G84/G86, 128bit DDR2, VGA, DVI-I, HDTV,HDMI

V092

BASE ON V079-10 modify, change GPU to G84/G86

PAGE SUMMARY:

REV HISTORY

Base on V079-10 modify

1.PAGE 2/6:For G84/G86, CN1.B5/CN1.B6 connect to G1.B1/G1.C1

2.PAGE 3/6: Add FB_VREF; FBx_DEBUG connect to FBx_ODT

3.PAGE 3: FBVDD connect to FBVDDQ, G1.G23 connect to PEX1V2

4.PAGE 11: Add common choke

5.PAGE 16: Modify SPDIF

6.PAGE 17: Add PCI_DEVID_4/MIOx_EN_33V

7.PAGE 18: Add DAC_REF

8.PAGE 20: Add L7(co-layout)

SKU	VARIANT	NVPN	ASSEMBLY
0	0000	600-10501-0000-100	G73 400/350MHz 256MB 128bit DDR2 16MX16 DVI-I+VGA+HDTVOUT
1	0001	600-10501-0001-100	G73-V 375/350MHZ 256MB 128bit DDR2 16MX16 DVI-I+VGA+HDTVOUT
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3	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
4	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
5	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
6	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
7	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
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9	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
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11	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
12	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
13	<UNDEFINED>	<UNDEFINED>	<UNDEFINED>
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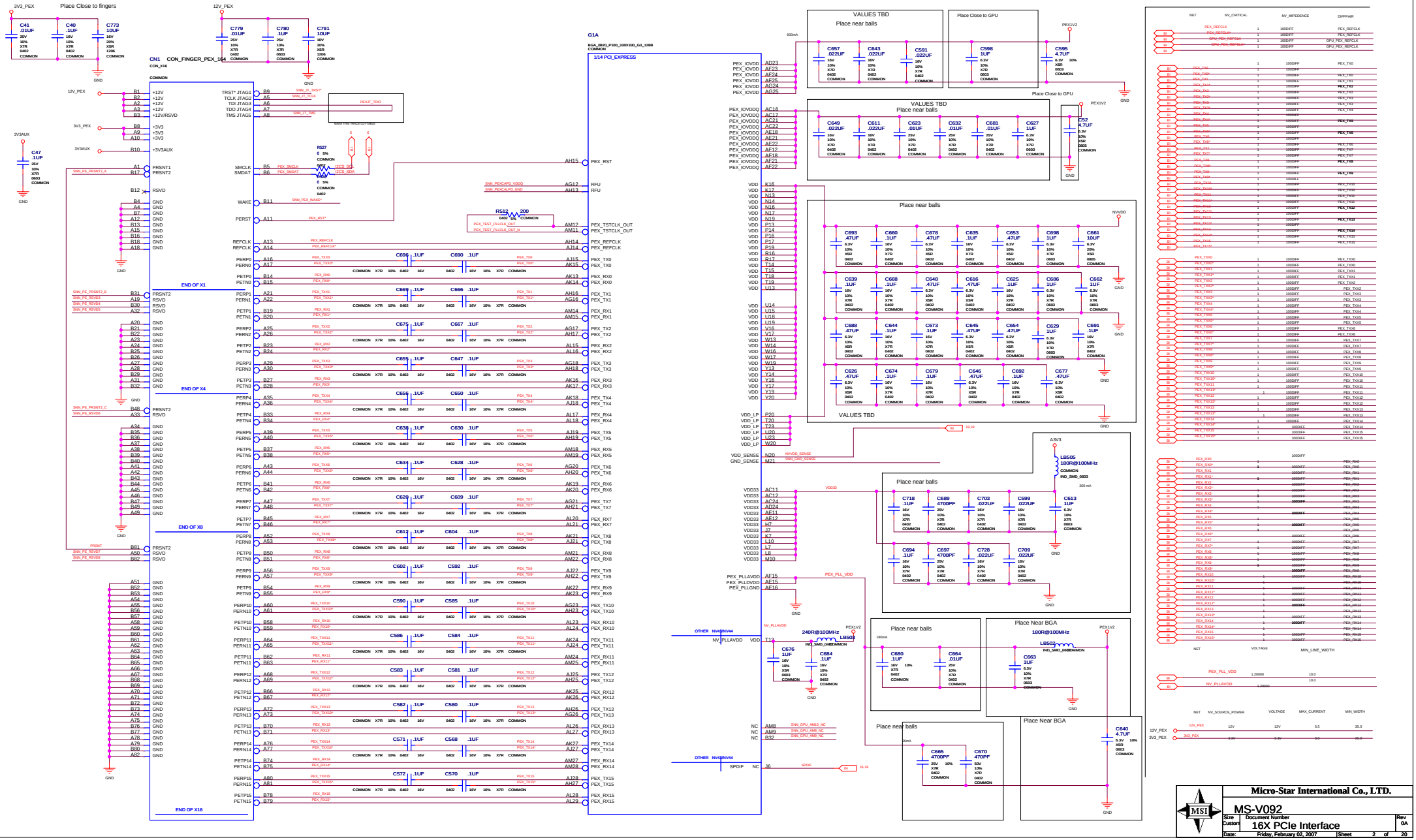
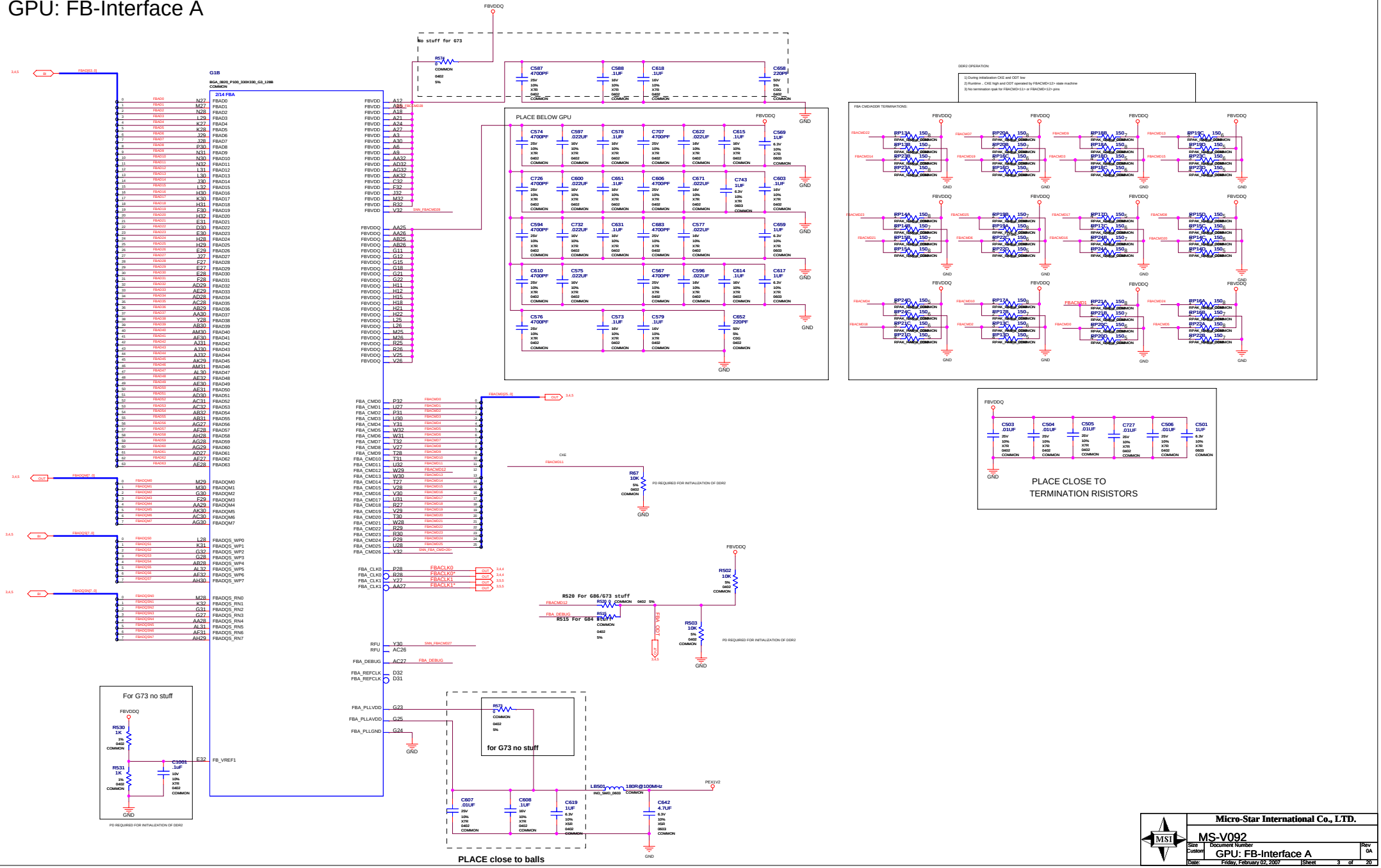
16X PCIe Interface



GPU: FB-Interface A



Micro-Star International Co., LTD.	
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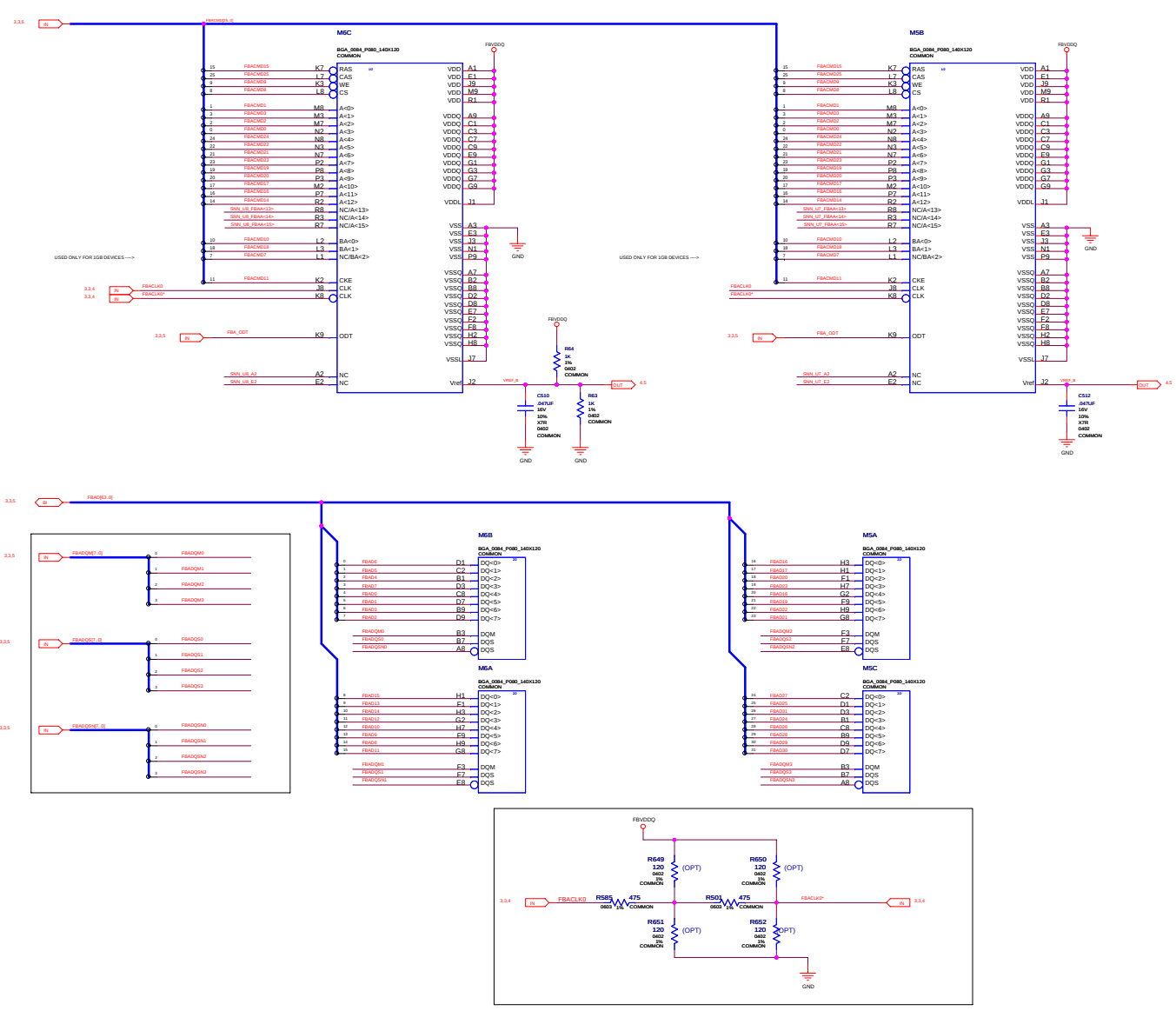
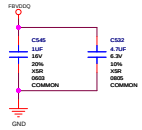
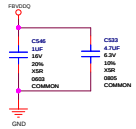
Size: Custom	Document Number: GPU: FB-Interface A
Rev: 0A	
Date: Friday, February 02, 2007	Sheet 3 of 20

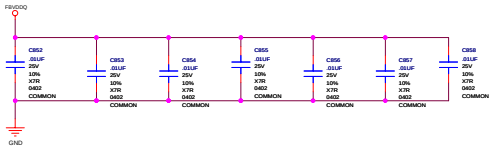
FBA MEMORY 1st bank 0..31

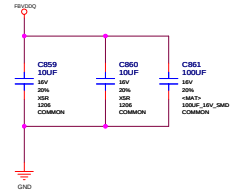
PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY











Micro-Star International Co., LTD.			
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Size: Custom	Document Number: FBA MEMORY 1st bank 0..31		Rev: 0A
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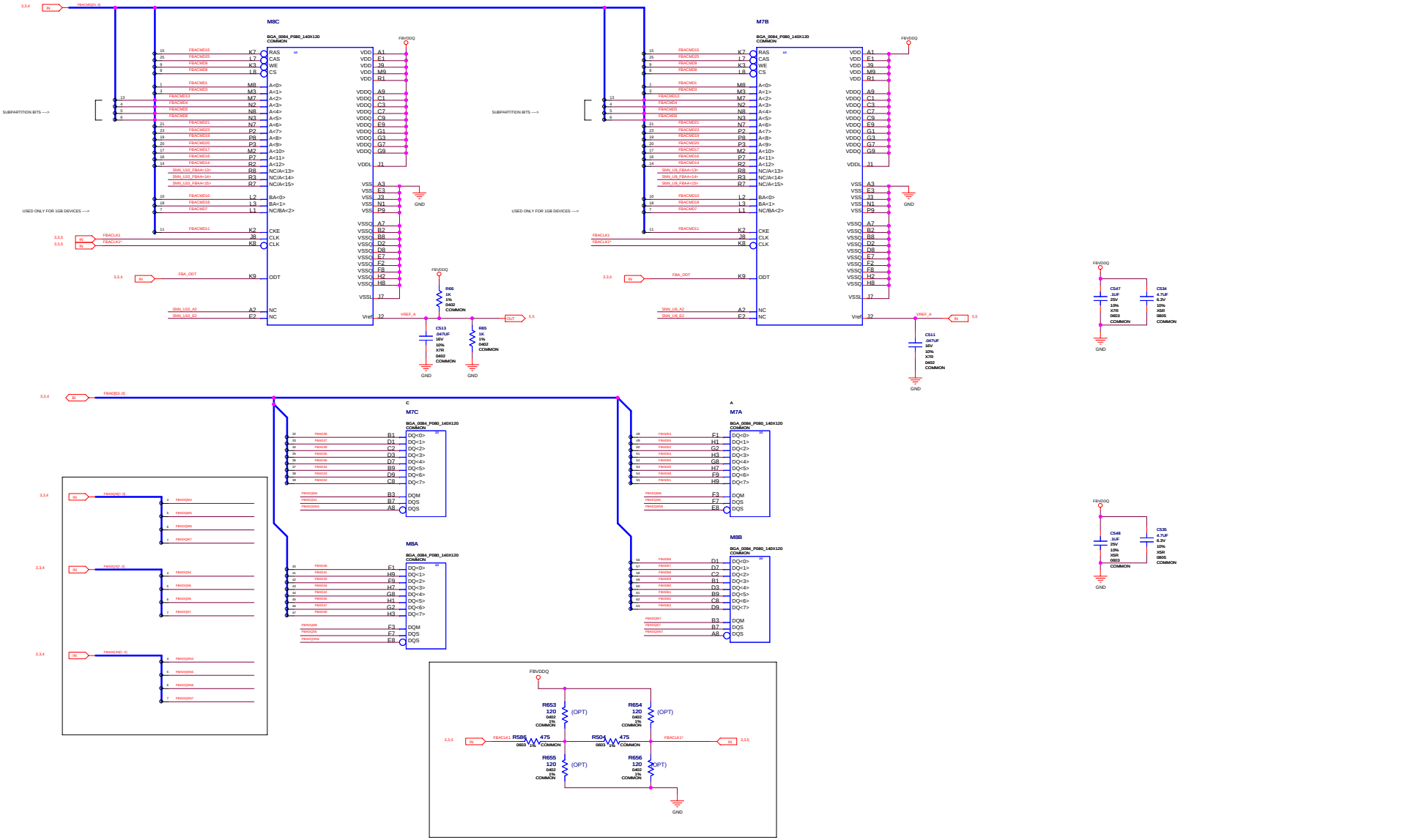
FBA MEMORY 1st bank 32..63

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY



NAME	MIN_LINE_WIDTH
VREF_A	12.0
VREF_B	12.0

Micro-Star International Co., LTD.		
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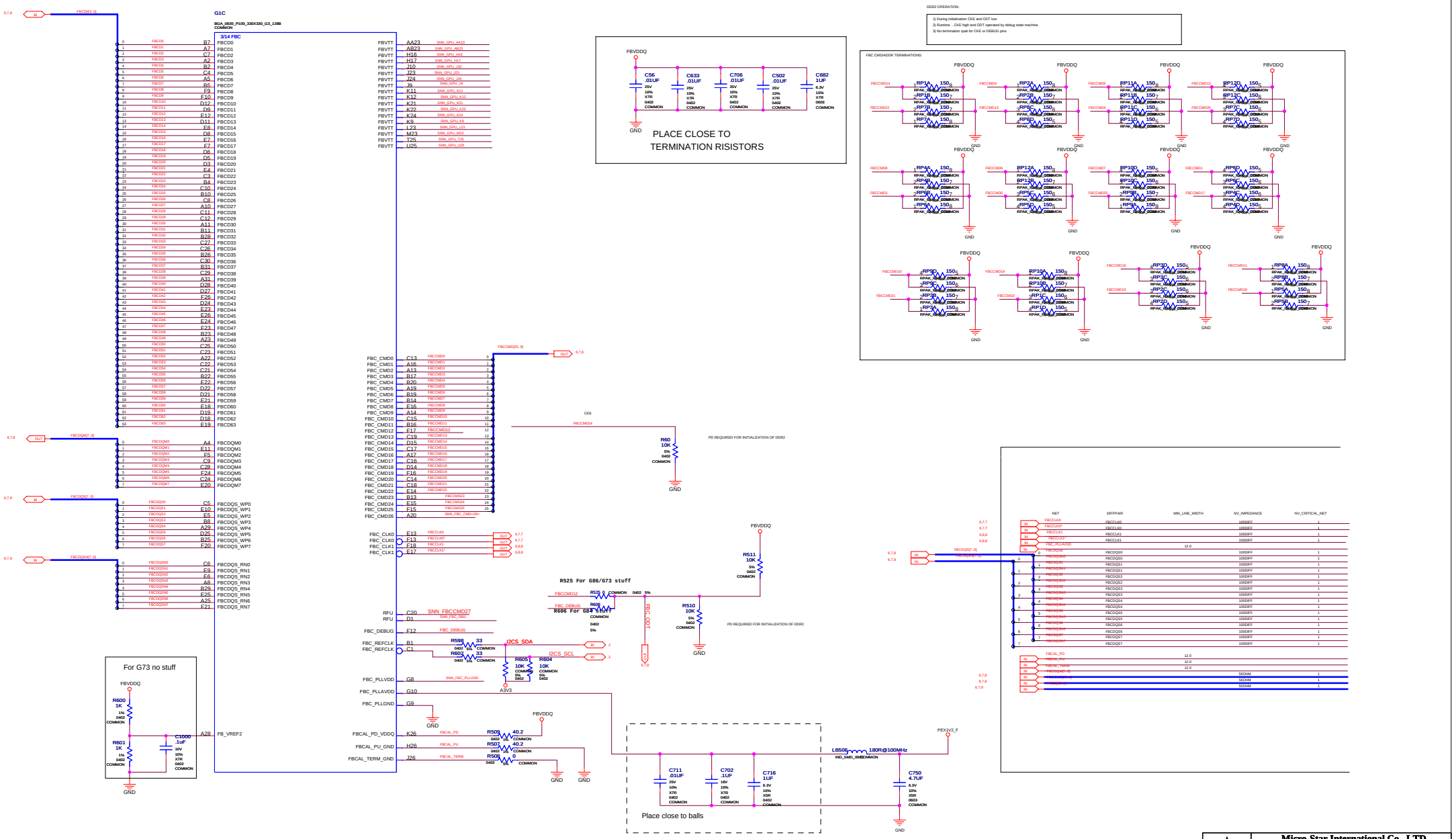
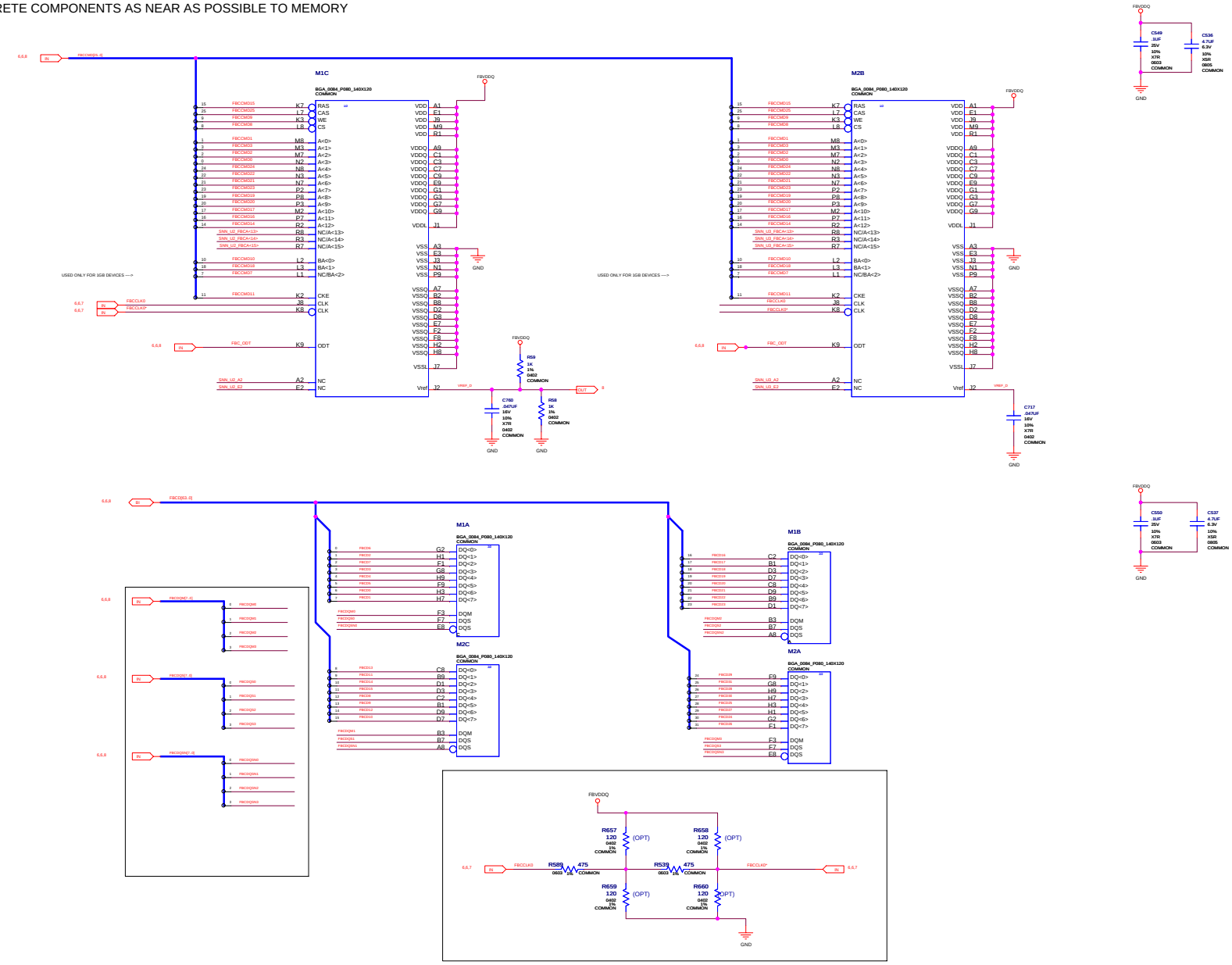
GPU: FB-Interface C



FBC MEMORY 2nd bank 0..31

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY



Micro-Star International Co., LTD.	
MS-V092	
Size: Custom	Document Number: FBC MEMORY 2nd bank 0..31
Date: Friday, February 02, 2007	Sheet 7 of 20
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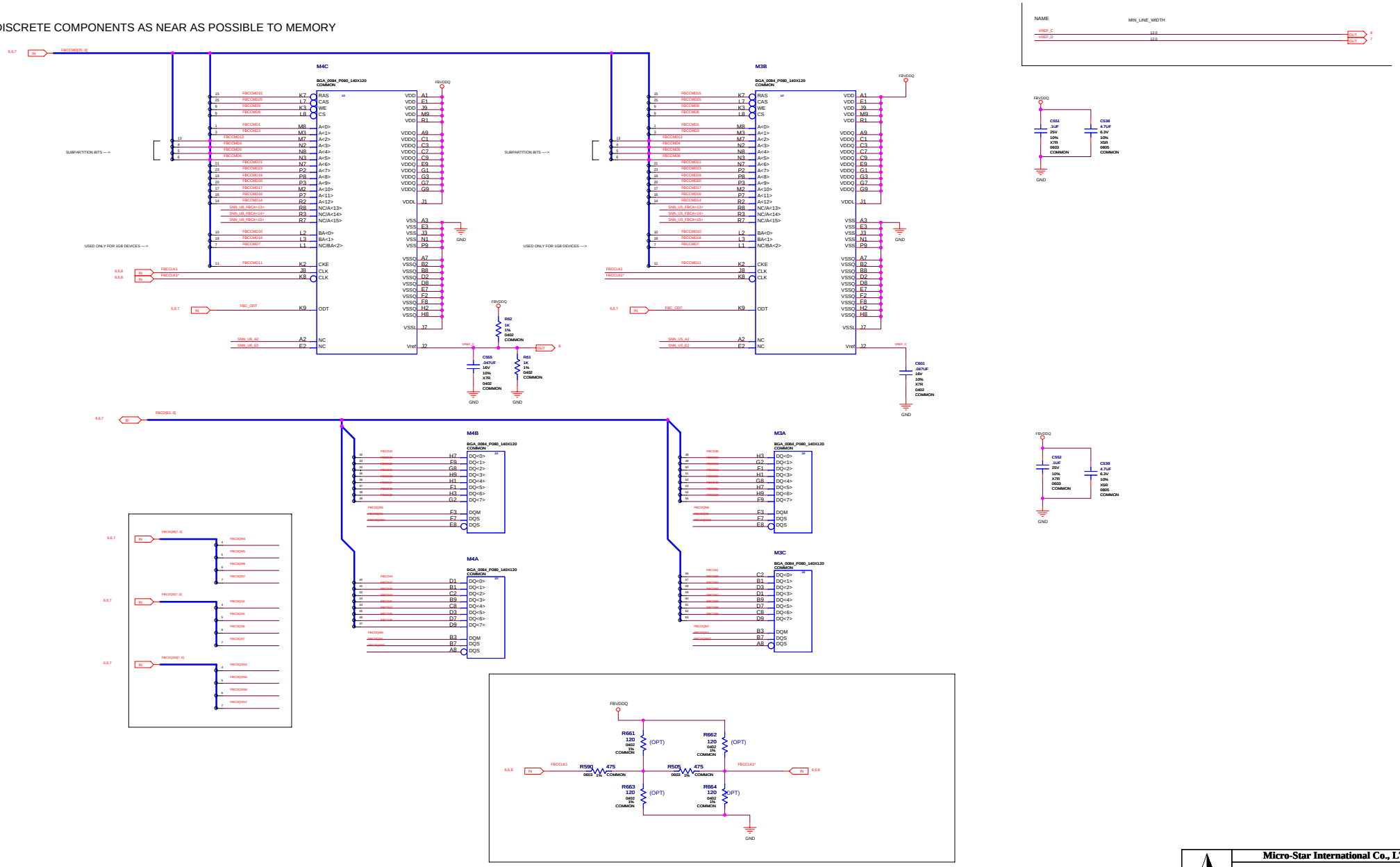
FBC MEMORY 2nd bank 32..63

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY



NAME	MIN_LINE_WIDTH
VREF_C	12.0
VREF_D	12.0

Micro-Star International Co., LTD.	
MS-V092	
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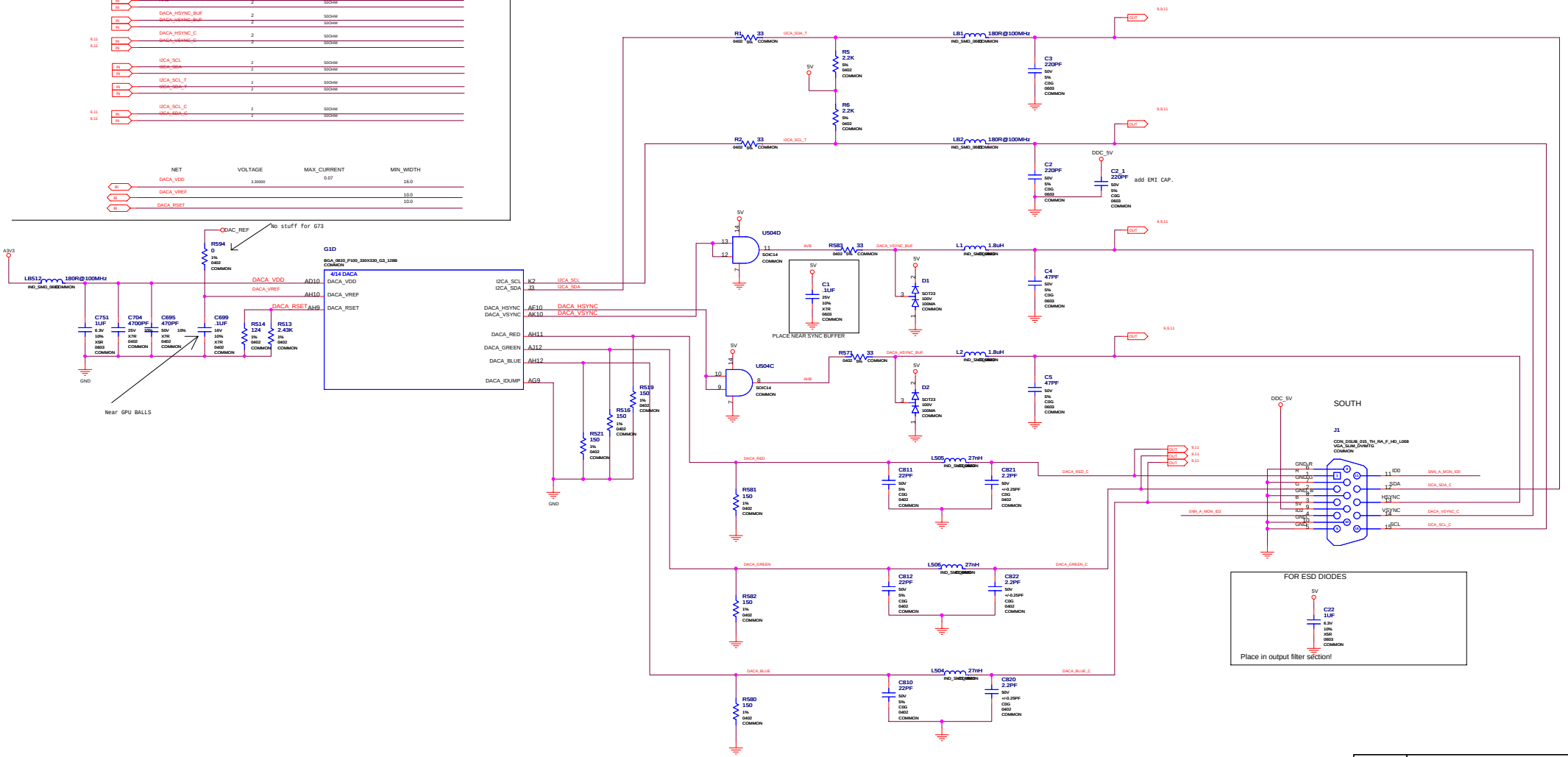
Primary Display (DACA), Slim DB15

DACA NET RULES

NET	NV_CRITICAL	NV_IMPEDANCE	DIFFPAIR
DACA_RED	1	50OHM	
DACA_GREEN	1	50OHM	
DACA_BLUE	1	50OHM	
DACA_RED_C	1	50OHM	
DACA_GREEN_C	1	50OHM	
DACA_BLUE_C	1	50OHM	
DACA_HSYNC	2	50OHM	
DACA_VSYNC	2	50OHM	
AVB	2	50OHM	
AHB	2	50OHM	
DACA_HSYNC_BUF	2	50OHM	
DACA_VSYNC_BUF	2	50OHM	
DACA_HSYNC_C	2	50OHM	
DACA_VSYNC_C	2	50OHM	
I2CA_SCL	2	50OHM	
I2CA_SDA	2	50OHM	
I2CA_SCL_T	2	50OHM	
I2CA_SDA_T	2	50OHM	
I2CA_SCL_C	2	50OHM	
I2CA_SDA_C	2	50OHM	

NET	VOLTAGE	MAX_CURRENT	MIN_WIDTH
DACA_VDD	3.30000	0.07	16.0
DACA_VREF			10.0
DACA_RSET			10.0

DACA RGB-FILTER



Micro-Star International Co., LTD.	
MS-V092	
Size: Custom	Document Number: Primary Display (DACA), Slim DB15
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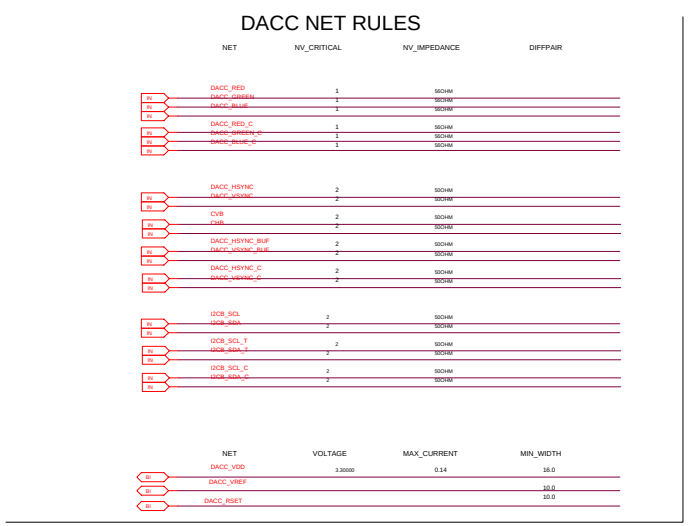
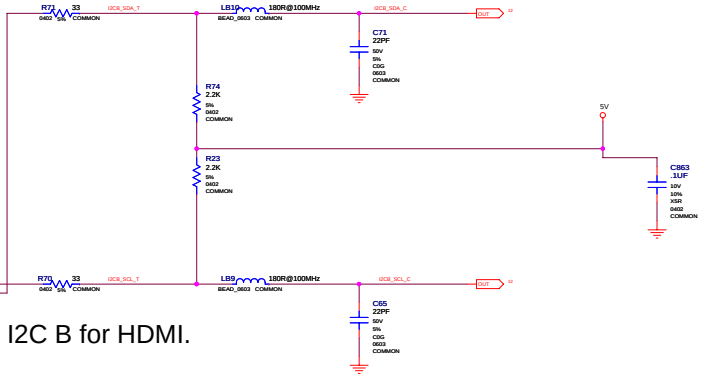
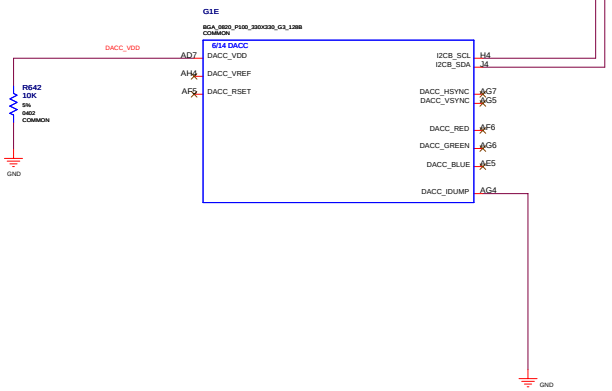
Secondary Display (DACC), DB15





I2C B for HDMI.



Micro-Star International Co., LTD.			
MS-V092			
Size: Custom	Document Number: Secondary Display (DACC), DB15		Rev: 0E
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INTERNAL TMDS .. LINK A & B

IFPAB NET RULES

NET	NV_CRITICAL	NV_IMPEDANCE	DIFFPAIR

NET	VOLTAGE	MAX_CURRENT	MIN_WIDTH
IFPAB_PLLVDD	3.30000	0.04	16.0
IFPAB_IOVDD	3.30000	0.24	16.0
IFPABRSET			12.0
DVI_SOUTH_HPD_C	1	50OHM	
DVI_SOUTH_HPD_R	1	50OHM	

IFPAB_PLLVDD is 2.5V for G73

G1F
BGA_0820_P100_330X330_G3_128B
COMMON
7/14 IFPAB

SNN_VPROBEAB	AM4	IFPAB_VPROBE
IFPABRSET	AL5	IFPAB_RSET
IFPAB_PLLVDD	AC9	IFPAB_PLLVDD
	AD9	IFPAB_PLLGND
	AF9	IFPB_IOVDD
	AF8	IFPB_IOVDD

NETNAME	NV_CRITICAL_NET	NV_IMPEDANCE	DIFF PAIR NAME
IFPA_TXC	AJ9 ATXC*	1 100DIFF	ATXC
IFPA_TXC	AK9 ATXC	1 100DIFF	ATXC
IFPA_TXD0	AJ6 ATXD0*	1 100DIFF	ATXD0
IFPA_TXD0	AH6 ATXD0	1 100DIFF	ATXD0
IFPA_TXD1	AH7 ATXD1*	1 100DIFF	ATXD1
IFPA_TXD1	AH8 ATXD1	1 100DIFF	ATXD1
IFPA_TXD2	AK8 ATXD2*	1 100DIFF	ATXD2
IFPA_TXD2	AJ8 ATXD2	1 100DIFF	ATXD2
IFPA_TXD3	AH5 SNN_ATXD3*		
IFPA_TXD3	AJ5 SNN_ATXD3		
IFPB_TXC	AL4 SNN_BTXC*		
IFPB_TXC	AK4 SNN_BTXC		
IFPB_TXD4	AM5 BTXD4*	1 100DIFF	BTXD4
IFPB_TXD4	AM6 BTXD4	1 100DIFF	BTXD4
IFPB_TXD5	AL7 BTXD5*	1 100DIFF	BTXD5
IFPB_TXD5	AM7 BTXD5	1 100DIFF	BTXD5
IFPB_TXD6	AK5 BTXD6*	1 100DIFF	BTXD6
IFPB_TXD6	AK6 BTXD6	1 100DIFF	BTXD6
IFPB_TXD7	AL8 SNN_BTXD7*		
IFPB_TXD7	AK7 SNN_BTXD7		

ATXD0*R
ATXD0R
ATXD1*R
ATXD1R
ATXD2*R
ATXD2R
BTXD4*R
BTXD4R
BTXD5*R
BTXD5R
BTXD6*R
BTXD6R
ATXC*R
ATXCR

DDC_5V
C10 4700PF 25V 10% X7R 0402 COMMON

J3 INS37250308
DVI_I_SLIM_SHLD_COMMON

25	SHIELD1	17	TX0-
26	SHIELD2	18	TX0+
27	SHIELD3	9	TX1-
28	SHIELD4	10	TX1+
29	SHIELD5	1	TX2-
		2	TX2+
		3	SHLD24
		11	SHLD13
		19	SHLD05
		12	TX3-
		13	TX3+
		4	TX4-
		5	TX4+
		20	TX5-
		21	TX5+
		6	DDCC
		7	DDCD
		14	VDDC
		15	GND
		22	SHLDC
		24	TXC-
		23	TXC+
		8	VSYNC
		16	HPD
		C1	R
		C2	G
		C3	B
		C5	AGND1
		C5A	AGND2
		C4	HSYNC
30	SHIELD6		
31	SHIELD7		
32	SHIELD8		
33	SHIELD9		
34	SHIELD10		

DACA_SCL_C
DACA_SDA_C
DACA_VSYNC_C
DVI_SOUTH_HPD_C
DACA_RED_C
DACA_GREEN_C
DACA_BLUE_C
DACA_HSYNC_C

TMDS_IOVDD
LB510 180R@100MHz IND_SMD_0603COMMON
LB504 180R@100MHz IND_SMD_0603COMMON
IFPAB_PLLVDD
IFPAB_IOVDD

C757 4.7UF 6.3V 10% X5R 0603 COMMON
C747 1UF 6.3V 10% X7R 0603 COMMON
C714 4700PF 25V 10% X7R 0402 COMMON
C700 470PF 50V 10% X7R 0402 COMMON
R45 1K 1% 0402 COMMON
C744 4.7UF 6.3V 10% X5R 0603 COMMON
C736 4700PF 25V 10% X7R 0402 COMMON
C720 470PF 50V 10% X7R 0402 COMMON
C719 1UF 6.3V 10% X7R 0603 COMMON
C730 4700PF 25V 10% X7R 0402 COMMON
C708 470PF 50V 10% X7R 0402 COMMON
GND

R608 0 0402 COMMON
L815 X_90ohm_0603 COMMON
R587 0 0402 5% COMMON
R609 0 0402 COMMON
R610 0 0402 COMMON
L816 X_90ohm_0603 COMMON
R591 0 0402 5% COMMON
R614 0 0402 COMMON
R615 0 0402 COMMON
L817 X_90ohm_0603 COMMON
R595 0 0402 5% COMMON
R616 0 0402 COMMON
R617 0 0402 COMMON
L818 X_90ohm_0603 COMMON
R599 0 0402 5% COMMON
R618 0 0402 COMMON
R619 0 0402 COMMON
L819 X_90ohm_0603 COMMON
R603 0 0402 5% COMMON
R620 0 0402 COMMON
R622 0 0402 COMMON
L820 X_90ohm_0603 COMMON
R607 0 0402 5% COMMON
R623 0 0402 COMMON
R624 0 0402 COMMON
L821 X_90ohm_0603 COMMON
R611 0 0402 5% COMMON
R625 0 0402 COMMON

Hotplug Detection

3V3_PEX
DVI_MID_HPD
R13 1K 0402 5% COMMON
DVI_SOUTH_HPD_R
LB5 180R@100MHz IND_SMD_0603COMMON
C11 220PF 50V 5% C0G 0603 COMMON
R14 10K 5% 0402 COMMON
D5 SOT23 100V 100MA COMMON

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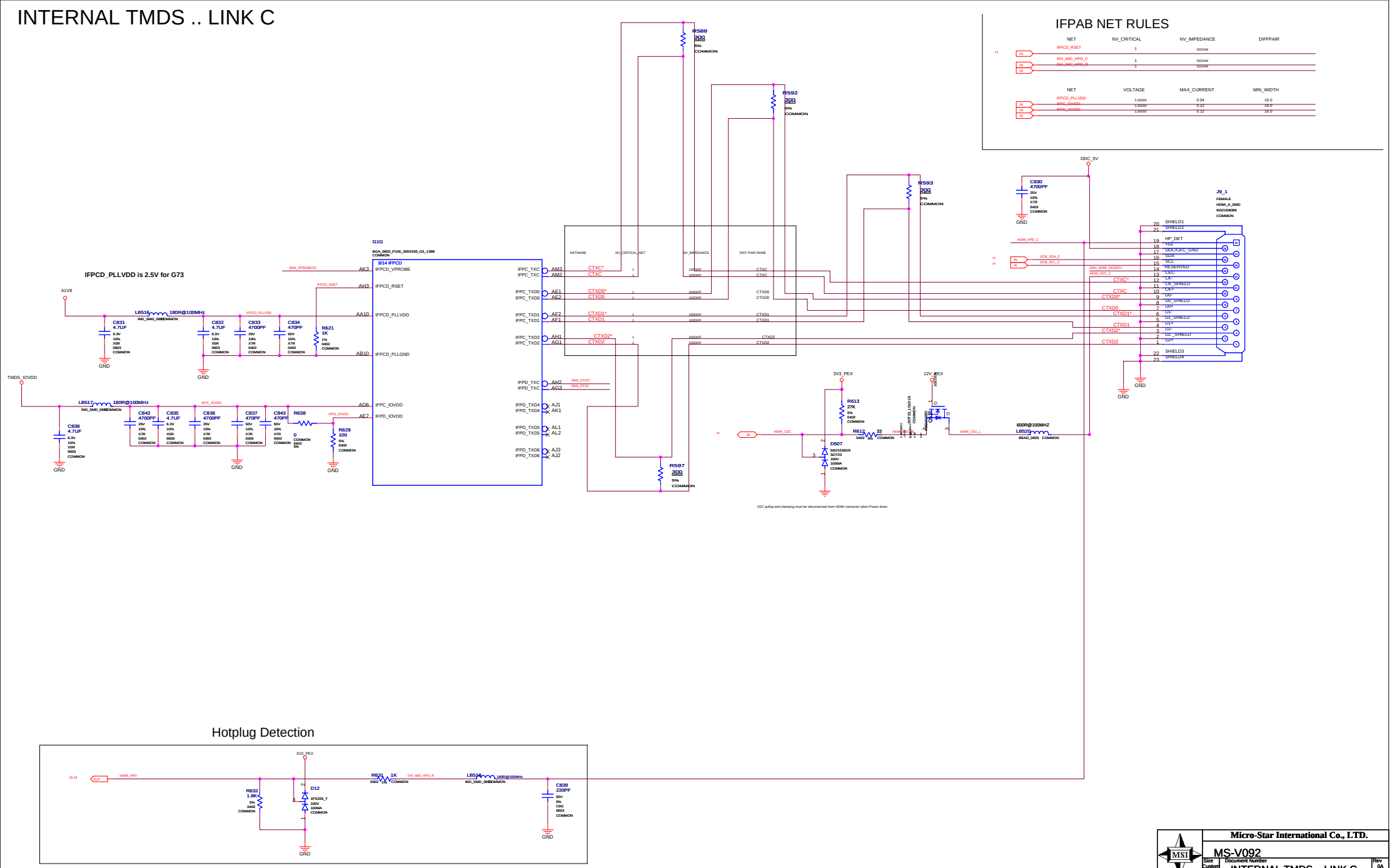
Size: Custom | Document Number: INTERNAL TMDS .. LINK A & B | Rev: 0A
Date: Friday, February 02, 2007 | Sheet 11 of 20

INTERNAL TMDS .. LINK C



Micro-Star International Co., LTD.	
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Size: Custom	Document Number: INTERNAL TMDS .. LINK C
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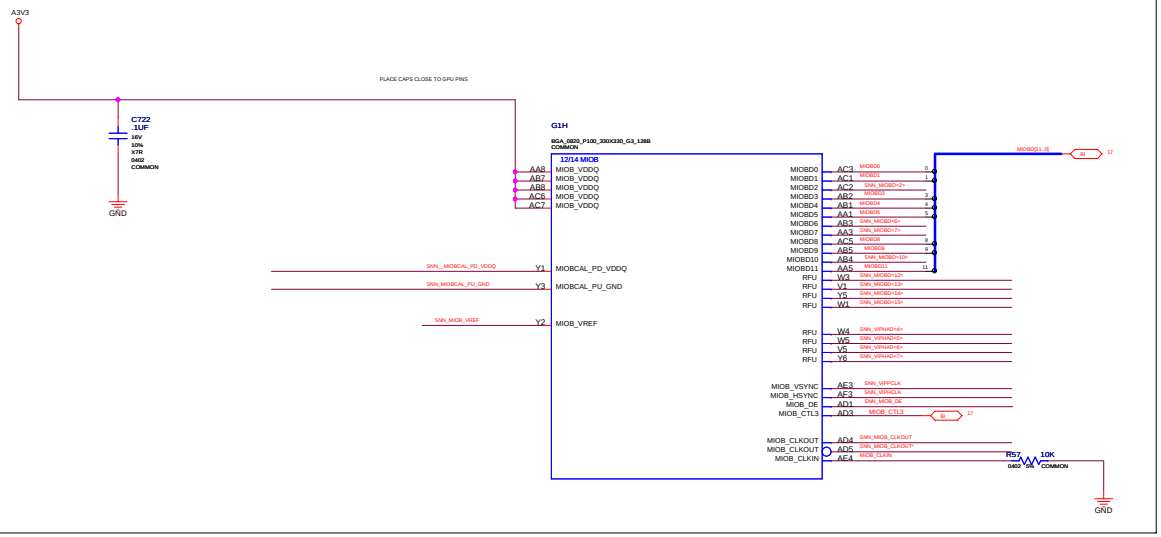
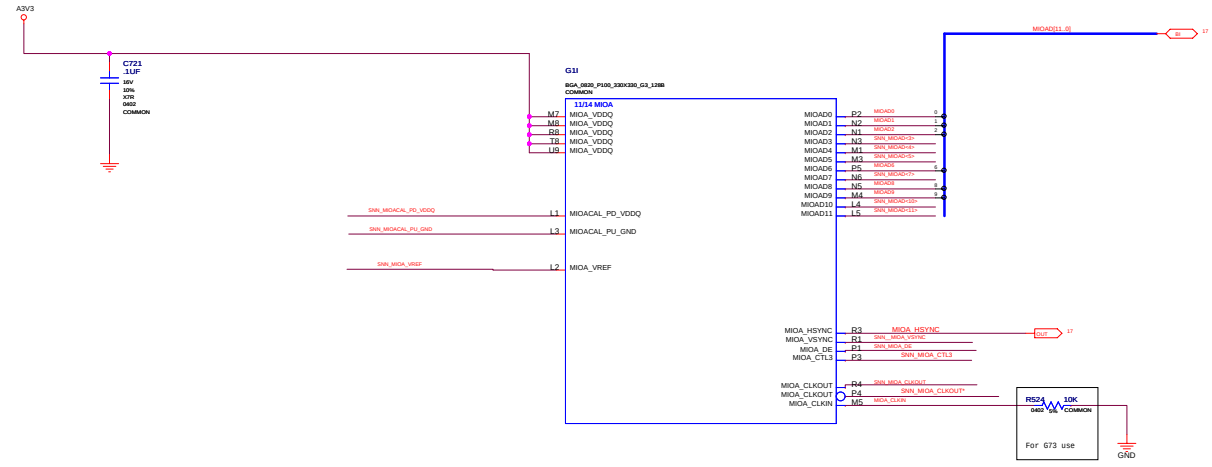
G3 VIP/MIOB/MIOA

G3 VIP/MIOB



G3 MIOA



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Size: Custom	Document Number: G3 VIP/MIOB/MIOA	Rev: 0A
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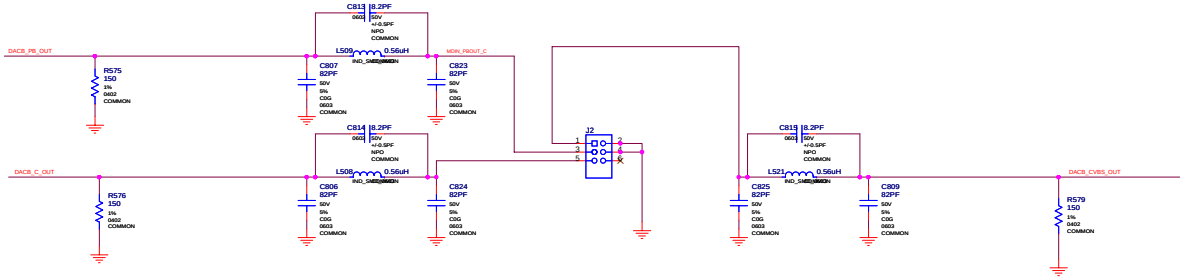
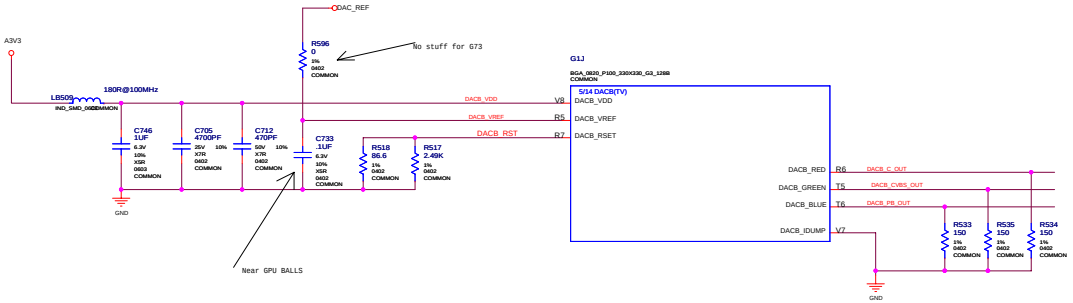
DACB .. MiniDIN VIDEO OUT CONNECTOR

DACB NET RULES

NET	NV_CRITICAL	NV_IMPEDANCE	DIFFPAIR
DACB_C_OUT	1	50OHM	
MDIN_COUT_C	1	50OHM	
DACB_CVBS_OUT	1	50OHM	
MDIN_YOUT_C	1	50OHM	
DACB_PB_OUT	1	50OHM	
MDIN_PBOUT_C	1	50OHM	
MDIN_SCL_C	2	50OHM	
MDIN_SDA_C	2	50OHM	

NET	VOLTAGE	MAX_CURRENT	MIN_WIDTH
DACB_VDD	3.30000	0.07	16.0
DACB_VREF			16.0
DACB_RSET			16.0





Micro-Star International Co., LTD.	
MS-V092	
Size: Custom	Document Number: DACB .. MiniDIN VIDEO OUT
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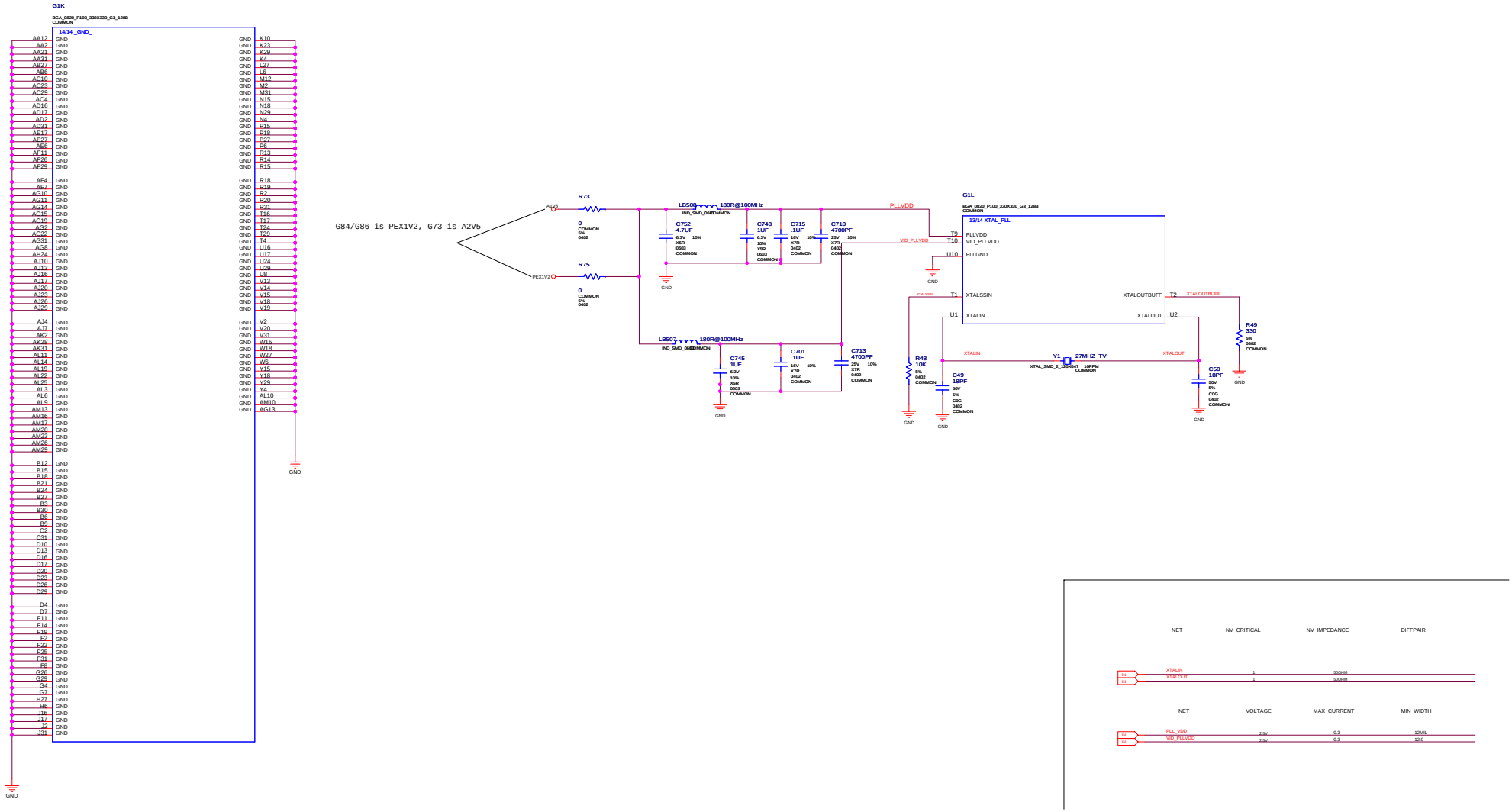

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MS-V092			
Size: Custom	Document Number: GND/XTAL/PLLVDD		Rev: 0A
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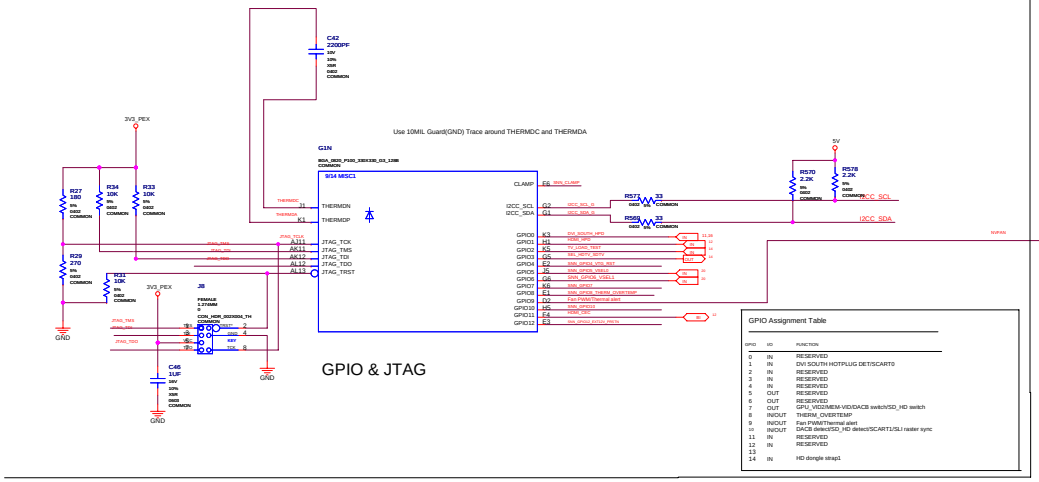
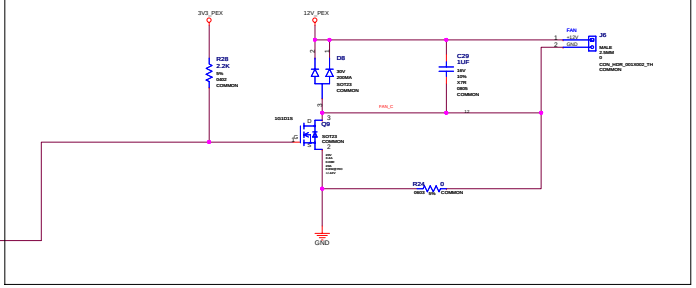
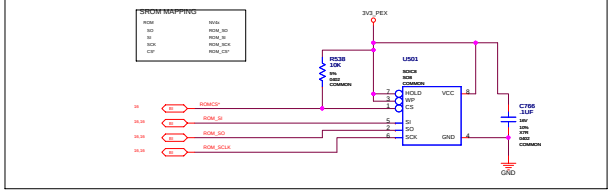
GPIO / JTAG / HDCP / BIOS / SPDIF



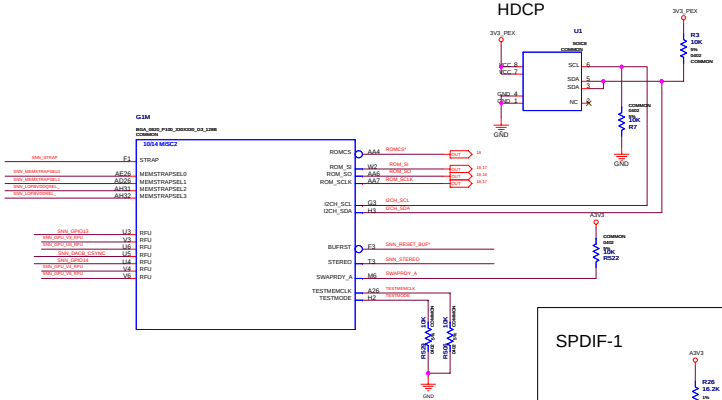
GPIO ON/OFF FAN Control



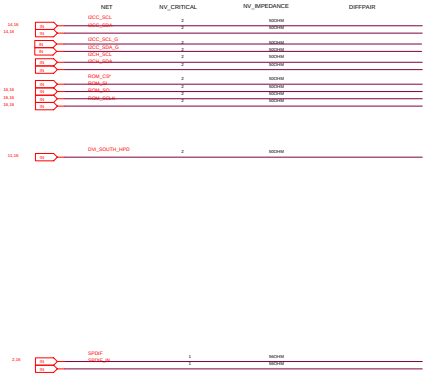
BIOS (serial)



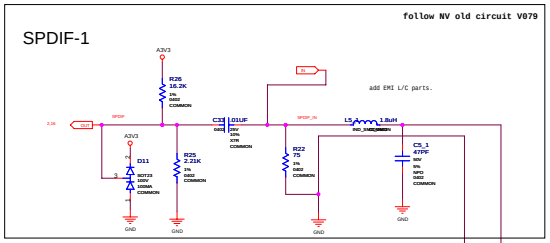
HDCP



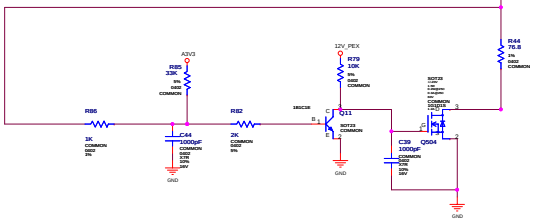
MISC NET RULES



SPDIF-1



SPDIF-2



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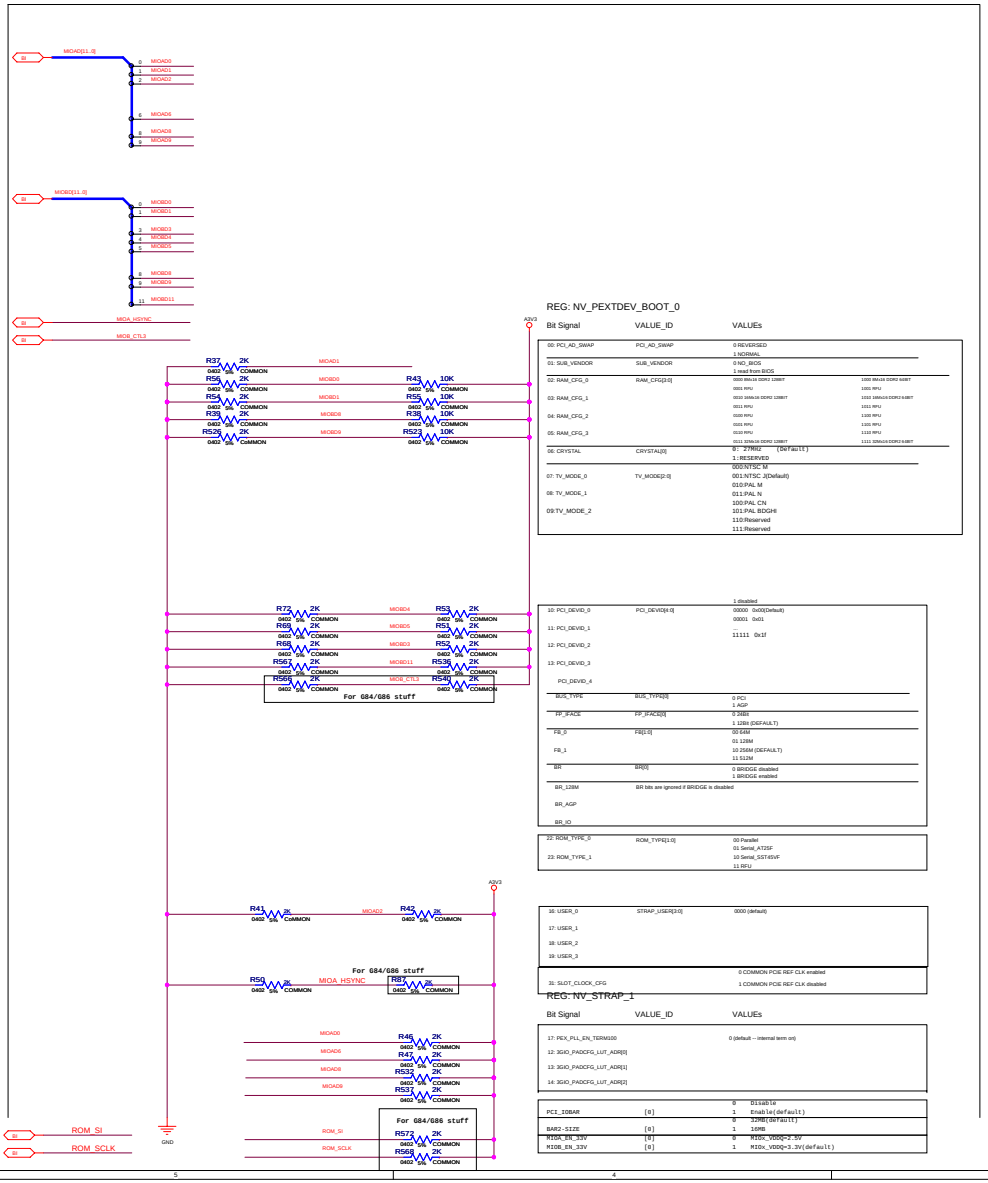
STRAPS, Mechanical Parts

Straps

Assembly: BIOS



REG: NV_PEXTDEV_BOOT_0

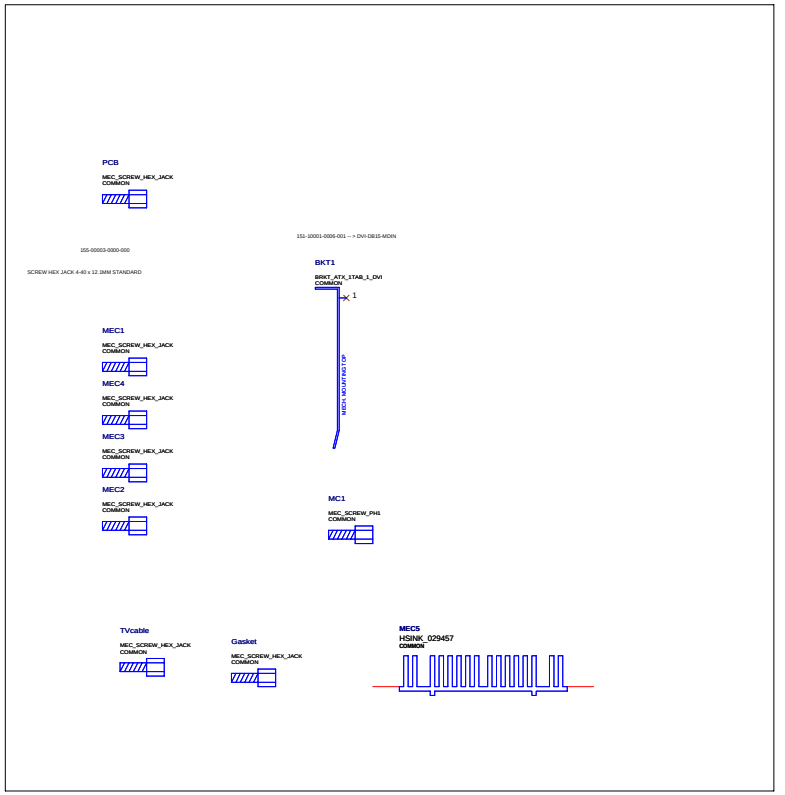
Bit	Signal	VALUE_ID	VALUEs
00: PCI_AD_SWAP		PCI_AD_SWAP	0:REVERSED 1:NORMAL
01: SUB_VENDOR		SUB_VENDOR	0:NO_BIOS 1:read from BIOS
02: RAM_CFG_0		RAM_CFG[3:0]	0000:8Mx16 DDR2 128MT 0001:RFU 0010:16Mx16 DDR2 128MT 0011:RFU 0100:RFU 0101:RFU 0110:RFU 0111:32Mx16 DDR2 128MT 1000:8Mx16 DDR2 64BT 1001:RFU 1010:16Mx16 DDR2 64BT 1011:RFU 1100:RFU 1101:RFU 1110:RFU 1111:32Mx16 DDR2 64BT
03: RAM_CFG_1			
04: RAM_CFG_2			
05: RAM_CFG_3			
06: CRYSTAL		CRYSTAL[0]	0: 27MHz (Default) 1: RESERVED
07: TV_MODE_0		TV_MODE[2:0]	000:NTSC M 001:NTSC J(Default) 010:PAL M 011:PAL N 100:PAL CN 101:PAL BDGHI 110:Reserved 111:Reserved
08: TV_MODE_1			
09:TV_MODE_2			
10: PCI_DEVID_0		PCI_DEVID[4:0]	1 disabled 00000 0x00(Default) 00001 0x01 ... 11111 0x1f
11: PCI_DEVID_1			
12: PCI_DEVID_2			
13: PCI_DEVID_3			
PCI_DEVID_4			
BUS_TYPE		BUS_TYP[0]	0 PCI 1 AGP
FP_IFACE		FP_IFACE[0]	0 24bit 1 12Bit (DEFAULT)
FB_0		FB[1:0]	00 64M 01 128M 10 256M (DEFAULT) 11 512M
FB_1			
BR		BR[0]	0 BRIDGE disabled 1 BRIDGE enabled
BR_128M		BR bits are ignored if BRIDGE is disabled	
BR_AGP			
BR_IO			
22: ROM_TYPE_0		ROM_TYP[1:0]	00 Parallel 01 Serial_AT25F 10 Serial_SST45VF 11 RFU
23: ROM_TYPE_1			

Bit	Signal	VALUE_ID	VALUEs
16: USER_0		STRAP_USER[3:0]	0000 (default)
17: USER_1			
18: USER_2			
19: USER_3			
31: SLOT_CLOCK_CFG			0 COMMON PCIE REF CLK enabled 1 COMMON PCIE REF CLK disabled

REG: NV_STRAP_1

Bit	Signal	VALUE_ID	VALUEs
17: 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]			
PCI_IOBAR	[0]		0 Disable 1 Enable(default)
BAR2-SIZE	[0]		0 32MB(Default) 1 16MB
MIOA_EN_33V	[0]		0 MIOx_VDDQ=2.5V
MIOB_EN_33V	[0]		1 MIOx_VDDQ=3.3V(default)

Mechanical parts



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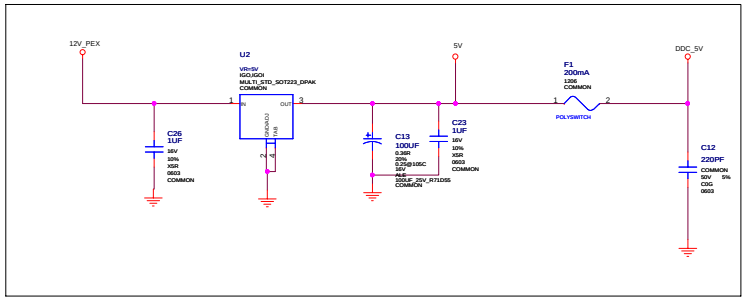
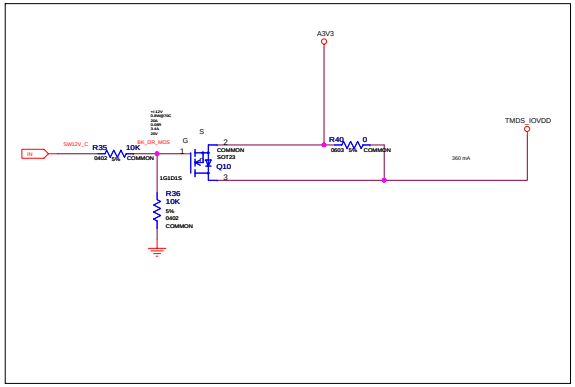
Power Supply:TMDS_IOVDD/A3V3/5V/DAC_REF

NETNAME	MAX_CURRENT	MIN_LINE_WIDTH	VOLTAGE
DDC_5V	0.1	12.0	5.00000
A2V5	0.96	25.0	2.50000
TMDS_IOVDD	0.24	20.0	3.30000
A3V3	1	20.0	3.30000
GND		35.0	0.000000

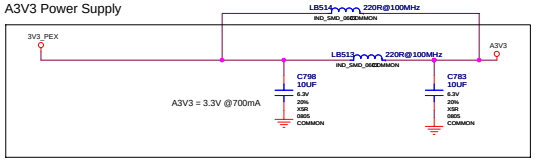
DDC 5V



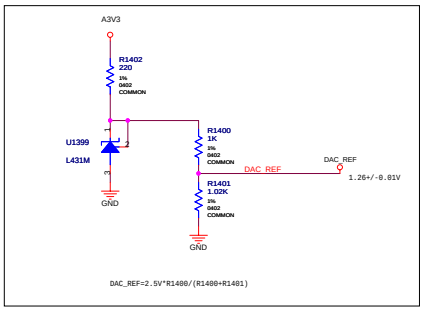
TMDS IO SUPPLY WITH BACKDRIVE PROTECTION



A3V3 Power Supply

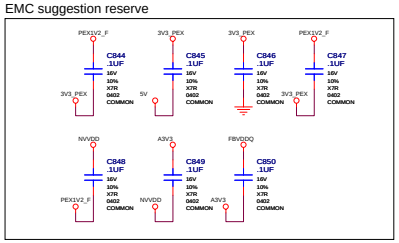


DAC_REF



FM1 FM4
FM2 FM5
FM3 FM6

EMC suggestion reserve



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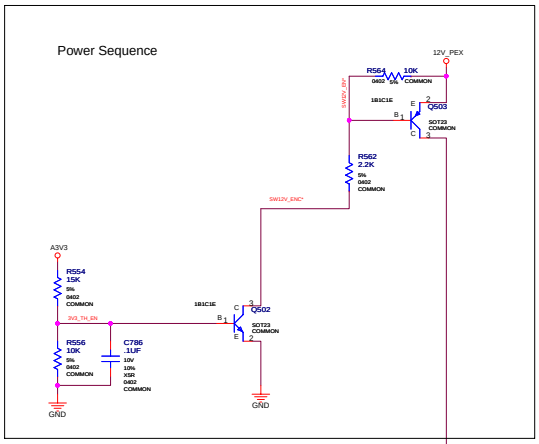
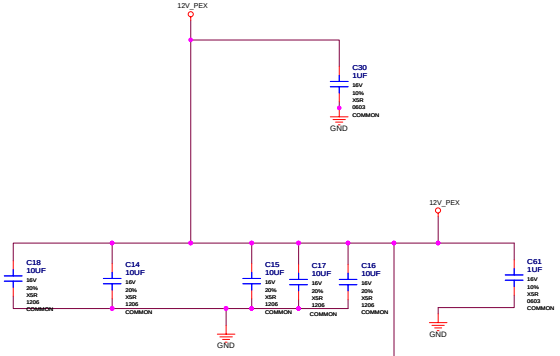
PowerSupplyI: NVVDD, A1V8

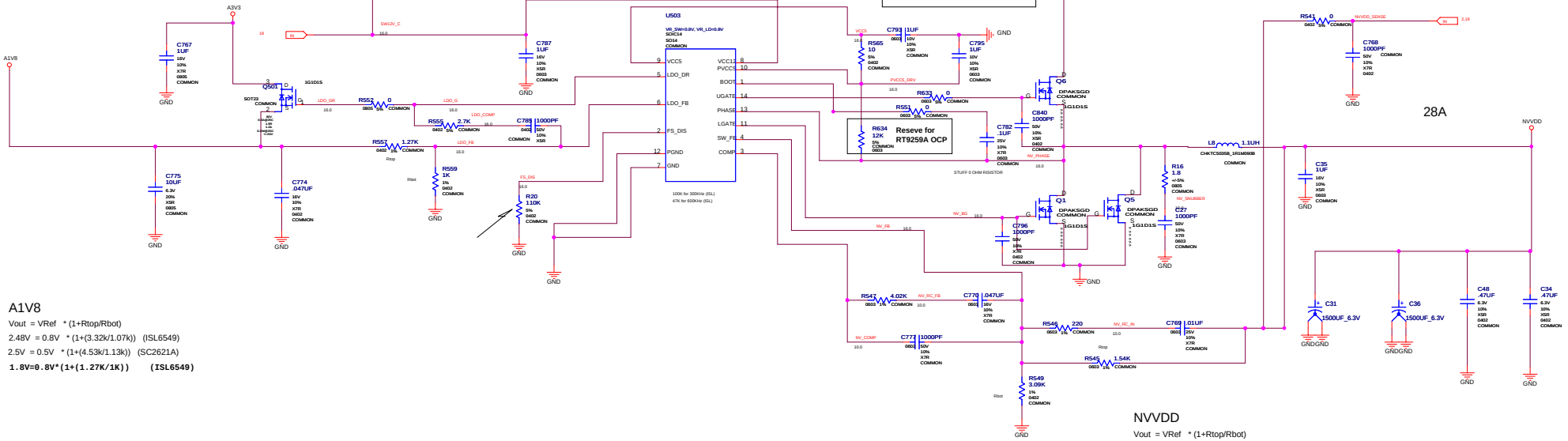
Net Name	LINE_WIDTH	Current	Voltage
12V_F	30MIL	3	12V
NVVDD	30MIL	15	1.2V
PEX1V2	24MIL	2	1.20000
NVVDD_SENSE	16MIL	0.5	1.2V
NVVDD_SENSE_M	16MIL	0.5	1.2V





ISL6549(SC2621A)

C795 change to 12K for APW7068 OCP
R565 remove for APW7068



A1V8

Vout = VRef * (1+Rtop/Rbot)

2.48V = 0.8V * (1+(3.32k/1.07k)) (ISL6549)

2.5V = 0.5V * (1+(4.53k/1.13k)) (SC2621A)

1.8V=0.8V*(1+(1.27K/1K)) (ISL6549)

NVVDD

Vout = VRef * (1+Rtop/Rbot)

1.2V = 0.8V * (1+(1.54k/3.09k)) (ISL6549)

1.2V = 0.5V * (1+(14.7k/10.5k)) (SC2621A)

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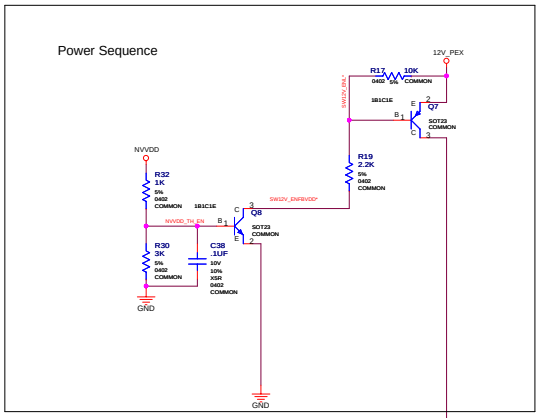
PowerSupplyIII: FBVDDQ,PEX1V2

Net Name	LINE_WIDTH	CURRENT	Voltage
FBVDDQ	12MIL	2A	2V
PEX1V2_F	24MIL	2.5A	1.2V



If NVVDD=1.2v, this part don't stuff

ISL6549 (SC2621A)

C781 change to 12K for APW7068 OCP
R553 remove for APW7068

Reseve for RT9259A OCP

PEX1V2

Vout = VRef * (1+Rtop/Rbot)

1.199V = 0.8V * (1+(1.54K/3.09K)) (ISL6549)

1.2V = 0.5V * (1+(1.47K/1.05K)) (SC2621A)

add FBVDD_GPIO5 FBVDD_GPIO6 circuit

FBVDDQ:

Vout = VRef * (1+Rtop/Rbot)

1.7966V = 0.8V * (1+(1.47K/1.18K)) (ISL6549)

1.8057V = 0.5V * (1+(3.16K/1.21K)) (SC2621A)

2.01V = 0.8V * (1+(1.54K/1.02K)) (ISL6549)

2.01V = 0.5V * (1+(14.7K/4.87K)) (SC2621A)

1.82V = 0.8V * (1+(1.54/1.21K)) (6549)

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