FBDQM[0:15]
FBD[0:127]
FBDQM[0:15]
FBD[0:127]

FBDQM[0:15] (4,5)
FBD[0:127] (4,5)

U100B

FBVDDQ

FBVDDQ

U100C

Place closest to the GPU

| C200 470pF 5% NPO 50V SMD0603 COMMON | C201 470pF 5% NPO 50V SMD0603 COMMON | C202 470pF 5% NPO 50V SMD0603 COMMON | C203 470pF 5% NPO 50V SMD0603 COMMON | C204 470pF 5% NPO 50V SMD0603 COMMON | C205 470pF 5% NPO 50V SMD0603 COMMON |

| C206 470pF 5% NPO 50V SMD0603 COMMON | C207 470pF 5% NPO 50V SMD0603 COMMON | C208 470pF 5% NPO 50V SMD0603 COMMON | C209 470pF 5% NPO 50V SMD0603 COMMON | C210 470pF 5% NPO 50V SMD0603 COMMON |

Place in second row

| C211 4700pF10% X7R 50V SMD0603 COMMON | C212 4700pF10% X7R 50V SMD0603 COMMON | C213 4700pF10% X7R 50V SMD0603 COMMON | C214 4700pF10% X7R 50V SMD0603 COMMON | C215 4700pF10% X7R 50V SMD0603 COMMON | C216 4700pF10% X7R 50V SMD0603 COMMON |

| C217 0.047uF 10% X7R 25V SMD0603 COMMON | C218 0.047uF 10% X7R 25V SMD0603 COMMON | C219 0.047uF 10% X7R 25V SMD0603 COMMON | C220 0.047uF 10% X7R 25V SMD0603 COMMON | C221 0.047uF 10% X7R 25V SMD0603 COMMON |

Place in GPU section

| C222 4.7u 10% X5R 6.3V SMD0805 COMMON | C223 4.7u 10% X5R 6.3V SMD0805 COMMON | C224 4.7u 10% X5R 6.3V SMD0805 COMMON |

GND

Place at T-point

FBACKE

R200 10k 5% SMD0603 COMMON

C225 25V 0.1uF 10% X7R SMD0603 NO_STUFF

GND

FBVDDQ

R201 1k 5% SMD0603 COMMON

Place close to the GPU

R202 1k 5% SMD0603 COMMON

C226 25V 0.1uF 10% X7R SMD0603 COMMON

GND

IC NV17 GPU BGA604
ic_nv17_bga604_1mm_skt
NV17-128D

IC NV17 GPU BGA604
ic_nv17_bga604_1mm_skt
NV17-128D

GND

FRAME BUFFER 0..63

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FBDQM[0:15]   FBDQM[0:15]   FBDQM[0:15]   FBDQM[0:15] (3,4)
FBD[0:127]   FBD[0:127]   FBD[0:127] (3,4)

MFBDQM[8:11]   Place close to memory

MFBDQM8	R223	15R 5%	FBDQM8
MFBDQM9	R225	15R 5%	FBDQM9
MFBDQM10	SMD0603 MEM-128B		FBDQM10
MFBDQM11	R227	15R 5%	FBDQM11
	R229	15R 5%	
	SMD0603	MEM-128B	

MFBDQM[12:15]   Place close to memory

MFBDQM12	R224	15R 5%	FBDQM12
MFBDQM13	R226	15R 5%	FBDQM13
MFBDQM14	R228	15R 5%	FBDQM14
MFBDQM15	R230	15R 5%	FBDQM15
	SMD0603	MEM-128B	

U202

A0 A1 A2 A3 A4 A5 A6 A7 A8(AP) BA0 BA1 A9 A10 A11 DQM0 DQM1 DQM2 DQM3 RAS CAS WE CS CLK CLK# CKE DSF VREF

U203

A0 A1 A2 A3 A4 A5 A6 A7 A8(AP) BA0 BA1 A9 A10 A11 DQM0 DQM1 DQM2 DQM3 RAS CAS WE CS CLK CLK# CKE DSF VREF

Memory decoupling

Place close to memory

Place in memory section

Place at end of stub

IC_8P4R_RESARRAY

MEM 1/2/4MX32
IC_PQFP100
MEM-128B

Micro-Star International Co., LTD.

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Place close together

DDC5V (7)

5V
F300
FUSE_MINISMDC035-050
COMMON
1A 6V
polyswitch
DDC5V

L300
SMD0805
COMMON
1 2 220R 5%
Ferrite 3A
DDC1VCC

Place close together

C300
220p 5%
NPO 50V
SMD0603
COMMON
GND

5V
R300
COMMON
2 2.2k 5%
SMD0603

I2C1SDA
R301
COMMON
2 33R 5%
SMD0603
TI2C1SDA

L301
SMD0603
COMMON
1 2 150_220 5%
Ferrite 300mA
MI2C1SDA

C301
220p 5%
NPO 50V
SMD0603
COMMON
GND

D300
5V 2 1 215mA 70V BAV99 IC_SOT23_123 SI2C_PROT
GND

5V
R302
COMMON
2 2.2k 5%
SMD0603

I2C1SCL
R303
COMMON
2 33R 5%
SMD0603
TI2C1SCL

L302
SMD0603
COMMON
1 2 150_220 5%
Ferrite 300mA
MI2C1SCL

C302
220p 5%
NPO 50V
SMD0603
COMMON
GND

D301
5V 215mA 70V BAV99 IC_SOT23_123 SI2C_PROT
GND

Decoupling sync driver

5V
C303
0.1uF 10%
X7R 25V
SMD0603
COMMON
GND

5V
U300B
IC 74ACT08 SO14
5V
C1HS
IC_SO14_150MIL
SYNC_DRIVER

R304
SYNC_DRIVER
2 33R 5%
SMD0603
C1HSBUF

L303
SMD0603
COMMON
1 2 150_220 5%
Ferrite 300mA
MCRT1HSYNC

C304
22p 5%
COG 50V
SMD0603
COMMON
GND

D302
5V 215mA 70V BAV99 IC_SOT23_123 SI2C_PROT
GND

R305
NO_SYNC_DRIVER
33R 5%
SMD0603

5V
U300D
IC 74ACT08 SO14
5V
C1VS
IC_SO14_150MIL
SYNC_DRIVER

R306
SYNC_DRIVER
2 33R 5%
SMD0603
C1VSBUF

L304
SMD0603
COMMON
1 2 150_220 5%
Ferrite 300mA
MCRT1VSYNC

C305
22p 5%
COG 50V
SMD0603
COMMON
GND

D303
5V 215mA 70V BAV99 IC_SOT23_123 SI2C_PROT
GND

R307
NO_SYNC_DRIVER
33R 5%
SMD0603

U100D

AH7 I2C1SCL CRTHSYNC AJ9 CRT1HSYNC
AH6 I2C1SDA CRTVSYNC AJ8 CRT1VSYNC

Place close together

A3.3V
L306
SMD0805
COMMON
1 2 150_220 5%
Ferrite 300mA

Place close to GPU

Place closest to GPU

AK11 DAC1VDD DACVDD
AJ11 DAC1VREF DACVREF
AJ10 DAC1RSET DACRSET

DACRED AH11 DAC1RED
DACGREEN AG12 DAC1GREEN
DACBLUE AF11 DAC1BLUE

Route 37.5Ohm

C306
4.7u 10%
X5R 6.3V
SMD0805
COMMON

C307
4700pF 10%
X7R 50V
SMD0603
COMMON

C308
470pF 5%
NPO 50V
SMD0603
COMMON

C309
0.01u 10%
X7R 50V
SMD0603
COMMON

R311
113R 1%
SMD0603
COMMON

L319
SMD0603
COMMON
1 2 0.082uH F1R
Ferrite

R310
75R 1%
SMD0603
COMMON
GND

C329
10p 5%
COG 50V
SMD0603
GND

L305
SMD0603
COMMON
1 2 0.082uH 5%
Ferrite 3A

C330
22p 5%
COG 50V
SMD0603
GND

C331
10p 5%
COG 50V
SMD0603
GND

A3.3V
D304
215mA 70V BAV99 IC_SOT23_123 RGB_PROT
GND

MDAC1RED

AK9 DACGND
GND

(7) I2C0SCL I2C0SCL AF9 CRT2HSYNC AE4 CRT2HSYNC (7)
(7) I2C0SDA I2C0SDA AG8 CRT2VSYNC AD5 CRT2VSYNC (7)

L309
SMD0805
COMMON
1 2 150_220 5%
Ferrite 300mA

AF1 DAC2VDD DAC2VDD DAC2RED AD4 DAC2RED DAC2RED (7,9)
AE2 DAC2VREF DAC2VREF DAC2GREEN AE3 DAC2GREEN DAC2GREEN (7,9)
AD2 DAC2RSET DAC2RSET DAC2BLUE AD3 DAC2BLUE DAC2BLUE (7,9)

Route 37.5Ohm

C310
4.7u 10%
X5R 6.3V
SMD0805
2NDVGA:DVI-I

C311
4700pF 10%
X7R 50V
SMD0603
COMMON

C312
470pF 5%
NPO 50V
SMD0603
2NDVGA:DVI-I

C313
0.01u 10%
X7R 50V
SMD0603
2NDVGA:DVI-I

R315
124R:124R:63.4R:63.4R
1%
SMD0603
2NDVGA:DVI-I:TV_OLT:VIVO

L320
SMD0603
COMMON
1 2 0.082uH F1G
Ferrite

R309
75R 1%
SMD0603
COMMON
GND

C332
10p 5%
COG 50V
SMD0603
NO_STUFF
GND

L307
SMD0603
COMMON
1 2 0.082uH 5%
Ferrite 3A

C333
22p 5%
COG 50V
SMD0603
NO_STUFF
GND

C334
10p 5%
COG 50V
SMD0603
GND

A3.3V
D305
215mA 70V BAV99 IC_SOT23_123 RGB_PROT
GND

MDAC1GREEN

AD1 DAC2GND
GND

L310
SMD0805
COMMON
1 2 150_220 5%
Ferrite 300mA

AK7 PLLVDD PLLVDD

L321
SMD0603
COMMON
1 2 0.082uH F1B
Ferrite

R308
75R 1%
SMD0603
COMMON
GND

C335
10p 5%
COG 50V
SMD0603
NO_STUFF
GND

L308
SMD0603
COMMON
1 2 0.082uH 5%
Ferrite 3A

C336
22p 5%
COG 50V
SMD0603
NO_STUFF
GND

C337
10p 5%
COG 50V
SMD0603
GND

A3.3V
D306
215mA 70V BAV99 IC_SOT23_123 RGB_PROT
GND

MDAC1BLUE

C316
4.7u 10%
X5R 6.3V
SMD0805
COMMON
GND

C317
4.7u 10%
X5R 6.3V
SMD0805
COMMON

C318
4700pF 10%
X7R 50V
SMD0603
COMMON

C319
470pF 5%
NPO 50V
SMD0603
COMMON

R316
10k 5%
SMD0603
COMMON

AH10 XTALSSIN XTALSSIN XTALOUTBUFF AG10 XTALOUTBUFF
AH9 XTALIN XTALIN XTALOUT AF10 XTALOUT

IC NV17 GPU BGA604
ic_nv17_bga604_1mm_skt
NV17-128D

Y300
XTAL_2P_HC49SM
XTAL_14:XTAL_27
1 2 14.318MHz:27MHz
50/100/5ppm:10/10/5ppm

C320
18p 5%
COG 50V
SMD0603
XTAL_14:XTAL_27
GND

Place close together

C321
18p 5%
COG 50V
SMD0603
XTAL_14:XTAL_27
GND

Place in ouput filter section

A3.3V
C314
4.7u 10%
X5R 6.3V
SMD0805
COMMON
GND

5V
C315
4.7u 10%
X5R 6.3V
SMD0805
COMMON
GND

P300
F RA VESA BLUE IRT
CON_15PF_DSUB_RA
COMMON
6 11 7 1 12 2 13 3 8 9 4 14 10 5 15

CGND

A3.3V

R801 1 2 0R 5% IFP0AVDD
NO_STUFF SMD0805

C800
100R 1%
Resistor NULL
SMD0603
COMMON
GND

R800 1 2 0R 5% IFP0BVDD
NO_STUFF SMD0805

C801
100R 1%
Resistor NULL
SMD0603
COMMON

STUFFED WITH
100R TO SHUT
DOWN

C802
0.1UF 10%
X7R 16V
SMD0603
NO_STUFF

R803 2 1k 5% IFP0RSET
COMMON SMD0603

GND

R802 1 2 0R 5% IFP0PLLVDD
NO_STUFF SMD0805

C803
100R 1%
Resistor NULL
SMD0603
COMMON

C807
4.7UF 10%
X5R 6.3V
SMD0805
NO_STUFF
GND

GND

A3.3V

L800
SMD0805 1 2 0R 5% IFP1VDD
NO_STUFF NULL
Resistor

C804
100R
SMD0603
COMMON
1%

C805
0.1UF 10%
X7R 16V
SMD0603
NO_STUFF

R804 2 1k 1% IFP1RSET
COMMON SMD0603

L801
SMD0805 1 2 0R 5% IFP1PLLVDD
NO_STUFF NULL
Resistor

C806
4.7UF 10%
X5R 6.3V
SMD0805
NO_STUFF
GND

GND

R805
100R 1%
SMD0603
COMMON

GND

U100E

IFP0IOAVDD Y1
IFP0IOBVDD AC1
IFP0VREF W2
IFP0RSET V1

IFP0IOGND W5

IFP0PLLVDD W1

IFP0PLLGND AB5

IFP1IOVDD U1
IFP1VREF T2
IFP1RSET R1

IFP1IOGND T5

IFP1PLLVDD T1

IFP1PLLGND V4

TXD0# V2
TXD0 V3
TXD1# W3
TXD1 W4
TXD2# Y2
TXD2 Y3
TXD3# AA1
TXD3 AA2
TXD4# AA3
TXD4 AA4
TXD5# AB2
TXD5 AB3
TXD6# AC2
TXD6 AC3
TXD7# AB4
TXD7 AC4
TXC0# U4
TXC0 U5
TXC1# Y4
TXC1 Y5

TXD8# R5
TXD8 R4
TXD9# T3
TXD9 T4
TXD10# U2
TXD10 U3
TXC2# R2
TXC2 R3

I2C2SDA AH8
I2C2SCL AJ7

GPIO7 J5
GPIO6 A3
GPIO5 A5
GPIO4 B6
GPIO3 C7
GPIO2 D7
GPIO1 E8
GPIO0 B5

IC NV17 GPU BGA604
ic_nv17_bga604_1mm_skt
NV17-128D

TESTPIN TESTPIN TESTPIN TESTPIN TESTPIN TESTPIN TESTPIN TESTPIN
P4 P3 P1 P8 P7 P6 P5 P2

TESTPIN TESTPIN TESTPIN TESTPIN TESTPIN TESTPIN TESTPIN TESTPIN TESTPIN TESTPIN TESTPIN
P9 P18 P17 P11 P14 P12 P19 P15 P16 P10 P13 P30

TESTPIN TESTPIN TESTPIN TESTPIN TESTPIN TESTPIN TESTPIN TESTPIN
P26 P22 P21 P20 P27 P23 P24 P25

TESTPIN TESTPIN TESTPIN TESTPIN TESTPIN TESTPIN TESTPIN
P42 P40 P43 P45 P44 P41 P46

I2C2SDA (9,12)
I2C2SCL (9,12)

3.3V

NO_STUFF
R4730
2.2k 5%
SMD0603
NO_STUFF

M1
Performance GPU
FANSINK
FAN

M2
HEATSINK_NV10
PASSIVE_HS
Passive

M3
BRACKET 1P
brkt_adb15_bdin9_cdvi_cdb15l
BRCKT_VGA_TV_DVI:BRCKT_VGA_TV_VGA:BRCKT_VGA_TV:BRCKT_VGA
151-10000-0004-000:151-10000-0006-000:151-10000-0002-000:151-10000-0001-000

CGND

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NV17_DVI-I
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(6) DDC5V DDC5V

L311
SMD0805 1 2 220R 5%
2NDVGA:DVI:DVI-I Ferrite 3A

DDC2VCC

C322
220p 5%
NPO 50V
SMD0603
2NDVGA:DVI:DVI-I
GND

5V R317
2NDVGA:DVI:DVI-I 1 2 2.2k 5%
SMD0603

(6) I2C0SDA I2C0SDA R318 1 2 33R 5%
2NDVGA:DVI:DVI-I SMD0603 TI2C0SDA

L312
SMD0603 1 2 150_220 5%
2NDVGA:DVI:DVI-I Ferrite 300mA

MI2C0SDA

C323
220p 5%
NPO 50V
SMD0603
2NDVGA:DVI:DVI-I
GND

5V 2 D307 1
215mA 70V
BAV99
IC_SOT23_123
2NDSI2C_PROT
GND

5V R319
2NDVGA:DVI:DVI-I 1 2 2.2k 5%
SMD0603

(6) I2C0SCL I2C0SCL R320 1 2 33R 5%
2NDVGA:DVI:DVI-I SMD0603 TI2C0SCL

L313
SMD0603 1 2 150_220 5%
2NDVGA:DVI:DVI-I Ferrite 300mA

MI2C0SCL

C324
220p 5%
NPO 50V
SMD0603
2NDVGA:DVI:DVI-I
GND

5V 2 D308 1
215mA 70V
BAV99
IC_SOT23_123
2NDSI2C_PROT
GND

5V
U300C
IC 74ACT08 SO14
5V
9
8 C2HS R321 1 2 33R 5%
10 SYNC_DRIVER2 SMD0603
IC_SO14_150MIL
SYNC_DRIVER
GND

L314
SMD0603 1 2 150_220 5%
2NDVGA:DVI:DVI-I Ferrite 300mA

MCRT2HSYNC

C325
22p 5%
COG 50V
SMD0603
2NDVGA:DVI-I
GND

5V 2 D309 1
215mA 70V
BAV99
IC_SOT23_123
2NDSI2C_PROT
GND

(6) CRT2HSYNC CRT2HSYNC R322 1 2 33R 5%
SMD0603
NO_SYNC_DRIVER2

5V
U300A
IC 74ACT08 SO14
5V
1
2 C2VS R323 1 2 33R 5%
3 SYNC_DRIVER2 SMD0603
IC_SO14_150MIL
SYNC_DRIVER
GND

L315
SMD0603 1 2 150_220_0.082uH 5%
2NDVGA:DVI-I Ferrite 300mA

MCRT2VSYNC

C326
22p 5%
COG 50V
SMD0603
2NDVGA:DVI-I
GND

5V 2 D310 1
215mA 70V
BAV99
IC_SOT23_123
2NDSI2C_PROT
GND

(6) CRT2VSYNC CRT2VSYNC R324 1 2 33R 5%
SMD0603
NO_SYNC_DRIVER2

(6,9) DAC2RED DAC2RED

L322
SMD0603 1 2 0.082uH F2R
2NDVGA:DVI-I

L316
SMD0603 1 2 0.082uH
Ferrite

MDAC2RED

C338
10p 5%
COG 50V
SMD0603
GND

C339
22p 5%
COG 50V
SMD0603
GND

C340
10p 5%
COG 50V
SMD0603
GND

A3.3V D311
215mA 70V
BAV99
IC_SOT23_123
2NDVGA_RGB_PROT
GND

(6,9) DAC2GREEN DAC2GREEN

L323
SMD0603 1 2 0.082uH F2G
2NDVGA:DVI-I

L317
SMD0603 1 2 0.082uH
Ferrite

MDAC2GREEN

C341
10p 5%
COG 50V
SMD0603
GND

C342
22p 5%
COG 50V
SMD0603
GND

C343
10p 5%
COG 50V
SMD0603
GND

A3.3V D312
215mA 70V
BAV99
IC_SOT23_123
2NDVGA_RGB_PROT
GND

(6,9) DAC2BLUE DAC2BLUE

L324
SMD0603 1 2 0.082uH F2B
2NDVGA:DVI-I

L318
SMD0603 1 2 0.082uH
Ferrite

MDAC2BLUE

C344
10p 5%
COG 50V
SMD0603
GND

C345
22p 5%
COG 50V
SMD0603
GND

C346
10p 5%
COG 50V
SMD0603
GND

A3.3V D313
215mA 70V
BAV99
IC_SOT23_123
2NDVGA_RGB_PROT
GND

CGND
P301
CON_15PF_DSUB_RA
F RA VESA BLUE IRT
COMMON

6
11
1
7
2
12
8
3
13
9
4
14
5
10
15

Place in
ouput filter
section

A3.3V
C327
4.7u 10%
X5R 6.3V
SMD0805
2NDVGA:DVI-I
GND

5V
C328
4.7u 10%
X5R 6.3V
SMD0805
2NDVGA:DVI-I
GND

Micro-Star International Co., LTD.

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(-------- SAA 7108 --------)

DECODER
SAA7114

ENCODER
SAA7102

PC-CODEC-7108E:SAA7102E:SAA7114E
VIVO:TV_OUT_PH:VIDCAP
IC_BGA156

IO CONNECTOR

P500
9-pin:4-pin:9-pin:3-pin
CON_S_VIDEO_9P_STD
VIVO:TV_OUT:VIDCAP:STEREO_OUT

U100F
NV17-P:NV17-GL-P
ic_nv17_bga604_1mm_skt
NV17-Pro:NV17-P-GL

Place south
west of
GPU.

DVOCLKIN   R2701 2   1 33R
C3715 4.7PF
GND

MS8866-0B

P70, NV17, 2M/4MX32 DDR, 32MB/64MB, RGB, TV-out, video capture, T-BIOS, Hardware Monitor, AGP4X

PCI DEVICE ID 0X0=0X171 FOR NV17-128D.

HISTORY:

X00:
  first version for layout start. No video capture, no stereo. NO DRC CHECK.

X01:
  fixed PCB footprints for IC_SO14_150MIL and CON_DVI-I_RA
  added end-termination r-packs for address-status-bus
  changed RGB filter to integrated 5-pole only
  added video capture, BIOS, Strapping
  changed RefDes
  NO DRC CHECK

X02:
  added missing end termination for FBBAx
  changed stereo 3pin header
  added clamp diodes for TV-out and video capture
  changed topology for 2nd DDC (VGA / DVI)
  NO DRC CHECK

X03:
  splitted analog/digital suply for SAA7113 (no component change)
  Fixed some RefDes
  Changed the strapping resistors cases to 0402
  NO DRC CHECK

X04:
  changed C617 to SMD0603
  changed U502 and U503 to TSSOP14
  added CKE connection to the memories
  added D505 to the stereo section
  changed L501, L502, L503 to 0603
  NO DRC CHECK

X05:
  changed U601 to SOT223-DPAK-D2PAK
  added bracket
  changed L600 to IND_CDR73
  added VIP connector
  NO DRC CHECK

X06:
  deleted VIP
  changed TPs to HOLE_48C28P
  changed switcher gate circuit (no component change)
  added C641 and C642 to the linear voltage regulator
  pinswap of memory termination
  NO DRC CHECK

X07:
  deleted page 10: 5.b ViVo
  changed filter topology for RGB
  added return traces for RGB
  NO DRC CHECK

X08:
  added TV filter caps with reference to GND (C511,C517,C522)
  separated RGB returns (NOTE: there will be a change for DAC2)
  NO DRC CHECK

X09:
  added net names to unused panel signals (test points)
  NO DRC CHECK

X10:
  added decoupling for DVO rail (C529 and C530)
  added GND connection to pin 1 of U700
  added R520 pull down for DVOCLKIN
  DRC CHECK DONE

X11:
  changed caps in power section to the combined footprints

X12:
  data bus swappings

X13:
  swapped CLKs for U201 and U202

X14:
  connected the RGB returns of VGA2 together

X15:
  update materials

X16:
  update stuffings

X17-A01:
  release A01
  changed DVOVDD from VID3.3V to A3.3V
  add linear regulator for NV17's VDD33
  connected the IFP-RSETs to GND
  deleted C134 and C135

X18:
  change to target release A02
  changed I2C assignments
  added I2C filter components for ViVo (L506,L507,R521-R524,D506,D507,C531,C532)

X19:
  added R243-R250 for clock pull-up.

X20-A02:
  material changes.

X21-A03:
  fixed values and descriptions for R609, R613 and C640
  changed the RGB filter topology:
  - delete R325-R330
  - connect all DACRTN to GND
  - move the 75R termination resistors to the connector
  changed RGB clamping to A3.3V
  add testpoint net XTALOUTBUFF
  changed XTAL-load caps C320 and C321 to 18pF
  removed obsolete 0603 0Ohm resistors
  NO_STUFFed the stereo 3-pin header.

X22-A03:
  changed bulk decoupling in VGA section from 3.3V to A3.3V
  fixed DAC1BLUE (net name was missing)

X23-A03:
  changed VDD33 to A3.3V

X24-A03:
  added C643 for memory core decoupling

X25-A03:
  changed the long body VGA connector to a three pin type
  changed C425 connection for fan decoupling
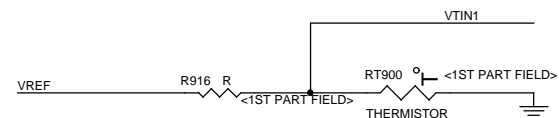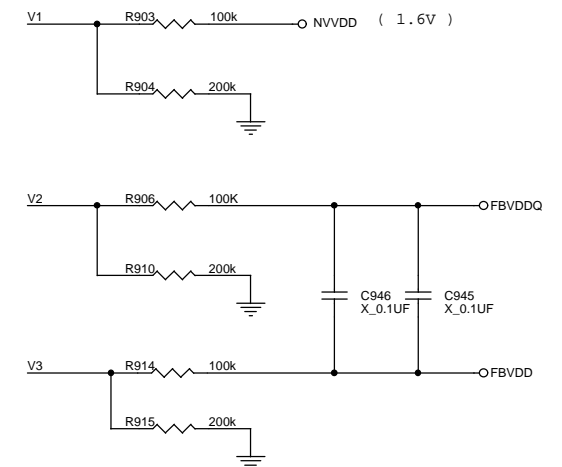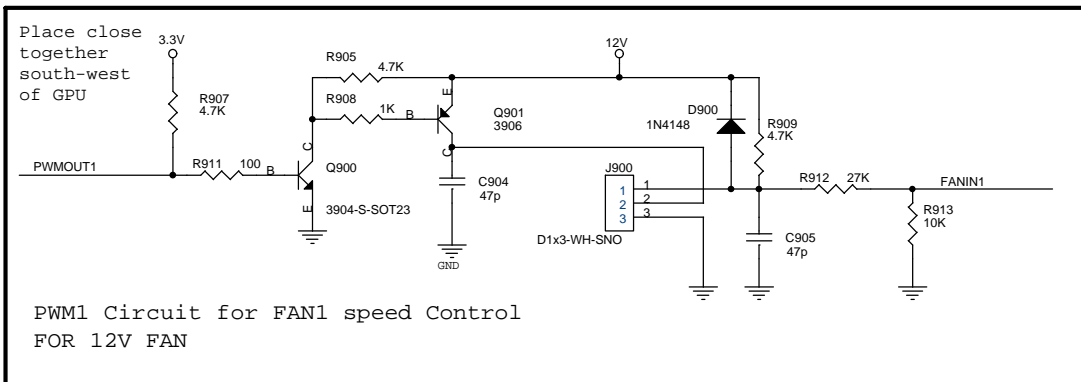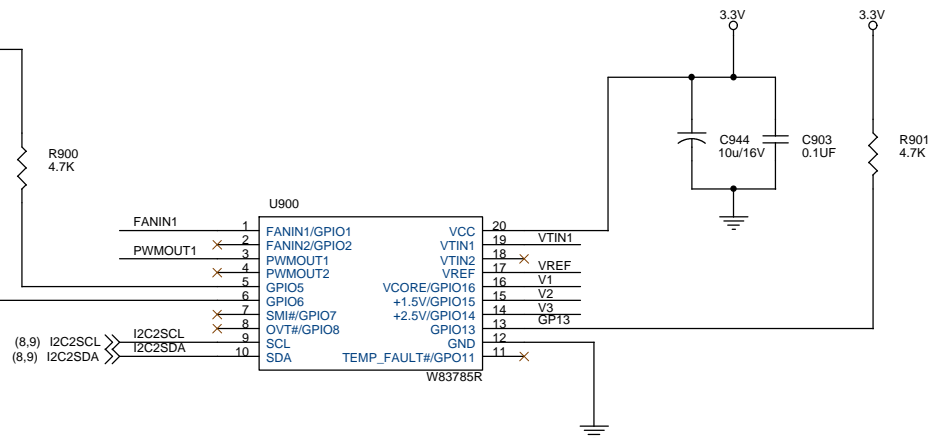
Stuffing Options	Meaning
COMMON	common components for all skus
NO_STUFF	no assembly at all
XTAL_27	stuff the 27MHz xtal for the GPU
XTAL_14	stuff the 14.318MHz xtal for the GPU
VIVO	stuff video I/O
VIDCAP	stuff video capture
TV_OUT	stuff TV-out
DVI-I	stuff the DVI-I option
DVI	stuff the DVI-D option
2NDVGA	stuff a second VGA
NO_DVI	don't stuff any DVI
SYNC_DRIVER2	stuff the termination resistors for the DACB syncs
SYNC_DRIVER	stuff the sync driver chip
NO_SYNC_DRIVER2	bypass the sync driver for the DAC B syncs
NO_SYNC_DRIVER	bypass the sync driver for the DAC A syncs
STEREOSYNCS	stuff the switchable stereo sync circuit
STEREOSYNC2	sync stereo to DAC B
STEREOSYNC1	sync stereo to DAC A
STEREO	stuff the generic stereo circuit
SI2C_PROT	stuff the protection diodes for syncs and I2C at DAC A
RGB_PROT	stuff the protection diodes for RGB at DAC A
2NDVGA_RGB_PROT	stuff the protection diodes for RGB at DAC B
2NDSI2C_PROT	stuff the protection diodes for syncs and I2C at DAC B
SET_NVVDD_ISL	set NVVDD voltage at Intersil switcher
SET_NVVDD_IRU	set NVVDD voltage at IR/Uniseml switcher
SET_FBVDDQ_ISL	set FBVDDQ voltage at Intersil switcher
SET_FBVDDQ_IRU	set FBVDDQ voltage at IR/Uniseml switcher
NO_1117	bypass the A3.3V regulator to AGP3.3V
ISL	stuff the Intersil switcher
IRU	stuff the IR/Unisem switcher
FBVDD_3.3	connect FBVVDD with AGP3.3V
FBVDD_2.5	connect FBVVDD with FBVDDQ
1117_ADJ	stuff the adjustable regulator for A3,3V
1117	stuff the fixed regulator for A3,3V
PASSIVE_HS	have passive heatsink
FAN	fan sink and components
BRCKT_VGA_TV_VGA	Bracket VGA-TV-VGA
BRCKT_VGA_TV_DVI	Bracket VGA-TV-DVI
BRCKT_VGA_TV	Bracket VGA-TV
BRCKT_VGA	Bracket VGA
MEMSTRAP1111	strap memory to 1111
MEM-64B	stuff 64 bit memory - 2pcs
MEM-128B	stuff 128 bit memory - 4pcs
NV17-128D	stuff NV17-128D

140-10070-0000-A03
602-10070-0000-A03

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MS-8866-P70-A03

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CE2-CE17 for EMI

FBVDDQ   FBVDD
2.8V

CE2
220PF
SMD0603
NPO
5%
50V

CE3
220PF
SMD0603
NPO
5%
50V

CE4
220PF
SMD0603
NPO
5%
50V

CE5
220PF
SMD0603
NPO
5%
50V

3.3V

CE8   CE9   CE10   CE11   CE12
0.1UF 10%   0.1UF 10%   0.1UF 10%   0.1UF 10%   0.1UF 10%
X7R   16V   X7R   16V   X7R   16V   X7R   16V   X7R   16V
SMD0603   SMD0603   SMD0603   SMD0603   SMD0603
NO_STUFF   NO_STUFF   NO_STUFF   NO_STUFF   NO_STUFF

GND

5V

CE13   CE14   CE15   CE16   CE17
0.1UF 10%   0.1UF 10%   0.1UF 10%   0.1UF 10%   0.1UF 10%
X7R   16V   X7R   16V   X7R   16V   X7R   16V   X7R   16V
SMD0603   SMD0603   SMD0603   SMD0603   SMD0603
NO_STUFF   NO_STUFF   NO_STUFF   NO_STUFF   NO_STUFF

GND

NVVDD

CE18   CE19   CE20   CE21   CE22
0.1UF 10%   0.1UF 10%   0.1UF 10%   0.1UF 10%   0.1UF 10%
X7R   16V   X7R   16V   X7R   16V   X7R   16V   X7R   16V
SMD0603   SMD0603   SMD0603   SMD0603   SMD0603
NO_STUFF   NO_STUFF   NO_STUFF   NO_STUFF   NO_STUFF

FBVDDQ

12V

CE6
0.1UF 10%
X7R   16V
SMD0603
NO_STUFF

GND

A3.3V   3.3V

CE7
0.1UF
NO_STUFF
SMD0603
X7R
10%
16V

NVVDD

CE23   CE24
180p   5%   180p   5%
NPO   50V   NPO   50V
SMD0603   SMD0603
NO_STUFF   NO_STUFF

GND

FBVDDQ

CE25   CE26
220PF 5%   220PF 5%
NPO   50V   NPO   50V
SMD0603   SMD0603
NO_STUFF   NO_STUFF

GND

3.3V

R902
4.7K

R900
4.7K

3.3V

3.3V

C944
10u/16V

C903
0.1UF

R901
4.7K

U900

	FANIN1/GPIO1	1		20	VCC	
FANIN1	FANIN2/GPIO2	2		19	VTIN1	VTIN1
PWMOUT1	PWMOUT1	3		18	VTIN2	
	PWMOUT2	4		17	VREF	VREF
	GPIO5	5		16	V1	V1
	GPIO6	6		15	V2	V2
	SMI#/GPIO7	7		14	V3	V3
	OVT#/GPIO8	8		13	GPIO13	GP13
(8,9) I2C2SCL	SCL	9		12	GND	
(8,9) I2C2SDA	SDA	10		11	TEMP_FAULT#/GPO11	

VCORE/GPIO16
+1.5V/GPIO15
+2.5V/GPIO14

W83785R

I2C2SCL
I2C2SDA

VOLTAGE SENSING CIRCUIT

V1   R903   100k   NVVDD (1.6V)
      R904   200k

V2   R906   100K   FBVDDQ
      R910   200k
              C946   C945
              X_0.1UF   X_0.1UF

V3   R914   100k   FBVDD
      R915   200k

Place close
together
south-west
of GPU

3.3V

R905   4.7K

R907
4.7K

R908   1K   B

Q901
3906

12V

D900
1N4148

R909
4.7K

PWMOUT1   R911   100   B   Q900

C   Q900

E   3904-S-SOT23

C904
47p

GND

J900
1
2
3

D1x3-WH-SNO

R912   27K   FANIN1

C905
47p

R913
10K

PWM1 Circuit for FAN1 speed Control
FOR 12V FAN

VTIN1

VREF   R916   R

<1ST PART FIELD>

RT900   <1ST PART FIELD>

THERMISTOR

TEMPERATURE SENSING CIRCUIT

Micro-Star International Co., LTD.

MS-8866-P70-A03

H/W MONITOR

Size B
Document Number
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Analog 3.3V

U600 (IRU3033, IC_SO6, IRU)

Pin	Signal
3	V12 — V12SW 2
7	DRV2 — DRV1 8
6	VFB2 — VFB1 1
5	GND — VHyst 4

12V — R600 10R 5% SMD0603 IRU — F12V
C600 1uF 10% X7R 25V SMD0805 IRU — GND
R603 1 → 2 470R 5% SMD0603 IRU — L_GATE / L_GATE_IRU
12V — C604 1uF 10% X7R 25V SMD0805 IRU — GND
S_GATE, SW_FB, SW_COMP, L_FB

3.3V — R601 1 → 2 0R 5% NO_1117 SMD0805
U601 (EZ1117-3.3:EZ1117-ADJ, IC_DPAK_223, 1117:1117_ADJ) VIN VOUT TAB — A3.3V
5V — C601 22uF 20% ALE 80mA 1.8Ohm CAP_SANYO_CASE_B 1117:1117_ADJ — GND
C605 22uF 20% ALE 80mA 1.8Ohm 10V CAP_SANYO_CASE_B NO_STUFF — GND
R602 100R 1% SMD0603 1117_ADJ
R605 0R:162R 5%:1% SMD0603 1117:1117_ADJ — GND
Output cap C637: 0.5 Ohm < ESR < 5 Ohm
C602 47uF 20% 6.3V ALE 150mA 0.76Ohm CAP_ALE_SMD_5_0 COMMON — GND
C603 47uF 20% 6.3V ALE 150mA 0.76Ohm CAP_ALE_TH_2_0_5 COMMON — GND
Can be placed on same location. Alternate stuffing

For adjustable regulators:
$A3.3V=1.25V*(1+R605/R602)+Iadj*R605$
$Iadj=55uA-120uA$

The inductor can be placed on top of the resistors. Alternative stuffing

3.3V — C611 1000uF 20% ALE 6.3V 0.45A 170mO CAPS_SMD_8_0-10_0_SANYO COMMON — GND
C612 470uF 20% ALE 6.3V 0.56A 110mO CAPS_TH_3_5_8-5_0_10 NO_STUFF — GND GND
Can be placed on same location. Alternative stuffing

R606 1 → 2 0R 5% COMMON SMD0805
R607 1 → 2 0R 5% COMMON SMD0805
R608 1 → 2 0R 5% COMMON SMD0805
L600 1.2uH 20% CHKM1052 Troic 8A NO_STUFF

Can be placed on same location. Alternative stuffing. Place close to Q601.
C641 100uF 20% ALE 230mA 0.44Ohm CAP_ALE_SMD_6_3 NO_STUFF — GND
C642 N/A N/A ALE N/A N/A CAP_ALE_TH_2_0_5 NO_STUFF — GND

C606 470uF 20% ALE-EX 6.3V 2.09A 25mO CAPS_SMD_8_0-10_0_SANYO COMMON — GND
C608 N/A OSCON N/A N/A CAPS_TH_3_5_8-5_0_10 NO_STUFF — GND GND
C616 4u7 10% X5R 6.3V SMD0805 COMMON — GND
Can be placed on same location. Alternate stuffing

5V — D600 200mA 25V BAT54ALT1 IC_SOT23_123 ISL
C617 1uF 20% X5R 16V SMD0603 ISL — GND
ISL_BOOT

NIKO-P3056LD-S-TO252 Q601 G
FBVDDQ — **FBVDDQ**
C627 1500uF 20% ALE 6.3V 0.67A 90mO CAPS_SMD_8_0-10_0_SANYO COMMON — GND
C628 820uF 20% ALE 6.3V 0.8A 85mO CAPS_TH_3_5_8-5_0_10 NO_STUFF — GND GND
Can be placed on same location. Alternative stuffing

U602 (ISL6528, IC_SO8, ISL)
Pin	Signal
1	VCC — BOOT 7
3	DRV2 — UGate 8
4	VFB2 — FB 6
5	GND — COMP

R609 1 → 2 6.8k 5% IRU SMD0603 IRU
C618 470p 5% SMD0603 COG 50V
TP603 L_FB FBVDDQ HOLE_48C28P NO_STUFF R610 1 → 2 9.09k:180 1% SMD0603 SET_FBVDDQ_ISL:SET_FBVDDQ_IRU
ISL6528: FBVDDQ=0.8V*(1+R610/R612)
R610 8.25k 9.09k
R612 3.83k 4.02k
FBVDDQ 2.52V 2.61V
IRU3033 FBVDDQ=1.25V*(1+R610/R612)
R613 1k 5% SMD0603 IRU — GND
R612 4.02k:180 1% SMD0603 SET_FBVDDQ_ISL:SET_FBVDDQ_IRU
TP605 GND HOLE_48C28P NO_STUFF

TP604 L_FB HOLE_48C28P NO_STUFF
C621 0.047uF 10% X7R 25V SMD0603 ISL — GND
5V — VCC

Q600 45N02LD TO252 — PHASE
R604 1 → 2 10R 5% SMD0603 SG IRU:ISL
D601 3A 20V SS32 CASE_403A_03_B COMMON — GND
C619 0.1uF 10% X7R 25V SMD0603 COMMON — GND
C632 N/A N/A ALE N/A N/A SMD0805 NO_STUFF
C633 N/A N/A ALE N/A N/A SMD0603 NO_STUFF — GND
R611 N/A N/A X7R 6.3V SMD0603 NO_STUFF
R614 N/A N/A SMD0603 NO_STUFF

L601 4.7uH 20% Troic 9A
FB4 COMMON
NVVDD

NVVDD=1.6V

C620 4u7 10% X5R 6.3V SMD0805 COMMON — GND
TP600 NVVDD HOLE_48C28P NO_STUFF
R615 1k 1% SMD0603 SET_NVVDD_ISL:SET_NVVDD_IRU
TP601 SW_FB HOLE_48C28P NO_STUFF

C622 1500uF 20% ALE 6.3V 0.67A 90mO CAPS_SMD_8_0-10_0_SANYO COMMON — GND
C623 820uF 20% ALE 6.3V 0.8A 85mO CAPS_TH_3_5_8-5_0_10 NO_STUFF — GND GND
Can be placed on same location. Alternative stuffing

C639 SMD0603 3300p:0R 20%:5% X7R:NULL 50V:NULL ISL:IRU — SW_CMP
R616 1 → 2 16k2:270k 5% 1%:5% SMD0603 ISL:IRU
C640 SMD0603 0.033u:10p 5% COG 50V ISL:IRU — SW_COMP
R617 1k:3.57k 1% SMD0603 SET_NVVDD_ISL:SET_NVVDD_IRU
TP602 GND HOLE_48C28P NO_STUFF
ISL6528: NVVDD=0.8V*(1+R615/R617)
IRU3033 NVVDD=1.25V*(1+R615/R617)

C634 1500uF 20% ALE 6.3V 0.67A 90mO CAPS_SMD_8_0-10_0_SANYO COMMON — GND
C635 820uF 20% ALE 6.3V 0.8A 85mO CAPS_TH_3_5_8-5_0_10 NO_STUFF — GND GND
Can be placed on same location. Alternative stuffing

FBVDD

FBVDDQ — FBVDD — 3.3V
FBVDD=FBVDDQ   **FBVDD=AGP3.3V**
R618 FBVDD_2.5 1 → 2 0R 5% SMD0805
R620 FBVDD_2.5 1 → 2 0R 5% SMD0805
R622 FBVDD_2.5 1 → 2 0R 5% SMD0805
R624 FBVDD_2.5 1 → 2 0R 5% SMD0805
R619 FBVDD_3.3 1 → 2 0R 5% SMD0805
R621 FBVDD_3.3 1 → 2 0R 5% SMD0805
R623 FBVDD_3.3 1 → 2 0R 5% SMD0805
R625 FBVDD_3.3 1 → 2 0R 5% SMD0805
C643 100uF 20% ALE 16V 230mA 0.44Ohm CAP_ALE_SMD_6_3 COMMON — GND

3.3V

0	R700 NO_STUFF 10k 5% SMD0402	DVOD0	R701 COMMON 10k 5% SMD0402	PCI_AD_SWAP	0: REVERSED 1: NORMAL **default**
1	R702 NO_STUFF 10k 5% SMD0402	DVOD1	R703 COMMON 10k 5% SMD0402	SUB_VENDOR	0: system BIOS 1: adapter BIOS **default**
2	R704 NO_STUFF 10k 5% SMD0603	DVOD2	R705 COMMON 10k 5% SMD0603	RAM_CFG_0	[3:0] 1111: 4Mx32 DDR SDRAM, DQS per 32 bits, dll-on, low drive strength
3	R706 NO_STUFF 10k 5% SMD0603	DVOD3	R707 COMMON 10k 5% SMD0603	RAM_CFG_1	
4	R708 NO_STUFF 10k 5% SMD0603	DVOD4	R709 COMMON 10k 5% SMD0603	RAM_CFG_2	
5	R710 NO_STUFF 10k 5% SMD0603	DVOD5	R711 COMMON 10k 5% SMD0603	RAM_CFG_3	
6 22	R712 COMMON 10k 5% SMD0603 R714 NO_STUFF 10k 5% SMD0603	DVOD6 VIPD6	R713 NO_STUFF 10k 5% SMD0603 R715 COMMON 10k 5% SMD0603	CRYSTAL_0 CRYSTAL_1	[1:0] 00: 13.5MHz 01: 14.318MHz 10: 27MHz 11: unknown
7 8	R716 COMMON 10k 5% SMD0603 R718 COMMON 10k 5% SMD0603	DVOD7 DVOD8	R717 COMMON 10k 5% SMD0603 R719 COMMON 10k 5% SMD0603	TVMODE_0 TVMODE_1	[1:0] 00: SECAM 01: NTSC 10: PAL 11: VGA
9	R722 COMMON 10k 5% SMD0402	DVOD9	R723 NO_STUFF 10k 5% SMD0402	AGP4x	0: enabled **default** 1: disabled
11	R724 COMMON 10k 5% SMD0402	VIPD7	R725 NO_STUFF 10k 5% SMD0402	AGP_FW	0: enabled **default** 1: disabled
12 13 20 21	R726 NO_STUFF 10k 5% SMD0603 R728 COMMON 10k 5% SMD0603 R730 COMMON 10k 5% SMD0603 R732 COMMON 10k 5% SMD0603	VIPD4 VIPD5 VIPD3 DVOHSYNC	R727 COMMON 10k 5% SMD0603 R729 NO_STUFF 10k 5% SMD0603 R731 NO_STUFF 10k 5% SMD0603 R733 NO_STUFF 10k 5% SMD0603	PCI_DEVID_0 PCI_DEVID_1 PCI_DEVID_2 PCI_DEVID_3	[3:0] 0001: NV17-128D
14		DVOD11	R735 COMMON 10k 5% SMD0402	BUS_TYPE	0: PCI 1: AGP **default**
16 17 18 19	R736 COMMON 10k 5% SMD0402 R738 COMMON 10k 5% SMD0402 R740 COMMON 10k 5% SMD0402 R742 COMMON 10k 5% SMD0402	VIPD0 VIPD1 VIPHAD0 VIPHAD1	R737 NO_STUFF 10k 5% SMD0402 R739 NO_STUFF 10k 5% SMD0402 R741 NO_STUFF 10k 5% SMD0402 R743 NO_STUFF 10k 5% SMD0402	USER_0 USER_1 USER_2 USER_3	USER[0]=0: PC **default** USER[0]=1: MAC
29 30	R744 COMMON 10k 5% SMD0402 R746 COMMON 10k 5% SMD0402	DVOD10 VIPD2	R745 NO_STUFF 10k 5% SMD0402	ROMTYPE_0 ROMTYPE_1	[1:0] 00: parallel **default** 01: serial AT25F 10: serial SST45V **not supported** 11: serial future **not supported**

GND

CHANGE 0402 TO 0603

(9) DVOD[0:11]   DVOD[0:11]

VIPD[0:7]   VIPD[0:7] (9)

U700

DVOD0 12 A0	Q0 13 VIPD0
DVOD1 11 A1	Q1 14 VIPD1
DVOD2 10 A2	Q2 15 VIPD2
DVOD3 9 A3	Q3 17 VIPD3
DVOD4 8 A4	Q4 18 VIPD4
DVOD5 7 A5	Q5 19 VIPD5
DVOD6 6 A6	Q6 20 VIPD6
DVOD7 5 A7	Q7 21 VIPD7
DVOD8 27 A8	
DVOD9 26 A9	
DVOD10 23 A10	
DVOD11 25 A11	
(9) DVOVSYNC DVOVSYNC 4 A12	
(9) DVOHSYNC DVOHSYNC 28 A13	
(9) ROMA14 ROMA14 29 A14	NC 1
(9) ROMA15 ROMA15 3 A15	NC/A16 2
(9) DVODE DVODE 30 NC/A17	

3.3V

R748 10k SMD0603 NO_STUFF 5%

GND

(9) ROMCS_   ROMCS_   22 CE   VDD 32   3.3V

(9) VIPHAD0   VIPHAD0   24 OE

(9) VIPHAD1   VIPHAD1   31 WE   GND 16

C700 0.1u 10% X7R 25V SMD0603 COMMON

GND

IC FLASH 64KX8 3.3V PLCC32 3.3V IC_PLCC32 COMMON

Twin BIOS

3.3V

DVODE   1 JP500 2 3

D1x3-BK

GND