PG410 A01

GP106 8GB/4GB GDDR5, 256b, 256Mx32/128MX32
Tall DVI-D + DP + DP + HDMI/DP + DP

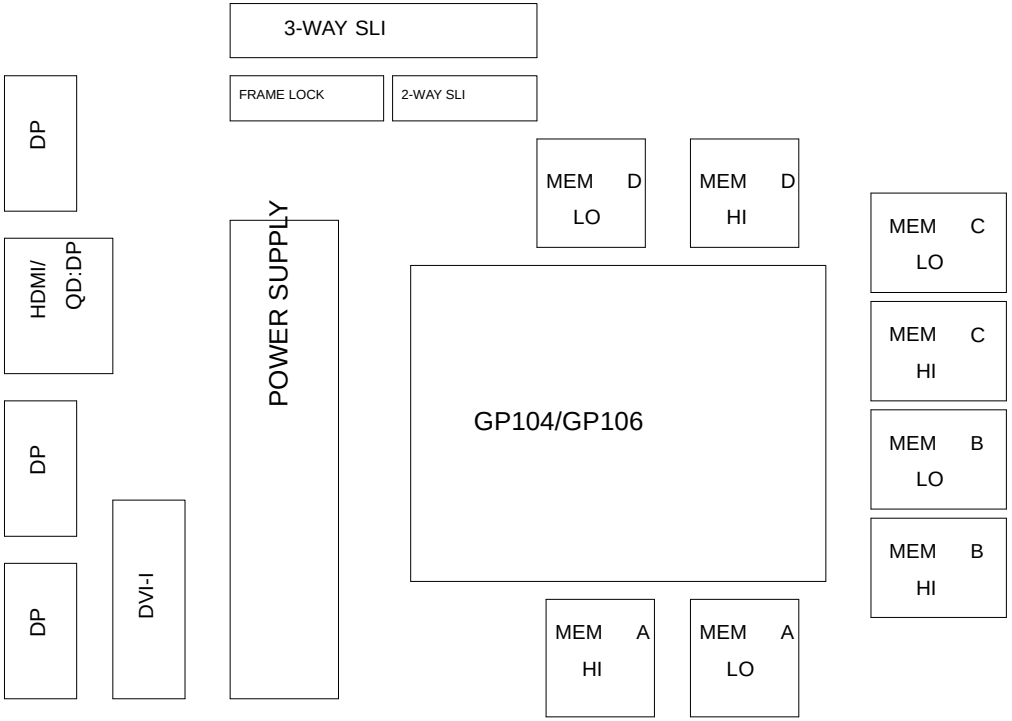
TABLE OF CONTENTS

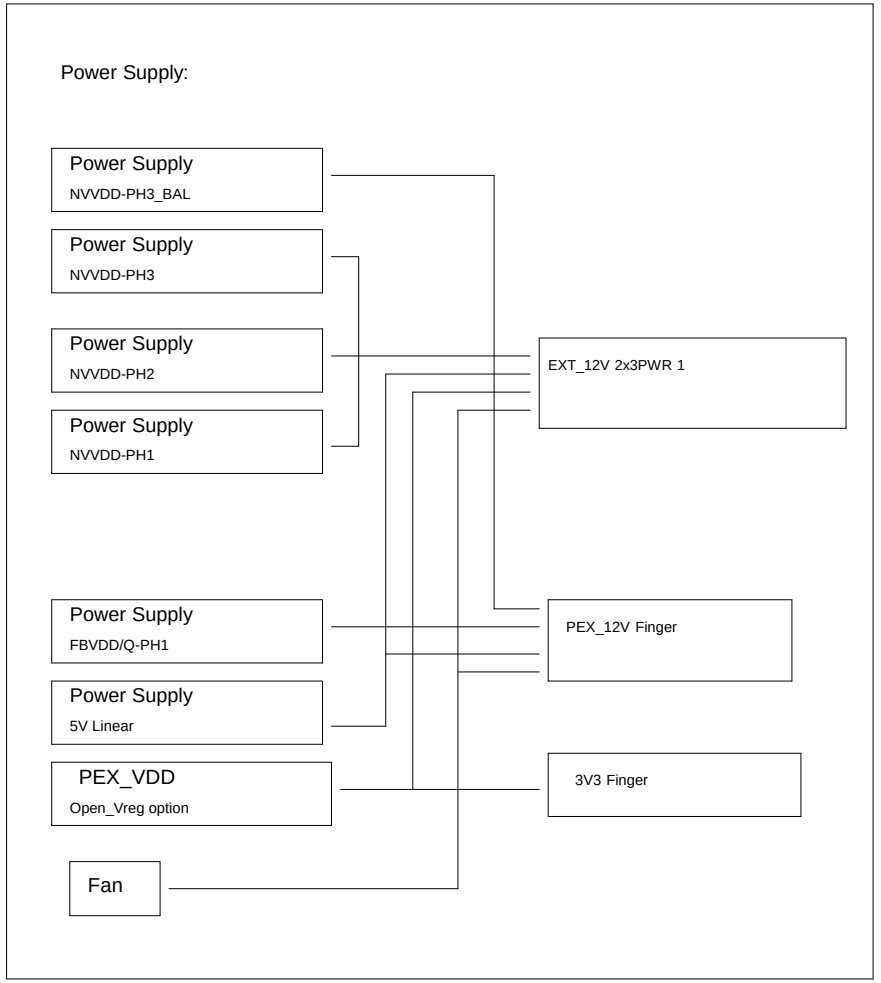
Page	Description
1	Table of Contents
2	Block Biagram
3	PCI Express
4	GPU FB_AB
5	MEMORY: FBA[31:0]
6	MEMORY: FBA[63:32]
7	MEMORY: FBB[31:0]
8	MEMORY: FBB[63:32]
9	MEM FB_AB PWR
10	GPU FB_CD
11	MEMORY: FBC[31:0]
12	MEMORY: FBC[63:32]
13	MEMORY: FBD[31:0]
14	MEMORY: FBD[63:32]
15	MEM FB_CD PWR
16	GPU PWR & GND
17	GPU Decoupling
18	IFPAB DVI-D-DL
19	IFPE DP
20	IFPF DP
21	IFPC HDMI/DP
22	IFPD DP
23	MIOA/B Interface and Frame Lock
24	MISC1: Fan, Thermal, JTAG, GPIO,STEREO
25	MISC2: ROM, XTAL,STRAPS
26	PS: 1V8_PLL, 1V8_AON
27	PS: 5V, PEX_VDD
28	PS: NV3V3, NV12V
29	PS: FBVDD
30	PS: NVVDD Controller
31	PS: NVVDD Phase 1,2 & 3
32	PS: NVVDD Rail Balance Login & Dynamic Phase
33	PS: Input, Filtering, and Monitoring
34	PS: 12V Power Steering,PSI Control & LED
35	PS: Shut Down and Sequencing
36	PS: GC6 MISC
37	MECH

6.1
1.修改 NVVDD_VREF 錯誤
2.修改 LED 錯誤
3.增加 COLAY 錯誤
4.修改 HDMI DP COLAY

MICRO-STAR INT'L CO.,LTD
MS-V328
Size: Custom | Document Description: 01 | Rev: 6.1
Date: Monday, July 18, 2016 | Sheet 1 of 37

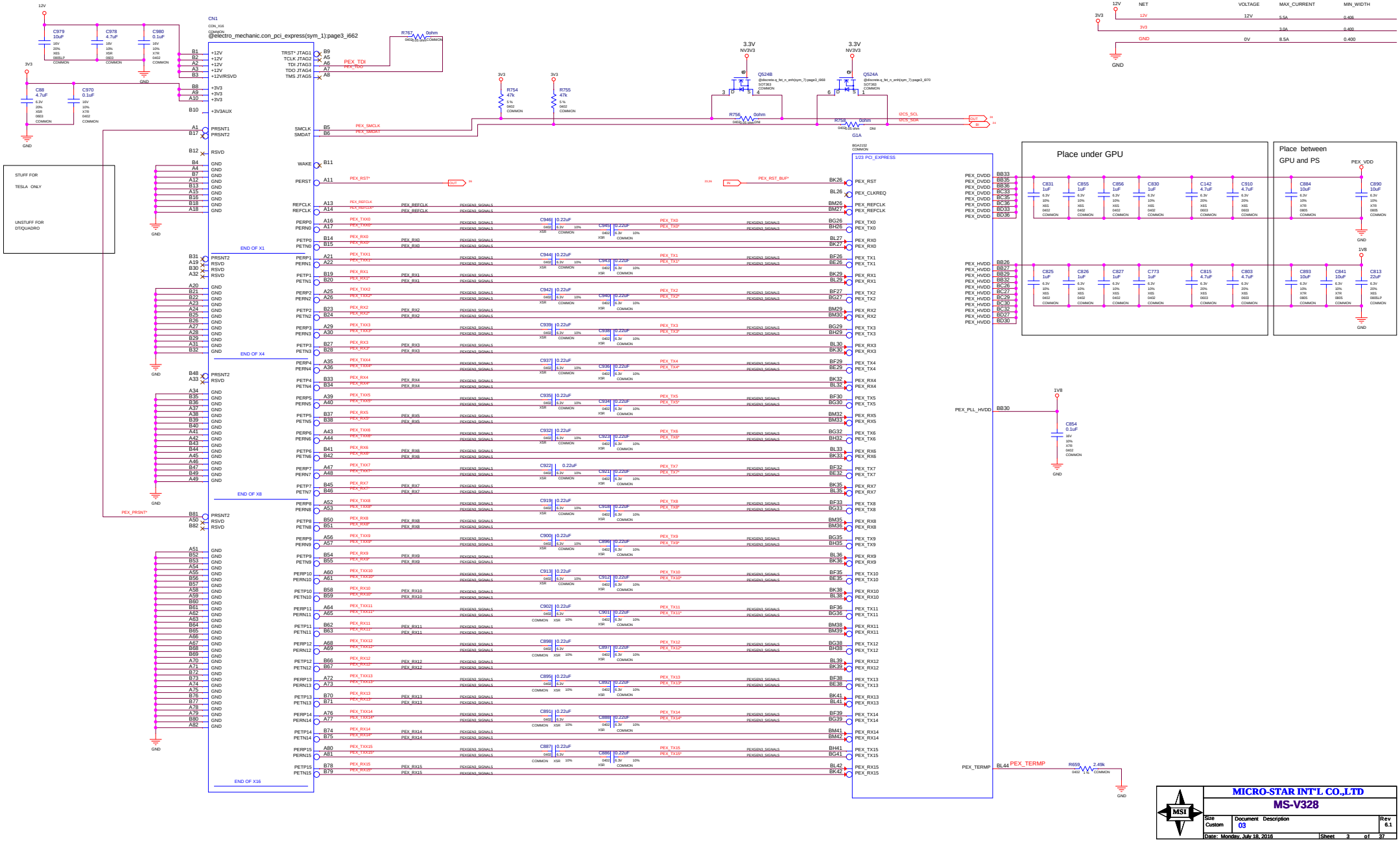
Page2: Block Diagram





MICRO-STAR INT'L CO.,LTD
MS-V328
Size: Custom | Document Description: 2 | Rev: 6.1
Date: Monday, July 18, 2016 | Sheet 2 of 37

Page3: PCI Express

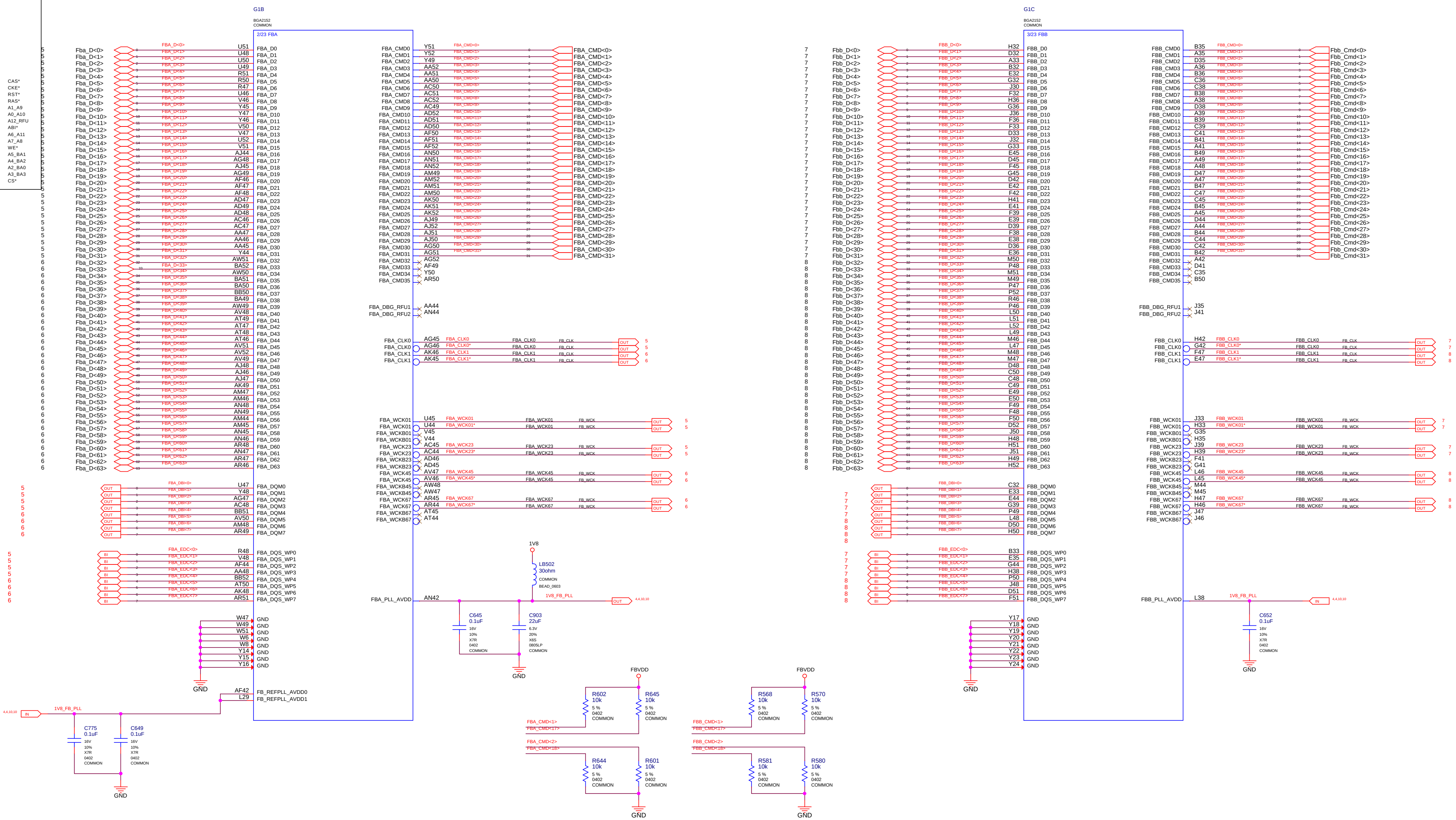


MICRO-STAR INT'L CO.,LTD			
MS-V328			
Size: Custom	Document Description: 03		Rev: 6.1
Date: Monday, July 18, 2016	Sheet 3 of 37		

Page4: MEMORY: GPU Partition A/B

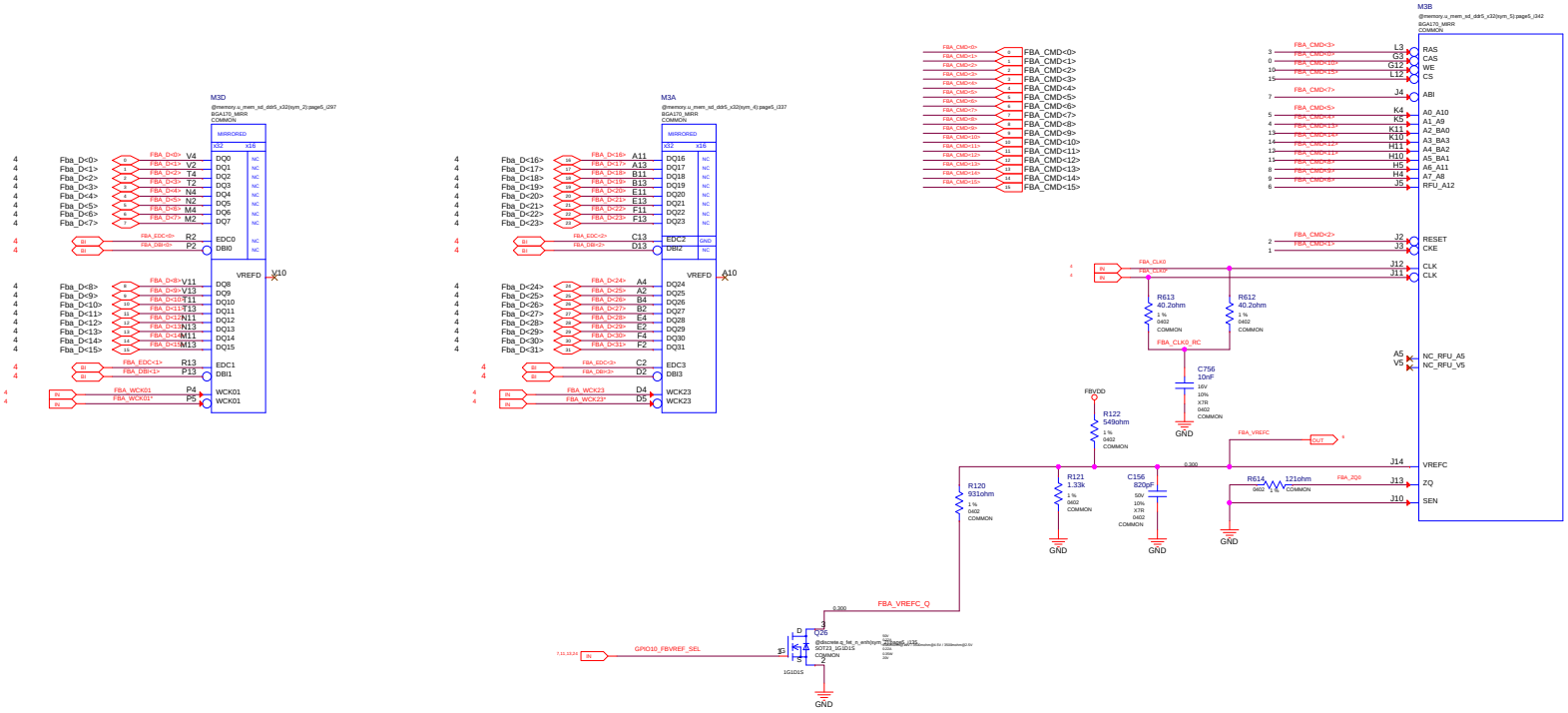
GDDR5 CMD Mapping

CMD	0..31	32..63
CMD0	CAS*	
CMD1	CKE*	
CMD2	RST*	
CMD3	RAS*	
CMD4	A1_A9	
CMD5	A0_A10	
CMD6	A12_RFU	
CMD7	ABI*	
CMD8	A6_A11	
CMD9	A7_A8	
CMD10	WE*	
CMD11	A5_BA1	
CMD12	A4_BA2	
CMD13	A2_BA0	
CMD14	A3_BA3	
CMD15	CS*	
CMD16		CAS*
CMD17		CKE*
CMD18		RST*
CMD19		RAS*
CMD20		A1_A9
CMD21		A0_A10
CMD22		A12_RFU
CMD23		ABI*
CMD24		A6_A11
CMD25		A7_A8
CMD26		WE*
CMD27		A5_BA1
CMD28		A4_BA2
CMD29		A2_BA0
CMD30		A3_BA3
CMD31		CS*



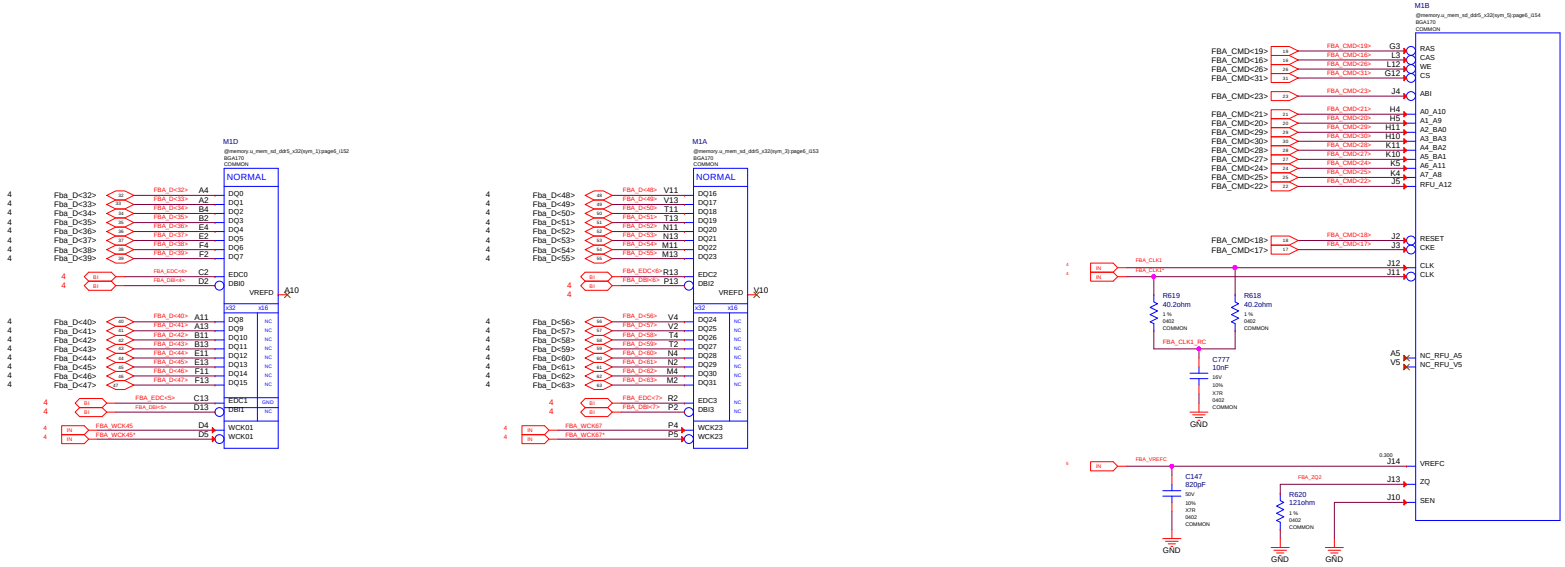
MICRO-STAR INT'L CO.,LTD		
MS-V328		
Size: Custom	Document Description: 04	Rev 6.1
Date: Monday, July 18, 2016	Sheet 4 of 37	

Page5: FRAME BUFFER PARTITION A [31:0]



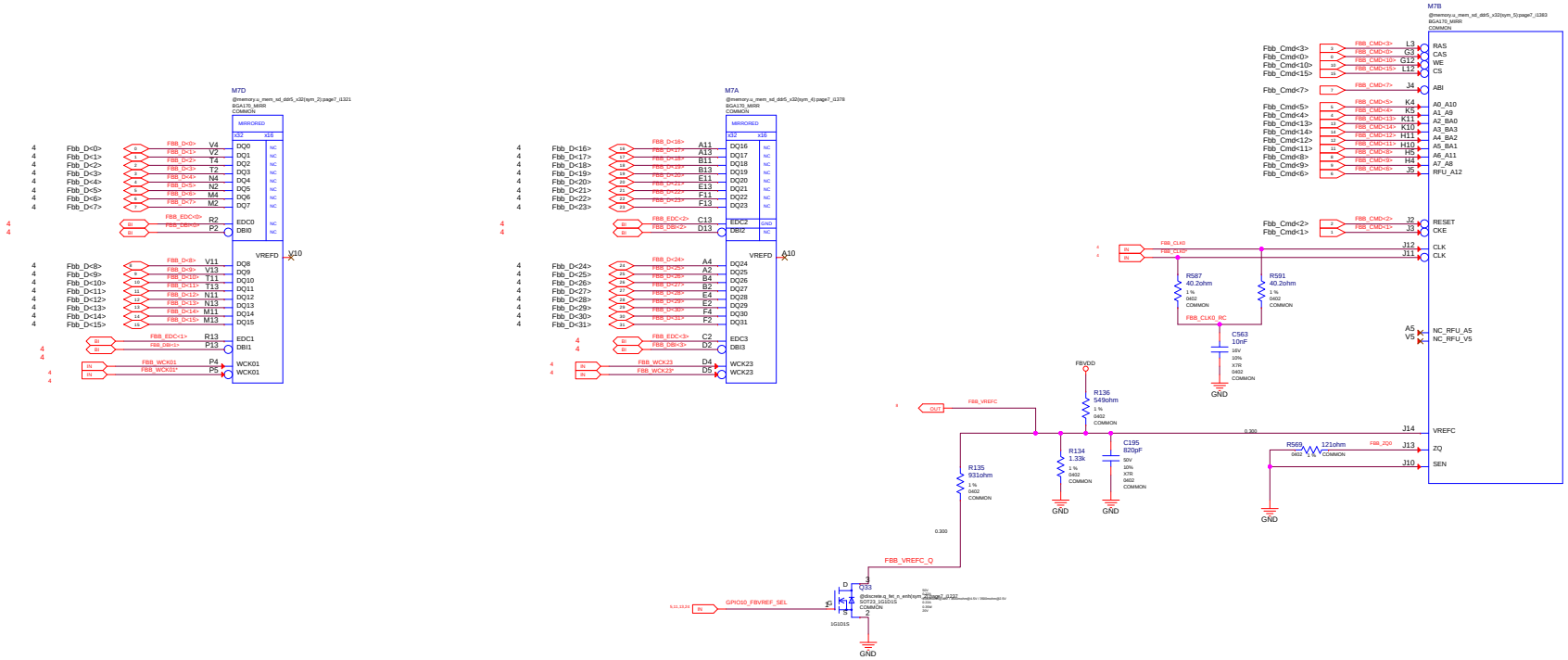
MICRO-STAR INT'L CO.,LTD		
MS-V328		
Size: Custom	Document Description: 05	Rev: 6.1
Date: Monday, July 18, 2016	Sheet 05 of 37	

Page6: FRAME BUFFER PARTITION A [63:32]

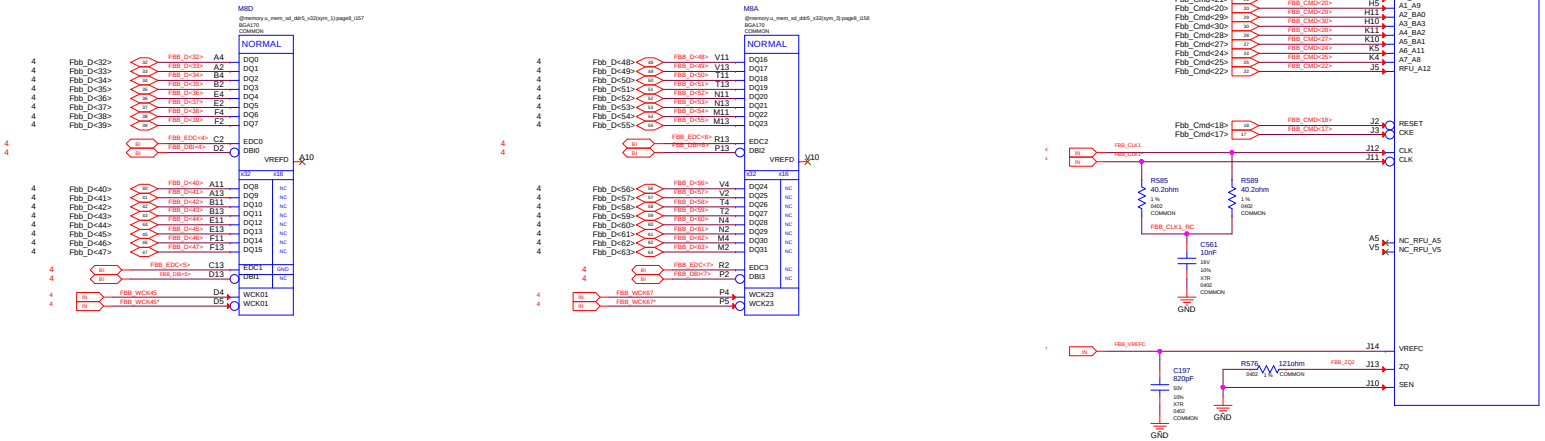


MICRO-STAR INT'L CO.,LTD		
MS-V328		
Size: Custom	Document Description: 06	Rev: 6.1
Date: Monday, July 18, 2016	Sheet 6 of 37	

Page7: FRAME BUFFER PARTITION B [31:0]



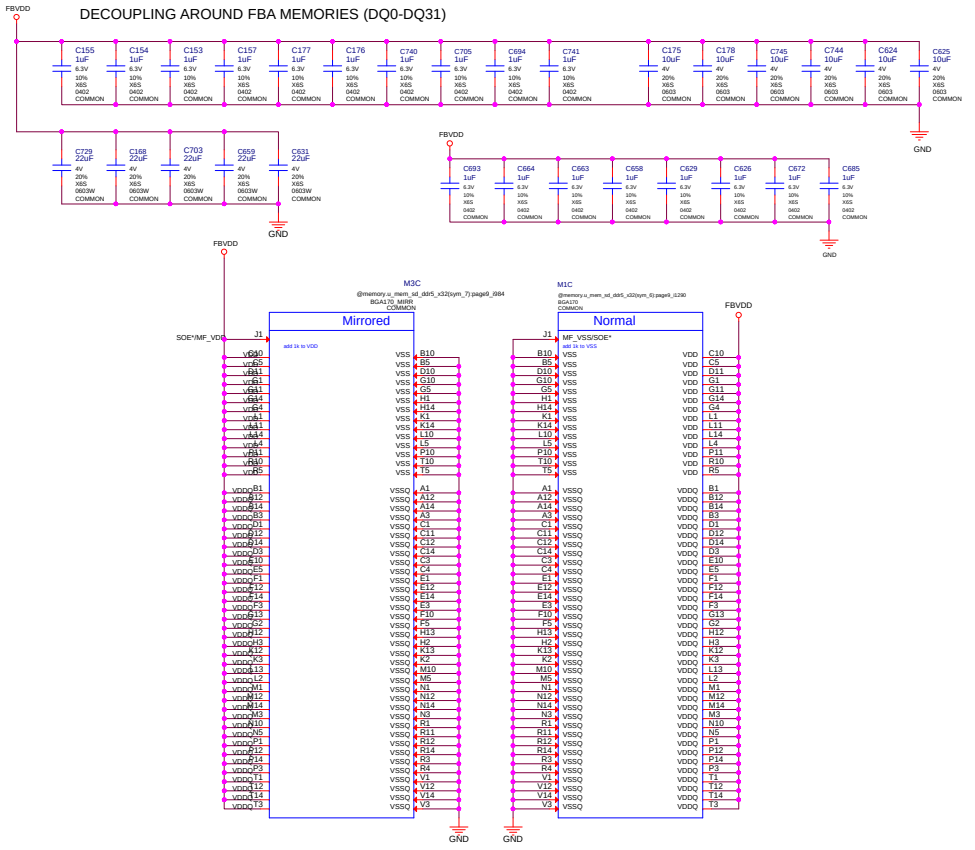
Page8: FRAME BUFFER PARTITION B [63:32]



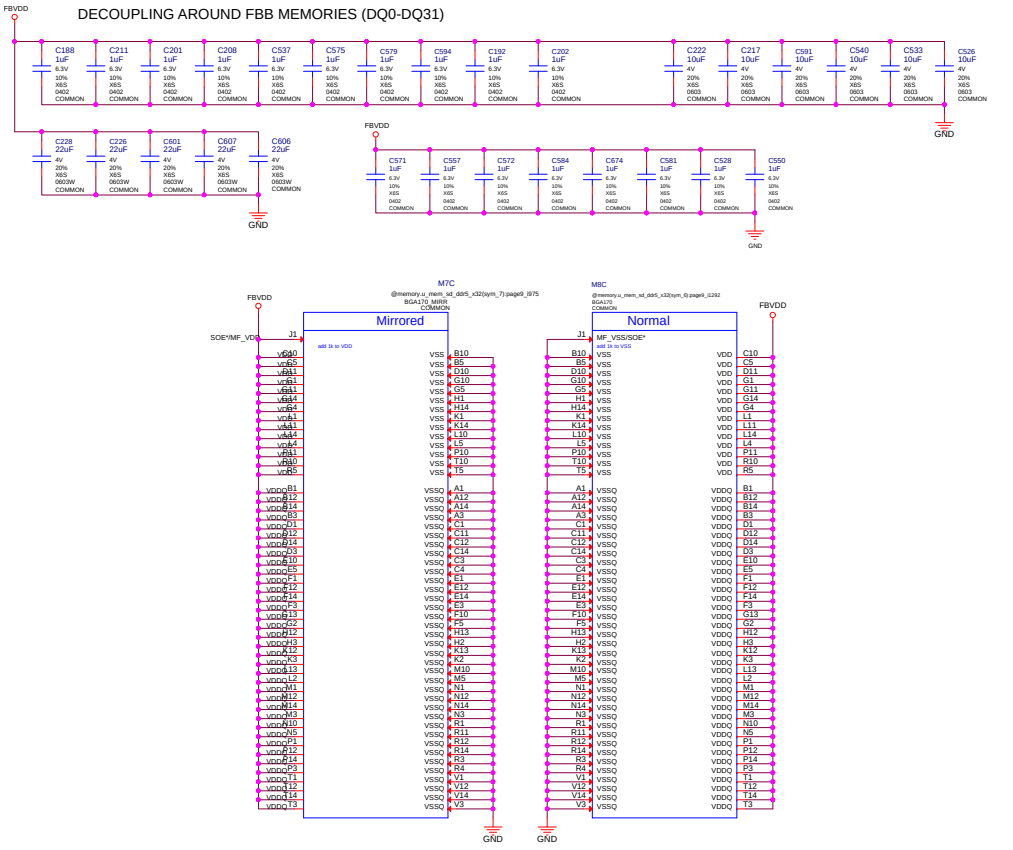
MSI	MICRO-STAR INT'L CO.,LTD	
	MS-V328	
Size: Custom	Document Description: 08	Rev: 6.1
Date: Monday, July 18, 2016	Sheet 8 of 37	

Page9: FRAME BUFFER PARTITION A/B DECOUPLING

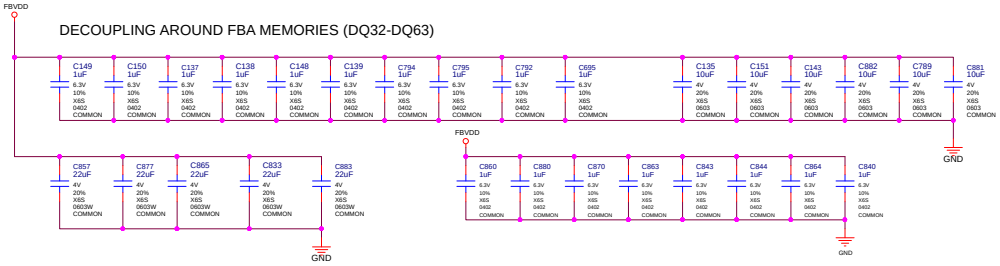
DECOUPLING AROUND FBA MEMORIES (DQ0-DQ31)



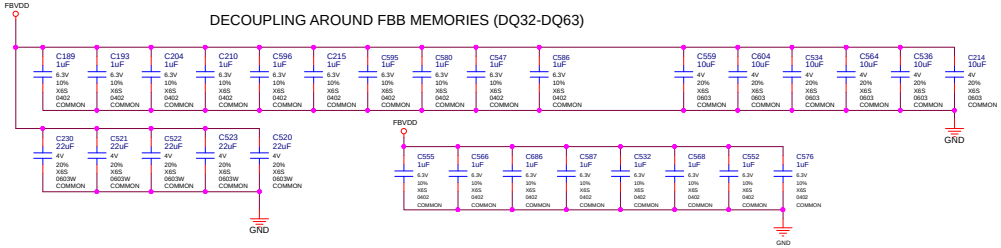
DECOUPLING AROUND FBB MEMORIES (DQ0-DQ31)



DECOUPLING AROUND FBA MEMORIES (DQ32-DQ63)



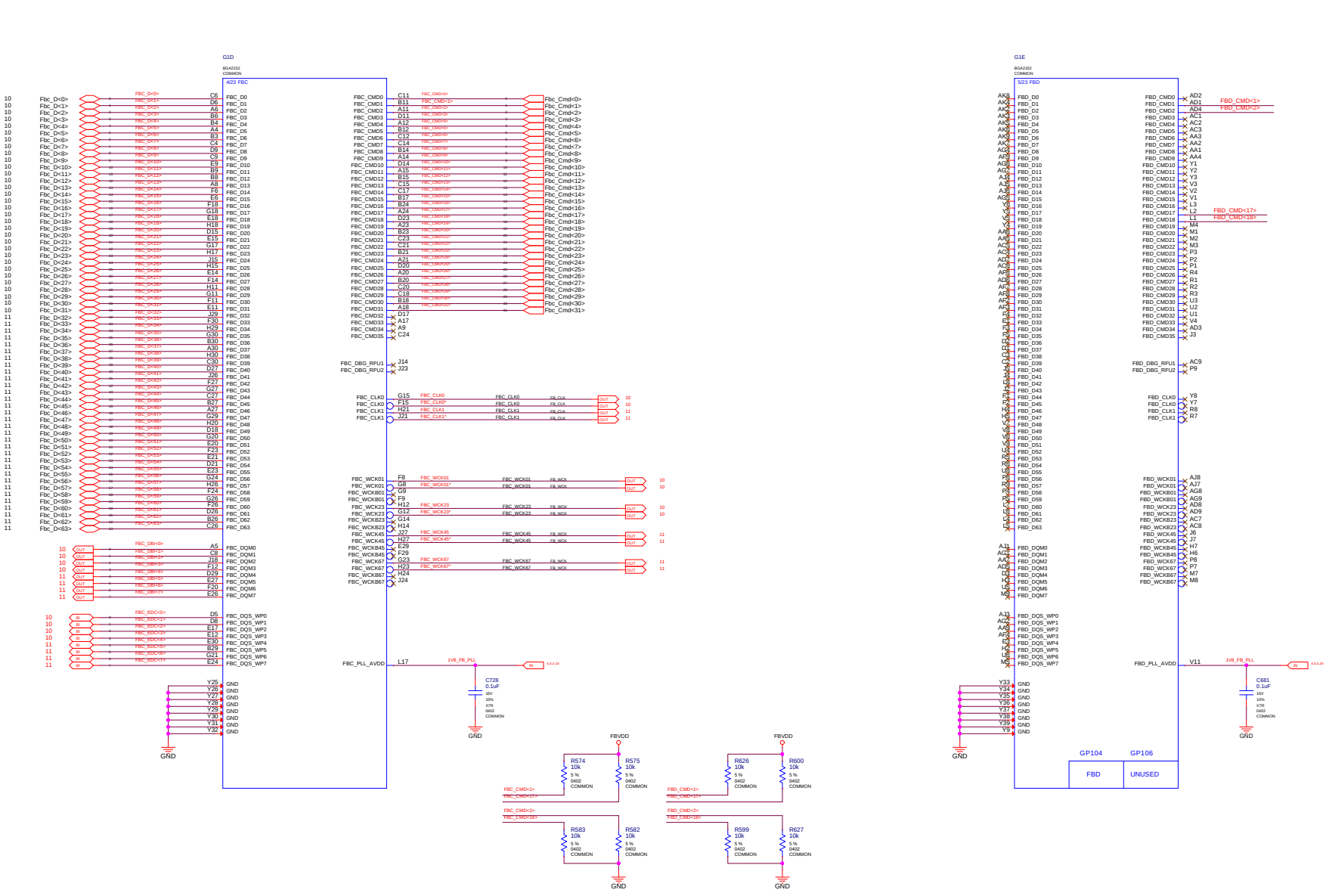
DECOUPLING AROUND FBB MEMORIES (DQ32-DQ63)



MSI	MICRO-STAR INT'L CO.,LTD	
	MS-V328	
Size: Custom	Document Description: 09	Rev: 6.1
Date: Monday, July 18, 2016	Sheet 09 of 37	

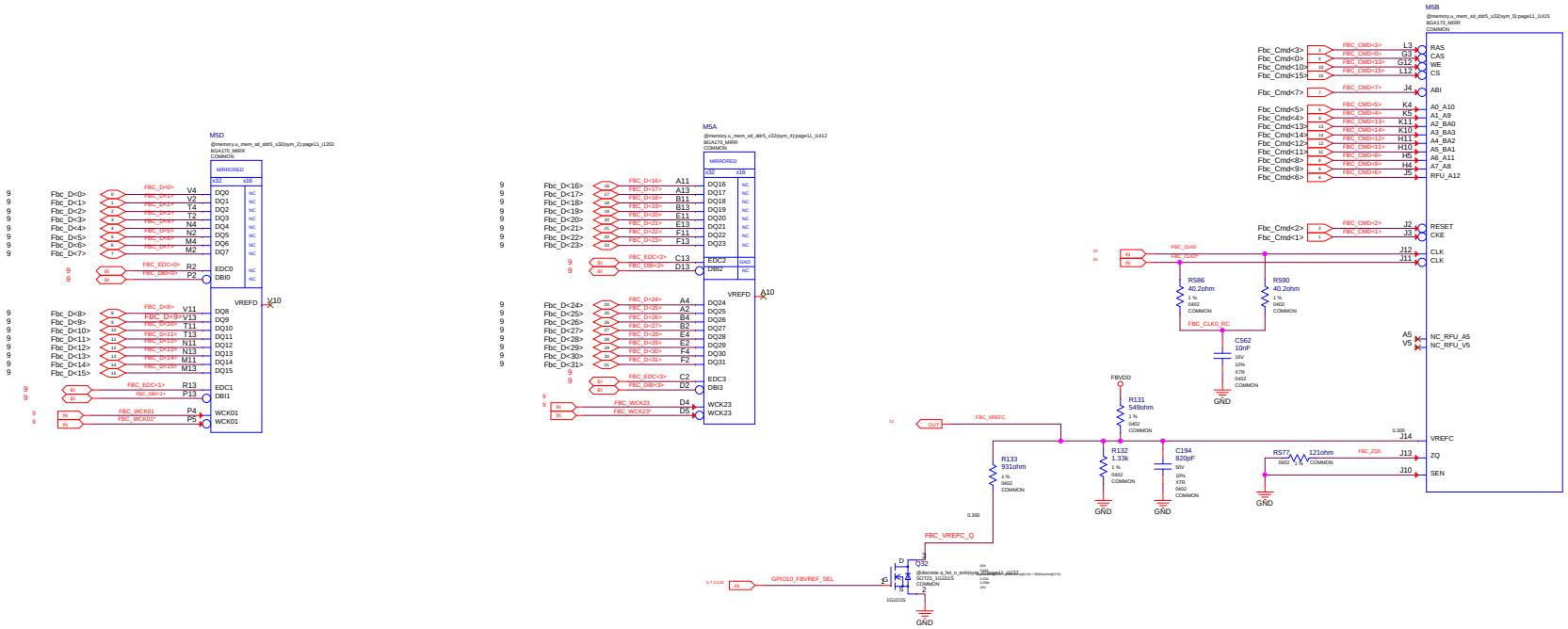
Page10: MEMORY: GPU Partition C/D

GDDR5 CMD Mapping		
CMD	0_31	32_63
CMD0	CAS*	
CMD1	CKE*	
CMD2	RST*	
CMD3	RAS*	
CMD4	A1_A9	
CMD5	A0_A10	
CMD6	A12_RFU	
CMD7	ABI*	
CMD8	A6_A11	
CMD9	A7_A8	
CMD10	WE*	
CMD11	A5_BA1	
CMD12	A4_BA2	
CMD13	A2_BA0	
CMD14	A3_BA3	
CMD15	CS*	
CMD16		CAS*
CMD17		CKE*
CMD18		RST*
CMD19		RAS*
CMD20		A1_A9
CMD21		A0_A10
CMD22		A12_RFU
CMD23		ABI*
CMD24		A6_A11
CMD25		A7_A8
CMD26		WE*
CMD27		A5_BA1
CMD28		A4_BA2
CMD29		A2_BA0
CMD30		A3_BA3
CMD31		CS*



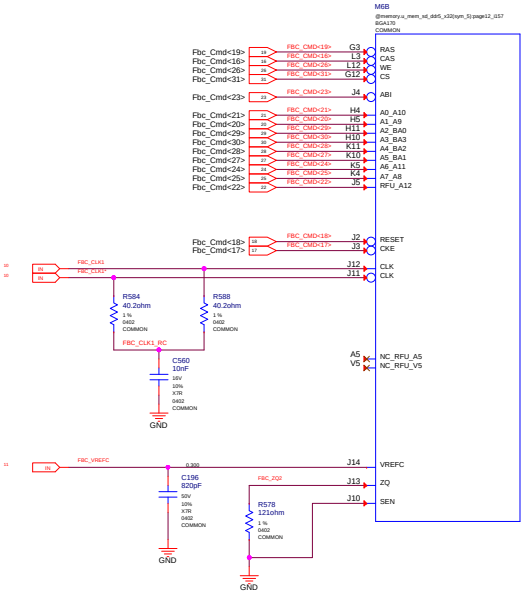
MSI	MICRO-STAR INT'L CO.,LTD	
	MS-V328	
Size: Custom	Document Description: 10	Rev: 6.1
Date: Monday, July 18, 2016	Sheet 10 of 37	

Page11: Frame Buffer Partition C [31:0]



MICRO-STAR INT'L CO.,LTD	
MS-V328	
Size: Custom	Document Description: 11
Rev: 6.0	
Date: Monday, July 18, 2016	Sheet 11 of 37

Page12: FRAME BUFFER PARTITION C [63:32]



MICRO-STAR INT'L CO.,LTD

MS-V328

Size	Document Description	Rev
Custom	12	6.0

Date: Monday, July 18, 2016 Sheet 12 of 37

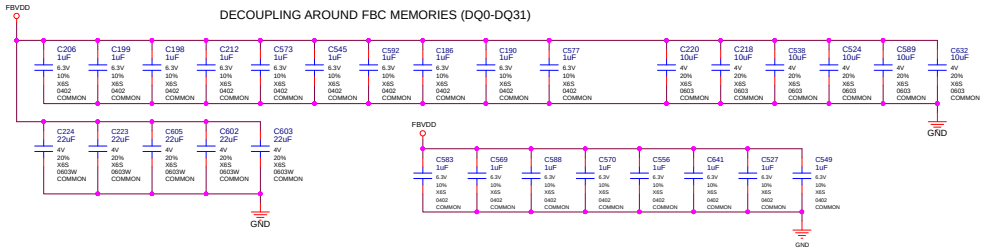
Page13: FRAME BUFFER PARTITION D[31:0]

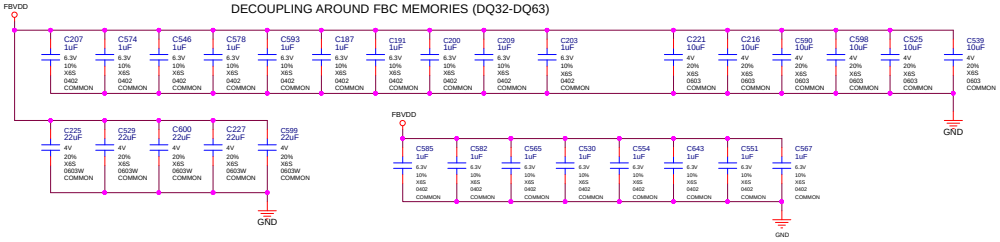
MICRO-STAR INT'L CO.,LTD	
MS-V328	
Size: Custom	Document Description: 13 — Rev: 6.0
Date: Monday, July 18, 2016	Sheet 13 of 37

Page14: FRAME BUFFER PARTITION D[63:32]

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-V328	
Size: Custom	Document Description: 14	Rev: 6.0
Date: Monday, July 18, 2016	Sheet 14 of 37	

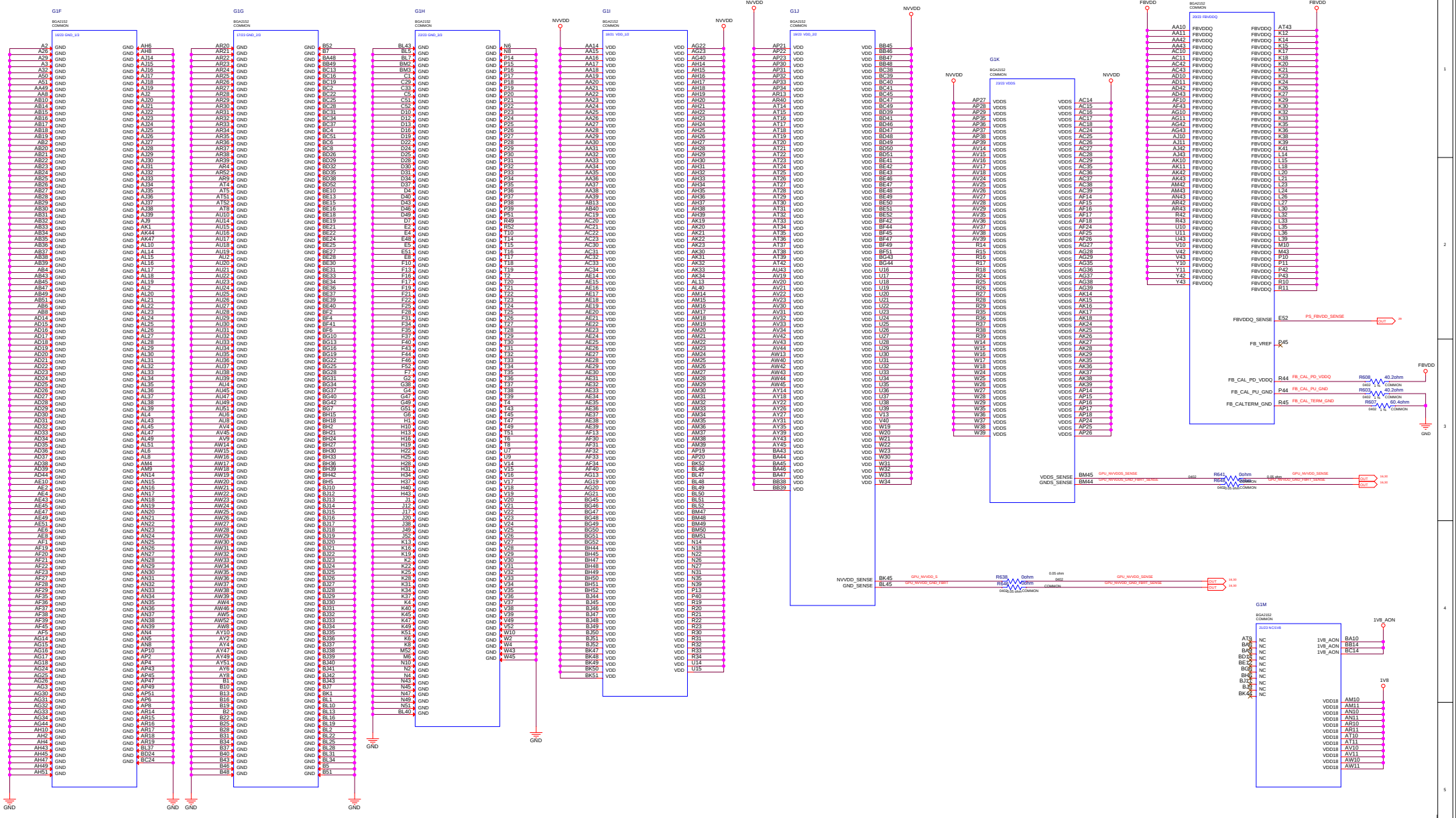
Page15: FRAME BUFFER PARTITION C/D DECOUPLING





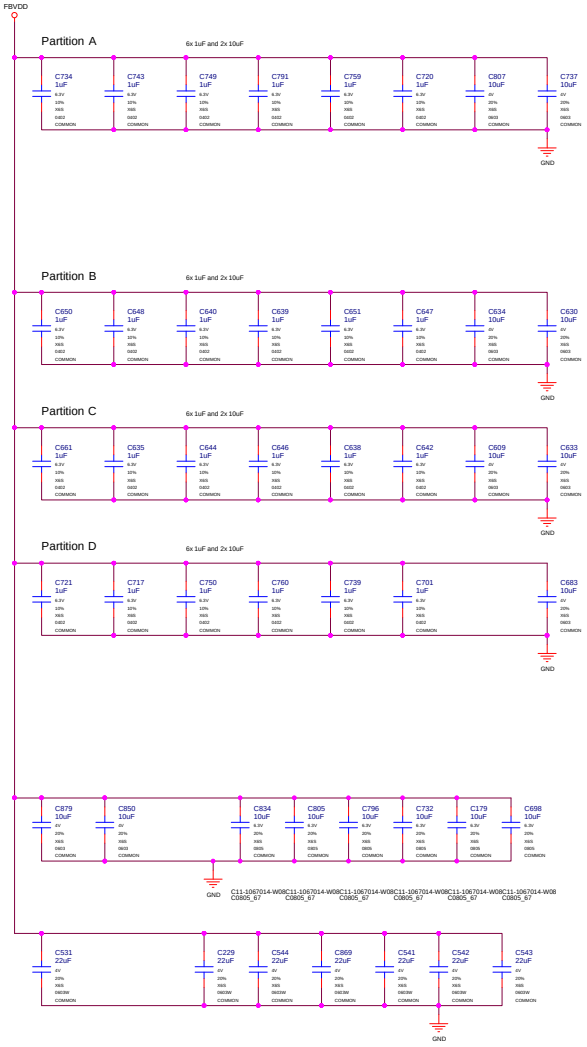
MICRO-STAR INT'L CO.,LTD		
MS-V328		
Size: Custom	Document Description: 15	Rev: 6.0
Date: Monday, July 18, 2016	Sheet 15 of 37	

Page16: GPU PWR and GND

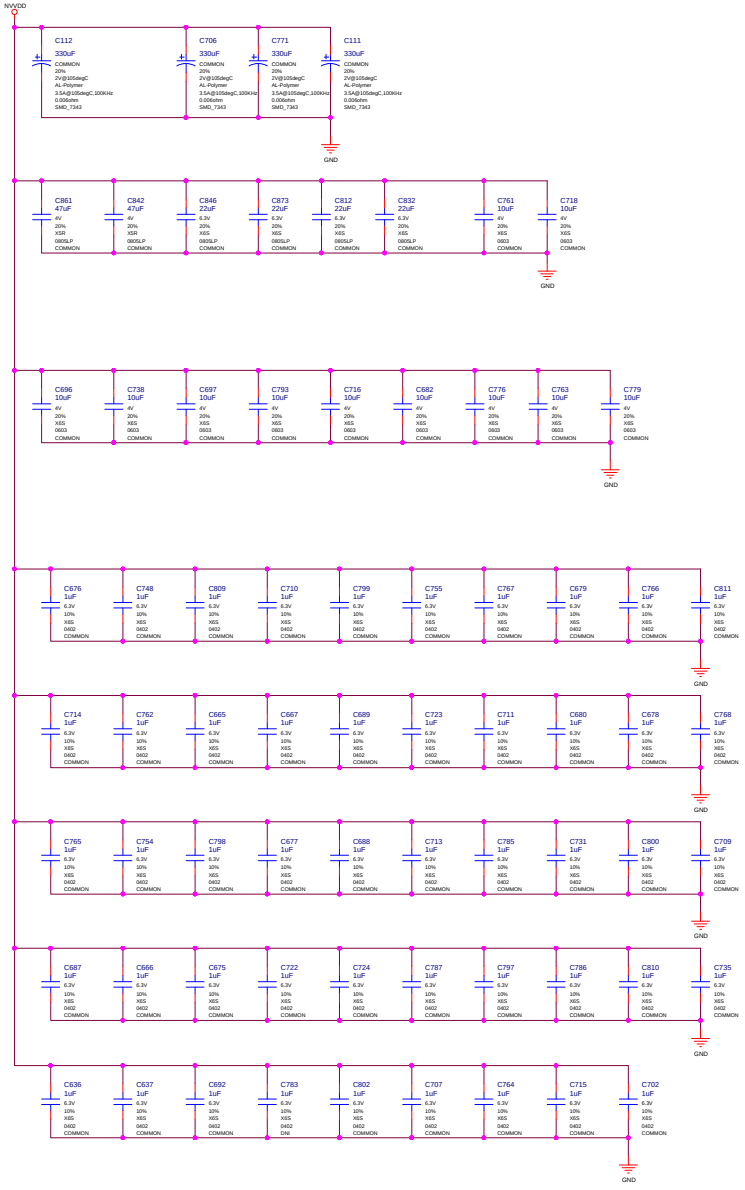


Page17: GPU Decoupling

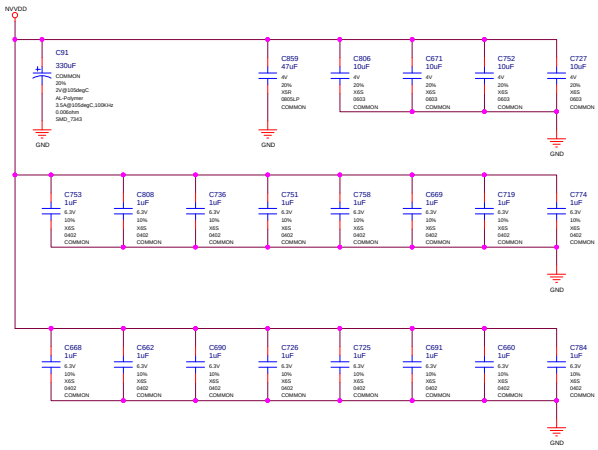
FBVDD



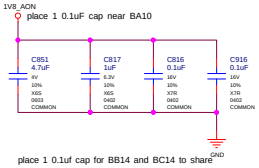
NVVDD



NVVDD

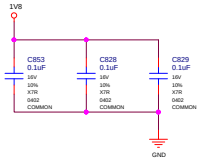


1V8_AON



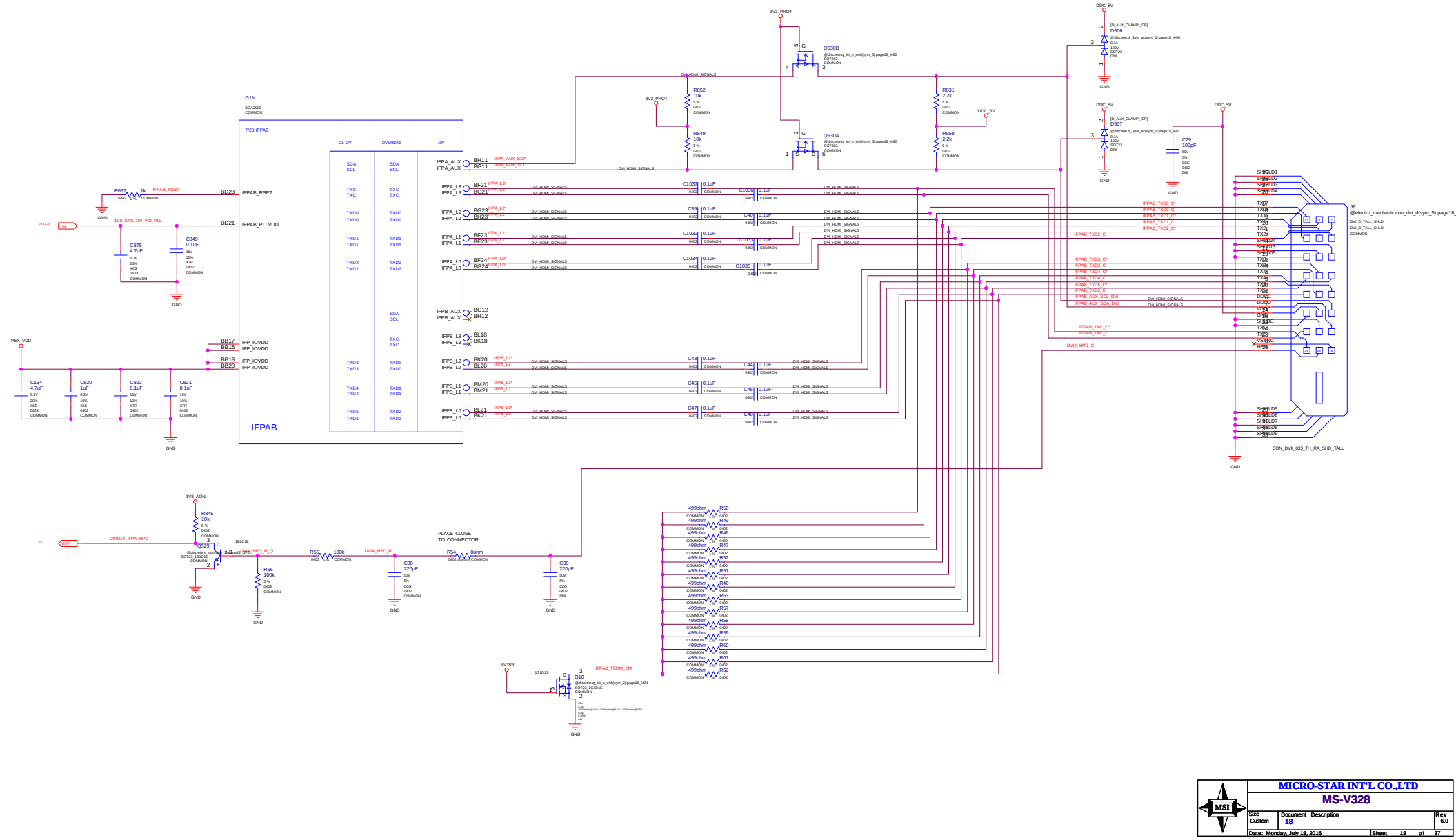
place 1 0.1uf cap for BB14 and BC14 to share

1V8_MAIN

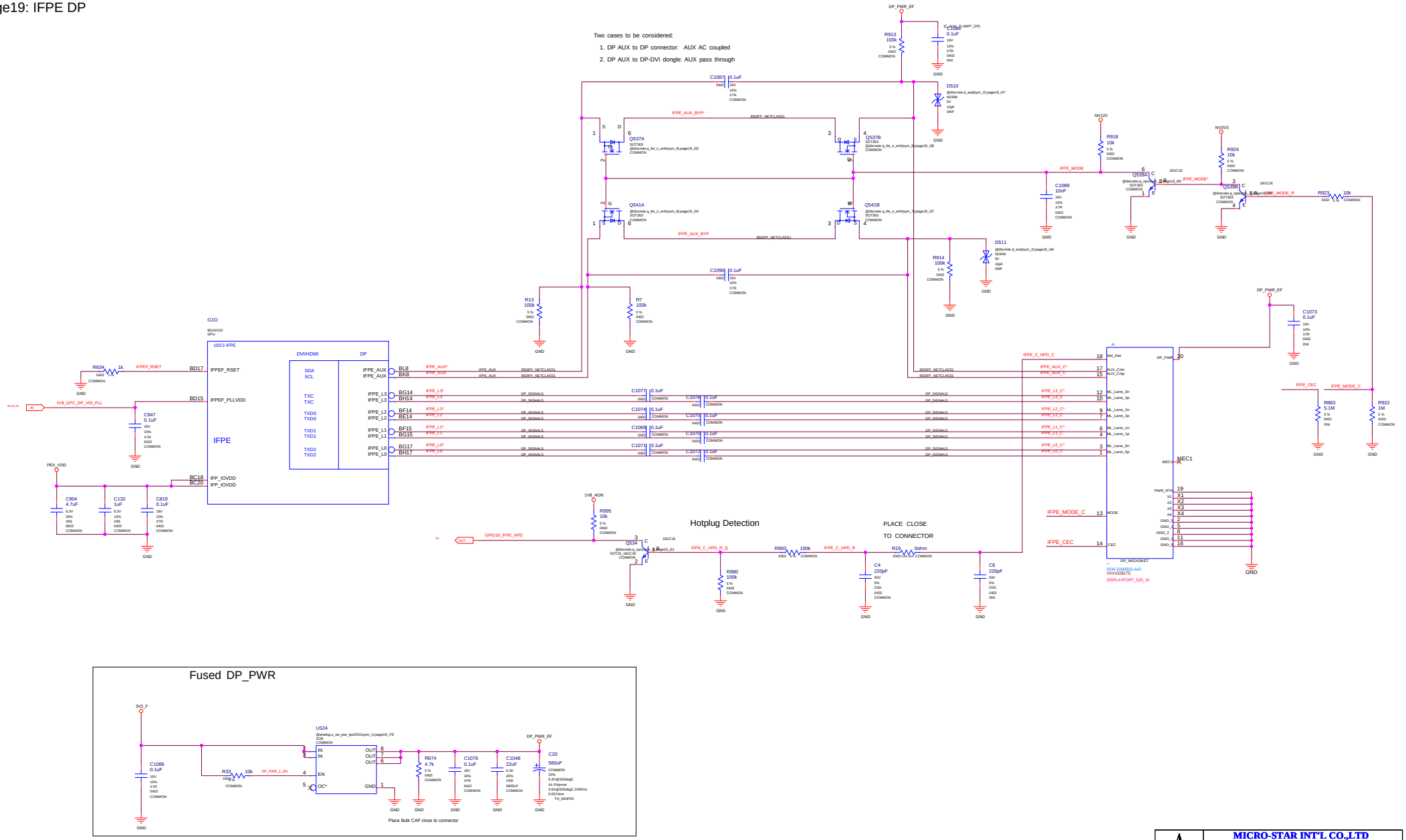


MICRO-STAR INT'L CO.,LTD		
MS-V328		
Size: Custom	Document Description: 17	Rev: 6.0
Date: Monday, July 18, 2016	Sheet 17 of 37	

Page18: IFPAB DVI-D-DL

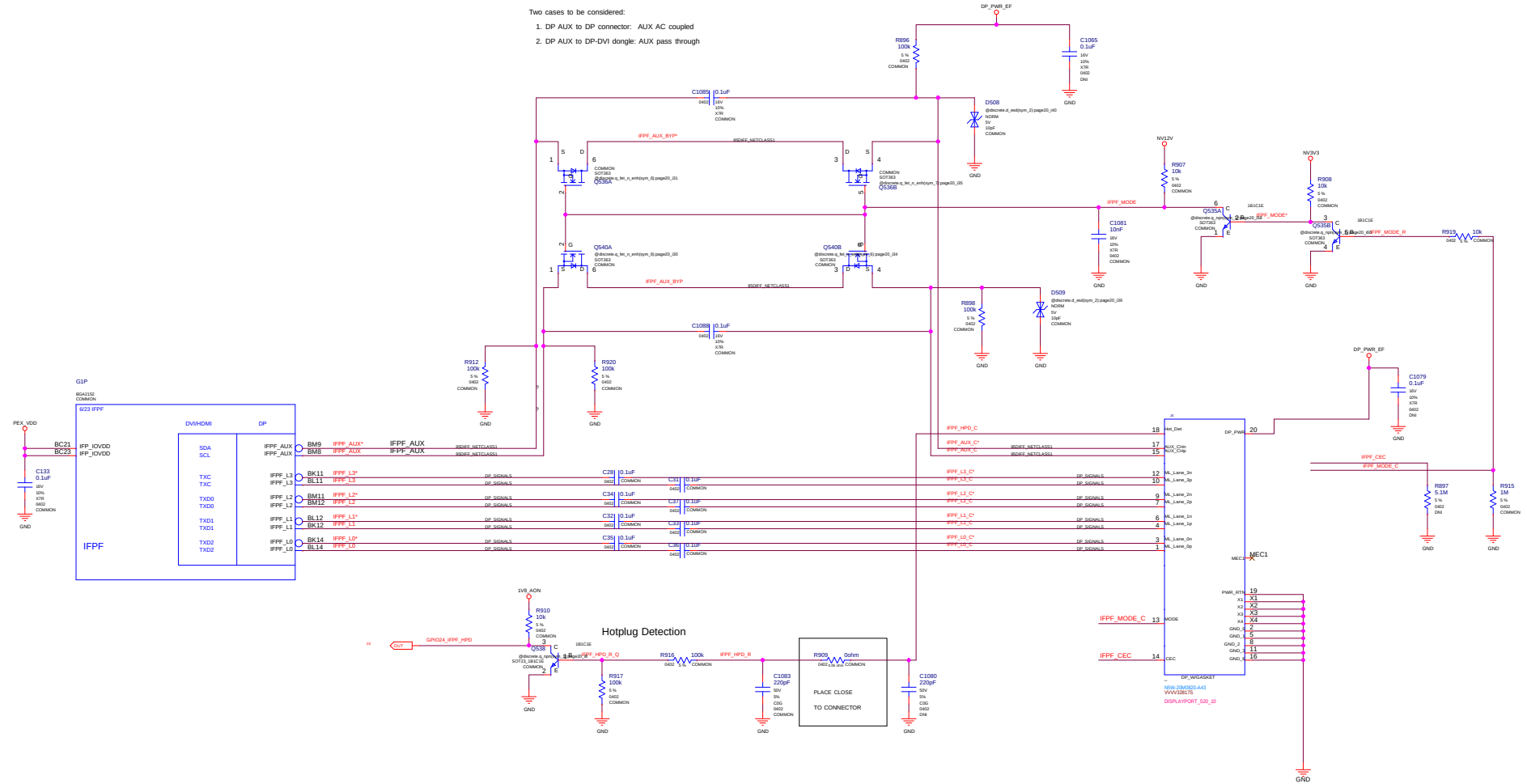


Page19: IFPE DP



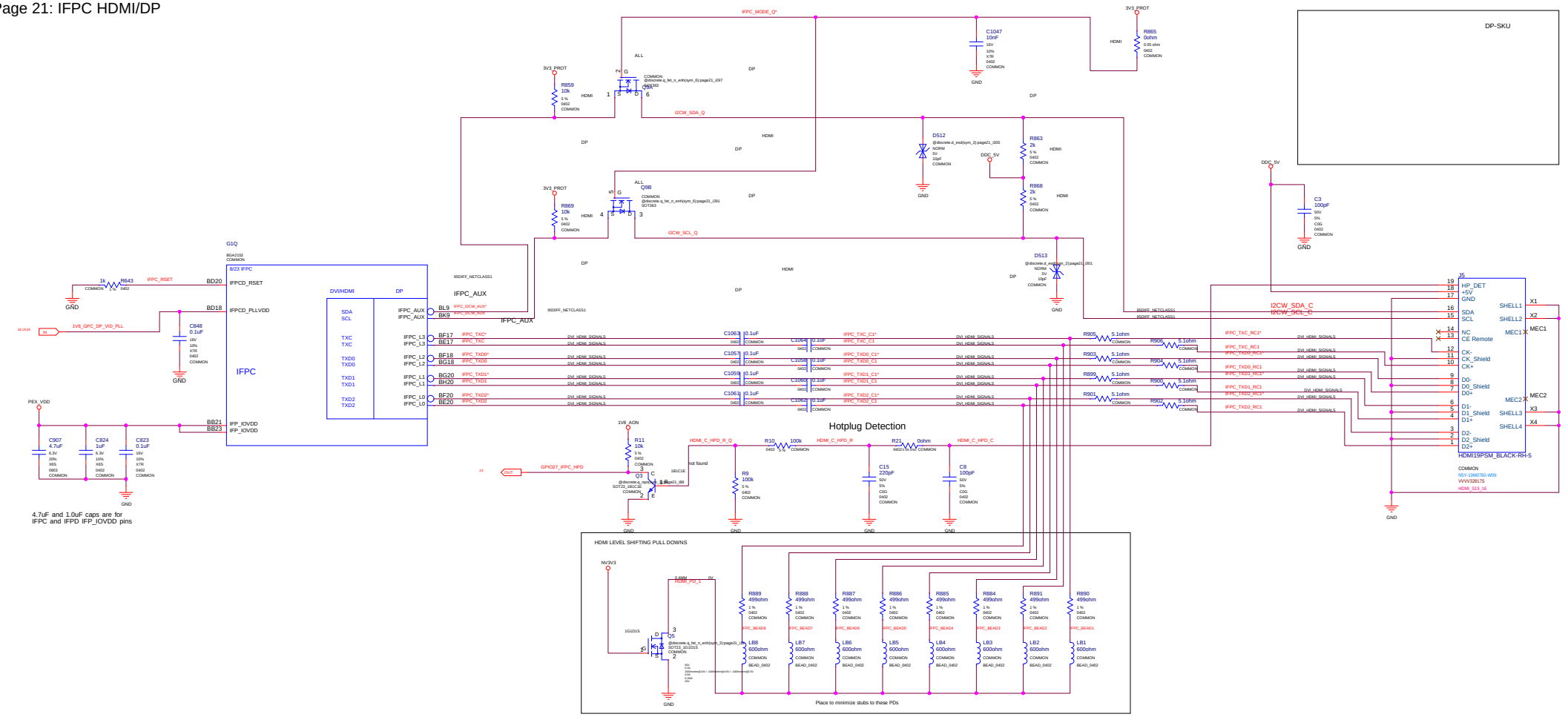
MICRO-STAR INT'L CO.,LTD	
MS-V328	
Size: Custom	Document Description: 19
Rev: 6.0	
Date: Monday, July 18, 2016	Sheet 19 of 37

Page 20: IFPF DP

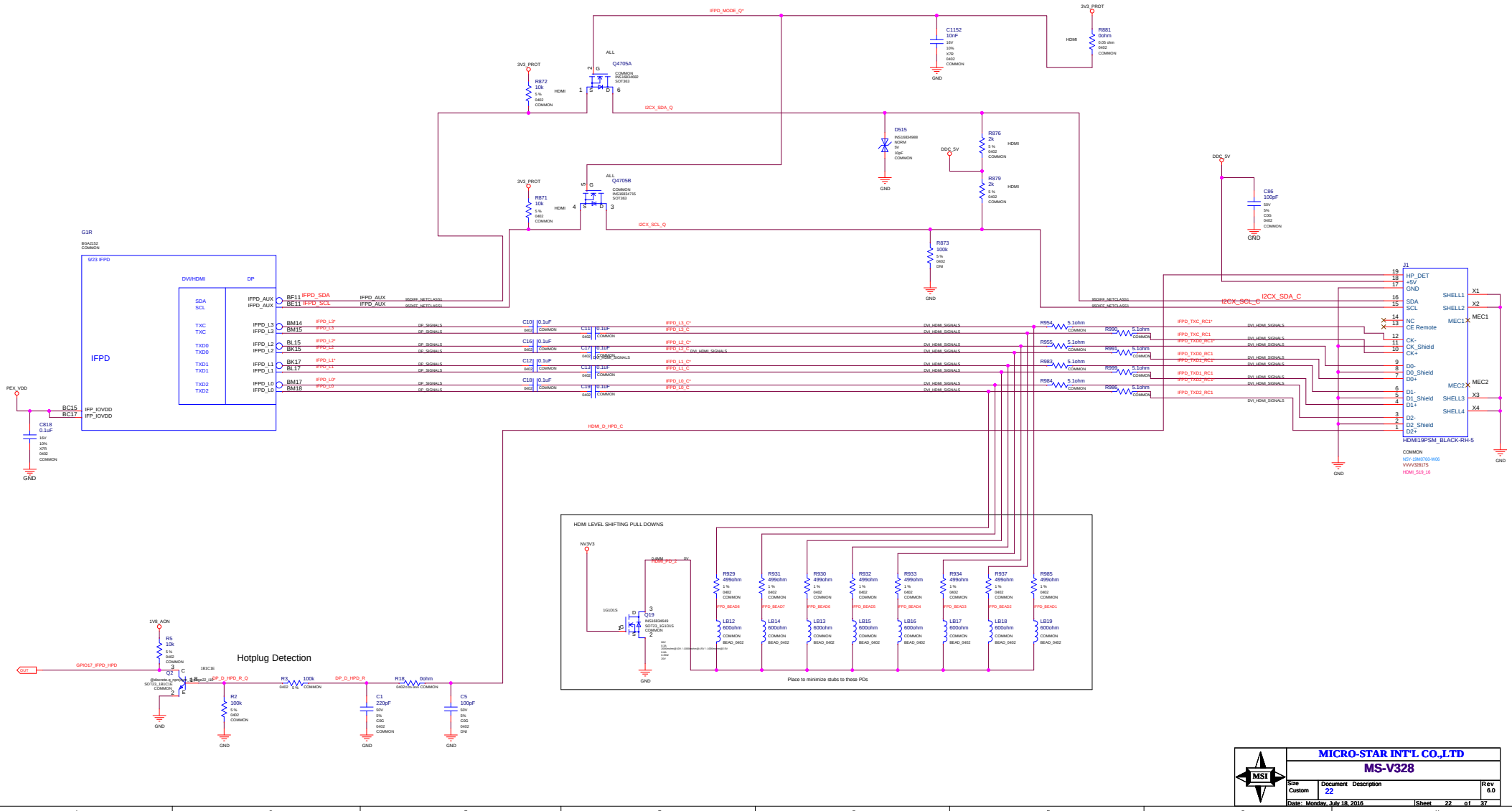


MICRO-STAR INT'L CO.,LTD			
MS-V328			
Size: Custom	Document Description: 20		Rev: 6.0
Date: Monday, July 18, 2016	Sheet 20 of 37		

Page 21: IFPC HDMI/DP

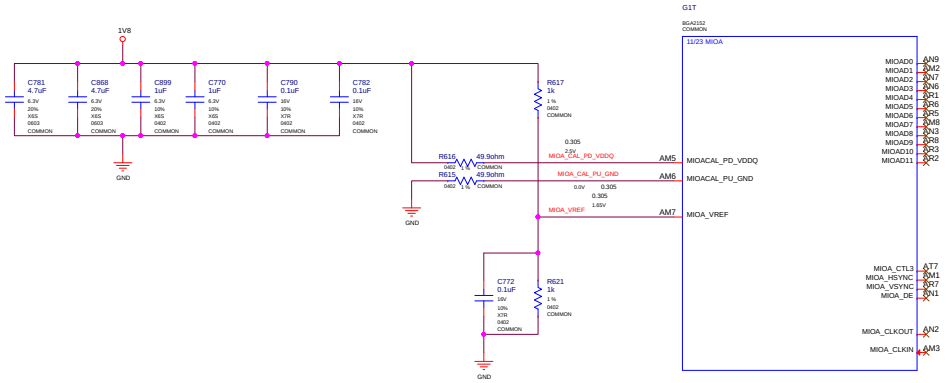


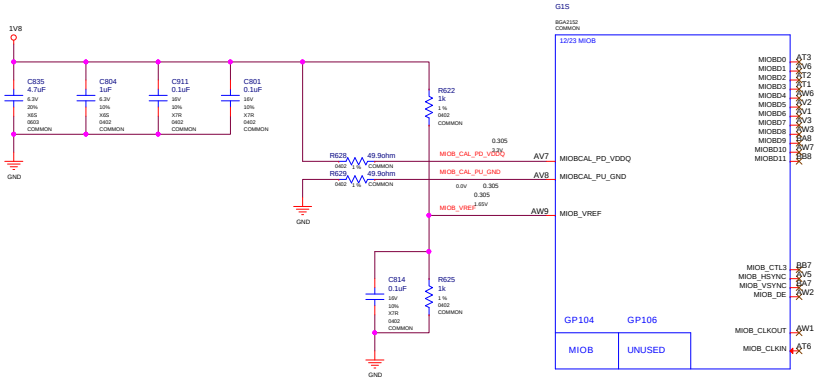
MSI	MICRO-STAR INT'L CO.,LTD	
	MS-V328	
Size: Custom	Document Description	Rev: 6.0
Date: Monday, July 18, 2016	Sheet 21 of 37	



MSI	MICRO-STAR INT'L CO.,LTD	
	MS-V328	
Size: Custom	Document Description: 22	Rev: 6.0
Date: Monday, July 18, 2016	Sheet 22 of 37	

Page 23: MIOA/B Interface and Frame Lock





Pad Overlap R1042 & R1043

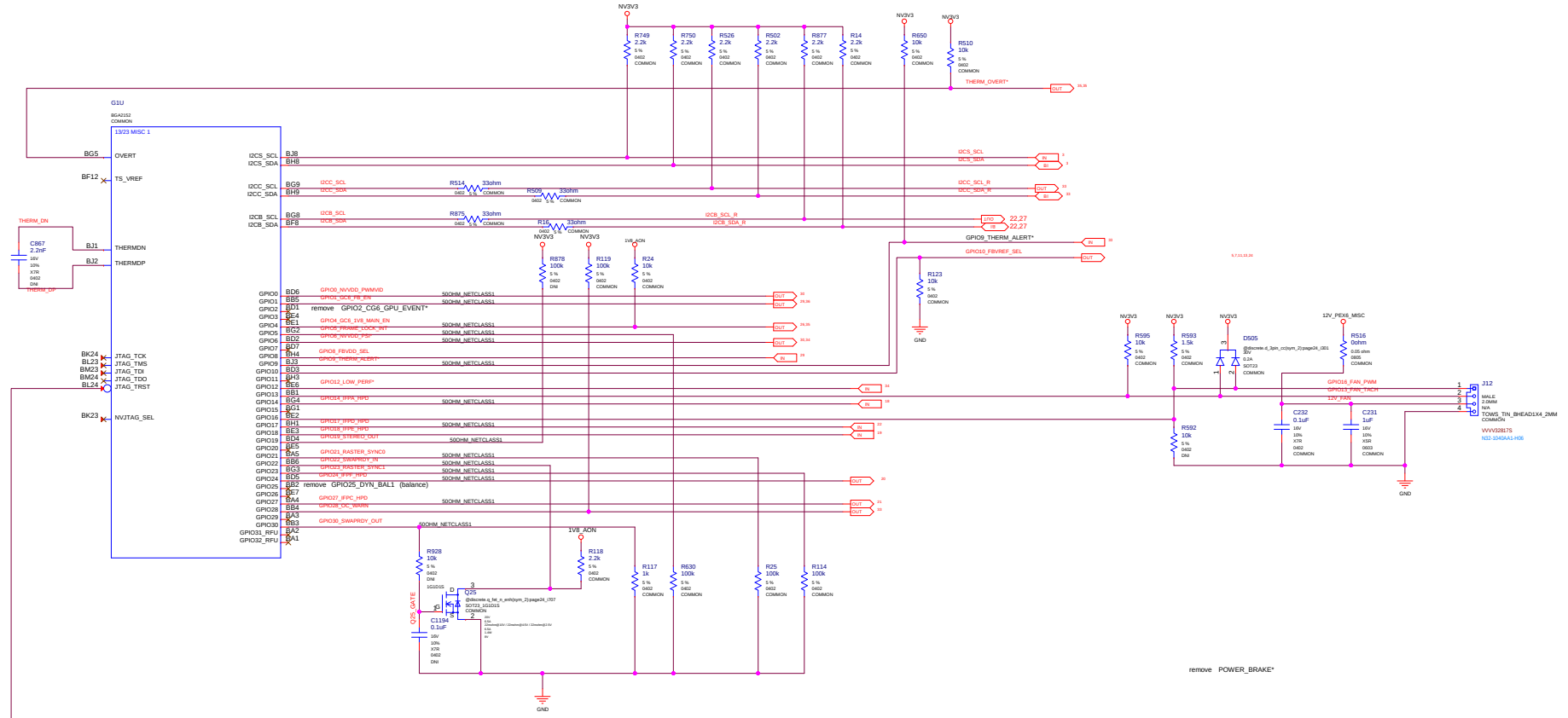
MICRO-STAR INT'L CO.,LTD

MS-V328

Size	Document Description	Rev
Custom	23	6.0

Date: Monday, July 18, 2016 Sheet 23 of 37

Page 24: MISC1: Fan, Thermal, JTAG, GPIO



MICRO-STAR INT'L CO.,LTD	
MS-V328	
Size: Custom	Document Description: 24
Rev: 6.0	
Date: Monday, July 18, 2016	Sheet 24 of 37

Page25: MISC2: ROM, XTAL, Straps

STRAP2	STRAP1	STRAP0	RAMCFG[4:0]
L	L	L	00000
L	L	H	00001
L	H	L	00010
L	H	H	00011
H	H	L	00110
H	H	H	00111
L	L	M	01000

ROM_SO	ROM_SI	ROM_SCLK	SOR_EXPOSED[3:0]	1:ENABLE 0:DISABLE
L	L	L	1111 DEFAULT	SOR0/1/2/3 ENABLE
L	L	H	1110	
L	H	L	1101	
L	H	H	1100	
H	L	L	1011	
H	L	H	1010	
H	H	L	1001	
H	H	H	1000	
L	L	M	0111	
L	M	L	0110	
L	M	H	0101	
L	H	M	0100	
H	L	M	0011	
H	M	L	0010	
H	M	H	0001	
H	H	M	0000	

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

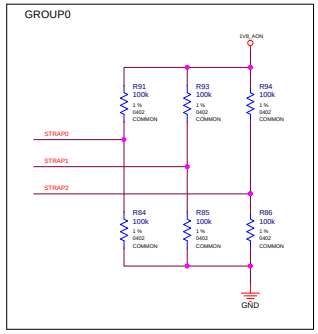
H=High :Tied to 1.8V
M=Middle:Tied to 0.9V
L=Low :Tied to 0V

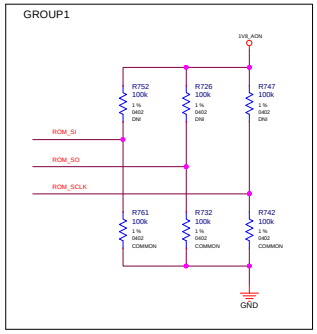
1:SMB_ALT_ADDR ENABLE
0:SMB_ALT_ADDR DISABLE

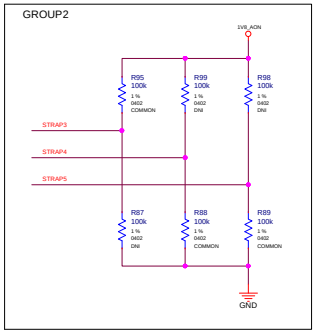
1:DEVID_SEL REBRAND
0:DEVID_SEL ORIGNAL

1:PCIE_CFG LOW POWER
0:PCIE_CFG HIGH POWER

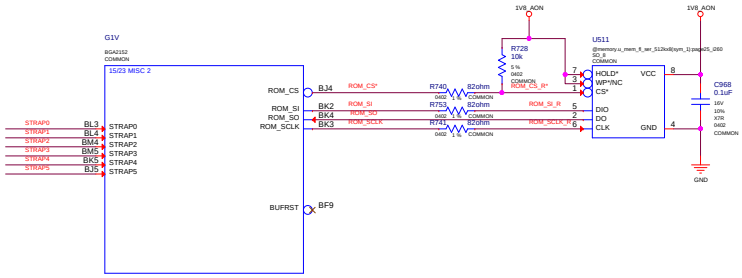
1:VGA_DEVICE ENABLE
0:VGA_DEVICE DISABLE

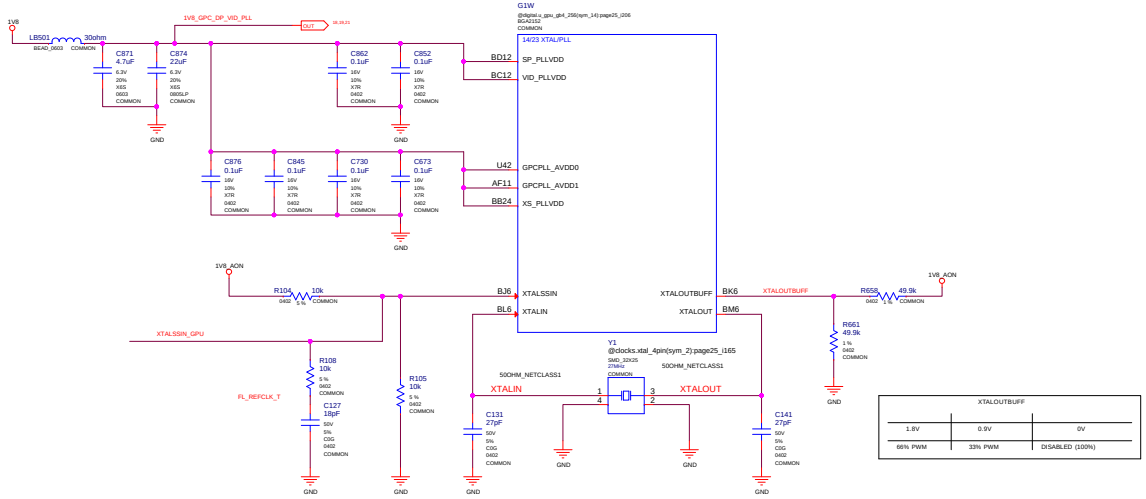






CFG[3:0]	Config Width	Vendor
0000	256Mx32 256-bit	Samsung
0001	256Mx32 256-bit	Micron
0010	256Mx32 256-bit	Hynix
0011	Reserved	
0100	Reserved	
0101	Reserved	
0110	Reserved	
0111	Reserved	



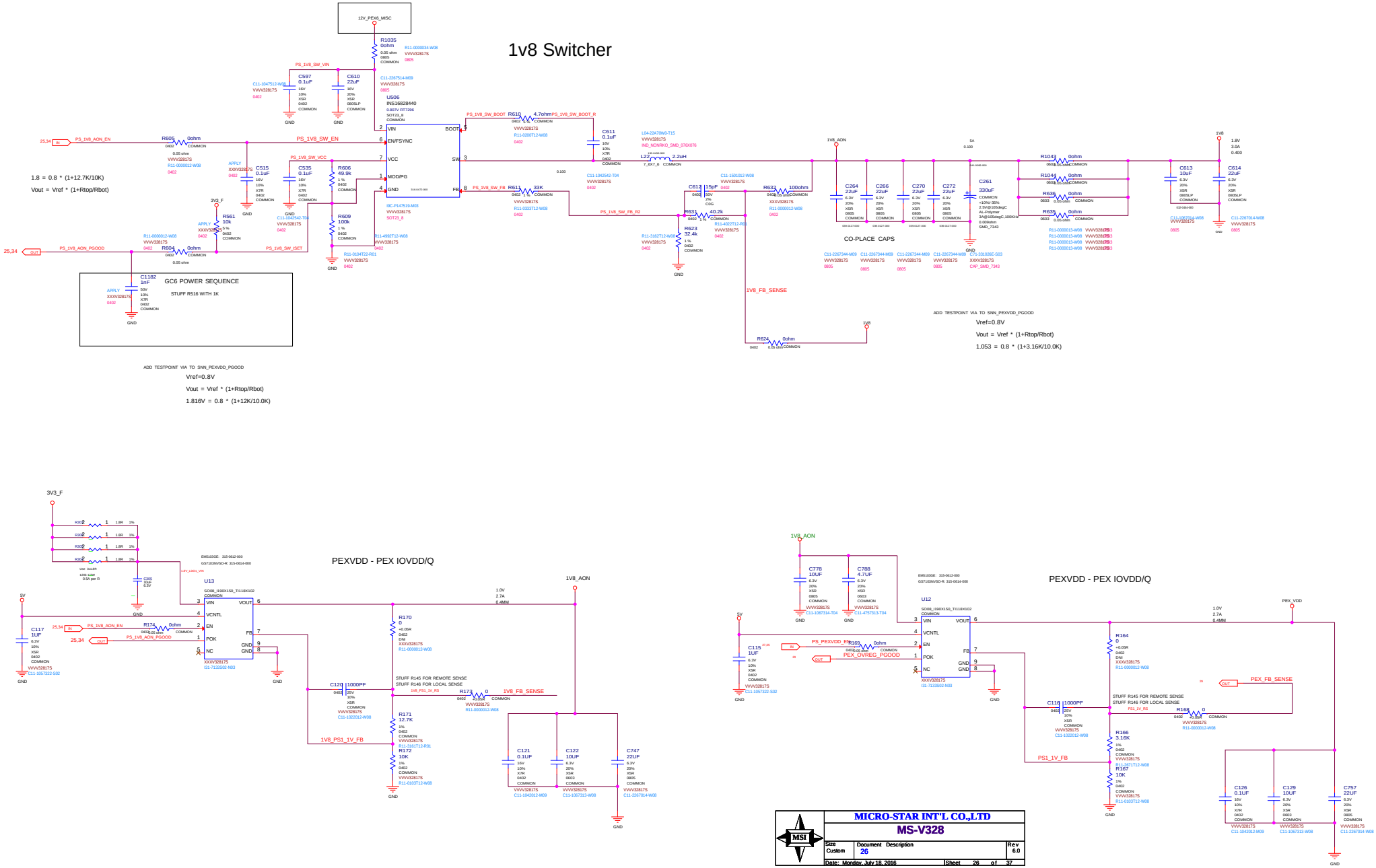


MICRO-STAR INT'L CO.,LTD

MS-V328

Size	Document Description	Rev
Custom	25	6.0

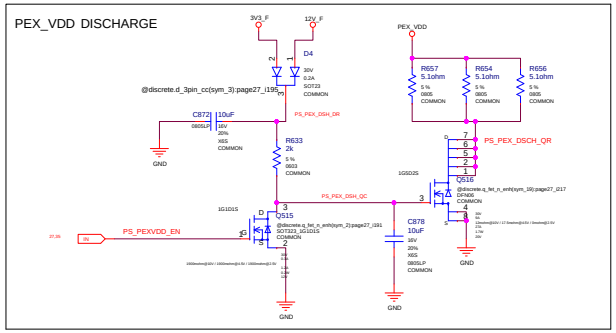
Date: Monday, July 18, 2016 Sheet 25 of 37



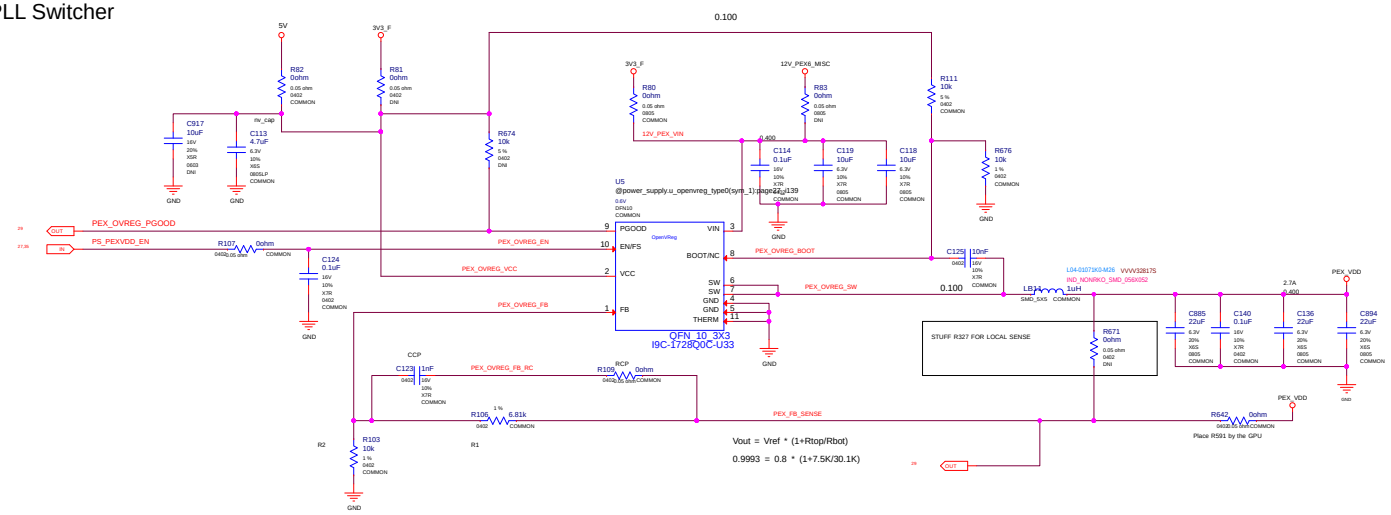
MICRO-STAR INT'L CO.,LTD	
MS-V328	
Size: Custom	Document: 26
Rev: 6.0	
Date: Monday, July 18, 2016	Sheet 26 of 37

Page27: PS: 5V SWITCHER,PEX VDD

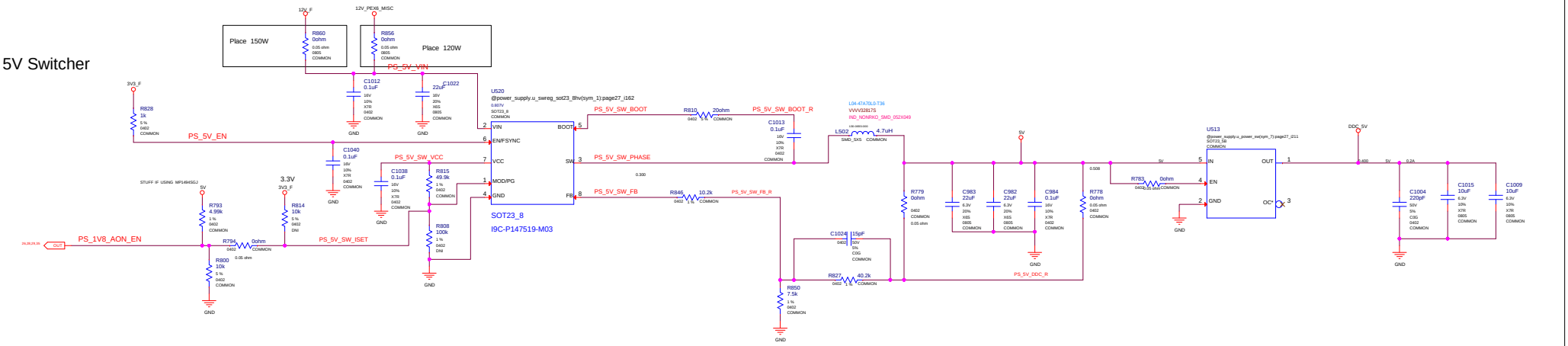
PEX_VDD DISCHARGE



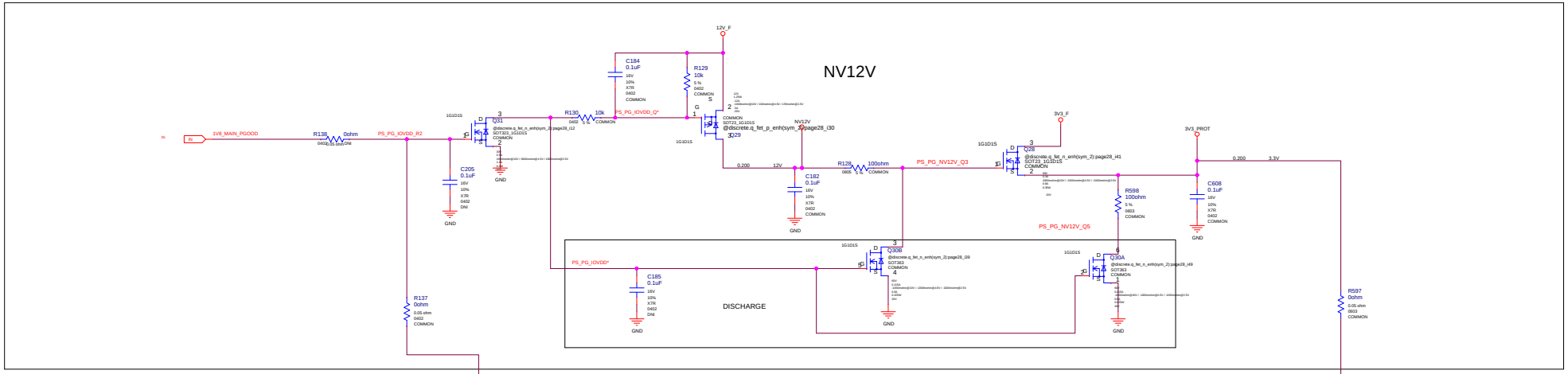
PEX PLL Switcher

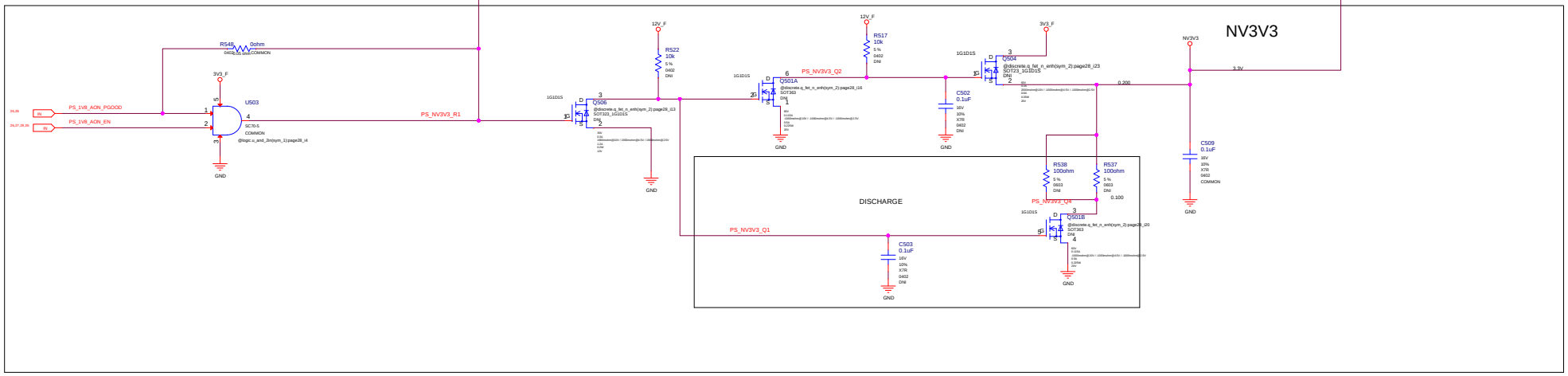


5V Switcher



MICRO-STAR INT'L CO.,LTD		
MS-V328		
Size: Custom	Document Description: 27	Rev: 6.0
Date: Monday, July 18, 2016	Sheet 27 of 37	





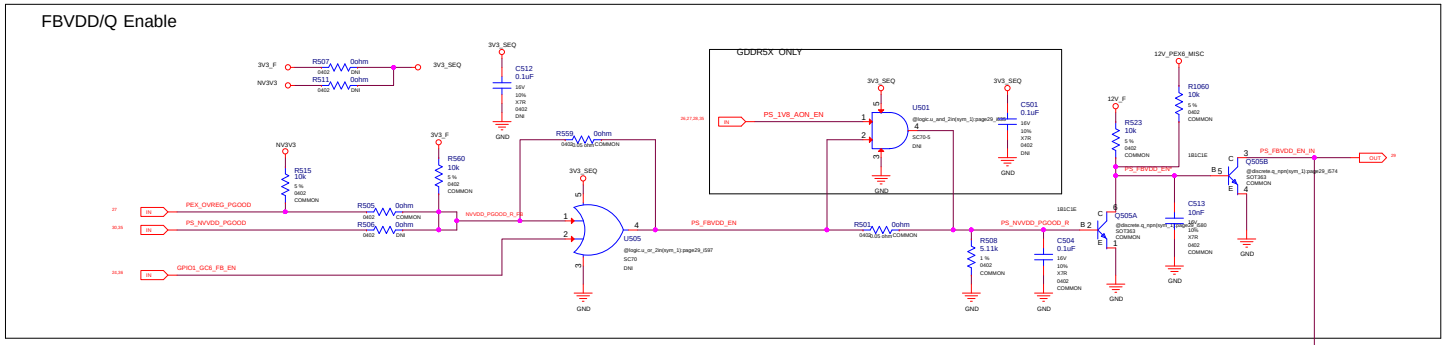
MSI	MICRO-STAR INT'L CO.,LTD	
	MS-V328	
Size: Custom	Document Description: 28	Rev: 6.0
Date: Monday, July 18, 2016	Sheet 28 of 37	

Page29: PS: FBVDDQ

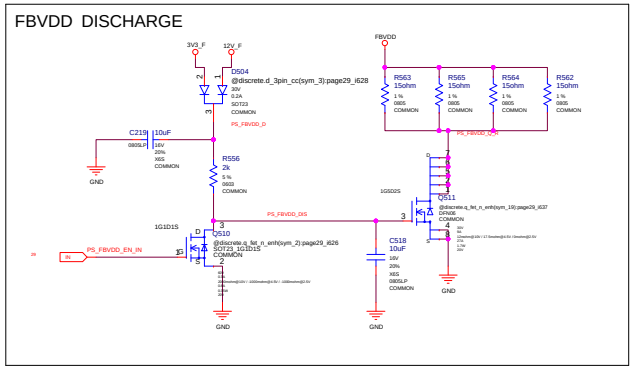
FBVDD

NETNAME	MAX_CURRENT	MIN_LINE_WIDTH	VOLTAGE
FBVDD			

FBVDD/Q Enable

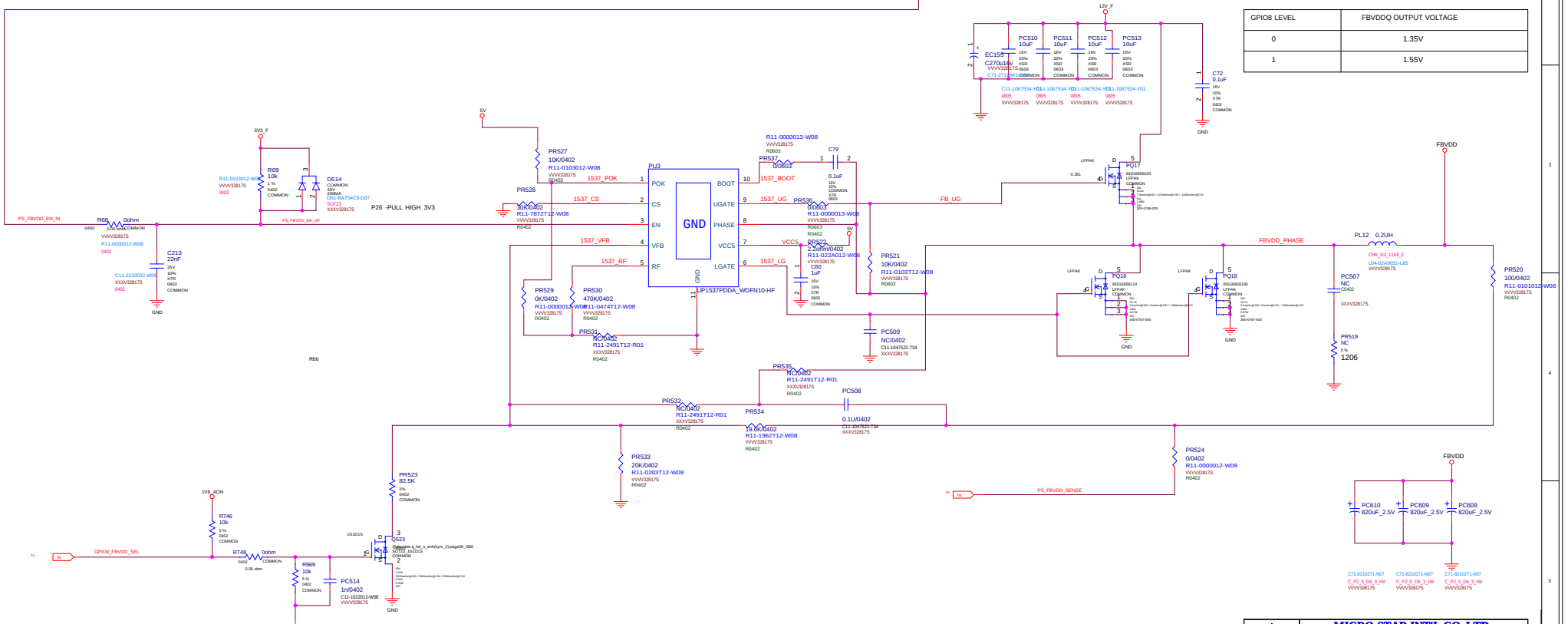


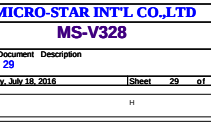
FBVDD DISCHARGE



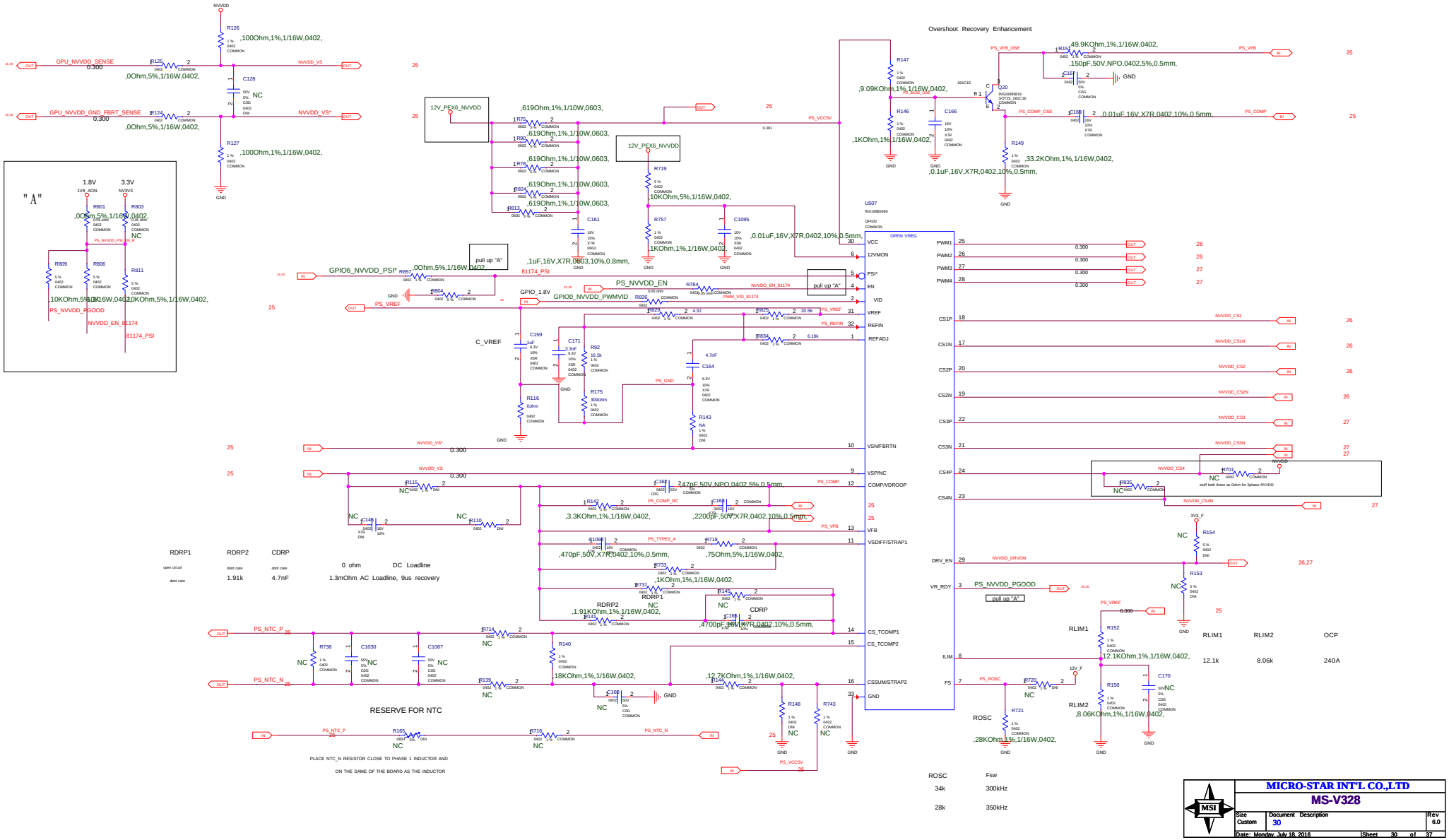
SAMSUNG

GPIO8 LEVEL	FBVDDQ OUTPUT VOLTAGE
0	1.35V
1	1.55V

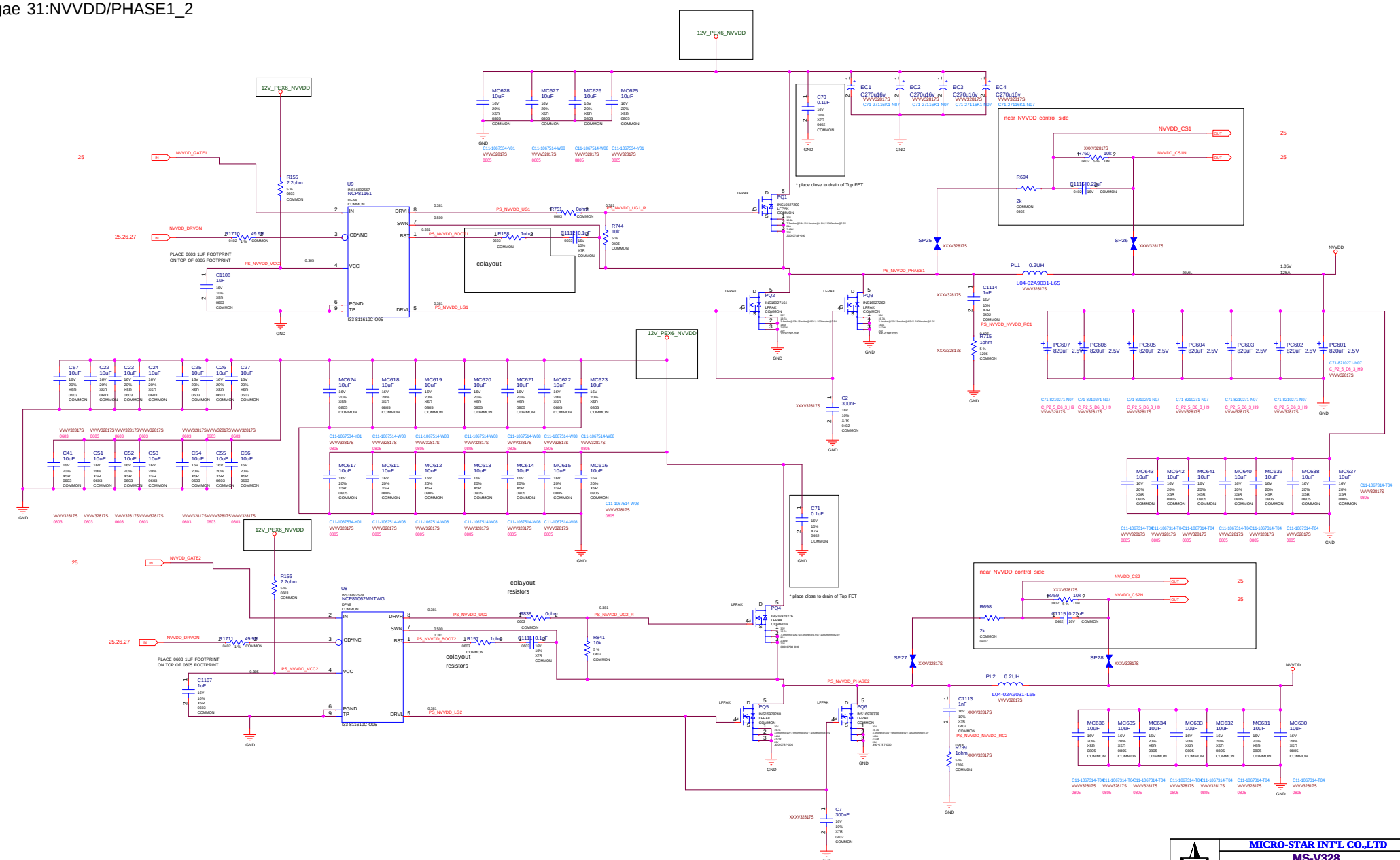




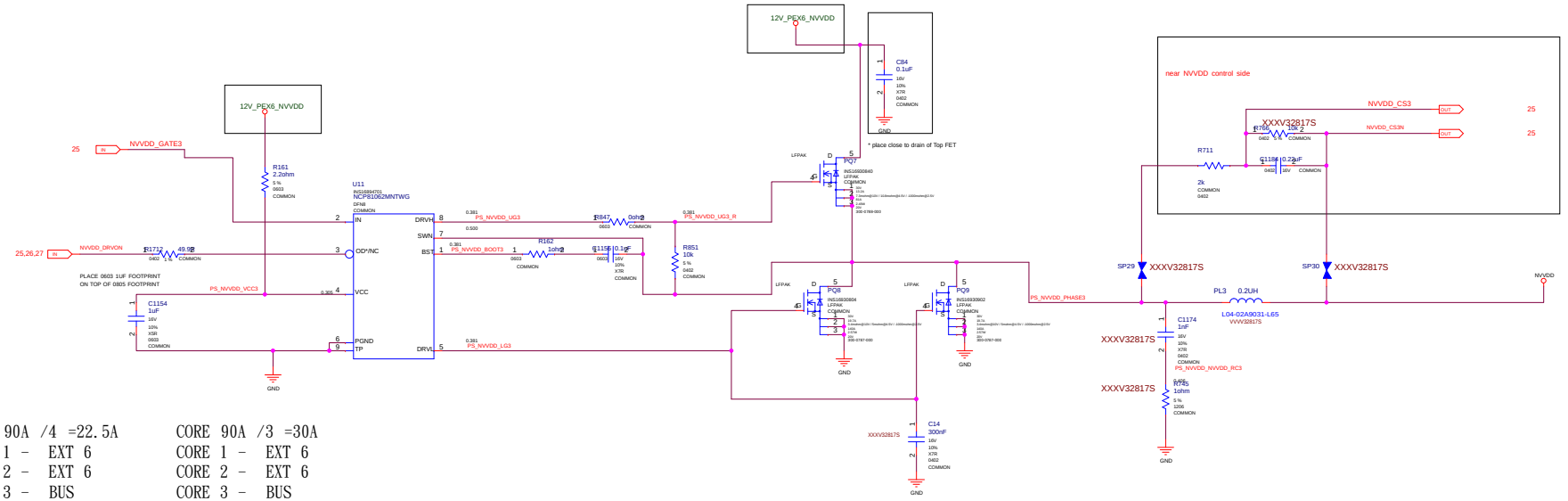
Page30: PS: NVVDD Controller



Pgae 31:NVVDD/PHASE1_2

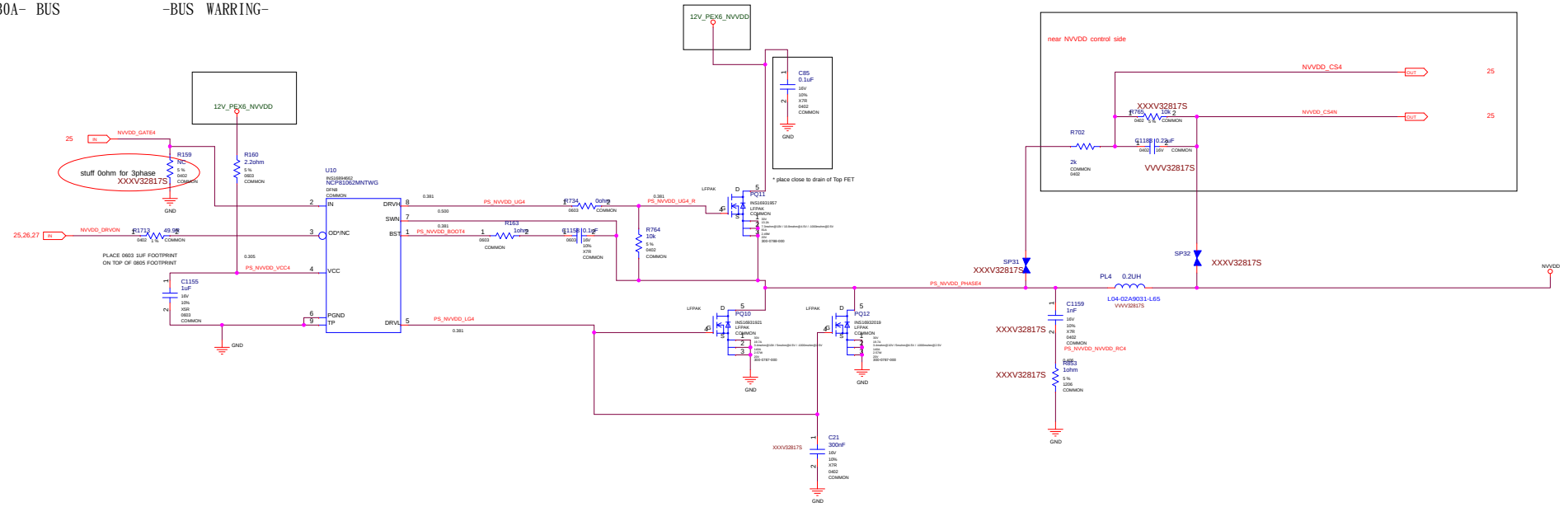


Page32: PS: NVVDD PHASE 3/4



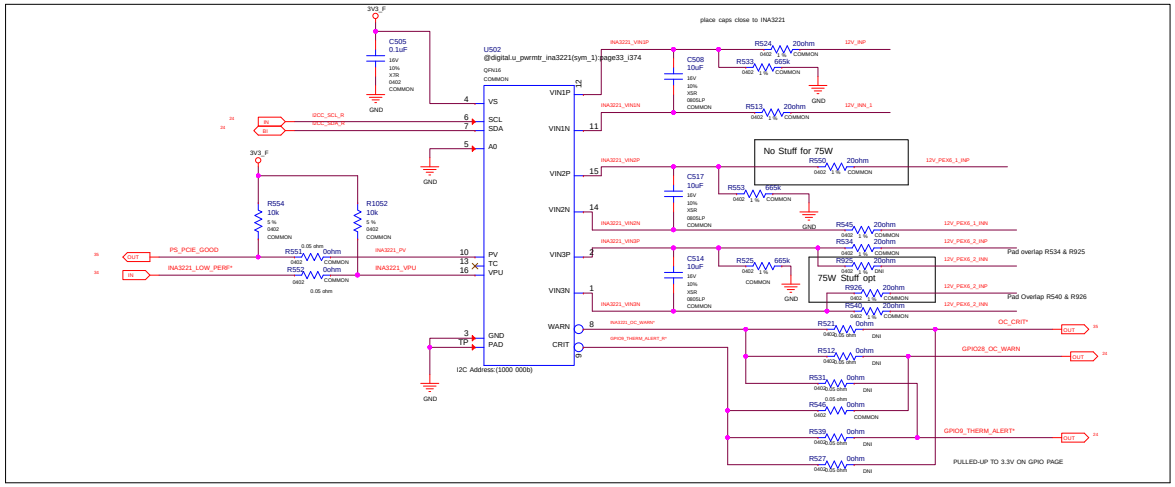
CORE 90A /4 =22.5A
CORE 1 - EXT 6
CORE 2 - EXT 6
CORE 3 - BUS
CORE 4 - EXT 6
MEM 30A- BUS

CORE 90A /3 =30A
CORE 1 - EXT 6
CORE 2 - EXT 6
CORE 3 - BUS
MEM 30A- BUS
-BUS WARRING-

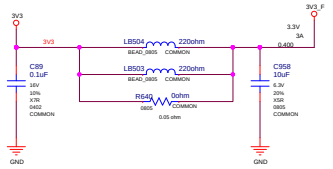


MSI	MICRO-STAR INT'L CO.,LTD			
	MS-V328			
	Size: Custom	Document Description: NVVDD/PHASE3_4		Rev: 6.0
	Date: Monday, July 18, 2016	Sheet 32 of 37		

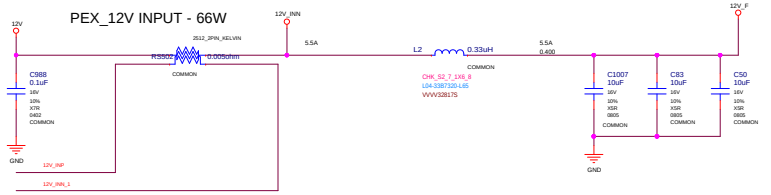
Page33: PS: Inputs, Filtering, and Monitoring



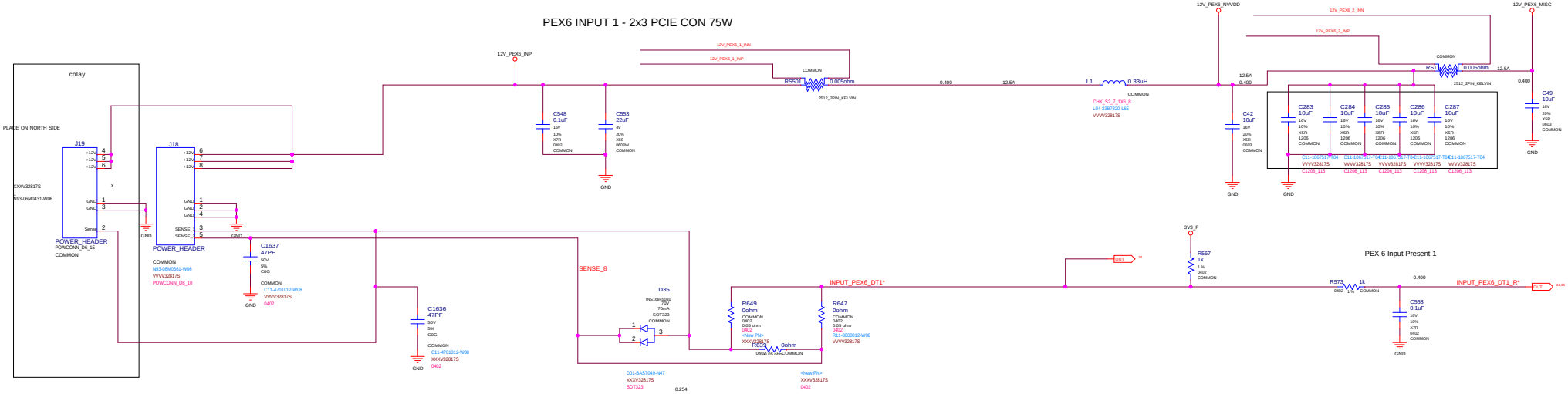
PEX 3V3 INPUT - 10W

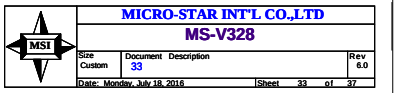


PEX_12V INPUT - 66W



PEX6 INPUT 1 - 2x3 PCIE CON 75W

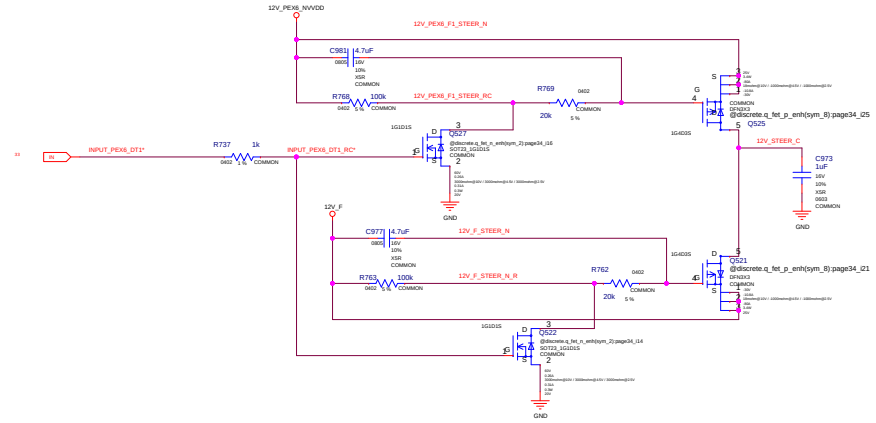




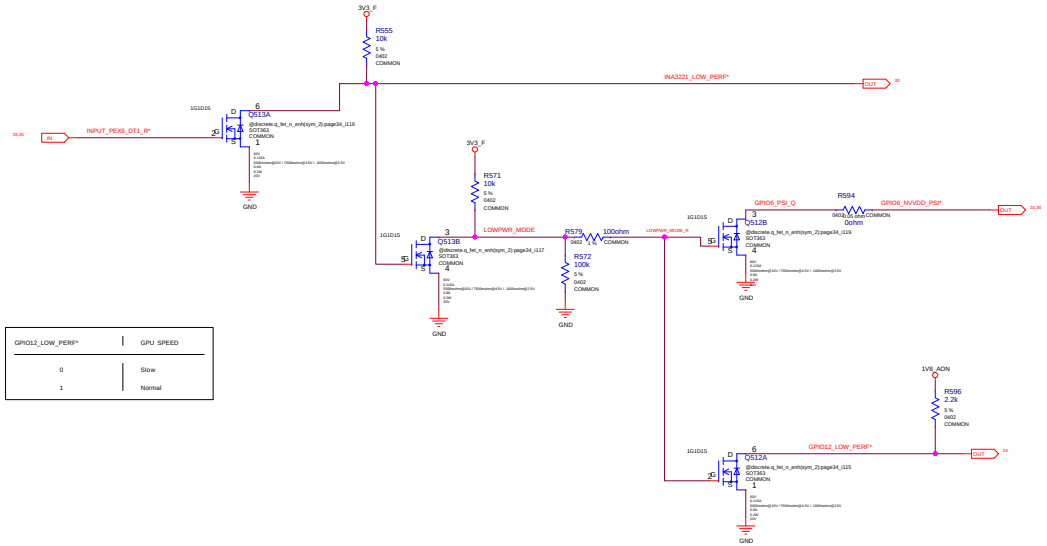
Page34: PS: 12V Current Steering, PSI Control, and LED

12V CURRENT STEERING (UNDER POWER BOOT):

GUIDES CURRENT FROM PEX EDGE TO PEX 6 PIN INPUT AREA



PEX Input - Power Level/PSI* Control

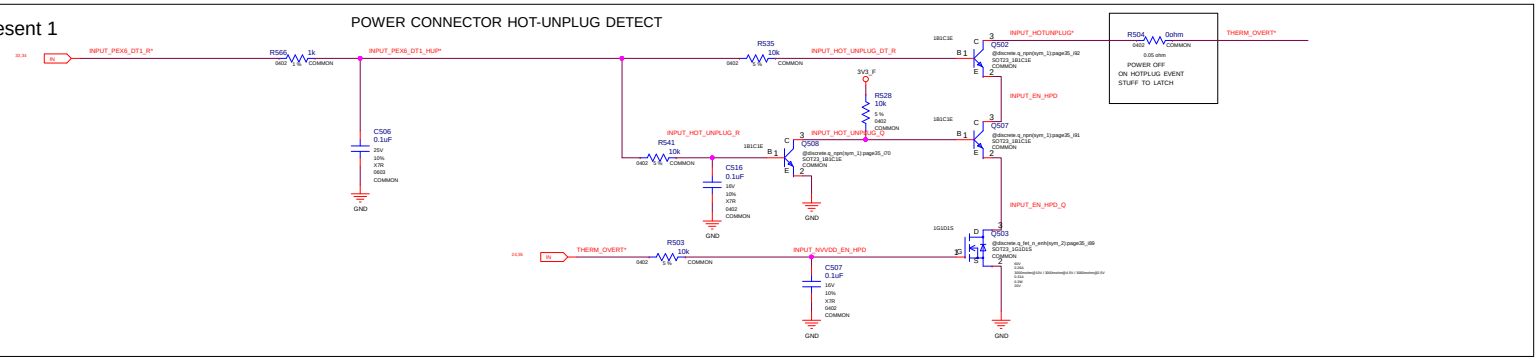


GPIO12_LOW_PERF*	GPU_SPEED
0	Slow
1	Normal

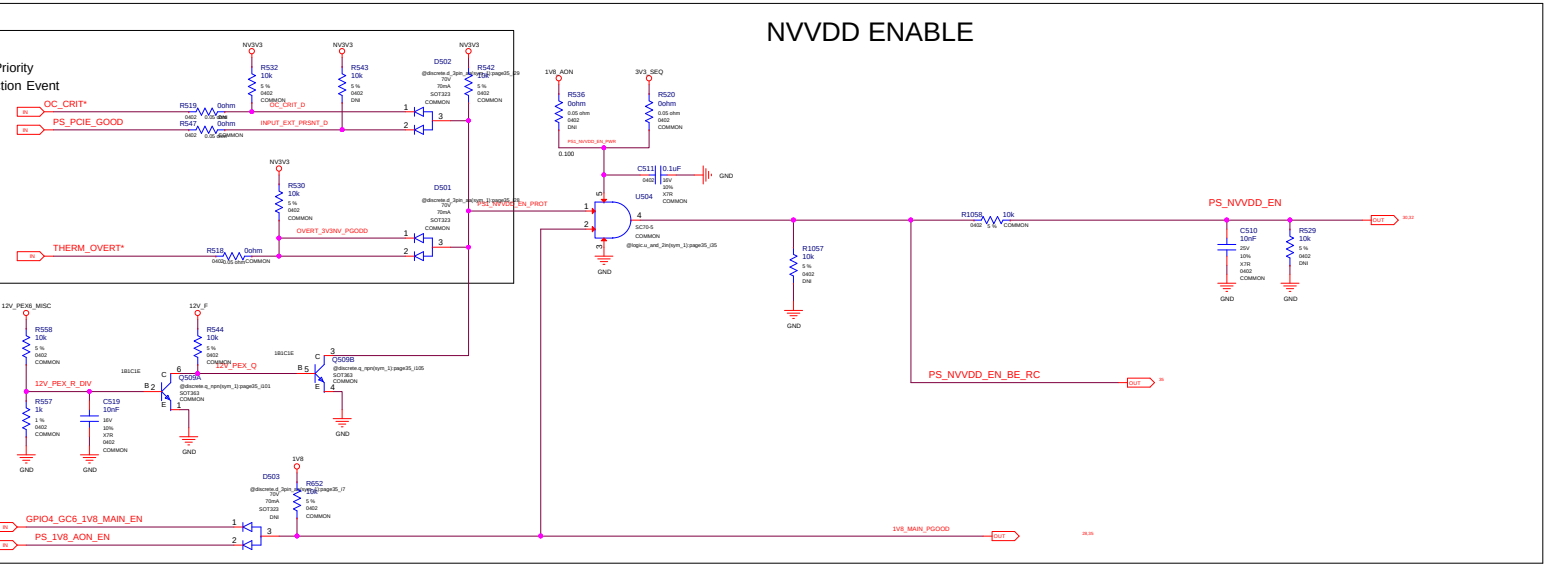
GeForce Logo LED

MSI	MICRO-STAR INT'L CO.,LTD	
	MS-V328	
Size: Custom	Document Description: 34	Rev: 6.0
Date: Monday, July 18, 2016	Sheet 34 of 37	

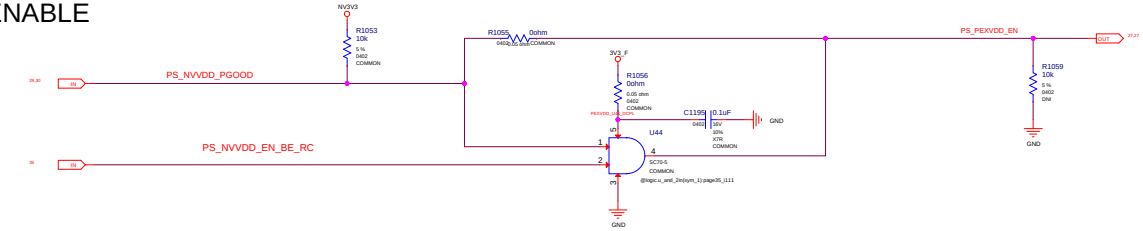
PEX Input Present 1



NVVDD ENABLE



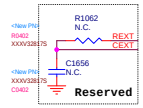
PEX ENABLE

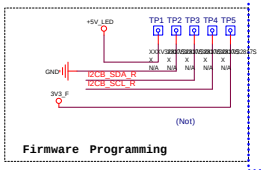


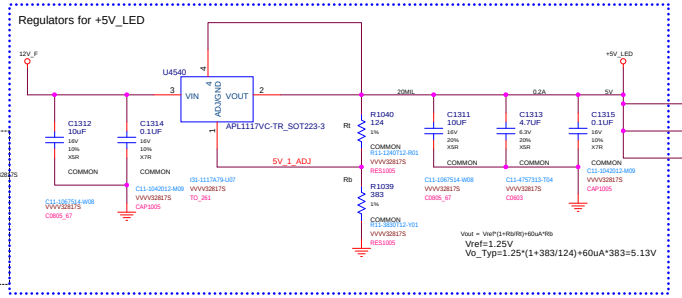
MSI	MICRO-STAR INT'L CO.,LTD		
	MS-V328		
Size: Custom	Document Description: 35		Rev: 6.0
Date: Monday, July 18, 2016		Sheet 35 of 37	

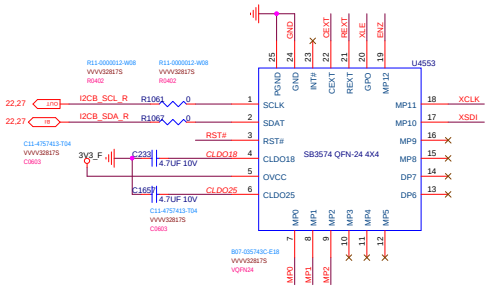
Page38: LED

remove GC6 FB ENABLE
remove GPU_EVENT*
remove PEX_CLKREQ*
PEX_RST# LOGIC

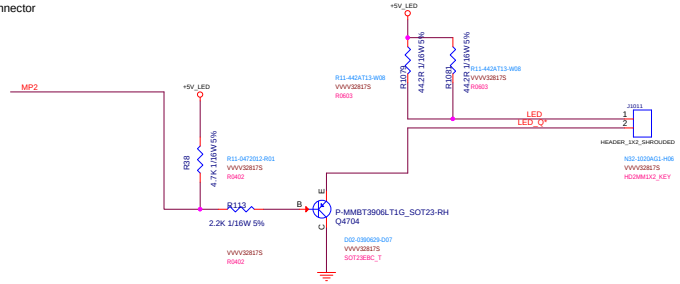


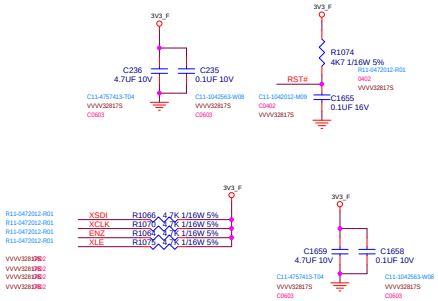


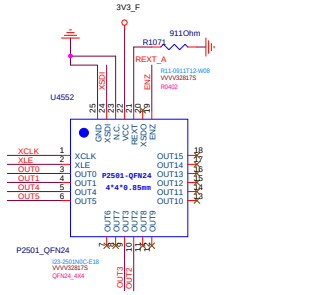


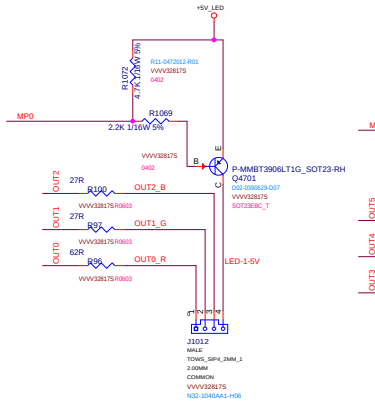


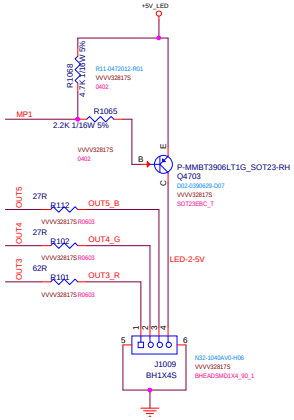
LED Connector







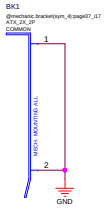


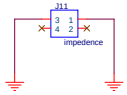


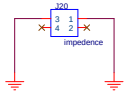
MICRO-STAR INT'L CO.,LTD		
MS-V328		
Size: Custom	Document Description: 36	Rev: 6.0
Date: Monday, July 18, 2016	Sheet 36 of 37	

Page40: MECH

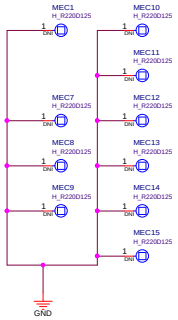
Brackets:



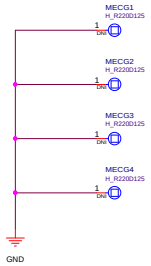


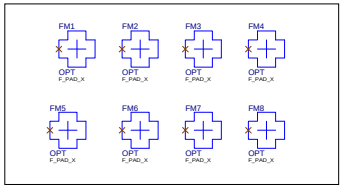


Mechanical Holes Symbol



GPU Stiffner





MICRO-STAR INT'L CO.,LTD		
MS-V328		
Size: Custom	Document Description: 37	Rev: 6.0
Date: Monday, July 18, 2016	Sheet 37 of 37	