

P381: G72, DDR2 MEMORY 16Mx16

Page 1: P381 Overview

Page 2: PCI Express Interface

Page 3: Frame Buffer Interface

Page 4: Memory 1st bank 0..31

Page 5: Memory 1st bank 32..63

Page 6: DACA, DACB, DACC, Sync Buffers

Page 7: DACB, VGA Output, TV Out

Page8: S-Video Minidin Connector

Page 9: TMDS Interface

Page 10: MIOA, MIOB Interface, LPC-ROM

Page 11: STRAPS, Mechanical Parts

Page 12: XTAL, GPIO, BIOS, FAN, JTAG, THERMAL


Page 13: PowerSupplyI: NVVDD, A3V3

Page 14: PowerSupplyII: 5V, DDC5V, F3V3, TMDS\_PLLVDD

REV	VARIANT	NVPN	ASSEMBLY
0	BASE	600-10381-xxxx-400	BASE LEVEL GENERIC SCHEMATIC ONLY. COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
1	SKU0010	600-10381-0010-400	P381: G3-647300LE, 64 BIT DDR2 16Mx16 MEMORY, VGA+DVI+TVout
2	SKU0011	600-10381-0011-400	P381: G3-647300LE, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+TVout
3	SKU0012	600-10381-0012-400	P381: G3-647300SE, 64 BIT DDR2 32Mx16 MEMORY, VGA+DVI+TVout
4	SKU0013	600-10381-0013-400	P381: G3-647300SE, 64 BIT DDR2 16Mx16 MEMORY, VGA+DVI+TVout
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>

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED AS IS. THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VIOLATIONS OR DEVIATIONS OF INDUSTRY STANDARDS AND SPECIFICATIONS. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS OR OTHERWISE, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF DESIGN, OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY. COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	P381 Overview



Micro-Star International Co., LTD.

<Title>

MS-V056-40

Size Custom

Document Number

P381-A04

Date

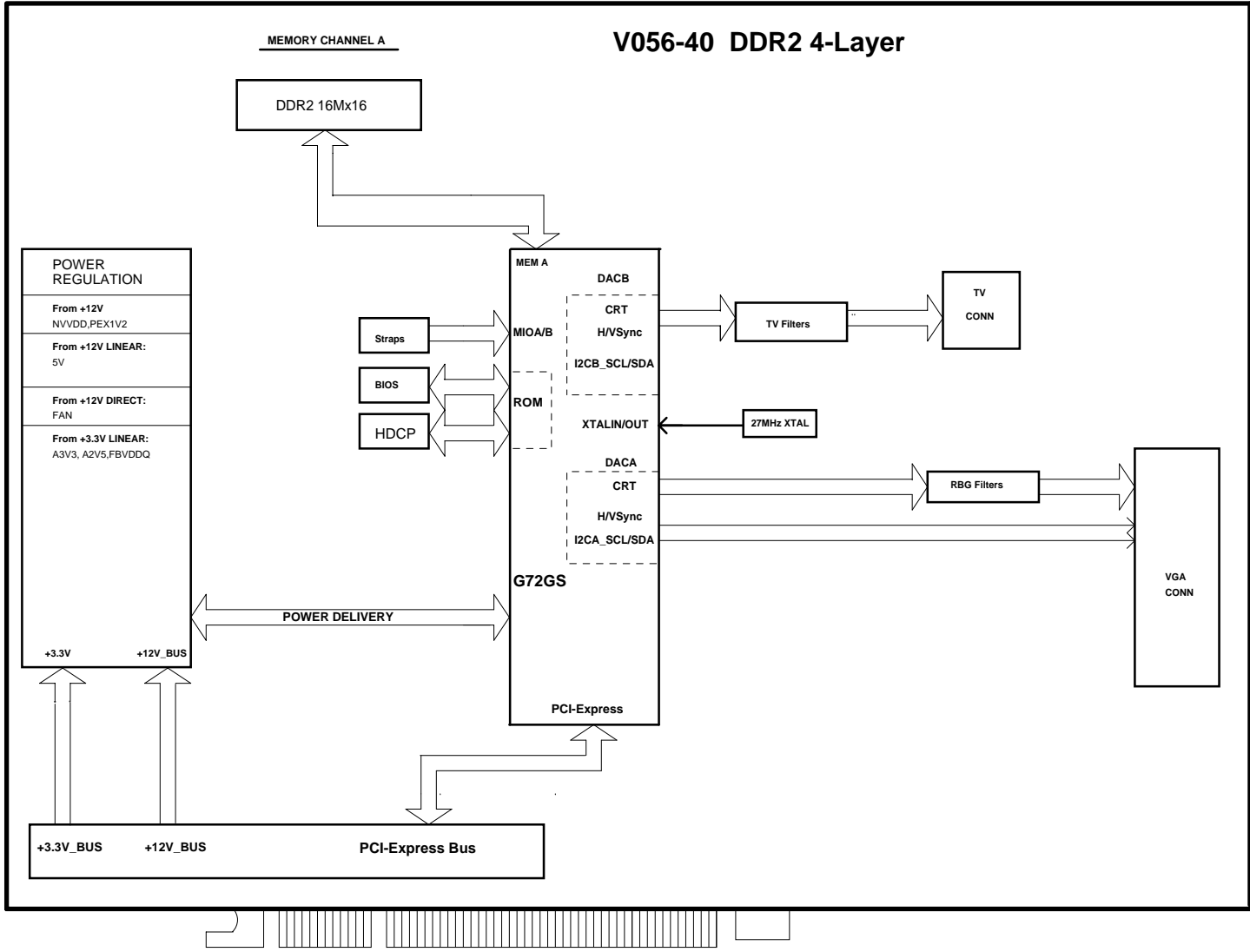
Tuesday, November 20, 2007

Sheet

1 of 14


Rev

<RevCode>



ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS OR INFORMATION (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED AS IS. THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VIOLATIONS OR DEVIATIONS OF INDUSTRY STANDARDS AND SPECIFICATIONS. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS OR OTHERWISE, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF DESIGN, OF NONINFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	P381 Overview

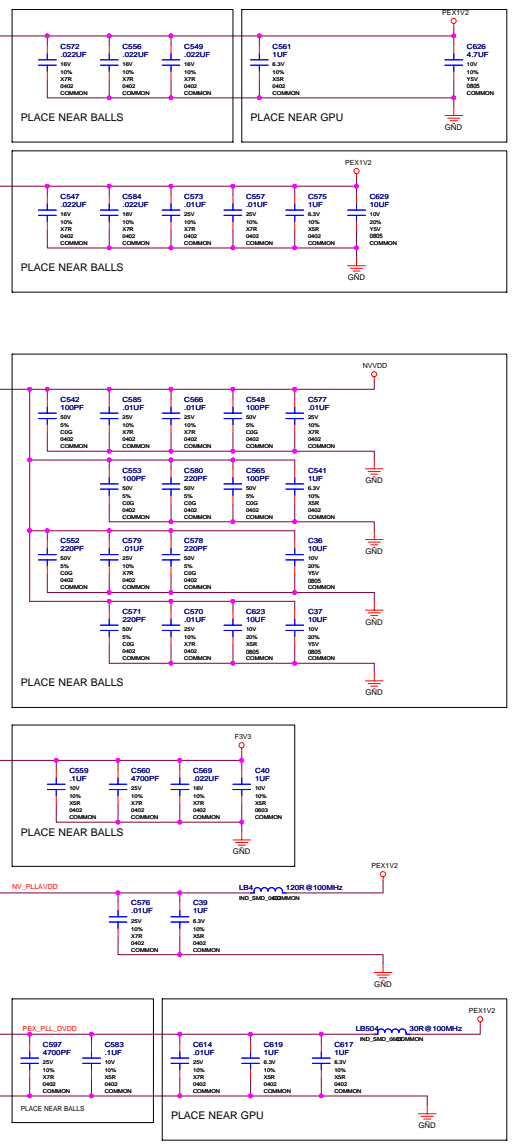


**Micro-Star International Co., LTD.**

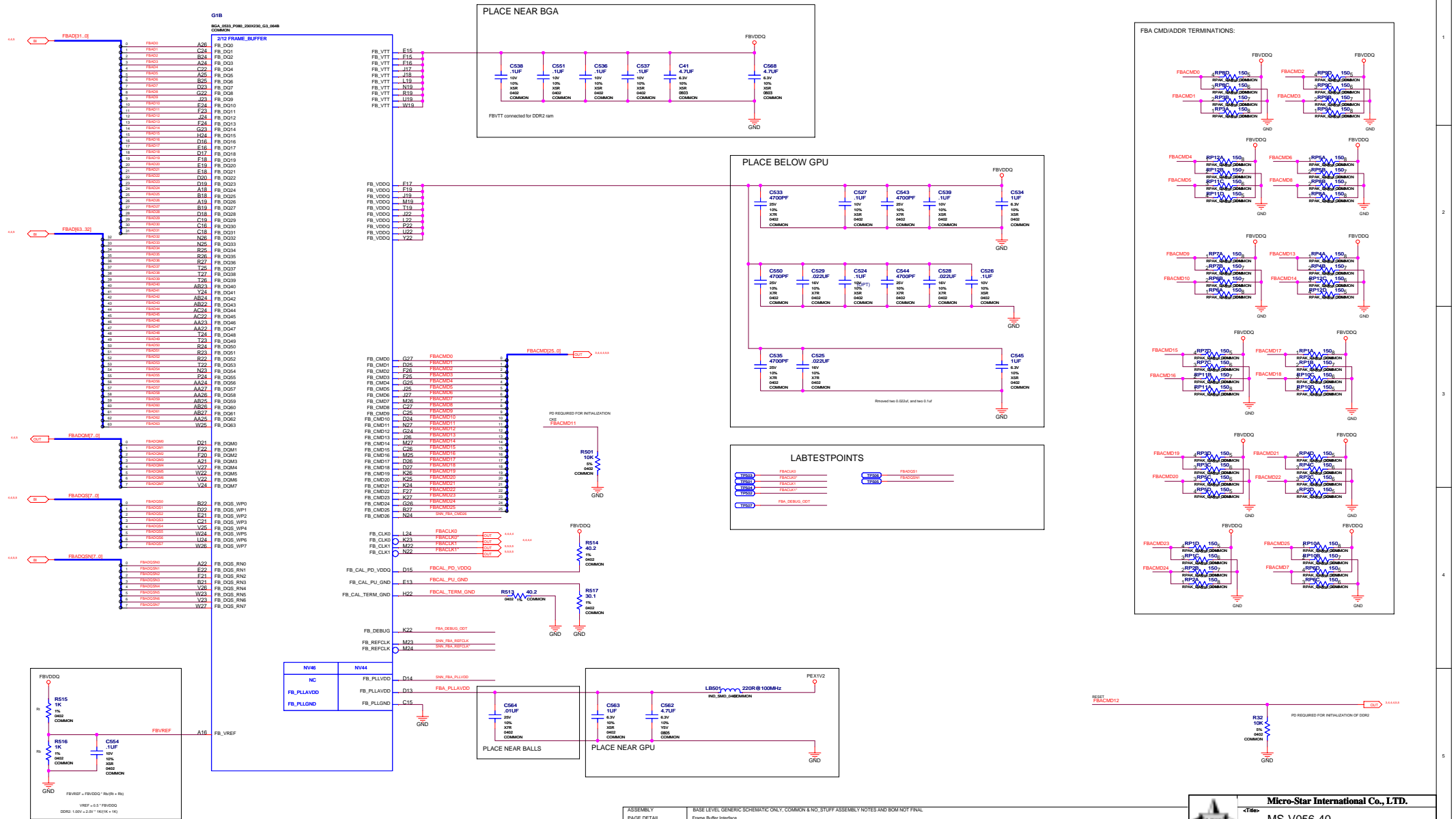
<Title> **MS-V056-40**

Size Custom Document Number **P381-A04** Rev

Date: **Tuesday, November 20, 2007** Sheet **15** of **15**



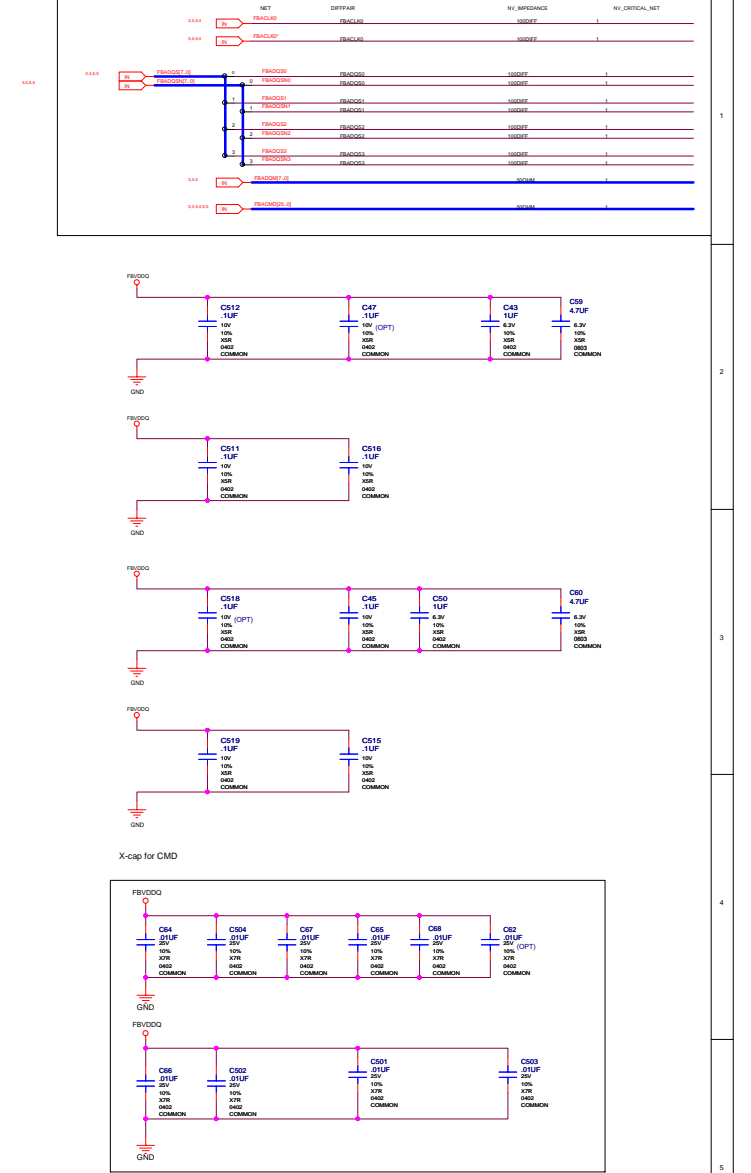
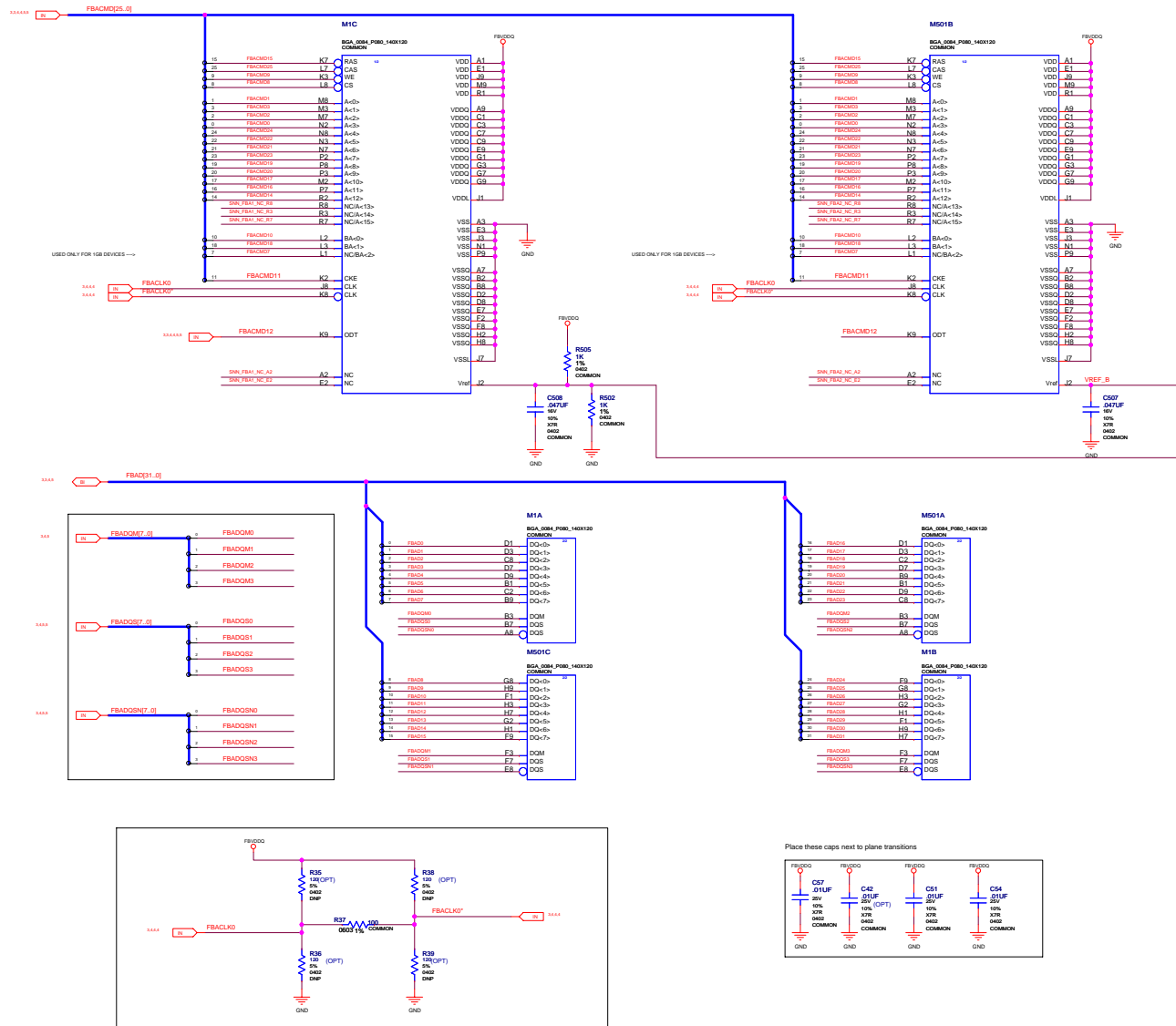
## GPU: FB-Interface



ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS OR INFORMATION (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED AS IS. THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VIOLATIONS OR DEVIATIONS OF INDUSTRY STANDARDS AND SPECIFICATIONS. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS OR OTHERWISE, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF DESIGN, OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

# Memory Bit 0.31

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY

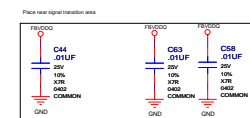
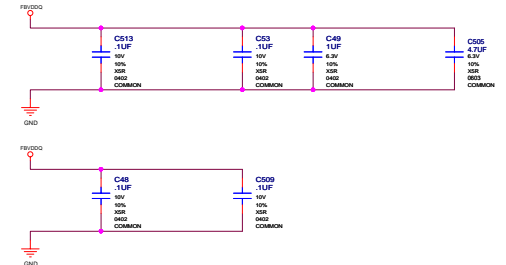
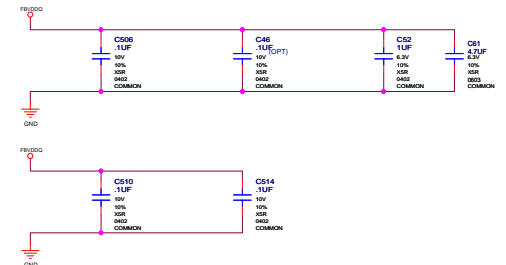
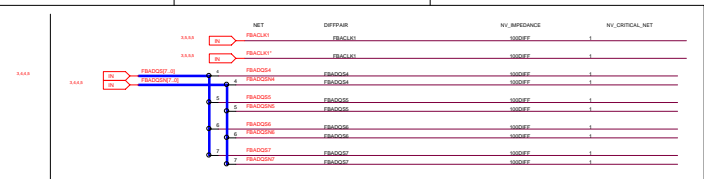


ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS." THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VIOLATIONS OR DEVIATIONS OF INDUSTRY STANDARDS AND SPECIFICATIONS. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS OR OTHERWISE, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF DESIGN, OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

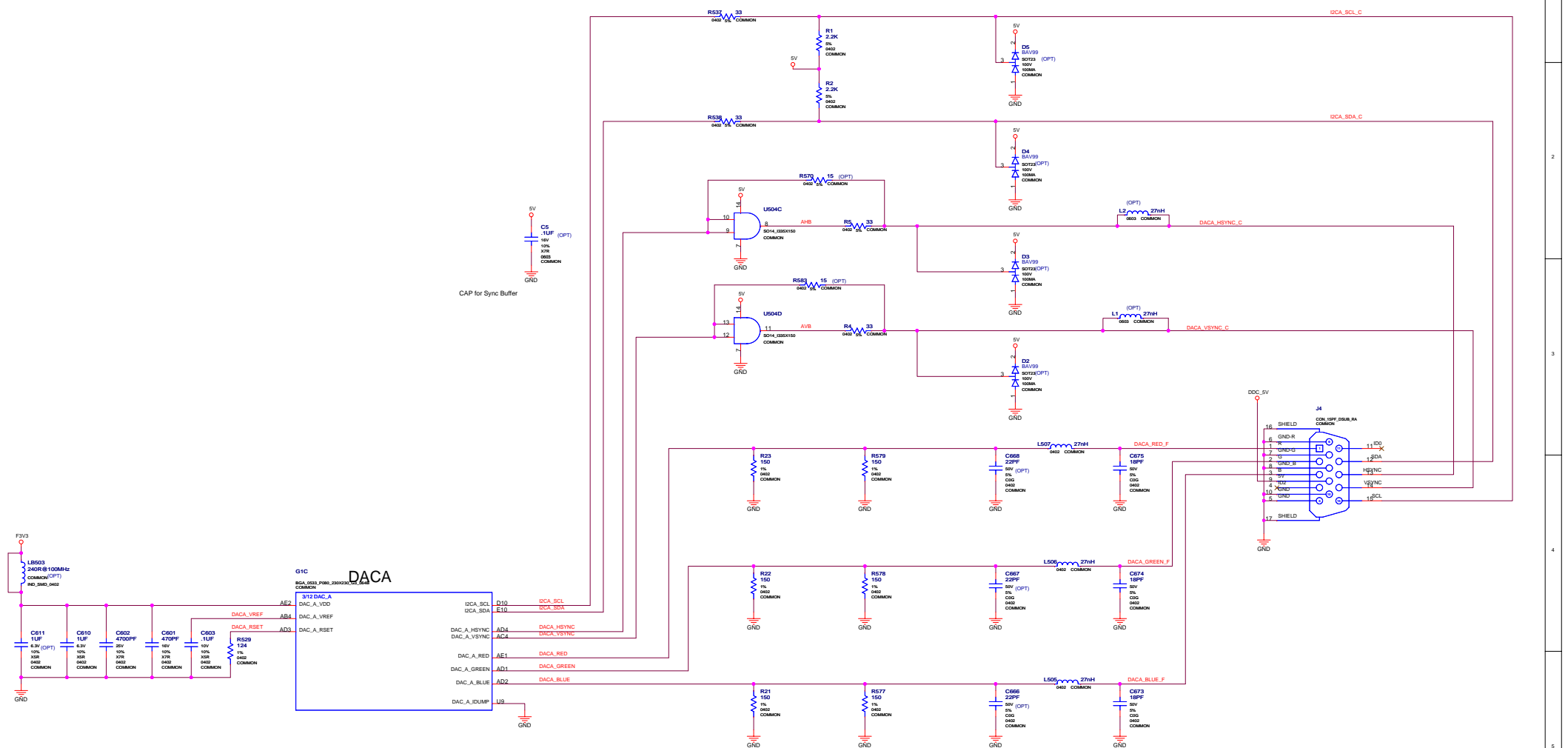
ASSEMBLY PAGE DETAIL  
SIZE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO. 31/UFF ASSEMBLY NOTES AND BOM NOT FINAL  
Memory 1st bank 0.31

Micro-Star International Co., LTD.	
MS-V056-40	
Size	Custom
Doc	Memory Bit 0.31
Date	Tuesday, November 20, 2007
Sheet	4 of 14


PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY



### DAC-A, DB15 Connector

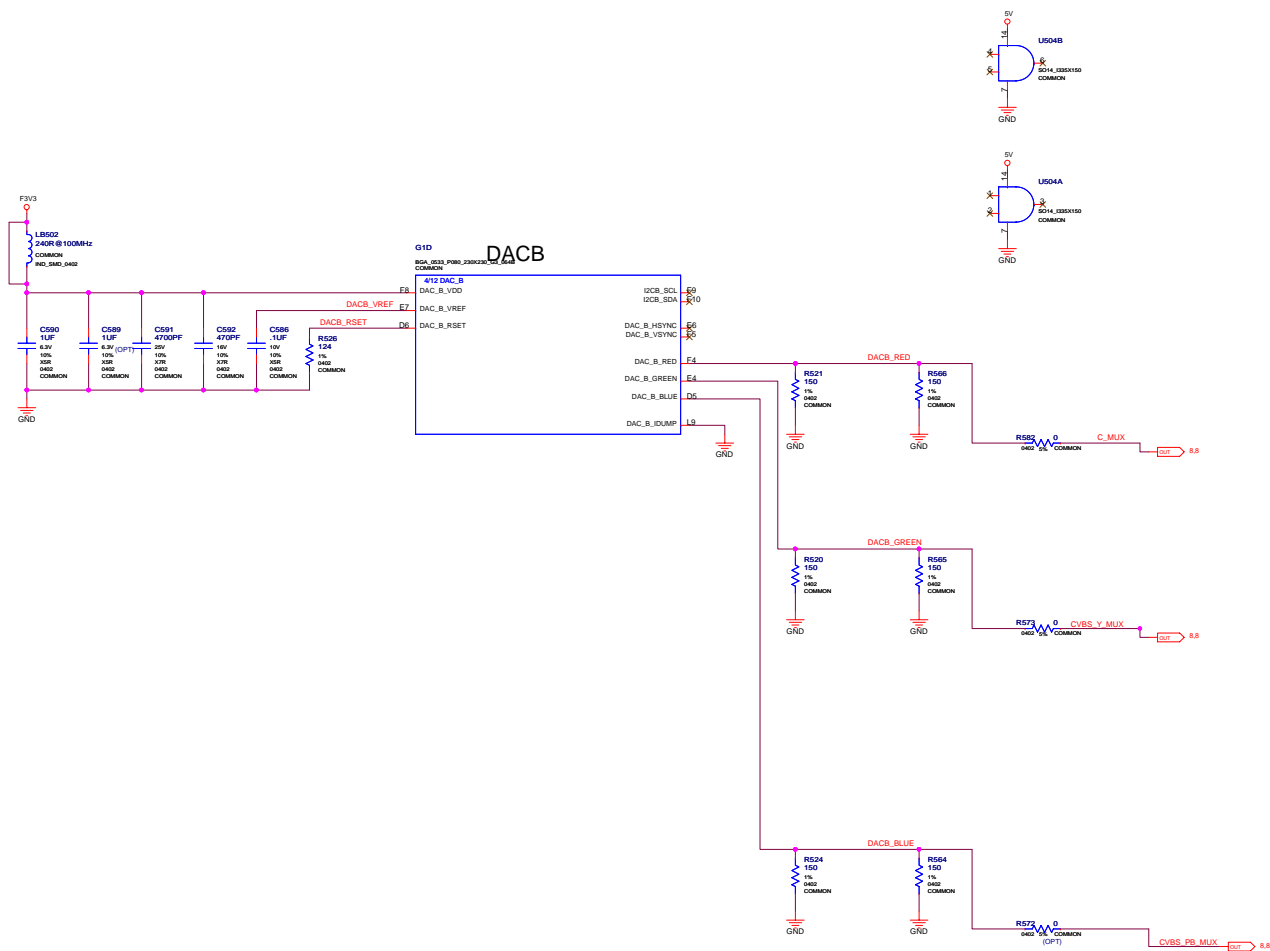


ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	DACA, DACB, DACC, Sync Buffers

	<b>Micro-Star International Co., LTD.</b>		
	<Title>		
	MS-V056-40		
	Size Custom	Document Number <b>DB15 Connector</b>	Rev A
Date:	Tuesday, November 20, 2007	1 Sheet	6 of 14

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS OR INFORMATION (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED AS IS. THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VULNERABILITIES OR DEVIATIONS OF INDUSTRY STANDARDS AND SPECIFICATIONS. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS OR OTHERWISE, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF DESIGN, OF NONINFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

## DAC-B, MUX, 2x6 HDR



ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS OR INFORMATION (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS." THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VIOLATIONS OR DEVIATIONS OF INDUSTRY STANDARDS AND SPECIFICATIONS. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS OR OTHERWISE, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF DESIGN, OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	DACB, VGA Output, TV Out



**Micro-Star International Co., LTD.**

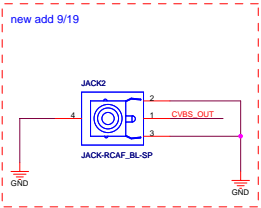
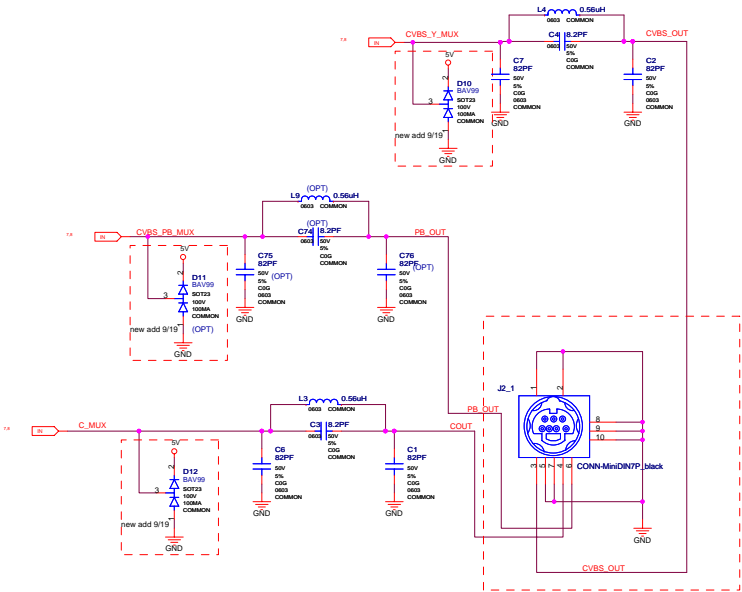
MS-V056-40

Size	Document Number
Custom	<Doc> DAC-B, MUX, 2x6 HDR

Rev	
-----	--



VIDEO CONNECTORS: MiniDIN



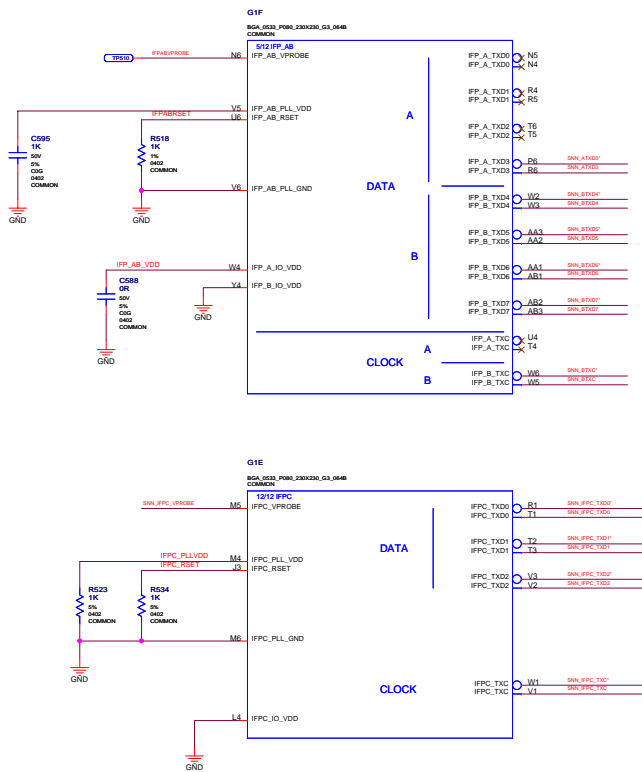
Replace MiniDin with Compupack Part

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS." THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VIOLATIONS OR DEVIATIONS OF INDUSTRY STANDARDS AND SPECIFICATIONS. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS OR OTHERWISE, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF DESIGN, OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

ASSEMBLY	BAZE LEVEL: GENERIC SCHEMATIC ONLY; COMMON & NO. 31UFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	VIDEO CONNECTORS: MHDIN, 246 HDR

Micro-Star International Co., L.T.D.			
<Title>		MS-V056-40	
Size	Custom	Document Number	<Doc>
Date	Tuesday, November 20, 2007	MiniDIN	<RevCode>
Sheet	8	of	14

Internal TMDS, DVI-Connector



ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS." THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VIOLATIONS OR DEVIATIONS OF INDUSTRY STANDARDS AND SPECIFICATIONS. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS OR OTHERWISE, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF DESIGN, OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

ASSEMBLY  
PAGE DETAIL

SIZE LEVEL: GENERIC SCHEMATIC ONLY; COMMON & NO. STUFF ASSEMBLY NOTES AND BOM NOT FINAL  
TMDS Interface



Micro-Star International Co., Ltd.

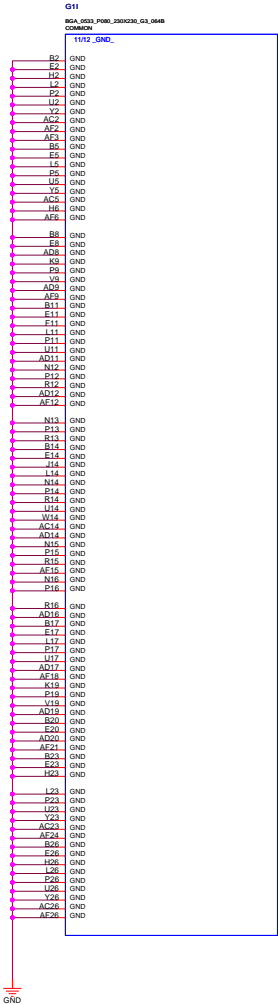
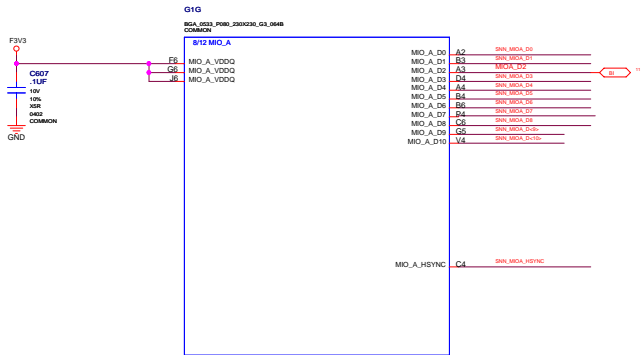
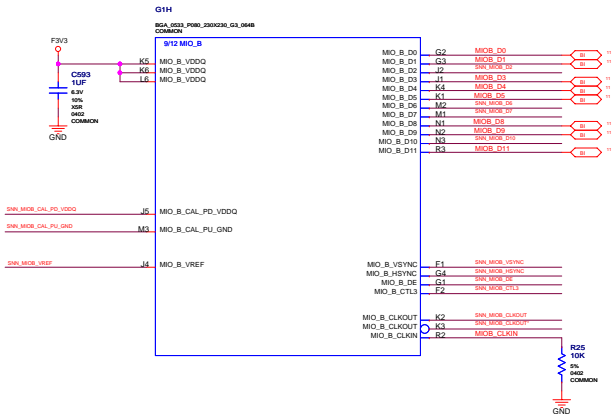
<Title>  
MS-V056-40

Size Custom Document Number  
Internal TMDS

Date: Tuesday, November 20, 2007 Sheet 9 of 14

Rev Code

MIOA, MIOB Interface

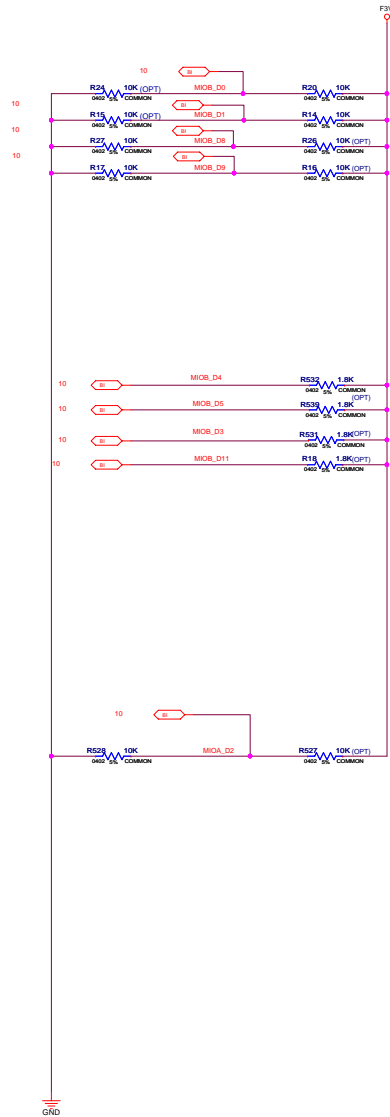


ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS") ARE PROVIDED AS IS. THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VIOLATIONS OR DEVIATIONS OF INDUSTRY STANDARDS AND SPECIFICATIONS. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF DESIGN, OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

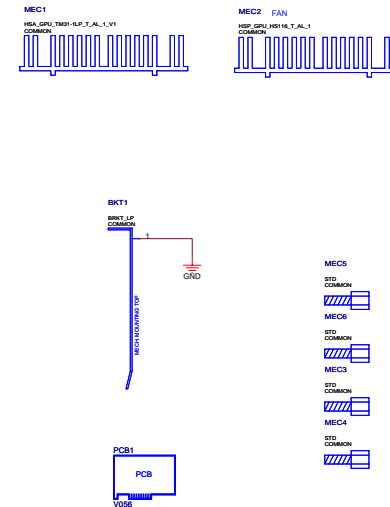
ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY; COMMON & NO. 31/0FF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE: DETAIL	MIOA, MIOB Interface, LPC-ROM

Micro-Star International Co., LTD.			
<Title>			
Size	Document Number	MS-V056-40	
Custom	<Doc>	MIOA, MIOB Interface	
Date	Tuesday, November 20, 2007	Sheet	10 of 14

## STRAPS, Mechanical Parts



Bit Signal		Values
00	PCI_AD_SIZE	2 (16/32/64) 1 (NOTSET)
01	SUB_VENDOR	0 (NO_BIOS) 1 (BIOS FROM BIOS)
02	RAM_CFG_0	000 0000 (DDR3.640) INF32IN 0001 RFU 0010 0000 (DDR3.640) INF32IN 0011 0000 (DDR3.640) INF32IN 1000 RFU 1001 RFU 1010 RFU 1011 0000 (DDR3.640) INF32IN 1100 RFU 1101 RFU 1110 RFU 1111 0000 (DDR3.640) INF32IN
03	RAM_CFG_1	
04	RAM_CFG_2	
05	RAM_CFG_3	
06	CRYSTAL_0	00 (13.500 Mhz) 01 (14.21818 MHz) 10 (12.500 Mhz) 11 UNKNOWN
22	CRYSTAL_1	
07	TV_MODE_0	0 (SDCAM) 01 (NTSC) 10 (PAL) 11 (GPT)
08	TV_MODE_1	
09	ASG_30_3h	0 (ASPG ENABLED) 1 (ASPG DISABLED)
10	ASG_33A	0 (SBA ENABLED) 1 (SBA DISABLED)
11	ASG_FASTIOH	0 (FIO ENABLED) 1 (FIO DISABLED)
12	PCI_DEVID_0	1 (00 (default 00FC))
13	PCI_DEVID_1	
20	PCI_DEVID_2	
21	PCI_DEVID_3	
14	BUS_TYPE	0 (PCI) 1 (AGP)
15	FP_FACE	0 (A0) 1 (NONE (DEFAULT))
23	FB_0	00 (64M) 01 (32M) 10 (32M (DEFAULT)) 11 (32M)
24	FB_1	
25	BR	0 (BRIDGE DISABLED) 1 (BRIDGE ENABLED)
26	BR_UBM	00 (BTS KNOCKED IF BRIDGE IS DISABLED)
27	BR_AGP	
28	BR_ID	
29	RCM_TYPE_0	00 (PARALLEL) 01 (SERIAL_ATPP) 10 (SERIAL_ST404VF) 11 (LPC)
30	RCM_TYPE_1	
16	USER_0	0000 (DEFAULT)
17	USER_1	
18	USER_2	
19	USER_3	
REV_PUL_IN_T000000		
SGDO_PACCFG_LUT_ADDR[0]		
SGDO_PACCFG_LUT_ADDR[1]		
hwdev_ext_block.configuration		



MEC5  
STD  
COMMON

MEC6  
STD  
COMMON

MEC3  
STD  
COMMON

MEC4  
STD  
COMMON

ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS OR INFORMATION (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED AS IS. THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VIOLATIONS OR DEVIATIONS OF INDUSTRY STANDARDS SPECIFICATIONS. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS OR OTHERWISE, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF DESIGN, OF NONINFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

ASSEMBLY	BASE LEVEL GENERIC SCHEMATIC ONLY, COMMON & NO_STUFF ASSEMBLY NOTES AND BOM NOT FINAL
PAGE DETAIL	STRAPS, Mechanical Parts



**Micro-Star International Co., LTD.**

<Title>	MS-V056-40
---------	------------

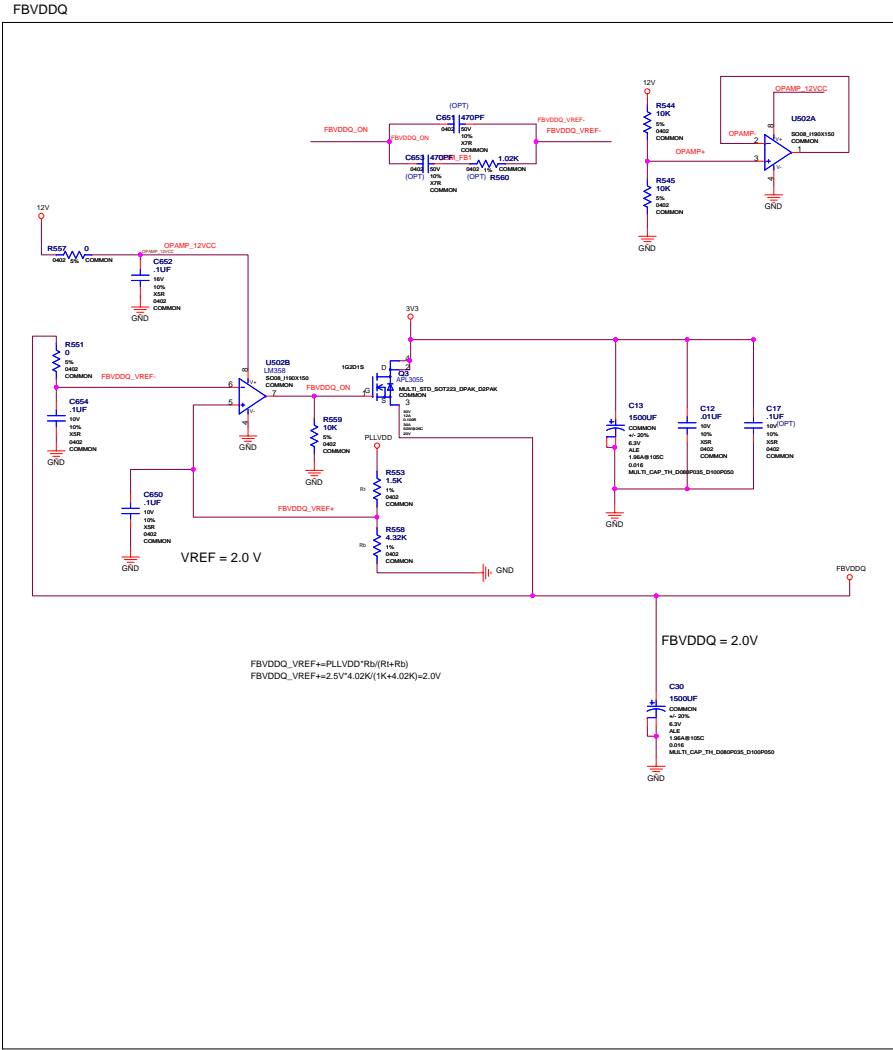
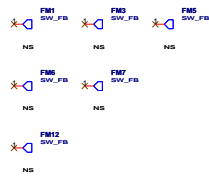
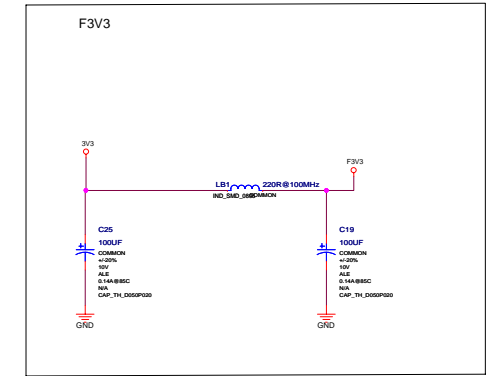
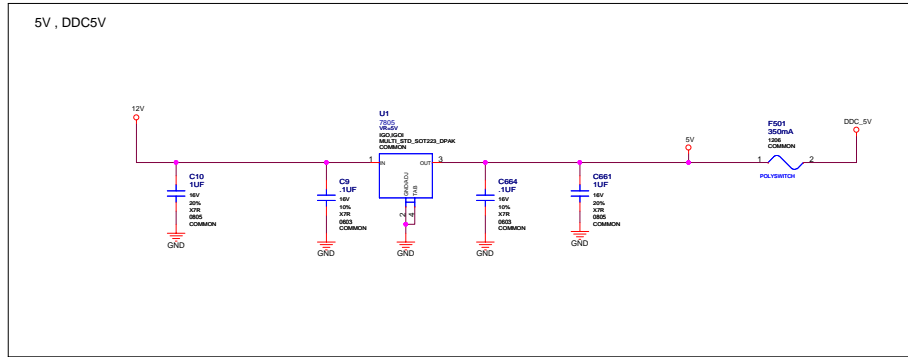
Size	Document Number
Custom	<Doc> STRAPS

Date: Tuesday, November 20, 2007 Sheet 11 of 14





PowerSupplyII: 5V, DDC5V, F3V3, FBVDDQ



ALL NVIDIA DESIGN SPECIFICATIONS, REFERENCE BOARDS, FILES, DRAWINGS, DIAGNOSTICS, LISTS AND OTHER DOCUMENTS (TOGETHER AND SEPARATELY, "MATERIALS") ARE BEING PROVIDED "AS IS". THE MATERIALS MAY CONTAIN KNOWN AND UNKNOWN VIOLATIONS OR DEVIATIONS OF INDUSTRY STANDARDS AND SPECIFICATIONS. NVIDIA MAKES NO WARRANTIES, EXPRESSED, IMPLIED, STATUTORY OR OTHERWISE WITH RESPECT TO THE MATERIALS OR OTHERWISE, AND EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF DESIGN, OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ARISING FROM A COURSE OF DEALING, TRADE USAGE, TRADE PRACTICE, OR INDUSTRY STANDARDS.

ASSEMBLY PAGE DETAIL  
BASE LEVEL GENERIC SCHEMATIC ONLY. COMMON & NO\_3TUFF ASSEMBLY NOTES AND BOM NOT FINAL  
PowerSupply: 5V, DDC5V, F3V3, TMDL, PLLVDD

Micro-Star International Co., LTD.			
<Title>		MS-V056-40	
Size	Document Number	Rev	Rev Code
Custom	5V, DDC5V, F3V3, FBVDDQ	1	
Date	Tuesday, November 20, 2007	Sheet	14 of 14

Change List:

Base on P381\_ A04 (V056-V3.0 - Comanche D ) modify

- Page8, removed mini-din 4pin. add mini-din 7pin support HDTV
- Page 13: PowerSupplyI: NVVDD, A3V3 add mlcc 10U/16V 1206 5pcs  
remove L5 1R0
- Page 9: ADD R589,R590,R591,R592,R593,R594,R595,R596 FOR EMI
- Page 12: XTAL Dual LOAYOUT SMD 49US

Base on P381\_ A04 (V056-V3.1) modify

- Page 15 add FAN control (imperfect)

Base on P381\_ A04 (V056-V3.2 - Comanche CP ) modify

- Page 15 add FAN control (improved)

Base on P381\_ A04 (V056-V4.0 - Comanche 128 ) modify

- Page 8. add AV connect
- Page 6 J1 d-sub silm change J6 d-sub
- Page 9 removed DVI-I connect and circuit and power
- Page 13 SO-8 MOS change TO-252 MOS , Gate R 0402 size change 0603 size , add BOOT R