

MS-V060 -- G73, 128/256 Mb DDR3-136pin, VGA, DVI-I, SD/HDTV, VIVO

SUMMARY:

1. Base on V045-10 to Modify
2. BGA-136 DDRIII
3. Dual MS-11 for NVVDD and FBVDD

Rev History

110

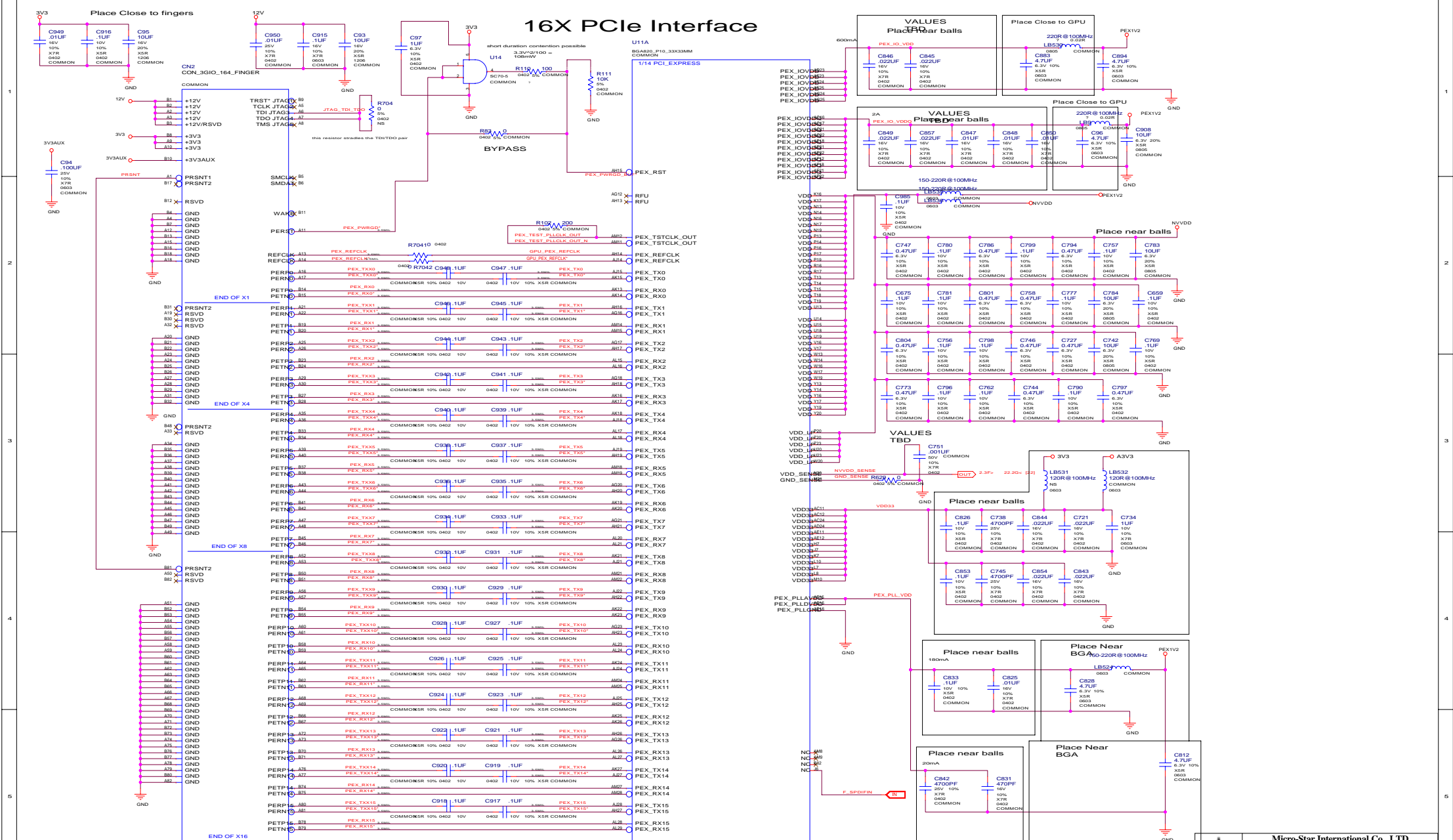
- 110... remove U518
- 110... Change Infineon DDR3 16x32 -1.4
- 110... VID table change to 2.0V
- 110... Strapping change to 0001
- 110... Change GPU with HDCP and add HDCP ROM circuit

120

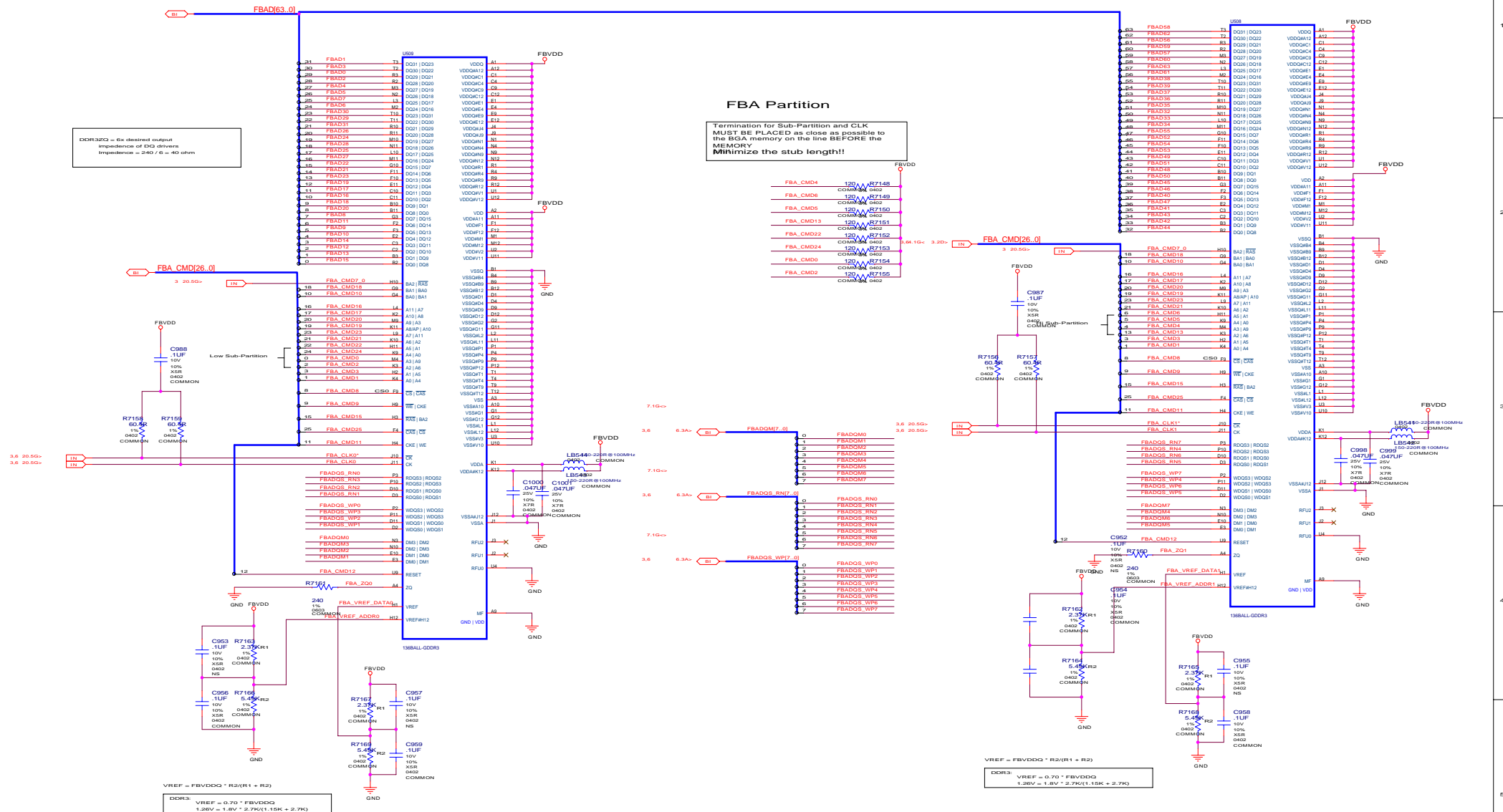
- Remove GPU with HDCP and add HDCP ROM circuit
- Add Q46
- Change L7008 to 1u 40A

Micro-Star International Co., LTD.			
SUMMARY			
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Custom			1.2
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16X PCIe Interface

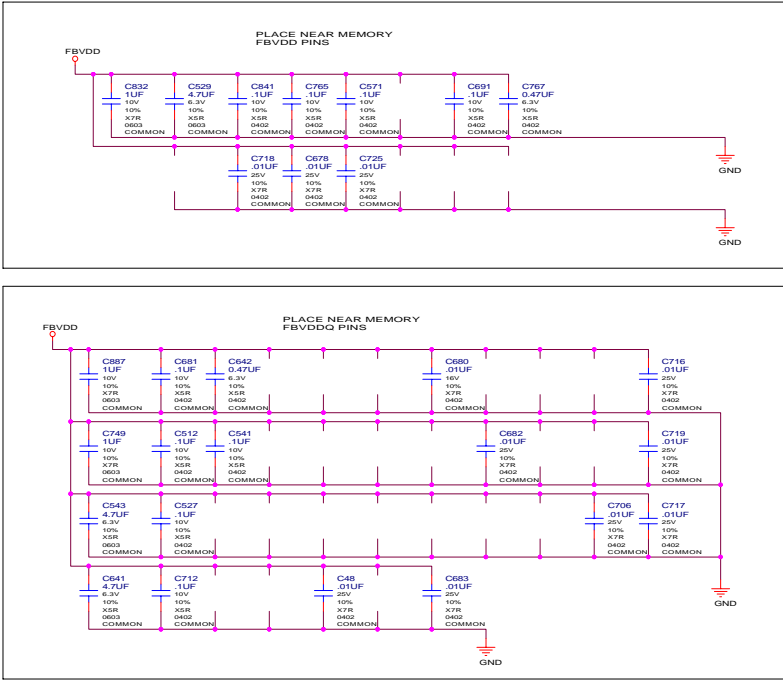


5 FrameBuffer: Partition A
8Mx32 BGA136 DDR3

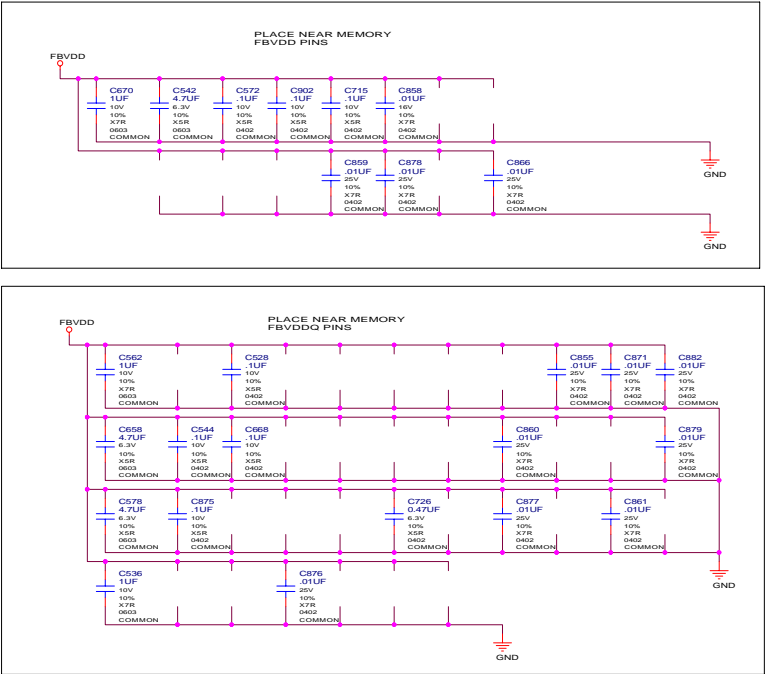


FRAME BUFFER: PARTITION A
DECOUPLING

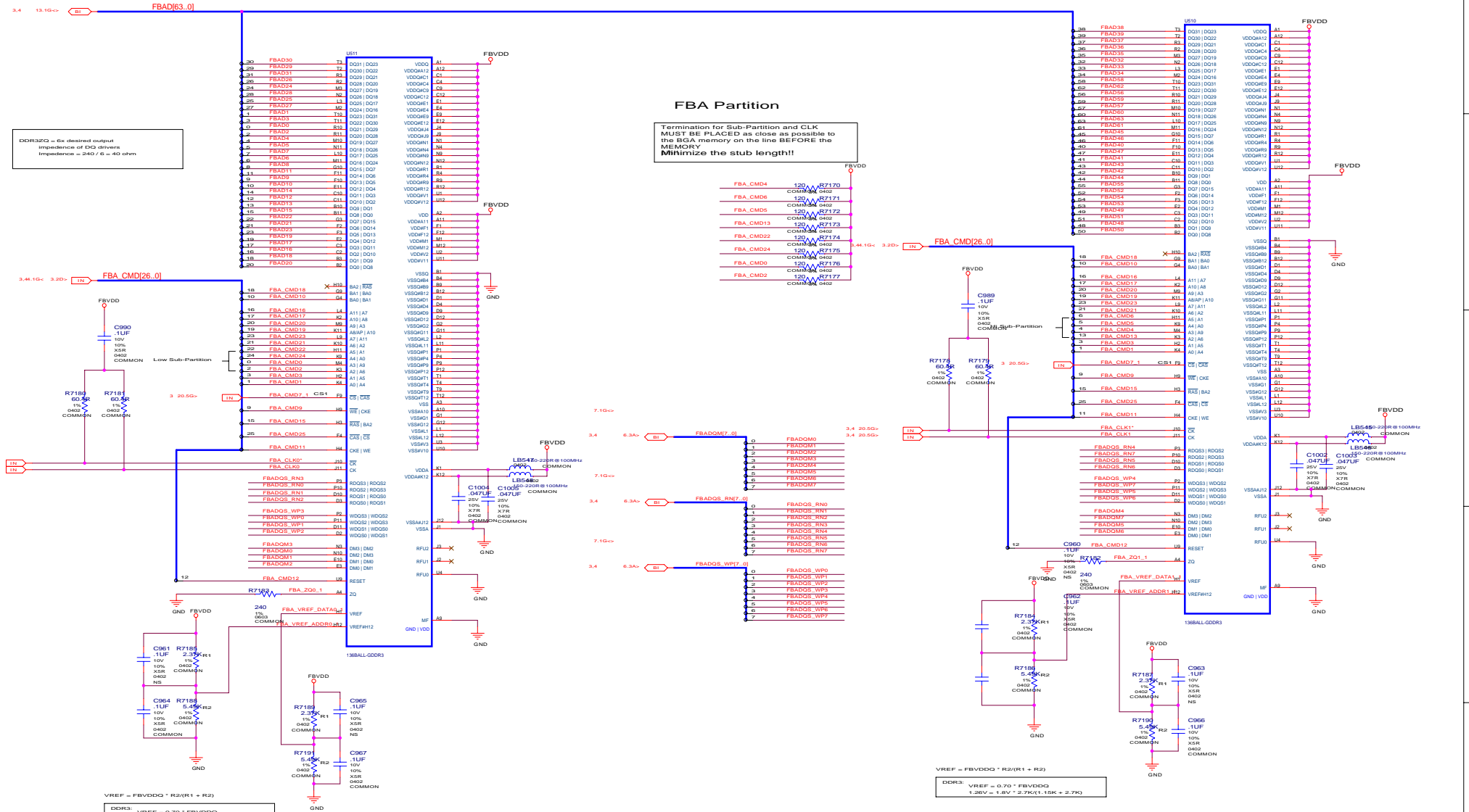
Decoupling for FBA 0..31



Decoupling for FBA 32..63



5 FrameBuffer: Partition A
8Mx32 BGA136 DDR3

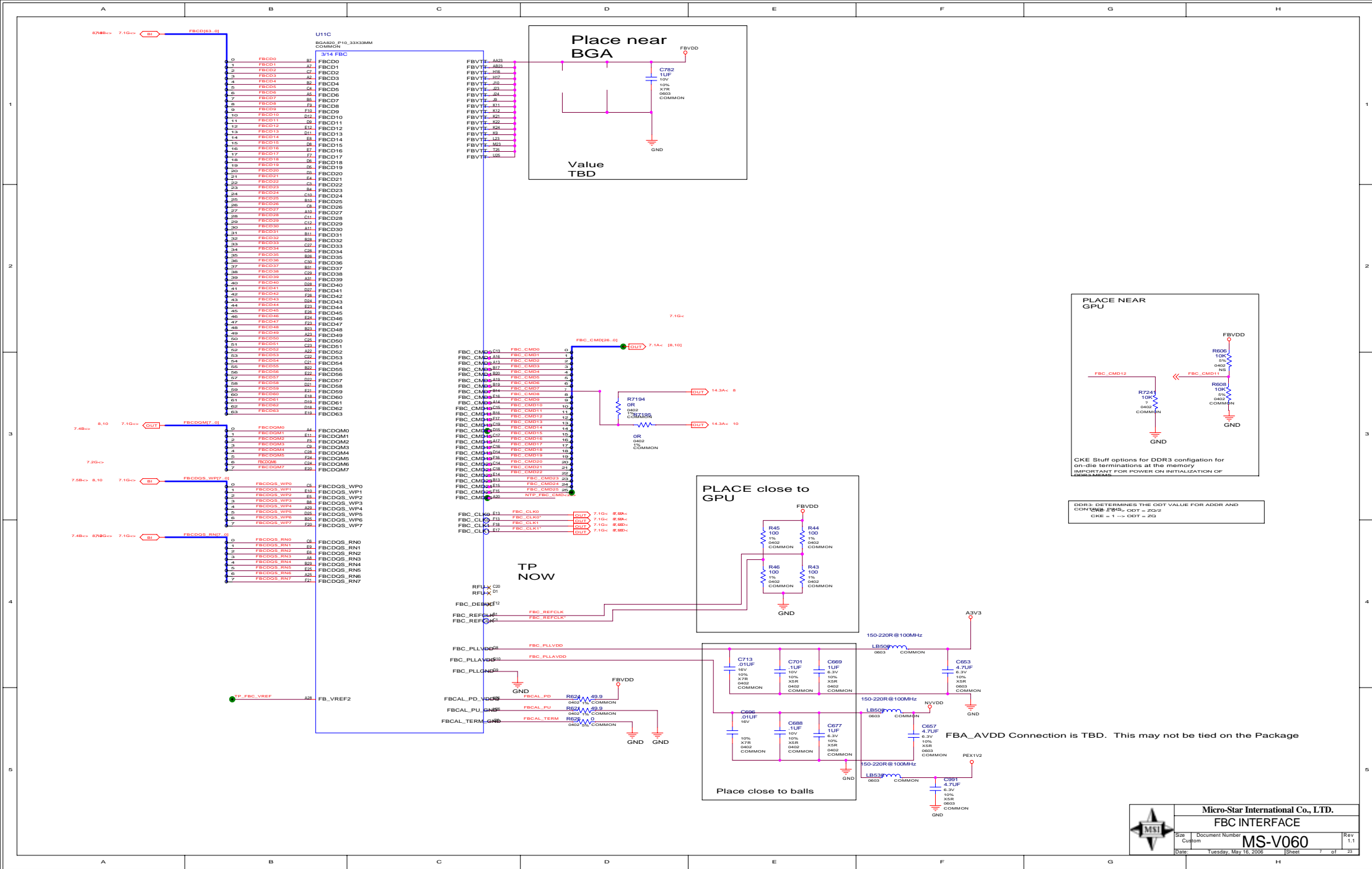


Micro-Star International Co., LTD.

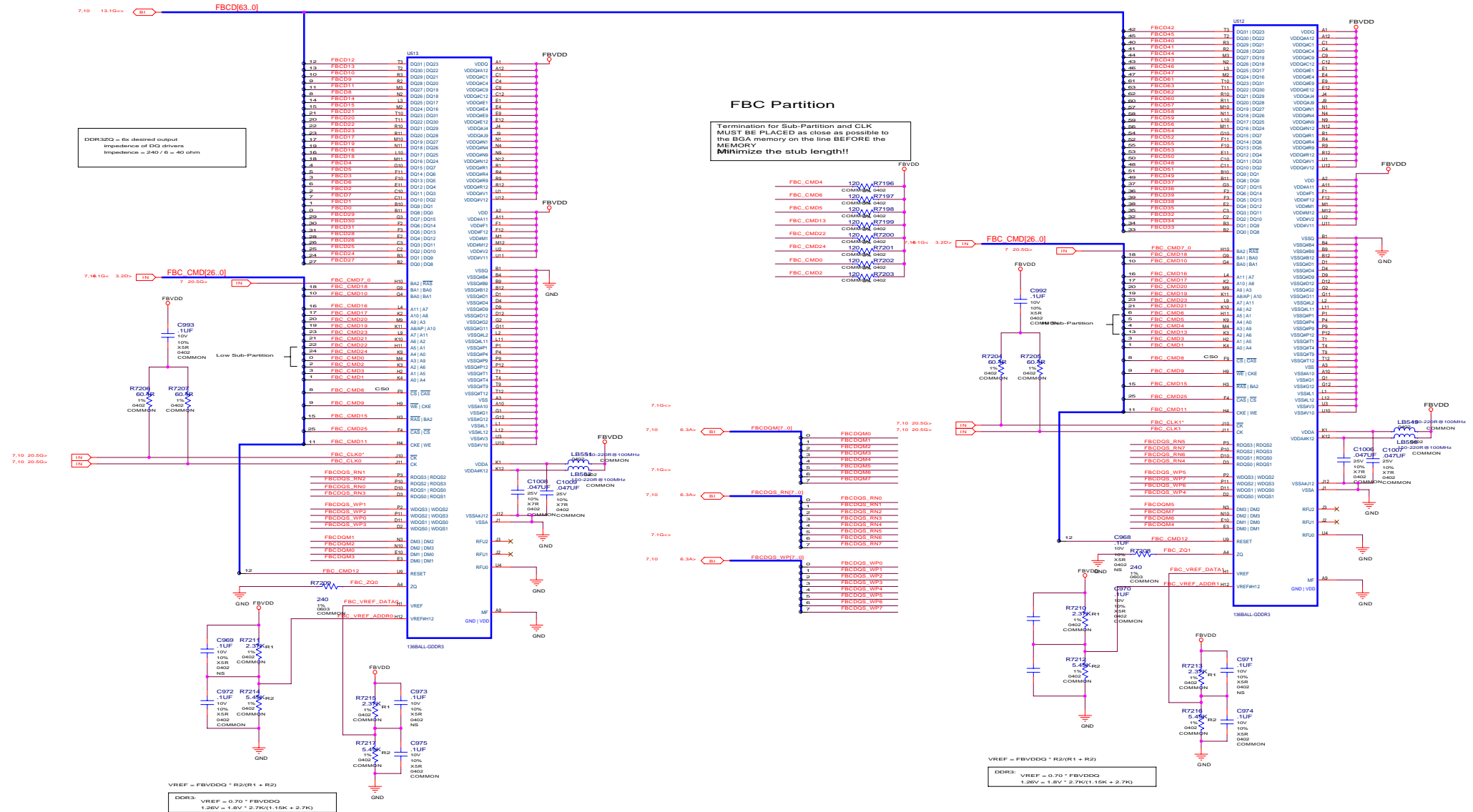
FB A2

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FRAMEBUFFER: PARTITION
C 8Mx32 BGA136 DDR3



Micro-Star International Co., LTD.

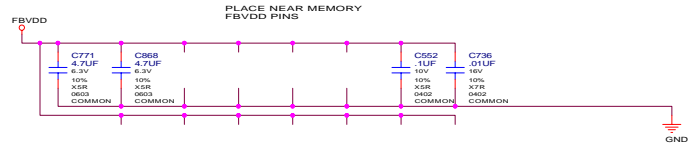
FB C1

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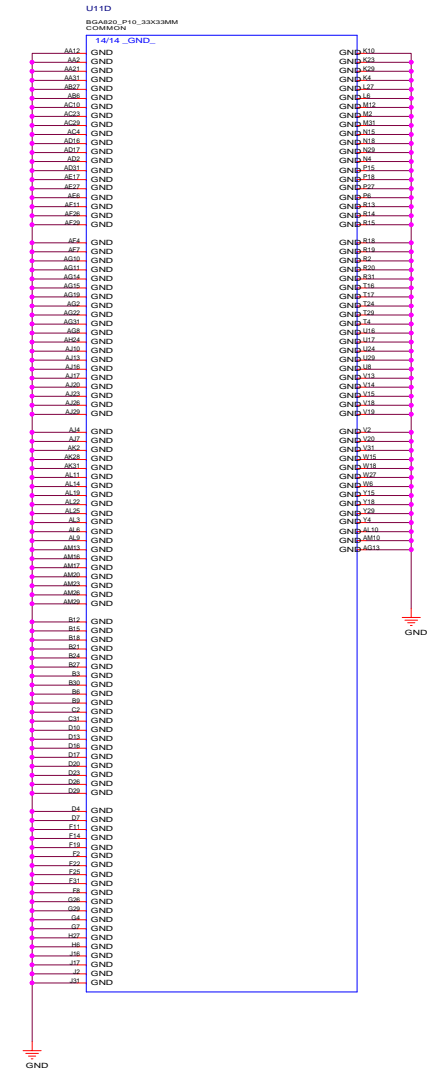
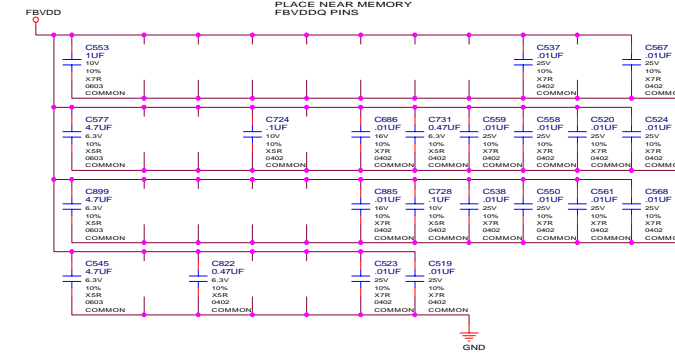
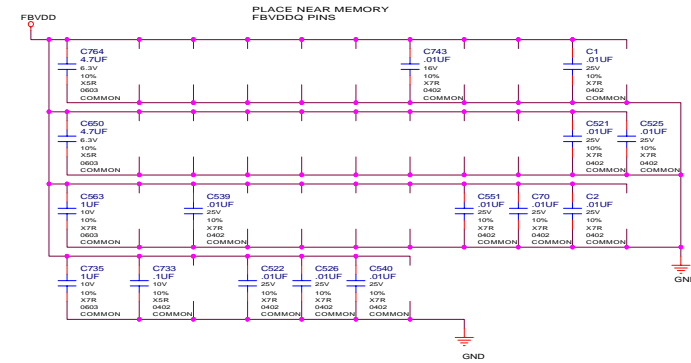
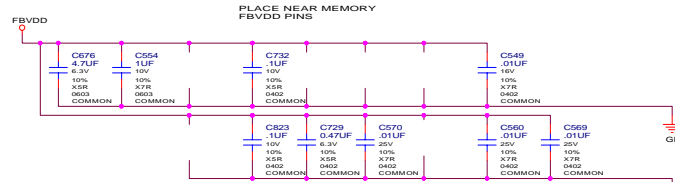
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FRAMEBUFFER: PARTITION C DECOUPLING

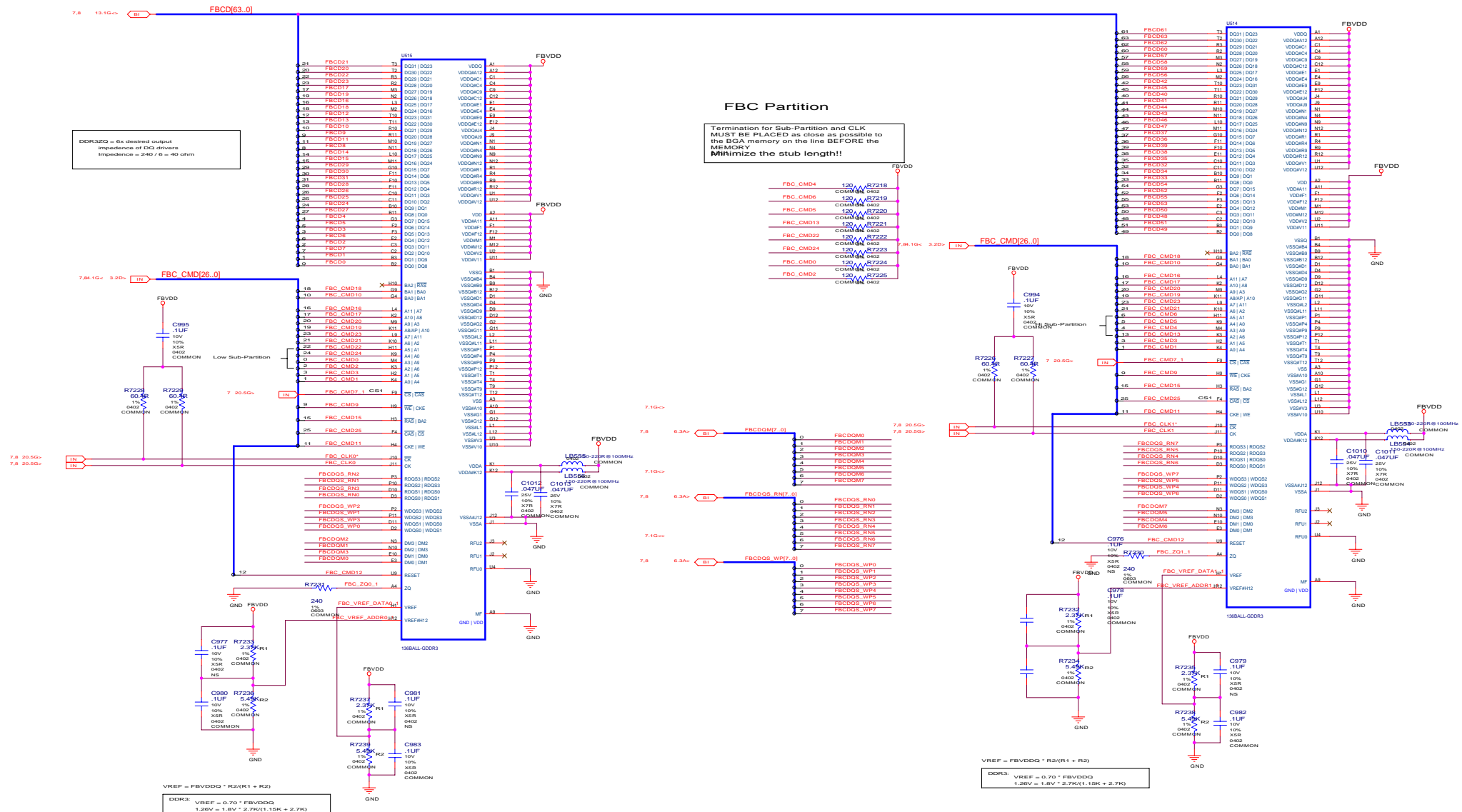
Decoupling for FBC 0..31



Decoupling for FBC 32..63



FRAMEBUFFER: PARTITION
C 8Mx32 BGA136 DDR3



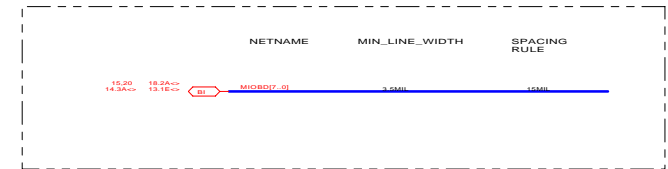
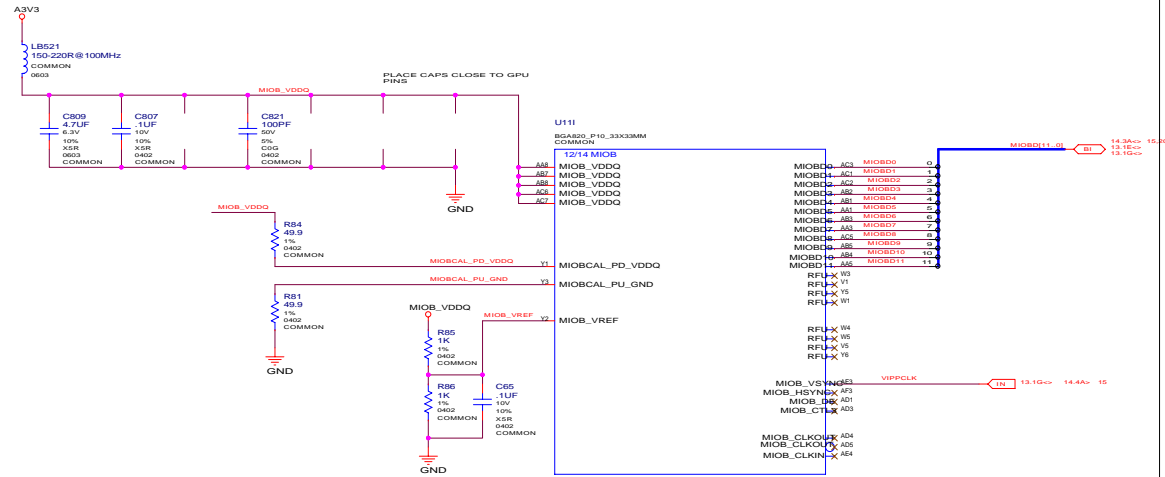
Micro-Star International Co., LTD.

FB C2

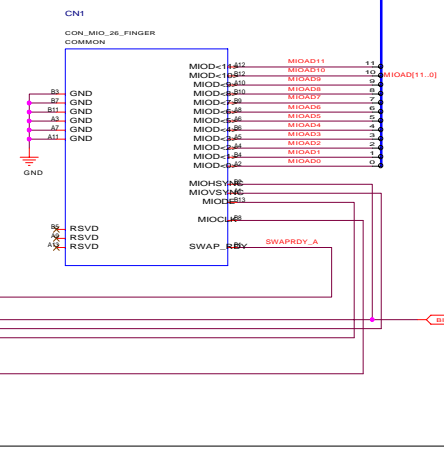
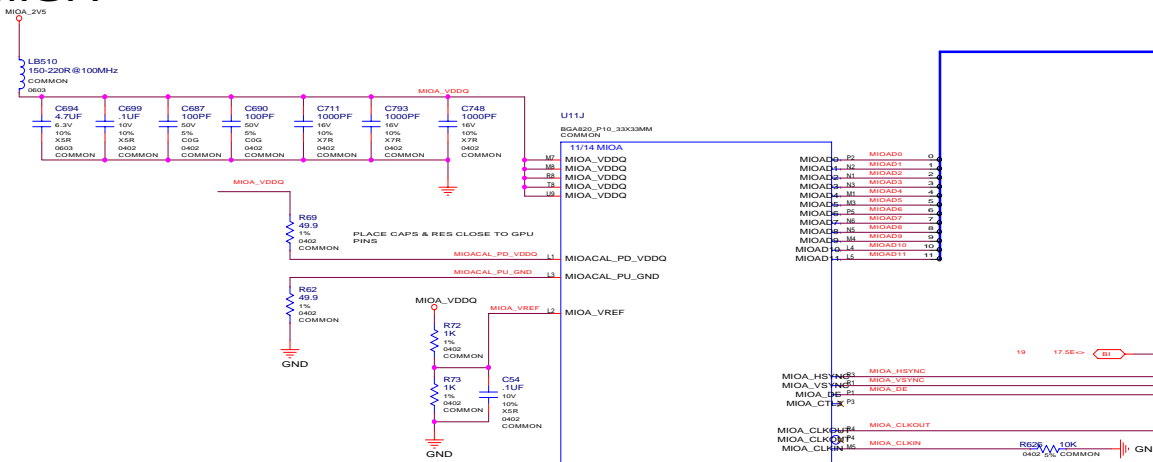
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G3
VIP/MIOB

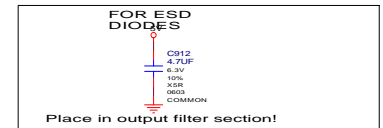


G3
MIOA

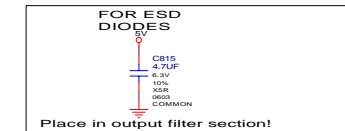


Micro-Star International Co., LTD.			
MIOA/MIOB			
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DACC
RGB-FILTER

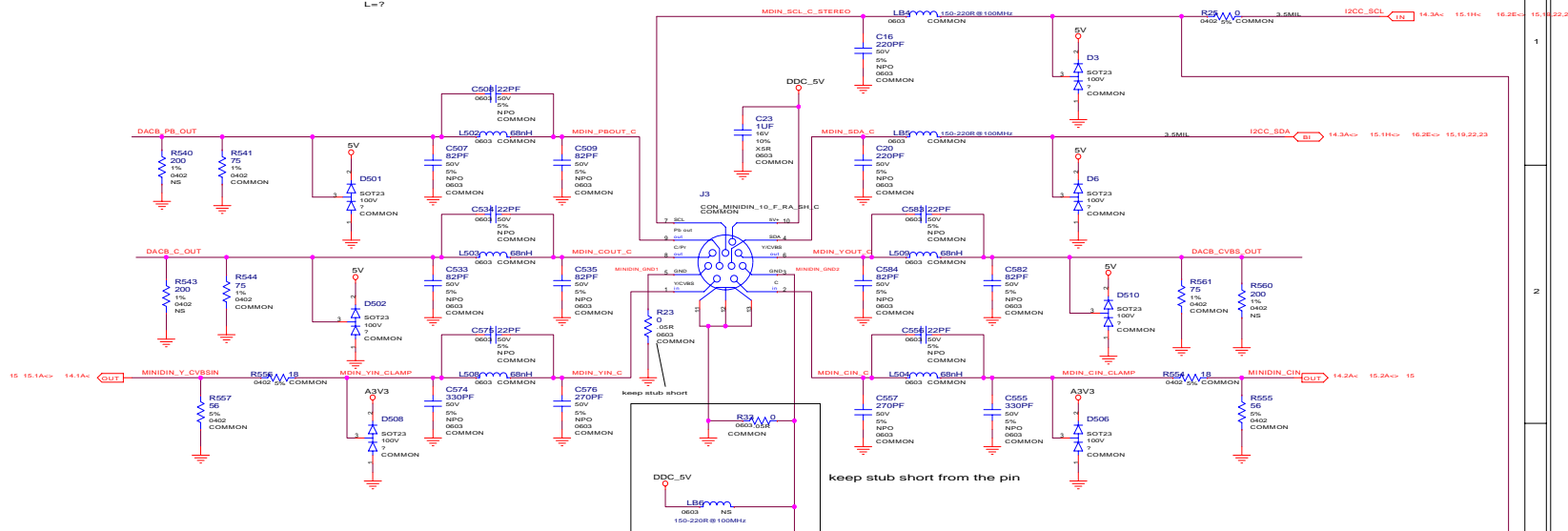


DACA
RGB-FILTER



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

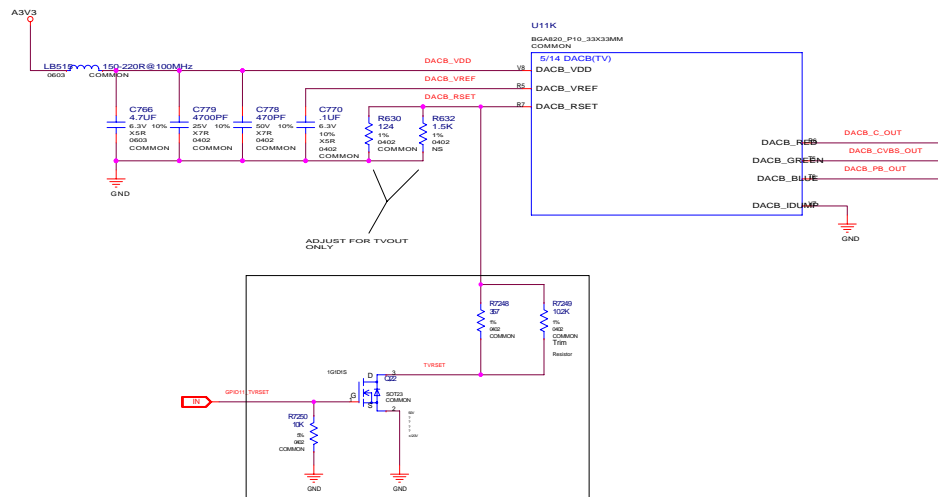
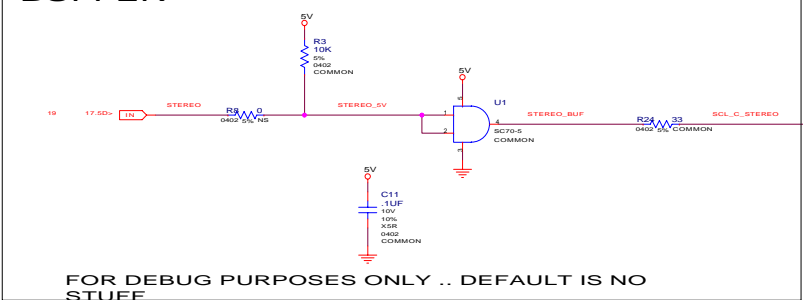
FILTER
NOTES:
SD- USE
NEC 0603
L=7



PLACE NEAR
CONNECTOR

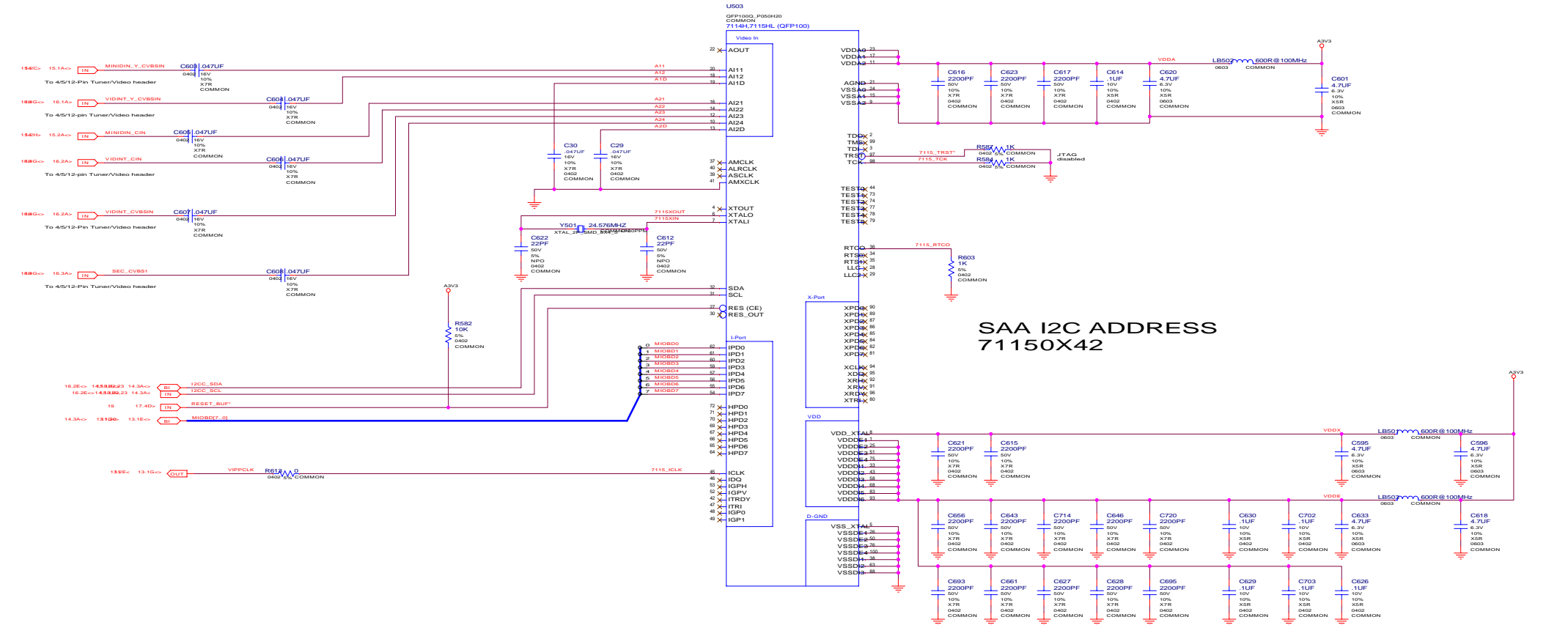
For STEREO GLASSES 3pin MiniDIN
0 Ohm bead!
And replace 0 Ohm resistor with 220PF cap!

STEREO GLASSES BUFFER to MiniDIN connector!

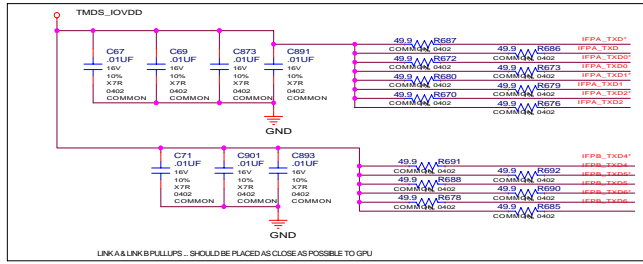


NC for G73

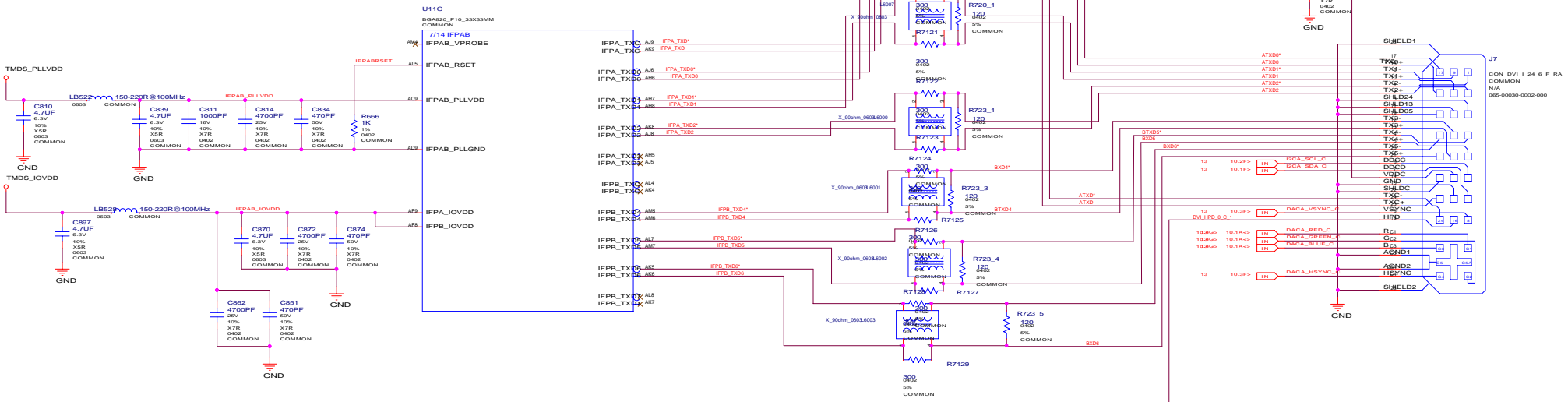
PHILIPS
VIDEO
CAPTURE



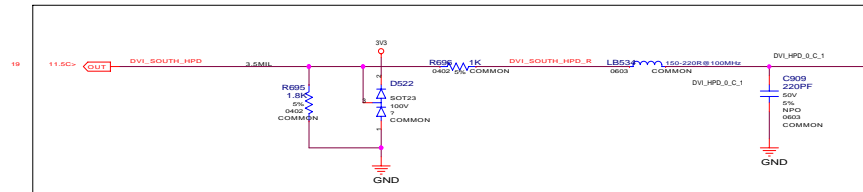
INTERNAL TMDS .. LINK A & B



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

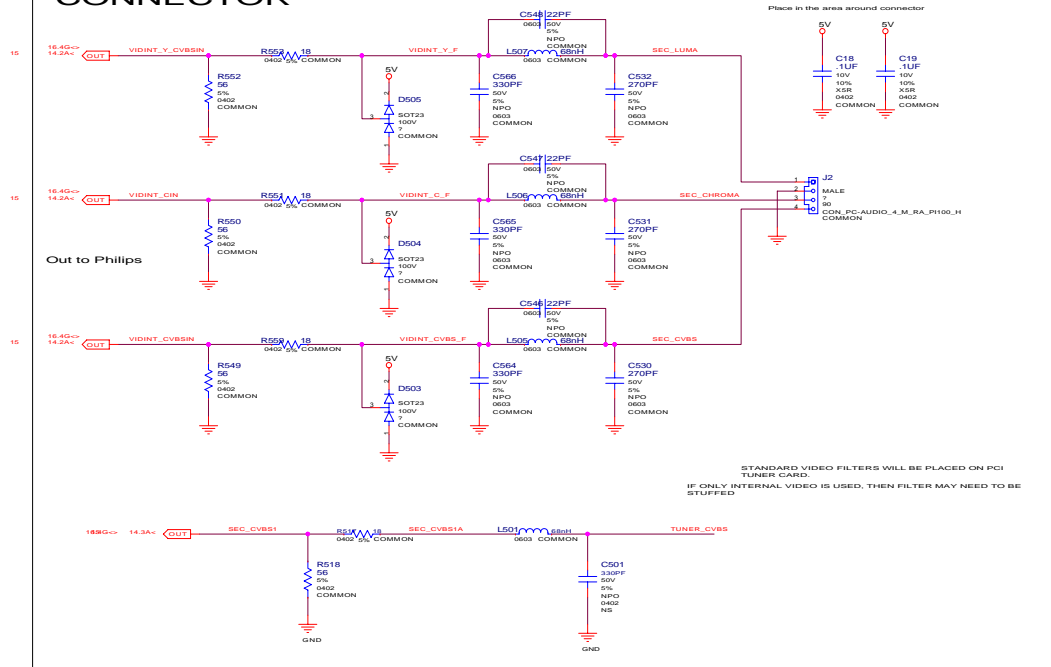


Hotplug Detection

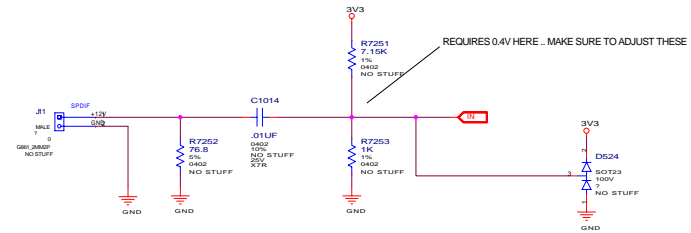


4-Pin Video In, 12-pin Video In connectors

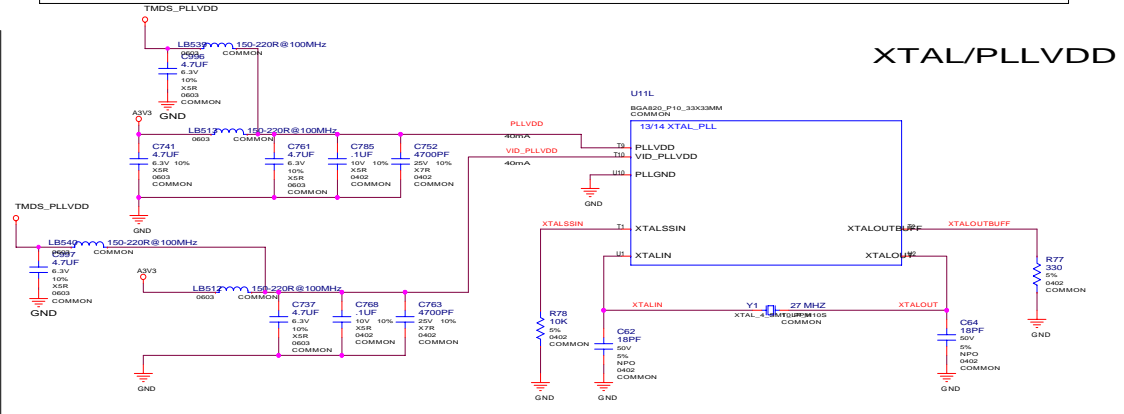
EXTERNAL 4-PIN VIDEO IN CONNECTOR

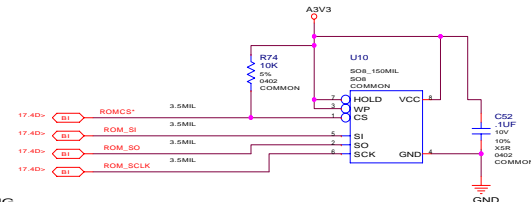
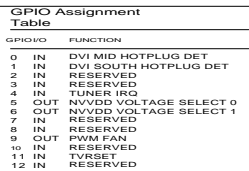


SPDIF IN



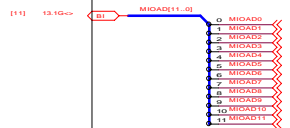
XTAL/PLLVDD



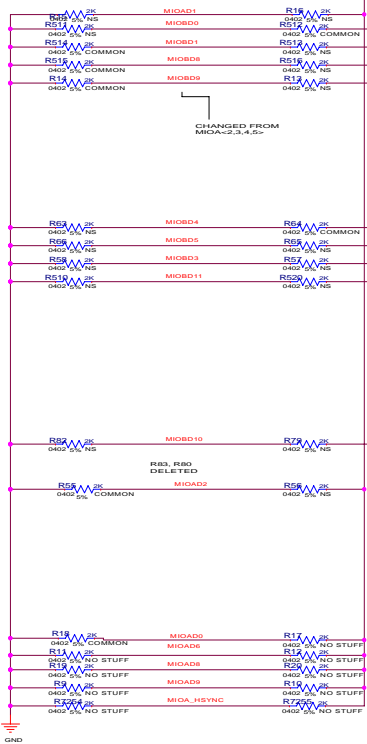


BIOS, Straps, Misc

Assembly:
BIOS



STUFF
2.0K
BOND OPTION 0 =
DISCRETE



REG:
NV_PEXTDEV_BOOT_0
Bit Signal VALUE_ID VALUES

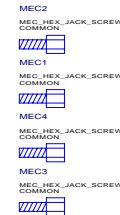
Bit	Signal	VALUE_ID	VALUES
00	PCL_AD_SWAP	0	0 REVERSED
01	SUB_VENDOR	0	00000000
02	RAM_CFG_0	0	00000000
03	RAM_CFG_1	0	00000000
04	RAM_CFG_2	0	00000000
05	RAM_CFG_3	0	00000000
06	CRYSTAL_0	0	00000000
07	CRYSTAL_1	0	00000000
08	TV_MODE_0	0	00000000
09	TV_MODE_1	0	00000000
10	AGP_Enable	0	00000000
11	AGP_FASTWR	0	00000000
12	PCL_DEVID_0	0	00000000
13	PCL_DEVID_1	0	00000000
14	PCL_DEVID_2	0	00000000
15	PCL_DEVID_3	0	00000000
16	BUS_TYPE	0	00000000
17	FP_IFACE	0	00000000
18	FB_0	0	00000000
19	FB_1	0	00000000
20	BR	0	00000000
21	BR_12M	0	00000000
22	BR_AGP	0	00000000
23	BR_IO	0	00000000
24	ROM_TYPE_0	0	00000000
25	ROM_TYPE_1	0	00000000
26	USER_0	0	00000000
27	USER_1	0	00000000
28	USER_2	0	00000000
29	USER_3	0	00000000

REG:
NV_STRAP_1
Bit Signal VALUE_ID VALUES

Bit	Signal	VALUE_ID	VALUES
11	PEX_PLL_EN_TERM100	0	(default -- internal term on)
12	3GIO_PADCFG_LUT_ADR[0]	0	00000000
13	3GIO_PADCFG_LUT_ADR[1]	0	00000000
14	3GIO_PADCFG_LUT_ADR[2]	0	00000000
15	SLOT_CLK_CONFIG	0	00000000

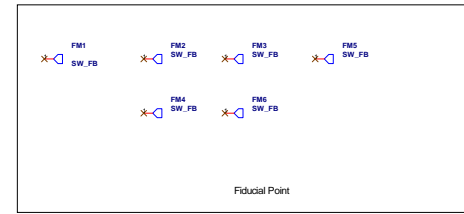
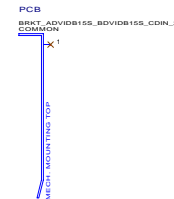
Mechanical parts

NEED FANSINK SYMBOL
FOR P216

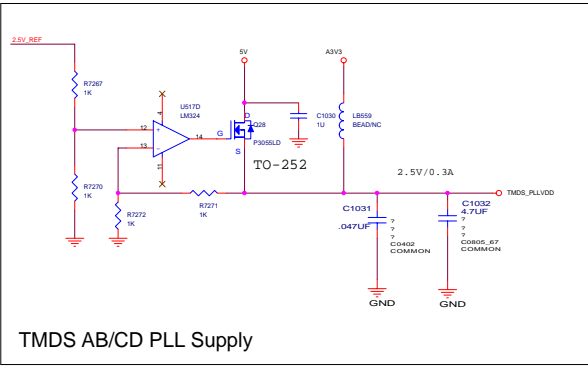
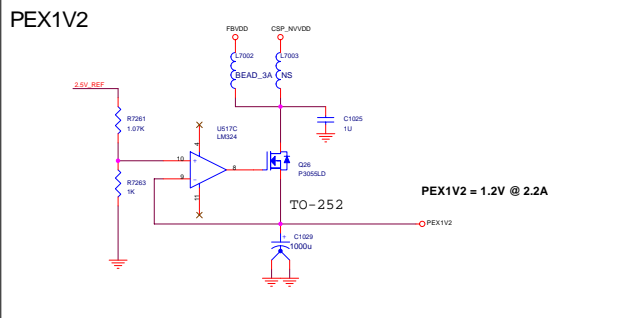
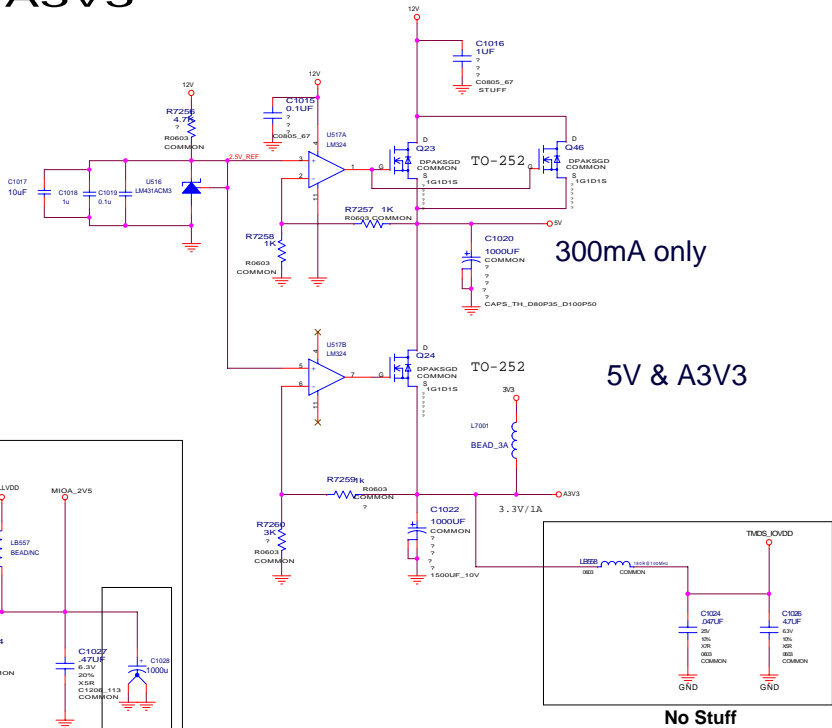
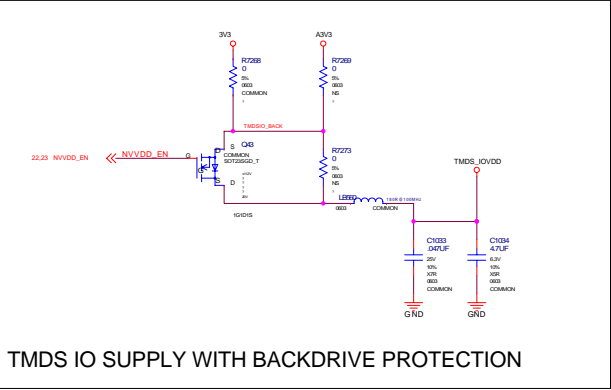
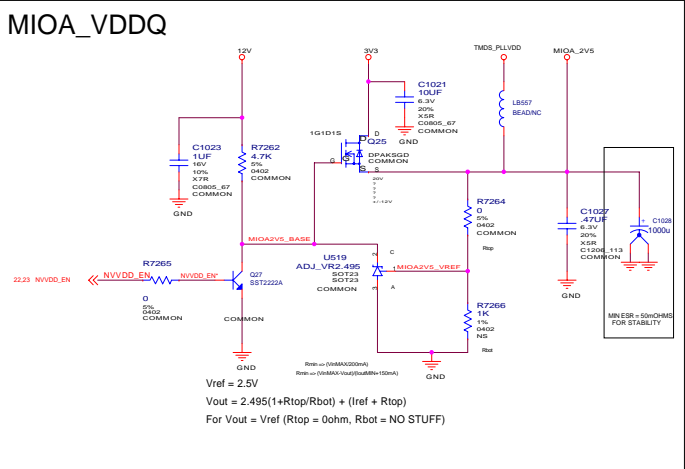
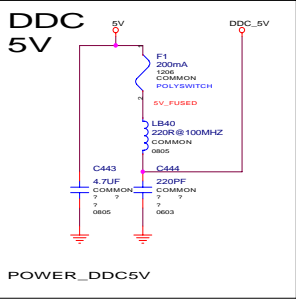


155-00002-0000-000 SCREW PHIL PAN HD SS MACH 4-40
3/16

MOS
HEATSINK



Power Supply TMD5/A3V3

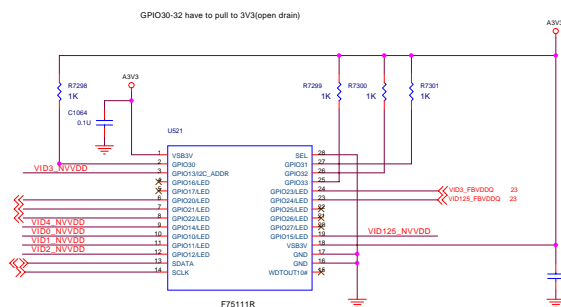
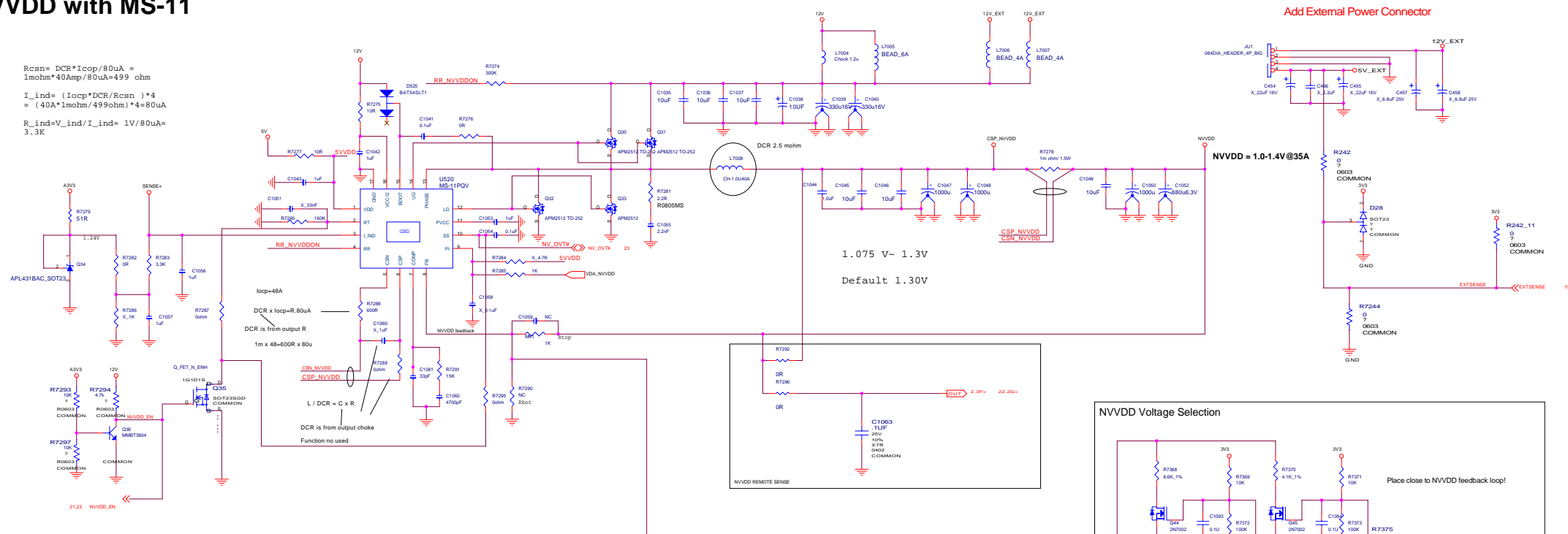


NVVDD with MS-11

```
Rcsn= DCR*Icop/80uA =
1mohm*40Amp/80uA=499 ohm

I_ind= (Icop*DCR/Rcsn) *4
= (40A*1mohm/499ohm)*4=80uA

R_ind=V_ind/I_ind= 1V/80uA=
3.3K
```

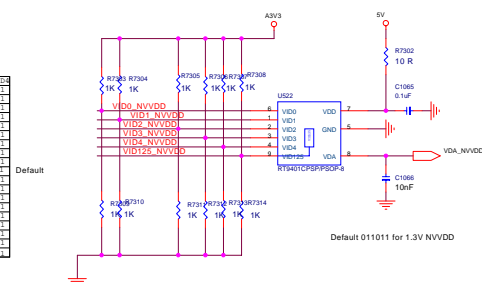


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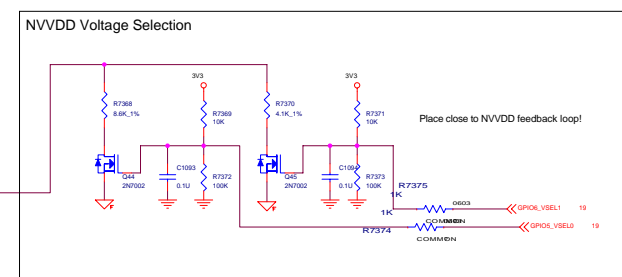
NVVDD_ GPIO:10~15
FBVDDQ_ GPIO:20~24
DACA_ RESET---GPIO:25~28
DACC_ RESET---GPIO:30~32

```

VDA_VDDC	VID125	ID0	ID3	ID2	ID3/1
E.1875V	0	1	1	0	1
E.200V	1	0	1	0	1
E.2125V	0	0	1	0	1
E.225V	1	1	0	0	1
E.2375V	0	1	0	0	1
E.250V	1	0	0	0	1
E.2625V	0	0	0	0	1
E.275V	1	1	1	1	0
E.287V	0	1	1	1	0
E.300V	1	0	1	1	0
E.3125V	0	0	1	1	0
E.325V	1	1	0	1	0
E.3375V	0	1	0	1	0
E.350V	1	1	0	0	1
E.3625V	0	0	0	1	0
E.375V	1	1	1	0	0
E.3875V	0	1	1	0	0
E.400V	1	0	1	0	0
E.4175V	1	2	2	2	2



NVVDD 1.33V default 010101



FBVDD with MS-11

FBVDD	VDA_PWB	VDD125	VDD100	VDD100	VDD100	VDD100	VDD100	VDD100	VDD100
1.85V	1.100V	1	0	1	1	1	1	1	1
1.868V	1.1125V	0	0	1	1	1	1	1	1
1.88V	1.125V	1	1	0	1	1	1	1	1
1.706V	1.1175V	0	1	0	1	1	1	1	1
1.725V	1.135V	1	0	0	1	1	1	1	1
1.743V	1.1625V	0	0	1	1	1	1	1	1
1.762V	1.19V	1	1	1	0	1	1	1	1
1.781V	1.181V	0	1	1	0	1	1	1	1
1.8V	1.20V	1	0	1	0	1	1	1	1
1.818V	1.2125V	0	1	0	1	1	1	1	1
1.837V	1.225V	0	1	0	1	1	1	1	1
1.855V	1.2375V	0	1	0	1	1	1	1	1
1.873V	1.25V	1	0	0	1	1	1	1	1
1.891V	1.2625V	0	0	1	1	1	1	1	1
1.91V	1.275V	1	1	1	1	1	1	1	1
1.928V	1.2875V	0	1	1	1	1	1	1	1
1.946V	1.3V	1	0	1	1	1	1	1	1
1.964V	1.3125V	0	0	1	1	1	1	1	1

FBVDD	VDA_PWB	VDD125	VDD100	VDD100	VDD100	VDD100	VDD100	VDD100	VDD100
1.900V	1.100V	1	0	1	1	1	1	1	1
1.9125V	1.1125V	0	0	1	1	1	1	1	1
1.925V	1.125V	0	1	0	1	1	1	1	1
1.9375V	1.1375V	0	0	0	1	1	1	1	1
1.95V	1.15V	1	0	0	1	1	1	1	1
1.9625V	1.1625V	0	0	1	1	1	1	1	1
1.975V	1.175V	1	1	1	0	1	1	1	1
1.9875V	1.1875V	0	1	1	0	1	1	1	1
2.0V	1.2V	1	0	1	0	1	1	1	1
2.0125V	1.2125V	0	1	0	1	1	1	1	1
2.025V	1.225V	0	1	0	1	1	1	1	1
2.0375V	1.2375V	0	1	0	1	1	1	1	1
2.05V	1.25V	1	0	0	1	1	1	1	1
2.0625V	1.2625V	0	0	1	1	1	1	1	1
2.075V	1.275V	1	1	1	1	1	1	1	1
2.0875V	1.2875V	0	1	1	0	1	1	1	1
2.1V	1.3V	1	0	1	0	1	1	1	1
2.1125V	1.3125V	0	1	0	1	1	1	1	1
2.125V	1.325V	1	1	0	1	1	1	1	1
2.1375V	1.3375V	0	0	1	1	1	1	1	1
2.15V	1.35V	1	0	0	1	1	1	1	1
2.1625V	1.3625V	0	0	1	1	1	1	1	1
2.175V	1.375V	1	1	1	0	1	1	1	1
2.1875V	1.3875V	0	1	1	0	1	1	1	1
2.2V	1.4V	1	0	1	0	1	1	1	1
2.2125V	1.4125V	0	1	0	1	1	1	1	1
2.225V	1.425V	1	1	0	1	1	1	1	1
2.2375V	1.4375V	0	1	0	1	1	1	1	1
2.25V	1.45V	1	0	0	1	1	1	1	1
2.2625V	1.4625V	0	0	1	1	1	1	1	1

FBVDD	VDA_PWB	VDD125	VDD100	VDD100	VDD100	VDD100	VDD100	VDD100	VDD100
2.275V	1.475V	1	1	1	0	1	1	1	1
2.2875V	1.4875V	0	1	1	0	1	1	1	1
2.3V	1.5V	1	0	1	0	1	1	1	1
2.3125V	1.5125V	0	1	0	1	1	1	1	1
2.325V	1.525V	1	1	0	1	1	1	1	1
2.3375V	1.5375V	0	1	0	1	1	1	1	1
2.35V	1.55V	1	0	0	1	1	1	1	1
2.3625V	1.5625V	0	0	1	1	1	1	1	1
2.375V	1.575V	1	1	1	0	1	1	1	1
2.3875V	1.5875V	0	1	1	0	1	1	1	1
2.4V	1.6V	1	0	1	0	1	1	1	1
2.4125V	1.6125V	0	1	0	1	1	1	1	1
2.425V	1.625V	1	1	0	1	1	1	1	1
2.4375V	1.6375V	0	1	0	1	1	1	1	1
2.45V	1.65V	1	0	0	1	1	1	1	1
2.4625V	1.6625V	0	0	1	1	1	1	1	1
2.475V	1.675V	1	1	1	0	1	1	1	1
2.4875V	1.6875V	0	1	1	0	1	1	1	1
2.5V	1.7V	1	0	1	0	1	1	1	1
2.5125V	1.7125V	0	1	0	1	1	1	1	1
2.525V	1.725V	1	1	0	1	1	1	1	1
2.5375V	1.7375V	0	1	0	1	1	1	1	1
2.55V	1.75V	1	0	0	1	1	1	1	1
2.5625V	1.7625V	0	0	1	1	1	1	1	1
2.575V	1.775V	1	1	1	0	1	1	1	1
2.5875V	1.7875V	0	1	1	0	1	1	1	1
2.6V	1.8V	1	0	1	0	1	1	1	1
2.6125V	1.8125V	0	1	0	1	1	1	1	1
2.625V	1.825V	1	1	0	1	1	1	1	1
2.6375V	1.8375V	0	1	0	1	1	1	1	1
2.65V	1.85V	1	0	0	1	1	1	1	1
2.6625V	1.8625V	0	0	1	1	1	1	1	1
2.675V	1.875V	1	1	1	0	1	1	1	1
2.6875V	1.8875V	0	1	1	0	1	1	1	1
2.7V	1.9V	1	0	1	0	1	1	1	1
2.7125V	1.9125V	0	1	0	1	1	1	1	1
2.725V	1.925V	1	1	0	1	1	1	1	1
2.7375V	1.9375V	0	1	0	1	1	1	1	1
2.75V	1.95V	1	0	0	1	1	1	1	1
2.7625V	1.9625V	0	0	1	1	1	1	1	1
2.775V	1.975V	1	1	1	0	1	1	1	1
2.7875V	1.9875V	0	1	1	0	1	1	1	1
2.8V	2.0V	1	0	1	0	1	1	1	1
2.8125V	2.0125V	0	1	0	1	1	1	1	1
2.825V	2.025V	1	1	0	1	1	1	1	1
2.8375V	2.0375V	0	1	0	1	1	1	1	1
2.85V	2.05V	1	0	0	1	1	1	1	1
2.8625V	2.0625V	0	0	1	1	1	1	1	1
2.875V	2.075V	1	1	1	0	1	1	1	1
2.8875V	2.0875V	0	1	1	0	1	1	1	1
2.9V	2.1V	1	0	1	0	1	1	1	1
2.9125V	2.1125V	0	1	0	1	1	1	1	1
2.925V	2.125V	1	1	0	1	1	1	1	1
2.9375V	2.1375V	0	1	0	1	1	1	1	1
2.95V	2.15V	1	0	0	1	1	1	1	1
2.9625V	2.1625V	0	0	1	1	1	1	1	1
2.975V	2.175V	1	1	1	0	1	1	1	1
2.9875V	2.1875V	0	1	1	0	1	1	1	1
3.0V	2.2V	1	0	1	0	1	1	1	1
3.0125V	2.2125V	0	1	0	1	1	1	1	1
3.025V	2.225V	1	1	0	1	1	1	1	1
3.0375V	2.2375V	0	1	0	1	1	1	1	1
3.05V	2.25V	1	0	0	1	1	1	1	1
3.0625V	2.2625V	0	0	1	1	1	1	1	1
3.075V	2.275V	1	1	1	0	1	1	1	1
3.0875V	2.2875V	0	1	1	0	1	1	1	1
3.1V	2.3V	1	0	1	0	1	1	1	1
3.1125V	2.3125V	0	1	0	1	1	1	1	1
3.125V	2.325V	1	1	0	1	1	1	1	1
3.1375V	2.3375V	0	1	0	1	1	1	1	1
3.15V	2.35V	1	0	0	1	1	1	1	1
3.1625V	2.3625V	0	0	1	1	1	1	1	1
3.175V	2.375V	1	1	1	0	1	1	1	1
3.1875V	2.3875V	0	1	1	0	1	1	1	1
3.2V	2.4V	1	0	1	0	1	1	1	1
3.2125V	2.4125V	0	1	0	1	1	1	1	1
3.225V	2.425V	1	1	0	1	1	1	1	1
3.2375V	2.4375V	0	1	0	1	1	1	1	1
3.25V	2.45V	1	0	0	1	1	1	1	1
3.2625V	2.4625V	0	0	1	1	1	1	1	1
3.275V	2.475V	1	1	1	0	1	1	1	1
3.2875V	2.4875V	0	1	1	0	1	1	1	1
3.3V	2.5V	1	0	1	0	1	1	1	1
3.3125V	2.5125V	0	1	0	1	1	1	1	1
3.325V	2.525V	1	1	0	1	1	1	1	1
3.3375V	2.5375V	0	1	0	1	1	1	1	1
3.35V	2.55V	1	0	0	1	1	1	1	1
3.3625V	2.5625V	0	0	1	1	1	1	1	1
3.375V	2.575V	1	1	1	0	1	1	1	1
3.3875V	2.5875V	0	1	1	0	1	1	1	1
3.4V	2.6V	1	0	1	0	1	1	1	1
3.4125V	2.6125V	0	1	0	1	1	1	1	1
3.425V	2.625V	1	1	0	1	1	1	1	1
3.4375V	2.6375V	0	1	0	1	1	1	1	1
3.45V	2.65V	1	0	0	1	1	1	1	1
3.4625V	2.6625V	0	0	1	1	1	1	1	1
3.475V	2.675V	1	1	1	0	1	1	1	1
3.4875V	2.6875V	0	1	1	0	1	1	1	1
3.5V	2.7V	1	0	1	0	1	1	1	1
3.5125V	2.7125V	0	1	0	1	1	1	1	1
3.525V	2.725V	1	1	0	1	1	1	1	1
3.5375V	2.7375V	0	1	0	1	1	1	1	1
3.55V	2.75V	1	0	0	1	1	1	1	1
3.5625V	2.7625V	0	0	1	1	1	1	1	1
3.575V	2.775V	1	1	1	0	1	1	1	1
3.5875V	2.7875V	0	1	1	0	1	1	1	1
3.6V	2.8V	1	0	1	0	1	1	1	1
3.6125V	2.8125V	0	1	0	1	1	1	1	1
3.625V	2.825V	1	1	0	1	1	1	1	1
3.6375V	2.8375V	0	1	0	1	1	1	1	1
3.65V	2.85V	1	0	0	1	1	1	1	1
3.6625V	2.8625V	0	0	1	1	1	1	1	1
3.675V	2.875V	1	1	1	0	1	1	1	1
3.6875V	2.8875V	0	1	1	0	1	1	1	1
3.7V	2.9V	1	0	1	0	1	1	1	1
3.7125V	2.9125V	0	1	0	1	1	1	1	1
3.725V	2.925V	1	1	0	1	1	1	1	1
3.7375V	2.9375V	0	1	0	1	1	1	1	1
3.75V	2.95V	1	0	0	1	1	1	1	1
3.7625V	2.9625V	0	0	1	1	1	1	1	1
3.775V	2.975V	1	1	1	0	1	1	1	1
3.7875V	2.9875V	0	1	1	0	1	1	1	1
3.8V	3.0V	1	0	1	0	1	1	1	1
3.8125V	3.0125V	0	1	0	1	1	1	1	1
3.825V	3.025V	1	1	0	1	1	1	1	1
3.8375V	3.0375V	0	1	0	1	1	1	1	1
3.85V	3.05V	1	0	0	1	1	1	1	1
3.8625V	3.0625V	0	0	1	1	1	1	1	1
3.875V	3.075V	1	1	1	0	1	1	1	1
3.8875V	3.0875V	0	1	1	0	1	1	1	1
3.9V	3.1V	1	0	1	0	1	1	1	1
3.9125V	3.1125V	0	1	0	1	1	1	1	1
3.925V	3.125V	1	1	0	1	1	1	1	1
3.9375V	3.1375V	0	1	0	1	1	1	1	1
3.95V	3.15V	1	0	0	1	1	1	1	1
3.9625V	3.1625V	0	0	1	1	1	1	1	1
3.975V	3.175V	1	1	1	0	1	1	1	1
3.9875V	3.1875V	0	1	1	0	1	1	1	1
4.0V	3.2V	1	0	1	0	1	1	1	1
4.0125V	3.2125V	0	1	0	1	1	1	1	1
4.025V	3.225V	1	1	0	1	1	1	1	1
4.0375V	3.2375V	0	1	0	1	1	1	1	1
4.05V	3.25V	1	0	0	1	1	1	1	1
4.0625V	3.2625V	0	0	1	1	1	1	1	1
4.075V	3.275V	1	1	1	0	1	1	1	1
4.0875V	3.2875V	0	1	1	0	1	1	1	1
4.1V	3.3V	1	0	1	0	1	1	1	1
4.1125V	3.3125V	0	1	0	1	1	1	1	1
4.125V	3.325V	1	1	0	1	1	1	1	1
4.1375V	3.3375V	0	1	0	1	1	1	1	1
4.15V	3.35V	1	0	0	1	1	1	1	1
4.1625V	3.3625V	0	0	1	1	1	1	1	1
4.175V	3.375V	1	1	1	0	1	1	1	1
4.1875V	3.3875V	0	1	1	0	1	1	1	1
4.2V	3.4V	1	0	1	0	1	1	1	1
4.2125V	3.4125V	0	1	0	1	1	1	1	1
4.225V	3.425V	1	1	0	1	1	1	1	1
4.2375V	3.4375V	0	1	0	1	1	1	1	1
4.25V	3.45V	1	0	0	1	1	1	1	1
4.2625V	3.4625V	0	0	1	1	1	1	1	1
4.275V	3.475V	1	1	1	0	1	1	1	1
4.2875V	3.4875V	0	1	1	0	1	1	1	1
4.3V	3.5V	1	0	1	0	1	1	1	1
4.3125V	3.5125V	0	1	0	1	1	1	1	1
4.325V	3.525V	1	1	0	1	1	1	1	1
4.3375V	3.5375V	0	1						