V064 G73 7600GS DDR2

0A base on 8988 modify, for G73 chip
remove DDR dram
add DDR2 dram
add RT9218 for FBVDDQ

0B schematic no any component change.

REVISION HISTORY:

X1 Initial Release

PAGE SUMMARY:

8981 Ver : 00A modify P229-B01 Summary

Page 11. Add Video in connect to mini-din 10 pin & remove J5.

Page 12. Add DVI-I common choke.

Page 13. Connect net MIOBD 2 , MIOBD 6 & MIOBD 7 to BUS.

Page 15. Modify Power ,PWM change to ISL6549.

Page 16. Add Video function.

8988 Ver : 00A modify 8981-100 Summary

Page 02. Delete PCI-E connector

Page 15. Change 5V power supply to BR02VDD & Add sequence

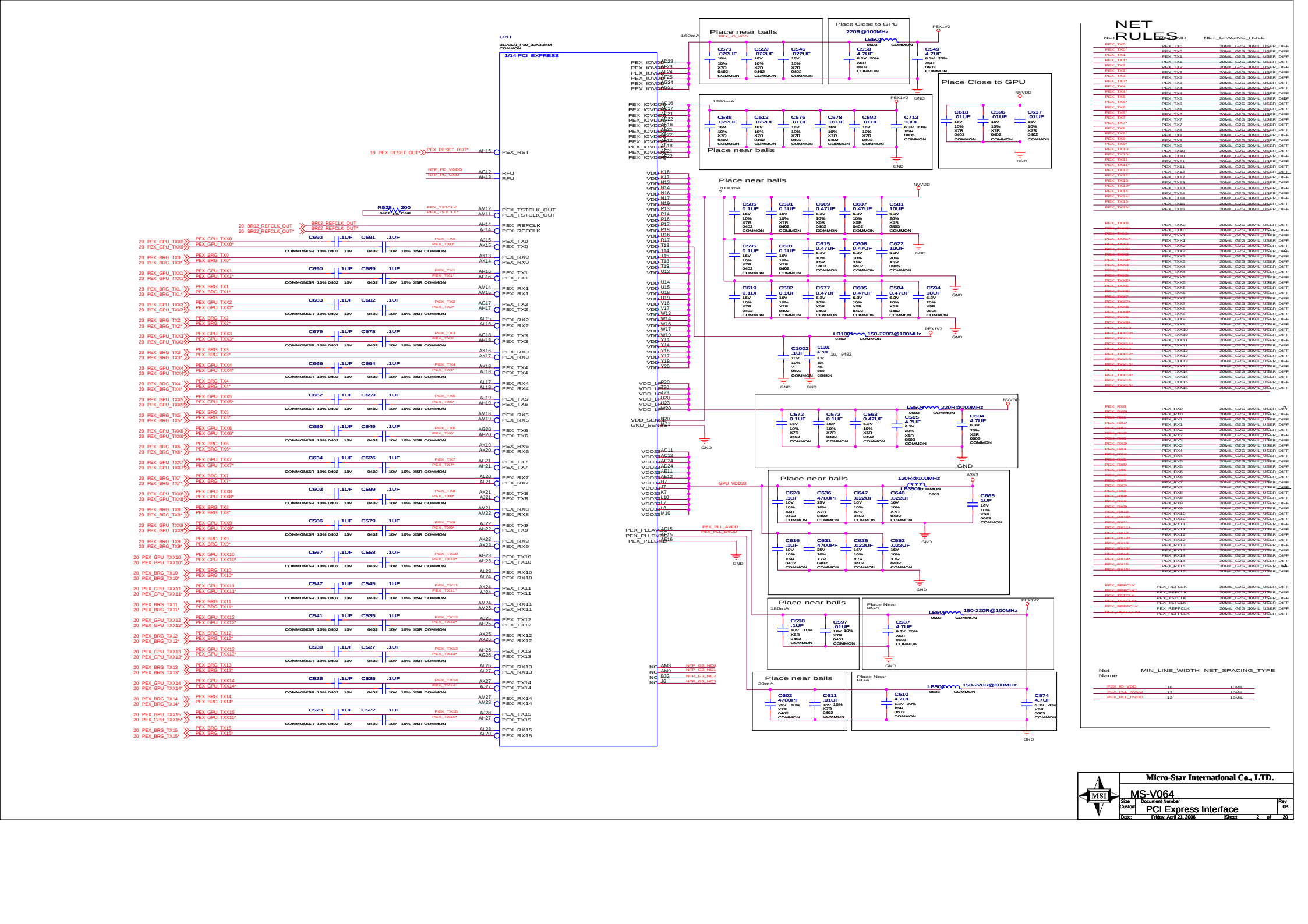
Page 17,18,19,20. Add BR02 bradge circuit

8988 Ver : 00A BOM

SKU000:MSI 602-8988-A10 MS-8988 00A NV43/VGA/DVI-I/VHT-10/256M DDR (Hynix 16*16-4)

SKU001:MSI 602-8988-A20 MS-8988 00A OPT:A NV43/VGA/DVI-I/VHT-10/128M DDR(Samsung 8*16-3.6)

SKU	VARIANT	NVPN	ASSEMBLY
B	BASE	600-10229-BASE-SCH	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES
1	nv43dvivgatv128m16x	600-10229-0002-101	P229-B01 NV43 GEN DVI-I/VGA/S-VIDEO 128MB
2	nv43dvivgatv128m8x	600-10229-0003-101	P229-B01 NV43 GEN DVI-I/VGA/HDTV 128MB 8Mx16
3	43gldvivgatv128m8x	600-50229-0001-101	P229-B01 NV43-GL GEN DVI-I/VGA/HDTV 128MB
4	nv43dvivgatv256m16x	600-10229-0004-101	P229-B01 NV43 GEN DVI-I/VGA/HDTV 256MB 16Mx16
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>



NET RULES

NET_NAME	NET_CLASS	NET_SPACING_RULE
PEX_TX0	PEX_TX0	20MIL_G2G_30MIL_USER_DIFF
PEX_TX0*	PEX_TX0	20MIL_G2G_30MIL_USER_DIFF
PEX_TX1	PEX_TX1	20MIL_G2G_30MIL_USER_DIFF
PEX_TX1*	PEX_TX1	20MIL_G2G_30MIL_USER_DIFF
PEX_TX2	PEX_TX2	20MIL_G2G_30MIL_USER_DIFF
PEX_TX2*	PEX_TX2	20MIL_G2G_30MIL_USER_DIFF
PEX_TX3	PEX_TX3	20MIL_G2G_30MIL_USER_DIFF
PEX_TX3*	PEX_TX3	20MIL_G2G_30MIL_USER_DIFF
PEX_TX4	PEX_TX4	20MIL_G2G_30MIL_USER_DIFF
PEX_TX4*	PEX_TX4	20MIL_G2G_30MIL_USER_DIFF
PEX_TX5	PEX_TX5	20MIL_G2G_30MIL_USER_DIFF
PEX_TX5*	PEX_TX5	20MIL_G2G_30MIL_USER_DIFF
PEX_TX6	PEX_TX6	20MIL_G2G_30MIL_USER_DIFF
PEX_TX6*	PEX_TX6	20MIL_G2G_30MIL_USER_DIFF
PEX_TX7	PEX_TX7	20MIL_G2G_30MIL_USER_DIFF
PEX_TX7*	PEX_TX7	20MIL_G2G_30MIL_USER_DIFF
PEX_TX8	PEX_TX8	20MIL_G2G_30MIL_USER_DIFF
PEX_TX8*	PEX_TX8	20MIL_G2G_30MIL_USER_DIFF
PEX_TX9	PEX_TX9	20MIL_G2G_30MIL_USER_DIFF
PEX_TX9*	PEX_TX9	20MIL_G2G_30MIL_USER_DIFF
PEX_TX10	PEX_TX10	20MIL_G2G_30MIL_USER_DIFF
PEX_TX10*	PEX_TX10	20MIL_G2G_30MIL_USER_DIFF
PEX_TX11	PEX_TX11	20MIL_G2G_30MIL_USER_DIFF
PEX_TX11*	PEX_TX11	20MIL_G2G_30MIL_USER_DIFF
PEX_TX12	PEX_TX12	20MIL_G2G_30MIL_USER_DIFF
PEX_TX12*	PEX_TX12	20MIL_G2G_30MIL_USER_DIFF
PEX_TX13	PEX_TX13	20MIL_G2G_30MIL_USER_DIFF
PEX_TX13*	PEX_TX13	20MIL_G2G_30MIL_USER_DIFF
PEX_TX14	PEX_TX14	20MIL_G2G_30MIL_USER_DIFF
PEX_TX14*	PEX_TX14	20MIL_G2G_30MIL_USER_DIFF
PEX_TX15	PEX_TX15	20MIL_G2G_30MIL_USER_DIFF
PEX_TX15*	PEX_TX15	20MIL_G2G_30MIL_USER_DIFF

PEX_TX0	PEX_TX0	20MIL_G2G_30MIL_USER_DIFF
PEX_TX0*	PEX_TX0	20MIL_G2G_30MIL_USER_DIFF
PEX_TX1	PEX_TX1	20MIL_G2G_30MIL_USER_DIFF
PEX_TX1*	PEX_TX1	20MIL_G2G_30MIL_USER_DIFF
PEX_TX2	PEX_TX2	20MIL_G2G_30MIL_USER_DIFF
PEX_TX2*	PEX_TX2	20MIL_G2G_30MIL_USER_DIFF
PEX_TX3	PEX_TX3	20MIL_G2G_30MIL_USER_DIFF
PEX_TX3*	PEX_TX3	20MIL_G2G_30MIL_USER_DIFF
PEX_TX4	PEX_TX4	20MIL_G2G_30MIL_USER_DIFF
PEX_TX4*	PEX_TX4	20MIL_G2G_30MIL_USER_DIFF
PEX_TX5	PEX_TX5	20MIL_G2G_30MIL_USER_DIFF
PEX_TX5*	PEX_TX5	20MIL_G2G_30MIL_USER_DIFF
PEX_TX6	PEX_TX6	20MIL_G2G_30MIL_USER_DIFF
PEX_TX6*	PEX_TX6	20MIL_G2G_30MIL_USER_DIFF
PEX_TX7	PEX_TX7	20MIL_G2G_30MIL_USER_DIFF
PEX_TX7*	PEX_TX7	20MIL_G2G_30MIL_USER_DIFF
PEX_TX8	PEX_TX8	20MIL_G2G_30MIL_USER_DIFF
PEX_TX8*	PEX_TX8	20MIL_G2G_30MIL_USER_DIFF
PEX_TX9	PEX_TX9	20MIL_G2G_30MIL_USER_DIFF
PEX_TX9*	PEX_TX9	20MIL_G2G_30MIL_USER_DIFF
PEX_TX10	PEX_TX10	20MIL_G2G_30MIL_USER_DIFF
PEX_TX10*	PEX_TX10	20MIL_G2G_30MIL_USER_DIFF
PEX_TX11	PEX_TX11	20MIL_G2G_30MIL_USER_DIFF
PEX_TX11*	PEX_TX11	20MIL_G2G_30MIL_USER_DIFF
PEX_TX12	PEX_TX12	20MIL_G2G_30MIL_USER_DIFF
PEX_TX12*	PEX_TX12	20MIL_G2G_30MIL_USER_DIFF
PEX_TX13	PEX_TX13	20MIL_G2G_30MIL_USER_DIFF
PEX_TX13*	PEX_TX13	20MIL_G2G_30MIL_USER_DIFF
PEX_TX14	PEX_TX14	20MIL_G2G_30MIL_USER_DIFF
PEX_TX14*	PEX_TX14	20MIL_G2G_30MIL_USER_DIFF
PEX_TX15	PEX_TX15	20MIL_G2G_30MIL_USER_DIFF
PEX_TX15*	PEX_TX15	20MIL_G2G_30MIL_USER_DIFF

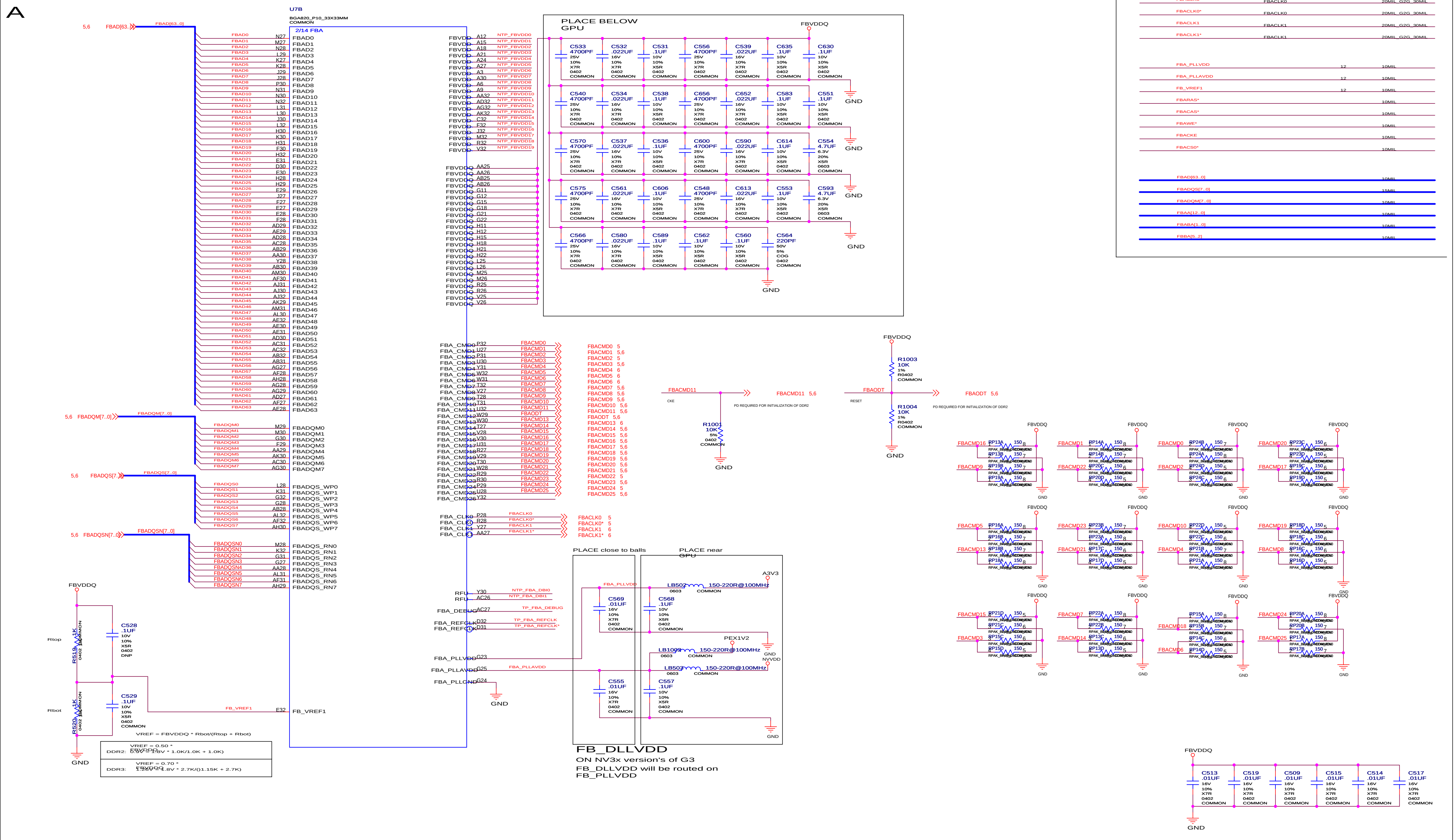
PEX_RX0	PEX_RX0	20MIL_G2G_30MIL_USER_DIFF
PEX_RX0*	PEX_RX0	20MIL_G2G_30MIL_USER_DIFF
PEX_RX1	PEX_RX1	20MIL_G2G_30MIL_USER_DIFF
PEX_RX1*	PEX_RX1	20MIL_G2G_30MIL_USER_DIFF
PEX_RX2	PEX_RX2	20MIL_G2G_30MIL_USER_DIFF
PEX_RX2*	PEX_RX2	20MIL_G2G_30MIL_USER_DIFF
PEX_RX3	PEX_RX3	20MIL_G2G_30MIL_USER_DIFF
PEX_RX3*	PEX_RX3	20MIL_G2G_30MIL_USER_DIFF
PEX_RX4	PEX_RX4	20MIL_G2G_30MIL_USER_DIFF
PEX_RX4*	PEX_RX4	20MIL_G2G_30MIL_USER_DIFF
PEX_RX5	PEX_RX5	20MIL_G2G_30MIL_USER_DIFF
PEX_RX5*	PEX_RX5	20MIL_G2G_30MIL_USER_DIFF
PEX_RX6	PEX_RX6	20MIL_G2G_30MIL_USER_DIFF
PEX_RX6*	PEX_RX6	20MIL_G2G_30MIL_USER_DIFF
PEX_RX7	PEX_RX7	20MIL_G2G_30MIL_USER_DIFF
PEX_RX7*	PEX_RX7	20MIL_G2G_30MIL_USER_DIFF
PEX_RX8	PEX_RX8	20MIL_G2G_30MIL_USER_DIFF
PEX_RX8*	PEX_RX8	20MIL_G2G_30MIL_USER_DIFF
PEX_RX9	PEX_RX9	20MIL_G2G_30MIL_USER_DIFF
PEX_RX9*	PEX_RX9	20MIL_G2G_30MIL_USER_DIFF
PEX_RX10	PEX_RX10	20MIL_G2G_30MIL_USER_DIFF
PEX_RX10*	PEX_RX10	20MIL_G2G_30MIL_USER_DIFF
PEX_RX11	PEX_RX11	20MIL_G2G_30MIL_USER_DIFF
PEX_RX11*	PEX_RX11	20MIL_G2G_30MIL_USER_DIFF
PEX_RX12	PEX_RX12	20MIL_G2G_30MIL_USER_DIFF
PEX_RX12*	PEX_RX12	20MIL_G2G_30MIL_USER_DIFF
PEX_RX13	PEX_RX13	20MIL_G2G_30MIL_USER_DIFF
PEX_RX13*	PEX_RX13	20MIL_G2G_30MIL_USER_DIFF
PEX_RX14	PEX_RX14	20MIL_G2G_30MIL_USER_DIFF
PEX_RX14*	PEX_RX14	20MIL_G2G_30MIL_USER_DIFF
PEX_RX15	PEX_RX15	20MIL_G2G_30MIL_USER_DIFF
PEX_RX15*	PEX_RX15	20MIL_G2G_30MIL_USER_DIFF

PEX_REFCLK	PEX_REFCLK	20MIL_G2G_30MIL_USER_DIFF
PEX_REFCLK*	PEX_REFCLK	20MIL_G2G_30MIL_USER_DIFF
PEX_TSTCLK	PEX_TSTCLK	20MIL_G2G_30MIL_USER_DIFF
PEX_TSTCLK*	PEX_TSTCLK	20MIL_G2G_30MIL_USER_DIFF
PEX_REFCLK	PEX_REFFCLK	20MIL_G2G_30MIL_USER_DIFF
PEX_REFCLK*	PEX_REFFCLK	20MIL_G2G_30MIL_USER_DIFF

Net Name	MIN_LINE_WIDTH	NET_SPACING_TYPE
PEX_IO_VDD	16	10MIL
PEX_PLL_AVDD	12	10MIL
PEX_PLL_DVDD	12	10MIL

Micro-Star International Co., LTD.		
MS-V064		
Size: Custom	Document Number: PCI Express Interface	Rev: 0B
Date: Friday, April 21, 2006	Sheet 2 of 20	

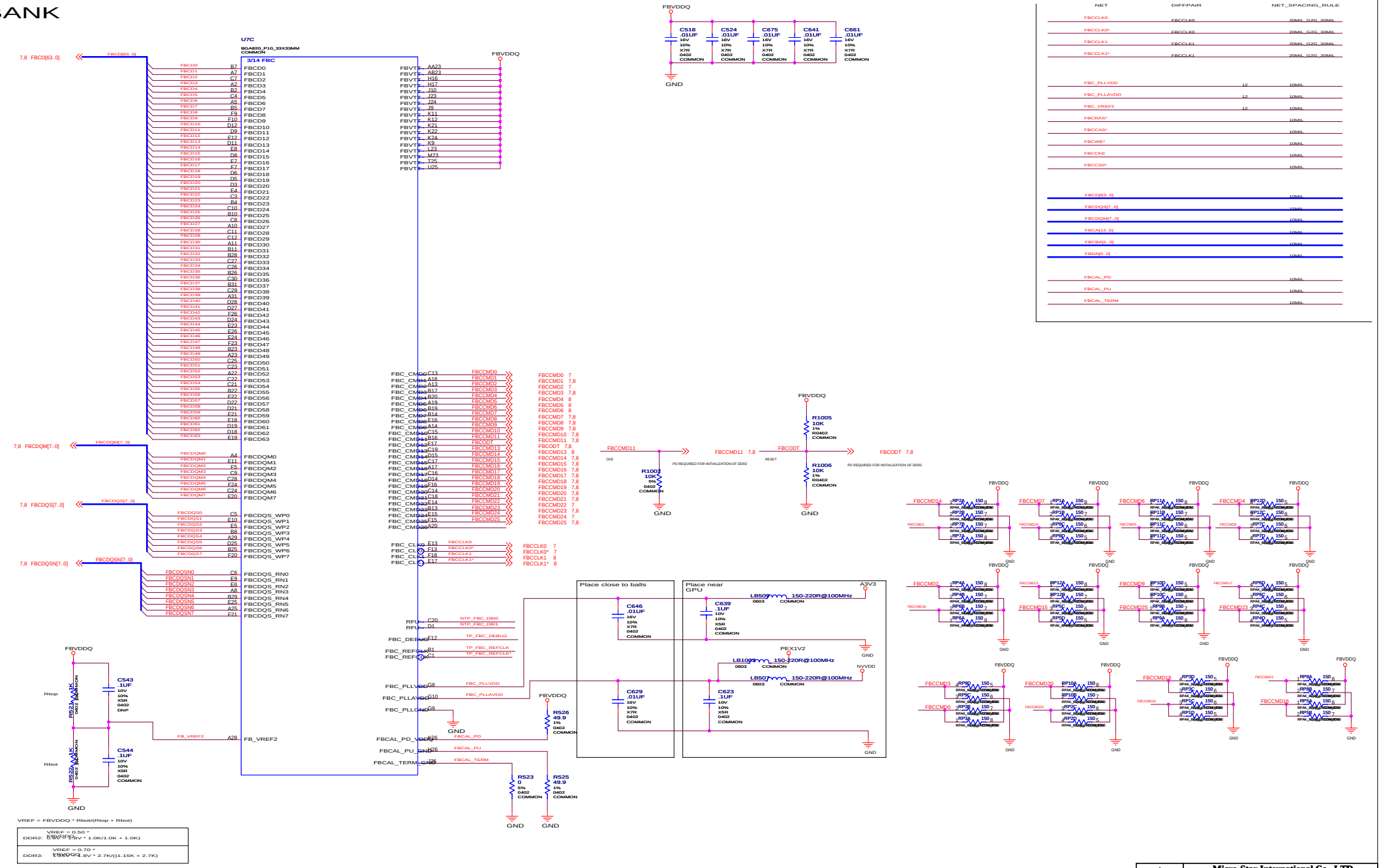
FB BANK A



U7B
BGA820_P10_33X33MM
COMMON
2/14 FBA
PLACE BELOW GPU
FBVDDQ
GND
PLACE close to balls
PLACE near GPU
A3V3
PEX1V2
NVVDD
PD REQUIRED FOR INITIALIZATION OF DDR2
CKE
RESET
Rtop
Rbot
VREF = FBVDDQ * Rbot/(Rtop + Rbot)
DDR2: VREF = 0.50 * FBVDDQ 0.9V = 1.8V * 1.0K/(1.0K + 1.0K)
DDR3: VREF = 0.70 * FBVDDQ 1.26V = 1.8V * 2.7K/(1.15K + 2.7K)
FB_DLLVDD
ON NV3x version's of G3
FB_DLLVDD will be routed on
FB_PLLVDD
NET
DIFFPAIR
NET_SPACING_RULE

Micro-Star International Co., LTD.		
MS-V064		
Size: Custom	Document Number: FB BANK A	Rev: 0B
Date: Friday, April 21, 2006	Sheet 3 of 20	

FB BANK C

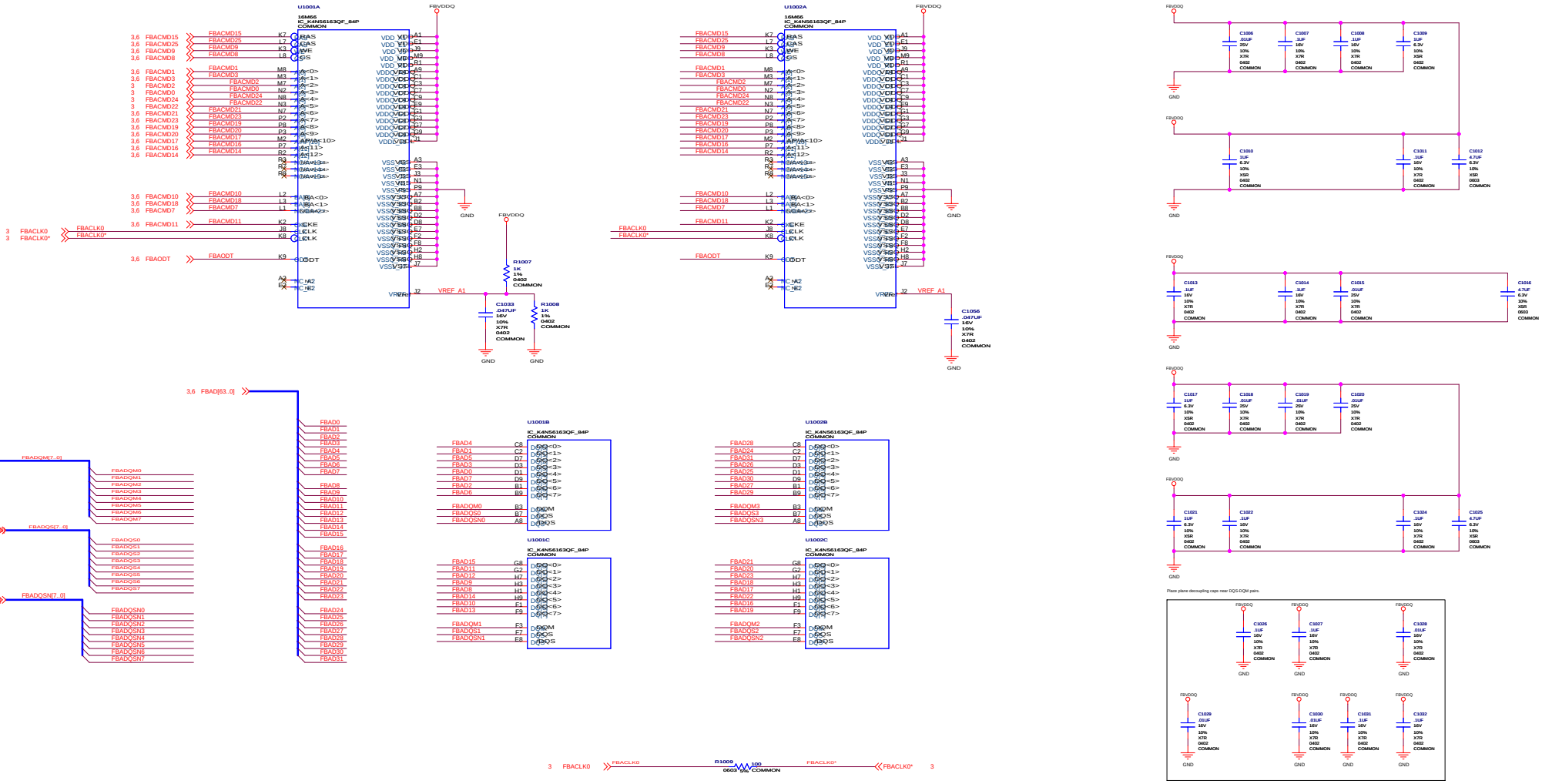


NET	DIFFPAIR	NET_SPACING_RULE
FBCCLK0	FBCCLK0	20MIL_G2G_30MIL
FBCCLK0*	FBCCLK0	20MIL_G2G_30MIL
FBCCLK1	FBCCLK1	20MIL_G2G_30MIL
FBCCLK1*	FBCCLK1	20MIL_G2G_30MIL
FBC_PLLVDD	12	10MIL
FBC_PLLAVDD	12	10MIL
FBC_VREF2	12	10MIL
FBCRAS*		10MIL
FBCCAS*		10MIL
FBCWE*		10MIL
FBCCKE		10MIL
FBCCS0*		10MIL
FBCD[63..0]		10MIL
FBCDQS[7..0]		10MIL
FBCDQM[7..0]		10MIL
FBCA[12..0]		10MIL
FBCBA[1..0]		10MIL
FBDA[5..2]		10MIL
FBCAL_PD		10MIL
FBCAL_PU		10MIL
FBCAL_TERM		10MIL

Micro-Star International Co., LTD.	
MS-V064	
Size: Custom	Document Number: FB BANK C
Rev: 0B	
Date: Friday, April 21, 2006	Sheet 4 of 20

MEMORY 1st bank
0..31

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY



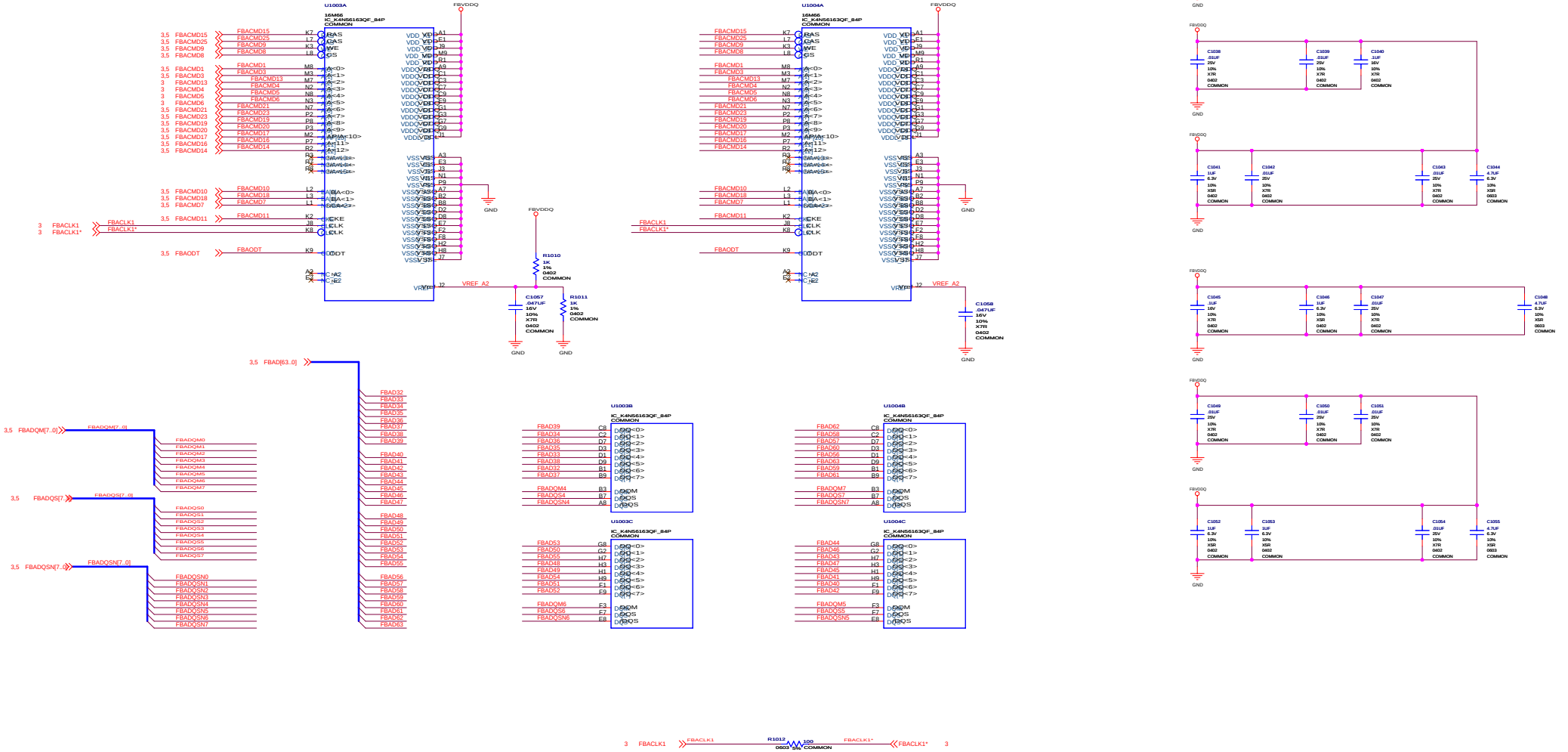
16x powerground pin pairs per mem
3x 0.022uF - 5.3 to 1
6x 4700uF - 2.7 to 1
5x 220pF - 3.2 to 1
2x 0.047uF - 8 to 1
2x 4.7uF - 9 to 1

Place plane decoupling caps near DQS-DQM pairs.

Micro-Star International Co., LTD.			
MS-V064			
Size: Custom	Document Number: Memory 1st bank 0..31		Rev: 0B
Date: Friday, April 21, 2006		Sheet 5 of 20	

MEMORY 1st bank
32..63

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY



Micro-Star International Co., LTD.

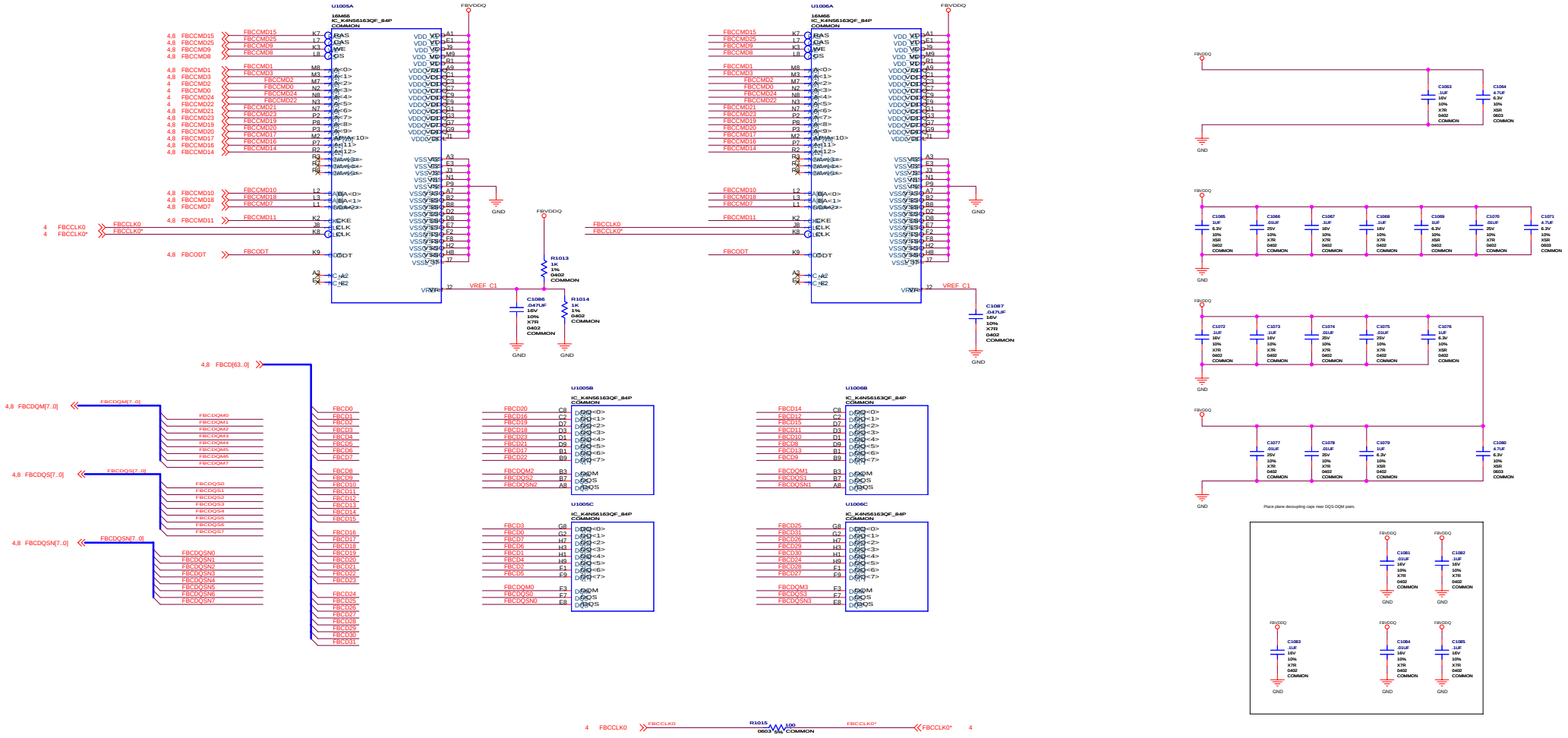
MS-V064

Size: Custom | Document Number: Memory 1st 32..63 | Rev: 0B

Date: Friday, April 21, 2006 | Sheet 6 of 20

MEMORY 2nd bank
0..31

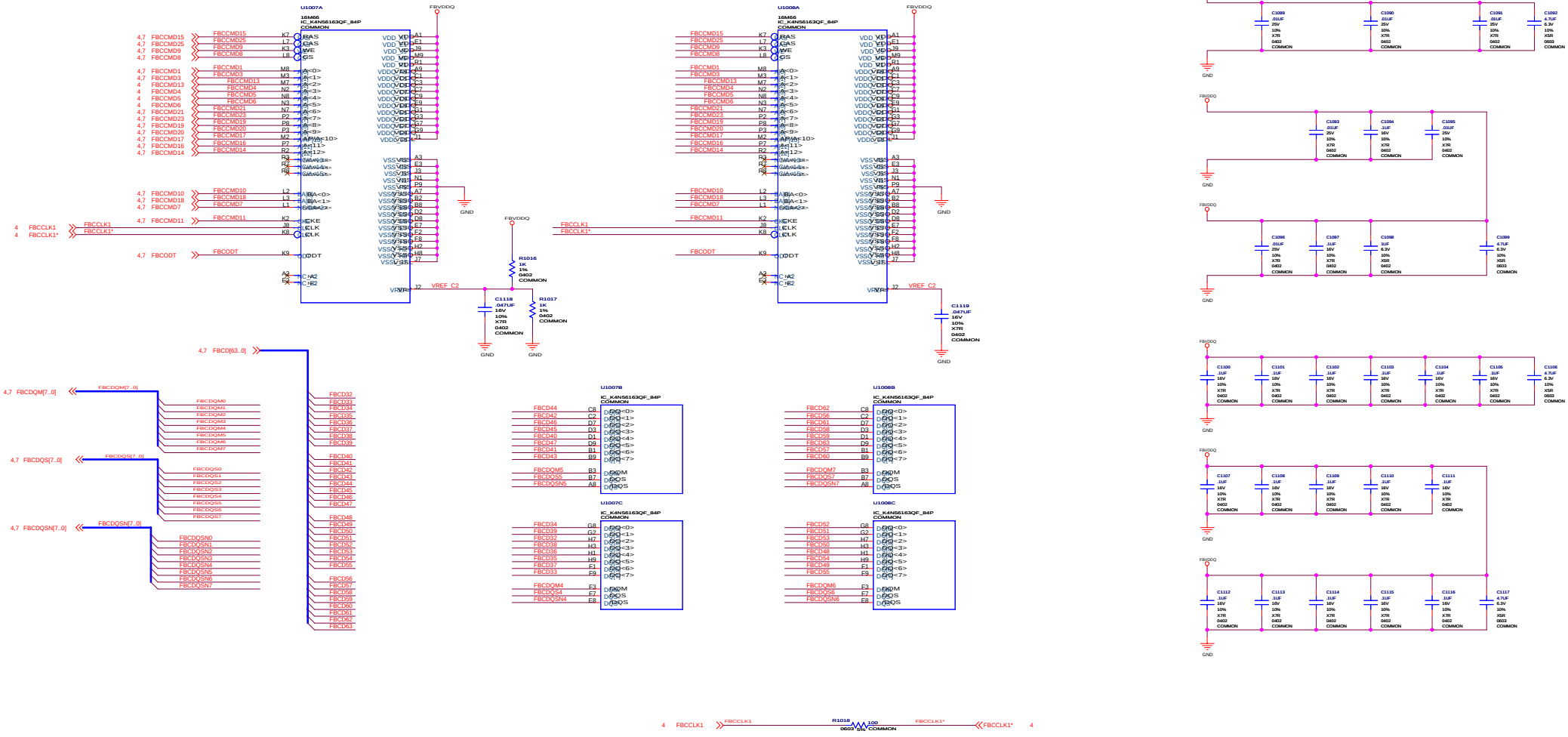
PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY



Micro-Star International Co., LTD.	
MS-V064	
Size: Custom	Document Number: Memory 2nd bank 0..31
Rev: 0B	
Date: Friday, April 21, 2006	Sheet 7 of 20

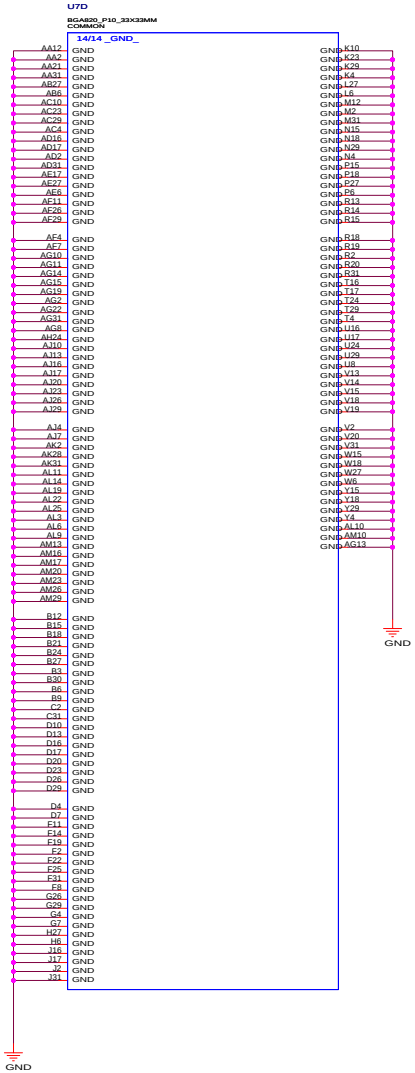
MEMORY 2nd bank
32..63

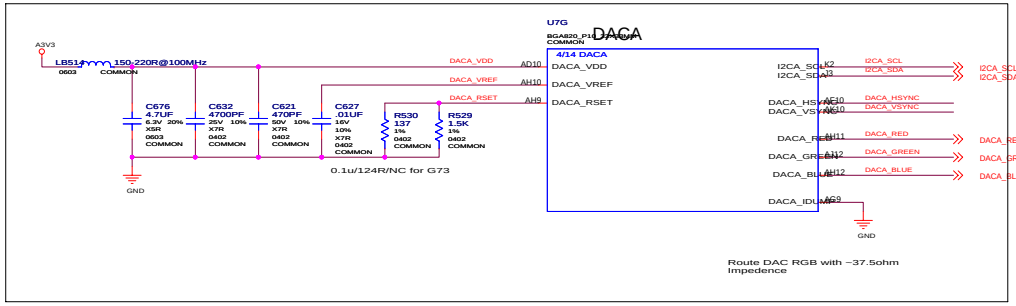
PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE
TO MEMORY

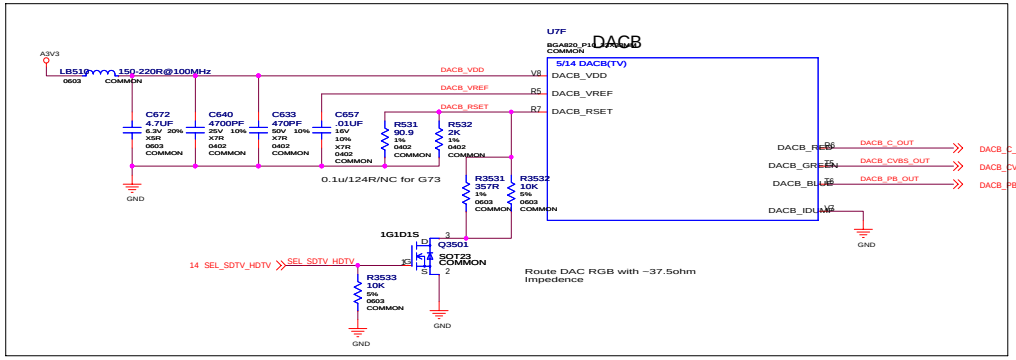


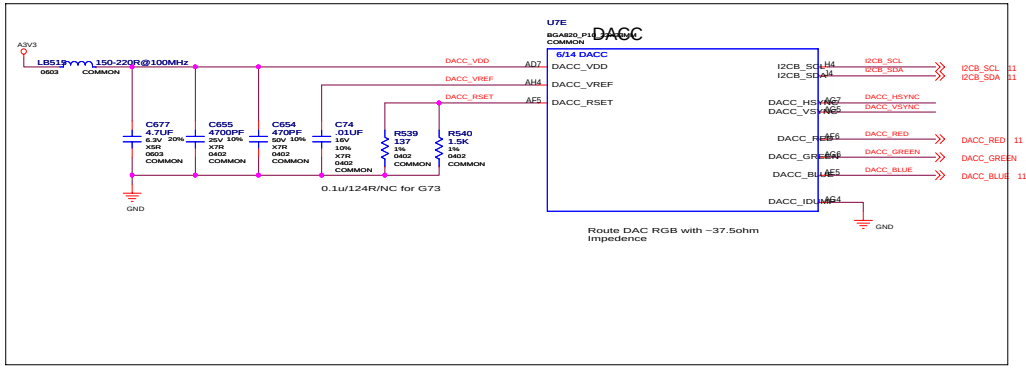
Micro-Star International Co., LTD.		
MS-V064		
Size: Custom	Document Number: Memory 2nd bank 32..63	Rev: 0B
Date: Friday, April 21, 2006	Sheet 8 of 20	

GND,DACA,DACB,DACC





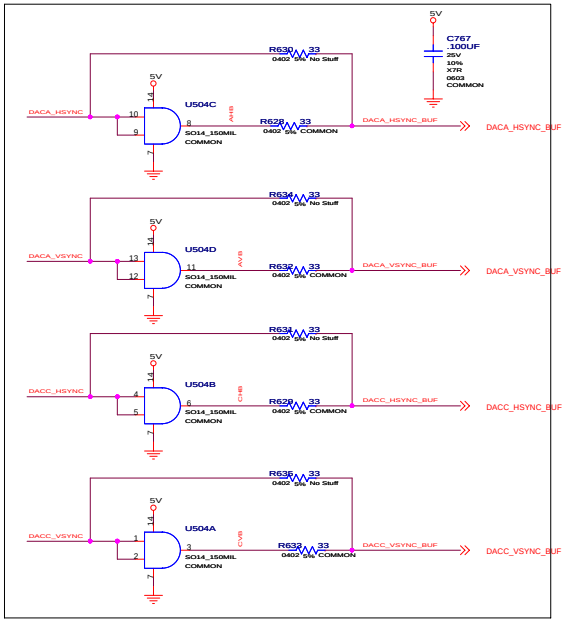




NET RULES

NET_NAME	MIN_LINE_WIDTH	NET_SPACING_RULE	IMPEDANCE
I2CA_SCL		10MIL	
I2CA_SDA		10MIL	
DACA_HSYNC		10MIL	
DACA_VSYNC		10MIL	
DACA_RED		20MIL	U6.AH11:R617.1:37.50 OHM:2%
DACA_GREEN		20MIL	U6.AJ12:R616.1:37.50 OHM:2%
DACA_BLUE		20MIL	U6.AH12:R615.1:37.50 OHM:2%
DACA_VDD	10MIL		
DACA_VREF	12	10MIL	
DACA_RSET	12	10MIL	
DACB_C_OUT		20MIL	U6.R6:R641.1:37.50 OHM:2%
DACB_CVBS_OUT		20MIL	U6.T5:R608.1:37.50 OHM:2%
DACB_PB_OUT		20MIL	U6.T6:R633.1:37.50 OHM:2%
DACB_VDD	10MIL		
DACB_VREF	12	10MIL	
DACB_RSET	12	10MIL	
DACC_HSYNC		10MIL	
DACC_VSYNC		10MIL	
DACC_RED		20MIL	U6.AF6:R623.1:37.50 OHM:2%
DACC_GREEN		20MIL	U6.AG6:R627.1:37.50 OHM:2%
DACC_BLUE		20MIL	U6.AE5:R620.1:37.50 OHM:2%
DACC_VDD	10MIL		
DACC_VREF	12	10MIL	
DACC_RSET	12	10MIL	
TV_RSET_SEL	12	10MIL	
I2CB_SDA		10MIL	
I2CB_SCL		10MIL	
SEL_2ND_DEV		10MIL	
AHB		10MIL	
AVB		10MIL	
DACA_HSYNC_BUF		10MIL	
DACA_VSYNC_BUF		10MIL	
CHB		10MIL	
CVB		10MIL	
DACC_HSYNC_BUF		10MIL	
DACC_VSYNC_BUF		10MIL	

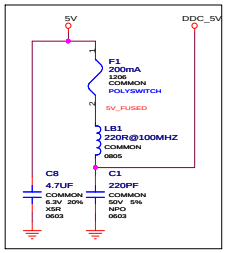
DACA & DACC Sync Buffers



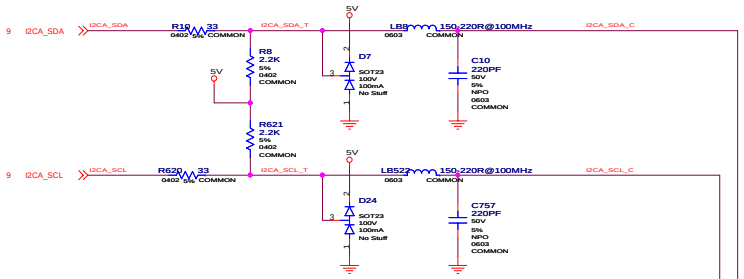
Micro-Star International Co., LTD.	
MS-V064	
Size: Custom	Document Number: GND,DACA, DACB, DACC
Rev: 08	
Date: Friday, April 21, 2006	Sheet 9 of 20

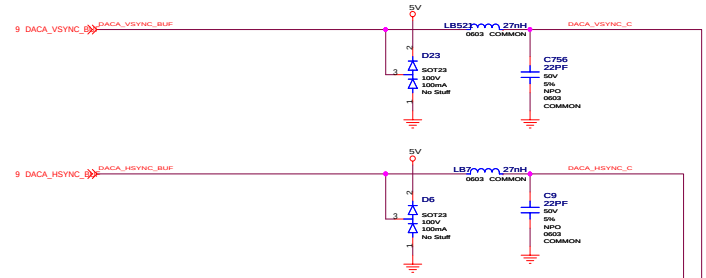
VGA
DACA

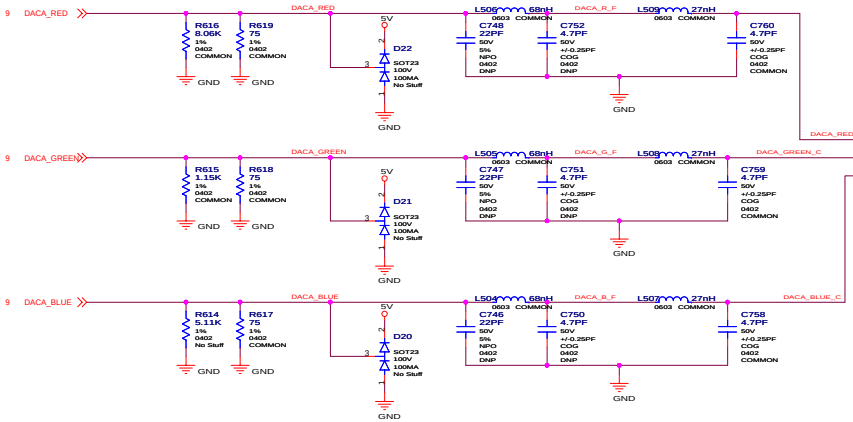
DDC
5V

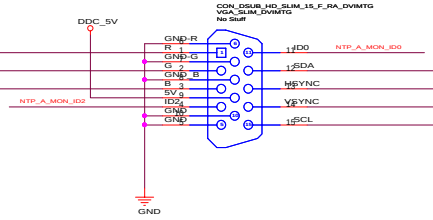


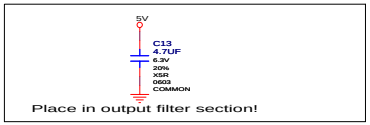
Changed the FUSE to 200mA



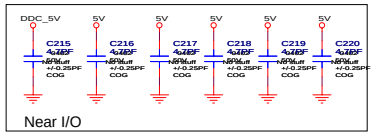


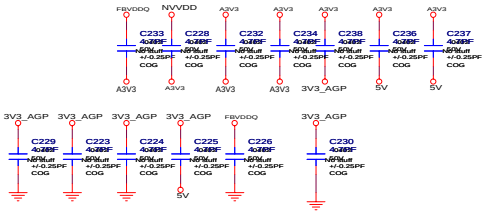


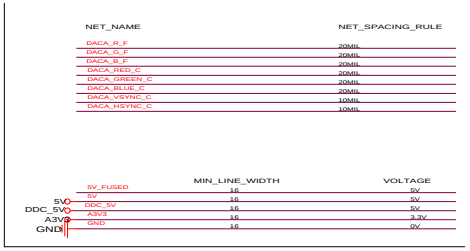




EMI Reserve Cap.

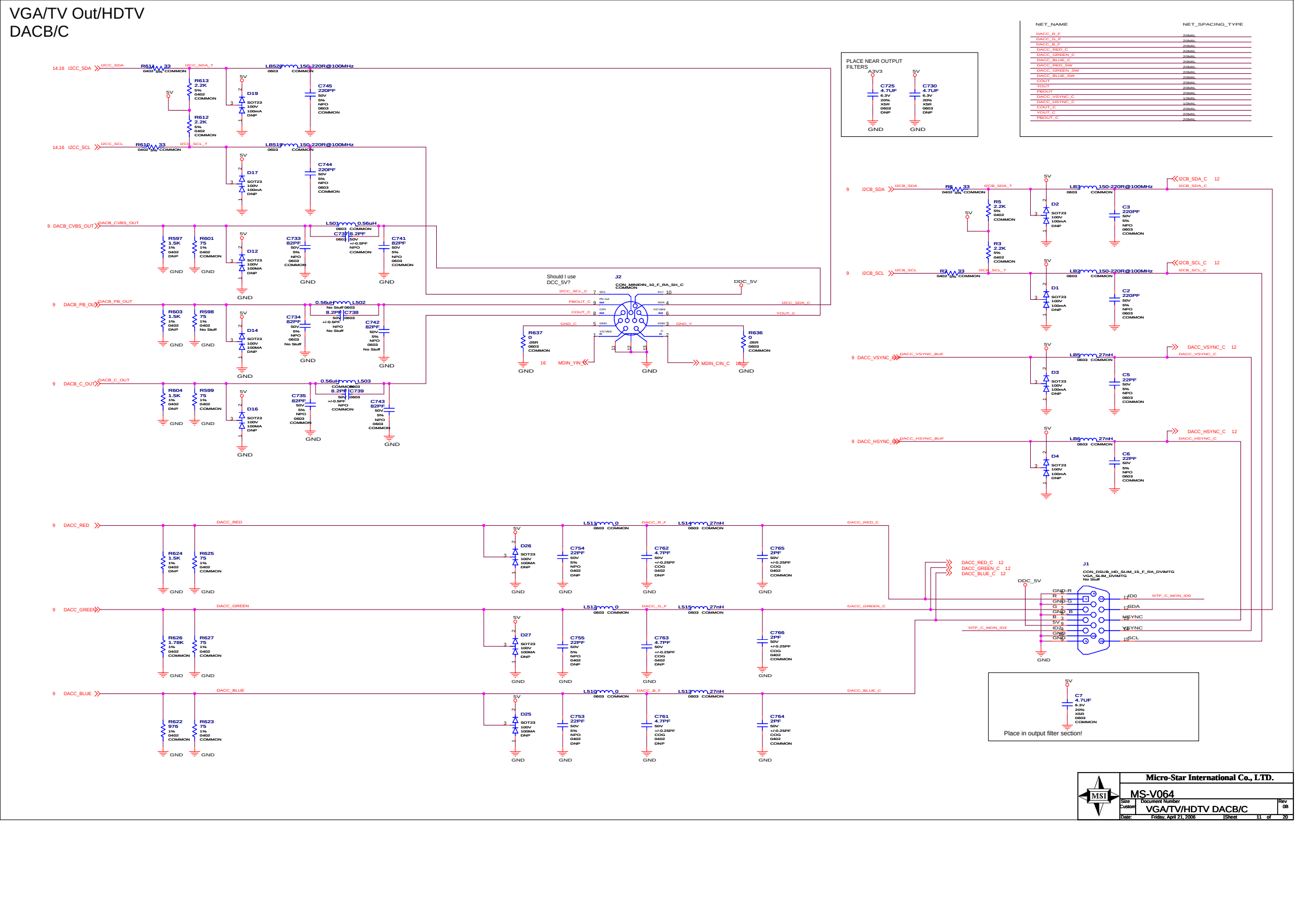






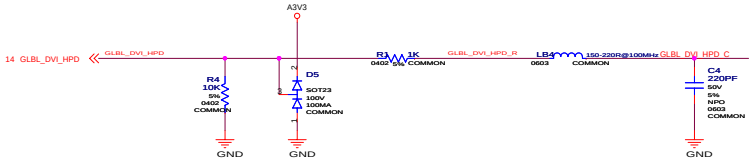
Micro-Star International Co., LTD.		
MS-V064		
Size: Custom	Document Number: VGA DACA	Rev: 0B
Date: Friday, April 21, 2006	Sheet 10 of 20	

VGA/TV Out/HDTV
DACB/C



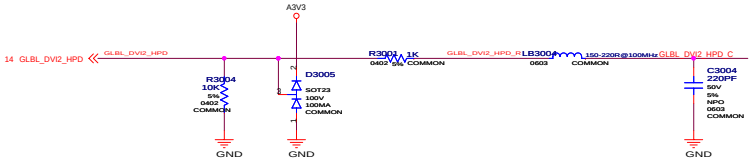
INTERNAL TMDS

Hotplug Detection



If no diodes stuffed shoud I stuff this?

Hotplug Detection2

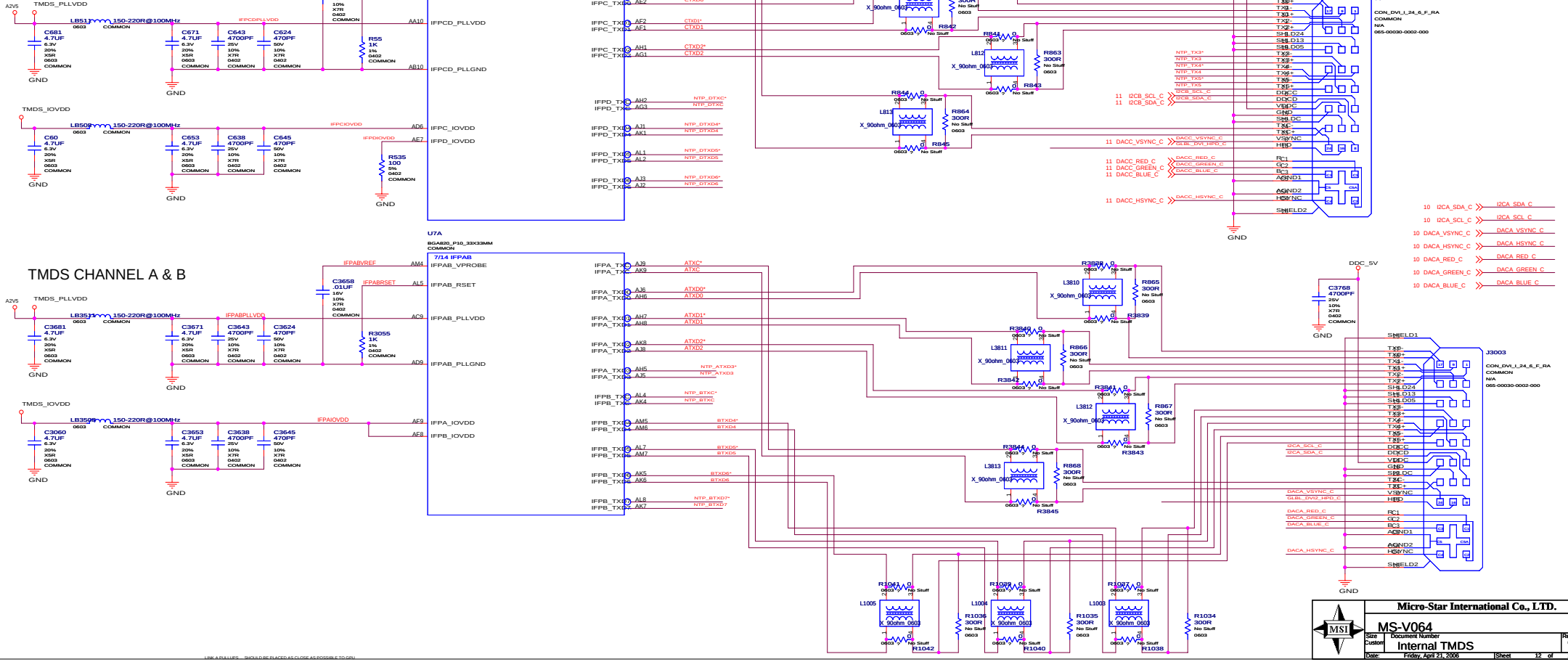


If no diodes stuffed shoud I stuff this?

INTERNAL TMDS ..LINK C/D

NETNAME	DIFF PAIR NAME	SPACING RULE

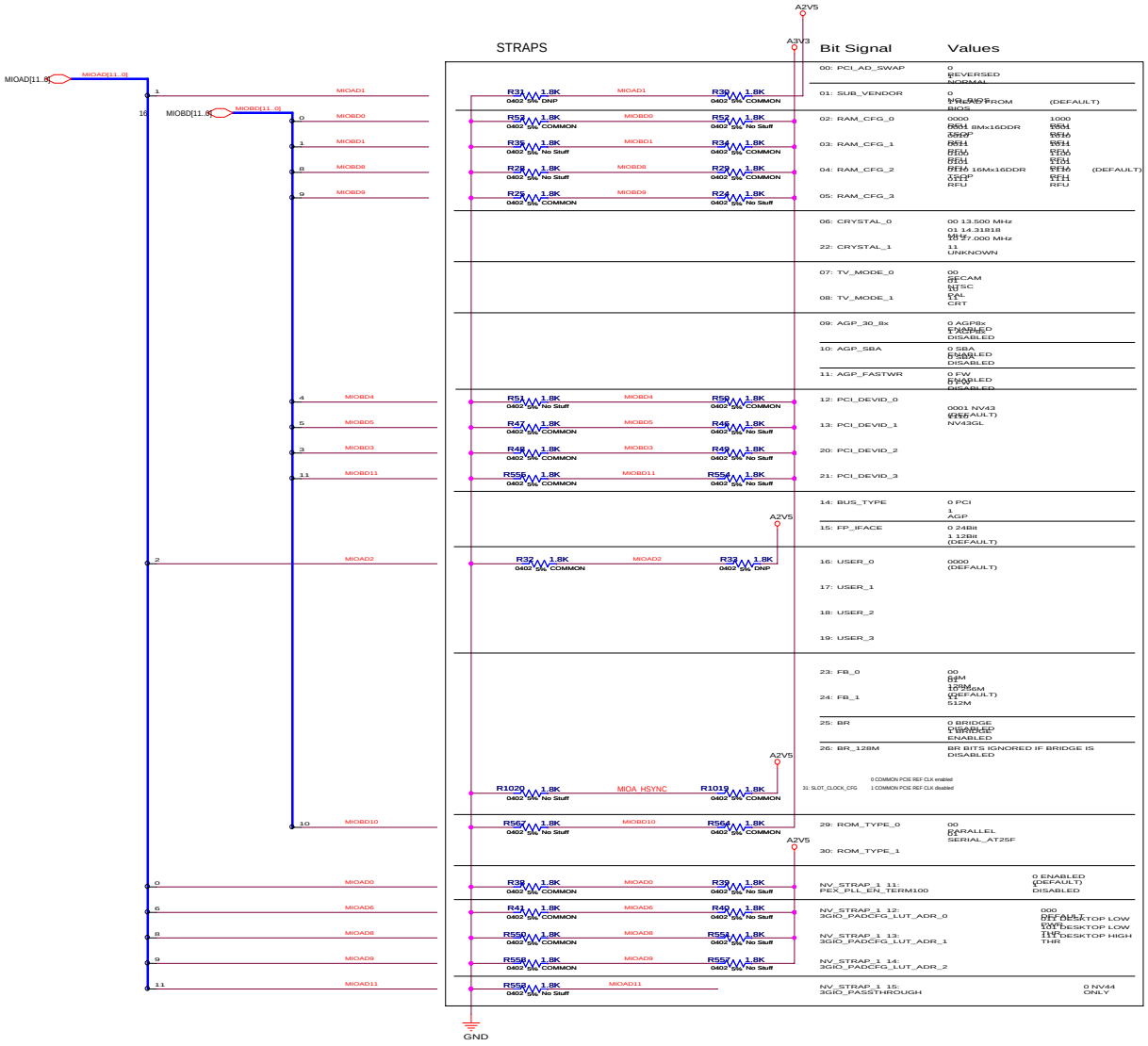
TMDS CHANNEL A & B



Micro-Star International Co., LTD.	
MS-V064	
Size: Custom	Document Number: Internal TMDS
Rev: 08	
Date: Friday, April 21, 2006	Sheet 12 of 20

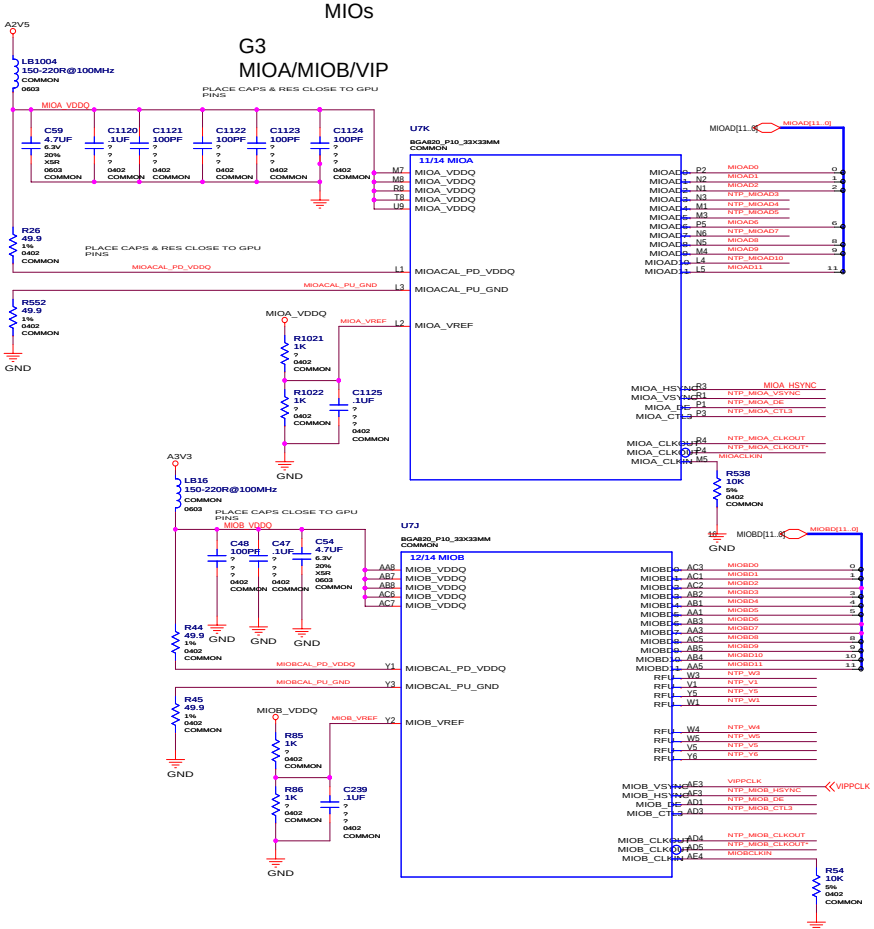
STRAPS, MIOA/MIOB

STRAPS



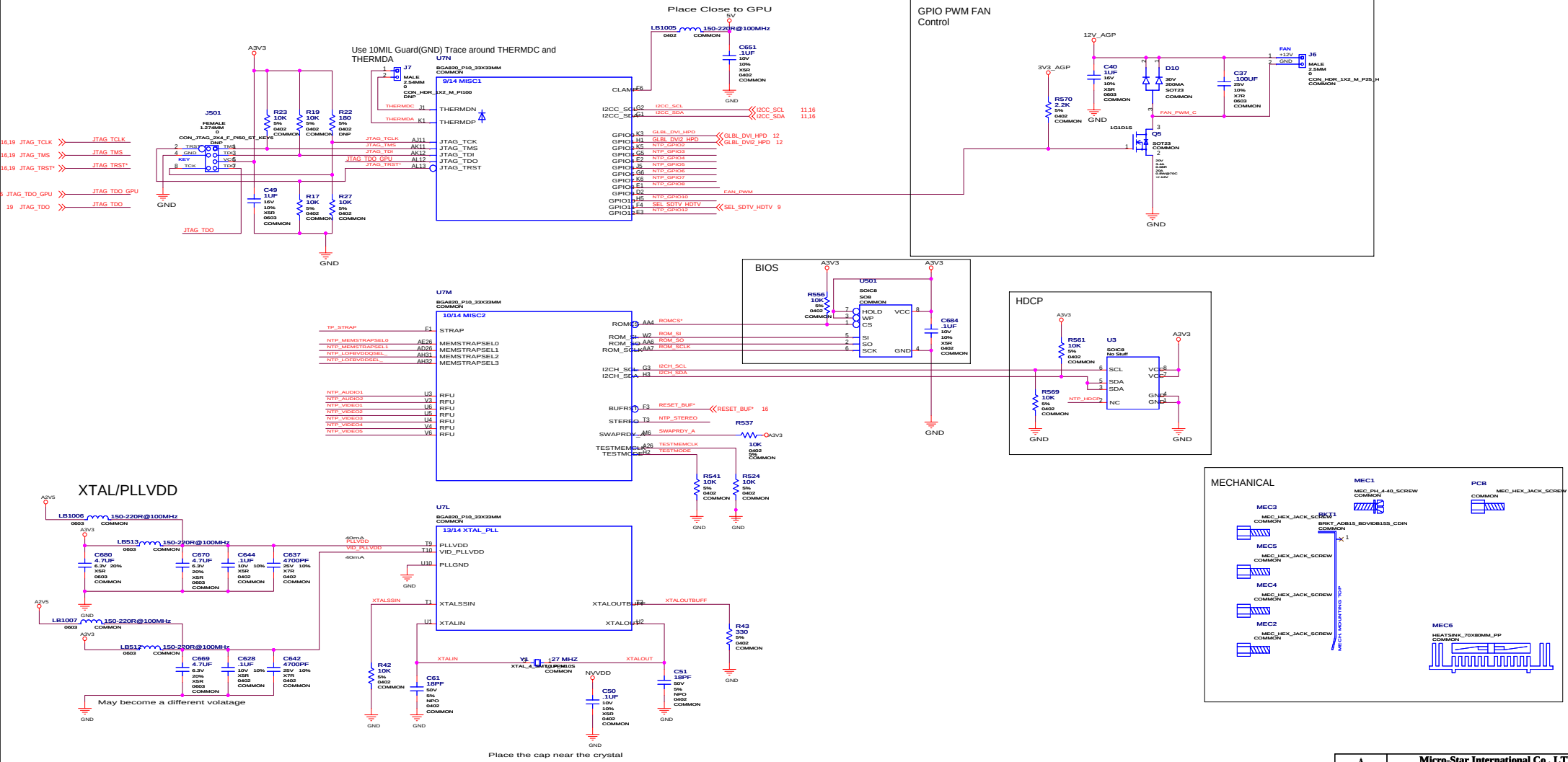
MIOs

G3 MIOA/MIOB/VIP

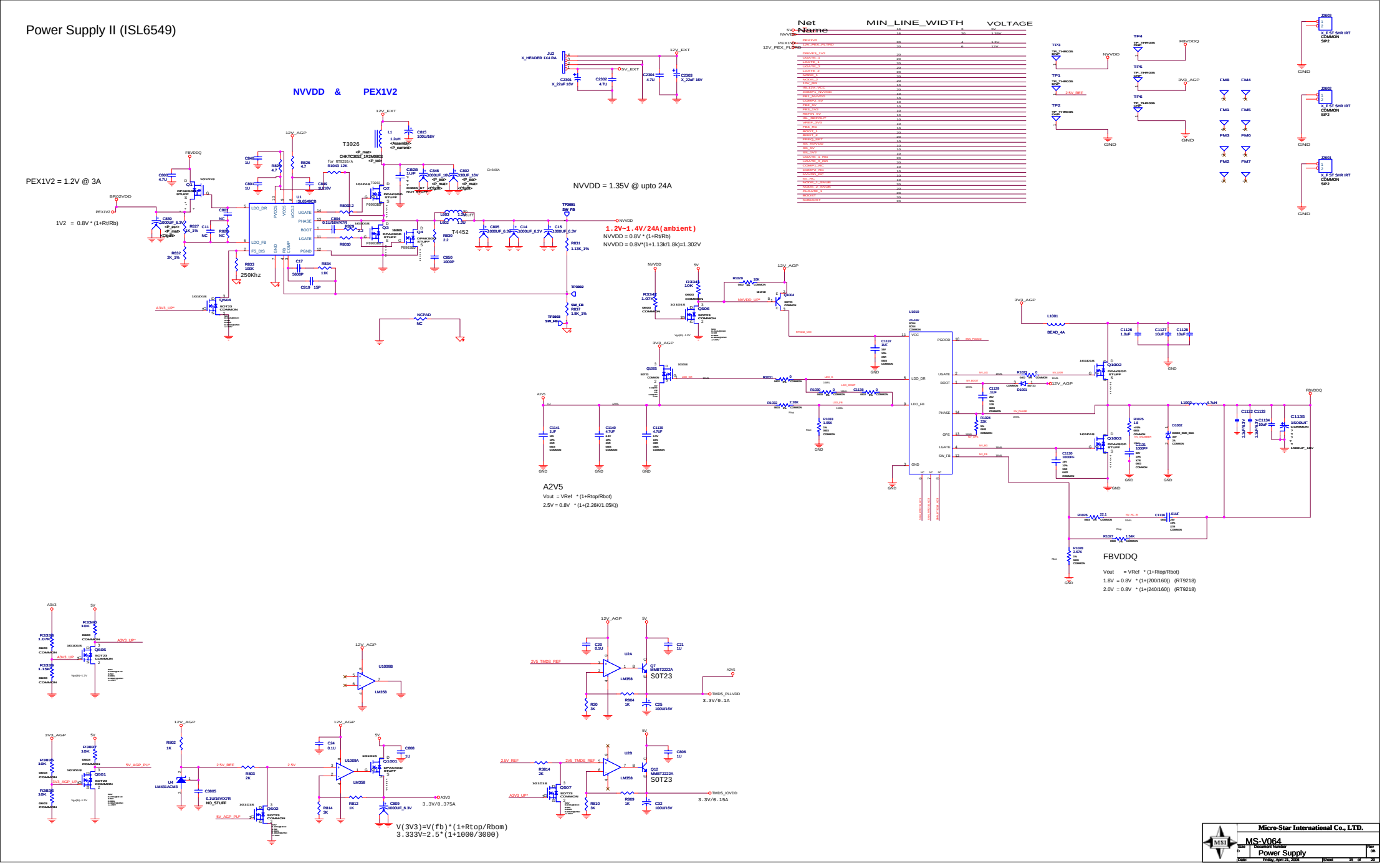


XTAL, GPIO, ROM

NET	MIN_LIN_WIDTH	NET_SPACING_RULE
XTALIN		20MIL
XTALOUT		20MIL
PLLVDD	12	10MIL
VID_PLLVDD	12	10MIL
FAN_PWM		20MIL
FAN_PWM_B		20MIL
FAN_PWM_C		20MIL
THERMDC	10	
THERMDA	10	

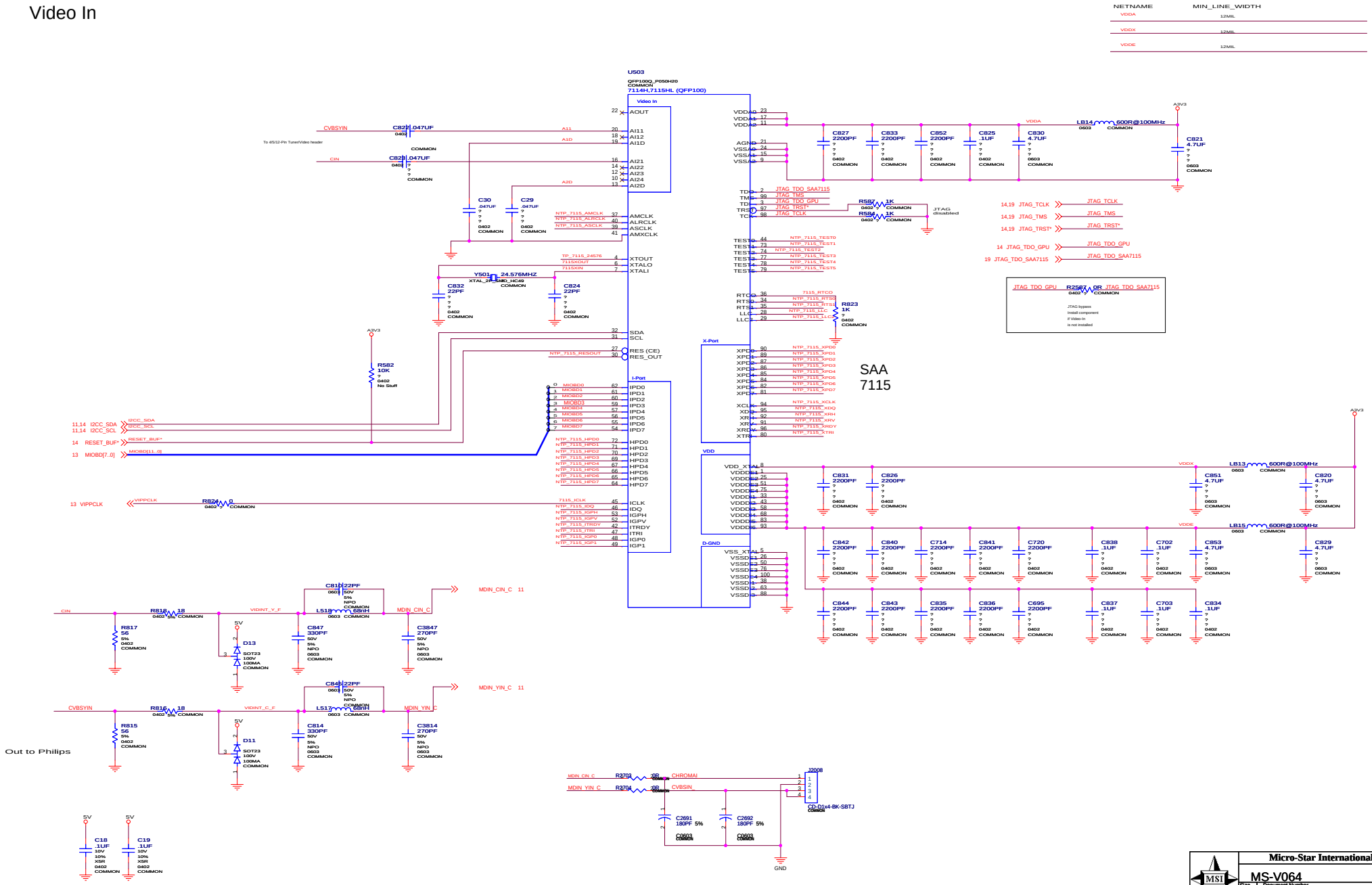


Power Supply II (ISL6549)



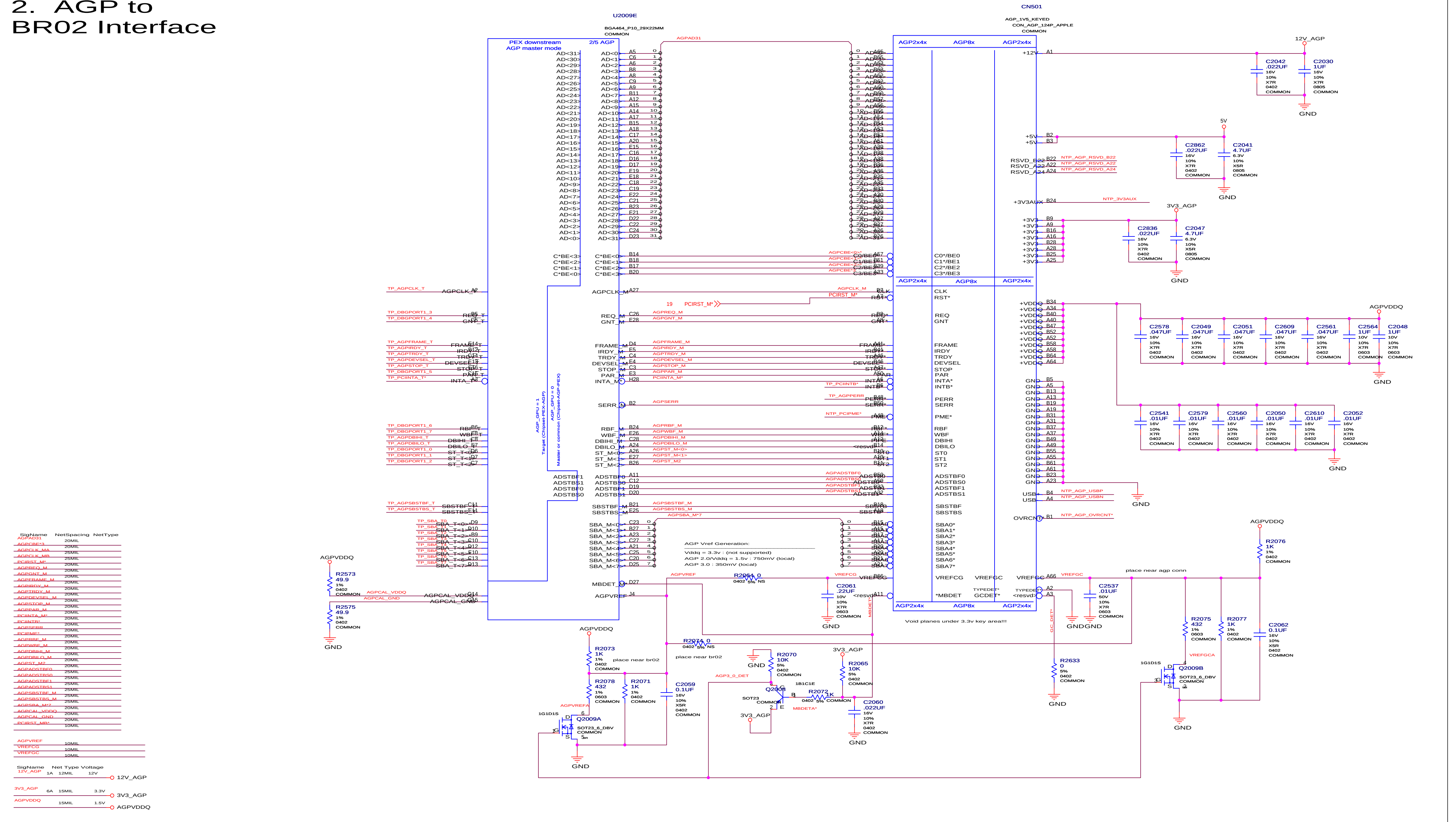
Micro-Star International Co., LTD.			
MS-V064			
Size: D	Document Number: Power Supply		Rev: 0B
Date: Friday, April 21, 2006		Sheet: 15 of 20	

Video In


NETNAME MIN_LINE_WIDTH
VDDA 12MIL
VDDX 12MIL
VDDE 12MIL
U503
QFP100Q_P050H20
COMMON
7114H,7115HL (QFP100)
Video in
SAA
7115
X-Port
I-Port
D-GND
VDD
JTAG_TDO_SAA7115
JTAG_TMS
JTAG_TDO_GPU
JTAG_TRST*
JTAG_TCLK
JTAG disabled
JTAG_TDO_GPU R2587 0R JTAG_TDO_SAA7115
JTAG bypass
Install component
if Video-In
is not installed
Y501 24.576MHZ
XTAL_2P_SMD_HC49
COMMON
CVBSYIN
CIN
To 4/5/12-Pin Tuner/Video header
I2CC_SDA
I2CC_SCL
RESET_BUF*
MIOBD[11..0]
VIPPCLK
MDIN_CIN_C 11
MDIN_YIN_C 11
Out to Philips
CHROMAI
CVBSIN
J2008
CD-D1x4-BK-SBTJ
GND
Micro-Star International Co., LTD.
MS-V064
Video In
Rev 0B
Friday, April 21, 2006
Sheet 16 of 20

2. AGP to BR02 Interface

1

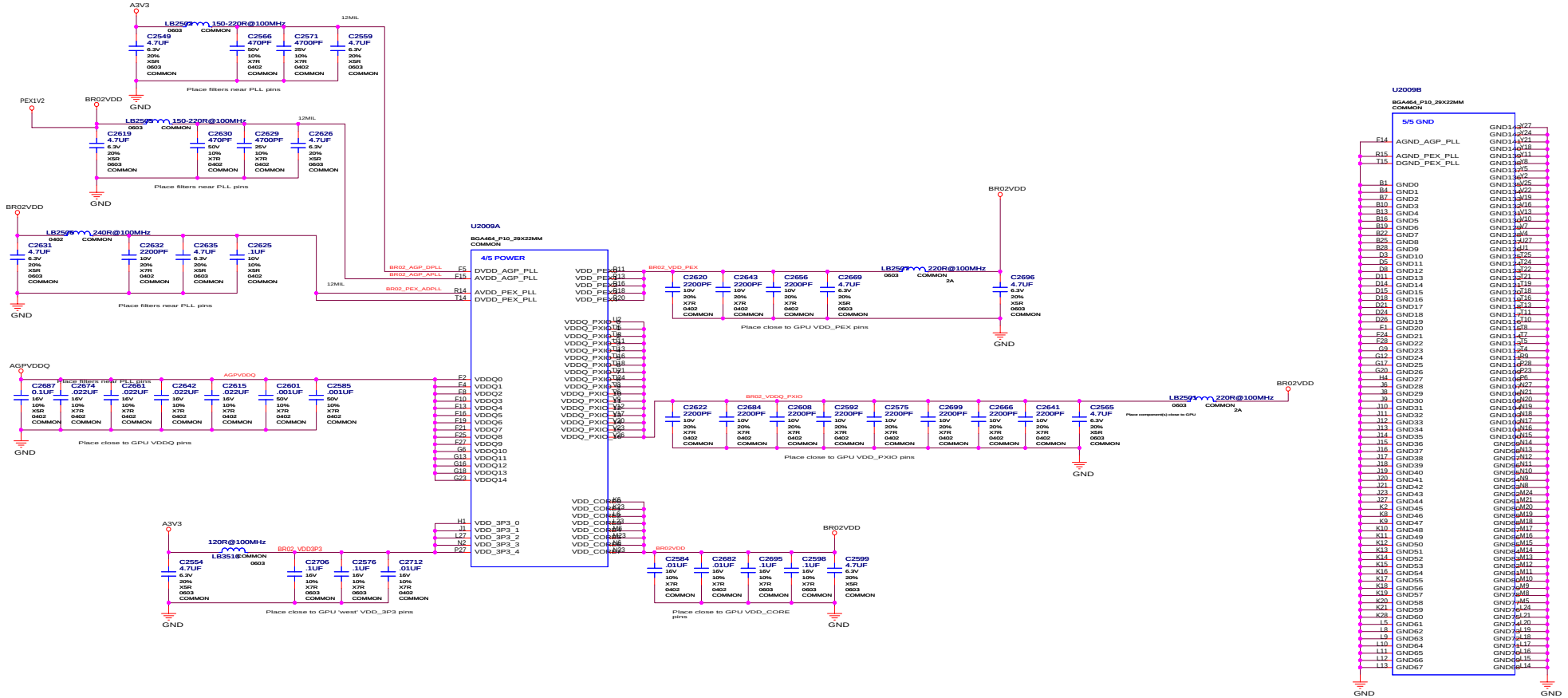


ASSEMBLY | BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL

PAGE DETAIL | AGP to BR02 Interface

Micro-Star International Co., LTD.		
MS-V064		
Size: Custom	Document Number: AGP to BR02 Interface	Rev: 0B
Date: Friday, April 21, 2006	Sheet 17 of 20	

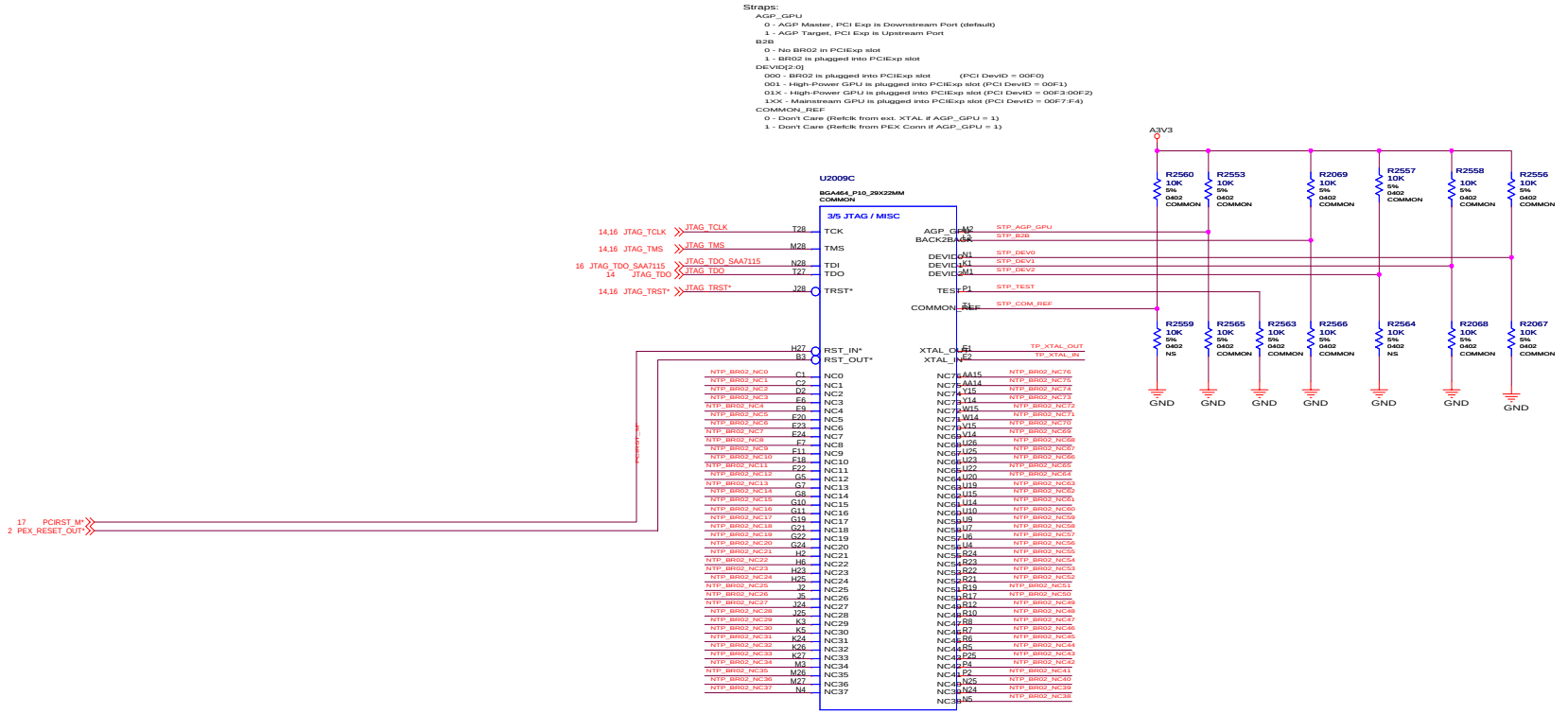
3. BR02
PWR/GND/De-Coupling



ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	BR02 PWR/GND/De-Coupling

Micro-Star International Co., LTD.	
MS-V064	
Size: Custom	Document Number: BR02 PWR/GND/De-Coupling
Rev: 0B	
Date: Friday, April 21, 2006	Sheet 18 of 20

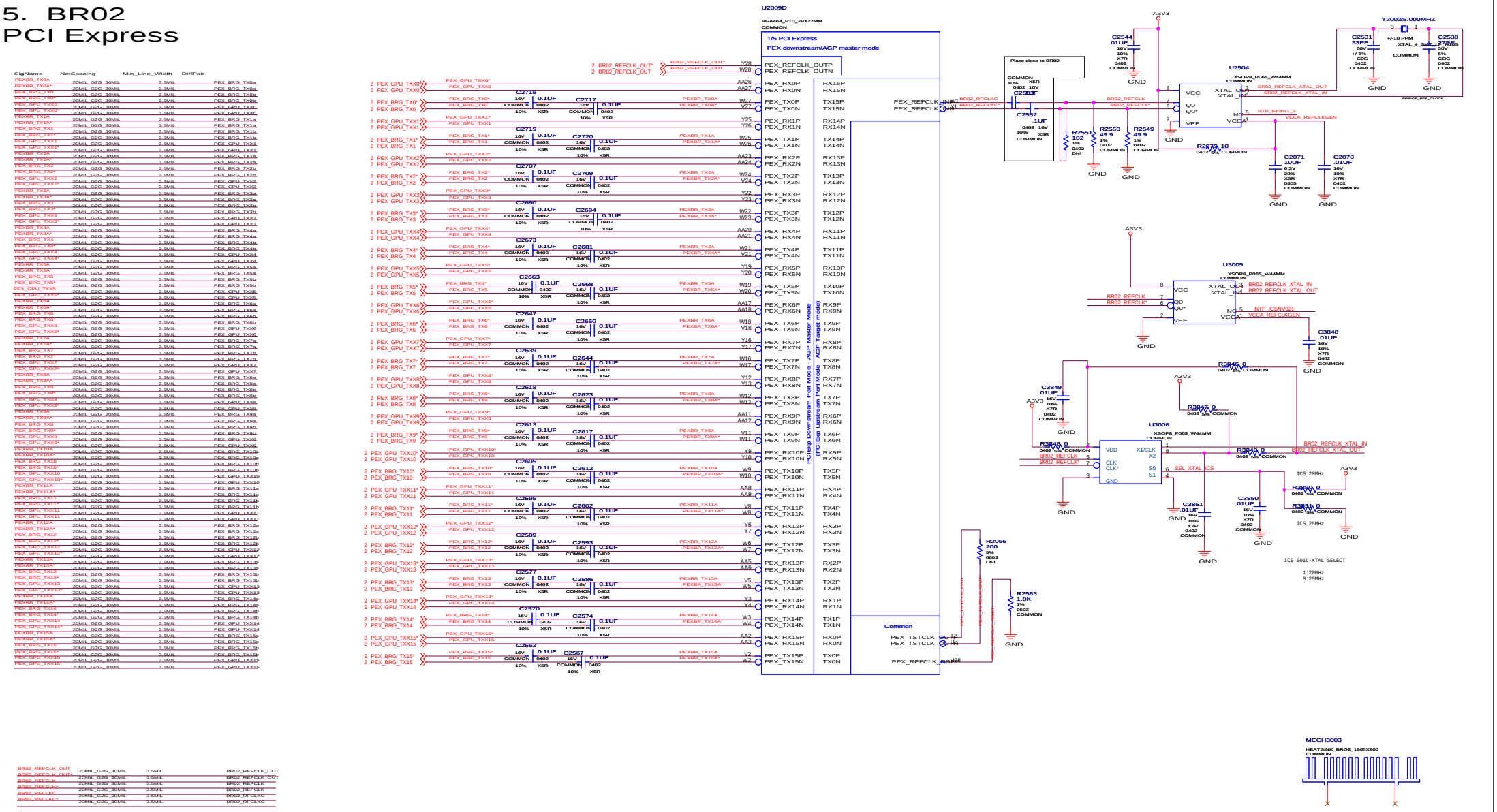
4. BR02 JTAG / Straps / Misc.



ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	BR02 STRAPS / MISC.

Micro-Star International Co., LTD.		
MS-V064		
Size: Custom	Document Number: BR02 JTAG / Straps / Misc.	Rev: 0B
Date: Friday, April 21, 2006	Sheet 19 of 20	

5. BR02
PCI Express



SigName	NetSpacing	Min_Line_Width	DiffPair
PEXBR_TX0A	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX0a
PEXBR_TX0A*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX0a
PEX_BRG_TX0	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX0b
PEX_BRG_TX0*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX0b
PEX_GPU_TX00	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX00
PEX_GPU_TX00*	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX00
PEXBR_TX1A	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX1a
PEXBR_TX1A*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX1a
PEX_BRG_TX1	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX1b
PEX_BRG_TX1*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX1b
PEX_GPU_TX01	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX01
PEX_GPU_TX01*	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX01
PEXBR_TX2A	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX2a
PEXBR_TX2A*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX2a
PEX_BRG_TX2	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX2b
PEX_BRG_TX2*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX2b
PEX_GPU_TX02	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX02
PEX_GPU_TX02*	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX02
PEXBR_TX3A	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX3a
PEXBR_TX3A*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX3a
PEX_BRG_TX3	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX3b
PEX_BRG_TX3*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX3b
PEX_GPU_TX03	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX03
PEX_GPU_TX03*	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX03
PEXBR_TX4A	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX4a
PEXBR_TX4A*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX4a
PEX_BRG_TX4	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX4b
PEX_BRG_TX4*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX4b
PEX_GPU_TX04	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX04
PEX_GPU_TX04*	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX04
PEXBR_TX5A	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX5a
PEXBR_TX5A*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX5a
PEX_BRG_TX5	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX5b
PEX_BRG_TX5*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX5b
PEX_GPU_TX05	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX05
PEX_GPU_TX05*	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX05
PEXBR_TX6A	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX6a
PEXBR_TX6A*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX6a
PEX_BRG_TX6	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX6b
PEX_BRG_TX6*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX6b
PEX_GPU_TX06	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX06
PEX_GPU_TX06*	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX06
PEXBR_TX7A	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX7a
PEXBR_TX7A*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX7a
PEX_BRG_TX7	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX7b
PEX_BRG_TX7*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX7b
PEX_GPU_TX07	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX07
PEX_GPU_TX07*	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX07
PEXBR_TX8A	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX8a
PEXBR_TX8A*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX8a
PEX_BRG_TX8	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX8b
PEX_BRG_TX8*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX8b
PEX_GPU_TX08	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX08
PEX_GPU_TX08*	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX08
PEXBR_TX9A	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX9a
PEXBR_TX9A*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX9a
PEX_BRG_TX9	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX9b
PEX_BRG_TX9*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX9b
PEX_GPU_TX09	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX09
PEX_GPU_TX09*	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX09
PEXBR_TX10A	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX10a
PEXBR_TX10A*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX10a
PEX_BRG_TX10	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX10b
PEX_BRG_TX10*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX10b
PEX_GPU_TX10	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX10
PEX_GPU_TX10*	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX10
PEXBR_TX11A	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX11a
PEXBR_TX11A*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX11a
PEX_BRG_TX11	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX11b
PEX_BRG_TX11*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX11b
PEX_GPU_TX11	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX11
PEX_GPU_TX11*	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX11
PEXBR_TX12A	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX12a
PEXBR_TX12A*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX12a
PEX_BRG_TX12	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX12b
PEX_BRG_TX12*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX12b
PEX_GPU_TX12	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX12
PEX_GPU_TX12*	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX12
PEXBR_TX13A	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX13a
PEXBR_TX13A*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX13a
PEX_BRG_TX13	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX13b
PEX_BRG_TX13*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX13b
PEX_GPU_TX13	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX13
PEX_GPU_TX13*	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX13
PEXBR_TX14A	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX14a
PEXBR_TX14A*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX14a
PEX_BRG_TX14	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX14b
PEX_BRG_TX14*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX14b
PEX_GPU_TX14	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX14
PEX_GPU_TX14*	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX14
PEXBR_TX15A	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX15a
PEXBR_TX15A*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX15a
PEX_BRG_TX15	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX15b
PEX_BRG_TX15*	20MIL_G2G_30MIL	3.5MIL	PEX_BRG_TX15b
PEX_GPU_TX15	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX15
PEX_GPU_TX15*	20MIL_G2G_30MIL	3.5MIL	PEX_GPU_TX15

BR02_REFCLK_OUT	20MIL_G2G_30MIL	3.5MIL	BR02_REFCLK_OUT
BR02_REFCLK_OUT*	20MIL_G2G_30MIL	3.5MIL	BR02_REFCLK_OUT
BR02_REFCLK	20MIL_G2G_30MIL	3.5MIL	BR02_REFCLK
BR02_REFCLK*	20MIL_G2G_30MIL	3.5MIL	BR02_REFCLK
BR02_REFCLKC	20MIL_G2G_30MIL	3.5MIL	BR02_REFCLKC
BR02_REFCLKC*	20MIL_G2G_30MIL	3.5MIL	BR02_REFCLKC

PEX_REFCLK_RSET		3.5MIL	
PEX_TSTCLK_OUT	20MIL_G2G_30MIL	3.5MIL	PEX_TSTCLK_OUT
PEX_TSTCLK_OUT*	20MIL_G2G_30MIL	3.5MIL	PEX_TSTCLK_OUT
BR02_REFCLK_OUT	20MIL_G2G_30MIL	3.5MIL	BR02_REFCLK_OUT
BR02_REFCLK_OUT*	20MIL_G2G_30MIL	3.5MIL	BR02_REFCLK_OUT

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	BR02 PCI Express

Micro-Star International Co., LTD.	
MS-V064	
Size: Custom	Document Number: BR02 PCI Express
Rev: 08	
Date: Friday, April 21, 2006	Sheet 20 of 20