

Petronas-14 DC

CPU : Sandy Bridge PGA
Chip Set : Intel Cougar Point
GFX : NVIDIA N12P-GVR
Remarks : Huron River Platform

Model Name : Petronas-14
PBA Name : MAIN_Dual
PCB Code : BA41-01666A

Dev. Step : MP
Revision : 1.2
T.R. Date : 2011.08.12

Design	CHECK	APPROVAL
MS YANG	MK KIM	BL LEE

Owner : SEC Mobile R & D Signature : X

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DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG
CHECK	MK KIM	DEV. STEP	MP	MAIN		ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.2	COVER		PART NO. BA41-01666A
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	1	OF 51

BOARD INFORMATION

SCHEMATIC ANNOTATIONS AND BOARD INFORMATION

Voltage Rails		Active in
VDC P3.3V_MICOM P5.0V_STB P5.0V_ALW P3.3V_ALW P12.0V_ALW	Primary DC system power supply (7 to 21V) 3.3V always power rail (for Micom) 5.0V always power rail 5.0V always power rail 3.3V always power rail 12.0V always power rail	S4 - S5
P5.0V_AUX P3.3V_AUX P1.5V_AUX	5.0V switched on power rail (off in S4-S5) 3.3V switched on power rail (off in S4-S5) 1.5V power rail for DDR3 (off in S4-S5)	
P5.0V P3.3V P1.8V P1.5V P0.75V P0.8V	5.0V switched power rail (off in S3-S5) 3.3V switched power rail (off in S3-S5) 1.8V switched power rail (off in S3-S5) 1.5V switched power rail (off in S3-S5) 0.75V power rail for DDR3 (off in S3-S5) 0.8V switched power rail (off in S3-S5)	
VCC_CORE EGFX_CORE P1.05V (VCCP)	Core Voltage for CPU Core Voltage for GPU VCC for COUGARPOINT	
P3.3V_D P1.5V_D P1.05V_D	3.3V discrete power rail for N12X 1.5V discrete power rail for N12X 1.05V discrete power rail for N12X	
		S3
		S0
		S0

USB PORT Assign		PCI Express Assign	
PORT #	ASSIGNED TO	PORT #	ASSIGNED TO
0	SYSTEM PORT 0	1	Mini Card 1 (WLAN)
1	SYSTEM PORT 1	2	NC
2	Mini PCI Express	3	NC
3	Multi Memory Card Controller	4	LAN CONTROLLER
4	SYSTEM PORT 2	5	NC
5	NC	6	NC
6	NC	7	NC
7	NC	8	NC
8	NC		
9	NC		
10	BLUETOOTH		
11	Camera(LCD Cable)		
12	NC		
13	NC		

SATA PORT Assign	
PORT #	ASSIGNED TO
0	HDD
1	NC
2	ODD
3	NC
4	NC
5	NC

Crystal / Oscillator

TYPE	FREQUENCY	DEVICE	USAGE
Crystal	32.768KHz	HM65	Real Time Clock
Crystal	25MHz	LAN	Intel LAN
Crystal	25MHz	GREENCLK	GREENCLK
Crystal	25MHz	HM65	INTEL
Crystal	27MHz	N12P-GVR	NVIDIA

LCD Pannel Detect (TBD)

Devices	Resolution	PANNEL_DETECT_0
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I²C / SMB Address

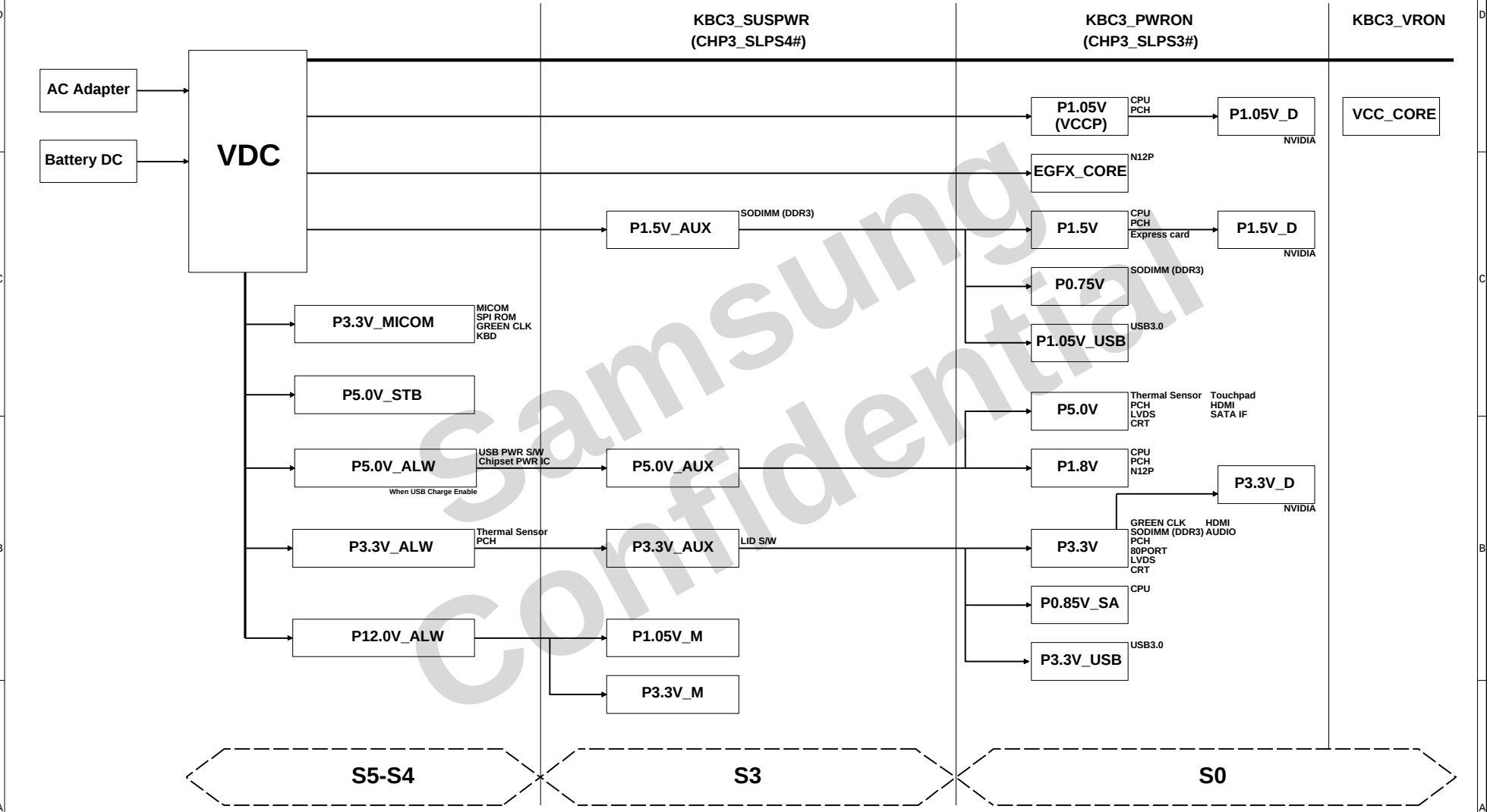
Devices	Address	Hex	Bus
HM65	Master	-	SMBUS Master
CPU Thermal Sensor	0111 101x	7Ah	Thermal Sensor
SODIMM0	1010 000x	A0h	
SODIMM1	1010 010x	A4h	
Thermal Sensor on SODIMM0	0011 000x	30h	
Thermal Sensor on SODIMM1	0011 010x	34h	
Thermal Sensor on board	1101 100x	98h	
Power thermal management TS	1101 011x	96h	

DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG
CHECK	MK KIM	DEV. STEP	MP		MAIN	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.2		BOARD INFO	PART NO.
MODULE CODE	undefined	LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	3	BA41-01666A
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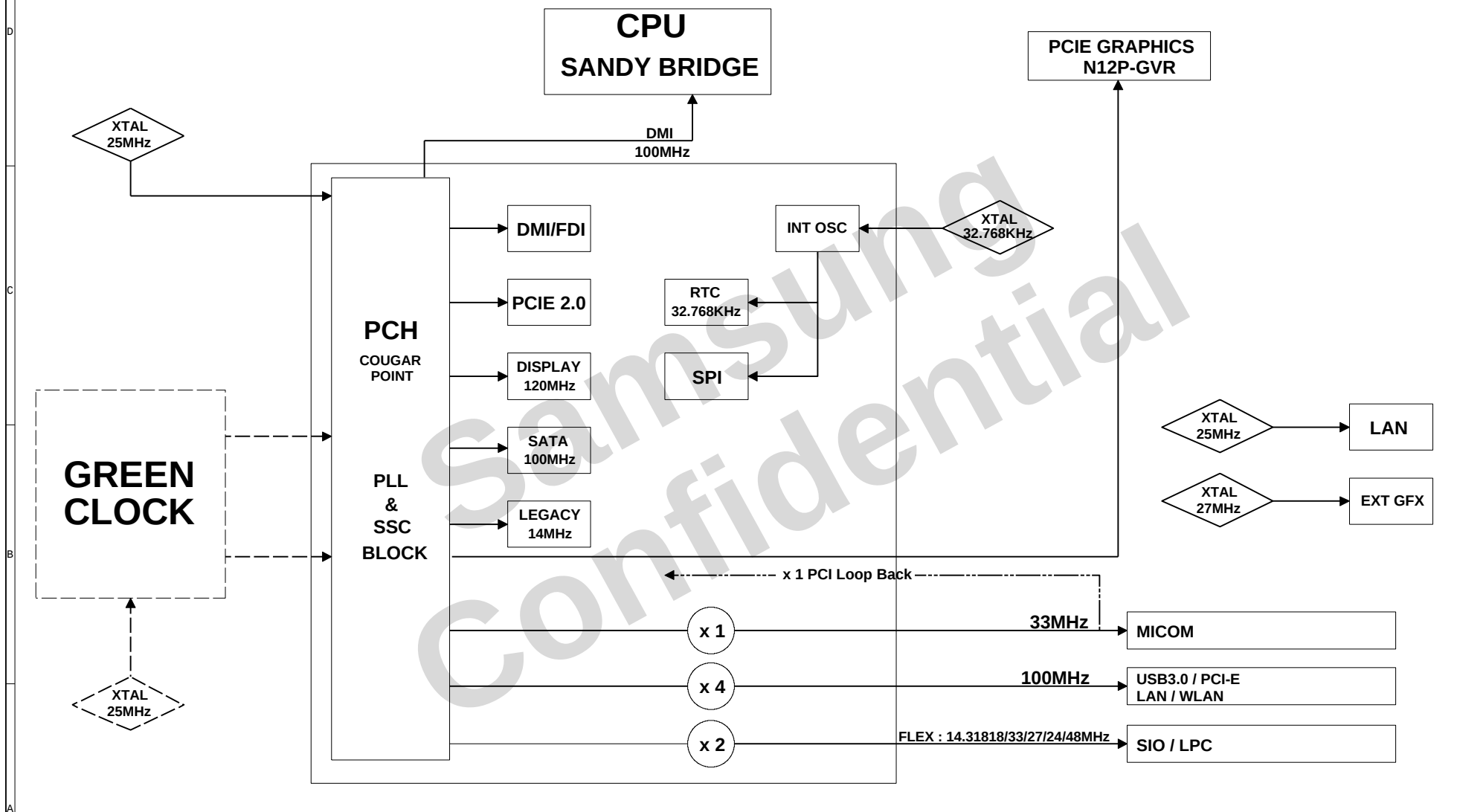
POWER DIAGRAM

Rev 0.8



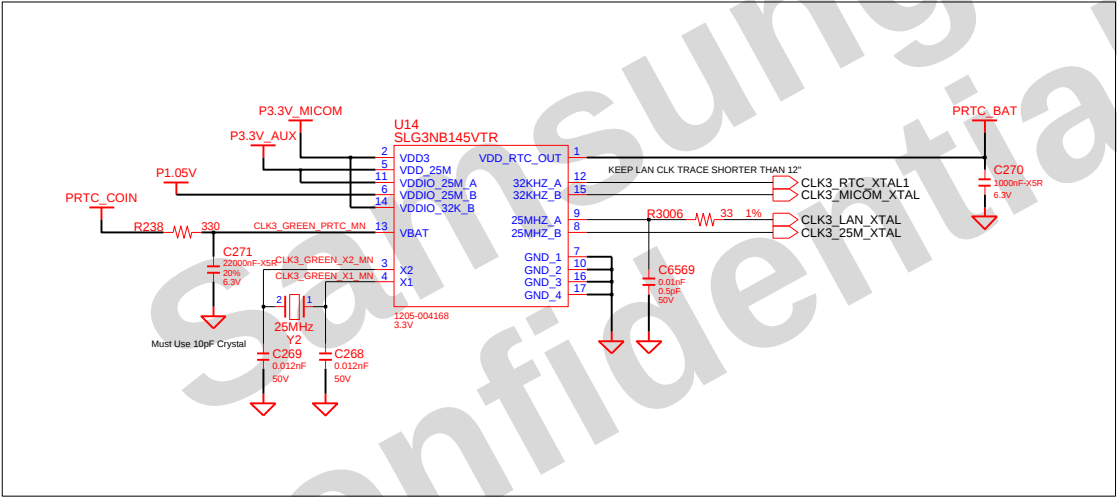
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CHECK	MK KIM	DEV. STEP	MP	MAIN	POWER DIAGRAM	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.2			PART NO.
MODULE CODE	undefined	LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	4	BA41-01666A
				OF	51	

CLOCK DISTRIBUTION Rev. 0.8



DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG
CHECK	MK KIM	DEV. STEP	MP	MAIN		ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.2	CLOCK DIAGRAM	PART NO.	BA41-01666A
MODULE CODE	undefined	LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	5	OF 51

CLOCK DISTRIBUTOR



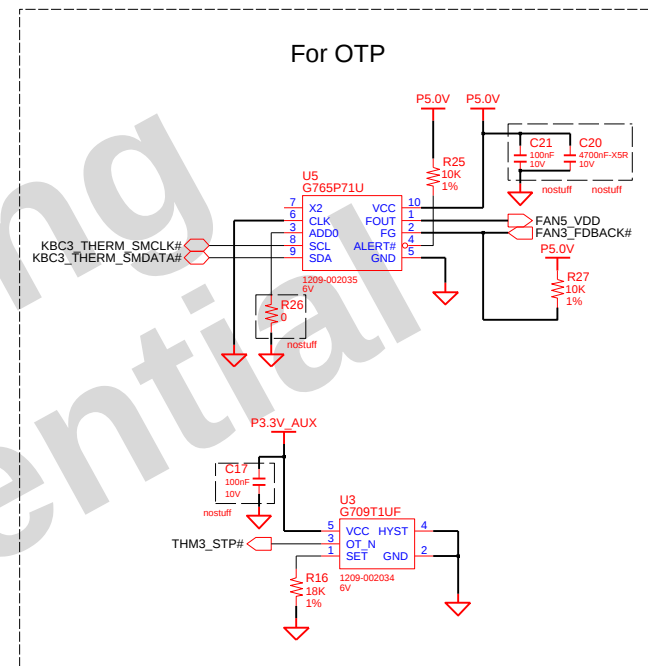
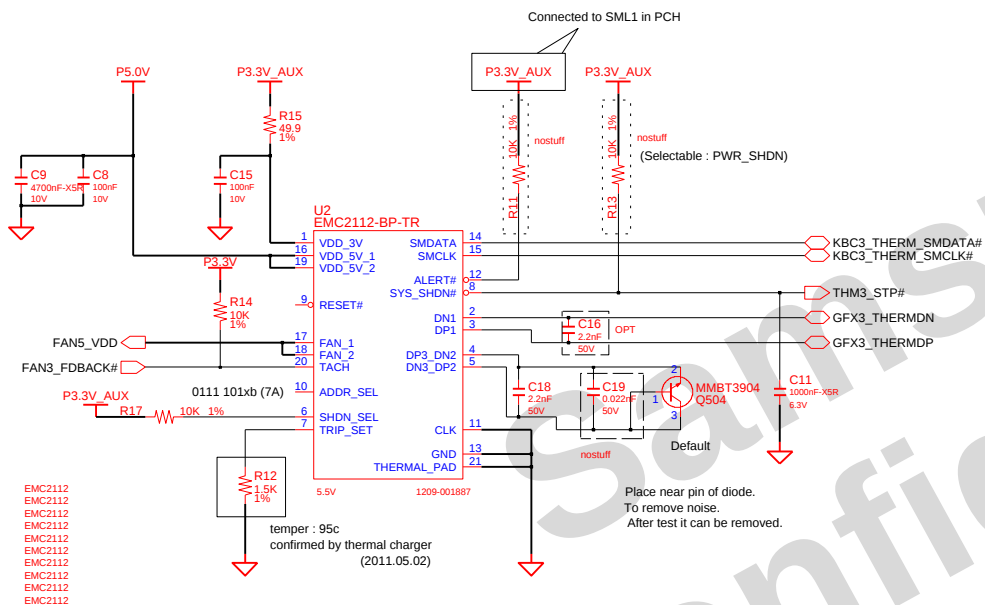
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK

DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC CLOCK CLOCK DISTRIBUTION	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			PART NO. BA41-01666A
APPROVAL	BL LEE	REV	REV 1.2			
MODULE CODE	undefined	LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	6	OF 51

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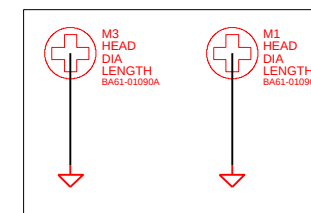
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THERMAL SENSOR & FAN CONTROL



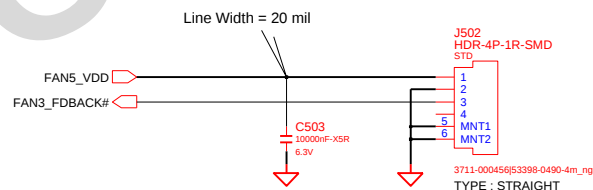
Temperature : 95.78c
confirmed by thermal charger
(2011.05.02)
 $R_{th}(\text{kohm}) = 0.0012T^2 - 0.9308T + 96.147$

FAN PEM

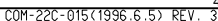


ADDRESSSEL MODE	
0	0101 111xb
✓ HIGH Z	0111 101xb (7A)
1	0101 110xb

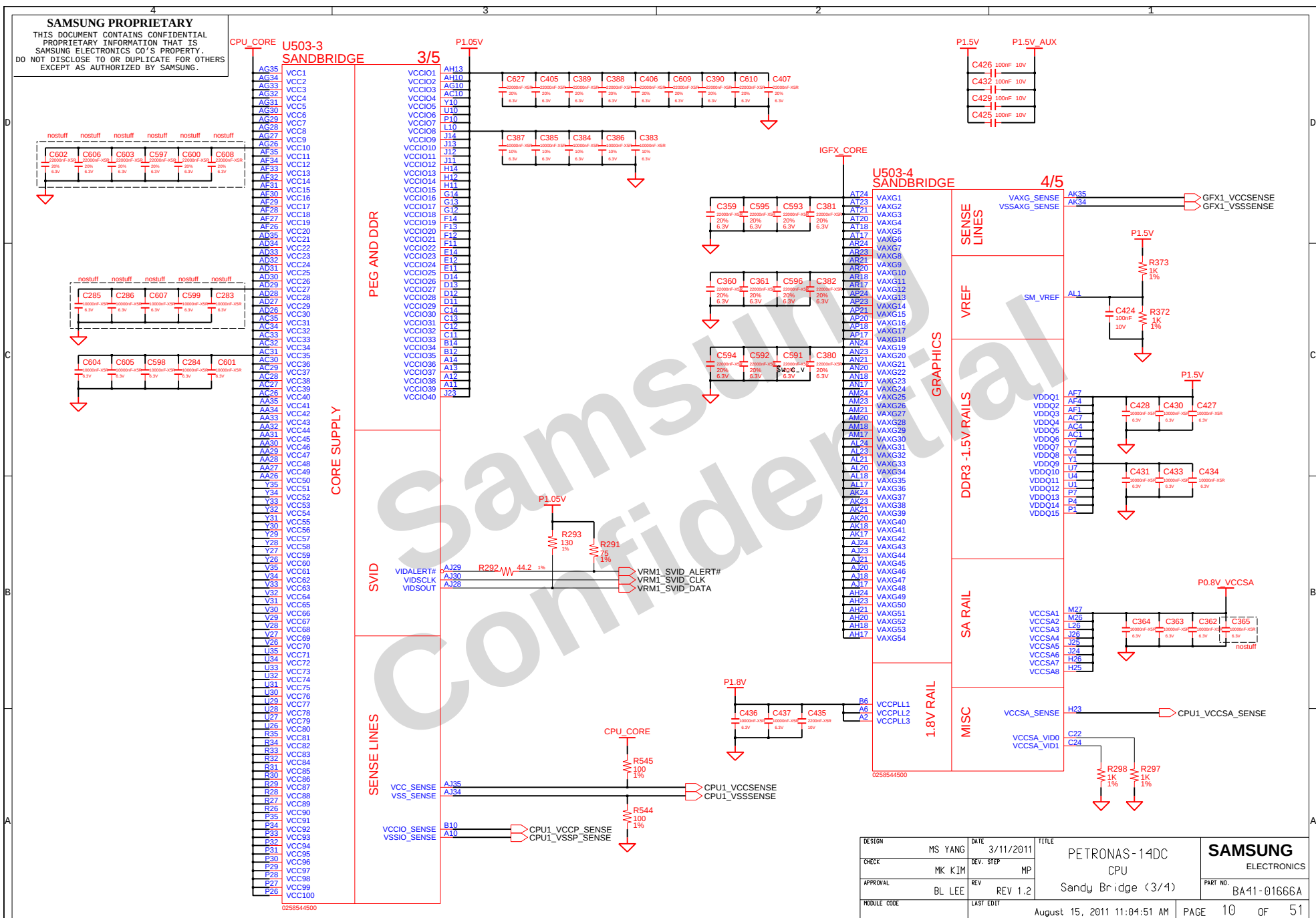
SHDN_SEL MODE	
0	INTEL TR MODE
✓ HIGH Z	AMD CPU/DIODE MODE
1	EXT.DIODE 2 MODE

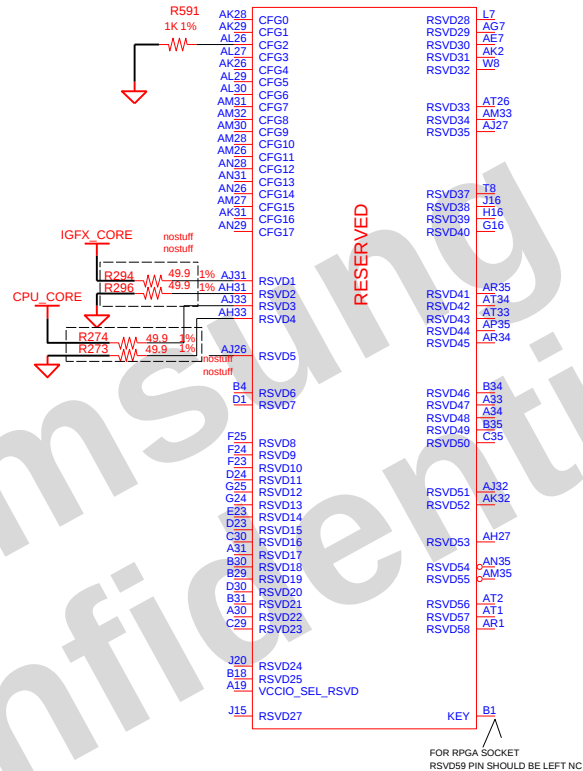
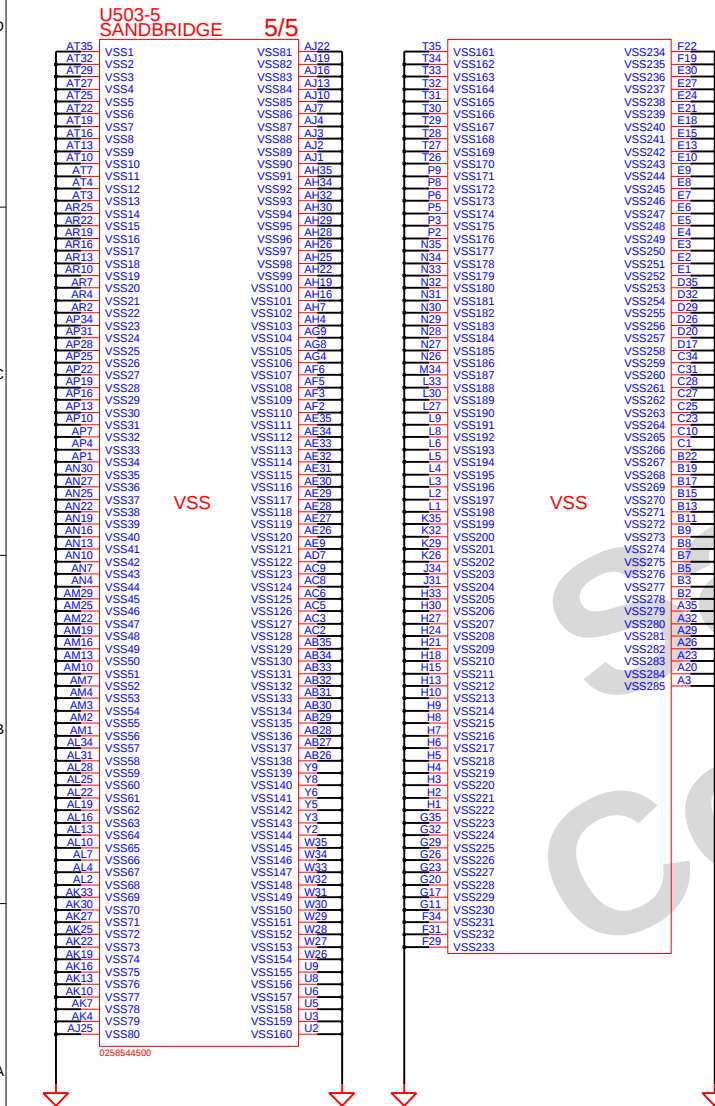


DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC THERMAL SENSOR	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			
APPROVAL	BL LEE	REV	REV 1.2		THERMAL SENSOR EMC2112	PART NO. BA41-01666A
MODULE CODE		LAST EDIT			August 15, 2011 11:04:51 AM	PAGE 7 OF 51



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





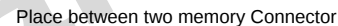
CFG Straps for Processor

PEG STATIC LANE REVERSAL - CFG2 IS FOR THE 16X	
CFG2	1 : (DEFAULT) NORMAL OPERATION 0 : LANE REVERSED
PCIe PORT BIFURCATION STRAPS	
CFG[6:5]	11 : (DEFAULT) X16 - DEVICE 1 FUNCTIONS 1 AND 2 DISABLED 10 : X8, X8 - DEVICE 1 FUNCTION 1 ENABLED ; FUNCTION 2 DISABLED 01 : RESERVED - (DEVICE 1 FUNCTION 1 DISABLED ; FUNCTION 2 ENABLED) 00 : X8, X4, X4 - DEVICE 1 FUNCTIONS 1 AND 2 ENABLED
Display Port Presence	
CFG4	1 : Disabled - No DP device is connected to eDP 0 : Enabled - (DP device is connected to eDP)
PEG DEFER TRAINING	
CFG7	1 : (DEFAULT) PEG TRAIN IMMEDIATELY FOLLOWING XXRESETB DEASSERTION 0 : PEG WAIT FOR BIOS FOR TRAINING

DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC CPU Sandy Bridge (4/4)	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			PART NO. BA41-01666A
APPROVAL	BL LEE	REV	REV 1.2			
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P/N : 3709-001609 (Concraft)



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

SAMSUNG
ELECTRONICS

PART NO. BA41-01666A

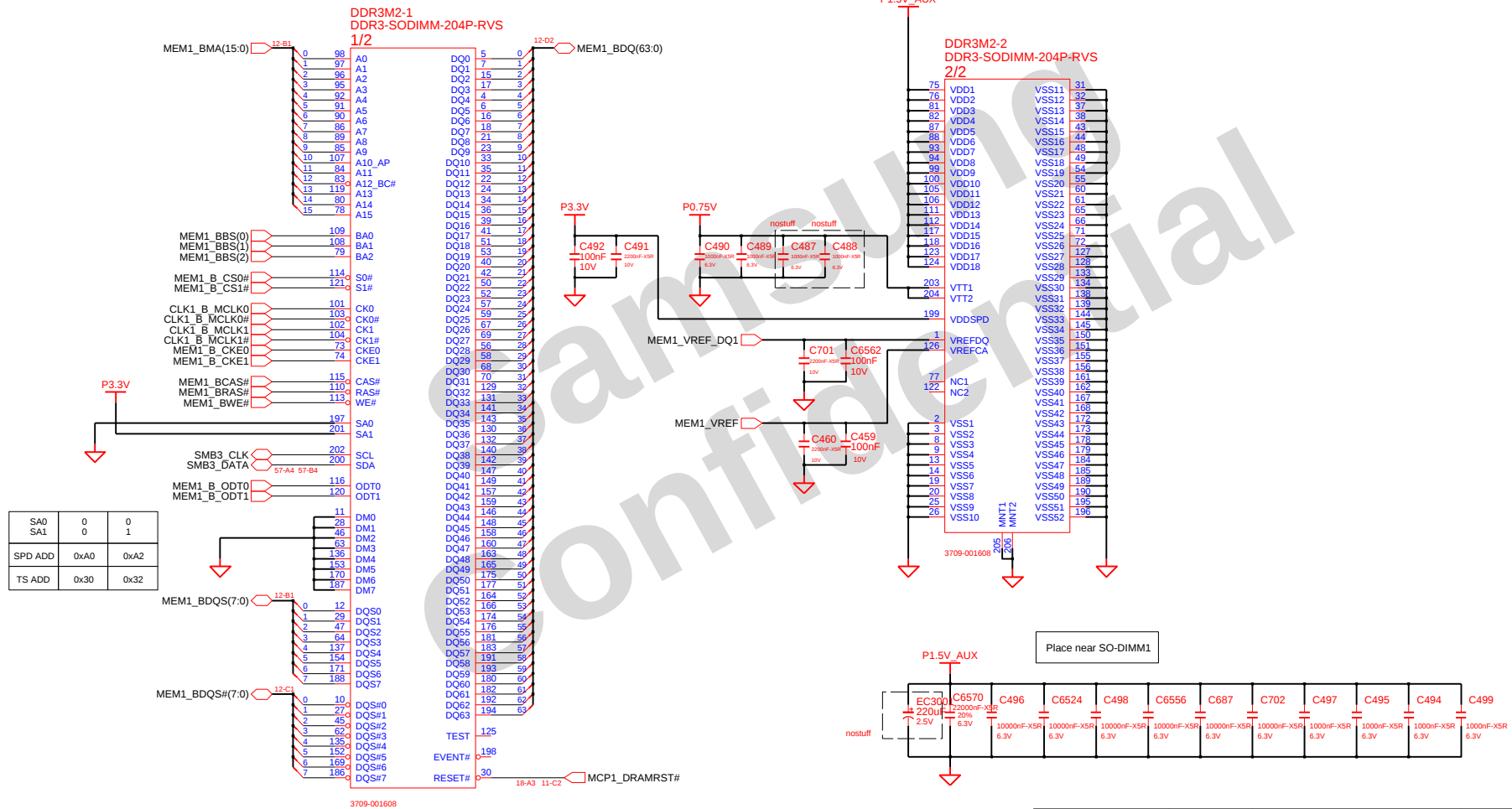
SO-DIMM#1 : 1st SO-DIMM

DDR SO-DIMM #1

Height : 4.0 mm (REVERSE)

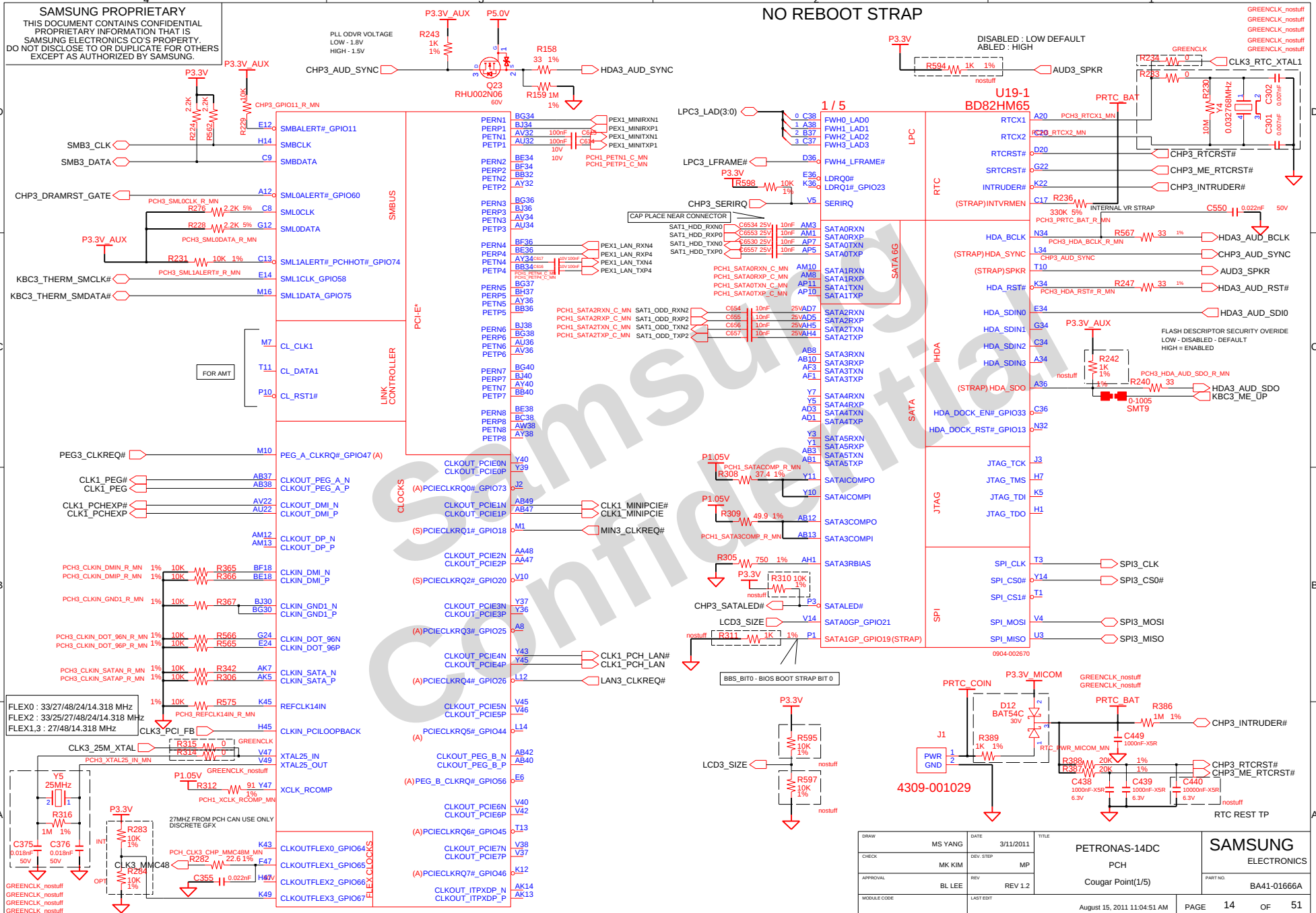
P/N : 3709-001654 (Foxconn)

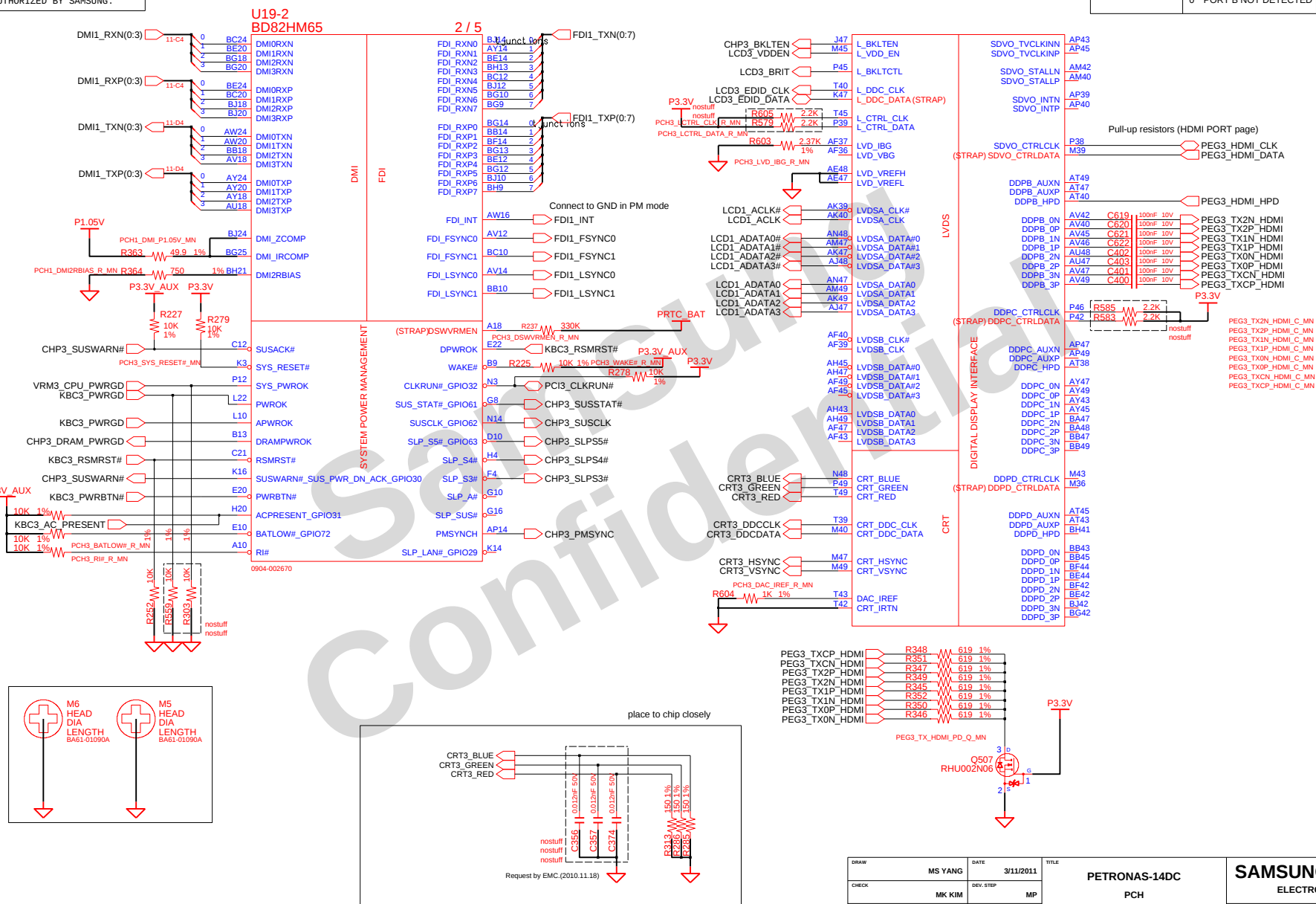
P/N : 3709-001608 (Concraft)



DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG
CHECK	MK KIM	DEV. STEP	MP	SODIMM B	ELECTRONICS	
APPROVAL	BL LEE	REV	REV 1.2	DDR3	PART NO.	BA41-01666A
MODULE CODE		LAST EDIT				
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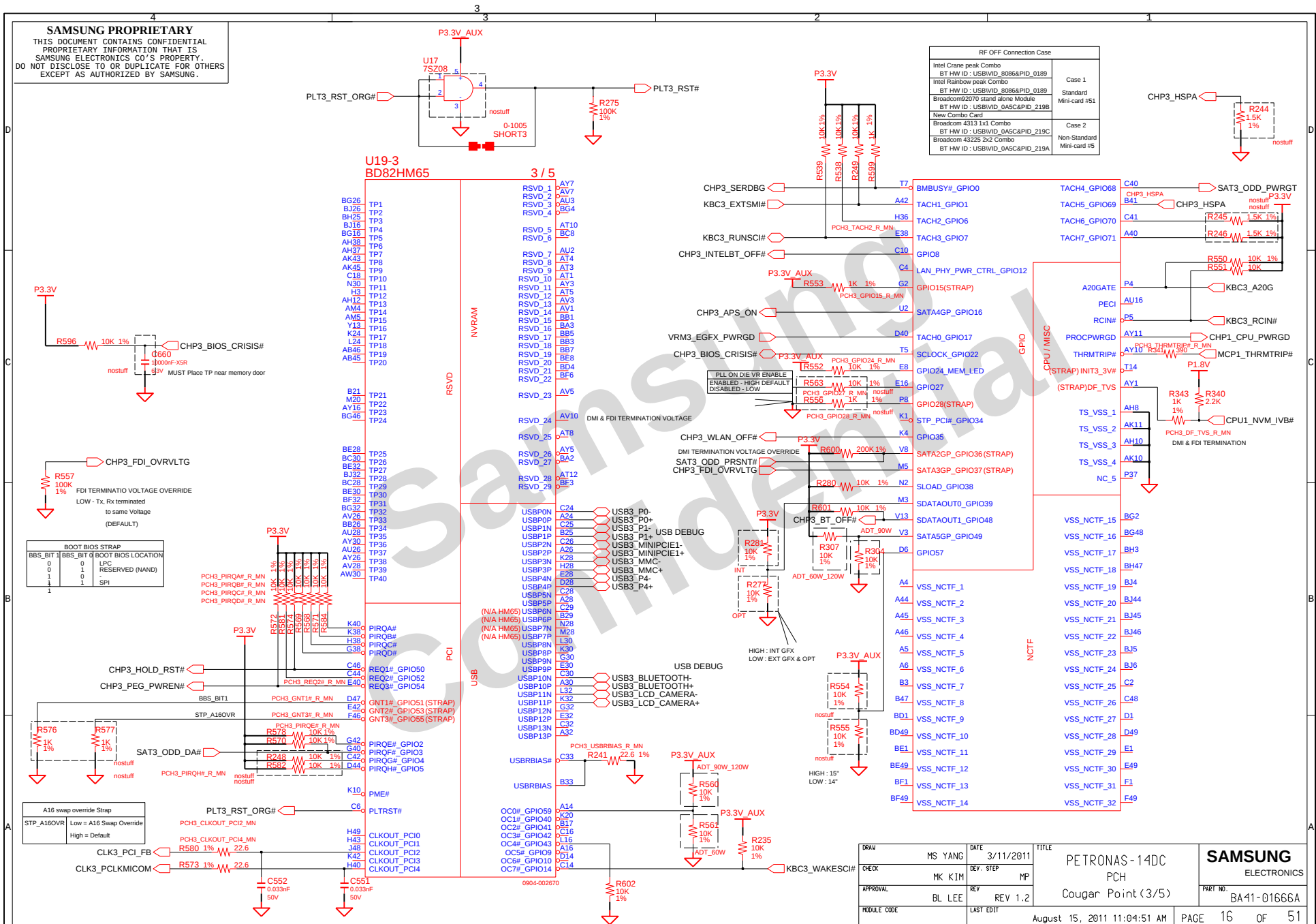
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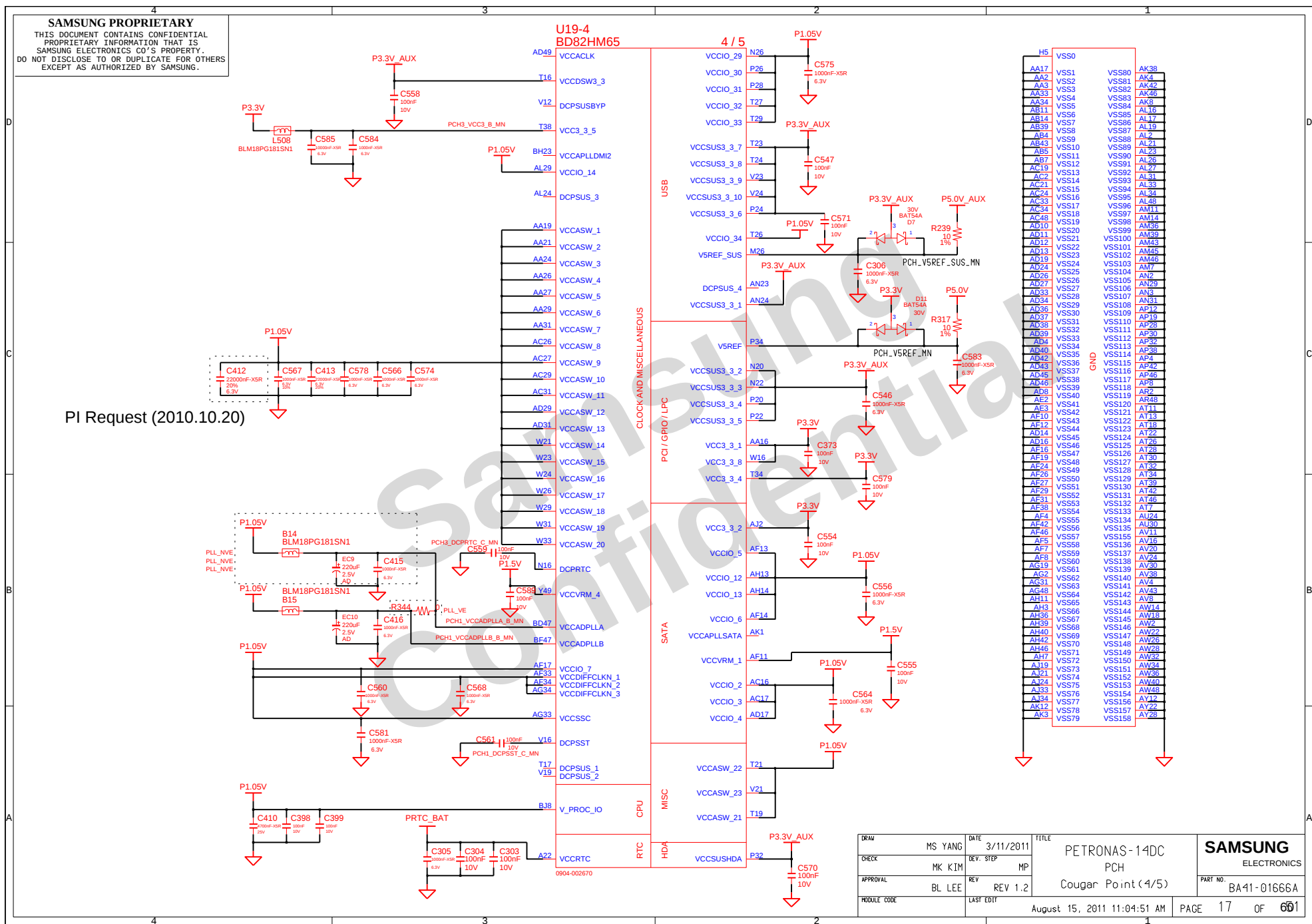




DRAW	MS YANG	DATE	3/11/2011	TITLE PETRONAS-14DC PCH Cougar Point(2/5)	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP		
APPROVAL	BL LEE	REV	REV 1.2		
PART NO. BA41-01666A					
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U19-5
BD82HM65

This power share with thermal sensor

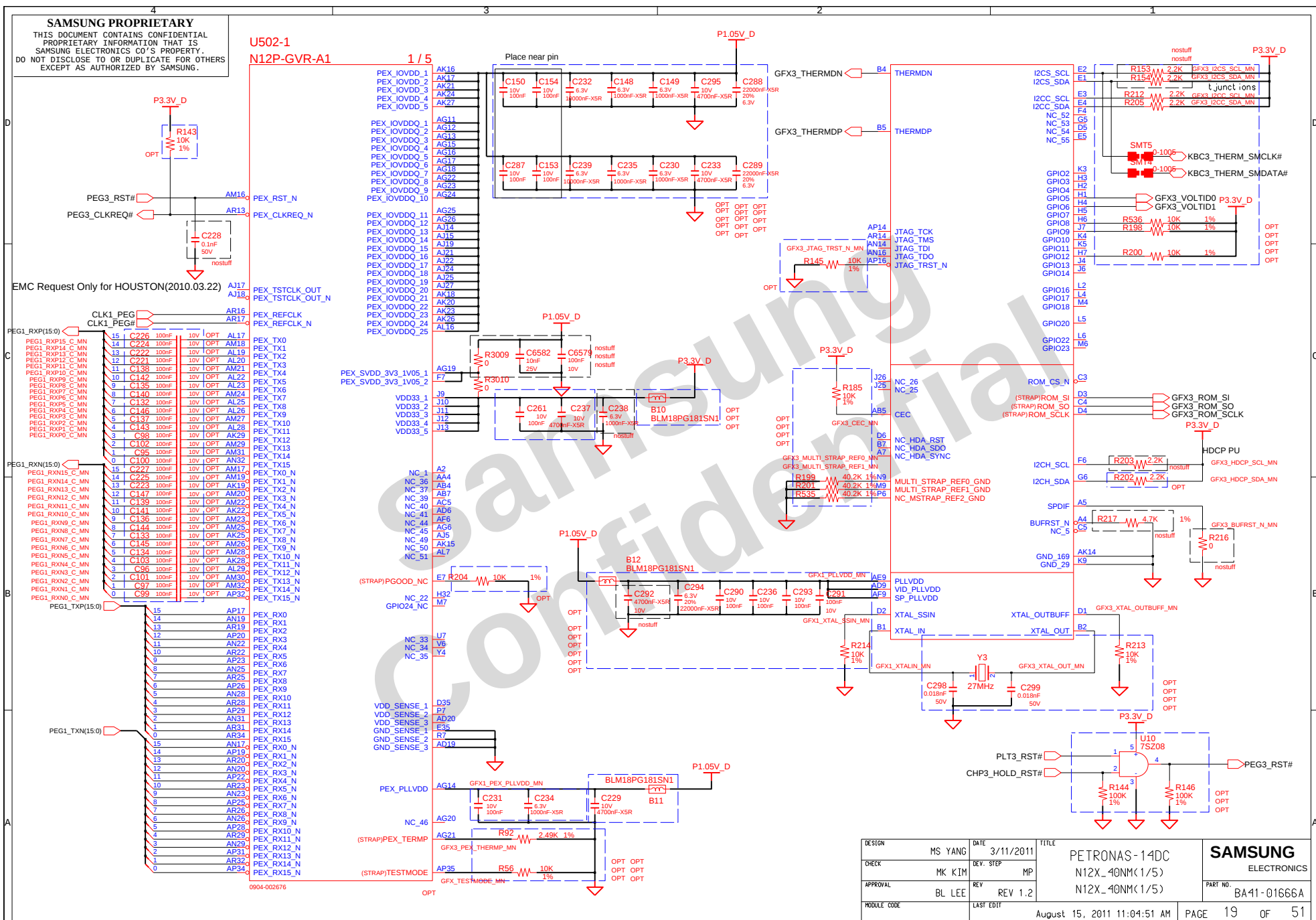
5 / 5

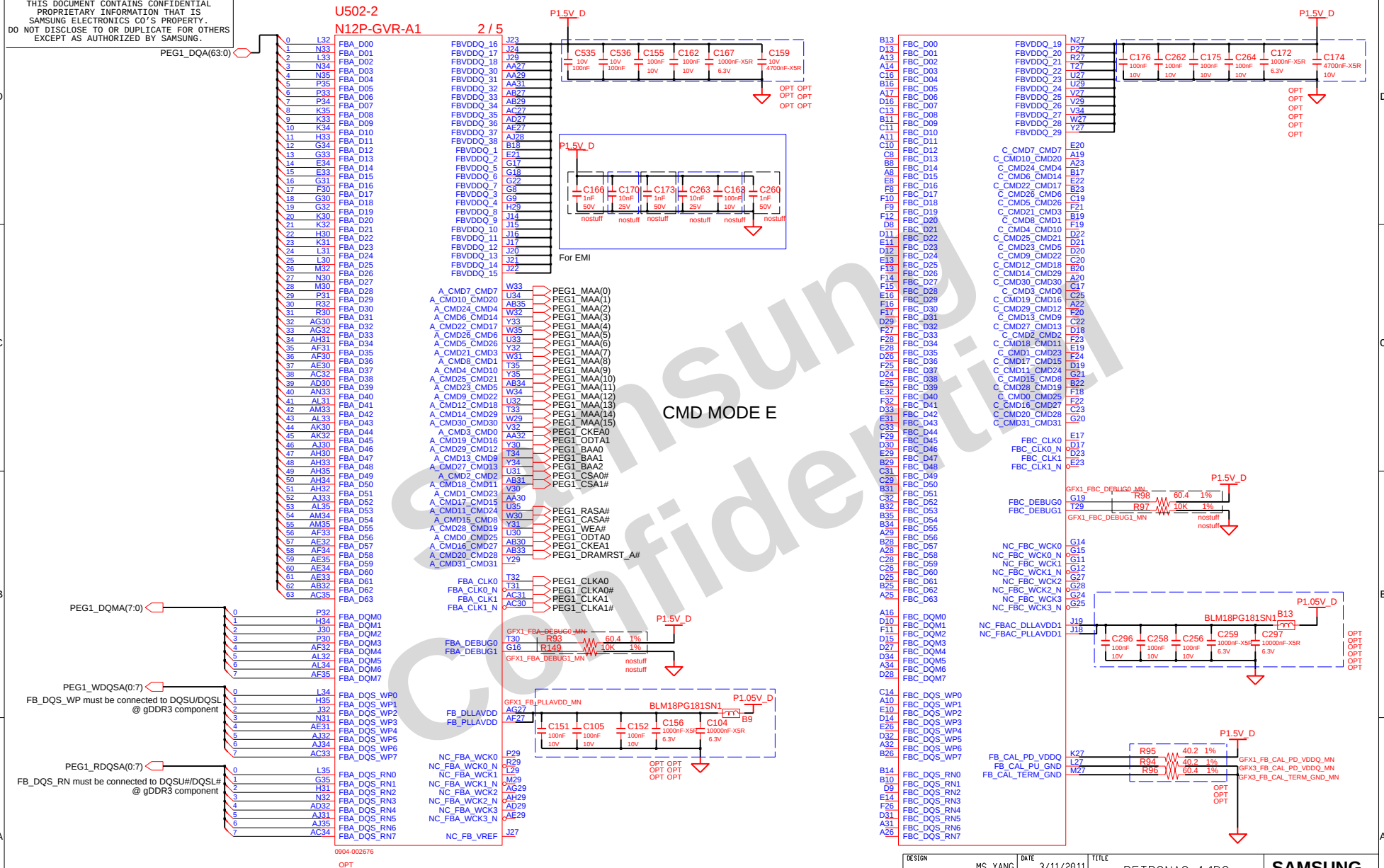
AY4	VSS159	VSS259	H46
AY2	VSS160	VSS260	K18
AY46	VSS161	VSS261	K30
AY8	VSS162	VSS262	K46
B11	VSS163	VSS263	L18
B15	VSS164	VSS264	L2
B19	VSS165	VSS265	L20
B23	VSS166	VSS266	L26
B27	VSS167	VSS267	L28
B31	VSS168	VSS268	L36
B35	VSS169	VSS269	L48
B39	VSS170	VSS270	M12
B7	VSS171	VSS271	M16
F45	VSS172	VSS272	M22
BB12	VSS173	VSS273	M24
BB16	VSS174	VSS274	M30
BB20	VSS175	VSS275	M32
BB22	VSS176	VSS276	M34
BB24	VSS177	VSS277	M36
BB28	VSS178	VSS278	M42
BB30	VSS179	VSS279	M46
BB38	VSS180	VSS280	M48
BB4	VSS181	VSS281	M6
BB46	VSS182	VSS282	M18
BC14	VSS183	VSS283	M20
BC18	VSS184	VSS284	M26
BC2	VSS185	VSS285	M28
BC22	VSS186	VSS286	M30
BC26	VSS187	VSS287	M32
BC32	VSS188	VSS288	M34
BC34	VSS189	VSS289	M36
BC36	VSS190	VSS290	M42
BC40	VSS191	VSS291	M46
BC42	VSS192	VSS292	M48
BC46	VSS193	VSS293	M6
BD46	VSS194	VSS294	M18
BD5	VSS195	VSS295	M20
BD22	VSS196	VSS296	M26
BD26	VSS197	VSS297	M28
BD40	VSS198	VSS298	M30
BF10	VSS199	VSS299	M32
BF12	VSS200	VSS300	M34
BF16	VSS201	VSS301	M36
BF20	VSS202	VSS302	M42
BF22	VSS203	VSS303	M46
BF24	VSS204	VSS304	M48
BF26	VSS205	VSS305	M6
BF28	VSS206	VSS306	M18
BF3	VSS207	VSS307	M20
BF38	VSS208	VSS308	M26
BF40	VSS209	VSS309	M28
BF9	VSS210	VSS310	M30
BG17	VSS211	VSS311	M32
BG21	VSS212	VSS312	M34
BG21	VSS213	VSS313	M36
BG33	VSS214	VSS314	M42
BG44	VSS215	VSS315	M46
BG8	VSS216	VSS316	M48
BH11	VSS217	VSS317	M6
BH15	VSS218	VSS318	M18
BH17	VSS219	VSS319	M20
BH19	VSS220	VSS320	M26
H10	VSS221	VSS321	M28
BH27	VSS222	VSS322	M30
BH31	VSS223	VSS323	M32
BH33	VSS224	VSS324	M34
BH36	VSS225	VSS325	M36
BH38	VSS226	VSS326	M42
BH43	VSS227	VSS327	M46
BH7	VSS228	VSS328	M48
D3	VSS229	VSS329	M6
D12	VSS230	VSS330	M18
D16	VSS231	VSS331	M20
D18	VSS232	VSS332	M26
D22	VSS233	VSS333	M28
D24	VSS234	VSS334	M30
D26	VSS235	VSS335	M32
D30	VSS236	VSS336	M34
D32	VSS237	VSS337	M36
D34	VSS238	VSS338	M42
D38	VSS239	VSS339	M46
D42	VSS240	VSS340	M48
D8	VSS241	VSS341	M6
E18	VSS242	VSS342	M18
E26	VSS243	VSS343	M20
G19	VSS244	VSS344	M26
G20	VSS245	VSS345	M28
G26	VSS246	VSS346	M30
G28	VSS247	VSS347	M32
G36	VSS248	VSS348	M34
G46	VSS249	VSS349	M36
H12	VSS250	VSS350	M42
H18	VSS251	VSS351	M46
H22	VSS252	VSS352	M48
H24	VSS253		
H26	VSS254		
H30	VSS255		
H32	VSS256		
H34	VSS257		
F3	VSS258		

0904-002670

PI Request (2010.10.20)

DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC PCH Cougar Point(5/5)	SAMSUNG ELECTRONICS PART NO. BA41-01666A
CHECK	MK KIM	DEV. STEP	MP			
APPROVAL	BL LEE	REV	REV 1.2			
MODULE CODE	undefined	LAST EDIT	August 15, 2011 11:04:51 AM			PAGE 18 OF 51





DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC N12X_40NM(2/5) N12X_40NM(2/5)	SAMSUNG ELECTRONICS		
CHECK	MK KIM	DEV. STEP	MP					
APPROVAL	BL LEE	REV	REV 1.2				PART NO.	BA41-01666A
MODULE CODE	LAST EDIT		August 15, 2011 11:04:51 AM				PAGE 20 OF 51	

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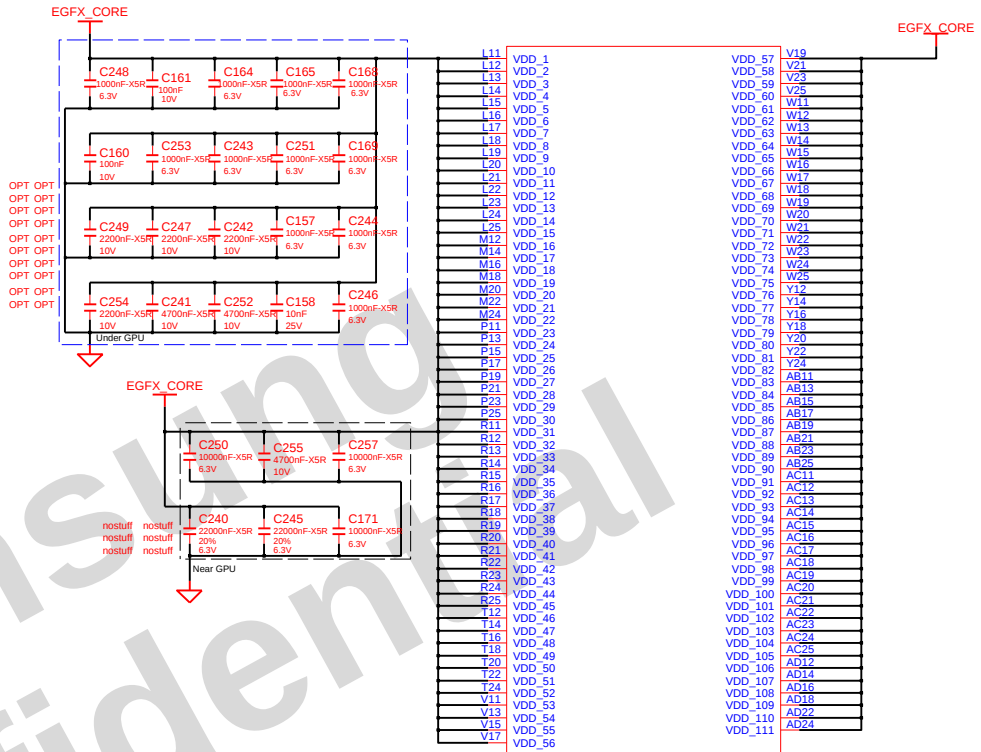
U502-3
N12P-GVR-A1

3/5

B3	GND_1	GND_97	V16
B6	GND_2	GND_98	V18
B9	GND_3	GND_99	V20
B12	GND_4	GND_100	V22
B15	GND_5	GND_101	V31
B21	GND_6	GND_102	V32
B24	GND_7	GND_103	Y11
B27	GND_8	GND_104	Y13
B30	GND_9	GND_105	Y15
B33	GND_10	GND_106	Y17
C2	GND_11	GND_107	Y19
C34	GND_12	GND_108	Y21
E6	GND_13	GND_109	Y23
E9	GND_14	GND_110	Y25
E12	GND_15	GND_111	AA2
E15	GND_16	GND_112	AA5
E18	GND_17	GND_113	AA11
E24	GND_18	GND_114	AA12
E27	GND_19	GND_115	AA13
E30	GND_20	GND_116	AA14
F2	GND_21	GND_117	AA15
F5	GND_22	GND_118	AA16
F91	GND_23	GND_119	AA17
F34	GND_24	GND_120	AA18
J2	GND_25	GND_121	AA19
J5	GND_26	GND_122	AA20
J31	GND_27	GND_123	AA22
J34	GND_28	GND_124	AA23
M2	GND_30	GND_125	AA24
M5	GND_31	GND_126	AA25
M11	GND_32	GND_127	AA34
M13	GND_33	GND_128	AB12
M15	GND_34	GND_129	AB14
M17	GND_35	GND_130	AB16
M19	GND_36	GND_131	AB18
M21	GND_37	GND_132	AB20
M23	GND_38	GND_133	AB22
M25	GND_39	GND_134	AB24
M31	GND_40	GND_135	AC9
M34	GND_41	GND_136	AD5
N11	GND_42	GND_137	AD11
N12	GND_43	GND_138	AD13
N13	GND_44	GND_139	AD15
N14	GND_45	GND_140	AD17
N15	GND_46	GND_141	AD19
N16	GND_47	GND_142	AD21
N17	GND_48	GND_143	AD23
N18	GND_49	GND_144	AD25
N19	GND_50	GND_145	AD31
N20	GND_51	GND_146	AD33
N21	GND_52	GND_147	AE11
N22	GND_53	GND_148	AE12
N23	GND_54	GND_149	AE13
N24	GND_55	GND_150	AE14
N25	GND_56	GND_151	AE15
P12	GND_57	GND_152	AE16
P14	GND_58	GND_153	AE17
P16	GND_59	GND_154	AE18
P19	GND_60	GND_155	AE19
P20	GND_61	GND_156	AE20
P22	GND_62	GND_157	AE21
P24	GND_63	GND_158	AE22
P25	GND_64	GND_159	AE23
R2	GND_65	GND_160	AE24
R31	GND_66	GND_161	AE25
R34	GND_67	GND_162	AG2
T11	GND_68	GND_163	AG5
T13	GND_69	GND_164	AG31
T15	GND_70	GND_165	AG34
T17	GND_71	GND_166	AK2
T19	GND_72	GND_167	AK5
T21	GND_73	GND_168	AK31
T23	GND_74	GND_170	AK34
T25	GND_75	GND_171	AL6
U11	GND_76	GND_172	AL9
U12	GND_77	GND_173	AL12
U13	GND_78	GND_174	AL15
U14	GND_79	GND_175	AL18
U15	GND_80	GND_176	AL21
U16	GND_81	GND_177	AL24
U17	GND_82	GND_178	AL27
U18	GND_83	GND_179	AL30
U19	GND_84	GND_180	AN2
U20	GND_85	GND_181	AN34
U21	GND_86	GND_182	AP3
U22	GND_87	GND_183	AP6
U23	GND_88	GND_184	AP9
U24	GND_89	GND_185	AP12
U25	GND_90	GND_186	AP15
V2	GND_91	GND_187	AP18
V5	GND_92	GND_188	AP21
V9	GND_93	GND_189	AP24
V12	GND_94	GND_190	AP27
V14	GND_95	GND_191	AP30
	GND_96	GND_192	AP33
		GND_193	

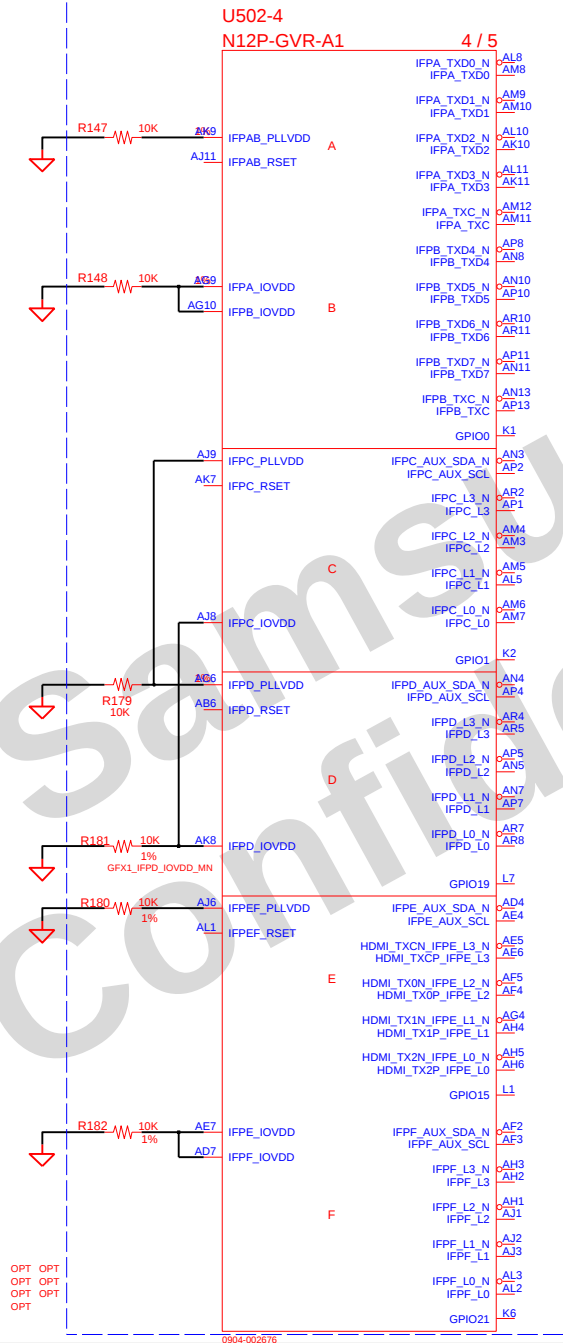
0904-002676

OPT



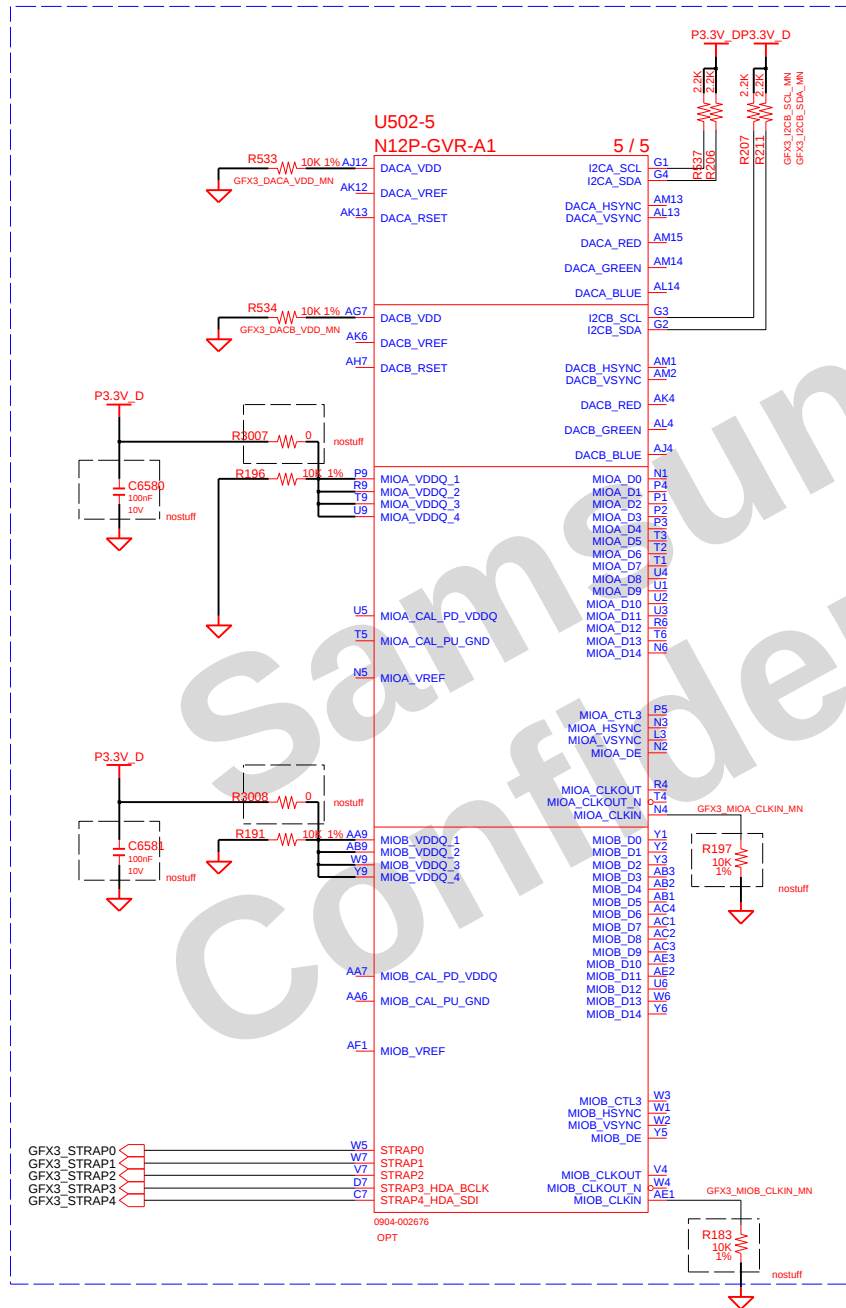
DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG ELECTRONICS PART NO. BA41-01666A
CHECK	MK KIM	DEV. STEP	MP		N12X_40NM(3/5)	
APPROVAL	BL LEE	REV	REV 1.2		N12X_40NM(3/5)	
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	21 OF 51	

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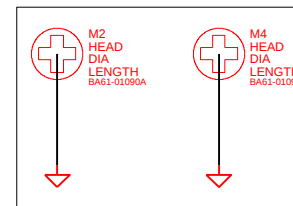


DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG ELECTRONICS PART NO. BA41-01666A
CHECK	MK KIM	DEV. STEP	MP		N12X_40NM(4/5)	
APPROVAL	BL LEE	REV	REV 1.2		N12X_40NM(4/5)	
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	22 OF 51	

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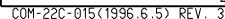
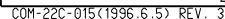
GPU Thermal



INT GFX and OPT GFX model need.

DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG
CHECK	MK KIM	DEV. STEP	MP	N12X_40NM(5/5)	ELECTRONICS	
APPROVAL	BL LEE	REV	REV 1.2	N12X_40NM(5/5)	PART NO.	BA41-01666A
MODULE CODE		LAST EDIT			PAGE	23 OF 51

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



P1.5V D

C107 6.3V 1000nF-XSR

C45 6.3V 1000nF-XSR

C49 6.3V 1000nF-XR

C81 6.3V 1000nF-XR

C44 10V 100nF

C42 10V 100nF

C43 10V 100nF

C77 10V 100nF

C80 10V 100nF

nostuff

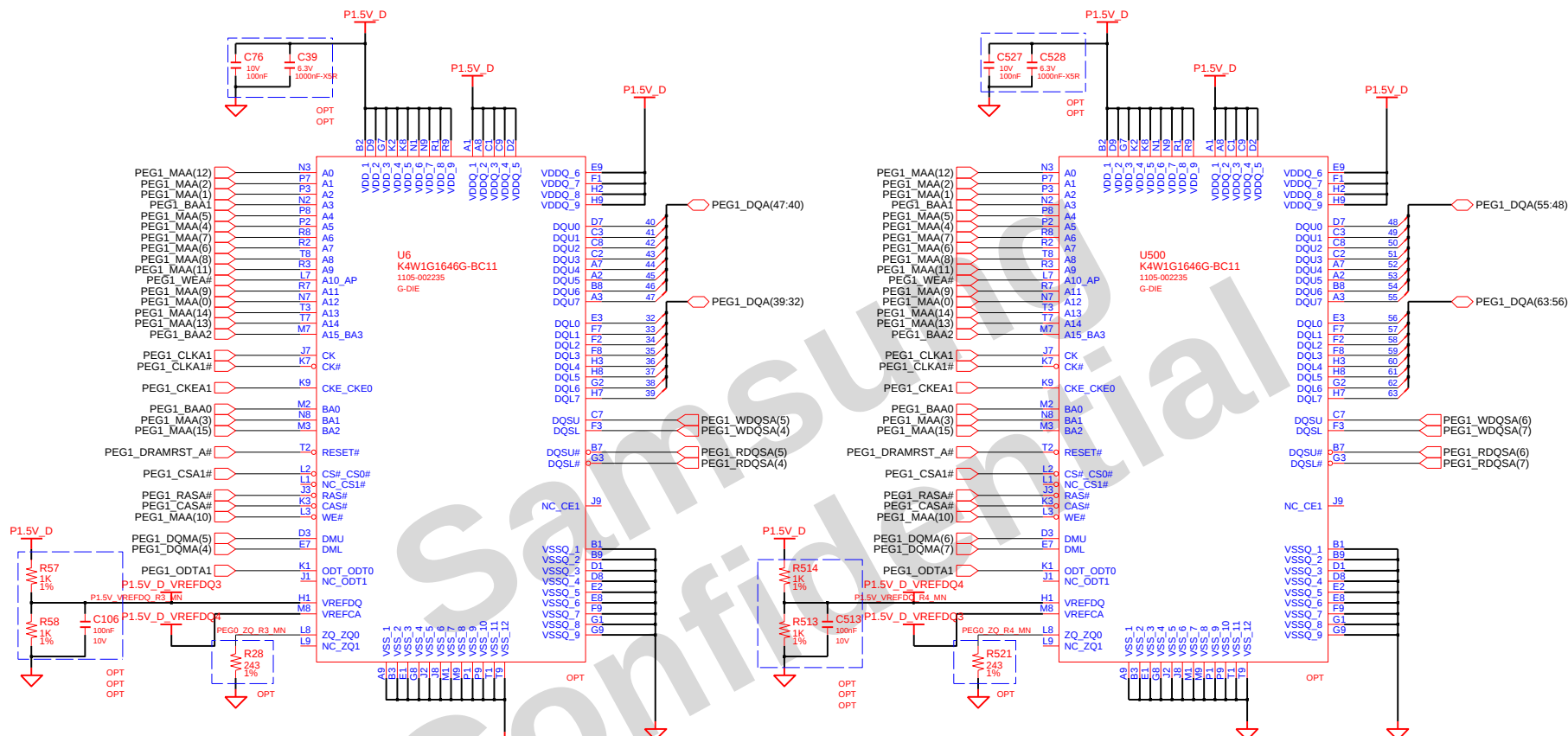
OPT OPT OPT OPT OPT OPT

D:/users/mobile39/mentor/Petronas-14 DC/mp1.25/Petronas-14 MAIN

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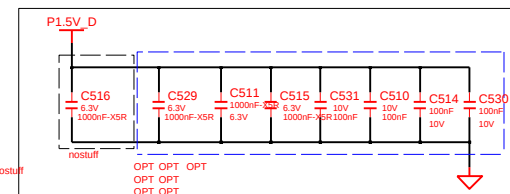
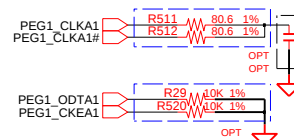
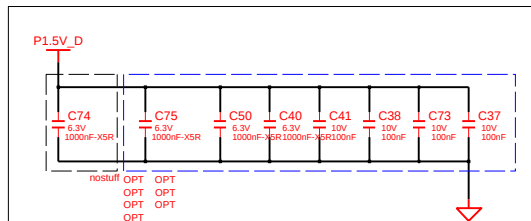
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A-Channel #1 (E-mode)



Place near to VDDQ

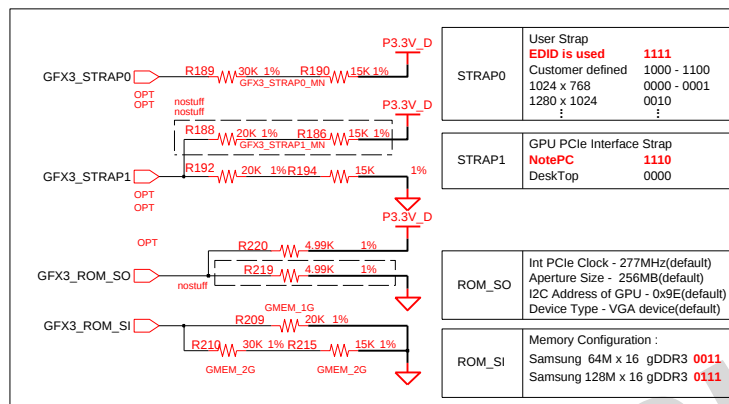
Place near to VDDQ



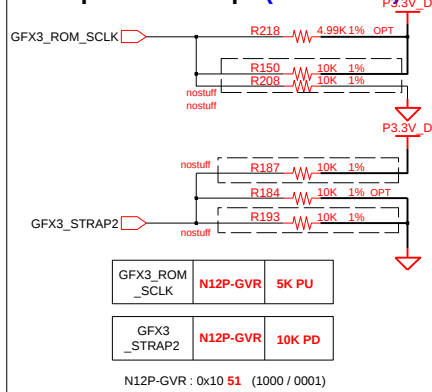
DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP		GRAPHIC_MEM A#1	
APPROVAL	BL LEE	REV	REV 1.2		GRAPHIC_MEM A#1	
MODULE CODE		LAST EDIT				
August 15, 2011 11:04:51 AM						PART NO. BA41-01666A
PAGE 25 OF 51						

N12x_40nm STRAP

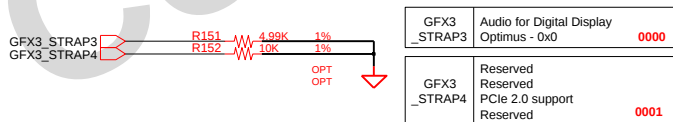
Function Straps



Chip Select Straps (N12P-GV1)



Only for GV



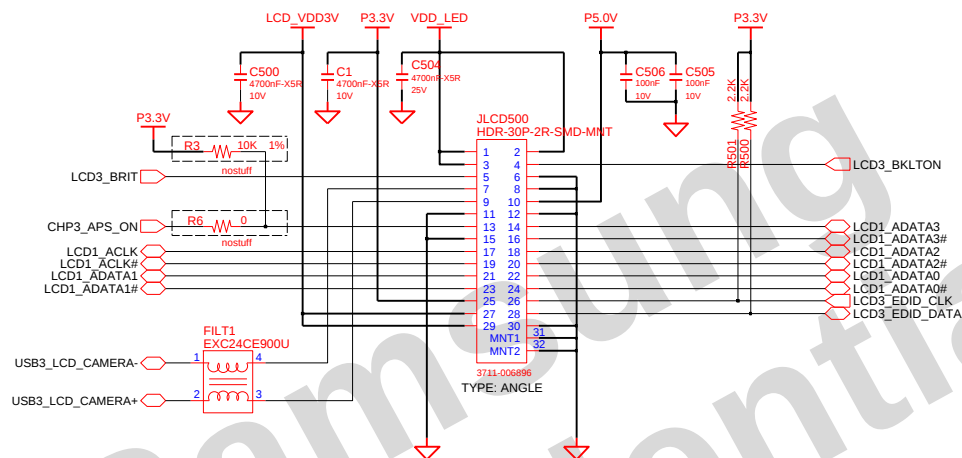
RESISTOR	PULL UP	PULL DOWN
5K	1000	0000
10K	1001	0001
15K	1010	0010
20K	1011	0011
25K	1100	0100
30K	1101	0101
35K	1110	0110
45K	1111	0111

STRAP PIN	BIT 3	BIT 2	BIT 1	BIT 0
STRAP0	USER[3]	USER[2]	USER[1]	USER[0]
STRAP1	3GIO_PADCFG[3]	3GIO_PADCFG[2]	3GIO_PADCFG[1]	3GIO_PADCFG[0]
ROM_SO	XCLK_417	FB_0_BAR_SIZE	SMB_ALT_ADDR	VGA_DEVICE
ROM_SI	RAMCFG[3]	RAMCFG[2]	RAMCFG[1]	RAMCFG[0]
STRAP2	PCI_DEVID[3]	PCI_DEVID[2]	PCI_DEVID[1]	PCI_DEVID[0]
ROM_SCLK	PCI_DEVID[4]	SUB_VENDOR	SLOT_CLK_CFG	PEX_PLL_EN_TERM

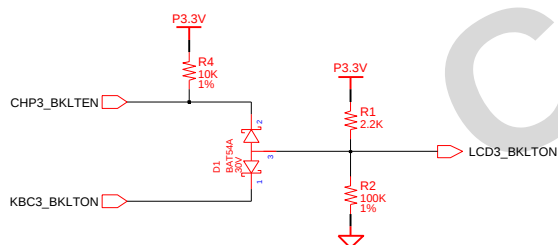
DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG
CHECK	MK KIM	DEV. STEP	MP		GRAPHIC_MEM C#0	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.2		GRAPHIC_MEM C#0	PART NO.
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	26	BA41-01666A
				OF	51	

LVDS LOGIC

1Ch. LCD Connector + CAMERA

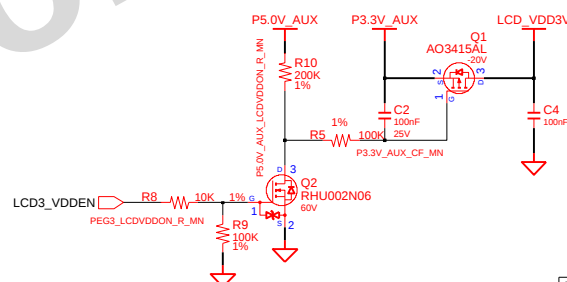


Backlight On

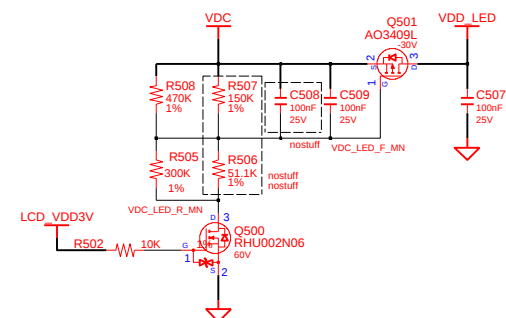


LCD Power

EBL Purpose



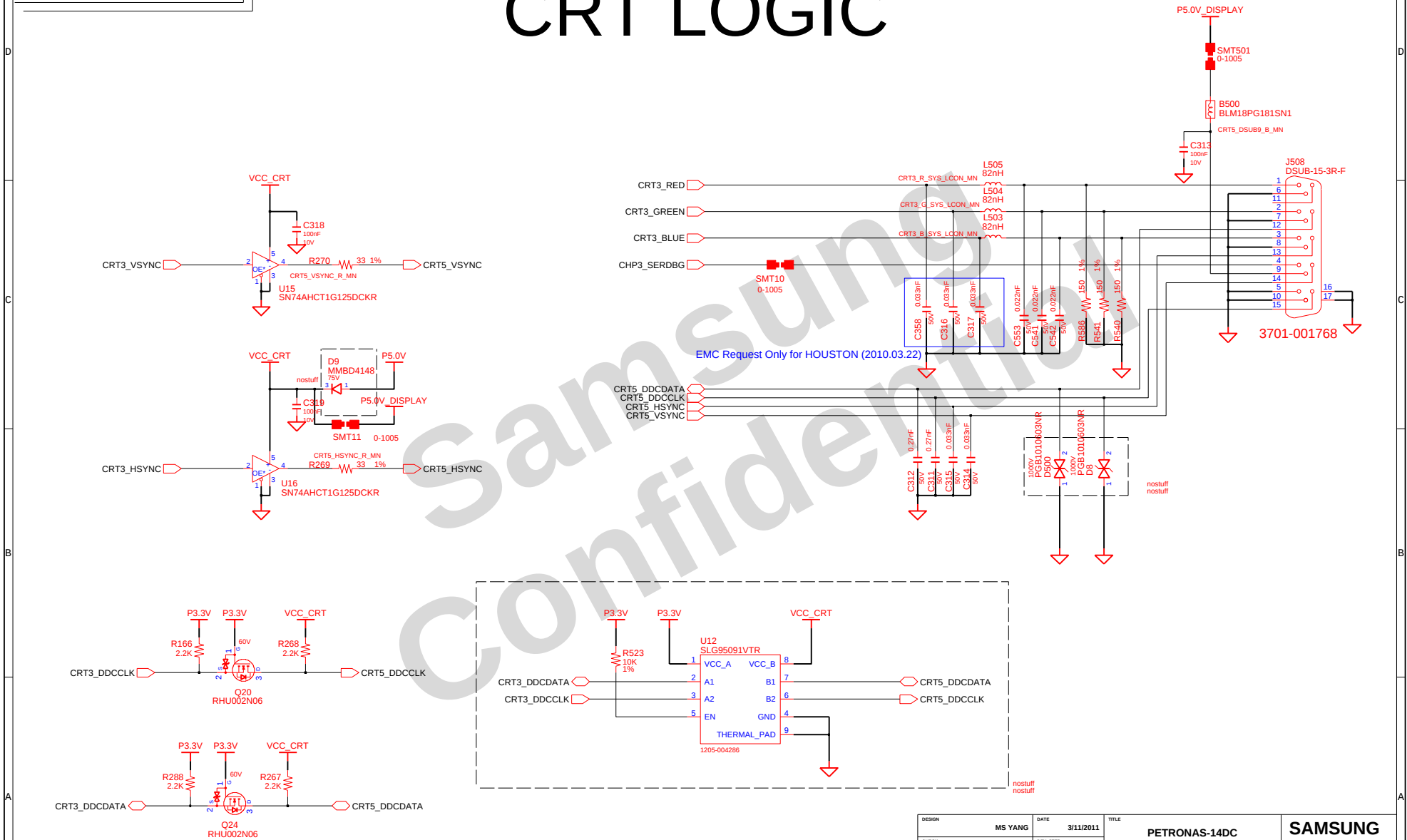
LED Power



DESIGN	MS YANG	DATE	3/11/2011	TITLE PETRONAS-14DC GRAPHICS_IF LVDS	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP		
APPROVAL	BL LEE	REV	REV 1.2		
MODULE CODE	LAST EDIT				
August 15, 2011 11:04:51 AM				PAGE	27
				OF	51

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CRT LOGIC



DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC GRAPHICS_IF CRT	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			PART NO. BA41-01666A
APPROVAL	BL LEE	REV	REV 1.2			
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	28	OF 51

After checking, Houston need to use CMC for each signal.

(EMC request at 2010.04.15)

After checking, Veyron_R don't need to use CMC for each signal.

(EMC request at 2010.12.03)

PEG3_HDMI_CLK

P3.3V

R609 2.2K

Q506 RHU002N06 60V

PEG5_HDMI_CLK

N10x/N11x_40nm HDMI/DP/LVDS support only 3.3V voltage tolerance

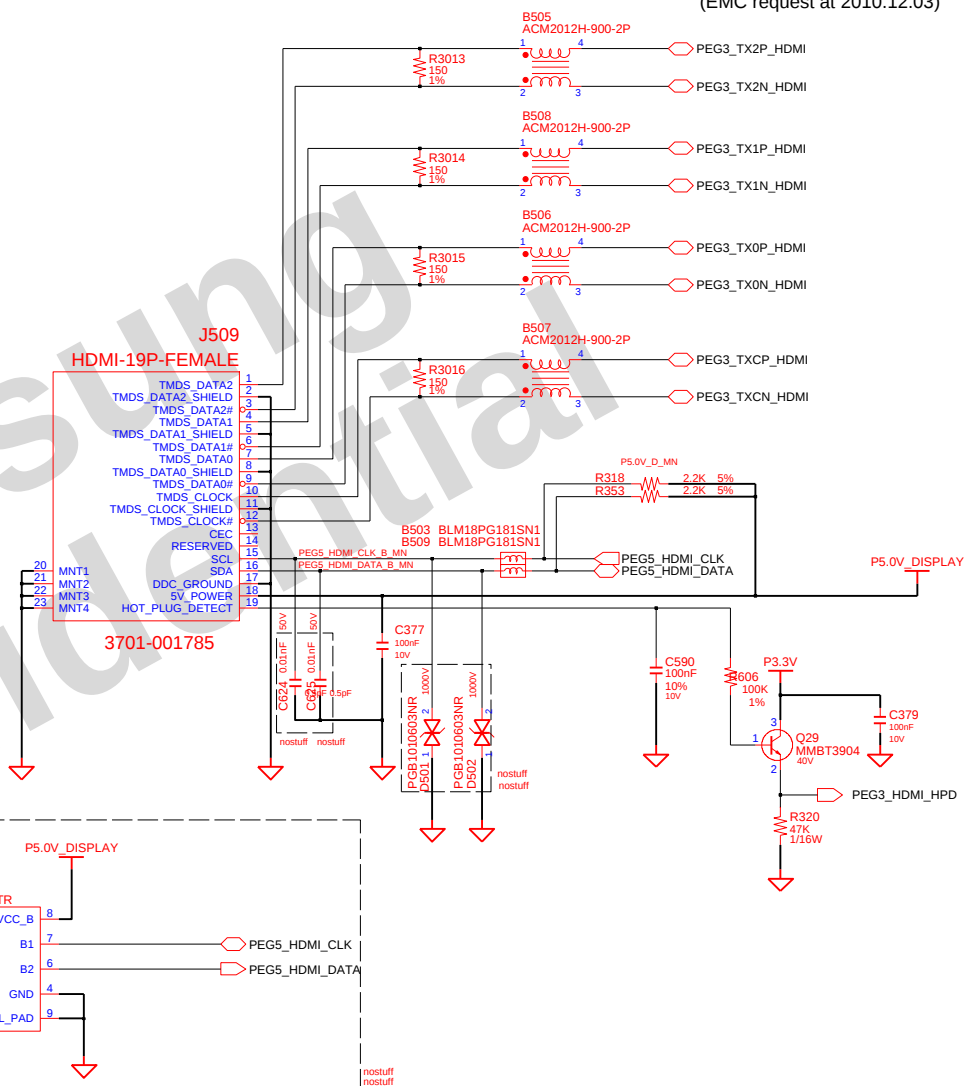
P3.3V

R608 2.2K

U504 RHU002N06 60V

PEG3_HDMI_DATA

PEG5_HDMI_DATA



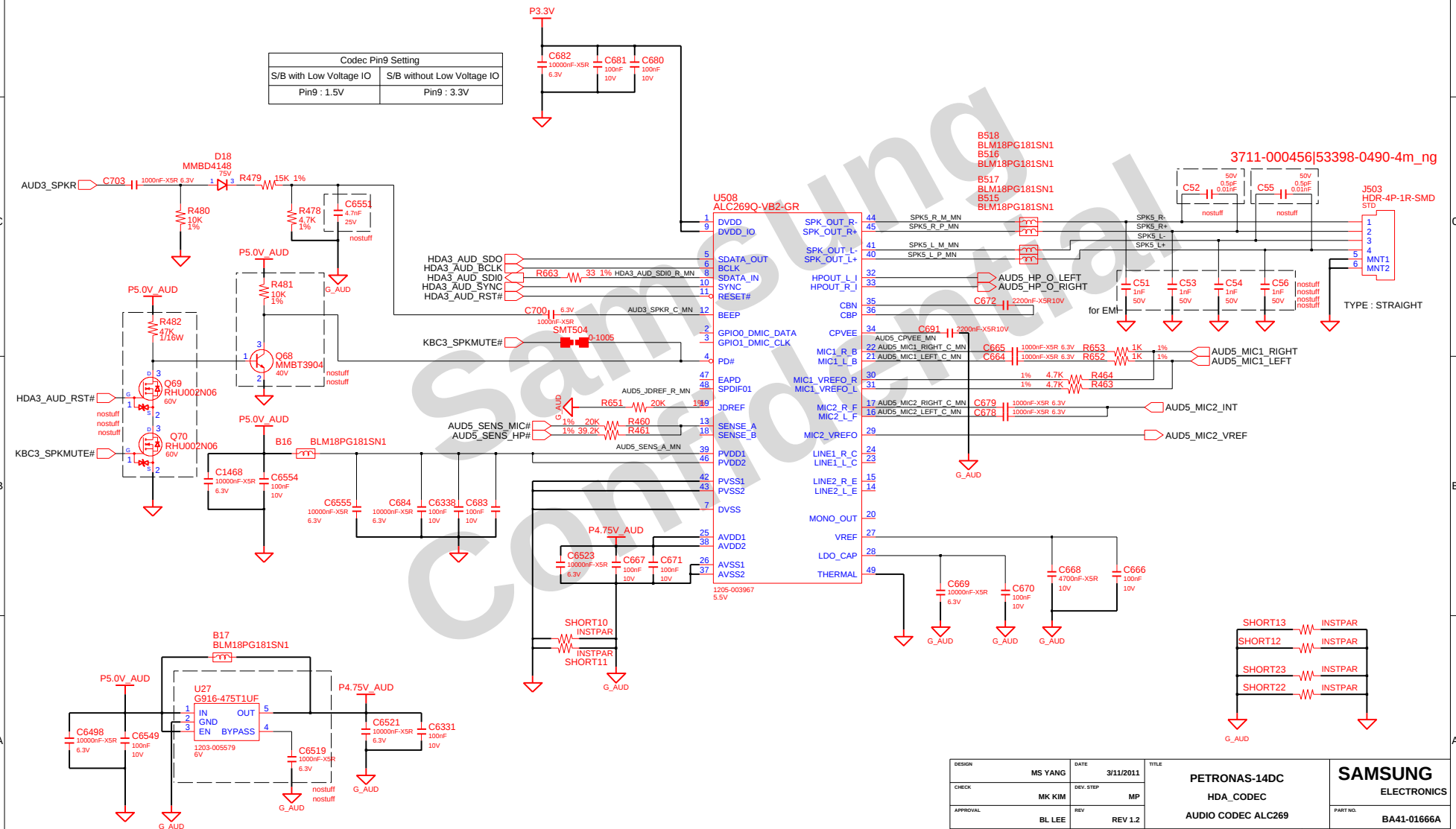
DESIGN	MS YANG	DATE	3/11/2011	PETRONAS-14DC GRAPHICS_IF HDMI	SAMSUNG ELECTRONICS	PART NO: BA41-01666A
CHECK	MK KIM	DEV. STEP	MP			
APPROVAL	BL LEE	REV	REV 1.2			
MODULE CODE	LAST EDIT					
				August 15, 2011 11:04:51 AM	PAGE	29 OF 51

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HD AUDIO

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

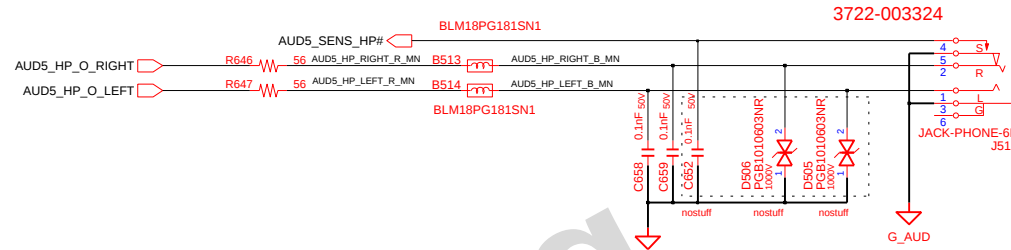


DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC
CHECK	MK KIM	DEV. STEP	MP		HDA_CODEC
APPROVAL	BL LEE	REV	REV 1.2		AUDIO CODEC ALC269
MODULE CODE		LAST EDIT			
				August 15, 2011 11:04:51 AM	PAGE 30 OF 51

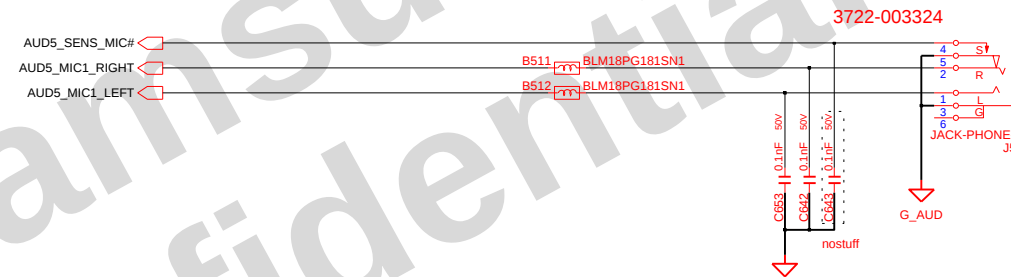
SAMSUNG	
ELECTRONICS	
PART NO.	BA41-01666A

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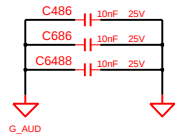
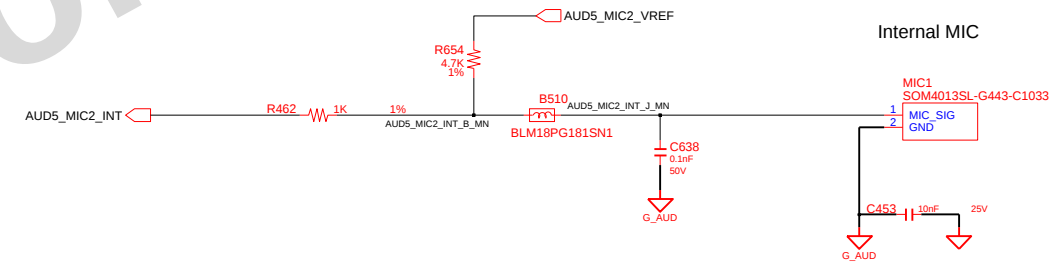
HEADPHONE



MIC JACK



Internal MIC



DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC HDA_CODEC AUDIO JACK	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			
APPROVAL	BL LEE	REV	REV 1.2			
				PART NO.	BA41-01666A	
MODULE CODE	LAST EDIT		August 15, 2011 11:04:51 AM		PAGE	31 OF 51

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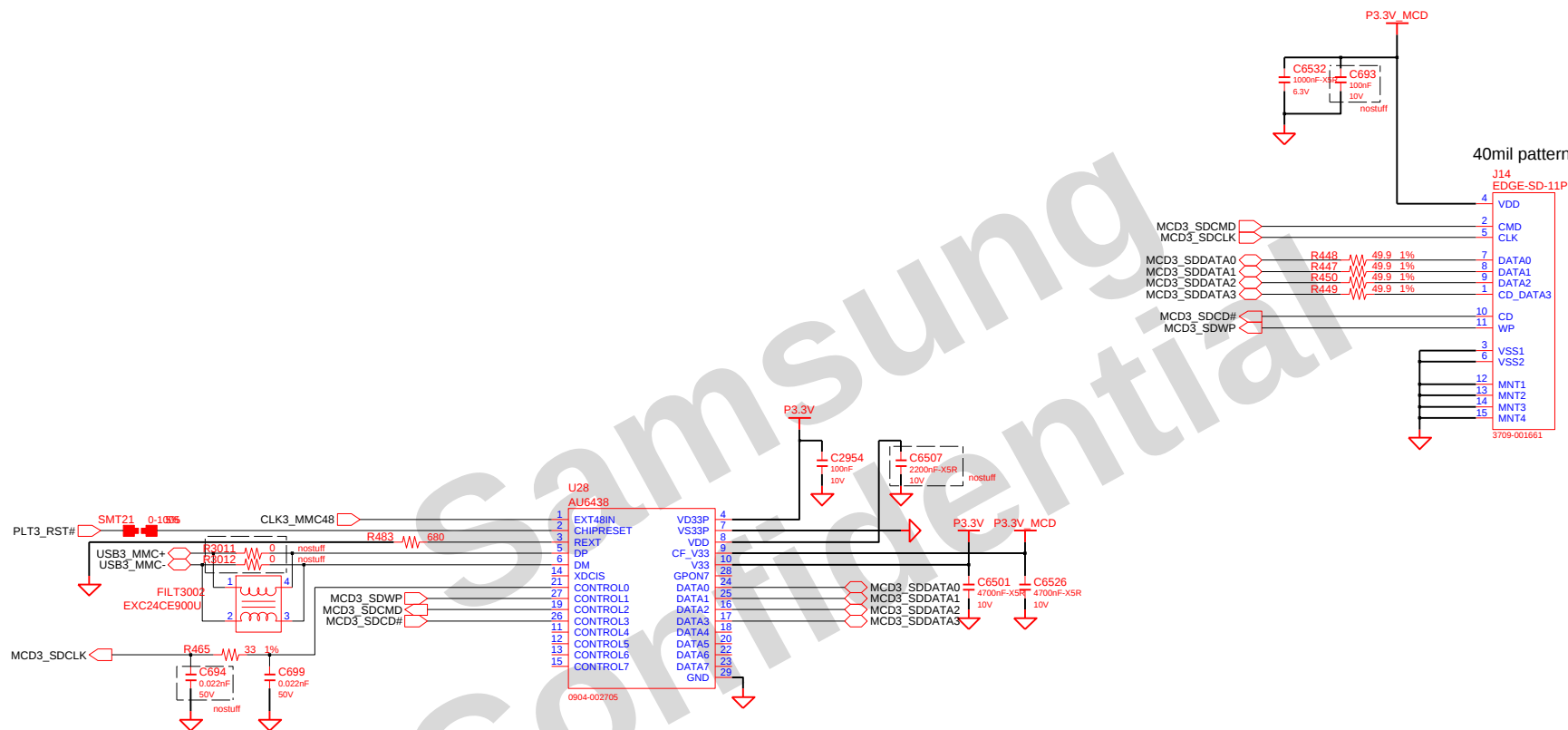
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4 IN 1 CARD

40mil pattern

J14
EDGE-SD-11P

4 VDD
2 CMD
5 CLK
7 DATA0
8 DATA1
9 DATA2
1 CD_DATA3
10 CD
11 WP
3 VSS1
6 VSS2
12 MNT1
13 MNT2
14 MNT3
15 MNT4
3709-001661

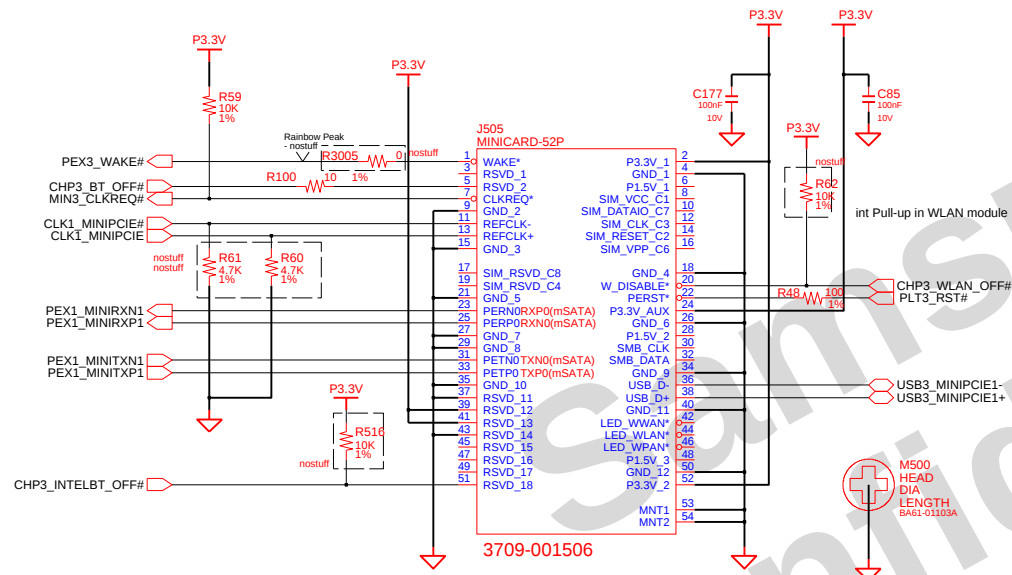


DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC MULTICARD 4 IN 1 CARD(AU6438)	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			PART NO. BA41-01666A
APPROVAL	BL LEE	REV	REV 1.2			
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	33	OF 51

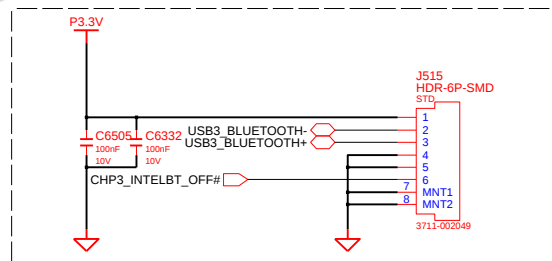
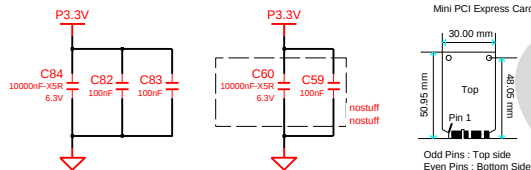
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WLAN, 7mm



Bluetooth Interface

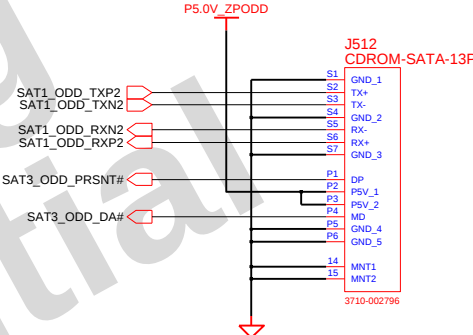
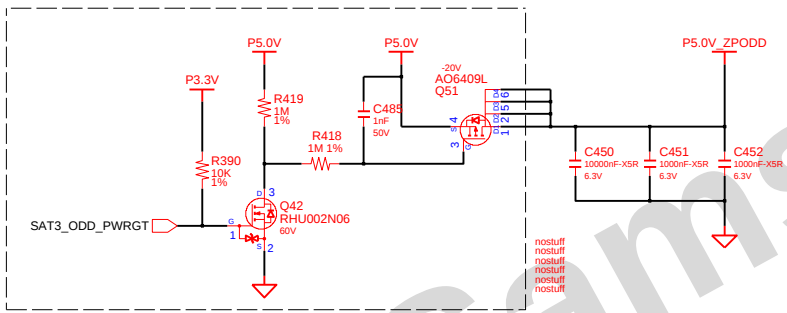


DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG
CHECK	MK KIM	DEV. STEP	MP	MINI_PCIE_CONN	ELECTRONICS	
APPROVAL	BL LEE	REV	REV 1.2	WLAN	PART NO.	BA41-01666A
MODULE CODE		LAST EDIT				
				August 15, 2011 11:04:51 AM	PAGE	34 OF 51

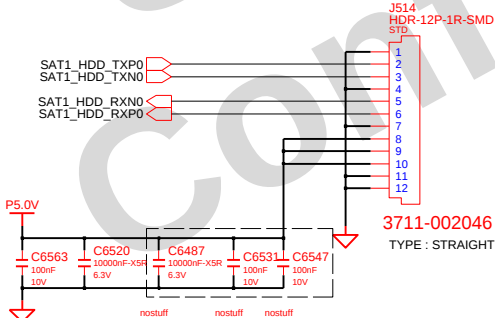
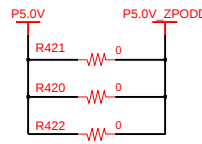
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SATA I/F CONN

SATA ODD CONN 14"



SATA HDD CONN



DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP	SATA_DEVICES		
APPROVAL	BL LEE	REV	REV 1.2	HDD & ODD SUB CONNECTOR	PART NO.	BA41-01666A
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	35	OF 51

MAIN BOARD (MICOM)

U18 W25Q32BVSSIG

1107-001915

1 2 3 4 5 6 7 8

CE* SO HOLD* SCK SI

VDD VSS

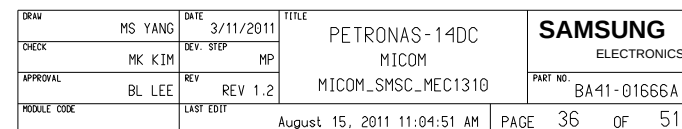
KBC3_SPI_CS# KBC3_SPI_DI

P3.3V_MICOM

R263 10K 1%

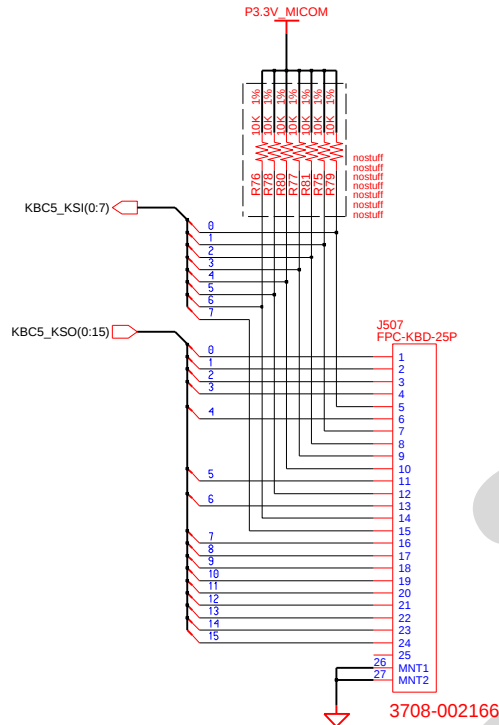
P3.3V_MICOM_HOLDIF_R_MN

KBC3_SPI_CLK KBC3_SPI_DO

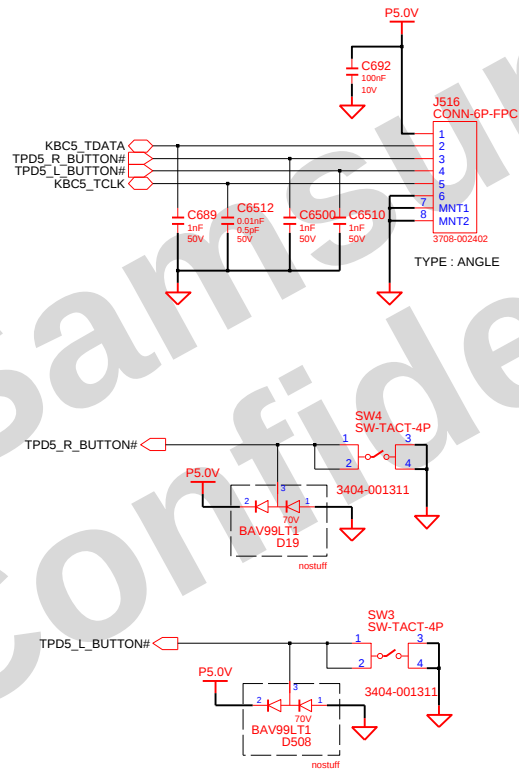


Micom Glue Logic

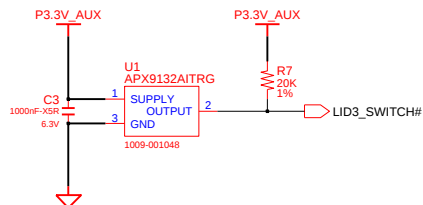
KEYBOARD



TOUCHPAD

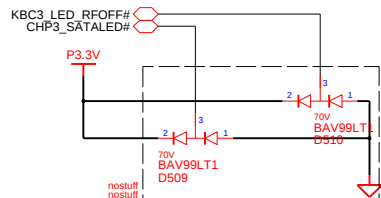


LID_SWITCH



DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC MICOM GLUE LOGIC KEYBOARD & TOUCHPAD	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			PART NO. BA41-01666A
APPROVAL	BL LEE	REV	REV 1.2			
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	37	OF 51

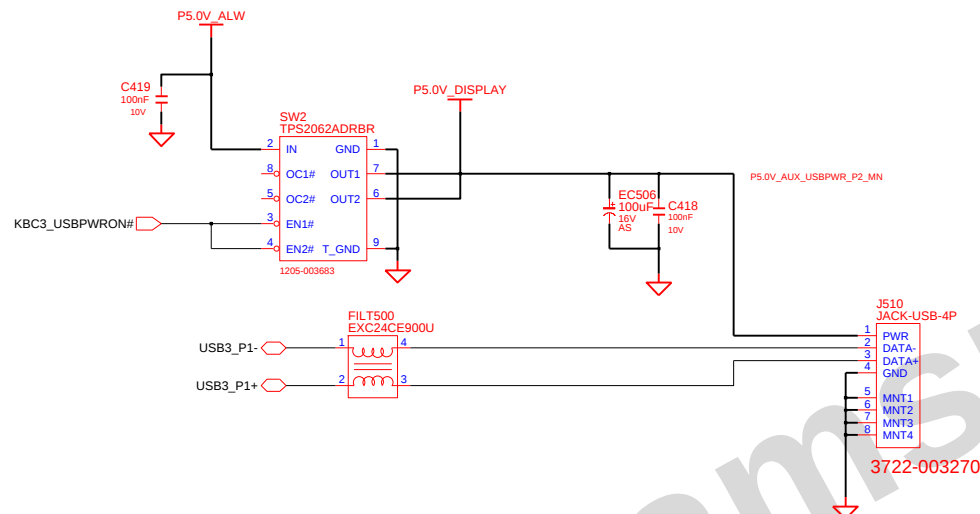
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DRAW	MS YANG	DATE	3/11/2011	TITLE PETRONAS-14DC LED_SWITCH LED_SWITCH	SAMSUNG ELECTRONICS	
CHECK	MK KIM	DEV. STEP	MP			
APPROVAL	BL LEE	REV	REV 1.2			
PART NO.						
				BA41-01666A		
MODULE CODE		LAST EDIT			August 15, 2011 11:04:51 AM	PAGE 38 OF 51

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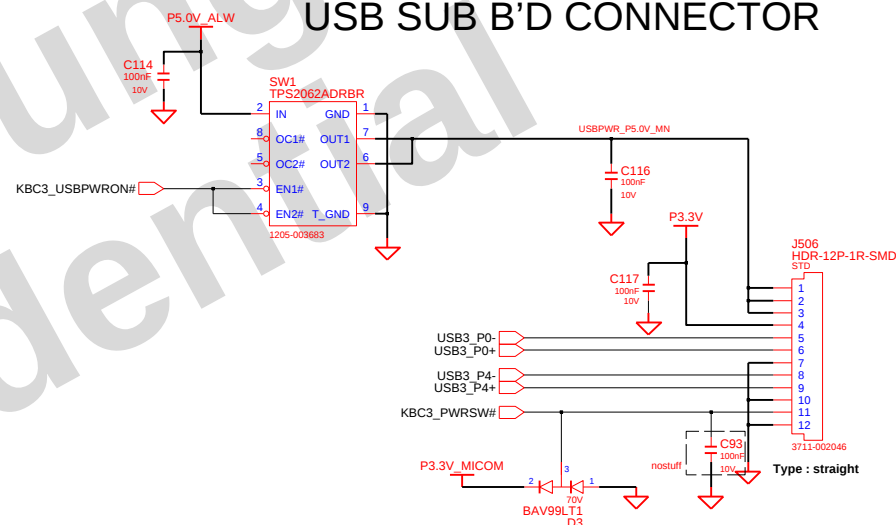
USB Single connector



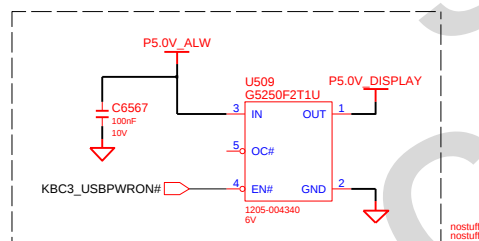
MAIN TO SUB USB CONN

Right 2USB Port

USB SUB B'D CONNECTOR

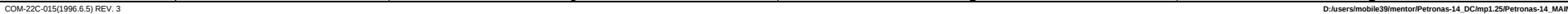


PLACE CLOSE TO USB SUB B'D Conenctor

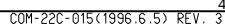


DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG
CHECK	MK KIM	DEV. STEP	MP	USB_CONN	USB_CONN	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.2	USB Port		PART NO.
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM			BA41-01666A
			PAGE	39	OF	51

CHARGER & POWER MANAGEMENT



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

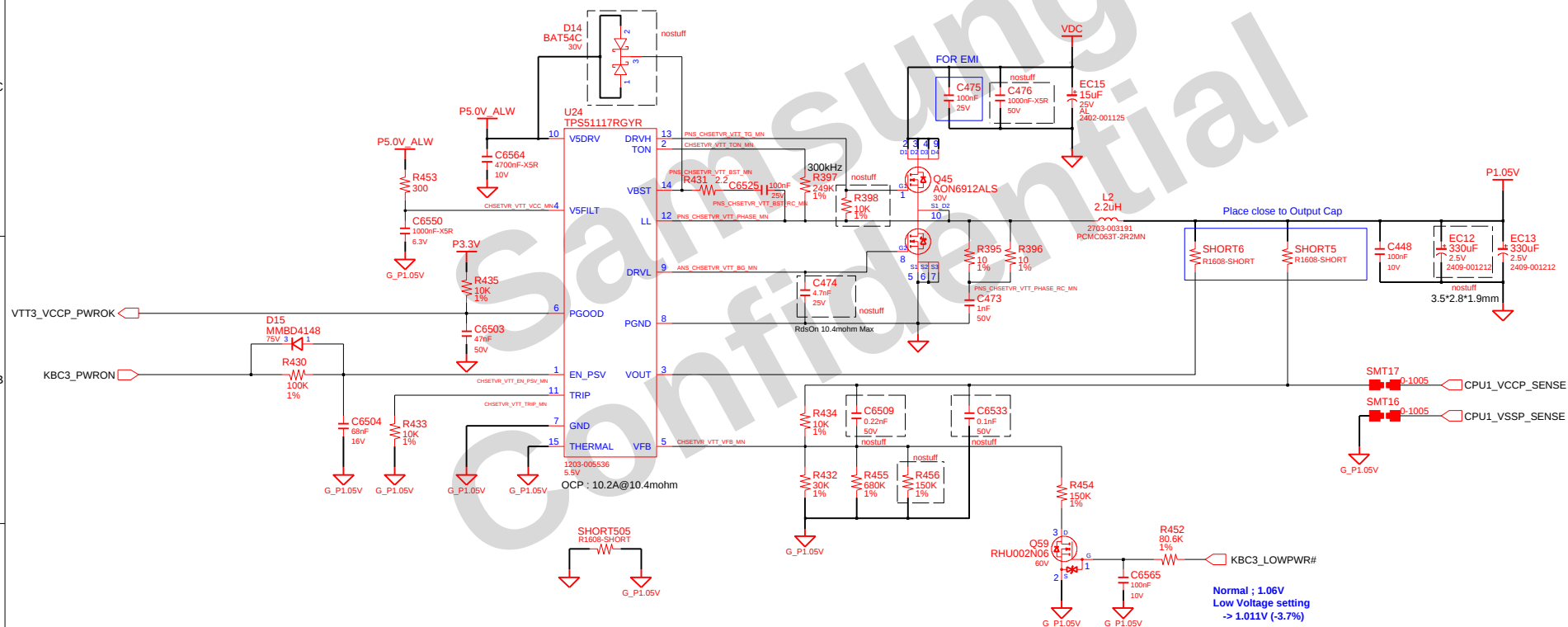


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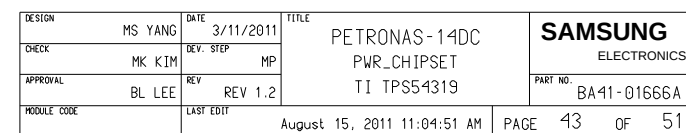
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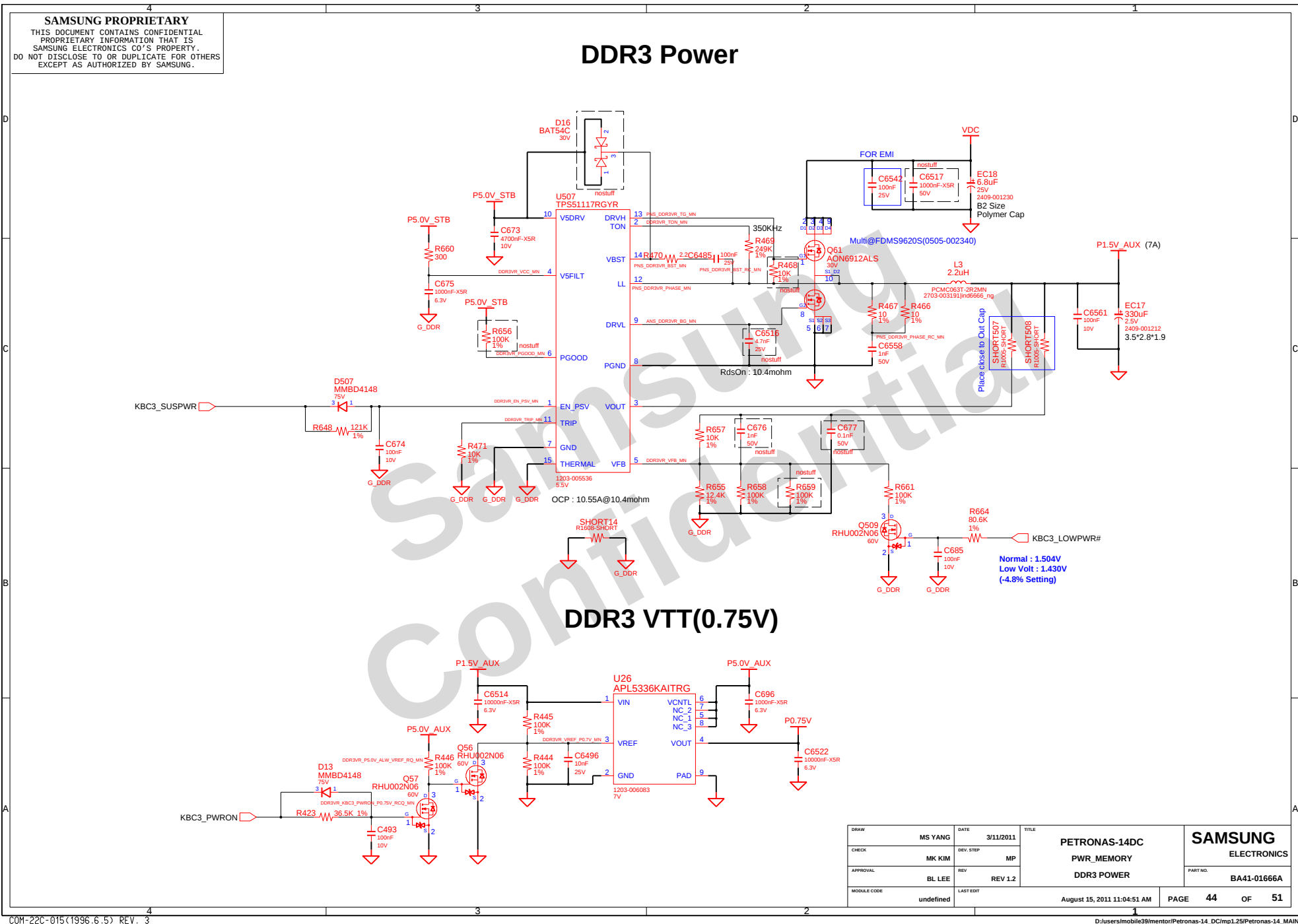
Chipset Power (P1.05V)



DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC P1.05V TI TPS5117	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			PART NO. BA41-01666A
APPROVAL	BL LEE	REV	REV 1.2			
MODULE CODE	undefined	LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	42	OF 51

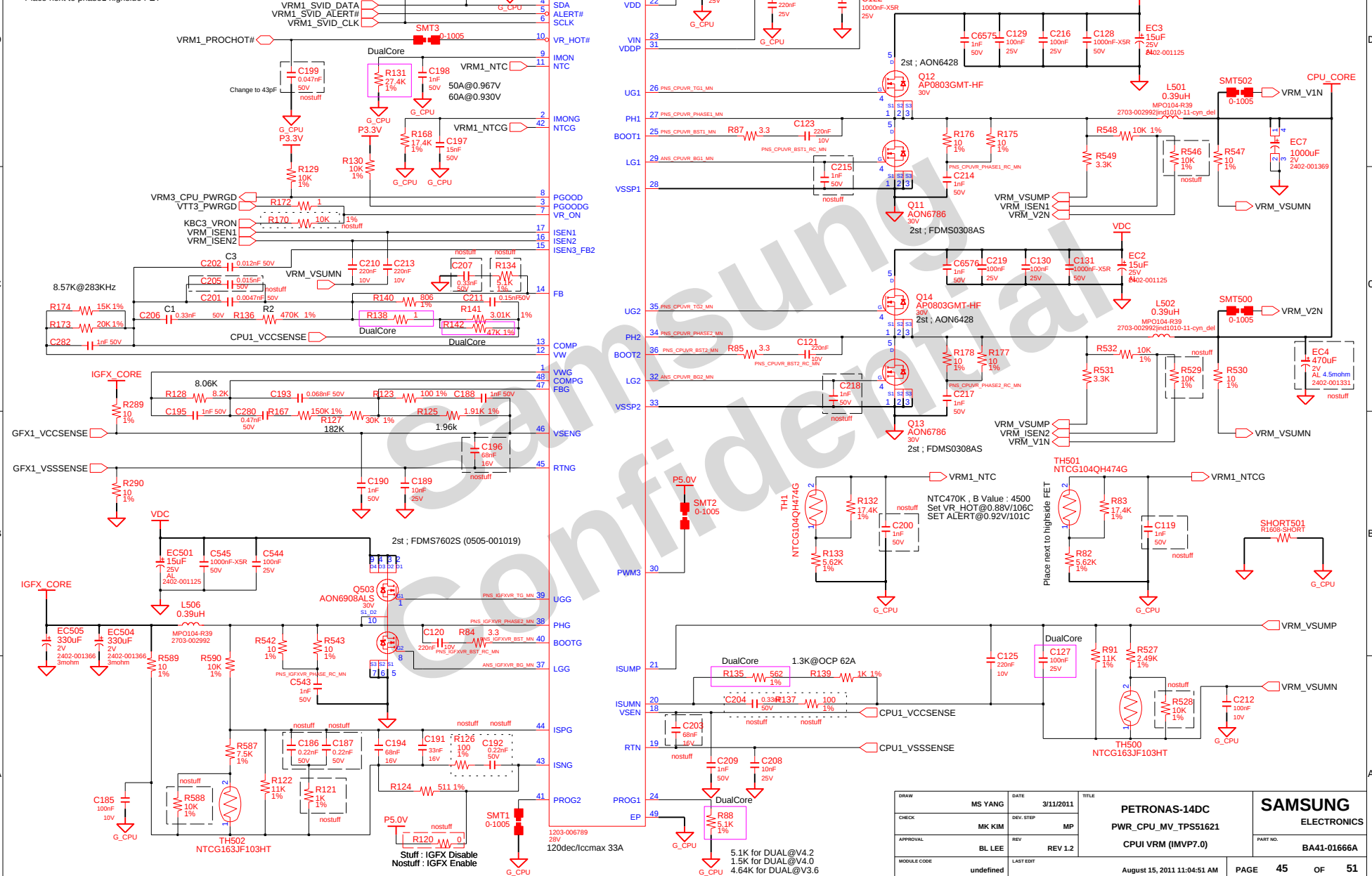
CHIPSET POWER(VCCSA)



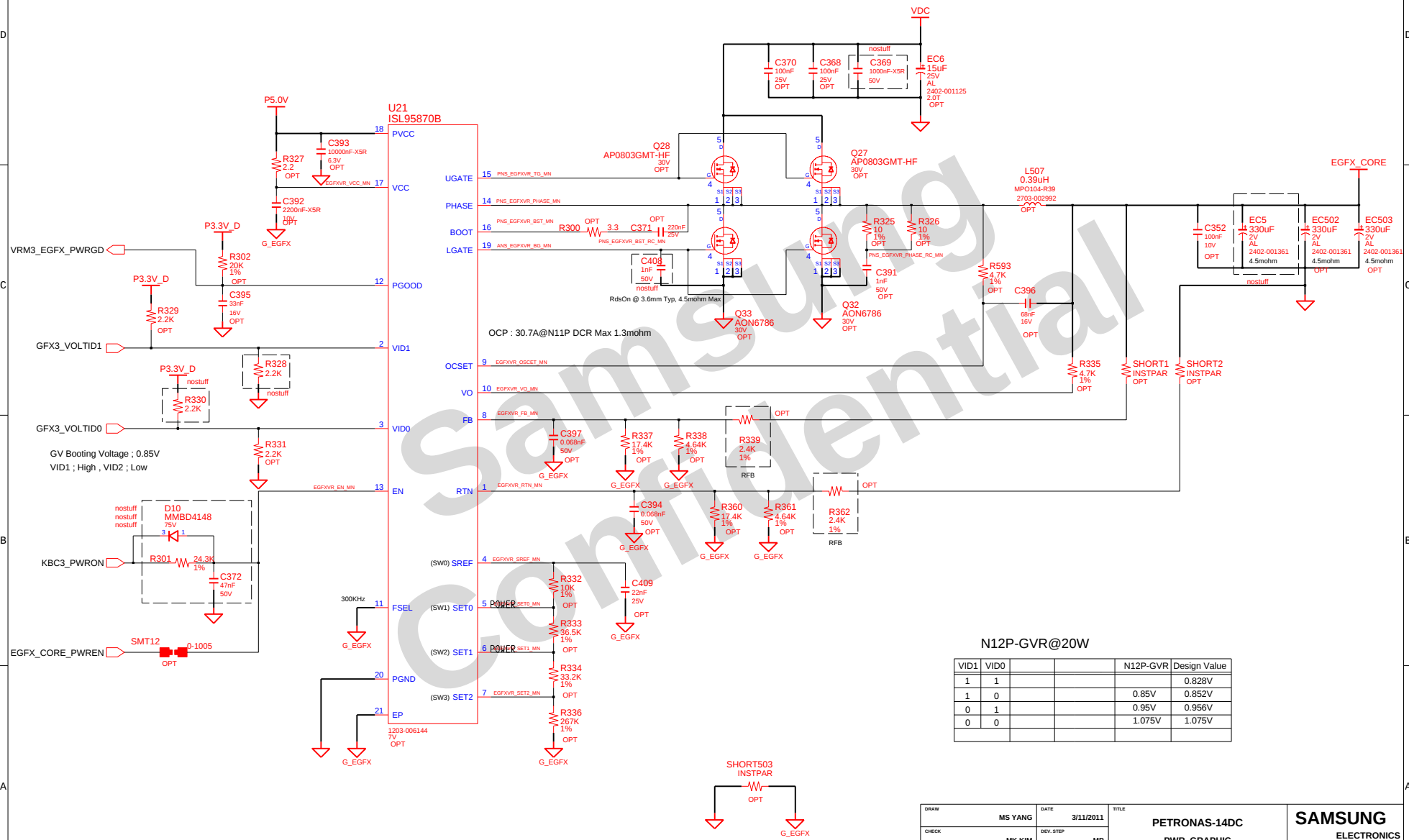


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Place next to phase1 highside FET



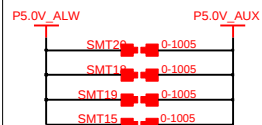
External Graphic Core Power



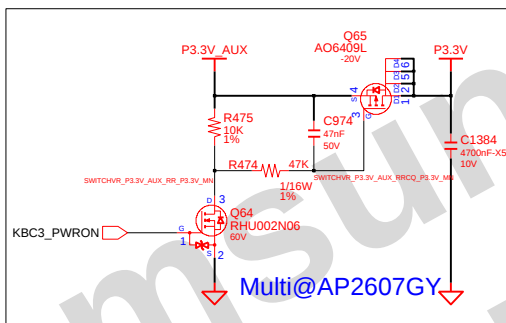
Switched Power 1

(P5.0V -> P3.3V -> EGFX_CORE -> P1.8V -> P1.5V -> P0.75V -> P1.05V -> P0.85V_SA -> CPU_CORE)

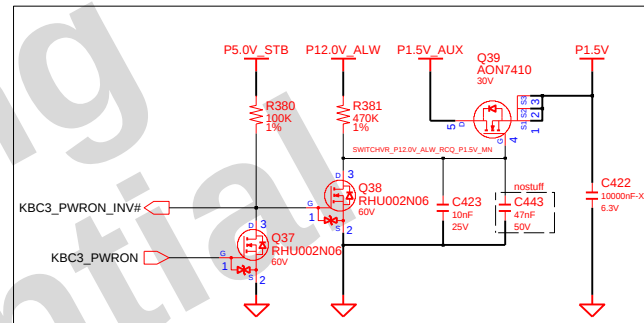
P5.0V_AUX



Switched Power On (P3.3V)

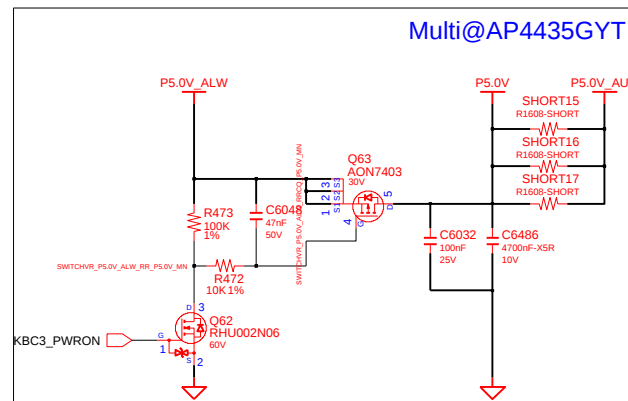


Switched Power On (P1.5V)



For nVIDIA GFX PWR Sequence
NVDD(EGFX_CORE) first and then FBVDDQ(qDDR3)

Switched Power On (P5.0V)



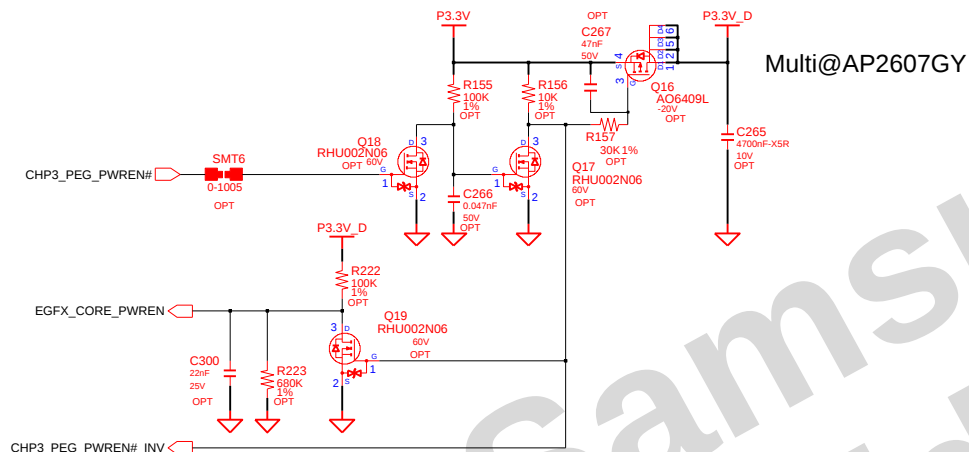
DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG
CHECK	MK KIM	DEV. STEP	MP		Switched PWR 2	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.2		Switched Power	PART NO.
MODULE CODE	undefined	LAST EDIT	August 15, 2011 11:04:51 AM			BA41-01666A
				PAGE	47	OF 51

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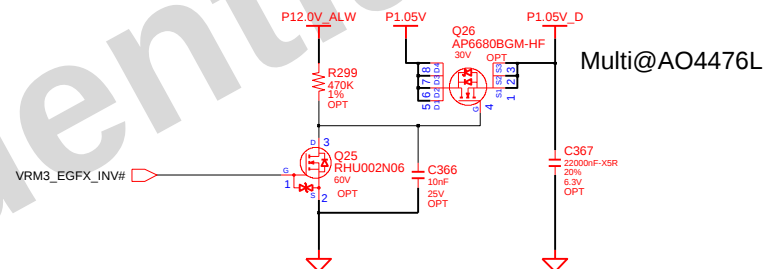
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Switched Power 2 (For nVidia GFX Power Sequence)

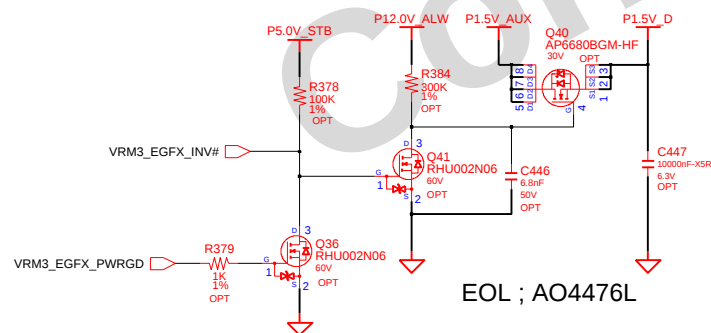
Discrete Switched Power (D3.3V : Max_1.2A)



Discrete Switched Power (D1.05V : Max 3.6A)



Discrete Switched Power (D1.5V : Max 5.0A)



DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG
CHECK	MK KIM	DEV. STEP	MP	Switched PWR	FOR OPTIMUS PWR	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.2			PART NO.
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	48	BA41-01666A
				OF	51	

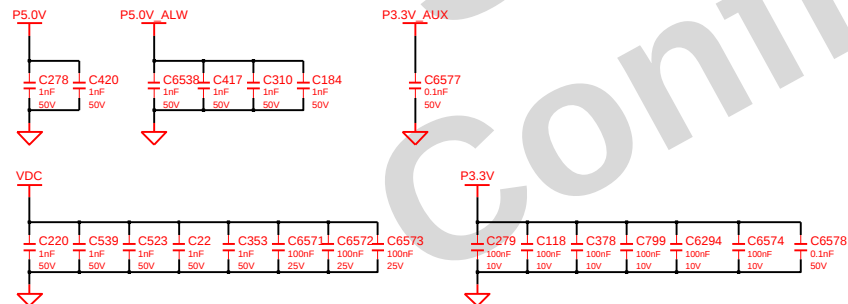
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The schematic diagram illustrates the power management IC (KBC3) and its associated power planes. The top section shows the KBC3_SUSPWR pin connected to a network of resistors (R427, R428, R451, R429, R425) and MOSFETs (Q54, Q58, Q53, Q52) that discharge various power planes: P5.0V_STB, P5.0V_AUX, P3.3V_AUX, and P1.5V_AUX. The bottom section shows the KBC3_PWRON_INV# pin connected to a network of resistors (R476, R324, R662, R371, R592) and MOSFETs (Q66, Q31, Q510, Q35, Q505) that discharge power planes: P3.3V, P1.05V, P5.0V, P1.5V, and EGF_X_CORE. The right side of the diagram shows the KBC3_PWRON_INV# pin connected to a network of resistors (R221, R195, R99) and MOSFETs (Q22, Q21, Q15) that discharge power planes: P3.3V_D, P1.05V_D, and P1.5V_D. The diagram also includes a large watermark 'SamSung' and a 'nostuff' label for several components.

DESIGN	MS YANG	DATE	3/11/2011	PETRONAS-14DC DISCHARGER LOGIC DISCHARGING LOGIC	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP		
APPROVAL	BL LEE	REV	REV 1.2		
PART NO. BA41-01666A					
MODULE CODE	LAST EDIT			August 15, 2011 11:04:51 AM	PAGE 49 OF 51

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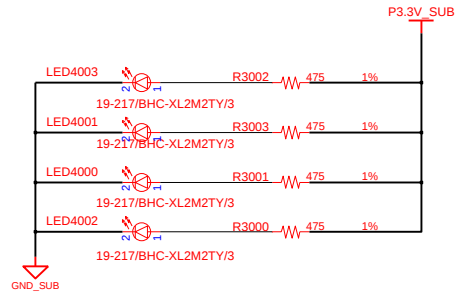
Diagram showing the connection of 8 pins (MT2, MT3, MT4, MT5, MT8, MT9, MT13, MT14) to the RMNT-30-76-1P connector. Each pin is connected to a corresponding pin on the connector via a vertical line and a downward-pointing triangle.



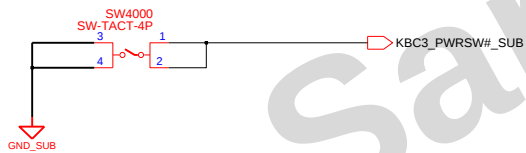
DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG ELECTRONICS		
CHECK	MK KIM	REV. STEP	MP				MT Hole	
APPROVAL	BL LEE	REV	REV 1.2				MT Hole	PART NO.
MODULE CODE	LAST EDIT		August 15, 2011 11:04:51 AM				PAGE	
						50 OF 51		

USB SUB BOARD

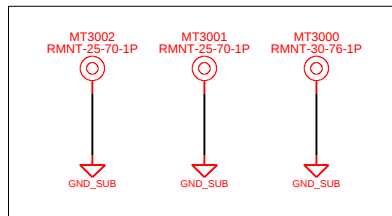
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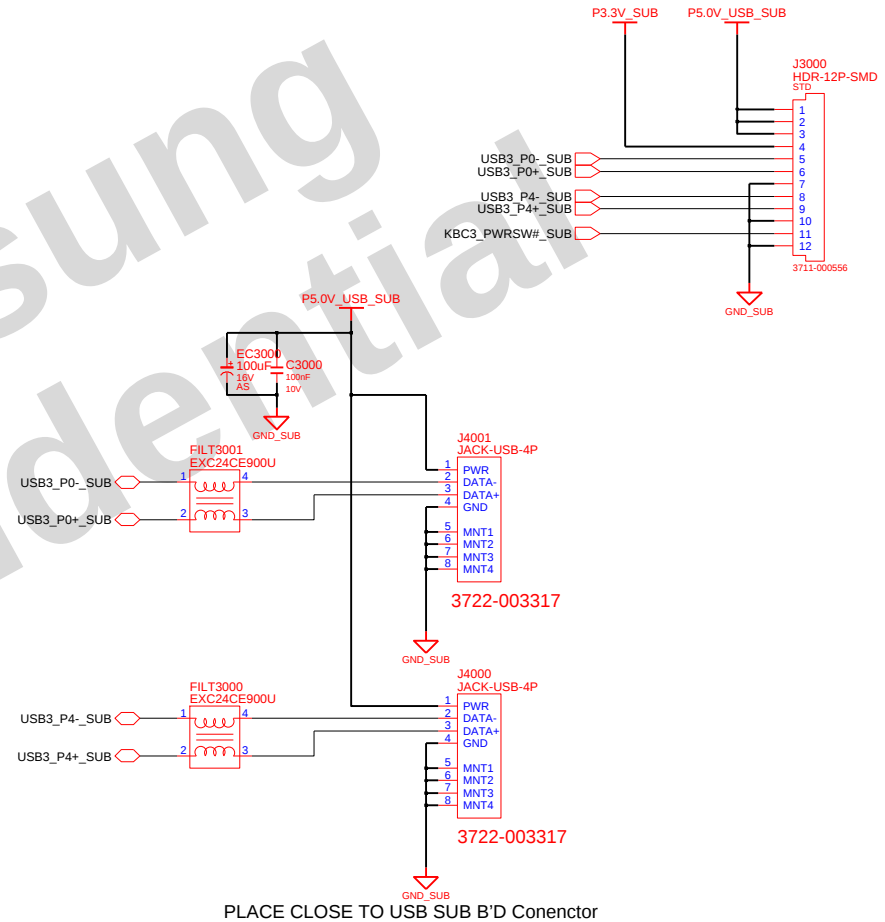
Power Switch Button



PCB Mount



SUB TO MAIN



PLACE CLOSE TO USB SUB B'D Conenctor

DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG ELECTRONICS PART NO. BA41-01666A
CHECK	MK KIM	DEV. STEP	MP		SUB BOARD	
APPROVAL	BL LEE	REV	REV 1.2		SUB BOARD	
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	51 OF 51	