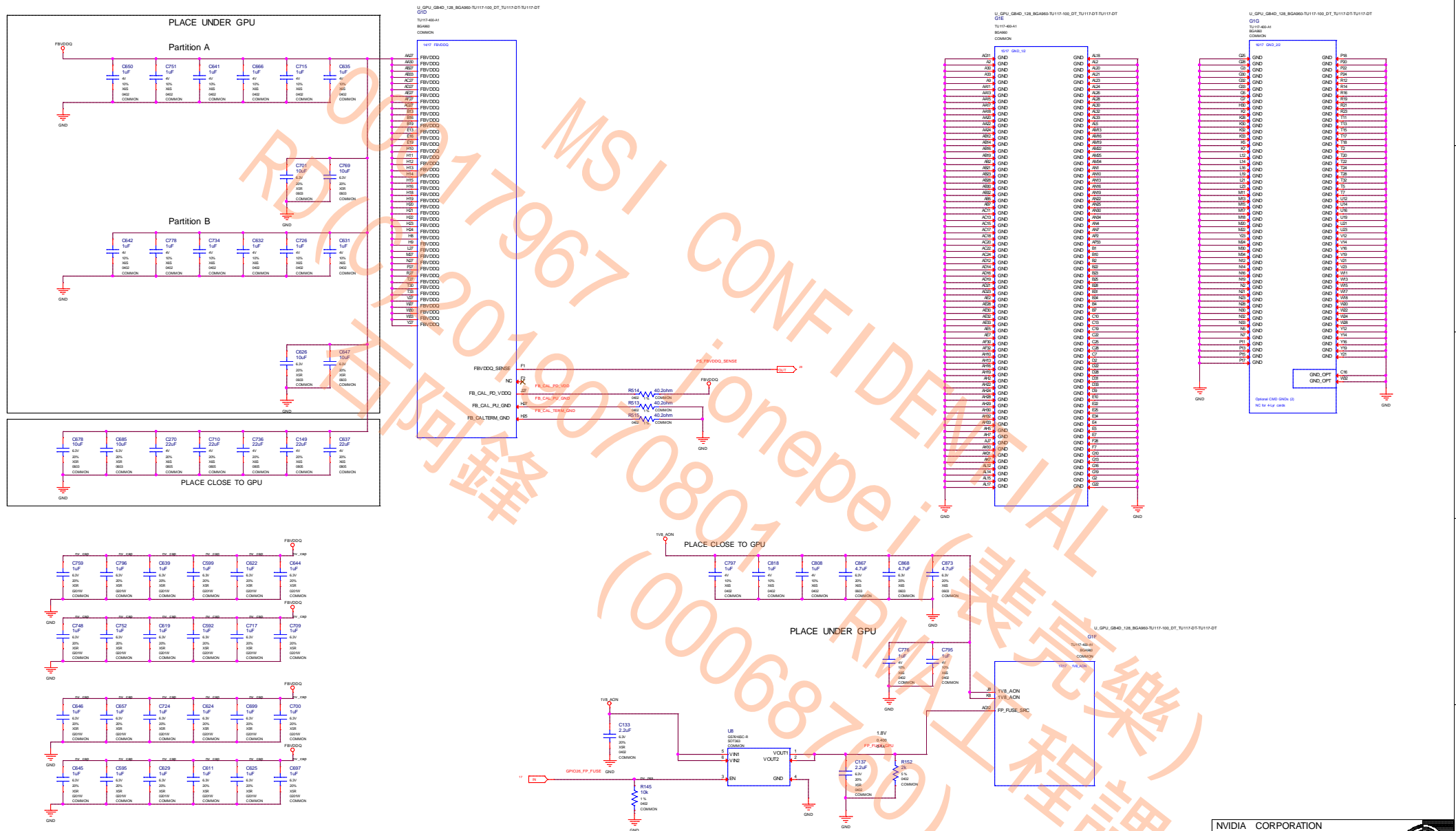
NVIDIA CORPORATION

2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA



ASSEMBLY	ASSEMBLY DESCRIPTION	SANTA CLARA, CA 95050, USA	
PLATE DETAIL	MEMORY FR03-32	600-1G174-BASE-A01	
REV	REV	REV	REV
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10	10	10	10
11	11	11	11
12	12	12	12
13	13	13	13
14	14	14	14
15	15	15	15
16	16	16	16
17	17	17	17
18	18	18	18
19	19	19	19
20	20	20	20
21	21	21	21
22	22	22	22
23	23	23	23
24	24	24	24
25	25	25	25
26	26	26	26
27	27	27	27
28	28	28	28
29	29	29	29
30	30	30	30
31	31	31	31
32	32	32	32
33	33	33	33
34	34	34	34
35	35	35	35
36	36	36	36
37	37	37	37
38	38	38	38
39	39	39	39
40	40	40	40
41	41	41	41
42	42	42	42
43	43	43	43
44	44	44	44
45	45	45	45
46	46	46	46
47	47	47	47
48	48	48	48
49	49	49	49
50	50	50	50
51	51	51	51
52	52	52	52
53	53	53	53
54	54	54	54
55	55	55	55
56	56	56	56
57	57	57	57
58	58	58	58
59	59	59	59
60	60	60	60
61	61	61	61
62	62	62	62
63	63	63	63
64	64	64	64
65	65	65	65
66	66	66	66
67	67	67	67
68	68	68	68
69	69	69	69
70	70	70	70
71	71	71	71
72	72	72	72
73	73	73	73
74	74	74	74
75	75	75	75
76	76	76	76
77	77	77	77
78	78	78	78
79	79	79	79
80	80	80	80
81	81	81	81
82	82	82	82
83	83	83	83
84	84	84	84
85	85	85	85
86	86	86	86
87	87	87	87
88	88	88	88
89	89	89	89
90	90	90	90
91	91	91	91
92	92	92	92
93	93	93	93
94	94	94	94
95	95	95	95
96	96	96	96
97	97	97	97
98	98	98	98
99	99	99	99
100	100	100	100

GPU FBVDDQ & 1V8 Decoupling



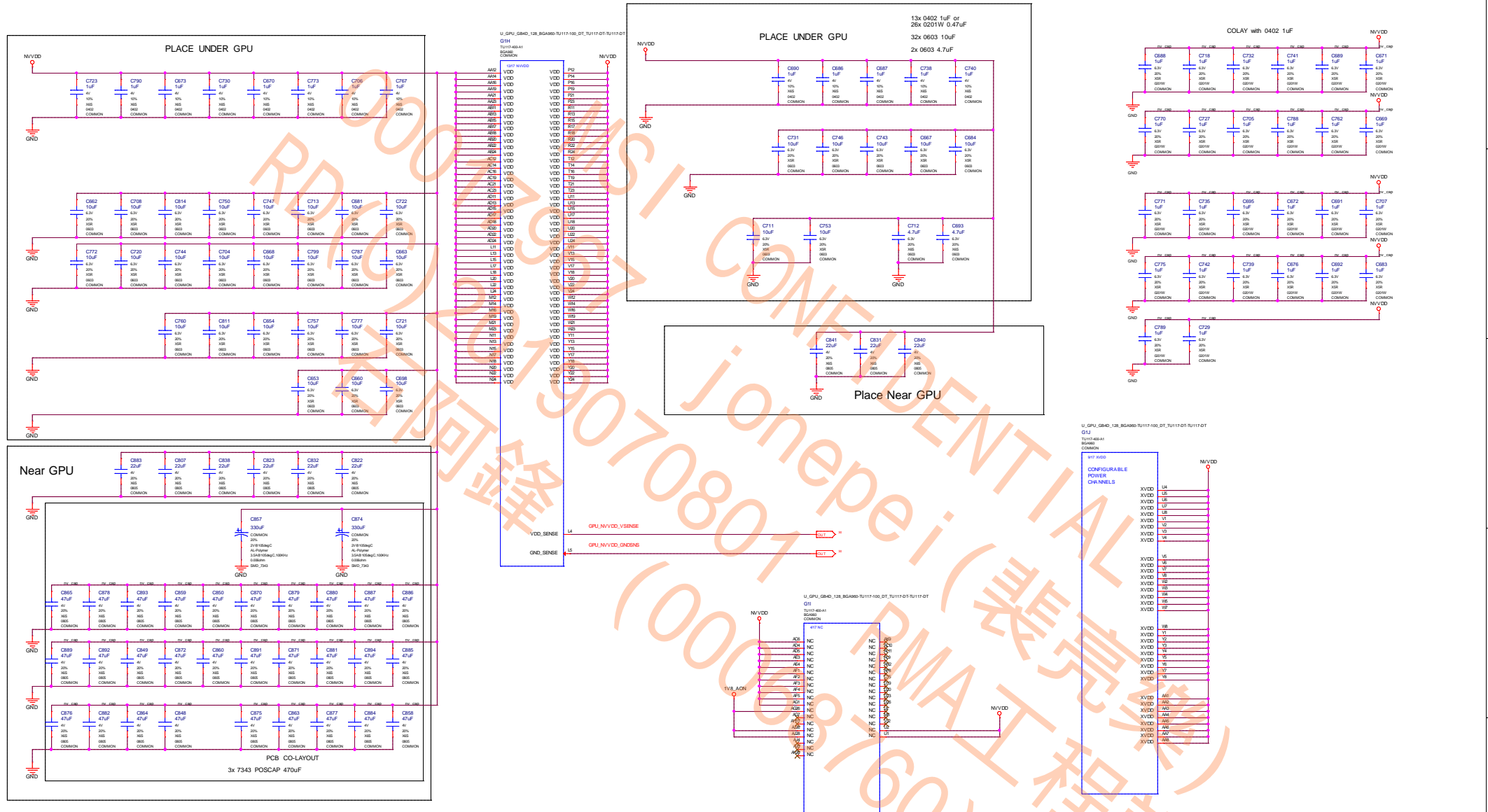
NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA



NV_PN	600-1G174-BASE-A01
-------	--------------------

POB REV	PG174-A01
BOM REV	A

GPU NVVDD Decoupling



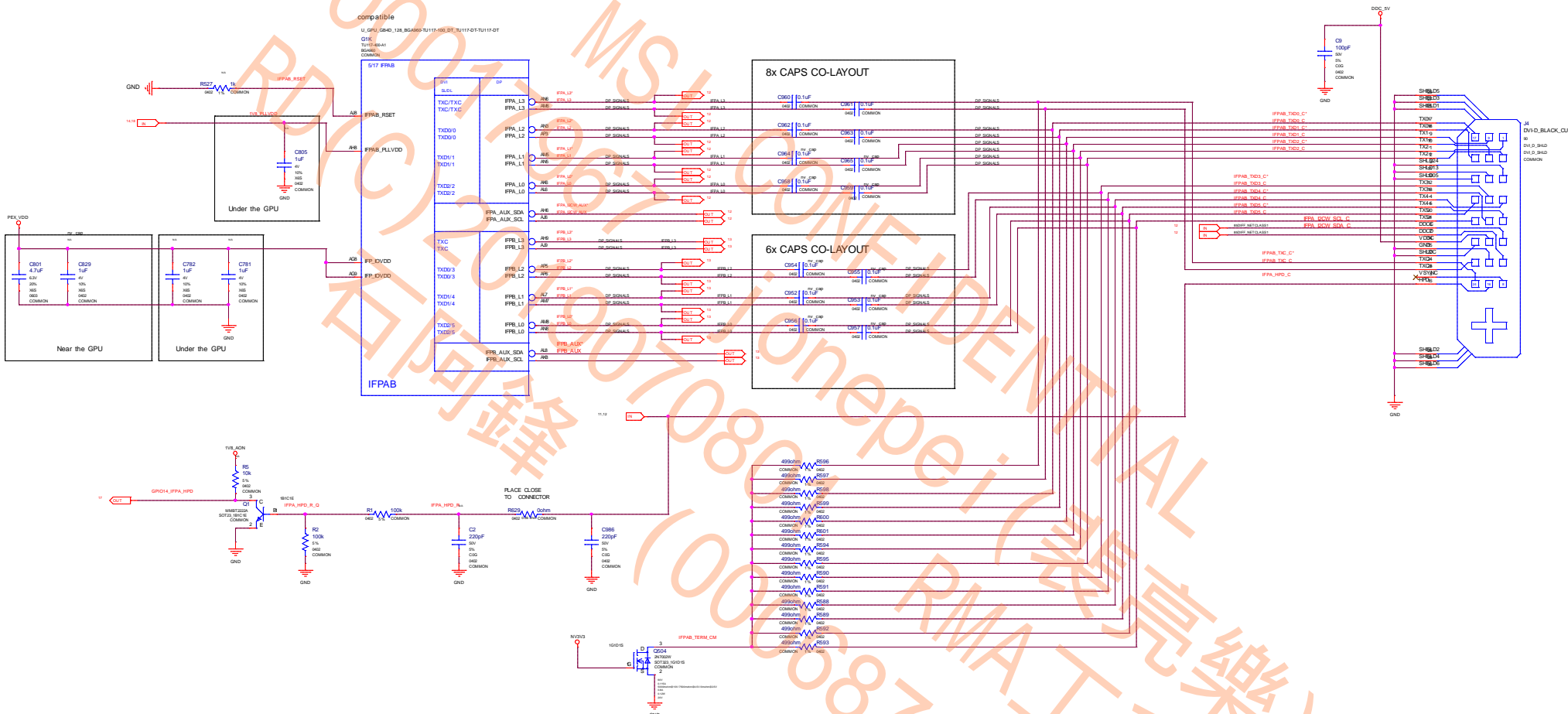
ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS OR INFORMATION (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS." THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VIOLATIONS OR DEVIATIONS OF INDUSTRY STANDARDS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

ASSEMBLY	ASSEMBLY_DESCRIPTION
PAGE DETAIL	GPU NVVDD DECOUPLING

NV_PN	600-1G174-BASE-A01		
POB_REV	PG174-A01	PAGE	10 OF 32
BOM_REV	A	DATE	10-DEC-2018

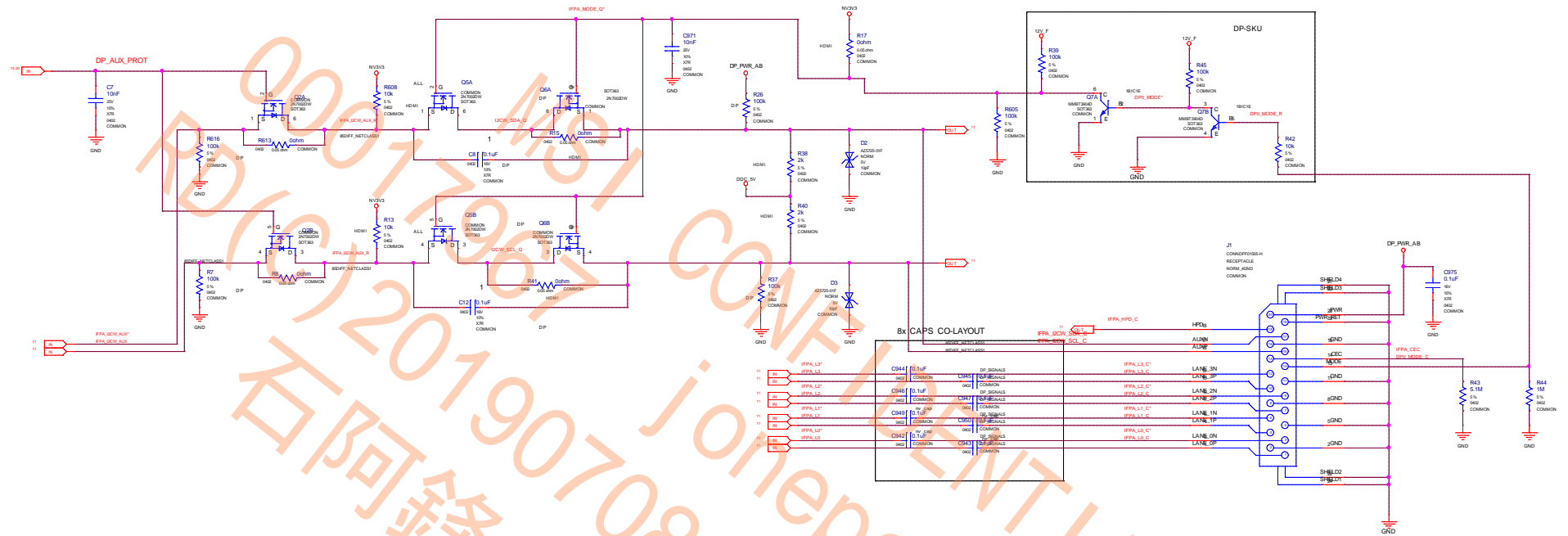
	H
--	---

IFPAB DVI-D-DL CO-LAYOUT WITH 2x DP



ALL NVIDIA DESIGN 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 AND/OR, 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.

NVIDIA CORPORATION	
2701 SAN TOMAS EXPRESSWAY	
SANTA CLARA, CA 95050, USA	
NV_PN	600-1G174-BASE-A01
PCB REV	PG174-A01
ICM REV	A
PRGE	11 OF 32
DATE	10-DEC-2018



IFPA DP CO-LAYOUT WITH IFPAB DVI-D-DL

ASSEMBLY	<ASSEMBLY_DESCRIPTION>
PAGE DETAIL	FPA DP

NVIDIA CORPORATION

2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA



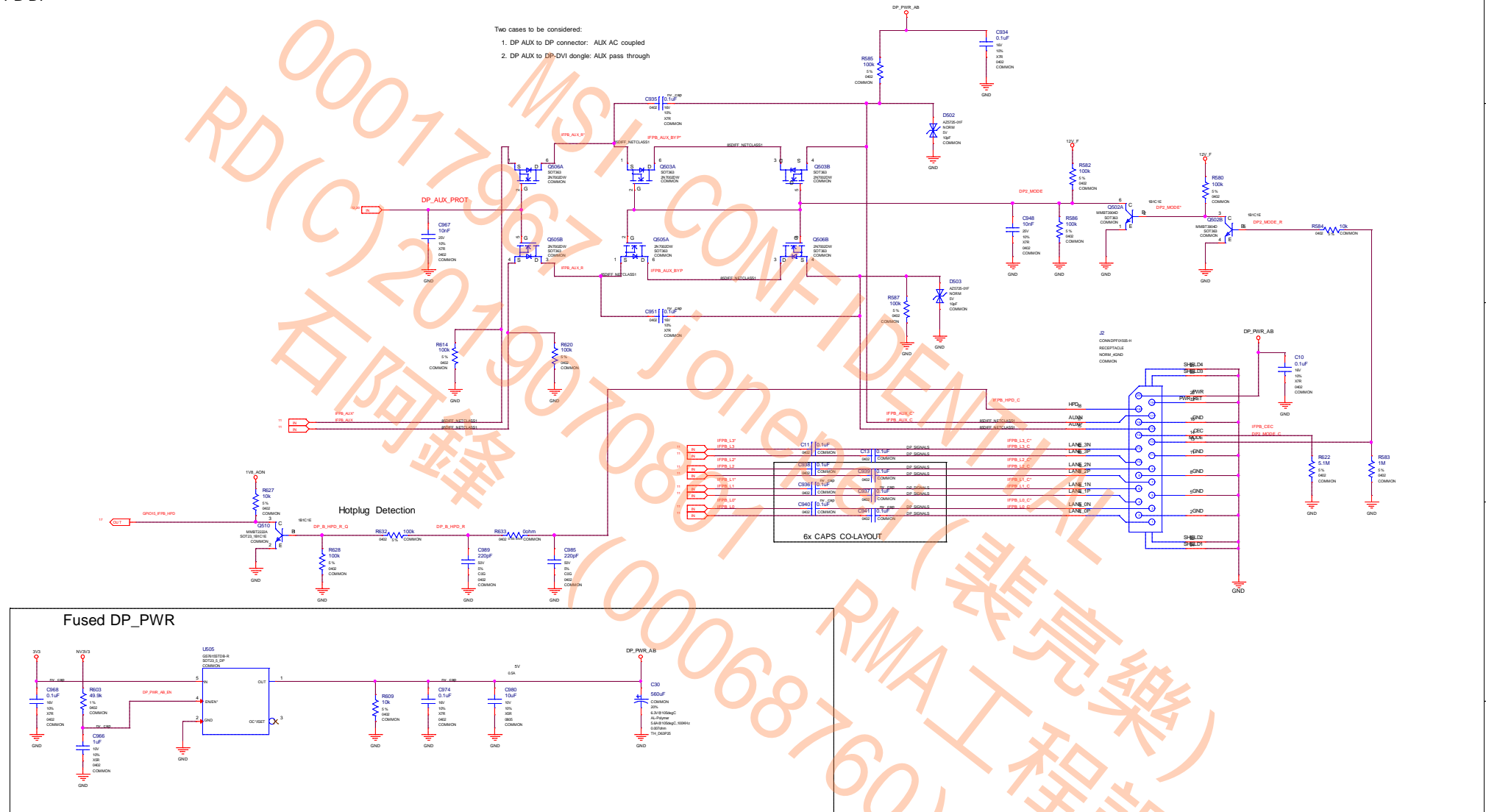
NV_PN	600-1G174-BASE-A01
-------	--------------------

POB REV	PG174-A01	PAGE	12 OF 32
BOM REV	A	DATE	10-DEC-2018

BOM REV	A	DATE	10-DEC-2018
---------	---	------	-------------

IFPB DP CO-LAYOUT WITH IFPAB DVI-D-DL

Page13: IFPB DP



NVIDIA CORPORATION

2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA



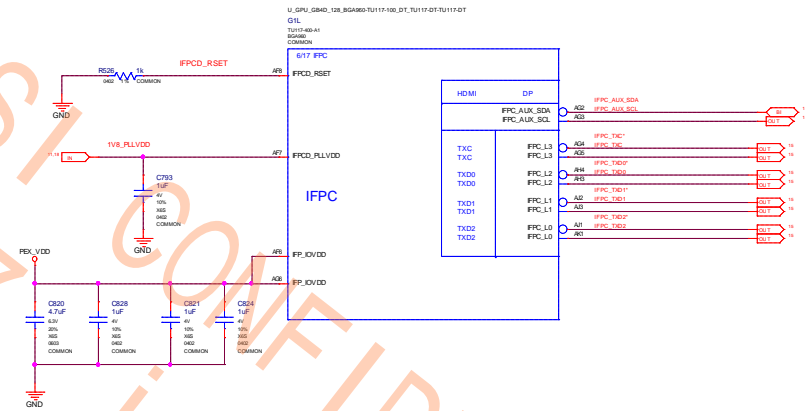
NV_PN	600-1G174-BASE-A01
-------	--------------------

POB REV	PG174-A01	PAGE	13 OF 32
BOM REV	A	DATE	10-DEC-2018


[illegible]

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 NONINFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE OR INDUSTRY STANDARDS.

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

[illegible]

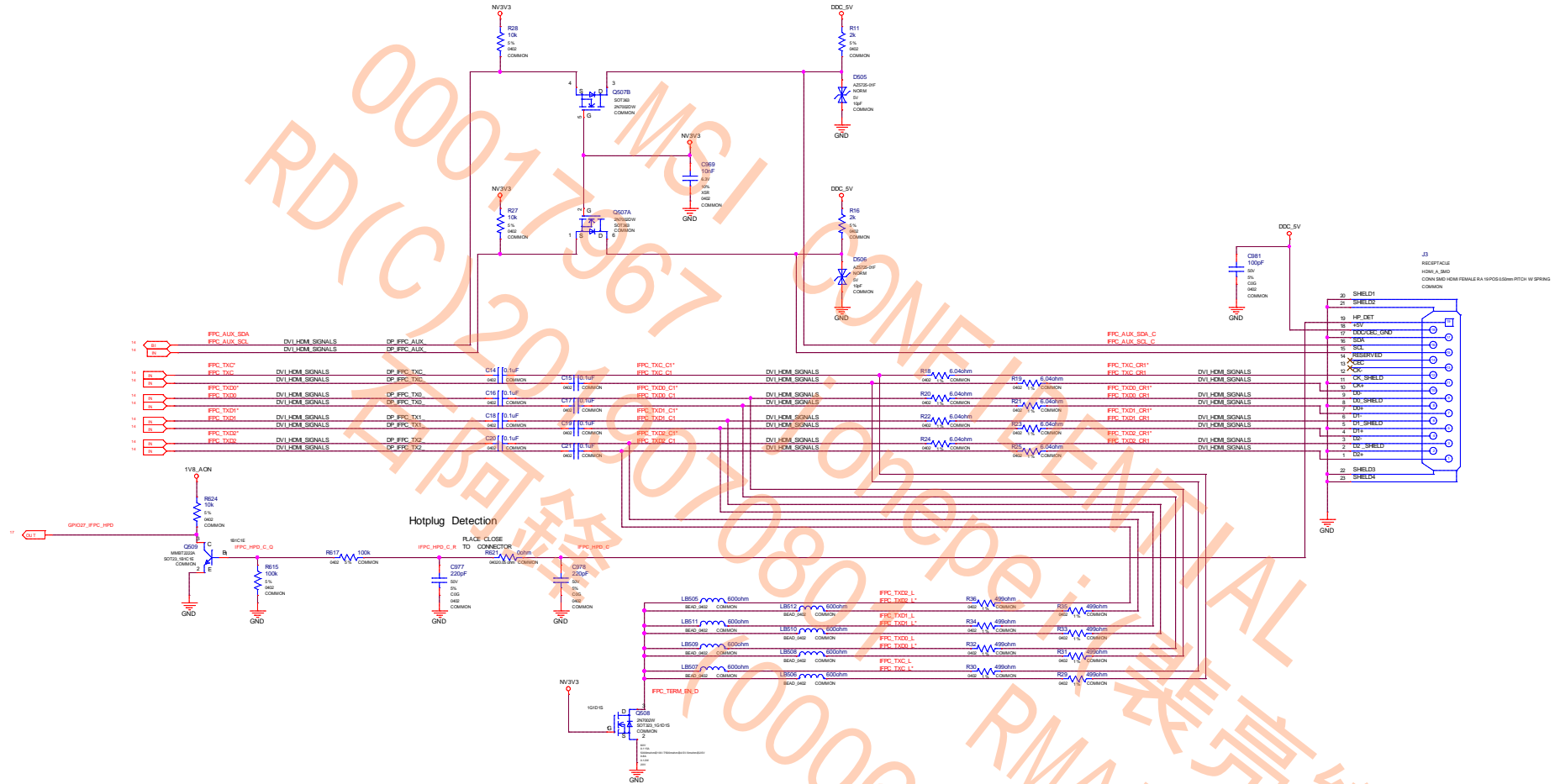
ASSEMBLY	<ASSEMBLY_DESCRIPTION>
PAGE DETAIL	IFPC

NVIDIA CORPORATION 2701 SAN TOMAS EXPRESSWAY SANTA CLARA, CA 95050, USA				
NV_PN		601-1G174-BASE-A01		
PCB REV	PG174-A01	PAGE	14 OF 32	
BOM REV	A	DATE	10-DEC-2018	



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 INDEFINITE AND UNUSUAL VARIATIONS 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.

IFPC HDMI



NVIDIA CORPORATION	
2701 SAN TOMAS EXPRESSWAY	
SANTA CLARA, CA 95050, USA	
NV_PN	600-1G174-BASE-A01
PCB REV	PG174-A01
ICM REV	A
PRGE	15 OF 32
DATE	10-DEC-2018

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 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.

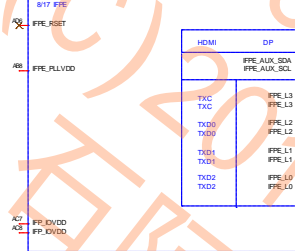
IFPDEF UNUSED



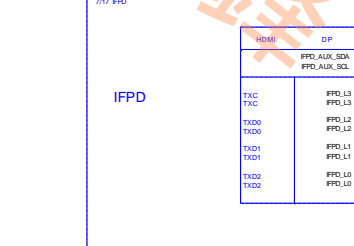
G1M

TU117-400-A
DEAGGS
CONCRETE

8/17 E



U_GPU_GB4D_128_BGA260-TU117-100_DT_TU117-DT-TU117-DT



ASSEMBLY	ASSEMBLY_DESCRIPTION
PAGE DETAIL	FPDEF UNUSED

NVIDIA CORPORATION

NVIDIA® CORP.

2701 SAN TOMAS EXPRESSWAY



NV_PN	600-1G174-BASE-A01
-------	--------------------

POB REV	PG174-AD1
---------	-----------

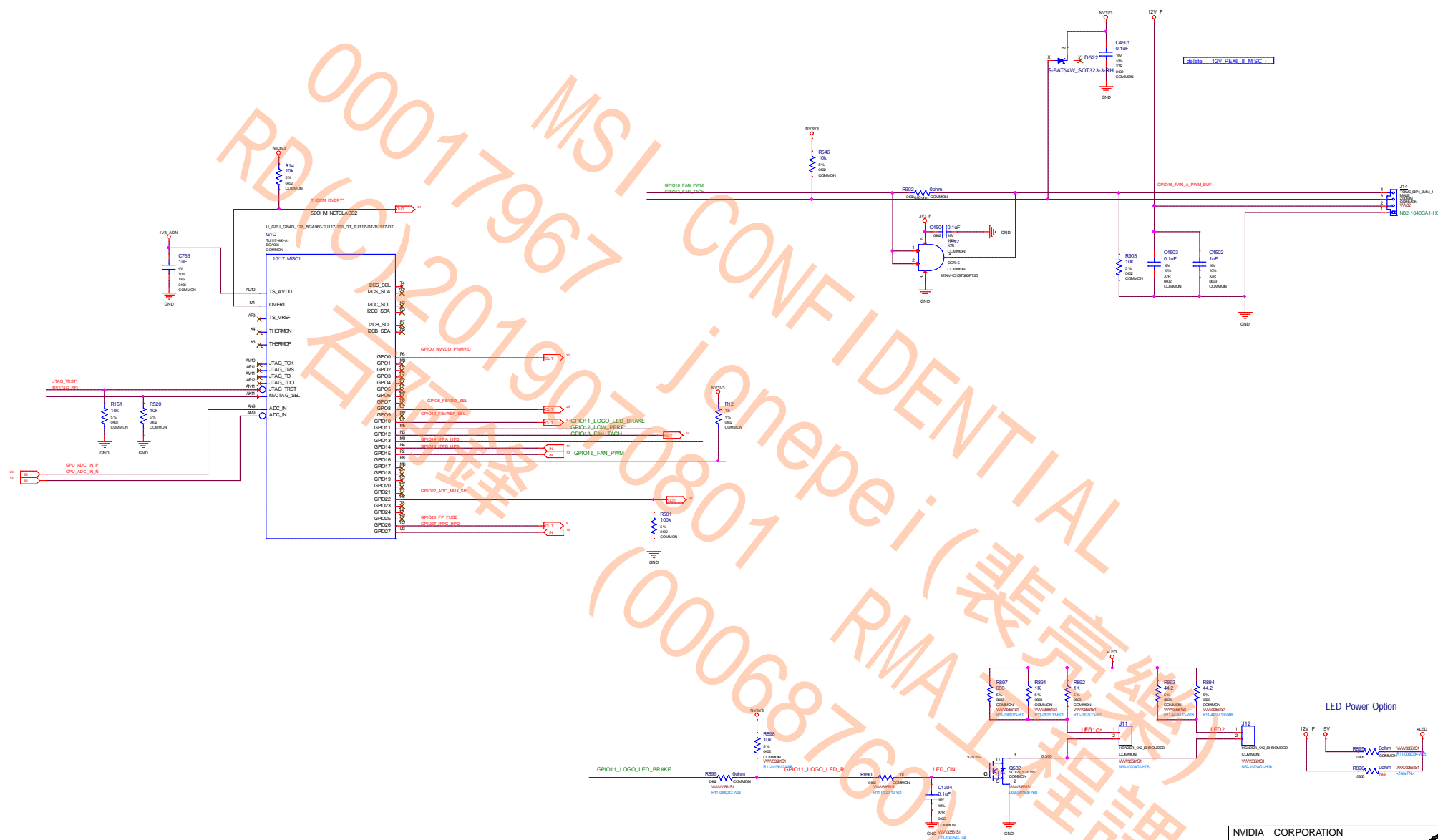
POB REV	
BOM REV	

PAGE 16 OF 32

DATE	10-DEC-2018
------	-------------

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 VARIATIONS 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.

MISC1: GPIO, Fan, Thermal, JTAG



ASSEMBLY	«ASSEMBLY_DESCRIPTION»
PAGE DETAIL	MISC1: Fan, Thermal, JTAG, GPIO

NVIDIA CORPORATION

2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

NV_PN	600-1G174-BASE-A01
-------	--------------------

PCB REV	PG174-A0
BOM REV	A

PAGE	17 OF 32
DATE	10-DEC-2018

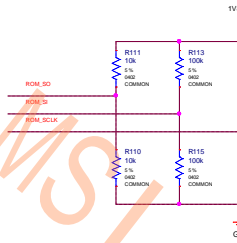


17 OF 32
10-DEC-2018

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 KNOWING 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.

MISC2: ROM, XTAL, Straps

ROM_SO	ROM_SI	ROM_SCLK	DUMMY{2:0}.FS_OVERT	1:ENABLE 0:DISABLE
L	L	L	xxx1	FS_OVERT ENABLE
L	L	M	xxx0	FS_OVERT DISABLE



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

STRAP2	STRAP1	STRAP0	RAMCFG{4:0}
L	L	L	0000 Samsung 8Gb 256Mx32 K4G80325FC-HC25
L	L	H	0001 Micron 8Gb 256Mx32 MT51J256M32HF-80.B
L	H	L	0010 Hynix 8Gb 256Mx32 H5GC8H24AJR-R2C
L	H	H	0011 Hynix 8Gb 256Mx32 H5GQ8H24MJR-R4C
H	H	L	0110
H	H	H	0111
L	L	M	1000
L	M	L	1001

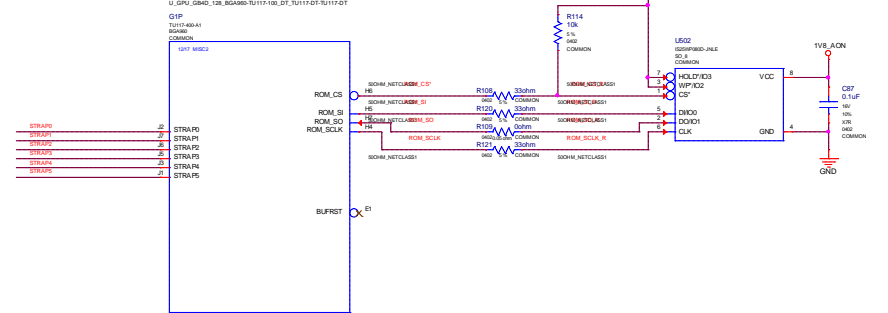
STRAP5	STRAP4	STRAP3	SMB_ALT_ADDR	DEVID_SEL	PCIE_CFG	VGA_DEVICE
M	H	H	1	1	1	1
M	H	L	1	1	1	0
M	L	H	1	1	0	1
M	L	L	1	1	0	0
L	M	H	1	0	1	0
L	M	L	1	0	0	1
L	L	M	1	0	0	0
H	H	H	0	1	1	1
H	H	L	0	1	1	0
H	L	H	0	1	0	1
H	L	L	0	1	0	0
L	H	H	0	0	1	1
L	H	L	0	0	1	0
L	L	H	0	0	0	1 DEFAULT
L	L	L	0	0	0	0

- 1:SMB_ALT_ADDR ENABLE
0:SMB_ALT_ADDR DISABLE

1:DEVID_SEL REBRAND
0:DEVID_SEL ORIGINAL

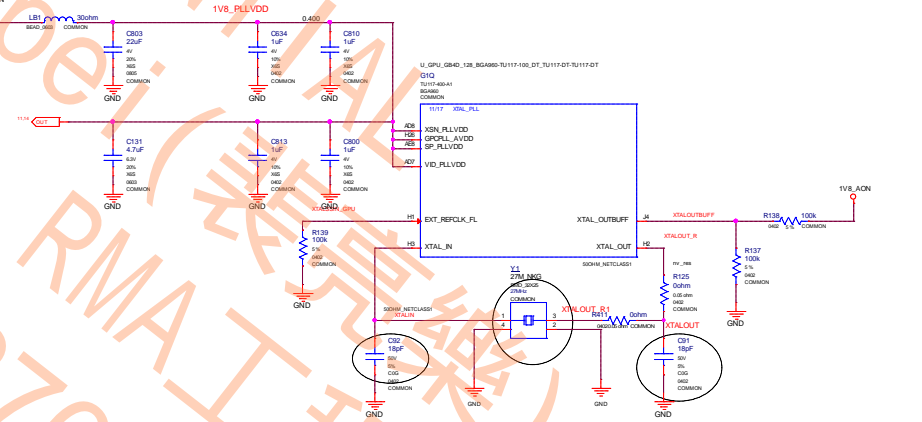
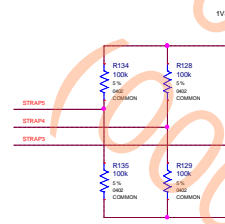
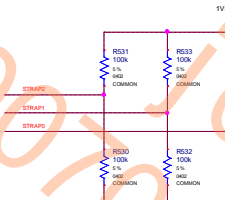
1:PCIE_CFG LOW POWER
0:PCIE_CFG HIGH POWER

1:VGA_DEVICE ENABLE
0:VGA_DEVICE DISABLE



Smart Fan

XTALOUTBUFF	Volatge	SmartFan PWM	GPIO/PWM at the FAN
Low	0V	GPIO Disabled	100%
Middle	0.9V	66% PWM	33% PWM (Typical)
High	1.8V	33% PWM	66% PWM



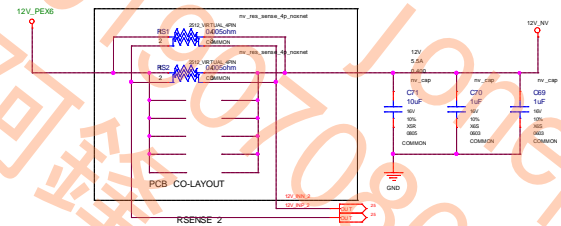
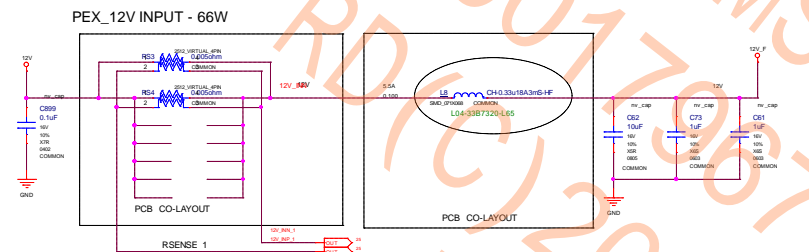
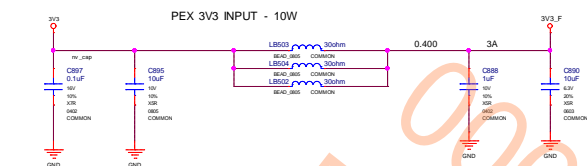
NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

NV_PN 600-1G174-BASE-A01
PCB REV PG174-A01
ROM REV A

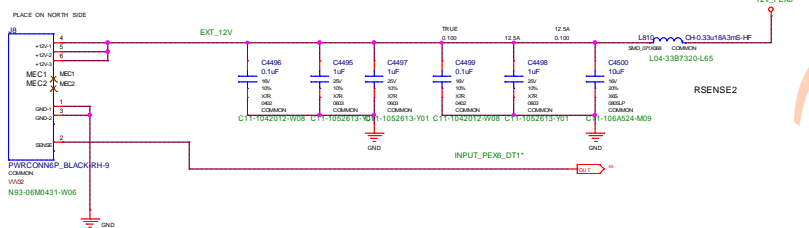
DATE 10-DEC-2018

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 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.

Power Inputs and Filtering



PEX6 INPUT 1 - 2x3 PCIE CON 75W



NVIDIA CORPORATION

2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA



NV_PN 600-1G174-BASE-A01

PCB REV PG174-A01

BOM REV A

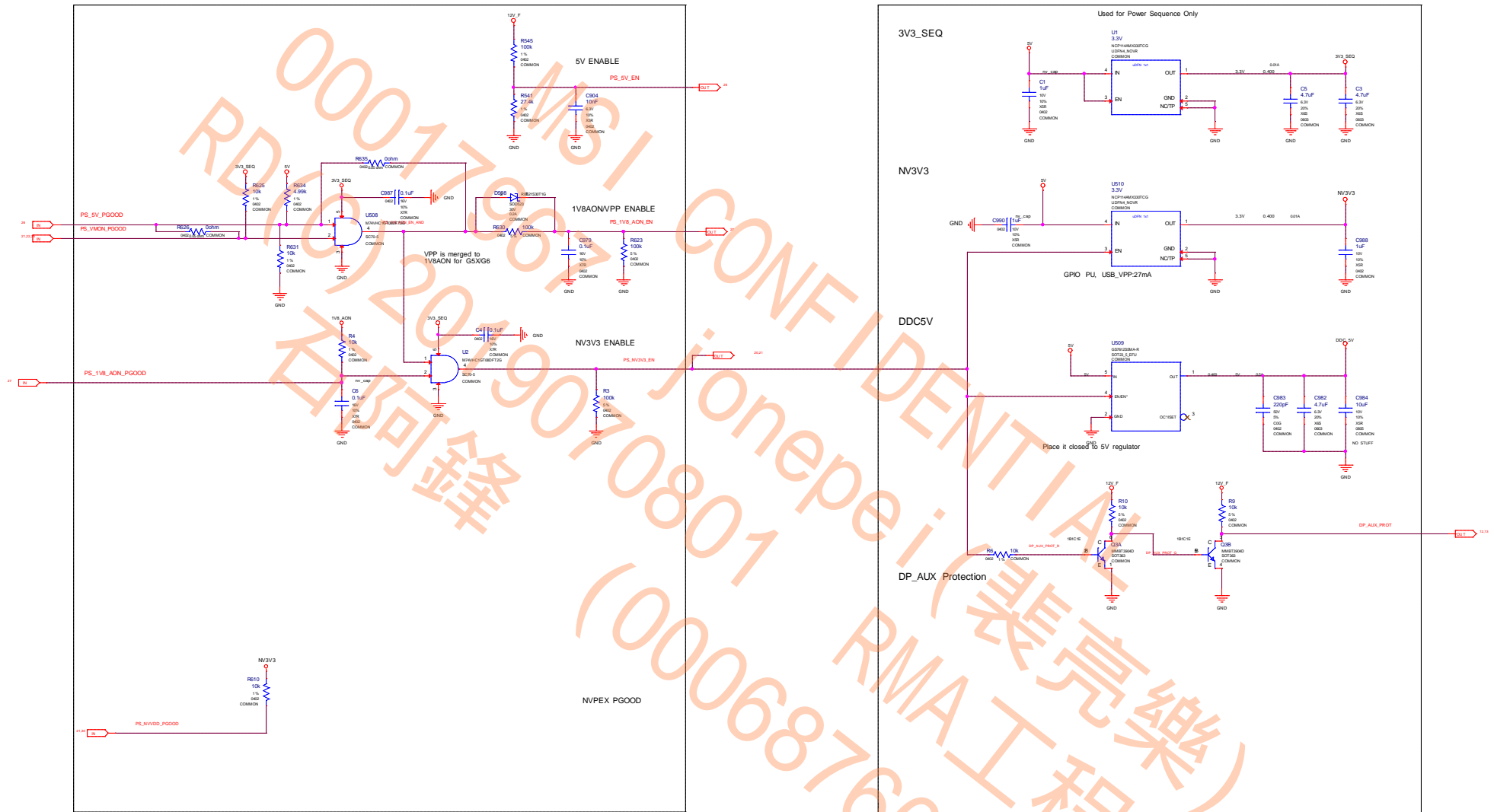
PRGE 19 OF 32

DATE 10-DEC-2018

ASSEMBLY
PAGE DETAIL

ASSEMBLY DESCRIPTION
Power Inputs and Filtering

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 VARIATIONS OR DEVIATIONS OF INDUSTRY STANDARDS AND SPECIFICATIONS. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE, WITH RESPECT TO THE MATERIALS 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.



NVIDIA CORPORATION

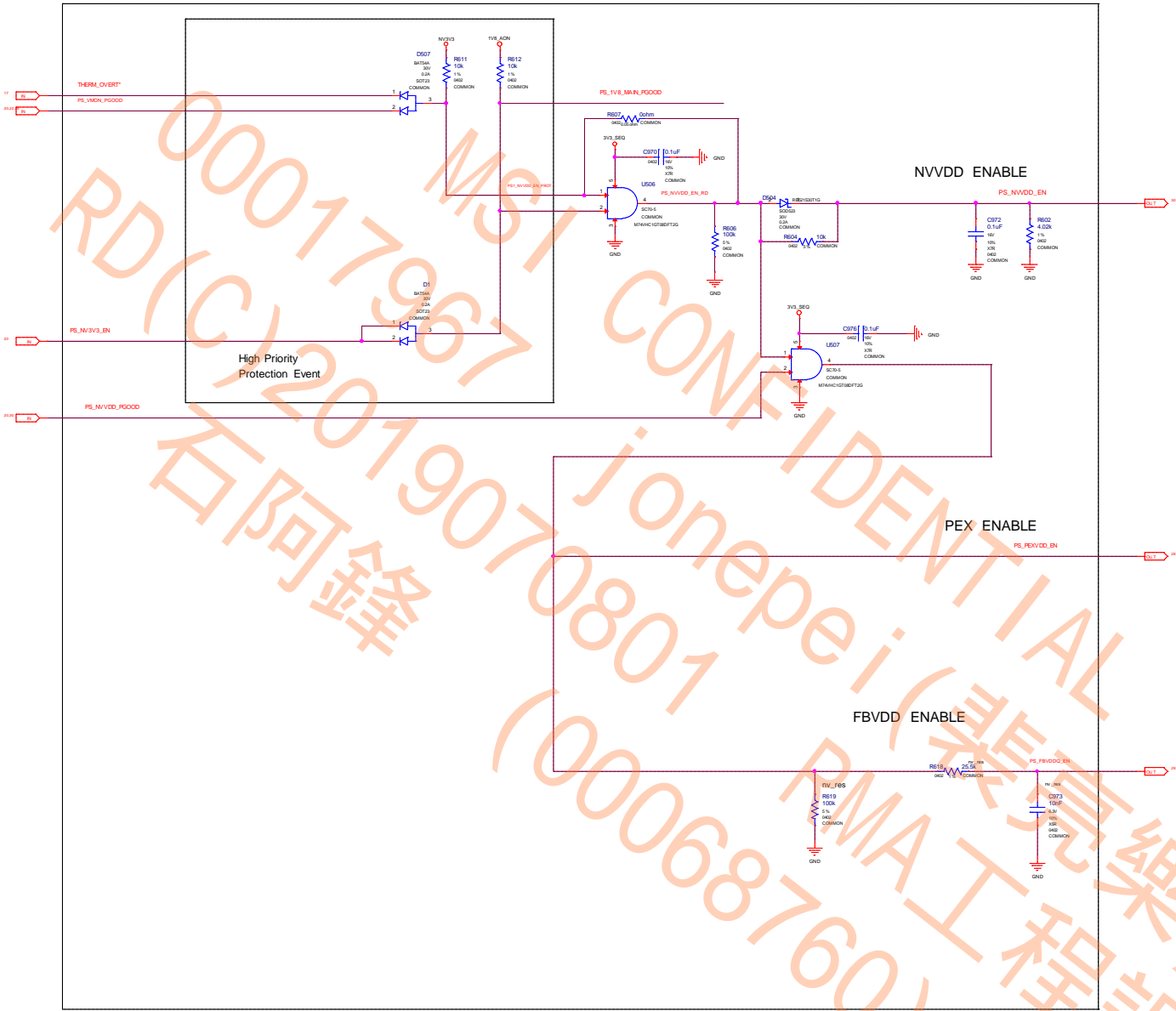
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA



NV_PN	600-1G174-BASE-A01		
PCB REV	PG174-A01	PAGE	20 OF 32
BOM REV	A	DATE	10-DEC-2018

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 REGARD 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.

SEQ:NV,PEX,FB ENABLE



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 NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

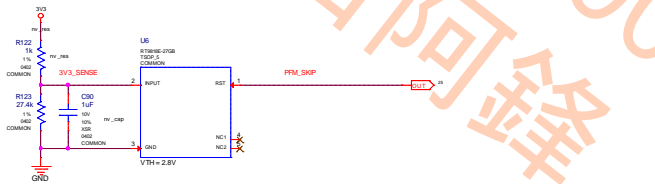
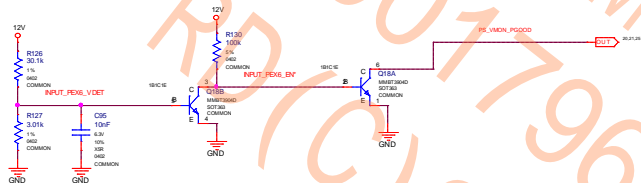
NVIDIA CORPORATION

2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA



NV_PN 600-1G174-BASE-A01

PCB REV	PG174-A01	PRGE	21 OF 32
BCM REV	A	DATE	10-DEC-2018



ASSEMBLY	ASSEMBLY DESCRIPTION
PCB DETAIL	SEQ VOLTAGE MONITOR

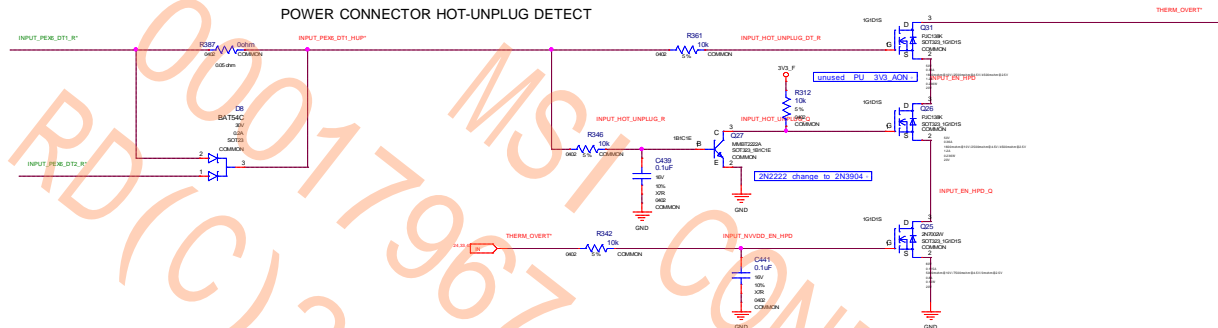
19ci203

NVIDIA CORPORATION			
2701 SAN TOMAS EXPRESSWAY			
SANTA CLARA, CA 95050, USA			
NV_PN	600-1G174-BASE-A01		
PCB REV	PG174-A01	PRGE	22 OF 32
BOM REV	A	DATE	10-DEC-2018

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 NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.



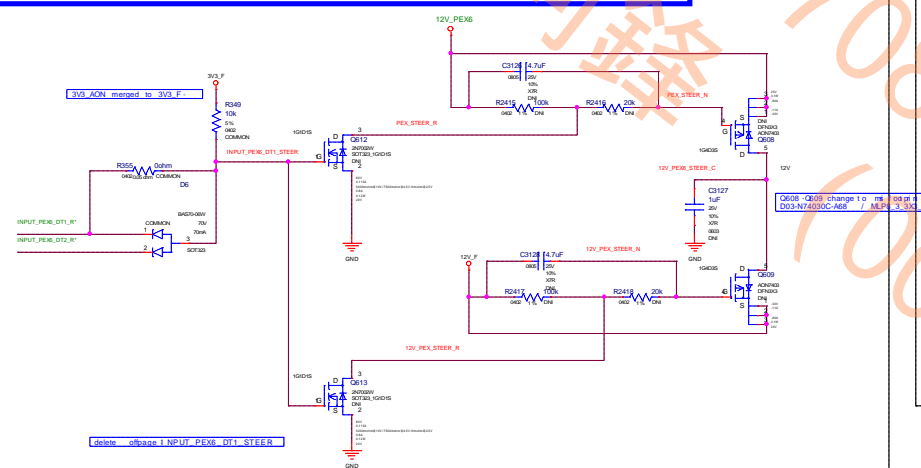
POWER CONNECTOR HOT-UNPLUG DETECT



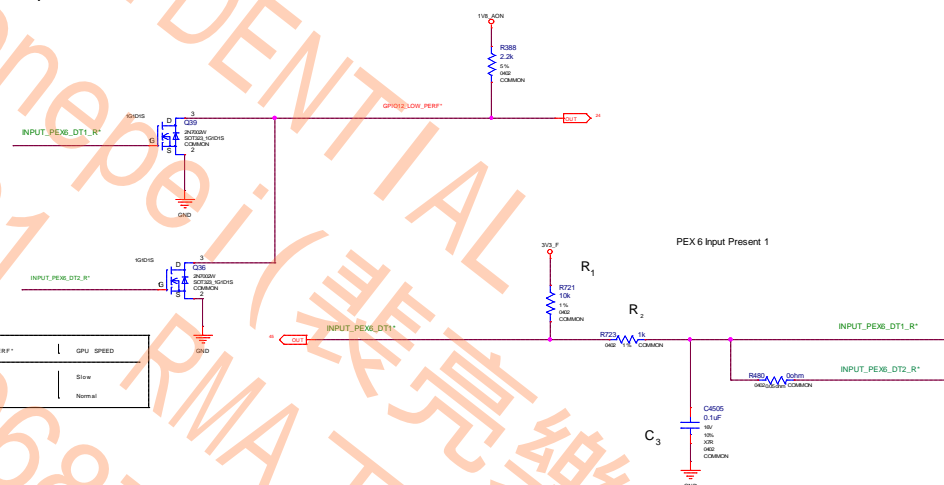
12V CURRENT STEERING (UNDER POWER BOOT):

GUIDES CURRENT FROM PEX EDGE TO PEX 6 PIN INPUT AREA

copied 12V CURRENT STEERING from V373-2.0 and BOM stuff ed



PEX Input - Power Level/PSI* Control



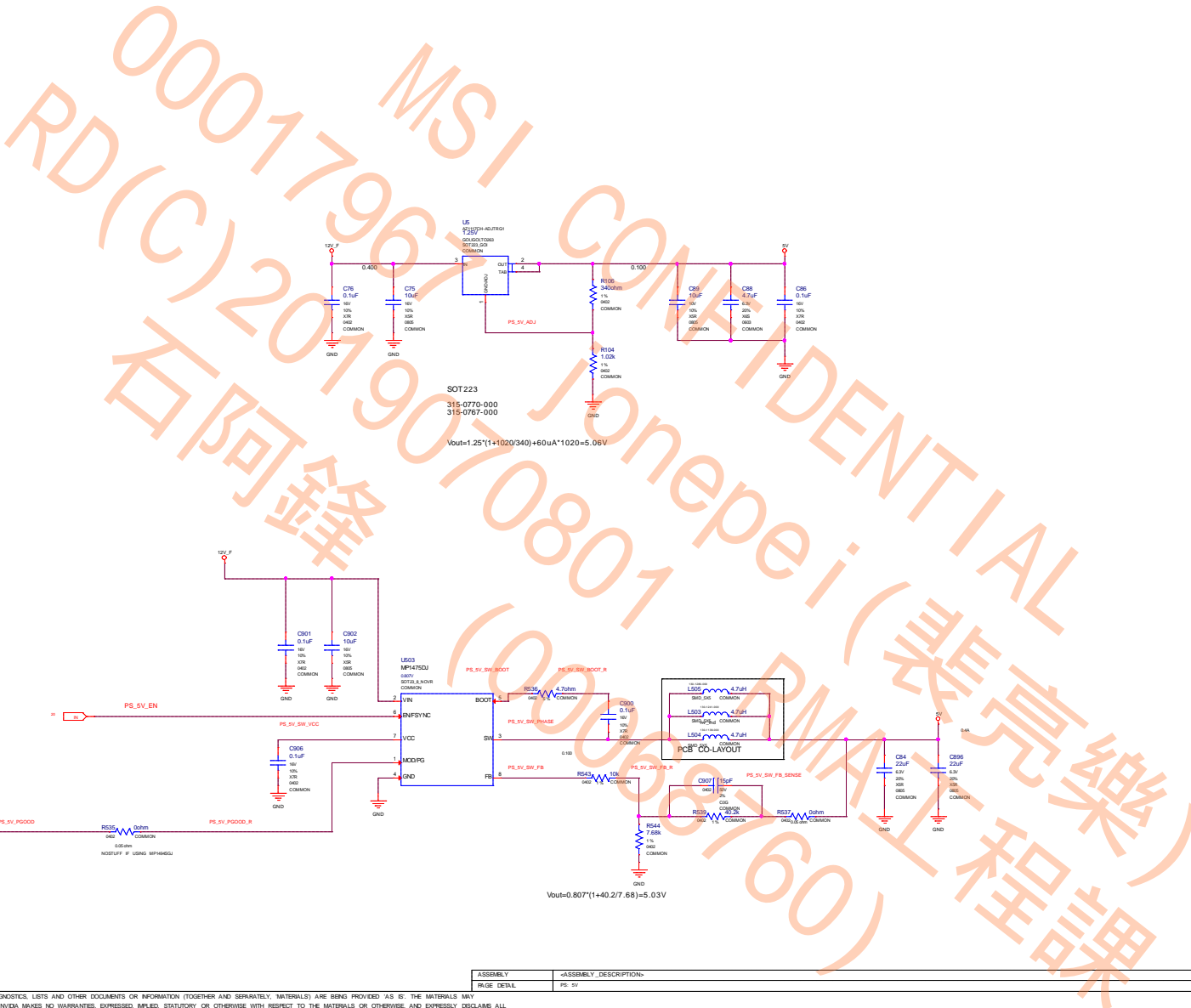
ASSEMBLY	<ASSEMBLY_DESCRIPTION>
PAGE DETAIL	SEQ: DISCHARGE

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA



NV_PN	600-1G174-BASE-A01		
PCB REV	PG174-A01	PAGE	23 OF 3
RCM REV	A	DATE	10-DEC-2018

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 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.



A	B	C	D
---	---	---	---

MAY
DISCLAIMS ALL
STANDARDS.

2701 SAN TOMAS EXPRESSWAY

NV_PN	600-1G
-------	--------

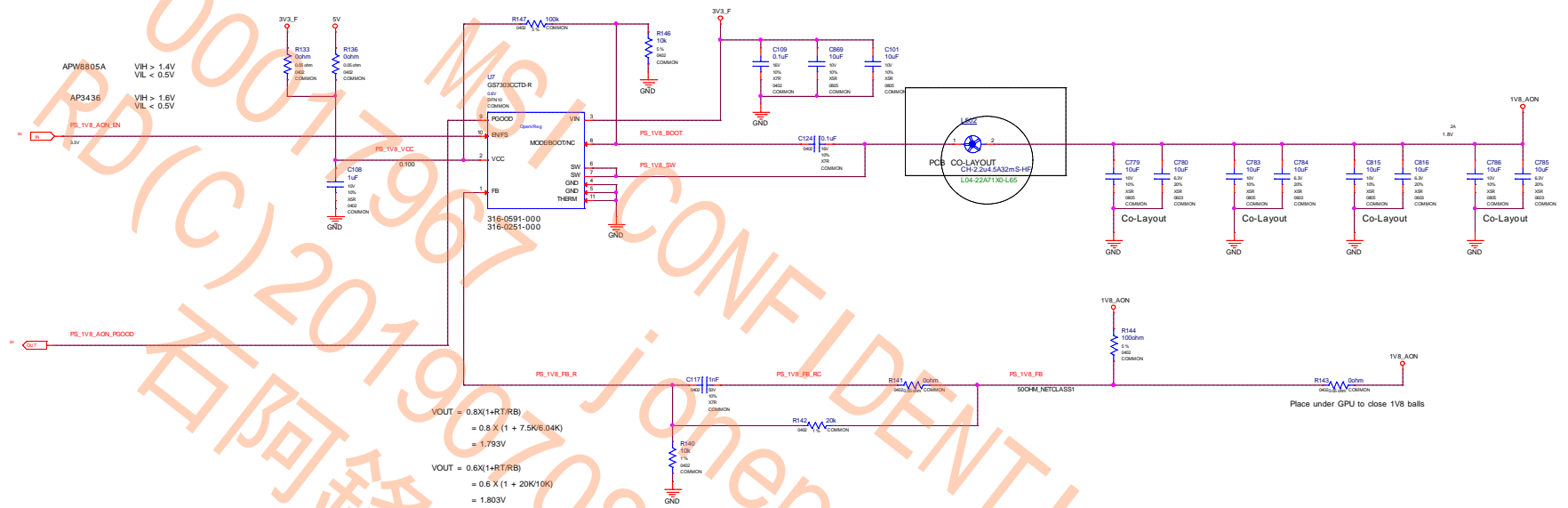


PCB REV	PG174-A01
---------	-----------

[illegible]

H

PS: 1V8


$$\begin{aligned} V_{OUT} &= 0.8X(1+R_T/R_B) \\ &= 0.8 \times (1 + 7.5K/6.04K) \\ &= 1.793V \end{aligned}$$
$$\begin{aligned} V_{OUT} &= 0.6X(1+R_T/R_B) \\ &= 0.6 \times (1 + 20K/10K) \\ &= 1.803V \end{aligned}$$
$$\begin{aligned} V_{OUT} &= 0.6X(1+R_T/R_B) \\ &= 0.6 \times (1 + 20K/10K) \\ &= 1.803V \end{aligned}$$

NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA



NV_PN	600-1G174-BASE-A01
-------	--------------------

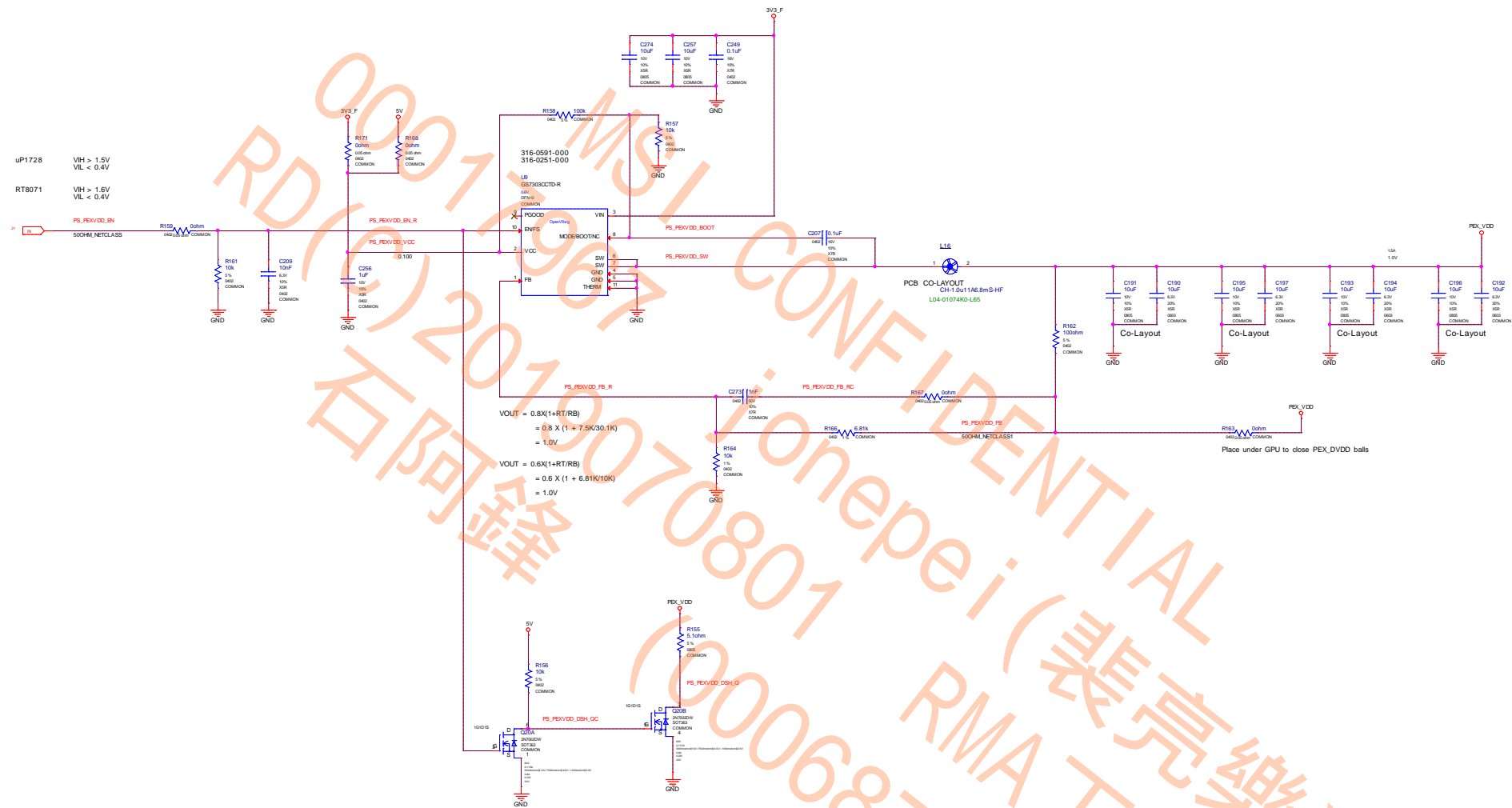
PCB REV	PG174-A01	PAGE	27 OF 32
BOM REV	A	DATE	10-DEC-2018

BOM REV	A	DATE	10-DEC-2018
---------	---	------	-------------

BOM REV	A	DATE	10-DEC-2018
---------	---	------	-------------

BOM REV	A	DATE	10-DEC-2018
---------	---	------	-------------

PS: PEXVDD



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 VARIATIONS OR DEVIATIONS OF INDUSTRY STANDARDS AND SPECIFICATIONS. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS OR OTHERWISE, 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.

ASSEMBLY	«ASSEMBLY_DESCRIPTION
PAGE DETAIL	PS: PEXVDD

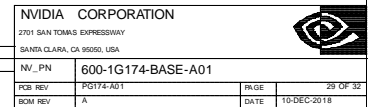
NVIDIA CORPORATION

2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA

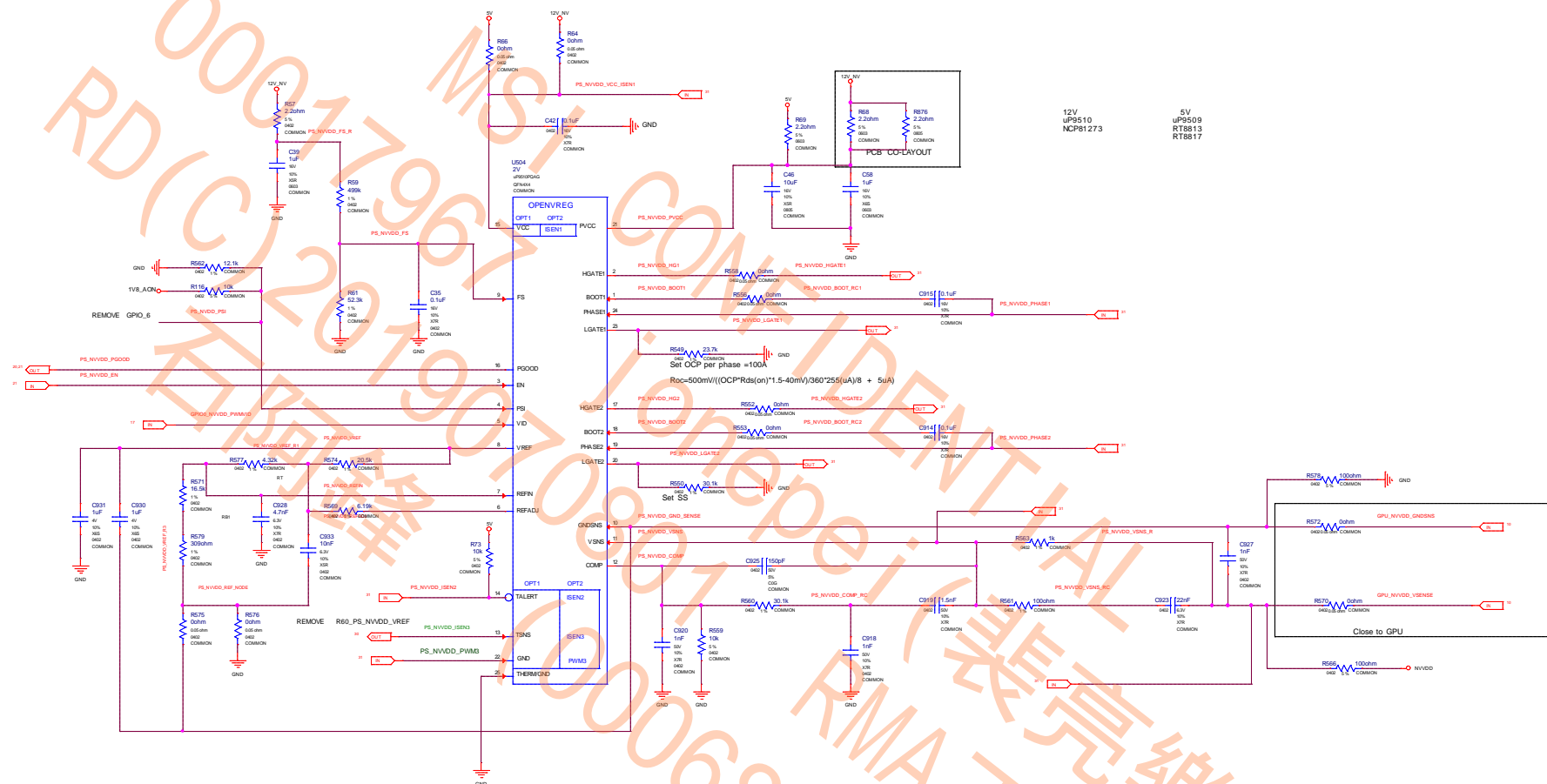


NV_PN	600-1G174-BASE-A01
-------	--------------------

POB REV	PG174-A01	PAGE	28 OF 32
BOM REV	A	DATE	10-DEC-2018



PS: NVVDD OVR2+1



NVPN	Name	PVCC(21)	VCC(15)
316-0478-000	NCP81273	12v	LDO_OUT
316-0476-000	up9510	12v	ISENSE
316-0484-000	RT8817A	5v	NC

<--Default
<--2nd source

19ci203

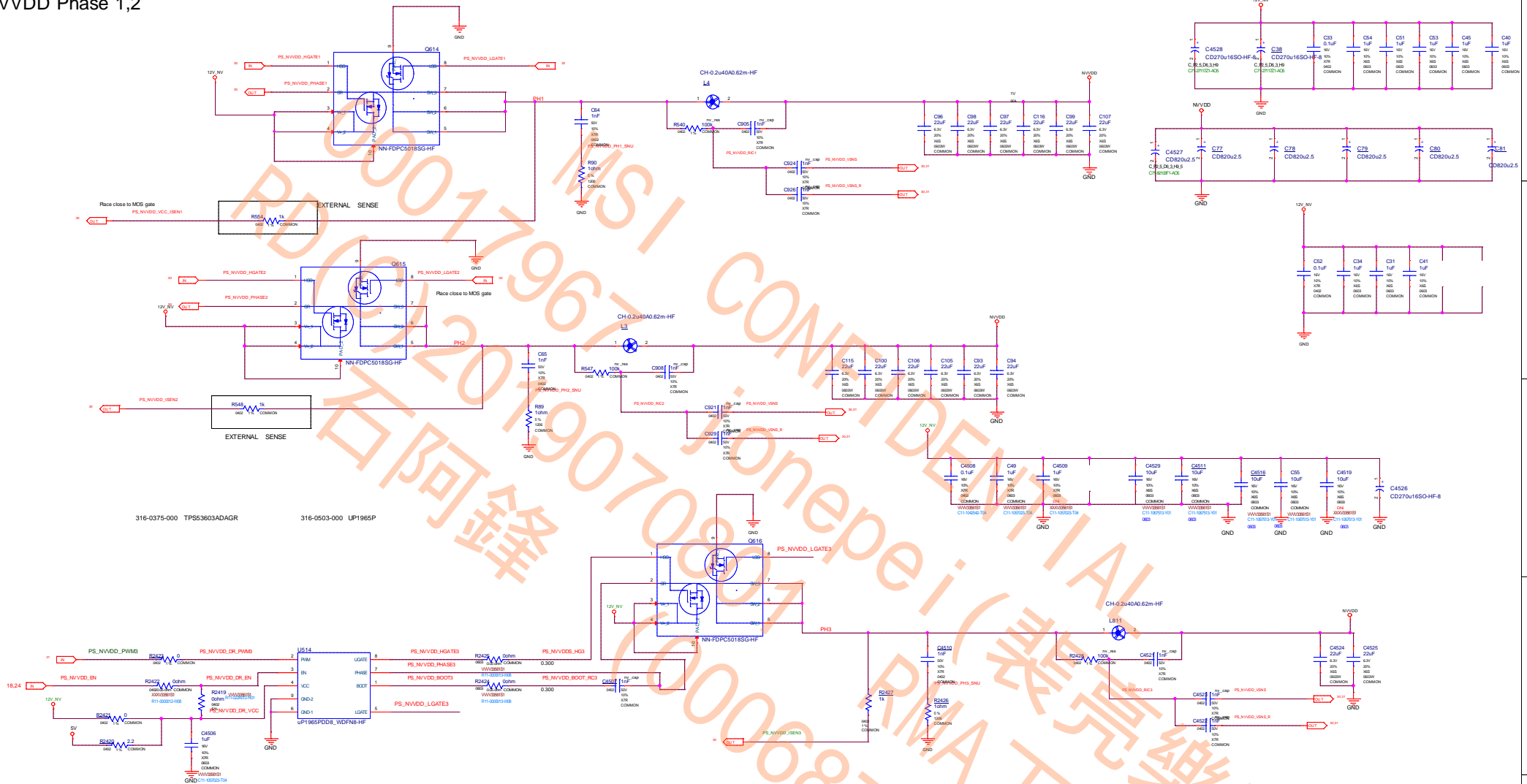
NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA



NV_PN	600-1G174-BASE-A01		
PCB REV	PG174-A01	PAGE	30 OF 32
BOM REV	A	DATE	10-DEC-2018

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 NONINFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

PS: NVVDD Phase 1,2



NVIDIA CORPORATION

2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA



NV_PN	600-1G174-BASE-A01
-------	--------------------

POB REV	PG174-A01
---------	-----------

BOM REV

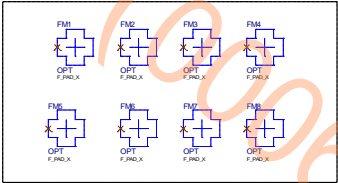
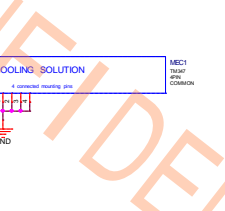
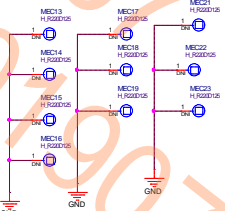
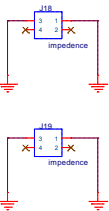
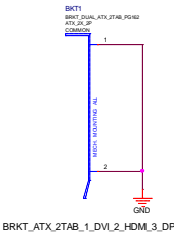
PAGE 31 OF 32

DATE	10-DEC-2018
------	-------------

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 NONINFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY

Mechanical: Bracket/Thermal Solution

Brackets:



NVIDIA CORPORATION
2701 SAN TOMAS EXPRESSWAY
SANTA CLARA, CA 95050, USA



NV_PN	600-1G174-BASE-A01	PG#	32 OF 32
PCB REV	PG174-A01	DATE	10-DEC-2018
BOM REV	A		

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 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.