G94-P545-A01 - GDDR3, DVI/VGA + DVI/VGA + HDTV/SDTV-Out

SKU	VARIANT	NVPN	ASSEMBLY
B	BASE	600-10545-base-100	P545 BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
1	SKU9100	600-10545-9100-100	G94-400 650MHz/1000MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out (Bring Up SKU)
2	SKU0000	600-10545-0000-100	G94-400 650MHz/1000MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
3	SKU0010	600-10545-0010-100	G94-300 500MHz/800MHz 512MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
4	SKU0020	600-10545-0020-100	G94-200 500MHz/800MHz 384MB 16Mx32 BGA136 GDDR3, DVI-I-DL+DVI-I-DL+HDTV-Out
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7	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
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15	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>

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V127-0A Base on P545

1.PAGE18: ADD Display port circuit
2.PAGE21: ADD GPIO circuit
3.PAGE 21: change SPDIF circuit
4.PAGE 27: remove PEX_VDD power switch circuit
5.PAGE 27: remove IFP_PLLVDD/2V5 power switch circuit cahnge APL5713 and APL5910 circuit
6.PAGE 28: remove FBVDDQ power switch circuit change APW7067N power circuit
7.PAGE 29: remove NVVDD VID circuit
8.PAGE 30: change NNVDD POWER APW7088 circuit
9.PAGE 16/17 : ADD EMI bridge R
10.PAGE 17 CO-LAYOUT HDIM CONNECT
11.PAGE 15 remove J2 D_SUB SLIM CONNECT
12.PAGE 29 ADD CH7322 circuit

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1.PAGE18 remove Display port co-lay circuit
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ASSEMBLY	P545 BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	Overview

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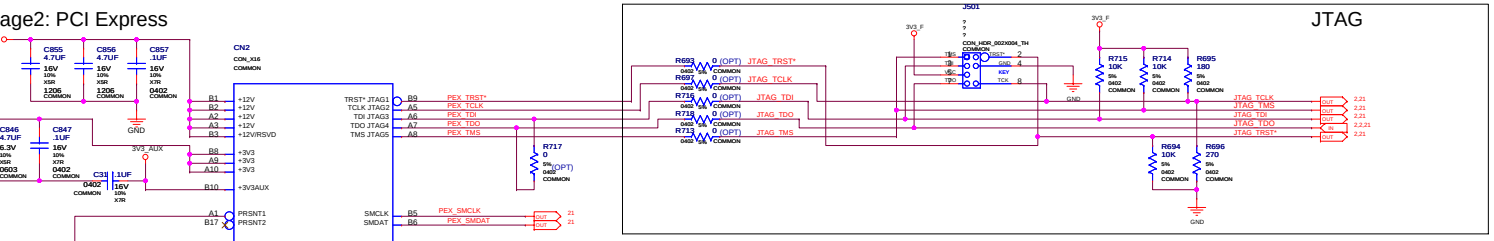
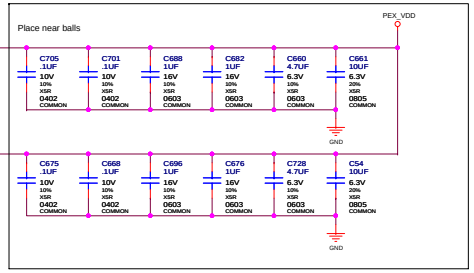
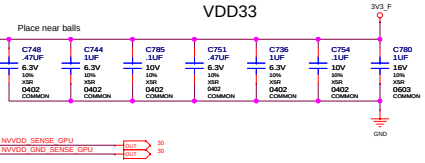
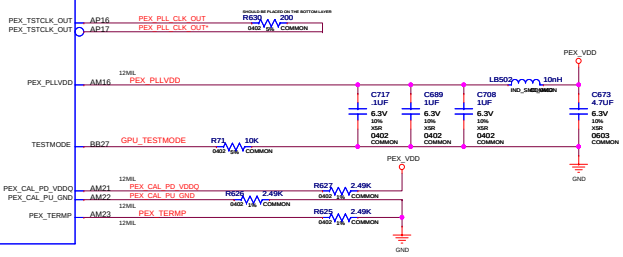
Page2: PCI Express









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Micro-Star International Co., LTD.

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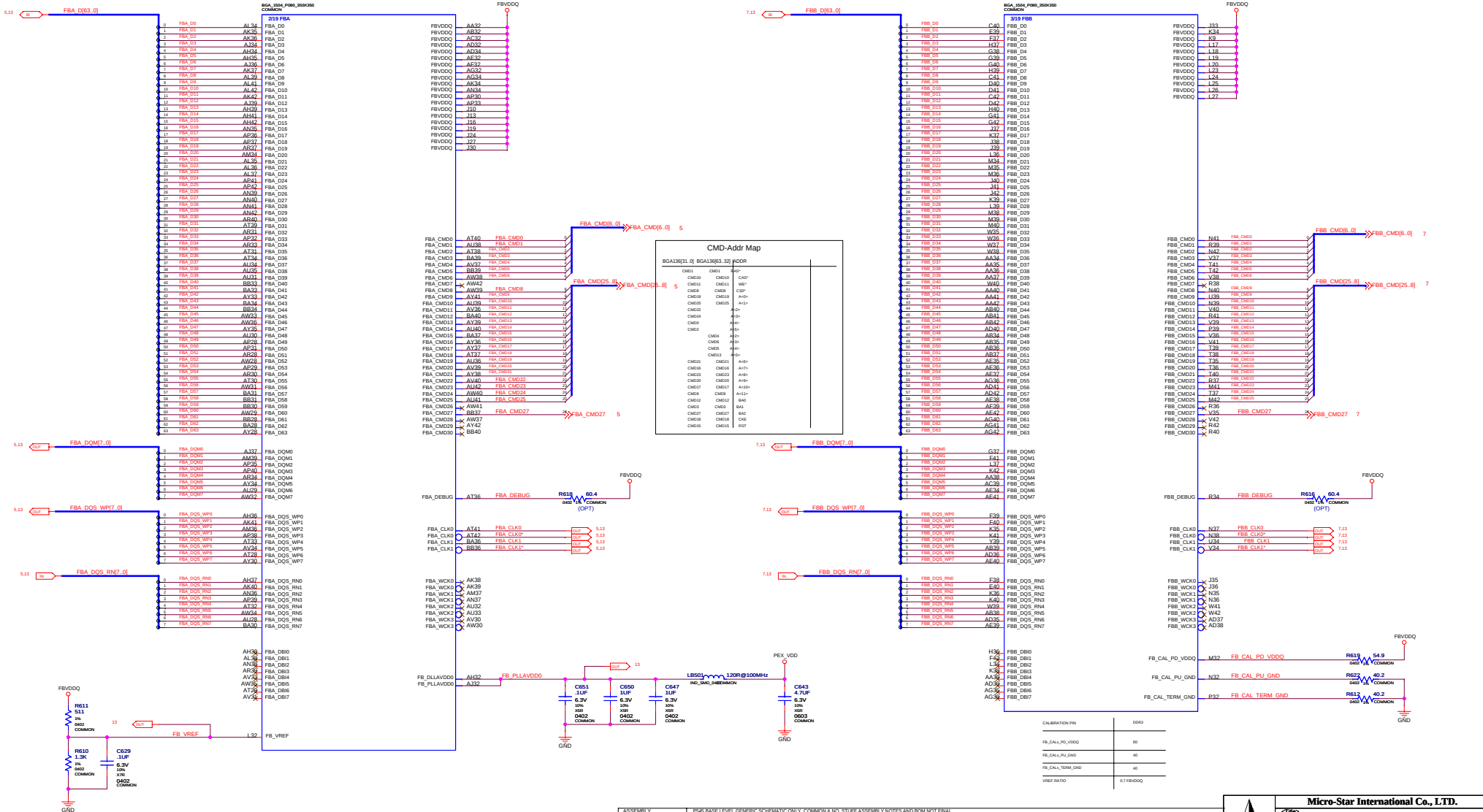
Page3: MEMORY: GPU Partition A/B



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PAGE DETAIL	MEMORY: GPU Partition A/B

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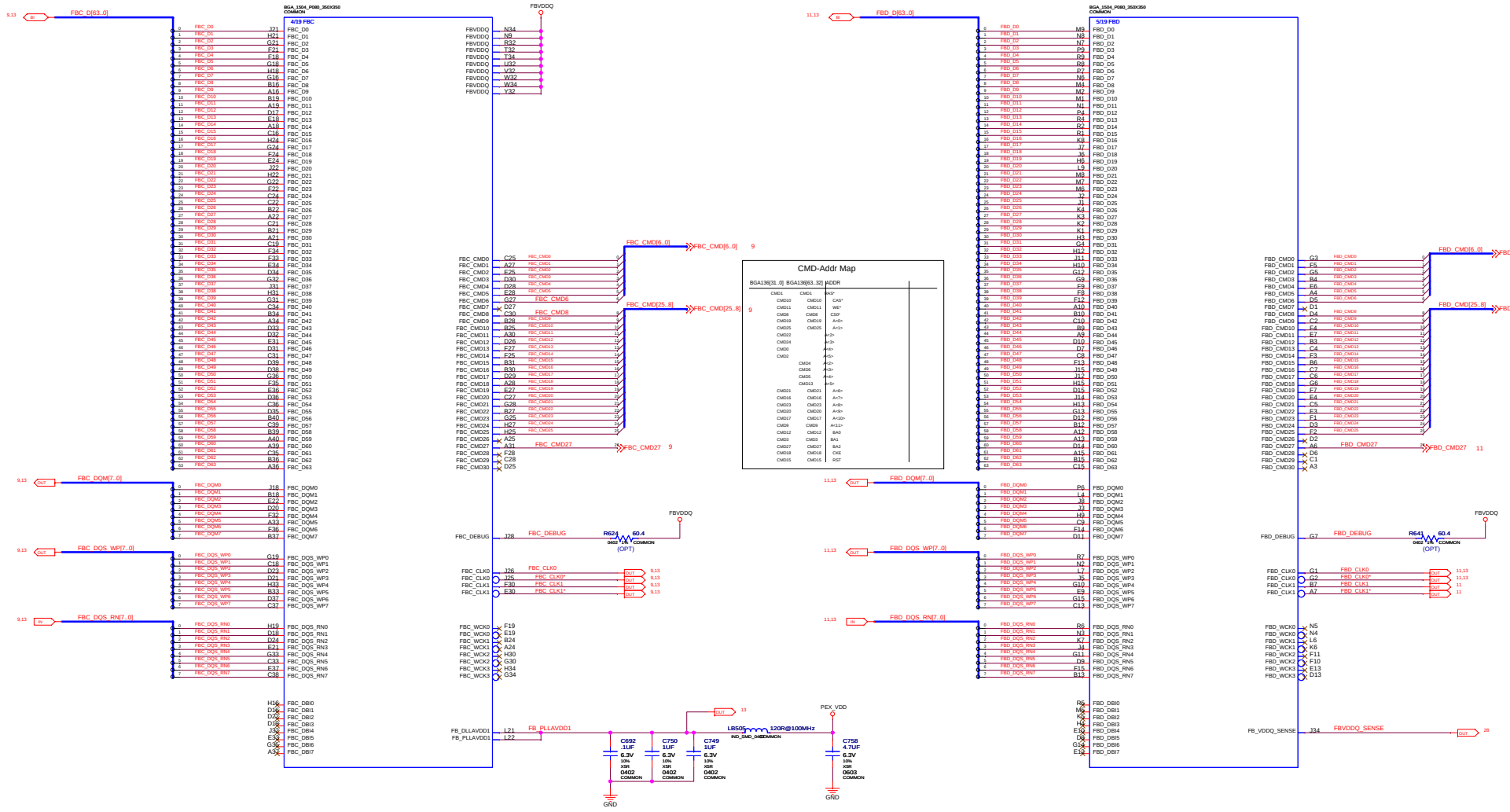
Page4: MEMORY: GPU Partition C/D



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ASSEMBLY	P545 BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	MEMORY: GPU Partition C/D

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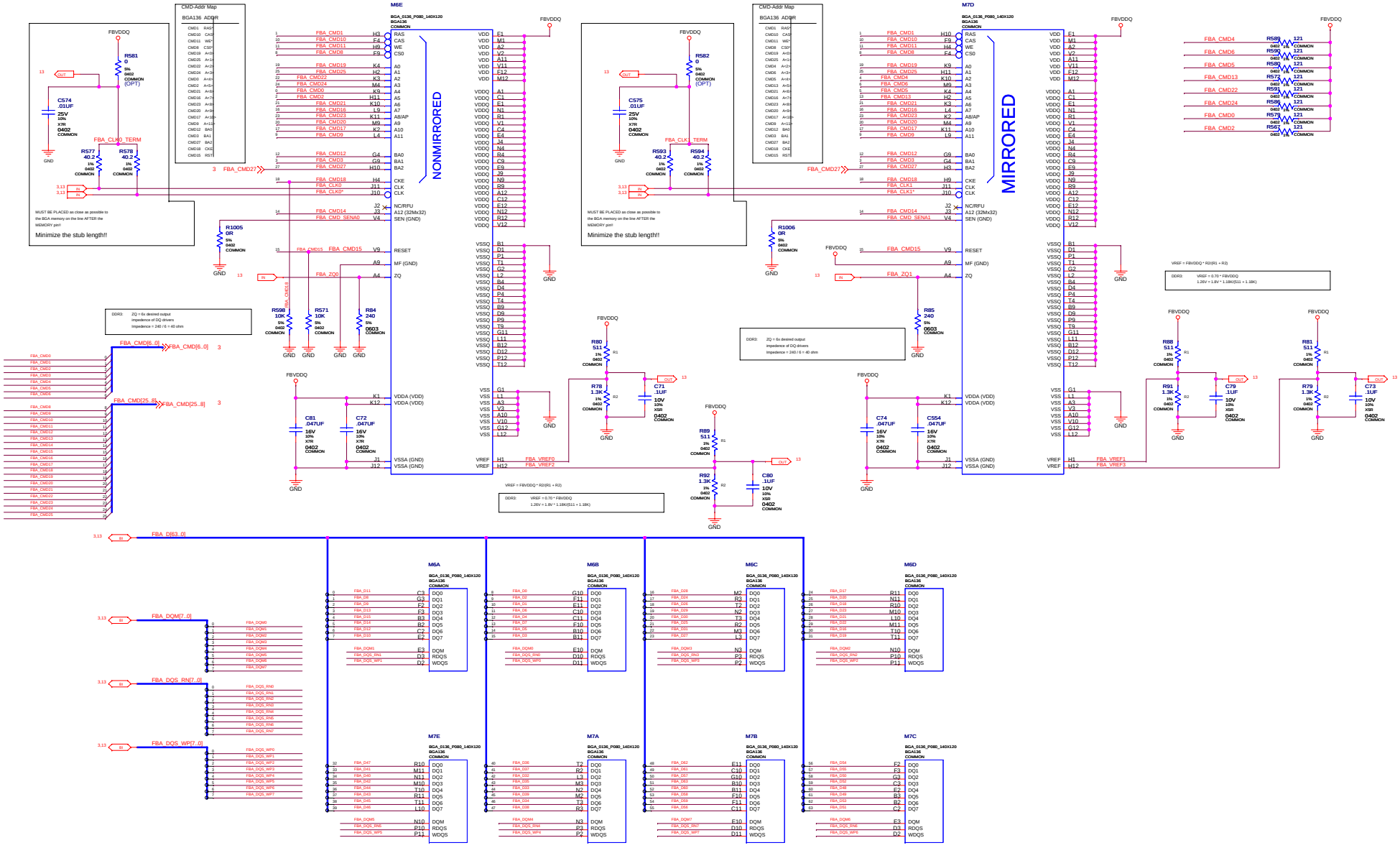
Page5: FBA Partition



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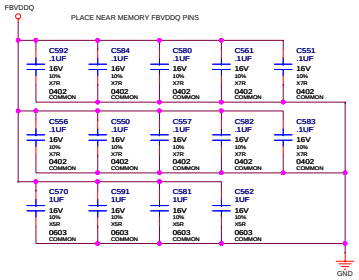
Page6: FBA Partition Decoupling

Decoupling for FBA 31..0



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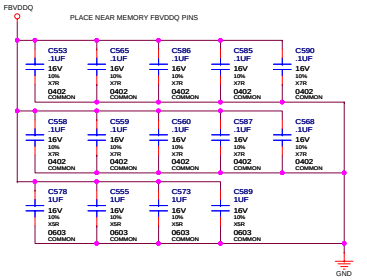

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Micro-Star International Co., LTD.

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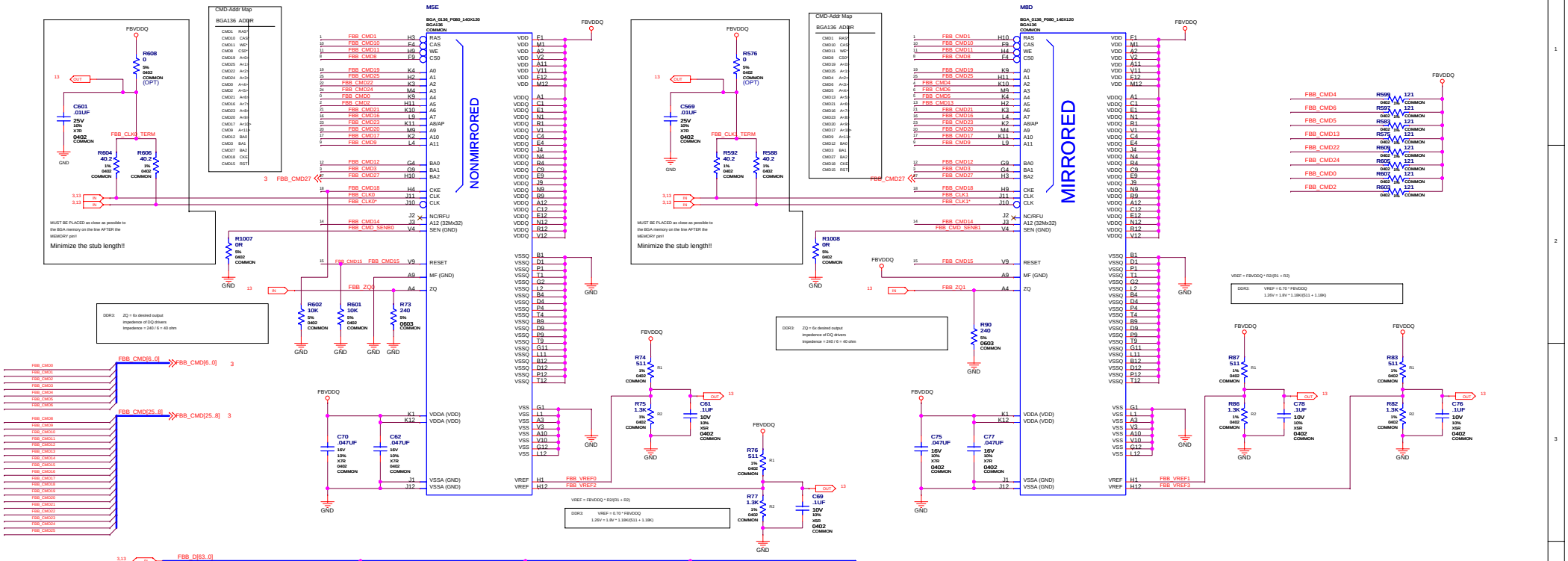
Page7: FBB Partition



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PAGE DETAIL: FBB Partition

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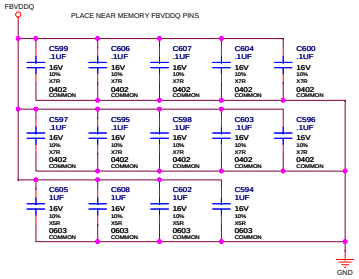
Page8: FBB Partition Decoupling

Decoupling for FBB 31..0



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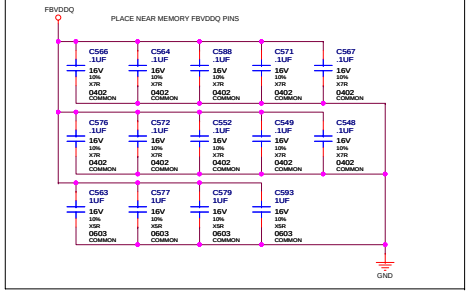

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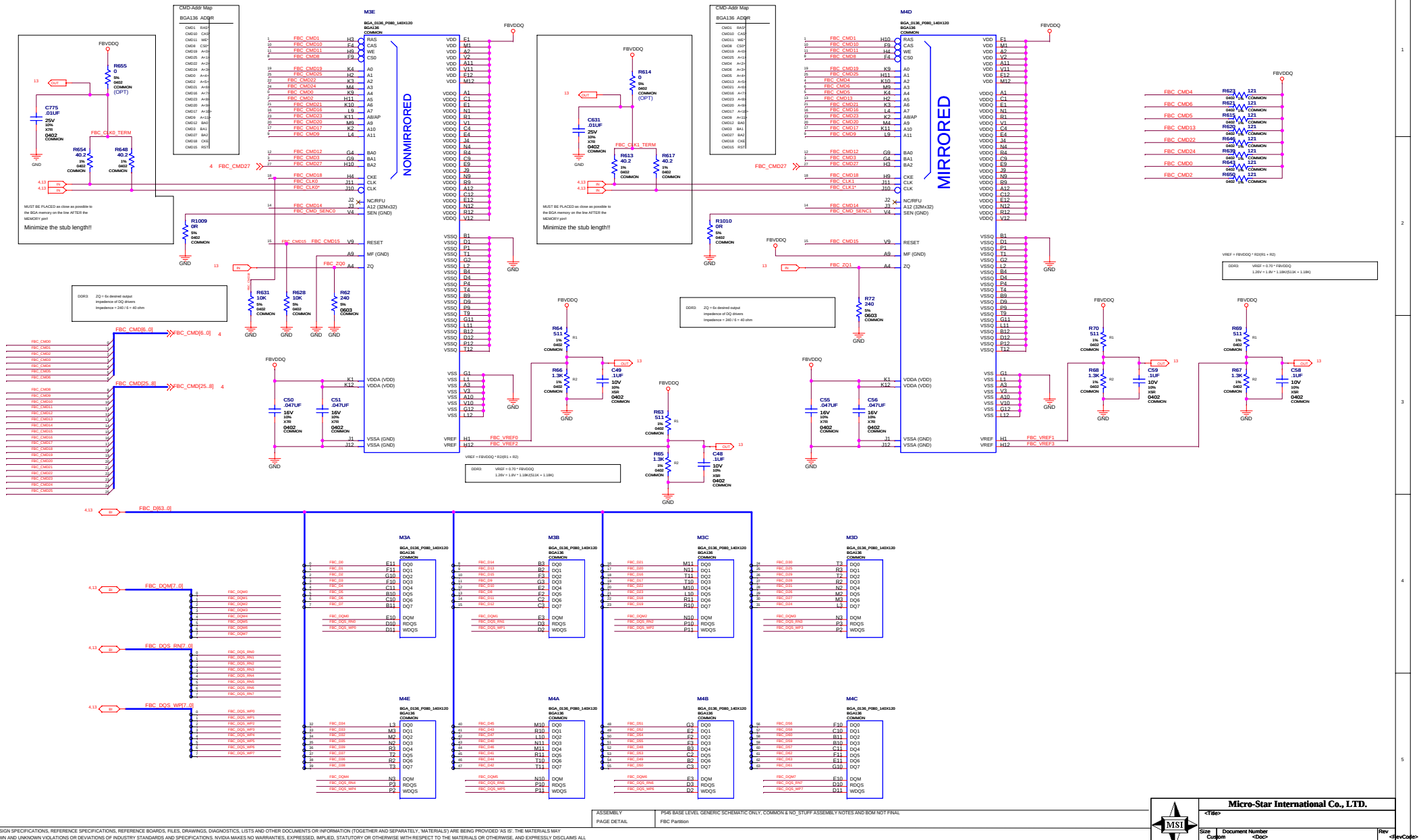
Page9: FBC Partition



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PAGE DETAIL | FBC Partition

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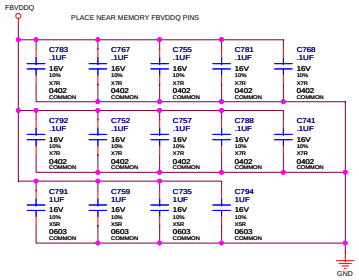
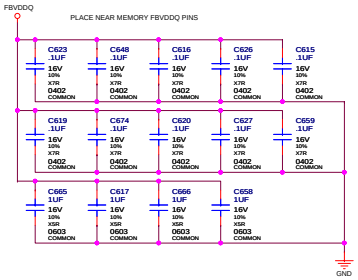
Page10: FBC Partition

Decoupling for FBC 31..0



Decoupling for FBC 63..32



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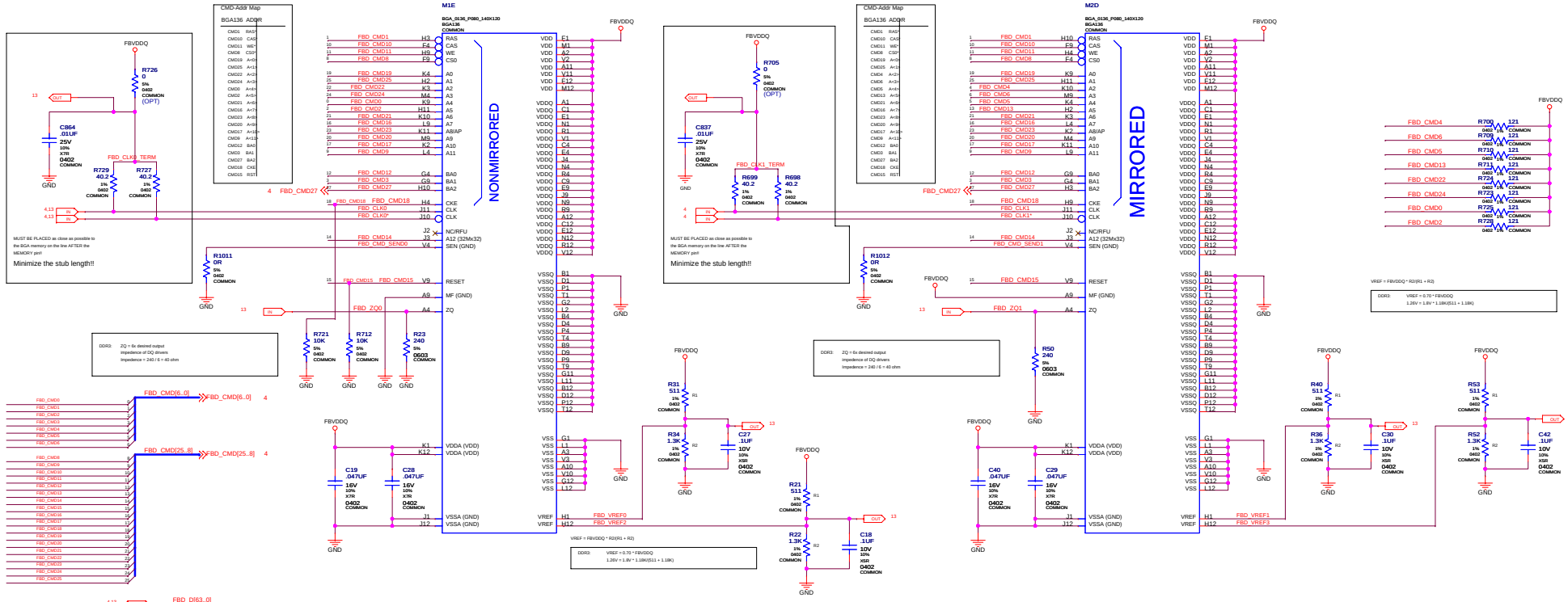
Page11: FBD Partition



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PAGE DETAIL | FBD Partition

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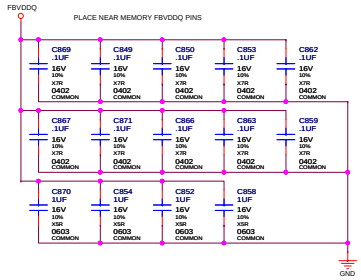
Page12: FBD Partition Decoupling

Decoupling for FBD 31..0



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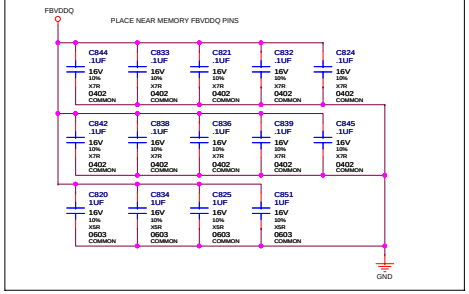

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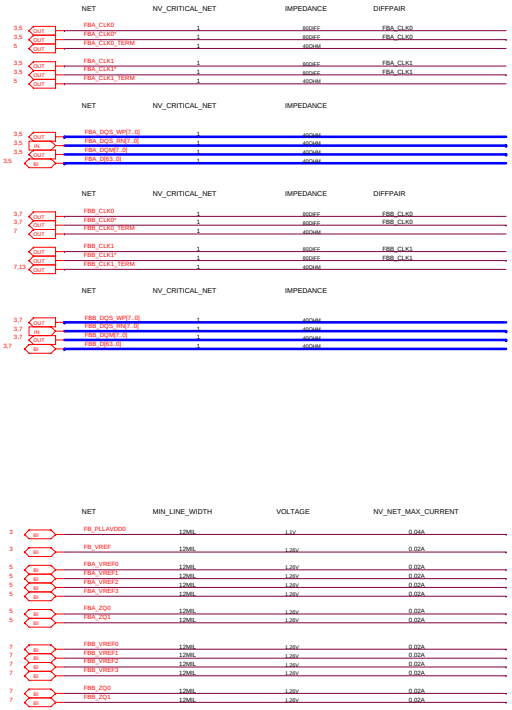
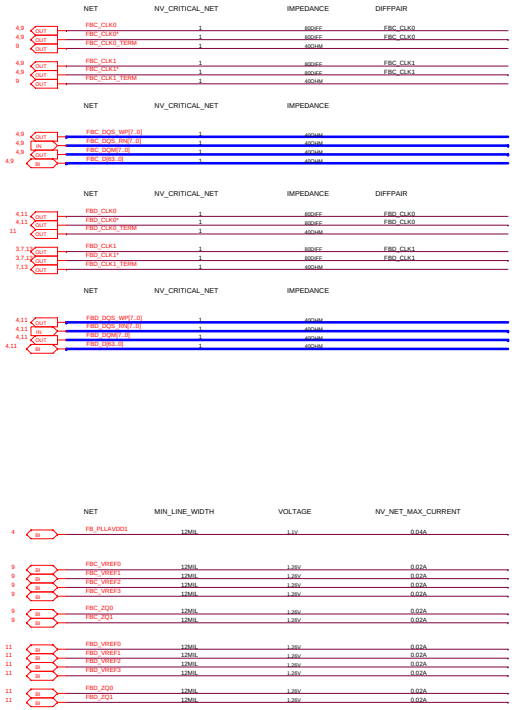
Page13: FB Net Properties

NET RULES for FBA and FBB



NET RULES for FBC and FBD



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PAGE DETAIL	FB Net Properties

Micro-Star International Co., LTD.			
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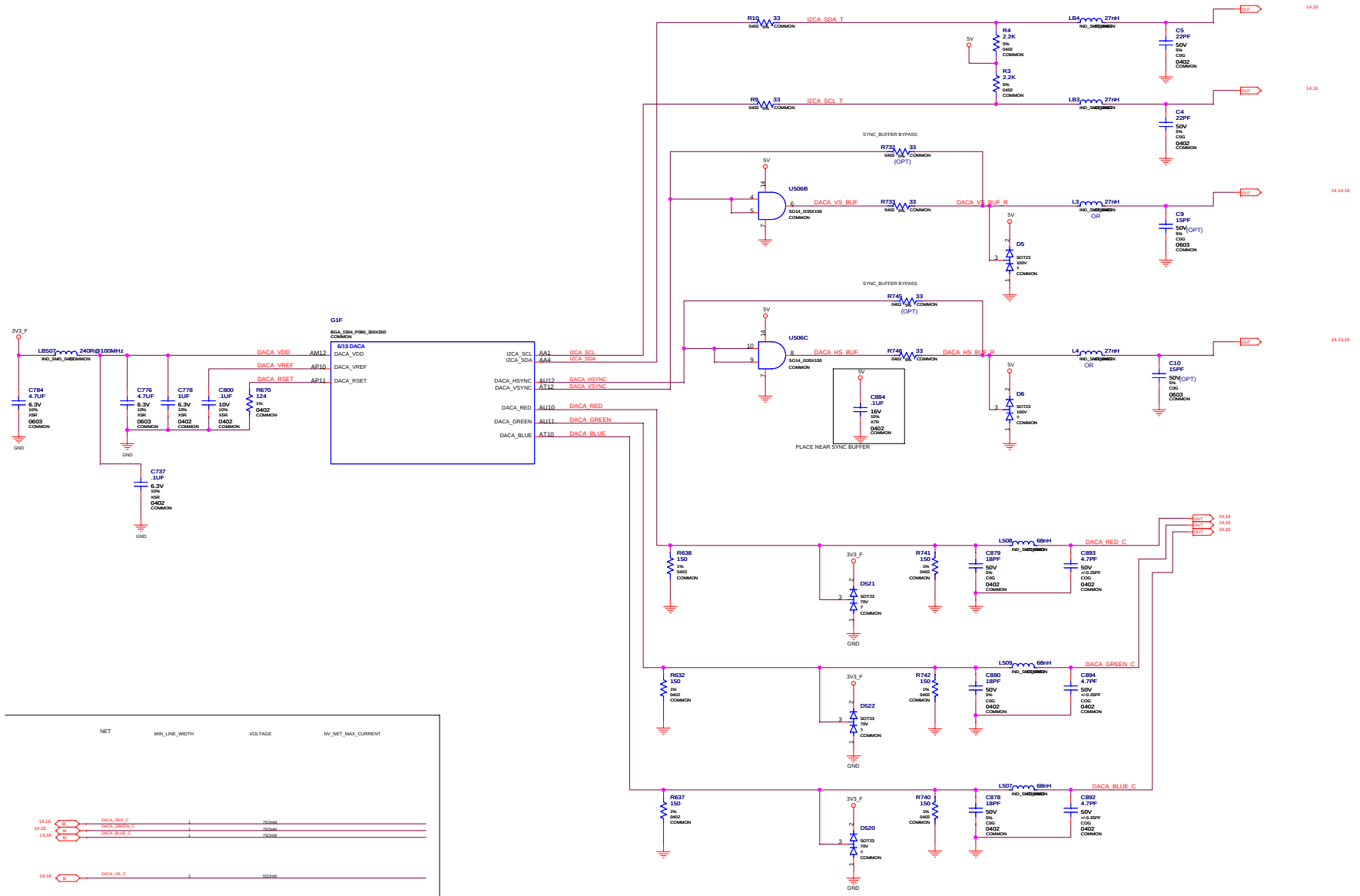
Page14: DACA Interface

DACA RGB-FILTER



NET	MIN_LINE_WIDTH	VOLTAGE	NV_NET_MAX_CURRENT
DACA_RED_C	1	75OHM	
DACA_GREEN_C	1	75OHM	
DACA_BLUE_C	1	75OHM	
DACA_HS_C	2	50OHM	
DACA_VS_C	2	50OHM	

ASSEMBLY	P545 BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	DACA Interface

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Rev: <FevCode>	
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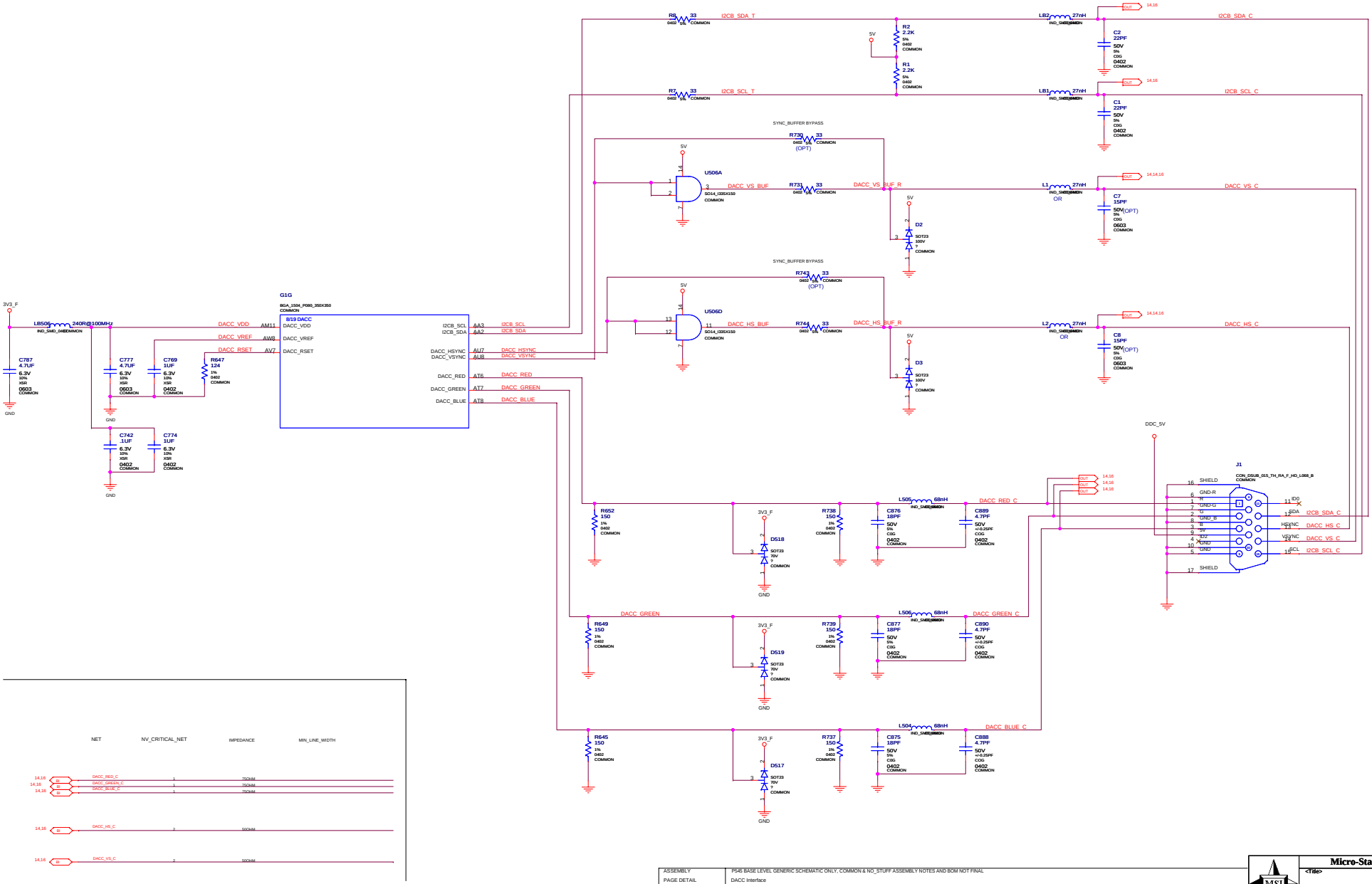
Page15: DACC Interface

DACC RGB-FILTER



NET	NV_CRITICAL_NET	IMPEDANCE	MIN_LINE_WIDTH
DACC_RED_C		75OHM	
DACC_GREEN_C		75OHM	
DACC_BLUE_C		75OHM	
DACC_HS_C		50OHM	
DACC_VS_C		50OHM	

ASSEMBLY: P545 BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL

PAGE DETAIL: DACC Interface

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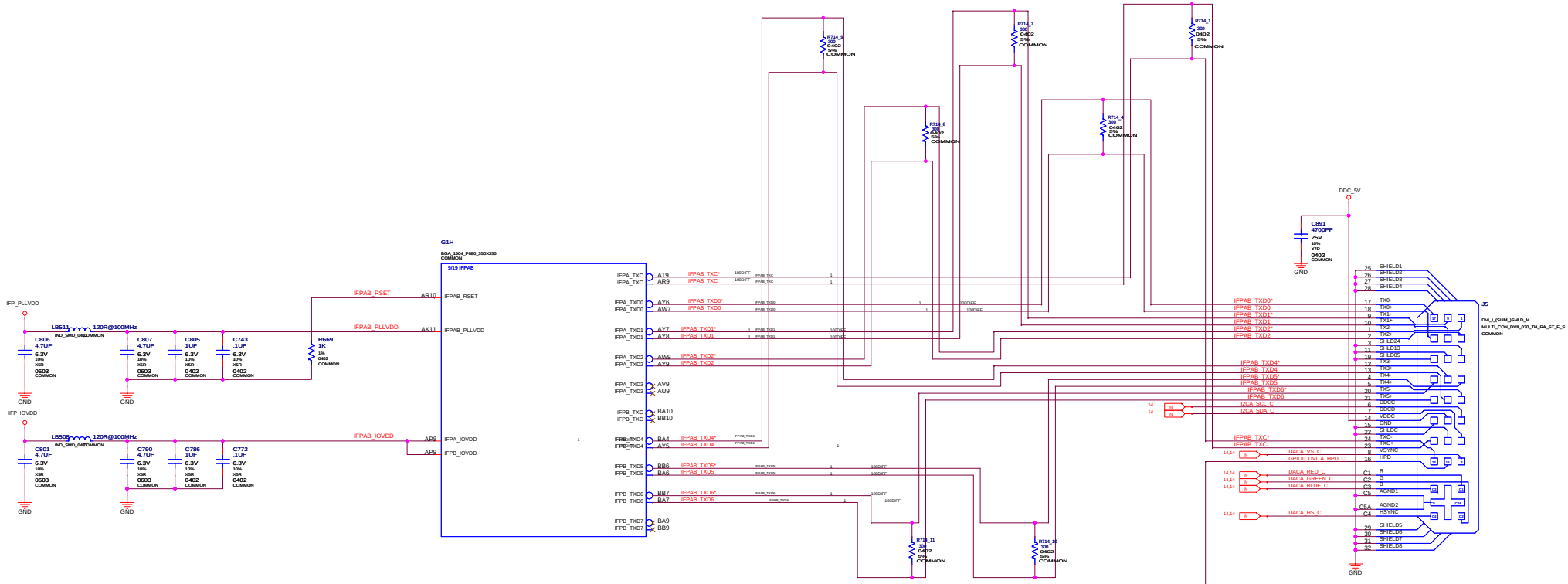
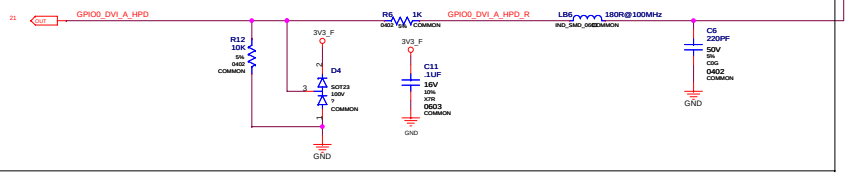
Page16: IFP A/B Interface -- DVI Connector South



DVIAB Hotplug Detection



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ASSEMBLY	P546 BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	IFP A/B Interface -- DVI Connector South

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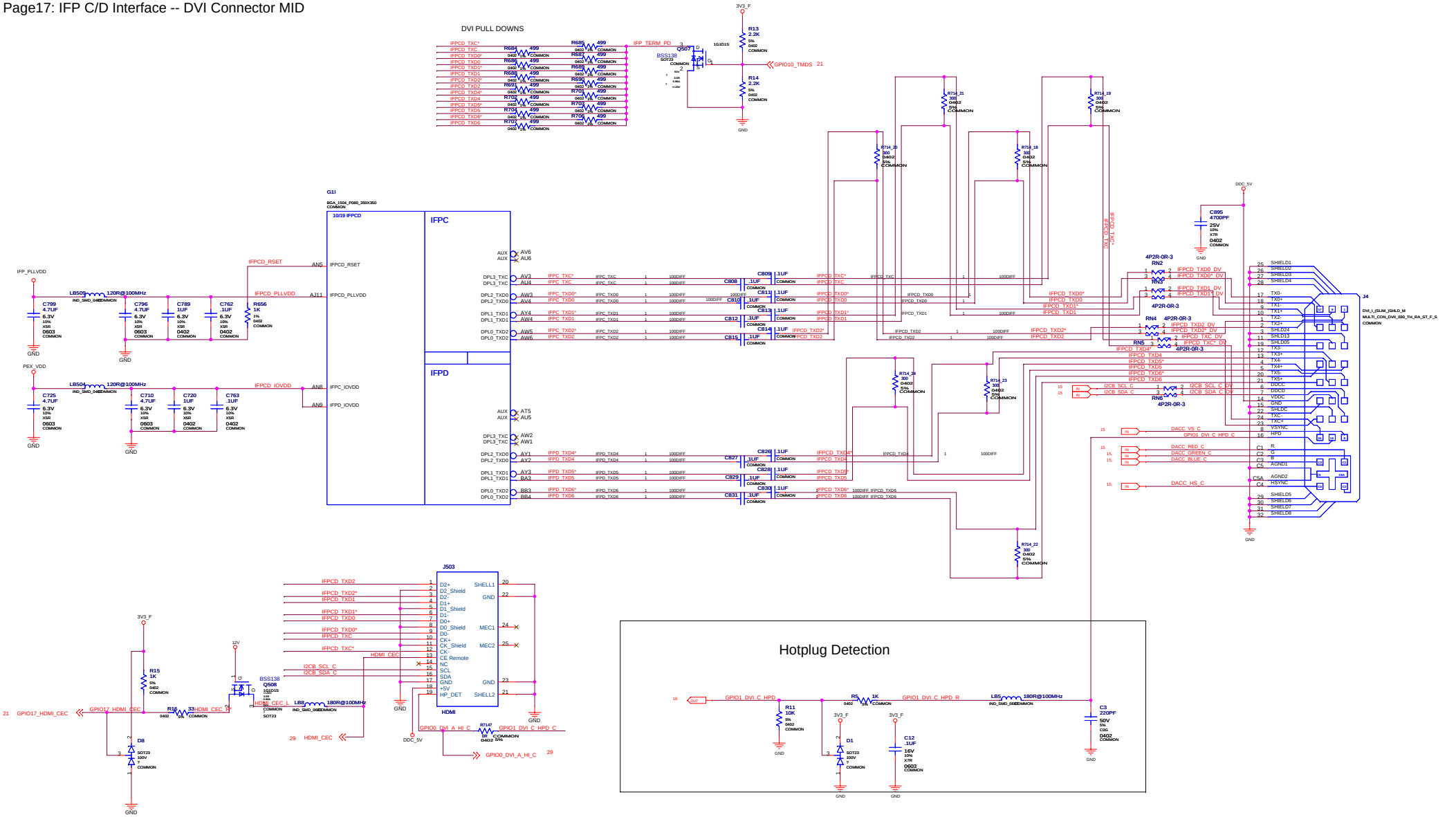
Page17: IFP C/D Interface -- DVI Connector MID



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PAGE DETAIL	IFP C/D Interface -- DVI Connector MID

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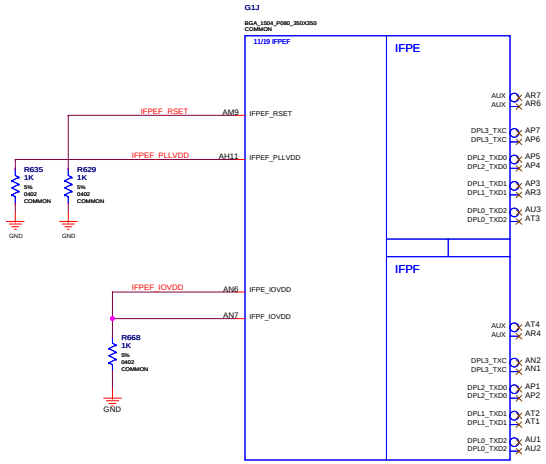
Page18: IFP E/F Interface -- Unused

TMDS E : Display Port



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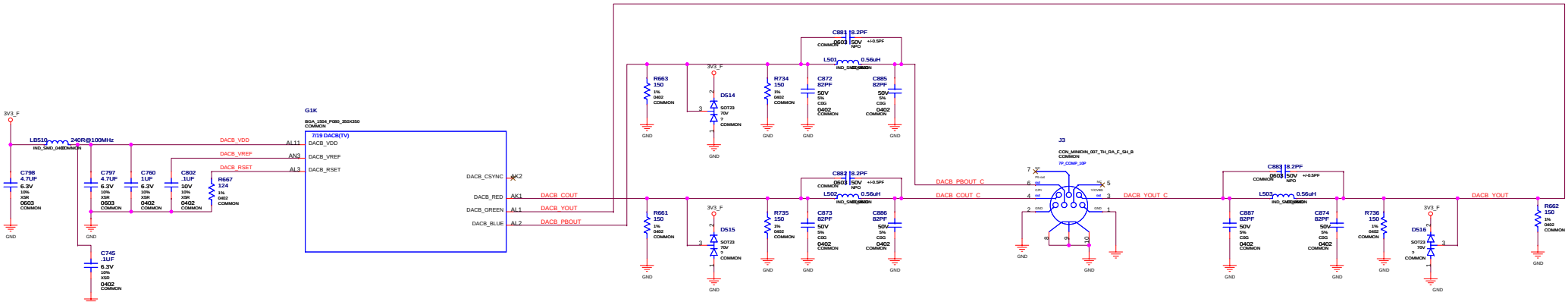
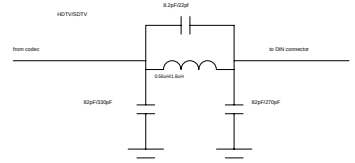
Page19: DACB and HDTV/SDTV-Out



FILTER CIRCUIT



ASSEMBLY	P545 BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	DACB and HDTV/SDTV-Out

Micro-Star International Co., LTD.

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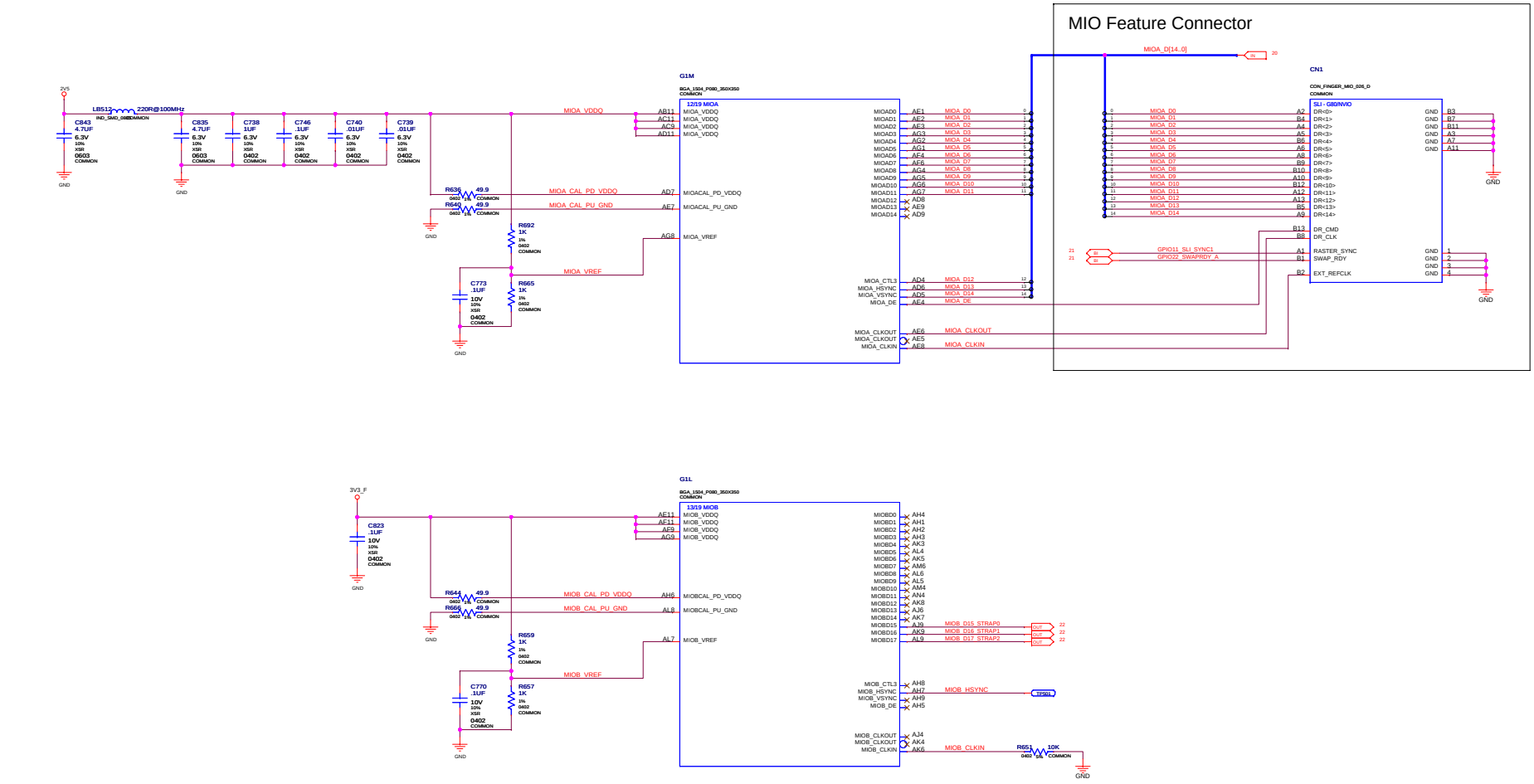
Page20: MIO A/B Interface



NET	NV_CRITICAL_NET	IMPEDANCE	DIFFPAIR
MIOA_D[14..0]	1	60ohm	

ASSEMBLY: P545 BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL

PAGE DETAIL: MIO A/B Interface

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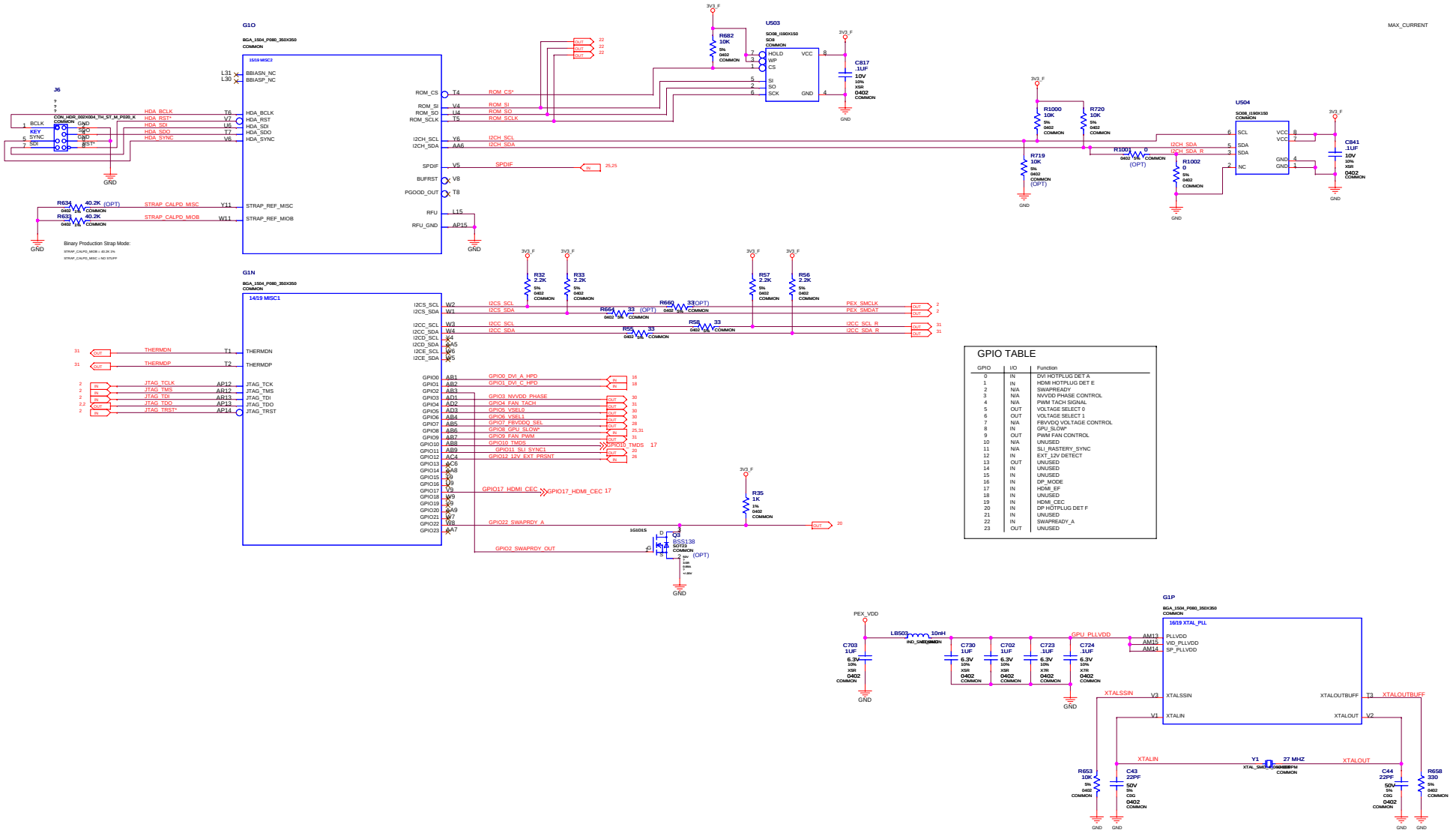
Page21: MISC: GPIO, I2C, ROM, HDCP, and XTAL



GPIO TABLE

GPIO	I/O	Function
0	IN	DVI HOTPLUG DET A
1	IN	HDMI HOTPLUG DET E
2	N/A	SWAPREADY
3	N/A	NVVDD PHASE CONTROL
4	N/A	PWM TACH SIGNAL
5	OUT	VOLTAGE SELECT 0
6	OUT	VOLTAGE SELECT 1
7	N/A	FBVVDQ VOLTAGE CONTROL
8	IN	GPU_SLOW*
9	OUT	PWM FAN CONTROL
10	N/A	UNUSED
11	N/A	SLI_RASTERY_SYNC
12	IN	EXT_12V DETECT
13	OUT	UNUSED
14	IN	UNUSED
15	IN	UNUSED
16	IN	DP_MODE
17	IN	HDMI_EF
18	IN	UNUSED
19	IN	HDMI_CEC
20	IN	DP HOTPLUG DET F
21	IN	UNUSED
22	IN	SWAPREADY_A
23	OUT	UNUSED

NV_IMPEDANCE DIFFPAIR

MAX_CURRENT MIN_WIDTH

ASSEMBLY	P545 BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	MISC: GPIO, I2C, ROM, HDCP, and XTAL

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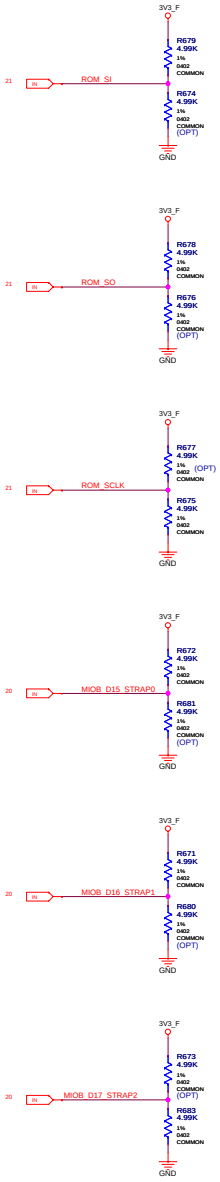
Page22: Strap Configuration



STRAP PIN	STRAP NAME
ROM_SI	PCI_DEVID_EXT

STRAP PIN	STRAP NAME
ROM_SO	SLOT_CLK_CFG

STRAP PIN	STRAP NAME
ROM_SCLK	PCI_DEVID[3]

STRAP PIN	STRAP NAME
STRAP0	RAMCFG0
STRAP1	RAMCFG1
STRAP2	RAMCFG2

* RAMCFG[2:0]

256MB (8Mx32)	512MB (16Mx32)	1024MB (32Mx32)
101 --- 256-bit Qimonda 110 --- 256-bit Hynix 111 --- 256-bit Samsung	001 --- 256-bit Qimonda 010 --- 256-bit Hynix 011 --- 256-bit Samsung	101 --- 256-bit Hynix 110 --- 256-bit Hynix 111 --- 256-bit Samsung

* VBIOS will be defined on a per SKU basis.

	3V3	GND
5K	1	0

G1Q

BGA_1504_P080_35DX35D
COMMON

MIS9 NC

NC

ASSEMBLY	P545 BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	Strap Configuration

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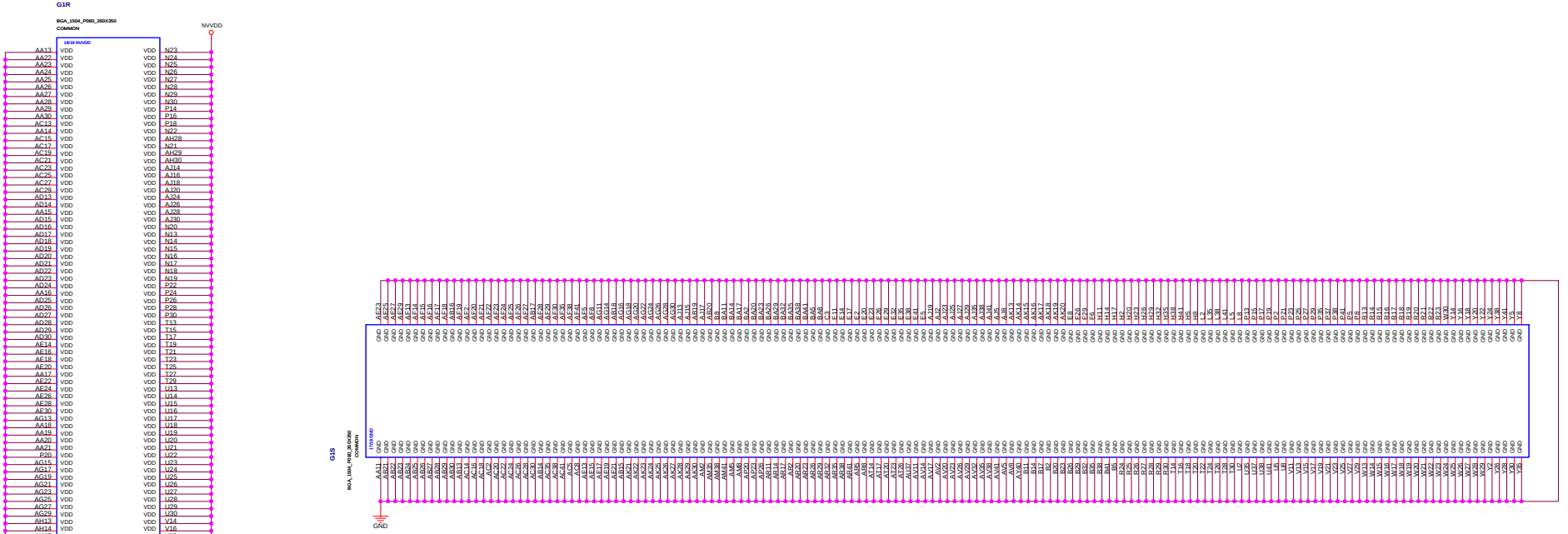
Page23: PWR and GND Signals



ASSEMBLY	P545 BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	PWR and GND Signals

Micro-Star International Co., LTD.

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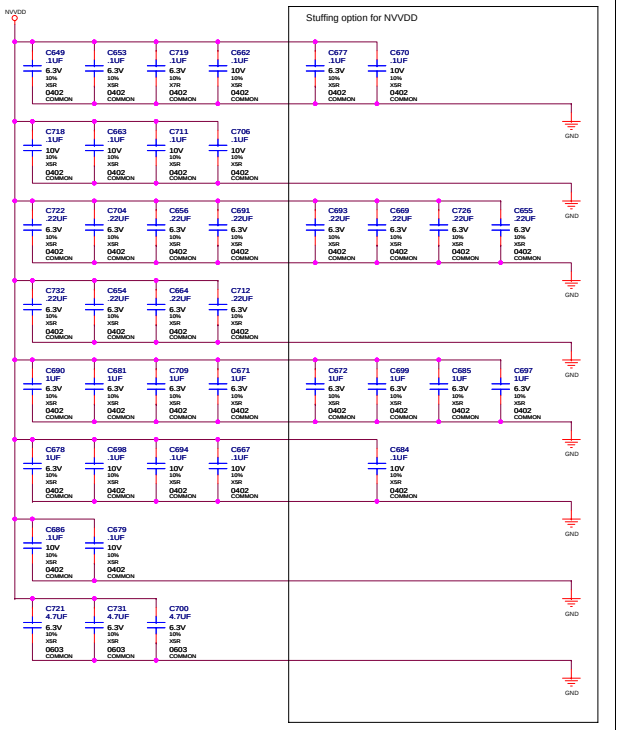
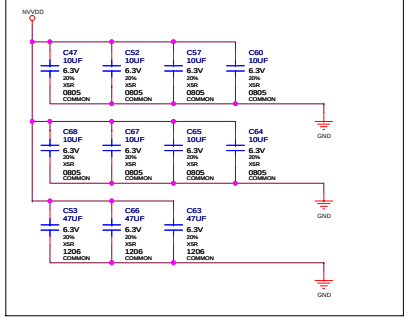
Page24: NVVDD and FBVDDQ Decoupling

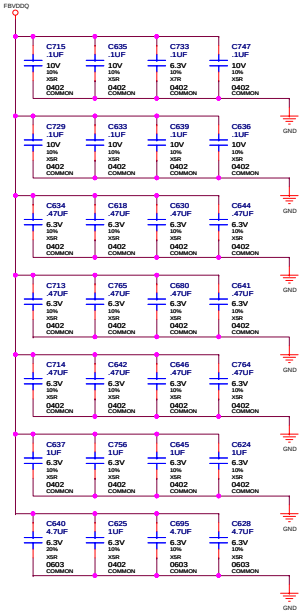
NVVDD
Place under GPU



NVVDD
Place close to GPU



FBVDDQ
Place near BGA



ASSEMBLY	P545 BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	NVVDD and FBVDDQ Decoupling

Micro-Star International Co., LTD.

<Title>

Size	Document Number	Rev
Custom	<Doc>	<FevCode>

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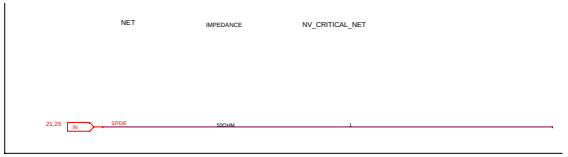
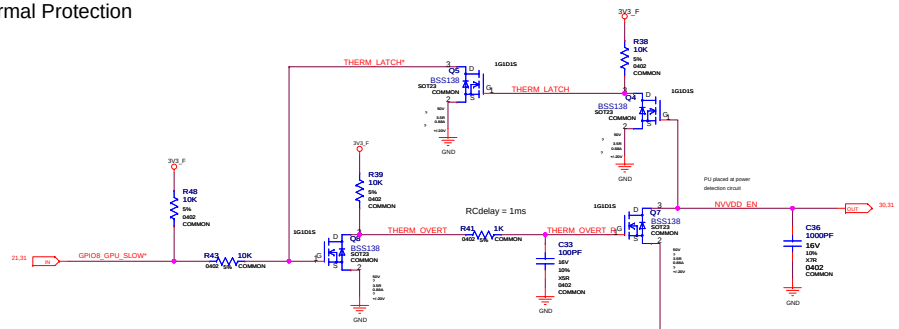
Page25: SPDIF Input, Thermal Protection, and IFP_IOVDD Power Supply

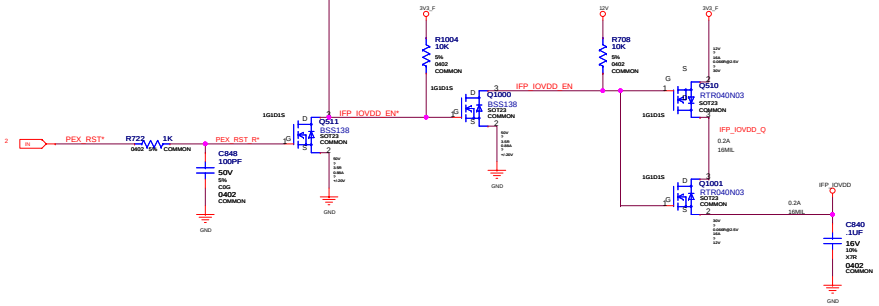


Thermal Protection

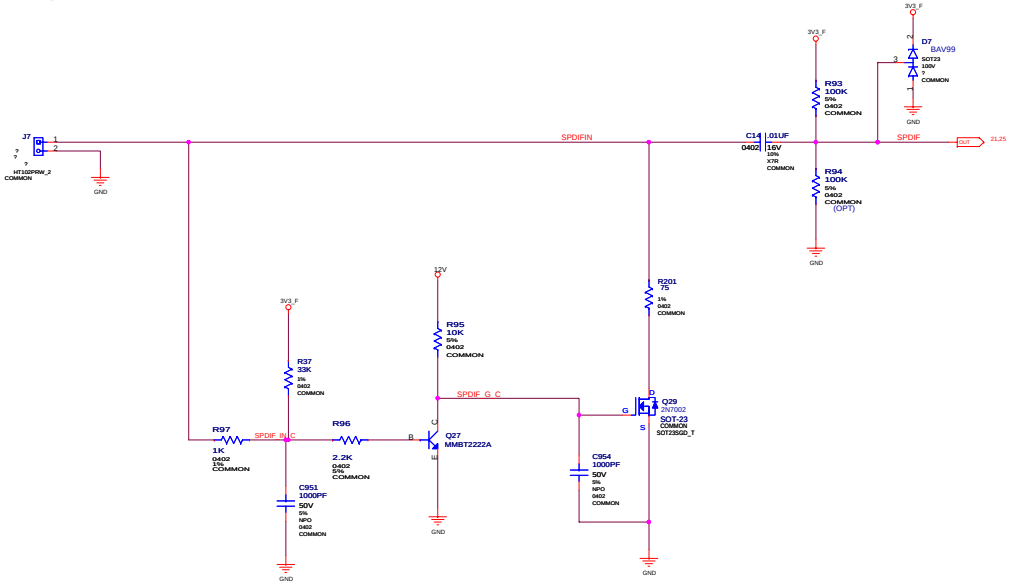


IFP_IOVDD Backdrive Prevention

Stuffing posibilities for thermal control and protection:



SPDIF Input



ASSEMBLY	P545 BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	SPDIF Input, Backdrive Protection, and IFP_IOVDD Power Supply

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<Title>			
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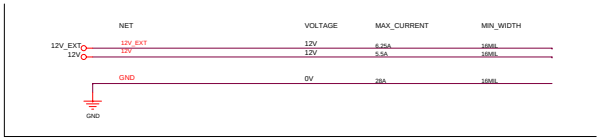
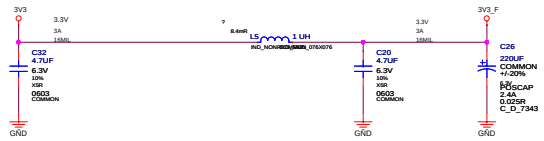
Page26: PS I: 3V3, 12V, and 12V_EXT Power Supply Filter



3V3 Power Supply Filter

3V3_F = 3.3V @ 2.5A



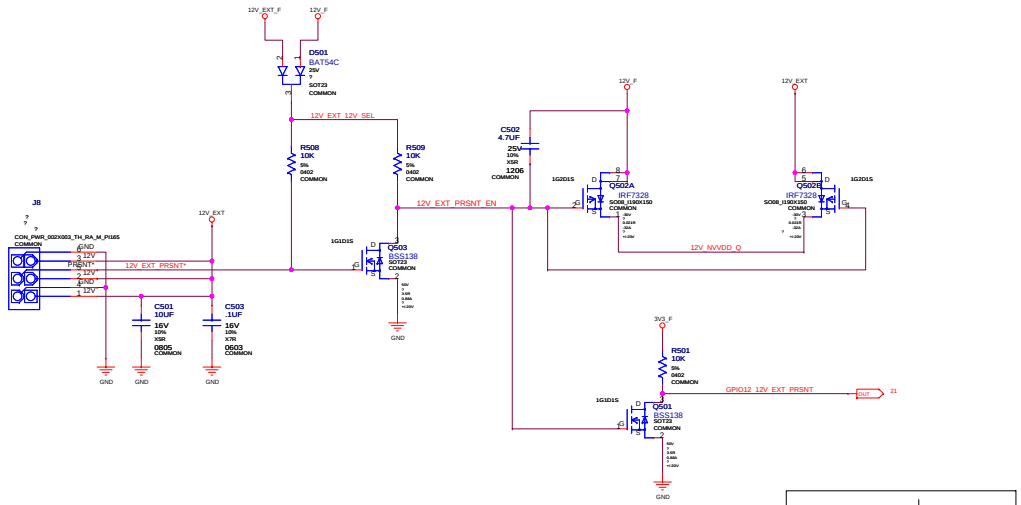
12V Power Supply Filter

12V_F = 12V @ 5.5A

12V_EXT Power Supply Filter

12V_EXT_F = 12V @ 6.25A

INPUT POWER SELECTION for NVVDD



	GPIO12
EMERENCY MODE (12V_EXT present)	0
150W POWER MODE (12V_EXT NOT present)	1

ASSEMBLY	P545 BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	PS I: 3V3, 12V, and 12V_EXT Power Supply Filter

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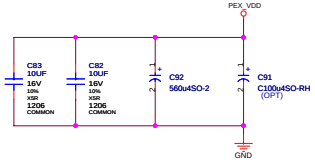
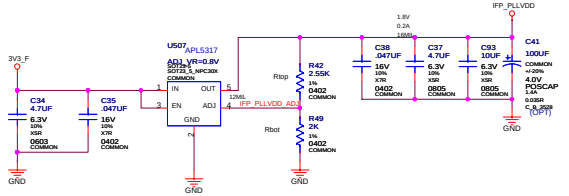
Page27: PS II: IFP_PLLVDD, 2V5, 5V, and DDC_5V Power Supply



IFP_PLLVDD Power Supply

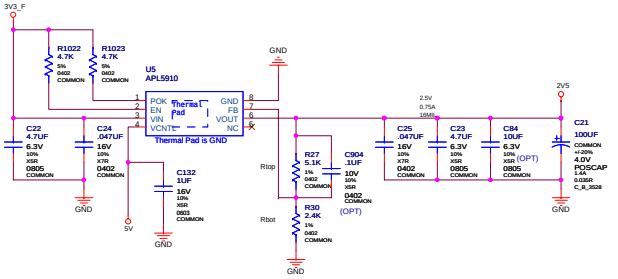
IFP_PLLVDD = 1.8V @ 200mA



IFP_PLLVDD = VREF * (1 + (Rtop / Rbot))
1.82V = 0.8V * (1 + (2.5K/2K))

2V5 Power Supply

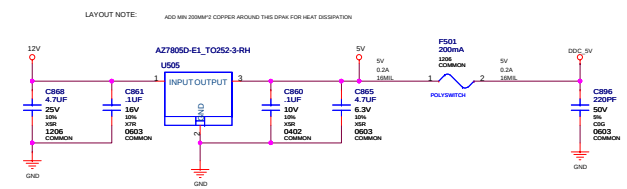
2V5 = 2.5V @ 750mA



2V5 = VREF * (1 + (Rtop / Rbot))
2.5V = 0.8V * (1 + (5.1K/2.4K))

5V and DDC_5V Power Supply

DDC_5V = 5V @ 200mA



ASSEMBLY	P545 BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	PS II: PEX_VDD, IFP_PLLVDD, 2V5, 5V, and DDC_5V Power Supply

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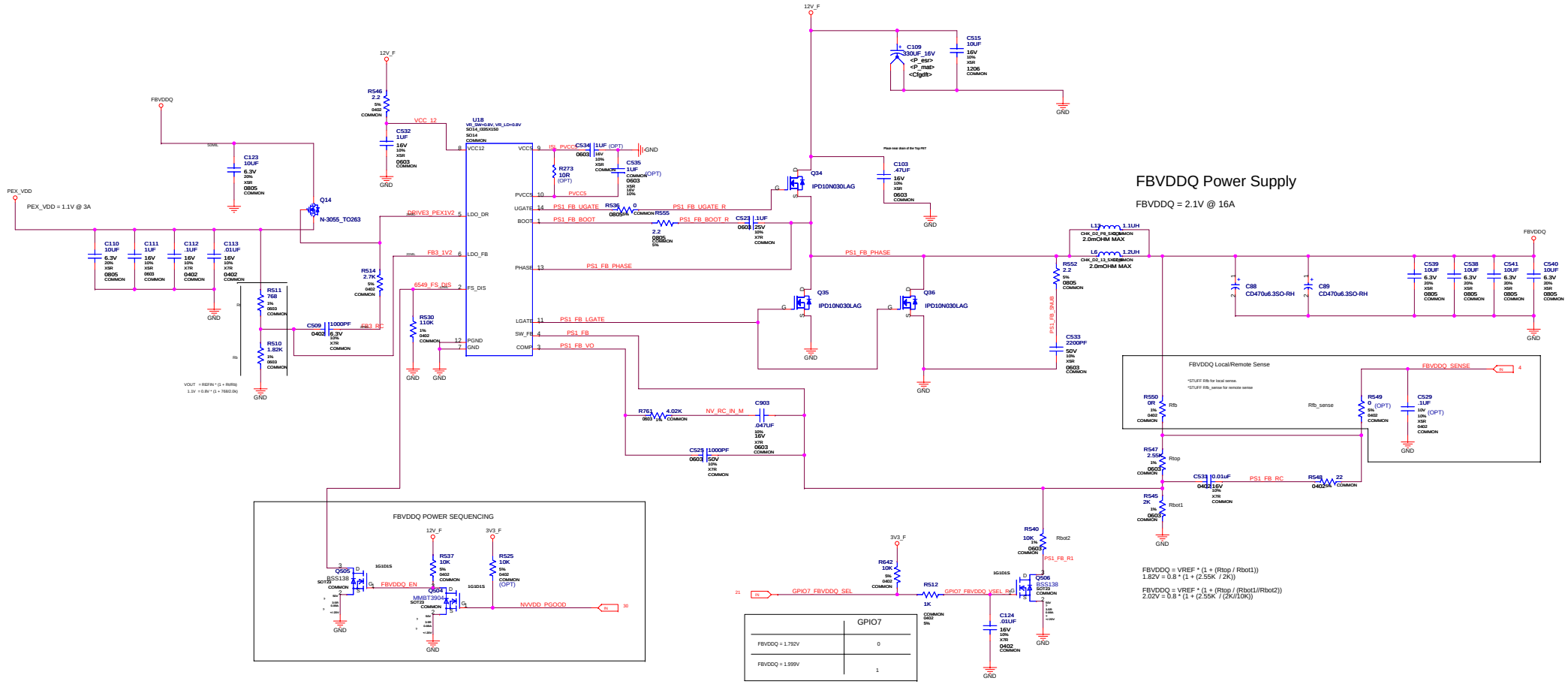
Page28: PS III: FBVDDQ Power Supply



ASSEMBLY	PS4S BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	PS III: FBVDDQ Power Supply

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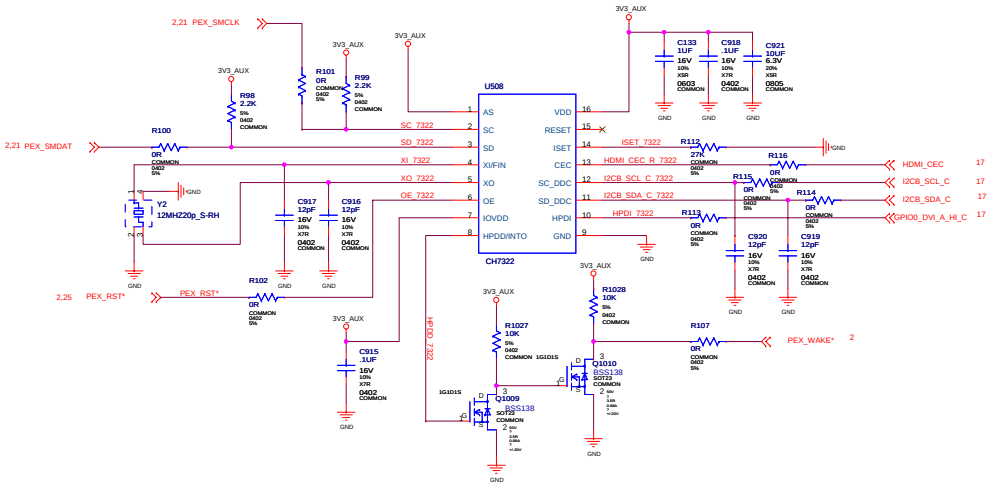
Page29: PS IV: NVVDD VID Control



NVVDD Voltage Select

NVVDD range 0.80V-1.40V

Regulator: ADP3208
Control via NV_GPIOs NV_VSEL[1..0]

VID							NVVDD	
6	5	4	3	2	1	0	Vout	G94
0	1	1	0	1	0	0	0.80V	
0	1	1	0	1	0	1	0.85V	
0	1	1	0	0	0	0	0.90V	
0	1	0	1	1	0	0	0.95V	
0	1	0	1	0	0	0	1.00V	=> Default
0	1	0	0	1	0	0	1.05V	=> Voltage1
0	1	0	0	0	0	0	1.10V	=> Voltage2
0	0	1	1	1	0	0	1.15V	
0	0	1	1	0	0	0	1.20V	
0	0	1	0	1	0	0	1.25V	
0	0	1	0	0	0	0	1.30V	
0	0	0	1	1	0	0	1.35V	
0	0	0	1	0	0	0	1.40V	

ASSEMBLY: PS4S BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL: PS IV: NVVDD VID Control

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Page30: PS V: NVVDD Power Supply

GPIO6	GPIO5	NVVDD
1	0	1.1V
0	1	1.05V
0	0	1.0V

NET	VOLTAGE	MAX_CURRENT	MIN_WIDTH

NVVDD Power Supply

NVVDD = 0.9-1.2V @ 40-50A

NVVDD Sequence

	GPIO3
2-PHASE CONFIG	0
1-PHASE CONFIG	1

ASSEMBLY	P545 BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	PS V: NVVDD Power Supply

Micro-Star International Co., LTD.

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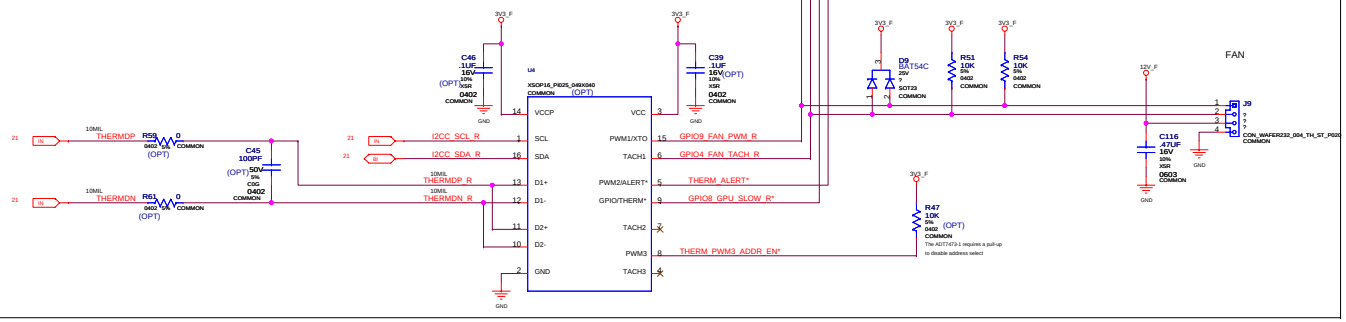
Page31: Thermal Diode and Fan Control

ADT7473 External Fan/Thermal Control



ASSEMBLY	P545 BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	Thermal Diode and Fan Control

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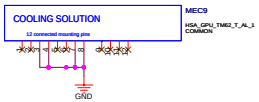
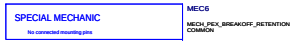
Page32: Thermal, Mechanical, and Bracket

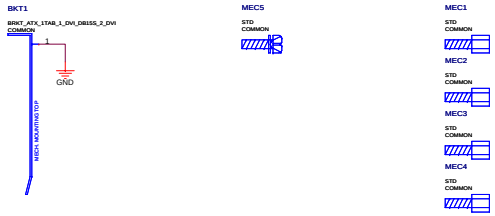
Thermal

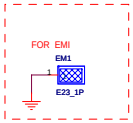


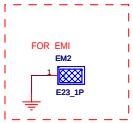
Mechanical

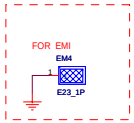


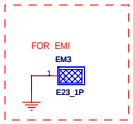
Bracket

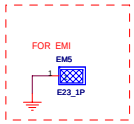


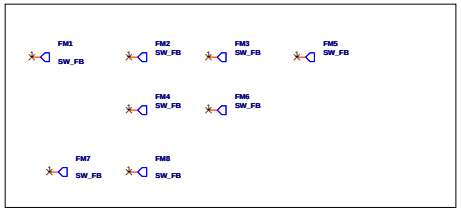


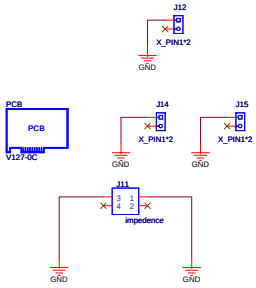












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ASSEMBLY	P545 BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	Thermal, Mechanical, and Bracket

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