PG132-A02

370W, FH Std PCB, 384b, GDDR6x 2CH X16
DP + DP + DP + HDMI/DP

TABLE OF CONTENTS

V389-20

Page	Description
1	Table of Contents
2	BLOCK DIAGRAM
3	PCI EXPRESS
4	MEMORY: GPU PARTITION A/B
5	MEMORY: FBA PARTITION[31:0]
6	MEMORY: FBA PARTITION[63:32]
7	MEMORY: FBB PARTITION[31:0]
8	MEMORY: FBB PARTITION[63:32]
9	MEMORY: GPU PARTITION C/D
10	MEMORY: FBC PARTITION[31:0]
11	MEMORY: FBC PARTITION[63:32]
12	MEMORY: FBD PARTITION[31:0]
13	MEMORY: FBD PARTITION[63:32]
14	MEMORY: GPU PARTITION E/F
15	MEMORY: FBE PARTITION[31:0]
16	MEMORY: FBE PARTITION[63:32]
17	MEMORY: FBF PARTITION[31:0]
18	MEMORY: FBF PARTITION[63:32]
19	GPU GND, RFUs & RSVD
20	GPU POWERS
21	GPU DECOUPLING NVVDD
22	GPU DECOUPLING FBVDDQ
23	GPU DECOUPLING MSVDD
24	BLANK
25	NVHS x16
26	MISC: THERMAL, JTAG, GPIO
27	IFPA UNUSED, IFPB UNUSED
28	IFPE DP
29	IFPD DP
30	IFPC HDMI/DP
31	IFPF DP
32	MISC. ROM, STRAPS
33	MISC. XTAL, PLL
34	PS: 5V
35	PS: PEX_DVDD and 1V8
36	BLANK
37	PS: FBVDD Controller OVR3
38	PS: FBVDDQ OVR4
39	PS: FBVDD PH1
40	PS: FBVDD PH3
41	PS: FBVDD PH2
42	PS: FBVDD PH4
43	PS: FBVDD OUTPUT CAP
44	PS: FBVDD_OUTPUT_CAP_NEAR_MEMORY
45	PS: MSVDD CONTROLLER
46	PS: MSVDD PH1
47	PS: MSVDD PH2
48	PS: MSVDD PH3 and PH5
49	PS: MSVDD PH4 and PH6
50	PS: MSVDD OUTPUT CAP(TOP)
51	BLANK
52	PS: NVVDD Controller_OVR8
53	PS: NVVDD PH1 (PWM1)
54	PS: NVVDD PH2(PWM6)
55	PS: NVVDD PH3 (PWM3) and PH4 (PWM3)
56	PS: NVVDD PH5(PWM7) and PH7(PWM8)
57	PS: NVVDD PH6 (PWM7)
58	PS: NVVDD PH8(PWM5) and PH9(PWM2)
59	PS: NVVDD PH10 (PWM4)
60	Colayout_Notes
61	BLANK
62	PS: NVVDD OUTPUT CAP(TOP)
63	BLANK
64	PS: INPUT SWITCH RTD3
65	BLANK
66	PS: INPUTS, FILTERING, and, MONITORING
67	PS: HOT UNPLUG
68	PS: Discrete Power Steering
69	PS: PREFILTER
70	PS: PREFILTER B
71	Sequence: 5V, 1V8, 3V3_SEQ
72	Sequence: NV, PEX, FB EN
73	Sequence: 3V3 MONITOR
74	Sequence: MISC
75	MISC: LED & FAN
26	Add I2CB & Remove GPIO5/11/19/31/35
32	Add Dual-BIOS
34	Remove choke co-lay & change footprint
	Add 5V_LED
35	Remove choke co-lay & change footprint
37	Remove FBVDDQ OVR3
39	Remove choke co-lay & change footprint
40	Remove choke co-lay & change footprint
	Change 12Vin source
41	Remove choke co-lay & change footprint
	Change 12Vin source
42	Remove choke co-lay & change footprint
43	Remove CAP co-lay & change footprint
46	Remove choke co-lay & change footprint
47	Remove choke co-lay & change footprint
	Change 12Vin source
48	Remove choke co-lay & change footprint
	Change 12Vin source
49	Remove choke co-lay & change footprint
	Change 12Vin source
50	Remove CAP co-lay & change footprint
53	Remove choke co-lay & change footprint
54	Remove choke co-lay & change footprint
	Change 12Vin source
55	Remove choke co-lay & change footprint
	Change 12Vin source
56	Remove choke co-lay & change footprint
	Change 12Vin source
57	Remove choke co-lay & change footprint
	Change 12Vin source
58	Remove choke co-lay & change footprint
	Change 12Vin source
62	Remove CAP co-lay & change footprint
66	Add Fuse & PEX8 INPUT3
	Change intput choke footprint
67	Remove Hot Unplug Detect
68	Remove 12V CURRENT STEERING
75	Remove 2-PIN LED HEADER
76	Add MCU for LED

MICRO-STAR INT'L CO.,LTD

MS-V389

Size	Document Description	Rev
Custom	Table of Contents	2.1

Date: Wednesday, July 29, 2020 Sheet 1 of 79

Block Diagram

NVHS

DP_F

DP_E

DP_D

DP/HDMI_C

MEM D

MEM C

MEM E

NVHS x16

GA102
(GB5-384)

MEM B

MEM F

MEM A

PCIe 4.0 x16 EDGE FINGER

NVVDD — Power Supply
NVVDD: PH1-10 OVR4+

MSVDD — Power Supply
MSVDD: PH1-6 OVR4+

FBVDDQ — Power Supply
FBVDD/Q PH1-4
OVR4+/OVR3I

1V8 — Power Supply
1V8

5V — Power Supply
5V SWITCHER OVRU

PEX_VDD — Power Supply
PEX_VDD

Input Switch
OVRS
(RTD3 GC6 12V-OFF)

2xFAN

EXT_12V 2x4 PWR 1

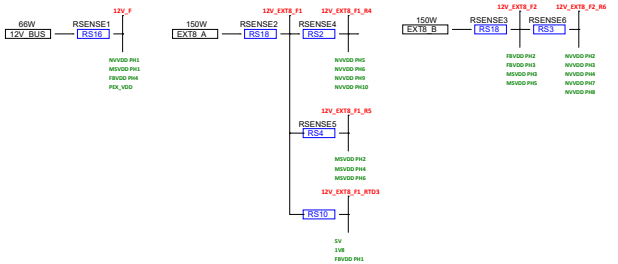
EXT_12V 2x4 PWR 2

PEX_12V Finger

PEX_3V3 Finger

3V3_AUX Finger

PG132 sku30 Power Topology

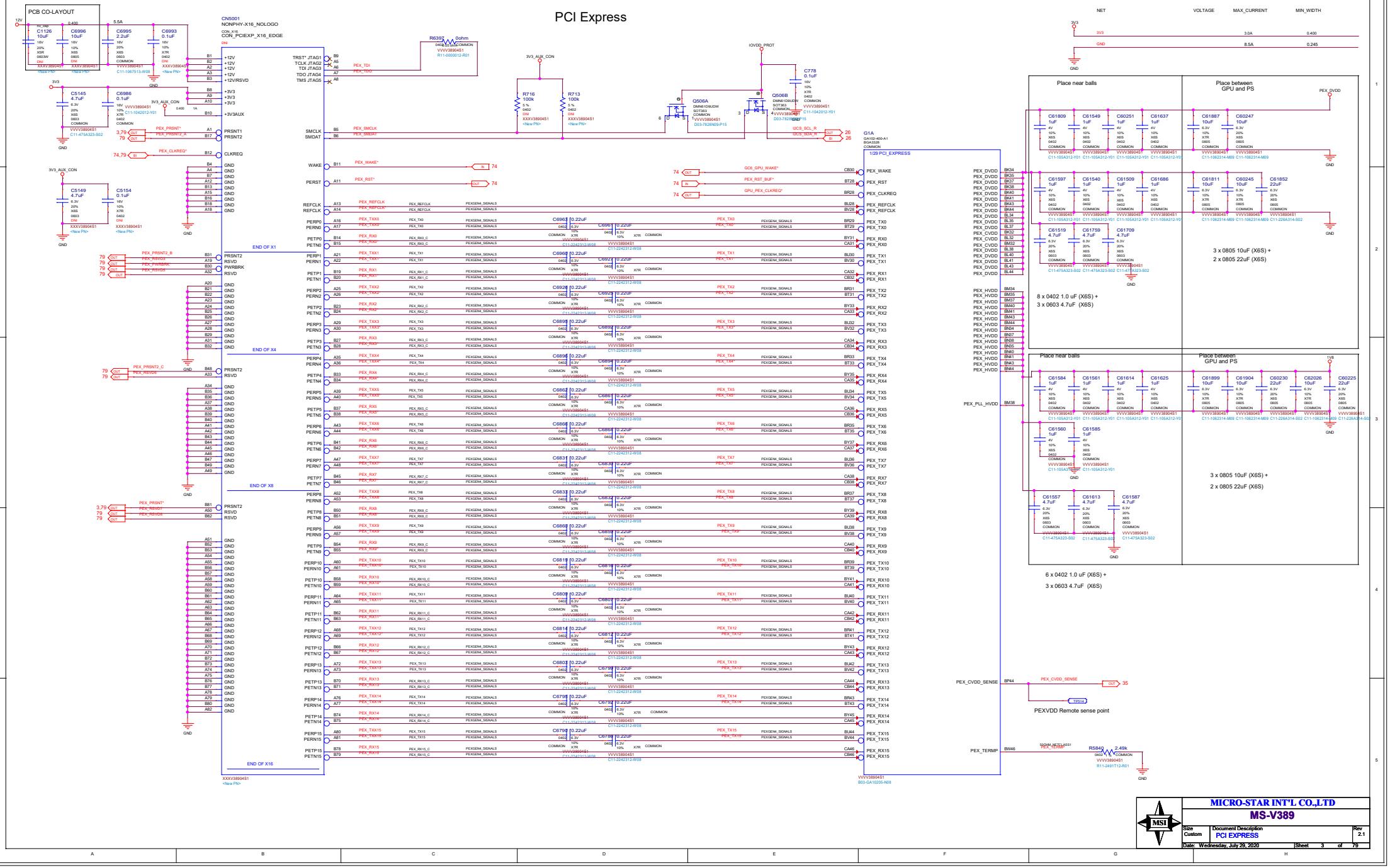


MICRO-STAR INT'L CO.,LTD
MS-V389

Size	Document Description	Rev
Custom	BLOCK DIAGRAM	2.1

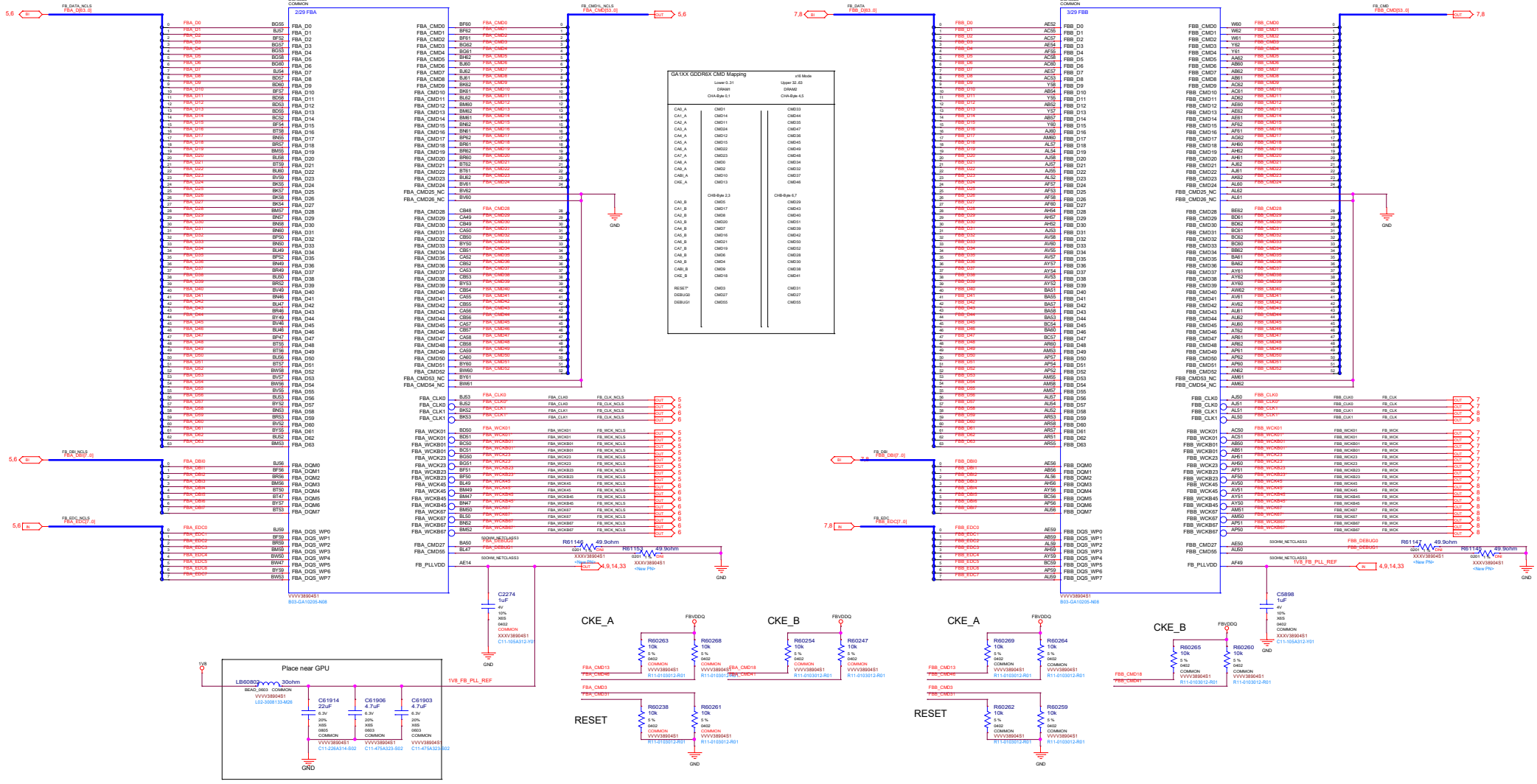
Date: Wednesday, July 29, 2020 Sheet 2 of 79

PCI Express



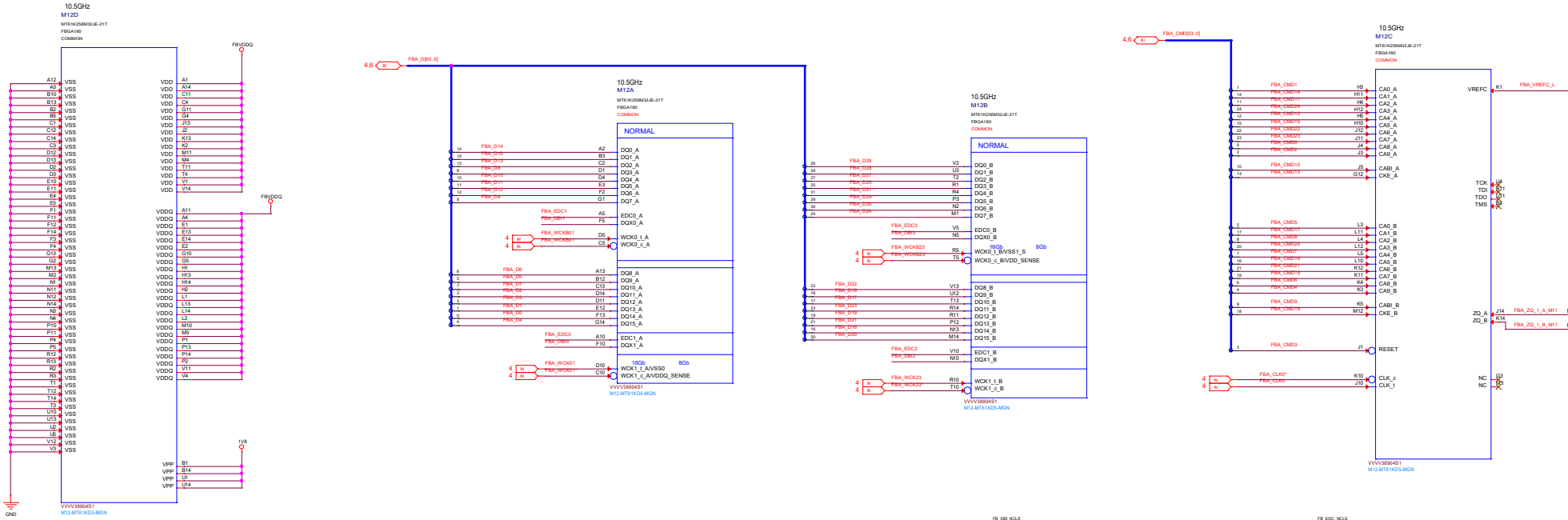
Company	MICRO-STAR INT'L CO.,LTD
Model	MS-V389
Size	Custom
Document Description	PCI EXPRESS
Rev	2.1
Date	Wednesday, July 29, 2020
Sheet	3 of 79

MEMORY: GPU Partition A/B

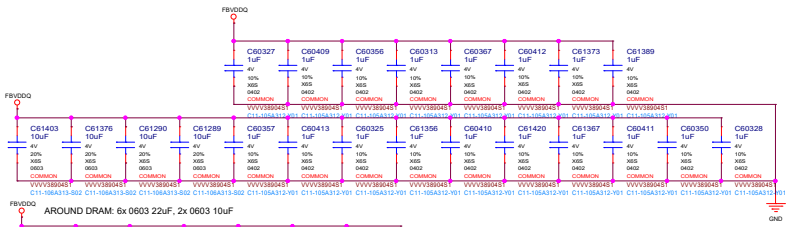


MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: MEMORY: GPU Partition A/B	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 4 of 79	

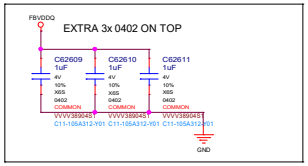
MEMORY: FBA Partition 31..0



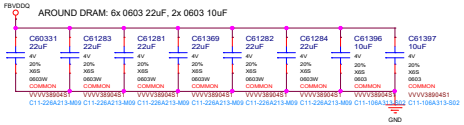
CLOSE TO DRAM: 4x 0603 10uF, 18x 0402 1uF



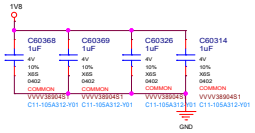
EXTRA 3x 0402 ON TOP



AROUND DRAM: 6x 0603 22uF, 2x 0603 10uF

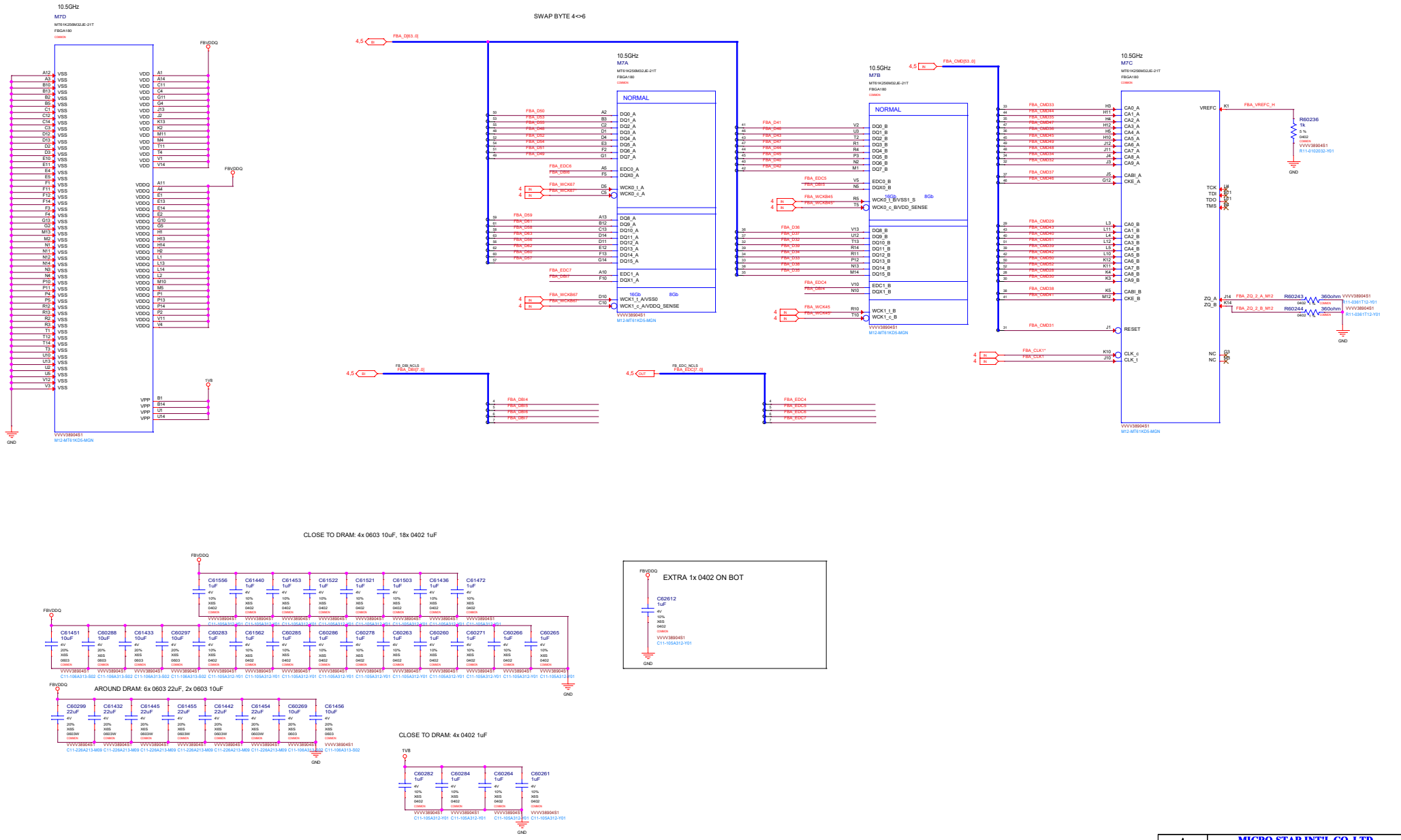


CLOSE TO DRAM: 4x 0402 1uF



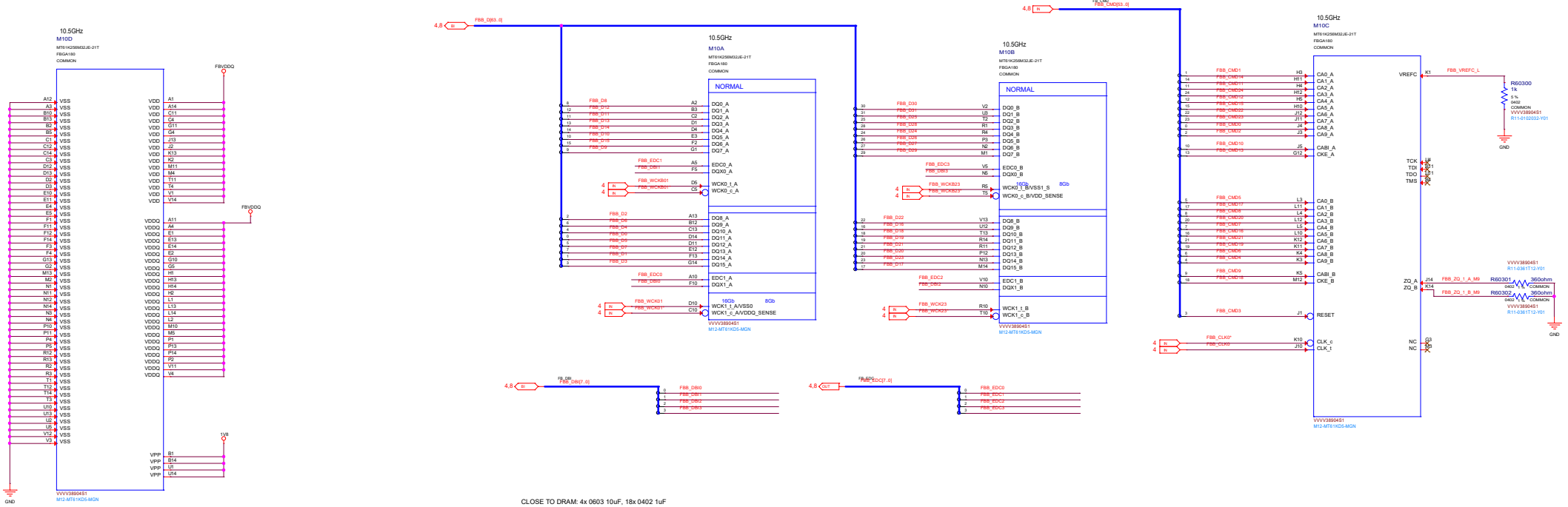
MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: MEMORY: FBA Partition 31..0	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 5 of 79	

MEMORY: FBA Partition 63..32



MICRO-STAR INT'L CO.,LTD
MS-V389
Size: Custom
Document Description: MEMORY: FBA Partition 63..32
Rev: 2.1
Date: Wednesday, July 29, 2020
Sheet 6 of 79

MEMORY: FBB Partition 31..0

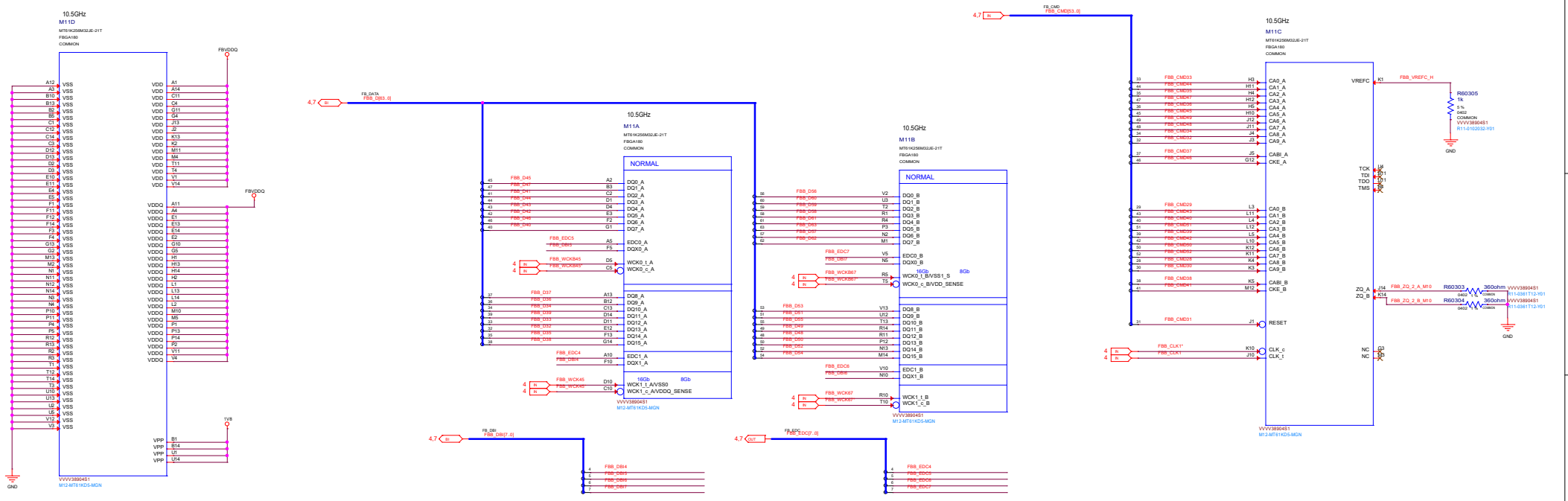


MICRO-STAR INT'L CO.,LTD
MS-V389

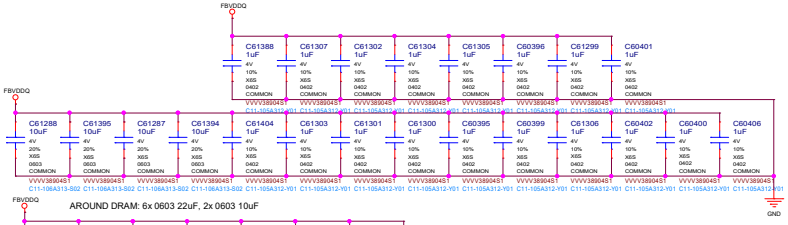
Size	Document Description	Rev
Custom	MEMORY: FBB Partition 31..0	2.1

Date: Wednesday, July 29, 2020 Sheet 7 of 79

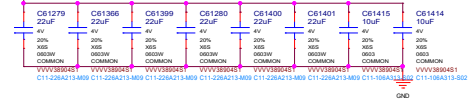
MEMORY: FBB Partition 63..32



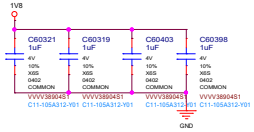
CLOSE TO DRAM: 4x 0603 10uF, 18x 0402 1uF



AROUND DRAM: 6x 0603 22uF, 2x 0603 10uF

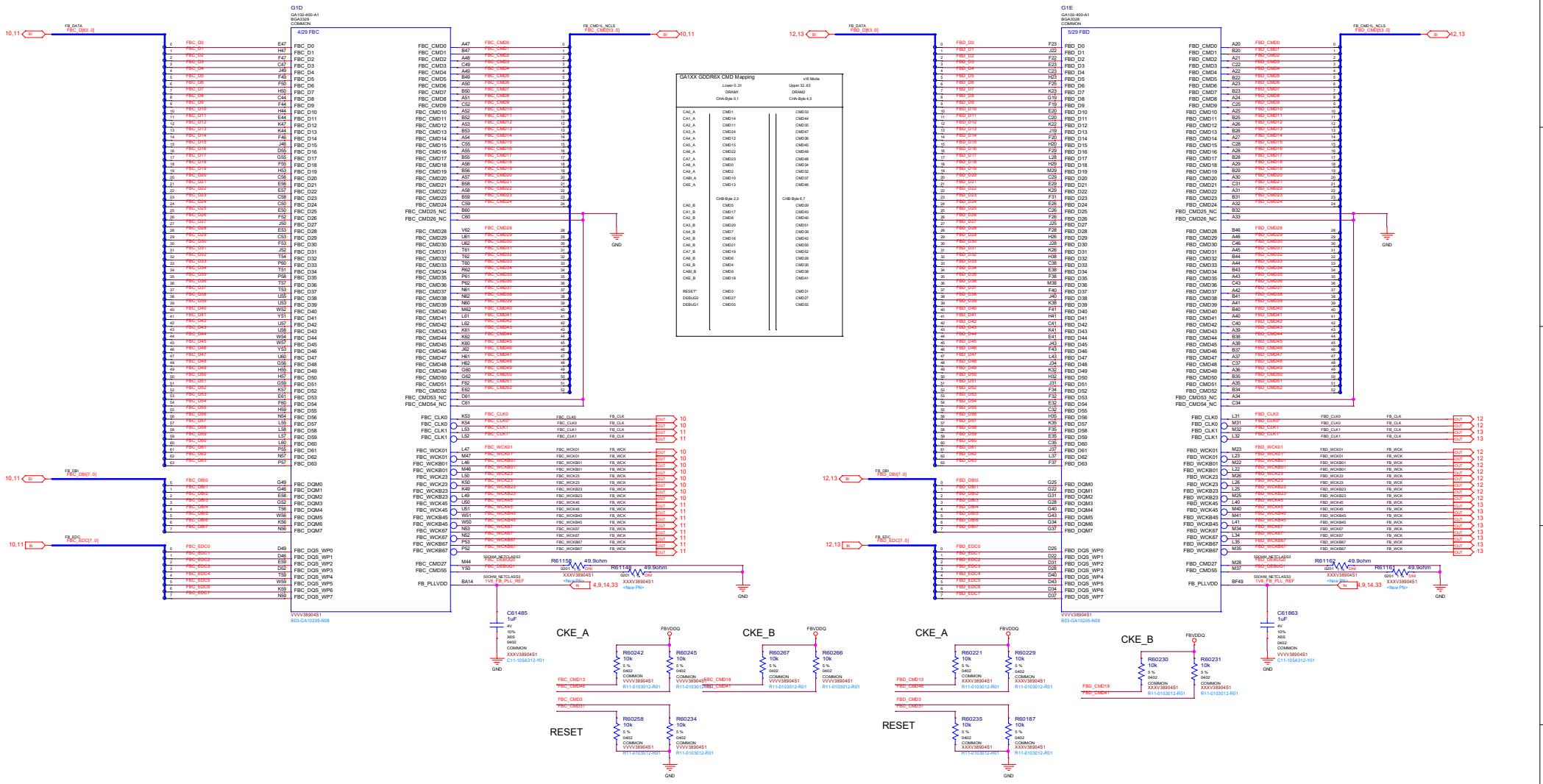


CLOSE TO DRAM: 4x 0402 1uF



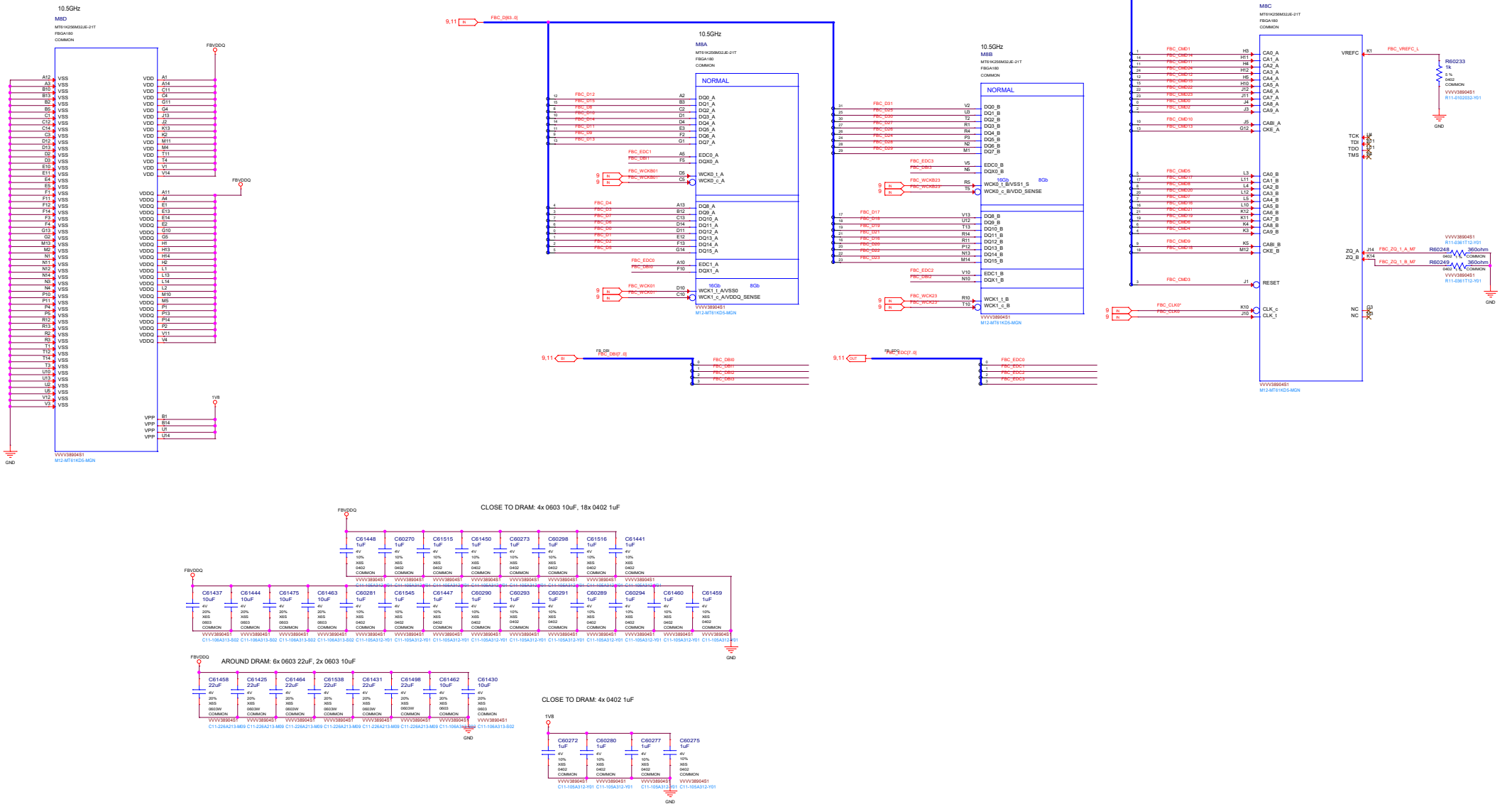
MICRO-STAR INT'L CO.,LTD			
MS-V389			
Size: Custom	Document Description: MEMORY: FBB Partition 63..32		Rev: 2.1
Date: Wednesday, July 29, 2020		Sheet 8 of 79	

MEMORY: GPU Partition C/D



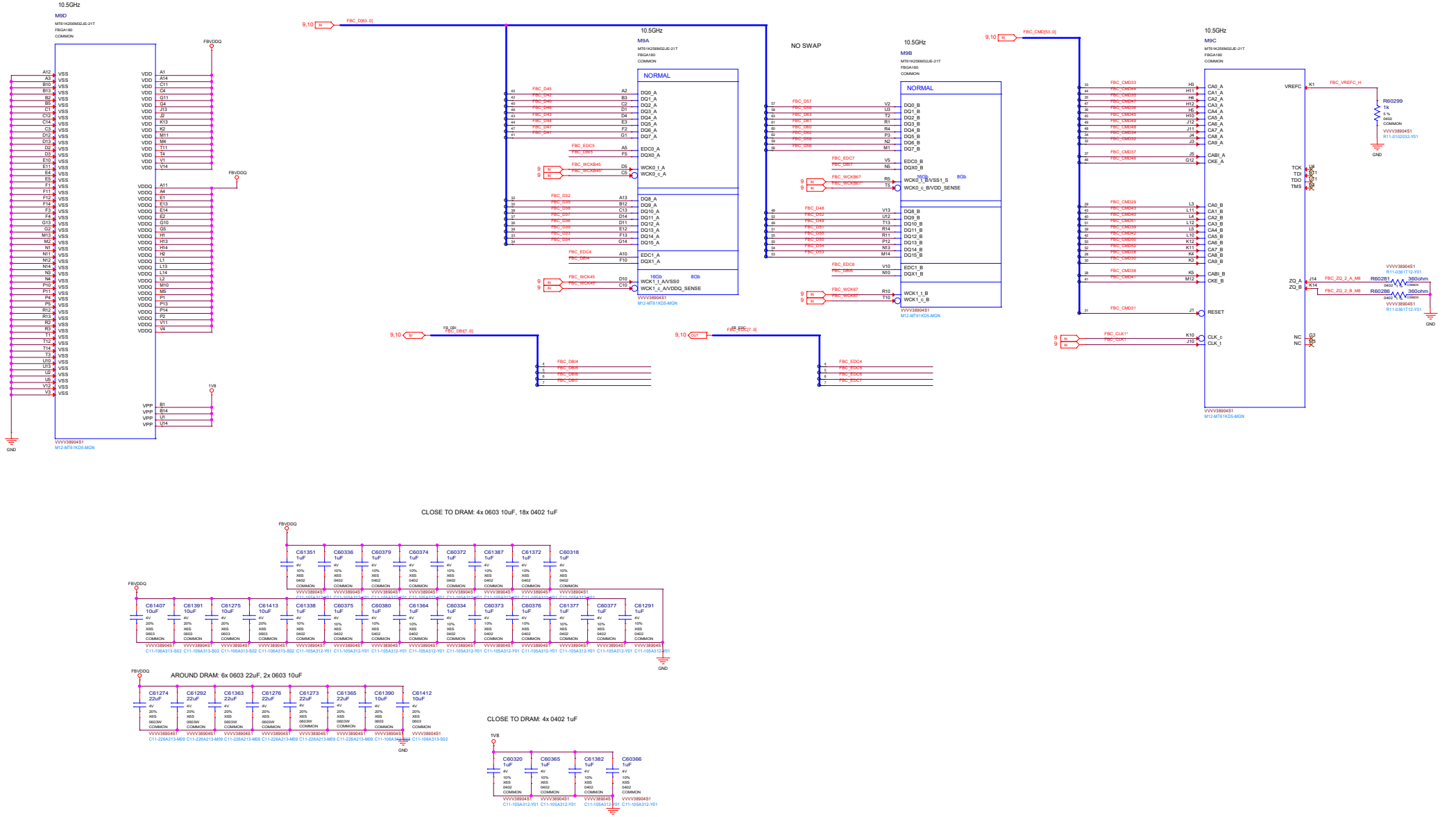
MICRO-STAR INT'L CO.,LTD	
MS-V389	
Size: Custom	Document Description: MEMORY: GPU Partition C/D
Rev: 2.1	
Date: Wednesday, July 29, 2020	Sheet 9 of 79

MEMORY: FBC Partition 31..0



MICRO-STAR INT'L CO.,LTD			
MS-V389			
Size: Custom	Document Description: MEMORY: FBC Partition 31..0		Rev: 2.1
Date: Wednesday, July 29, 2020		Sheet 10 of 79	

MEMORY: FBC Partition 63..32



CLOSE TO DRAM: 4x 0603 10uF, 18x 0402 1uF

AROUND DRAM: 6x 0603 22uF, 2x 0603 10uF

CLOSE TO DRAM: 4x 0402 1uF

20ci203T

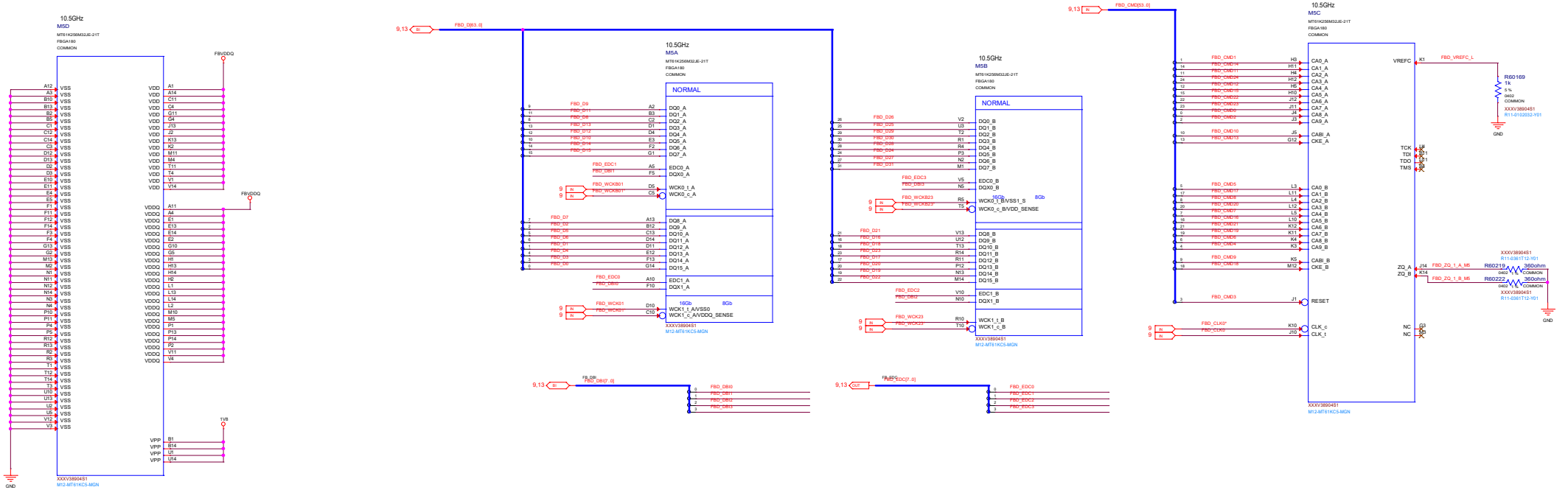
MICRO-STAR INT'L CO.,LTD

MS-V389

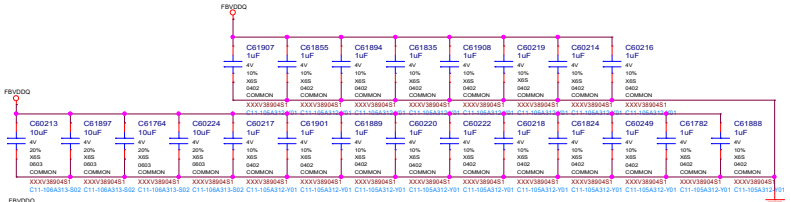
Size	Document Description	Rev
Custom	MEMORY: FBC Partition 63..32	2.1

Date: Wednesday, July 29, 2020 Sheet 11 of 79

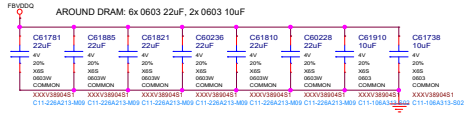
MEMORY: FBD Partition 31..0



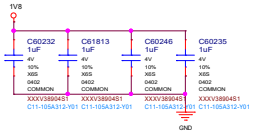
CLOSE TO DRAM: 4x 0603 10uF, 18x 0402 1uF



AROUND DRAM: 6x 0603 22uF, 2x 0603 10uF



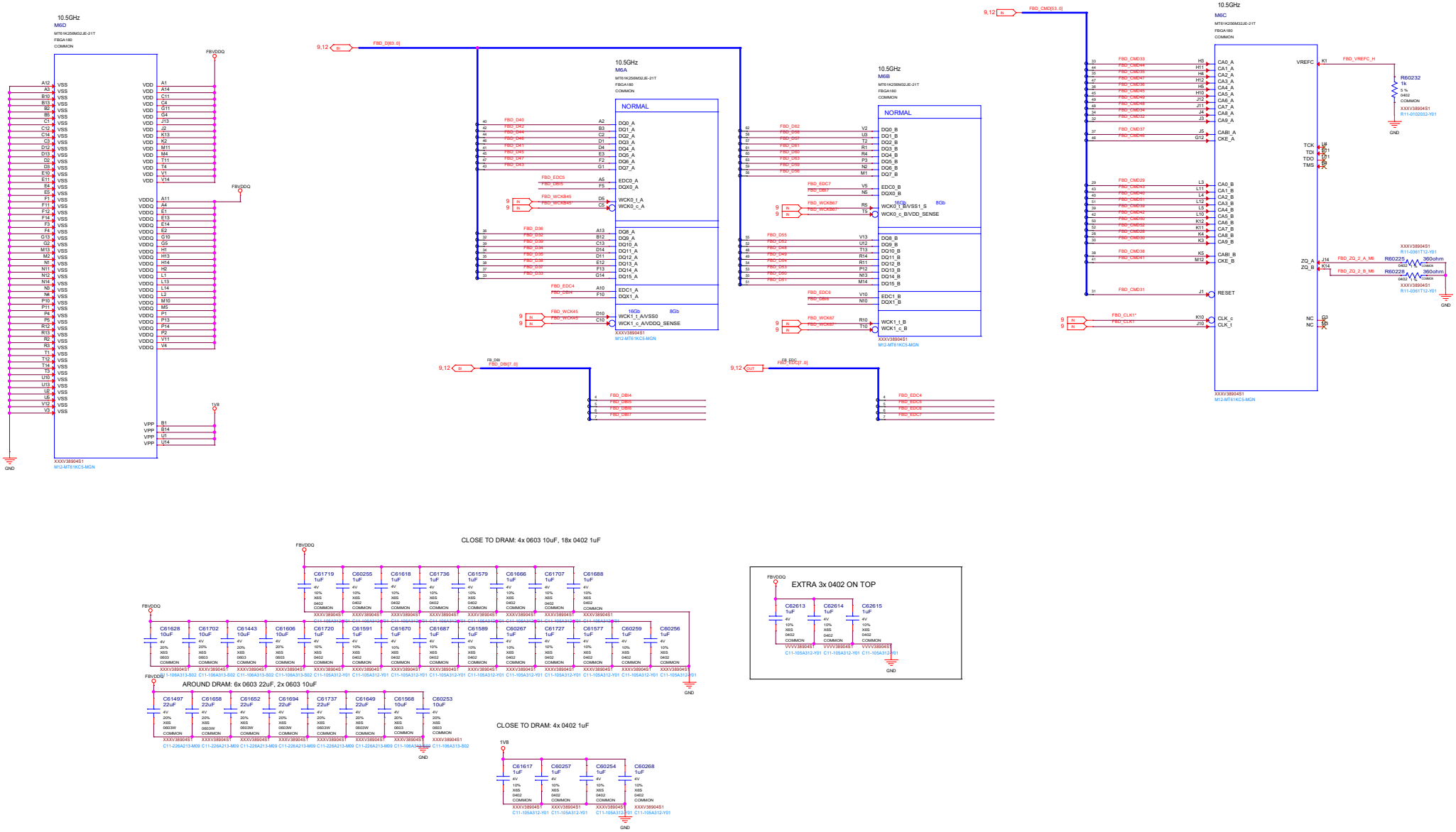
CLOSE TO DRAM: 4x 0402 1uF



20ci203T

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-V389	
Size: Custom	Document Description: MEMORY: FBD Partition 31..0	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 12 of 79	

MEMORY: FBD Partition 63..32



20ci203T

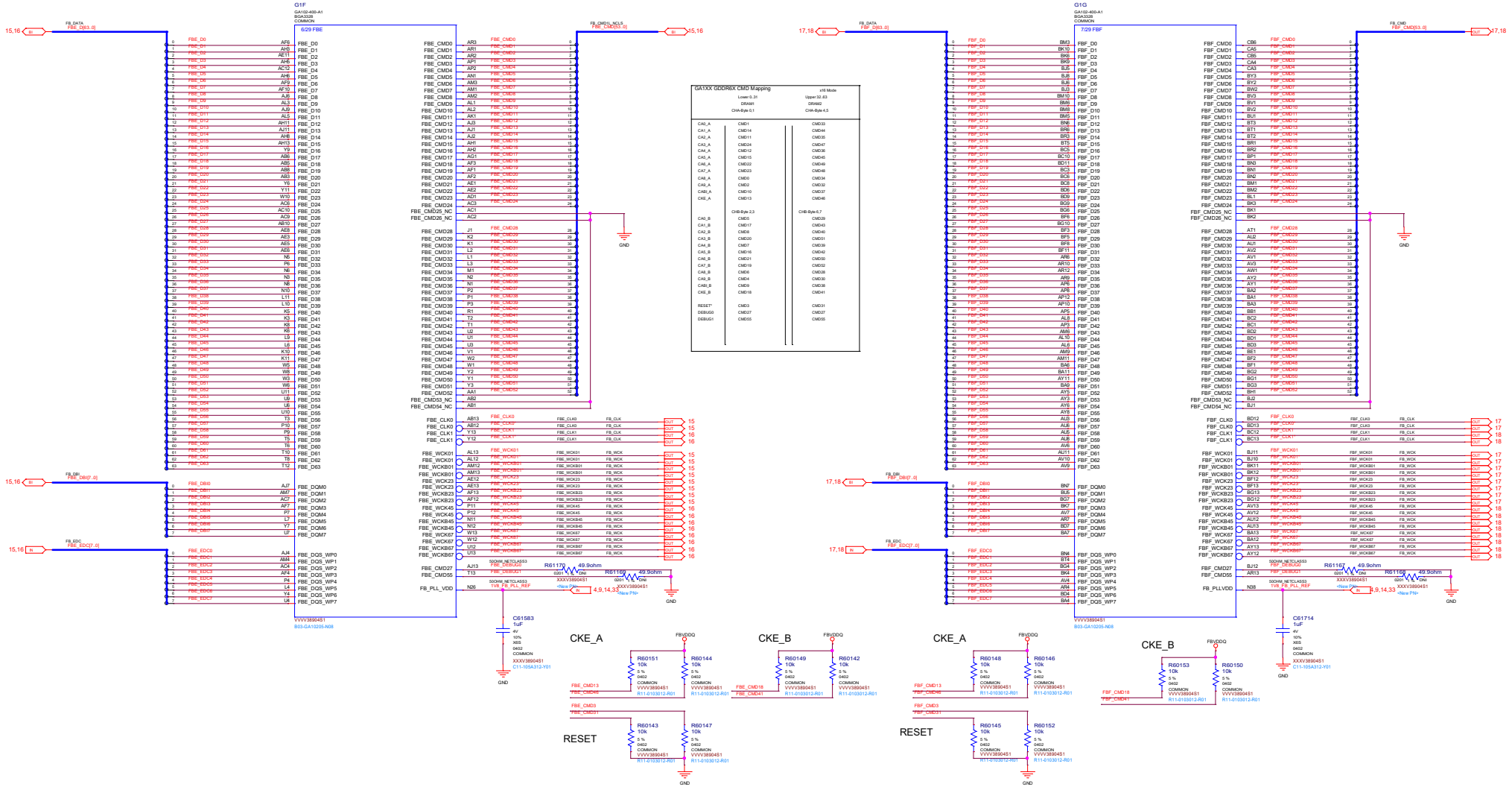
MICRO-STAR INT'L CO.,LTD

MS-V389

Size	Document Description	Rev
Custom	MEMORY: FBD Partition 63..32	2.1

Date: Wednesday, July 29, 2020 Sheet 13 of 79

MEMORY: GPU Partition E/F



MICRO-STAR INT'L CO.,LTD

MS-V389

Size: Custom

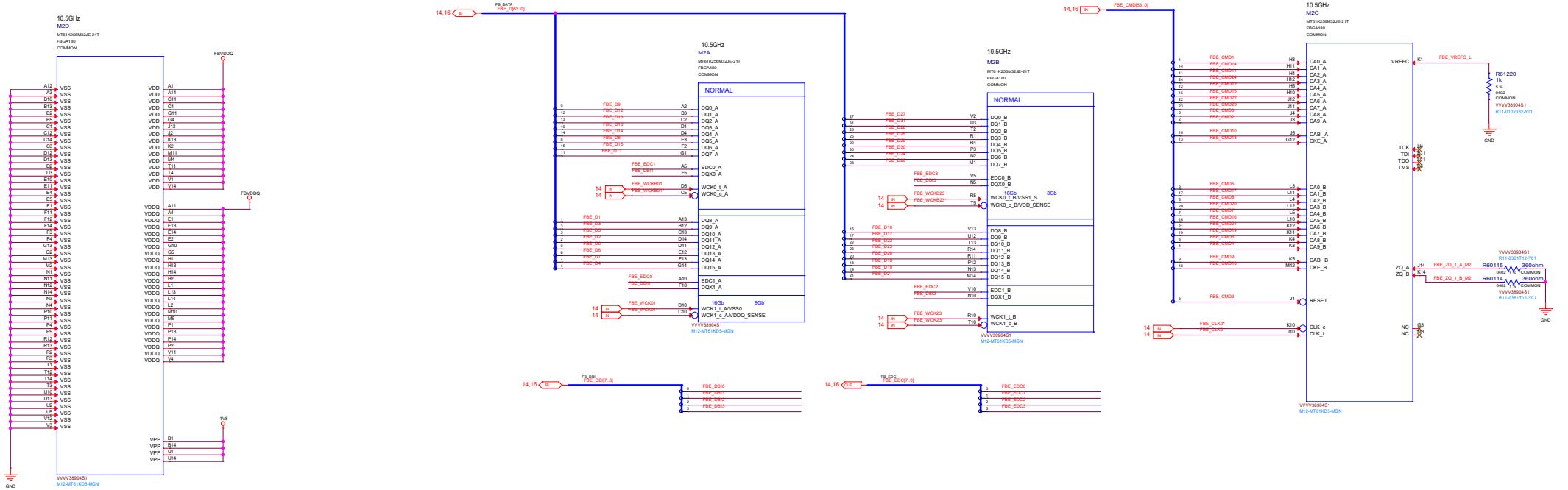
Document Description: MEMORY: GPU Partition E/F

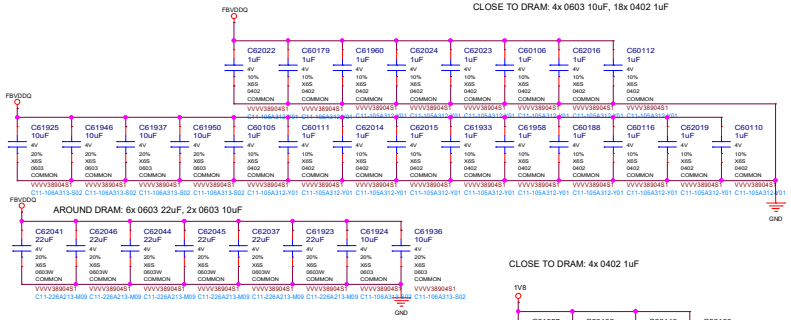
Rev: 2.1

Date: Wednesday, July 29, 2020

Sheet 14 of 79

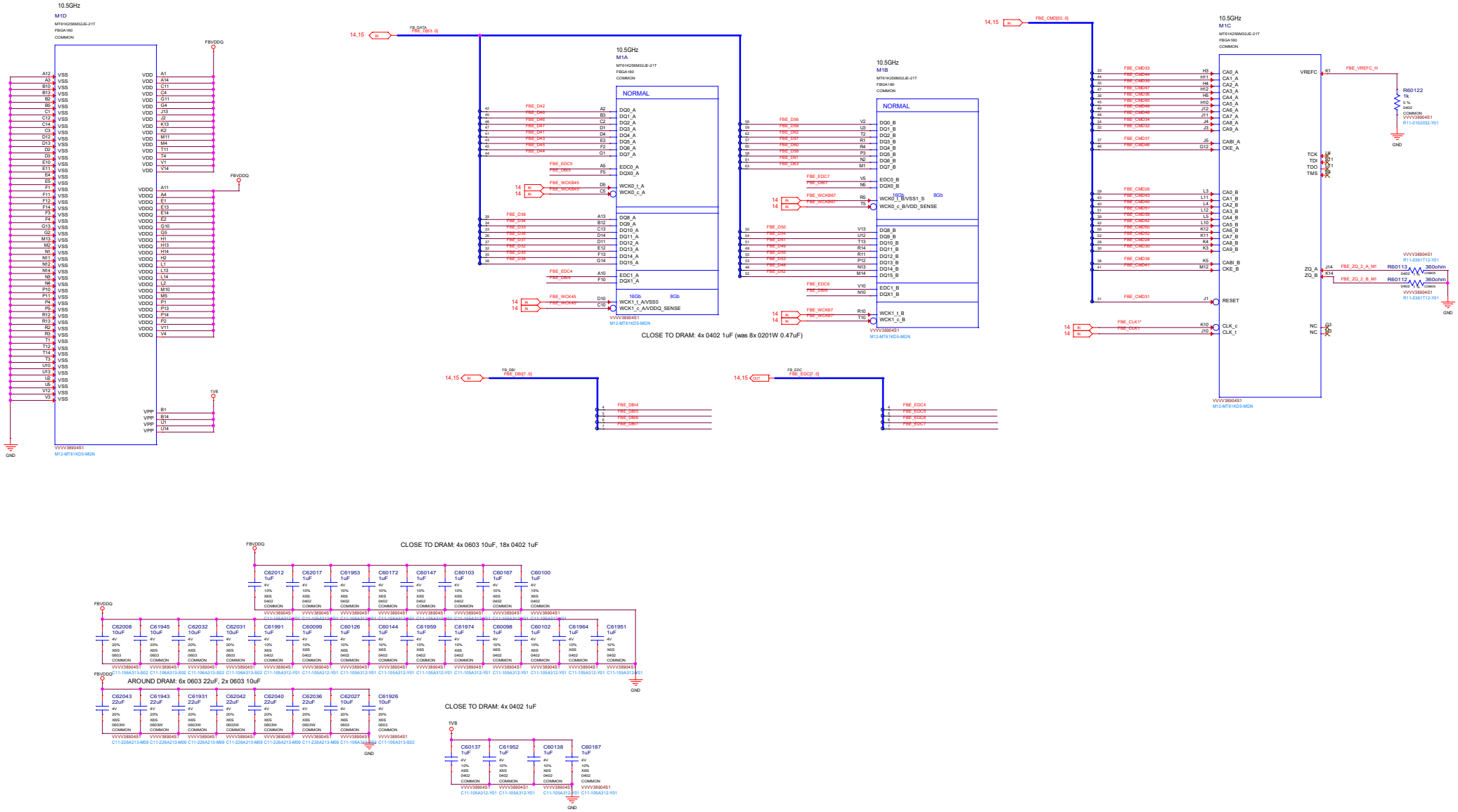
MEMORY: FBE Partition 31..0



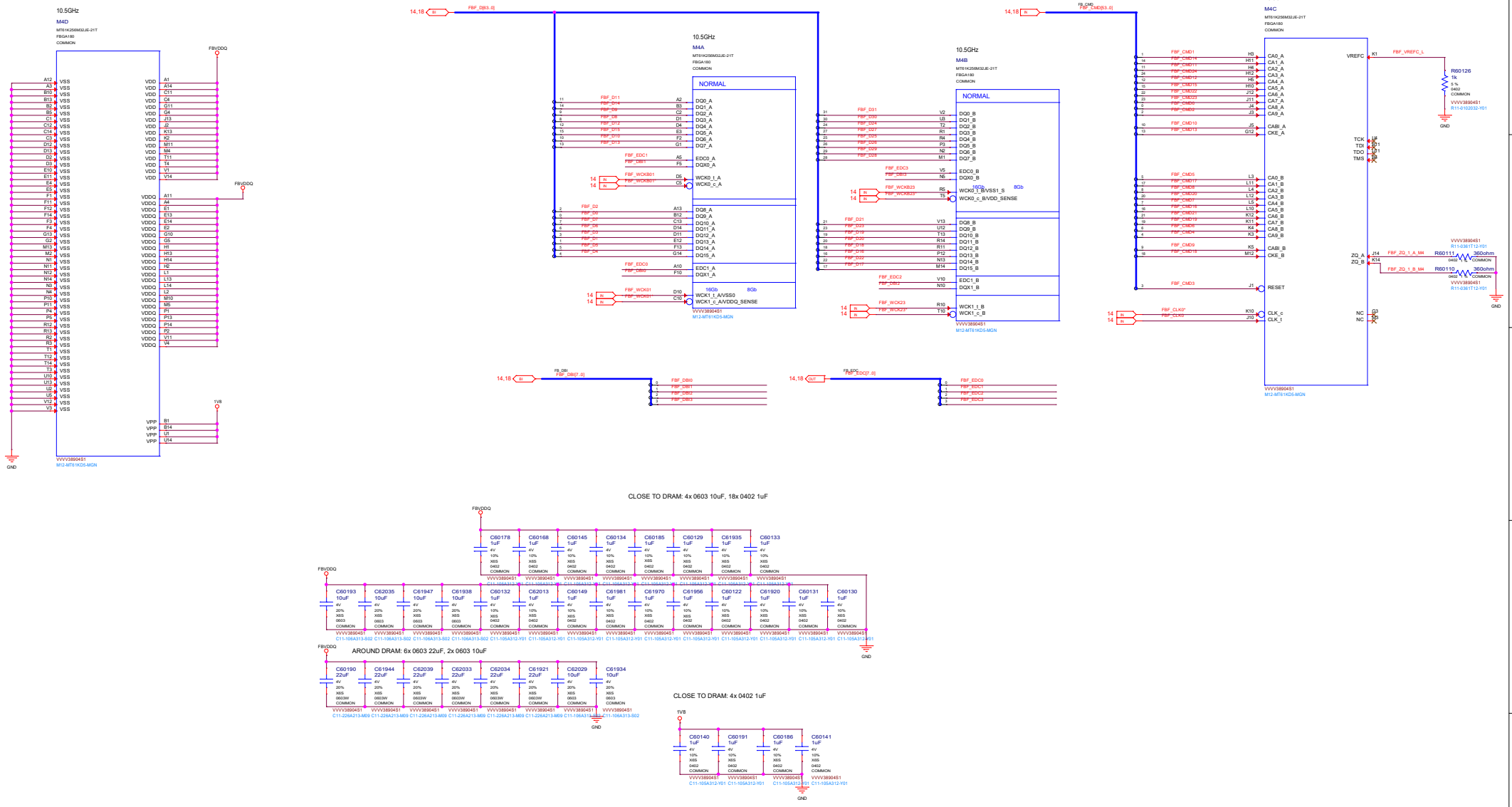


MICRO-STAR INT'L CO.,LTD			
MS-V389			
Size: Custom	Document Description: MEMORY: FBE Partition 31..0		Rev: 2.1
Date: Wednesday, July 29, 2020		Sheet 15 of 79	

MEMORY: FBE Partition 63..32



MEMORY: FBF Partition 31..0



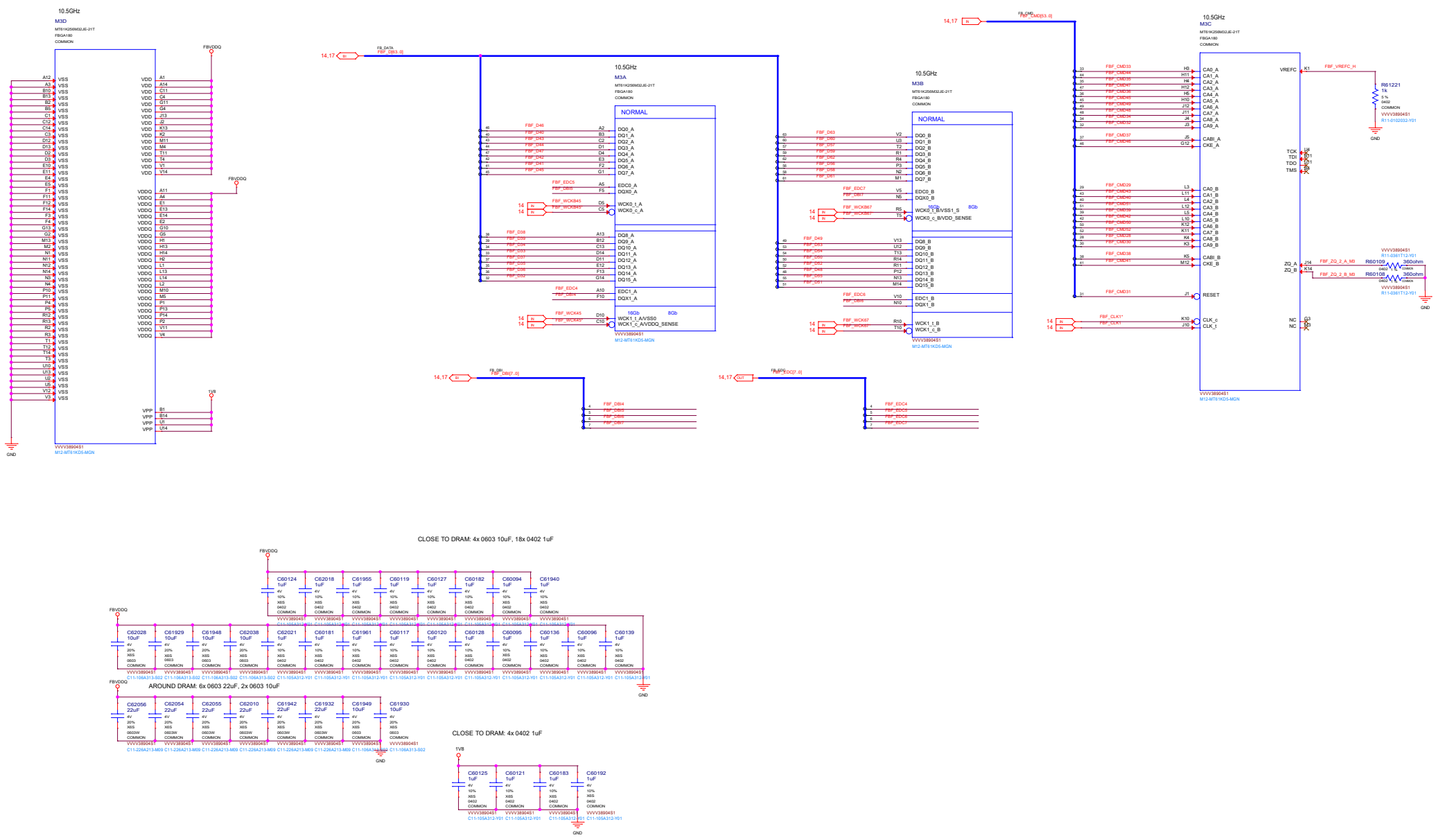
MICRO-STAR INT'L CO.,LTD

MS-V389

Size	Document Description	Rev
Custom	MEMORY: FBF Partition 31..0	2.1

Date: Wednesday, July 29, 2020 Sheet 17 of 79

MEMORY: FBF Partition 63..32



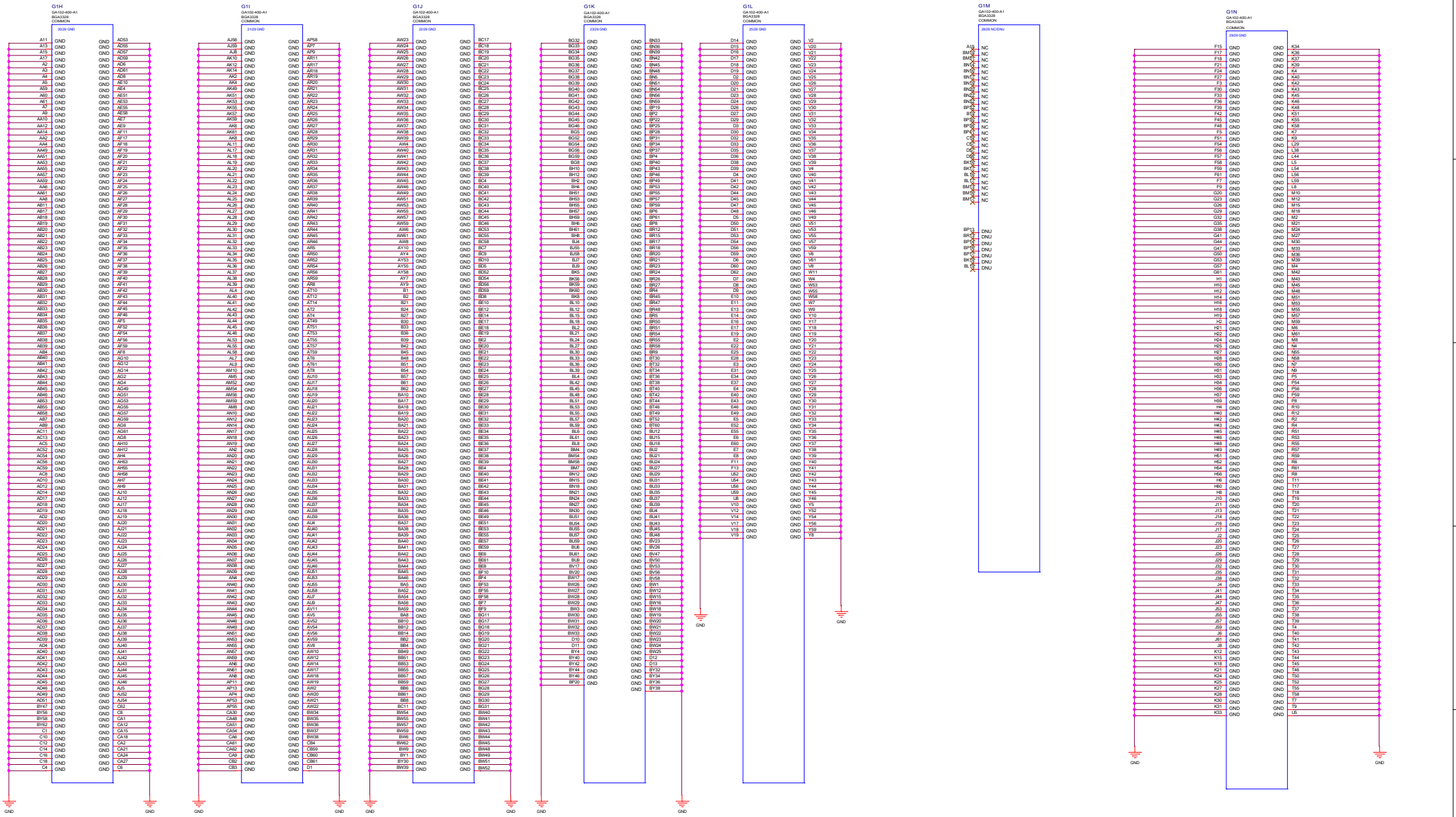
CLOSE TO DRAM: 4x 0603 10uF, 18x 0402 1uF

AROUND DRAM: 6x 0603 22uF, 2x 0603 10uF

CLOSE TO DRAM: 4x 0402 1uF

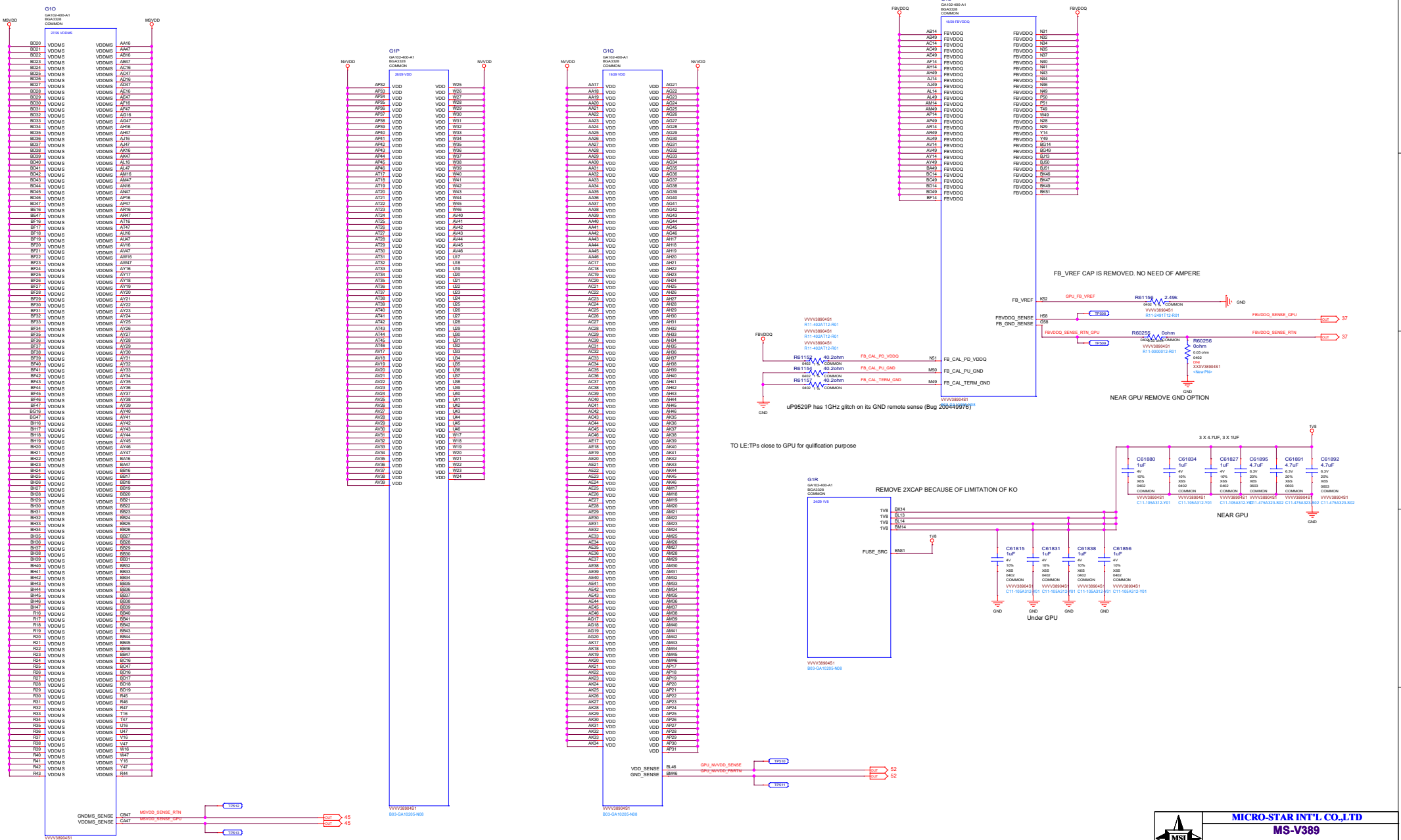
MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: MEMORY: FBF Partition 63..32	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 18 of 79	

GPU GND, RFUs & RSVD



MICRO-STAR INT'L CO.,LTD	
MS-V389	
Size: Custom	Document Description: GPU GND, RFUs & RSVD
Rev: 2.1	
Date: Wednesday, July 29, 2020	Sheet 19 of 79

GPU PWR and GND



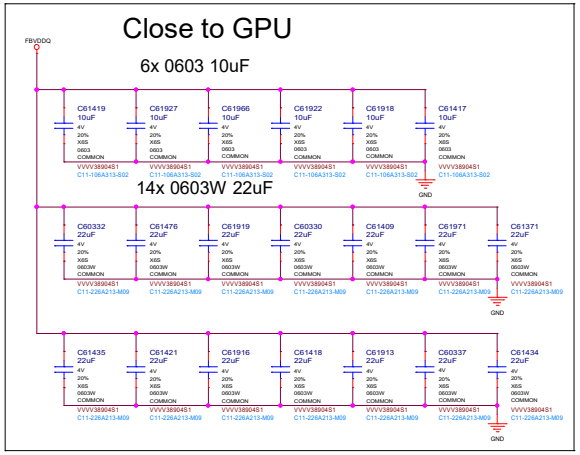
MICRO-STAR INT'L CO.,LTD			
MS-V389			
Size: Custom	Document Description: GPU PWR and GND		Rev: 2.1
Date: Wednesday, July 29, 2020		Sheet 20 of 79	

NVVDD

UNDER GPU

MICRO-STAR INT'L CO.,LTD			
MS-V389			
Size: Custom	Document Description: GPU: NVVDD DECOUPLING		Rev: 2.1
Date: Wednesday, July 29, 2020		Sheet 21 of 79	

FBVDDQ



MICRO-STAR INT'L CO.,LTD

MS-V389

Size	Document Description	Rev
Custom	GPU: FBVDD DECOUPLING	2.1

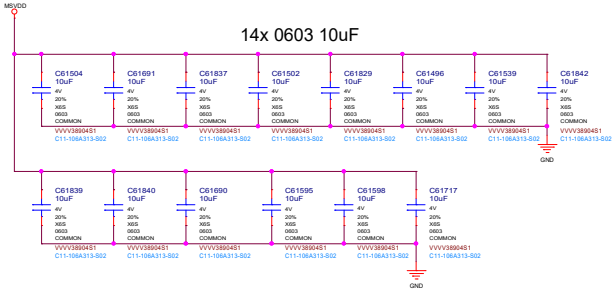
Date: Wednesday, July 29, 2020 Sheet 22 of 79

Page 23: GPU: MSVDD DECOUPLING

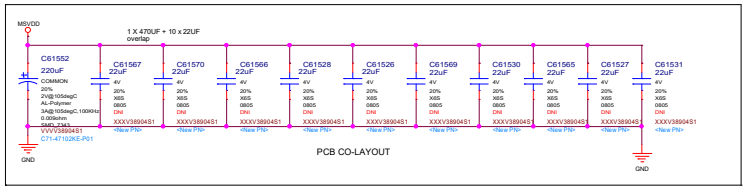
UNDER GPU

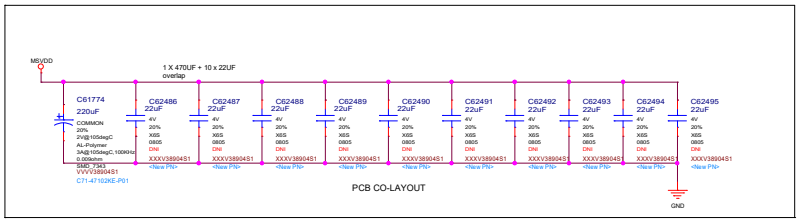
MSVDD

14x 0603 10uF

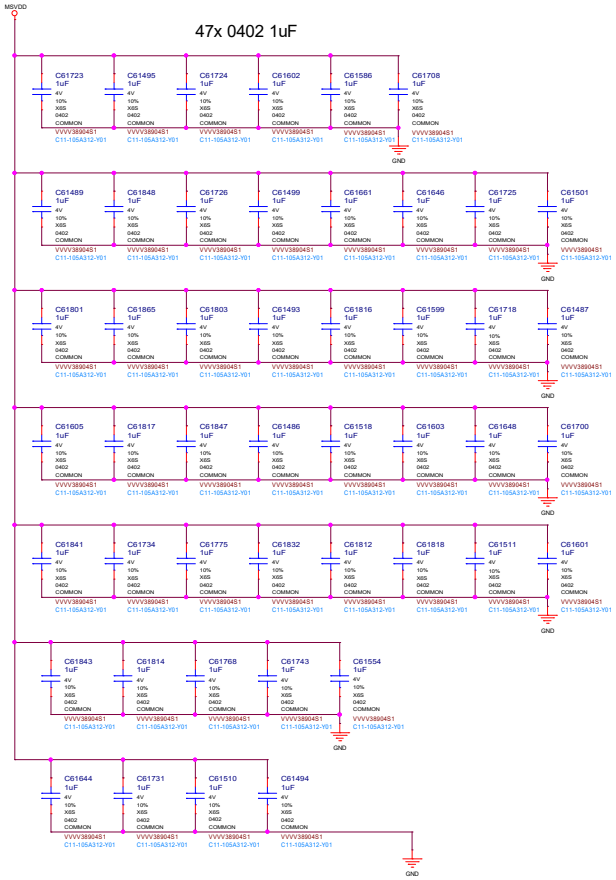


2x SMD7343 220uF (EACH CO-LAYOUT WITH 10x 22uF 0805)





47x 0402 1uF



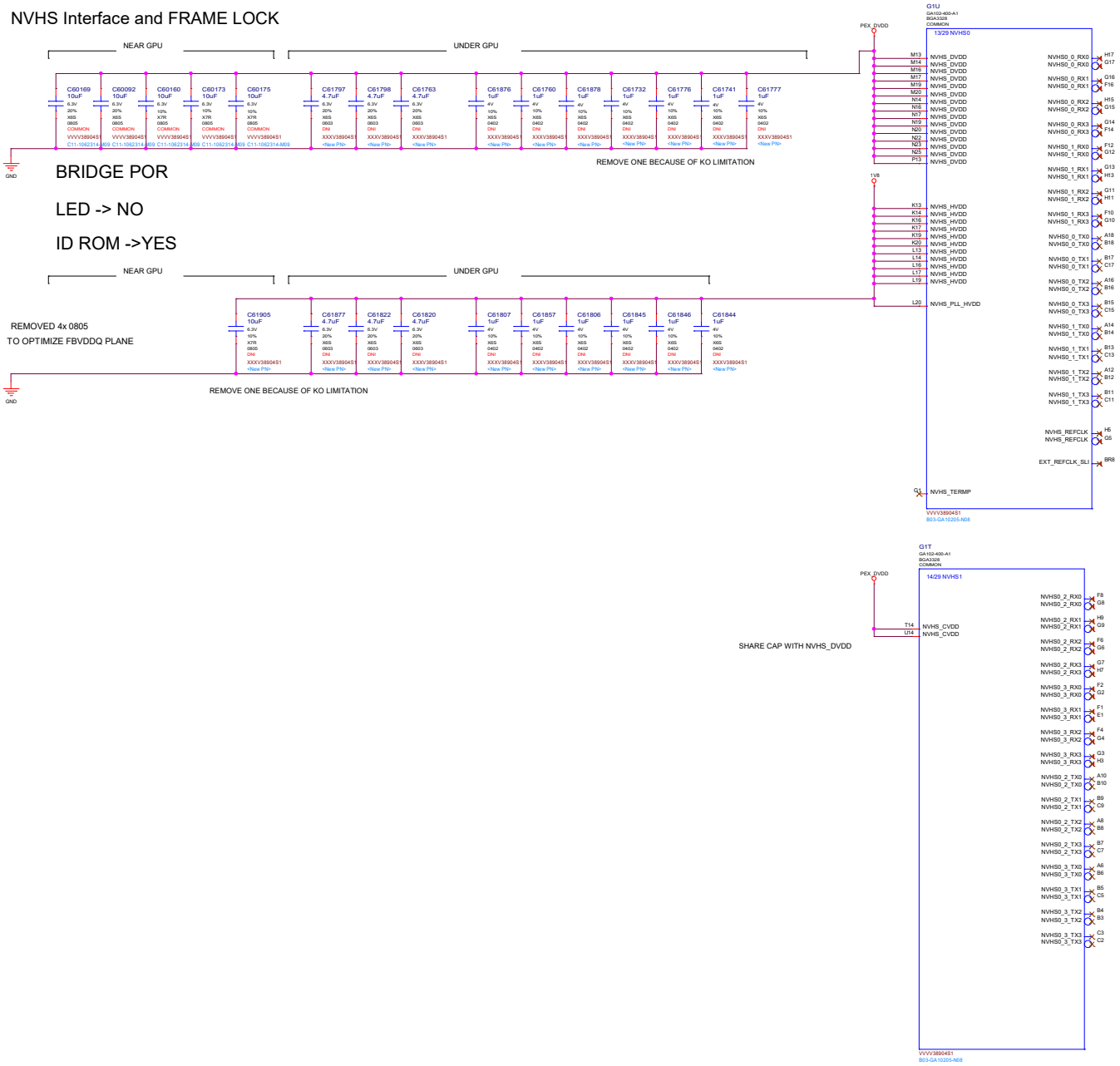
REMOVED 3X 1uF 0402 DUE TO SPACE RESTRICTION

MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: GPU: MSVDD DECOUPLING	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 23 of 79	

BLANK

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-V389	
Size: Custom	Document Description: BLANK	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 24 of 79	

NVHS Interface and FRAME LOCK



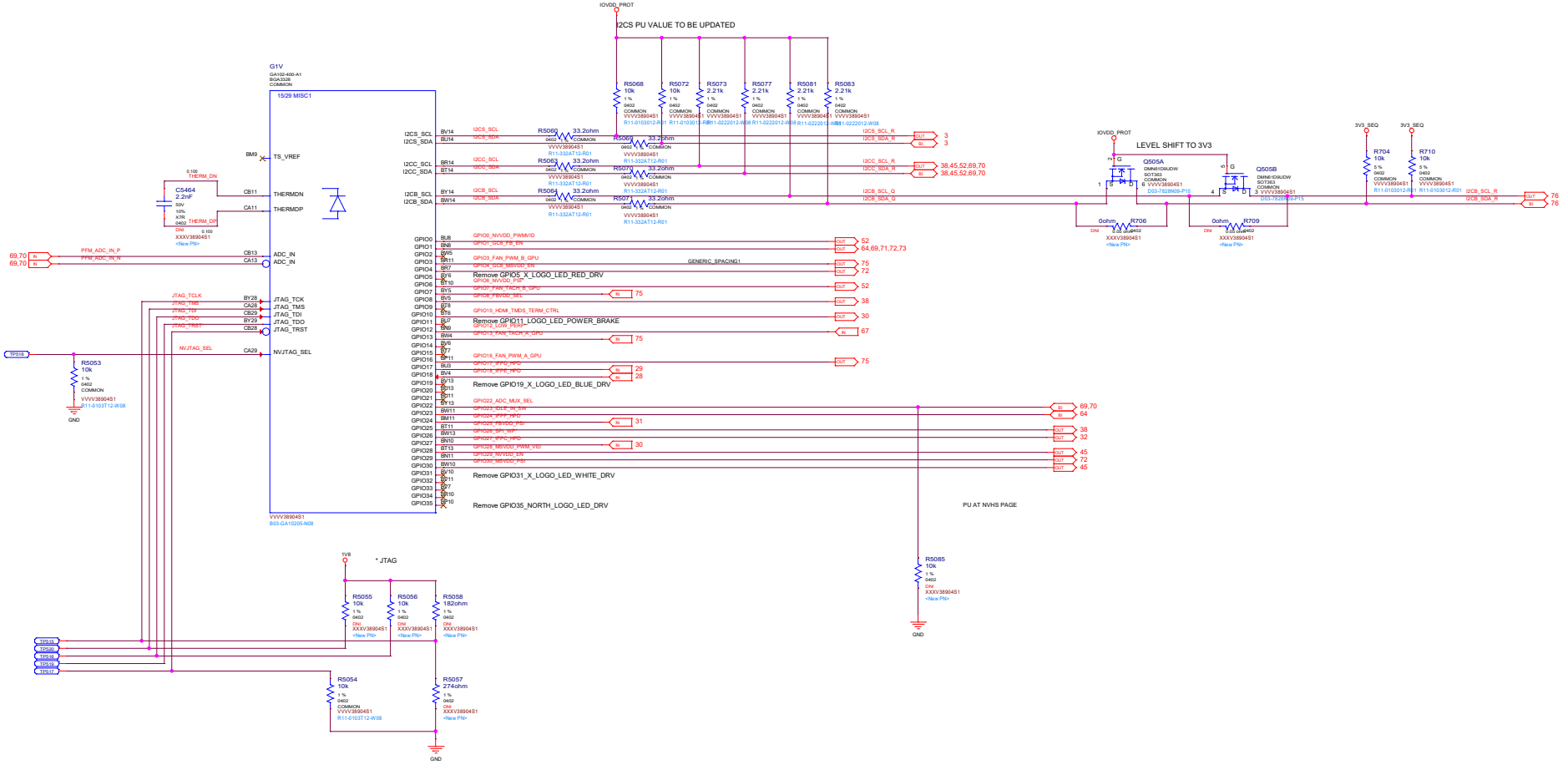
MICRO-STAR INT'L CO.,LTD

MS-V389

Size	Document Description	Rev
Custom	NVHS Interface and FRAME LOCK	2.1

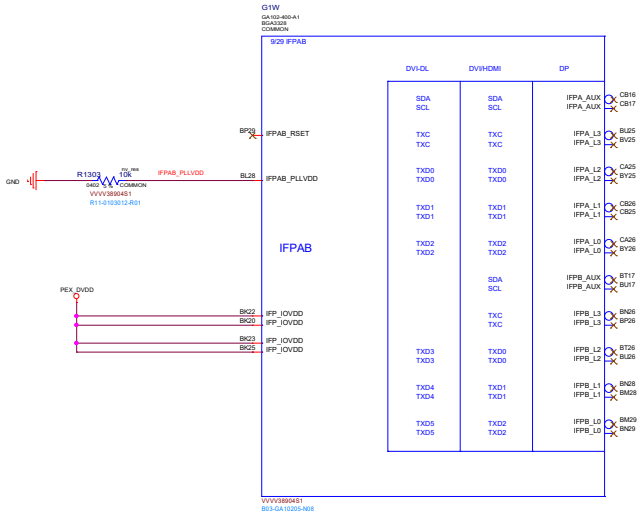
Date: Wednesday, July 29, 2020 Sheet 25 of 79

MISC1: Fan, Thermal, JTAG, GPIO, STEREO

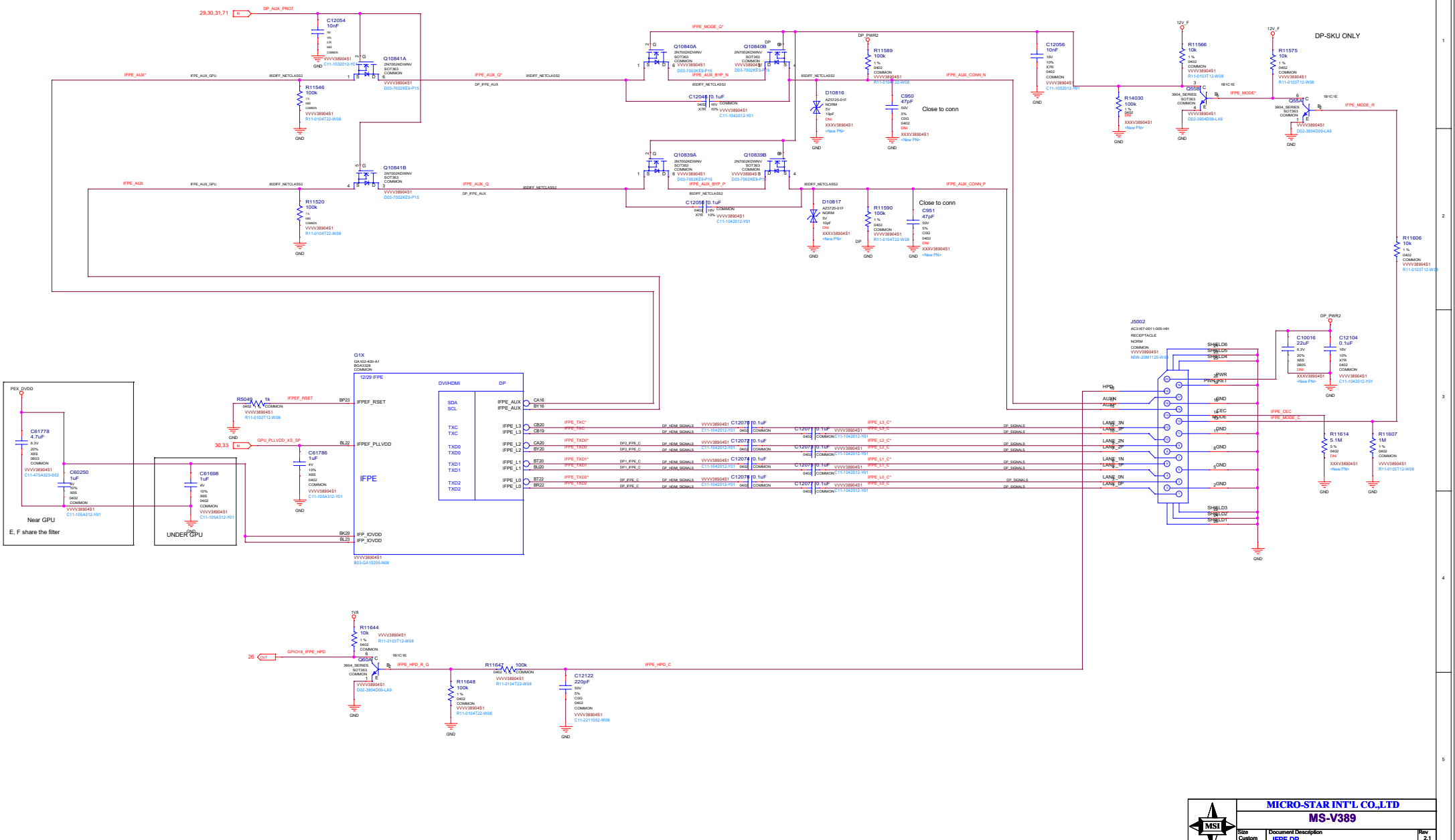


MICRO-STAR INT'L CO.,LTD			
MS-V389			
Size: Custom	Document Description: MISC1: Fan, Thermal, JTAG, GPIO, STEREO		Rev: 2.1
Date: Wednesday, July 29, 2020		Sheet 26 of 79	

IFPA UNUSED, IFPB UNUSED

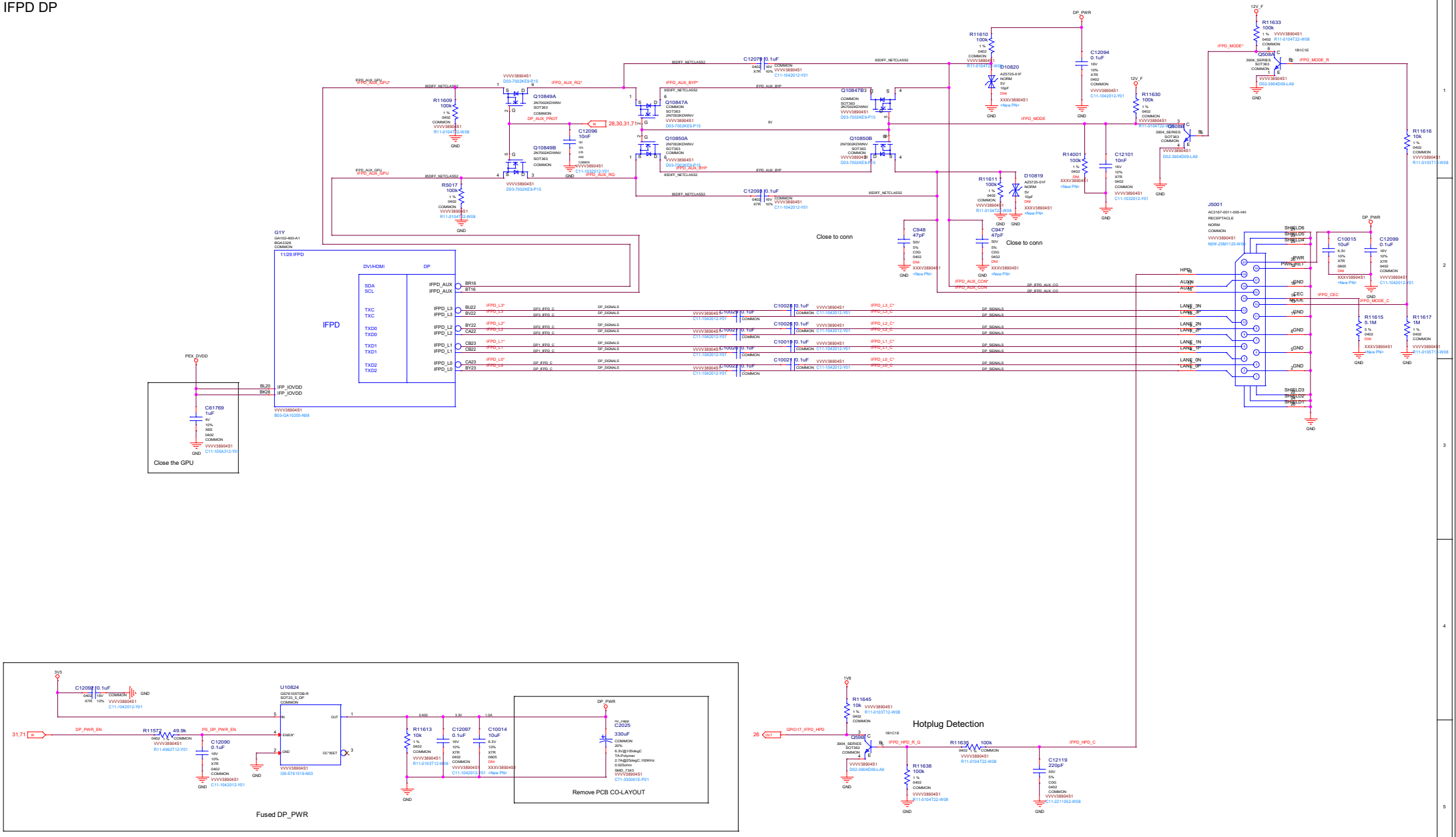


IFPE DP



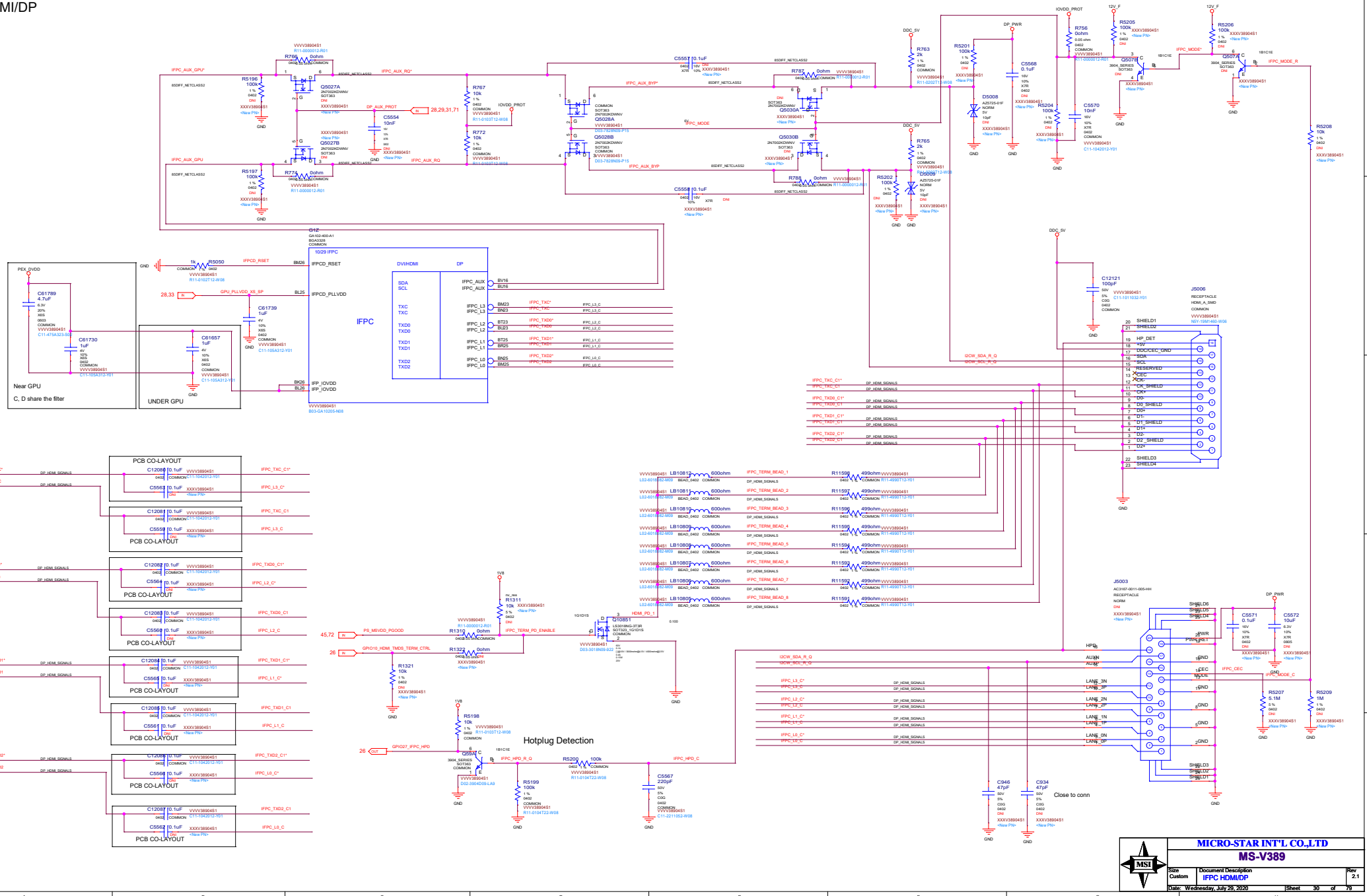
Company	MICRO-STAR INT'L CO.,LTD
Model	MS-V389
Size	Custom
Document Description	IFPE DP
Rev	2.1
Date	Wednesday, July 29, 2020
Sheet	28 of 79

IFPD DP



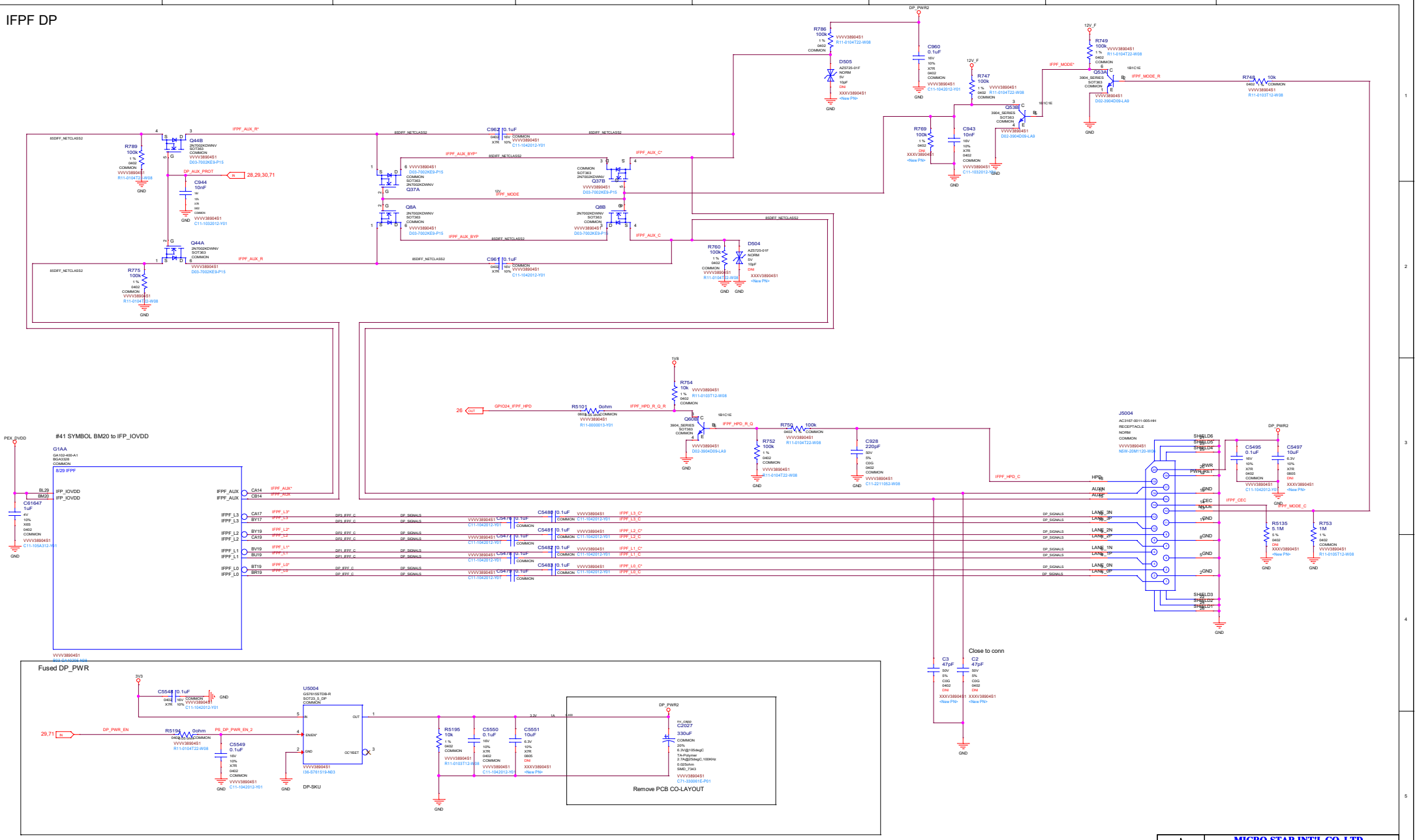
MICRO-STAR INT'L CO.,LTD			
MS-V389			
Size: Custom	Document Description: IFPD DP		Rev: 2.1
Date: Wednesday, July 29, 2020		Sheet 29 of 79	

IFPC HDMI/DP



MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: IFPC HDMI/DP	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 30 of 79	

IFPF DP



MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: IFPF DP	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 31 of 79	

MISC: ROM, Straps

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

GROUP0

STRAP2	STRAP1	STRAP0	RAMCFG[4:0]	
L	L	L	00000	RAMCFG MICRON 8Gb G6X 19Gbps x16 (161-0430-900)
H	L	L	00100	RAMCFG MICRON 8Gb G6X 19Gbps x8 (161-0430-900)
H	L	H	00101	RAMCFG MICRON 8Gb G6X 21Gbps x8 (161-0431-900)
L	L	M	01000	RAMCFG MICRON 8Gb G6X 20Gbps x16 (161-0424-900)
L	L	H	00001	RAMCFG MICRON 8Gb G6X 21Gbps x16 (161-0431-900)
L	M	H	01010	RAMCFG MICRON 8Gb G6X 19Gbps x16 (161-0430-900)

<-A01 PCB

<-OLD

<-LATEST A02 PCB

ROM_SO	ROM_SI	ROM_SCLK	SMARTFAN[2:0],FS_OVERT	1:ENABLE 0:DISABLE	
H	H	H	0111	FS_OVERT ENABLE	DEFAULT
L	L	L	0000	FS_OVERT DISABLE	

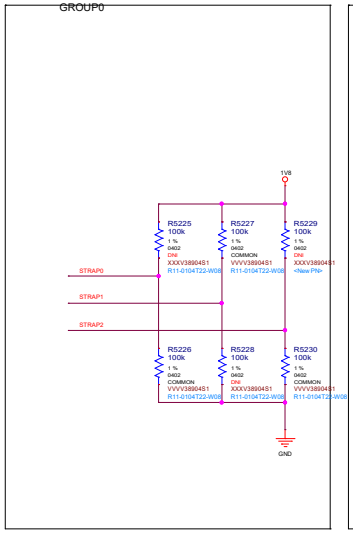
1:SMB_ALT_ADDR ENABLE
0:SMB_ALT_ADDR DISABLE

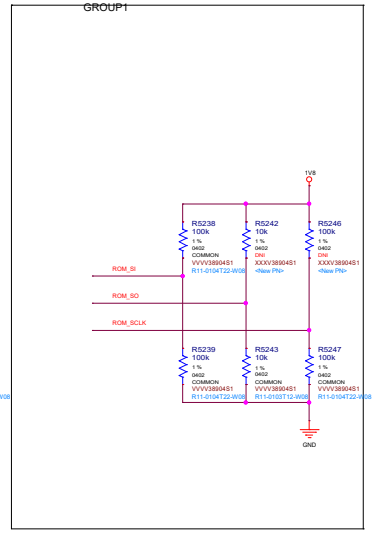
1:DEVID_SEL REBRAND
0:DEVID_SEL ORIGNAL

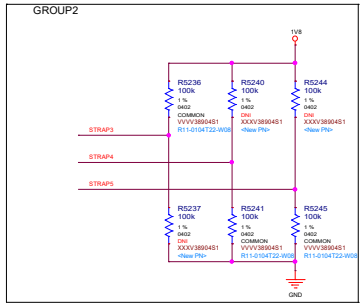
1:PCIE_CFG LOW POWER
0:PCIE_CFG HIGH POWER

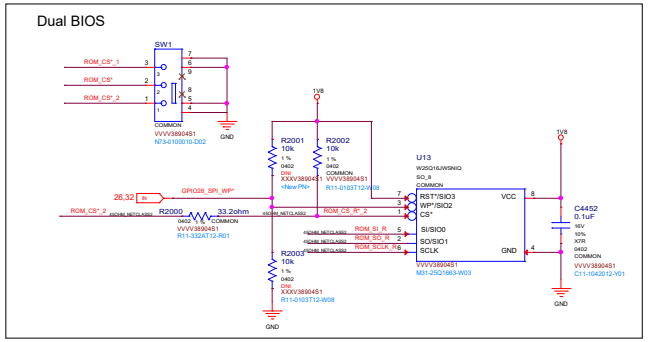
1:VGA_DEVICE ENABLE
0:VGA_DEVICE DISABLE

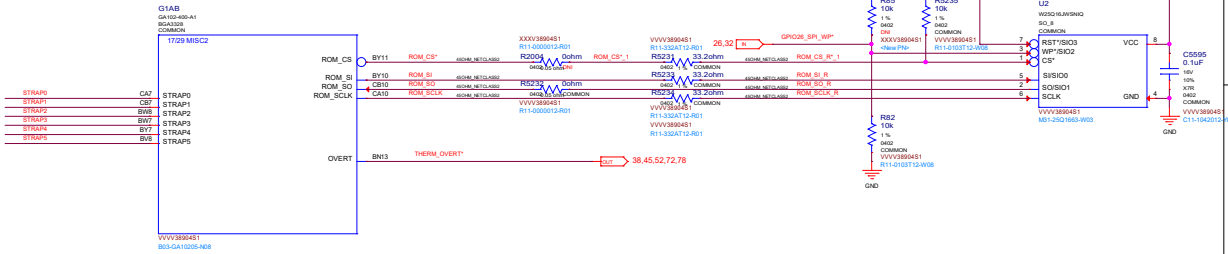
STRAP5	STRAP4	STRAP3	SMB_ALT_ADDR	DEVID_SEL	PCIE_CFG	VGA_DEVICE	
M	H	H	1	1	1	1	
M	H	L	1	1	1	0	
M	L	H	1	1	0	1	
M	L	L	1	1	0	0	
L	H	M	1	0	1	1	
L	M	H	1	0	1	0	
L	M	L	1	0	0	1	
L	L	M	1	0	0	0	
H	H	H	0	1	1	1	
H	H	L	0	1	1	0	
H	L	H	0	1	0	1	
H	L	L	0	1	0	0	
L	H	H	0	0	1	1	
L	H	L	0	0	1	0	
L	L	H	0	0	0	1	Default
L	L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





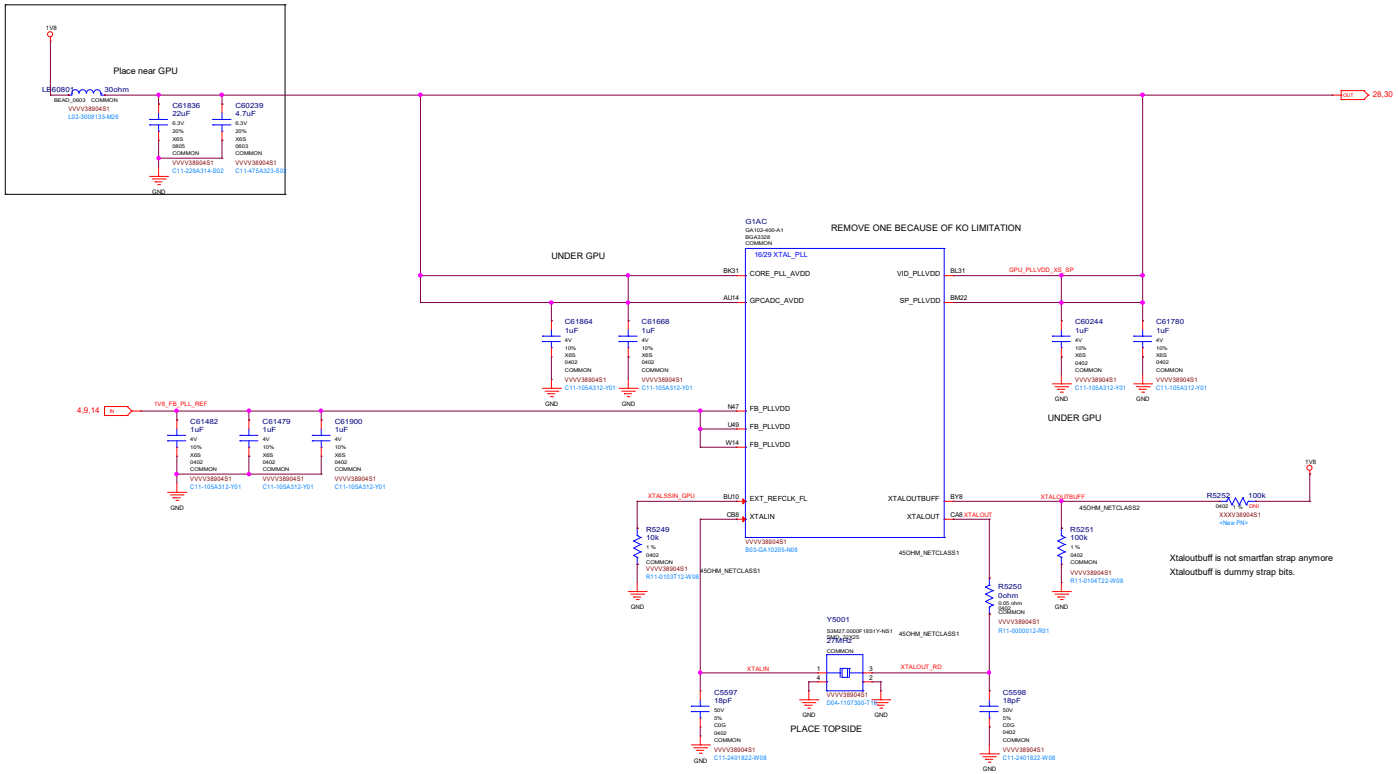






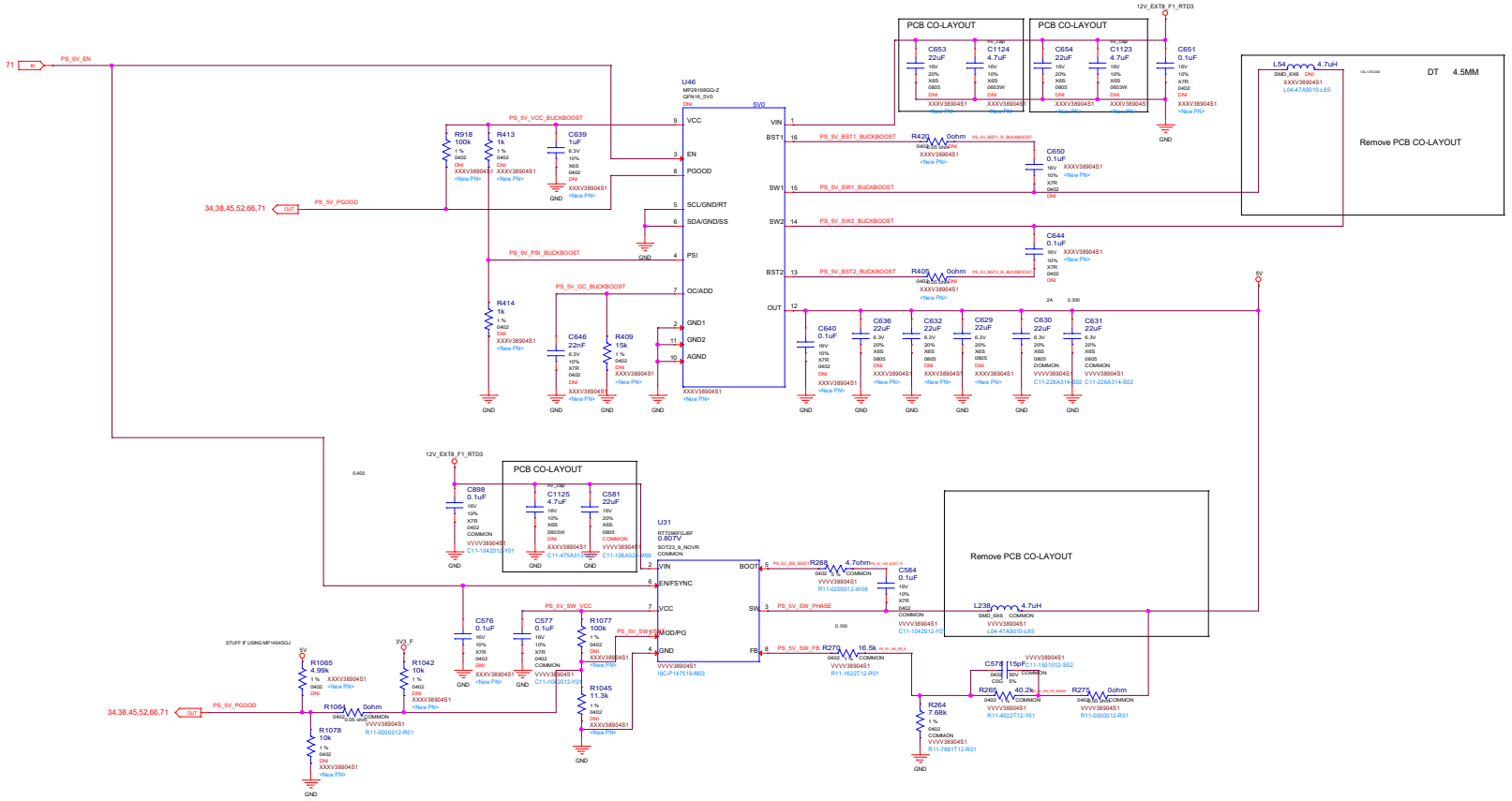
MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: MISC: ROM, Straps	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 32 of 79	

MISC: XTAL. PLL

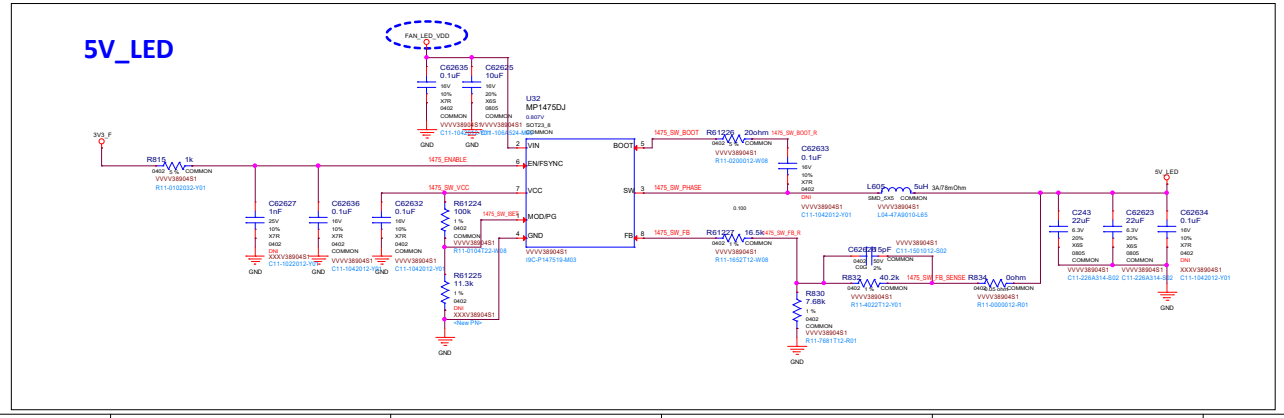


MICRO-STAR INT'L CO.,LTD			
MS-V389			
Size: Custom	Document Description: MISC: XTAL. PLL		Rev: 2.1
Date: Wednesday, July 29, 2020		Sheet 33 of 79	

PS: 5V, 5V_BACKUP, 5V_LED

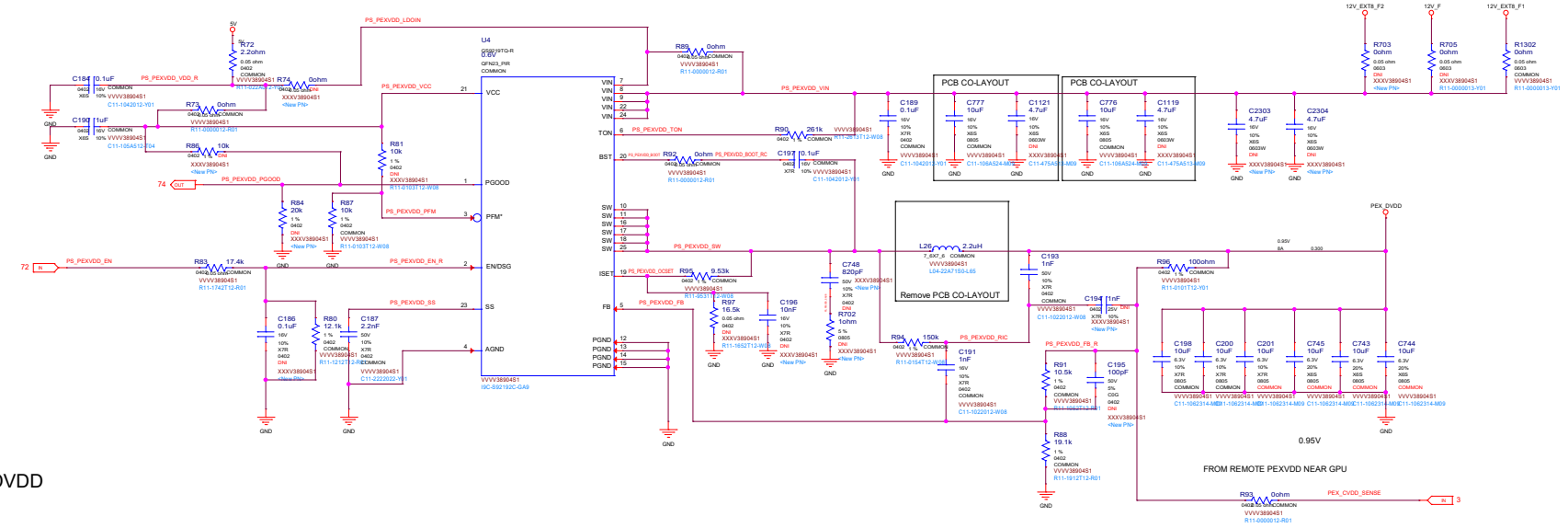


5V_LED

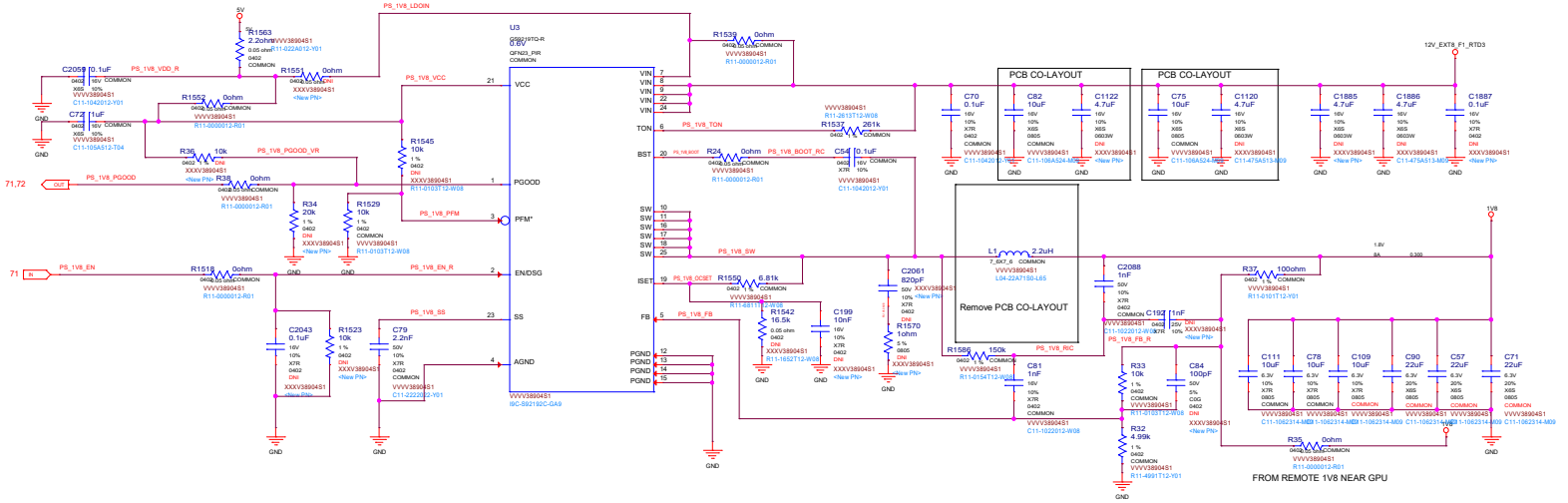


MICRO-STAR INT'L CO.,LTD			
MS-V389			
Size: Custom	Document Description: PS: 5V, 5V_BACKUP, 5V_LED		Rev: 2.1
Date: Wednesday, July 29, 2020		Sheet 34 of 79	

PS: PEX_DVDD 1V8 Rail



PEX_DVDD



1V8

MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: PS: PEX_DVDD 1V8 Rail	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 35 of 79	

BLANK

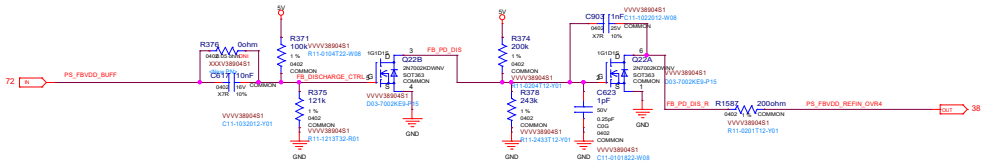
MICRO-STAR INT'L CO.,LTD

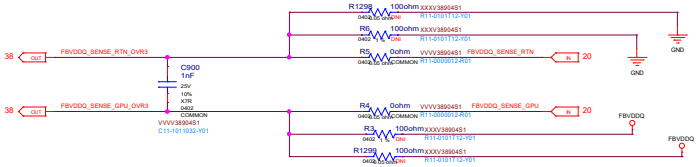
MS-V389

Size	Document Description	Rev
Custom	BLANK	2.1

Date: Wednesday, July 29, 2020 Sheet 36 of 79

Remove FBVDD Controller OVR3

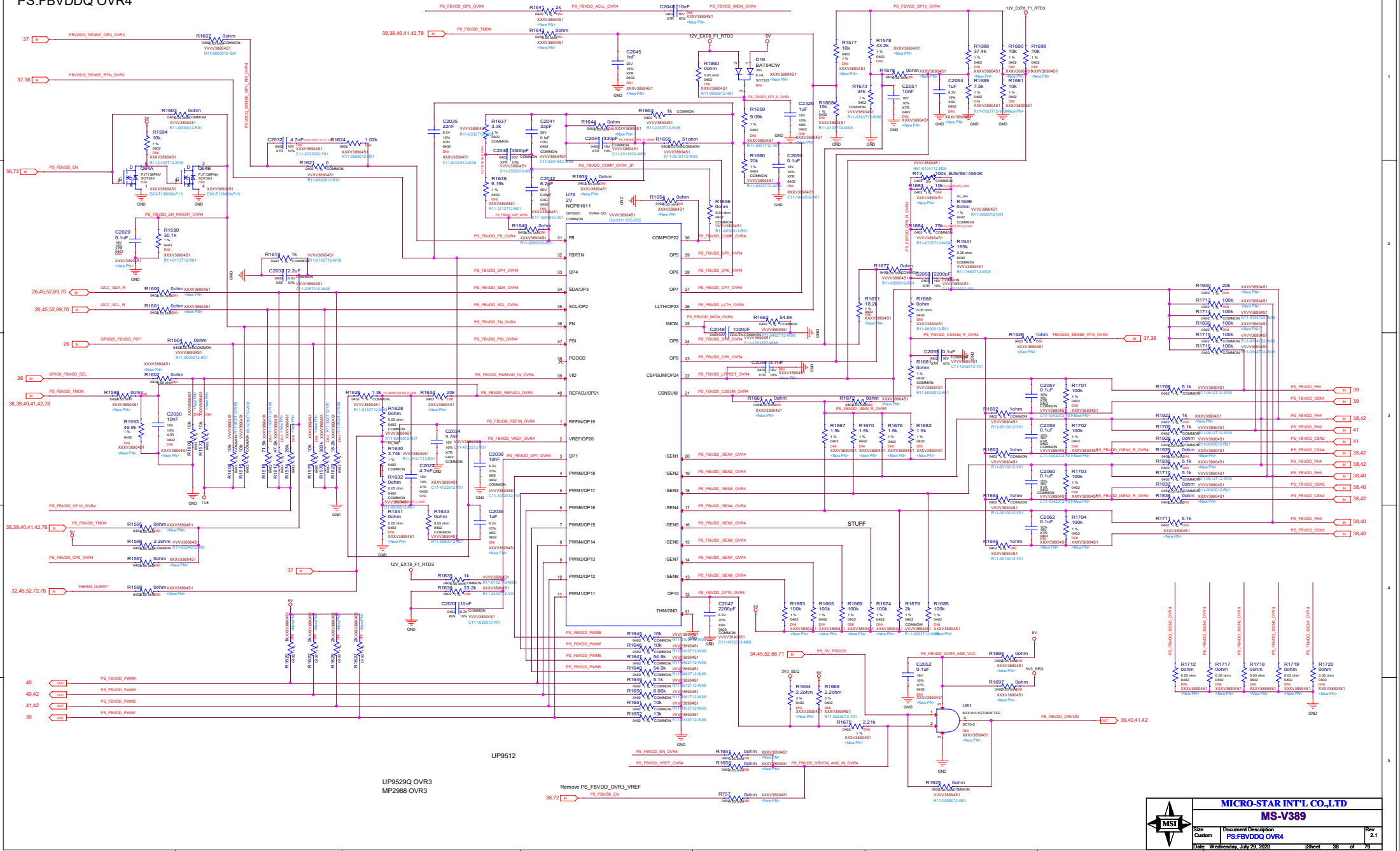




FOR DT SKU

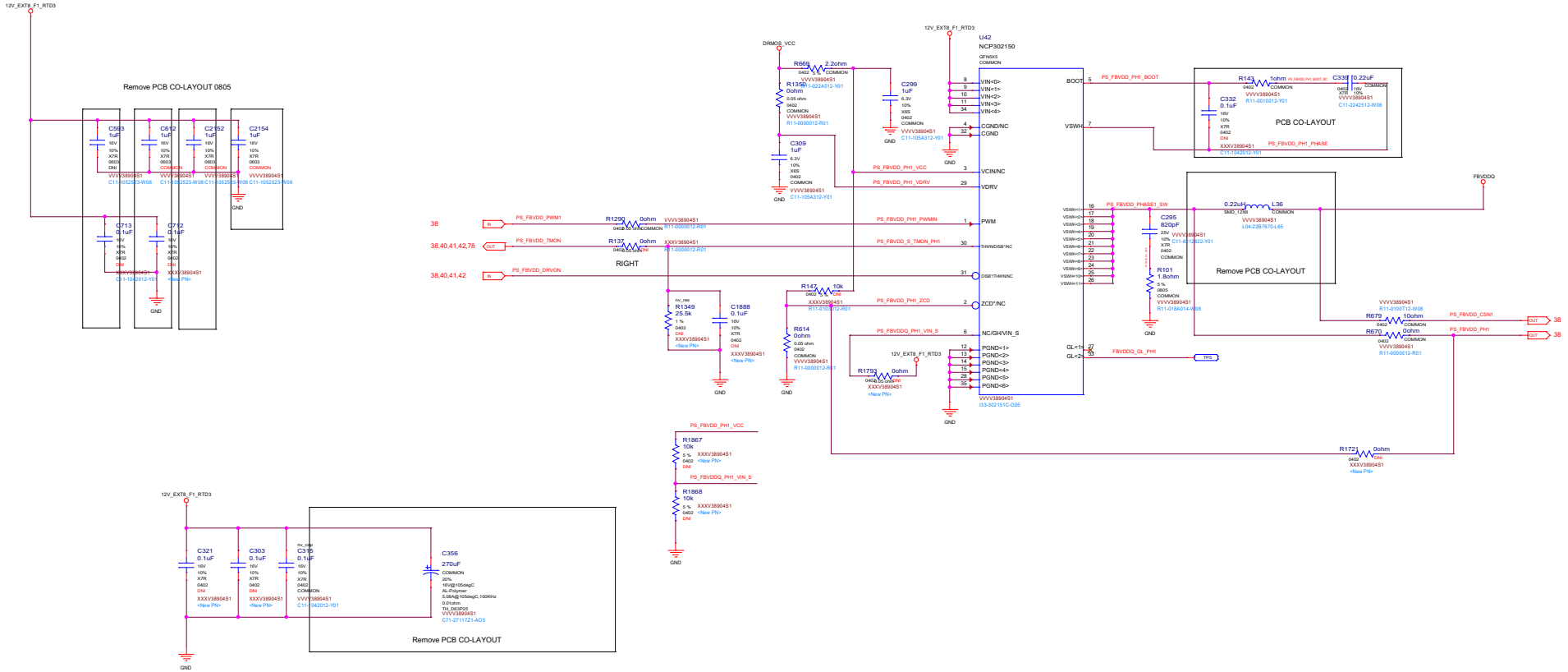
MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: PS: FBVDD Controller OVR3	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 37 of 79	

PS:FBVDDQ OVR4



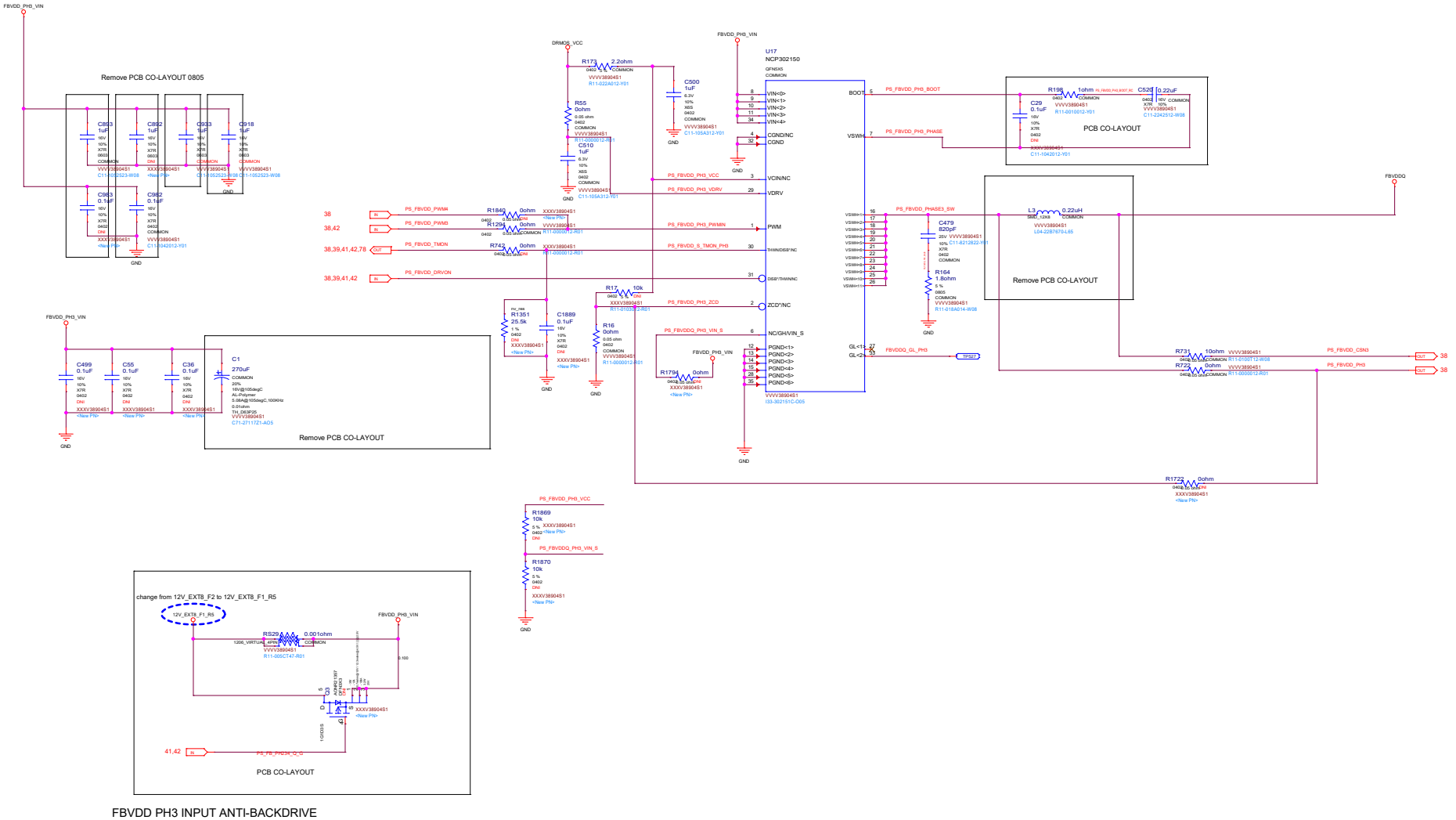
MICRO-STAR INT'L CO.,LTD
MS-V389
Size: Custom
Document Description: PS:FBVDDQ OVR4
Rev: 2.1
Date: Wednesday, July 29, 2020
Sheet 38 of 79

PS: FBVDD PH1



MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: PS: FBVDD PH1	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 39 of 79	

PS: FBVDD PH3



FBVDD PH3 INPUT ANTI-BACKDRIVE

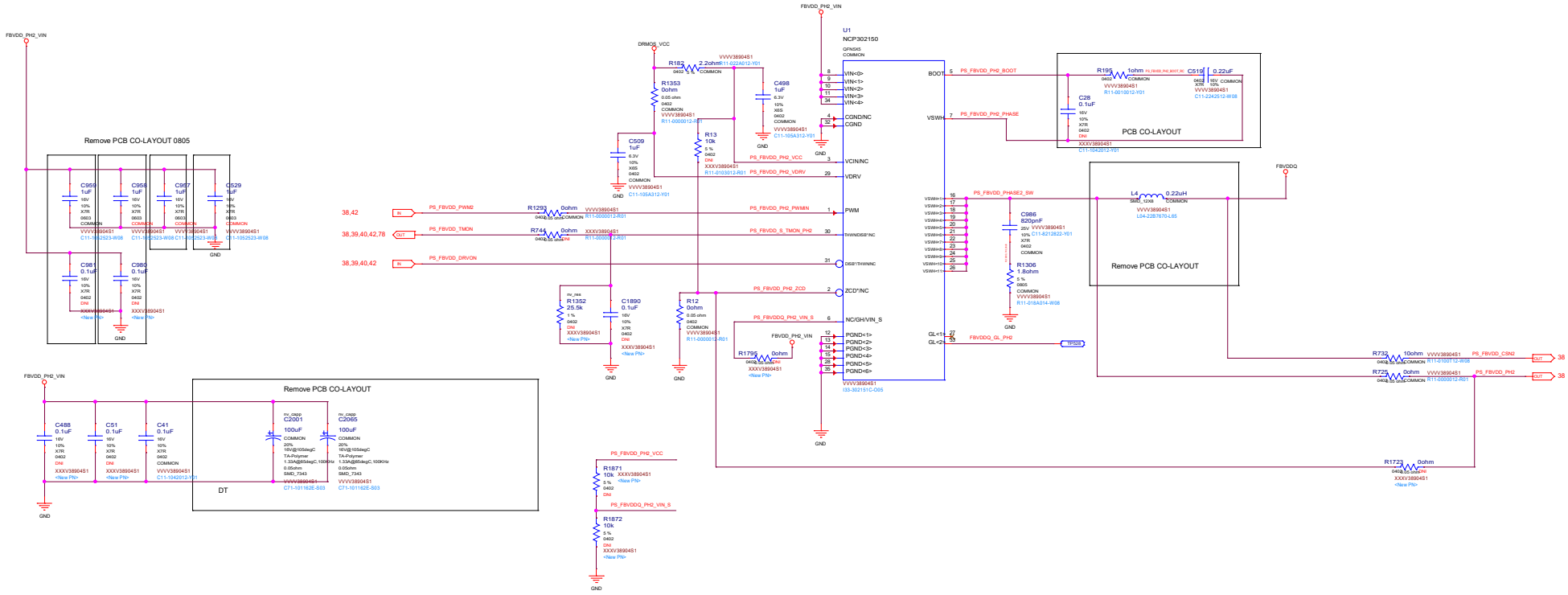
MICRO-STAR INT'L CO.,LTD

MS-V389

Size	Document Description	Rev
Custom	PS: FBVDD PH3	2.1

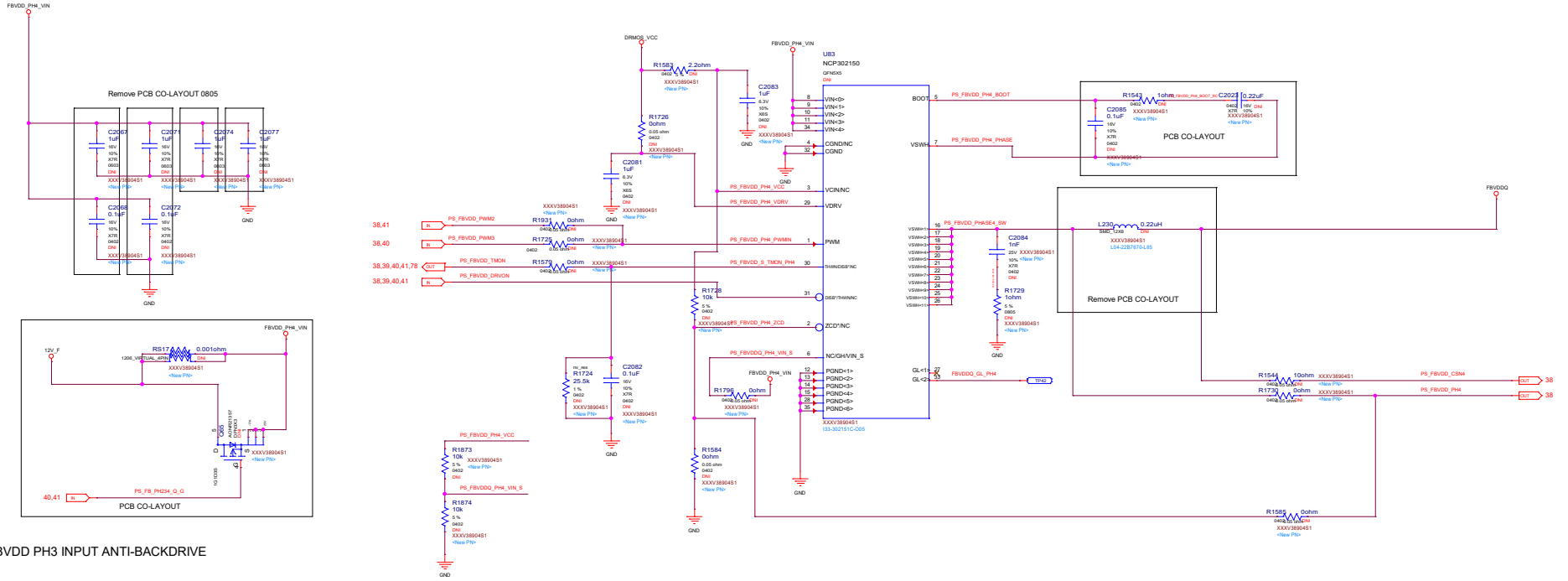
Date: Wednesday, July 29, 2020 Sheet 40 of 79

PS: FBVDD PH2

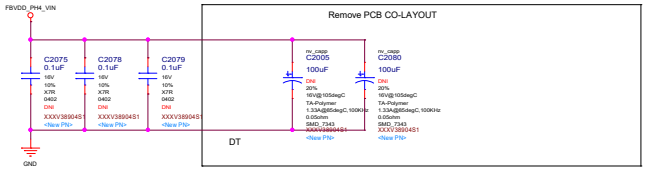


MICRO-STAR INT'L CO.,LTD	
MS-V389	
Size: Custom	Document Description: PS: FBVDD PH2
Rev: 2.1	
Date: Wednesday, July 29, 2020	Sheet 41 of 79

PS: FBVDD PH4



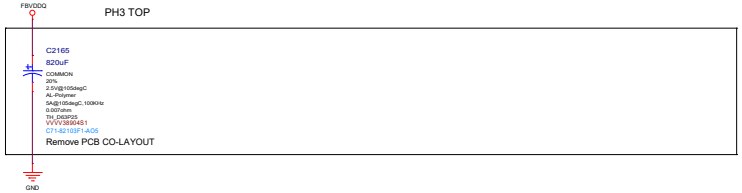
FBVDD PH3 INPUT ANTI-BACKDRIVE

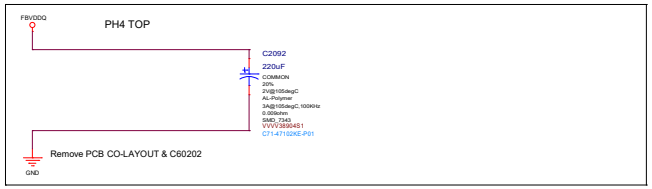


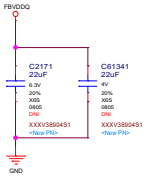
MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: PS: FBVDD PH4	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 42 of 79	

PS: FBVDD OUTPUT CAP

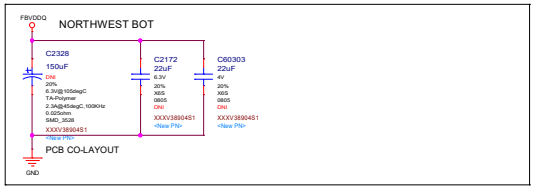
3x 820uF TH FBVDD OUTPUT BULK CAPS

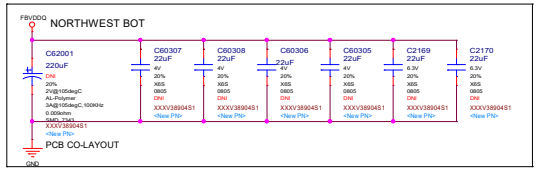


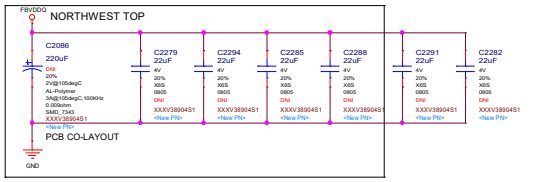


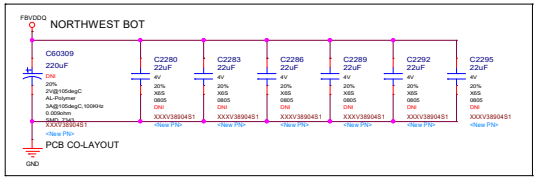


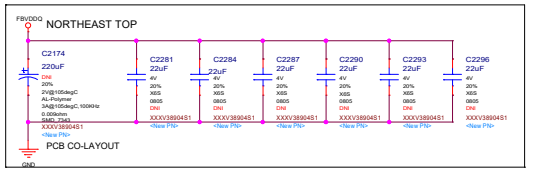
CLOSE TO FB PH3 OUTPUT STUFF

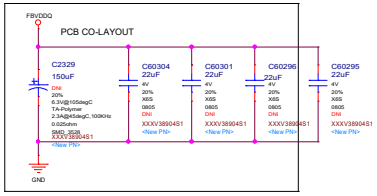


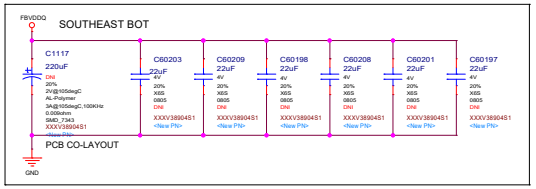


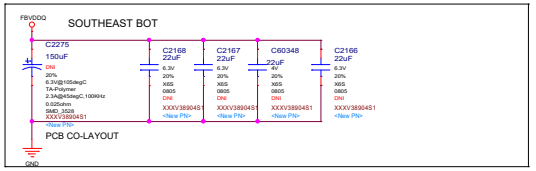


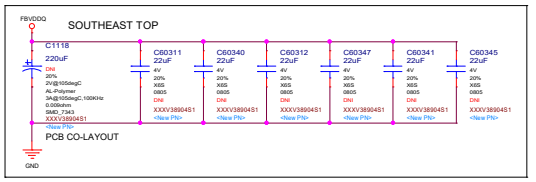


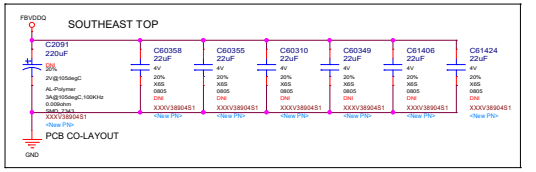


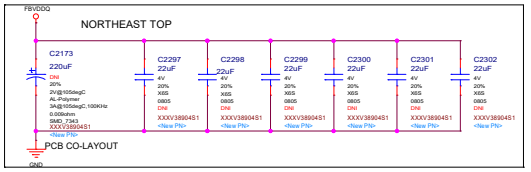












MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: PS: FBVDD OUTPUT CAP	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 43 of 79	

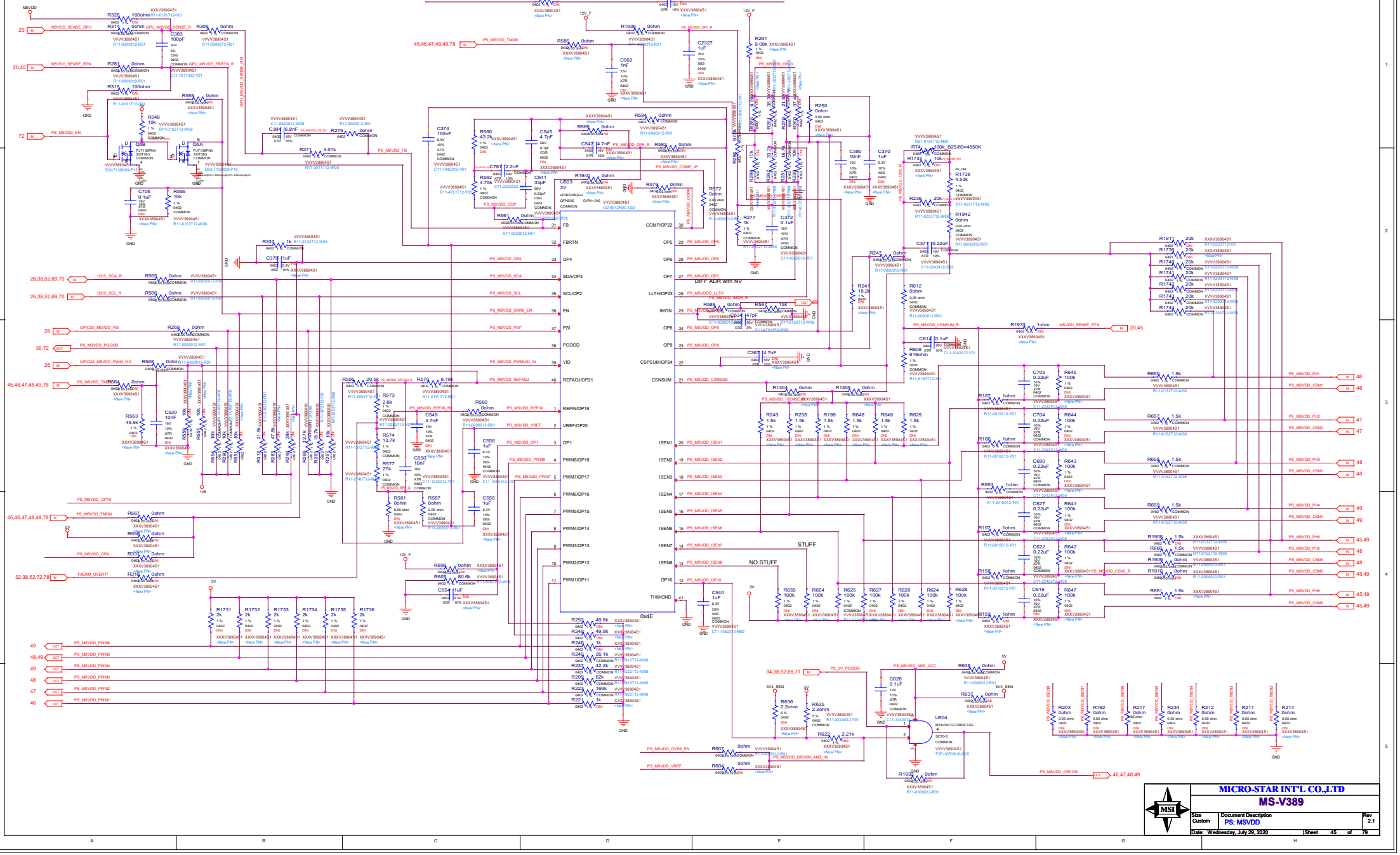
PS_ FBVDD_OUTPUT_CAP_NEAR_MEM

Added for A01 x16

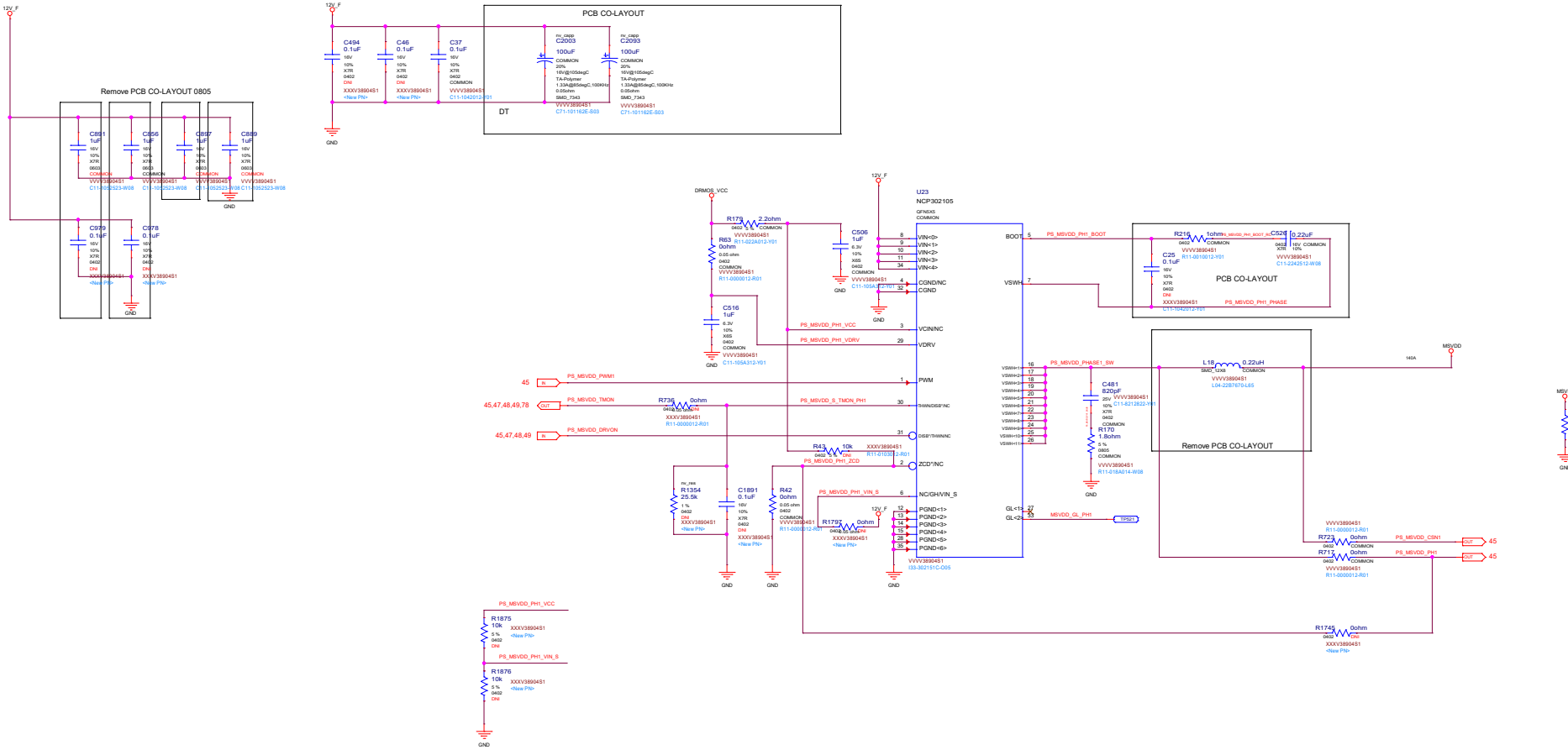
ADDED FOR A00 X16 DESIGN: PLACE UNDER MEMORIES

MICRO-STAR INT'L CO.,LTD	
MS-V389	
Size: Custom	Document Description: PS_ FBVDD_OUTPUT_CAP_NEAR_MEM
Rev: 2.1	
Date: Wednesday, July 29, 2020	Sheet 44 of 79

PS: MSVDD

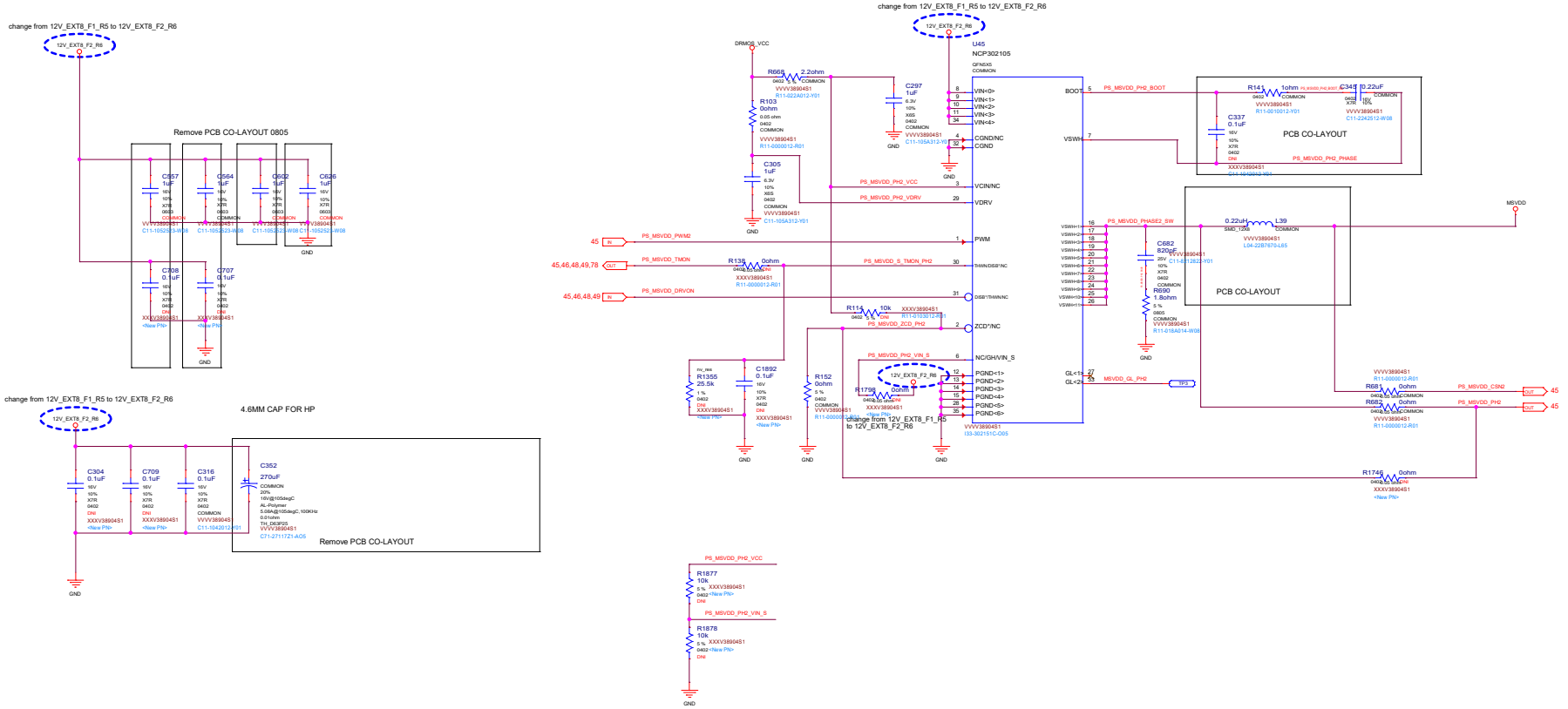

U503
2V
uP6512RQKQJ
QFN5X5
OVR=+5X5
COMMON
FB
FBRTN
OP4
SDA/OP3
SCL/OP2
EN
PSI
PGOOD
VID
REFADJ/OP21
REFIN/OP19
VREF/OP20
OP1
PWM8/OP18
PWM7/OP17
PWM6/OP16
PWM5/OP15
PWM4/OP14
PWM3/OP13
PWM2/OP12
PWM1/OP11
COMP/OP22
OP5
OP6
OP7
LLTH/OP23
IMON
OP8
OP9
CSPSUM/OP24
CSNSUM
ISEN1
ISEN2
ISEN3
ISEN4
ISEN5
ISEN6
ISEN7
ISEN8
OP10
THM/GND
DIFF ADR with NV
STUFF
NO STUFF
MSVDD
MICRO-STAR INT'L CO.,LTD
MS-V389
Size
Custom
Document Description
PS: MSVDD
Rev
2.1
Date: Wednesday, July 29, 2020
Sheet 45 of 79

PS: MSVDD Phase 1



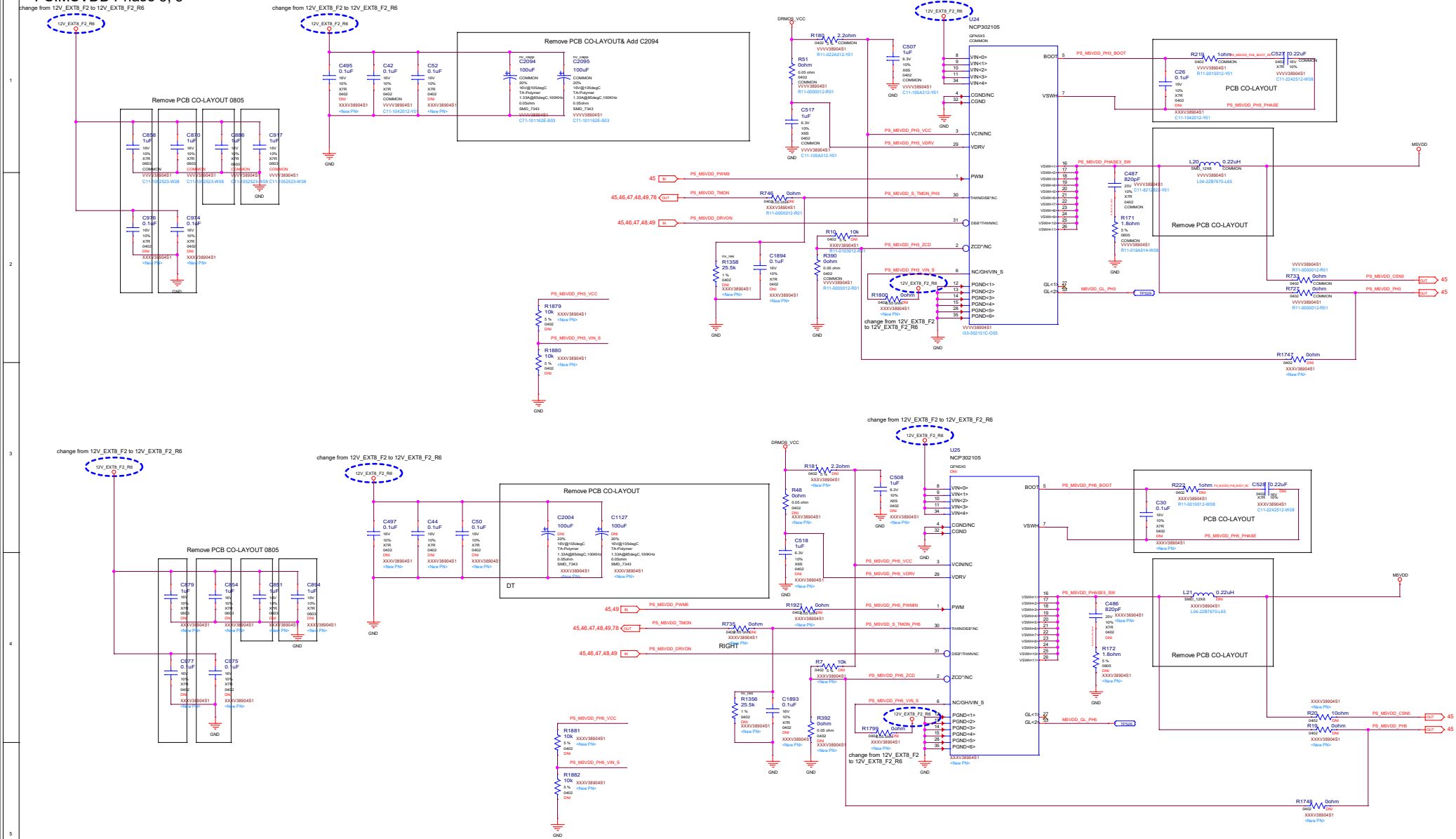
MICRO-STAR INT'L CO.,LTD	
MS-V389	
Size: Custom	Document Description: PS: MSVDD Phase 1
Rev: 2.1	
Date: Wednesday, July 29, 2020	Sheet 46 of 79

PS: MSVDD PH 2

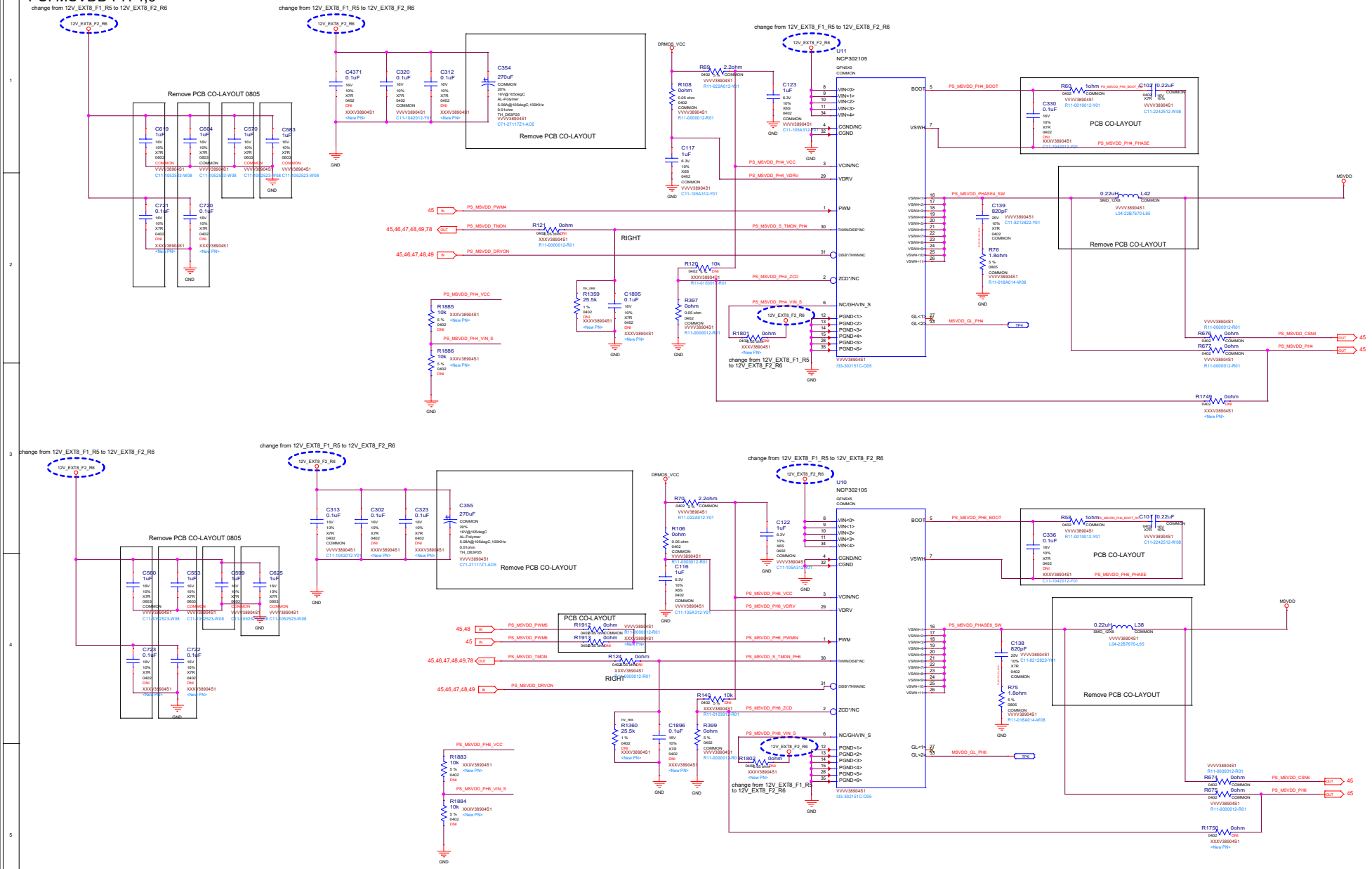


MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: PS: MSVDD PH 2	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 47 of 79	

PS:MSVDD Phase 3, 5

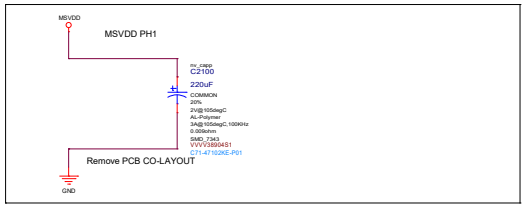


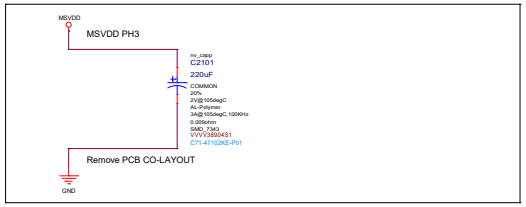
PS: MSVDD PH 4,6

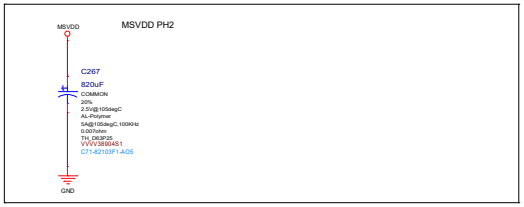


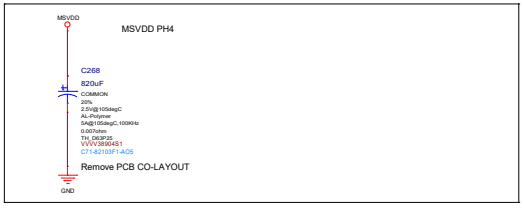
MICRO-STAR INT'L CO.,LTD	
MS-V389	
Size: Custom	Document Description: PS: MSVDD PH 4,6
Rev: 2.1	
Date: Wednesday, July 29, 2020	Sheet 49 of 79

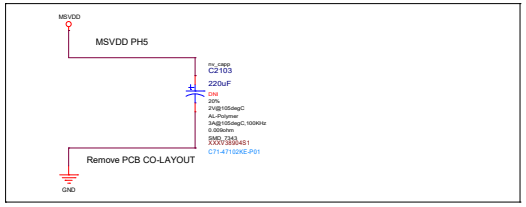
PS:MSVDD OUTPUT CAP (TOP)

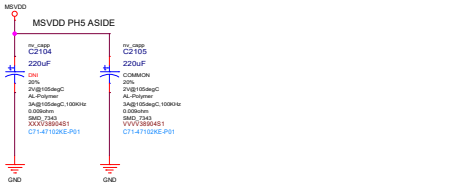


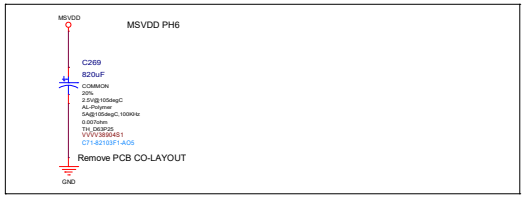












MICRO-STAR INT'L CO.,LTD

MS-V389

Size	Document Description	Rev
Custom	PS:MSVDD OUTPUT CAP (TOP)	2.1

Date: Wednesday, July 29, 2020 Sheet 50 of 79

BLANK

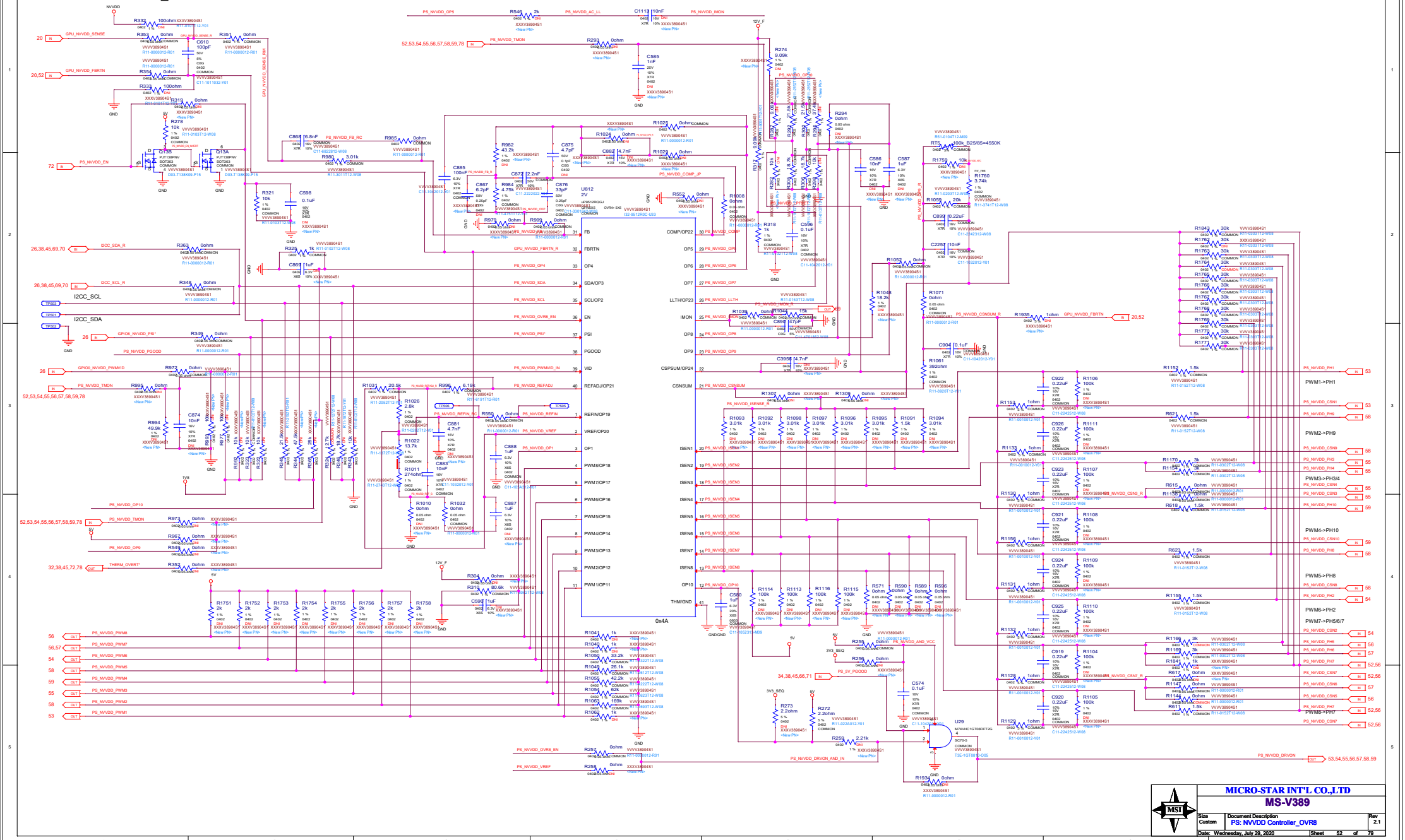
MICRO-STAR INT'L CO.,LTD

MS-V389

Size	Document Description	Rev
Custom	BLANK	2.1

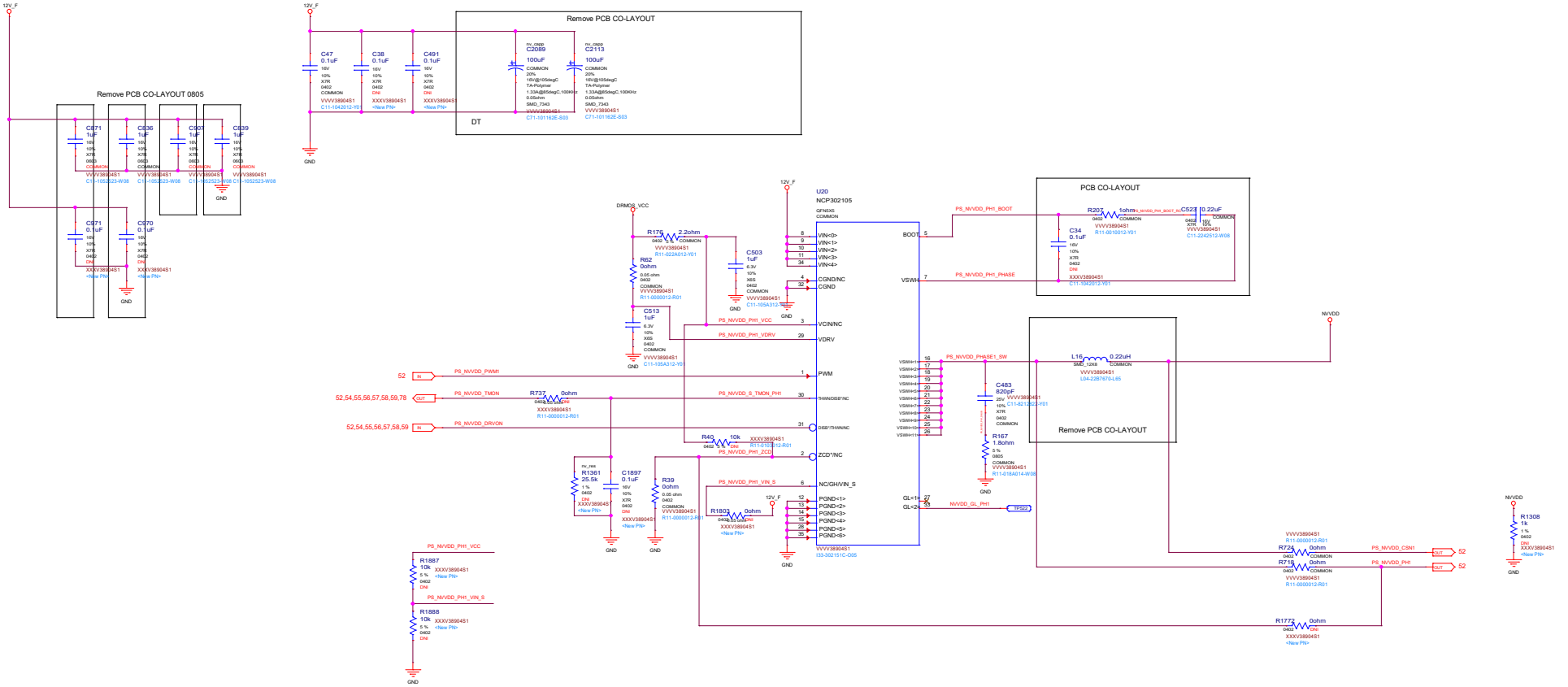
Date: Wednesday, July 29, 2020 Sheet 51 of 79

PS: NVVDD Controller_OVR8



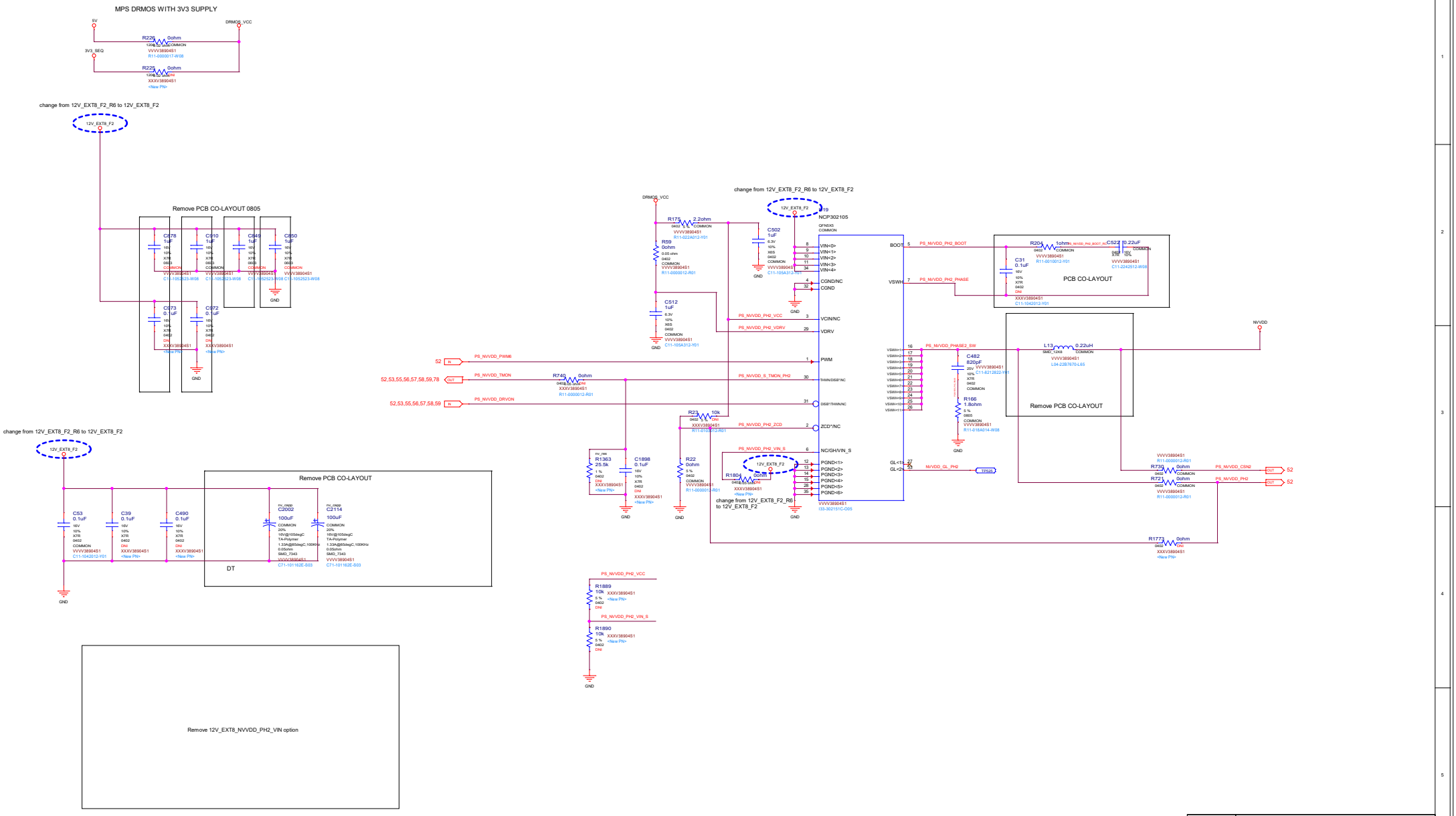
MICRO-STAR INT'L CO.,LTD	
MS-V389	
Size: Custom	Document Description: PS: NVDD Controller_OVR8
Rev: 2.1	
Date: Wednesday, July 29, 2020	Sheet 52 of 79

PS: NVVDD Phase 1



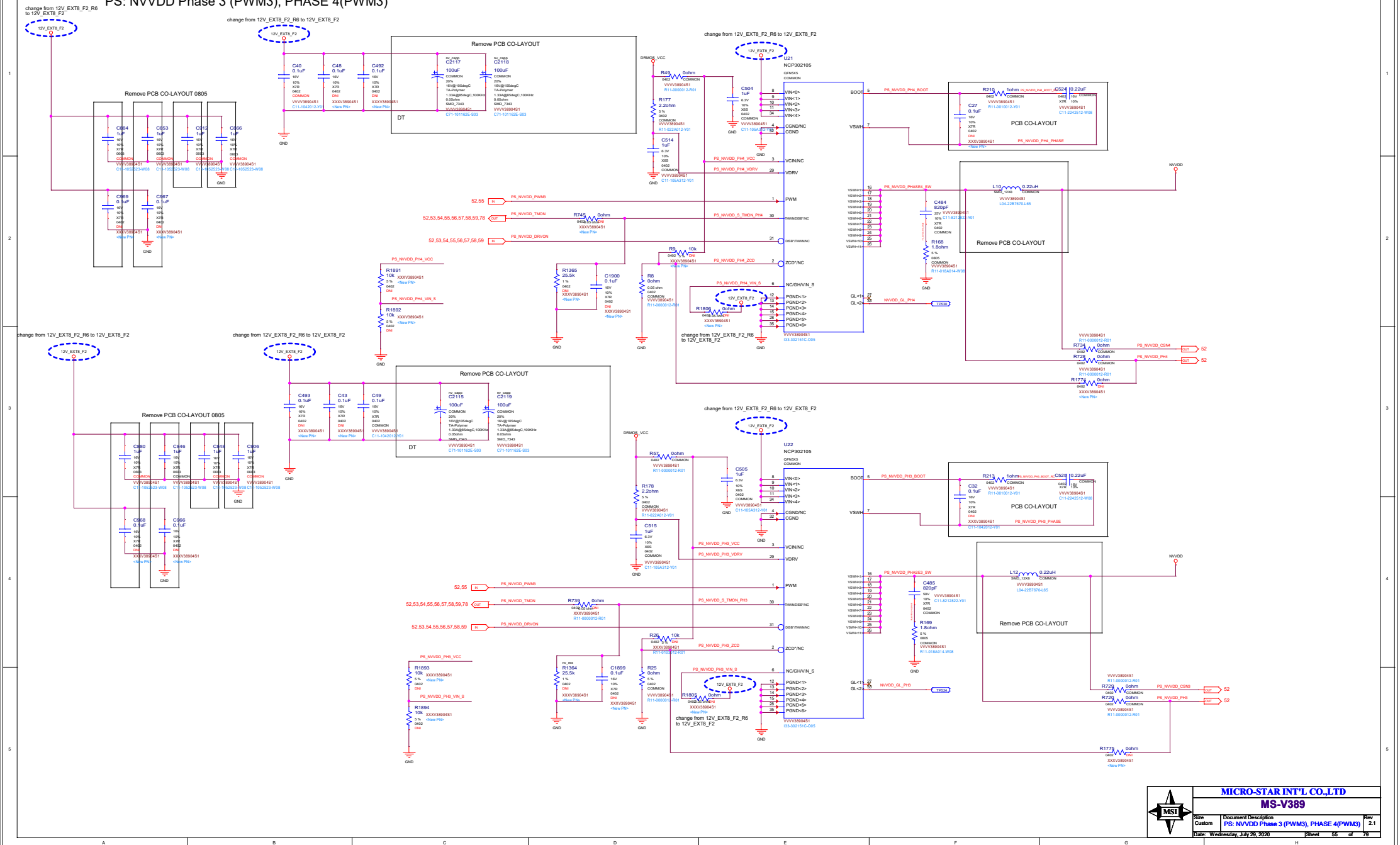
MICRO-STAR INT'L CO.,LTD	
MS-V389	
Size: Custom	Document Description: PS: NVVDD Phase 1
Rev: 2.1	
Date: Wednesday, July 29, 2020	Sheet 53 of 79

PS: NVVDD Phase 2



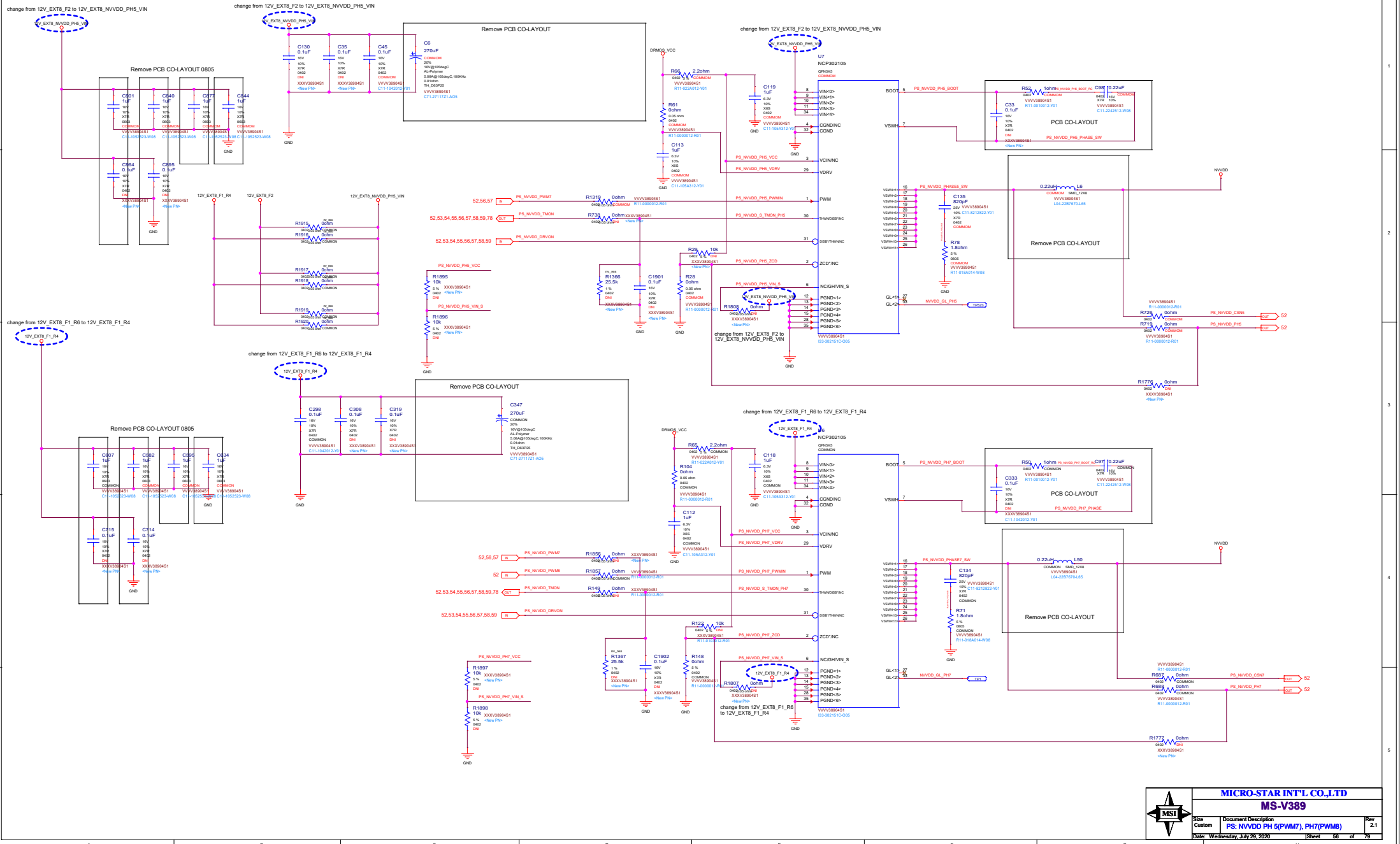
MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: PS: NVVDD Phase 2	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 54 of 79	

PS: NVVDD Phase 3 (PWM3), PHASE 4(PWM3)



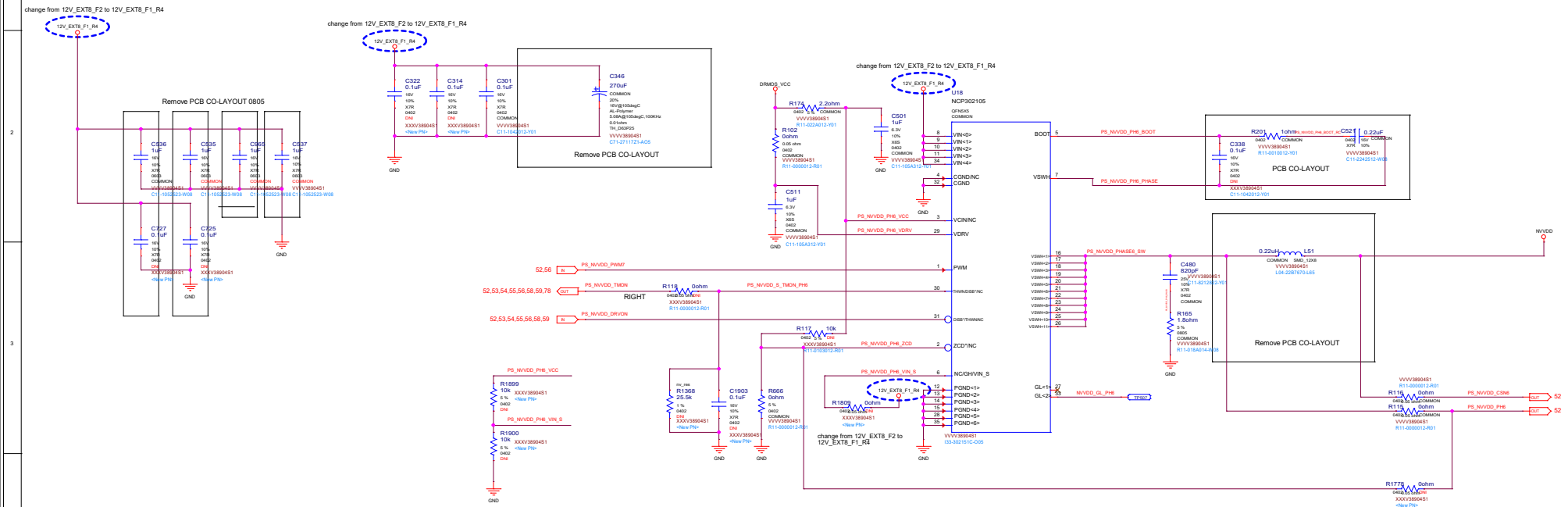
MICRO-STAR INT'L CO.,LTD			
MS-V389			
Size: Custom	Document Description: PS: NVVDD Phase 3 (PWM3), PHASE 4(PWM3)		Rev: 2.1
Date: Wednesday, July 29, 2020		Sheet 55 of 79	

PS: NVVDD PH 5(PWM7), PH7(PWM8)



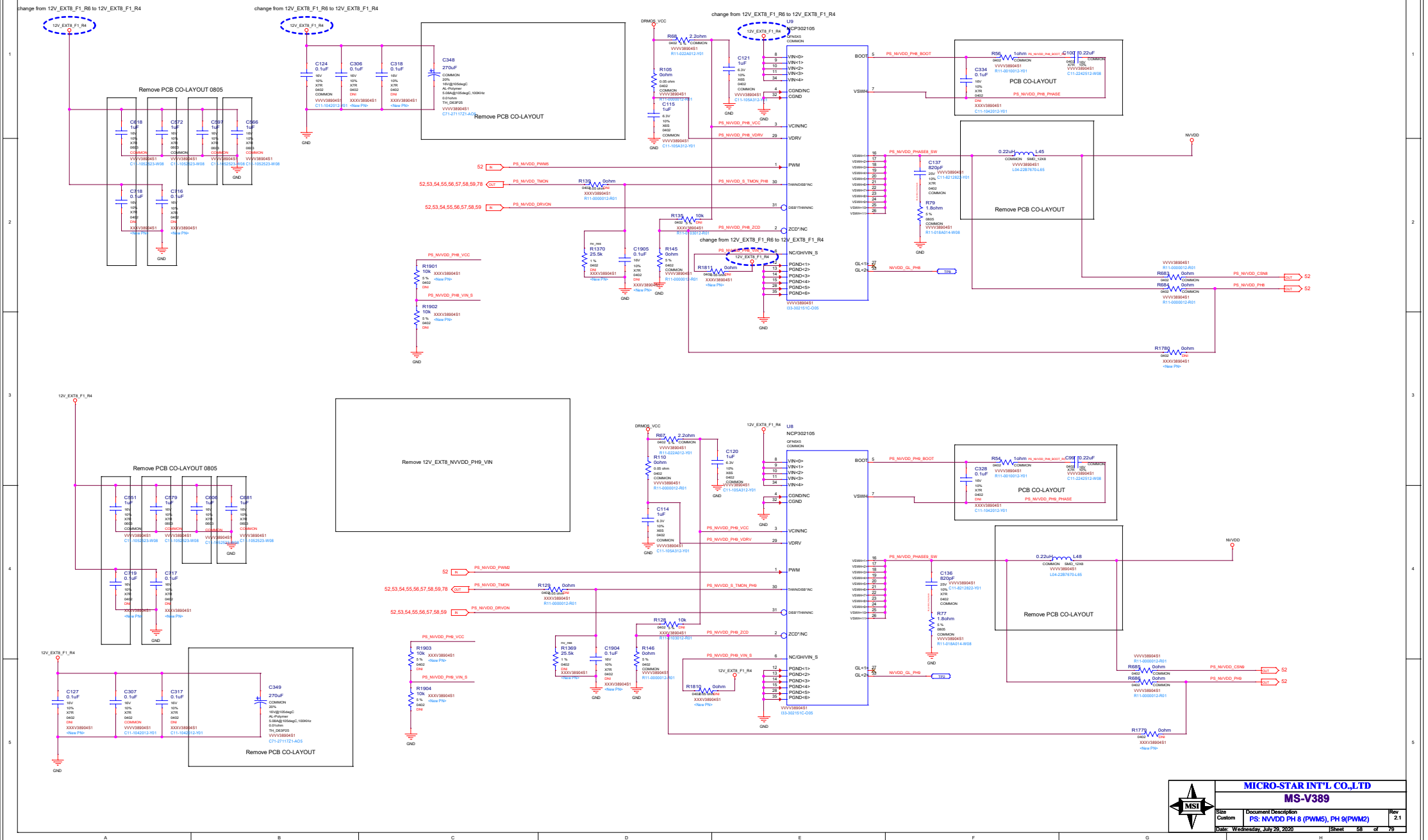
Company	MICRO-STAR INT'L CO.,LTD
Model	MS-V389
Size	Custom
Document Description	PS: NVVDD PH 5(PWM7), PH7(PWM8)
Rev	2.1
Date	Wednesday, July 29, 2020
Sheet	56 of 79

PS: NVVDD Phase 6(PWM7)



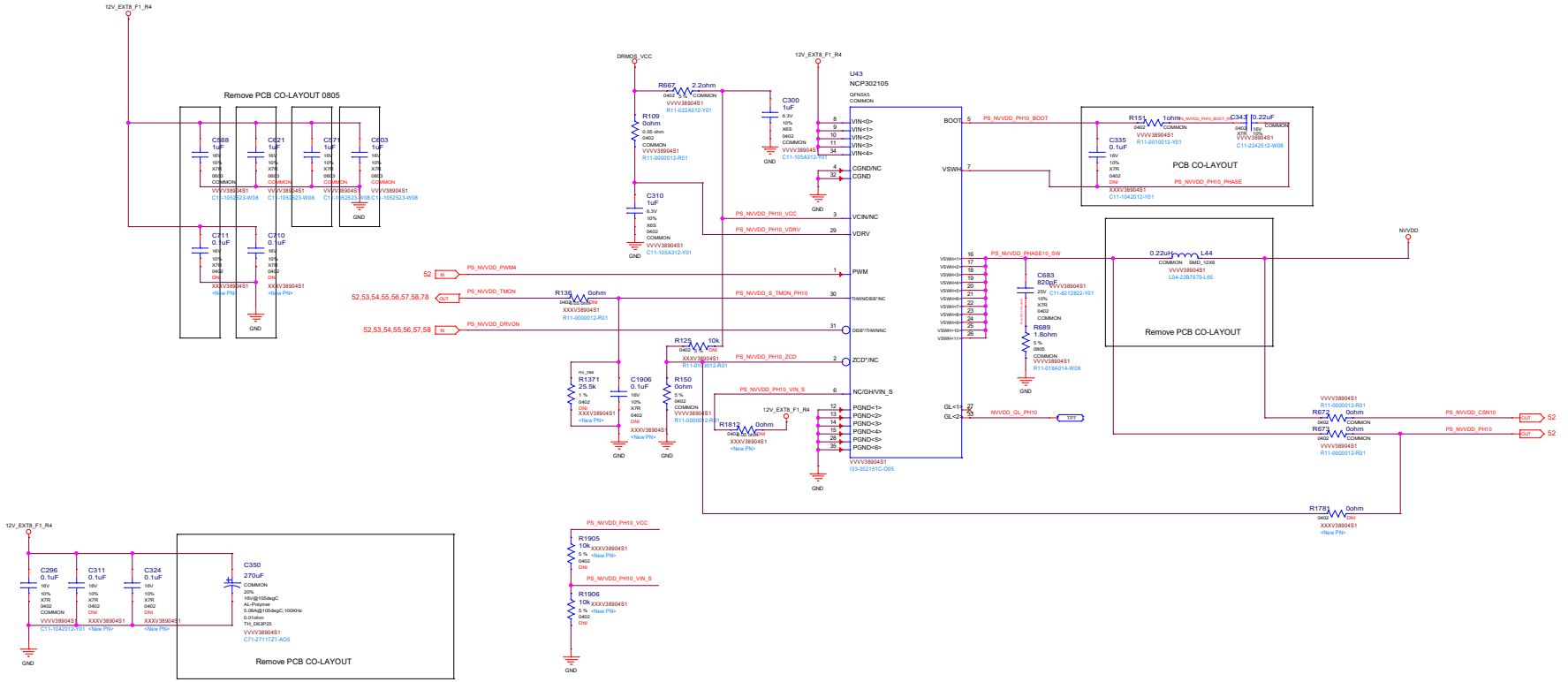
MSI	MICRO-STAR INT'L CO.,LTD	
	MS-V389	
Size: Custom	Document Description: PS: NVVDD Phase 6(PWM7)	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 57 of 79	

PS: NVVDD PH 8 (PWM5), PH 9(PWM2)



MICRO-STAR INT'L CO.,LTD	
MS-V389	
Size: Custom	Document Description: PS: NVVDD PH 8 (PWM5), PH 9(PWM2)
Rev: 2.1	
Date: Wednesday, July 29, 2020	Sheet 58 of 79

PS: NVVDD Phase 10 (PWM8)



MICRO-STAR INT'L CO.,LTD	
MS-V389	
Size: Custom	Document Description: PS: NVVDD Phase 10 (PWM8)
Rev: 2.1	
Date: Wednesday, July 29, 2020	Sheet 59 of 79

PCB CO-LAYOUT

C131, C132, C133, C140, C141, C142, C2106, C2107, C2133, C2134, C2135, C2137, C264, C265, C266, C267, C61, C64, C65, C66, C67, C68, C69, C77, C80, C83, C88

PCB CO-LAYOUT

C103, C105, C106, C107, C108, C110, C1208, C125, C1254, C1256, C1267, C128, C144, C145, C146, C151, C152, C153, C154, C159, C160, C161, C162, C170, C173, C2092, C2100, C2101, C2102, C2103, C2104, C2138, C2139, C2140, C2141, C2142, C2143, C2144, C2272, C230, C231, C232, C233, C243, C245, C246, C248, C253, C254, C255, C256, C270, C274, C275, C276, C283, C289, C290, C291, C60202, C62004, C62005

C163, C164, C166, C167, C2087, C2105, C2109, C2110, C2111, C224, C225, C261, C268, C269, C60354, C61428, C62, C63, C89, C91, C96

PCB CO-LAYOUT

MICRO-STAR INT'L CO.,LTD

MS-V389

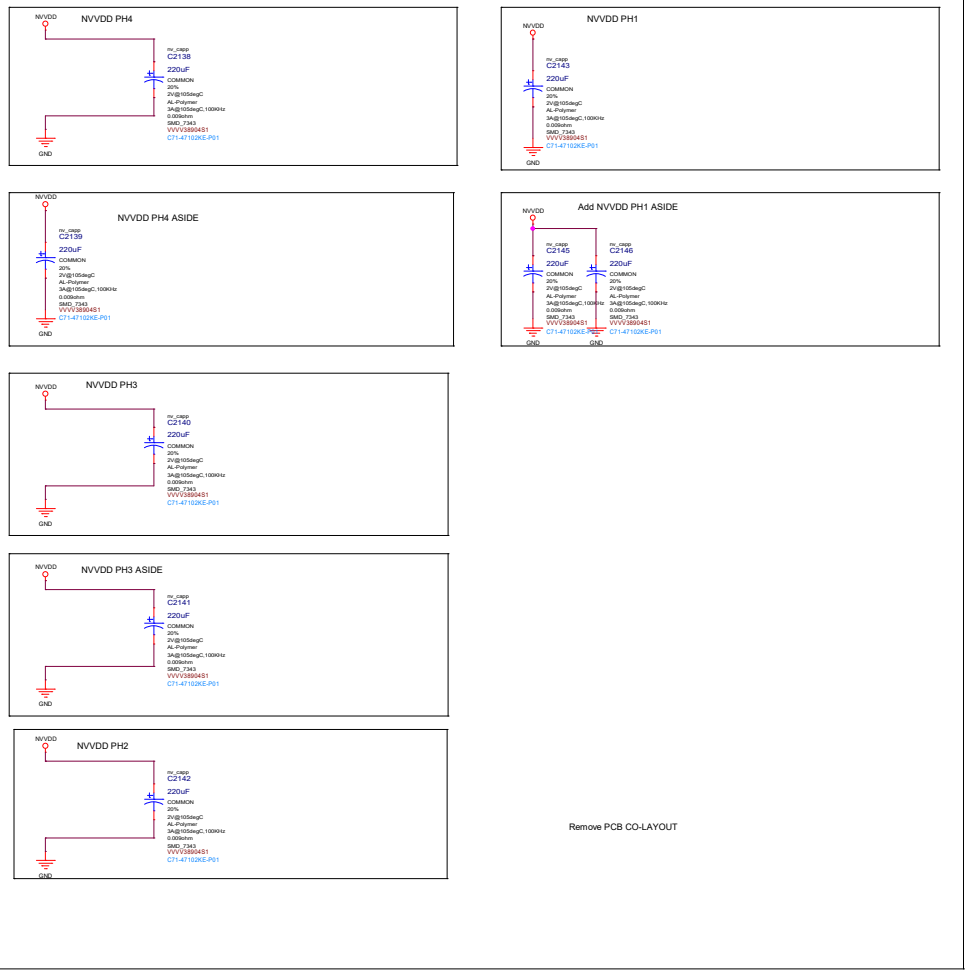
Size: Custom | Document Description: 0060_Colayout_Notes | Rev: 2.1

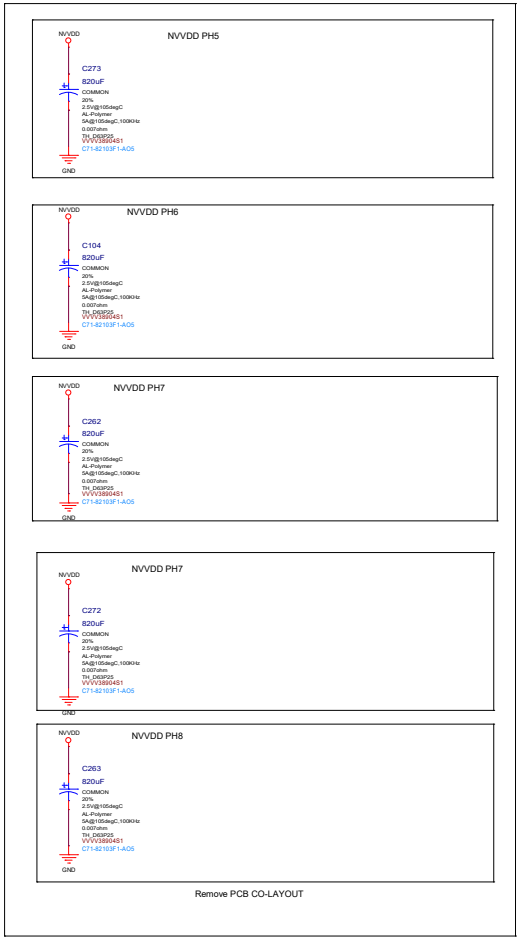
Date: Wednesday, July 29, 2020 | Sheet 60 of 79

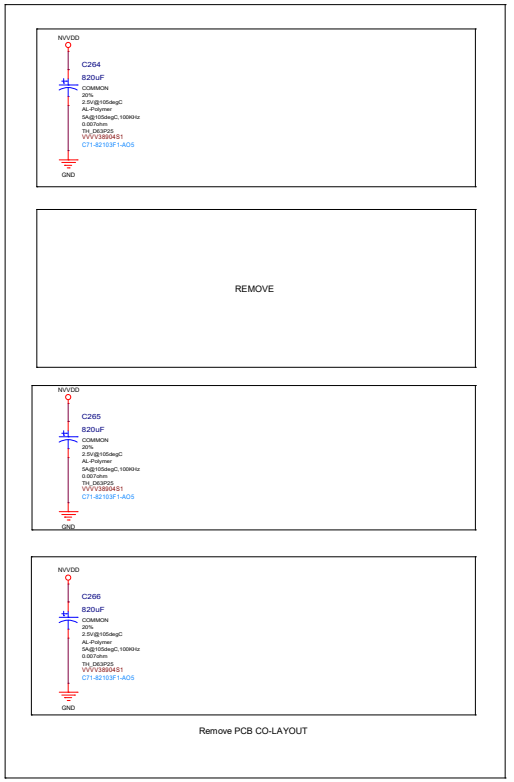
BLANK

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-V389	
Size: Custom	Document Description: BLANK	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 61 of 79	

PS: NVVDD OUTPUT CAP(TOP)







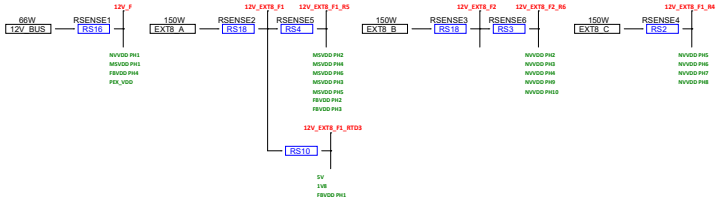
MICRO-STAR INT'L CO.,LTD

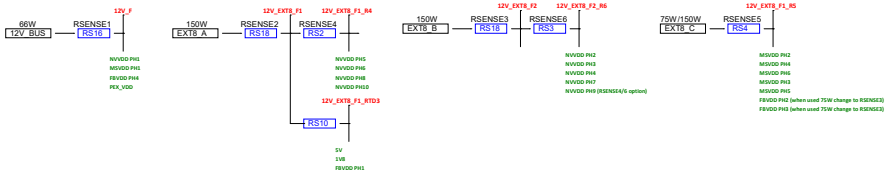
MS-V389

Size	Document Description	Rev
Custom	PS: NVVDD OUTPUT CAP(TOP)	2.1

Date: Wednesday, July 29, 2020 Sheet 82 of 79

Power Topology





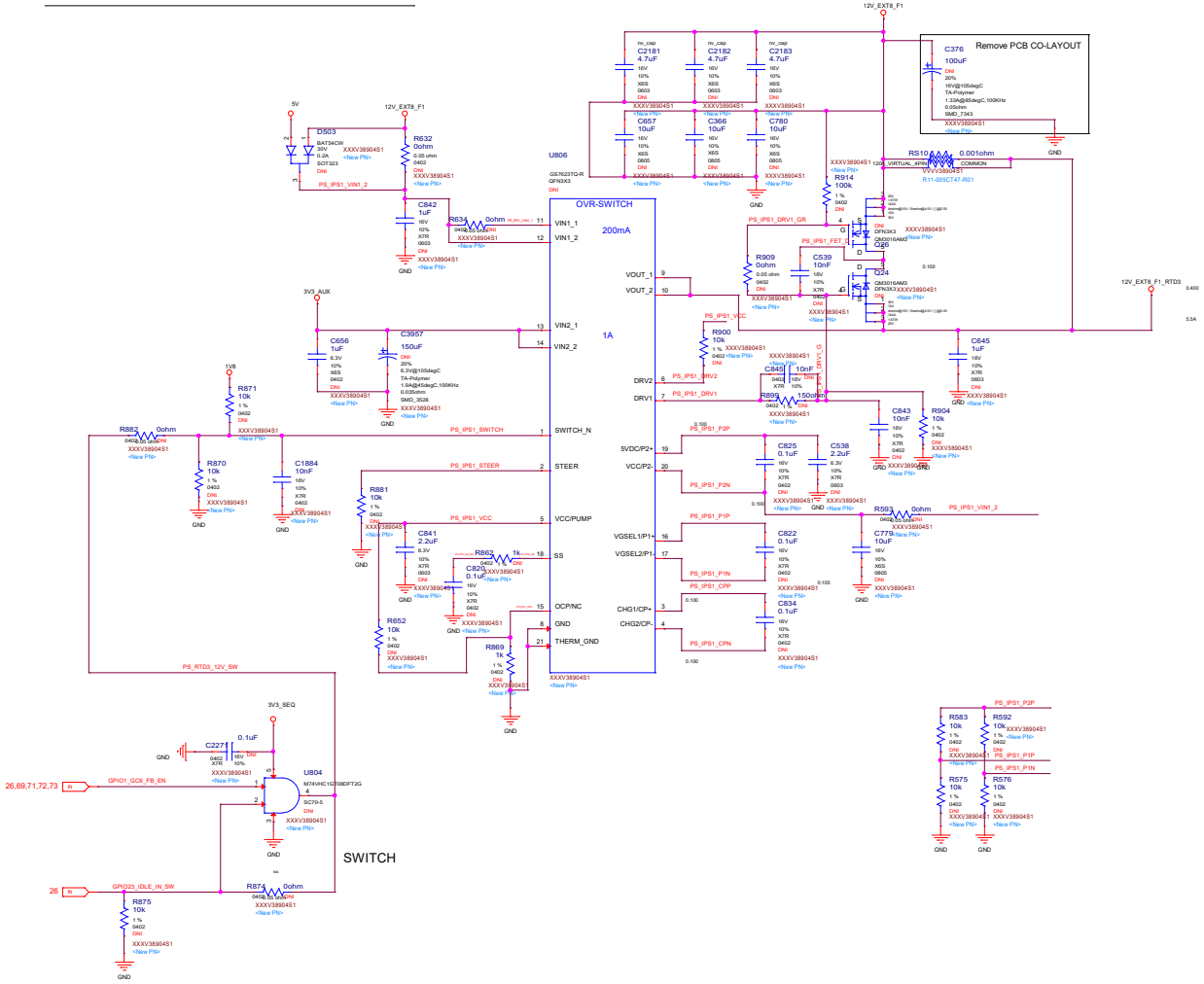
BLANK

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-V389	
Size: Custom	Document Description: BLANK	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 63 of 79	

PS: INPUT SWITCH RTD3

AND GATE LOGIC FOR P-BOARD

GPIO1	GPIO23	SWITCH	VOUT
0	0	0	12V_F
0	1	0	12V_F
1	0	0	12V_F
1	1	1	3V3A

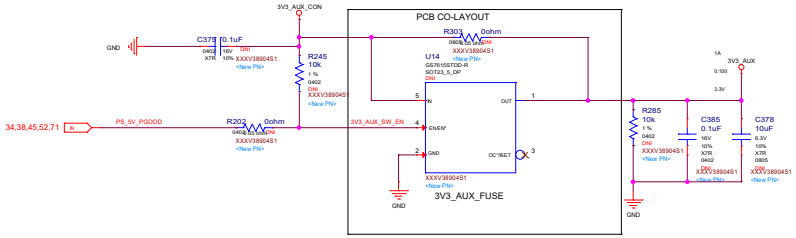


MICRO-STAR INT'L CO.,LTD
MS-V389
Size: Custom
Document Description: PS: INPUT SWITCH RTD3
Rev: 2.1
Date: Wednesday, July 29, 2020
Sheet 84 of 79

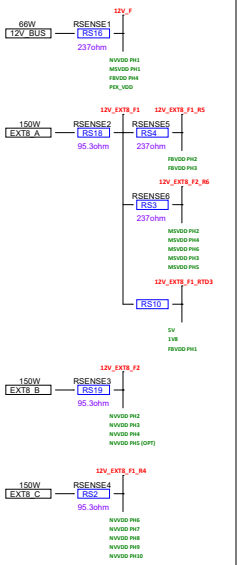
BLANK

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-V389	
Size: Custom	Document Description: BLANK	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 65 of 79	

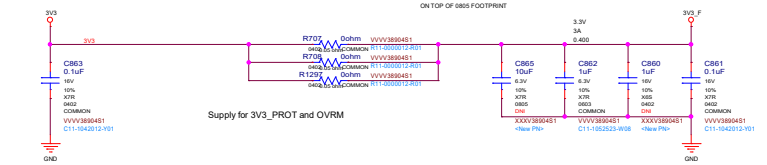
PS: Inputs, Filtering, and Monitoring



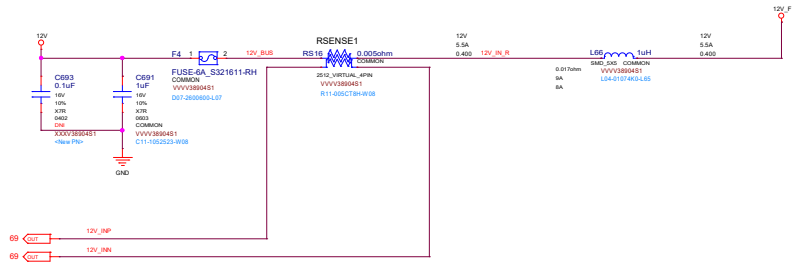
Power Topology



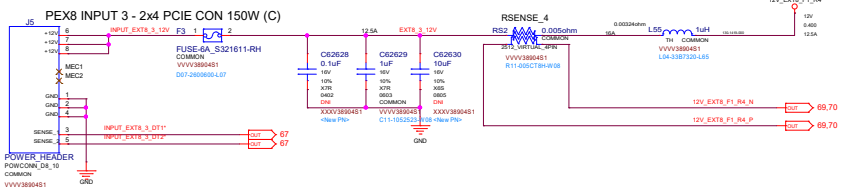
PEX 3V3 INPUT - 10W



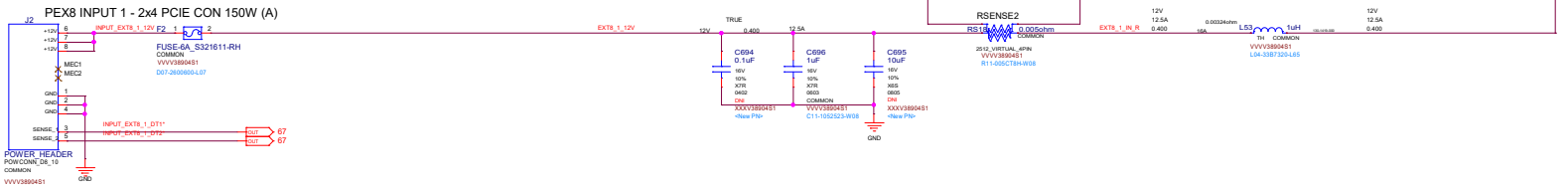
PEX_12V INPUT - 66W



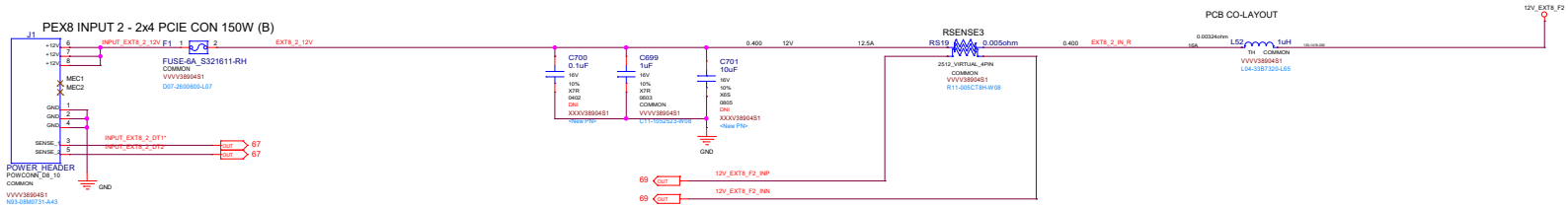
PEX8 INPUT 3 - 2x4 PCIE CON 150W (C)



PEX8 INPUT 1 - 2x4 PCIE CON 150W (A)

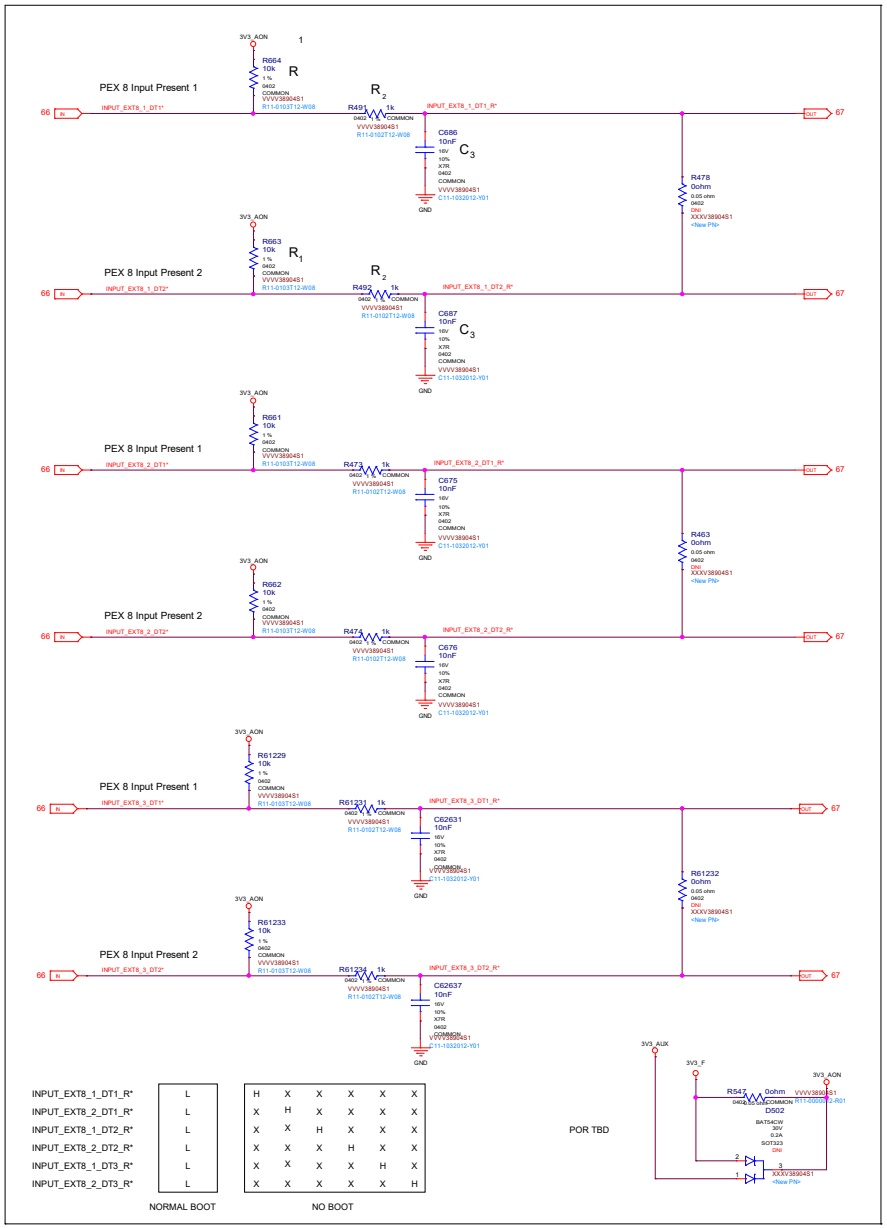


PEX8 INPUT 2 - 2x4 PCIE CON 150W (B)



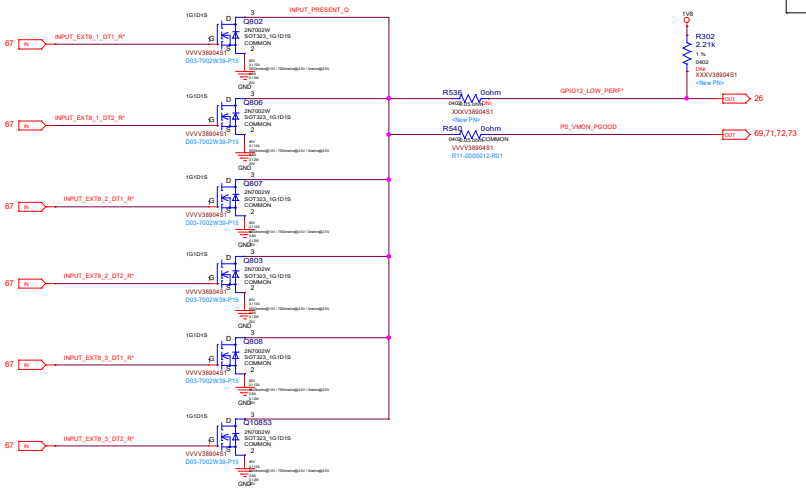
MICRO-STAR INT'L CO.,LTD			
MS-V389			
Size: Custom	Document Description: PS: Inputs, Filtering, and Monitoring		Rev: 2.1
Date: Wednesday, July 29, 2020		Sheet 66 of 79	

PS: Hot Unplug Detect



PEX Input - Under Power Boot Controls

GPIO12_LOW_PERP*	GPU SPEED
0	Slow
1	Normal



A 2 x 4 auxiliary power connector plug from the power supply unit must not use the 75 W sense coding (Sense1=Open and Sense0=Ground) to avoid end-user confusion.

MICRO-STAR INT'L CO.,LTD

MS-V389

Size	Document Description	Rev
Custom	PS: Hot Unplug Detect	2.1

Date: Wednesday, July 29, 2020 Sheet 87 of 79

PS: Discrete Steering

12V CURRENT STEERING (UNDER POWER BOOT):

PEX12V AND 12V_EXT8_F1

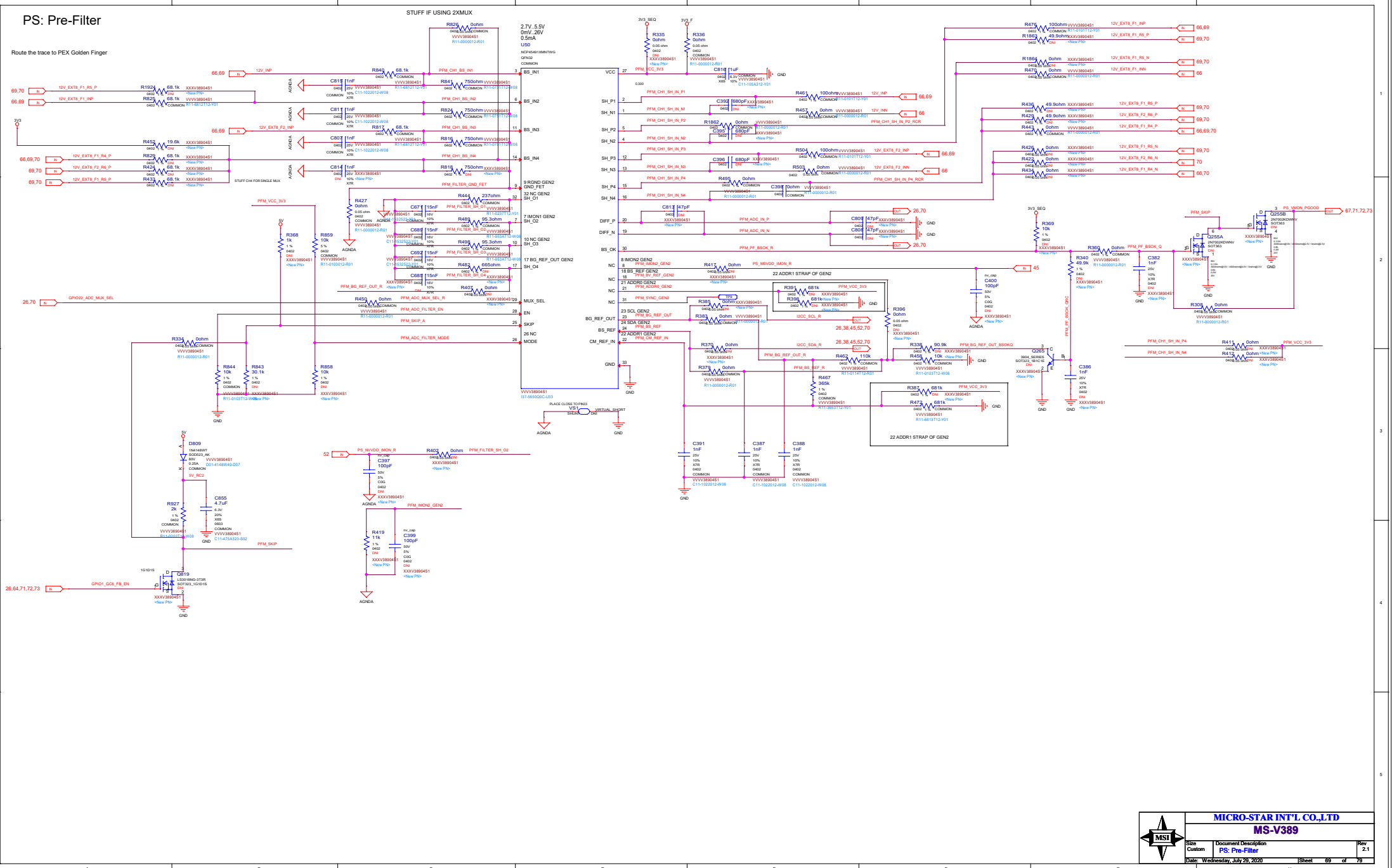
Remove 12V CURRENT STEERING

NO STUFF BY DEFAULT REF ONLY

PEX12V AND 12V_EXT8_F2

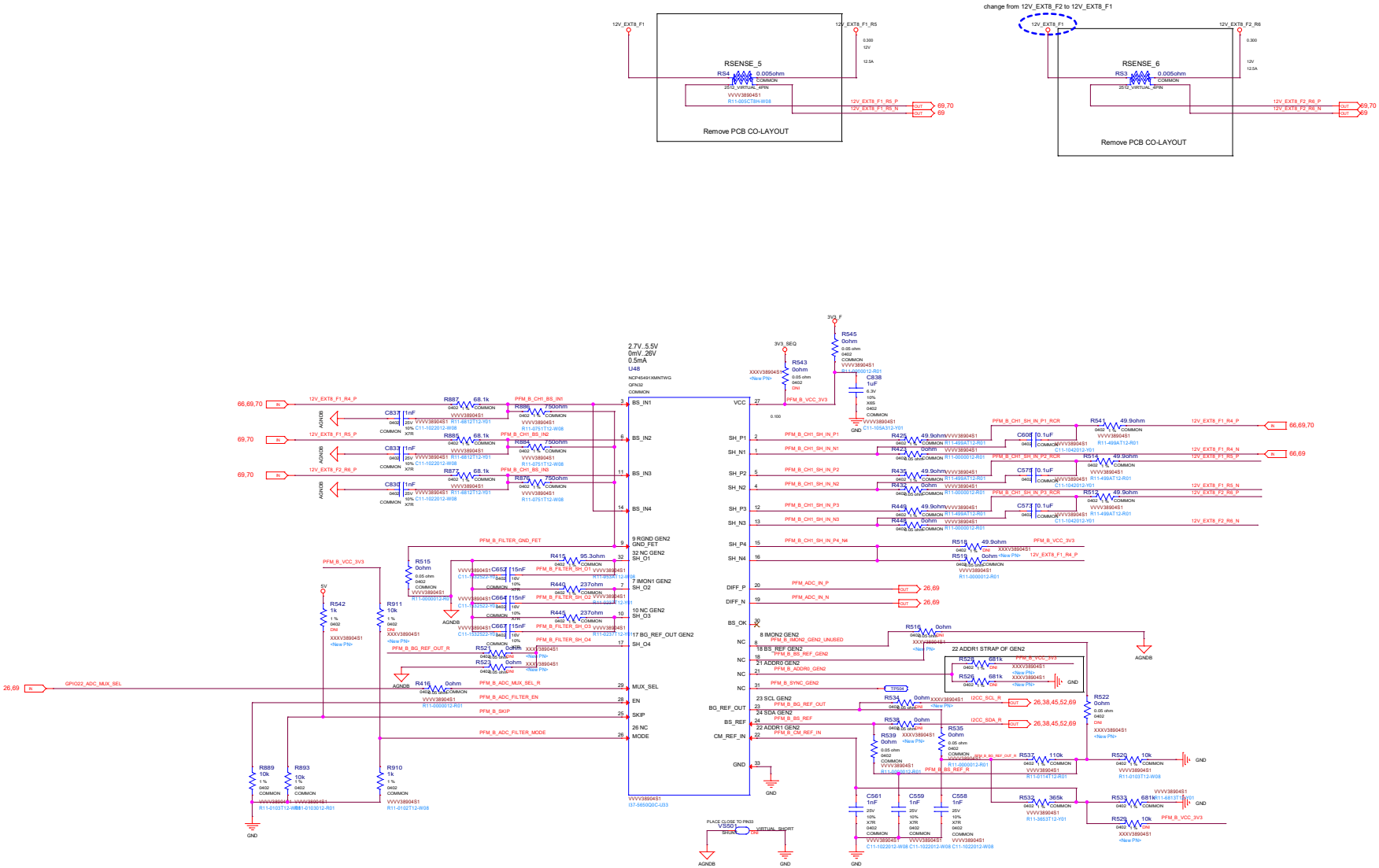
PS: Pre-Filter

Route the trace to PEX Golden Finger



MICRO-STAR INT'L CO.,LTD	
MS-V389	
Size: Custom	Document Description: PS: Pre-Filter
Rev: 2.1	
Date: Wednesday, July 29, 2020	Sheet 89 of 79

PS: Pre-Filter B

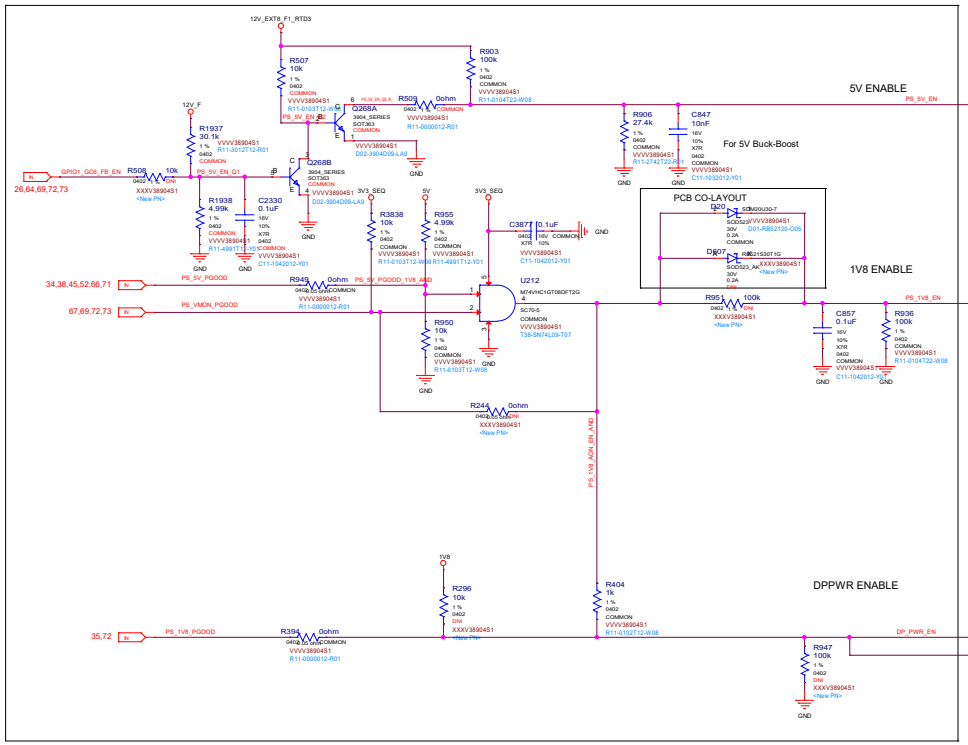


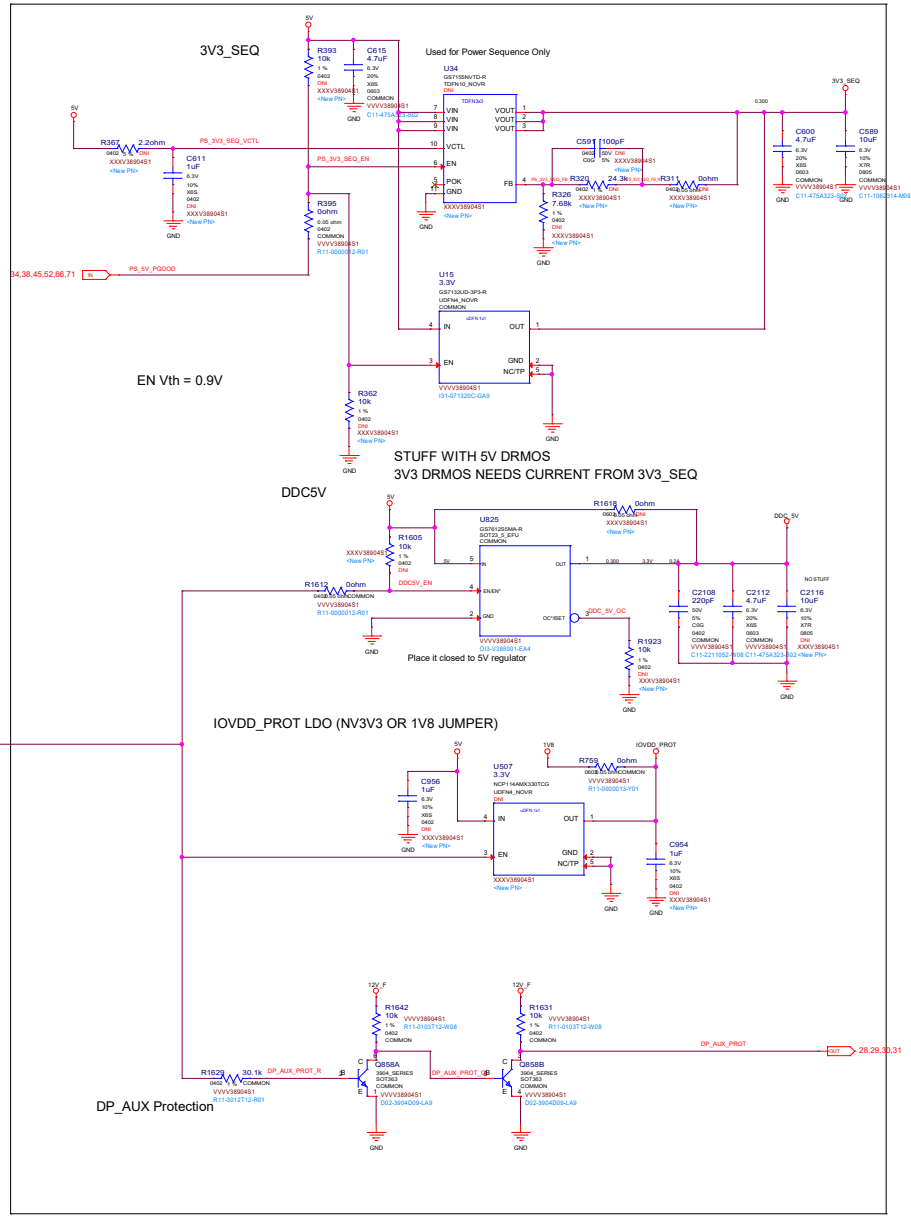
MICRO-STAR INT'L CO.,LTD
MS-V389

Size	Document Description	Rev
Custom	PS: Pre-Filter B	2.1

Date: Wednesday, July 29, 2020 Sheet 70 of 79

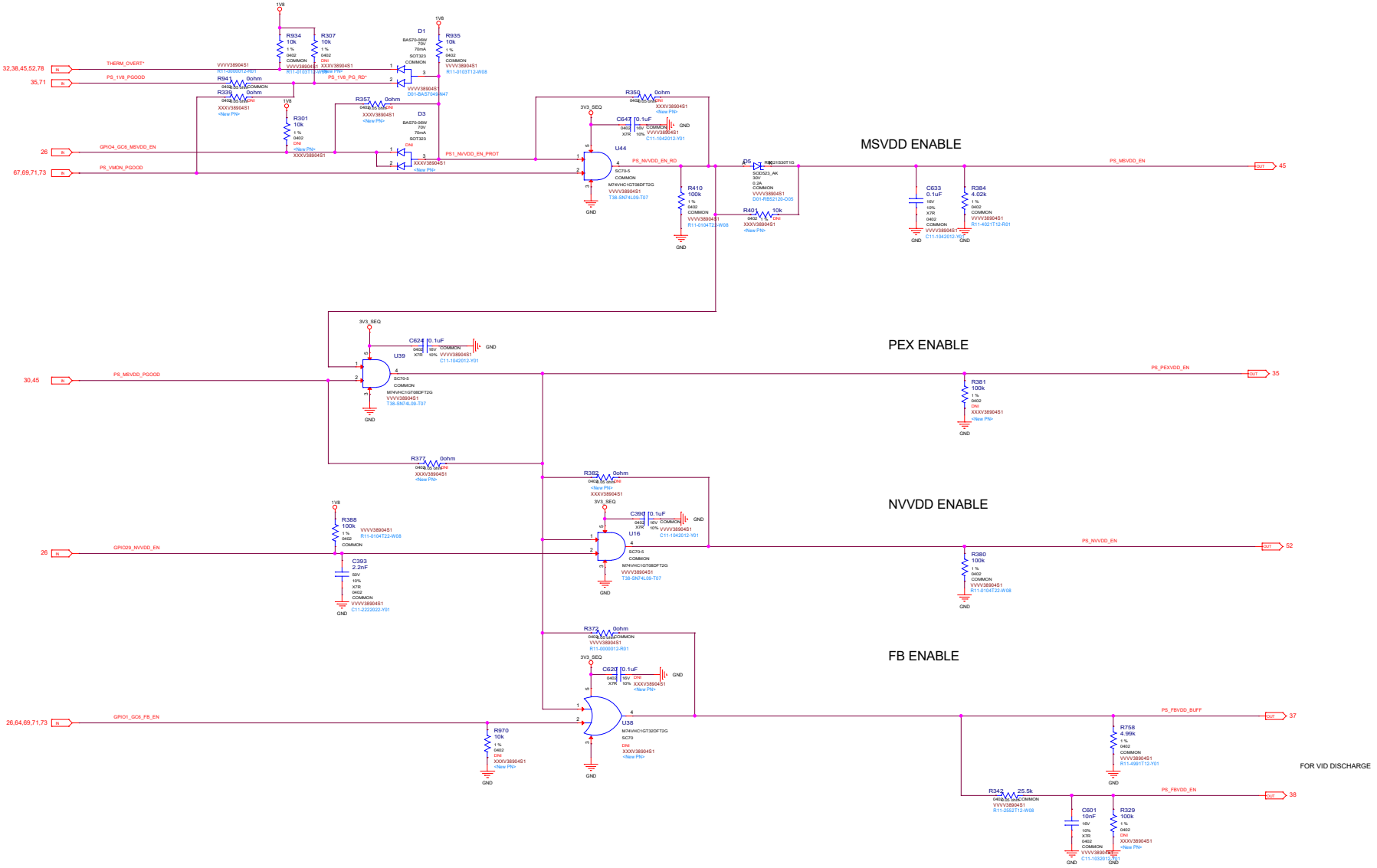
SEQUENCE:5V,1V8,3V3_SEQ ENABLE





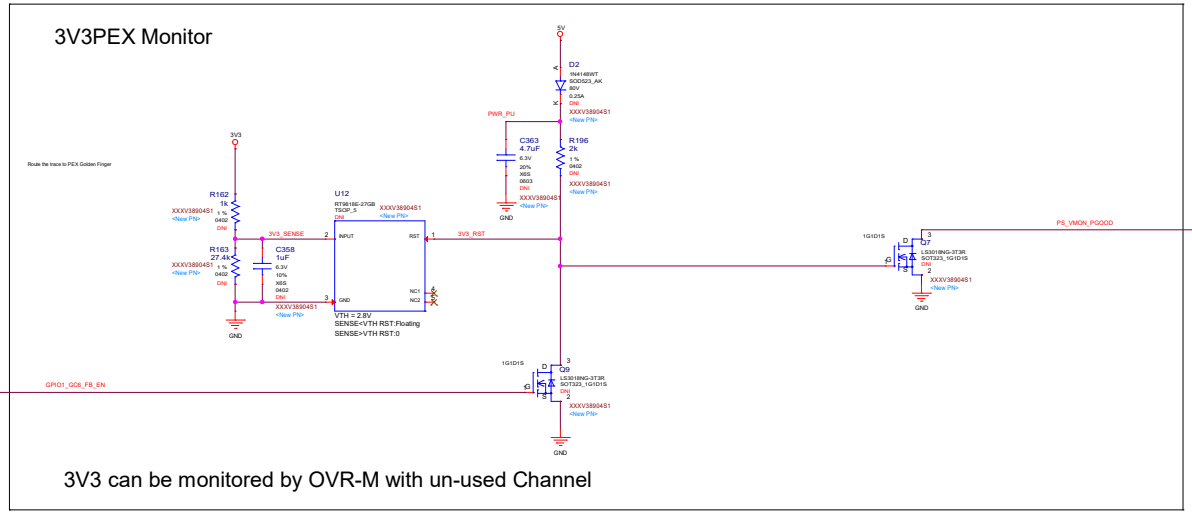
MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: SEQUENCE:5V,1V8,3V3_SEQ ENABLE	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 71 of 79	

SEQUENCE:NV,PEX,FB ENABLE



MICRO-STAR INT'L CO.,LTD			
MS-V389			
Size: Custom	Document Description: SEQUENCE:NV,PEX,FB ENABLE		Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 72 of 79		

Sequence: 3V3 MONITOR



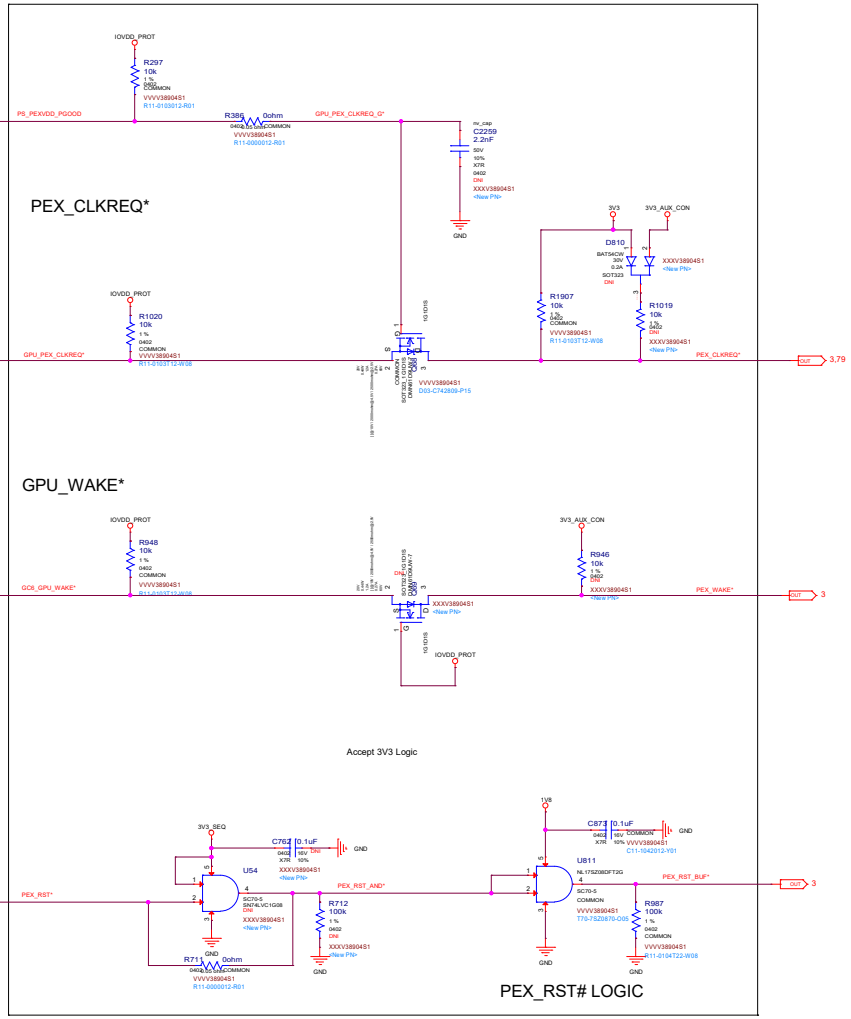
MICRO-STAR INT'L CO.,LTD

MS-V389

Size	Document Description	Rev
Custom	Sequence: 3V3 MONITOR	2.1

Date: Wednesday, July 29, 2020 Sheet 73 of 79

SEQUENCE:MISC

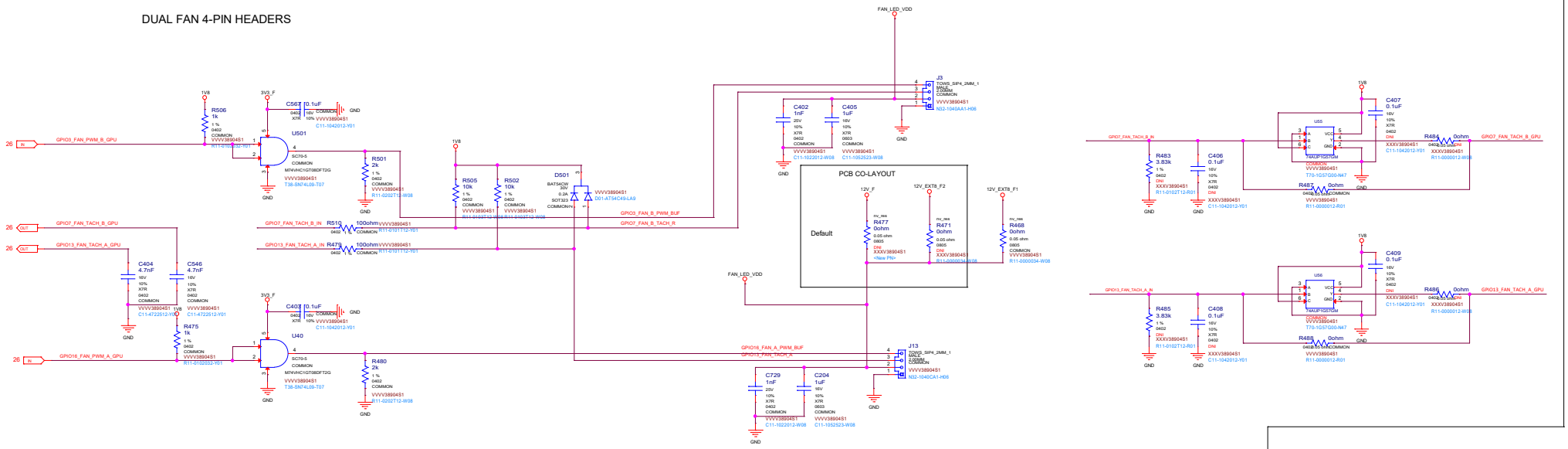


MICRO-STAR INT'L CO.,LTD			
MS-V389			
Size: Custom	Document Description: SEQUENCE:MISC		Rev: 2.1
Date: Wednesday, July 29, 2020		Sheet 74 of 79	

MISC: LED & FAN

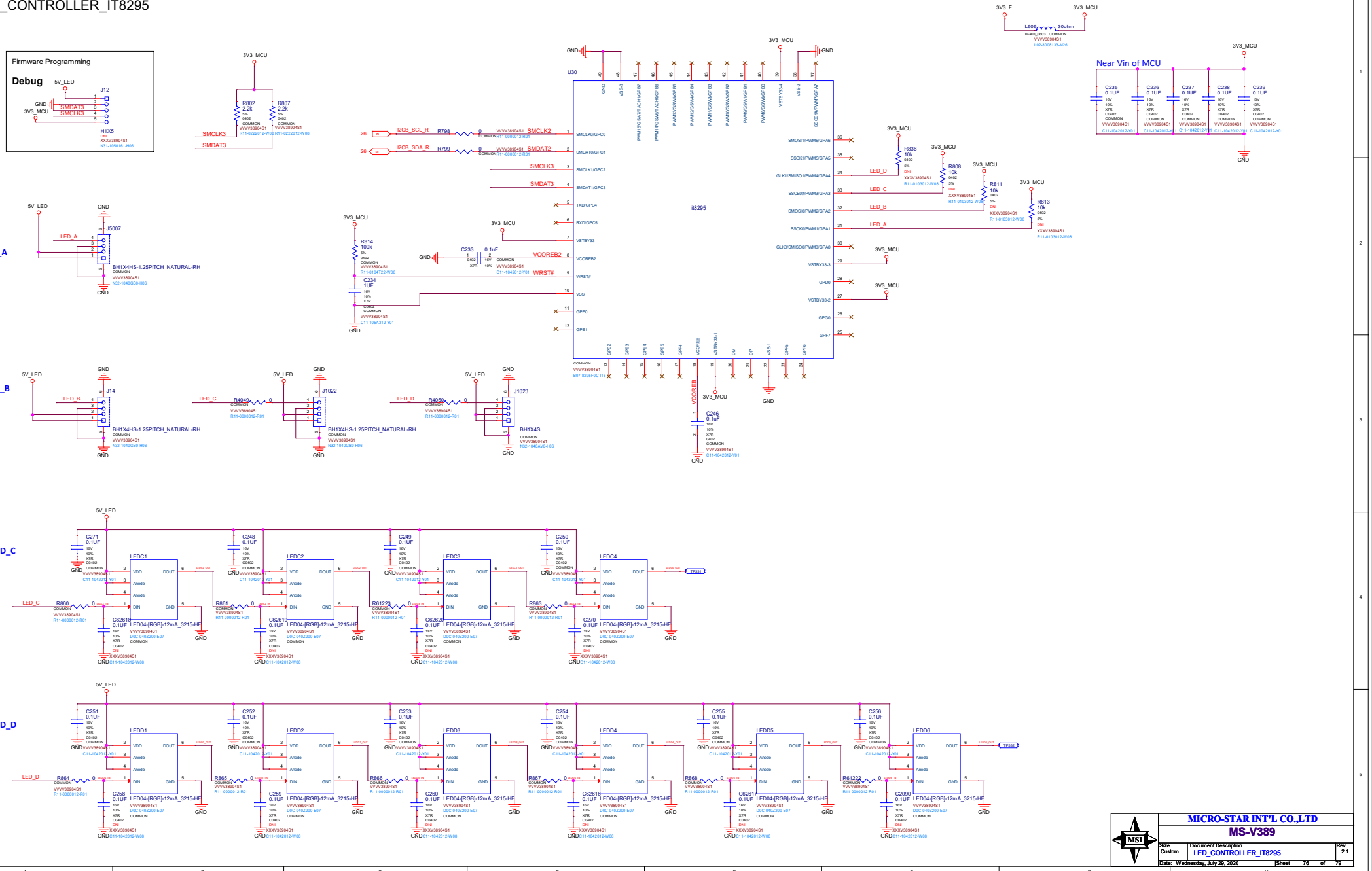
Remove 2-PIN LED HEADER

DUAL FAN 4-PIN HEADERS



MICRO-STAR INT'L CO.,LTD	
MS-V389	
Size: Custom	Document Description: MISC: LED & FAN
Rev: 2.1	
Date: Wednesday, July 29, 2020	Sheet 75 of 79

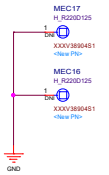
LED_CONTROLLER_IT8295



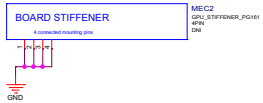
MICRO-STAR INT'L CO.,LTD	
MS-V389	
Size: Custom	Document Description: LED_CONTROLLER_IT8295
Rev: 2.1	
Date: Wednesday, July 29, 2020	Sheet 76 of 79

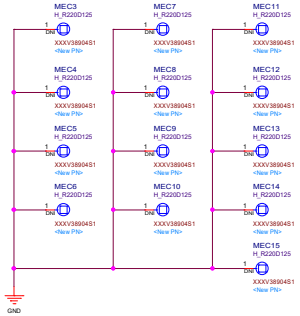
Mechanical: Mounting holes

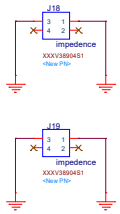
2 connected mounting pins for Bracket

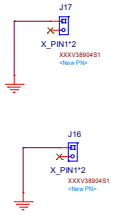


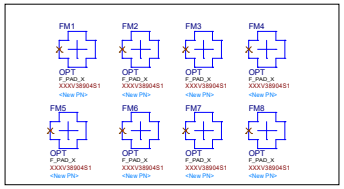
BACK STIFFENER:





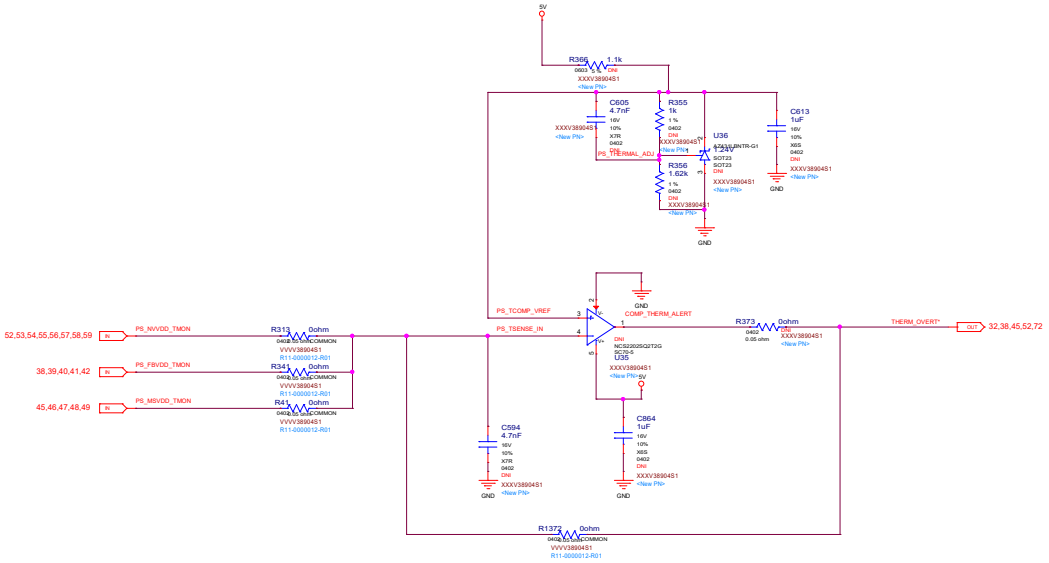






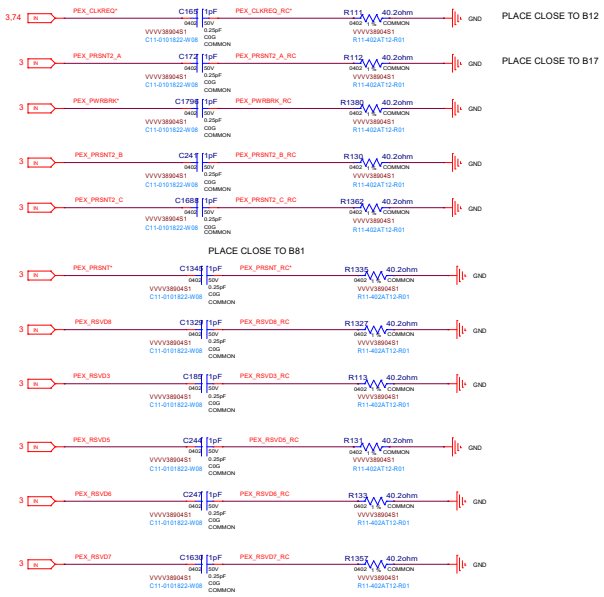
MSI	MICRO-STAR INT'L CO.,LTD	
	MS-V389	
Size: Custom	Document Description: Mechanical: Mounting holes	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 77 of 79	

VR THERMAL PROTECTION



MICRO-STAR INT'L CO.,LTD		
MS-V389		
Size: Custom	Document Description: VR THERMAL PROTECTION	Rev: 2.1
Date: Wednesday, July 29, 2020	Sheet 78 of 79	

PCI TERM



MICRO-STAR INT'L CO.,LTD	
MS-V389	
Size: Custom	Document Description: PCI TERM
Rev: 2.1	
Date: Wednesday, July 29, 2020	Sheet 79 of 79