

NETWORK INFRASTRUCTURE  
DESIGN CENTER

ASPEN CPU BOARD

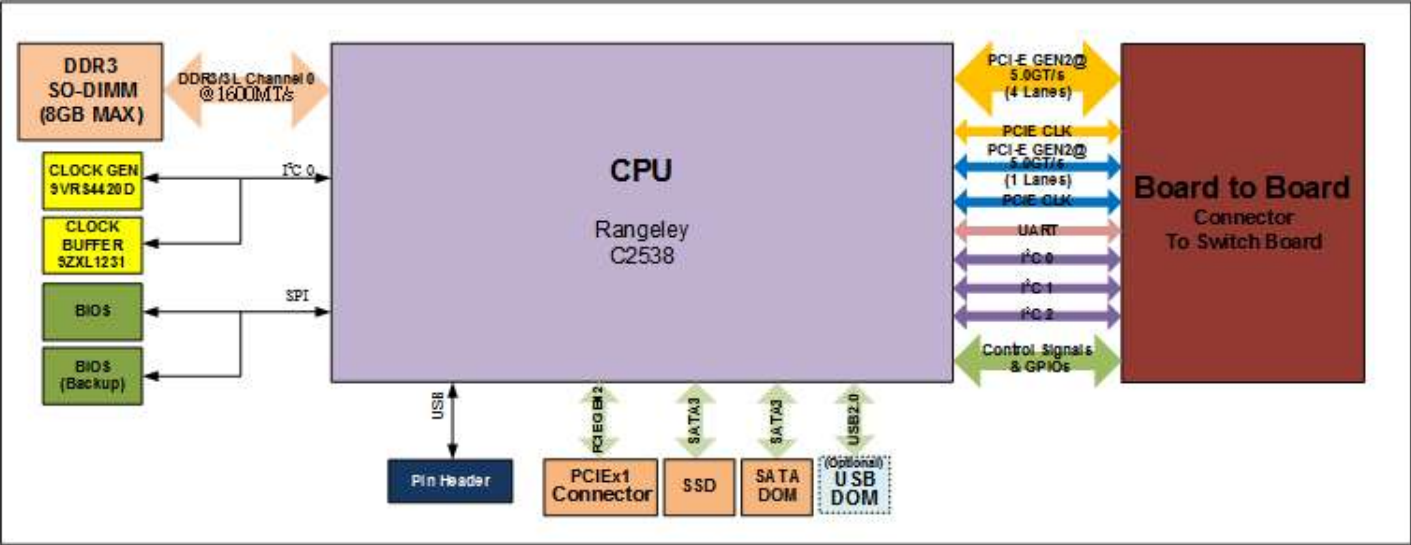
PCA NO. : 1.395A27.37001 (X01)  
PCB NO. : 6050A27.37001 (A01)  
REV : 1.00  
DATE : 2014/12/24

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INVENTEC				DRN. XXX	DATE 3-DEC-2014	TITLE: SCHEMATIC, MODEL, PROJECT, FUNCTION			
ENG. XXX		DATE 3-DEC-2014		CHK. D. XXX		DATE 3-DEC-2014			
SHEET 1		OF 48		PCB NUMBER 6050A2737001		REV XXX		SIZE B	
		FRI Dec 26 13:36:35 2014		2014A2737001				DOCUMENT NUMBER K-CS-1395A2737001	
								REV 1.00	

B		7	6	5	4	3	2	1		
D	1. TITLE PAGE				25. RESET CONTROL					
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B	9. CPU_C2538\RTC & BIOS(SPI+PROG HEADER)				33. P12V TO PVCC_CPU & PVNN (1 OF 3)					
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	12. CPU_C2538\DDR3 CHANNEL 1				36. P3V3 TO P1V35_CPU					
A	13. CPU_C2538\PCIE GEN2 (16 LANES)				37. P3V3 TO P1V5_CLK					
	14. CPU_C2538\GBE CONTROLLER\GPIO SUS				38. P5V TO P3V3_CPU					
	15. CPU_C2538\SATA & USB				39. P5V TO P1V8_CPU					
	16. CPU_C2538\POWER 1				40. PVRRDA TO P0V75_DDR3					
17. CPU_C2538\POWER 2				41. P5V TO P1V07_CPU						
18. CPU_C2538\GROUND				42. P12V TO P5V						
19. CPU POWER SEQUENCE CONTROL 1				43. P12V TO P3V3						
20. CPU POWER SEQUENCE CONTROL 2				44. P12V TO P1V_CPU						
21. CLOCK GEN IDT 9VRS4420				45. P12V POWER GOOD						
22. CLOCK BUFFER IDT 9ZXL1231				46. THERMAL SENSOR & MOUNTING HOLES						
23. BOARD TO BOARD CONNECTOR				47. GOUPON (1 OF 2)						
24. USB PORT HEADER				48. GOUPON (2 OF 2)						
MODULE=HEADER FUNCTION=INDEX				INVENTEC CONFIDENTIAL DO NOT COPY				ENG. xxx    DATE 3-DEC-2014    TITLE: SCHEMATIC, SHEET 2 OF 48    MODEL, PROJECT, FUNCTION Fri Dec 25 13:36:35 2014		
				PCB NUMBER 6050A2737001		REV XXX		SIZE B	DOCUMENT NUMBER K-CS-1395A2737001-0-0	REV X01
B		7	6	5	4	3	2	1		

HARDWARE BLOCK DIAGRAM



MODULE=HEADER  
FUNCTION=HARDWARE BLOCK DIAGRAM

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ENG.   XXX	DATE 3-DEC-2014	TITLE:           SCHEMATIC, MODEL, PROJECT, FUNCTION		
SHEET   3           OF   48 Fri Dec 26 13:36:35 2014				
PCB NUMBER 6050A2737001		REV XXX	SIZE           DOCUMENT NUMBER B           K-CS-1395A2737001-0-0	REV X01

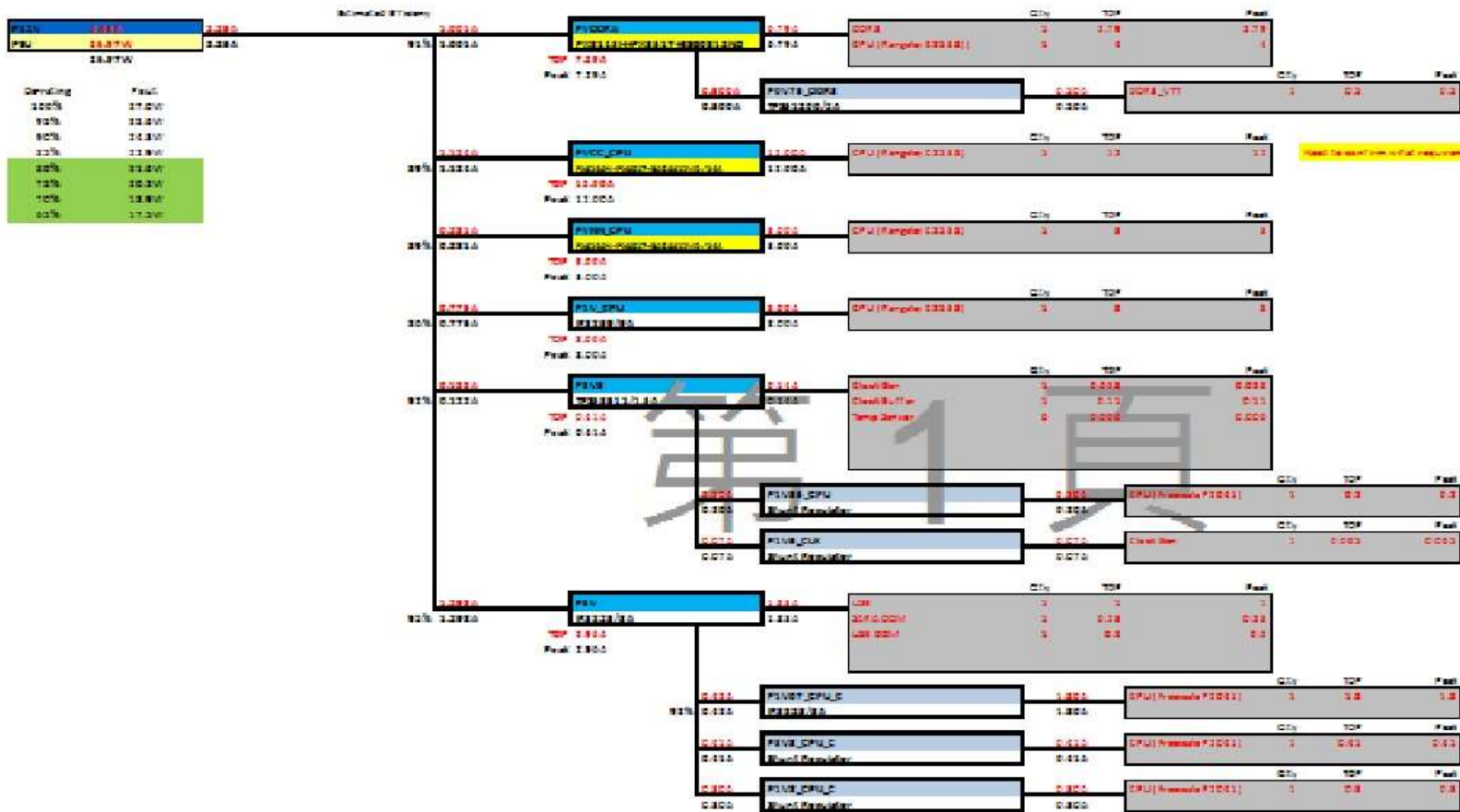
POWER DISTRIBUTION DIAGRAM (1/2)

Redwood/Aspen Power Budget

Create by: Chris Wu  
Revision: AX001  
Date: 11/24/2014

PS1V

XXX for Inventec Internal Reference Only XXX



MODULE=HEADER  
FUNCTION=POWER DISTRIBUTION DIAGRAM

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ENG. XXX	DATE 3-DEC-2014	TITLE: SCHEMATIC, MODEL, PROJECT, FUNCTION
SHEET 4 OF 48	Rev: Dec 25 13:36:35 2014	
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		REV X01

# POWER DISTRIBUTION DIAGRAM (2/2)

Create by: Chris Wu  
Revision : AX0.1  
Date : 11/24/2014

	Power Rail	VRD solution	Power up Sequence	Level	VRD type	Estimated Eff (%)	Input Voltage (V)	Estimated Input current (A)	Estimated Input power (W)	Output (V)	Output current (A)	Output Power (W)	VRD power loss (W)	Schematic Page
<b>CPU Board (P2041)</b>														
1	P1V5_DDR3_P	PXB143H+PX3517+BSG0812ND		0	SW	91.0%	12.0	0.45	5.42	1.50	3.29	4.94	0.49	37-38
2	P0V75_DDR3_P	TP551200/2A		1	LDO	—	1.5	0.50	0.75	0.75	0.50	0.38	0.38	43
3	PVCC_CPU_P	PX3240H+PX3517+BSG0812ND/24A		0	SW	91.0%	12.0	1.48	17.80	1.00	16.20	16.20	1.60	39-41
4	P3V3_P	TP553511/1.5A		0	SW	92.0%	12.0	0.08	1.02	3.30	0.28	0.93	0.08	45
5	P5V	IR3823/3A		0	SW	95.0%	12.0	1.14	13.68	5.00	2.60	13.00	0.68	44
6	P1V5_CPU_P	IR3823/3A		0	SW	95.0%	12.0	0.95	11.40	1.00	1.58	1.58	9.82	42
<b>CPU Board (C2538)</b>														
7	PVDDR4	PXB143H+PX3517+BSG0812ND		0	SW	91.0%	12.0	1.00	12.02	1.50	7.29	10.94	1.08	31-32
8	P0V75_DDR3	TP551200/2A		1	LDO	—	1.5	0.50	0.75	0.75	0.50	0.38	0.38	40
9	PVCC_CPU	PX3240H+PX3517+BSG0812ND/24A		0	SW	89.0%	12.0	1.12	13.48	1.00	12.00	12.00	1.48	33-35
10	PVNN_CPU	PX3240H+PX3517+BSG0812ND/24A		0	SW	89.0%	12.0	0.28	3.37	1.00	3.00	3.00	0.37	33-35
11	P1V_CPU	IR3859/9A		0	SW	86.0%	12.0	0.75	9.30	1.00	8.00	8.00	1.30	44
12	P3V3	TP553511/1.5A		0	SW	92.0%	12.0	0.12	1.47	3.30	0.41	1.35	0.12	43
13	P1V35_CPU	Shunt Regulator		1	LDO	—	3.3	0.20	0.66	1.35	0.20	0.27	0.39	38
14	P1V5_CLK	Shunt Regulator		1	LDO	—	3.3	0.07	0.21	1.50	0.07	0.10	0.12	37
15	P5V	IR3823/3A		0	SW	85%	12.0	1.30	15.57	5.00	2.96	14.79	0.78	42
16	P1V07_CPU_C	IR3823/3A		1	SW	92%	5.0	0.42	2.09	1.07	1.80	1.93	0.17	41
17	P3V3_CPU_C	Shunt Regulator		1	LDO	—	5.0	0.41	2.05	3.30	0.41	1.35	0.70	38
18	P1V8_CPU_C	Shunt Regulator		1	LDO	—	5.0	0.30	1.50	1.80	0.30	0.54	0.96	39

MODULE=HEADER  
FUNCTION=POWER DISTRIBUTION DIAGRAM

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ENG. XXX	DATE 3-DEC-2014	TITLE: SCHEMATIC,	
SHEET 5	OF 48	MODEL, PROJECT, FUNCTION	
Fri Dec 26 13:36:35 2014			
PCB NUMBER 6050A2737001	REV XXX	SIZE B	DOCUMENT NUMBER K-CS-1395A2737001-0-0
			REV X01



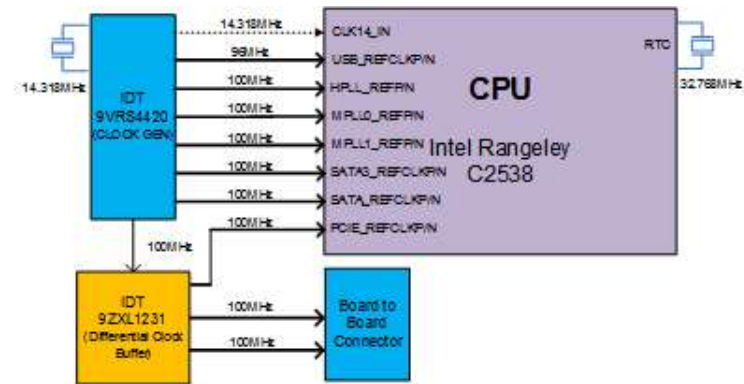
RESERVED

MODULE=HEADER  
FUNCTION=RESET/POWER TOPOLOGY

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ENG. XXX	DATE 3-DEC-2014	TITLE: SCHEMATIC,		
SHEET 7	OF 48	MODEL, PROJECT, FUNCTION		
Fri Dec 26 13:36:35 2014				
PCB NUMBER 6050A2737001	REV XXX	SIZE B	DOCUMENT NUMBER K-CS-1395A2737001-0-0	REV X01

CLOCK TOPOLOGY



MODULE=HEADER  
FUNCTION=CLOCK TOPOLOGY

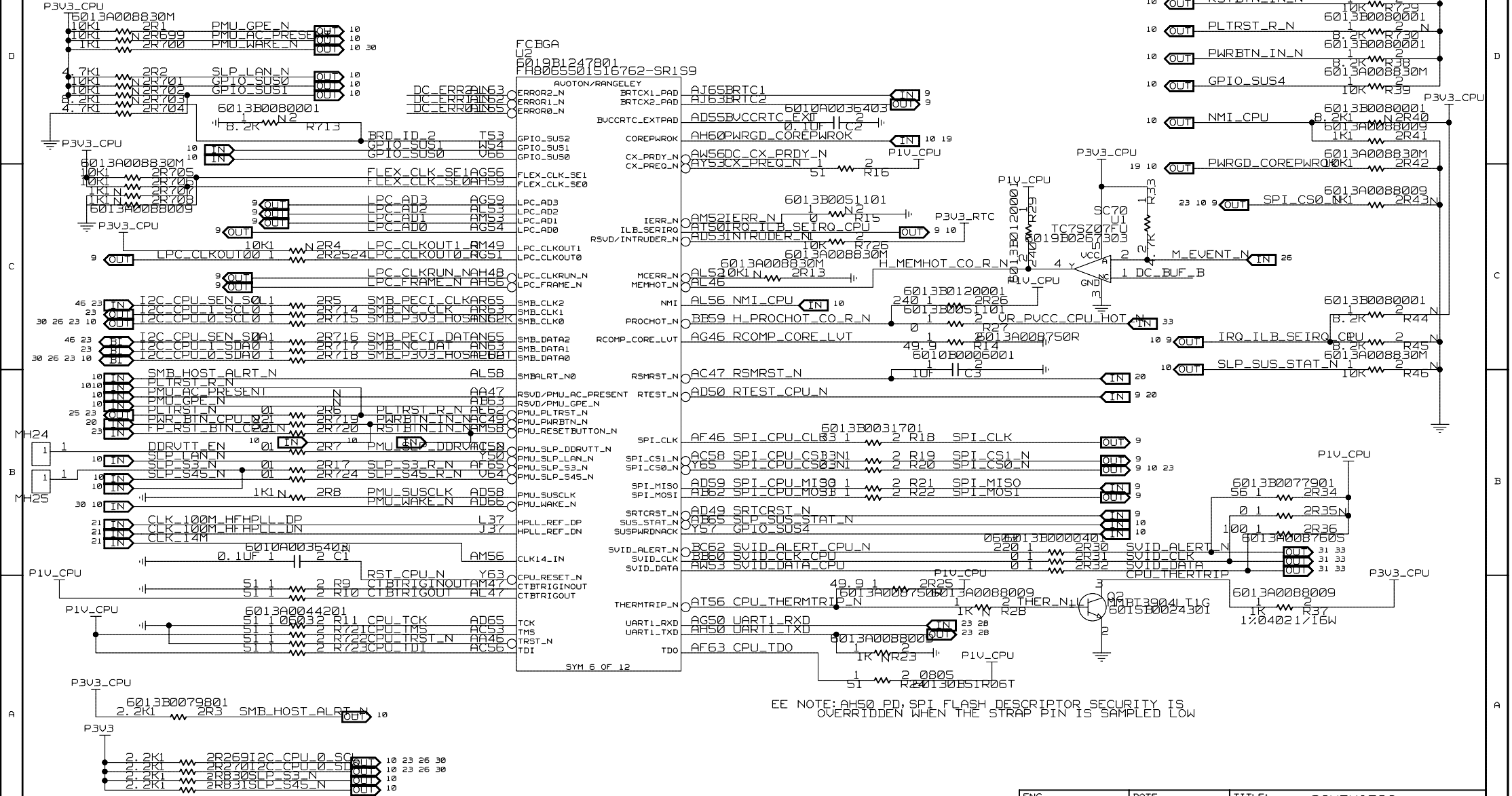
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ENG. XXX	DATE 3-DEC-2014	TITLE: SCHEMATIC, MODEL, PROJECT, FUNCTION		
SHEET B	OF 4B			
Fri Dec 26 13:36:35 2014				
PCB NUMBER 6050A2737001	REV XXX	SIZE B	DOCUMENT NUMBER K-CS-1395A2737001-0-0	REV X01





# CPU C25.38 (2 OF 10) LPC\_SMB\_MISC\_SPI



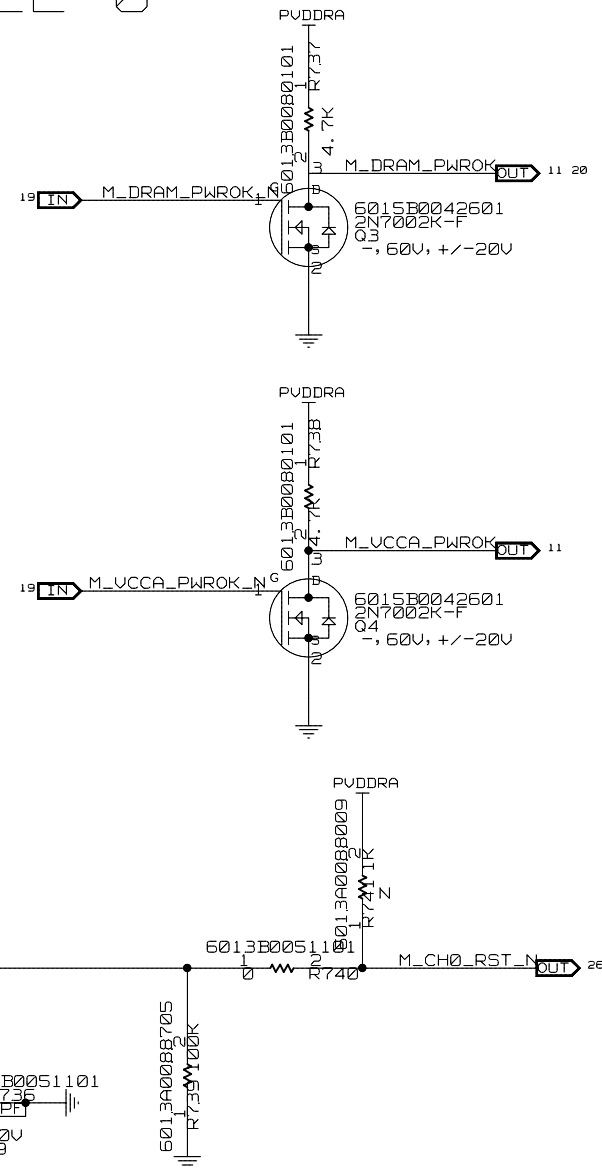
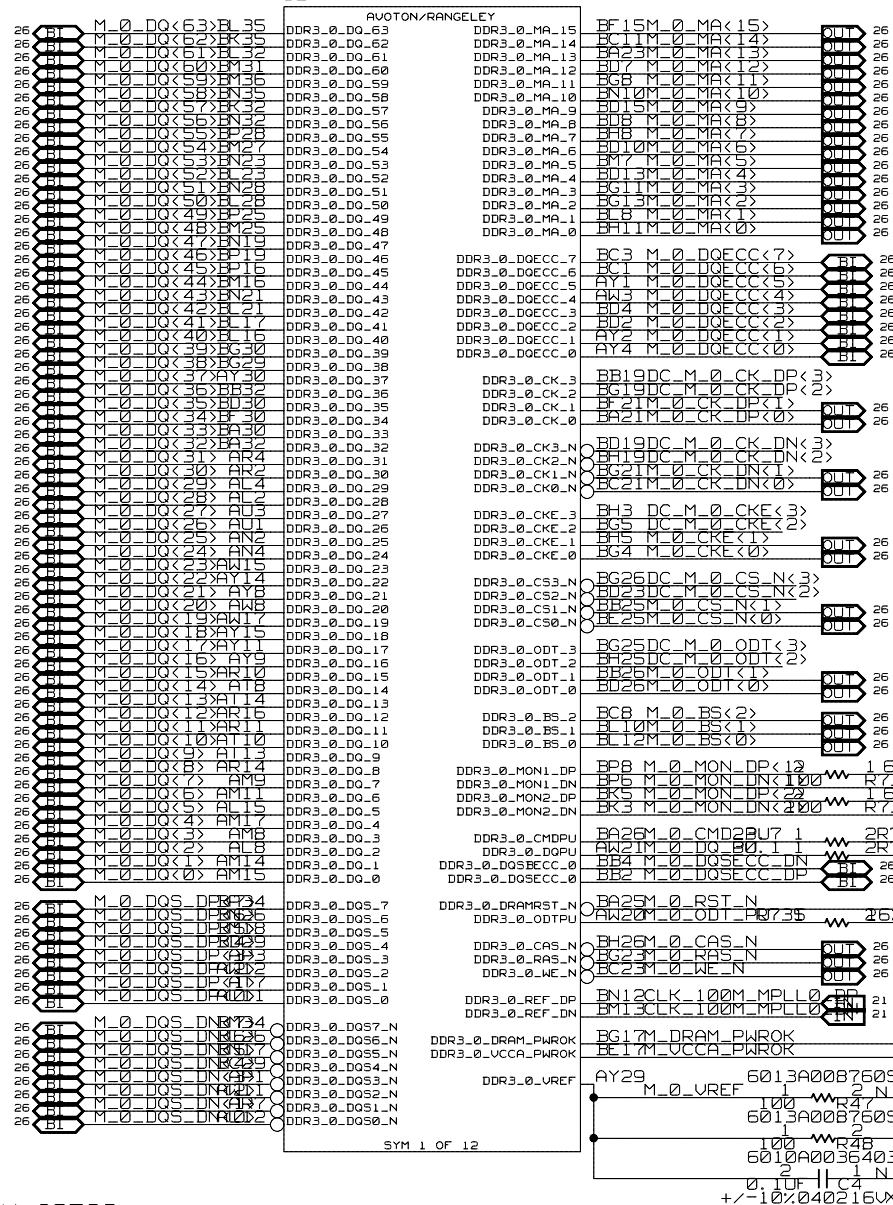
MODULE=CPU\_C2538  
FUNCTION=LPC & SMB & MISC & SPI

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ENG. XXX	DATE 3-DEC-2014	TITLE: SCHEMATIC,
SHEET 10 OF 48	DATE Fri Dec 25 13:36:35 2014	MODEL, PROJECT, FUNCTION
PCB NUMBER 6050A2737001	REV XXX	SIZE B
		DOCUMENT NUMBER K-CS-1395A2737001-0-0
		REV X01

## CPU C25.38 (3 OF 10) - DDR CHANNEL 0

FH8065501516762-5R168  
12601981247801

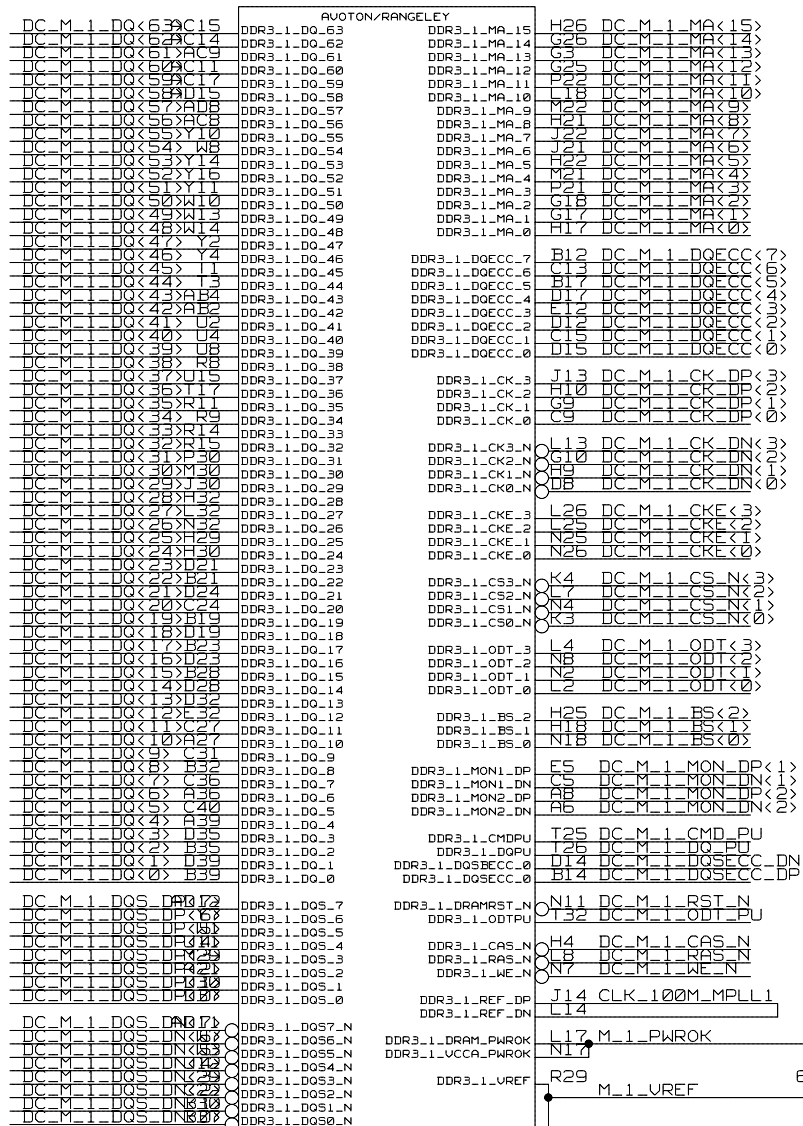


```
MODULE=CPU_C25.38
FUNCTION=DDR3 CHANNEL 0
```

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ENG. xxx	DATE 3-DEC-2014	TITLE: SCHEMATIC,		
SHEET 11 OF 48		MODEL, PORJECT, FUNCTION		
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PCB NUMBER 6050A2737001	REV xxx	SIZE B	DOCUMENT NUMBER K-CS-1395A2737001-0-0	REV x01

## CPU C2538 ( 4 OF 10 ) - DDR CHANNEL 1

FH065501516762-SR009A  
U2 6019B1247801

SYM 2 OF 12

MODULE=CPU\_C2538  
FUNCTION=DDR3 CHANNEL 1

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ENG. XXX	DATE 3-DEC-2014	TITLE: SCHEMATIC,
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		REV X01



MODULE=CPU\_C2538  
FUNCTION=GBE OR GPIO



Y	PCB NUMBER 6050A2737001
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```
MODULE=CPU_C25.38
FUNCTION=POWER
```



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Fri Dec 26 13:36:36 2014				
PCB NUMBER 6050A2737001		REV xxx	SIZE B	DOCUMENT NUMBER K-CS-1395A2737001-0-0
				REV x01

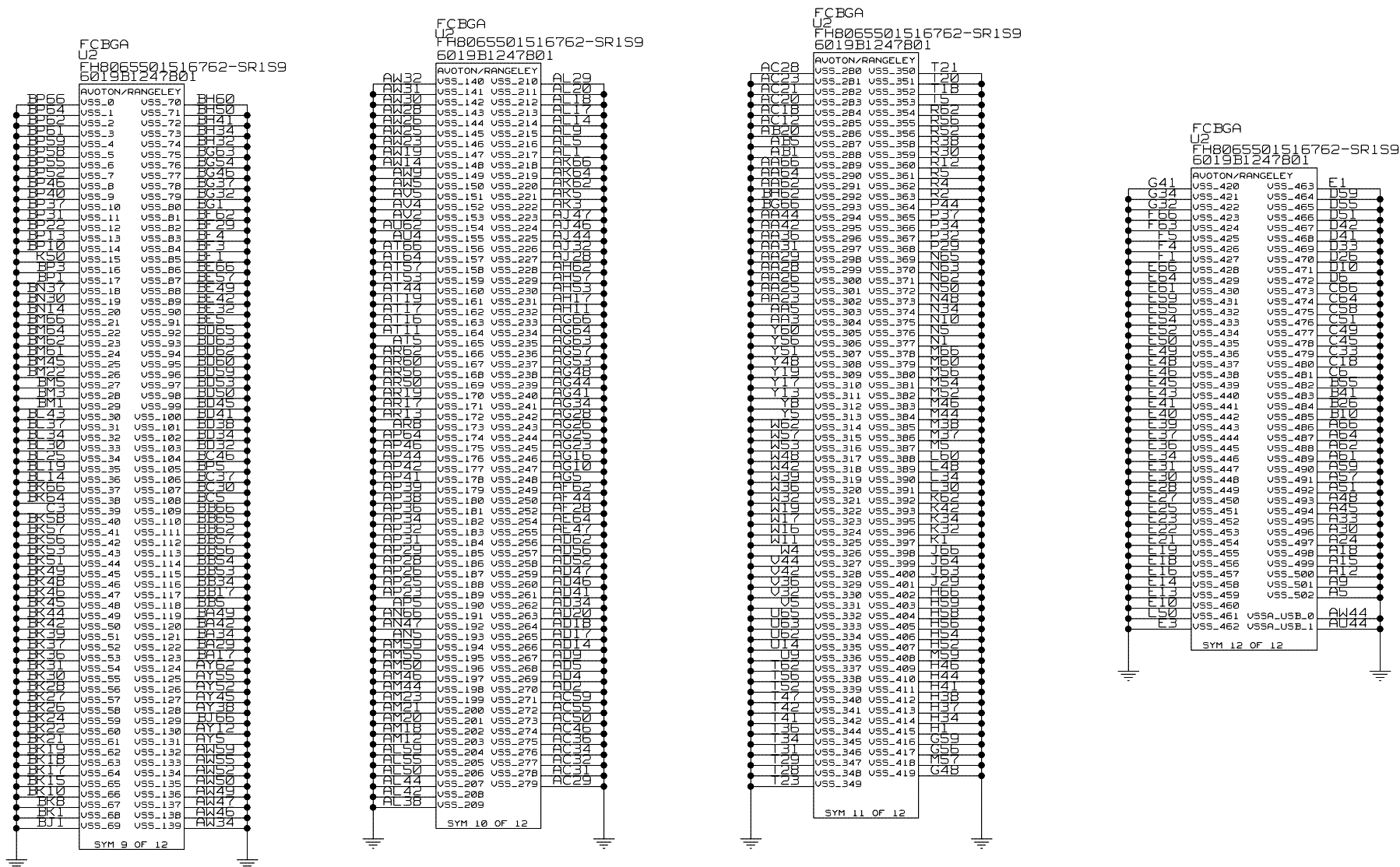


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MODULE=CPU_C2538
FUNCTION=POWER
```



ENG. xxx	DATE 3-DEC-2014	TITLE: SCHEMATIC,		
SHEET 17 OF 48		MODEL, PORJECT, FUNCTION		
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PCB NUMBER 6050A2737001	REV xxx	SIZE B	DOCUMENT NUMBER K-CS-1.395A2737001-0-0	REV x01

# CPU C2358 (10 OF 10) - GROUND



MODULE=CPU\_C2358  
FUNCTION=GROUND

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ENG. XXX	DATE 3-DEC-2014	TITLE: SCHEMATIC,
SHEET 18 OF 48	REV XXX	MODEL, PORJECT, FUNCTION
PCB NUMBER 6050A2737001	SIZE B	DOCUMENT NUMBER K-CS-1395A2737001-0-0
REV XXX	REV X01	REV X01

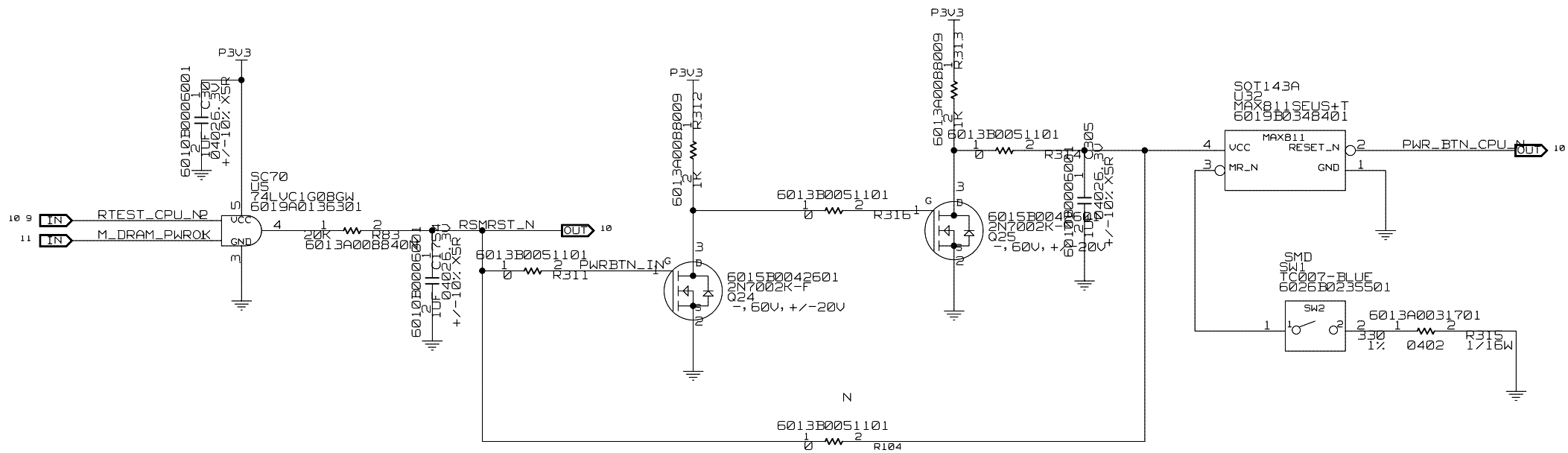
MODULE=CPU\_C2538  
FUNCTION=POWER SEQUENCE & RESET CONTROL



ENG. xxx	DATE 3-DEC-2014	TITLE: SCHEMATIC,		
SHEET 19 OF 48		MODEL, PORJECT, FUNCTION		
Fri Dec 26 13:36:37 2014				
PCB NUMBER 6050A2737001	REV xxx	SIZE B	DOCUMENT NUMBER K-CS-1395A2737001-0-0	REV x01

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## CPU POWER SEQUENCE CONTROL (2 OF 2)

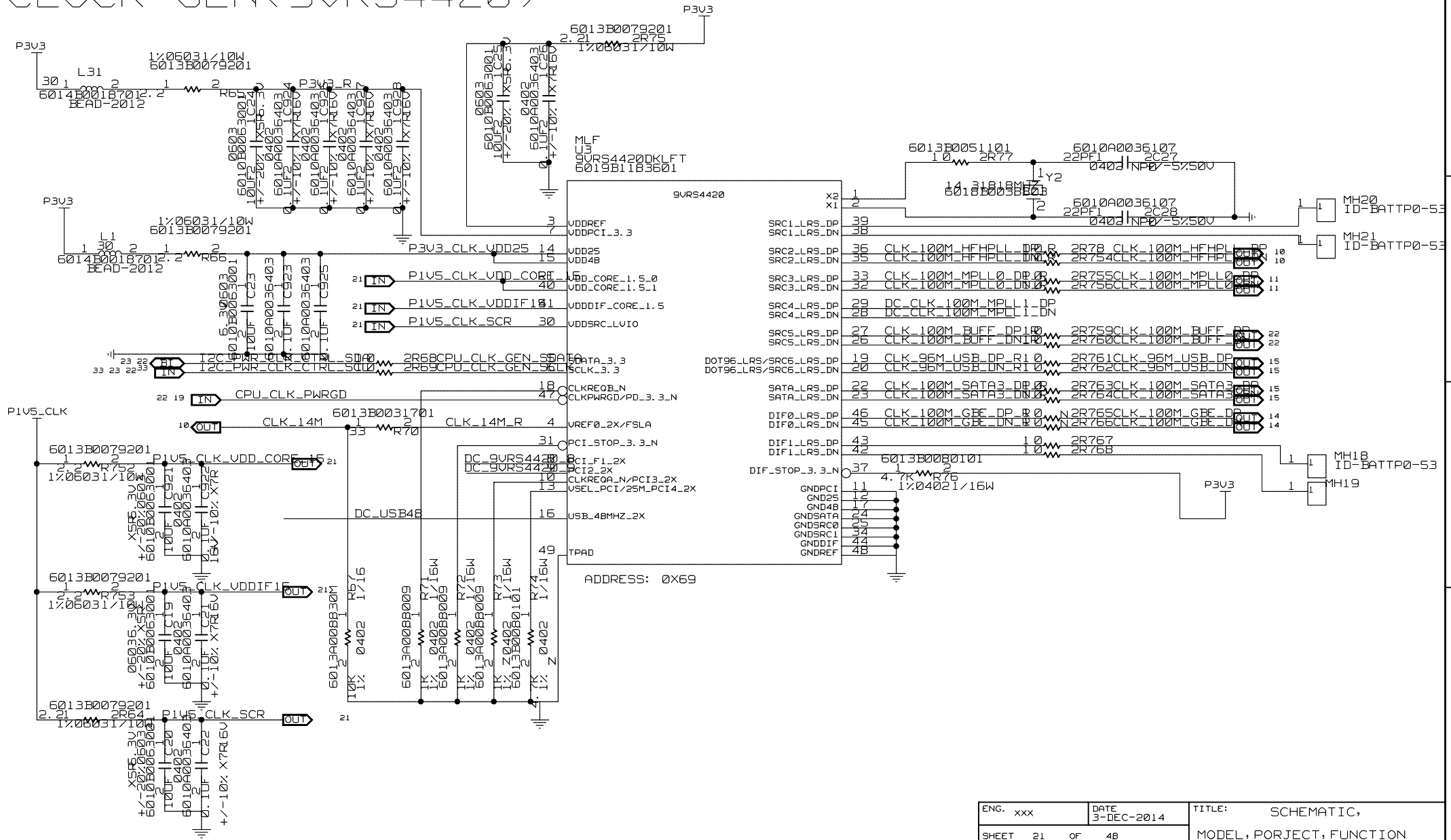


MODULE=CPU\_C2538  
FUNCTION=POWER SEQUENCE & RESET CONTROL

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ENG. xxx	DATE 3-DEC-2014	TITLE: SCHEMATIC,		
SHEET 20 OF 48		MODEL, PORJECT, FUNCTION		
Fri Dec 26 13:36:37 2014				
PCB NUMBER 6050A2737001	REV xxx	SIZE B	DOCUMENT NUMBER K-CS-1395A2737001-0-0	REV x01

CLOCK GEN<9VRS4420>

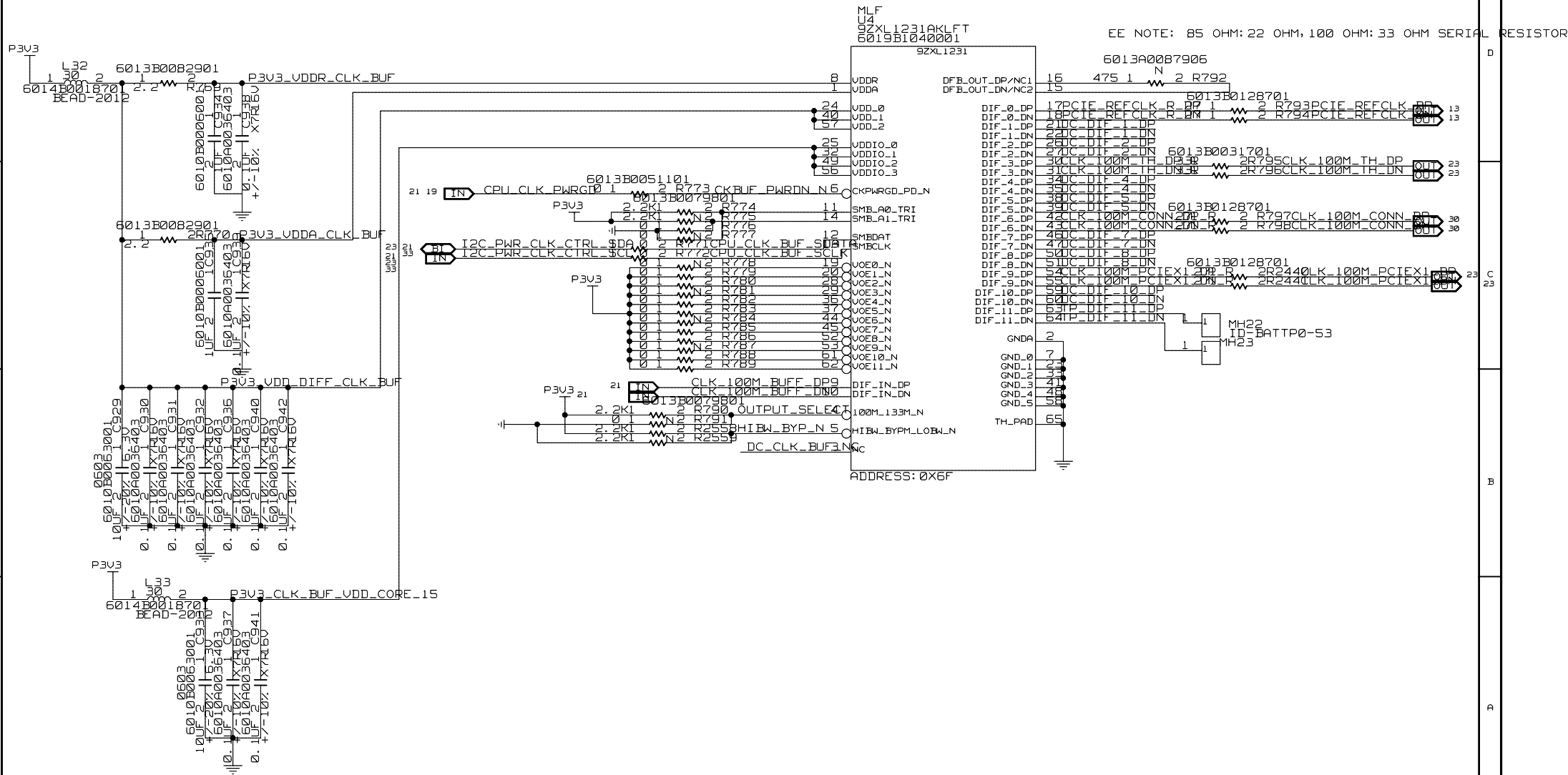


MODULE=CPU\_C2538  
FUNCTION=CLOCK GEN: 9VRS4420

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ENG. xxx	DATE 3-DEC-2014	TITLE: SCHEMATIC,		
SHEET 21 OF 48		MODEL, PORJECT, FUNCTION		
Fri Dec 25 13:36:37 2014				
PCB NUMBER 6050A2737001	REV xxx	SIZE B	DOCUMENT NUMBER K-CS-1.395A2737001-0-0	REV x01

## CLOCK BUFFER(9ZXL1231)



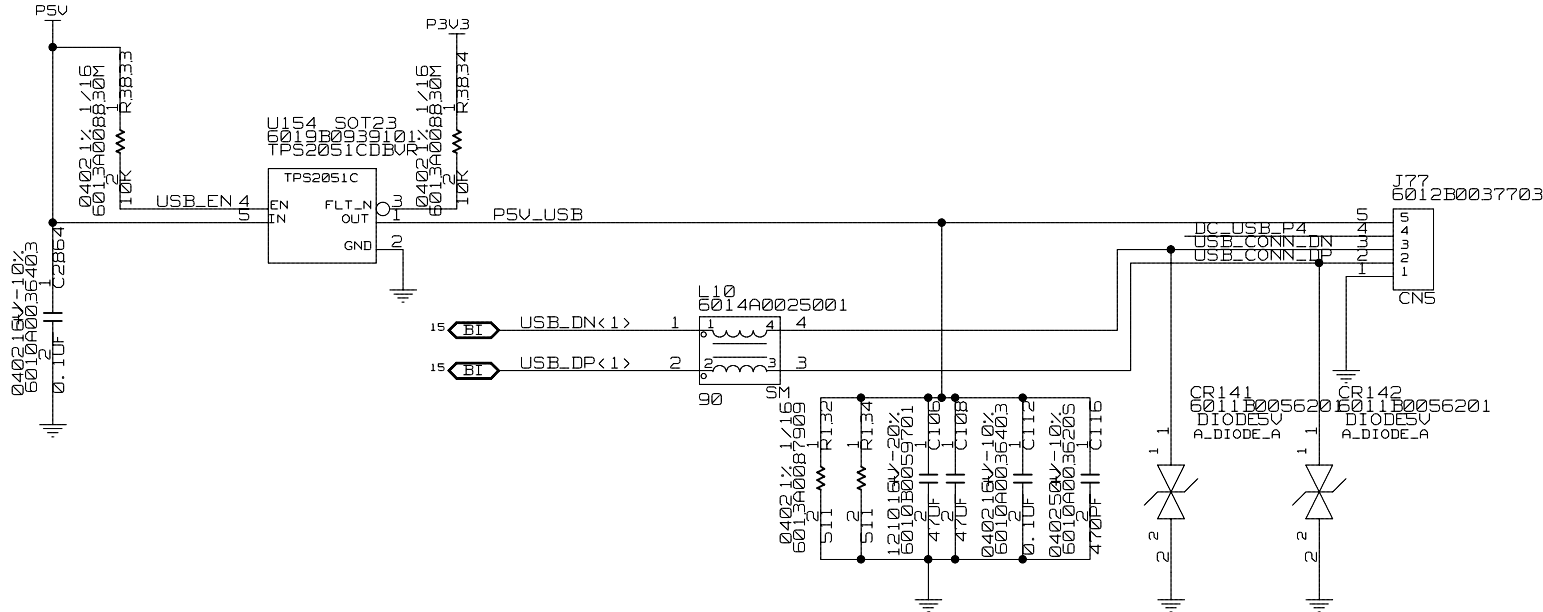
MODULE=CPU\_C2538  
FUNCTION=CLOCK BUFFER: 9ZXL1231

ENG. xxx		DATE 3-DEC-2014		TITLE: SCHEMATIC, MODEL, PROJECT, FUNCTION		
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Y	PCB NUMBER 6050A2737001		REV xxx	SIZE B	DOCUMENT NUMBER K-CS-1395A2737001-0-0	REV x01

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# USB CONNECTOR



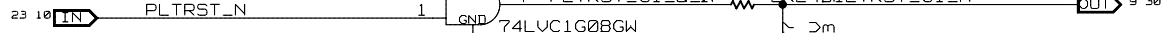
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MODULE=MISC
FUNCTION=USB &SD CARD
```

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ENG. xxx	DATE 3-DEC-2014	TITLE: SCHEMATIC,		
SHEET 24 OF 48		MODEL, PROJECT, FUNCTION		
Fri Dec 26 13:36:38 2014				
PCB NUMBER 605062737001	REV xxx	SIZE B	DOCUMENT NUMBER K-CS-1395A2737001-0-0	REV X01



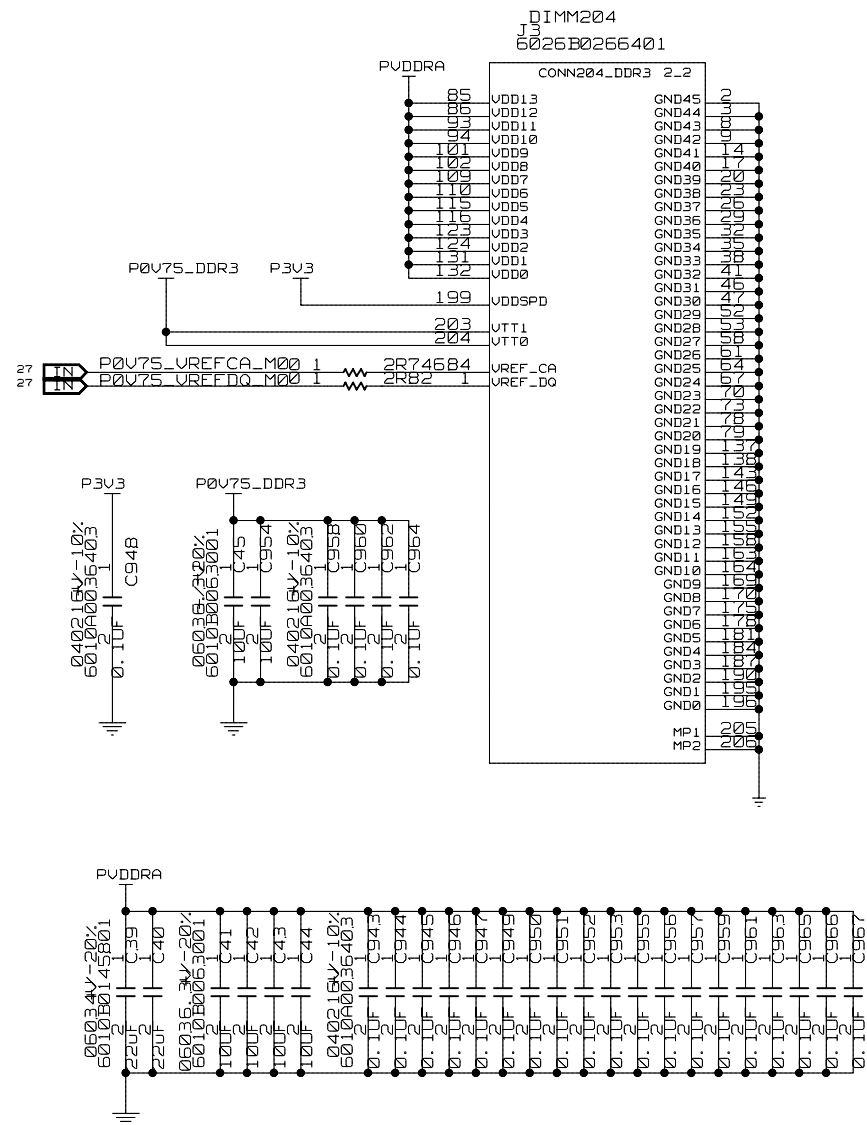
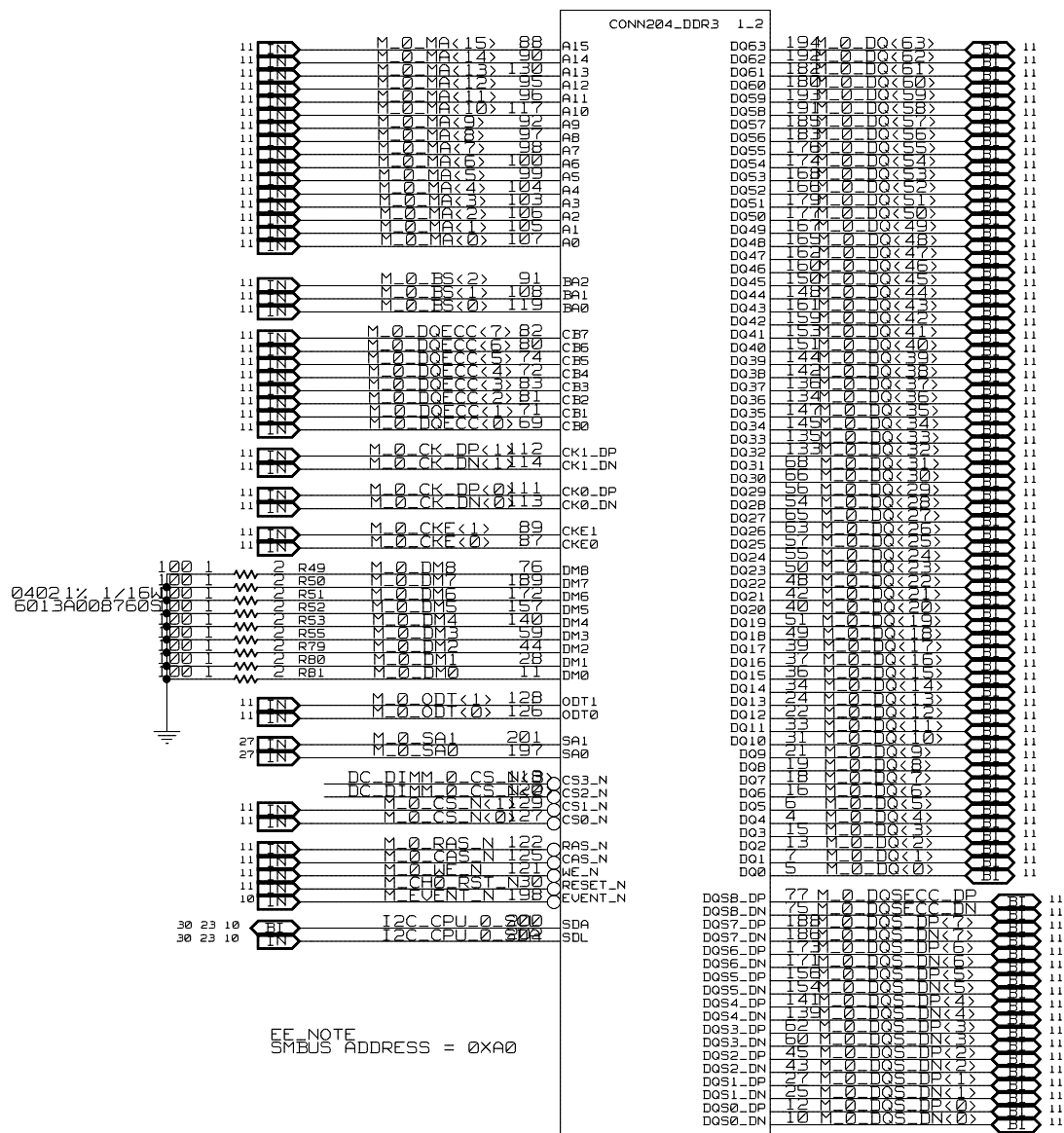
8	7	6	5	4	3	2	1
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INVENTEC CONFIDENTIAL DO NOT COPY	PCB NUMBER 6050A2737001	REV XXX	SIZE B	DOCUMENT NUMBER K-CS-1395A2737001-0-0	REV X01
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ENG. xxx	DATE 3-DEC-2014	TITLE: SCHEMATIC,		
SHEET 25 OF 48		MODEL, PORJECT, FUNCTION		
Fri Dec 26 13:36:38 2014				
PCB NUMBER 6050A2737001	REV xxx	SIZE B	DOCUMENT NUMBER K-CS-1395A2737001-0-0	REV x01

DDR3 CH0 SO-DIMM DIMM204  
J3 6026B0266401

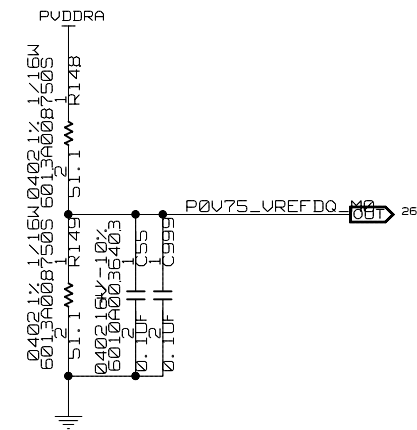
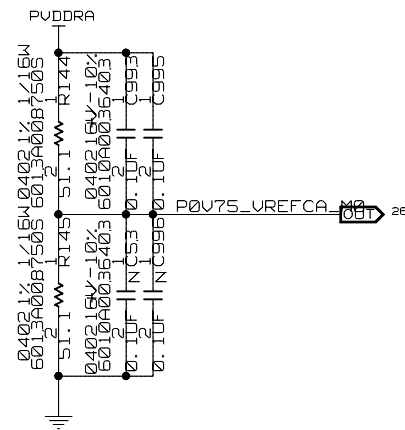
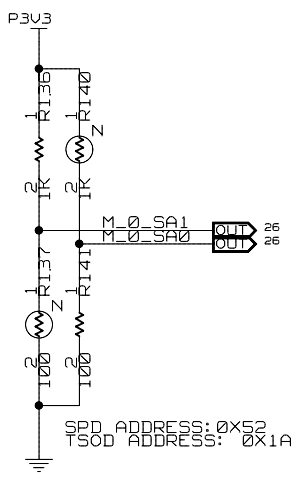


```
MODULE=DDR3 DIMM MODULE
FUNCTION=DDR3 SO-DIMM SOCKET
```

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ENG. XXX	DATE 3-DEC-2014	TITLE: SCHEMATIC,		
SHEET 26 OF 48		MODEL, PORJECT, FUNCTION		
Fri Dec 26 13:36:38 2014				
PCB NUMBER 6050A2737001	REV XXX	SIZE B	DOCUMENT NUMBER K-CS-1395A2737001-0-0	REV X01

DDR3 DIMM MISC

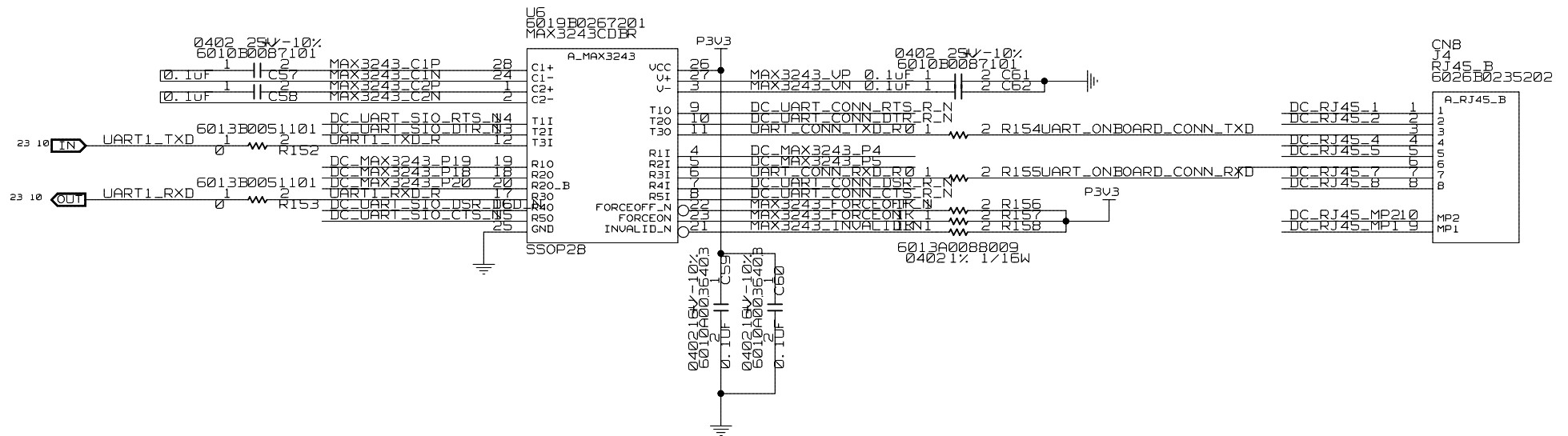


MODULE=DDR3 DIMM MODULE  
FUNCTION=SO-DIMM SOCKET

INVENTEC CONFIDENTIAL DO NOT COPY		PCB NUMBER 6050A2737001		REV XXX	SIZE B	DOCUMENT NUMBER K-CS-1395A2737001-0-0	REV X01
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ENG. XXX	DATE 3-DEC-2014	TITLE: SCHEMATIC, MODEL, PROJECT, FUNCTION	
SHEET 27 OF 48	FR1 Dec 25 13:36:38 2014		

## UART

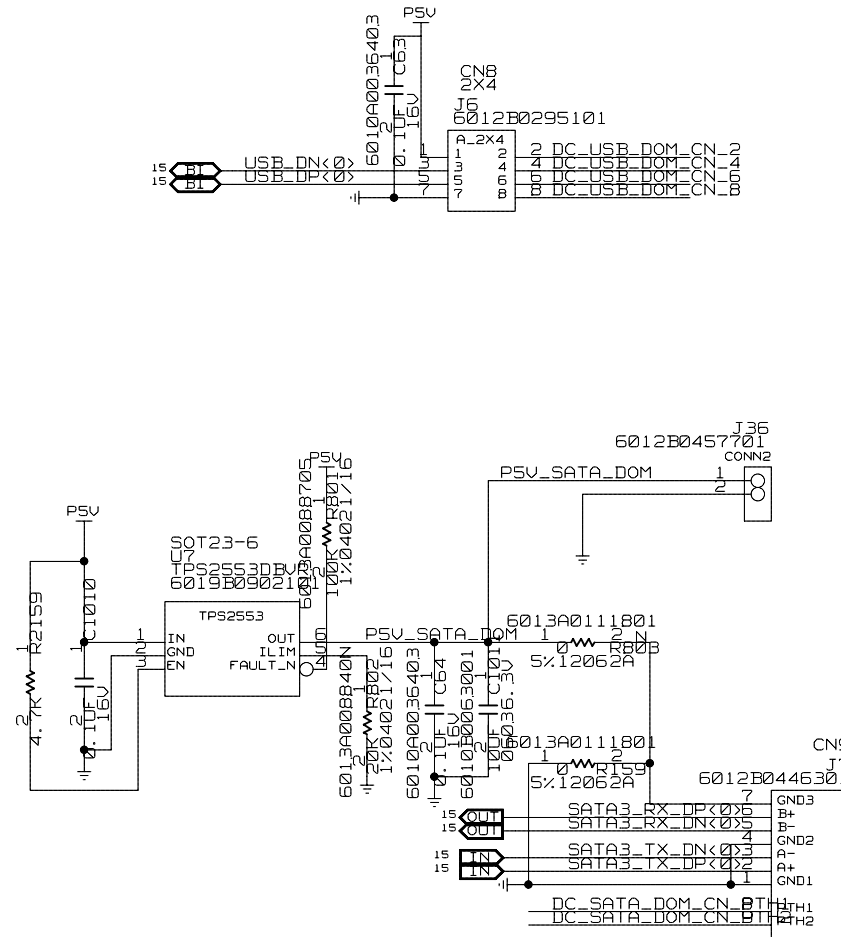


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MODULE=MISC
FUNCTION=RS232 UART
```

ENG. xxx	DATE 3-DEC-2014	TITLE: SCHEMATIC,		
SHEET 28 OF 48		MODEL, PORJECT, FUNCTION		
Fri Dec 26 13:36:38 2014				
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# SATA, USB DOM



MODULE=STORAGE & BOOT DEVICES  
FUNCTION=SATA DOM & USB DOM CONNECTOR

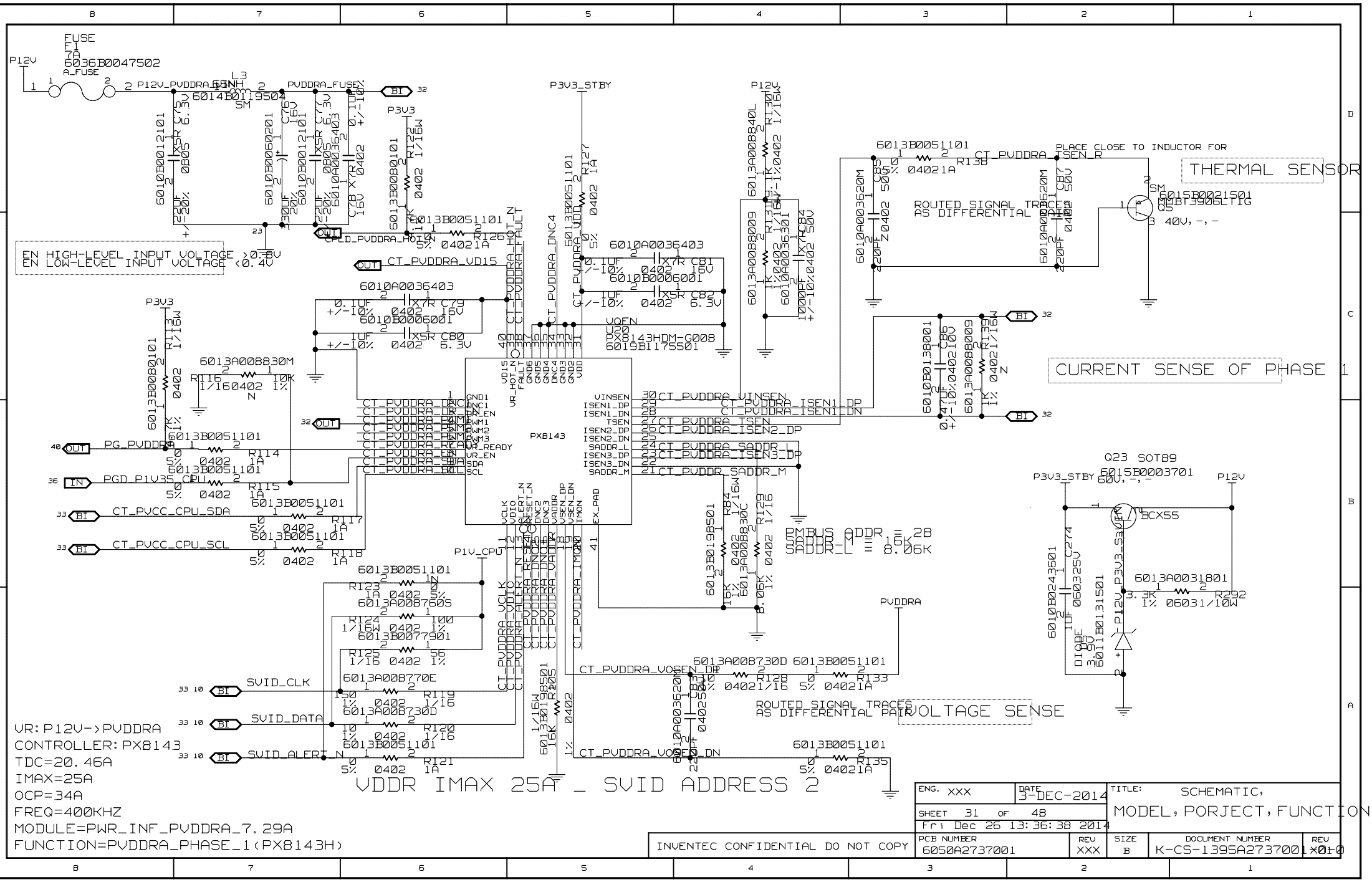
INVENTEC CONFIDENTIAL DO NOT COPY

ENG. XXX	DATE 3-DEC-2014	TITLE: SCHEMATIC,		
SHEET 29	OF 48	MODEL, PROJECT, FUNCTION		
Fri Dec 25 13:36:38 2014		PCB NUMBER 6050A2737001	REV XXX	SIZE B
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```
MODULE=DEBUG
FUNCTION=PCIE X1 CONNECTOR<DEBUG VGA CRAD>
```



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SHEET 30 OF 48		MODEL, PORJECT, FUNCTION		
Fri Dec 26 13:36:38 2014				
PCB NUMBER 6050A2737001	REV XXX	SIZE B	DOCUMENT NUMBER K-CS-1395A2737001-0-0	REV X01

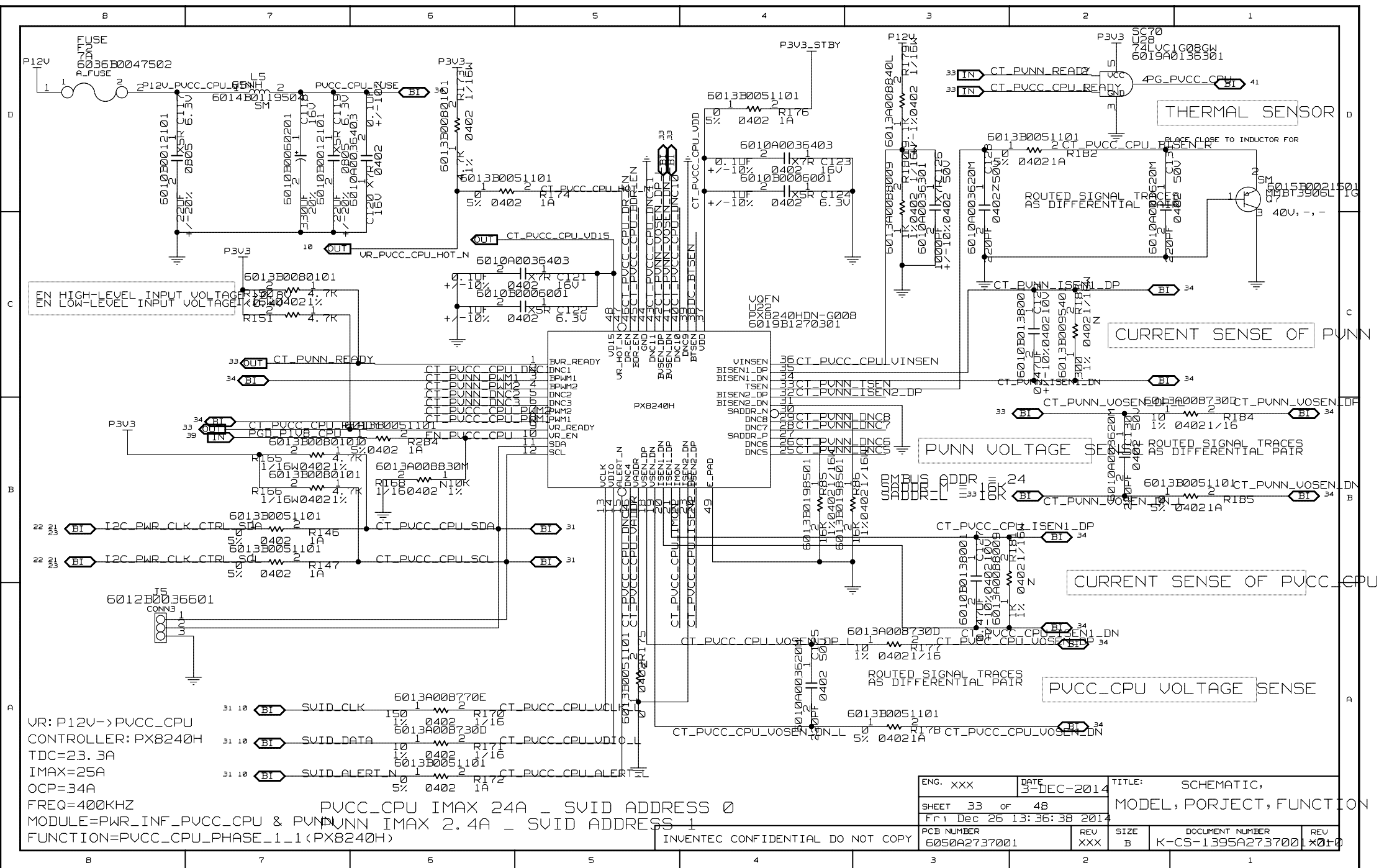


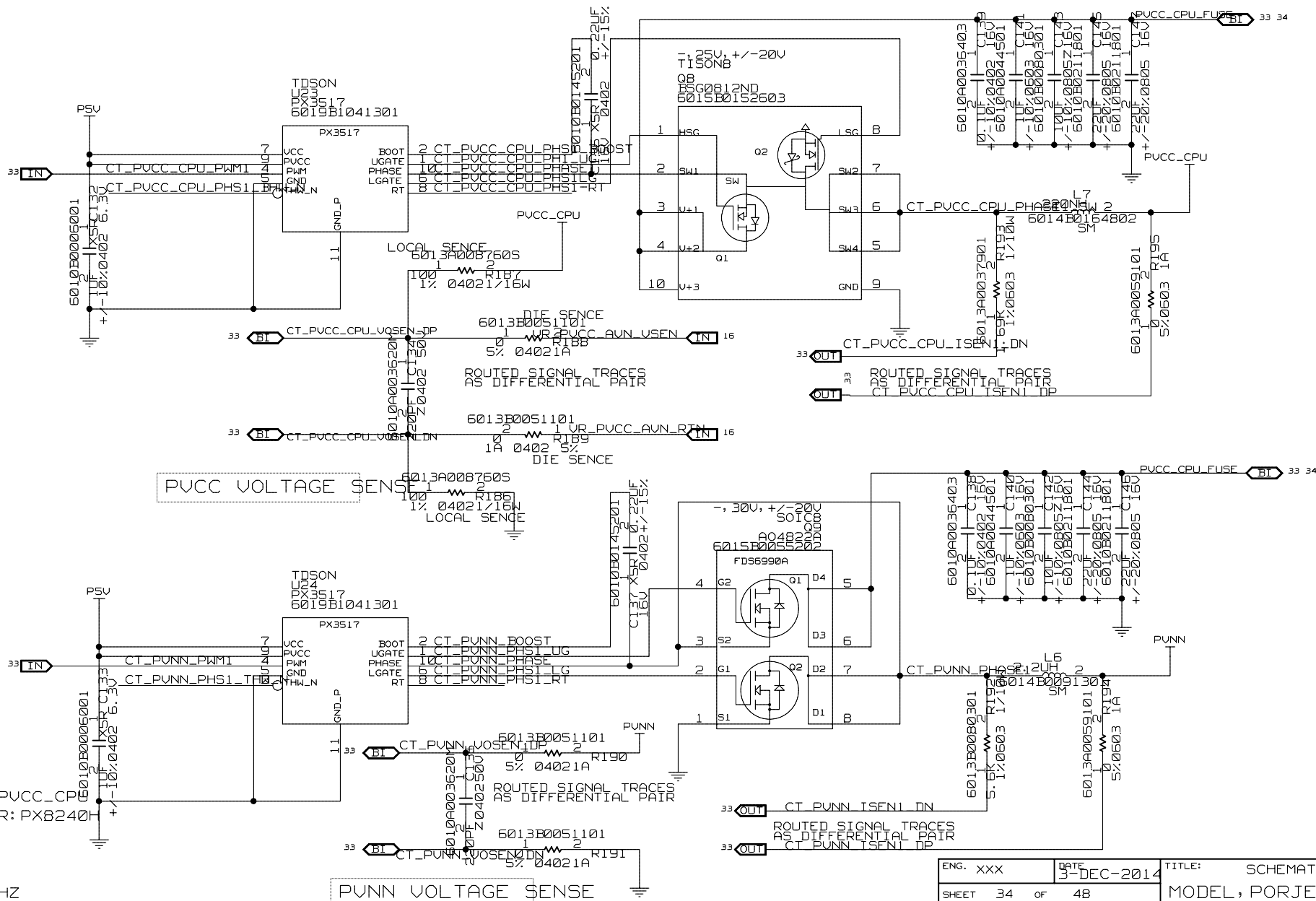
UR: P12V->PVDDRA  
CONTROLLER: PXB143  
TDC=20.46A  
IMAX=25A  
OCP=34A  
FREQ=400KHZ  
MODULE=PWR\_INF\_PVDDRA\_7.29A  
FUNCTION=PVDDRA\_PHASE\_1(PXB143H)

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VR: P12V->PVCC\_CPU  
 CONTROLLER: PX8240H  
 TDC=23.3A  
 IMAX=25A  
 OCP=34A  
 FREQ=400KHZ  
 MODULE=PWR\_INF\_PVCC\_CPU & PVNN  
 FUNCTION=PVCC\_CPU\_PHASE\_1\_2(PX8240H)

ENG. XXX	DATE	TITLE:	SCHEMATIC,
SHEET 34	5-DEC-2014	MODEL, PORJECT, FUNCTION	
PCB NUMBER	REV	SIZE	DOCUMENT NUMBER
6050A2737001	XXX	B	K-C5-1395A2737001

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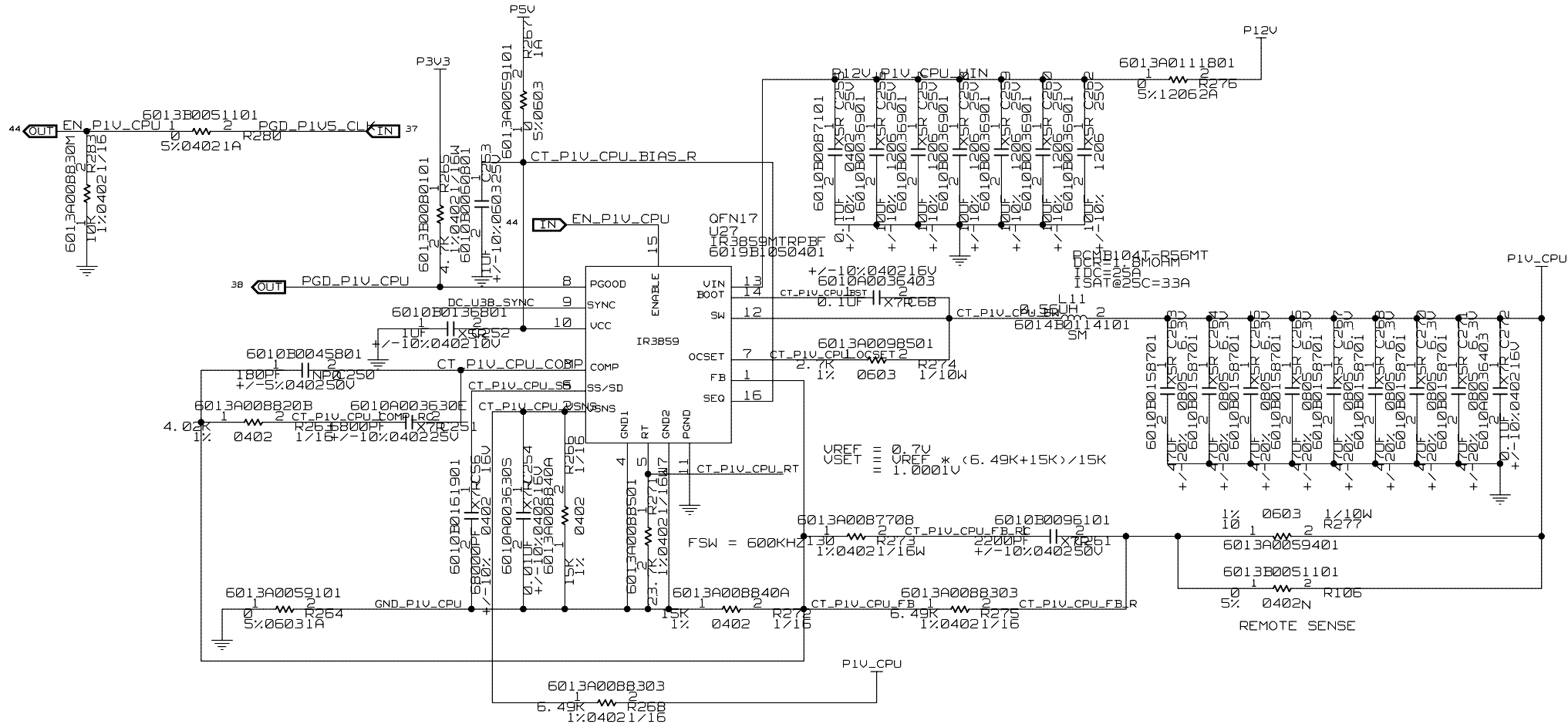












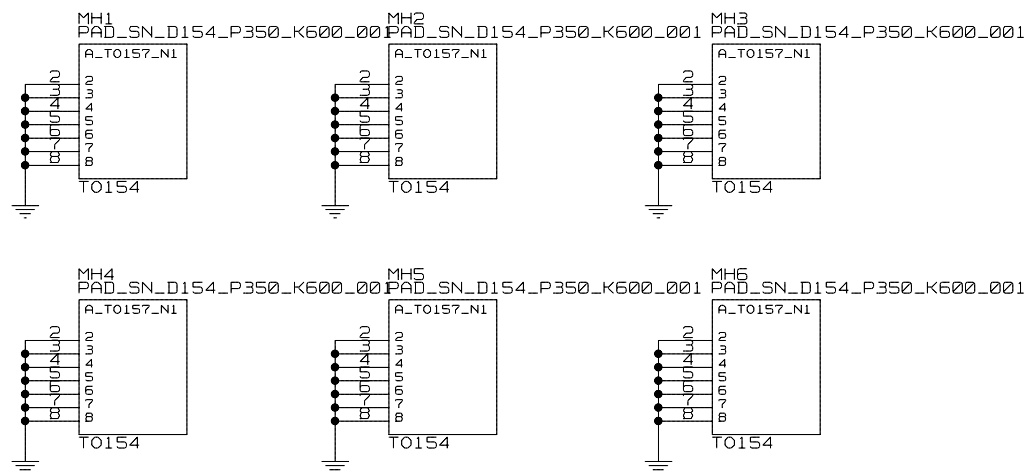
MODULE=PWR\_IR3859M\_P1V\_CPU\_9A  
FUNCTION=P1V\_CPU\_4.76A

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SHEET 44 OF 48	PCB NUMBER 6050A2737001	REV XXX
PCB NUMBER 6050A2737001	REV XXX	SIZE B
PCB NUMBER 6050A2737001	REV XXX	DOCUMENT NUMBER K-CS-1395A2737001-0-0
PCB NUMBER 6050A2737001	REV XXX	REV X01

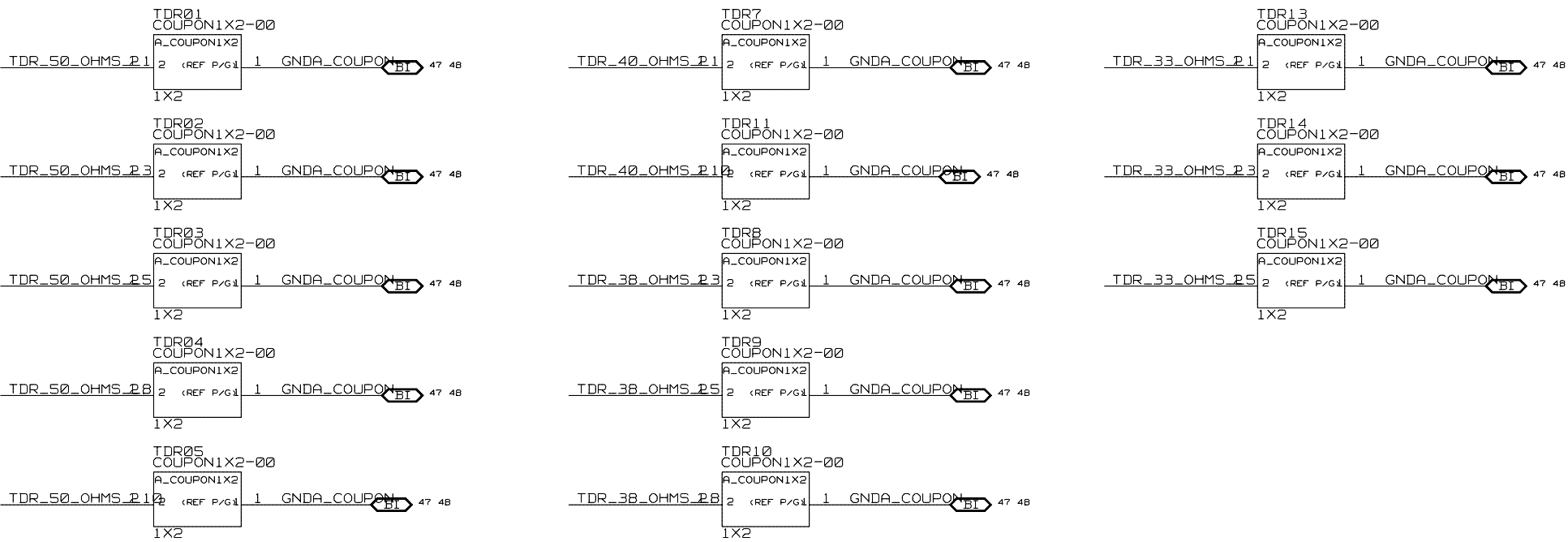


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MODULE=I2C_THERMAL_SENSOR
FUNCTION=TMP75 * .3
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GOUPON ( 1 OF 2 )

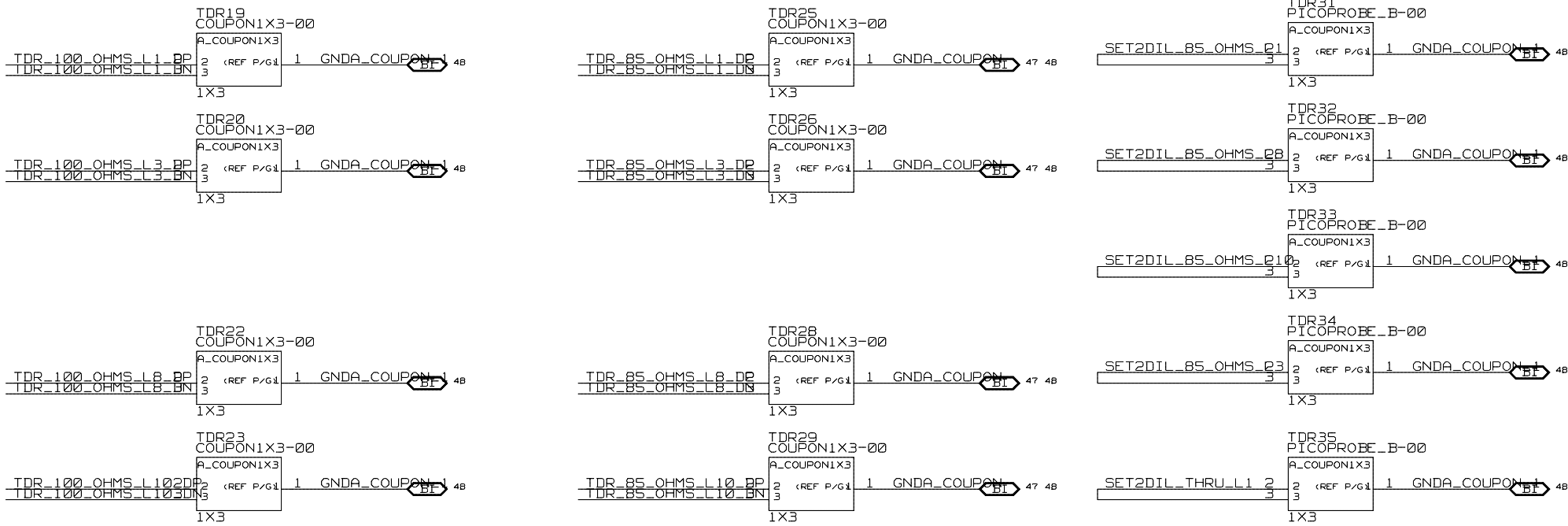


MODULE=GOUPON\_MOUNTING\_HOLES  
FUNCTION=GOUPON & MOUNTING HOLES

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ENG. XXX	DATE 3-DEC-2014	TITLE: SCHEMATIC, MODEL, PROJECT, FUNCTION		
SHEET 47 OF 48	FILE Dec 25 13:36:40 2014			
PCB NUMBER 6050A2737001	REV XXX	SIZE B	DOCUMENT NUMBER K-CS-1395A2737001-0-0	REV X01

GOUPON (2 OF 2)



MODULE=GOUPON\_MOUNTING\_HOLE  
FUNCTION=GOUPON & MOUNTING HOLES

ENG. XXX	DATE 3-DEC-2014	TITLE: SCHEMATIC, MODEL, PROJECT, FUNCTION
SHEET 48 OF 48	PCB NUMBER 6050A2737001	REV XXX
REV XXX	SIZE B	DOCUMENT NUMBER K-CS-1395A2737001-0-0
REV XXX	REV XXX	REV XXX