

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.

SantaFe

CPU : DOTHAN-ULV
Chip Set : INTEL 915GMS
Remarks : CPT LCD

Model Name : SantaFe
PBA Name :

Dev. Step : SR
Revision : 0.9
T.R. Date : 2005.xx.xx

DRAW	CHECK	APPROVAL
YM An	HJ Kim	JS Euh

Table of Contents

Page.1 ---- Cover
Page.2 ---- Operation Block diagram
Page.3 ---- Power Sequence
Page.4 ---- Clock distribution
Page.5 ---- Board Information
Page.6 ---- Clock Generator
Page.7~8 --- CPU
Page.9 ---- THERMAL SENSOR & FAN
Page.10~13- ALVISO-GMS
Page.14 ---- SODIMM
Page.15~18- ICH-6M
Page.19 ---- FWH & 80PORT
Page.20 ---- LVDS to LVTTTL & Tcon
Page.21 ---- LCD ANALOG POWER
Page.22 ---- LCD GAMMA & CONNECTOR & INVERTER POWER
Page.23 ---- VGA CONNECTOR & LEVEL SHIFT
Page.24 ---- HDD CONNECTOR
Page.25 ---- MICOM
Page.26 ---- LAN CONTROLLER & JACK
Page.27 ---- DMB CONN. & USB
Page.28 ---- CARDBUS CONTROLLER
Page.29 ---- MINI CARD & CF SLOT
Page.30 ---- TSP CONTROLLER & SUB B'D CONN. & SWITCH
Page.31 ---- AUDIO CODEC & ARRAY MIC
Page.32 ---- AMP & HP & SPEAKER
Page.33 ---- CHARGER
Page.34 ---- P3.3V_AUX & P5V_AUX
Page.35 ---- P1.5V & VCCP
Page.36 ---- DDR2 POWER
Page.37 ---- CPU VRM
Page.38 ---- SWITCHED POWER
Page.39 ---- MOUNT HOLE & RHE PEM & EMI FINGER & TP
Page.40 ---- SUB BOARD LEFT
Page.41 ---- SUB BOARD RIGHT

DRAW	Youngno An	DATE	3/7/2006	TITLE	SantaFe	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	COVER	PART NO.	
APPROVAL	JS Euh	REV	0.9	March 7, 2006 12:22:03 PM		PAGE 1 OF 41
MODULE CODE	LAST EDIT					

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.

BOARD INFORMATION

SCHEMATIC ANNOTATIONS AND BOARD INFORMATION

PCI Devices

Devices	IDSEL#	REQ/GNT#	Interrupts
CARDBUS	AD25	0	A
USB Hub to PCI	AD29(internal)	Programmable	
LPC Bridge/IDE/AC97/SMBUS	AD30(internal)		
Internal MAC	AD31(internal)		
Internal MAC	AD24(internal)		

I²C / SMB Address

Devices	Address	Hex	Bus
ICH6M	Master	-	SMBUS Master
CK-410M (Clock Generator)	1101 001x	D2h	Clock, Unused Clock Output Disable
SODIMM0	1010 001X	A2h	
MICOM	Master		
BATTERY	0001 011h	16h	-
THERMAL MORNITOR	x100 1100	4Ch	-

USB PORT Assign

PORT 0	RIGHT SIDE USB PORT
PORT 1	LEFT SIDE USB PORT
PORT 2	TSP CONTROLLER
PORT 3	DMB
PORT 4	BLUETOOTH
PORT 6	MINI CARD
PORT 5,7	EMPTY

System Power States

Power Rail	Devices (Page Number)
P5V	FAN(9) ICH6M(15) 80PORT(19) MICOM(25) DMB(27) USB(27) CARDBUS POWER(28) LDQ(31) AUDIO AMP(32)
P3.3V	CLOCK(6) Thermal sensor(9) SODIMM(14) ICH6-M(17) FWH(19) 80PORT(19) HDD(24) MICOM(25) DMB(27) CARDBUS Controller(28) MiniCARD(29) SUB Left(30) CPU VRM(37)
P1.5V	CPU(8) 915GMS(12) ICH6-M(17) MiniCARD(29)
P2.5V	915GMS(11) ICH6-M(17) LCD(22) CRT(23) LAN(26)
P1.8V	CARDBUS Controller(28)
P5V_AUX	ICH6M(17) ISL6227(35) DDR2 POWER(36)
P3.3V_AUX	LM26CIM5X-TPA(9) ICH6-M(17) MICOM(25) LAN(26) LB LED(25) MiniCARD(29) MAX1999(34)
P1.8V_AUX	915GMS(11) SODIMM(17) DDR2 POWER(36)
VCCP	CLOCK(6) CPU(8) 915GMS(10) ICH6-M(17) MICOM(25)
VCC_CORE	CPU (8)

Voltage Rails

Power Rail	Descriptions
PRTC_BAT VDC	3.3V (can drop to 2.0V min. in G3 state) supply for the RTC well. Primary DC system power supply (9 to 19V)
P5V_AUX	5.0V power rail (off in S4-S5)
P3.3V_AUX	3.3V power rail (off in S4-S5)
P1.8V_AUX	GMCH/DDR II Power Source(off in S4-S5)
MEMT_VREF	0.9V DDR2 Reference(off in S4-S5)
P5V	5.0V switched power rail (off in S3-S5)
P3.3V	3.3V switched power rail (off in S3-S5)
P1.5V	1.5V switched power rail (off in S3-S5)
P2.5V	2.5V switched power rail (off in S3-S5)
VCCP	1.05V power rail. GMCH core, CPU/GMCH FSB Termination.
VCC_CORE	Core voltage for DOTHAN CPU (0.74~1.30V)
MICOM_P3V	3.3V always on power rail for MICOM
P1.5V_DMI	1.5V (Direct Media Interface Compensation)
INV_VDC	DC power (Inverter)
LCD_VDD3V	3.3V (LCD)
VCC_CRT	5V (CRT)
CB3_A_VCC	3.3V (CF card)
AVDD	4.75V (AD1986)
AMP_VDD	5V (Audio AMP)
BLT_P3.3V	3.3V(BLUETOOTH)

CPU Core Voltage Table

VID5	VID4	VID3	VID2	VID1	VID0	Voltage	VID5	VID4	VID3	VID2	VID1	VID0	Voltage
0	0	0	0	0	0	1.708 V	1	0	0	0	0	0	1.196 V
0	0	0	0	0	1	1.692 V	1	0	0	0	0	1	1.180 V
0	0	0	1	0	0	1.676 V	1	0	0	0	1	0	1.164 V
0	0	0	0	1	1	1.660 V	1	0	0	0	1	1	1.148 V
0	0	0	1	0	0	1.644 V	1	0	0	1	0	0	1.132 V
0	0	0	1	0	1	1.628 V	1	0	0	1	0	1	1.116 V
0	0	1	0	1	0	1.612 V	1	0	0	1	1	0	1.100 V
0	0	0	1	1	1	1.596 V	1	0	0	1	1	1	1.084 V
0	0	1	0	0	0	1.580 V	1	0	1	0	0	0	1.068 V
0	0	1	0	0	1	1.564 V	1	0	1	0	0	1	1.052 V
0	0	1	0	1	0	1.548 V	1	0	1	0	1	0	1.036 V
0	0	1	0	1	1	1.532 V	1	0	1	0	1	1	1.020 V
0	0	1	1	0	0	1.516 V	1	0	1	1	0	0	1.004 V
0	0	1	1	0	1	1.500 V	1	0	1	1	0	1	0.988 V
0	0	1	1	1	0	1.484 V	1	0	1	1	1	0	0.972 V
0	0	1	1	1	1	1.468 V	1	0	1	1	1	1	0.956 V
0	1	0	0	0	0	1.452 V	1	1	0	0	0	0	0.930 V
0	1	0	0	0	1	1.436 V	1	1	0	0	0	1	0.924 V
0	1	0	0	1	0	1.420 V	1	1	0	0	1	0	0.908 V
0	1	0	0	1	1	1.404 V	1	1	0	0	1	1	0.892 V
0	1	0	1	0	0	1.388 V	1	1	0	1	0	0	0.876 V
0	1	0	1	0	1	1.372 V	1	1	0	1	0	1	0.860 V
0	1	0	1	1	0	1.356 V	1	1	0	1	1	0	0.844 V
0	1	0	1	1	1	1.340 V	1	1	0	1	1	1	0.828 V
0	1	1	0	0	0	1.324 V	1	1	1	0	0	0	0.812 V
0	1	1	0	0	1	1.308 V	1	1	1	0	0	1	0.796 V
0	1	1	0	1	0	1.292 V	1	1	1	0	1	0	0.780 V
0	1	1	0	1	1	1.276 V	1	1	1	0	1	1	0.764 V
0	1	1	1	0	0	1.260 V	1	1	1	1	0	0	0.748 V
0	1	1	1	0	1	1.244 V	1	1	1	1	0	1	0.732 V
0	1	1	1	1	0	1.228 V	1	1	1	1	1	0	0.716 V
0	1	1	1	1	1	1.212 V	1	1	1	1	1	1	0.700 V

DOTHAN-ULV
HIGH FREQUENCY MODE

DOTHAN-ULV
LOW FREQUENCY MODE

DOTHAN-ULV
DEEPER SLEEP MODE
Refer to page43

DRAW	Youngno An	DATE	3/7/2006	TITLE	SantaFe	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	MAIN		
APPROVAL	JS Euh	REV	0.9	BOARD INFORMATION		PART NO.
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE	5	OF 41

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.

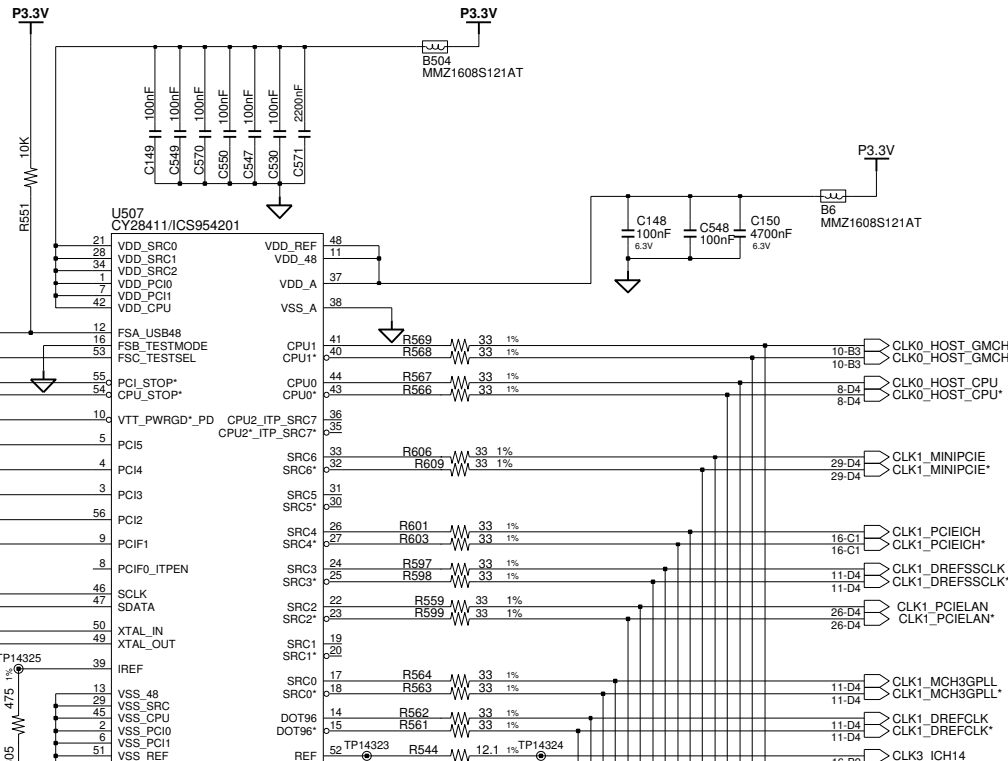
CK-410M

ICS954201
CY28411ZC

Bus Selection for CK-410M (100MHz)

F5B/F5C : by CPU/MCH BSEL(Page 6)
F5A : P3.3V PU

CK-410M CPU	F5A BSEL2	F5B BSEL1	F5C BSEL0	HOST CLK
	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

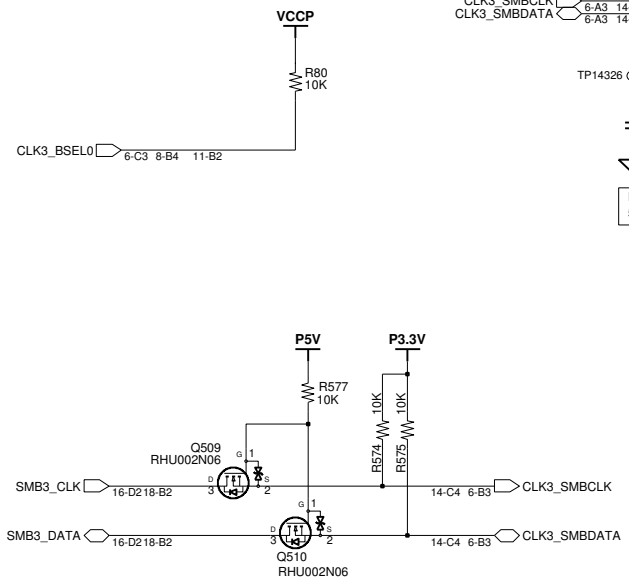


Place 14.318MHz within 500mils of CK-410M

Trace Width *2

SMBUS Address "D2h"
ICS: 1205-002705
Cypress: 1205-002574

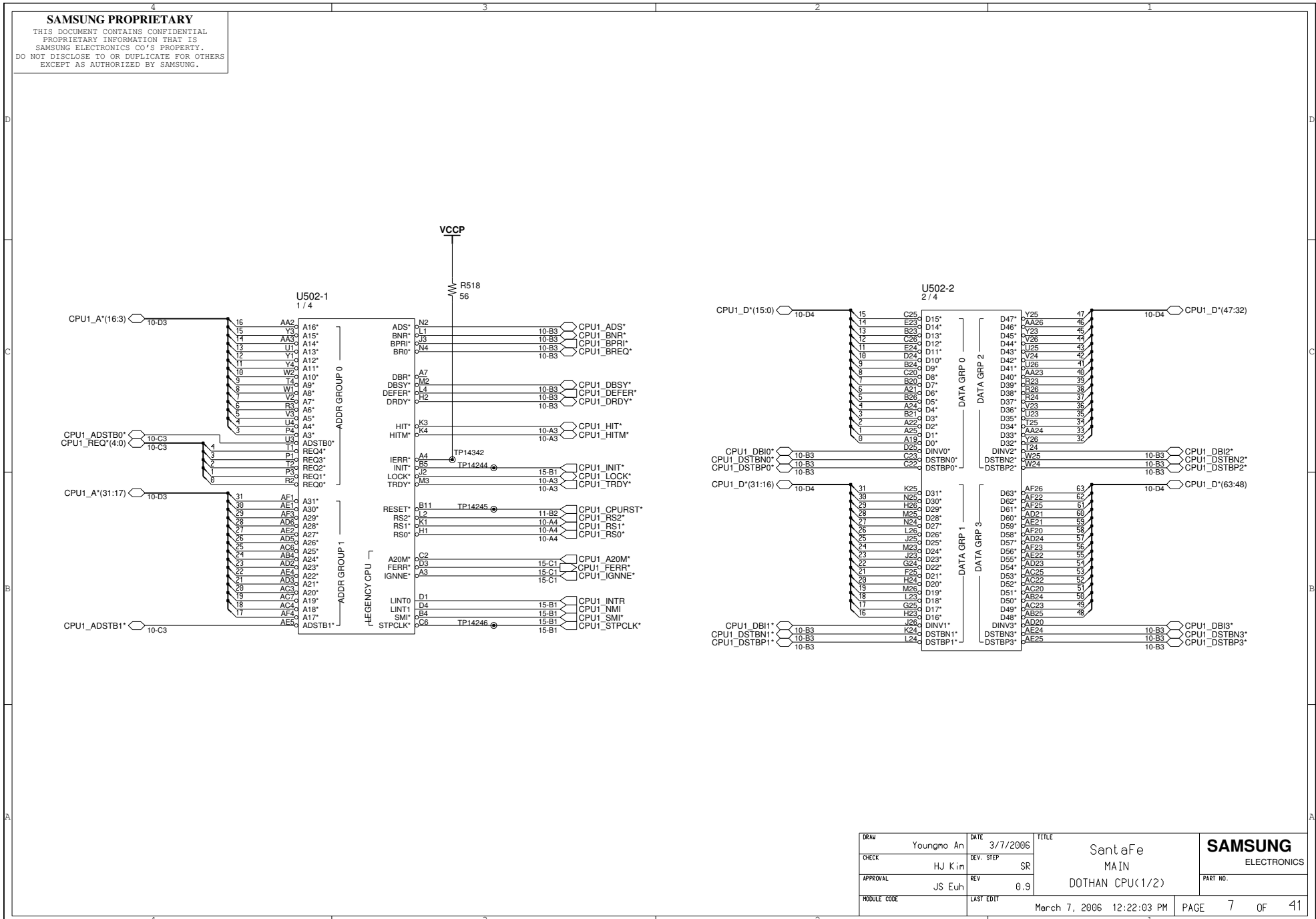
Place Termination close to CK-410M



DRAW	Youngno An	DATE	3/7/2006	TITLE	SantaFe MAIN CLOCK GENERATOR	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	REV	0.9	
APPROVAL	JS Euh	LAST EDIT	March 7, 2006 12:22:03 PM	PAGE	6 OF 41	PART NO.

SAMSUNG PROPRIETARY

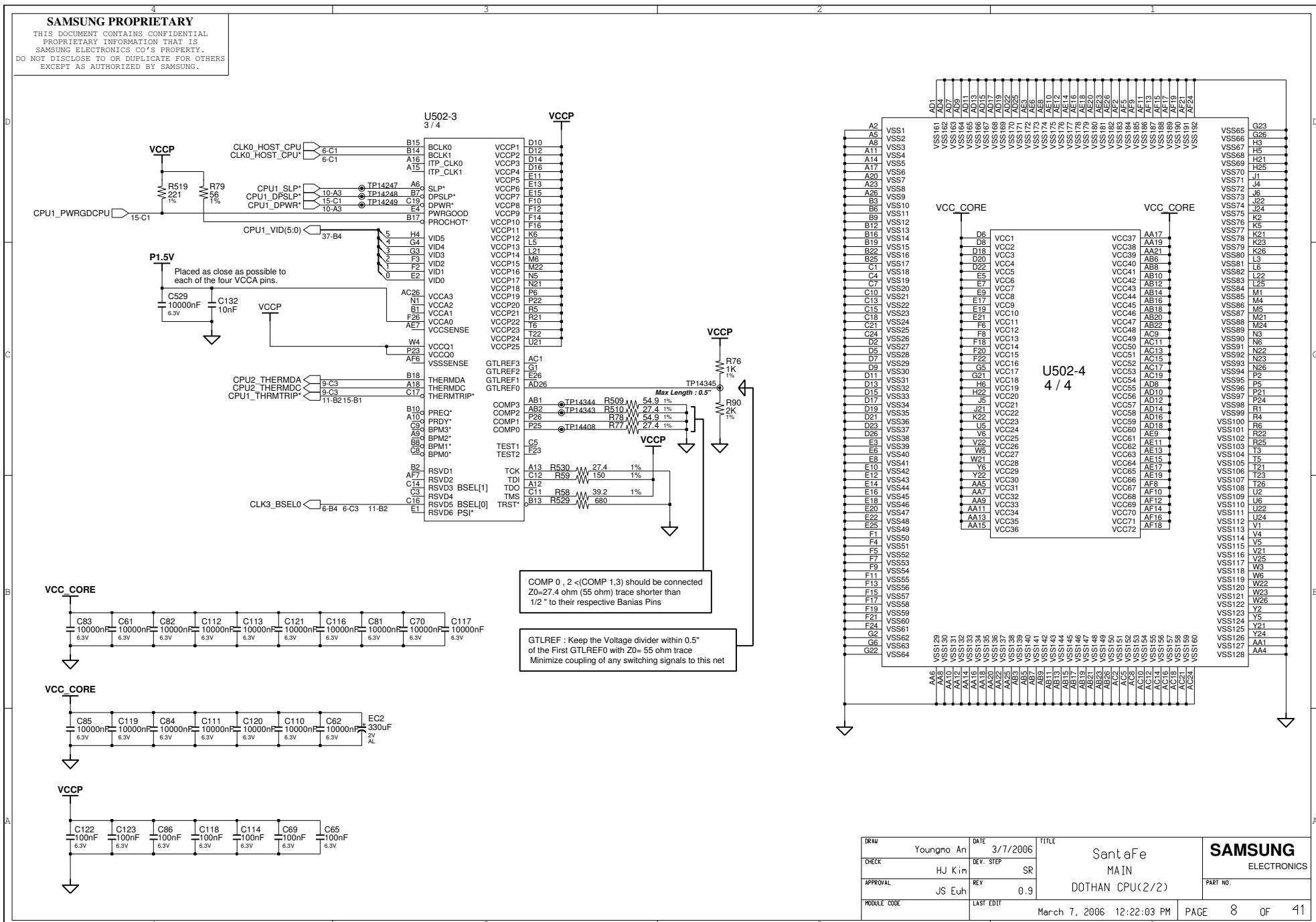
THIS DOCUMENT CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION THAT IS SAMSUNG ELECTRONICS CO.'S PROPERTY. DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS EXCEPT AS AUTHORIZED BY SAMSUNG.



DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN DOTHAN CPU(1/2)	SAMSUNG ELECTRONICS PART NO.
CHECK	HJ Kim	DEV. STEP	SR			
APPROVAL	JS Euh	REV	0.9			
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE 7 OF 41		

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.



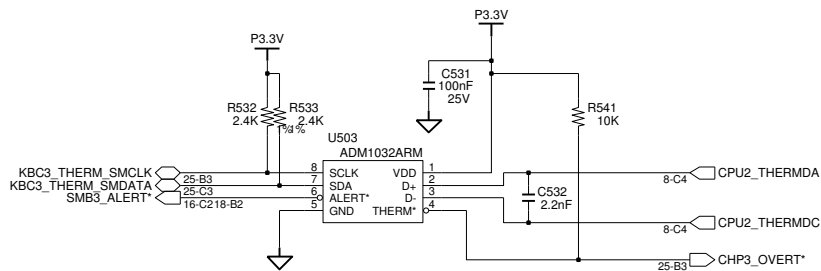
COMP 0, 2 <(COMP 1,3) should be connected Z0=27.4 ohm (55 ohm) trace shorter than 1/2" to their respective Banias Pins

GTLREF : Keep the Voltage divider within 0.5" of the First GTLREF0 with Z0= 55 ohm trace Minimize coupling of any switching signals to this net

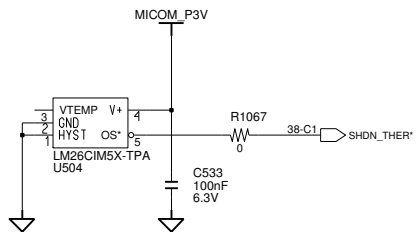
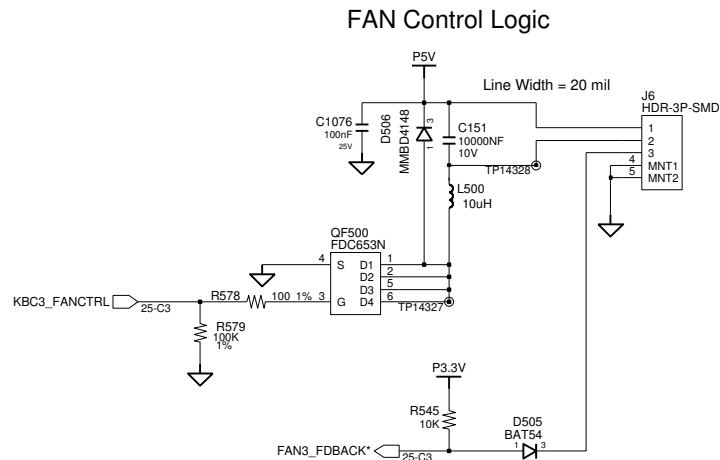
DRAW	Youngmo An	DATE	3/7/2006	TITLE	Santafe MAIN DOTHAN CPU(2/2)	SAMSUNG ELECTRONICS PART NO.
CHECK	HJ Kim	DEV. STEP	SR			
APPROVAL	JS Euh	REV	0.9			
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE	8 OF 41	

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.



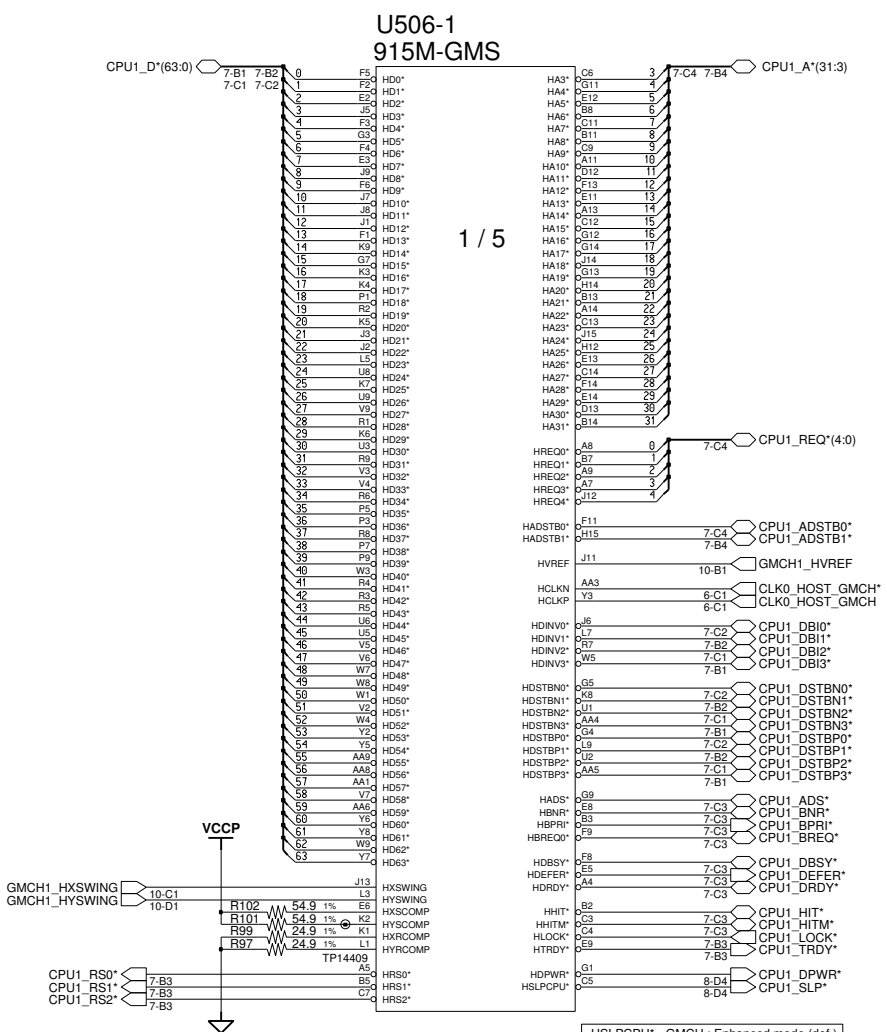
CPU Thermal Sensor
 SMBUS Addr"4Ch"(x100 1100)
 Put this sensor between CPU and MCH



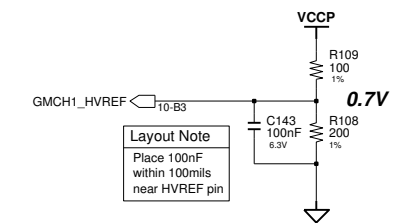
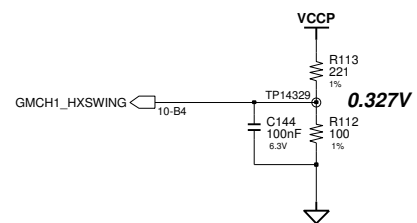
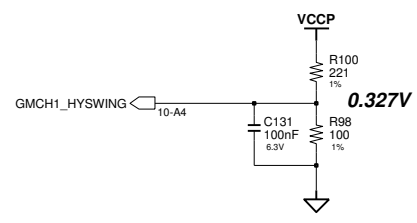
DRAW	Youngno An	DATE	3/7/2006	TITLE	SantaFe MAIN	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	THERMAL SENSOR/FAN CONTRL		
APPROVAL	JS Euh	REV	0.9	PART NO.		
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE	9	OF 41

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.



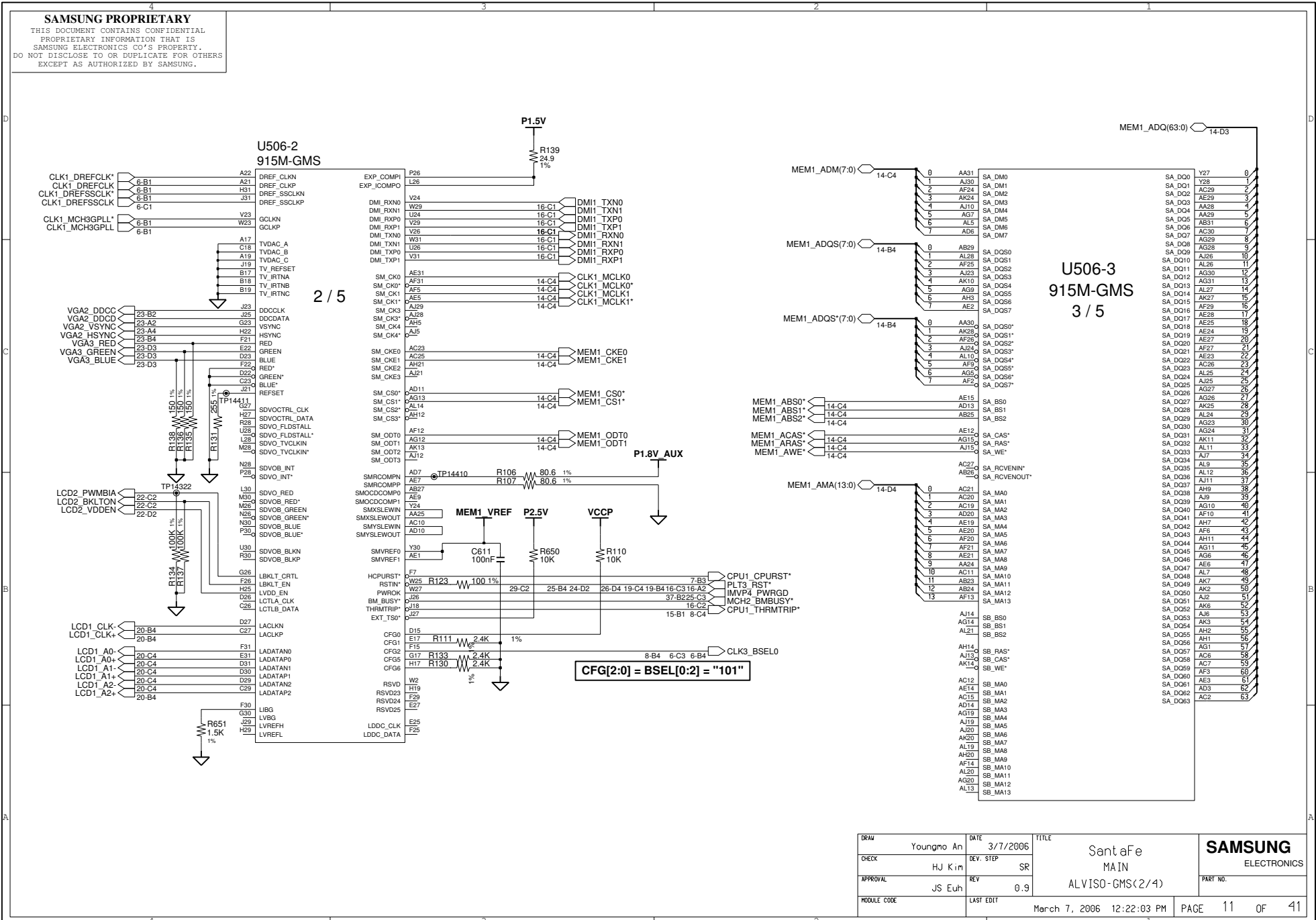
HSLPCPU* - GMCH : Enhanced mode (def.)
HSLPCPU* - ICH : Legacy mode



DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN ALVISO-GMS(1/4)	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	PART NO.		
APPROVAL	JS Euh	REV	0.9	March 7, 2006 12:22:03 PM	PAGE	10 OF 41
MODULE CODE		LAST EDIT				

SAMSUNG PROPRIETARY

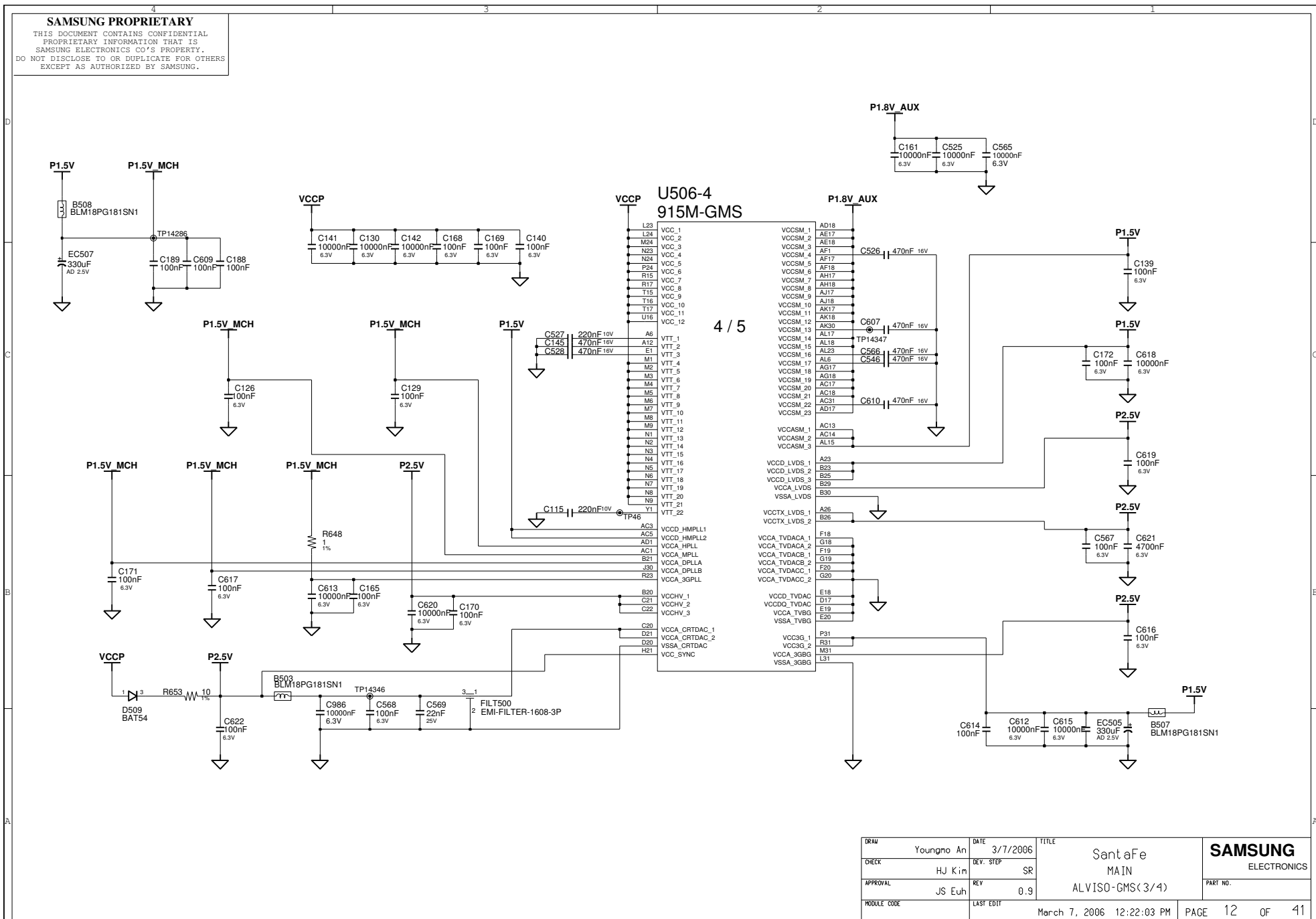
THIS DOCUMENT CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION THAT IS SAMSUNG ELECTRONICS CO.'S PROPERTY. DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS EXCEPT AS AUTHORIZED BY SAMSUNG.



DRAW	Youngmo An	DATE	3/7/2006	TITLE	Sant aFe	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	MAIN		
APPROVAL	JS Euh	REV	0.9	ALVISO-GMS(2/4)		
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE	11 OF 41	

SAMSUNG PROPRIETARY

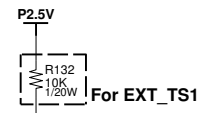
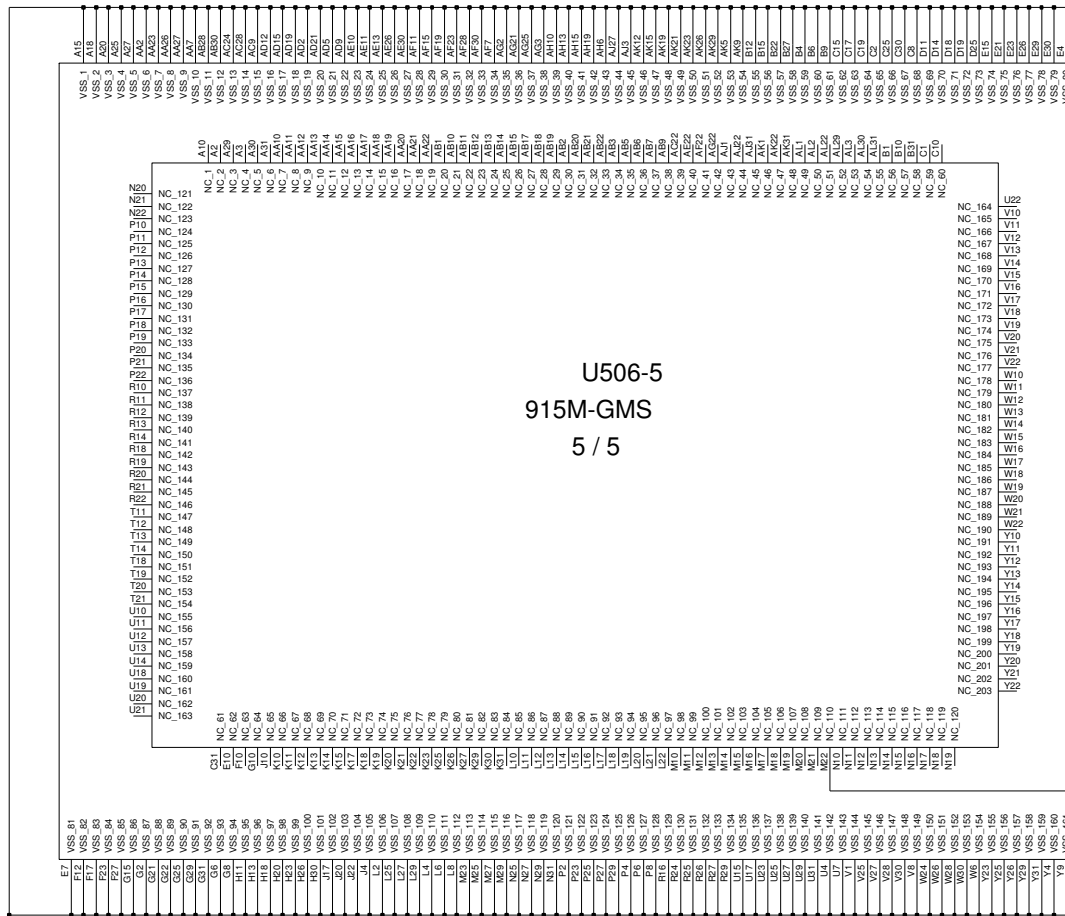
THIS DOCUMENT CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION THAT IS SAMSUNG ELECTRONICS CO.'S PROPERTY. DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS EXCEPT AS AUTHORIZED BY SAMSUNG.



DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN ALVISO-GMS(3/4)	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	PART NO.		
APPROVAL	JS Euh	REV	0.9			
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE 12 OF 41		

SAMSUNG PROPRIETARY

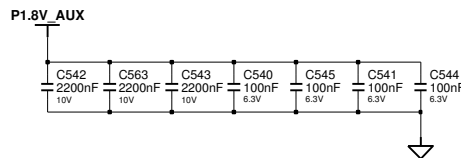
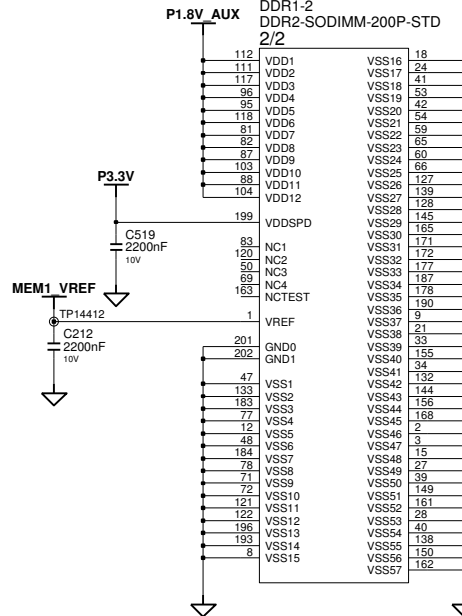
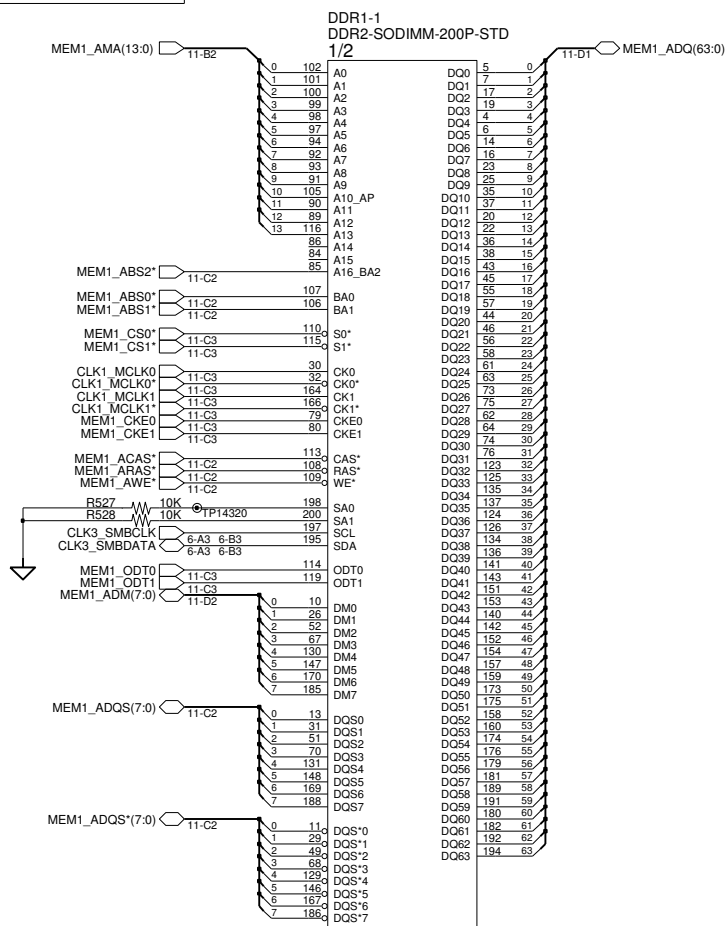
THIS DOCUMENT CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION THAT IS SAMSUNG ELECTRONICS CO.'S PROPERTY. DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS EXCEPT AS AUTHORIZED BY SAMSUNG.



DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN ALVISO-GMS(4/4)	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	PART NO.		
APPROVAL	JS Euh	REV	0.9			
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE	13	OF 41

SAMSUNG PROPRIETARY

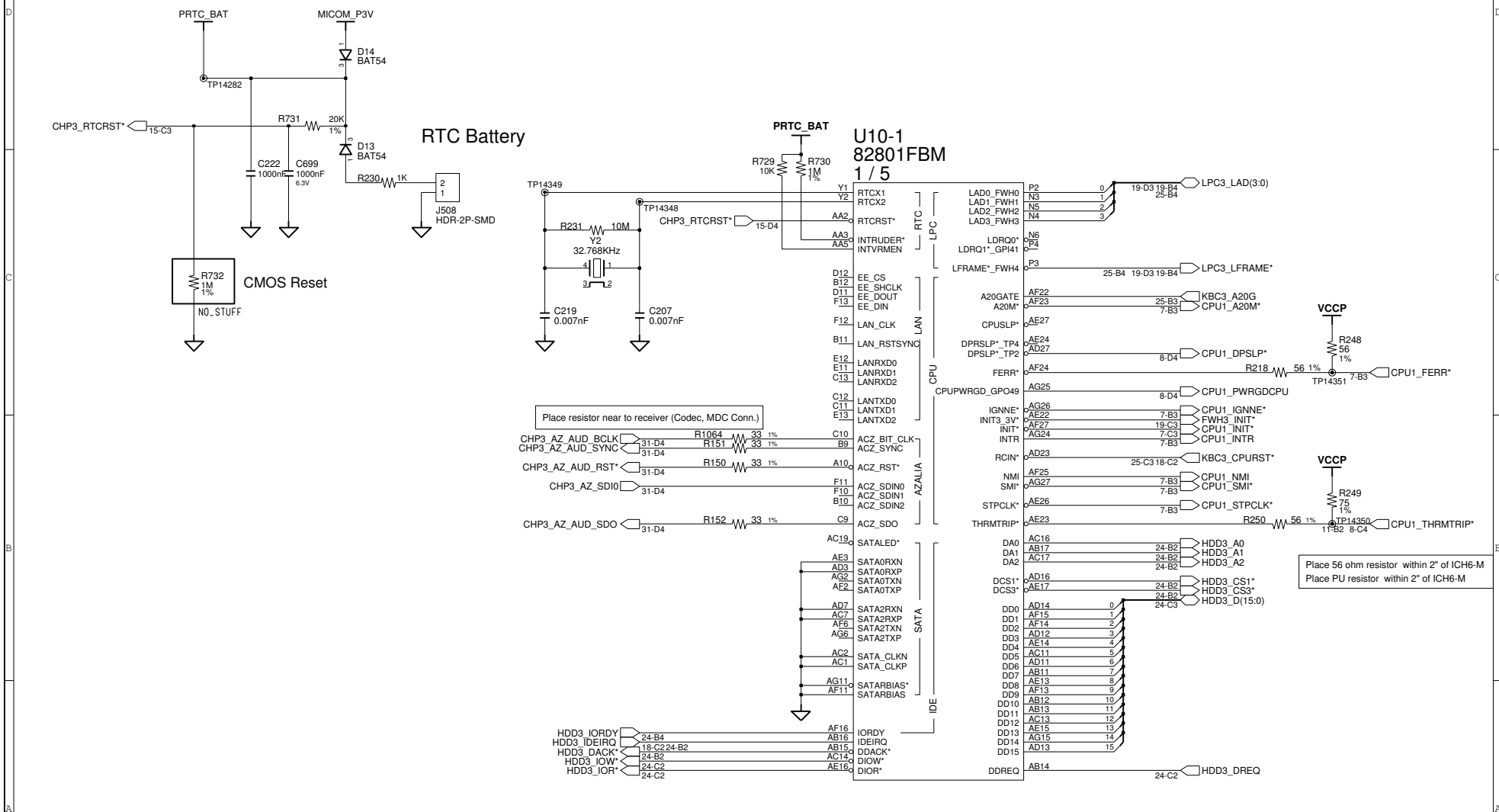
THIS DOCUMENT CONTAINS CONFIDENTIAL
 PROPRIETARY INFORMATION THAT IS
 SAMSUNG ELECTRONICS CO.'S PROPERTY.
 DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS
 EXCEPT AS AUTHORIZED BY SAMSUNG.



DRAW	Youngno An	DATE	3/7/2006	TITLE	SantaFe	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	MAIN		
APPROVAL	JS Euh	REV	0.9	DDR2 Memory		PART NO.
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE	14	OF 41

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.



DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN ICH6-M (1/4)	SAMSUNG ELECTRONICS PART NO.
CHECK	HJ Kim	DEV. STEP	SR			
APPROVAL	JS Euh	REV	0.9			
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE	15 OF 41	

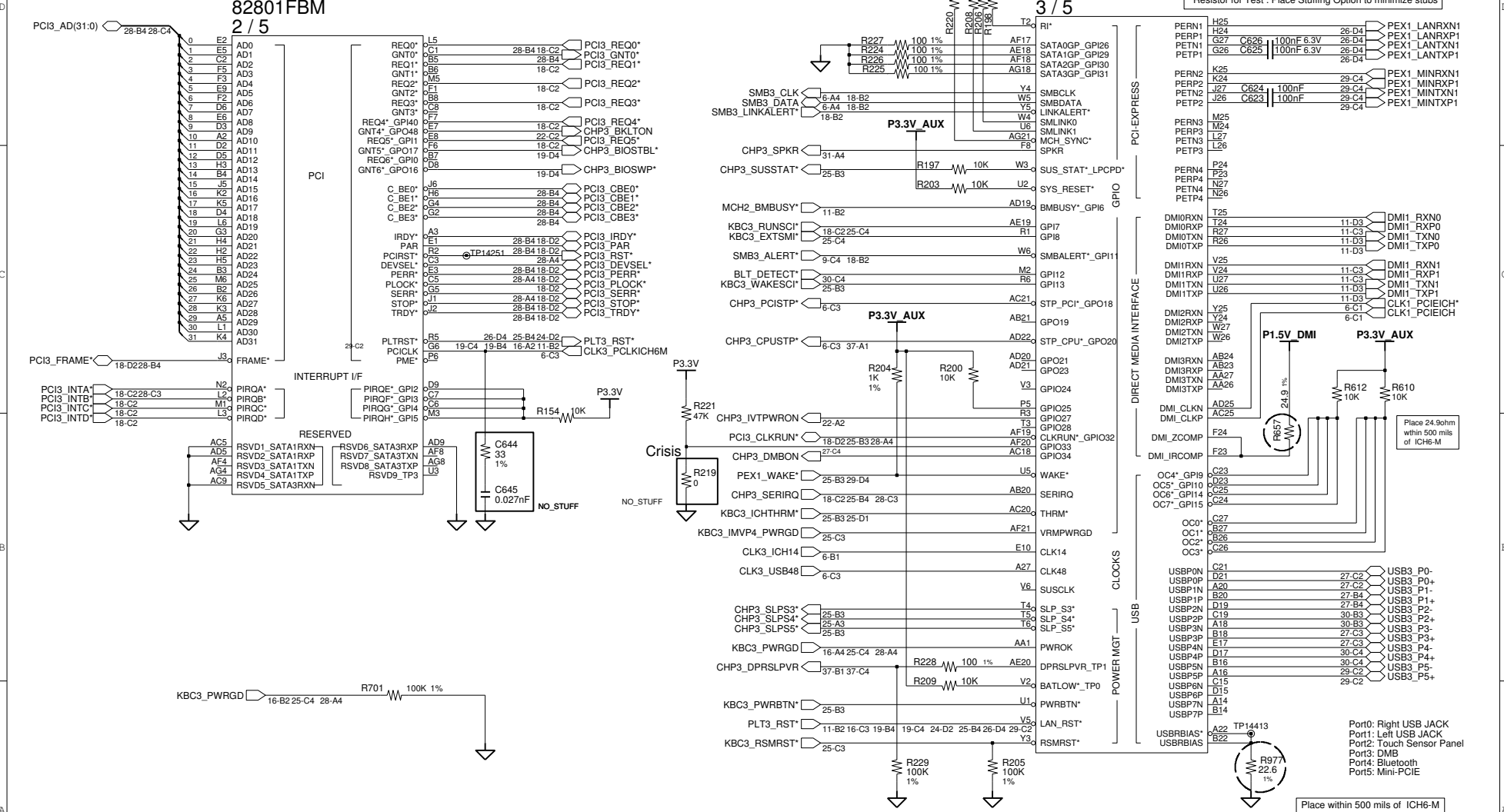
SAMSUNG PROPRIETARY

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.

**U10-2
82801FBM
2 / 5**

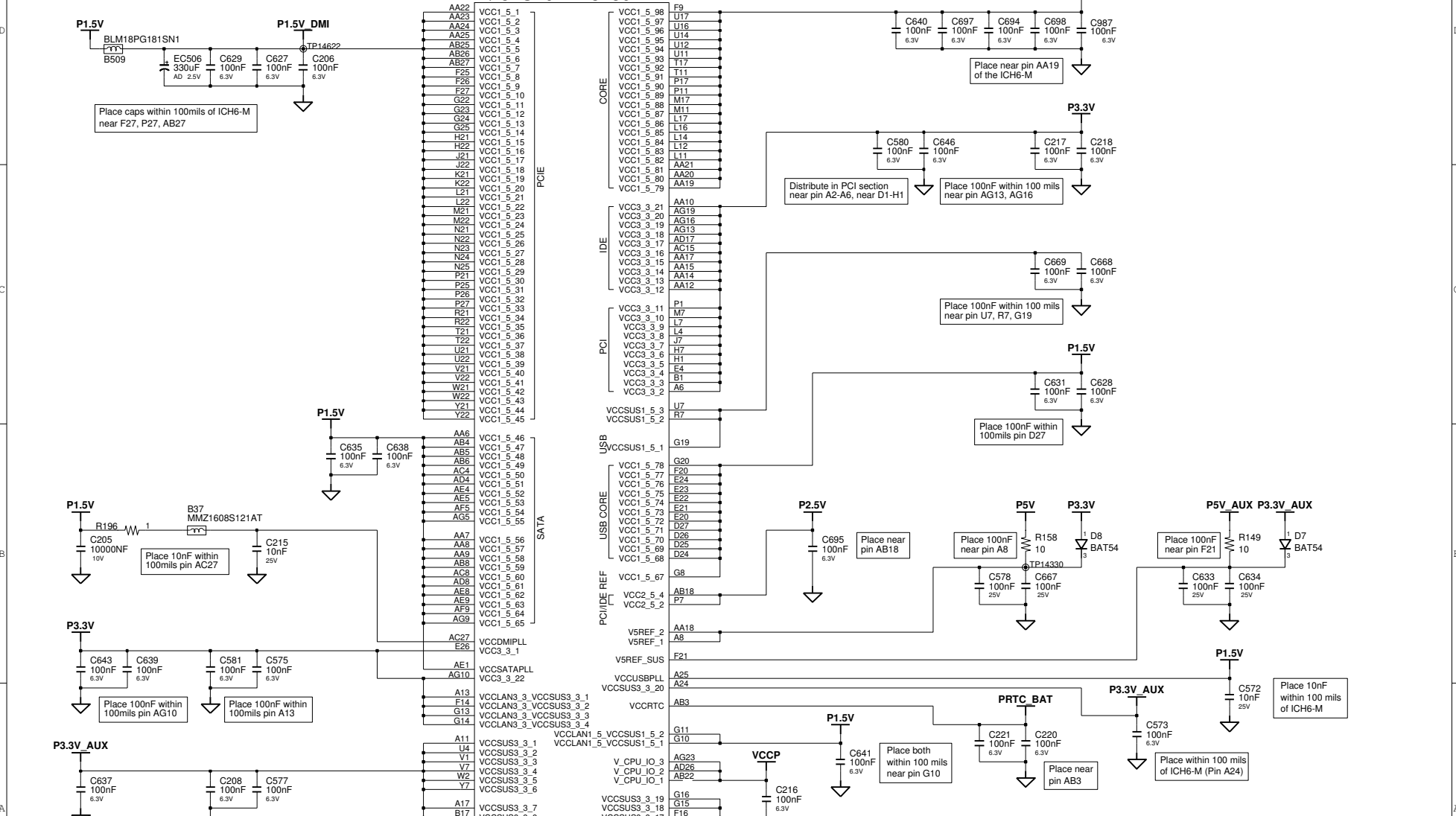
**U10-3
82801FBM
3 / 5**

AC caps : PCIe need to be within 250mils of the driver
Resistor for Test : Place Stuffing Option to minimize stubs



DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN ICH6-M(2/4)	SAMSUNG ELECTRONICS PART NO.
CHECK	HJ Kim	DEV. STEP	SR			
APPROVAL	JS Euh	REV	0.9			
MODULE CODE		LAST EDIT				
			March 7, 2006 12:22:03 PM	PAGE	16 OF 41	

4 / 5 U10-4 82801FBM



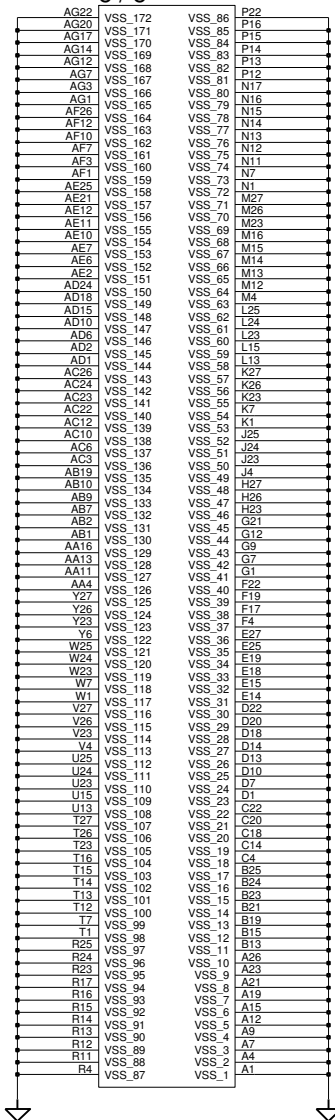
DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN ICH6 - M(3/4)	SAMSUNG ELECTRONICS PART NO.
CHECK	HJ Kim	DEV. STEP	SR			
APPROVAL	JS Euh	REV	0.9			
MODULE CODE		LAST EDIT				

March 7, 2006 12:22:03 PM PAGE 17 OF 41

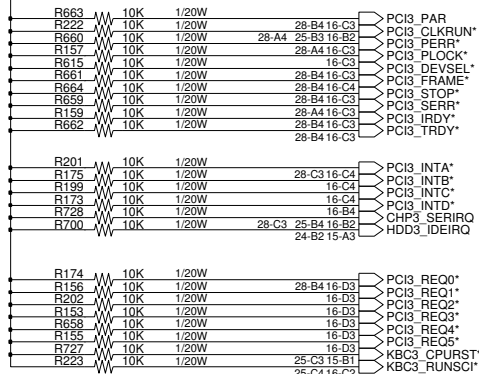
SAMSUNG PROPRIETARY

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.

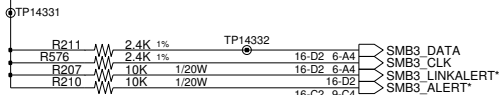
**U10-5
82801FBM
5 / 5**



P3.3V



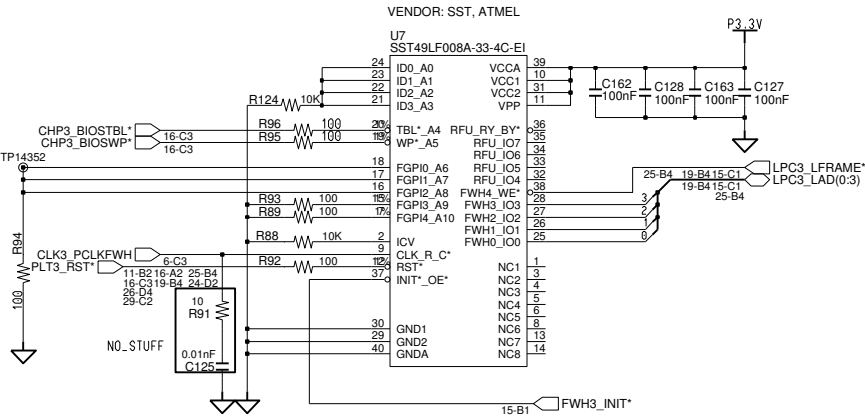
P3.3V_AUX



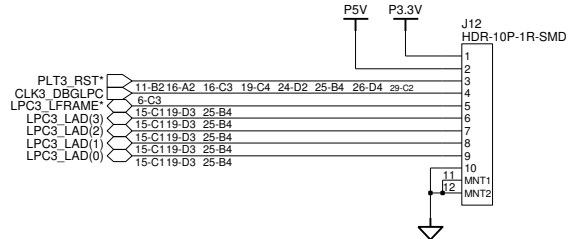
DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR		MAIN	
APPROVAL	JS Euh	REV	0.9		ICH6 - M(4/4)	PART NO.
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE	18	OF 41

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.



80 Port



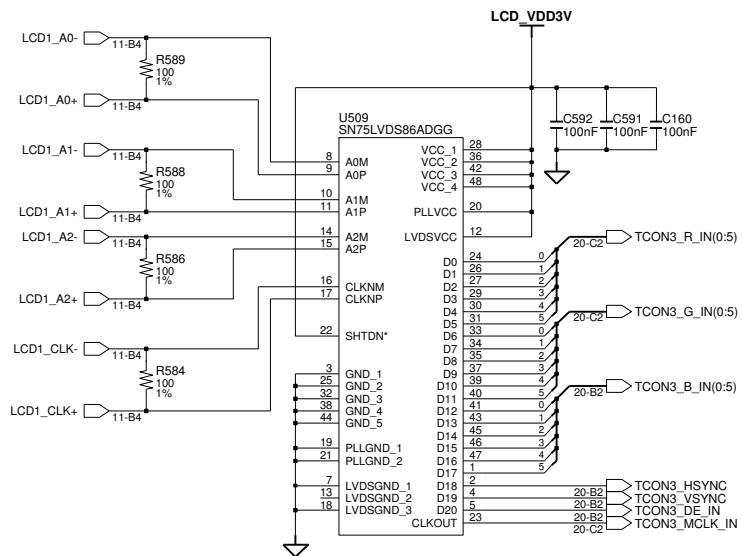
- 02 VERIFY REAL MODE
- 03 DISABLE NMI
- 04 GET CPU TYPE
- 06 INIT. SYSTEM H/W
- 08 INIT. CHIPSET REG.
- 09 SET IN POST FLAG
- 0A INIT CPU.REG
- 0B CPU CACHE ON
- 0C INIT.CACHE TO POST
- 0E INIT. I/O VALUE
- 0F ENABLE THE L-BUS IDE
- 10 INIT. POWER MANAGER
- 11 LOAD ALTERNATE REG.
- 13 PCI BUS MASTER RESET WITH INITIAL POST VALUE
- 14 INIT. KEYBOARD CONTROLLER
- 16 CHECK CHECKSUM
- 18 8254 TIMER INIT.
- 1A 8237 DMA CONTROLLER INIT.
- 1C RESET INTERRUPT CONTROLLER
- 20 TEST DRAM REFRESH
- 22 TEST 8742 KEYBOARD CONTROLLER
- 24 SET ES SEGMENT REG. TO 4GB
- 26 ENABLE A20
- 28 AUTO SIZING DRAM
- 32 COMPUTE THE CPU SPEED
- 34 TESET CMOS RAM
- 38 SHADOW SYSTEM BIOS ROM
- 3A AUTO SIZING CACHE
- 3C CONFIGURE ADVANCED CHIPSET REG.
- 3D LOAD ALTER REG. WITH CMOS VALUE
- 42 INIT. INTERRUPT VECTOR
- 44 INIT. BIOS INTERRUPT
- 46 CHECK ROM COPYRIGHT NOTICE
- 47 INIT. I20 SUPPORT IF INSTALLED
- 48 CHECK VIDEO CONFIGURE AGAINST CMOS
- 49 INIT. PCI BUS AND DEVICE
- 4A INIT. ALL VIDEO BIOS ROM
- 4C SHADOW VIDEO BIOS ROM
- 50 DISPLAY CPU TYPE AND SPEED
- 52 TEST KEYBOARD
- 54 SET KEYCLICK IF ENABLED
- 56 ENABLE KEYBOARD
- 58 TEST FOR UNEXPECTED INTERRUPTS
- 5A DISPLAY " PRESS SETUP"
- 5C TEST RAM BETWEEN 512K AND 640K
- 60 TEST EXTENDED MEMORY
- 62 TEST EXTENDED MEMORY ADDRESS LINE
- 64 JUMP TO USER PATCH 1
- 66 CONFIGURE ADVANCE CACHE REG.
- 6A DISPLAY EXTERNAL CACHE SIZE
- 6C DISPLAY SHADOW MESSAGE
- 6E DISPLAY NON-DISPOSABLE SEGMENT
- 70 DISPLAY ERROR MESSAGE
- 72 CHECK FOR CONFIGURATION ERROR
- 74 TEST REAL-TIME CLOCK
- 76 CHECK FOR KEYBOARD ERROR
- 7C SETUP HARDWARE INTERRUPT VECTOR
- 7E TEST COPROCESSER IF PRESENT
- 80 DISABLE ON-BOARD I/O PORT
- 82 DETECT AND INSTALL EXT.RS232C
- 84 DETECT AND INSTALL EXT.PARALLEL
- 86 RE-INIT. ON-BOARD I/O PORT
- 88 INIT. BIOS DATA ROM
- 8A INIT.EXTENDED BIOS DATA AREA
- 8C INIT. FDD CONTROLLER
- 9A SHADOW OPTION ROMS
- 9C SETUP POWER MANAGEMENT
- 9E ENABLE H/W INTERRUPT
- A0 SET TIME OF DAY
- A4 INIT. TYPOMATIC RATE
- A8 ERASE F2 PROMPT
- AA SCAN FOR F2 KEY STROKE
- AC ENTER SETUP
- AE CLEAR IN POST FLAG
- B0 CHECK FOR ERRORS
- B2 POST DONE-PREPARE TO BOOT 0/S
- B4 ONE BEEP
- B6 CHECK PASSWORD (OPTION)
- B7 ACPI INIT
- BA DMI INIT
- BE CLEAR SCREEN
- C0 TRY BOOT WITH INT19
- D0 INTERRUPT HANDLER ERROR
- D2 UNKNOWN INTERRUPT ERROR
- D4 PENDING INTERRUPT ERROR
- D6 SHUTDOWN 5
- D8 SHUTDOWN ERROR
- DA EXTENDED BLOCK MOVE
- DC SHUTDOWN 10
- 89 ENABLE NMI
- 90 INIT. HDD CONTROLLER
- 91 INIT. LOCAL BUS HDD CONTROLLER
- 92 JUMP TO USER PATCH 2
- 94 DISABLE A20 ADDRESS LINE
- 96 CLEAR HUGE ES SEGMENT REG.
- 98 SEARCH FOR OPTION ROMS

DRAW	Youngno An	DATE	3/7/2006	TITLE	SantaFe	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	MAIN		
APPROVAL	JS Euh	REV	0.9	FWH & 80Port		PART NO.
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE	19	OF 41

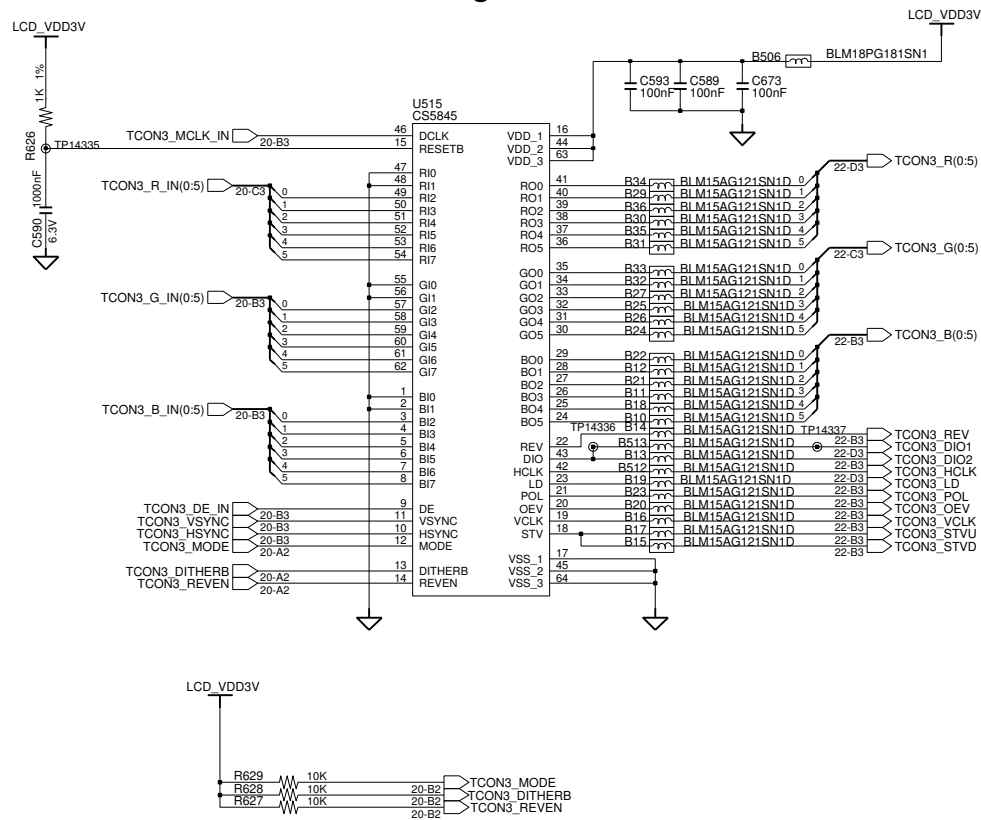
SAMSUNG PROPRIETARY

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 to LVTTTL



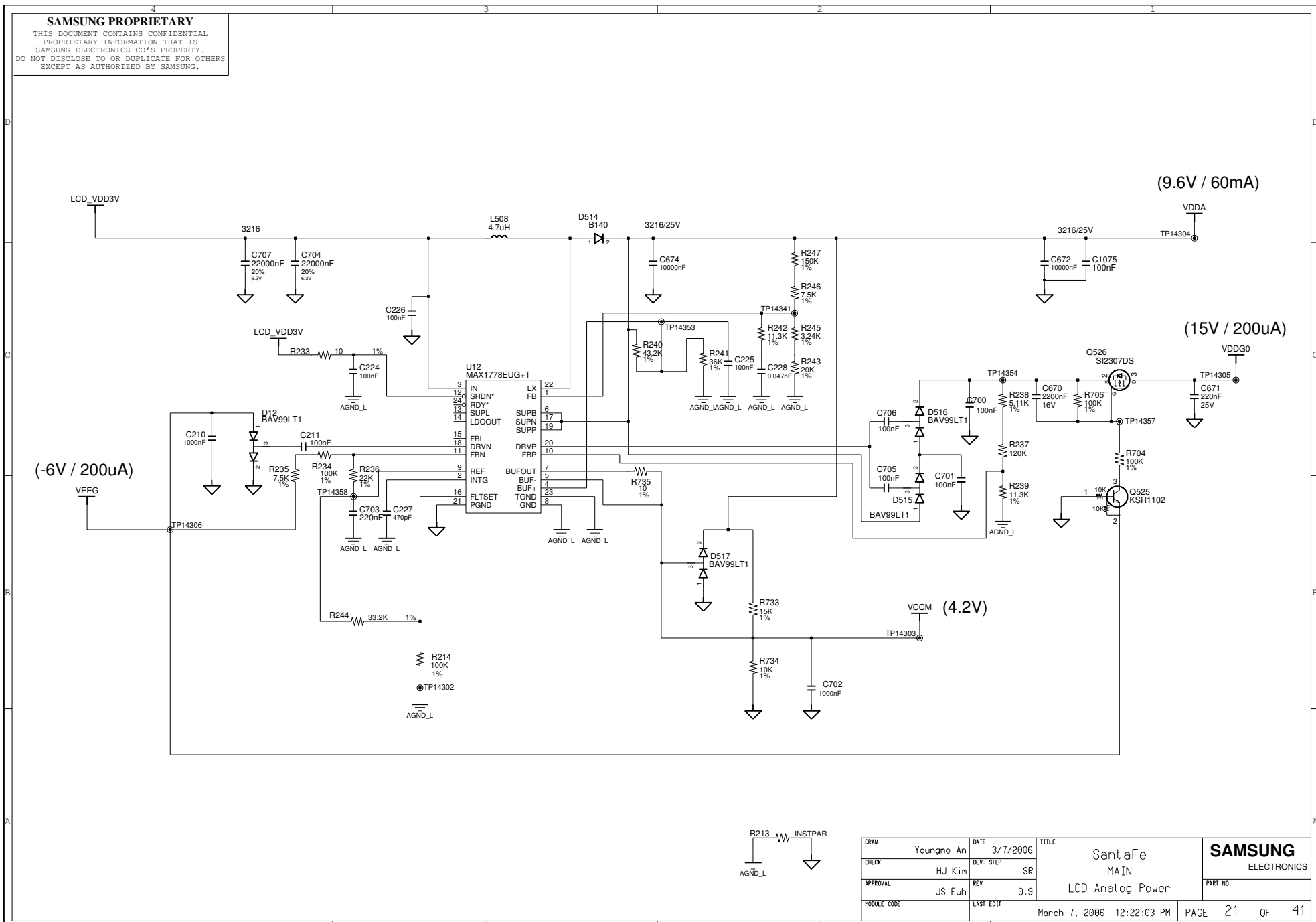
LCD Timing Controller



DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	LVDS TO LVTTTL & Tcon		
APPROVAL	JS Euh	REV	0.9	March 7, 2006 12:22:03 PM		PART NO.
MODULE CODE		LAST EDIT		PAGE 20 OF 41		

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.

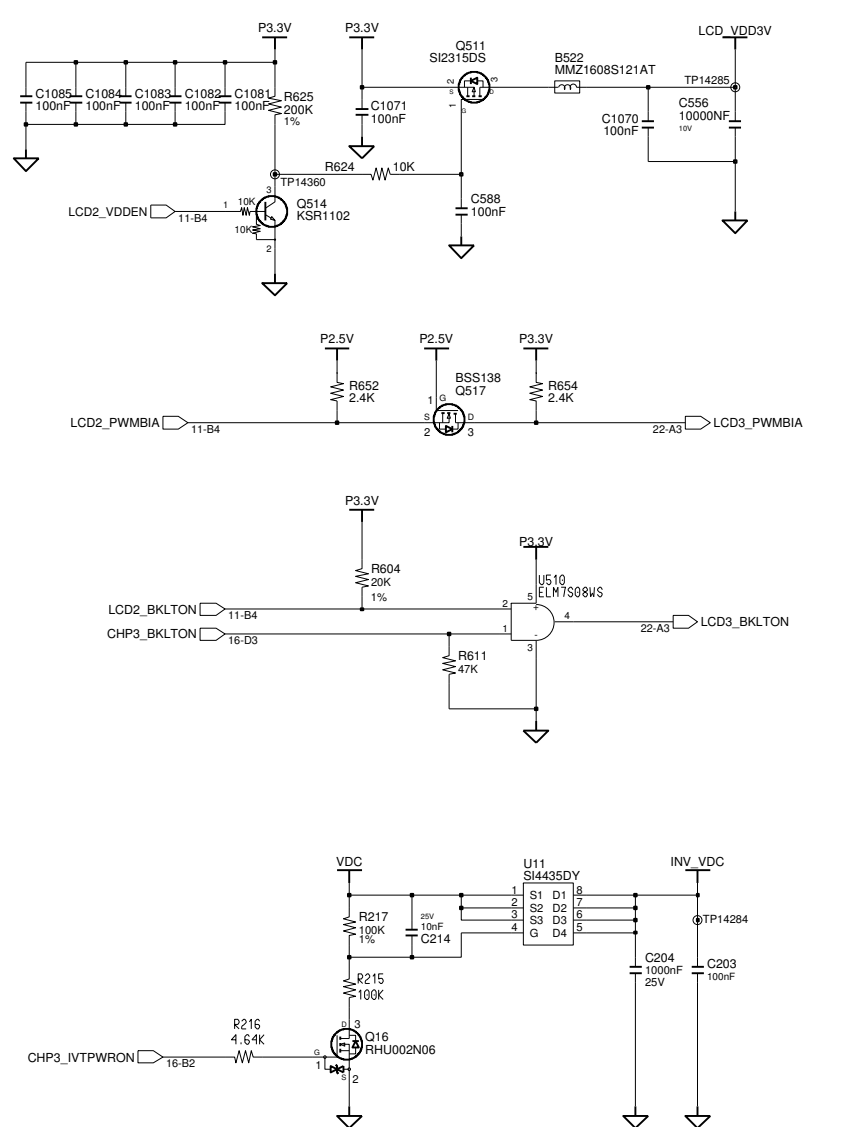


DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN LCD Analog Power	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	PART NO.		
APPROVAL	JS Euh	REV	0.9	March 7, 2006 12:22:03 PM		PAGE 21 OF 41
MODULE CODE		LAST EDIT				

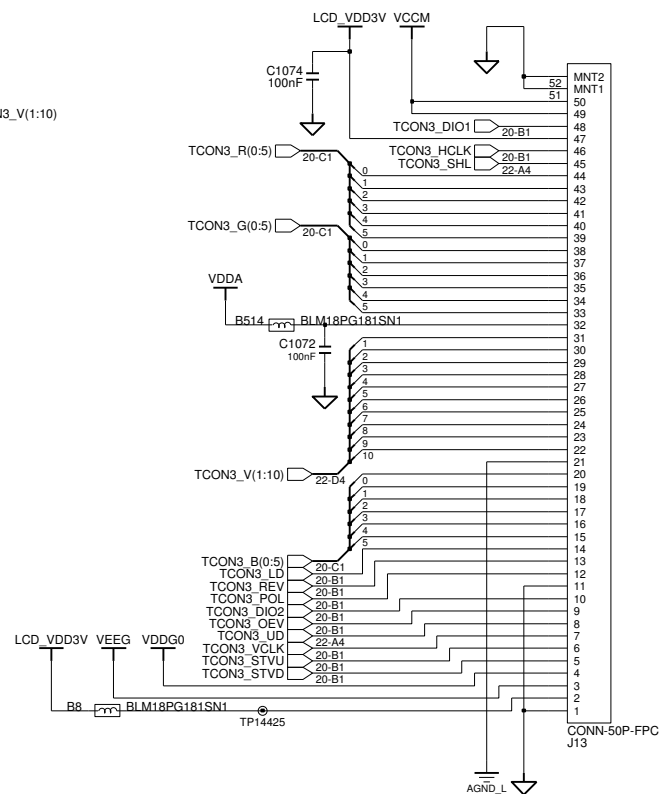
SAMSUNG PROPRIETARY

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.

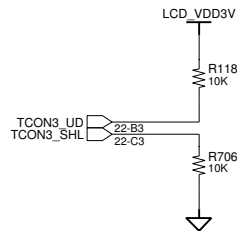
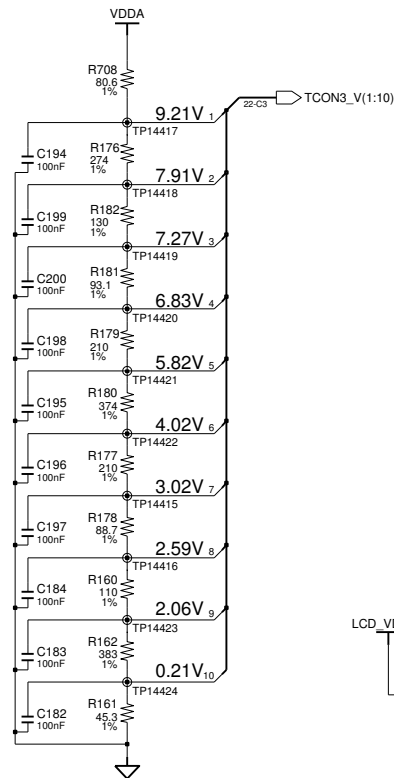
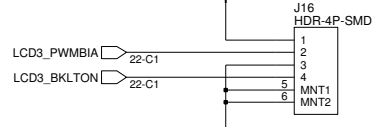
D
C
B
A



LCD Connector



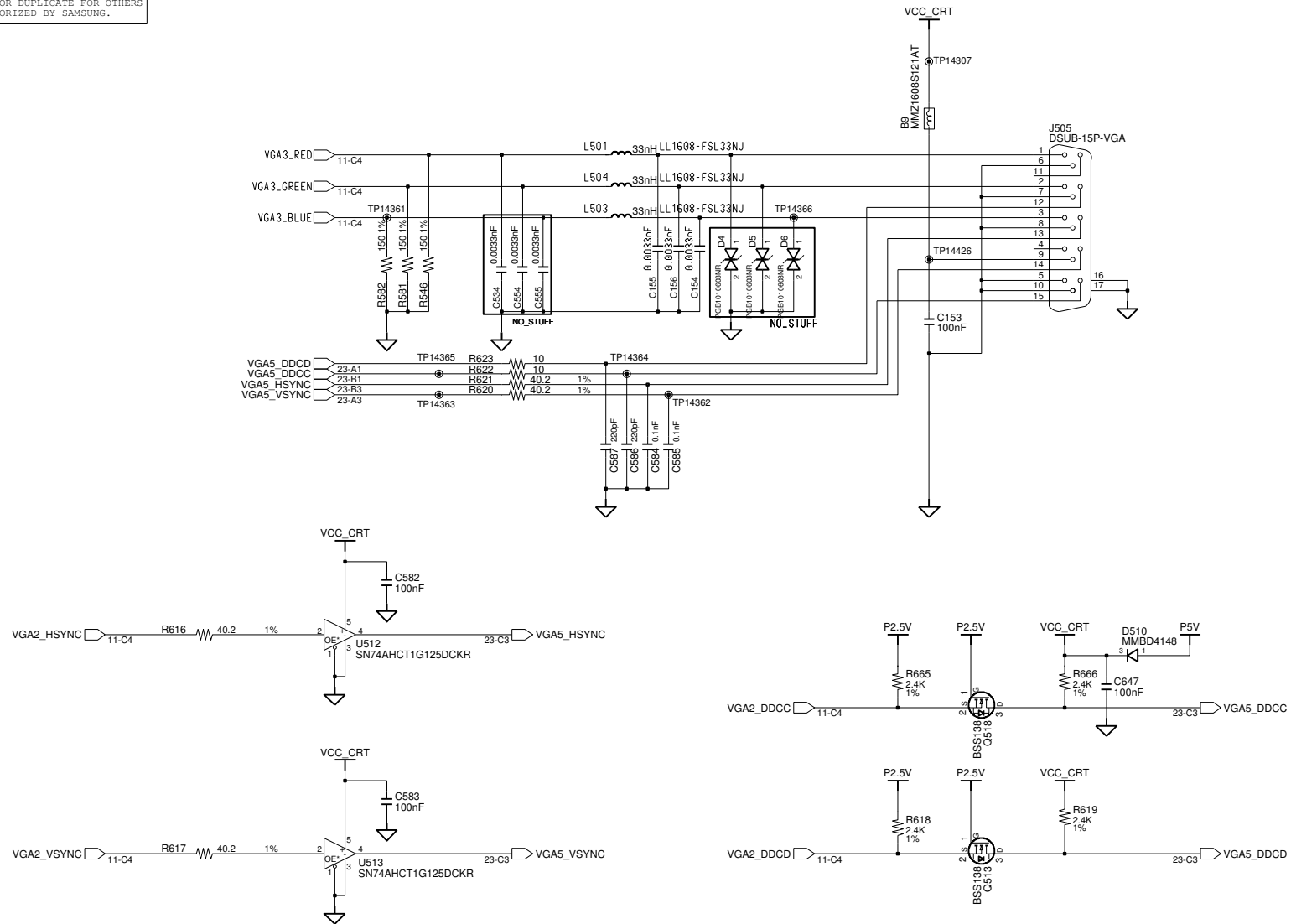
Inverter Conn.



DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN LCD Gamma & Conn.	SAMSUNG ELECTRONICS PART NO.
CHECK	HJ Kim	DEV. STEP	SR			
APPROVAL	JS Euh	REV	0.9			
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE	22 OF 41	

SAMSUNG PROPRIETARY

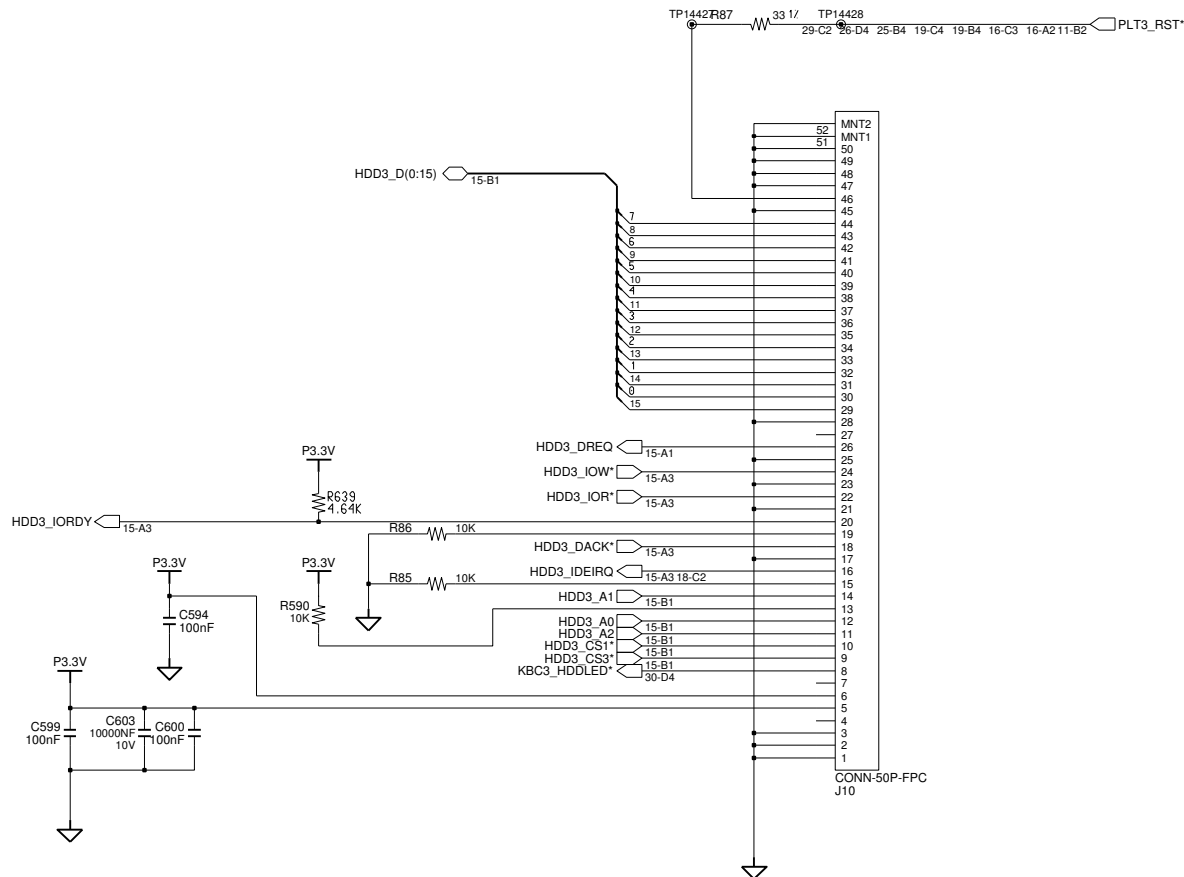
THIS DOCUMENT CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION THAT IS SAMSUNG ELECTRONICS CO.'S PROPERTY. DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS EXCEPT AS AUTHORIZED BY SAMSUNG.



DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN VGA Level Shift	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	PART NO.		
APPROVAL	JS Euh	REV	0.9			
MODULE CODE	LAST EDIT		March 7, 2006 12:22:03 PM		PAGE	23 OF 41

SAMSUNG PROPRIETARY

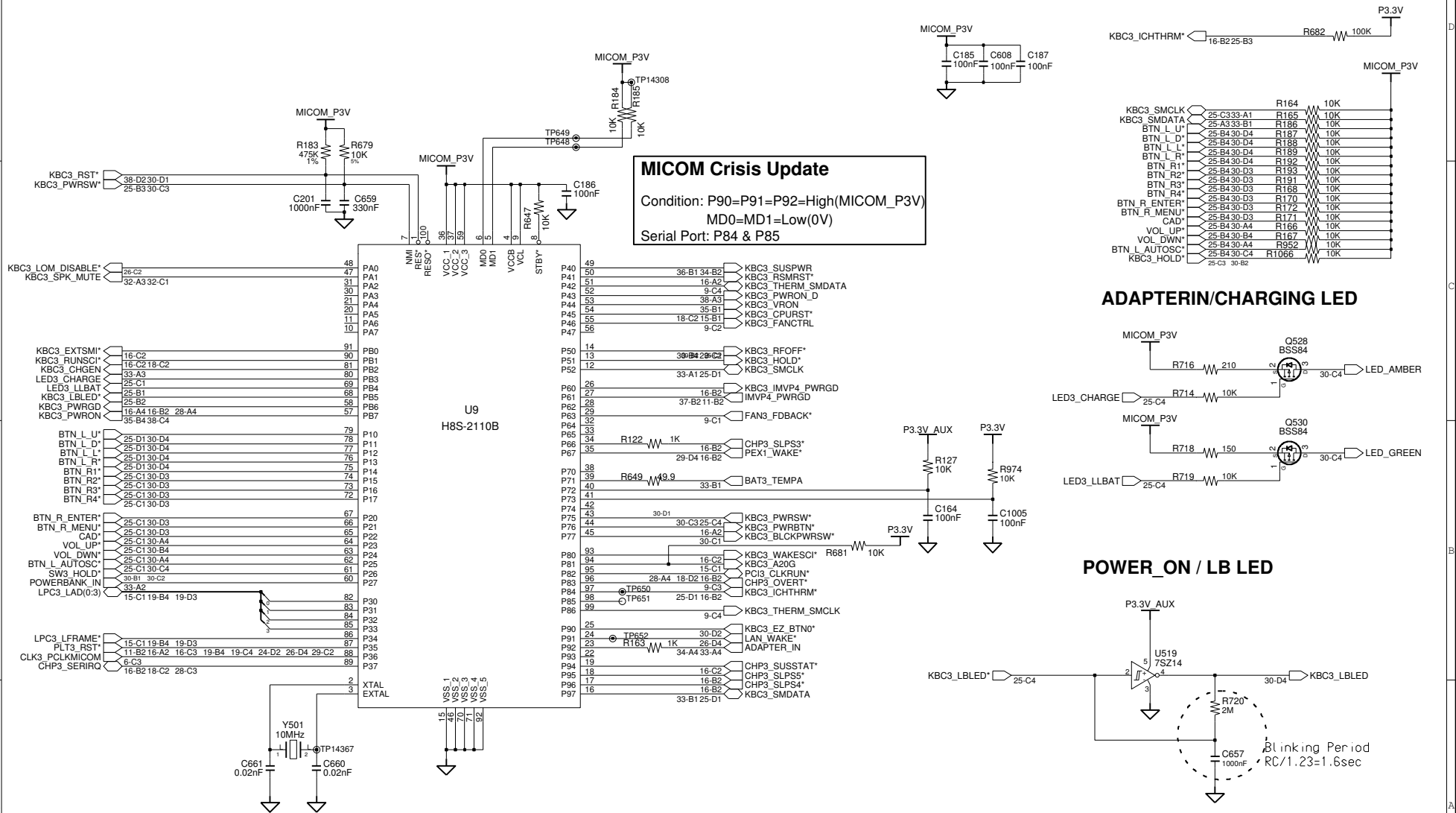
THIS DOCUMENT CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION THAT IS SAMSUNG ELECTRONICS CO.'S PROPERTY. DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS EXCEPT AS AUTHORIZED BY SAMSUNG.



DRAW	Youngmo An	DATE	3/7/2006	TITLE	Sant aFe MAIN HDD CONNECTOR	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	PART NO.		
APPROVAL	JS Euh	REV	0.9			
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE 24 OF 41		

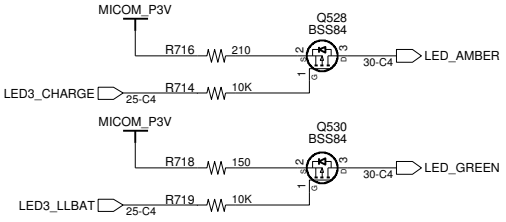
SAMSUNG PROPRIETARY

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.

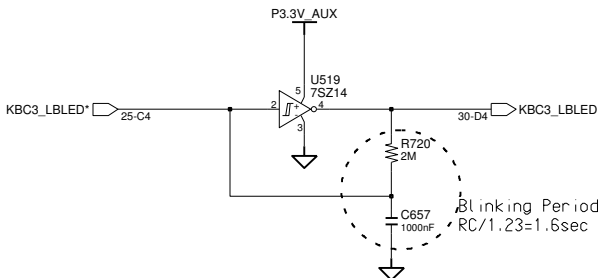


MICOM Crisis Update
 Condition: P90=P91=P92=High(MICOM_P3V)
 MD0=MD1=Low(0V)
 Serial Port: P84 & P85

ADAPTERIN/CHARGING LED



POWER_ON / LB LED

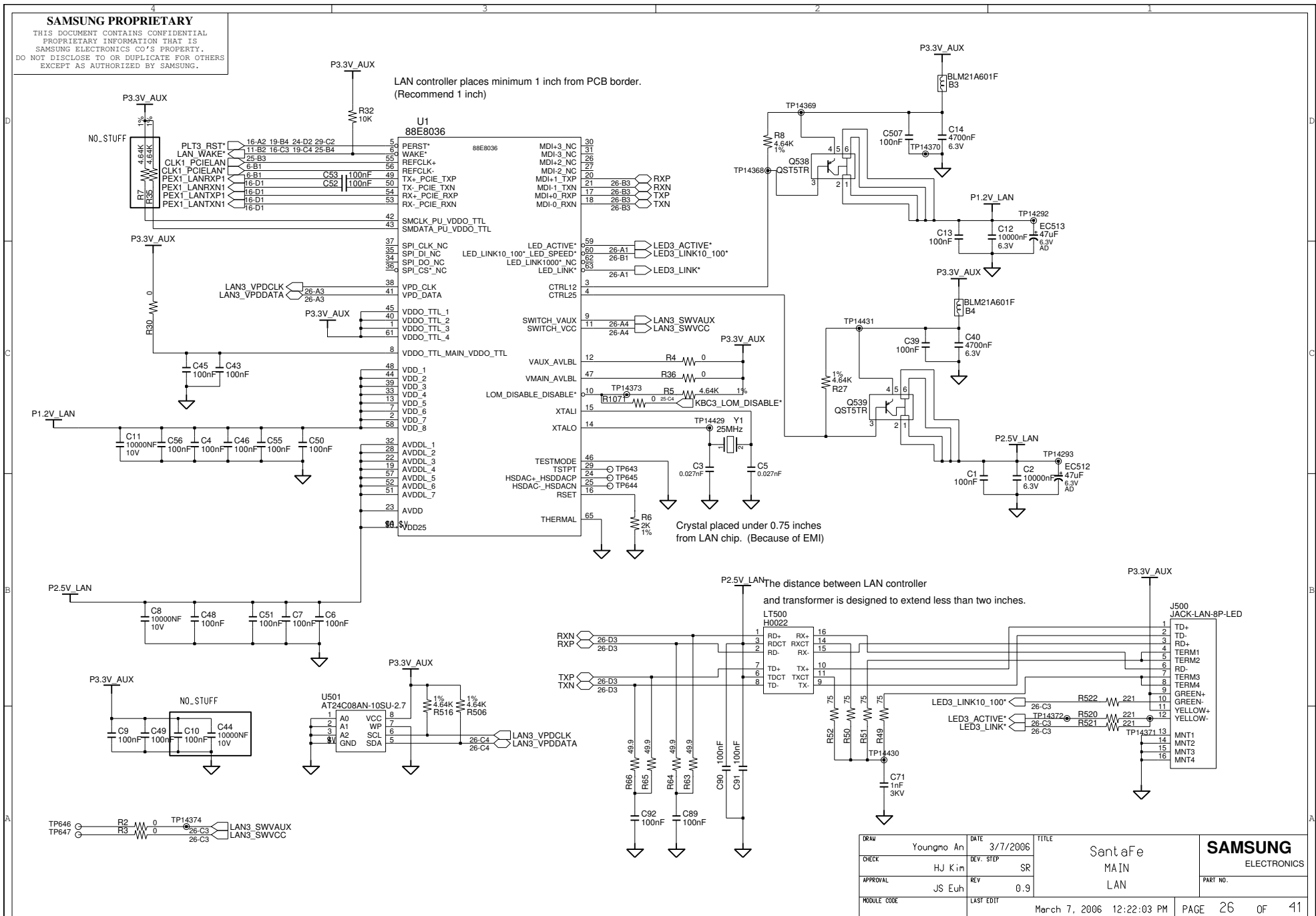


Optional External Thermal Sensor

DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN MICOM	SAMSUNG ELECTRONICS PART NO.
CHECK	HJ Kim	DEV. STEP	SR			
APPROVAL	JS Euh	REV	0.9			
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE	25 OF 41	

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.

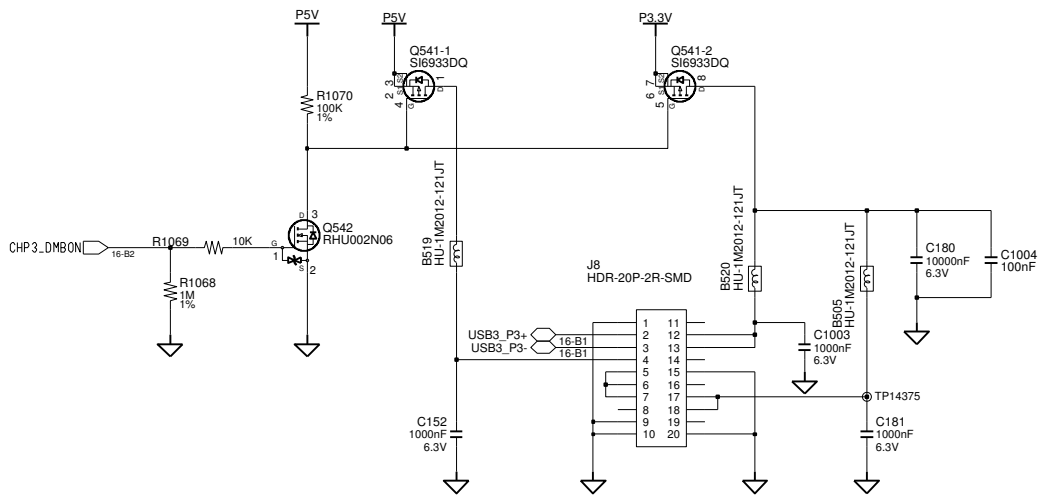


DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	MAIN	LAN	
APPROVAL	JS Euh	REV	0.9			PART NO.
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE	26	OF 41

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.

DMB Connector & Pem(5mm Height)

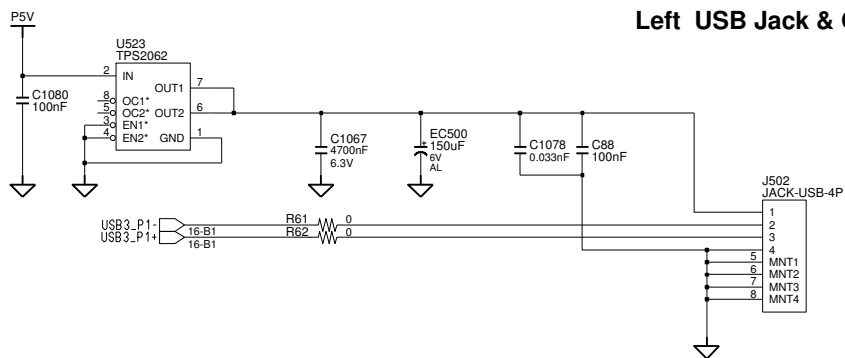


3711-005979

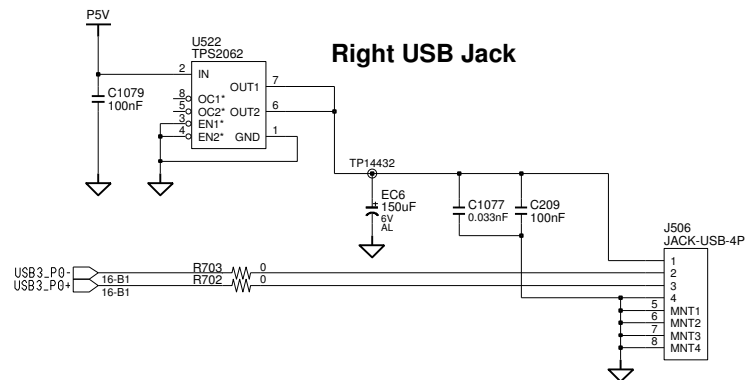


BA81-00730A

Left USB Jack & ODD Power Jack



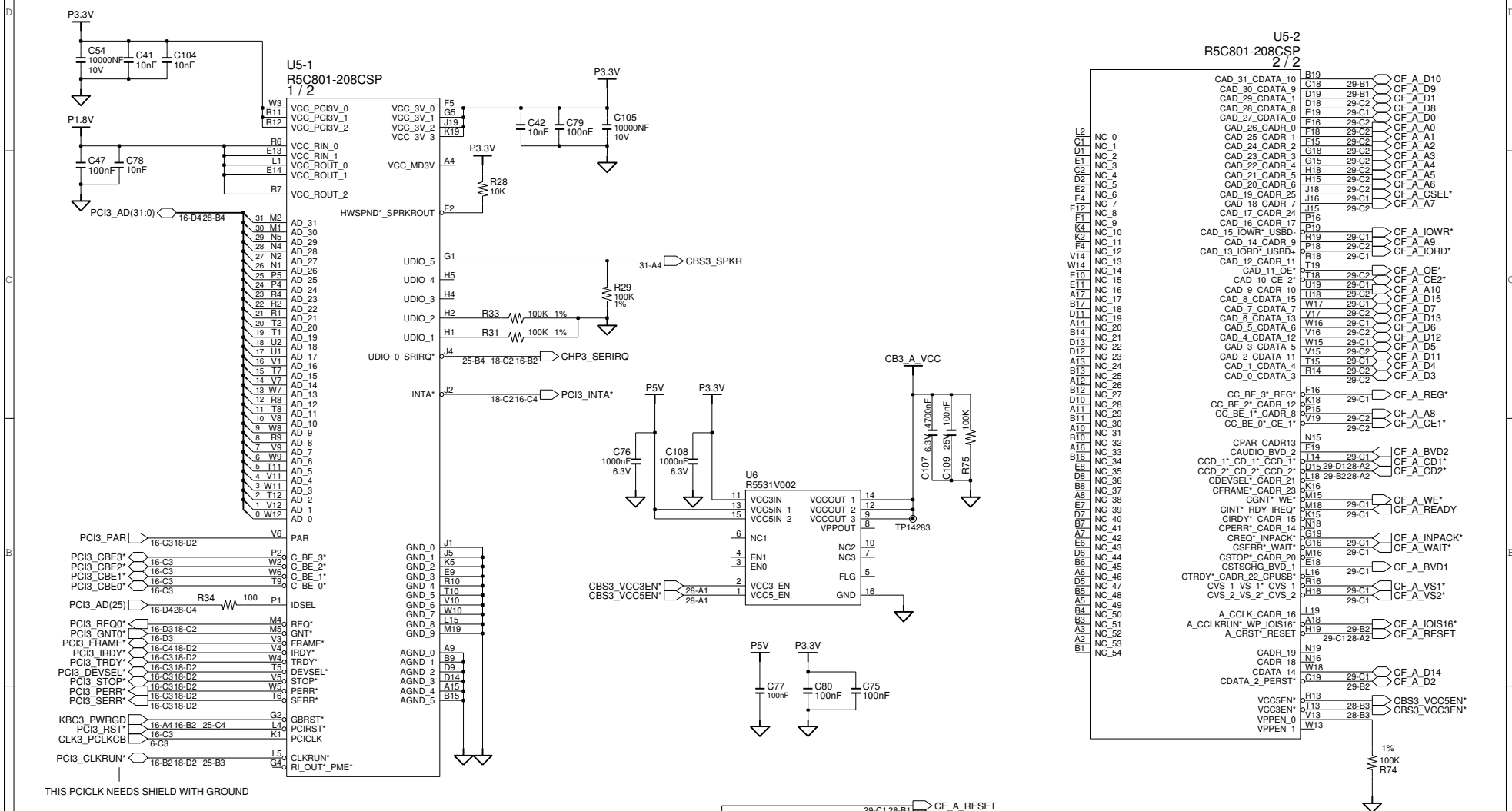
Right USB Jack



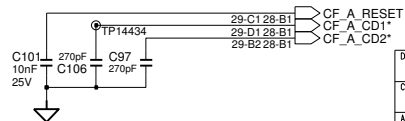
DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN DMB & USB	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	PART NO.		
APPROVAL	JS Euh	REV	0.9			
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE 27 OF 41		

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.



THIS PCICLK NEEDS SHIELD WITH GROUND

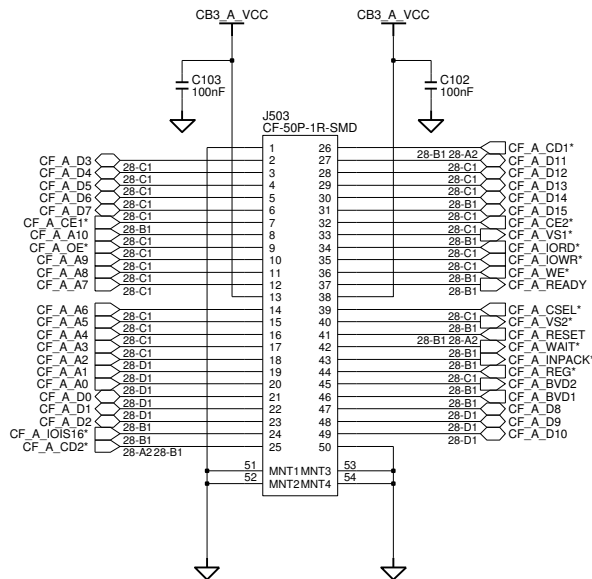
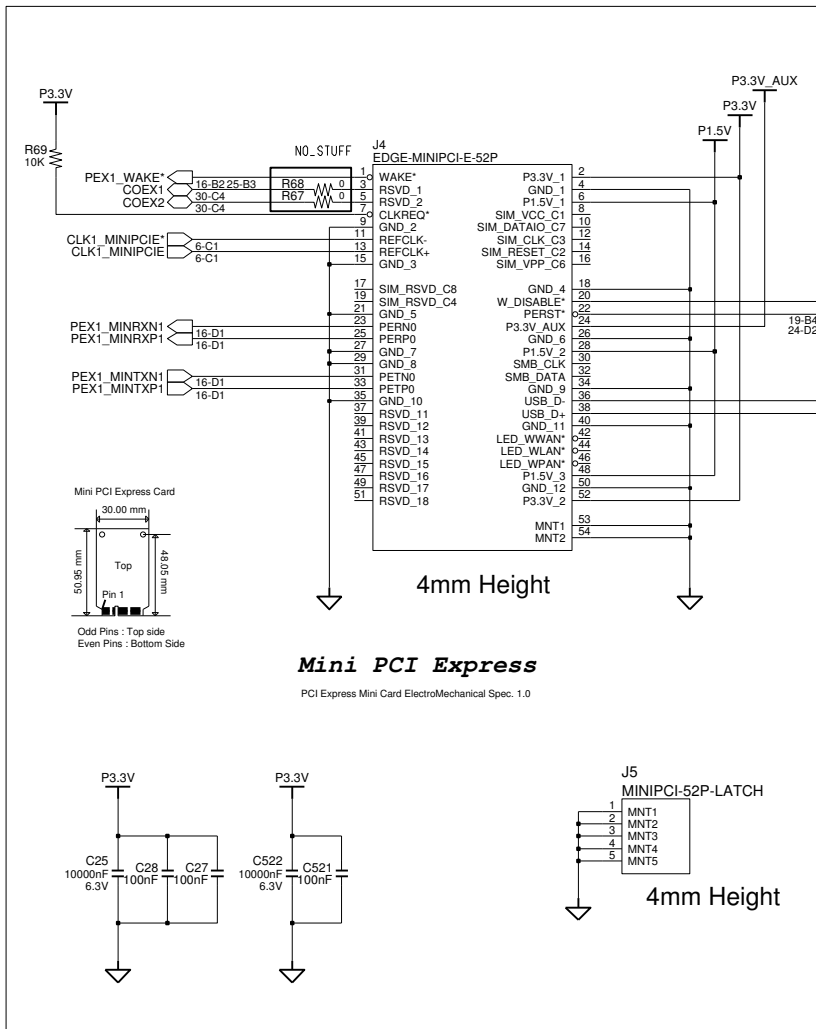


DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN Cardbus controller	SAMSUNG ELECTRONICS PART NO.
CHECK	HJ Kim	DEV. STEP	SR			
APPROVAL	JS Euh	REV	0.9			
MODULE CODE		LAST EDIT				
March 7, 2006 12:22:03 PM						

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.

CF SLOT

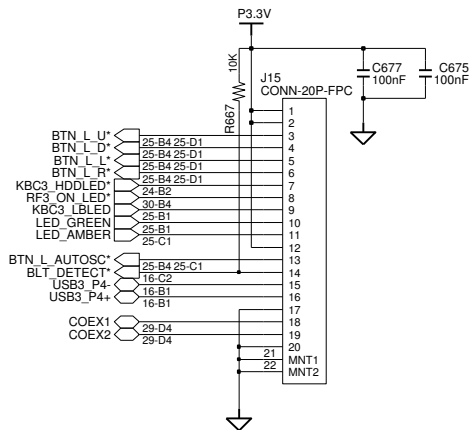


DRAW	Youngno An	DATE	3/7/2006	TITLE	SantaFe MAIN Mini Card & CF Slot	SAMSUNG ELECTRONICS PART NO.
CHECK	HJ Kim	DEV. STEP	SR			
APPROVAL	JS Euh	REV	0.9			
MODULE CODE		LAST EDIT				
				March 7, 2006 12:22:03 PM	PAGE	29 OF 41

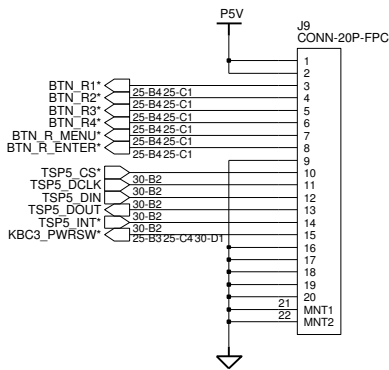
SAMSUNG PROPRIETARY

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.

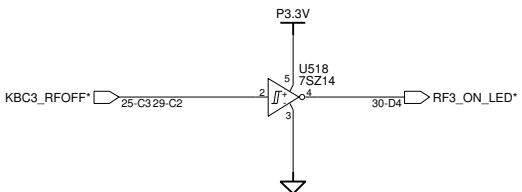
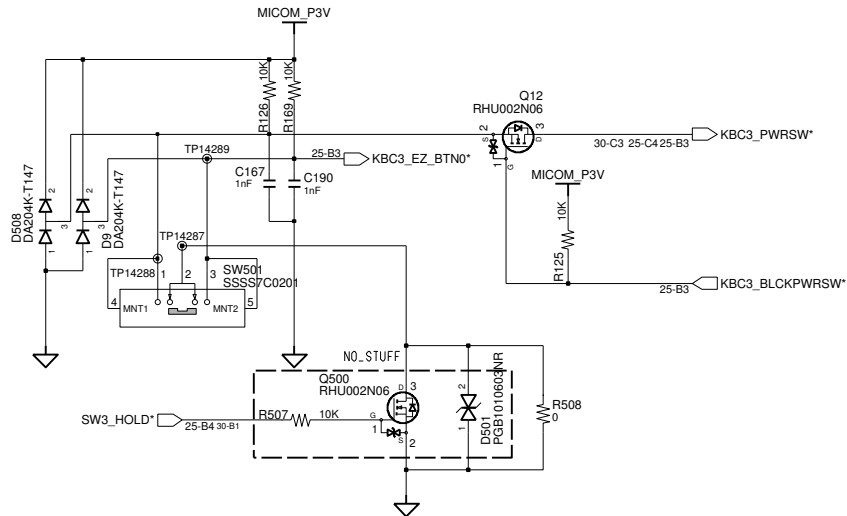
Main to Subboard(Left)



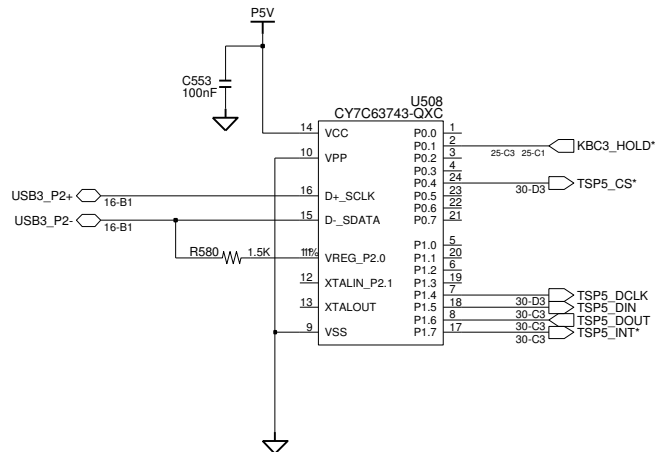
Main to Subboard(Right)



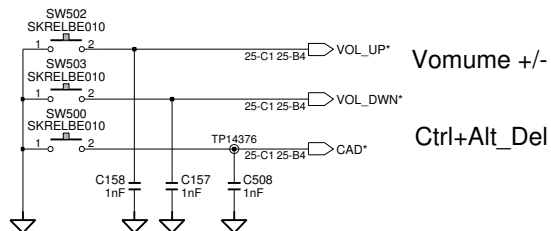
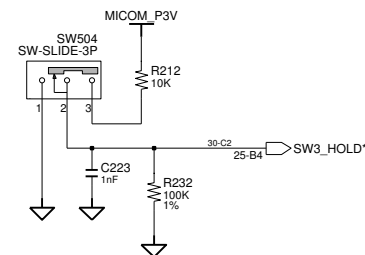
POWER & MIO S/W



TSP



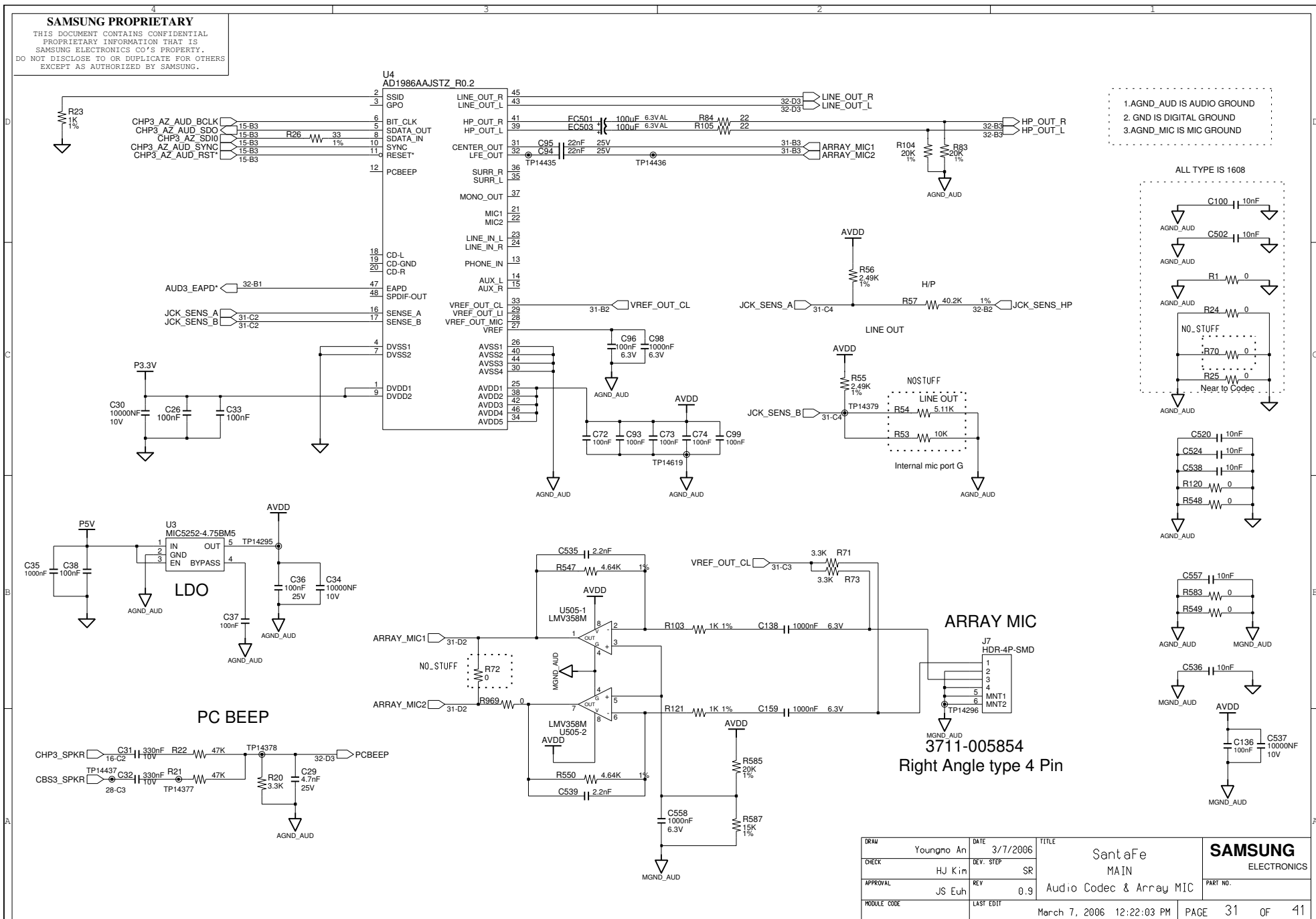
HOLD S/W



DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	MAIN		
APPROVAL	JS Euh	REV	0.9	TSP & SUB B'D Conn. & S/W		PART NO.
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE	30	OF 41

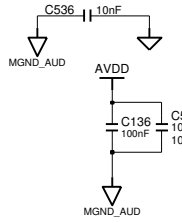
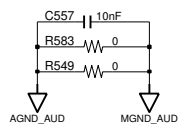
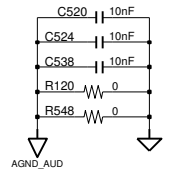
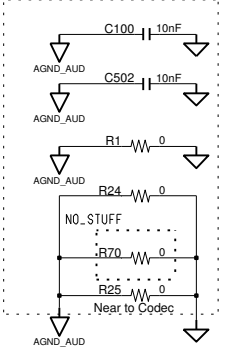
SAMSUNG PROPRIETARY

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.



- 1. AGND_AUD IS AUDIO GROUND
- 2. GND IS DIGITAL GROUND
- 3. AGND_MIC IS MIC GROUND

ALL TYPE IS 1608



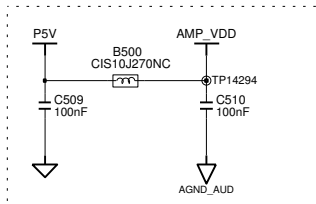
ARRAY MIC
3711-005854
 Right Angle type 4 Pin

DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	Audio Codec & Array MIC		
APPROVAL	JS Euh	REV	0.9	PART NO.		PAGE 31 OF 41
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE 31 OF 41		

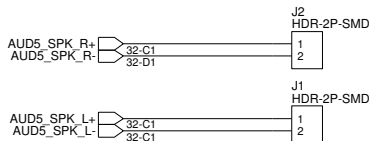
SAMSUNG PROPRIETARY

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.

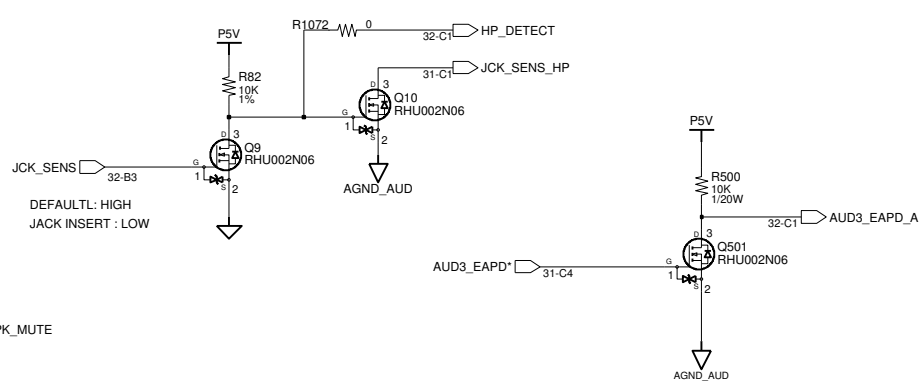
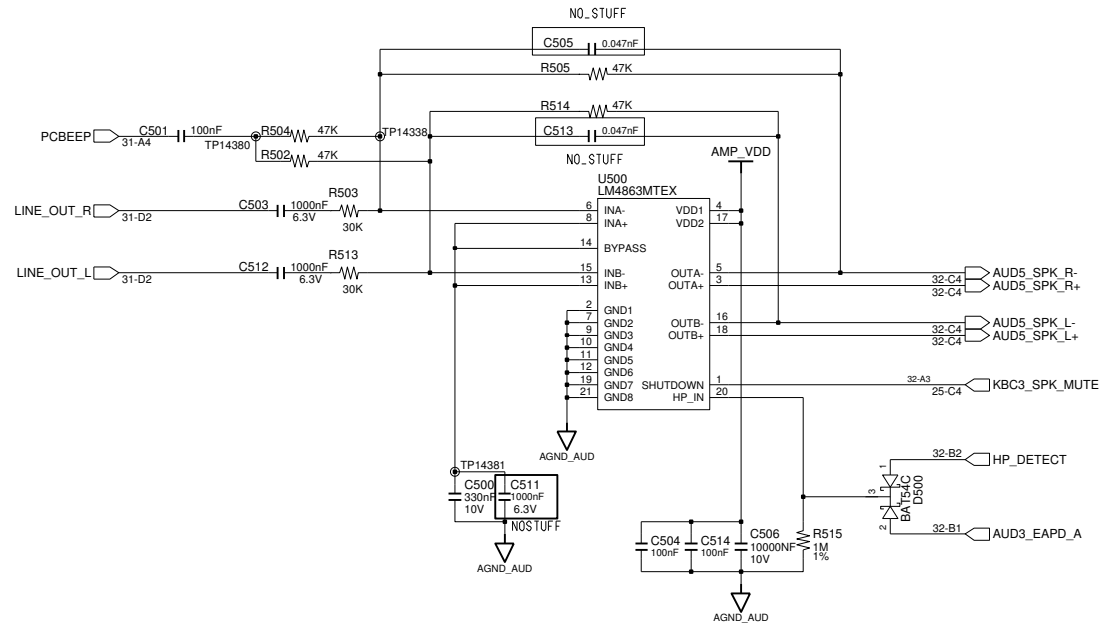
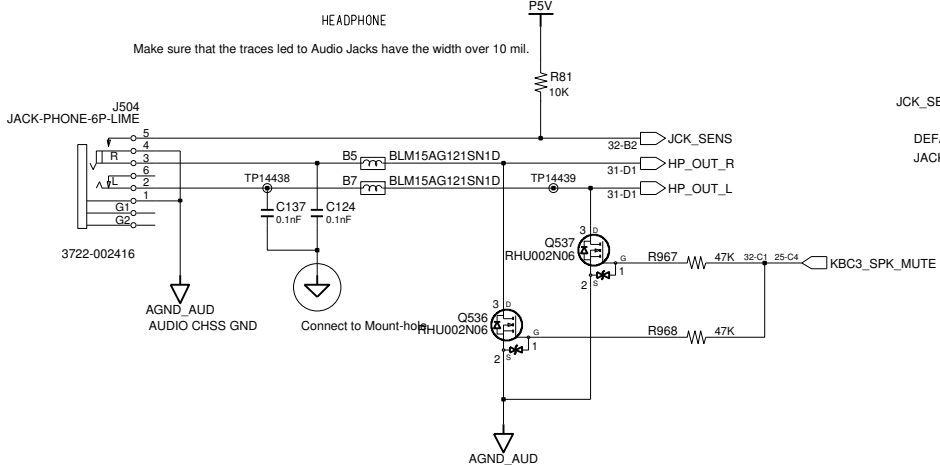
AMP_VDD



INTERNAL STEREO SPEAKERS



3711-005752

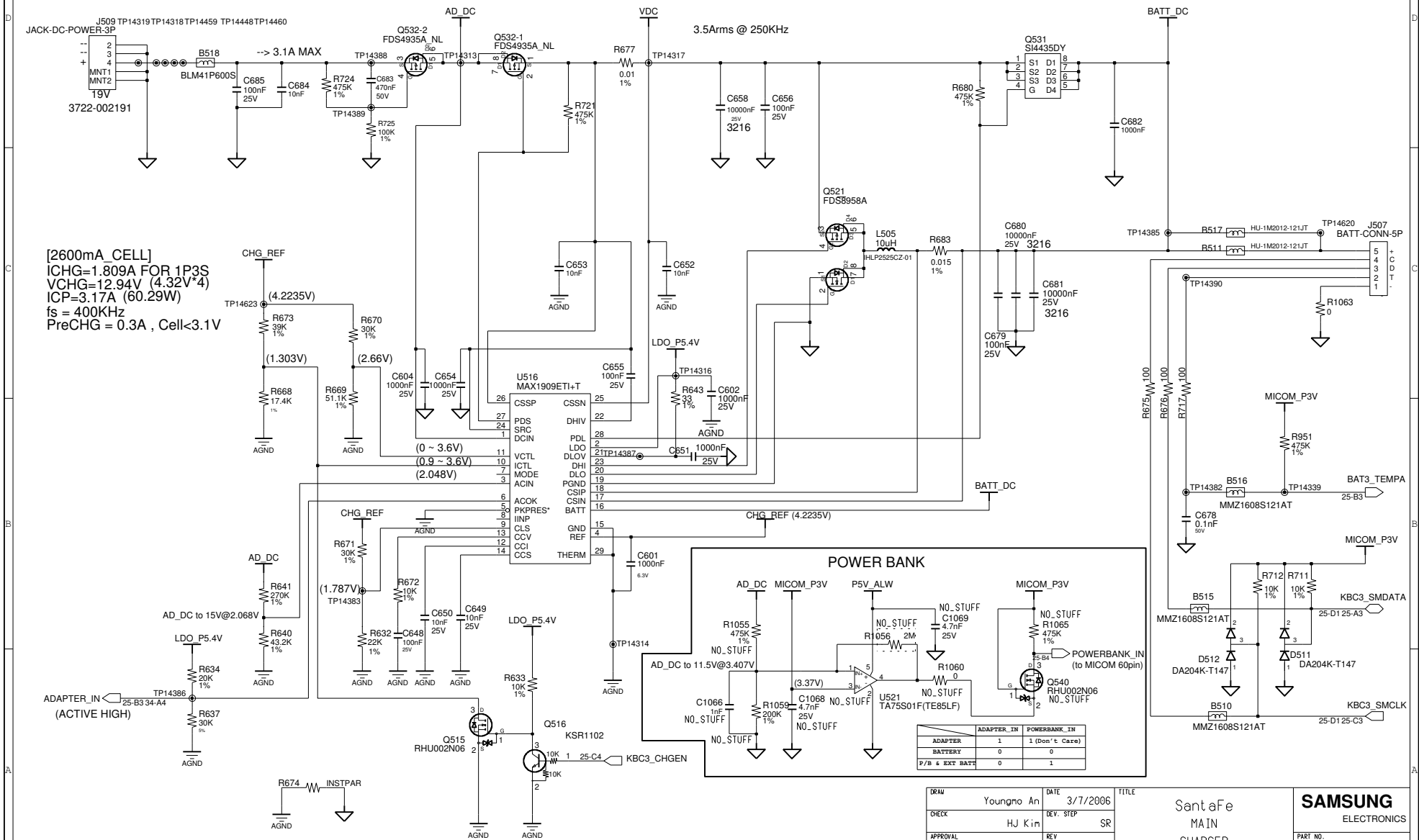


DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN AMP & Spkr Conn & HP Jack	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	PART NO.		
APPROVAL	JS Euh	REV	0.9			
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE 32 OF 41		

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.

CHARGER & POWER MANAGEMENT

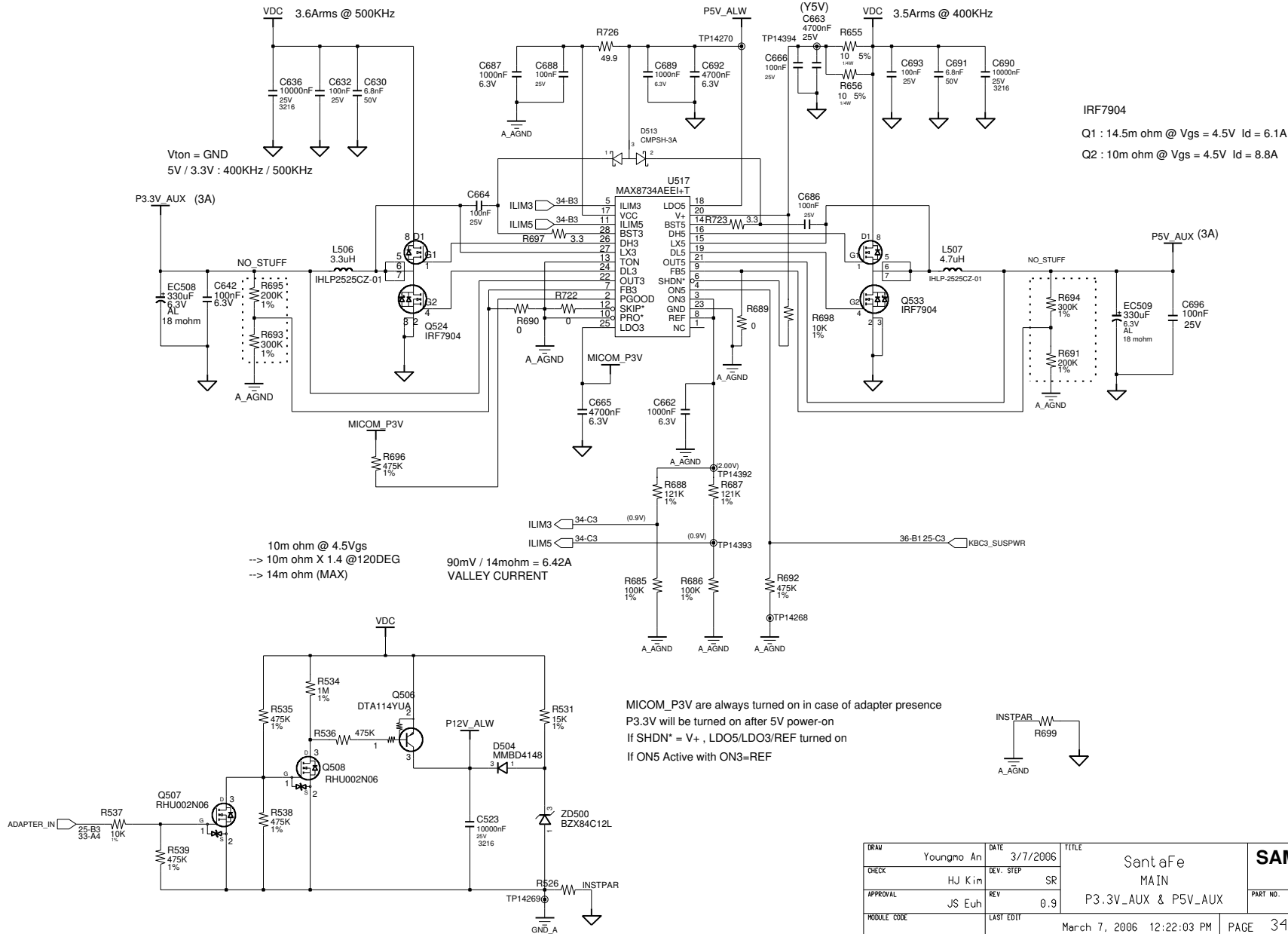


DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN CHARGER	SAMSUNG ELECTRONICS PART NO.
CHECK	HJ Kim	DEV. STEP	SR			
APPROVAL	JS Euh	REV	0.9			
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE	33 OF 41	

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.

P3.3V_AUX & P5V_AUX & MICOM_P3V



IRF7904
 Q1 : 14.5m ohm @ Vgs = 4.5V Id = 6.1A
 Q2 : 10m ohm @ Vgs = 4.5V Id = 8.8A

10m ohm @ 4.5Vgs
 --> 10m ohm X 1.4 @120DEG
 --> 14m ohm (MAX)

90mV / 14mohm = 6.42A
 VALLEY CURRENT

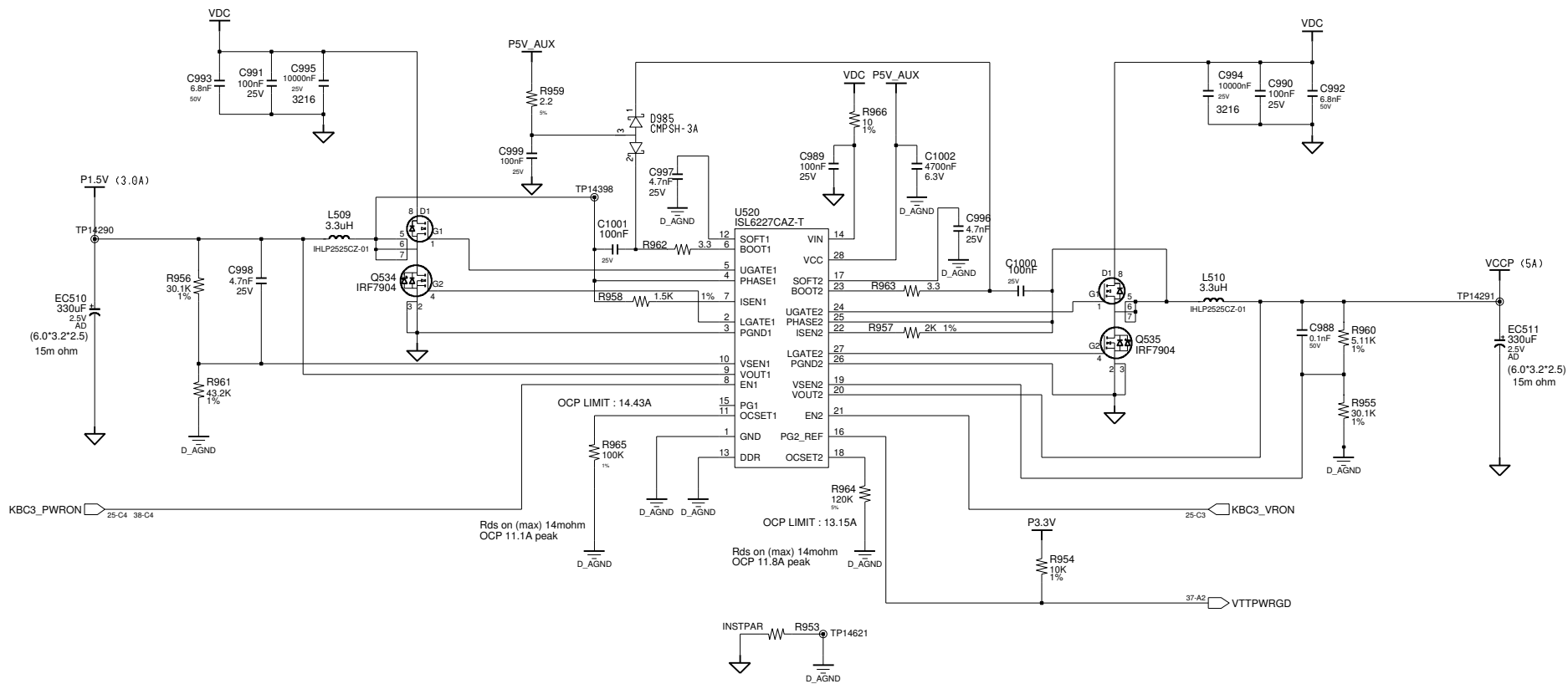
MICOM_P3V are always turned on in case of adapter presence
 P3.3V will be turned on after 5V power-on
 If SHDN* = V+ , LDO5/LDO3/REF turned on
 If ON5 Active with ON3=REF

DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN P3.3V_AUX & P5V_AUX	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	PART NO.		
APPROVAL	JS Euh	REV	0.9			
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE	34	OF 41

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.

P1.5V & VCCP (1.05V)

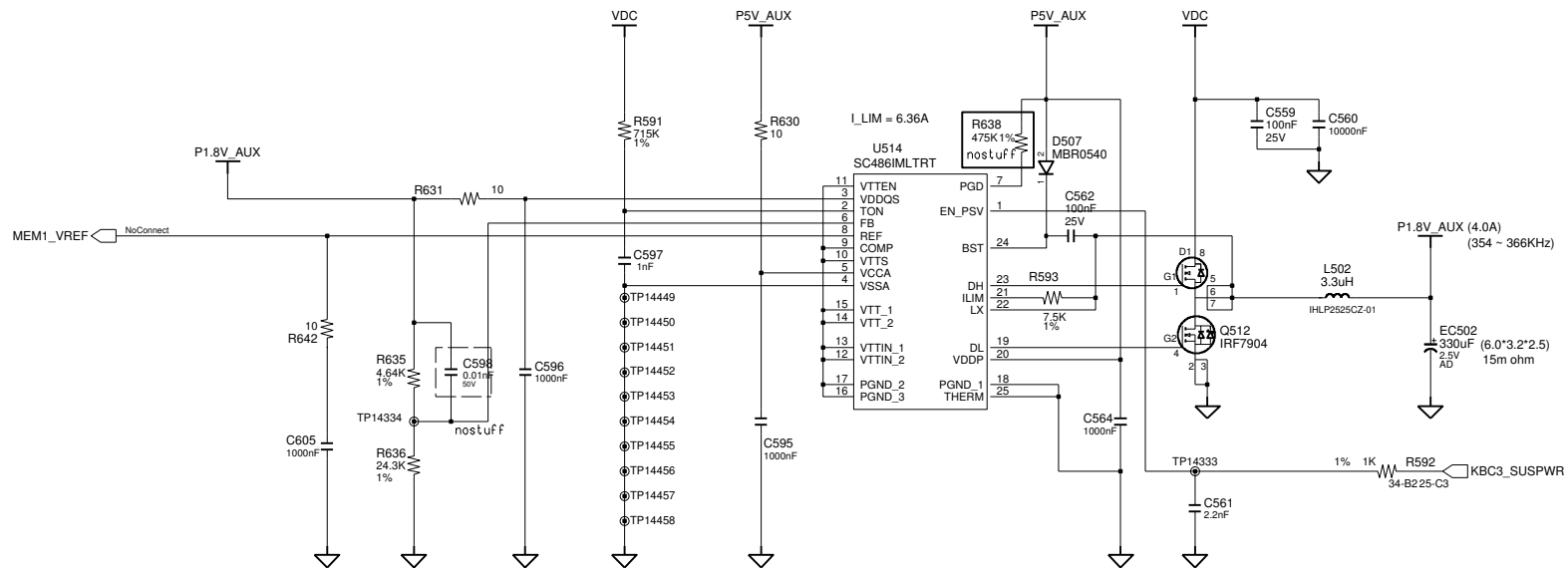


DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN P1.5V & VCCP	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	PART NO.		
APPROVAL	JS Euh	REV	0.9			
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE 35 OF 41		

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.

DDR2 Power

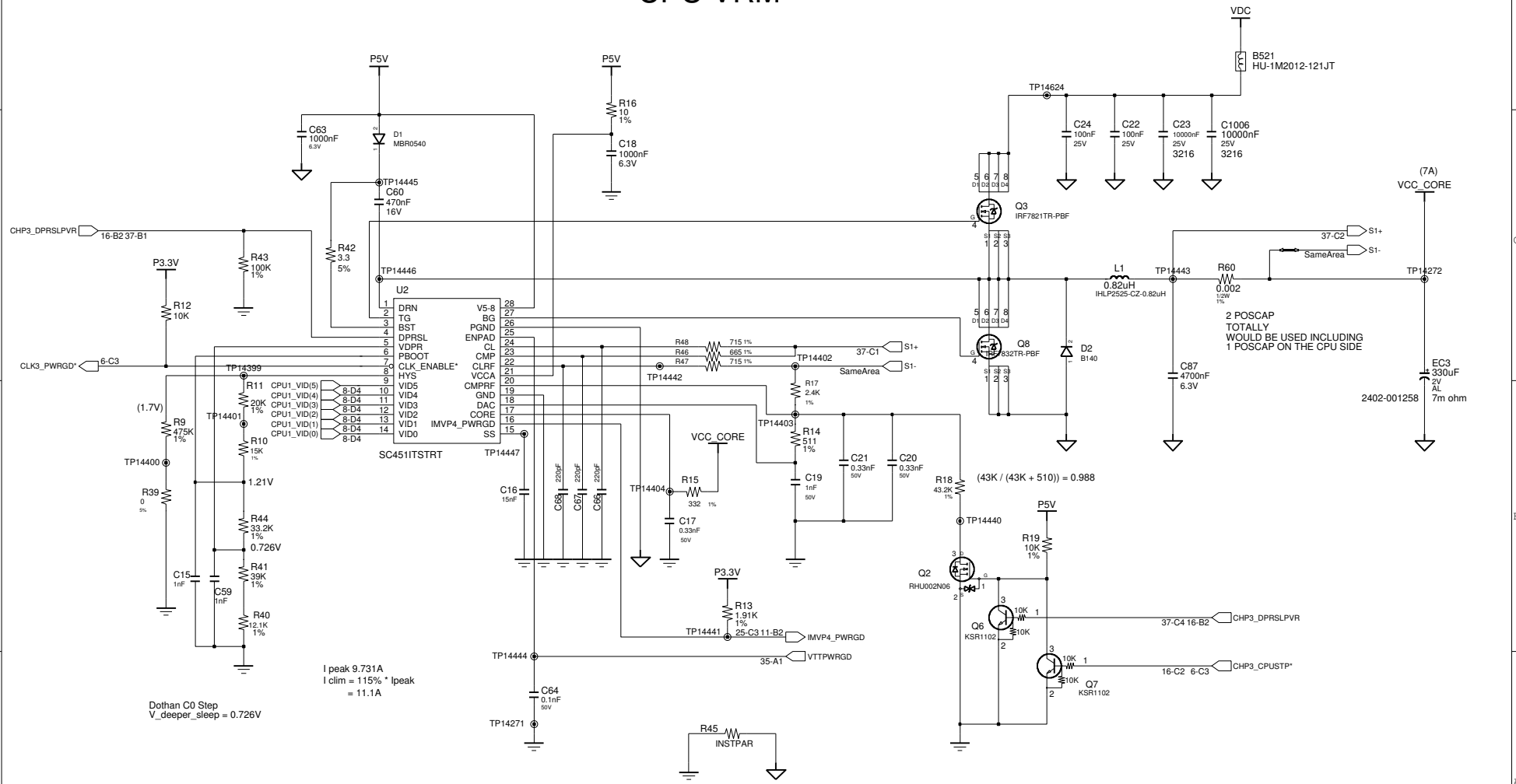


DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN DDR2 POWER	SAMSUNG ELECTRONICS PART NO.
CHECK	HJ Kim	DEV. STEP	SR			
APPROVAL	JS Euh	REV	0.9			
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE 36 OF 41		

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.

CPU VRM



Dothan C0 Step
V_deeper_sleep = 0.726V

I_peak = 9.731A
I_clim = 115% * I_peak
= 11.1A

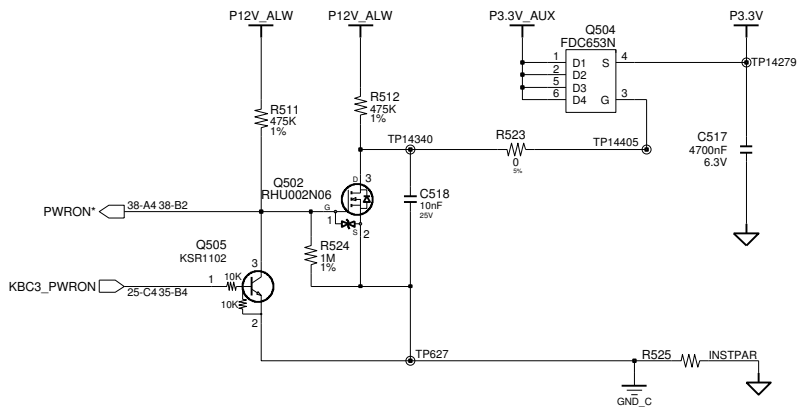
2 POSCAP
TOTALLY
WOULD BE USED INCLUDING
1 POSCAP ON THE CPU SIDE

DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN CPU VRM	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR			
APPROVAL	JS Euh	REV	0.9			PART NO.
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE	37	OF 41

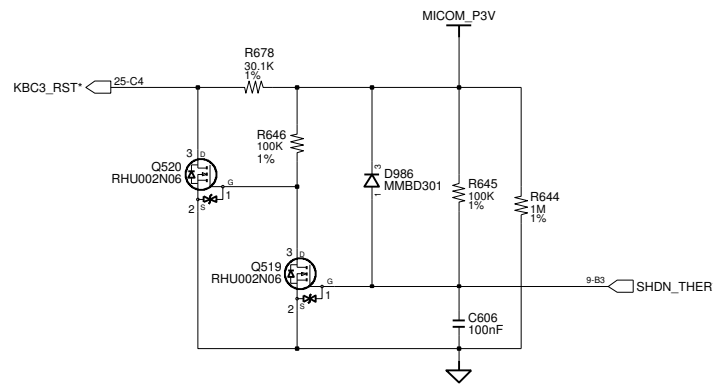
SAMSUNG PROPRIETARY

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.

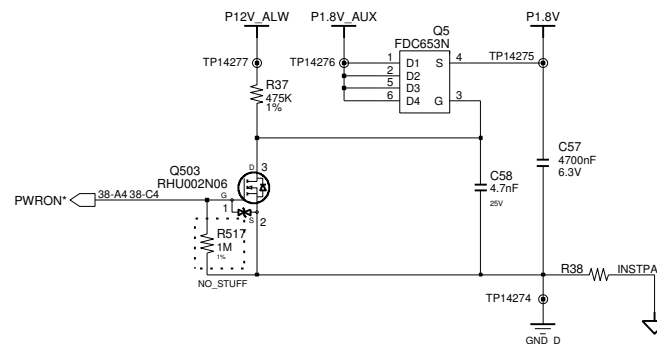
Switched Power On (P3.3V)



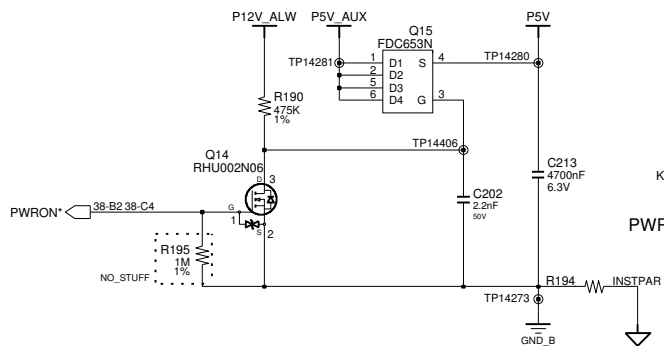
MICOM RESET



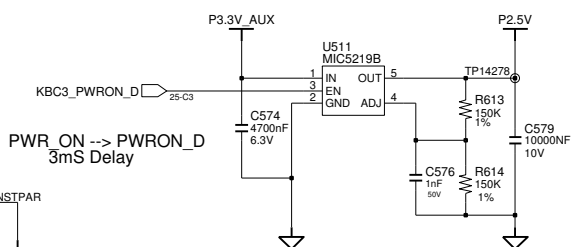
Switched Power On (P1.8V)



Switched Power On (P5V)



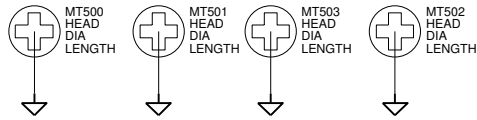
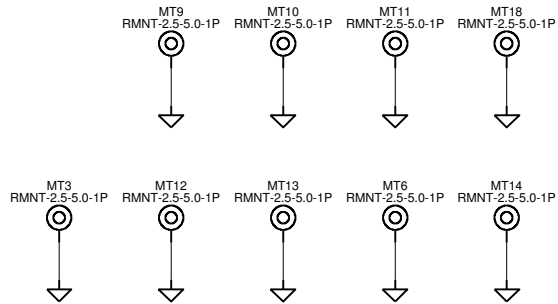
Switched Power On (P2.5V)



DRAW	Youngmo An	DATE	3/7/2006	TITLE	SantaFe MAIN Switched Power	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	PART NO.		
APPROVAL	JS Euh	REV	0.9	March 7, 2006 12:22:03 PM		PAGE 38 OF 41
MODULE CODE		LAST EDIT				

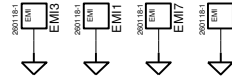
SAMSUNG PROPRIETARY

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.



RHE PEM(2mm): BA61-00955A

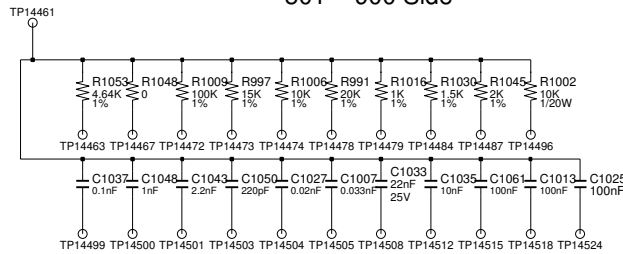
EMI FINGER : 005299021



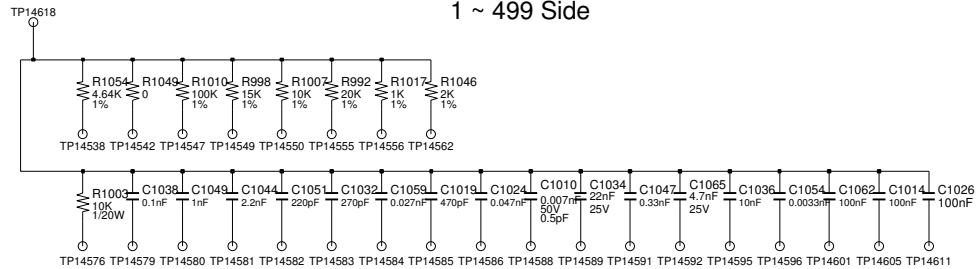
PCB REVISION CONTROL (ICT)				
NO	CONNECTION	DATE(Y/M/D)	REVISION	STEP
1	N.C.			
2	1-2			
3	2-3			
4	3-1			
5	1-2-3			
6	N.C.			
7	1-2			
8	2-3			
9	3-1			
10	1-2-3			

REV500
1 O
2 O O3

501 ~ 900 Side



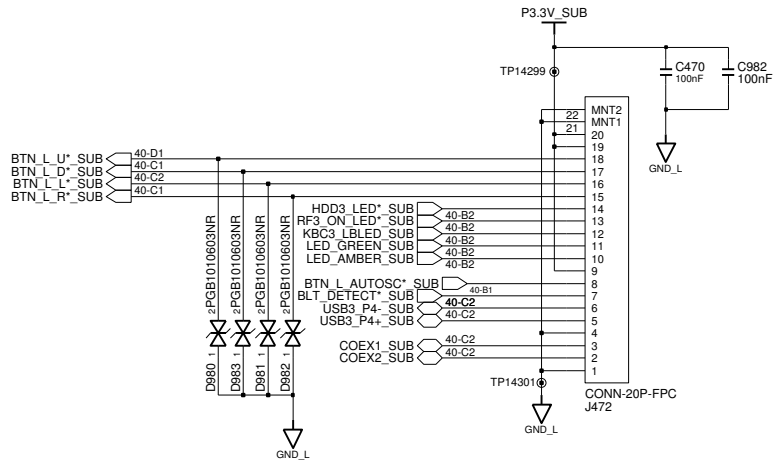
1 ~ 499 Side



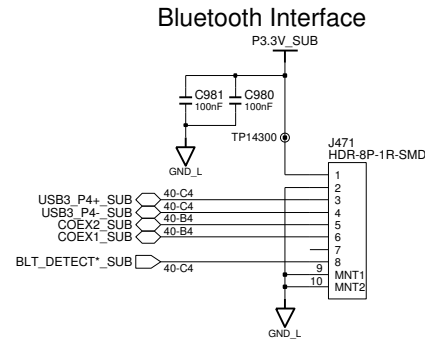
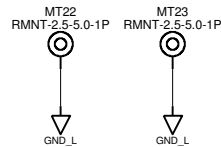
DRAW	Youngmo An	DATE	3/7/2006	TITLE	Sant aFe MAIN Mount Hole	SAMSUNG ELECTRONICS
CHECK	HJ Kim	DEV. STEP	SR	PART NO.		
APPROVAL	JS Euh	REV	0.9			
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE 39 OF 41		

SAMSUNG PROPRIETARY

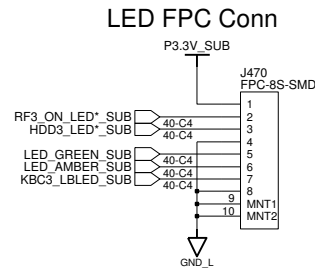
THIS DOCUMENT CONTAINS CONFIDENTIAL PROPRIETARY INFORMATION THAT IS SAMSUNG ELECTRONICS CO'S PROPERTY. DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS EXCEPT AS AUTHORIZED BY SAMSUNG.



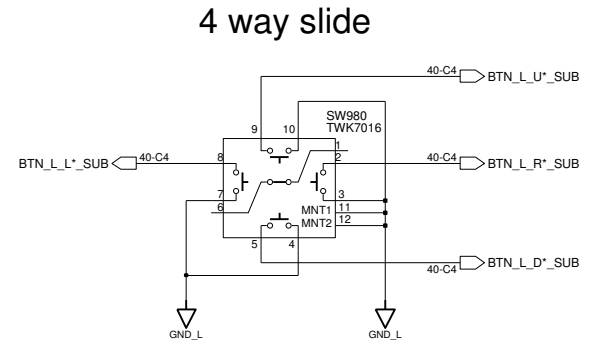
Main to Subboard(Left)



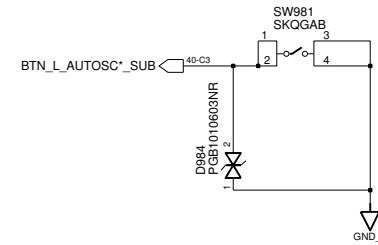
Bluetooth Interface



LED FPC Conn



4 way slide

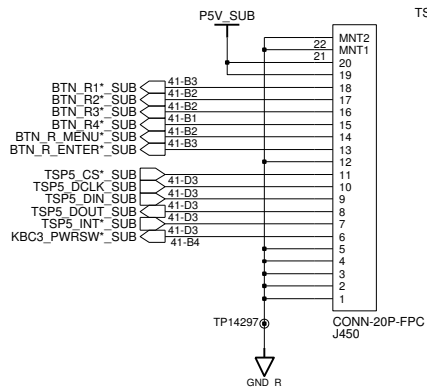


DRAW	YOUNGMO, AN	DATE	3/7/2006	TITLE	SantaFe MAIN SUB LEFT	SAMSUNG ELECTRONICS
CHECK	HJ, KIM	DEV. STEP	SR			PART NO.
APPROVAL	JS, EUH	REV	0.9			
MODULE CODE		LAST EDIT	March 7, 2006 12:22:03 PM	PAGE	40	OF 41

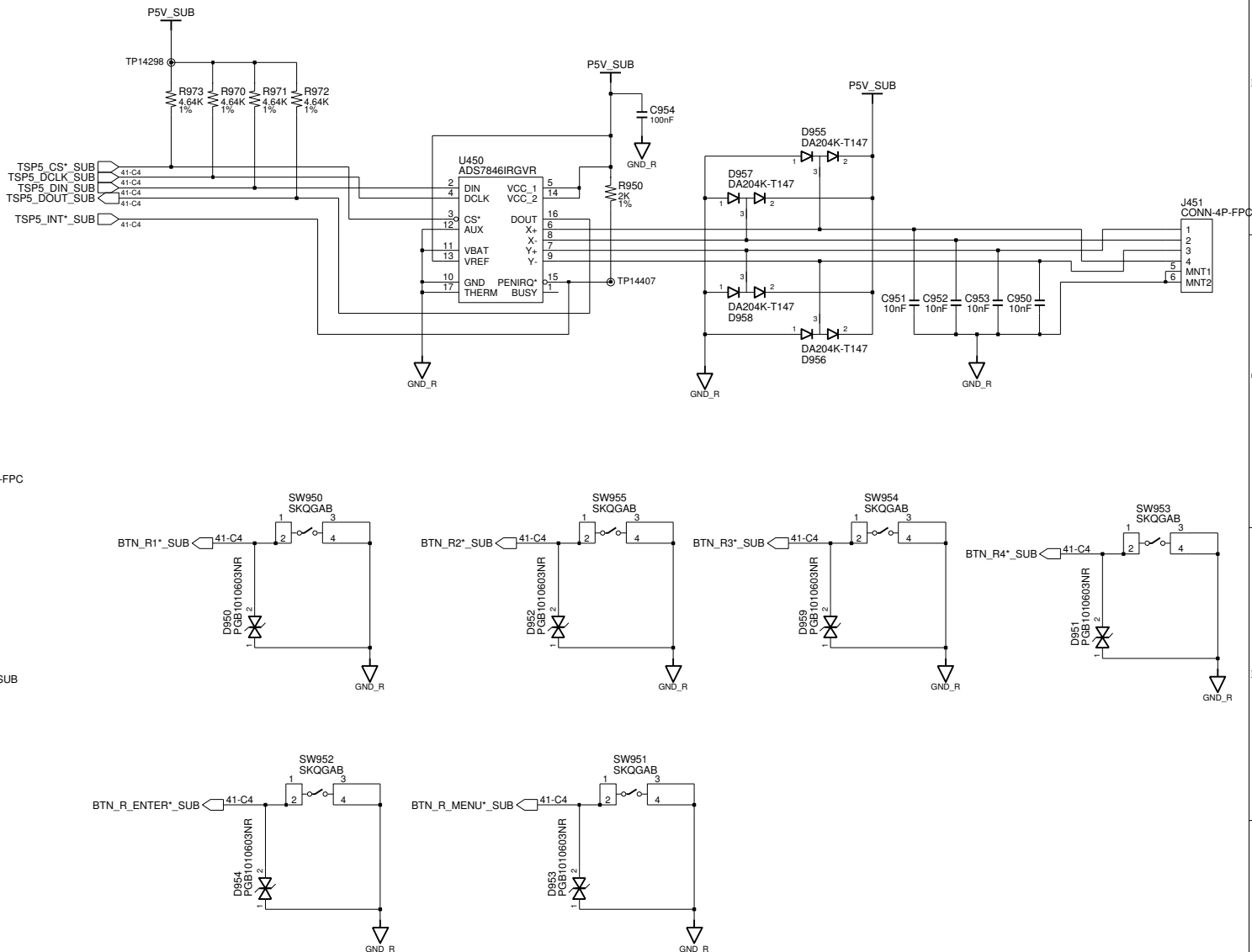
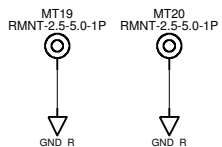
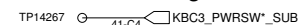
SAMSUNG PROPRIETARY

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.

**Top contact
Main to Subboard(Right)**



For FCT Jig



DRAW	YOUNGMO, AN	DATE	3/7/2006	TITLE	SantaFe MAIN SUB RIGHT	SAMSUNG ELECTRONICS
CHECK	HJ, KIM	DEV. STEP	SR	PART NO.		
APPROVAL	JS, EUH	REV	0.9			
MODULE CODE		LAST EDIT				
				March 7, 2006 12:22:03 PM	PAGE	41 OF 41