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# Scala3-15 DC

CPU : Sandy Bridge PGA  
Chip Set : Intel Cougar Point  
GFX : NVIDIA N12M-GE  
Remarks : Huron River Platform

Model Name : Scala3-15 DC  
PBA Name : MAIN\_Dual  
PCB Code : BA41-01761A  
BA41-01762A  
BA41-01763A  
BA41-01764A  
Dev. Step : MP  
Revision : 1.3  
T.R. Date : 2011.08.26

Design	CHECK	APPROVAL
Pei Wang	RJ Zheng	BC LEE

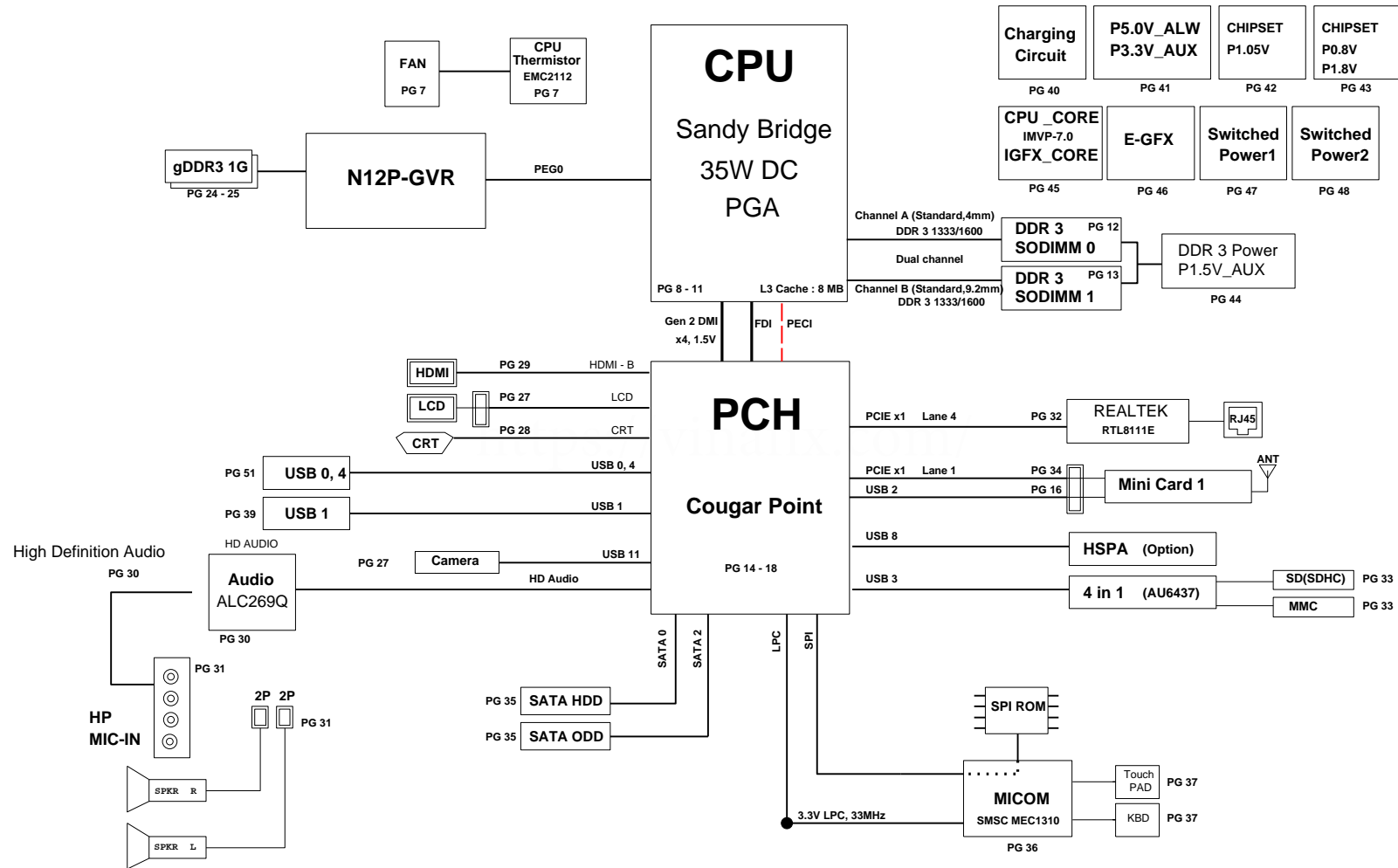
Owner : SEC Mobile R & D Signature : X

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DRAW	MS YANG	DATE	3/11/2011	TITLE	Scala3-15	SAMSUNG
CHECK	MK KIM	DEV. STEP	MP	MAIN		ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.1	COVER		PART NO. BA41-01761A
MODULE CODE		LAST EDIT	August 26, 2011 15:51:14 PM	PAGE	1	OF 51

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# BLOCK DIAGRAM



DRAW	MS YANG	DATE	3/11/2011	TITLE	Scala3-15 MAIN BLOCK DIAGRAM	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			PART NO. BA41-01761A
APPROVAL	BL LEE	REV	REV 1.1			
MODULE CODE	undefined	LAST EDIT	August 26, 2011 15:51:14 PM	PAGE	2	OF 51

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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
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

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

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

Crystal / Oscillator
TYPEFREQUENCYDEVICEUSAGE
Crystal32.768KHzHM65Real Time Clock
Crystal25MHzLANIntel LAN
Crystal25MHzGREENCLKGREENCLK
Crystal25MHzHM65INTEL
Crystal27MHzN12P-GVRNVIDIA

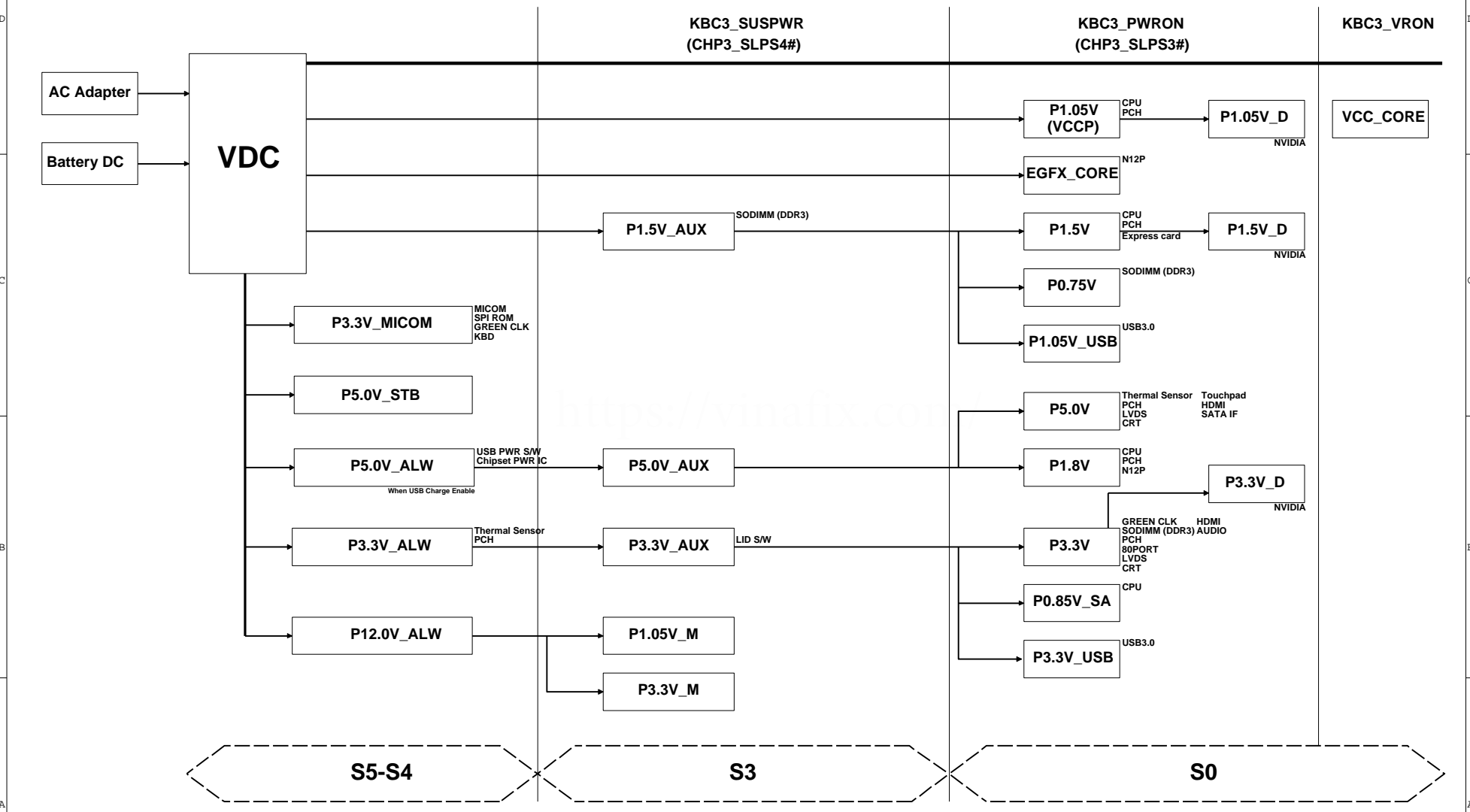
LCD Pannel Detect (TBD)
DevicesResolutionPANNEL_DETECT_0

I <sup>2</sup> C / SMB Address
DevicesAddressHexBus
HM65Master-SMBUS Master
CPU Thermal Sensor0111 101x7AhThermal Sensor
SODIMM01010 000xA0h-
SODIMM11010 010xA4h-
Thermal Sensor on SODIMM00111 000x30h-
Thermal Sensor on SODIMM10011 010x34h-
Thermal Sensor on board1101 100x98h-
Power thermal management TS1101 011x96h-

DRAWMS YANG	DATE3/11/2011	TITLE	Scala3-15 MAIN BOARD INFO	SAMSUNG ELECTRONICS
CHECKMK KIM	DEV. STEPMP			
APPROVALBL LEE	REVREV 1.1			
MODULE CODEundefined	LAST EDIT	August 26, 2011 15:51:14 PM		
			PAGE3	OF51

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

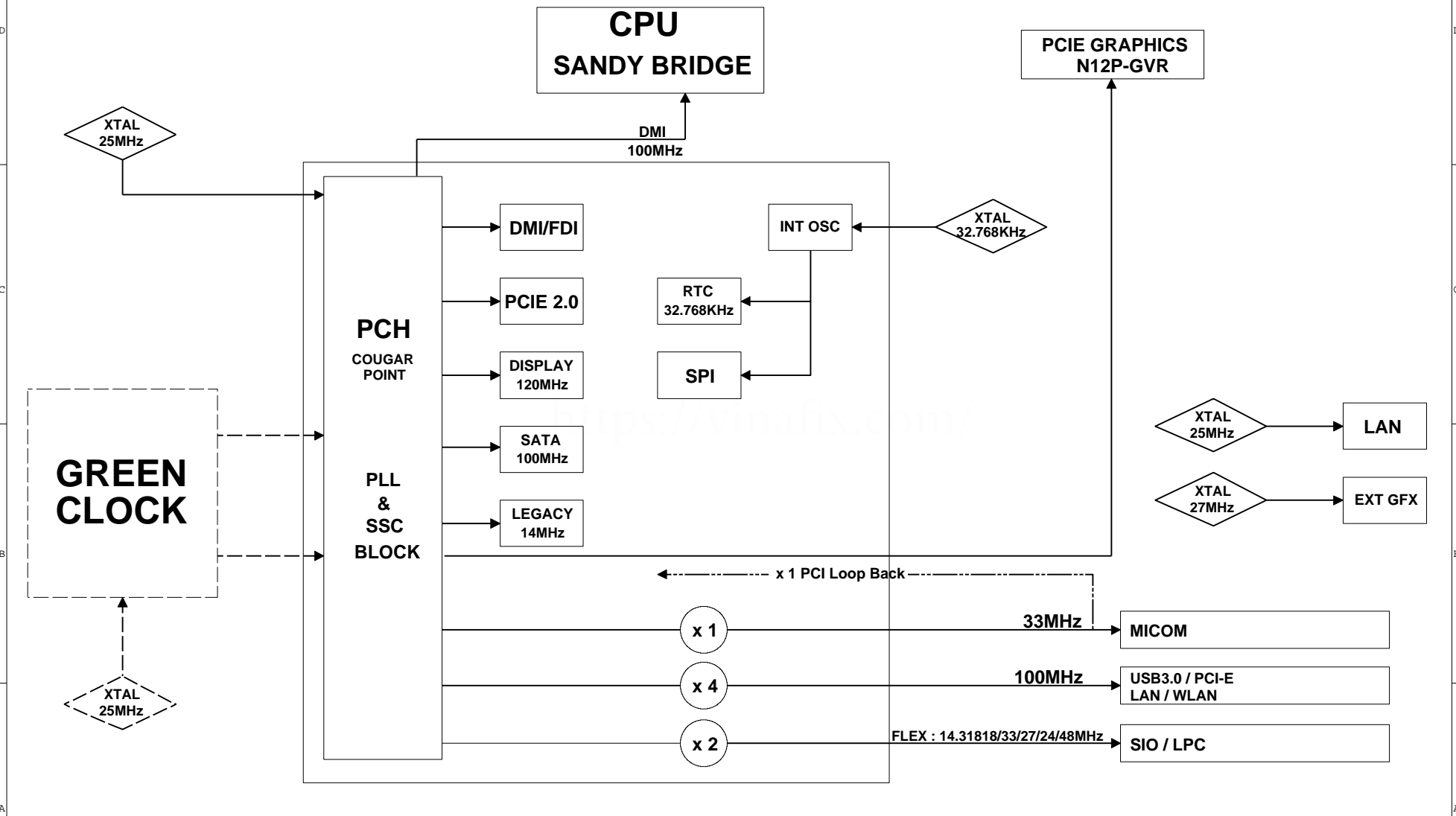
D:/users/ecad42/scala3-15/MP1.1/GB/Scala3\_15\_MP1.1



DRAW	MS YANG	DATE	3/11/2011	TITLE	Scala3-15	SAMSUNG
CHECK	MK KIM	DEV. STEP	MP		MAIN	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.1		POWER DIAGRAM	PART NO.
MODULE CODE	undefined	LAST EDIT	August 26, 2011 15:51:14 PM			BA41-01761A
				PAGE	4	OF 51

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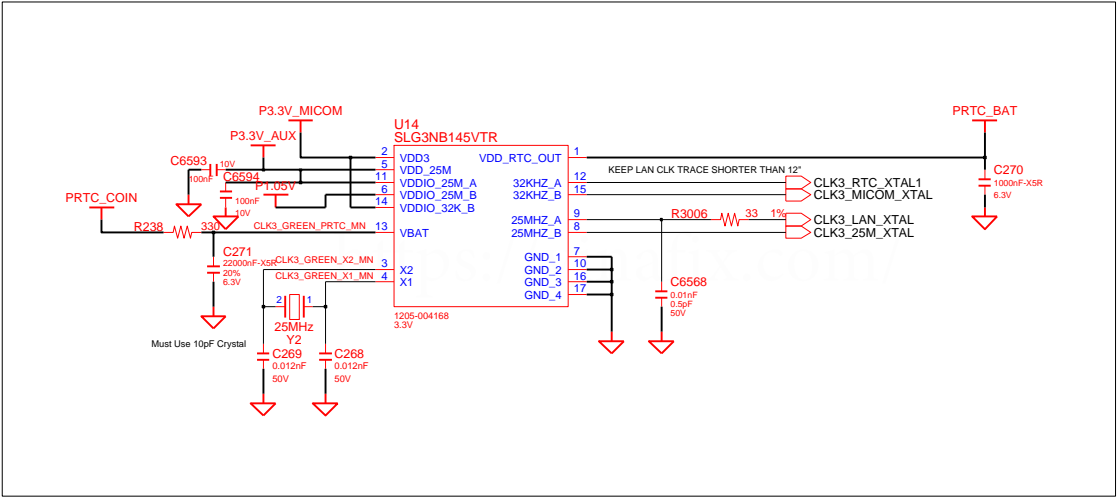
# CLOCK DISTRIBUTION Rev. 0.8



DRAW	MS YANG	DATE	3/11/2011	TITLE	Scala3-15	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP	MAIN		
APPROVAL	BL LEE	REV	REV 1.1	CLOCK DIAGRAM	PART NO.	
MODULE CODE	undefined	LAST EDIT	August 26, 2011 15:51:14 PM	PAGE	5 OF 51	

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**CLOCK DISTRIBUTOR**



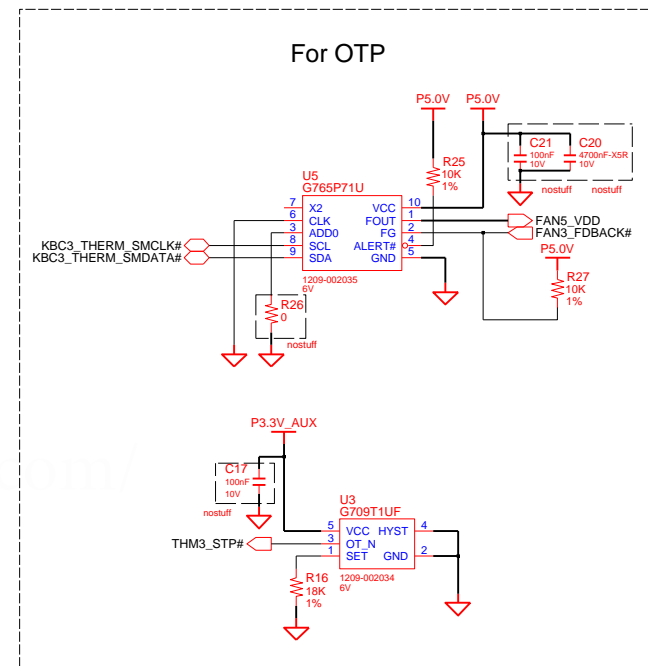
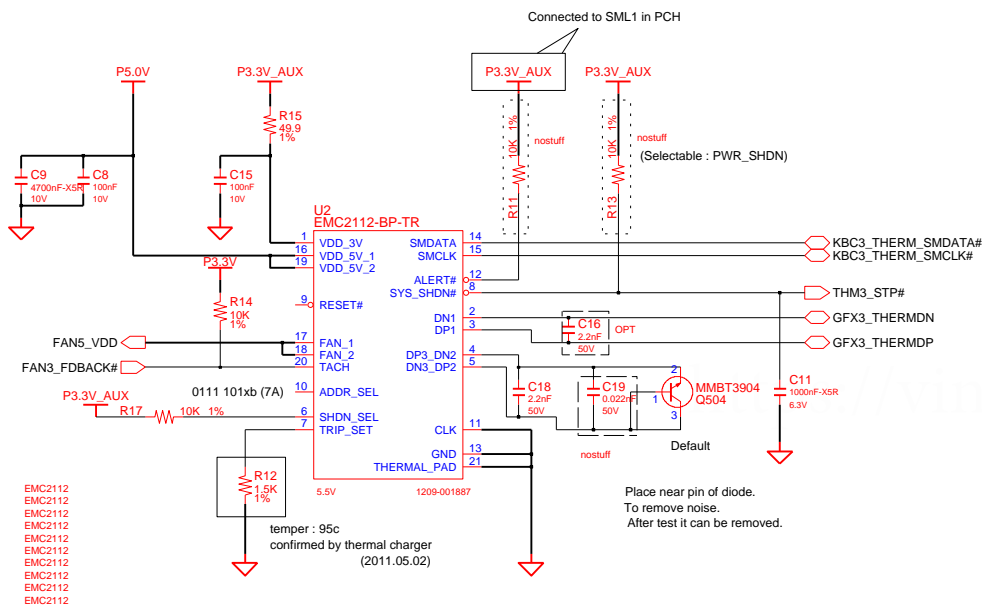
GREENCLK  
GREENCLK  
GREENCLK  
GREENCLK  
GREENCLK  
GREENCLK  
GREENCLK  
GREENCLK  
GREENCLK  
GREENCLK

DRAW	MS YANG	DATE	3/11/2011	TITLE	Scala3-15 CLOCK CLOCK DISTRIBUTION	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			PART NO. BA41-01761A
APPROVAL	BL LEE	REV	REV 1.1			
MODULE CODE	undefined	LAST EDIT	August 26, 2011 15:51:14 PM	PAGE	6	OF 51

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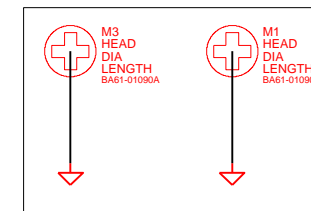
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## THERMAL SENSOR & FAN CONTROL



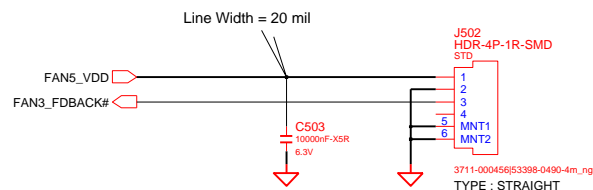
Temperature : 95.78c  
confirmed by thermal charger  
(2011.05.02)  
 $R_{th}(\text{kohm}) = 0.0012T^2 - 0.9308T + 96.147$

### FAN PEM



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

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



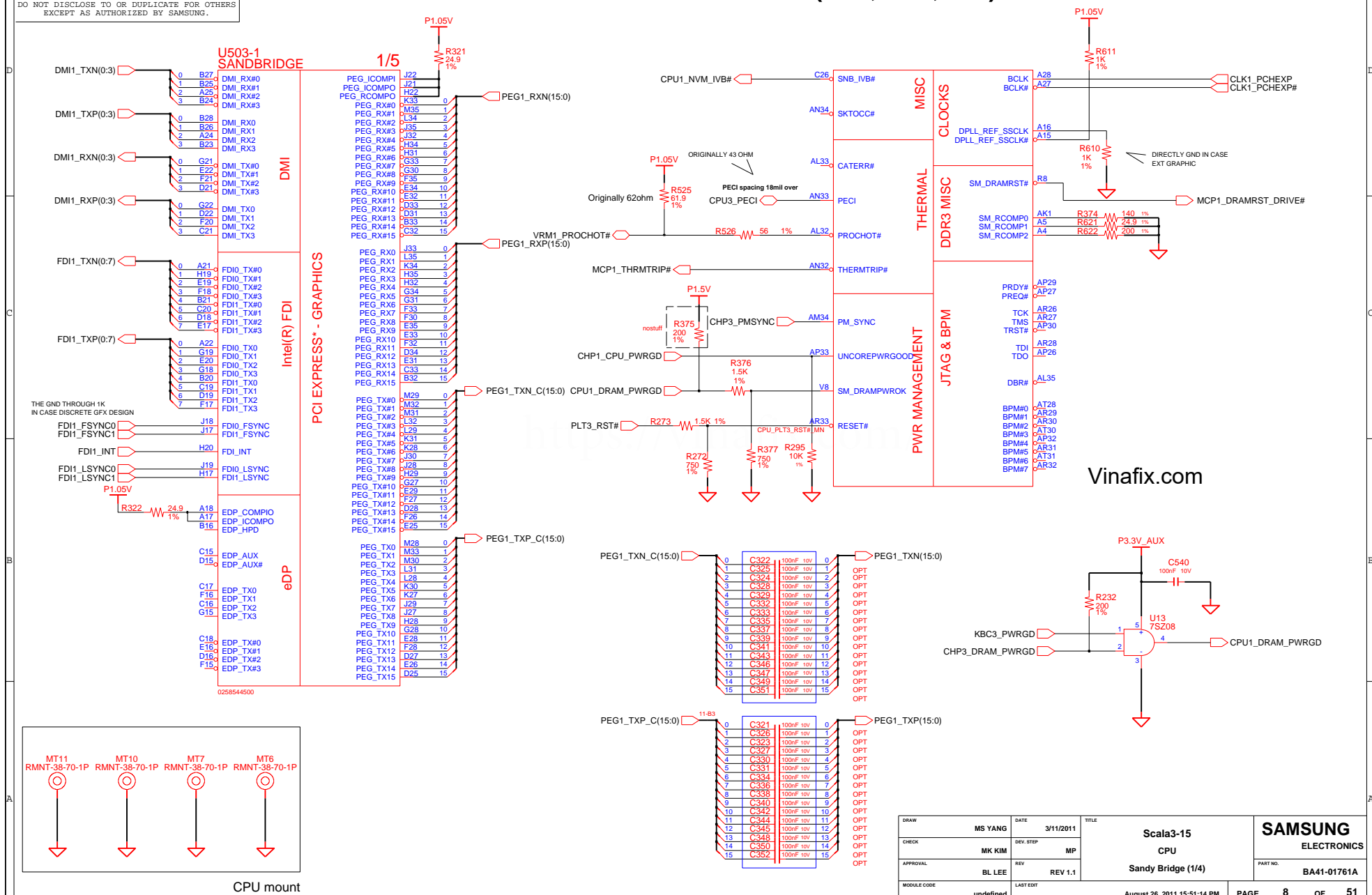
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CHECK	MK KIM	DEV. STEP	MP		THERMAL SENSOR
APPROVAL	BL LEE	REV	REV 1.1		THERMAL SENSOR EMC2112
MODULE CODE		LAST EDIT			
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BA41-01761A

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## SANDYBRIDGE PROCESSOR (DMI,PEG, FDI)

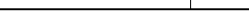
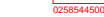
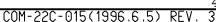




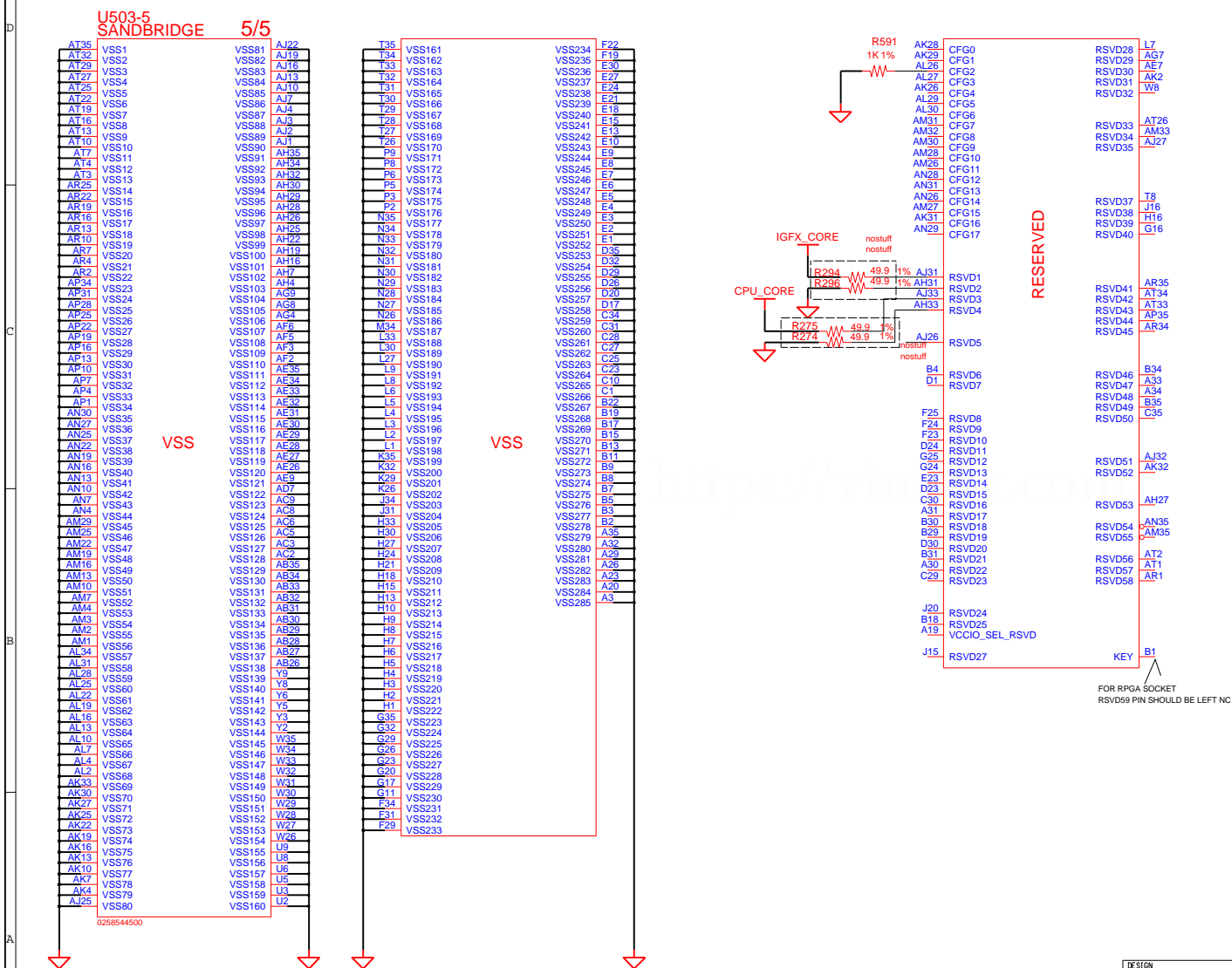
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COM-22C-015(1996.6.5) REV. 3

D:/users/ecad42/scalæ3-15/MP1.1/GB/Scalæ3\_15\_MP1

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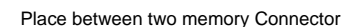
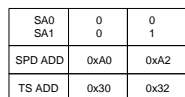


PEG STATIC LANE REVERSAL - CFG2 IS FOR THE 16X	
CFG2	1: (DEFAULT) NORMAL OPERATION 0: LANE REVERSED
PCIE PORT BIFURCATION STRAPS	
CFG[6:5]	11: (DEFAULT) X16 - DEVICE 1 FUNCTIONS 1 AND 2 DISABLED 10: X8 - X8 - DEVICE 1 FUNCTION 1 ENABLED ; FUNCTION 2 DISABLED 01: RESERVED - (DEVICE 1 FUNCTION 1 DISABLED ; 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 XRESRSTB DEASSERTION 0: PEG WAIT FOR BIOS FOR TRAINING


DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scala3-15		
CHECK	MK KIM	DEV. STEP	MP	CPU			
APPROVAL	BL LEE	REV	REV 1.1	Sandy Bridge (4/4)		PART NO.	
MODULE CODE	LAST EDIT		August 26, 2011 15:51:14 PM		PAGE	11 OF 51	

## DDR SO-DIMM #0

P/N : 3709-001609 (Concraft)



Place near SO-DIMM0

DRAW	MS YANG	DATE	3/11/2011	TITLE  Scala3-15 SODIMM A DDR3	
CHECK	MK KIM	DEV. STEP	MP		
APPROVAL	BL LEE	REV	REV 1.1		
MODULE CODE	undefined	LAST EDIT	August 26, 2011 15:51:14 PM		
					PART NO. BA41-01761A

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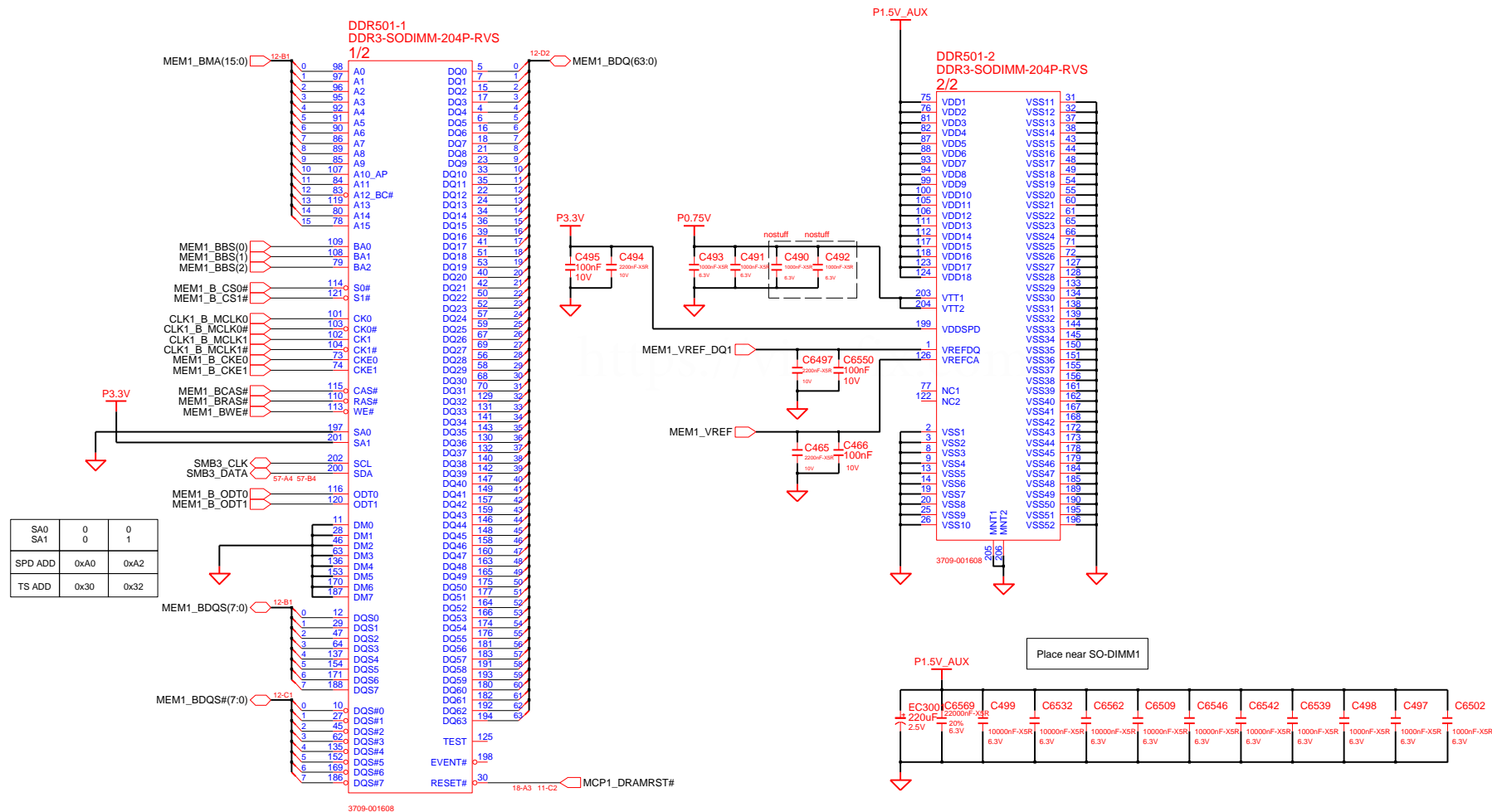
## SO-DIMM#1 : 1st SO-DIMM

### DDR SO-DIMM #1

Height : 4.0 mm (REVERSE)

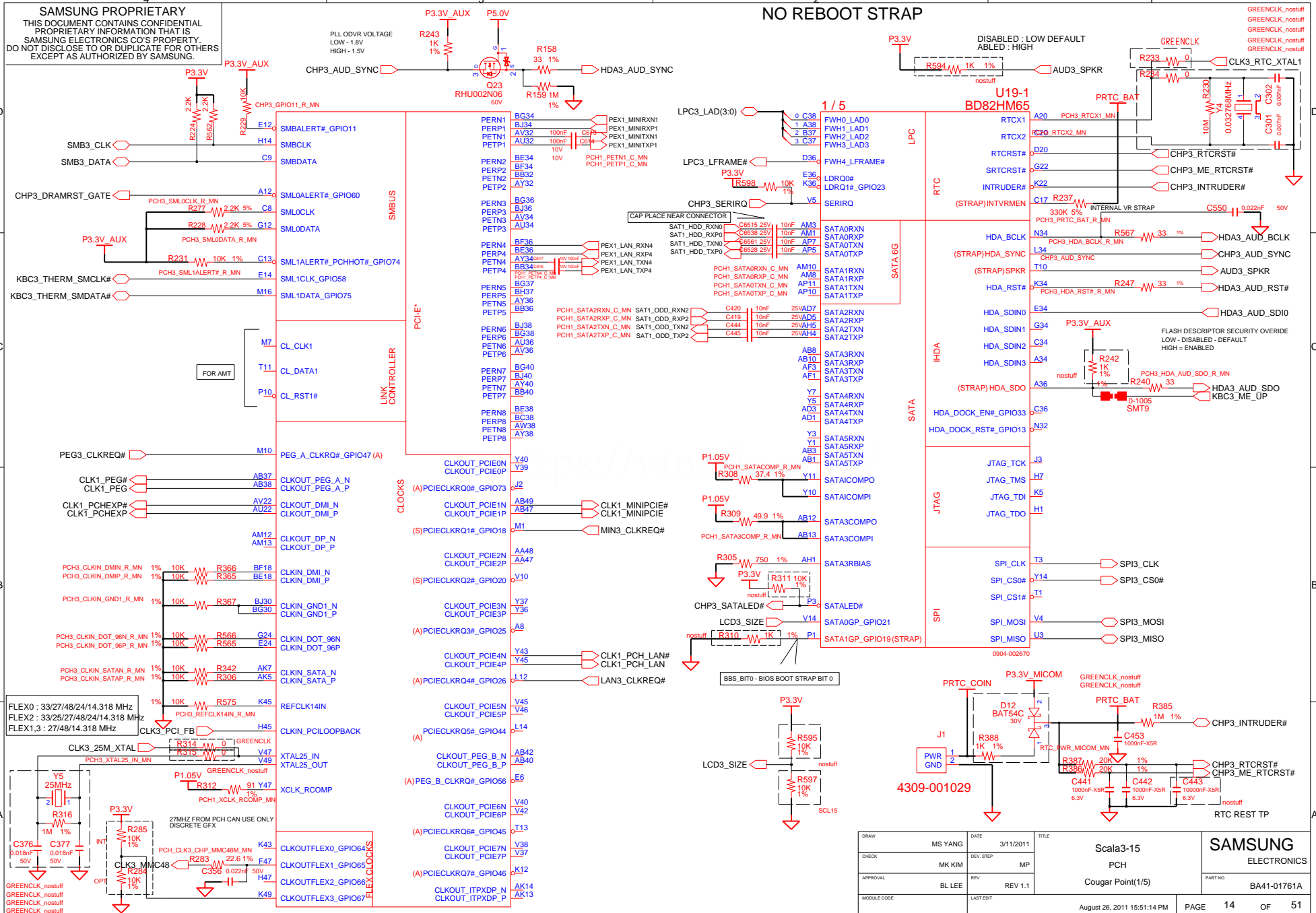
P/N : 3709-001654 (Foxconn)

P/N : 3709-001608 (Concraft)



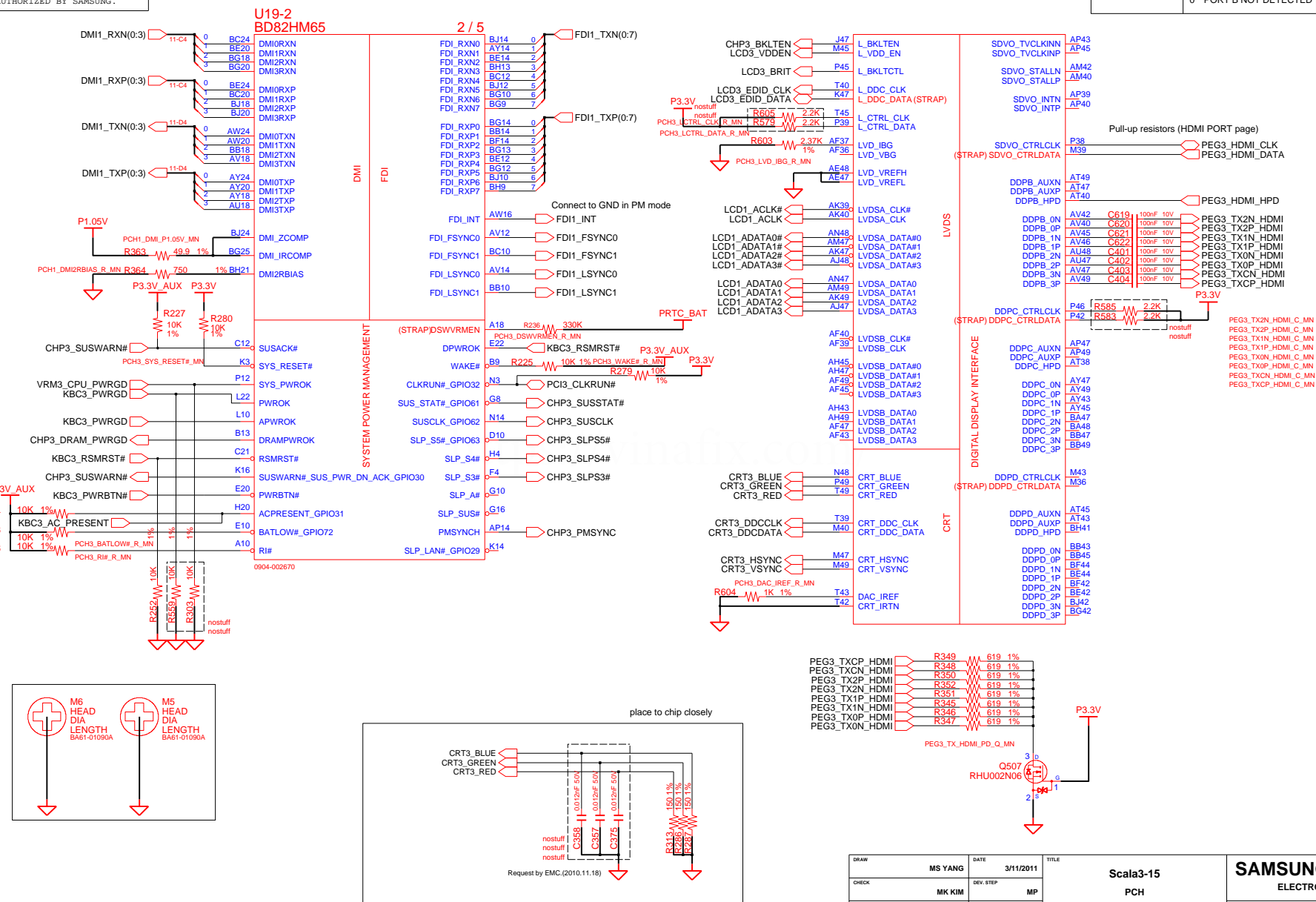
DRAW	MS YANG	DATE	3/11/2011	TITLE	Scala3-15	SAMSUNG
CHECK	MK KIM	DEV. STEP	MP		SODIMM B	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.1		DDR3	PART NO.
MODULE CODE		LAST ENT				BA41-01761A
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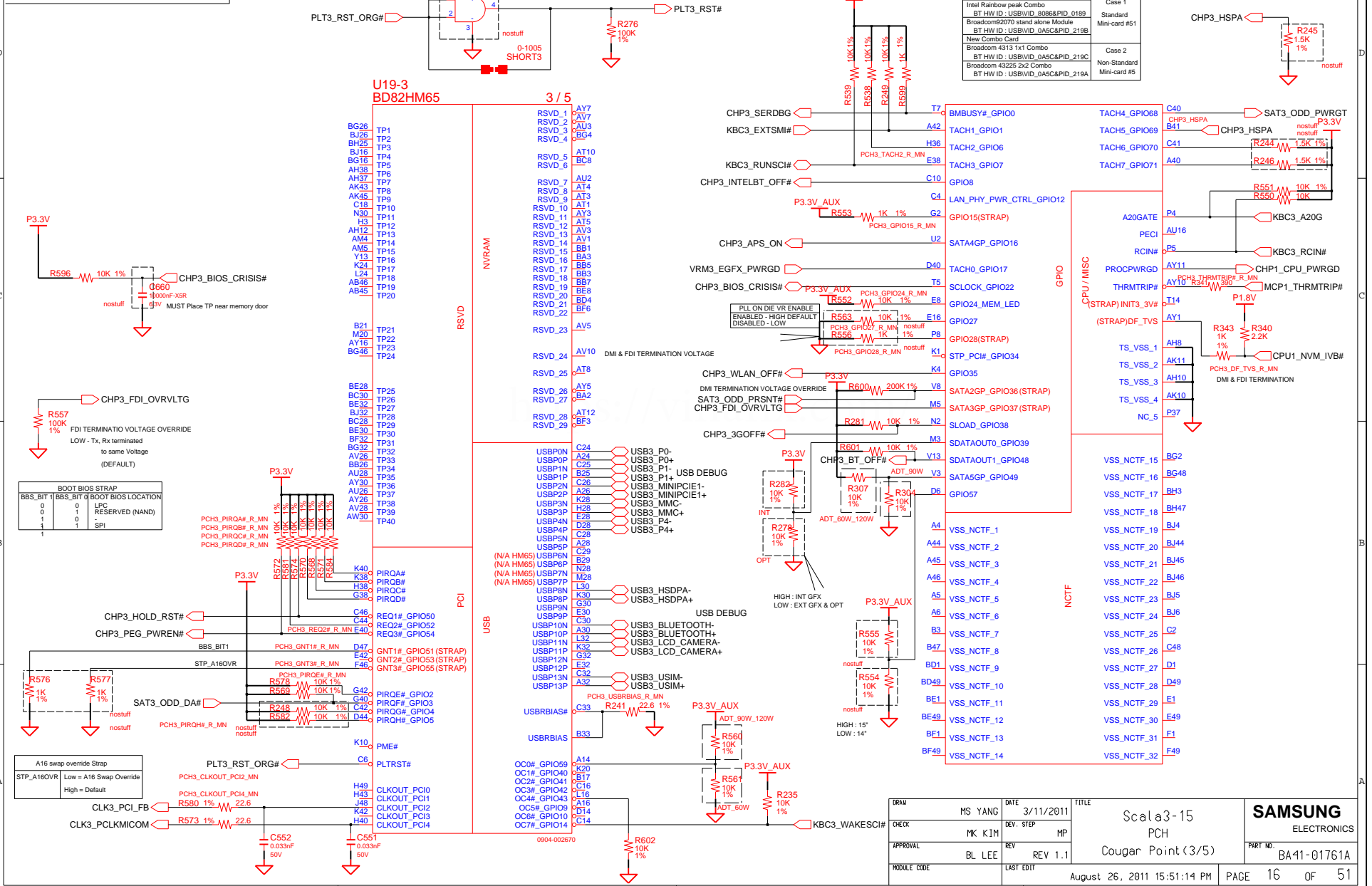


DRAW	MS YANG	DATE	3/11/2011	TITLE	Scala3-15
CHECK	MK KIM	DEV. STEP	MP		PCH
APPROVAL	BL LEE	REV	REV 1.1		Cougar Point(2/5)
MODULE CODE		LAST EDIT			
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 PART NO. BA41-01761A



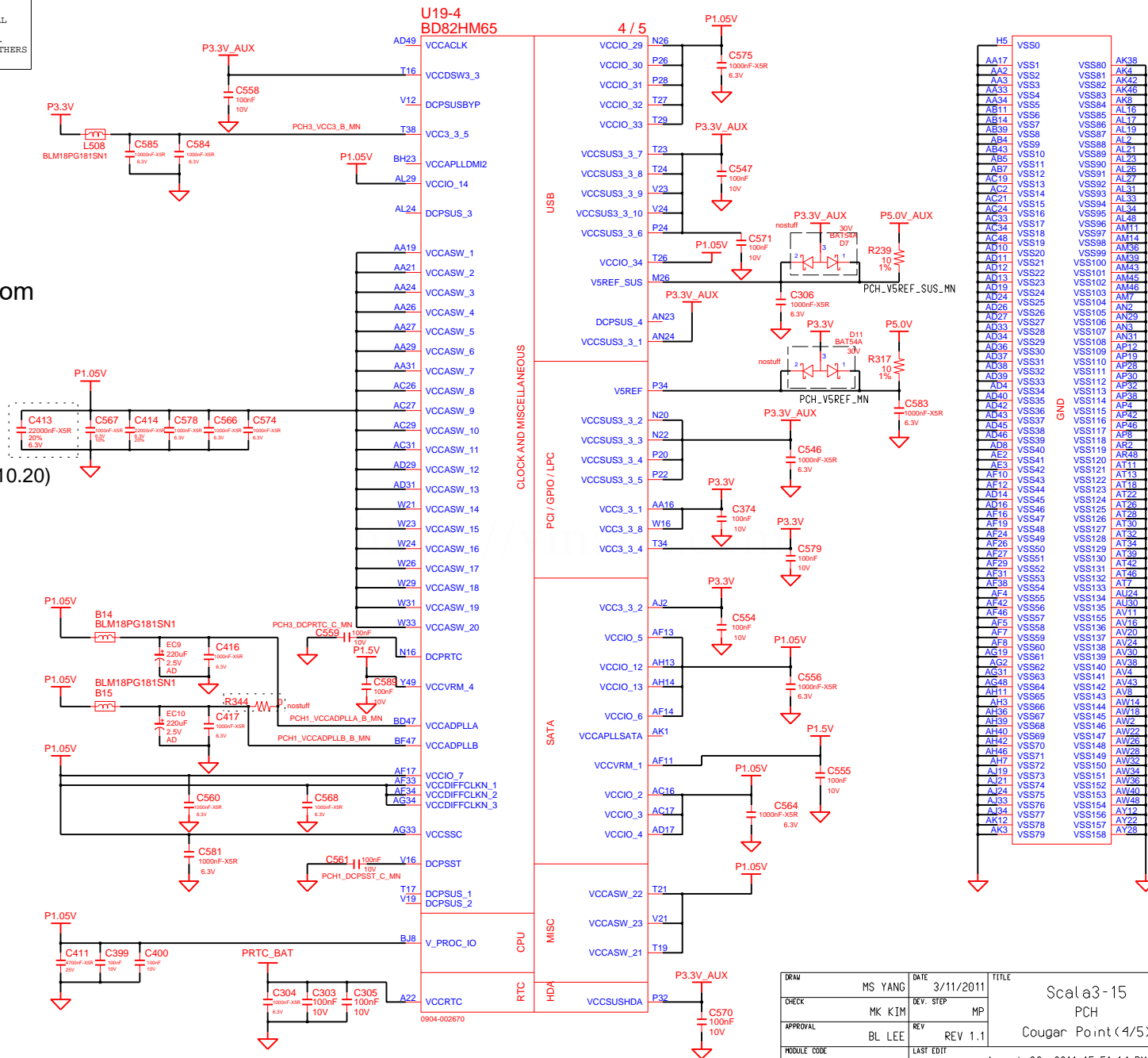
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Vinafix.com

PI Request (2010.10.20)



DRAW	MS YANG	DATE	3/11/2011	TITLE	Scala3-15		
CHECK	MK KIM	DEV. STEP	MP		PCH		
APPROVAL	BL LEE	REV	REV 1.1		Cougar Point (4/5)		
MODULE CODE	LAST EDIT		August 26, 2011 15:51:14 PM		PAGE		

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U19-5  
BD82HM65

This power share with thermal sensor

5 / 5

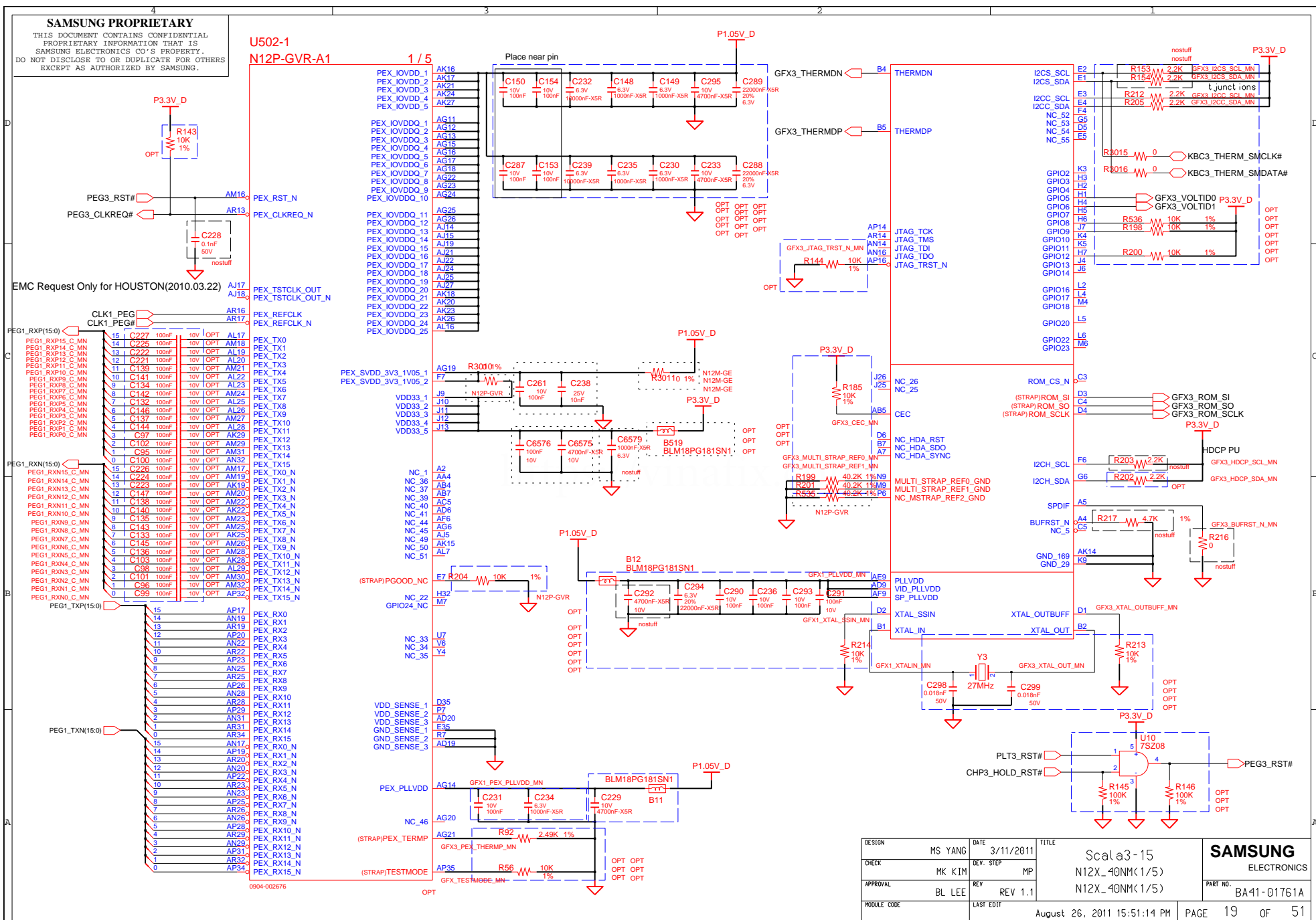
AY4	VSS159	VSS259	H46
AY42	VSS160	VSS260	K18
AY46	VSS161	VSS261	K26
AY8	VSS162	VSS262	K30
B11	VSS163	VSS263	K46
B15	VSS164	VSS264	K7
B19	VSS165	VSS265	L2
B23	VSS166	VSS266	L20
B27	VSS167	VSS267	L26
B31	VSS168	VSS268	L26
B35	VSS169	VSS269	L28
B39	VSS170	VSS270	L48
B7	VSS171	VSS271	M12
F45	VSS172	VSS272	P16
BB12	VSS173	VSS273	P16
BB16	VSS174	VSS274	M18
BB20	VSS175	VSS275	M24
BB22	VSS176	VSS276	M30
BB24	VSS177	VSS277	M32
BB28	VSS178	VSS278	M34
BB30	VSS179	VSS279	M36
BB38	VSS180	VSS280	M4
BB4	VSS181	VSS281	M46
BB46	VSS182	VSS282	M46
BC14	VSS183	VSS283	N18
BC18	VSS184	VSS284	N18
BC2	VSS185	VSS285	P30
BC22	VSS186	VSS286	P40
BC26	VSS187	VSS287	P47
BC32	VSS188	VSS288	P47
BC34	VSS189	VSS289	T33
BC36	VSS190	VSS290	P40
BC48	VSS191	VSS291	P40
BD46	VSS192	VSS292	P47
BD5	VSS193	VSS293	P7
BD22	VSS194	VSS294	R2
BE26	VSS195	VSS295	R48
BE40	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	V11
BF28	VSS205	VSS305	V17
BD3	VSS206	VSS306	V26
BF30	VSS207	VSS307	V27
BF38	VSS208	VSS308	V29
BF40	VSS209	VSS309	V30
BF9	VSS210	VSS310	V31
BG17	VSS211	VSS311	V36
BG21	VSS212	VSS312	V43
BG23	VSS213	VSS313	V7
BG33	VSS214	VSS314	V7
BG44	VSS215	VSS315	W17
B9	VSS216	VSS316	W19
BH11	VSS217	VSS317	W2
BH15	VSS218	VSS318	W27
BH17	VSS219	VSS319	W48
BH19	VSS220	VSS320	Y12
H10	VSS221	VSS321	Y3
BH27	VSS222	VSS322	Y4
BH31	VSS223	VSS323	Y42
BH33	VSS224	VSS324	Y46
BH36	VSS225	VSS325	Y8
BH43	VSS226	VSS326	BG29
BH7	VSS227	VSS327	N24
D3	VSS228	VSS328	AJ3
D12	VSS229	VSS329	AD47
D16	VSS230	VSS330	B43
D18	VSS231	VSS331	BE10
D22	VSS232	VSS332	BG41
D24	VSS233	VSS333	G14
D26	VSS234	VSS334	H16
D30	VSS235	VSS335	T36
D32	VSS236	VSS336	BG22
D34	VSS237	VSS337	BG24
D36	VSS238	VSS338	C22
D42	VSS239	VSS339	AP13
D8	VSS240	VSS340	M14
E18	VSS241	VSS341	AP3
E26	VSS242	VSS342	AP1
E18	VSS243	VSS343	BE18
G18	VSS244	VSS344	BC16
G20	VSS245	VSS345	BG28
G26	VSS246	VSS346	BJ28
G28	VSS247	VSS347	
G36	VSS248	VSS348	
G48	VSS249	VSS349	
H12	VSS250	VSS350	
H18	VSS251	VSS351	
H22	VSS252	VSS352	
H26	VSS253		
H30	VSS254		
H32	VSS255		
H34	VSS256		
H36	VSS257		
F3	VSS258		

0904-002670

PI Request (2010.10.20)

DRAW	MS YANG	DATE	3/11/2011	Scala3-15 PCH Cougar Point(5/5)		SAMSUNG ELECTRONICS	
CHECK	MK KIM	DEV. STEP	MP				
APPROVAL	BL LEE	REV	REV 1.1				
				PART NO.		BA41-01761A	
MODULE CODE		LAST EDIT		August 26, 2011 15:51:14 PM		PAGE	18 OF 51

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CMD MODE E

DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scala3-15 N12X-40NM(2/5) N12X-40NM(2/5)	<b>SAMSUNG</b> ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			
APPROVAL	BL LEE	REV	REV 1.1			
MODULE CODE	LAST EDIT		August 26, 2011 15:51:14 PM			
				PART NO.	BA41-01761A	

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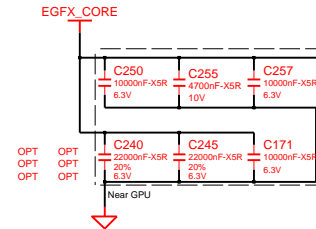
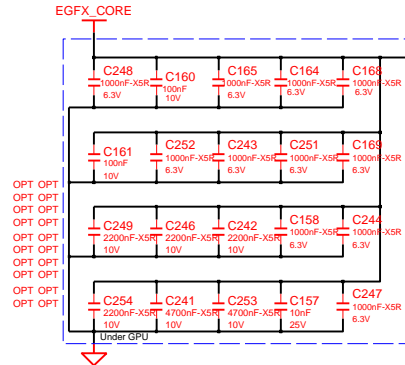
U502-3  
N12P-GVR-A1

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	AA18
F31	GND_23	GND_119	AA18
F34	GND_24	GND_120	AA19
J5	GND_25	GND_121	AA20
J31	GND_26	GND_122	AA21
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	AD5
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	AD34
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	AE21
P24	GND_63	GND_158	AE22
R2	GND_64	GND_159	AE23
R5	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



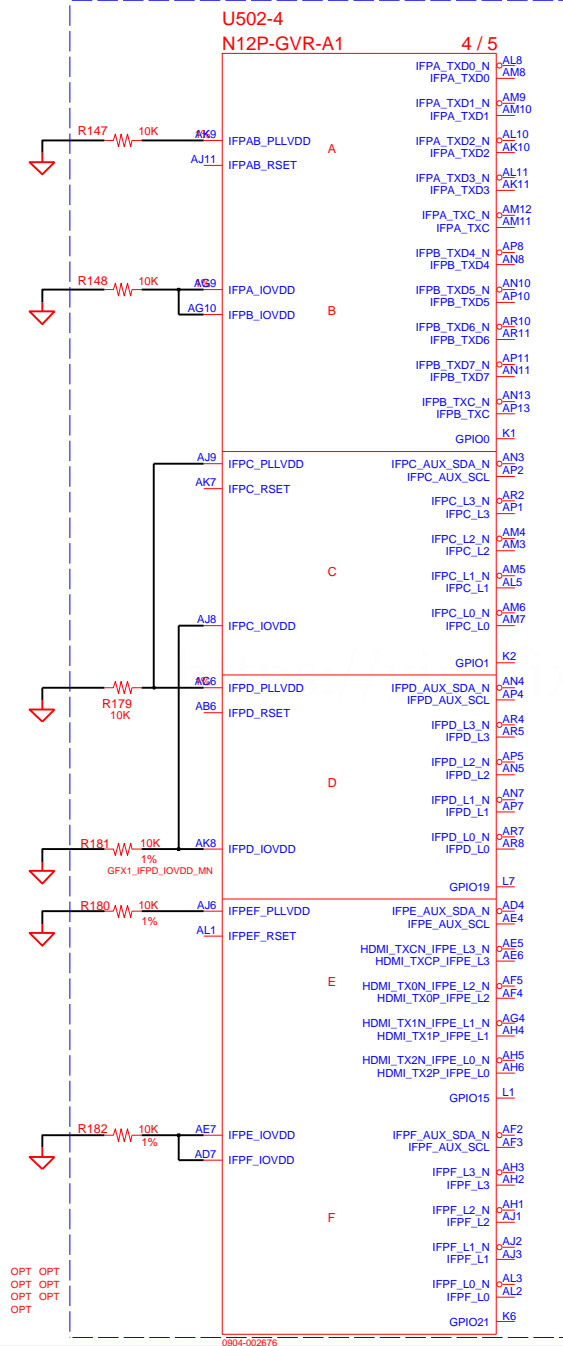
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L12	VDD_2	VDD_58	V21
L13	VDD_3	VDD_59	V23
L14	VDD_4	VDD_60	V25
L15	VDD_5	VDD_61	W11
L16	VDD_6	VDD_62	W12
L17	VDD_7	VDD_63	W13
L18	VDD_8	VDD_64	W14
L19	VDD_9	VDD_65	W15
L20	VDD_10	VDD_66	W16
L21	VDD_11	VDD_67	W17
L22	VDD_12	VDD_68	W18
L23	VDD_13	VDD_69	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

Vinafix.com

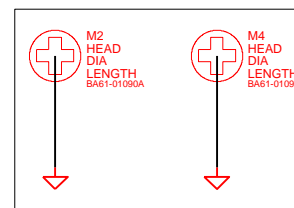
DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scala3-15	<b>SAMSUNG</b> ELECTRONICS PART NO. BA41-01761A
CHECK	MK KIM	DEV. STEP	MP		N12X_40NM(3/5)	
APPROVAL	BL LEE	REV	REV 1.1		N12X_40NM(3/5)	
MODULE CODE		LAST EDIT		August 26, 2011 15:51:14 PM		
PAGE 21 OF 51						

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DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scala3-15	<b>SAMSUNG</b> ELECTRONICS PART NO. BA41-01761A
CHECK	MK KIM	DEV. STEP	MP		N12X_40NM(4/5)	
APPROVAL	BL LEE	REV	REV 1.1		N12X_40NM(4/5)	
MODULE CODE		LAST EDIT				
August 26, 2011 15:51:14 PM						PAGE 22 OF 51

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OPT  
OPT

DESIGN	MS YANG	DATE	3/11/2011	TITLE  Scala3-15  N12X_40NM(5/5)  N12X_40NM(5/5)	<b>SAMSUNG</b>  ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP		
APPROVAL	BL LEE	REV	REV 1.1		
MODULE CODE	LAST EDIT			August 26, 2011 15:51:14 PM	PART NO. BA41-01761A
				PAGE 23	OF 51

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recommended value 240ohm 1/243ohm 1/7 also be available

recommended value 240ohm 1/243ohm 1/7 also be available

recommended value 240ohm 1/243ohm 1/7 also be available

N12M-GE use 2007-008437 121ohm for R32 R31

PEG1\_CLKA0  
PEG1\_CLKA0#

R32 80.6 1%  
R31 80.6 1%

C46 10nF 25V

OPT OPT  
OPT OPT

nostuff

PEG1\_ODTA0  
PEG1\_CKEA0  
PEG1\_DRAMRST\_A#

R522 100K 1%  
R47 100K 1%  
R30 100K 1%

OPT OPT  
OPT OPT

C537 6.3V 1000nF-XSR  
C517 6.3V 1000nF-XSR  
C518 6.3V 1000nF-XSR  
C521 10V 1000nF-XSR  
C532 10V 100nF  
C522 10V 100nF  
C520 10V 100nF  
C519 10V 100nF  
C539 10V 100nF

DESIGN	MS YANG	DATE	3/11/2011	TITLE
CHECK	MK KIM	DEV. STEP	MP	Scala3-15
APPROVAL	BL LEE	REV	REV 1.1	GRAPHIC_MEM A#0
				GRAPHIC_MEM A#0

S

PART N

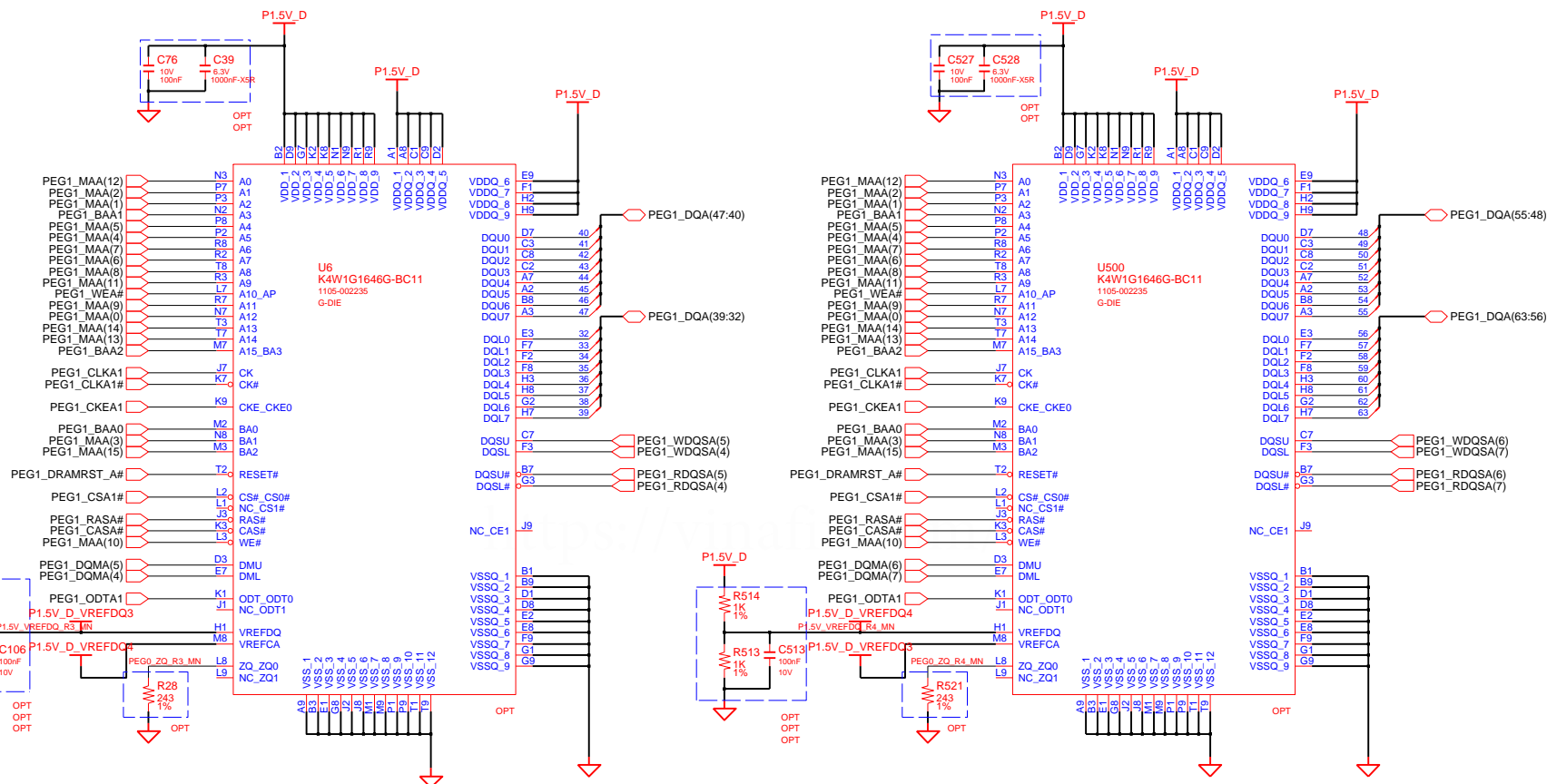
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CHECK	MK KIM	DEV. STEP	MP					
APPROVAL	BL LEE	REV	REV 1.1					
MODULE CODE		LAST EDIT		August 26, 2011 15:51:14 PM	PAGE	24	OF	51



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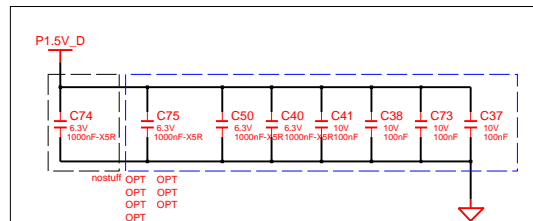
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## A-Channel #1 (E-mode)

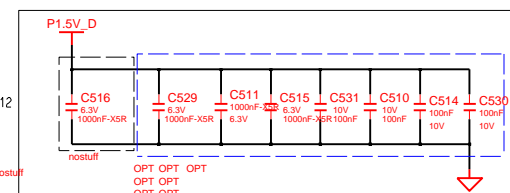
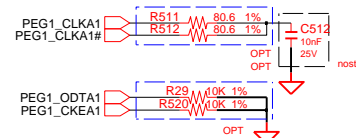


Place near to VDDQ

Place near to VDDQ



N12M-GE use 2007-008437 121ohm for R511 R512



DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scala3-15	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP		GRAPHIC_MEM A#1	
APPROVAL	BL LEE	REV	REV 1.1		GRAPHIC_MEM A#1	
MODULE CODE		LAST EDIT				
August 26, 2011 15:51:14 PM						PAGE 25 OF 51

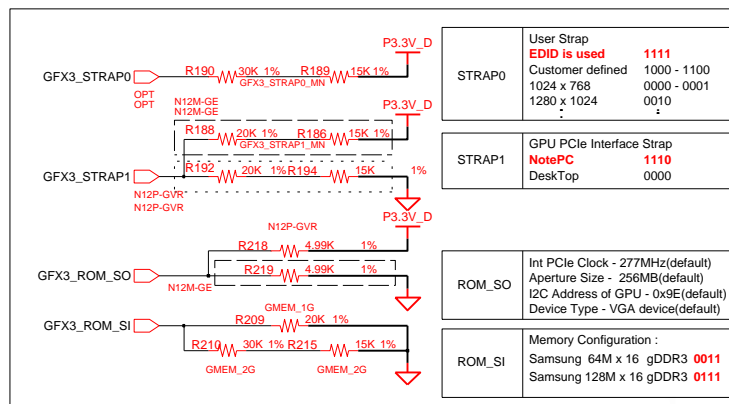
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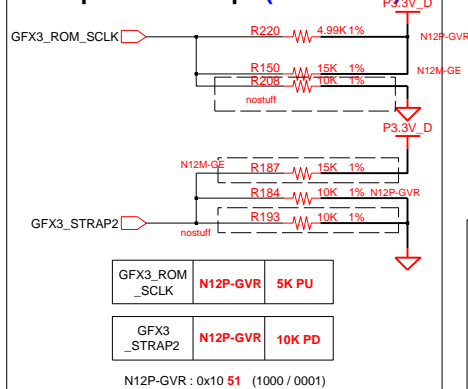
## N12x\_40nm STRAP

Vinafix.com

### 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

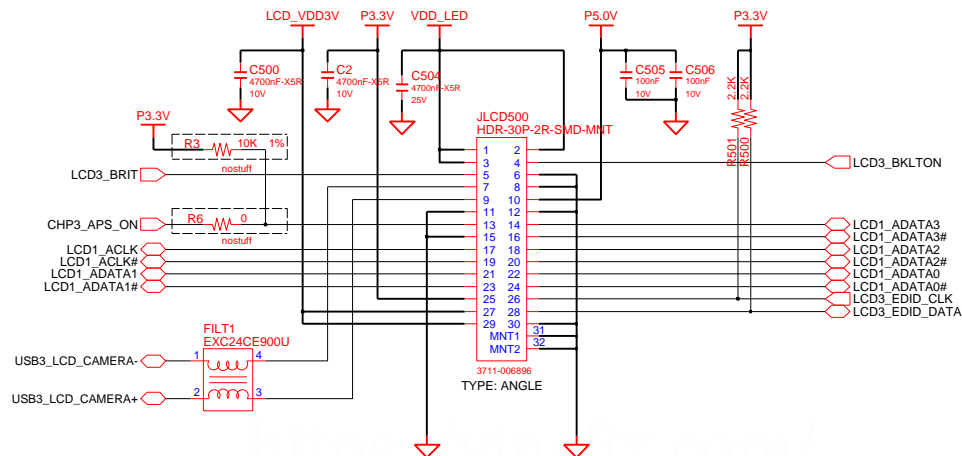
DESIGN	MS YANG	DATE	3/11/2011	Scala3-15 GRAPHIC_MEM C#0		SAMSUNG ELECTRONICS	
CHECK	MK KIM	DEV. STEP	MP				
APPROVAL	BL LEE	REV	REV 1.1	GRAPHIC_MEM C#0		PART NO.	BA41-01761A
MODULE CODE	LAST EDIT		August 26, 2011 15:51:14 PM			PAGE	26 OF 51

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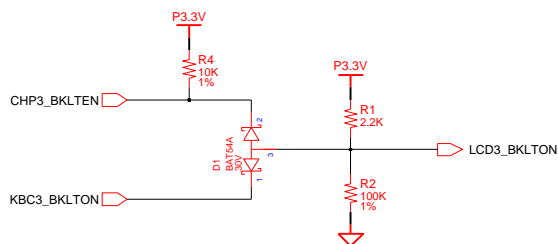
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# LVDS LOGIC

## 1Ch. LCD Connector + CAMERA

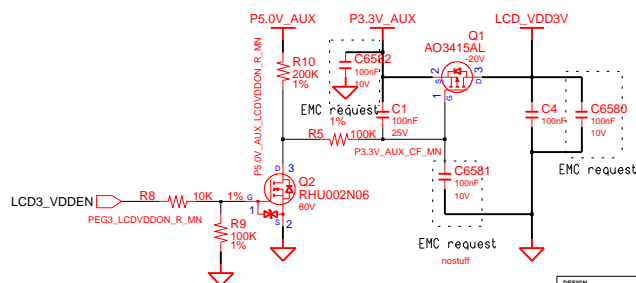


## Backlight On

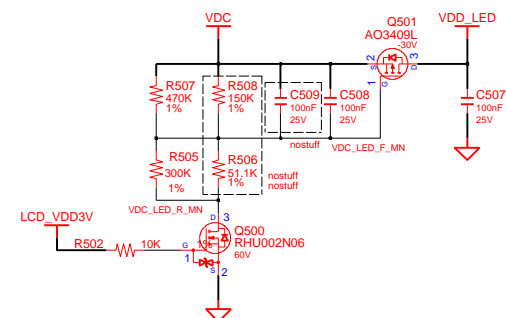


## LCD Power

EBL Purpose



## LED Power

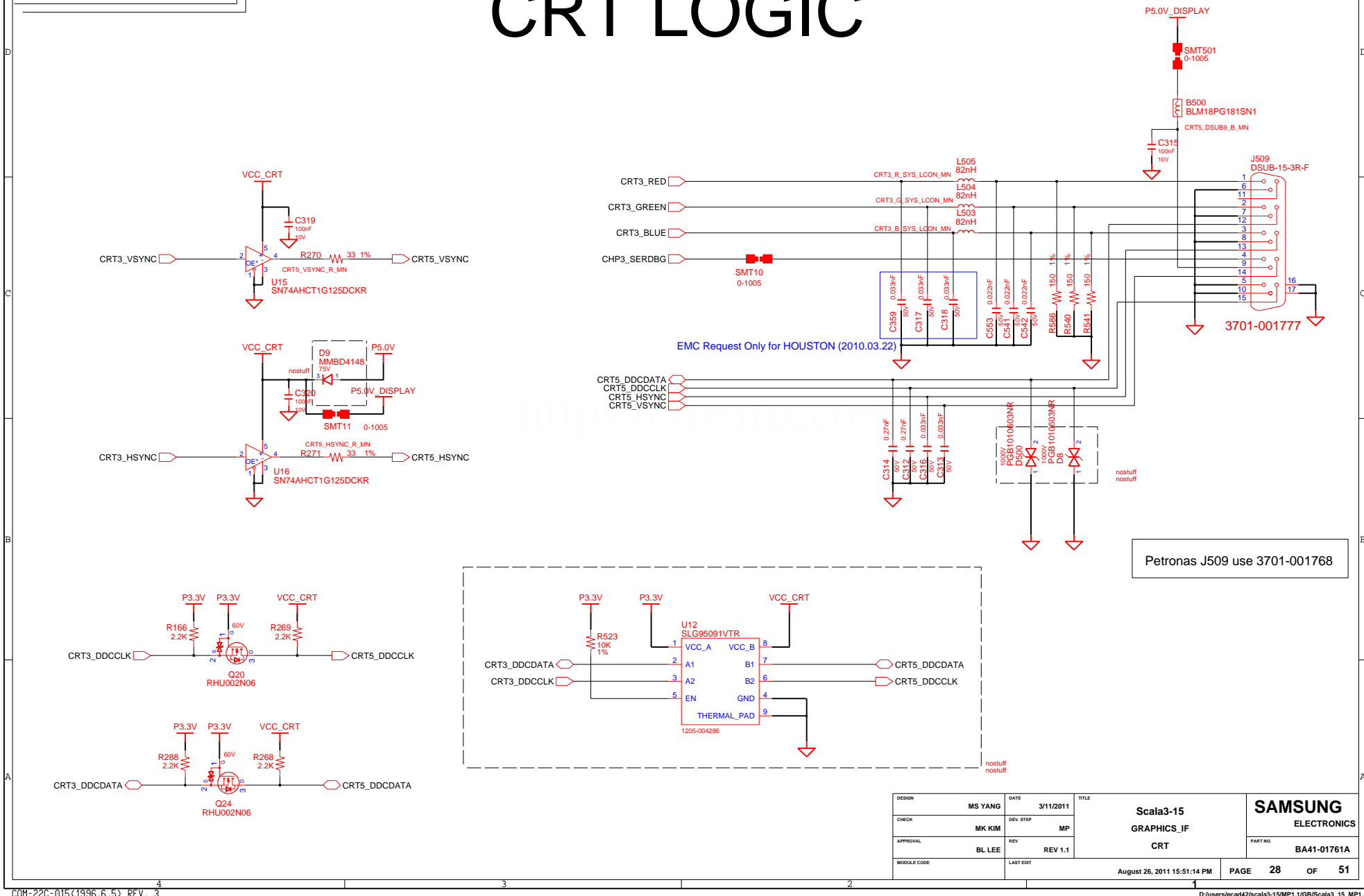


DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scala3-15	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP	GRAPHICS_IF		
APPROVAL	BL LEE	REV	REV 1.1	LVDS		
MODULE CODE		LAST EDIT		August 26, 2011 15:51:14 PM	PAGE 27 OF 51	PART NO. BA41-01761A

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# CRT LOGIC



Petronas J509 use 3701-001768

DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scala3-15	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP		GRAPHICS_IF	
APPROVAL	BL LEE	REV	REV 1.1		CRT	
MODULE CODE		LAST EDIT		August 26, 2011 15:51:14 PM	PAGE 28 OF 51	PART NO. BA41-01761A

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# HDMI Graphic

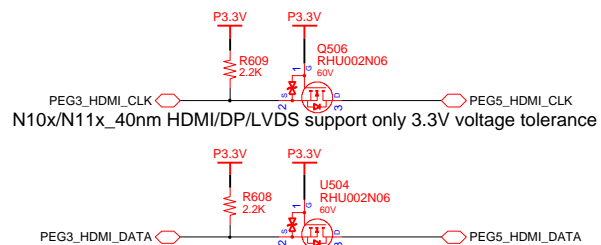
After checking, Houston need to use CMC for each signal.

(EMC request at 2010.04.15)

After checking, Veyron\_R don't need to use CMC for each signal.

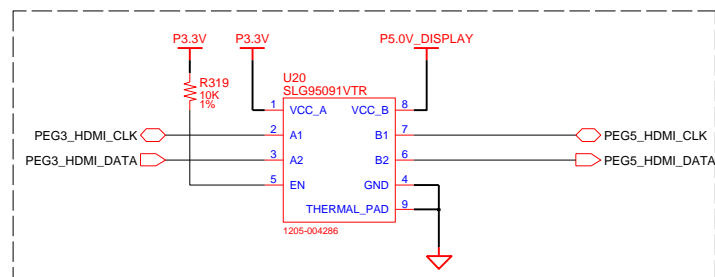
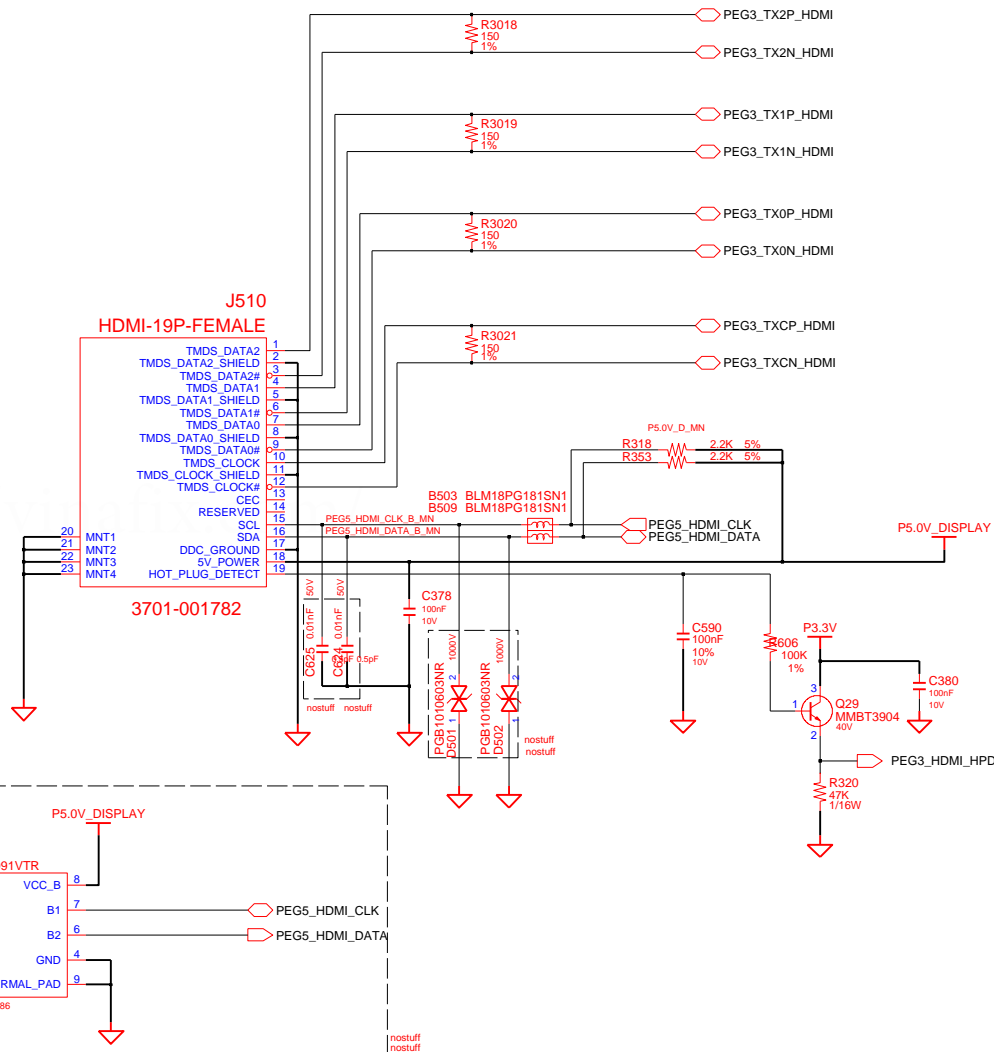
(EMC request at 2010.12.03)

## FOR HDMI VERIFICATION TEST



Petronas J510 use 3701-001758

## J510 HDMI-19P-FEMALE



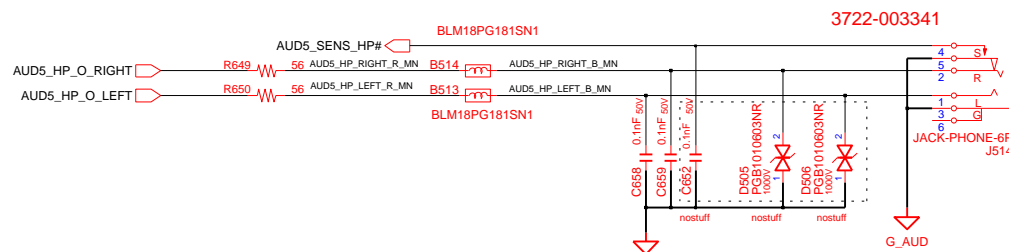
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CHECK	MK KIM	DEV. STEP	MP	GRAPHICS_IF	GRAPHICS_IF	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.1	HDMI	HDMI	PART NO.
MODULE CODE		LAST EDIT				BA41-01761A
				August 26, 2011 15:51:14 PM	PAGE 29	OF 51

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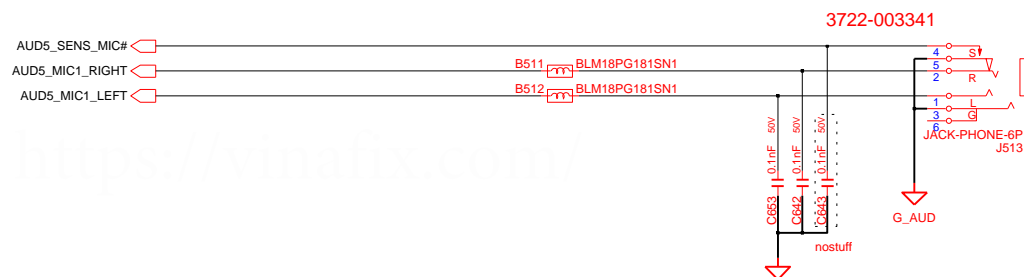
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## HEADPHONE

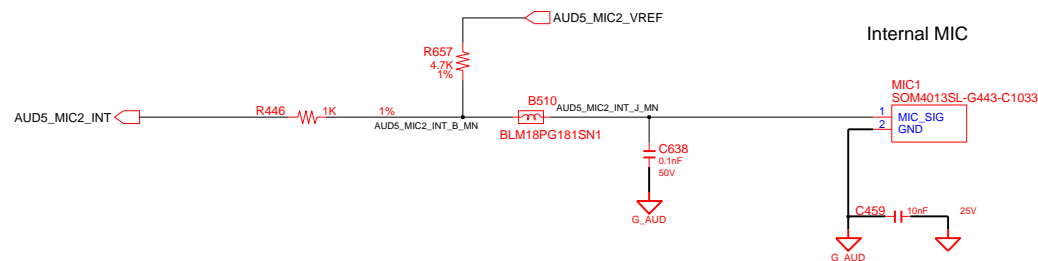


## MIC JACK



Petronas J513 J514 use 3722-003324

## Internal MIC



DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scala3-15	SAMSUNG
CHECK	MK KIM	DEV. STEP	MP		HDA_CODEC	ELECTRONICS
APPROVAL	BL LEE	REV	REV 1.1		AUDIO JACK	PART NO.
MODULE CODE		LAST EDIT				BA41-01761A
				August 26, 2011 15:51:14 PM	PAGE	31 OF 51





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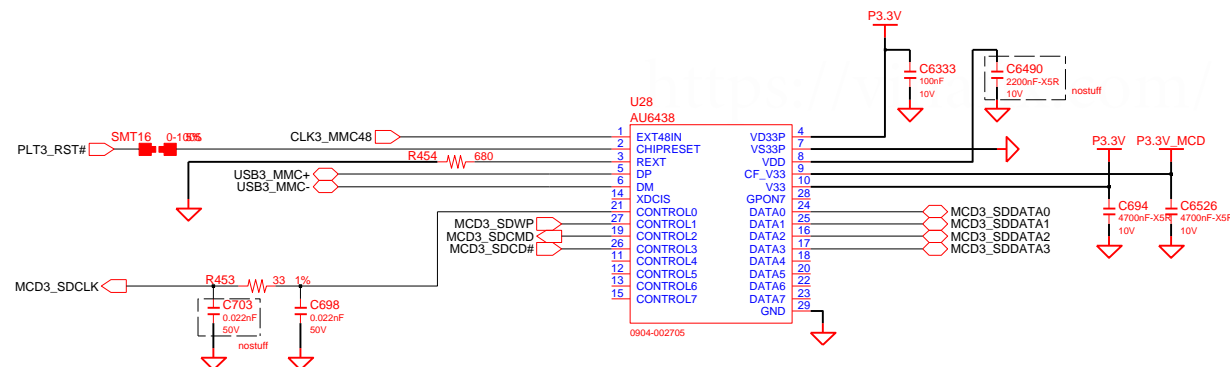
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# 4 IN 1 CARD

40mil pattern

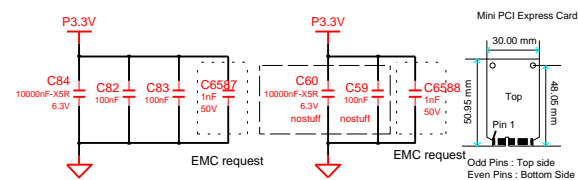
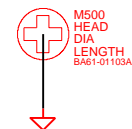
J2  
EDGE-SD-11P

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  
3709-001526



DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scala3-15 MULTICARD 3 IN 1 CARD(GL827S)	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			PART NO. BA41-01761A
APPROVAL	BL LEE	REV	REV 1.1			
MODULE CODE		LAST EDIT	August 26, 2011 15:51:14 PM	PAGE	33	OF 51

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[illegible][illegible]

DESIGN	MS YANG	DATE	3/11/2011	Scala3-15 MINI_PCIE_CONN WLAN	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV_STEP	MP		
APPROVAL	BL LEE	REV	REV 1.1		
PART NO.					
MODULE CODE	LAST EDIT			August 26, 2011 15:51:14 PM	PAGE 34 OF 51



SATA ODD CONN 15"

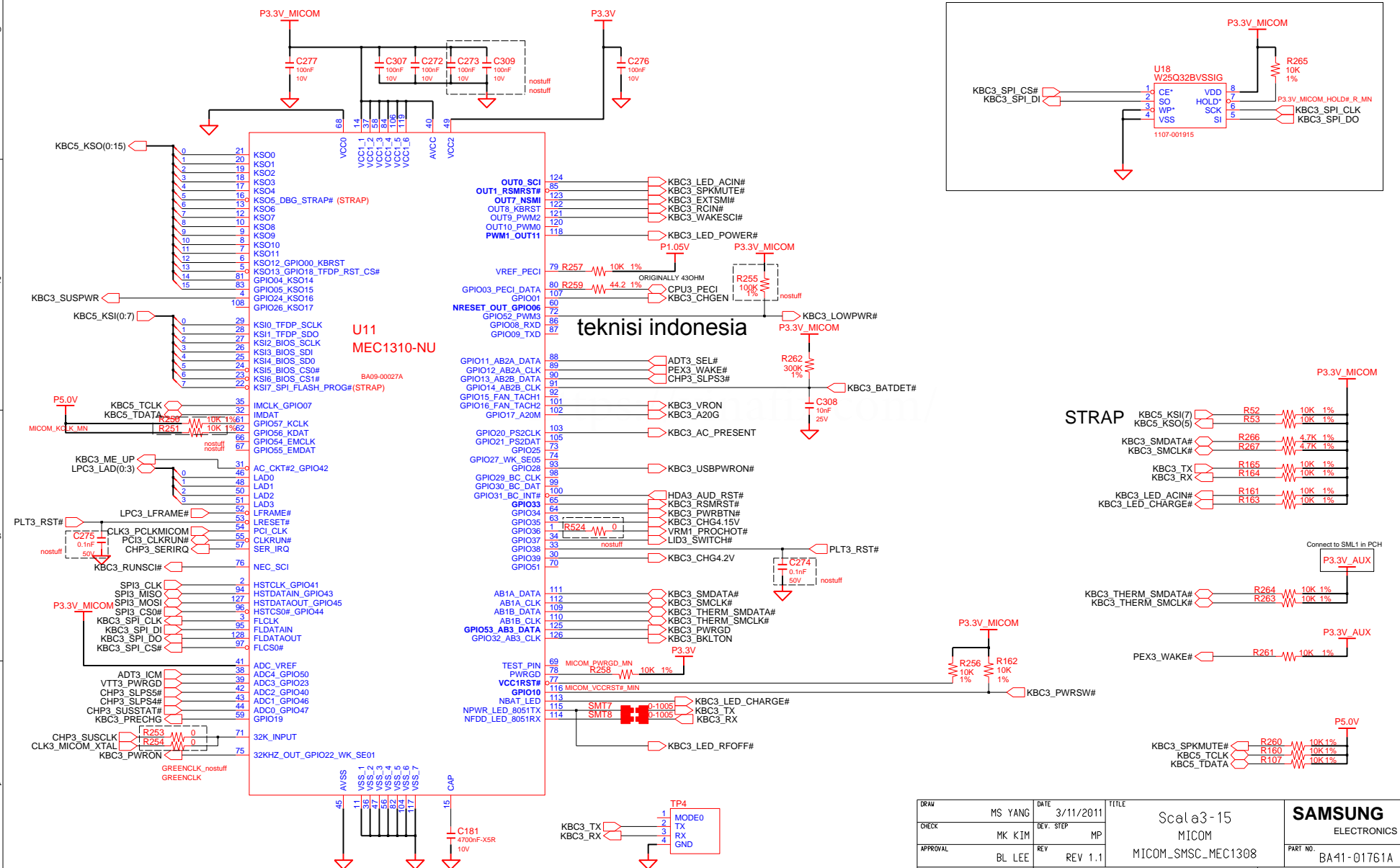


DESIGN	MS YANG	DATE	3/11/2011	TITLE  <b>Scala3-15</b> <b>SATA_DEVICES</b> <b>HDD &amp; ODD SUB CONNECTOR</b>	<b>SAMSUNG</b> ELECTRONICS	
CHECK	MK KIM	DEV. STEP	MP			
APPROVAL	BL LEE	REV	REV 1.1		PART NO.	BA41-01761A
MODULE CODE		LAST EDIT			August 26, 2011 15:51:14 PM	PAGE 35 OF 51

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# MAIN BOARD (MICOM)

BE CAUTION SPI ROM SIZE!!

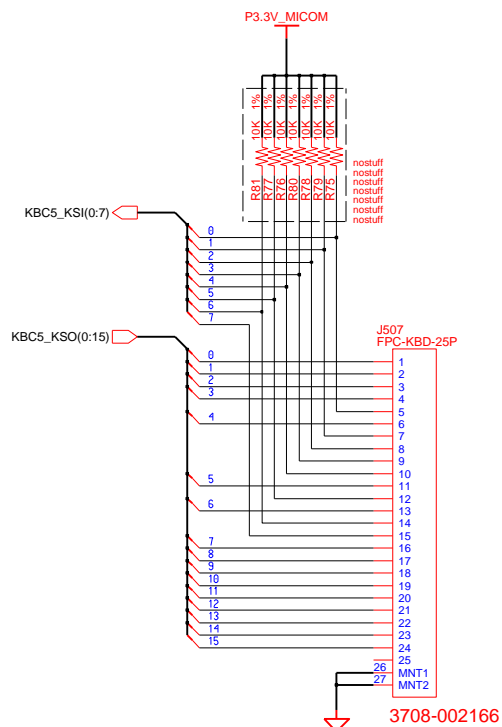


# SAMSUNG PROPRIETARY

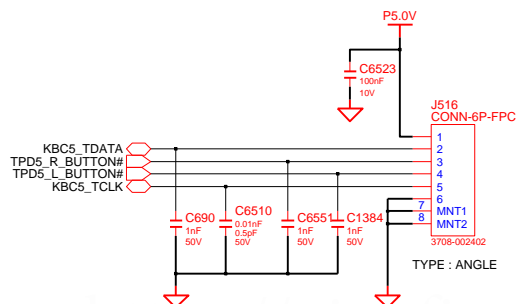
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## Micom Glue Logic

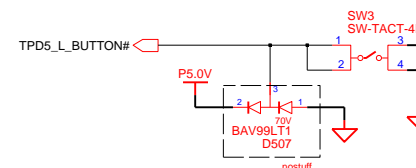
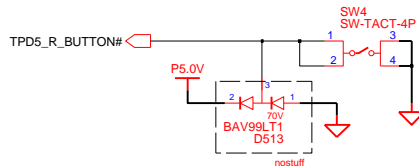
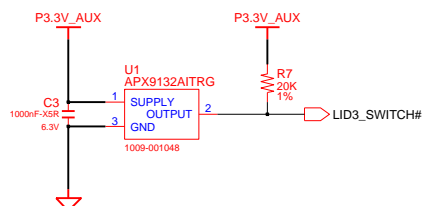
### KEYBOARD



### TOUCHPAD



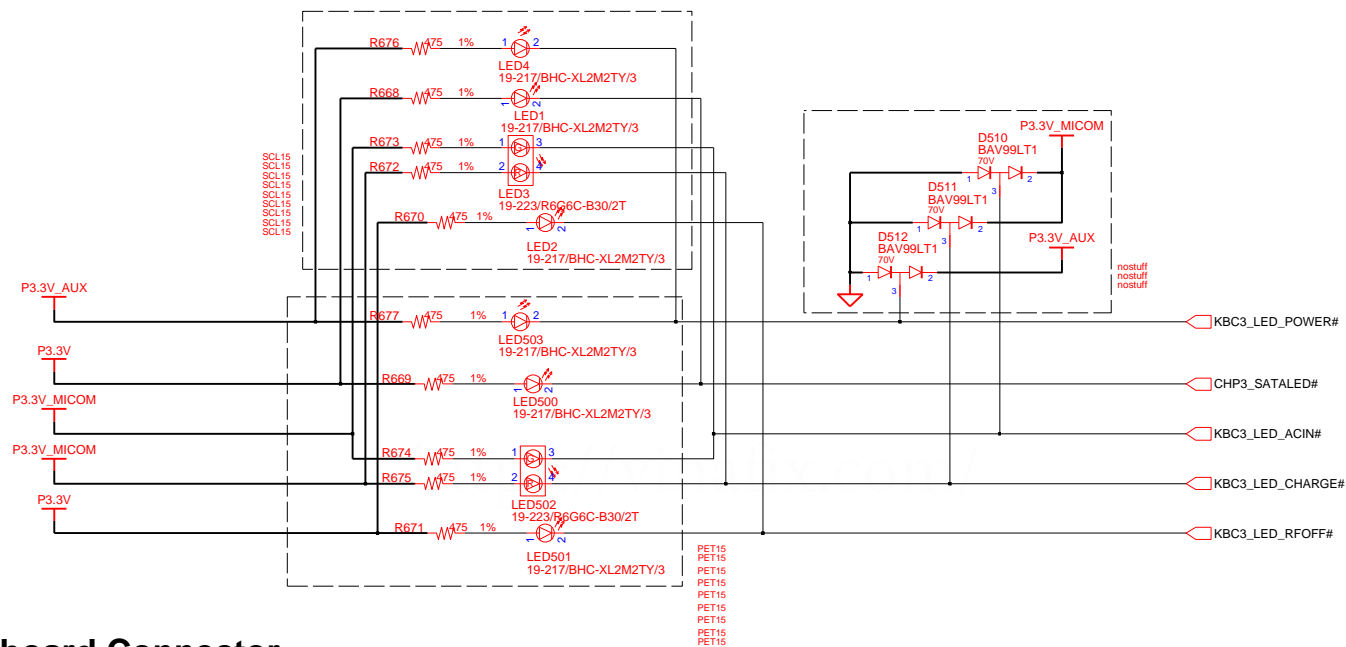
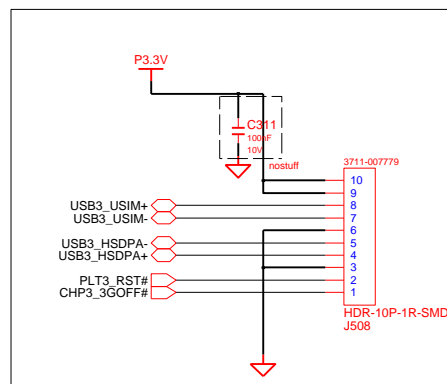
### LID\_SWITCH



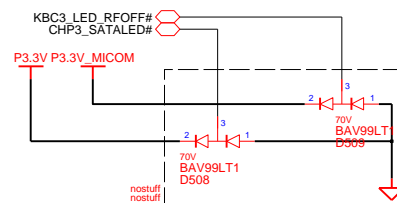
DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scala3-15 MICOM GLUE LOGIC KEYBOARD & TOUCHPAD	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			PART NO. BA41-01761A
APPROVAL	BL LEE	REV	REV 1.1			
MODULE CODE		LAST EDIT	August 26, 2011 15:51:14 PM	PAGE	37	OF 51

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**LED for 15"****HSPA Sub board Connector**

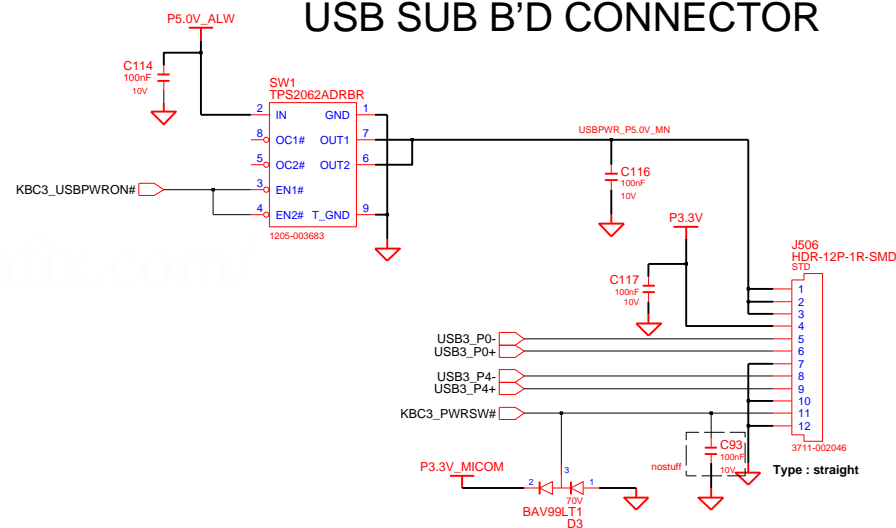
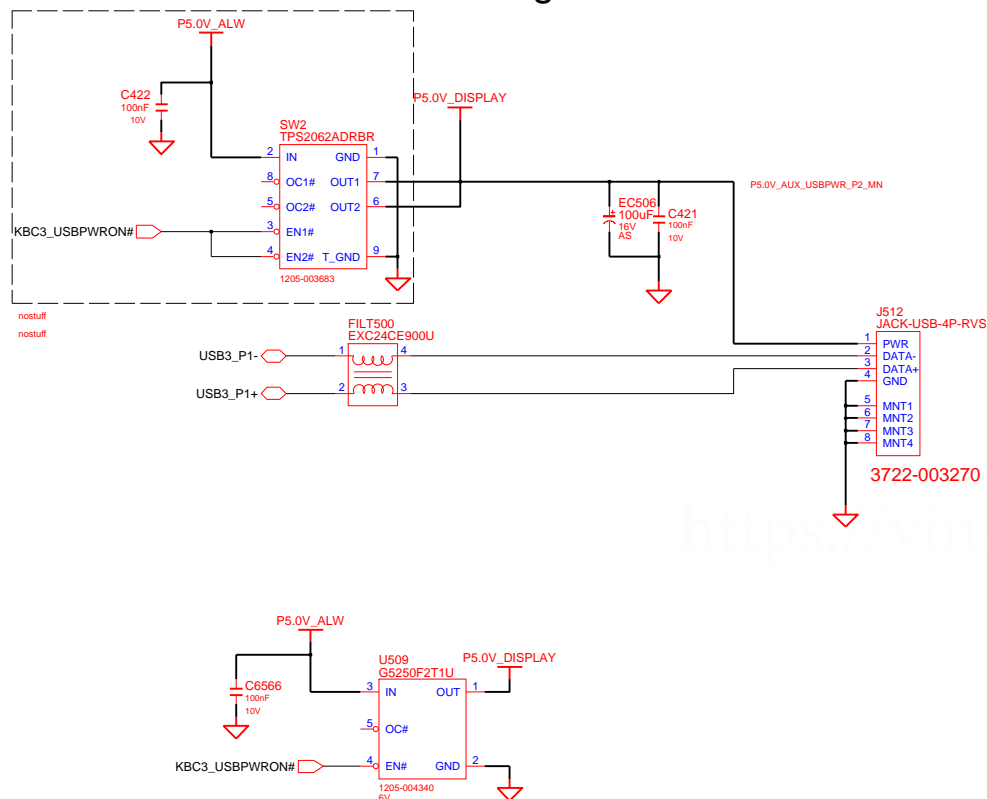
HSPA



DRAW	MS YANG	DATE	3/11/2011	TITLE	Scala3-15 LED_SWITCH	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			PART NO. BA41-01761A
APPROVAL	BL LEE	REV	REV 1.1		LED_SWITCH	
MODULE CODE		LAST EDIT		August 26, 2011 15:51:14 PM	PAGE 38 OF 51	

### Right 2USB Port

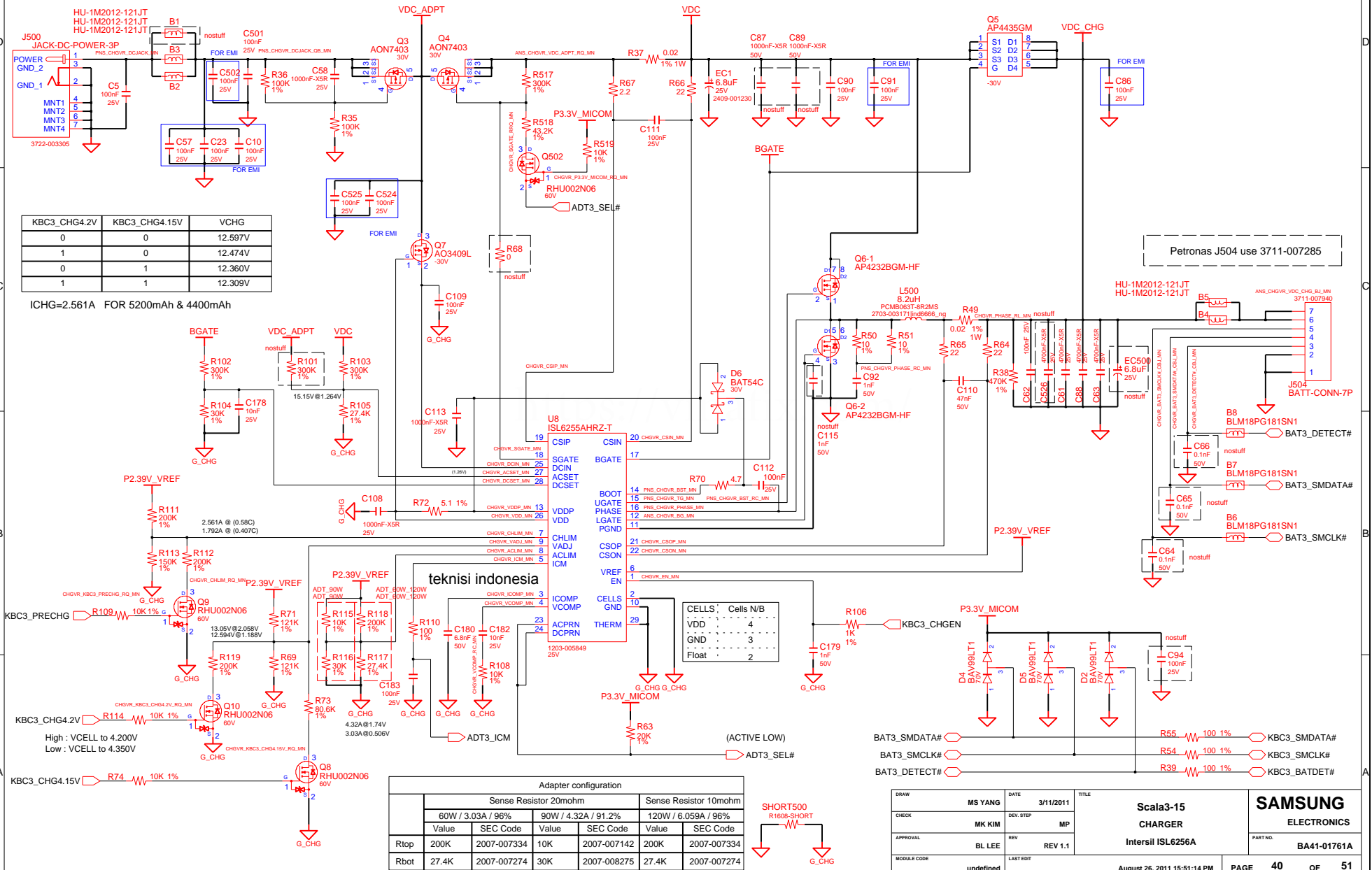
PLACE CLOSE TO USB SUB B'D Conenctor



DESIGN	MS YANG	DATE	3/11/2011	TITLE  Scala3-15 USB_CONN USB Port	SAMSUNG ELECTRONICS	PART NO.  BA41-01761A
CHECK	MK KIM	DEV. STEP	MP			
APPROVAL	BL LEE	REV	REV 1.1			
MODULE CODE	LAST EDIT					
				August 26, 2011 15:51:14 PM	PAGE 39	OF 51

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# CHARGER & POWER MANAGEMENT





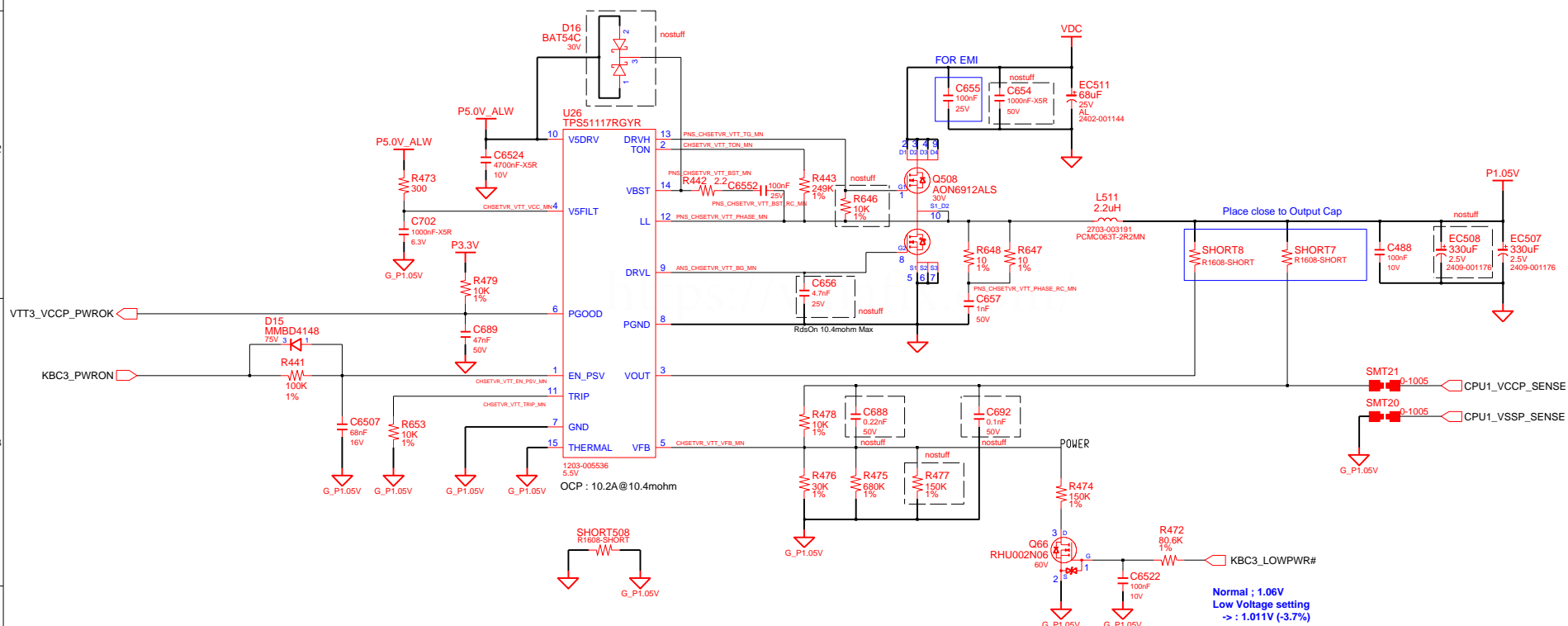
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[illegible]

COM-22C-015(1996.6.5) REV. 3 D:/users/ecad42/scal3-15/MP1.1/GB/Scal3-15\_MP1.

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DRAM	MS YANG	DATE	3/11/2011	TITLE	Scala3-15 P1.05V TI TPS51125	<b>SAMSUNG</b> ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			
APPROVAL	BL LEE	REV	REV 1.1			
MODULE CODE	undefined	LAST EDIT	August 26, 2011 15:51:14 PM			
				PART NO.	BA41-01761A	

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The schematic diagram illustrates the power management circuit for the TPS54319RTRT (U505). The IC is configured with the following components and connections:

- Input Section:**
  - P3.3V\_AUX:** Connected to VIN1, VIN2, and VIN3. Includes capacitors C633 (10000nF-XSR) and C634 (100nF).
  - P3.3V:** Connected to the PWRGD pin (14) via resistor R637 (2.2K) and capacitor C635 (100nF).
  - VTT3\_PWRGD:** Connected to the PWRGD pin (14).
  - VTT3\_VCCP\_PWROK:** Connected to the EN pin (15) via resistor R638 (10K) and capacitor C636 (100nF).
  - KBC3\_PWRON:** Connected to the RT\_CLK pin (8) via resistor R636 (100K) and capacitor C637 (100nF).
- Output Section:**
  - P0.8V\_VCCSA:** Connected to the AGND pin (5) via resistor R632 (22K) and capacitor C611 (100nF).
  - EC8:** 220uF electrolytic capacitor connected to the AGND pin (5).
  - C612:** 22000nF-XSR capacitor connected to the AGND pin (5).
  - C613:** 22000nF-XSR capacitor connected to the AGND pin (5).
- Feedback and Compensation:**
  - R635:** 1.91K resistor connected to the VSENSE pin (6) and the AGND pin (5).
  - R632:** 22K resistor connected to the AGND pin (5) and the AGND pin (5).
  - C629:** 2.2nF capacitor connected to the AGND pin (5) and the AGND pin (5).
  - R636:** 100K resistor connected to the AGND pin (5) and the AGND pin (5).
  - C637:** 100nF capacitor connected to the AGND pin (5) and the AGND pin (5).
- Other Components:**
  - L509:** 1.5uH inductor connected to the AGND pin (5) and the AGND pin (5).
  - D503:** MMSD4148 diode connected to the AGND pin (5) and the AGND pin (5).
  - SMT503:** 0-1005 capacitor connected to the AGND pin (5) and the AGND pin (5).

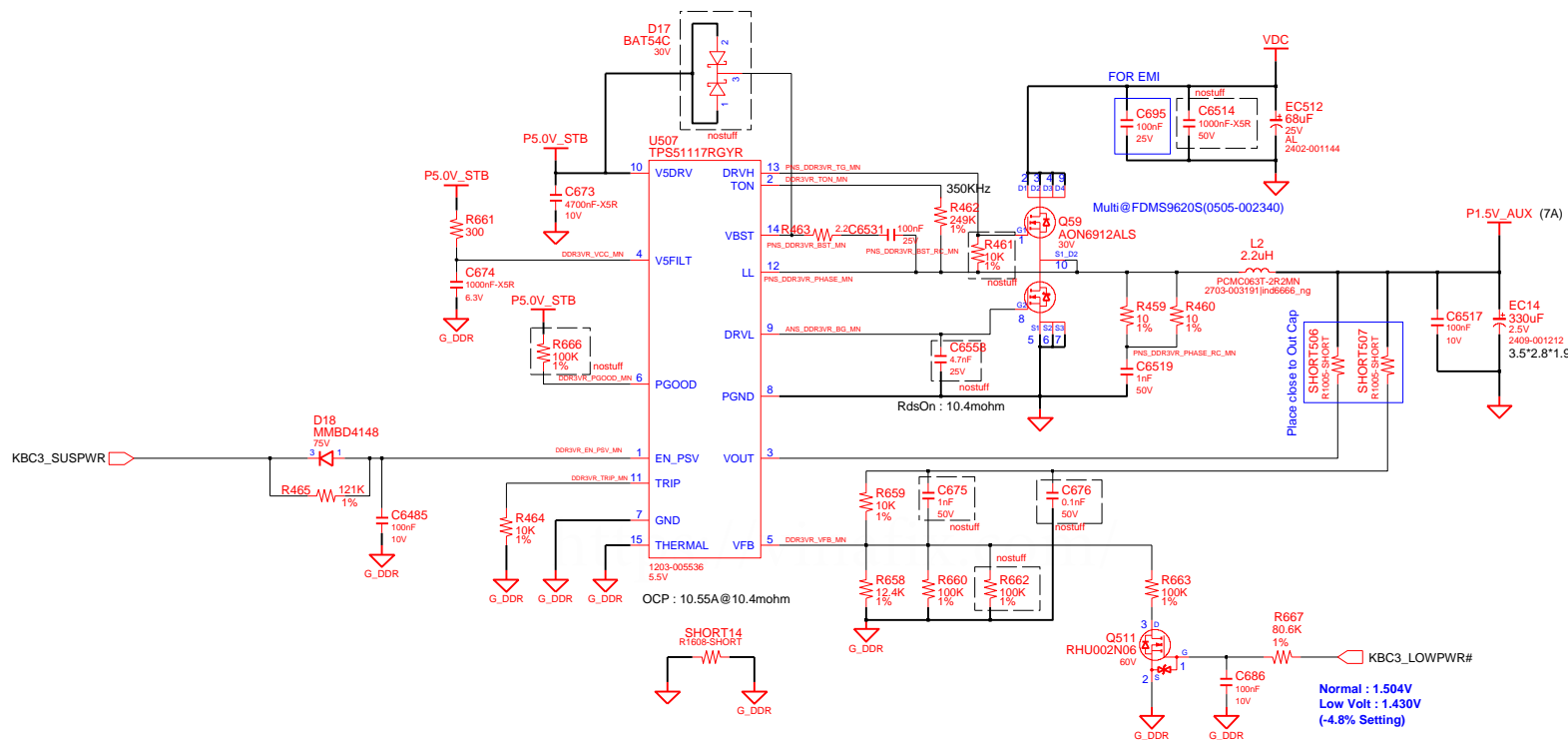
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DESIGN	MS YANG	DATE	3/11/2011	TITLE Scala3-15 P1.1V_VTT	<b>SAMSUNG</b> ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP		
APPROVAL	BL LEE	REV	REV 1.1		
MODULE CODE	LAST EDIT		August 26, 2011 15:51:14 PM		
				PART NO.	BA41-01761A

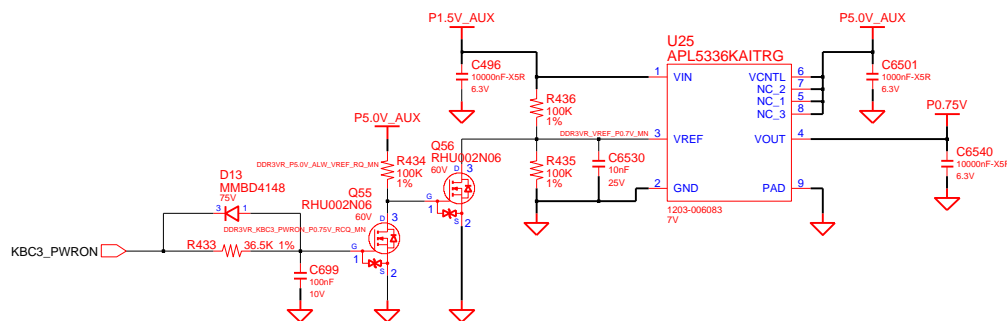
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## DDR3 Power



## DDR3 VTT(0.75V)



DRAW	MS YANG	DATE	3/11/2011	TITLE	Scala3-15 PWR_MEMORY DDR3 POWER	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP	REV	REV 1.1	PART NO. BA41-01761A
APPROVAL	BL LEE	LAST EDIT	August 26, 2011 15:51:14 PM	PAGE	44	OF 51
MODULE CODE	undefined					

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VRM1\_SVID\_DATA  
VRM1\_SVID\_ALERT#  
VRM1\_SVID\_CLK

SMT3

VRM1\_PROCHOT#

4 SDA  
5 G\_CPU  
6 ALERT#  
10 SCLK  
11 VRM1\_HOT#

[illegible]

**CPU Vrm (IMVP6.5)**

**Legend:**

- 2st ; AON6428
- Q12 AP0803GMT-HF 30V
- Q14 AP0803GMT-HF 30V
- Q11 AON6786 30V
- Q13 AON6786 30V
- Q15 AON6786 30V
- Q16 AON6786 30V
- Q17 AON6786 30V
- Q18 AON6786 30V
- Q19 AON6786 30V
- Q20 AON6786 30V
- Q21 AON6786 30V
- Q22 AON6786 30V
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- Q94 AON6786 30V
- Q95 AON6786 30V
- Q96 AON6786 30V
- Q97 AON6786 30V
- Q98 AON6786 30V
- Q99 AON6786 30V
- Q100 AON6786 30V

**Table:**

DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scal3-15
CHECK	MK KIM	DEV. STEP	MP	PWR_CPU_MV_TPS51621	
APPROVAL	BL LEE	REV	REV 1.1	CPU1 VRM (IMVP6.5)	
MODULE CODE	undefined	LAST EDIT			

**Table:**

DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scal3-15
CHECK	MK KIM	DEV. STEP	MP	PWR_CPU_MV_TPS51621	
APPROVAL	BL LEE	REV	REV 1.1	CPU1 VRM (IMVP6.5)	
MODULE CODE	undefined	LAST EDIT			

**Table:**

DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scal3-15
CHECK	MK KIM	DEV. STEP	MP	PWR_CPU_MV_TPS51621	
APPROVAL	BL LEE	REV	REV 1.1	CPU1 VRM (IMVP6.5)	
MODULE CODE	undefined	LAST EDIT			

**Table:**

DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scal3-15
CHECK	MK KIM	DEV. STEP	MP	PWR_CPU_MV_TPS51621	
APPROVAL	BL LEE	REV	REV 1.1	CPU1 VRM (IMVP6.5)	
MODULE CODE	undefined	LAST EDIT			

**Table:**

DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scal3-15
CHECK	MK KIM	DEV. STEP	MP	PWR_CPU_MV_TPS51621	
APPROVAL	BL LEE	REV	REV 1.1	CPU1 VRM (IMVP6.5)	
MODULE CODE	undefined	LAST EDIT			

**Table:**

DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scal3-15
CHECK	MK KIM	DEV. STEP	MP	PWR_CPU_MV_TPS51621	
APPROVAL	BL LEE	REV	REV 1.1	CPU1 VRM (IMVP6.5)	
MODULE CODE	undefined	LAST EDIT			

**Table:**

DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scal3-15
CHECK	MK KIM	DEV. STEP	MP	PWR_CPU_MV_TPS51621	
APPROVAL	BL LEE	REV	REV 1.1	CPU1 VRM (IMVP6.5)	
MODULE CODE	undefined	LAST EDIT			

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DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scal3-15
CHECK	MK KIM	DEV. STEP	MP	PWR_CPU_MV_TPS51621	
APPROVAL	BL LEE	REV	REV 1.1	CPU1 VRM (IMVP6.5)	
MODULE CODE	undefined	LAST EDIT			

**Table:**

DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scal3-15
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DRAW	MS YANG	DATE	3/11/2011	Scala3-15  PWR_CPU_MV_TPS51621  CPUI VRM (IMVP6.5)		SAMSUNG  ELECTRONICS			
CHECK	MK KIM	DEV. STEP	MP						
APPROVAL	BL LEE	REV	REV 1.1						
MODULE CODE		LAST EDIT		August 26, 2011 15:51:14 PM		PAGE	45	OF	51

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**U21 ISL95870B**

**GV Booting Voltage ; 0.85V**  
**VID1 ; High , VID2 : Low**

**Table 1: Component Values for Different Output Voltages**

VID1	VID0	N12P-GVR	Design Value	N12M-GE	Design Value
1	1		0.828V		0.82V
1	0	0.85V	0.852V	0.85V	0.853V
0	1	0.95V	0.956V		0.95V
0	0	1.075V	1.075V	1.00V	1.006V

**Table 2: Component Values for Different Output Currents**

Component	N12P-GVR	N12M-GE
R337	2007-007937 17.4K	2007-007274 27.4K
R360	2007-007937 17.4K	2007-007274 27.4K
R332	2007-007142 10K	2007-007312 20K
R333	2007-007843 36.5K	2007-002912 33.2K
R334	2007-002912 33.2K	2007-007521 14.7K

**N12P-GVR@20W**

**Table 3: Component Values for N12P-GVR@20W**

Component	Value
R337	2007-007937 17.4K
R360	2007-007937 17.4K
R332	2007-007142 10K
R333	2007-007843 36.5K
R334	2007-002912 33.2K

**Table 4: Component Values for N12M-GE**

Component	Value
R337	2007-007274 27.4K
R360	2007-007274 27.4K
R332	2007-007312 20K
R333	2007-002912 33.2K
R334	2007-007521 14.7K

	N12P-GVR	N12M-GE
R337	2007-007937 17.4K	2007-007274 27.4K
R360	2007-007937 17.4K	2007-007274 27.4K
R332	2007-007142 10K	2007-007312 20K
R333	2007-007843 36.5K	2007-002912 33.2K
R334	2007-002912 33.2K	2007-007521 14.7K

N12P-GVR@20W

VID1	VID0		N12P-GVR	Design Value	N12M-GE	Design Value
1	1			0.828V		0.82v
1	0		0.85V	0.852V	0.85v	0.853V
0	1			0.95V		0.95v
0	0			1.075V		1.075V
					1.00V	1.006V

DRAW MS YANG		DATE 3/11/2011	TITLE Scala3-15 PWR_MV_SWITCHED SWITCHED POWER		SAMSUNG ELECTRONICS PART NO. BA41-01761A	
CHECK MK KIM		DEV. STEP MP				
APPROVAL BL LEE		REV REV 1.1				
MODULE CODE		LAST EDIT August 26, 2011 15:51:14 PM				

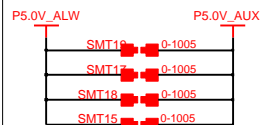
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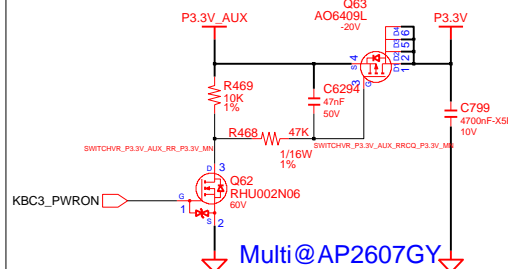
# Switched Power 1

(P5.0V -> P3.3V -> EGFX\_CORE -> P1.8V -> P1.5V -> P0.75V -> P1.05V -> P0.85V\_SA -> CPU\_CORE)

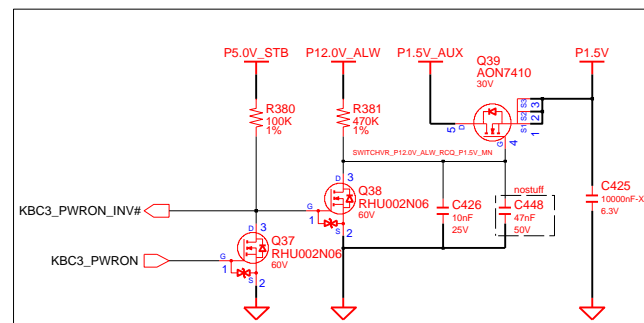
## P5.0V\_AUX



## Switched Power On (P3.3V)

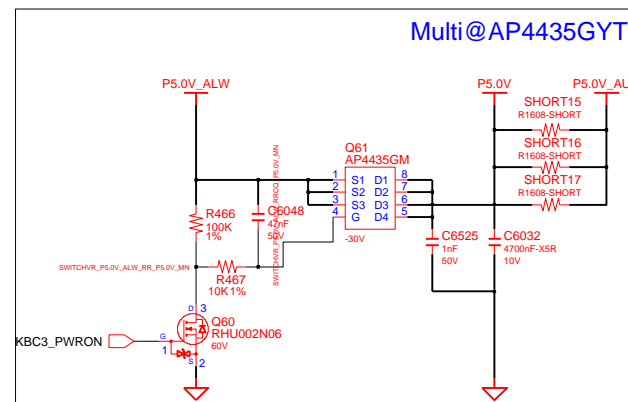


## Switched Power On (P1.5V)



For nVIDIA GFX PWR Sequence  
NVDD(EGFX\_CORE) first and then FBVDDQ(qDDR3)

## Switched Power On (P5.0V)



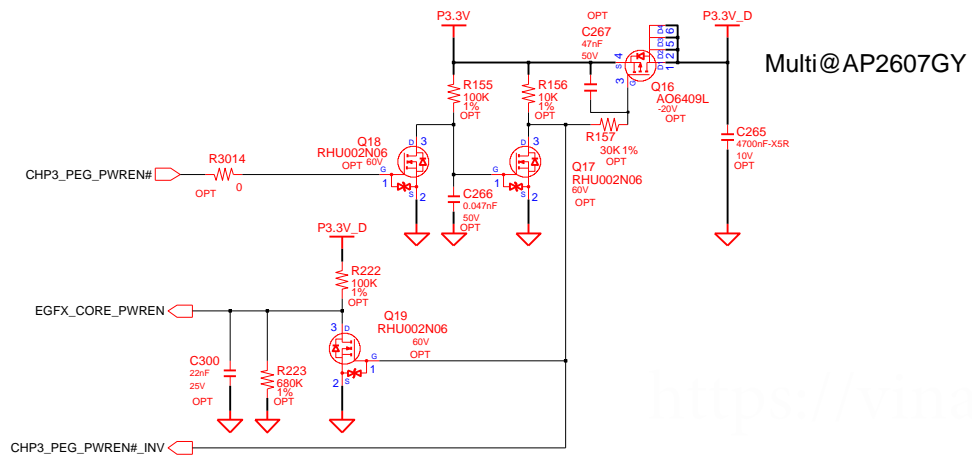
DRAW	MS YANG	DATE	3/11/2011	Scala3-15 PWR_MV DISCHARGER DISCHARGING LOGIC		SAMSUNG ELECTRONICS	
CHECK	MK KIM	DEV. STEP	MP				
APPROVAL	BL LEE	REV	REV 1.1				
				PART NO.		BA41-01761A	
MODULE CODE		undefined		LAST EDIT		August 26, 2011 15:51:14 PM	
				PAGE		47 OF 51	

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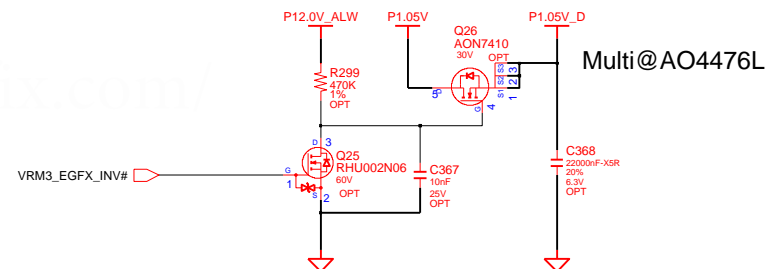
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## Switched Power 2 (For nVidia GFX Power Sequence)

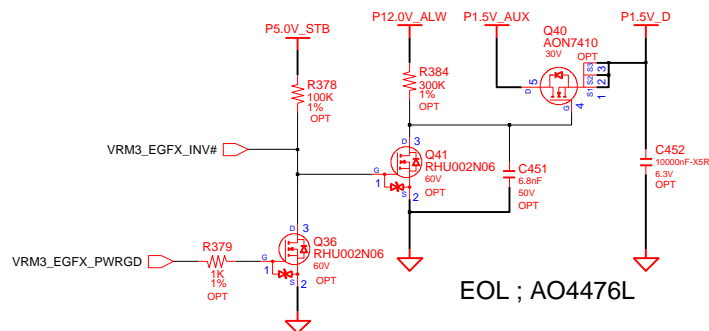
### Discrete Switched Power (D3.3V : Max\_1.2A)



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



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



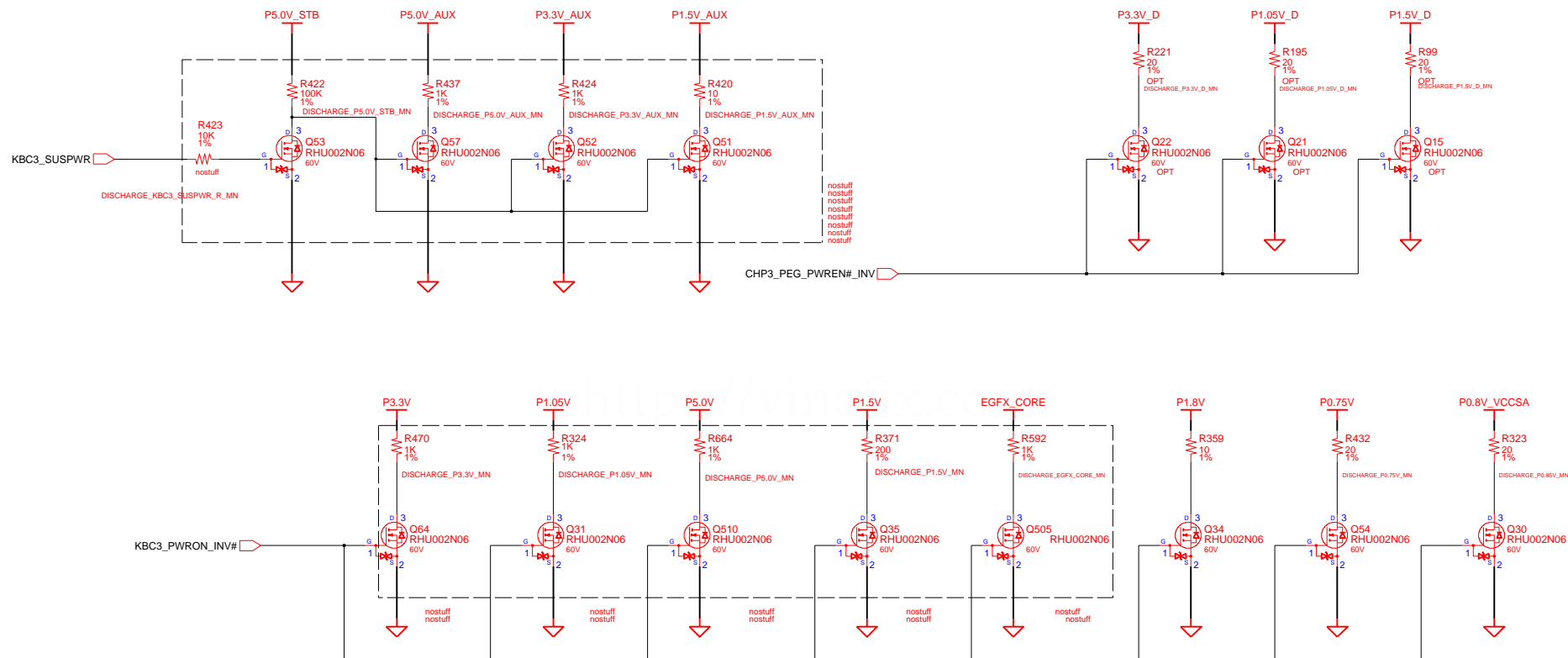
DRAW	MS YANG	DATE	3/11/2011	TITLE	Scala3-15	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP	Switched PWR 2		
APPROVAL	BL LEE	REV	REV 1.1	FOR OPTIMUS PWR	PART NO. BA41-01761A	
MODULE CODE		LAST EDIT		August 26, 2011 15:51:14 PM	PAGE 48 OF 51	



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# POWER DISCHARGER

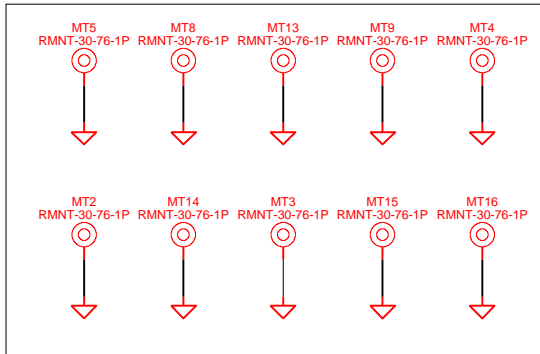


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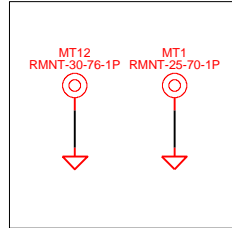
DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scala3-15 SUB BOARD1 2 USB & POWER SW	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			PART NO. BA41-01761A
APPROVAL	BL LEE	REV	REV 1.1			
MODULE CODE		LAST EDIT	August 26, 2011 15:51:14 PM	PAGE	49	OF 51

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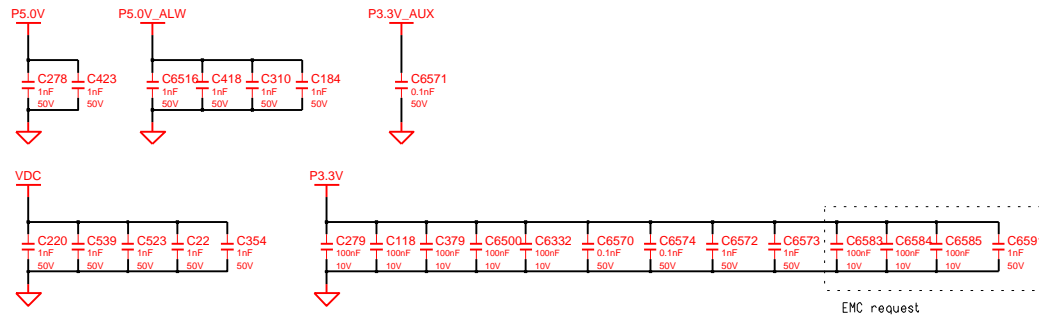
### Mainboard Mount ((30-76)X8EA)



### PCB FIX



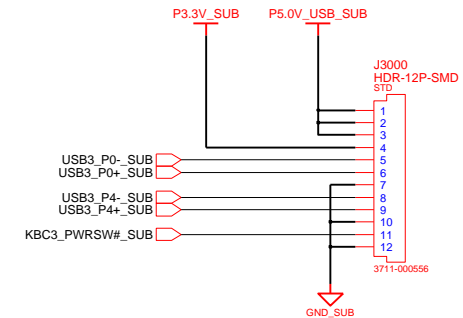
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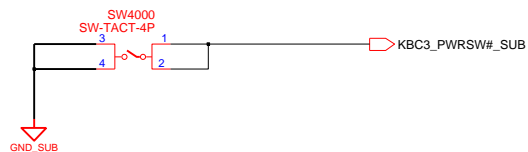
DESIGN	MS YANG	DATE	3/11/2011	TITLE	Scala3-15 SUB BOARD	SAMSUNG ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP			
APPROVAL	BL LEE	REV	REV 1.1		SUB BOARD	PART NO. BA41-01761A
MODULE CODE		LAST EDIT	August 26, 2011 15:51:14 PM	PAGE	50	OF 51

# USB SUB BOARD

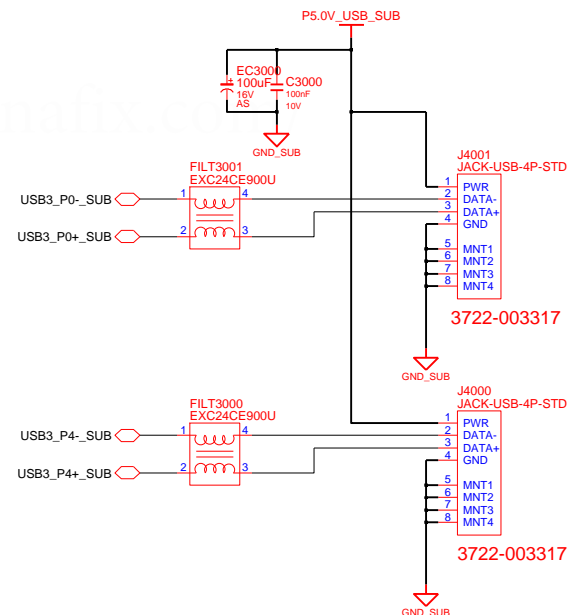
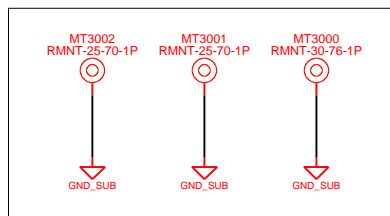
**SUB TO MAIN**



## Power Switch Button



### PCB Mount



PLACE CLOSE TO USB SUB B'D Conenctor

DESIGN	MS YANG	DATE	3/11/2011	TITLE		Scala3-15 SUB BOARD	<b>SAMSUNG</b> ELECTRONICS
CHECK	MK KIM	DEV. STEP	MP				
APPROVAL	BL LEE	REV	REV 1.1			SUB BOARD	PART NO. BA11-01761A
MODULE CODE			LAST EDIT	August 26, 2011 15:51:14 PM		PAGE	51 OF 51