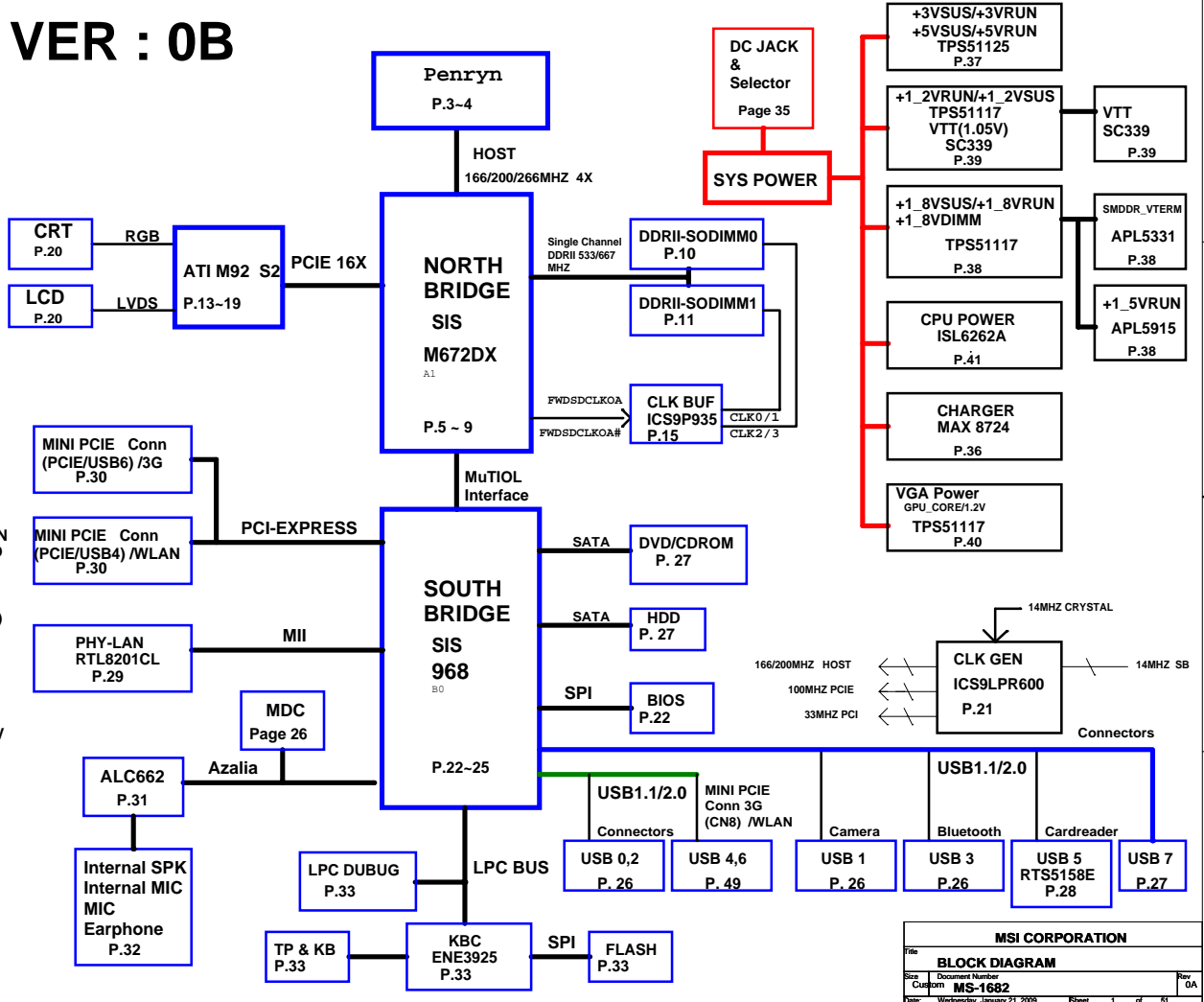


MS-1682 VER : 0B

- 01_BLOCK DIAGRAM
- 02_PLATFORM
- 03_PENRYN-1 (HOST BUS)
- 04_PENRYN-2 (POWER/GND)
- 05_M672DX-1 (HOST BUS & PCIE)
- 06_M672DX-2 (MutI/O)
- 07_M672DX-3 (DDR2)
- 08_M672DX-4 (POWER)
- 09_M672DX-5 (VSS)
- 10_DDR2 SODIMM 0
- 11_DDR2 SODIMM 1
- 12_DDR2 TERMINATION
- 13_M92M-host-lvds
- 14_M92M-IO
- 15_M92M-power
- 16_M92M-power-straps
- 17_M92M_MEM_Interface
- 18_M92M_DDR2_A0
- 19_M92M_DDR2_A1
- 20_CRT & LVDS_CONN
- 21_CLOCK GEN & Dimm BUF
- 22_SIS968-1 (PCI/IDE/SPI/MutIO)
- 23_SIS968-2 (USB/SATA)
- 24_SIS968-3 (CPU/HD/PCIE/GPIO)
- 25_SIS968-4 (POWER/GND)
- 26_USBX2&Camera&MDC&BT_CONN
- 27_HDD & ODD CONN & NEW CARD
- 28_RT55158E_CARD READER
- 29_PHY LAN (RTL8201CL)
- 30_MINI_PCIECARD & LED & SW
- 31_AUDIO(ALC662) / AMP(APA2031)
- 32_SPK & HP & MIC
- 33_KBC/EC/uP (ENE3925)
- 34_PWRGD & FAN & C3/C4
- 35_Battery select
- 36_Battery Charger
- 37_M_System Power
- 38_M_1.8V & SMDRR_VTERM & 1.5V
- 39_M_1.2V & VTT power
- 40_VGA power
- 41_CPU power
- 42_Screw
- 43_EMI
- 44_Power Sequence-1
- 45_Power Sequence-2
- 46_Power Sequence_3
- 47_Launch Board
- 48_TP Board
- 49_USBx2 & RJ45 & RJ11 Board



MSI CORPORATION			
File	BLOCK DIAGRAM		
Size	Document Number	Rev	0A
Custom	MS-1682		
Date	Wednesday, January 21, 2009	Sheet	1 of 61

Voltage Rails

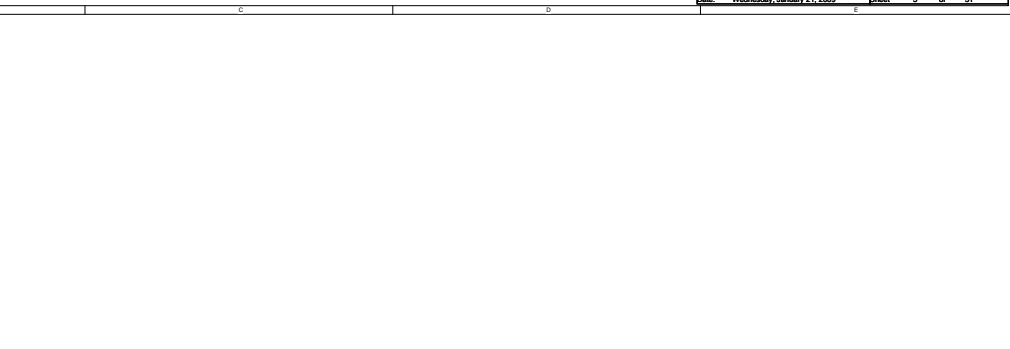
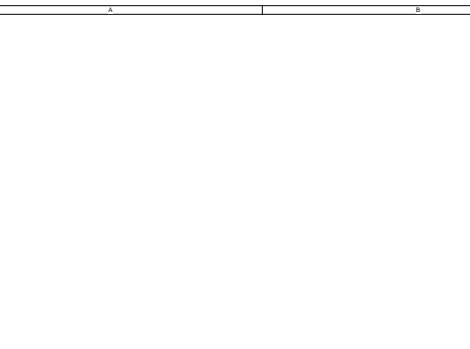
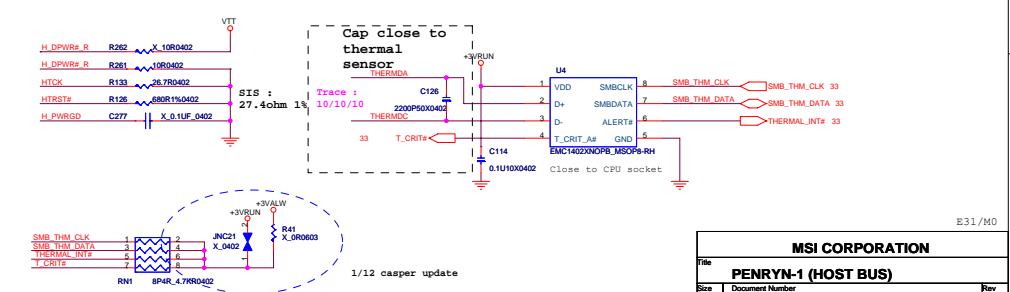
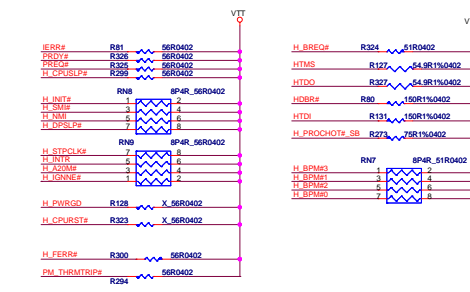
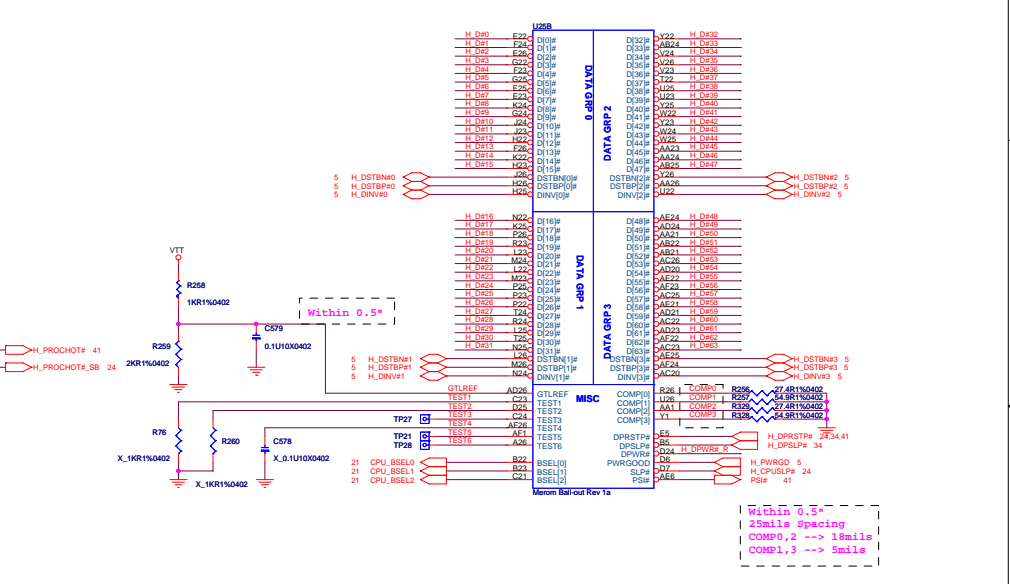
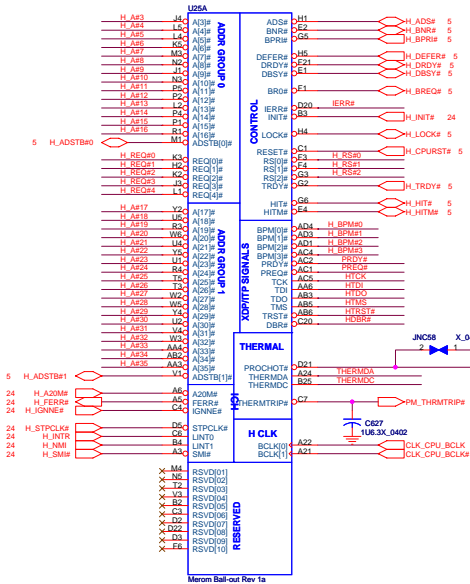
Voltage	Description	Control Signal
PWR_SRC	AC ADAPTER OR BATTERY IN	
V_CORE	Core Voltage for Processor	VR_ON
+VTT	1.05 rail for Processor & SIS968 GTL IO	+1_5VM_PG
+1_5VRUN	1.5V switched power rail(off in S3-S5)	+5VRUN
+1_2VRUN	1.2V power rail SISM672FX Analog (off in S3-S5)	RUND (RUN_ON)
+3VRUN	3.3V switched power rail(off in S3-S5)	RUND (RUN_ON)
+5VRUN	5.0V switched power rail(off in S3-S5)	RUND (RUN_ON)
SMDDR_VTERM	0.9V DDR Termination voltage (off in S4-S5)	RUN_ON
+1_8VDIMM	1.8V power rail DDRII (off in S4-S5)	DIMM_ON
+1_8VRUN	1.8V power for SIS968 MuTIOL IO and core logic (off in S3-S5)	RUND (RUN_ON)
+1_8VSUS	1.8V power rail for SB core logic (off in S4-S5)	SUS_ON
+3VSUS	3.3V power rail (off in S4-S5)	SUS_ON
+5VSUS	5.0V power rail (off in S4-S5)	SUS_ON
+3VALW	3.3V always on power rail	PWR_SRC
+5VALW	5.0V always on power rail	PWR_SRC
+V5_AUDIO	5.0V Power rail Audio codec(off in S3-S5)	RUND
+1_2VSUS	1.2V power rail SISM672FX Digital (off in S4-S5)	SUS_ON

POWER STATES

STATE	SIGNAL	SLP_S3#	SLP_S5#	+V*ALWAYS	+V*SUS	+V*RUN	Clocks	+1_8VDIMM
Full ON		HIGH	HIGH	ON	ON	ON	ON	ON
S1(Power On Suspend)		HIGH	HIGH	ON	ON	ON	LOW	ON
S3(Suspend to RAM)		LOW	HIGH	ON	ON	OFF	OFF	ON
S4(Suspend to Disk)		LOW	LOW	ON	OFF	OFF	OFF	OFF
S5 / Soft OFF		LOW	LOW	ON	OFF	OFF	OFF	OFF

Note : WHEN AC MODE , System turn on then +V*SUS will always keep high

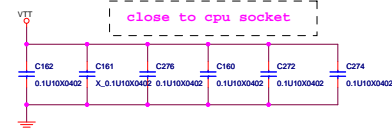
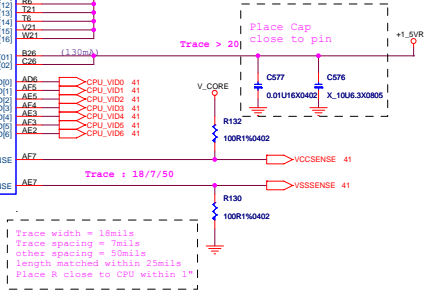
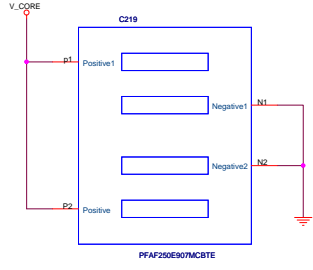
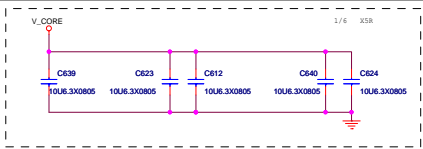
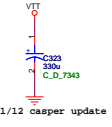
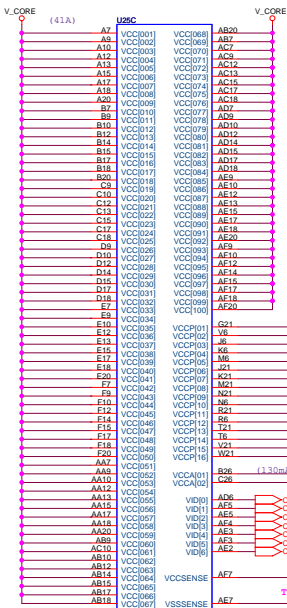
MSI CORPORATION		
File	PLATFORM	
Size	Document Number	Rev
Custom	MS-1682	0A
Date	Wednesday, January 21, 2009	Sheet 2 of 51



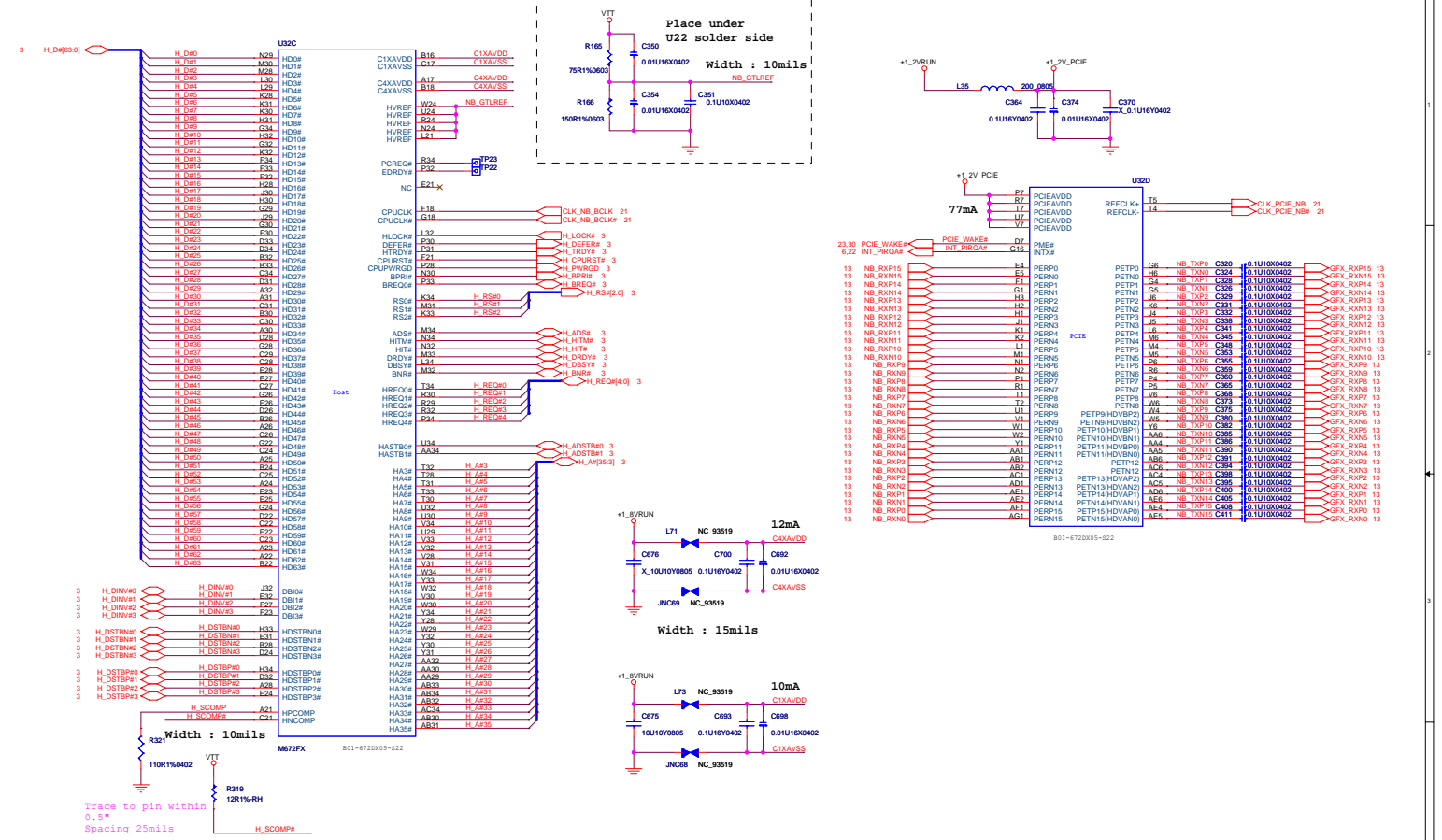
MSI CORPORATION	
PENRYN-1 (HOST BUS)	
Doc No	MS-1682
Date	Wednesday, January 21, 2009
Sheet	3 of 51

E31/M0

U29D		
A1	VSS001	VSS082
A1	VSS002	VSS083
A11	VSS003	VSS084
A11	VSS004	VSS085
A11	VSS005	VSS086
A19	VSS006	VSS087
A19	VSS007	VSS088
A2	VSS008	VSS089
A2	VSS009	VSS090
B1	VSS010	VSS091
B1	VSS011	VSS092
B11	VSS012	VSS093
B11	VSS013	VSS094
B11	VSS014	VSS095
B2	VSS015	VSS096
B2	VSS016	VSS097
C1	VSS017	VSS098
C1	VSS018	VSS099
C11	VSS019	VSS100
C11	VSS020	VSS101
C16	VSS021	VSS102
C16	VSS022	VSS103
C2	VSS023	VSS104
C2	VSS024	VSS105
D1	VSS025	VSS106
D1	VSS026	VSS107
D1	VSS027	VSS108
D11	VSS028	VSS109
D11	VSS029	VSS110
D11	VSS030	VSS111
D16	VSS031	VSS112
D16	VSS032	VSS113
D16	VSS033	VSS114
D2	VSS034	VSS115
D2	VSS035	VSS116
E1	VSS036	VSS117
E1	VSS037	VSS118
E11	VSS038	VSS119
E11	VSS039	VSS120
E11	VSS040	VSS121
E2	VSS041	VSS122
E2	VSS042	VSS123
E2	VSS043	VSS124
F1	VSS044	VSS125
F1	VSS045	VSS126
F11	VSS046	VSS127
F11	VSS047	VSS128
F11	VSS048	VSS129
F19	VSS049	VSS130
F2	VSS050	VSS131
F2	VSS051	VSS132
G1	VSS052	VSS133
G1	VSS053	VSS134
G2	VSS054	VSS135
G2	VSS055	VSS136
G2	VSS056	VSS137
H1	VSS057	VSS138
H1	VSS058	VSS139
H2	VSS059	VSS140
H2	VSS060	VSS141
J1	VSS061	VSS142
J1	VSS062	VSS143
J2	VSS063	VSS144
J2	VSS064	VSS145
K1	VSS065	VSS146
K1	VSS066	VSS147
K2	VSS067	VSS148
K2	VSS068	VSS149
L1	VSS069	VSS150
L1	VSS070	VSS151
L2	VSS071	VSS152
L2	VSS072	VSS153
M1	VSS073	VSS154
M1	VSS074	VSS155
M2	VSS075	VSS156
M2	VSS076	VSS157
M2	VSS077	VSS158
N1	VSS078	VSS159
N1	VSS079	VSS160
N2	VSS080	VSS161
N2	VSS081	VSS162
N2	VSS082	VSS163

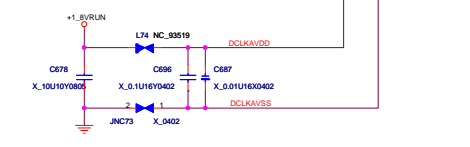
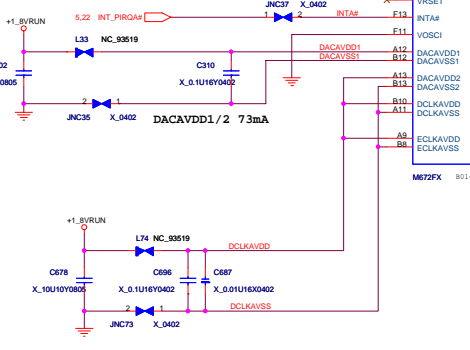
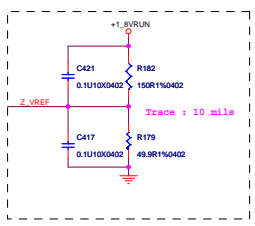
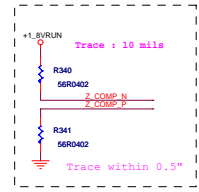
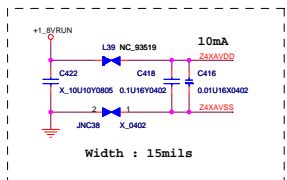
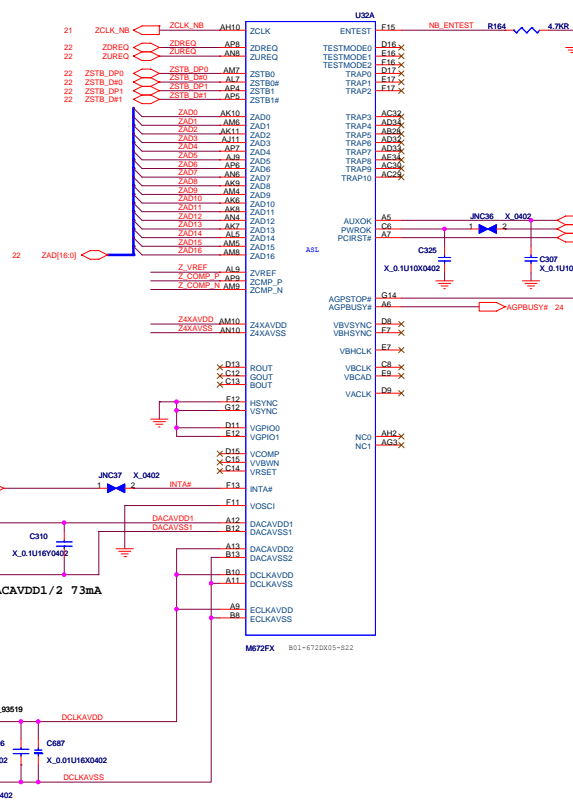


Trace width = 18mil
 Trace spacing = 7mil
 other spacing = 50mil
 length matched within 25mil
 Place R close to CPU within 1"



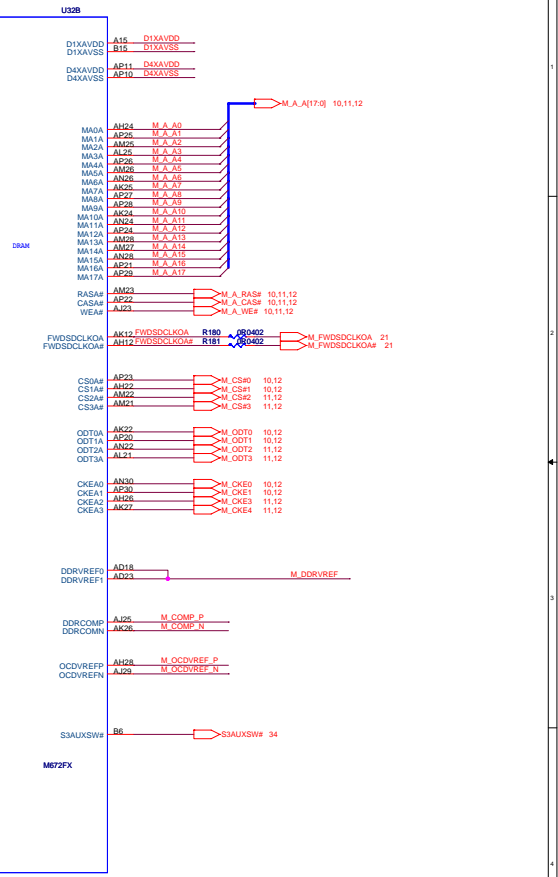
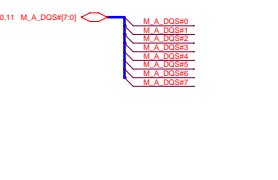
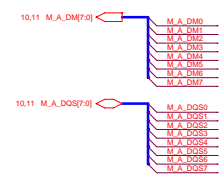
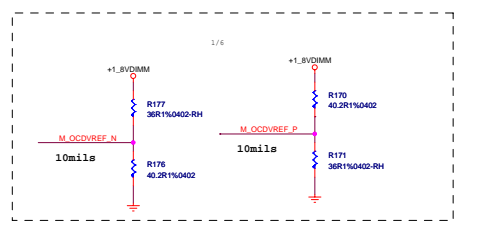
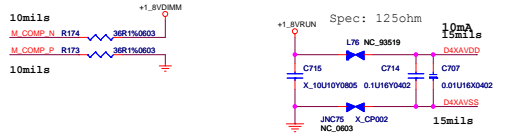
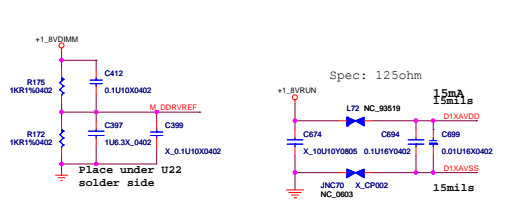
E49 / M0

MSI CORPORATION			
672DX-1 (HOST BUS & PCIE)			
File	Document Number		
Size	Custom	MS-1682	Rev 0A
Date	Wednesday, January 21, 2009	Sheet	6 of 61



E1.2/M0

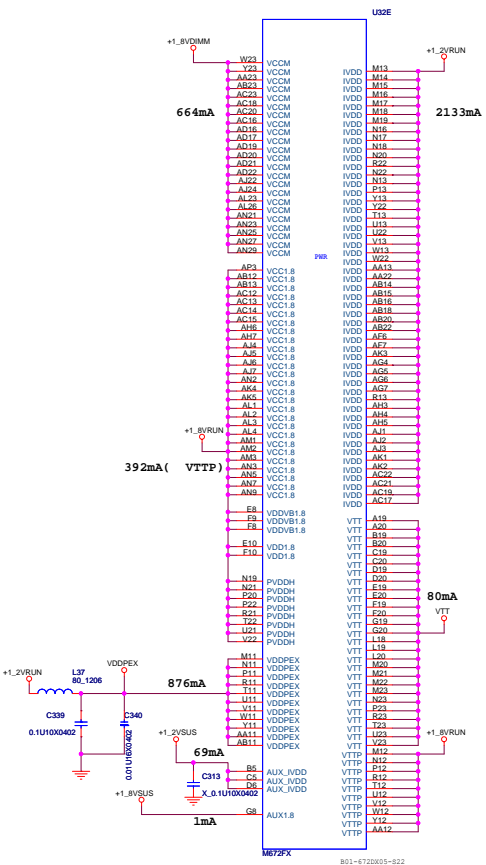
MSI CORPORATION		
File	672DX-2 (MultiO&VGA)	
Size	Document Number	Rev
Custom	MS-1682	0A
Date	Wednesday, January 21, 2009	Sheet 6 of 61



801-6720035-022

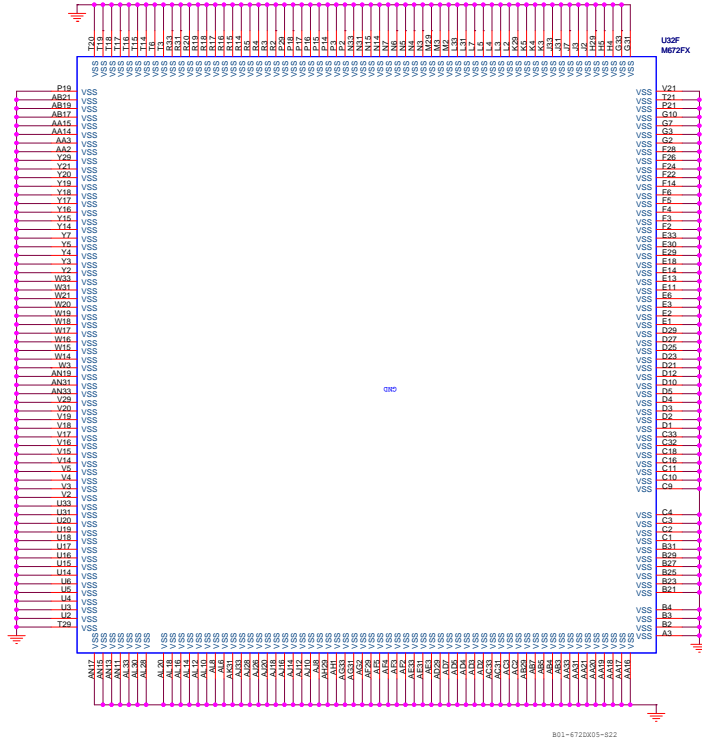
E17/M0

MSI CORPORATION	
File	672DX-3 (DDR2)
Size	Document Number
Custom	MS-1682
Date	Wednesday, January 21, 2009
Sheet	7 of 81
Rev	0A

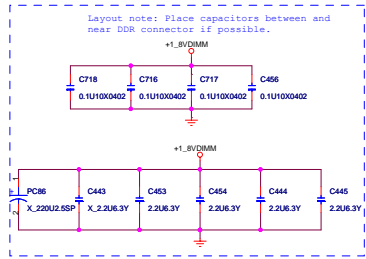
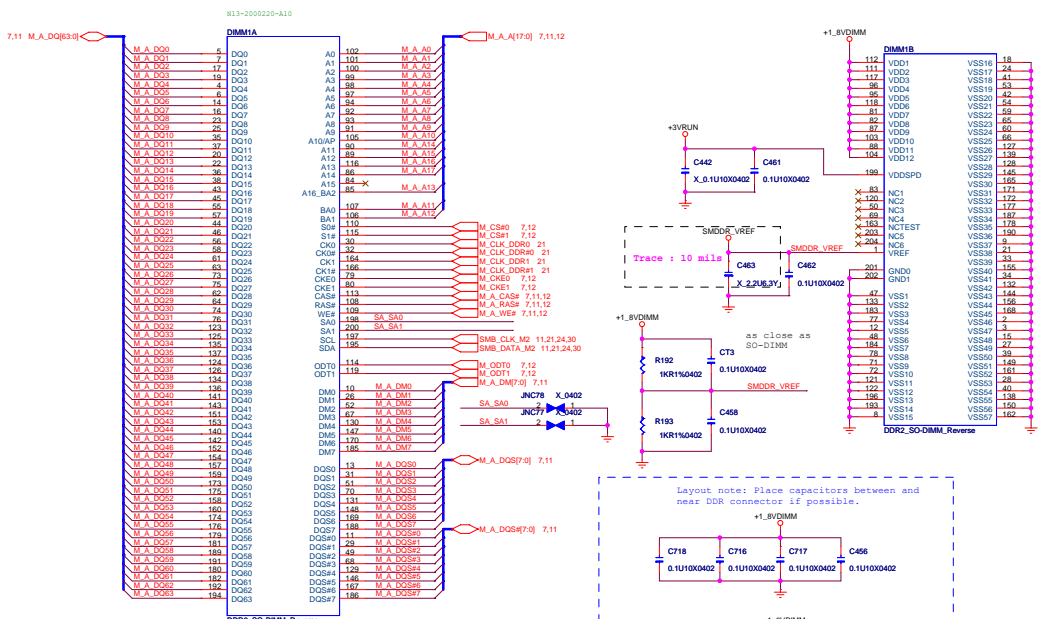


802-672005-022

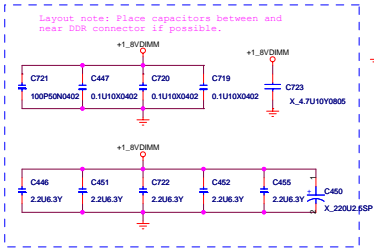
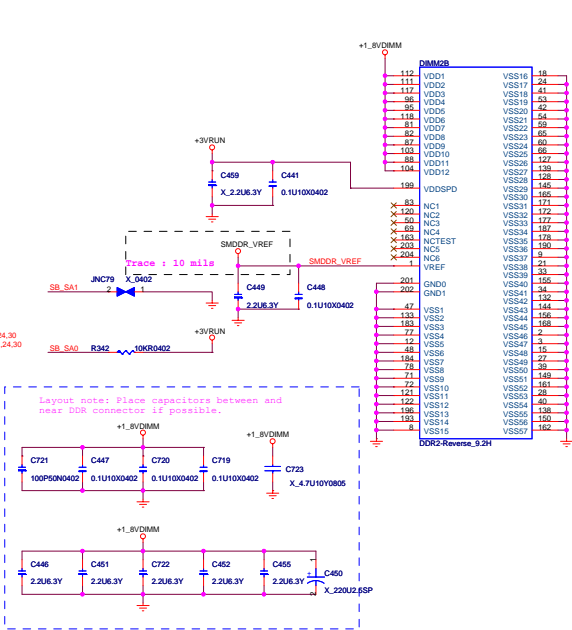
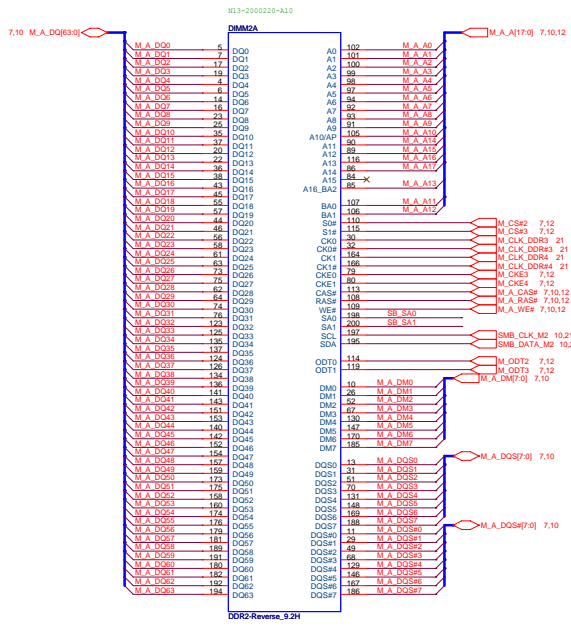
MSI CORPORATION	
File: 672DX-5 (POWER)	
Size: Custom	Document Number: MS-1682
Date: Wednesday, January 21, 2009	Sheet: 8 of 81



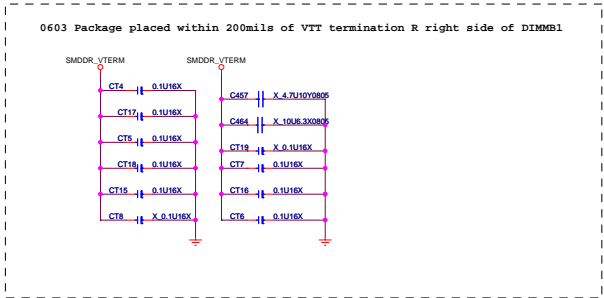
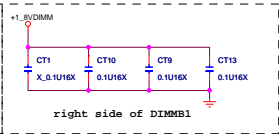
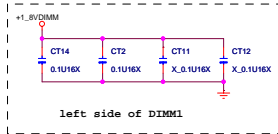
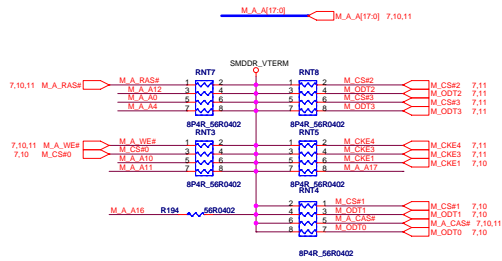
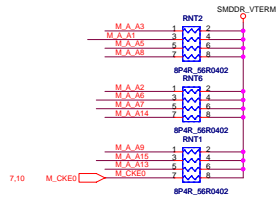
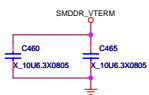
MSI CORPORATION		
File	672DX-6 (VSS)	E1 / M0
Size	Document Number	Rev
Custom	MS-1682	0A
Date	Wednesday, January 21, 2009	Sheet 8 of 81



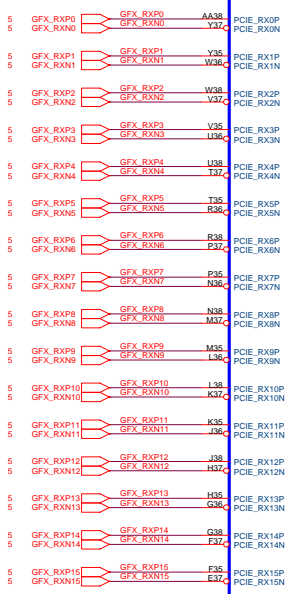
MSI CORPORATION		
Title	DDR2 SODIMM 0	
Size	Document Number	Rev
Custom	MS-1682	0A
Date	Wednesday, January 21, 2009	Sheet 10 of 61



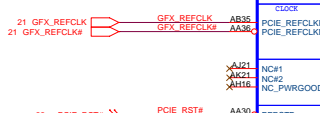
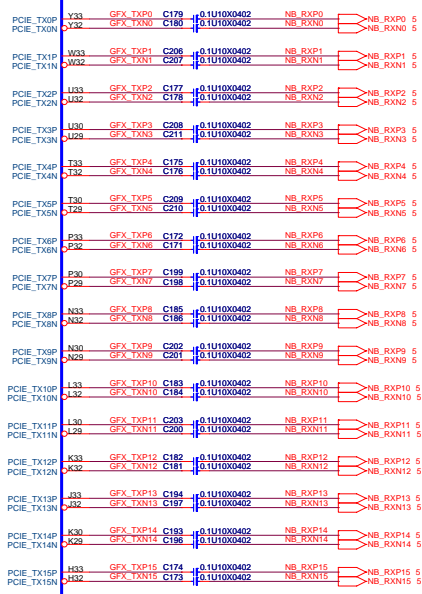
MSI CORPORATION	
File	DDR2 SODIMM 1
Size	Document Number
Custom	MS-1682
Date	Wednesday, January 21, 2009 Sheet 11 of 51



U22A

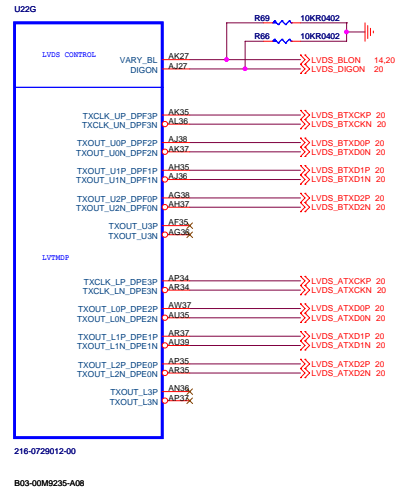


PCI EXPRESS INTERFACE



216-0729012-00

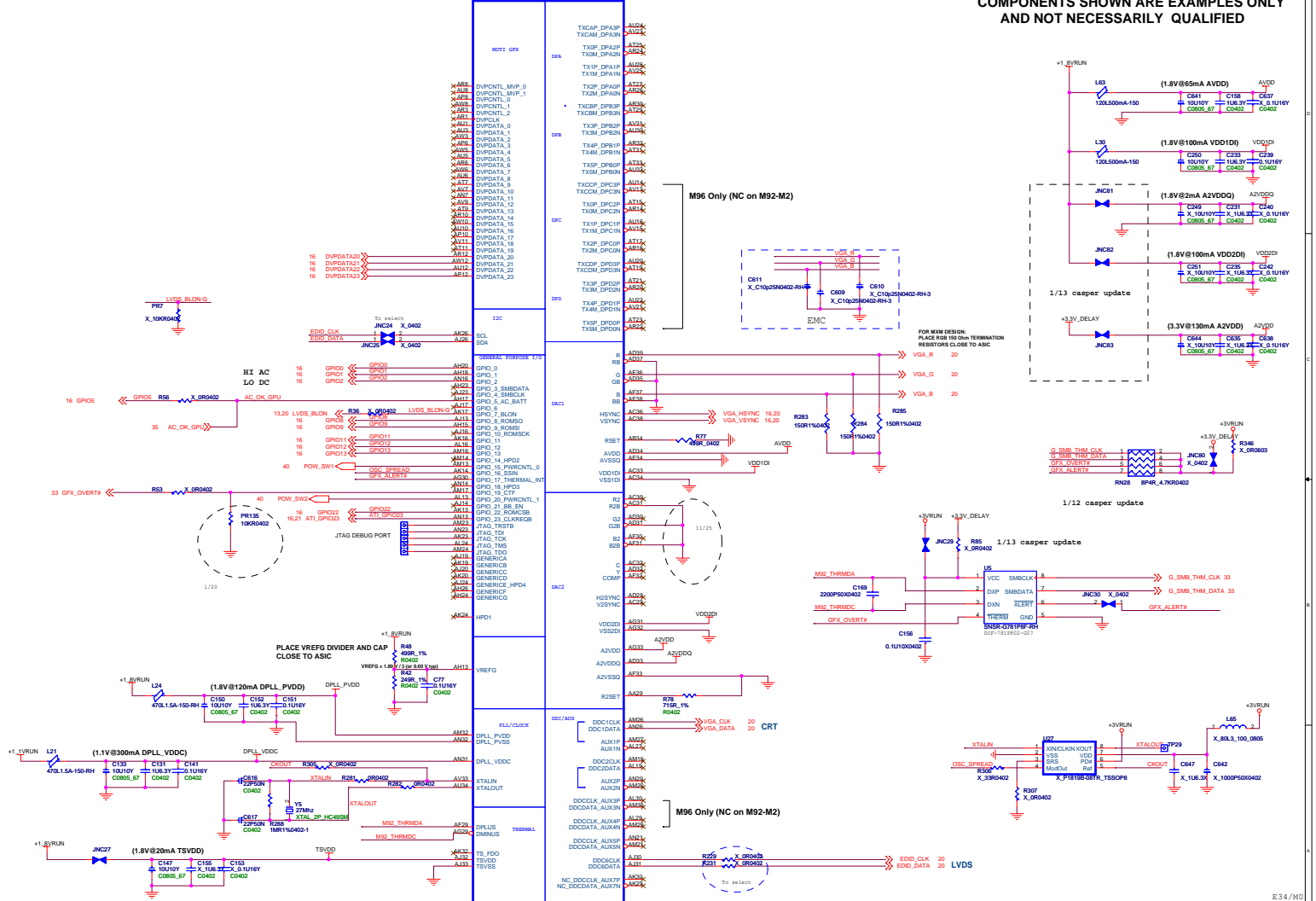
LVDS Interface



DisplayPort E Configuration

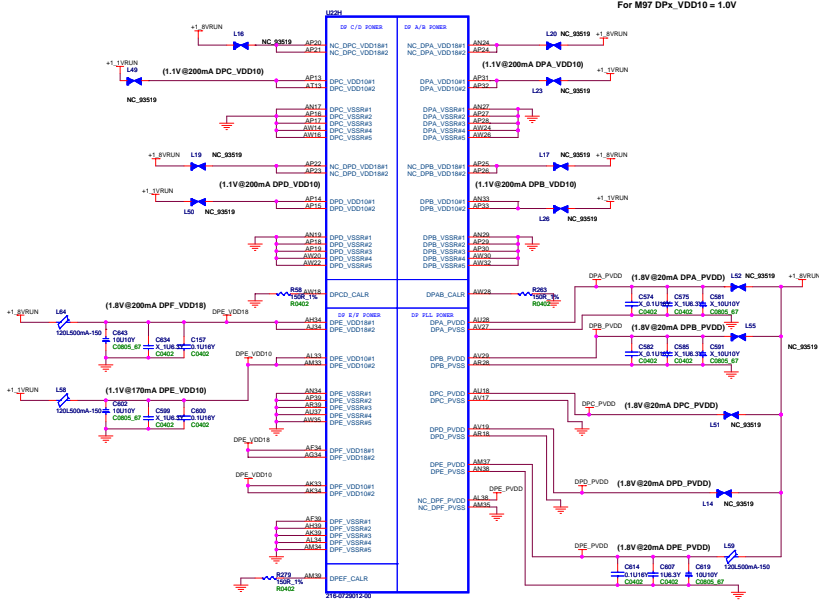
E43/M0

MSI CORPORATION			
File	M92M-HOST/LVDS		
Size	Document Number		Rev
Custom	MS-1682		0A
Date	Wednesday, January 21, 2009	Sheet	13 of 51

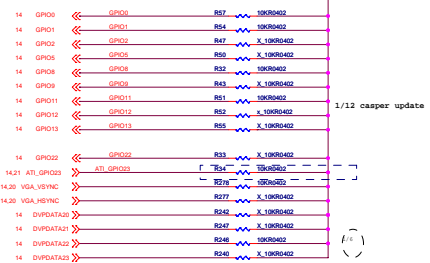


E.34/MO

MSI CORPORATION		
File:	M92M-I0	
Size:	Document Number	MS-1682
Rev:	1.0	0A
Date:	Wednesday, January 21, 2009	Page 14 of 51



PIN STRAPS



CONFIGURATION STRAPS			RECOMMENDED SETTINGS
ALLOW FOR PULLUP PADS FOR THESE STRAPS AND IF THESE GPHOS ARE USED, THEY MUST NOT CONFLICT DURING RESET			IN DO NOT INSTALL RESISTOR * = INSTALL 10K RESISTOR ** = CONFIGURATION DEPENDENT NA = NOT APPLICABLE
STRAPS	PIN	DESCRIPTION OF DEFAULT SETTINGS	
TX_PWRS_ENB	GPD0	Transmitter Power Saving Enable 0:20% Tx output swing (default setting for desktop)	1
TX_DEEMPH_EN	GPD1	PCI Express Transmitter De-emphasis Enable 0:Tx de-emphasis disabled for mobile mode 1:Tx de-emphasis enable (default setting for desktop)	1
BIF_GEN2_EN	GPD2	0 = Advertises the PCIe device as 2.0 GT/s capable at power-on 1 = Advertises the PCIe device as 3.0 GT/s capable at power-on 2:0 GT/s Capability will be controlled by	0
STRAP_BIF_CLK_PAL_EN	GPD8	Enable CLKREQ Power Management 0: CLKREQ Power Management capability is disabled 1: CLKREQ Power Management capability is enable	0
BIF_VGA_DIS	GPD9	VGA ENABLED	0
BIF_RX_PLL_CALIB_BP	GPD21	BIF_RX_PLL_CALIB_BP	0
BIOS_ROM_EN	GPD_22_ROMC38	Enable external BIOS ROM device 0: disable external BIOS ROM device 1: enable external BIOS ROM device	0
config2 T 0	GPD13 12 11	GPD_13_12_11_CONFIG_12_11 0: If BIOS_ROM_EN = 0, then Config[12] defines the rom type 1: If BIOS_ROM_EN = 0, then Config[12] defines the Aperture size	0 0 1 256MB
Mem type	DVDDAT021_22	If VIP_DEVICE_STRAP_EN is set to '1' then this pin is used to sense whether a VIP device is connected to the VIP bus (instead of VIP_DEVICE_STRAP_EN is set to '0'). If this pin is not used as a strap at all, its value during reset is unimportant, and it can be used as a regular GPIO	0 0 0 vendor
VIP_DEVICE_STRAP_EN	V5SYNC		0
RSVD	HS5VNC		0
AUX0	GENERIC		1
AUX1	HS5VNC		0

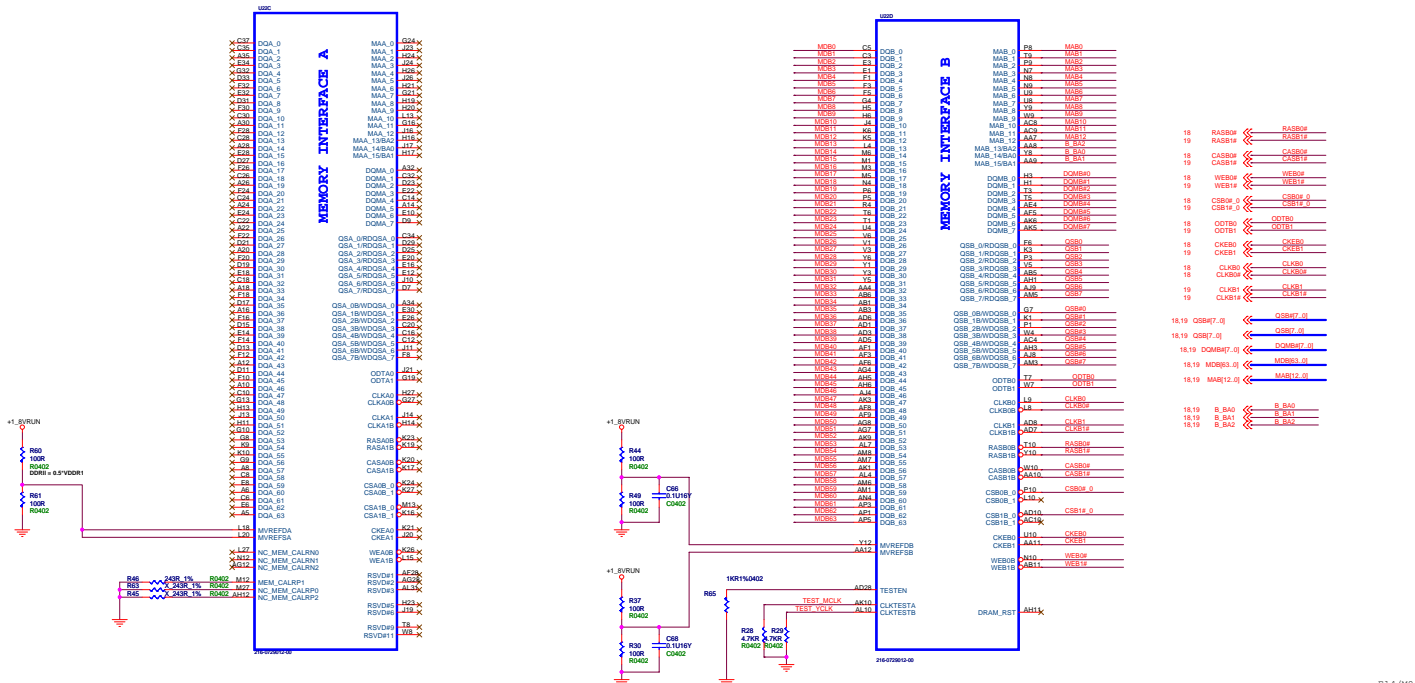
DV DATA	23	22	21	20	
SAMSUNG	0	0	0	0	32*16
Hynix	0	0	0	1	32*16
SAMSUNG	0	0	1	0	64*16
Hynix	0	1	0	0	64*16

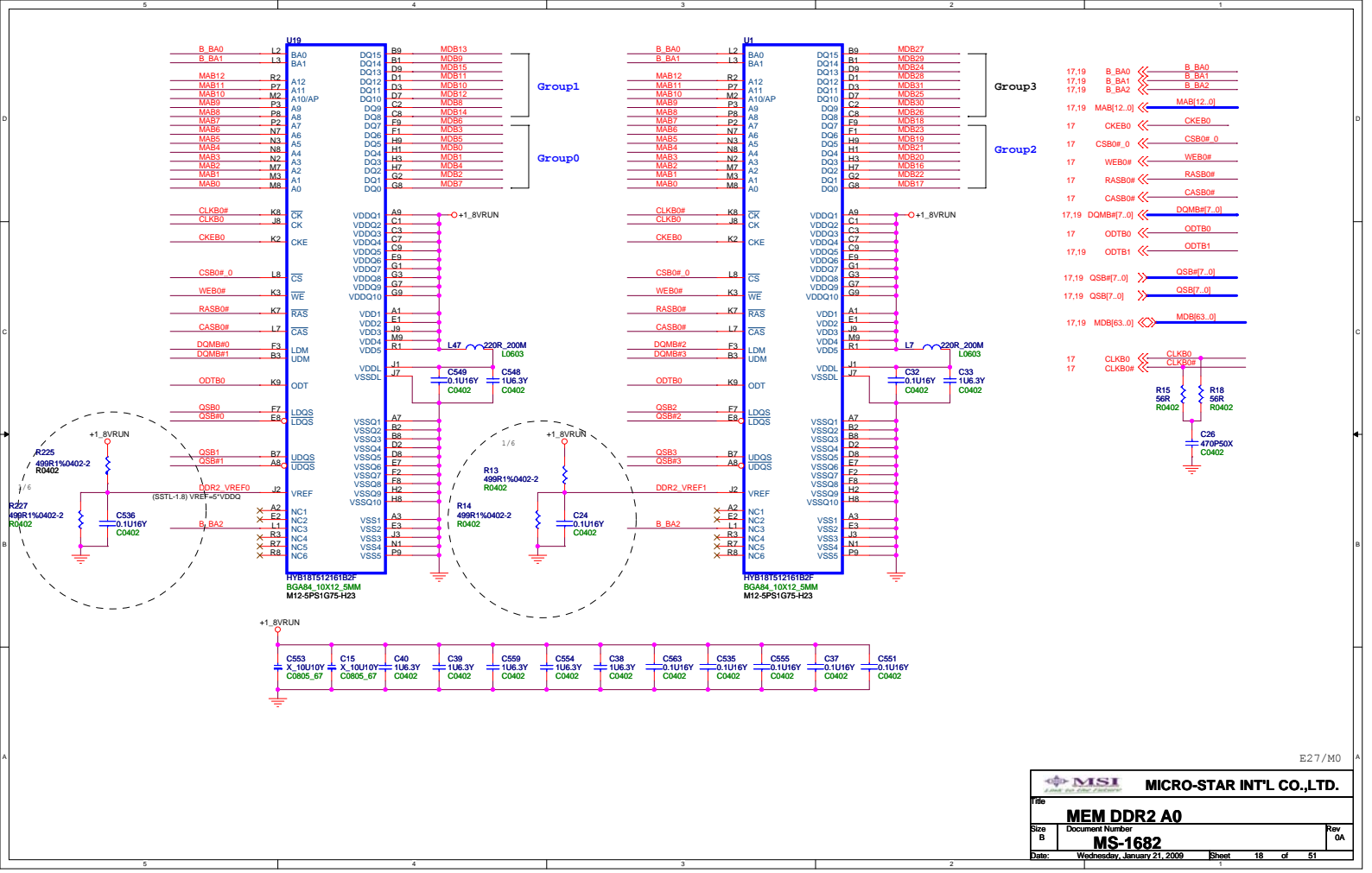
MSI CORPORATION

M92M-power straps

Custom **MS-1682**

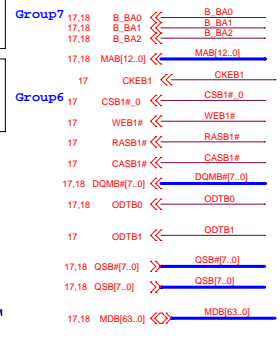
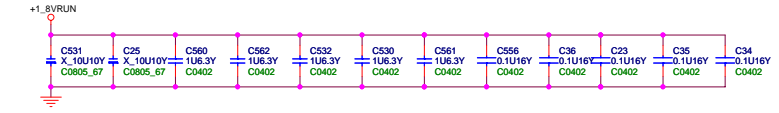
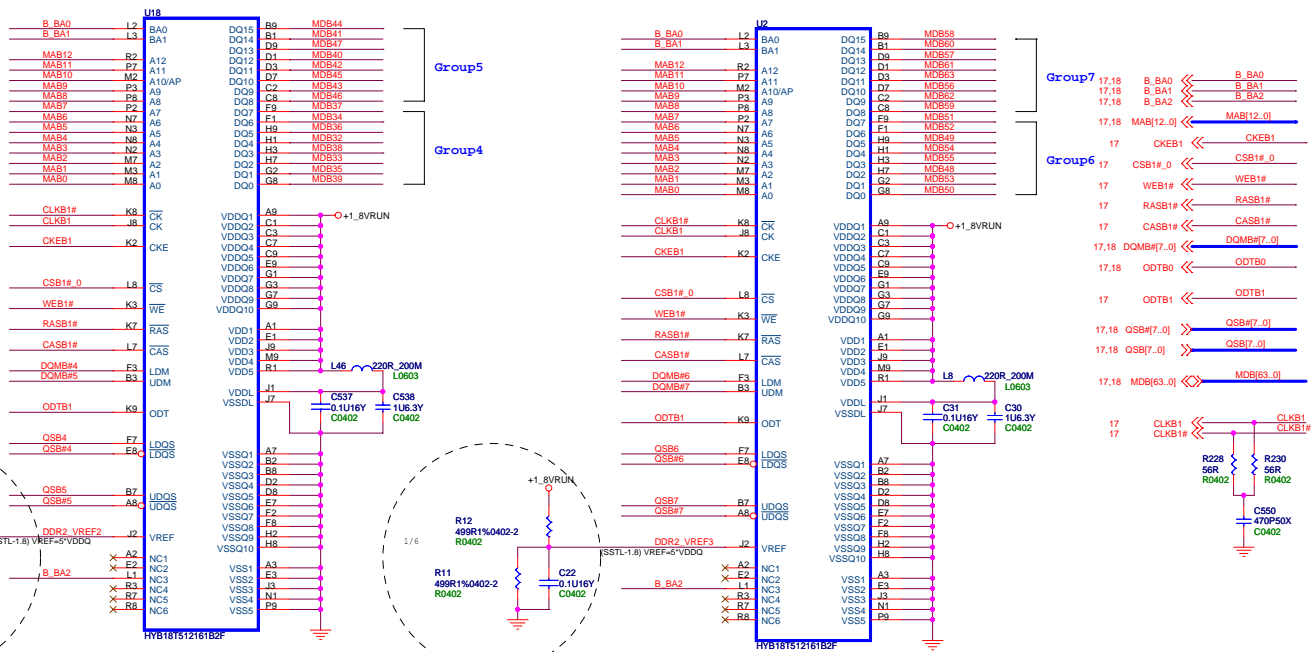
Ver: Wednesday, January 21, 2009 Sheet: 18 of 51





E27/M0

MICRO-STAR INTL CO.,LTD.	
File	MEM DDR2 A0
Size	Document Number
B	MS-1682
Date:	Wednesday, January 21, 2009
Sheet	18 of 51

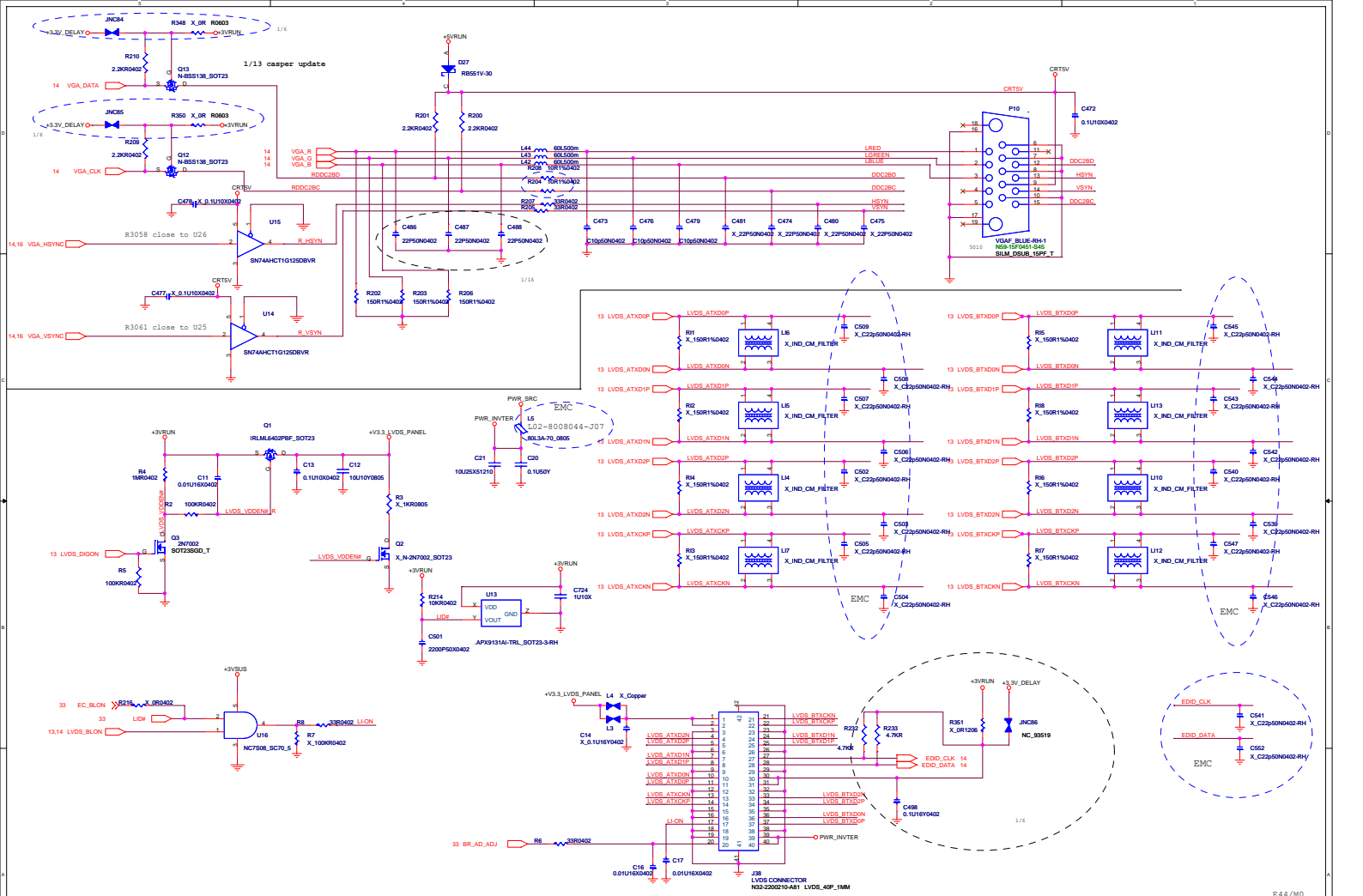


E27 / M0

MSI
MEMORIE

MICRO-STAR INT'L CO., LTD.

File	MEM DDR2 A1		Rev	0A
Size	B		Document Number	MS-1682
Date:	Wednesday, January 21, 2009		Sheet	19 of 51



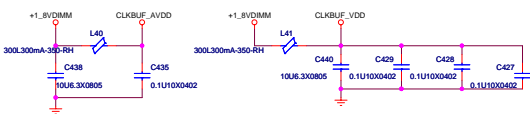
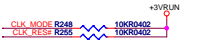
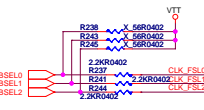
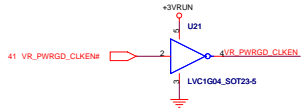
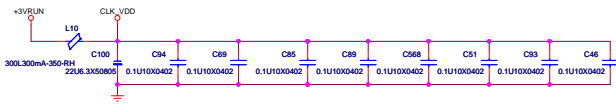
E44/30

MICRO-STAR INT'L CO., LTD.

CRT & LVDS & CONN

MS-1682

Date: Wednesday, January 21, 2009 Floor: 20 of 51

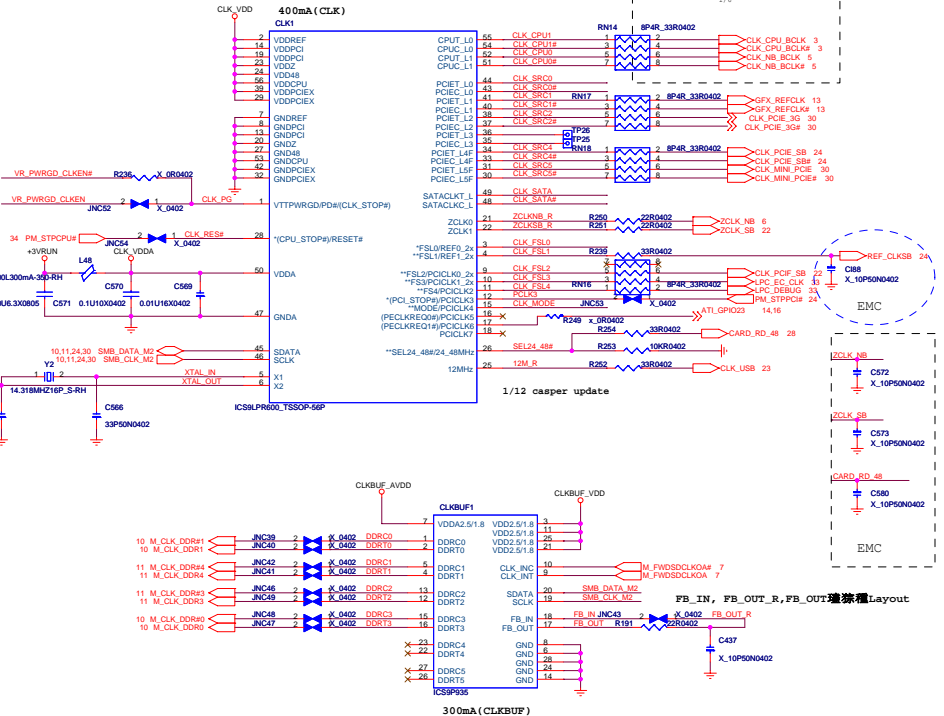
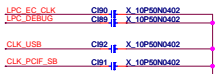


Strapping Configuration(IC5)

PIN#	High	Low(DeFault)
15	Pin 16/17 : PCLKREQ	Pin 16/17 : PCICLK

CPU Table			FSB Freq (MHz)
BSEL[2]	BSEL[1]	BSEL[0]	
L	H	H	667 MHz
L	H	L	800 MHz
L	L	L	1066 MHz

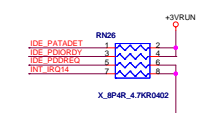
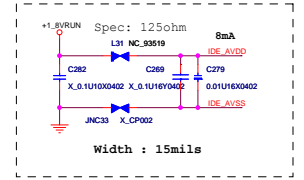
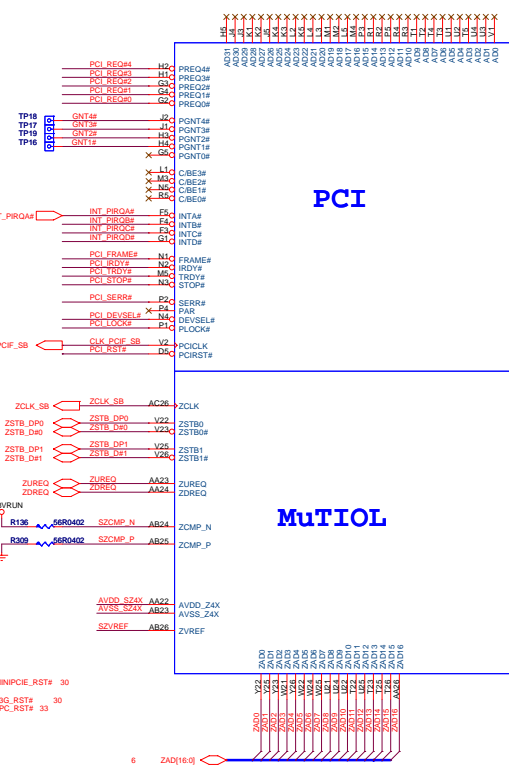
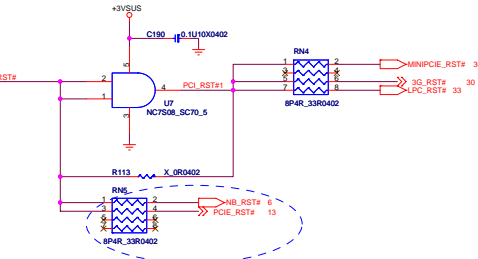
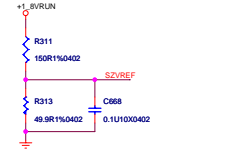
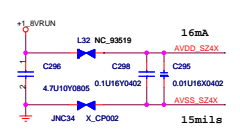
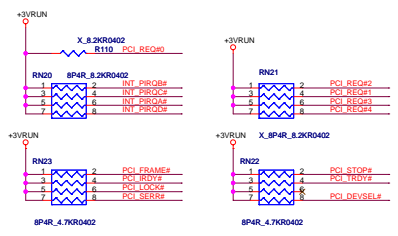
FOR EMI close to CLK1



1/16 JNC39,40,41,42 +1.5" AND JNC43 +2"FOR 3D MARK 06 BUG ,

E45/M0

MSI CORPORATION			
CLOCK Generator ' Dimm BUF			
File	Document Number	Rev	0A
Size	Custom	MS-1682	
Date	Wednesday, January 21, 2009	Sheet	21 of 81

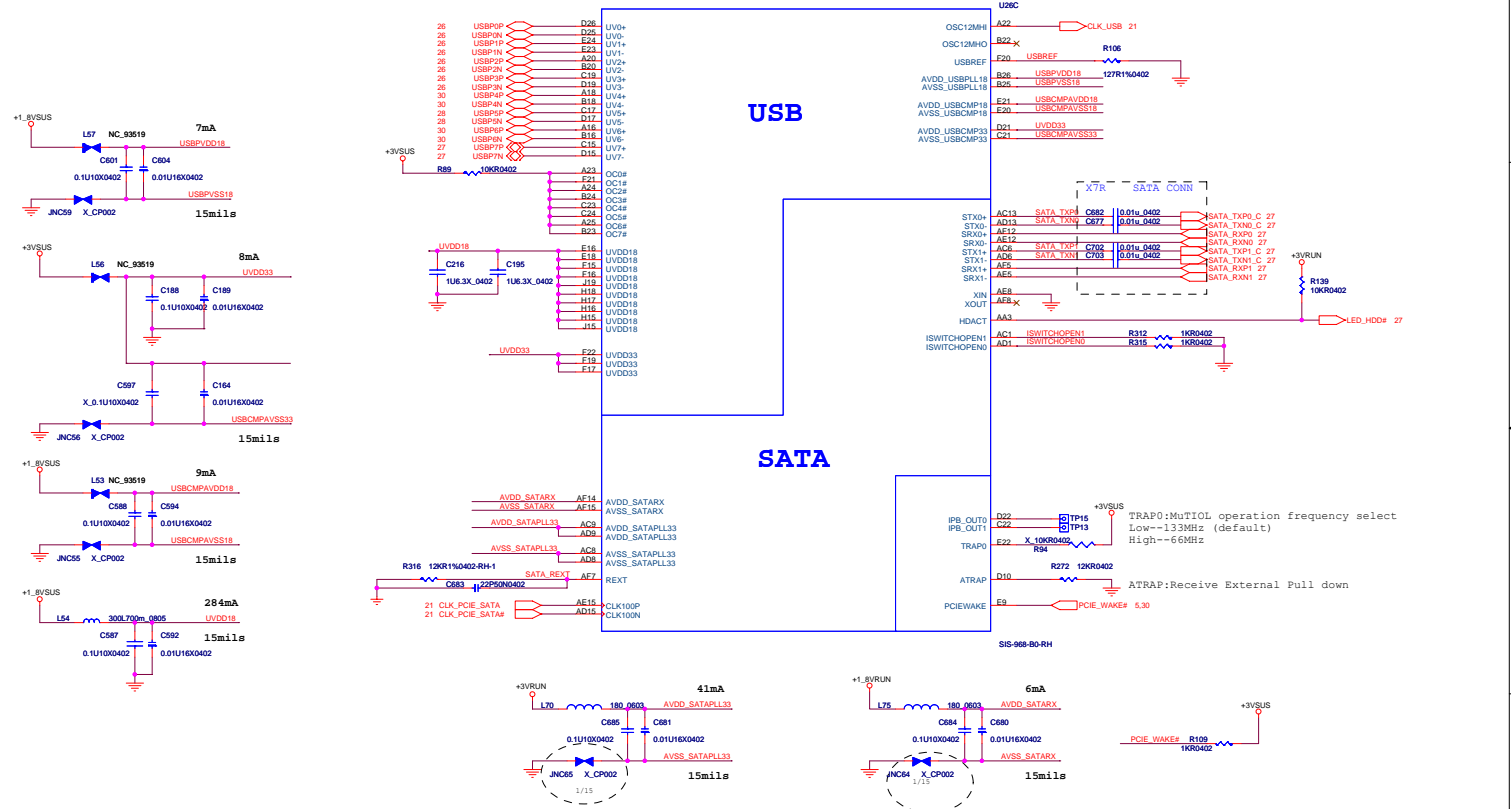


1/6 DEL B100 CHANGE TO LPC EQ

SPI_HARDWARE_TRAP:
Low-LPC interface (default)
High-SPI interface

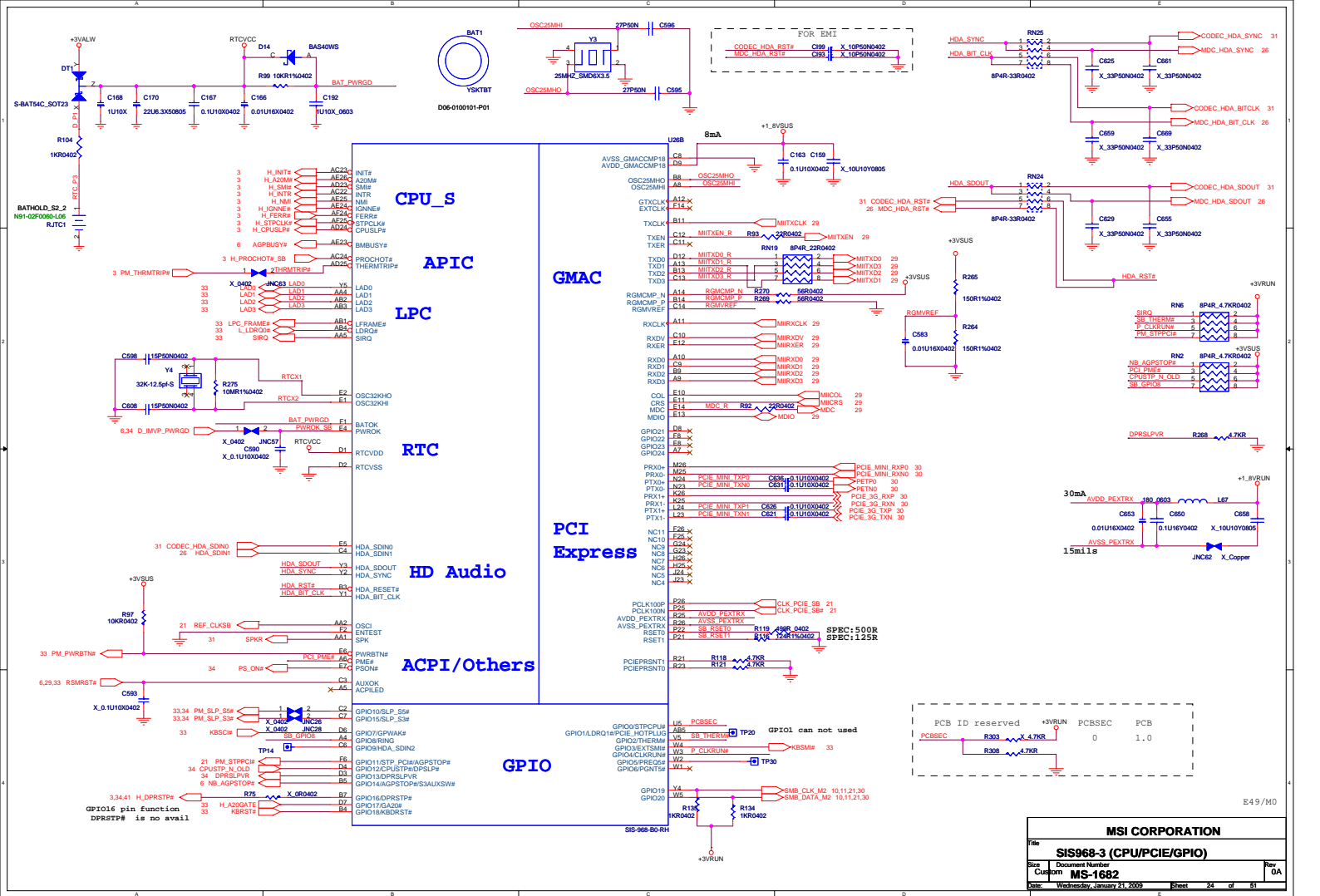
MSI CORPORATION			
File	SIS968-1 (PCI/IDE/SPI/MutIO)		E2.4 / M0
Size	Document Number		Rev
Custom	MS-1682		0A
Date	Wednesday, January 21, 2009	Sheet	22 of 61

USB 0 ,USB 0,2,4,5
USB 1 ,USB 1,3,5,7



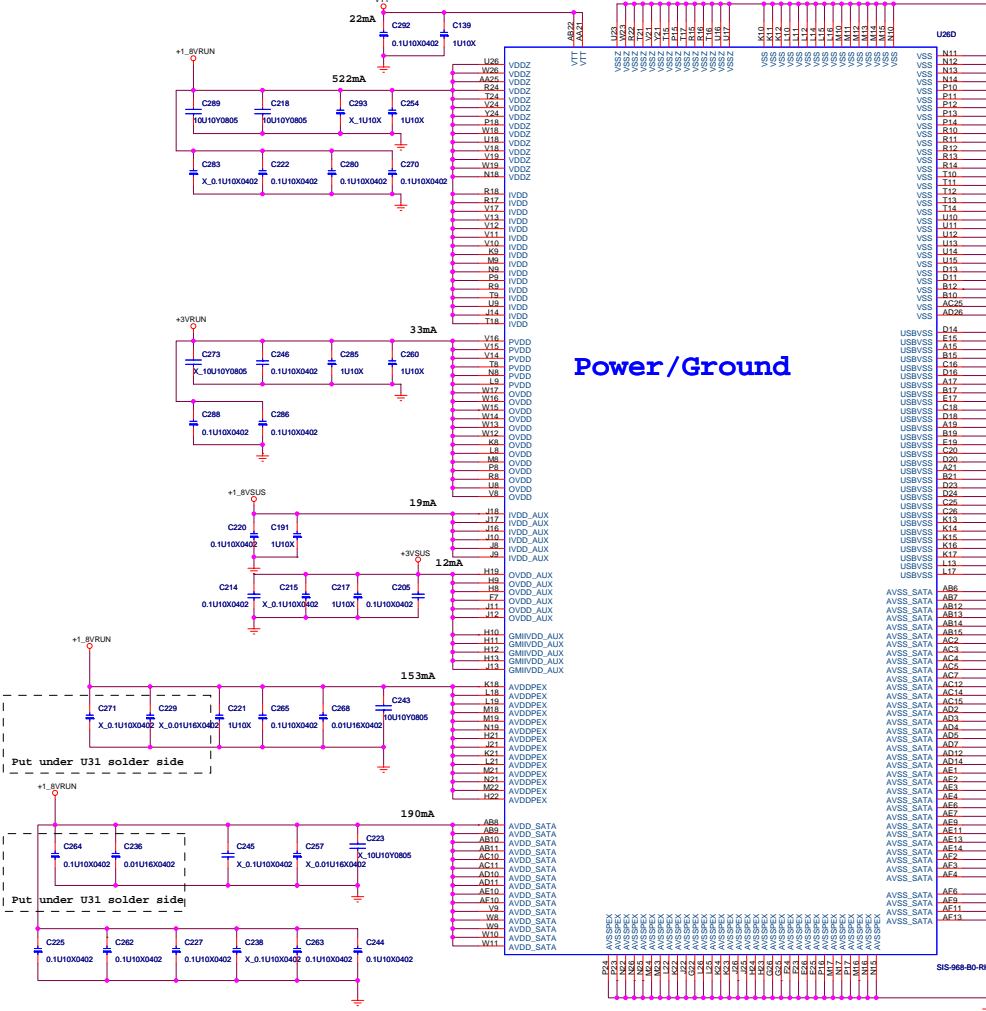
E32/M0

MSI CORPORATION			
File	SIS968-2 (USB/SATA)		
Size	Document Number		Rev 0A
Custom	MS-1682		
Date	Wednesday, January 21, 2009	Sheet	23 of 51

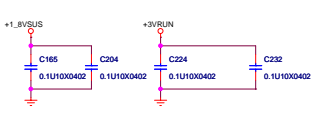
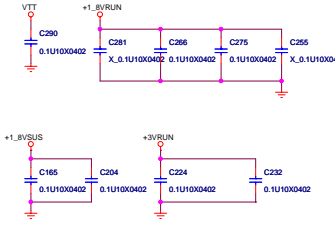
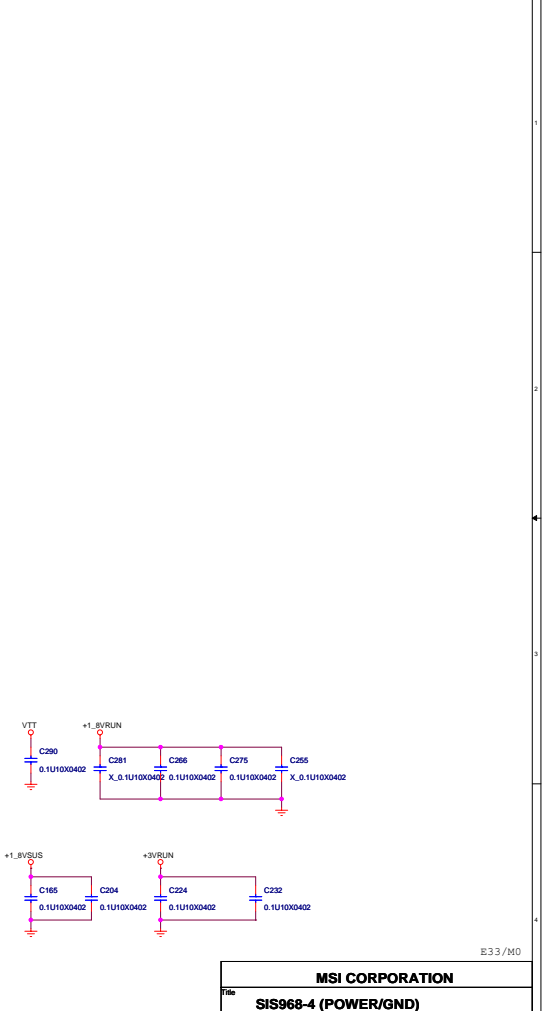


MSI CORPORATION			
File	SIS968-3 (CPU/PCIe/GPIO)		
Size	Document Number		Rev 0A
Custom	MS-1682		
Date	Wednesday, January 21, 2009	Sheet	24 of 51

E49/90



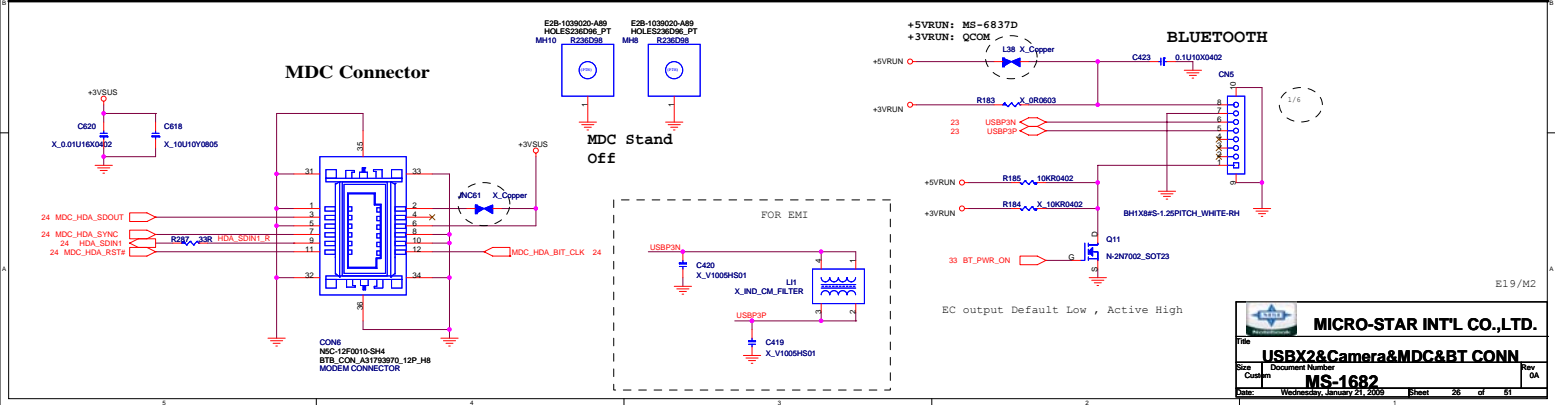
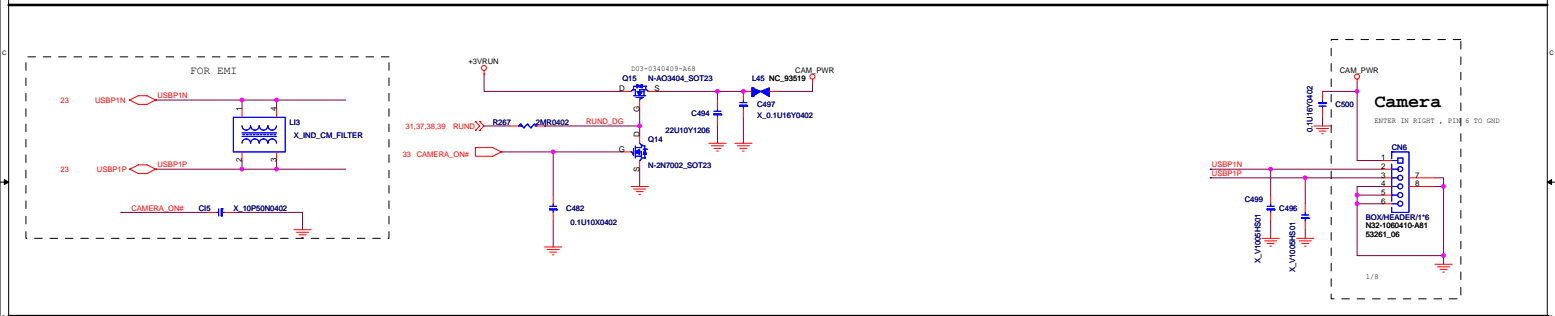
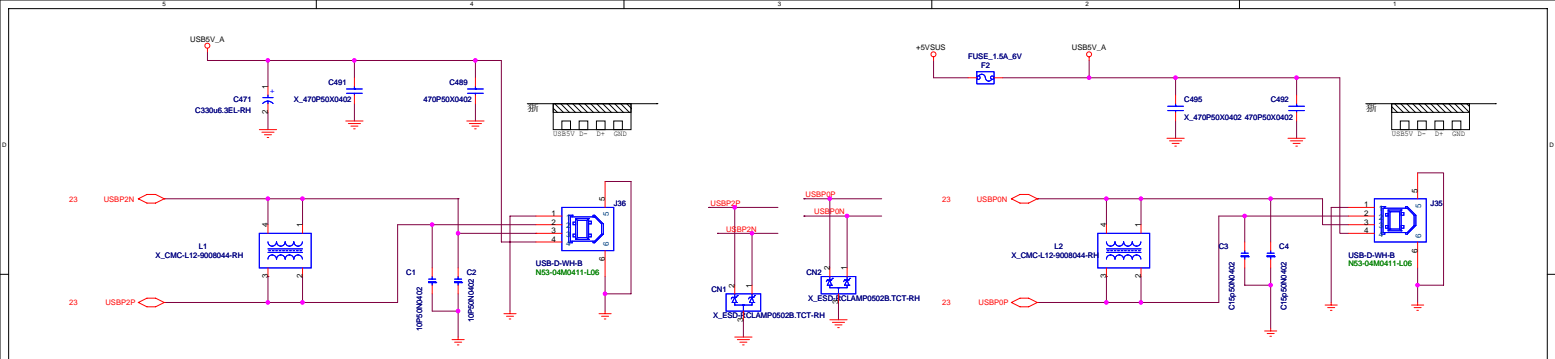
Power / Ground



Put under U31 solder side

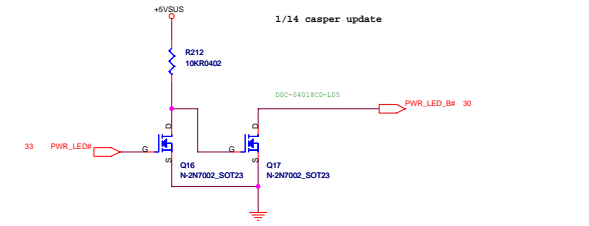
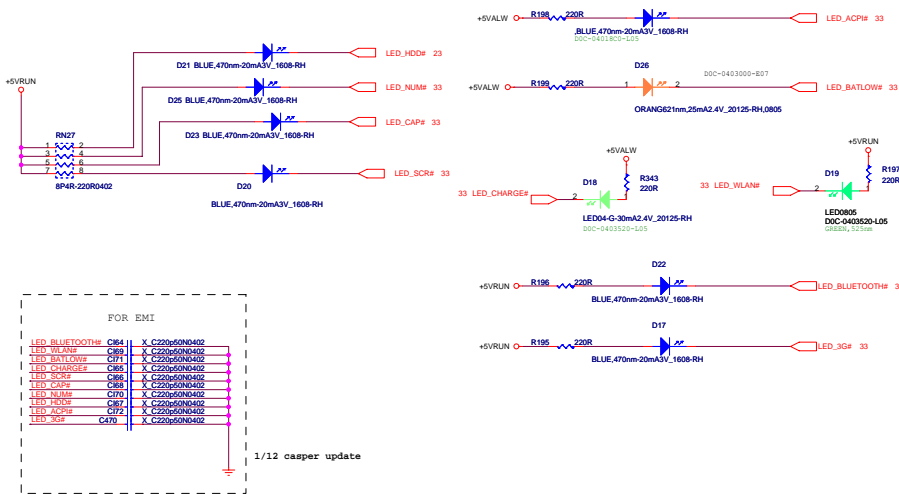
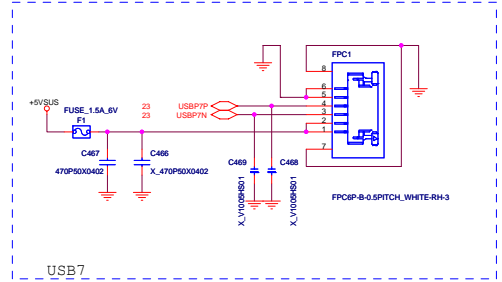
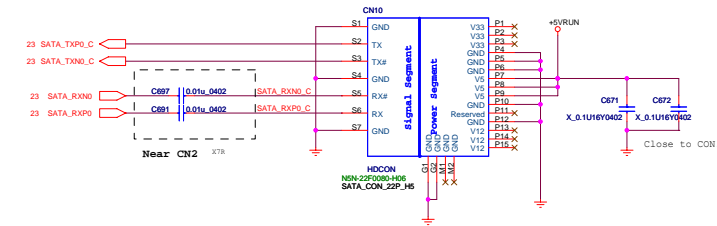
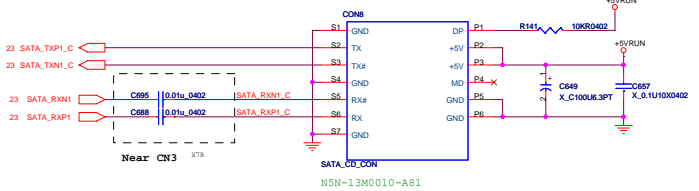
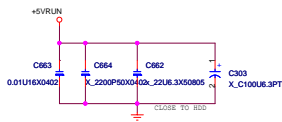
Put under U31 solder side

MSI CORPORATION	
SIS968-4 (POWER/GND)	
Size	Document Number
Custom	MS-1682
Date	Wednesday, January 21, 2009
Sheet	25 of 51



B19/M2

MICRO-STAR INT'L CO.,LTD.			
File	USBX2&Camera&MDC&BT CONN		
Size	Document Number		
Customer	MS-1682		
Date	Wednesday, January 21, 2009	Sheet	26 of 61



FOR EMI

LED_BLUETOOTH#	C664	X	C220p50N0402
LED_WLAN#	C665	X	C220p50N0402
LED_BATLOW#	C666	X	C220p50N0402
LED_CHARGE#	C667	X	C220p50N0402
LED_SCR#	C668	X	C220p50N0402
LED_CAP#	C669	X	C220p50N0402
LED_NUM#	C670	X	C220p50N0402
LED_HDD#	C671	X	C220p50N0402
LED_3G#	C672	X	C220p50N0402
LED_3G#	C470	X	C220p50N0402

1/132 casper update

B.32/M0

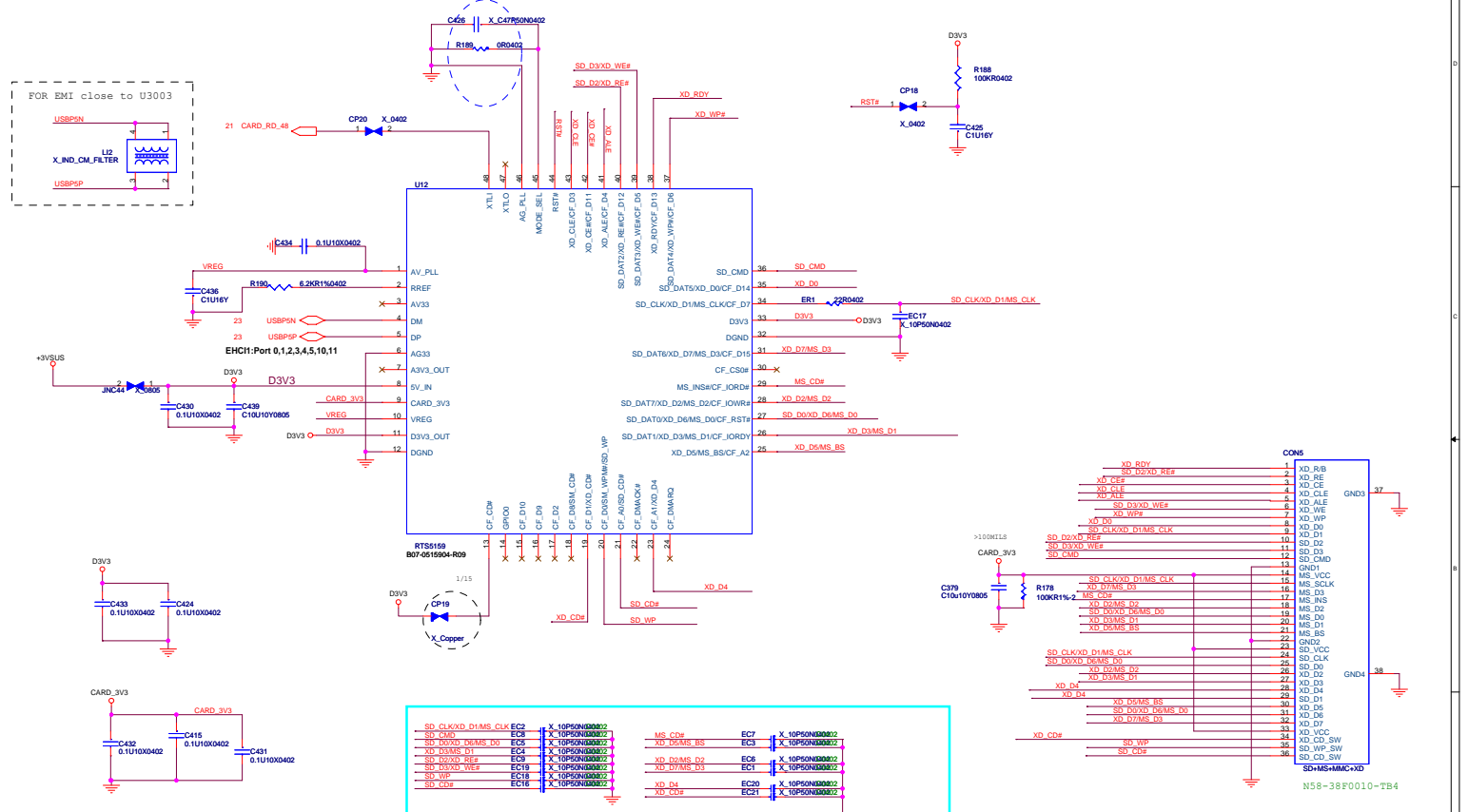
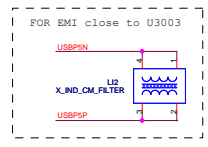
MICRO-STAR INT'L CO.,LTD.

File: **HDD & ODD CONN & USB7 & LED**

Size: _____ Document Number: _____

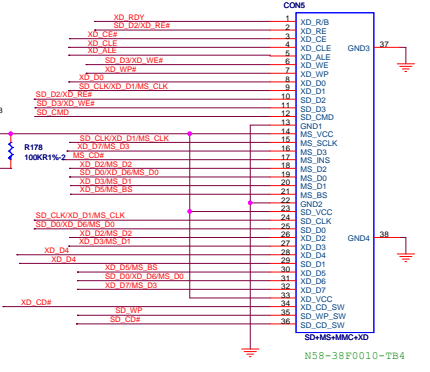
Customer: **MS-1682** Rev: **0A**

Date: **Wednesday, January 21, 2009** Sheet: **27** of **51**



SD_CLKXD_D1MS_CLK	EC2	X-10P50N03002	MS_CDE	EC7	X-10P50N03002
SD_D0XD_D6MS_D0	EC5	X-10P50N03002	XD_D6MS_BS	EC3	X-10P50N03002
XD_D3MS_D1	EC4	X-10P50N03002	XD_D2MS_D2	EC6	X-10P50N03002
SD_D3XD_WE#	EC9	X-10P50N03002	XD_D7MS_D3	EC1	X-10P50N03002
SD_WP	EC18	X-10P50N03002	XD_D4	EC20	X-10P50N03002
SD_CDE	EC16	X-10P50N03002	XD_CDE	EC21	X-10P50N03002
XD_RDY	EC15	X-10P50N03002			
XD_CDE	EC14	X-10P50N03002			
XD_CLE	EC13	X-10P50N03002			
XD_ALE	EC12	X-10P50N03002			
XD_WP#	EC11	X-10P50N03002			
XD_D0	EC10	X-10P50N03002			

For EMI suggestion :
 Clock Line add CAP close to IC
 Data Line add CAP close to Conn



E18/M0

MICRO-STAR INT'L CO.,LTD.

File: **RTS5158E_CARD READER**

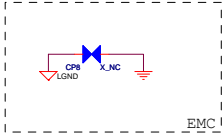
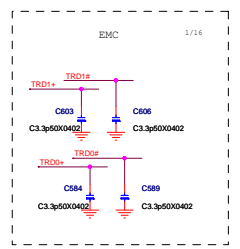
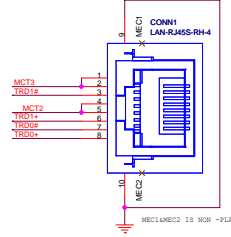
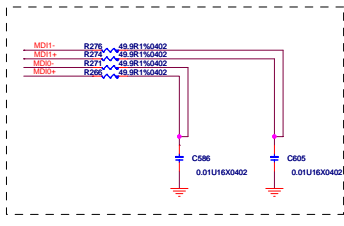
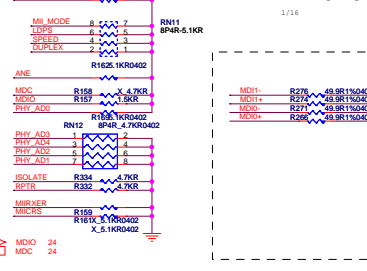
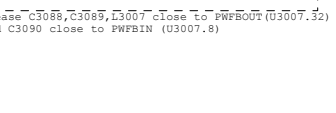
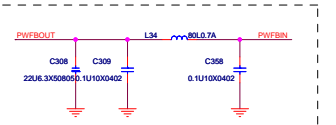
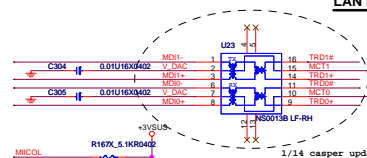
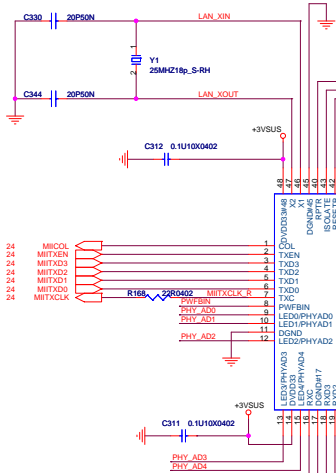
Size: Custom Document Number: **MS-1682** Rev: 0A

Date: Wednesday, January 21, 2009 Sheet: 28 of 51

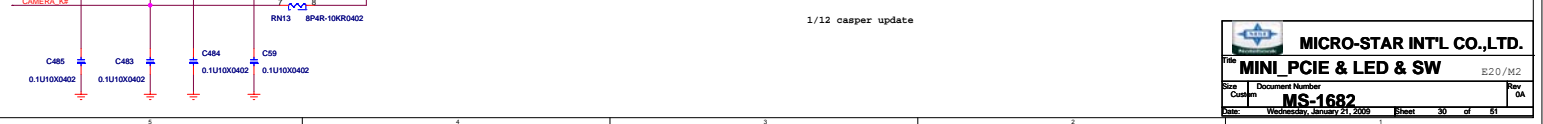
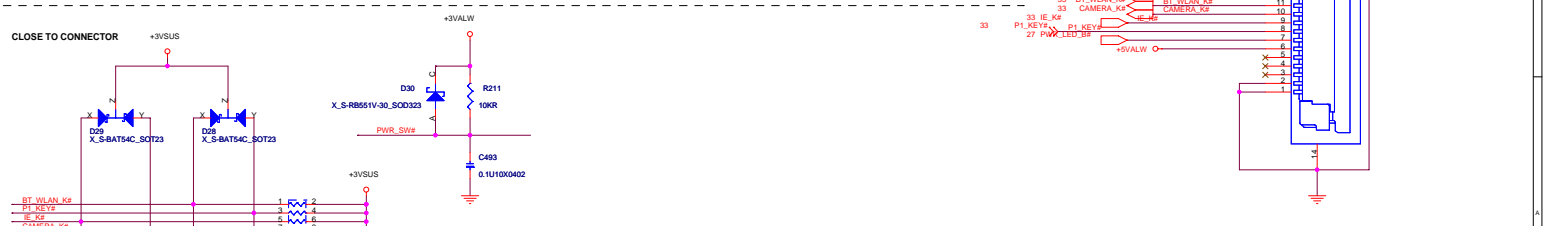
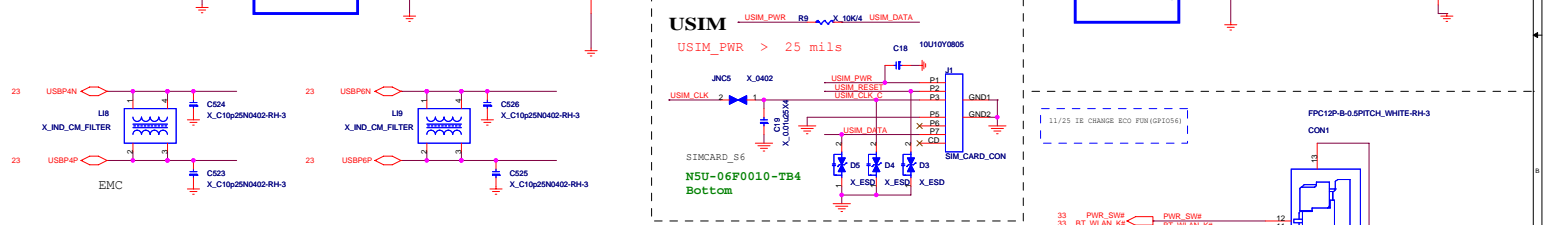
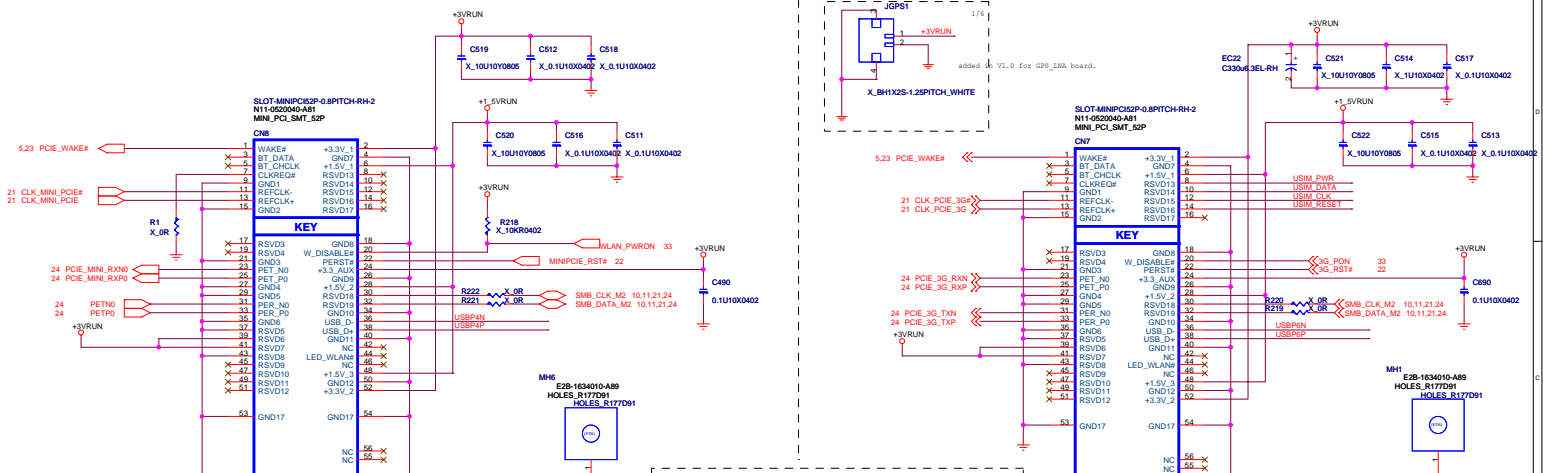
LAN MAGNETICS

PWFBOUT R156 050603 V_DAC

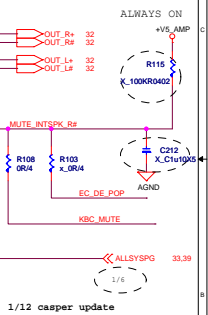
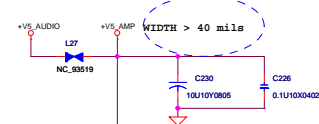
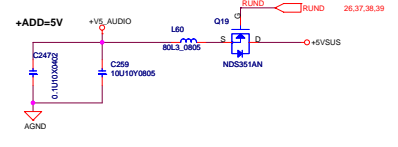
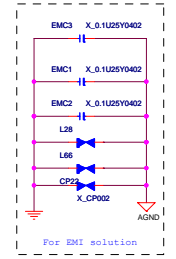
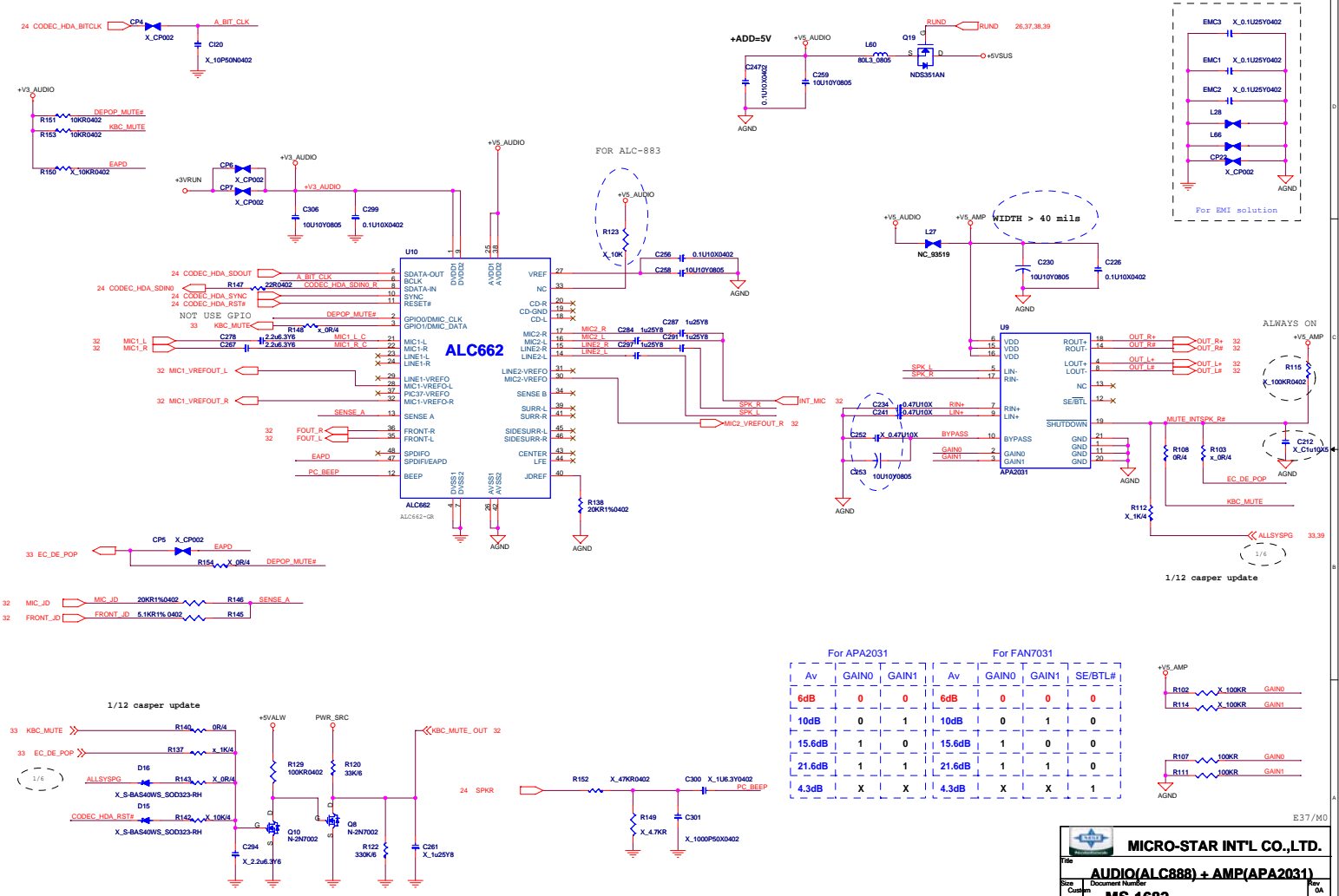
1/12 casper update



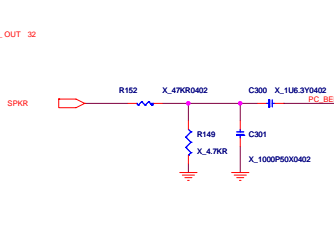
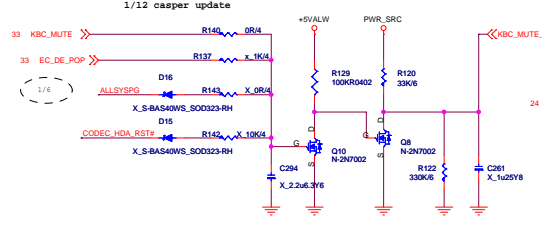
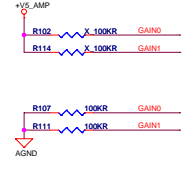
MICRO-STAR INT'L CO., LTD.
 Title: **PHY LAN (RTL8201CL)** E37/M0
 Size: Custom Document Number: **MS-1682** Rev: 0A
 Date: Wednesday, January 21, 2009 Sheet: 25 of 51



MICRO-STAR INT'L CO.,LTD.
MINI-PCIE & LED & SW
 Size: E20/M2
 Custom: MS-1682
 Date: Wednesday, January 21, 2009
 Sheet: 30 of 51



For APA2031			For FAN7031			
Av	GAIN0	GAIN1	Av	GAIN0	GAIN1	SE/BTL#
6dB	0	0	6dB	0	0	0
10dB	0	1	10dB	0	1	0
15.6dB	1	0	15.6dB	1	0	0
21.6dB	1	1	21.6dB	1	1	0
4.3dB	X	X	4.3dB	X	X	1



MICRO-STAR INT'L CO.,LTD.

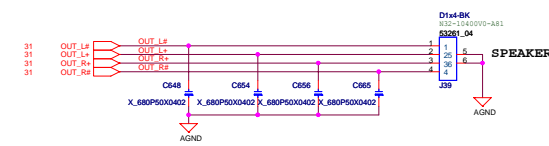
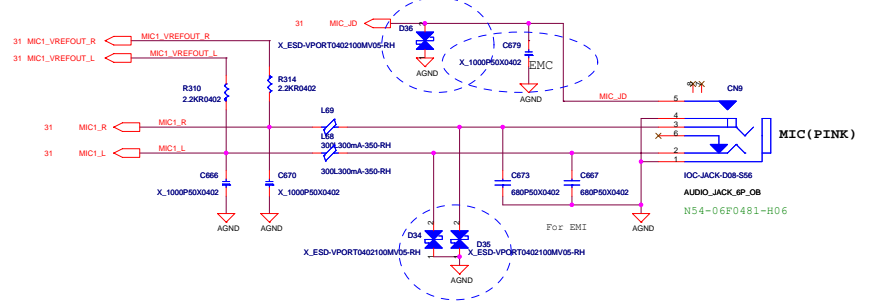
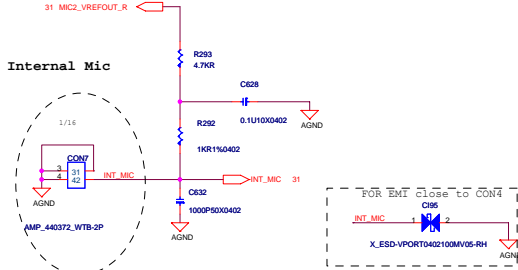
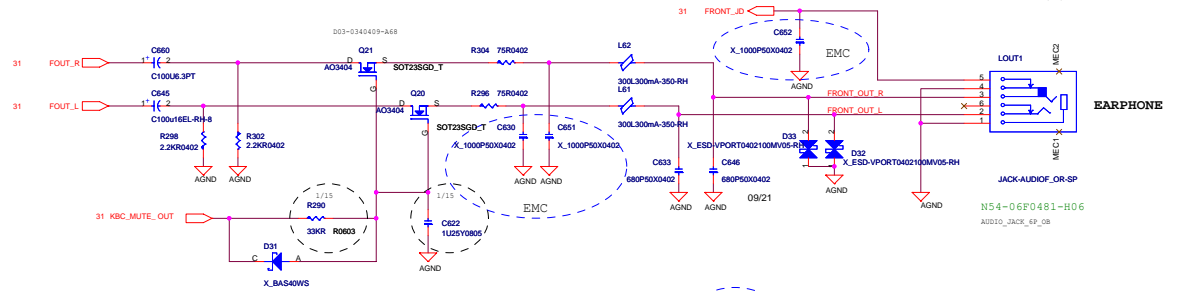
File: **AUDIO(ALC888) + AMP(APA2031)**

Size: **MS-1682**

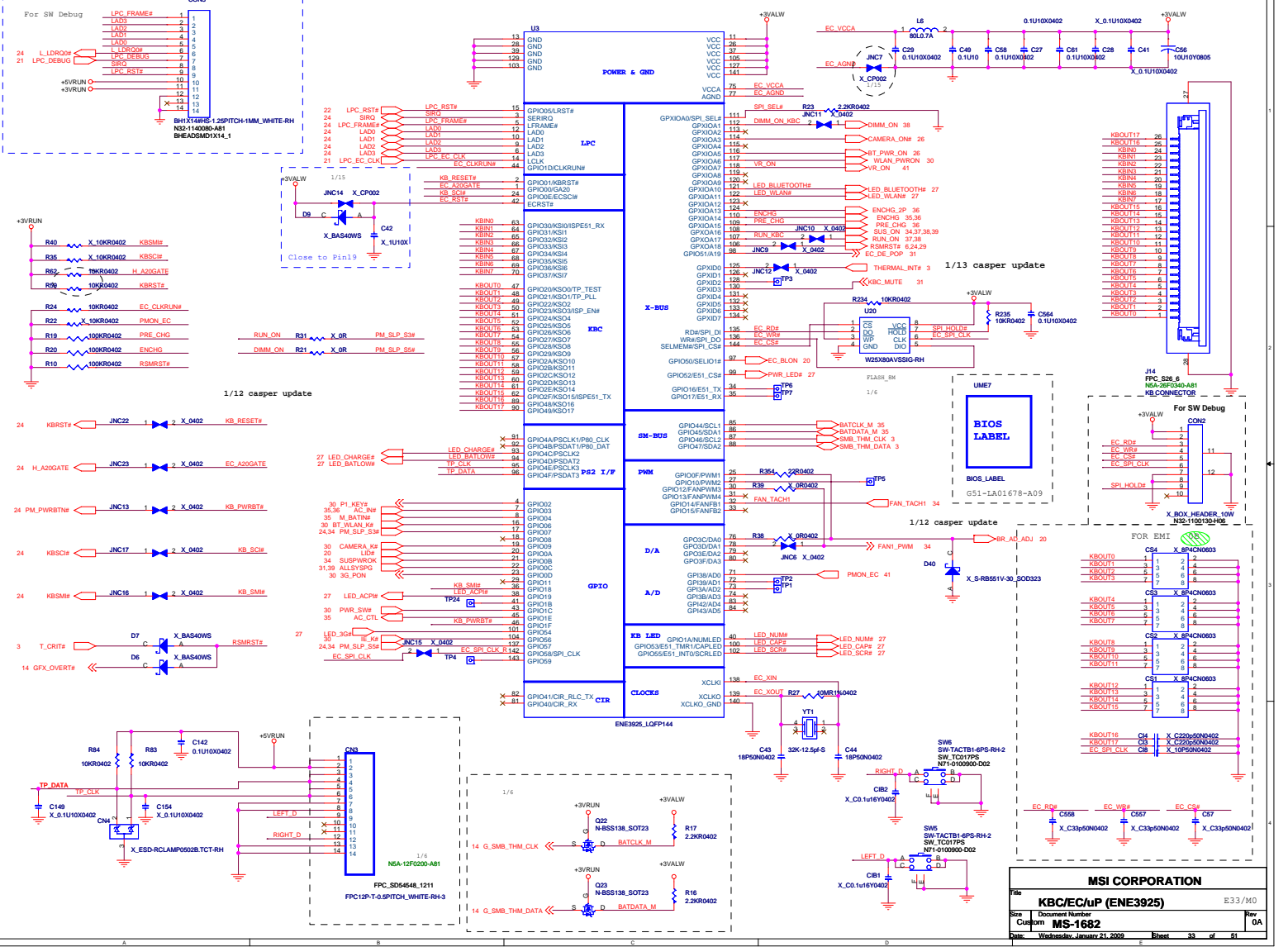
Date: Wednesday, January 25, 2006 Sheet: 31 of 51

1/20 EAPD DELAY 650ms

RP IN IS LOW

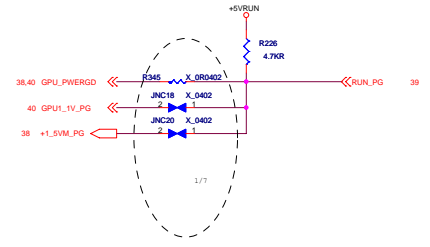
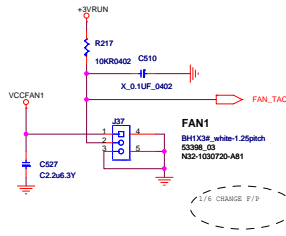
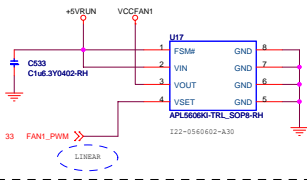


MICRO-STAR INT'L CO.,LTD.			
Title	SPK / HP / MIC		E2B / M0
Size	Document Number		Rev 0A
Customer	MS-1682		
Date	Wednesday, January 21, 2009		Sheet 32 of 51

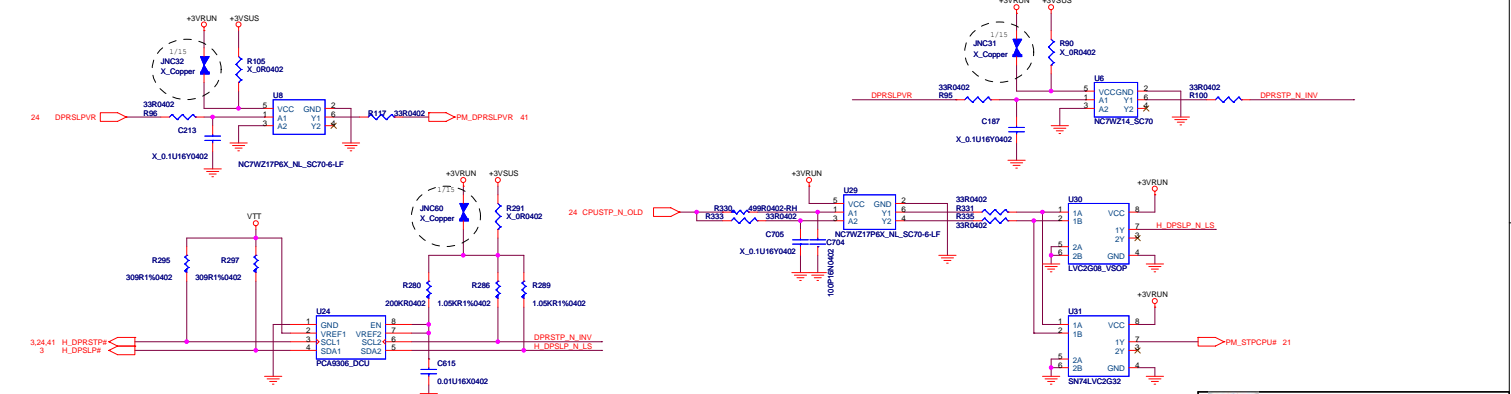
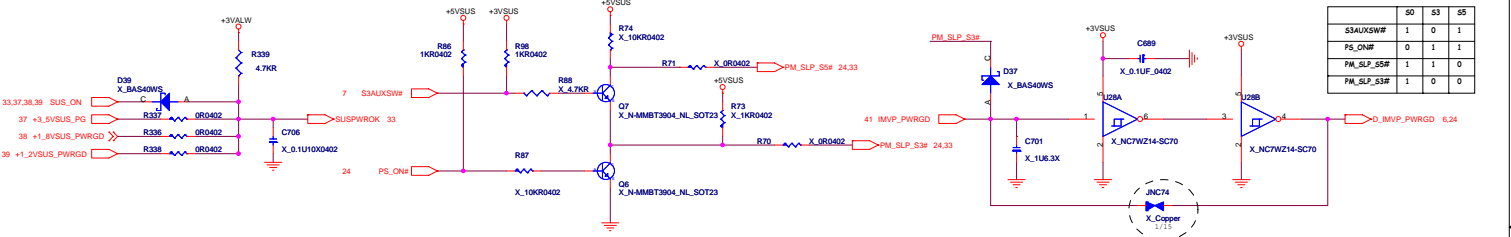


MSI CORPORATION	
File	KBC/EC/UP (ENE3925)
Document Number	B33/M0
Version	MS-1682
Date	Wednesday, January 21, 2009
Sheet	33 of 81

$$VCCFAN1 = 1.6 + FAN1_PWM$$



	S0	S3	S5
S3AUXSW#	1	0	1
PS_ON#	0	1	1
PM_SLP_S#F	1	1	0
PM_SLP_S#F	1	0	0

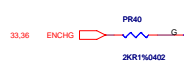
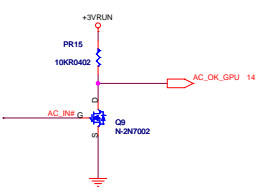
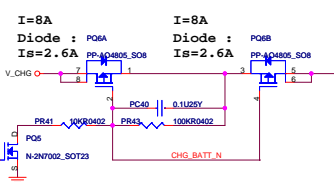
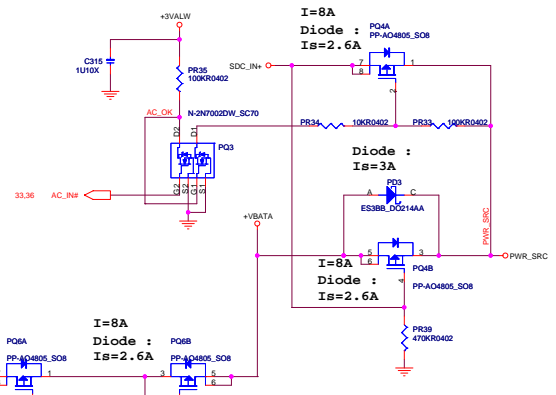
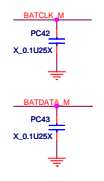
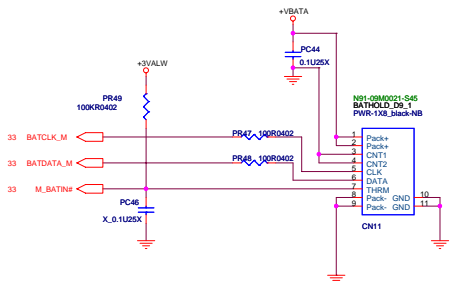
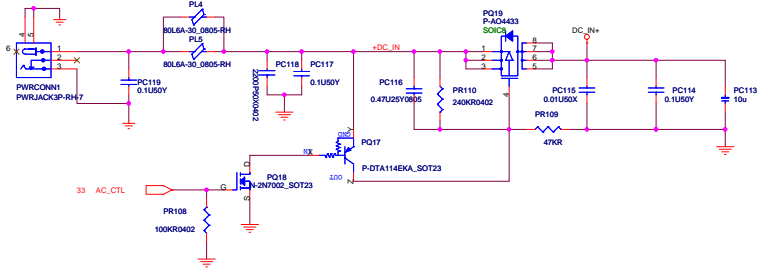


MICRO-STAR INT'L CO.,LTD.

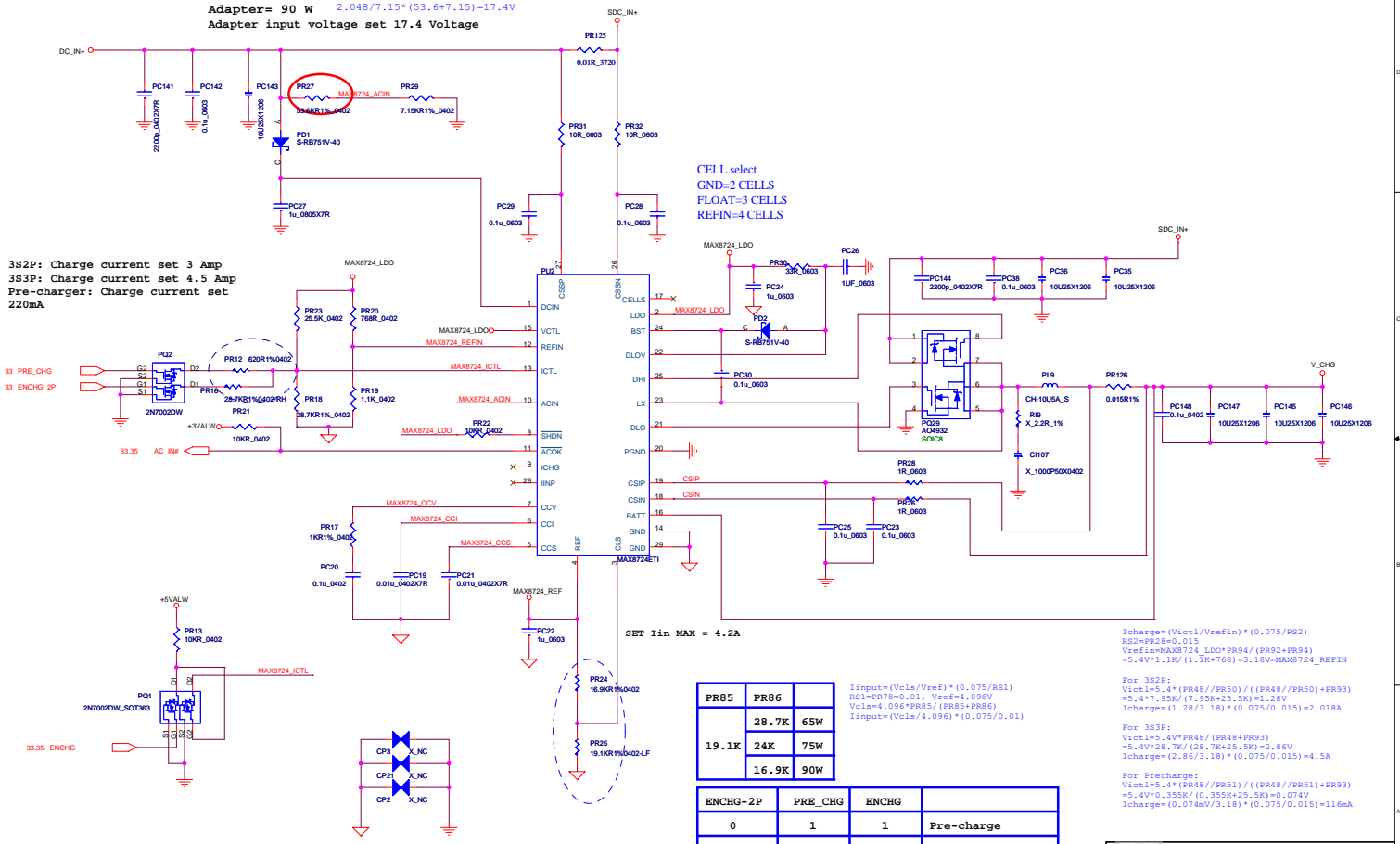
File: **PWRGD & FAN & C3/C4** E33/M0

Size: **MS-1682** Rev: **0A**

Date: Wednesday, January 21, 2009 Sheet: **34** of **51**



Adapter= 90 W $2.048/7.15*(53.6+7.15)=17.4V$
 Adapter input voltage set 17.4 Voltage



3S2P: Charge current set 3 Amp
 3S3P: Charge current set 4.5 Amp
 Pre-charger: Charge current set 220mA

CELL select
 GND=2 CELLS
 FLOAT=3 CELLS
 REFIN=4 CELLS

SET Iin MAX = 4.2A

FR85	FR86	
19.1K	28.7K	65W
	24K	75W
	16.9K	90W

$I_{in} = (V_{c1s}/V_{ref}) * (0.075/RS1)$
 $RS1 = PR78 + 0.01$, $V_{ref} = 1.096V$
 $V_{c1s} = 4.096 * PR85 / (PR85 + PR86)$
 $I_{in} = (V_{c1s}/4.096) * (0.075/0.01)$

$I_{charge} = (V_{c1t1}/V_{refin}) * (0.075/RS2)$
 $RS2 = PR28 + 0.015$
 $V_{refin} = MAX8724_LDO_LDO + PR94 / (PR92 + PR94)$
 $= 5.4V * 1.1K / (1.1K + 768) = 3.18V = MAX8724_REFIN$

For 3S2P:
 $V_{c1t1} = 5.4 * (PR48 / PR50) / ((PR48 / PR50) + PR93)$
 $= 5.4 * 7.95K / (7.95K + 25.5K) = 1.28V$
 $I_{charge} = (1.28 / 3.18) * (0.075 / 0.015) = 2.018A$

For 3S3P:
 $V_{c1t1} = 5.4 * PR48 / (PR48 + PR93)$
 $= 5.4 * 28.7K / (28.7K + 25.5K) = 2.86V$
 $I_{charge} = (2.86 / 3.18) * (0.075 / 0.015) = 4.5A$

For Precharge:
 $V_{c1t1} = 5.4 * (PR48 / PR51) / ((PR48 / PR51) + PR93)$
 $= 5.4 * 0.355K / (0.355K + 25.5K) = 0.074V$
 $I_{charge} = (0.074mV / 3.18) * (0.075 / 0.015) = 116\mu A$

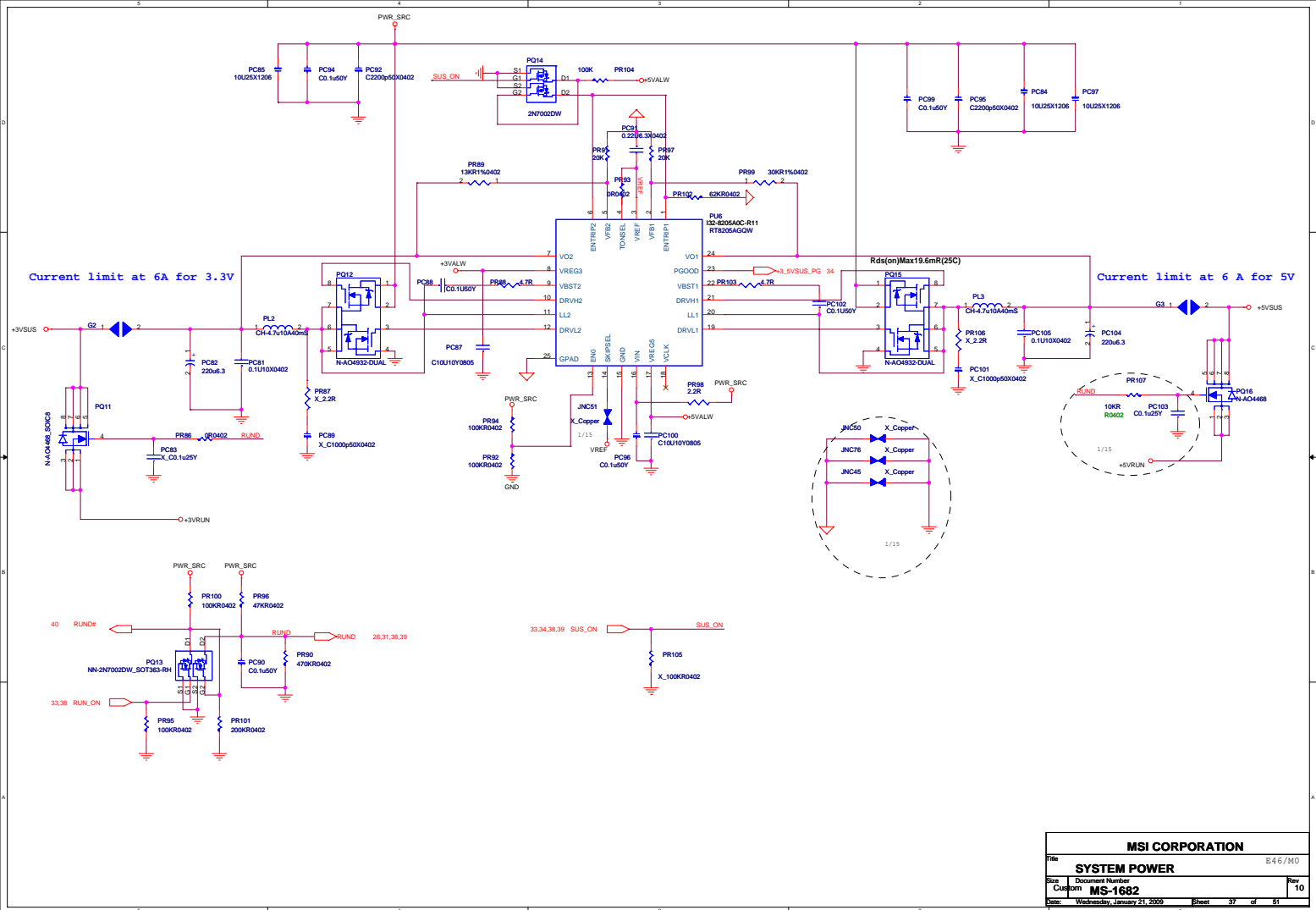
ENCHG-2P	PRE_CHG	ENCHG	
0	1	1	Pre-charge
1	0	1	3S2P-Fast charge
0	0	1	3S3P-Fast charge
0	0	0	STOP CHARGE

MICRO-STAR INT'L CO.,LTD.

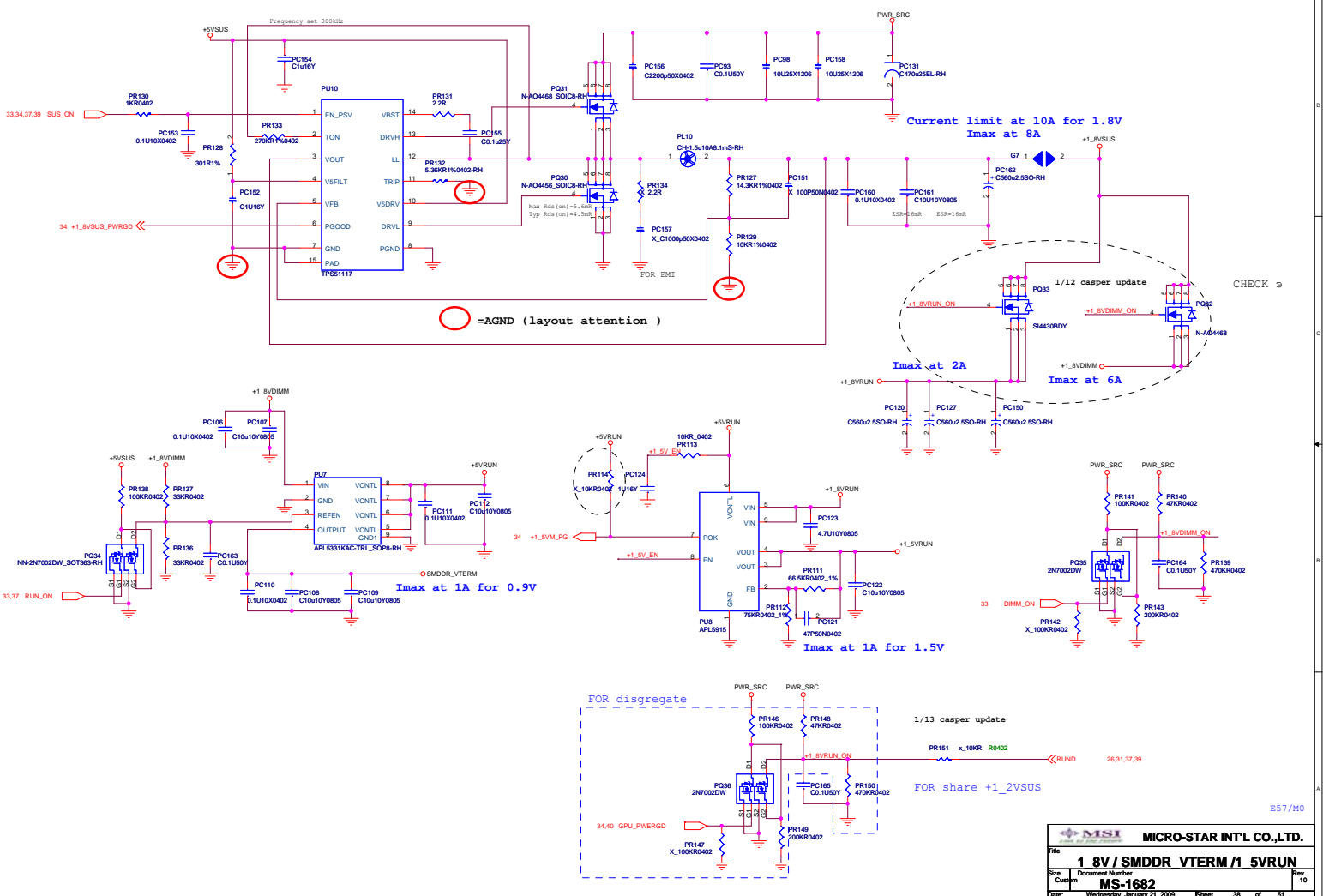
File: **Battery Charger** E51/M0

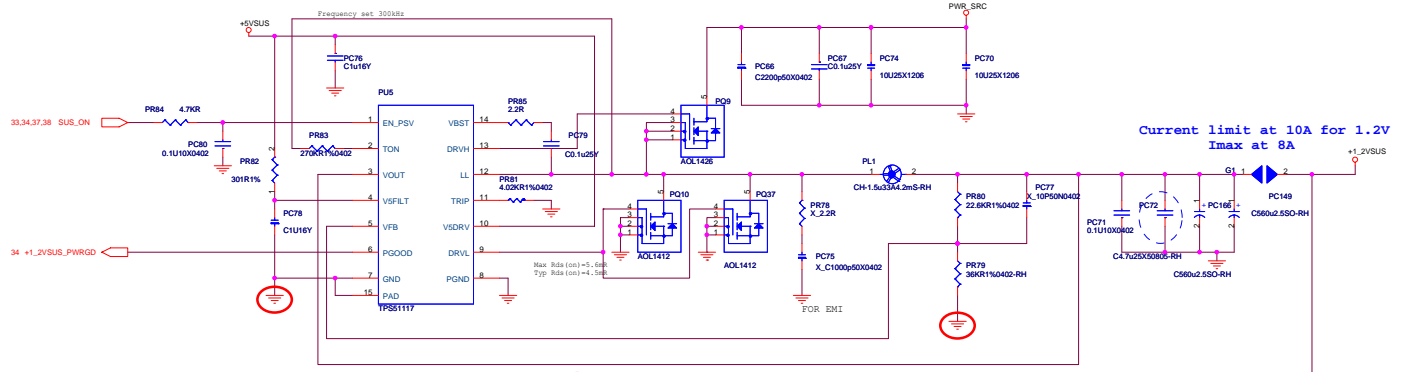
Size: Custom Document Number: MS-1682 Rev: 10

Date: Wednesday, January 21, 2009 Sheet: 35 of 51

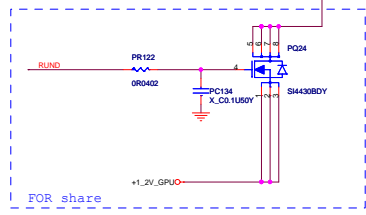
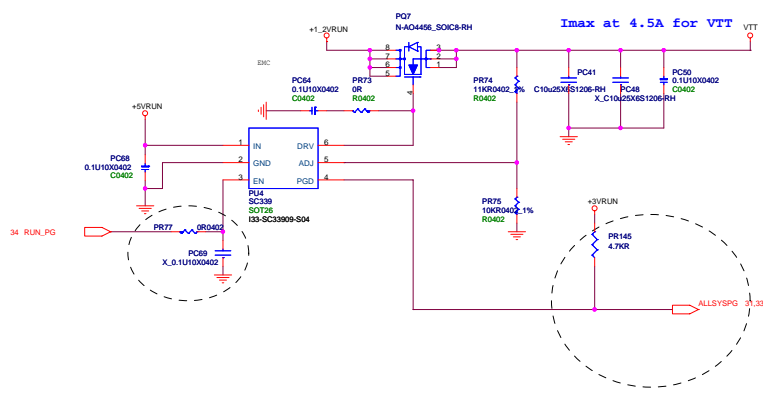
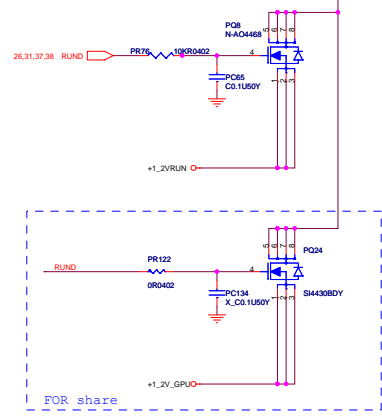


MSI CORPORATION			
File	SYSTEM POWER	E:46/M0	
Size	Document Number		
Custom	MS-1682	Rev 10	
Date	Wednesday, January 21, 2009	Sheet	37 of 51

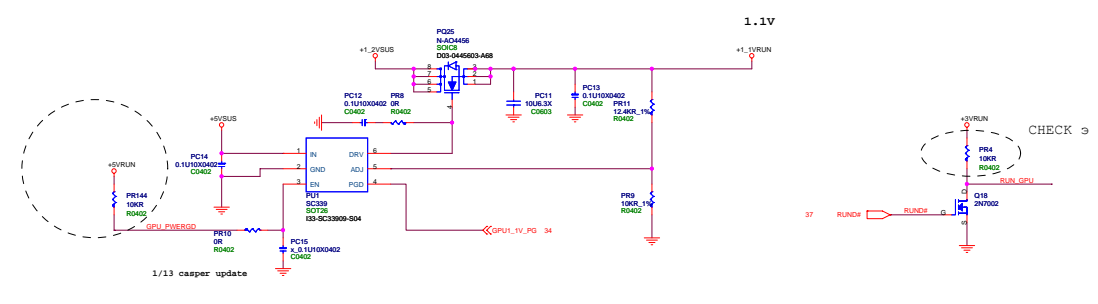
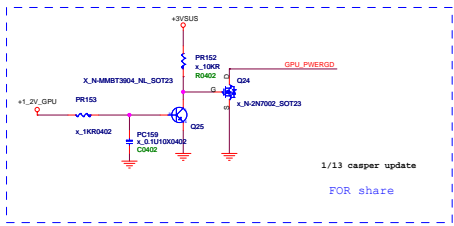
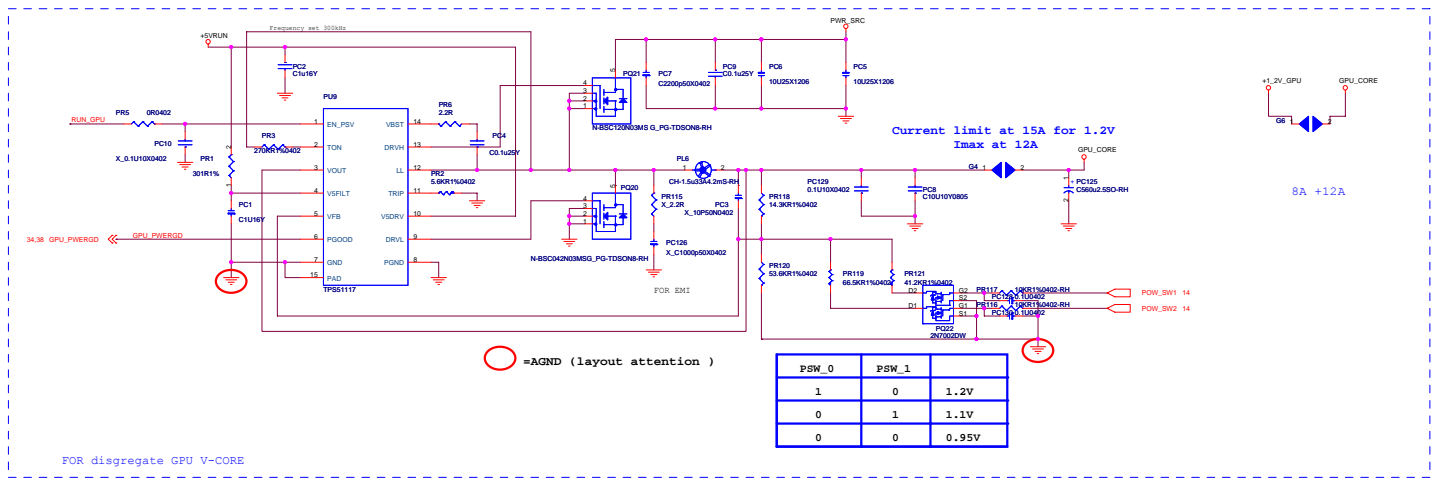




○ =AGND (layout attention)

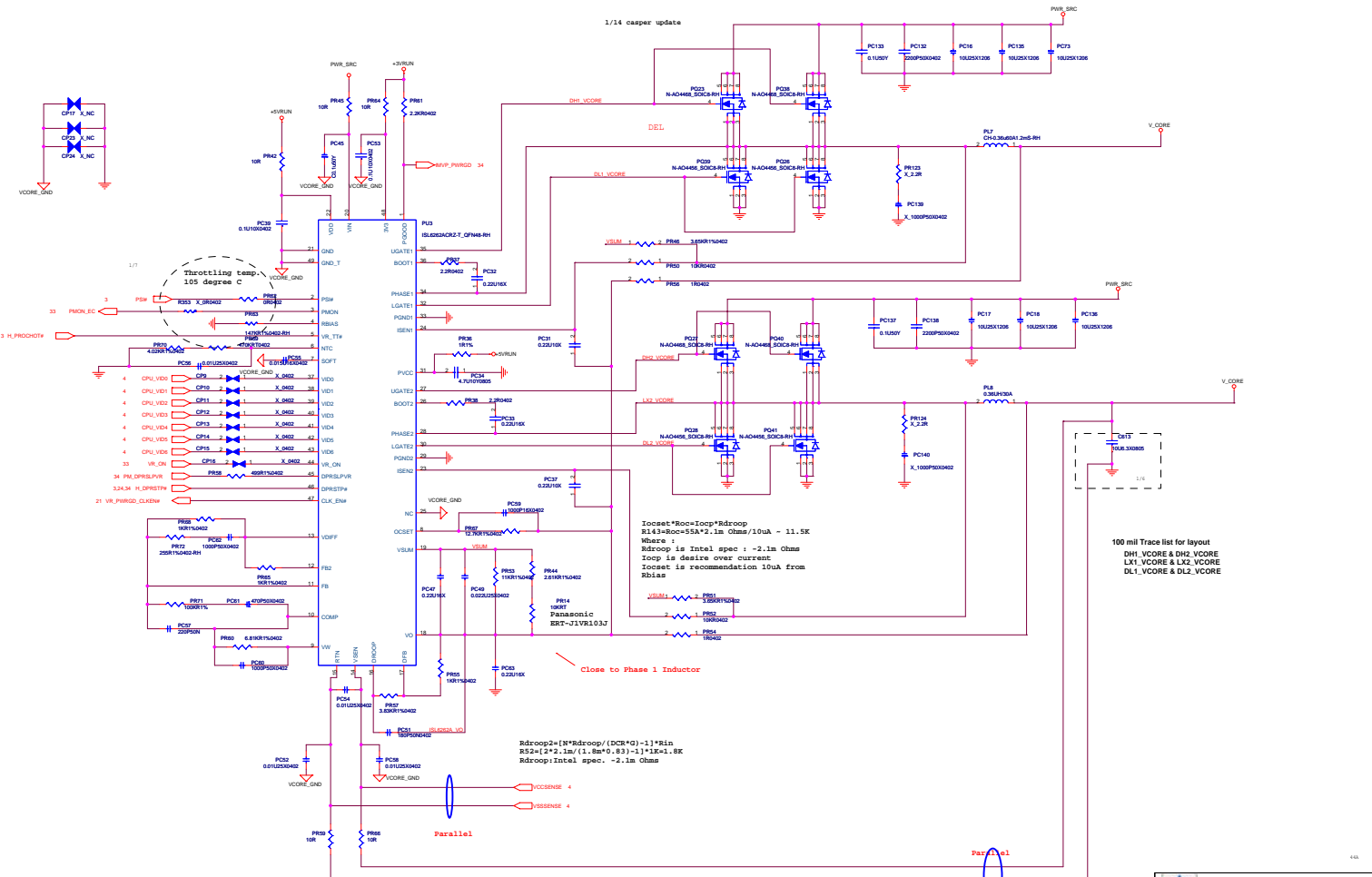


MSI		MICRO-STAR INT'L CO.,LTD.	
Title	1.2V & VTT		E38 / M0
Size	Document Number		Rev
Custom	MS-1682		10
Date	Wednesday, January 21, 2009		Sheet 99 of 91



File	<Title>	E417/M0
Size	Document Number	M5-1682
Rev	Version	1.0
Date	Wednesday, January 21, 2009	Page 40 of 51

1/14 casper update



Throttling temp.
105 degree C

$I_{ocset} = I_{oc} \times I_{ocp} \times R_{idrop}$
 $R_{idrop} = 55A \times 2.1m \text{ Ohms} / 10uA = 11.5k$
 Where :
 R_{idrop} is Intel spec : -2.1m Ohms
 I_{ocp} is desire over current
 I_{ocset} is recommendation 10uA from BIOS

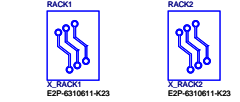
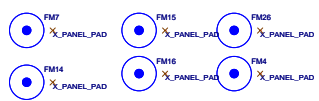
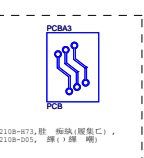
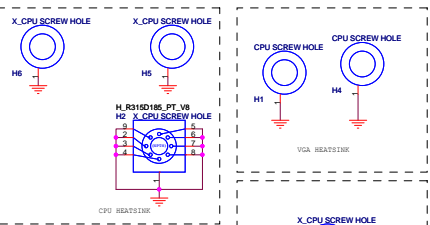
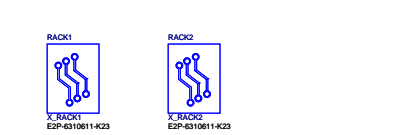
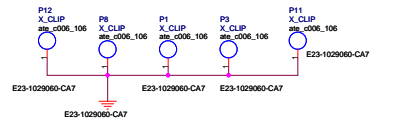
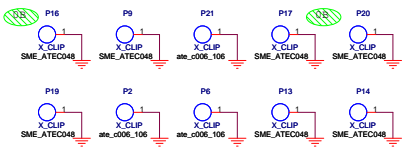
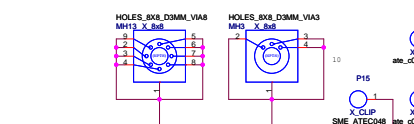
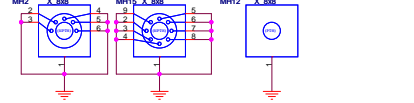
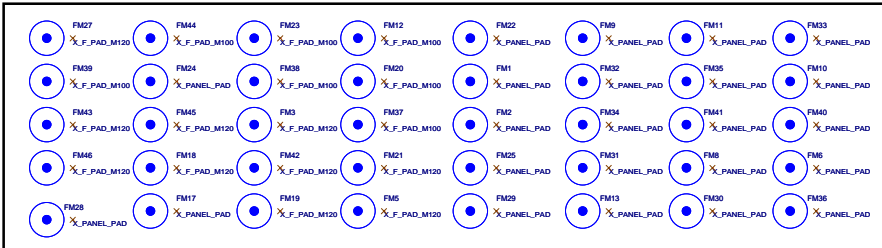
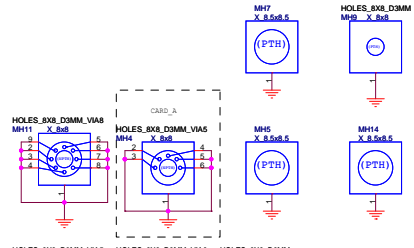
$R_{idrop2} = (N \times R_{idrop}) / (DCR \times 0.1)$
 $R_{idrop2} = (4 \times 2.1m / (1.1 \times 0.1)) = 7.636 \times 10^{-3} k$
 R_{idrop} : Intel spec. -2.1m Ohms

100 mil Trace list for layout
 DH1_VCORE & DH2_VCORE
 LX1_VCORE & LX2_VCORE
 DL1_VCORE & DL2_VCORE

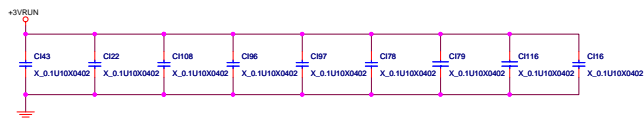
MICRO-STAR INT'L CO., LTD.

CPU POWER E71/A0

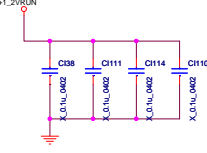
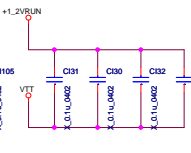
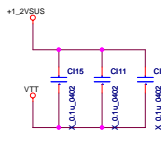
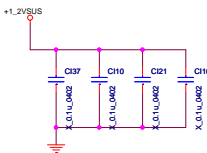
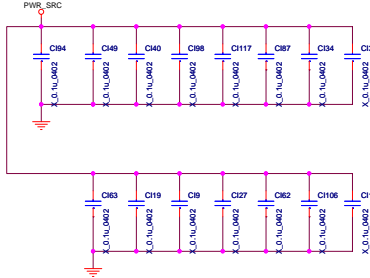
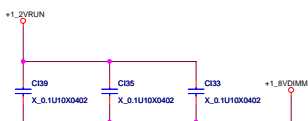
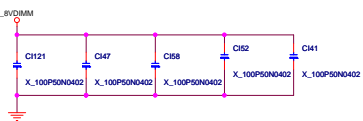
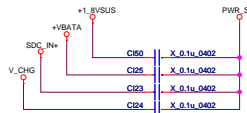
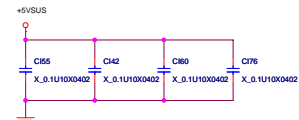
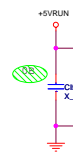
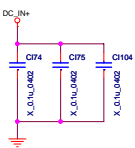
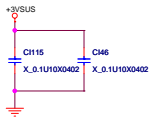
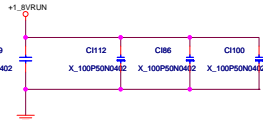
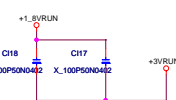
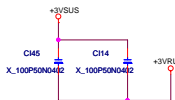
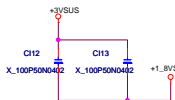
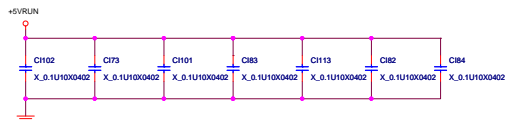
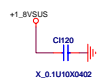
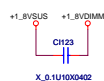
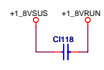
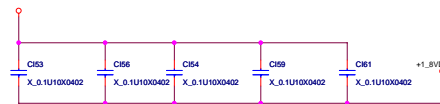
MS-1682 Rev 1.0



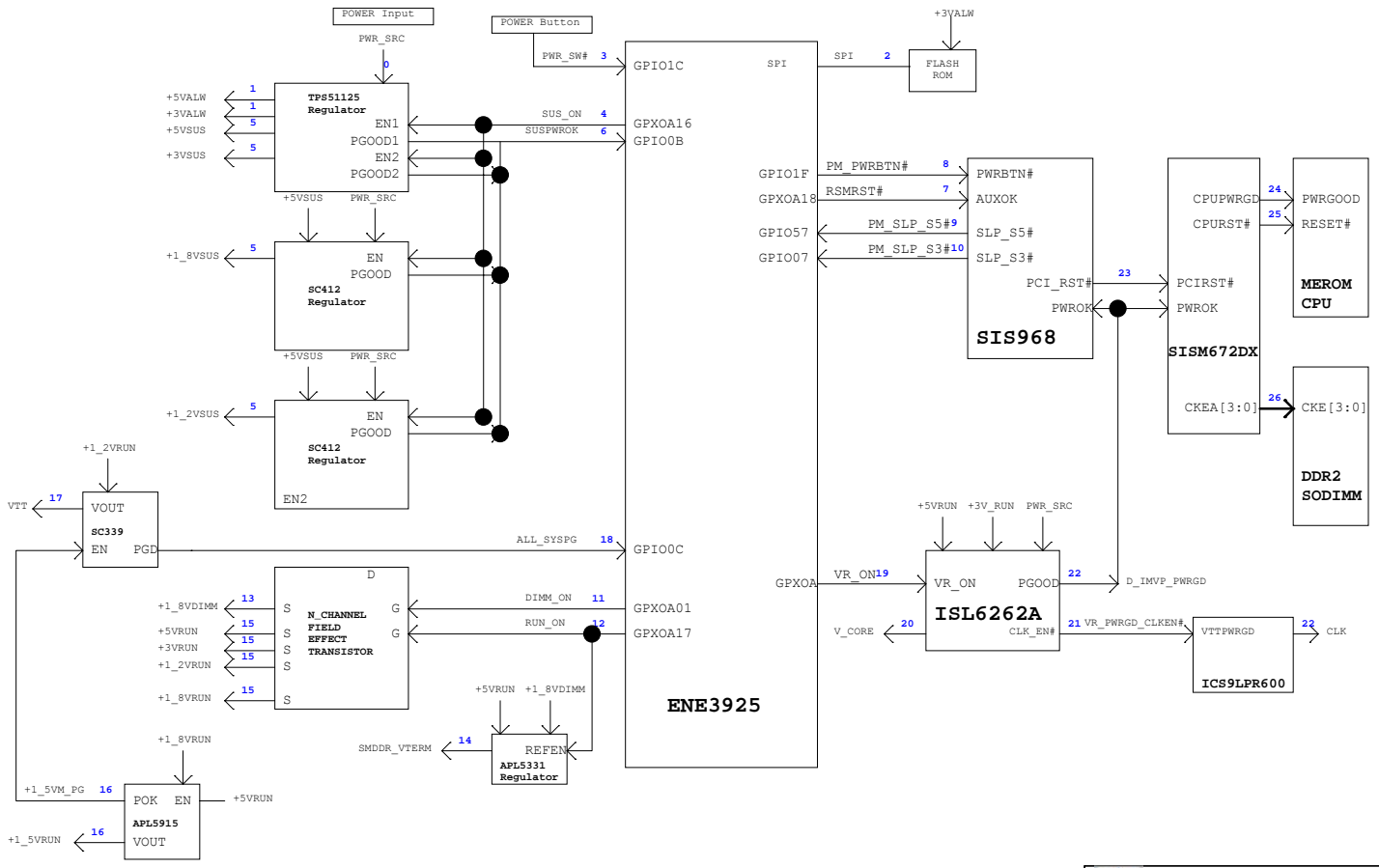
P30-1682128-H73, 墊 (銅珠/螺絲仁) -
P30-1682128-D05, 彈 () 螺 (螺)



SMDR_VTERM

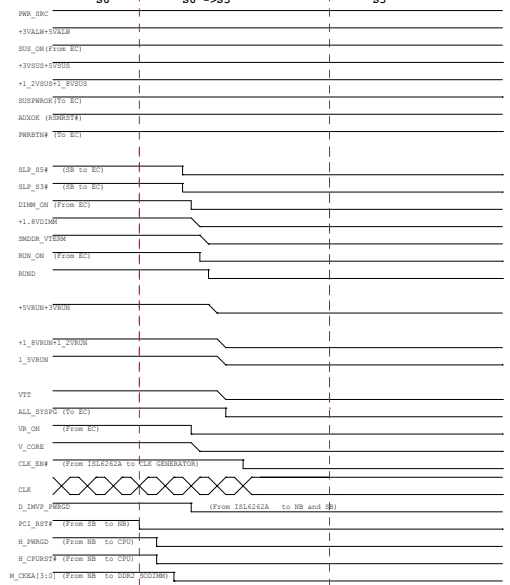
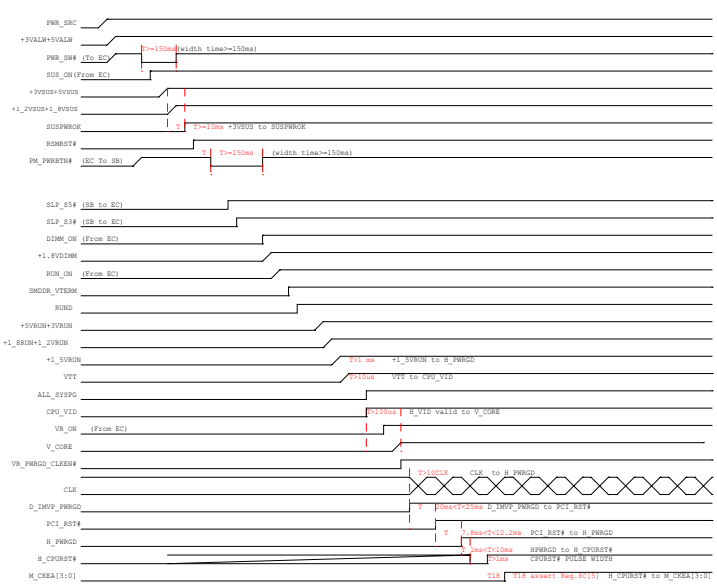



MICRO-STAR INT'L CO.,LTD.	
File	FMI
Size	Customer
Document Number	MS-1682
Date	Wednesday, January 21, 2009
Sheet	43 of 51
Rev	0A



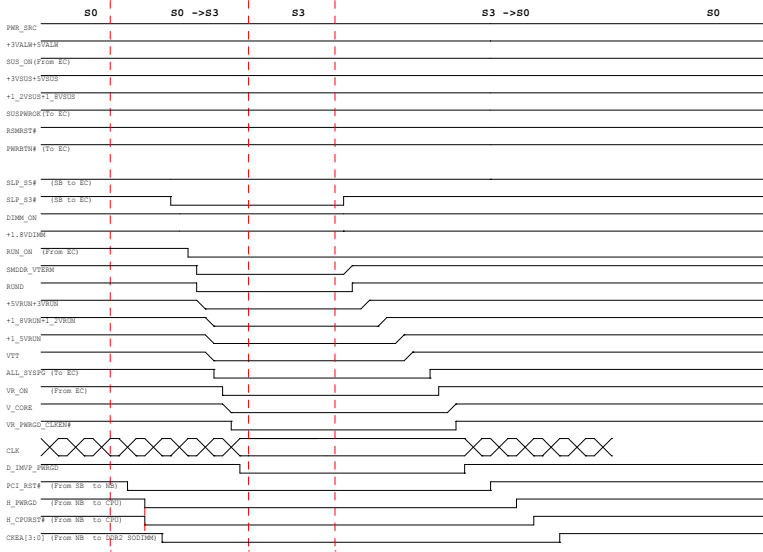
AC S5-S0
 EC programming timing
 SiSM672FX + 968 timing SPEC

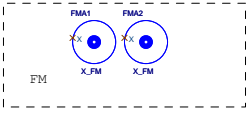
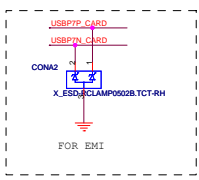
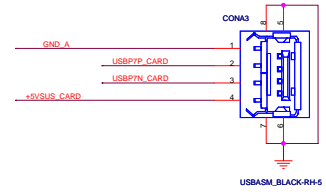
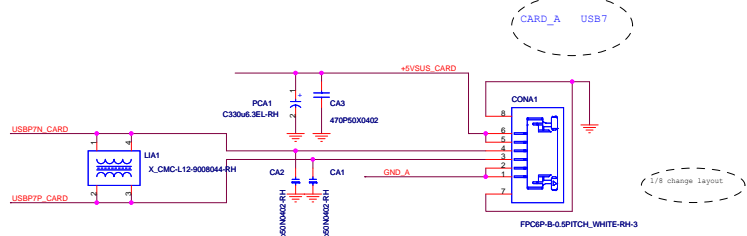
AC S0-S5
 EC programming timing
 SiSM672FX + 968 timing SPEC



 MICRO-STAR INT'L CO.,LTD.	
File: Power Sequency-2	
Size: Custom	Document Number: MS-1682
Date: Wednesday, January 21, 2009	Sheet: 45 of 51

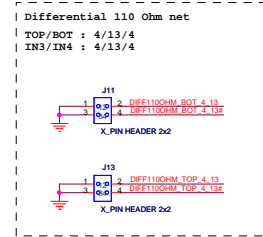
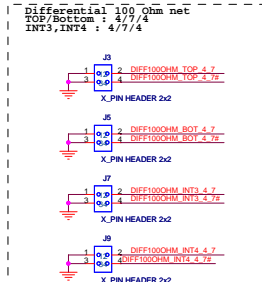
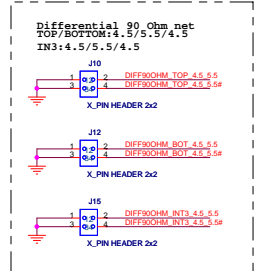
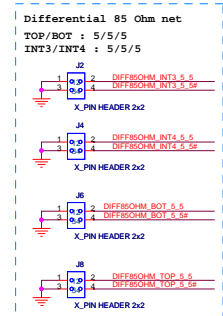
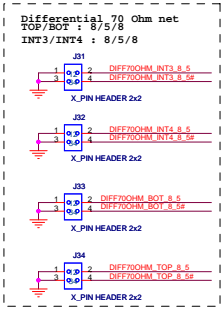
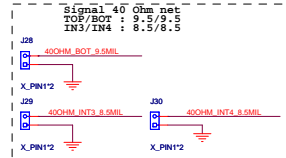
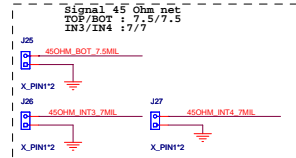
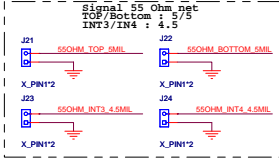
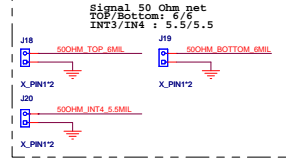
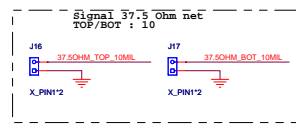
AC S0-S3-S0
 EC programming timing
 SiSM672FX + 968 timing SPEC



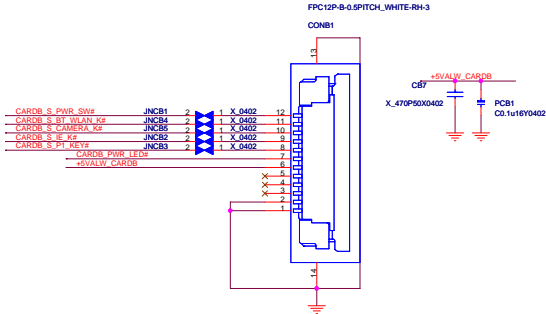
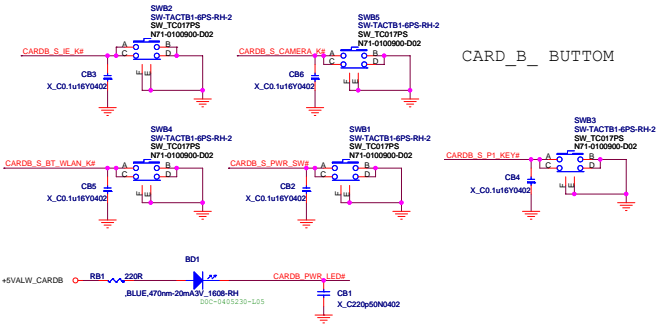


P30-1682A0B-H73, 胜 痲缺(履集仁)
 P30-1682A0B-D05, 纒()纒 喇),

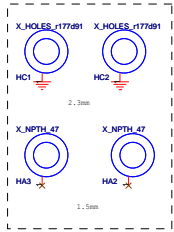
MICRO-STAR INT'L CO.,LTD.	
File	E5/M0
USB Board	
Size	Document Number
Custom	MS-16821A
Date	Wednesday, January 21, 2009 Sheet 47 of 51
Rev	0A



CARD_B_ BUTTOM



F30-1682B0B-H73, 胜 痴缺 (履集仁)
 F30-1682B0B-D05, 纒 () 纒 喇),



		MICRO-STAR INT'L CO.,LTD.	
File		E10/M0	
Title		Button Board	
Size	Document Number	Rev 0A	
Custom	MS-16821B		
Date	Wednesday, January 21, 2009	Sheet	49 of 51

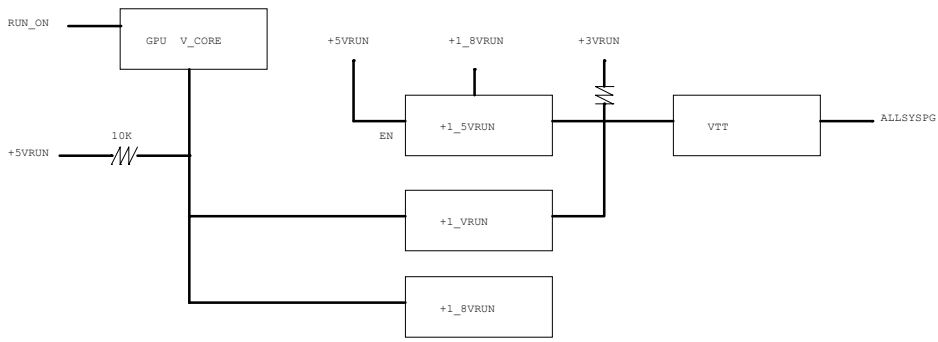
0A -- 0B Note

MS-1682

P03, C579 INSTALL by SA BUG ,R41 CHANGE F/P TO R0603
 P04, C639,C623,C612,C640,C624 INSTALL X5R
 P06, R322 INSTALL
 P07, R177,R171 CHANGE 36R , R170,R176 CHANGE 40.2R ,JNC70,JNC75 CHANGE F/P TO NC_0603
 P14, R124,R125,R301 CHANG JNC81,JNC82,JNC83 AND INSTALL , R67,R68 DEL ,ADD PR135,RN28,JNC80,R346 ,R346 CHANGE F/P TO R0603, U5 PIN 8 ,7 CHANGE NET NAME ,JNC29 &R85 CHANGE
 P15, C50 INSTALL
 P16, R52,R246 INSTALL ,R51,R242 DON'T INSTALL
 P18, R225,R227,R13,R14 CHANGE 499R
 P19, R223,R224,R12,R11 CHANGE 499R
 P20, CHANGE U15 FOOTPRINT TO " SOT23_5_NPC30X " , VGA_DATA AND VGA_CLK AND "J38 : PIN 30 "CHANGE TO +3.3V_DELAY , R232,R233 ,C486,C487,C488 INSTALL
 P21, RN14 PIN 2,4 SWAP PIN 6,8
 P22, DEL SPI SKET1,JNC66,JNC67,JNC71,JNC72,CON4 , R318 INSTALL, R317 DON'T INSTALL ,JNC34 ,JNC33 CHANGE F/P TO NC_0603
 P23, JNC65,JNC64,JNC59,JNC56,JNC55 INSTALL by SA BUG ,R41 CHANGE F/P TO R0603
 P26, CN5 CHANGE CAD, CN6 CHANGE LAYOUT AND PIN 6 TO GND
 P27, DEL D1,D2, R212 CHANGE TO +5VSUS
 P28, R189 CHANGE 0 Ohm AND INSTALL , CHANGE CON5 PIN 29,20,27 NET NAME, DEL R187,R186 , U12 CHANGE 5159 "B07-0515904-R09 "
 P29, Y1 CHANGE F/P, U23 NET CHANGE
 P30, JGFS1 DON'T INSTALL, USIM_PWR > 25 mils, DEL SW1,SW2,SW3,SW4,JNC1,2,3,4
 P31, R112,D16 TO ALLSYSFG, R115,C212 NOT INSTALL, R108 INSTALL
 P32, R290 CHANGE TO 33K ,C622 CHANGE TO 4.7U,CON7 SWAP PIN 1 &PIN 2
 P33, U20 CHANGE FOOTPRINT SIC8_SST_S2A , CN3 CHANGE NEW PN , DEL R346 TO RUN_PG, U3 PIN 113 CHANGE TO PIN 23 , U3 PIN 98 & PIN 130 SWAP,JNC8 CGANGE R38 , ADD R354 220HM , SW5,SW6 SWAP LAYOUT, YT1 MOVE
 P34, JNC19 CHANGE R345 DON'T INSTALL ,J37 CHANGE FOOT PRINT
 P36, PR12 360 CHANGE 620 (R11-0621T12-R01) (spre-charge current), PR16 9.31K CHANGE 28.7K(R11-2872T12-W08) (>6-CELL charge current)
 P37, PR107 CHANGE 10K ,INSTALL PC103
 P38, ADD PQ36 TO DELAY +1 8VRUN, DEL PR135,PC159 , DON'T INSTALL PR114
 P39, PU4 PIN4 TO ALLSYSFG ,PR77 CHANGE 0 Ohm, PC69 DON'T INSTALL ,PC72 10uF CHANGE 4.7uF(C11-4753014-W08) (>jitter)
 P40, PR4 CHANGE TO 10K Ohm ,PR63 147 CHANGE 147K(R11-1473T12-Y01) ,ADD GPU_PWERGD NET WAY
 P41, PR63 CHANGE TO 147K Ohm , ADD R353 DON'T INSTALL ,C613 INSTALL
 P42 , H1:P30 , MH1:CHANGE TO 5020
 P47 , CONA1 CHANGE LAYOUT

JNC21, JNC80 齐全
 ADD PR144 TO +5VRUN #check
 ADD PR145 TO +3VRUN #check

MSI CORPORATION			
Title Note			
Size	Document Number		Rev
Custom	MS-1682		0A
Date:	Wednesday, January 21, 2009	Sheet	60 of 61



MSI CORPORATION			
File: Note			
Size: Custom	Document Number: MS-1682		Rev: 0A
Date: Wednesday, January 21, 2009	Sheet: 01	of 01	