AmP Demonstration Board

AmP8DB2

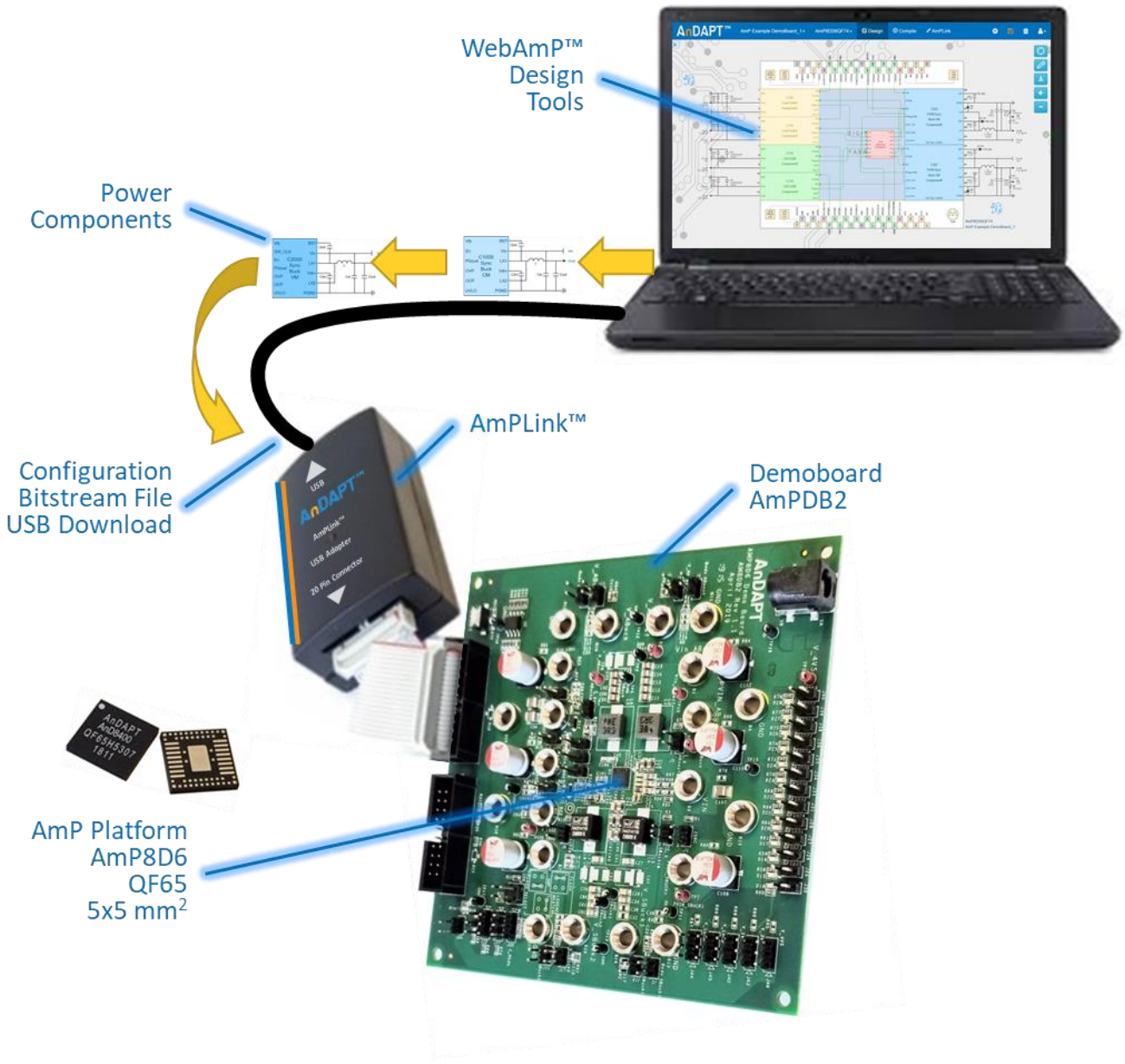
Features

- AmP8D6QF65 platform 5x5 mm^2 package on board
- Demonstrates Power Components:
  - Synchronous Buck
  - Asynchronous Buck
  - Asynchronous Boost
  - LDO
  - Load Switch
  - Supervisor Functions
- Connects to AmPLink™ USB adapter
- WebAmP Tool Downloads Configuration File
  - .HEX file (Intel HEX) to program on board Flash
  - .HAX file to configure AmP device directly

Description

The AmP8DB2 is a ready to use Demonstration Board to evaluate Power Components on the AmP, Adaptive Multi-Rail Power Platform. Simply drag and drop Power Components in the WebAmP design tool and compile into a Configuration Bitstream File. In the AmPLink Control tab, download the file over the AmPLink USB adapter to the AmP8DB2 Demonstration Board. The .HEX file is used to download to the Flash memory or the .HAX file is used to download directly to the AmP Platform. Synchronous Buck, Async Buck, Async Boost, LDO, Load Switch and Supervisor Power Components may then be evaluated.

Application of Demonstration Board



Getting Started

Step 1.
Set jumper connections to the default configuration **Load AmP from USB** as shown in the Jumper Selection Table. Also provided for clarity is a jumper legend on the PCB silkscreen. For details see: AmPLink Config & Cntrl

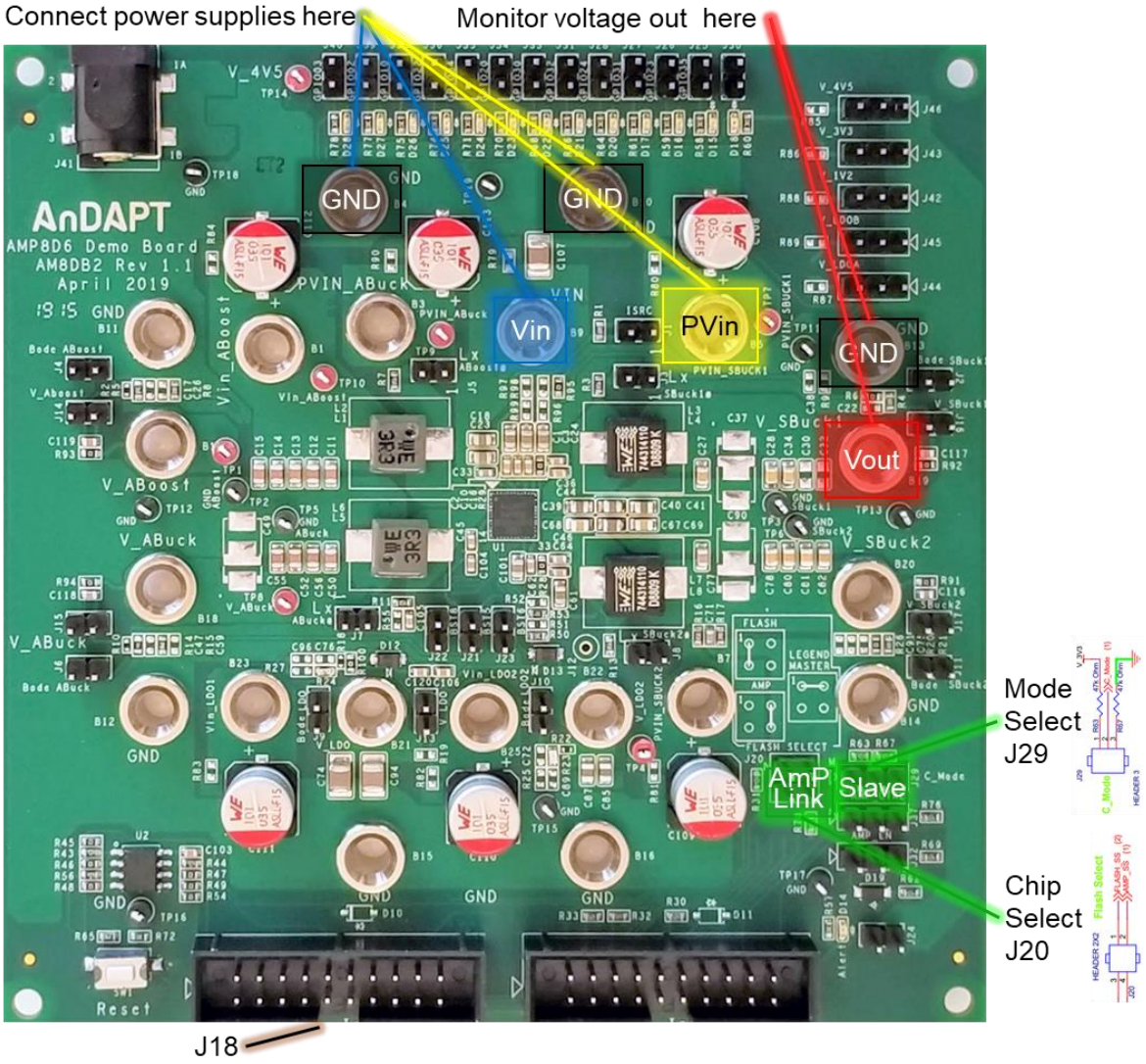
Step 2.
Connect power supplies to Vin, Sync Buck1 PVin and GND banana jacks as shown in the figure below. In this example, use Vin = PVIN = 12V.

Step 3.
Download AmP8DB2_B_syncBuck2x_LDO1x.json project file, Impot to WebAmP and compile. Connect AmPLink USB cable to computer and AmPLink 20-pin flat ribbon cable to J18 as shown on page 1. From the AmPLink tab, install AmPLink drivers if required, then click Program & Verify. Set CTRL, EN, to “1”. Observe 1.2V on the Vout banana plug below.
See: Video - Using AmPLink

Jumper Selection Table for J20 and J29

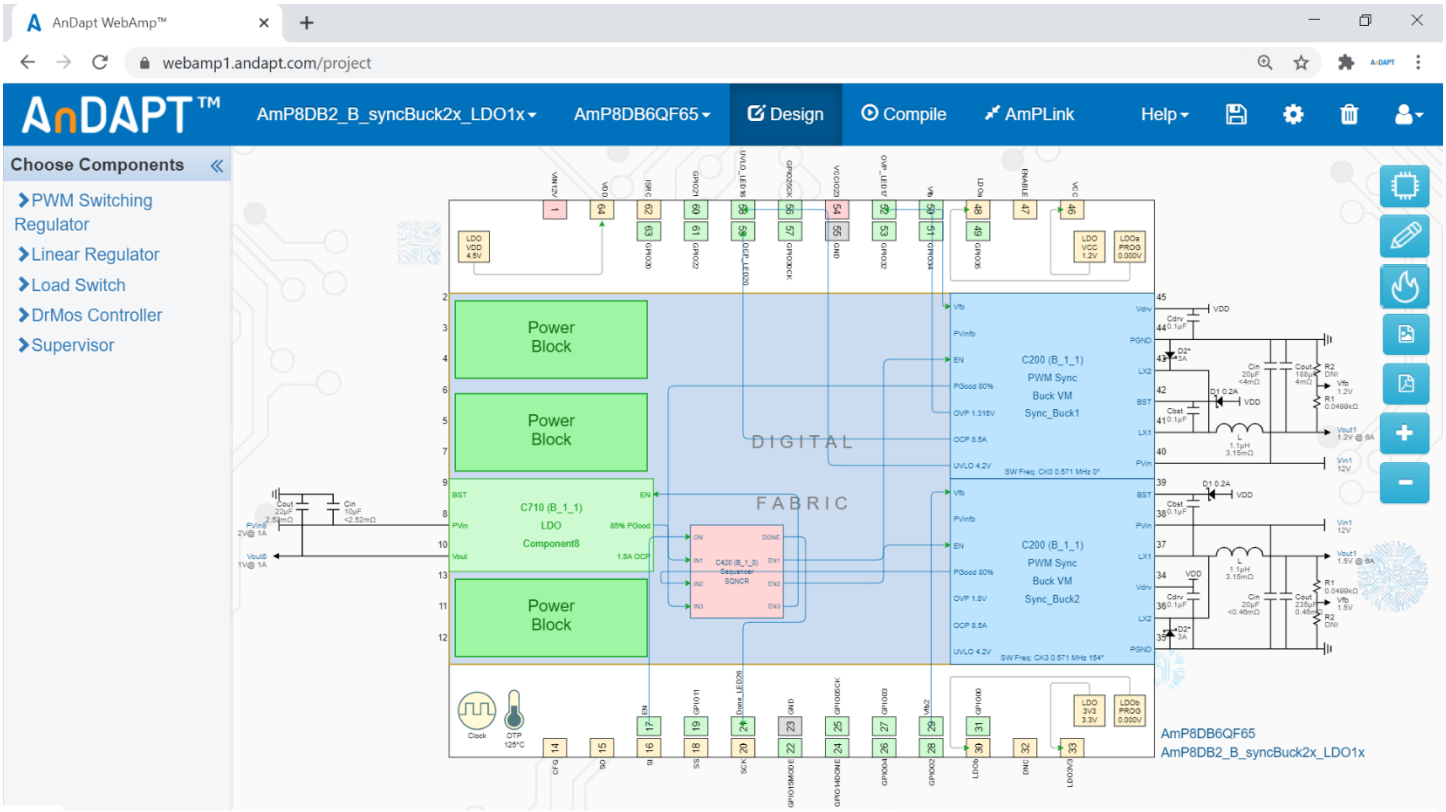
Function	Header	Load AmP from FLASH	Load AmP from USB	Program FLASH from USB
Chip Select	J20	1-2 	2-4 	1-3 
Mode	J29 	1-2 	2-3 	2-3 

Power Supply and Jumper Configurations

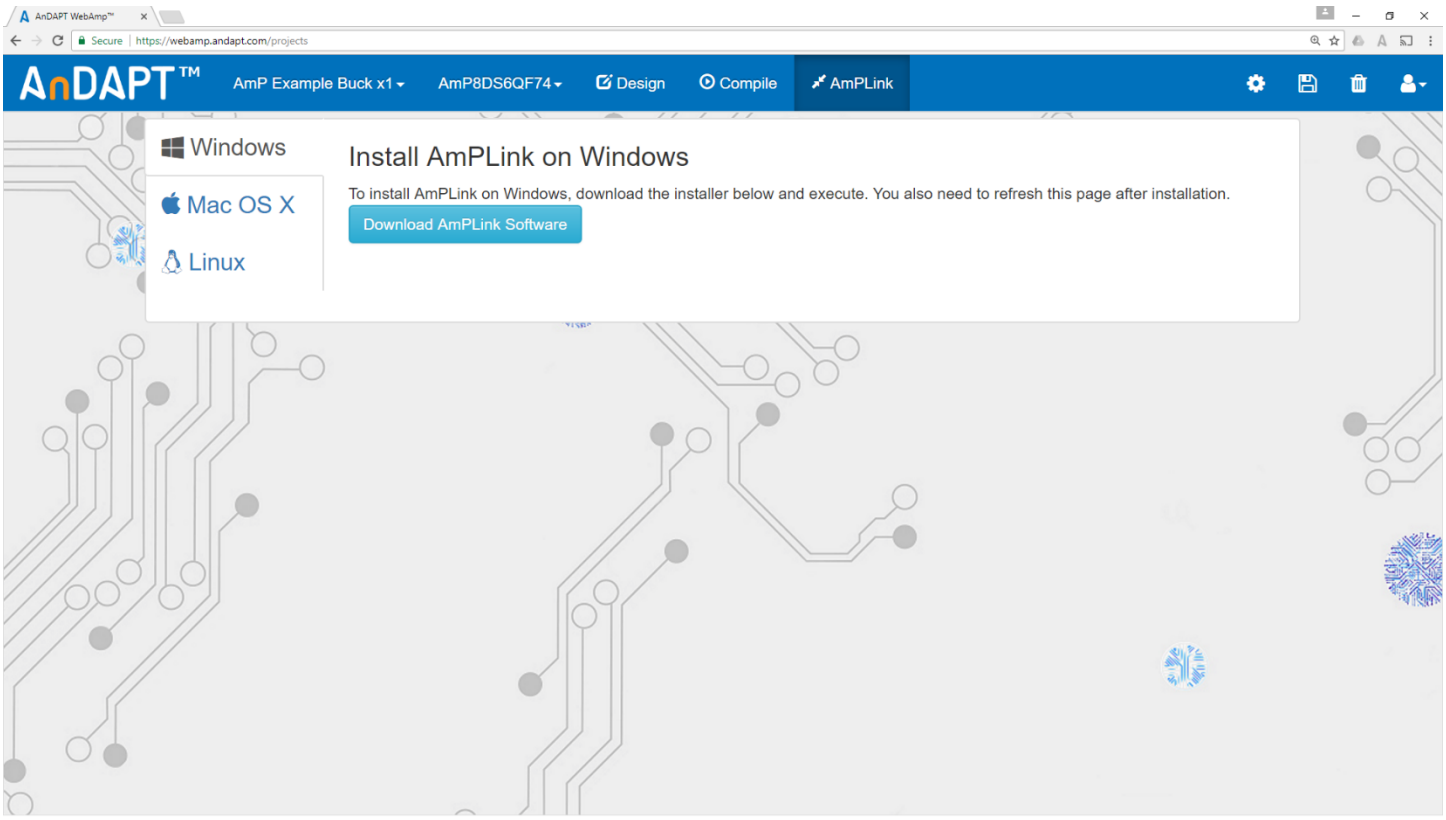


Getting Started with WebAmP example project, AmP Example B_syncBuck2x_LDO1x

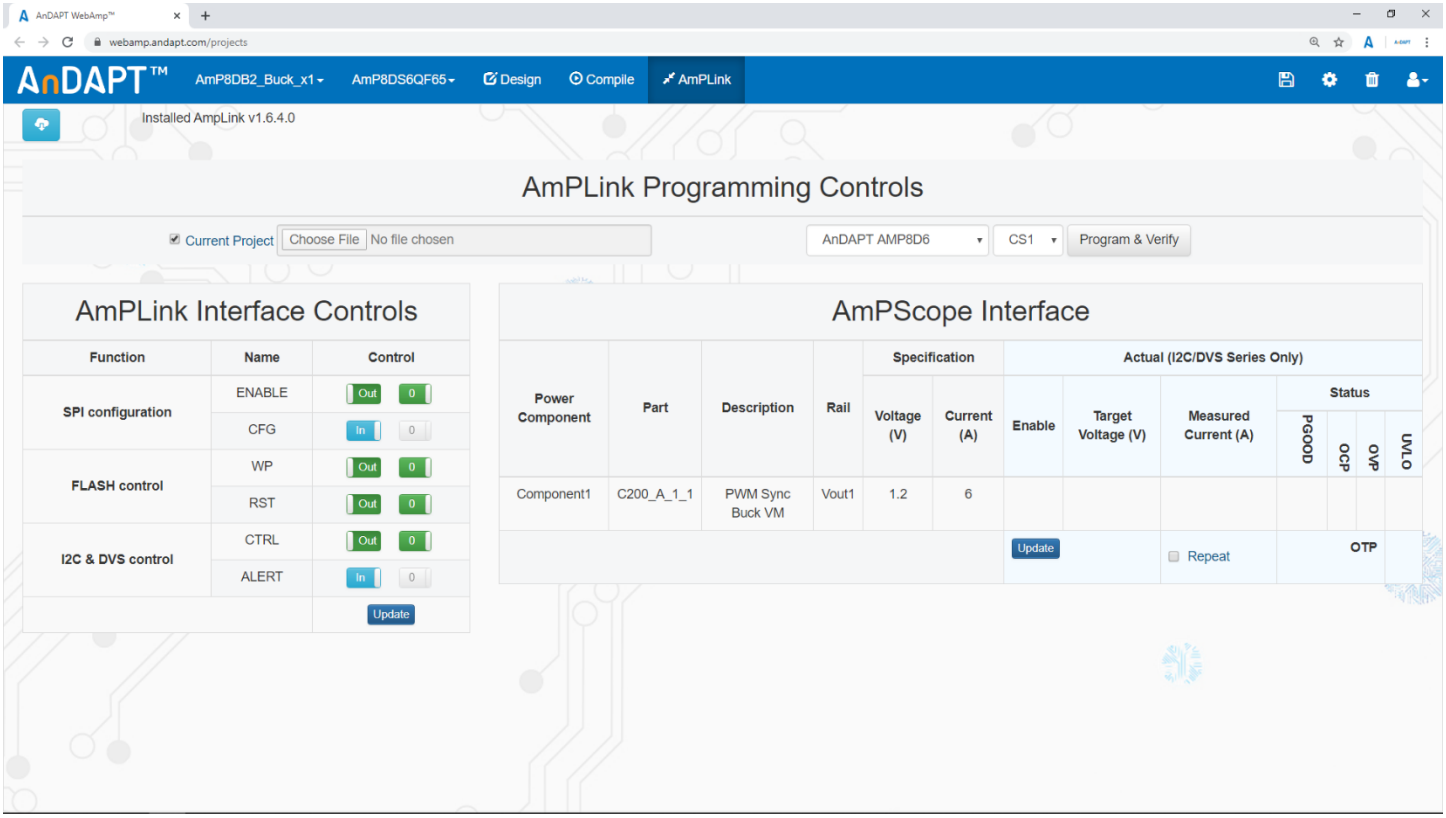
Project File: AmP8DB2_B_syncBuck2x_LDO1x.json



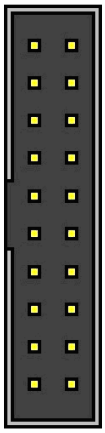
Getting Started with WebAmP: Install AmPLink



Getting Started with WebAmP: AmPLink Program, Verify & Status



AmPLink Pin Out



GND –	1	2	– CS2
AMP_SCLK –	3	4	– GND
AMP_SI –	5	6	– CS1
CS3 –	7	8	– CS4
AMP_Config –	9	10	– FLASH_RST
AMP_SO –	11	12	– GND
3.3V –	13	14	– AMP_SCL
FLASH_WP –	15	16	– AMP_SDA
AMP_ALERT –	17	18	– AMP_CTRL
AMP_EN –	19	20	– VBUS

LDO Examples

LDO examples for testing a single LDO at a time.

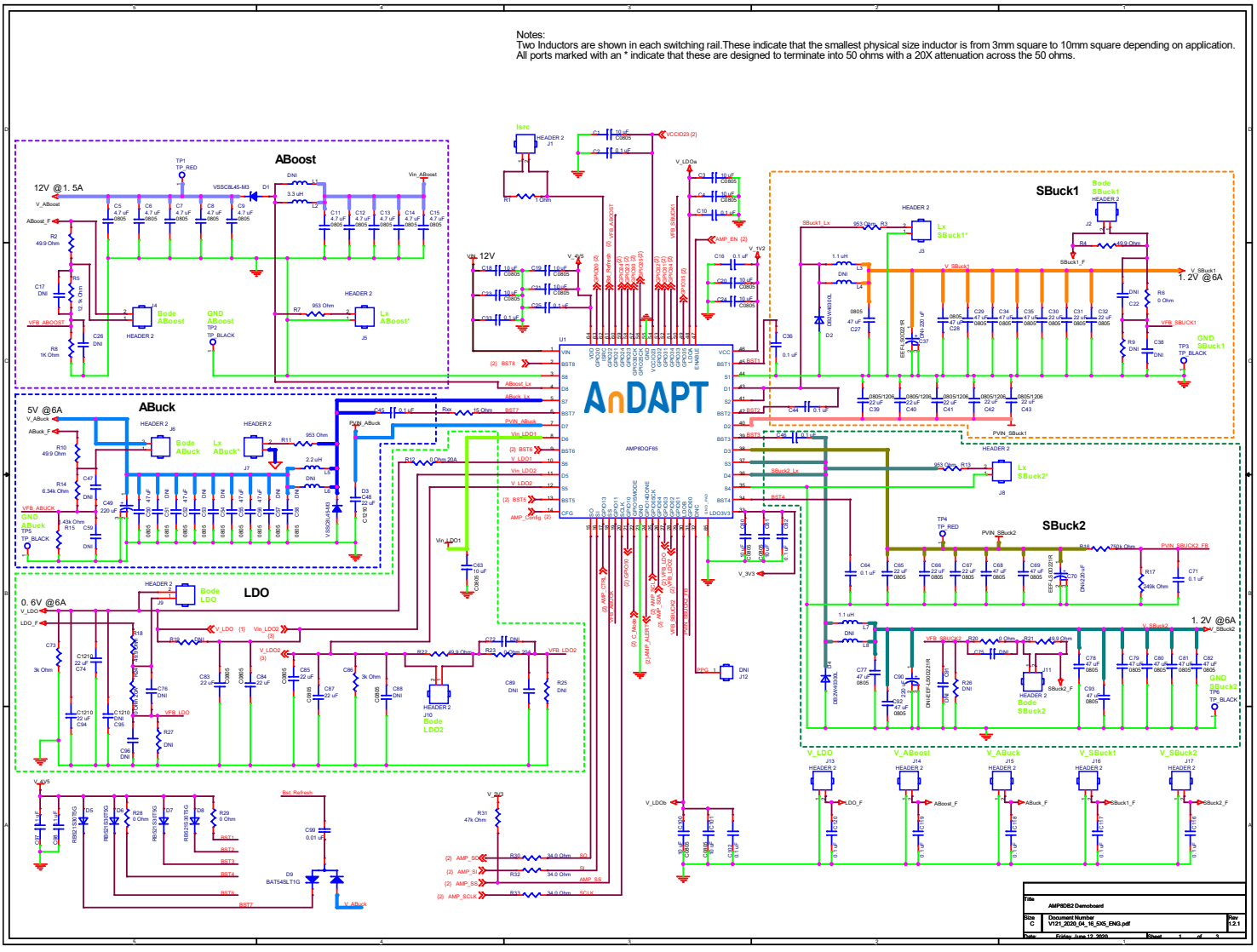
Project File: AmP8DB2_B_LDO1_1x.json
Project File: AmP8DB2_B_LDO2_1x.json

Basic LED Examples

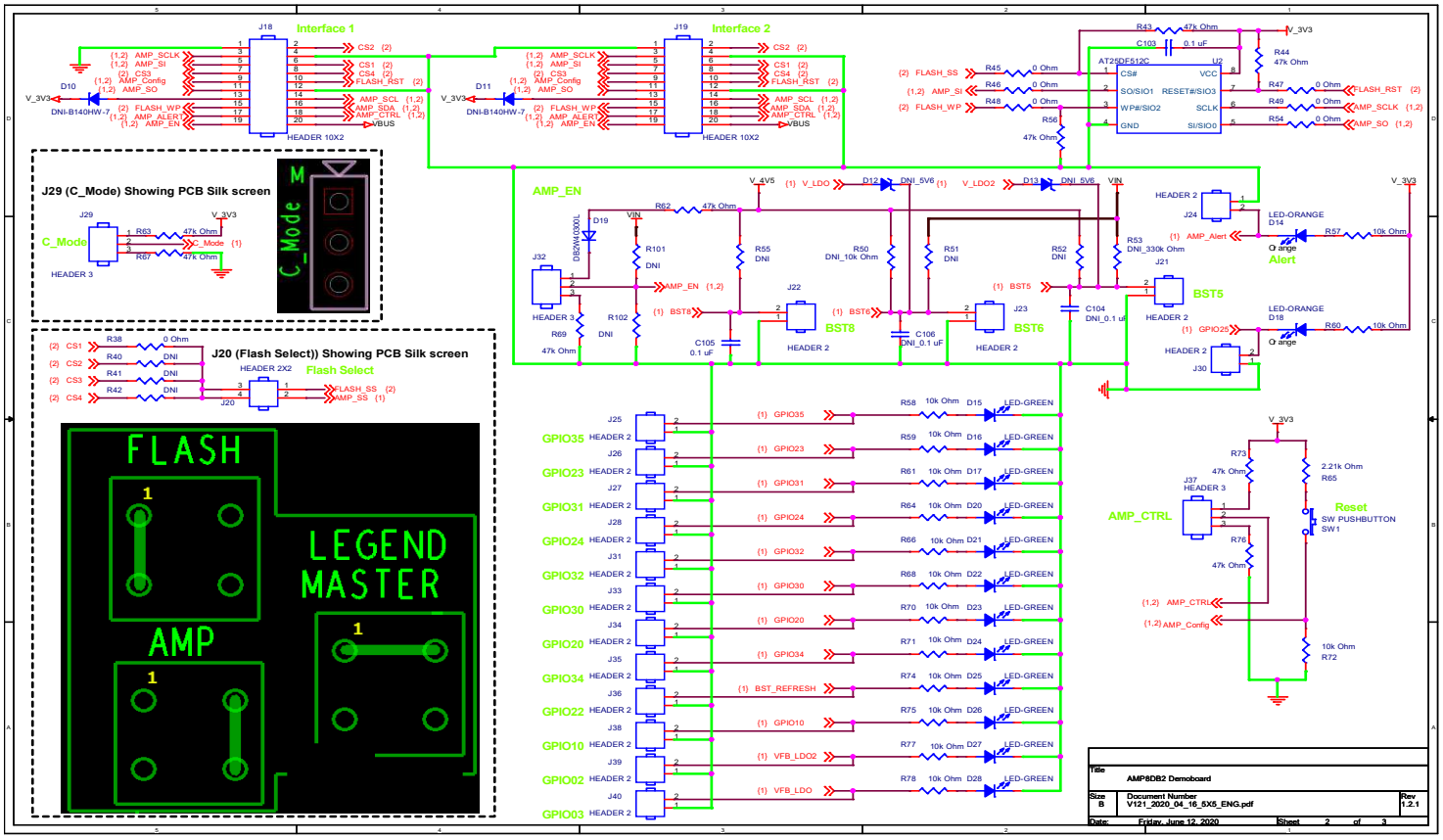
Basic includes Blink, Count and Shift examples to demonstrate use the of C430 AND gate, C430 NOR gate, C432 DFF4, and C450 Reset Generator

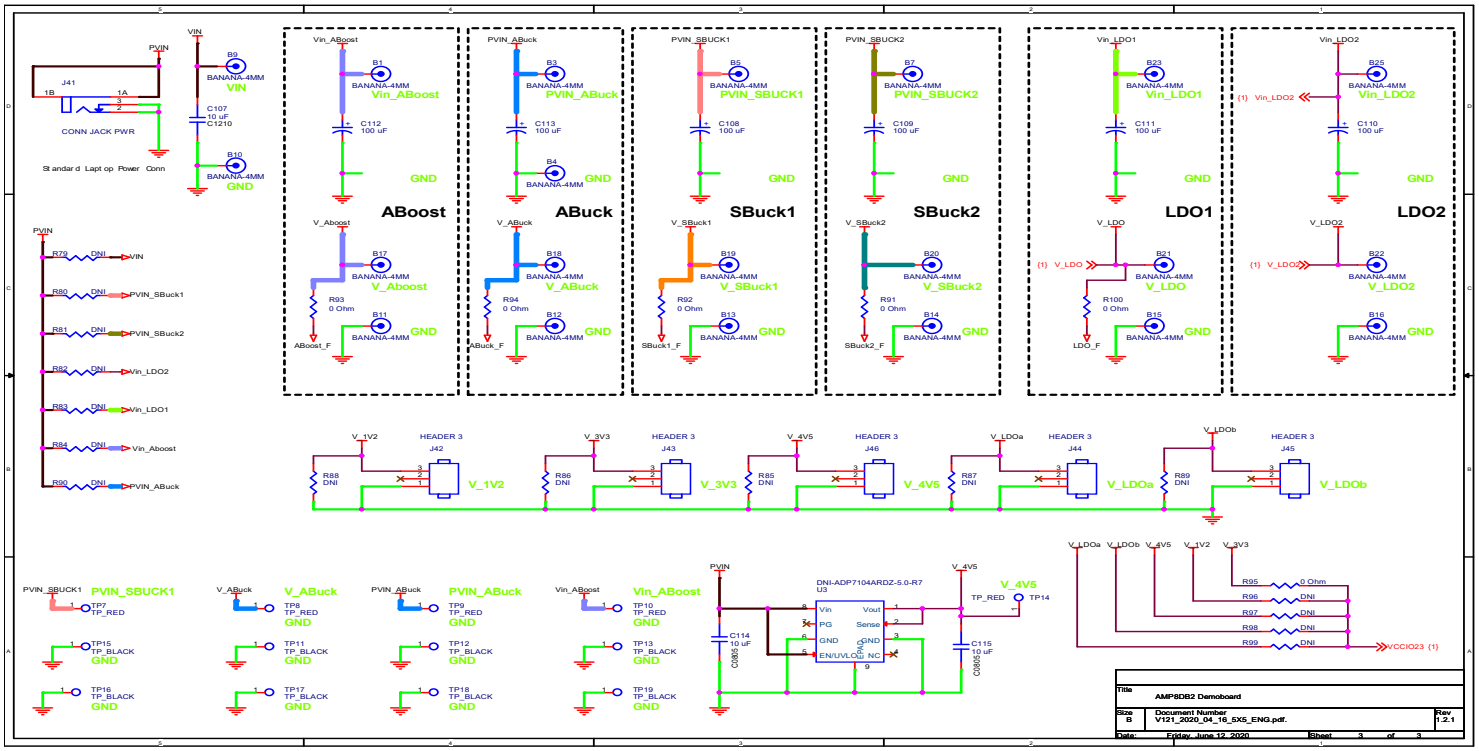
Project File: AmP8DB2_LED_Blink_2Hz.json
Project File: AmP8DB2_LED_Count_2Hz,json
Project File: AmP8DB2_LED_Shift_2Hz.json

Demonstration Board AmP8DB2 Schematic

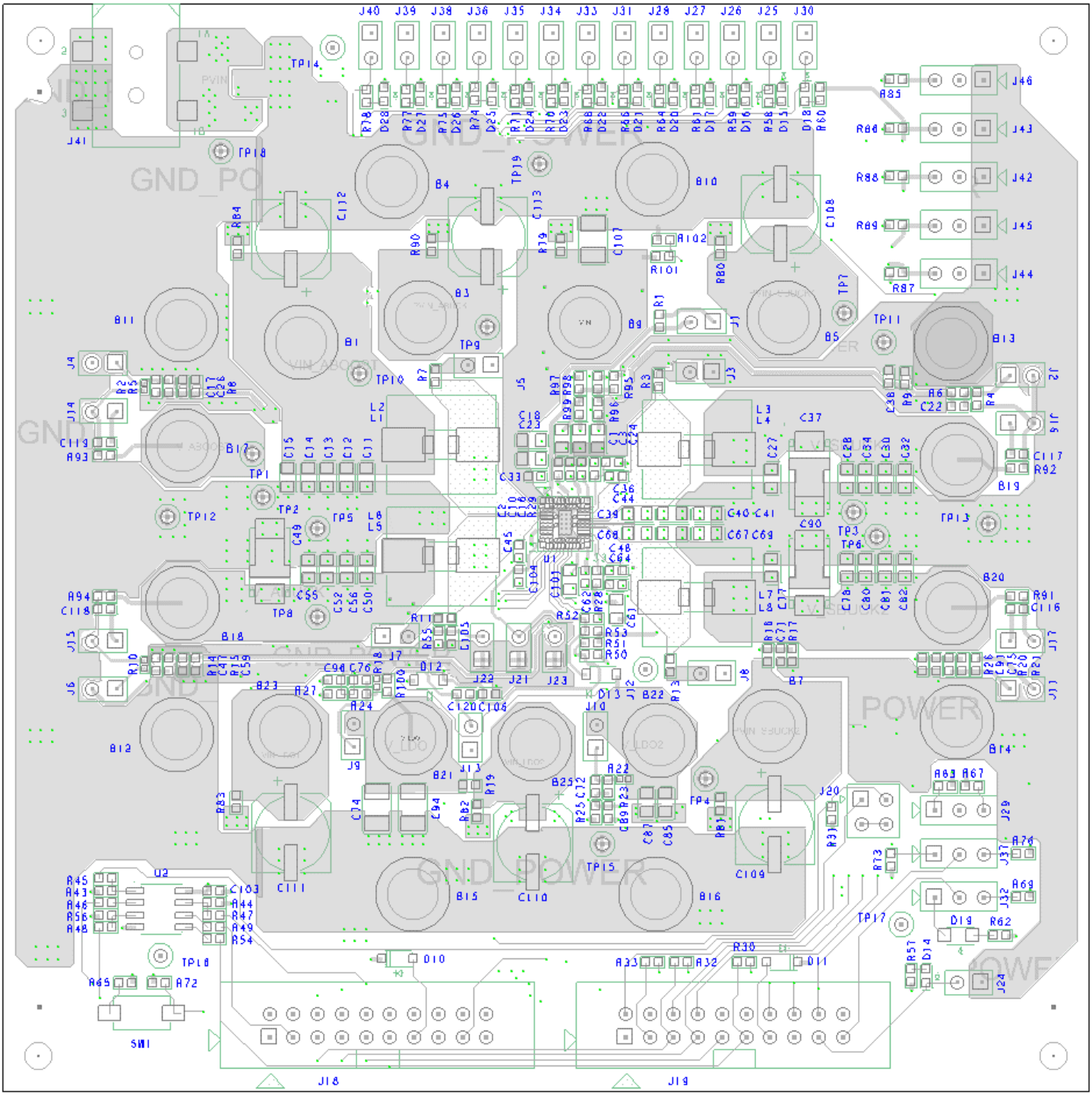


Demonstration Board AmP8DB2 Schematic

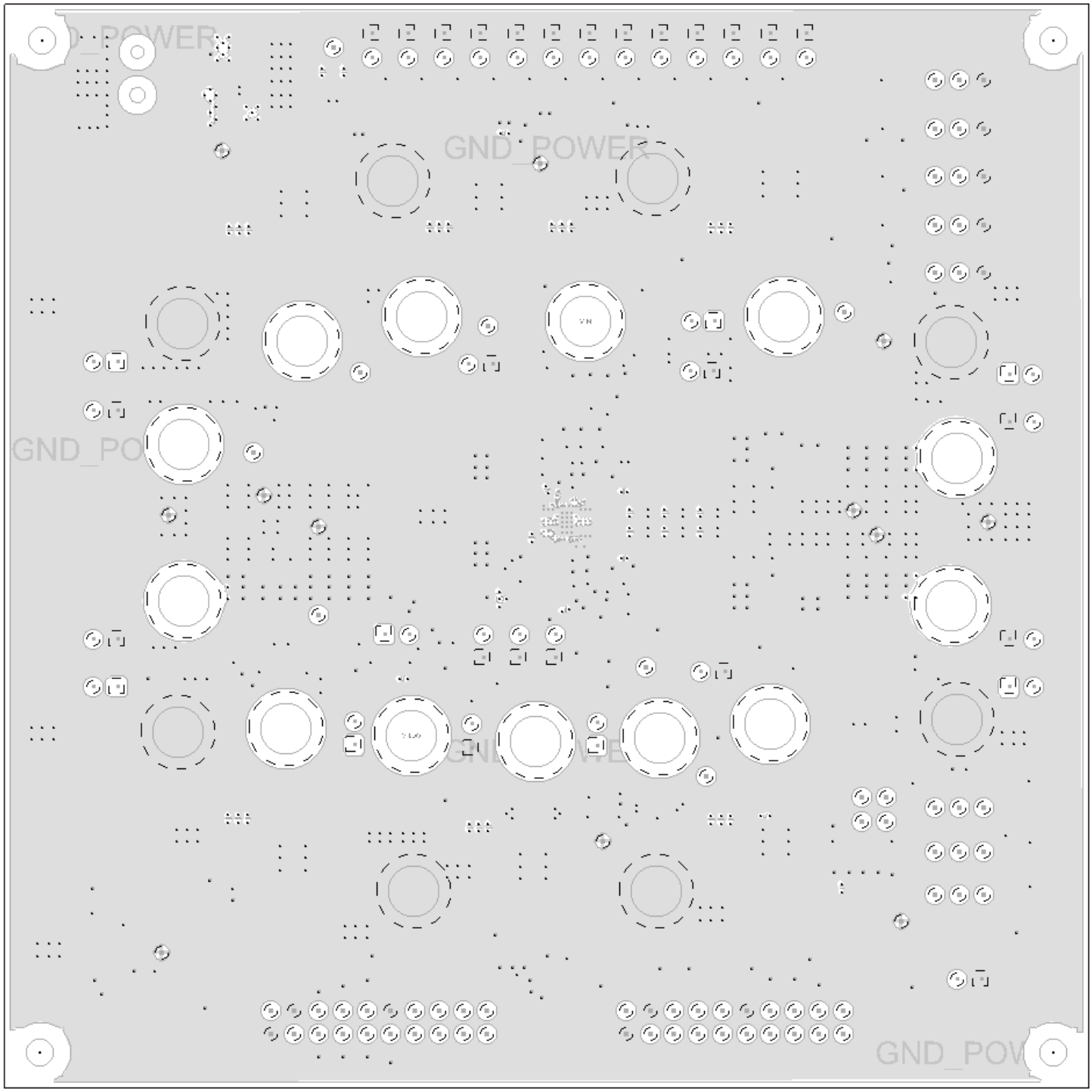




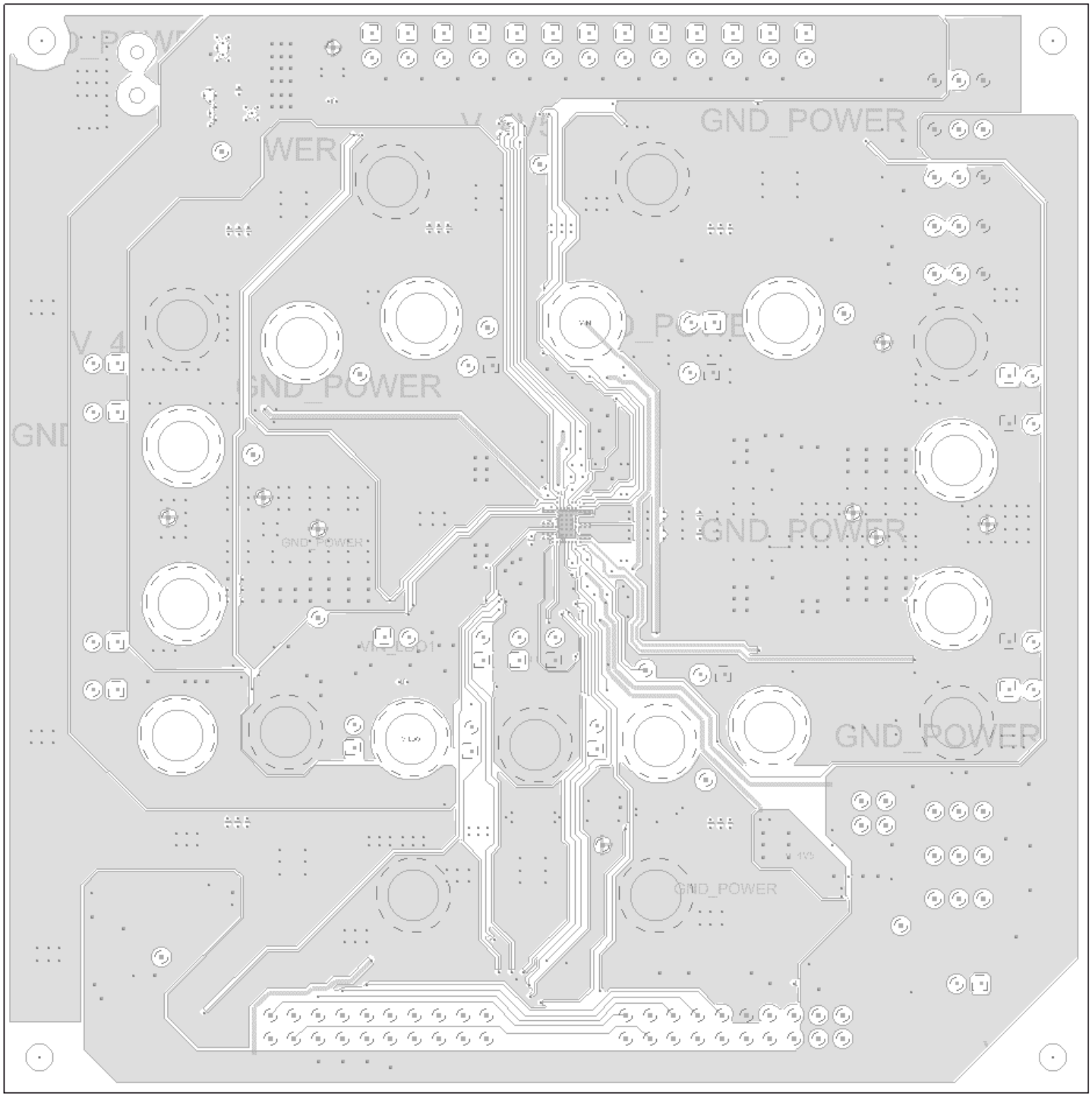
PCB Top Layer with Silk Screen



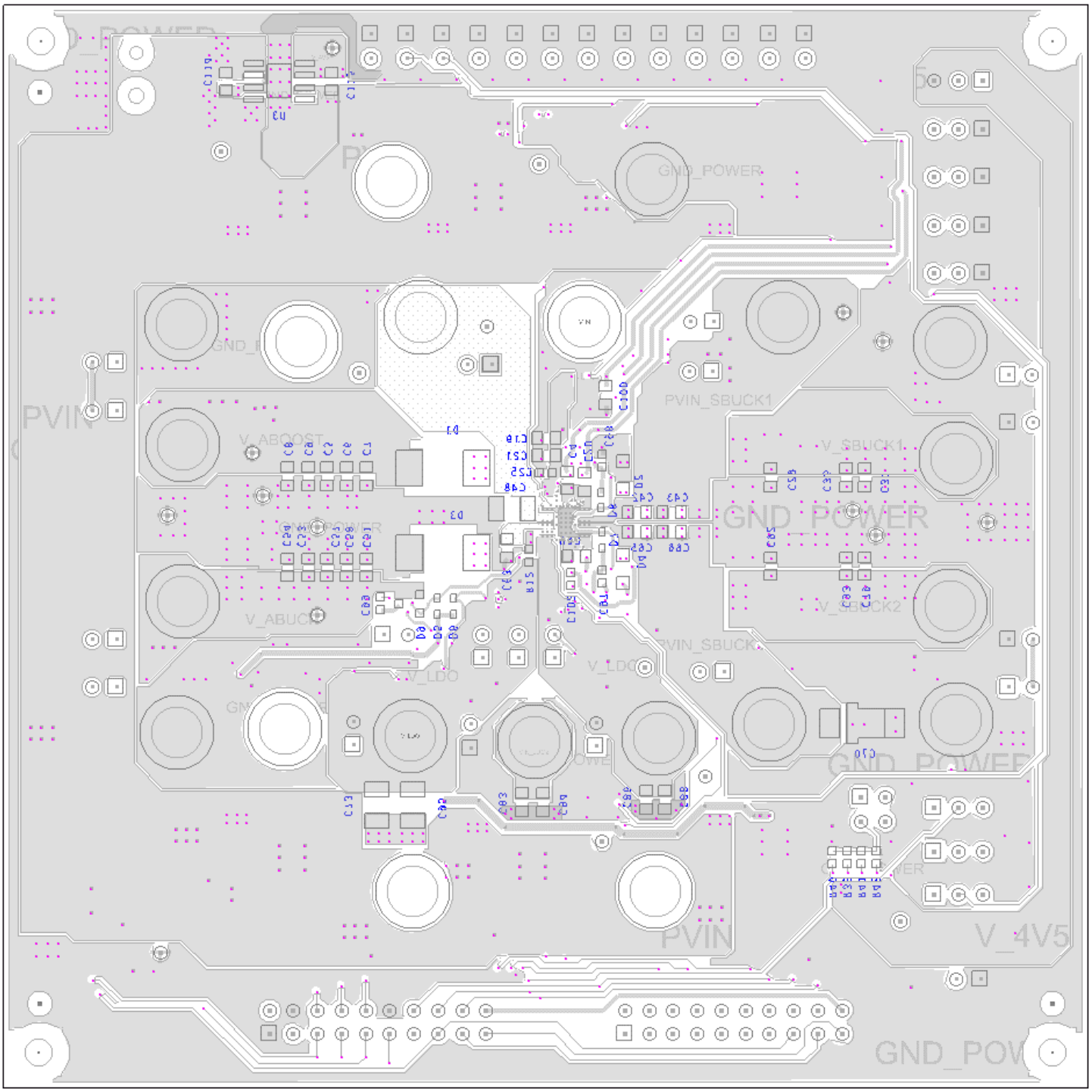
PCB Layer 2 Ground



PCB Layer 3 Power



PCB Bottom Layer with Silk Screen



Bill of Materials

Item	Qty	Reference	Value	Description
1	21	B4, B10, B11, B1, B3, B9, B5, B13, B17, B19, B18, B20, B12, B23, B21, B25, B22, B7, B14, B15, B16	476-2	Banana Jack Connector Standard Banana Solder
2	13	C1,C3,C4,C18,C19,C20,C21,C23,C24,C60,C61,C100,C101	10 uF	CAP CER 10UF 16V X5R 0805
3	24	C2,C10,C16,C25,C33,C36,C44,C45,C46,C62,C64,C71,C97,C98,C102,C103,C104,C105,C106,C116,C117,C118,C119,C120	0.1 uF	CAP CER 0.1UF 50V X7R 0603
4.1	10	C5,C6,C7,C8,C9,C11,C12,C13,C14,C15,	4.7 uF	CAP CER 4.7UF 10% 16V X7R 0805
4.2	5	C51, C53, C54, C57, C58		
4.3	4	C50,C52,C55,C56	47 uF	**CAP CER 47UF 10V X5R 0805**
5	12	C17,C22,C26,C38,C47,C59,C72,C75,C76,C89,C91,C96	DNI	CAP CER 6800PF 50V X7R 0603
6	5	C27,C28,C29,C34,C35	47uF	CAP CER 47UF 6.3V X5R 0805
7	3	C30,C31,C32	CAP	CAP CER 22UF 35V X5R 0805
8	2	C37,C70	DNI-220uF	CAP ALUM POLY 220UF 20% 2V SMD
9	11	C39,C40,C41,C42,C43,C83,C84,C85,C86,C87,C88	22 uF	CAP CER 22UF 10V X5R 0805
10	1	C48	22uF	22uF 16V X5R +/-20% 1210
11	1	C49	220uF	CAP ALUM POLY 220UF 20% 2V SMD
12	3	C63,C114,C115	10 uF	CAP CER 10UF 35V X5R 0805
13	3	C65,C66,C67	22uF	CAP CER 22UF 35V X5R 0805
14	2	C68,C69	47uF	CAP CER 47UF 6.3V X5R 0805
15	4	C73,C74,C94,C95	22 uF	CAP CER 22UF 25V X5R 1210
16	8	C77,C78,C79,C80,C81,C82,C92,C93	47uF	CAP CER 47UF 6.3V X5R 0805
17	1	C90	220uF	CAP ALUM POLY 220UF 20% 2V SMD
18	1	C99	0.01u	CAP CER 0.01uF 25V X7R 10% 0603
19	1	C107	10 uF	CAP CER 10UF 25V X7R 1210
20	6	C108,C109,C110,C111,C112,C113	100uF	CAP 100 UF 20% 35 V
21	2	D1,D3	VSSC8L45-M3	DIODE SCHOTTKY 45V 4.9A DO214AB
22	3	D2,D4,D19	DB2W40300L	DIODE SCHOTTKY 40V 3A MINI2
23	3	D5,D6,D8	RB521S30T5G	DIODE SCHOTTKY 30V 200MA SOD523
24	1	D7	RB521S30T5G	DIODE SCHOTTKY 30V 200MA SOD523
25	1	D9	BAT54SLT1G	DIODE SCHOTTKY 30V 200mA SOT-23
26	2	D10,D11	DNI-B140HW-7	DIODE SCHOTTKY 40V 1A SOD123
27	2	D12,D13	5V6	Zener Diode 5.6V 400mW ±2% SOD-323
28	2	D14,D18	LED-ORANGE	LED RED CLEAR 0603 SMD
29	12	D15,D16,D17,D20,D21,D22,D23,D24,D25,D26,D27,D28	LED-GREEN	LED GREEN CLEAR 0603 SMD

Bill of Materials

Item	Qty	Reference	Value	Description
30	33	J1,J2,J3,J4,J5,J6,J7,J8,J9,J10,J11,J13,J14,J15,J16,J17,J21,J22,J23,J24,J25,J26,J27,J28,J30,J31,J33,J34,J35,J36,J38,J39,J40	HEADER 2	CONN HEADER 2 POS 2.54
31	1	J12	DNI	CONN HEADER 9 POS 2.54
32	2	J18,J19	HEADER 10X2	CONN HEADER VERT 20POS GOLD
33	1	J20	HEADER 2X2	CONN HEADER VERT DUAL 4POS 2.54
34	8	J29,J32,J37,J42,J43,J44,J45,J46	HEADER 3	CONN HEADER 3 POS 2.54
35	1	J41	CONN JACK PWR	CONN PWR JACK 2.5X5.5MM SOLDER
36	4	L1,L4,L6,L8		
37.1	1	L2	3.3uH	FIXED IND 3.3UH 9A 9 MOHM SMD
37.2	1	L5	2.2uH	FIXED IND 2.2UH 9A 11.4 MOHM SMD
37.3	2	L3,L7	1.1uH	FIXED IND 1.1UH 15A 3.15 MOHM
38	1	R1	1 Ohm	RES SMD 1 OHM JUMPER 1/8W 0603
39	3	R2,R18,R22	49.9 Ohm	RES SMD 49.9 OHM 1% 1/16W 0402
40	4	R3,R7,R11,R13	953 Ohm	RES SMD 953 OHM 1% 1/8W 0603
41	2	R4,R21	49.9 Ohm	RES SMD 49.9 OHM 1% 1/10W 0603
42	1	R5	12.1k Ohm	RES SMD 12.1K OHM 1% 1/10W 0603
43	17	R6,R20,R28,R29,R38,R45,R46,R47,R48,R49,R54,R91,R92,R93,R94,R95,R100	0 Ohm	RES SMD 0 OHM JUMPER 1/10W 0603
44	1	R8	1K Ohm	RES SMD 1K OHM 1% 1/10W 0603
45	19	R9,R25,R26,R27,R40,R41,R42,R51,R52,R55,R85,R86,R87,R88,R89,R96,R97,R98,R99	DNI	-
46	1	R10	49.9 Ohm	RES SMD 49.9 OHM 1% 1/16W 0402
47	3	R12,R23,R24	0 Ohm 20A	RES SMD 0 OHM JUMPER 1/2W 0603 200uohm
48	1	R14	6.34k Ohm	RES SMD 6.34K OHM 1% 1/10W 0603
49	1	R15	1.43k Ohm	RES SMD 1.43K OHM 1% 1/10W 0603
50	1	R16	750k Ohm	RES SMD 750K OHM 1% 1/10W 0603
51	1	R17	249k Ohm	RES SMD 249K OHM 1% 1/10W 0603
52	8	R19,R79,R80,R81,R82,R83,R84,R90	DNI	RES SMD 0 OHM JUMPER 1/2W 0603 200uohm
53	3	R30,R32,R33	34.0 Ohm	RES SMD 34 OHM 1% 1/10W 0603
54	12	R31,R43,R44,R56,R62,R63,R67,R69,R73,R76,R101,R102	47k Ohm	RES SMD 47K OHM 1% 1/10W 0603

Bill of Materials

Item	Qty	Reference	Value	Description
54	12	R31,R43,R44,R56,R62,R63,R67,R69,R73,R76,R101,R102	47k Ohm	RES SMD 47K OHM 1% 1/10W 0603
55	16	R50,R57,R58,R59,R60,R61,R64,R66,R68,R70,R71,R72,R74,R75,R77,R78	10k Ohm	RES SMD 10K OHM 1% 1/10W 0603
56	1	R53	330k	RES SMD 330K OHM 1% 1/10W 0603
57	1	R65	2.21k Ohm	RES SMD 2.21K OHM 1% 1/10W 0603
58	1	SW1	SW PUSHBUTTON	SWITCH TACTILE SPST-NO 0.05A 12V
59	7	TP1,TP4,TP7,TP8,TP9,TP10,TP14	TP_RED	TEST POINT PC MINI .040"D RED
60	12	TP2,TP3,TP5,TP6,TP11,TP12,TP13,TP15,TP16,TP17,TP18,TP19	TP_BLACK	TEST POINT PC MINI .040"D BLACK
61	1	U1	AMP8DQF65	-
62	1	U2	AT25DF512C	IC FLASH 512KBIT 85MHZ 8SOIC
63	1	U3	ADP7104ARDZ-5.0-R7	Voltage Regulators 20V 500mA CMOS LDO

Additional Resources

- AmP Platform Datasheet
- AmPLink USB Adapter Datasheet
- AmPLink Configuration and Control
- Video - WebAmP Development Software
- Video - Using AmPLink
- Power Components Datasheets

Revision History

Date	Revision
12/30/2020	Added Example Design Project files AmP8DB2_B_syncBuck2x_LDO1x.json, AmP8DB2_B_LDO1_1x.json, AmP8DB2_B_LDO2_1x.json, AmP8DB2_LED_Blink_2Hz.json, AmP8DB2_LED_Count_2Hz,json, AmP8DB2_LED_Shift_2Hz.json
6/26/2020	Updated schematic
2/20/2020	Initial

AnDAPT

On-Demand Power Management

https://www.andapt.com

Trademarks