MS-V041 VER 0A

NV43-PCIE NV43 128MB/64bit, BGA 16MX16 DDR2,VGA,DVI-I,TV-OUT(HT-10)

P295-A00 DESIGN NV43 300/267MHZ 128MB/256MB/512MB DDR2 84-FBGA

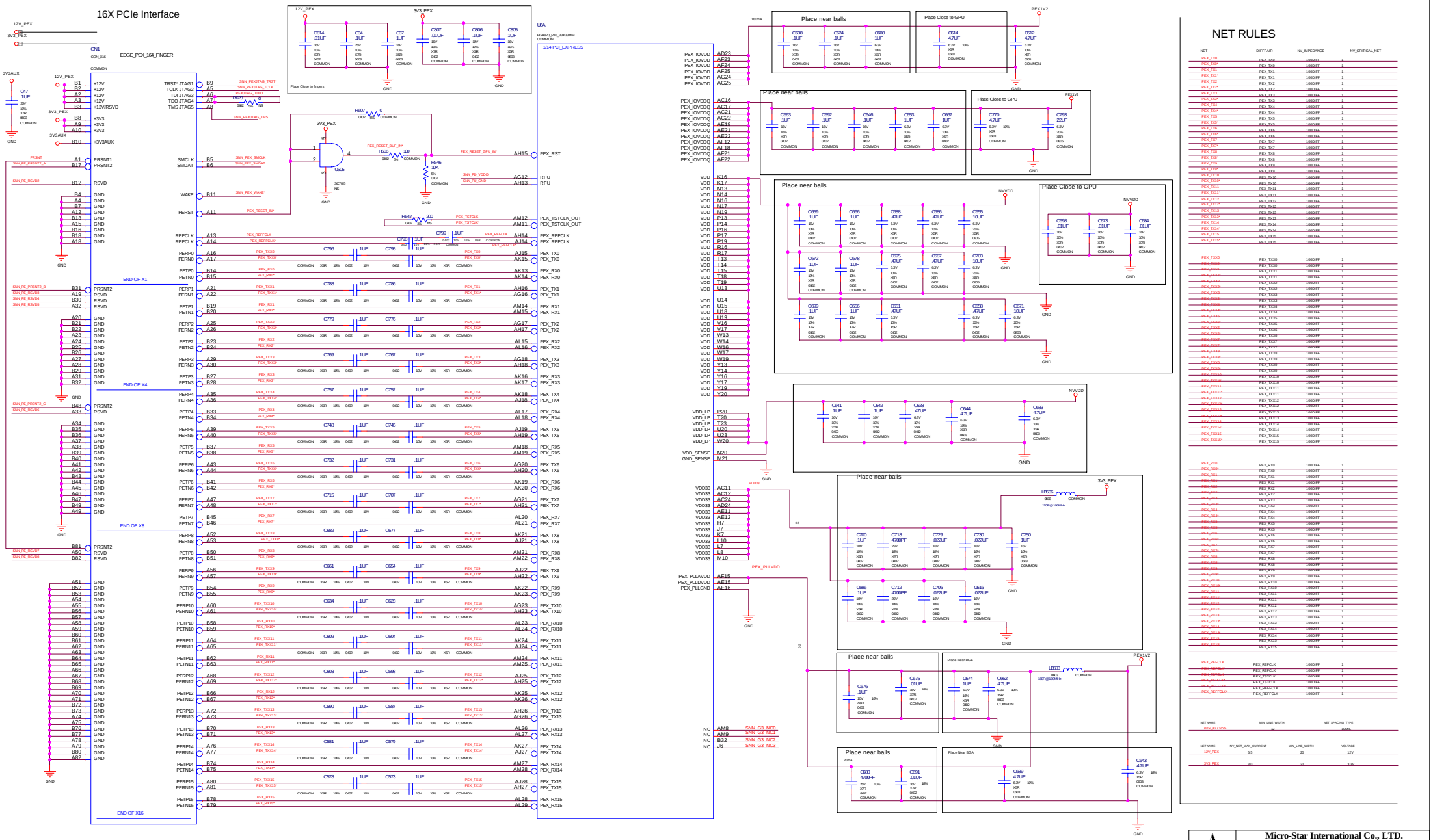
PAGE SUMMARY:

REV HISTORY

A00
-08/04/2005:

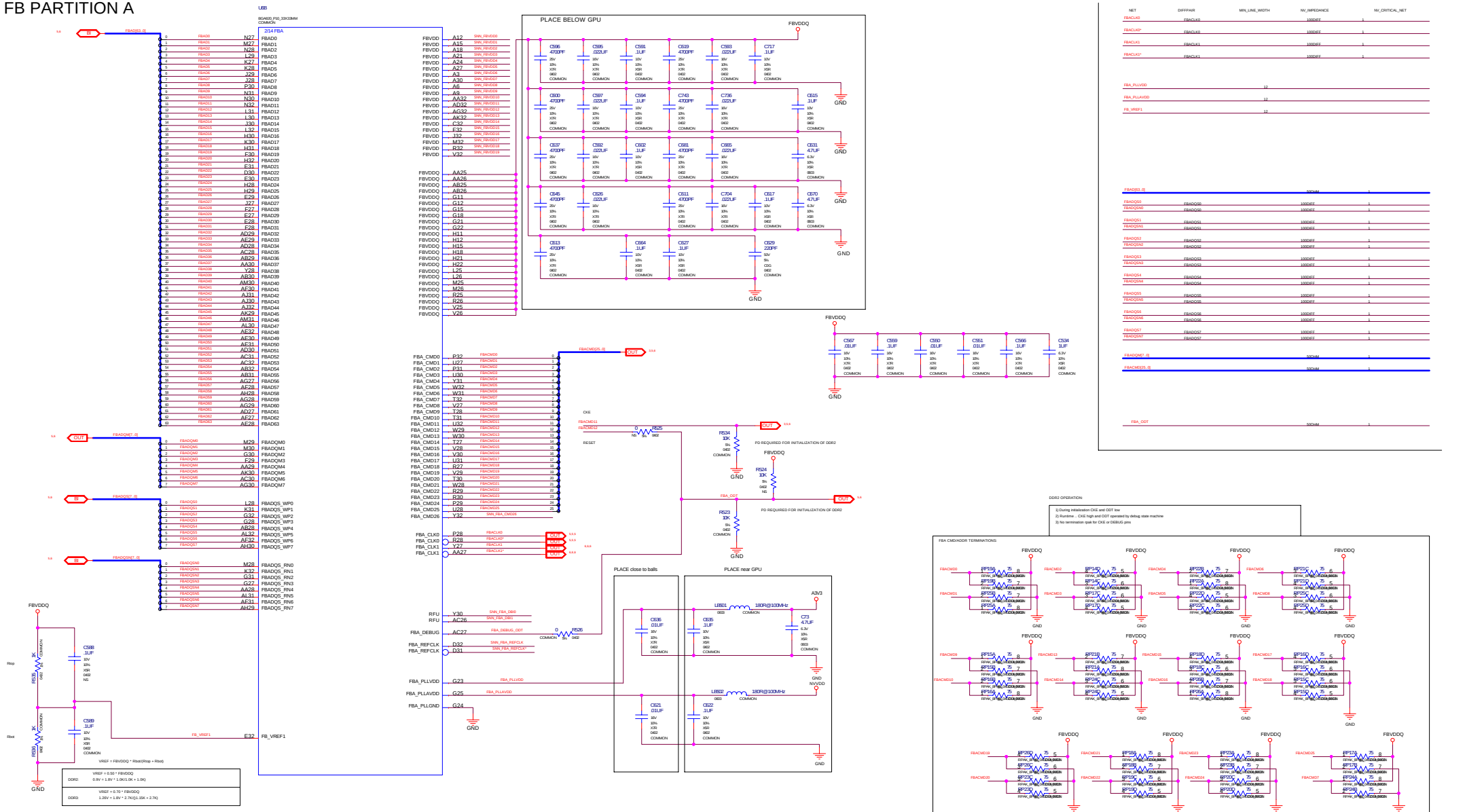
BOM	VARIANT	NVPN	ASSEMBLY
B	BASE	602-10295-BASE-SCH	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
1	SKU000	602-10295-0000-000	GF-6600-A04 GEN 300/267MHZ 256MB 84-FBGA DDR2 16MX16 VGA+DVI-I+HDTV
2	SKU001	602-10295-0001-000	GF-6600-A04 GEN 300/267MHZ 128MB 84-FBGA DDR2 8MX16 VGA+DVI-I+HDTV
3	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
4	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
5	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
6	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
7	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
8	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
9	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
10	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
11	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
12	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
13	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
14	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
15	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>

02 PCI EXPRESS, NVVDD, VDD33



03 FB BANK A, FBVDDQ DECOUPLING

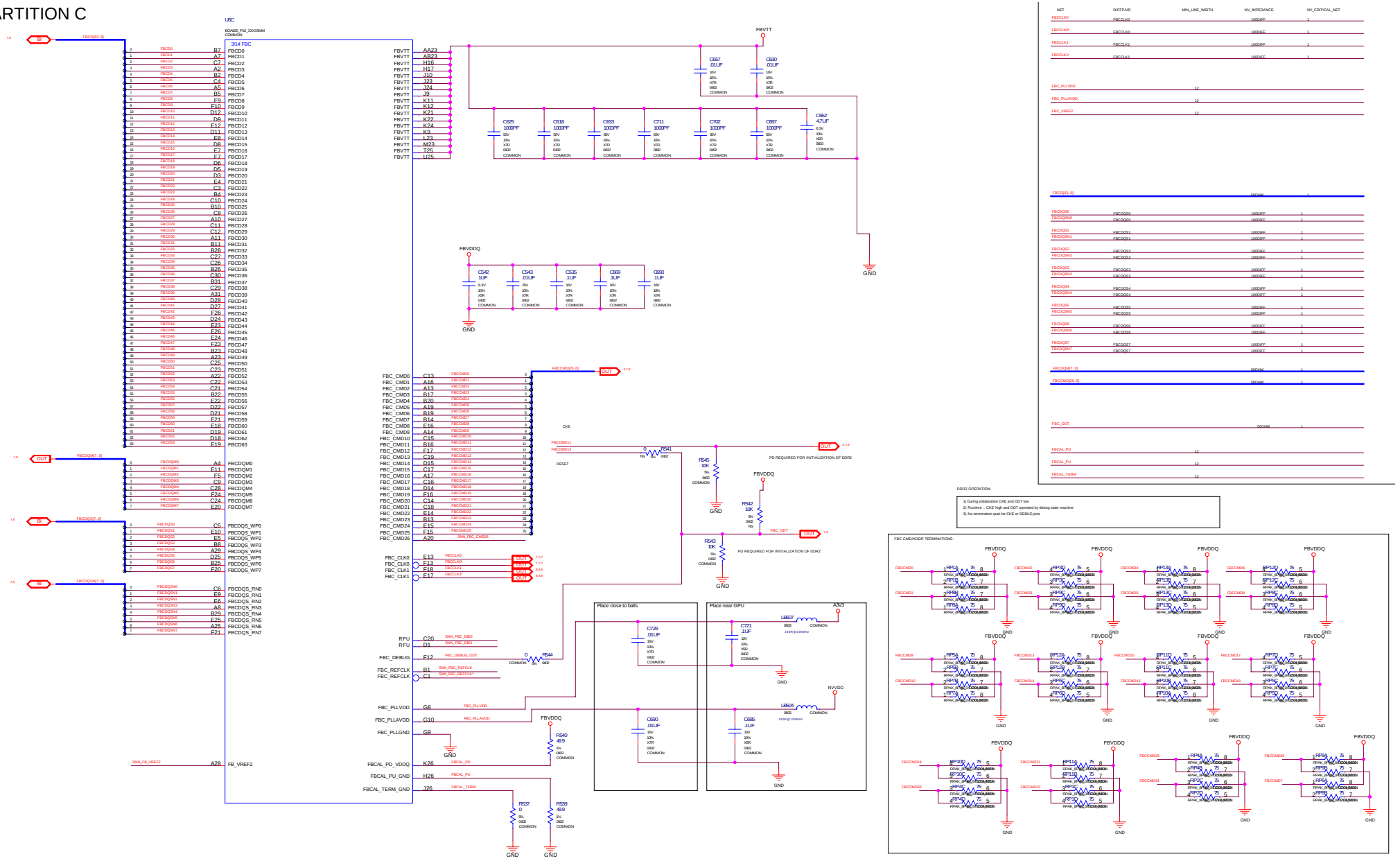
FB PARTITION A



Micro-Star International Co., LTD.			
MS-V041			
Size: Custom	Document Number: FB BANK A,FBVDDQ DECOUPLING		Rev: 0A
Date: Wednesday, August 24, 2005	Sheet 3 of 19		

04 FB BANK C, FBVTT TERMINATIONS

FB PARTITION C

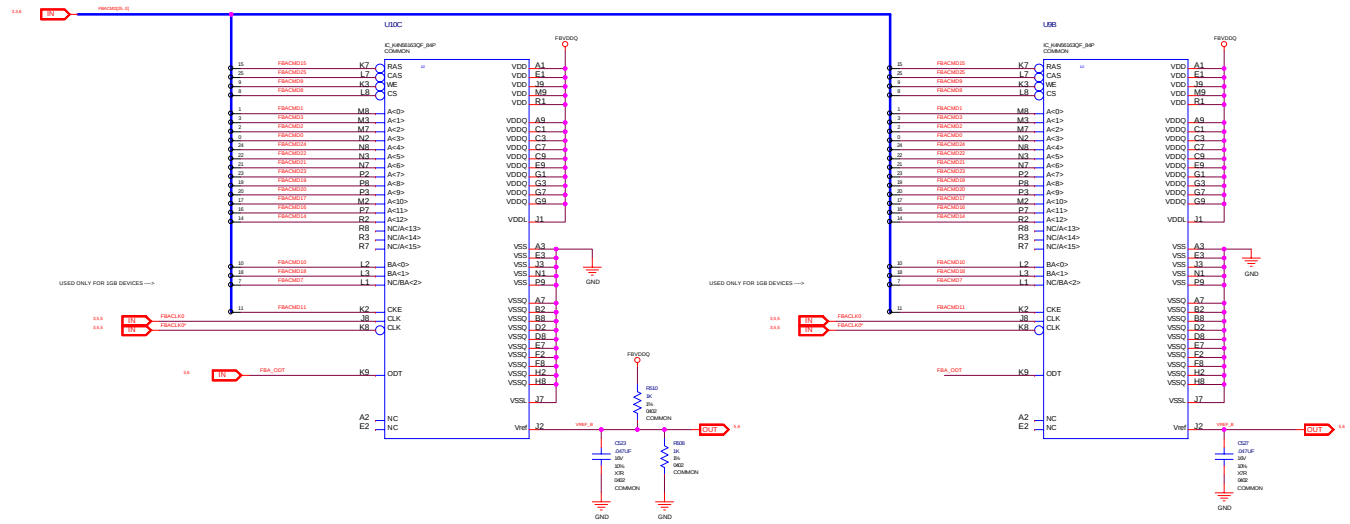


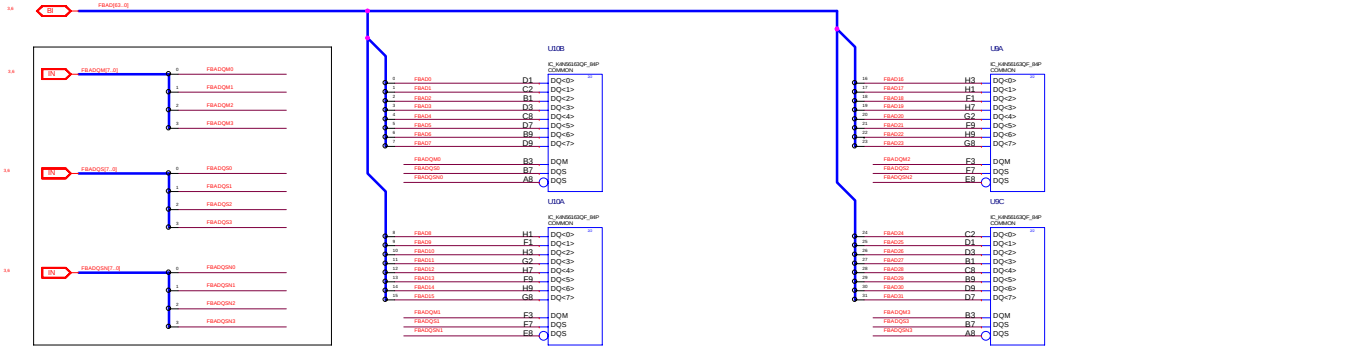
Micro-Star International Co., LTD.	
MS-V041	
Size: Custom	Document Number: FB BANK C, FBVTT TERMINATIONS
Rev: 0A	
Date: Wednesday, August 24, 2005	Sheet 4 of 19

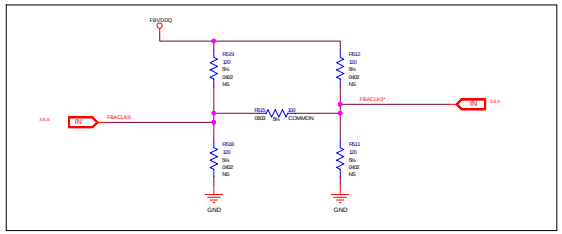
05 MEMORY PARTITION A 0..31

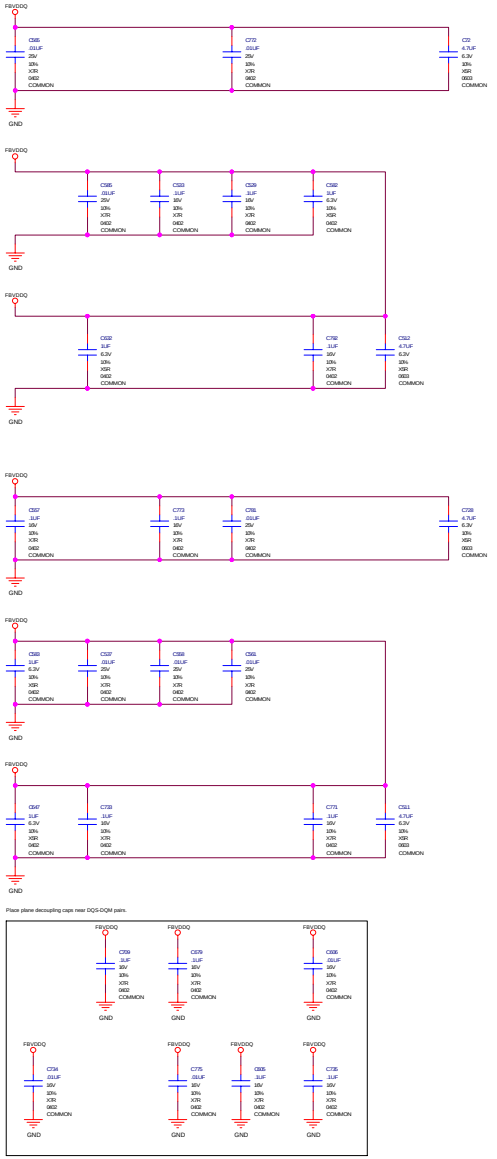
FBA MEMORY 1st bank 0..31

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY







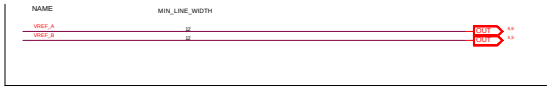


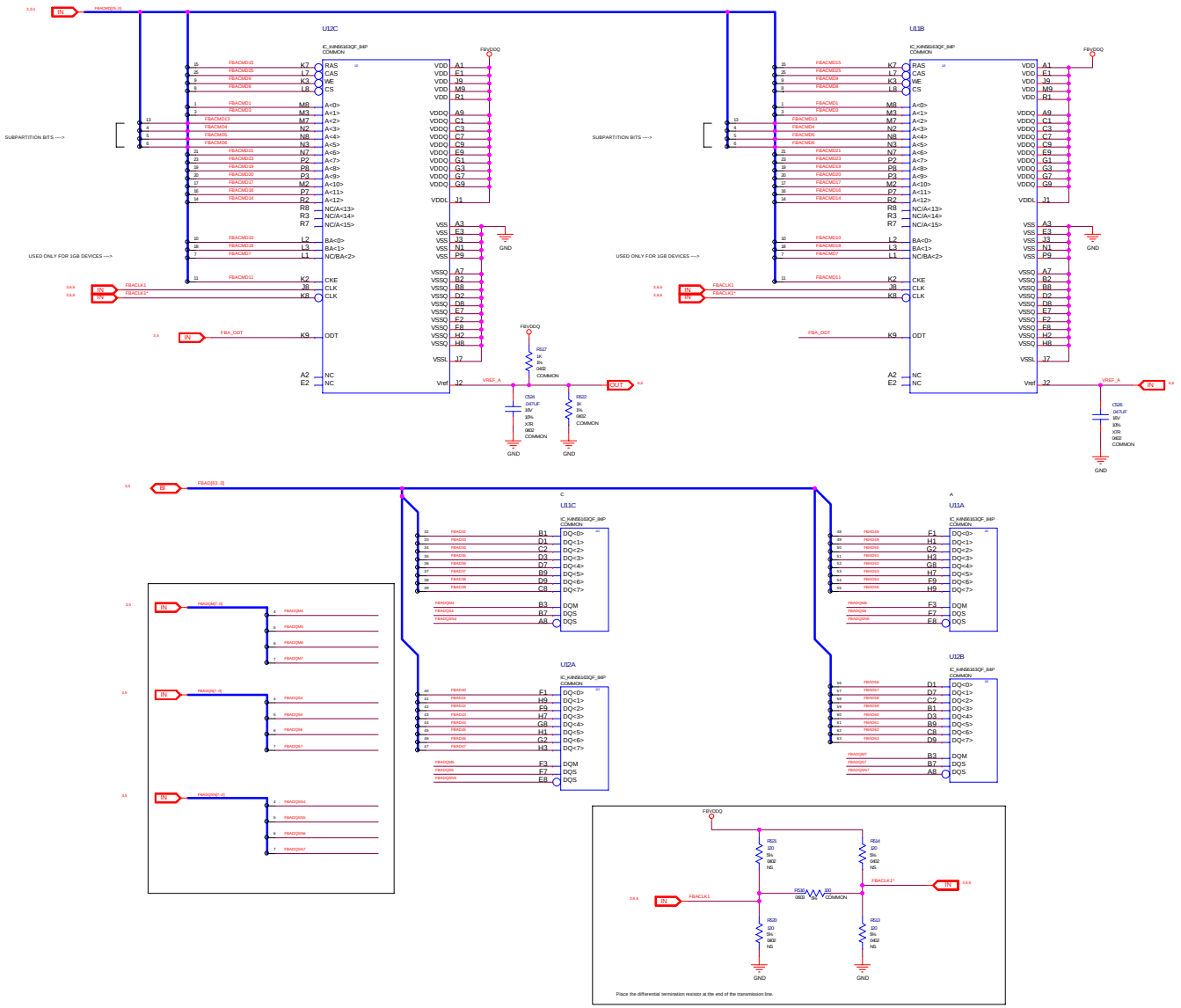
Micro-Star International Co., LTD.		
MS-V041		
Size: Custom	Document Number: MEMORY PARTITION A 0..31	Rev: 0A
Date: Wednesday, August 24, 2005	Sheet 5 of 19	

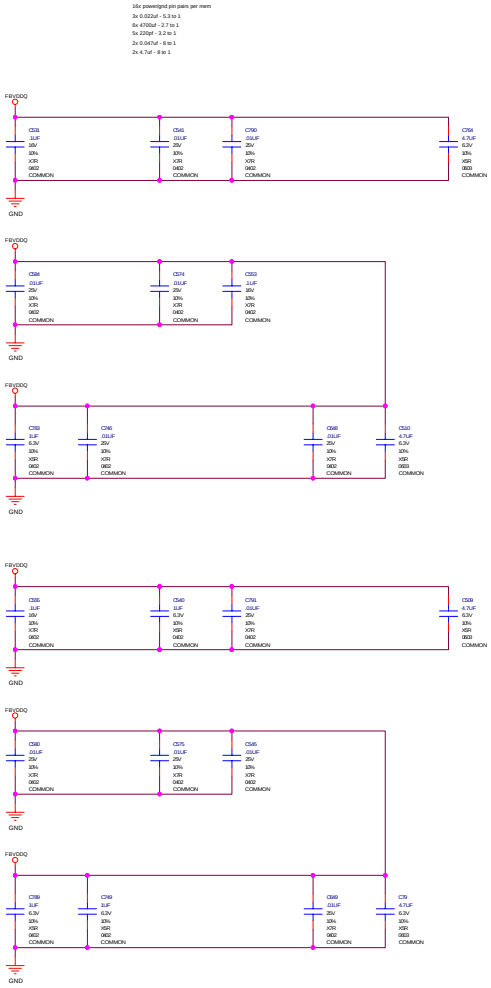
06 MEMORY PARTITION A 32..63

FBA MEMORY 1st bank 32..63

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY





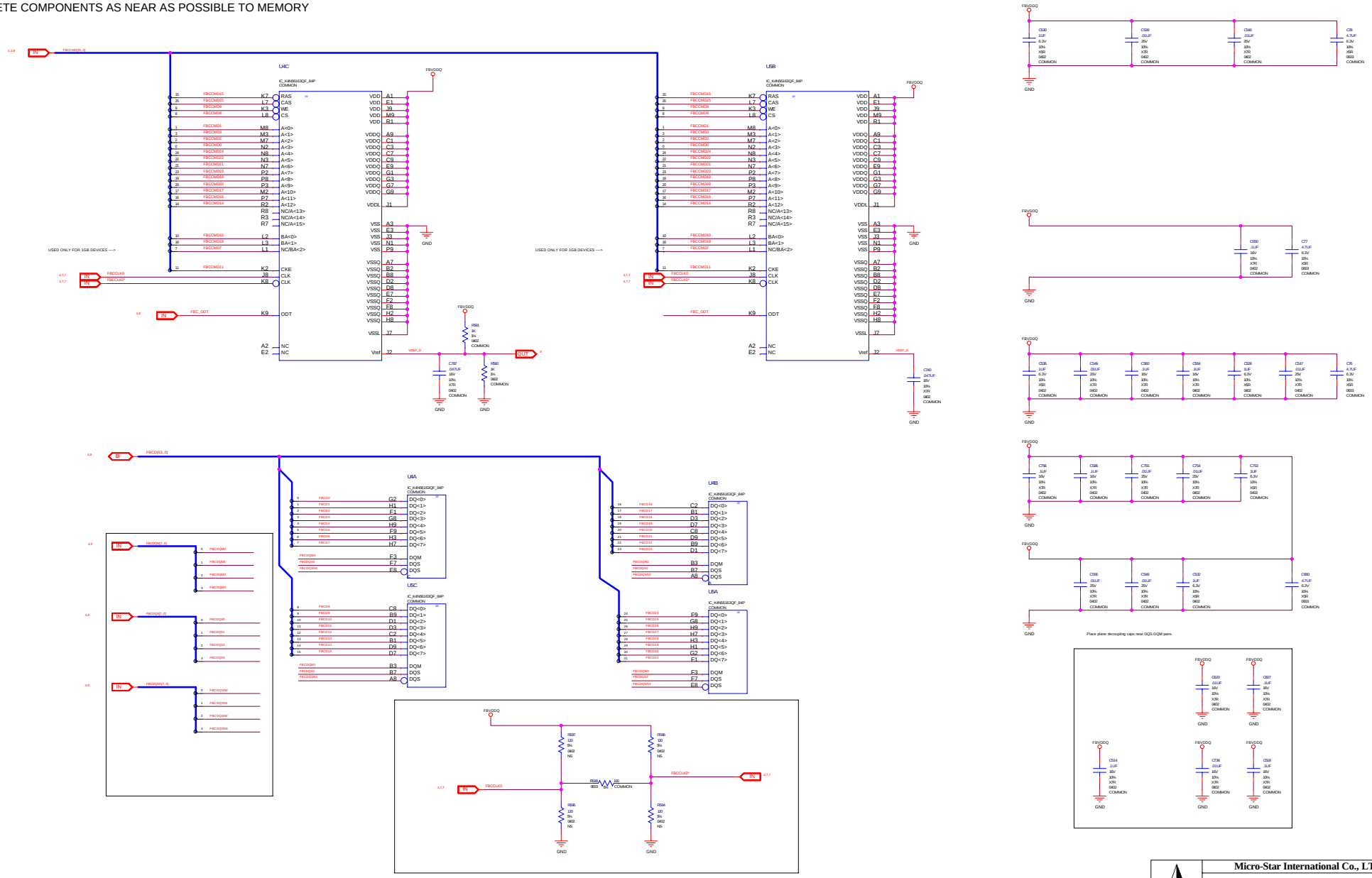


Micro-Star International Co., LTD.			
MS-V041			
Size: Custom	Document Number: MEMORY PARTITION A 32..63		Rev: 0A
Date: Wednesday, August 24, 2005	Sheet 6 of 19		

07 MEMORY PARTITION C 0..31

FBC MEMORY 2nd bank 0..31

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY

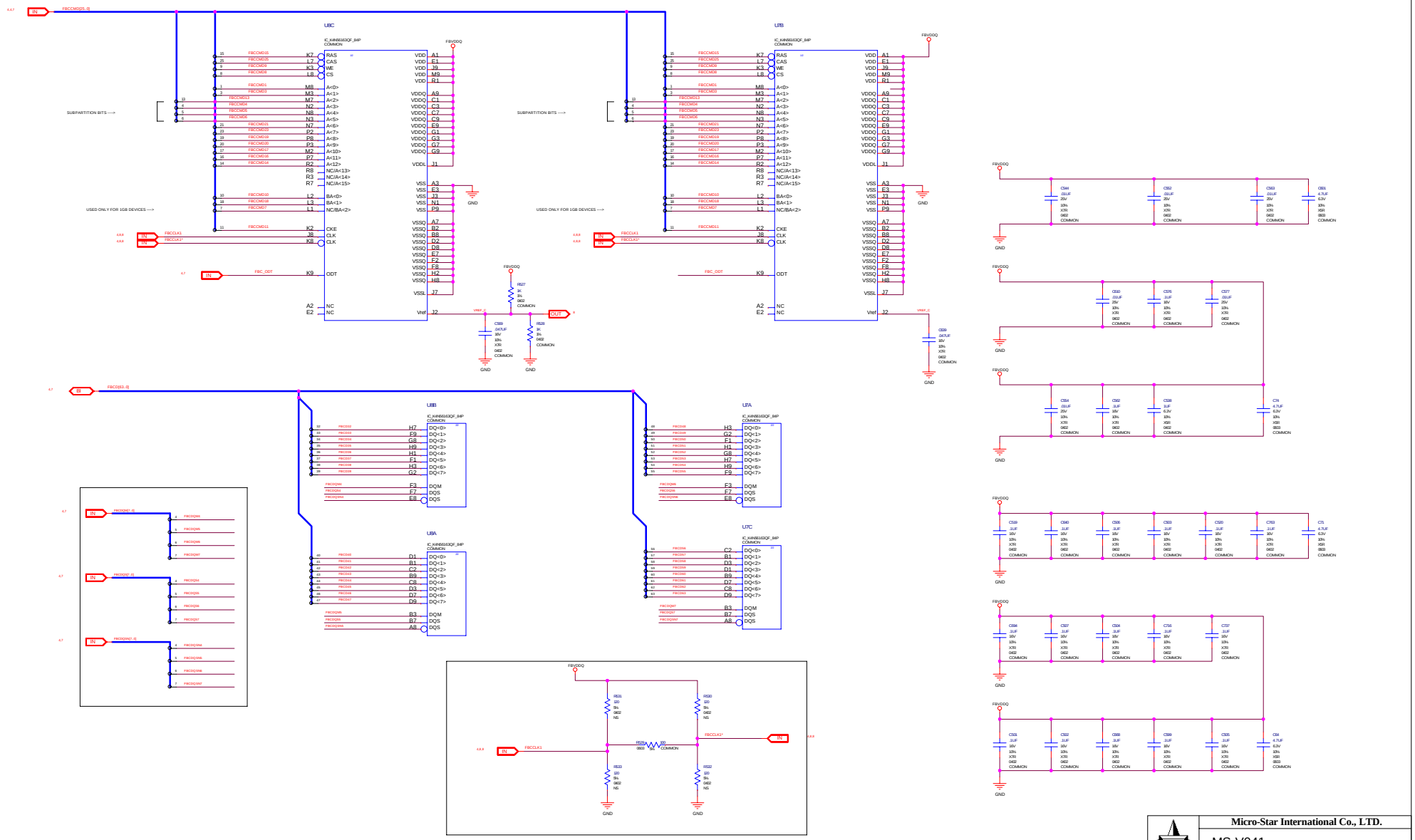


Micro-Star International Co., LTD.		
MS-V041		
Size: Custom	Document Number: MEMORY PARTITION C 0..31	Rev: 0A
Date: Wednesday, August 24, 2005	Sheet 7 of 19	

08 MEMORY PARTITION C 32..63

FBC MEMORY 2nd bank 32..63

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY



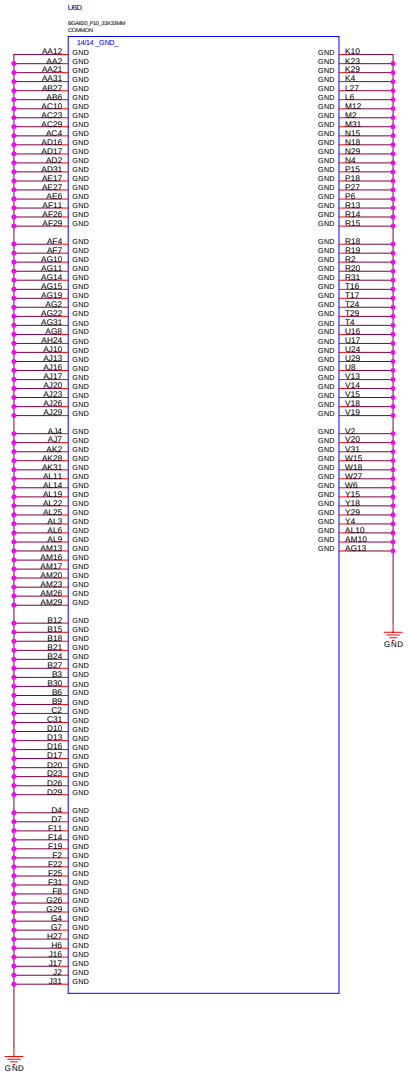
Micro-Star International Co., LTD.

MS-V041

Size: Custom | Document Number: MEMORY PARTITION C 32..63 | Rev: 0A

Date: Wednesday, August 24, 2005 | Sheet 8 of 19

09 GPU GND

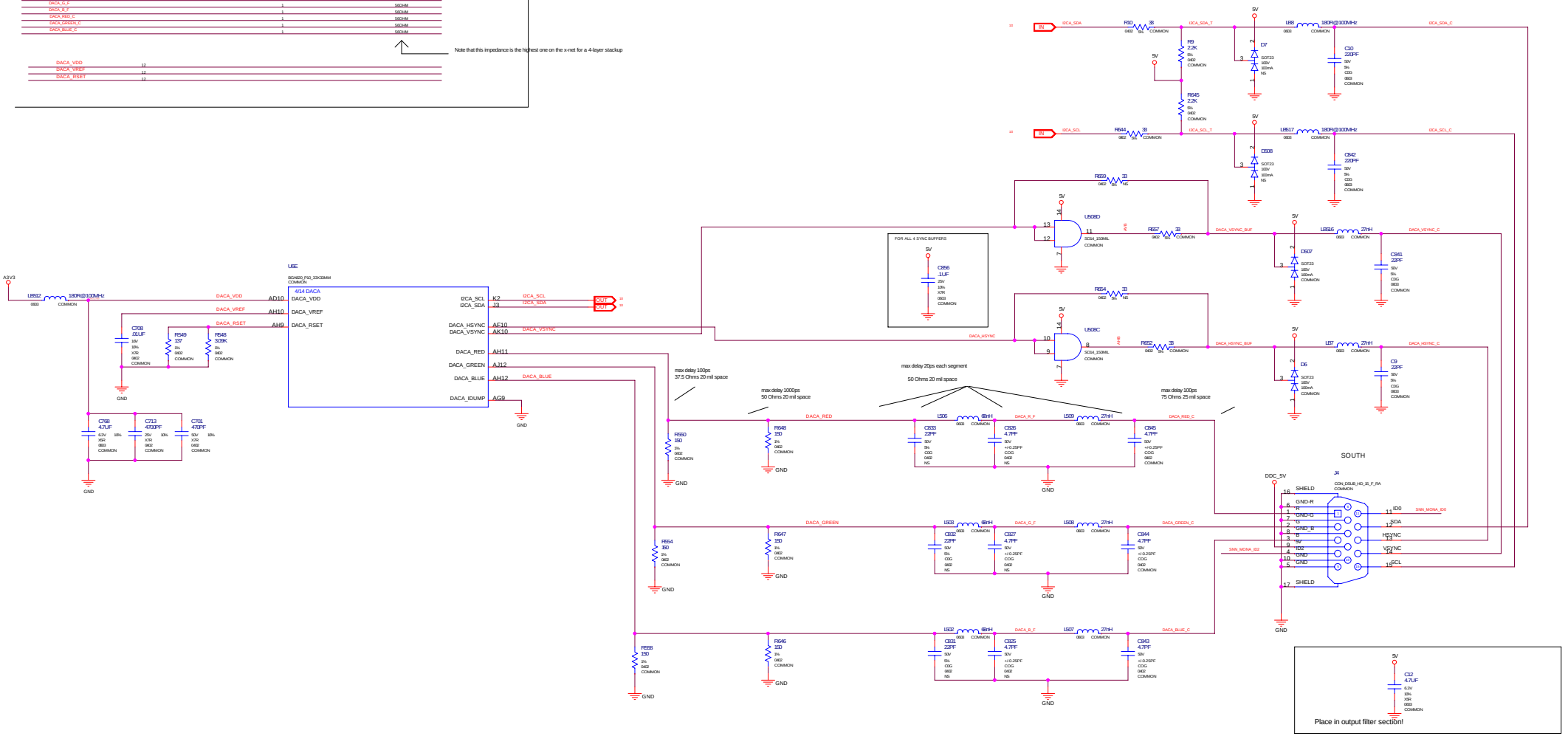


	Micro-Star International Co., LTD.	
	MS-V041	
Size: Custom	Document Number: GPU GND	Rev: 0A
Date: Wednesday, August 24, 2005	Sheet 9 of 19	

10 DACA - VGA

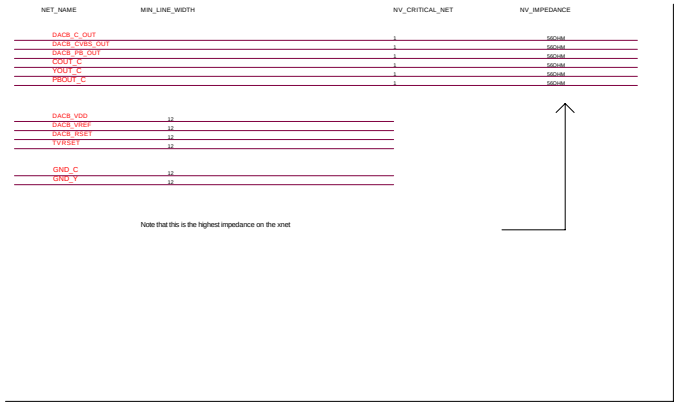
NET_NAME	MIN_LINE_WIDTH	NV_CRITICAL_NET	NV_IMPEDANCE
I2CA_SCL			
I2CA_SDA			
DACA_HSYNC		2	50OHM
DACA_VSYNC		2	50OHM
DACA_HSYNC_BUF		2	50OHM
DACA_VSYNC_BUF		2	50OHM
DACA_VSYNC_C		2	50OHM
DACA_HSYNC_C		2	50OHM
AVB		2	50OHM
A VB		2	50OHM
DACA_RED		1	50OHM
DACA_GREEN		1	50OHM
DACA_BLUE		1	50OHM
DACA_R_F		1	50OHM
DACA_G_F		1	50OHM
DACA_B_F		1	50OHM
DACA_RED_C		1	50OHM
DACA_GREEN_C		1	50OHM
DACA_BLUE_C		1	50OHM
DACA_VDD		12	
DACA_VREF		12	
DACA_RSET		12	

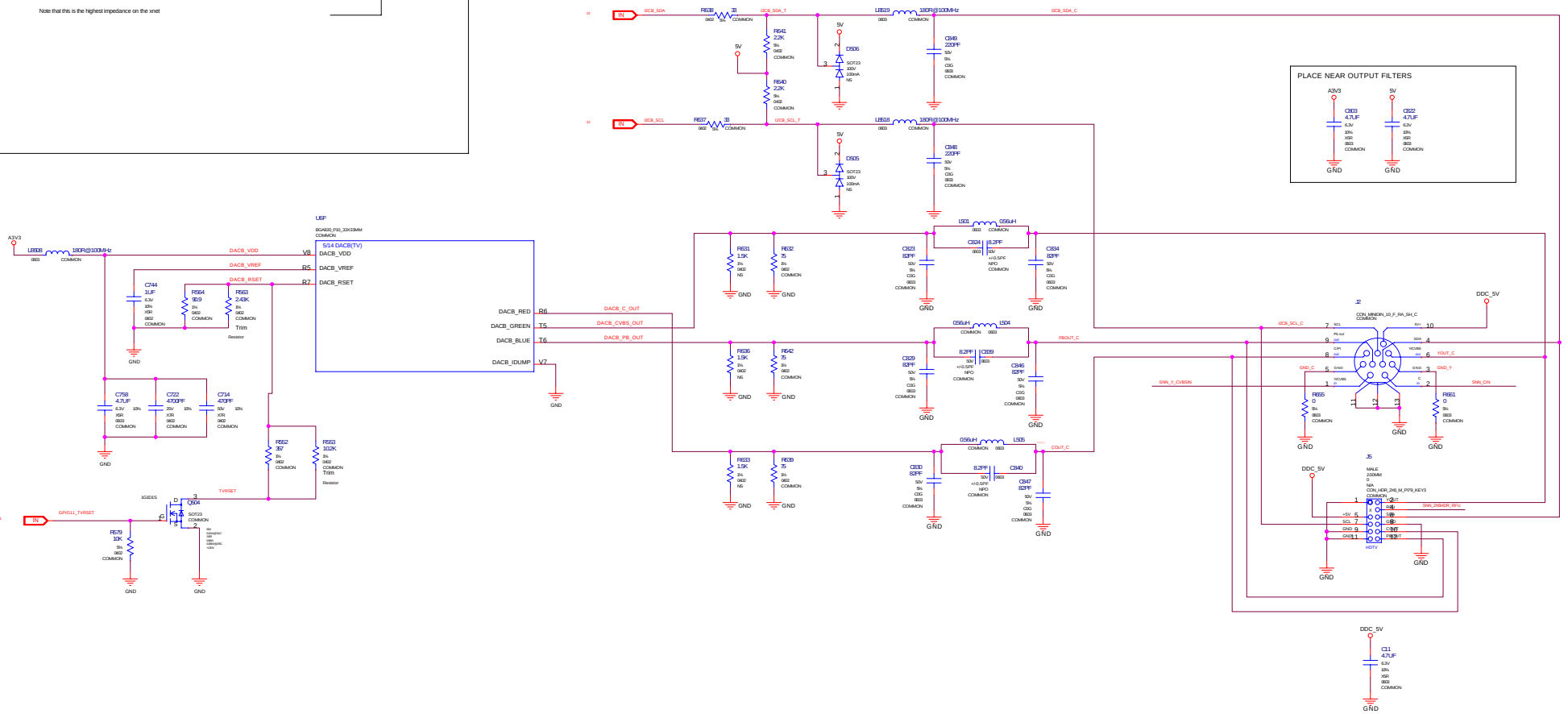
Note that this impedance is the highest one on the x-net for a 4-layer stackup



Micro-Star International Co., LTD.
MS-V041
Size: Custom | Document Number: DACA - VGA | Rev: 0A
Date: Wednesday, August 24, 2005 | Sheet 10 of 19

11 DACB - TVOUT, VIDEO IN

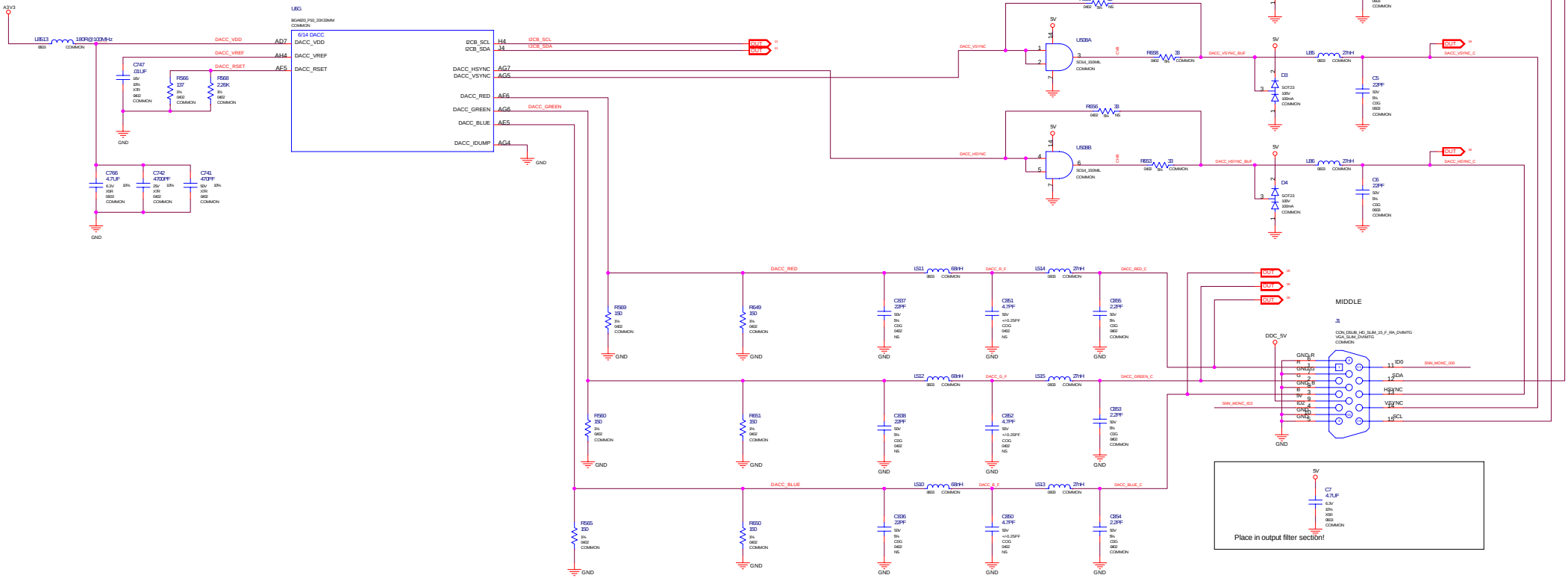




Micro-Star International Co., LTD.	
MS-V041	
Size: Custom	Document Number: DACB - TVOUT, VIDEO IN
Rev: 0A	
Date: Wednesday, August 24, 2005	Sheet 11 of 19

12 DACC - VGA

NET_NAME	MIN_LINE_WIDTH	NET_SPACING_RULE	NV_CRITICAL_NET	NV_IMPEDANCE
I2CB_SCL				
I2CB_SDA				
DACC_HSYNC		2		50OHM
DACC_VSYNC		2		50OHM
DACC_HSYNC_BUF		2		50OHM
DACC_VSYNC_BUF		2		50OHM
DACC_VSYNC_C		2		50OHM
DACC_HSYNC_C		2		50OHM
CHB		2		50OHM
CVB		2		50OHM
DACC_RED		1		50OHM
DACC_GREEN		1		50OHM
DACC_BLUE		1		50OHM
DACC_R_F		1		50OHM
DACC_G_F		1		50OHM
DACC_B_F		1		50OHM
DACC_RED_C		1		50OHM
DACC_GREEN_C		1		50OHM
DACC_BLUE_C		1		50OHM
DACC_VDD		12		
DACC_VREF		12		
DACC_RSET		12		



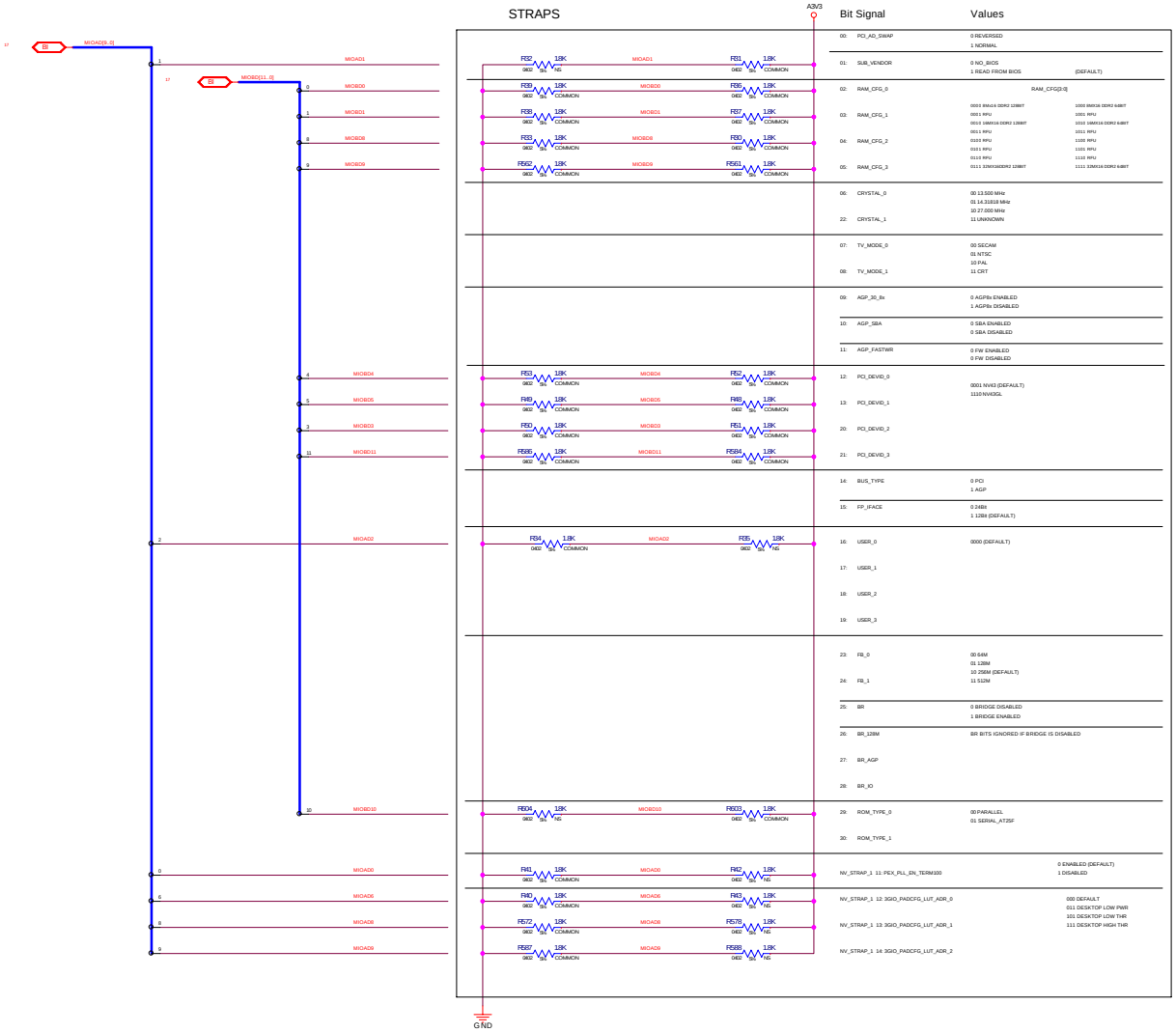
Micro-Star International Co., LTD.	
MS-V041	
Size: Custom	Document Number: DACC - VGA
Rev: 0A	
Date: Wednesday, August 24, 2005	Sheet 12 of 19

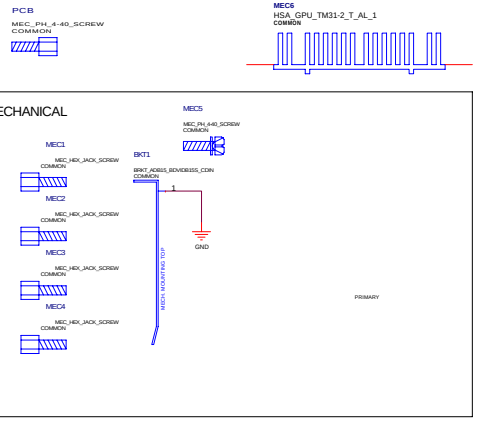
13 STRAPS, FANSINK, MECHANICALS

Overlap pads to save space and to prevent assembly of both resistors.

Layout

Ground — Signal — High logic voltage





Micro-Star International Co., LTD.			
MS-V041			
Size: Custom	Document Number: STRAPS, FANSINK, MECHANICALS		Rev: 0A
Date: Wednesday, August 24, 2005		Sheet 13 of 19	

14 GPIO, HDCP, VBIOS, FAN CON

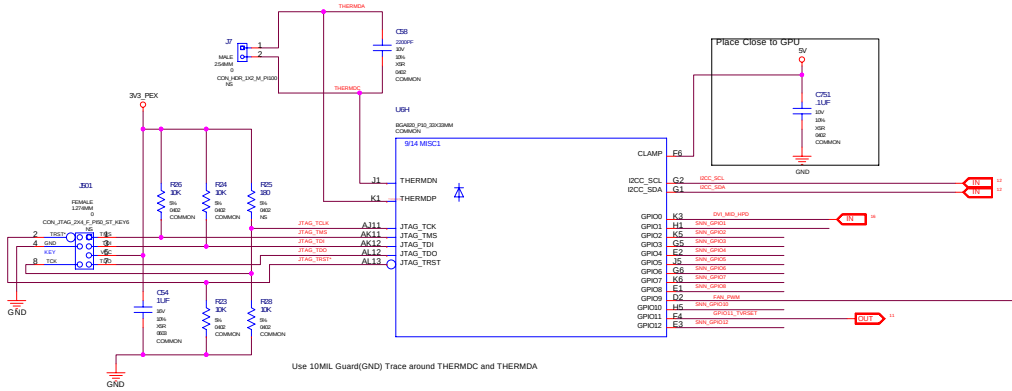
JTAG, GPIO, BIOS ROM

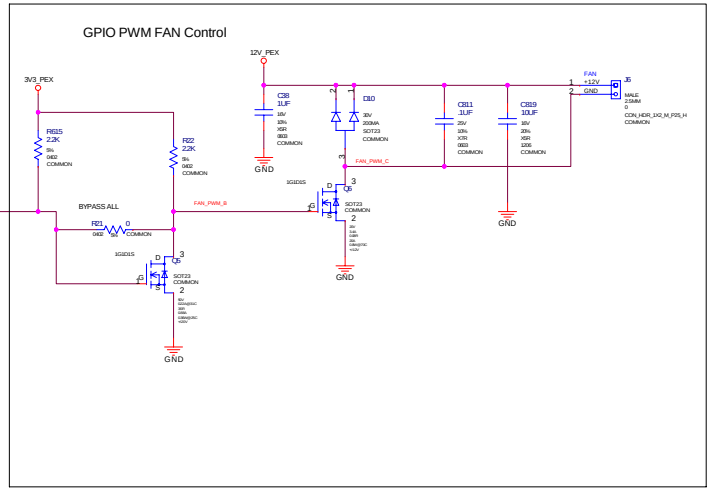
GPIO Assignment Table

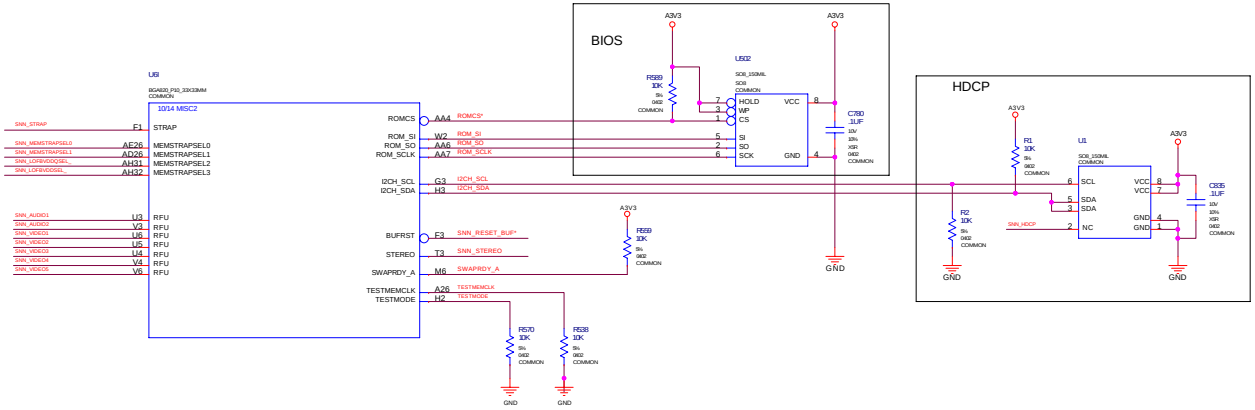
GPIO	I/O	FUNCTION
0	IN	DVI MID HOTPLUG DET
1	IN	RESERVED
2	IN	RESERVED
3	IN	RESERVED
4	IN	RESERVED
5	IN	RESERVED
6	IN	RESERVED
7	IN	RESERVED
8	IN	THERM ALERT/SLOW
9	OUT	FAN CONTROL
10	IN	RESERVED
11	OUT	HDTV/SDTV SELECT
12	IN	RESERVED

NET MIN_LINE_WIDTH

FAN_THERM_BYPASS 10
FAN_PWM 10
FAN_PWM_B 10
FAN_PWM_C 10
THERMDC 10
THERMDA 10





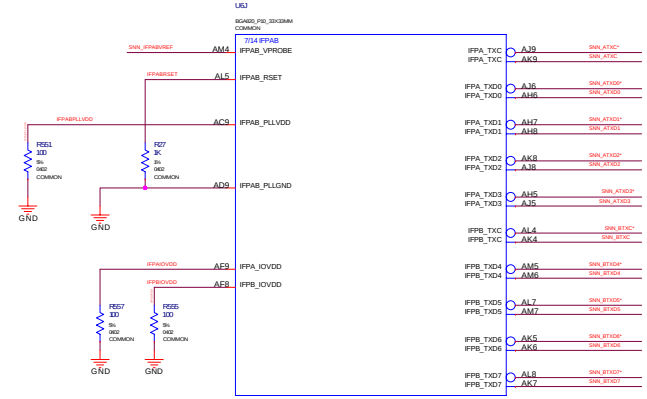


Micro-Star International Co., LTD.		
MS-V041		
Size: Custom	Document Number: GPIO, HDCP, VBIOS, FAN CON	Rev: 0A
Date: Wednesday, August 24, 2005	Sheet 14 of 19	

15 INTERNAL TMDS LINK A/B

NET	MIN_LINE_WIDTH
IFPABRSET	12
IFPABPLLVDD	12
IFPAIOVDD	12
IFPBIOVDD	12

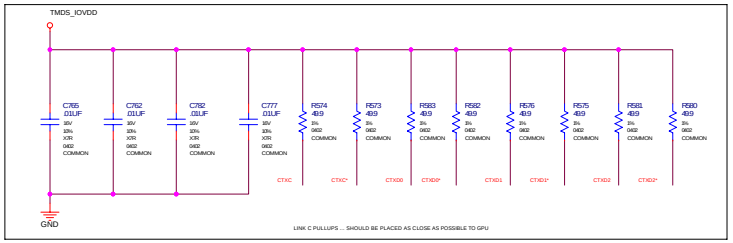
INTERNAL TMDS ..LINK A/B



DISABLED

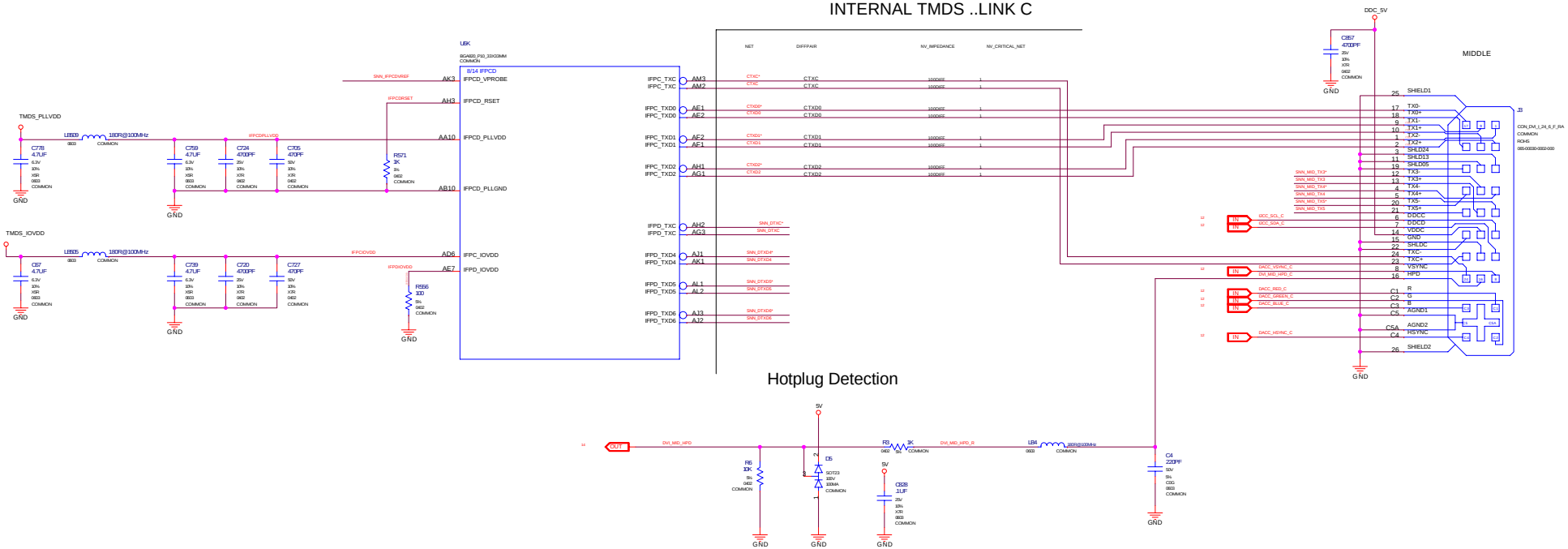
MSI	Micro-Star International Co., LTD.	
	MS-V041	
Size: Custom	Document Number: INTERNAL TMDS LINK A/B	Rev: 0A
Date: Wednesday, August 24, 2005	Sheet 15 of 19	

16 INTERNAL TMDS LINK C/D



NET	MIN_LINE_WIDTH	VOLTAGE
IFPCDVREF	12	3.3V
IFPCDPLLVDD	12	3.3V
IFPCDVDD	12	3.3V
IFPDIOVDD	12	3.3V
IFPCDRSET	12	

INTERNAL TMDS ..LINK C

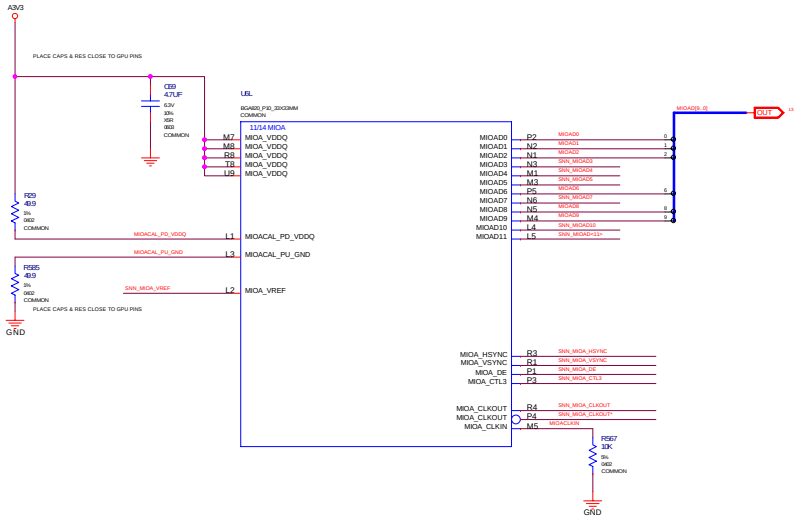


Hotplug Detection

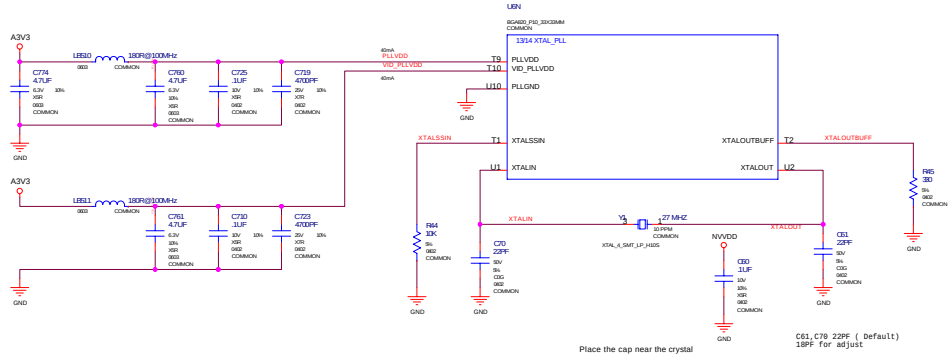
MSI	Micro-Star International Co., LTD.	
	MS-V041	
Size: Custom	Document Number: INTERNAL TMDS LINK C/D	Rev: 0A
Date: Wednesday, August 24, 2005	Sheet 16 of 19	

17 MIOA, MIOB, NVPLL

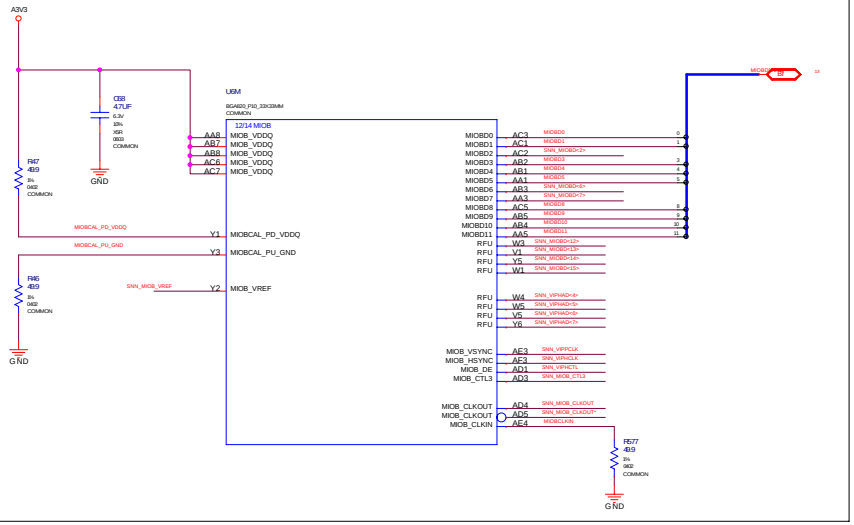
MIOA



XTAL/PLLVDD



MIOB



NET	MIN_LINE_WIDTH
VID_PLLVDD	12
XTALIN	
XTALOUT	
PLLVDD	12

Micro-Star International Co., LTD.

MS-V041

Size: Custom | Document Number: MIOA, MIOB, NVPLL | Rev: 0A

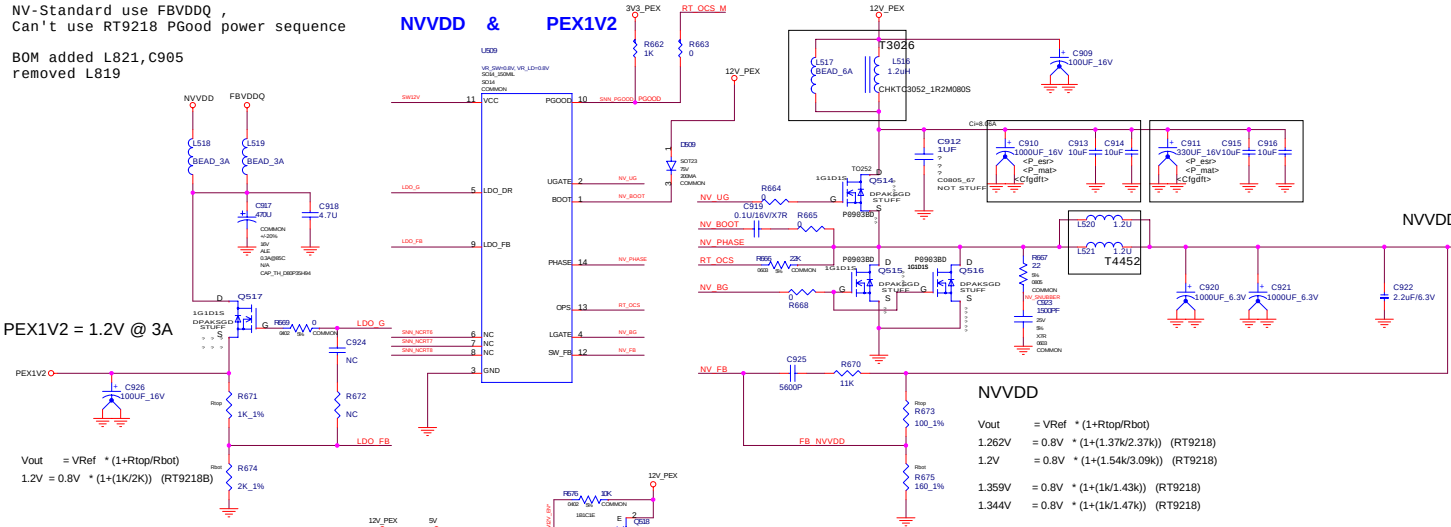
Date: Wednesday, August 24, 2005 | Sheet 17 of 19

18 Power Supply (RT9218)
NVVDD,PEX1V2,FBVDDQ

NV-Standard use FBVDDQ ,
Can't use RT9218 PGood power sequence

BOM added L821,C905
removed L819

NVVDD & PEX1V2



NVVDD = 1.35V @ upto 18A

1.2V~1.4V/24A(ambient)

NVVDD = 0.8V * (1+Rt/Rb)

PEX1V2 = 1.2V @ 3A

Vout = VRef * (1+Rtop/Rbot)
1.2V = 0.8V * (1+(1K/2K)) (RT9218B)

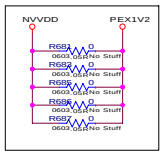
NVVDD

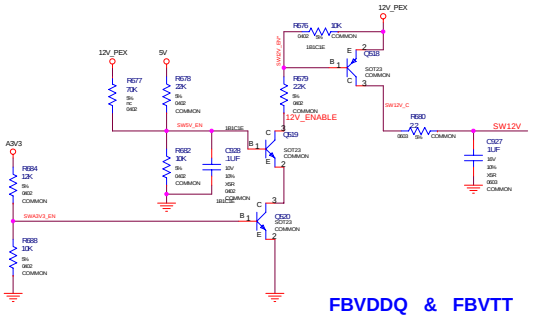
Vout = VRef * (1+Rtop/Rbot)
1.262V = 0.8V * (1+(1.37k/2.37k)) (RT9218)
1.2V = 0.8V * (1+(1.54k/3.09k)) (RT9218)

1.359V = 0.8V * (1+(1k/1.43k)) (RT9218)
1.344V = 0.8V * (1+(1k/1.47k)) (RT9218)

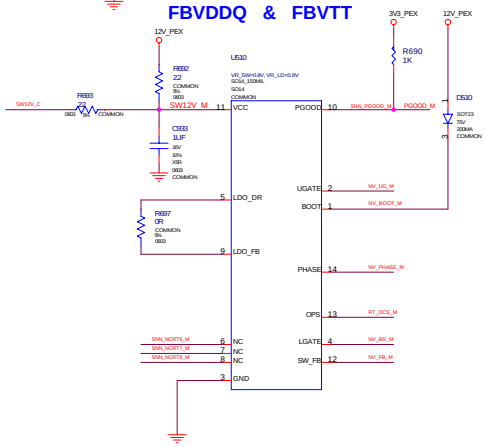
1.344V = 0.8V * (1+(100/147)) (RT9218)
1.3V = 0.8V * (1+(100/160)) (RT9218) default

1V2 NVVDD bypass





FBVDDQ & FBVTT



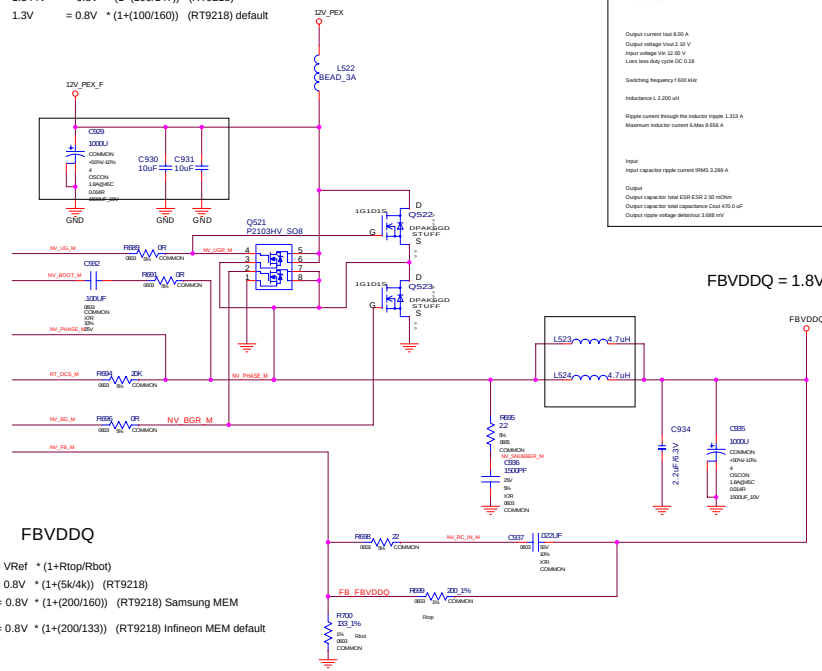
Choose RT9218 PGood power sequence

Added BOM R883,R904

Removed R905

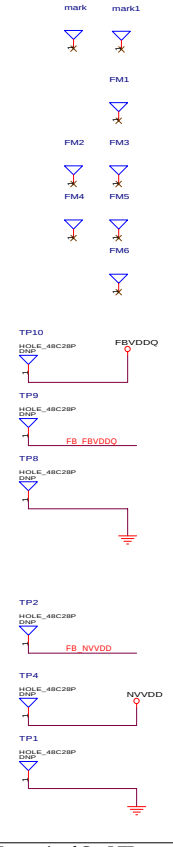
FBVDDQ = 1.8V @ upto 5A

1.8V/5.0A



Net Name	MIN_LINE_WIDTH		VOLTAGE
5V	16	3	5V
NVVDD	16	20	1.35V
12V_PEX	20	6	12V
PEX1V2	20	4	1.2V
12V_PEX_FLTRD	20	6	12V
FBVTT	20	1.5	FBVTT/2 V

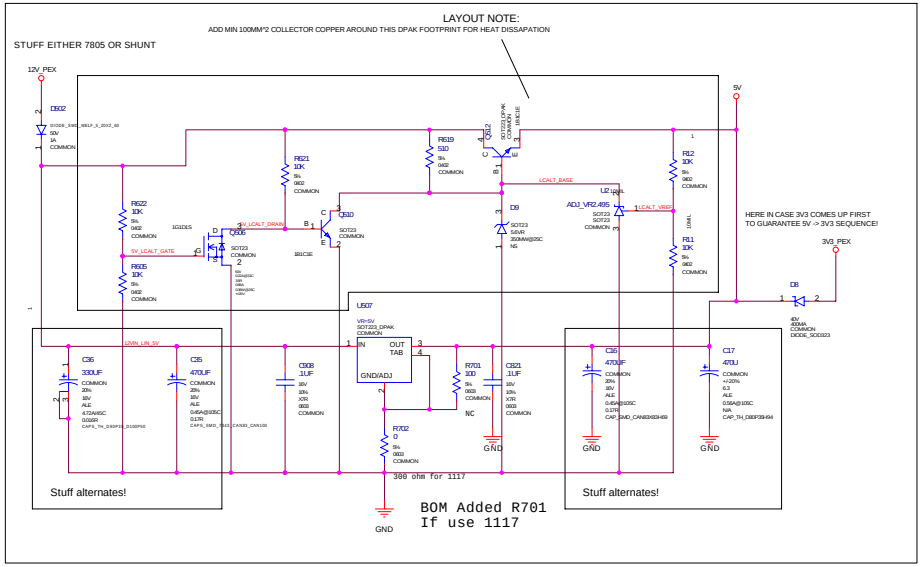
DRIVE3_1V2	20	
UGATE_1	20	
LGATE_1	20	
UGATE_2	20	
LGATE_2	20	
NODE_1	20	
NODE_2	20	
12V_RR	10	
ISL12V_VCC	20	
COMP1_NVVDD	10	
FB1_NVVDD	10	
COMP2_5V	10	
FB2_5V	10	
FB3_1V2	10	
REFIN_5V	10	
ISL_REFOUT	10	
VREF_3V3	10	
FB3_RC	10	
BOOT_1	20	
BOOT_2	20	
FREQ_SET	10	
SS_NVVDD	10	
SS_5V	10	
SS_1V2	10	
UGATE_1_RG	20	
UGATE_2_RG	20	
COMP1_RC	10	
COMP2_RC	10	
NVVDD_RC	10	
5V_RC	10	
NODE_1_SNUB	20	
NODE_2_SNUB	20	
CLGATE_1	20	
BOOST	20	
5VBOOST	20	



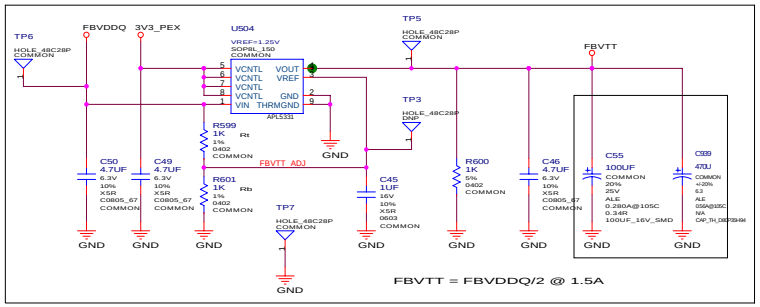
Micro-Star International Co., LTD.			
MS-V041			
Size: Custom	Document Number: NVVDD,PEX1V2,FBVDDQ		Rev: 0A
Date: Wednesday, August 24, 2005	Sheet 18 of 19		

19 Others Power Supply (Linears)
5V,FBVDDQ,A3V3,3V3,TMDS_PLLVDD,TMDS_IOVDD,FBVTT

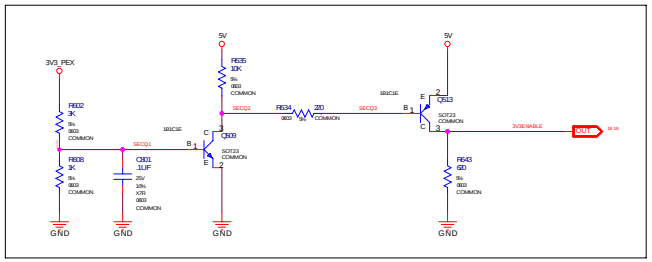
5V LOW COST REGULATOR



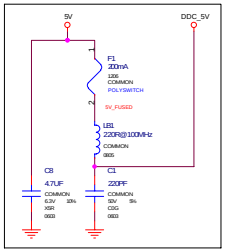
FBVTT TERMINATION



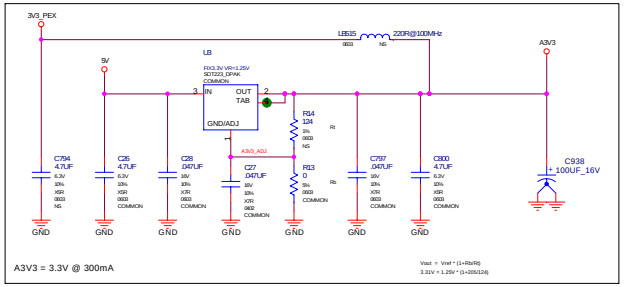
Power Sequencing



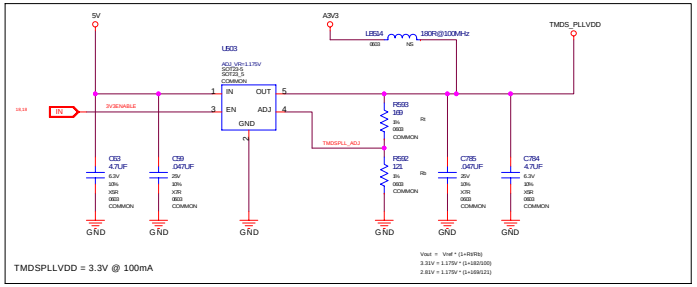
DDC 5V



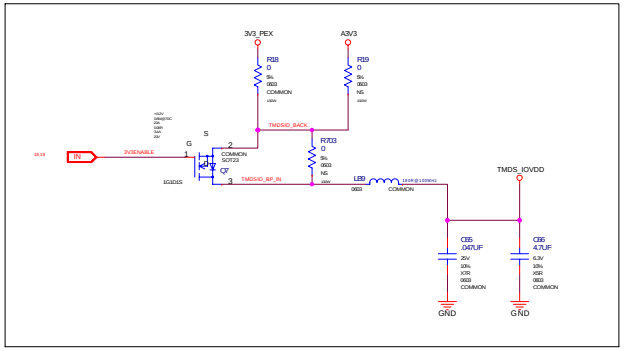
A3V3 Power Supply

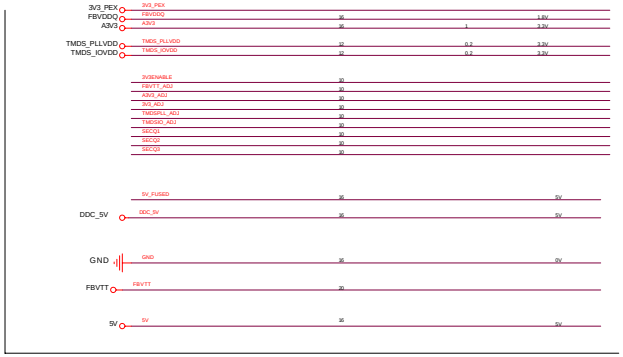


TMDS PLL Supply



TMDS IO SUPPLY WITH BACKDRIVE PROTECTION





Micro-Star International Co., LTD.	
MS-V041	
Size: Custom	Document Number: Others Power Supply (Linears)
Rev: 0A	
Date: Wednesday, August 24, 2005	Sheet 19 of 19