

Shark(DDR3)

CPU : INTEL PINEVIEW-M
Chip Set : INTEL TIGERPOINT
Remarks : DDR3 / LV / DC / SC

Model Name : PINE TRAIL-M
PCB Part No :

Dev. Step : PR
Revision : 0.95
T.R. Date : 2010.08.17

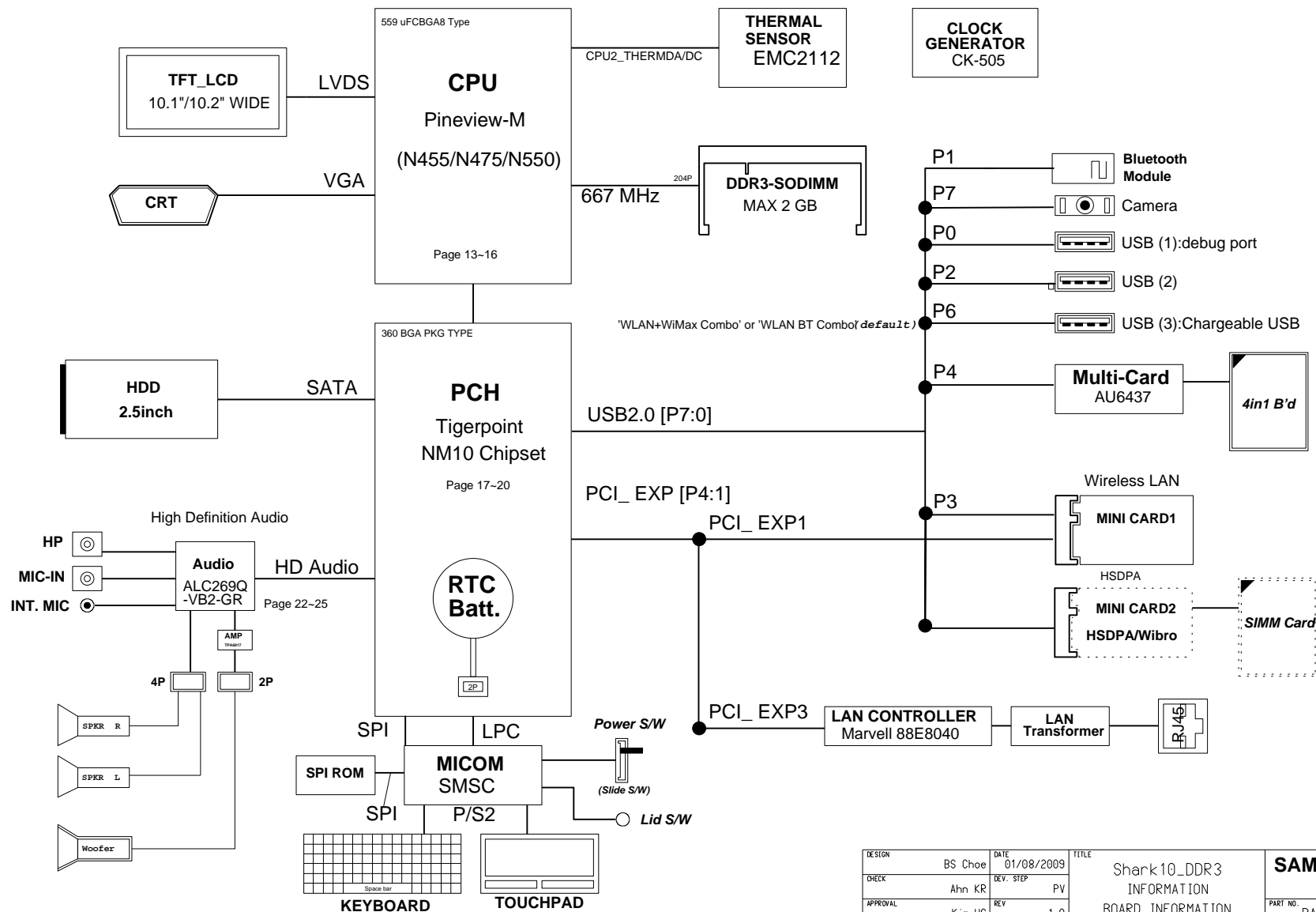
DRAW	CHECK	APPROVAL
LEE.H.H.	KIM.Y.J.	KOO.J.G.

Table of Contents

Page. 1	COVER
Page. 2	OPERATION BLOCK DIAGRAM
Page. 3	BOARD INFORMATION
Page. 4~6	POWER DIAGRAM / SEQUENCE
Page. 7	CLOCK DISTRIBUTION
Page. 8	CLOCK GENERATOR (CK-505M)
Page. 9	THERMAL MONITOR
Page. 10~12	PINEVIEW-M (N455/N475/N550 CPU)
Page. 13~15	TIGERPOINT (NM10 CHIPSET)
Page. 16	SPI ROM & DEBUG PORT
Page. 17	DDR3 SODIMM
Page. 18	CRT CONN.
Page. 19	LCD(LVDS) CONN.
Page. 20	AUDIO CODEC (ALC269Q-GR)
Page. 21	HP & MIC & INT. MIC
Page. 22	HDD CONNECTOR (SATA)
Page. 23	LAN (10/100)
Page. 24	MINI-CARD (Wireless & HSDPA/WIBRO)
Page. 25	USB
Page. 26	Bluetooth
Page. 27	CARDBUS CONTROLLER (AU6437)
Page. 28	MICOM (SMSC)
Page. 29	KBD CONN & MICOM GLUE LOGIC
Page. 30	LED Logic
Page. 31	CPU VRM POWER (CPU_CORE)
Page. 32	CHIPSET, GFX-Core PWR (P1.05V, P0.89V)
Page. 33	DDR3 POWER
Page. 34	P3.3V_AUX & P5V_AUX
Page. 35	CHARGER
Page. 36	CHIPSET POWER(P1.8V)
Page. 37	SWITCHED POWER
Page. 38	POWER DISCHARGER
Page. 39	MOUNT HOLE
Page. 40	Sub Board I/F

DESIGN	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3	SAMSUNG ELECTRONICS PART NO. BA41-XXXXXA
CHECK	Ahn KR	DEV. STEP	PV	MAIN		
APPROVAL	Kim.HS	REV	1.0	COVER		
MODULE CODE	undefined	LAST EDIT	July 13, 2010 21:01:08 PM	PAGE	1 OF 44	

OPERATION BLOCK DIAGRAM

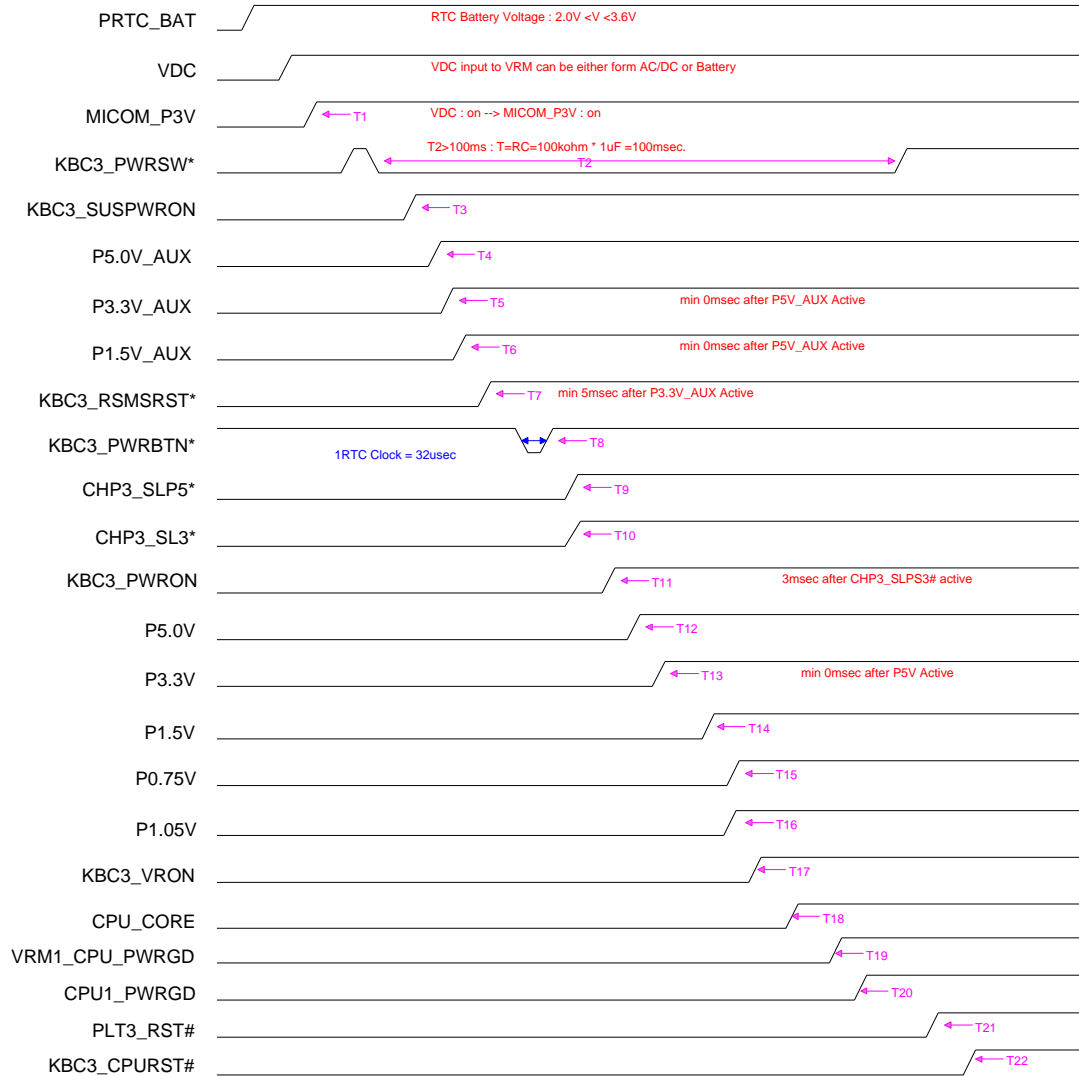


DESIGN	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3 INFORMATION BOARD INFORMATION	SAMSUNG ELECTRONICS
CHECK	Ahn KR	DEV. STEP	PV			PART NO. BA41-XXXXXA
APPROVAL	Kim.HS	REV	1.0			
MODULE CODE		LAST EDIT	July 13, 2010 21:01:08 PM	PAGE	2	OF 44

BOARD INFORMATION

SCHEMATIC ANNOTATIONS AND BOARD INFORMATION

Power Sequence Timing



PCI Devices

Devices	IDSEL#	REQ/GNT#	Interrupts
USB Hub to PCI LPC Bridge/IDE/AC97/SMBUS Internal MAC	AD29(internal) AD30(internal) AD31(internal) AD24(internal)	Programmable	

I²C / SMB Address

Devices	Address	Hex	Bus
TigerPoint CK-505M (Clock Generator) SODIMMO CPU Thermal Sensor	Master 1101 001X 1010 000X 0111 101X	D2h A0h 7Ah	SMBUS Master Clock, Unused Clock Output Disable Thermal Sensor

USB PORT Assign

Port Number	ASSIGNED TO	Port Number	ASSIGNED TO
UHCL_0	0	UHCL_2	4
UHCL_1	1	UHCL_3	5
	2		6
	3		7
	USB Port		CardBus Cont.
	Mini Card (For WLAN/WWAN)		Bluetooth Module
			USB Port(Chargeable)
			CAMERA

PCI Express Assign

Port Number	ASSIGNED TO
1	Mini Card 1(Wireless LAN)
2	Mini Card 2 (HSDPA/Wibro)
3	LOM

Voltage Rails

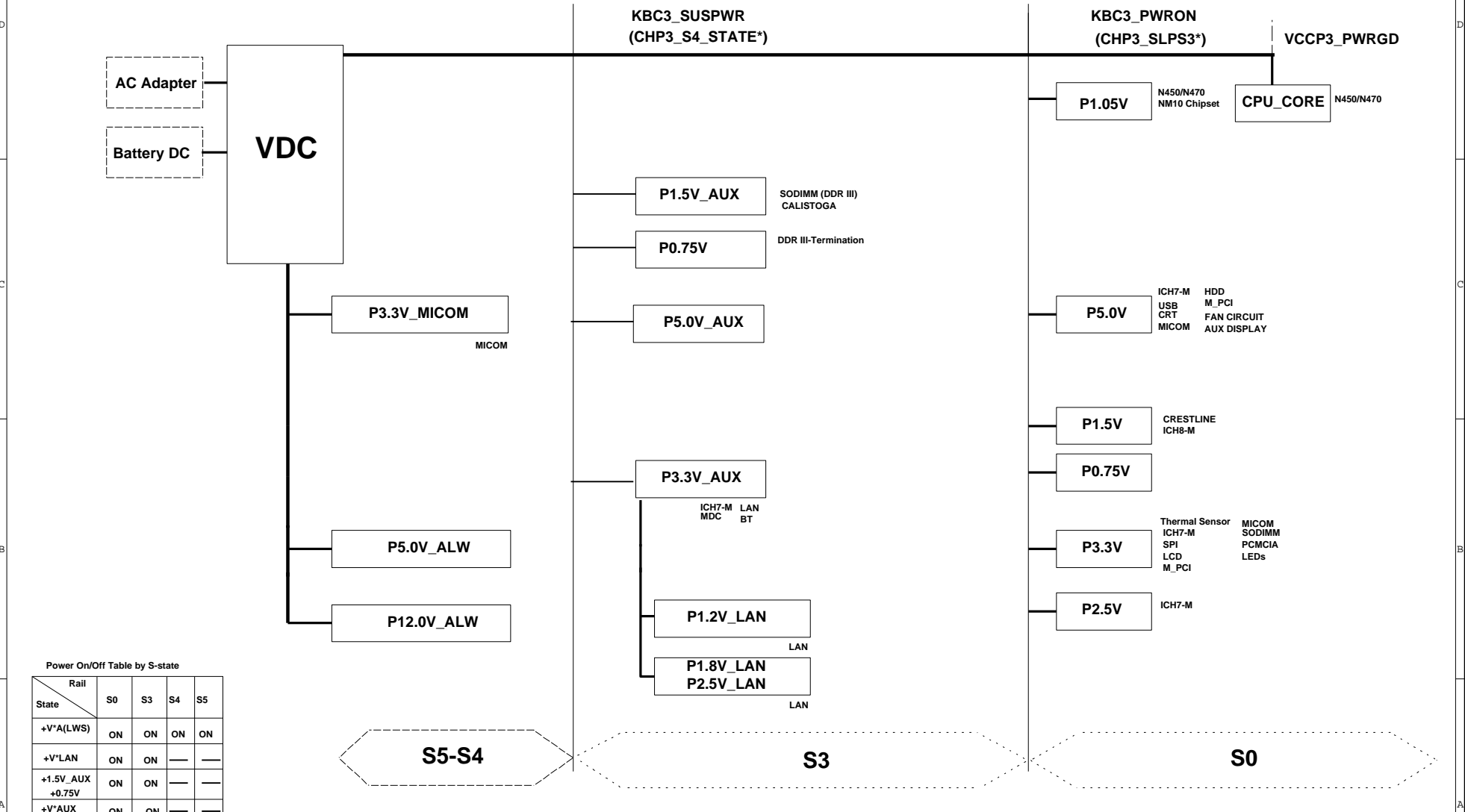
Power Rail	Descriptions
PRTC_BAT	3.3V (can drop to 2.0V min. in G3 state) supply for the RTC well.
VDC	Primary DC system power supply (9 to 19V)
P1.05V(VCCP)	VTT for CPU, Callistoga & ICH7-M
P3.3V_MICOM	3.3V always power rail(for Micom)
P1.5V	1.5V switched power rail (off in S3-S5)
P1.5V_AUX	1.5V power rail for DDR (off in S4-S5)
P0.75V	0.75V power rail for DDR (off in S4-S5)
P5.0V_AUX	5.0V power rail (off in S4-S5)
P3.3V_AUX	3.3V power rail (off in S4-S5)
P5.0V	5.0V switched power rail (off in S3-S5)
P3.3V	3.3V switched power rail (off in S3-S5)
CPU_CORE	Core voltage for Atom CPU

DRAW	BS Choe	DATE	11/14/2009	TITLE	Shark10_DDR3 INFORMATION Board Information	SAMSUNG ELECTRONICS
CHECK	Ahn KR	DEV. STEP	PV			PART NO. BA41-XXXXXA
APPROVAL	Kin.HS	REV	1.0			
MODULE CODE		LAST EDIT	July 13, 2010 21:01:08 PM	PAGE	3	OF 44

SAMSUNG PROPRIETARY
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

POWER DIAGRAM

Rev 0.1



Power On/Off Table by S-state

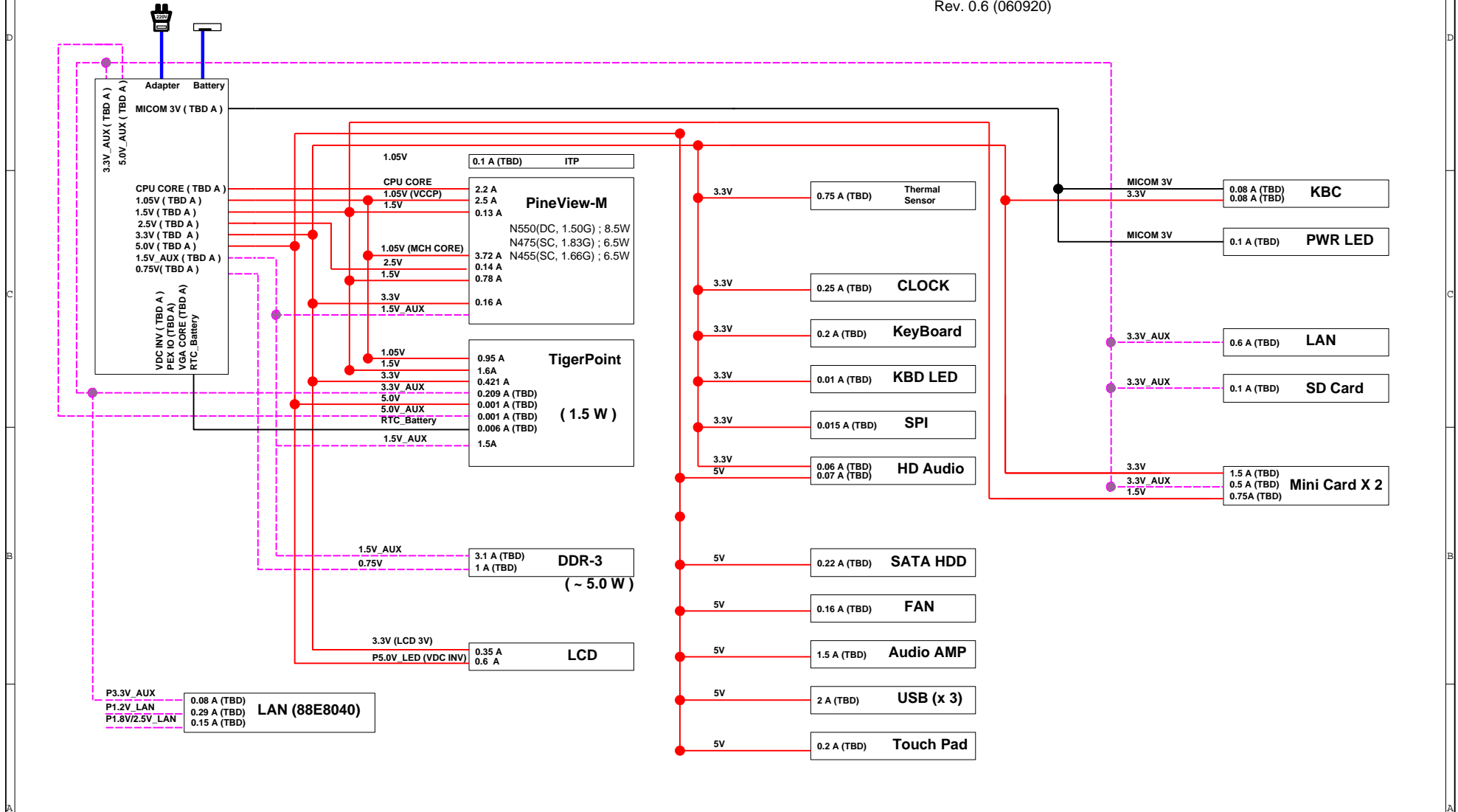
Rail	S0	S3	S4	S5
State				
+V*A(LWS)	ON	ON	ON	ON
+V*LAN	ON	ON	—	—
+1.5V_AUX +0.75V	ON	ON	—	—
+V*AUX	ON	ON	—	—
+V	ON	—	—	—
+V* (CORE)	ON	—	—	—

DRAW	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3 INFORMATION CLOCK DISTRIBUTION	SAMSUNG ELECTRONICS
CHECK	Ahn KR	DEV. STEP	PV			PART NO. BA41-XXXXXA
APPROVAL	Kim.HS	REV	1.0			
MODULE CODE		LAST EDIT	July 13, 2010 21:01:08 PM	PAGE	4	OF 44

SAMSUNG PROPRIETARY
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

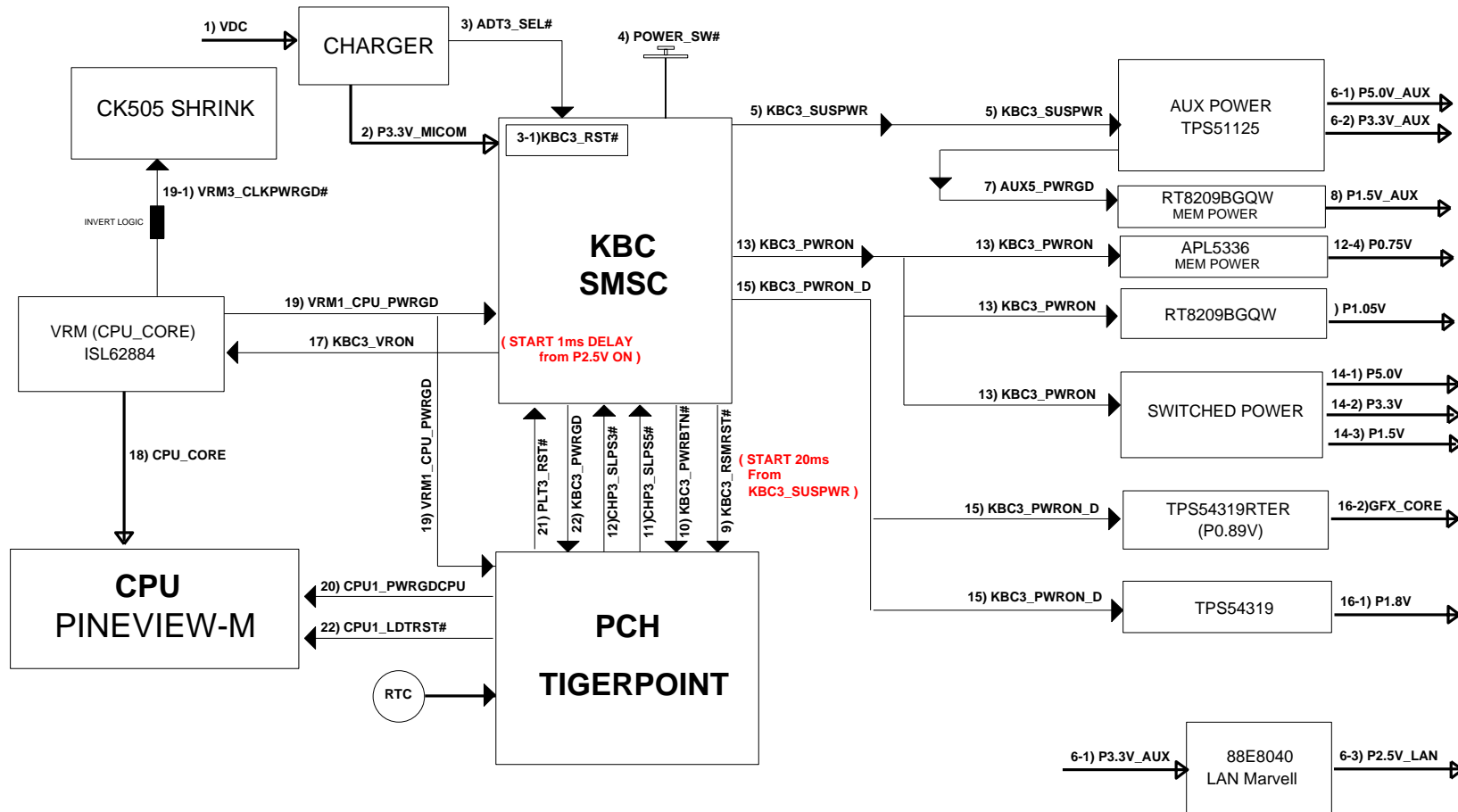
POWER RAILS ANALYSIS

Rev. 0.6 (060920)



DESIGN	BS Choe	DATE	11/14/2009	TITLE	Shark10_DDR3 INFORMATION Power Rail Analysis	SAMSUNG ELECTRONICS
CHECK	Ahn KR	DEV. STEP	PV			PART NO. BA41-XXXXXA
APPROVAL	Kim.HS	REV	1.0			
MODULE CODE		LAST EDIT	July 13, 2010 21:01:08 PM	PAGE	5	OF 44

POWER SEQUENCE BLOCK DIAGRAM



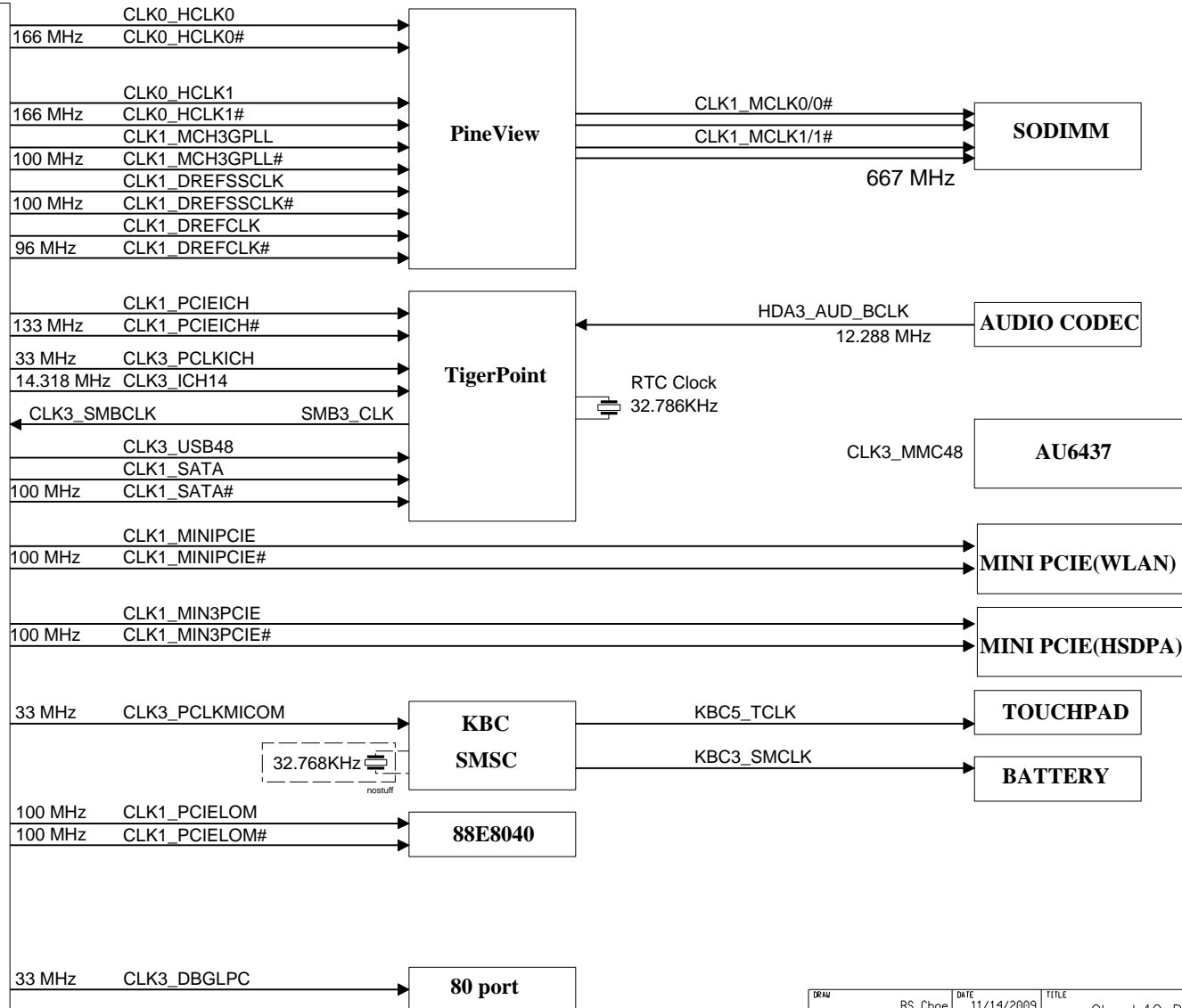
DESIGN	BS Choe	DATE	11/14/2009	TITLE	Shark10_DDR3 INFORMATION	SAMSUNG ELECTRONICS
CHECK	Ahn KR	DEV. STEP	PV			PART NO. BA41-XXXXXA
APPROVAL	Kim.HS	REV	1.0		Power Sequence Block	
MODULE CODE		LAST EDIT	July 13, 2010 21:01:08 PM	PAGE	6	OF 44

SAMSUNG PROPRIETARY
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

CLOCK DISTRIBUTION

1205-002574

CLOCK GENERATOR
CK-505M
IDTCV179BNLG

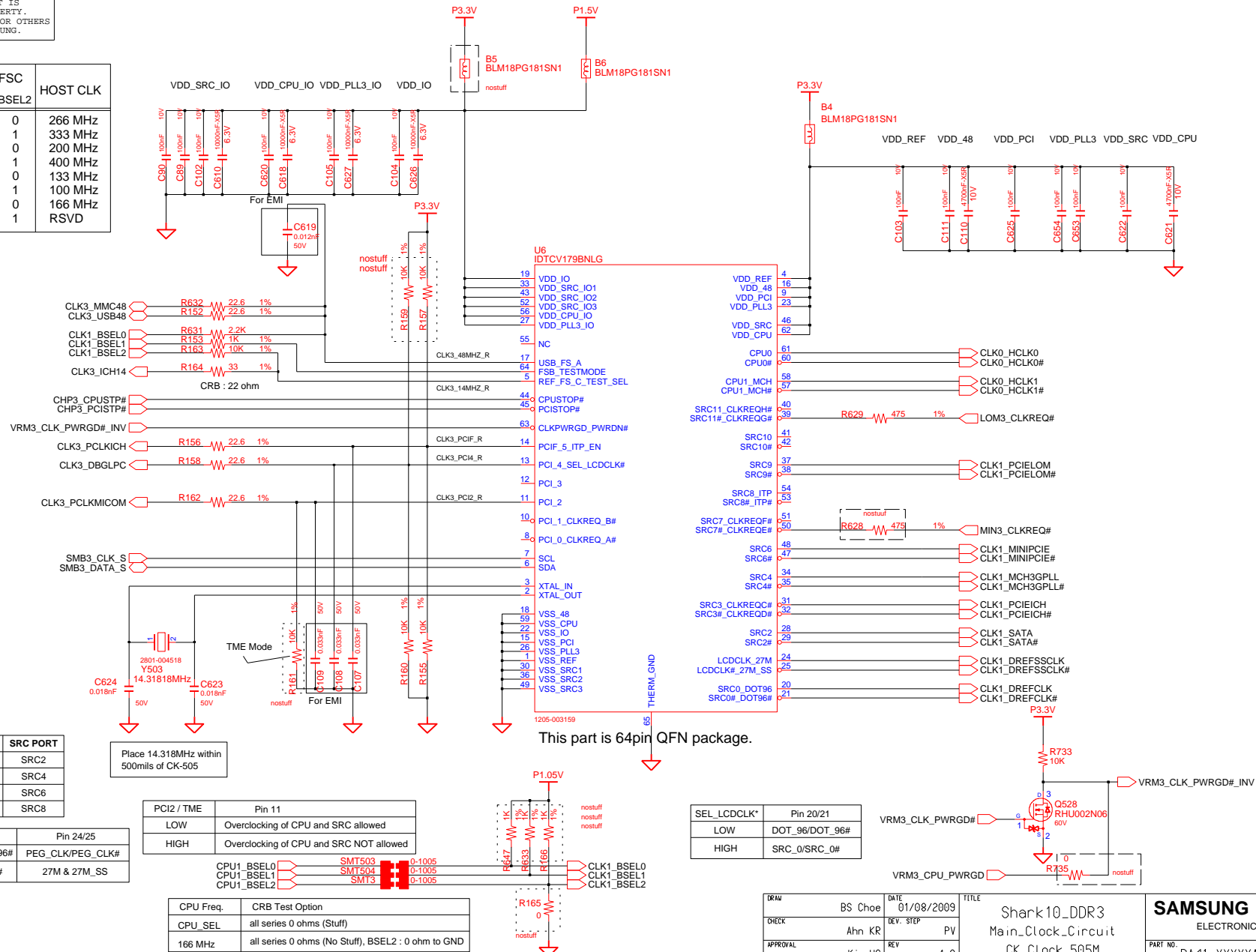


DRAW	BS Choe	DATE	11/14/2009	TITLE	Shark10_DDR3 INFORMATION	SAMSUNG ELECTRONICS
CHECK	Ahn KR	DEV. STEP	PV			PART NO. BA41-XXXXXA
APPROVAL	Kim.HS	REV	1.0		Clock Distribution	
MODULE CODE		LAST EDIT	July 13, 2010 21:01:08 PM	PAGE	7	OF 44

SAMSUNG PROPRIETARY

THIS DOCUMENT CONTAINS CONFIDENTIAL
 PROPRIETARY INFORMATION THAT IS
 SAMSUNG ELECTRONICS CO.'S PROPERTY.
 DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
 EXCEPT AS AUTHORIZED BY SAMSUNG.

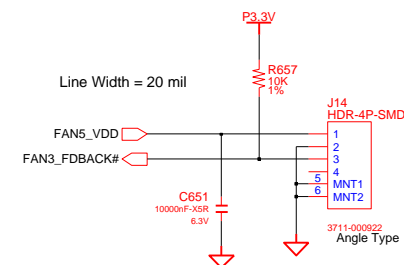
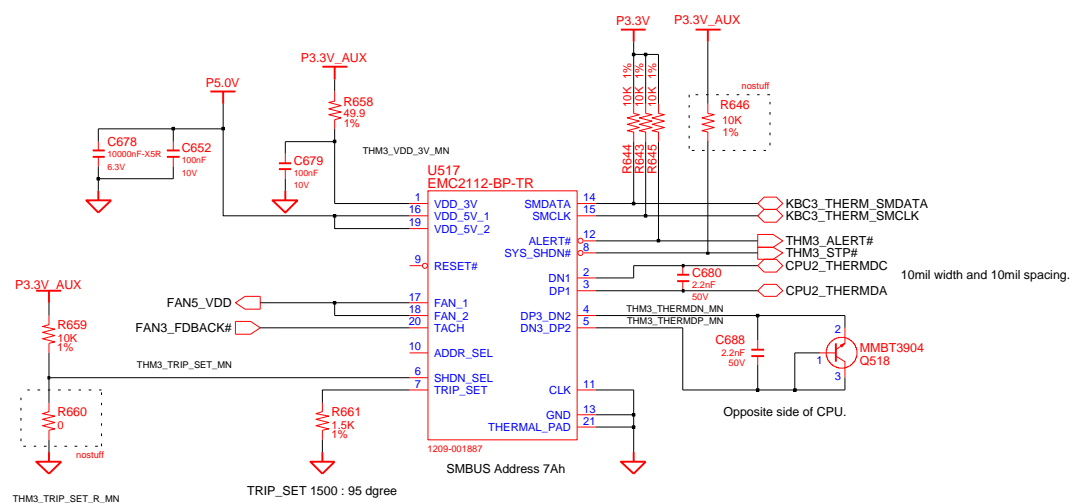
FSA	FSB	FSC	HOST CLK
BSEL0	BSEL1	BSEL2	
0	0	0	266 MHz
0	0	1	333 MHz
0	1	0	200 MHz
0	1	1	400 MHz
1	0	0	133 MHz
1	0	1	100 MHz
1	1	0	166 MHz
1	1	1	RSVD



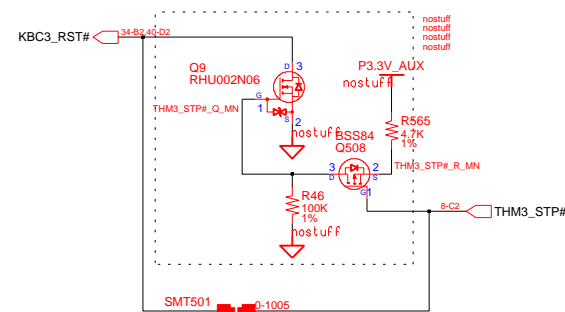
SAMSUNG PROPRIETARY

THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

THERMAL SENSOR & FAN CONTROL



MICOM RESET



DESIGN	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3	SAMSUNG ELECTRONICS PART NO. BA41-XXXXXA
CHECK	Ahn KR	DEV. STEP	PV		Thermal Sensor EMC2102	
APPROVAL	Kim.HS	REV	1.0		THERMAL SENSOR	
MODULE CODE		LAST EDIT	July 13, 2010 21:01:08 PM	PAGE	9 OF 44	

A

THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO'S PROPERTY.
NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

PINEVIEW-M(DDR3)1 / 5



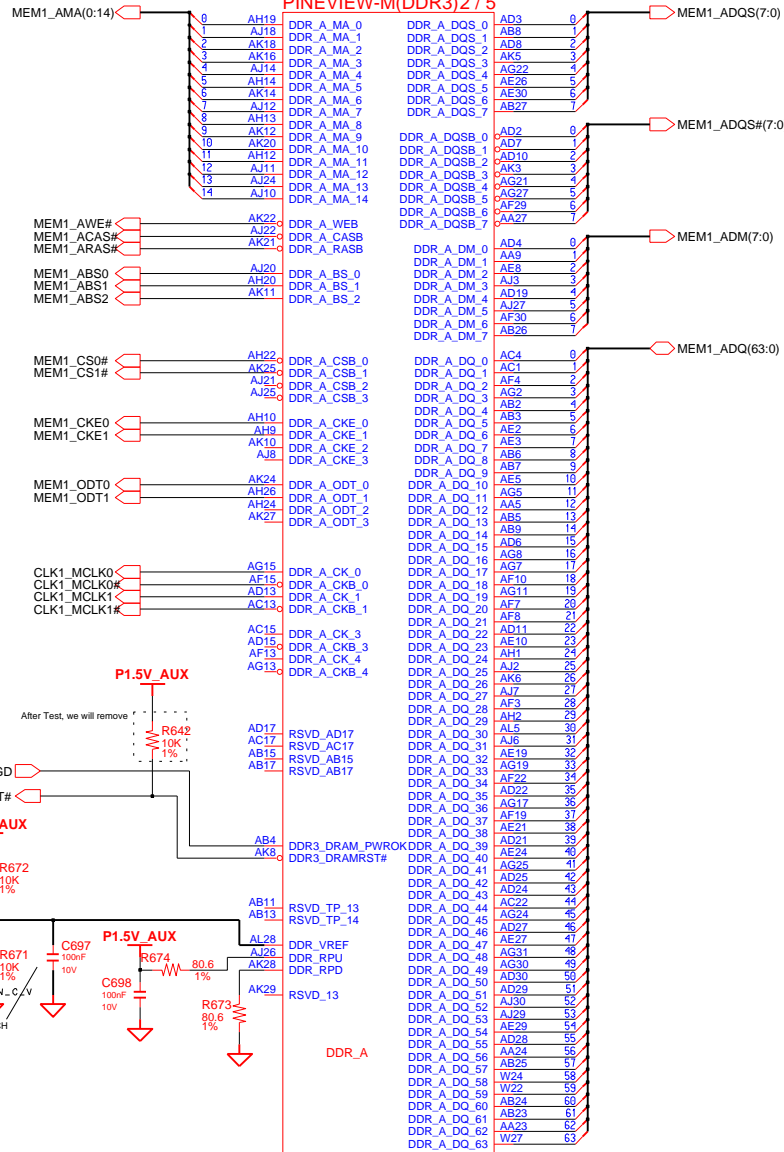
M500
HEAD
DIA
LENGTH
BA61-01090A

COM-22C-015(1996.6.5) REV. 3

PINEVIEW(2/3)

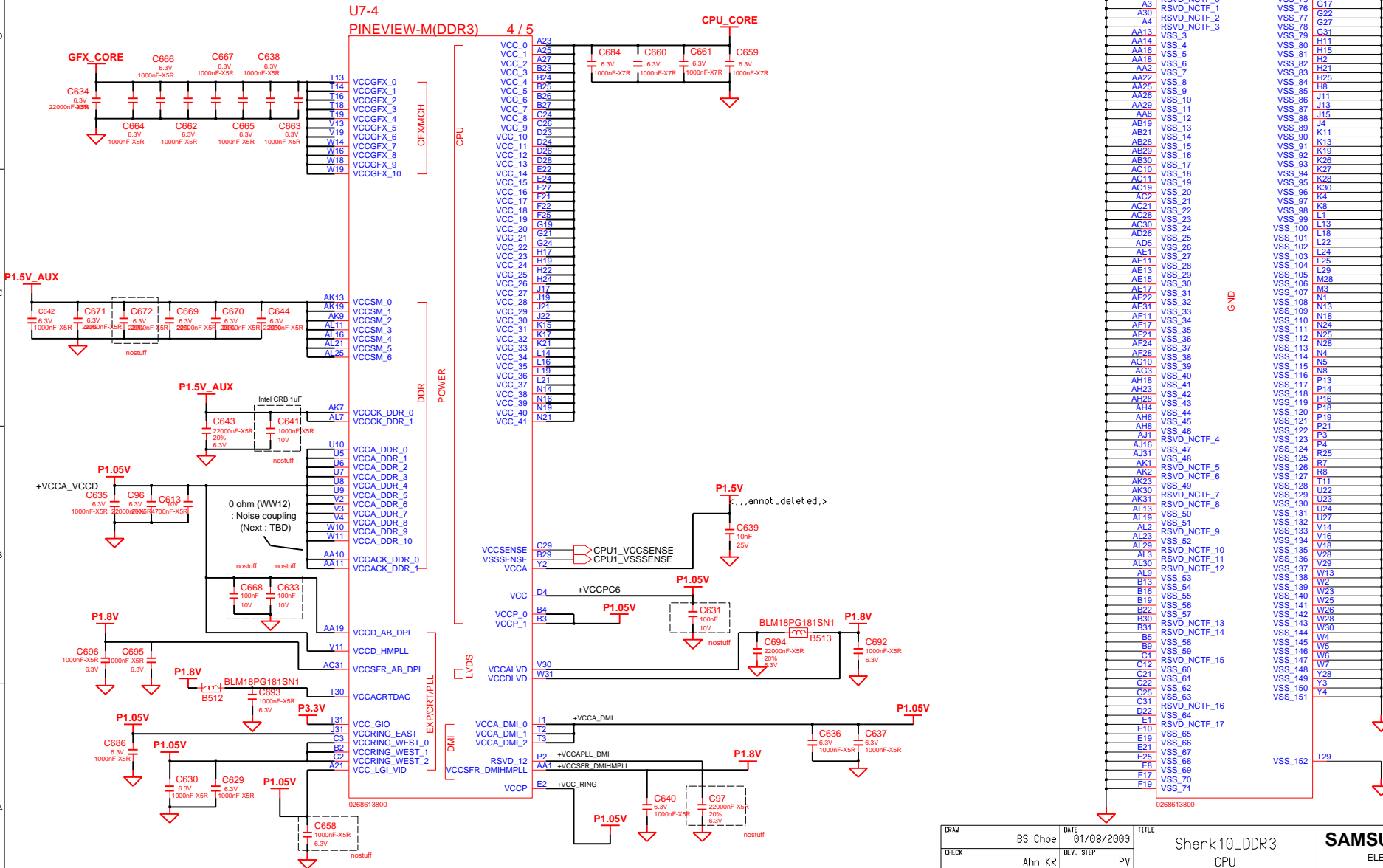
U7-2

PINEVIEW-M(DDR3)2 / 5



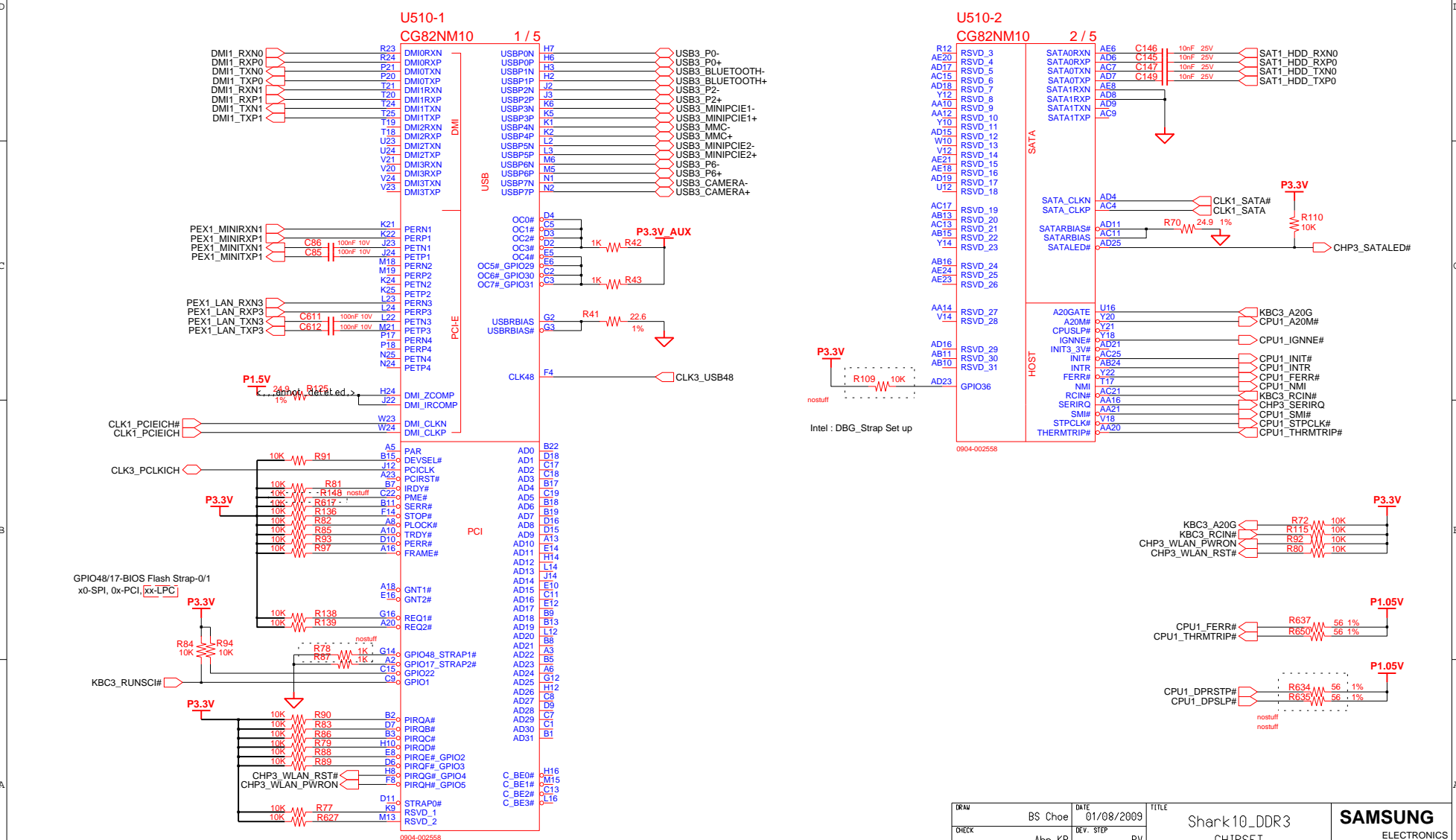
SAMSUNG PROPRIETARY
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

PINEVIEW(3/3)



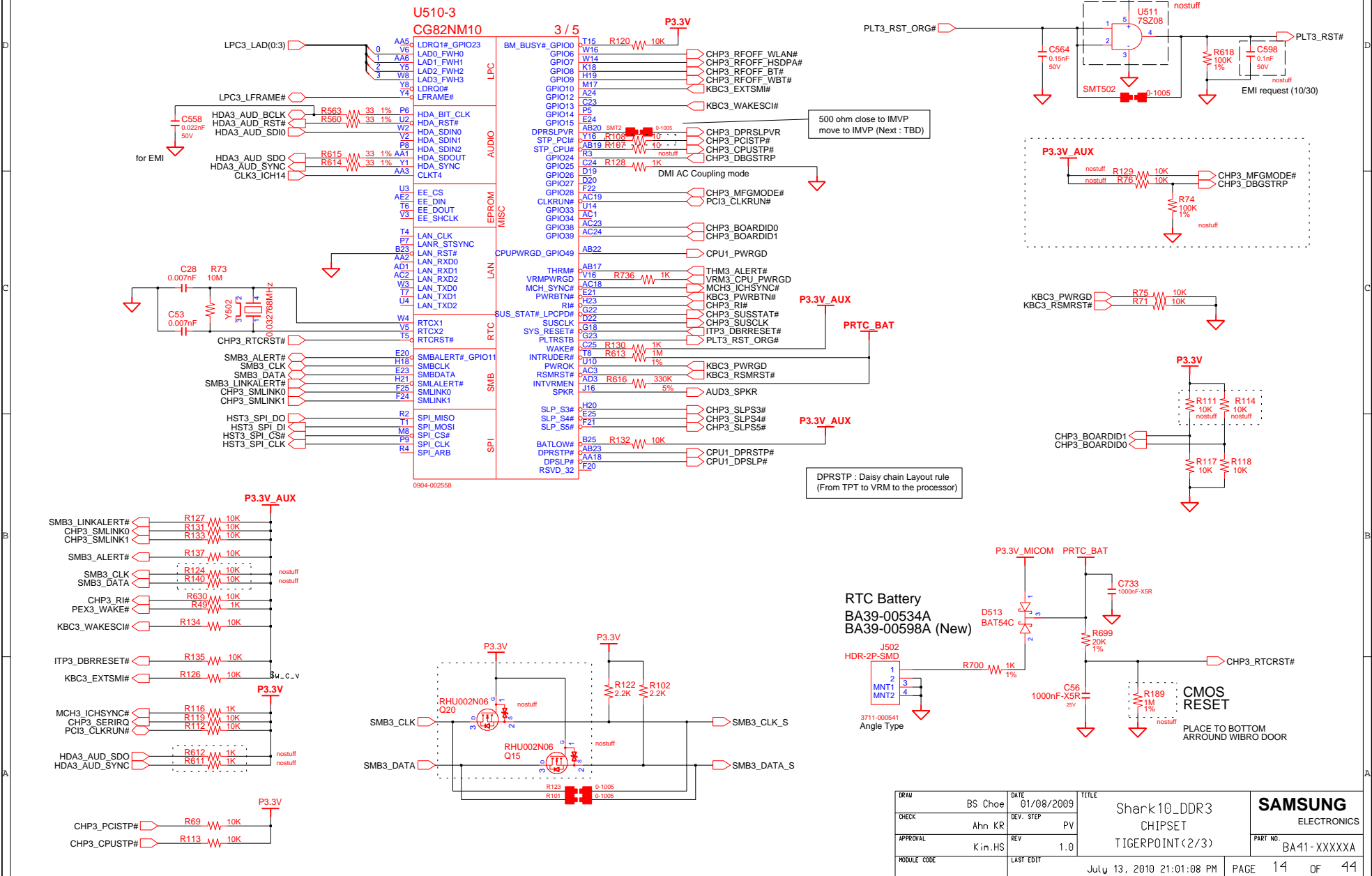
DRAW	BS Choe	DATE	01/08/2009	TITLE Shark10_DDR3 CPU PINEVIEW-M (3/3)		SAMSUNG ELECTRONICS PART NO. BA41-XXXXXA	
CHECK	Ahn KR	DEV. STEP	PV				
APPROVAL	Kim.HS	REV	1.0				
MODULE CODE		LAST EDIT					
				July 13, 2010 21:01:08 PM	PAGE	12	OF 44

Tigerpoint (1/3)



DRAW	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3 CHIPSET TIGERPOINT (1/3)	SAMSUNG ELECTRONICS PART NO. BA41-XXXXXA
CHECK	Ahn KR	DEV. STEP	PV			
APPROVAL	Kim.HS	REV	1.0			
MODULE CODE		LAST EDIT	July 13, 2010 21:01:08 PM	PAGE	13 OF 44	

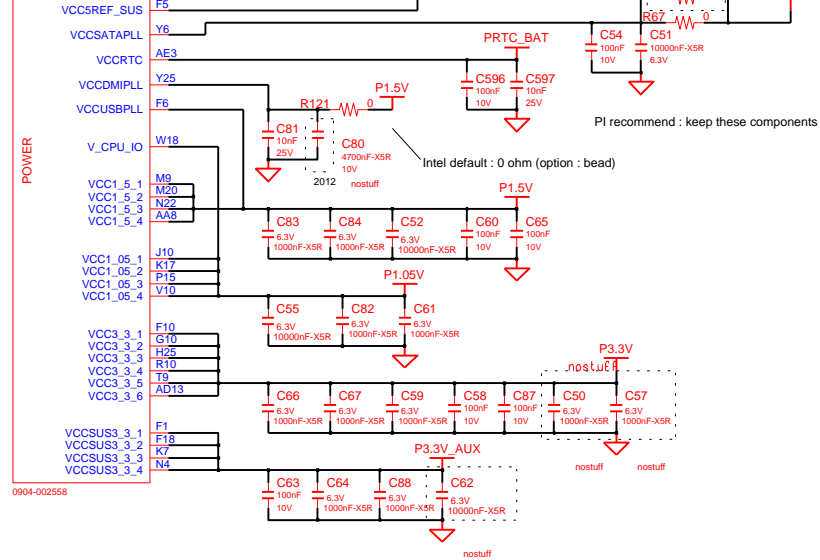
Tigerpoint (2/3)



Tigerpoint (3/3)

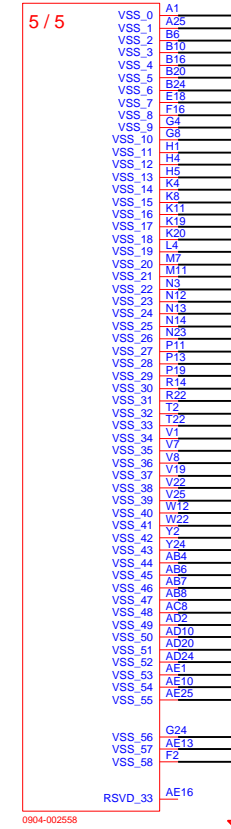
U510-4
CG82NM10

4 / 5



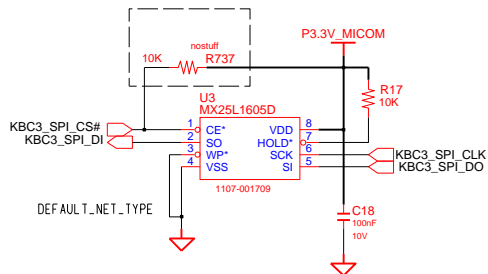
U510-5
CG82NM10

5 / 5

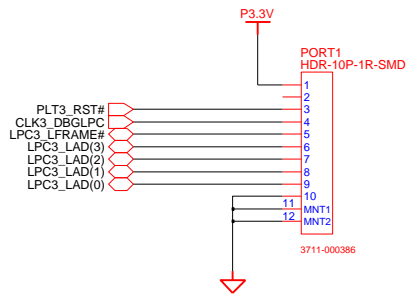


DRAW	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3 CHIPSET TIGERPOINT(3/3)	SAMSUNG ELECTRONICS PART NO. BA41-XXXXXA
CHECK	Ahn KR	DEV. STEP	PV			
APPROVAL	Kim.HS	REV	1.0			
MODULE CODE		LAST EDIT		July 13, 2010 21:01:08 PM	PAGE 15 OF 44	

SPI_BIOS_ROM



80H DECODER CONNECTOR

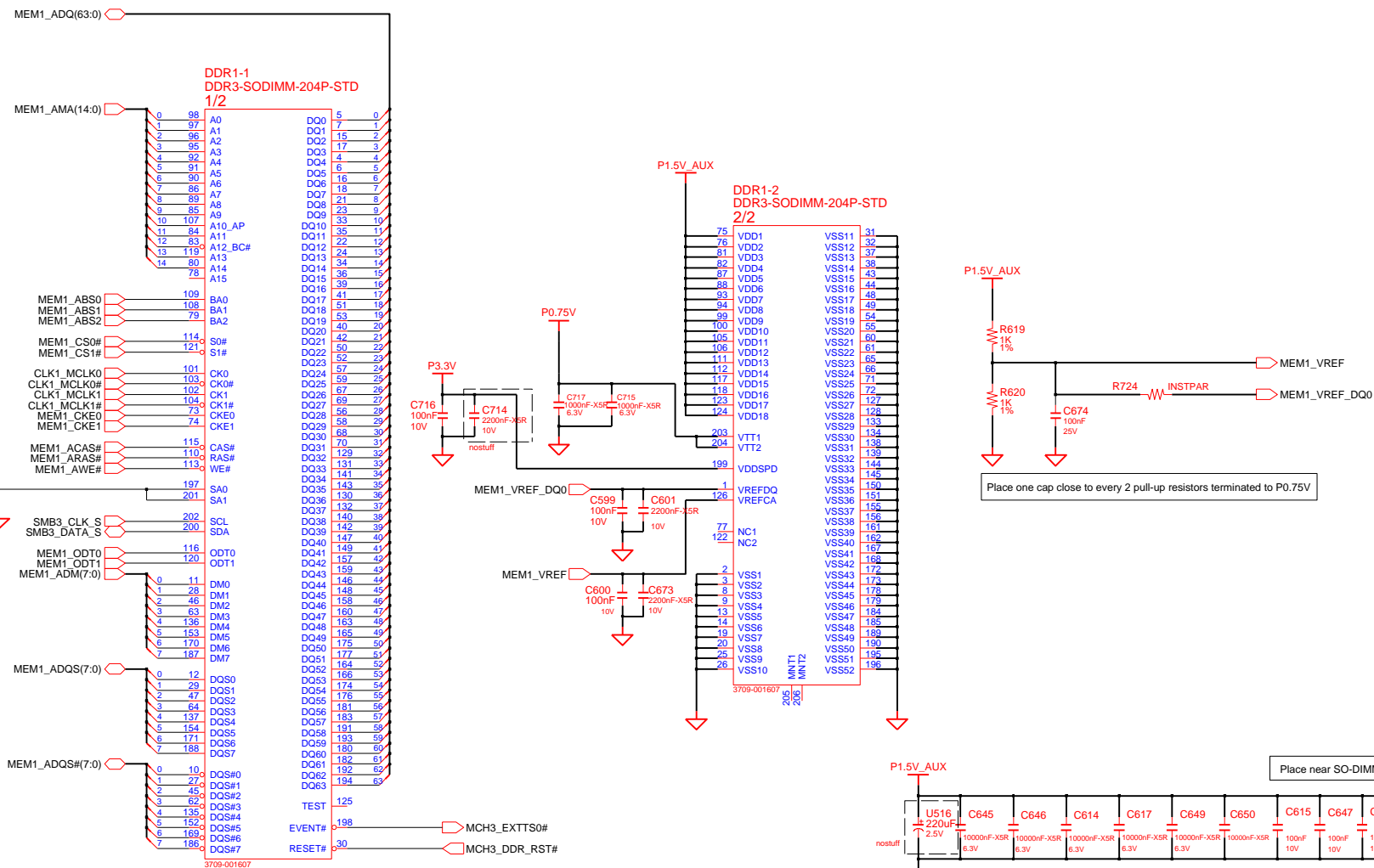


02	VERIFY REAL MODE	66	CONFIGURE ADVANCE CACHE REG.
03	DISABLE NMI	6A	DISPLAY EXTERNAL CACHE SIZE
04	GET CPU TYPE	6C	DISPLAY SHADOW MESSAGE
06	INIT. SYSTEM H/W	6E	DISPLAY NON-DISPOSABLE SEGMENT
08	INIT. CHIPSET REG.	70	DISPLAY ERROR MESSAGE
09	SET IN POST FLAG	72	CHECK FOR CONFIGURATION ERROR
0A	INIT CPU REG	74	TEST REAL-TIME CLOCK
0B	CPU CACHE ON	76	CHECK FOR KEYBOARD ERROR
0C	INIT CACHE TO POST	7C	SETUP HARDWARE INTERRUPT VECTOR
0E	INIT. IO VALUE	7E	TEST COPROCESSER IF PRESENT
0F	ENABLE THE L-BUS IDE	80	DISABLE ON-BOARD I/O PORT
10	INIT. POWER MANAGER	82	DETECT AND INSTALL EXT RS232C
11	LOAD ALTERNATE REG	84	DETECT AND INSTALL EXT PARALLEL
13	PCI BUS MASTER RESET	86	RE-INIT. ON-BOARD I/O PORT
		88	INIT. BIOS DATA ROM
	WITH INITIAL POST VALUE	8A	INIT. EXTENDED BIOS DATA AREA
14	INIT. KEYBOARD CONTROLLER	8C	INIT. FDD CONTROLLER
16	CHECK CHECKSUM	9A	SHADOW OPTION ROMS
18	8254 TIMER INIT	9C	SETUP POWER MANAGEMENT
1A	8237 DMA CONTROLLER INIT.	9E	ENABLE H/W INTERRUPT
1C	RESET INTERRUPT CONTROLLER	A0	SET TIME OF DAY
20	TEST DRAM REFRESH	A4	INIT. TYPEMATIC RATE
22	TEST 8742 KEYBOARD CONTROLLER	A8	ERASE F2 PROMPT
24	SET ES SEGMENT REG. TO 4GB	AA	SCAN FOR F2 KEY STROKE
26	ENABLE A20	AC	ENTER SETUP
28	AUTO SIZING DRAM	AE	CLEAR IN POST FLAG
32	COMPUTE THE CPU SPEED	B0	CHECK FOR ERRORS
34	TEST CMOS RAM	B2	POST DONE-PREPARE TO BOOT O/S
38	SHADOW SYSTEM BIOS ROM	B4	ONE BEEP
3A	AUTO SIZING CACHE	B6	CHECK PASSWORD (OPTION)
3C	CONFIGURE ADVANCED CHIPSET REG.	B7	ACPI INIT
3D	LOAD ALTER REG. WITH CMOS VALUE	BA	DMI INIT
42	INIT. INTERRUPT VECTOR	BE	CLEAR SCREEN
44	INIT. BIOS INTERRUPT	C0	TRY BOOT WITH INT19
46	CHECK ROM COPYRIGHT NOTICE	D0	INTERRUPT HANDLER ERROR
47	INIT. I20 SUPPORT IF INSTALLED	D2	UNKNOWN INTERRUPT ERROR
48	CHECK VIDEO CONFIGURE AGAINST CMOS	D4	PENDING INTERRUPT ERROR
49	INIT. PCI BUS AND DEVICE	D6	SHUTDOWN 5
4A	INIT. ALL VIDEO BIOS ROM	D8	SHUTDOWN ERROR
4C	SHADOW VIDEO BIOS ROM	DA	EXTENDED BLOCK MOVE
50	DISPLAY CPU TYPE AND SPEED	DC	SHUTDOWN 10
52	TEST KEYBOARD	D9	ENABLE NMI
54	SET KEYCLICK IF ENABLED	90	INIT. HDD CONTROLLER
56	ENABLE KEYBOARD	91	INIT. LOCAL BUS HDD CONTROLLER
58	TEST FOR UNEXPECTED INTERRUPTS	92	JUMP TO USER PATCH 2
5A	DISPLAY PRESS SETUP	94	DISABLE A20 ADDRESS LINE
5C	TEST RAM BETWEEN 812K AND 640K	96	CLEAR HUGE ES SEGMENT REG.
60	TEST EXTENDED MEMORY	98	SEARCH FOR OPTION ROMS
62	TEST EXTENDED MEMORY ADDRESS LINE		
64	JUMP TO USER PATCH 1		

DRAW	BS Choe	DATE	01/08/2009	TITLE Shark10_DDR3 SPI_BIOS_ROM SPI_BIOS_ROM		SAMSUNG ELECTRONICS	
CHECK	Ahn KR	DEV. STEP	PV				
APPROVAL	Kim.HS	REV	1.0				
MODULE CODE	LAST EDIT		July 13, 2010 21:01:08 PM				
				PAGE	16	OF	44

Height : 4 mm (STANDARD)

P/N : 3709-001560 (Foxconn)



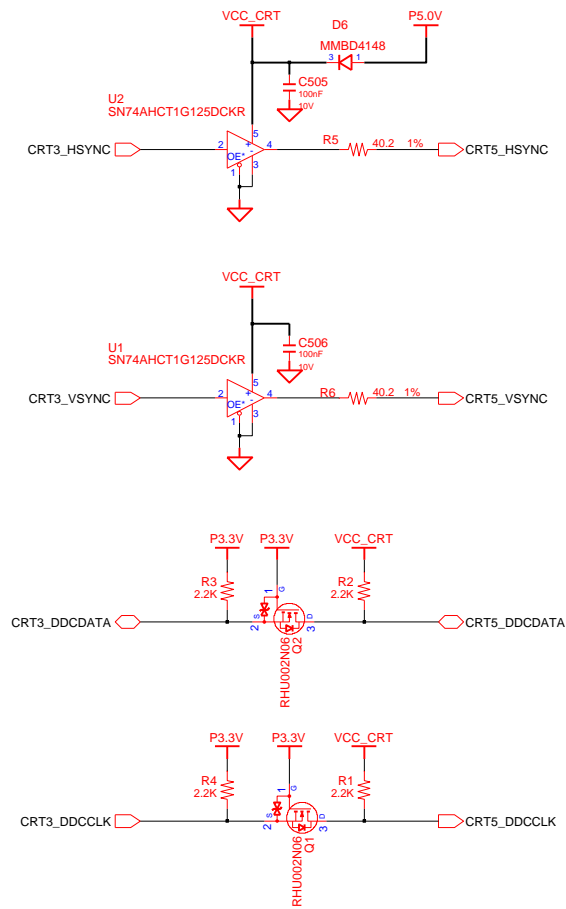
SA0	0	0
SA1	0	1
SPD ADD	0xA0	0xA2
TS ADD	0x30	0x32

DRAM	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3 SODIMM_DDR3 SODIMM_DDR3 #1	SAMSUNG ELECTRONICS	
CHECK	Ahn KR	DEV. STEP	PV				
APPROVAL	Kim,HS	REV	1.0				
MODULE CODE	LAST EDIT		July 13, 2010 21:01:08 PM				PAGE
				PART NO.	BA41-XXXXXA		

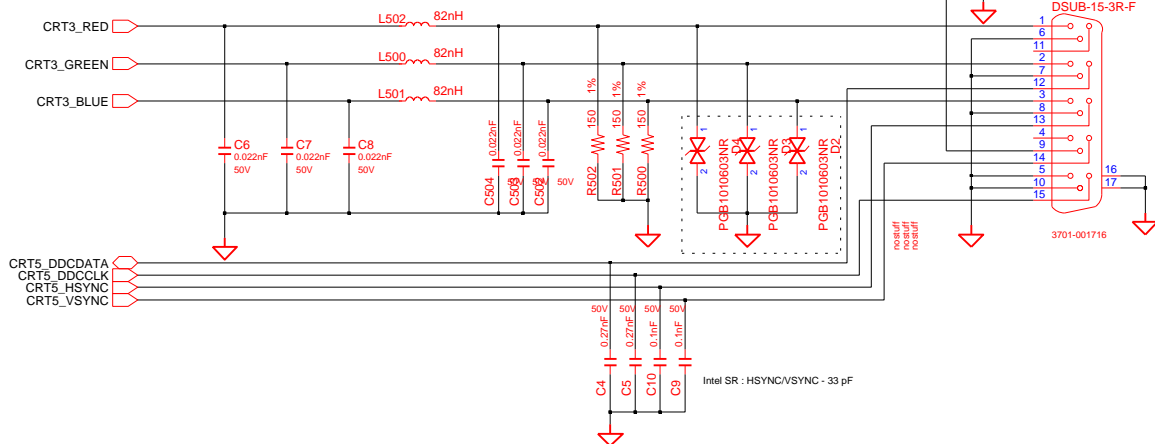
SAMSUNG PROPRIETARY

THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

CRT



CRT CONNECTOR

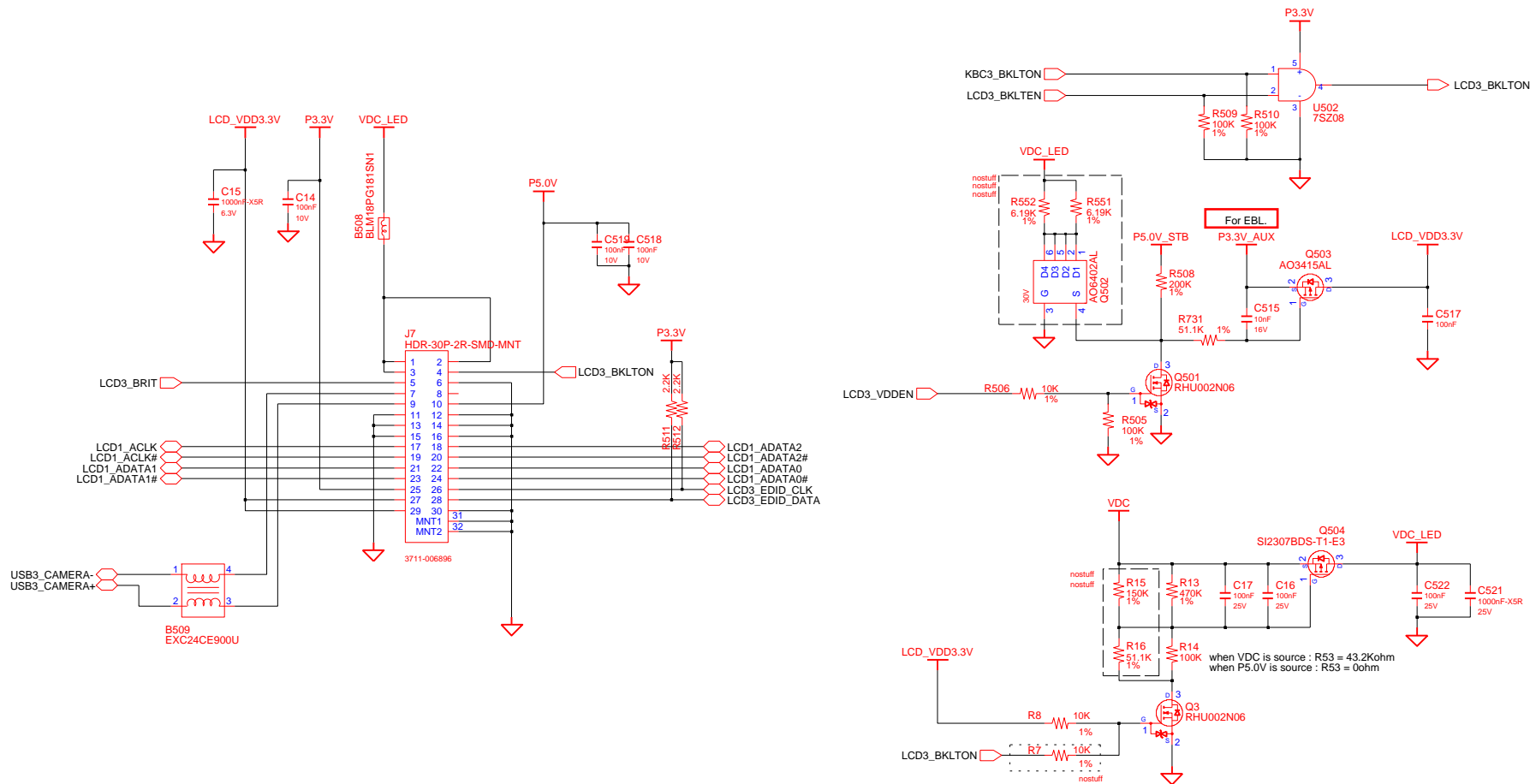


DESIGN	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3 GRAPHICS_IF CRT	SAMSUNG ELECTRONICS
CHECK	Ahn KR	DEV. STEP	PV			PART NO. BA41-XXXXXA
APPROVAL	Kim.HS	REV	1.0			
MODULE CODE		LAST EDIT	July 13, 2010 21:01:08 PM	PAGE	18	OF 44

SAMSUNG PROPRIETARY

THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

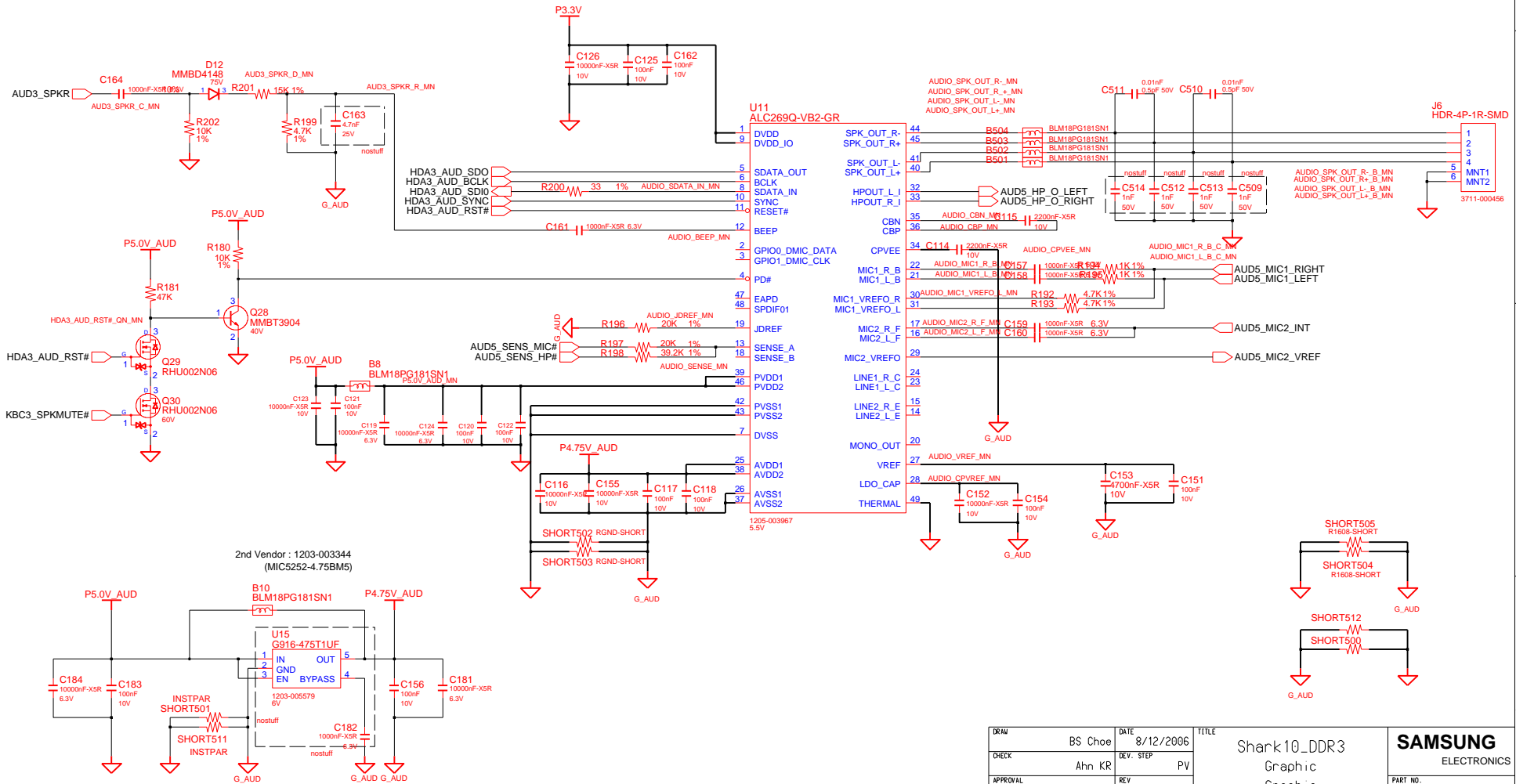
LVDS



DESIGN	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3 GRAPHICS_IF LED LCD I/F	SAMSUNG ELECTRONICS PART NO. BA41-XXXXXA
CHECK	Ahn KR	DEV. STEP	PV			
APPROVAL	Kim.HS	REV	1.0			
MODULE CODE		LAST EDIT	July 13, 2010 21:01:08 PM	PAGE	19 OF 44	

HD AUDIO

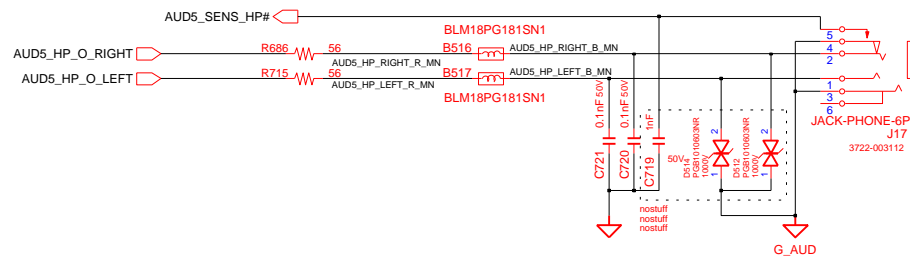
Codec Pin9 Setting	
S/B with Low Voltage IO	S/B without Low Voltage IO
Pin9 : 1.5V	Pin9 : 3.3V



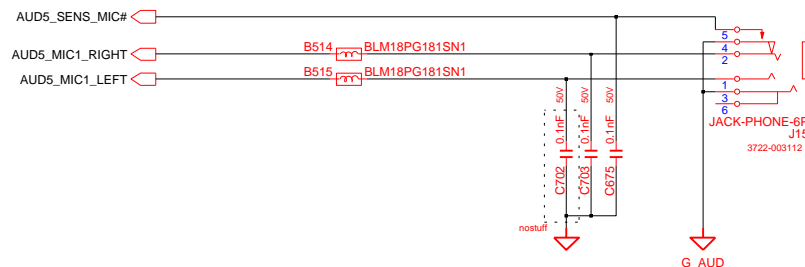
SAMSUNG PROPRIETARY

THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

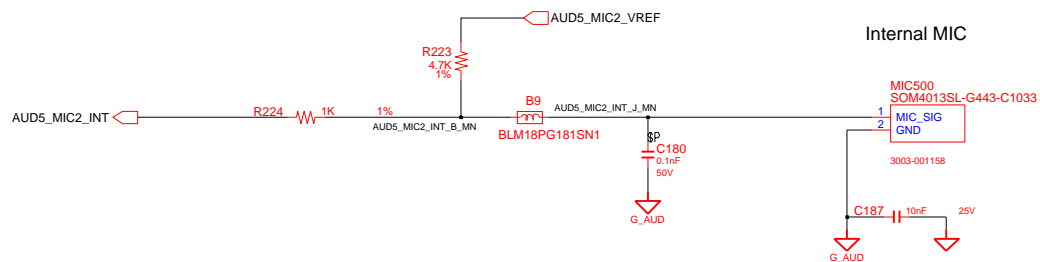
HEADPHONE



MIC JACK



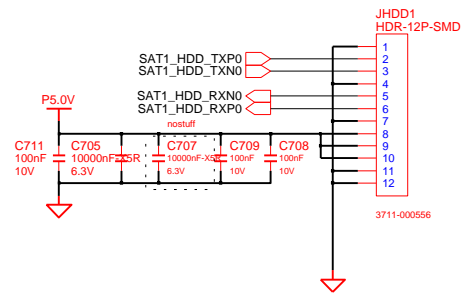
Internal MIC



DESIGN	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3	SAMSUNG ELECTRONICS PART NO. BA41-XXXXXA
CHECK	Ahn KR	DEV. STEP	PV		AUDIO	
APPROVAL	Kim.HS	REV	1.0		AUDIO	
MODULE CODE		LAST EDIT				
				July 13, 2010 21:01:08 PM	PAGE 21 OF 44	

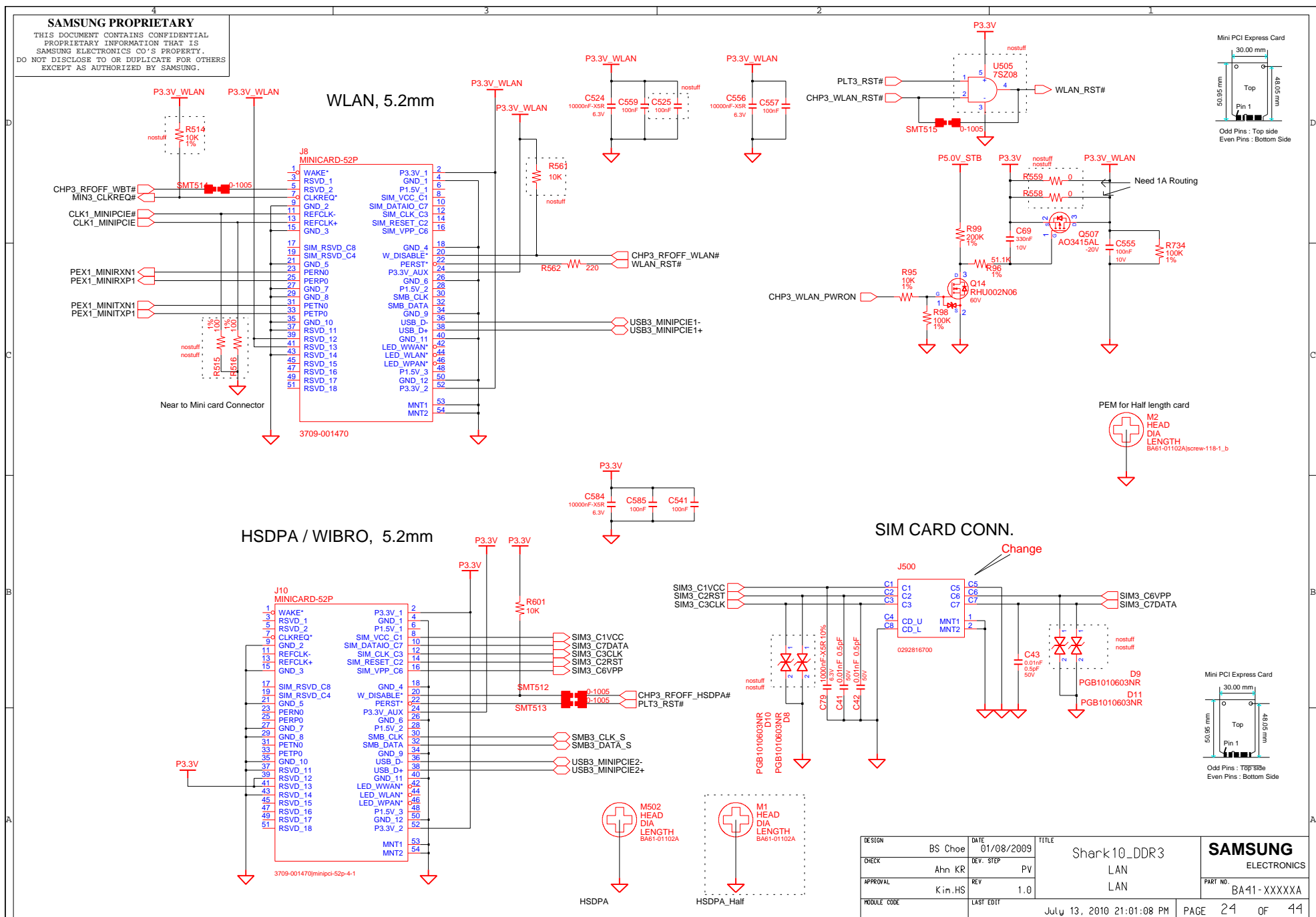
SATA I/F CONN

SATA HDD Cable Connector



DESIGN	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3	SAMSUNG ELECTRONICS PART NO. BA41-XXXXXA
CHECK	Ahn KR	DEV. STEP	PV		AUDIO	
APPROVAL	Kim.HS	REV	1.0		AUDIO	
MODULE CODE		LAST EDIT		July 13, 2010 21:01:08 PM	PAGE 22 OF 44	

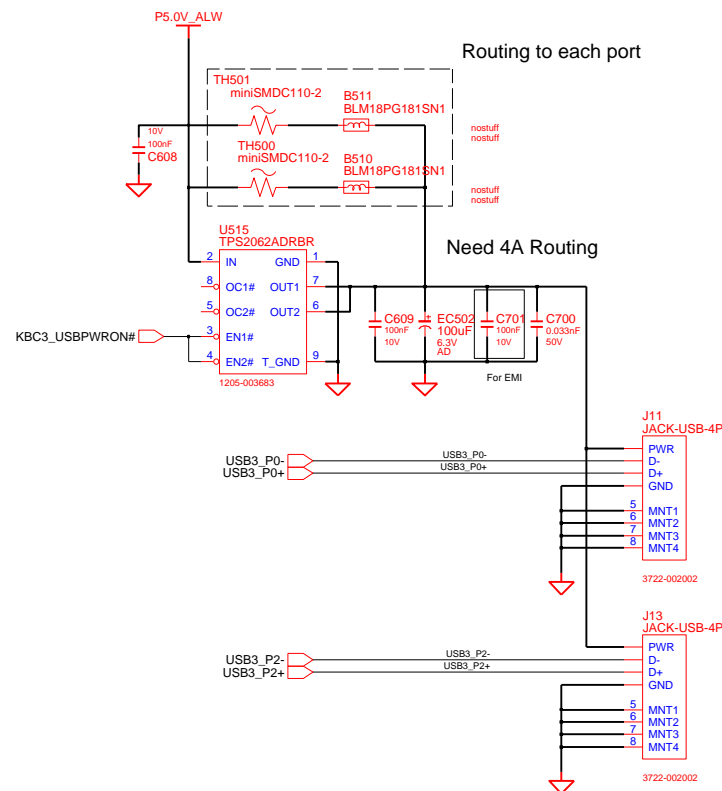
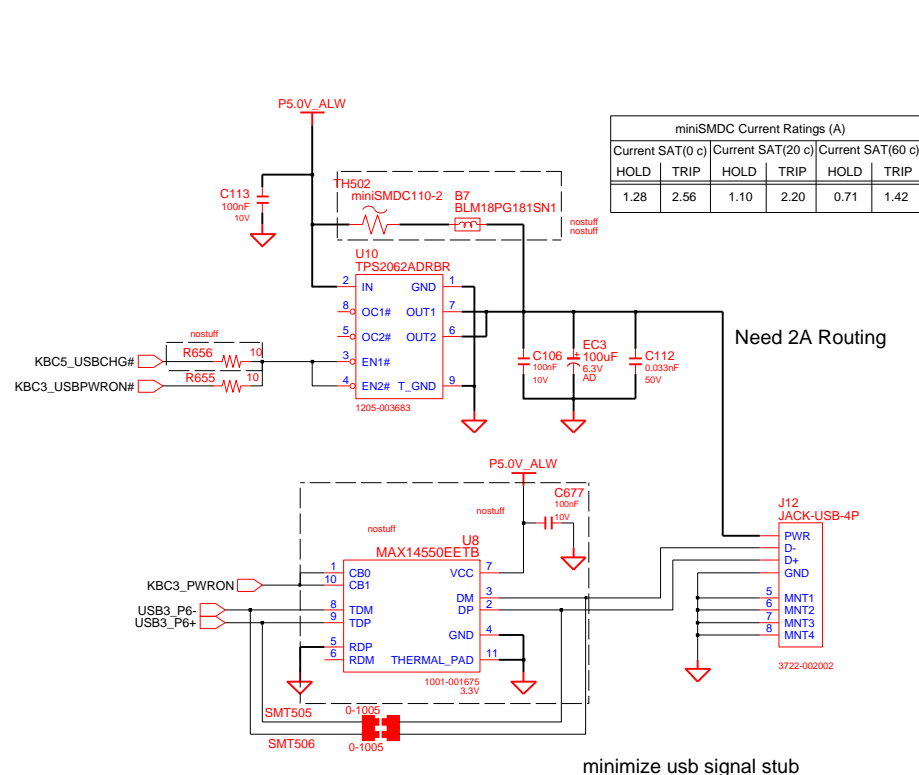
COM-22C-015(1996.6.5) REV. 3



SAMSUNG PROPRIETARY

THIS DOCUMENT CONTAINS CONFIDENTIAL
 PROPRIETARY INFORMATION THAT IS
 SAMSUNG ELECTRONICS CO.'S PROPERTY.
 DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
 EXCEPT AS AUTHORIZED BY SAMSUNG.

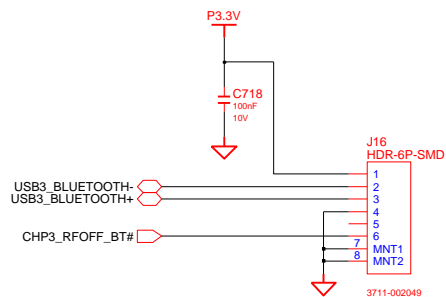
3 PORT USB CONNECTOR



DESIGN	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3 SATA_DEVICES SATA	SAMSUNG ELECTRONICS
CHECK	Ahn KR	DEV. STEP	PV			PART NO. BA41-XXXXXA
APPROVAL	Kim.HS	REV	1.0			
MODULE CODE		LAST EDIT	July 13, 2010 21:01:08 PM	PAGE	25	OF 44

THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

Bluetooth Interface



Wi-Max Sku Only

CAMERA

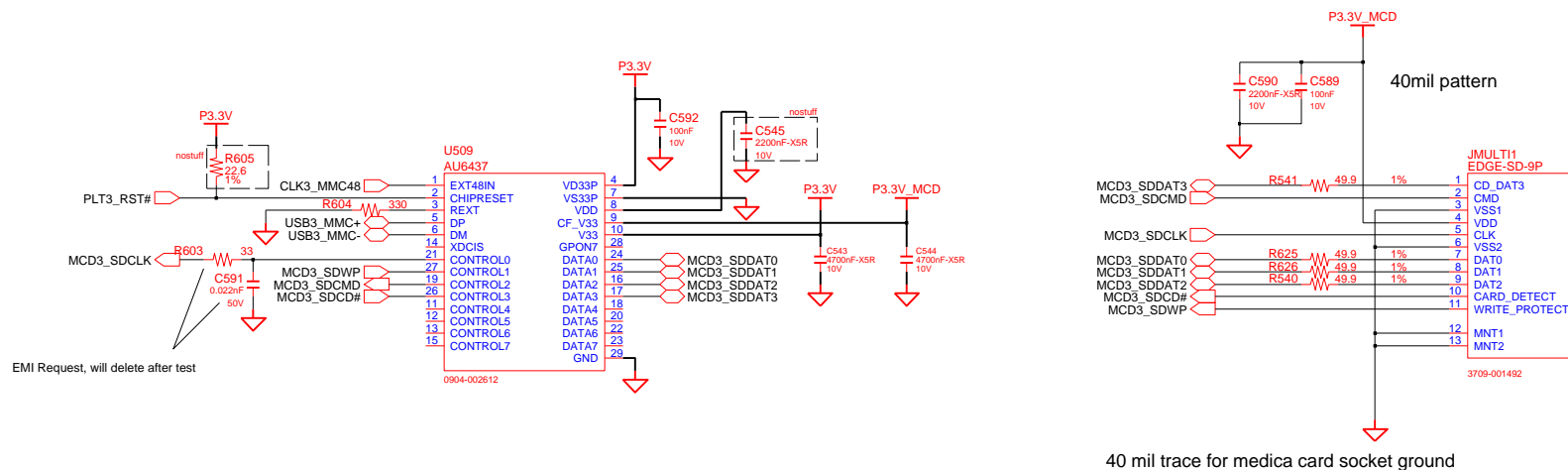
Camra I/F Circuit was moved to LVDS I/F Circuit Block.

DESIGN	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3 MINI_PCIE_CONN MINI PCI	SAMSUNG ELECTRONICS
CHECK	Ahn KR	DEV. STEP	PV			
APPROVAL	Kim.HS	REV	1.0			
MODULE CODE	LAST EDIT		July 13, 2010 21:01:08 PM			
				PART NO.	BA41-XXXXXA	

SAMSUNG PROPRIETARY

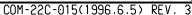
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

AU6437 (4-in-1)



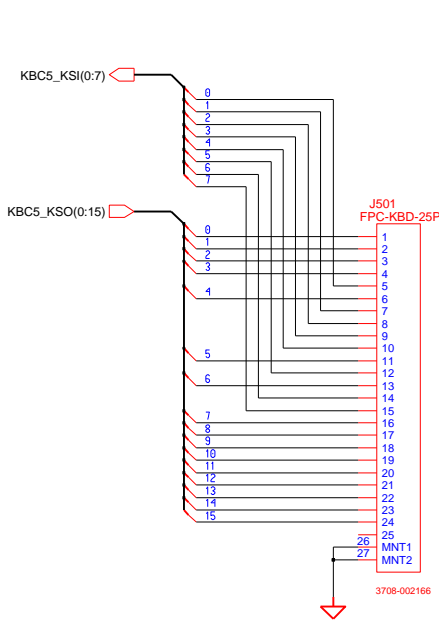
DESIGN	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3	SAMSUNG ELECTRONICS
CHECK	Ahn KR	DEV. STEP	PV		USB_CONN	
APPROVAL	Kim.HS	REV	1.0		USB PORT	
MODULE CODE		LAST EDIT				
July 13, 2010 21:01:08 PM						PAGE 27 OF 44

SMSC

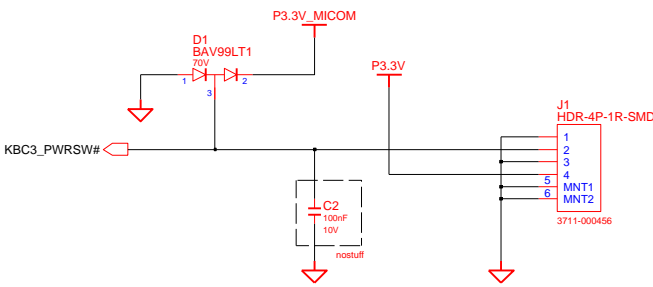


Micom Glue Logic

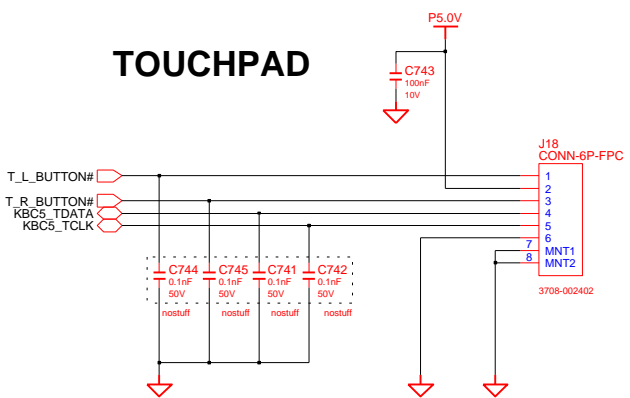
KEYBOARD



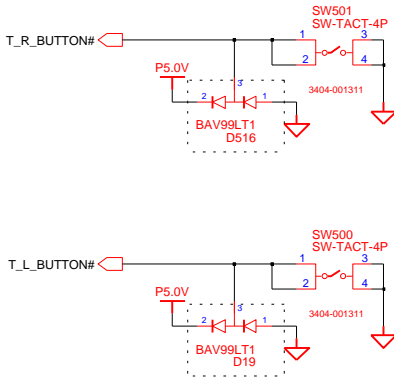
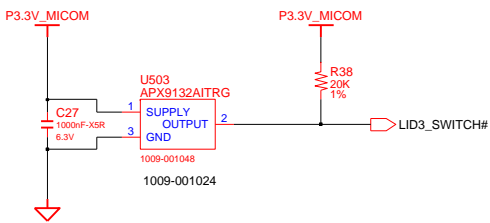
POWER ON/OFF TO SUB Board



TOUCHPAD



LID_SWITCH

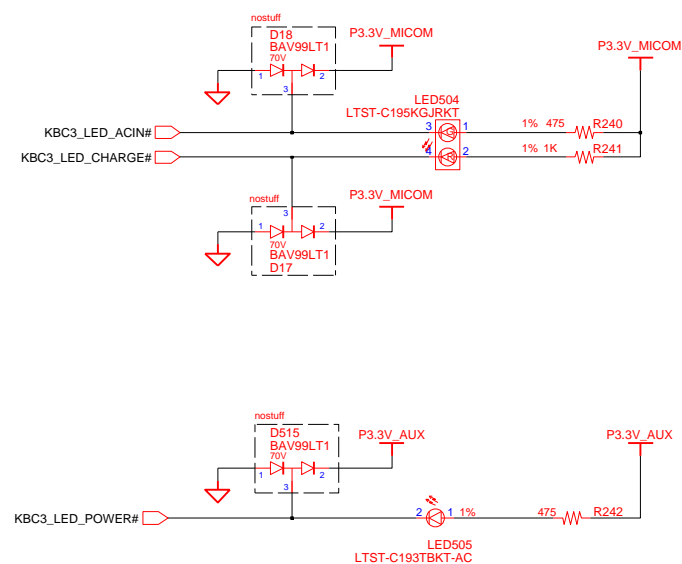
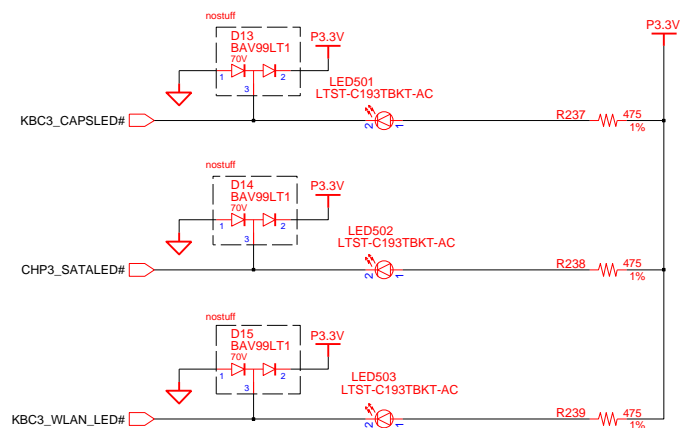


DRAW	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3	SAMSUNG ELECTRONICS PART NO. BA41-XXXXXA
CHECK	Ahn KR	DEV. STEP	PV		OTHERS	
APPROVAL	Kim.HS	REV	1.0		MMC	
MODULE CODE		LAST EDIT	July 13, 2010 21:01:08 PM	PAGE	29 OF 43	

SAMSUNG PROPRIETARY

THIS DOCUMENT CONTAINS CONFIDENTIAL
 PROPRIETARY INFORMATION THAT IS
 SAMSUNG ELECTRONICS CO.'S PROPERTY.
 DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
 EXCEPT AS AUTHORIZED BY SAMSUNG.

LED SWITCH LOGIC



DRAW	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3	SAMSUNG ELECTRONICS PART NO. BA41-XXXXXA
CHECK	Ahn KR	DEV. STEP	PV	MICOM_Renesas2110_100p		
APPROVAL	Kim.HS	REV	1.0	MICOM_Renesas2110_100p		
MODULE CODE		LAST EDIT				
				July 13, 2010 21:01:08 PM	PAGE 30 OF 44	

THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

[illegible]

LOC	VALUE	
	SINGLE (CODE)	DUAL (CODE)
R678	nostuff	2.49K (2007-007617)
TH1	nostuff	stuff (1404-001152)
R698	5.62k (2007-007878)	11K (2007-002900)
R696	499ohm (2007-008429)	1K (2007-007318)
R695	332ohm (2007-007788)	1K (2007-007318)
R693	200k (2007-007334)	270K (2007-007592)
R692	220ohm (2007-000570)	665ohm (2007-008194)
C727	2.2nF (2203-000489)	1.0nF (2203-000438)
C728	0.47nF (2203-000940)	0.22nF (2203-000585)
C726	0.1nF (2203-000233)	0.047nF (2203-000995)
C723	nostuff	stuff (2203-002050)

DESIGN	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3 MICOM MICOM GLUE LOGIC	SAMSUNG ELECTRONICS		
CHECK	Ahn KR	DEV. STEP	PV					
APPROVAL	Kim.HS	REV	1.0					
MODULE CODE	LAST EDIT		July 13, 2010 21:01:08 PM				PAGE	31
				PART NO.	BA41-XXXXXA			

THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

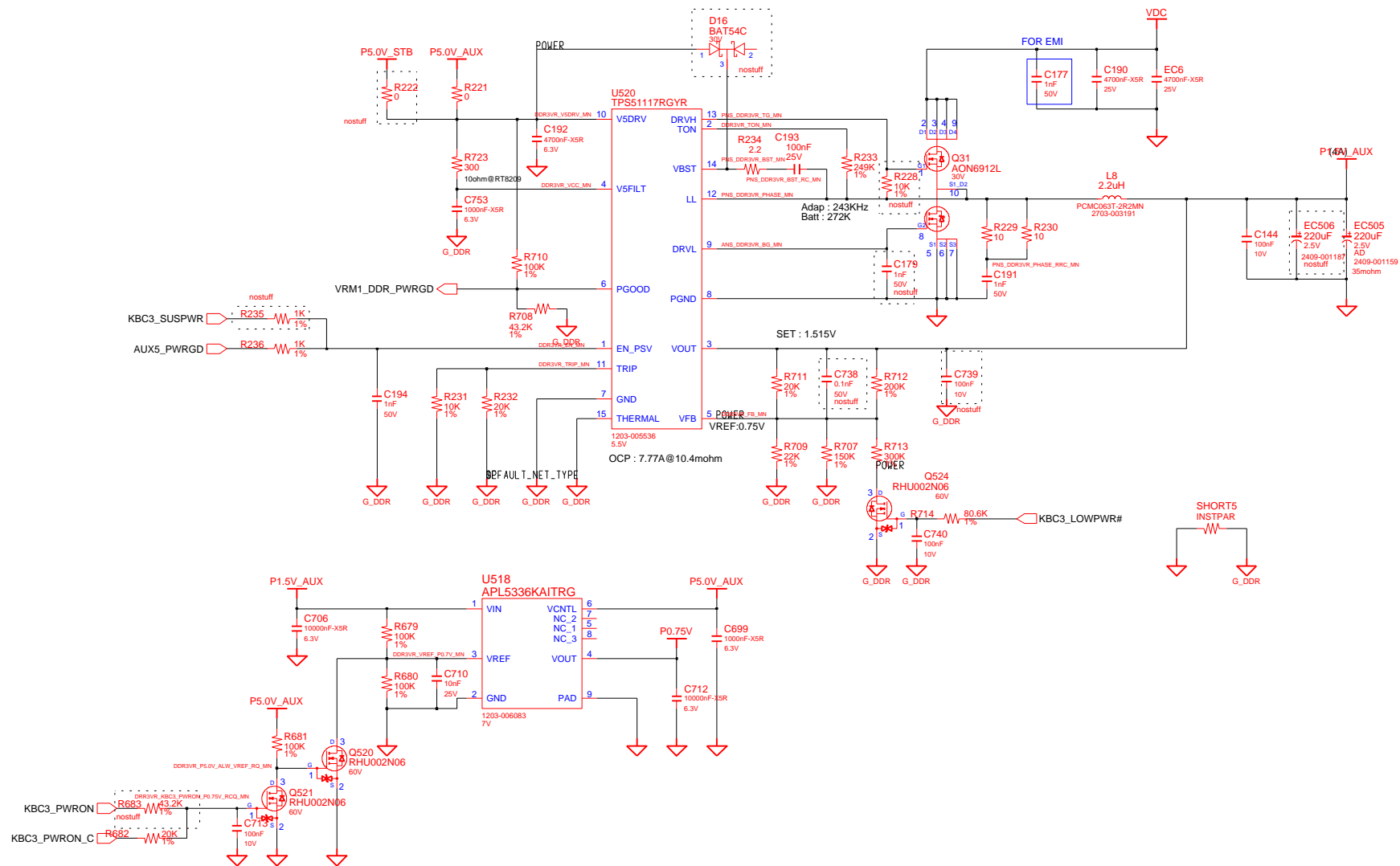
The schematic diagram illustrates the power management section of the Shark10_DDR3 board, centered around the U14 TPS54319RTER DC-DC converter. The input is derived from the P3.3V_AUX supply, which is filtered by C188 (10000nF-XSR, 6.3V) and C189 (100nF, 10V). The output of the converter is the P5.0V_AUX supply, which is filtered by R218 (100K, 1%) and C178 (1nF, 50V, nostuff). The converter's output is also connected to the GCORE5_PWGRD signal. The U14 is configured with VIN1, VIN2, and VIN3 pins connected to the input, and VSENSE, BOOT, PH1, PH2, and PH3 pins connected to the output. The output is filtered by C176 (100nF, 10V) and L7 (1.5uH). The output is also connected to the G_GCORE signal. The U14 is connected to the G_GCORE signal through a network of resistors (R706, R704, R705, R707, R708, R709, R710, R711, R712, R713, R714, R715, R716, R717, R718, R719, R720, R721, R722, R723, R724, R725, R726, R727, R728, R729, R730, R731, R732, R733, R734, R735, R736, R737, R738, R739, R740, R741, R742, R743, R744, R745, R746, R747, R748, R749, R750, R751, R752, R753, R754, R755, R756, R757, R758, R759, R760, R761, R762, R763, R764, R765, R766, R767, R768, R769, R770, R771, R772, R773, R774, R775, R776, R777, R778, R779, R780, R781, R782, R783, R784, R785, R786, R787, R788, R789, R790, R791, R792, R793, R794, R795, R796, R797, R798, R799, R800, R801, R802, R803, R804, R805, R806, R807, R808, R809, R810, R811, R812, R813, R814, R815, R816, R817, R818, R819, R820, R821, R822, R823, R824, R825, R826, R827, R828, R829, R830, R831, R832, R833, R834, R835, R836, R837, R838, R839, R840, R841, R842, R843, R844, R845, R846, R847, R848, R849, R850, R851, R852, R853, R854, R855, R856, R857, R858, R859, R860, R861, R862, R863, R864, R865, R866, R867, R868, R869, R870, R871, R872, R873, R874, R875, R876, R877, R878, R879, R880, R881, R882, R883, R884, R885, R886, R887, R888, R889, R890, R891, R892, R893, R894, R895, R896, R897, R898, R899, R900, R901, R902, R903, R904, R905, R906, R907, R908, R909, R910, R911, R912, R913, R914, R915, R916, R917, R918, R919, R920, R921, R922, R923, R924, R925, R926, R927, R928, R929, R930, R931, R932, R933, R934, R935, R936, R937, R938, R939, R940, R941, R942, R943, R944, R945, R946, R947, R948, R949, R950, R951, R952, R953, R954, R955, R956, R957, R958, R959, R960, R961, R962, R963, R964, R965, R966, R967, R968, R969, R970, R971, R972, R973, R974, R975, R976, R977, R978, R979, R980, R981, R982, R983, R984, R985, R986, R987, R988, R989, R990, R991, R992, R993, R994, R995, R996, R997, R998, R999, R1000, R1001, R1002, R1003, R1004, R1005, R1006, R1007, R1008, R1009, R1010, R1011, R1012, R1013, R1014, R1015, R1016, R1017, R1018, R1019, R1020, R1021, R1022, R1023, R1024, R1025, R1026, R1027, R1028, R1029, R1030, R1031, R1032, R1033, R1034, R1035, R1036, R1037, R1038, R1039, R1040, R1041, R1042, R1043, R1044, R1045, R1046, R1047, R1048, R1049, R1050, R1051, R1052, R1053, R1054, R1055, R1056, R1057, R1058, R1059, R1060, R1061, R1062, R1063, R1064, R1065, R1066, R1067, R1068, R1069, R1070, R1071, R1072, R1073, R1074, R1075, R1076, R1077, R1078, R1079, R1080, R1081, R1082, R1083, R1084, R1085, R1086, R1087, R1088, R1089, R1090, R1091, R1092, R1093, R1094, R1095, R1096, R1097, R1098, R1099, R1100, R1101, R1102, R1103, R1104, R1105, R1106, R1107, R1108, R1109, R1110, R1111, R1112, R1113, R1114, R1115, R1116, R1117, R1118, R1119, R1120, R1121, R1122, R1123, R1124, R1125, R1126, R1127, R1128, R1129, R1130, R1131, R1132, R1133, R1134, R1135, R1136, R1137, R1138, R1139, R1140, R1141, R1142, R1143, R1144, R1145, R1146, R1147, R1148, R1149, R1150, R1151, R1152, R1153, R1154, R1155, R1156, R1157, R1158, R1159, R1160, R1161, R1162, R1163, R1164, R1165, R1166, R1167, R1168, R1169, R1170, R1171, R1172, R1173, R1174, R1175, R1176, R1177, R1178, R1179, R1180, R1181, R1182, R1183, R1184, R1185, R1186, R1187, R1188, R1189, R1190, R1191, R1192, R1193, R1194, R1195, R1196, R1197, R1198, R1199, R1200, R1201, R1202, R1203, R1204, R1205, R1206, R1207, R1208, R1209, R1210, R1211, R1212, R1213, R1214, R1215, R1216, R1217, R1218, R1219, R1220, R1221, R1222, R1223, R1224, R1225, R1226, R1227, R1228, R1229, R1230, R1231, R1232, R1233, R1234, R1235, R1236, R1237, R1238, R1239, R1240, R1241, R1242, R1243, R1244, R1245, R1246, R1247, R1248, R1249, R1250, R1251, R1252, R1253, R1254, R1255, R1256, R1257, R1258, R1259, R1260, R1261, R1262, R1263, R1264, R1265, R1266, R1267, R1268, R1269, R1270, R1271, R1272, R1273, R1274, R1275, R1276, R1277, R1278, R1279, R1280, R1281, R1282, R1283, R1284, R1285, R1286, R1287, R1288, R1289, R1290, R1291, R1292, R1293, R1294, R1295, R1296, R1297, R1298, R1299, R1300, R1301, R1302, R1303, R1304, R1305, R1306, R1307, R1308, R1309, R1310, R1311, R1312, R1313, R1314, R1315, R1316, R1317, R1318, R1319, R1320, R1321, R1322, R1323, R1324, R1325, R1326, R1327, R1328, R1329, R1330, R1331, R1332, R1333, R1334, R1335, R1336, R1337, R1338, R1339, R1340, R1341, R1342, R1343, R1344, R1345, R1346, R1347, R1348, R1349, R1350, R1351, R1352, R1353, R1354, R1355, R1356, R1357, R1358, R1359, R1360, R1361, R1362, R1363, R1364, R1365, R1366, R1367, R1368, R1369, R1370, R1371, R1372, R1373, R1374, R1375, R1376, R1377, R1378, R1379, R1380, R1381, R1382, R1383, R1384, R138

DRAM	BS Choe	DATE	8/12/2006	TITLE	Shark10_DDR3 LED_Switch LED_Switch	SAMSUNG ELECTRONICS
CHECK	Ahn KR	DEV. STEP	PV			
APPROVAL	Kim.HS	REV	1.0			
MODULE CODE	LAST EDIT		July 13, 2010 21:01:08 PM			
				PART NO.	BA41-XXXXXA	

SAMSUNG PROPRIETARY

THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

DDR3 Power (P1.5V_AUX & 0.75V)



DRAW	BS Choe	DATE	8/12/2006	TITLE	Shark10_DDR3	SAMSUNG ELECTRONICS
CHECK	Ahn KR	DEV. STEP	PV		PWR_Memory	
APPROVAL	Kin.HS	REV	1.0		PWR_Memory	PART NO. BA41-XXXXXA
MODULE CODE	undefined	LAST EDIT	July 13, 2010 21:01:08 PM	PAGE	33	OF 44

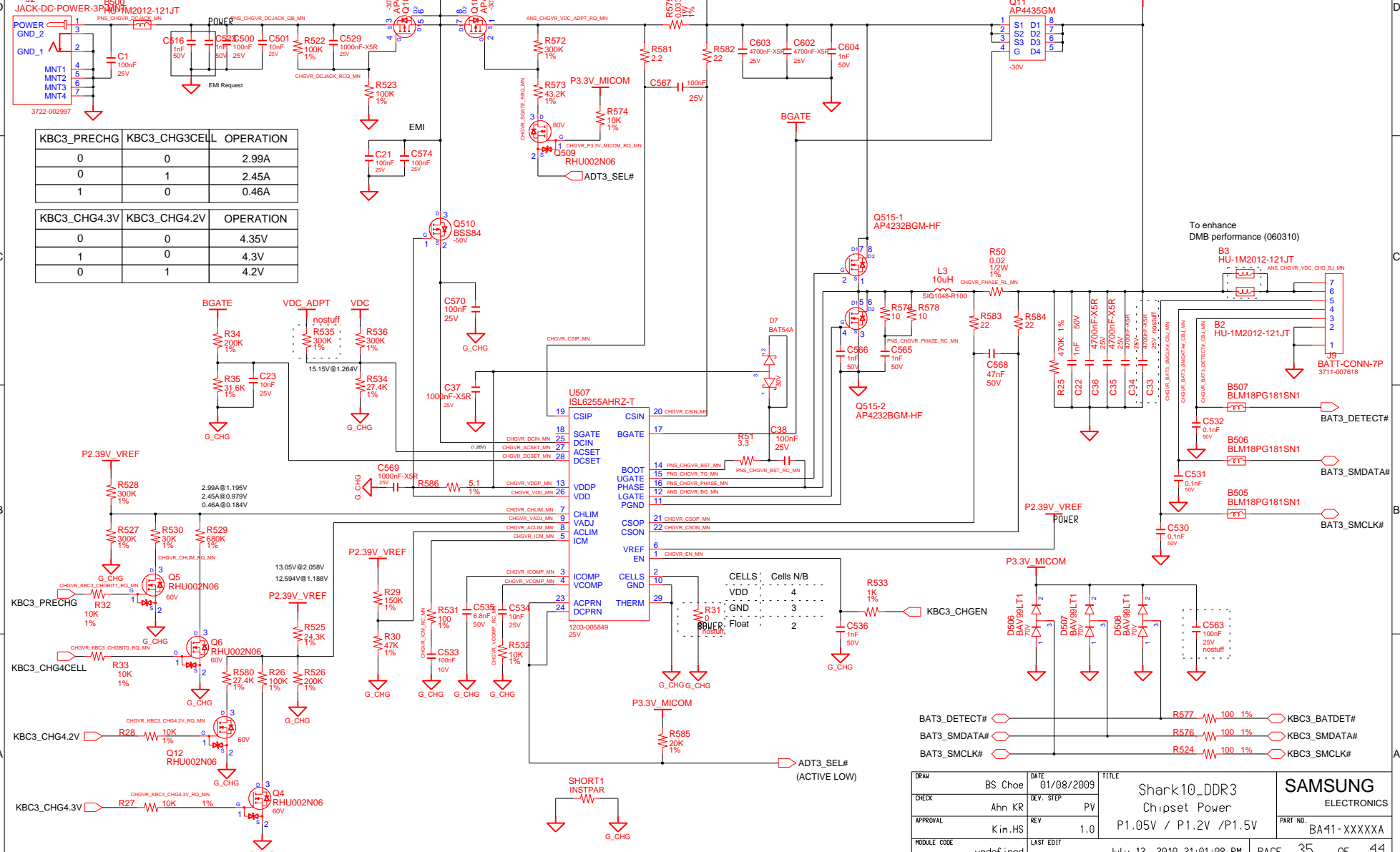
THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

[illegible]

DESIGN	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3 POWER CPU VRM	SAMSUNG ELECTRONICS	
CHECK	Ahn KR	REV. STEP	PV				
APPROVAL	Kim HS	REV	1.0				
MODULE CODE	LAST EDIT		July 13, 2010 21:01:08 PM				PAGE
				PART NO.		BA14-XXXXXA	

VCHG=8.4V@6600Cell
VCHG=8.7V@8850Cell
ICHG=2.99A FOR 6600mAh & 8850mAh

VDC_ADPT 1 957 A GM VDC

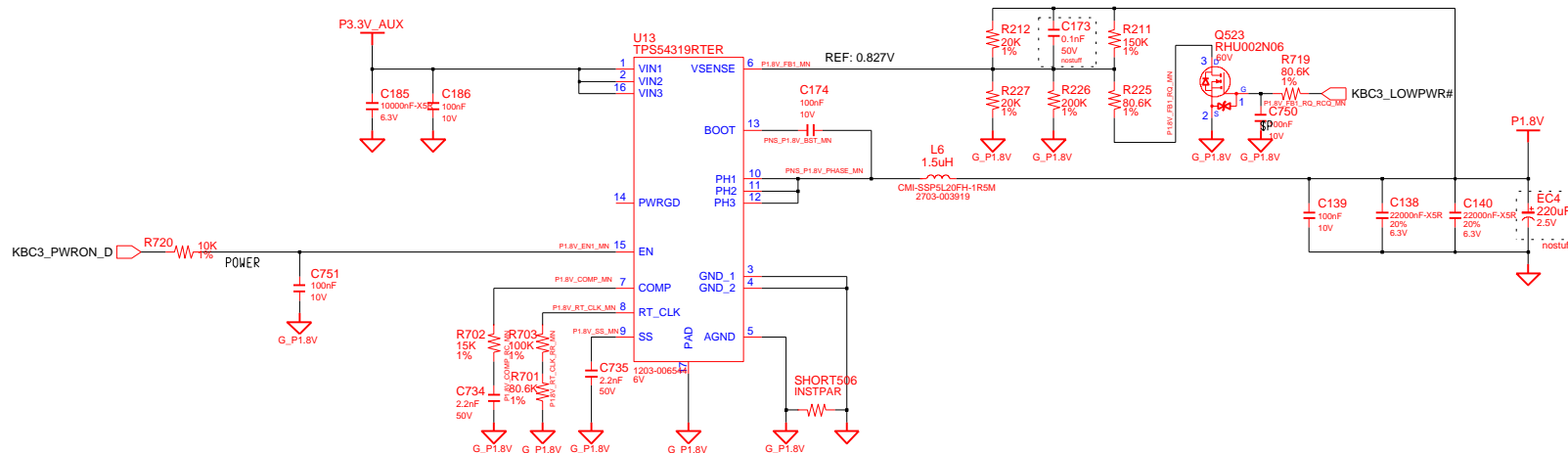


DRAW	BS Choe	DATE	01/08/2009	Shark10_DDR3 Chipset Power P1.05V / P1.2V / P1.5V		SAMSUNG ELECTRONICS PART NO. BA41-XXXXXA	
CHECK	Ahn KR	REV. STEP	PV				
APPROVAL	Kim.HS	REV	1.0				
MODULE CODE	undefined	LAST EDIT	July 13, 2010 21:01:08 PM				

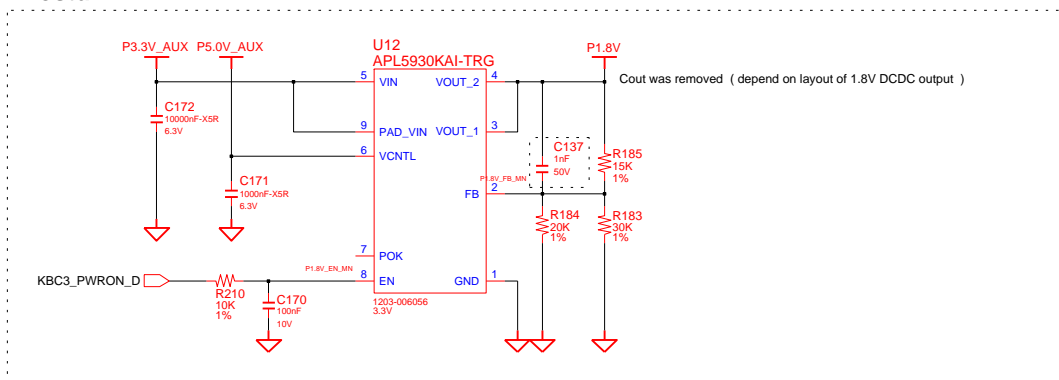
SAMSUNG PROPRIETARY

THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

Chipset Power (P1.8V)



nostuff

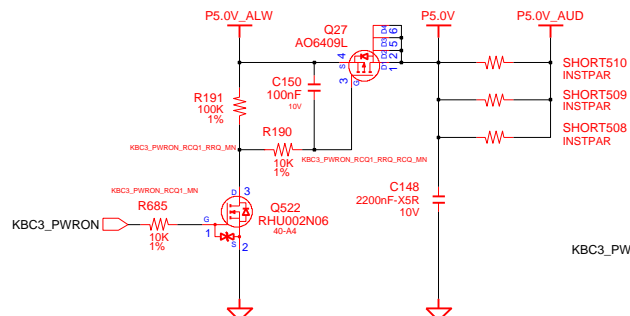


DRAW	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3	SAMSUNG ELECTRONICS PART NO. BA41-XXXXXA
CHECK	Ahn KR	DEV. STEP	PV		PWR_Memory	
APPROVAL	Kim.HS	REV	1.0		P1.8V_AUX	
MODULE CODE	undefined	LAST EDIT	July 13, 2010 21:01:08 PM	PAGE	36 OF 44	

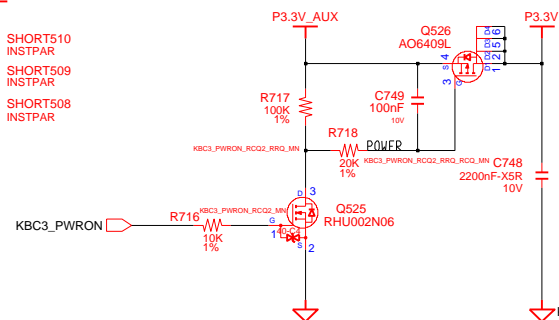
SAMSUNG PROPRIETARY

THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO.'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

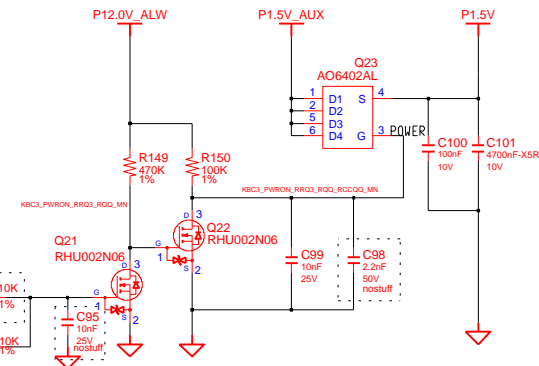
Load Switch Control (P5.0V)



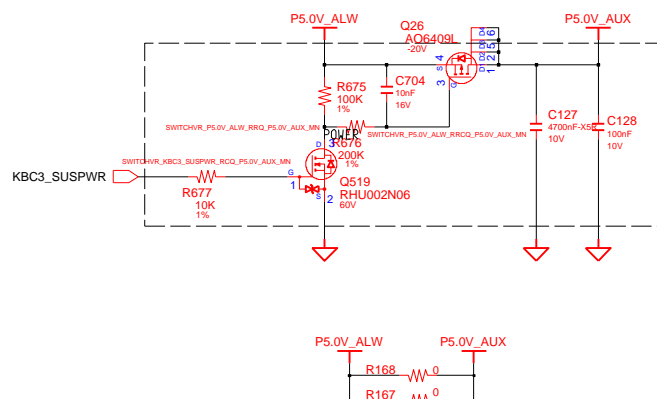
Load Switch Control (P3.3V)



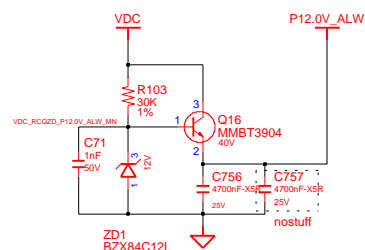
Load Switch Control (P1.5V)



Sleep'n Charger



P12V_ALW



DRAW	BS Choe	DATE	01/08/2009	TITLE	Shark10_DDR3	SAMSUNG ELECTRONICS
CHECK	Ahn KR	DEV. STEP	PV		PWR_MV_3V_5V	
APPROVAL	Kim.HS	REV	1.0		P3.3V_AUX / P5.0V_AUX	
MODULE CODE	undefined	LAST EDIT	July 13, 2010 21:01:08 PM	PAGE	37 OF 44	

[illegible]

THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

MT504 RMNT-25-70-1P MT509 RMNT-25-70-1P MT503 RMNT-25-70-1P

MT501 RMNT-25-70-1P MT510 RMNT-25-70-1P MT508 RMNT-25-70-1P

MT507
RMNT-25-70-1P

MT505
RMNT-25-70-1P

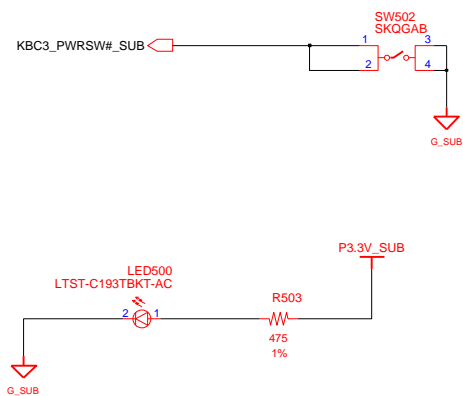
MT502 MT506
RMNT-45-70-1P RMNT-45-70-1P

PCB REVISION CONTROL (ICT)				
NO	CONNECTION	DATE(Y/Y/MM/DD)	REVISION	STEP
1	N.C.			
2	1-2			
3	2-3			
4	3-1			
5	1-2-3			
6	N.C.			
7	1-2			
8	2-3			
9	3-1			
10	1-2-3			


DESIGN	BS Choe	DATE	01/08/2009	TITLE	Shark 10_DDR3 INT GFX POWER 0.89V	SAMSUNG ELECTRONICS
CHECK	Ahn KR	DEV. STEP	PV			
APPROVAL	Kim.HS	REV	1.0			
MODULE CODE	LAST EDIT		July 13, 2010 21:01:08 PM			
				PART NO.	BA41-XXXXXA	

THIS DOCUMENT CONTAINS CONFIDENTIAL
PROPRIETARY INFORMATION THAT IS
SAMSUNG ELECTRONICS CO'S PROPERTY.
DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
EXCEPT AS AUTHORIZED BY SAMSUNG.

Power Tact Switch



MT500
RMNT-25-70-1P



G_SUB

DESIGN	BS Choe	DATE	01/08/2009	TITLE Shark10_DDR3 Switched PWR Switched PWR	SAMSUNG ELECTRONICS
CHECK	Ahn KR	DEV. STEP	PV		
APPROVAL	Kim.HS	REV	1.0		
MODULE CODE	LAST EDIT		July 13, 2010 21:01:08 PM		
					PART NO. BA41-XXXXXA