

PSOC CONTROL C3 STANDALONE DUAL BUCK BOARD

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Drawing Numbers

PCBA	121-60686-01
PCB	600-60686-01
FAB DRW	610-60686-01
ASSY DRW	620-60686-01
SCH DRW	630-60686-01

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INPUT POWER SUPPLY

The schematic diagram illustrates the input power supply circuitry for a Dual Buck Board. It features several key components and sections:

- Main Power Input Section:**
 - Input voltage: $V_{IN} = 24V$.
 - Connectors: J1 (PWR_IN), J2 (OSTYC022150).
 - Diodes: D1 (B560CQ-13-F), D2 (P6SMB58CA), D16 (ESD3V3D5-TP).
 - Capacitors: C1 (10uF 100V), C2 (0.1uF 100V), C3 (1500pF 50V), C4 (0.1uF 100V), C5 (0.1uF 100V), C6 (1500pF 50V), C61 (0.1uF 100V), C62 (1500pF 50V).
 - Resistors: R1 (22K), R2 (1.5K), R3 (0 OHM), R4 (270 OHM), R5 (1.5K), R6 (270 OHM), R8 (10K), R9 (120 OHM), R10 (120 OHM).
 - Test Points: TP1 RED, TP2 GREEN.
 - Sense Voltage: $V_{IN_SENSE} = 1.53V$.
 - Output: A7_VIN [9].
- LED Indicators:**
 - FAULT_LED [9] (RED) driven by D3 through R4 from +3V3_IN.
 - ACT_LED [9] (GREEN) driven by D5 through R6 from +3V3_IN.
 - POWER_LED (GREEN) driven by D4 through R5 from +10V.
- User Button:**
 - [9] USER_BUTTON connected to SW1 (EVQ-PE105K) through R8 (10K) to +3V3_IN and C5 (0.1uF 100V) to ground.
- Temperature Sensor Interfaces:**
 - B5_TEMP_SENSE1 [9]: MCP9700T-E/TT (U1) powered by +3V3_IN (C4) and GND. Output VOUT passes through R9 (120 OHM) to B5_TEMP_SENSE1 [9]. Formula: $V_{out} = (TC \cdot TA) + V_0$, $V_{out} = (10mV \cdot 70C) + 500mV = 1.2V$.
 - P80_TEMP_SENSE2 [9]: MCP9700T-E/TT (U10) powered by +3V3_IN (C61) and GND. Output VOUT passes through R10 (120 OHM) to P80_TEMP_SENSE2 [9]. Formula: $V_{out} = (TC \cdot TA) + V_0$, $V_{out} = (10mV \cdot 70C) + 500mV = 1.2V$.

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Page Title: Input power supply

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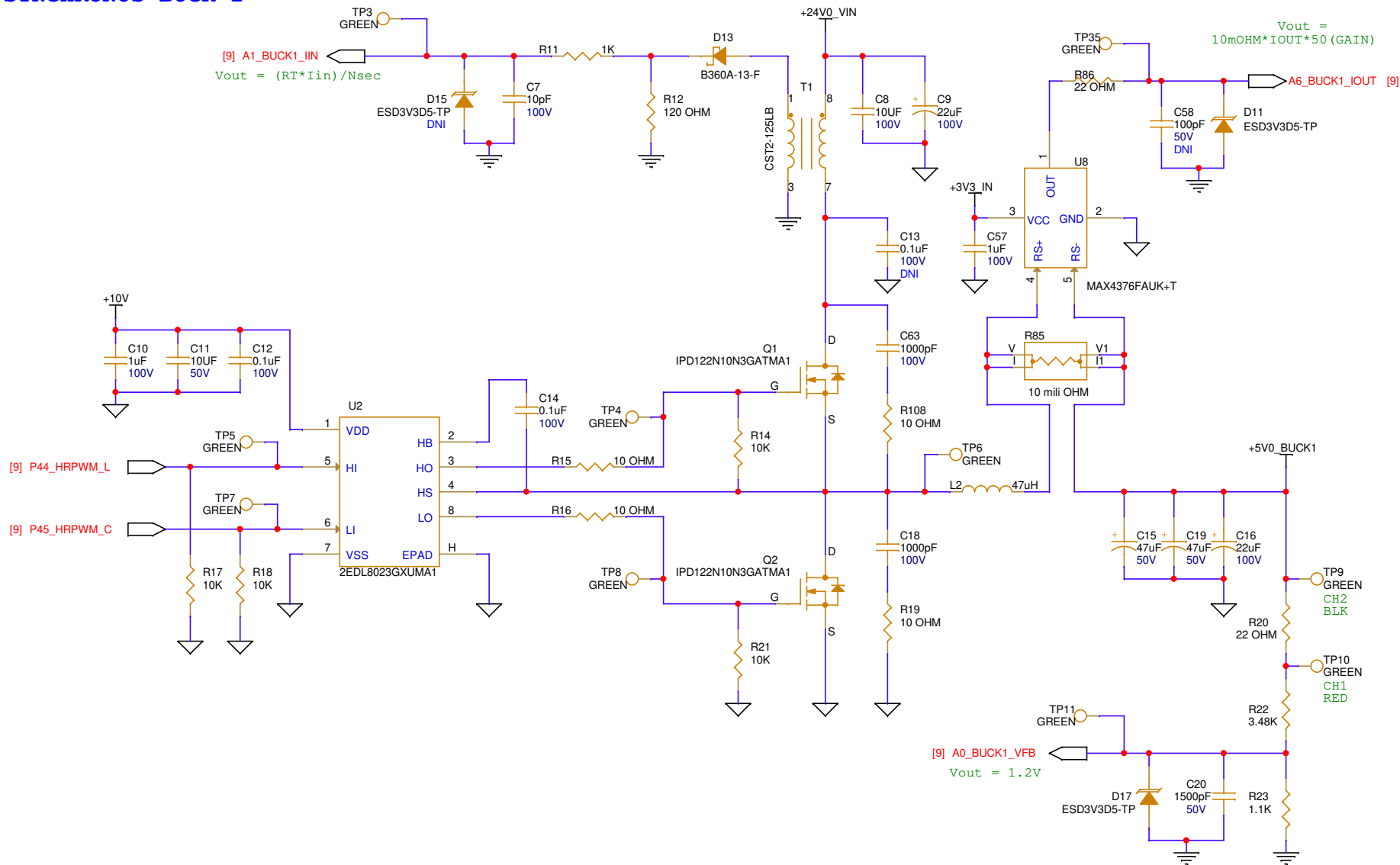
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SYNCHRONUS BUCK 1



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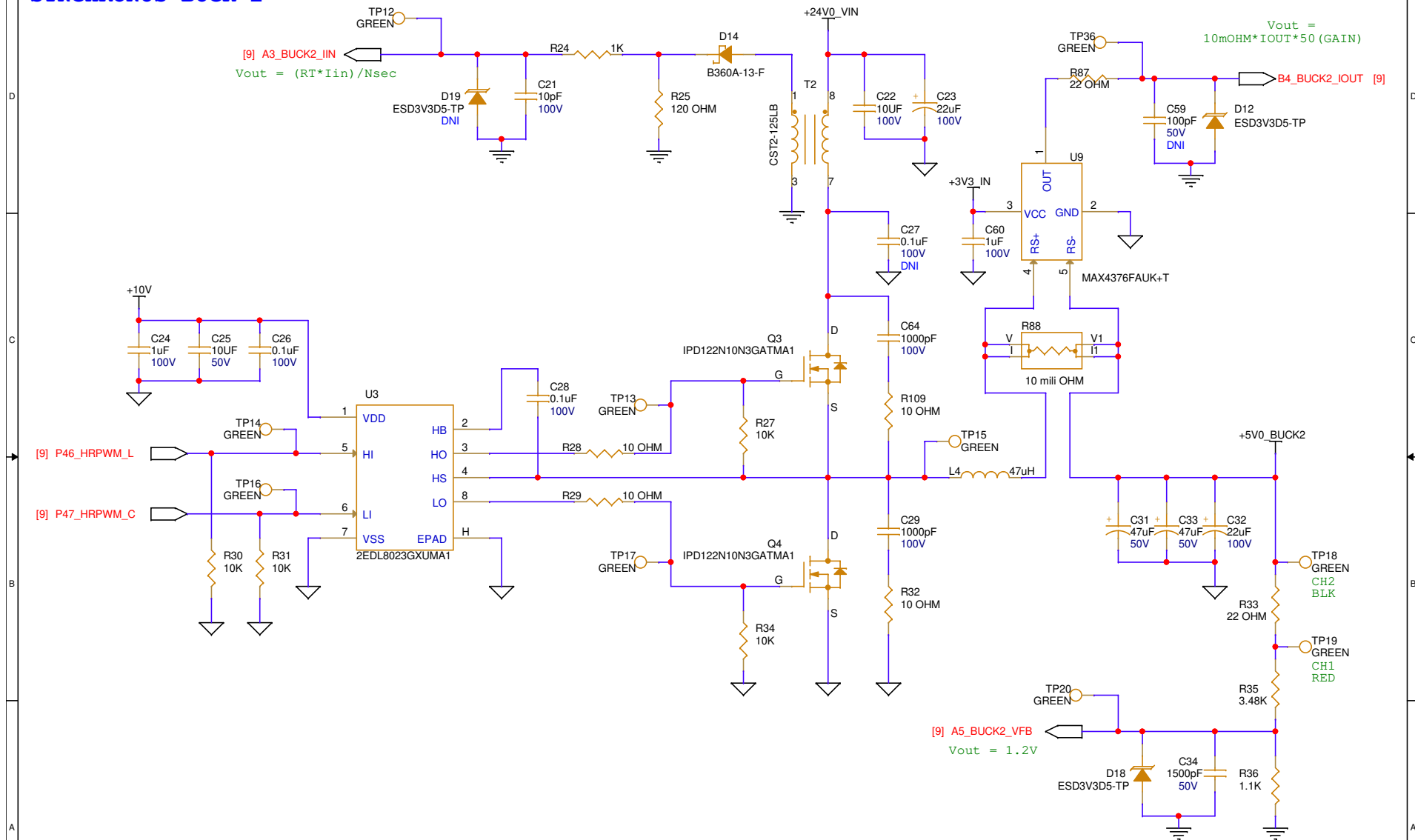


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SYNCHRONUS BUCK 2



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Page Title: Synchronous buck 2

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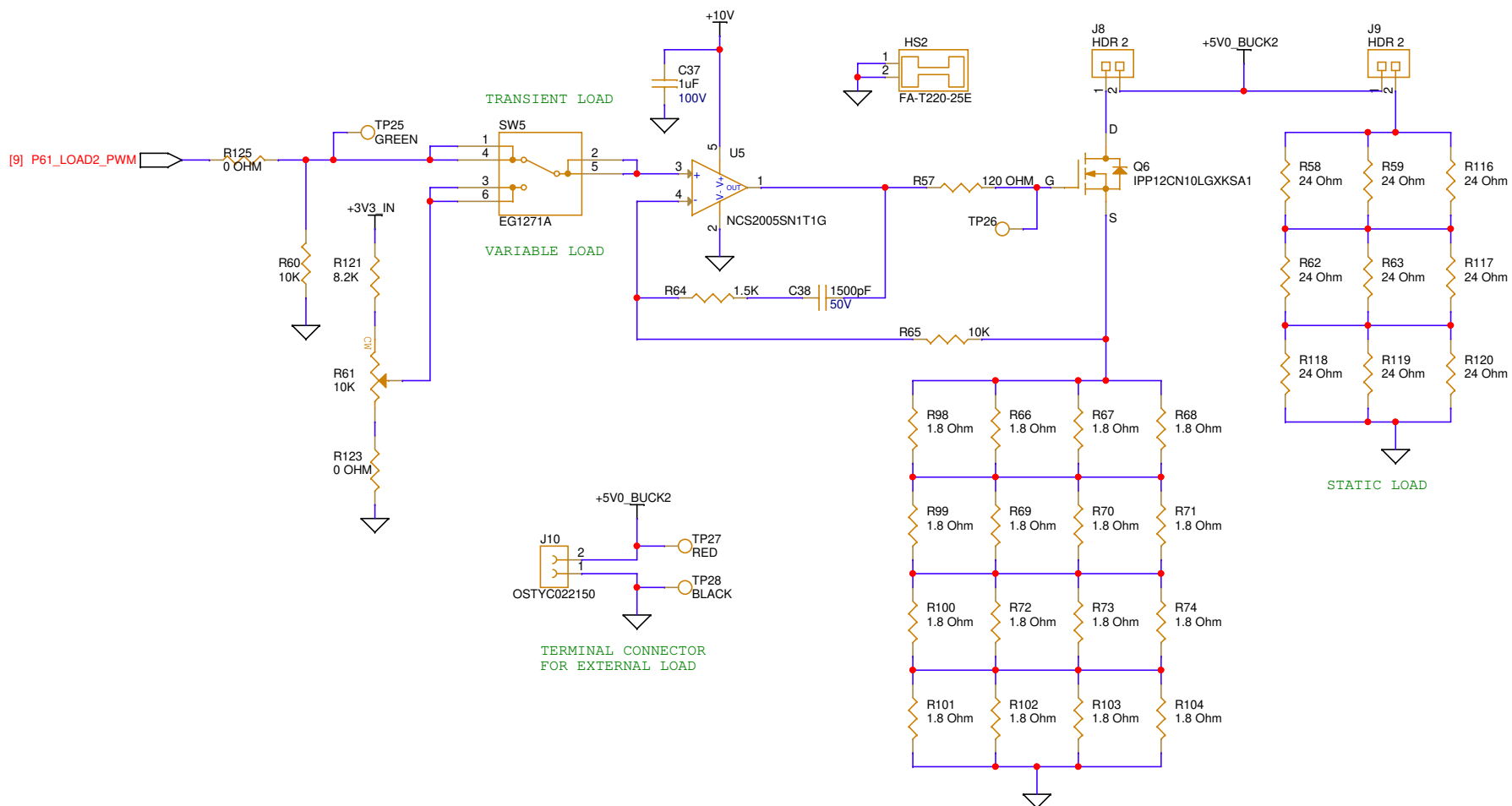
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LOAD 2



NOTE: FOR HIGHER BUCK OUTPUT VOLTAGE USER MUST DISCONNECT ON BOARD LOAD FROM CONNECTORS J8, J9 AND USE EXTERNAL LOAD ON CONNECTOR J10

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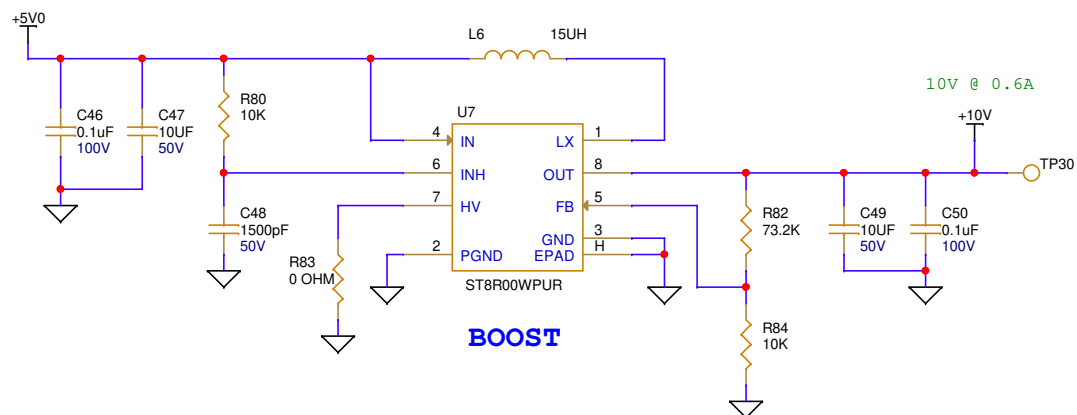
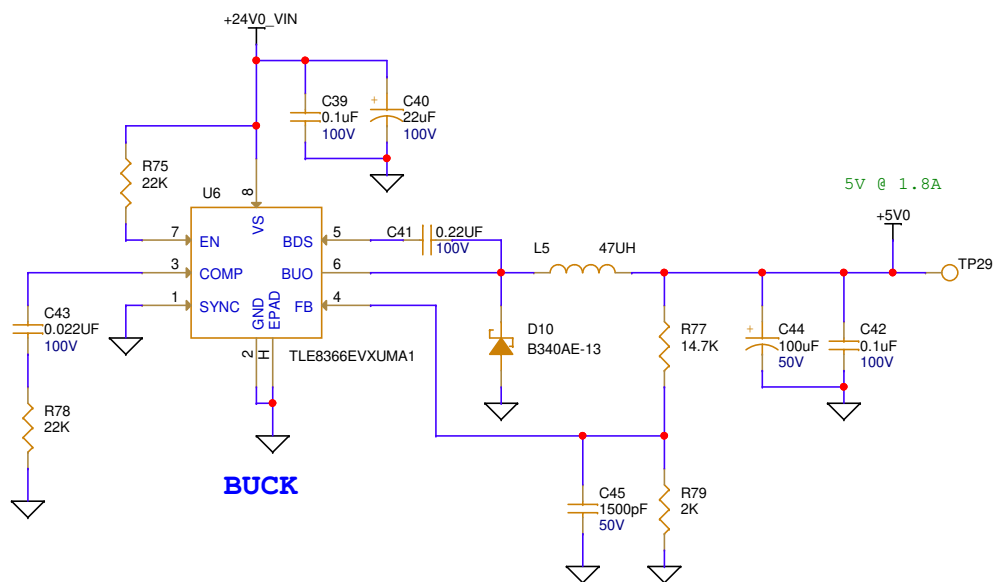


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REGULATORS



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CONNECTORS

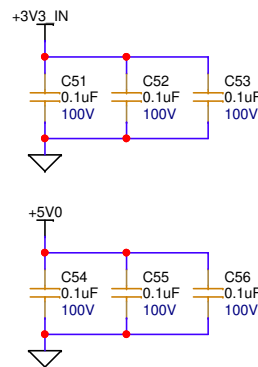
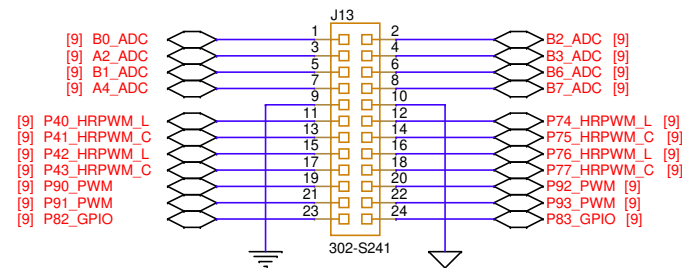
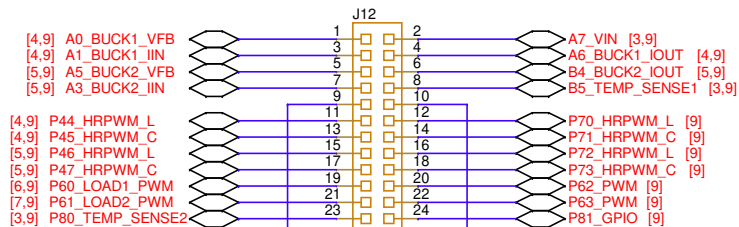
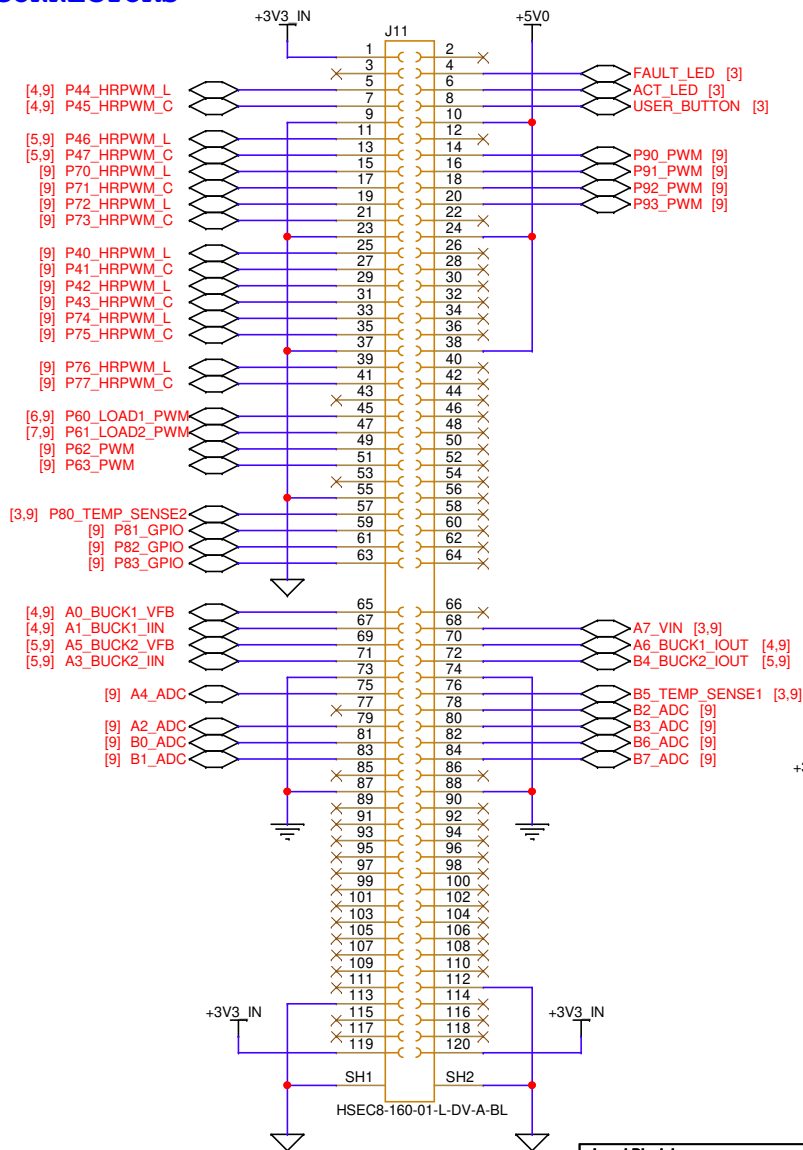
120PIN CONNECTOR

DAISY CHAIN CONNECTORS

SLAVE IN

MASTER OUT

MULTIPHASE HEADER



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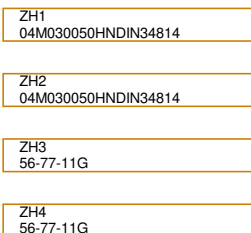
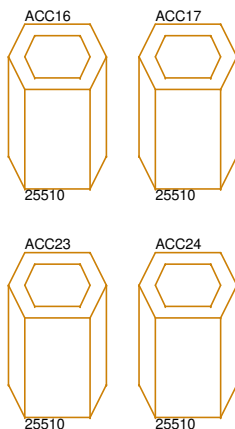
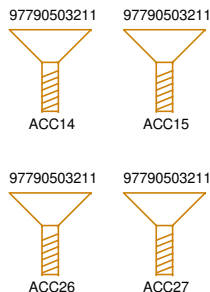
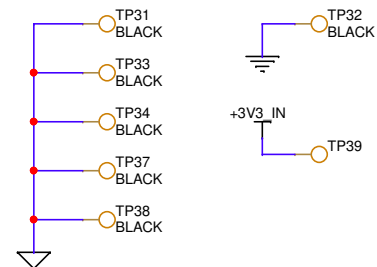
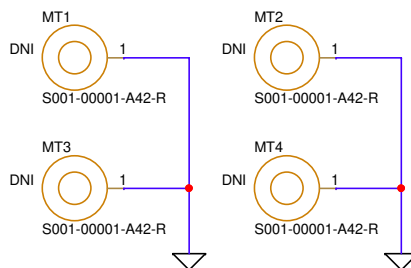
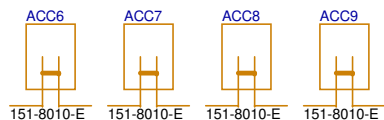


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ACCESSORIES



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REVISION HISTORY

REV	DESCRIPTION OF CHANGE	DATE
0.1	Initial Draft	31-07-2023
0.2	Review comments updated	29-08-2023
0.3	Deleted D6, D8	13-09-2023
0.4	Replaced 100pF capacitor and SW6 with new parts	06-10-2023
0.5	Updated input supply connector connections, output current sensing circuit added	17-10-2023
1.1	Swapped ADC pins on Slave in and Master out connectors for IIN	01-12-2023
1.2	BOOST switching regulator output voltage changed from 12V to 10V	13-12-2023
1.3	Deleted switches on feedback path	16-12-2023
1.4	Added a Diode on current transformer secondary side	03-01-2024
1.5	Added second temperature sensor, changed input voltage to 24V, output voltages to 5V	30-01-2024
2.1	Removed second LC filter at Buck regulator output, Added additional load resistor for better thermal relief FAULT_LED changed to P3.0, ACT_LED changed to P3.1	30-05-2024
2.2	Variable load max current changed to 1A, 24 OHM resistor network increased to 3x3, Output current sensing location changed to before output capacitors	30-09-2024
2.3	R86, R87 changed to 22 OHM, C58, C59 DNI Output current snese amplifer changed to 50 gain and sense resistor value changed to 20mili ohm	04-10-2024

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