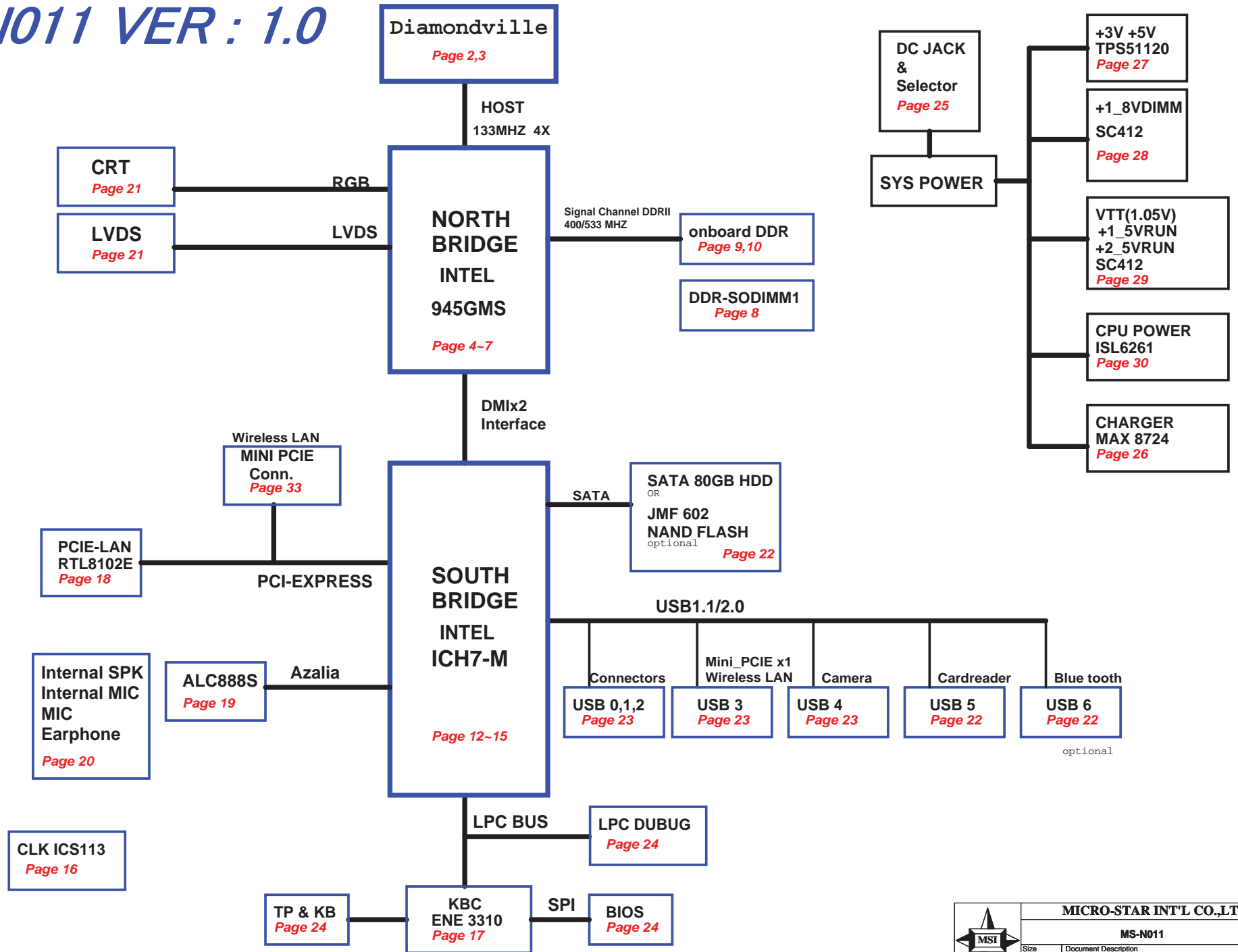
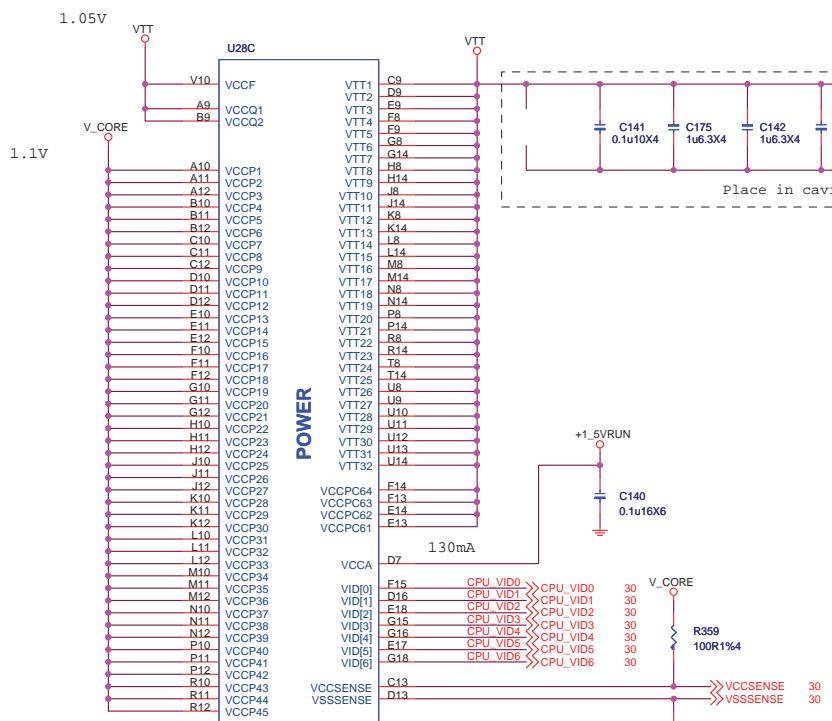
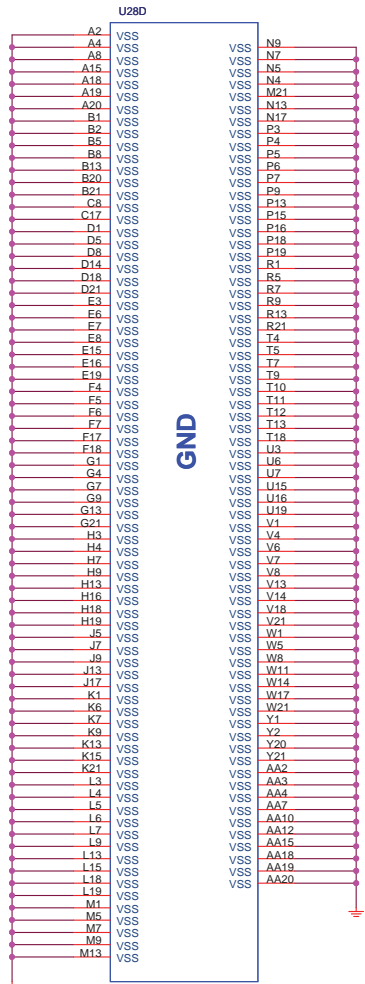


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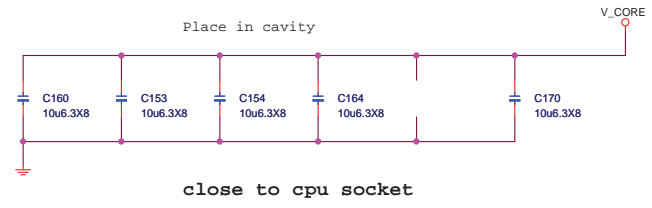
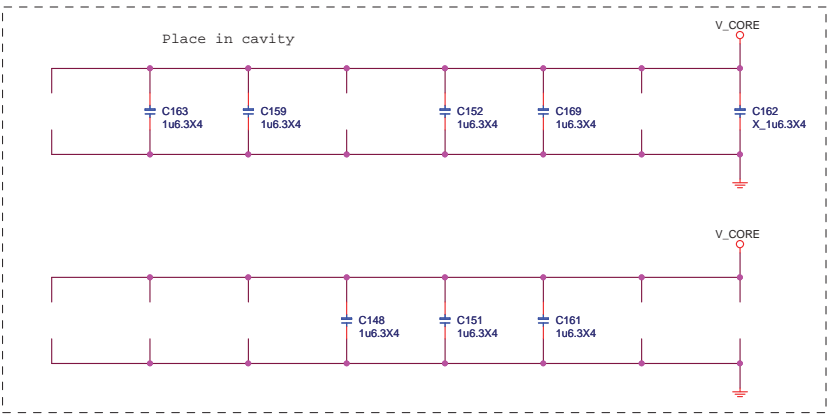
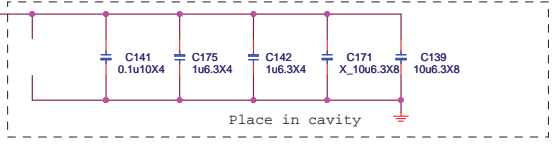


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MS-N011		
Size Custom	Document Description BLOCK DIAGRAM	Rev 1.0
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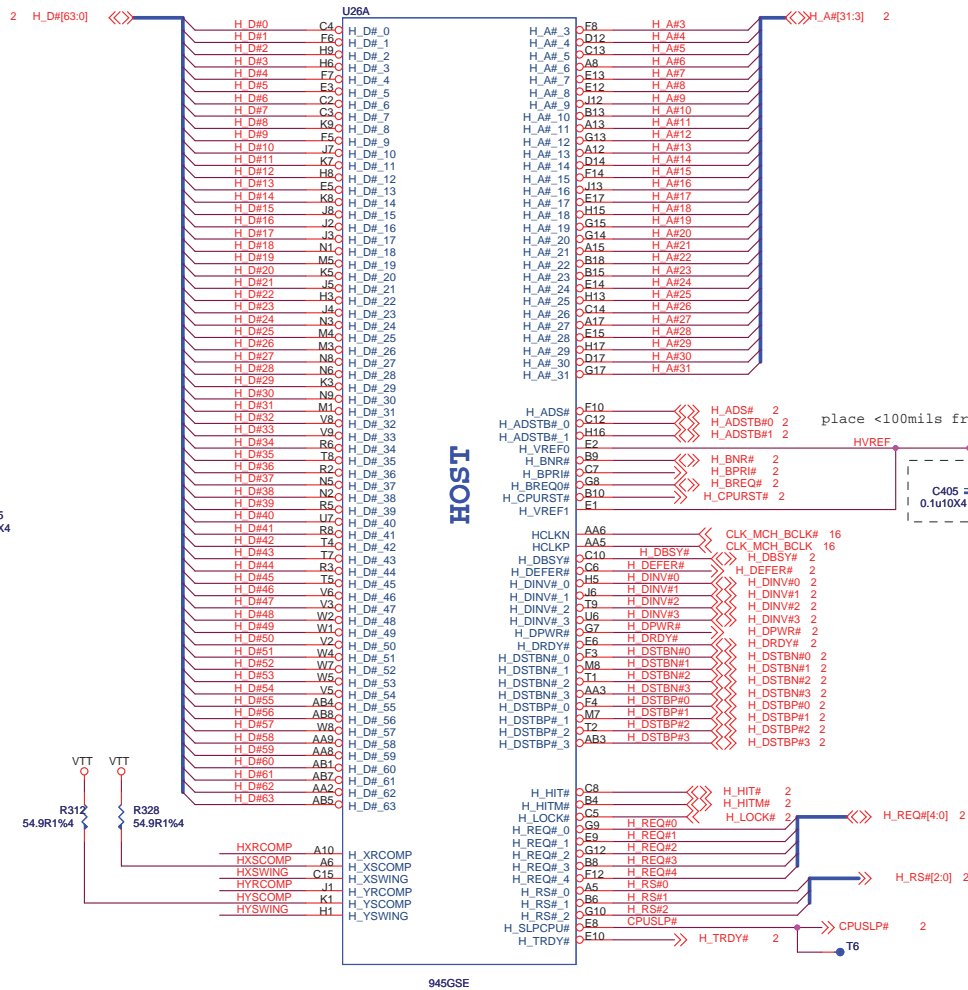
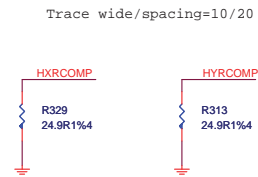
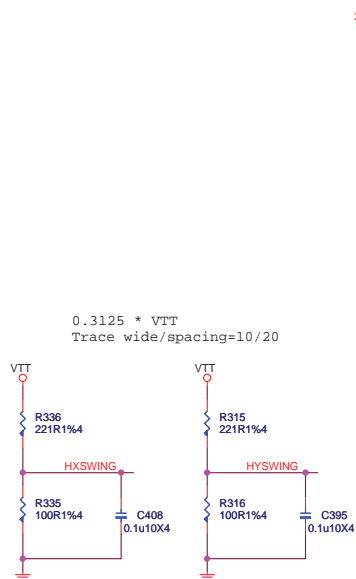
2.5A: before VCC stable
1.5A: after VCC stable

Diamondville



LAYOUT NOTE:
Route VCCSENSE and VSSSENSE traces at 27.4ohms with 50 mil spacing.
Place PU and PD within 1 inch of CPU.

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MS-N011			
Size	Document Description	Rev	
Custom	945GMS_HOST	1.0	
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8.9 SA_MD[0.63] <<<

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SA MD1 AB28 SA DO 1
SA MD2 AE33 SA DO 2
SA MD3 AF32 SA DO 3
SA MD4 AC33 SA DO 3
SA MD5 AB32 SA DO 4
SA MD6 AB31 SA DO 6
SA MD7 AE31 SA DO 7
SA MD8 AH31 SA DO 8
SA MD9 AK31 SA DO 9
SA MD10 AL28 SA DO 10
SA MD11 AK27 SA DO 11
SA MD12 AH30 SA DO 12
SA MD13 AL32 SA DO 12
SA MD14 AJ28 SA DO 14
SA MD15 AJ27 SA DO 15
SA MD16 AH32 SA DO 16
SA MD17 AE31 SA DO 16
SA MD18 AH27 SA DO 17
SA MD19 AF28 SA DO 18
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945GSE

8.11 SB_CAS- <<< SB_CAS- AG19
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VTT

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W14 VCC_NCTF451
V14 VCC_NCTF452
U14 VCC_NCTF453
T14 VCC_NCTF454
R14 VCC_NCTF455
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N14 VCC_NCTF457
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T14 VCC_NCTF724
R14 V

945 GMS Power

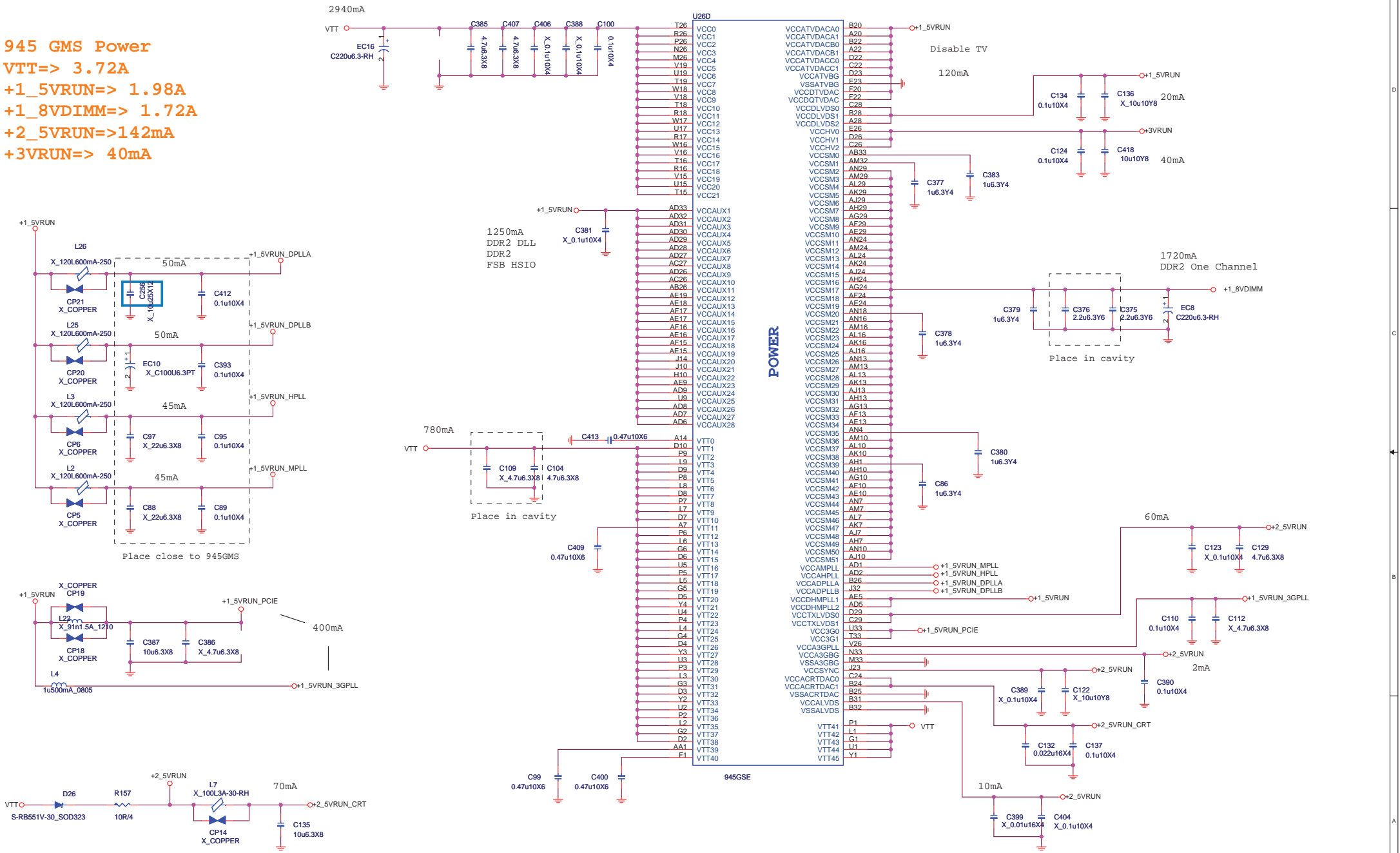
VTT=> 3.72A

+1_5VRUN=> 1.98A

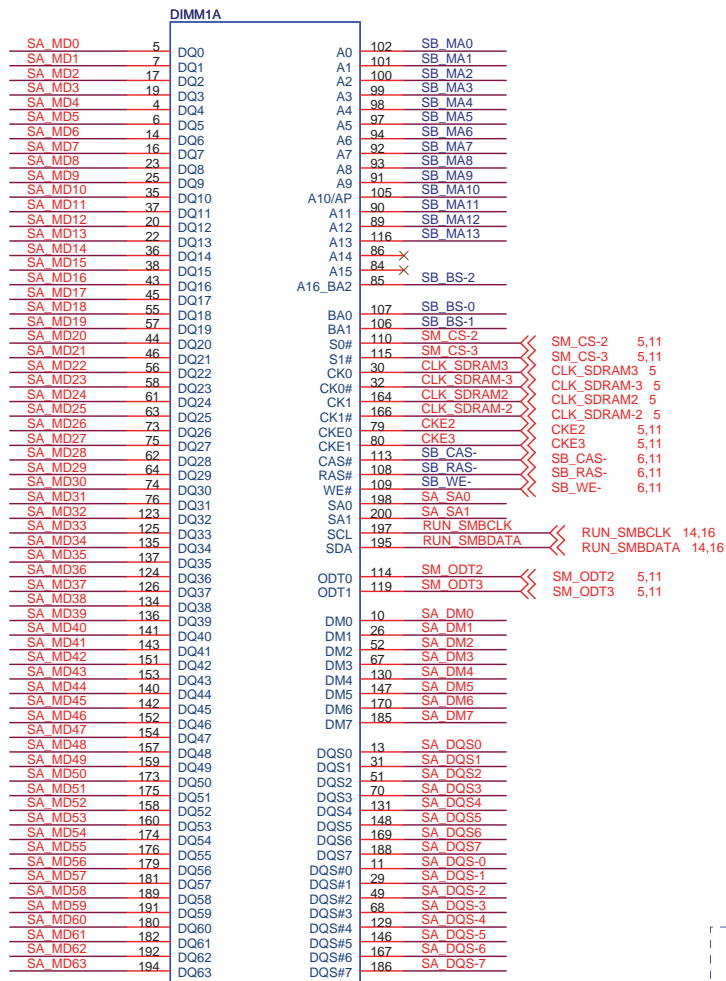
+1_8VDIMM=> 1.72A

+2_5VRUN=>142mA

+3VRUN=> 40mA

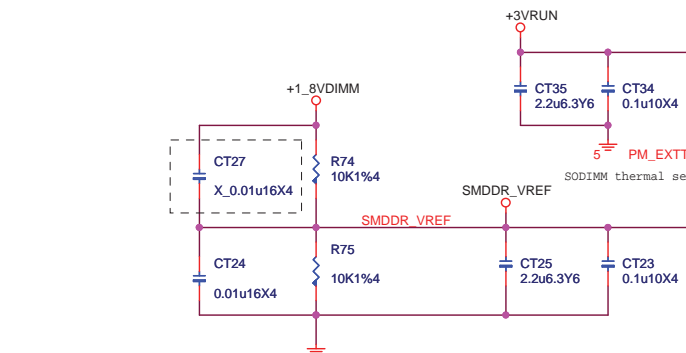
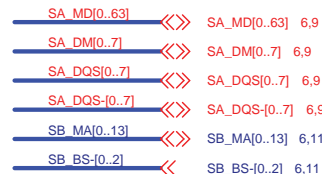


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MSI		
MS-N011		
Size Custom	Document Description 945GMS_POWER	Rev 1.0
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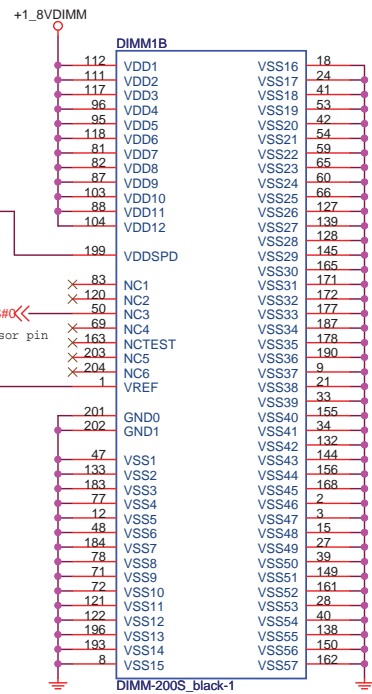
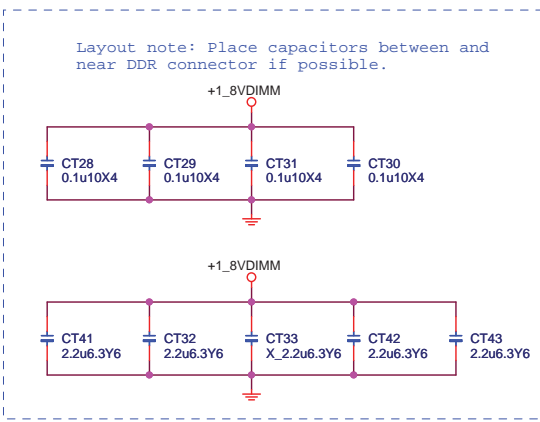


N13-2000220-A10
Bottom

DIMM-200S_black-1



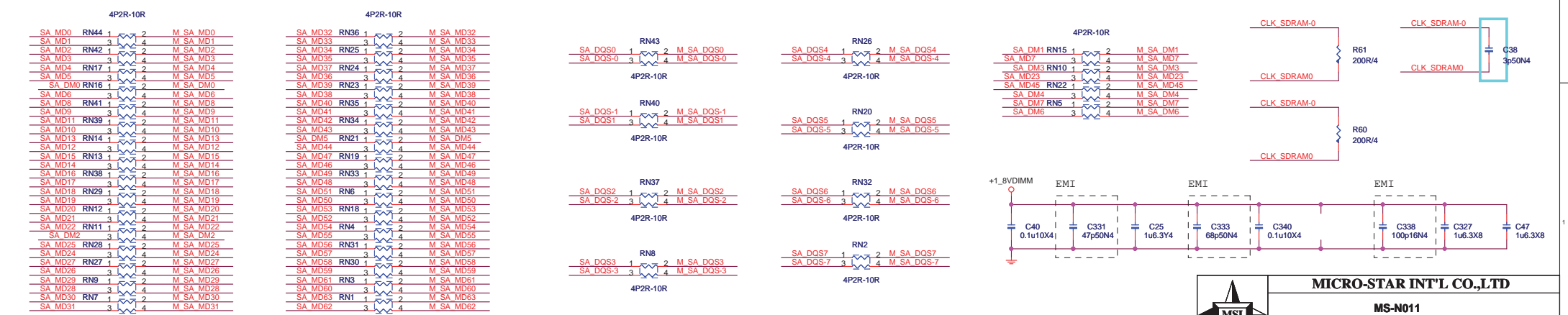
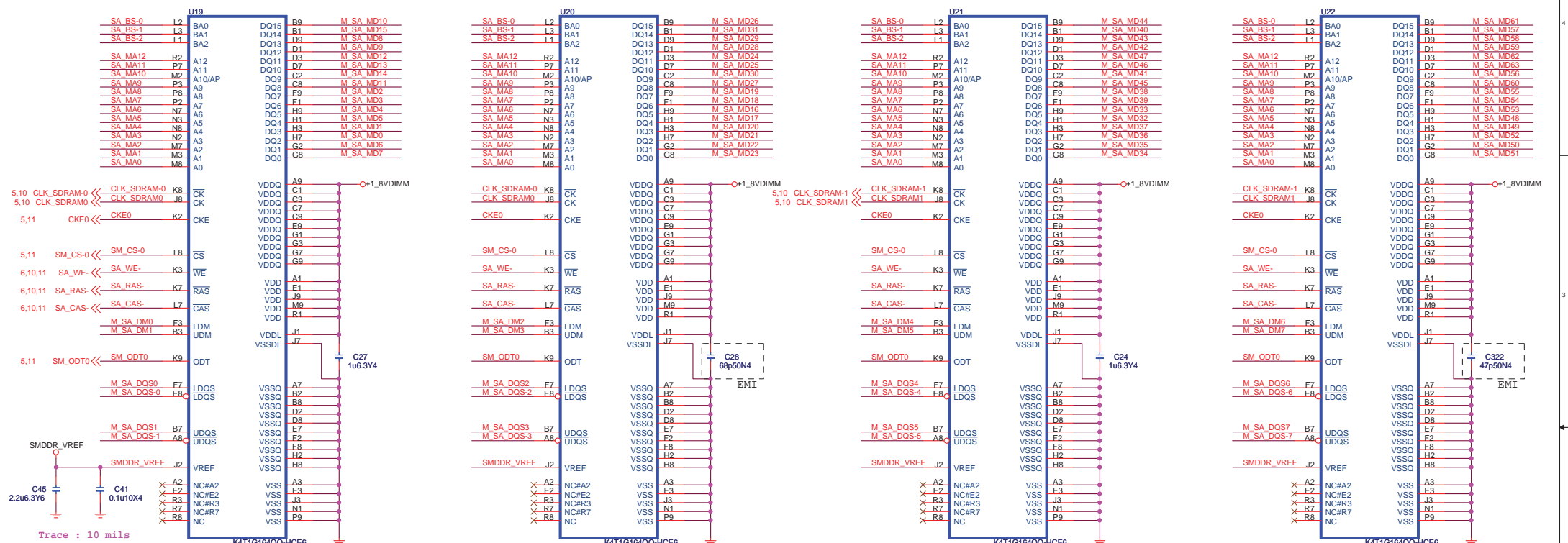
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0xA2



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Size B	Document Description	Rev 1.0
ONBOARD DDR2 memory		
Date: Friday, April 11, 2008	Sheet 8	of 39



M12-K4T1G05-S02
M12-5PS1G25-H23

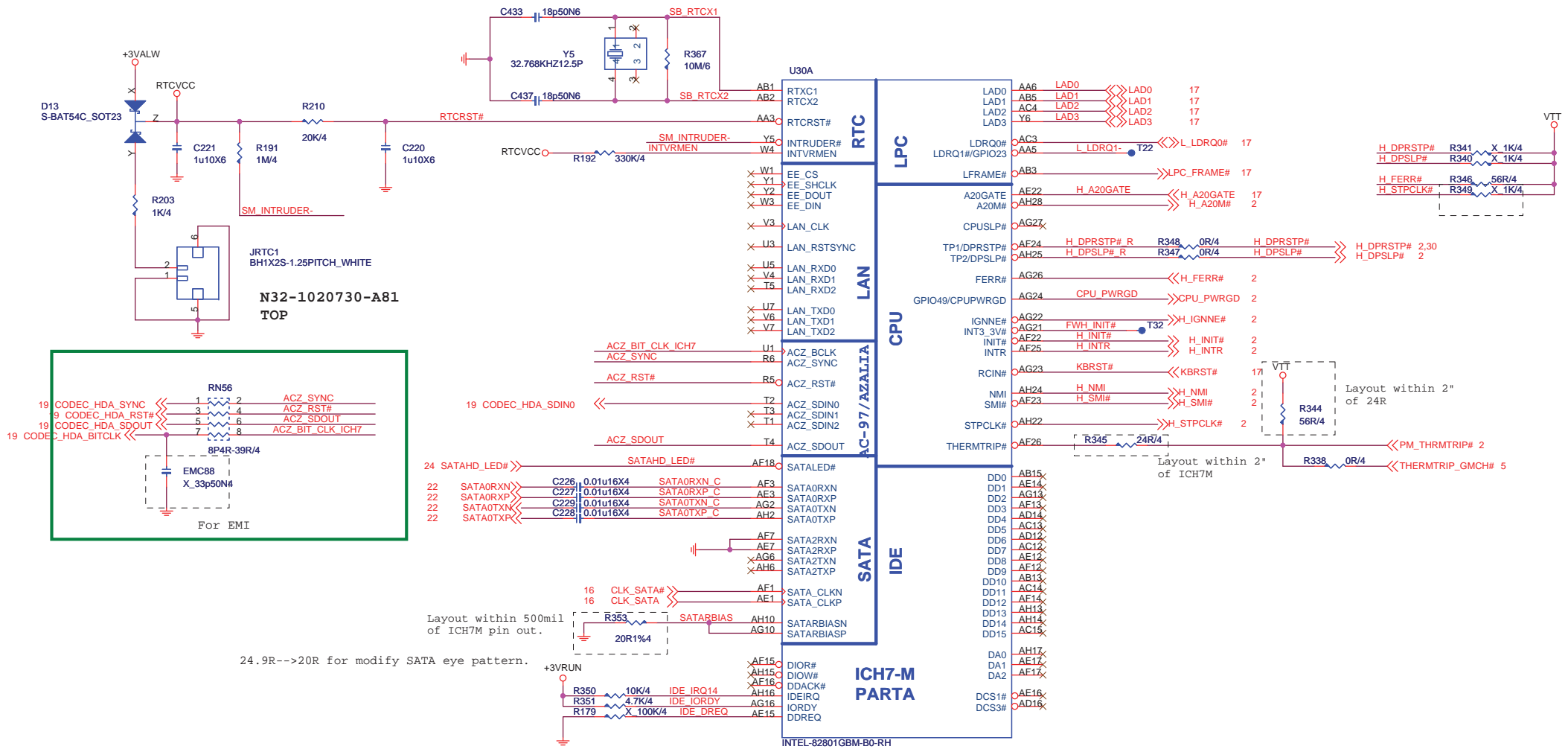


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Size: Custom Document Description: **DDR2 64*16 BGA A** Rev: 1.0

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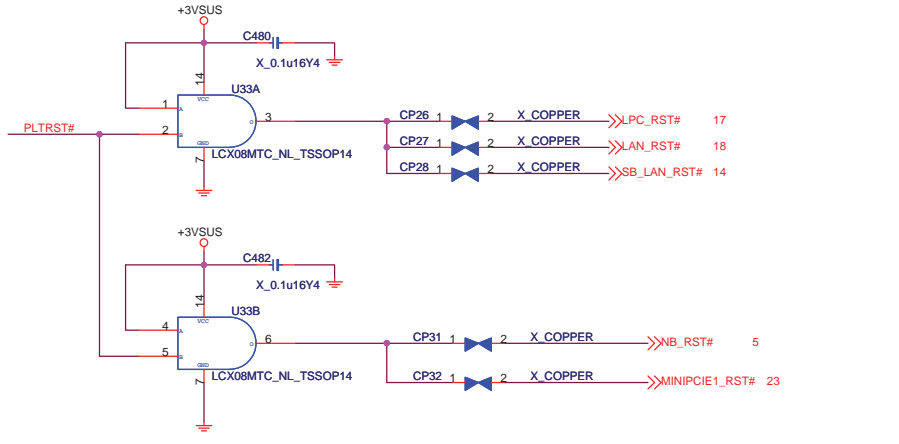
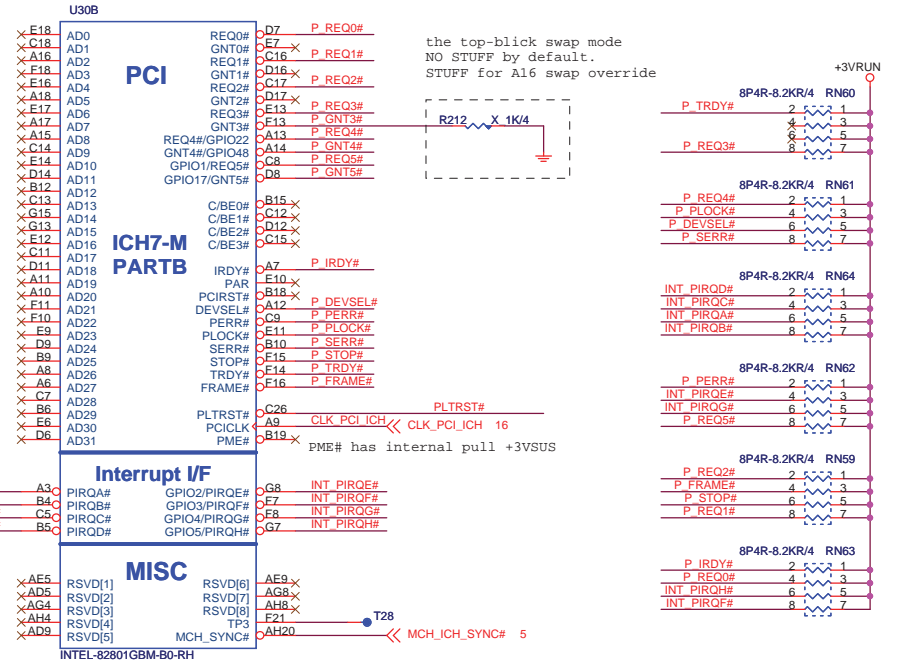
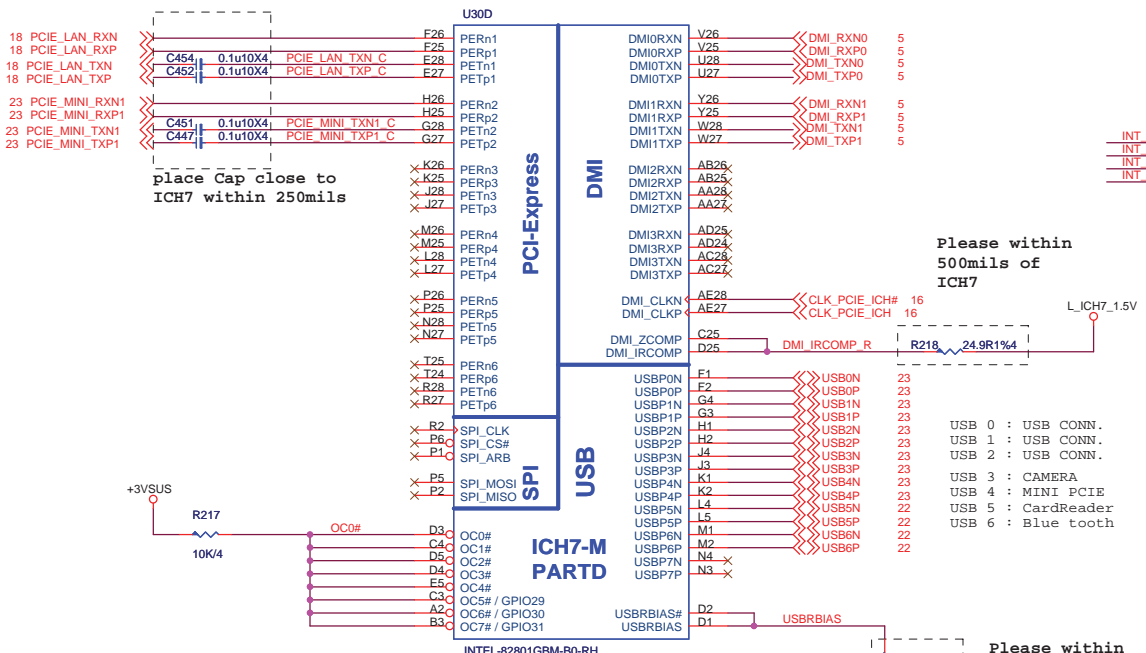
24.9R-->20R for modify SATA eye pattern.

Layout within 500mil of ICH7M pin out.

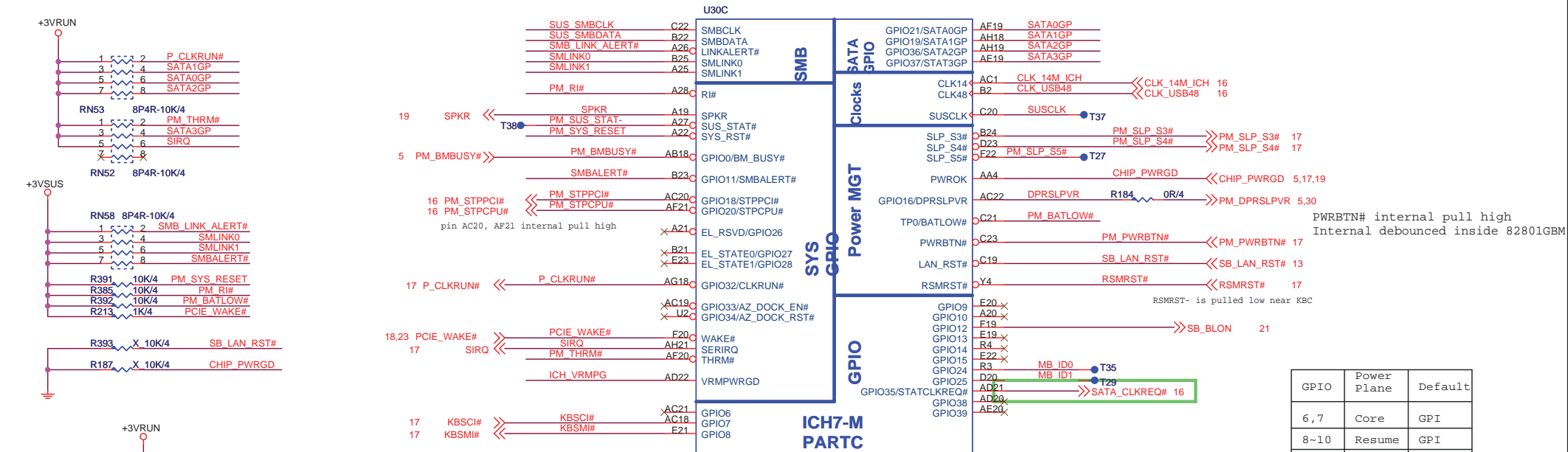


MICRO-STAR INT'L CO.,LTD			
MS-N011			
Size Custom	Document Description ICH7M_CPU, LPC, SATA, HDA		Rev 1.0
Date: Friday, April 11, 2008		Sheet 12 of 39	

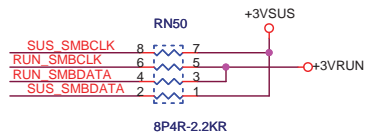
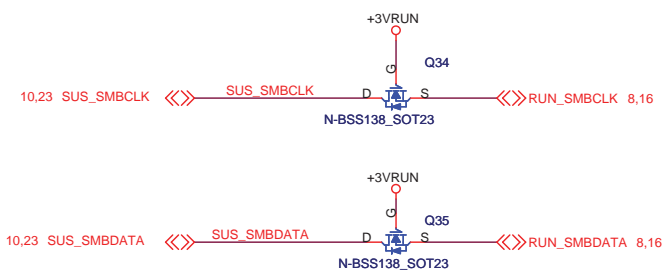
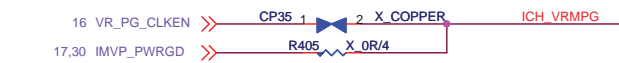
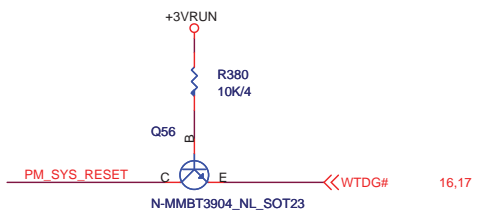
BOOT BIOS SELECT STRAPS			
BOOT DEVICE	STRAPS	GNT5#	GNT4#
FWH(LPC default)	11	UNSTUFF	UNSTUFF
PCI	10	UNSTUFF	STUFF
SPI	01	STUFF	UNSTUFF



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	Size Custom	Document Description ICH7M_PCI, USB, DMI, PCIE	Rev 1.0
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GPIO	Power Plane	Default
6, 7	Core	GPI
8~10	Resume	GPI
12~15	Resume	GPI
24, 25	Resume	GPO
38, 39	Core	GPI

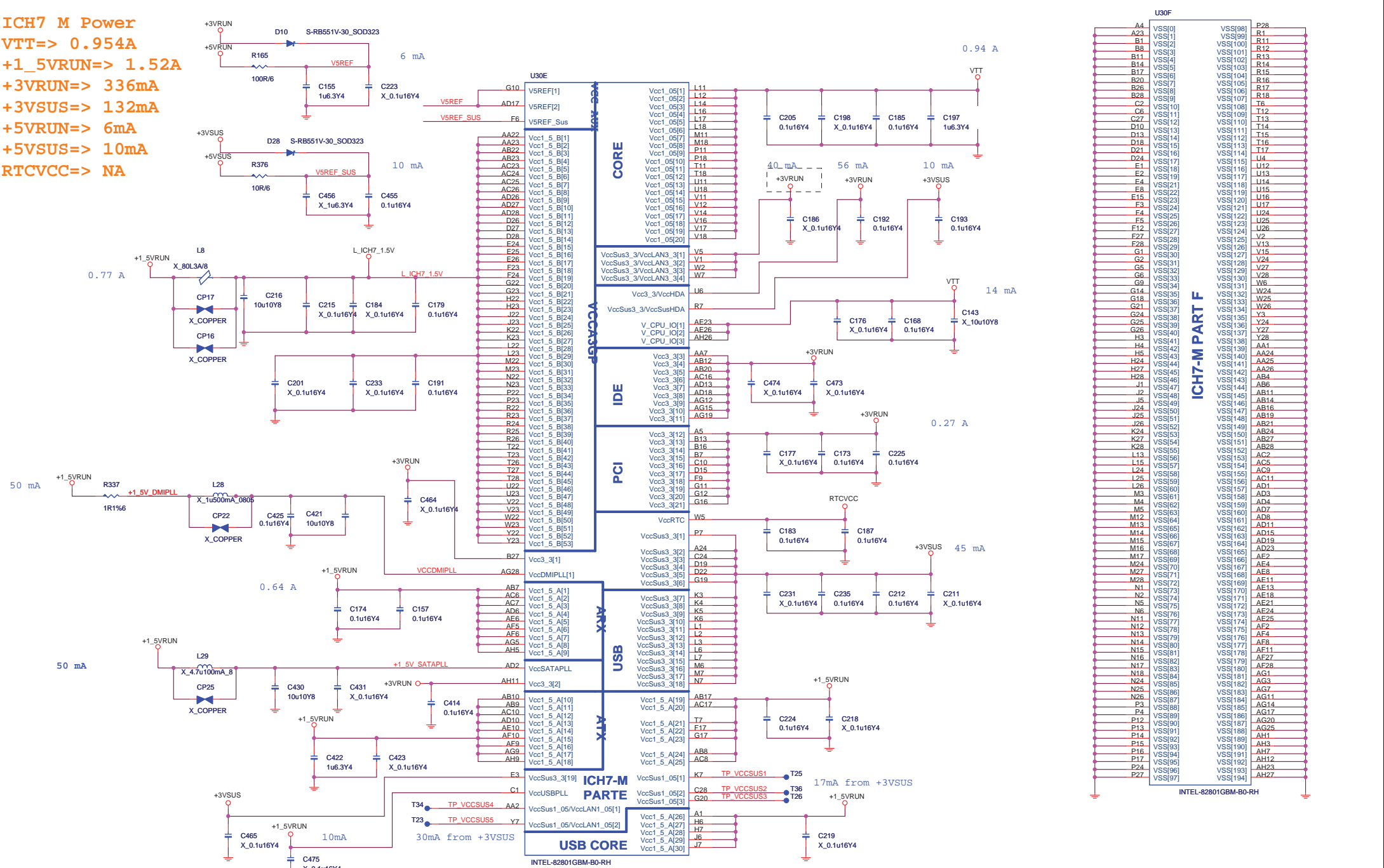


MICRO-STAR INT'L CO.,LTD


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Size Custom	Document Description ICH7M_GPIO, CLK, SM	Rev 1.0
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ICH7 M Power
VTT=> 0.954A
+1_5VRUN=> 1.52A
+3VVRUN=> 336mA
+3VSUS=> 132mA
+5VRUN=> 6mA
+5VSUS=> 10mA
RTCVCC=> NA

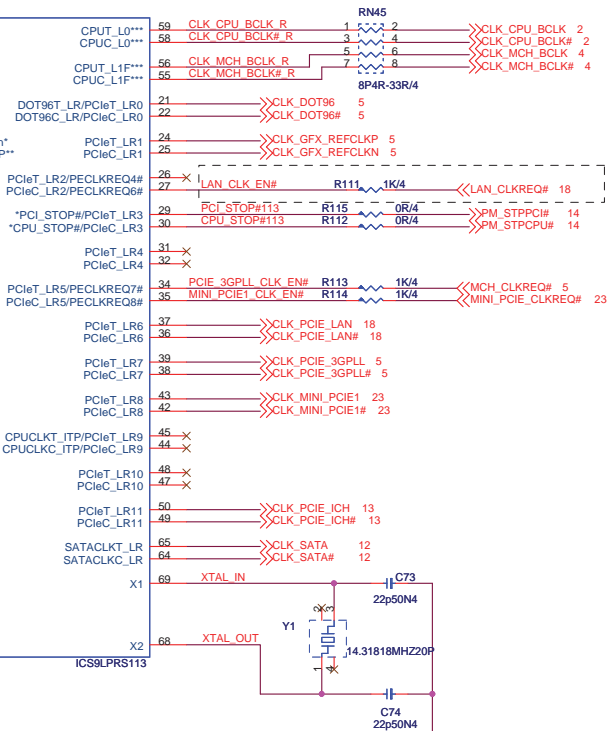
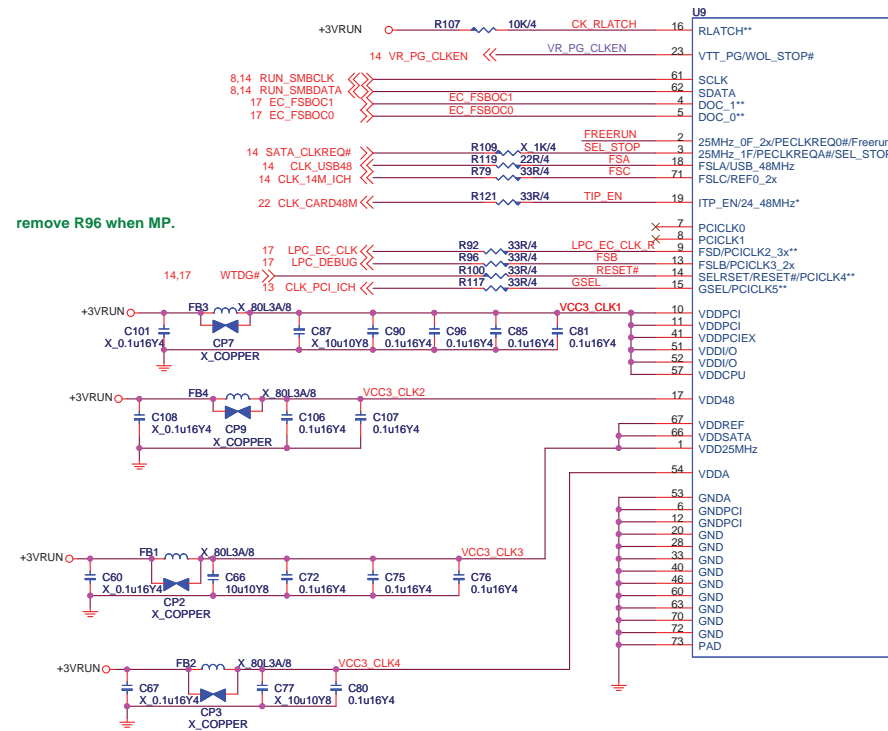


PIN AA2,Y7,K7,C28,G20 : VccSus 1.05V for RTCVCC

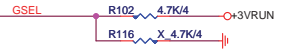
		MICRO-STAR INT'L CO.,LTD	
		MS-N011	
Size Custom	Document Description ICH7M POWER	Rev 1.0	
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CLK Gen ICS9LPRS113

CLOCK GEN STRAPING

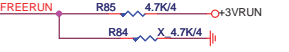


1 => Pin21/22 96MHz
0 => Pin21/22 100MHz

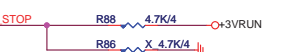


113 TIP_EN=0 => PCIE9, TIP_EN=1 => CPU_ITP

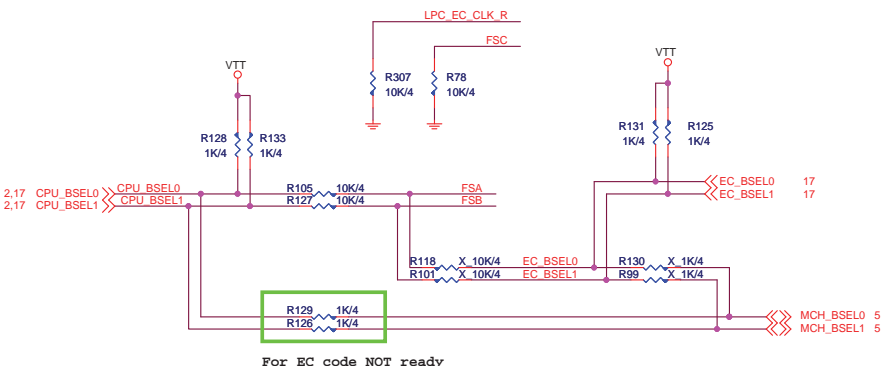
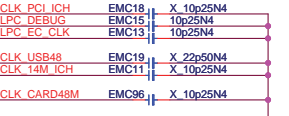
110 TIP_EN=0 => 48MHz, TIP_EN=1 => 24MHz



Selects pin 29/830
1 = PCI_STOP#/CPU_STOP#
0 = PCIE9 CLK output



EMI

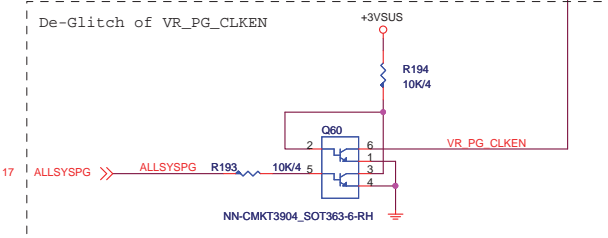


CPU Table

BSEL[2]	BSEL[1]	BSEL[0]	BCLK
L	L	L	100MHZ
L	L	H	133MHZ
L	H	L	RESERVED
L	H	H	166MHZ

CLK Gen 113

BSEL[2]	BSEL[1]	BSEL[0]	BCLK
H	L	H	100MHZ
L	L	H	133MHZ
L	H	L	200MHz
L	H	H	166MHZ



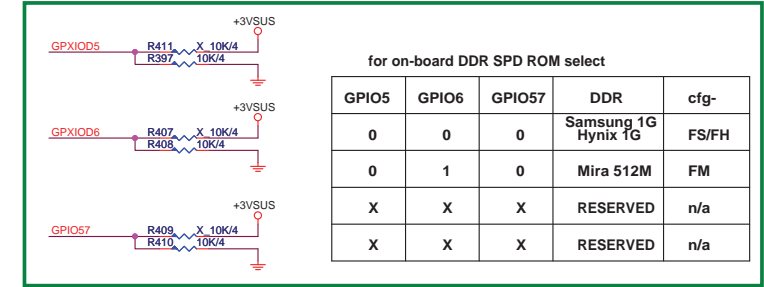
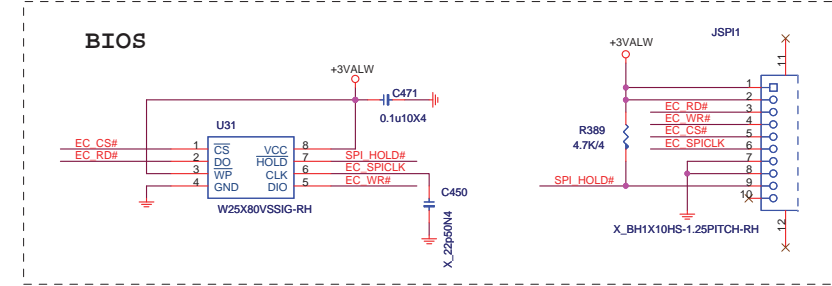
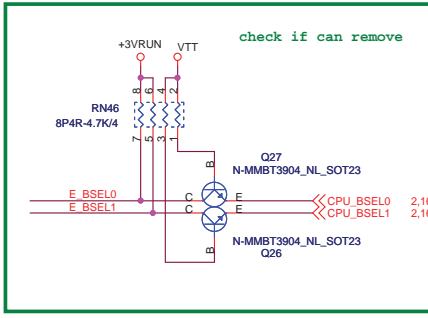
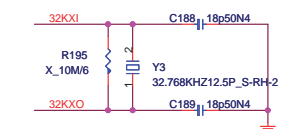
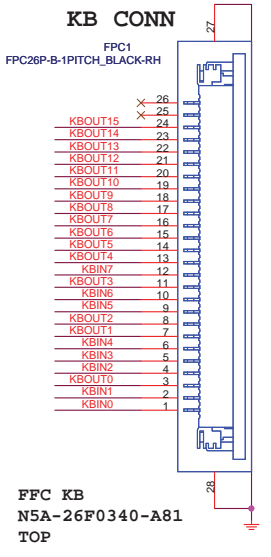
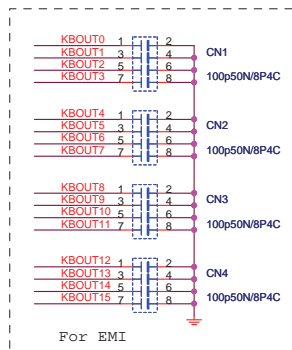
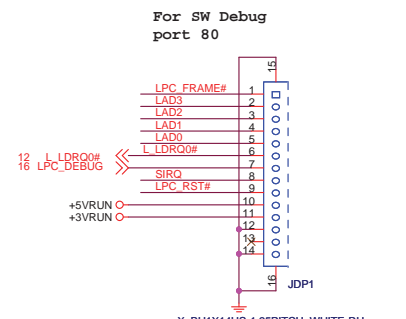
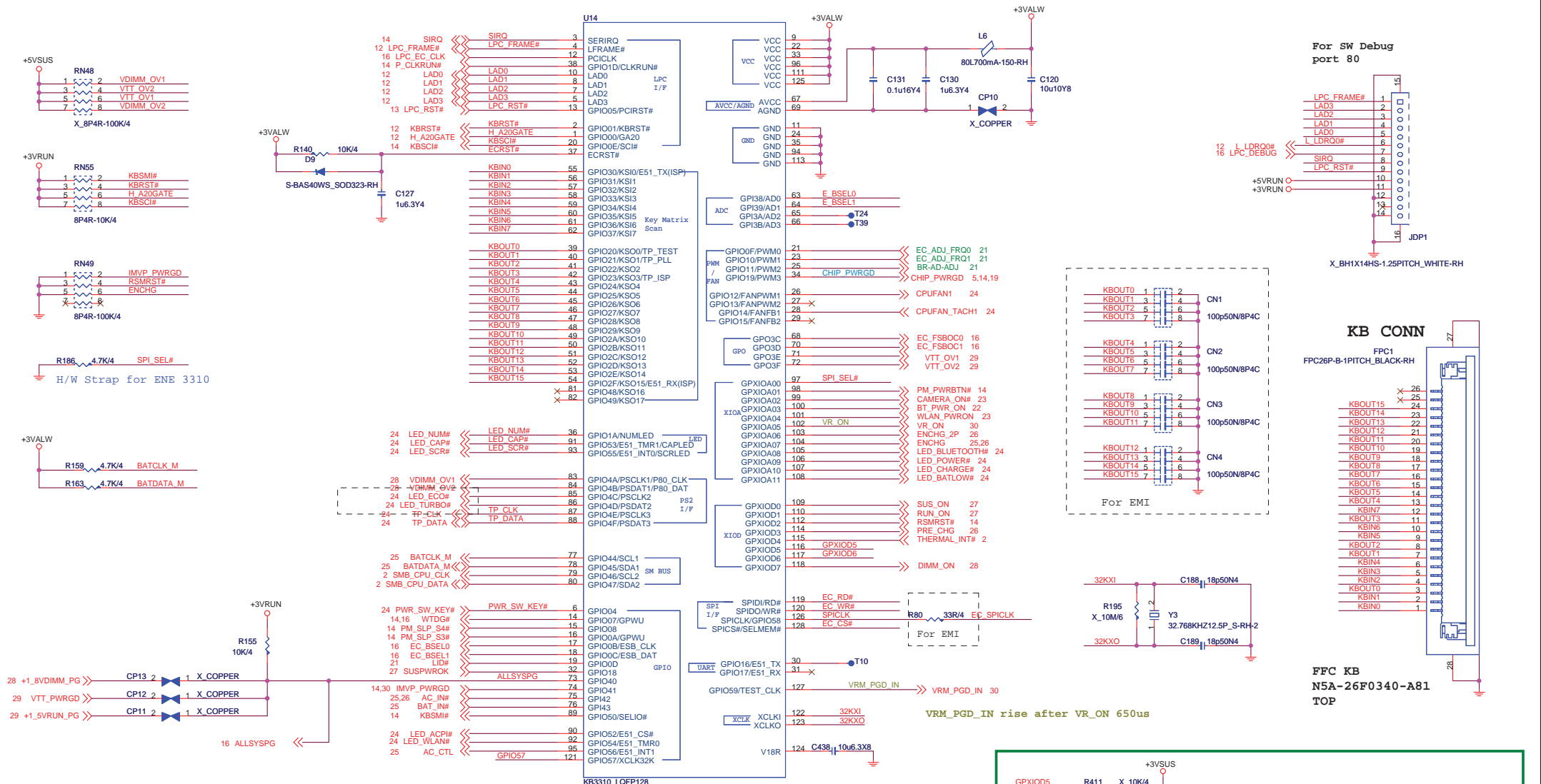
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CLK_GEN_113

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GPIO5	GPIO6	GPIO7	DDR	cfg-
0	0	0	Samsung 1G Hynix 1G	FS/FH
0	1	0	Mira 512M	FM
X	X	X	RESERVED	n/a
X	X	X	RESERVED	n/a

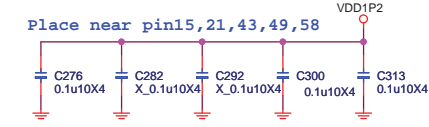
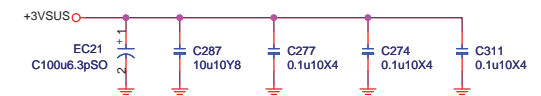
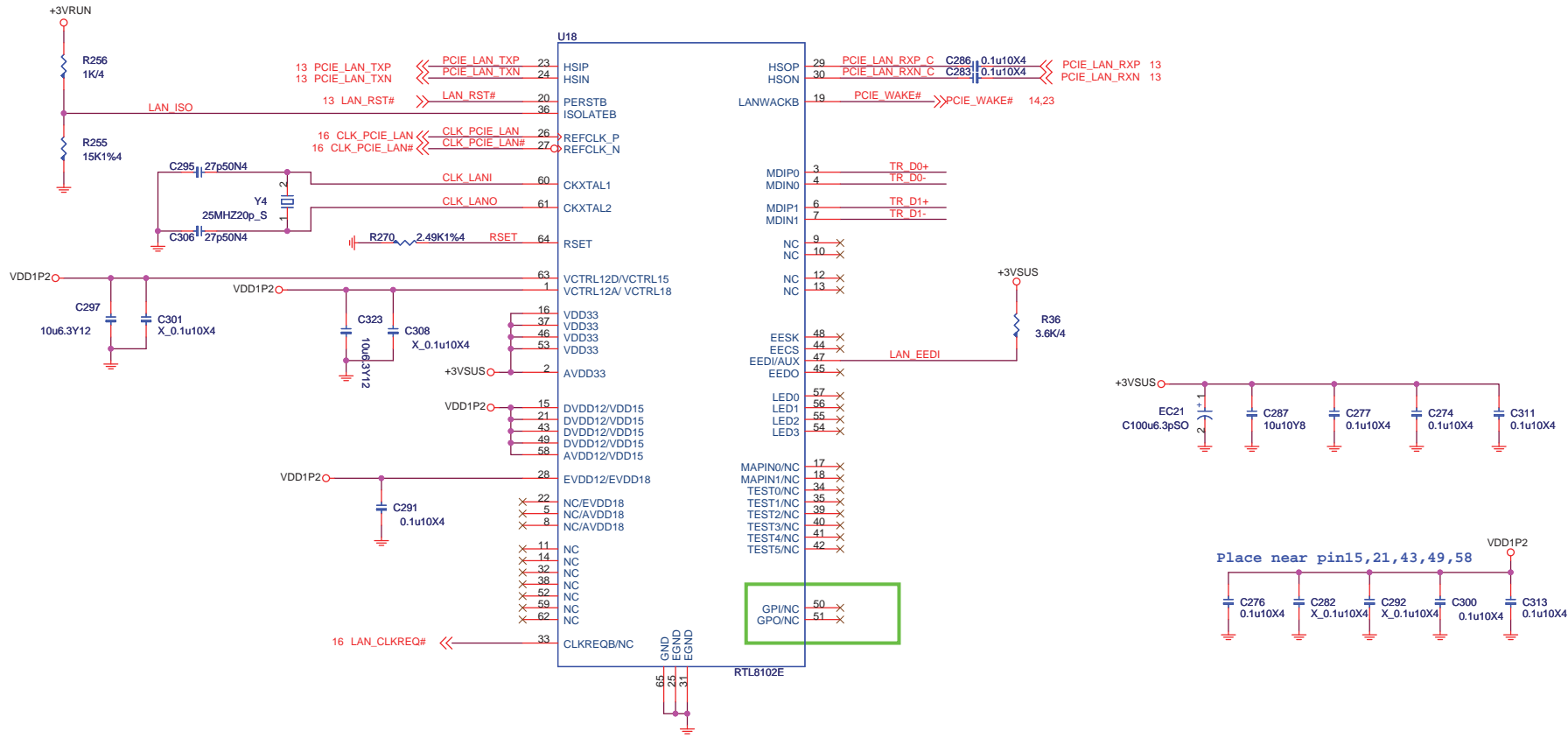
MICRO-STAR INT'L CO.,LTD

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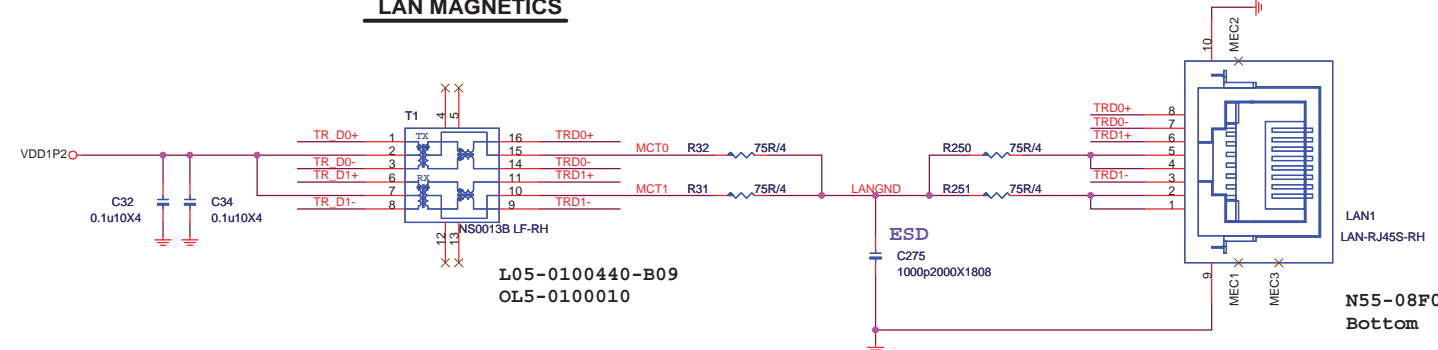
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RTL8102E 10/100M LAN



LAN MAGNETICS

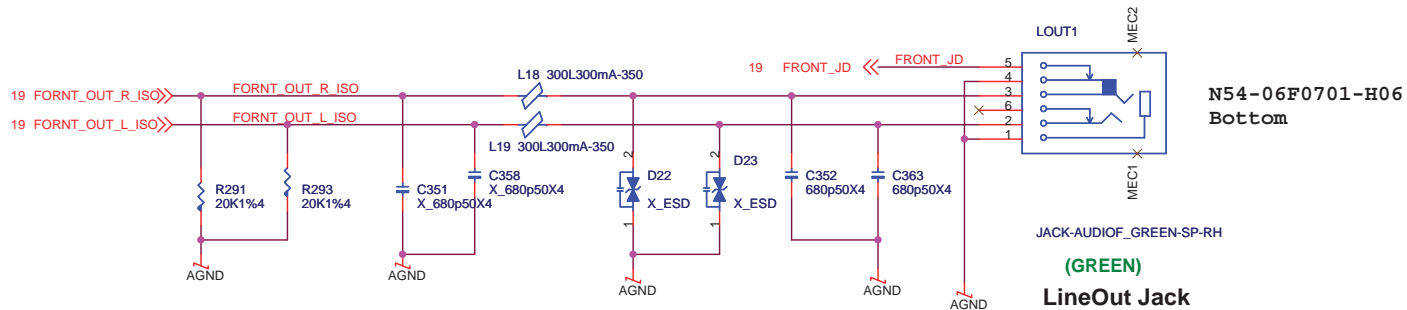
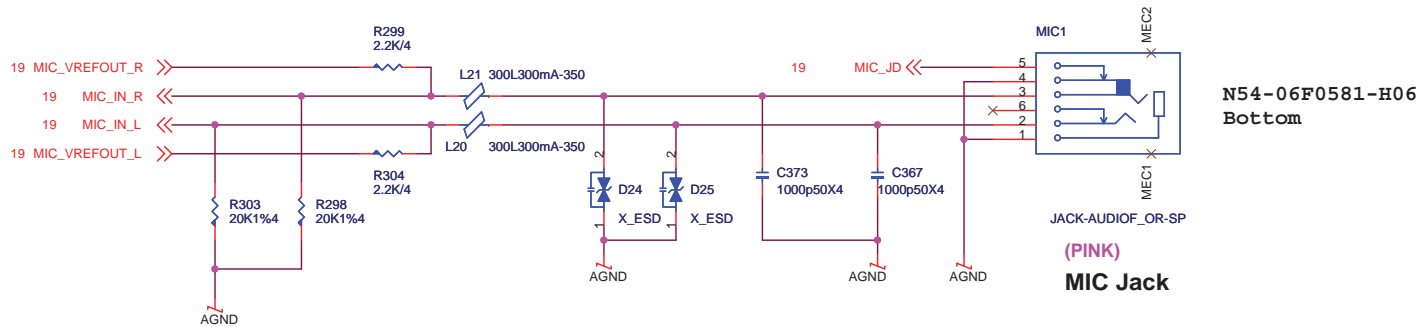
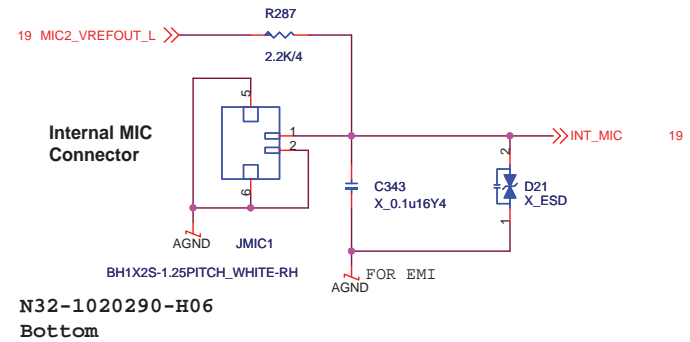
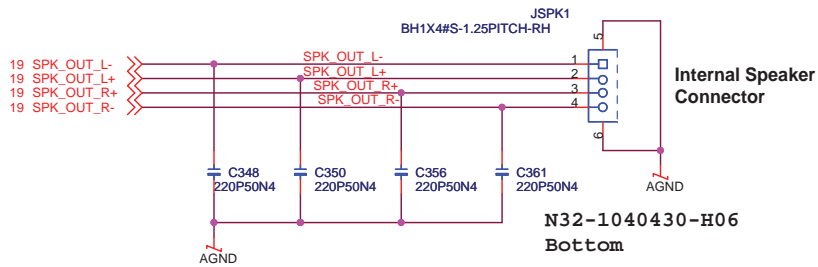


POWER			
BOOT DEVICE	VDD1P2	VDD1P8	VDD33
8101E (378.3mW)	1.5V	1.8V	3.3V
8102E	1.2V	NC	3.3V
365mA			

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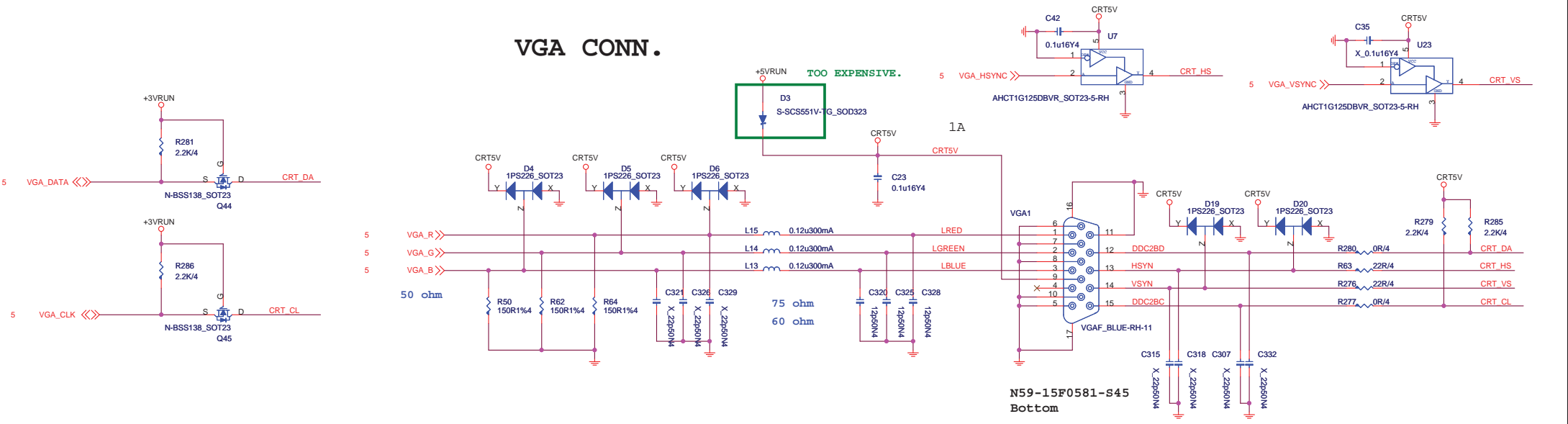
MS-N011

Size A3	Document Description LAN_RTL8102E/8101E	Rev 1.0
Date: Friday, April 11, 2008		Sheet 18 of 39



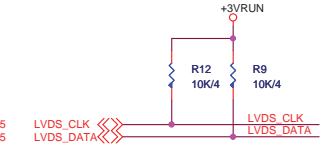
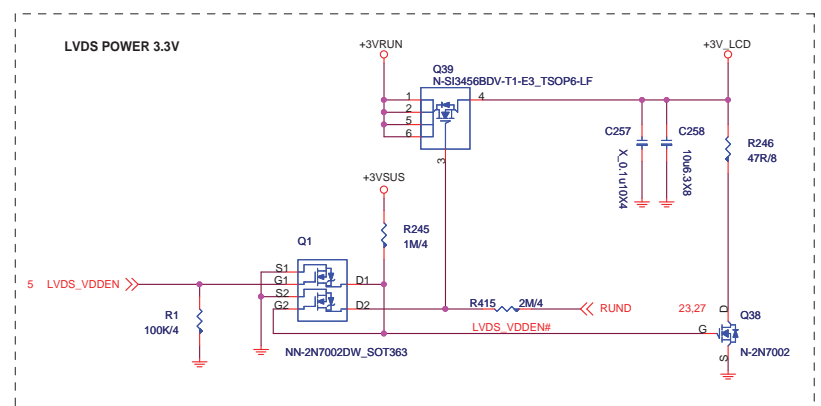
MSI			
MICRO-STAR INT'L CO.,LTD			
MS-N011			
Size Custom	Document Description Audio JACKS		Rev 1.0
Date: Friday, April 11, 2008		Sheet 20	of 39

VGA CONN.

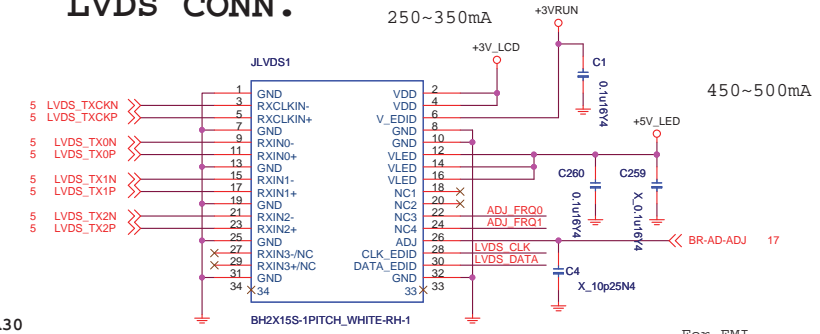


N59-15F0581-S45
Bottom

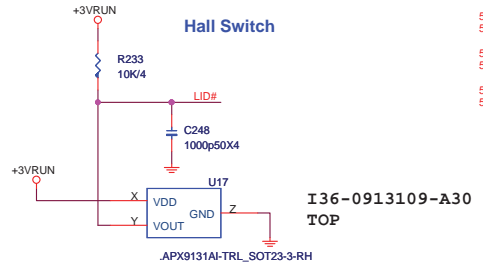
LVDS POWER 3.3V



LVDS CONN.



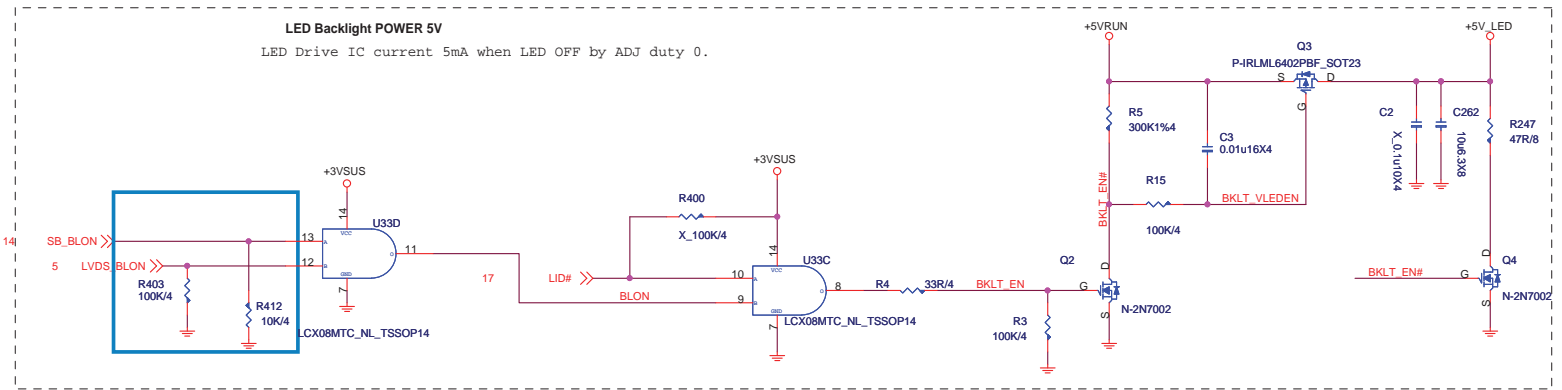
N5Q-30F0030-H21
Bottom



I36-0913109-A30
TOP

LED Backlight POWER 5V

LED Drive IC current 5mA when LED OFF by ADJ duty 0.



LVDS_TXCKN	R13	200R/4	LVDS_TXCKP
LVDS_TX0N	R11	200R/4	LVDS_TX0P
LVDS_TX1N	R14	200R/4	LVDS_TX1P
LVDS_TX2N	R10	200R/4	LVDS_TX2P

ADJ_FRQ0	R8	10K/4	EC_ADJ_FRQ0	17
ADJ_FRQ1	R7	10K/4	EC_ADJ_FRQ1	17

EC_ADJ_FRQ0	EC_ADJ_FRQ1	Vendor	Adj Freq
0	0	CPT/HannStar	20KHZ
0	1	INNOLUX	300Hz
1	0	Reserve	Reserve
1	1	Reserve	Reserve

MSI

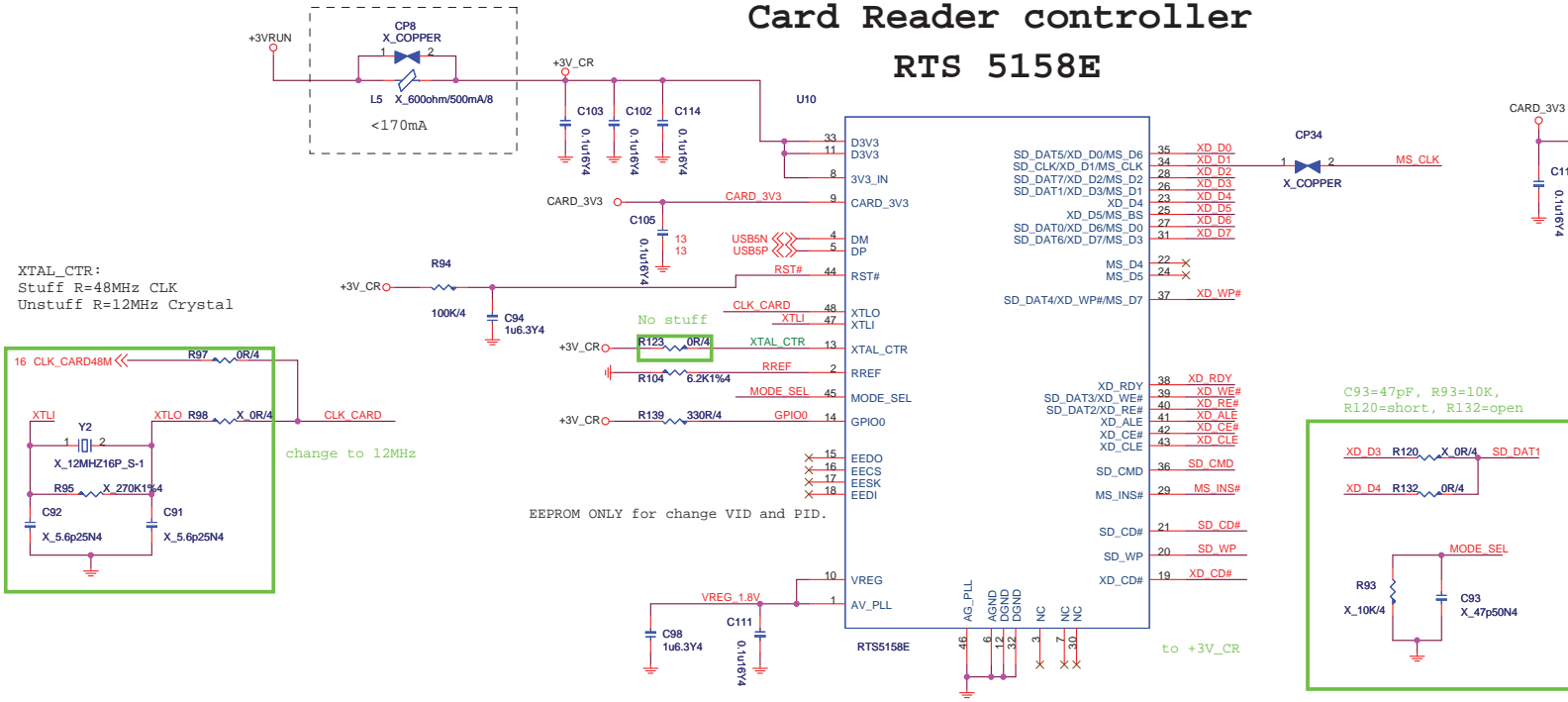
MICRO-STAR INT'L CO.,LTD

MS-N011

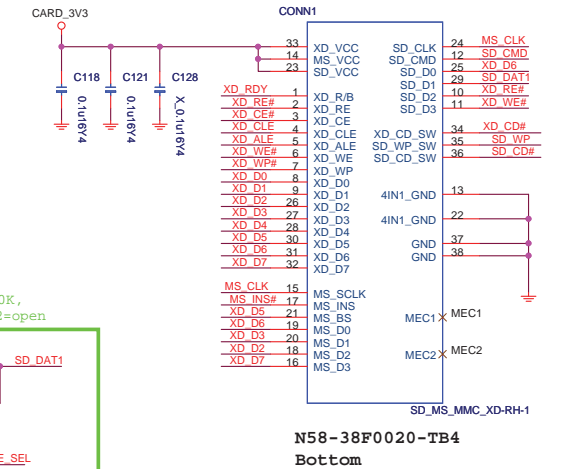
Size Custom | Document Description CRT, LVDS CONN | Rev 1.0

Date: Friday, April 11, 2008 | Sheet 21 of 39

Card Reader controller RTS 5158E



Flash Card Socket

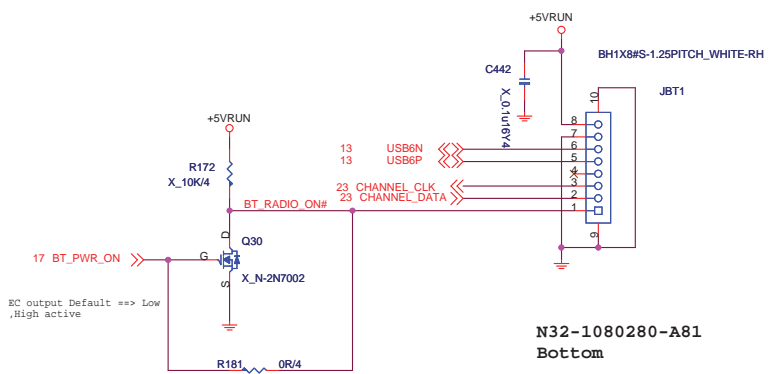


Media I/F (Chip)	SD Card	Memory Stick	xD Card
XD_RDY	X	X	XD_R/B
XD_RE#/SD_DAT2	SD_D2	X	XD_RE
XD_CE#	X	X	XD_CE
XD_CLE	X	X	XD_CLE
XD_ALE	X	X	XD_ALE
XD_WE#/SD_DAT3	SD_D3	X	XD_WE
XD_WP#/SD_DAT4/MS_D7	X	X	XD_WP
XD_D0/SD_DAT0/MS_D6	X	X	XD_D0
XD_D1/SD_CLK/MS_CLK	SD_CLK	MS_CLK	XD_D1
XD_D2/SD_DAT7/MS_D2	X	MS_D2	XD_D2
XD_D3/SD_DAT1/MS_D1	SD_D1	MS_D1	XD_D3
XD_D4	X	X	XD_D4
XD_D5/MS_BS	X	MS_BS	XD_D5
XD_D6/SD_DAT0/MS_D0	SD_D0	MS_D0	XD_D6
XD_D7/SD_DAT6/MS_D3	X	MS_D3	XD_D7
XD_CD#	X	X	XD_CD_SW
SD_CMD	SD_CMD	X	X
SD_CD#	SD_CD_SW	X	X
SD_WP	SD_WP_SW	X	X
MS_INS#	X	MS_INS	X
MS_D4	X	X	X
MS_D5	X	X	X

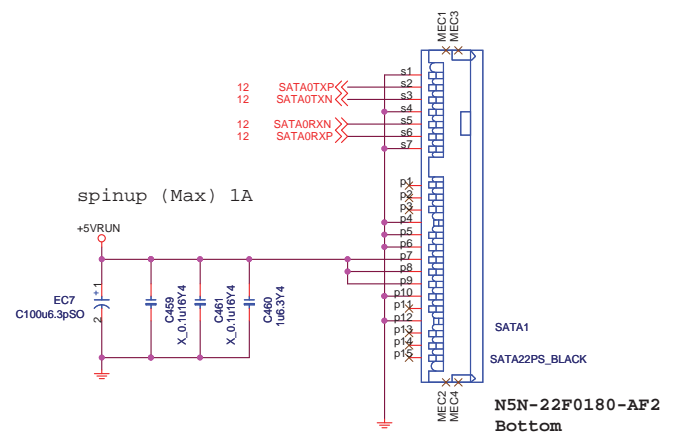
SATA HDD

SATA, 2.5 inch, 80GB, 5400RPM
 WD S71-2408505-W36
 Fujitsu S71-2408511-F06
 Toshiba S71-2408517-T14

BLUETOOTH



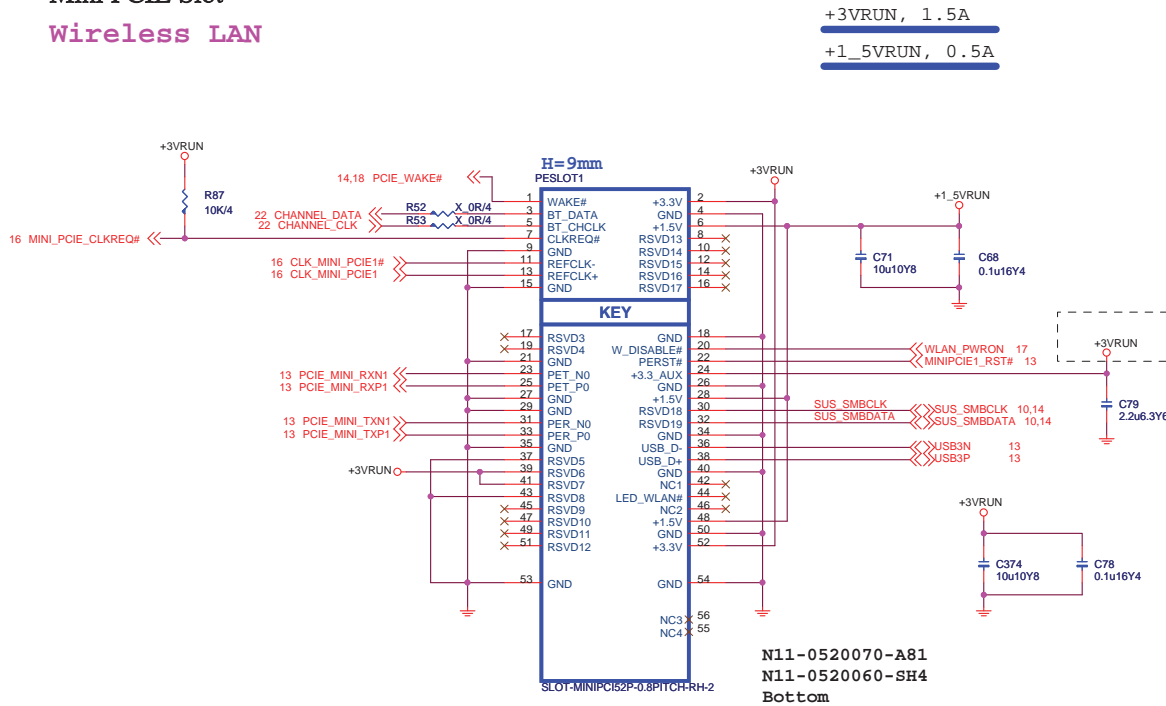
SATA HDD CONN



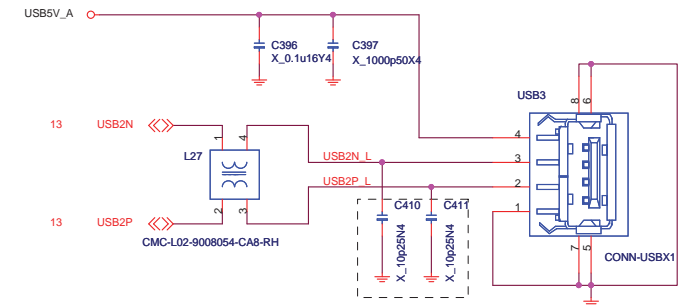
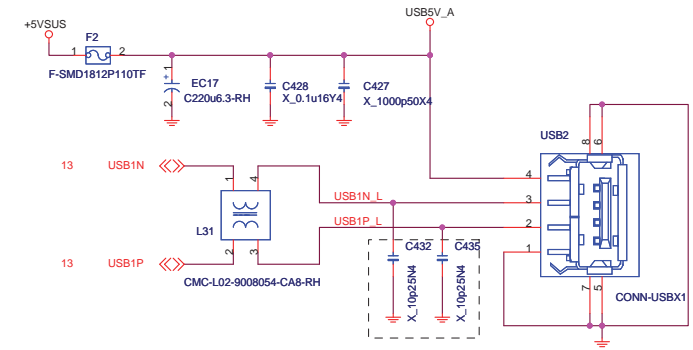
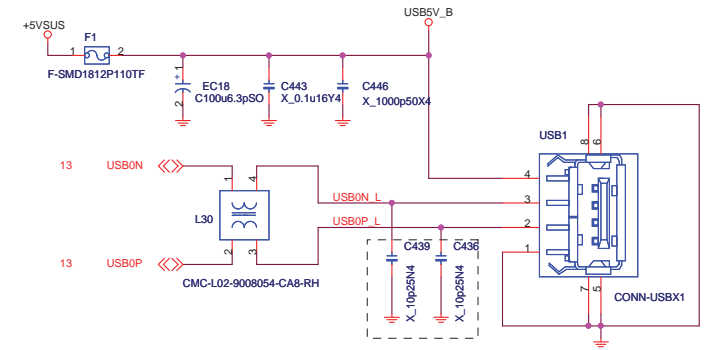
MICRO-STAR INT'L CO.,LTD
MS-N011
 Size Custom | Document Description **CardReader RTS5158E/ BT/ SATA HDD** | Rev 1.0
 Date: Friday, April 11, 2008 | Sheet 22 of 39

Mini PCIE Slot

Wireless LAN

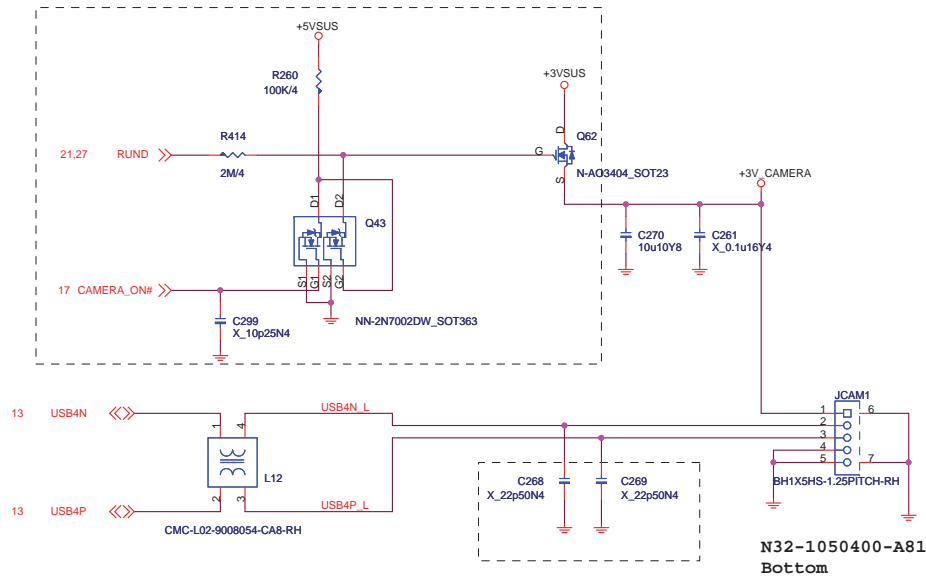


USB CONN

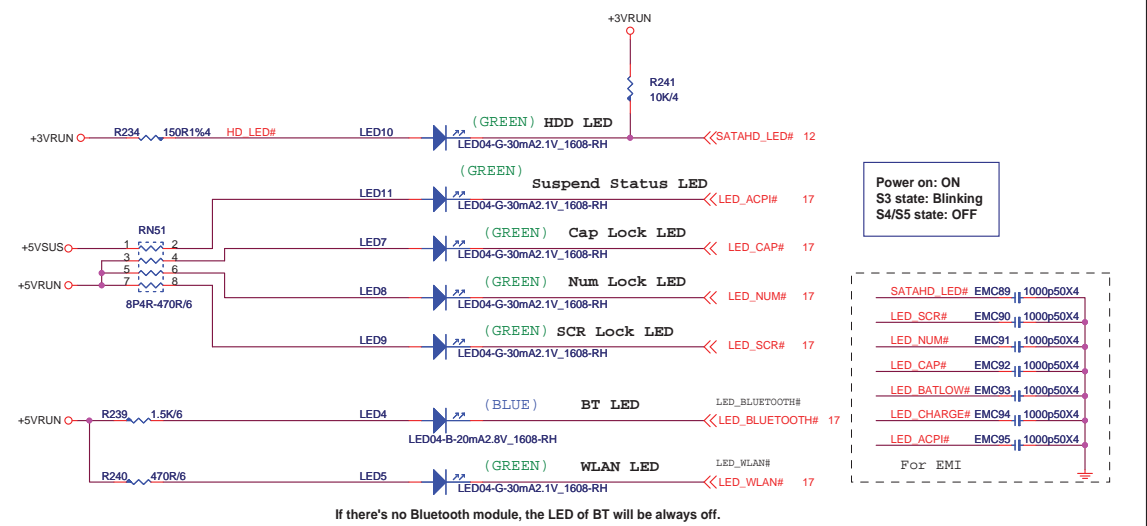
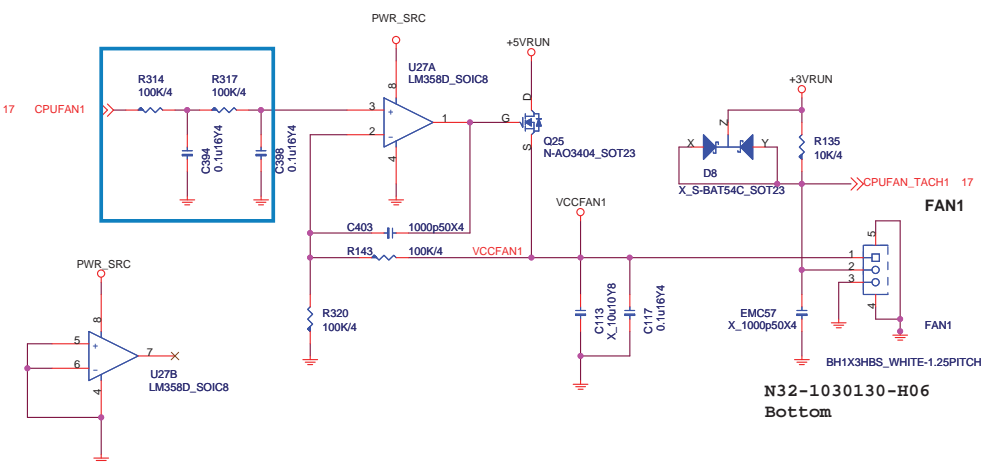


DOG-25B0600-R02
DIS EMI/ESD PROTECTOR, RAYCHEM/PESD0402-060, 6V, 0.25pF,
, SMD-1.0x0.5x0.38mm, ESD PROTECTOR, RoHS (EU EXEMPTION)

CAMERA



MICRO-STAR INT'L CO.,LTD			
MS-N011			
Size	Document Description	Rev	
Custom	Mini PCIE, CAMERA, USB CONN	1.0	
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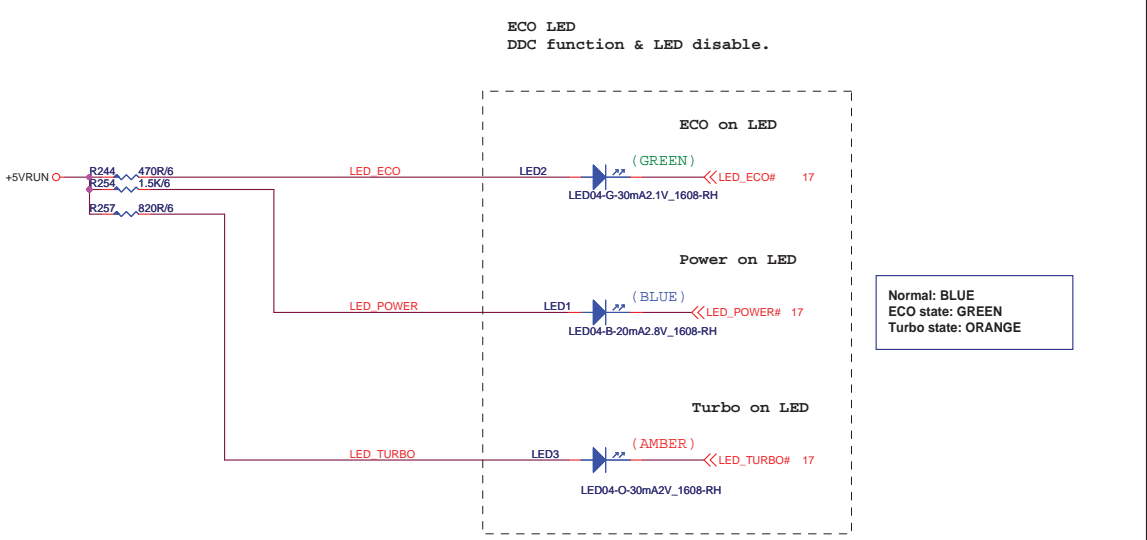
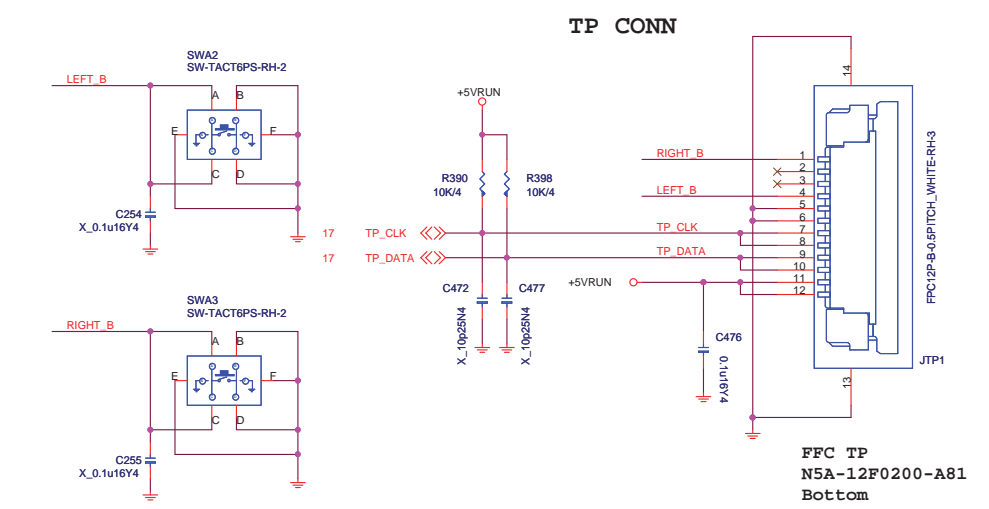
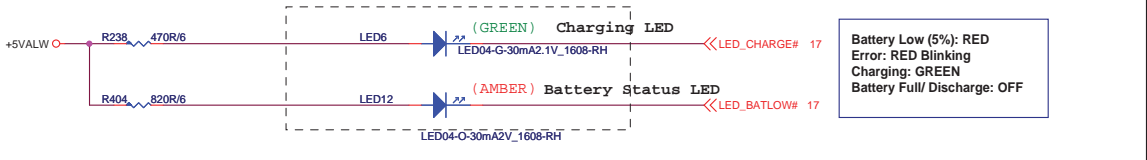
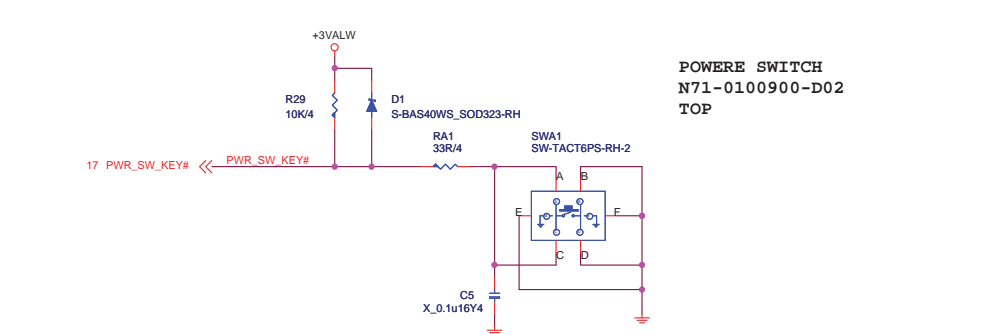


Power on: ON
S3 state: Blinking
S4/S5 state: OFF

- SATAHD_LED# EMC89 1000p50X4
 - LED_SCR# EMC90 1000p50X4
 - LED_NUM# EMC91 1000p50X4
 - LED_CAP# EMC92 1000p50X4
 - LED_BATLOW# EMC93 1000p50X4
 - LED_CHARGE# EMC94 1000p50X4
 - LED_ACPI# EMC95 1000p50X4
- For EMI

If there's no Bluetooth module, the LED of BT will be always off.

Battery Low (5%): RED
Error: RED Blinking
Charging: GREEN
Battery Full/ Discharge: OFF

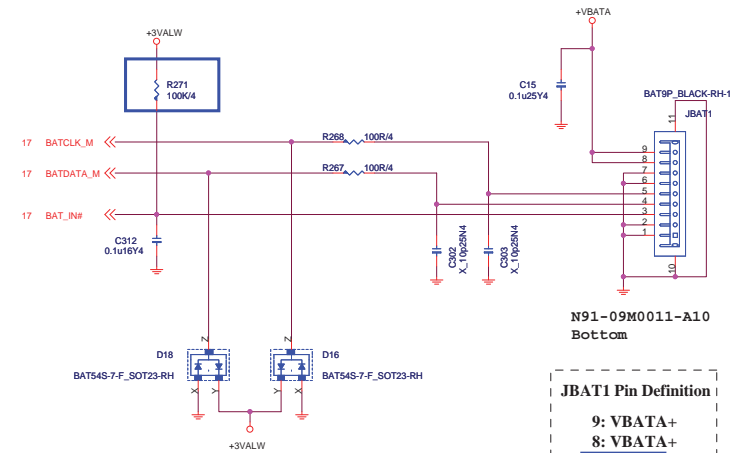
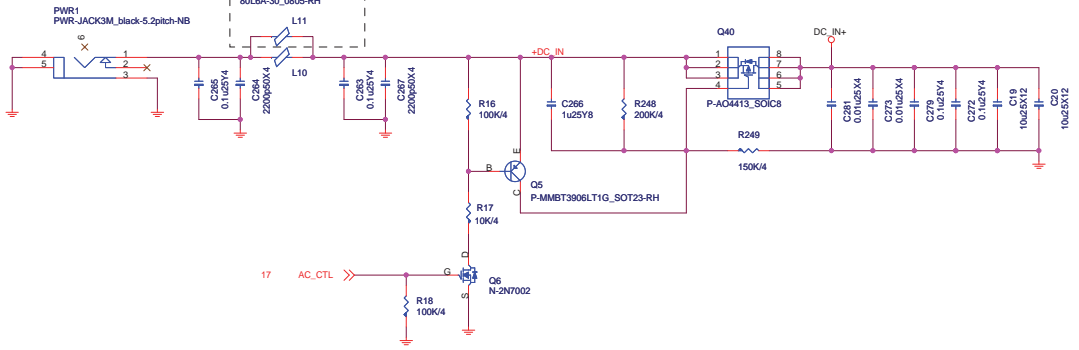


Normal: BLUE
ECO state: GREEN
Turbo state: ORANGE

DOC-0400700-L05 (OLD) --->470R
DOC-0409200-L05 (NEW) --->330R

MICRO-STAR INT'L CO.,LTD			
MS-N011			
Size Custom	Document Description FAN, LED & SW		Rev 1.0
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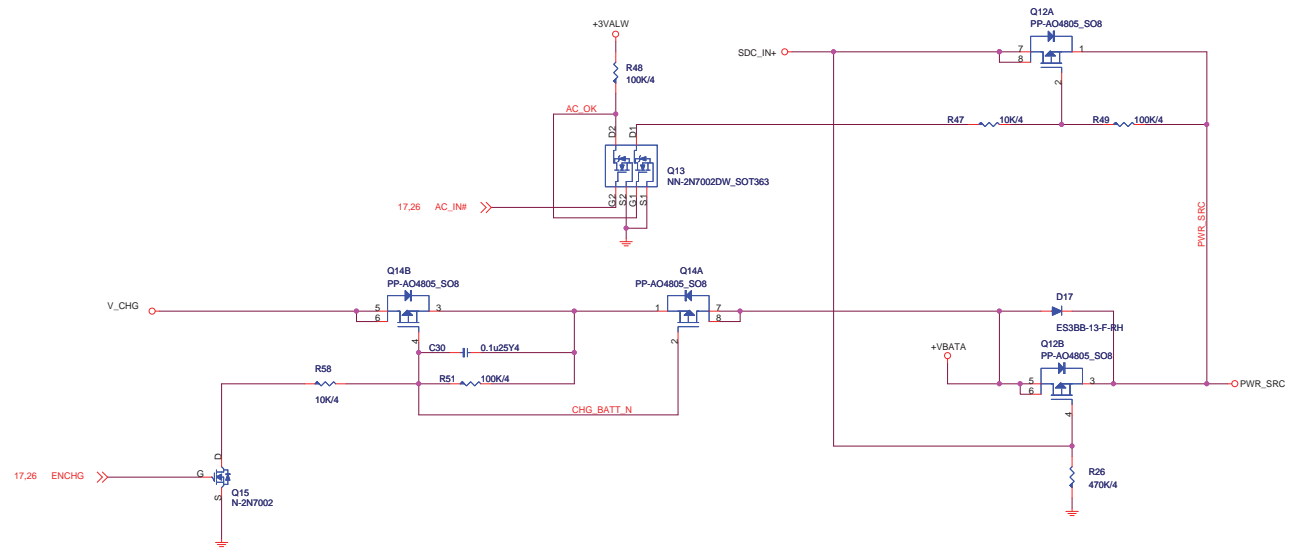
N92-03M0131-A10
N92-03M0131-H06
Bottom



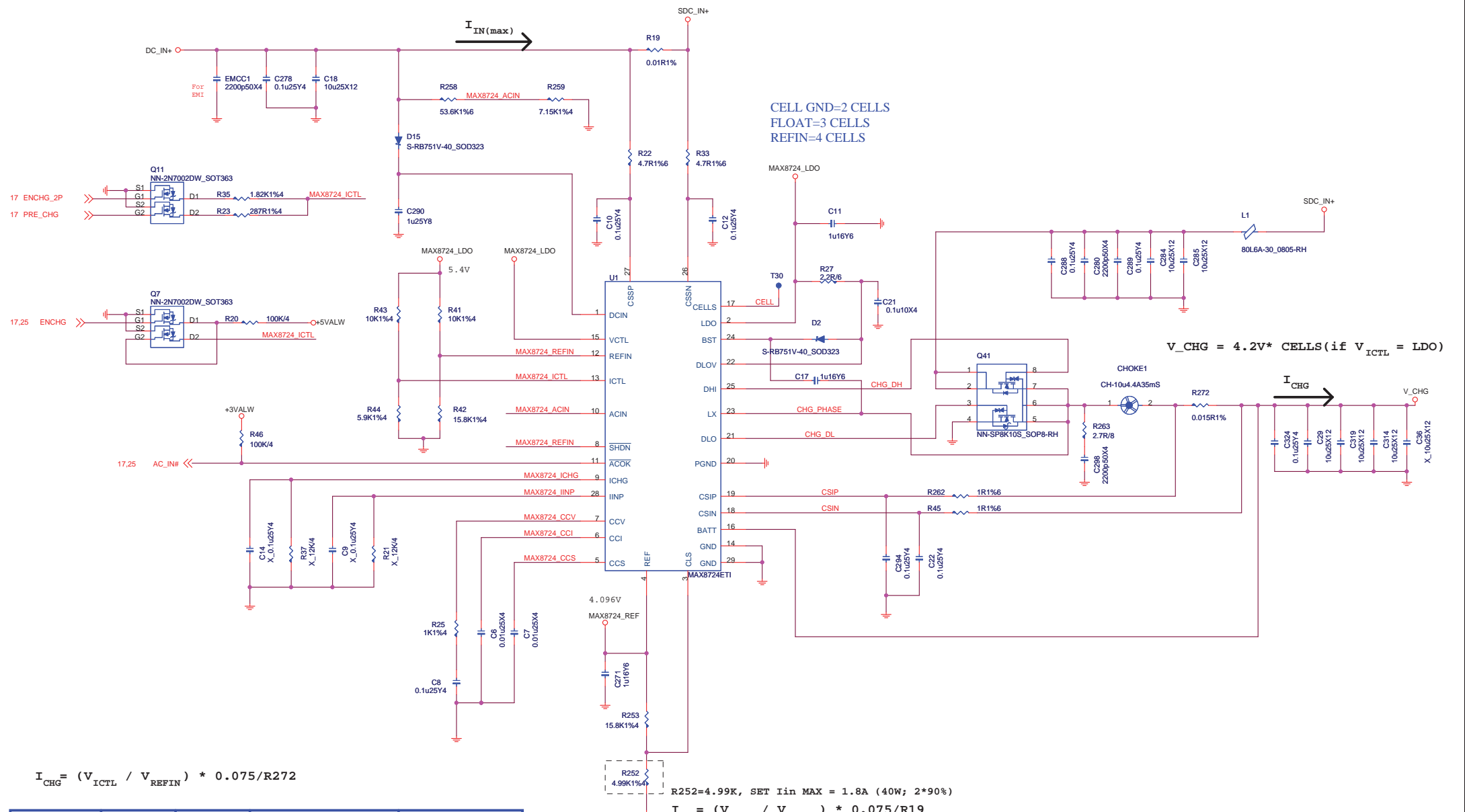
N91-09M0011-A10
Bottom

JBAT1 Pin Definition

- 9: VBATA+
- 8: VBATA+
- 7: NC
- 6: NC
- 5: SMBCLK
- 4: SMBDATA
- 3: BAT_IN#
- 2: GND
- 1: GND



Adapter= 40 W
 Adapter input voltage set 20 Voltage 2 Amps



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

V_CHG = 4.2V* CELLS (if V_ICTL = LDO)

$$I_{CHG} = (V_{ICTL} / V_{REFIN}) * 0.075 / R272$$

$$I_{IN} = (V_{CLS} / V_{REF}) * 0.075 / R19$$

ENCHG-2P	PRE_CHG	ENCHG	charge status	charge current
0	1	1	Pre-charge	220 mA
1	0	1	3S-Fast charge	1.0 A
0	0	1	3S2P-Fast charge	3A
X	X	0	STOP CHARGE	0

3S battery max charge current 1540mA, 0.7C=>1000mA

MICRO-STAR INT'L CO.,LTD

MS-N011

Size Custom Document Description Rev 1.0
 Battery Charger

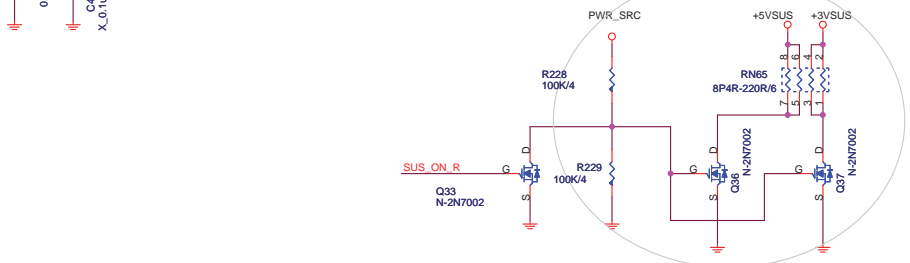
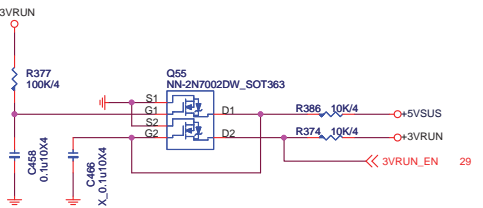
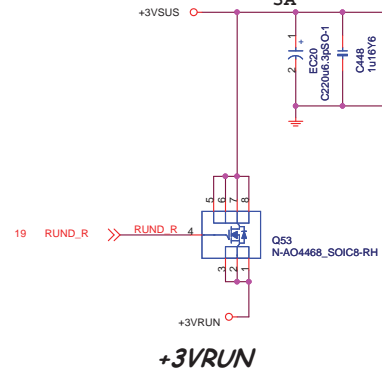
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0.747A
 ICH7M : 132mA ;
 PCIE LAN: 365mA ;
 MINI PCIE +3VRUN: 250mA ;

2.188A
 945GMS +3VRUN : 40mA ;
 ICH7M +3VRUN : 336mA ;
 ICH7M +2_5VRUN : 142mA ;
 MINI PCIE +3VRUN: 1250mA ;
 CLOCK Gen: 200mA ;
 CardReader: 170mA ;
 Audio 888S: 50mA ;
 CAMERA: ??mA ;

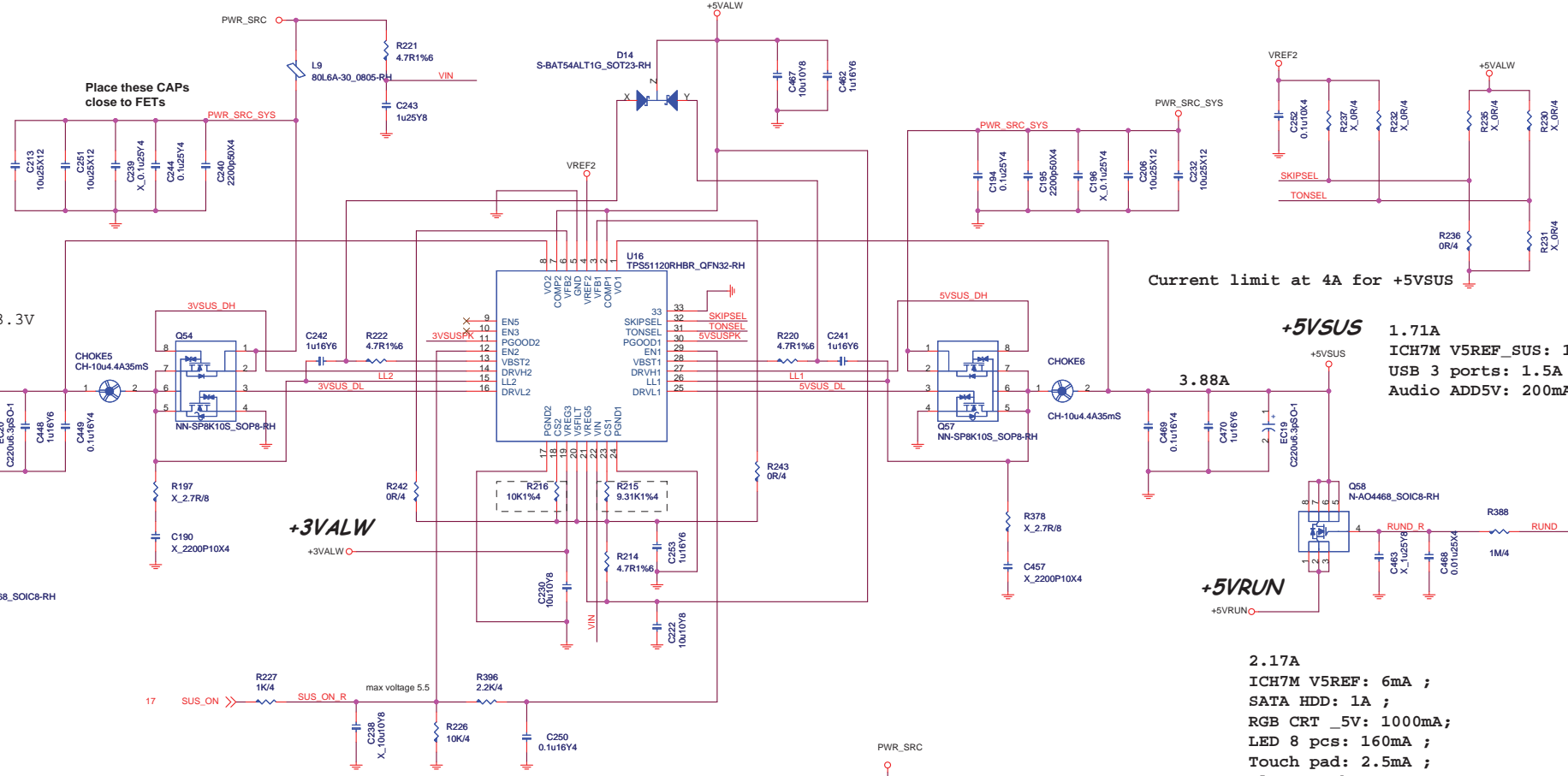
Current limit at 4A for +3.3V

+3VSUS



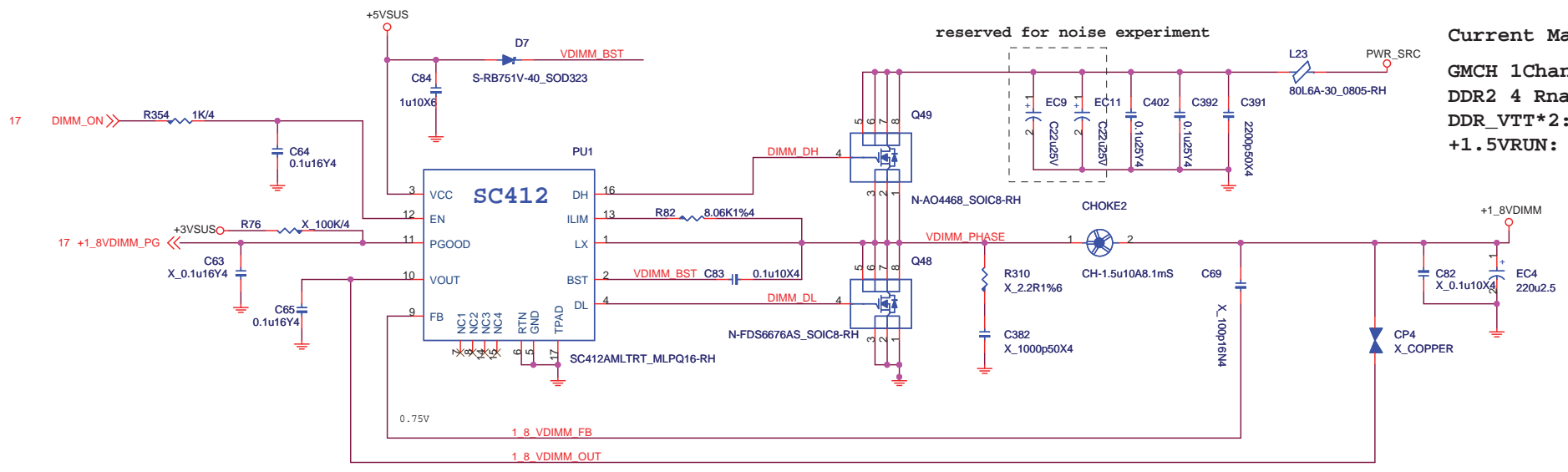
NEXT VERSION CHANGE TO TI/TPS51125 FOR COST DOWN

+5VALW

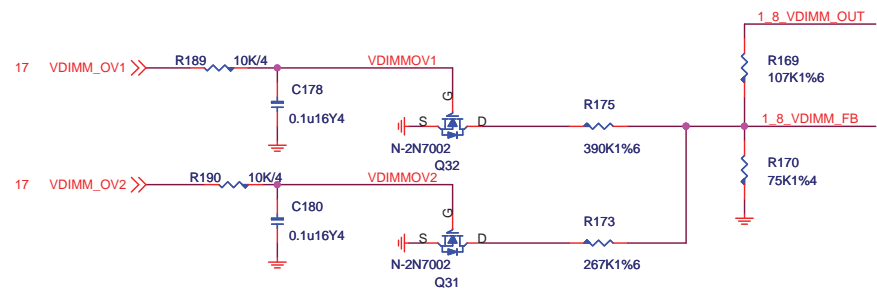


+1_8VDIMM

Current Max at 10.3A
 GMCH 1Channel: 1720mA ;
 DDR2 4 Rnaks/16 pcs: 3840mA;
 DDR_VTT*2: 600mA;
 +1.5VRUN: 4130mA;



VDIMM OC



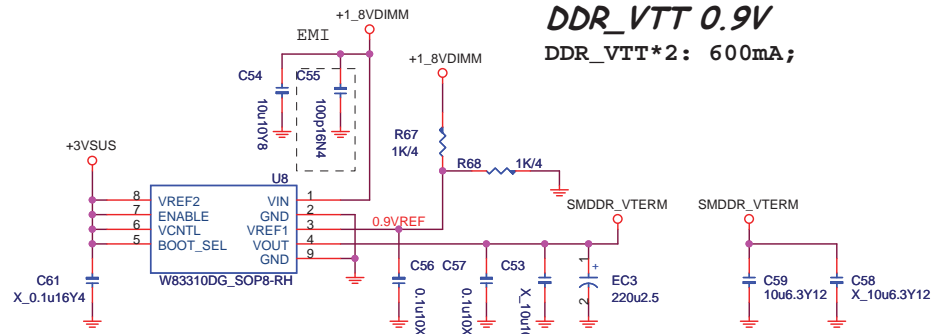
VDIMM OverVoltage TABLE

OV1	OV2	VDIMM OverVoltage
0	0	1.85V(default)
1	0	2V
0	1	2.15V

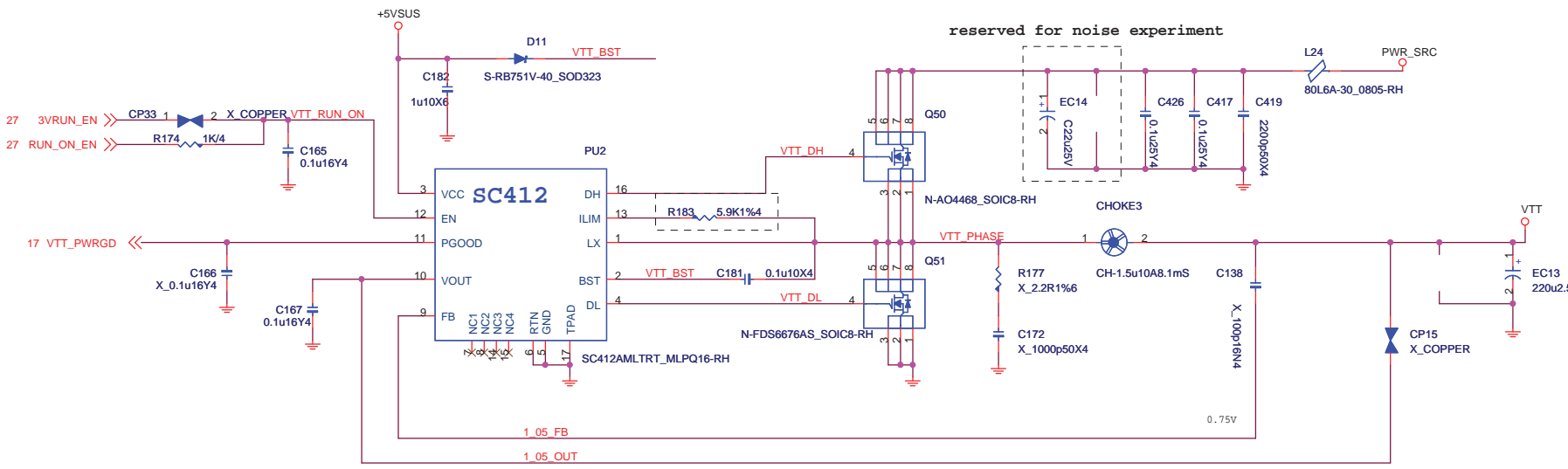
Note: 1=> HIGH 0=> LOW

DDR_VTT 0.9V

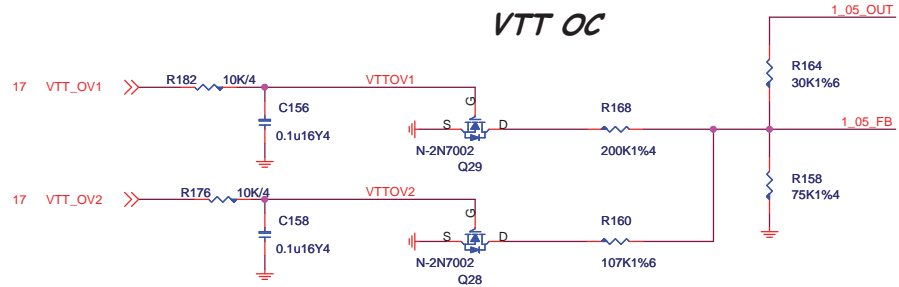
DDR_VTT*2: 600mA;



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Size B	Document Description	Rev 1.0
DDR & VTT_DDR Power		
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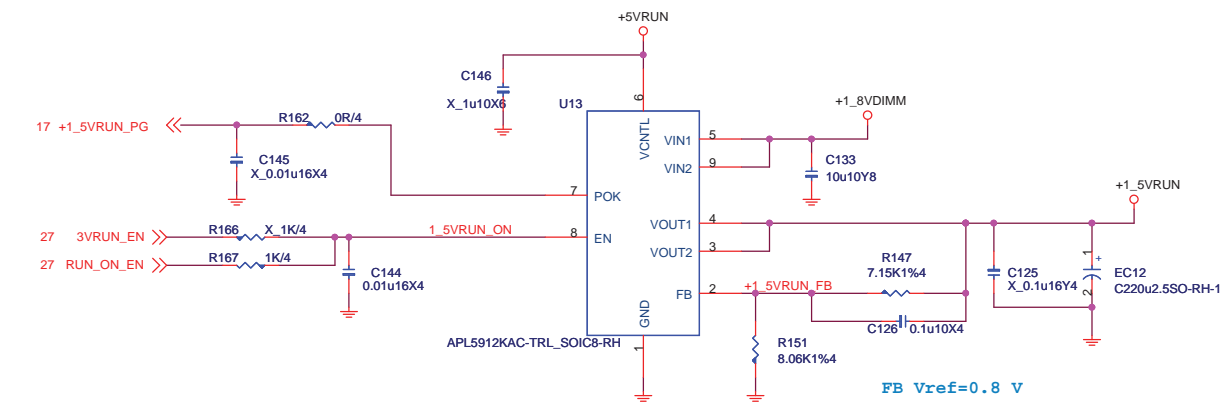
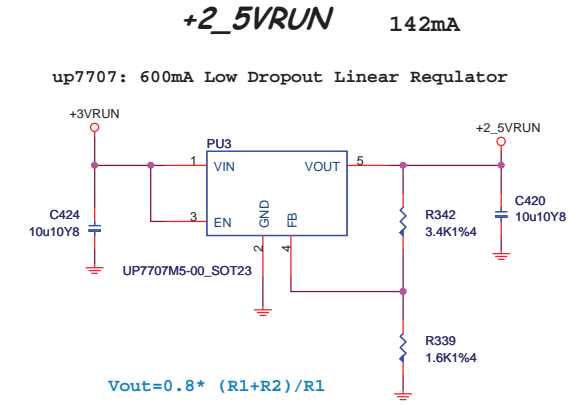
VTT /+1.05Vcore
6.674A
 Current Limit at 10A
 Current MAX at 8A
 CPU Vccp: 2000mA
 GMCH core:2940mA
 GMCH Vccp:780mA
 ICH7M core:940mA
 ICH7M Vcc_IO:14mA



VTT OverVoltage TABLE

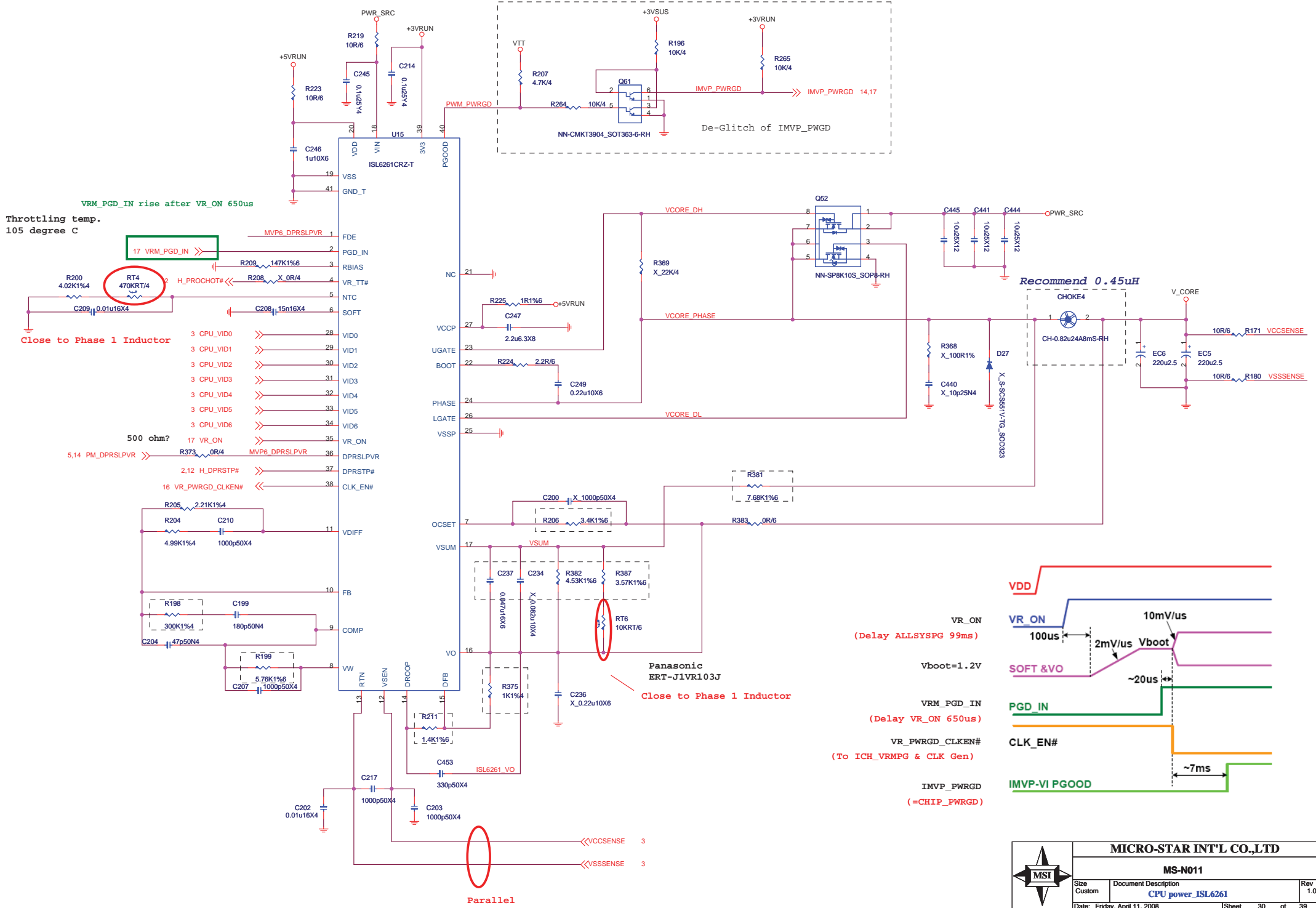
OV1	OV2	VTT OverVoltage
0	0	1.05V(default)
1	0	1.15V
0	1	NA

Note: 1=> HIGH 0=> LOW

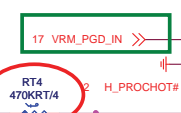


+1.5Vcore
4.13A
 CPU Vccp: 130mA
 GMCH core:1980mA
 ICH7M core:1520mA
 MINI PCIE :500mA

MICRO-STAR INT'L CO.,LTD		
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VRM_PGD_IN rise after VR_ON 650us
Throttling temp.
105 degree C



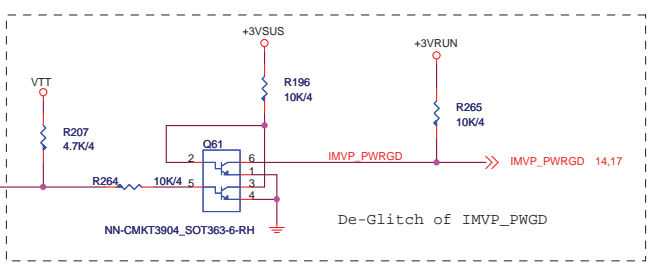
Close to Phase 1 Inductor

500 ohm?

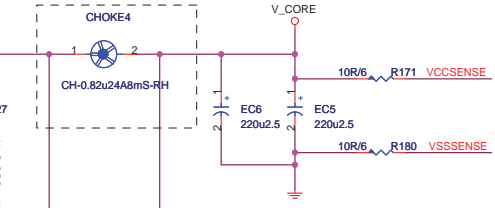
Close to Phase 1 Inductor

Parallel

Parallel



Recommend 0.45uH



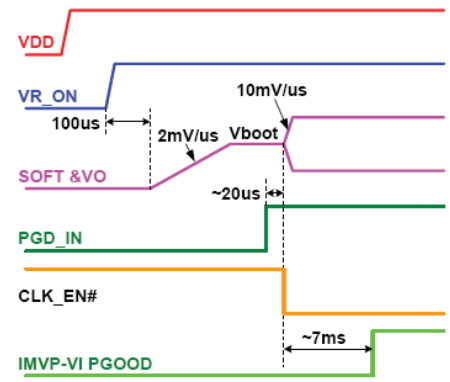
VR_ON
(Delay ALLSYSPPG 99ms)

Vboot=1.2V

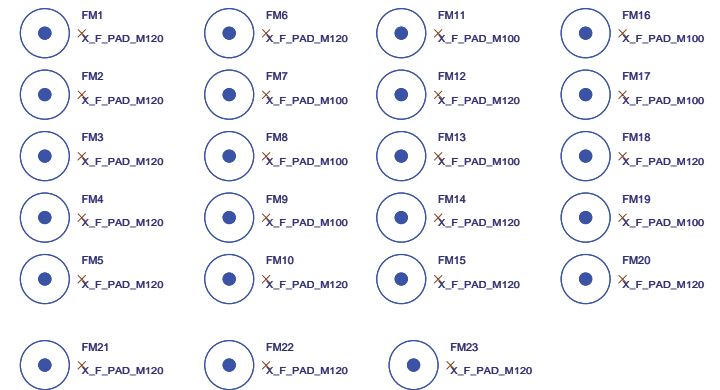
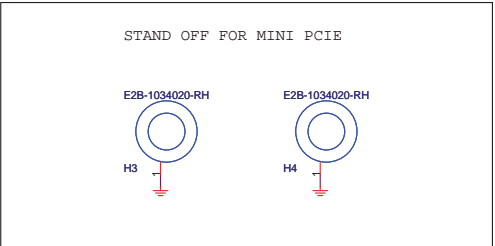
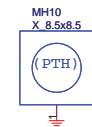
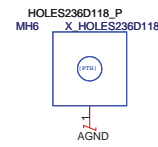
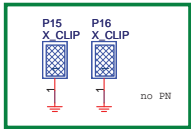
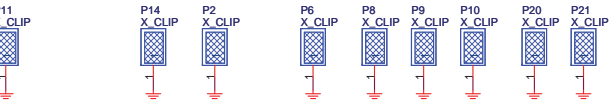
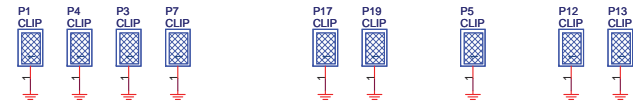
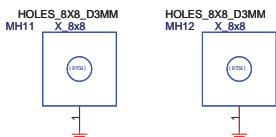
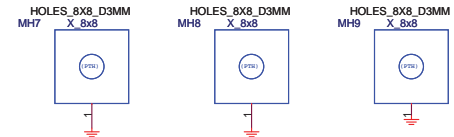
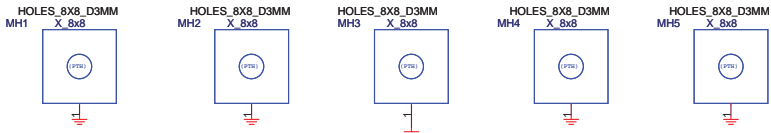
VRM_PGD_IN
(Delay VR_ON 650us)

VR_PWRGD_CLKEN#
(To ICH_VRMFG & CLK Gen)

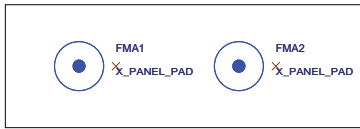
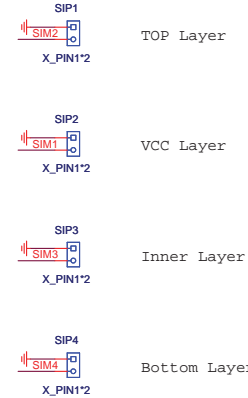
IMVP_PWRGD
(=CHIP_PWRGD)



MICRO-STAR INT'L CO.,LTD		
MS-N011		
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Simulation

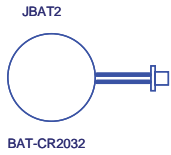


OPT	Configure	BOM	Function
A	cfg-FS	607-N0111-01S	MS-N0111 OPT:A Diamondville CPU, 945GMS+ICH7M, 1G SAMSUNG DDR2), ALC888S,ENE3310,Relteak 5158E+RTL8102E
B	cfg-FH	607-N0111-02S	MS-N0111 OPT:B Diamondville CPU, 945GMS+ICH7M, 1G HYNIX DDR2), ALC888S,ENE3310,Relteak 5158E+RTL8102E
C	cfg-FM	607-N0111-03S	MS-N0111 OPT:C Diamondville CPU, 945GMS+ICH7M, 512M MIRA DDR2), ALC888S,ENE3310,Relteak 5158E+RTL8102E

MICRO-STAR INT'L CO.,LTD

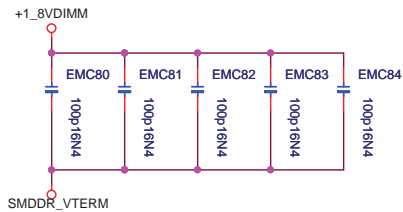
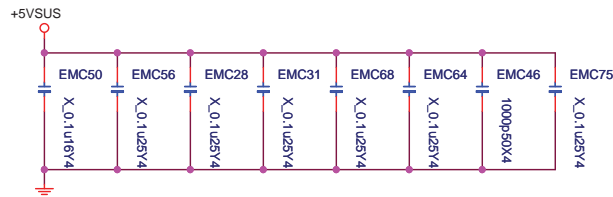
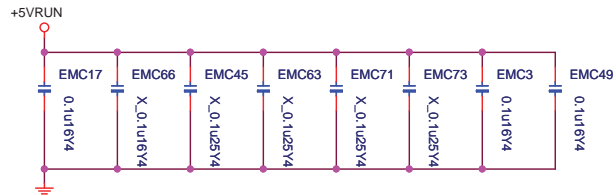
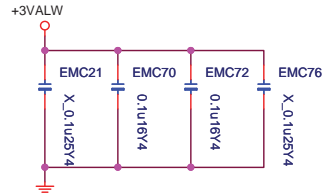
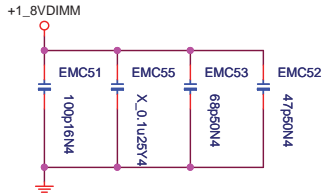
MS-N011

Size Custom	Document Description Screw	Rev 1.0
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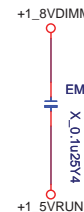
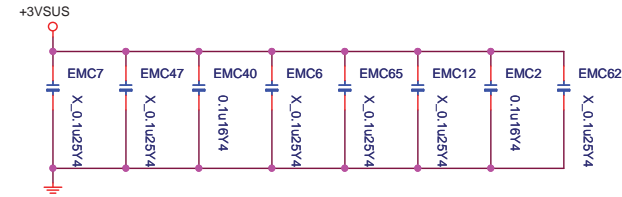
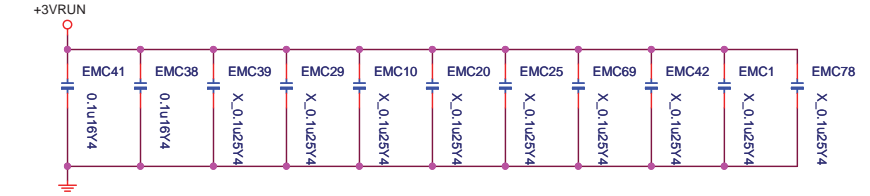
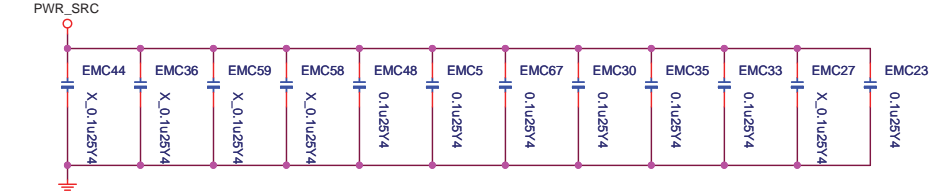
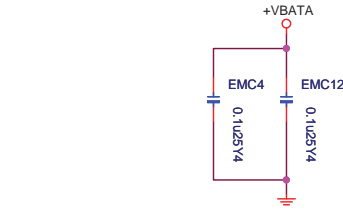
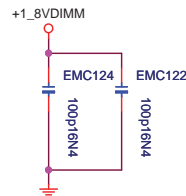
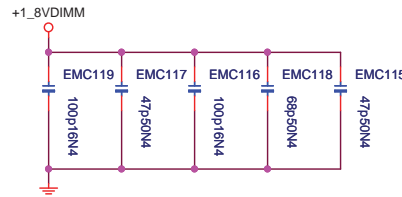
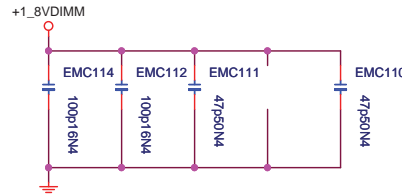
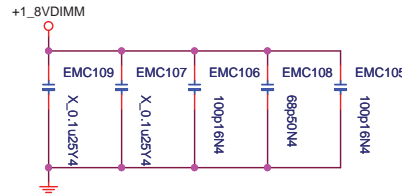
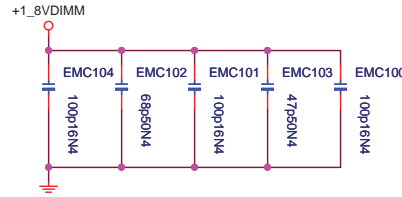
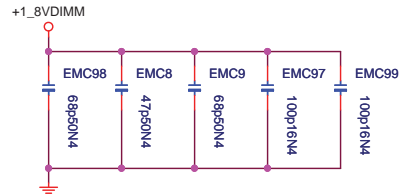


PCB-N0111

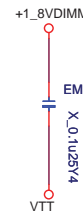
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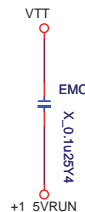
SMDDR_VTERM



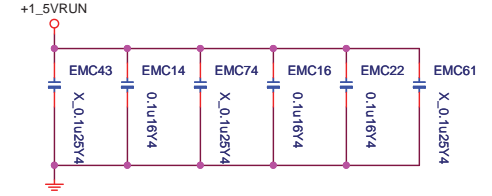
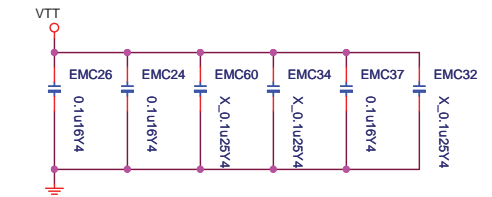
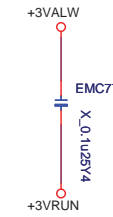
+1_5VRUN



VTT



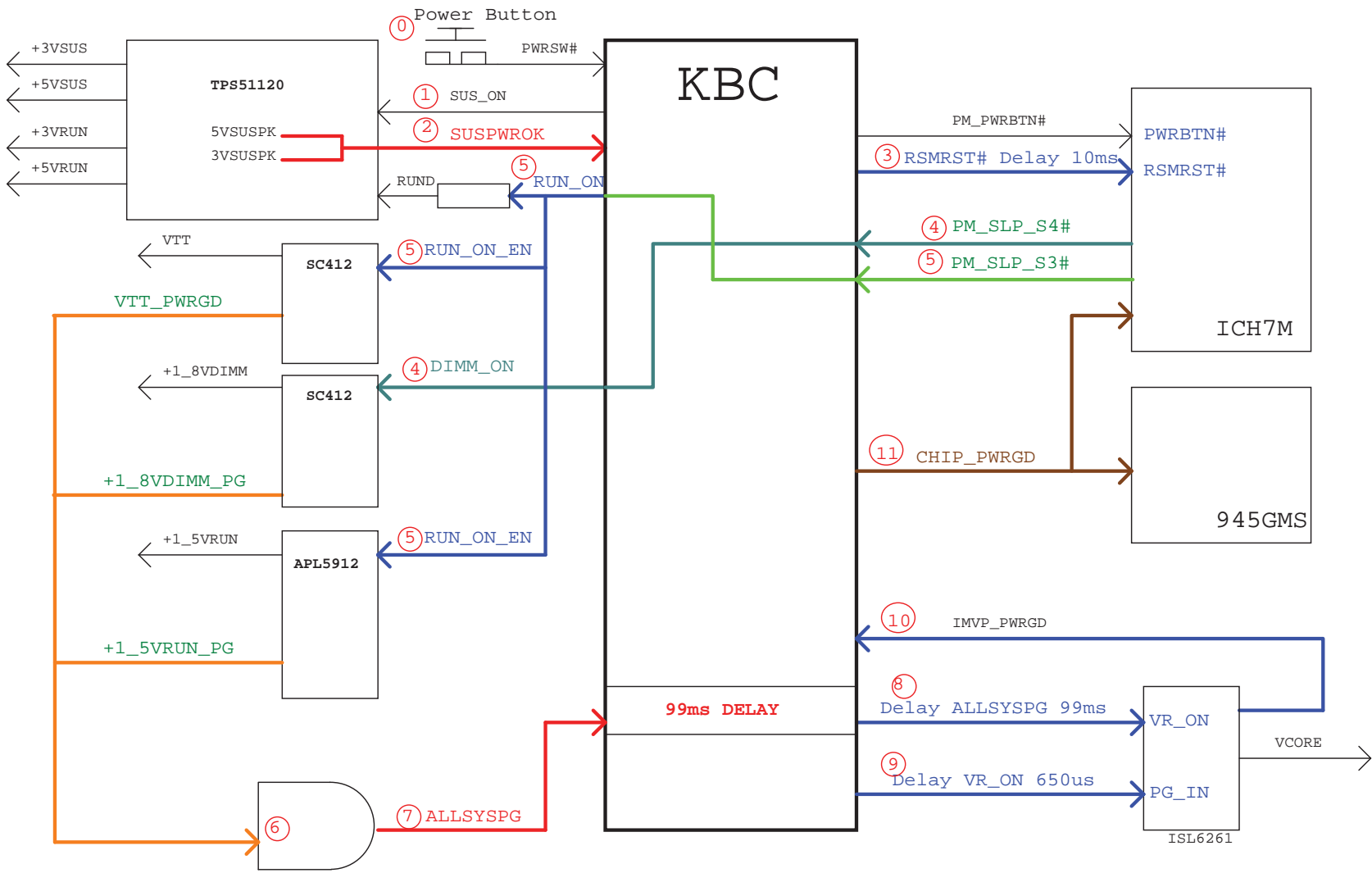
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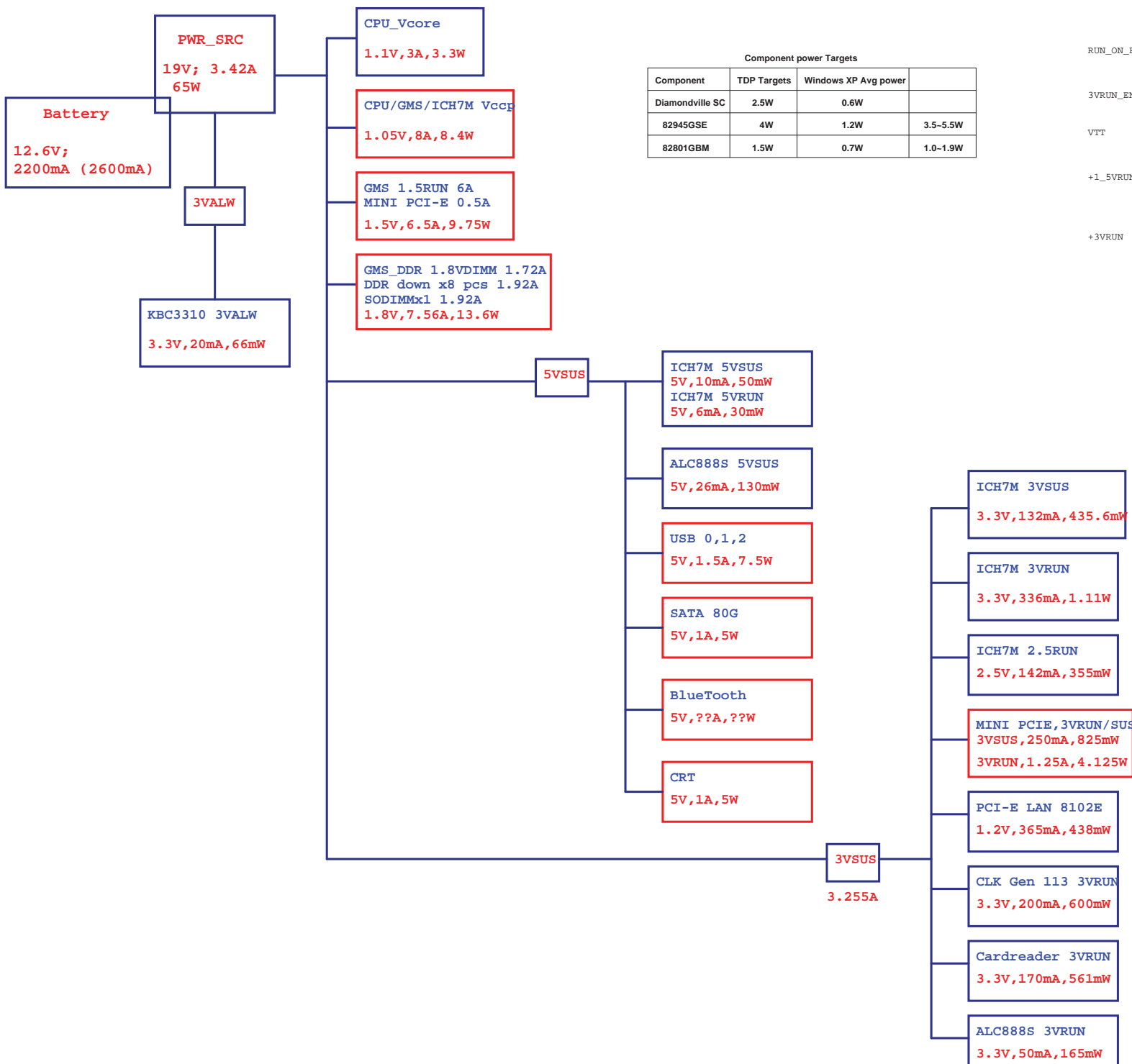
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Size B	Document Description	Rev 1.0
Manual Parts		
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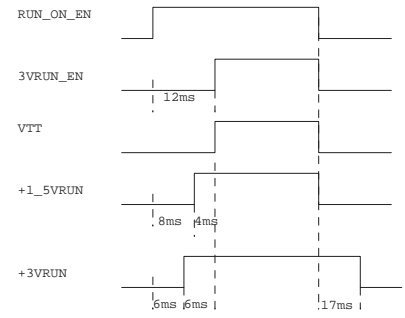


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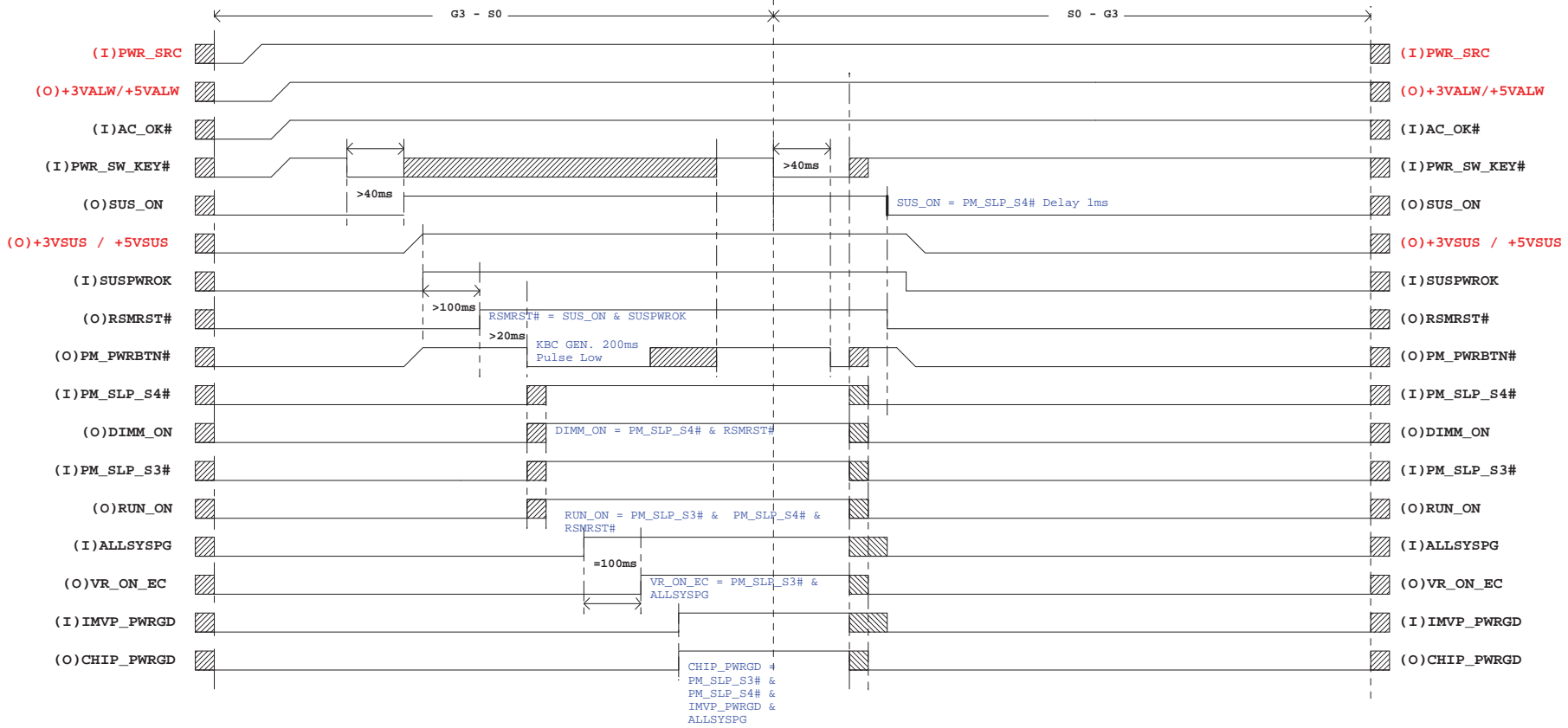
Component power Targets

Component	TDP Targets	Windows XP Avg power	
Diamondville SC	2.5W	0.6W	
82945GSE	4W	1.2W	3.5-5.5W
82801GBM	1.5W	0.7W	1.0-1.9W



RED: POWER
BLACK: KBC

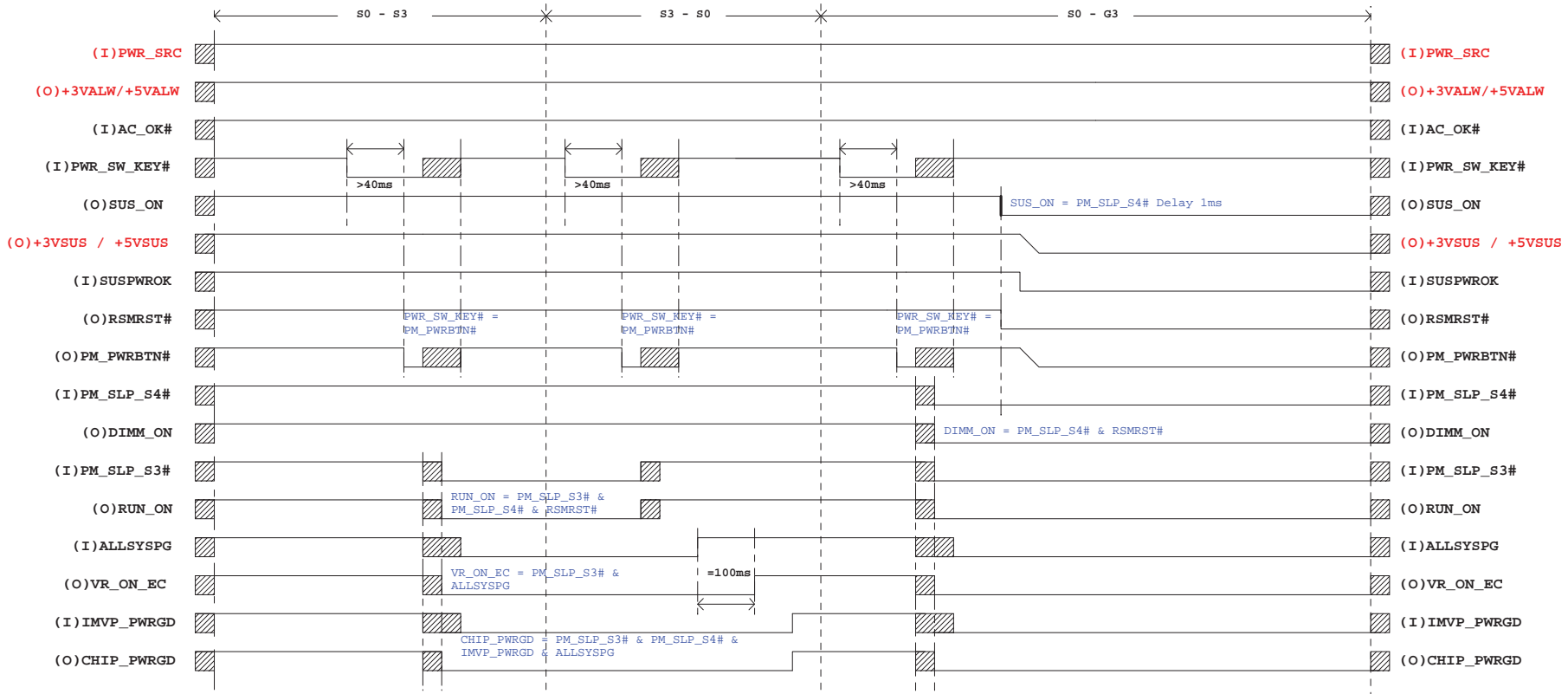
Battery Mode G3 - S0 - G3



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RED: POWER
BLACK: KBC

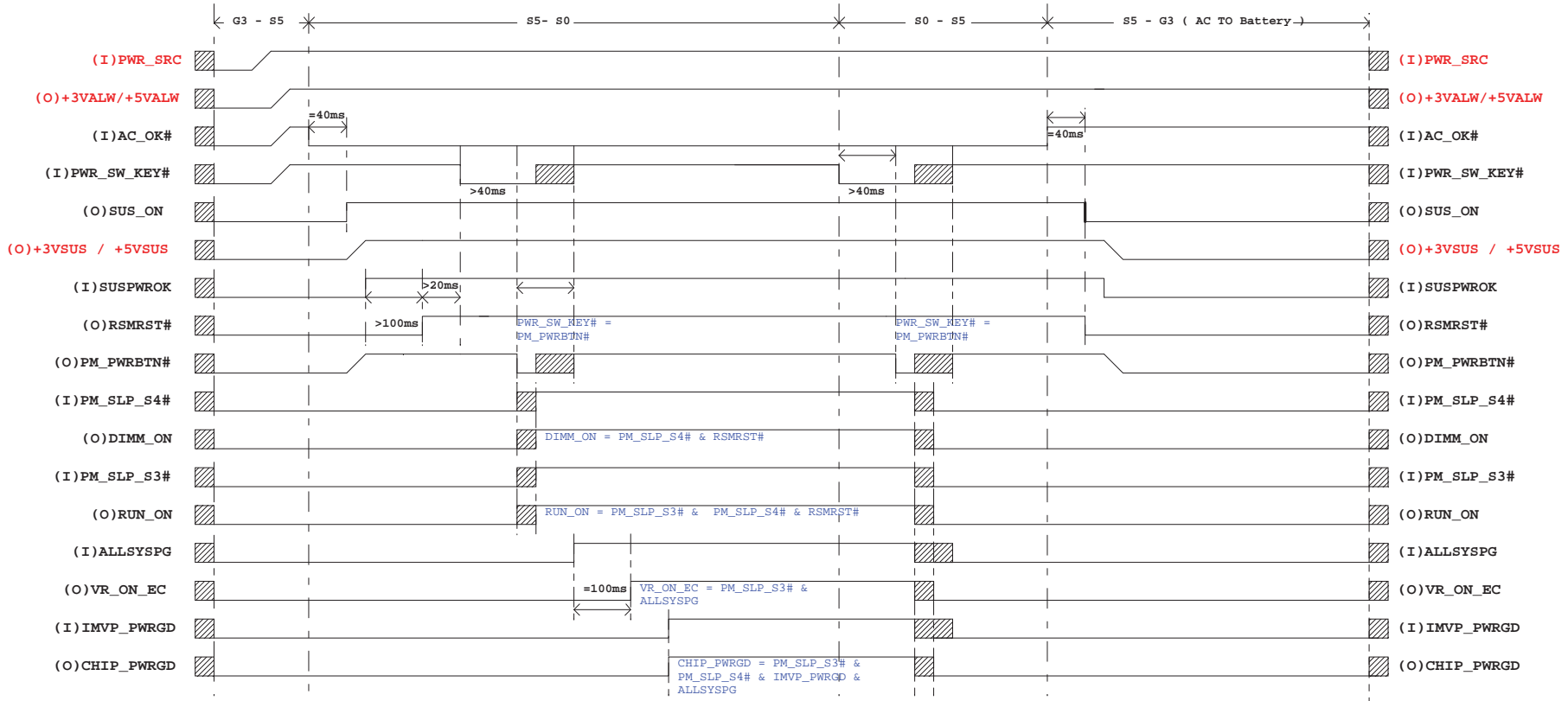
Battery Mode S0 - S3 - S0



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RED: POWER
BLACK: KBC

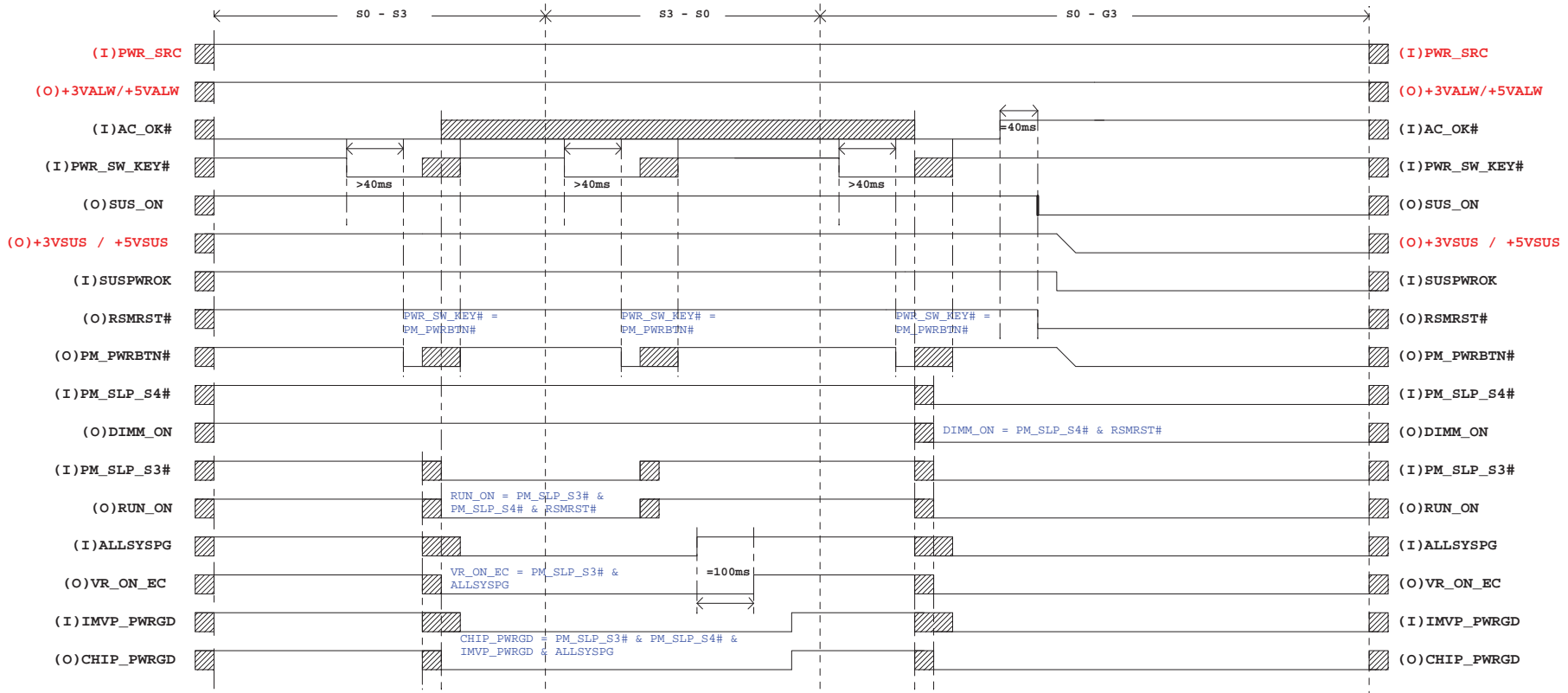
AC Mode G3 - S5 - S0 - S5 - G3



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RED: POWER
BLACK: KBC

AC Mode S0 - S3 - S0



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1. PAGE7: EC15 close to ICH7M cause RMA difficult to rework, change EC15 to C256 (1206) size.
2. PAGE21: Remove R413 & change R412 pull down to GND for LCD backlight blinking while power on.
3. Swap BT & WLAN LED.
4. PAGE25: JBAT1 pin6,7 connector to GND.
5. PAGE23: Remove CP35, CP34.
6. PAGE24: RN47 separate to R244, R254, R257. For tune LED brightness.
7. PAGE23: USB add CMC for EMI request.
8. PAGE23: Add EMC96 for EMI request.
9. PAGE26: Modify R252 value to match new 40W /20V Adapter.
9. PAGE27,29: Modify R215=9.31KR, R216=10KR, R183=5.9KR by power team.

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				MS-N011			
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