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DragonBoard 820c

CONTRACT NO.		TITLE DragonBoard 820c				
DRAWN BY					DATE	
ENGINEER						
PROJECT ENGINEER						
QUALITY ASSURANCE						
CONFIGURATION						
DESIGN ACTIVITY APPROVAL						
DESIGN APPROVAL				SIZE D	DRAWING NO LM25-P2751-1	REV B
		SCALE NONE	RELEASE DATE	SHEET 1 OF 44		

TITLE

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REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

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SHEET	BLOCK	SCHEMATIC	SHEET	BLOCK	SCHEMATIC	SHEET	BLOCK	SCHEMATIC	SHEET	BLOCK	SCHEMATIC
1	\	TITLE									
2	\	TABLE_OF_CONTENTS									
3	\	APQ8096 CONTROL MEMORY IO									
4	\	APQ8096 - MIPI DSI/CSI/HDMI									
5	\	APQ8096 - RF									
6	\	APQ8096 - GPIO [0-73]/I2C PULL									
7	\	APQ8096 - GPIO [74-145]									
8	\	I2C PULL-UP RESISTORS									
9	\	APQ8096 - PWR1									
10	\	APQ8096 - PWR2									
11	\	APQ8096 - PWR3									
12	\	APQ8096 - PWR4									
13	\	APQ8096 - GND									
14	\	POWER - BUCK VPH PWR									
15	\	POWER - BUCKS 5V AND 3P3V									
16	\	POWER - REG 1P5V AND S4A BHEL									
17	\	PMI8996 - CHARGE									
18	\	PMI8996 - CONTROL									
19	\	PMI8996 - REG/WLED									
20	\	PMI8996 - GND									
21	\	PM8996 - CONTROL/CLOCK									
22	\	PM8996 - LDO									
23	\	PM8996 - VSMPS S1A-S6A/GPIO									
24	\	PM8996 - VSMPS S7A-S12A									
25	\	MEMORY - POP LPDDR4									
26	\	MEMORY - USD CONNECTOR									
27	\	MEMORY - UFS									
28	\	DISPLAY - HDMI									
29	\	USB - USB 3 HUB									
30	\	USB - SWITCH/DEVICE CONNECTOR									
31	\	USB - HOSTS CONNECTORS									
32	\	GBE ETHERNET - AR8151									
33	\	MINI PCIE CONNECTOR									
34	\	SENSORS									
35	\	AUDIO ANALOG TASHA									
36	\	AUDIO DIGITAL TASHA									
37	\	AUDIO CONNECTORS									
38	\	QCA6174 - WIFI-BT M2 MODULE									
39	\	WGR7640									
40	\	HS/LS EXPANSION CONNECTORS									
41	\	SWITCHES/LEDS									
42	\	JTAG/BOOT CONFIG									
43	\	CAMERA CONNECTOR									

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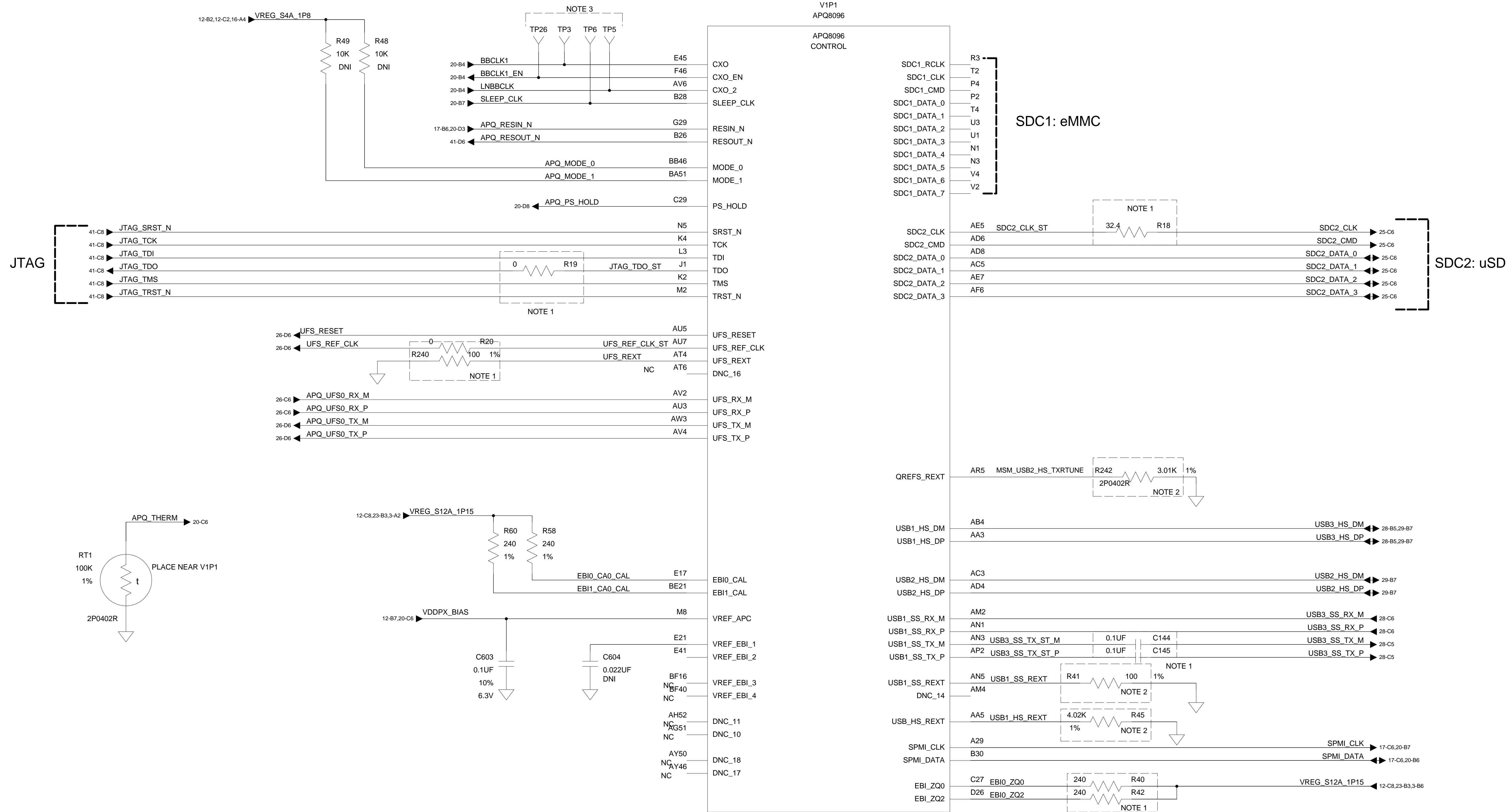
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TITLE DragonBoard 820c			
SIZE D	DRAWING NO LM25-P2751-1	REV B	
SCALE NONE	SHEET 2	OF 44	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



CAD NOTES:
 NOTE 1: Place close to APQ
 NOTE 2: Place close to APQ. Avoid crosstalk from other signals
 NOTE 3: Avoid long stub

APQ8096 CONTROL MEMORY IO

TITLE DragonBoard 820c		
SIZE D	DRAWING NO LM25-P2751-1	REV B
SCALE NONE	SHEET 3	OF 44

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

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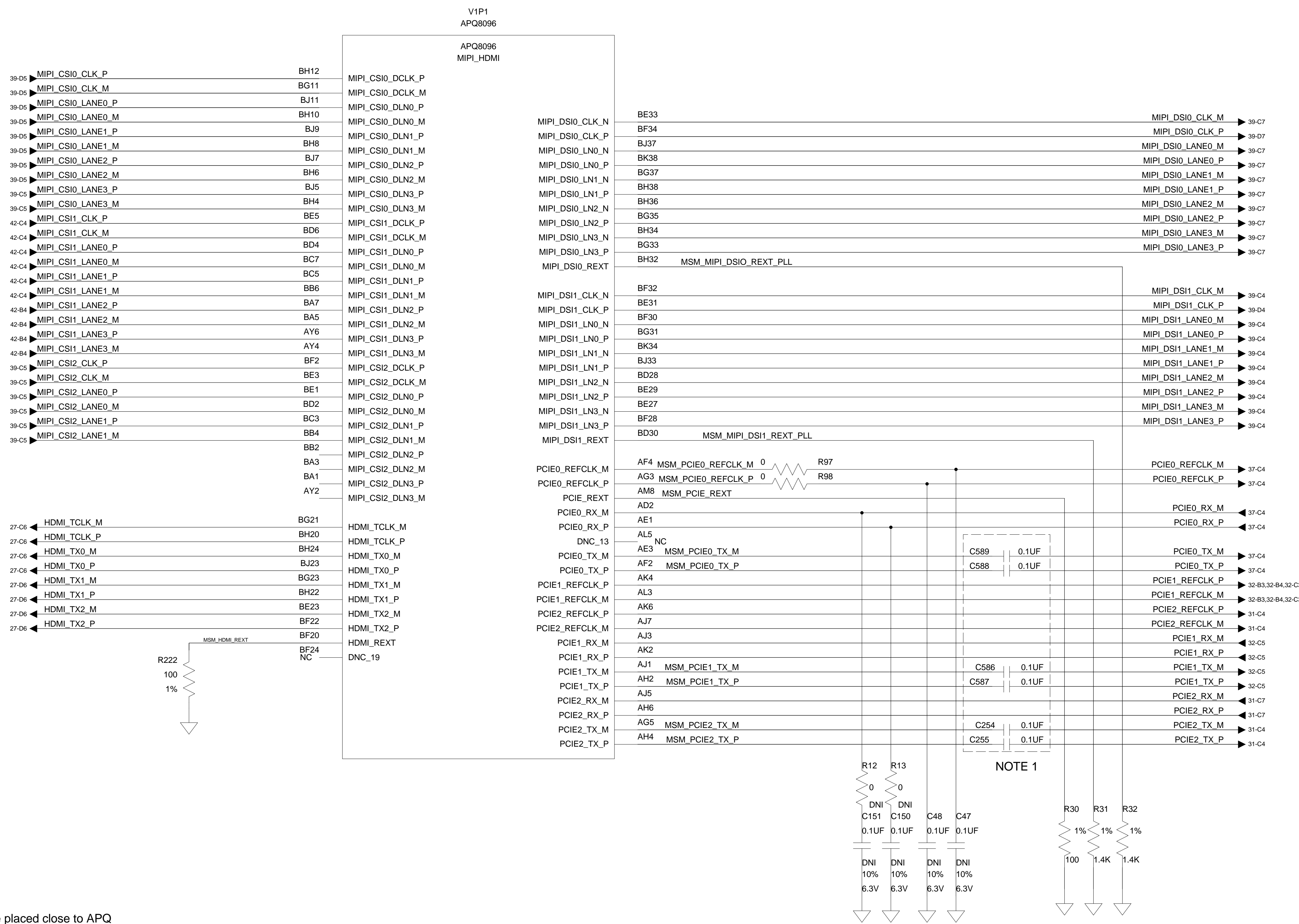
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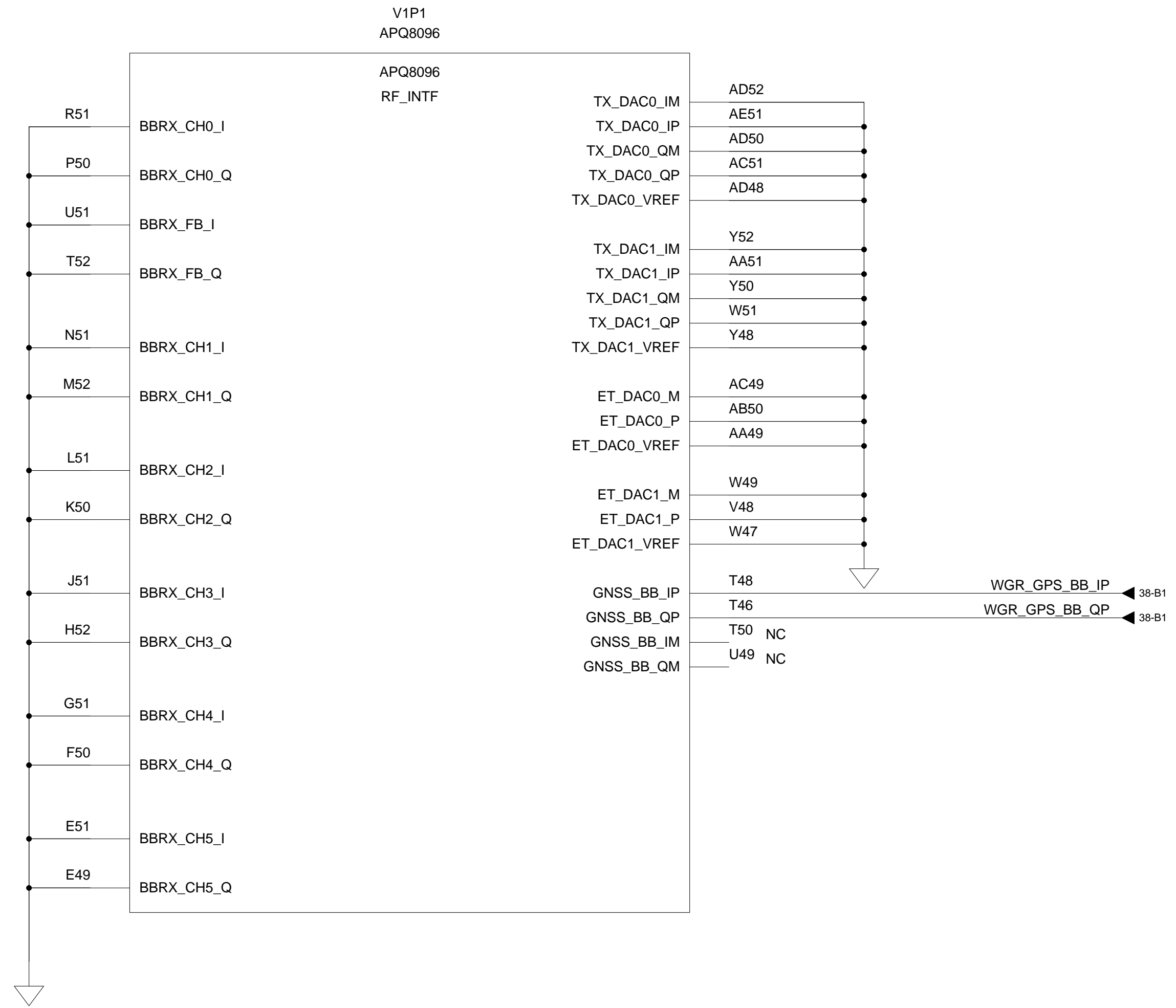
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CAD NOTE:
NOTE1: The caps on PCIE do NOT need to be placed close to APQ

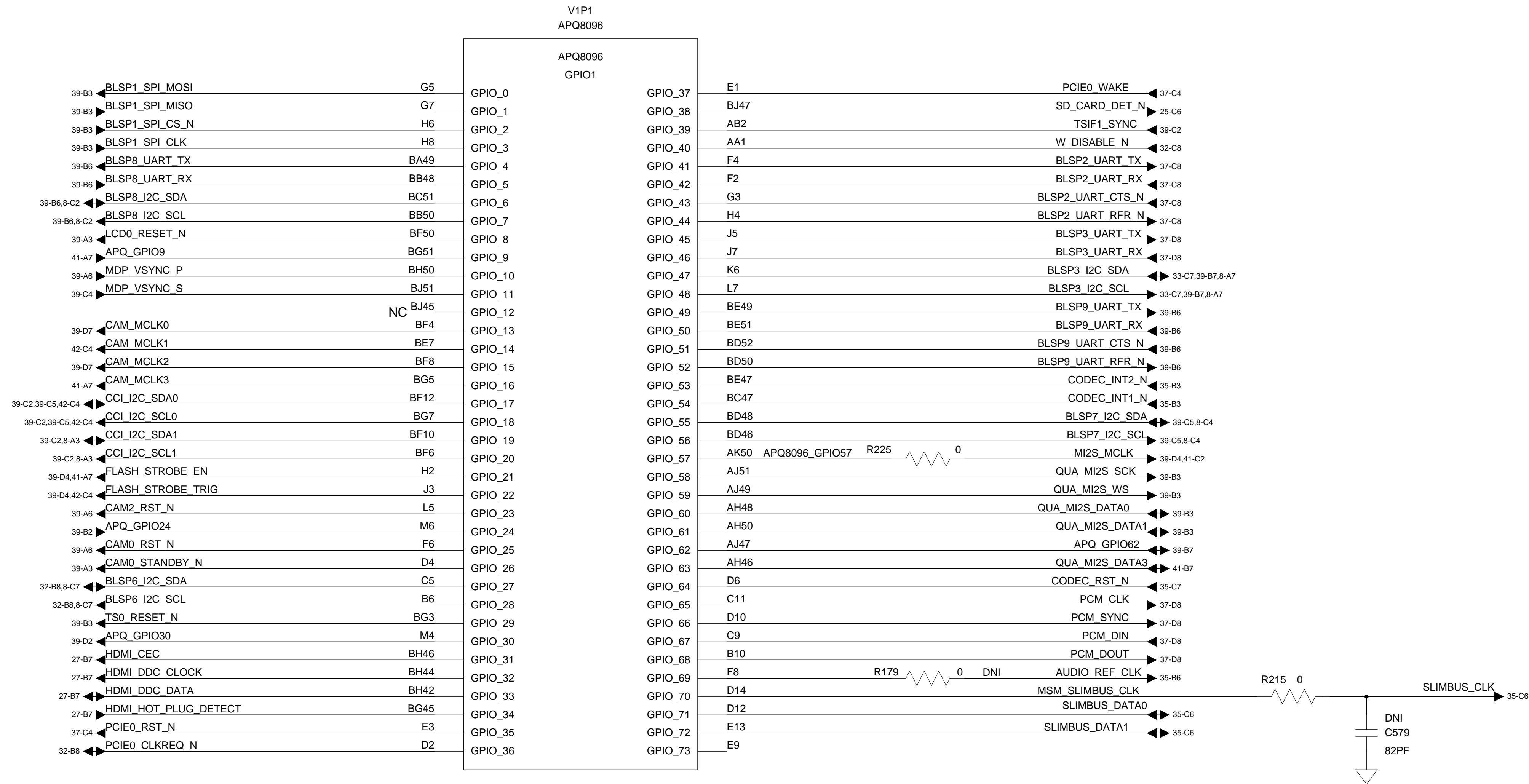
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SIZE D	DRAWING NO LM25-P2751-1	REV B	
SCALE NONE	SHEET 4	OF 44	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



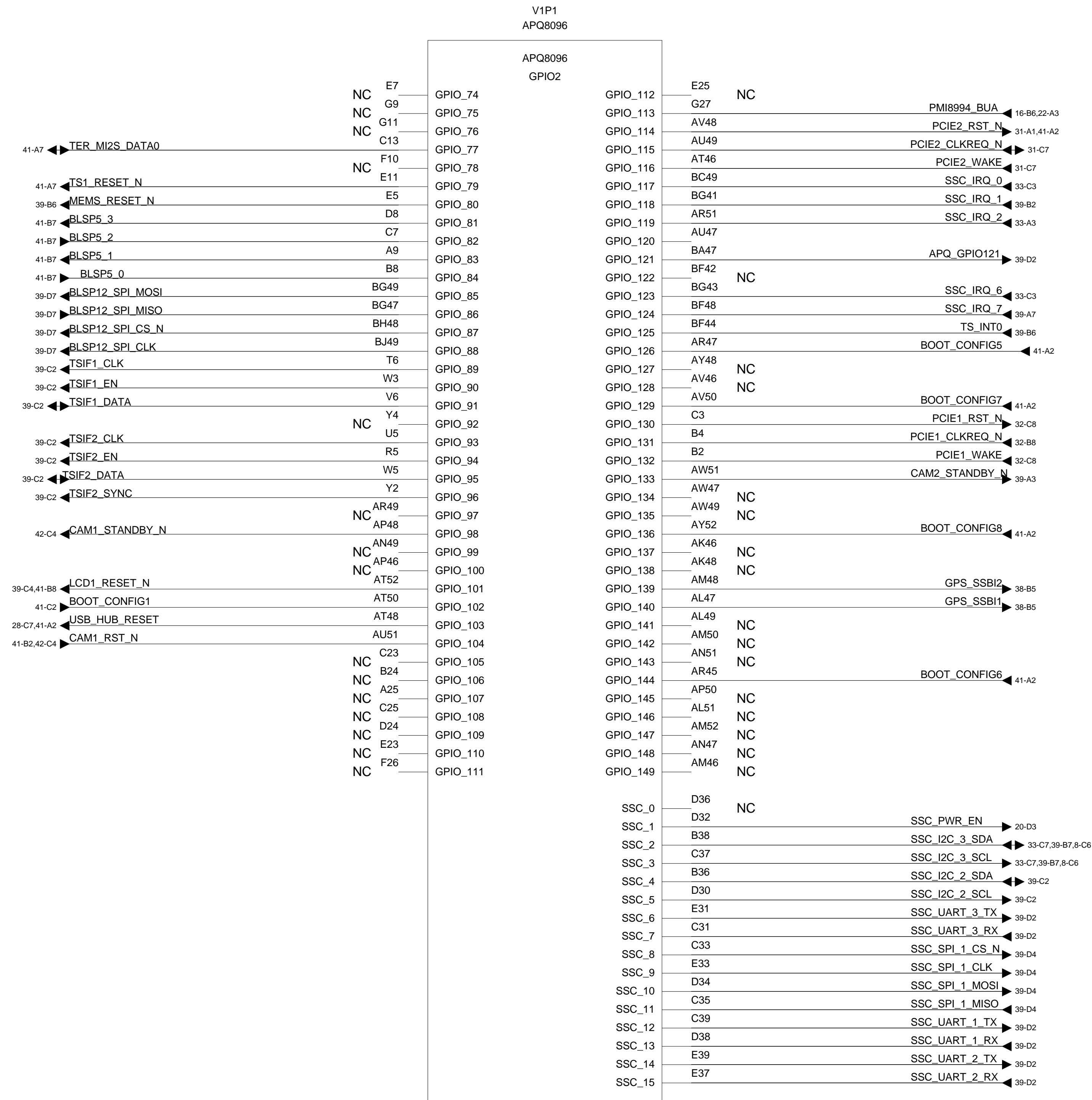
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SCALE NONE	SHEET 5	OF 44	

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SIZE D	DRAWING NO LM25-P2751-1	REV B	
SCALE NONE	SHEET 6	OF 44	

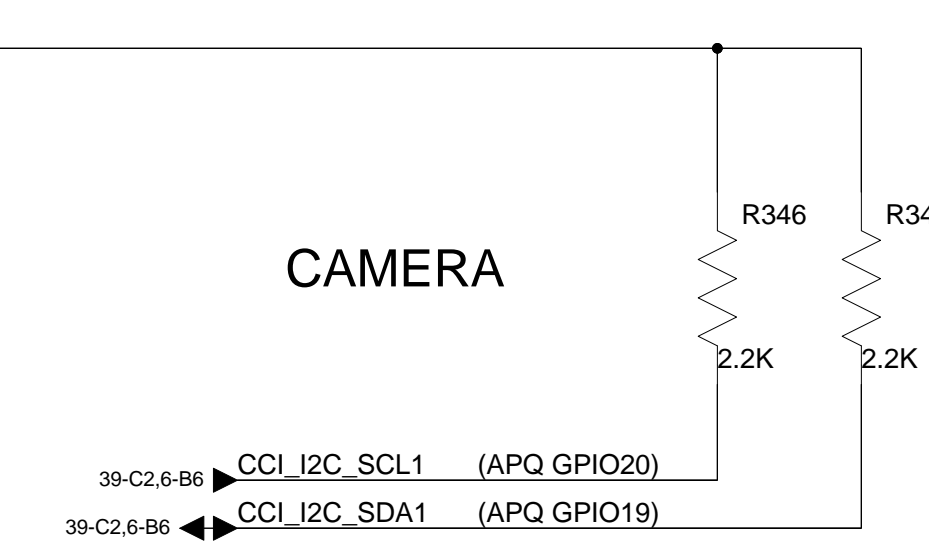
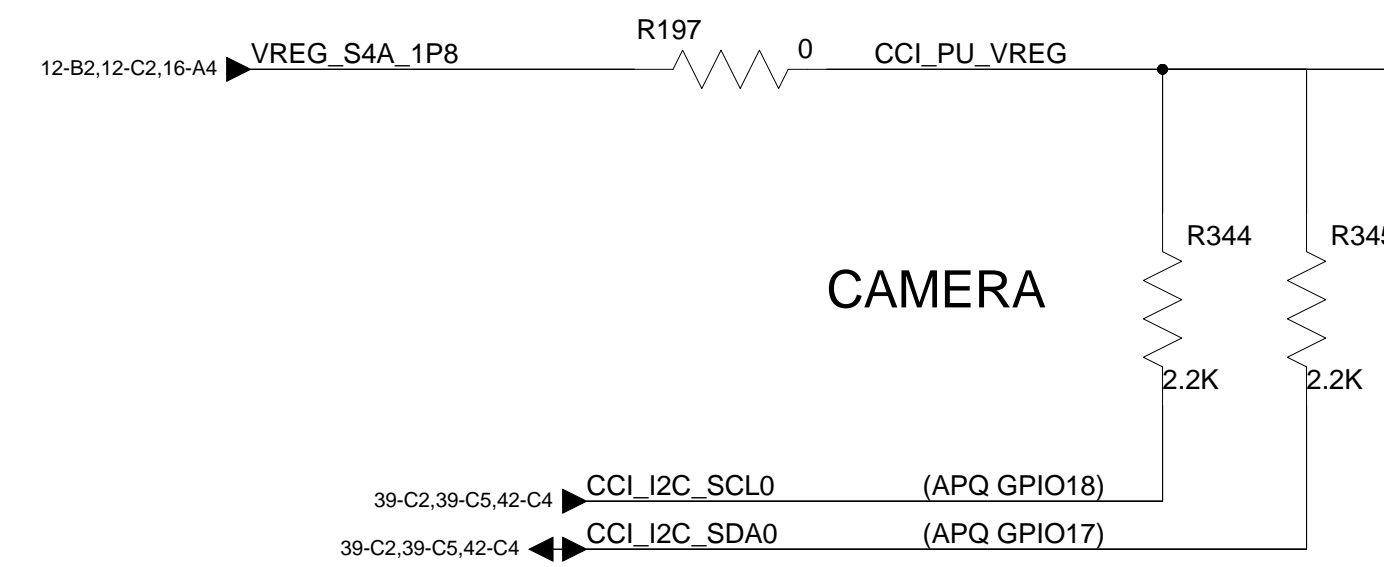
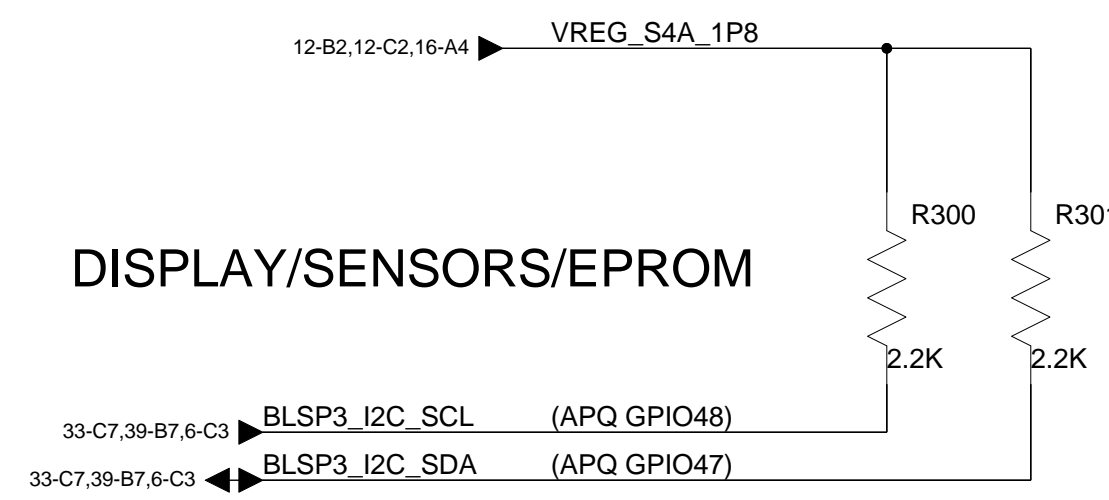
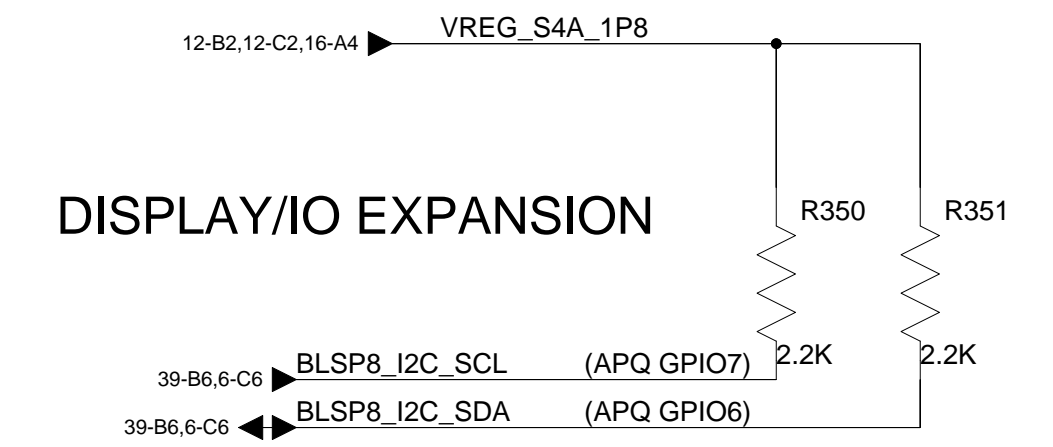
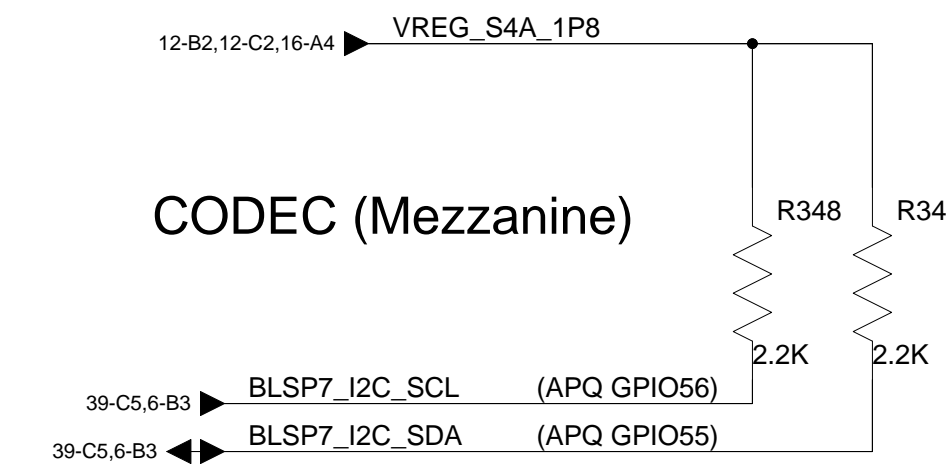
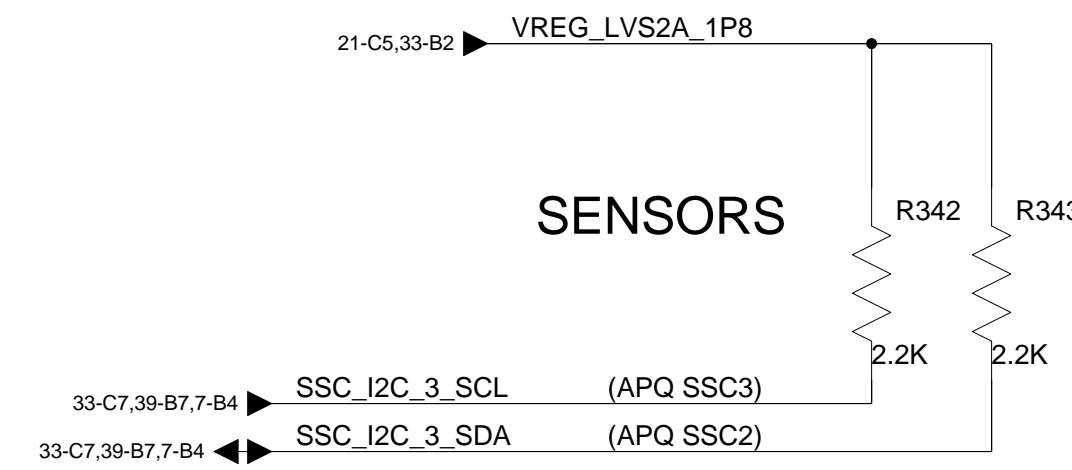
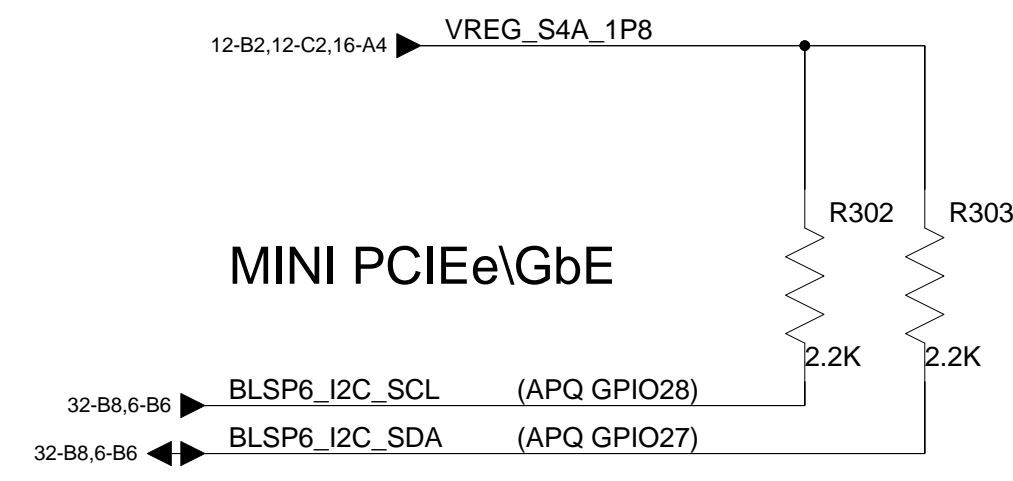
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LTR	DESCRIPTION	DATE	APPROVED



TITLE DragonBoard 820c			
SIZE D	DRAWING NO LM25-P2751-1	REV B	
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I2C PULL-UP RESISTORS



TITLE			
DragonBoard 820c			
SIZE	DRAWING NO	REV	
D	LM25-P2751-1	B	
SCALE	NONE	SHEET 8	OF 44

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LTR	DESCRIPTION	DATE	APPROVED

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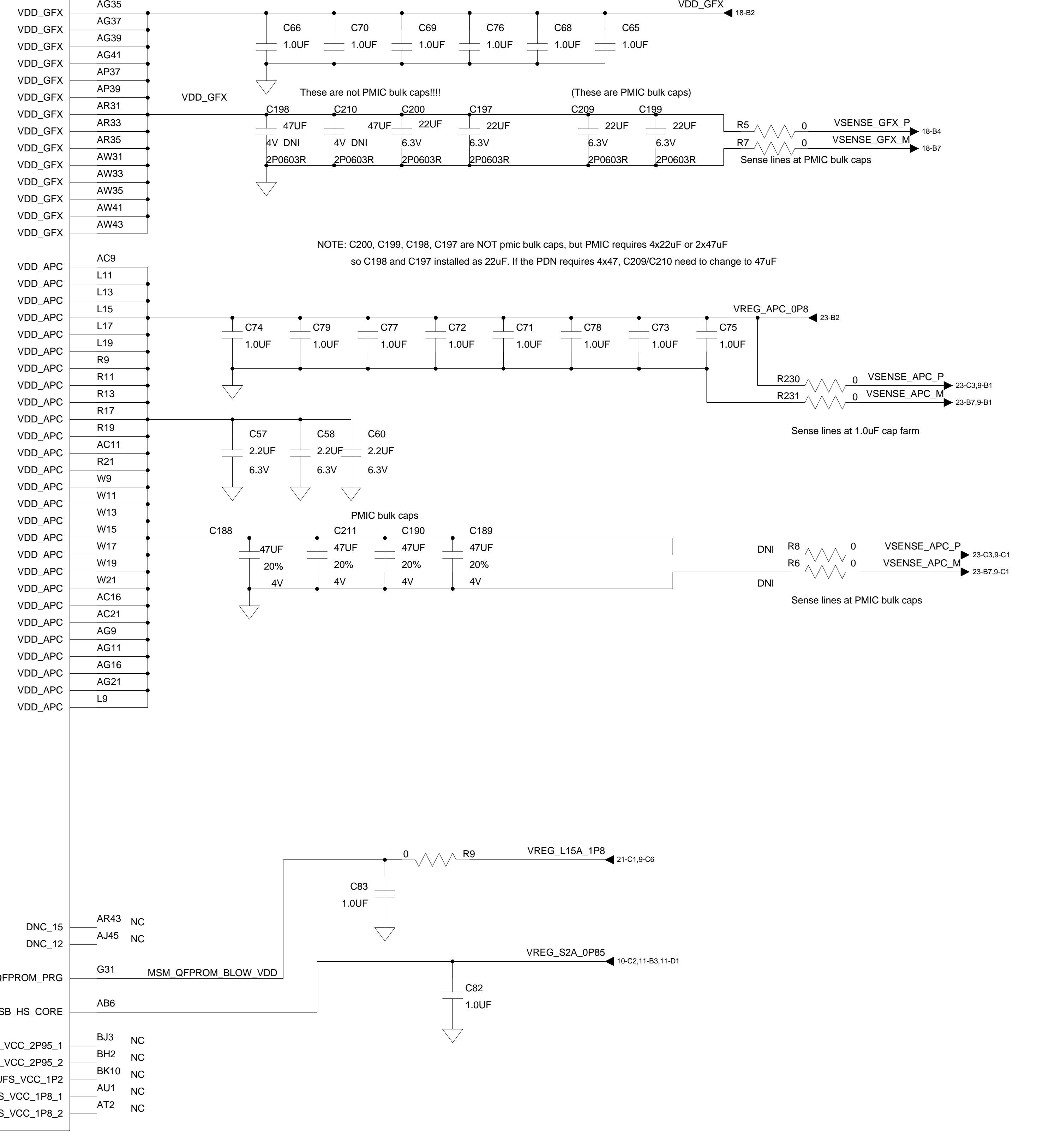
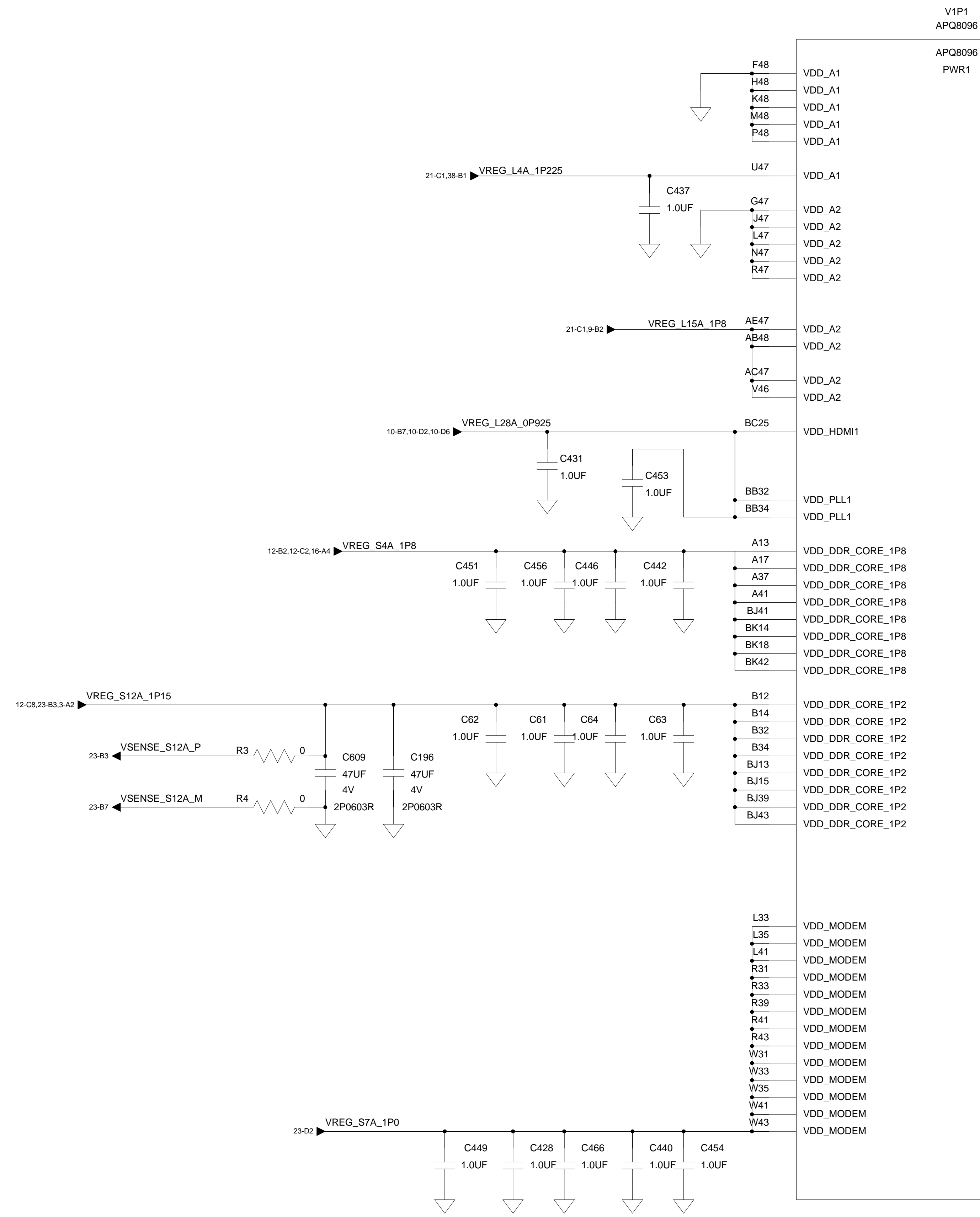
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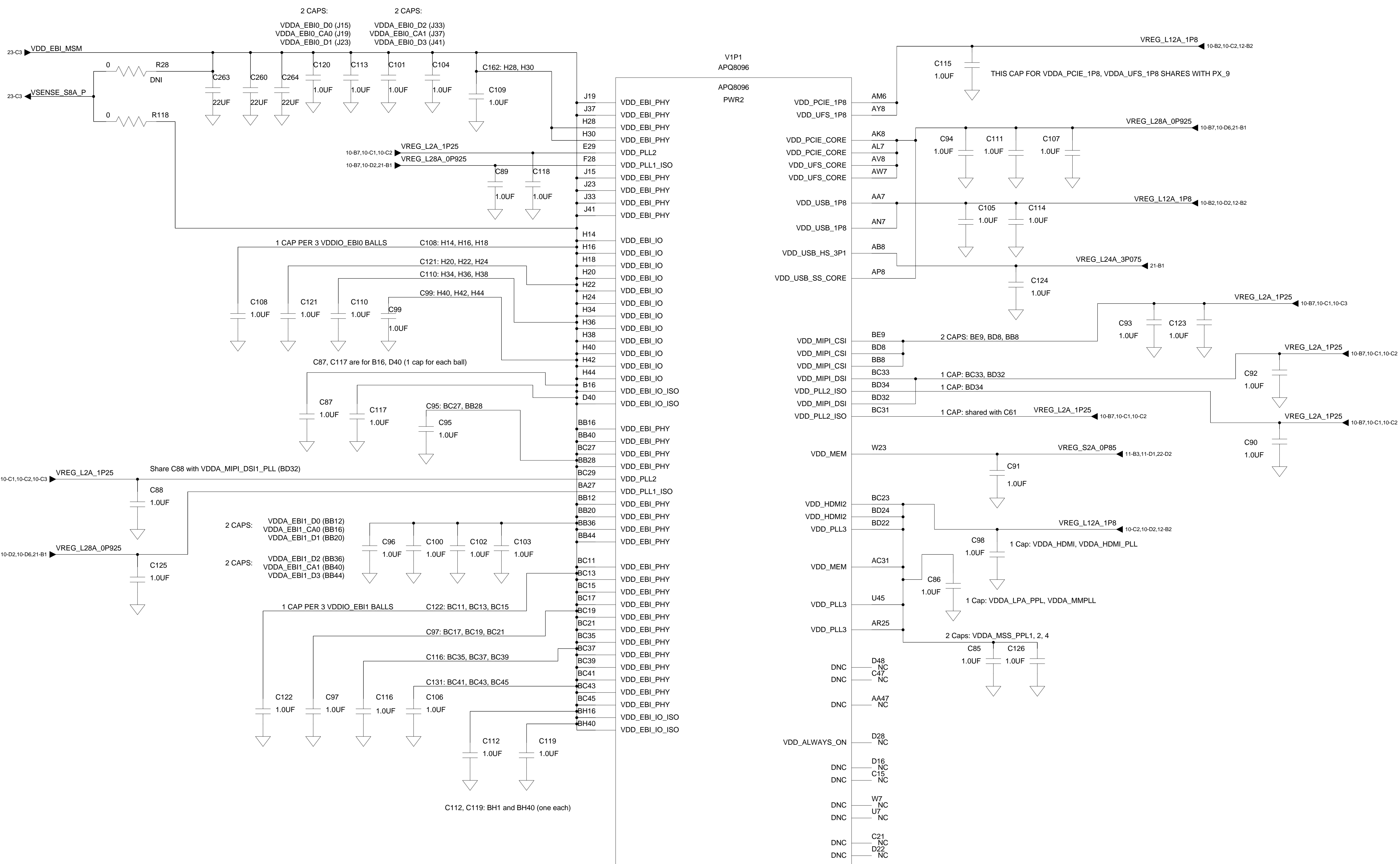
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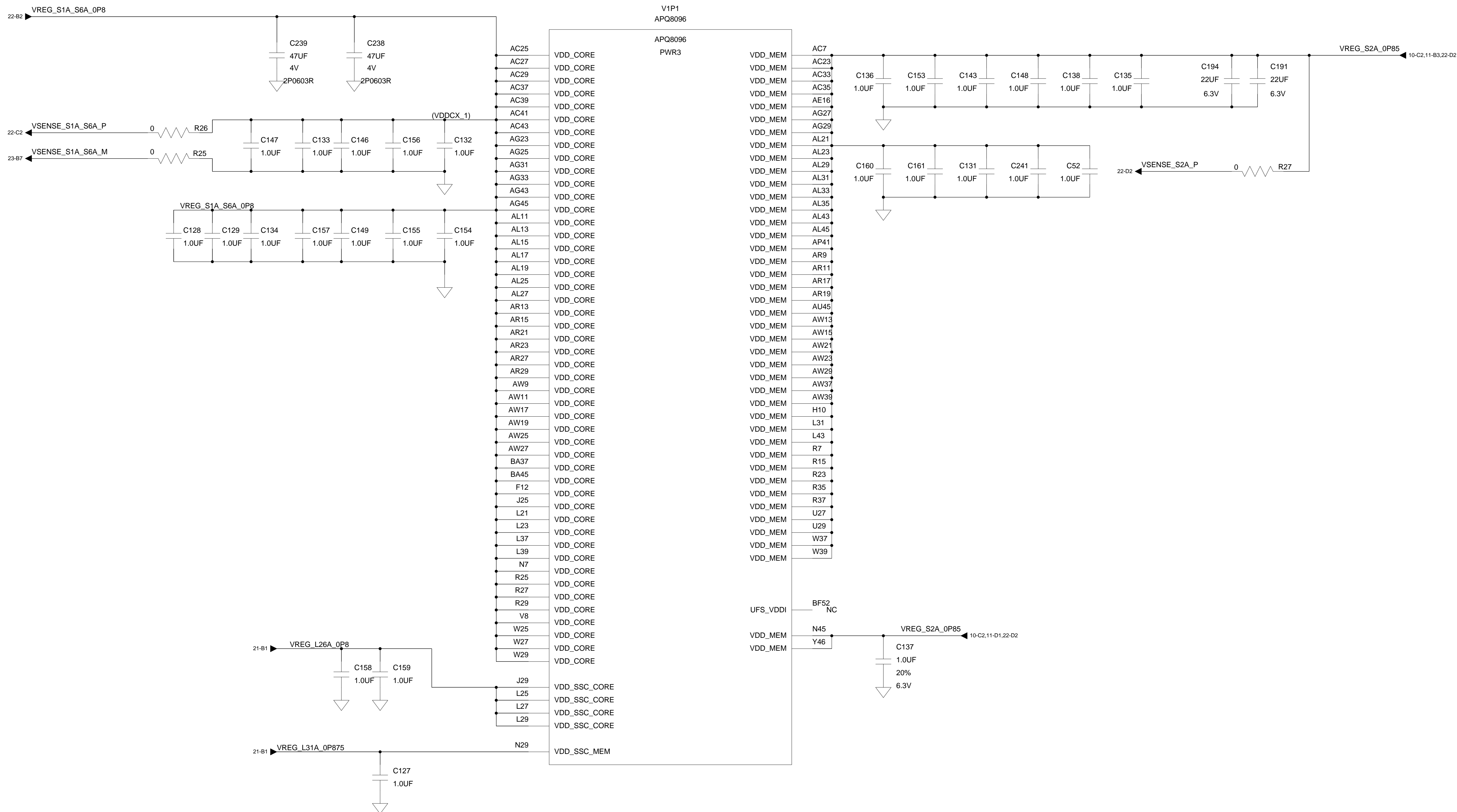
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SCALE NONE	SHEET 9	OF 44

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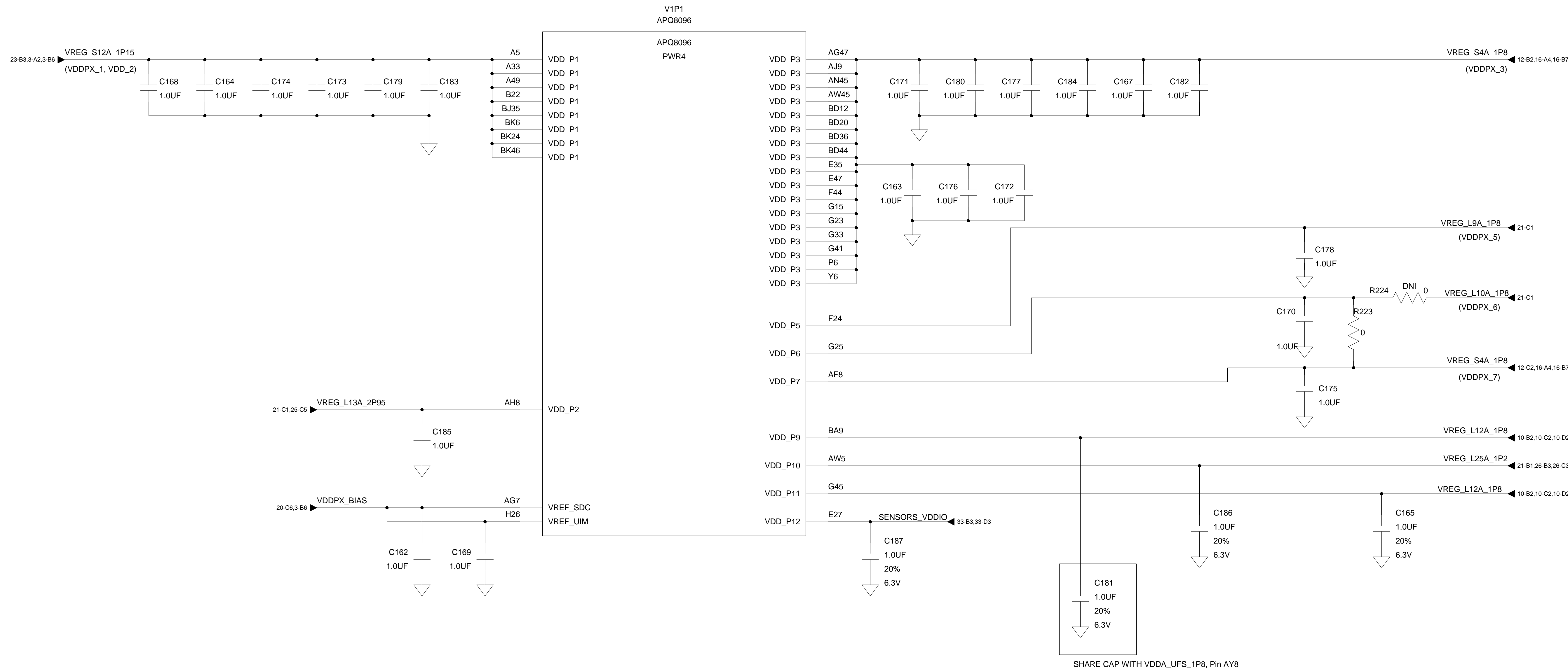
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SIZE D	DRAWING NO LM25-P2751-1	REV B	
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TITLE DragonBoard 820c			
SIZE D	DRAWING NO LM25-P2751-1		REV B
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LTR	DESCRIPTION	DATE	APPROVED

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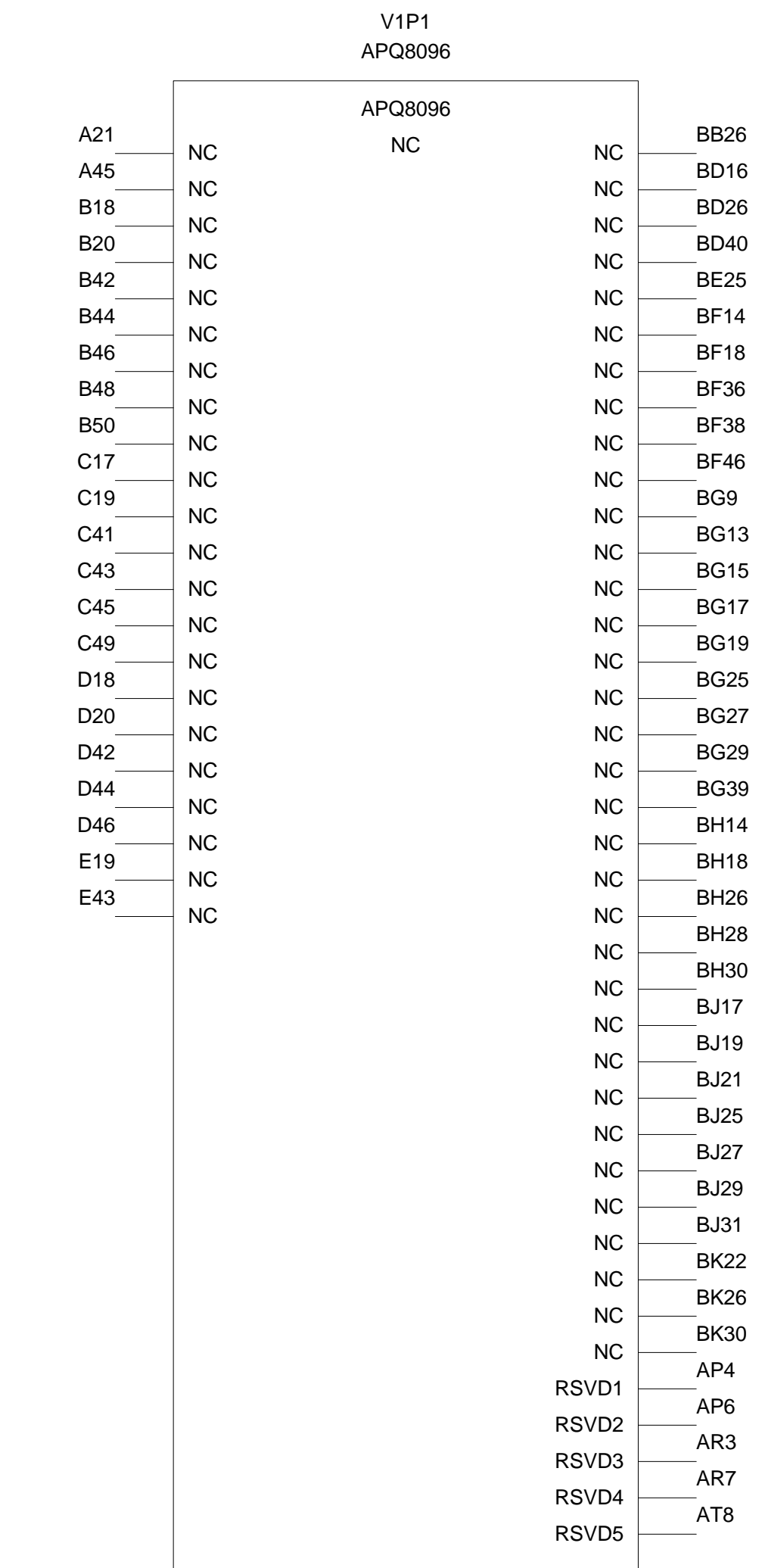
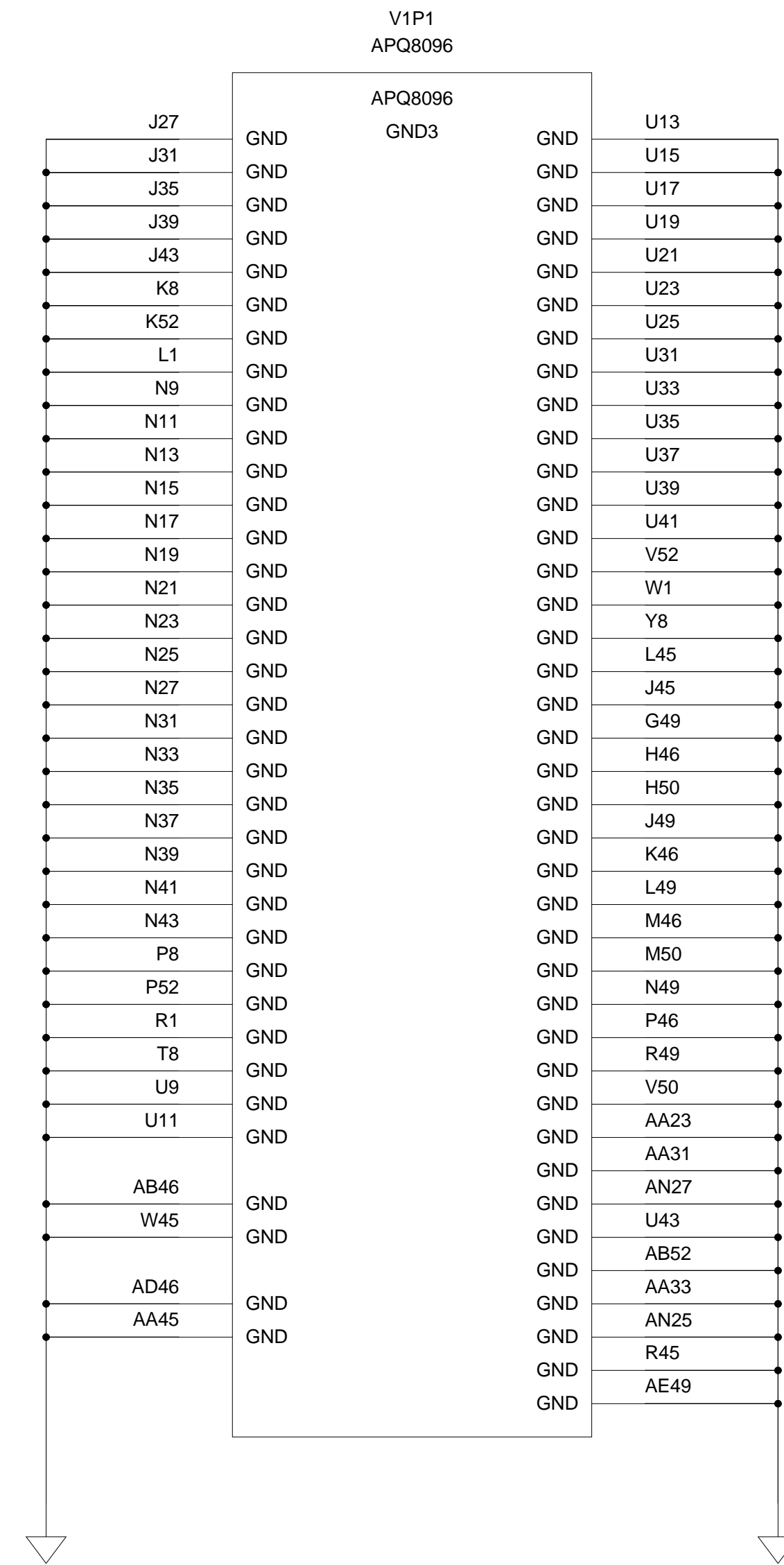
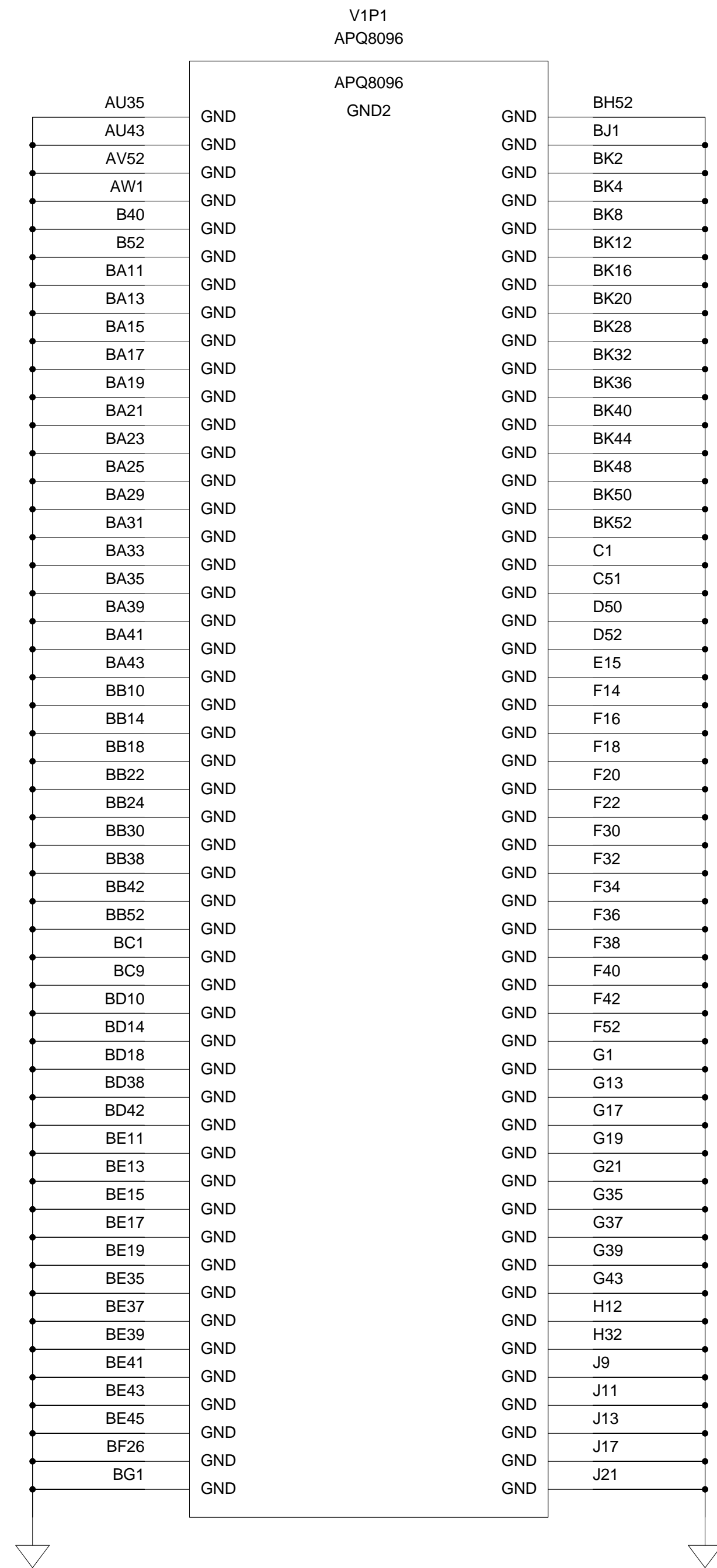
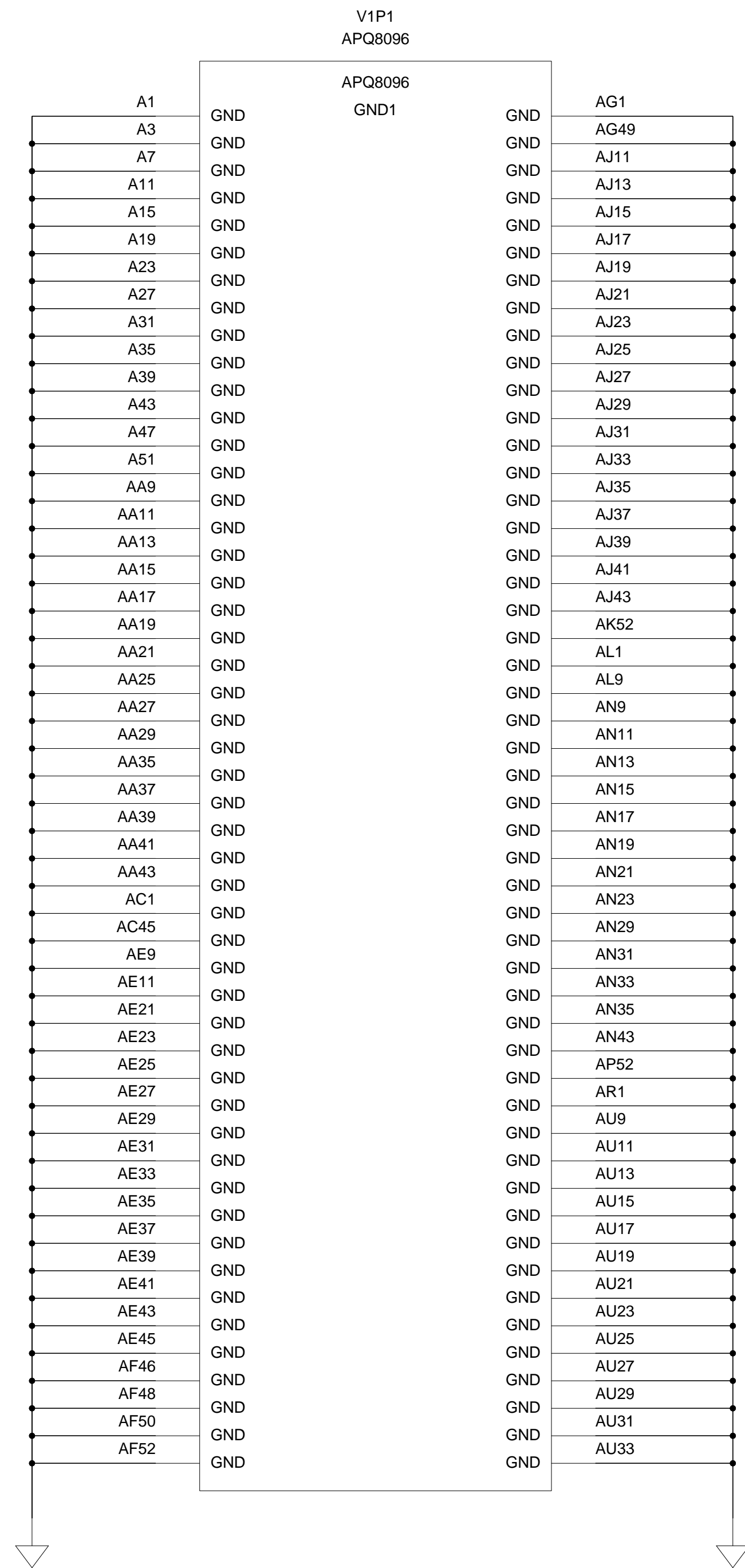
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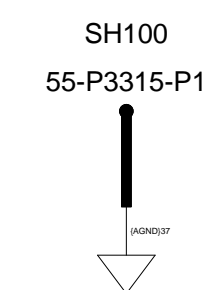
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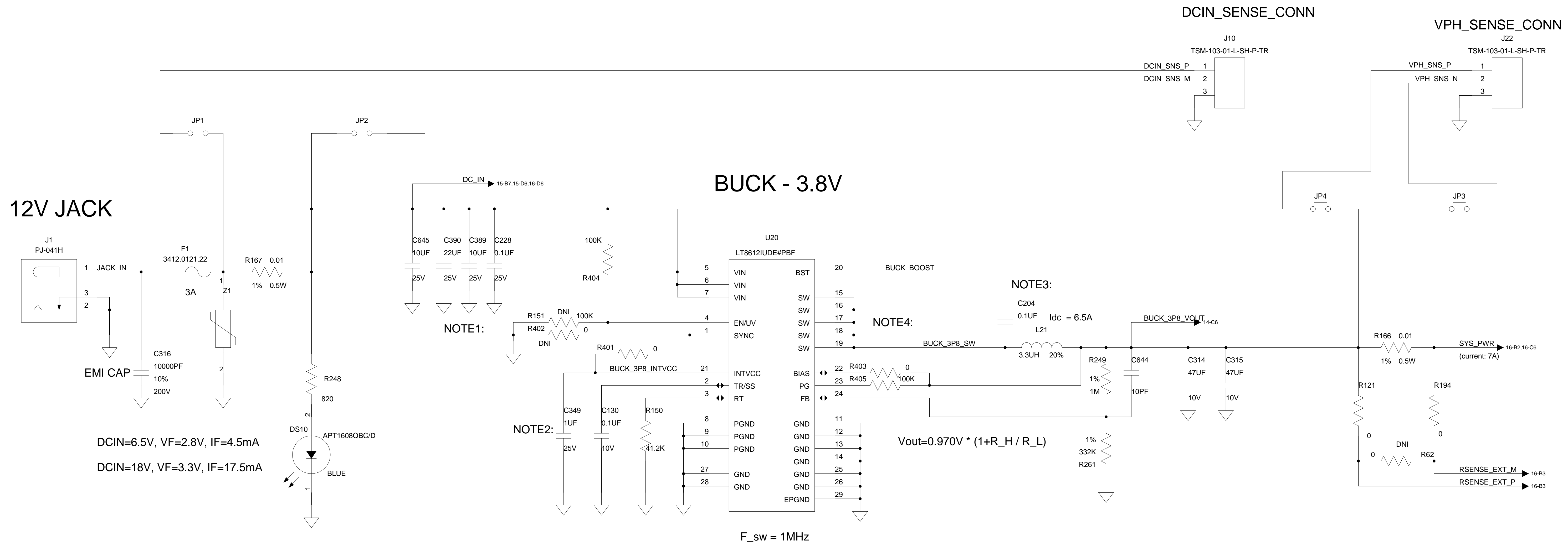


MAIN SHIELD



TITLE DragonBoard 820c		
SIZE D	DRAWING NO LM25-P2751-1	REV B
SCALE NONE	SHEET 13	OF 44

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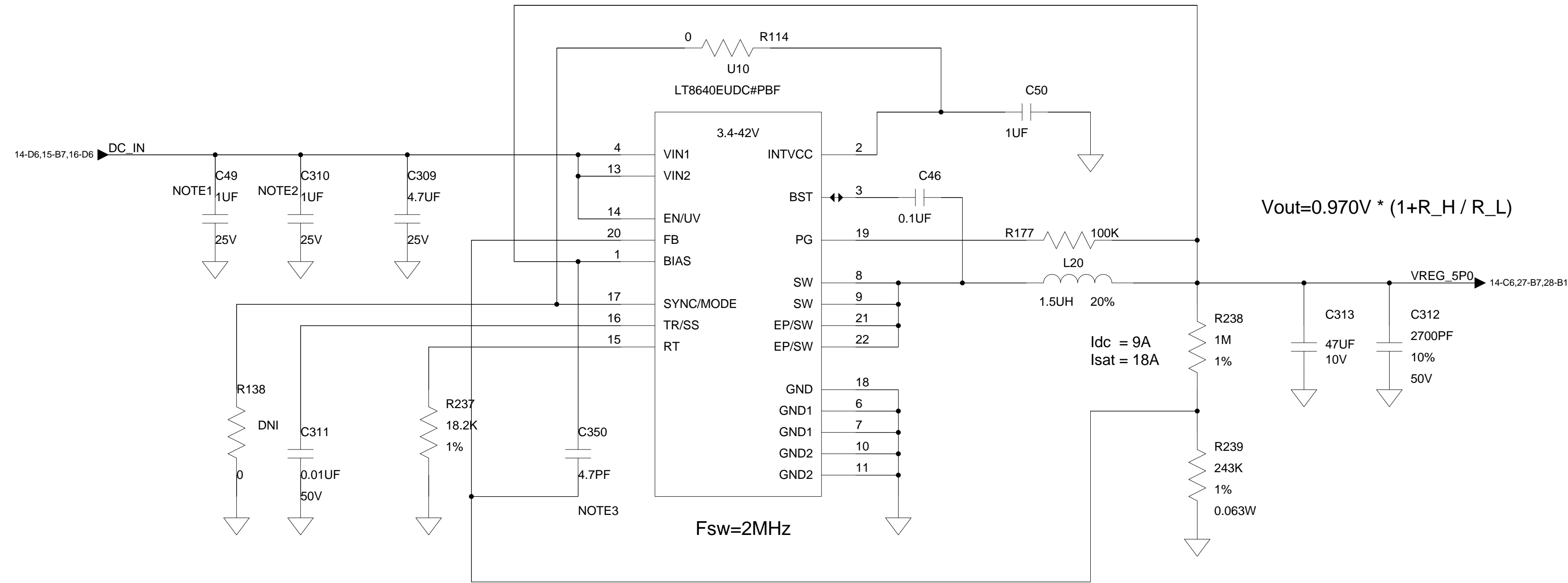
CAD NOTES:

- NOTE1: Connect the input capacitor(s), CIN, close to the IC
- NOTE2: Connect the INTVCC decoupling capacitor, CVCC, closely to the INTVCC and PGND pins
- NOTE3: Connect the top driver boost capacitor, C204, closely to the BOOST and SW pins
- NOTE4: Keep the high dV/dT SW, BOOST and TG nodes away from sensitive small-signal nodes

TITLE DragonBoard 820c		
SIZE D	DRAWING NO LM25-P2751-1	REV B
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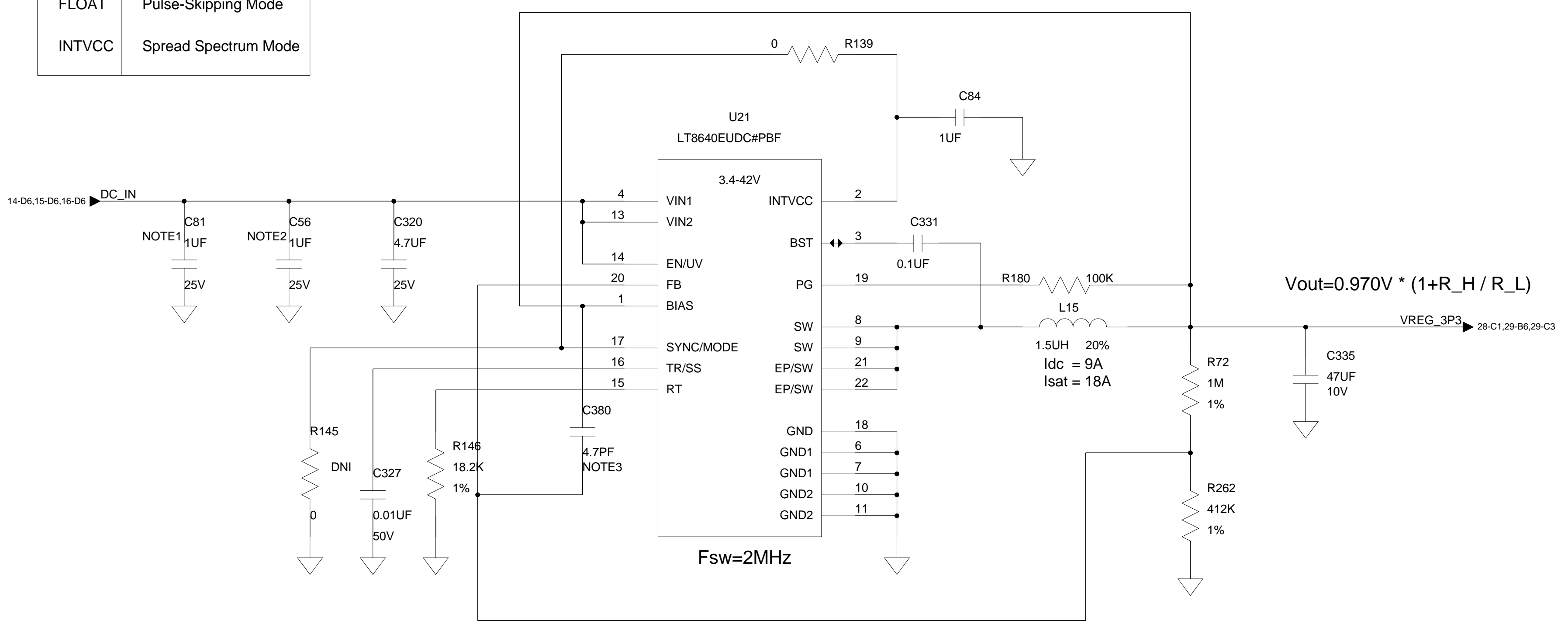
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

BUCK - 5.0V



SYNC	Mode
GND	BURST Mode
FLOAT	Pulse-Skipping Mode
INTVCC	Spread Spectrum Mode

BUCK - 3.3V



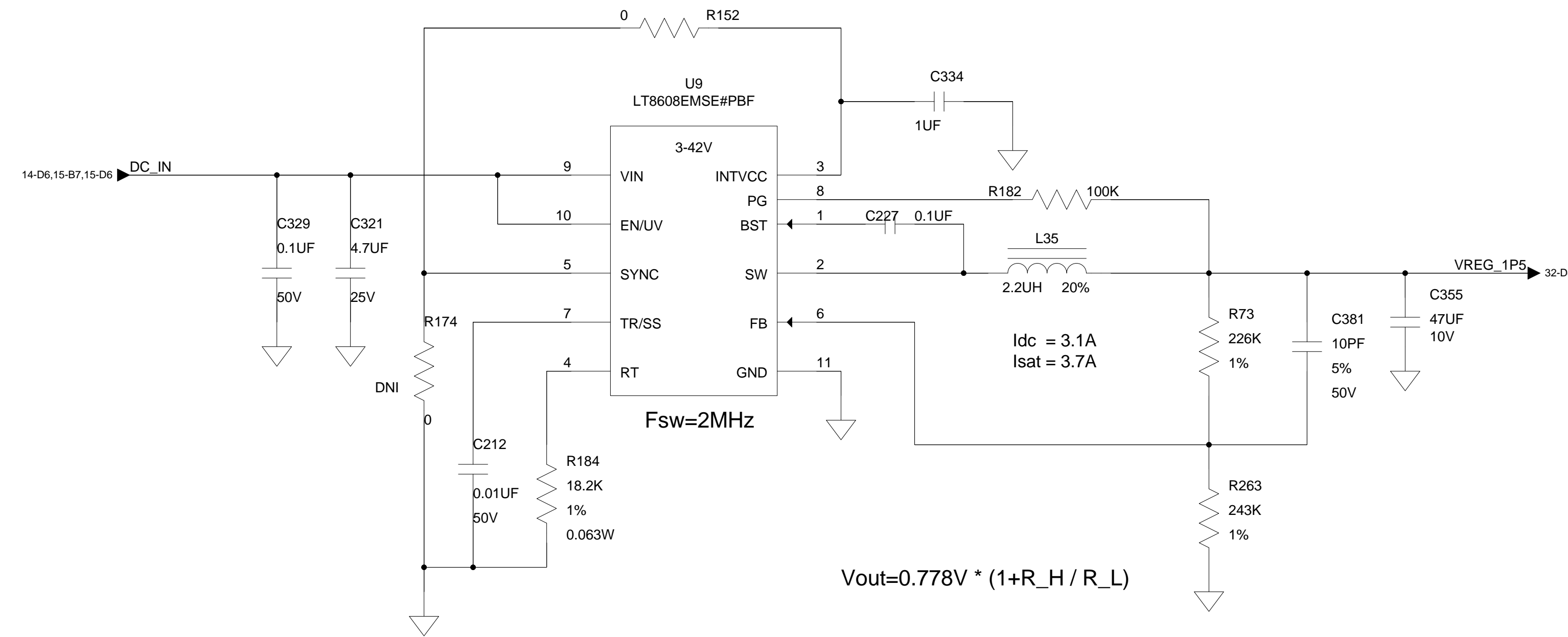
CAD NOTES:
 NOTE1: PLACE NEAR VIN1
 NOTE1: PLACE NEAR VIN2
 NOTE3: PLACE NEAR BIAS PIN

TITLE DragonBoard 820c		
SIZE D	DRAWING NO LM25-P2751-1	REV B
SCALE NONE	SHEET 15	OF 44

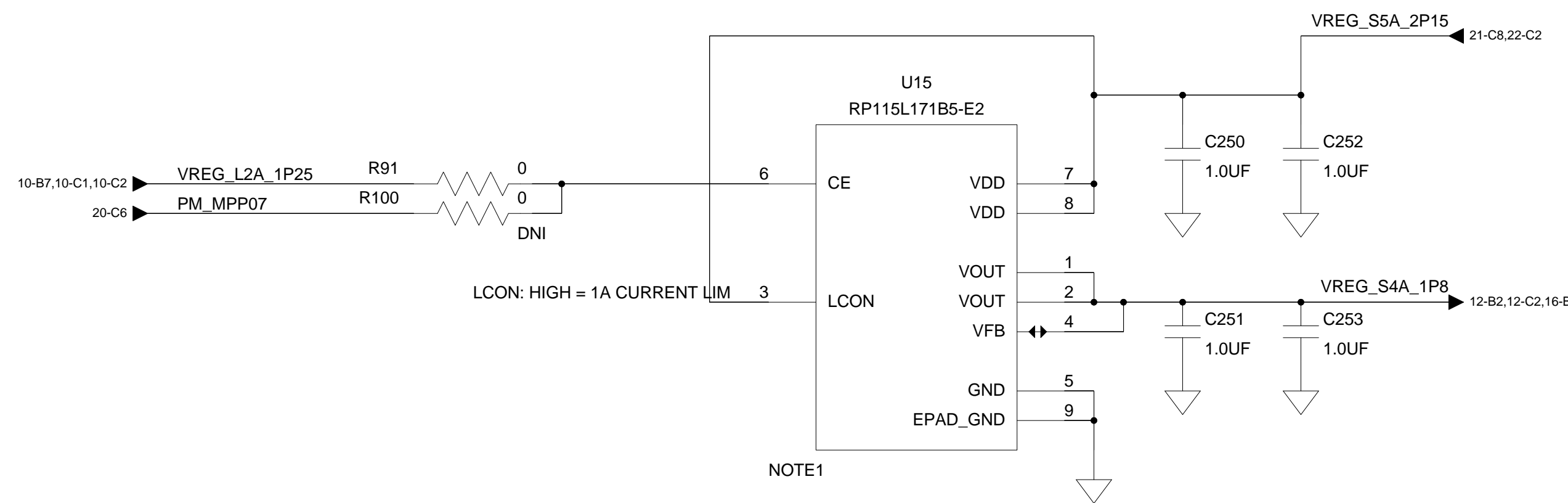
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

BUCK - 1.5V

SYNC	Mode
GND	BURST Mode
FLOAT	Pulse-Skipping Mode
INTVCC	Spread Spectrum Mode



S4A BHELPER



CAD NOTES:
NOTE 1: place Bhelper near the main VREG_S4 rail

Note: Peak worst case current consumption on VREG_S4A SMPS is estimated to be approx. 2.7A when ALL the ICs are consuming peak currents.

Since VREG_S4A is rated to provide only 2A of current, an external LDO is required in parallel with S4A to supplement additional current from VREG_S5A.

POWER - REG 1P5V AND S4A BHELPER

TITLE DragonBoard 820c		
SIZE D	DRAWING NO LM25-P2751-1	REV B
SCALE NONE	SHEET 16	OF 44

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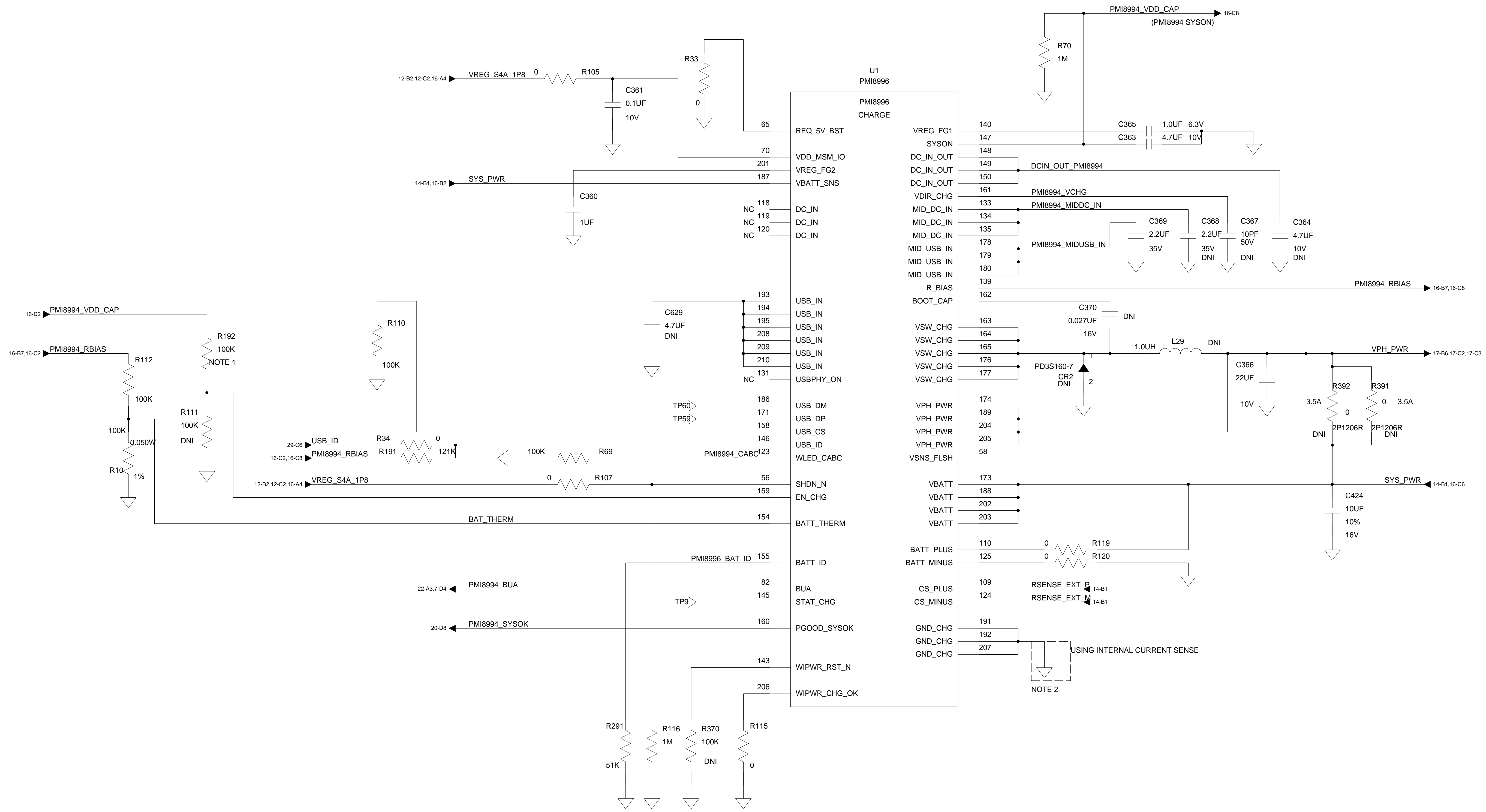
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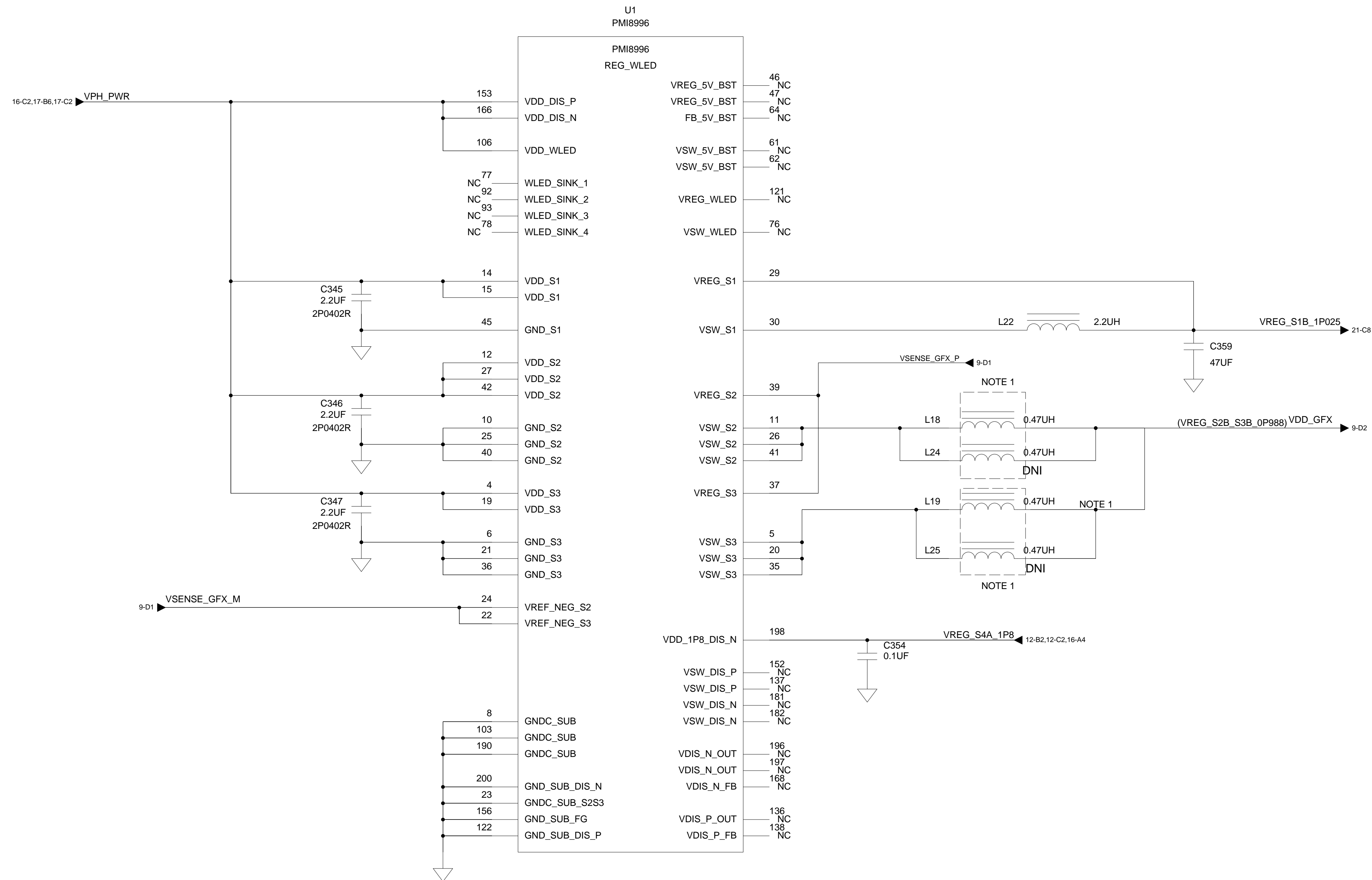
CAD NOTES:

- NOTE 1: Charger disabled when EN='1'
- NOTE 2: Connect to the low side of the VSYS, USBIN bypass capacitor and then via down to GND plane

PMI8996 - CHARGE

TITLE DragonBoard 820c		
SIZE D	DRAWING NO LM25-P2751-1	REV B
SCALE NONE	SHEET 17	OF 44

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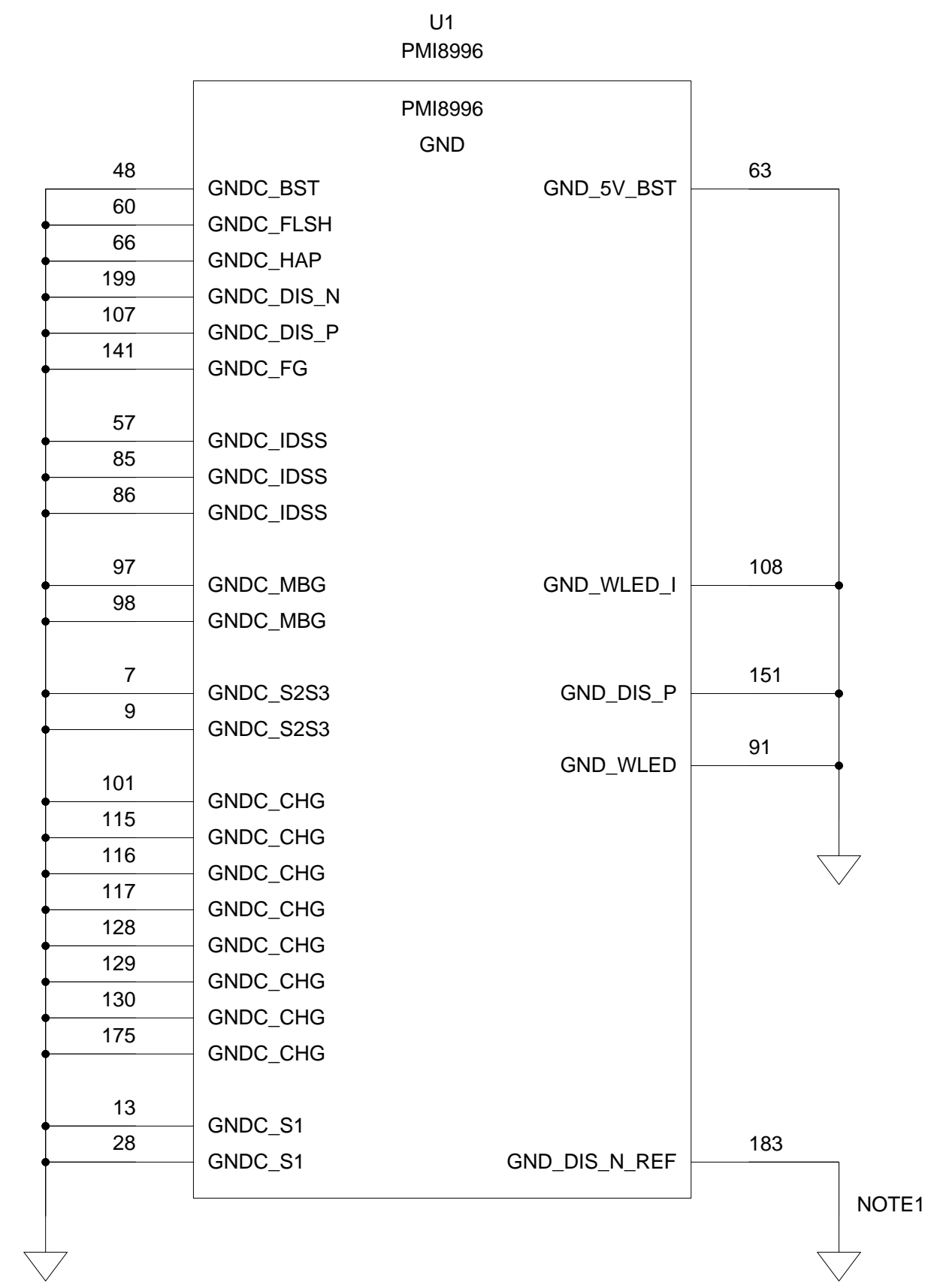


CAD NOTES
NOTE 1: Dual footprint

PMI8996 - REG/WLED

TITLE DragonBoard 820c			
SIZE D	DRAWING NO LM25-P2751-1	REV B	
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CAD NOTES:
NOTE 1: Connect PIN# 183 TO GND of C382

TITLE DragonBoard 820c			
SIZE D	DRAWING NO LM25-P2751-1	REV B	
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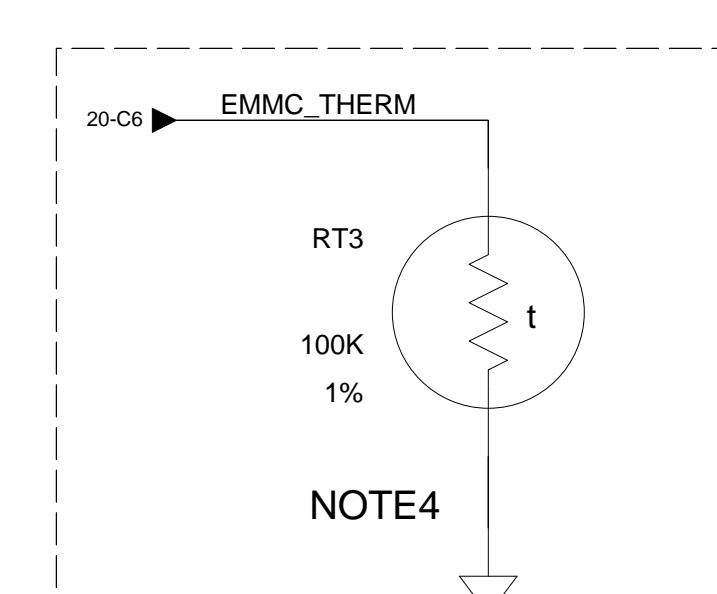
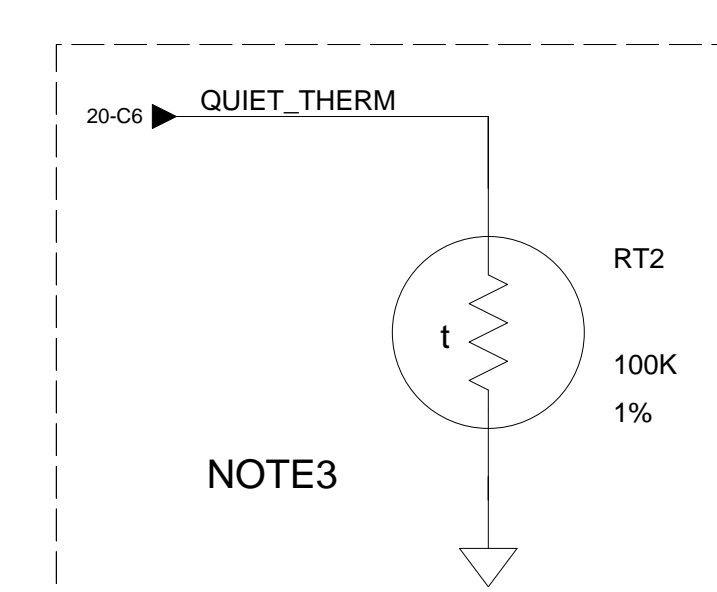
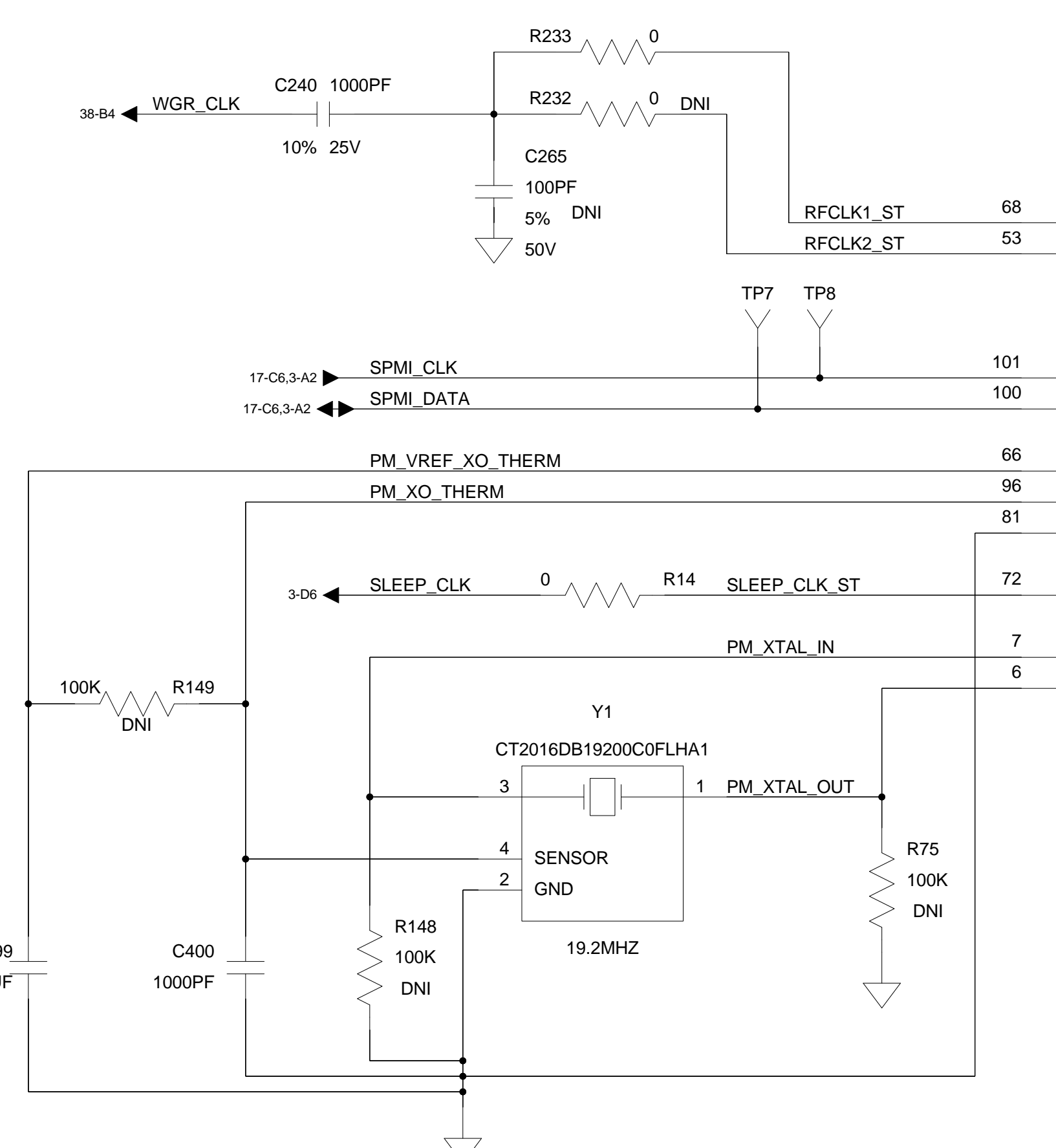
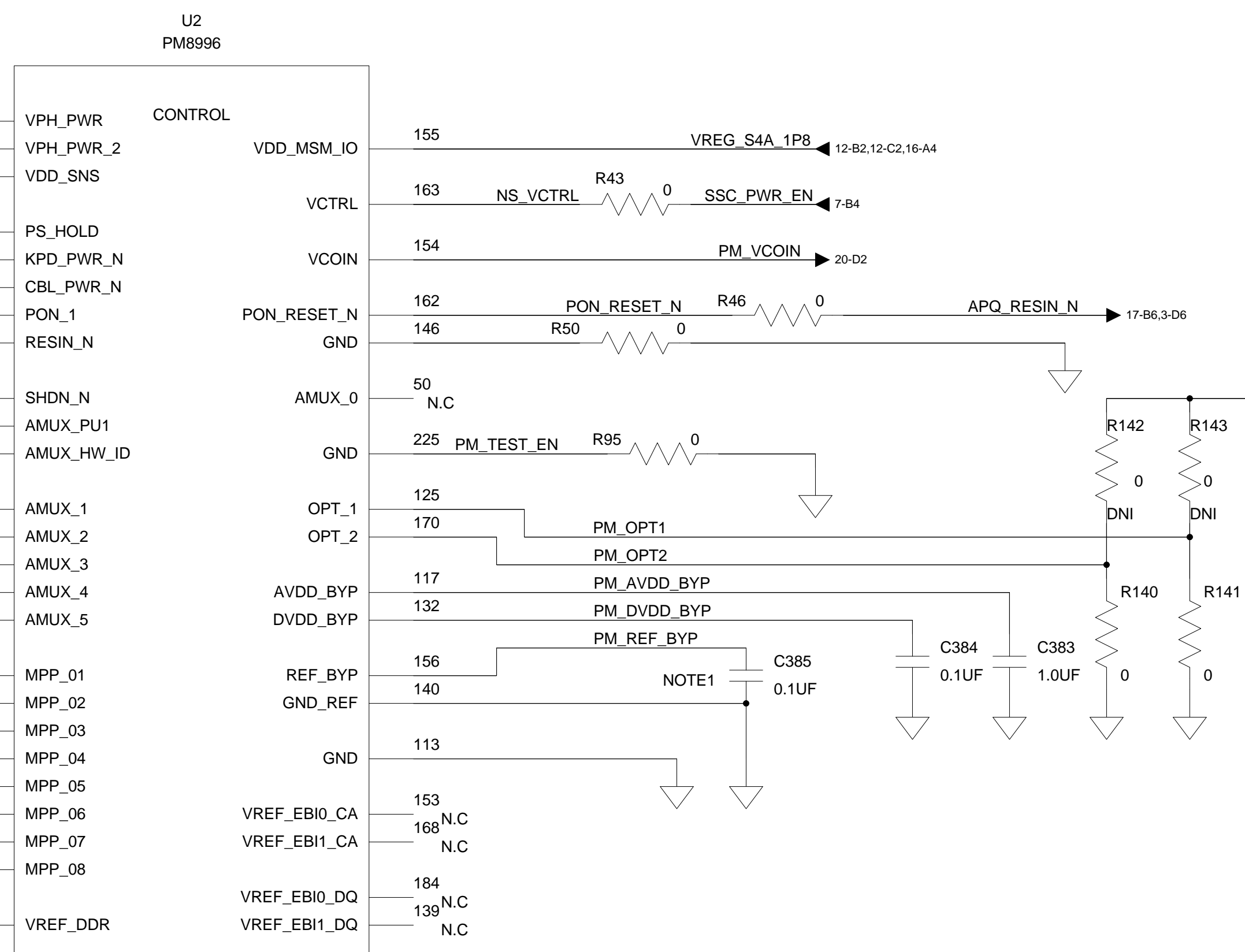
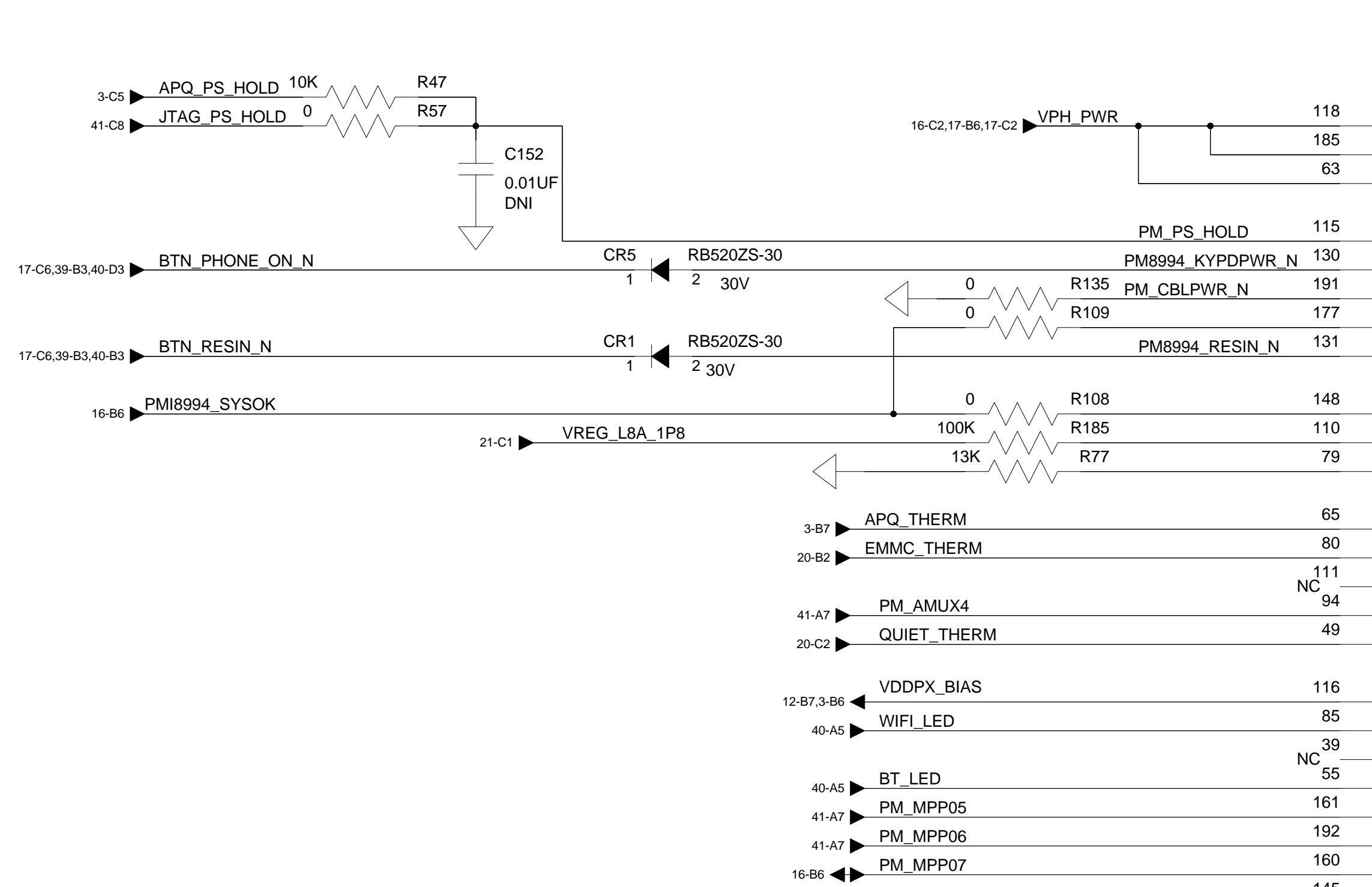
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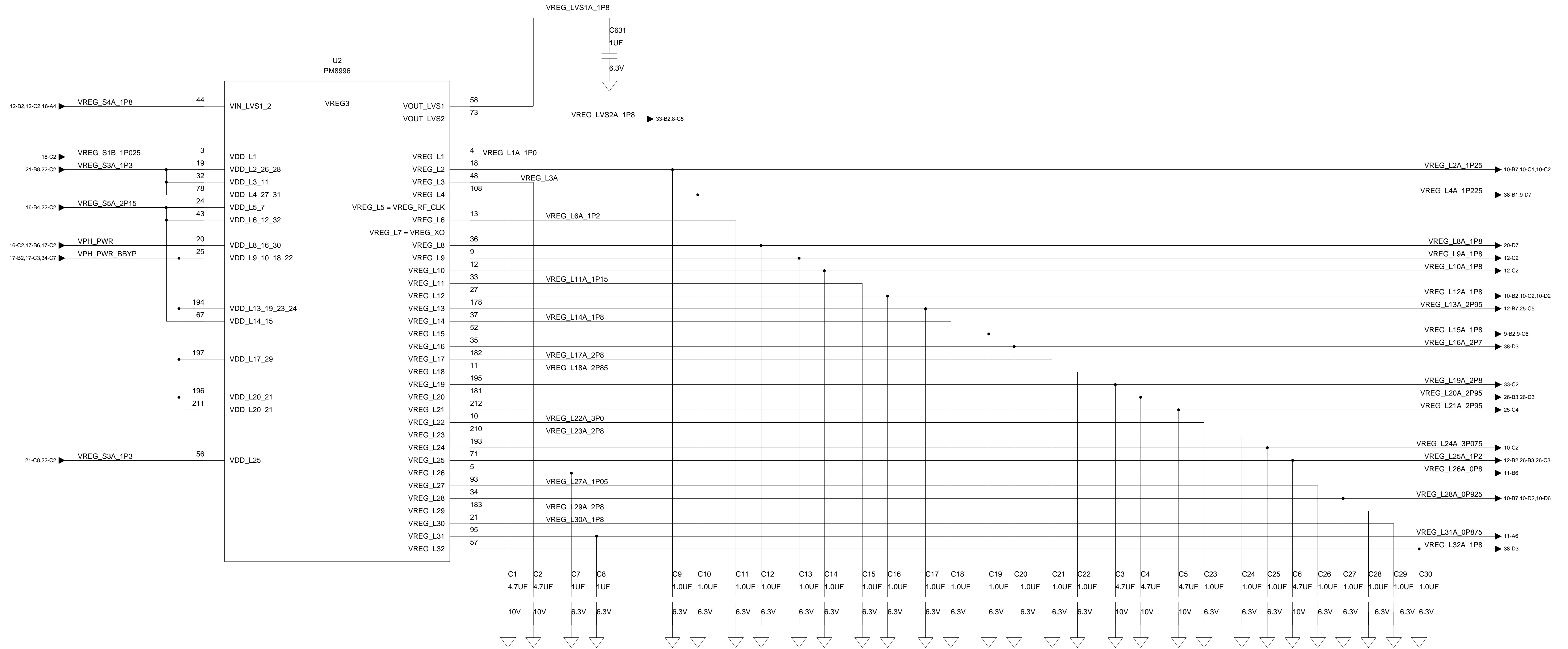
CAD NOTES

- NOTE 1: Connect ground on the capacitor
- NOTE 2: Place C387 and C388 close to PMIC
- NOTE 3: Place in quiet area
- NOTE 4: Place between eMMC and UFS

PM8996 - CONTROL/CLOCK

TITLE DragonBoard 820c		
SIZE D	DRAWING NO LM25-P2751-1	REV B
SCALE NONE	SHEET 21	OF 44

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NOTE1

NOTE2

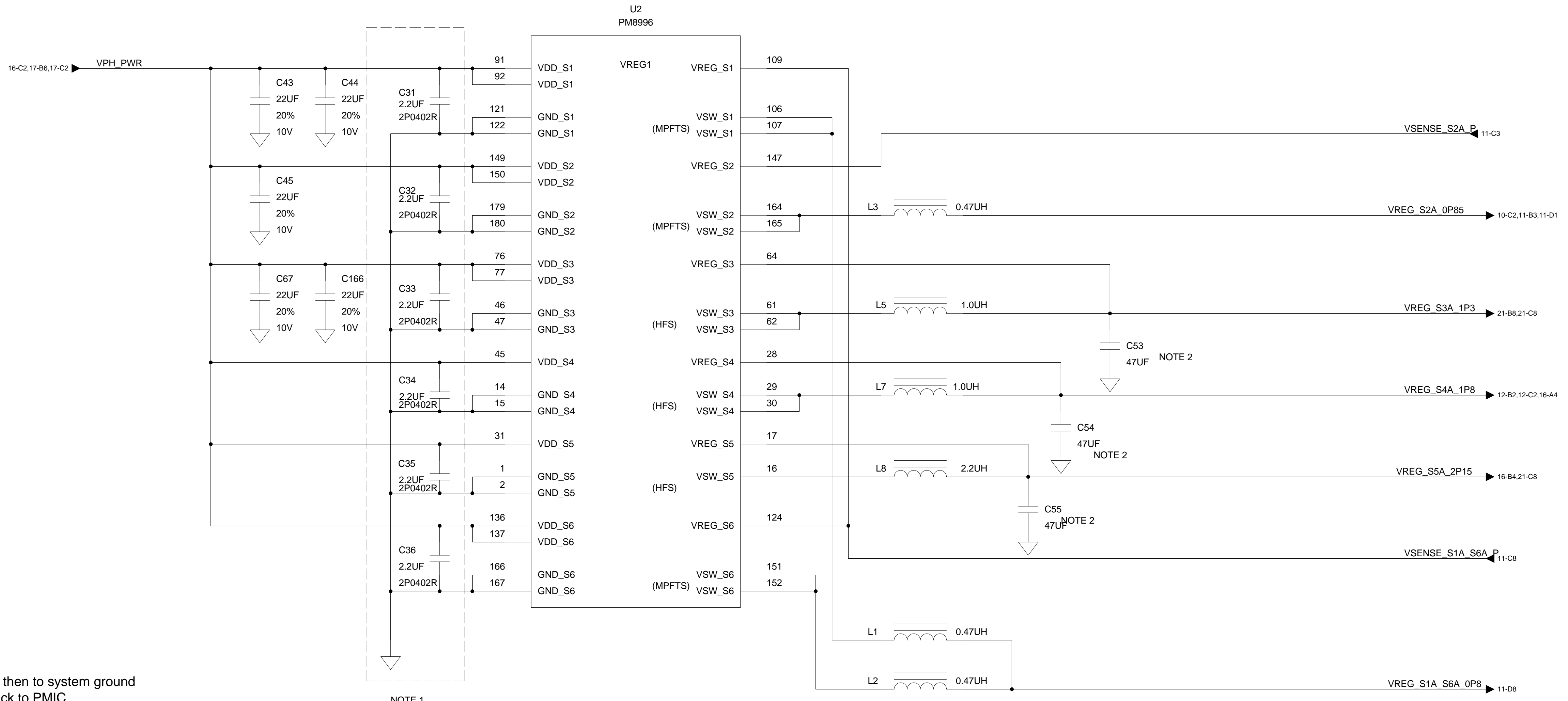
CAD NOTE:

NOTE1: PLACE NEAR PMIC

NOTE2: PLACE NEAR LOAD

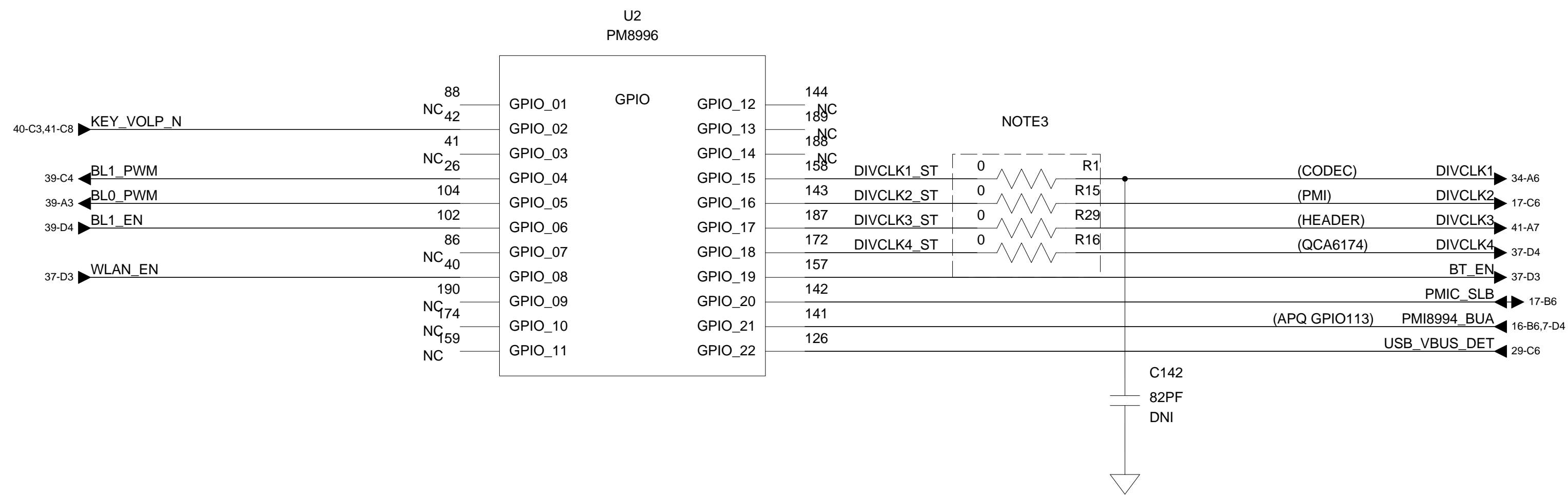
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SCALE NONE	SHEET 22		OF 44

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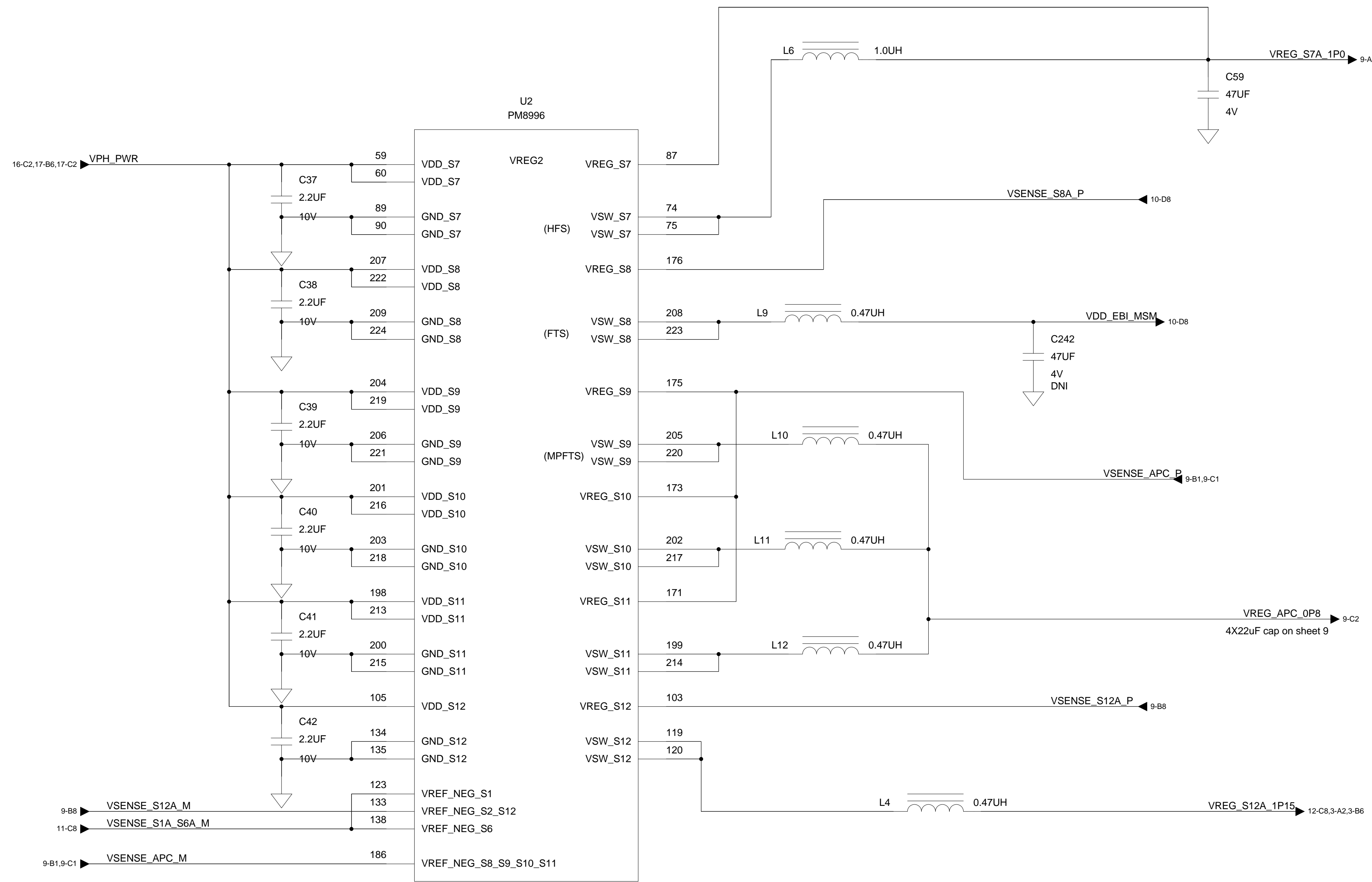
CAD NOTES

- NOTE 1: Connect ground from PMIC to input capacitor, then to system ground
- NOTE 2: Route as single trace from output capacitor back to PMIC
- NOTE 3: PLACE CLOSE TO U2



TITLE DragonBoard 820c		
SIZE D	DRAWING NO LM25-P2751-1	REV B
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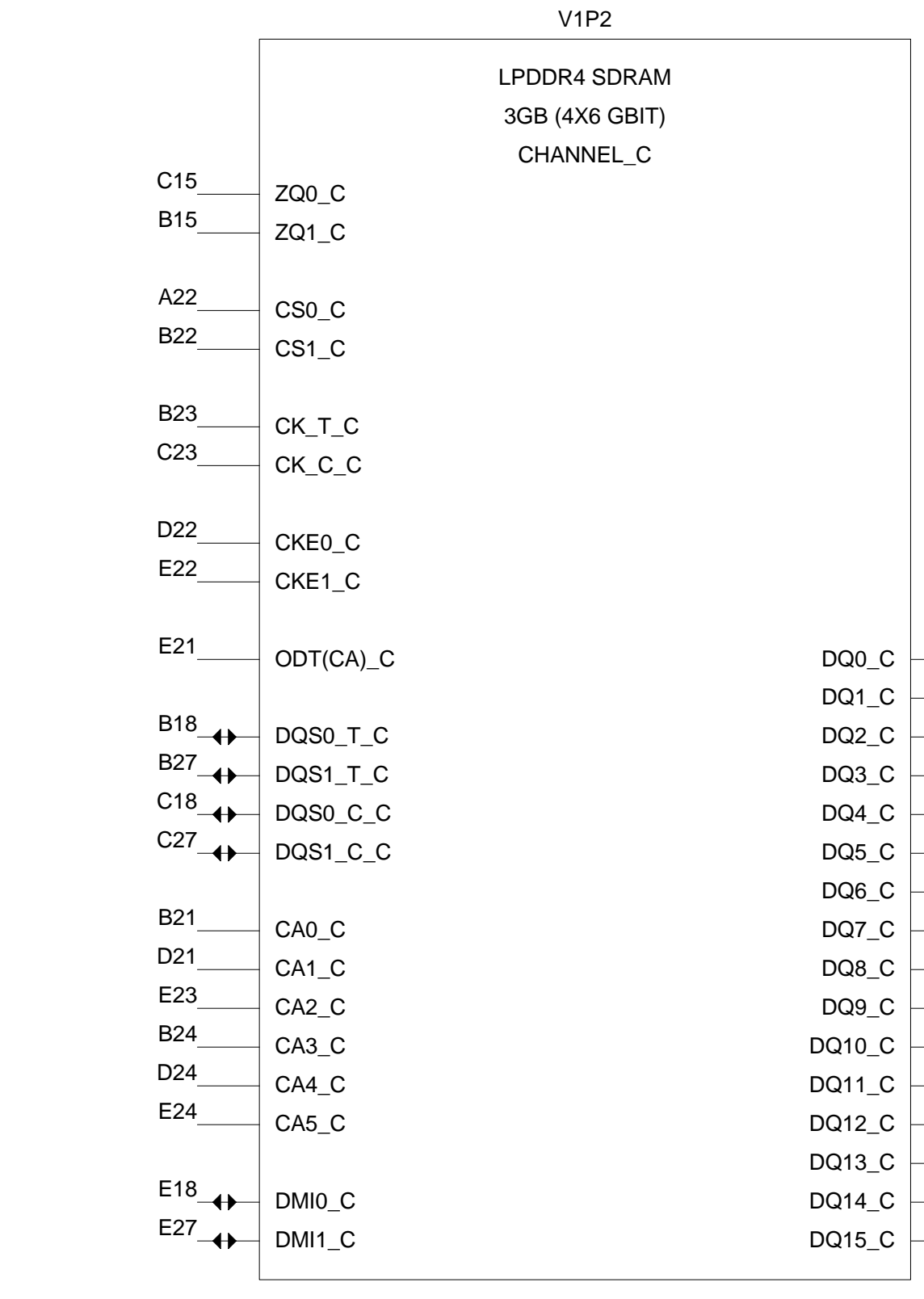
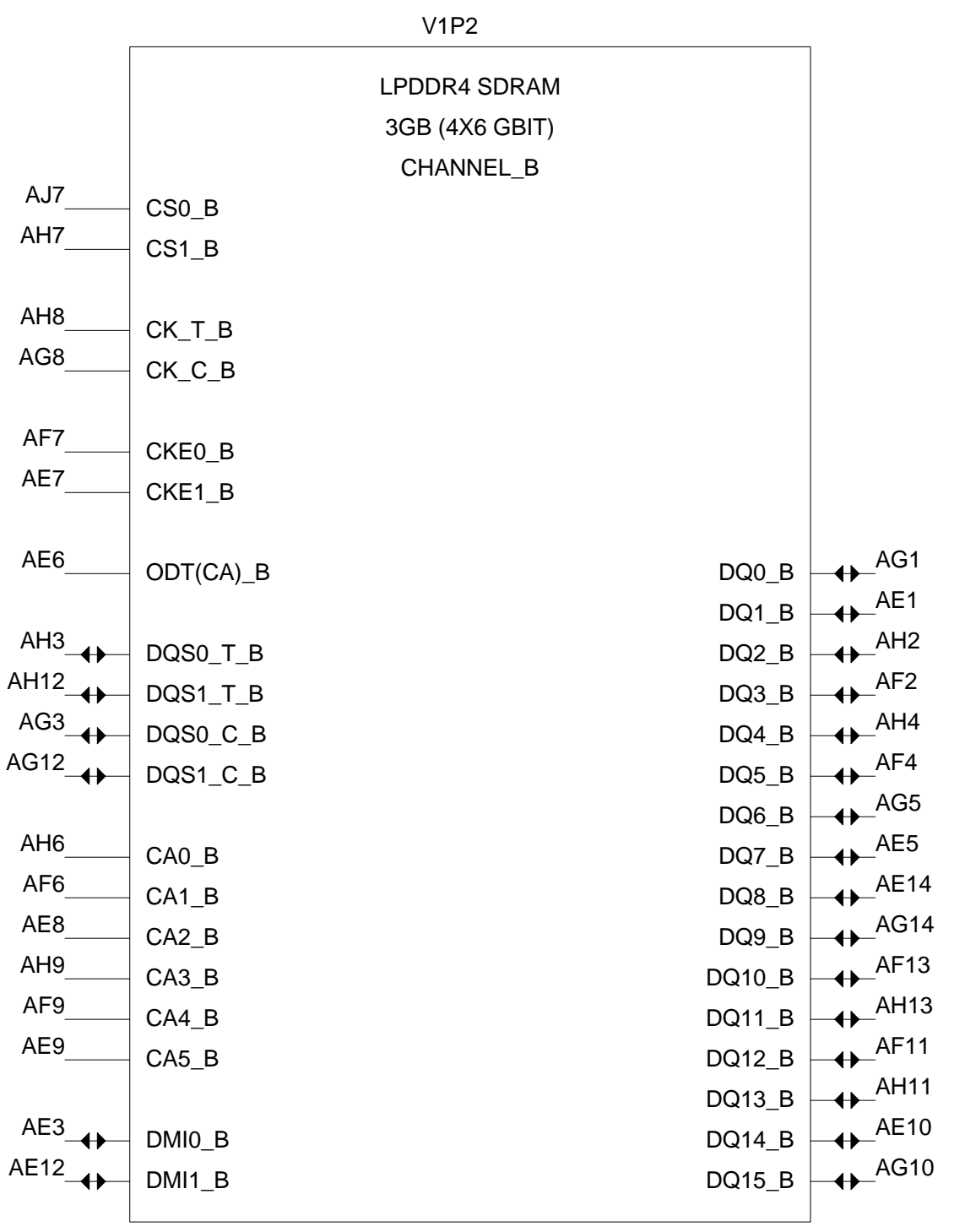
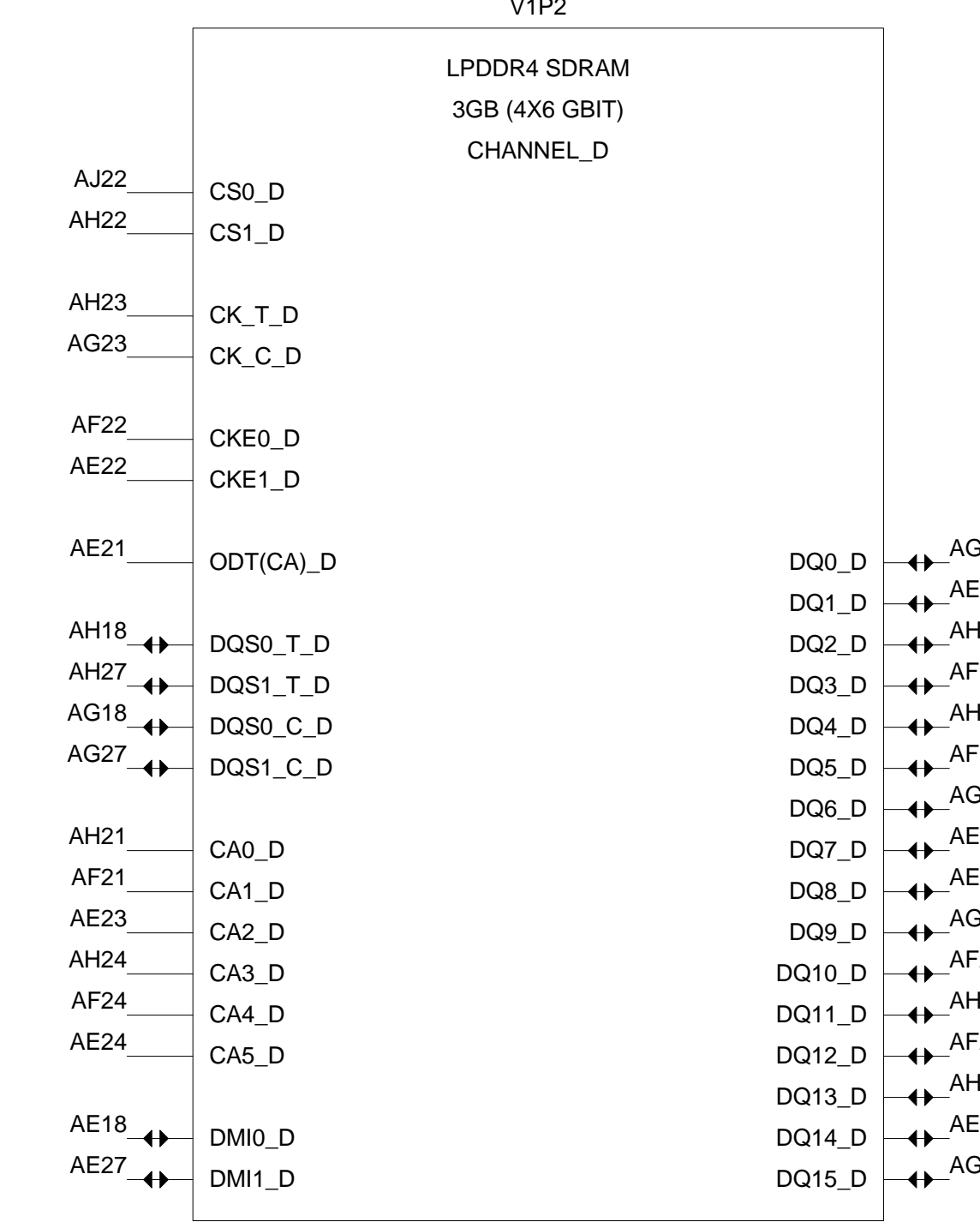
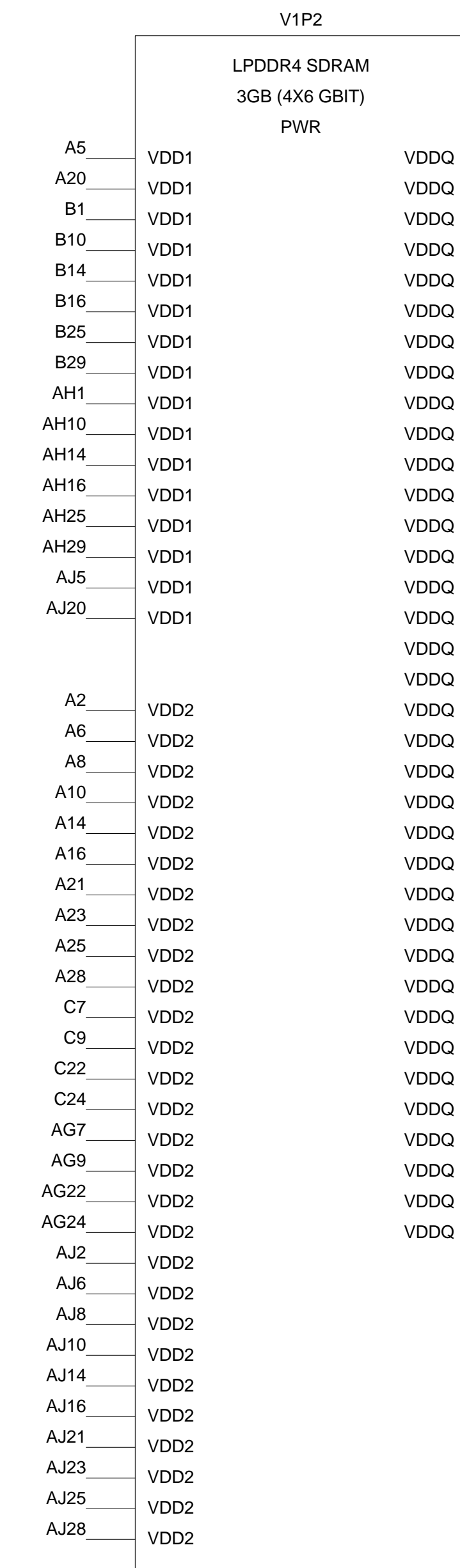
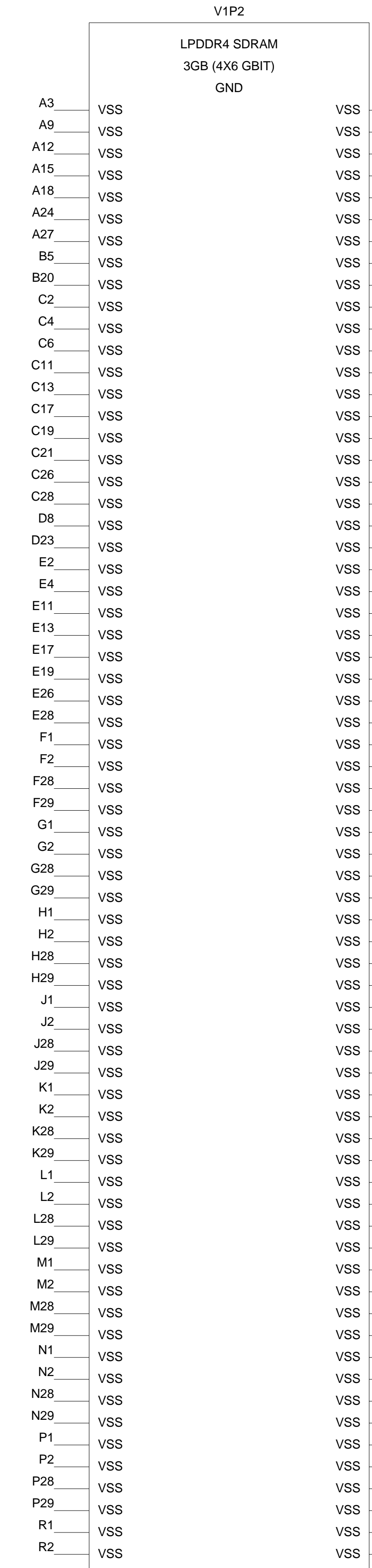
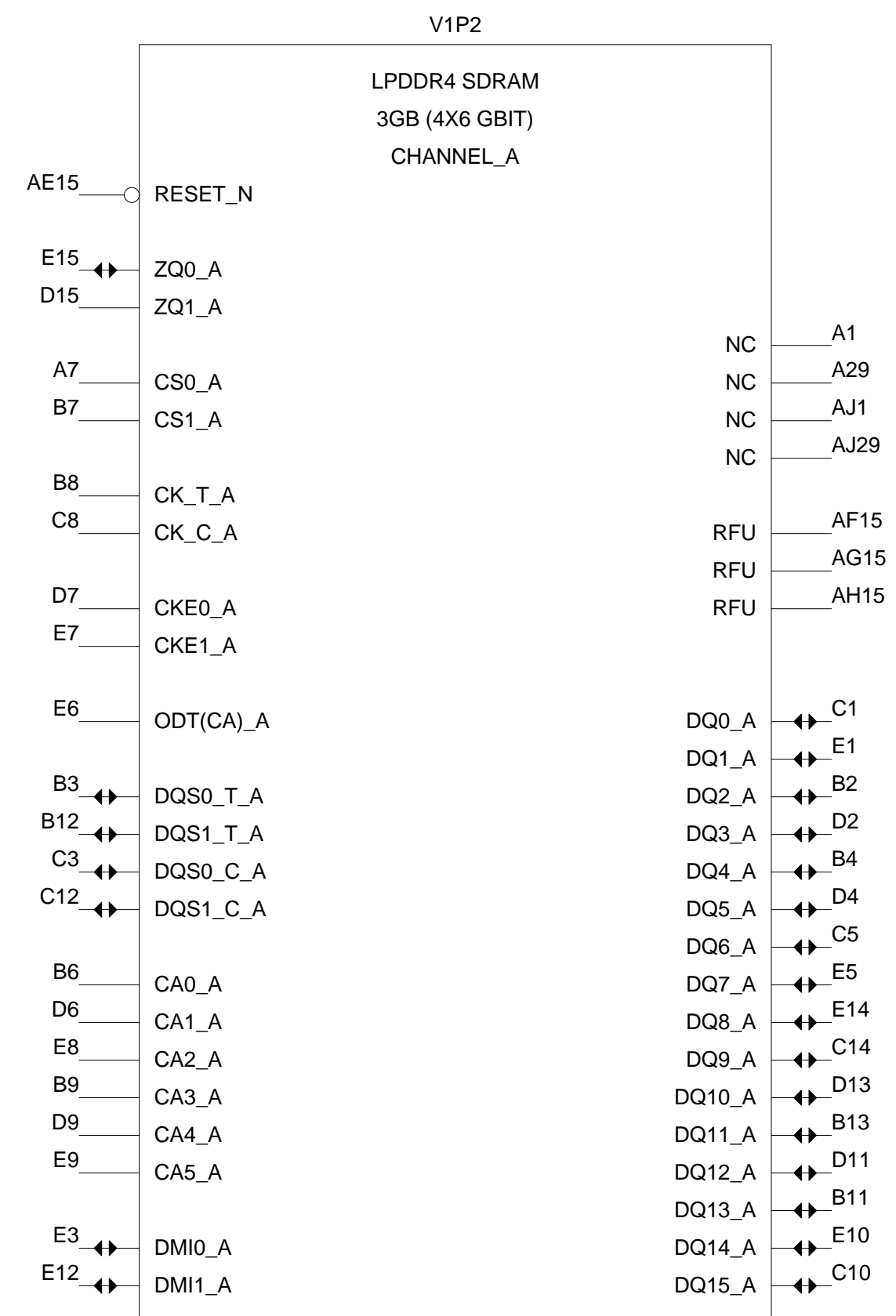
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LTR	DESCRIPTION	DATE	APPROVED



TITLE DragonBoard 820c			
SIZE D	DRAWING NO LM25-P2751-1	REV B	
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APQ8096 PoP LPDDR4

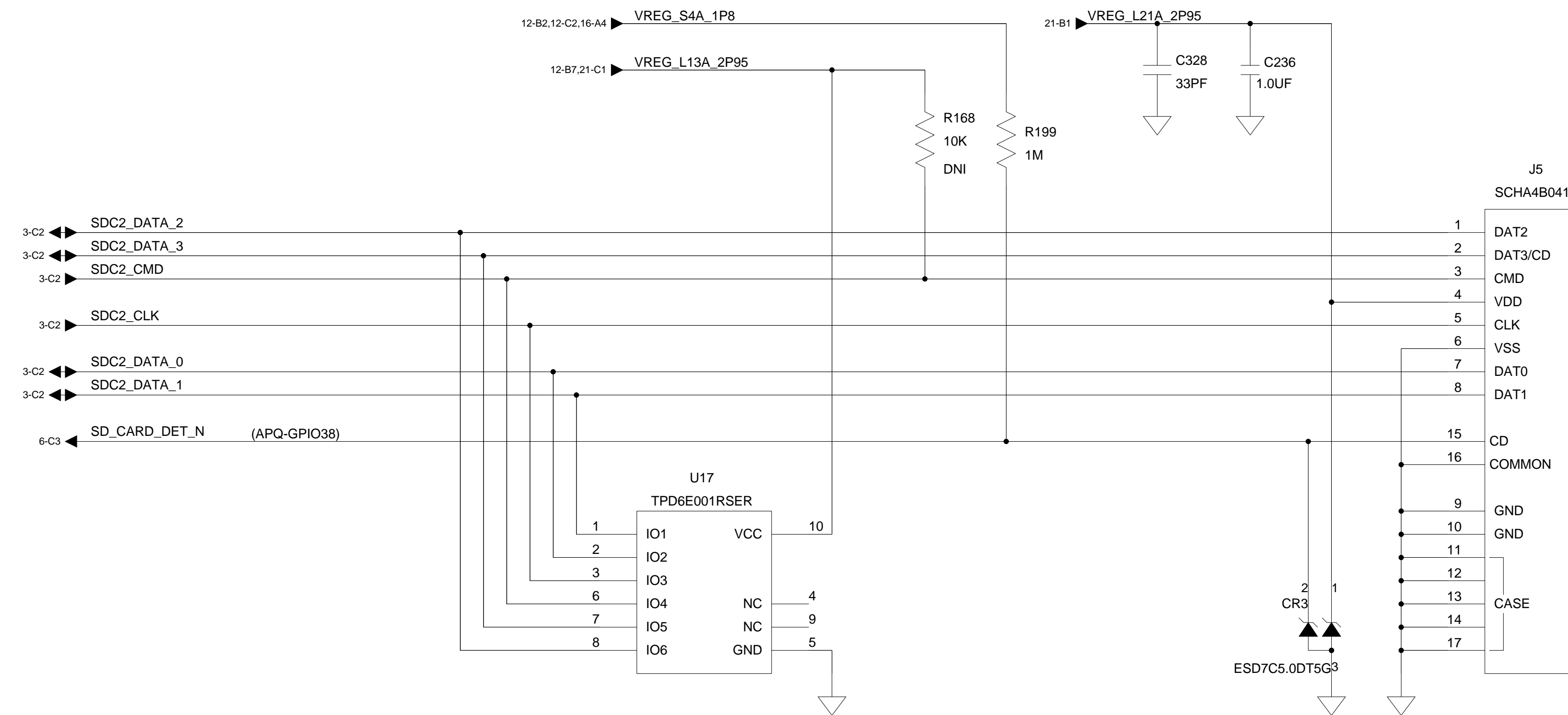
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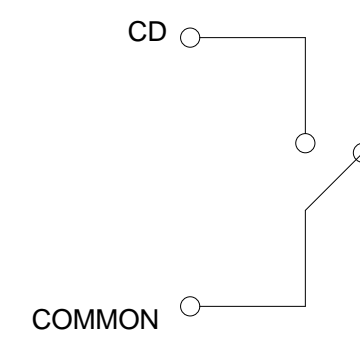
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SIZE D	DRAWING NO LM25-P2751-1	REV B	
SCALE NONE	SHEET 25		OF 44

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MEMORY - uSD CONNECTOR

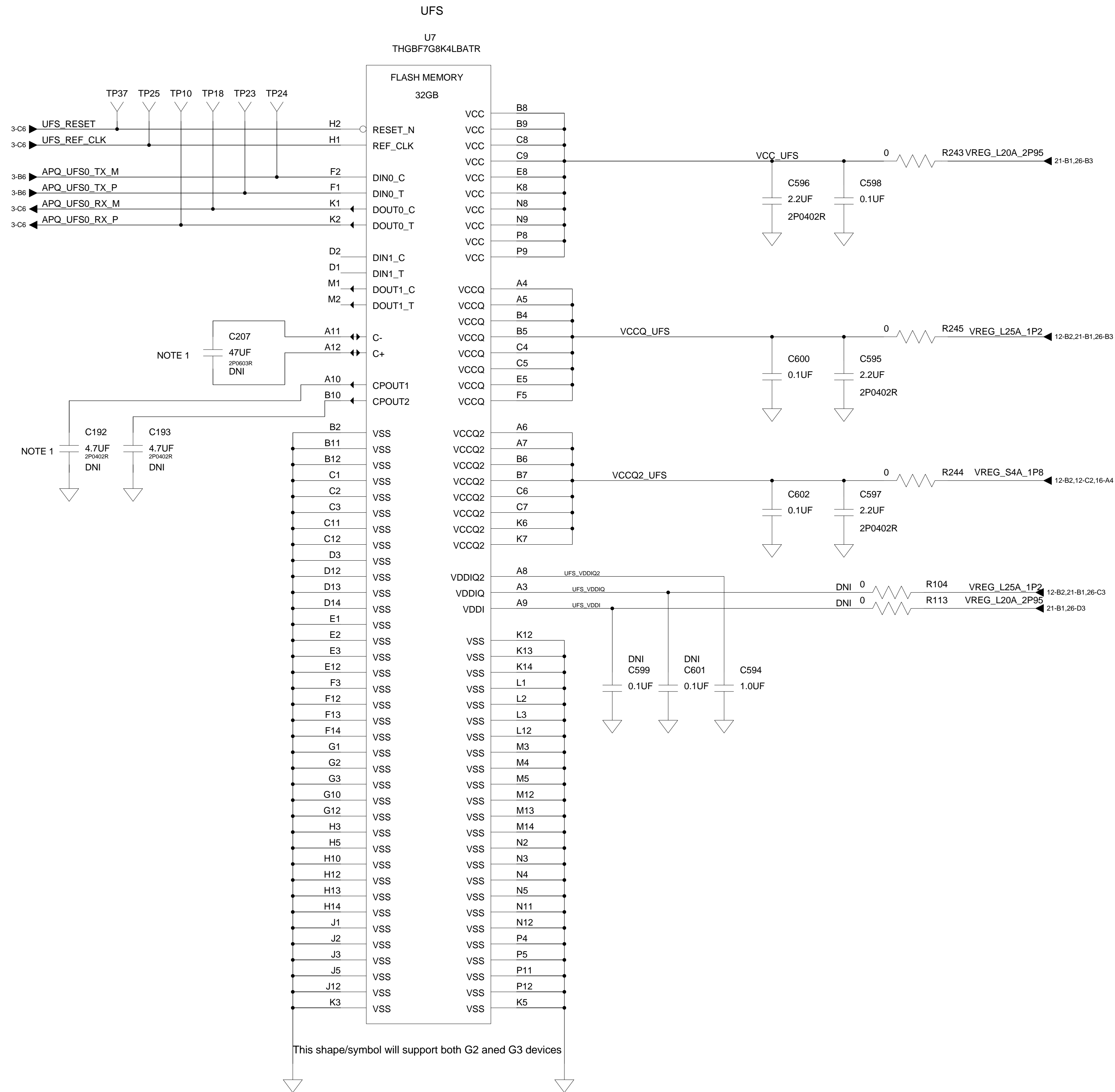


CARD DETECT	CASE
CARD NOT INSTALLED	CD-COMMON SW=OFF
CARD INSTALLED	CD-COMMON SW=ON



TITLE DragonBoard 820c			
SIZE D	DRAWING NO LM25-P2751-1	REV B	
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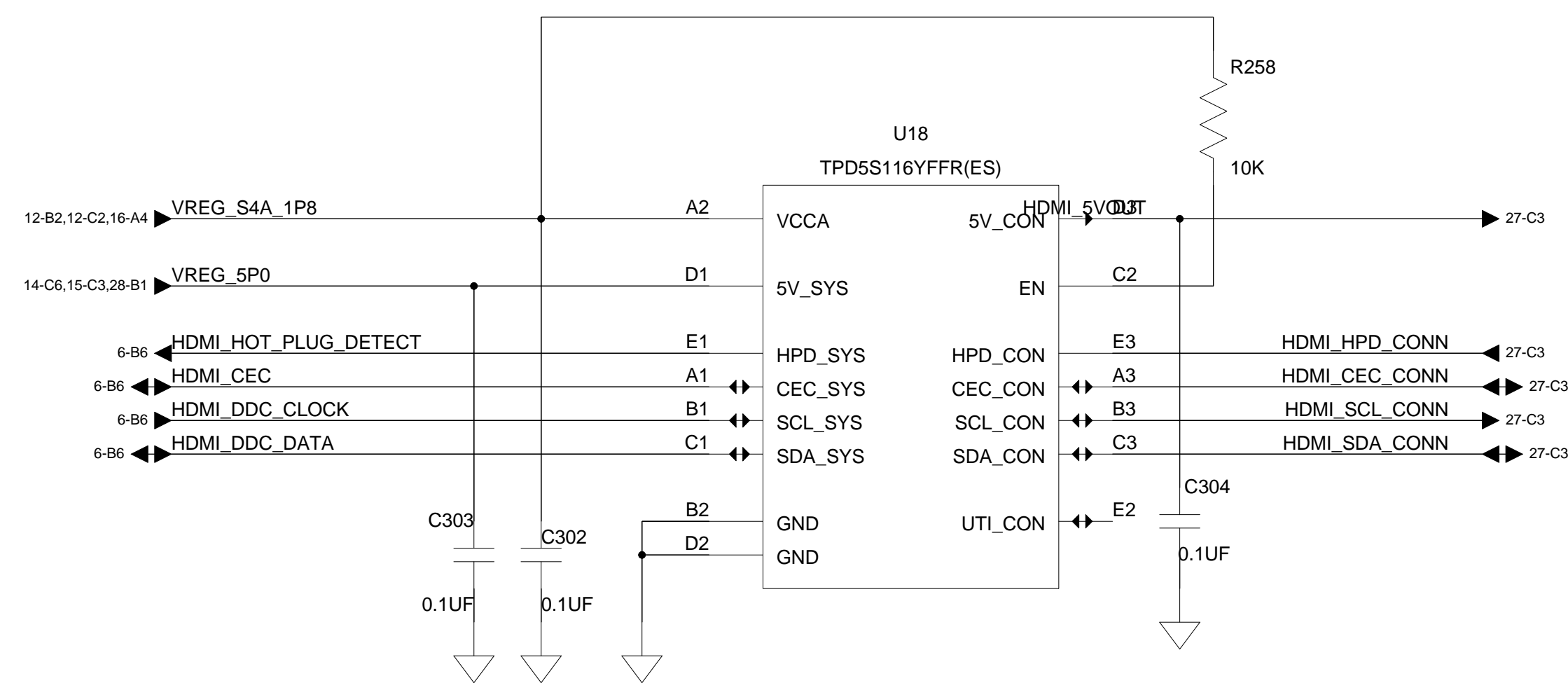
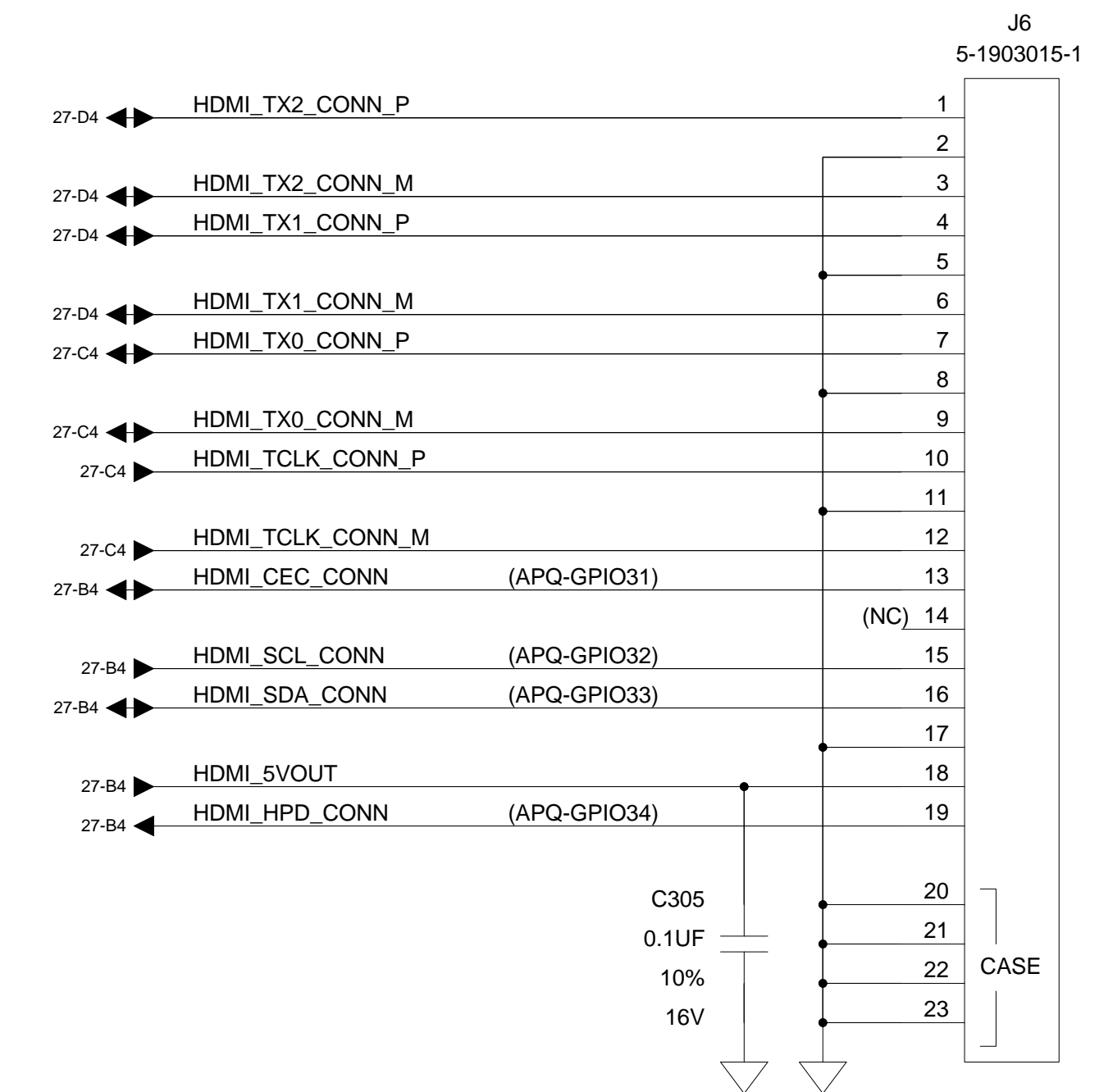
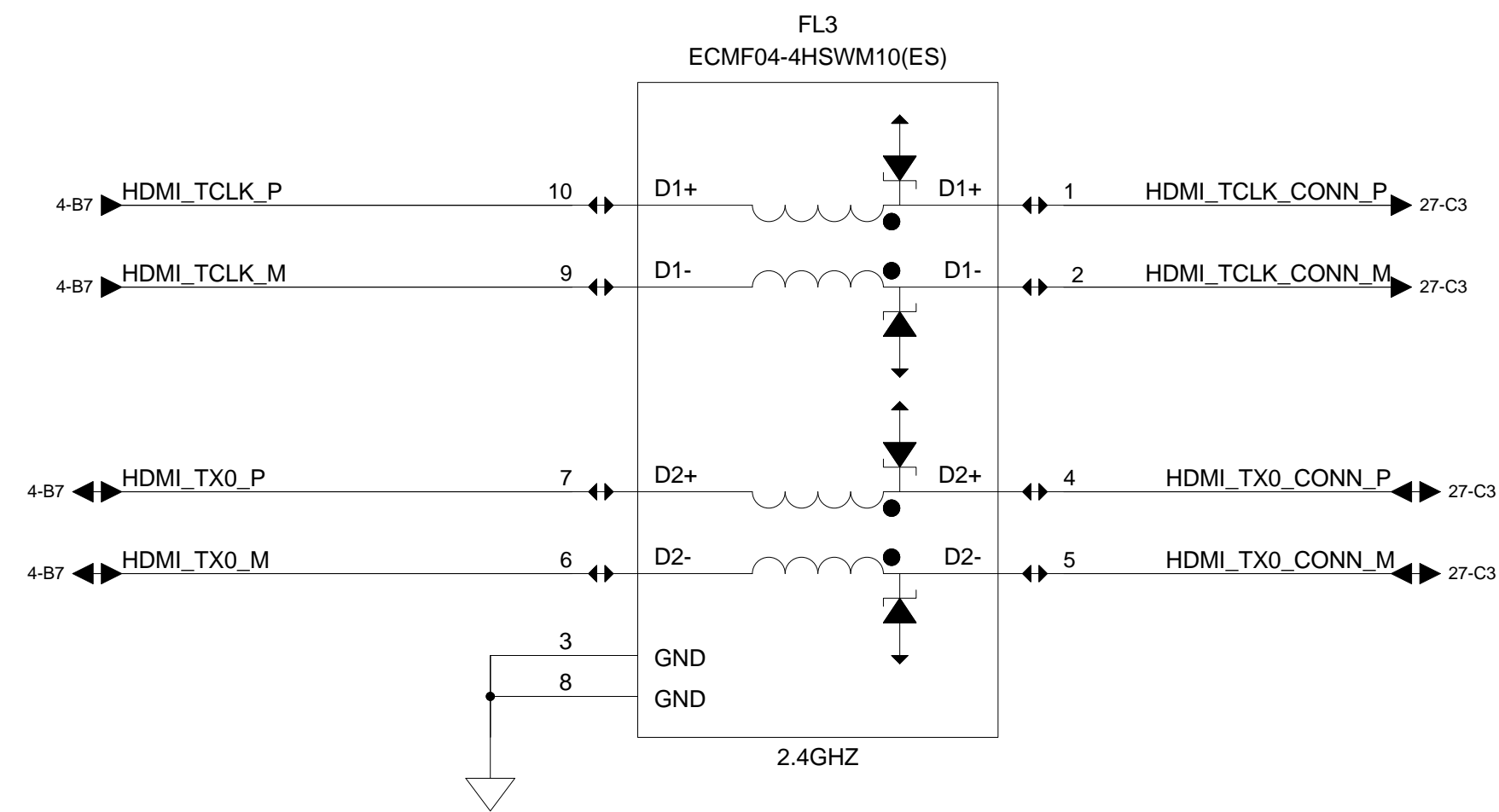
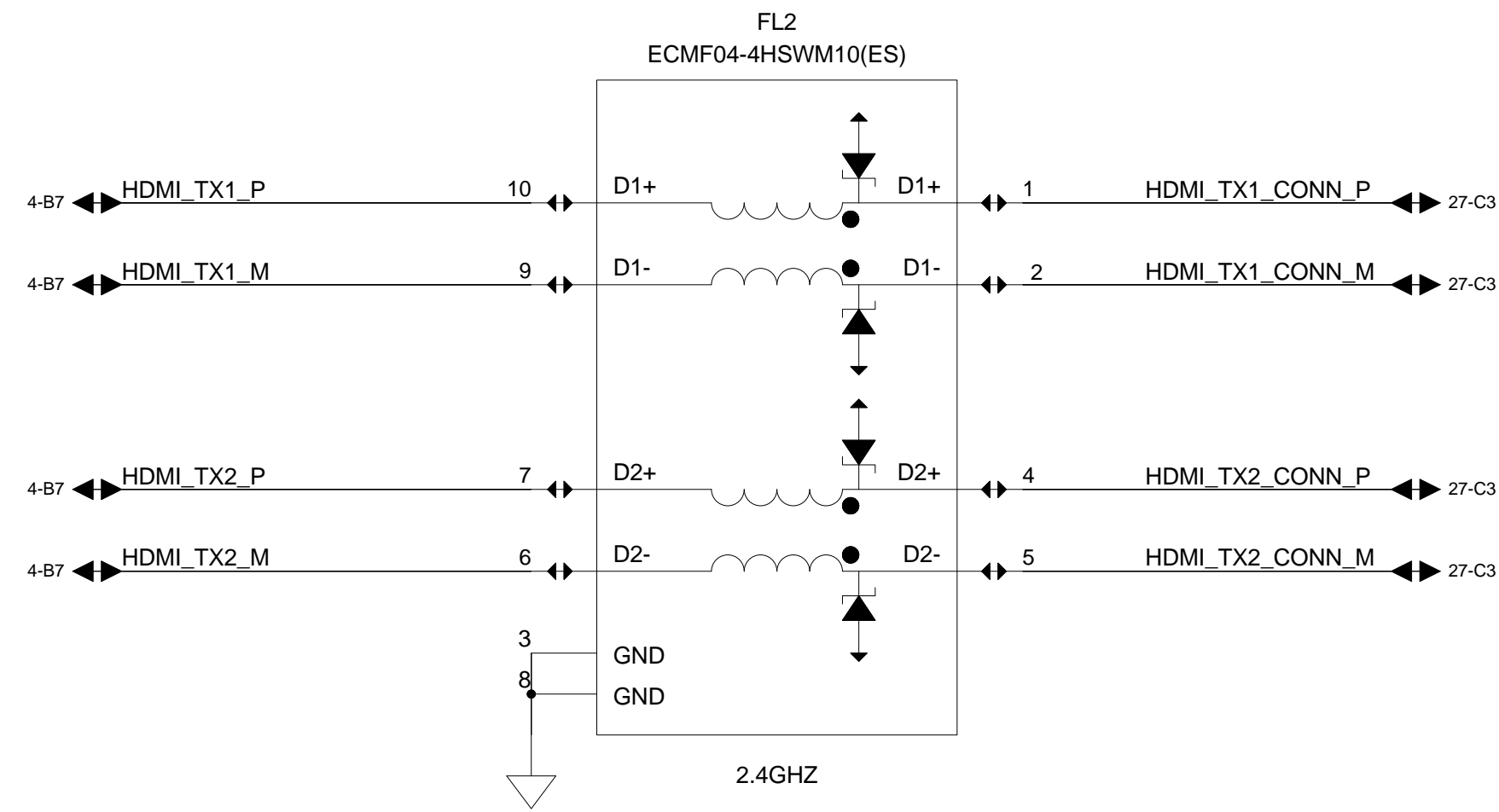
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CAD NOTES
NOTE 1: Place holder for future UFS use

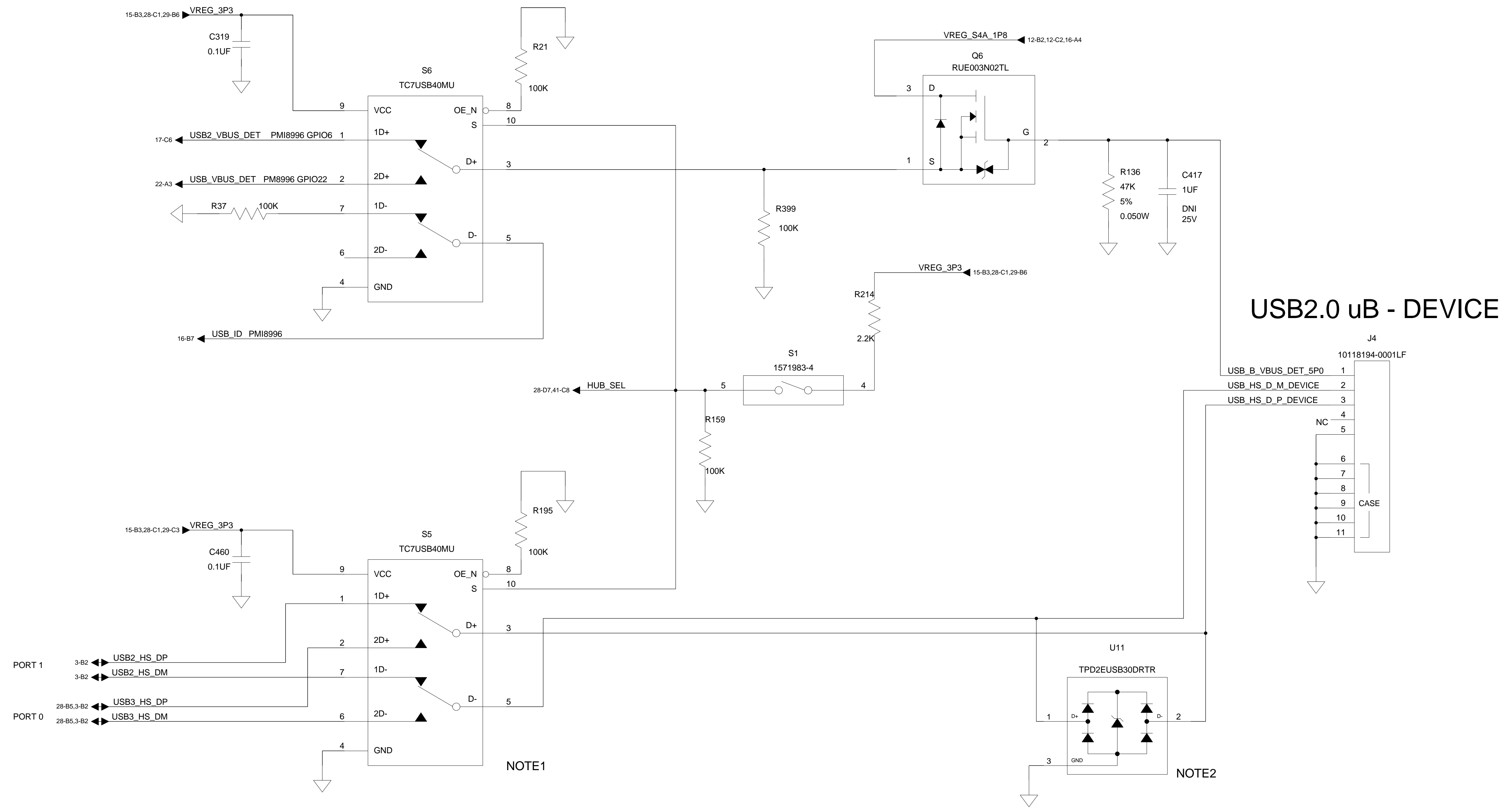
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SIZE D	DRAWING NO LM25-P2751-1		REV B
SCALE NONE	SHEET 27		OF 44

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TITLE DragonBoard 820c			
SIZE D	DRAWING NO LM25-P2751-1	REV B	
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REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



HUB_SEL	Description	USB Switch	P0 USB_ID	P0 VBUS_DET	P1 USB_ID	P1 USB_VBUS
LOW (S1 OFF)	Normal	PORT 1	Low (Host)	Open	Open	USB_VBUS
HIGH (S1 ON)	EDL	PORT 0	Float (Device)	USB_VBUS	Open	USB_VBUS

CAD NOTES:

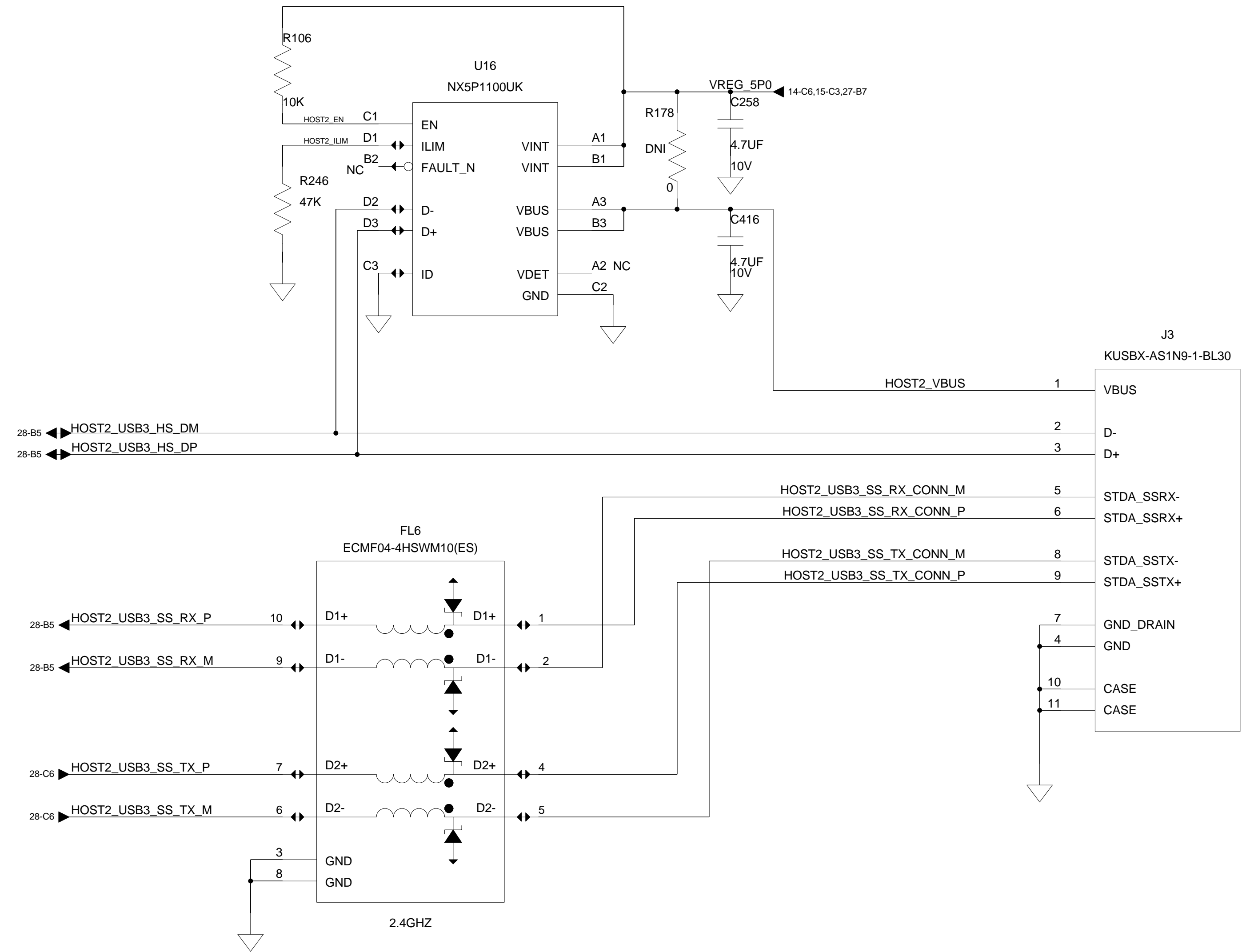
NOTE1: PLACE USB SWITCH NEAR USB3.0 HUB TO SHORT USB3_HS_DP/M STUB
PLACE ESD PART NEAR J4

USB - SWITCH/DEVICE CONNECTOR

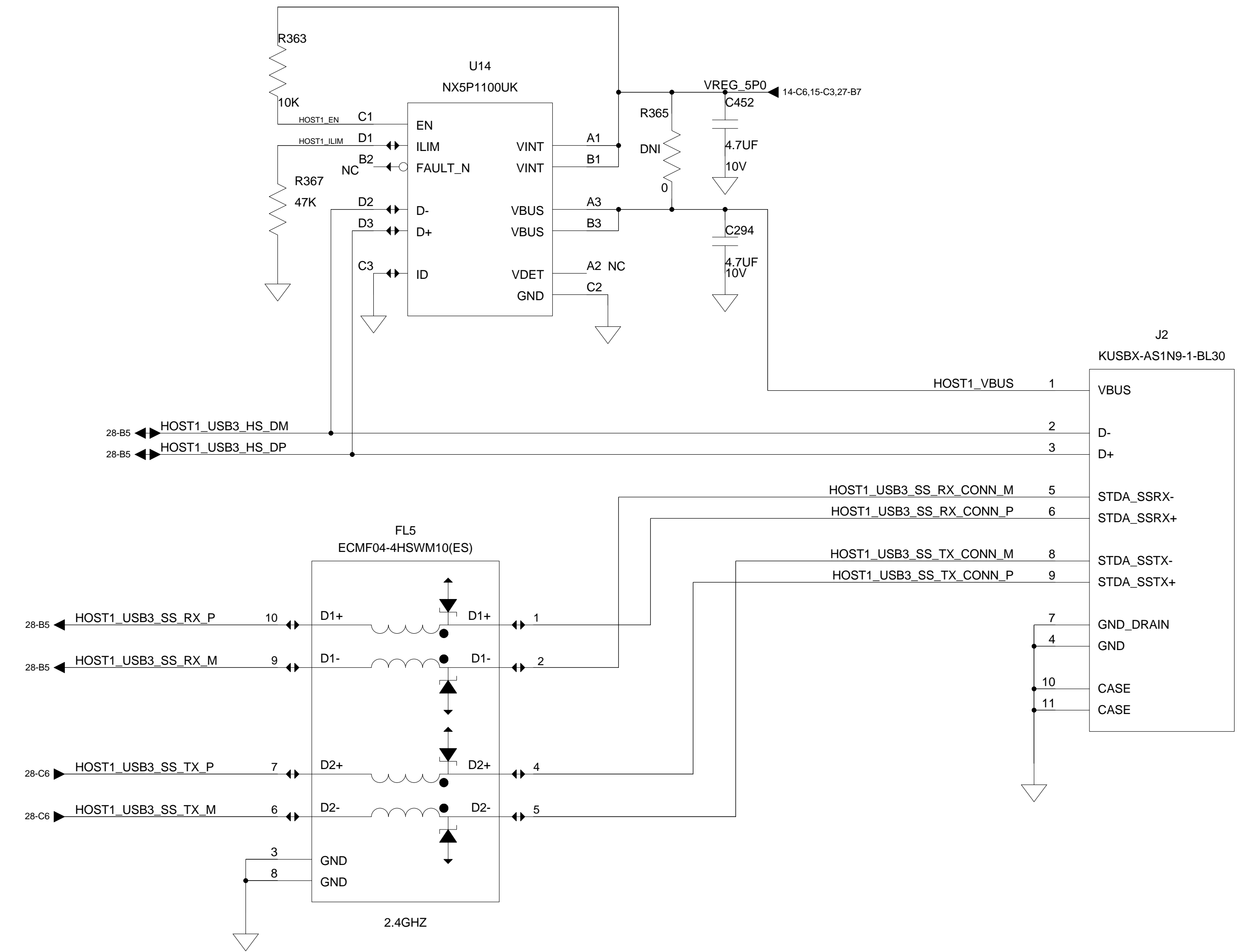
TITLE DragonBoard 820c			
SIZE D	DRAWING NO LM25-P2751-1		REV B
SCALE NONE	SHEET 30		OF 44

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

USB3.0 Type A - HOST2

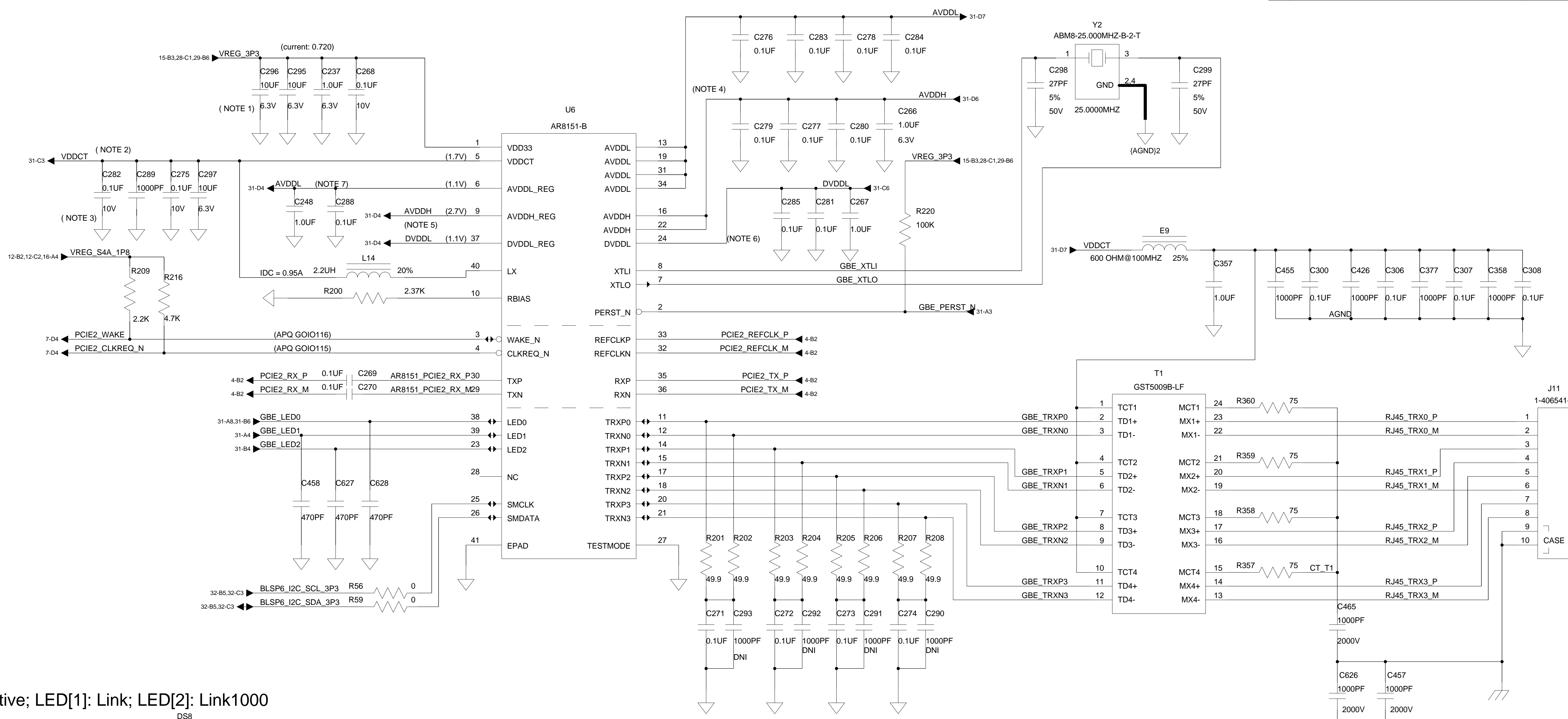


USB3.0 Type A - HOST1

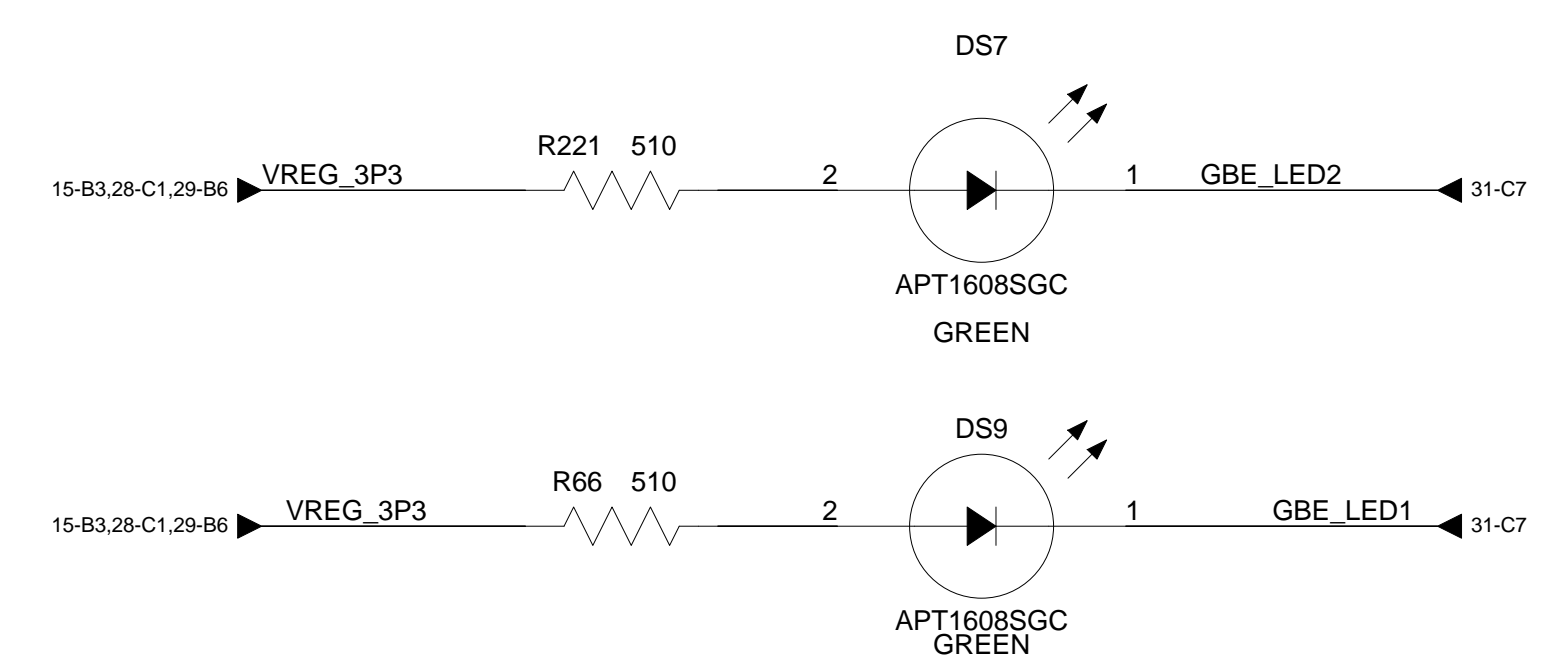
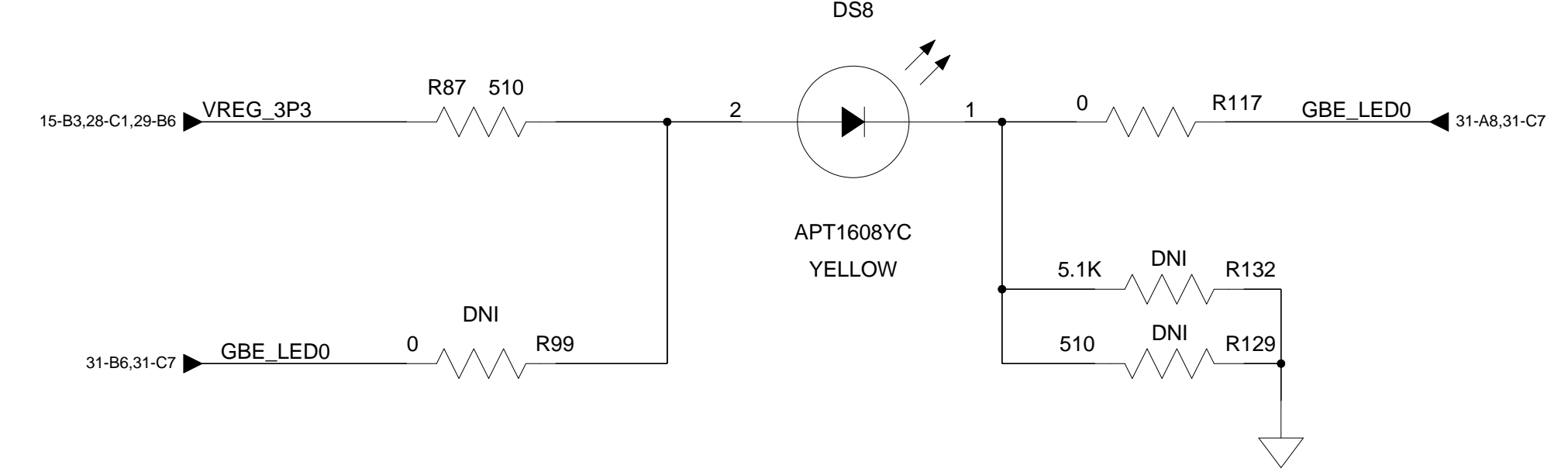


TITLE DragonBoard 820c			
SIZE D	DRAWING NO LM25-P2751-1		REV B
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LED
LED[0]: Active; LED[1]: Link; LED[2]: Link1000

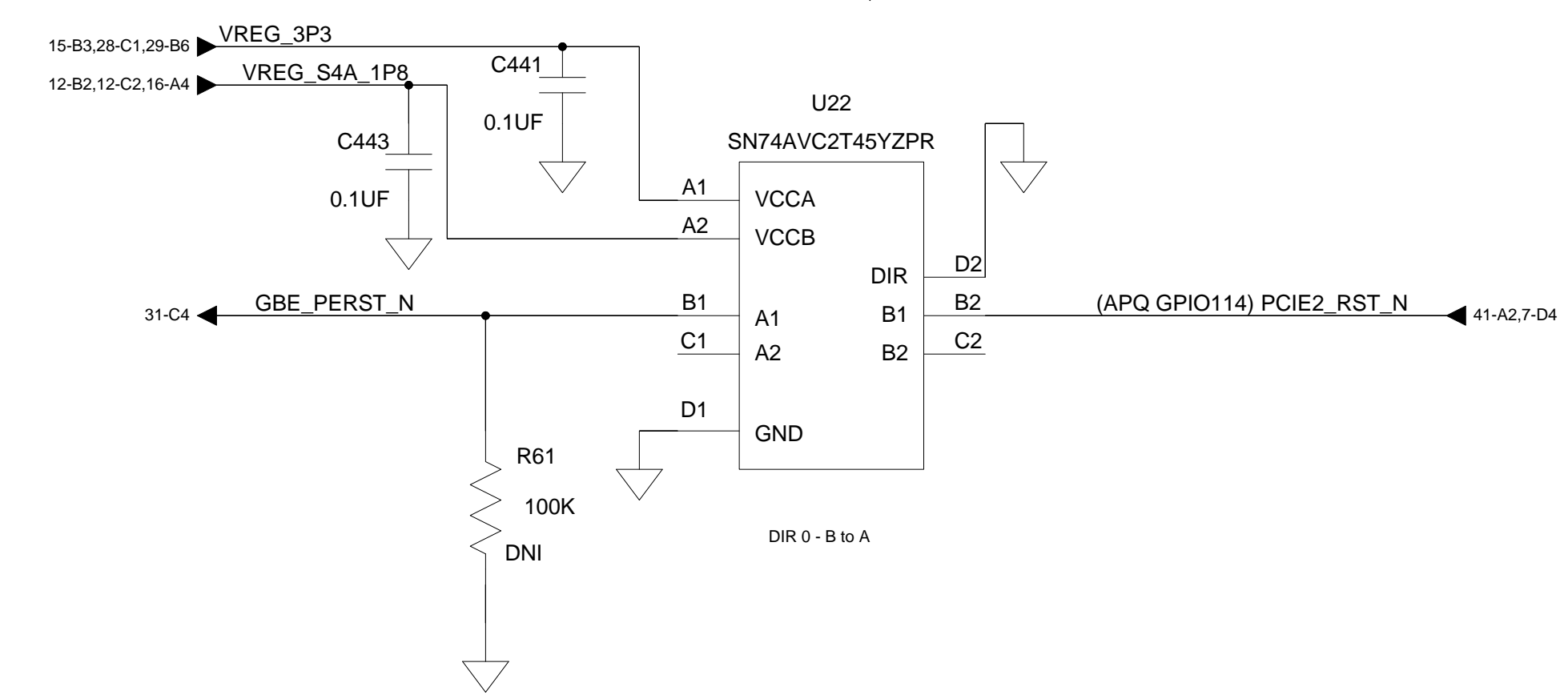


CAD NOTES:

- NOTE1: The decoupling capacitors 0.1uF should be placed within 200 mils (0.5cm) of pin VDD33
- NOTE2: Keep bulk de-coupling capacitors within 200 mils of inductor
- NOTE3: Place 0.1uF capacitor within 200 mils of pin VDDCT (pin 5)
- NOTE4: Place 0.1uF capacitors to all four AVDDL pins
- NOTE5: Place 1uF + 0.1uF close to DVDDL_REG
- NOTE6: Place 0.1uF decoupling capacitor close to DVDDL pin
- NOTE7: Place 1uF + 0.1uF capacitors close to AVDDH_REG

Power-on-strapping

Mode	R87	R117	R99	R129	R132
Overclocking	Install	Install	DNI	DNI	DNI
Un-overclocking	DNI	DNI	Install	Install	Install



REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

D

D

C

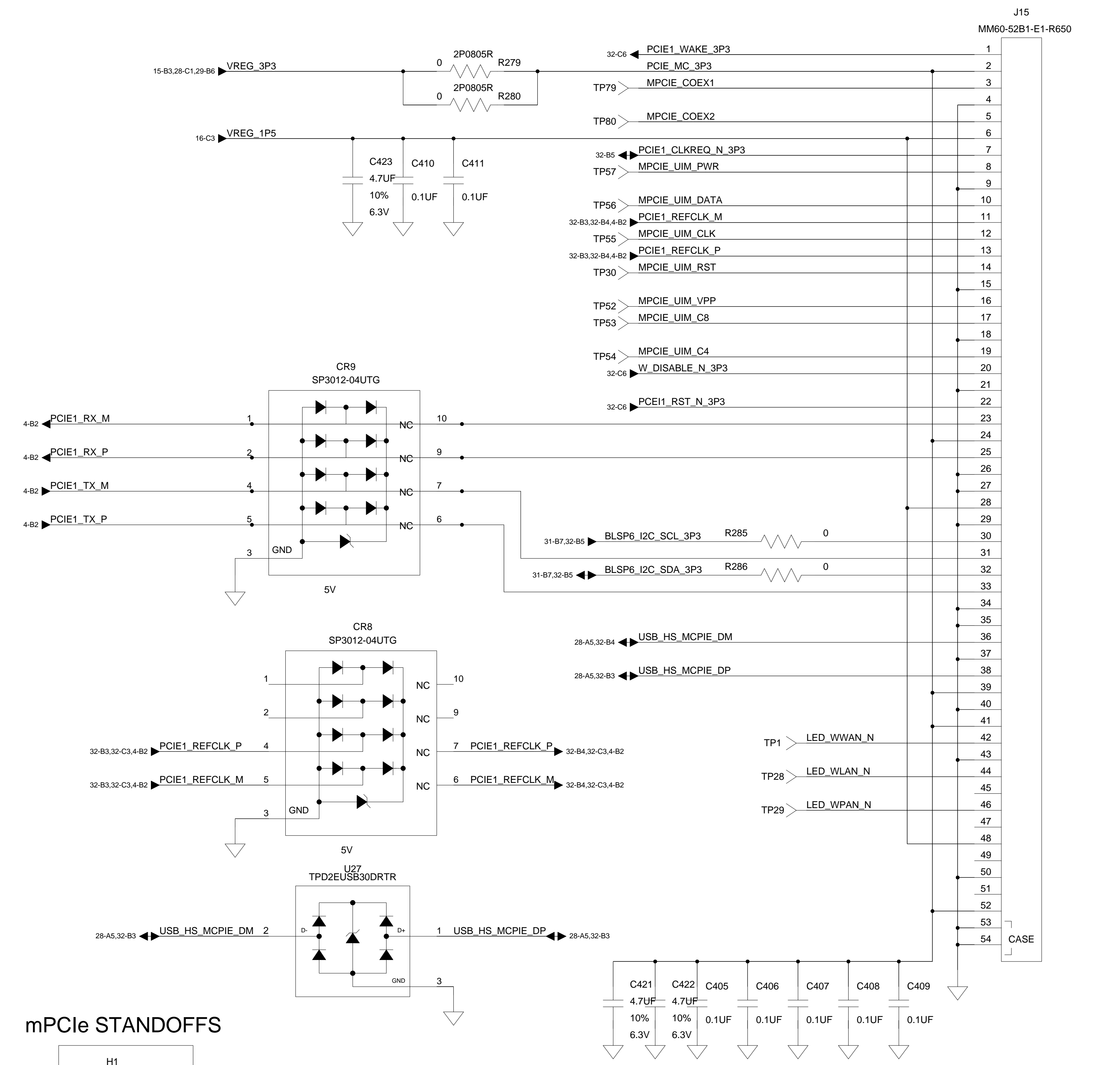
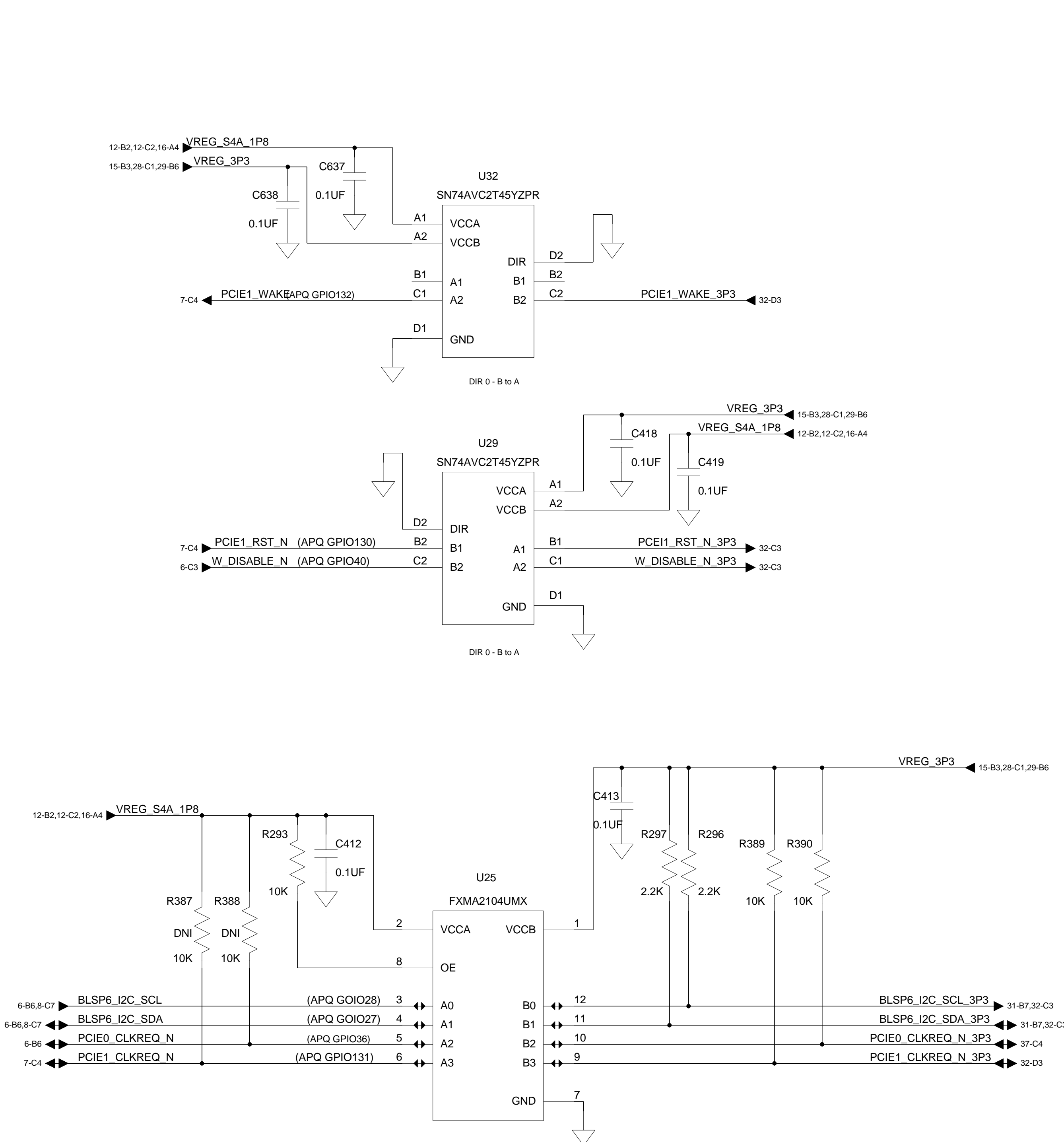
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B

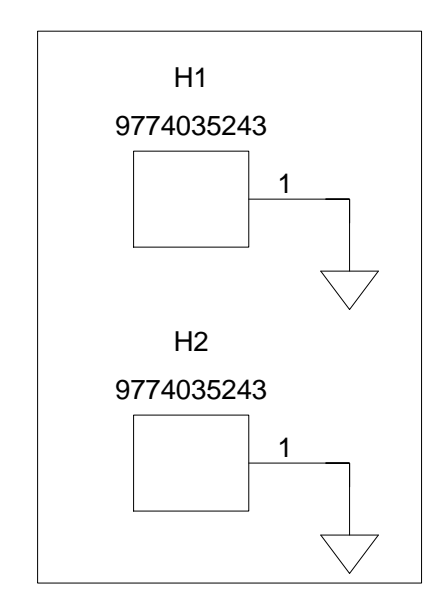
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A

A



mPCIe STANDOFFS

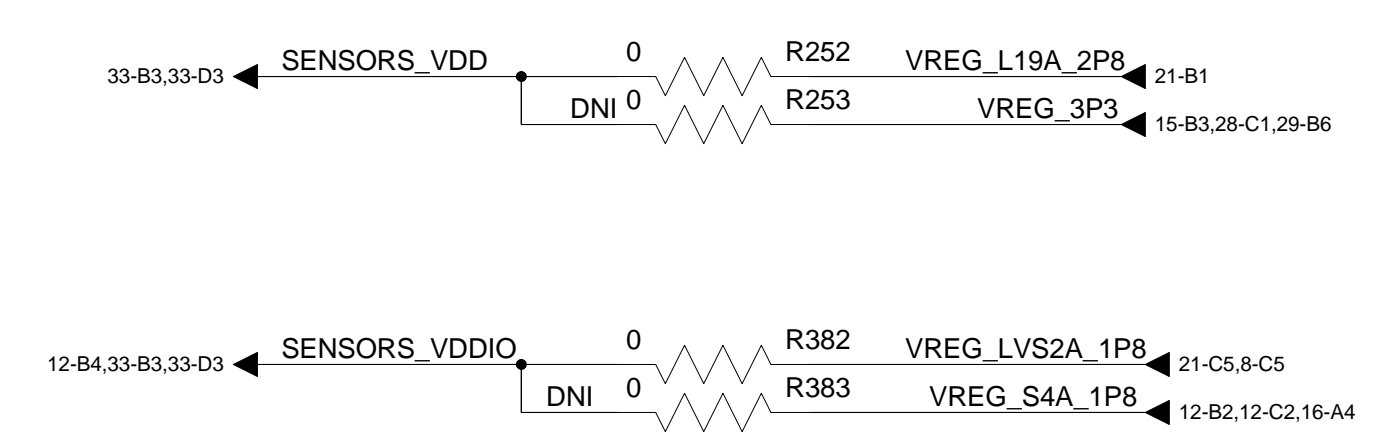
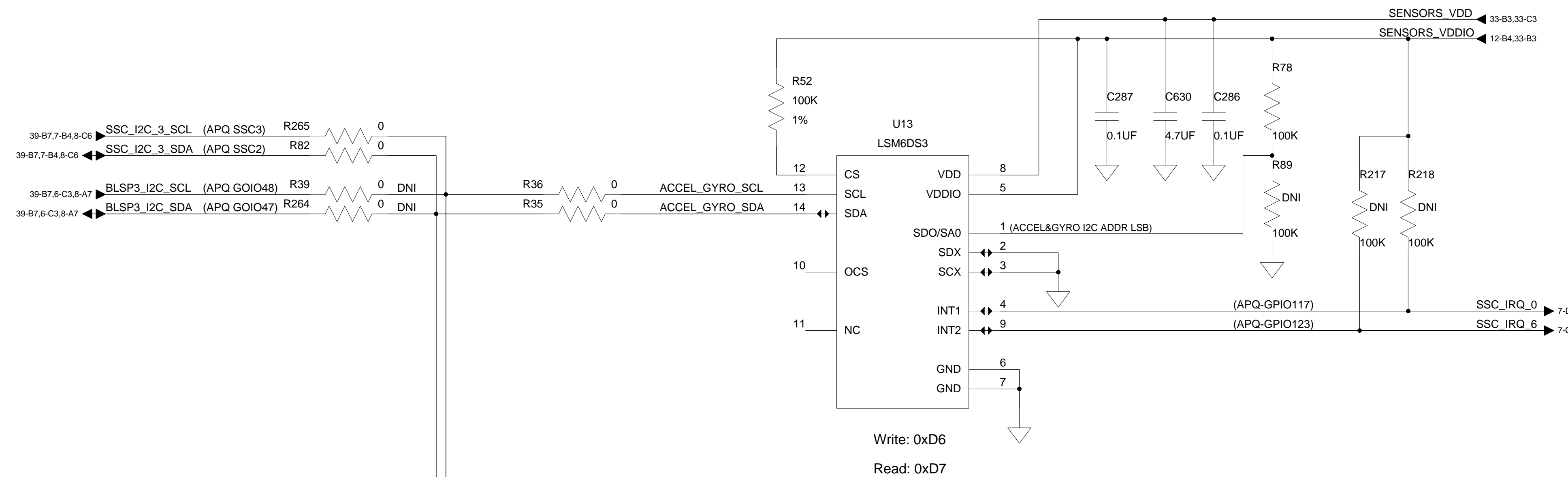


MINI PCIe CONNECTOR

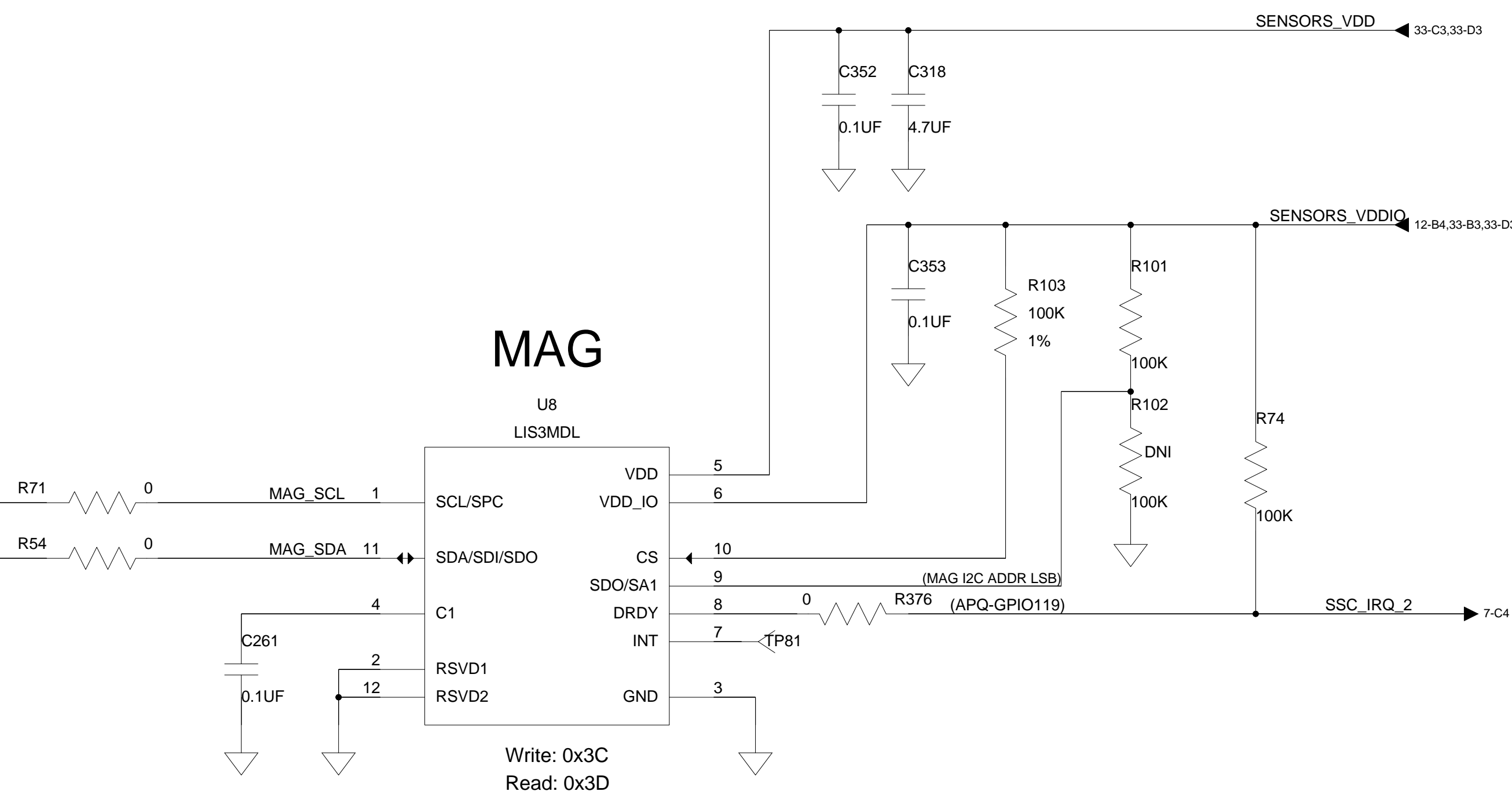
TITLE DragonBoard 820c			
SIZE D	DRAWING NO LM25-P2751-1		REV B
SCALE NONE	SHEET 33		OF 44

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LTR	DESCRIPTION	DATE	APPROVED

ACCEL/GYRO

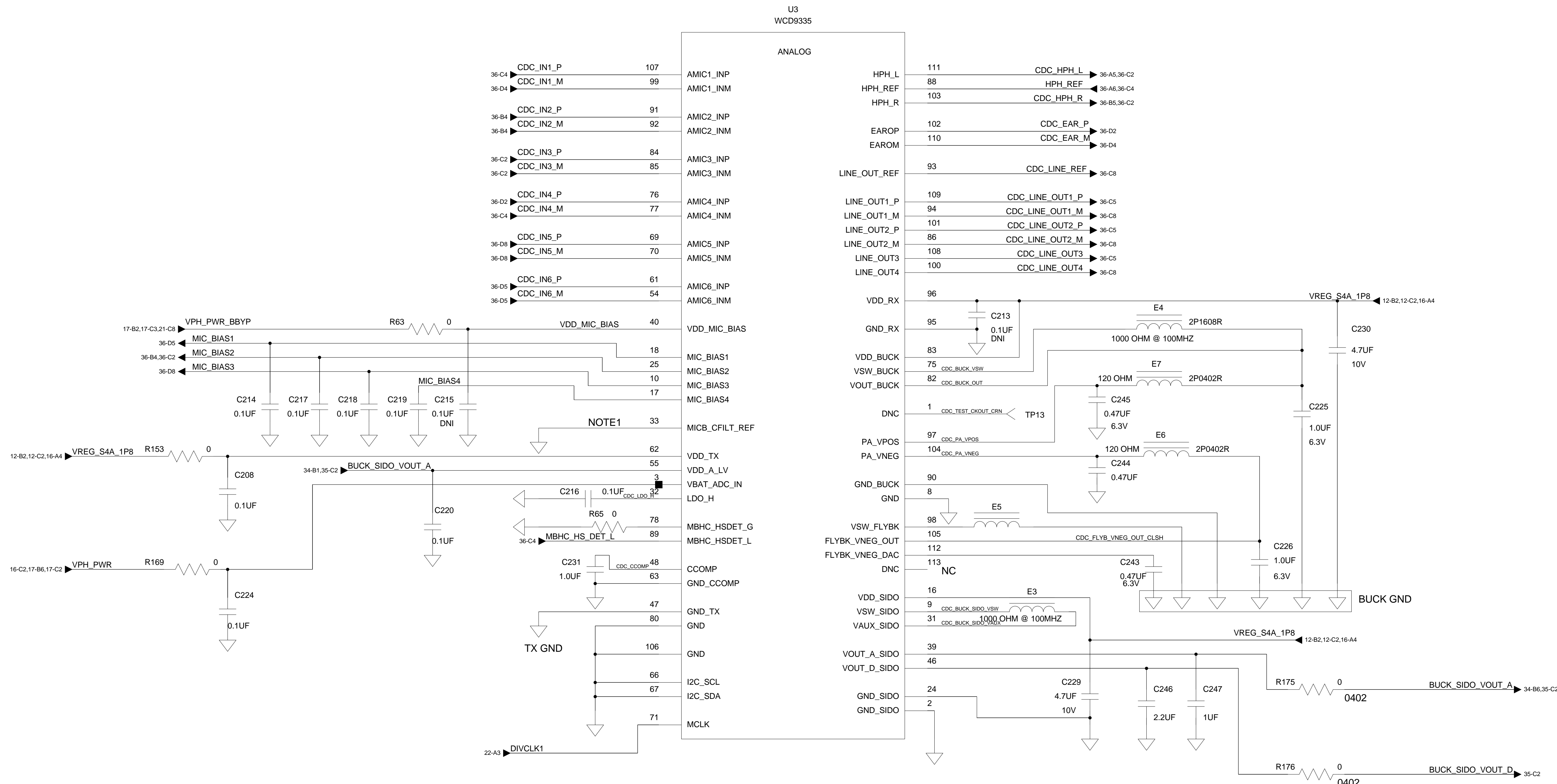


MAG



TITLE DragonBoard 820c			
SIZE D	DRAWING NO LM25-P2751-1	REV B	
SCALE NONE	SHEET 34		OF 44

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

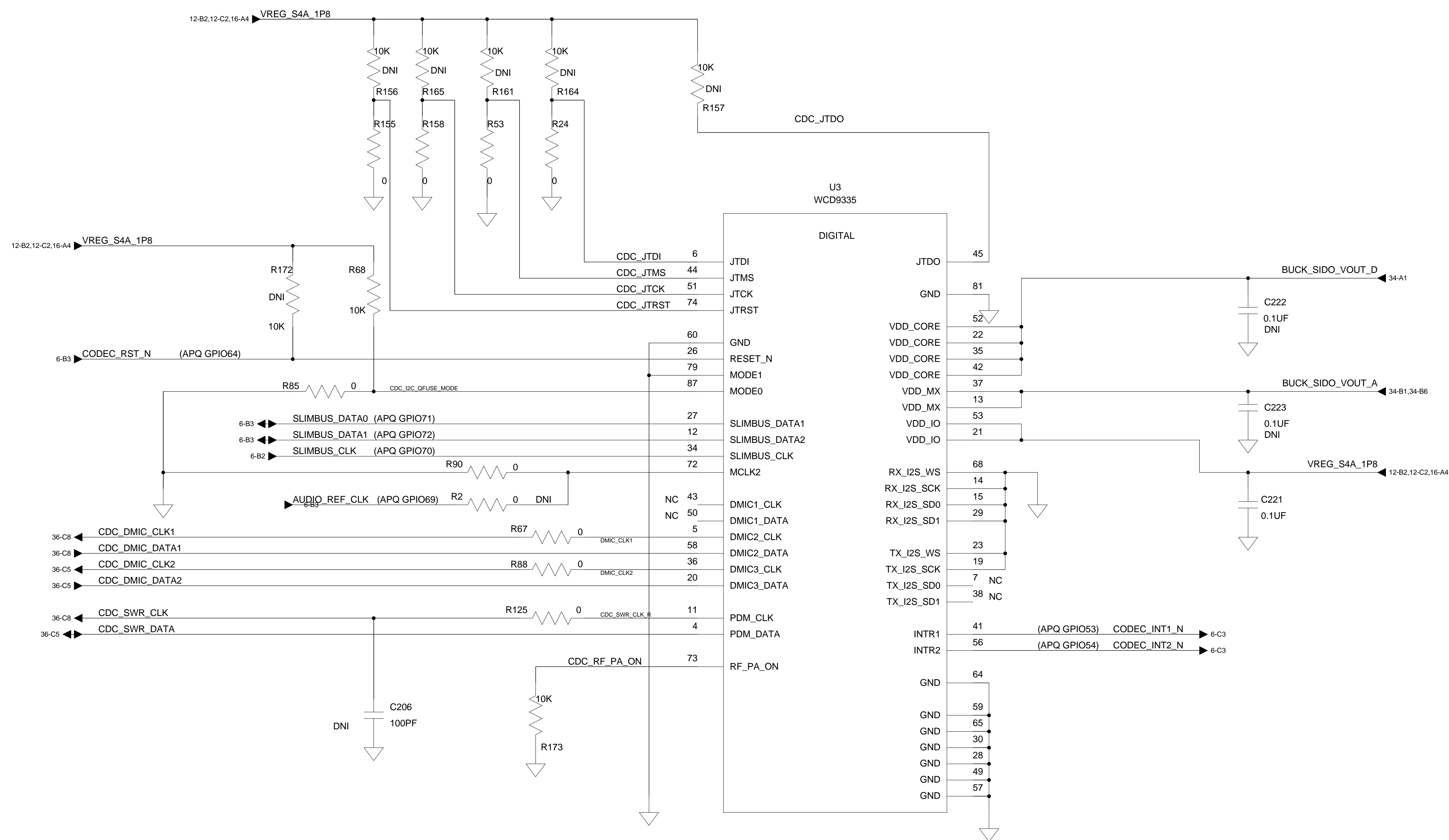


NOTE1: CONNECT DIERCTLY TO GND PLANE

CAD NOTES:
NOTE1: CONNECT DIERCTLY TO GND PLANE

TITLE DragonBoard 820c			
SIZE D	DRAWING NO LM25-P2751-1	REV B	
SCALE NONE	SHEET 35	OF 44	

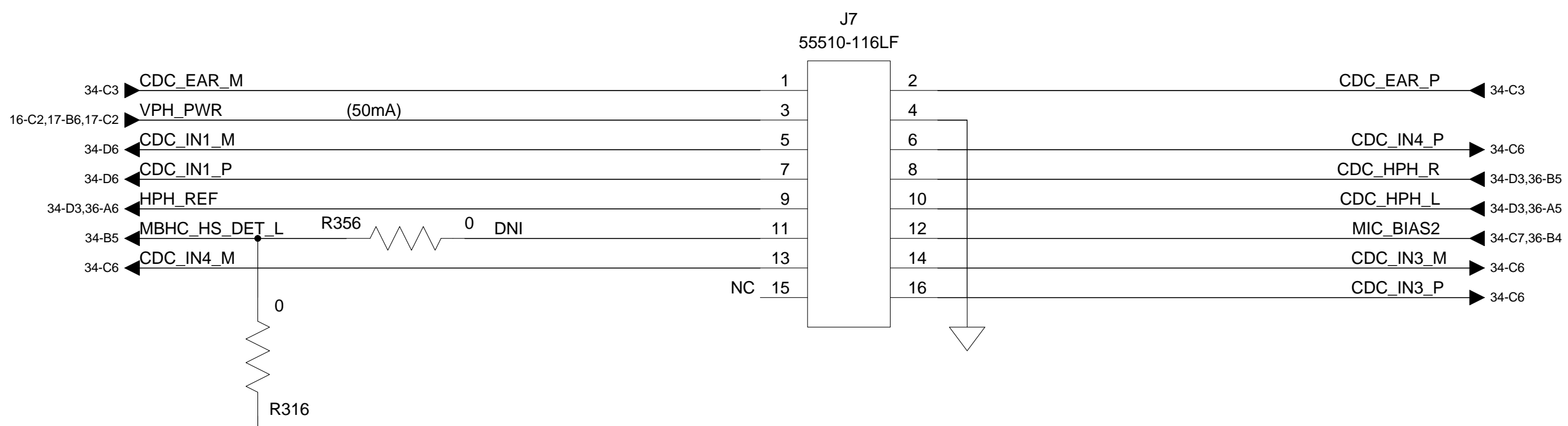
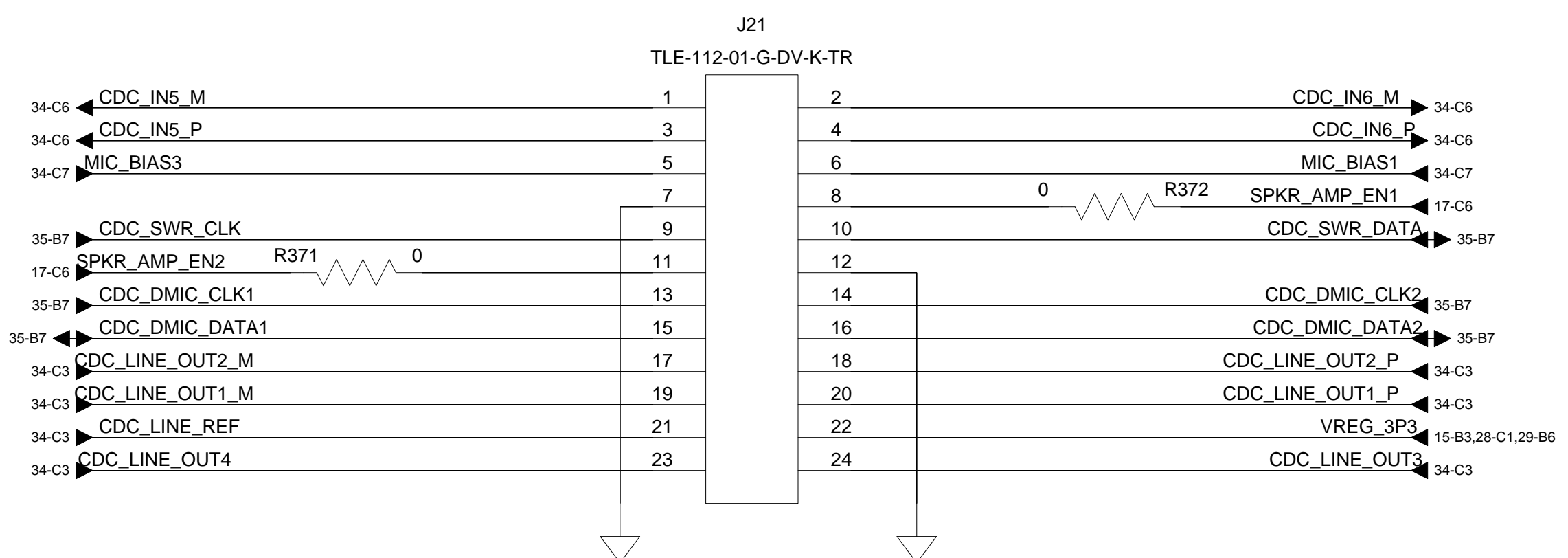
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



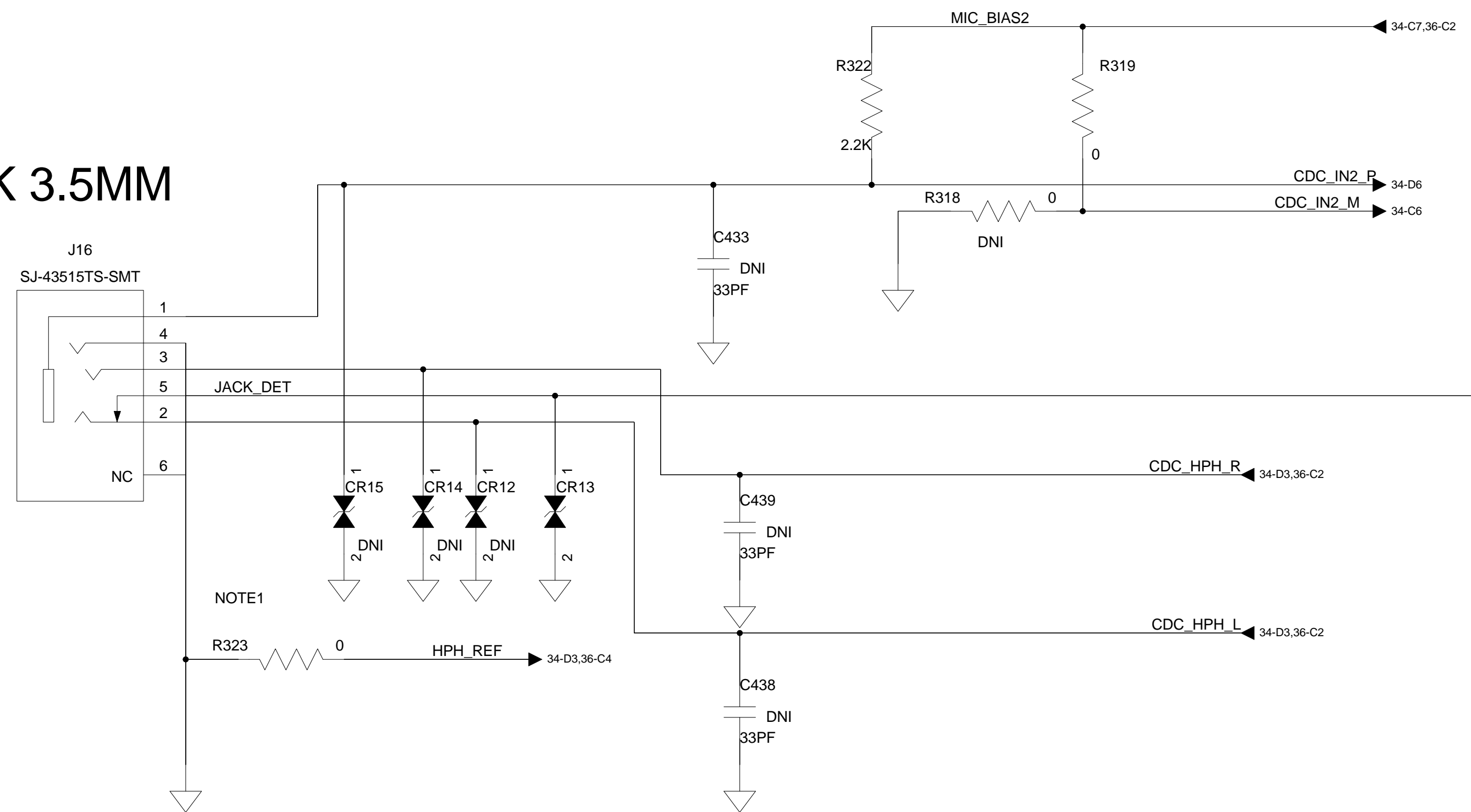
TITLE DragonBoard 820c			
SIZE D	DRAWING NO LM25-P2751-1	REV B	
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AUDIO EXPANSION CONNECTORS



JACK 3.5MM



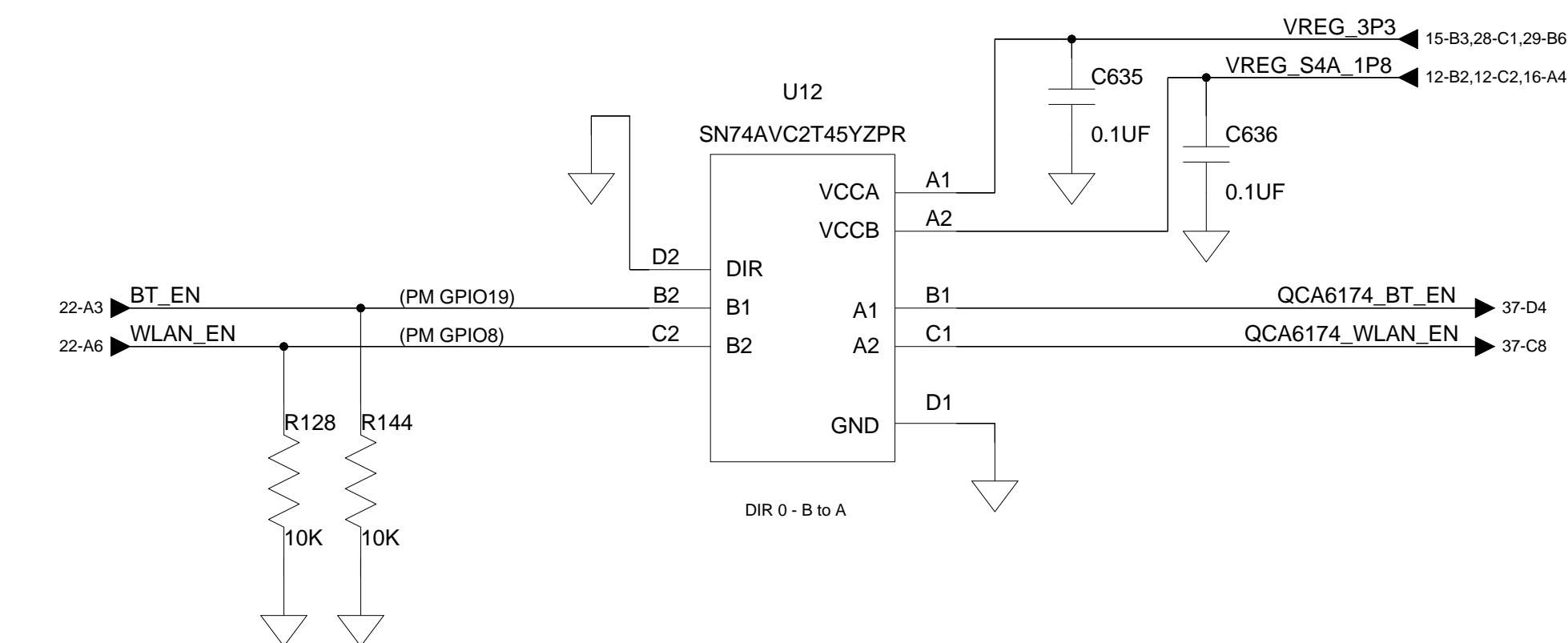
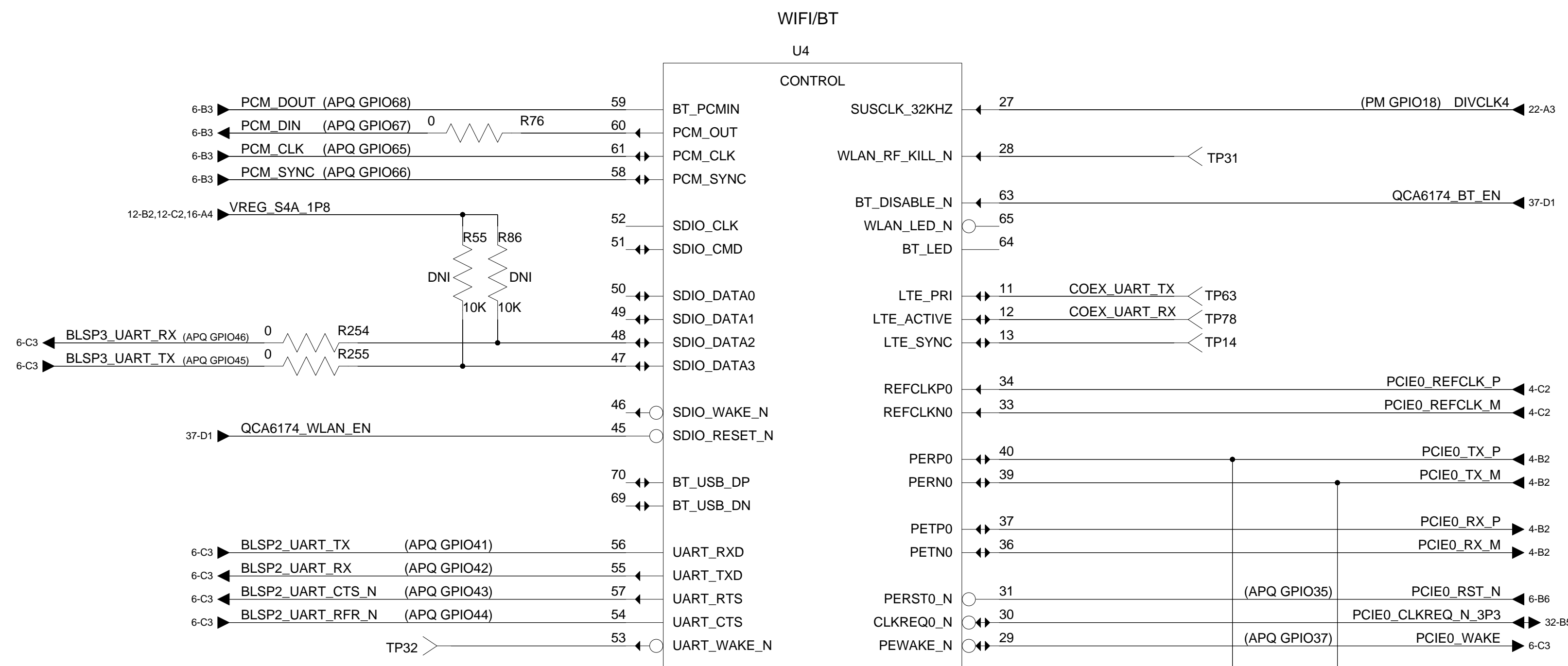
CAD NOTES:
NOTE1: PLACE NEAR THE CONNECTOR

TITLE DragonBoard 820c			
SIZE D	DRAWING NO LM25-P2751-1	REV B	
SCALE NONE	SHEET 37		OF 44

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

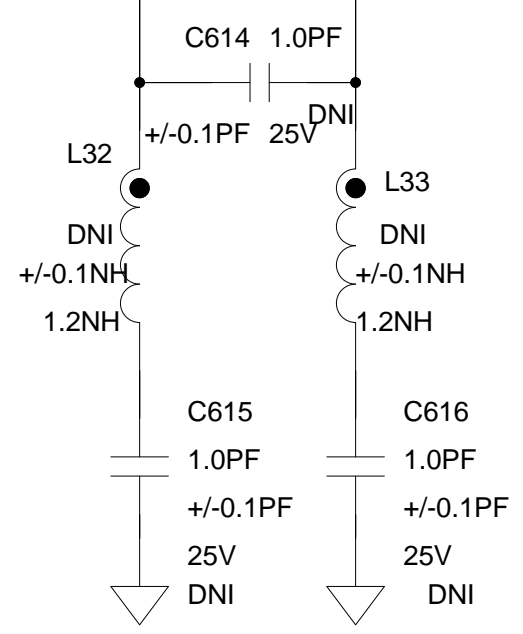
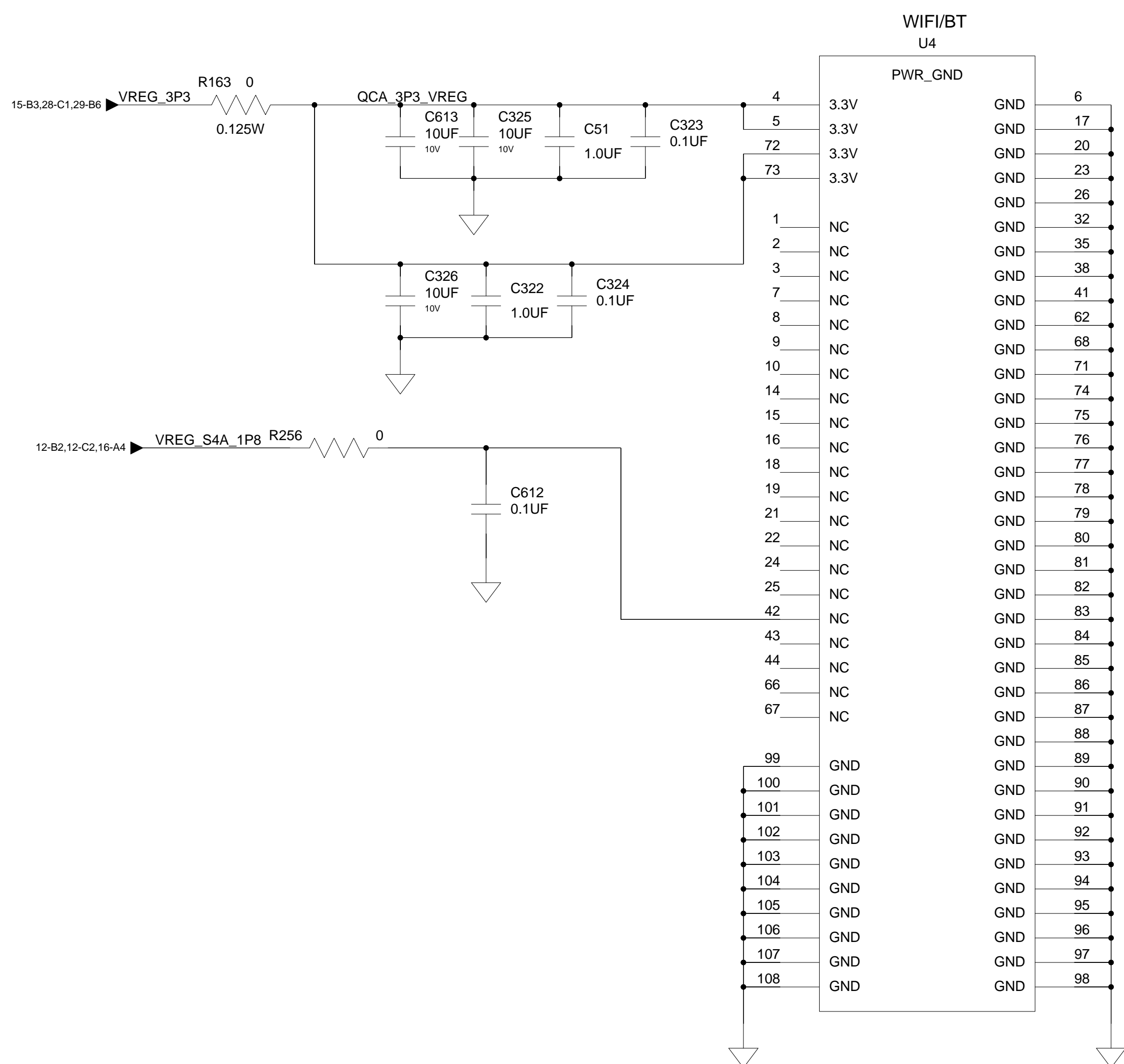
D

D



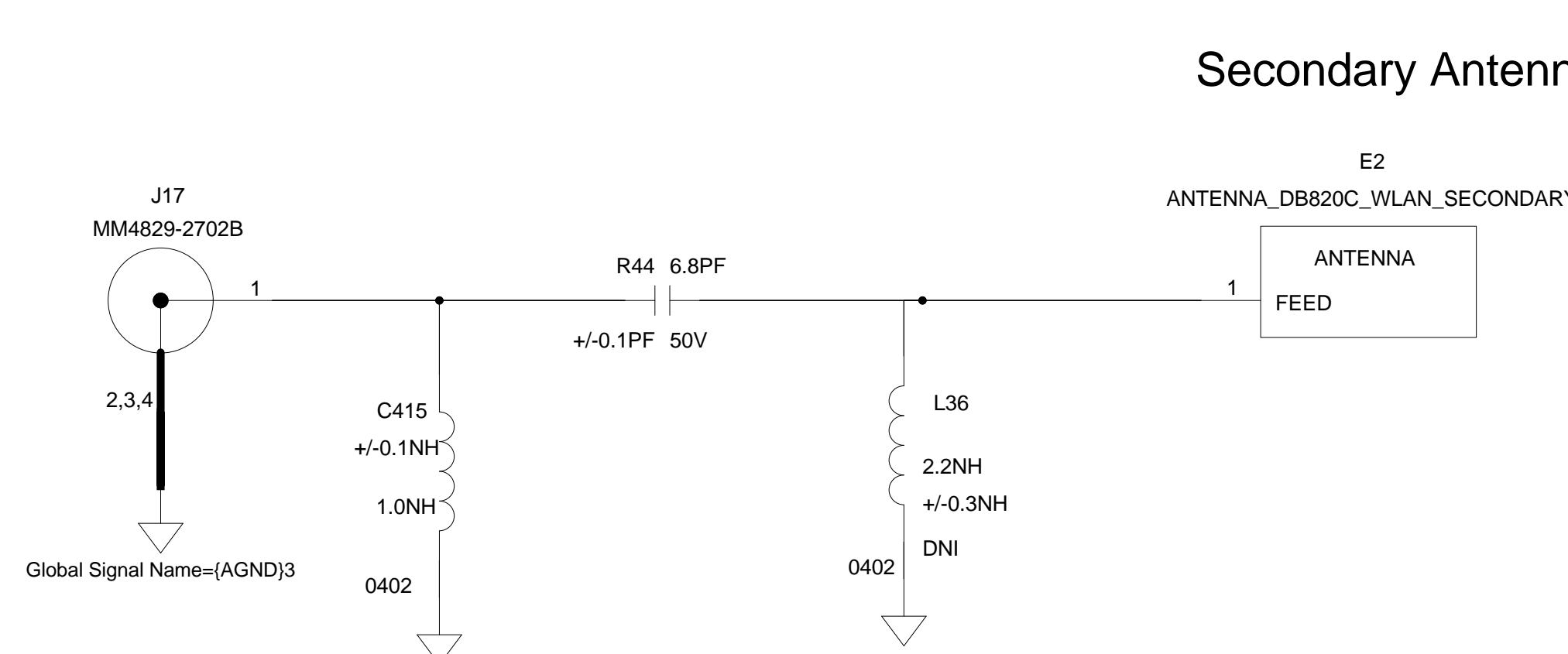
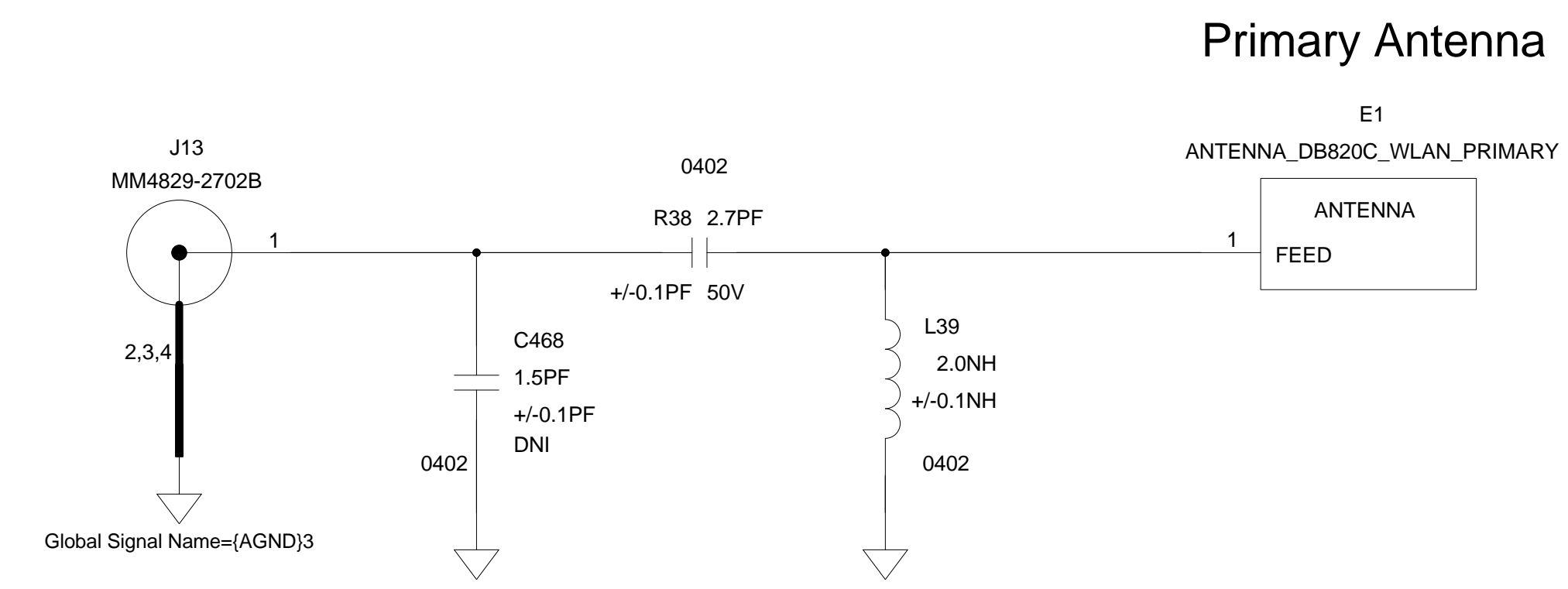
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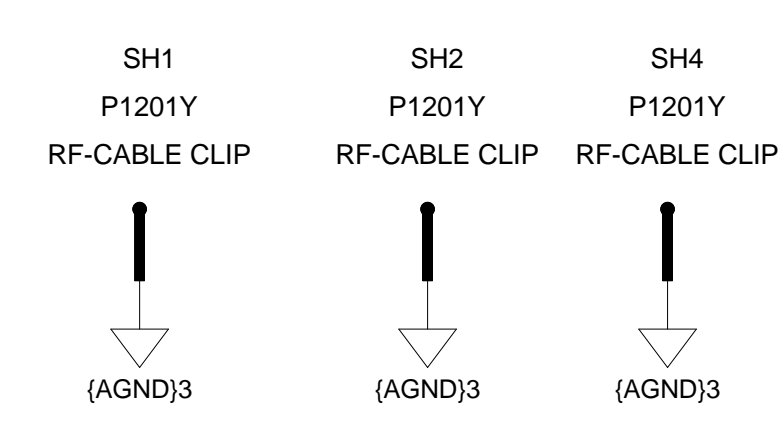


B

B



RF Cable Clips



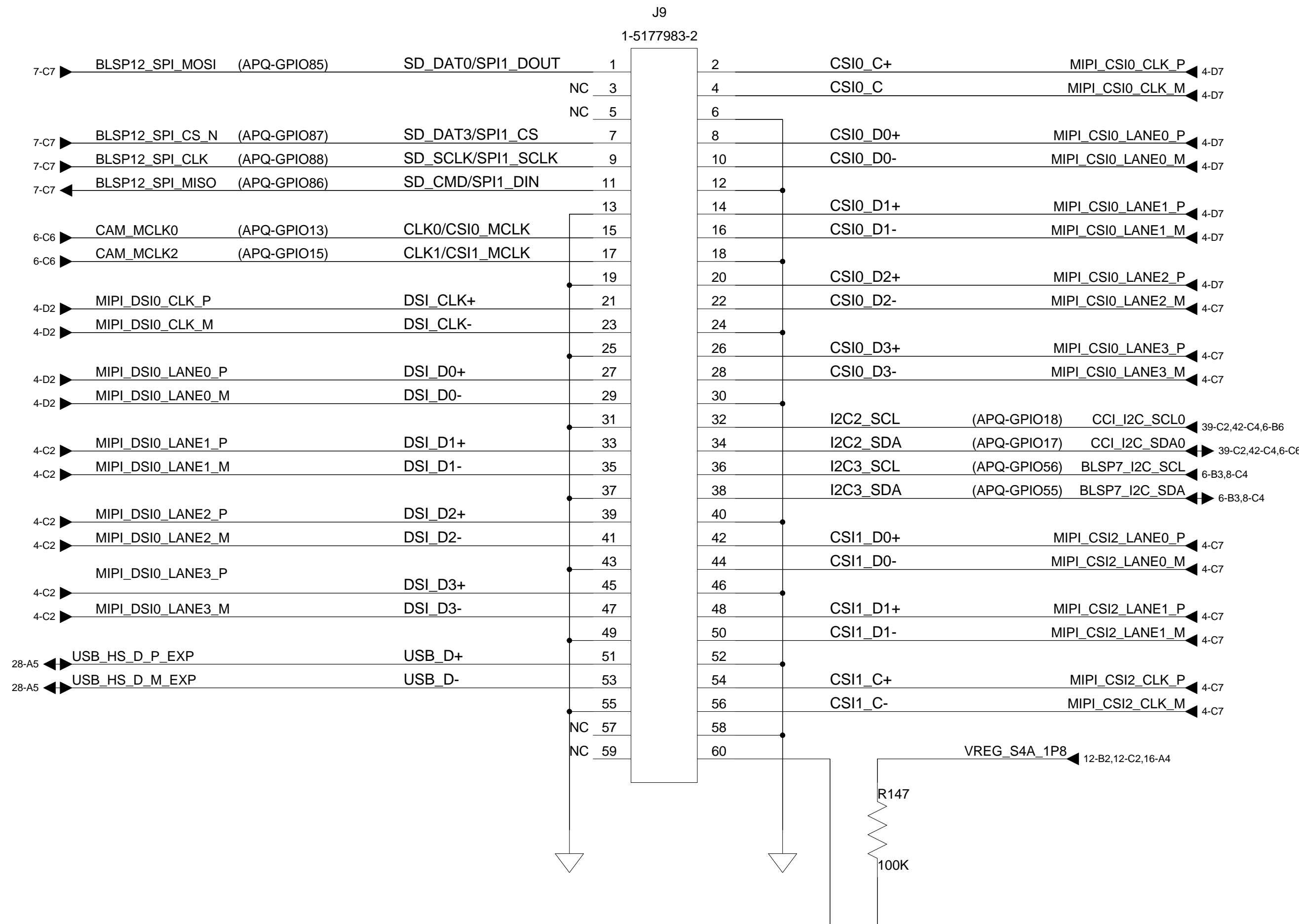
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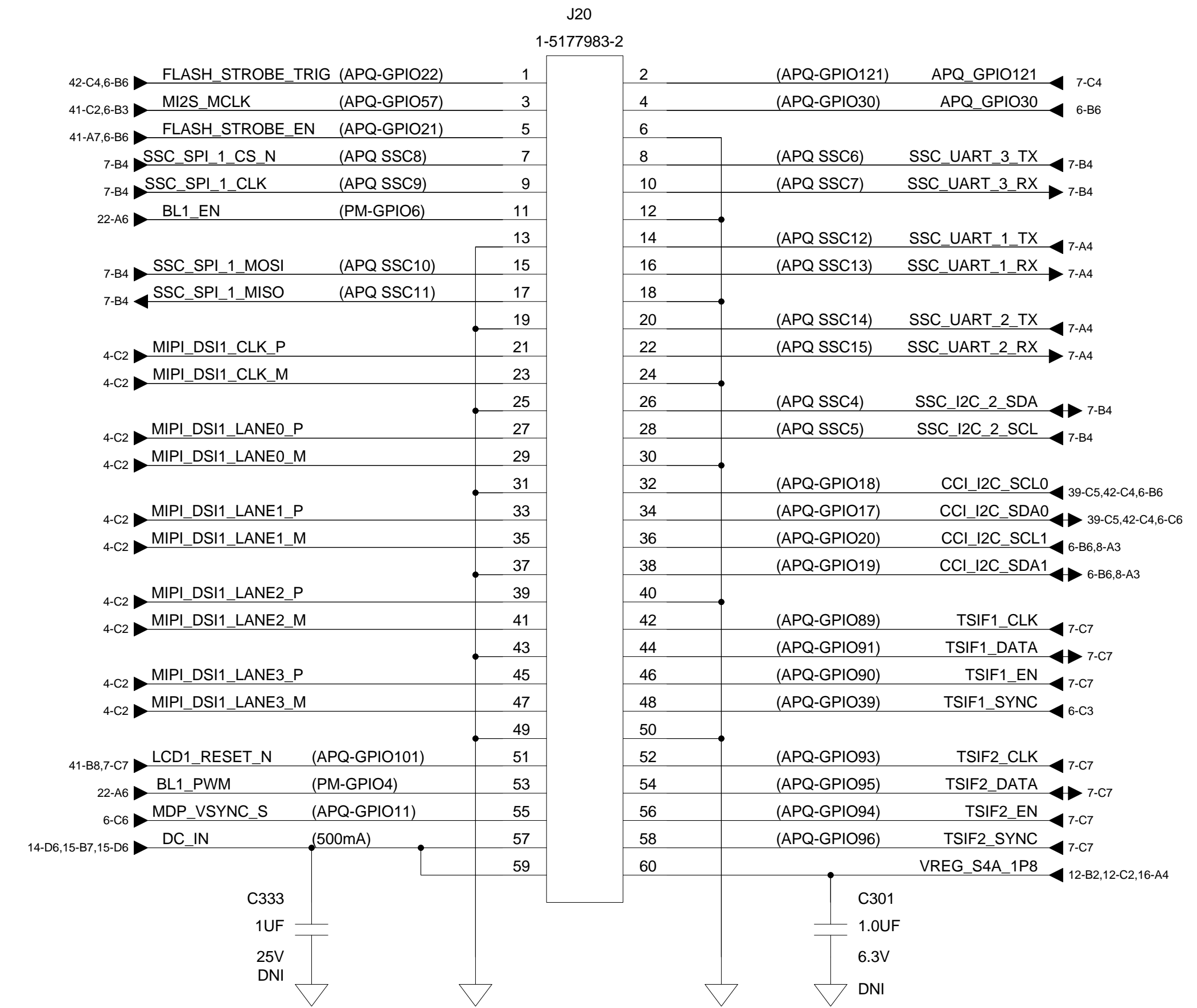
TITLE DragonBoard 820c		
SIZE D	DRAWING NO LM25-P2751-1	REV B
SCALE NONE	SHEET 38	OF 44

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
B	ECO C597371		

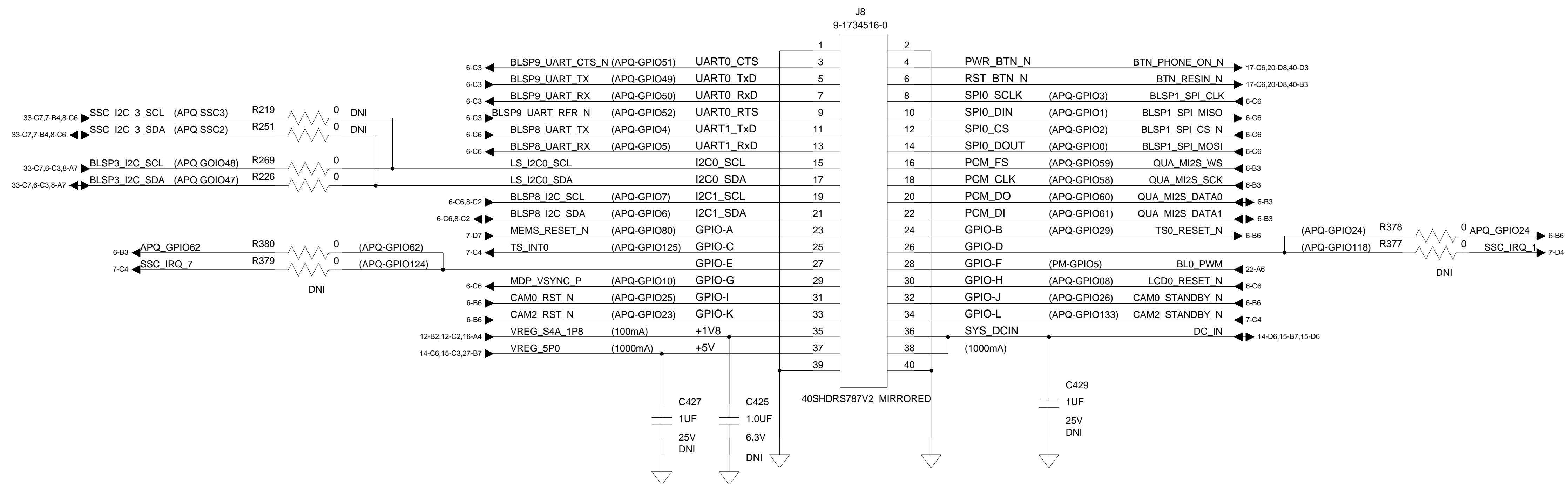
MAIN HS EXPANSION



SECONDARY HS EXPANSION



LS EXPANSION CONNECTOR



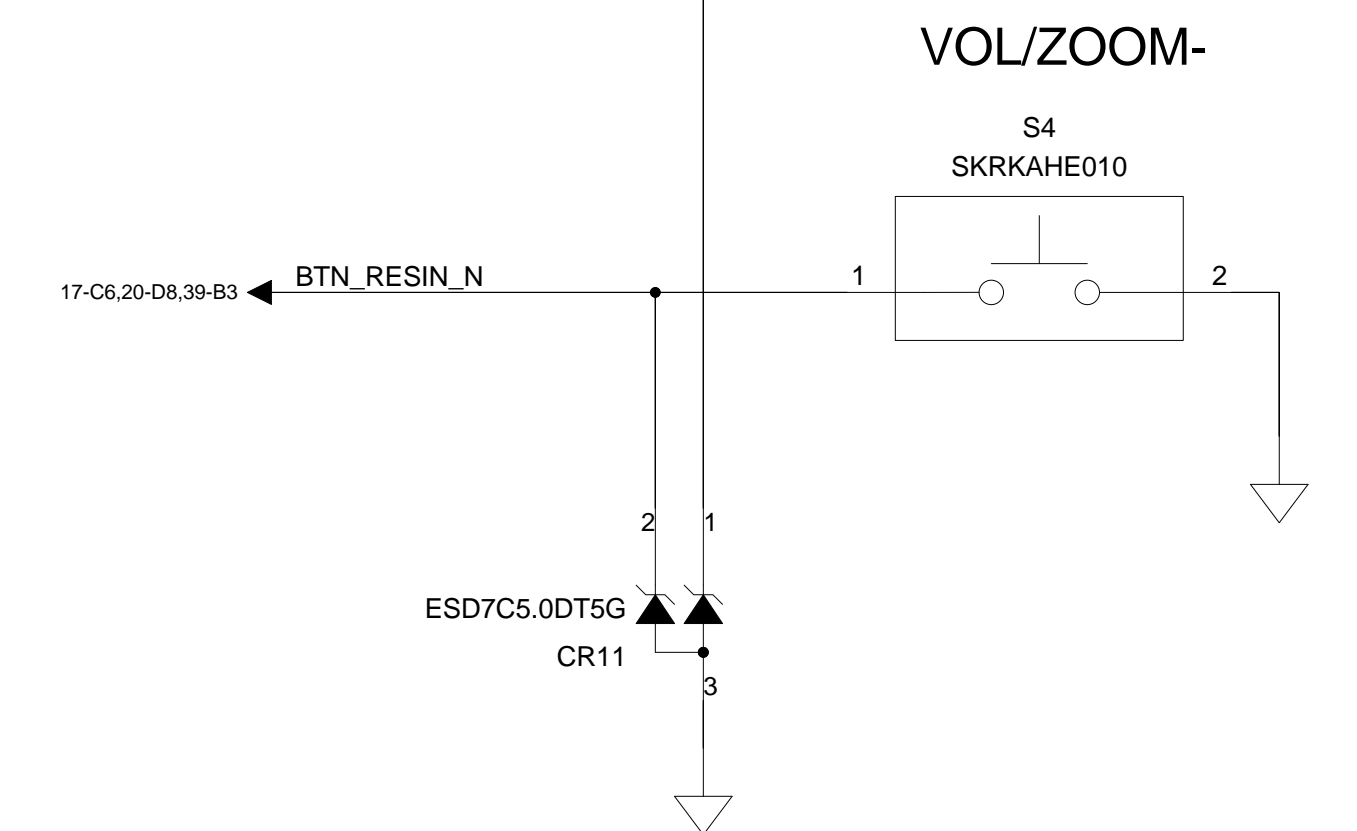
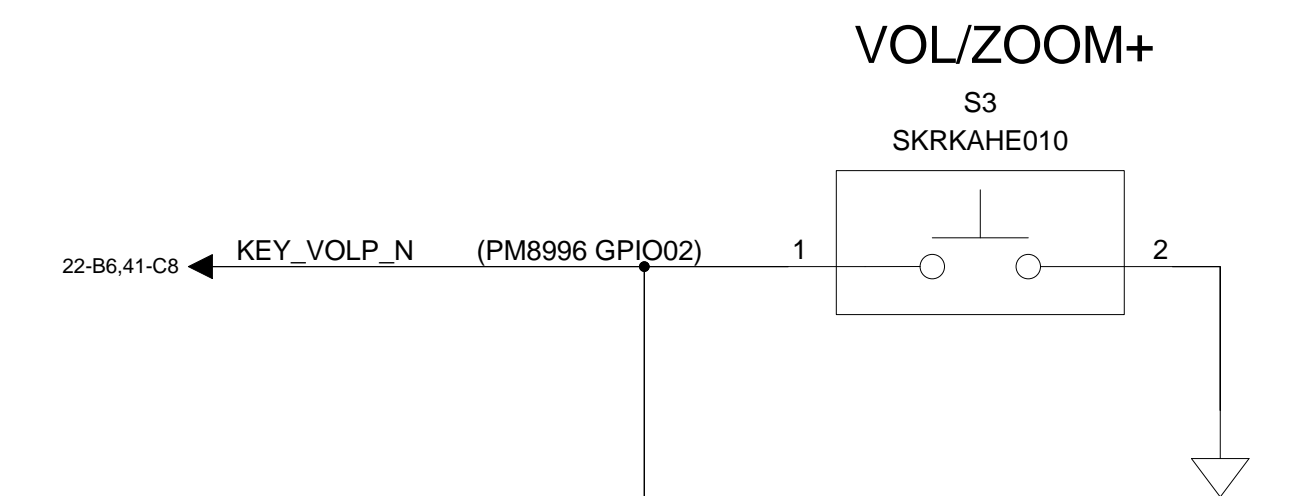
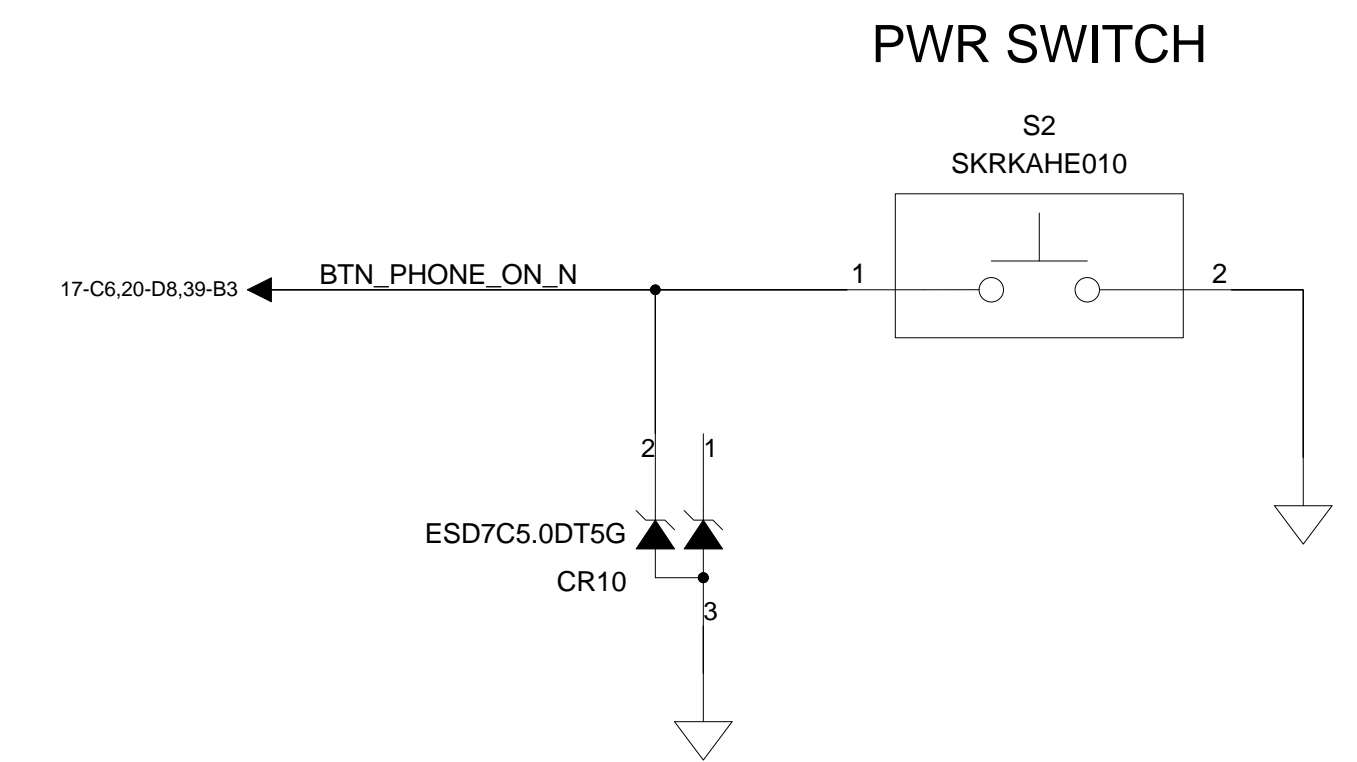
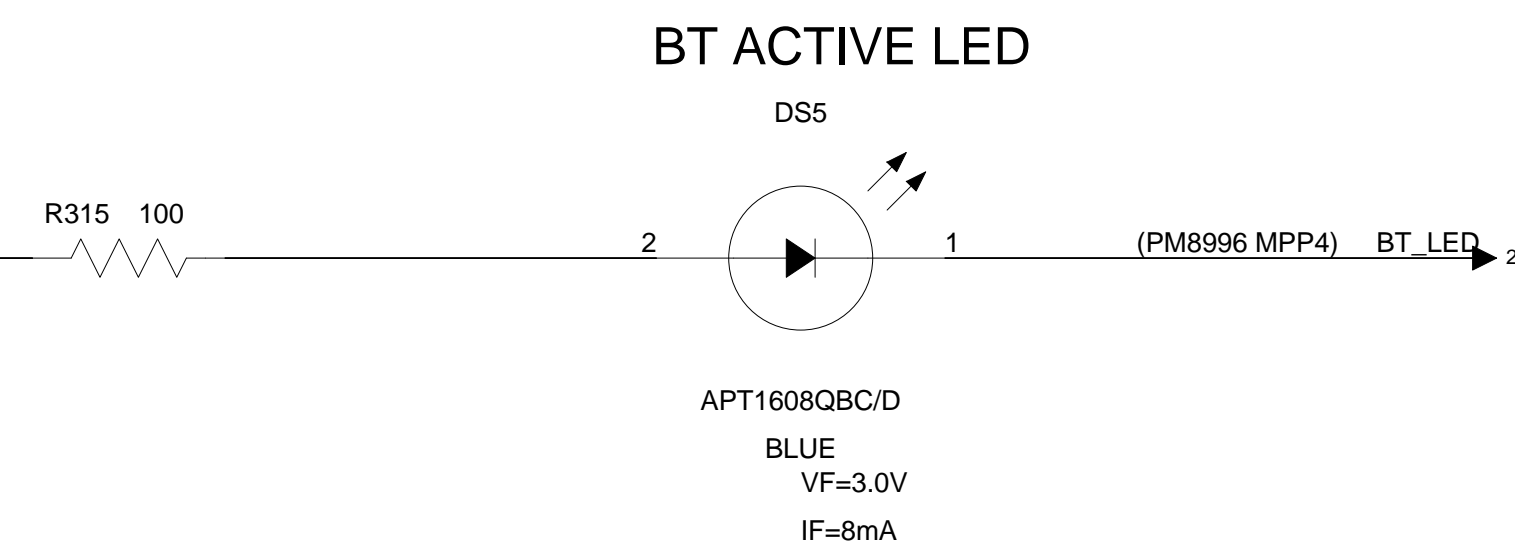
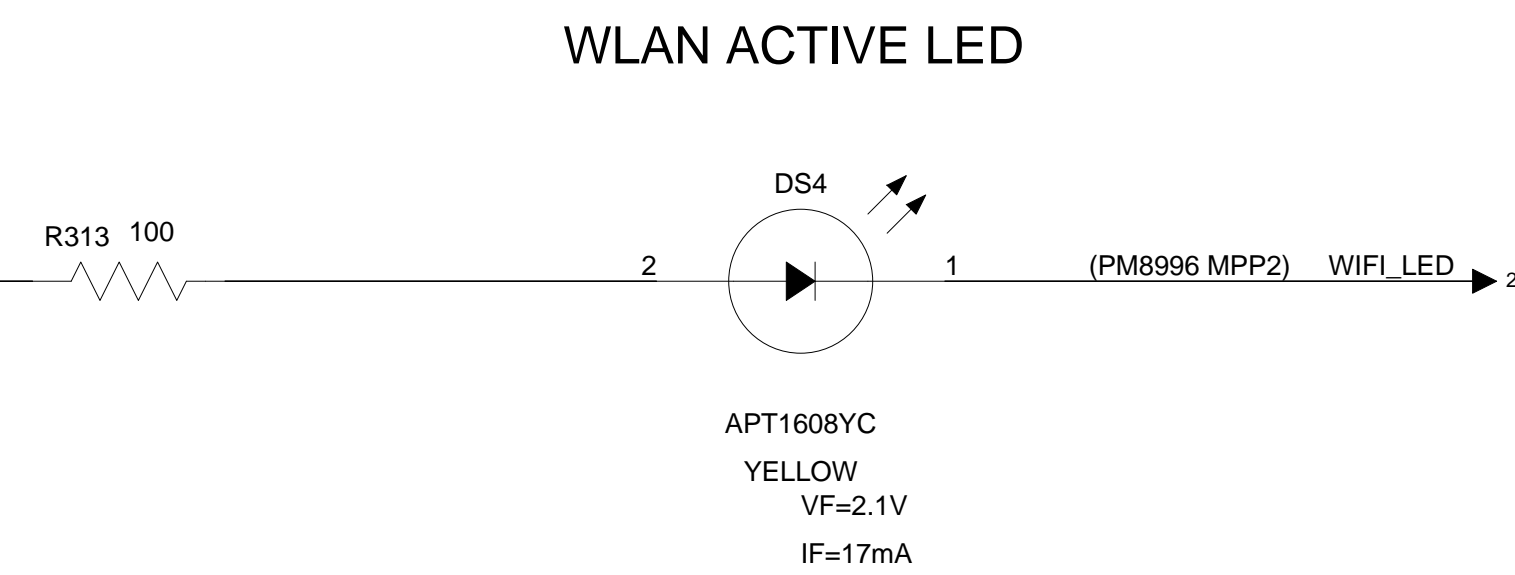
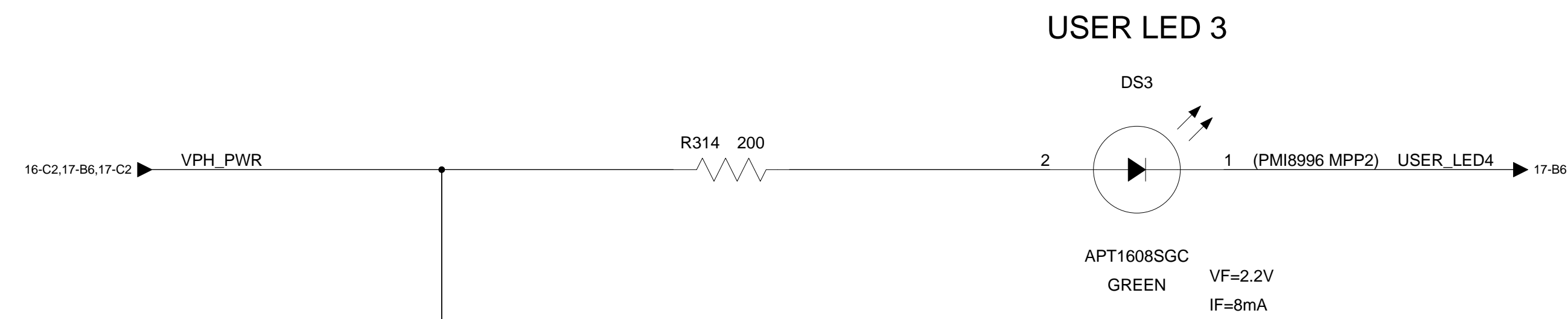
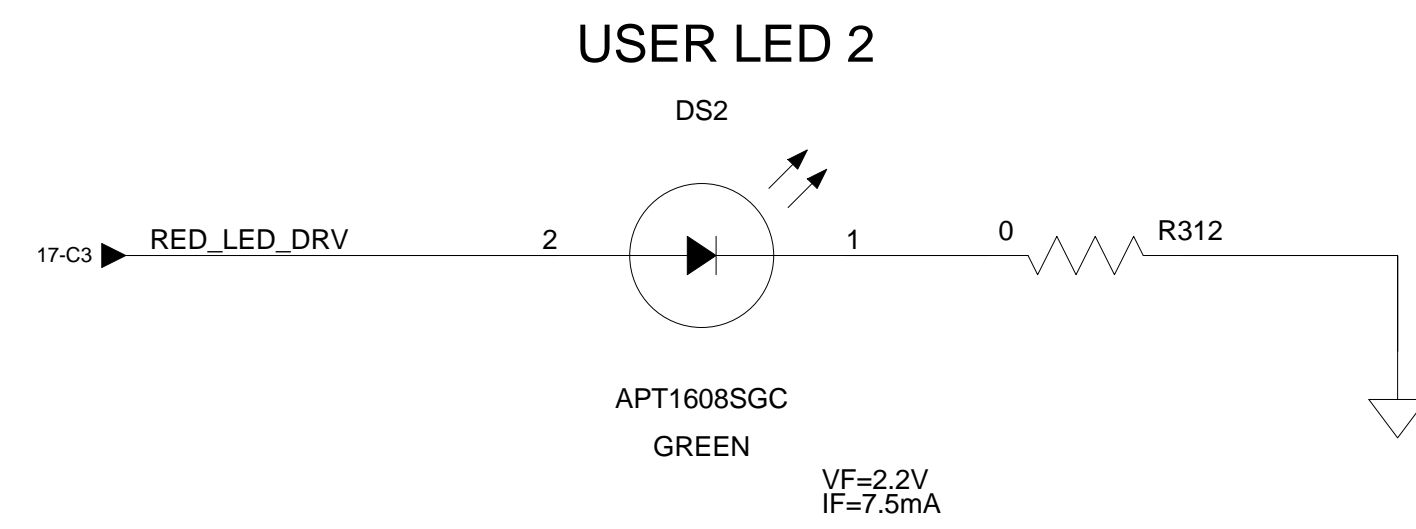
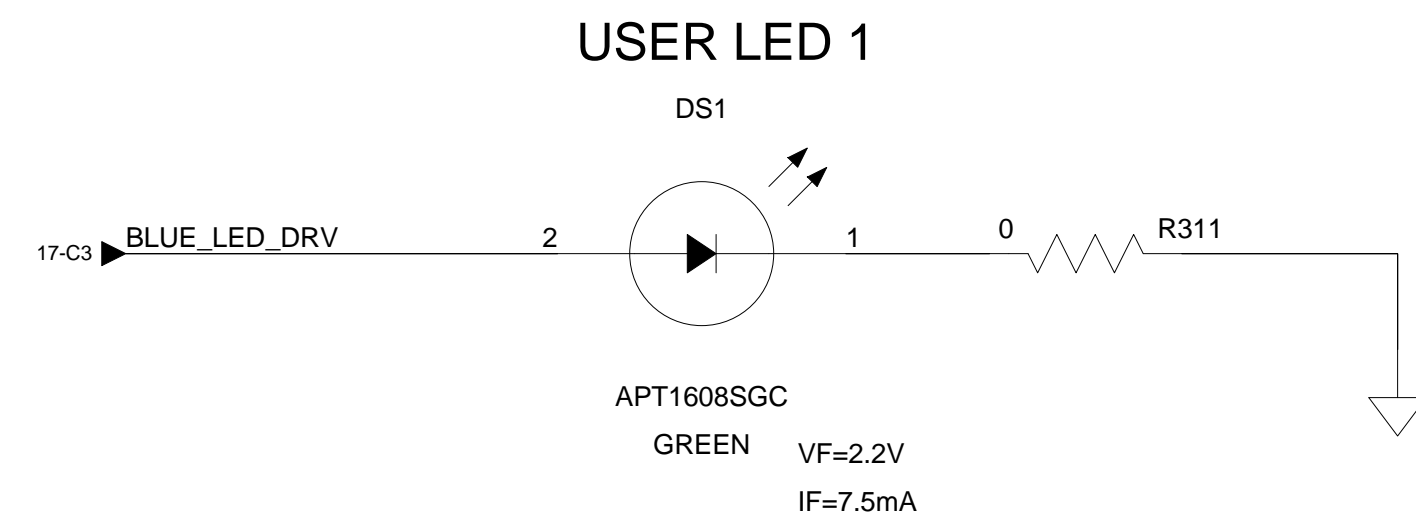
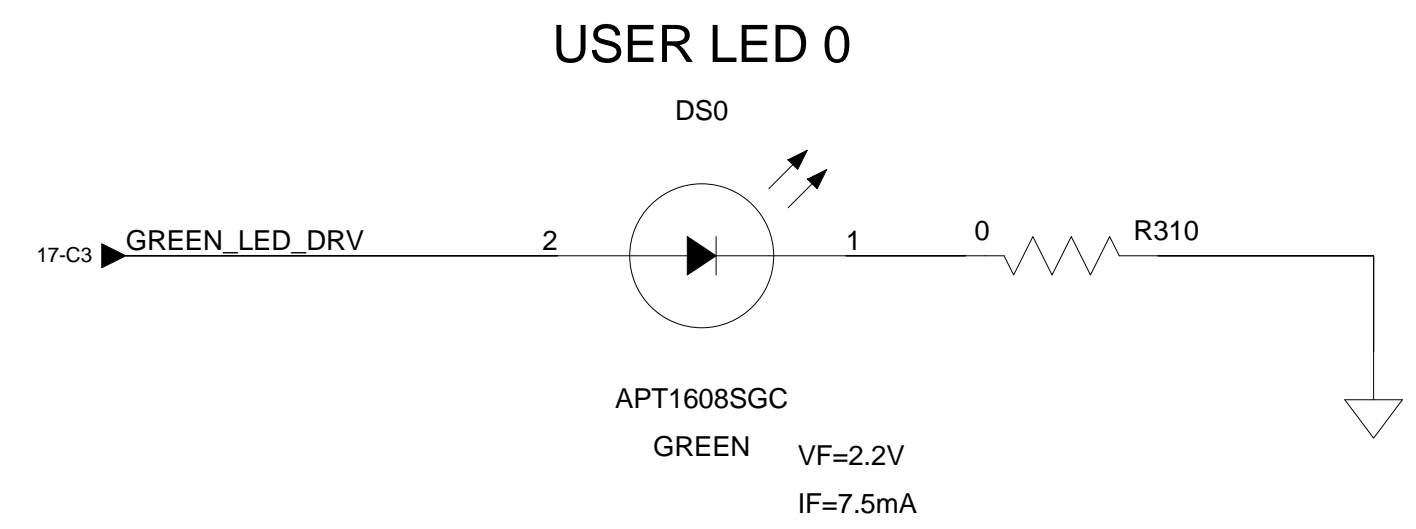
HS/LS EXPANSION CONNECTORS

TITLE DragonBoard 820c			
SIZE B	DRAWING NO LM25-P2751-1	REV B	
SCALE NONE	SHEET 40		OF 44

QUALCOMM TECHNOLOGIES, INC.
5775 MOREHOUSE DRIVE
SAN DIEGO, CA 92121 U.S.A.

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

SWITCHES / LEDS

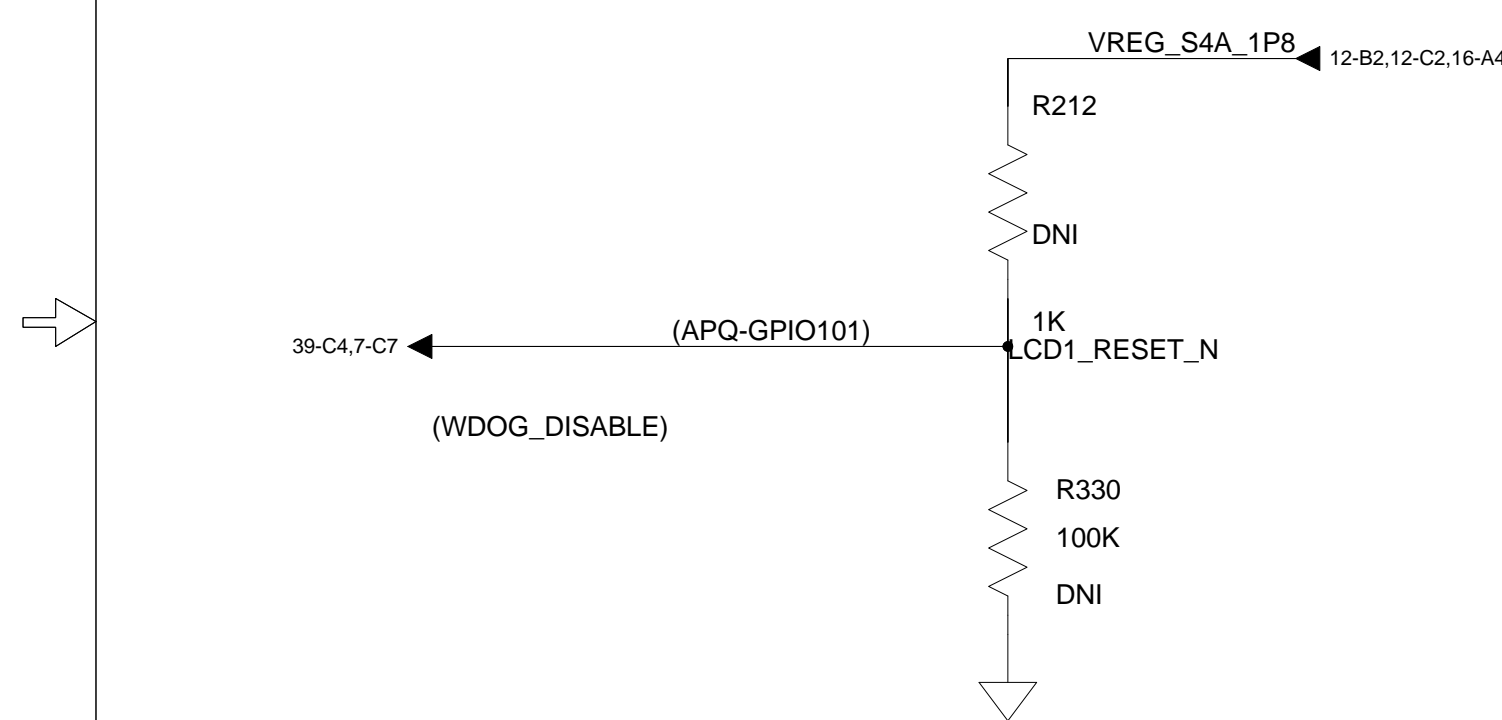
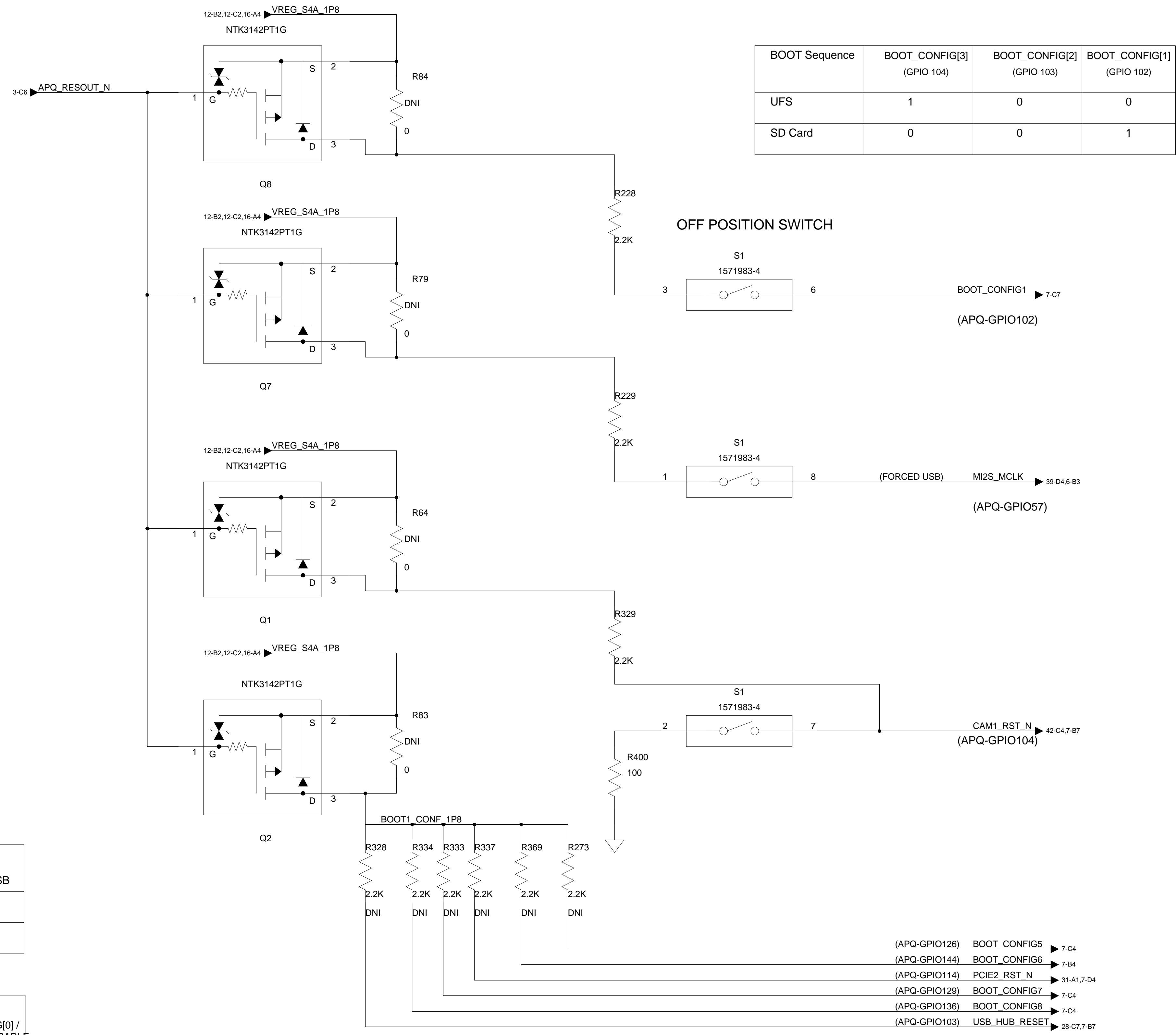
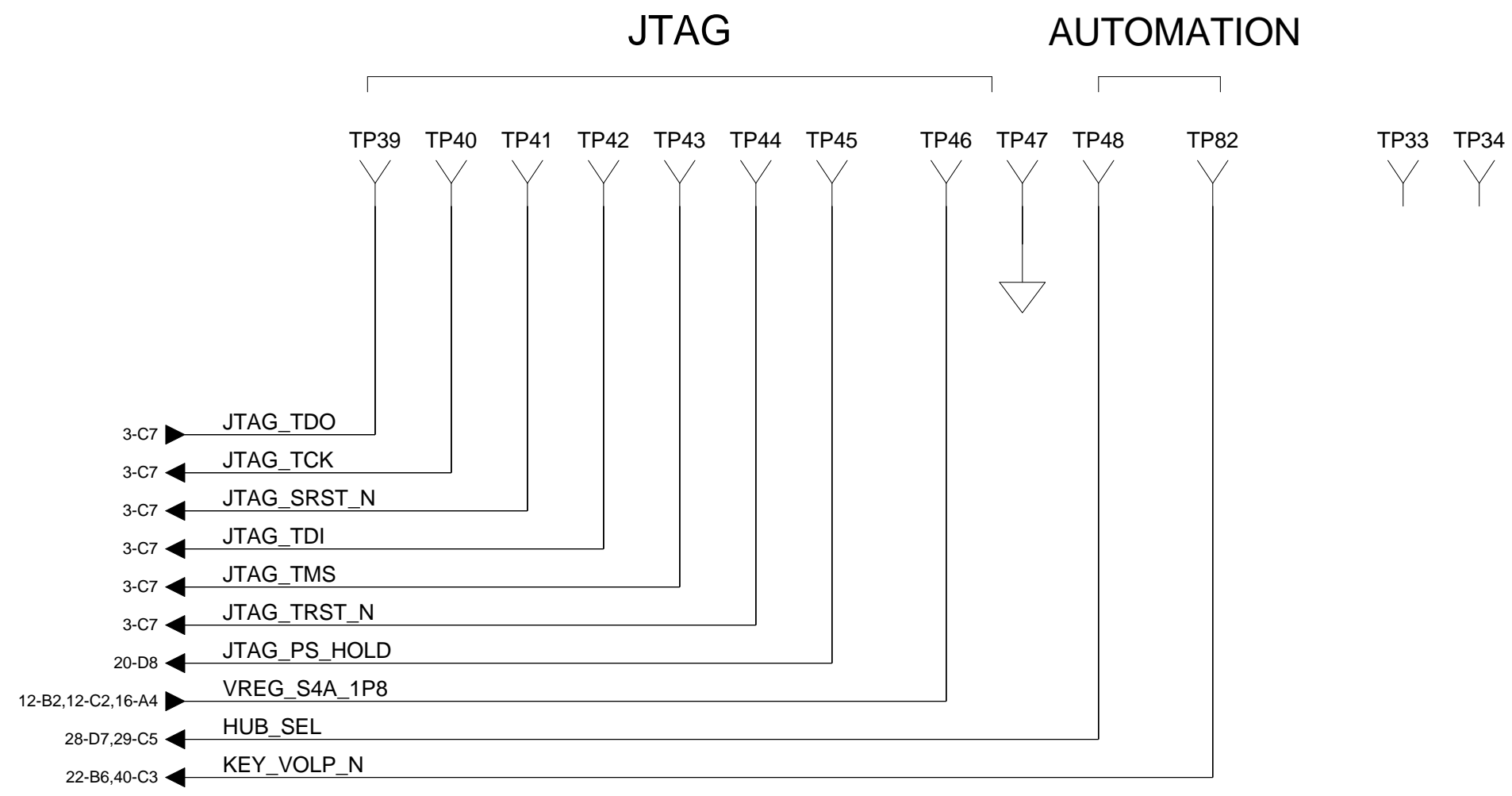


TITLE DragonBoard 820c			
SIZE D	DRAWING NO LM25-P2751-1	REV B	
SCALE NONE	SHEET 41		OF 44

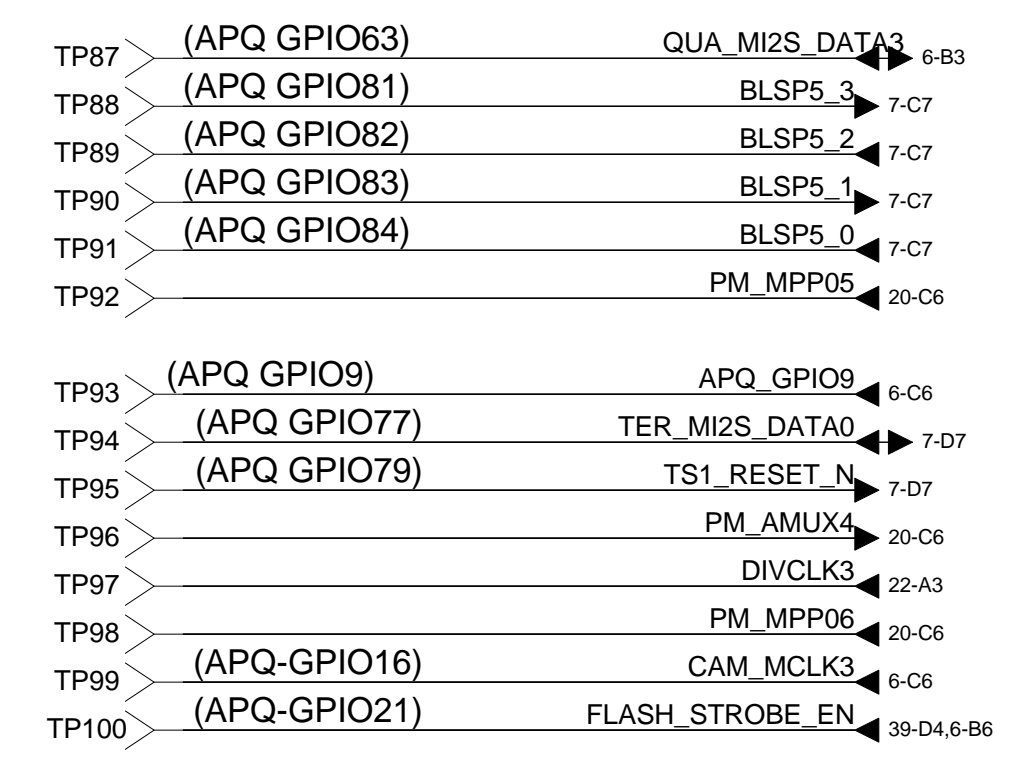
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
B	ECO C597371		

BOOT CONFIG

POGO PINS



PROBE HEADER



BOOT Option	GPIO 57 FORCE_USB
Enabled	1
Disabled	0

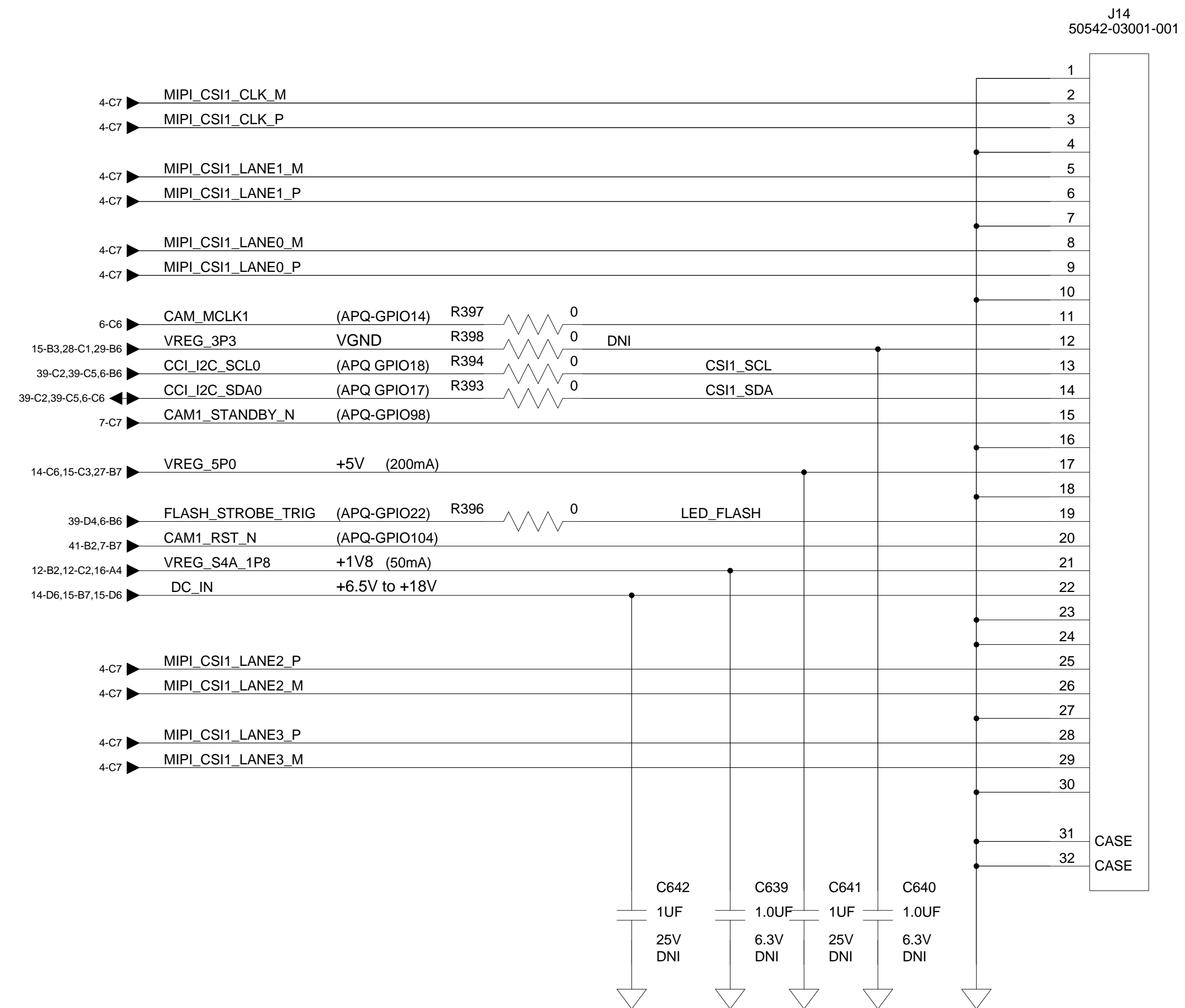
BOOT Option	GPIO 101 BOOT_CONFIG[0] / WATCHDOG_DISABLE
Enabled	0
Disabled	1

JTAG/BOOT CONFIG

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TITLE DragonBoard 820c			
SIZE B	DRAWING NO LM25-P2751-1	REV B	
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CAMERA CONNECTOR

TITLE DragonBoard 820c			
SIZE D	DRAWING NO LM25-P2751-1	REV B	
SCALE NONE	SHEET 43	OF 44	

EXHIBIT1

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