1. ALL RESISTANCE VALUES ARE IN OHMS, 0.1 WATT +/- 5%.
2. ALL CAPACITANCE VALUES ARE IN MICROFARADS.
3. ALL CRYSTALS & OSCILLATOR VALUES ARE IN HERTZ.

REV	ZONE	ECN	DESCRIPTION OF CHANGE	CK APPD DATE	ENG APPD DATE
E		396944	PRODUCTION RELEASED	08/26/05	?

SCHEM,MLB,PB15"
08/25/2005

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BOM OPTIONS (IN COMMON PARTS)

STUFF	NO STUFF
1_8V_MAXBUS	1_5V_MAXBUS
NO_SSCG	SSCG
5V_HD_LOGIC	3V_HD_LOGIC
NO_BBANG	BBANG
INT_2_5V_COLD	INT_2_5V_HOT
ATI_MEMIO_HI	ATI_MEMIO_LO
SOFT_MODEM	USB_MODEM
GPU_PWRMSR	EMI
GPU_SS	EXT_TMDS (BETTER/BEST)
VGA_BUFFER_RES	INT_TMDS (BEST128)
MMM	SUPERCAP
INT_TMDS (BETTER/BEST)	ADT7460
EXT_TMDS (BEST128)	
BACKUP_BATT	
ADT7467	

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
051-6680	1	SCHEM,MLB,PB15	SCH1	
820-1679	1	PCBF,MLB,PB15	PCB1	
826-4393	1	LABEL,PCB,28MM X 6MM	EEE:U3Z	LABEL_BST128
826-4393	1	LABEL,PCB,28MM X 6MM	EEE:U40	LABEL_BST64
826-4393	1	LABEL,PCB,28MM X 6MM	EEE:U41	LABEL_BTR

DIMENSIONS ARE IN MILLIMETERS
XX ±
X.XX ±
X.XXX ±
ANGLES °
DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

METRIC

DRAFTER		DESIGN CK	
ENG APPD		MFG APPD	
QA APPD		DESIGNER	
RELEASE		SCALE	NONE

MATERIAL/FINISH NOTED AS APPLICABLE

SIZE D

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TITLE
SCHEM,MLB,PB15

DRAWING NUMBER 051-6680 REV. E

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U51 INTREPID

J23 Ethernet Connector P.28
4 DATA PAIRS
U43 Ethernet PHY P.28
G/MII 3.3V 10/100/1000 8BIT TX 8BIT RX 125MHZ

J24 FW - A Connector P.30
2 DATA PAIRS @ 200MHZ
J20 FW - B Connector P.30
2 DATA PAIRS @ 400MHZ
U36 FireWire PHY P.29
1394 OHCI 3.3V 8BIT TX/RX 50MHZ

J13 ODD Connector P.26
EIDE
J12 HDD Connector P.26
UIDE

J15 SW MODEM Connector P.27
J3 LIO/Audio Connector P.27
I2S
I2C
I2C
U53/J1/J18 Fan Circuit P.27

J2 RUX Board Connector P.24
J19 ALS BOARD Connector P.24
J16 BACKUP BATTERY CONNECTOR P.33
C692 SUPERCAP P.33
J26 Battery Connector P.32
Power Supply & Charger P.32-36
J27 DC-In Connector P.32
J8 SLEEP LED P.24
SMBUS 3.3V

U15/U20/U58 MMM P.25
U41 BATTERY CURRENT SENSOR P.25

NOT USED

ETHERNET 10/100/1000 P.13	FIREWIRE 400 MB/S P.13	UATA 100 P.13	EIDE P.13	CARDSLOT P.13	I2S P.14	I2C P.13 P.14

NOT USED USB PORT A P.14
NOT USED USB PORT B P.14
NOT USED USB PORT C P.14
NOT USED USB PORT D P.14
USB PORT E P.14
USB PORT F P.14
MAXBUS P.8

SCCA P.14
VIA/PMU P.14
BOOTROM P.12
PCI 64BITS 33MHZ P.12
4X AGP P.12

J28 Serial Debug Connector P.27
U28 PMU P.31
SERIAL 5V
J5 CARDBUS Connector P.18
33MHZ 16/32 BITS 3.3V/5V
U8 TI PCI1510 CardBus Controller P.18
U11 BOOT ROM 1M X 8 P.9
J6 AIRPORT Connector P.26
PCI BUS 32BITS 33MHZ 3.3V

J3 BlueTooth (LIO) P.27
J10 SPIDEY P.24
MAXBUS 1.8V 167MHZ 32BIT ADDRESS 64BIT DATA

U56 APOLLO CPU (MPC7447) P.5-6
CPU PLL Config P.7
PMU

DDR MEMORY P.9
MEMORY BUS 2.5V 167MHZ 64BITS
U16/U18/U28/U27 2:1 DDR MUXES P.10
J25 DDR SDRAM DIMM 0
DDR SDRAM DIMM 1 SO-DIMM Connector P.11

AGP BUS 1.5V/3.3V 32BITS 66MHZ
U47 ATI M11 64MB P.19-22
MEMORY CH. A (INTERNAL MEM)
MEMORY CH. C (INTERNAL MEM)
MEMORY CH. B (INTERNAL MEM)
MEMORY CH. D (INTERNAL MEM)

U17 NEC USB2.0 EHCI HC P.17
J3 LEFT USB (VIA LIO) P.27
J17 RIGHT USB (VIA STATLER) P.27

J4 Inverter Connector P.23
LVDS
EDID (I2C)
S-VIDEO
COMPOSITE
TMDS (VIA SIL1162)
RGB
DDC
J14 LCD Panel Connector P.23
J21 S-Video Connector P.23
J22 DVI-I Connector P.23

SYSTEM BLOCK DIAGRAM

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SIZE D | DRAWING NUMBER 051-6680 | REV. E
SCALE NONE | SHT 2 OF 46

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POWER SYSTEM ARCHITECTURE

AC ADAPTER IN PG 32

INRUSH LIMITER PG 32

+24V_PBUS

1V20_REF - PG 33
>~13.44V TURNS-ON
<~13.44V SHUTS-OFF

RUN/SS
BUCK VCC REGULATOR (LTC1625) PG 33
AC: 12.8V
NO AC: BATTERY VOLTAGE
1625 NOT RUNNING
SHUTDOWN: RUNNING
SLEEP: RUNNING
RUN: RUNNING

+PBUS

RC AT 1M*0.047UF @ 24V
STARTS 2.0MSEC AFTER DCDC_EN_L BECOMES LOW

14V_PBUS

+3V_PMU LDO PG 33

+5V_MAIN
+3V_PMU
+4_6V_BU

+BATT

RUN/SS - 5V
TURNS ON AT >1V
<100UA ALLOWED
INTERNAL ZENER CLAMP TO 6V

MAIN 3V/5V DC/DC (LTC3707) PG 34

VCC STBYMD PGOOD

SHUTDOWN: STOPPED
SLEEP: RUNNING
RUN: RUNNING

INTERNAL ZENER CLAMP TO 6V
<100UA ALLOWED
TURNS ON AT >1V
RUN/SS - 3V

+5V_MAIN
3V_5V_OK

HOLDS BOTH RUN/SS AT GND WHEN IT'S CONNECTED TO GND
TURNS CONTROL TO RUN/SS WHEN IT'S OPEN

+3.3V_MAIN

RC AT 1M*0.1UF @ 24V
STARTS ~4.25MSEC AFTER DCDC_EN_L BECOMES LOW

NO INRUSH PROTECTION
WHEN ONLY BATTERY IS CONNECTED

+24V_PBUS

BACKUP BATTERY

14V_PBUS

14V CHARGES BACKUP BATTERY

24V IS OUTPUT ONLY FROM BACKUP BATTERY

CHARGER INPUT & BOOST OUTPUT PG 33

BACKUP BATTERY CIRCUIT CHARGES OFF +PBUS AND PREVENTS +PBUS AND +24V_PBUS FROM DROPPING BELOW 6V (UNTIL DRAINED)

BATTERY CHARGER (MAX1772) PG 32

DC/DC (LTC3411)

SHUTDOWN: STOPPED
SLEEP: STOPPED
RUN: RUNNING

PG 36

+1.8V_MAIN
MAXBUS

+BATT

3S 2P 18650 CELLS

NO INRUSH PROTECTION
WHEN ONLY BATTERY IS CONNECTED

BATTERY VOLTAGE FEED-IN PATH PG 32

+PBUS

BACKLIGHT INVERTER

+5V_MAIN

VCC
MAIN 2.5V/1.5V DC/DC (MAX1715) PG 36

SHUTDOWN: STOPPED
SLEEP: RUNNING
RUN: RUNNING

PGOOD

TURNS ON OUTPUT @ 2.4V ON1/ON2

MAP31 DDR CORE
MAP31 DDR I/O
DDR POWER

+2.5V_MAIN
1_5V_2_5V_OK
+1.5V_MAIN

INTREPID CORE
AGP I/O

+5V_MAIN

DCDC_EN_L

AFTER PMU IS UP AND RUNNING DCDC_EN_L WILL PULL ON1/ON2 LOW IN SHUTDOWN

+PBUS

+5V_MAIN

EXT_VCC
VCC
DC/DC (LTC1778)

SHUTDOWN: STOPPED
SLEEP: D3COLD
RUN: RUNNING

TURNS ON AS LOW AS 0.8V/TYP 1.5V
INTERNAL 1.2UA CURRENT SOURCE

RUN/SS PG 20

GPU_VCORE +1.2V

DCDC_EN
SLEEP
D3_COLD

GPU_VCORE SEQUENCING

1M & 0.1UF @14V, IT TAKES ~5.88MS TO START SWITCHER

1_5V_2_5V_OK
D3_HOT

DCDC_EN_L
D3_HOT

1_5V_2_5V_OK WILL NOT PULL LOW UNTIL +5V_MAIN TURNS ON
HOWEVER, 5V SHOULD TURN ON ~2.23MS AFTER DCDC_EN_L OR PMU_POWERUP_L BECOMES '1'; MUCH LESS THAN THE RC CHARGING AT INT_VCC (5V)

+PBUS

DCDC_EN
SLEEP

MAXBUS SEQUENCING

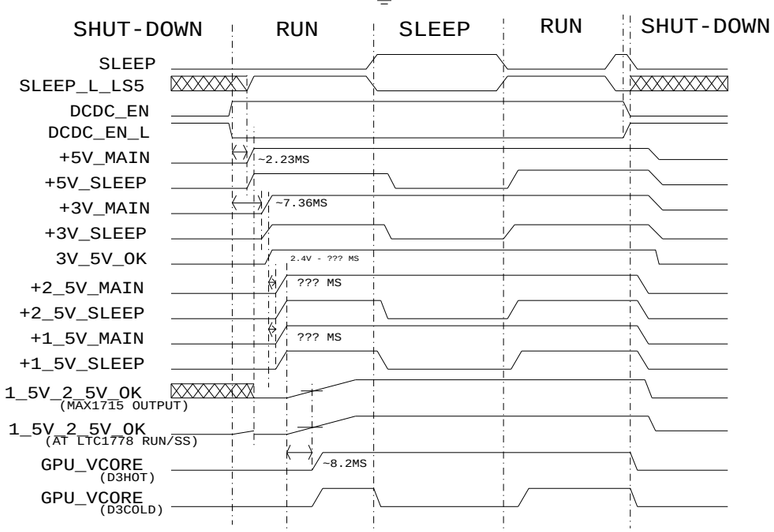
+5V_MAIN

VCC SHDN
DC/DC (MAX1717)

SHUTDOWN: STOPPED
SLEEP: STOPPED
RUN: RUNNING

PG 35

CPU_VCORE (+1.385V)



POWER BLOCK DIAGRAM

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SCALE	SHT	OF
NONE	3	46

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PCB SPECS

THICKNESS : 1.2 MM / 0.047 IN
1/2 OZ CU THICKNESS: 0.7 MILS
1.0 OZ CU THICKNESS: 1.4 MILS

IMPEDANCE : 50 OHMS +/- 10%
DIELECTRIC: FR-4
LAYER COUNT: 10
SIGNAL TRACE WIDTH: 4 MILS
SIGNAL TRACE SPACING: 4 MILS
PREPREG THICKNESS: 2-3 MILS

SEE PCB CAD FILES FOR MORE SPECIFIC INFO.

BOARD STACK-UP AND CONSTRUCTION

1-8-1 BLIND MICROVIA/20R10 BURIED VIA/20R10 TH VIA

1		SIGNAL (1/2 OZ + COPPER PLATING)
2	PREPREG (3 MIL)	SIGNAL (1/2 OZ)
3	PREPREG (3 MIL)	GROUND (1/2 OZ)
4	CORE (3 MIL)	SIGNAL (1/2 OZ)
5	PREPREG (5 MIL)	CUT POWER PLANE (1 OZ)
6	CORE (5 MIL)	CUT POWER PLANE (1 OZ)
7	PREPREG (5 MIL)	SIGNAL (1/2 OZ)
8	CORE (3 MIL)	GROUND (1/2 OZ)
9	PREPREG (3 MIL)	SIGNAL (1/2 OZ)
10	PREPREG (3 MIL)	SIGNAL (1/2 OZ + COPPER PLATING)

BOARD HOLES

CHASSIS MOUNTS

ASICS HEATSINK MOUNTS
ZT7 HOLE-VIA-20R10 LEFT CPU
ZT21 HOLE-VIA-20R10 UPPER RT GPU
ZT58 HOLE-VIA-20R10 LWR CPU
ZT59 HOLE-VIA-20R10 LWR RT GPU

I/O AREA
ZT85 HOLE-VIA-20R10 DVI — CHGND2
ZT86 HOLE-VIA-20R10 DVI 1394 — CHGND1
ZT16 HOLE-VIA-20R10 BATT. CHRGR — CHGND5

INVERTER
SH1 QG-583040 SHLD-SM — CHGND3

MECH. HOLES
ZT74 HOLE-VIA-20R10
ZT36 HOLE-VIA-20R10 — ZT301 SPN NO_TEST=TRUE
ZT23 HOLE-VIA-20R10 — ZT302 SPN NO_TEST=TRUE
ZT42 HOLE-VIA-20R10 — ZT10 SPN NO_TEST=TRUE

GROUND VIAS

ZT76 ZT28 ZT72 ZT69 ZT68 ZT64 ZT61 ZT38 ZT39 ZT40 ZT41 ZT46 ZT71 ZT78 ZT80
ZT50 ZT51 ZT52 ZT53 ZT57 ZT60 ZT82 ZT22 ZT17 ZT35 ZT45 ZT79 ZT81 ZT83 ZT49
ZT48 ZT47 ZT54 ZT55 ZT56 ZT84 ZT5 ZT15 ZT44 ZT4 ZT8 ZT6 ZT32 ZT3 ZT10
ZT11 ZT34 ZT20 ZT43 ZT70 ZT2 ZT9 ZT75 ZT73 ZT63 ZT77 ZT66 ZT62 ZT65 ZT13
ZT25 ZT19 ZT24 ZT67 ZT37 ZT29 ZT31 ZT1 ZT14 ZT12 ZT27 ZT26 ZT30 ZT33 ZT18

(all HOLE-VIA-20R10)

BOARD INFORMATION

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CPU_VCORE DECOUPLING NETWORK

CPU_VCORE_SLEEP 5 6 35 40 41

R38 470 5% 1/16W MF 402

C32 10uF 20% 6.3V CERM 805 · C59 10uF 20% 6.3V CERM 805 · C104 10uF 20% 6.3V CERM 805

C33 10uF 20% 6.3V CERM 805 · C58 10uF 20% 6.3V CERM 805 · C107 0.1uF 20% 10V CERM 402

C34 2.2uF 20% 10V CERM 805 · C62 2.2uF 20% 10V CERM 805 · C109 0.1uF 20% 10V CERM 402

C26 C39 C50 C45 C29 C55 C2 C108 0.1uF 20% 10V CERM 402

C30 C49 C31 C47 C27 C53 C103 C110 0.1uF 20% 10V CERM 402

C28 C48 C56 C46 C25 C54 C68 C1 0.1uF 20% 10V CERM 402

MORE 0805 10UF CAPS ON VCORE POWER SUPPLY PAGE (PG 32)

OMIT
XW34
SM

27 ADT7467_VCORE_MON 1 2

CPU_OVDD DECOUPLING NETWORK

MAXBUS_SLEEP 6 7 8 15 16 35 40

R89 470 5% 1/16W MF 402

C38 C88 C44 C20 C87 C61 C18 C89 C72 C10 C69 C81 C86 C9 C75 C73 C17 C82 0.1uF 20% 10V CERM 402

MPC7447 PULL-UPS

+1_5V_SLEEP · 1_5V_MAXBUS · R281 0 5% 1/16W MF 603

+1_8V_SLEEP · 1_8V_MAXBUS · R283 0 5% 1/16W MF 603

40 35 16 15 8 7 6 5 MAXBUS_SLEEP

8 5 CPU_TBEN	R24 10K 5% 1/16W MF 402	
5 CPU_CHKS_L	R4 10K 5% 1/16W MF 402	
5 CPU_SHD0_L	R25 10K 5% 1/16W MF 402	
5 CPU_SHD1_L	R46 10K 5% 1/16W MF 402	
5 CPU_MCP_L	R13 10K 5% 1/16W MF 402	
5 CPU_LSSD_MODE	R26 10K 5% 1/16W MF 402	
5 CPU_L2TSTCLK	R8 10K 5% 1/16W MF 402	
41 5 CPU_CHKSTP_OUT_L	R7 1K 5% 1/16W MF 402	
5 CPU_SRWX_L	R28 10K 5% 1/16W MF 402	
5 CPU_PMONIN_L	R27 10K 5% 1/16W MF 402	
5 CPU_EMODE1_L	R33 10K 5% 1/16W MF 402	
5 CPU_PULLUP	R3 1K 5% 1/16W MF 402	
41 7 6 5 CPU_HRESET_L	R20 10K 5% 1/16W MF 402	
31 5 CPU_SMI_L	R34 10K 5% 1/16W MF 402	
41 6 5 JTAG_CPU_TMS	R32 470 5% 1/16W MF 402	
41 6 5 JTAG_CPU_TDI	R2 470 5% 1/16W MF 402	
14 5 MPIC_CPU_INT_L	R19 10K 5% 1/16W MF 402	
41 5 CPU_SRESET_L	R6 10K 5% 1/16W MF 402	
5 CPU_L1TSTCLK	R37 10K 5% 1/16W MF 402	
5 CPU_EDTI	R36 10K 5% 1/16W MF 402	
41 6 5 JTAG_CPU_TCK	R11 10K 5% 1/16W MF 402	
5 CPU_PULLDOWN	R45 470 5% 1/16W MF 402	

CPU INTERNAL PLL FILTERING

For CPU DFS mode, Must stuff R748

NO STUFF

R453 10 1% 1/16W MF 402 · CPU_VCORE_SLEEP 5 6 35 40 41

R748 10 1% 1/16W MF 402 · 40 CPU_AVDD_VOUT

40 CPU_AVDD

C810 0.1uF 20% 10V CERM 402 · C811 4.7uF 20% 6.3V CERM 805

+3V_SLEEP

Vout=0.59*(1+R1/R2)

Place R449 & R452 close to U5 pin 6&5

R302 0 5% 1/16W MF 603

U5 FAN2558 SOT23-6: VIN 1 · PG 4 · EN 3 · GND 2 · VOUT 6 · ADJ 5

C626 0.001uF 10% 50V CERM 402

R1 1% 1/16W MF 402 · R449 118K 1% 1/16W MF 402 · CPU_BST_VCORE128&CPU_BST_VCORE13

R2 1% 1/16W MF 402 · R452 100K 1% 1/16W MF 402 · CPU_BST_VCORE128&CPU_BTR_VCORE122&CPU_BST_VCORE126

C102 1uF 10% 6.3V CERM 402

40 CPU_AVDD_VIN

CPU_AVDD_SHDN_L

D17 SN MBR0530 · R455 100K 5% 1/16W MF 402

C85 2.2uF 10% 6.3V CERM1 603

C502 0.1uF 20% 10V CERM 402

35 VCORE_SHDN_L

VCORE_SHDN_L_3V

R755 0 5% 1/16W MF 402 · 4700HM FOR BOOT BANGER

NO STUFF

R775 200K 5% 1/16W MF 402 · 4700HM FOR BOOT BANGER

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
114S0413	1	RES,MF,1/16W,105K OHM,1%,0402,SMD	R449 (R1)		CPU_BTR_VCORE128&CPU_BTR_VCORE122
114S1155	1	RES,MF,1/16W,115K OHM,1%,0402,SMD	R449 (R1)		CPU_BST_VCORE126
114S9764	1	RES,MF,1/16W,97.6K OHM,1%,0402,SMD	R452 (R2)		CPU_BST_VCORE13&CPU_BTR_VCORE122

H8 H10 H12 J7 J9 J11 J13 K8 K10 K12 K14 L7 L9 L11 L13 M8 M10 M12 — VDD

B4 C2 C12 D5 F2 H3 J5 K2 L5 M3 N6 P2 P8 P11 R4 R13 R16 T6 T9 U2 U12 U16 V4 V7 V10 V14 E18 G18 — OVDD

A8 — AVDD

(NAP VOLTAGE=0.98V FOR ALL CONFIG.)

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
337S2952	1	IC,A7PM,R1.2.3,1.50GHZ,1.2VCORE,18W,85C	U56	CRITICAL	CPU_BTR_VCORE12_R123
337S2953	1	IC,A7PM,R1.2.3,1.67GHZ,1.28VCORE,23W,85C	U56	CRITICAL	CPU_BST_VCORE128_R123
337S3069	1	IC,A7PM,R1.2.3,1.67GHZ,1.26VCORE,23W,85C	U56	CRITICAL	CPU_BST_VCORE126_R123
337S3027	1	IC,A7PM,R1.3,1.50GHZ,1.20VCORE,18W,85C	U56	CRITICAL	NO STUFF
337S3028	1	IC,A7PM,R1.3,1.67GHZ,1.29VCORE,18W,85C	U56	CRITICAL	NO STUFF
337S3105	1	IC,A7PM,R1.2.3,1.67GHZ,1.30VCORE,23W,85C	U56	CRITICAL	CPU_BST_VCORE13_R123
337S3095	1	IC,A7PM,R1.2.3,1.50GHZ,1.22VCORE,18W,85C	U56	CRITICAL	CPU_BTR_VCORE122_R123
337S3132	1	IC,A7PM,R1.4,1.67GHZ,1.28VCORE,23W,85C	U56	CRITICAL	CPU_BST_VCORE128_R14
337S3133	1	IC,A7PM,R1.4,1.50GHZ,1.22VCORE,18W,85C	U56	CRITICAL	CPU_BTR_VCORE122_R14
337S3217	1	IC,A7PM,R1.5,1.67GHZ,1.28VCORE,23W,85C	U56	CRITICAL	CPU_BST_VCORE128_R15
337S3218	1	IC,A7PM,R1.5,1.50GHZ,1.22VCORE,18W,85C	U56	CRITICAL	CPU_BTR_VCORE122_R15

OMIT

U56
1.50GHZ-1.28V
APOLL7_PM-R1.1
BGA
(1 OF 3)

38 8 CPU_BR_L	D2	BR*
38 8 CPU_BG_L	M1	BG*
38 8 CPU_TS_L	L4	TS*
5 CPU_PULLDOWN	E11	A0
	H1	A1
	C11	A2
	G3	A3
38 8 CPU_ADDR<0>	F10	A4
38 8 CPU_ADDR<1>	L2	A5
38 8 CPU_ADDR<2>	D11	A6
38 8 CPU_ADDR<3>	D1	A7
38 8 CPU_ADDR<4>	C10	A8
38 8 CPU_ADDR<5>	G2	A9
38 8 CPU_ADDR<6>	D12	A10
38 8 CPU_ADDR<7>	L3	A11
38 8 CPU_ADDR<8>	G4	A12
38 8 CPU_ADDR<9>	T2	A13
38 8 CPU_ADDR<10>	F4	A14
38 8 CPU_ADDR<11>	V1	A15
38 8 CPU_ADDR<12>	J4	A16
38 8 CPU_ADDR<13>	R2	A17
38 8 CPU_ADDR<14>	K5	A18
38 8 CPU_ADDR<15>	W2	A19
38 8 CPU_ADDR<16>	J2	A20
38 8 CPU_ADDR<17>	K4	A21
38 8 CPU_ADDR<18>	N4	A22
38 8 CPU_ADDR<19>	J3	A23
38 8 CPU_ADDR<20>	M5	A24
38 8 CPU_ADDR<21>	P5	A25
38 8 CPU_ADDR<22>	N3	A26
38 8 CPU_ADDR<23>	T1	A27
38 8 CPU_ADDR<24>	V2	A28
38 8 CPU_ADDR<25>	U1	A29
38 8 CPU_ADDR<26>	N5	A30
38 8 CPU_ADDR<27>	W1	A31
38 8 CPU_ADDR<28>	B12	A32
38 8 CPU_ADDR<29>	C4	A33
38 8 CPU_ADDR<30>	G10	A34
38 8 CPU_ADDR<31>	B11	A35
NC	C1	AP0
NC	E3	AP1
NC	H6	AP2
NC	F5	AP3
NC	G7	AP4
38 8 CPU_TT<0>	E5	TT0
38 8 CPU_TT<1>	E6	TT1
38 8 CPU_TT<2>	F6	TT2
38 8 CPU_TT<3>	E9	TT3
38 8 CPU_TT<4>	C5	TT4
38 8 CPU_TBST_L	F11	TBST*
38 8 CPU_TSIZ<0>	G8	TSIZ0
38 8 CPU_TSIZ<1>	F7	TSIZ1
38 8 CPU_TSIZ<2>	E7	TSIZ2
38 8 CPU_GBL_L	E2	GBL*
38 8 CPU_WT_L	D3	WT*
38 8 CPU_CI_L	J1	CI*
38 8 CPU_AACK_L	R1	AACK*
38 8 CPU_ARTRY_L	N2	ARTRY*
5 CPU_SHD0_L	E4	SHD0*
5 CPU_SHD1_L	H5	SHD1*
38 8 CPU_HIT_L	B2	HIT*

	B7	BVSEL — CPU_BUS_VSEL 7
SYSCLK	A10	SYSCLK_CPU 8 37
CLK_OUT	H2	CPU_CLKOUT_SPN — NO_TEST=TRUE
PLL_CFG0	B8	CPU_PLL_CFG<0> 7
PLL_CFG1	C8	CPU_PLL_CFG<1> 7
PLL_CFG2	C7	CPU_PLL_CFG<2> 7
PLL_CFG3	D7	CPU_PLL_CFG<3> 7
PLL_CFG4	A7	CPU_PLL_CFG<4> 7
DBG*	M2	CPU_DBG_L 8 38
DRDY*	R3	CPU_DRDY_L 8 38
DTI0	G1	CPU_EDTI 5
DTI1	K1	CPU_DTI<0> 8 38
DTI2	P1	CPU_DTI<1> 8 38
DTI3	N1	CPU_DTI<2> 8 38
TDI	B9	JTAG_CPU_TDI 5 6 41
TDO	A4	JTAG_CPU_TDO_TP 41
TMS	F1	JTAG_CPU_TMS 5 6 41
TCK	C6	JTAG_CPU_TCK 5 6 41
TRST*	A5	JTAG_CPU_TRST_L 6 41
LSSD_MODE*	E8	CPU_LSSD_MODE 5
L1_TSTCLK	G8	CPU_L1TSTCLK 5
L2_TSTCLK	B3	CPU_L2TSTCLK 5
TA*	K6	CPU_TA_L 8 38
TEA*	L1	CPU_TEA_L 8 38
TBEN	E1	CPU_TBEN 5 8
QREQ*	P4	CPU_QREQ_L 8 38
QACK*	G5	CPU_QACK_L 8 38
CKSTP_IN*	A3	
CKSTP_OUT*	B1	CPU_CHKSTP_OUT_L 5 41
INT*	D4	MPIC_CPU_INT_L 5 14
SMI*	F9	CPU_SMI_L 5 31
MCP*	C9	CPU_MCP_L 5
SRESET*	A2	CPU_SRESET_L 5 41
HRESET*	D8	CPU_HRESET_L 5 6 7 41
PMON_IN*	D9	CPU_PMONIN_L 5
PMON_OUT*	A9	NC
BMODE0*	G9	CPU_EMODE0_L 7
BMODE1*	F8	CPU_EMODE1_L 5
EXT_QUAL	A11	CPU_PULLDOWN 5
CHKS*	A12	CPU_CHKS_L 5
SRW0*	B10	
SRW1*	E10	CPU_SRWX_L 5
IARTRY0*	B6	CPU_PULLUP 5
DX*	D10	CPU_PULLDOWN 5

GND

B5 C3 D6 D13 E17 F3 G17 H4 H7 H9 H11 H13 J6 J8 J10 J12 K7 K3 K9 K11 K13 L6 L8 L10 L12 M4 M7 M9 M11 M13 N7 P3 P9 P12 R5 R14 R17 T7 T10 U3 U13 U17 V5 V8 V11 V15

MPC7447 MAXBUS

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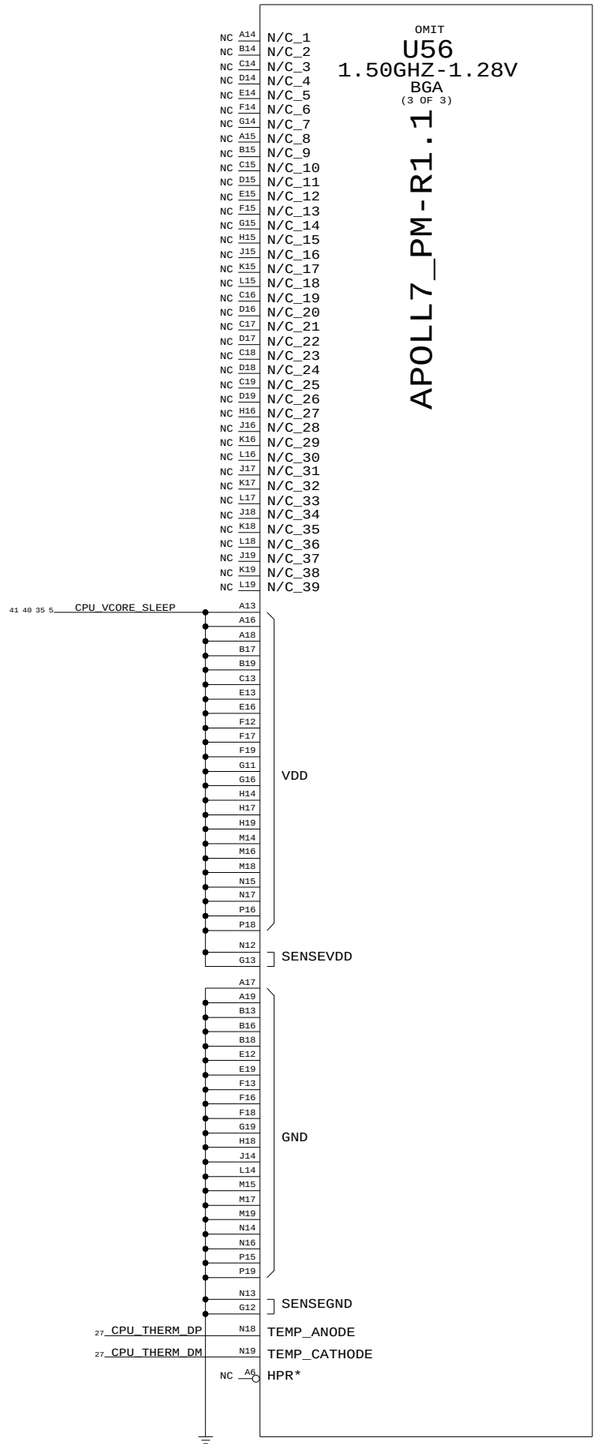
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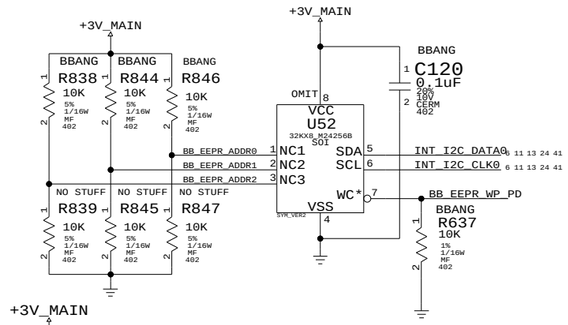
SCALE NONE · SHT 5 OF 46

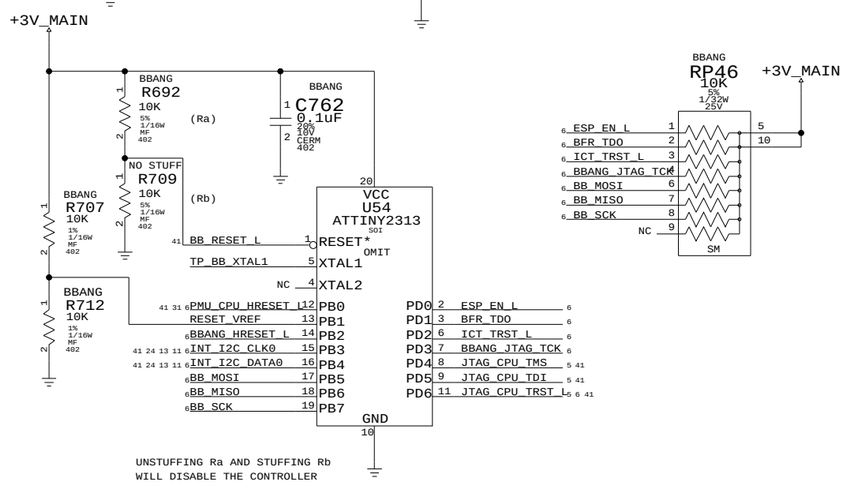
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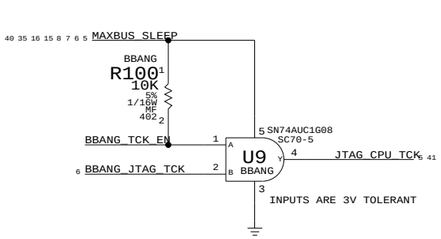


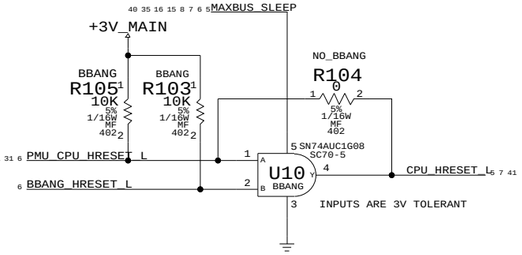
BOOT BANGER - TWEAK PROCESSOR BITS AFTER POWER-ON

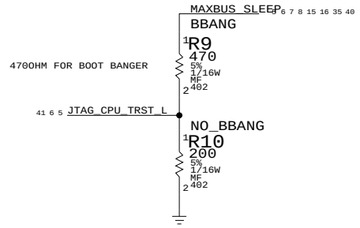




PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
341S1660	1	MCU,PROGRAMMED W/ BBANGER	U54	BBANG
341S1661	1	I2C EEPROM,PROGRAMMED W/ BBANGER	U52	BBANG







MPC7447/BBANG

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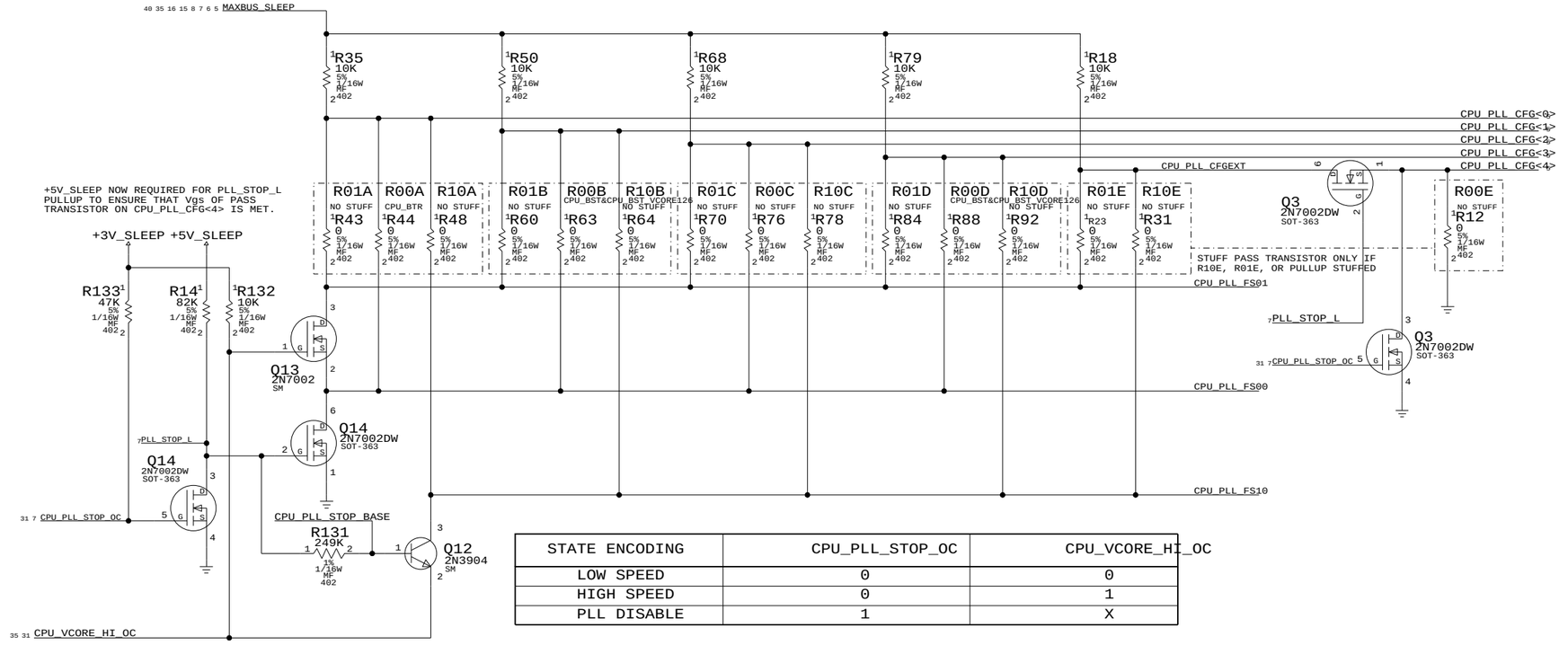
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SIZE	DRAWING NUMBER	REV.
D	051-6680	E

SCALE	SHT	OF
NONE	6	46

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CPU PLL CONFIG CIRCUITRY



STATE ENCODING	CPU_PLL_STOP_OC	CPU_VCORE_HI_OC
LOW SPEED	0	0
HIGH SPEED	0	1
PLL DISABLE	1	X

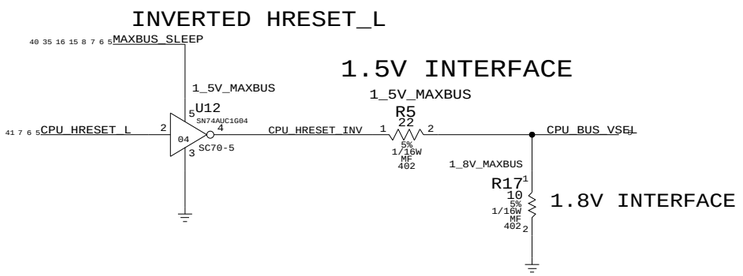
CPU FREQUENCY CONFIGURATION

APOLLO 7PM

MULTIPLIER (Bus-to-Core)	CORE FREQUENCY (AT BUS FREQUENCY) 167MHZ (MHZ)	133MHZ (MHZ)	CPU_PLL_CFG 4 E	0123 ABCD	HEX
0.0X	PLL OFF		0	1111	0F
1.0X	PLL BYPASS		0	0011	03
2.0X	333	267	0	0100	04
3.0X	500	400	0	1000	08
4.0X	667	533	0	1010	0A
5.0X	833	667	0	1011	0B
5.5X	917	733	0	1001	09
6.0X	1000	800	0	1101	0D
6.5X	1083	867	0	0101	05
7.0X	1167	933	0	0010	02
7.5X	1250	1000	0	0001	01
8.0X	1333	1067	0	1100	0C
8.5X	1417	1133	0	0110	06
9.0X	1500	1200	1	0111	17
9.5X	1583	1267	0	0111	07
10.0X	1667	1333	1	1010	1A
10.5X	1750	1400	1	1000	18
11.0X	1833	1467	1	1001	19
11.5X	1917	1533	0	0000	00
12.0X	2000	1600	1	1011	1B
12.5X	2083	1667	1	1111	1F
13.0X	2167	1733	1	0101	15
13.5X	2250	1800	0	1110	0E
14.0X	2333	1867	1	1100	1C
15.0X	2500	2000	1	0001	11
16.0X	2667	2133	1	1101	1D
17.0X	2833	2267	1	0000	10
18.0X	3000	2400	1	0010	12
20.0X	3333	2667	1	0011	13
21.0X	3500	2800	1	0100	14
24.0X	4000	3200	1	0110	16
28.0X	4667	3733	1	1110	1E

CPU CONFIGURATION

MAXBUS VSEL



BUSTYPE SELECT



APOLLO ONLY SUPPORTS MAXBUS

DESKTOP HAD PROBLEM USING INVERTER TO INVERT HRESET_L NEED TO CHARACTERIZE

SIGNAL	TIED	APPLICATION
CPU_EMODE0_L (PROCESSOR)	HIGH	60X BUS MODE
	CPU_HRESET_L	MAX BUS MODE
CPU_BUS_VSEL (PROCESSOR)	CPU_HRESET_L	2.5V INTERFACE
	LOW	1.8V INTERFACE
	CPU_HRESET_INV	1.5V INTERFACE

CPU CONFIGURATION

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INTREPID BOOT STRAPS

MAXBUS_SLEEP

BIT 32 TO 39

R640 NO STUFF	R639 NO STUFF	R638 NO STUFF	R666	R622	R619	R618	R653 NO STUFF
CPU_DATA<32>	CPU_DATA<33>	CPU_DATA<34>	CPU_DATA<35>	CPU_DATA<36>	CPU_DATA<37>	CPU_DATA<38>	CPU_DATA<39>
0: DDR_TRDMODE Enable 1: HDI output	0: Analyzer Clk_En_h Active 1: Active	0: DDR_IPGEN Pol Active High 1: Active Low	0: External SDRAM Pull Up 1: Pull Down	Spare	Spare	Spare	Spare

MAXBUS_SLEEP

BIT 40 TO 47

R641 NO STUFF	R665 SSCG	R664 NO STUFF	R693 NO_SSCG	R694 NO STUFF	R699 NO STUFF		
CPU_DATA<40>	CPU_DATA<41>	CPU_DATA<42>	CPU_DATA<43>	CPU_DATA<44>	CPU_DATA<45>	CPU_DATA<46>	CPU_DATA<47>

R648	R677	R623	R651 NO_SSCG	R649	R678 SSCG	R679	R684
Spare	Spare	BIT2	BIT1	BIT0	0: PLL4 Spread Disable 1: PLL4 Spread Enable	0: PLL3 Spread Disable 1: PLL3 Spread Enable	0: PLL1 Spread Disable 1: PLL1 Spread Enable

PLL4MODESEL_NXT[2:0] (SW CNTL ONLY)
000: 166.4MHZ (2.5X)
001: 149.76MHZ
010: 133.12MHZ (2.0X)
011: 99.84MHZ (1.5X)
100: 83.20MHZ

MODE A (2.5X) IS FOR STATIC OPERATION
MODE C (2.0X) IS FOR CLOCK SLEW OPERATION

MAXBUS_SLEEP

BIT 48 TO 55

R696 SSCG	R695 SSCG	R667	R668 NO STUFF	R643 NO STUFF	R642 NO STUFF	R698	
CPU_DATA<48>	CPU_DATA<49>	CPU_DATA<50>	CPU_DATA<51>	CPU_DATA<52>	CPU_DATA<53>	CPU_DATA<54>	CPU_DATA<55>

R681 NO_SSCG	R680 NO_SSCG	R654 NO STUFF	R655	R625	R624	R683 NO STUFF	R626
0: PLL4 ExtSrc 1: External source	0: PLL5 1: External source	OBSOLETE (Should remain high) 0: BOOTROM on IDE/CardSlot 1: BOOTROM on PCI1	0: 100ohm workaround 1: TI PHY workaround	BIT2	BIT1	BIT0	Spare

MaxBus output impedance
111: 28.6 ohm
011: 33.3 ohm
101: 40 ohm
001: 50 ohm
110: 66.6 ohm
010: 100 ohm
100: 200 ohm
000: 200 ohm

R159 4.7 5% 1/16W MF 402

+1_5V_INTREPID_PLL → +1_5V_INTREPID_PLL7

C187 0.22uF 20% 6.3V CERM 402

H26 VDD15A_7 (PLL6)

OMIT
U51
INTREPID-REV2.1
BGA

CPU_BR_L	E29	BR INPUT
CPU_BG_L	E26	BG NO BUS KEEPER
CPU_TS_L	B27	TS NO BUS KEEPER

(1 OF 9)
CRITCAL

CPU_ADDR<0>	D24	A_0
CPU_ADDR<1>	D25	A_1
CPU_ADDR<2>	A27	A_2
CPU_ADDR<3>	E24	A_3
CPU_ADDR<4>	G23	A_4
CPU_ADDR<5>	B26	A_5
CPU_ADDR<6>	A26	A_6
CPU_ADDR<7>	D23	A_7
CPU_ADDR<8>	A25	A_8
CPU_ADDR<9>	E23	A_9
CPU_ADDR<10>	J22	A_10
CPU_ADDR<11>	B25	A_11
CPU_ADDR<12>	H22	A_12
CPU_ADDR<13>	G22	A_13
CPU_ADDR<14>	D22	A_14
CPU_ADDR<15>	B24	A_15
CPU_ADDR<16>	B23	A_16
CPU_ADDR<17>	E22	A_17
CPU_ADDR<18>	J21	A_18
CPU_ADDR<19>	G21	A_19
CPU_ADDR<20>	E21	A_20
CPU_ADDR<21>	A24	A_21
CPU_ADDR<22>	D21	A_22
CPU_ADDR<23>	A23	A_23
CPU_ADDR<24>	H20	A_24
CPU_ADDR<25>	B22	A_25
CPU_ADDR<26>	H21	A_26
CPU_ADDR<27>	A22	A_27
CPU_ADDR<28>	E20	A_28
CPU_ADDR<29>	B21	A_29
CPU_ADDR<30>	D20	A_30
CPU_ADDR<31>	A21	A_31

MAXBUS INTERFACE

CPU_CI_L	G26	CI
CPU_GBL_L	A29	GBL
CPU_TBST_L	A28	TBST
CPU_TSIZ<0>	G24	TSIZ_0
CPU_TSIZ<1>	H24	TSIZ_1
CPU_TSIZ<2>	D26	TSIZ_2
CPU_TT<0>	E25	TT_0
CPU_TT<1>	G25	TT_1
CPU_TT<2>	B28	TT_2
CPU_TT<3>	D27	TT_3
CPU_TT<4>	J25	TT_4
CPU_WT_L	D28	WT
CPU_AACK_L	B29	AACK NO BUS KEEPER - PU
CPU_ARTRY_L	H23	ARTRY NO BUS KEEPER - PU
CPU_HIT_L	B31	HIT INPUT - PU
CPU_QREQ_L	A32	QREQ INPUT - PD
CPU_QACK_L	G27	QACK NO BUS KEEPER - ?
INT_SUSPEND_REQ_L	AK9	SUSPENDREQ
INT_SUSPEND_ACK_L	AM8	SUSPENDACK

FB BUFFER HAS 50 OHM OUTPUT IMPEDANCE

Vin = Intrepid Vcore (1.5V)
Vout = MaxBus rail (1.8V)

INT_CPUFB_IN	J24	CPU_FB_IN
INT_CPUFB_OUT	H16	CPU_FB_OUT NO BUS KEEPER - PU
SYSCLK_LA_TP	G8	ANALYZER_CLK
CPU_CLK_EN	AH9	STOPCPUCLK INPUT - PU
INTREPID_ACS_REF	H13	ACS_REF NO BUS KEEPER - ?
SYSCLK_CPU_UF	J15	CPU_CLK NO BUS KEEPER - PU
CPU_TBEN	A31	TBEN NO BUS KEEPER - PU

	K25	DTI_0 NO BUS KEEPER - ?
	D29	DTI_1 NO BUS KEEPER - ?
	B30	DTI_2 NO BUS KEEPER - ?
CPU_TA_L	E27	TA NO BUS KEEPER - PU
CPU_TEA_L	E28	TEA NO BUS KEEPER - PU

INTREPID OUTPUTS HIGH BY DEFAULT

VSSA_7 (PLL6) H25

R169 511 1% 1/16W MF 402

R168 0 5% 1/16W MF 402

R161 1K 1% 1/16W MF 402

SHORT = 1" SHORTER THAN MATCHED LENGTH

R155 0 5% 1/16W MF 402

R140 0 5% 1/16W MF 402

R146 NO STUFF 0 5% 1/16W MF 402

R147 0 5% 1/16W MF 402

LONG = 1" LONGER THAN MATCHED LENGTH

R128 NO STUFF 0 5% 1/16W MF 402

R141 0 5% 1/16W MF 402

R136 NO STUFF 0 5% 1/16W MF 402

INT_CPUFB_OUT → INT_CPUFB_OUT_SHORT → INT_CPUFB_OUT_NORM → INT_CPUFB_LONG

INT_CPUFB_IN → INT_CPUFB_IN_NORM

THE FOLLOWING STRAP BITS CAN BE CHANGED BY SOFTWARE:

1/ D47 - SELAGPSPREADCLK - SLEEP/WAKE CYCLE REQUIRED
2/ D46 - SELPCI1SPREADCLK - SLEEP/WAKE CYCLE REQUIRED
3/ D44 - PLL4MODESEL_NXT<0> - SLEEP/WAKE CYCLE REQUIRED
4/ D43 - PLL4MODESEL_NXT<1> - SLEEP/WAKE CYCLE REQUIRED
5/ D42 - PLL4MODESEL_NXT<2> - SLEEP/WAKE CYCLE REQUIRED
6/ D33 - ANALYZERCLK_EN_H - IMMEDIATE EFFECT

IF A STRAP IS NOT LISTED, THEN
IT CANNOT BE CHANGED BY SOFTWARE

D_0	D10	CPU_DATA<0>
D_1	G12	CPU_DATA<1>
D_2	E11	CPU_DATA<2>
D_3	H11	CPU_DATA<3>
D_4	B9	CPU_DATA<4>
D_5	B8	CPU_DATA<5>
D_6	A9	CPU_DATA<6>
D_7	A8	CPU_DATA<7>
D_8	E12	CPU_DATA<8>
D_9	D11	CPU_DATA<9>
D_10	B10	CPU_DATA<10>
D_11	J13	CPU_DATA<11>
D_12	A10	CPU_DATA<12>
D_13	D12	CPU_DATA<13>
D_14	E13	CPU_DATA<14>
D_15	G13	CPU_DATA<15>
D_16	B11	CPU_DATA<16>
D_17	D13	CPU_DATA<17>
D_18	A11	CPU_DATA<18>
D_19	G14	CPU_DATA<19>
D_20	H14	CPU_DATA<20>
D_21	E14	CPU_DATA<21>
D_22	B12	CPU_DATA<22>
D_23	G15	CPU_DATA<23>
D_24	B13	CPU_DATA<24>
D_25	H15	CPU_DATA<25>
D_26	D14	CPU_DATA<26>
D_27	B14	CPU_DATA<27>
D_28	A12	CPU_DATA<28>
D_29	G16	CPU_DATA<29>
D_30	E15	CPU_DATA<30>
D_31	J16	CPU_DATA<31>
D_32	D15	CPU_DATA<32>
D_33	A14	CPU_DATA<33>
D_34	A13	CPU_DATA<34>
D_35	D16	CPU_DATA<35>
D_36	E16	CPU_DATA<36>
D_37	G17	CPU_DATA<37>
D_38	B15	CPU_DATA<38>
D_39	H17	CPU_DATA<39>
D_40	A15	CPU_DATA<40>
D_41	B16	CPU_DATA<41>
D_42	E17	CPU_DATA<42>
D_43	A16	CPU_DATA<43>
D_44	J18	CPU_DATA<44>
D_45	H18	CPU_DATA<45>
D_46	D17	CPU_DATA<46>
D_47	G18	CPU_DATA<47>
D_48	A17	CPU_DATA<48>
D_49	B17	CPU_DATA<49>
D_50	E18	CPU_DATA<50>
D_51	B18	CPU_DATA<51>
D_52	D18	CPU_DATA<52>
D_53	A18	CPU_DATA<53>
D_54	A19	CPU_DATA<54>
D_55	H19	CPU_DATA<55>
D_56	B19	CPU_DATA<56>
D_57	J19	CPU_DATA<57>
D_58	A20	CPU_DATA<58>
D_59	D19	CPU_DATA<59>
D_60	E19	CPU_DATA<60>
D_61	G19	CPU_DATA<61>
D_62	B20	CPU_DATA<62>
D_63	G20	CPU_DATA<63>
	A30	CPU_DBG_L
	G28	CPU_DRDY_L
	K25	CPU_DTI<0>
	D29	CPU_DTI<1>
	B30	CPU_DTI<2>
	E27	CPU_TA_L
	E28	CPU_TEA_L

MAXBUS PULL-UPS

MAXBUS_SLEEP

RP3 10K	RP3 10K	RP3 10K	RP2 10K	R152 10K	RP2 10K	RP2 10K	RP2 10K
CPU_TS_L	CPU_TA_L	CPU_ARTRY_L	CPU_BR_L	CPU_HIT_L	CPU_DRDY_L	CPU_TEA_L	CPU_AACK_L

R150 10K	RP3 10K	R151 10K		
CPU_DBG_L	CPU_BG_L	CPU_QREQ_L		

INTREPID BOOT STRAPS

MAXBUS_SLEEP

BIT 56 TO 63

R669 NO STUFF	R645 NO STUFF	R697 NO STUFF	R670 NO STUFF	R644 NO STUFF	R646 NO STUFF		
CPU_DATA<56>	CPU_DATA<57>	CPU_DATA<58>	CPU_DATA<59>	CPU_DATA<60>	CPU_DATA<61>	CPU_DATA<62>	CPU_DATA<63>

R656	R685	R657	R628	R682	R658	R627 NO STUFF	R629
Spare	Spare	OBSOLETE ROM Overlay R70 1: 0-1 IDE / 2-3 PCI1	PCI1_REQ1_L / PCI1_GNT1_L 0: REQ/GNT GPIOs	PCI1_REQ1_L / PCI1_GNT1_L 1: REQ/GNT GPIOs	PCI1_REQ0_L / PCI1_GNT0_L 0: REQ/GNT GPIOs	Firewire PHY interface 1: B-mode interface	Processor Bus Mode 0: 60x bus (G4) 1: 6xx bus (G3)

Intrepid MaxBus

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SERIES RESISTORS FOR CLOCK/CONTROL SIGNALS

PINS ARE SWAPABLE FOR RPAKS

1MB BOOT ROM

OMIT
U51
INTREPID-REV2.1
BGA
(2 OF 9)
CRITICAL

DDR MEMORY INTERFACE

DDR_DATA_0	AK32	MEM_DATA<0>	
DDR_DATA_1	AK33	MEM_DATA<1>	
DDR_DATA_2	AK31	MEM_DATA<2>	
DDR_DATA_3	AK35	MEM_DATA<3>	
DDR_DATA_4	AK36	MEM_DATA<4>	
DDR_DATA_5	AJ32	MEM_DATA<5>	
DDR_DATA_6	AJ35	MEM_DATA<6>	
DDR_DATA_7	AJ36	MEM_DATA<7>	
DDR_DATA_8	AG33	MEM_DATA<8>	
DDR_DATA_9	AG35	MEM_DATA<9>	
DDR_DATA_10	AH35	MEM_DATA<10>	
DDR_DATA_11	AG36	MEM_DATA<11>	
DDR_DATA_12	AH36	MEM_DATA<12>	
DDR_DATA_13	AH32	MEM_DATA<13>	
DDR_DATA_14	AG32	MEM_DATA<14>	
DDR_DATA_15	AG31	MEM_DATA<15>	
DDR_DATA_16	AE32	MEM_DATA<16>	
DDR_DATA_17	AF35	MEM_DATA<17>	
DDR_DATA_18	AF36	MEM_DATA<18>	
DDR_DATA_19	AE36	MEM_DATA<19>	
DDR_DATA_20	AE35	MEM_DATA<20>	
DDR_DATA_21	AE33	MEM_DATA<21>	
DDR_DATA_22	AD36	MEM_DATA<22>	
DDR_DATA_23	AD35	MEM_DATA<23>	
DDR_DATA_24	AA36	MEM_DATA<24>	
DDR_DATA_25	AA35	MEM_DATA<25>	
DDR_DATA_26	AA33	MEM_DATA<26>	
DDR_DATA_27	AB36	MEM_DATA<27>	
DDR_DATA_28	AB35	MEM_DATA<28>	
DDR_DATA_29	AC36	MEM_DATA<29>	
DDR_DATA_30	AA32	MEM_DATA<30>	
DDR_DATA_31	AB33	MEM_DATA<31>	
DDR_DATA_32	V36	MEM_DATA<32>	
DDR_DATA_33	U33	MEM_DATA<33>	
DDR_DATA_34	U32	MEM_DATA<34>	
DDR_DATA_35	V35	MEM_DATA<35>	
DDR_DATA_36	T36	MEM_DATA<36>	
DDR_DATA_37	U36	MEM_DATA<37>	
DDR_DATA_38	U35	MEM_DATA<38>	
DDR_DATA_39	T36	MEM_DATA<39>	
DDR_DATA_40	P33	MEM_DATA<40>	
DDR_DATA_41	R36	MEM_DATA<41>	
DDR_DATA_42	P35	MEM_DATA<42>	
DDR_DATA_43	P36	MEM_DATA<43>	
DDR_DATA_44	R36	MEM_DATA<44>	
DDR_DATA_45	R35	MEM_DATA<45>	
DDR_DATA_46	R33	MEM_DATA<46>	
DDR_DATA_47	R32	MEM_DATA<47>	
DDR_DATA_48	N35	MEM_DATA<48>	
DDR_DATA_49	M36	MEM_DATA<49>	
DDR_DATA_50	L35	MEM_DATA<50>	
DDR_DATA_51	M35	MEM_DATA<51>	
DDR_DATA_52	M33	MEM_DATA<52>	
DDR_DATA_53	L36	MEM_DATA<53>	
DDR_DATA_54	N33	MEM_DATA<54>	
DDR_DATA_55	M36	MEM_DATA<55>	
DDR_DATA_56	J32	MEM_DATA<56>	
DDR_DATA_57	J33	MEM_DATA<57>	
DDR_DATA_58	J35	MEM_DATA<58>	
DDR_DATA_59	K32	MEM_DATA<59>	
DDR_DATA_60	K33	MEM_DATA<60>	
DDR_DATA_61	J36	MEM_DATA<61>	
DDR_DATA_62	K36	MEM_DATA<62>	
DDR_DATA_63	K35	MEM_DATA<63>	

DDR_A_0	H35	MEM_ADDR<0>	
DDR_A_1	G35	MEM_ADDR<1>	
DDR_A_2	G36	MEM_ADDR<2>	
DDR_A_3	F36	MEM_ADDR<3>	
DDR_A_4	F35	MEM_ADDR<4>	
DDR_A_5	E35	MEM_ADDR<5>	
DDR_A_6	E36	MEM_ADDR<6>	
DDR_A_7	G32	MEM_ADDR<7>	
DDR_A_8	D36	MEM_ADDR<8>	
DDR_A_9	H36	MEM_ADDR<9>	
DDR_A_10	G33	MEM_ADDR<10>	
DDR_A_11	H33	MEM_ADDR<11>	
DDR_A_12	D35	MEM_ADDR<12>	
DDR_BA_0	L30	MEM_BA<0>	
DDR_BA_1	M29	MEM_BA<1>	
DDRCS_0	AN34	MEM_CS_L<0>	’0’ & ’1’ GO TO SLOT A
DDRCS_1	AN36	MEM_CS_L<1>	’2’ & ’3’ GO TO SLOT B
DDRCS_2	AL35	MEM_CS_L<2>	
DDRCS_3	AL33	MEM_CS_L<3>	
DDR_DQS_0	AJ31	MEM_DQS<0>	
DDR_DQS_1	AH31	MEM_DQS<1>	
DDR_DQS_2	AD32	MEM_DQS<2>	
DDR_DQS_3	AB30	MEM_DQS<3>	
DDR_DQS_4	V30	MEM_DQS<4>	
DDR_DQS_5	P32	MEM_DQS<5>	
DDR_DQS_6	N29	MEM_DQS<6>	
DDR_DQS_7	L32	MEM_DQS<7>	
DDR_DM_0	AJ33	MEM_DQM<0>	
DDR_DM_1	AH33	MEM_DQM<1>	
DDR_DM_2	AD33	MEM_DQM<2>	
DDR_DM_3	AC35	MEM_DQM<3>	
DDR_DM_4	T35	MEM_DQM<4>	
DDR_DM_5	T33	MEM_DQM<5>	
DDR_DM_6	N32	MEM_DQM<6>	
DDR_DM_7	L33	MEM_DQM<7>	
DDRRAS	L29	MEM_RAS_L	
DDRCAS	H32	MEM_CAS_L	
DDRWE	K30	MEM_WE_L	
DDRCKE0	AN35	MEM_CKE<0>	’0’ & ’1’ GO TO SLOT A
DDRCKE1	AM35	MEM_CKE<1>	’2’ & ’3’ GO TO SLOT B
DDRCKE2	AM36	MEM_CKE<2>	
DDRCKE3	AL36	MEM_CKE<3>	
DDR_SELHI_0	AB32	MEM_MUXSEL_MSB_L_TP	
DDR_SELHI_1	AE29	MEM_MUXSEL_MSB	’0’S ARE SAME POLARITY (ACTIVE-LO)
DDR_SELLO_0	N30	MEM_MUXSEL_LSB_L_TP	’1’S ARE SAME POLARITY (ACTIVE-HI)
DDR_SELLO_1	T32	MEM_MUXSEL_LSB	
DDR_MCLK_0_P	Y32	SYSCLK_DDRCLK_A0_UF	
DDR_MCLK_0_N	Y33	SYSCLK_DDRCLK_A0_L_UF	
DDR_MCLK_1_P	Y35	SYSCLK_DDRCLK_A1_UF	
DDR_MCLK_1_N	Y36	SYSCLK_DDRCLK_A1_L_UF	
DDR_MCLK_2_P	Y30	INT_DDRCLK2_P_TP	
DDR_MCLK_2_N	W30	INT_DDRCLK2_N_TP	
DDR_MCLK_3_P	W32	SYSCLK_DDRCLK_B0_UF	
DDR_MCLK_3_N	W33	SYSCLK_DDRCLK_B0_L_UF	
DDR_MCLK_4_P	V33	SYSCLK_DDRCLK_B1_UF	
DDR_MCLK_4_N	V32	SYSCLK_DDRCLK_B1_L_UF	
DDR_MCLK_5_P	W35	INT_DDRCLK5_P_TP	
DDR_MCLK_5_N	W36	INT_DDRCLK5_N_TP	
DDR_REF	AA22	INT_MEM_REF_H	
DDR_VREF_0	Y22	INT_MEM_VREF	
DDR_VREF_1	T22		

MEM_VREF

R209 1K 1% 1/16W MF 402

+2.5V_INTREPID

R208 10K 1% 1/16W MF 402

R202 10K 1% 1/16W MF 402

C249 0.1uF 10% 16V CERM 402

INT_MEM_VREF

CLOCKS

SYSCLK_DDRCLK_A1_UF	RP20 22	4	5
SYSCLK_DDRCLK_A1_L_UF	RP20 22	3	6
SYSCLK_DDRCLK_A0_UF	RP22 22	1	8
SYSCLK_DDRCLK_A0_L_UF	RP22 22	2	7
SYSCLK_DDRCLK_B1_UF	RP20 22	2	7
SYSCLK_DDRCLK_B1_L_UF	RP20 22	1	8
SYSCLK_DDRCLK_B0_UF	RP22 22	3	6
SYSCLK_DDRCLK_B0_L_UF	RP22 22	4	5

CS

MEM_CS_L<0>	RP31 22	3	6
MEM_CS_L<1>	RP31 22	2	7
MEM_CS_L<2>	RP29 22	3	6
MEM_CS_L<3>	RP29 22	4	5

CKE

MEM_CKE<0>	RP31 22	1	8
MEM_CKE<1>	RP31 22	4	5
MEM_CKE<2>	RP29 22	1	8
MEM_CKE<3>	RP29 22	2	7

ADDR

MEM_ADDR<0>	RP14 22	3	6
MEM_ADDR<1>	RP12 22	2	7
MEM_ADDR<2>	RP12 22	1	8
MEM_ADDR<3>	RP12 22	4	5
MEM_ADDR<4>	RP12 22	3	6
MEM_ADDR<5>	RP9 22	2	7
MEM_ADDR<6>	RP9 22	1	8
MEM_ADDR<7>	RP14 22	2	7
MEM_ADDR<8>	RP9 22	4	5
MEM_ADDR<9>	RP14 22	4	5
MEM_ADDR<10>	RP14 22	1	8
MEM_ADDR<11>	RP17 22	4	5
MEM_ADDR<12>	RP9 22	3	6

BA

MEM_BA<0>	RP17 22	2	7
MEM_BA<1>	RP17 22	1	8

CNTL

MEM_WE_L	RP17 22	3	6
MEM_CAS_L	R162 22	1	2
MEM_RAS_L	R176 22	1	2

RAM_CS_L<0>		
RAM_CS_L<1>		
RAM_CS_L<2>		
RAM_CS_L<3>		
RAM_CKE<0>		
RAM_CKE<1>		
RAM_CKE<2>		
RAM_CKE<3>		
RAM_ADDR<0>		
RAM_ADDR<1>		
RAM_ADDR<2>		
RAM_ADDR<3>		
RAM_ADDR<4>		
RAM_ADDR<5>		
RAM_ADDR<6>		
RAM_ADDR<7>		
RAM_ADDR<8>		
RAM_ADDR<9>		
RAM_ADDR<10>		
RAM_ADDR<11>		
RAM_ADDR<12>		
RAM_BA<0>		
RAM_BA<1>		
RAM_WE_L		
RAM_CAS_L		
RAM_RAS_L		

+3V_MAIN

C125 2.2uF 10% 10V CERM 805

C773 0.1uF 10% 10V CERM 402

C122 0.1uF 10% 10V CERM 402

U11
1MX8-3.3V
TSOP

A0	21	DQ0	25
A1	20	DQ1	26
A2	19	DQ2	27
A3	18	DQ3	28
A4	17	DQ4	32
A5	16	DQ5	33
A6	15	DQ6	34
A7	14	DQ7	35
A8	8		
A9	7		
A10	36		
A11	6		
A12	5		
A13	4		
A14	3		
A15	2		
A16	1		
A17	40		
A18	13		
A19	37		
A20	38		
CE	22		
OE	24		
WE	9		
WP	12		
PWD	10		
VPP	11		
OMIT	30		
VCC	31		
GND	23, 39		

PCI_AD<0>	
PCI_AD<1>	
PCI_AD<2>	
PCI_AD<3>	
PCI_AD<4>	
PCI_AD<5>	
PCI_AD<6>	
PCI_AD<7>	
PCI_AD<8>	
PCI_AD<9>	
PCI_AD<10>	
PCI_AD<11>	
PCI_AD<12>	
PCI_AD<13>	
PCI_AD<14>	
PCI_AD<15>	
PCI_AD<16>	
PCI_AD<17>	
PCI_AD<18>	
PCI_AD<19>	
PCI_AD<20>	
ROM_ONBOARD_CS_L	
ROM_OE_L	
ROM_RW_L	
ROM_WP_L	
INT_RESET_L	

ROM_CS_TP_L

R236 0 NO STUFF 5% 1/16W MF 402

R691 10K 5% 1/16W MF 402

R112 10K 5% 1/16W MF 402

ROM_CS_L

R674 1K 5% 1/16W MF 402

R1 0 NO STUFF 5% 1/16W MF 402

ROM_ONBOARD_CS_TP_L

R271 0 NO STUFF 5% 1/16W MF 402

ROM_OE_TP_L

R194 0 NO STUFF 5% 1/16W MF 402

ROM_RW_TP_L

OVERRIDE ROM MODULE
INTERCEPTS ROM CHIP SELECT

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
341S1792	1	IC,BOOTROM,4.9.1F3,Q16B	U11	CRITICAL	?

Weak pulldowns ensure CKEs stay low
after 2.5V I/O to Intrepid shuts off.

RAM_CKE<0>
RAM_CKE<1>
RAM_CKE<2>
RAM_CKE<3>

R247 10K 5% 1/16W MF 402 INT_2_5V_COLD

R257 10K 5% 1/16W MF 402 INT_2_5V_COLD

R260 10K 5% 1/16W MF 402 INT_2_5V_COLD

R265 10K 5% 1/16W MF 402 INT_2_5V_COLD

INT - DDR/BOOTROM

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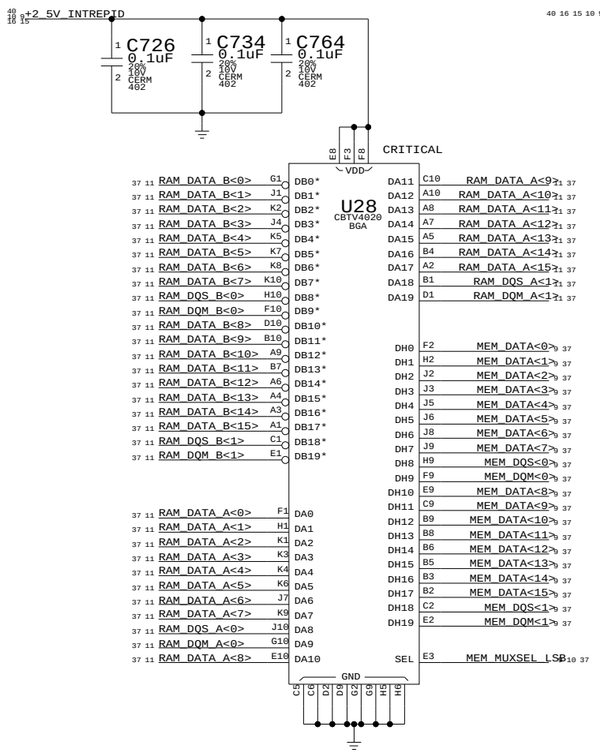
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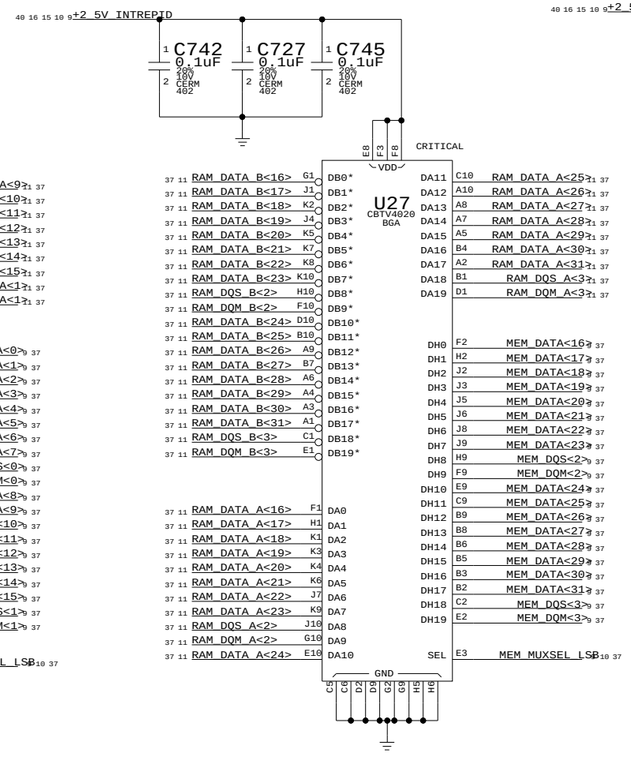
SIZE	DRAWING NUMBER	REV.
D	051-6680	E
SCALE: NONE	SHT 9 OF 46	

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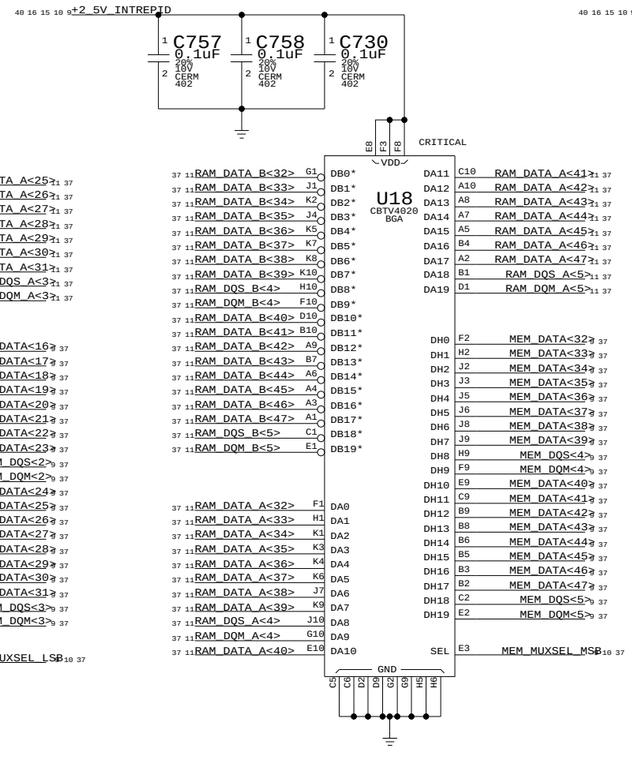
BIT 0..15



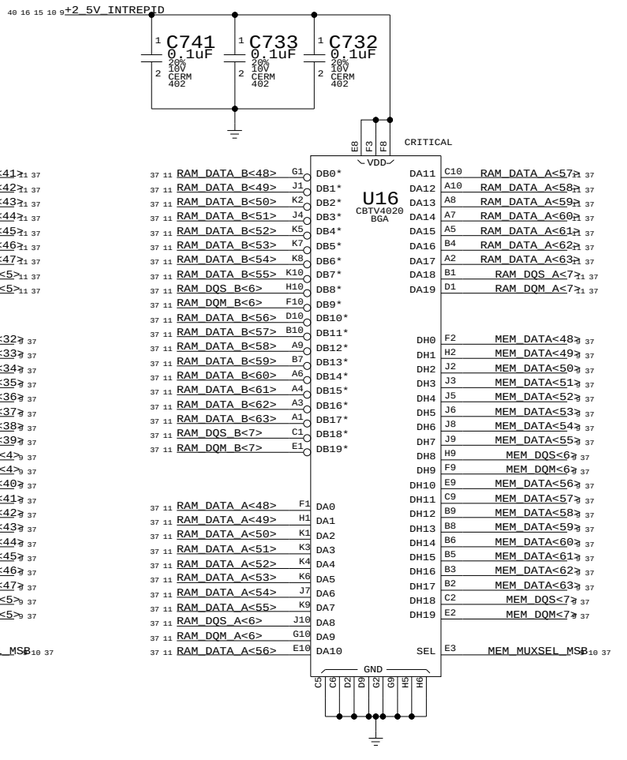
BIT 16..31



BIT 32..47



BIT 48..63



SEL = LOW; HOST = B PORT; A PORT = 100OHM TO GND
SEL = HIGH; HOST = A PORT; B PORT = 100OHM TO GND

16BIT 2:1 DDR MUXES

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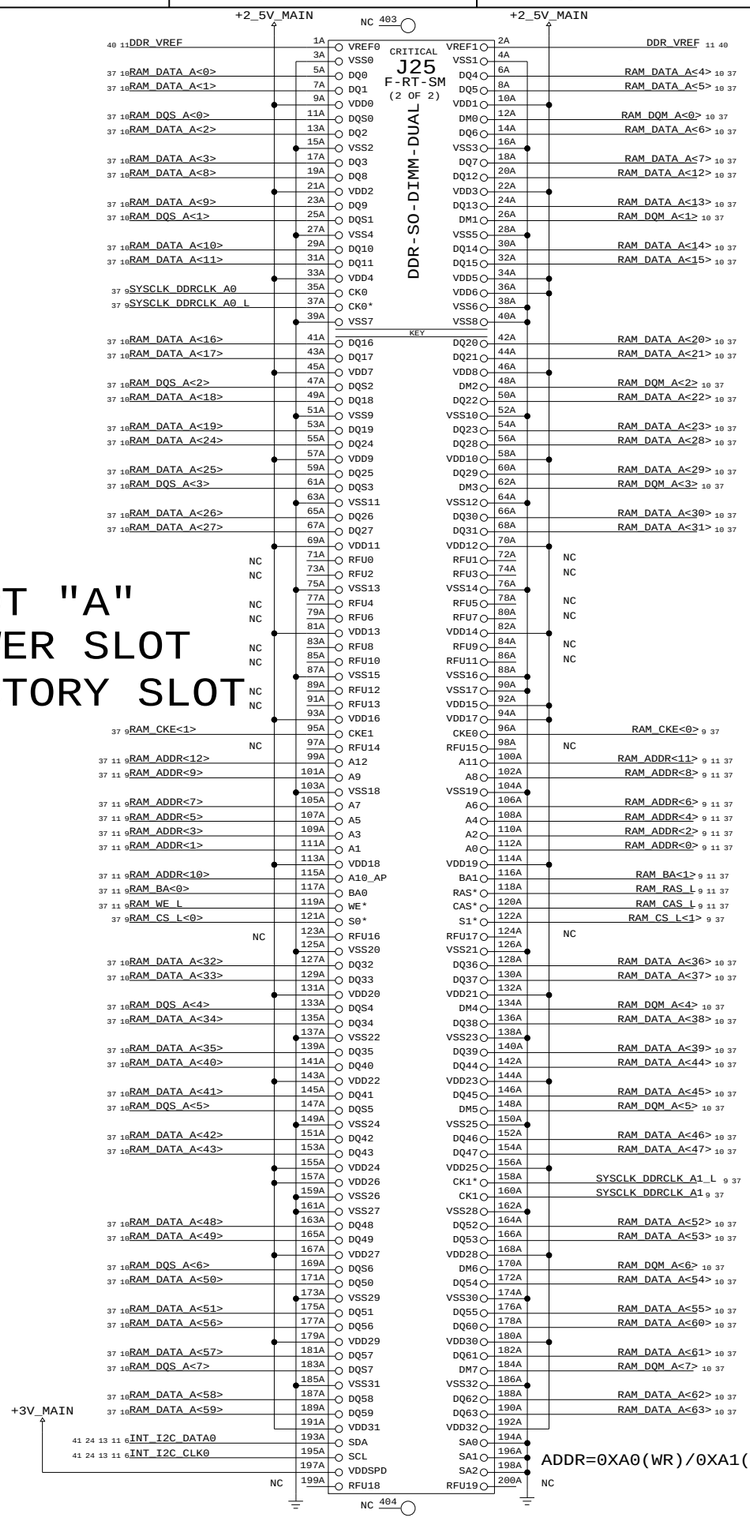
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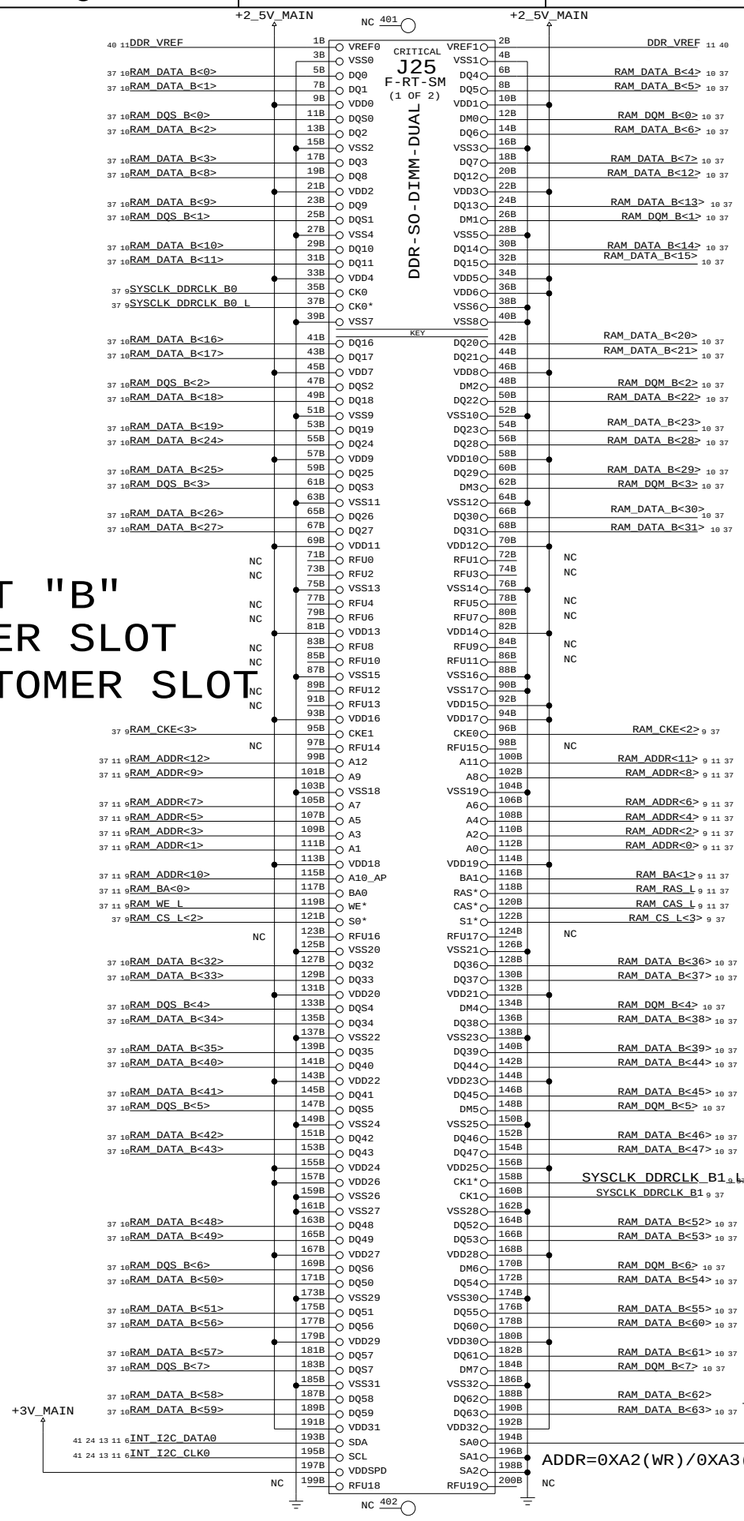
SIZE	DRAWING NUMBER	REV.
D	051-6680	E

SCALE	SHT OF
NONE	10 46

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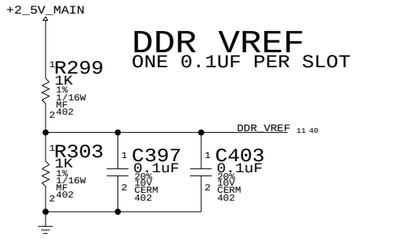


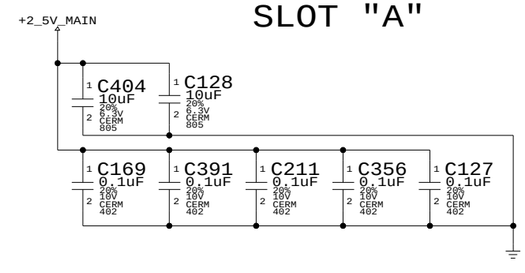
SLOT "A"
LOWER SLOT
FACTORY SLOT

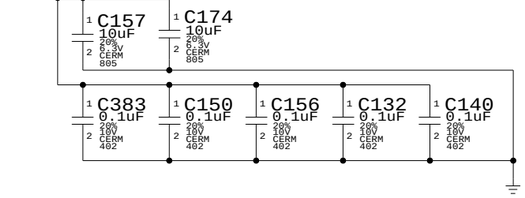


SLOT "B"
UPPER SLOT
CUSTOMER SLOT

NOTE: The SODIMM connector footprint has a through-hole slot on the PCB for additional mounting







DDR SODIMM CONNS

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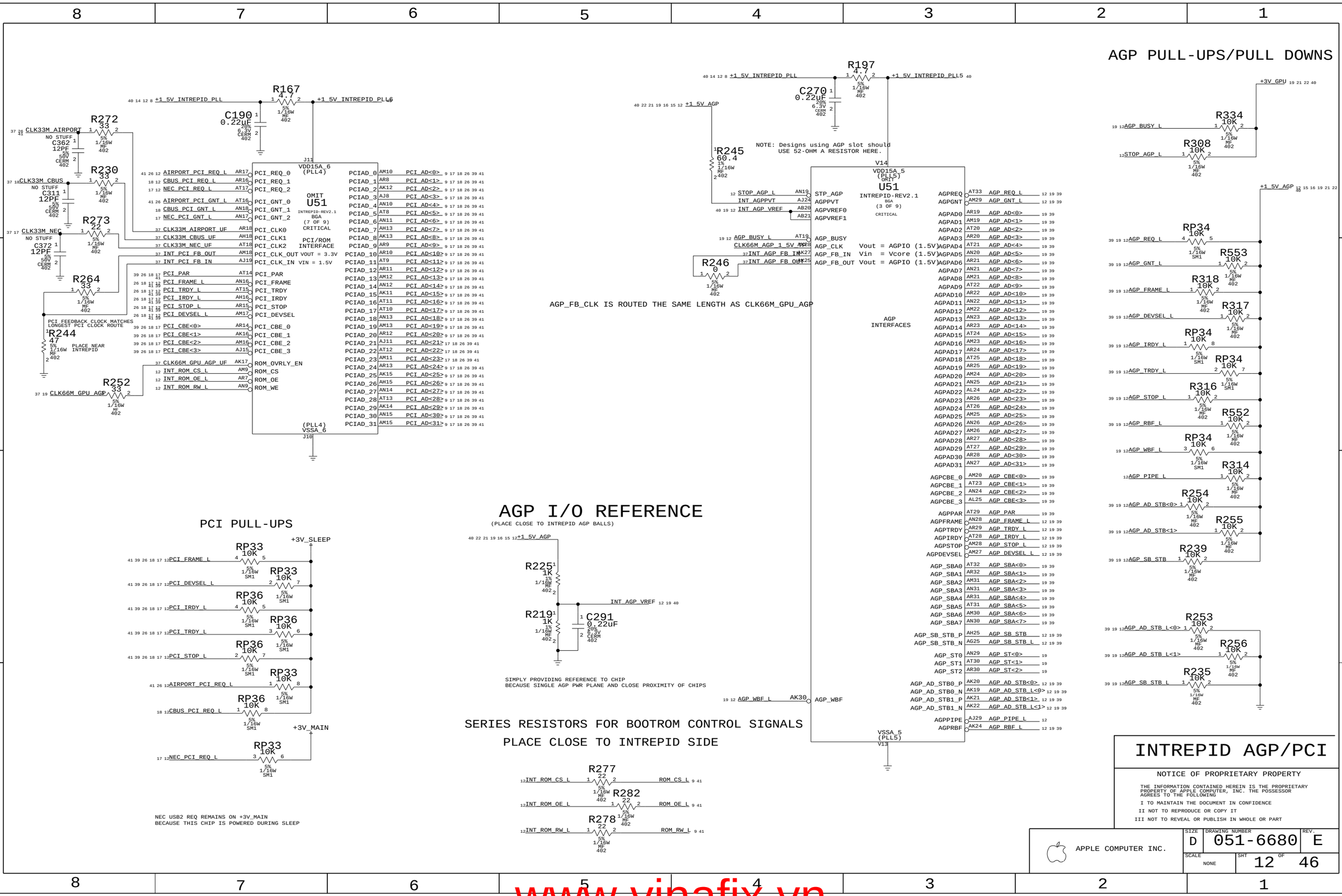
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SIZE	DRAWING NUMBER	REV.
D	051-6680	E
SCALE: NONE		SHT 11 OF 46

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INTREPID AGP/PCI

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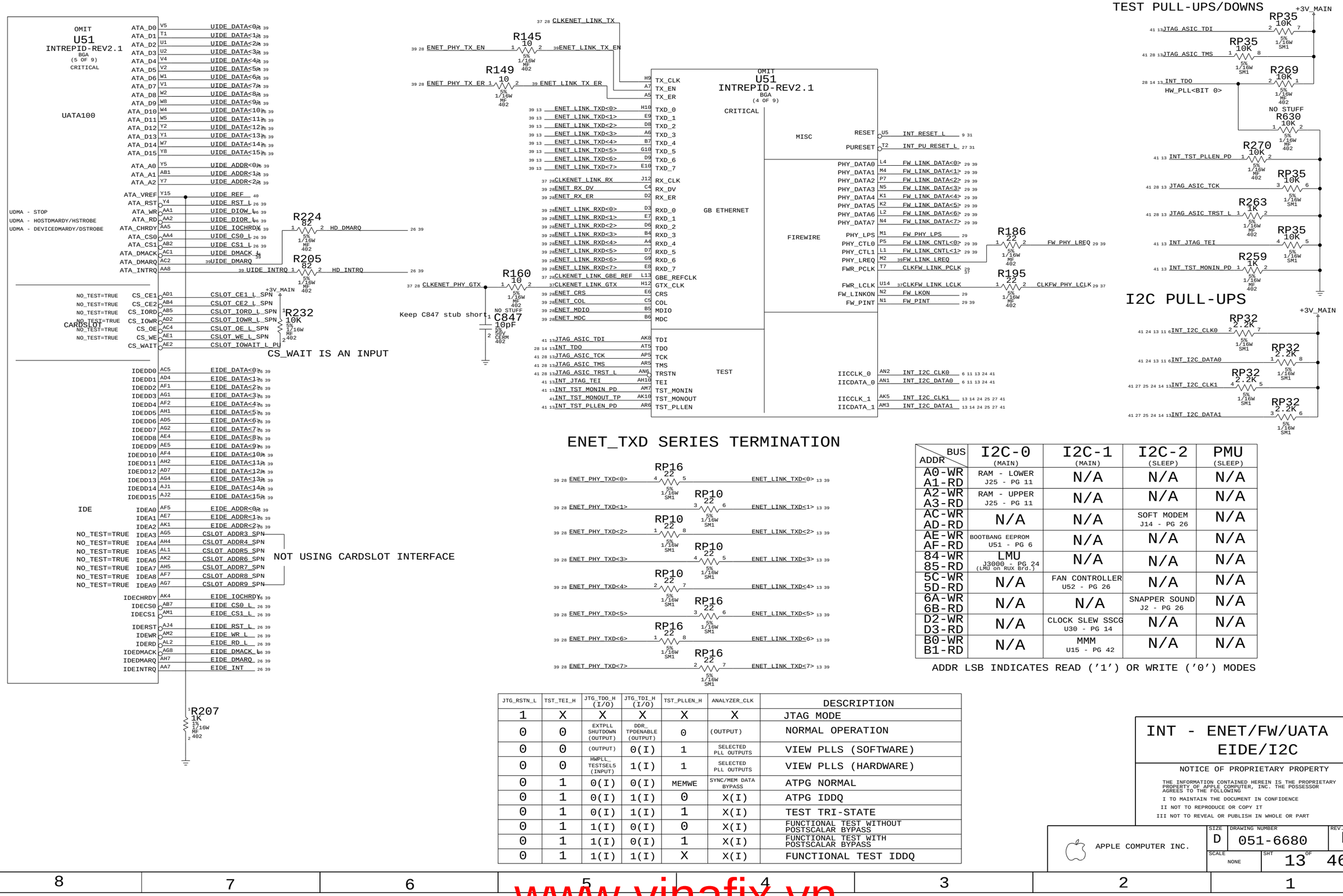
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SIZE	DRAWING NUMBER	REV.
D	051-6680	E

SCALE	SHT	OF
NONE	12	46



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USB PORT ASSIGNMENTS

PORT A B C D/UNUSED

R181 10K — USB_DAM
R183 10K — USB_DAP
R123 10K — USB_DBP
R121 10K — USB_DBM
R164 10K — USB_DCM
R165 10K — USB_DCP
R182 10K — USB_DDM
R180 10K — USB_DDP

PORT E/BLUETOOTH

R174 22 — USB_DEP — BT_USB_DP
R179 22 — USB_DEM — BT_USB_DM
R178 15K — R175 15K

PORT F/TRACKPAD

R635 22 — USB_DFP — USB_TPAD_P
R603 22 — USB_DFM — USB_TPAD_N
R129 15K — R125 15K

+2_5V_MAIN — NO STUFF R568 0 — +1_8V_MAIN — R565 0

U49 LTC1962-ADJ MSOP
IN ← +2_5V_MAIN (LTC1962_INT_VIN)
NC, NC
ADJ ← LTC1962_INT_ADJ
BYP ← LTC1962_INT_BYP
GND
SHDN
OUT → +1_5V_INTREPID_PLL -> 1.55V OUTPUT

C721 1uF 10V CERM 603
C392 0.01uF 20% 16V CERM 402
R574 18.7K 1% 1/16W MF 402
R567 68.1K 1% 1/16W MF 402
C723 10uF 20% 6.3V CERM 805

+3V_SLEEP
R148 10K — CBUS_INT_L
R746 10K — AIRPORT_PCI_INT_L
+3V_MAIN
R158 10K — NEC_PCI_INT_L

PCI INTERRUPTS

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
359S0086	1	IC,CY28512-2	U31	CRITICAL	SSCG

+3V_MAIN — GPIO/EXTINT PULLUPS

R187 10K — USB_PWREN_EF_L
R191 10K — USB_OC_EF_L
RP11 10K — USB_OC_AB_L
RP11 10K — USB_PWREN_CD_L
RP8 10K — USB_PWREN_AB_L
RP11 10K — USB_OC_CD_L
RP8 10K — INT_EXTINT14_PU
RP5 10K — INT_EXTINT8_PU
RP6 10K — COMM_RING_DET_L
RP11 10K — INT_GPIO15_PU
RP6 10K — PMU_INT_NMI
RP6 10K — PMU_INT_L
R250 10K — PMU_REQ_L
RP7 10K — INT_GPIO12_PU
RP7 10K — INT_EXTINT13_PU
RP4 10K — INT_EXTINT16_PU
RP6 10K — INT_EXTINT10_PU
RP8 10K — INT_GPIO9_PU
RP8 10K — INT_GPIO1_PU
R153 10K — INT_EXTINT3_PU
RP15 10K — INT_MOD_DTO_UF
RP15 10K — INT_MOD_CLKOUT_UF
RP5 10K — NC EXTINT11
RP4 10K — NC EXTINT12
RP15 10K — INT_MOD_DTI
RP15 10K — INT_MOD_SYNC_UF
R206 10K — INT_MOD_BITCLK_UF
R166 100K — SND_HW_RESET_L

+3V_MAIN — L15 400-OHM-EMI SM-1 — +3V_CG_PLL_MAIN
+2_5V_MAIN — L14 400-OHM-EMI SM-1 — +2_5V_CG_MAIN

MAIN_RESET_L
NO STUFF R286 0
SSCG R287 10K
SSCG R288 10K
NO STUFF R295 10K

SSCG C400 0.1uF
SSCG C402 1uF
SSCG C399 0.1uF
SSCG C394 0.1uF

CRITICAL U31 CY28512D TSSOP OMIT
INTERNAL 250K PULL-UP
OUTPUT IMPEDANCE ~18-20 OHMS

CLKIN	INT_REF_CLK_OUT
FSEL	CG_FSEL
SCLK	INT_I2C_CLK1
SDATA	INT_I2C_DATA1
ADDRSEL (INTERNAL 250K PULL-DOWN)	CG_ADDRSEL
RESET*	CG_RESET_L
PD*	CG_SYSCLK_EN
LOCK (OPEN DRAIN OUTPUT)	CG_LOCK
ODSEL (INTERNAL 250K PULL-UP)	NC
CPU0	CG_CLKOUT
VDD0, VDD1, VDDA, VDDC, VDD0	+3V_MAIN
VSS0, VSS1, VSSA, VSSC, VSSQ	GND

SSCG R293 33 — INT_REF_CLK_IN
SSCG R292 75 — PLACE NEAR INTREPID TO MINIMIZE OVERSHOOT
SSCG R142 0 — VCORE_VGATE

NO STUFF R467 0 — SYSTEM_CLK_EN
R457 0 — INT_TDO — CG_SYSCLK_EN
NO STUFF J9 U.FL-R-SMT — CLK18M_INT_EXT
NO STUFF R134 0 — CLK18M_INT_XOUT
NO STUFF R113 51 — CLK18M_INT_XIN
NO STUFF R144 10M
R143 0
CRITICAL Y2 OMIT 18.432M 8X4.5MM-SM — CLK18M_XTAL_IN
C152 22pF — C151 22pF
CRYSTAL LOAD CAPACITANCE IS 16PF
R218 0 — INT_REF_CLK_OUT

HWPLL_TESTMUXSEL	SIGNAL NAME
5	MOD_BITCLK_B_H
4	MOD_CLKOUT_B_H
3	MOD_DTO_B_H
2	MOD_SYNC_B_H
1	MOD_DTI_B_H
0	JTG_TDO_H

R802 10K — MMM_SIRQ_L
R801 10K — MMM_FFIRQ_L

R240 4.7 — +1_5V_INTREPID_PLL
R280 4.7 — +1_5V_INTREPID_PLL
R279 4.7 — +1_5V_INTREPID_PLL
R243 4.7 — +1_5V_INTREPID_PLL
R201 4.7 — +1_5V_INTREPID_PLL
C337 0.22uF — C389 0.22uF — C388 0.22uF — C386 0.22uF — C387 0.22uF

+3V_MAIN — L13 FERR-EMI-100-OHM SM
+3V_INTREPID_USB
C235 0.01uF — C246 0.1uF — C256 10uF

SSCG R450 0 — CG_FSEL

U51 INTREPID-REV2.1 BGA CRITICAL (6 OF 9) — OMIT

GPIO0	VCORE A/B SEL
GPIO1	GENERAL PURPOSE I/O'S
GPIO2	
GPIO3	
GPIO4	
GPIO5	
GPIO6	
GPIO9	
GPIO11	
GPIO12	
GPIO15	
GPIO16	
EXTINT0	INTERRUPTS
EXTINT1	
EXTINT2	
EXTINT3	
EXTINT4	
EXTINT5	
EXTINT6	
EXTINT7	
EXTINT8	POWERBOOK SPARE
EXTINT9	
EXTINT10	CBUS_REG_L
EXTINT11	CBUS_IREQ_L
EXTINT12	
EXTINT13	
EXTINT14	
EXTINT15	
EXTINT16	
EXTINT17	
CPU_INT	
PCIPME	
PROCSLEEPREQ	
PENDPROCINT	
XTAL_IN	CLOCKS
XTAL_OUT	
STOPXTAL	
WATCHDOG	
BUF_REF_CLK_OUT	
SS_REF_CLK_IN	
IICCLK_2	IIC
IICDATA_2	
SCCTXDA	USB
SCCRTSA	
SCCDTRA	
SCCRXDA	
SCCGPIOA	
SCCTRXCA	
SCCTXDB	
SCCRTSB	
SCCRXDB	
SCCGPIOB	
SCCTRXCB	
USB_VD0_P	
USB_VD0_N	
USB_VD1_P	
USB_VD1_N	
USB_PRTPWR0	
USB_PWRFLT0	
USB_VD2_P	
USB_VD2_N	
USB_VD3_P	
USB_VD3_N	
USB_PRTPWR1	
USB_PWRFLT1	
USB_VD4_P	
USB_VD4_N	
USB_VD5_P	
USB_VD5_N	
USB_PRTPWR2	
USB_PWRFLT2	
AUD_DTO	AUDIO/I2S
AUD_DTI	
AUD_SYNC	
AUD_BITCLK	
AUD_CLKOUT	
MOD_DTO	(SIGNAL FROM MODEM)
MOD_DTI	
MOD_SYNC	
MOD_BITCLK	
MOD_CLKOUT	
VIA	
MISO	
REQ*	
MOSI	
ACK*	
SCK	

VSSA1 (PLL1), VSSA2 (PLL2), VSSA3 (PLL3), VSSA4 (PLL7), VSSA_8 (PLL9), VSSU_1, VSSU_2
PCI VDD15A_1 (PLL1), PCI VDD15A_2 (PLL2), PCI VDD15A_3 (PLL3), PCI VDD15A_4 (PLL7), PCI VDD15A_8 (PLL9), VDDU33_1, VDDU33_2

COMM_TXD_L, COMM_RTS_L, COMM_DTR_L, COMM_RXD, COMM_GPIO_L, COMM_TRXC
PMU_FROM_INT, PMU_REQ_L, PMU_TO_INT, PMU_ACK_L, PMU_CLK
USB_DAP, USB_DAM, USB_DBP, USB_DBM, USB_PWREN_AB_L, USB_OC_AB_L, USB_DCP, USB_DCM, USB_DDP, USB_DDM, USB_PWREN_CD_L, USB_OC_CD_L, USB_DEP, USB_DEM, USB_DFP, USB_DFM, USB_PWREN_EF_L, USB_OC_EF_L
INT_I2S0_SND_TO_DAC_UF, INT_I2S0_SND_FROM_ADC_UF, INT_I2S0_SND_LRCLK_UF, INT_I2S0_SND_SCLK_UF, INT_I2S0_SND_MCLK_UF
INT_MOD_DTO_UF, INT_MOD_DTI, INT_MOD_SYNC_UF, INT_MOD_BITCLK_UF, INT_MOD_CLKOUT_UF

+3V_SLEEP — R258 1K — R241 1K — INT_I2C_CLK2, INT_I2C_DATA2

RP13 47 — INT_I2S0_SND_TO_DAC
RP13 47 — INT_I2S0_SND_LRCLK
RP13 47 — INT_I2S0_SND_SCLK
RP13 47 — INT_I2S0_SND_MCLK
SOFT_MODEM RP47 0K — INT_MOD_DTO
SOFT_MODEM RP47 0K — INT_MOD_SYNC
SOFT_MODEM RP47 0K — INT_MOD_BITCLK
SOFT_MODEM RP47 0K — INT_MOD_CLKOUT

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
197S0090	1	XTAL,CER,LOW PROF,18,432MHZ,8X4.5MM,SMD	Y2	CRITICAL	?

PART #	QTY	DEVICE	PACKAGE	DESCRIPTION	VALUE	VOLT.	WATT.	TOL.	REFERENCE DESIGNATOR(S)	BOM OPTION
116S1104	1	RES	RES-0402-V2	RESISTOR	10K		1/16W	5%	R292	NO_SSCG

INT - USB/GPIOS/I2S

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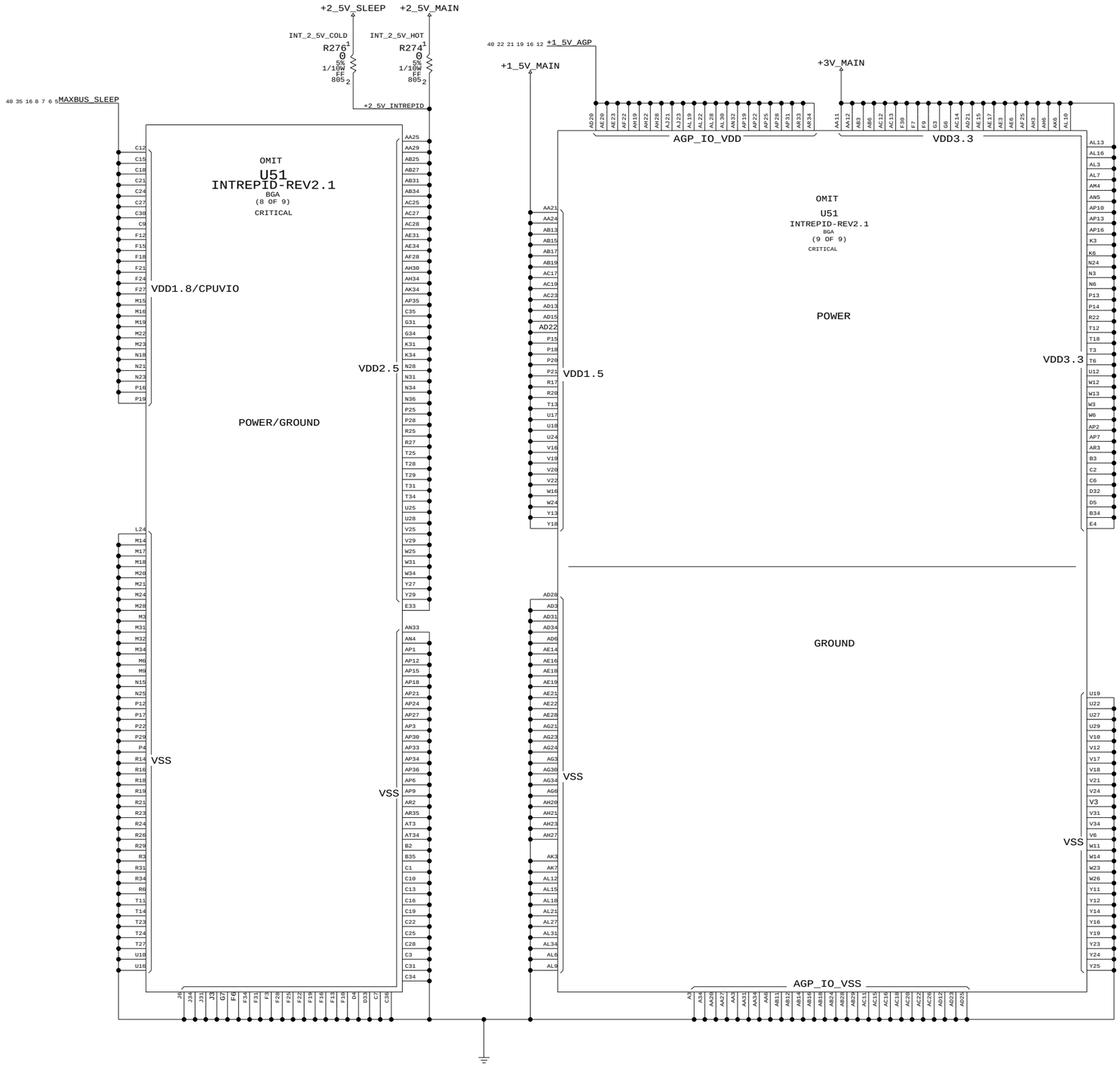
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D	051-6680	E
SCALE: NONE	SHT 14 OF 46	

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PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
343S0305	1	IC,ASIC,INTREPID,REV2.1,974 BGA,FAST	U51	CRITICAL	?

Intrepid Power

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SCALE	SHT
NONE	15 OF 46

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INTREPID MAXBUS DECOUPLING

35 15 8 7 6 5 MAXBUS_SLEEP 40

24 Balls
4 X 10UF (0805)
28 X 0.22UF (0402)

C148 10uF 20% 6.3V CERM 805 · C142 10uF 20% 6.3V CERM 805 · C144 10uF 20% 6.3V CERM 805 · C146 10uF 20% 6.3V CERM 805

C182 0.22uF 20% 6.3V CERM 402 · C178 0.22uF 20% 6.3V CERM 402 · C141 0.22uF 20% 6.3V CERM 402 · C145 0.22uF 20% 6.3V CERM 402 · C214 0.22uF 20% 6.3V CERM 402 · C163 0.22uF 20% 6.3V CERM 402 · C164 0.22uF 20% 6.3V CERM 402 · C225 0.22uF 20% 6.3V CERM 402 · C160 0.22uF 20% 6.3V CERM 402 · C159 0.22uF 20% 6.3V CERM 402

C204 0.22uF 20% 6.3V CERM 402 · C166 0.22uF 20% 6.3V CERM 402 · C205 0.22uF 20% 6.3V CERM 402 · C223 0.22uF 20% 6.3V CERM 402 · C229 0.22uF 20% 6.3V CERM 402 · C181 0.22uF 20% 6.3V CERM 402 · C207 0.22uF 20% 6.3V CERM 402 · C208 0.22uF 20% 6.3V CERM 402 · C183 0.22uF 20% 6.3V CERM 402 · C180 0.22uF 20% 6.3V CERM 402

C165 0.22uF 20% 6.3V CERM 402 · C206 0.22uF 20% 6.3V CERM 402 · C147 0.22uF 20% 6.3V CERM 402 · C149 0.22uF 20% 6.3V CERM 402 · C179 0.22uF 20% 6.3V CERM 402 · C162 0.22uF 20% 6.3V CERM 402 · C161 0.22uF 20% 6.3V CERM 402 · C213 0.22uF 20% 6.3V CERM 402

INTREPID CORE DECOUPLING

+1_5V_MAIN

30 Balls
4 X 10UF (0805)
29 X 0.22UF (0402)

C324 10uF 20% 6.3V CERM 805 · C325 10uF 20% 6.3V CERM 805 · C201 10uF 20% 6.3V CERM 805 · C200 10uF 20% 6.3V CERM 805

C299 0.22uF 20% 6.3V CERM 402 · C279 0.22uF 20% 6.3V CERM 402 · C262 0.22uF 20% 6.3V CERM 402 · C292 0.22uF 20% 6.3V CERM 402 · C248 0.22uF 20% 6.3V CERM 402 · C302 0.22uF 20% 6.3V CERM 402 · C300 0.22uF 20% 6.3V CERM 402 · C290 0.22uF 20% 6.3V CERM 402 · C272 0.22uF 20% 6.3V CERM 402 · C259 0.22uF 20% 6.3V CERM 402

C301 0.22uF 20% 6.3V CERM 402 · C278 0.22uF 20% 6.3V CERM 402 · C226 0.22uF 20% 6.3V CERM 402 · C238 0.22uF 20% 6.3V CERM 402 · C250 0.22uF 20% 6.3V CERM 402 · C263 0.22uF 20% 6.3V CERM 402 · C224 0.22uF 20% 6.3V CERM 402 · C222 0.22uF 20% 6.3V CERM 402 · C261 0.22uF 20% 6.3V CERM 402 · C227 0.22uF 20% 6.3V CERM 402

C271 0.22uF 20% 6.3V CERM 402 · C310 0.22uF 20% 6.3V CERM 402 · C288 0.22uF 20% 6.3V CERM 402 · C260 0.22uF 20% 6.3V CERM 402 · C303 0.22uF 20% 6.3V CERM 402 · C287 0.22uF 20% 6.3V CERM 402 · C258 0.22uF 20% 6.3V CERM 402 · C236 0.22uF 20% 6.3V CERM 402 · C289 0.22uF 20% 6.3V CERM 402

INTREPID AGP I/O DECOUPLING

40 22 21 19 15 12 +1_5V_AGP

21 Balls
4 X 10UF (0805)
21 X 0.22UF (0402)

C381 10uF 20% 6.3V CERM 805 · C380 10uF 20% 6.3V CERM 805 · C382 10uF 20% 6.3V CERM 805 · C379 10uF 20% 6.3V CERM 805

C367 0.22uF 20% 6.3V CERM 402 · C319 0.22uF 20% 6.3V CERM 402 · C330 0.22uF 20% 6.3V CERM 402 · C363 0.22uF 20% 6.3V CERM 402 · C366 0.22uF 20% 6.3V CERM 402 · C332 0.22uF 20% 6.3V CERM 402 · C361 0.22uF 20% 6.3V CERM 402 · C320 0.22uF 20% 6.3V CERM 402 · C328 0.22uF 20% 6.3V CERM 402 · C364 0.22uF 20% 6.3V CERM 402

C365 0.22uF 20% 6.3V CERM 402 · C329 0.22uF 20% 6.3V CERM 402 · C345 0.22uF 20% 6.3V CERM 402 · C346 0.22uF 20% 6.3V CERM 402 · C373 0.22uF 20% 6.3V CERM 402 · C344 0.22uF 20% 6.3V CERM 402 · C331 0.22uF 20% 6.3V CERM 402 · C312 0.22uF 20% 6.3V CERM 402 · C354 0.22uF 20% 6.3V CERM 402 · C347 0.22uF 20% 6.3V CERM 402

C321 0.22uF 20% 6.3V CERM 402

INTREPID 3.3V DECOUPLING

+3V_MAIN

57 Balls
4 X 10UF (0805)
40 X 0.22UF (0402)

C378 10uF 20% 6.3V CERM 805 · C376 10uF 20% 6.3V CERM 805 · C377 10uF 20% 6.3V CERM 805 · C375 10uF 20% 6.3V CERM 805

C170 0.22uF 20% 6.3V CERM 402 · C358 0.22uF 20% 6.3V CERM 402 · C268 0.22uF 20% 6.3V CERM 402 · C327 0.22uF 20% 6.3V CERM 402 · C342 0.22uF 20% 6.3V CERM 402 · C215 0.22uF 20% 6.3V CERM 402 · C352 0.22uF 20% 6.3V CERM 402 · C171 0.22uF 20% 6.3V CERM 402 · C158 0.22uF 20% 6.3V CERM 402 · C309 0.22uF 20% 6.3V CERM 402

C175 0.22uF 20% 6.3V CERM 402 · C357 0.22uF 20% 6.3V CERM 402 · C351 0.22uF 20% 6.3V CERM 402 · C350 0.22uF 20% 6.3V CERM 402 · C286 0.22uF 20% 6.3V CERM 402 · C176 0.22uF 20% 6.3V CERM 402 · C189 0.22uF 20% 6.3V CERM 402 · C167 0.22uF 20% 6.3V CERM 402 · C371 0.22uF 20% 6.3V CERM 402 · C359 0.22uF 20% 6.3V CERM 402

C285 0.22uF 20% 6.3V CERM 402 · C283 0.22uF 20% 6.3V CERM 402 · C269 0.22uF 20% 6.3V CERM 402 · C221 0.22uF 20% 6.3V CERM 402 · C234 0.22uF 20% 6.3V CERM 402 · C247 0.22uF 20% 6.3V CERM 402 · C257 0.22uF 20% 6.3V CERM 402 · C343 0.22uF 20% 6.3V CERM 402 · C313 0.22uF 20% 6.3V CERM 402 · C228 0.22uF 20% 6.3V CERM 402

C360 0.22uF 20% 6.3V CERM 402 · C308 0.22uF 20% 6.3V CERM 402 · C318 0.22uF 20% 6.3V CERM 402 · C237 0.22uF 20% 6.3V CERM 402 · C317 0.22uF 20% 6.3V CERM 402 · C341 0.22uF 20% 6.3V CERM 402 · C177 0.22uF 20% 6.3V CERM 402 · C212 0.22uF 20% 6.3V CERM 402 · C349 0.22uF 20% 6.3V CERM 402 · C184 0.22uF 20% 6.3V CERM 402

INTREPID DDR DECOUPLING

40 15 10 9 +2_5V_INTREPID

44 Balls
4 X 10UF (0805)
46 X 0.22UF (0402)

C314 10uF 20% 6.3V CERM 805 · C322 10uF 20% 6.3V CERM 805 · C191 10uF 20% 6.3V CERM 805 · C202 10uF 20% 6.3V CERM 805

C304 0.22uF 20% 6.3V CERM 402 · C266 0.22uF 20% 6.3V CERM 402 · C172 0.22uF 20% 6.3V CERM 402 · C281 0.22uF 20% 6.3V CERM 402 · C243 0.22uF 20% 6.3V CERM 402 · C253 0.22uF 20% 6.3V CERM 402 · C334 0.22uF 20% 6.3V CERM 402 · C241 0.22uF 20% 6.3V CERM 402 · C348 0.22uF 20% 6.3V CERM 402 · C192 0.22uF 20% 6.3V CERM 402

C306 0.22uF 20% 6.3V CERM 402 · C252 0.22uF 20% 6.3V CERM 402 · C275 0.22uF 20% 6.3V CERM 402 · C297 0.22uF 20% 6.3V CERM 402 · C240 0.22uF 20% 6.3V CERM 402 · C218 0.22uF 20% 6.3V CERM 402 · C274 0.22uF 20% 6.3V CERM 402 · C369 0.22uF 20% 6.3V CERM 402 · C368 0.22uF 20% 6.3V CERM 402 · C168 0.22uF 20% 6.3V CERM 402

C265 0.22uF 20% 6.3V CERM 402 · C251 0.22uF 20% 6.3V CERM 402 · C216 0.22uF 20% 6.3V CERM 402 · C254 0.22uF 20% 6.3V CERM 402 · C305 0.22uF 20% 6.3V CERM 402 · C186 0.22uF 20% 6.3V CERM 402 · C219 0.22uF 20% 6.3V CERM 402 · C315 0.22uF 20% 6.3V CERM 402 · C264 0.22uF 20% 6.3V CERM 402 · C294 0.22uF 20% 6.3V CERM 402

C323 0.22uF 20% 6.3V CERM 402 · C273 0.22uF 20% 6.3V CERM 402 · C242 0.22uF 20% 6.3V CERM 402 · C203 0.22uF 20% 6.3V CERM 402 · C333 0.22uF 20% 6.3V CERM 402 · C217 0.22uF 20% 6.3V CERM 402 · C230 0.22uF 20% 6.3V CERM 402 · C293 0.22uF 20% 6.3V CERM 402 · C231 0.22uF 20% 6.3V CERM 402 · C296 0.22uF 20% 6.3V CERM 402

C239 0.22uF 20% 6.3V CERM 402 · C316 0.22uF 20% 6.3V CERM 402 · C185 0.22uF 20% 6.3V CERM 402 · C282 0.22uF 20% 6.3V CERM 402 · C295 0.22uF 20% 6.3V CERM 402 · C280 0.22uF 20% 6.3V CERM 402

INTREPID/MAIN 2.5V DECOUPLING

+2_5V_MAIN

10 X 0.22UF (0402)

C770 0.22uF 20% 6.3V CERM 402 · C139 0.22uF 20% 6.3V CERM 402 · C335 0.22uF 20% 6.3V CERM 402 · C735 0.22uF 20% 6.3V CERM 402 · C245 0.22uF 20% 6.3V CERM 402 · C736 0.22uF 20% 6.3V CERM 402 · C739 0.22uF 20% 6.3V CERM 402 · C395 0.22uF 20% 6.3V CERM 402 · C374 0.22uF 20% 6.3V CERM 402 · C385 0.22uF 20% 6.3V CERM 402

Place these 2.5V Decoupling Caps near the Edge of +2.5V_MAIN and +2.5V_INTREPID split

Intrepid Decoupling

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D	051-6680	E
SCALE: NONE	SHT 16 OF 46	

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PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
197S0087	1	XTAL,CER,LW PROF,30.0000MHZ,8X4.5MM,SMD	Y1	CRITICAL	?

+3V_NEC_VDD 17 40

C749 0.1uF 20% 10V CERM 402
C746 0.1uF 20% 10V CERM 402
C761 0.1uF 20% 10V CERM 402
C750 0.1uF 20% 10V CERM 402
C756 0.1uF 20% 10V CERM 402
C748 0.1uF 20% 10V CERM 402
C769 0.1uF 20% 10V CERM 402
C752 0.1uF 20% 10V CERM 402
C747 0.1uF 20% 10V CERM 402
C197 10uF 20% 6.3V CERM 805
C765 0.1uF 20% 10V CERM 402
C768 0.1uF 20% 10V CERM 402

+3V_MAIN

L7 FERR-EMI-100-OHM SM

R172 0 5% 1/16W MF 603

C760 0.1uF 20% 10V CERM 402
C751 0.1uF 20% 10V CERM 402
C173 10uF 20% 6.3V CERM 805

40 NEC_AVDD

40 17 +3V_NEC_VDD

Y1's LOAD CAPACITANCE = 16 pF

OMIT CRITICAL

Y1 30.0000M 8X4.5MM-SM

NEC_XT2_R

C759 27pF 5% 50V CERM 402
C136 27pF 5% 50V CERM 402
R124 100 5% 1/16W MF 402

R613 43.2 1% 1/16W MF 402 — NEC_USB_DAM 27 39 41 — Low/Full/High Speed (External)
R612 43.2 1% 1/16W MF 402 — NEC_USB_DAP 27 39 41
R609 43.2 1% 1/16W MF 402 — NEC_USB_DBM 27 39 41 — Low/Full/High Speed (External)
R610 43.2 1% 1/16W MF 402 — NEC_USB_DBP 27 39 41

CRITICAL

U17
NEC_uPD720101_USB2
FBGA

			H3 M4 C8 P2 P3 P12 A13 A12 A3 E2 N8 L13 J13 H13 F13 D13 G12 H4 D7 N10 M12
			VDD_PCI
			VDD
			AVDD
41 39 26 18 12 9 PCI_AD<0>	M5	AD0	
41 39 26 18 12 9 PCI_AD<1>	P5	AD1	
41 39 26 18 12 9 PCI_AD<2>	N5	AD2	
41 39 26 18 12 9 PCI_AD<3>	P4	AD3	
41 39 26 18 12 9 PCI_AD<4>	N4	AD4	
41 39 26 18 12 9 PCI_AD<5>	M3	AD5	
41 39 26 18 12 9 PCI_AD<6>	N3	AD6	
41 39 26 18 12 9 PCI_AD<7>	M1	AD7	
41 39 26 18 12 9 PCI_AD<8>	L2	AD8	
41 39 26 18 12 9 PCI_AD<9>	L1	AD9	
41 39 26 18 12 9 PCI_AD<10>	K2	AD10	
41 39 26 18 12 9 PCI_AD<11>	L3	AD11	
41 39 26 18 12 9 PCI_AD<12>	K1	AD12	
41 39 26 18 12 9 PCI_AD<13>	K3	AD13	
41 39 26 18 12 9 PCI_AD<14>	J2	AD14	
41 39 26 18 12 9 PCI_AD<15>	J1	AD15	
41 39 26 18 12 9 PCI_AD<16>	F2	AD16	
41 39 26 18 12 9 PCI_AD<17>	E3	AD17	
41 39 26 18 12 9 PCI_AD<18>	E1	AD18	
41 39 26 18 12 9 PCI_AD<19>	D3	AD19	
41 39 26 18 12 9 PCI_AD<20>	D1	AD20	
41 39 26 18 12 PCI_AD<21>	D2	AD21	
41 39 26 18 12 PCI_AD<22>	C2	AD22	
41 39 26 18 12 PCI_AD<23>	C1	AD23	
41 39 26 18 12 9 PCI_AD<24>	B4	AD24	
41 39 26 18 12 9 PCI_AD<25>	A4	AD25	
41 39 26 18 12 9 PCI_AD<26>	B5	AD26	
(PCI_AD<27>)	C4	AD27	
41 39 26 18 12 9 PCI_AD<28>	A5	AD28	
41 39 26 18 12 9 PCI_AD<29>	C5	AD29	
41 39 26 18 12 9 PCI_AD<30>	B6	AD30	
41 39 26 18 12 9 PCI_AD<31>	A6	AD31	
39 26 18 12 PCI_CBE<0>	M2	CBE0	
39 26 18 12 PCI_CBE<1>	J3	CBE1	
39 26 18 12 PCI_CBE<2>	F1	CBE2	
39 26 18 12 PCI_CBE<3>	C3	CBE3	
41 39 26 18 12 PCI_PAR	J4	PAR	
41 39 26 18 12 PCI_FRAME_L	F3	FRAME	
41 39 26 18 12 PCI_IRDY_L	F4	IRDY	
41 39 26 18 12 PCI_TRDY_L	G1	TRDY	
41 39 26 18 12 PCI_STOP_L	G3	STOP	
NEC_IDSEL	B3	IDSEL	
41 39 26 18 12 PCI_DEVSEL_L	G2	DEVSEL	
12 NEC_PCI_REQ_L	C6	REQ	
12 NEC_PCI_GNT_L	D6	GNT	
18 PCI_PERR_L	H2	PERR	
18 PCI_SERR_L	H1	SERR	OD
NEC_PCI_INTA_L	C7	INTA	OD
NEC_PCI_INTB_L	B7	INTB	OD
NEC_PCI_INTC_L	A7	INTC	OD
37 12 CLK33M_NEC	A8	PCLK	
17 NEC_IO_RESET_L	B8	VBRSRT	
NEC_CRUN_L	N6	CRUN	OD
17 NEC_PME_L	D8	PME	OD
17 NEC_MAIN_RESET_L	C8	VCCRST	OD
NEC_SMI_L_TP	L6	SMI	OD
17 NEC_LEGC	L7	LEGC	
			VSS
			B1 N1 P10 N14 H14 B14 A2 B2 N2 N13 B13 M11 L12 H12 D12 G4 J11 F11 D8
			AVSS(R)
			N11 P13 M12
			AVSS

XT1/SCLK L9 NEC_XT1
XT2 P8 NEC_XT2

RSDM1 M14 NEC_USB_RSDM1
DM1 M13 (NEC_USB_DAM)
DP1 L14 (NEC_USB_DAP)
RSDP1 K13 NEC_USB_RSDP1
RSDM2 K14 NEC_USB_RSDM2
DM2 K12 (NEC_USB_DBM)
DP2 J14 (NEC_USB_DBP)
RSDP2 J12 NEC_USB_RSDP2
RSDM3 H11 NC
DM3 G11
DP3 G13
RSDP3 G14 NC
RSDM4 F12 NC
DM4 F14
DP4 E12
RSDP4 E14 NC
RSDM5 E13 NC
DM5 D14
DP5 C13
RSDP5 C14 NC

RREF P11 NEC_RREF — R614 9.09K 1% 1/16W MF 402 — NEC_AVSS_F 17

Tie to GND (NEC_AVSS_F) at ball N11

OCI1 B12 NEC_LUSB_OCI
OCI2 B11 NEC_RUSB_OCI
OCI3 B10 NEC_OCI<3>
OCI4 A10 NEC_OCI<4>
OCI5 B9 NEC_OCI<5>

RP43 10K 5% 1/16W SM1 (3 6)
RP43 10K 5% 1/16W SM1 (4 5)
R606 10K 5% 1/16W MF 402
R615 1K 5% 1/16W MF 402
R632 1K 5% 1/16W MF 402

+3V_NEC_VDD 17 40

PPON1 C12 OUT NEC_LUSB_PPON 41
PPON2 A11 OUT NEC_RUSB_PPON 41
PPON3 C11 OUT NEC_PPON3_TP
PPON4 C10 OUT NEC_PPON4_TP
PPON5 A9 OUT NEC_PPON5_TP

NC1 P6 NEC_NC<1>
NC2 M6 NEC_NC<2>

NEC documentation indicates that NCs must be tied high.

NTEST1 M8 IPD NC
SMC M7 IPD NC
TEB N7 IPD NC
AMC P7 IPD NEC_AMC_TP
TEST L8 IPD NC

NANDTEST M10 NEC_NANDTESTEN_TP
SRCLK M9 NC
SRDTA N9 NEC_NANDTESTOUT_TP
SRMOD P9 IPD NC

R798 0 5% 1/16W MF 603 — NEC_AVSS_F 1

Series Rpaks required to facilitate NAND-tree testing

RP45 47 5% 1/16W SM1
NC 1 — 8 NC
14 NEC_PCI_INT 2 — 7 NEC_PCI_INTA_L
3 — 6 NEC_PCI_INTB_L
4 — 5 NEC_PCI_INTC_L

R617 4.7k 5% 1/16W MF 402

RP44 47 5% 1/16W SM1
31 28 25 24 IO_RESET_L 1 — 8 NEC_IO_RESET_L 17
41 31 26 14 PMU_PME_L 2 — 7 NEC_PME_L 17
41 31 26 20 19 18 14 MAIN_RESET_L 3 — 6 NEC_MAIN_RESET_L 17
17 NEC_LEGC 4 — 5

+3V_MAIN

RP43 10K 5% 1/16W SM1 (7 2)
RP43 10K 5% 1/16W SM1 (8 1)

R607 0 5% 1/16W MF 402 — 17 NEC_LUSB_OCI — NEC_LUSB_OCI_UF 27 41
R608 0 5% 1/16W MF 402 — 17 NEC_RUSB_OCI — NEC_RUSB_OCI_UF 27 41

C743 0.1uF 20% 10V CERM 402 NO STUFF
C744 0.1uF 20% 10V CERM 402 NO STUFF

USB 2.0

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PCI1510 PULL-UPS

MAKE SURE VCC AND VPP ARE WIDE PLANE/TRACES TO MINIMIZE INDUCTANCE!

0.1UF ARE USED TO INCREASE ESD DISCHARGES OF UP TO 10KV

TI REFERENCE SCHEMATIC DID NOT HAVE BULK ON +VCC_CBUS_SW

INTEGRATED PULL-UP

PC CARD/CARDBUS CONNECTOR

J5 QT500806-L111 M-ST-SM1

CARDBUS

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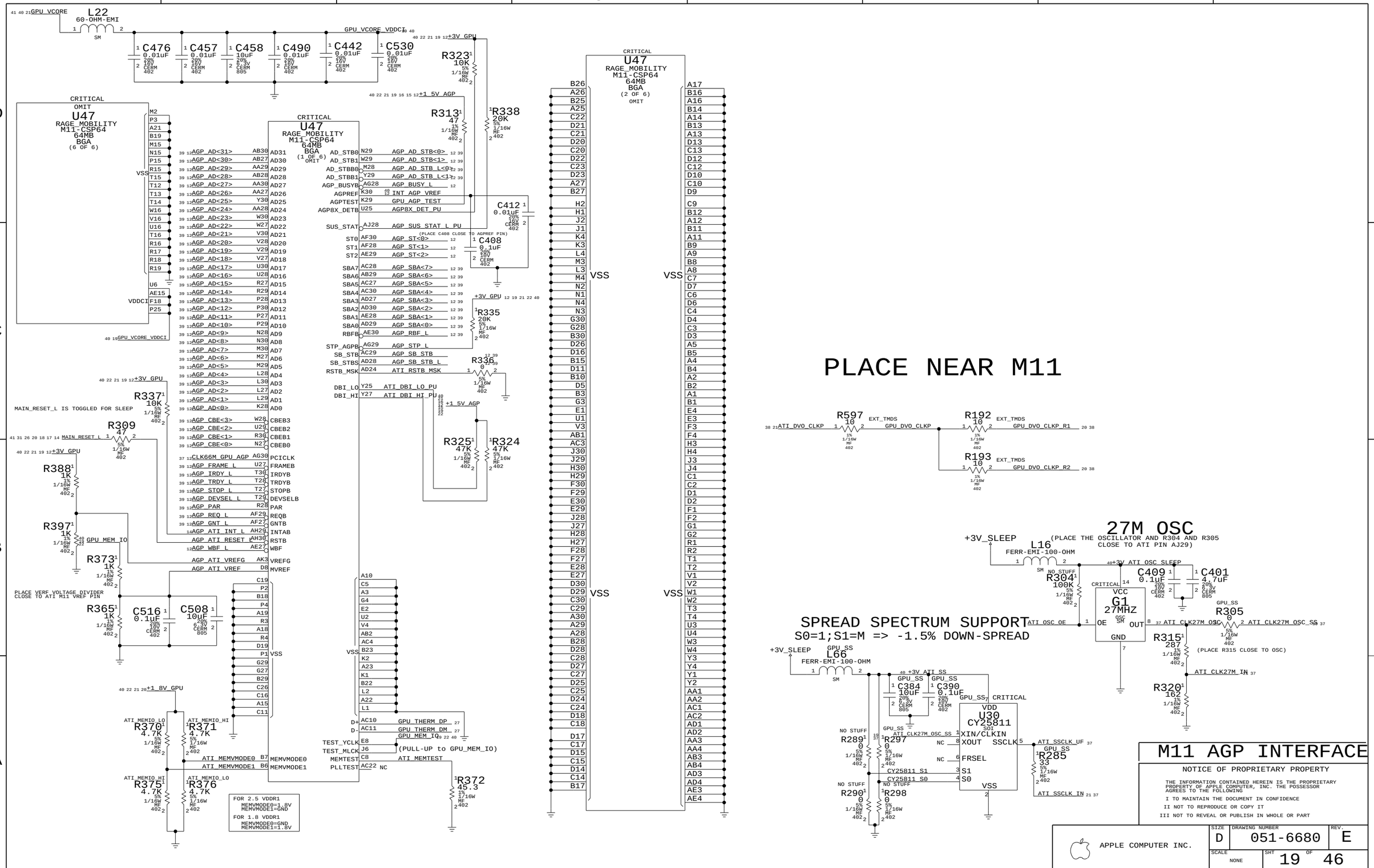
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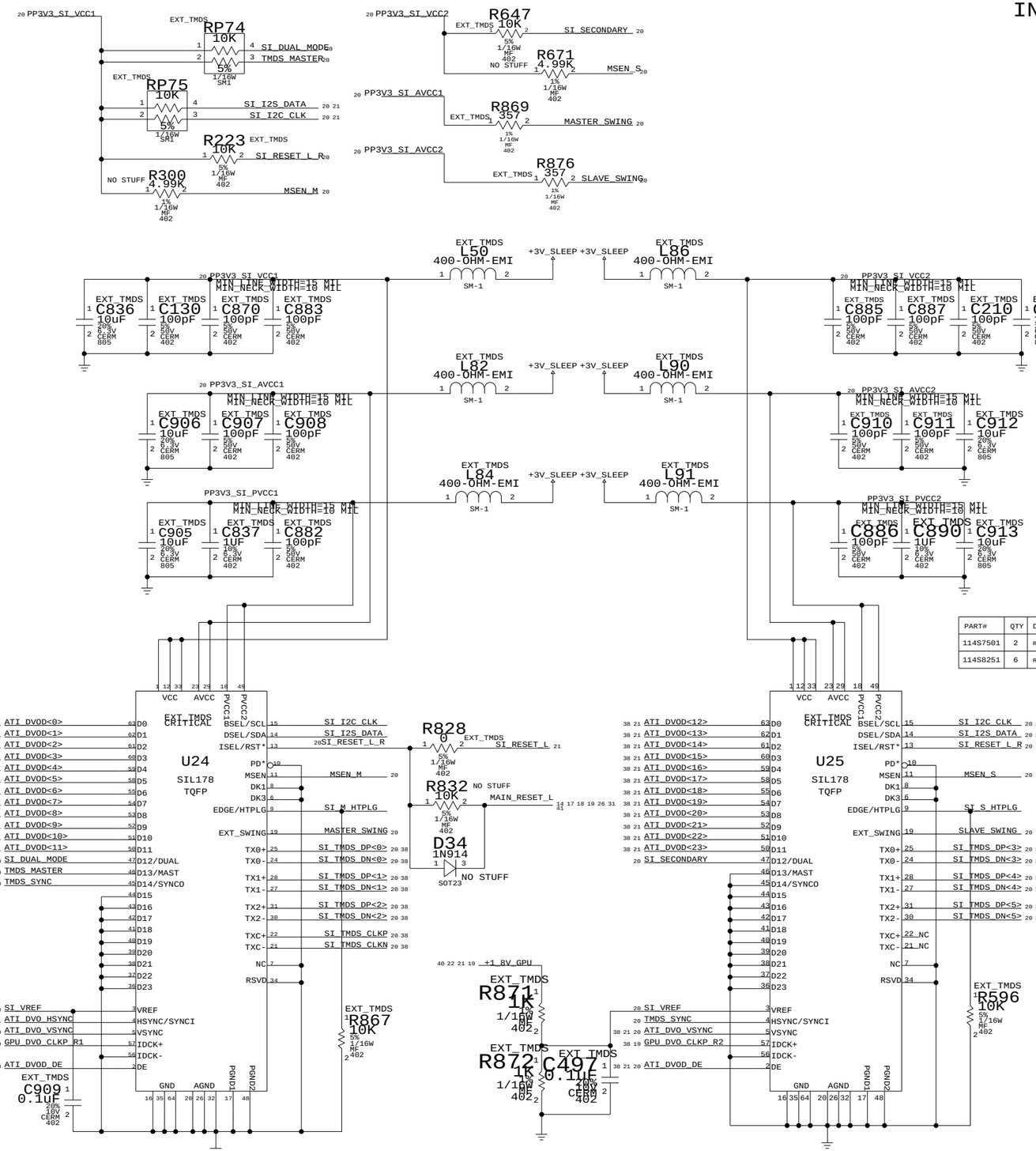
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GPU VCORE - 1.2V

(PUT ALL CAPS BELOW ATI ASIC)

GPU VCORE SUPPLY

M10 Power Shut down Sequencing

PLACE ALL TMDS 0 OHMS close to GPU

WHEN VCORE_CNTL HIGH => 1.2V
1.2V = 0.8V * (1 + R329 / (R328//R330))

WHEN VCORE_CNTL LOW => 1.0V
1.0V = 0.8V * (1 + R329 / R330)

M11 CORE PWR/LVDS/TMDS

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GPU PLL - 1.8V

+2_5V_SLEEP
U34 MM1571J SOT-25A (150mA MAX) CRITICAL
VIN VOUT CONT NOISE GND
GPU_CORE_OK
ATI_PVDD_BYP
C830 1uF 20% 10V CERM 603
C553 0.01uF 20% 10V CERM 402
1_8V_PVDD_STD
R787 0 5% 1/16W MF 402
+1_8V_ATI_PVDD
L20 FERR-220-OHM 0402
+1_8V_GPU_PLL (21mA)
C418 10uF 20% 6.3V CERM 805
C414 0.1uF 20% 10V CERM 402
C413 0.01uF 20% 10V CERM 402
C552 10uF 20% 6.3V CERM 805
+1_8V_GPU
L19 FERR-220-OHM 0402
+1_8V_GPU_AVDD (AVDD+VDDDI=75mA)
C427 10uF 20% 6.3V CERM 805
C453 0.01uF 20% 10V CERM 402
C450 0.01uF 20% 10V CERM 402

+2_5V_SLEEP
L23 FERR-220-OHM 0402 (140mA) +2_5V_GPU_A2VDD
C459 10uF 20% 6.3V CERM 805
C460 0.01uF 20% 10V CERM 402
C461 0.01uF 20% 10V CERM 402

+1_8V_GPU
L21 FERR-220-OHM 0402 (2mA) +1_8V_GPU_AVDDQ
C464 10uF 20% 6.3V CERM 805
C463 0.01uF 20% 10V CERM 402

+1_8V_GPU
L24 FERR-220-OHM 0402 (AVDD+VDDDI=75mA) +1_8V_GPU_VDDDI
C478 10uF 20% 6.3V CERM 805
C462 0.01uF 20% 10V CERM 402
C454 0.01uF 20% 10V CERM 402

+2_5V_SLEEP
L28 FERR-220-OHM 0402 +2_5V_GPU_MCLK
C511 10uF 20% 6.3V CERM 805
C527 0.01uF 20% 10V CERM 402
C472 0.01uF 20% 10V CERM 402

+1_5V_SLEEP
R275 0 5% 1/10W FF 805
+1_5V_AGP
1.5V

+1_8V_SLEEP
R363 0 5% 1/10W FF 805
+1_8V_GPU
1.8V

+1_8V_SLEEP +2_5V_SLEEP
ATI_MEMIO_LO R312 0 5% 1/10W FF 805
ATI_MEMIO_HI R319 0 5% 1/10W FF 805
GPU_MEM_IO
1.8V 2.5V

+3V_SLEEP
R379 0 5% 1/10W FF 805
+3V_GPU
3.3V

GPU POWER SOURCES - 1.5V, 1.8V, 2.5V & 3.3V

AGP 4X I/O - 1.5V

+1_5V_AGP
L18 FERR-10-OHM-500MA SM (20mA)
C438 0.1uF 20% 10V CERM 402
C444 0.1uF 20% 10V CERM 402
C423 0.1uF 20% 10V CERM 402
C424 0.1uF 20% 10V CERM 402
C422 10uF 20% 6.3V CERM 805
C439 0.01uF 20% 10V CERM 402
C447 0.01uF 20% 10V CERM 402
C425 0.01uF 20% 10V CERM 402
C417 0.01uF 20% 10V CERM 402

MEMORY CORE - 2.5V

+2_5V_SLEEP
L25 FERR-220-OHM 0805 (1800mA)
+2_5V_GPU_MEMCORE
C470 0.1uF 20% 10V CERM 402
C539 0.1uF 20% 10V CERM 402
C475 0.1uF 20% 10V CERM 402
C419 0.1uF 20% 10V CERM 402
C483 10uF 20% 6.3V CERM 805
C471 0.01uF 20% 10V CERM 402
C538 0.01uF 20% 10V CERM 402
C504 0.01uF 20% 10V CERM 402
C420 0.01uF 20% 10V CERM 402

LVDS PLL - 1.8V

+1_8V_ATI_PVDD
L32 FERR-220-OHM 0402
+1_8V_GPU_PNLPLL (40mA)
C493 10uF 20% 6.3V CERM 805
C468 0.01uF 20% 10V CERM 402

MEMORY PLL - 1.8V

+1_8V_ATI_PVDD
L30 FERR-220-OHM 0402
+1_8V_GPU_MEMPLL
C537 10uF 20% 6.3V CERM 805
C523 0.01uF 20% 10V CERM 402
+1_8V_GPU_TP_PLL
C831 10uF 20% 6.3V CERM 805
C832 0.01uF 20% 10V CERM 402

LVDS - 2.5V

+2_5V_SLEEP
L26 FERR-10-OHM-500MA SM (20mA)
+2_5V_GPU_PNLIO (350mA)
C499 10uF 20% 6.3V CERM 805
C500 0.01uF 20% 10V CERM 402
C473 0.01uF 20% 10V CERM 402

LVDS/TMDS - 1.8V

+1_8V_GPU
L29 FERR-220-OHM 0402
+1_8V_GPU_PNLIO (180mA)
C514 10uF 20% 6.3V CERM 805
C492 0.1uF 20% 10V CERM 402
C496 0.1uF 20% 10V CERM 402
C489 0.1uF 20% 10V CERM 402
C491 0.1uF 20% 10V CERM 402
C501 0.01uF 20% 10V CERM 402
C506 0.01uF 20% 10V CERM 402

OMIT CRITICAL
U47 RAGE_MOBILITY M11-CSP64 64MB BGA (4 OF 6)

AK29 PVDD
AF23 AVDD0
AF24 AVDD1
A2VDD0 +2_5V_GPU_A2VDD
A2VDD1
A2VDDQ +1_8V_GPU_AVDDQ
AH23 VDD1DI +1_8V_GPU_VDDDI
AF20 VDD2DI
VDDRH0 +2_5V_GPU_MCLK
VDDRH1
K25 L25 T25 Y28 K27 AA25 K26 L26 M26 N26 P26 R26 T26 U26 V26 Y26 AA26 AB26 AC26 VDDP
E5 E6 E12 E13 E18 E19 E20 E26 F26 VDDM
E7 H26 E9 E10 E11 E14 E15 E16 E17 E21 E22 E23 E24 E25 VDDR1
AK21 LPVDD
AK11 TPVDD
A7 MPVDD
AE16 AF16 AG16 AF17 LVDDR_18 LVDDR_18 LVDDR_25 LVDDR_25
AG12 AG13 AG14 AG15 TXVDDR0 TXVDDR1 TXVDDR2 TXVDDR3

PVSS AK30
AVSSQ AF22
A2VSSQ AJ22
AVSSN0 AE22
AVSSN1 AE23
A2VSSN0 AE19
A2VSSN1 AE20
VSS1DI AG23
VSS2DI AF19
VSSRH0 F20
VSSRH1 M6
F5 G5 H5 J5 K5 L5 M5 N5 P5 R5 T5 U5 V5 W5 Y5 AA5 AB5 AC5 AD5 G26 K6 R6 Y6 AA6 F8 F9 F15 F16 F21 F22 H25 J25 J26 VDDR1
AF6 AE7 AF7 AE8 AF8 AE9 AF9 AF10 AD25 AE25 AE26 AF26 VDDR4 VDDR3
LPVSS AJ21
TPVSS AJ11
MPVSS A6
LVSSR0 AH16
LVSSR1 AG17
LVSSR2 AH17
LVSSR3 AF18
DVOVMODE AH12
TXVSSR1 AH13
TXVSSR2 AH14
TXVSSR3 AH15

MEMORY I/O

+2_5V_SLEEP
U60 MM1571J SOT-25A (150mA MAX) CRITICAL
VIN VOUT CONT NOISE GND
GPU_CORE_OK
ATI_TPVDD_BYP
C833 1uF 20% 10V CERM 603
C834 0.01uF 20% 10V CERM 402
+1_8V_ATI_TPVDD
L75 FERR-220-OHM 0402
1_8V_TPVDD_STD
R788 0 5% 1/16W MF 402
C835 10uF 20% 6.3V CERM 805
GPU_MEM_IO
L31 FERR-220-OHM 0805
(1200mA) GPU_MEM_IO_FLT
C551 10uF 20% 6.3V CERM 805
C421 0.1uF 20% 10V CERM 402
C456 0.1uF 20% 10V CERM 402
C488 0.1uF 20% 10V CERM 402
C517 0.1uF 20% 10V CERM 402
C546 0.1uF 20% 10V CERM 402
C545 0.1uF 20% 10V CERM 402
C544 0.1uF 20% 10V CERM 402
C543 0.1uF 20% 10V CERM 402
C541 0.1uF 20% 10V CERM 402
C436 0.1uF 20% 10V CERM 402
C437 0.1uF 20% 10V CERM 402
C540 0.1uF 20% 10V CERM 402
C547 0.1uF 20% 10V CERM 402
C542 0.01uF 20% 10V CERM 402

1.8V DVO POWER (EXT.TMDS)

+1_8V_GPU
EXT_TMDS L81 FERR-10-OHM-500MA SM
+1_8V_GPU_DVO
C535 10uF 20% 6.3V CERM 805
C519 0.1uF 20% 10V CERM 402
C534 0.1uF 20% 10V CERM 402
C521 0.1uF 20% 10V CERM 402
INT_TMDS R843 0 5% 1/16W MF 603
+3V_GPU
L33 FERR-10-OHM-500MA SM
+3V_GPU_FLT
C550 10uF 20% 6.3V CERM 805
C518 0.1uF 20% 10V CERM 402
C520 0.1uF 20% 10V CERM 402
C430 0.1uF 20% 10V CERM 402
C880 0.1uF 20% 10V CERM 402
C881 0.1uF 20% 10V CERM 402
C426 0.1uF 20% 10V CERM 402

3.3V IO SUPPLY

(Max Current varies, depends on usage)

+1_8V_GPU
EXT_TMDS R842 0 5% 1/16W MF 402
ATI_DVOVMODE
INT_TMDS R841 0 5% 1/10W MF 402

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
338S0214	1	IC,ATI,M11-CSP128,GRAPHICTLR,667BGA,HYNIX GC	U47	CRITICAL	ATI_128MB
338S0207	1	IC,ATI,M11-CSP64,GRAPHICTLR,667BGA,HYNIX MEM	U47	CRITICAL	ATI_64MB

M11 POWER

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EXTERNAL VIDEO (DVI) INTERFACE

VGA SYNC BUFFERS

+3V_MAIN
74AHC1G32 U40 (SM, 32) — OMIT L38 FERR-60-OHM-0.1A (0402)
21 ATI_VSYNC → ATI_VSYNC_BUF → VGA_VSYNC 3 41
PLACE L1002 & L1003 CLOSE TO DVI CONNECTOR
+3V_MAIN
74AHC1G32 U39 (SM, 32) — OMIT L36 FERR-60-OHM-0.1A (0402)
21 ATI_HSYNC → ATI_HSYNC_BUF → VGA_HSYNC 3 41

TMDS FILTERING
PLACE CLOSE TO CONNECTOR

L37 370-OHM (SM, SYM_VER-1)
39 20 TMDS_CLKP ↔ TMDS_CONN_CLKP 38 41
39 20 TMDS_CLKN ↔ TMDS_CONN_CLKN 38 41

ANALOG FILTERING
PLACE CLOSE TO CONNECTOR

FL1 LCFILTER SM-220MHZ CRITICAL — 38 21 GPU_B → VGA_B 23 41
FL2 LCFILTER SM-220MHZ CRITICAL — 38 21 GPU_G → VGA_G 23 41
FL3 LCFILTER SM-220MHZ CRITICAL — 38 21 GPU_R → VGA_R 23 41

C641	3.3pF ±0.25% 50V CERM 402	R462 75 1% 1/16W MF 402 NO STUFF
C634	3.3pF ±0.25% 50V CERM 402	R458 75 1% 1/16W MF 402 NO STUFF
C631	3.3pF ±0.25% 50V CERM 402	R456 75 1% 1/16W MF 402 NO STUFF

DVI DDC CURRENT LIMIT
(55mA requirement per DVI spec)

+5V_SLEEP → F2 0.5AMP-13.2V CRITICAL (SM) → +5V_DDC_SLEEP_UF → L42 400-OHM-EMI (SM-1) → +5V_DDC_SLEEP 40 41

DVI DDC CLOCK ISOLATION

Isolation required for DVI power switch

D19 MBR0530 (SM): DDC_CLK_ISO → R476 4.7K 5% 1/16W MF 402 → +5V_DDC_SLEEP
R478 4.7K 5% 1/16W MF 402 → +5V_DDC_SLEEP
R479 100 5% 1/16W MF 402: DDC_CLK_ISO → DVI_DDC_CLK
C654 100pF 5% 25V CERM 201
C655 100pF 5% 25V CERM 201
R477 100 5% 1/16W MF 402: DDC_CLK_ISO → DVI_DDC_DATA
R469 100 5% 1/16W MF 402: DDC_CLK_ISO → DVI_HPD

3V LEVEL SHIFTERS

+3V_SLEEP
Q39 2N7002DW SOT-363: DVI_DDC_CLK → GPU_DVI_DDC_CLK
Q39 2N7002DW SOT-363: DVI_DDC_DATA → GPU_DVI_DDC_DATA
Q40 2N7002DW SOT-363: DVI_HPD → GPU_HPD
R480 10K 5% 1/16W MF 402 → +3V_SLEEP
R474 10K 5% 1/16W MF 402 → +3V_SLEEP
R481 100K 5% 1/16W MF 402 → +3V_SLEEP
NOTE: Pulldown for DVI_HPD provided by DVI power switch interface

DVI POWER SWITCH

Power key detect path when system is shutdown or asleep.. DDC CLK is isolated from NV17M DURING SHUTDOWN. WHEN power key on remote device is pressed, 5V will be driven into DDC CLK. Since host rails will be low, TP0610 will turn on, driving SOFT_PWR_ON low. As host rails rise, TP0610 will turn off, and DDC CLK remote device path will be disabled as well.

Q38 TP0610 (SM): 41 23 DVI_DDC_CLK_UF → DVI_DDC_CLK; 41 40 23 +5V_DDC_SLEEP
R473 680 5% 1/16W MF 402: DVI_TURN_ON → DVI_TURN_ON_TLM
R460 10K 5% 1/16W MF 402: DVI_TURN_ON_TLM → Q35 MMDT3904 SOT-363 (DVI_TURN_ON_BASE)
SOFT_PWR_ON_L 24 31 35 41
R459 330 5% 1/16W MF 402: Pulldown prevents 3904 from turning on when DVI monitor has active, self-powered DDC clock pullup.
+3V_SLEEP
Power key detect path when system is running. HPD normally driven to 3.3V. When power key on remote device pressed, HPD will be driven to 5V. COMPARATOR ENABLED BY NV17MAP
R485 68.1K 1% 1/16W MF 402
C668 0.1UF 20% 10V CERM 402
HPD_4V_REF
U42 LMC7211 (SM)
R472 10K 1% 1/16W MF 402: 41 23 DVI_HPD_UF → DVI_HPD_DIV
R475 10K 5% 1/16W MF 402: HPD_PWR_SW_BASE → Q35 MMDT3904 SOT-363
R484 100K 1% 1/16W MF 402: DVI_HPD_DIV → HPD_REF_EN_L
R482 10K 1% 1/16W MF 402
HPD_PWR_SW
R470 330 5% 1/16W MF 402
Q40 2N7002DW SOT-363: 21 HPD_PWR_SNS_EN → HPD_REF_EN_L
R483 470K 5% 1/16W MF 402

LCD INTERFACE

LVDS INTERFACE

J22 QHI112 F-RT-TH (CHGND1)
L45 90-OHM-300mA 2012H CRITICAL
41 39 20 TMDS_DN<0> → TMDS_CONN_DN<0>; 41 39 20 TMDS_DP<0> → TMDS_CONN_DP<0> (SYM_VER-1)
38 23 TMDS_CONN_DN<5>; 38 23 TMDS_CONN_DP<5>
41 38 23 TMDS_CONN_CLKP; 41 38 23 TMDS_CONN_CLKN
TMDS_CONN_DN<2> 23 38; TMDS_CONN_DN<1> 23 38; TMDS_CONN_DP<2> 23 38; TMDS_CONN_DP<1> 23 38; TMDS_CONN_DN<4> 23 38; TMDS_CONN_DN<3> 23 38; TMDS_CONN_DP<4> 23 38; TMDS_CONN_DP<3> 23 38
41 23 DVI_DDC_CLK_UF; (+5V_DDC_SLEEP); 41 23 DVI_DDC_DATA_UF; 23 41 VGA_VSYNC; 41 23 DVI_HPD_UF
41 23 VGA_B; 23 41 VGA_R; 41 23 VGA_HSYNC; 23 41 VGA_G
CHGND1; CHGND2

C667 0.01UF 20% 50V CERM 603
PLACE NEAR C5A & C5B
R464 0 5% 1/16W MF 402: CHGND2 → DVI_DDC_CLK
C653 100pF 5% 25V CERM 201
R463 0 5% 1/16W MF 402: CHGND2 → CHGND1
PLACE NEAR 3, 11 & 19

CRITICAL L47 90-OHM-300mA 2012H (SYM_VER-1)
38 23 TMDS_CONN_DN<2> 1 ↔ 4 TMDS_DN<2> 20 39 41
38 23 TMDS_CONN_DP<2> 2 ↔ 3 TMDS_DP<2> 20 39 41
CRITICAL L46 90-OHM-300mA 2012H (SYM_VER-1)
38 23 TMDS_CONN_DN<1> 1 ↔ 4 TMDS_DN<1> 20 39 41
38 23 TMDS_CONN_DP<1> 2 ↔ 3 TMDS_DP<1> 20 39 41
CRITICAL L44 90-OHM-300mA 2012H EXT_TMDS (SYM_VER-1)
38 20 TMDS_DN<3> 2 ↔ 3 TMDS_CONN_DN<3> 23 38
38 20 TMDS_DP<3> 1 ↔ 4 TMDS_CONN_DP<3> 23 38

CRITICAL L49 90-OHM-300mA 2012H EXT_TMDS (SYM_VER-1)
38 20 TMDS_DN<4> 2 ↔ 3 TMDS_CONN_DN<4> 23 38
38 20 TMDS_DP<4> 1 ↔ 4 TMDS_CONN_DP<4> 23 38
CRITICAL L85 90-OHM-300mA 2012H EXT_TMDS (SYM_VER-1)
38 20 TMDS_DN<5> 2 ↔ 3 TMDS_CONN_DN<5> 23 38
38 20 TMDS_DP<5> 1 ↔ 4 TMDS_CONN_DP<5> 23 38

LCD POWER SWITCH

+3V_MAIN
R347 100K 5% 1/16W MF 402
C474 2200pF 5% 50V CERM 603
R354 100K 5% 1/16W MF 402: LCD_PWREN_L
LCD_DIGON_L
Q28 2N7002 SM: 23 21 FP_PWR_EN_L
Q29 SI3443DV TSOP: LCD_PWREN_L → +3V_LCD_SW
+3V_SLEEP
L27 FERR-250-OHM (SM): +3V_LCD_SW → +3V_LCD
C503 0.001UF 20% 50V CERM 402: +3V_LCD → CHGND4
C548 0.001UF 20% 50V CERM 402: +3V_LCD → CHGND4
(LVDS DDC POWER)
R543 100K 1% 1/16W MF 402; R544 100K 1% 1/16W MF 402
C701 0.001UF 20% 50V CERM 402
LVDS_DDC_CLK 23; LVDS_DDC_DATA 23
100K pull-ups are for no-panel case (development) Panel has 2K pull-ups
NO STUFF C702 0.001UF 20% 50V CERM 402
C549 0.001UF 20% 50V CERM 402

CRITICAL J14 G-501973 F-RT-SM
23 21 LVDS_DDC_CLK; 23 21 LVDS_DDC_DATA; 39 21 LVDS_L0N; 39 21 LVDS_L0P; 39 21 LVDS_L1N; 39 21 LVDS_L1P; 41 39 21 LVDS_L2N; 41 39 21 LVDS_L2P; 41 39 21 CLKLVDS_LN; 41 39 21 CLKLVDS_LP
NC pins

+PBUS INVERTER INTERFACE

+5V_MAIN
Q76 FDG6324L SC70-6 (D1/D2/G1/G2/S1/S2)
R750 100K 5% 1/16W MF 402: FP_PWR_EN_L
23 21 FP_PWR_EN
+5V_INV_UF_SW
L74 400-OHM-EMI (SM-1) → +5V_INV_SW
C813 10UF 20% 6.3V CERM 805
C812 0.001UF 20% 50V CERM 402
J4 SM-2MT
C815 0.001UF 20% 50V CERM 402
L72 400-OHM-EMI (SM-1): BRIGHT_PWM
C816 0.001UF 20% 50V CERM 402
C19 0.001UF 20% 50V CERM 402
L1 FERR-250-OHM (SM)
+3V_MAIN
C22 0.1UF 10% 16V CERM 402
U2 NC7S32 SC70: 21 INV_ON_PWM → BRIGHT_PWM_UF
INVERTER EXPECTS ACTIVE HIGH SIGNAL
L73 FERR-1K-OHM-EMI (SM): +14V_INV

R753 0 5% 1/16W MF 402
C819 0.01UF 20% 16V CERM 603

S-VIDEO/COMP OUT INTERFACE

Place GND shorts at graphics controller

XW15 (SM): GPU_TV_GND1 → L54 FERR-10-OHM-500MA (SM) → TV_GND1 40 41
C657 0.01UF 20% 50V CERM 603
21 GPU_Y → L53 3.3UH (0603)
21 GPU_C → L57 3.3UH (0603)
21 GPU_COMP → L55 3.3UH (0603)
C663 560PF 10% 50V CERM 402; C656 560PF 10% 50V CERM 402; C661 560PF 10% 50V CERM 402; C660 560PF 10% 50V CERM 402; C664 560PF 10% 50V CERM 402; C658 560PF 10% 50V CERM 402
CRITICAL J21 MINIDIN RT-TH MH11773-WMR8A
TV_C 41; TV_Y 41; TV_COMP 41
XW14 (SM): GPU_TV_GND2 → L56 FERR-10-OHM-500MA (SM) → TV_GND2 40 41
C659 0.01UF 20% 50V CERM 603
Place GND shorts at graphics controller
CHGND1

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
116S1331	2	DISCRETE,RES,33OHM,0402	L36,L38		VGA_BUFFER_RES

VIDEO CONNECTORS

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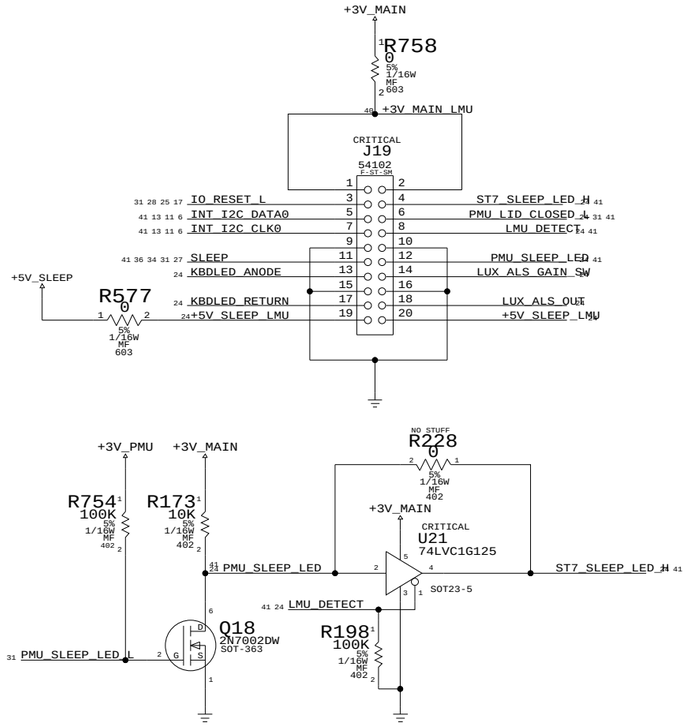
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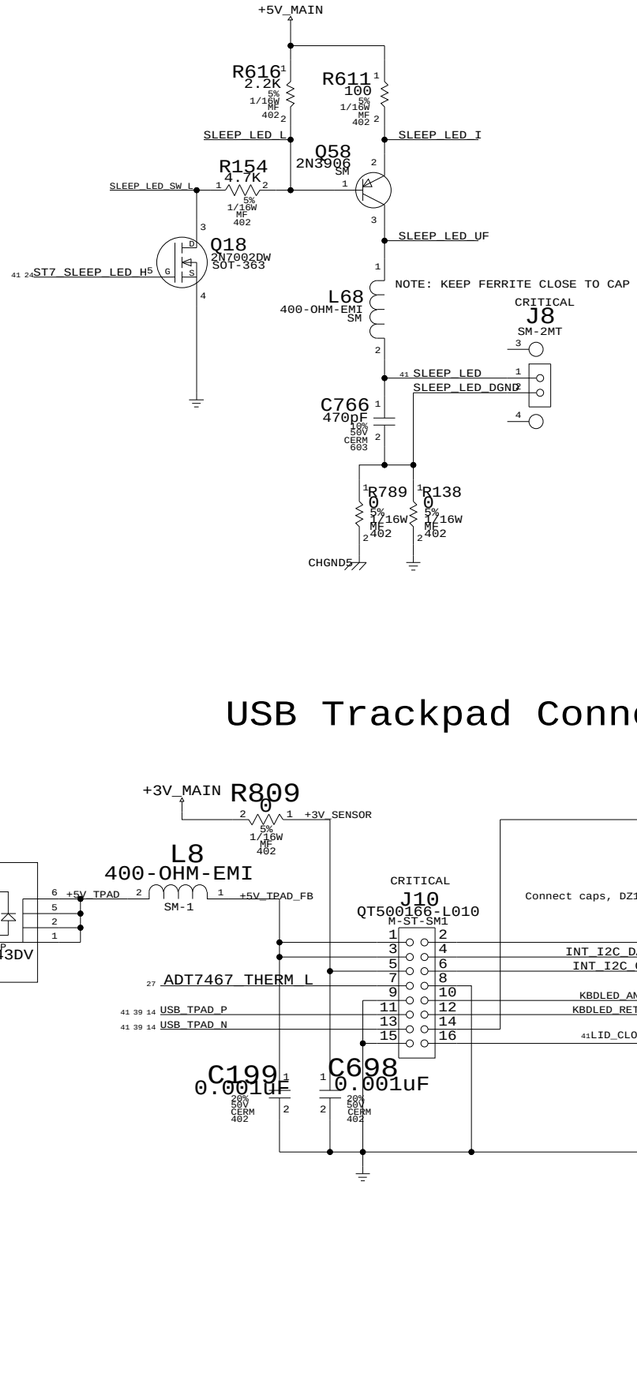
APPLE COMPUTER INC.
SIZE D | DRAWING NUMBER 051-6680 | REV. E
SCALE NONE | SHT 23 OF 46

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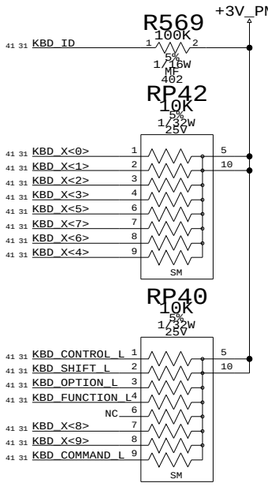
LMU/RIGHT SENSOR CONNECTOR



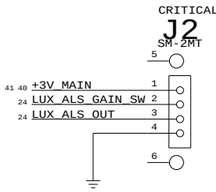
SLEEP LED

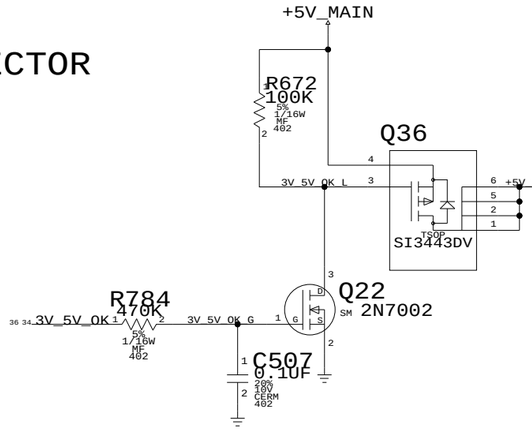


KEYBOARD PULLUPS

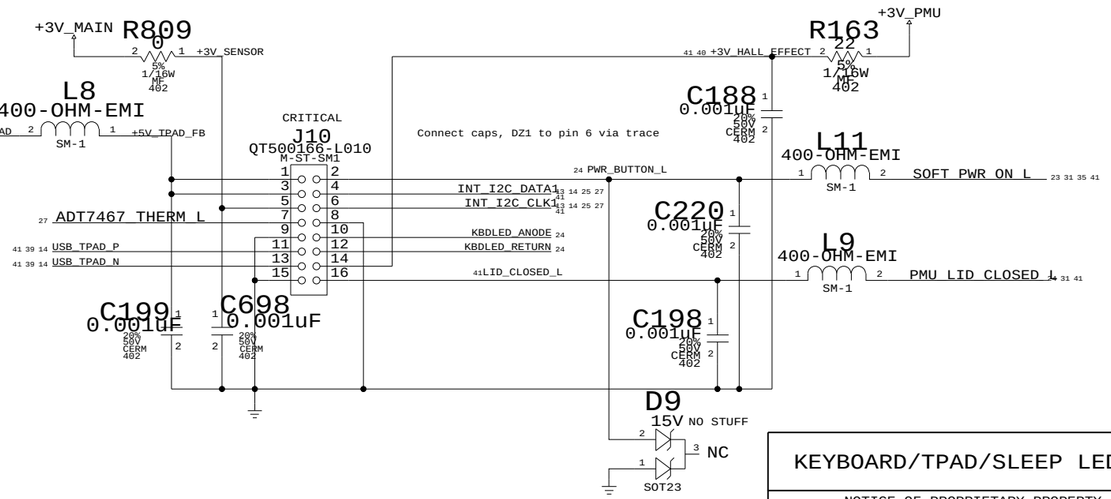


LEFT LIGHT SENSOR CONNECTOR

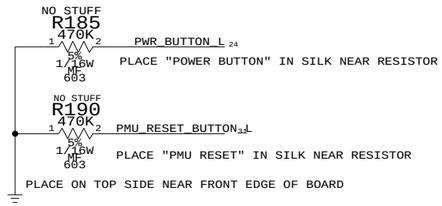




USB Trackpad Connector



DEBUG HELPERS



KEYBOARD/TPAD/SLEEP LED

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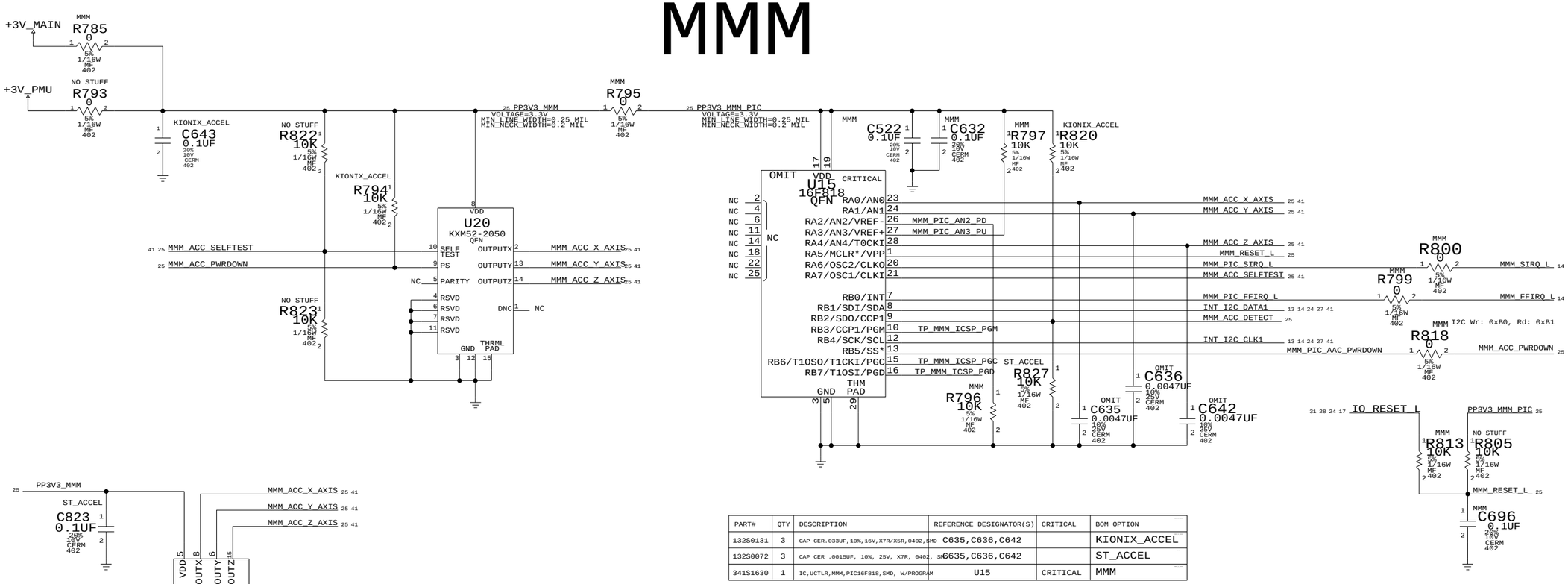
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SIZE	DRAWING NUMBER	REV.
D	051-6680	E

SCALE	SHT	OF
NONE	24	46

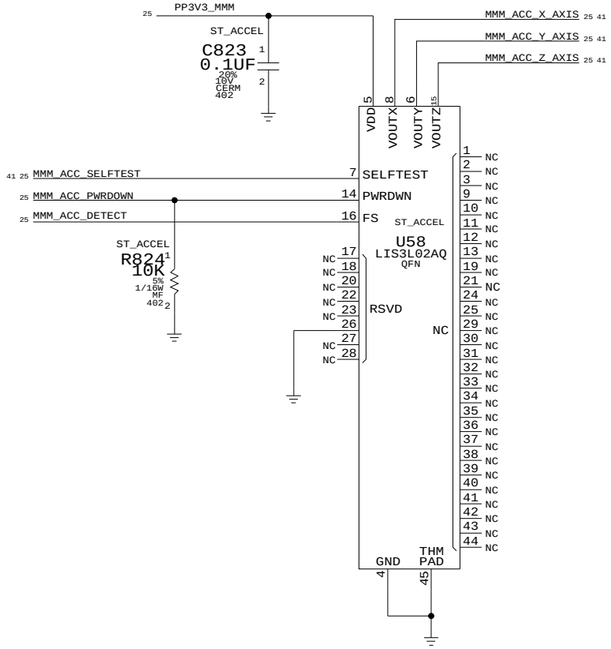
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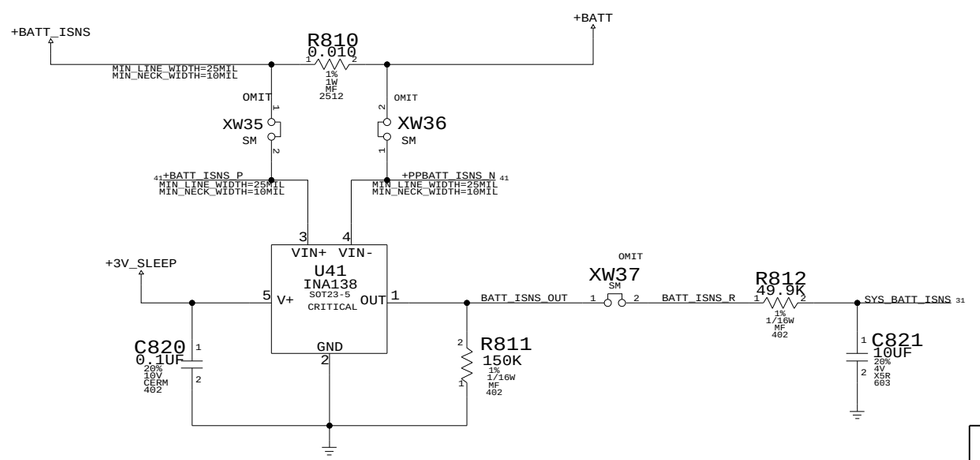
MMM



PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
132S0131	3	CAP CER.033UF,10%,16V,X7R/X5R,0402,SMD	C635,C636,C642		KIONIX_ACCEL
132S0072	3	CAP CER .0015UF, 10%, 25V, X7R, 0402, SM	C635,C636,C642		ST_ACCEL
341S1630	1	IC,UCTLR,MMM,PIC16F818,SMD, W/PROGRAM	U15	CRITICAL	MMM

BATTERY CURRENT SENSE





MMM & BATTERY CURRENT SENSOR

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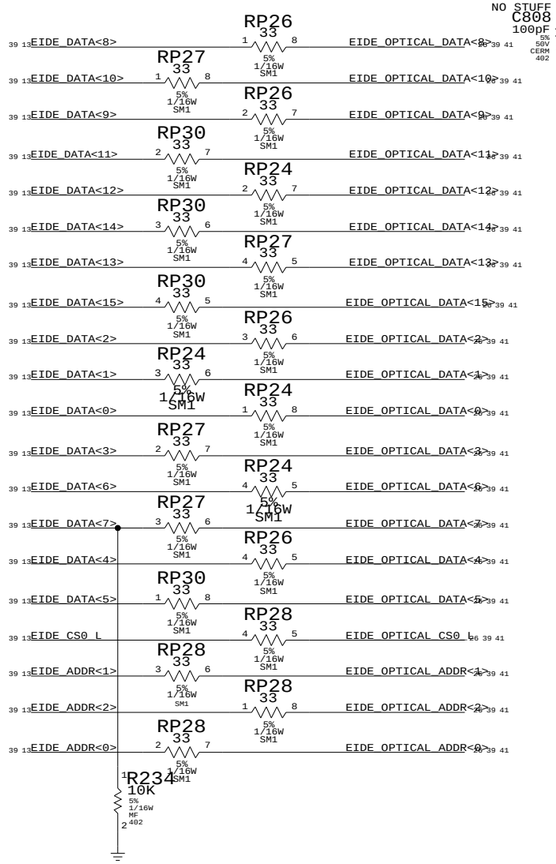
APPLE COMPUTER INC.

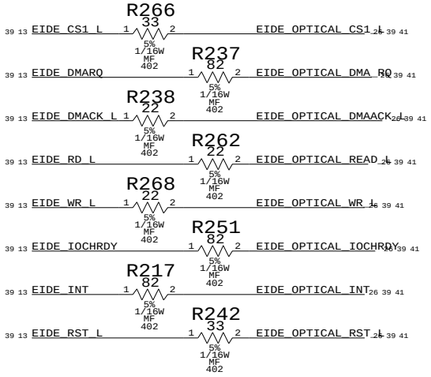
SIZE	DRAWING NUMBER	REV.
D	051-6680	E
SCALE: NONE	SHT 25 OF 46	

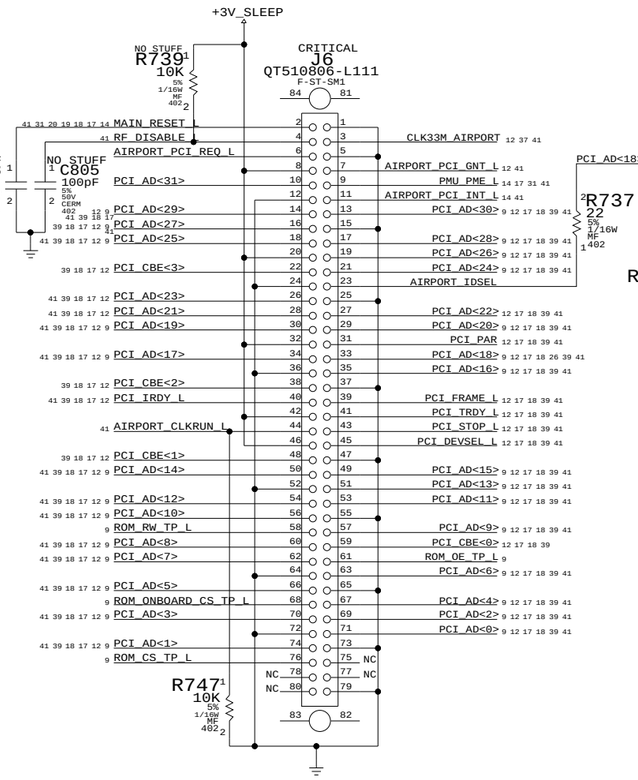
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WIRELESS INTERFACE

EIDE SERIES TERMINATION
PLACE TERMINATORS NEAR INTREPID

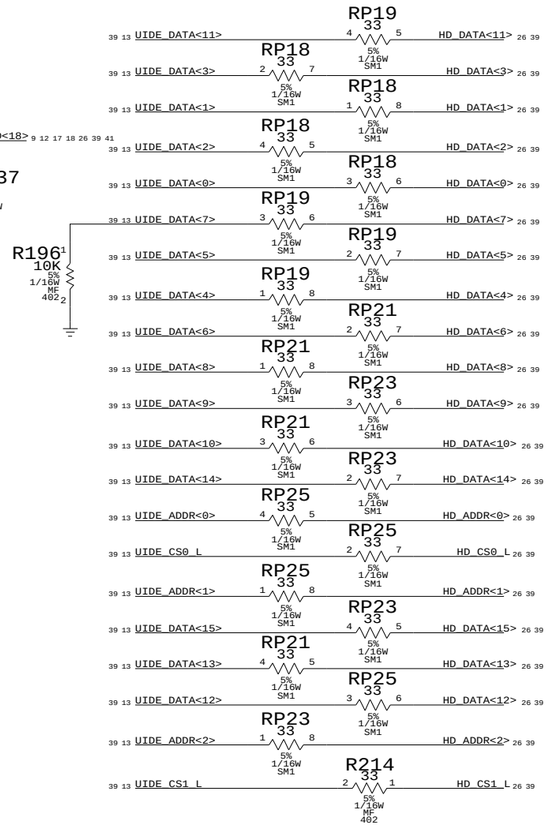




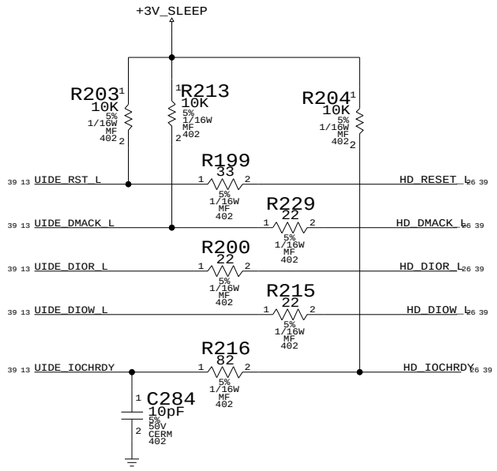


OPTICAL DRIVE INTERFACE (EIDE)

PLACE SERIES R CLOSE TO INTREPID

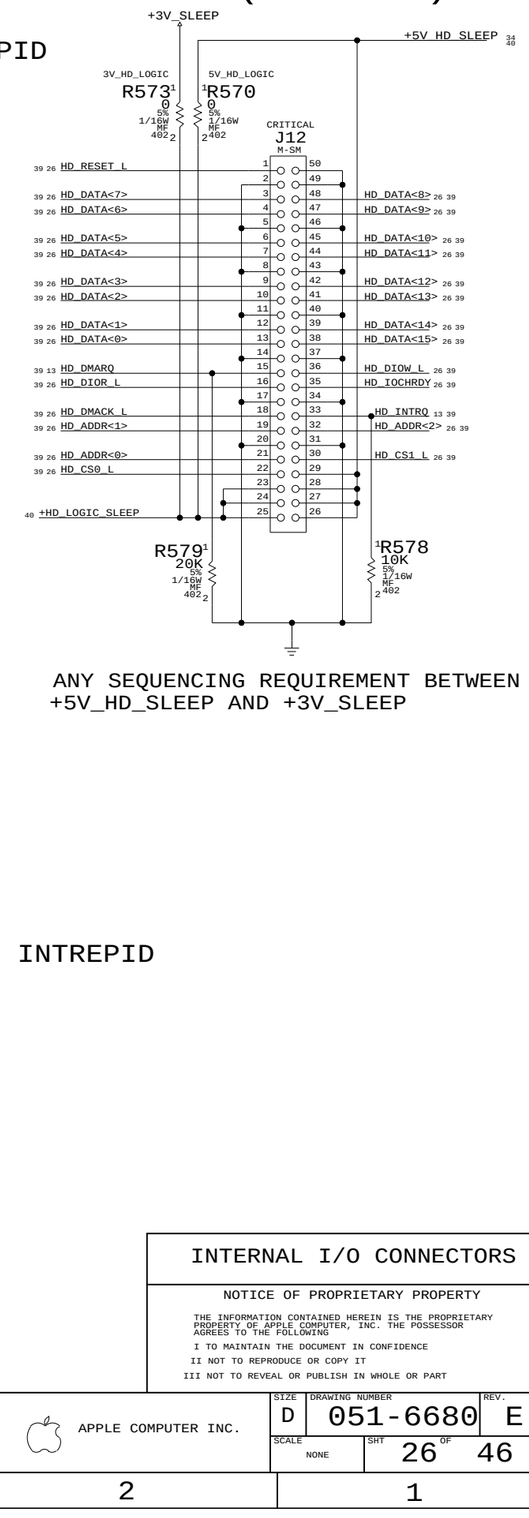


PLACE PULLUP RESISTORS CLOSE TO INTREPID



IOCHRDY - UATA100 REQUIRES PULL-UP TO 3.3V

HARD DRIVE INTERFACE (UATA100)



ANY SEQUENCING REQUIREMENT BETWEEN +5V_HD_SLEEP AND +3V_SLEEP

INTERNAL I/O CONNECTORS

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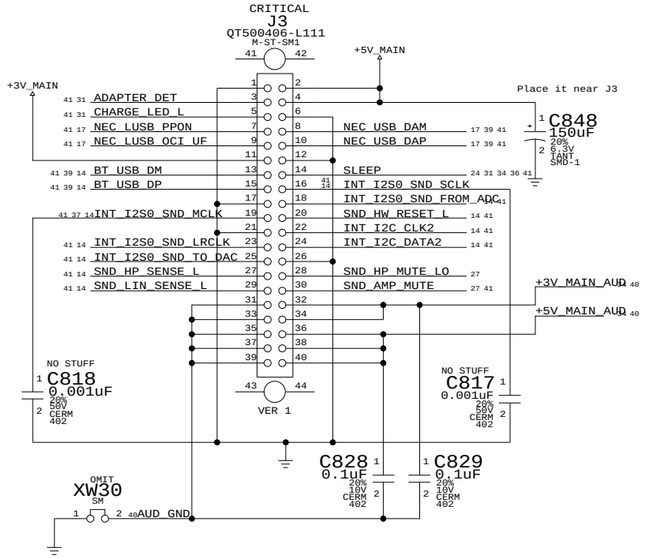
III NOT TO REVEAL OR PUBLISH IN WHOLE OR PART

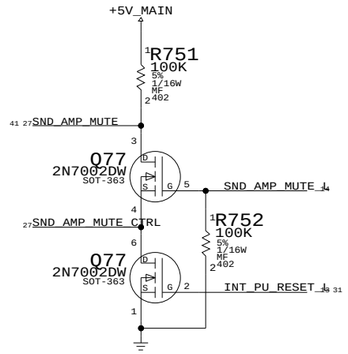
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SIZE	DRAWING NUMBER	REV.
D	051-6680	E
SCALE: NONE	SHT 26 OF 46	

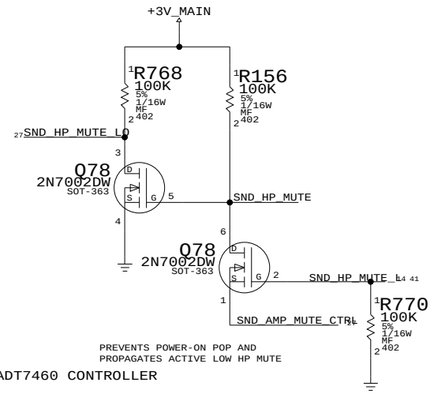
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LEFT I/O & AUDIO BOARD (LIO)



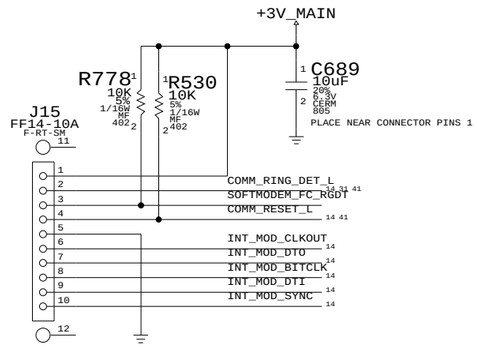


PREVENTS POWER-ON POP AND
GENERATES ACTIVE HIGH SPKR MUTE



PREVENTS POWER-ON POP AND
PROPAGATES ACTIVE LOW HP MUTE

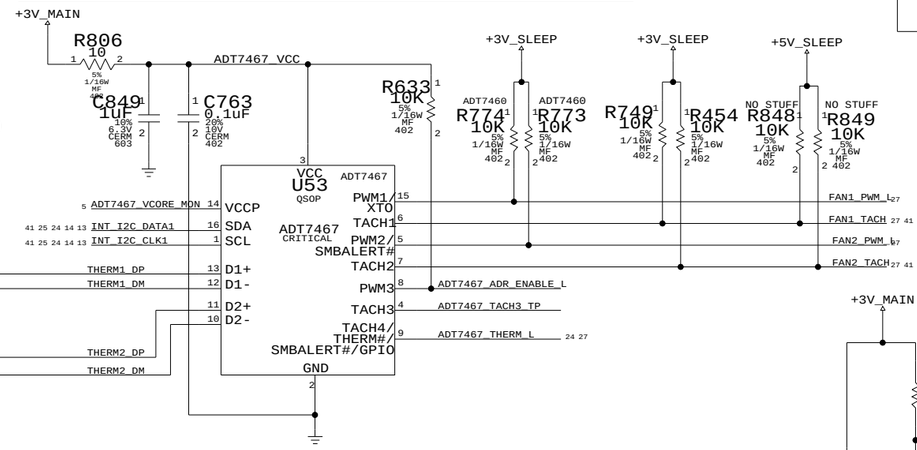
SOFT MODEM CONN



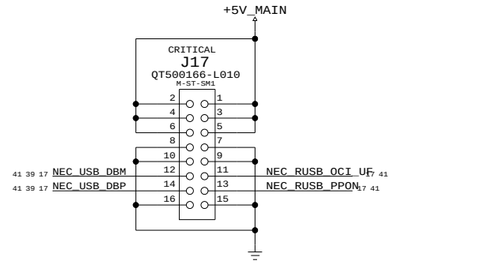
FAN INTERFACE

FAN CONTROLLER

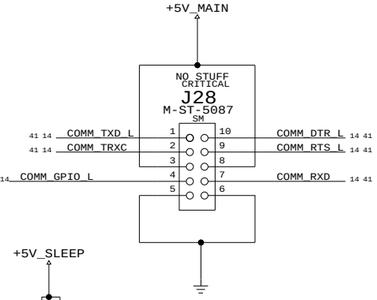
PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
353S0608	1	IC,ADT7460,FAN CTLR,16P QSOP	U53	CRITICAL	ADT7460



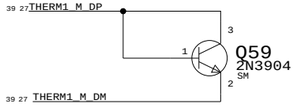
RIGHT USB BOARD



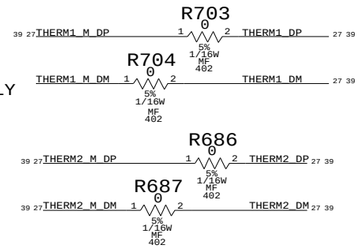
SERIAL DEBUG INTERFACE



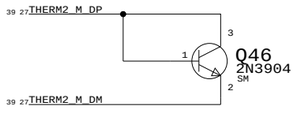
PLACE CLOSE TO CPU
MAIN1



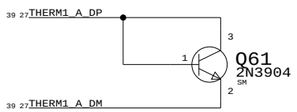
KEEP STUFFING RESISTORS CLOSE TO ADT7460 CONTROLLER



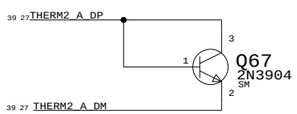
PLACE IN BETWEEN 3/5/1.5/2.5V PWR SUPPLY
MAIN2



PLACE UNDERNEATH UPPER RAM
ALTERNATE1



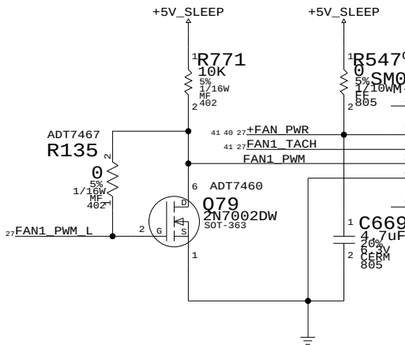
PLACE CLOSE TO BATTERY CHARGER/VCORE
ALTERNATE2



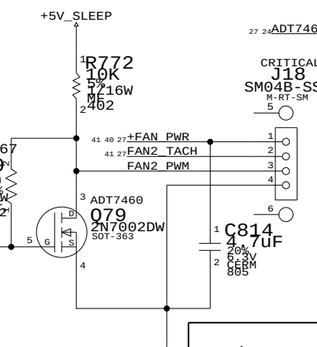
KEEP STUFFING RESISTORS CLOSE TO ADT7460 CONTROLLER

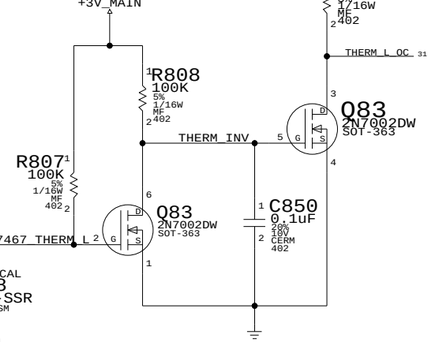


CPU FAN



GPU FAN





FAN/MODEM/SOUND/BACKUP BATT.

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SIZE	DRAWING NUMBER	REV.
D	051-6680	E
SCALE: NONE	SHT 27 OF 46	

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PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
338S0079	338S0223		U43	ALT FOR 88E1111 B1

Ethernet routing priority:
1. Decoupling caps
2. TX SERIES TERMINATION - LOCATE NEAR LINK
3. RX SERIES TERMINATION - LOCATE NEAR PHY

All differential signals should be close, parallel, matched lengths, with minimum via count, and short if possible

Must maintain 50-ohms trace impedance on all MDI pairs and all RJ45 pairs

Sandwich each RJ54 pair between chassis grounds

+3V_MAIN

C680 10uF 20% 6.3V CERM 805

NO STUFF R513 0 5% 1/16W MF 402

3405_MODE

R507 0 5% 1/16W MF 402

U45 LTC3405 SOT23-6 CRITICAL

VIN, RUN, MODE, GND, SW, VFB

LTC3405_SW

CRITICAL L60 3.3uH SM1

R506 665K 1% 1/16W MF 402 R2A

C675 22pF 5% 50V CERM 402

R504 49.9K 1% 1/16W MF 402 R2B

C674 10uF 20% 6.3V CERM 805

3405_VFB

R503 182K 1% 1/16W MF 402 R1

+1_0V_MARVELL

VOUT = 0.8V*(1+R2EQV/R1)
R2EQV = R2A||R2B

PLACE ALL SERIES RES CLOSE TO PHY

R423 0 5% 1/16W MF 402 — CLKENET_LINK_TX — CLKENET_PHY_TX

R421 0 5% 1/16W MF 402 — CLKENET_LINK_RX — CLKENET_PHY_RX

R445 0 5% 1/16W MF 402 — CLKENET_LINK_GBE_REF — CLKENET_PHY_GBE_REF

NO STUFF C851 10pF 5% 50V CERM 402 — C852 10pF 5% 50V CERM 402

Keep C851 & C852 Stubs short

U43 88E1111-BDIE BCC

TX_CLK, RX_CLK, 125CLK (CRITICAL), CTRL10, NC

DVDD: C594 0.1uF, C601 0.01uF, C608 0.1uF, C619 0.01uF, C603 0.1uF, C599 0.01uF

PLACE CAPS (IN ORDER) ON PINS 1, 6, 10/15, 57/62, 67/71, 85

+2_5V_MAIN

R442 0 5% 1/16W FF 805

+2_5V_MARVELL

VDDO: C597 0.1uF, C612 0.01uF, C623 0.1uF, C600 0.01uF, C598 0.1uF, C595 10uF

PLACE CAPS (IN ORDER) ON PINS 5, 21/26, 48/52, 66/72, 88, 96

C646 0.1uF, C648 0.1uF, C645 0.1uF, C647 0.1uF

PLACE CAPS AT CONNECTOR PINS 5 & 6

VDDOH

VDDOX

+2_5V_MARVELL_AVDD

L35 FERR-EMI-600-OHM SM

AVDD: C614 0.1uF, C616 0.1uF, C618 0.1uF, C602 0.01uF, C592 10uF

PLACE CAPS (IN ORDER) ON PINS 32/35, 36/40, 45 & 78

R814 0 5% 1/16W FF 805

+2_5V_MARVELL_CONN

J23 MJ-R0076 F-RT-TH

PRIMARY

ENET_CTAP, ENET_CTAP, MDI_0+, MDI_0-, MDI_1+, MDI_1-, MDI_2+, MDI_2-, MDI_3+, MDI_3-

1CT:1CT, 75 OHM

SECONDARY J1 J2 J3 J4 J5 J6 J7 J8

RJ45 CABLE SIDE

RJ45 CHIP SIDE

CHGND1

SHIELD 1000PF, 2000V

TXD0–TXD7, TX_EN, TX_ER, GTX_CLK

RXD0–RXD7, RX_DV, RX_ER, CRS, COL, MDC, MDIO, INT-/INT+, RESET, COMA, S_IN+, S_IN-, S_OUT+, S_OUT-, S_CLK+, S_CLK-, HSDAC+, HSDAC-, XTAL1, XTAL2, VSSC

MDI0+, MDI0-, MDI1+, MDI1-, MDI2+, MDI2-, MDI3+, MDI3-

R433 49.9 1% 1/16W MF 402 — R434 49.9 — MDI0_PD — C622 0.01uF

R435 49.9 — R436 49.9 — MDI1_PD — C613 0.01uF

R437 49.9 — R438 49.9 — MDI2_PD — C615 0.01uF

R439 49.9 — R440 49.9 — MDI3_PD — C617 0.01uF

PLACE RESISTORS CLOSE TO PHY

LED_LINK10, LED_LINK100, LED_LINK1000, LED_DUPLEX, LED_RX, LED_TX

LED_LINK10, LED_LINK100, LED_RX_SPN

CONFIG0–CONFIG6

(000), (000), (111), (110), (111), (101), (000)

SEE CONFIG TABLES (BELOW)

TDI, TDO, TCK, TMS, TRST

INT_TDO, JTAG_ASIC_TDO_TP, JTAG_ASIC_TCK, JTAG_ASIC_TMS, JTAG_ASIC_TRST_L

RSET, SEL_OSC, SEL_2.5V, GND

ENET_RSET

R427 4.99K 1% 1/16W MF 402

NO STUFF R424 49.9 1% 1/16W MF 402 — NO STUFF R429 49.9 1% 1/16W MF 402 — R428 10K 5% 1/16W MF 402

R431 10K 5% 1/16W MF 402 — R430 10K 5% 1/16W MF 402 — R432 1.5K 5% 1/16W MF 402

R422 1K 5% 1/16W MF 402 — INT_ENET_RST_L

D15 1N914 SOT23 — IO_RESET_L — ENET_RST_L

ENET_ENERGY_DET

C611 2.2uF 10% 10V CERM 805

Q32 2N7002DW SOT-363 — AC_IN

Q32 2N7002DW SOT-363 — SLEEP_L_LS5

PLACES PHY IN "COMA" MODE WHEN ASLEEP ON BATTERY (SAVES POWER)

ENET_HSDACP, ENET_HSDACM

CLK25M_ENET_XIN, CLK25M_ENET_XOUT

ENET_VSSC

PUT CRYSTAL CIRCUIT CLOSE TO PHY

NO STUFF R425 20K 5% 1/16W MF 402

R441 0 5% 1/16W MF 402

CRITICAL Y5 SM-3 25.0000M

CLK25M_XTAL_IN

C604 27pF 5% 50V CERM 402 — C624 27pF 5% 50V CERM 402

Y6 LOAD CAPACITANCE IS 16PF

CONFIG DEFINITIONS	
PIN	BIT[2:0]
VDDO	111
LED_LINK10	110
LED_LINK100	101
LED_LINK1000	100
LED_DUPLEX	011
LED_RX	010
LED_TX	001
VSS	000

CONFIG INPUTS			
PIN	BIT[2]	BIT[1]	BIT[0]
CONFIG<0>	PHYADR[2]	PHYADR[1]	PHYADR[0]
CONFIG<1>	ENA_PAUSE	PHYADR[4]	PHYADR[3]
CONFIG<2>	ANEG[3]	ANEG[2]	ANEG[1]
CONFIG<3>	ANEG[0]	ENA_XC	DIS_125
CONFIG<4>	MODE[2]	MODE[1]	MODE[0]
CONFIG<5>	DIS_FC	DIS_SLEEP	MODE[3]
CONFIG<6>	SEL_BDT	INT_POL	75/50 OHM

MARVELL 88E1111

10/100/1000 ETHERNET

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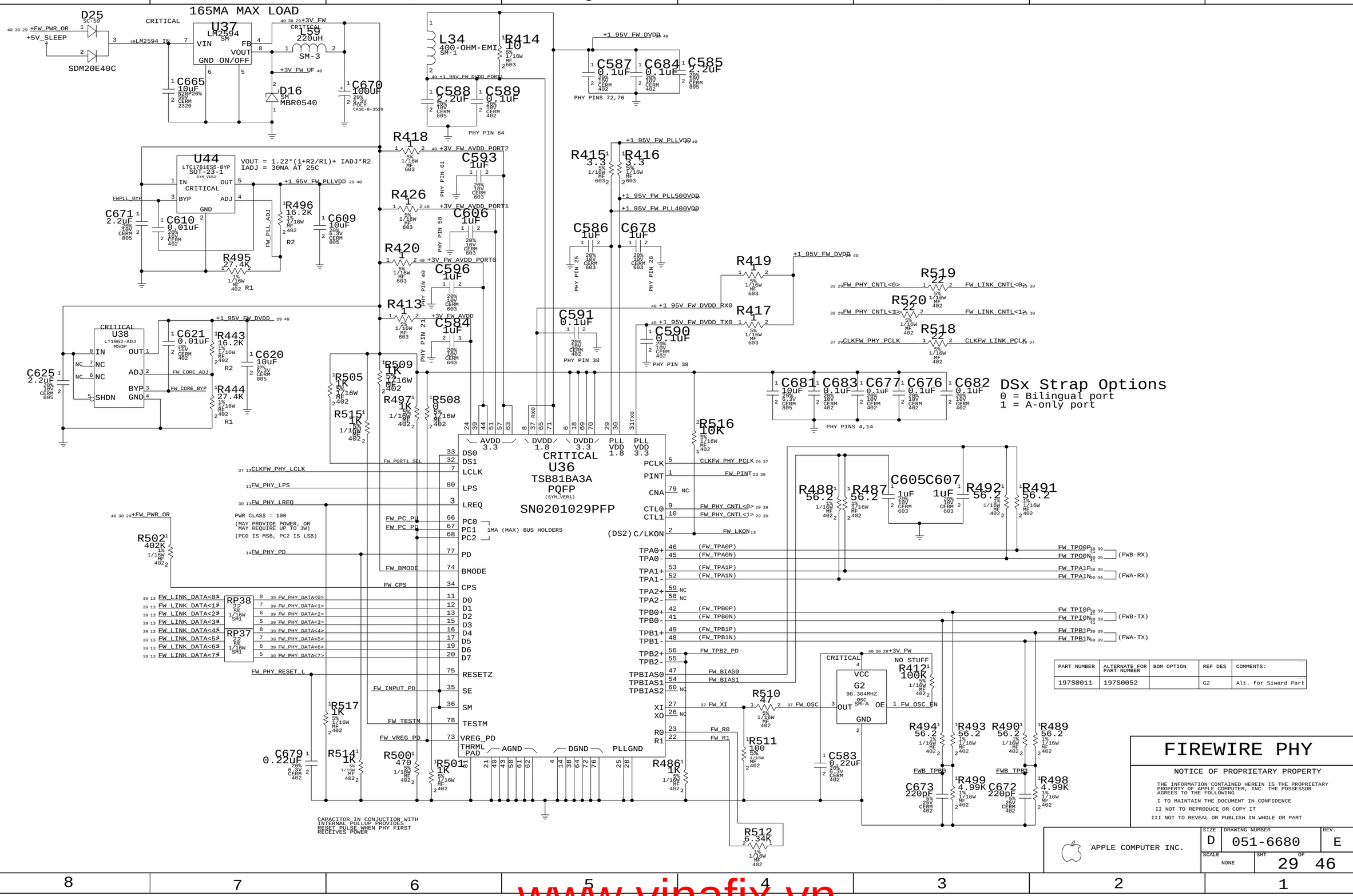
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NONE	28	46

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PORT POWER SWITCH

+PBUS
F3 1.5A-24V MINISMDC
+FW_PBUS
CRITICAL Q34 NDS9407 SOI
+FW_SW
CRITICAL D24 SMB B340B
+FW_PWR_OR
R448 470K 5% 1/16W MF 402
C639 0.01UF 20% 16V CERM 402
FW_GATE_EN
+3V_PMU
R447 100K 5% 1/16W MF 402
DP6 BAS16TW SOT-363
POWER_UP
Q33 2N7002DW SOT-363
PMU_POWER_UP_L
R461 330K 5% 1/16W MF 402
FW_GATE_EN_RC
Q33 2N7002DW SOT-363
FW_POWER_UP
R803 0 5% 1/16W MF 402
DCDC_EN
DCDC_EN_CTRL
DP6 BAS16TW SOT-363
R446 10K 5% 1/16W MF 402
AC_IN
AC_IN_FW_CNTL
DP6 BAS16TW SOT-363
R777 470K 5% 1/16W MF 402

ENABLES PORT POWER WHEN
MACHINE IS RUNNING OR WHEN ASLEEP ON AC

+3V_FW
R451 10K 5% 1/16W MF 402
+3V_FW_ESD_ITM
L39 400-OHM-EMI SM-1
NO STUFF C822 0.1UF 20% 10V CERM 402
C630 0.1UF 20% 10V CERM 402
C637 0.001UF 20% 50V CERM 402
D21 1N5227B SOT23
C638 0.01UF 20% 16V CERM 402
+3V_FW_ESD
D20 BAV99DW SOT-363
D23 BAV99DW SOT-363
D20 BAV99DW SOT-363
D23 BAV99DW SOT-363
C633 0.01UF 20% 16V CERM 402

L76 CRITICAL 90-OHM-300mA 2012H SYM_VER-1
FW_TPO0P
FW_TPO0N
L77 CRITICAL 90-OHM-300mA 2012H SYM_VER-1
FW_TPI0P
FW_TPI0N
(AREF)
(BREF)
FW_VGND0
NC
FW_VP0
(TPI0R)

PORT 0
1394a/b
(BILINGUAL)
514S0058

CRITICAL J20 1394B F-RT-SM
INT-SHIELD
TPA
TPA(R)
TPA*
VG
SC
VP
TPB
TPB(R)
TPB*
INT-SHIELD
CHGND1

L51 FERR-250-OHM SM
C650 0.01UF 20% 16V CERM 402
R465 1M 5% 1/16W MF 402
C649 0.1uF 20% 50V CERM 805
NO STUFF C652 0.01UF 20% 16V CERM 402
R466 0 5% 1/10W MF 805
NO STUFF C651 0.01UF 20% 16V CERM 402
CHGND1

AREF NEEDS TO BE ISOLATED FROM
ALL LOCAL GROUNDS PER 1394B SPEC
SO WHEN A BILINGUAL DEVICE IS
PLUGGED TO A BETA-ONLY DEVICE,
THERE'S NO DC PATH BETWEEN THEM
(TO AVOID GROUND OFFSET ISSUE)

BREF SHOULD BE HARD CONNECTED TO
LOGIC GROUND FOR SPEED SIGNALING
AND CONNECTION DETECTION CURRENTS
PER 1394B V1.33

R837 0 5% 1/16W MF 603
+FW_PWR_OR_F
PLACE NEAR D24
Q37 NO STUFF SI2319DS SOT23
NO STUFF R829 470K 5% 1/16W MF 402
+FW_PWR_OR_GATE
NO STUFF R830 470K 5% 1/16W MF 402
+FW_PWR_OR_GATE_L
NO STUFF R831 649K 1% 1/16W MF 402
NO STUFF Q73 2N7002 SM
+FW_PWR_CTRL
NO STUFF C824 1UF 20% 10V CERM 603
NO STUFF D35 SM MBR0540
+2_5V_REG_F
NO STUFF C825 0.1UF 20% 10V CERM 402
NO STUFF U59 LMC7211 SM
+3V_FW_ESD_R
NO STUFF R834 10K 5% 1/16W MF 402
NO STUFF R835 102K 1% 1/16W MF 402
+3V_FW_ESD
+2_5V_REG
2.5V REG
NO STUFF C826 0.01UF 20% 16V CERM 402
NO STUFF R836 332K 1% 1/16W MF 402
PLACE NEAR D23
NO STUFF R833 604K 1% 1/16W MF 402

2.5V REG: 2.50V - 2.15V
200MS - 500MS

F1 1.5AMP-33V SM
+FW_PWR1
L58 FERR-250-OHM SM

+3V_FW_ESD
D22 BAV99DW SOT-363
D18 BAV99DW SOT-363
C640 0.01UF 20% 16V CERM 402
D22 BAV99DW SOT-363
D18 BAV99DW SOT-363
C644 0.01UF 20% 16V CERM 402

PORT 1
1394a ONLY
514-0057

L52 260-OHM-330MA SM1 SYM_VER-2
FW_TPA1P
FW_TPA1N
L48 260-OHM-330MA SM1 SYM_VER-2
FW_TPB1P
FW_TPB1N
FW_TPO1P
FW_TPO1N
FW_TPI1P
FW_TPI1N
FW_VP1
FW_VGND1

CRITICAL J24 1394A F-RT-TH
TPO
TPO#
TPI
TPI#
VP
VGND

CLEAR OUT ALL PLANES UNDER TRANSFORMERS
R471 0 5% 1/10W MF 805
C662C666 0.01uF 0.01UF 20% 16V CERM 402
CHGND1

R816 0 5% 1/16W MF 402 EMI
CHGND1

FIREWIRE PORTS

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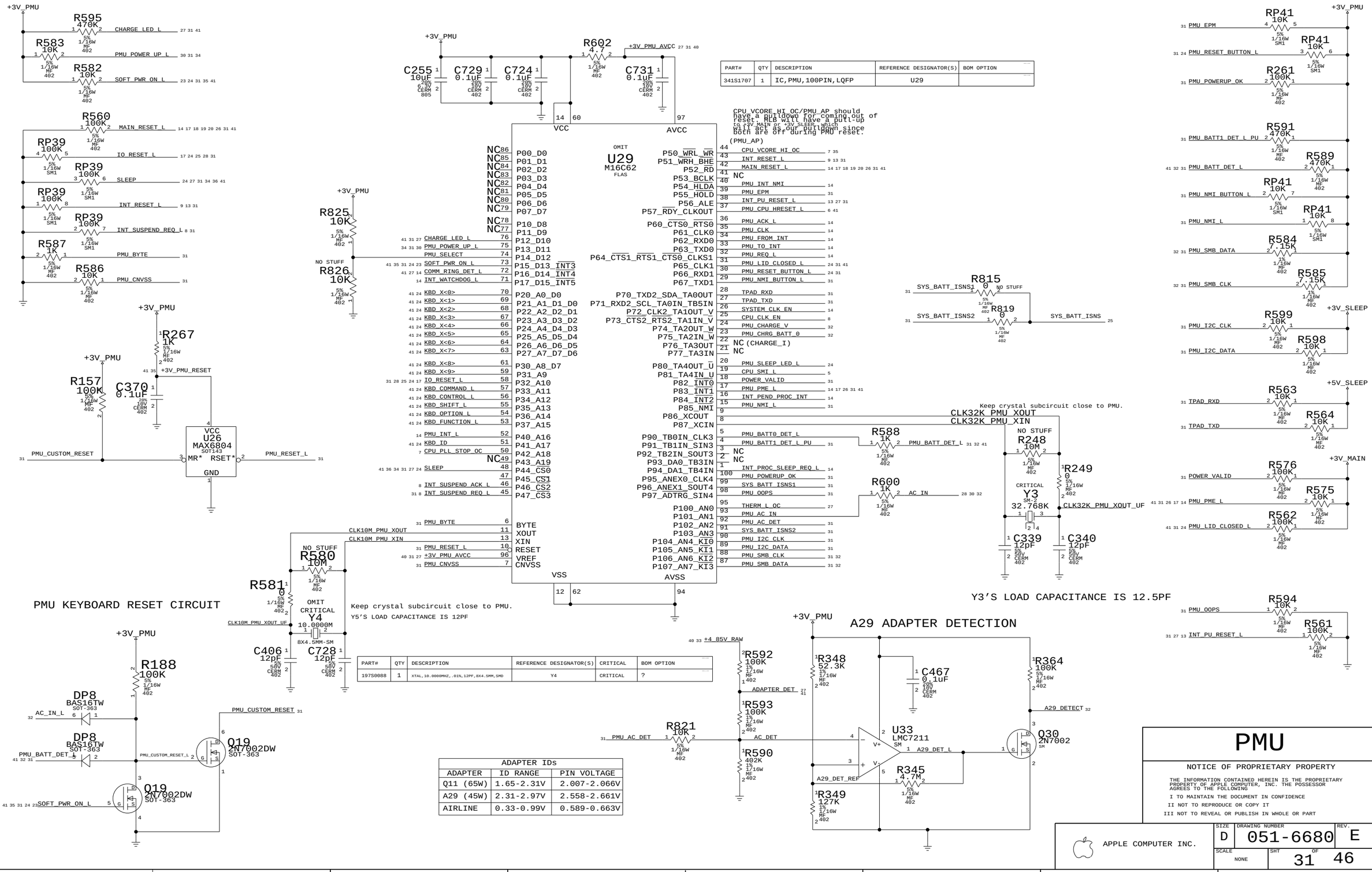
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DC POWER INPUT

(POWER JACK, ETC. ON SEPARATE BOARD)

CRITICAL
J27
87438-0433
M-RT-SM

41 40 33 +ADAPTER

C35 0.1uF 10% 50V X7R 603-1

DC INRUSH LIMITER

Q68 SI4435DY SOI

R21 330K 5% 1/16W MF 402

C11 0.1uF 20% 50V CERM 805

AC_ENABLE_GATE

R29 470K 5% 1/16W MF 402

AC_ENABLE_L

+3V_PMU

R51 20K 1% 1/16W MF 402

R40 97.6K 1% 1/16W MF 402

R16 100K 1% 1/16W MF 402

C801 0.01uF 20% 16V CERM 402

R15 10K 5% 1/16W MF 402

40 33 1V20_REF

U1 LMC7211 SM

AC_IN 28 30 31 32

AC_DIV

R41 1M 5% 1/16W MF 402

AC_IN_L 31 32

R42 10K 1% 1/16W MF 402

R30 57.6K 1% 1/16W MF 402

Q1 2N7002DW SOT-363

R22 470K 5% 1/16W MF 402

GREATER THAN 13.1V DETECT

BACKFEED PROTECTION

40 +ADAPTER_SW

Q69 SI4435DY SOI

+ADAPTER_SENSE 40

BKFD_PROT_GATE

C803 0.01UF 20% 16V CERM 603

R734 68K 5% 1/16W MF 402

BKFD_PROT_EN_L

32 31 30 28 AC_IN

Q9 2N7002DW SOT-363

CRITICAL
U3 MAX4172 TSSOP

RS+ RS- PG OUT GND NC NC1 NC2

MAX4172_OUT 2

CRITICAL
R77 2.21K 0.1% 1/16W MF 603

C36 0.01uF 20% 50V CERM 603

+24V_PBUS

Place close to RS-

C233 0.1uF 10% 50V X7R 603-1

PLACE U24 NEXT TO R382

CRITICAL
R61 0.025 1% 1W MF 2512

R82 4.7 5% 1/16W MF 402

R87 4.7 5% 1/16W MF 402

1772_CSSP

1772_CSSN

R57 100K 1% 1/16W MF 402

D4 1N914 SOT23

R49 12.7K 1% 1/16W MF 402

C67 1uF 20% 6.3V CERM 1210

C71 0.47uF 10% 16V CERM 1206

C95 0.47UF 10% 16V CERM 1206

CSSP CSSN

U6 MAX1772 QSOP

40 1772_DCIN
32 1772_ACIN
32 1772_ACOK_L
(+3V_PMU)
1772_VCTL
1772_ICTL
1772_ICHG
1772_IINP
1772_CCV
1772_CCI
1772_CCS

DCIN ACIN ACOK RFIN VCTL ICTL ICHG IINP CCV CCI CCS

CELLS LDO DLOV BST DHI LX DLO PGND CSIP CSIN BATT

1772_CELLS
1772_DLOV
1772_BST
1772_DHI
1772_LX
1772_DLO
(GND)
1772_CSIP
1772_CSIN

REF CLS GND

CRITICAL
C41 1uF 20% 16V CERM 603

C98 0.1uF 20% 25V CERM 603

C99 0.1uF 20% 25V CERM 603

R55 1K 1% 1/16W MF 402

C43 0.01uF 20% 16V CERM 402

C42 0.01uF 20% 16V CERM 402

1772_CCV_RC

1772_REF

C23 1uF 20% 16V CERM 603

R54 10K 1% 1/16W MF 402

R53 4.12K 1% 1/16W MF 402

1772_CLS

R83 1K 1% 1/16W MF 402

C24 0.1uF 20% 16V CERM 402

40 1772_GND

R94 100K 5% 1/16W MF 402

XW1 SM

+PBUS CURRENT LIMIT

R728 1K 1% 1/16W MF 402

1772_IAC_RC_COMP

C798 0.1uF 20% 16V CERM 402

+3V_PMU

C794 0.1uF 20% 16V CERM 402

R745 47.2K 0.1% 1/16W FF 603

IAC_FB

U55 LMC7111 SOT23-5

PLACE R383 CLOSE TO LTC1625
ROUTE LTC1625_ITH CAREFULLY

LTC1625_ITH

R727 10K 1% 1/16W MF 402

DP1 BAS16TW SOT-363

R119 150 1% 1/16W MF 402

1625_COMP 33

ADAPTER_I_REG

CURRENT_THRESHOLD

R736 42.2K 0.1% 1/16W FF 603

R738 82.5K 0.1% 1/16W FF 603

3V_PMU

R742 51.1K 0.1% 1/16W FF 603

A29_CURRENT_ADJ

OVER_18V_ADJ

R744 100K 5% 1/16W MF 402

32 31 A29_DETECT 2

Q2 2N7002DW SOT-363

AC_GTR_18V

Q74 2N7002DW SOT-363

32 1772_ACOK_L 2

Q74 2N7002DW SOT-363

C809 1uF 20% 16V CERM 603

BATTERY SWITCH-OVER CIRCUIT

+BATT

+24V_PBUS

F5 5AMP-125V SM-2

+PBUS

F4 5AMP-125V SM-2

40 32 +BATT_24V_FUSE

40 +BATT_14V_FUSE

CRITICAL
Q6 SI4435DY SOI

CRITICAL
Q7 SUD45P03 TO-252

R716 47K 5% 1/16W MF 402

R710 47K 5% 1/16W MF 402

BATT_24V_GATE

BATT_14V_GATE

R717 10K 5% 1/16W MF 402

R711 10K 5% 1/16W MF 402

DP1 BAS16TW SOT-363

BATT_24PBUS_EN 5

2 BATT_14PBUS_EN

32 31 AC_IN_L

DP1 BAS16TW SOT-363

R102 158K 1% 1/16W MF 402

Q9 2N7002DW SOT-363

AC_IN_L_RC

C118 10uF 20% 6.3V CERM 805

WHEN AC IS IN, P-CHANNEL FETS ARE QUICKLY (DIODE) TURNED OFF
WHEN AC IS NOT PLUGGED, P-CHANNEL FETS ARE ON
RC TIME IS 480K*10uF @ +3V_PMU

SWITCHER VOLTAGE CONTROL

PMU SELECTS BETWEEN TWO VOLTAGES

+3V_PMU

R73 27.4K 1% 1/16W MF 402

R62 10K 1% 1/16W MF 402

R58 10K 1% 1/16W MF 402

SWITCHER CURRENT CONTROL

CHARGE DISABLED BY PMU OR INPUT VOLTAGE <18V
CHARGE THROTTLED BY LOW BATTERY VOLTAGE

OD OUTPUT LOW - WHEN AC GREATER THAN 18V

R74 4.12K 1% 1/16W MF 402

R733 20K 1% 1/16W MF 402

R731 1K 1% 1/16W MF 402

R56 1K 1% 1/16W MF 402

BATT_LOW_L

BATTV_HIGH

R59 100K 5% 1/16W MF 402

Q4 2N7002DW SOT-363

R75 5.23K 1% 1/16W MF 402

BATTV_LOW 2

Q71 2N7002DW SOT-363

Q71 2N7002DW SOT-363

31 PMU_CHARGE 5

Q4 2N7002DW SOT-363

+3V_PMU

R741 100K 5% 1/16W MF 402

CHARGE_DISABLE 2

Q72 2N7002DW SOT-363

31 PMU_CHRG_BATT_0 5

Q72 2N7002DW SOT-363

$V_{BATT} = CELLS \times (4.096 + (0.4096 * V_{VCTL} / V_{REFIN}))$

For 4.15V cells, VCTL = 0.123 REFIN

For 4.20V cells, VCTL = 0.245 REFIN

$I_{CHG} = (0.2048/R_{62}) * (V_{ICTL} / V_{REFIN})$

+3V_PMU

C799 0.1uF 20% 16V CERM 402

U57 LMC7211 SM

BATT_LOW 1

R729 100K 1% 1/16W MF 402

R740 499K 1% 1/16W MF 402

BATT_DIV

1V65_REF

R730 100K 1% 1/16W MF 402

R735 100K 1% 1/16W MF 402

C807 0.047uF 10% 16V CERM 402

R47 6.34K 1% 1/16W MF 402

A29_CLS_ADJ

32 31 A29_DETECT 5

Q2 2N7002DW SOT-363

BATTERY CONNECTOR

CRITICAL
J26
87438-0833
M-RT-SM

41 40 +BATT_POS
(BATT_IN_PD)
41 BATT_CLK
41 BATT_DATA
PMU_BATT_DET 41
41 40 BATT_NEG

40 +BATT_VSNS

L5 FERR-EMI-100-OHM SM

L2 FERR-50-OHM SM

+BATT_ISNS

L6 FERR-50-OHM SM

L4 FERR-EMI-100-OHM SM

2 PMU_SMB_CLK

L3 FERR-EMI-100-OHM SM

2 PMU_SMB_DATA

1772_LDO

R725 33 1% 1/10W FF 1206

D6 1N914 SOT23

1772_BST_ESR

R52 100K 5% 1/16W MF 402

C97 0.1uF 20% 25V CERM 603

R96 4.7 5% 1/16W MF 603

+24V_PBUS

C96 0.1uF 20% 50V CERM 805

CRITICAL
Q70 IRF7805 SM

C112 2.2UF 20% 6.3V X7R 1206

C117 2.2UF 20% 6.3V X7R 1206

C113 2.2UF 20% 6.3V X7R 1206

C115 2.2UF 20% 6.3V X7R 1206

C116 2.2UF 20% 6.3V X7R 1206

CRITICAL
L70 10uH SM1

+BATT_RSNS 40

R715 0.05 1% 1W MF 2512

+BATT_24V_FUSE 2 40

C780 4.7UF 20% 25V CERM 1206

C795 4.7UF 20% 25V CERM 1206

C790 4.7UF 20% 25V CERM 1206

C779 33uF 20% 25V SPEC SM1

CRITICAL
D36 SM MBRS140T3

CRITICAL
Q64 IRF7811W SO-8

NO STUFF
C853 1000pF 10% 25V X7R 402

R720 1 5% 1/16W MF 603

R713 1 5% 1/16W MF 603

C777 4.7UF 20% 25V CERM 1206

C792 4.7UF 20% 25V CERM 1206

C785 4.7UF 20% 25V CERM 1206

BATTERY CHARGER

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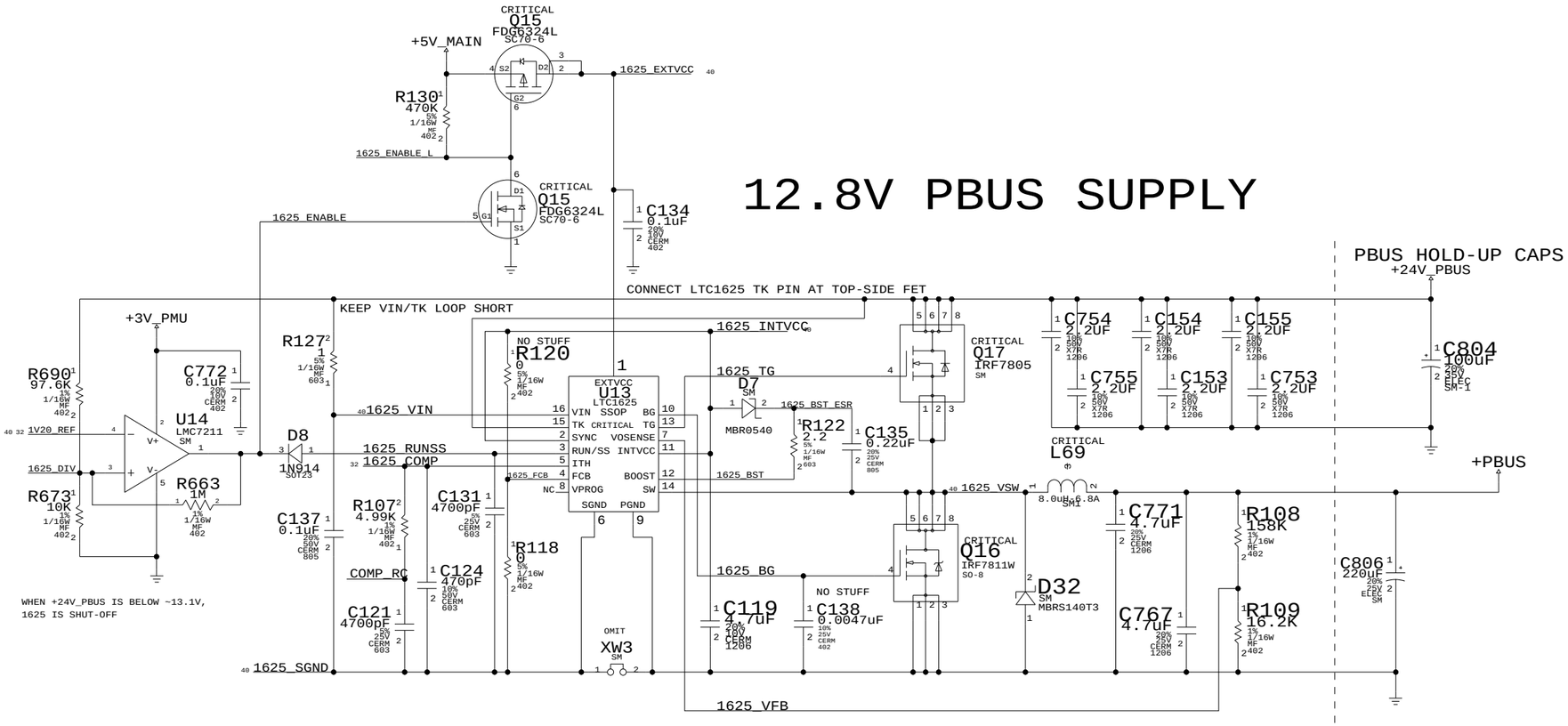
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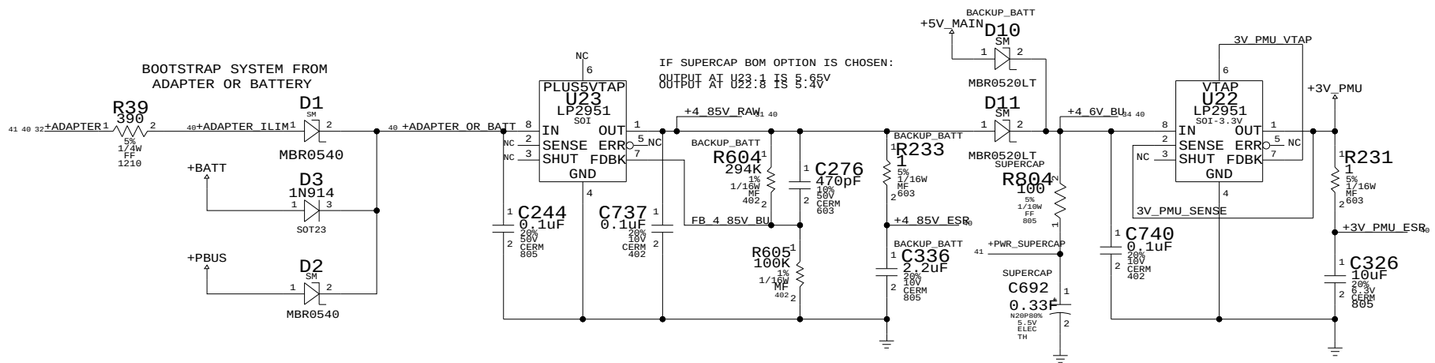
SCALE	SHT	OF
NONE	32	46

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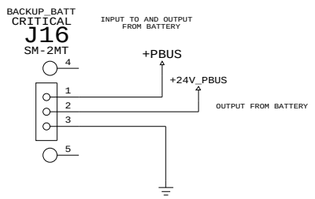
12.8V PBUS SUPPLY



PMU SUPPLY



BACKUP BATTERY



PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
114S3575	1	RES,MF,1/16W,357K OHM,1%,0402,SMD	R604	?	SUPERCAP

12.8V REGULATOR

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3.3V/5V MAIN SUPPLY

+24V_PBUS

+5V_MAIN

+3V_MAIN

+3V_SLEEP

C558 C559 C561 C560 22uF 10% 25V X7R 1206

C582 C581 C580 C579 22uF 10% 25V X7R 1206

Q41 IRF7805 SM CRITICAL

Q45 IRF7805 SM CRITICAL

L61 4.7uH IHLP-5050 CRITICAL

L62 4.7uH IHLP-5050 CRITICAL

R522 0.005 1% 1/2W 1206 5V_RSNS

R538 0.005 1% 1/2W 1206 3V_RSNS

XW31 OMIT SM

XW32 OMIT SM

+5V_MAIN_AUD

+3V_MAIN_AUD

C687 22uF 20% 10V CERM 1210

C685 330uF 20% 6.3V FANI CASE-D4 CRITICAL

C686 22uF 20% 10V CERM 1210

C700 22uF 20% 10V CERM 1210

C703 330uF 20% 6.3V FANI CASE-D4 CRITICAL

C699 22uF 20% 10V CERM 1210

R521 10 5% 1/16W MF 402

R523 10 5% 1/16W MF 402

R537 10 5% 1/16W MF 402

R539 10 5% 1/16W MF 402

D26 MBRS140T3 SM

D28 MBRS140T3 SM

Q42 IRF7811W SO-8 CRITICAL

Q47 IRF7811W SO-8 CRITICAL

C277 0.001uF 10% 50V CERM 402 NO STUFF

C469 0.001uF 10% 50V CERM 402 NO STUFF

C565 0.001uF 10% 50V CERM 402 NO STUFF

C576 0.001uF 10% 50V CERM 402 NO STUFF

D14 MBR0540 SM

D13 MBR0540 SM

R411 1M 5% 1/16W MF 402

R405 0 5% 1/16W MF 402

R406 100K 1% 1/16W MF 402

C574 4.7uF 20% 10V CERM 1206

R399 1M 5% 1/16W MF 402

R409 4.7 5% 1/16W MF 603

C575 0.22uF 20% 25V CERM 805

R402 4.7 5% 1/16W MF 603

C564 0.22uF 20% 25V CERM 805

U35 LTC3707 SSOP

EXTINI VIN 3.3 VCC VCC VOUT

5V_TG TG1 TG2 3V_TG

5V_BOOST BOOST1 BOOST2 3V_BOOST

5V_SW SW1 SW2 3V_SW

5V_BG BG1 BG2 3V_BG

5V_SNSP SNS1+ SNS2+ 3V_SNSP

5V_SNSM SNS1- SNS2- 3V_SNSM

5V_VOSNS VOSNS1 VOSNS2 3V_VOSNS

5V_ITH ITH1 ITH2 3V_ITH

5V_RUNSS RUN/SS1 RUN/SS2

FCB

3707_FSET FREQSET PGOOD

3707_FCB STBYMD

3707_STBY SGND PGND

3707_SGND

C8 C114 C415 C123 C554 C7 C557 C562 C629 0.1uF 20% 10V CERM 402

DISTRIBUTE CAPS ALONG TOP EDGE AND FAN CUT-OUT

C555 C416 C353 C627 C126 C143 C556 C563 C628 0.1uF 20% 10V CERM 402

DISTRIBUTE CAPS ALONG TOP EDGE AND FAN CUT-OUT

R408 113K 1% 1/16W MF 402

C573 180pF 5% 50V CERM 402 NO STUFF

C571 0.0022uF 10% 50V CERM 402

C577 0.047uF 10% 16V CERM 402

C569 0.0022uF 10% 50V CERM 402

C566 0.1uF 20% 10V CERM 402

C568 180pF 5% 50V CERM 402 NO STUFF

R401 63.4K 1% 1/16W MF 402

R410 21.5K 1% 1/16W MF 402

R404 15K 1% 1/16W MF 402

C570 100pF 5% 50V CERM 402

C572 0.01uF 10% 25V CERM 402

R407 100K 1% 1/16W MF 402

C567 100pF 5% 50V CERM 402

R403 12K 1% 1/16W MF 402

R400 20K 1% 1/16W MF 402

5V START TO TURN ON ~12.5MS AFTER DCDC_EN_L

3V START TO TURN ON ~25MS AFTER DCDC_EN_L

DIODE WILL ENSURE DCDC_EN_L IS QUICKLY DISCHARGED DURING SHUT-DOWN

POWERDOWN DELAY IS AROUND 4MS-15.6MS

R524 1M 5% 1/16W MF 402

Q43 2N7002 SM

XW13 SM

C578 220pF 5% 25V CERM 402

3V_5V_OK

THIS SIGNAL IS OPEN COLLECTOR TO GND WHEN POWER IS NOT GOOD

220PF IS USED TO QUIET NOISE ON PGOOD ONCE INTERNAL OPEN DRAIN IS DISENGAGED

D27 1N914 SOT23

C688 0.01uF 10% 16V CERM 402

+4_6V_BU

DCDC_EN_L

LTC3707_START_RC

R533 470K 5% 1/16W MF 402

DCDC_EN

R534 100K 5% 1/16W MF 402

PMU_POWER_UP_L

Q44 2N7002DW SOT-363

C694 0.01uF 10% 16V CERM 402

SLEEP

DCDC_EN TRUTH TABLE

PMU_POWER_UP	SLEEP	DCDC_EN	DCDC_EN_L	State
0	0	1	0	Run
1 (2.99V)	1	1	0	Sleep
1	0	0	1	Shutdown
+3V_PMU	+3V_PMU	+4_6V_BU	+3V_PMU	VOLTAGE

SLEEP LEVEL SHIFTER (3V -> 5V)

+5V_MAIN

R548 100K 5% 1/16W MF 402 NO STUFF

SLEEP_L_LS5_NET

Q50 2N7002DW SOT-363 NO STUFF

+3V_SLP_OK

R551 100K 5% 1/16W MF 402 NO STUFF

+3V_SLP_ON

Q50 2N7002DW SOT-363 NO STUFF

R550 470K 5% 1/16W MF 402 NO STUFF

+3V_SLEEP

R294 100K 5% 1/16W MF 402 NO STUFF

C713 100UF 20% 6.3V CASE-B-3528

R572 100K 5% 1/16W MF 402

Q21 SI3443DV TSOP

C398 2200pF 5% 50V CERM 603

3V_SLEEP_PWREN_L

R301 100K 5% 1/16W MF 402

Q20 2N7002DW SOT-363 NO STUFF

SLEEP_NET_INV

R291 100K 5% 1/16W MF 402

Q20 2N7002DW SOT-363 NO STUFF

SLEEP_NET

+3V_SLEEP LOADS

1) CPU PLL CONFIG CONTROL
2) INTREPID - I2C PULLUPS & OSCILLATOR
3) MAP31 - 3V RAIL (IF USING D3COLD)
4) GRAPHIC CHIP SPREAD SPECTRUM CHIP
5) LVDS DDC PULL-UPS
6) DVI LEVEL SHIFTERS & PULLUPS & HPD
7) BOOT BANGER
8) HARD DRIVE (IF USING 3V LOGIC)
9) WIRELESS
10) PMU - I2C PULLUPS

+5V_MAIN

C432 0.01uF 20% 16V CERM 402

R321 100K 5% 1/16W MF 402

SLEEP_LS5

5V_HD_PWREN

C428 10UF 20% 6.3V CERM 805

Q26 SI3443DV TSOP

+5V_HD_SLEEP

C709 100UF 20% 6.3V CASE-B-3528

C433 0.1uF 20% 10V CERM 402

R322 100K 5% 1/16W MF 402

5V_SLEEP_PWREN

C429 10UF 20% 6.3V CERM 805

Q27 SI3443DV TSOP

+5V_SLEEP

C710 100UF 20% 6.3V CASE-B-3528

+5V_SLEEP LOADS

1) FAN
2) Headphone amplifier
3) OPTICAL DRIVE
4) DVI
5) TRACKPAD

+5V_MAIN

R306 100K 1% 1/16W MF 402

R307 100K 1% 1/16W MF 402

SLEEP_L_LS5

SLEEP_LS5

SLEEP_L_LS5_EN_L

R311 100K 5% 1/16W MF 402

Q24 2N7002DW SOT-363

R310 100K 5% 1/16W MF 402

Q24 2N7002DW SOT-363

SLEEP_LS5_EN_L

C410 0.01uF 10% 16V CERM 402

3.3V/5V REGULATOR

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SCALE: NONE	SHT 34 OF 46	

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VCORE POWER SEQUENCING

CPU core follows CPU I/O voltage
(approx. 7ms delay)

+5V_MAIN

R101 100K 5% 1/16W MF 402
R106 100K 5% 1/16W MF 402
R111 100K 1% 1/16W MF 402

MAXBUS_SLEEP (40 16 15 8 7 6 5)
CPU_VCORE_PWR_SEQ
CPU_VCORE_SEQ_L
CPU_VCORE_SEQ

R99 10K 5% 1/16W MF 402

Q8 2N3904 SM
Q5 2N3904 SM

DP2 BAS16TW SOT-363 (x4)

SLEEP_L (36 34 28 21 18)
LS5
DCDC_EN (34 30 21)

1.67GHZ (1.28VCORE) 1.300V->0.975V
1.50GHZ 1.200V->0.975V
1.67GHZ (1.26VCORE) 1.300V->0.975V

(VALUE WITHOUT OFFSET)

+3V_MAIN

CPU_BST&CPU_BST_VCORE126

R757 470K 5% 1/16W MF 402 — CPU_BTR — <D4>
R137 470K 5% 1/16W MF 402 — CPU_BST&CPU_BST_VCORE126 — <D3>
R631 470K 5% 1/16W MF 402 — CPU_BST&CPU_BST_VCORE126 — <D2>
R662 0 5% 1/16W MF 402 — NO STUFF — <D1>

VCORE_VID<1> 35
VCORE_VID<2> 35
VCORE_VID<3> 35
VCORE_VID<4> 35

CPU_BST&CPU_BST_VCORE126

R126 470K 5% 1/16W MF 402 — CPU_BTR — <D4>
R139 470K 5% 1/16W MF 402 — CPU_BTR — <D3>
R634 470K 5% 1/16W MF 402 — CPU_BTR — <D2>
R660 0 5% 1/16W MF 402 — NO STUFF — <D1>

+PBUS

Keep trace fat (40-100 mils) and short!!

OMIT CRITICAL C77 10uF 20% 16V TANT CASE-D
OMIT CRITICAL C91 10uF 20% 16V TANT CASE-D
OMIT CRITICAL C78 10uF 20% 16V TANT CASE-D
OMIT CRITICAL C52 10uF 20% 16V TANT CASE-D
OMIT CRITICAL C92 10uF 20% 16V TANT CASE-D
OMIT CRITICAL C111 10uF 20% 16V TANT CASE-D
OMIT CRITICAL C51 10uF 20% 16V TANT CASE-D

CRITICAL Q62 SI7860DP SO-8-PWRPK
CRITICAL Q65 SI7860DP SO-8-PWRPK

CPU_VCORE_SLEEP (41 40 35 6 5)

C101 10uF 20% 6.3V CERM 805
C12 10uF 20% 6.3V CERM 805
C74 10uF 20% 6.3V CERM 805
C100 10uF 20% 6.3V CERM 805
C16 10uF 20% 6.3V CERM 805
C90 10uF 20% 6.3V CERM 805
C57 10uF 20% 6.3V CERM 805
C21 10uF 20% 6.3V CERM 805
C6 10uF 20% 6.3V CERM 805
C15 10uF 20% 6.3V CERM 805
C83 10uF 20% 6.3V CERM 805
C63 10uF 20% 6.3V CERM 805
C3 10uF 20% 6.3V CERM 805
C5 10uF 20% 6.3V CERM 805
C14 10uF 20% 6.3V CERM 805
C76 10uF 20% 6.3V CERM 805
C106 10uF 20% 6.3V CERM 805
C105 10uF 20% 6.3V CERM 805
C4 10uF 20% 6.3V CERM 805
C13 10uF 20% 6.3V CERM 805

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
126S0036	7	CAP,AL,POLY,8.2uF,20%,16V,V CASE,SMD	C51,C52,C77,C78,C91,C92,C111	CRITICAL	
152S0242	1	IND,PWR,1.0UH,20,20.5A,SMD	L71	CRITICAL	

+5V_MAIN

R86 20 5% 1/16W MF 402
C93 1uF 20% 10V CERM 603 — PLACE C423 CLOSE TO PINS 15 & 13!
D5 SM MBR0530 — CRITICAL

VCORE_BOOST (40)

VCORE_VCC (40)
R85 0 5% 1/16W MF 402
C84 1uF 20% 10V CERM 603

U7 MAX1717 QSOP

VCC	7		
VDD	15		
SKP/SDN	2		
FBS	5	(VCORE_SNS)	
ILIM	10		
GNDS	11	(VCORE_GNDSNS)	
A/B	16		
REF	9		
TON	8		
CC	6		
D0	21		
D1	20		
D2	19		
D3	18		
D4	17		
V+	1	(VCORE_VPLUS)	
BST	22	VCORE_BST	
DH	24		
LX	23		
DL	14		
GND	13		
FB	4		
TIME	3		
VGATE	12		

R91 27.4K 1% 1/16W MF 402
VCORE_SHDN_L (5)
VCORE_ILIM (40)
VCORE_AB_SEL (35)
VCORE_REF (40)
VCORE_TON (40)
VCORE_CC (40)
VCORE_GNDA (40)

R71 2.2 5% 1/16W MF 603
VCORE_DH (40)
C64 0.1uF 20% 25V CERM 603
VCORE_LX (40)
VCORE_DL (40)
VCORE_GND (40)
VCORE_FB (41 40)
VCORE_TIME (40)
VCORE_VGATE (14 40)
VGATE PULLUP PROVIDED BY INTREPID

C841 0.001uF 20% 50V CERM 402
C842 0.001uF 20% 50V CERM 402
C843 0.001uF 20% 50V CERM 402

CRITICAL Q60 IRF7832 SO-8
CRITICAL Q63 IRF7832 SO-8
CRITICAL Q66 IRF7832 SO-8

R69 390K 5% 1/16W MF 402
C70 0.001uF 20% 50V CERM 402

NO STUFF C65 0.0047uF 10% 25V CERM 402

XW28 SM
XW2 SM

Keep trace fat and short!!

OMIT CRITICAL L71 1.2UH-18.3A SM1

XW29 SM
VCORE_VSENSE (1)
Keep trace fat and short!!
R743 0.001 1% 1W MF 2512
(VCORE=1.385V for EVTB)
CPU_VCORE_SLEEP (5 6 35 40 41)

CRITICAL C797 330uF 20% 2.5V-ESR9V POLY CASE-D2E
CRITICAL C788 330uF 20% 2.5V-ESR9V POLY CASE-D2E
CRITICAL C781 330uF 20% 2.5V-ESR9V POLY CASE-D2E
CRITICAL C774 330uF 20% 2.5V-ESR9V POLY CASE-D2E
CRITICAL C793 330uF 20% 2.5V-ESR9V POLY CASE-D2E
CRITICAL C802 330uF 20% 2.5V-ESR9V POLY CASE-D2E

CRITICAL D33 B540C SM

R90 2.2 5% 1/4W MF 1210 — NO STUFF — CPU_VCORE_SNUB
C79 0.0022uF 10% 50V CERM 603 — NO STUFF
R72 100 5% 1/16W MF 402

XW27 SM — PLACE THIS SHORT AT PIN OF 1000uF CAP CLOSEST TO CPU

MAX1717 VID INPUTS ARE 3.3-5V TOLERANT

CPU_BST&CPU_BST_VCORE126

R65 0 5% 1/16W MF 402
C66 0.01uF 20% 16V CERM 402
R67 178K 1% 1/16W MF 402
R95 12.7K 1% 1/16W MF 402
C94 1uF 20% 10V CERM 603
C80 220pF 5% 25V CERM 402

NO STUFF R80 0 5% 1/16W MF 402 — CPU_VCORE_HI_OC (31 7)
R81 0 5% 1/16W MF 402 — INT_GPIO1_PU (14)

+3V_MAIN

CPU_BTR R66 0 5% 1/16W MF 402 — <D0>

VCORE_VID<0>
VCORE_VID<1>
VCORE_VID<2>
VCORE_VID<3>
VCORE_VID<4>
(35)

Note:No stuff R67 to set skip mode of Vcore

(R93 CPU_BTR BOM OPTION SEE BOM TABLE)

+3V_MAIN

CPU_BST_VCORE128

R93 6.04K 1% 1/16W MF 402 — VCORE_OFFSET_DIV
R98 158K 1% 1/16W MF 402 (Ra)

CPU_BST&CPU_BTR
R790 100K 5% 1/16W MF 402
CPU_BST_VCORE126
R792 0 5% 1/16W MF 402
R791 0 5% 1/16W MF 402
VCORE_AB_SEL_INV

Q82 2N7002DW SOT-363 (x2)

VCORE_GNDDIV (35 40)
CPU_BST_VCORE128
R97 2K 1% 1/16W MF 402 (Rb)

ROUTE AS DIFFERENTIAL PAIR

GROUND SENSE VOLTAGE DIVIDER

Connect MAX1717 GND pin 13 to GND at bottom-side FET

This allows for an offset to the ground sense to adjust the output voltage.
VREF = 2.0V, HENCE VOFFSET = 2.0V*0.85*(Rb / Ra) AND VCORE = VDAC + VOFFSET.
NOTE: Ra NO STUFFED FOR NO OFFSET CASE

(CPU Vcore value with offset)

1.67GHZ	1.320V->0.990V	(CPU SPEC: 1.280V -> 0.980V)
1.50GHZ	1.240V->0.990V	(CPU SPEC: 1.200V -> 0.980V)
1.67GHZ(1.26VCORE)	1.300V->0.990V	(CPU SPEC: 1.260V -> 0.980V)

(R93&R97 CPU_BTR BOM OPTION SEE BOM TABLE)

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
114S2493	1	RES,MF,1/16W,2.49K OHM,1%,0402,SMD	R93	?	CPU_BTR_VCORE12
114S4023	1	RES,MF,1/16W,4.02K OHM,1%,0402,SMD	R97	?	CPU_BTR_VCORE12
116S1000	1	RES,MF,1/16W,0 OHM,5%,0402,SMD	R93	?	CPU_BST_VCORE126
114S1503	1	RES,MF,1/16W,1.5K OHM,1%,0402,SMD	R97	?	CPU_BST_VCORE126
114S2433	1	RES,MF,1/16W,2.43K OHM,1%,0402,SMD	R93	?	CPU_BST_VCORE13
114S4023	1	RES,MF,1/16W,4.02K OHM,1%,0402,SMD	R97	?	CPU_BST_VCORE13
114S2003	1	RES,MF,1/16W,2K OHM,1%,0402,SMD	R93	?	CPU_BTR_VCORE122
114S6043	1	RES,MF,1/16W,6.04K OHM,1%,0402,SMD	R97	?	CPU_BTR_VCORE122

40 35 VCORE_GNDSNS
40 VCORE_SNS

OUTPUT VOLTAGE

V_{DAC} D4=0	V_{DAC} D4=1	D3	D2	D1	D0
2.00	1.275	0	0	0	0
1.95	1.250	0	0	0	1
1.90	1.225	0	0	1	0
1.85	1.200	0	0	1	1
1.80	1.175	0	1	0	0
1.75	1.150	0	1	0	1
1.70	1.125	0	1	1	0
1.65	1.100	0	1	1	1
1.60	1.075	1	0	0	0
1.55	1.050	1	0	0	1
1.50	1.025	1	0	1	0
1.45	1.000	1	0	1	1
1.40	0.975	1	1	0	0
1.35	0.950	1	1	0	1
1.30	0.925	1	1	1	0
NO CPU	NO CPU	1	1	1	1

FOR V-STEP:

	A/B_ =	
D<4..0>	Hi/Fast	Lo/Slow
<= 1K PU	1	0
>= 100K PU	1	1
>= 100K PD	0	1
<= 1K PD	0	0

When A/B_ is high (fast): D4-D0 read as-is
When A/B_ is low (slow): <=1K-ohm -> 0
>=100K-ohm -> 1

If all pull-ups are >=100K and all pull-downs are <=1K, V = VA. B

Fmax Test Connections

NO STUFF R706 2.05K 1% 1/16W MF 402 — VCORE_GNDDIV (40 35) — VCORE_GNDDIV_TEST
NO STUFF R708 100 1% 1/16W MF 402 — VCORE_GNDSNS (40 35) — VCORE_GNDSNS_TEST

NO STUFF J7 M-ST-SM-52465-1217

1		12	VCORE_D0
2		11	VCORE_D1
3		10	VCORE_D2
4	+3V_PMU_RESET (41 31)	9	VCORE_D3
5	SOFT_PWR_ON_L (24 31)	8	VCORE_D4
6	NC (RFU)	7	

VCORE SUPPLY

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1.5V/2.5V SWITCHER

+1_5V_SLEEP LOADS

1) AGP I/O - IF USING D3COLD
2) MAXBUS I/O - IF 1.5V INTERFACE

+1_5V_MAIN LOADS

1) INTREPID CORE

+2_5V_MAIN LOADS

1) MAP31 - FBCORE/FBIO IF USING D3HOT
2) GIGABIT ETHERNET - AVDDL
3) DDR SODIMMS - CORE/IO
4) DDR MUXES

M11 Power Shut down Sequencing

+2_5V_SLEEP LOADS

1) FBCORE/FBIO IF USING D3COLD

1.8V SWITCHER

+1_8V_MAIN LOADS

1) INTREPID PLLS

+1_8V_SLEEP LOADS

1) MPC7447 - MAXBUS I/O - IF 1.8V INTERFACE
2) CPU JTAG & MaxBus Pull-ups
3) CPU PLL Config Straps

1.5V/1.8V/2.5V SUPPLIES

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DIGITAL SIGNALS

GROUP	SIG_NAME	PROPAGATION_DELAY	MAX_VIAS	MAX_EXPOSED_LENGTH	STUB_LENGTH	NET_SPACING_TYPE	NO_TEST	PULSE_PARAM
				STUB_LENGTH OF 200 MILS NEEDED WHEN WE CONVERT TO 14.2				
GROUP 0	MEM_DATA<7..0>	L:S:1602:1700	7	500	(200)			167 MHZ
	MEM_DQM<0>	L:S:1602 MIL:1700 MIL	7	500.0000	(200)			167.0 MHz
	MEM_DQS<0>	L:S:1602 MIL:1700 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DATA_A<7..0>	L:S:1903:2000	7	500	(200)	TOTAL LENGTH CONTROLLED BY SPREADSHEET		167 MHZ
	RAM_DQM_A<0>	L:S:1903 MIL:2000 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DQS_A<0>	L:S:1903 MIL:2000 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DATA_B<7..0>	L:S:2000:2100	7	500	(200)			167 MHZ
	RAM_DQM_B<0>	L:S:2000 MIL:2100 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DQS_B<0>	L:S:2000 MIL:2100 MIL	7	500.0000	(200)			167.0 MHz
GROUP 1	MEM_DATA<15..8>	L:S:1344:1660	7	500	(200)			167 MHZ
	MEM_DQM<1>	L:S:1344 MIL:1660 MIL	7	500.0000	(200)			167.0 MHz
	MEM_DQS<1>	L:S:1344 MIL:1660 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DATA_A<15..8>	L:S:1905:2000	7	500	(200)	TOTAL LENGTH CONTROLLED BY SPREADSHEET		167 MHZ
	RAM_DQM_A<1>	L:S:1905 MIL:2000 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DQS_A<1>	L:S:1905 MIL:2000 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DATA_B<15..8>	L:S:2004:2412	7	500	(200)			167 MHZ
	RAM_DQM_B<1>	L:S:2004 MIL:2412 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DQS_B<1>	L:S:2004 MIL:2412 MIL	7	500.0000	(200)			167.0 MHz
GROUP 2	MEM_DATA<23..16>	L:S:1435:1500	7	500	(200)			167 MHZ
	MEM_DQM<2>	L:S:1435 MIL:1500 MIL	7	500.0000	(200)			167.0 MHz
	MEM_DQS<2>	L:S:1435 MIL:1500 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DATA_A<23..16>	L:S:1707:1800	7	500	(200)	TOTAL LENGTH CONTROLLED BY SPREADSHEET		167 MHZ
	RAM_DQM_A<2>	L:S:1707 MIL:1800 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DQS_A<2>	L:S:1707 MIL:1800 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DATA_B<23..16>	L:S:1900:2000	7	500	(200)			167 MHZ
	RAM_DQM_B<2>	L:S:1900 MIL:2000 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DQS_B<2>	L:S:1900 MIL:2000 MIL	7	500.0000	(200)			167.0 MHz
GROUP 3	MEM_DATA<31..24>	L:S:1233:1485	7	500	(200)			167 MHZ
	MEM_DQM<3>	L:S:1233 MIL:1485 MIL	7	500.0000	(200)			167.0 MHz
	MEM_DQS<3>	L:S:1233 MIL:1485 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DATA_A<31..24>	L:S:1700:2165	7	500	(200)	TOTAL LENGTH CONTROLLED BY SPREADSHEET		167 MHZ
	RAM_DQM_A<3>	L:S:1700 MIL:2165 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DQS_A<3>	L:S:1700 MIL:2165 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DATA_B<25..24>	L:S:1907:2356	7	500	(200)			167 MHZ
	RAM_DATA_B<26>	L:S:1907 MIL:2356 MIL	7		(200)			167.0 MHz
	RAM_DATA_B<31..27>	L:S:1907:2356	7	500	(200)			167 MHZ
	RAM_DQM_B<3>	L:S:1907 MIL:2356 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DQS_B<3>	L:S:1907 MIL:2356 MIL	7	500.0000	(200)			167.0 MHz
GROUP 4	MEM_DATA<39..32>	L:S:1915:2000	7	500	(200)			167 MHZ
	MEM_DQM<4>	L:S:1915 MIL:2000 MIL	7	500.0000	(200)			167.0 MHz
	MEM_DQS<4>	L:S:1915 MIL:2000 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DATA_A<39..32>	L:S:1205:1387	7	500	(200)	TOTAL LENGTH CONTROLLED BY SPREADSHEET		167 MHZ
	RAM_DQM_A<4>	L:S:1205 MIL:1387 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DQS_A<4>	L:S:1205 MIL:1387 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DATA_B<39..32>	L:S:1404:1686	7	500	(200)			167 MHZ
	RAM_DQM_B<4>	L:S:1404 MIL:1686 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DQS_B<4>	L:S:1404 MIL:1686 MIL	7	500.0000	(200)			167.0 MHz
GROUP 5	MEM_DATA<47..40>	L:S:1719:1893	7	500	(200)			167 MHZ
	MEM_DQM<5>	L:S:1719 MIL:1893 MIL	7	500.0000	(200)			167.0 MHz
	MEM_DQS<5>	L:S:1719 MIL:1893 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DATA_A<47..40>	L:S:1607:1898	7	500	(200)	TOTAL LENGTH CONTROLLED BY SPREADSHEET		167 MHZ
	RAM_DQM_A<5>	L:S:1607 MIL:1898 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DQS_A<5>	L:S:1607 MIL:1898 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DATA_B<47..40>	L:S:1716:2102	7	500	(200)			167 MHZ
	RAM_DQM_B<5>	L:S:1716 MIL:2102 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DQS_B<5>	L:S:1716 MIL:2102 MIL	7	500.0000	(200)			167.0 MHz
GROUP 6	MEM_DATA<55..48>	L:S:2101:2170	7	500	(200)			167 MHZ
	MEM_DQM<6>	L:S:2101 MIL:2170 MIL	7	500.0000	(200)			167.0 MHz
	MEM_DQS<6>	L:S:2101 MIL:2170 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DATA_A<55..48>	L:S:1204:1357	7	500	(200)	TOTAL LENGTH CONTROLLED BY SPREADSHEET		167 MHZ
	RAM_DQM_A<6>	L:S:1204 MIL:1357 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DQS_A<6>	L:S:1204 MIL:1357 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DATA_B<55..48>	L:S:1400:1546	7	500	(200)			167 MHZ
	RAM_DQM_B<6>	L:S:1400 MIL:1546 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DQS_B<6>	L:S:1400 MIL:1546 MIL	7	500.0000	(200)			167.0 MHz
GROUP 7	MEM_DATA<63..56>	L:S:1903:2000	7	500	(200)			167 MHZ
	MEM_DQM<7>	L:S:1903 MIL:2000 MIL	7	500.0000	(200)			167.0 MHz
	MEM_DQS<7>	L:S:1903 MIL:2000 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DATA_A<63..56>	L:S:1611:1696	7	500	(200)	TOTAL LENGTH CONTROLLED BY SPREADSHEET		167 MHZ
	RAM_DQM_A<7>	L:S:1611 MIL:1696 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DQS_A<7>	L:S:1611 MIL:1696 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DATA_B<63..56>	L:S:1809:1887	7	500	(200)			167 MHZ
	RAM_DQM_B<7>	L:S:1809 MIL:1887 MIL	7	500.0000	(200)			167.0 MHz
	RAM_DQS_B<7>	L:S:1809 MIL:1887 MIL	7	500.0000	(200)			167.0 MHz
ADDR	MEM_ADDR<12..0>	L:S::500	4					83 MHZ
	RAM_ADDR<12..0>	L:S:2000:3000	10		(200)			
	MEM_BA<1..0>	L:S::500	4					
	RAM_BA<1..0>	L:S:2000:3300	8		(200)			
CONTROL	MEM_CS_L<3..0>	L:S::500	4					
	RAM_CS_L<3..0>	L:S:2500:3200	7		(200)			
	MEM_CKE<3..0>	L:S::500	4					
	RAM_CKE<3..0>	L:S:2500:3200	7		(200)			
	MEM_RAS_L	L:S::500 MIL	4					
	RAM_RAS_L	L:S:2000 MIL:4100 MIL	7		(200)			
	MEM_CAS_L	L:S::500 MIL	4					
	RAM_CAS_L	L:S:2000 MIL:4100 MIL	7		(200)			
	MEM_WE_L	L:S::500 MIL	4					
	RAM_WE_L	L:S:2000 MIL:3100 MIL	8		(200)			
	MEM_MUXSEL_MSB	L:S:1700 MIL:3000 MIL	8					
	MEM_MUXSEL_LSB	L:S:1700 MIL:3000 MIL	7					

PRIORITY: 2
PRIMARY LAYERS: 4,7
SECONDARY LAYERS: 2,9
GOAL: MINIMIZE
EXPOSED ROUTES
MINIMIZE VIAS

CLOCK LINE CONSTRAINTS

GROUP	SIG_NAME	PROPAGATION_DELAY	MATCHED_DELAY	MAX VIAS	MAX EXPOSED LENGTH	STUB_LENGTH	NET_SPACING_TYPE	PULSE PARAM
INTREPID CLOCKS	SYSCLK CPU UF	L:S::150 MIL					10 MIL SPACING	167.0 MHz
	SYSCLK_CPU	L:S:2650 MIL:2750 MIL		5	250.0000	(200)	10 MIL SPACING	167.0 MHz
	INT_CPUFB_OUT	L:S::150 MIL		5	250.0000		10 MIL SPACING	167.0 MHz
	INT_CPUFB_OUT_SHORT	L:S:700 MIL:850 MIL		5	250.0000		10 MIL SPACING	167.0 MHz
	INT_CPUFB_OUT_NORM	L:S:500 MIL:600 MIL		5	250.0000		10 MIL SPACING	167.0 MHz
	INT_CPUFB_IN_NORM	L:S:500 MIL:600 MIL		5	250.0000		10 MIL SPACING	167.0 MHz
	INT_CPUFB_LONG	L:S:1050 MIL:1150 MIL		5	250.0000		10 MIL SPACING	167.0 MHz
	INT_CPUFB_IN	L:S:700 MIL:800 MIL		5	250.0000	(200)	10 MIL SPACING	167.0 MHz
	SYSCLK_DDRCLK_A0_UF	L:S:300 MIL:350 MIL	SYSCLK_DDRCLK_A0_UF:G:L:S:0 MIL:25 MIL			(200)	10 MIL SPACING	167.0 MHz
	SYSCLK_DDRCLK_A0	L:S:300 MIL:350 MIL	SYSCLK_DDRCLK_A0_UF:G:L:S:0 MIL:25 MIL			(200)	10 MIL SPACING	167.0 MHz
	SYSCLK_DDRCLK_A1_UF	L:S:300 MIL:350 MIL	SYSCLK_DDRCLK_A1_UF:G:L:S:0 MIL:25 MIL			(200)	10 MIL SPACING	167.0 MHz
	SYSCLK_DDRCLK_A1	L:S:300 MIL:350 MIL	SYSCLK_DDRCLK_A1_UF:G:L:S:0 MIL:25 MIL			(200)	10 MIL SPACING	167.0 MHz
	SYSCLK_DDRCLK_B0_UF	L:S:300 MIL:350 MIL	SYSCLK_DDRCLK_B0_UF:G:L:S:0 MIL:25 MIL			(200)	10 MIL SPACING	167.0 MHz
	SYSCLK_DDRCLK_B0	L:S:300 MIL:350 MIL	SYSCLK_DDRCLK_B0_UF:G:L:S:0 MIL:25 MIL			(200)	10 MIL SPACING	167.0 MHz
	SYSCLK_DDRCLK_B1_UF	L:S:300 MIL:350 MIL	SYSCLK_DDRCLK_B1_UF:G:L:S:0 MIL:25 MIL			(200)	10 MIL SPACING	167.0 MHz
	SYSCLK_DDRCLK_B1	L:S:300 MIL:350 MIL	SYSCLK_DDRCLK_B1_UF:G:L:S:0 MIL:25 MIL			(200)	10 MIL SPACING	167.0 MHz
	SYSCLK_DDRCLK_A0	L:S:2900 MIL:3000 MIL	SYSCLK_DDRCLK_A0:G:L:S:0 MIL:25 MIL	7	250.0000	(200)	10 MIL SPACING	167.0 MHz
	SYSCLK_DDRCLK_A0	L:S:2900 MIL:3000 MIL	SYSCLK_DDRCLK_A0:G:L:S:0 MIL:25 MIL	7	250.0000	(200)	10 MIL SPACING	167.0 MHz
	SYSCLK_DDRCLK_A1	L:S:2900 MIL:3000 MIL	SYSCLK_DDRCLK_A1:G:L:S:0 MIL:25 MIL	7	250.0000	(200)	10 MIL SPACING	167.0 MHz
	SYSCLK_DDRCLK_A1	L:S:2900 MIL:3000 MIL	SYSCLK_DDRCLK_A1:G:L:S:0 MIL:25 MIL	7	250.0000	(200)	10 MIL SPACING	167.0 MHz
	SYSCLK_DDRCLK_B0	L:S:3100 MIL:3200 MIL	SYSCLK_DDRCLK_B0:G:L:S:0 MIL:25 MIL	7	250.0000	(200)	10 MIL SPACING	167.0 MHz
	SYSCLK_DDRCLK_B0	L:S:3100 MIL:3200 MIL	SYSCLK_DDRCLK_B0:G:L:S:0 MIL:25 MIL	7	250.0000	(200)	10 MIL SPACING	167.0 MHz
	SYSCLK_DDRCLK_B1	L:S:3100 MIL:3200 MIL	SYSCLK_DDRCLK_B1:G:L:S:0 MIL:25 MIL	7	250.0000	(200)	10 MIL SPACING	167.0 MHz
	SYSCLK_DDRCLK_B1	L:S:3100 MIL:3200 MIL	SYSCLK_DDRCLK_B1:G:L:S:0 MIL:25 MIL	7	250.0000	(200)	10 MIL SPACING	167.0 MHz
	INT_REF_CLK_OUT_UF	L:S::400 MIL				(200)	10 MIL SPACING	49.92 MHz
	INT_REF_CLK_OUT	L:S:1000 MIL:1150 MIL		5	250.0000	(200)	10 MIL SPACING	49.92 MHz
	INT_REF_CLK_IN	L:S:1900 MIL:2000 MIL		5	250.0000	(200)	10 MIL SPACING	167.0 MHz
	CLK66M_GPU_AGP_UF	L:S::150 MIL				(200)	10 MIL SPACING	66.00 MHz
	CLK66M_GPU_AGP	L:S:1800 MIL:1900 MIL		6	400.0000	(200)	10 MIL SPACING	66.00 MHz
	INT_AGP_FB_OUT	L:S::150 MIL				(200)	10 MIL SPACING	66.00 MHz
	INT_AGP_FB_IN	L:S:1450 MIL:1550 MIL		6	500.0000	(200)	10 MIL SPACING	66.00 MHz
	CLK33M_CBUS_UF	L:S::250 MIL				(200)	10 MIL SPACING	33.00 MHz
	CLK33M_CBUS	L:S:5000 MIL:6000 MIL		9	500.0000	(200)	10 MIL SPACING	33.00 MHz
	CLK33M_AIRPORT_UF	L:S::250 MIL				(200)	10 MIL SPACING	33.00 MHz
	CLK33M_AIRPORT	L:S:9500 MIL:10500 MIL		6	500.0000	(200)	10 MIL SPACING	33.00 MHz
	CLK33M_NEC_UF	L:S::250 MIL				(200)	10 MIL SPACING	33.00 MHz
	CLK33M_NEC	L:S:4000 MIL:6000 MIL		7	500.0000	(200)	10 MIL SPACING	33.00 MHz
	INT_PCI_FB_OUT	L:S::300 MIL				(200)	10 MIL SPACING	33.00 MHz
	INT_PCI_FB_IN	L:S:6500 MIL:7500 MIL		7	500.0000	(200)	10 MIL SPACING	33.00 MHz
M11 & OSC	ATI_CLK27M_OSC	L:S::400 MIL		5		(200)	10 MIL SPACING	
	ATI_CLK27M_OSC_SS	L:S::400 MIL		5		(200)	10 MIL SPACING	
	ATI_CLK27M_IN	L:S::200 MIL		5		(200)	10 MIL SPACING	
	ATI_SSCLK_UF	L:S::200 MIL		5		(200)	10 MIL SPACING	
	ATI_SSCLK_IN	L:S::1800 MIL		5	500.0000	(200)	10 MIL SPACING	
CRYSTALS	CLK18M_INT_XIN	L:S:1400 MIL:1500 MIL					10 MIL SPACING	
	CLK18M_INT_XOUT	L:S:1250 MIL:1350 MIL					10 MIL SPACING	
	CLK18M_XTAL_IN	L:S::300 MIL					10 MIL SPACING	
	CLK18M_INT_EXT	L:S::400 MIL					10 MIL SPACING	
SOUND	INT_I2S0_SND_MCLK			6	500.0000	(200)	10 MIL SPACING	
ETHERNET	CLKENET_PHY_RX	L:S::300 MIL				(200)		125.0 MHz
	CLKENET_LINK_RX	L:S:8000 MIL:9000 MIL		6	800.0000	(200)	10 MIL SPACING	125.0 MHz
	CLKENET_PHY_GBE_REF	L:S::300 MIL				(200)		125.0 MHz
	CLKENET_LINK_GBE_REF	L:S:8000 MIL:9000 MIL		6	500.0000	(200)	10 MIL SPACING	125.0 MHz
	CLKENET_PHY_TX	L:S::300 MIL				(200)		25.00 MHz
	CLKENET_LINK_TX	L:S:8000 MIL:9000 MIL		6	500.0000	(200)	10 MIL SPACING	25.00 MHz
	CLKENET_LINK_GTX	L:S::300 MIL				(200)		125.0 MHz
	CLKENET_PHY_GTX	L:S:8000 MIL:9000 MIL		6	600.0000	(200)	10 MIL SPACING	125.0 MHz
FIREWIRE	CLKFW_PHY_PCLK	L:S::300 MIL				(200)		49.15 MHz
	CLKFW_LINK_PCLK	L:S:7500 MIL:8000 MIL		5	500.0000	(200)	10 MIL SPACING	49.15 MHz
	CLKFW_PHY_LCLK	L:S:7500 MIL:8000 MIL		5	500.0000	(200)	10 MIL SPACING	49.15 MHz
	CLKFW_LINK_LCLK	L:S::300 MIL				(200)		49.15 MHz
	FW_XI	L:S::500 MIL				(200)	10 MIL SPACING	98.03 MHz
	FW_OSC	L:S::300 MIL				(200)	10 MIL SPACING	98.03 MHz

PRIORITY: 1
PRIMARY LAYERS: 4,7
SECONDARY LAYERS: 2,9
GOAL: MINIMIZE EXPOSURE ON LONG NETS

SIGNAL CONSTRAINTS - PAGE 1

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APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6680	E
SCALE: NONE	SHT 37 OF 46	

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DIGITAL SIGNALS

GROUP	SIG_NAME	PROPAGATION_DELAY	MAX_VIAS	MAX_EXPOSED_LENGTH	STUB_LENGTH	NET_SPACING_TYPE	NO_TEST	PULSE_PARAM
MAXBUS0	CPU_AACK_L	L:S:1500 MIL:2700	MIL7		(250)			
	CPU_ADDR<0..31>	L:S:1500:3100	7		(250)		TRUE	83 MHZ
	CPU_ARTRY_L	L:S:1500 MIL:2700	MIL7		(250)			
	CPU_BG_L	L:S:1500 MIL:2700	MIL7		(250)			
	CPU_BR_L	L:S:1500 MIL:2700	MIL7		(250)			
	CPU_CI_L	L:S:1500 MIL:2700	MIL7		(250)			
	CPU_DATA<0..31>	L:S:1100:2700	7		(250)		TRUE	83 MHZ
	CPU_DATA<32..63>	L:S:1100:2700	8		(250)			83 MHZ
	CPU_DBG_L	L:S:1500 MIL:2700	MIL7		(250)			
	CPU_DTI<0..2>	L:S:1500:2950	7		(250)			
	CPU_DRDY_L	L:S:1500 MIL:3200	MIL7		(250)			
	CPU_GBL_L	L:S:1500 MIL:2700	MIL7		(250)			
	CPU_HIT_L	L:S:1500 MIL:2800	MIL7		(250)			
	CPU_OACK_L	L:S:1500 MIL:2700	MIL7		(250)			
	CPU_OREQ_L	L:S:1500 MIL:2700	MIL7		(250)			
	CPU_TA_L	L:S:1500 MIL:2700	MIL7		(250)			
	CPU_TBST_L	L:S:1500 MIL:2700	MIL7		(250)			
	CPU_TEA_L	L:S:1500 MIL:3000	MIL7		(250)			
	CPU_TS_L	L:S:1500 MIL:2700	MIL7		(250)			
	CPU_TSIZ<0..2>	L:S:1500:3500	7		(250)			
	CPU_TT<0..4>	L:S:1500:3400	7		(250)			
	CPU_WT_L	L:S:1500 MIL:3100	MIL7		(250)			

PRIORITY: 4
PRIMARY LAYERS: 9
SECONDARY LAYERS: 4,7
GOAL: MINIMIZE TH VIAS

STUB_LENGTH OF 250 MILS NEEDED WHEN DESIGN SWITCHED TO 14.2

TMDS/DVO SIGNAL CONSTRAINTS

ALL TMDS GROUP SIGNALS ROUTE AT LAYER 4 OR 7 AND HAVE SAME WIDTH SPACING RULE AS OTHER TMDS SIGNALES

SI_TMDS_CLKN	SI_CLKTMDS	SITMDS:G:L:S:0 MIL:300 MIL		100 OHM SPACING FOR TMDS
SI_TMDS_CLKP	SI_CLKTMDS	SITMDS:G:L:S:0 MIL:300 MIL		100 OHM SPACING FOR TMDS
SI_TMDS_DN<0>	SI_TMDS_D0			100 OHM SPACING FOR TMDS
SI_TMDS_DP<0>	SI_TMDS_D0			100 OHM SPACING FOR TMDS
SI_TMDS_DN<1>	SI_TMDS_D1			100 OHM SPACING FOR TMDS
SI_TMDS_DP<1>	SI_TMDS_D1			100 OHM SPACING FOR TMDS
SI_TMDS_DN<2>	SI_TMDS_D2			100 OHM SPACING FOR TMDS
SI_TMDS_DP<2>	SI_TMDS_D2			100 OHM SPACING FOR TMDS
SI_TMDS_DN<3>	SI_TMDS_D3			100 OHM SPACING FOR TMDS
SI_TMDS_DP<3>	SI_TMDS_D3			100 OHM SPACING FOR TMDS
SI_TMDS_DN<4>	SI_TMDS_D4			100 OHM SPACING FOR TMDS
SI_TMDS_DP<4>	SI_TMDS_D4			100 OHM SPACING FOR TMDS
SI_TMDS_DN<5>	SI_TMDS_D5			100 OHM SPACING FOR TMDS
SI_TMDS_DP<5>	SI_TMDS_D5			100 OHM SPACING FOR TMDS

ALL THE DVOD GROUP SIGNALS ROUTE AT LAYER 4 OR 7 AND ROUTE AS STANDARD 50OHM SIGNALS AT 4 MILS

ATI_DVOD<23..0>	ATIDVOD:G:L:S:1600 MIL:1700 MIL	6	610		
ATI_DVOD_DE	ATIDVOD:G:L:S:1600 MIL:1700 MIL	6	610.0000		
ATI_DVO_HSYNC	ATIDVOD:G:L:S:1600 MIL:1700 MIL	6	610.0000		
ATI_DVO_VSYNC	ATIDVOD:G:L:S:1600 MIL:1700 MIL	6	610.0000		
ATI_DVO_CLKP	ATIDVOD:G:L:S:0 MIL:500 MIL	6	610.0000	165.0 MHz:::	
GPU_DVO_CLKP_R1	ATIDVOD:G:L:S:0 MIL:1100 MIL	6	610.0000	165.0 MHz:::	
GPU_DVO_CLKP_R2	ATIDVOD:G:L:S:0 MIL:1100 MIL	6	610.0000	165.0 MHz:::	

TMDS_CONN_CLKN	CLKCONN_TMDS	TMDS_CONN:G:L:S:0 MIL:50 MIL	500.0000	100 OHM SPACING FOR TMDS
TMDS_CONN_CLKP	CLKCONN_TMDS	TMDS_CONN:G:L:S:0 MIL:50 MIL	500.0000	100 OHM SPACING FOR TMDS
TMDS_CONN_DN<0>	CONN_TMDS_D0		500.0000	100 OHM SPACING FOR TMDS
TMDS_CONN_DP<0>	CONN_TMDS_D0		500.0000	100 OHM SPACING FOR TMDS
TMDS_CONN_DN<1>	CONN_TMDS_D1		500.0000	100 OHM SPACING FOR TMDS
TMDS_CONN_DP<1>	CONN_TMDS_D1		500.0000	100 OHM SPACING FOR TMDS
TMDS_CONN_DN<2>	CONN_TMDS_D2		500.0000	100 OHM SPACING FOR TMDS
TMDS_CONN_DP<2>	CONN_TMDS_D2		500.0000	100 OHM SPACING FOR TMDS
TMDS_CONN_DN<3>	CONN_TMDS_D3		500.0000	100 OHM SPACING FOR TMDS
TMDS_CONN_DP<3>	CONN_TMDS_D3		500.0000	100 OHM SPACING FOR TMDS
TMDS_CONN_DN<4>	CONN_TMDS_D4		500.0000	100 OHM SPACING FOR TMDS
TMDS_CONN_DP<4>	CONN_TMDS_D4		500.0000	100 OHM SPACING FOR TMDS
TMDS_CONN_DN<5>	CONN_TMDS_D5		500.0000	100 OHM SPACING FOR TMDS
TMDS_CONN_DP<5>	CONN_TMDS_D5		500.0000	100 OHM SPACING FOR TMDS

GPU_R	GPU_R	500.0000	100 OHM SPACING
GPU_G	GPU_G	500.0000	100 OHM SPACING
GPU_B	GPU_B	500.0000	100 OHM SPACING

SIGNAL CONSTRAINTS - PAGE 1

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D	051-6680	E

SCALE: NONE | SHT 38 OF 46

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Digital Signals (cont'd)

GROUP	SIG_NAME	PROPAGATION_DELAY	MAX_VIAS	MAX_EXPOSED_LENGTH	STUB_LENGTH	NET_SPACING_TYPE	NO_TEST	PULSE_PARAM
AGP	AGP_AD<15..0>	L:S:1050:1450	7					66 MHZ
AGP BYTES 0-1	AGP_CBE<1..0>	L:S:1050:1450	7					66 MHZ
	AGP_AD_STB<0>	L:S:1050 MIL:1450 MIL			(250)	8 MIL SPACING		133.0 MHZ
	AGP_AD_STB_L<0>	L:S:1050 MIL:1450 MIL			(250)	8 MIL SPACING		133.0 MHZ
AGP BYTES 2-3	AGP_AD<31..16>	L:S:1050:1450	7					66 MHZ
	AGP_CBE<3..2>	L:S:1050:1450	7					66 MHZ
	AGP_AD_STB<1>	L:S:1050 MIL:1450 MIL			(250)	8 MIL SPACING		133.0 MHZ
	AGP_AD_STB_L<1>	L:S:1050 MIL:1450 MIL			(250)	8 MIL SPACING		133.0 MHZ
AGP SIDEBAND	AGP_SBA<7..0>	L:S:1050:1450	7					66 MHZ
	AGP_SB_STB	L:S:1050 MIL:1450 MIL			(350)	8 MIL SPACING		66.00 MHZ
	AGP_SB_STB_L	L:S:1050 MIL:1450 MIL			(350)	8 MIL SPACING		66.00 MHZ
AGP CONTROL	AGP_FRAME_L	L:S:1250 MIL:1950 MIL						66.00 MHZ
	AGP_IRDY_L	L:S:1250 MIL:1950 MIL						66.00 MHZ
	AGP_TRDY_L	L:S:1250 MIL:1950 MIL						66.00 MHZ
	AGP_DEVSEL_L	L:S:1250 MIL:1950 MIL						66.00 MHZ
	AGP_STOP_L	L:S:1250 MIL:1950 MIL						66.00 MHZ
	AGP_PAR	L:S:1250 MIL:1950 MIL						66.00 MHZ
	AGP_REQ_L	L:S:1250 MIL:1950 MIL						66.00 MHZ
	AGP_GNT_L	L:S:1250 MIL:1950 MIL						66.00 MHZ
	AGP_RBF_L	L:S:1250 MIL:1950 MIL						66.00 MHZ
PCI	PCI_AD<31..0>	L:S:6000:12500				MIN_DAISY_CHAIN		33 MHZ
	PCI_CBE<3..0>	L:S:6000:12500				MIN_DAISY_CHAIN		33 MHZ
	PCI_FRAME_L	L:S:6000 MIL:12500 MIL				MIN_DAISY_CHAIN		33.00 MHZ
	PCI_IRDY_L	L:S:6000 MIL:12500 MIL				MIN_DAISY_CHAIN		33.00 MHZ
	PCI_TRDY_L	L:S:6000 MIL:12500 MIL				MIN_DAISY_CHAIN		33.00 MHZ
	PCI_DEVSEL_L	L:S:6000 MIL:12500 MIL				MIN_DAISY_CHAIN		33.00 MHZ
	PCI_STOP_L	L:S:6000 MIL:12500 MIL				MIN_DAISY_CHAIN		33.00 MHZ
	PCI_PAR	L:S:6000 MIL:12500 MIL				MIN_DAISY_CHAIN		33.00 MHZ
ULTRA ATA-100	UIDE_DATA<15..8>	L:S::710				(200)		100 MHZ
	UIDE_DATA<7>	U51.V1:RP19.3::600 MIL				(200)		100.0 MHZ
	UIDE_DATA<6..0>	L:S::600				(200)		100 MHZ
	UIDE_ADDR<2..0>	L:S::650			(200)	NEED TO MATCH DELAY TO 250		100 MHZ
	UIDE_RST_L	L:S::400 MIL				(200)		100.0 MHZ
	UIDE_DIOW_L	L:S::400 MIL				(200)		100.0 MHZ
	UIDE_DIOR_L	L:S::600 MIL		10 MIL SPACING		(200)		100.0 MHZ
	UIDE_DMACK_L	L:S::400 MIL				(200)		100.0 MHZ
	UIDE_CS0_L	L:S::500 MIL				(200)		100.0 MHZ
	UIDE_CS1_L	L:S::500 MIL				(200)		100.0 MHZ
	UIDE_DMARQ	L:S::400 MIL				(200)		100.0 MHZ
	UIDE_IOCHRDY	L:S::600 MIL		10 MIL SPACING		(200)		100.0 MHZ
	UIDE_INTRQ	L:S::400 MIL				(200)		100.0 MHZ
	HD_DATA<15..0>	L:S:5000:6500	7			(200)		100 MHZ
	HD_ADDR<2..0>	L:S:5000:6500	7			(200)		100 MHZ
	HD_RESET_L	L:S:4000 MIL:6000 MIL			(200)	TOTAL UIDE+HD SKEW <500MIL		100.0 MHZ
	HD_DIOW_L	L:S:3000 MIL:5200 MIL				(200)		100.0 MHZ
	HD_DIOR_L	L:S:6100 MIL:6150 MIL		10 MIL SPACING		(200)		100.0 MHZ
	HD_DMACK_L	L:S:4500 MIL:6000 MIL				(200)		100.0 MHZ
	HD_CS0_L	L:S:3000 MIL:6000 MIL				(200)		100.0 MHZ
	HD_CS1_L	L:S:3000 MIL:6000 MIL				(200)		100.0 MHZ
	HD_DMARQ	L:S:4500 MIL:6000 MIL				(200)		100.0 MHZ
	HD_IOCHRDY	L:S:6200 MIL:6300 MIL		10 MIL SPACING		(200)		100.0 MHZ
	HD_INTRQ	L:S:3000 MIL:5000 MIL						100.0 MHZ
EIDE INTREPID	EIDE_DATA<15..0>	L:S::850						33 MHZ
	EIDE_ADDR<2..0>	L:S::850						33 MHZ
	EIDE_CS0_L	L:S::850 MIL						33.00 MHZ
	EIDE_CS1_L	L:S::850 MIL						33.00 MHZ
	EIDE_RD_L	L:S::500 MIL						33.00 MHZ
	EIDE_WR_L	L:S::500 MIL						33.00 MHZ
	EIDE_IOCHRDY	L:S::500 MIL						33.00 MHZ
	EIDE_INT	L:S::500 MIL						33.00 MHZ
	EIDE_RST_L	L:S::500 MIL						33.00 MHZ
	EIDE_DMACK_L	L:S::500 MIL						33.00 MHZ
	EIDE_DMARQ	L:S::500 MIL						33.00 MHZ
OPTICAL	EIDE_OPTICAL_DATA<15..0>	L:S:4000:6000						33 MHZ
	EIDE_OPTICAL_ADDR<2..0>	L:S:4000:6000						33 MHZ
	EIDE_OPTICAL_CS0_L	L:S:4500 MIL:6500 MIL						33.00 MHZ
	EIDE_OPTICAL_CS1_L	L:S:4500 MIL:6500 MIL						33.00 MHZ
	EIDE_OPTICAL_READ_L	L:S:4500 MIL:6500 MIL						33.00 MHZ
	EIDE_OPTICAL_WR_L	L:S:4500 MIL:6500 MIL						33.00 MHZ
	EIDE_OPTICAL_IOCHRDY	L:S:4500 MIL:6500 MIL						33.00 MHZ
	EIDE_OPTICAL_INT	L:S:5000 MIL:7000 MIL						33.00 MHZ
	EIDE_OPTICAL_RST_L	L:S:4500 MIL:6500 MIL						33.00 MHZ
	EIDE_OPTICAL_DMAACK_L	L:S:4500 MIL:6500 MIL						33.00 MHZ
	EIDE_OPTICAL_DMA_RQ	L:S:4500 MIL:6500 MIL						33.00 MHZ
ETHERNET MII	ENET_LINK_RXD<7..0>	L:S:8000:9000	7	(400)		(400)		100 MHZ
	ENET_RX_DV	L:S:8000 MIL:9000 MIL						100.0 MHZ
	ENET_RX_ER	L:S:8000 MIL:9000 MIL						100.0 MHZ
	ENET_PHY_TXD<7..0>	L:S:8000:9000	7	(400)		(400)		100 MHZ
	ENET_LINK_TXD<7..0>	L:S::600						100 MHZ
	ENET_PHY_TX_ER	L:S:8000 MIL:9000 MIL						100.0 MHZ
	ENET_LINK_TX_ER	L:S::400 MIL						100 MHZ
	ENET_PHY_TX_EN	L:S:8000 MIL:9000 MIL						100.0 MHZ
	ENET_LINK_TX_EN	L:S::400 MIL						100 MHZ
	ENET_MDIO	L:S:8000 MIL:9000 MIL						100.0 MHZ
	ENET_MDC	L:S:8000 MIL:9000 MIL						100.0 MHZ
	ENET_COL	L:S:8000 MIL:9000 MIL						100.0 MHZ
	ENET_CRS	L:S:8000 MIL:9000 MIL						100.0 MHZ
FIREWIRE MII	FW_LINK_DATA<7..0>	L:S:2700:3500	7	(400)		(400)		100 MHZ
	FW_PHY_DATA<7..0>	L:S:4700:5500	7	(400)		(400)		100 MHZ
	FW_LINK_CNTL<1..0>	L:S:9000:10000						100 MHZ
	FW_PHY_CNTL<1..0>	L:S::300						100 MHZ
	FW_LINK_LREQ	L:S::300 MIL						100 MHZ
	FW_PHY_LREQ	L:S:8500 MIL:9500 MIL						100.0 MHZ
	FW_PINT	L:S:8500 MIL:9500 MIL						100.0 MHZ

PRIORITY: 4
PRIMARY LAYERS: 9
SECONDARY LAYERS: 4,7
GOAL: MINIMIZE TH VIAS

PRIORITY: 7
PRIMARY LAYERS: 4,7
SECONDARY LAYERS: 2,9

PRIORITY: 6
PRIMARY LAYERS: 4,7
SECONDARY LAYERS: 2,9

PRIORITY: 8
PRIMARY LAYERS: 4,7
SECONDARY LAYERS: 2,9

PRIORITY: 5
PRIMARY LAYERS: 4,7
SECONDARY LAYERS: 2,9

PRIORITY: 5
PRIMARY LAYERS: 4,7
SECONDARY LAYERS: 2,9

Differential Signals

GROUP	SIG_NAME	DIFFERENTIAL_PAIR	RELATIVE_PROPAGATION_DELAY	MAX_EXPOSED_LENGTH	NET_SPACING_TYPE	MAX_VIAS
FIREWIRE Zo = 110	FW_TPI0N	FW_TPI0	FW_TPI0:G:L:S:0 MIL:5 MIL	500.0000	110 OHM SPACING	
	FW_TPI0P	FW_TPI0	FW_TPI0:G:L:S:0 MIL:5 MIL	500.0000	110 OHM SPACING	
	FW_TPO0N	FW_TPO0	FW_TPO0:G:L:S:0 MIL:5 MIL	500.0000	110 OHM SPACING	
	FW_TPO0P	FW_TPO0	FW_TPO0:G:L:S:0 MIL:5 MIL	500.0000	110 OHM SPACING	
	FW_TPBI0N	FW_TPBI0	FW_TPBI0:G:L:S:0 MIL:5 MIL	500.0000	110 OHM SPACING	
	FW_TPBI0P	FW_TPBI0	FW_TPBI0:G:L:S:0 MIL:5 MIL	500.0000	110 OHM SPACING	
	FW_TPAO0N	FW_TPAO0	FW_TPAO0:G:L:S:0 MIL:5 MIL	500.0000	110 OHM SPACING	
	FW_TPAO0P	FW_TPAO0	FW_TPAO0:G:L:S:0 MIL:5 MIL	500.0000	110 OHM SPACING	
	FW_TPA1N	FW_TPA1	FW_TPA1:G:L:S:0 MIL:4%	500.0000	110 OHM SPACING	
	FW_TPA1P	FW_TPA1	FW_TPA1:G:L:S:0 MIL:4%	500.0000	110 OHM SPACING	
	FW_TPB1N	FW_TPB1	FW_TPB1:G:L:S:0 MIL:4%	500.0000	110 OHM SPACING	
	FW_TPB1P	FW_TPB1	FW_TPB1:G:L:S:0 MIL:4%	500.0000	110 OHM SPACING	
	FW_TPI1N	FW_TPI1	FW_TPI1:G:L:S:0 MIL:4%	500.0000	110 OHM SPACING	
	FW_TPI1P	FW_TPI1	FW_TPI1:G:L:S:0 MIL:4%	500.0000	110 OHM SPACING	
	FW_TPO1N	FW_TPO1	FW_TPO1:G:L:S:0 MIL:4%	500.0000	110 OHM SPACING	
	FW_TPO1P	FW_TPO1	FW_TPO1:G:L:S:0 MIL:4%	500.0000	110 OHM SPACING	
ETHERNET Zo = 100	MDI_P<0>	ENET_MDI0	ENET_MDI0:G:U43.29:J23.1:0 MIL:100 MIL		ENET 11 MIL SPACING	
	MDI_M<0>	ENET_MDI0	ENET_MDI0:G:U43.31:J23.2:0 MIL:100 MIL		ENET 11 MIL SPACING	
	MDI_P<1>	ENET_MDI1	ENET_MDI1:G:U43.33:J23.3:0 MIL:100 MIL		ENET 11 MIL SPACING	
	MDI_M<1>	ENET_MDI1	ENET_MDI1:G:U43.34:J23.4:0 MIL:100 MIL		ENET 11 MIL SPACING	
	MDI_P<2>	ENET_MDI2	ENET_MDI2:G:U43.39:J23.7:0 MIL:100 MIL		ENET 11 MIL SPACING	
	MDI_M<2>	ENET_MDI2	ENET_MDI2:G:U43.41:J23.8:0 MIL:100 MIL		ENET 11 MIL SPACING	
	MDI_P<3>	ENET_MDI3	ENET_MDI3:G:U43.42:J23.9:0 MIL:100 MIL		ENET 11 MIL SPACING	
	MDI_M<3>	ENET_MDI3	ENET_MDI3:G:U43.43:J23.10:0 MIL:100 MIL		ENET 11 MIL SPACING	
LVDS Zo = 100 LOWER	CLKLVDS_LN	CLKLVDS_L	LVDS:G:L:S:0 MIL:110 MIL	500.0000	100 OHM SPACING	4
	CLKLVDS_LP	CLKLVDS_L	LVDS:G:L:S:0 MIL:110 MIL	500.0000	100 OHM SPACING	4
	LVDS_L0N	LVDS_L0	LVDS:G:L:S:0 MIL:110 MIL	500.0000	100 OHM SPACING	
	LVDS_L0P	LVDS_L0	LVDS:G:L:S:0 MIL:110 MIL	500.0000	100 OHM SPACING	
	LVDS_L1N	LVDS_L1	LVDS:G:L:S:0 MIL:110 MIL	500.0000	100 OHM SPACING	
	LVDS_L1P	LVDS_L1	LVDS:G:L:S:0 MIL:110 MIL	500.0000	100 OHM SPACING	
	LVDS_L2N	LVDS_L2	LVDS:G:L:S:0 MIL:110 MIL	500.0000	100 OHM SPACING	
	LVDS_L2P	LVDS_L2	LVDS:G:L:S:0 MIL:110 MIL	500.0000	100 OHM SPACING	
UPPER	CLKLVDS_UN	CLKLVDS_U	LVDS:G:L:S:0 MIL:110 MIL	500.0000	100 OHM SPACING	4
	CLKLVDS_UP	CLKLVDS_U	LVDS:G:L:S:0 MIL:110 MIL	500.0000	100 OHM SPACING	4
	LVDS_U0N	LVDS_U0	LVDS:G:L:S:0 MIL:110 MIL	500.0000	100 OHM SPACING	
	LVDS_U0P	LVDS_U0	LVDS:G:L:S:0 MIL:110 MIL	500.0000	100 OHM SPACING	
	LVDS_U1N	LVDS_U1	LVDS:G:L:S:0 MIL:110 MIL	500.0000	100 OHM SPACING	
	LVDS_U1P	LVDS_U1	LVDS:G:L:S:0 MIL:110 MIL	500.0000	100 OHM SPACING	
	LVDS_U2N	LVDS_U2	LVDS:G:L:S:0 MIL:110 MIL	500.0000	100 OHM SPACING	
	LVDS_U2P	LVDS_U2	LVDS:G:L:S:0 MIL:110 MIL	500.0000	100 OHM SPACING	
TMDS Zo = 100	TMDS_CLKN	CLKTMDS	TMDS:G:L:S:0 MIL:50 MIL	500.0000	100 OHM SPACING	5
	TMDS_CLKP	CLKTMDS	TMDS:G:L:S:0 MIL:50 MIL	500.0000	100 OHM SPACING	5
	TMDS_DN<0>	TMDS_D0		500.0000	100 OHM SPACING	8
	TMDS_DP<0>	TMDS_D0		500.0000	100 OHM SPACING	8
	TMDS_DN<1>	TMDS_D1		500.0000	100 OHM SPACING	8
	TMDS_DP<1>	TMDS_D1		500.0000	100 OHM SPACING	8
	TMDS_DN<2>	TMDS_D2		500.0000	100 OHM SPACING	8
	TMDS_DP<2>	TMDS_D2		500.0000	100 OHM SPACING	8
	ATI_TMDS_CLKN	ATI_CLKTMDS	ATITMDS:G:L:S:0 MIL:50 MIL	200.0000	100 OHM SPACING	5
	ATI_TMDS_CLKP	ATI_CLKTMDS	ATITMDS:G:L:S:0 MIL:50 MIL	200.0000	100 OHM SPACING	5
	ATI_TMDS_DN<0>	ATI_TMDS_D0		200.0000	100 OHM SPACING	8
	ATI_TMDS_DP<0>	ATI_TMDS_D0		200.0000	100 OHM SPACING	8
	ATI_TMDS_DN<1>	ATI_TMDS_D1		200.0000	100 OHM SPACING	8
	ATI_TMDS_DP<1>	ATI_TMDS_D1		200.0000	100 OHM SPACING	8
	ATI_TMDS_DN<2>	ATI_TMDS_D2		500.0000	100 OHM SPACING	8
	ATI_TMDS_DP<2>	ATI_TMDS_D2		500.0000	100 OHM SPACING	8
USB 1.1 Zo = 90	USB_DEM	USB_DE	USB_DE:G:L:S:0 MIL:200 MIL		5.6 MIL SPACING	
	USB_DEP	USB_DE	USB_DE:G:L:S:0 MIL:200 MIL		5.6 MIL SPACING	
	USB_DFM	USB_DF	USB_DF:G:L:S:0 MIL:200 MIL		5.6 MIL SPACING	
	USB_DFP	USB_DF	USB_DF:G:L:S:0 MIL:200 MIL		5.6 MIL SPACING	
	BT_USB_DM	BT_USB_D	BT_USB:G:L:S:0 MIL:200 MIL		5.6 MIL SPACING	
	BT_USB_DP	BT_USB_D	BT_USB:G:L:S:0 MIL:200 MIL		5.6 MIL SPACING	
	USB_TPAD_N	USB_TPAD_N	TPAD_USB:G:L:S:0 MIL:200 MIL		5.6 MIL SPACING	
	USB_TPAD_P	USB_TPAD_P	TPAD_USB:G:L:S:0 MIL:200 MIL		5.6 MIL SPACING	
USB 2.0 Zo = 90	NEC_USB_DAM	USB_D1	USB_D1:G:L:S:0 MIL:20 MIL	500.0000	90 OHM SPACING	
	NEC_USB_DAP	USB_D1	USB_D1:G:L:S:0 MIL:20 MIL	500.0000	90 OHM SPACING	
	NEC_USB_DBM	USB_D2	USB_D2:G:L:S:0 MIL:20 MIL	500.0000	90 OHM SPACING	
	NEC_USB_DBP	USB_D2	USB_D2:G:L:S:0 MIL:20 MIL	500.0000	90 OHM SPACING	
THERMOSTAT	THERM1_DM		THERM1:G:L:S:0 MIL:100 MIL			
	THERM1_DP		THERM1:G:L:S:0 MIL:100 MIL			
	THERM2_DM		THERM2:G:L:S:0 MIL:100 MIL			
	THERM2_DP		THERM2:G:L:S:0 MIL:100 MIL			
	1772_CSSN					
	1772_CSSP					
	1772_CSIN					
	1772_CSIP					
	3V_SNSM					
	3V_SNSP					
	5V_SNSM					
	5V_SNSP					
	THERM1_M_DM					
	THERM1_M_DP					
	THERM2_M_DM					
	THERM2_M_DP					
	THERM1_A_DM					
	THERM1_A_DP					
	THERM2_A_DM					
	THERM2_A_DP					

REMOVE CONSTRAIN TO AVOID DRC OCCUR

PRIORITY: 3
PRIMARY LAYERS: 4,7 FOR CONTROLLED IMPEDANCE DIFF PAIRS
SECONDARY LAYERS: 2,9 FOR UNCONTROLLED IMPEDANCE DIFF PAIRS

LAYERS 4 OR 7
Er = 4.3 (DIELECTRIC CONSTANT)
W = 3MIL (TRACE WIDTH)
S = 11MIL (TRACE SEPERATION)
H = 16.8MIL (DIST BETW PLANES)
T = 0.6MIL (TRACE THICKNESS)

Zo(diff) = 106.2 OHMS
Zo(single) = 55.4 OHMS

Clear adjacent power plane!
Zo will be lower due to asymmetric stackup.

LAYERS 4 OR 7
Er = 4.3 (DIELECTRIC CONSTANT)
W = 3.1MIL (TRACE WIDTH)
S = 4.9MIL (TRACE SEPERATION)
H = 9.6MIL (DIST BETW PLANES)
T = 0.6MIL (TRACE THICKNESS)

Zo(diff) = 94 OHMS
Zo(single) = 50 OHMS

LAYERS 4 OR 7
Er = 4.3 (DIELECTRIC CONSTANT)
W = 3.9MIL (TRACE WIDTH)
S = 5.6MIL (TRACE SEPERATION)
H = 9.6MIL (DIST BETW PLANES)
T = 0.6MIL (TRACE THICKNESS)

Zo(diff) = 89.8 OHMS
Zo(single) = 46.6 OHMS

LAYERS 2 OR 9

SIGNAL CONSTRAINTS - PAGE 2

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SIZE	DRAWING NUMBER	REV.
D	051-6680	E
SCALE: NONE	SHT 39 OF 46	

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POWER NET CONSTRAINTS

GROUP	SIG_NAME	VOLTAGE	MIN_LINE_WIDTH	MIN_NECK_WIDTH	
MAIN/SLEEP	+24V_PBUS	VOLTAGE=24V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	41
	+BATT	VOLTAGE=12.8V	MIN_LINE_WIDTH=10MIL	MIN_NECK_WIDTH=25MIL	
	+PBUS	VOLTAGE=12.8V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	41
	+5V_MAIN	VOLTAGE=5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	41
	+5V_SLEEP	VOLTAGE=5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	41
	+3V_MAIN	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	24 41
	+3V_SLEEP	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=6	41
	+3V_PMU	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	41
	+2_5V_MAIN	VOLTAGE=2.5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	41
	+2_5V_SLEEP	VOLTAGE=2.5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	
	+1_8V_MAIN	VOLTAGE=1.8V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=6	41
	+1_8V_SLEEP	VOLTAGE=1.8V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	
	+1_5V_MAIN	VOLTAGE=1.5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	
	+1_5V_SLEEP	VOLTAGE=1.5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	
	+1_5V_LDO	VOLTAGE=1.5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	
	+1_5V_SLEEP_VIN	VOLTAGE=1.5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	
ADAPTER	+ADAPTER	VOLTAGE=24V	MIN_LINE_WIDTH=50	MIN_NECK_WIDTH=10	32 33 41
	I496 +ADAPTER_SW	VOLTAGE=24V	MIN_LINE_WIDTH=50	MIN_NECK_WIDTH=10	32 40
	+ADAPTER_SW	VOLTAGE=24V	MIN_LINE_WIDTH=50	MIN_NECK_WIDTH=10	32 40
	+ADAPTER_SENSE	VOLTAGE=24V	MIN_LINE_WIDTH=50	MIN_NECK_WIDTH=10	32
BATTERY CHARGER	+BATT_POS	VOLTAGE=16.8V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	32 41
	BATT_NEG	VOLTAGE=0V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	32 41
	1772_DCIN	VOLTAGE=24V	MIN_LINE_WIDTH=10		32
	1772_LX	VOLTAGE=12.6V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	32
	+BATT_14V_FUSE	VOLTAGE=12.6V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	32
	+BATT_24V_FUSE	VOLTAGE=12.6V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	32
	+BATT_RSNS	VOLTAGE=12.6V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	32
	+BATT_VSNS	VOLTAGE=12.6V	MIN_LINE_WIDTH=10	MIN_NECK_WIDTH=10	32
	1772_LDO	VOLTAGE=5.4V	MIN_LINE_WIDTH=10		32
	1772_DLOV	VOLTAGE=5.4V	MIN_LINE_WIDTH=10		32
	1772_GND	VOLTAGE=0V	MIN_LINE_WIDTH=10		32
PMU	+ADAPTER_ILIM	VOLTAGE=24V	MIN_LINE_WIDTH=10		33
	+ADAPTER_OR_BATT	VOLTAGE=24V	MIN_LINE_WIDTH=10		33
	+4_85V_RAW	VOLTAGE=4.85V	MIN_LINE_WIDTH=10		31 33
	+4_6V_BU	VOLTAGE=4.6V	MIN_LINE_WIDTH=10		33 34
	+4_85V_ESR	VOLTAGE=4.85V	MIN_LINE_WIDTH=10		33
	+3V_PMU_ESR	VOLTAGE=3.3V	MIN_LINE_WIDTH=10		33
	+3V_PMU_AVCC	VOLTAGE=3.3V	MIN_LINE_WIDTH=10		27 31
MISC HD	+5V_HD_SLEEP	VOLTAGE=5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	26 34
	+HD_LOGIC_SLEEP	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	26
TRACKPAD	+5V_TPAD_SLEEP	VOLTAGE=5V	MIN_LINE_WIDTH=10		41
HALL EFFECT	+3V_HALL_EFFECT	VOLTAGE=3.3V	MIN_LINE_WIDTH=10		24 41
VIDEO	+14V_INV	VOLTAGE=14V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	23 41
	+5V_INV_UF_SW	VOLTAGE=5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	23
	+5V_INV_SW	VOLTAGE=5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	23 41
	+5V_DDC_SLEEP	VOLTAGE=5V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	23 41
	+5V_DDC_SLEEP_UF	VOLTAGE=5V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	23
	+3V_LCD	VOLTAGE=3.3V	MIN_LINE_WIDTH=12	MIN_NECK_WIDTH=10	23 41
	+3V_LCD_SW	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	23
	GPU_TV_GND1	VOLTAGE=0V	MIN_LINE_WIDTH=25		23
	GPU_TV_GND2	VOLTAGE=0V	MIN_LINE_WIDTH=25		23
	TV_GND1	VOLTAGE=0V	MIN_LINE_WIDTH=25		23 41
	TV_GND2	VOLTAGE=0V	MIN_LINE_WIDTH=25		23 41
AUDIO	I435 +5V_MAIN_AUD	VOLTAGE=5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	27 34
	I435 +3V_MAIN_AUD	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	27 34
	I435 AUD_GND	VOLTAGE=0V	MIN_LINE_WIDTH=50		27
FAN	I438 +FAN_PWR	VOLTAGE=5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	27 41
	FAN1_GND	VOLTAGE=0V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	41
	FAN2_GND	VOLTAGE=0V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	41

I/O AREA
INVERTER
TRACKPAD
LVDS

CHGND1	VOLTAGE=0V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=6	IN
CHGND2	VOLTAGE=0V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=12	IN
CHGND3	VOLTAGE=0V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=12	IN
CHGND4	VOLTAGE=0V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=12	IN

ENET_CTAP_CHGND VOLTAGE=0V MIN_LINE_WIDTH=25 MIN_NECK_WIDTH=12

GROUP	SIG_NAME	VOLTAGE	MIN_LINE_WIDTH	MIN_NECK_WIDTH	
CPU	CPU_VCORE_SLEEP	VOLTAGE=1.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	5 6 35 41
	CPU_AVDD	VOLTAGE=1.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	5
	MAXBUS_SLEEP	VOLTAGE=1.8V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	5 6 7 8 15 16 35
	I486 CPU_AVDD_VIN	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	5
	I486 CPU_AVDD_VOUT	VOLTAGE=1.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	5
DDR RAM	DDR_VREF	VOLTAGE=1.25V	MIN_LINE_WIDTH=10		11
INTREPID	I434 +2_5V_INTREPID	VOLTAGE=2.5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	9 10 15 16
	+3V_INTREPID_USB	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	14
PLLS	+1_5V_INTREPID_PLL	VOLTAGE=1.5V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	8 12 14
	+1_5V_INTREPID_PLL1	VOLTAGE=1.5V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=6	14
	+1_5V_INTREPID_PLL2	VOLTAGE=1.5V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=6	14
	+1_5V_INTREPID_PLL3	VOLTAGE=1.5V	MIN_LINE_WIDTH=10	MIN_NECK_WIDTH=6	14
	+1_5V_INTREPID_PLL4	VOLTAGE=1.5V	MIN_LINE_WIDTH=10	MIN_NECK_WIDTH=6	14
	+1_5V_INTREPID_PLL5	VOLTAGE=1.5V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=6	12
	+1_5V_INTREPID_PLL6	VOLTAGE=1.5V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=6	12
	+1_5V_INTREPID_PLL7	VOLTAGE=1.5V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=6	8
	+1_5V_INTREPID_PLL8	VOLTAGE=1.5V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=6	14
REFERENCE	INT_MEM_VREF	VOLTAGE=1.25V	MIN_LINE_WIDTH=10		9
	INT_AGP_VREF	VOLTAGE=1.25V	MIN_LINE_WIDTH=10		12 19
	INT_MEM_REF_H	VOLTAGE=0V	MIN_LINE_WIDTH=10		9
	VIDE_REF	VOLTAGE=0V	MIN_LINE_WIDTH=8		13
AIRPORT	+3V_AIRPORT	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	41
CARDBUS	I486 +3V_SLEEP_PCCARD	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	18
	+VCC_CBUS_SW	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	18
	+VPP_CBUS_SW	VOLTAGE=5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	18
ATI M11	GPU_VCORE	VOLTAGE=1.2V	MIN_LINE_WIDTH=30	MIN_NECK_WIDTH=10	19 21 41
	+3V_GPU	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	12 19 21 22
	+3V_GPU_FLT	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	22
	+2_5V_GPU	VOLTAGE=2.5V	MIN_LINE_WIDTH=30	MIN_NECK_WIDTH=10	22
	GPU_MEM_IO	VOLTAGE=2.5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	19 22
	GPU_MEM_IO_FLT	VOLTAGE=2.5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	22
	+2_5V_GPU_MEMCORE	VOLTAGE=2.5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	22
	+1_8V_GPU	VOLTAGE=1.8V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	19 20 21 22
	+1_5V_AGP	VOLTAGE=1.5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	12 15 16 19 21 22
	+2_5V_GPU_PNLIO	VOLTAGE=2.5V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	22
	+1_8V_ATI_PVDD	VOLTAGE=1.8V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	21 22
	+1_5V_AGP_GPU	VOLTAGE=1.5V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	22
	+1_5V_GPU_VDD15	VOLTAGE=1.5V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	21
	+1_8V_GPU_PLL	VOLTAGE=1.8V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	22
	+1_8V_GPU_VDDDI	VOLTAGE=1.8V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	22
	GPU_VCORE_VDDCI	VOLTAGE=1.2V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	19
	+2_5V_GPU_A2VDD	VOLTAGE=2.5V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	22
	+1_8V_GPU_AVDD	VOLTAGE=1.8V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	22
	+1_8V_GPU_PNLPLL	VOLTAGE=1.8V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	22
	+1_8V_GPU_PNLIO	VOLTAGE=1.8V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	22
	+2_5V_GPU_MCLK	VOLTAGE=2.5V	MIN_LINE_WIDTH=10	MIN_NECK_WIDTH=10	22
	+1_8V_GPU_AVDDQ	VOLTAGE=1.8V	MIN_LINE_WIDTH=10	MIN_NECK_WIDTH=10	22
	+1_8V_GPU_MEMPLL	VOLTAGE=1.8V	MIN_LINE_WIDTH=10	MIN_NECK_WIDTH=10	22
	+3V_ATI_OSC_SLEEP	VOLTAGE=3.3V	MIN_LINE_WIDTH=10	MIN_NECK_WIDTH=10	19
	+3V_ATI_SS	VOLTAGE=3.3V	MIN_LINE_WIDTH=10	MIN_NECK_WIDTH=10	19
	I446 +GPU_VDD15_UF	VOLTAGE=1.5V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	21
	I434 +2_5V_SLEEP_NECK1	VOLTAGE=2.5V	MIN_LINE_WIDTH=10		21
	I446 +3V_SLEEP_NECK	VOLTAGE=3V	MIN_LINE_WIDTH=10		36
	I446 +1_5V_AGP_NECK	VOLTAGE=1.5V	MIN_LINE_WIDTH=10		21
	I456 +1_8V_PVDD_NECK	VOLTAGE=1.8V	MIN_LINE_WIDTH=10		21
	I456 GPU_VCORE_NECK	VOLTAGE=1.2V	MIN_LINE_WIDTH=10		21
	I456 +GPU_VDD15_NECK	VOLTAGE=1.5V	MIN_LINE_WIDTH=10		21
	I456 +2_5V_SLEEP_NECK2	VOLTAGE=2.5V	MIN_LINE_WIDTH=10		36
	I456 +1_8V_SLEEP_NECK	VOLTAGE=1.8V	MIN_LINE_WIDTH=10		36
	I456 +1_5V_SLEEP_NECK	VOLTAGE=1.5V	MIN_LINE_WIDTH=10		36
	I466 +1_8V_ATI_TPVDD	VOLTAGE=1.8V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	22
	I464 +1_8V_GPU_TP_PLL	VOLTAGE=1.8V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	22
ETHERNET 88E1111 NEC USB2.0	+2_5V_MARVELL	VOLTAGE=2.5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	28
	+2_5V_MARVELL_AVDD	VOLTAGE=2.5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	28
	+1_0V_MARVELL	VOLTAGE=1.0V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	28
	LTC3405_SW	VOLTAGE=1.0V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	28
	I431 +3V_NEC_VDD	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	17
	I431 NEC_AVDD	VOLTAGE=3.3V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	17
FW	I432 LM2594_IN	VOLTAGE=33V	MIN_LINE_WIDTH=40	MIN_NECK_WIDTH=12	29
	I414 +FW_PBUS	VOLTAGE=12.8V	MIN_LINE_WIDTH=100	MIN_NECK_WIDTH=12	30
	+FW_SW	VOLTAGE=12.8V	MIN_LINE_WIDTH=100	MIN_NECK_WIDTH=12	30
	I446 +FW_AMP_SENSE	VOLTAGE=12.8V	MIN_LINE_WIDTH=100	MIN_NECK_WIDTH=12	
	+FW_PWR_OR	VOLTAGE=33V	MIN_LINE_WIDTH=100	MIN_NECK_WIDTH=12	29 30
	I416 +FW_PWR1	VOLTAGE=33V	MIN_LINE_WIDTH=100	MIN_NECK_WIDTH=12	30
	+FW_VP0	VOLTAGE=33V	MIN_LINE_WIDTH=100	MIN_NECK_WIDTH=12	30 41
	+FW_VP1	VOLTAGE=33V	MIN_LINE_WIDTH=100	MIN_NECK_WIDTH=12	30 41
	+3V_FW	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	29 30
	+3V_FW_UF	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	29
	+3V_FW_AVDD_PORT2	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	29
	+3V_FW_AVDD_PORT1	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	29
	+3V_FW_AVDD_PORT0	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	29
	+3V_FW_AVDD	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	29
	+1_95V_FW_DVDD	VOLTAGE=1.95V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	29
	+1_95V_FW_DVDD_RX0	VOLTAGE=1.95V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	29
	+1_95V_FW_DVDD_TX0	VOLTAGE=1.95V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	29
	+1_95V_FW_DVDD_PORT1	VOLTAGE=1.95V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	29
	+1_95V_FW_PLLVDD	VOLTAGE=1.95V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	29
	+1_95V_FW_PLL400VDD	VOLTAGE=1.95V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	29
	+1_95V_FW_PLL500VDD	VOLTAGE=1.95V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	29
	FW_VGND0	VOLTAGE=0V	MIN_LINE_WIDTH=100	MIN_NECK_WIDTH=12	30
	I416 FW_VGND1	VOLTAGE=0V	MIN_LINE_WIDTH=100	MIN_NECK_WIDTH=12	30
	I456 FW_VDD_ON	VOLTAGE=12.8V	MIN_LINE_WIDTH=100	MIN_NECK_WIDTH=12	

GROUP	SIG_NAME	VOLTAGE	MIN_LINE_WIDTH	MIN_NECK_WIDTH	
LTC1625 14V SWITCHER	1625_VIN	VOLTAGE=24V	MIN_LINE_WIDTH=10		33
	1625_VSW	VOLTAGE=14V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	33
	+PBUS_JUMPER	VOLTAGE=14V	MIN_LINE_WIDTH=10		33
	1625_EXTVCC	VOLTAGE=5V	MIN_LINE_WIDTH=10		33
	1625_INTVCC	VOLTAGE=5V	MIN_LINE_WIDTH=10		33
	1625_SGND	VOLTAGE=0V	MIN_LINE_WIDTH=10		33
	1V20_REF	VOLTAGE=1.2V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	32 33
LTC3707 5V SWITCHER	3707_INTVCC	VOLTAGE=5V	MIN_LINE_WIDTH=10	MIN_NECK_WIDTH=10	34
	5V_SW	VOLTAGE=5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	34
	5V_RSNS	VOLTAGE=5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	34
	+5V_MAIN_JUMPER	VOLTAGE=5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	34
3V SWITCHER	3V_SW	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	34
	3V_RSNS	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	34
	+3V_MAIN_JUMPER	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	34
	3707_SGND	VOLTAGE=0V	MIN_LINE_WIDTH=10		34
MAX1715 2.5V SWITCHER	2_5V_LX	VOLTAGE=2.5V	MIN_LINE_WIDTH=50	MIN_NECK_WIDTH=10	36
	2_5V_LX_F	VOLTAGE=2.5V	MIN_LINE_WIDTH=50	MIN_NECK_WIDTH=10	36
	2_5V_BST	VOLTAGE=5V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	36
	2_5V_BOOST	VOLTAGE=5V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	36
	2_5V_DH	VOLTAGE=2.5V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	36
	2_5V_DL	VOLTAGE=2.5V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	36
1.65V SWITCHER	1_5V_FB	VOLTAGE=1.5V	MIN_LINE_WIDTH=8		36
	1_5V_LX	VOLTAGE=1.5V	MIN_LINE_WIDTH=50	MIN_NECK_WIDTH=10	36
	1_5V_LX_F	VOLTAGE=1.5V	MIN_LINE_WIDTH=50	MIN_NECK_WIDTH=10	36
	1_5V_BST	VOLTAGE=5V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	36
	1_5V_BOOST	VOLTAGE=5V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	36
	1_5V_DH	VOLTAGE=1.5V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	36
	1_5V_DL	VOLTAGE=1.5V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	36
CONTROL	1_5V_ILIM		MIN_LINE_WIDTH=8		36
	2_5V_ILIM		MIN_LINE_WIDTH=8		36
	MAX1715_TON		MIN_LINE_WIDTH=8		36
	MAX1715_SKIP		MIN_LINE_WIDTH=8		36
	MAX1715_REF	VOLTAGE=2.0V	MIN_LINE_WIDTH=8		36
	MAX1715_VCC	VOLTAGE=5V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	36
	MAX1715_GND	VOLTAGE=0V	MIN_LINE_WIDTH=30	MIN_NECK_WIDTH=10	36
	VCORE_VCC	VOLTAGE=5V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	35
MAX1717	VCORE_LX	VOLTAGE=1.4V	MIN_LINE_WIDTH=200	MIN_NECK_WIDTH=10	35
	VCORE_DH		MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	35
	VCORE_DL		MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	35
	VCORE_BOOST	VOLTAGE=5V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	35
	VCORE_BST	VOLTAGE=5V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	35
	VCORE_ILIM		MIN_LINE_WIDTH=8		35
	VCORE_REF		MIN_LINE_WIDTH=8		35
	VCORE_TON	VOLTAGE=5V	MIN_LINE_WIDTH=8		35
	VCORE_CC		MIN_LINE_WIDTH=8		35
	VCORE_FB	VOLTAGE=1.4V	MIN_LINE_WIDTH=8		35 41
	VCORE_TIME		MIN_LINE_WIDTH=8		35
	VCORE_VGATE		MIN_LINE_WIDTH=8		14 35
	VCORE_GND	VOLTAGE=0V	MIN_LINE_WIDTH=30		35
	VCORE_GNDSNS	VOLTAGE=0V	MIN_LINE_WIDTH=8		35
	VCORE_SNS	VOLTAGE=1.4V	MIN_LINE_WIDTH=8		35
	VCORE_GNDDIV	VOLTAGE=0V	MIN_LINE_WIDTH=8		35
	I434 VCORE_GNDA	VOLTAGE=0V	MIN_LINE_WIDTH=10		35
LTC1778	1778_VIN	VOLTAGE=14V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	21
	1778_VCC	VOLTAGE=5V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	21
	1778_GND	VOLTAGE=0V	MIN_LINE_WIDTH=30	MIN_NECK_WIDTH=10	21
	1778_BST	VOLTAGE=5V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	21
	1778_BST_RC	VOLTAGE=5V	MIN_LINE_WIDTH=15	MIN_NECK_WIDTH=10	21
	1778_TG		MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	21
	1778_BG		MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	21
	GPU_VCORE_SW	VOLTAGE=1.2V	MIN_LINE_WIDTH=50	MIN_NECK_WIDTH=10	21
	GPU_VCORE_SW_F	VOLTAGE=1.2V	MIN_LINE_WIDTH=50	MIN_NECK_WIDTH=10	21
	1778_ION		MIN_LINE_WIDTH=8		21
	1778_ITH		MIN_LINE_WIDTH=8		21
	1778_ITH_RC		MIN_LINE_WIDTH=8		21
	1778_VFB		MIN_LINE_WIDTH=8		21 41
	1778_FCB		MIN_LINE_WIDTH=8		21
	1778_VRNG		MIN_LINE_WIDTH=8		21
LTC3411	LTC3411_VCC	VOLTAGE=3.3V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	36
	LTC3411_GND	VOLTAGE=0V	MIN_LINE_WIDTH=30	MIN_NECK_WIDTH=10	36
	1_8V_SW	VOLTAGE=1.8V	MIN_LINE_WIDTH=30	MIN_NECK_WIDTH=10	36
	1_8V_SW_F	VOLTAGE=1.8V	MIN_LINE_WIDTH=30	MIN_NECK_WIDTH=10	36
	1_8V_VFB		MIN_LINE_WIDTH=8		36
	LTC3411_ITH_RC		MIN_LINE_WIDTH=8		36
	LTC3411_ITH		MIN_LINE_WIDTH=8		36
	LTC3411_SYNC		MIN_LINE_WIDTH=8		36
	LTC3411_SHDN		MIN_LINE_WIDTH=8		36
LTC1962 INT PLLS	LTC1962_INT_VIN		MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10	14
CY28512D LMU CONN	I436 +3V_MAIN_SSCG	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	
	I436 +3V_MAIN_LMU	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	24
OPT DRIVER	I436 +5V_SLEEP_OPT	VOLTAGE=5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10	26

SIGNAL CONSTRAINTS - PAGE 3

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SCALE: NONE	SHT: 40 OF 46	

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FUNCTIONAL TEST POINTS

PROBES ARE ON BOTTOM SIDE. MINIMUM PAD/HOLE SIZE IS 25 MIL.
FUNC_TEST IS ONLY PROPERTY USED BY THE TOOLS. FUNC_QTY IS FOR REFERENCE AND LISTS THE NUMBER OF TEST POINTS ON THAT NET AND WITHIN THAT GROUP/CONNECTOR.
FUNC_DIST IS SIMILARLY USED TO DEFINE MAXIMUM DISTANCE FROM A CONNECTOR.

GROUP	SIG_NAME	FUNC_TEST	FUNC_QTY	FUNC_DIST	
SCAN/TEST	JTAG_ASIC_TMS	TRUE			13 28
	JTAG_ASIC_TDI	TRUE			13
	JTAG_ASIC_TDO_TP	TRUE			28
	JTAG_ASIC_TCK	TRUE			13 28
	JTAG_ASIC_TRST_L	TRUE			13 28
	CPU_CHKSTP_OUT_L	TRUE			5
	CPU_SRESET_L	TRUE			5
	CPU_HRESET_L	TRUE			5 6 7
	JTAG_CPU_TMS	TRUE			5 6
	JTAG_CPU_TDI	TRUE			5 6
	JTAG_CPU_TDO_TP	TRUE			5
	JTAG_CPU_TCK	TRUE			5 6
	JTAG_CPU_TRST_L	TRUE			5 6
	INT_JTAG_TEI	TRUE			13
	INT_TST_MONIN_PD	TRUE			13
	INT_TST_MONOUT_TP	TRUE			13
	INT_TST_PLLEN_PD	TRUE			13
INT I2C	INT_I2C_CLK0	TRUE			6 11 13 24
	INT_I2C_DATA0	TRUE			6 11 13 24
	INT_I2C_CLK1	TRUE			13 14 24 25 27
	INT_I2C_DATA1	TRUE			13 14 24 25 27
PWR/GND	+PBUS	TRUE			40
	+24V_PBUS	TRUE			40
	GPU_VCORE	TRUE			19 21 40
	1778_VFB	TRUE			21 40
	CPU_VCORE_SLEEP	TRUE			5 6 35 40
	VCORE_FB	TRUE			35 40
	+1_8V_MAIN	TRUE			40
	+2_5V_MAIN	TRUE			40
	+5V_MAIN	TRUE	2		40 41
	+5V_SLEEP	TRUE	2		40 41
	+3V_MAIN	TRUE	4		24 40
		TRUE		1000	IN
	+3V_PMU	TRUE			40
CARDBUS DVI	CBUS_DET_1_L	TRUE		2000	18
	CBUS_DET_2_L	TRUE		2000	18
	TMDS_CONN_CLKN	TRUE		1000	23 38
	TMDS_CONN_CLKP	TRUE		1000	23 38
	VGA_R	TRUE		1000	23
	VGA_G	TRUE		1000	23
	VGA_B	TRUE		1000	23
	VGA_HSYNC	TRUE		1000	23
	VGA_VSYNC	TRUE		1000	23
	DVI_DDC_CLK_UF	TRUE		1000	23
	DVI_DDC_DATA_UF	TRUE		1000	23
	DVI_HPD_UF	TRUE		1000	23
	+5V_DDC_SLEEP	TRUE		2000	23 40
		TRUE	2	2000	IN
CHGND1		TRUE	6	1000	IN
LVDS	LVDS_L0N			1000	21 23 39
	LVDS_L0P			1000	21 23 39
	LVDS_L1N			1000	21 23 39
	LVDS_L1P			1000	21 23 39
	LVDS_L2N			1000	21 23 39
	LVDS_L2P			1000	21 23 39
	CLKLVDS_LN	TRUE		1000	21 23 39
	CLKLVDS_LP	TRUE		1000	21 23 39
	LVDS_DDC_CLK	TRUE		1000	21 23
	LVDS_DDC_DATA	TRUE		1000	21 23
	+3V_LCD	TRUE	2	2000	23 40
	+3V_SLEEP	TRUE		2000	40 41
		TRUE	2	2000	IN
CHGND4		TRUE	6	1000	IN
INVERTER	+14V_INV	TRUE		2000	23 40
	+5V_INV_SW	TRUE		2000	23 40
	BRIGHT_PWM	TRUE		2000	23
	INV_GND	TRUE		2000	23
		TRUE		1000	IN
S-VIDEO	TV_C	TRUE		2000	23
	TV_Y	TRUE		2000	23
	TV_COMP	TRUE		2000	23
	TV_GND1	TRUE		2000	23 40
	TV_GND2	TRUE		2000	23 40
LIO	INT_I2S0_SND_TO_DAC	TRUE		1000	14 27
	INT_I2S0_SND_LRCLK	TRUE		1000	14 27
	INT_I2S0_SND_MCLK	TRUE		1000	14 27 37
	INT_I2S0_SND_SCLK	TRUE		1000	14 27
	INT_I2S0_SND_FROM_ADC	TRUE		1000	14 27
	SND_HP_MUTE_L	TRUE		1000	14 27
	SND_AMP_MUTE	TRUE		1000	27
	SND_HW_RESET_L	TRUE		1000	14 27
	SND_HP_SENSE_L	TRUE		1000	14 27
	SND_LIN_SENSE_L	TRUE		1000	14 27
	INT_I2C_CLK2	TRUE		1000	14 27
	INT_I2C_DATA2	TRUE		1000	14 27
	ADAPTER_DET	TRUE		1000	27 31
	CHARGE_LED_L	TRUE		1000	27 31
	NEC_LUSB_OCI_UF	TRUE		1000	17 27
	NEC_LUSB_PPON	TRUE		1000	17 27
	+5V_MAIN	TRUE	2	2000	40 41
	+5V_SLEEP	TRUE	2	3000	40 41
	+3V_SLEEP	TRUE		2000	40 41

GROUP	SIG_NAME	FUNC_TEST	FUNC_QTY	FUNC_DIST	
USB	NEC_USB_DAM	TRUE			17 27 39
	NEC_USB_DAP	TRUE			17 27 39
	NEC_USB_DBM	TRUE			17 27 39
	NEC_USB_DBP	TRUE			17 27 39
	BT_USB_DM	TRUE			14 27 39
	BT_USB_DP	TRUE			14 27 39
	USB_TPAD_N	TRUE			14 24 39
	USB_TPAD_P	TRUE			14 24 39
RT. USB WIRELESS	NEC_RUSB_PPON	TRUE			17 27
	NEC_RUSB_OCI_UF	TRUE			17 27
	PCI_AD<0..31>	TRUE		1000	9 12 17 18 26 39
	PCI_FRAME_L	TRUE		1000	12 17 18 26 39
	PCI_TRDY_L	TRUE		1000	12 17 18 26 39
	PCI_IRDY_L	TRUE		1000	12 17 18 26 39
	PCI_DEVSEL_L	TRUE		1000	12 17 18 26 39
	PCI_STOP_L	TRUE		1000	12 17 18 26 39
	PCI_PAR	TRUE		1000	12 17 18 26 39
	AIRPORT_PCI_REQ_L	TRUE		1000	12 26
	AIRPORT_PCI_GNT_L	TRUE		1000	12 26
	AIRPORT_PCI_INT_L	TRUE		1000	14 26
	MAIN_RESET_L	TRUE		1000	14 17 18 19 20 26 31
	CLK33M_AIRPORT	TRUE		1000	12 26 37
	PMU_PME_L	TRUE		1000	14 17 26 31
	ROM_ONBOARD_CS_L	TRUE		1000	9
	ROM_OE_L	TRUE		1000	9 12
	ROM_CS_L	TRUE		1000	9 12
	ROM_RW_L	TRUE		1000	9 12
	RF_DISABLE_L	TRUE		1000	26
	AIRPORT_CLKRUN_L	TRUE		1000	26
	+3V_AIRPORT	TRUE	4	2000	40
		TRUE	6	1000	IN
OPTICAL	EIDE_OPTICAL_DATA<0..15>	TRUE		2000	26 39
	EIDE_OPTICAL_DMA_RQ	TRUE		2000	26 39
	EIDE_OPTICAL_READ_L	TRUE		2000	26 39
	EIDE_OPTICAL_DMAACK_L	TRUE		2000	26 39
	EIDE_OPTICAL_ADDR<0..2>	TRUE		2000	26 39
	EIDE_OPTICAL_CS0_L	TRUE		2000	26 39
	EIDE_OPTICAL_CS1_L	TRUE		2000	26 39
	EIDE_OPTICAL_RST_L	TRUE		2000	26 39
	EIDE_OPTICAL_WR_L	TRUE		2000	26 39
	EIDE_OPTICAL_IOCHRDY	TRUE		2000	26 39
	EIDE_OPTICAL_INT	TRUE		2000	26 39
TRACKPAD	+5V_TPAD_SLEEP	TRUE		3000	40
	TPAD_F_TXD	TRUE		3000	
	TPAD_F_RXD	TRUE		3000	
	SOFT_PWR_ON_L	TRUE		3000	23 24 31 35
MODEM/ SERIAL	COMM_RESET_L	TRUE		4000	14 27
	COMM_SHUTDOWN	TRUE		4000	
	COMM_RING_DET_L	TRUE		4000	14 27 31
	COMM_TXD_L	TRUE		4000	14 27
	COMM_TRXC	TRUE		4000	14 27
	COMM_GPIO_L	TRUE		4000	14 27
	COMM_DTR_L	TRUE		4000	14 27
	COMM_RTS_L	TRUE		4000	14 27
	COMM_RXD	TRUE		4000	14 27
KEYBOARD	KBD_ID	TRUE		3000	24 31
	KBD_INTL	TRUE		3000	
	KBD_JIS	TRUE		3000	
	KBD_CAPSLOCK_LED	TRUE		3000	
	KBD_NUMLOCK_LED	TRUE		3000	
	KBD_FUNCTION_L			3000	24 31
	KBD_COMMAND_L			3000	24 31
	KBD_OPTION_L			3000	24 31
	KBD_CONTROL_L			3000	24 31
	KBD_SHIFT_L			3000	24 31
	KBD_X<0..9>			3000	24 31
	KBD_Y<0..7>			3000	
BATTERY	+BATT_POS	TRUE	(100 MIL PROBE PREFERRED)	1000	32 40
	BATT_NEG	TRUE	(100 MIL PROBE PREFERRED)	1000	32 40
	BATT_CLK	TRUE		1000	32
	BATT_DATA	TRUE		1000	32
	PMU_BATT_DET_L	TRUE		1000	31 32
FANS	+FAN_PWR	TRUE		3000	27 40
	FAN1_TACH	TRUE		3000	27
	FAN2_TACH	TRUE		3000	27
	FAN1_GND	TRUE		3000	40
	FAN2_GND	TRUE		3000	40
ETHERNET	MDI_P<0..3>	TRUE		1000	28 39
	MDI_M<0..3>	TRUE		1000	28 39
FIREWIRE	FW_TPO0P	TRUE		1000	29 30 39
	FW_TPO0N	TRUE		1000	29 30 39
	FW_TPO0R	TRUE		1000	30
	FW_TPI0P	TRUE		1000	29 30 39
	FW_TPI0N	TRUE		1000	29 30 39
	+FW_VP0	TRUE		1000	30 40
	FW_VGND	TRUE		1000	41

GROUP	SIG_NAME	FUNC_TEST	FUNC_QTY	FUNC_DIST	
FIREWIRE (CONT.)	FW_TPO1P	TRUE		1000	30 39
	FW_TPO1N	TRUE		1000	30 39
	FW_TPI1P	TRUE		1000	30 39
	FW_TPI1N	TRUE		1000	30 39
	+FW_VP1	TRUE		1000	30 40
	FW_VGND	TRUE		1000	41
DC PWR IN	+ADAPTER	TRUE	3 (100 MIL PROBE PREFERRED)	1000	32 33 40
LMU/ALS	ST7_SLEEP_LED_H	TRUE			24
	PMU_SLEEP_LED	TRUE			24
	PMU_LID_CLOSED_L	TRUE			24 31
	LMU_DETECT	TRUE			24
		TRUE	6	1000	IN
MISC.			(100 MIL PROBE PREFERRED)		
	SLEEP_LED	TRUE			24
	PMU_KB_RESET_L	TRUE			
	SLEEP	TRUE			24 27 31 34 36
	PMU_CPU_HRESET_L	TRUE			6 31
	BB_RESET_L	TRUE			6
	+3V_PMU_RESET	TRUE			31 35
	MMM_ACC_X_AXIS	TRUE			25
	MMM_ACC_Y_AXIS	TRUE			25
	MMM_ACC_Z_AXIS	TRUE			25
	MMM_ACC_SELFTEST	TRUE			25
	+BATT_ISNS_P	TRUE			25
	+PPBATT_ISNS_N	TRUE			25
	+PWR_SUPERCAP	TRUE			33
	REMOVE CONSTRAIN FOR UNUSED FUNCTIONAL TP				
	+3V_HALL_EFFECT				24 40
	LID_CLOSED_L				24
	TMDS_DN<0..2>				20 23 39
	TMDS_DP<0..2>				20 23 39

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APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6680	E
SCALE: NONE	SHT 41 OF 46	

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REVISION HISTORY

EVT2 RELEASE

08/13/04 - 1. CHANGE EXT TMDS SWING RESISTORS TO 510 OHM (R869, R876), REMOVE SI_RESET PULL HIGH
2. CHANGE RGB SIGNAL INPEDENCE (R341, R342, R346, R456, R458, R462)
3. ADD 2 RESISTORS (NO STUFF) BETWEEN FAN_PWM AND FAN_PWM_L OF FAN1 AND FAN2
4. CHANGE 2 CAPS (C233, C803) TO IMPROVE FEEDBACK PROTECTION AND PBUS CURRENT LIMIT CIRCUIT
5. MODIFY CPU_VCORE VID AND CPU_VCORE SETTING

08/16/04 - 1. MODIFY CPU_AVDD SETTING
08/20/04 - 1. ADD TRACKPAD POWER +5V_TPAD CONTROL CIRCUIT
09/01/04 - 1. CHANGE ALL FONTS INTO SMALL ONES
09/02/04 - 1. MODIFT CPU_VCORE VID AND CPU_VCORE SEETING AGAIN
2. MODIFY CPU_AVDD SEETING AGAIN
3. CHANGE INT TMDS DAMPING RESISTERS (R760-R767) TO 0 OHM
09/03/04 - 1. ADD MMM CIRCUIT, ARRANGE 2 INTREPID GPIOS FOR MM_FFIRQ_L, MM_SIRQ_L AND PULL UP RESISTORS R801, R802
2. ADD R803 BETWEEN DP6 AND DCDC_IN
3. ADD R804 AND SUPERCAP C692 ON +4_6V_BU
4. CHANGE TRACKPAD CONNECTOR J10 AND PIN OUT

09/06/04 - 1. ADD EMI SOLUTION L12
09/07/04 - 1. CHANGE TRACKPAD CONNECTOR PIN OUT
09/08/04 - 1. ADD BATTERY CURRENT SENSOR CIRCUIT
09/09/04 - 1. ADD EMI SOLUTION R816; ADD MMM RESET CIRCUIT
09/10/04 - 1. MODIFY FIREWIRE PORT0 POWER CIRCUIT
2. ADD NET FROM BATTERY CURRENT SENSOR CIRCUIT TO PMU
09/13/04 - 1. ADD CURRENT LIMITER R821 BETWEEN PMU(U29) AND U33
2. ADD PULL UP AND PULL DOWN RESISTORS FOR MMM SENSOR

DVT RELEASE

09/27/04 - 1. ADD ST MMM SENSOR CIRCUIT
10/14/04 - 2. ADD FIREWIRE POWER PROTECT CIRCUIT
10/15/04 - 3. CHANGE EXT_TMDS TERMINAL RESISTERS AND V SWINING RESISTOR
10/22/04 - 4. CHANGE FAN CONTROLLER FROM ADT7460 TO ADT7467
11/02/04 - 5. CHANGE BBANG IC TO ATTINY2313

PVT RELEASE

12/17/04 - 1. REMOVE ALL OPEN JUMPER
12/17/04 - 2. SCHEMATIC RELEASE FOR PRODUCTION

PVT RELEASE (REV C)

02/11/05 - 1. CHANGE FW F3 TO 740S0018

PRODUCTION RELEASE (REV D)

04/12/05 - 1. ADD MPU R1.4
2. CHANGE 88E1111 B1(338S0223) TO PRIMARY AND B0 (338S0079) TO SECONDARY

PRODUCTION RELEASE (REV E)

08/24/05 - 1. ADD MPU R1.5 (337S3217 AND 337S3218)
08/25/05 - 1. ADD 341S1792 (BOOTROM,4.9.1F3)

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SCALE NONE | SHT 42 OF 46

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*** Signal Cross-Reference for the entire design ***

+1_0V_MARVELL      28D2< 40B3>
+1_5V_AGP          12B5< 12D1< 12D4< 15D6< 16C8<
                   19C6< 19D6< 21A8< 21B4<> 21D5<>
                   22B8< 22D6< 40C3>
+1_5V_AGP_GPU      22C5< 40C3>
+1_5V_AGP_NECK     21B4<> 40B3>
+1_5V_GPU_VDD15    21D3< 40C3>
+1_5V_INTREPID_PLL  8D6< 12D4< 12D8< 14D6<> 40D3>
+1_5V_INTREPID_PLL1  14C3< 40D3>
+1_5V_INTREPID_PLL2  14D3< 40D3>
+1_5V_INTREPID_PLL3  14D3< 40D3>
+1_5V_INTREPID_PLL4  14D3< 40D3>
+1_5V_INTREPID_PLL5  12D3< 40D3>
+1_5V_INTREPID_PLL6  12D6< 40D3>
+1_5V_INTREPID_PLL7  8D5< 40D3>
+1_5V_INTREPID_PLL8  14D3< 40C3>
+1_5V_LDO          40D6>
+1_5V_MAIN         40D6>
+1_5V_SLEEP        40D6>
+1_5V_SLEEP_NECK   36D2<> 40B3>
+1_5V_SLEEP_VIN    40D6>
+1_8V_ATI_PVDD     21C5<> 22B6< 22B6< 22D6<> 40C3>
+1_8V_ATI_TPVDD    22D2<> 40B3>
+1_8V_GPU          19A8< 20A6< 21D7< 22A2< 22A6<
                   22B1< 22B6< 22C8< 22D6< 22D8< 40C3>
+1_8V_GPU_AVDD     22D5< 40B3>
+1_8V_GPU_AVDDQ    22D4< 22D7< 40B3>
+1_8V_GPU_DVO      22B2<
+1_8V_GPU_MEMPLL   22B5< 40B3>
+1_8V_GPU_PLL      22D5< 40C3>
+1_8V_GPU_PNLIO    22A5< 40B3>
+1_8V_GPU_PNLPLL   22B5< 40B3>
+1_8V_GPU_TP_PLL   22B5< 22D1< 40B3>
+1_8V_GPU_VDDDI    22C7< 22D4< 40C3>
+1_8V_MAIN         40D6> 41C6>
+1_8V_PVDD_NECK    21B5<> 40B3>
+1_8V_SLEEP        40D6>
+1_8V_SLEEP_NECK   36D2<> 40B3>
+1_95V_FW_DVDD     29C4< 29C7<> 29D5< 40A3>
+1_95V_FW_DVDD_PORT1  29D6< 40A3>
+1_95V_FW_DVDD_RX0  29C5< 40A3>
+1_95V_FW_DVDD_TX0  29C5< 40A3>
+1_95V_FW_PLL400VDD  29C4< 40A3>
+1_95V_FW_PLL500VDD  29D4< 40A3>
+1_95V_FW_PLLVDD  29D4< 29D6<> 40A3>
+2_5V_CG_MAIN      14C6<
+2_5V_GPU          22A7<> 40C3>
+2_5V_GPU_A2VDD    22D4< 22D7< 40B3>
+2_5V_GPU_MCLK     22C7< 22D4< 40B3>
+2_5V_GPU_MEMCORE  22C5< 40C3>
+2_5V_GPU_PNLIO    22A5< 40C3>
+2_5V_INTREPID     9A7< 10D3< 10D5< 10D6< 10D8< 15D6<
                   16B8< 40D3>
+2_5V_MAIN         40D6> 41C6>
+2_5V_MARVELL      28B8< 28C4< 40B3>
+2_5V_MARVELL_AVDD  28C4< 40B3>
+2_5V_MARVELL_CONN  28B3<>
+2_5V_REG          30A6<
+2_5V_REG_F        30A7<>
+2_5V_SLEEP        40D6>
+2_5V_SLEEP_NECK1  21C4<> 40B3>
+2_5V_SLEEP_NECK2  36D2<> 40B3>
+3V_AIRPORT        40C3> 41C3>
+3V_ATI_OSC_SLEEP  19B2< 40B3>
+3V_ATI_SS         19A3< 40B3>
+3V_CG_PLL_MAIN    14C6<
+3V_FW             29A3< 29D7<> 30B7<> 30D5< 40A3>
+3V_FW_AVDD        29C6< 40A3>
+3V_FW_AVDD_PORT0  29C6< 40A3>
+3V_FW_AVDD_PORT1  29C6< 40A3>
+3V_FW_AVDD_PORT2  29D6< 40A3>
+3V_FW_ESD         30A5< 30B4<> 30D3<>
+3V_FW_ESD_ILIM    30D4<
+3V_FW_ESD_R       30A6<
+3V_FW_UF          29D7<> 40A3>
+3V_GPU            12D1< 19B8< 19C6< 19C8< 19D6<
                   21C4< 21C5< 21C7< 21D7< 22A6< 22B1<
                   40C3>
+3V_GPU_FLT        22B2< 40C3>
+3V_HALL_EFFECT    24B2<> 40B6> 41C1>
+3V_INTREPID_USB   14C3< 40D3>
+3V_LCD            23B4<> 40B6> 41B6>
+3V_LCD_SW         23B4<> 40B6>
+3V_MAIN           24B8<> 40D6> 41C6>
+3V_MAIN_AUD       27C6<> 34C1<> 40B6>
+3V_MAIN_JUMPER    34D2<> 40D1>
+3V_MAIN_LMU       24D7<> 40A1>
+3V_MAIN_SSCG      40A1>
+3V_NEC_VDD        17B3< 17D7< 17D7< 40A3>
+3V_PMU            40D6> 41C6>
+3V_PMU_AVCC       27B1< 31B6< 31D5<> 40C6>
+3V_PMU_ESR        33A2< 40C6>
+3V_PMU_RESET      31C7< 35A4<> 41C1>
+3V_SENSOR         24B4<>
+3V_SLEEP          40D6> 41A6> 41B6>
+3V_SLEEP_NECK     36D1<> 40B3>
+3V_SLEEP_PCCARD   18D7< 40C3>
+3V_SLP_OK_L       34B4<>
+3V_SLP_ON         34A5<>
+4_6V_BU           33B3<> 34B7< 40C6>
+4_85V_ESR         33A4< 40C6>
+4_85V_RAW         31A4< 33B4<> 40C6>
+5V_DDC_SLEEP      23D3<> 23D5<> 40B6> 41B6>
+5V_DDC_SLEEP_UF   23D6< 40B6>
+5V_HDD            26D1<>
+5V_HD_SLEEP       26D1<> 34A7<> 40C6>
+5V_INV_SW         23B2<> 40B6> 41A6>
+5V_INV_UF_SW      23B2<> 40B6>
+5V_MAIN           40D6> 41A6> 41C6>
+5V_MAIN_AUD       27C6<> 34C8<> 40B6>
+5V_MAIN_JUMPER    34D8<> 40D1>
+5V_SLEEP          40D6> 41A6> 41C6>
+5V_SLEEP_LMU      24C6<> 24C7<>
+5V_SLEEP_OPT      26B5<> 40A1>
+5V_TPAD           24B5<>
+5V_TPAD_FB        24B4<>
+5V_TPAD_SLEEP     40B6> 41B3>
+14V_INV           23B2<> 40B6> 41B6>
+24V_PBUS          40D6> 41C6>
+ADAPTER           32D8<> 33A7< 40C6> 41D1>
+ADAPTER_ILIM      33A6<> 40C6>
+ADAPTER_OR_BATT   33A5<> 40C6>
+ADAPTER_SENSE     32D4<> 40C6>
+ADAPTER_SW        32D5<> 40C6> 40C6>
+BATT              40D6>
+BATT_14V_FUSE     32D1<> 40C6>
+BATT_24V_FUSE     32B1< 32D2<> 40C6>
+BATT_ISNS_P       25A5<> 41C1>
+BATT_POS          32A4<> 40C6> 41A3>
+BATT_RSNS         32B2< 40C6>
+BATT_VSNS         32A4< 40C6>
+FAN_PWR           27A3< 27A4< 40B6> 41A3>
+FW_AMP_SENSE      40A3>
+FW_PBUS           30D7<> 40A3>
+FW_PWR1           30B5< 40A3>
+FW_PWR_CTRL       30A7<>
+FW_PWR_OR         29B8< 29D8<> 30D5<> 40A3>
+FW_PWR_OR_F       30B7<>
+FW_PWR_OR_GATE    30B8<>
+FW_PWR_OR_GATE_L  30A8<
+FW_SW             30D5<> 40A3>
+FW_VP0            30C1<> 40A3> 41A3>
+FW_VP1            30A3<> 40A3> 41D1>
+GPU_VDD15_NECK    21B5<> 40B3>
+GPU_VDD15_UF      21B5<> 21D4<> 40B3>
+HD_LOGIC_SLEEP    26C2<> 40C6>
+PBUS              40D6> 41C6>
+PBUS_JUMPER       33C3<> 40D1>
+PPBATT_ISNS_N     25A4<> 41C1>
+PWR_SUPERCAP      33A4< 41C1>
+VCC_CBUS_SW       18B1< 18B2< 18D2<> 40C3>
+VPP_CBUS_SW       18B1< 18B2< 18D2<> 40C3>
1V20_REF           32C7< 33C8< 40D1>
1V65_REF           32A5<
1_5V_BOOST         36C6<> 40C1>
1_5V_BST           36C5<> 40C1>
1_5V_DH            36C5<> 40C1>
1_5V_DL            36B5<> 40C1>
1_5V_FB            36B5< 36B7< 40C1>
1_5V_ILIM          36C5<> 40C1>
1_5V_LX            36B5<> 40C1>
1_5V_LX_F          36B7<> 36C5> 40C1>
1_5V_SLEEP_EN_L    36C7<> 36D7<>
1_8V_PVDD_STD      22D6<
1_8V_SLEEP_PWREN_L  36A3<>
1_8V_SW            36A5<> 40A1>
```

```
1_8V_SW_F          36A4<> 40A1>
1_8V_TPVDD_STD     22D1<
1_8V_VFB           36A5<> 40A1>
2_5V_BOOST         36C4<> 40D1>
2_5V_BST           36C4<> 40D1>
2_5V_DH            36C3<> 40D1>
2_5V_DL            36B3<> 40C1>
2_5V_FB            36B4<
2_5V_ILIM          36C5<> 40C1>
2_5V_LX            36B3<> 40D1>
2_5V_LX_F          36B2<> 36C4<> 40D1>
2_5V_SLEEP_PWREN_L  36C2<>
3V_5V_OK           24A6< 34B4<> 36A8< 36D6<
3V_5V_OK_G         24A6<
3V_5V_OK_L         24B5<>
3V_BG              34C4<>
3V_BOOST           34C4<>
3V_BOOST_ESR       34D3<>
3V_ITH             34C4<>
3V_ITH_RC          34C3<
3V_PMU_VTAP        33B3<
3V_RSNS            34D2< 40D1>
3V_RUNSS           34C4<
3V_SLEEP_PWREN_L   34B3<>
3V_SNSM            34C4< 39A2>
3V_SNSP            34C4< 39A2>
3V_SW              34C4<> 40D1>
3V_TG              34D4<>
3V_VOSNS           34C4<>
5V_BG              34C5<>
5V_BOOST           34C5<>
5V_BOOST_ESR       34D6<>
5V_HD_PWREN        34A8<>
5V_ITH             34C5<>
5V_ITH_RC          34C6<
5V_RSNS            34D7< 40D1>
5V_RUNSS           34C5<
5V_SLEEP_PWREN     34A8<>
5V_SNSM            34C5< 39A2>
5V_SNSP            34C5< 39A2>
5V_SW              34C5<> 40D1>
5V_TG              34C5<>
5V_VOSNS           34C5<>
1625_BG            33C5<>
1625_BST           33C5<
1625_BST_ESR       33C5<>
1625_COMP          32D2< 33C6<
1625_DIV           33C8<
1625_ENABLE        33D7<>
1625_ENABLE_L      33D6<>
1625_EXTVCC        33D5<> 40D1>
1625_FCB           33C6<
1625_INTVCC        33C5<> 40D1>
1625_RUNSS         33C6<
1625_SGND          33B7<> 40D1>
1625_TG            33C5<>
1625_VFB           33B5<>
1625_VIN           33C6< 40D1>
1625_VSW           33C4<> 40D1>
1772_ACIN          32B5<
1772_ACOK_L        32B5<> 32C4<>
1772_BST           32B4<>
1772_BST_ESR       32C3<
1772_CCI           32B5<>
1772_CCS           32B5<
1772_CCV           32B5<>
1772_CCV_RC        32B5<
1772_CELLS         32B4<
1772_CLS           32A4<
1772_CSIN          32B4<> 39A2>
1772_CSIP          32B4<> 39A2>
1772_CSSN          32C5< 39A2>
1772_CSSP          32C5< 39A2>
1772_DCIN          32B5< 40C6>
1772_DHI           32B4<>
1772_DLO           32B4<>
1772_DLOV          32B4<> 40C6>
1772_GND           32A5<> 40C6>
1772_ICHG          32B5<>
1772_ICTL          32B5<>
1772_IINP          32B5<
1772_LDO           32C4<> 40C6>
1772_LX            32B4<> 40C6>
1772_REF           32B5<>
1772_VCTL          32B5<
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1778_BST           21A5<> 40B1>
1778_BST_RC        21A5< 40B1>
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1778_ITH           21A6<> 40B1>
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1778_TG            21A5<> 40B1>
1778_VCC           21A5< 40B1>
1778_VFB           21A2< 21A5< 40B1> 41C6>
1778_VIN           21A5< 40B1>
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3707_FSET          34C5<
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3707_SGND          34B5<> 40D1>
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A29_CURRENT_ADJ    32C4<>
A29_DETECT         31A2< 32A5<> 32C4<>
A29_DET_L          31A3<
A29_DET_REF        31A4<
AC_DET             31A4<
AC_DIV             32C7<
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AC_ENABLE_L        32C5<>
AC_GTR_18V         32C3<>
AC_IN              28B8<> 30C8< 31B3< 32C5<> 32C6<>
AC_IN_FW_CNTL      30C7<>
AC_IN_L            31A8<> 32C2<> 32C6<>
AC_IN_L_RC         32C2<>
ADAPTER_DET        27D8<> 31A4< 41A6>
ADAPTER_I_REG      32D3<>
ADT7467_ADR_ENABLE_L  27B3<>
ADT7467_TACH3_TP   27B3<
ADT7467_THERM_L    24B4<> 27A2<> 27B3<
ADT7467_VCC        27C4<
ADT7467_VCORE_MON  5C8<> 27B4<
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AGP_AD<29>         12B2<> 19D7<>
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AGP_AD_STB<1>      12A2<> 12B2< 19D6<> 39D5>
AGP_AD_STB_L<0>    12A2<> 12B2< 19D6<> 39D5>
AGP_AD_STB_L<1>    12A2<> 12A2< 19D6<> 39D5>
AGP_ATI_INT_L      14B5<> 19B7<>
AGP_ATI_RESET_L    19B7<
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AGP_ATI_VREFG      19B7<
AGP_BUSY_L         12C4<> 12D2< 19D6>
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AGP_CBE<1..0>      39D5>
AGP_CBE<1>         12B2<> 19B7<>
AGP_CBE<2>         12B2<> 19B7<>
AGP_CBE<3..2>      39D5>
AGP_CBE<3>         12B2<> 19B7<>
AGP_DEVSEL_L       12B2<> 12C2< 19B7<> 39D5>
AGP_FRAME_L        12B2<> 12C2< 19B7<> 39D5>
AGP_GNT_L          12C2< 12D2<> 19B7< 39D5>
AGP_IRDY_L         12B2<> 12C2< 19B7<> 39D5>
AGP_PAR            12B2<> 19B7> 39D5>
AGP_PIPE_L         12A2<> 12B2<
AGP_RBF_L          12A2<> 12C2< 19C6> 39C5>
AGP_REQ_L          12C2< 12D2<> 19B7<> 39D5>
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AGP_SBA<7..0>      39D5>
AGP_SBA<1>         12B2<> 19C6>
AGP_SBA<2>         12B2<> 19C6>
AGP_SBA<3>         12B2<> 19C6>
AGP_SBA<4>         12B2<> 19C6>
AGP_SBA<5>         12B2<> 19C6>
AGP_SBA<6>         12B2<> 19C6>
AGP_SBA<7>         12B2<> 19C6<>
AGP_SB_STB         12B2<> 12B2< 19C6<> 39D5>
AGP_SB_STB_L       12A2< 12A2<> 19C6<> 39D5>
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AGP_ST<2>          12A2<> 19C6<
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AGP_STP_L          19C6<
AGP_SUS_STAT_L_PU  19C6<
AGP_TRDY_L         12B2<> 12C2< 19B7<> 39D5>
AGP_WBF_L          12A4<> 12B2< 19B7>
AIRPORT_CLKRUN_L   26C6<> 41C3>
AIRPORT_IDSEL      26C5<>
AIRPORT_PCI_GNT_L  12D7<> 26D5<> 41C3>
AIRPORT_PCI_INT_L  14B5<> 14D7< 26D5<> 41C3>
AIRPORT_PCI_REQ_L  12A7< 12D7<> 26D6<> 41C3>
ATI_AGP_FBSKEW<0>  21C2< 21C7<>
ATI_AGP_FBSKEW<1>  21C2< 21C7<>
ATI_BUS_CFG<0>     21B2< 21C7<>
ATI_BUS_CFG<1>     21B2< 21C7<>
ATI_BUS_CFG<2>     21B2< 21C7<>
ATI_CLK27M_IN      19A1< 21B7< 37B1>
ATI_CLK27M_OSC     19B2< 37B1>
ATI_CLK27M_OSC_SS  19A3< 19B1< 37B1>
ATI_DBI_HI_PU      19C6<>
ATI_DBI_LO_PU      19C6<>
ATI_DVOD<0>        20B8< 21D7<>
ATI_DVOD<23..0>    38C1>
ATI_DVOD<1>        20B8< 21D7<>
ATI_DVOD<2>        20B8< 21D7<>
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ATI_DVOD<10>       20B8< 21D7<>
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ATI_DVOD<12>       20B6< 21D7<>
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ATI_DVOD<14>       20B6< 21D7<>
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ATI_DVOD<19>       20B6< 21C7<>
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ATI_DVOD<22>       20B6< 21C7<>
ATI_DVOD<23>       20A6< 21C7<>
ATI_DVOD_DE        20A6< 20A8< 21C7<> 38C1>
ATI_DVOVMODE       22A3<
ATI_DVO_CLKP       19B4< 21C7<> 38C1>
ATI_DVO_HSYNC      20A8< 21C7<> 38C1>
ATI_DVO_VSYNC      20A6< 20A8< 21C7<> 38C1>
ATI_GPIO8_PD       21C7<>
ATI_GPIO9_SPN      21C7<>
ATI_GPIO10_SPN     21C7<>
ATI_GPIO11_SPN     21C7<>
ATI_GPIO12_SPN     21C7<>
ATI_GPIO13_SPN     21C7<>
ATI_HSYNC          21D5<> 23D8<
ATI_HSYNC_BUF      23D8<>
ATI_MEMTEST        19A6<>
ATI_MEMVMODE0      19A7<
ATI_MEMVMODE1      19A7<
ATI_OSC_OE         19B3<
ATI_PVDD_BYP       22D6<>
ATI_R2SET          21D6<>
ATI_RSET           21D6<>
ATI_RSTB_MSK       19C6<>
ATI_SSCLK_IN       19A2< 21B7<> 37B1>
ATI_SSCLK_UF       19A2<> 37B1>
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ATI_TMDS_CLKN      20C2< 21B7> 39B2>
ATI_TMDS_CLKP      20C2< 21B7> 39B2>
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ATI_TMDS_DN<2>     20C2< 21B7> 39B2>
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ATI_TMDS_DP<1>     20D2< 21B7> 39B2>
ATI_TMDS_DP<2>     20C2< 21B7> 39B2>
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ATI_VSYNC          21D5<> 23D8<
ATI_VSYNC_BUF      23D8<>
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ATI_X1CLK_SKEW<1>  21B2< 21C7<>
AUD_GND            27C8<> 40B6>
AUXWIN_PU          21C6<>
BATTV_HIGH         32B7<>
BATTV_LOW          32B8<>
BATT_14PBUS_EN     32C1<>
BATT_14V_GATE      32C1<>
BATT_24PBUS_EN     32C2<>
BATT_24V_GATE      32C1<>
BATT_CLK           32A4<> 41A3>
BATT_DATA          32A4<> 41A3>
BATT_DIV           32A5<
BATT_ISNS_OUT      25A4<>
BATT_ISNS_R        25A3<>
BATT_LOW           32A6<>
BATT_LOW_L         32B6<>
BATT_NEG           32A4<> 40C6> 41A3>
BBANG_HRESET_L     6A2< 6B3<>
BBANG_JTAG_TCK     6A4< 6B2<> 6C2<
BBANG_TCK_EN       6A4<
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BB_EEPR_ADDR1      6D3<
BB_EEPR_ADDR2      6D3<
BB_EEPR_WP_PD      6D2<>
BB_MISO            6B3<> 6C2<
BB_MOSI            6B3<> 6C2<
BB_RESET_L         6C3< 41C1>
BB_SCK             6B3<> 6C2<
BFR_TDO            6C2< 6C2<>
BKFD_PROT_EN_L     32C5<>
BKFD_PROT_GATE     32D5<>
BRIGHT_PWM         23A2<> 41A6>
BRIGHT_PWM_UF      23A2<>
BT_USB_DM          14C1< 27D8<> 39B2> 41D3>
BT_USB_DP          14C1< 27D8<> 39B2> 41D3>
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CBUS_ADDR<11>      18B1< 18B4>
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CBUS_CE2_L         18B2< 18B4>
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CBUS_DET_2_L       18A2< 18C4< 41C6>
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CBUS_IORD_L        18B2< 18C4>
CBUS_IOWR_L        18B2< 18C4>
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CBUS_MFUNC2_PD     18A7< 18A7<>
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CBUS_MFUNC6_PD     18A7< 18A7<>
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CBUS_PCI_RESET_L   18A7<
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CBUS_RESET_L       18B2< 18C4>
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CBUS_VCCD1_L       18C4<>
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CBUS_VPPD1         18C5<>
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CBUS_VS2           18B2< 18C4<>
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CG_CLKOUT          14B6<>
CG_FSEL            14B7< 14C5<
CG_FSEL_INT        14C5<>
CG_LOCK            14B7<>
CG_RESET_L         14B7<
CG_SYSCLK_EN       14B5< 14B7<
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CHARGE_LED_L       27D8<> 31C6<> 31D7< 41A6>
CLK10M_PMU_XIN     31B6<
CLK10M_PMU_XOUT    31B6<
CLK10M_PMU_XOUT_UF  31B7<
CLK18M_INT_EXT     14B6<> 37B1>
CLK18M_INT_XIN     14A5< 37B1>
CLK18M_INT_XOUT    14A5<> 37B1>
CLK18M_XTAL_IN     14A5< 37B1>
CLK25M_ENET_XIN    28A7<>
CLK25M_ENET_XOUT   28A7<>
CLK25M_XTAL_IN     28A7<>
CLK32K_PMU_XIN     31B3<>
CLK32K_PMU_XOUT    31B3<>
CLK32K_PMU_XOUT_UF  31B2<>
CLK33M_AIRPORT     12D8< 26D5<> 37C1> 41C3>
CLK33M_AIRPORT_UF  12C7<> 37C1>
CLK33M_CBUS        12D8< 18A7< 37C1>
CLK33M_CBUS_UF     12C7<> 37C1>
CLK33M_NEC         12C8< 17B7< 37C1>
CLK33M_NEC_UF      12C7<> 37C1>
CLK66M_AGP_1_5V_TP  12C4>
CLK66M_GPU_AGP     12C8< 19B7< 37C1>
CLK66M_GPU_AGP_UF  12C7<> 37C1>
CLKENET_LINK_GBE_REF  13C5< 28C8< 37B1>
CLKENET_LINK_GTX   13C5<> 37A1>
CLKENET_LINK_RX    13D5< 28C8< 37B1>
CLKENET_LINK_TX    13D5< 28D8< 37A1>
CLKENET_PHY_GBE_REF  28C7<> 37B1>
CLKENET_PHY_GTX    13C6< 28C7< 37A1>
CLKENET_PHY_RX     28C7<> 37B1>
CLKENET_PHY_TX     28D7<> 37A1>
CLKFW_LINK_LCLK    13C3<> 37A1>
CLKFW_LINK_PCLK    13C3<> 29C3< 37A1>
CLKFW_PHY_LCLK     13C2< 29B7< 37A1>
CLKFW_PHY_PCLK     29B4> 29C4< 37A1>
CLKLVDS_LN         21B5> 23A4<> 39C2> 41B6>
CLKLVDS_LP         21B5> 23A4<> 39C2> 41B6>
CLKLVDS_UN         39C2>
CLKLVDS_UP         39C2>
COMM_DTR_L         14C2> 27C1<> 41B3>
COMM_GPIO_L        14C2<> 27C2<> 41B3>
COMM_RESET_L       14C5<> 27D3< 41B3>
COMM_RING_DET_L    14B5<> 14C7< 27D3< 31C6<> 41B3>
COMM_RTS_L         14C2> 27C1<> 41B3>
COMM_RXD           14C2<> 27C1<> 41B3>
COMM_SHUTDOWN      41B3>
COMM_TRXC          14C2<> 27C2<> 41B3>
COMM_TXD_L         14C2<> 27C2<> 41B3>
COMP_RC            33C6<
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CPU_ADDR<29>       5B7<> 8C5<>
CPU_ADDR<30>       5B7<> 8C5<>
CPU_ADDR<31>       5B7<> 8C5<>
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CPU_AVDD_ADJ       5C2<>
CPU_AVDD_SHDN_L    5C3<>
CPU_AVDD_VIN       5C3< 40D3>
CPU_AVDD_VOUT      5C2<> 40D3>
CPU_BG_L           5C7< 8C2< 8D5<> 38D5>
CPU_BR_L           5C7> 8D2< 8D5< 38D5>
CPU_BUS_VSEL       5C3< 7A6<
CPU_CHKSTP_OUT_L   5B3<> 5C2< 41D6>
CPU_CHKS_L         5A3< 5D2<
CPU_CI_L           5A7> 8B5<> 38D5>
CPU_CLKOUT_SPN     5C3>
CPU_CLK_EN         8A5< 31C4<>
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CPU_DATA<0..31>    38D5>
CPU_DATA<1>        6D8<> 8D3<>
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CPU_DATA<3>        6D8<> 8D3<>
CPU_DATA<4>        6D8<> 8D3<>
CPU_DATA<5>        6D8<> 8D3<>
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```
CPU_DATA<6>        6D8<> 8D3<>
CPU_DATA<7>        6D8<> 8D3<>
CPU_DATA<8>        6D8<> 8D3<>
CPU_DATA<9>        6C8<> 8D3<>
CPU_DATA<10>       6C8<> 8D3<>
CPU_DATA<11>       6C8<> 8D3<>
CPU_DATA<12>       6C8<> 8C3<>
CPU_DATA<13>       6C8<> 8C3<>
CPU_DATA<14>       6C8<> 8C3<>
CPU_DATA<15>       6C8<> 8C3<>
CPU_DATA<16>       6C8<> 8C3<>
CPU_DATA<17>       6C8<> 8C3<>
CPU_DATA<18>       6C8<> 8C3<>
CPU_DATA<19>       6C8<> 8C3<>
CPU_DATA<20>       6C8<> 8C3<>
CPU_DATA<21>       6C8<> 8C3<>
CPU_DATA<22>       6C8<> 8C3<>
CPU_DATA<23>       6C8<> 8C3<>
CPU_DATA<24>       6C8<> 8C3<>
CPU_DATA<25>       6C8<> 8C3<>
CPU_DATA<26>       6C8<> 8C3<>
CPU_DATA<27>       6C8<> 8C3<>
CPU_DATA<28>       6C8<> 8C3<>
CPU_DATA<29>       6C8<> 8C3<>
CPU_DATA<30>       6C8<> 8C3<>
CPU_DATA<31>       6C8<> 8C3<>
CPU_DATA<32>       6C8<> 8C3<> 8D8<
CPU_DATA<32..63>   38D5>
CPU_DATA<33>       6C8<> 8C3<> 8D8<
CPU_DATA<34>       6C8<> 8C3<> 8D8<
CPU_DATA<35>       6C8<> 8C3<> 8D8<
CPU_DATA<36>       6B8<> 8C3<> 8D8<
CPU_DATA<37>       6B8<> 8C3<> 8D8<
CPU_DATA<38>       6B8<> 8C3<> 8D8<
CPU_DATA<39>       6B8<> 8B3<> 8D8<
CPU_DATA<40>       6B8<> 8B3<> 8C8<
CPU_DATA<41>       6B8<> 8B3<> 8C8<
CPU_DATA<42>       6B8<> 8B3<> 8C8<
CPU_DATA<43>       6B8<> 8B3<> 8C8<
CPU_DATA<44>       6B8<> 8B3<> 8C8<
CPU_DATA<45>       6B8<> 8B3<> 8C8<
CPU_DATA<46>       6B8<> 8B3<> 8B8<
CPU_DATA<47>       6B8<> 8B3<> 8B8<
CPU_DATA<48>       6B8<> 8A8< 8B3<>
CPU_DATA<49>       6B8<> 8A8< 8B3<>
CPU_DATA<50>       6B8<> 8A8< 8B3<>
CPU_DATA<51>       6B8<> 8A8< 8B3<>
CPU_DATA<52>       6B8<> 8A8< 8B3<>
CPU_DATA<53>       6B8<> 8A8< 8B3<>
CPU_DATA<54>       6B8<> 8A8< 8B3<>
CPU_DATA<55>       6B8<> 8A8< 8B3<>
CPU_DATA<56>       6B8<> 8B3< 8B3<>
CPU_DATA<57>       6B8<> 8B3< 8B3<>
CPU_DATA<58>       6B8<> 8B3< 8B3<>
CPU_DATA<59>       6B8<> 8B3< 8B3<>
CPU_DATA<60>       6B8<> 8B3< 8B3<>
CPU_DATA<61>       6B8<> 8B3< 8B3<>
CPU_DATA<62>       6A8<> 8B3< 8B3<>
CPU_DATA<63>       6A8<> 8B3< 8B3<>
CPU_DBG_L          5C3< 8A3<> 8C2< 38D5>
CPU_DRDY_L         5C3> 8A3< 8C2< 38D5>
CPU_DTI<0>         5C3< 8A3<>
CPU_DTI<0..2>      38D5>
CPU_DTI<1>         5C3< 8A3<>
CPU_DTI<2>         5C3< 8A3<>
CPU_EDTI           5A2< 5C3<
CPU_EMODE0_L       5A3< 7A4<
CPU_EMODE1_L       5A3< 5C2<
CPU_GBL_L          5A7<> 8B5<> 38D5>
CPU_HIT_L          5A7> 8B5 8D2< 38D5>
CPU_HRESET_INV     7A7<>
CPU_HRESET_L       5B3< 5C2< 6A1<> 7A5< 7A8< 41D6>
CPU_L1TSTCLK       5B2< 5B3<
CPU_L2TSTCLK       5B3< 5C2<
CPU_LSSD_MODE      5B3< 5C2<
CPU_MCP_L          5B3< 5D2<
CPU_PLL_CFG<0>     5C3< 7D3<
CPU_PLL_CFG<1>     5C3< 7D3<
CPU_PLL_CFG<2>     5C3< 7D3<
CPU_PLL_CFG<3>     5C3< 7D3<
CPU_PLL_CFG<4>     5C3< 7D3<>
CPU_PLL_CFGEXT     7D4<>
CPU_PLL_FS00       7C4<>
CPU_PLL_FS01       7C4<
CPU_PLL_FS10       7C4<
CPU_PLL_STOP_BASE  7C7<
CPU_PLL_STOP_OC    7C4<> 7C8<> 31B6<>
CPU_PMONIN_L       5A3< 5C2<
CPU_PULLDOWN       5A2< 5A3< 5A3< 5C7<>
CPU_PULLUP         5A3< 5C2<
CPU_QACK_L         5B3< 8B5<> 38D5>
CPU_QREQ_L         5B3> 8B5< 8C2< 38D5>
CPU_SHD0_L         5A7<> 5D2<
CPU_SHD1_L         5A7<> 5D2<
CPU_SMI_L          5B3< 5C2< 31C4<>
CPU_SRESET_L       5B2< 5B3< 41D6>
CPU_SRWX_L         5A3< 5C2<
CPU_TA_L           5B3< 8A3<> 8D2< 38D5>
CPU_TBEN           5B3< 5D2< 8A5<>
CPU_TBST_L         5A7> 8B5<> 38D5>
CPU_TEA_L          5B3< 8A3<> 8C2< 38D5>
CPU_THERM_DM       6A6<> 27A6<
CPU_THERM_DP       6A6<> 27A6<
CPU_TSIZ<0>        5A7> 8B5<>
CPU_TSIZ<0..2>     38D5>
CPU_TSIZ<1>        5A7> 8B5<>
CPU_TSIZ<2>        5A7> 8B5<>
CPU_TS_L           5C7<> 8D2< 8D5<> 38D5>
CPU_TT<0>          5A7<> 8B5<>
CPU_TT<0..4>       38D5>
CPU_TT<1>          5A7<> 8B5<>
CPU_TT<2>          5A7<> 8B5<>
CPU_TT<3>          5A7<> 8B5<>
CPU_TT<4>          5A7<> 8B5<>
CPU_VCORE_HI_OC    7B8< 31D4<> 35C8<
CPU_VCORE_PWR_SEQ  35D8<>
CPU_VCORE_SEQ      35D8<
CPU_VCORE_SEQ_L    35D8<
CPU_VCORE_SLEEP    5D2< 5D8<> 6C6<> 35C1< 35D2< 40D3>
                   41C6>
CPU_VCORE_SNUB     35B3<
CPU_WT_L           5A7<> 8B5<> 38C5>
CSLOT_ADDR3_SPN    13B7>
CSLOT_ADDR4_SPN    13B7>
CSLOT_ADDR5_SPN    13B7>
CSLOT_ADDR6_SPN    13B7>
CSLOT_ADDR7_SPN    13B7>
CSLOT_ADDR8_SPN    13B7>
CSLOT_ADDR9_SPN    13B7>
CSLOT_CE1_L_SPN    13C7>
CSLOT_CE2_L_SPN    13C7>
CSLOT_IORD_L_SPN   13C7>
CSLOT_IOWAIT_L_PU  13C7<
CSLOT_IOWR_L_SPN   13C7>
CSLOT_OE_L_SPN     13C7>
CSLOT_WE_L_SPN     13C7>
CURRENT_THRESHOLD  32C3<
CY25811_S0         19A3<
CY25811_S1         19A3<
DCDC_EN            21A7<> 30C8< 34B7<> 35C7<>
DCDC_EN_CTRL       30C7<>
DCDC_EN_L          34B6< 34B7<> 36C7<>
DDC_CLK_ISO        23D4<>
DDR_VREF           11D1< 11D3<> 11D5<> 11D6<> 11D8<>
                   40D3>
DVI_DDC_CLK        23D4<>
DVI_DDC_CLK_UF     23C5<> 23D3<> 41B6>
DVI_DDC_DATA       23C4<>
DVI_DDC_DATA_UF    23C5<> 41B6>
DVI_HPD            23C4<>
DVI_HPD_DIV        23C2<
DVI_HPD_UF         23C3< 23C5<> 41B6>
DVI_TURN_ON        23D3<>
DVI_TURN_ON_BASE   23D2<>
DVI_TURN_ON_ILIM   23D2<
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EIDE_ADDR<2..0>    39B5>
EIDE_ADDR<1>       13B7> 26B8<
EIDE_ADDR<2>       13B7> 26B8<
EIDE_CS0_L         13B7> 26B8< 39B5>
EIDE_CS1_L         13B7> 26A8< 39B5>
EIDE_DATA<0>       13C7<> 26C8<
EIDE_DATA<15..0>   39B5>
EIDE_DATA<1>       13C7<> 26C8<
EIDE_DATA<2>       13C7<> 26C8<
EIDE_DATA<3>       13C7<> 26C8<
EIDE_DATA<4>       13C7<> 26B8<
EIDE_DATA<5>       13B7<> 26B8<
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```
EIDE_DATA<6>       13B7<> 26B8<
EIDE_DATA<7>       13B7<> 26B8<
EIDE_DATA<8>       13B7<> 26D8<
EIDE_DATA<9>       13B7<> 26C8<
EIDE_DATA<10>      13B7<> 26D8<
EIDE_DATA<11>      13B7<> 26C8<
EIDE_DATA<12>      13B7<> 26C8<
EIDE_DATA<13>      13B7<> 26C8<
EIDE_DATA<14>      13B7<> 26C8<
EIDE_DATA<15>      13B7<> 26C8<
EIDE_DMACK_L       13A7<> 26A8< 39B5>
EIDE_DMARQ         13A7< 26A8< 39B5>
EIDE_INT           13A7< 26A8< 39B5>
EIDE_IOCHRDY       13B7< 26A8< 39B5>
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EIDE_OPTICAL_ADDR<2..0>  39B5> 41C3>
EIDE_OPTICAL_ADDR<1>  26A5<> 26B7<
EIDE_OPTICAL_ADDR<2>  26A6<> 26B7<
EIDE_OPTICAL_CS0_L  26A5<> 26B7< 39B5> 41C3>
EIDE_OPTICAL_CS1_L  26A6<> 26A7< 39B5> 41C3>
EIDE_OPTICAL_DATA<0>  26A5<> 26C7<
EIDE_OPTICAL_DATA<15..0>  39B5> 41C3>
EIDE_OPTICAL_DATA<1>  26A5<> 26C7<
EIDE_OPTICAL_DATA<2>  26A5<> 26C7<
EIDE_OPTICAL_DATA<3>  26A5<> 26C7<
EIDE_OPTICAL_DATA<4>  26A5<> 26B7<
EIDE_OPTICAL_DATA<5>  26A5<> 26B7<
EIDE_OPTICAL_DATA<6>  26A5<> 26B7<
EIDE_OPTICAL_DATA<7>  26A5<> 26B7<
EIDE_OPTICAL_DATA<8>  26A6<> 26D7<
EIDE_OPTICAL_DATA<9>  26A6<> 26C7<
EIDE_OPTICAL_DATA<10>  26A6<> 26D7<
EIDE_OPTICAL_DATA<11>  26A6<> 26C7<
EIDE_OPTICAL_DATA<12>  26A6<> 26C7<
EIDE_OPTICAL_DATA<13>  26A6<> 26C7<
EIDE_OPTICAL_DATA<14>  26A6<> 26C7<
EIDE_OPTICAL_DATA<15>  26A6<> 26C7<
EIDE_OPTICAL_DMAACK_L  26A6<> 26A7< 39A5> 41C3>
EIDE_OPTICAL_DMA_RQ  26A6<> 26A7< 39A5> 41C3>
EIDE_OPTICAL_INT  26A5<> 26A7< 39A5> 41B3>
EIDE_OPTICAL_IOCHRDY  26A5<> 26A7< 39A5> 41B3>
EIDE_OPTICAL_READ_L  26A6<> 26A7< 39B5> 41C3>
EIDE_OPTICAL_RST_L  26A7< 26B5<> 39A5> 41C3>
EIDE_OPTICAL_WR_L  26A5<> 26A7< 39B5> 41B3>
EIDE_RD_L          13A7> 26A8< 39B5>
EIDE_RST_L         13B7> 26A8< 39B5>
EIDE_WR_L          13A7> 26A8< 39B5>
ENET_COL           13C5< 28B7> 39A5>
ENET_COMA          28B7<>
ENET_CRS           13C5< 28B7> 39A5>
ENET_CTAP_CHGND    40A6>
ENET_ENERGY_DET    14B5<> 28B7<>
ENET_HSDACM        28A7<>
ENET_HSDACP        28A7<>
ENET_LINK_RXD<0>   13C5< 28C7>
ENET_LINK_RXD<7..0>  39A5>
ENET_LINK_RXD<1>   13C5< 28C7>
ENET_LINK_RXD<2>   13C5< 28C7>
ENET_LINK_RXD<3>   13C5< 28B7>
ENET_LINK_RXD<4>   13C5< 28B7>
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ENET_LINK_RXD<6>   13C5< 28B7>
ENET_LINK_RXD<7>   13C5< 28B7>
ENET_LINK_TXD<0>   13B4< 13D5>
ENET_LINK_TXD<7..0>  39A5>
ENET_LINK_TXD<1>   13B4< 13D5>
ENET_LINK_TXD<2>   13B4< 13D5>
ENET_LINK_TXD<3>   13B4< 13D5>
ENET_LINK_TXD<4>   13B4< 13D5>
ENET_LINK_TXD<5>   13B4< 13D5>
ENET_LINK_TXD<6>   13A4< 13D5>
ENET_LINK_TXD<7>   13A4< 13D5>
ENET_LINK_TX_EN    13D5<> 39A5>
ENET_LINK_TX_ER    13D5<> 39A5>
ENET_MDC           13C5> 28B7< 39A5>
ENET_MDIO          13C5<> 28B7<> 39A5>
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ENET_PHY_TXD<7..0>  39A5>
ENET_PHY_TXD<1>    13B5< 28C7<
ENET_PHY_TXD<2>    13B5< 28C7<
ENET_PHY_TXD<3>    13B5< 28C7<
ENET_PHY_TXD<4>    13B5< 28C7<
ENET_PHY_TXD<5>    13B5< 28C7<
ENET_PHY_TXD<6>    13A5< 28C7<
ENET_PHY_TXD<7>    13A5< 28C7<
ENET_PHY_TX_EN     13D6< 28C7< 39A5>
ENET_PHY_TX_ER     13D6< 28C7< 39A5>
ENET_RSET          28A5<
ENET_RST_L         28B7<
ENET_RX_DV         13D5< 28B7> 39A5>
ENET_RX_ER         13C5< 28B7> 39A5>
ENET_VSSC          28A7<>
ESP_EN_L           6C2<> 6C2<
EXT_TMDS_D3_CMF    20B3<
EXT_TMDS_D4_CMF    20A3<
EXT_TMDS_D5_CMF    20A3<
FAN1_GND           40B6> 41A3>
FAN1_PWM           27A4<>
FAN1_PWM_L         27A5<> 27B2<>
FAN1_TACH          27A4< 27B2< 41A3>
FAN2_GND           40B6> 41A3>
FAN2_PWM           27A3<>
FAN2_PWM_L         27A3<> 27B2<>
FAN2_TACH          27A3< 27B2< 41A3>
FB_4_85V_BU        33A5<
FP_PWR_EN          21C6<> 23A5< 23B3<>
FP_PWR_EN_L        23B3<>
FWB_TPB0           29A3<
FWB_TPB1           29A3<
FWPLL_BYP          29D8<>
FW_BIAS0           29A4<>
FW_BIAS1           29A4<>
FW_BMODE           29B6<
FW_CORE_ADJ        29C7<
FW_CORE_BYP        29C7<>
FW_CPS             29B6<
FW_GATE_EN         30D6<>
FW_GATE_EN_RC      30C6<>
FW_INPUT_PD        29A6<
FW_LINK_CNTL<0>    13C3<> 29C3<
FW_LINK_CNTL<1..0>  39A5>
FW_LINK_CNTL<1>    13C3<> 29C3<
FW_LINK_DATA<0>    13D3<> 29B7<
FW_LINK_DATA<7..0>  39A5>
FW_LINK_DATA<1>    13D3<> 29B7<
FW_LINK_DATA<2>    13D3<> 29B7<
FW_LINK_DATA<3>    13D3<> 29B7<
FW_LINK_DATA<4>    13C3<> 29B7<
FW_LINK_DATA<5>    13C3<> 29A7<
FW_LINK_DATA<6>    13C3<> 29A7<
FW_LINK_DATA<7>    13C3<> 29A7<
FW_LINK_LREQ       13C3<> 39A5>
FW_LKON            13C3<> 29B4<>
FW_OSC             29A4< 37A1>
FW_OSC_EN          29A3<
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FW_PC_PU           29B6<
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FW_PHY_CNTL<1..0>  39A5>
FW_PHY_CNTL<1>     29B4<> 29C4<
FW_PHY_DATA<0>     29B7<>
FW_PHY_DATA<7..0>  39A5>
FW_PHY_DATA<1>     29B7<>
FW_PHY_DATA<2>     29B7<>
FW_PHY_DATA<3>     29B7<>
FW_PHY_DATA<4>     29B7<>
FW_PHY_DATA<5>     29A7<>
FW_PHY_DATA<6>     29A7<>
FW_PHY_DATA<7>     29A7<>
FW_PHY_LPS         13C3<> 29B7<
FW_PHY_LREQ        13C2< 29B7< 39A5>
FW_PHY_PD          14C5<> 29B7<
FW_PHY_RESET_L     29A7<
FW_PINT            13C3<> 29B4> 39A5>
FW_PLL_ADJ         29C7<
FW_PORT1_SEL       29B6<
FW_POWER_UP        30C7<>
FW_R0              29A4<>
FW_R1              29A4<>
FW_TESTM           29A6<
FW_TPA1N           29B2<> 30A4<> 39D2>
FW_TPA1P           29B2<> 30A4<> 39D2>
FW_TPAO0N          30C2<> 39D2>
FW_TPAO0P          30C2<> 39D2>
FW_TPB1N           29A2<> 30A4<> 39D2>
FW_TPB1P           29B2<> 30A4<> 39D2>
FW_TPB2_PD         29A4<>
FW_TPBI0N          30C2<> 39D2>
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```
FW_TPBI0P          30C2<> 39D2>
FW_TPI0N           29B2<> 30C3<> 39D2> 41A3>
FW_TPI0P           29B2<> 30C3<> 39D2> 41A3>
FW_TPI1N           30A3<> 39D2> 41D1>
FW_TPI1P           30A3<> 39D2> 41D1>
FW_TPO0N           29B2<> 30C3<> 39D2> 41A3>
FW_TPO0P           29B2<> 30C3<> 39D2> 41A3>
FW_TPO0R           30C1<> 41A3>
FW_TPO1N           30A3<> 39D2> 41D1>
FW_TPO1P           30A3<> 39D2> 41D1>
FW_VDD_ON          40A3>
FW_VGND            41A3> 41D1>
FW_VGND0           30C1<> 40A3>
FW_VGND1           30A3<> 40A3>
FW_VREG_PD         29A6<
FW_XI              29A4<> 37A1>
GPU_AGP_TEST       19C6<
GPU_B              21D6<> 23C8< 38A1>
GPU_C              21D6<> 23A8<
GPU_COMP           21D6<> 23A8<
GPU_CORE_OK        21A6<> 21D4<> 22D2<> 22D7<>
GPU_DVI_DDC_CLK    21C5<> 23D3<>
GPU_DVI_DDC_DATA   21C5<> 23C3<>
GPU_DVO_CLKP       19B3<
GPU_DVO_CLKP_R1    19B2< 20A8< 38C1>
GPU_DVO_CLKP_R2    19B2< 20A6< 38C1>
GPU_G              21D6<> 23C8< 38B1>
GPU_HPD            21C5< 23C3<>
GPU_MEM_IO         19A6<> 19B8< 22A7< 22B4< 22D2<
                   40C3>
GPU_MEM_IO_FLT     22C2< 40C3>
GPU_R              21D6<> 23B8< 38B1>
GPU_THERM_DM       19A6<> 27A6<
GPU_THERM_DP       19A6<> 27A6<
GPU_TV_GND1        23B8<> 40B6>
GPU_TV_GND2        23A8<> 40B6>
GPU_VCORE          19D8< 21B3<> 21B5<> 21D4< 40C3>
                   41C6>
GPU_VCORE_CNTL     21A3<>
GPU_VCORE_CNTL_L   21A4< 21B7<>
GPU_VCORE_CNTL_RC  21A3<>
GPU_VCORE_NECK     21B5<> 40B3>
GPU_VCORE_PWR_SEQ  21A8<>
GPU_VCORE_SEQ      21A8<
GPU_VCORE_SEQ_L    21A8<
GPU_VCORE_SW       21A4<> 40B1>
GPU_VCORE_SW_F     21A3<> 40B1>
GPU_VCORE_VDDCI    19C8< 19D6< 40B3>
GPU_Y              21D6<> 23B8<
HD_ADDR<0>         26C2<> 26C3<
HD_ADDR<2..0>      39C5>
HD_ADDR<1>         26C2<> 26C3<
HD_ADDR<2>         26B3< 26C1<>
HD_CS0_L           26C2<> 26C3< 39B5>
HD_CS1_L           26B3< 26C1<> 39B5>
HD_DATA<0>         26C2<> 26D3<
HD_DATA<15..0>     39C5>
HD_DATA<1>         26C2<> 26D3<
HD_DATA<2>         26D2<> 26D3<
HD_DATA<3>         26D2<> 26D3<
HD_DATA<4>         26C3< 26D2<>
HD_DATA<5>         26C3< 26D2<>
HD_DATA<6>         26C3< 26D2<>
HD_DATA<7>         26C3< 26D2<>
HD_DATA<8>         26C3< 26D1<>
HD_DATA<9>         26C3< 26D1<>
HD_DATA<10>        26C3< 26D1<>
HD_DATA<11>        26D1<> 26D3<
HD_DATA<12>        26B3< 26D1<>
HD_DATA<13>        26B3< 26D1<>
HD_DATA<14>        26C1<> 26C3<
HD_DATA<15>        26B3< 26C1<>
HD_DIOR_L          26A3< 26C2<> 39B5>
HD_DIOW_L          26A3< 26C1<> 39B5>
HD_DMACK_L         26A3< 26C2<> 39B5>
HD_DMARQ           13C6< 26C2<> 39B5>
HD_INTRQ           13C6< 26C1<> 39B5>
HD_IOCHRDY         26A3< 26C1<> 39B5>
HD_RESET_L         26A3< 26D2<> 39C5>
HIGH_VCORE         21A2<>
HIGH_VCORE_DIVD    21A3<
HPD_4V_REF         23C2<
HPD_PWR_SNS_EN     21C7<> 23C3<>
HPD_PWR_SW         23C1<
HPD_PWR_SW_BASE    23C2<>
HPD_REF_EN_L       23C2<>
IAC_FB             32D4<
IAC_RC_COMP        32D3<
ICT_TRST_L         6B2<> 6C2<
INTREPID_ACS_REF   8A5<
INT_AGPPVT         12D4<>
INT_AGP_FB_IN      12C4< 37C1>
INT_AGP_FB_OUT     12C4<> 37C1>
INT_AGP_VREF       12B5< 12D4<> 19D6< 40C3>
INT_CPUFB_IN       8A5< 8B5< 37D1>
INT_CPUFB_IN_NORM  8A4< 37D1>
INT_CPUFB_LONG     8A3< 37D1>
INT_CPUFB_OUT      8A5<> 8A5< 37D1>
INT_CPUFB_OUT_NORM  8A4< 37D1>
INT_CPUFB_OUT_SHORT  8A5< 37D1>
INT_DDRCLK2_N_TP   9B6<>
INT_DDRCLK2_P_TP   9B6<>
INT_DDRCLK5_N_TP   9B6<>
INT_DDRCLK5_P_TP   9B6<>
INT_ENET_RST_L     14B5<> 28B8<
INT_EXTINT3_PU     14A7< 14B5<>
INT_EXTINT8_PU     14B5<> 14C7<
INT_EXTINT10_PU    14B5<> 14B7<
INT_EXTINT13_PU    14B5<> 14B7<
INT_EXTINT14_PU    14B5<> 14C7<
INT_EXTINT16_PU    14B5<> 14B7<
INT_GPIO1_PU       14B7< 14C5<> 35C8<
INT_GPIO9_PU       14B5<> 14B7<
INT_GPIO12_PU      14B5<> 14B7<
INT_GPIO15_PU      14B5<> 14B7<
INT_I2C_CLK0       6B3<> 6D2< 11A5<> 11A8<> 13C2<
                   13C3<> 24D7<> 41C6>
INT_I2C_CLK1       13C2< 13C3<> 14B7< 24B3<> 25C2<>
                   27B4< 41C6>
INT_I2C_CLK2       14A2<> 27D7<> 41A6>
INT_I2C_DATA0      6B3<> 6D2< 11A5<> 11A8<> 13C2<
                   13C3<> 24D7<> 41C6>
INT_I2C_DATA1      13B2< 13C3<> 14B7< 24B3<> 25C2<>
                   27B4<> 41C6>
INT_I2C_DATA2      14A2<> 27D7<> 41A6>
INT_I2S0_SND_FROM_ADC  14B2< 27D7<> 41A6>
INT_I2S0_SND_LRCLK  14B1< 27D8<> 41A6>
INT_I2S0_SND_LRCLK_UF  14A3<>
INT_I2S0_SND_MCLK  14B1< 27D8<> 37B1> 41A6>
INT_I2S0_SND_MCLK_UF  14A3<>
INT_I2S0_SND_SCLK  14B1< 27D7<> 41A6>
INT_I2S0_SND_SCLK_UF  14A3<>
INT_I2S0_SND_TO_DAC  14B1< 27D8<> 41A6>
INT_I2S0_SND_TO_DAC_UF  14B3<>
INT_JTAG_TEI       13C2< 13C5< 41D6>
INT_MEM_REF_H      9B6< 40C3>
INT_MEM_VREF       9A7< 9B6<> 40C3>
INT_MOD_BITCLK     14A1< 27C3<
INT_MOD_BITCLK_UF  14A3<> 14A7<
INT_MOD_CLKOUT     14A1< 27C3<
INT_MOD_CLKOUT_UF  14A3<> 14A7<
INT_MOD_DTI        14A2< 14A7< 27C3<
INT_MOD_DTO        14B1< 27C3<
INT_MOD_DTO_UF     14A3<> 14A7<
INT_MOD_SYNC       14A1< 27C3<
INT_MOD_SYNC_UF    14A3<> 14A7<
INT_PCI_FB_IN      12C7< 37C1>
INT_PCI_FB_OUT     12C7<> 37C1>
INT_PEND_PROC_INT  14A5> 31C4<>
INT_PROC_SLEEP_REQ_L  14A5< 31B4<>
INT_PU_RESET_L     13D3< 27D5<> 31A2< 31C4<>
INT_REF_CLK_IN     14A5< 14B5< 37C1>
INT_REF_CLK_OUT    14A5< 14B7< 37C1>
INT_REF_CLK_OUT_UF  14A5<> 37C1>
INT_RESET_L        9B3< 13D3< 31C7< 31D4<>
INT_ROM_CS_L       12A5< 12C7>
INT_ROM_OE_L       12A5< 12C7>
INT_ROM_RW_L       12A5< 12C7>
INT_SUSPEND_ACK_L  8B5> 31B6<>
INT_SUSPEND_REQ_L  8B5< 31B6<> 31C7<
INT_TDO            13C5> 13D2< 14A6< 28A5<
INT_TST_MONIN_PD   13C2< 13C5< 41C6>
INT_TST_MONOUT_TP  13C5> 41C6>
INT_TST_PLLEN_PD   13C5< 13D2< 41C6>
INT_WATCHDOG_L     14A5> 31C6<>
INV_GND            23A1<> 41A6>
INV_ON_PWM         21C6<> 23A3<
```

```
IO_RESET_L         17A8< 24D7<> 25C2< 28B8< 31C6<>
                   31D7<
JTAG_ASIC_TCK      13C5< 13D2< 28A5< 41D6>
JTAG_ASIC_TDI      13C5< 13D2< 41D6>
JTAG_ASIC_TDO_TP   28A5> 41D6>
JTAG_ASIC_TMS      13C5< 13D2< 28A5< 41D6>
JTAG_ASIC_TRST_L   13C2< 13C5< 28A5< 41D6>
JTAG_CPU_TCK       5A2< 5B3< 6A3< 41D6>
JTAG_CPU_TDI       5B2< 5C3< 6B2<> 41D6>
JTAG_CPU_TDO_TP    5C3> 41D6>
JTAG_CPU_TMS       5B2< 5B3< 6B2<> 41D6>
JTAG_CPU_TRST_L    5B3< 6A4< 6B2<> 41D6>
KBDLED_ANODE       24B3<> 24D7<>
KBDLED_RETURN      24B3<> 24D7<>
KBD_CAPSLOCK_LED   41B3>
KBD_COMMAND_L      24C2< 31C6<> 41B3>
KBD_CONTROL_L      24C2< 31C6<> 41A3>
KBD_FUNCTION_L     24C2< 31B6<> 41B3>
KBD_ID             24D2< 31B6<> 41B3>
KBD_INTL           41B3>
KBD_JIS            41B3>
KBD_NUMLOCK_LED    41B3>
KBD_OPTION_L       24C2< 31B6<> 41B3>
KBD_SHIFT_L        24C2< 31C6<> 41A3>
KBD_X<0>           24D2< 31C6<>
KBD_X<0..9>        41A3>
KBD_X<1>           24D2< 31C6<>
KBD_X<2>           24C2< 31C6<>
KBD_X<3>           24C2< 31C6<>
KBD_X<4>           24C2< 31C6<>
KBD_X<5>           24C2< 31C6<>
KBD_X<6>           24C2< 31C6<>
KBD_X<7>           24C2< 31C6<>
KBD_X<8>           24C2< 31C6<>
KBD_X<9>           24C2< 31C6<>
KBD_Y<0..7>        41A3>
LCD_DIGON_L        23B6<
LCD_PWREN_L        23B5<>
LED_LINK10         28B5<>
LED_LINK100        28B5<>
LED_RX_SPN         28B5>
LID_CLOSED_L       24A3<> 41C1>
LM2594_IN          29D8<> 40A3>
LMU_DETECT         24C7< 24D6<> 41D1>
LT1962_INT_ADJ     14D7<
LT1962_INT_BYP     14D7<>
LTC1625_ITH        32D2<>
LTC1962_INT_VIN    14D8<> 40A1>
LTC3405_SW         28D4<> 40A3>
LTC3411_EN_L       36A7<
LTC3411_GND        36A5<> 40A1>
LTC3411_ITH        36A5<> 40A1>
LTC3411_ITH_RC     36A5< 40A1>
LTC3411_SHDN       36A6<> 40A1>
LTC3411_SYNC       36A6<> 40A1>
LTC3411_VCC        36A6< 36A7< 40B1>
LTC3707_START_RC   34B6<
LUX_ALS_GAIN_SW    24B8<> 24D6<
LUX_ALS_OUT        24B8<> 24D6<>
LVDS_DDC_CLK       21C5<> 23A4< 23B4<> 41B6>
LVDS_DDC_DATA      21C5<> 23A4< 23B4<> 41B6>
LVDS_L0N           21B5> 23B4<> 39C2> 41B6>
LVDS_L0P           21B5> 23B4<> 39C2> 41B6>
LVDS_L1N           21B5> 23B4<> 39C2> 41B6>
LVDS_L1P           21B5> 23B4<> 39C2> 41B6>
LVDS_L2N           21B5> 23A4<> 39C2> 41B6>
LVDS_L2P           21B5> 23A4<> 39C2> 41B6>
LVDS_L3N_TP        21B5>
LVDS_L3P_TP        21B5>
LVDS_U0N           39C2>
LVDS_U0P           39C2>
LVDS_U1N           39C2>
LVDS_U1P           39C2>
LVDS_U2N           39C2>
LVDS_U2P           39C2>
MAIN_RESET_L       14C7< 17A8< 18A7< 19B8< 20B6<
                   26D6<> 31D4<> 31D7< 41C3>
MASTER_SWING       20B7< 20D6<
MAX1715_GND        36B5<> 36C5< 40C1>
MAX1715_ON_RC      36C7<>
MAX1715_REF        36B5<> 40C1>
MAX1715_SKIP       36C4< 40C1>
MAX1715_TON        36C5< 40C1>
MAX1715_VCC        36D5< 40C1>
MAX4172_OUT        32D4<>
MAXBUS_SLEEP       5D2< 5D5< 6A3< 6B2< 6B4< 7B7< 7D8<
                   8B3< 8B8< 8C8< 8D1< 8D8< 15D8< 16D8<
                   35D8< 40D3>
MDI0_PD            28B4<
MDI1_PD            28B4<
MDI2_PD            28B4<
MDI3_PD            28B3<
MDI_M<0>           28B5<> 39D2>
MDI_M<0..3>        41A3>
MDI_M<1>           28B5<> 39D2>
MDI_M<2>           28B5<> 39C2>
MDI_M<3>           28B5<> 39C2>
MDI_P<0>           28B5<> 39D2>
MDI_P<0..3>        41A3>
MDI_P<1>           28B5<> 39D2>
MDI_P<2>           28B5<> 39C2>
MDI_P<3>           28B5<> 39C2>
MEM_ADDR<0>        9B5< 9D6<>
MEM_ADDR<12..0>    37A5>
MEM_ADDR<1>        9B5< 9D6<>
MEM_ADDR<2>        9B5< 9D6<>
MEM_ADDR<3>        9B5< 9D6<>
MEM_ADDR<4>        9B5< 9D6<>
MEM_ADDR<5>        9B5< 9D6<>
MEM_ADDR<6>        9B5< 9D6<>
MEM_ADDR<7>        9B5< 9D6<>
MEM_ADDR<8>        9B5< 9D6<>
MEM_ADDR<9>        9A5< 9D6<>
MEM_ADDR<10>       9A5< 9D6<>
MEM_ADDR<11>       9A5< 9D6<>
MEM_ADDR<12>       9A5< 9D6<>
MEM_BA<0>          9A5< 9D6<>
MEM_BA<1..0>       37A5>
MEM_BA<1>          9A5< 9C6<>
MEM_CAS_L          9A5< 9C6<> 37A5>
MEM_CKE<0>         9B6<> 9C5<
MEM_CKE<3..0>      37A5>
MEM_CKE<1>         9B6<> 9C5<
MEM_CKE<2>         9B6<> 9C5<
MEM_CKE<3>         9B6<> 9C5<
MEM_CS_L<0>        9C5< 9C6<>
MEM_CS_L<3..0>     37A5>
MEM_CS_L<1>        9C5< 9C6<>
MEM_CS_L<2>        9C5< 9C6<>
MEM_CS_L<3>        9C5< 9C6<>
MEM_DATA<0>        9D8<> 10C7<>
MEM_DATA<7..0>     37D5>
MEM_DATA<1>        9D8<> 10C7<>
MEM_DATA<2>        9D8<> 10C7<>
MEM_DATA<3>        9D8<> 10C7<>
MEM_DATA<4>        9D8<> 10C7<>
MEM_DATA<5>        9D8<> 10C7<>
MEM_DATA<6>        9D8<> 10C7<>
MEM_DATA<7>        9D8<> 10C7<>
MEM_DATA<8>        9D8<> 10C7<>
MEM_DATA<15..8>    37D5>
MEM_DATA<9>        9D8<> 10C7<>
MEM_DATA<10>       9D8<> 10C7<>
MEM_DATA<11>       9D8<> 10C7<>
MEM_DATA<12>       9D8<> 10B7<>
MEM_DATA<13>       9C8<> 10B7<>
MEM_DATA<14>       9C8<> 10B7<>
MEM_DATA<15>       9C8<> 10B7<>
MEM_DATA<16>       9C8<> 10C5<>
MEM_DATA<23..16>   37C5>
MEM_DATA<17>       9C8<> 10C5<>
MEM_DATA<18>       9C8<> 10C5<>
MEM_DATA<19>       9C8<> 10C5<>
MEM_DATA<20>       9C8<> 10C5<>
MEM_DATA<21>       9C8<> 10C5<>
MEM_DATA<22>       9C8<> 10C5<>
MEM_DATA<23>       9C8<> 10C5<>
MEM_DATA<24>       9C8<> 10C5<>
MEM_DATA<31..24>   37C5>
MEM_DATA<25>       9C8<> 10C5<>
MEM_DATA<26>       9C8<> 10C5<>
MEM_DATA<27>       9C8<> 10C5<>
MEM_DATA<28>       9C8<> 10C5<>
MEM_DATA<29>       9C8<> 10B5<>
MEM_DATA<30>       9C8<> 10B5<>
MEM_DATA<31>       9C8<> 10B5<>
MEM_DATA<32>       9C8<> 10C3<>
MEM_DATA<39..32>   37C5>
```

```
MEM_DATA<33>       9C8<> 10C3<>
MEM_DATA<34>       9C8<> 10C3<>
MEM_DATA<35>       9C8<> 10C3<>
MEM_DATA<36>       9C8<> 10C3<>
MEM_DATA<37>       9C8<> 10C3<>
MEM_DATA<38>       9C8<> 10C3<>
MEM_DATA<39>       9B8<> 10C3<>
MEM_DATA<40>       9B8<> 10C3<>
MEM_DATA<47..40>   37B5>
MEM_DATA<41>       9B8<> 10C3<>
MEM_DATA<42>       9B8<> 10C3<>
MEM_DATA<43>       9B8<> 10C3<>
MEM_DATA<44>       9B8<> 10C3<>
MEM_DATA<45>       9B8<> 10B3<>
MEM_DATA<46>       9B8<> 10B3<>
MEM_DATA<47>       9B8<> 10B3<>
MEM_DATA<48>       9B8<> 10C1<>
MEM_DATA<55..48>   37B5>
MEM_DATA<49>       9B8<> 10C1<>
MEM_DATA<50>       9B8<> 10C1<>
MEM_DATA<51>       9B8<> 10C1<>
MEM_DATA<52>       9B8<> 10C1<>
MEM_DATA<53>       9B8<> 10C1<>
MEM_DATA<54>       9B8<> 10C1<>
MEM_DATA<55>       9B8<> 10C1<>
MEM_DATA<56>       9B8<> 10C1<>
MEM_DATA<63..56>   37A5>
MEM_DATA<57>       9B8<> 10C1<>
MEM_DATA<58>       9B8<> 10C1<>
MEM_DATA<59>       9B8<> 10C1<>
MEM_DATA<60>       9B8<> 10C1<>
MEM_DATA<61>       9B8<> 10B1<>
MEM_DATA<62>       9B8<> 10B1<>
MEM_DATA<63>       9B8<> 10B1<>
MEM_DQM<0>         9C6<> 10C7<> 37D5>
MEM_DQM<1>         9C6<> 10B7<> 37D5>
MEM_DQM<2>         9C6<> 10C5<> 37C5>
MEM_DQM<3>         9C6<> 10B5<> 37C5>
MEM_DQM<4>         9C6<> 10C3<> 37B5>
MEM_DQM<5>         9C6<> 10B3<> 37B5>
MEM_DQM<6>         9C6<> 10C1<> 37B5>
MEM_DQM<7>         9C6<> 10B1<> 37A5>
MEM_DQS<0>         9C6<> 10C7<> 37D5>
MEM_DQS<1>         9C6<> 10B7<> 37D5>
MEM_DQS<2>         9C6<> 10C5<> 37C5>
MEM_DQS<3>         9C6<> 10B5<> 37C5>
MEM_DQS<4>         9C6<> 10C3<> 37B5>
MEM_DQS<5>         9C6<> 10B3<> 37B5>
MEM_DQS<6>         9C6<> 10C1<> 37B5>
MEM_DQS<7>         9C6<> 10B1<> 37A5>
MEM_MUXSEL_LSB     9B6<> 10B5<> 10B7<> 37A5>
MEM_MUXSEL_LSB_L_TP  9B6<>
MEM_MUXSEL_MSB     9B6<> 10B1<> 10B3<> 37A5>
MEM_MUXSEL_MSB_L_TP  9B6<>
MEM_RAS_L          9A5< 9C6<> 37A5>
MEM_WE_L           9A5< 9C6<> 37A5>
MMM_ACC_DETECT     25B8<> 25C2<>
MMM_ACC_PWRDOWN    25B8<> 25C1< 25C7<>
MMM_ACC_SELFTEST   25B8<> 25C2<> 25C7<> 41C1>
MMM_ACC_X_AXIS     25C5> 25C6< 25D2<> 41C1>
MMM_ACC_Y_AXIS     25B6< 25C2<> 25C5> 41C1>
MMM_ACC_Z_AXIS     25B6< 25C2<> 25C5> 41C1>
MMM_FFIRQ_L        14A6< 14B5<> 25C1<
MMM_PIC_AAC_PWRDOWN  25C2<>
MMM_PIC_AN2_PD     25C4<>
MMM_PIC_AN3_PU     25C4<>
MMM_PIC_FFIRQ_L    25C2<>
MMM_PIC_SIRQ_L     25C2<>
MMM_RESET_L        25C1< 25C2<>
MMM_SIRQ_L         14A6< 14B5<> 25C1<
MPIC_CPU_INT_L     5B2< 5B3< 14B5>
MSEN_M             20B7> 20D7<
MSEN_S             20B4> 20D6<
NEC_AMC_TP         17A5<
NEC_AVDD           17D6< 40A3>
NEC_AVSS_F         17A5< 17B4<
NEC_CRUN_L         17A7<>
NEC_IDSEL          17B7<
NEC_IO_RESET_L     17A7< 17B7<
NEC_LEGC           17A7< 17A8<
NEC_LUSB_OCI       17B3< 17B5<
NEC_LUSB_OCI_UF    17B1< 27D8<> 41A6>
NEC_LUSB_PPON      17B5> 27D8<> 41A6>
NEC_MAIN_RESET_L   17A7< 17A7<
NEC_NANDTESTEN_TP  17A4<
NEC_NANDTESTOUT_TP  17A4<>
NEC_NC<1>          17B5<>
NEC_NC<2>          17B5<>
NEC_OCI<3>         17B5<
NEC_OCI<4>         17B5<
NEC_OCI<5>         17B5<
NEC_PCI_GNT_L      12C7<> 17B7<
NEC_PCI_INTA_L     17B7<>
NEC_PCI_INTB_L     17B7<>
NEC_PCI_INTC_L     17B7<>
NEC_PCI_INT_L      14B5<> 14D7< 17B8<
NEC_PCI_REQ_L      12A7< 12D7<> 17B7>
NEC_PME_L          17A7> 17A7<
NEC_PPON3_TP       17B5>
NEC_PPON4_TP       17B5>
NEC_PPON5_TP       17B5>
NEC_RREF           17B5<>
NEC_RUSB_OCI       17B3< 17B5<
NEC_RUSB_OCI_UF    17B1< 27D1<> 41D3>
NEC_RUSB_PPON      17B5> 27D1<> 41D3>
NEC_SMI_L_TP       17A7>
NEC_USB_DAM        17D2<> 27D7<> 39B2> 41D3>
NEC_USB_DAP        17D2<> 27D7<> 39B2> 41D3>
NEC_USB_DBM        17C2<> 27D2<> 39B2> 41D3>
NEC_USB_DBP        17C2<> 27D2<> 39B2> 41D3>
NEC_USB_RSDM1      17C5<>
NEC_USB_RSDM2      17C5<>
NEC_USB_RSDP1      17C5<>
NEC_USB_RSDP2      17C5<>
NEC_XT1            17D5<
NEC_XT2            17D5<>
NEC_XT2_R          17D4<
OVER_18V_ADJ       32C3<>
PCI1510_VR_EN_L    18C7<
PCI_AD<0>          9C3< 12D6<> 17D7<> 18C7<> 26B5<>
PCI_AD<31..0>      39C5> 41D3>
PCI_AD<1>          9C3< 12D6<> 17D7<> 18C7<> 26B6<>
PCI_AD<2>          9C3< 12D6<> 17D7<> 18C7<> 26C5<>
PCI_AD<3>          9C3< 12D6<> 17C7<> 18C7<> 26C6<>
PCI_AD<4>          9C3< 12D6<> 17C7<> 18C7<> 26C5<>
PCI_AD<5>          9C3< 12D6<> 17C7<> 18C7<> 26C6<>
PCI_AD<6>          9C3< 12C6<> 17C7<> 18C7<> 26C5<>
PCI_AD<7>          9C3< 12C6<> 17C7<> 18C7<> 26C6<>
PCI_AD<8>          9C3< 12C6<> 17C7<> 18C7<> 26C6<>
PCI_AD<9>          9C3< 12C6<> 17C7<> 18C7<> 26C5<>
PCI_AD<10>         9C3< 12C6<> 17C7<> 18C7<> 26C6<>
PCI_AD<11>         9C3< 12C6<> 17C7<> 18C7<> 26C5<>
PCI_AD<12>         9C3< 12C6<> 17C7<> 18C7<> 26C6<>
PCI_AD<13>         9C3< 12C6<> 17C7<> 18C7<> 26C5<>
PCI_AD<14>         9C3< 12C6<> 17C7<> 18C7<> 26C6<>
PCI_AD<15>         9C3< 12C6<> 17C7<> 18C7<> 26C5<>
PCI_AD<16>         9C3< 12C6<> 17C7<> 18C7<> 26C5<>
PCI_AD<17>         9C3< 12C6<> 17C7<> 18C7<> 26C6<>
PCI_AD<18>         9C3< 12C6<> 17C7<> 18B7<> 26C5<>
                   26D4<
PCI_AD<19>         9B3< 12C6<> 17C7<> 18B7<> 26C6<>
PCI_AD<20>         9B3< 12C6<> 17C7<> 18B7<> 26C5<>
PCI_AD<21>         12C6<> 17C7<> 18B7<> 26C6<>
PCI_AD<22>         12C6<> 17C7<> 18B7<> 26C5<>
PCI_AD<23>         12C6<> 17C7<> 18B7<> 26C6<>
PCI_AD<24>         9C1<> 12C6<> 17C7<> 18B7<> 26C5<>
PCI_AD<25>         9C1<> 12C6<> 17C7<> 18B7<> 26C6<>
PCI_AD<26>         9C1<> 12C6<> 17C7<> 18B7<> 26C5<>
PCI_AD<27>         9C1<> 12C6<> 17C8<> 18B7<> 26D6<>
PCI_AD<28>         9C1<> 12C6<> 17C7<> 18B7<> 26C5<>
PCI_AD<29>         9C1<> 12C6<> 17B7<> 18B7<> 26D6<>
PCI_AD<30>         9C1<> 12C6<> 17B7<> 18B7<> 26D5<>
PCI_AD<31>         9C1<> 12C6<> 17B7<> 18B7<> 26D6<>
PCI_CBE<0>         12C7<> 17B7<> 18B7<> 26C5<>
PCI_CBE<3..0>      39C5>
PCI_CBE<1>         12C7<> 17B7<> 18B7<> 26C6<>
PCI_CBE<2>         12C7<> 17B7<> 18B7<> 26C6<>
PCI_CBE<3>         12C7<> 17B7<> 18B7<> 26C6<>
PCI_DEVSEL_L       12B7< 12C7<> 17B7<> 18A7<> 26C5<>
                   39C5> 41C3>
PCI_FRAME_L        12B7< 12C7<> 17B7<> 18B7<> 26C5<>
                   39C5> 41D3>
PCI_IRDY_L         12B7< 12C7<> 17B7<> 18B7<> 26C6<>
                   39C5> 41D3>
PCI_PAR            12C7<> 17B7<> 18B7<> 26C5<> 39C5>
                   41C3>
PCI_PERR_L         17B7<> 18B7<> 18D7<
PCI_SERR_L         17B7> 18B7> 18D7<
```


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```
PCI_STOP_L       12A7< 12C7<> 17B7<> 18B7<> 26C5<>
                 39C5> 41C3>
PCI_TRDY_L       12B7< 12C7<> 17B7<> 18A7<> 26C5<>
                 39C5> 41D3>
PLL_STOP_L        7C4<> 7C8<>
PMU_ACK_L        14C2< 31C4<>
PMU_AC_DET       31A5< 31B4<>
PMU_AC_IN        31B4<>
PMU_BATT0_DET_L  31B4<>
PMU_BATT1_DET_L_PU  31B4<> 31D2<
PMU_BATT_DET_L   31A8<> 31B3< 31D2< 32A4<> 41A3>
PMU_BYTE         31B6< 31C7<
PMU_CHARGE_V     31C4<> 32B8<>
PMU_CHRG_BATT_B  31C4<> 32A8<>
PMU_CLK          14C2<> 31C4<>
PMU_CNVSS        31B6< 31C7<
PMU_CPU_HRESET_L  6A2< 6C3<> 31C4<> 41C1>
PMU_CUSTOM_RESET  31A7<> 31B8<
PMU_CUSTOM_RESET_L  31A8<>
PMU_EPM          31C4<> 31D2<
PMU_FROM_INT     14C2<> 31C4<>
PMU_I2C_CLK      31B4<> 31C2<
PMU_I2C_DATA     31B4<> 31C2<
PMU_INT_L        14B5<> 14B7< 31B6<>
PMU_INT_NMI      14B5<> 14B7< 31D4<>
PMU_KB_RESET_L   41C1>
PMU_LID_CLOSED_L  24A1< 24D6<> 31B2< 31C4<> 41D1>
PMU_NMI_BUTTON_L  31C2< 31C4<>
PMU_NMI_L        31C2< 31C4<>
PMU_OOPS         31B2< 31B4<>
PMU_PME_L        14A5<> 17A8< 26D5<> 31B2< 31C4<>
                 41C3>
PMU_POWERUP_OK   31B4<> 31D2<
PMU_POWER_UP_L   30C8<> 31C6<> 31D7< 34B8<
PMU_RFQ_L        14B7< 14C2> 31C4<>
PMU_RESET_BUTTON_L  24A7< 31C4<> 31D2<
PMU_RESET_L      31B6< 31B7>
PMU_SELECT       31C6<>
PMU_SLEEP_LED    24C7<> 24D6<> 41D1>
PMU_SLEEP_LED_L  24C8<> 31C4<>
PMU_SMB_CLK      31B4<> 31C2< 32A3<
PMU_SMB_DATA     31B4<> 31C2< 32A2<
PMU_TO_INT       14C2<> 31C4<>
POWER_UP         30D7<>
POWER_VALID      31B2< 31C4<>
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PP3V3_MMM_PIC    25C1< 25D5<
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PP3V3_SI_AVCC2   20C5< 20D7<
PP3V3_SI_PVCC1   20C7<
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RAM_DATA_A<7..0>  37D5>
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RAM_DATA_A<63>   10C1<> 11A6<>
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RAM_DATA_B<7..0>  37D5>
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RAM_DATA_B<8>    10C8<> 11D5<>
RAM_DATA_B<15..8>  37C5>
RAM_DATA_B<9>    10C8<> 11D5<>
RAM_DATA_B<10>   10C8<> 11D5<>
RAM_DATA_B<11>   10C8<> 11D5<>
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RAM_DATA_B<13>   10C8<> 11D3<>
RAM_DATA_B<14>   10C8<> 11D3<>
RAM_DATA_B<15>   10C8<> 11D3<>
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RAM_DATA_B<23..16>  37C5>
RAM_DATA_B<17>   10C6<> 11C5<>
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RAM_DATA_B<39..32>  37B5>
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RAM_WE_L         9A4< 11B5<> 11B8<> 37A5>
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RF_DISABLE_L     26D6<> 41C3>
ROM_CS_L         9B3< 12A4< 41C3>
ROM_CS_TP_L      9C4< 26B6<>
ROM_OE_L         9B3< 12A4< 41C3>
ROM_OE_TP_L      9B3< 26C5<>
ROM_ONBOARD_CS_L  9B3< 41C3>
ROM_ONBOARD_CS_TP_L  9B3< 26C6<>
ROM_RW_L         9B3< 12A4< 41C3>
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ROM_WP_L         9B3<
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SI_I2C_CLK       20B4< 20B7< 20D7< 21C5<>
SI_I2S_DATA      20B4<> 20B7<> 20D7< 21C5<>
SI_M_HTPLG       20B7<
SI_RESET_L       20B6< 21C7<>
SI_RESET_L_R     20B4< 20B7< 20D7<
SI_SECONDARY     20A8< 20D6<>
SI_S_HTPLG       20B4<
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SI_TMDS_CLKP     20A7< 20C2< 38D1>
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SLEEP_LED_L      24D4<
SLEEP_LED_SW_L   24D4<>
SLEEP_LED_UF     24D3<
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SND_AMP_MUTE_CTRL  27B5<> 27D6<>
SND_AMP_MUTE_L   14B5<> 27D5<>
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SND_HP_MUTE_LO   27C6<> 27C7<>
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SND_HW_RESET_L   14A8< 14B5<> 27D7<> 41A6>
SND_LIN_SENSE_L  14B5<> 27C8<> 41A6>
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SYSCLK_CPU_UF    8A5<> 37D1>
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SYSCLK_DDRCLK_A0_L  9D4< 11D8<> 37C1>
SYSCLK_DDRCLK_A0_L_UF  9B6<> 9D5< 37D1>
SYSCLK_DDRCLK_A0_UF  9B6<> 9D5< 37D1>
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SYSCLK_DDRCLK_A1_L  9D4< 11A6<> 37C1>
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SYSCLK_DDRCLK_B0_L  9C4< 11D5<> 37C1>
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SYSCLK_DDRCLK_B1_L  9D4< 11A3<> 37C1>
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THERM_L_OC       27B1<> 31B4<>
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TMDS_CONN_CLKP   23C6<> 23C7<> 38C1> 41C6>
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TMDS_DN<3>       20B1< 20B2< 23B4<> 38B1>
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TPAD_F_TXD       41B3>
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TPAD_TXD         31B2< 31C4<>
TPS2211_SHTDWN_L  18C5<
TP_BB_XTAL1      6C3<>
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TV_COMP          23A6<> 41A6>
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TV_GND2          23A6<> 40B6> 41A6>
TV_Y             23A6<> 41A6>
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SIZE	DRAWING NUMBER	REV.
D	051-6680	E
SCALE: NONE	SHT 44 OF 46	

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*** Part Cross-Reference for the entire design ***

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RP41	RPAK4P	31
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U2	NC7S32	23
U3	AMP_MAX4172	32
U4	PWR_CNTRL_TPS2211	18
U5	FAN2558	5
U6	MAX1772	32
U7	MAX1717	35
U8	PCI1510GGU	18
U9	SN74AUC1G08	6
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U11	FEPR_1MX8	9
U12	SN74AUC1G04	7
U13	LTC1625	33
U14	COMPARATOR_LMC7211	33
U15	PIC16F818_QFN	25
U16	CBTV4020	10
U17	UPD720101_FBGA	17
U18	CBTV4020	10
U19	MAX1715	36
U20	KXM52	25
U21	741125	24
U22	VREG_LP2951	33
U23	VREG_LP2951	33
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U27	CBTV4020	10
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U30	CLK_GEN_CY25811	19
U31	CLK_GEN_CY28512	14
U32	LTC1778	21
U33	COMPARATOR_LMC7211	31
U34	VREG_MM1571J	22
U35	LTC3707	34
U36	TSB81BA3A	29
U37	VREG_LM2594	29
U38	VREG_LT1962	29
U39	741G32	23
U40	741G32	23
U41	INA138	25
U42	COMPARATOR_LMC7211	23
U43	TRANSCEIVER_88E1111	28
U44	LTC1761	29
U45	LTC3405	28
U46	LTC3411	36
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U49	VREG_LT1962	14
U50	TRA_SI3447DV	36
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