# MS-V046 VER 10

Base on P295-A00 DESIGN NV43 300/267MHZ 128MB/256MB/512MB DDR2 84-FBGA to modify V046

## PAGE SUMMARY:



## Page Changed:

Chage FBVDD & NVVDD Power solution for MS11 20050829
Adding DACA_C RSET SETTING 20050829
Adding Bridge & termernation resister for DVI 20050829
Pull 3v3 for GPIO30-33 of GPIO controller 20050831

**-20051031**

1.Page 10&15 : Modify DACA RGB Net J4,J502 RGB Net need connect,
2.Page 12&16 : Modify I2CB_SDA and I2CB_SCL Net
3.Page 19 : Memory sence circuit CSP & CSN swap
4.Page 19 : Modify Capacitor 1,2 to C1111,C2222
5.For G73 reserve circuit
a.2.5V
a.2.5V

**Suggestion : remove MS11 FBVDD VID control**

**-20051125**

**Reserve G73 circuit**
**Reserve FBVTT circuit**
**Reserve HDCP circuit**

| | | |
|---|---|---|
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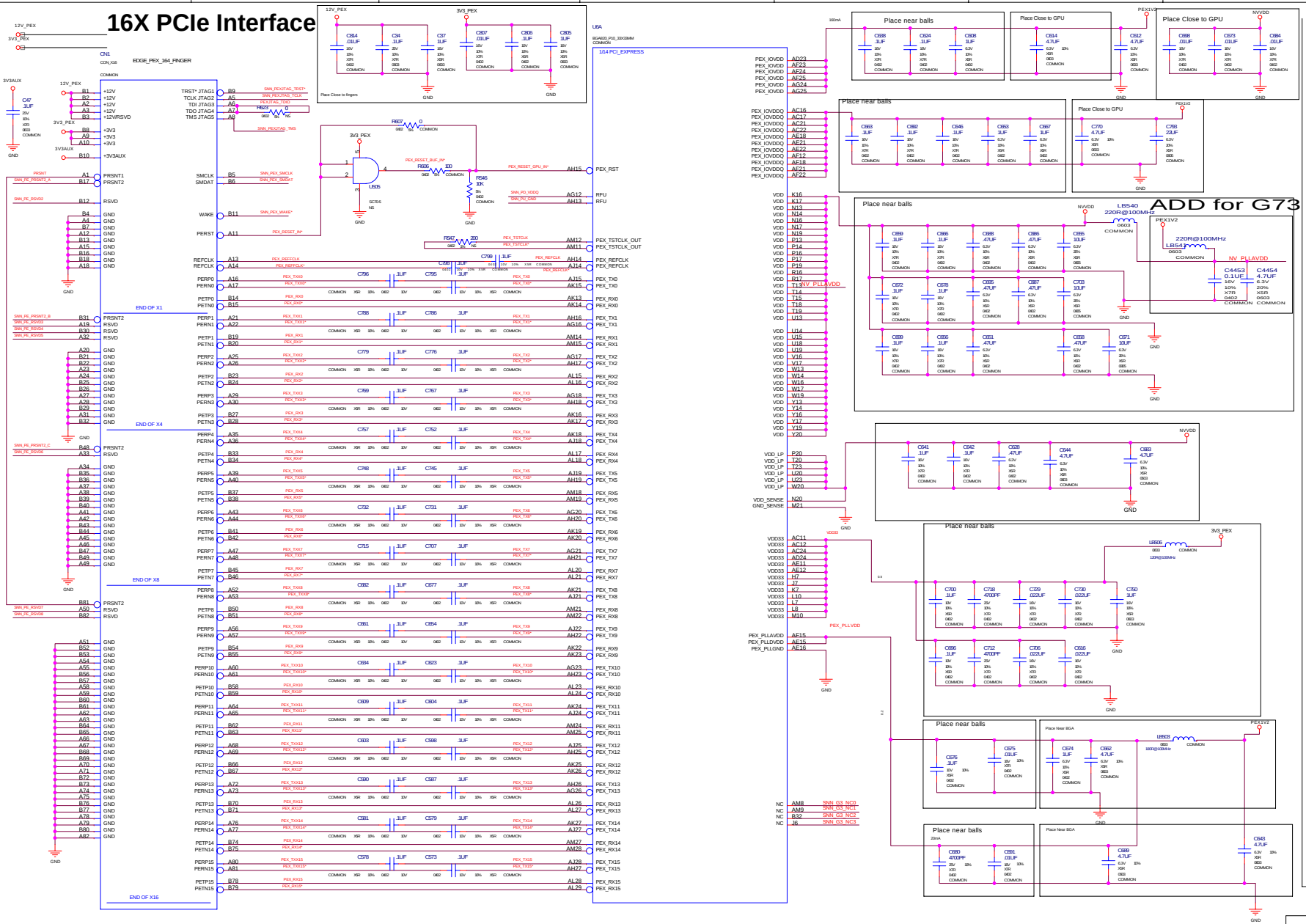
| Date: Thursday, December 01, 2005 | Sheet 1 of 20 | |

# 16X PCIe Interface

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| Size: Custom | Document Number: 16X PCIe Interface |
| Rev: 10 | |
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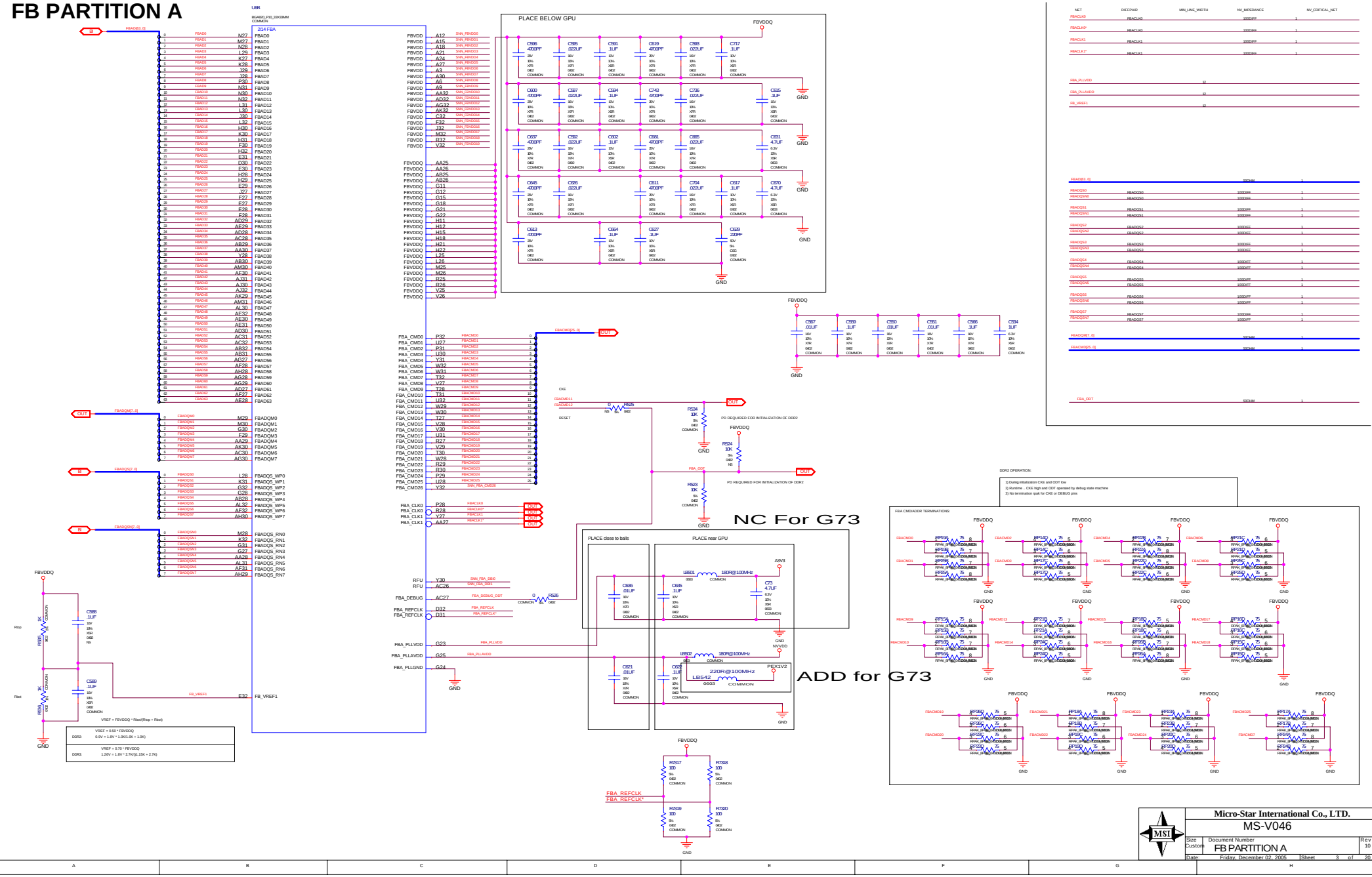
# FB PARTITION A

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| Rev: 10 | |
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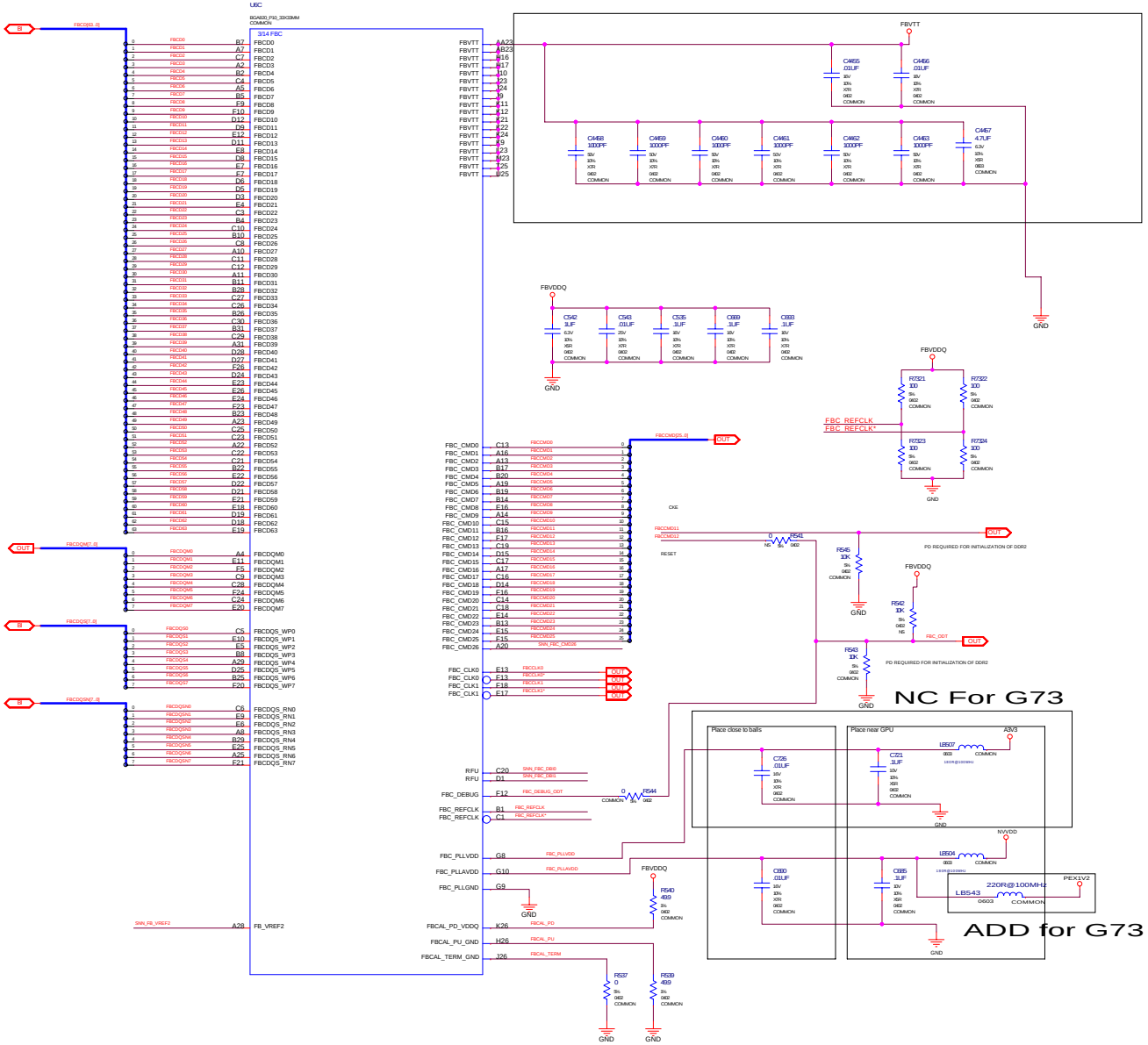
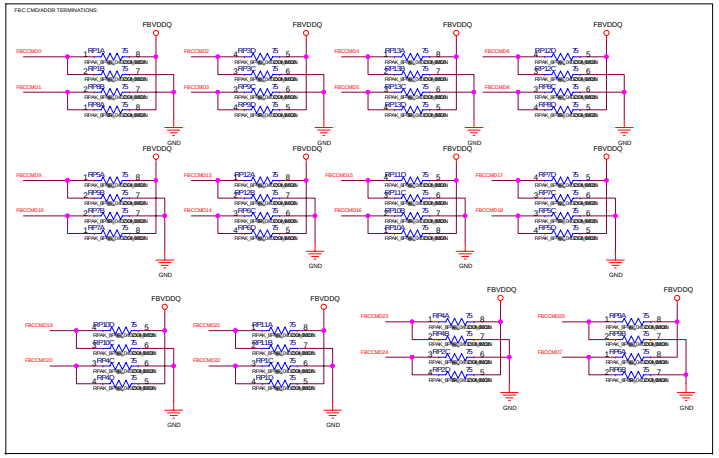
# FB PARTITION C

## NC For G73




## NC For G73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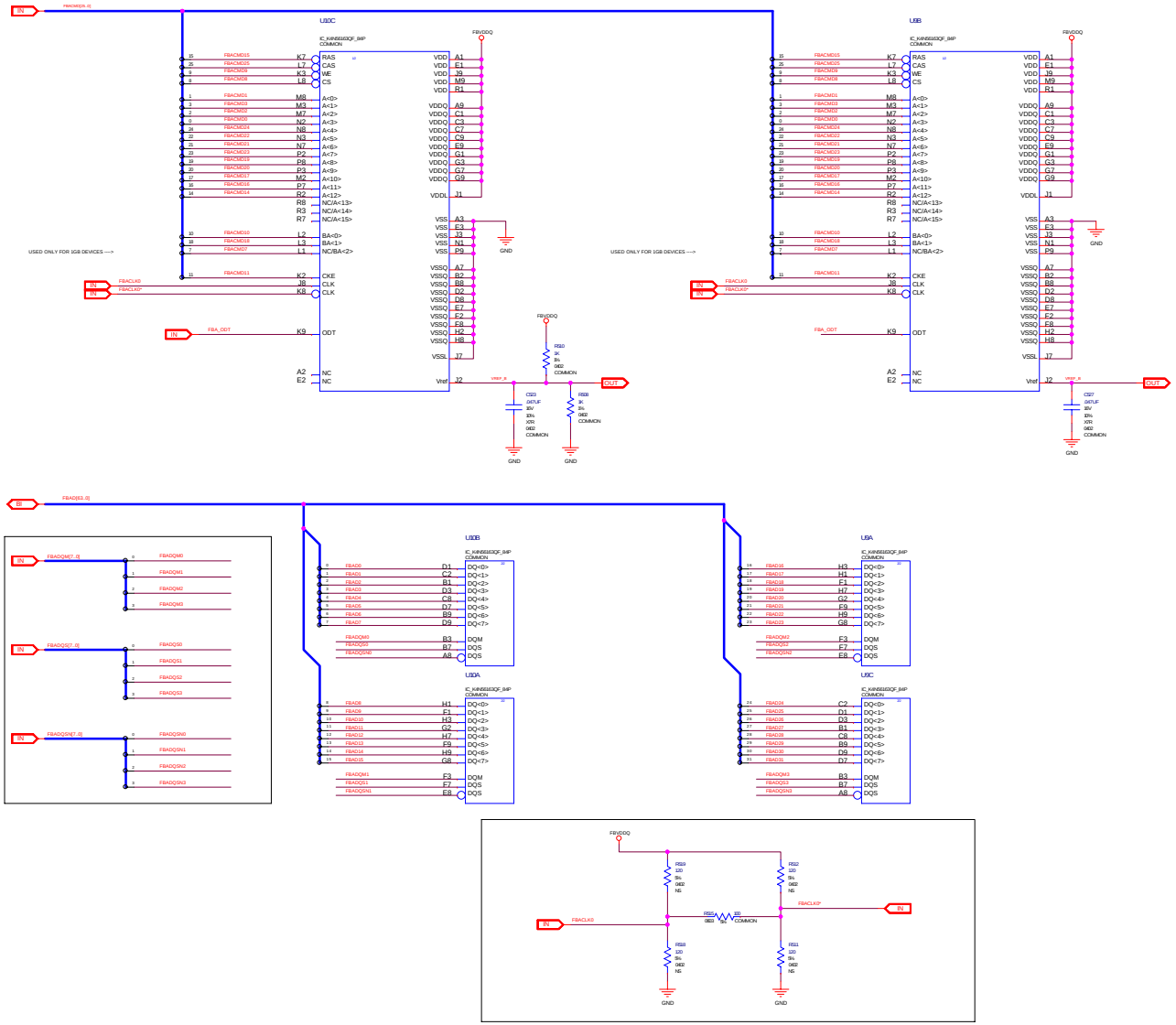
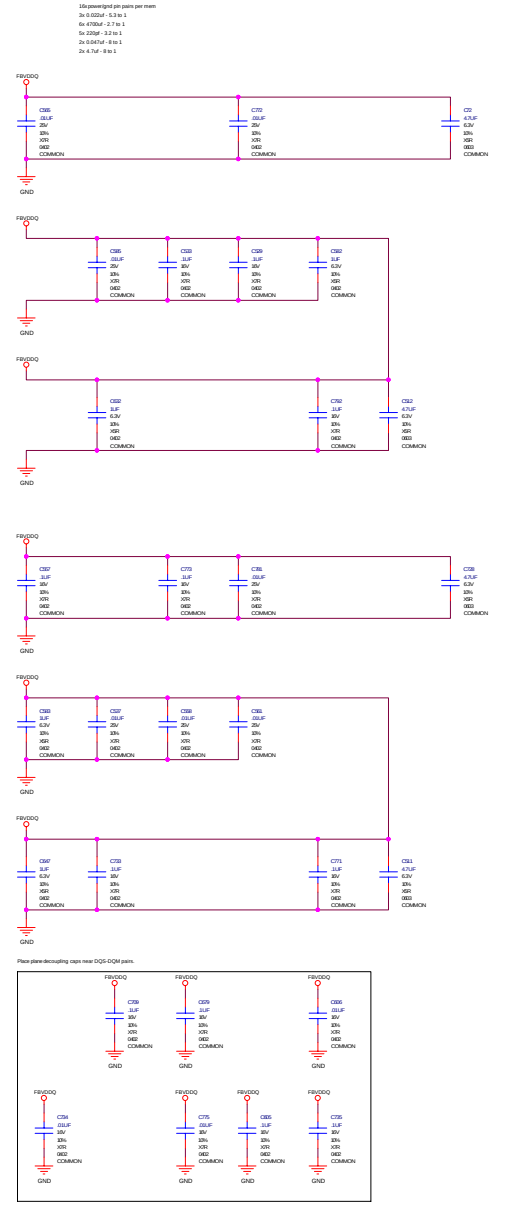
# FBA MEMORY 1st bank 0..31

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY





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|---|---|---|
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| Size: Custom | Document Number: FBA MEMORY 1st bank 0..31 | Rev: 10 |
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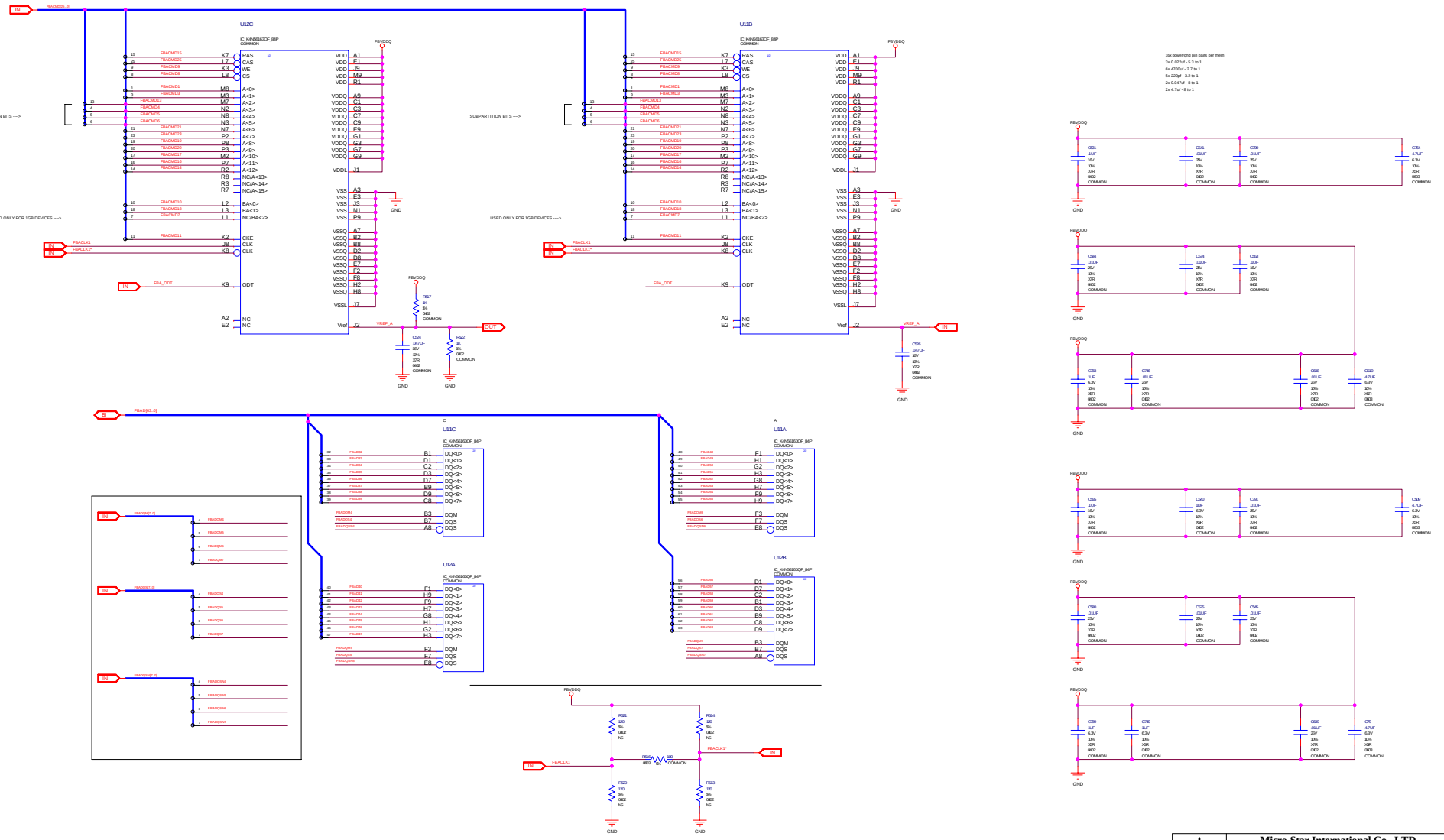
# FBA MEMORY 1st bank 32..63

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY





Place the differential termination resistor at the end of the transmission line.

| | |
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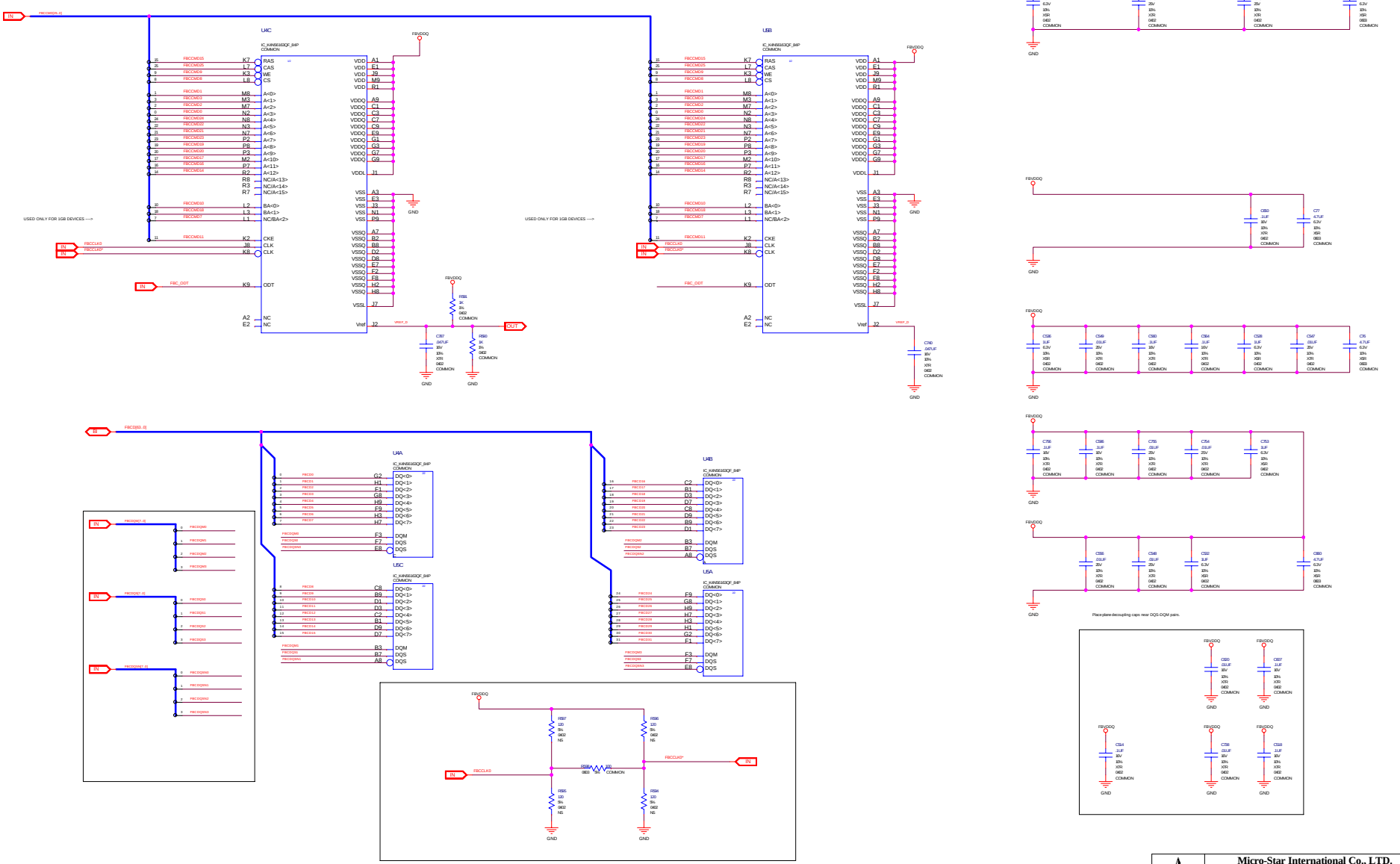
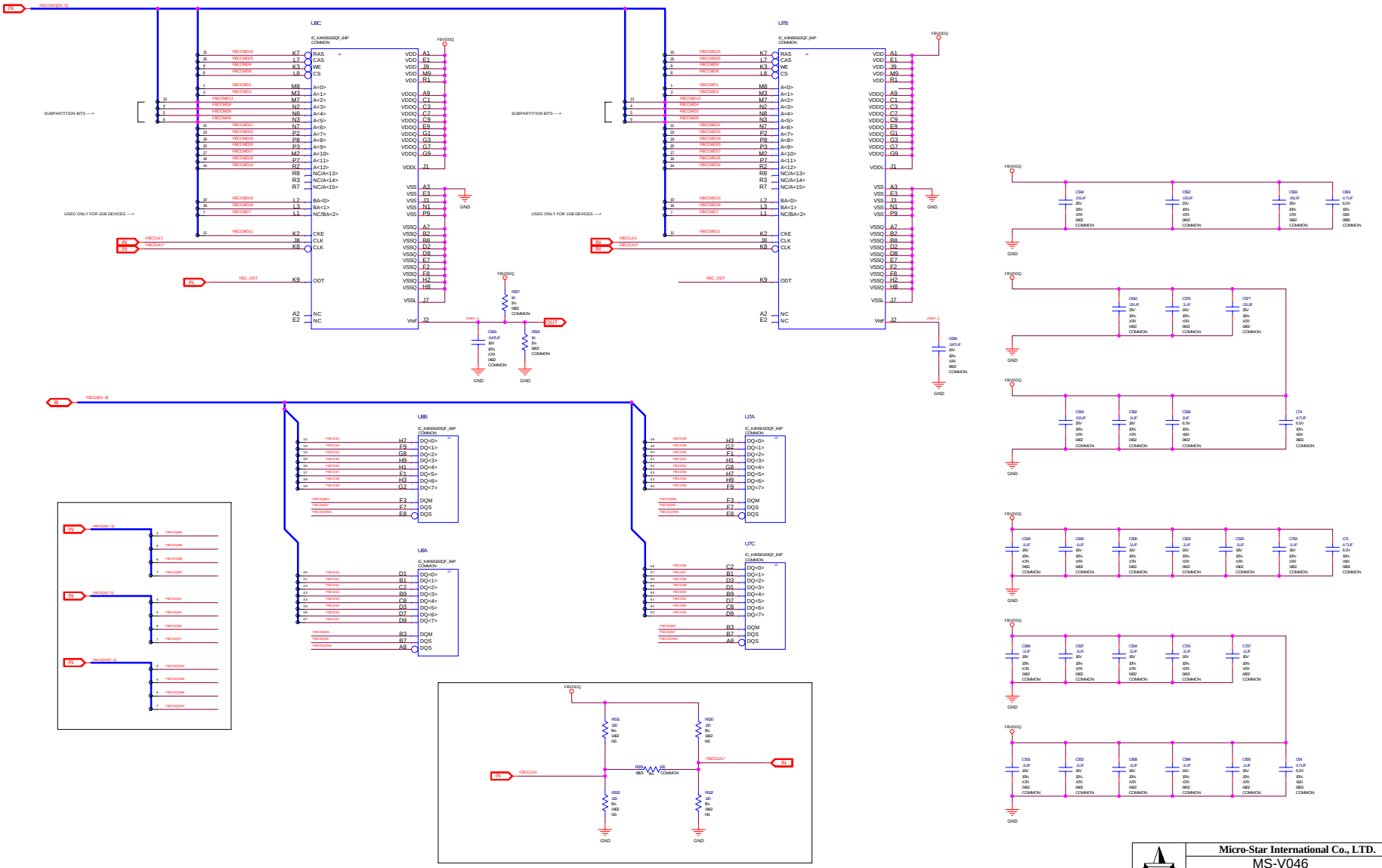
# FBC MEMORY 2nd bank 0..31

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY



# FBC MEMORY 2nd bank 32..63

PLACE ALL DISCRETE COMPONENTS AS NEAR AS POSSIBLE TO MEMORY



| NAME | MIN_LINE_WIDTH |
|---|---|
| VREF_C | 12 |
| VREF_D | 12 |

| | | |
|---|---|---|
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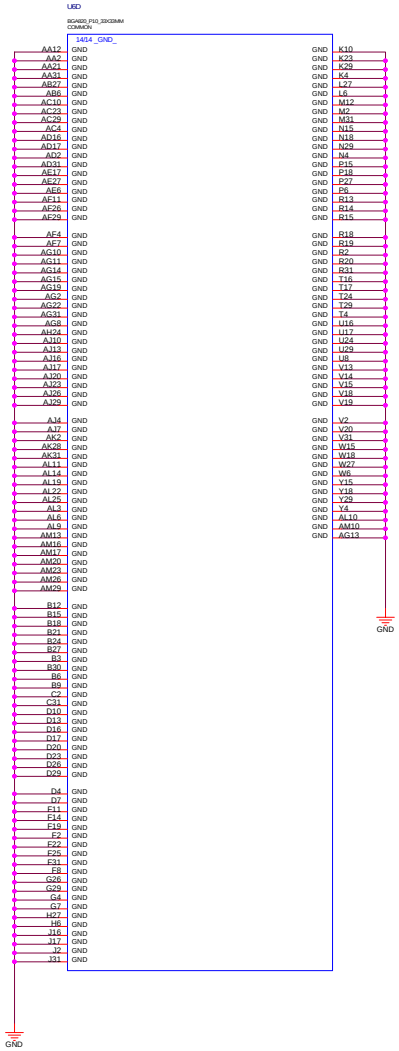
# GND

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|---|---|---|---|
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| Size: Custom | Document Number: GND | | Rev: 10 |
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# DACA VGA

| NET_NAME | MIN_LINE_WIDTH | NV_CRITICAL_NET | NV_IMPEDANCE |
|---|---|---|---|
| I2CA_SCL | | | |
| I2CA_SDA | | | |
| DACA_HSYNC | | 2 | 50OHM |
| DACA_VSYNC | | 2 | 50OHM |
| DACA_VSYNC_BUF | | 2 | 50OHM |
| DACA_VSYNC_BUF | | 2 | 50OHM |
| DACA_VSYNC_C | | 2 | 50OHM |
| DACA_HSYNC_C | | 2 | 50OHM |
| AHB | | 2 | 50OHM |
| AVB | | 2 | 50OHM |
| DACA_RED | | 1 | 95OHM |
| DACA_GREEN | | 1 | 95OHM |
| DACA_BLUE | | 1 | 95OHM |
| DACA_R_F | | 1 | 95OHM |
| DACA_G_F | | 1 | 95OHM |
| DACA_B_F | | 1 | 95OHM |
| DACA_RED_C | | 1 | 95OHM |
| DACA_GREEN_C | | 1 | 95OHM |
| DACA_BLUE_C | | 1 | 95OHM |
| DACA_VDD | 12 | | |
| DACA_VREF | 12 | | |
| DACA_RSET | 12 | | |

Note that this impedance is the highest one on the x-net for a 4-layer stackup

Change for G73

C708 0.1u
R549 124ohm
R548 1.78Kohm

U8E
BGA920_P10_23X23MM
COMMON
4/14 DACA

DACA_VDD AD10
DACA_VREF AH10
DACA_RSET AH9
I2CA_SCL K2
I2CA_SDA J3
DACA_HSYNC AF10
DACA_VSYNC AK10
DACA_RED AH11
DACA_GREEN AJ12
DACA_BLUE AH12
DACA_IDUMP AG9

A3V3 — LB512 180R@100MHz 0603 COMMON
C708 .01UF 16V X7R 10% 0402 COMMON
R549 137 1% 0402 COMMON
R548 309K 1% 0402 COMMON
C709 4.7UF 6.3V X5R 10% 0603 COMMON
C713 4700PF 25V X7R 10% 0402 COMMON
C701 470PF 50V X7R 10% 0402 COMMON

DACA_RSET
<<<20>>> GPIO25_DACA
<<<20>>> GPIO26_DACA
<<<20>>> GPIO27_DACA
Q602 N-2N7002_SOT23
Q604 N-2N7002_SOT23
Q603 N-2N7002_SOT23
R7116 10K 1% R0402 COMMON
R7115 10K 1% R0402 COMMON
R7114 10K 1% R0402 COMMON
Stuff option

max delay 100ps 37.5 Ohms 20 mil space
max delay 1000ps 50 Ohms 20 mil space
max delay 20ps each segment 50 Ohms 20 mil space
max delay 100ps 75 Ohms 25 mil space

DACA_RED — R680 33 1% 0402 COMMON — LS06 68nH 0603 COMMON — C683 22PF 50V 5% C0G 0402 NS — C326 4.7PF 50V +/-0.25PF C0G 0402 NS — LS09 27nH 0603 COMMON — C345 4.7PF 50V +/-0.25PF C0G 0402 COMMON — DACA_RED_C
DACA_GREEN — R647 33 1% 0402 COMMON — LS03 68nH 0603 COMMON — C682 22PF 50V 5% C0G 0402 NS — C327 4.7PF 50V +/-0.25PF C0G 0402 NS — LS08 27nH 0603 COMMON — C344 4.7PF 50V +/-0.25PF C0G 0402 COMMON — DACA_GREEN_C
DACA_BLUE — R646 33 1% 0402 COMMON — LS02 68nH 0603 COMMON — C681 22PF 50V 5% C0G 0402 NS — C325 4.7PF 50V +/-0.25PF C0G 0402 NS — LS07 27nH 0603 COMMON — C343 4.7PF 50V +/-0.25PF C0G 0402 COMMON — DACA_BLUE_C
R650 33 1% 0402 COMMON
R654 33 1% 0402 COMMON
R658 33 1% 0402 COMMON
GND

FOR ALL 4 SYNC BUFFERS
C656 .1UF 25V 10% X7R 0603 COMMON

I2CA_SCL — R630 33 0402 5% COMMON — I2CA_SCL_T — LB516 180R@100MHz 0603 COMMON — I2CA_SCL_C — OUT
I2CA_SDA — R644 33 0402 5% COMMON — I2CA_SDA_T — LB517 180R@100MHz 0603 COMMON — I2CA_SDA_C — OUT
R9 2.2K 5% 0402 COMMON
R645 2.2K 5% 0402 COMMON
D7 SOT23 100V 100mA NS
D8 SOT23 100V 100mA NS
C310 220PF 50V 5% C0G 0603 COMMON
C342 220PF 50V 5% C0G 0603 COMMON
5V

DACA_VSYNC — R657 33 0402 5% COMMON — DACA_VSYNC_BUF — LB516 27nH 0603 COMMON — DACA_VSYNC_C — OUT
DACA_HSYNC — R652 33 0402 5% COMMON — DACA_HSYNC_BUF — LB7 27nH 0603 COMMON — DACA_HSYNC_C — OUT
U508C SOT_150MIL COMMON
U508D SOT_150MIL COMMON
AVB
D507 SOT23 100V 100mA COMMON
D6 SOT23 100V 100mA COMMON
C341 22PF 50V 5% C0G 0603 COMMON
C9 22PF 50V 5% C0G 0603 COMMON

SOUTH
J14
CON_DSUB_HD_SLIM_15_F_RA_DVIMTG
VGA_SLIM_DVIMTG
COMMON
DDC_5V
GND-R 1
GND-G 2
GND_B 3
5V 9
IDO 4
GND 6
GND 7
IDO 11
SDA 12
HSYNC 13
VSYNC 14
SCL 15
SNN_MONA_IDO
SNN_MONA_ID2

C12 4.7UF 6.3V 10% X5R 0603 COMMON
Place in output filter section!

| | |
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# DACB TVOUT

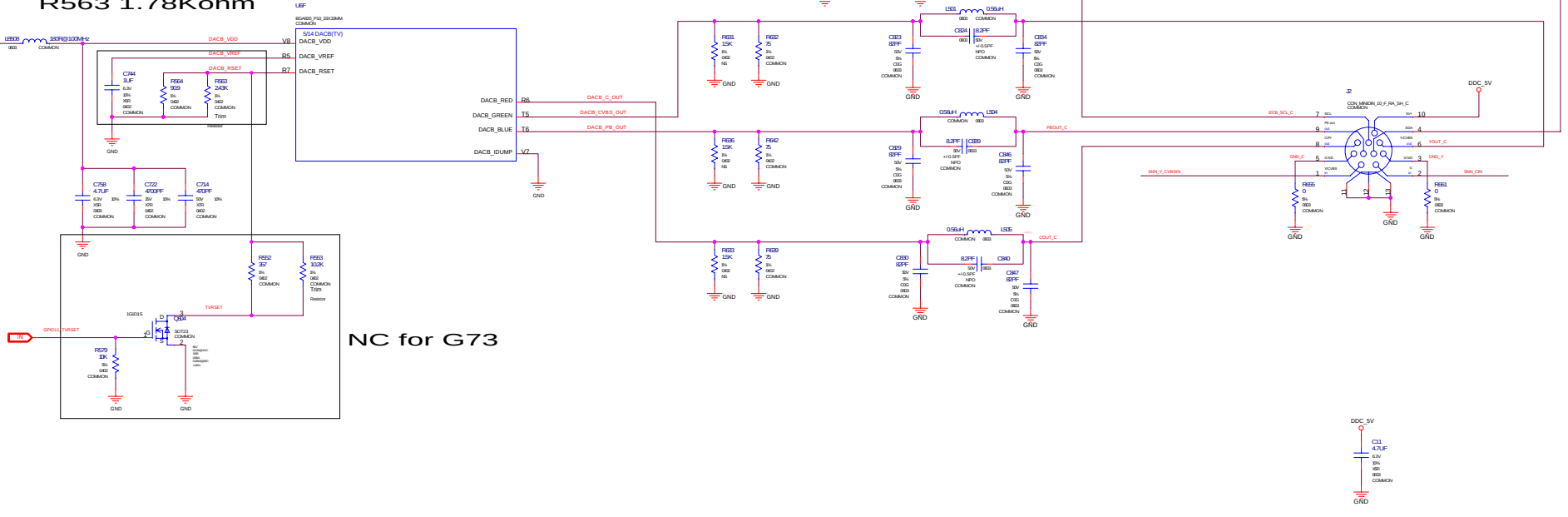
| NET_NAME | MIN_LINE_WIDTH | NV_CRITICAL_NET | NV_IMPEDANCE |
|---|---|---|---|
| DACB_C_OUT | | | 56OHM |
| DACB_CVBS_OUT | | | 56OHM |
| DACB_PB_OUT | | | 56OHM |
| COUT_C | | | 56OHM |
| YOUT_C | | | 56OHM |
| PBOUT_C | | | 56OHM |
| DACB_VDD | 12 | | |
| DACB_VREF | 12 | | |
| DACB_RSET | 12 | | |
| TVRSET | 12 | | |
| GND_C | 12 | | |
| GND_Y | 12 | | |

Note that this is the highest impedance on the xnet

Change for G73

C744 0.1u
R564 124ohm
R563 1.78Kohm

NC for G73

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|---|---|
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# DACC VGA

| NET_NAME | MIN_LINE_WIDTH | NET_SPACING_RULE | NV_CRITICAL_NET | NV_IMPEDANCE |
|---|---|---|---|---|
| I2CB_SCL | | | | |
| I2CB_SDA | | | | |
| DACC_HSYNC | | 2 | | 50OHM |
| DACC_VSYNC | | 2 | | 50OHM |
| DACC_HSYNC_BUF | | 2 | | 50OHM |
| DACC_VSYNC_BUF | | 2 | | 50OHM |
| DACC_VSYNC_C | | 2 | | 50OHM |
| DACC_HSYNC_C | | 2 | | 50OHM |
| CYB | | 2 | | 50OHM |
| CYB | | 2 | | 50OHM |
| DACC_RED | | 1 | | 50OHM |
| DACC_GREEN | | 1 | | 50OHM |
| DACC_BLUE | | 1 | | 50OHM |
| DACC_R_F | | 1 | | 50OHM |
| DACC_G_F | | 1 | | 50OHM |
| DACC_B_F | | 1 | | 50OHM |
| DACC_RED_C | | 1 | | 50OHM |
| DACC_GREEN_C | | 1 | | 50OHM |
| DACC_BLUE_C | | 1 | | 50OHM |
| DACC_VDD | | I2 | | |
| DACC_VREF | | I2 | | |
| DACC_RSET | | I2 | | |

Change for G73

C747 0.1u
R566 124ohm
R568 1.78Kohm

Stuff option

Place in output filter section!

MIDDLE

| | |
|---|---|
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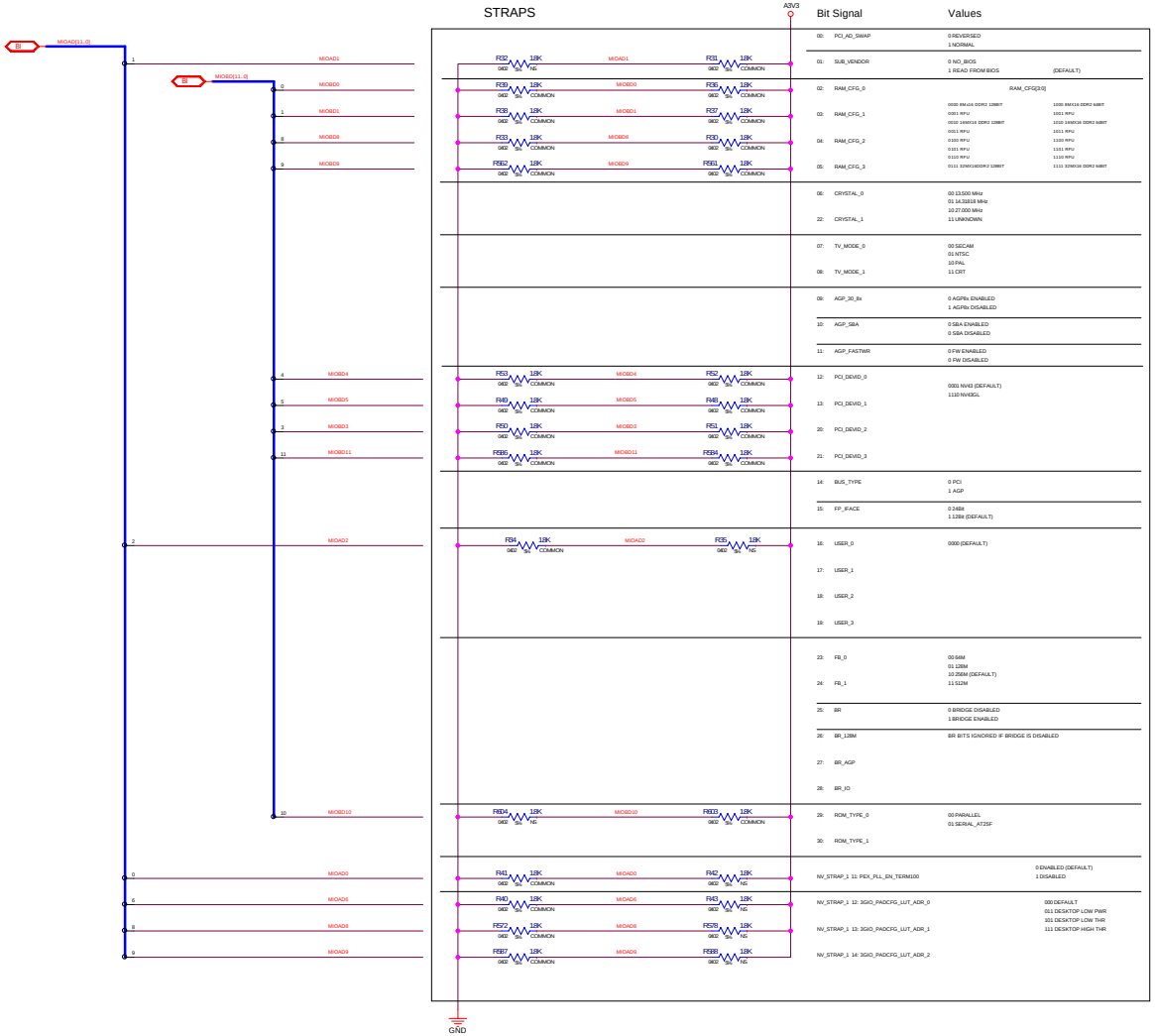
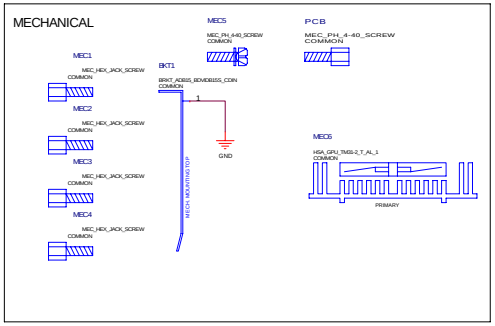
# STRAPS

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# JTAG, GPIO, BIOS ROM

GPIO Assignment Table

| GPIO | I/O | FUNCTION |
|---|---|---|
| 0 | IN | DVI MID HOTPLUG DET |
| 1 | IN | RESERVED |
| 2 | IN | RESERVED |
| 3 | IN | RESERVED |
| 4 | IN | RESERVED |
| 5 | IN | RESERVED |
| 6 | IN | RESERVED |
| 7 | IN | RESERVED |
| 8 | IN | THERM ALERT/SLOW |
| 9 | OUT | FAN CONTROL |
| 10 | IN | RESERVED |
| 11 | OUT | HDTV/SDTV SELECT |
| 12 | IN | RESERVED |

NET MIN_LINE_WIDTH

FAN_THERM_BYPASS 30
FAN_PWM 30
FAN_PWM_B 30
FAN_PWM_C 30
THERMDC 30
THERMDA 30

THERMDA <<<19>>>

NC for G73

Place Close to GPU

3V3_PEX

U6H

9/14 MISC1

JTAG_TCLK JTAG_TMS JTAG_TDI JTAG_TDO JTAG_TRST*

THERMDA THERMDN THERMDP

CLAMP I2CC_SCL I2CC_SDA

GPIO0 GPIO1 GPIO2 GPIO3 GPIO4 GPIO5 GPIO6 GPIO7 GPIO8 GPIO9 GPIO10 GPIO11 GPIO12

DVI_MID_HPD DVI_SCLUTH_HPD GPIO_SMI#

Use 10MIL Guard(GND) Trace around THERMDC and THERMDA

BIOS

HDCP

U6I

10/14 MISC2

STRAP MEMSTRAPSEL0 MEMSTRAPSEL1 MEMSTRAPSEL2 MEMSTRAPSEL3

ROMCS ROM_SI ROM_SO ROM_SCLK

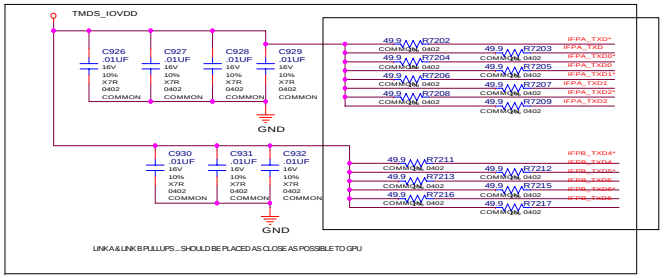
I2CH_SCL I2CH_SDA

BUFRST STEREO SWAPRDY_A

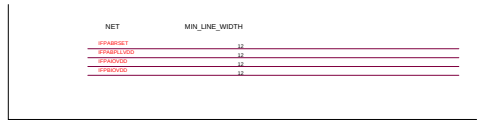
TESTMEMCLK TESTMODE

RFU

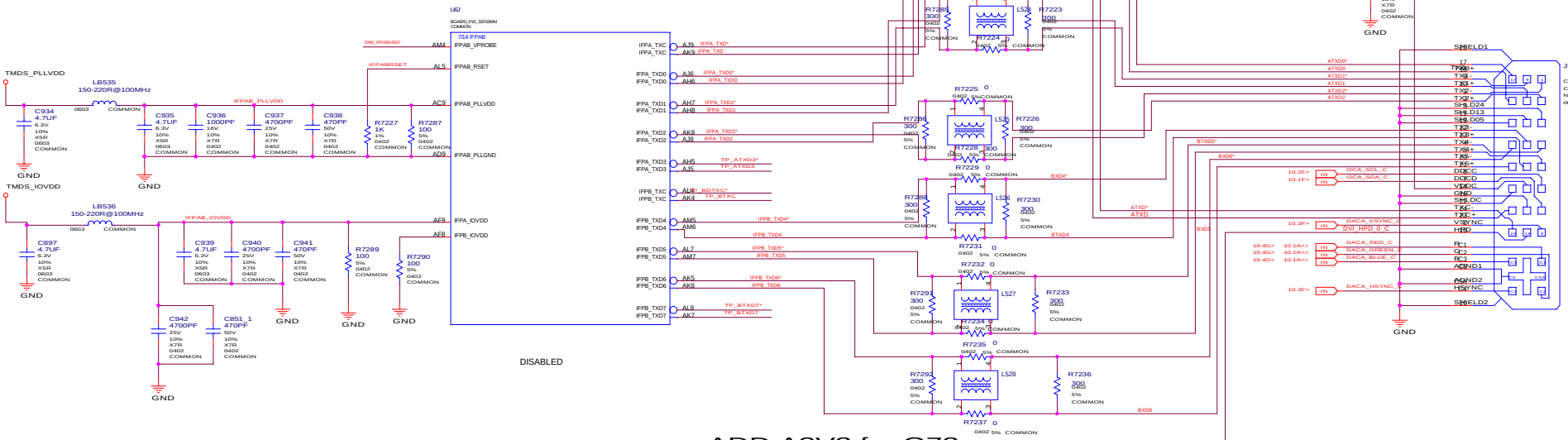
# INTERNAL TMDS LINK A/B




NC for G73



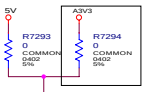

INTERNAL TMDS ..LINK A/B



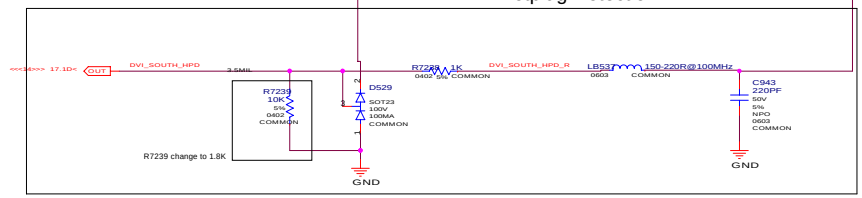

DISABLED




ADD A3V3 for G73




Hotplug Detection




R7239 change to 1.8K for G73

| | | |
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| Size: Custom | Document Number: INTERNAL TMDS LINK A/B | Rev: 10 |
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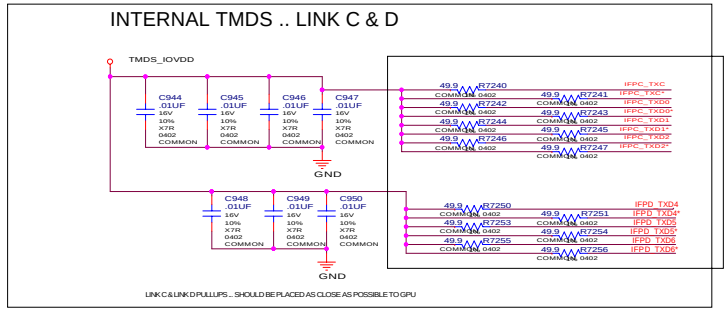
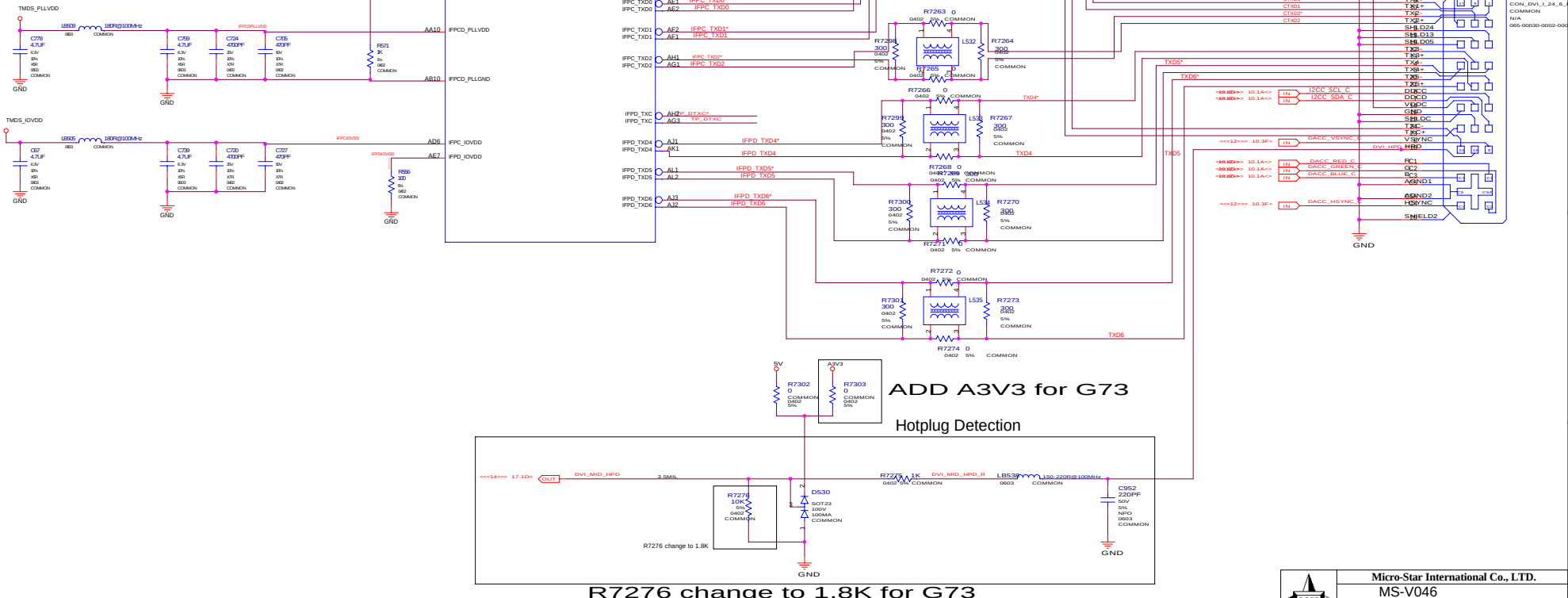
# INTERNAL TMDS LINK C/D




NC for G73

| NET | MIN_LINE_WIDTH | VOLTAGE |
|---|---|---|
| IFPCVRSET | 12 | 3.3V |
| IFPCPLLVDD | 12 | 3.3V |
| IFPDIVDD | 12 | 3.3V |
| IFPDVDD | 12 | 3.3V |
| IFPDRSET | 12 | |




ADD A3V3 for G73

Hotplug Detection




R7276 change to 1.8K for G73

| | | |
|---|---|---|
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| Size: Custom | Document Number: INTERNAL TMDS LINK C/D | Rev: 10 |
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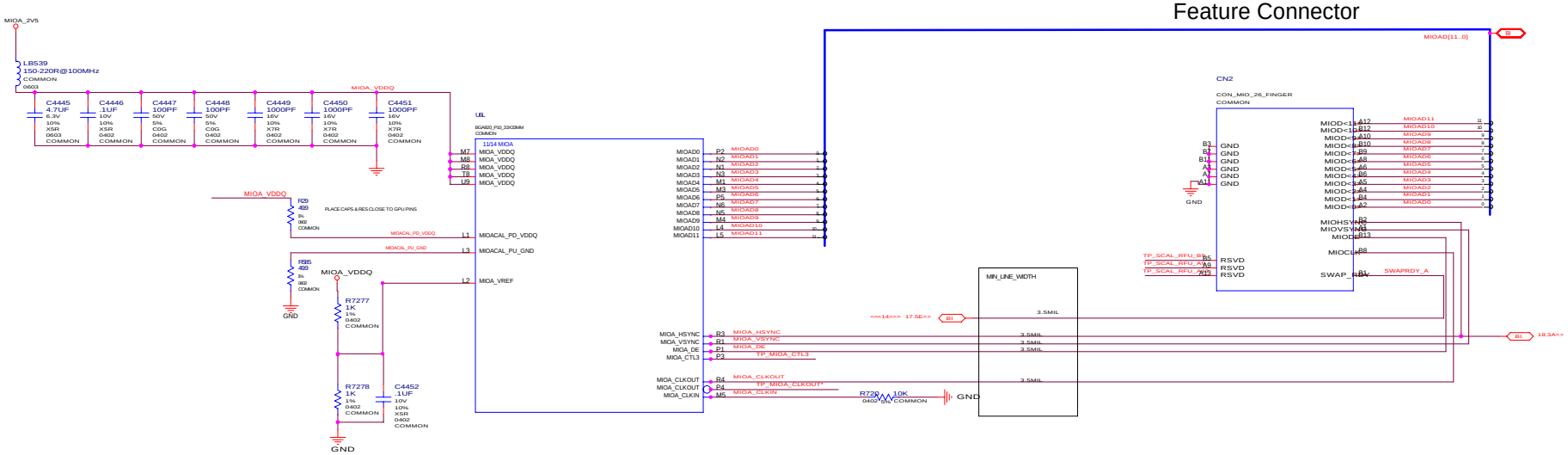
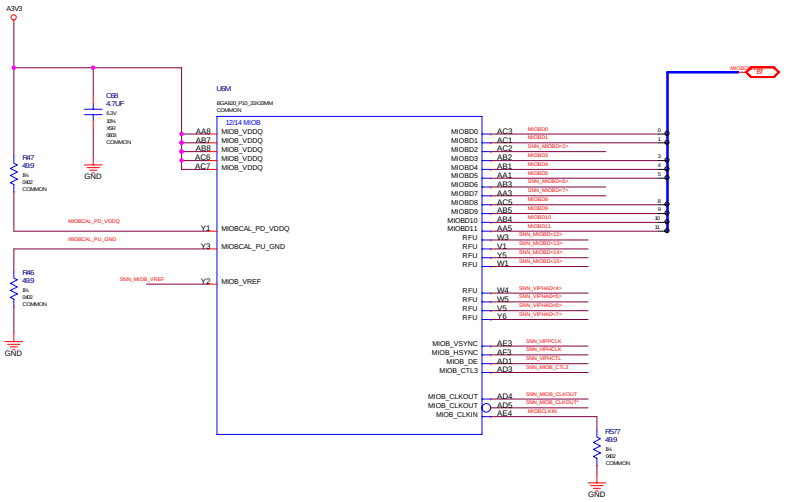
# MIOA/B XTALPLLVDD

## MIOA

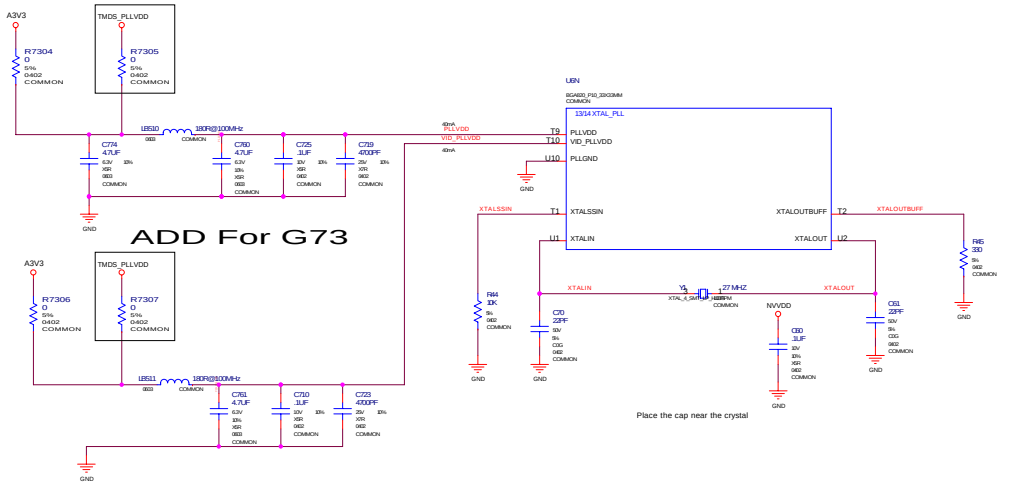



## MIOB




## XTAL/PLLVDD

ADD For G73




ADD For G73



Place the cap near the crystal

| | | |
|---|---|---|
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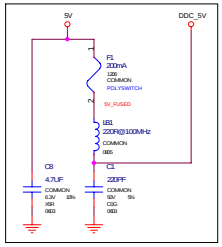
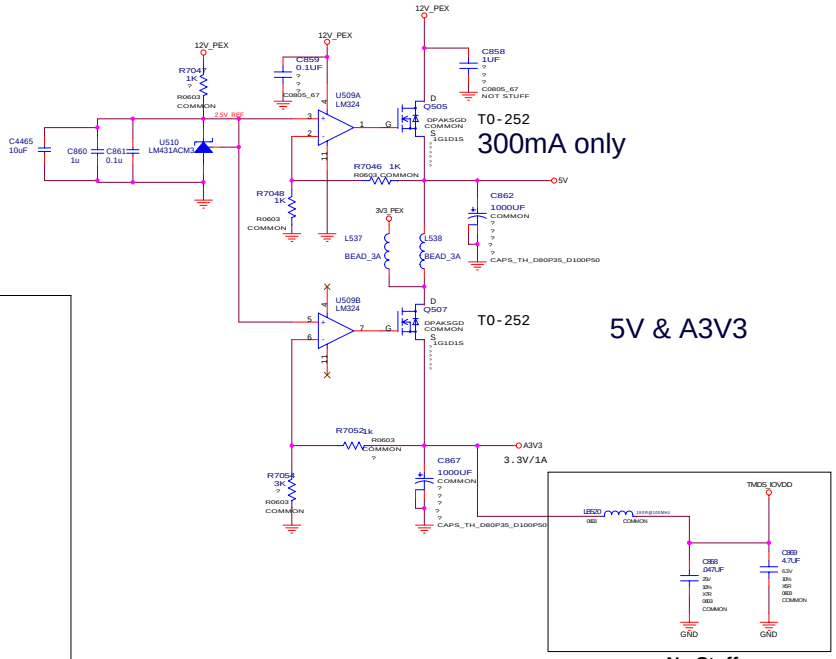
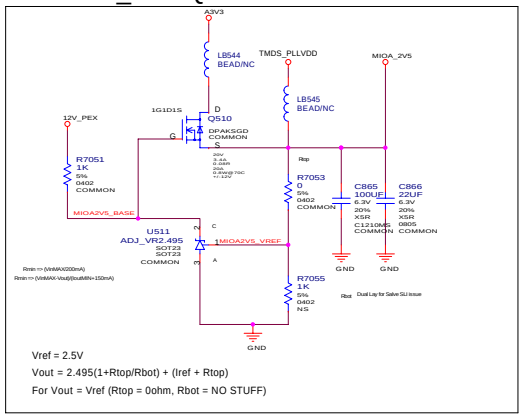
# 5V/PEX1V2/PLLVDD/IOVDD

## DDC 5V

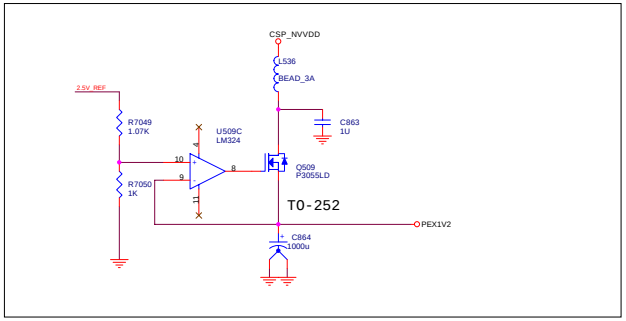


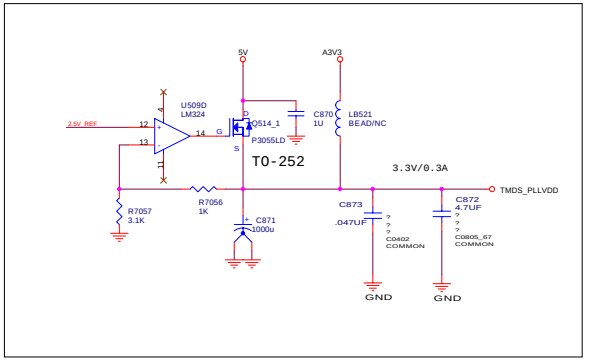

## MIOA_VDDQ



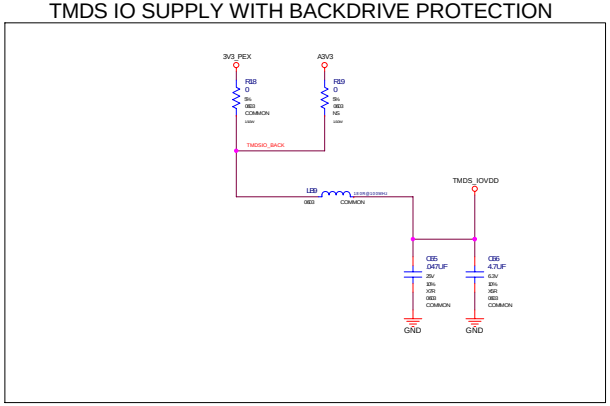

## PEX1V2




## TMDS AB/CD PLL Supply




## TMDS IO SUPPLY WITH BACKDRIVE PROTECTION




FM4 FM1 FM5 FM3 FM6 FM7

| | | |
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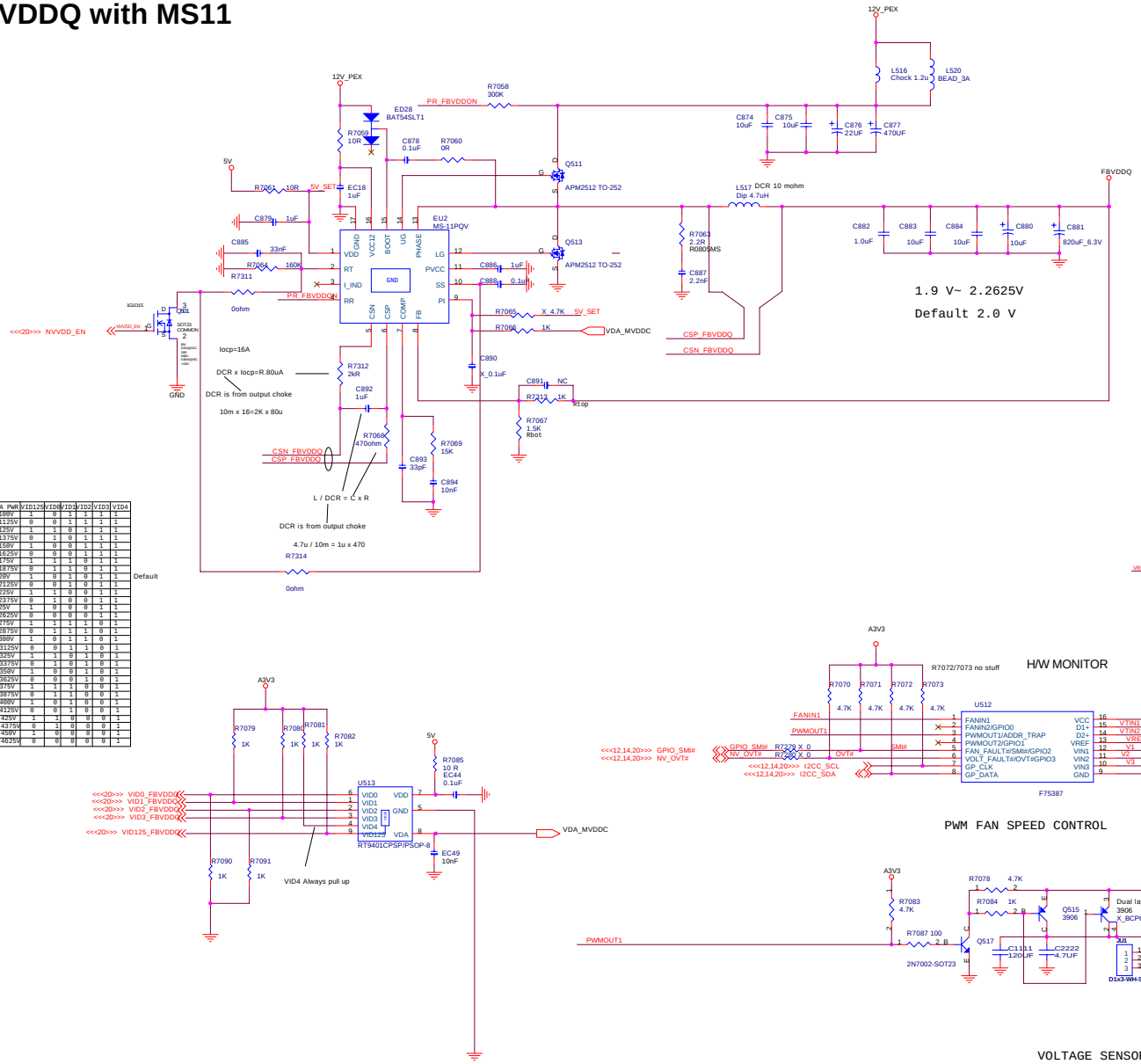
# FBVDDQ with MS11




| FBVDD | VDA_PWR | VID125 | VID8 | VID1 | VID2 | VID3 | VID4 |
|---|---|---|---|---|---|---|---|
| 1.980V | 1.980V | 1 | 0 | 1 | 1 | 1 | 1 |
| 1.9125V | 1.1125V | 0 | 0 | 1 | 1 | 1 | 1 |
| 1.925V | 1.125V | 1 | 1 | 0 | 1 | 1 | 1 |
| 1.9375V | 1.1375V | 0 | 1 | 0 | 1 | 1 | 1 |
| 1.950V | 1.150V | 1 | 0 | 0 | 1 | 1 | 1 |
| 1.9625V | 1.1625V | 0 | 0 | 0 | 1 | 1 | 1 |
| 1.975V | 1.175V | 1 | 1 | 1 | 0 | 1 | 1 |
| 1.9875V | 1.1875V | 0 | 1 | 1 | 0 | 1 | 1 |
| 2.00V | 1.20V | 1 | 0 | 1 | 0 | 1 | 1 |
| 2.0125V | 1.2125V | 0 | 0 | 1 | 0 | 1 | 1 |
| 2.025V | 1.225V | 1 | 1 | 0 | 0 | 1 | 1 |
| 2.0375V | 1.2375V | 0 | 1 | 0 | 0 | 1 | 1 |
| 2.05V | 1.25V | 1 | 0 | 0 | 0 | 1 | 1 |
| 2.0625V | 1.2625V | 0 | 0 | 0 | 0 | 1 | 1 |
| 2.075V | 1.275V | 1 | 1 | 1 | 1 | 0 | 1 |
| 2.0875V | 1.2875V | 0 | 1 | 1 | 1 | 0 | 1 |
| 2.100V | 1.300V | 1 | 0 | 1 | 1 | 0 | 1 |
| 2.1125V | 1.3125V | 0 | 0 | 1 | 1 | 0 | 1 |
| 2.125V | 1.325V | 1 | 1 | 0 | 1 | 0 | 1 |
| 2.1375V | 1.3375V | 0 | 1 | 0 | 1 | 0 | 1 |
| 2.150V | 1.350V | 1 | 0 | 0 | 1 | 0 | 1 |
| 2.1625V | 1.3625V | 0 | 0 | 0 | 1 | 0 | 1 |
| 2.175V | 1.375V | 1 | 1 | 1 | 0 | 0 | 1 |
| 2.1875V | 1.3875V | 0 | 1 | 1 | 0 | 0 | 1 |
| 2.200V | 1.400V | 1 | 0 | 1 | 0 | 0 | 1 |
| 2.2125V | 1.4125V | 0 | 0 | 1 | 0 | 0 | 1 |
| 2.225V | 1.425V | 1 | 1 | 0 | 0 | 0 | 1 |
| 2.2375V | 1.4375V | 0 | 1 | 0 | 0 | 0 | 1 |
| 2.250V | 1.450V | 1 | 0 | 0 | 0 | 0 | 1 |
| 2.2625V | 1.4625V | 0 | 0 | 0 | 0 | 0 | 1 |





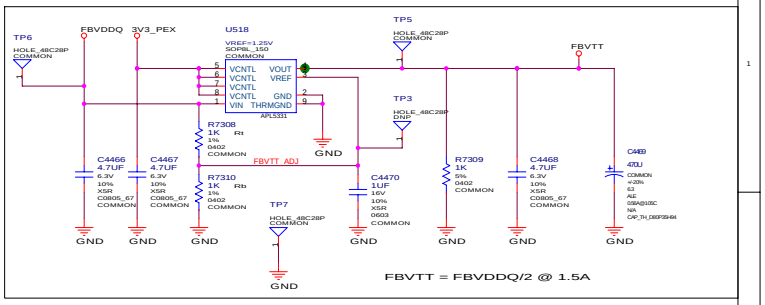


PWM FAN SPEED CONTROL




VOLTAGE SENSORING CIRCUIT

## FBVTT TERMINATION

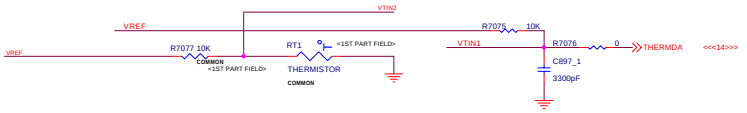



FBVTT TERMINATION

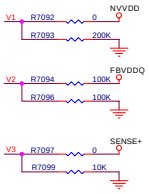
ASSEMBLY=FBVTT_POW*

FBVTT = FBVDDQ/2 @ 1.5A

## TEMPERATURE MONITOR




VOLTAGE SENSORING CIRCUIT

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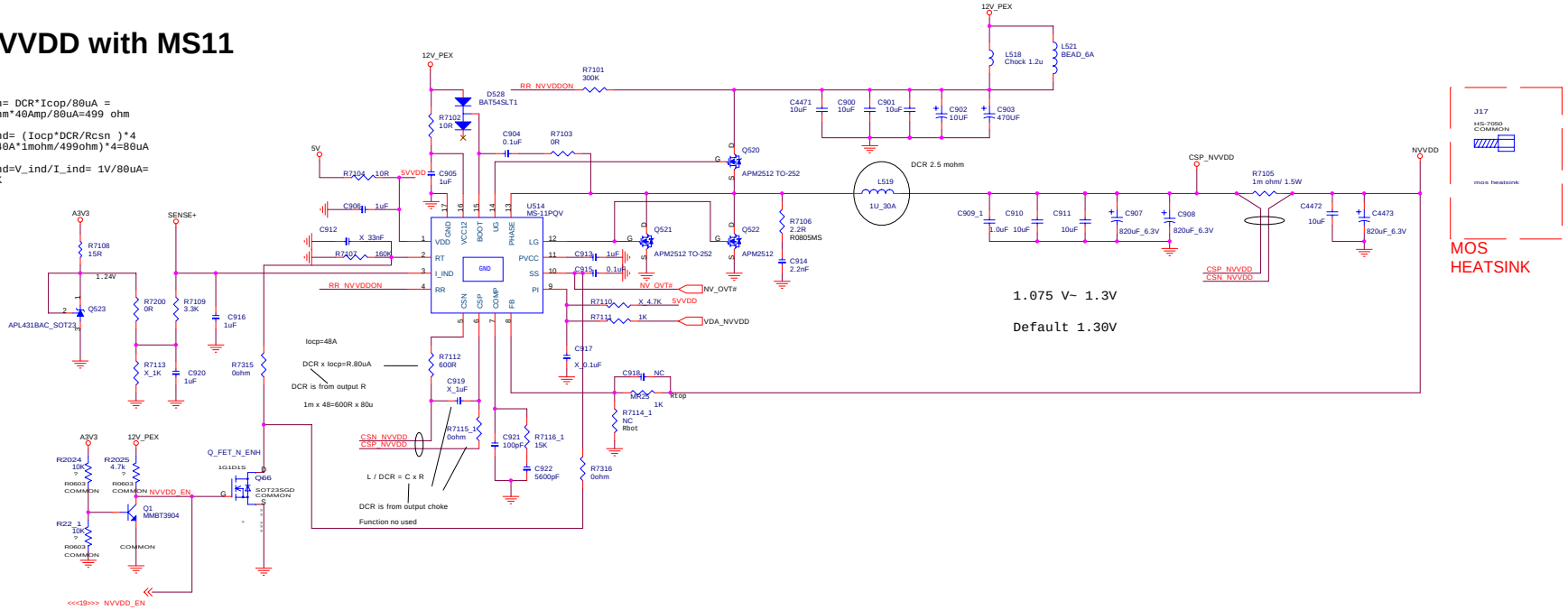
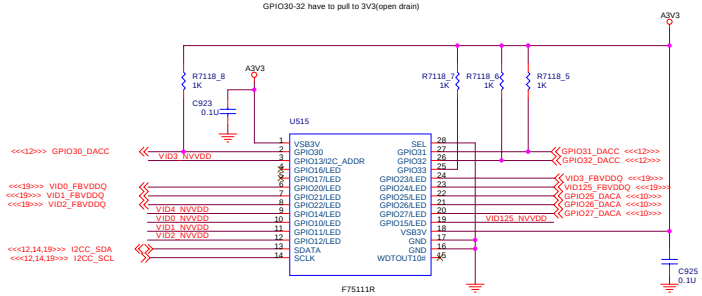
# NVVDD with MS11

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

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

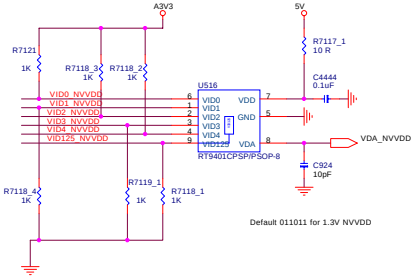
R_ind=V_ind/I_ind= 1V/80uA=
3.3K




| VDA_VID0 | VID125 | VID4 | VID3 | VID2 | VID1 | VID0 | |
|---|---|---|---|---|---|---|---|
| 1.1875V | 0 | 1 | 1 | 0 | 1 | 1 | |
| 1.200V | 1 | 0 | 1 | 0 | 1 | 1 | |
| 1.2125V | 0 | 0 | 1 | 0 | 1 | 1 | |
| 1.225V | 1 | 1 | 0 | 0 | 1 | 1 | |
| 1.2375V | 0 | 1 | 0 | 0 | 1 | 1 | |
| 1.250V | 1 | 0 | 0 | 0 | 1 | 1 | |
| 1.2625V | 0 | 0 | 0 | 0 | 1 | 1 | |
| 1.275V | 1 | 1 | 1 | 0 | 1 | 1 | |
| 1.287V | 0 | 1 | 1 | 0 | 1 | 1 | |
| 1.300V | 1 | 0 | 1 | 0 | 1 | 1 | |
| 1.3125V | 0 | 0 | 1 | 1 | 0 | 1 | |
| 1.325V | 1 | 1 | 0 | 1 | 0 | 1 | |
| 1.3375V | 0 | 1 | 0 | 1 | 0 | 1 | |
| 1.350V | 1 | 0 | 0 | 1 | 0 | 1 | |
| 1.3625V | 0 | 0 | 0 | 1 | 0 | 1 | |
| 1.375V | 1 | 1 | 1 | 0 | 0 | 1 | |
| 1.3875V | 0 | 1 | 1 | 0 | 0 | 1 | |
| 1.400V | 1 | 0 | 1 | 0 | 0 | 1 | |
| 1.4125V | 0 | 0 | 1 | 0 | 0 | 1 | |

Default




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

## NVVDD 1.33V default 010101

| | |
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