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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

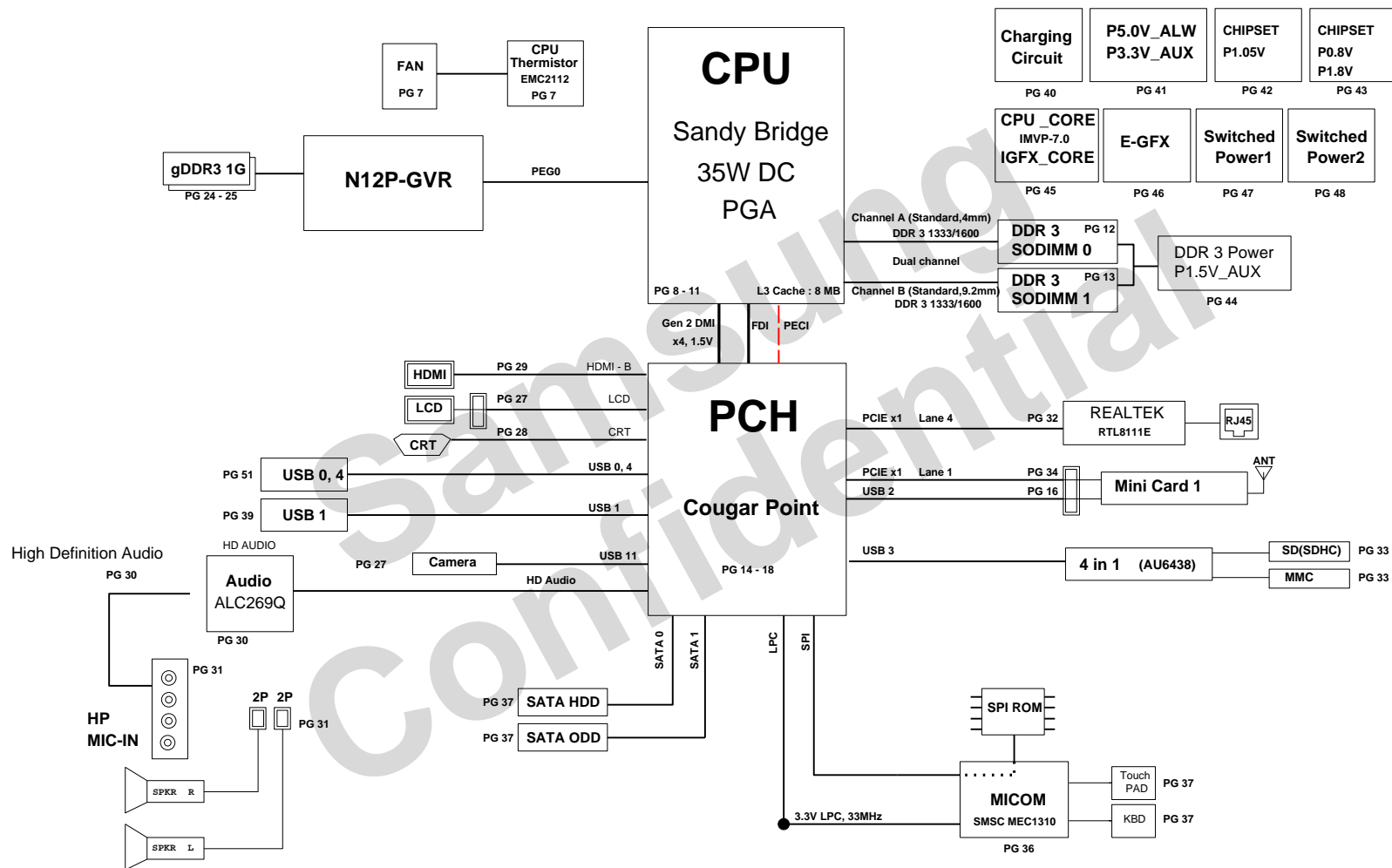
■ Owner : SEC Mobile R & D Signature : X

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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

CPU

Sandy Bridge
35W DC
PGA



DRAW	MS YANG	DATE	3/11/2011	PETRONAS-14DC MAIN BLOCK DIAGRAM	SAMSUNG ELECTRONICS
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 2 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
---------	------------	-----------------

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

KBC3_SUSPWR
(CHP3_SLPS4#)

KBC3_PWRON
(CHP3_SLPS3#)

KBC3_VRON

AC Adapter

Battery DC

VDC

P3.3V_MICOM

MICOM
SPI ROM
GREEN CLK
KBD

P5.0V_STB

P5.0V_ALW

USB PWR S/W
Chipset PWR IC
When USB Charge Enable

P3.3V_ALW

Thermal Sensor
PCH

P12.0V_ALW

P1.5V_AUX

SODIMM (DDR3)

P5.0V_AUX

P3.3V_AUX

LID S/W

P1.05V_M

P3.3V_M

P1.05V
(VCCP)

CPU
PCH

P1.05V_D

NVIDIA

EGFX_CORE

N12P

P1.5V

CPU
PCH

Express card

P1.5V_D

NVIDIA

P0.75V

SODIMM (DDR3)

P1.05V_USB

USB3.0

P5.0V

Thermal Sensor
PCH

LVDS
CRT

Touchpad
HDMI
SATA IF

P1.8V

CPU
PCH
N12P

P3.3V_D

NVIDIA

P3.3V

GREEN CLK
SODIMM (DDR3)

PCH
80PORT
LVDS
CRT

HDMI
AUDIO

P0.85V_SA

CPU

P3.3V_USB

USB3.0

S5-S4

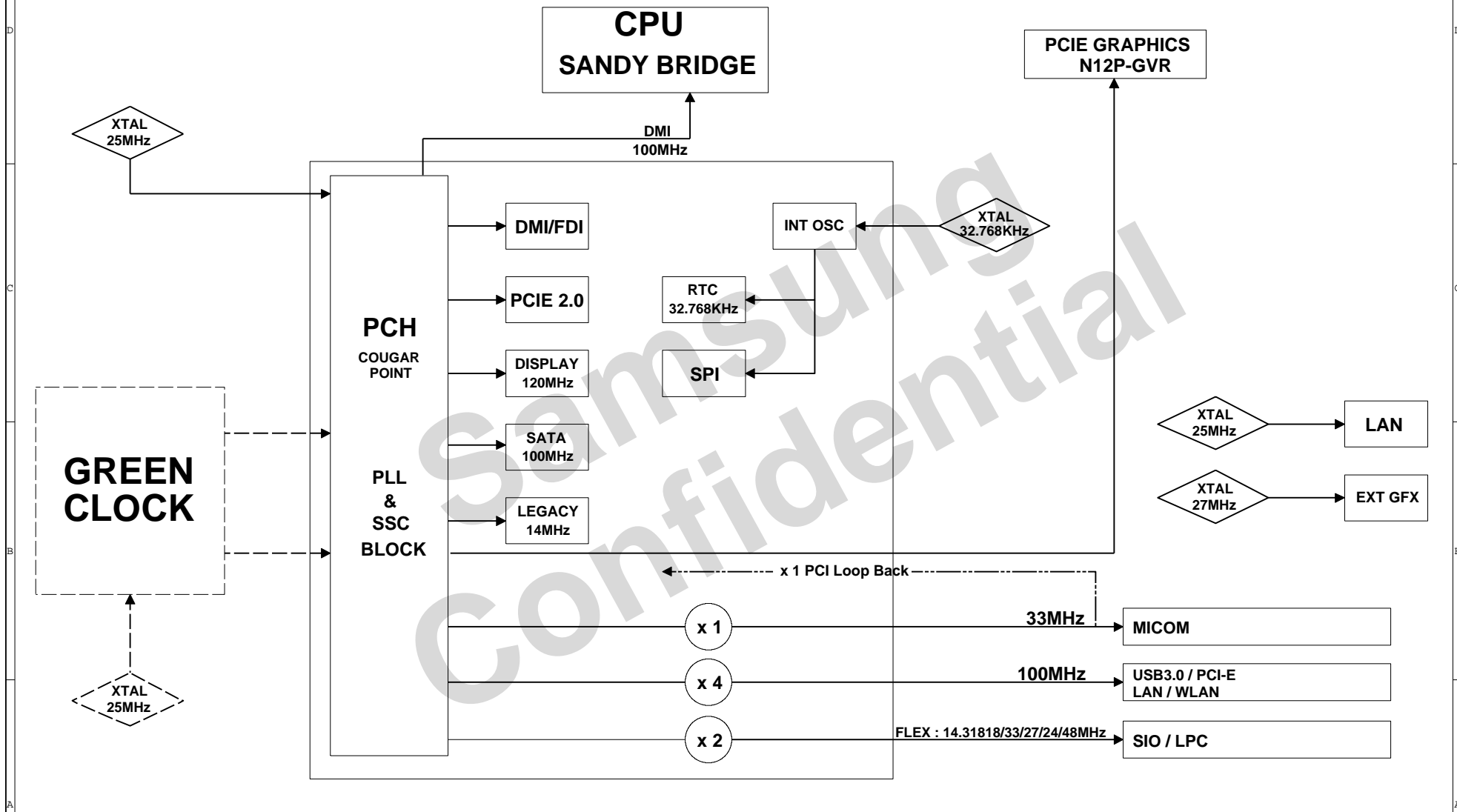
S3

S0

DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG
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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	

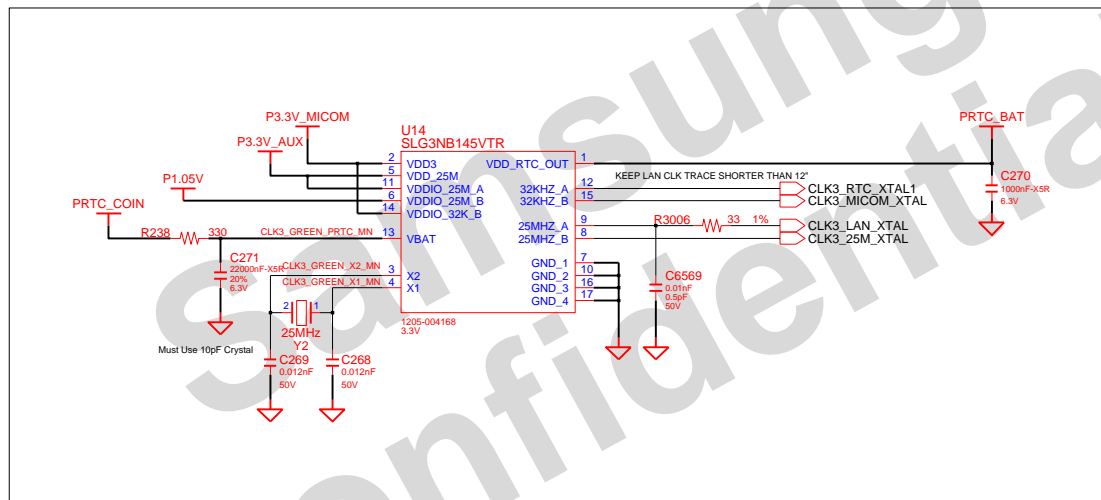
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CLOCK DISTRIBUTION Rev. 0.8



DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP	MAIN		
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



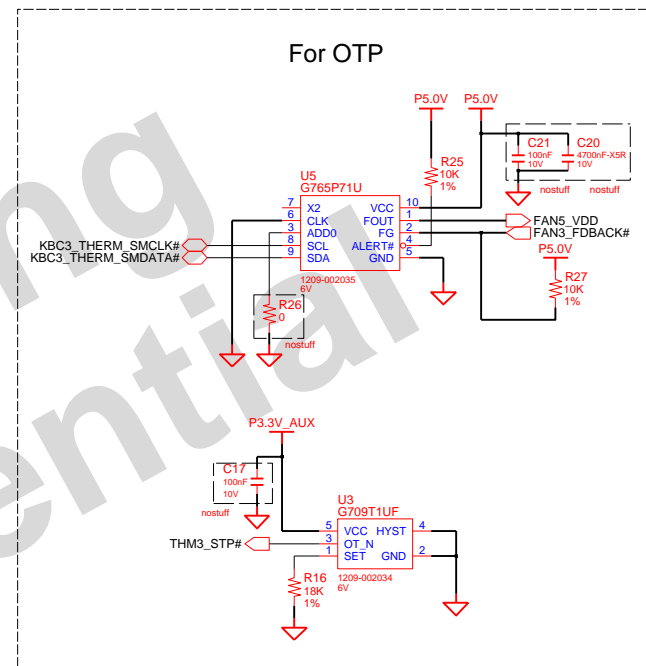
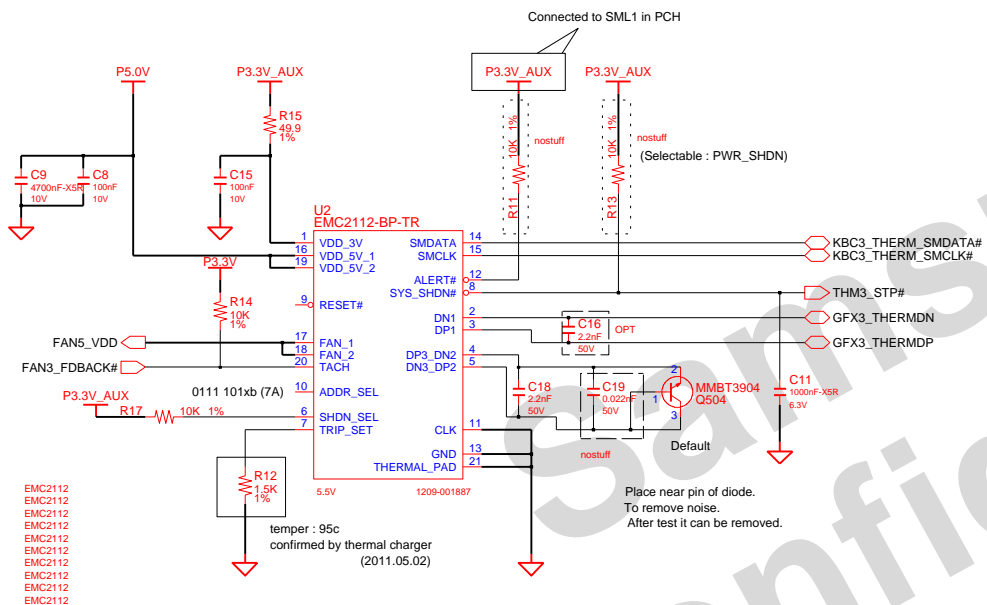
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK
GREENCLK

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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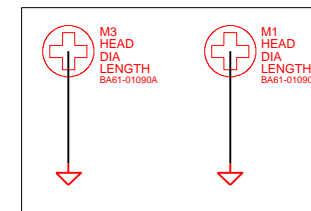
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THERMAL SENSOR & FAN CONTROL



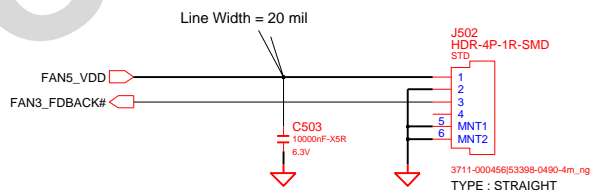
Temperature : 95.78c
confirmed by thermal charger
(2011.05.02)
 $R_{th}(\text{kohm}) = 0.0012T^2 - 0.9308T + 96.147$

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

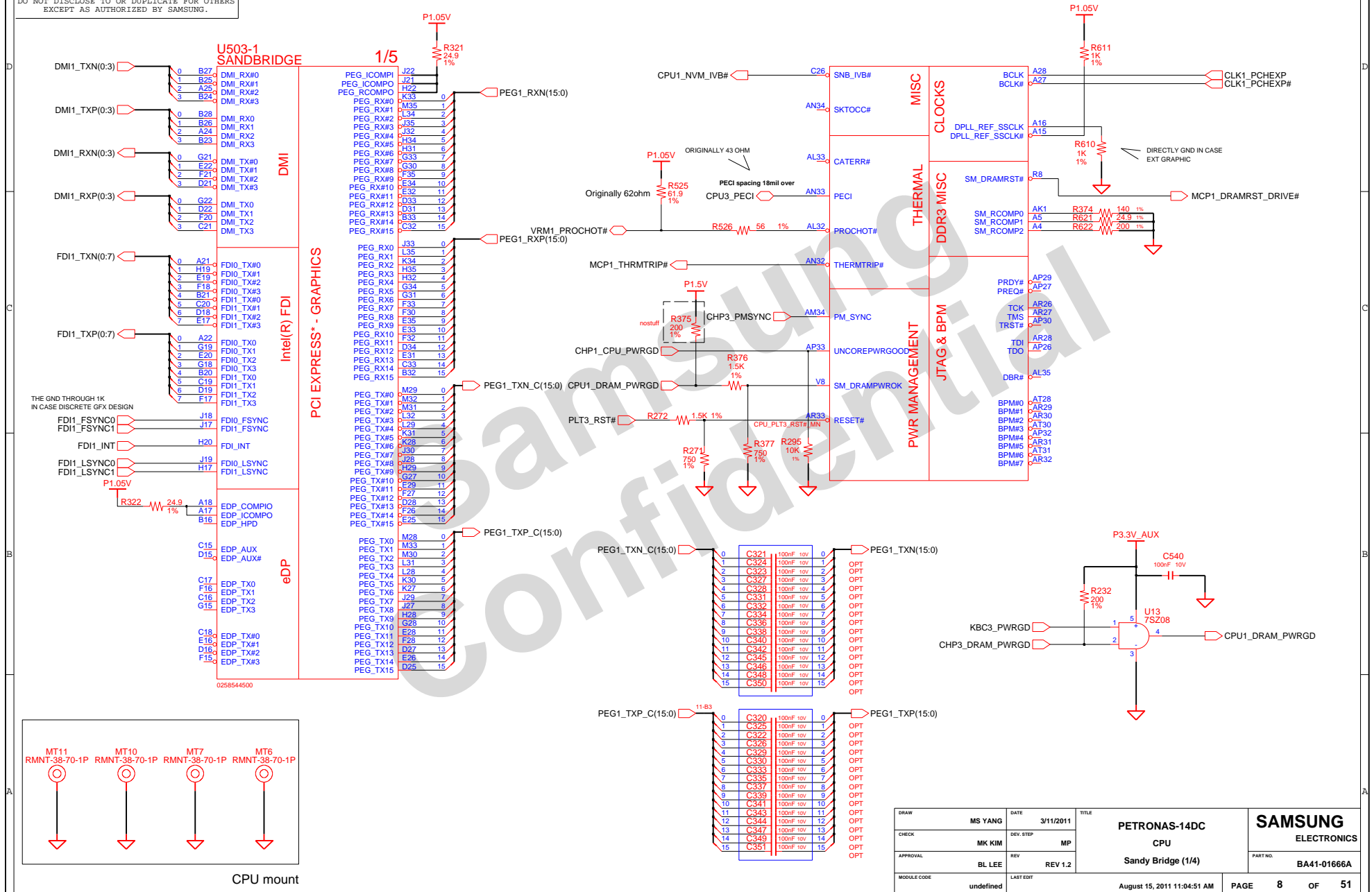


DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC THERMAL SENSOR	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			
APPROVAL	BL LEE	REV	REV 1.2		THERMAL SENSOR EMC2112	PART NO. BA41-01666A
MODULE CODE		LAST EDIT			August 15, 2011 11:04:51 AM	PAGE 7 OF 51

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SANDYBRIDGE PROCESSOR (DMI,PEG, FDI)



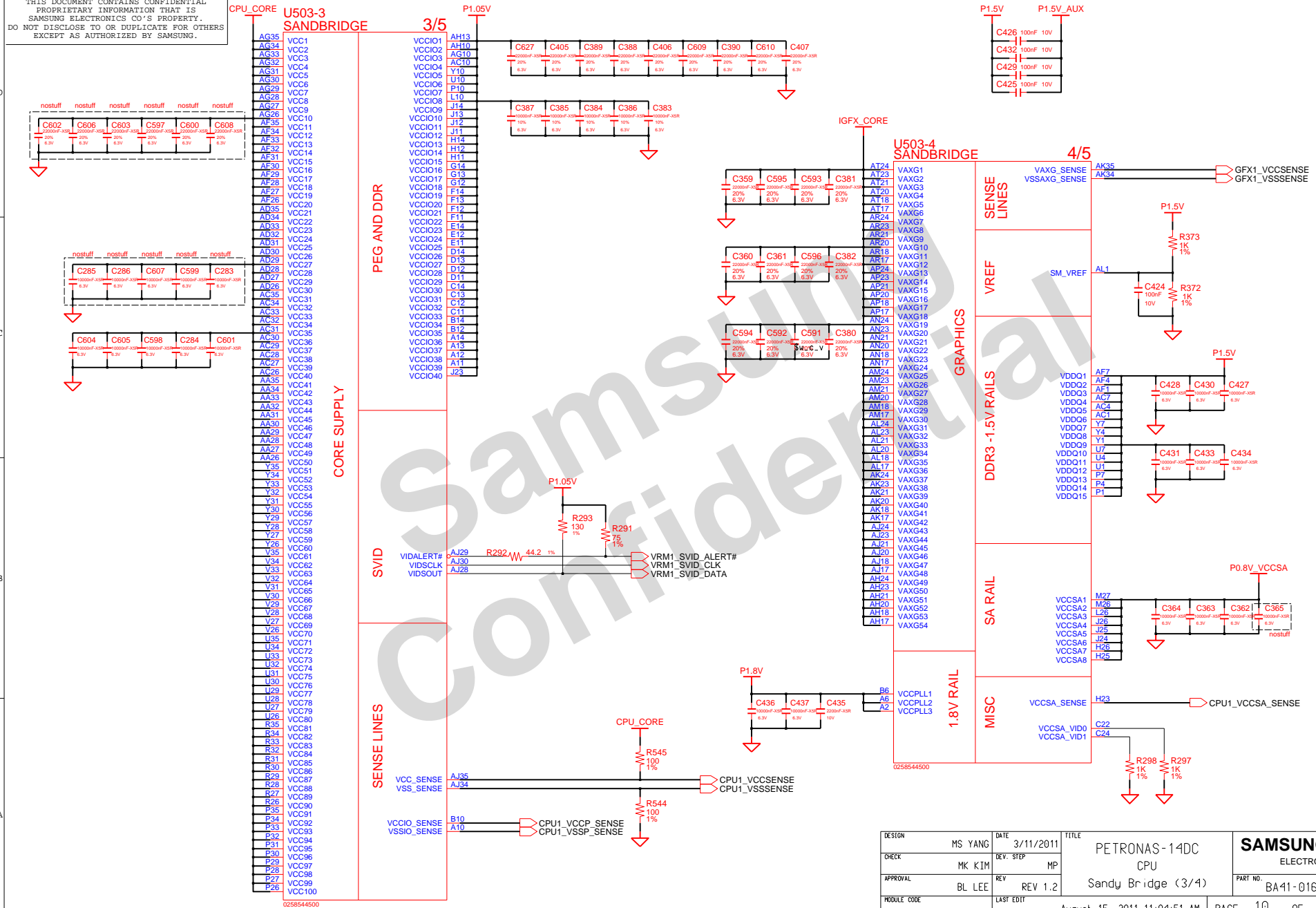
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CHECK	MK KIM	DEV. STEP	MP		CPU
APPROVAL	BL LEE	REV	REV 1.2		Sandy Bridge (1/4)
MODULE CODE	undefined	LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	8 OF 51

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DRAW	MS YANG	DATE	3/11/2011	PETRONAS-14DC CPU Sandy Bridge (2/4)	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	9 OF 51

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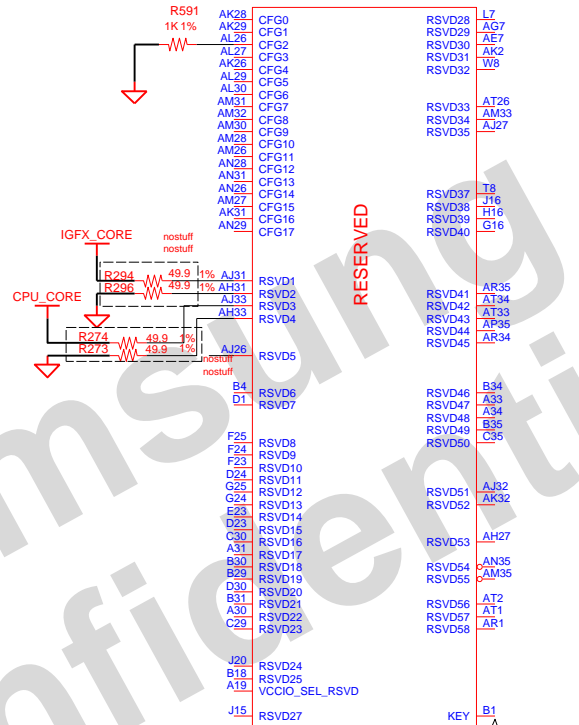
**U503-5
SANDBRIDGE 5/5**

AT35	VSS1	VSS81	AJ22
AT32	VSS2	VSS82	AJ19
AT29	VSS3	VSS83	AJ16
AT26	VSS4	VSS84	AJ13
AT25	VSS5	VSS85	AJ10
AT22	VSS6	VSS86	AJ7
AT19	VSS7	VSS87	AJ3
AT16	VSS8	VSS88	AJ2
AT13	VSS9	VSS89	AJ1
AT10	VSS10	VSS90	AH35
AT7	VSS11	VSS91	AH34
AT4	VSS12	VSS92	AH32
AT3	VSS13	VSS93	AH31
AR25	VSS14	VSS94	AH30
AR22	VSS15	VSS95	AH29
AR19	VSS16	VSS96	AH28
AR16	VSS17	VSS97	AH26
AR13	VSS18	VSS98	AH25
AR10	VSS19	VSS99	AH22
AR7	VSS20	VSS100	AH19
AR4	VSS21	VSS101	AH18
AP34	VSS22	VSS102	AH7
AP31	VSS23	VSS103	AH4
AP28	VSS24	VSS104	AG9
AP25	VSS25	VSS105	AG8
AP22	VSS26	VSS106	AG4
AP19	VSS27	VSS107	AF6
AP16	VSS28	VSS108	AF5
AP13	VSS29	VSS109	AF2
AP10	VSS30	VSS110	AE35
AP7	VSS31	VSS111	AE34
AP4	VSS32	VSS112	AE33
AP1	VSS33	VSS113	AE31
AN30	VSS34	VSS114	AE29
AN27	VSS35	VSS115	AE28
AN25	VSS36	VSS116	AE27
AN22	VSS37	VSS117	AE26
AN19	VSS38	VSS118	AE25
AN16	VSS39	VSS119	AE24
AN13	VSS40	VSS120	AE23
AN10	VSS41	VSS121	AE22
AN7	VSS42	VSS122	AE21
AN4	VSS43	VSS123	AE20
AM29	VSS44	VSS124	AC6
AM26	VSS45	VSS125	AC5
AM22	VSS46	VSS126	AC3
AM19	VSS47	VSS127	AC2
AM16	VSS48	VSS128	AB35
AM13	VSS49	VSS129	AB34
AM10	VSS50	VSS130	AB33
AM7	VSS51	VSS131	AB32
AM4	VSS52	VSS132	AB31
AM3	VSS53	VSS133	AB30
AM2	VSS54	VSS134	AB29
AM1	VSS55	VSS135	AB28
AL34	VSS56	VSS136	AB27
AL31	VSS57	VSS137	AB26
AL28	VSS58	VSS138	AB25
AL25	VSS59	VSS139	AB24
AL22	VSS60	VSS140	AB23
AL19	VSS61	VSS141	AB22
AL16	VSS62	VSS142	AB21
AL13	VSS63	VSS143	AB20
AL10	VSS64	VSS144	AB19
AL7	VSS65	VSS145	AB18
AL4	VSS66	VSS146	AB17
AL2	VSS67	VSS147	AB16
AK33	VSS68	VSS148	AB15
AK30	VSS69	VSS149	AB14
AK27	VSS70	VSS150	AB13
AK25	VSS71	VSS151	AB12
AK22	VSS72	VSS152	AB11
AK19	VSS73	VSS153	AB10
AK16	VSS74	VSS154	AB9
AK13	VSS75	VSS155	AB8
AK10	VSS76	VSS156	AB7
AK7	VSS77	VSS157	AB6
AK4	VSS78	VSS158	AB5
AJ25	VSS79	VSS159	AB4
	VSS80	VSS160	AB3

VSS

VSS

T35	VSS161	VSS234	F22
T34	VSS162	VSS235	F19
T32	VSS163	VSS236	E30
T31	VSS164	VSS237	E27
T30	VSS165	VSS238	E24
T29	VSS166	VSS239	E21
T28	VSS167	VSS240	E18
T27	VSS168	VSS241	E15
T26	VSS169	VSS242	E13
T25	VSS170	VSS243	E10
T24	VSS171	VSS244	E9
T23	VSS172	VSS245	E8
T22	VSS173	VSS246	E7
T21	VSS174	VSS247	E6
T20	VSS175	VSS248	E5
T19	VSS176	VSS249	E4
T18	VSS177	VSS250	E3
T17	VSS178	VSS251	E2
T16	VSS179	VSS252	E1
T15	VSS180	VSS253	D35
T14	VSS181	VSS254	D32
T13	VSS182	VSS255	D29
T12	VSS183	VSS256	D26
T11	VSS184	VSS257	D23
T10	VSS185	VSS258	D20
T9	VSS186	VSS259	D17
T8	VSS187	VSS260	D14
T7	VSS188	VSS261	D11
T6	VSS189	VSS262	D8
T5	VSS190	VSS263	D5
T4	VSS191	VSS264	C35
T3	VSS192	VSS265	C32
T2	VSS193	VSS266	C29
T1	VSS194	VSS267	C26
	VSS195	VSS268	C23
	VSS196	VSS269	C20
	VSS197	VSS270	C17
	VSS198	VSS271	C14
	VSS199	VSS272	C11
	VSS200	VSS273	C8
	VSS201	VSS274	C5
	VSS202	VSS275	B35
	VSS203	VSS276	B32
	VSS204	VSS277	B29
	VSS205	VSS278	B26
	VSS206	VSS279	B23
	VSS207	VSS280	B20
	VSS208	VSS281	B17
	VSS209	VSS282	B14
	VSS210	VSS283	B11
	VSS211	VSS284	B8
	VSS212	VSS285	B5
	VSS213		
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	VSS233		



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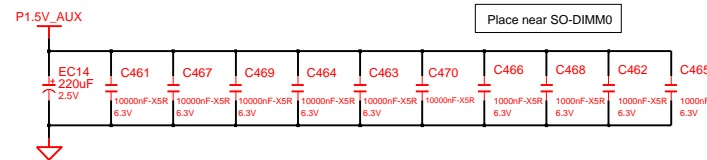
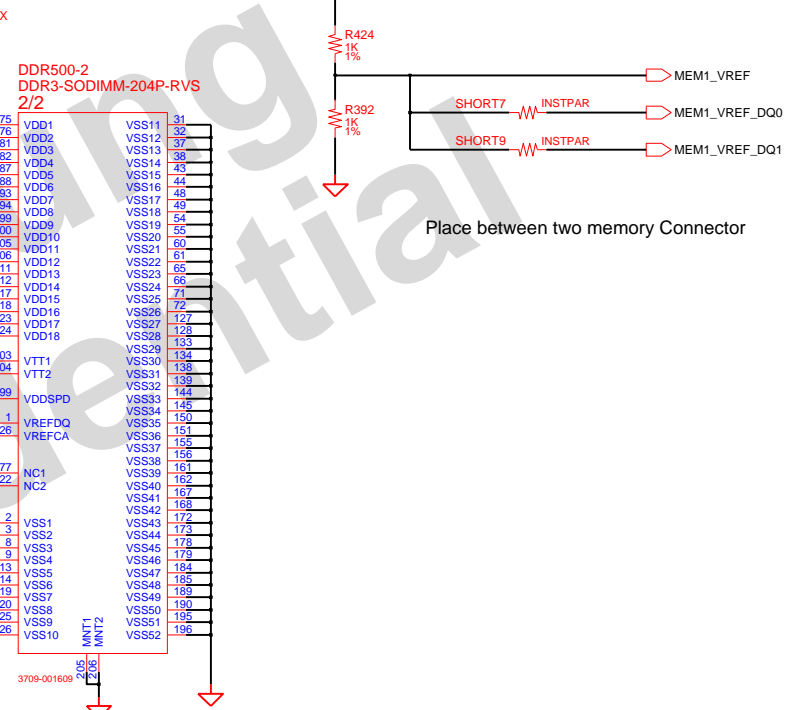
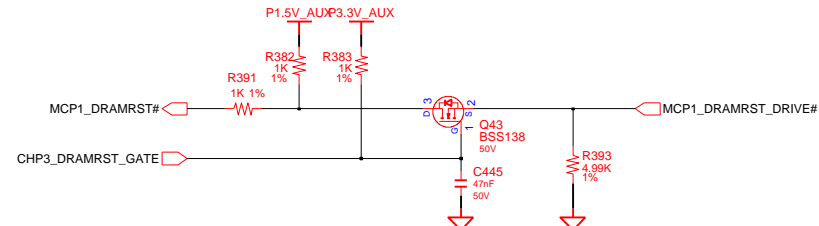
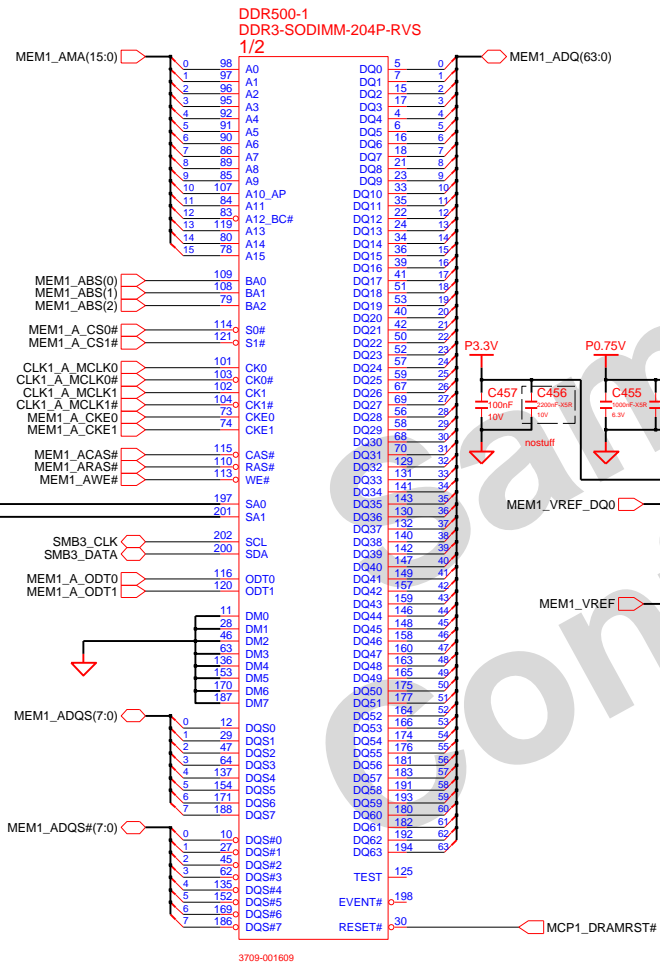
SO-DIMM#0 : 2nd SO-DIMM

DDR SO-DIMM #0

Height : 9.2 mm (REVERSE)

P/N : 3709-001656 (Foxconn)

P/N : 3709-001609 (Concraft)



DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG
CHECK	MK KIM	DEV. STEP	MP		SODIMM A	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.2		DDR3	PART NO.
MODULE CODE	undefined	LAST EDIT	August 15, 2011 11:04:51 AM			BA41-01666A
					PAGE	12 OF 51

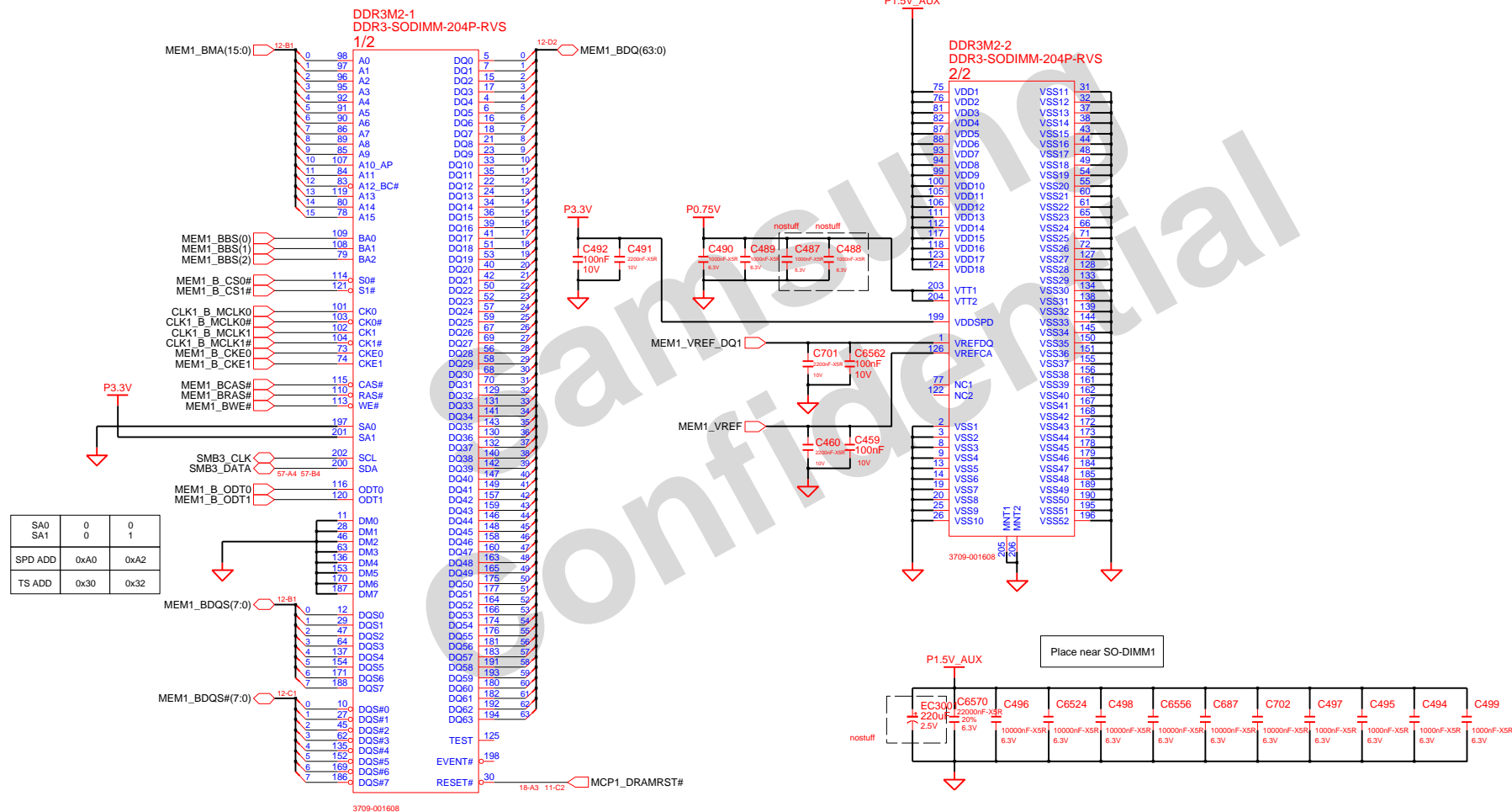
SO-DIMM#1 : 1st SO-DIMM

DDR SO-DIMM #1

Height : 4.0 mm (REVERSE)

P/N : 3709-001654 (Foxconn)

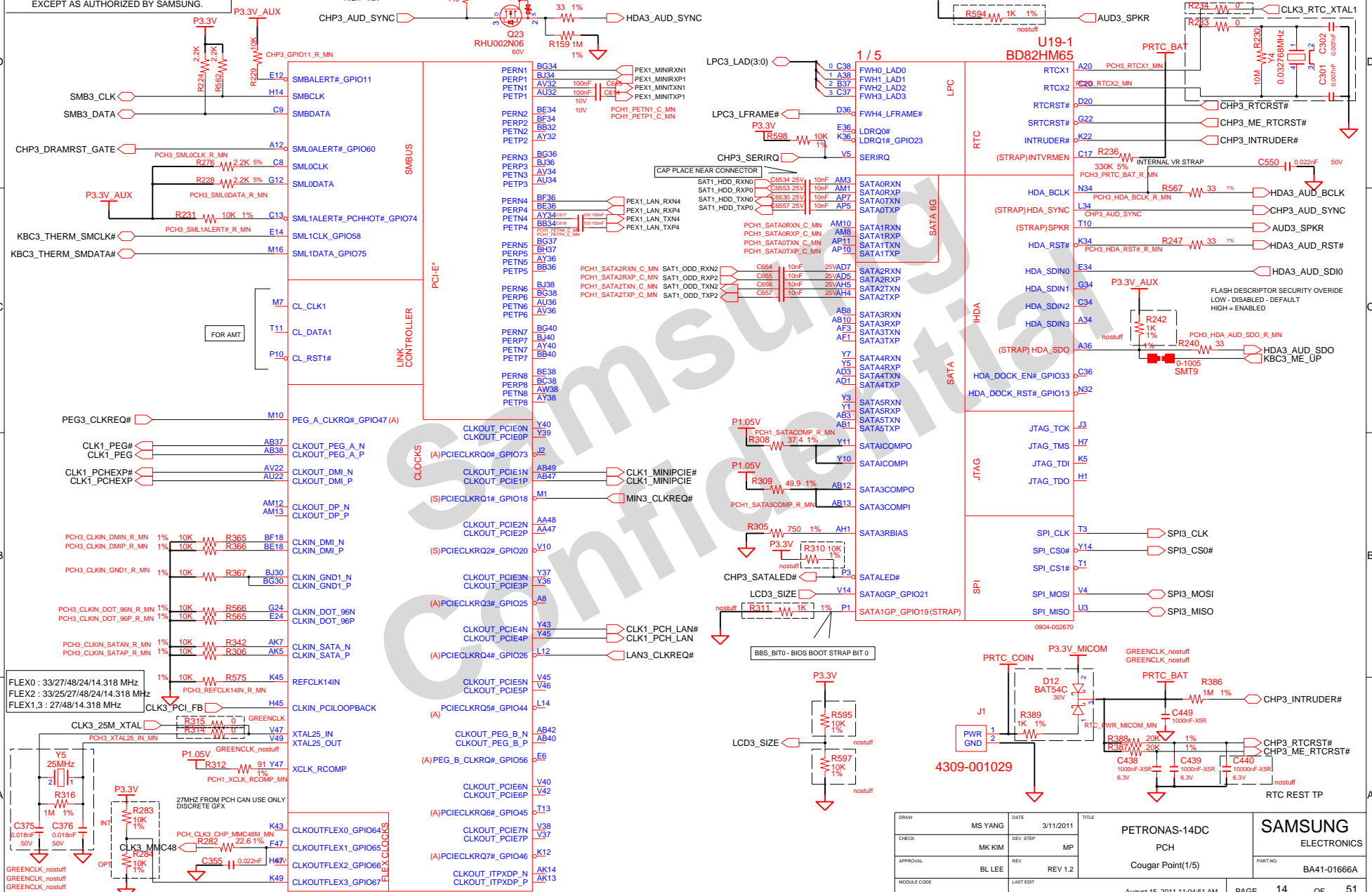
P/N : 3709-001608 (Concraft)



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 ENT				

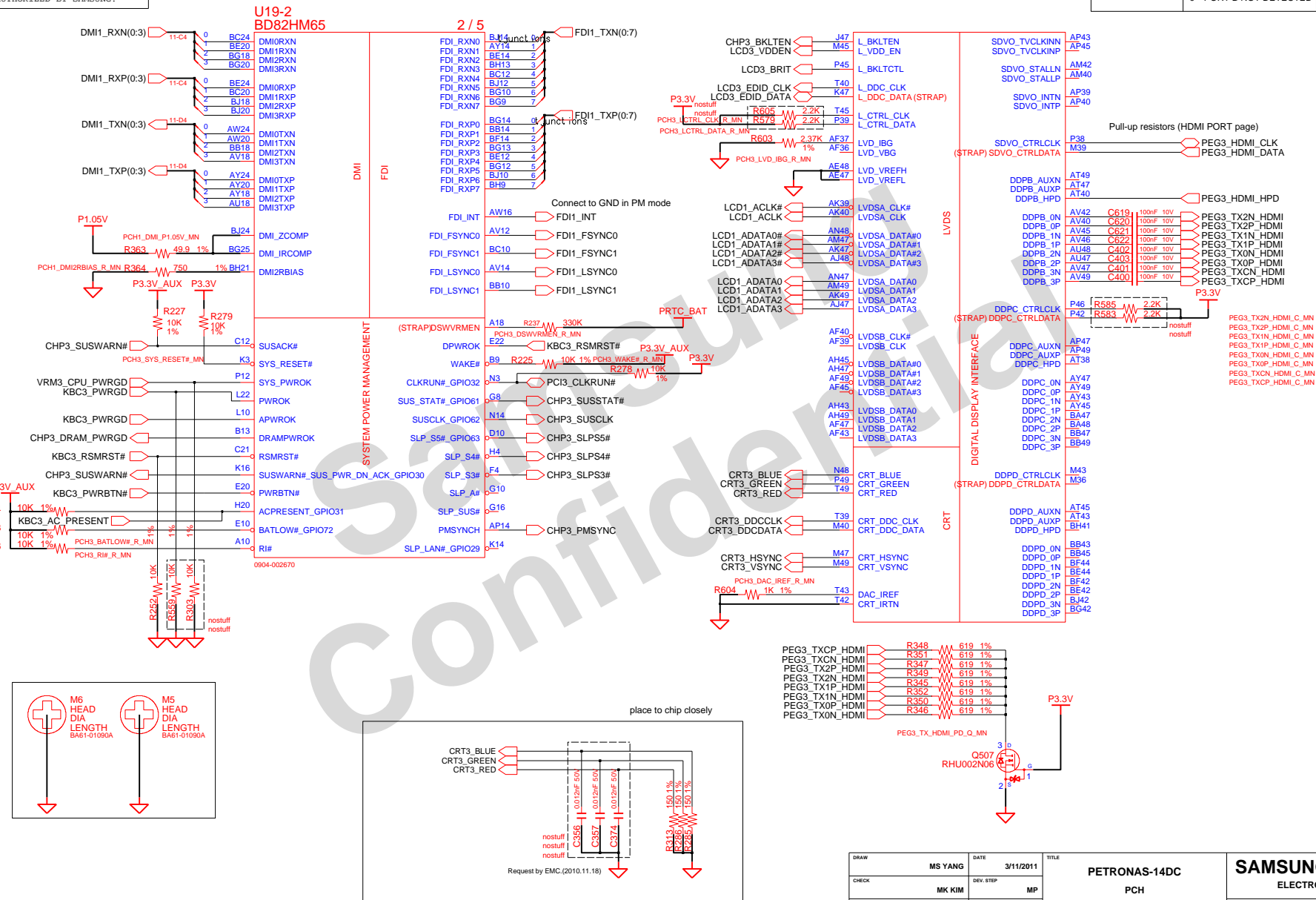
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NO REBOOT STRAP

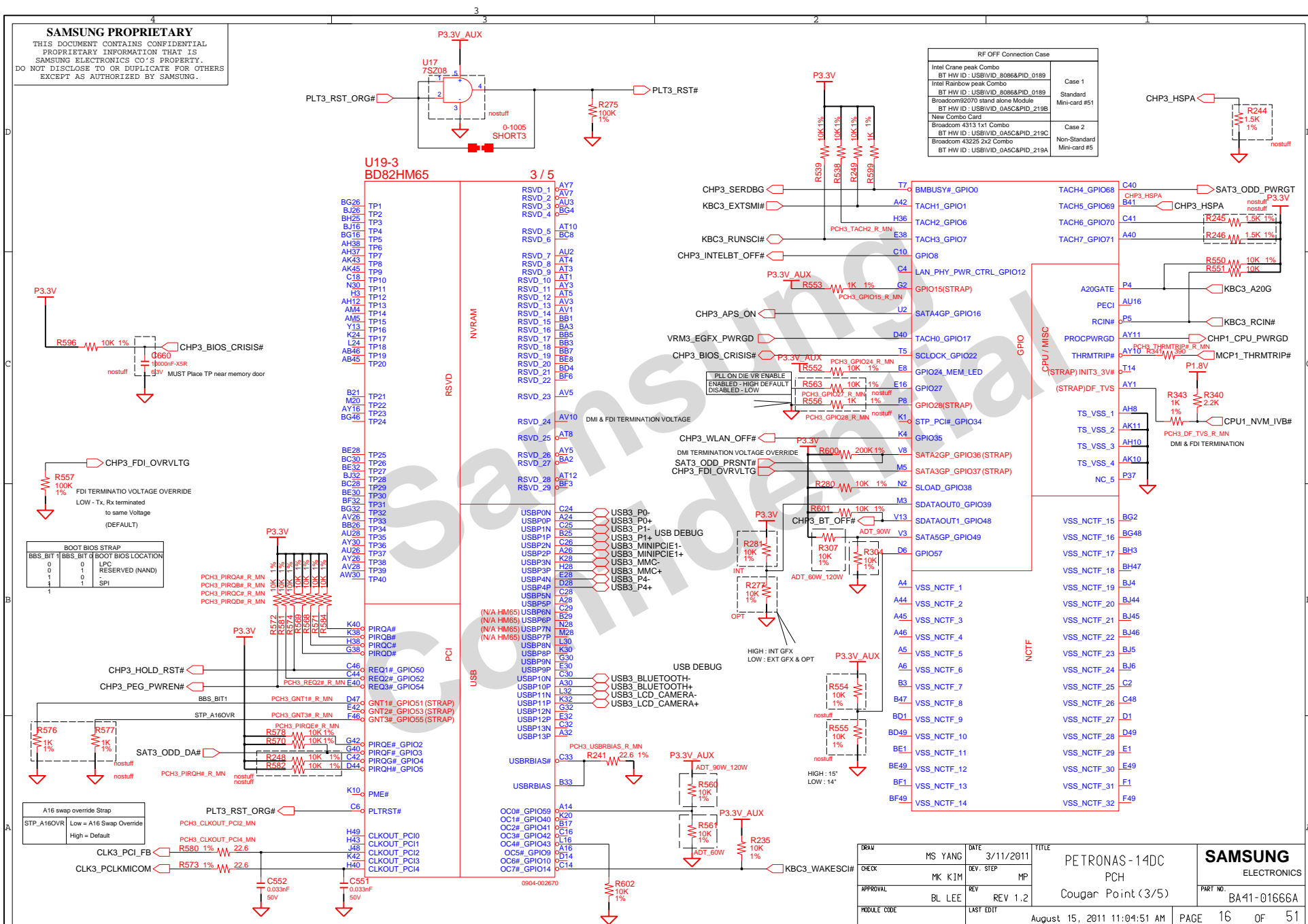


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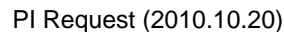
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COM-22C-015(1996.6.5) REV. 3

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U19-5
BD82HM65

This power share with thermal sensor

5 / 5

AY4	VSS159	VSS259	H46
AY42	VSS160	VSS260	K18
AY46	VSS161	VSS261	K26
AY8	VSS162	VSS262	K30
B11	VSS163	VSS263	K46
B15	VSS164	VSS264	K7
B19	VSS165	VSS265	L18
B23	VSS166	VSS266	L2
B27	VSS167	VSS267	L20
B31	VSS168	VSS268	L26
B35	VSS169	VSS269	L28
B39	VSS170	VSS270	L36
B7	VSS171	VSS271	L48
F45	VSS172	VSS272	M12
BB12	VSS173	VSS273	P16
BB16	VSS174	VSS274	M18
BB20	VSS175	VSS275	M22
BB22	VSS176	VSS276	M24
BB24	VSS177	VSS277	M30
BB28	VSS178	VSS278	M32
BB30	VSS179	VSS279	M34
BB38	VSS180	VSS280	M36
BB4	VSS181	VSS281	M4
BB46	VSS182	VSS282	M42
BC14	VSS183	VSS283	M46
BC18	VSS184	VSS284	N18
BC2	VSS185	VSS285	P30
BC22	VSS186	VSS286	N47
BC26	VSS187	VSS287	P47
BC32	VSS188	VSS288	P18
BC34	VSS189	VSS289	T33
BC36	VSS190	VSS290	P40
BC40	VSS191	VSS291	P42
BC48	VSS192	VSS292	P47
BD46	VSS193	VSS293	P7
BD5	VSS194	VSS294	R2
BD22	VSS195	VSS295	R48
BD26	VSS196	VSS296	T12
BE40	VSS197	VSS297	T31
BF10	VSS198	VSS298	T37
BF12	VSS199	VSS299	T4
BF16	VSS200	VSS300	W34
BF20	VSS201	VSS301	T46
BF22	VSS202	VSS302	T47
BF24	VSS203	VSS303	T8
BF26	VSS204	VSS304	V17
BF28	VSS205	VSS305	V26
BF3	VSS206	VSS306	V27
BF38	VSS207	VSS307	V29
BF40	VSS208	VSS308	V36
BF9	VSS209	VSS309	V38
BG17	VSS210	VSS310	V39
BG19	VSS211	VSS311	V43
BG21	VSS212	VSS312	V7
BG23	VSS213	VSS313	W17
BG33	VSS214	VSS314	W2
BG44	VSS215	VSS315	W27
CG8	VSS216	VSS316	W48
BH11	VSS217	VSS317	Y12
BH15	VSS218	VSS318	Y38
BH17	VSS219	VSS319	Y42
BH19	VSS220	VSS320	Y46
BH27	VSS221	VSS321	Y8
BH31	VSS222	VSS322	BG29
BH33	VSS223	VSS323	N24
BH36	VSS224	VSS324	AJ3
BH39	VSS225	VSS325	AD47
BH43	VSS226	VSS326	B43
BH7	VSS227	VSS327	BE10
D3	VSS228	VSS328	BG41
D12	VSS229	VSS329	G14
D16	VSS230	VSS330	H18
D18	VSS231	VSS331	T36
D22	VSS232	VSS332	BG22
D24	VSS233	VSS333	BG24
D26	VSS234	VSS334	C22
D30	VSS235	VSS335	AP13
D32	VSS236	VSS336	M14
D34	VSS237	VSS337	AP3
D38	VSS238	VSS338	AP1
D42	VSS239	VSS339	BE16
D8	VSS240	VSS340	BC16
E18	VSS241	VSS341	BG28
E26	VSS242	VSS342	BJ28
E19	VSS243	VSS343	
G20	VSS244	VSS344	
G26	VSS245	VSS345	
G28	VSS246	VSS346	
G36	VSS247	VSS347	
G48	VSS248	VSS348	
H12	VSS249	VSS349	
H18	VSS250	VSS350	
H22	VSS251	VSS351	
H24	VSS252	VSS352	
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H34	VSS256		
H36	VSS257		
H38	VSS258		

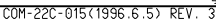
0904-002670

PI Request (2010.10.20)

Confidential

DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG ELECTRONICS
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APPROVAL	BL LEE	REV	REV 1.2		Cougar Point(5/5)	
MODULE CODE	undefined	LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	18	OF 51

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CMD MODE E

DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP	N12X-40NM(2/5)		
APPROVAL	BL LEE	REV	REV 1.2	N12X-40NM(2/5)	PART NO.	
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	20 OF 51	

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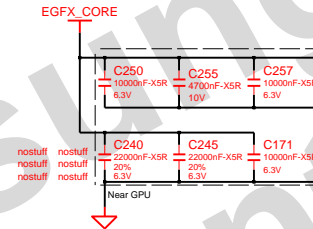
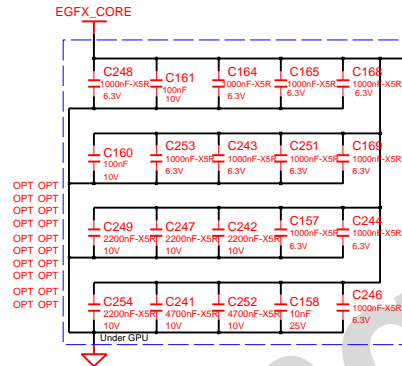
U502-3
N12P-GVR-A1

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	V33
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
F12	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
F31	GND_23	GND_119	AA17
F34	GND_24	GND_120	AA18
J5	GND_25	GND_121	AA19
J31	GND_26	GND_122	AA20
J34	GND_27	GND_123	AA22
L9	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	AD2
N11	GND_42	GND_137	AD5
N12	GND_43	GND_138	AD11
N13	GND_44	GND_139	AD13
N14	GND_45	GND_140	AD15
N15	GND_46	GND_141	AD17
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
P18	GND_60	GND_155	AE19
P20	GND_61	GND_156	AE20
P22	GND_62	GND_157	AE22
P24	GND_63	GND_158	AE23
R2	GND_64	GND_159	AE24
R5	GND_65	GND_160	AE25
R31	GND_66	GND_161	AG5
R34	GND_67	GND_162	AG2
T11	GND_68	GND_163	AG3
T13	GND_69	GND_164	AG34
T15	GND_70	GND_165	AK2
T17	GND_71	GND_166	AK5
T19	GND_72	GND_167	AK31
T21	GND_73	GND_168	AK33
T23	GND_74	GND_169	AL6
T25	GND_75	GND_170	AL9
U11	GND_76	GND_171	AL12
U12	GND_77	GND_172	AL15
U13	GND_78	GND_173	AL18
U14	GND_79	GND_174	AL21
U15	GND_80	GND_175	AL24
U16	GND_81	GND_176	AL27
U17	GND_82	GND_177	AL30
U18	GND_83	GND_178	AN2
U19	GND_84	GND_179	AN34
U20	GND_85	GND_180	AP3
U21	GND_86	GND_181	AP8
U22	GND_87	GND_182	AP12
U23	GND_88	GND_183	AP15
U24	GND_89	GND_184	AP18
U25	GND_90	GND_185	AP21
V2	GND_91	GND_186	AP24
V5	GND_92	GND_187	AP27
V9	GND_93	GND_188	AP30
V12	GND_94	GND_189	AP33
V14	GND_95	GND_190	
	GND_96	GND_191	
		GND_192	
		GND_193	

0904-002676

OPT

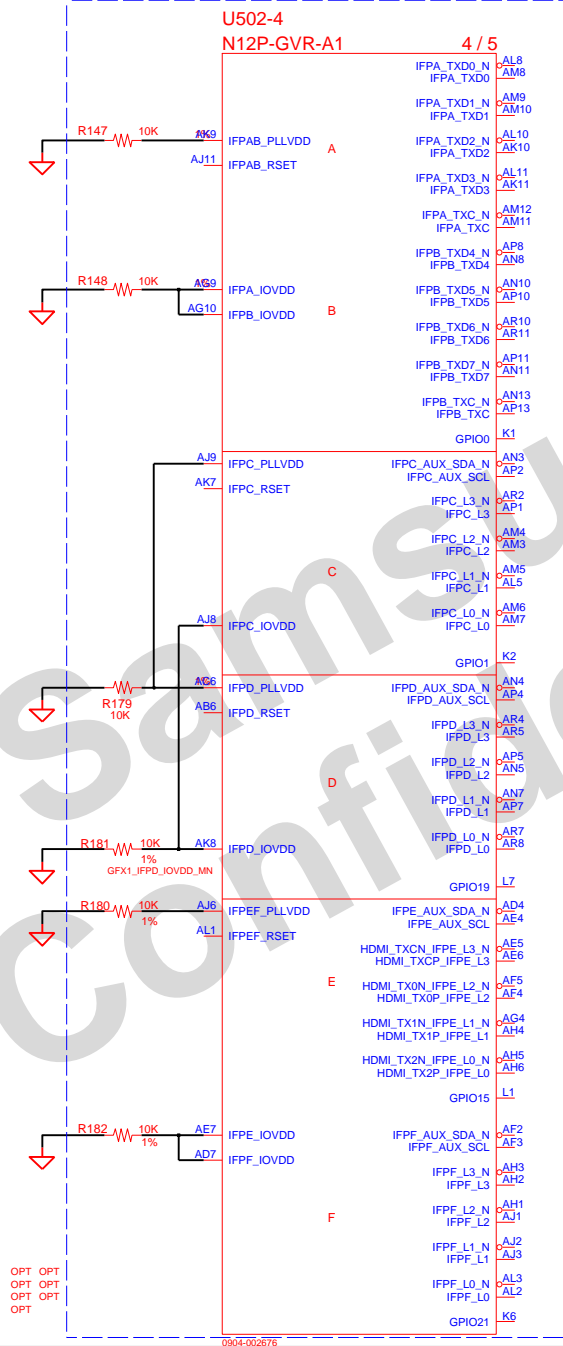


L11	VDD_1	VDD_57	V19
L12	VDD_2	VDD_58	V21
L13	VDD_3	VDD_59	V23
L14	VDD_4	VDD_60	V25
L15	VDD_5	VDD_61	W11
L16	VDD_6	VDD_62	W12
L17	VDD_7	VDD_63	W13
L18	VDD_8	VDD_64	W14
L19	VDD_9	VDD_65	W15
L20	VDD_10	VDD_66	W16
L21	VDD_11	VDD_67	W17
L22	VDD_12	VDD_68	W18
L23	VDD_13	VDD_69	W19
L24	VDD_14	VDD_70	W20
L25	VDD_15	VDD_71	W21
M12	VDD_16	VDD_72	W22
M14	VDD_17	VDD_73	W23
M16	VDD_18	VDD_74	W24
M18	VDD_19	VDD_75	W25
M20	VDD_20	VDD_76	Y12
M22	VDD_21	VDD_77	Y14
M24	VDD_22	VDD_78	Y16
P11	VDD_23	VDD_79	Y18
P13	VDD_24	VDD_80	Y20
P15	VDD_25	VDD_81	Y22
P17	VDD_26	VDD_82	Y24
P19	VDD_27	VDD_83	AB11
P21	VDD_28	VDD_84	AB13
P23	VDD_29	VDD_85	AB15
P25	VDD_30	VDD_86	AB17
R11	VDD_31	VDD_87	AB19
R12	VDD_32	VDD_88	AB21
R13	VDD_33	VDD_89	AB23
R14	VDD_34	VDD_90	AB25
R15	VDD_35	VDD_91	AC11
R16	VDD_36	VDD_92	AC12
R17	VDD_37	VDD_93	AC13
R18	VDD_38	VDD_94	AC14
R19	VDD_39	VDD_95	AC15
R20	VDD_40	VDD_96	AC16
R21	VDD_41	VDD_97	AC17
R22	VDD_42	VDD_98	AC18
R23	VDD_43	VDD_99	AC19
R24	VDD_44	VDD_100	AC20
R25	VDD_45	VDD_101	AC21
T12	VDD_46	VDD_102	AC22
T14	VDD_47	VDD_103	AC23
T16	VDD_48	VDD_104	AC24
T18	VDD_49	VDD_105	AC25
T20	VDD_50	VDD_106	AD12
T22	VDD_51	VDD_107	AD14
T24	VDD_52	VDD_108	AD16
V11	VDD_53	VDD_109	AD18
V13	VDD_54	VDD_110	AD22
V15	VDD_55	VDD_111	AD24
V17	VDD_56		

EGFX_CORE

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

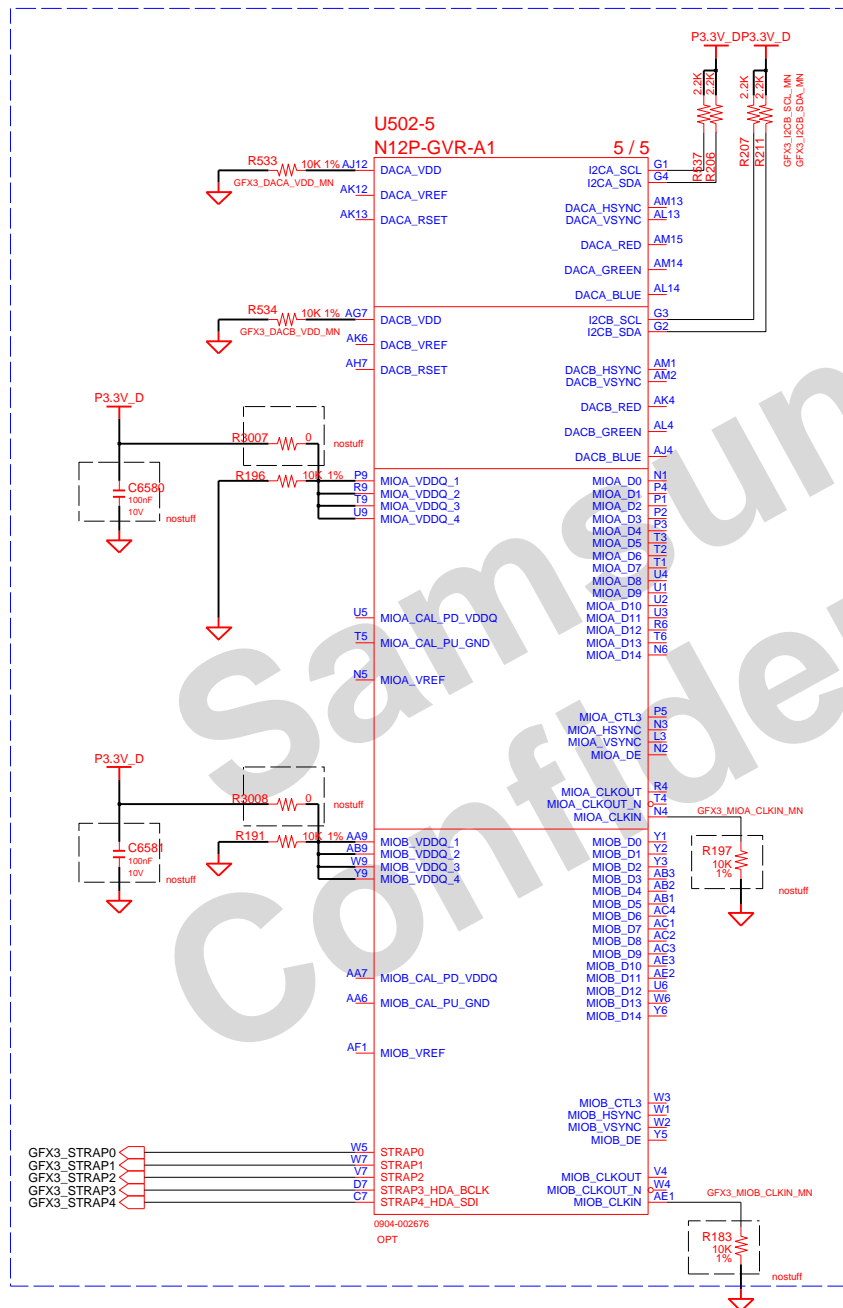
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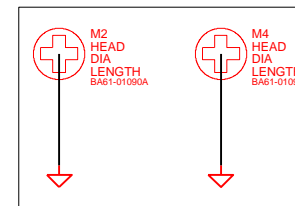
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APPROVAL	BL LEE	REV	REV 1.2		N12X_40NM(4/5)	
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	22 OF 51	

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GPU Thermal



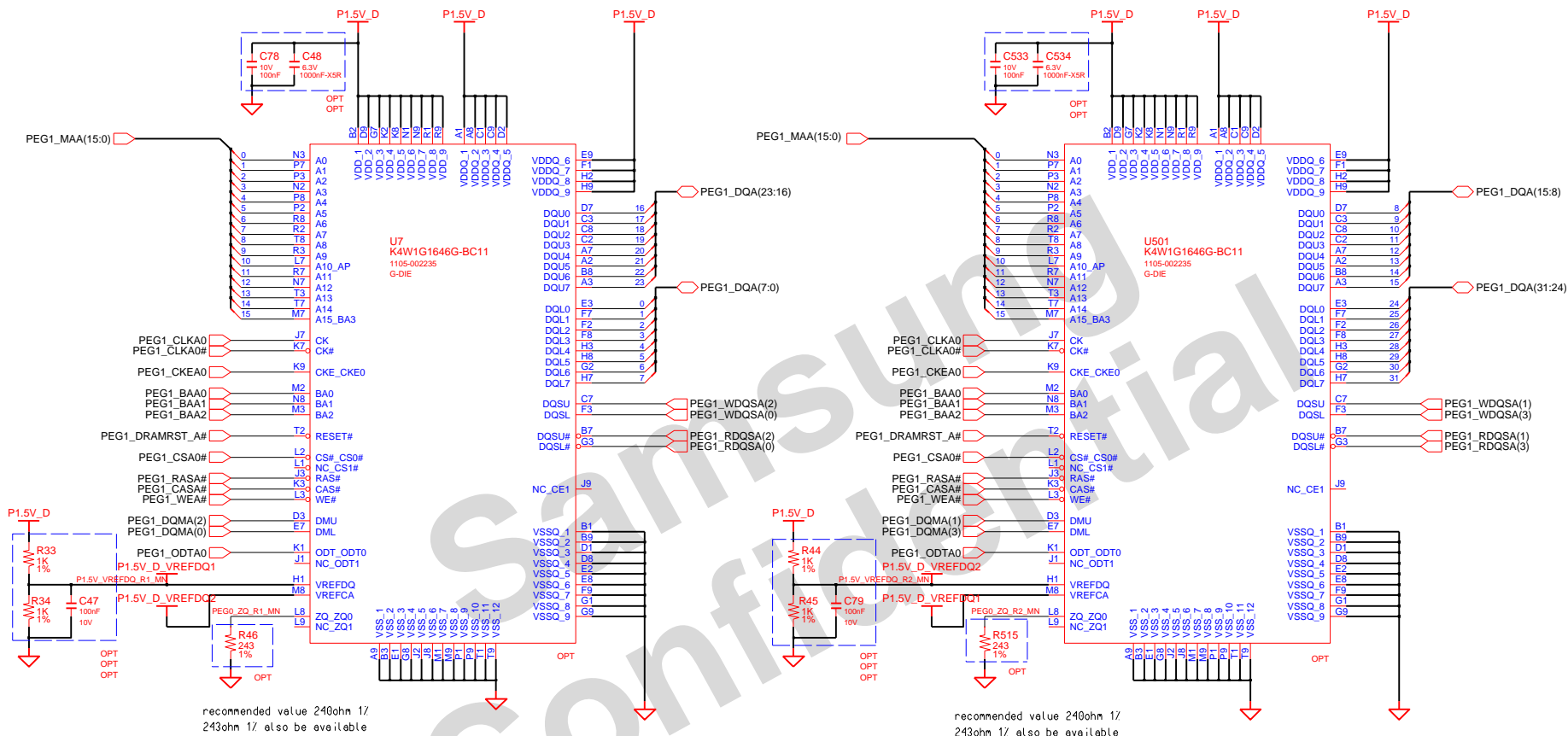
INT GFX and OPT GFX model need.

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.
MODULE CODE		LAST EDIT				BA41-01666A
				August 15, 2011 11:04:51 AM	PAGE	23 OF 51

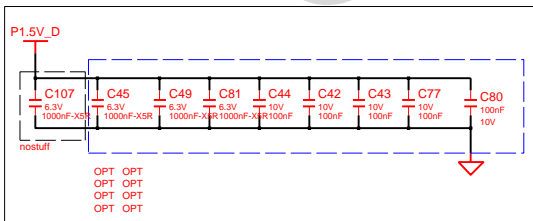
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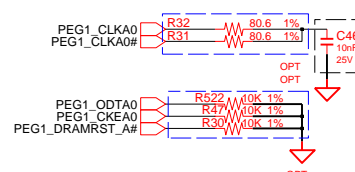
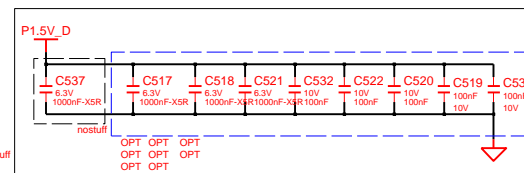
A-Channel #0 (E-mode)



Place near to VDDQ



Place near to VDDQ

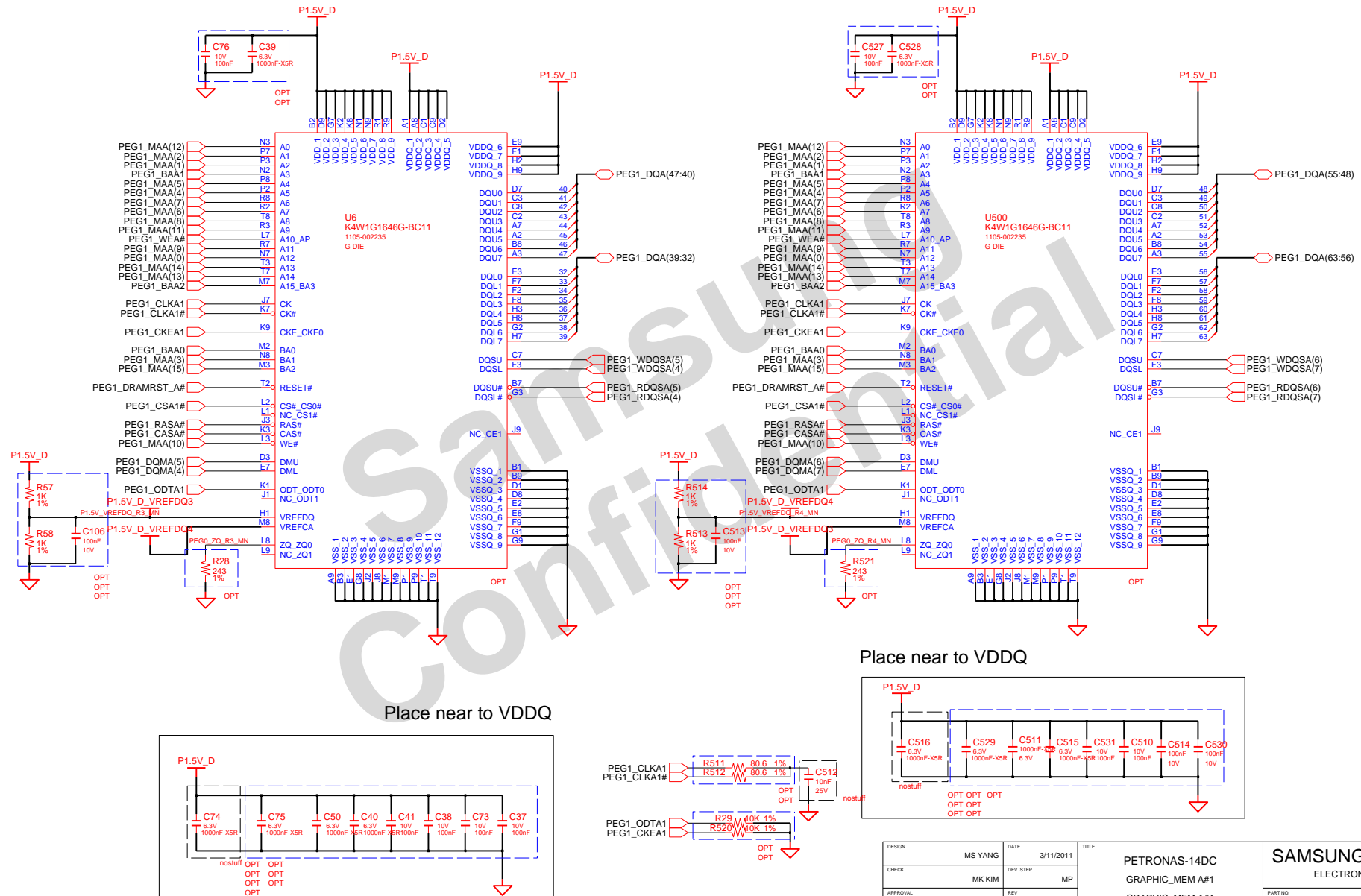


DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG ELECTRONICS
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APPROVAL	BL LEE	REV	REV 1.2		GRAPHIC_MEM A#0	PART NO. BA41-01666A
MODULE CODE		LAST EDIT		August 15, 2011 11:04:51 AM	PAGE	24 OF 51

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A-Channel #1 (E-mode)



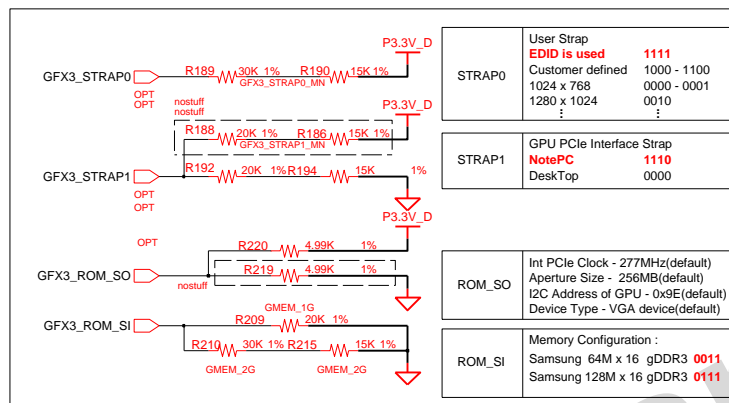
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APPROVAL	BL LEE	REV	REV 1.2		GRAPHIC_MEM A#1	PART NO.
MODULE CODE		LAST EDIT				BA41-01666A
August 15, 2011 11:04:51 AM						PAGE 25 OF 51

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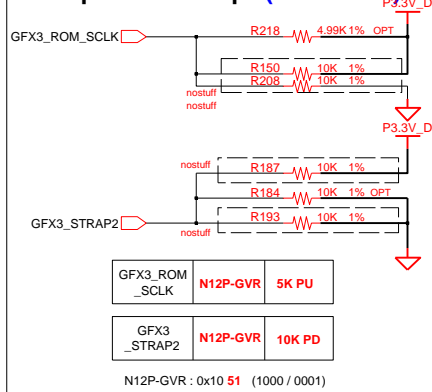
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N12x_40nm STRAP

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

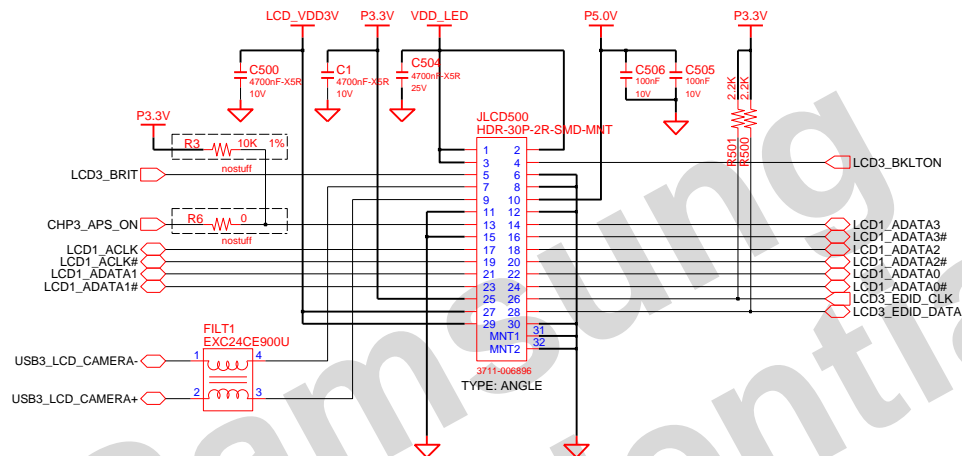
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CHECK	MK KIM	DEV. STEP	MP		GRAPHIC_MEM C#0	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.2		GRAPHIC_MEM C#0	PART NO.
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	26	BA41-01666A
				OF	51	

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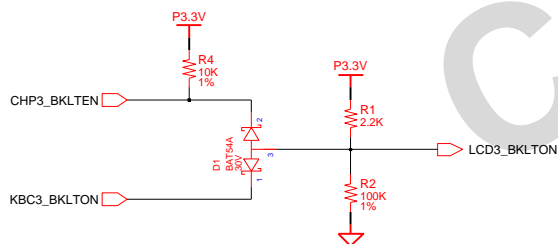
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LVDS LOGIC

1Ch. LCD Connector + CAMERA

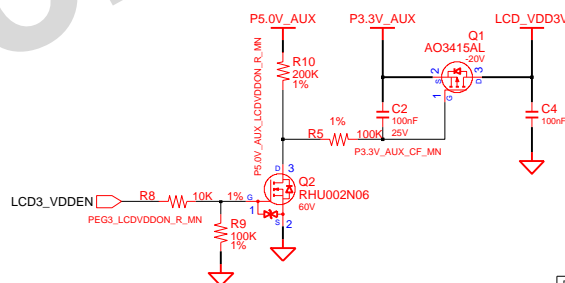


Backlight On

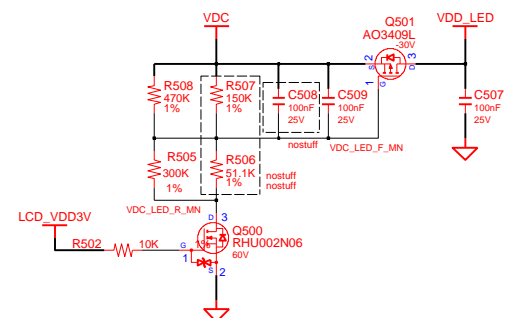


LCD Power

EBL Purpose



LED Power

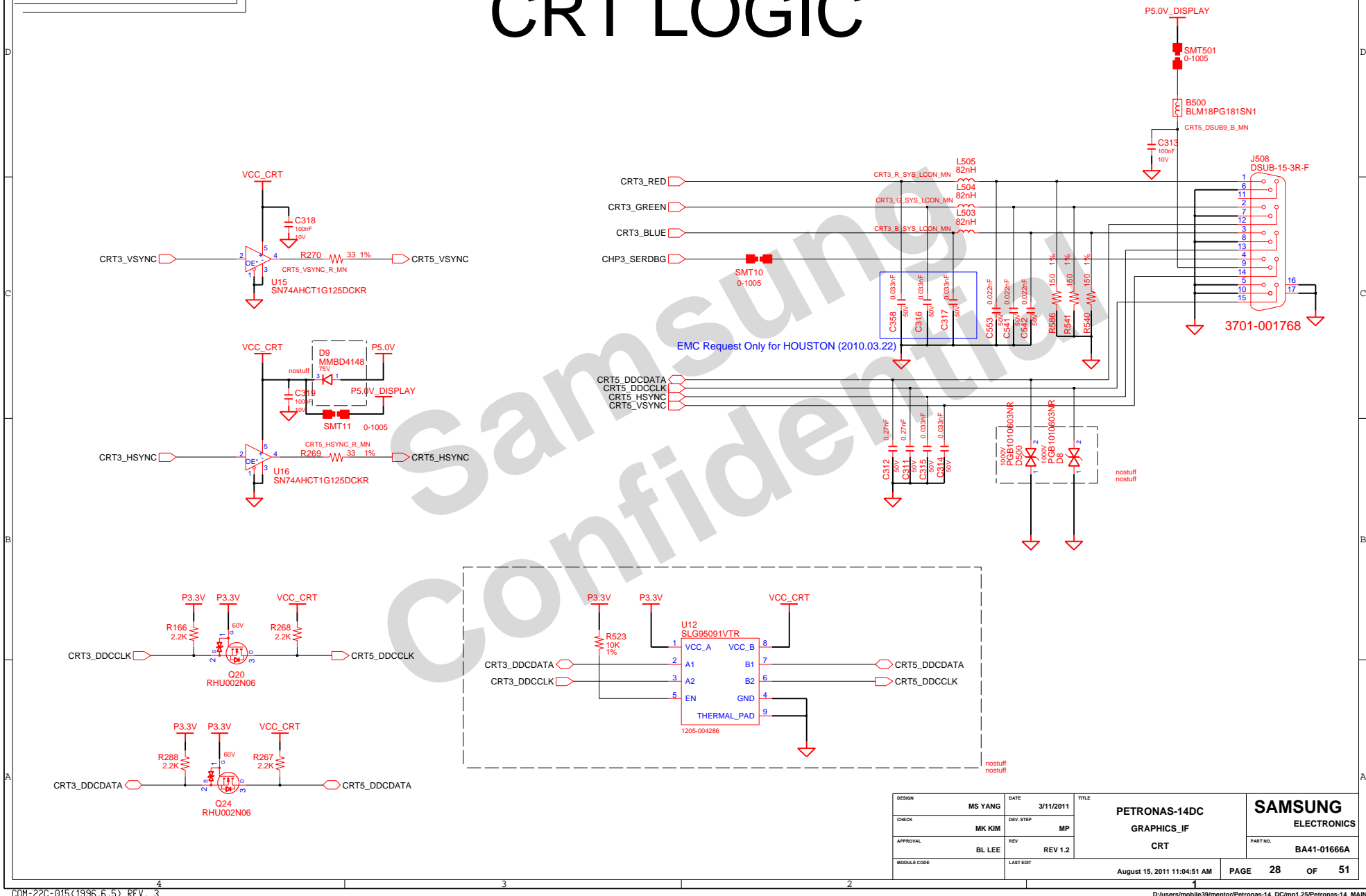


DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG
CHECK	MK KIM	DEV. STEP	MP	GRAPHICS_IF	GRAPHICS_IF	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.2	LVDS	LVDS	PART NO.
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM			BA41-01666A
					PAGE	27 OF 51

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CRT LOGIC



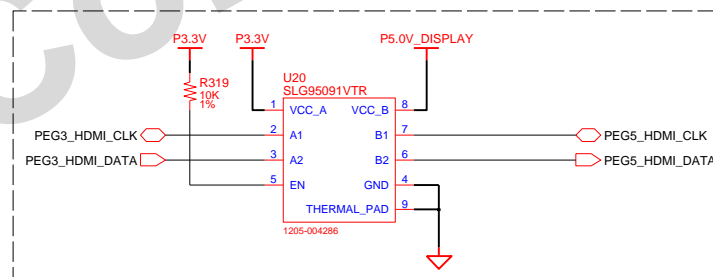
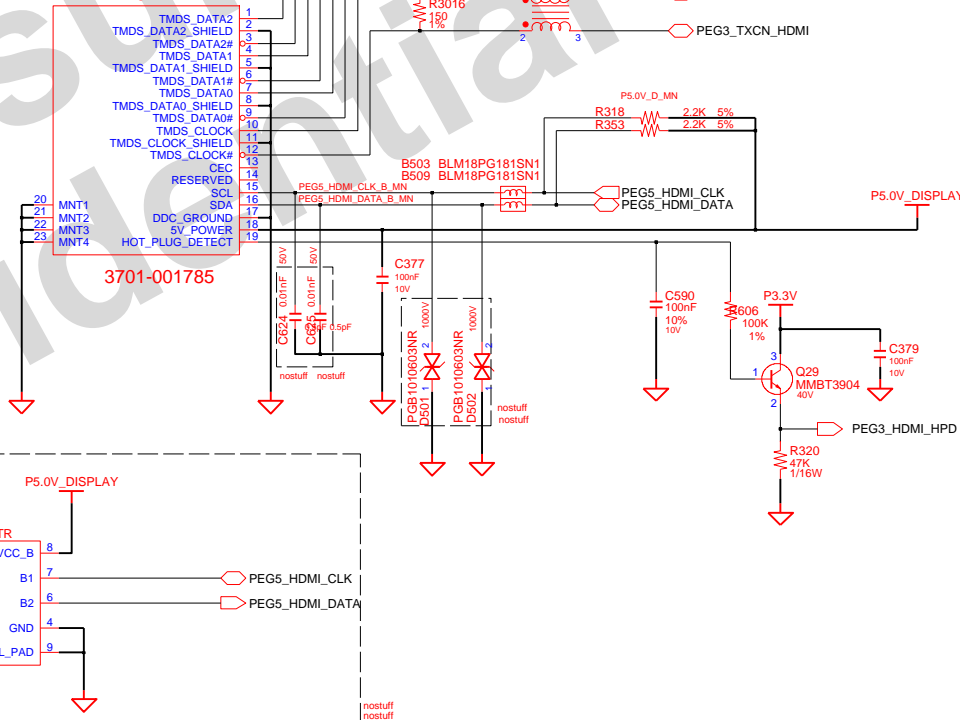
After checking, Houston need to use CMC for each signal.

(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)

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



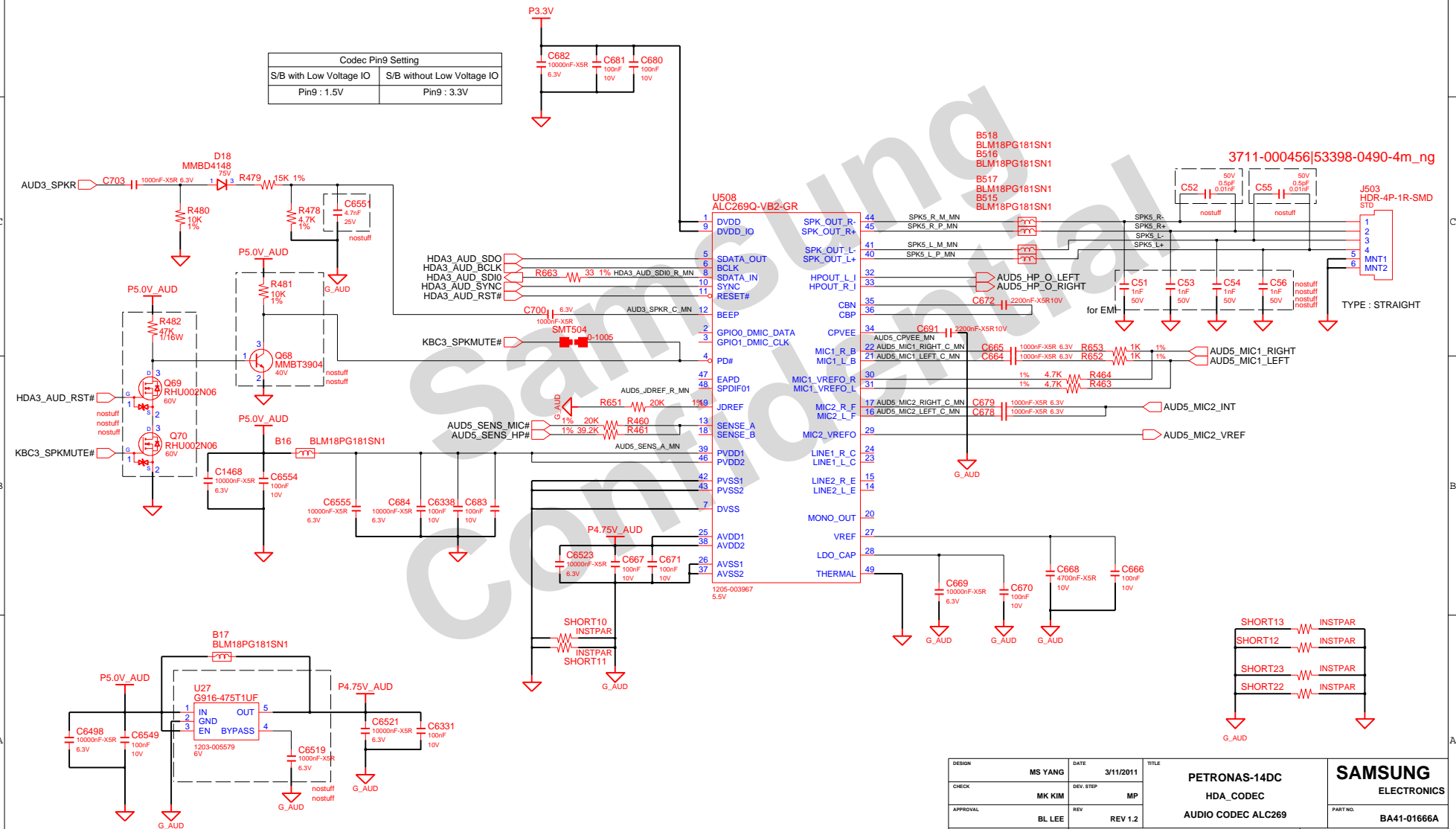
DESIGN	MS YANG	DATE	3/11/2011	PETRONAS-14DC GRAPHICS_IF HDMI	SAMSUNG ELECTRONICS	
CHECK	MK KIM	DEV. STEP	MP		PART NO.	BA41-01666A
APPROVAL	BL LEE	REV	REV 1.2			
MODULE CODE	LAST EDIT				August 15, 2011 11:04:51 AM	PAGE 29 OF 51

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HD AUDIO

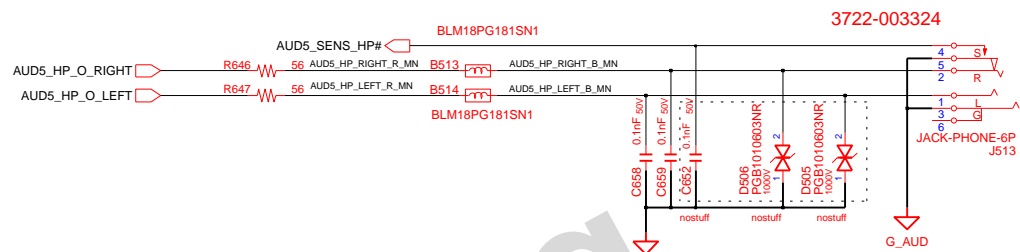
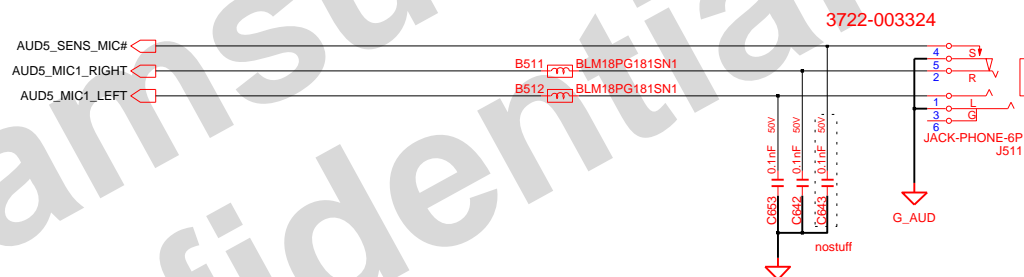
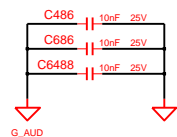
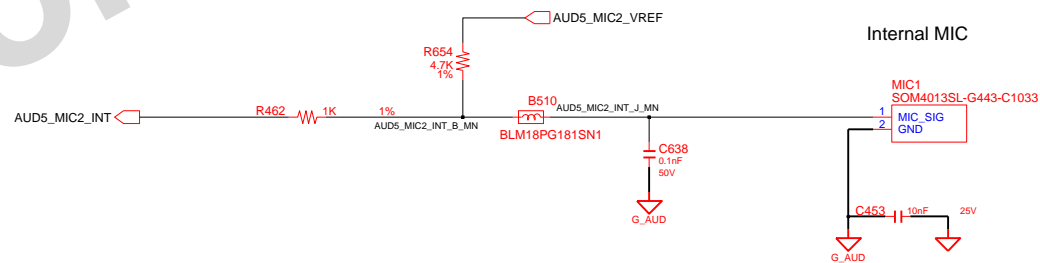
Codec Pin9 Setting	
S/B with Low Voltage IO	S/B without Low Voltage IO
Pin9 : 1.5V	Pin9 : 3.3V



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

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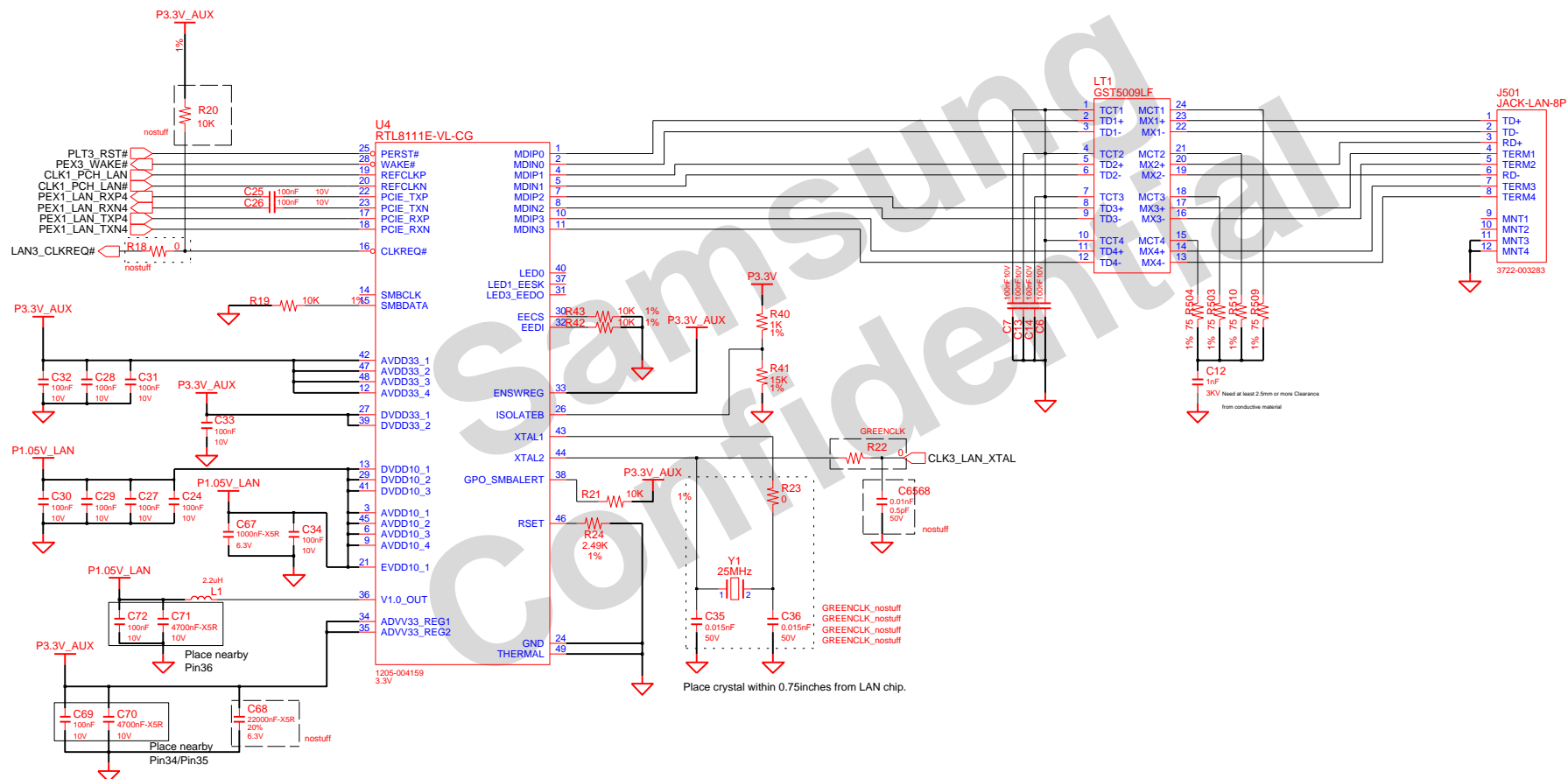
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HEADPHONE**MIC JACK****Internal MIC**

DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP	HDA_CODEC		
APPROVAL	BL LEE	REV	REV 1.2	AUDIO JACK		
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	31	OF 51

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Reatek RTL8111E



DESIGN	MS YANG	DATE	3/11/2011	PETRONAS-14DC LAN LAN_Realtek_RTL8111E	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP		
APPROVAL	BL LEE	REV	REV 1.2		
PART NO.					
MODULE CODE	LAST EDIT			August 15, 2011 11:04:51 AM	PAGE 32 OF 51

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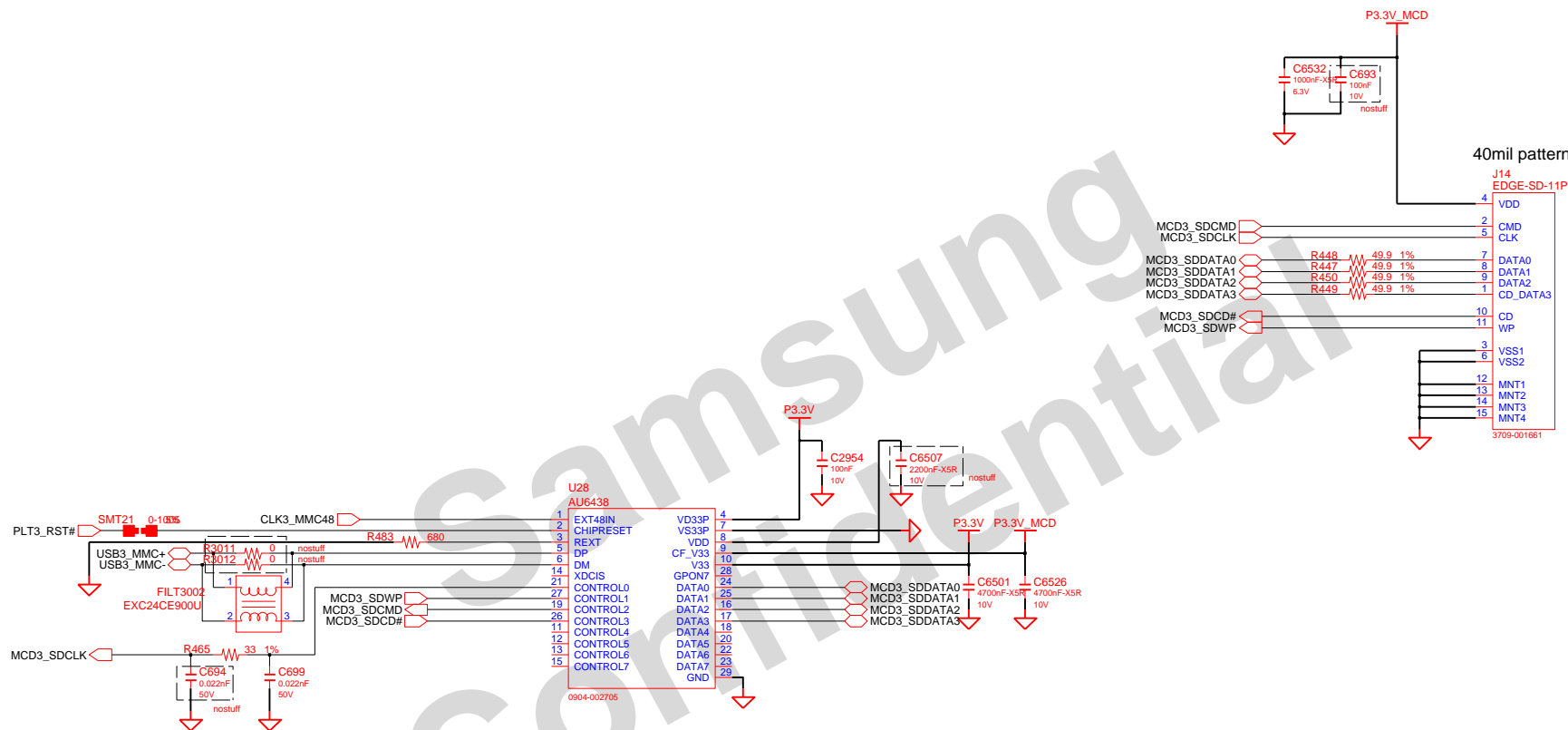
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4 IN 1 CARD

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

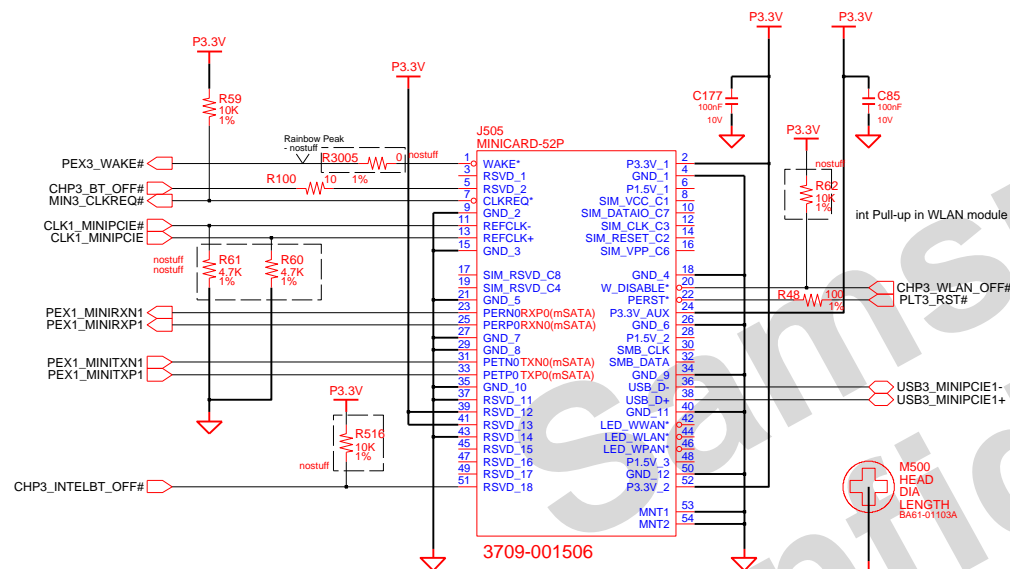


DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC MULTICARD 4 IN 1 CARD(AU6438)	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			PART NO. BA41-01666A
APPROVAL	BL LEE	REV	REV 1.2			
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	33	OF 51

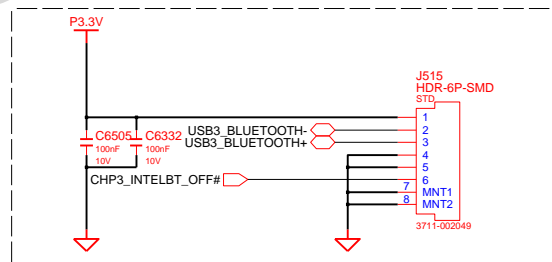
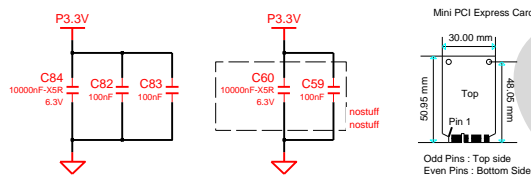
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WLAN, 7mm



Bluetooth Interface



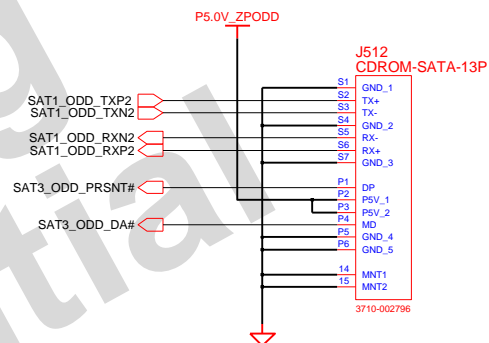
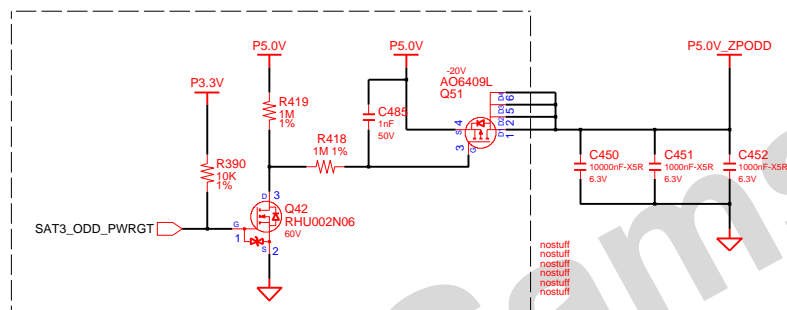
DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC MINI_PCIE_CONN WLAN	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			PART NO. BA41-01666A
APPROVAL	BL LEE	REV	REV 1.2			
MODULE CODE		LAST EDIT		August 15, 2011 11:04:51 AM	PAGE 34 OF 51	

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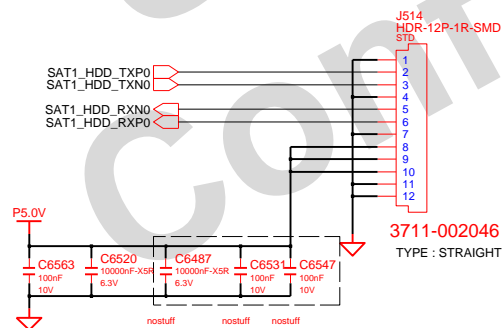
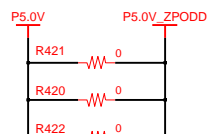
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SATA I/F CONN

SATA ODD CONN 14"



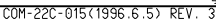
SATA HDD CONN



DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG
CHECK	MK KIM	DEV. STEP	MP	SATA_DEVICES	SATA_DEVICES	ELECTRONICS
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

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BE CAUTION SPI ROM SIZE!!

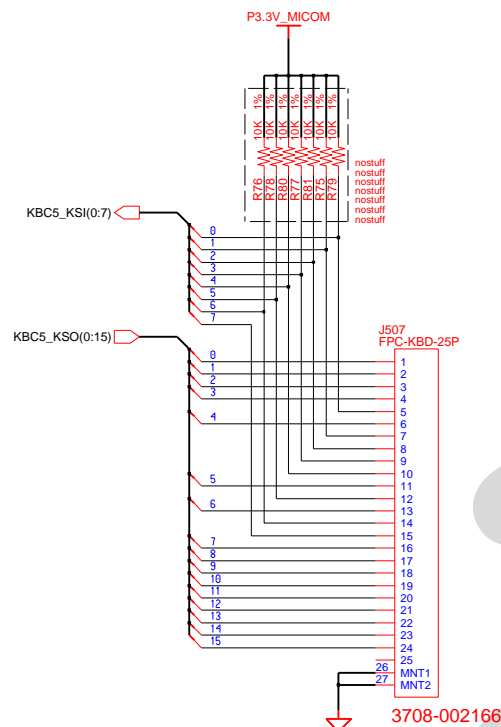


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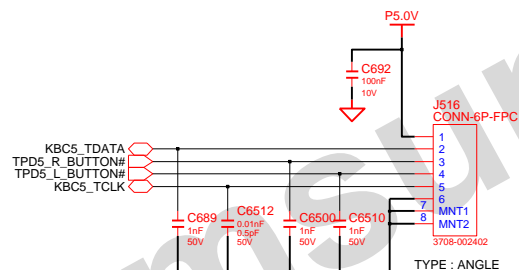
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Micom Glue Logic

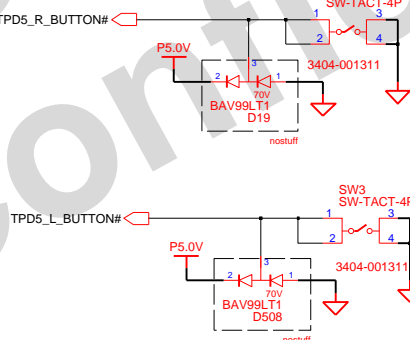
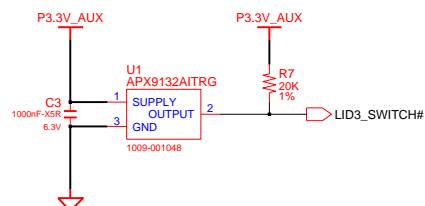
KEYBOARD



TOUCHPAD



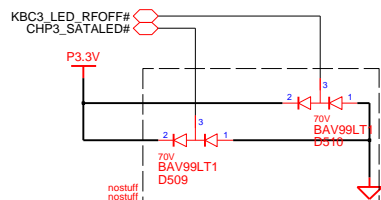
LID_SWITCH



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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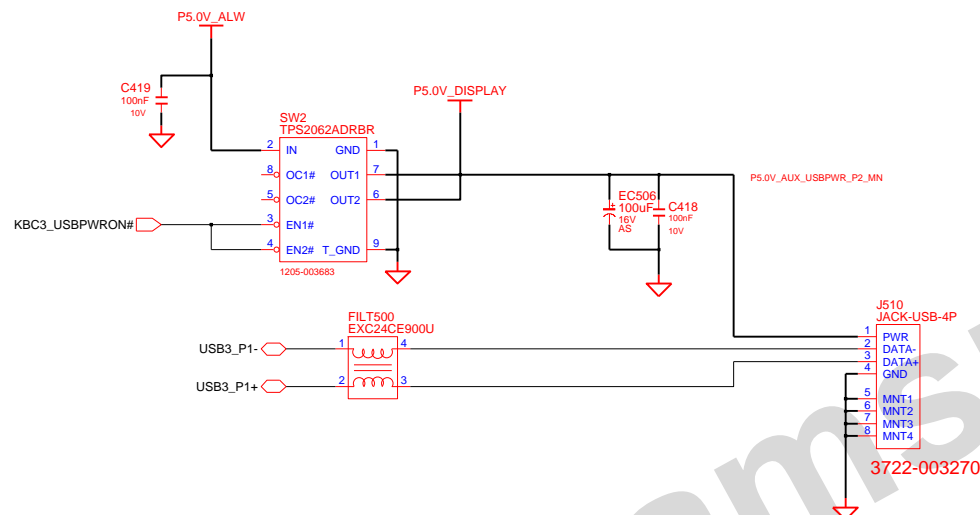
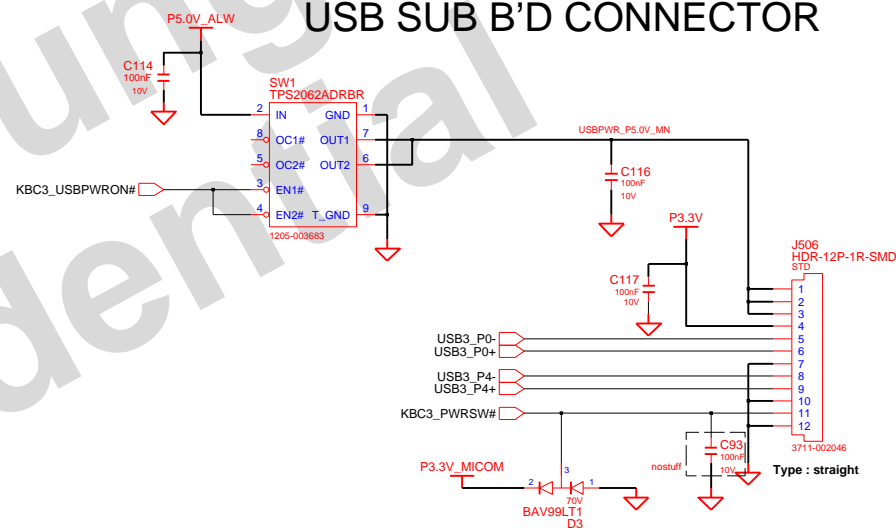
The schematic diagram illustrates the LED driver circuit for the KBC3 module. The circuit is powered by P3.3V_AUX and P3.3V_MICOM. It features a series of resistors (R673, R665, R670, R669, R667, R674, R666, R671, R672, R668) and LEDs (LED4, LED1, LED3, LED2, LED503, LED500, LED502, LED501) connected in a daisy-chain configuration. The LEDs are labeled with their part numbers: 19-217/BHC-XL2M2TY/3 and 19-223/R6G6C-B30/2T. The circuit is controlled by SCL14 and PET14 signals. A separate section shows the connection of the LEDs to the KBC3 module pins: KBC3_LED_POWER#, CHP3_SATALED#, KBC3_LED_ACIN#, KBC3_LED_CHARGE#, and KBC3_LED_RFOFF#.



DRAW	MS YANG	DATE	3/11/2011	PETRONAS-14DC LED_SWITCH LED_SWITCH	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	38 OF 51

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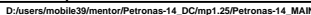
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USB Single connector**MAIN TO SUB USB CONN****Right 2USB Port****USB SUB B'D CONNECTOR**

PLACE CLOSE TO USB SUB B'D Conenctor

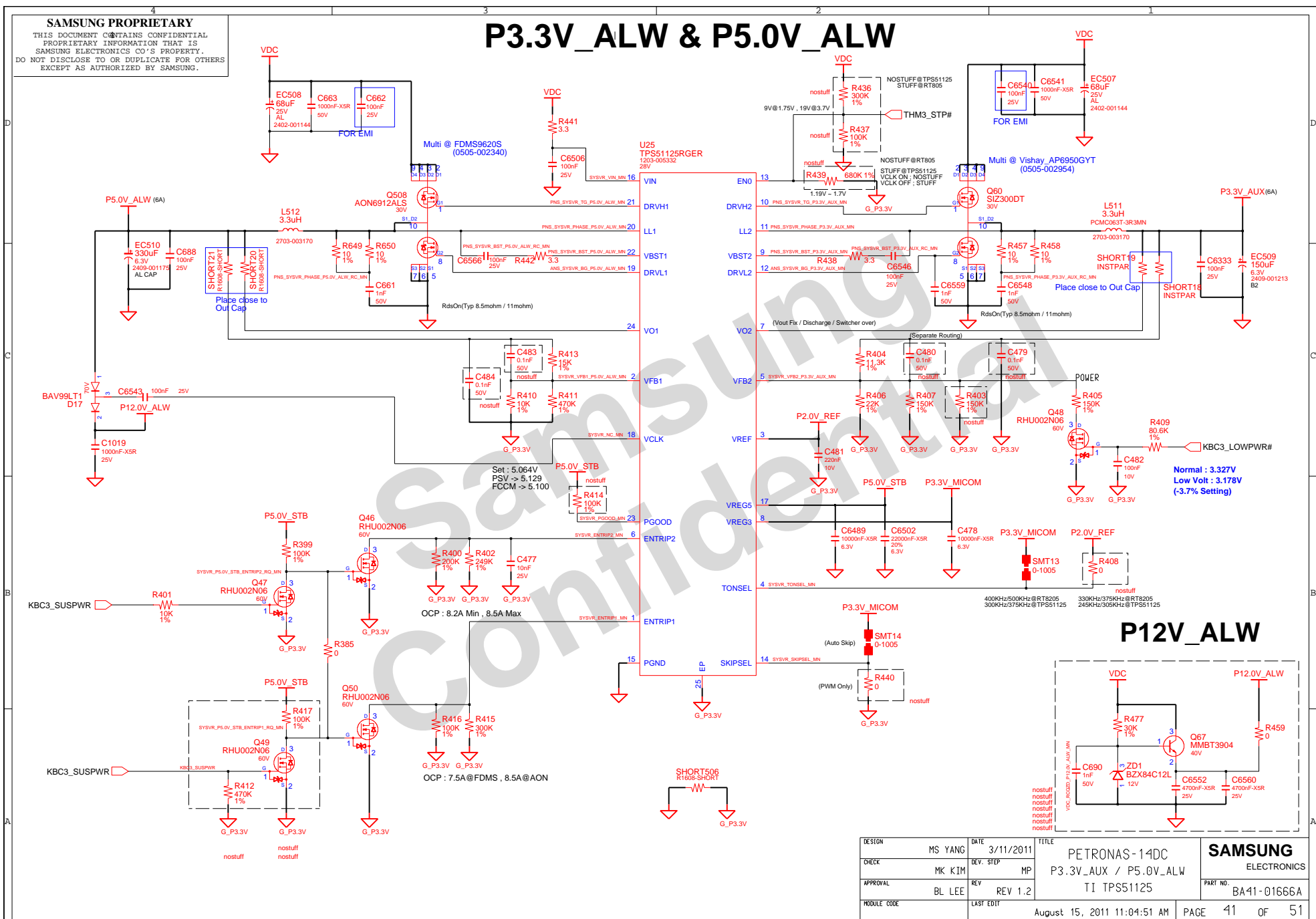
DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG
CHECK	MK KIM	DEV. STEP	MP	USB_CONN	USB_CONN	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.2	USB Port		PART NO.
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM			BA41-01666A
				PAGE	39	OF 51

CHARGER & POWER MANAGEMENT



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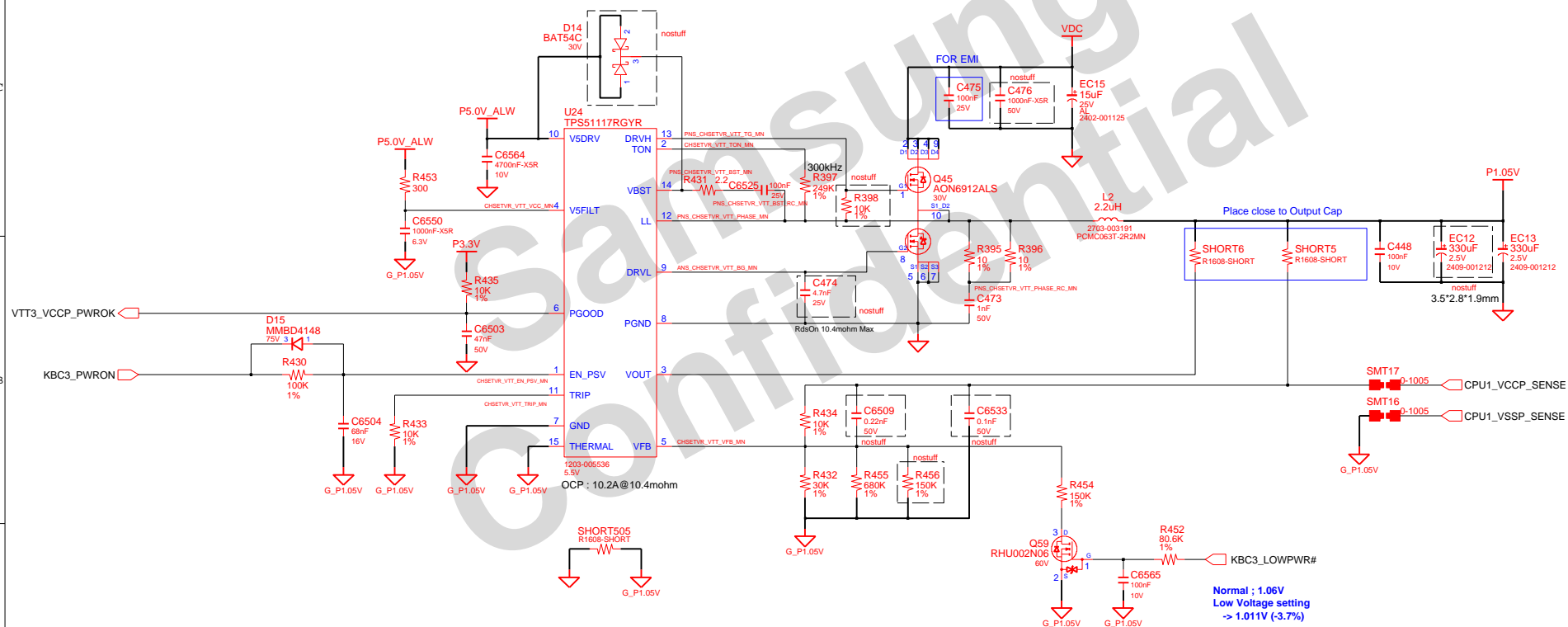
P3.3V ALW & P5.0V ALW



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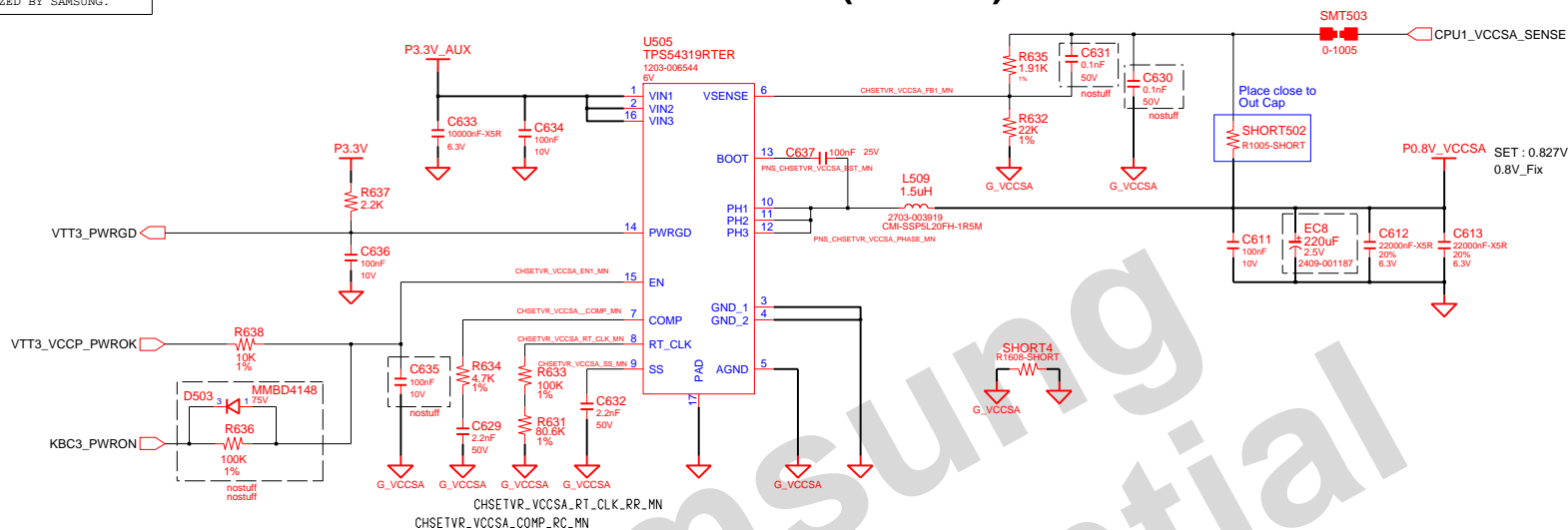
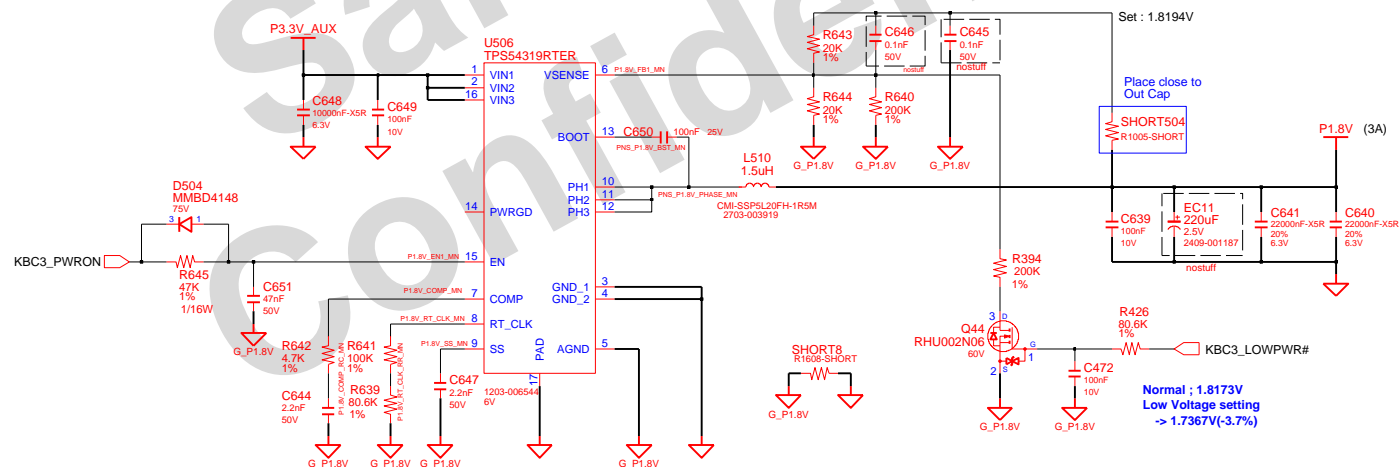
Chipset Power (P1.05V)



DRW	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

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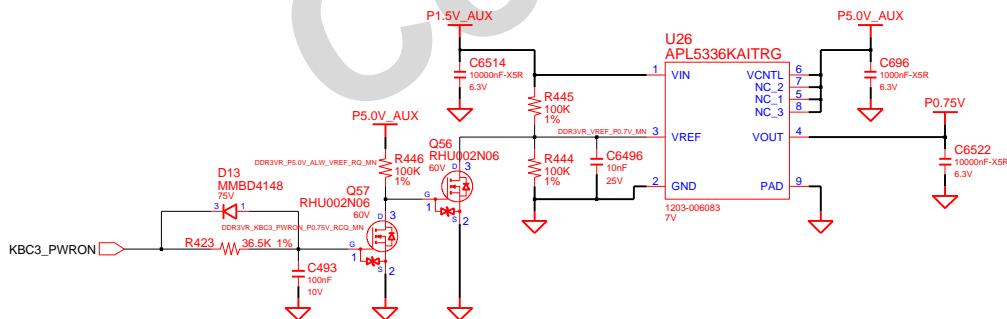
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CHIPSET POWER(VCCSA)**CHIPSET POWER(P1.8V)**

DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG ELECTRONICS PART NO. BA41-01666A
CHECK	MK KIM	DEV. STEP	MP		PWR_CHIPSET	
APPROVAL	BL LEE	REV	REV 1.2		TI TPS54319	
MODULE CODE		LAST EDIT				
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DDR3 VTT(0.75V)



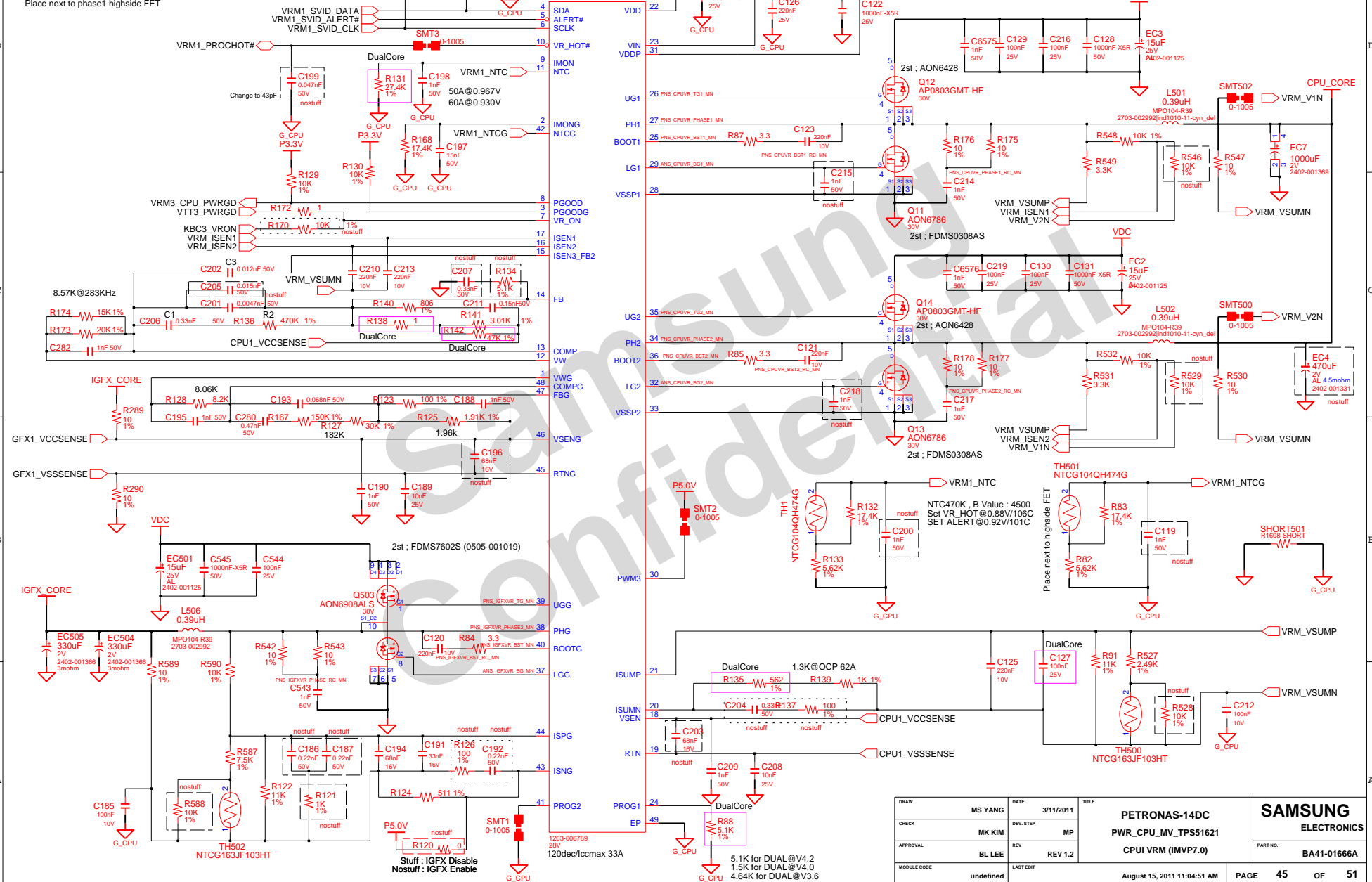
DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC PWR MEMORY DDR3 POWER	
CHECK	MK KIM	DEV. STEP	MP			
APPROVAL	BL LEE	REV	REV 1.2			
MODULE CODE		LAST EDIT		August 15, 2011 11:04:51 AM		PART NO. BA41-01666A
undefined				PAGE 44 OF 51		

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Place next to phase1 highside FET

U9
ISL95831AHRTZ-T

VDC



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DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG	
CHECK	MK KIM	DEV. STEP	MP		PWR_GRAPHIC	ELECTRONICS	
APPROVAL	BL LEE	REV	REV 1.2		ISL95870	PART NO.	BA41-01666A
MODULE CODE	LAST EDIT				August 15, 2011 11:04:51 AM	PAGE	46 OF 51

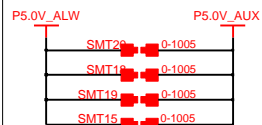
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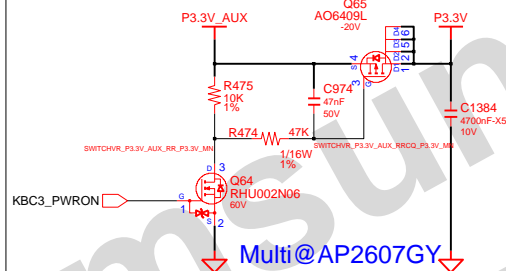
Switched Power 1

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

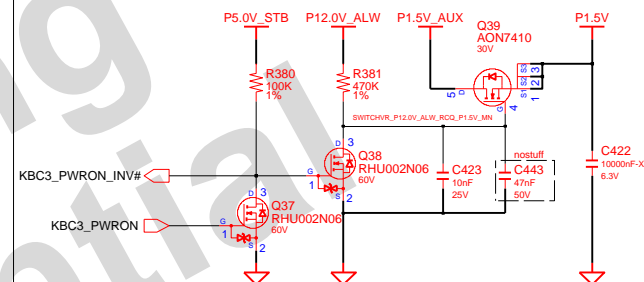
P5.0V_AUX



Switched Power On (P3.3V)

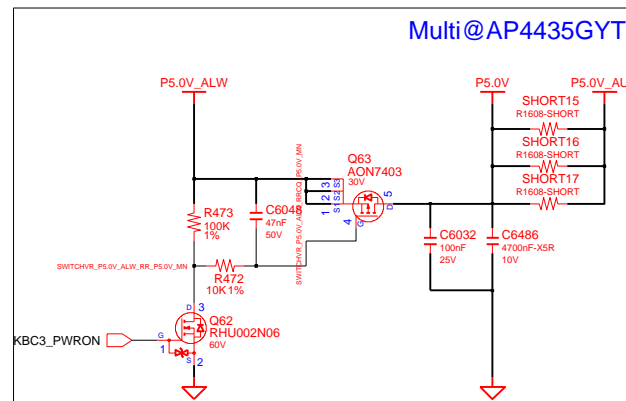


Switched Power On (P1.5V)



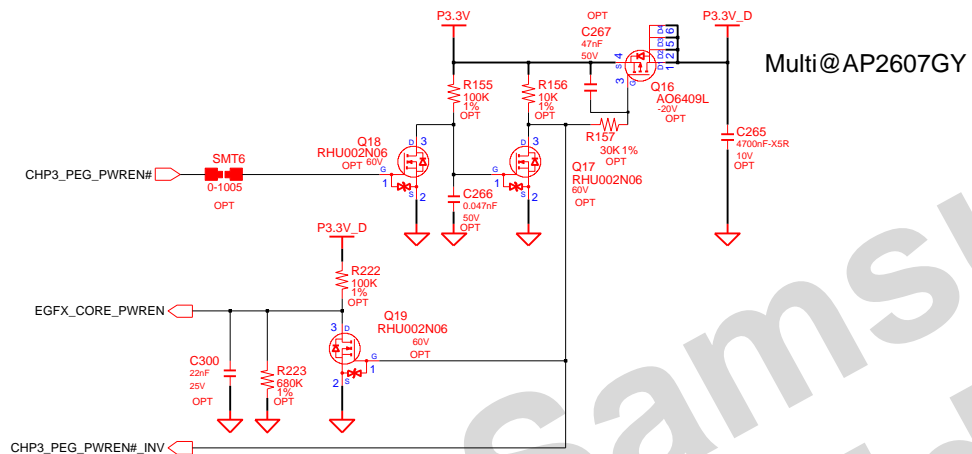
For nVIDIA GFX PWR Sequence
NVDD(EGFX_CORE) first and then FBVDDQ(qDDR3)

Switched Power On (P5.0V)

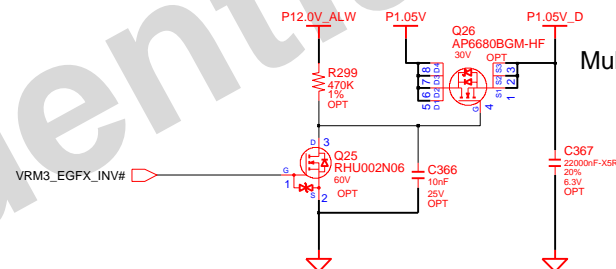


DRAW	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG
CHECK	MK KIM	DEV. STEP	MP		Switched PWR 2	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.2		Switched Power	PART NO.
MODULE CODE	undefined	LAST EDIT	August 15, 2011 11:04:51 AM			BA41-01666A
				PAGE	47	OF 51

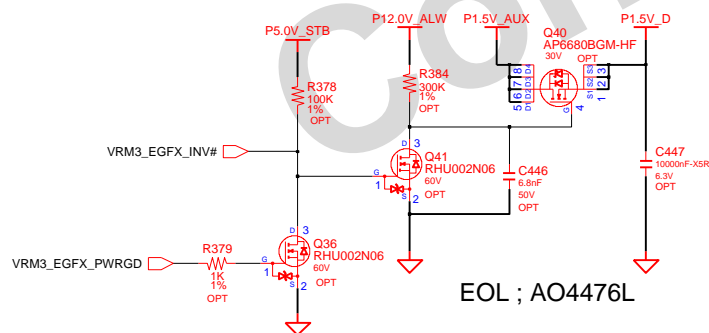
Discrete Switched Power (D3.3V : Max_1.2A)



Multi@AO4476L



EOL ; AO4476L

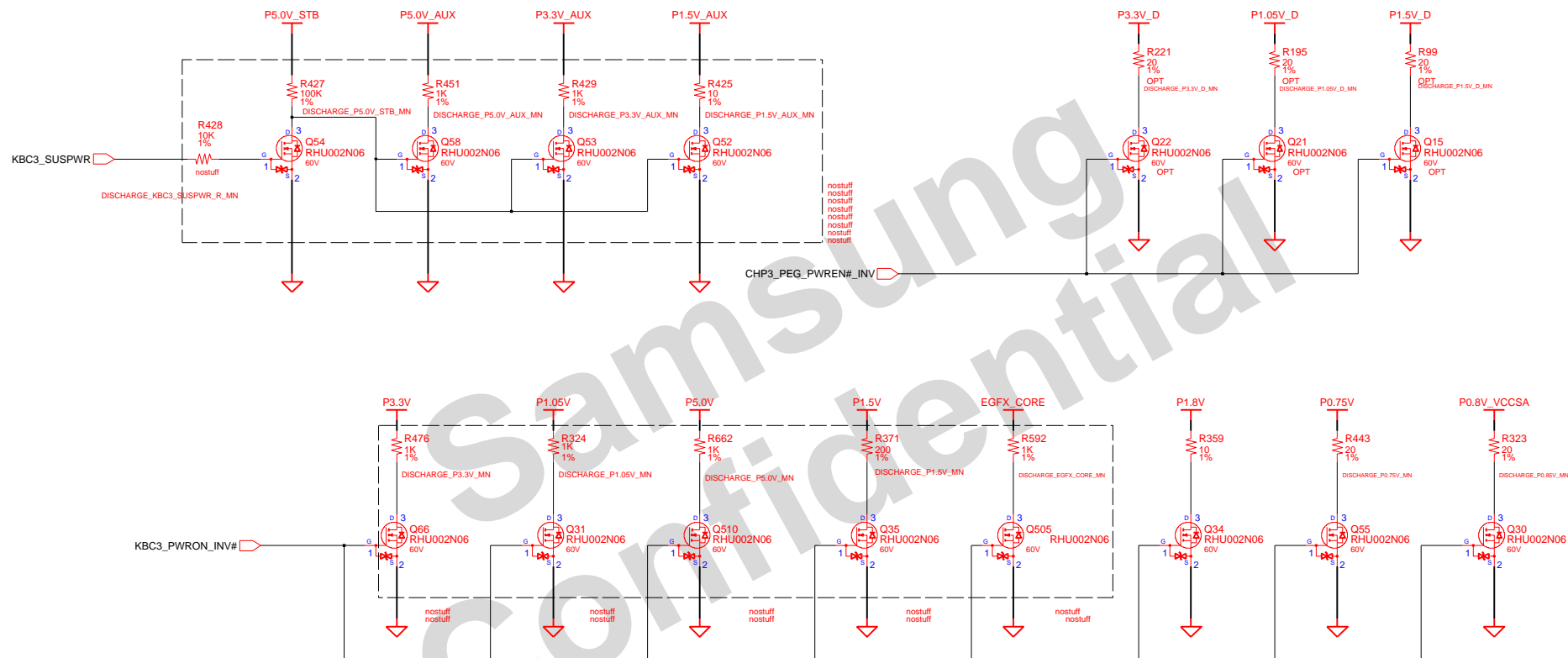


DRAW	MS YANG	DATE	3/11/2011	PETRONAS-14DC Switched PWR FOR OPTIMUS PWR	SAMSUNG ELECTRONICS			
CHECK	MK KIM	DEV. STEP	MP		PART NO.	BA41-01666A		
APPROVAL	BL LEE	REV	REV 1.2					
MODULE CODE	LAST EDIT				August 15, 2011 11:04:51 AM	PAGE	48	OF

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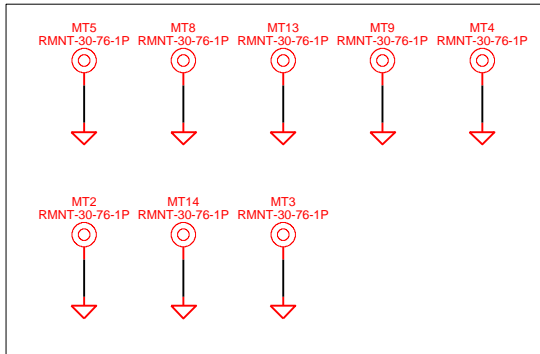
POWER DISCHARGER



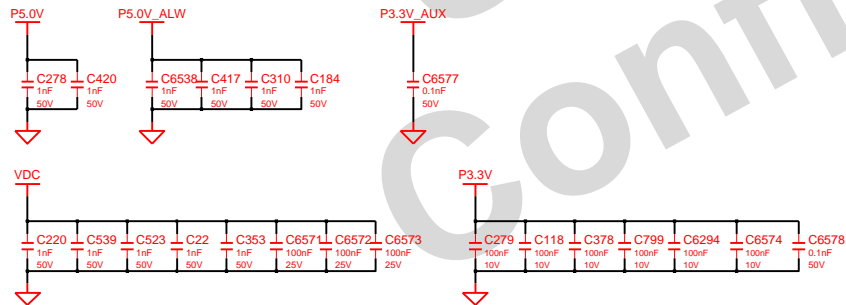
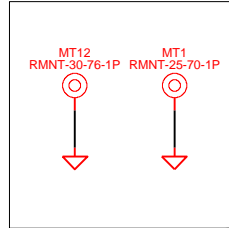
DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC DISCHARGER LOGIC DISCHARGING LOGIC	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			PART NO. BA41-01666A
APPROVAL	BL LEE	REV	REV 1.2			
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	49	OF 51

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Mainboard Mount ((30-76)X8EA)



PCB FIX

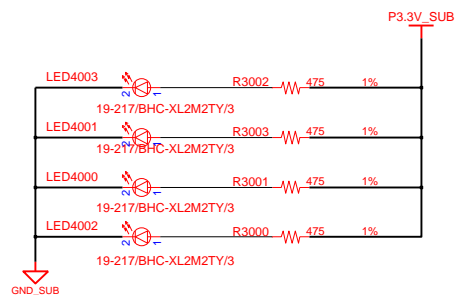


DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC	SAMSUNG ELECTRONICS PART NO. BA41-01666A
CHECK	MK KIM	DEV. STEP	MP		MT Hole	
APPROVAL	BL LEE	REV	REV 1.2		MT Hole	
MODULE CODE		LAST EDIT	August 15, 2011 11:04:51 AM	PAGE	50	OF 51

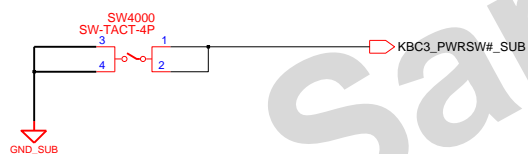
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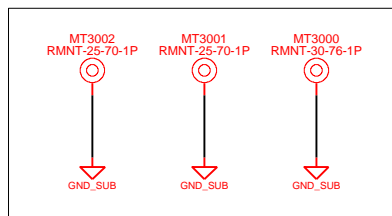
USB SUB BOARD



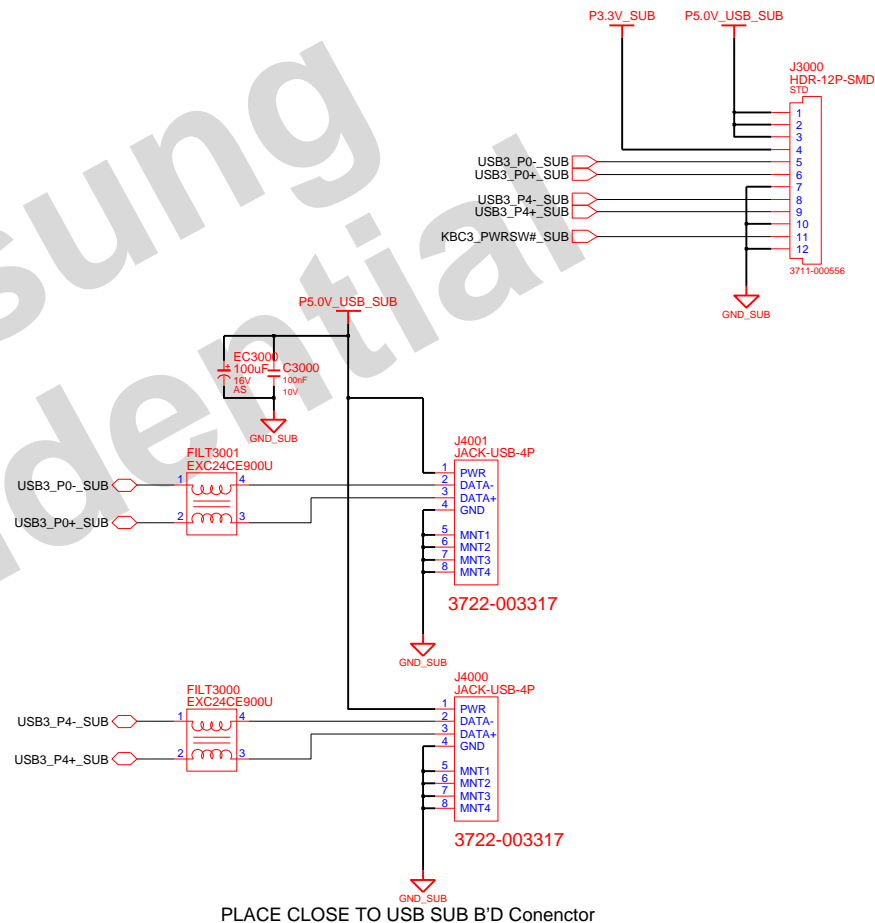
Power Switch Button



PCB Mount



SUB TO MAIN



PLACE CLOSE TO USB SUB B'D Conenctor

DESIGN	MS YANG	DATE	3/11/2011	TITLE	PETRONAS-14DC SUB BOARD SUB BOARD	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	51	OF 51