MS-V089 -- G73GT/G84, 128/256 MB 16x32 DDR3-136pin, DVI-I,SD/HDTV,VIVO,HDMI

SUMMARY:

1. Base on V069-100 to Modify HDMI change to internal support
2. BGA-136 DDRIII
3. RT-8805 Two Phase PWM for NVVDD
4. MS-11 for FBVDD

Table of Contents:

Rev History

OA

Page 3 Enable G23pin H_PLLVDD 1V2 for G84 only
Page 11 reserve G84 SLI circuit
Page 12,13,14 reserve DAC_Vref power for G84 DACA,B,C
Page 16 reserve 1V8 for G84 IFPAB_PLLVDD
Page 17 reserve 1V8 for G84 IFPCD_PLLVDD
Page 18 reserve 1V2 for G84 PLLVDD and VID_PLLVDD
Page 20 reserve MIOB_CTL3 new strap for G84 PCI_DEVID_4
Page 20 reserve ROM_SI pull-down resister required if MIOA VDDQ=2.5V for G84
Page 21add 1V8 power for G84
Page 22,23 Reserve MS-V1co-lay circuit

100

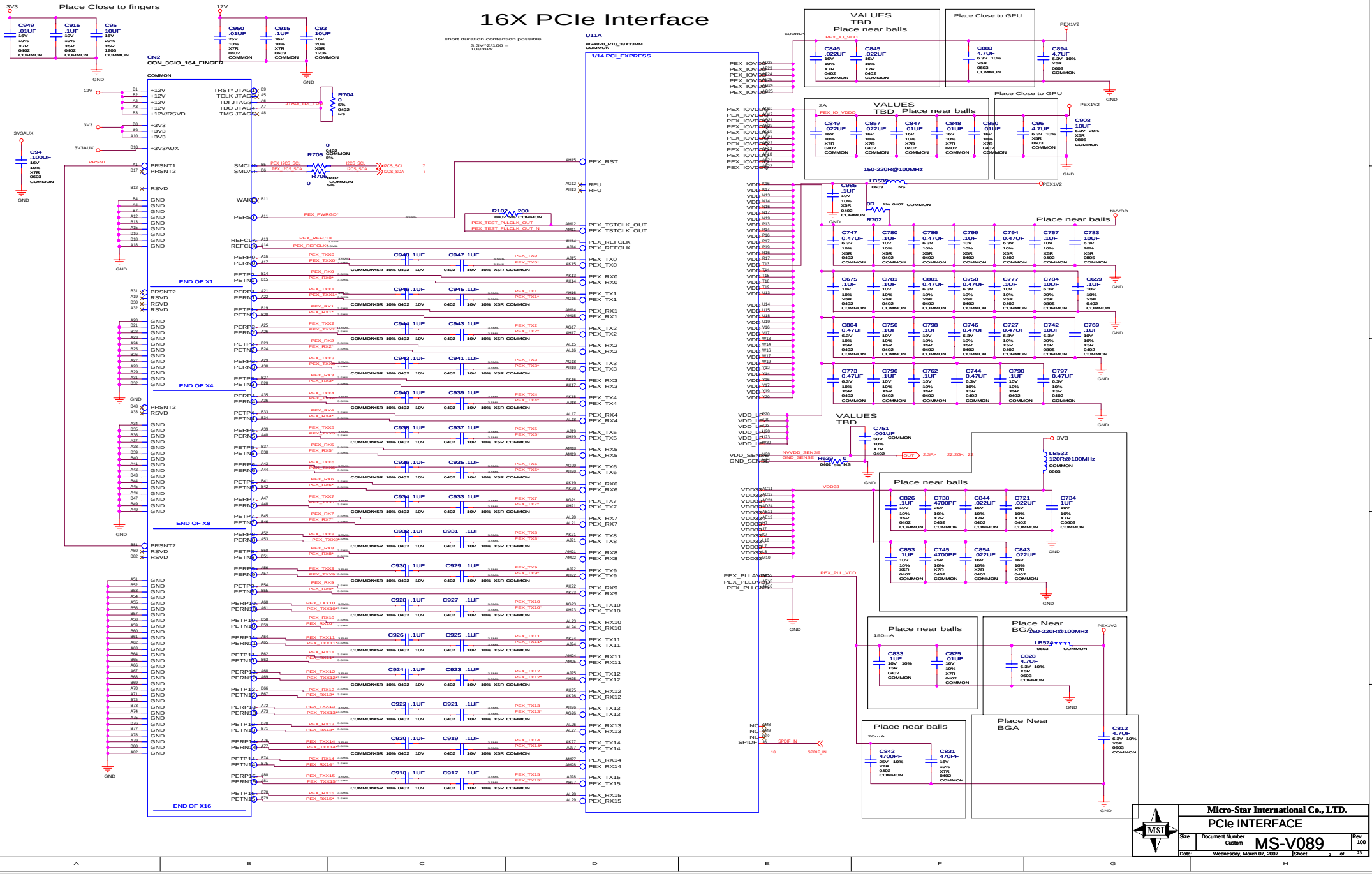
Page 3 H_PLLVDD 1V2 use 0ohm connect to PEX1V2
Page 3 Reserve G84 Dual Rank(Stacked Die) circuit FBA_CMD7----CS1 FBA_CMD27---BA2
Page 7 Reserve G84 Dual Rank(Stacked Die) circuit FBC_CMD7----CS1 FBC_CMD27---BA2
Page 7 Reserve I2CS citcuit for G84
Page 6,10 Enable FBAA2 and FBCC2 BA2 Pin this is for Stacked Die Function
Page 13 Modify RGB circuit
Page 15 Modify SAA7115 RESET circuit
Page 18 Modify Spidf circuit
Page 21 Modify Linear Power circuit
Page 22 NVVDD PWM Change to RT-8805 Two Phase
Page 22,23 Remove MS-V1co-lay circuit

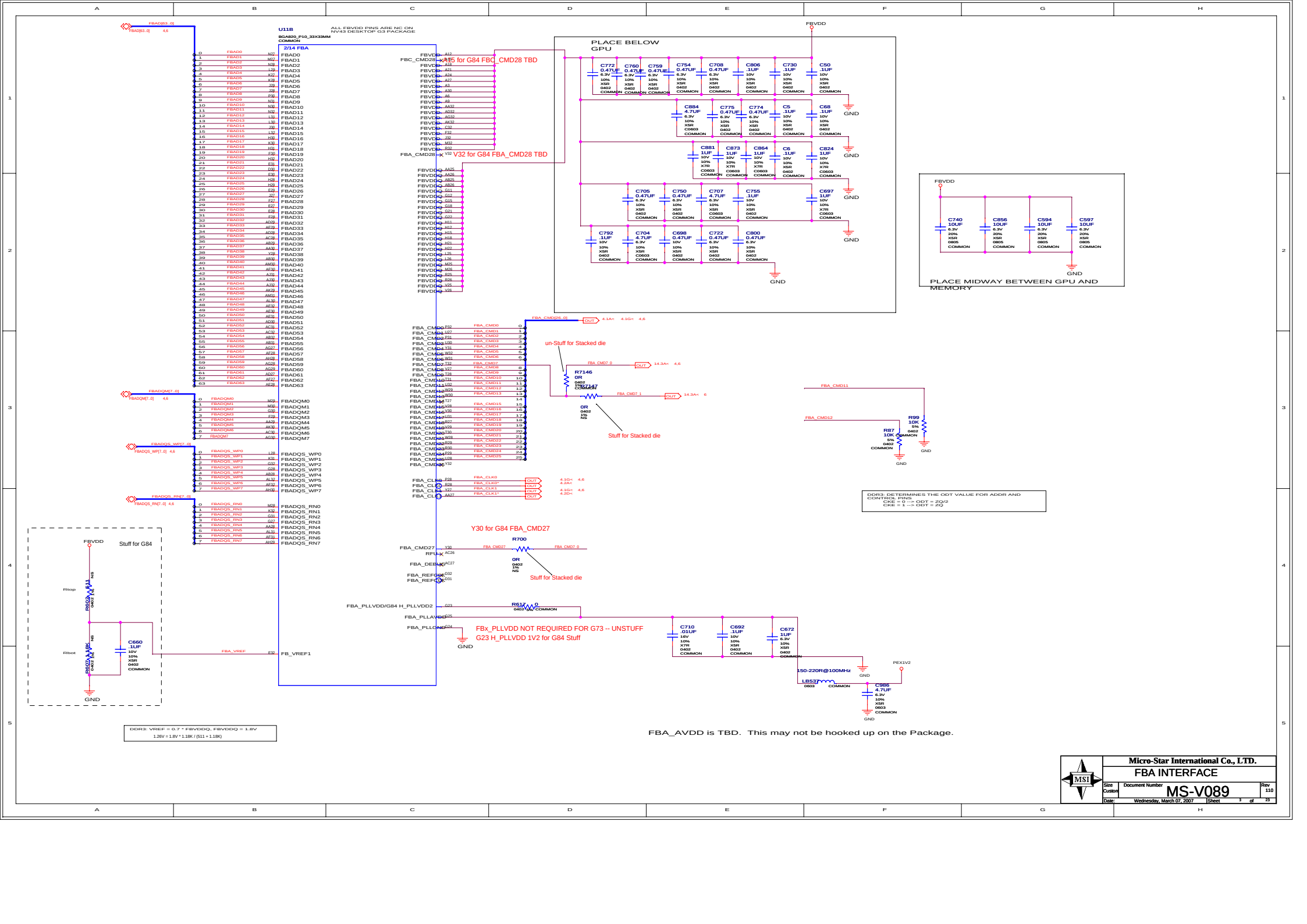
110

Page 3 Connect FBVDD for G84
Page 18 Reverve other Spidf circuit
Page 22 Co-lay small chock for NVVDD

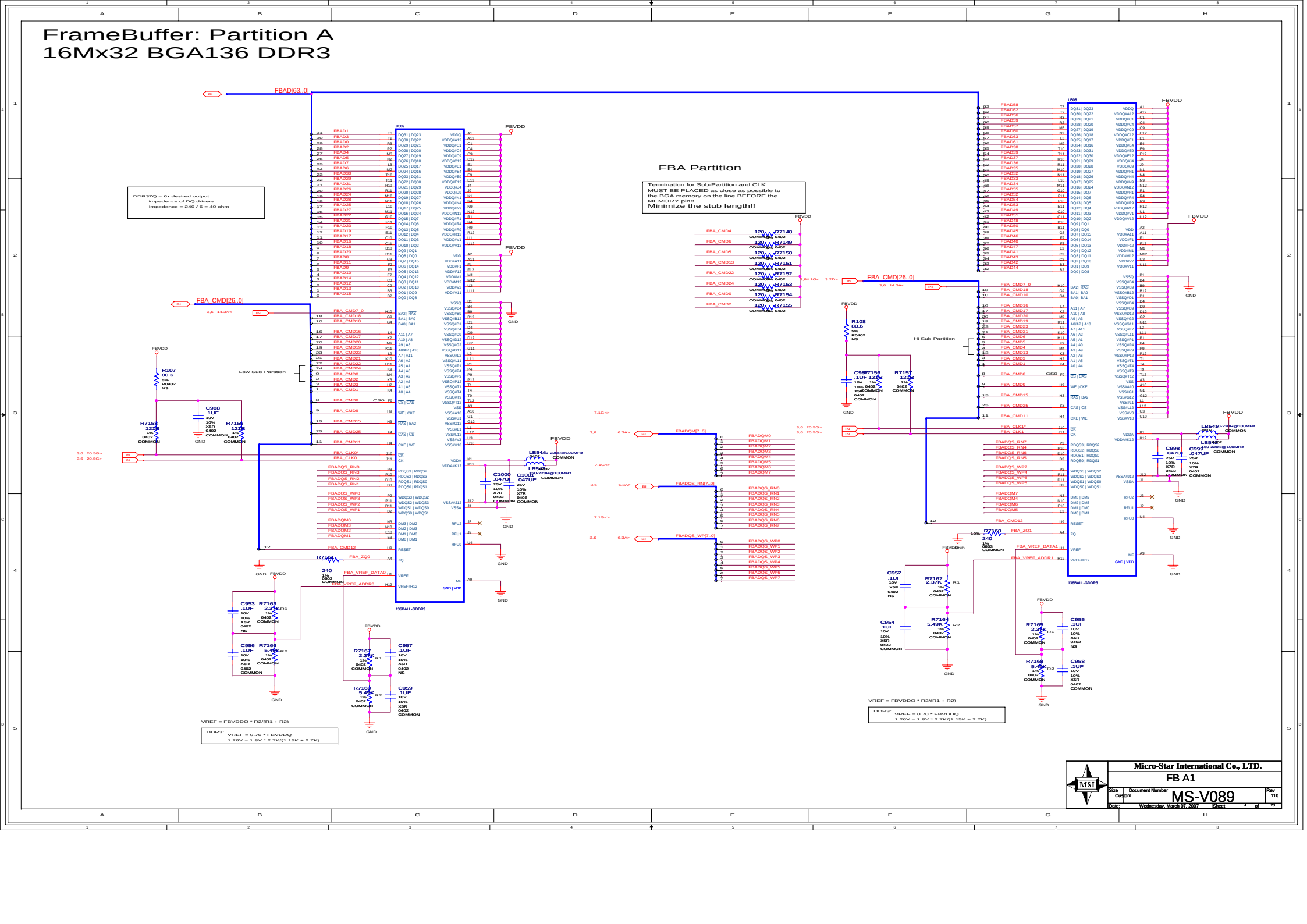
MSI	Micro-Star International Co., LTD.	
	SUMMARY	
Size: Custom	Document Number: MS-V089	Rev: 100
Date: Wednesday, March 07, 2007	Sheet 1 of 23	

16X PCIe Interface




U11B
BGA820_P10_33X33MM
COMMON
2/14 FBA
ALL FBVDD PINS ARE NC ON NV43 DESKTOP G3 PACKAGE
PLACE BELOW GPU
FBVDD
GND
C772 0.47UF 6.3V 10% X5R 0402 COMMON
C760 0.47UF 6.3V 10% X5R 0402 COMMON
C759 0.47UF 6.3V 10% X5R 0402 COMMON
C754 0.47UF 6.3V 10% X5R 0402 COMMON
C708 0.47UF 6.3V 10% X5R 0402 COMMON
C806 .1UF 10V 10% X5R 0402 COMMON
C730 .1UF 10V 10% X5R 0402 COMMON
C50 .1UF 10V 10% X5R 0402 COMMON
C884 4.7UF 6.3V 10% X5R C0603 COMMON
C775 0.47UF 6.3V 10% X5R 0402 COMMON
C774 0.47UF 6.3V 10% X5R 0402 COMMON
C5 .1UF 10V 10% X5R 0402 COMMON
C68 .1UF 10V 10% X5R 0402 COMMON
C881 1UF 10V 10% X7R C0603 COMMON
C873 1UF 10V 10% X7R C0603 COMMON
C864 1UF 10V 10% X7R C0603 COMMON
C6 .1UF 10V 10% X5R 0402 COMMON
C824 1UF 10V 10% X7R C0603 COMMON
C705 0.47UF 6.3V 10% X5R 0402 COMMON
C750 0.47UF 6.3V 10% X5R 0402 COMMON
C707 4.7UF 6.3V 10% X5R C0603 COMMON
C755 .1UF 10V 10% X5R 0402 COMMON
C697 1UF 10V 10% X7R C0603 COMMON
C792 .1UF 10V 10% X5R 0402 COMMON
C704 4.7UF 6.3V 10% X5R C0603 COMMON
C698 0.47UF 10V 10% X5R 0402 COMMON
C722 0.47UF 6.3V 10% X5R 0402 COMMON
C800 0.47UF 6.3V 10% X5R 0402 COMMON
PLACE MIDWAY BETWEEN GPU AND MEMORY
C740 10UF 6.3V 20% X5R 0805 COMMON
C856 10UF 6.3V 20% X5R 0805 COMMON
C594 10UF 6.3V 20% X5R 0805 COMMON
C597 10UF 6.3V 20% X5R 0805 COMMON
FBA_CMD28 V32 for G84 FBA_CMD28 TBD
FBC_CMD28 A35 for G84 FBC_CMD28 TBD
un-Stuff for Stacked die
Stuff for Stacked die
R7146 0R 0402 1% NS
R7147 0R 0402 1% NS
FBA_CMD11
FBA_CMD12
R99 10K 5% 0402 COMMON
R87 10K 5% 0402 COMMON
DDR3: DETERMINES THE ODT VALUE FOR ADDR AND CONTROL PINS
CKE = 0 --> ODT = ZQ/2
CKE = 1 --> ODT = ZQ
Y30 for G84 FBA_CMD27
R700
0R 0402 1% NS
Stuff for Stacked die
FBA_PLLVDD/G84 H_PLLVDD2
R617 0 0603 COMMON
FBx_PLLVDD NOT REQUIRED FOR G73 -- UNSTUFF
G23 H_PLLVDD 1V2 for G84 Stuff
C710 .01UF 16V 10% X7R 0402 COMMON
C692 .1UF 10V 10% X5R 0402 COMMON
C672 1UF 6.3V 10% X5R 0402 COMMON
PEX1V2
150-220R@100MHz
LB537 0603 COMMON
C986 4.7UF 6.3V 10% X5R 0603 COMMON
Stuff for G84
FBVDD
Rtop
Rbot
R6029 0 0402 NS
R6030 1.69K 0402 NS
C660 .1UF 10V 10% X5R 0402 COMMON
FBA_VREF
FB_VREF1
DDR3: VREF = 0.7 * FBVDDQ, FBVDDQ = 1.8V
1.26V = 1.8V * 1.18K / (511 + 1.18K)
FBA_AVDD is TBD. This may not be hooked up on the Package.
Micro-Star International Co., LTD.
FBA INTERFACE
Size: Custom
Document Number: MS-V089
Rev: 110
Date: Wednesday, March 07, 2007
Sheet 3 of 23

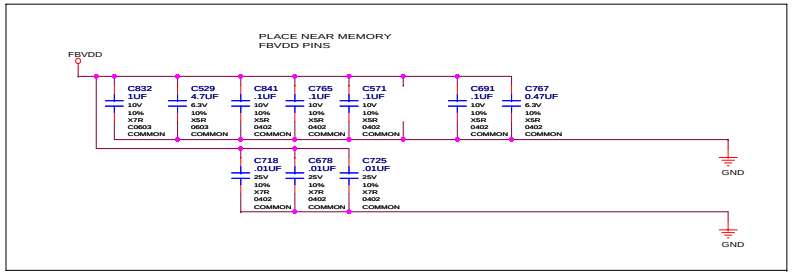
FrameBuffer: Partition A
16Mx32 BGA136 DDR3

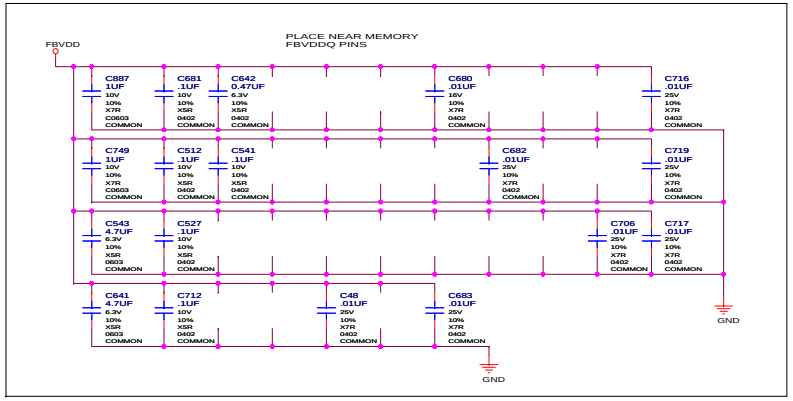


Micro-Star International Co., LTD.	
FB A1	
Size: Custom	Document Number: MS-V089
Rev: 110	
Date: Wednesday, March 07, 2007	Sheet 4 of 23

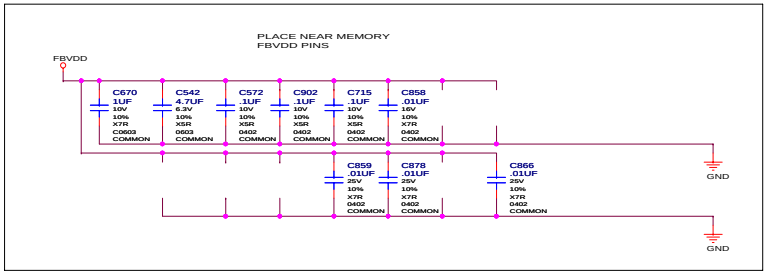
FRAME BUFFER: PARTITION A DECOUPLING

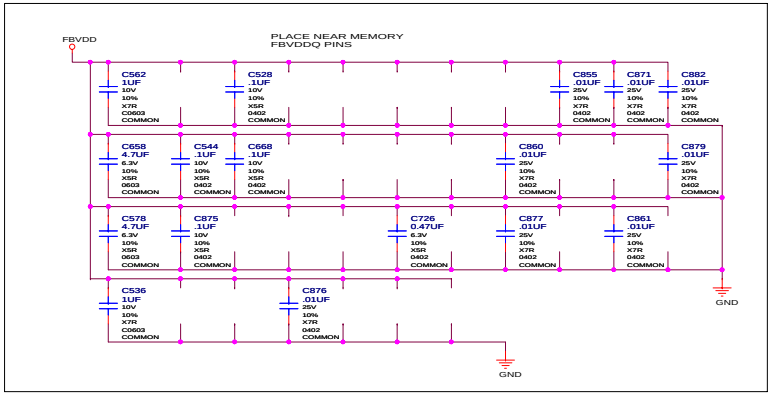
Decoupling for FBA 0..31





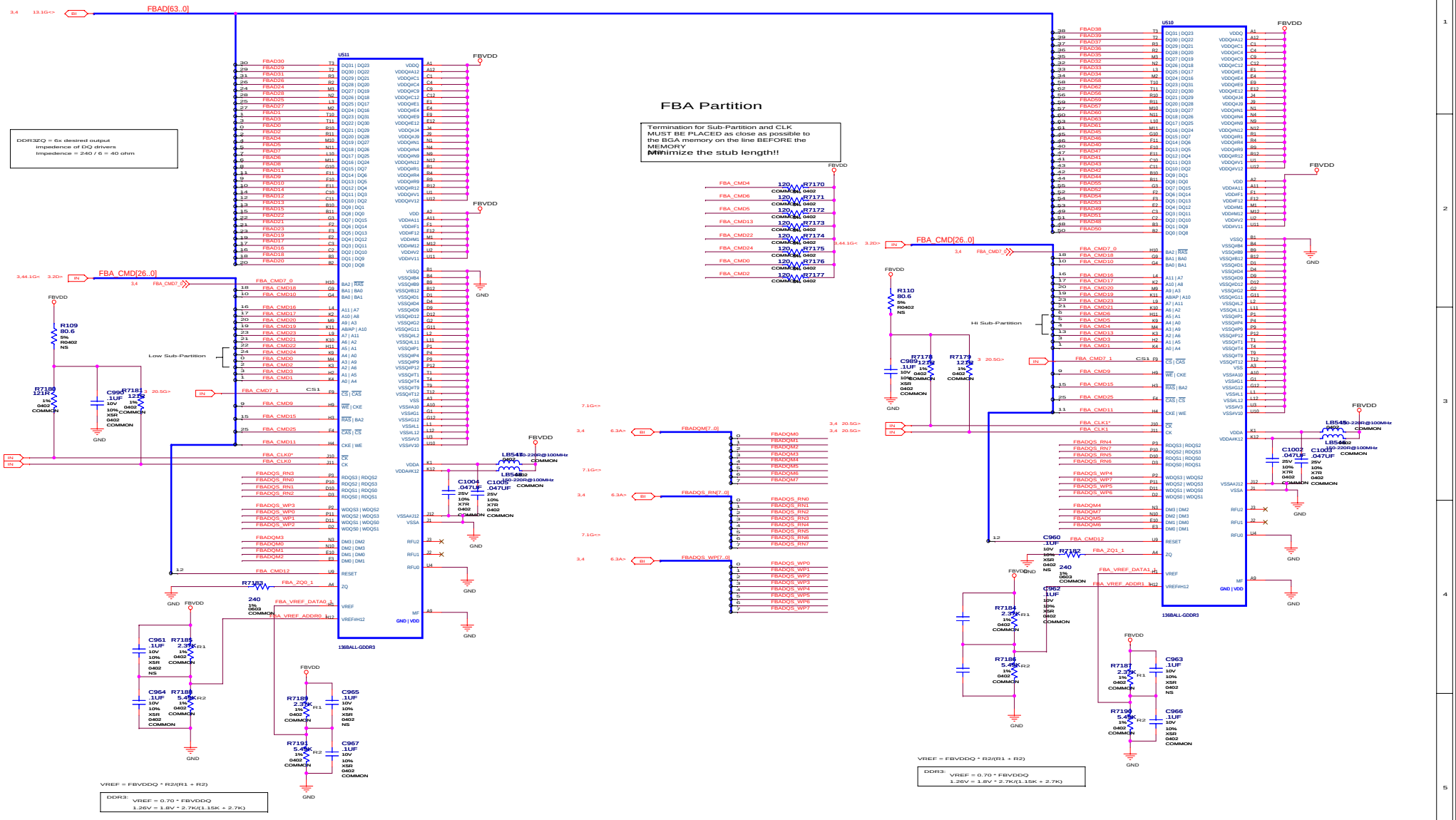
Decoupling for FBA 32..63



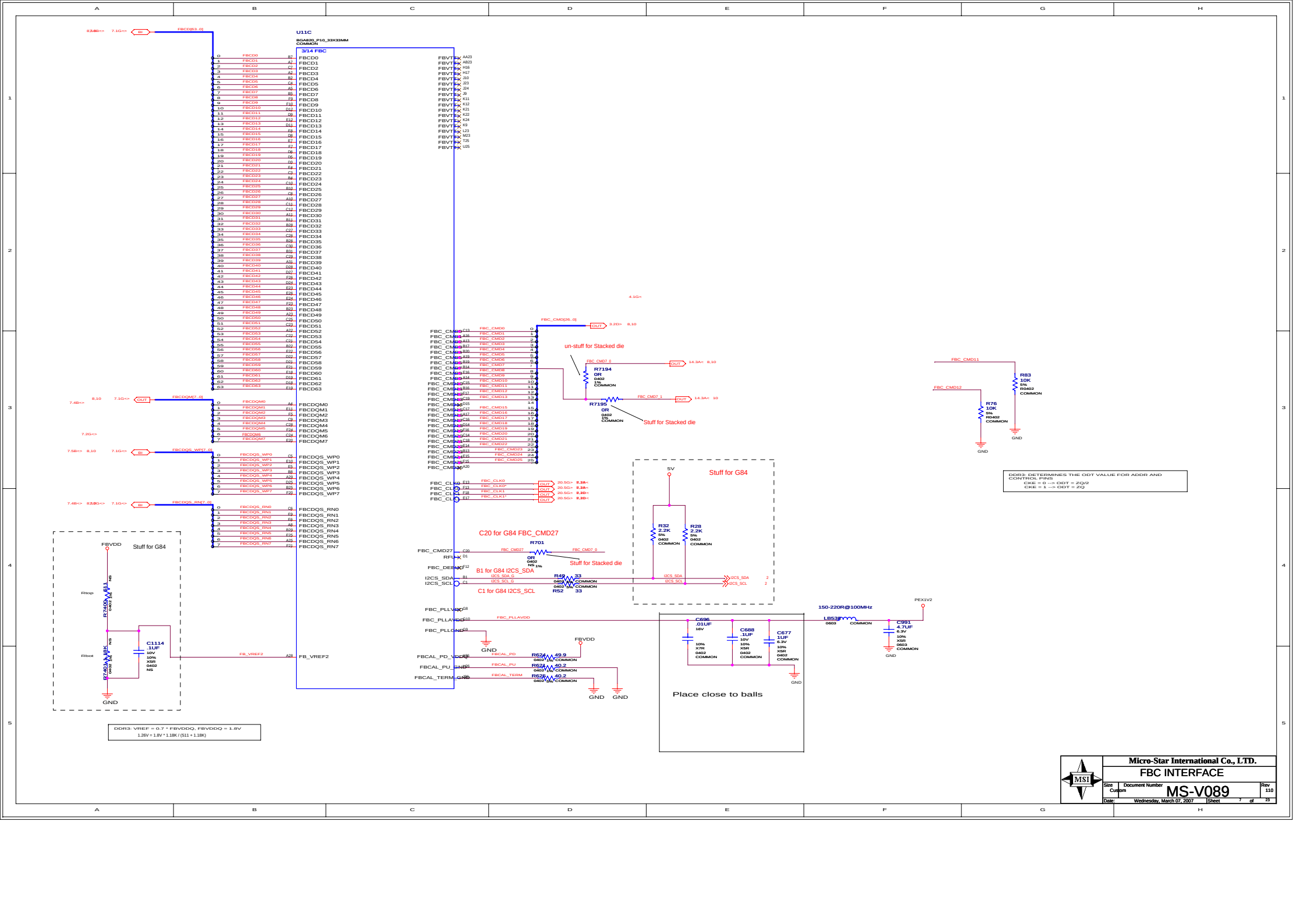


Micro-Star International Co., LTD.	
FBA DECOUPLING	
Size: Custom	Document Number: MS-V089
Rev: 100	
Date: Wednesday, March 07, 2007	Sheet 5 of 23

FrameBuffer: Partition A
16Mx32 BGA136 DDR3

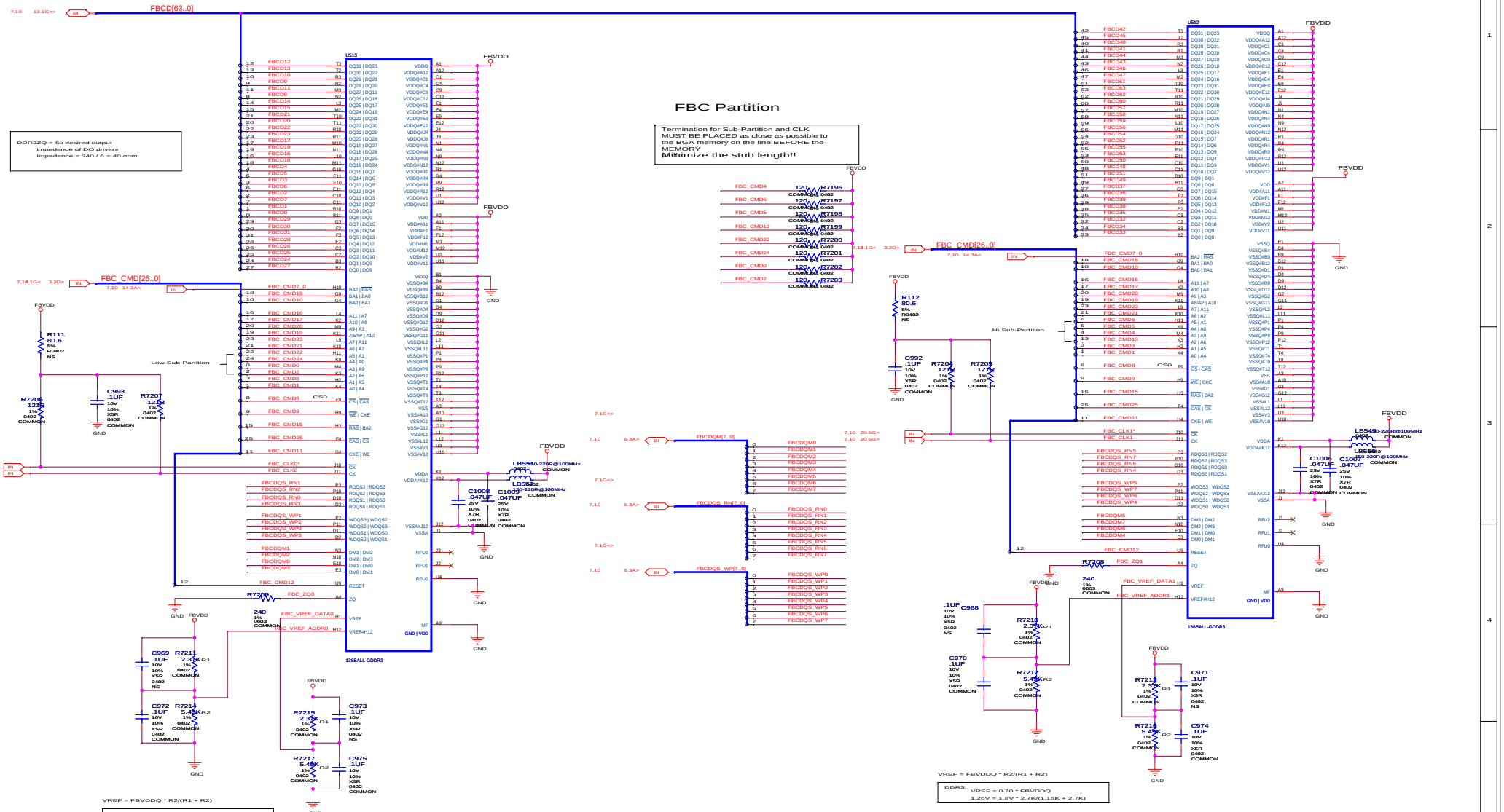


Micro-Star International Co., LTD.	
FB A2	
Size: Custom	Document Number: MS-V089
Rev: 110	
Date: Wednesday, March 07, 2007	Sheet 6 of 23



Micro-Star International Co., LTD.	
FBC INTERFACE	
Size: Custom	Document Number: MS-V089
Rev: 110	
Date: Wednesday, March 07, 2007	Sheet 7 of 23

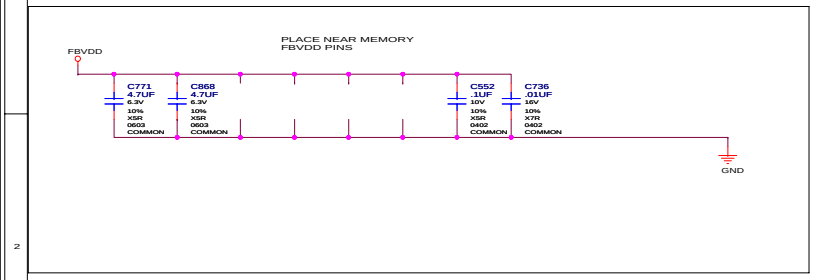
FRAMEBUFFER: PARTITION
C 16Mx32 BGA136 DDR3



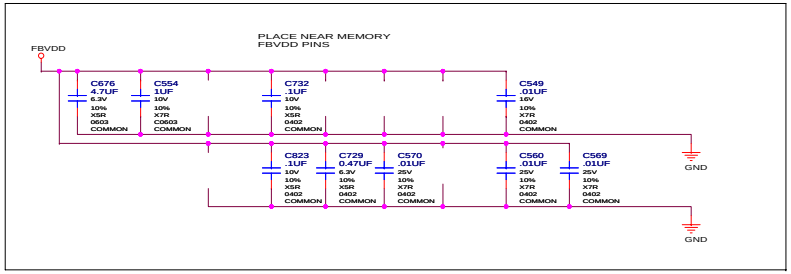
Micro-Star International Co., LTD.	
FB C1	
Size: Custom	Document Number: MS-V089
Rev: 100	
Date: Wednesday, March 07, 2007	Sheet 8 of 23

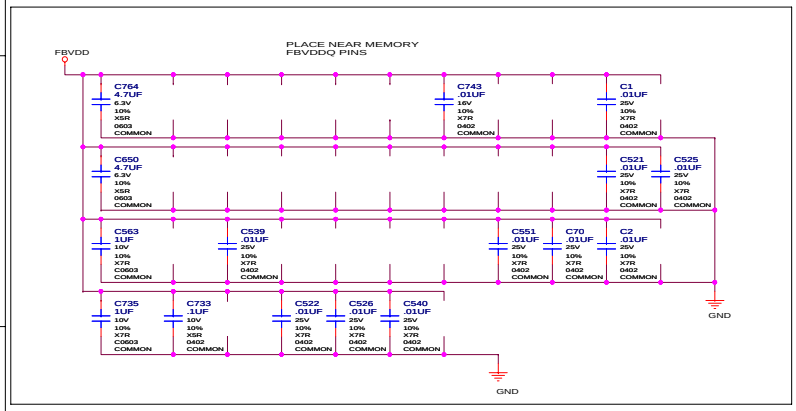
FRAMEBUFFER: PARTITION C DECOUPLING

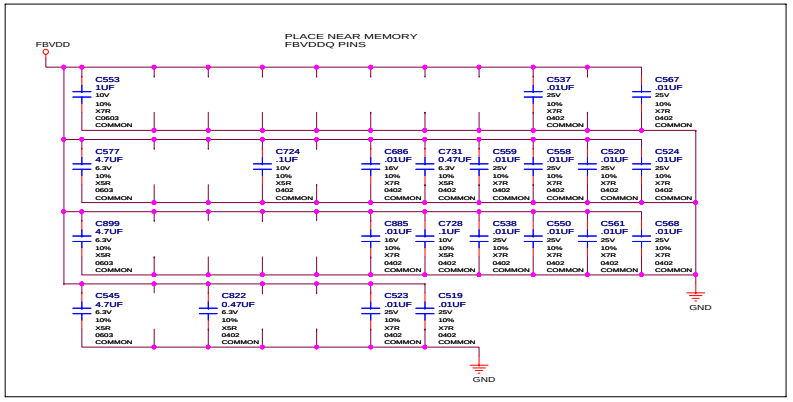
Decoupling for FBC 0..31

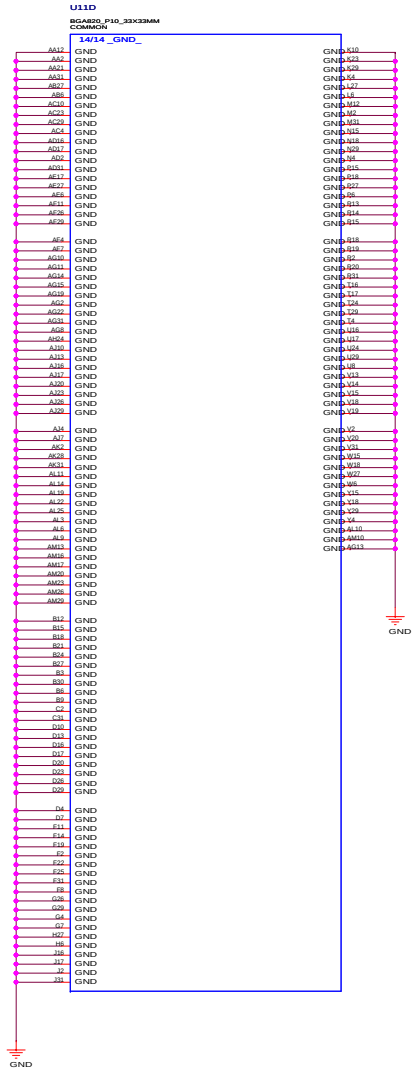


Decoupling for FBC 32..63



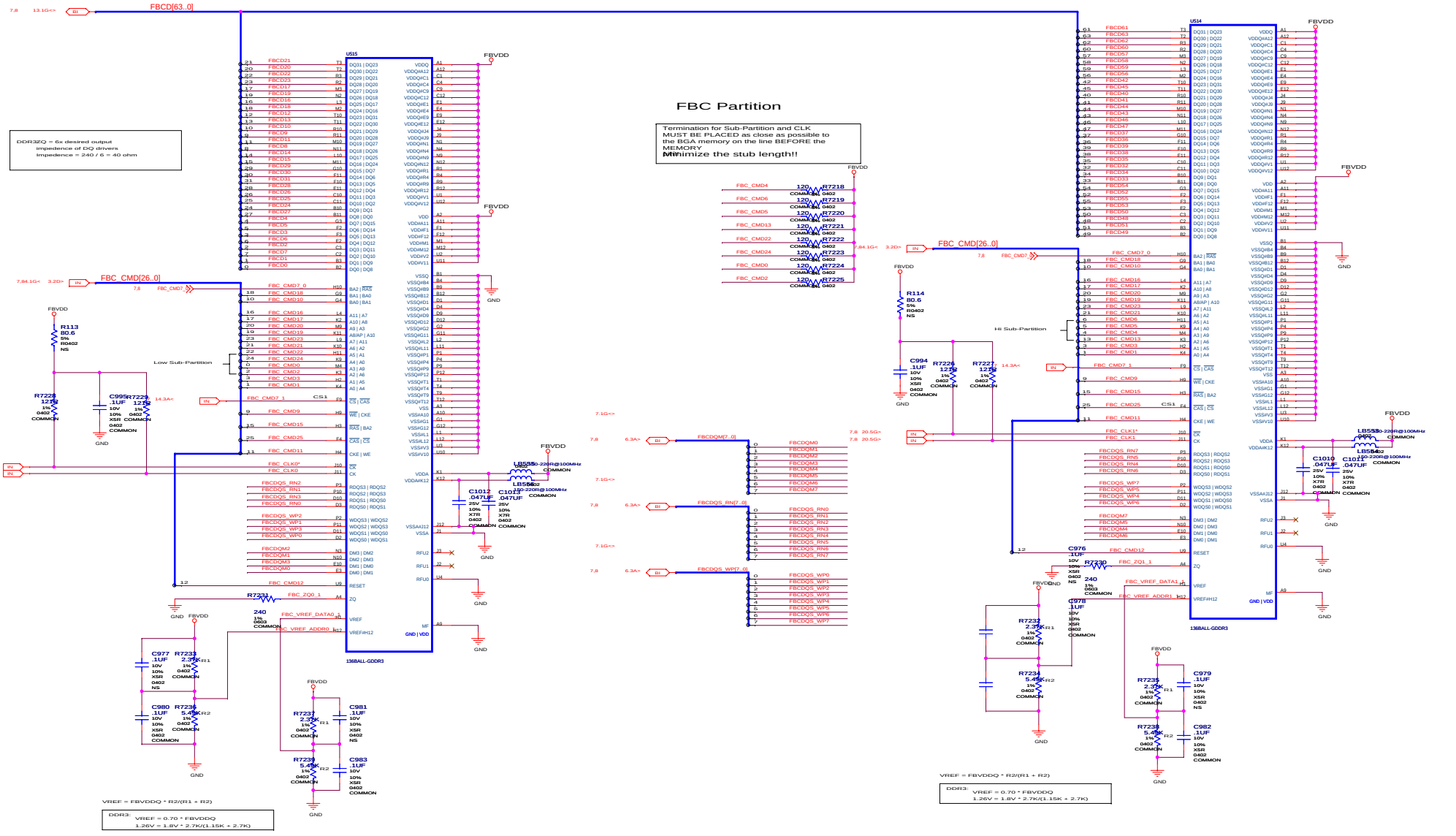






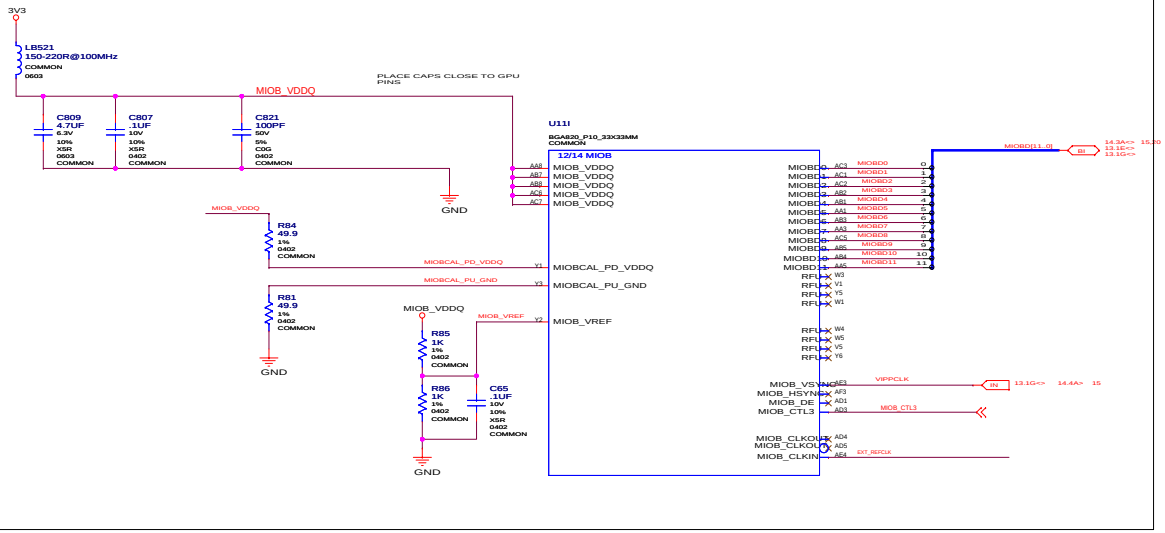
Micro-Star International Co., LTD.	
FBC DECOUPLING	
Size: Custom	Document Number: MS-V089
Rev: 100	
Date: Wednesday, March 07, 2007	Sheet 9 of 23

FRAMEBUFFER: PARTITION C 8Mx32 BGA136 DDR3



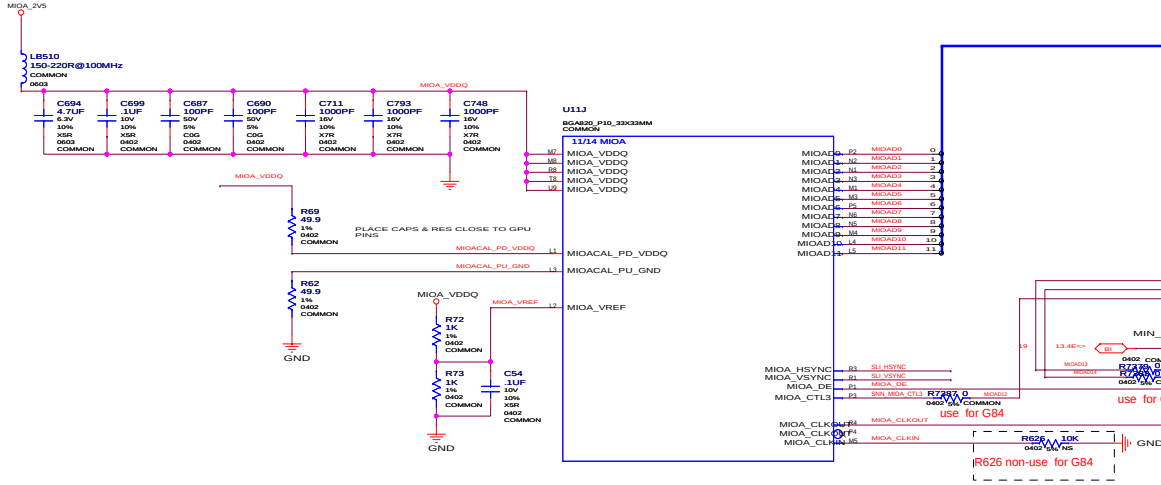
Micro-Star International Co., LTD.	
FB C2	
Size: Custom	Document Number: MS-V089
Rev: 110	
Date: Wednesday, March 07, 2007	Sheet 10 of 23

G3 VIP/MIOB

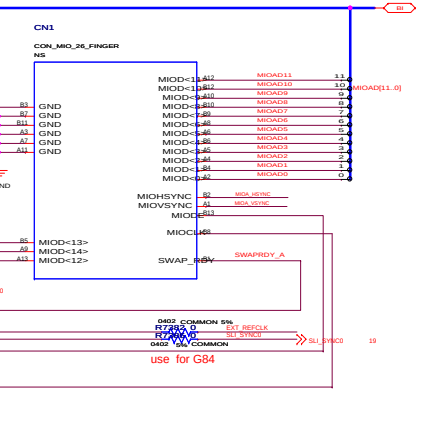


NETNAME	MIN_LINE_WIDTH	SPACING RULE
MIOBD[7..0]	3.5MIL	15MIL

G3 MIOA

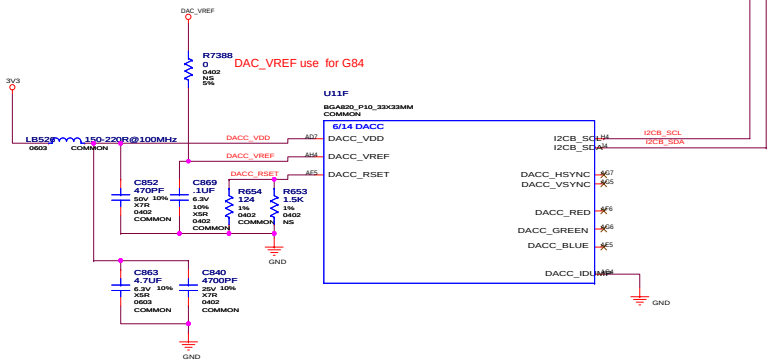


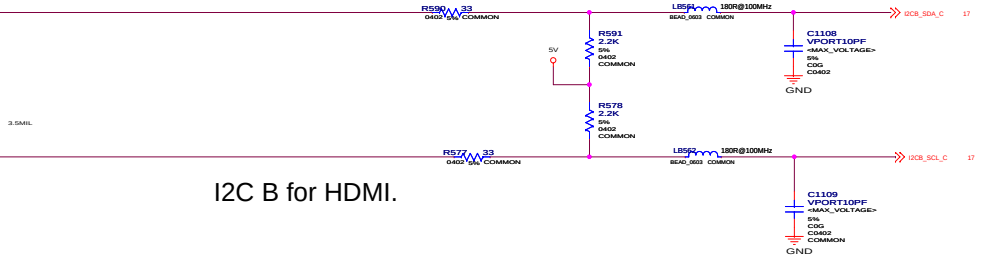
Feature Connector



Micro-Star International Co., LTD.	
MIOA/MIOB	
Size: Custom	Document Number: MS-V089
Rev: 100	
Date: Wednesday, March 07, 2007	Sheet 11 of 23

Secondary Display (DACC), HDMI



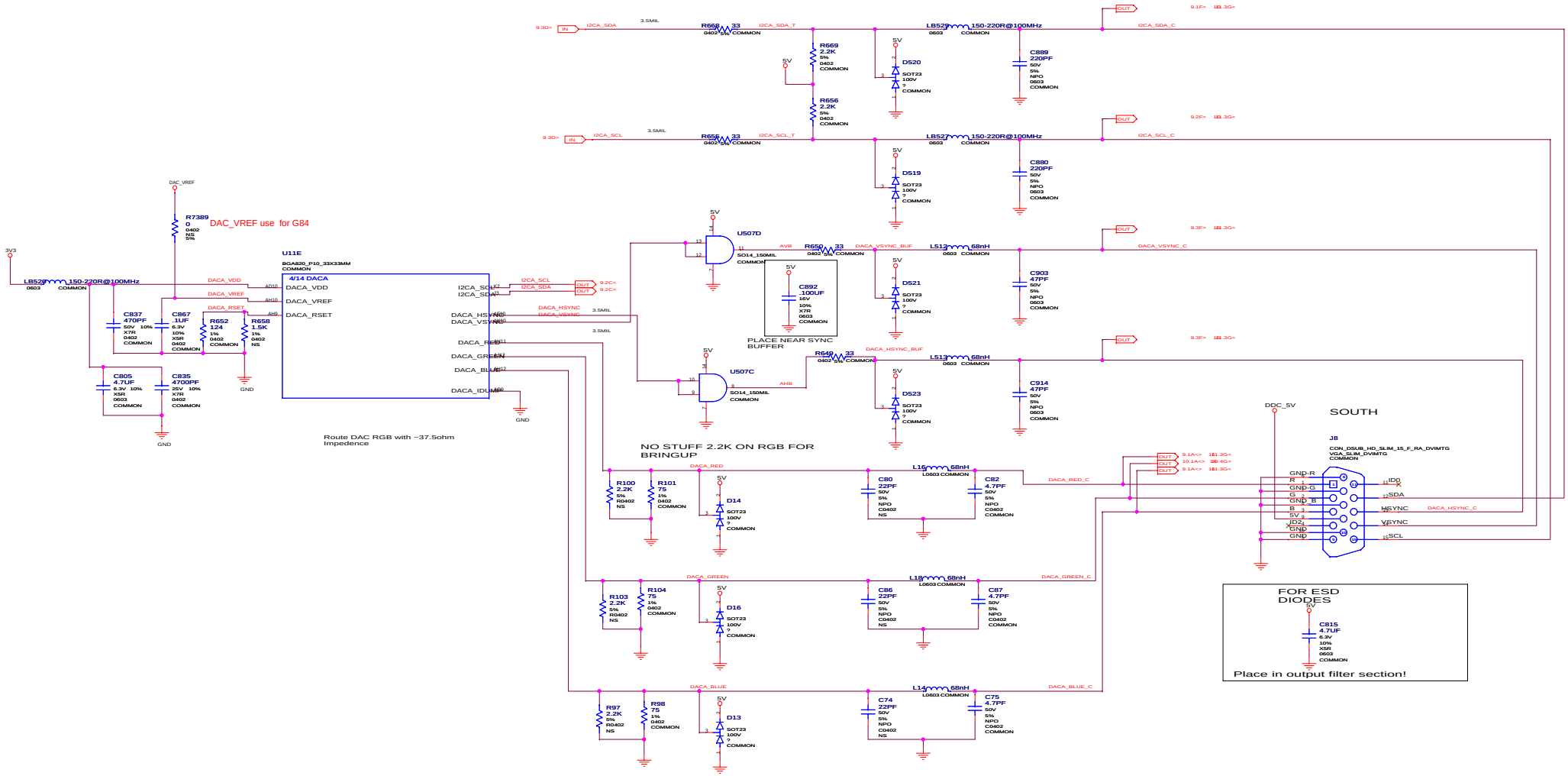


I2C B for HDMI.

MSI	Micro-Star International Co., LTD.	
	DACC	
Size: Custom	Document Number: MS-V089	Rev: 100
Date: Wednesday, March 07, 2007	Sheet 12 of 23	

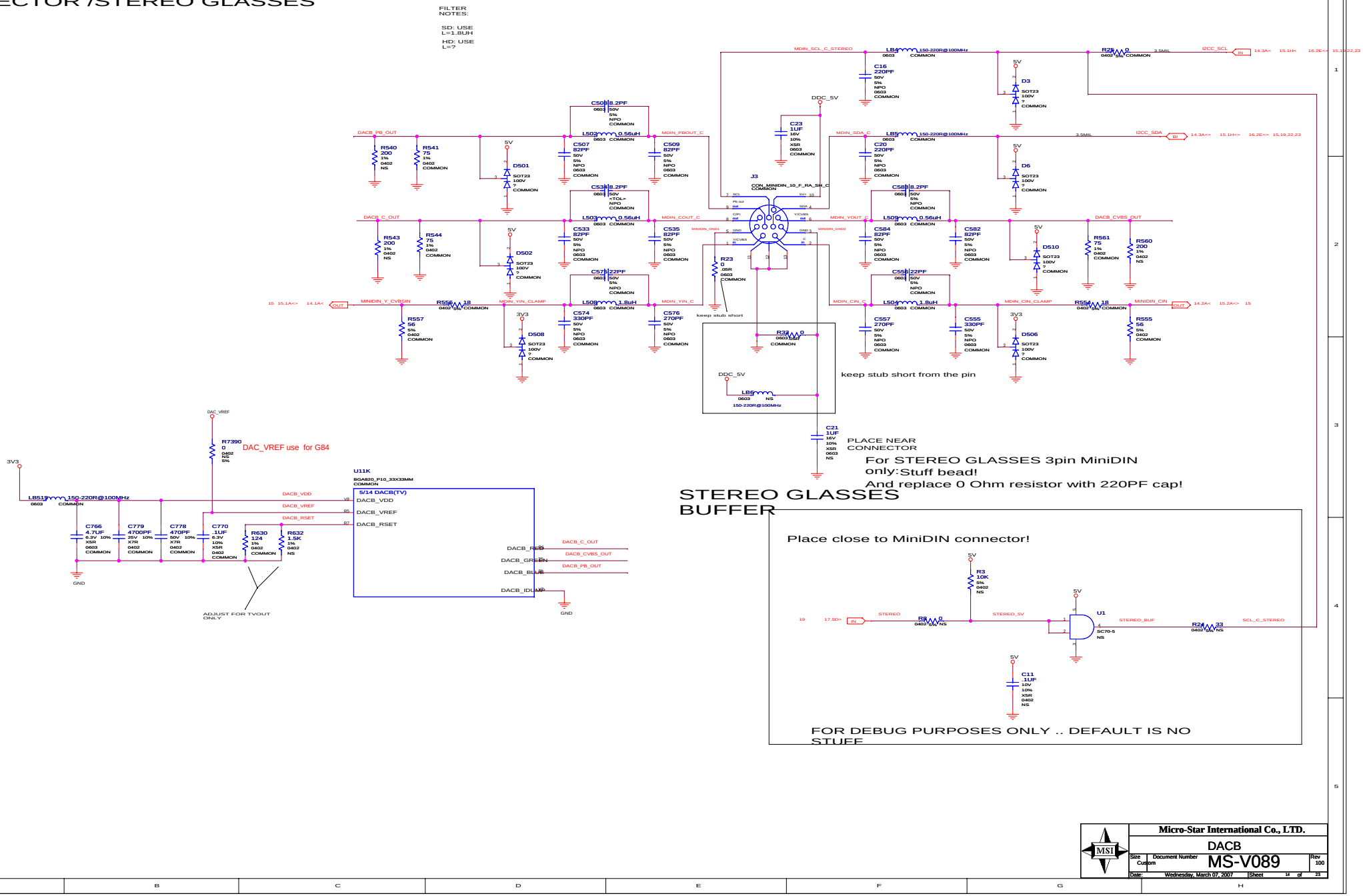
Primary Display (DACA), Slim DB15

DACA
RGB-FILTER



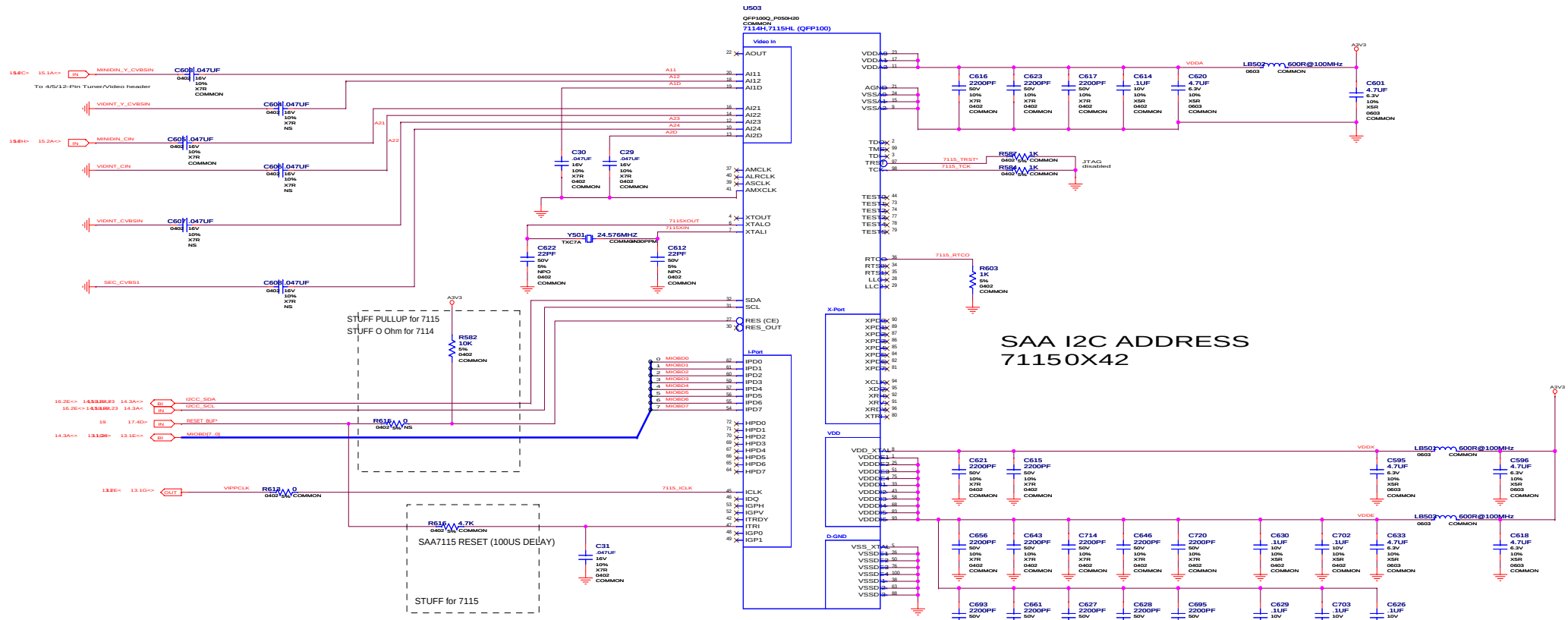
Micro-Star International Co., LTD.	
DACA	
Size: Custom	Document Number: MS-V089
Rev: 100	
Date: Wednesday, March 07, 2007	Sheet 13 of 23

DACB .. MiniDIN VIDEO IN/OUT CONNECTOR /STEREO GLASSES



Micro-Star International Co., LTD.	
DACB	
Size: Custom	Document Number: MS-V089
Rev: 100	
Date: Wednesday, March 07, 2007	Sheet 14 of 23

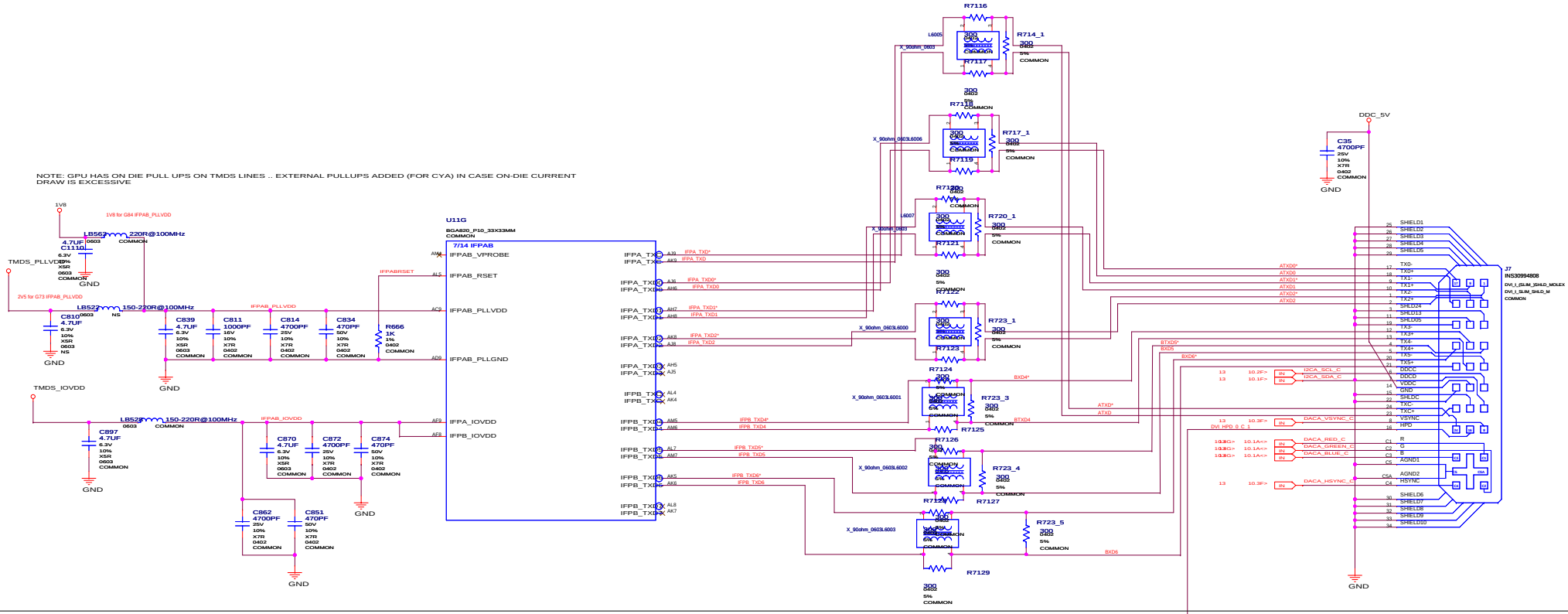
PHILIPS
VIDEO
CAPTURE



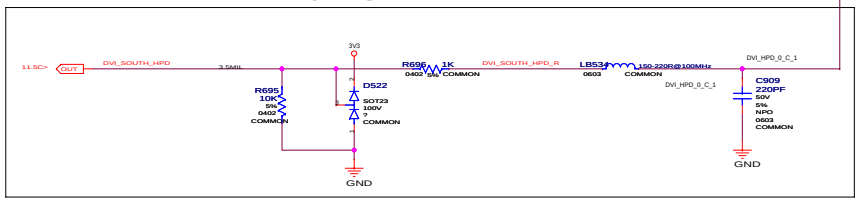
Micro-Star International Co., LTD.	
VIDEO CAPTURE	
Size: Custom	Document Number: MS-V089
Rev: 100	
Date: Wednesday, March 07, 2007	Sheet 15 of 23

INTERNAL TMDS .. LINK A & B

NOTE: GPU HAS ON DIE PULL UPS ON TMDS LINES .. EXTERNAL PULLUPS ADDED (FOR CYA) IN CASE ON-DIE CURRENT DRAW IS EXCESSIVE

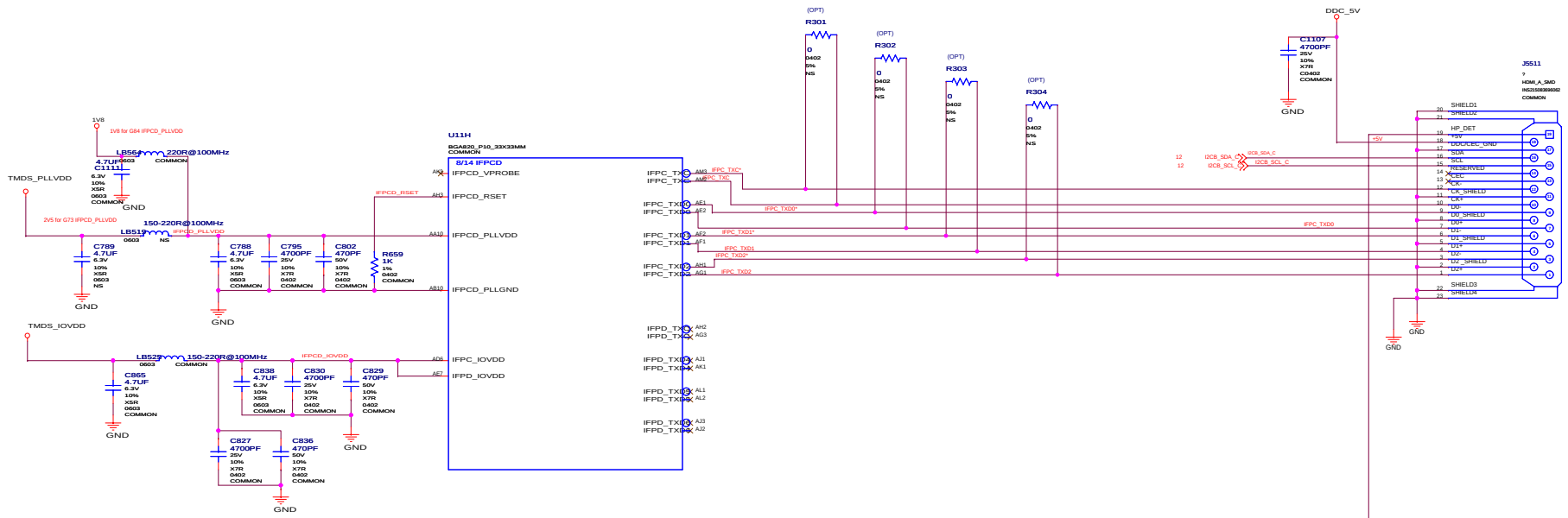


Hotplug Detection

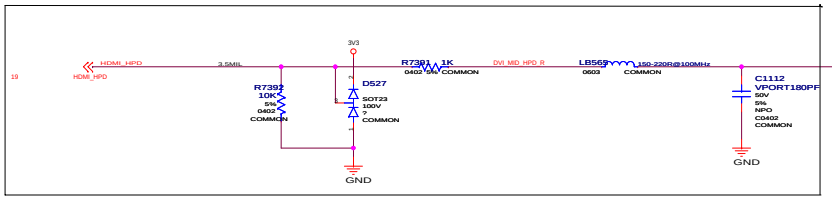


Micro-Star International Co., LTD.			
TMDS LINK A & B			
Size: Custom	Document Number: MS-V089		Rev: 100
Date: Wednesday, March 07, 2007	Sheet 16 of 23		

INTERNAL TMDS
.. LINK C & D

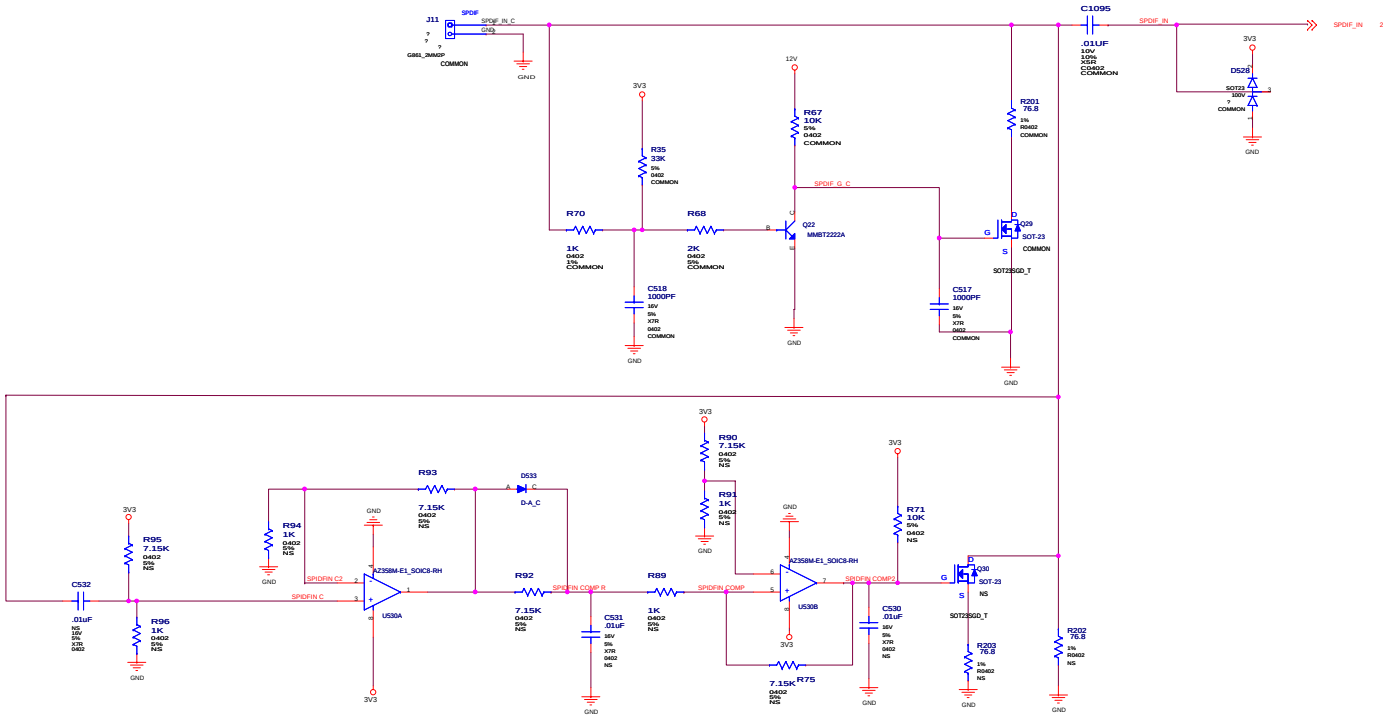


Hotplug Detection

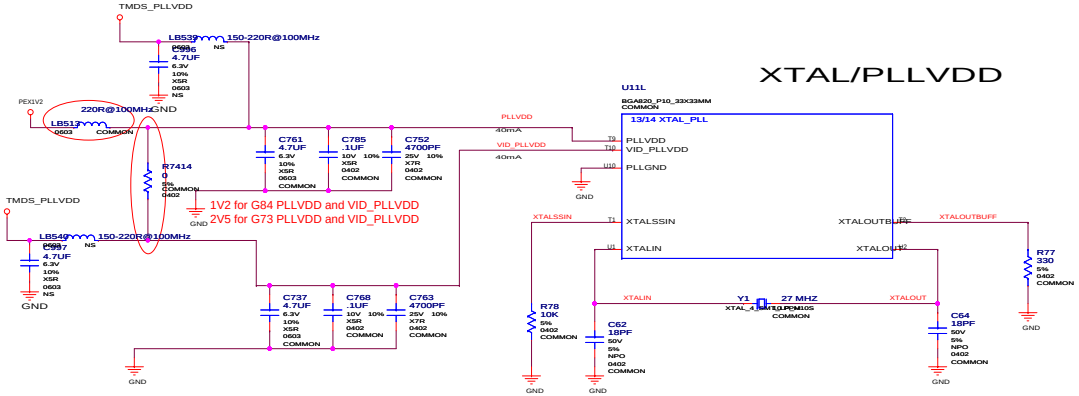


Micro-Star International Co., LTD.		
TMDS LINK C & D		
Size: Custom	Document Number: MS-V089	Rev: 100
Date: Wednesday, March 07, 2007	Sheet 17 of 23	

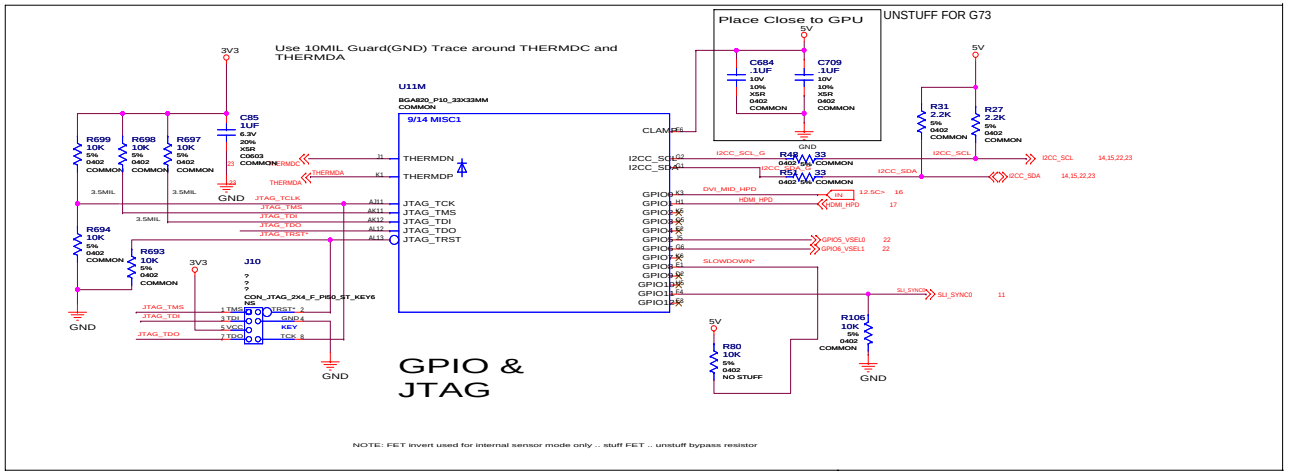
SPDIF IN



XTAL/PLLVDD

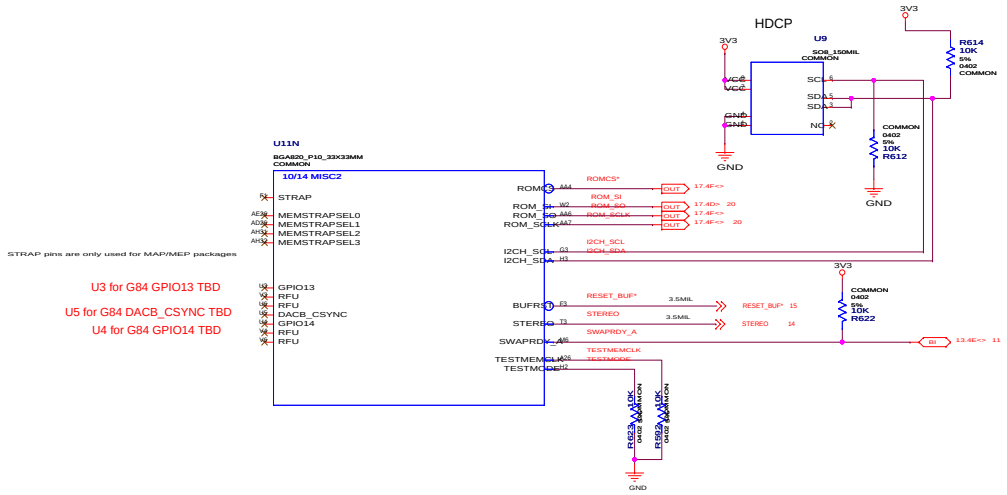


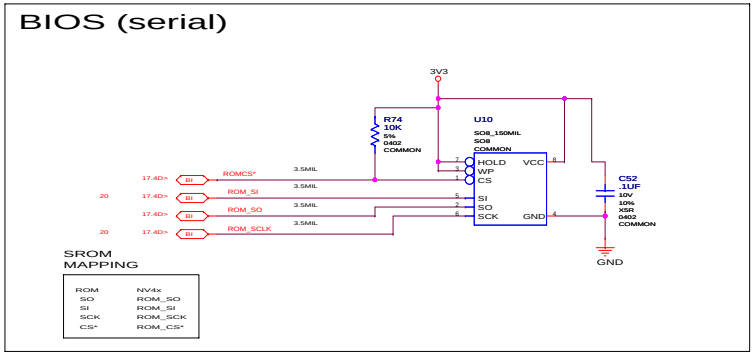
Micro-Star International Co., LTD.			
XTAL/SPDIF IN			
Size: Custom	Document Number: MS-V089		Rev: 110
Date: Wednesday, March 07, 2007	Sheet 18 of 23		



GPIO Assignment Table

GPIO	I/O	FUNCTION
0	IN	DVI MID HOTPLUG DET
1	IN	HDMI hotplug
2	IN	RESERVED
3	IN	RESERVED
4	IN	TUNER IRQ
5	OUT	NVVDD VOLTAGE SELECT 0
6	OUT	NVVDD VOLTAGE SELECT 1
7	Out	TPI INTERRUPT ENABLE
8	IN	RESERVED
9	OUT	PWM FAN
10	IN	INT from Sii1930 TVRSET
11	IN	TVRSET
12	IN	uC PROGRAMMING CONTROL



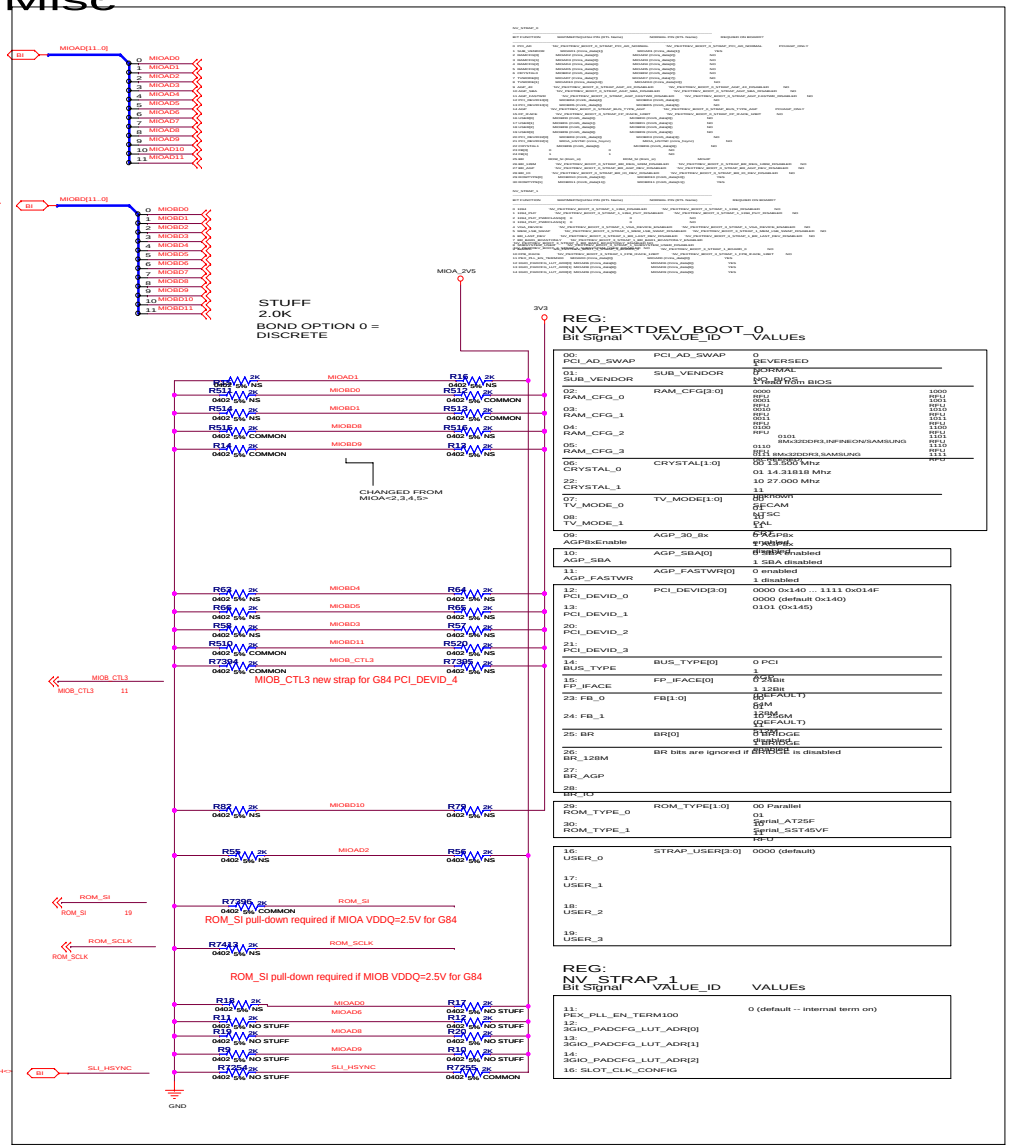


Micro-Star International Co., LTD.	
GPIO/ROM/HDCP ROM	
Size: Custom	Document Number: MS-V089
Rev: 100	
Date: Wednesday, March 07, 2007	Sheet 19 of 23

BIOS, Straps, Misc

Straps

Assembly: BIOS



REG: NV_PEXTDEV_BOOT_0

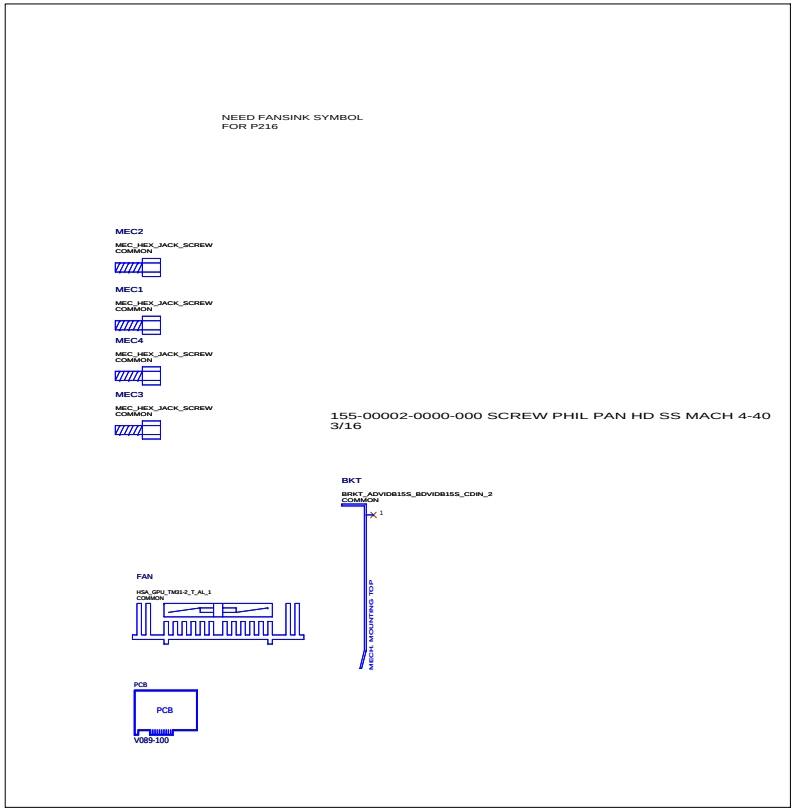
Bit	Signal	VALUE_ID	VALUEs
00:	PCI_AD_SWAP	PCI_AD_SWAP	0 REVERSED 1 NORMAL
01:	SUB_VENDOR	SUB_VENDOR	NO_BIOS 1 Read from BIOS
02:	RAM_CFG_0	RAM_CFG[3:0]	0000 RFU 0001 RFU 0010 RFU 0011 RFU 0100 RFU 0101 RFU 0110 RFU 0111 RFU 1000 RFU 1001 RFU 1010 RFU 1011 RFU 1100 RFU 1101 RFU 1110 RFU 1111 RFU
03:	RAM_CFG_1		
04:	RAM_CFG_2		
05:	RAM_CFG_3		0101 8M32DDR3,INFINEON/SAMSUNG 0110 RFU 0111 8M32DDR3,SAMSUNG
06:	CRYSTAL_0	CRYSTAL[1:0]	00 13.500 Mhz 01 14.31818 Mhz 10 27.000 Mhz 11
07:	TV_MODE_0	TV_MODE[1:0]	00 NTSC 01 SECAM 10 NTSC 11 PAL
08:	TV_MODE_1		
09:	AGP_30_8x	AGP_30_8x	0 AGP8x 1 AGP3.0
10:	AGP_SBA	AGP_SBA[0]	0 SBA enabled 1 SBA disabled
11:	AGP_FASTWR	AGP_FASTWR[0]	0 enabled 1 disabled
12:	PCI_DEVID_0	PCI_DEVID[3:0]	0000 0x140 .. 1111 0x014F 0000 (default 0x140) 0101 (0x145)
13:	PCI_DEVID_1		
20:	PCI_DEVID_2		
21:	PCI_DEVID_3		
14:	BUS_TYPE	BUS_TYPE[0]	0 PCI 1 AGP
15:	FP_IFACE	FP_IFACE[0]	0 24bit 1 12Bit
23:	FB_0	FB[1:0]	00 (DEFAULT) 01 32M 10 64M 11 128M (DEFAULT)
24:	FB_1		
25:	BR	BR[0]	0 BRIDGE disabled 1 BRIDGE enabled
26:	BR_128M	BR bits are ignored if BR/BIOS is disabled	
27:	BR_AGP		
28:	BR_IO		
29:	ROM_TYPE_0	ROM_TYPE[1:0]	00 Parallel 01 Serial_AT25F 10 Serial_SST45VF 11 RFU
30:	ROM_TYPE_1		

16:	USER_0	STRAP_USER[3:0]	0000 (default)
17:	USER_1		
18:	USER_2		
19:	USER_3		

REG: NV_STRAP_1

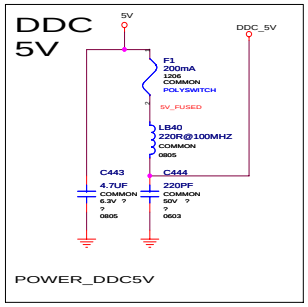
Bit	Signal	VALUE_ID	VALUEs
11:	PEX_PLL_EN_TERM100		0 (default -- internal term on)
12:	3GIO_PADCFG_LUT_ADR[0]		
13:	3GIO_PADCFG_LUT_ADR[1]		
14:	3GIO_PADCFG_LUT_ADR[2]		
16:	SLOT_CLK_CONFIG		

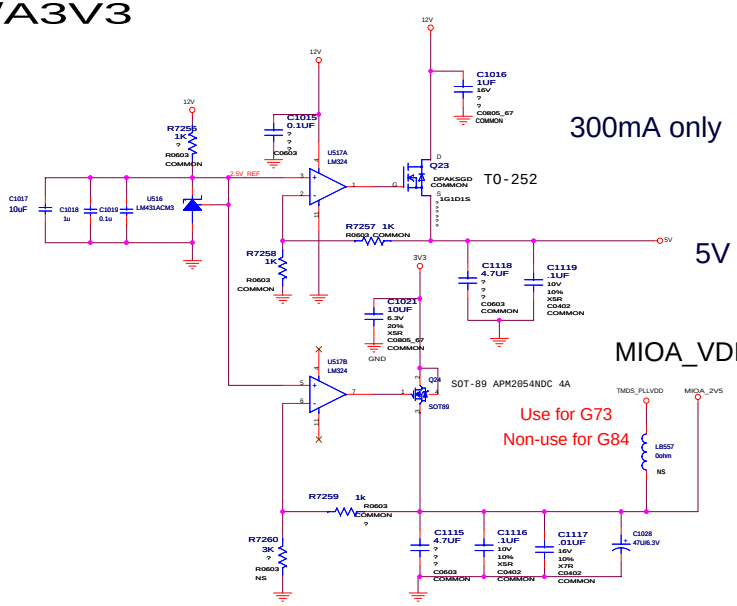
Mechanical parts



Micro-Star International Co., LTD.					
MSI	Straps/Mechanical				
Size: Custom	Document Number: MS-V089			Rev: 100	
Date: Wednesday, March 07, 2007	Sheet 20 of 23				

Power Supply TMDS/A3V3





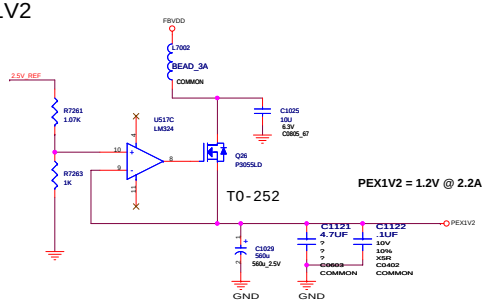
300mA only

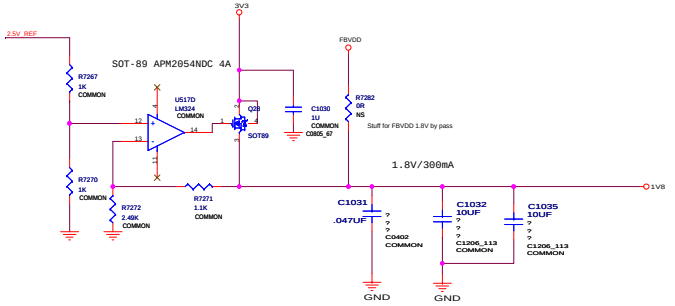
5V & A2V5

MIOA_VDDQ 2V5

Vout=2.5V

PEX1V2

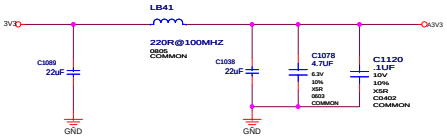


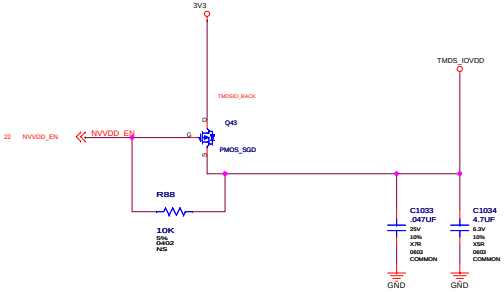


1V8 Supply use for G84 Non-use for G73

Vout=Vref(1+Rtopt/Rbot)

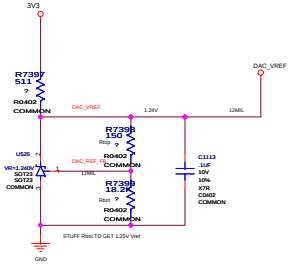
Vout=1.25(1+1.1K/2.49K)=1.8V





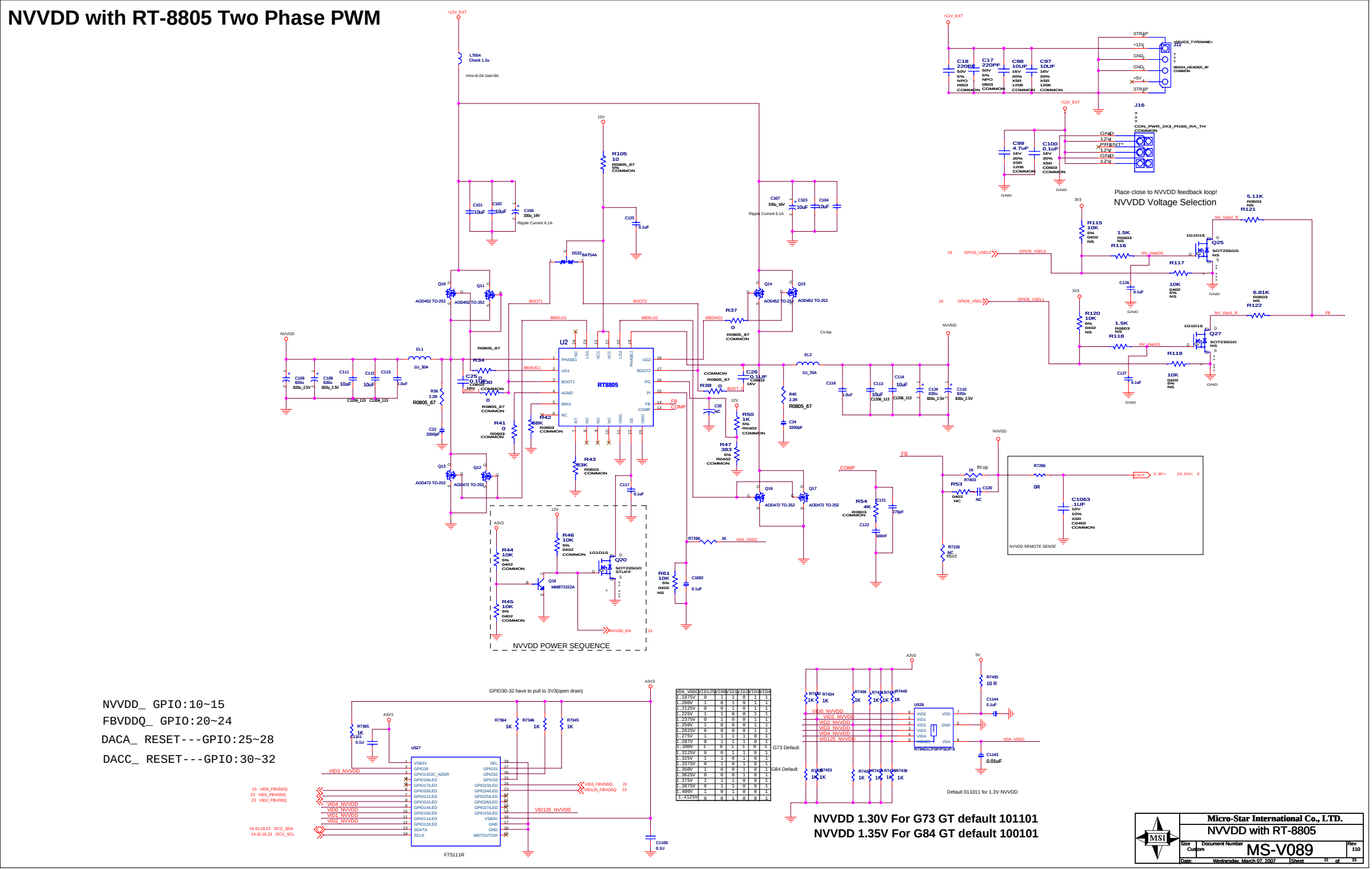
TMDS IO SUPPLY WITH BACKDRIVE PROTECTION

DAC V_REFERENCE SUPPLY for G84

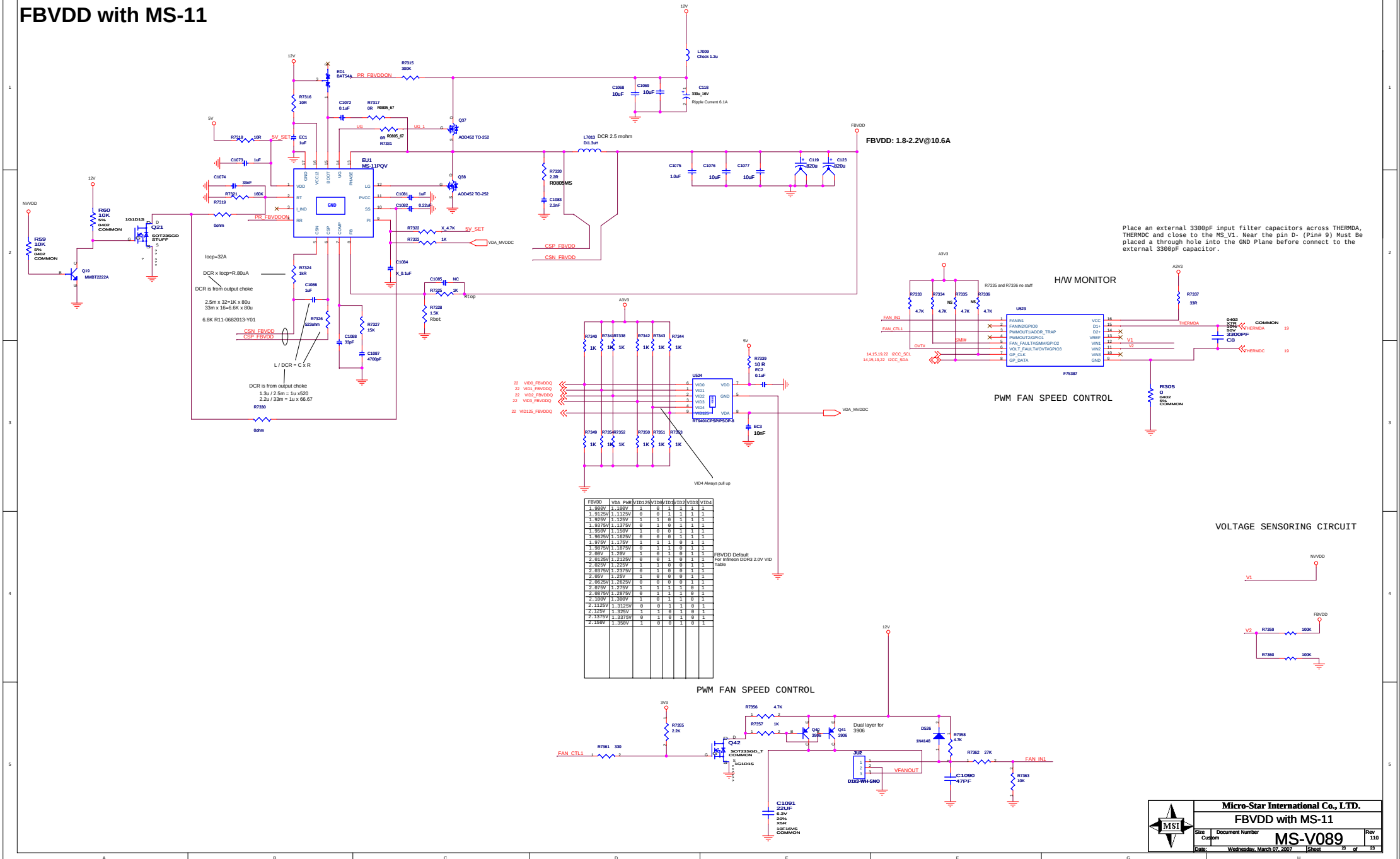


MSI	Micro-Star International Co., LTD.	
	Linear Power	
Size: Custom	Document Number: MS-V089	Rev: 100
Date: Wednesday, March 07, 2007	Sheet 21 of 23	

NVVDD with RT-8805 Two Phase PWM



FBVDD with MS-11



FBVDD	VDA_PWR	VID125	VID6	VID5	VID2	VID3	VID4
1.900V	1.100V	1	0	1	1	1	1
1.9125V	1.1125V	0	0	1	1	1	1
1.925V	1.125V	1	1	0	1	1	1
1.9375V	1.1375V	0	1	0	1	1	1
1.950V	1.150V	1	0	0	1	1	1
1.9625V	1.1625V	0	0	0	1	1	1
1.975V	1.175V	1	1	1	0	1	1
1.9875V	1.1875V	0	1	1	0	1	1
2.00V	1.20V	1	0	1	0	1	1
2.0125V	1.2125V	0	0	1	0	1	1
2.025V	1.225V	1	1	0	0	1	1
2.0375V	1.2375V	0	1	0	0	1	1
2.05V	1.25V	1	0	0	0	1	1
2.0625V	1.2625V	0	0	0	0	1	1
2.075V	1.275V	1	1	1	1	0	1
2.0875V	1.2875V	0	1	1	1	0	1
2.100V	1.300V	1	0	1	1	0	1
2.1125V	1.3125V	0	0	1	1	0	1
2.125V	1.325V	1	1	0	1	0	1
2.1375V	1.3375V	0	1	0	1	0	1
2.150V	1.350V	1	0	0	1	0	1

Micro-Star International Co., LTD.	
FBVDD with MS-11	
Size: Custom	Document Number: MS-V089
Rev: 110	
Date: Wednesday, March 07, 2007	Sheet 23 of 23