MS-1681 Ver : 10

Calpella Platform

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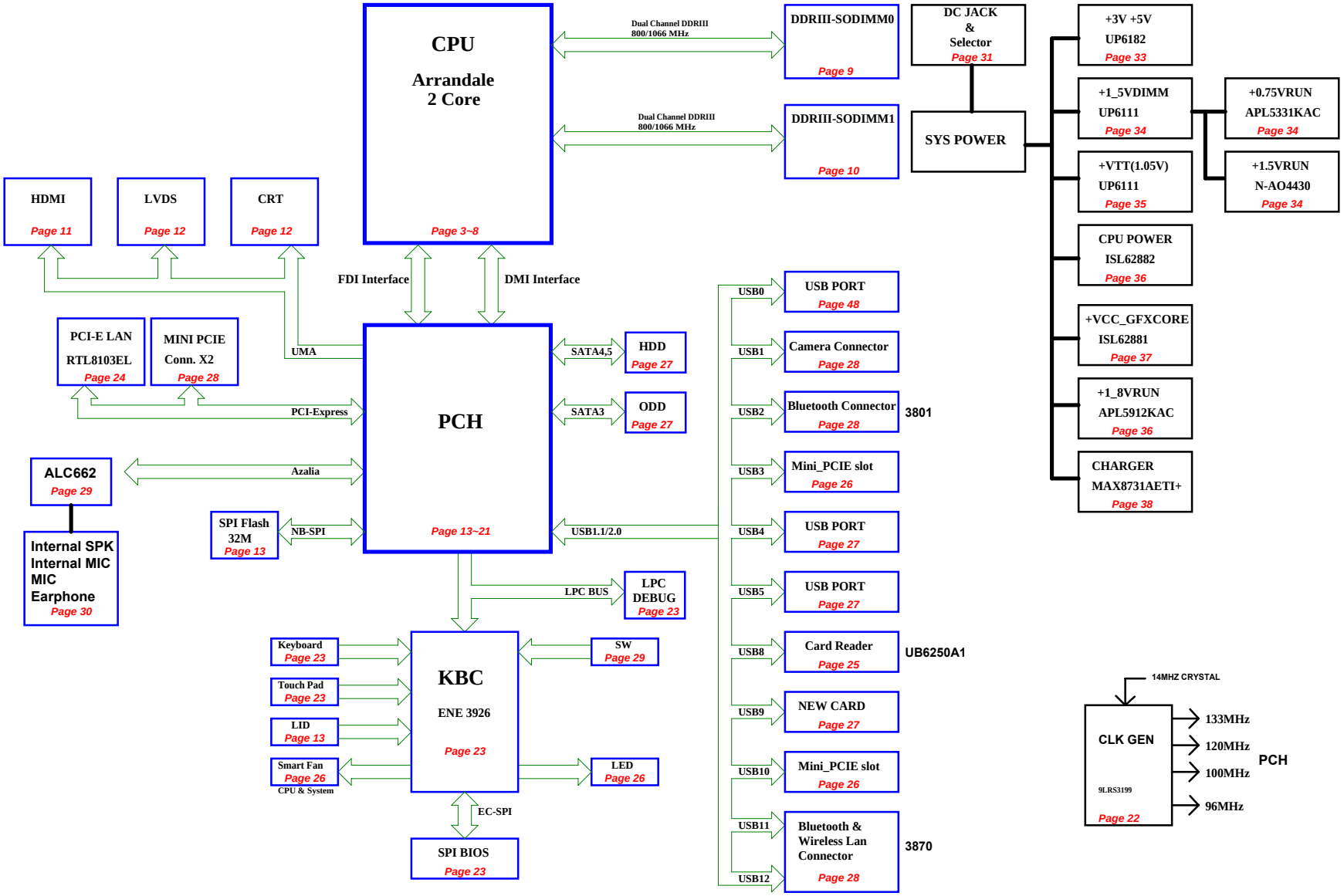


MICRO-STAR INT'L CO.,LTD.

BLOCK DIAGRAM

MS-1681

Rev 10

Tuesday, November 03, 2009

SCHEMATIC ANNOTATIONS AND BOARD INFORMATION

Voltage Rails

POWER PLANE	VOLTAGE	ACTIVE IN	DESCRIPTION
PWR_SRC	19V	S0,(S3-S5)	
+5VALW	5V	S0,(S3-S5)	
+5VRUN	5V	S0	
+5VSUS	5V	S0	
+3VALW	3.3V	S0,(S3-S5)	
+3VSUS	3.3V	S0,(S3-S5)	LAN
+3VRUN	3.3V	S0	
+1_5VDIMM	1.5V	S0,S3	DDRIII core
+1_5VRUN	1.5V	S0	
VTT	1.05V	S0	PCH
+0_75VRUN	0.75V	S0	DDRIII command & control pull up.
+VCC_CORE	1.05V-1.1V	S0	CPU core rail
+VCC_GFXCORE	1.1V	S0	Graphics core rail (Dual Core only)

Net Naming Conventions

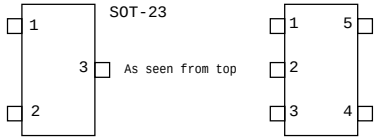
Suffix

\# = Active Low Signal

Prefix

H = Host
M = DDR Memory
TP = Test Point (does not connect anywhere else)

PCB Footprints



AC Mode

Power States	SLP_S3#	SLP_S4#	SLP_S5#	SLP_LAN#	+V*ALWAYS	+V*SUS	+V*RUN	CLK
S0 (Full on)	HIGH	HIGH	HIGH	HIGH	ON	ON	ON	ON
S3 (Suspend to RAM)	LOW	HIGH	HIGH	HIGH	ON	ON	OFF	OFF
S4 (Suspend to Disk)	LOW	LOW	HIGH	HIGH	ON	ON	OFF	OFF
S5 (Soft Off)	LOW	LOW	LOW	HIGH	ON	ON	OFF	OFF

Battery Mode

Power States	SLP_S3#	SLP_S4#	SLP_S5#	SLP_LAN#	+V*ALWAYS	+V*SUS	+V*RUN	CLK
S0 (Full on)	HIGH	HIGH	HIGH	HIGH	ON	ON	ON	ON
S3 (Suspend to RAM)	LOW	HIGH	HIGH	HIGH	ON	ON	OFF	OFF
S4 (Suspend to Disk)	LOW	LOW	HIGH	HIGH	ON	OFF	OFF	OFF
S5 (Soft Off)	LOW	LOW	LOW	HIGH	ON	OFF	OFF	OFF

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Title: PLATFORM

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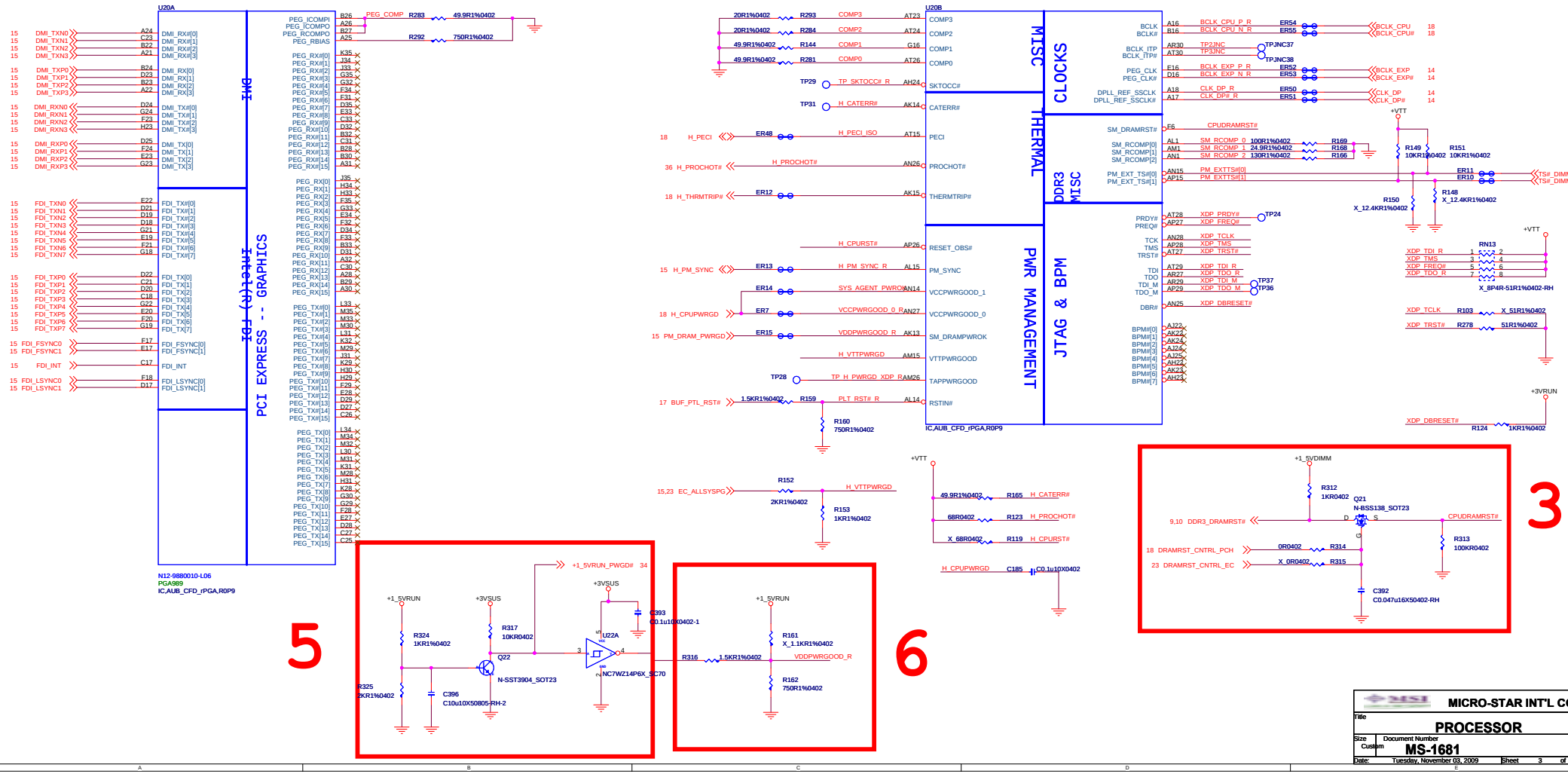
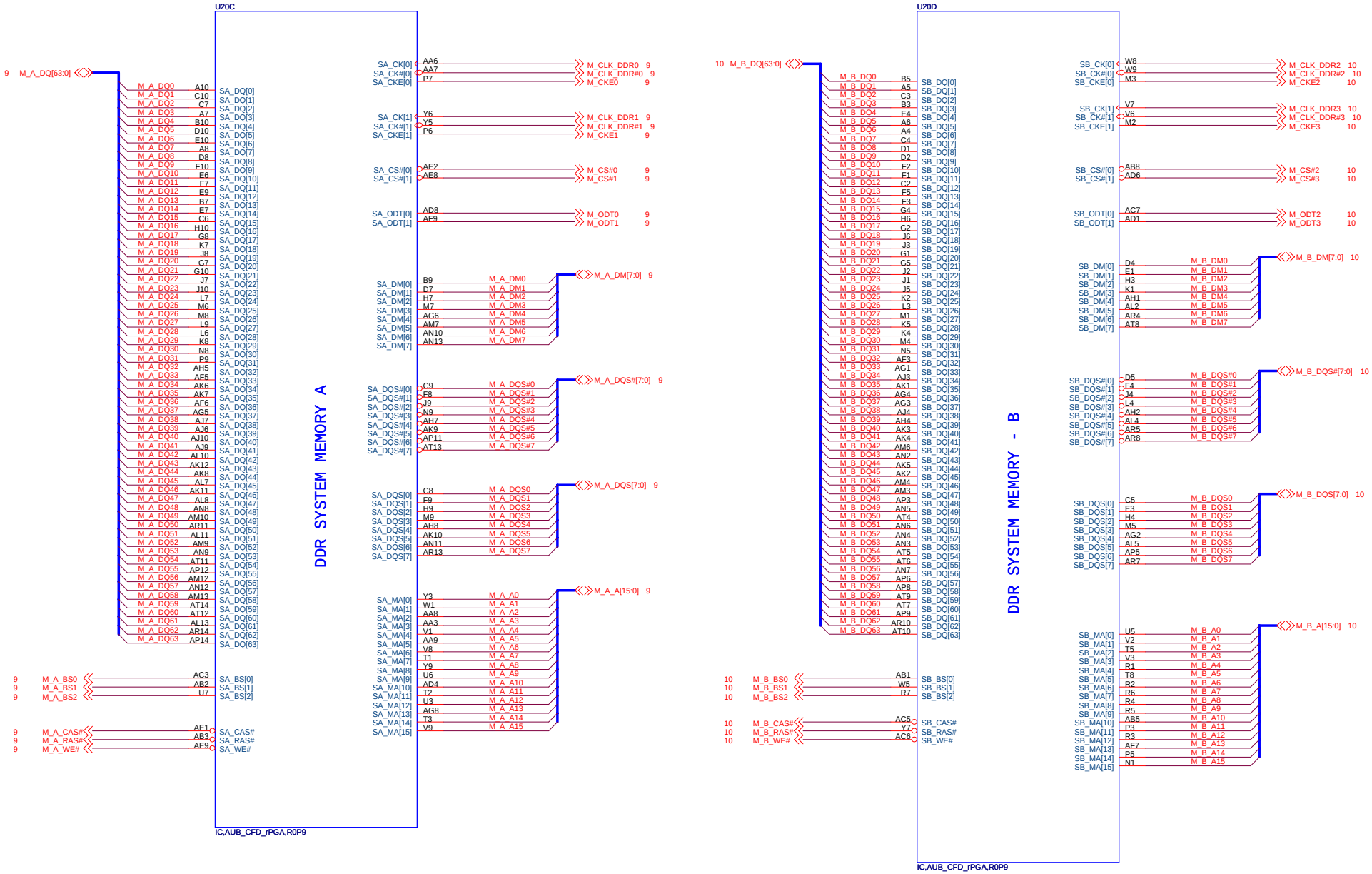
ARRANDALE PROCESSOR (CLK,MISC,JTAG)



ARRANDALE PROCESSOR (DDR3)



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Title: DDR3

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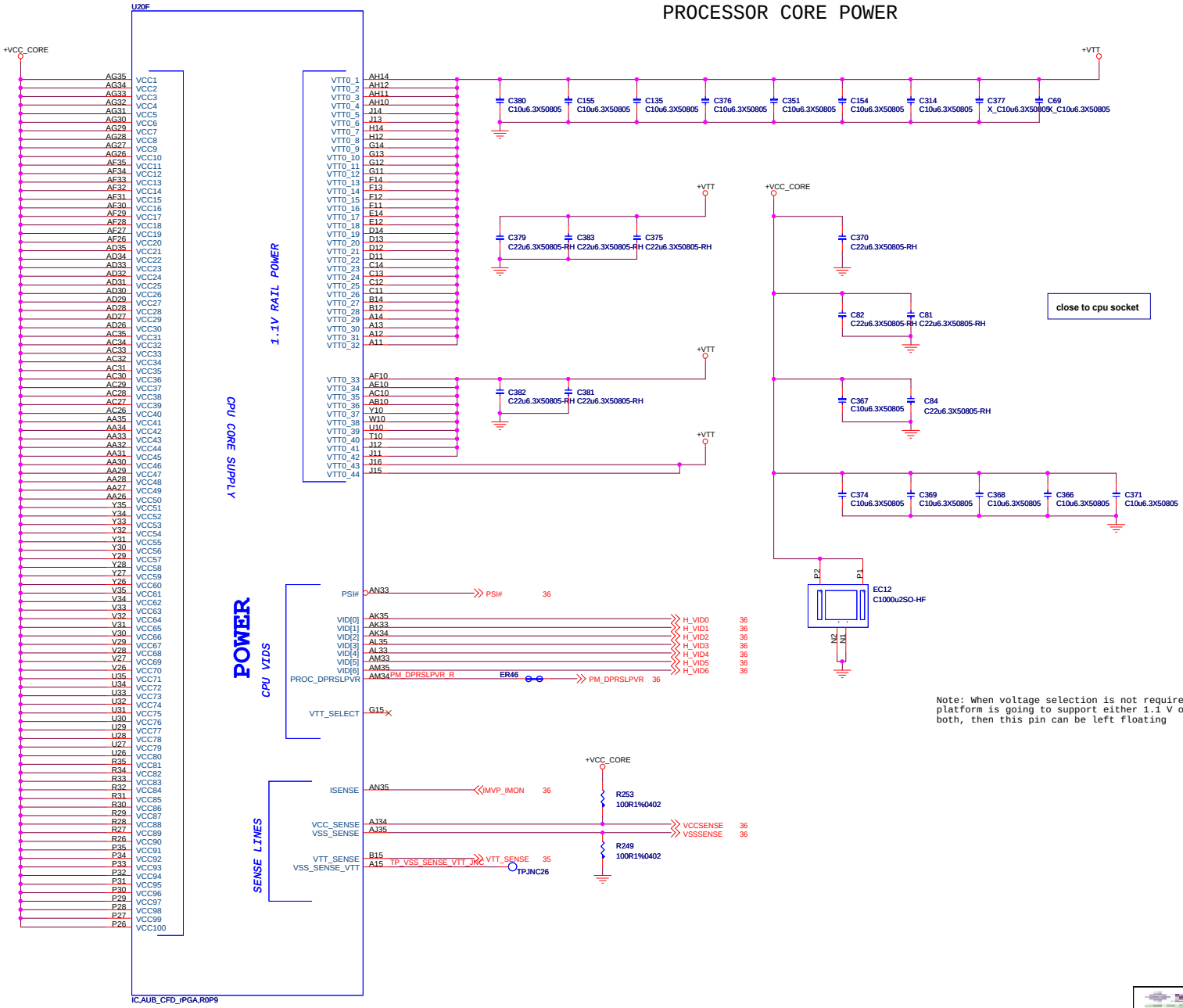
ARRANDALE PROCESSOR (POWER)

PROCESSOR CORE POWER



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Title: PROCESSOR POWER

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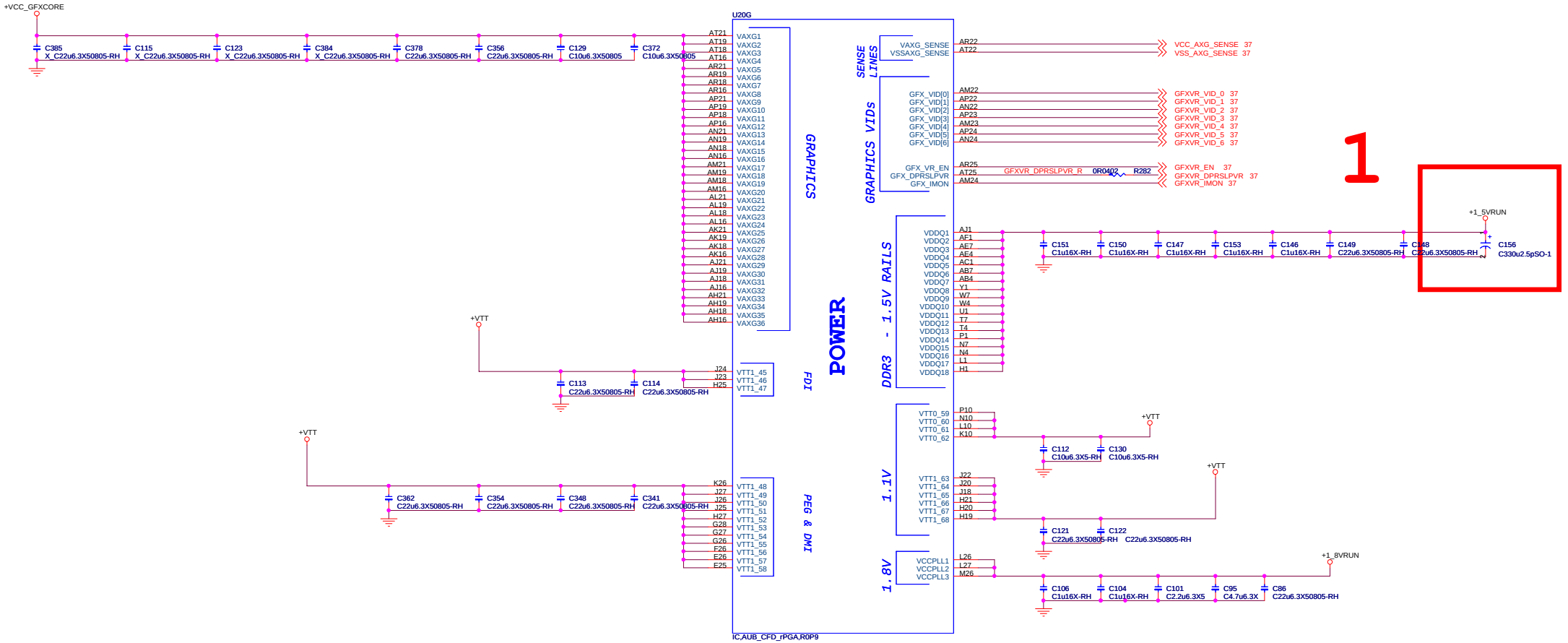
ARRANDALE PROCESSOR (GRAPHICS POWER)



1

MICRO-STAR INT'L CO.,LTD.		
Title: GRAPHICS POWER		
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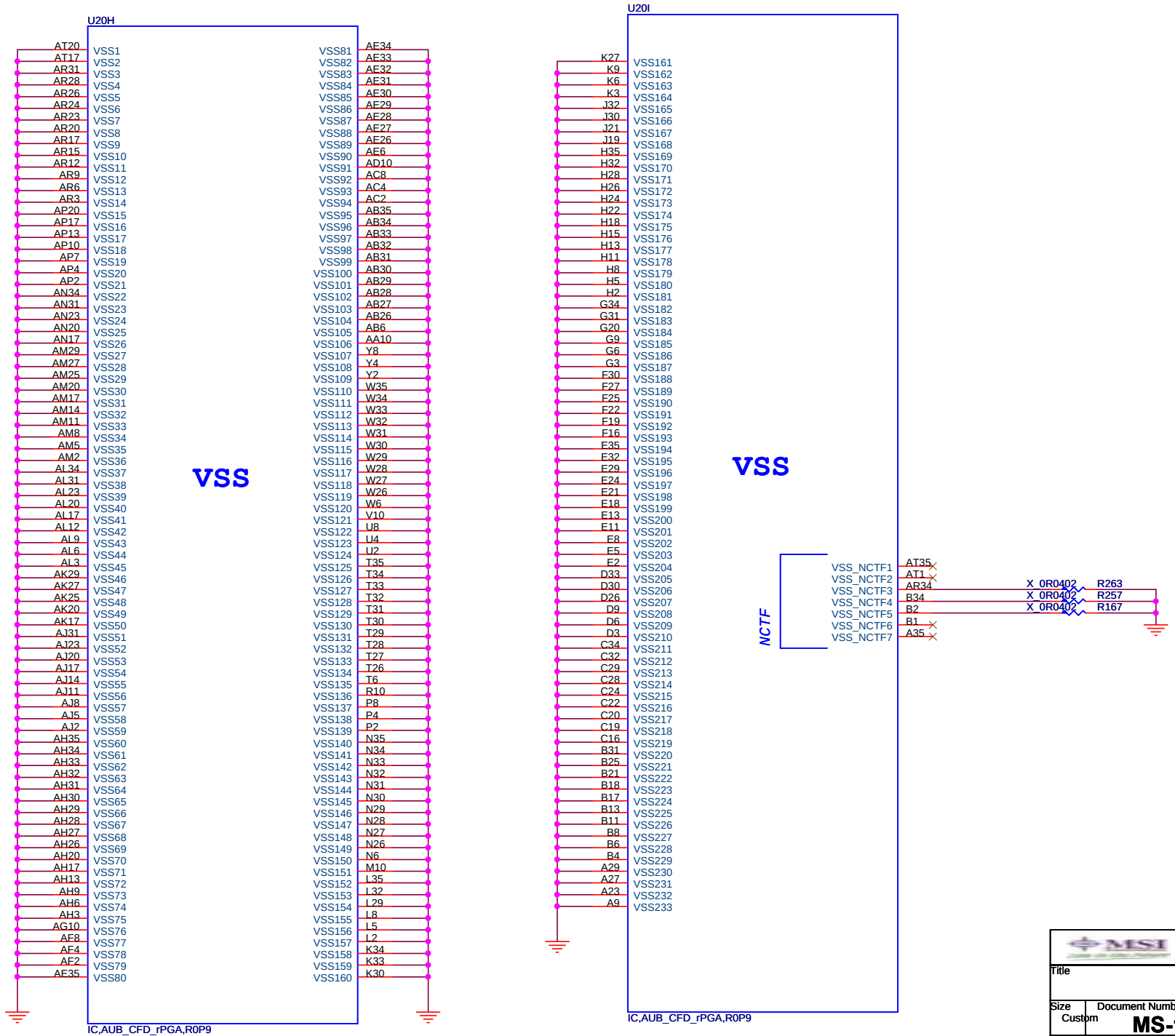
ARRANDALE PROCESSOR (GND)



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Title: PROCESSOR GND

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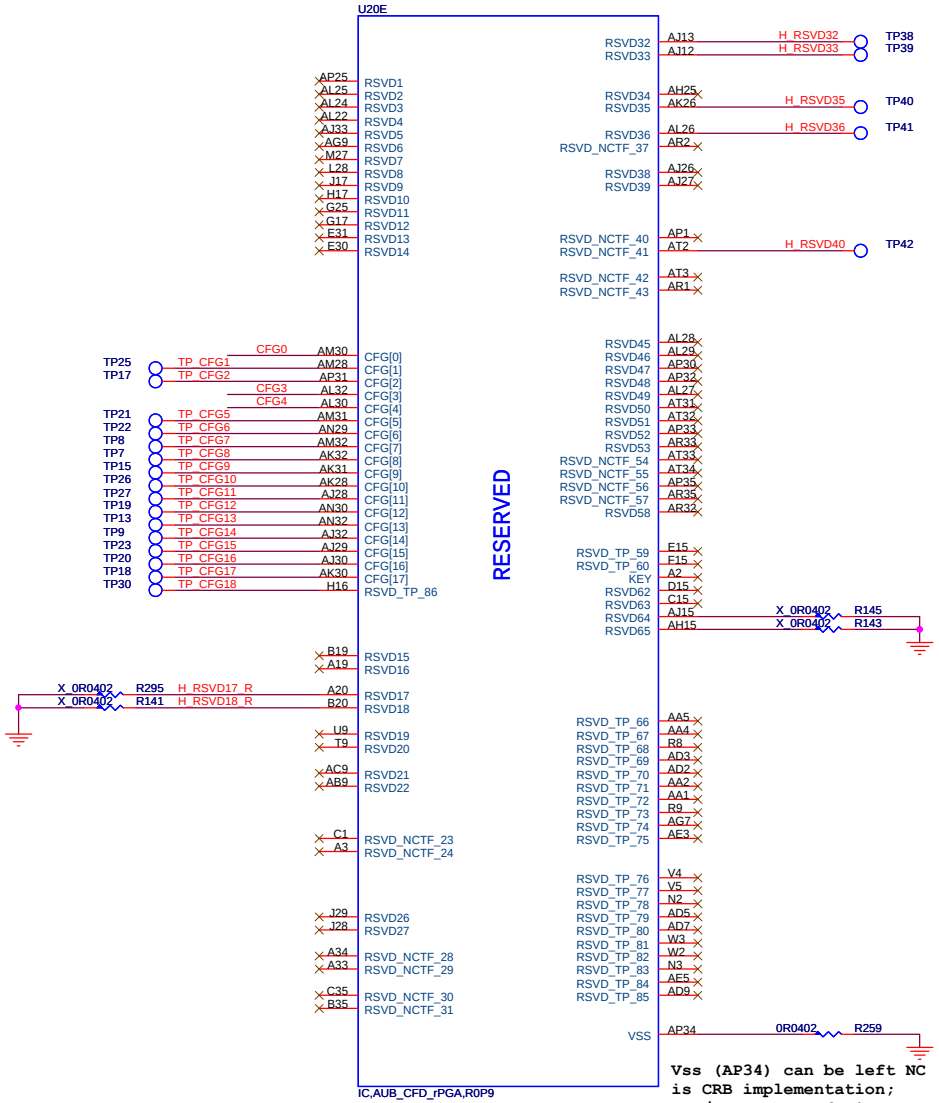
ARRANDALE PROCESSOR (RESERVED)

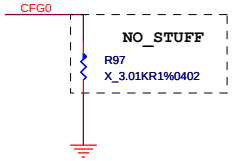


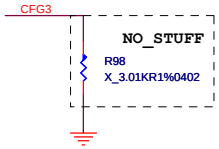
Vss (AP34) can be left NC is CRB implementation; EDS/DG recommendation to GND

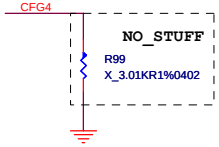
PCI-Express Configuration Select	
CFG0	1:Single PEG 0:Bifurcation enabled

CFG3 - PCI-Express Static Lane Reversal	
CFG3	1 :Normal Operation 0 :Lane Numbers Reversed 15 -> 0, 14 -> 1, ...

CFG4 - Display Port Presence	
CFG4	1:Disabled; No Physical Display Port attached to Embedded Display Port 0:Enabled; An external Display Port device is connected to the Embedded Display Port







Layout Note:
Location of all CFG strap resistors needs to be close to trace to minimize stub

CFG[3] – PCI Express* Static Lane Numbering Reversal. Lane Reversal will be applied across all 16 Lanes.
- 1: No lane reversal
- 0: Reversal

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Title: PROCESSOR RESERVED

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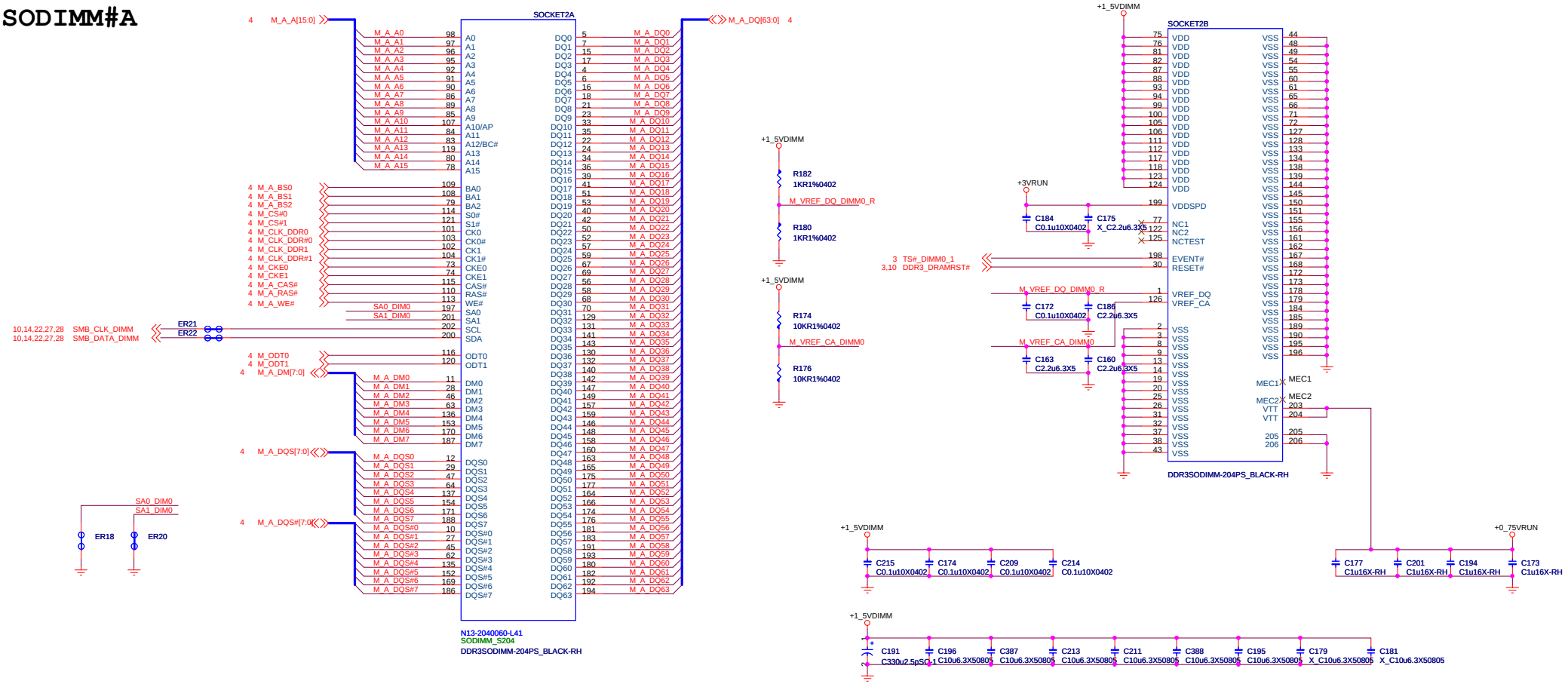
SODIMM#A



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Title: DDR3 SODIMM0

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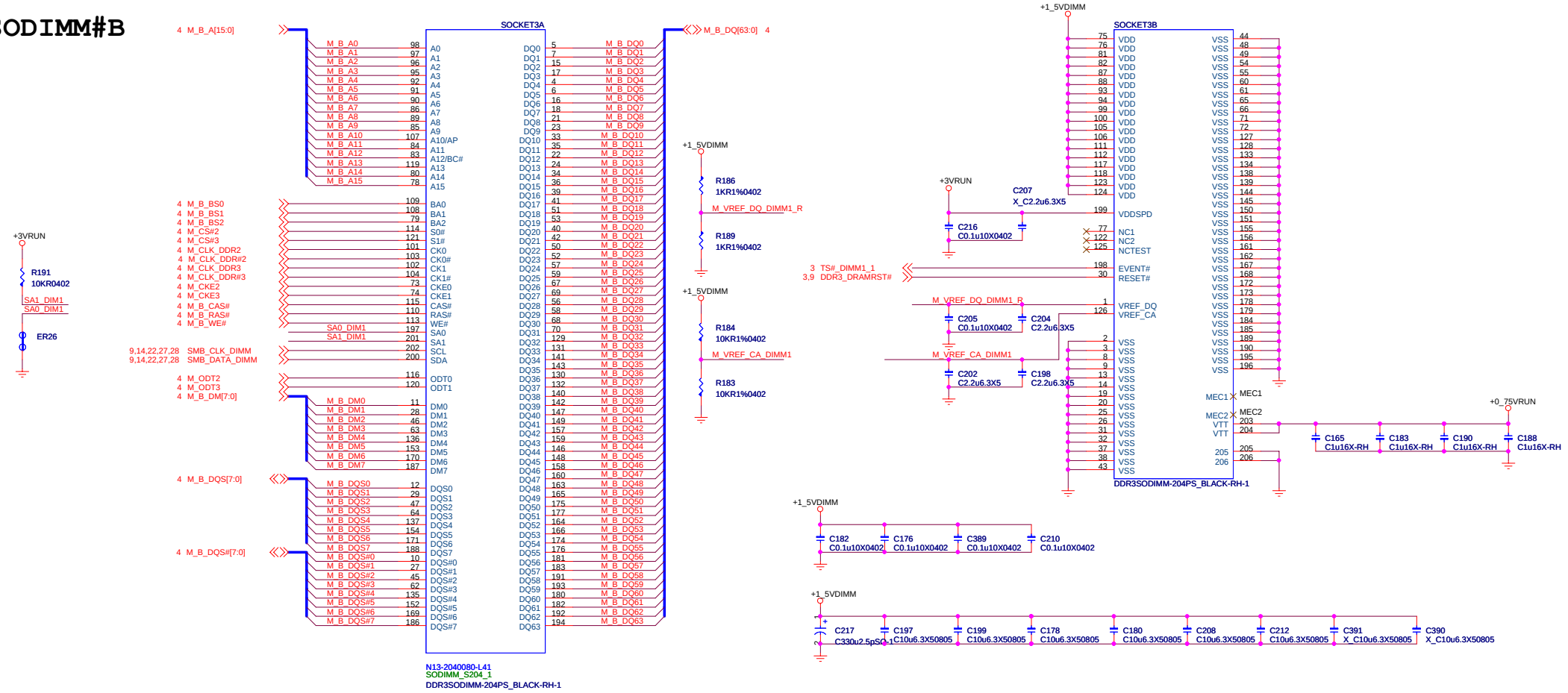
SODIMM#B



Title	DDR3 SODIMM1
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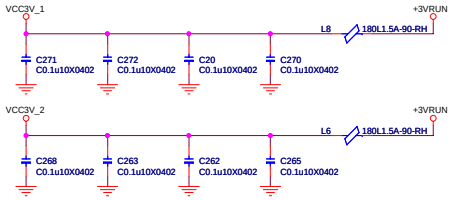
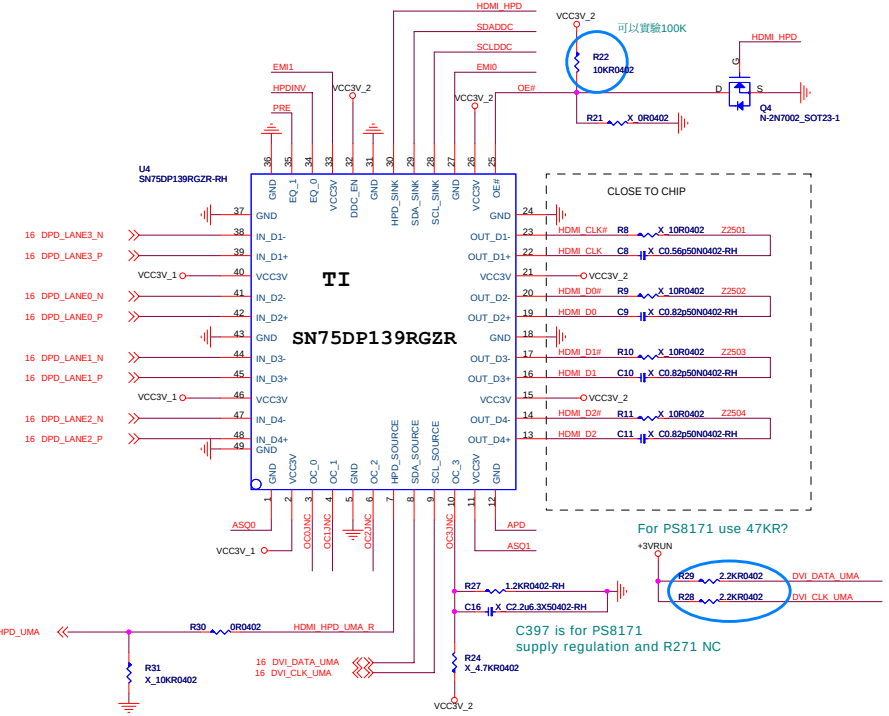
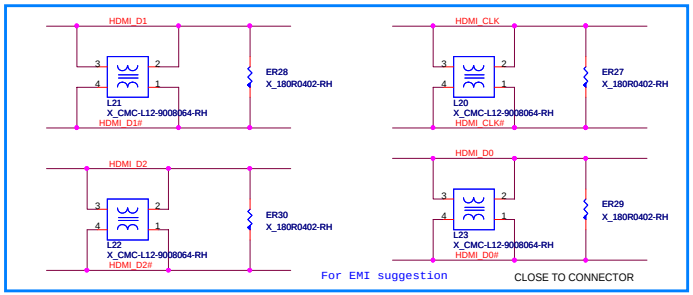
HDMI Switch

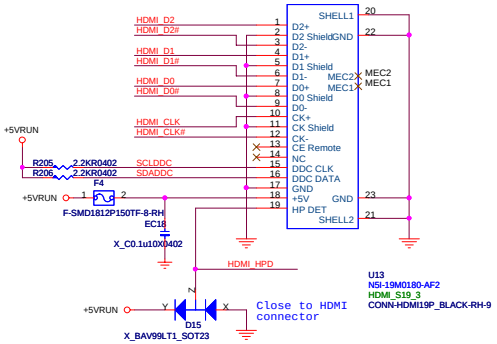


	HP_DET	OE#
UNPLUG	0	1 (HIGH Z)
PLUG	1	0 (ACTIVE)



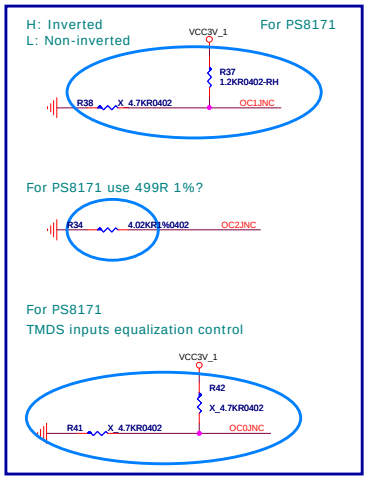


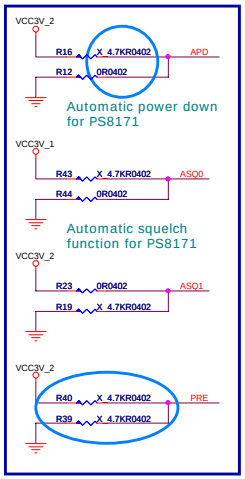
HDMI connector

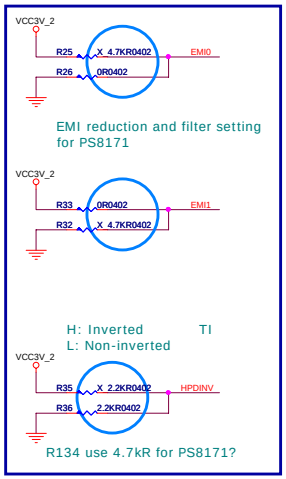


SN75DP139	PS8171	Pin no.
Floating	TMDS inputs equalization control (internal pull-down~500KΩ) PEQ = LOW: Mid level EQ (Default) PEQ = HIGH: High level EQ PEQ = MID: Low level EQ	Pin 3
High	(Internal pull down~500kΩ) PIO = LOW: HPD = HPD_SINK @ 3.3V CMOS output PIO = High: HPD= HPD_SINK# (inverted HPD) @ 0.9V	Pin 4
GND VCC	[ASQ1,ASQ0] = HL: No automatic squelch (Internal pull down~500kΩ) LL: Automatic squelch enable, Level = 120mVpp, default timer LH: Automatic squelch enable, Level = 100mVpp, default timer HH: Automatic squelch enable, Level = 80mVpp, default timer ML: Automatic squelch enable, Level = 120mVpp, extended timer MH: Automatic squelch enable, Level = 100mVpp, extended timer LM: Automatic squelch enable, Level = 80mVpp, extended timer HM: Reserved MM: Reserved	Pin 1 Pin 11
4.65K to GND	499R to GND	Pin 6
GND	Automatic power down management (Internal pull up~500kΩ) APD = LOW: Automatic power down disable APD = HIGH: Automatic power down enable APD = MID: Reserved	Pin 12
1.2K to GND	2.2uF to GND	Pin 10
GND VCC	EMI reduction and filter setting. (EMI1 internal pull up~500KΩ; EMI0 internal pull down~500KΩ) [EMI1,EMI0] = HL: No EMI reduction EMI0 = HIGH: Reduced rise/fall time MID: Reduced rise/fall time, 2nd EMI1 = LOW: EMI filter setting 1 MID: Reserved	Pin 27 Pin 33
Note2	DDC Active Buffer enable and setting (internal pull-down~500KΩ) DDCBUF = LOW: No DDC active buffer, passive DDC level shifting DDCBUF = HIGH: Active DDC buffer enable, setting 1 DDCBUF = MID: Active DDC buffer enable, setting 2	Pin 34
Floating	TMDS output driver pre-emphasis level setting (internal pull down~500KΩ) PRE = LOW No pre-emphasis PRE = HIGH: Low level pre-emphasis is added PRE = MID: High level pre-emphasis is added	Pin 35

Note2: High is HPD logic inverted, Low is HPD logic non-inverted







LAB2

Y01-RHDMI03-000

MICRO-STAR INT'L CO.,LTD.

Title: HDMI connector

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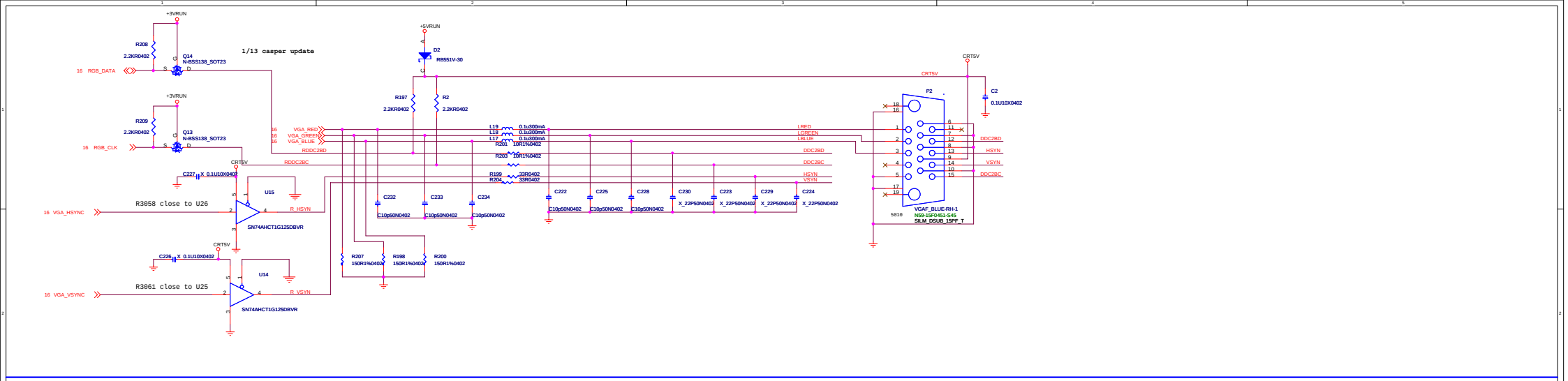

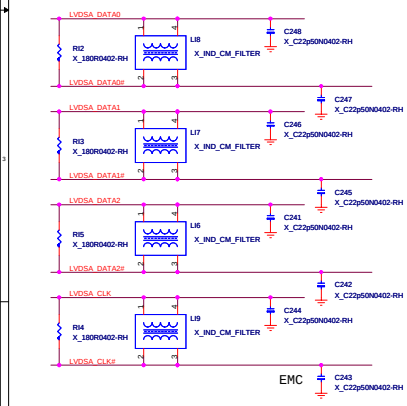

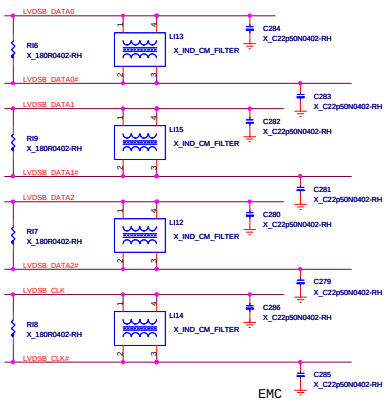

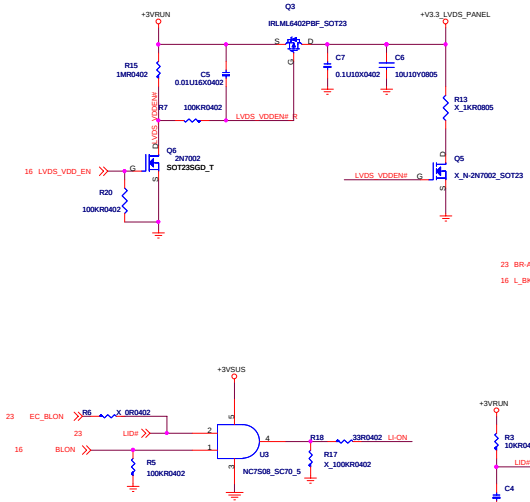

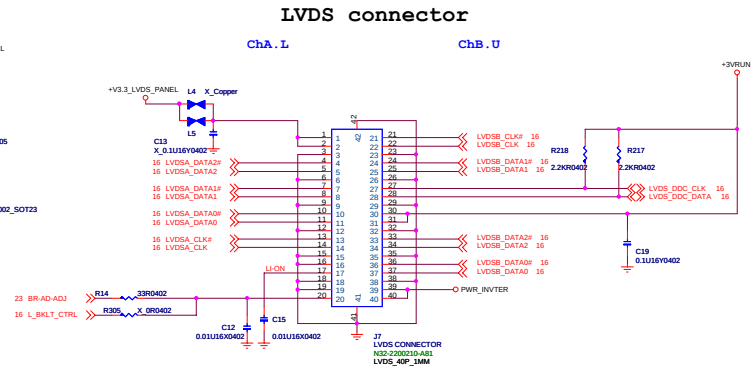

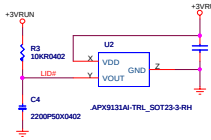

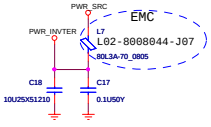

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Title: CRT,LVDS connector & LID

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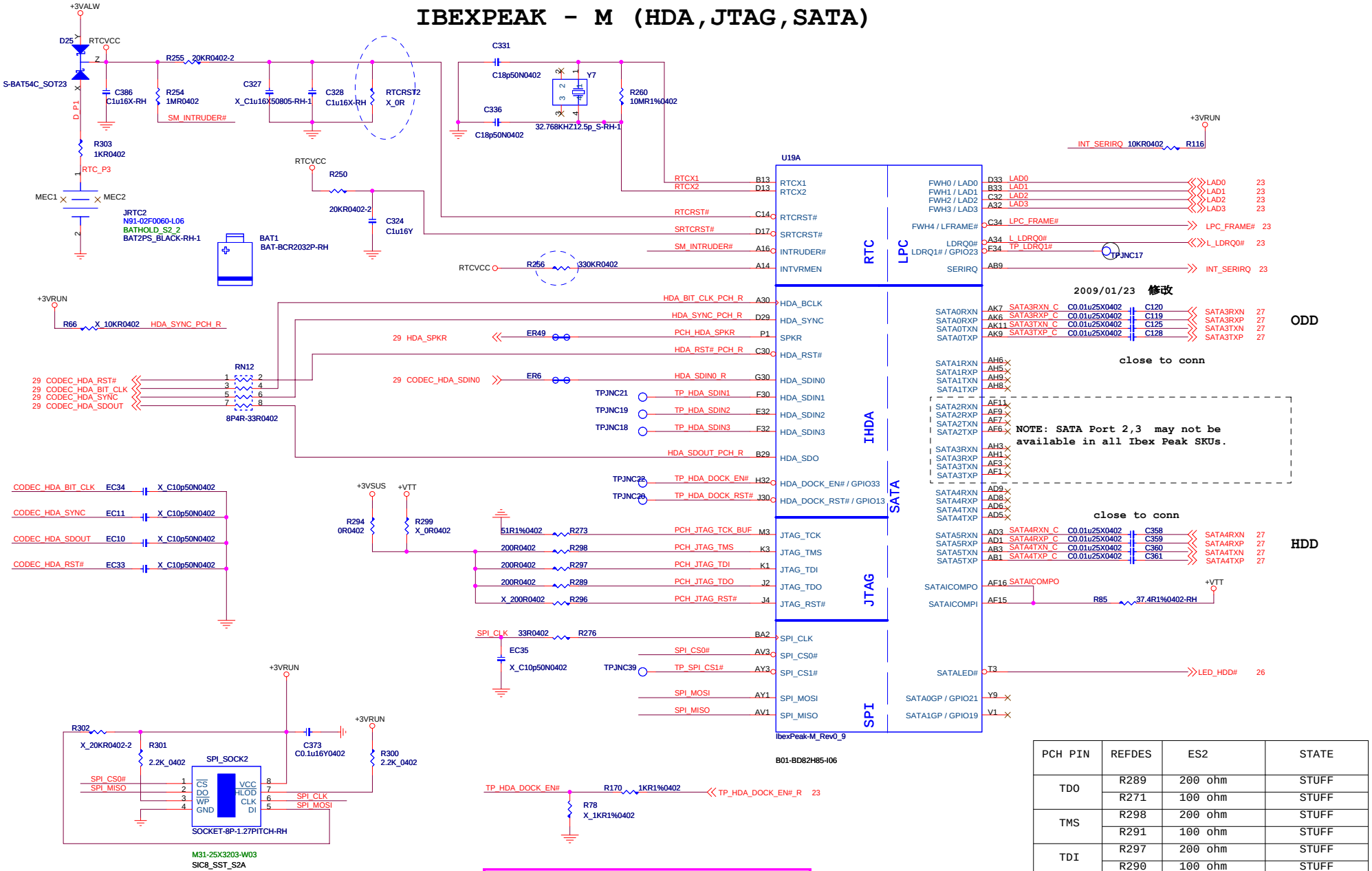
IBEXPEAK - M (HDA,JTAG,SATA)



PCH PIN	REFDES	ES2	STATE
TDO	R289	200 ohm	STUFF
	R271	100 ohm	STUFF
TMS	R298	200 ohm	STUFF
	R291	100 ohm	STUFF
TDI	R297	200 ohm	STUFF
	R290	100 ohm	STUFF
TCK	R273	51 ohm	STUFF
TRST#	R296	not applicable	NO STUFF
	R288	not applicable	NO STUFF

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Title: IBEXPEAK - M (HDA,JTAG,SATA)

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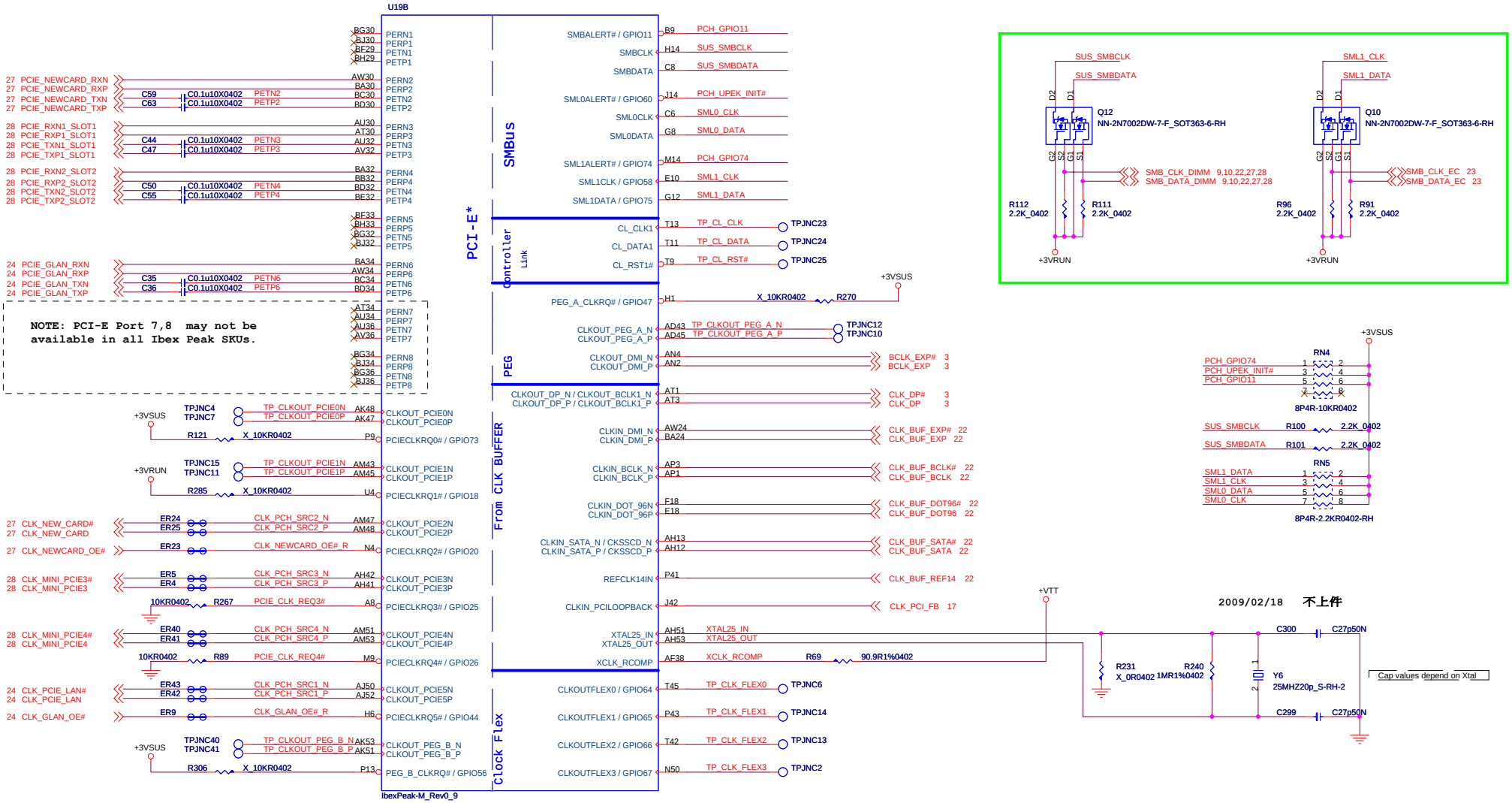
IBEXPEAK - M (PCI-E,SMBUS,CLK)



PCIECLKRQ1# / GPIO18 PCIECLKRQ1# / GPIO20	RUN Well
PCIECLKRQ0# and PCIECLKRQ3# ~ PCIECLKRQ7# PEG_A_CLKRQ# PEG_B_CLKRQ#	SUS Well

MICRO-STAR INT'L CO.,LTD.

Title: IBEXPEAK - M (PCI-E,SMBUS,CLK)

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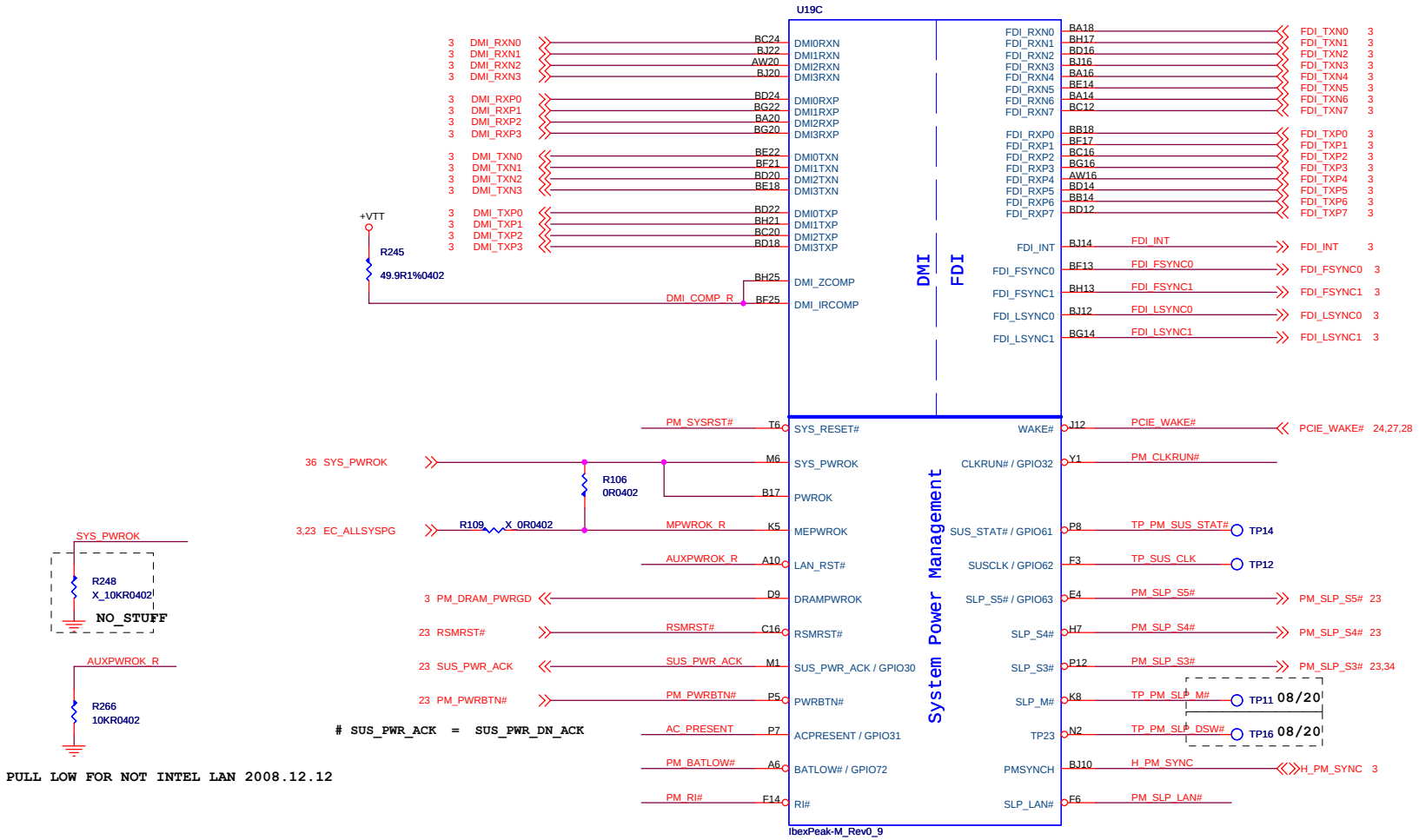
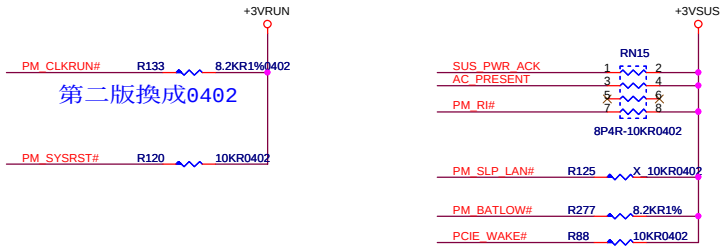
IBEXPEAK - M (DMI,FDI,GPIO)





MICRO-STAR INT'L CO.,LTD.			
Title: IBEXPEAK - M (DMI,FDI,GPIO)			
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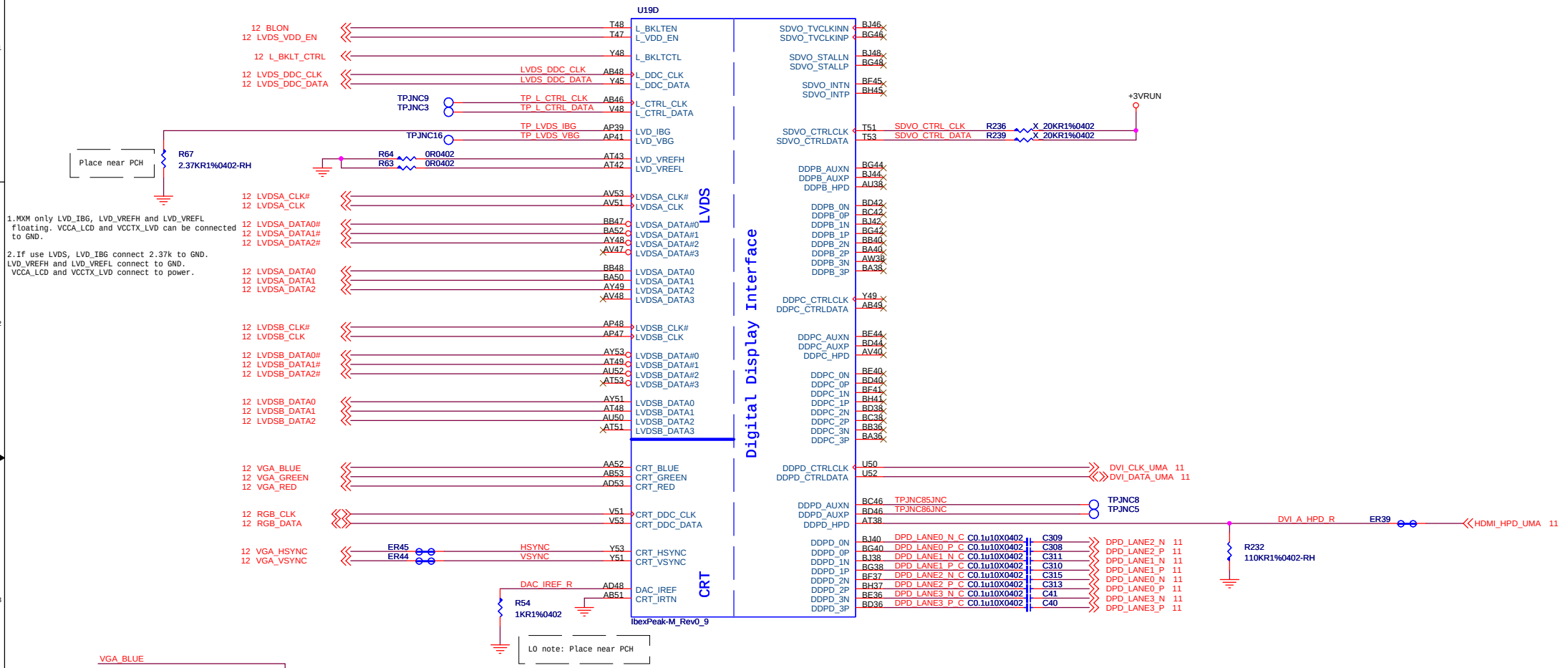
IBEXPEAK - M (LVDS,DDI)



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Title: IBEXPEAK - M (LVDS,DDI)

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IBEXPEAK - M (PCI,USB,NVRAM)

Boot BIOS Strap		
PCI_GNT#0	PCI_GNT#1	Boot BIOS Location
0	0	LPC
0	1	Reserved
1	0	PCI
1	1	SPI

A16 swap override Strap/Top-Block Swap Override jumper	
PCI_GNT#3	Low = A16 swap override/Top-Block Swap Override enabled High = Default

PCI_GNT#0
PCI_GNT#1
R58 X_1KR0402
R55 X_1KR0402
PCI_GNT#3
R49 X_1KR0402

U19E

PCI
AD0 H40
AD1 N34
AD2 C44
AD3 A38
AD4 C36
AD5 J34
AD6 A40
AD7 D45
AD8 E36
AD9 H48
AD10 E40
AD11 C40
AD12 M48
AD13 M45
AD14 F53
AD15 M40
AD16 M43
AD17 J36
AD18 K48
AD19 F40
AD20 C42
AD21 K46
AD22 M51
AD23 J52
AD24 K51
AD25 L34
AD26 F42
AD27 J40
AD28 G46
AD29 F44
AD30 M47
AD31 H36
C/BE0# J50
C/BE1# G42
C/BE2# H47
C/BE3# G34
PIRQA# G38
PIRQB# H51
PIRQC# B37
PIRQD# A44
REQ0# F51
REQ1# / GPIO50 A46
REQ2# / GPIO52 B45
REQ3# / GPIO54 M53
GNT0# F48
GNT1# / GPIO51 K45
GNT2# / GPIO53 F36
GNT3# / GPIO55 H53
PIRQE# / GPIO2 B41
PIRQF# / GPIO3 K53
PIRQG# / GPIO4 A36
PIRQH# / GPIO5 A48
PCIRST# K6
SERR# E44
PERR# E50
IRDY# A42
PAR H44
DEVSEL# F46
FRAME# C46
PLOCK# D49
STOP# D41
TRDY# C48
PME# M7
PLTRST# D5
CLKOUT_PCI0 N52
CLKOUT_PCI1 P53
CLKOUT_PCI2 P46
CLKOUT_PCI3 P51
CLKOUT_PCI4 P48

NVRAM
NV_CE#0 AY9
NV_CE#1 BD1
NV_CE#2 AP15
NV_CE#3 BD8
NV_DQS0 AV9
NV_DQS1 BG8
NV_DQ0 / NV_IO0 AP7
NV_DQ1 / NV_IO1 AP6
NV_DQ2 / NV_IO2 AT6
NV_DQ3 / NV_IO3 AT9
NV_DQ4 / NV_IO4 BB1
NV_DQ5 / NV_IO5 AV6
NV_DQ6 / NV_IO6 BB3
NV_DQ7 / NV_IO7 BA4
NV_DQ8 / NV_IO8 BE4
NV_DQ9 / NV_IO9 BB6
NV_DQ10 / NV_IO10 BD6
NV_DQ11 / NV_IO11 BB7
NV_DQ12 / NV_IO12 BC8
NV_DQ13 / NV_IO13 BJ8
NV_DQ14 / NV_IO14 BJ6
NV_DQ15 / NV_IO15 BG6
NV_ALE BD3
NV_CLE AY6
NV_RCOMP AU2 — NV_RCOMP — R275 X_32.4R1%0402-RH
NV_RB# AV7
NV_WR#0_RE# AY8
NV_WR#1_RE# AY5
NV_WE#_CK0 AV11
NV_WE#_CK1 BF5

USB
USBP0N H18 — USB_PN0 — USB_PN0 27
USBP0P J18 — USB_PP0 — USB_PP0 27
USBP1N A18 — USB_PN1 — USB_PN1 28
USBP1P C18 — USB_PP1 — USB_PP1 28
USBP2N N20 — USB_PN2 — USB_PN2 28
USBP2P P20 — USB_PP2 — USB_PP2 28
USBP3N J20 — USB_PN3 — USB_PN3 28
USBP3P L20 — USB_PP3 — USB_PP3 28
USBP4N F20 — USB_PN4 — USB_PN4 27
USBP4P G20 — USB_PP4 — USB_PP4 27
USBP5N A20 — USB_PN5 — USB_PN5 27
USBP5P C20 — USB_PP5 — USB_PP5 27
USBP6N M22
USBP6P N22
USBP7N B21
USBP7P D21
NOTE: USB Port 6,7 may not be available in all Ibex Peak SKUs.
USBP8N H22 — USB_PN8 — USB_PN8 25
USBP8P J22 — USB_PP8 — USB_PP8 25
USBP9N E22 — USB_PN9 — USB_PN9 27
USBP9P F22 — USB_PP9 — USB_PP9 27
USBP10N A22 — USB_PN10 — USB_PN10 28
USBP10P C22 — USB_PP10 — USB_PP10 28
USBP11N G24 — USB_PN11 — USB_PN11 28
USBP11P H24 — USB_PP11 — USB_PP11 28
USBP12N L24 — USB_PN12 — USB_PN12 28
USBP12P M24 — USB_PP12 — USB_PP12 28
USBP13N A24
USBP13P C24
2009/01/23 修改
USBRBIAS# B25 — USB_BIAS
USBRBIAS D25 — R244 22.6R1%0402 — +3VSUS
OC0# / GPIO59 N16
OC1# / GPIO40 J16
OC2# / GPIO41 F16
OC3# / GPIO42 L16
OC4# / GPIO43 E14
OC5# / GPIO9 G16
OC6# / GPIO10 F12
OC7# / GPIO14 T15
USB_OC# — R84 10KR0402 — +3VSUS

ibexPeak-M_Rev0_9

TP10 TP_PCI_PME#
PLT_RST#

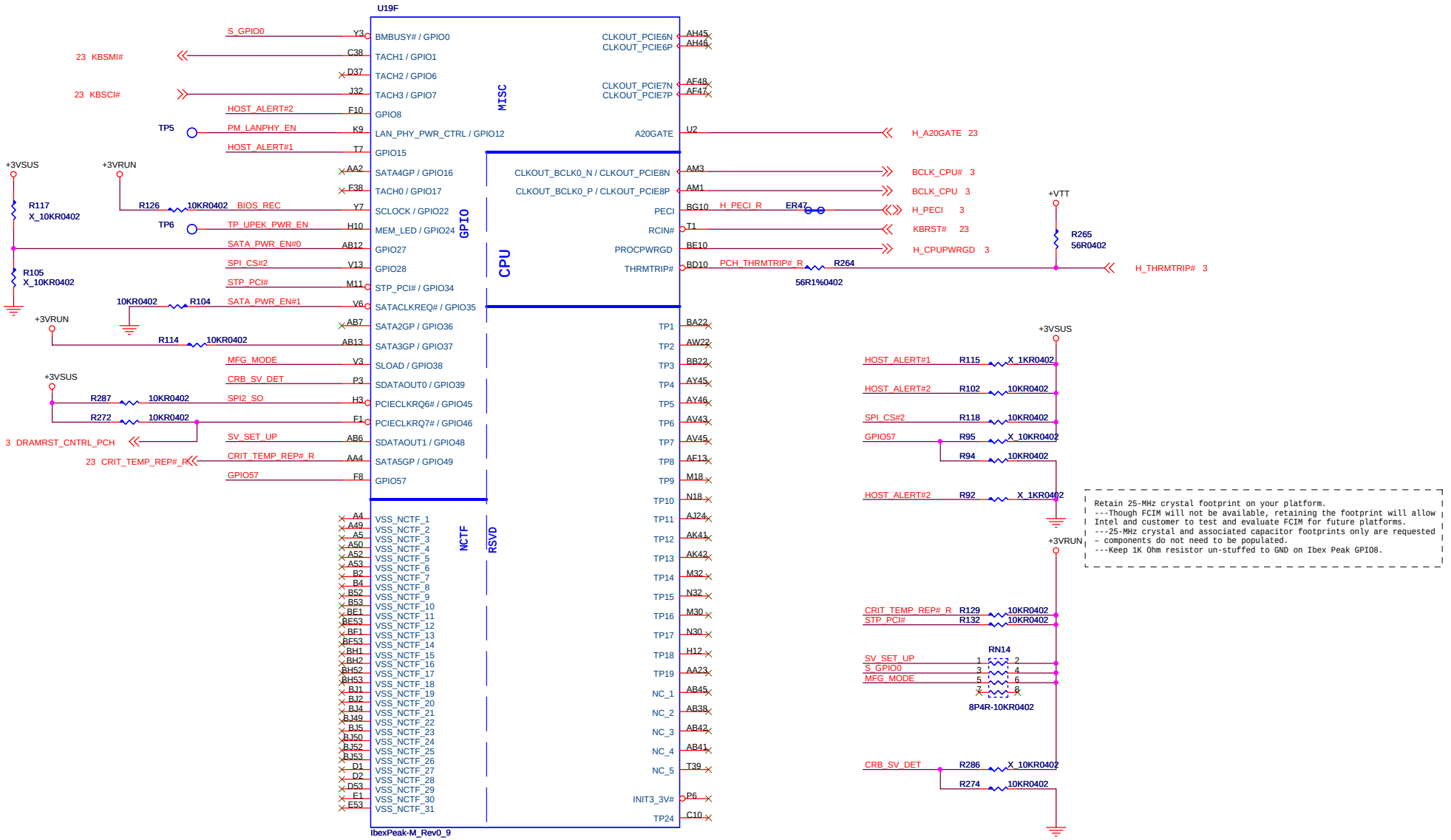
14 CLK_PCI_FB
23 CLK_PCI_KBC
23 CLK_PCIF_PORT80
CLK_PCI_FB — R238 22R0402 — CLKOUT_PCI1
CLK_PCI_KBC — R60 22R0402 — CLKOUT_PCI2
CLK_PCIF_PORT80 — R237 22R0402 — CLKOUT_PCI3
EC32 X_C10p50N0402
EC8 X_C10p50N0402
EC31 X_C10p50N0402
EMI

+3VRUN
PCI_REQ#1 RN9 1 2 8P4R-8.2KR0402-1
PCI_FRAME# 3 4
PCI_TRDY# 5 6
INT_PIRQH# 7 8
PCI_REQ#0 RN8 1 2 8P4R-8.2KR0402-1
INT_PIRQB# 3 4
INT_PIRQF# 5 6
PCI_REQ#3 7 8
INT_PIRQG# RN11 1 2 8P4R-8.2KR0402-1
INT_PIRQC# 3 4
INT_PIRQE# 5 6
PCI_STOP# 7 8
PCI_LOCK# RN3 1 2 8P4R-8.2KR0402-1
PCI_PERR# 3 4
PCI_DEVSEL# 5 6
INT_PIRQA# 7 8
PCI_IRDY# RN10 1 2 8P4R-8.2KR0402-1
PCI_SERR# 3 4
INT_PIRQD# 5 6
PCI_REQ#2 7 8
PCI_GNT#2 R68 10KR0402

PLT_RST# — R130 33R0402 — LAN_RST# 24
R131 33R0402 — LPC_RST# 23
+3VSUS
C107 C0.1u10X0402
U9 S08P5X_SC70
RN6 8P4R-33R0402
NEWCARD_RST# 27
WLAN_RST# 28
TV_RST# 28
ER8 — BUF_PTL_RST# 3

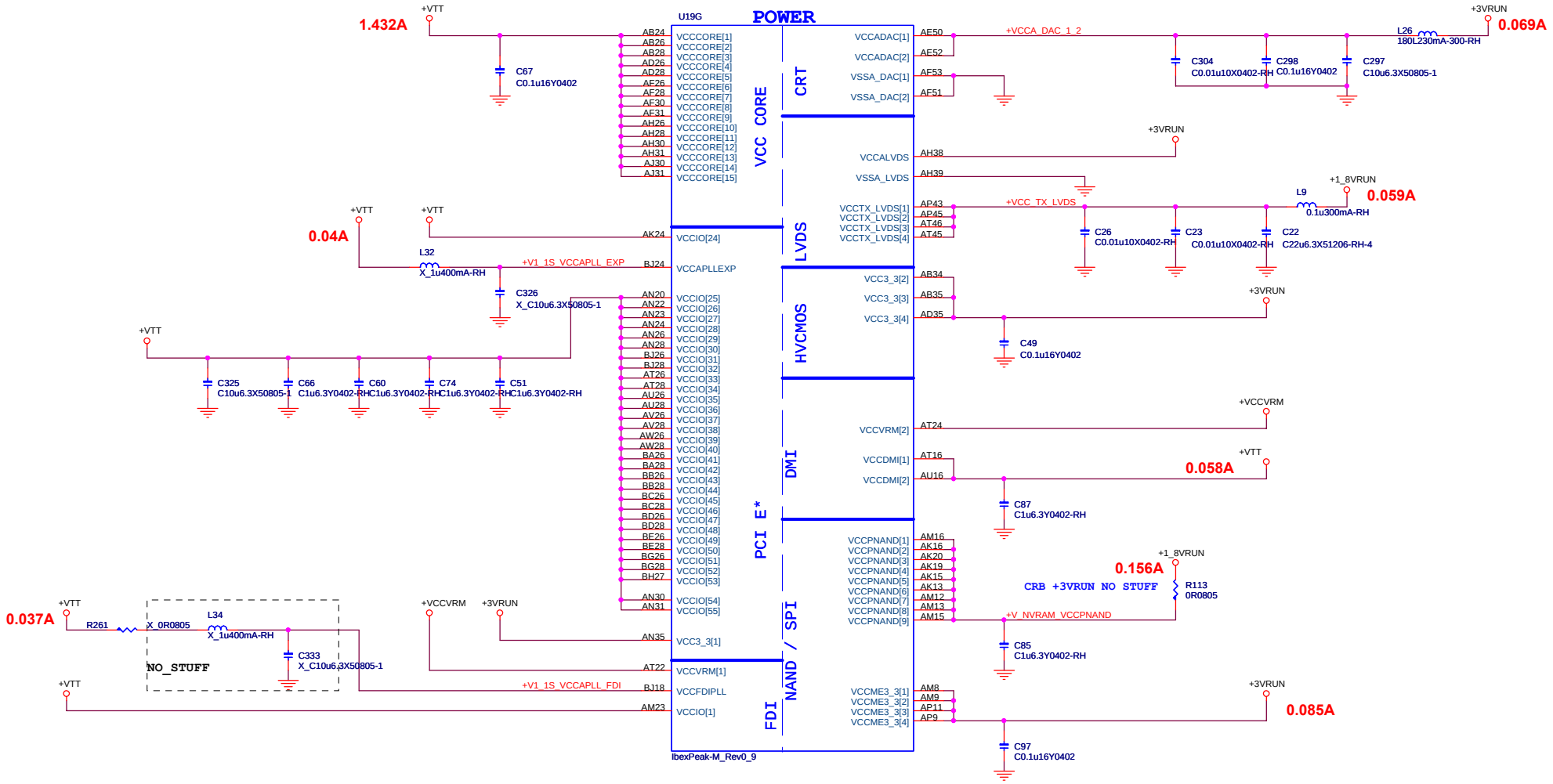
MICRO-STAR INT'L CO.,LTD.
Title: IBEXPEAK - M (PCI,USB,NVRAM)
Size: Custom | Document Number: MS-1681 | Rev: 10
Date: Tuesday, November 03, 2009 | Sheet 17 of 45

IBEXPEAK - M (GPIO,VSS_NCTF,RSVD)



MICRO-STAR INT'L CO.,LTD.		
Title: IBEXPEAK-M(GPIO,VSS_NCTF,RSVD)		
Size: Custom	Document Number: MS-1681	Rev: 10
Date: Tuesday, November 03, 2009	Sheet 18 of 45	

IBEXPEAK - M (POWER)



The VCCVRM rail (1.8 V/1.5 V) powers an internal voltage regulator module (VRM) that regulates clean 1.05-V voltage supply for analog rails (VCCACLK, VccapllEXP, VCCFDIPLL, and VCCSATAPLL). This solution will allow us to remove the LC filter requirements for those rails, thereby reducing platform BOM cost. VCCVRM is enabled by default via internal pull up to GPIO27, therefore GPIO27 should be left as No Connect. The following diagram shows implementation details on how to enable and disable VccVRM.

MICRO-STAR INT'L CO.,LTD.

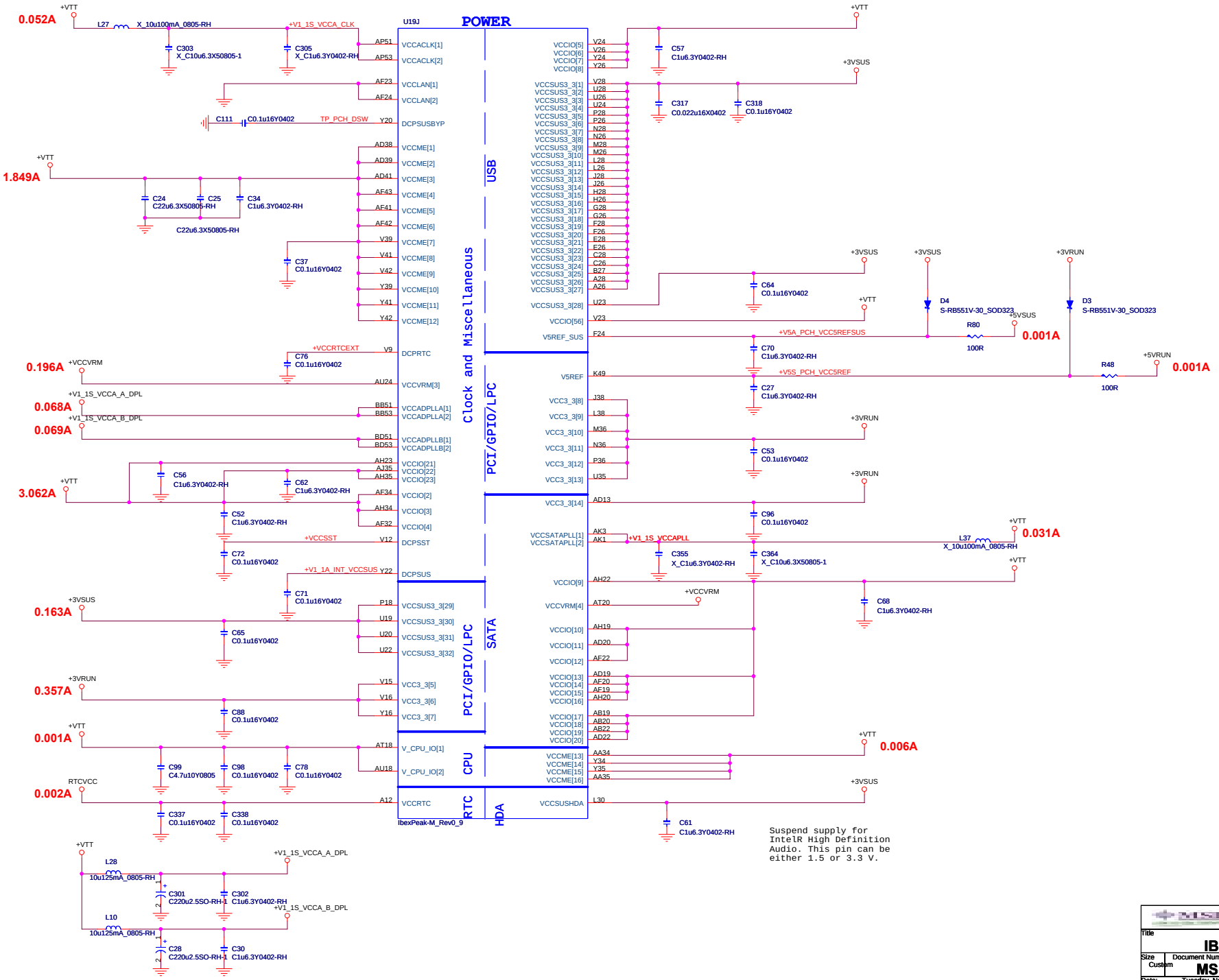
Title: IBEXPEAK - M (POWER)

Size: Custom | Document Number: MS-1681 | Rev: 10

Date: Tuesday, November 03, 2009 | Sheet 19 of 45

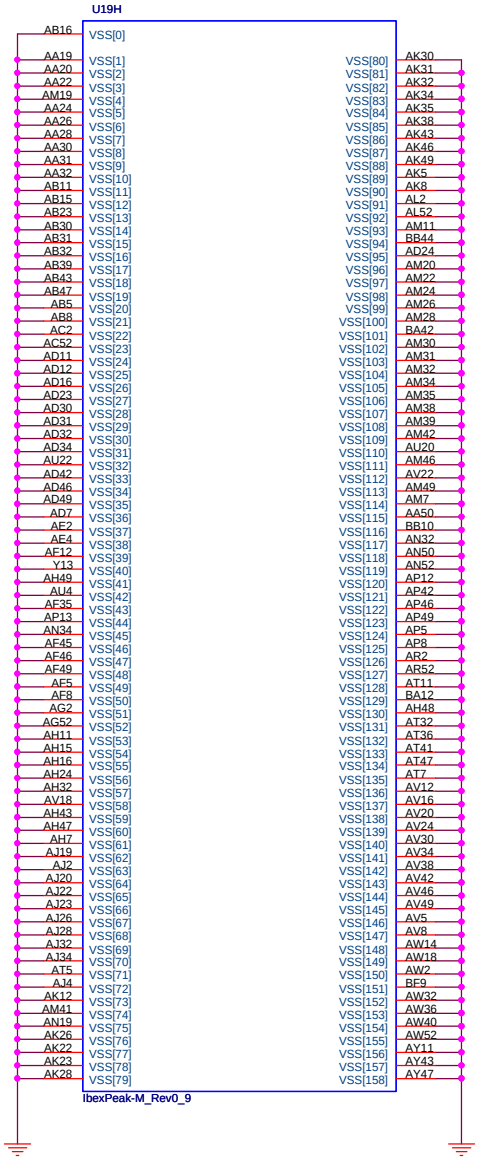
VccLAN may be grounded if Intel LAN is disabled.

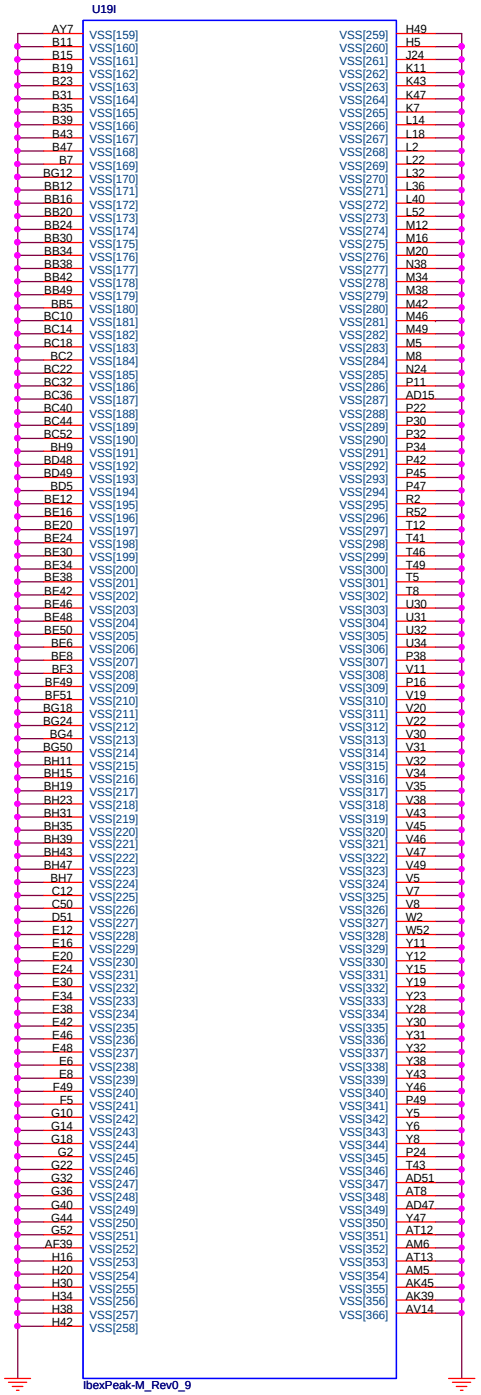
IBEXPEAK - M (POWER)



MICRO-STAR INT'L CO.,LTD.			
Title: IBEXPEAK - M (POWER)			
Size: Custom	Document Number: MS-1681		Rev: 10
Date: Tuesday, November 03, 2009		Sheet 20 of 45	

IBEXPEAK - M (GND)



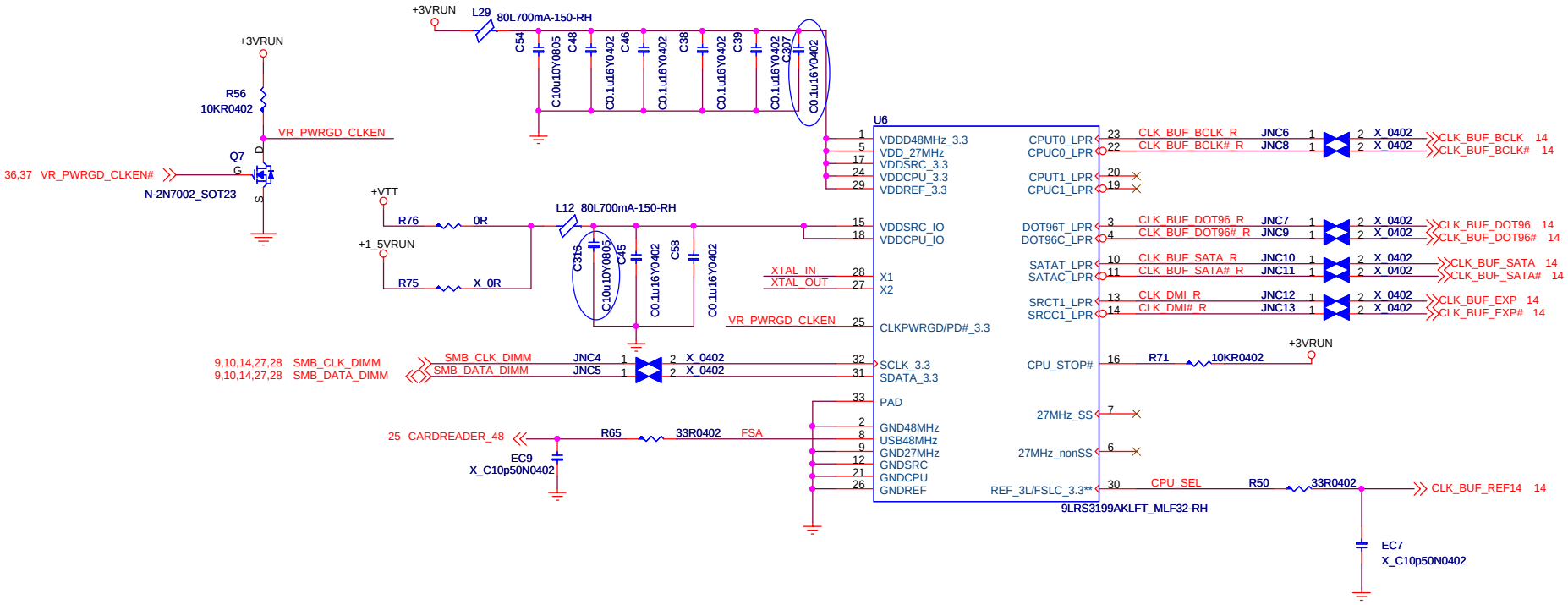


MICRO-STAR INT'L CO.,LTD.

Title: IBEXPEAK - M (GND)

Size: Custom | Document Number: MS-1681 | Rev: 10

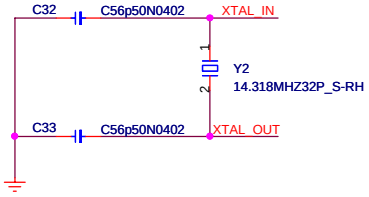
Date: Tuesday, November 03, 2009 | Sheet 21 of 45



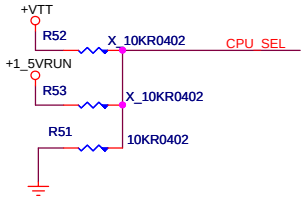
Capacity select

If LC=20pf C708/C709=33pf

If LC=32pf C708/C709=56pf



For CPU frequency select (133MHz)



CPU_SEL	CPU0	CPU1
0(Default)	133MHz	133MHz
1(1.05~1.5V)	100MHz	100MHz

Co-Lay Note:

For IDT IC9lRS3199

R598,R599,R600=10Kohm

For Silego SLG8SP587

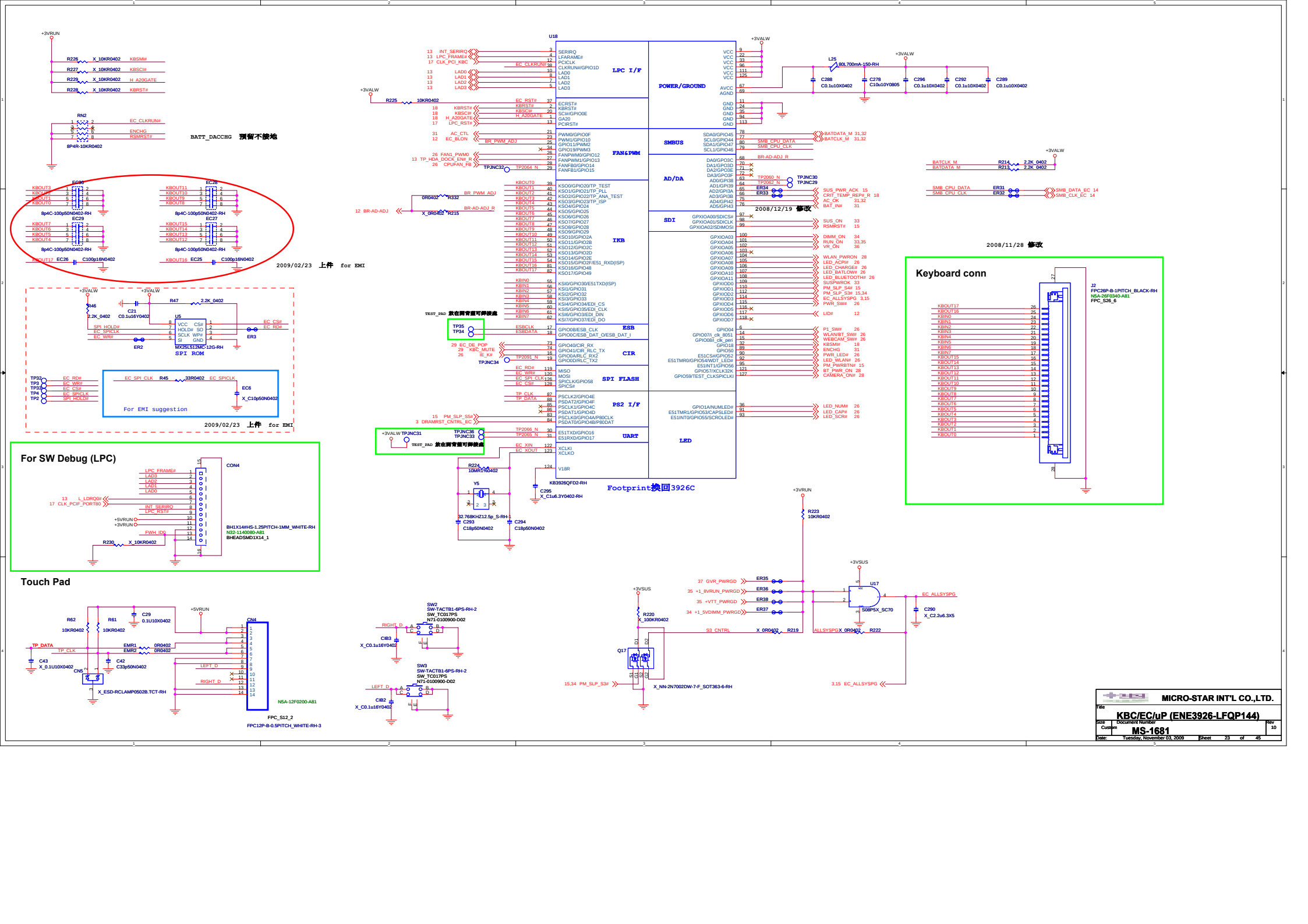
R598,R599,R600=4.7Kohm

MICRO-STAR INT'L CO.,LTD.

Title: Clock Generator (ICS9IRS3199)

Size: Custom | Document Number: MS-1681 | Rev: 10

Date: Tuesday, November 03, 2009 | Sheet 22 of 45


R226 X_10KR0402 KBSMI#
R227 X_10KR0402 KBSCI#
R229 X_10KR0402 H_A20GATE
R228 X_10KR0402 KBRST#
RN2 EC_CLKRUN# ENCHG RSMRST#
8P4R-10KR0402
BATT_DACCHG 預留不接地
EC30 EC28 EC29 EC27
8p4C-100p50N0402-RH
KBOUT3 KBOUT2 KBOUT1 KBOUT0
KBOUT11 KBOUT10 KBOUT9 KBOUT8
KBOUT7 KBOUT6 KBOUT5 KBOUT4
KBOUT15 KBOUT14 KBOUT13 KBOUT12
KBOUT17 EC26 C100p16N0402
KBOUT16 EC25 C100p16N0402
2009/02/23 上件 for EMI
+3VALW
R46 2.2K_0402
C21 C0.1u16Y0402
R47 2.2K_0402
U5 MX25L512MC-12G-RH
SPI_HOLD# EC_SPICLK EC_WR#
EC_CS# EC_RD#
ER2 ER3
SPI ROM
TP32 TP3 TP33 TP4 TP2
EC_RD# EC_WR# EC_CS# EC_SPICLK SPI_HOLD#
EC_SPI_CLK R45 33R0402 EC_SPICLK
EC6 X_C10p50N0402
For EMI suggestion
2009/02/23 上件 for EMI
For SW Debug (LPC)
CON4
LPC_FRAME# LAD3 LAD2 LAD1 LAD0
L_LDRQ0# CLK_PCIF_PORT80 INT_SERIRQ LPC_RST#
+5VRUN +3VRUN FWH_ID0
R230 X_10KR0402
BH1X14#HS-1.25PITCH-1MM_WHITE-RH
N32-1140080-A81
BHEADSMD1X14_1
Touch Pad
R62 10KR0402 R61 10KR0402
C29 0.1U10X0402
TP_DATA TP_CLK
C43 X_0.1U10X0402 C42 C33p50N0402
CN5 X_ESD-RCLAMP0502B.TCT-RH
EMR1 0R0402 EMR2 0R0402
LEFT_D RIGHT_D
CN4 FPC_S12_2
FPC12P-B-0.5PITCH_WHITE-RH-3
N5A-12F0200-A81
SW2 SW-TACTB1-6PS-RH-2 SW_TC017PS N71-0100900-D02
SW3 SW-TACTB1-6PS-RH-2 SW_TC017PS N71-0100900-D02
CIB3 X_C0.1u16Y0402
CIB2 X_C0.1u16Y0402
U18 KB3926QFD-2-RH
LPC I/F
FAN&PWM
IKB
ESB
CIR
SPI FLASH
PS2 I/F
UART
LED
POWER/GROUND
SMBUS
AD/DA
SDI
INT_SERIRQ LFRAME# PCICLK CLKRUN#/GPIO1D LAD0 LAD1 LAD2 LAD3
ECRST# KBRST# SCI#/GPIO0E GA20 PCIRST#
PWM0/GPIO00F PWM1/GPIO10 GPIO11/PWM2 GPIO19/PWM3 FANPWM0/GPIO12 FANPWM1/GPIO13 FANFB0/GPIO14 FANFB1/GPIO15
KSO0/GPIO20/TP_TEST KSO1/GPIO21/TP_PLL KSO2/GPIO22/TP_ANA_TEST KSO3/GPIO23/TP_ISP KSO4/GPIO24 KSO5/GPIO25 KSO6/GPIO26 KSO7/GPIO27 KSO8/GPIO28 KSO9/GPIO29 KSO10/GPIO2A KSO11/GPIO2B KSO12/GPIO2C KSO13/GPIO2D KSO14/GPIO2E KSO15/GPIO2F/ES1_RXD(ISP) KSO16/GPIO4B KSO17/GPIO49
KSI0/GPIO30/ES1TXD(ISP) KSI1/GPIO31 KSI2/GPIO32 KSI3/GPIO33 KSI4/GPIO34/EDI_CS KSI5/GPIO35/EDI_CLK KSI6/GPIO3/EDI_DIN KSI7/GPIO37/EDI_DO
GPIO0B/ESB_CLK GPIO0C/ESB_DAT_O/ESB_DAT_I
GPIO40/CIR_RX GPIO41/CIR_RLC_TX GPIO0A/RLC_RXZ GPIO0D/RLC_TX2
MISO MOSI SPICLK/GPIO58 SPICS#
PSCLK2/GPIO4E PSDAT2/GPIO4F PSCLK1/GPIO4C PSDAT1/GPIO4D PSCLK0/GPIO4A/P80CLK PSDAT0/GPIO4B/P80DAT
ES1TXD/GPIO16 ES1RXD/GPIO17
XCLKI XCLKO V18R
VCC AVCC AGND GND
SDA0/GPIO45 SCL0/GPIO44 SDA1/GPIO47 SCL1/GPIO46
DA0/GPO3C DA1/GPO3D DA2/GPO3E DA3/GPO3F AD0/GPI38 AD1/GPI39 AD2/GPI3A AD3/GPI3B AD4/GPI42 AD5/GPI43
GPXIOA00/SDICS# GPXIOA01/SDICLK GPXIOA02/SDIMOSI
GPXIOA03 GPXIOA04 GPXIOA05 GPXIOA06 GPXIOA07 GPXIOA08 GPXIOA09 GPXIOA10 GPXIOA11 GPXIOD0 GPXIOD1 GPXIOD2 GPXIOD3 GPXIOD4 GPXIOD5 GPXIOD6 GPXIOD7
GPIO04 GPIO07/I_clk_8051 GPIO08/I_clk_peri GPIO18 GPIO50 E51CS#/GPIO52 E51TMR0/GPIO54/WDT_LED# ES1INT1/GPIO56 GPIO57/XCLK32K GPIO59/TEST_CLKSPICLKI
GPIO1A/NUMLED# E51TMR1/GPIO53/CAPSLED# E51INT0/GPIO55/SCROLED#
+3VALW +3VSUS +3VRUN
L25 80L700mA-150-RH
C288 C0.1u10X0402 C278 C10u10Y0805 C296 C0.1u10X0402 C292 C0.1u10X0402 C289 C0.1u10X0402
R225 10KR0402 EC_RST#
R224 10MR1%0402
Y5 32.768KHZ12.5p_S-RH-1
C293 C18p50N0402 C294 C18p50N0402
C295 X_C1u6.3Y0402-RH
TPJNC32 TPJNC30 TPJNC29 TPJNC34 TPJNC36 TPJNC33 TPJNC31
TEST_PAD 放在跨背盖可卸接盖
TP35 TP34
R332 0R0402 R215 X_0R0402
BR_PWM_ADJ BR-AD-ADJ_R
TP2060_N TP2062_N TP2066_N TP2065_N TP2091_N
EC_CLKRUN# EC_RST# KBRST# KBSCI# H_A20GATE LPC_RST# AC_CTL EC_BLON BR_PWM_ADJ FAN1_PWM0 TP_HDA_DOCK_EN#_R CPUFAN_FB
KBOUT0 KBOUT1 KBOUT2 KBOUT3 KBOUT4 KBOUT5 KBOUT6 KBOUT7 KBOUT8 KBOUT9 KBOUT10 KBOUT11 KBOUT12 KBOUT13 KBOUT14 KBOUT15 KBOUT16 KBOUT17
KBIN0 KBIN1 KBIN2 KBIN3 KBIN4 KBIN5 KBIN6 KBIN7
ESBCLK ESBDATA
EC_DE_POP KBC_MUTE IE_K#
EC_RD# EC_WR# EC_SPI_CLK EC_CS# TP_CLK TP_DATA EC_XIN EC_XOUT
PM_SLP_S5# DRAMRST_CNTRL_EC
SUS_PWR_ACK CRIT_TEMP_REP# AC_OK BAT_IN#
SUS_ON RSMRST#
DIMM_ON RUN_ON VR_ON
WLAN_PWRON LED_ACPI# LED_CHARGE# LED_BATLOW# LED_BLUETOOTH# SUSPWROK PM_SLP_S4# PM_SLP_S3# EC_ALLSYSPG PWR_SW#
LID#
P1_SW# WLANBT_SW# WEBCAM_SW# KBSMI# ENCHG PWR_LED# LED_WLAN# PM_PWRBTN# BT_PWR_ON CAMERA_ON#
LED_NUM# LED_CAP# LED_SCR#
BATDATA_M BATCLK_M SMB_CPU_DATA SMB_CPU_CLK
BATCLK_M BATDATA_M R214 2.2K_0402 R213 2.2K_0402
SMB_CPU_DATA SMB_CPU_CLK ER31 ER32 SMB_DATA_EC SMB_CLK_EC
2008/12/19 修改
2008/11/28 修改
Keyboard conn
J2 FPC26P-B-1PITCH_BLACK-RH N5A-26F0340-A81 FPC_S26_6
KBOUT17 KBOUT16 KBIN0 KBIN1 KBIN2 KBIN3 KBIN4 KBIN5 KBIN6 KBIN7 KBOUT15 KBOUT14 KBOUT13 KBOUT12 KBOUT11 KBOUT10 KBOUT9 KBOUT8 KBOUT7 KBOUT6 KBOUT5 KBOUT4 KBOUT3 KBOUT2 KBOUT1 KBOUT0
R223 10KR0402
R220 X_100KR0402
Q17 X_NN-2N7002DW-7-F_SOT363-6-RH
ER35 ER36 ER38 ER37
37 GVR_PWRGD 35 +1_8VRUN_PWRGD 35 +VTT_PWRGD 34 +1_5VDIMM_PWRGD
S3_CNTRL X_0R0402 R219
ALLSYSPG X_0R0402 R222
15,34 PM_SLP_S3# 3,15 EC_ALLSYSPG
U17 S08PSX_SC70
EC_ALLSYSPG C290 X_C2.2u6.3X5
MICRO-STAR INT'L CO.,LTD.
Title KBC/EC/uP (ENE3926-LFQP144)
Size Custom Document Number MS-1681 Rev 10
Date: Tuesday, November 03, 2009 Sheet 23 of 45

1. Pin 46 : RSET res. should be close to LAN chip. Don't have power trace or high frequency trace beside it.

2. The trace of each Pair(MDIX+/-) should be equal in length and better have ground under.

3. Both EGND and GND can be connect together or use 0 Ohm res. to connect them.

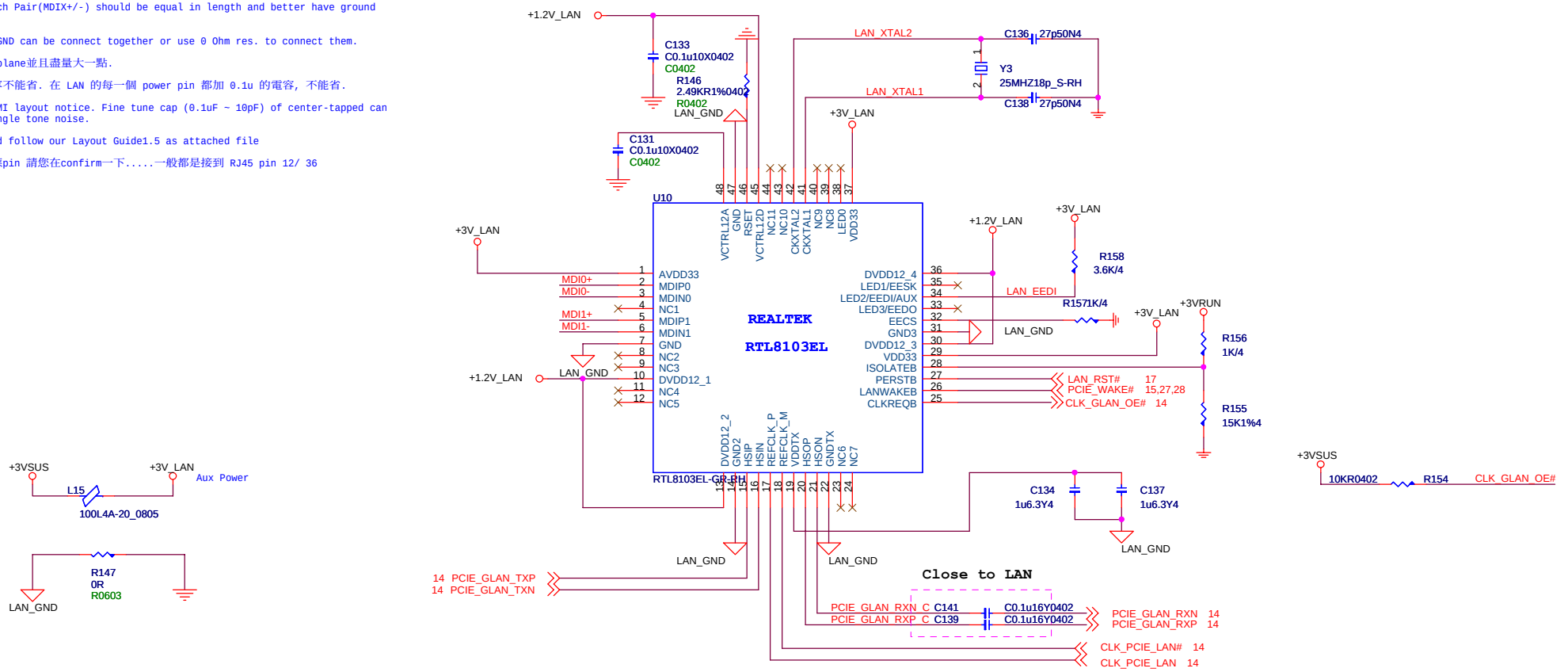
4. 1.2V請留 power plane並且盡量大一點.

5. 1.2V Bypass 電容不能省. 在 LAN 的每一個 power pin 都加 0.1u 的電容, 不能省.

6.請參考RTL8111C EMI layout notice. Fine tune cap (0.1uF ~ 10pF) of center-tapped can improve EMI for single tone noise.

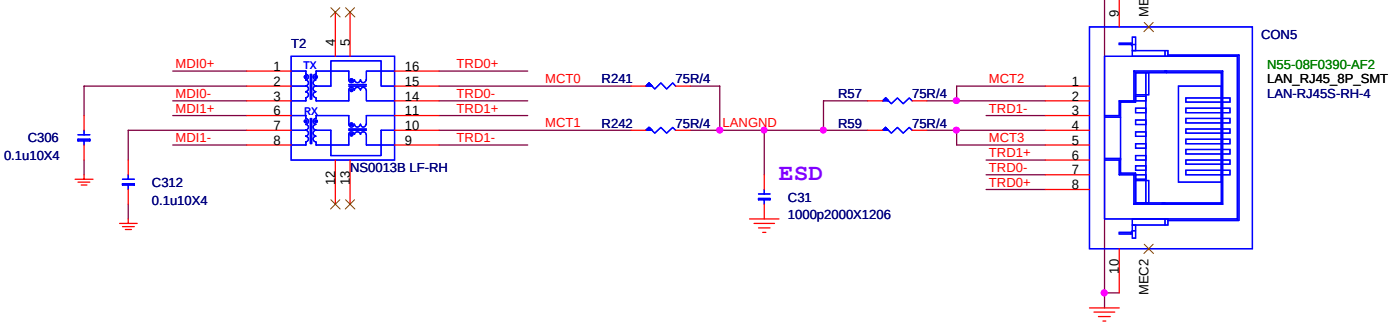
7. Please refer and follow our Layout Guide1.5 as attached file

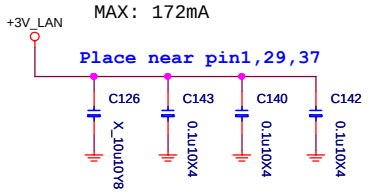
8. RJ45 的部份,對應pin 請您在confirm一下.....一般都是接到 RJ45 pin 12/ 36

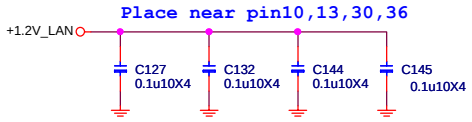


POWER Comparison

	3.3V	mW
10 M Idle/TxRx	87/172	287/568
100 M Idle/TxRx	112/165	370/545
ALDPS	60	198
D3 cold with link10M /without link	32/18	106/59.4







MICRO-STAR INT'L CO.,LTD.

Title: PCIE LAN (RTL8103EL)

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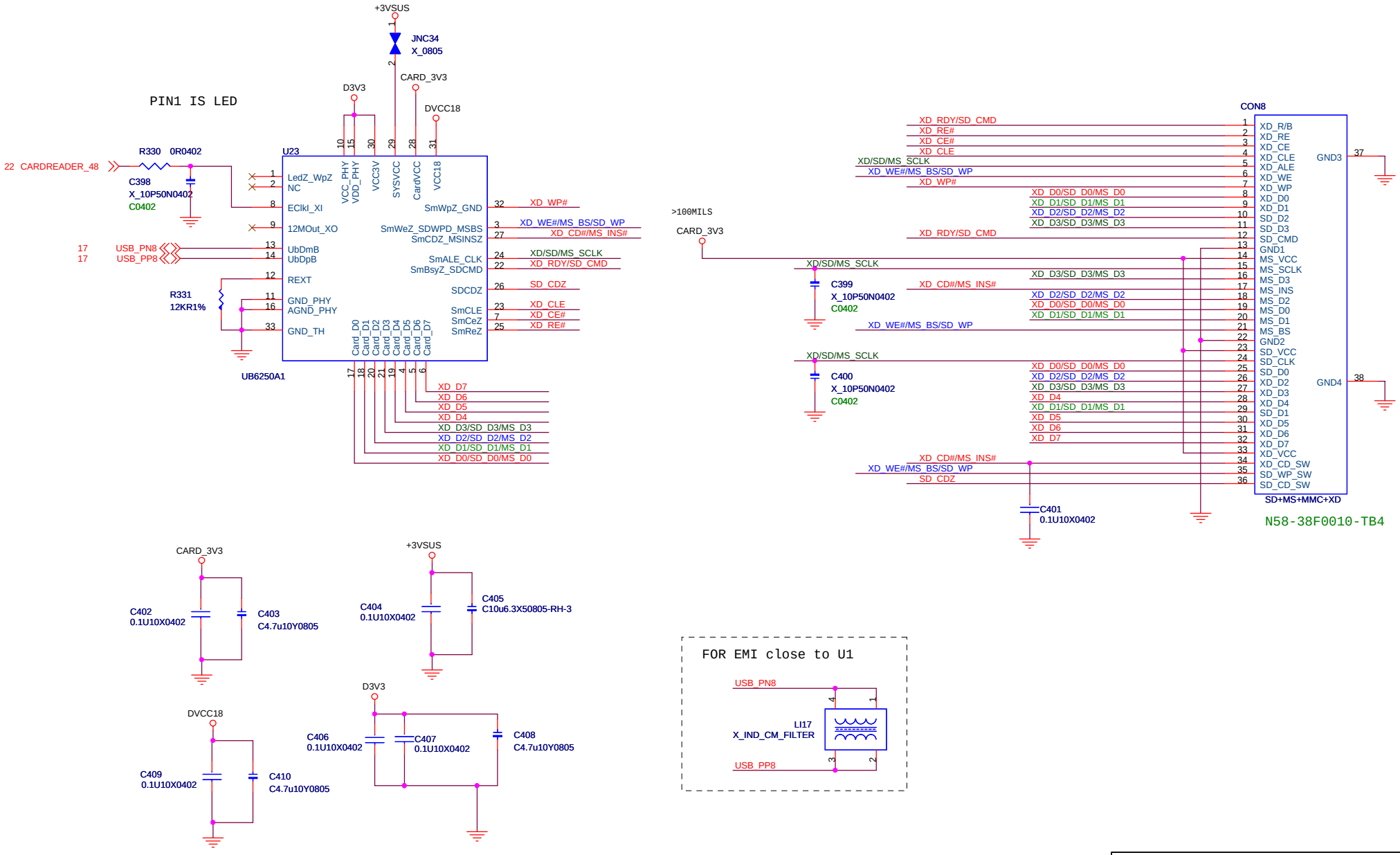
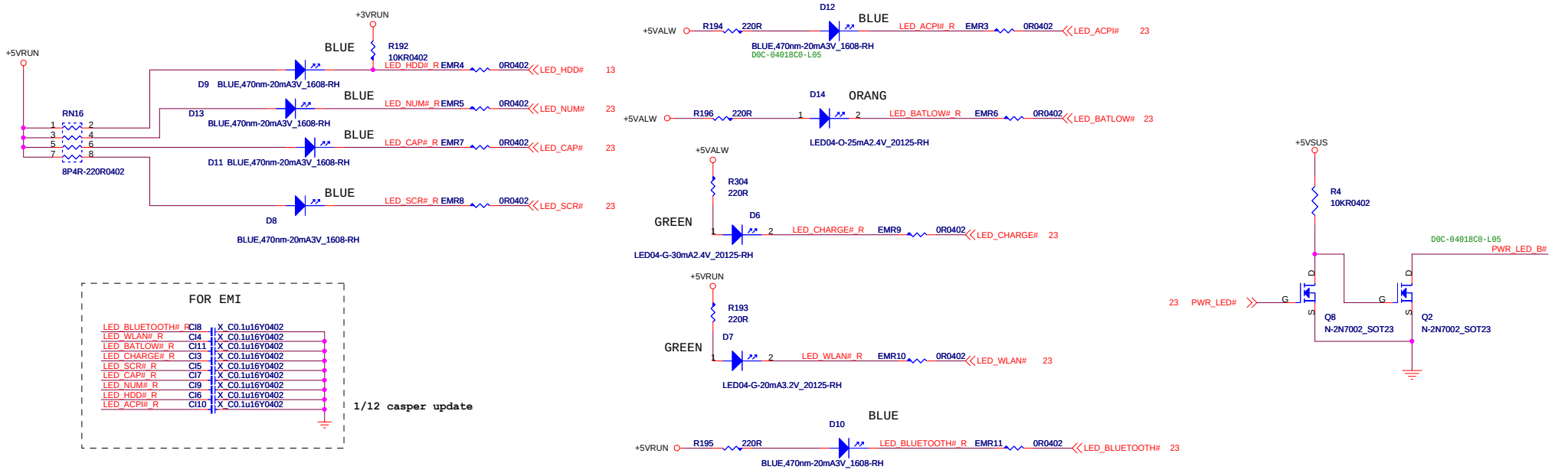
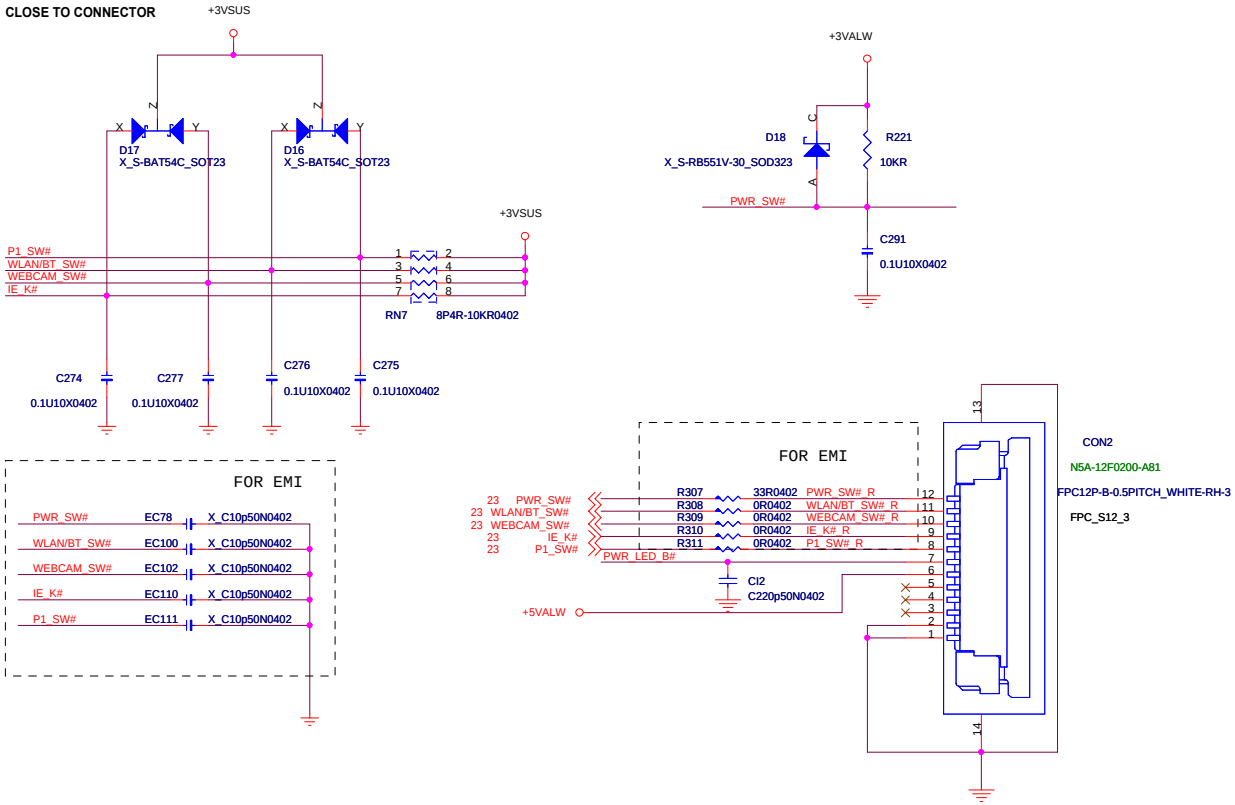
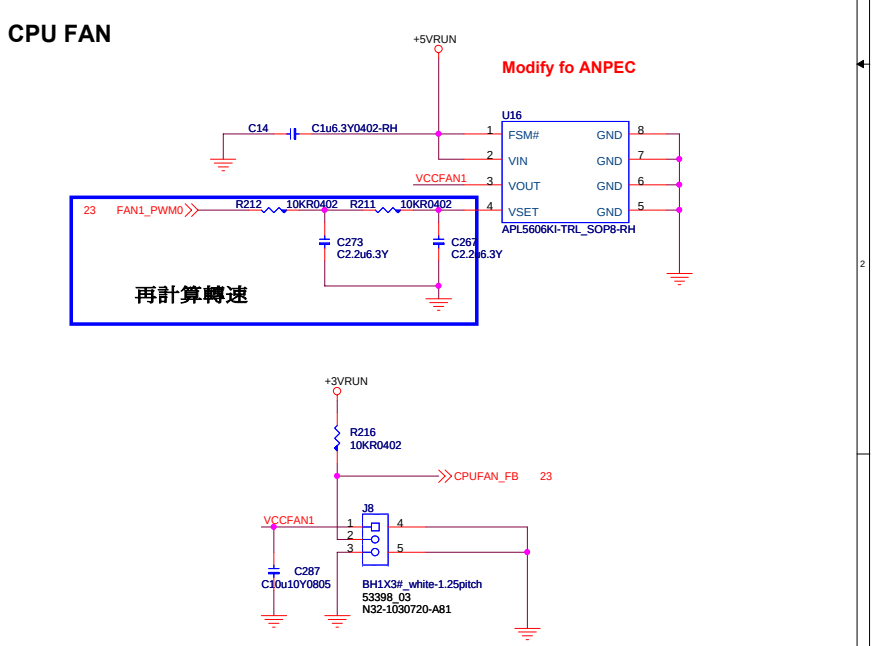


MICRO-STAR INT'L CO.,LTD.		
Title: Cardreader(UB6250A1)		
Size: Custom	Document Number: MS-1681	Rev: 10
Date:	Sheet 25 of 45	







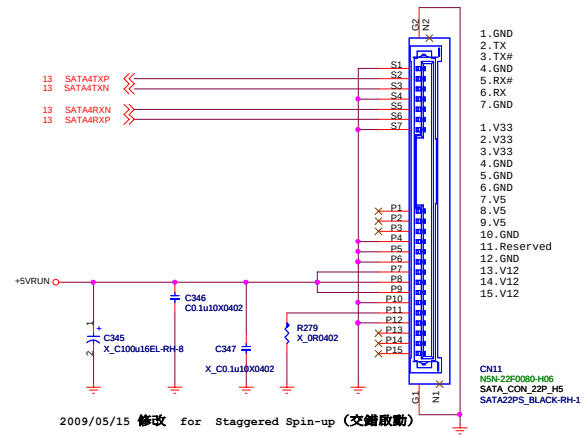
MICRO-STAR INT'L CO.,LTD.

Title: FAN,LED,Lauch board conn

Size: Custom | Document Number: MS-1681 | Rev: 10

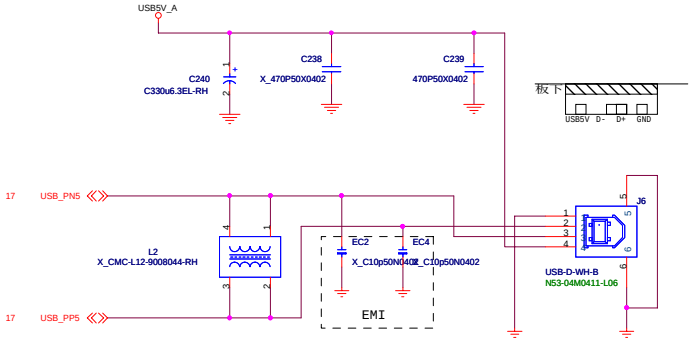
Date: | Sheet 26 of 45

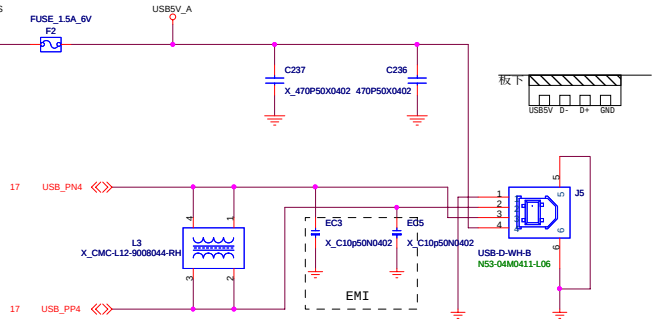
SATA HDD

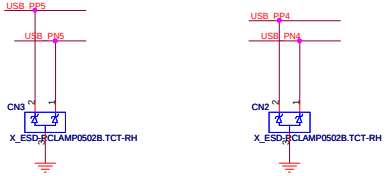


2009/05/15 修改 for Staggered Spin-up（交錯啟動）

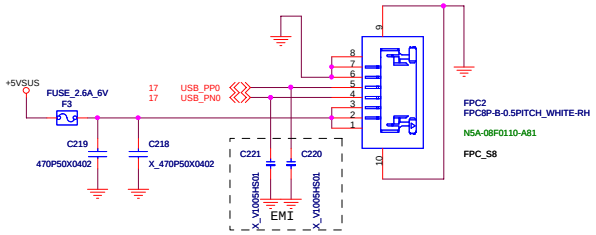
USB Port



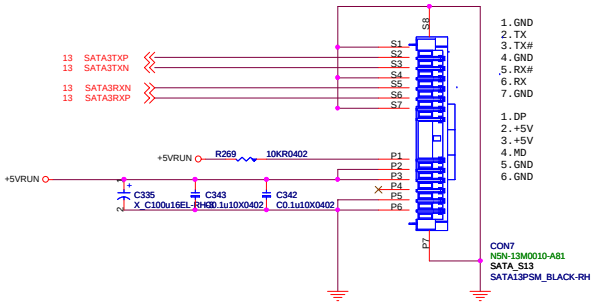




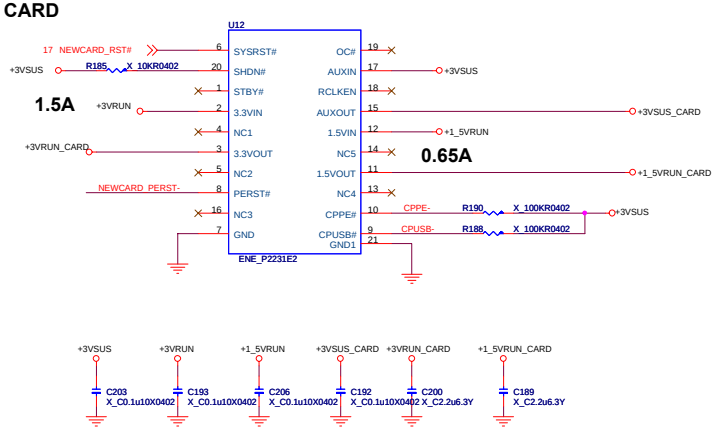
USB Port (to daughter board)

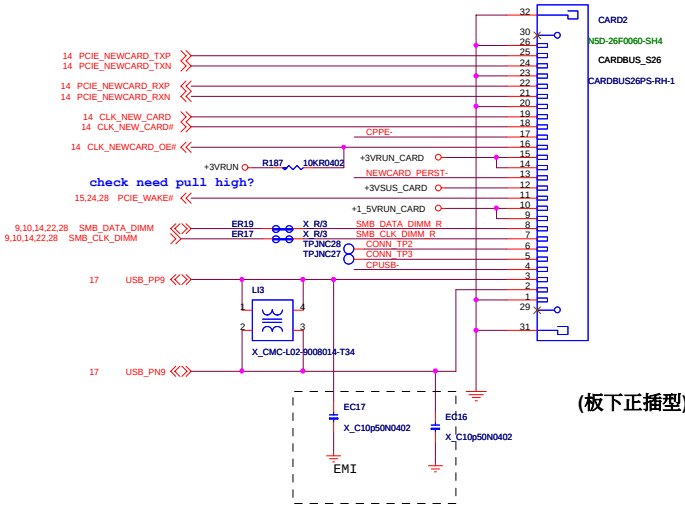


SATA ODD



NEW CARD





(板下正插型)

MICRO-STAR INT'L CO.,LTD.

Title: HDD,CDROM,USB ,NEW CARD

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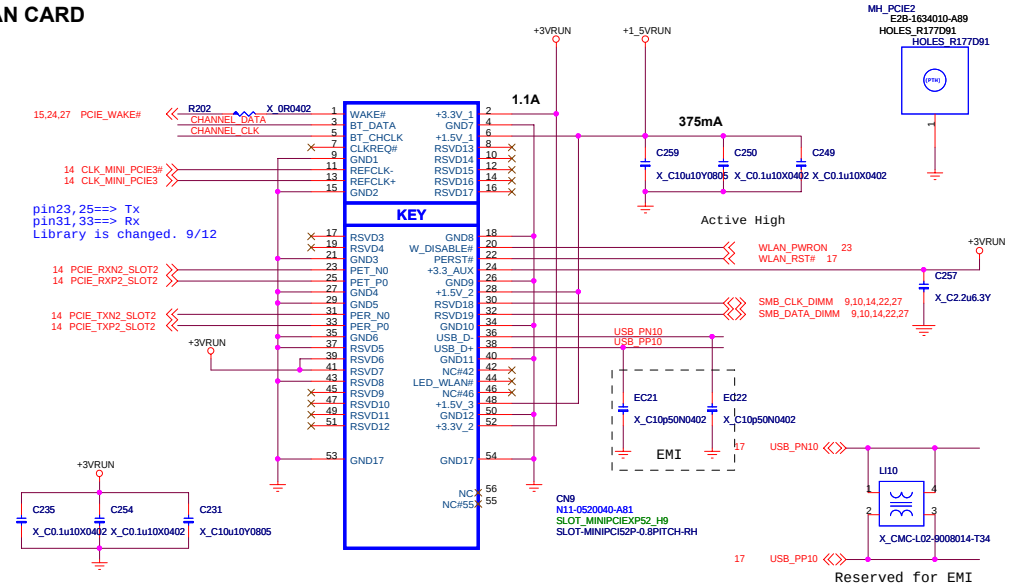
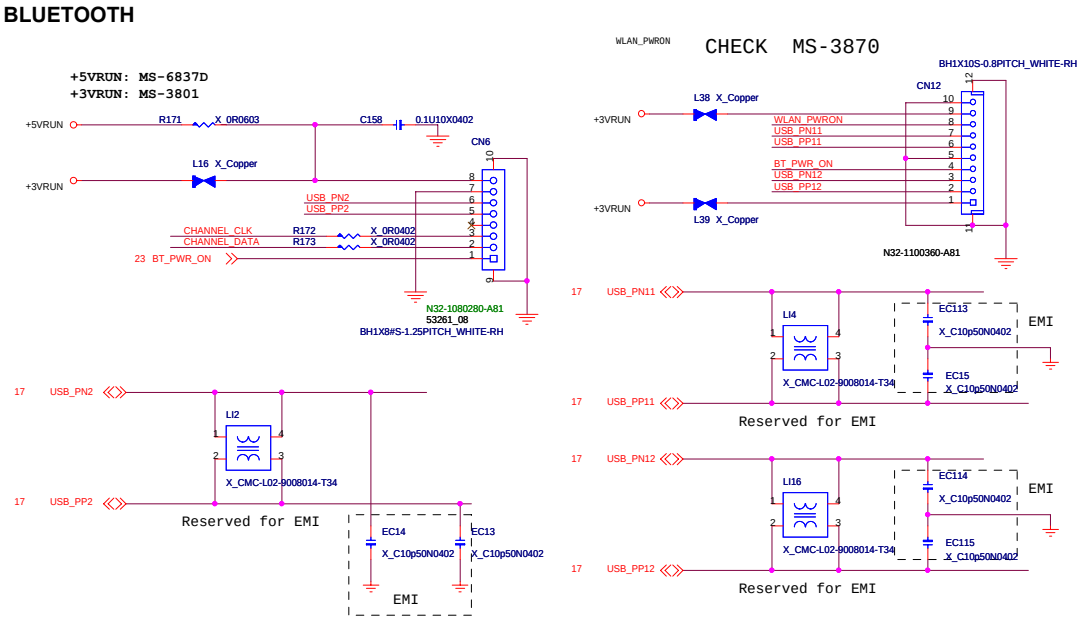
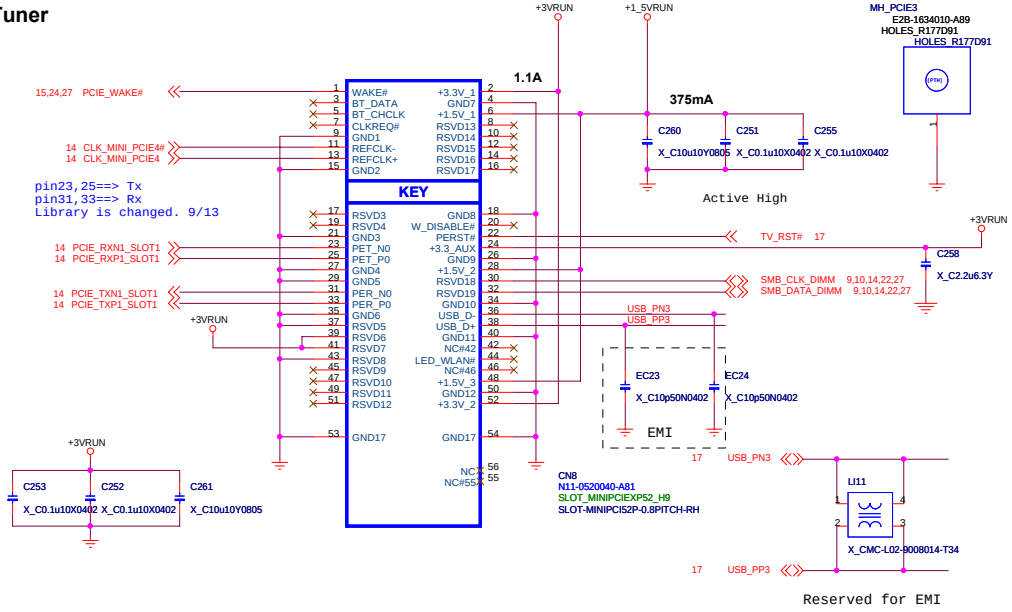
WLAN CARD



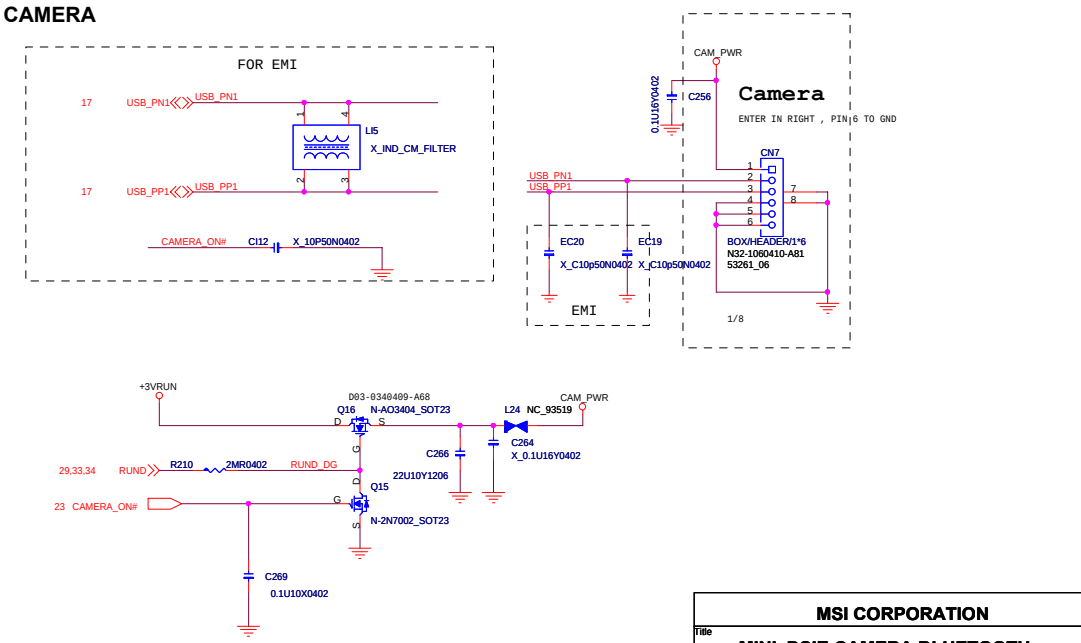
BLUETOOTH



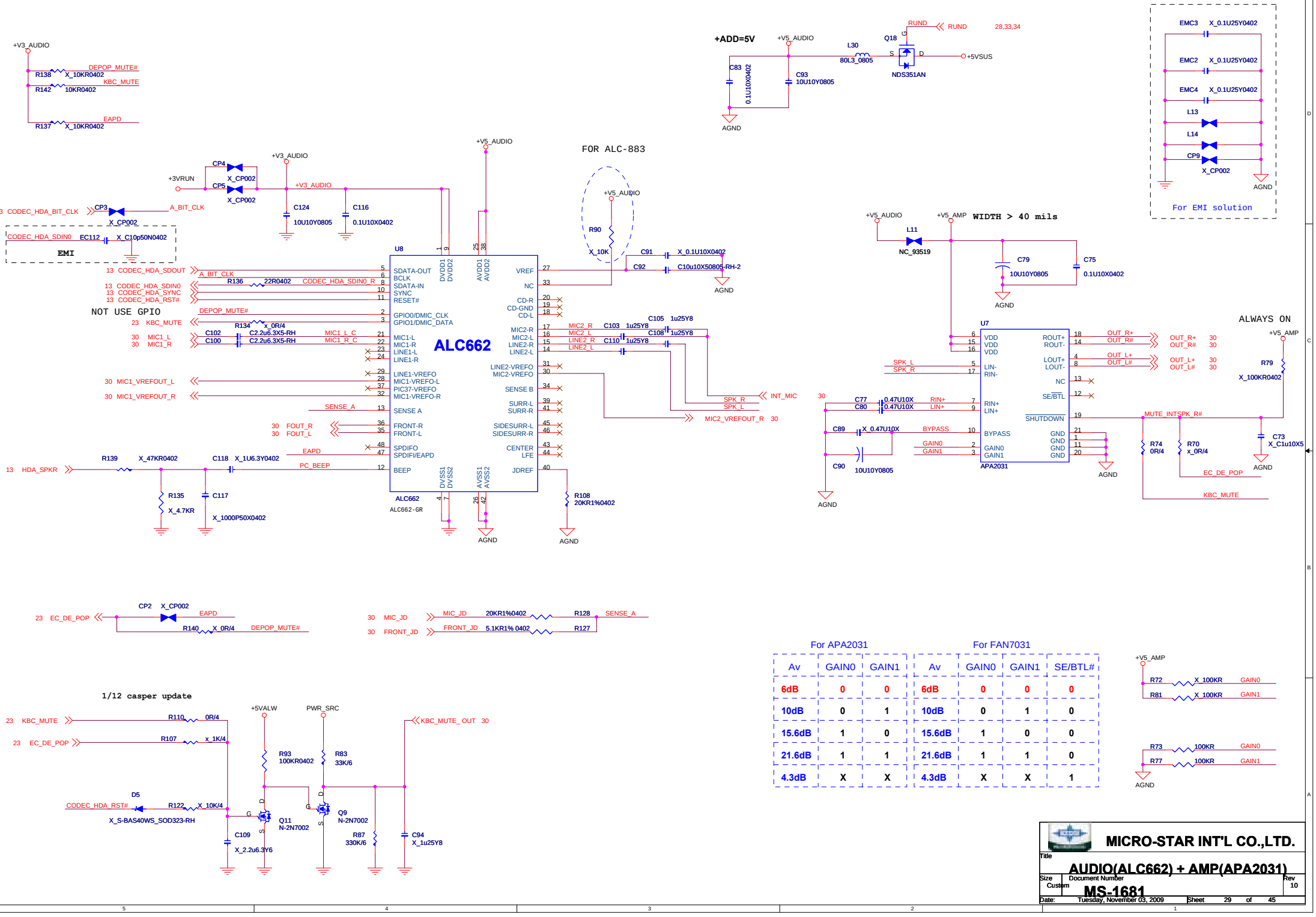
TV Tuner



CAMERA



MSI CORPORATION		
Title: MINI_PCIE,CAMERA,BLUETOOTH		
Size: Custom	Document Number: MS-1681	Rev: 10
Date: Tuesday, November 03, 2009	Sheet 28 of 45	



MICRO-STAR INT'L CO.,LTD.

Title: AUDIO(ALC662) + AMP(APA2031)

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1/20 EAPD DELAY 650ms

HP IN IS LOW

D03-0340409-A68

29 FOUT_R — C349 C100U6.3PT — FOUT_R_C — Q20 AO3404 — FOUT_R_Q — SOT23SGD_T — R262 75R0402 — FOUT_R_R — L33 300L300mA-350-RH

29 FOUT_L — C329 C100u16EL-RH-8 — FOUT_L_C — Q19 AO3404 — FOUT_L_Q — SOT23SGD_T — R251 75R0402 — FOUT_L_R — L31 300L300mA-350-RH

R252 2.2KR0402 — R258 2.2KR0402 — AGND

29 KBC_MUTE_OUT — R243 33KR R0603 — D19 X_BAS40WS — C319 1U25Y0805 — AGND

C321 X_C680p50X0402-RH — C334 X_C680p50X0402-RH — AGND AGND

EMC

29 FRONT_JD — C339 X_1000P50X0402 — EMC — AGND

FRONT_OUT_R — FRONT_OUT_L

D21 X_ESD-VPORT0402100MV05-RH — D20 X_ESD-VPORT0402100MV05-RH

C323 680P50X0402 — C330 680P50X0402 — AGND AGND

09/21

LOUT2 — MEC2 — MEC1 — EARPHONE

JACK-AUDIOF_OR-SP

N54-06F0481-H06

AUDIO_JACK_6P_OB

Internal Mic

1/16

29 MIC2_VREFOUT_R — R247 4.7KR — C320 0.1U10X0402 — R246 1KR1%0402 — AGND

CON6 — INT_MIC — INT_MIC 29 — C322 1000P50X0402 — AGND

AMP_440372_WTB-2P
N32-1020790-A81

FOR EMI close to CON4

CI13 — INT_MIC — X_ESD-VPORT0402100MV05-RH — AGND

29 MIC1_VREFOUT_R — MIC1_VREFOUT_R — X_ESD-VPORT0402100MV05-RH

29 MIC1_VREFOUT_L — MIC1_VREFOUT_L — R268 2.2KR0402 — R280 2.2KR0402

29 MIC_JD — D24 — C365 X_1000P50X0402 — AGND

MIC_JD — CN10

29 MIC1_R — MIC1_R — MIC1_R_L — L36 300L300mA-350-RH

29 MIC1_L — MIC1_L — MIC1_L_L — L35 300L300mA-350-RH

C353 X_C680p50X0402-RH — C357 X_C680p50X0402-RH — AGND AGND

C363 680P50X0402 — C352 680P50X0402 — AGND

For EMI

D22 — D23 — X_ESD-VPORT0402100MV05-RH — AGND

MIC(PINK)

IOC-JACK-D08-S56

AUDIO_JACK_6P_OB

N54-06F0481-H06

29 OUT_L# — OUT_L#
29 OUT_L+ — OUT_L+
29 OUT_R+ — OUT_R+
29 OUT_R# — OUT_R#

D1x4-BK
N32-10400V0-A81
53261_04
J10

C332 X_680P50X0402 — C340 X_680P50X0402 — C344 X_680P50X0402 — C350 X_680P50X0402 — AGND

SPEAKER

MICRO-STAR INT'L CO.,LTD.

Title: SPK / HP / MIC — E28/M0

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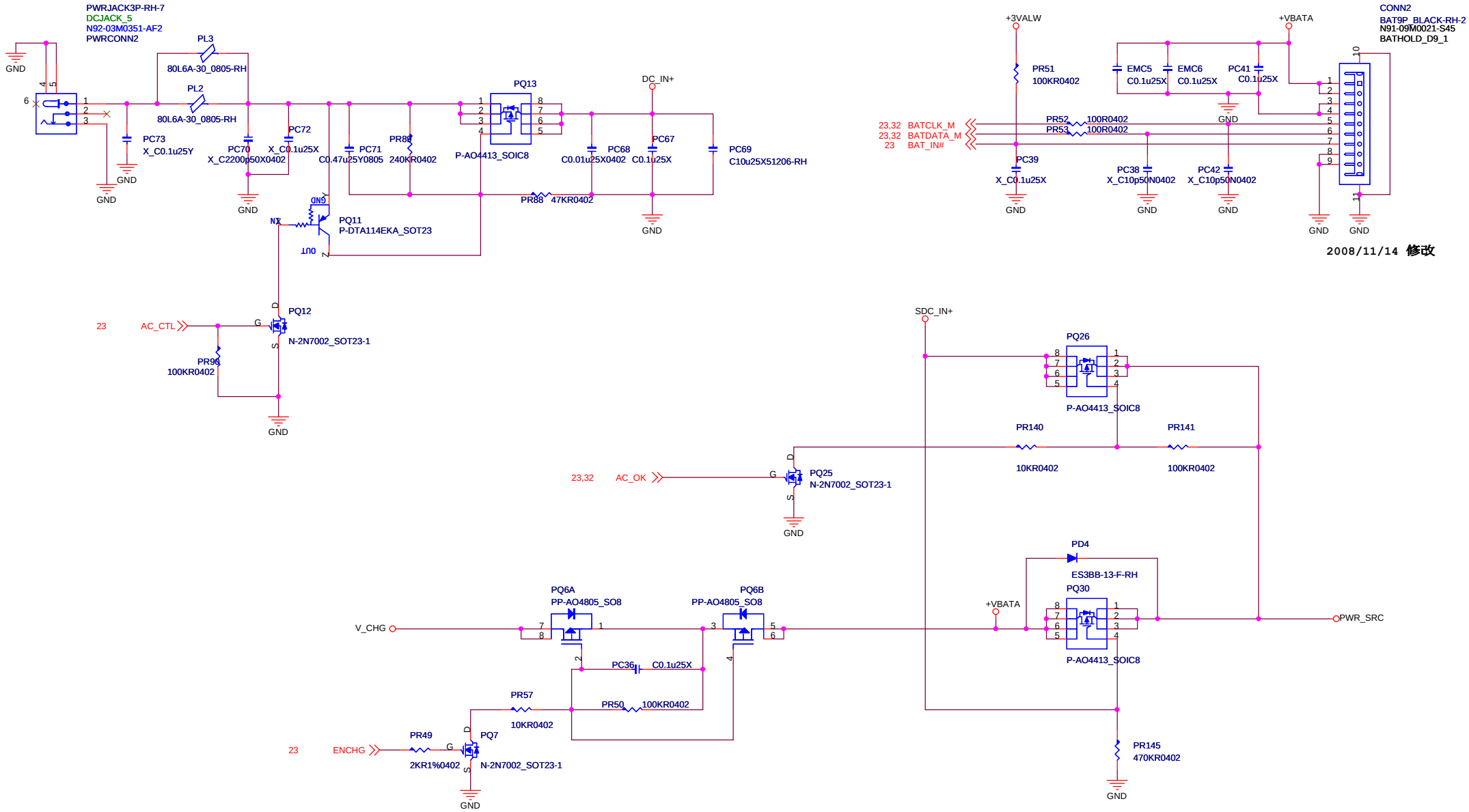

MICRO-STAR INT'L CO.,LTD.

Title: **Battery Select**

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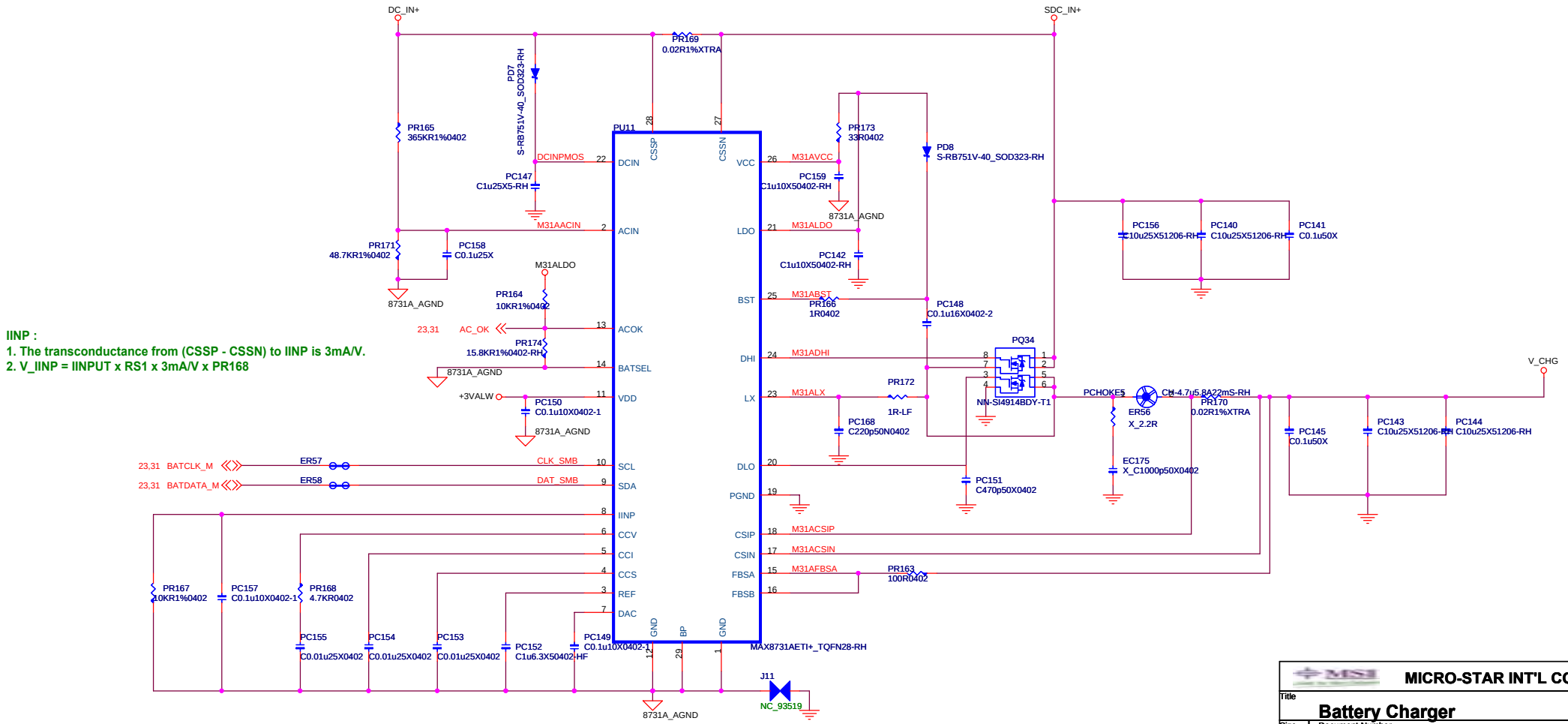
Adapter= 65W
Adapter input voltage set 19 Voltage



IINP :
1. The transconductance from (CSSP - CSSN) to IINP is 3mA/V.
2. V_IINP = IINPUT x RS1 x 3mA/V x PR168

MICRO-STAR INT'L CO.,LTD.			
Title: Battery Charger			
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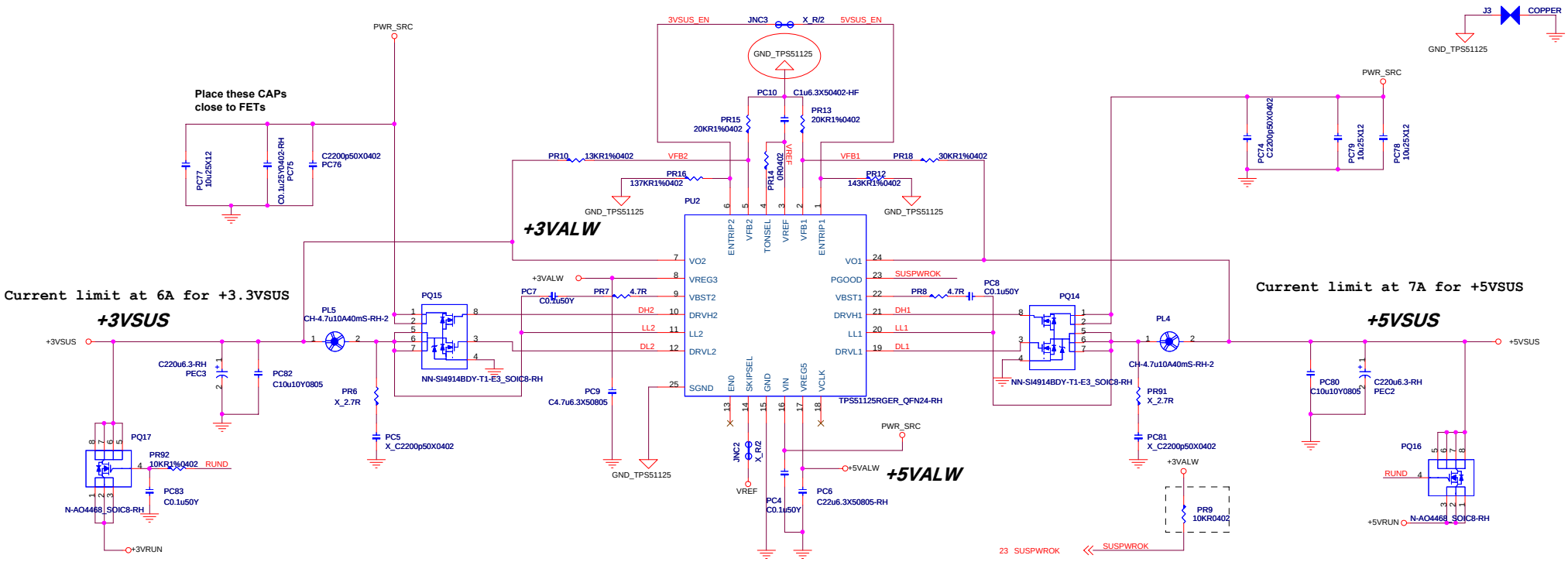
Date: Tuesday, November 03, 2009		Sheet 32 of 45	

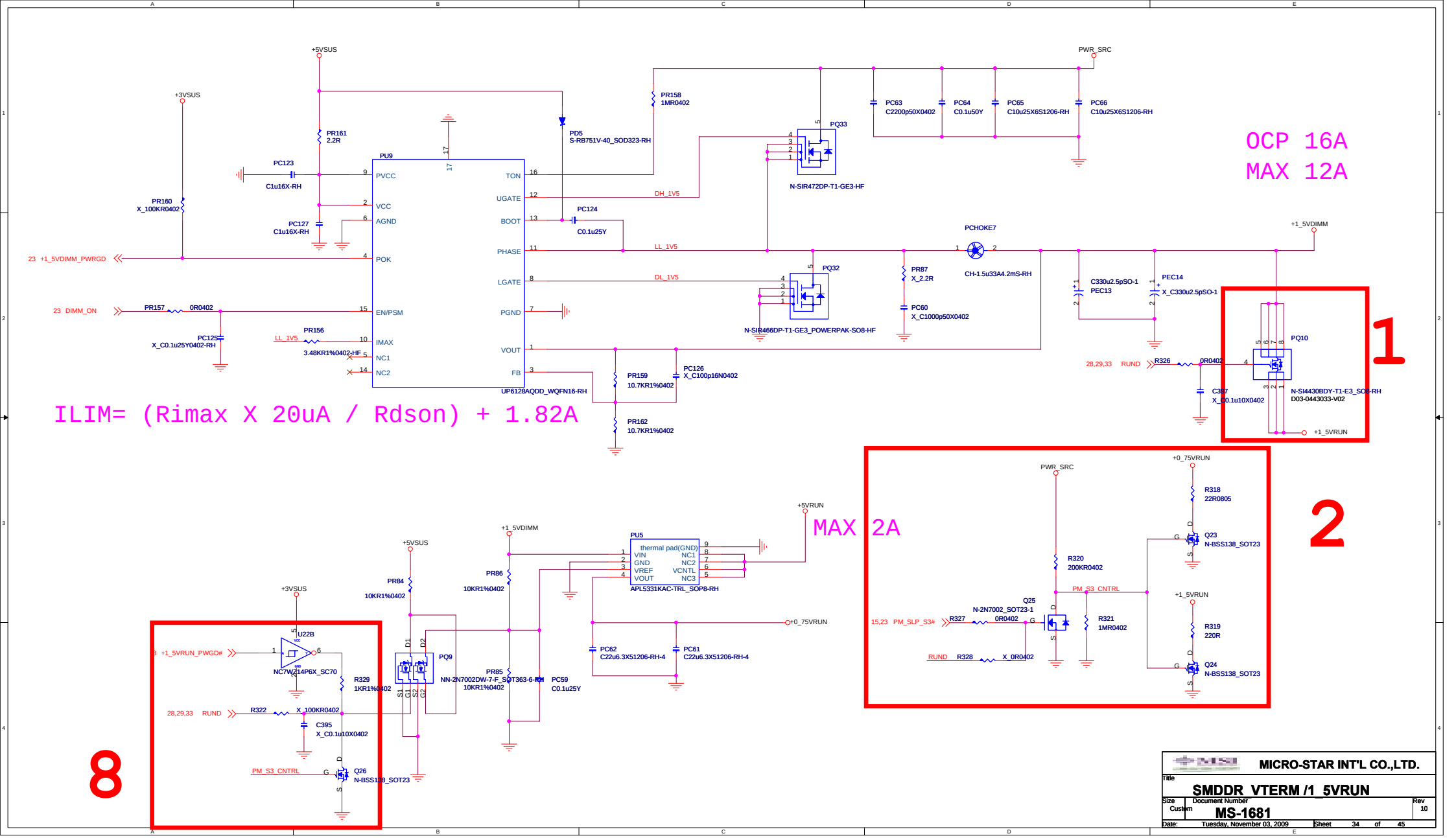


MICRO-STAR INT'L CO.,LTD.

Title: System power

Size	Document Number	Rev
Custom	MS-1681	10

Date: Tuesday, November 03, 2009 Sheet 33 of 45


+5VSUS
+3VSUS
PWR_SRC
PR161 2.2R
PC123 C1u16X-RH
PR160 X_100KR0402
PC127 C1u16X-RH
PU9
PVCC
VCC
AGND
POK
EN/PSM
IMAX
NC1
NC2
TON
UGATE
BOOT
PHASE
LGATE
PGND
VOUT
FB
UP6128AQDD_WQFN16-RH
PD5 S-RB751V-40_SOD323-RH
PR158 1MR0402
PC124 C0.1u25Y
PQ33
N-SIR472DP-T1-GE3-HF
DH_1V5
LL_1V5
DL_1V5
PQ32
N-SIR466DP-T1-GE3_POWERPAK-SO8-HF
PR87 X_2.2R
PC60 X_C1000p50X0402
PCHOKE7
CH-1.5u33A4.2mS-RH
PC63 C2200p50X0402
PC64 C0.1u50Y
PC65 C10u25X6S1206-RH
PC66 C10u25X6S1206-RH
C330u2.5pSO-1 PEC13
PEC14 X_C330u2.5pSO-1
+1_5VDIMM
23 +1_5VDIMM_PWRGD
23 DIMM_ON
PR157 0R0402
PC125 X_C0.1u25Y0402-RH
PR156 3.48KR1%0402-HF
PR159 10.7KR1%0402
PR162 10.7KR1%0402
PC126 X_C100p16N0402
OCP 16A
MAX 12A
ILIM= (Rimax X 20uA / Rdson) + 1.82A
28,29,33 RUND
R326 0R0402
PQ10
N-SI4430BDY-T1-E3_SO8-RH
D03-0443033-V02
C387 X_C0.1u10X0402
+1_5VRUN
1
2
MAX 2A
+0_75VRUN
R318 22R0805
Q23 N-BSS138_SOT23
R320 200KR0402
PM_S3_CNTRL
Q25 N-2N7002_SOT23-1
15,23 PM_SLP_S3#
R327 0R0402
R321 1MR0402
RUND R328 X_0R0402
R319 220R
Q24 N-BSS138_SOT23
PU5
thermal pad(GND)
VIN
GND
VREF
VOUT
NC1
NC2
VCNTL
NC3
APL5331KAC-TRL_SOP8-RH
PR84 10KR1%0402
PR86 10KR1%0402
PR85 10KR1%0402
PC59 C0.1u25Y
PC62 C22u6.3X51206-RH-4
PC61 C22u6.3X51206-RH-4
PQ9
NN-2N7002DW-7-F_SOT363-6-RH
U22B
NC7WZ14P6X_SC70
3 +1_5VRUN_PWGD#
R329 1KR1%0402
28,29,33 RUND
R322 X_100KR0402
C395 X_C0.1u10X0402
PM_S3_CNTRL
Q26 N-BSS138_SOT23
8
MICRO-STAR INT'L CO.,LTD.
Title
SMDDR_VTERM /1_5VRUN
Size Custom
Document Number MS-1681
Rev 10
Date: Tuesday, November 03, 2009
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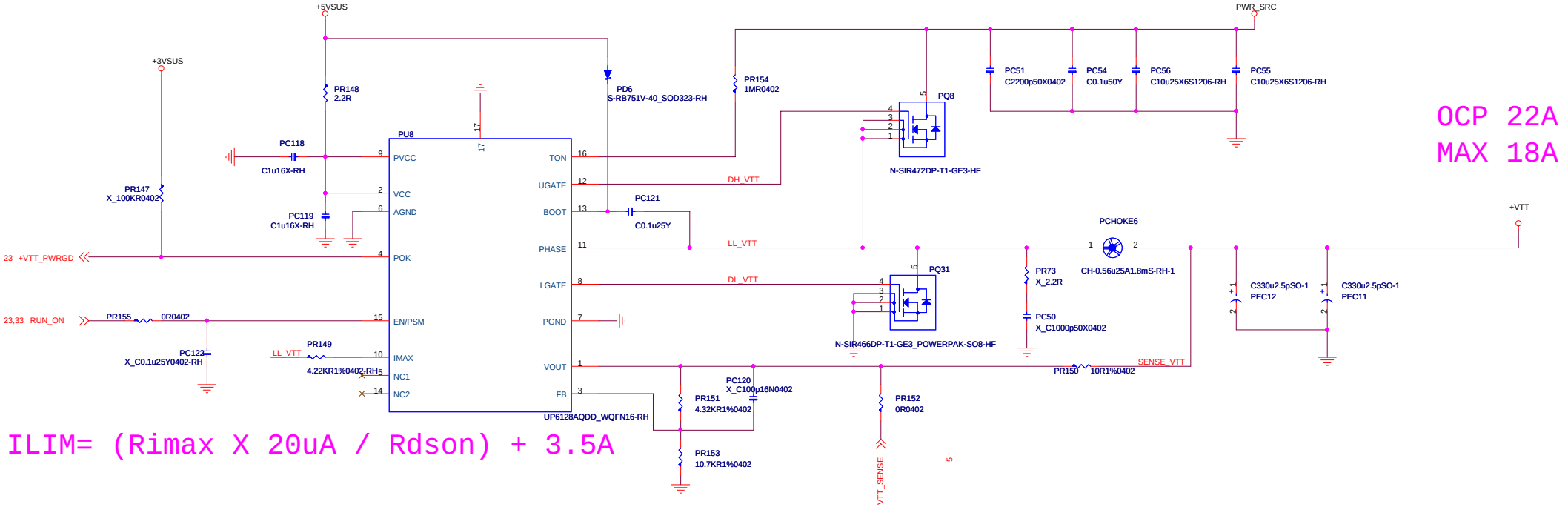

MICRO-STAR INT'L CO.,LTD.

Title: VTT Power,+1.8VRUN

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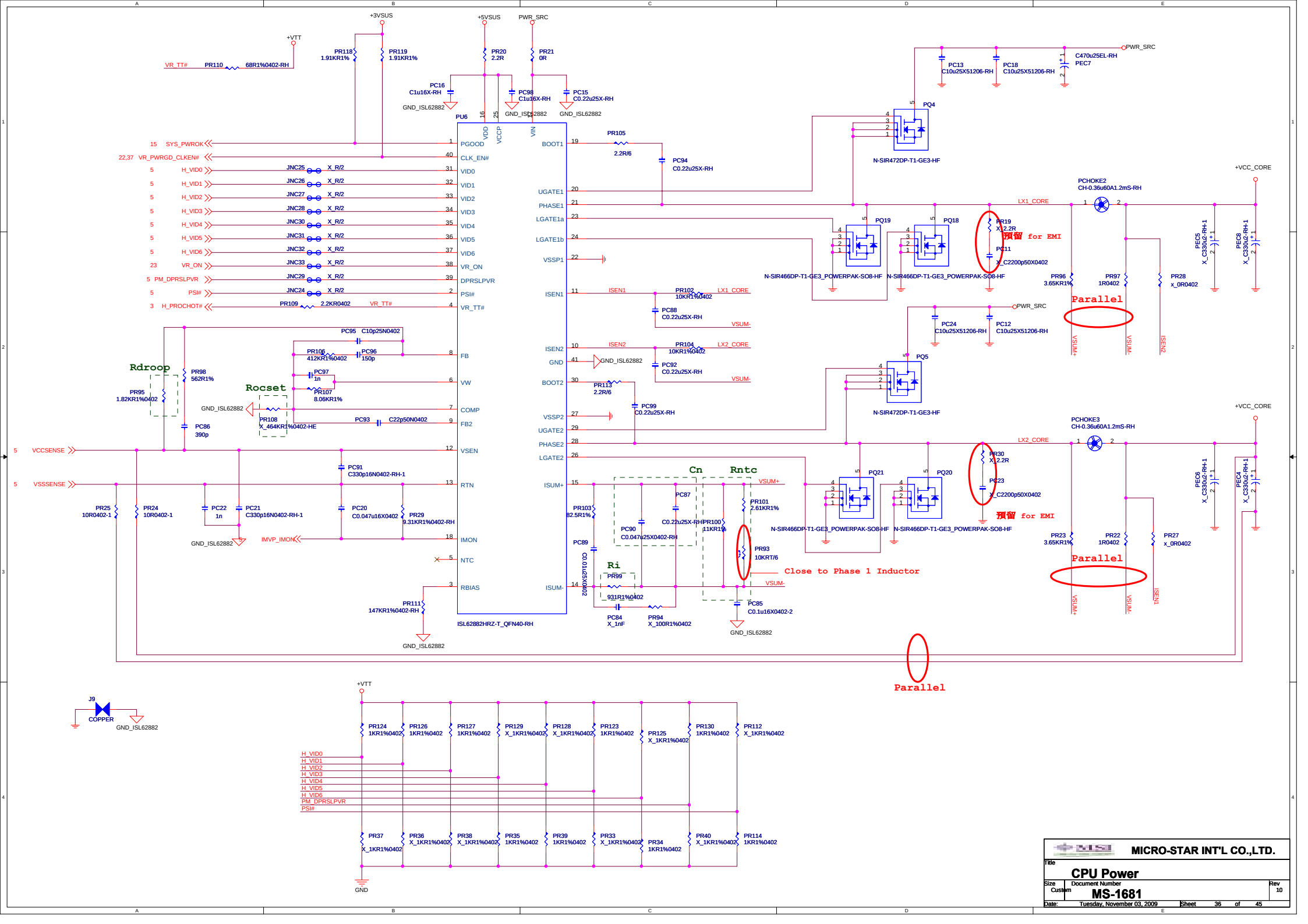

Title	CPU Power
Size	Custom
Document Number	MS-1681
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Date:	Tuesday, November 03, 2009
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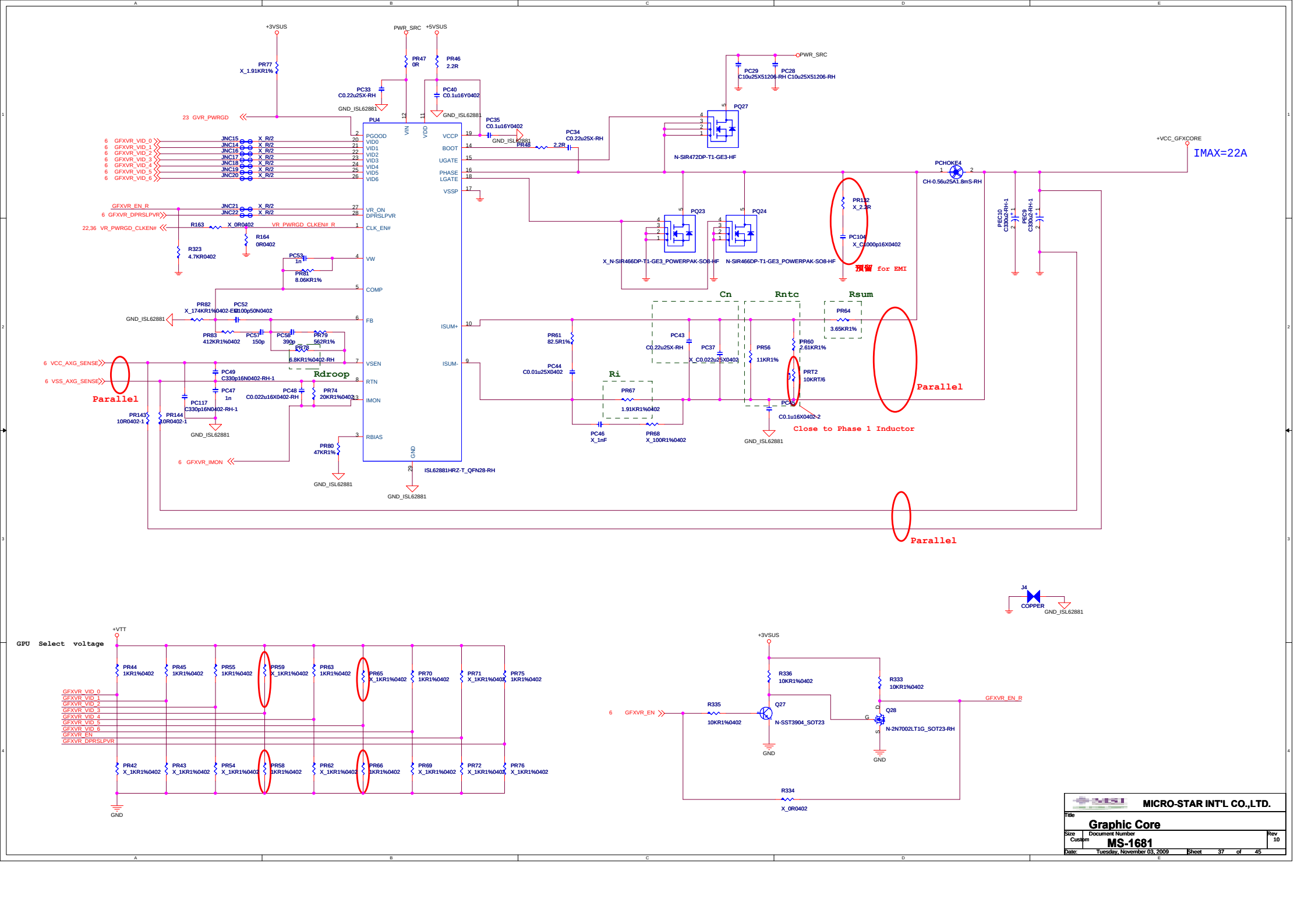
MICRO-STAR INT'L CO.,LTD.


+3VSUS
PWR_SRC
+5VSUS
PR77 X_1.91KR1%
PR47 0R
PR46 2.2R
PC33 C0.22u25X-RH
PC40 C0.1u16Y0402
GND_ISL62881
23 GVR_PWRGD
PU4
PC35 C0.1u16Y0402
PC34 C0.22u25X-RH
PR48 2.2R
PC29 C10u25X51206-RH
PC28 C10u25X51206-RH
PQ27
N-SIR472DP-T1-GE3-HF
+VCC_GFXCORE
IMAX=22A
PCHOKE4
CH-0.56u25A1.8mS-RH
PR112 X_2.2R
PC104 X_C1000p16X0402
PQ23
PQ24
X_N-SIR466DP-T1-GE3_POWERPAK-SO8-HF
N-SIR466DP-T1-GE3_POWERPAK-SO8-HF
預留 for EMI
PEC10 C330u2.RH-1
PEC9 C330u2.RH-1
6 GFXVR_VID_0
6 GFXVR_VID_1
6 GFXVR_VID_2
6 GFXVR_VID_3
6 GFXVR_VID_4
6 GFXVR_VID_5
6 GFXVR_VID_6
JNC15 X_R/2
JNC14 X_R/2
JNC16 X_R/2
JNC17 X_R/2
JNC18 X_R/2
JNC19 X_R/2
JNC20 X_R/2
PGOOD
VID0
VID1
VID2
VID3
VID4
VID5
VID6
VCCP
BOOT
UGATE
PHASE
LGATE
VSSP
GFXVR_EN_R
6 GFXVR_DPRSLPVR
JNC21 X_R/2
JNC22 X_R/2
VR_ON
DPRSLPVR
22,36 VR_PWRGD_CLKEN#
R163 X_0R0402
VR_PWRGD_CLKEN#_R
CLK_EN#
R164 0R0402
R323 4.7KR0402
PR81 8.06KR1%
PC53 1n
VW
COMP
PR82 X_174KR1%0402-EM
PC52 C100p50N0402
FB
PR83 412KR1%0402
PC57 150p
PC58 390p
PR79 562R1%
PR78 6.8KR1%0402-RH
Rdroop
6 VCC_AXG_SENSE
6 VSS_AXG_SENSE
Parallel
PC49 C330p16N0402-RH-1
PC47 1n
PC48 C0.022u16X0402-RH
PR74 20KR1%0402
PC117 C330p16N0402-RH-1
PR143 10R0402-1
PR144 10R0402-1
VSEN
RTN
IMON
RBIAS
PR80 47KR1%
6 GFXVR_IMON
GND
ISL62881HRZ-T_QFN28-RH
ISUM+
ISUM-
Cn
Rntc
Rsum
PR64 3.65KR1%
PR61 82.5R1%
PC43 C0.22u25X-RH
PC37 X_C0.022u25X0402
PR56 11KR1%
PR60 2.61KR1%
PR2 10KRT/6
PC44 C0.01u25X0402
Ri
PR67 1.91KR1%0402
PC45 C0.1u16X0402-2
PC46 X_1nF
PR68 X_100R1%0402
Close to Phase 1 Inductor
Parallel
Parallel
J4
COPPER
GPU Select voltage
+VTT
PR44 1KR1%0402
PR45 1KR1%0402
PR55 1KR1%0402
PR59 X_1KR1%0402
PR63 1KR1%0402
PR65 X_1KR1%0402
PR70 1KR1%0402
PR71 X_1KR1%0402
PR75 1KR1%0402
GFXVR_VID_0
GFXVR_VID_1
GFXVR_VID_2
GFXVR_VID_3
GFXVR_VID_4
GFXVR_VID_5
GFXVR_VID_6
GFXVR_EN
GFXVR_DPRSLPVR
PR42 X_1KR1%0402
PR43 X_1KR1%0402
PR54 X_1KR1%0402
PR58 1KR1%0402
PR62 X_1KR1%0402
PR66 1KR1%0402
PR69 X_1KR1%0402
PR72 X_1KR1%0402
PR76 X_1KR1%0402
+3VSUS
R336 10KR1%0402
R333 10KR1%0402
6 GFXVR_EN
R335 10KR1%0402
Q27 N-SST3904_SOT23
Q28 N-2N7002LT1G_SOT23-RH
GFXVR_EN_R
R334 X_0R0402
MICRO-STAR INT'L CO.,LTD.
Title
Graphic Core
Size Custom
Document Number MS-1681
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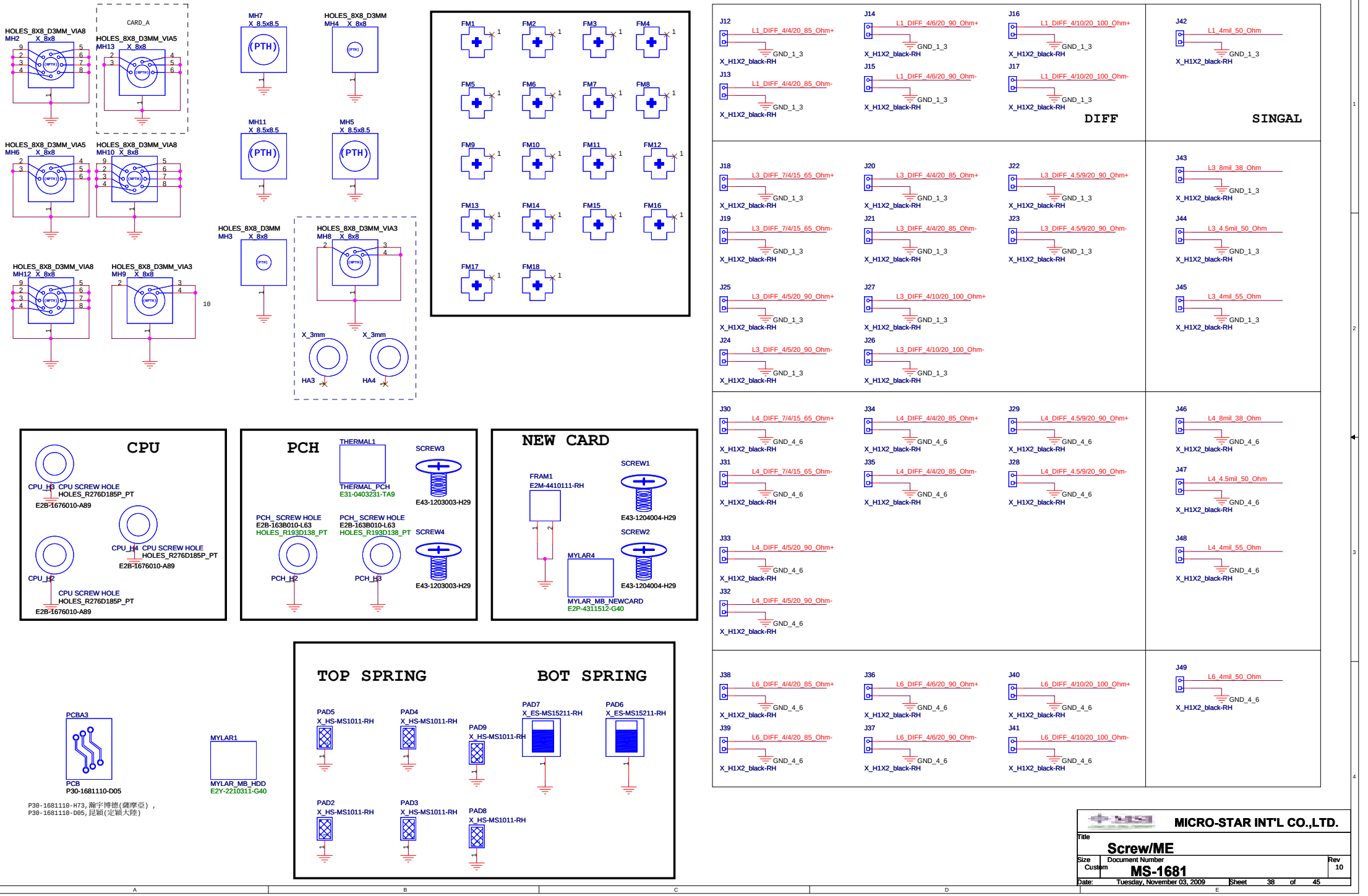

MICRO-STAR INT'L CO.,LTD.

Title: Screw/ME

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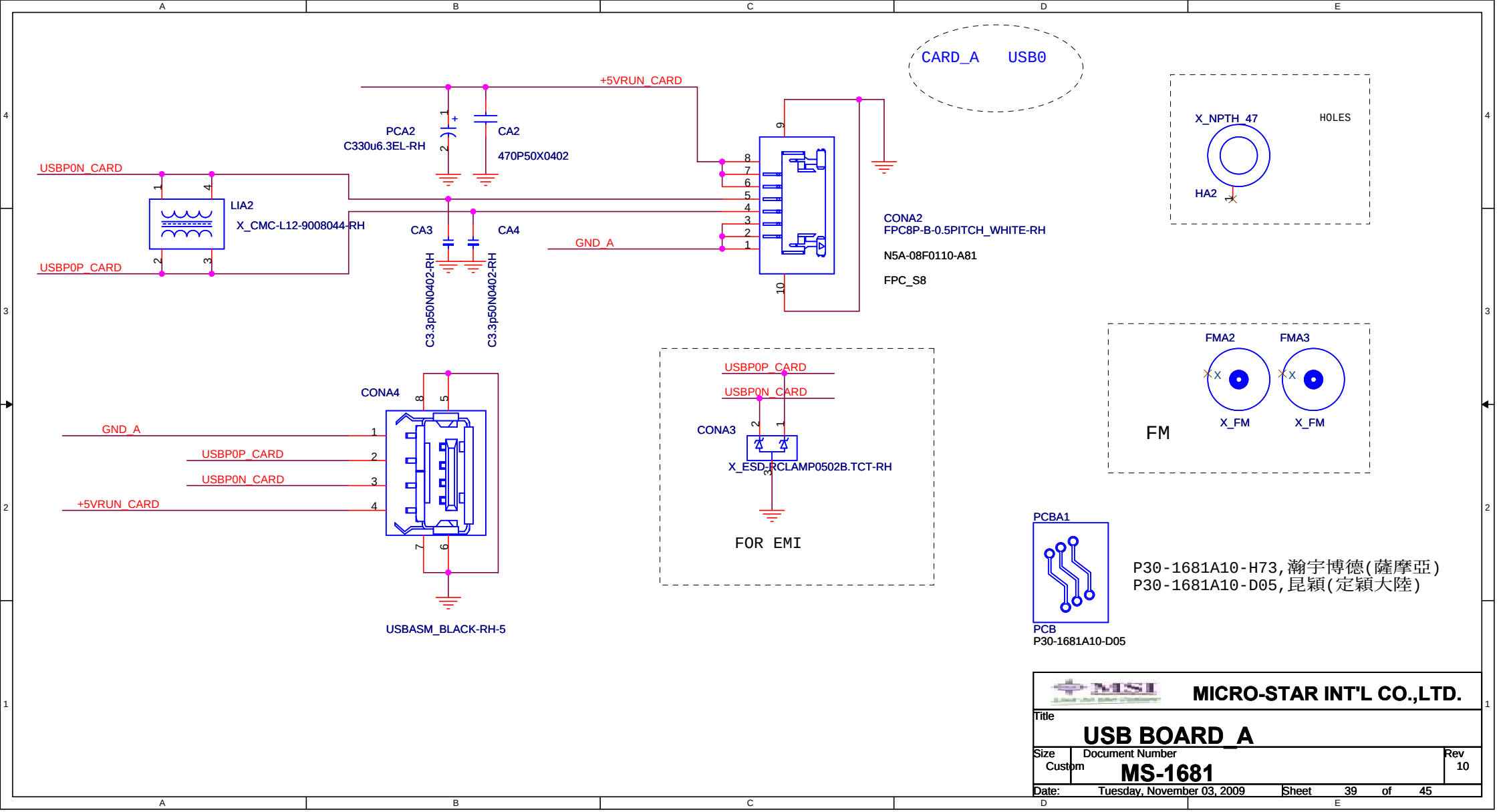
CARD_A USB0
+5VRUN_CARD
PCA2
C330u6.3EL-RH
CA2
470P50X0402
USBP0N_CARD
USBP0P_CARD
LIA2
X_CMC-L12-9008044-RH
CA3
CA4
C3.3p50N0402-RH
C3.3p50N0402-RH
GND_A
CONA2
FPC8P-B-0.5PITCH_WHITE-RH
N5A-08F0110-A81
FPC_S8
X_NPTH_47
HOLES
HA2
FMA2
FMA3
X
X
X_FM
X_FM
FM
CONA4
GND_A
USBP0P_CARD
USBP0N_CARD
+5VRUN_CARD
USBASM_BLACK-RH-5
USBP0P_CARD
USBP0N_CARD
CONA3
X_ESD-RCLAMP0502B.TCT-RH
FOR EMI
PCBA1
PCB
P30-1681A10-D05
P30-1681A10-H73,瀚宇博德(薩摩亞)
P30-1681A10-D05,昆穎(定穎大陸)
MICRO-STAR INT'L CO.,LTD.
Title
USB BOARD_A
Size
Custom
Document Number
MS-1681
Rev
10
Date: Tuesday, November 03, 2009
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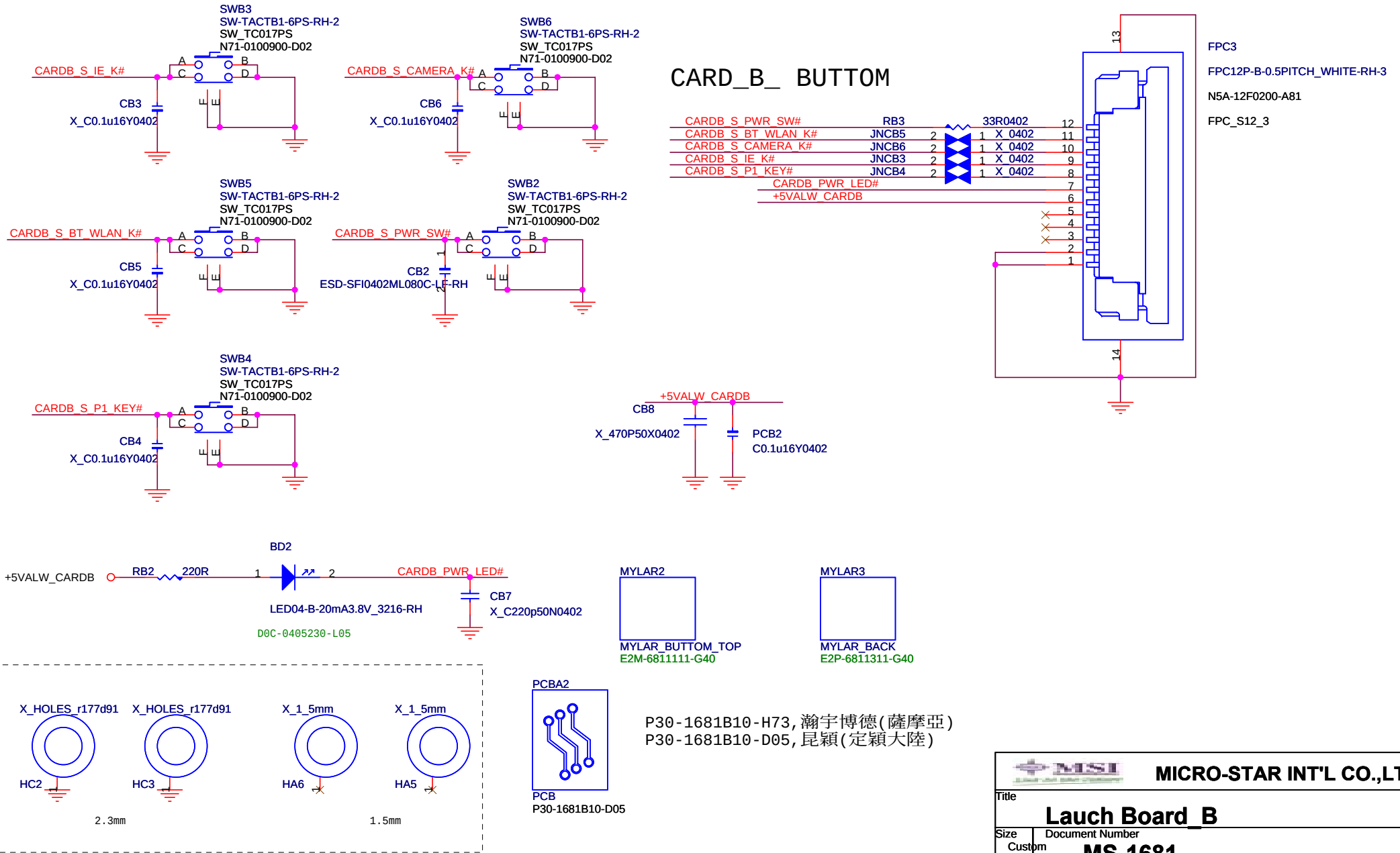

MICRO-STAR INT'L CO.,LTD.	
Title	Lauch Board_B
Size: Custom	Document Number: MS-1681
Rev	10
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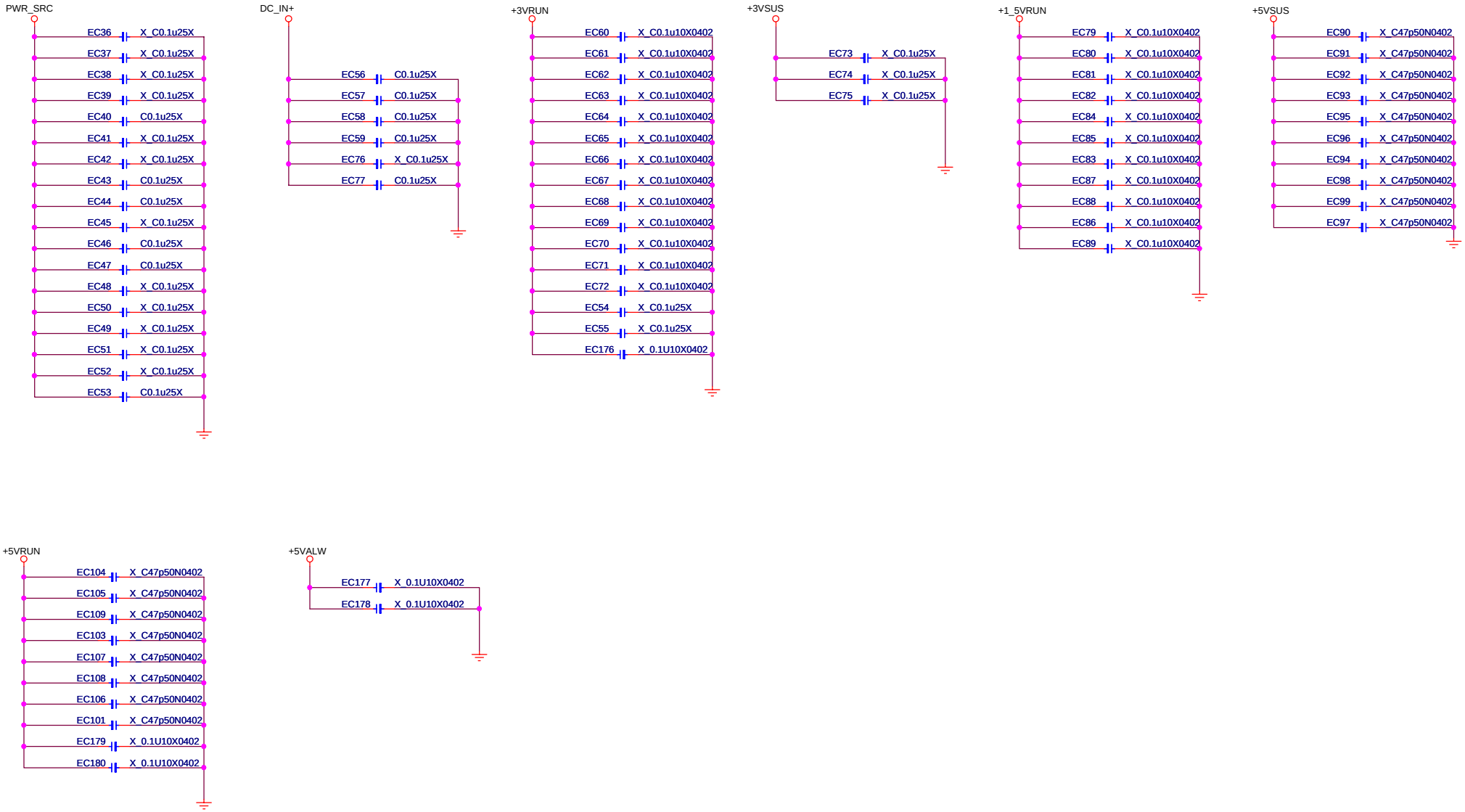

MICRO-STAR INT'L CO.,LTD.

Title: EMI

Size: B | Document Number: MS-1681 | Rev: 10

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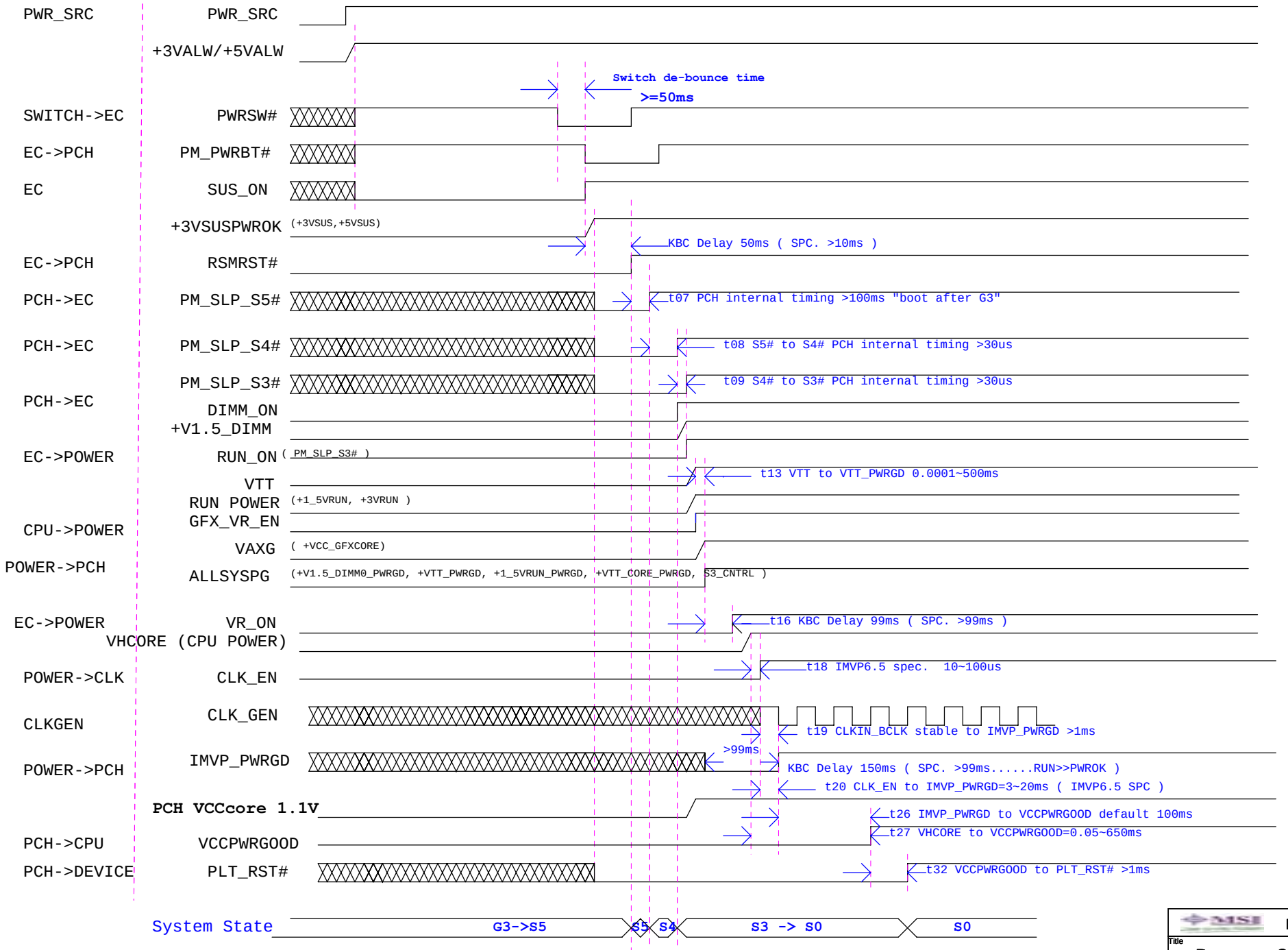
Calpella System Power on Sequence DC mode



MICRO-STAR INT'L CO.,LTD.

Title: Power on Sequency		
Size: A3	Document Number: MS-1681	Rev: 10
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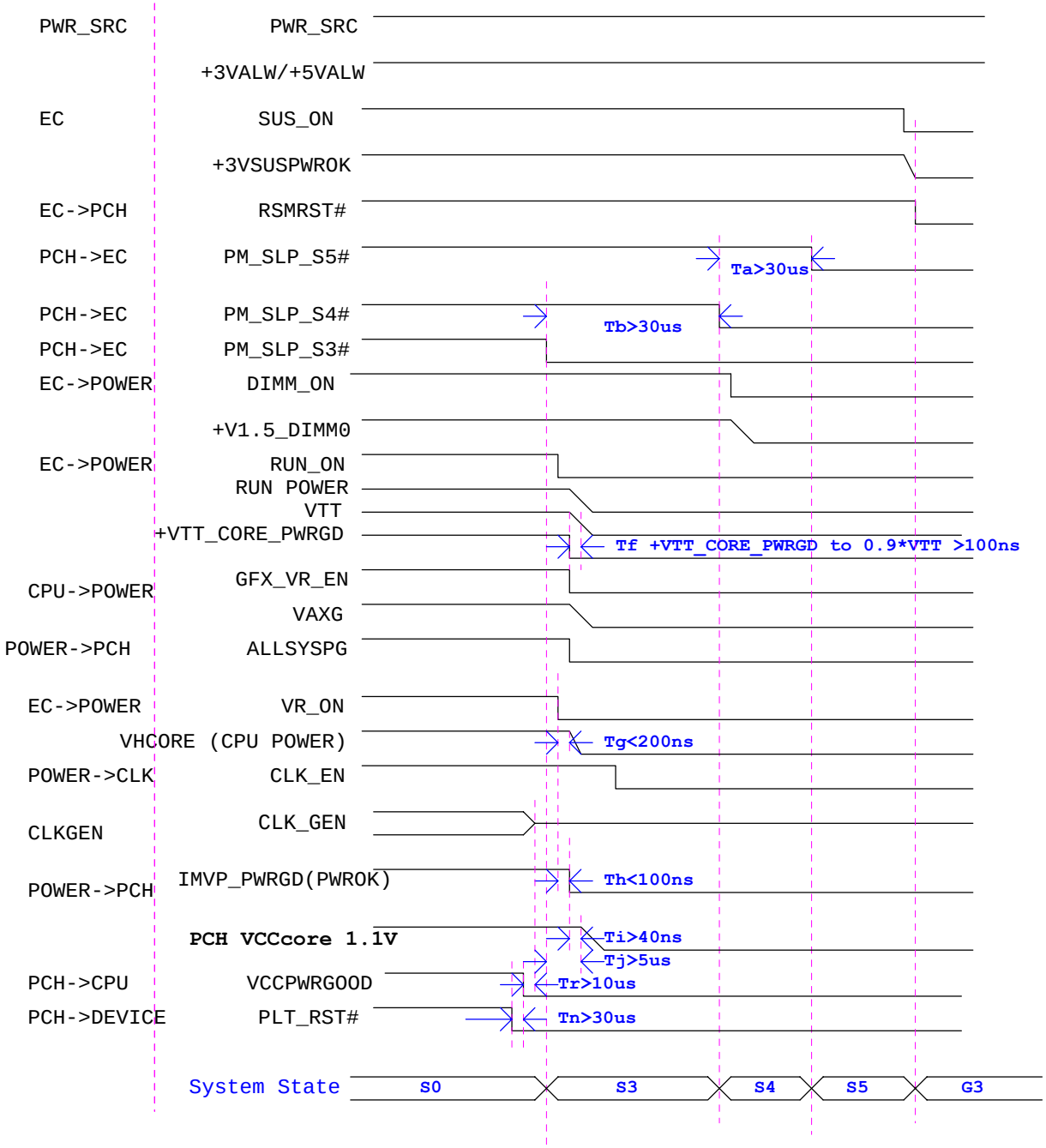
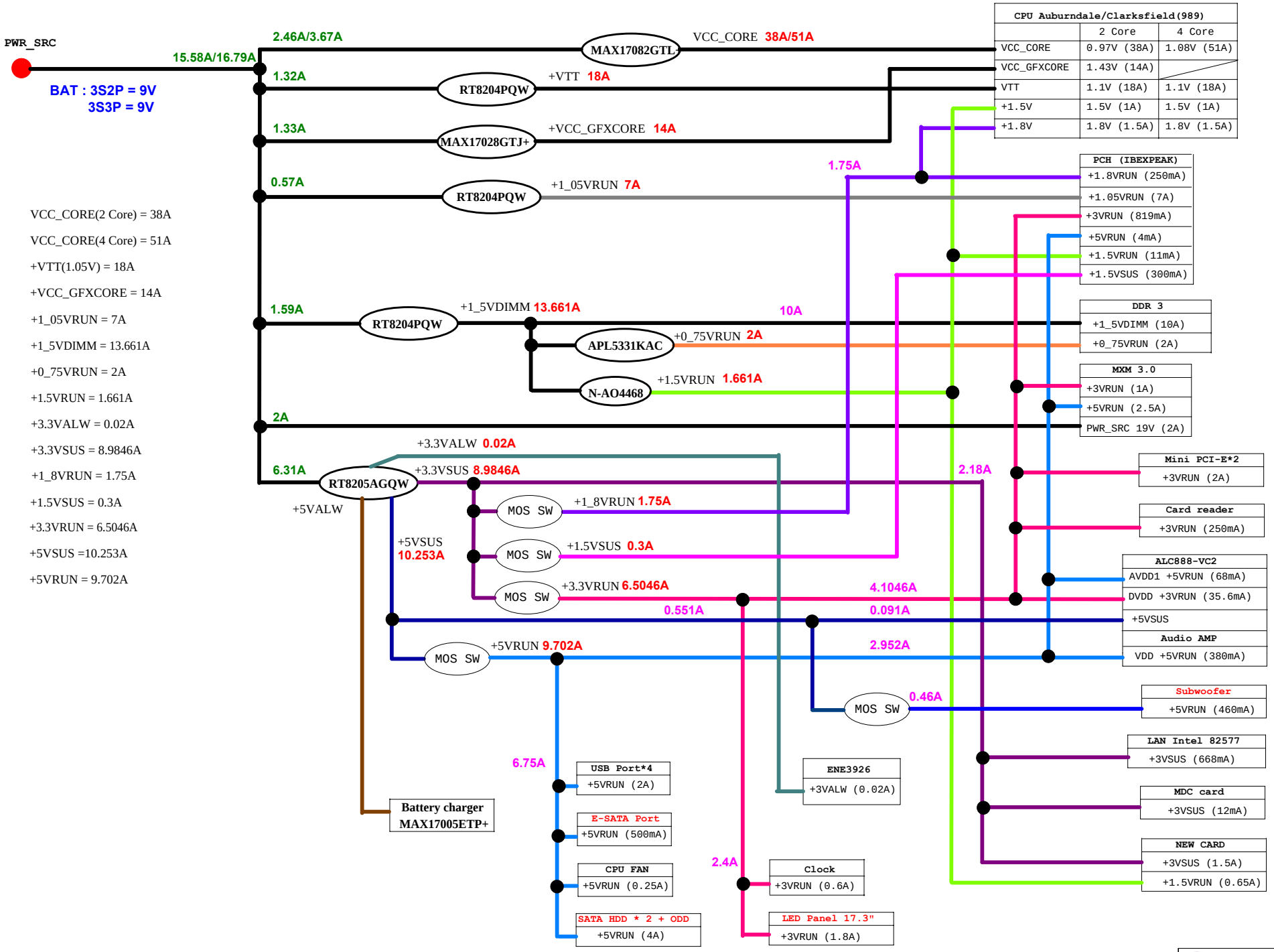
Power down Sequence DC mode S0 to G3



MICRO-STAR INT'L CO.,LTD.			
Title: Power on Sequency			
Size: A3	Document Number: MS-1681		Rev: 10
Date: Tuesday, November 03, 2009	Sheet 43 of 45		



VCC_CORE(2 Core) = 38A

VCC_CORE(4 Core) = 51A

+VTT(1.05V) = 18A

+VCC_GFXCORE = 14A

+1_05VRUN = 7A

+1_5VDIMM = 13.661A

+0_75VRUN = 2A

+1.5VRUN = 1.661A

+3.3VALW = 0.02A

+3.3VSUS = 8.9846A

+1_8VRUN = 1.75A

+1.5VSUS = 0.3A

+3.3VRUN = 6.5046A

+5VSUS =10.253A

+5VRUN = 9.702A

2008/11/13 修改

MICRO-STAR INT'L CO.,LTD.

Title: Power MAP

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Change Note :

0A-->0B

1.P19 stuff R113 & C85 for intel document about Braidwood

2.P23 add one PWM Pin for co-lay LED panel by EC

3.P25 Change CardReader to ENE

4.P26 Change "LED_HDD#" PU +5VRUN to +3VRUN

5.P26 Fan conn footprint change back to "53398_03"

6.P28 Add Wireless & Bluetooth combo(MS-3870)

7.P32 Change PR171 to 48.7K & PR172 to 1R0603

8.P33 Change PU2 from "UP6182AQAG" to "TPS51125" & PR18 to 30K

9.P34 Change PU9 from "UP6111AQDD" to "UP6128A" & PR156 to 3.48K & PR159 to 10.7K & PQ10 to "D03-0443033-V02"

10.P35 Change PU8 from "UP6111AQDD" to "UP6128A" & PR149 to 4.22K & remove C394

11.P36 Change PR95 to 1.82K & PR29 to 9.31K & PC90 to 47nf & PR99 to 931R & no stuff PC84 , PR94 , PEC4 , PEC5 , PEC6 , PEC8

0B-->10

1.P13 add net "TP_HDA_DOCK_EN#_R" for flash protect control.

2.P14 add wimax ac adepter schematic.

3.P23 add ENE GPIO13 for flash protect control.

4.P25 no stuff C399 & C400 for cardreader detect issus.

5.P26 change R307 from 0R to 33R for EMI.

6.P31 add 2 cap in +VBATA for EMI.

7.P34 change R329 from 0R to 1K for current limit.

8.P37 no stuff +VCC_GFXCOPE PQ23 no cost down.

9.P40 change JNCB2 to RB3 , and 33R for EMI.

10.P40 change CB2 from 0.1u to 300p for EMI.

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