NCP81295 Evaluation Board User's Manual

EVBUM2956/D

This user manual is intended to assist those using the NCP81295 Evaluation Board. It will provide useful tips and procedures for powering up and using the Evaluation Board (EVB). It is intended as a quick-start guide rather than a comprehensive manual.

Description

The NCP81295 is a 12 V, 50 A Smart Fuse intended for high current applications. It offers a highly accurate current sensor and a low 0.65 mΩ integrated MOSFET to reduce solution size and minimize power loss. The printed circuit board assembly (PCBA) contains all the circuitry and connections necessary to evaluate the performance of the NCP81295 under various load and system conditions.

Features

Power Features

- Co-packaged Power Switch, Hotswap Controller and Current Sense
- Up to 60 A Peak Current Output, 50 A Continuous
- Vin Range: 4.5 V to 18 V
- 0.65 mΩ, no RSENSE Required

Control Features

- Enable Input
- Optional Enable-controlled Output Pulldown when Disabled
- Programmable Soft-Start
- Programmable, Multi-level Current Limit

Reporting Features

- Accurate Analog Load Current Monitor
- Programmable Over Current Alert Output
- Analog Temperature Output
- Status Fault OK Output

Other Features

- 5 mm x 5 mm QFN32 Package
- Operating Temperature: −40 °C to 125 °C
- Can be Paralleled for Higher Current Applications
- Built-in Insertion Delay for Hotswap Applications
- NCP81295: Latch off for Following Protection Features
  NCP81296: Auto-Retry Mode for Following Protection Features
  - Current-limit after Delay
  - Fast Short-circuit Protection
  - Over-Temperature Shutdown
  - Excessive Soft-start Duration
- Internal Switch Fault Diagnostics
- Low-power Auxiliary Output Voltage

Quick Start Connection Guide

1. Connect a Power supply and Eload to Vin and Vout, respectively.
2. Connect a multimeter to GOK Pin under the "TopIC" section of the EVB.
3. Set power supply to 12 V.
4. Enable the device through the Enable Switch (SW1) by moving the switch to the 'ON' position.
5. Monitor Eload and Multimeter, 12 V and 5 V should be seen, respectively. The GOK LED will also be lit up now.
6. Set Eload to 5 A.
7. Monitor Eload and confirm that 12 V and 5 A are on the output of EVB.
8. Turn Eload off, then switch Enable Switch (SW1) to 'OFF' position, and set Power Supply off.*

* Must be done in this sequence to properly disable the EVB.

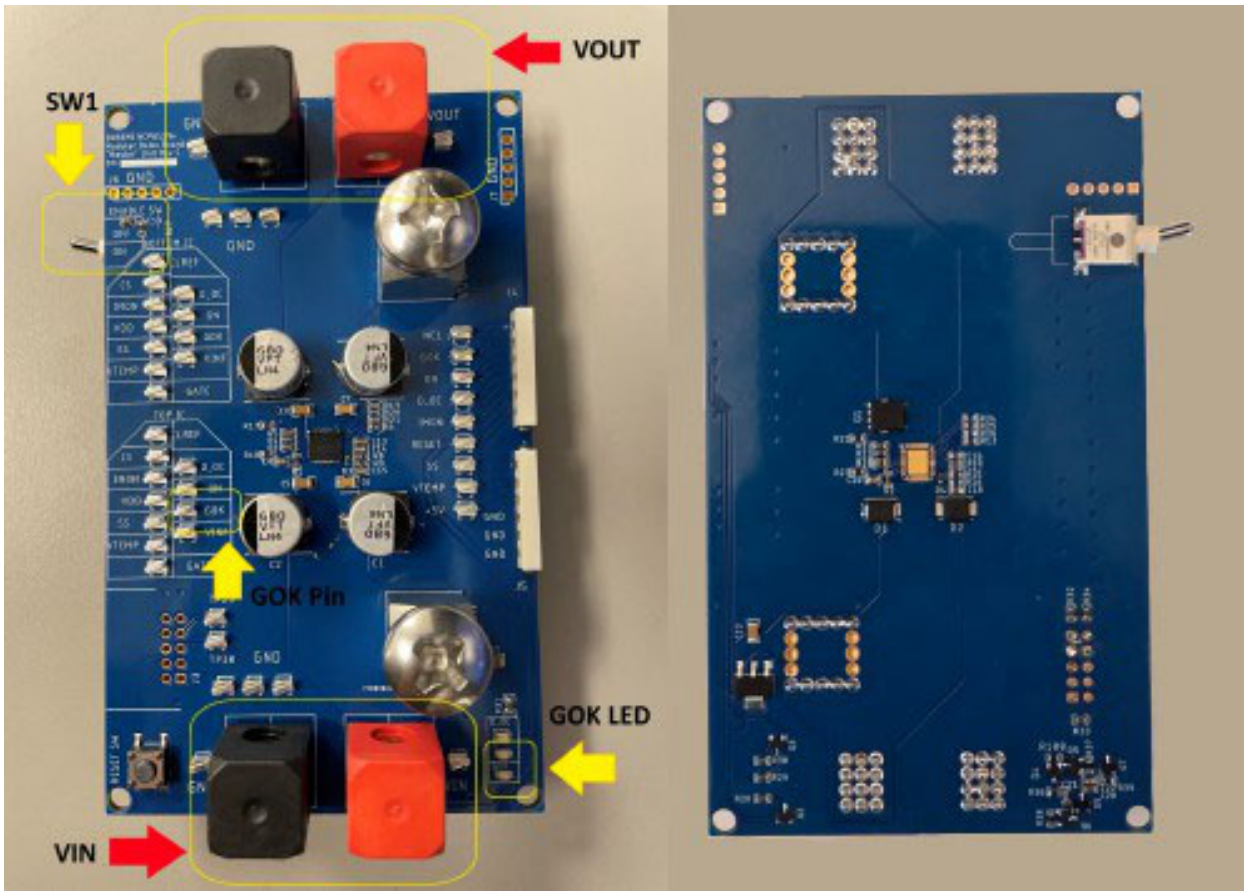

Figure 1. Top and Bottom of the NCP81295 Evaluation Board

SCHEMATIC FOR THE NCP81295GEVB EVALUATION BOARD

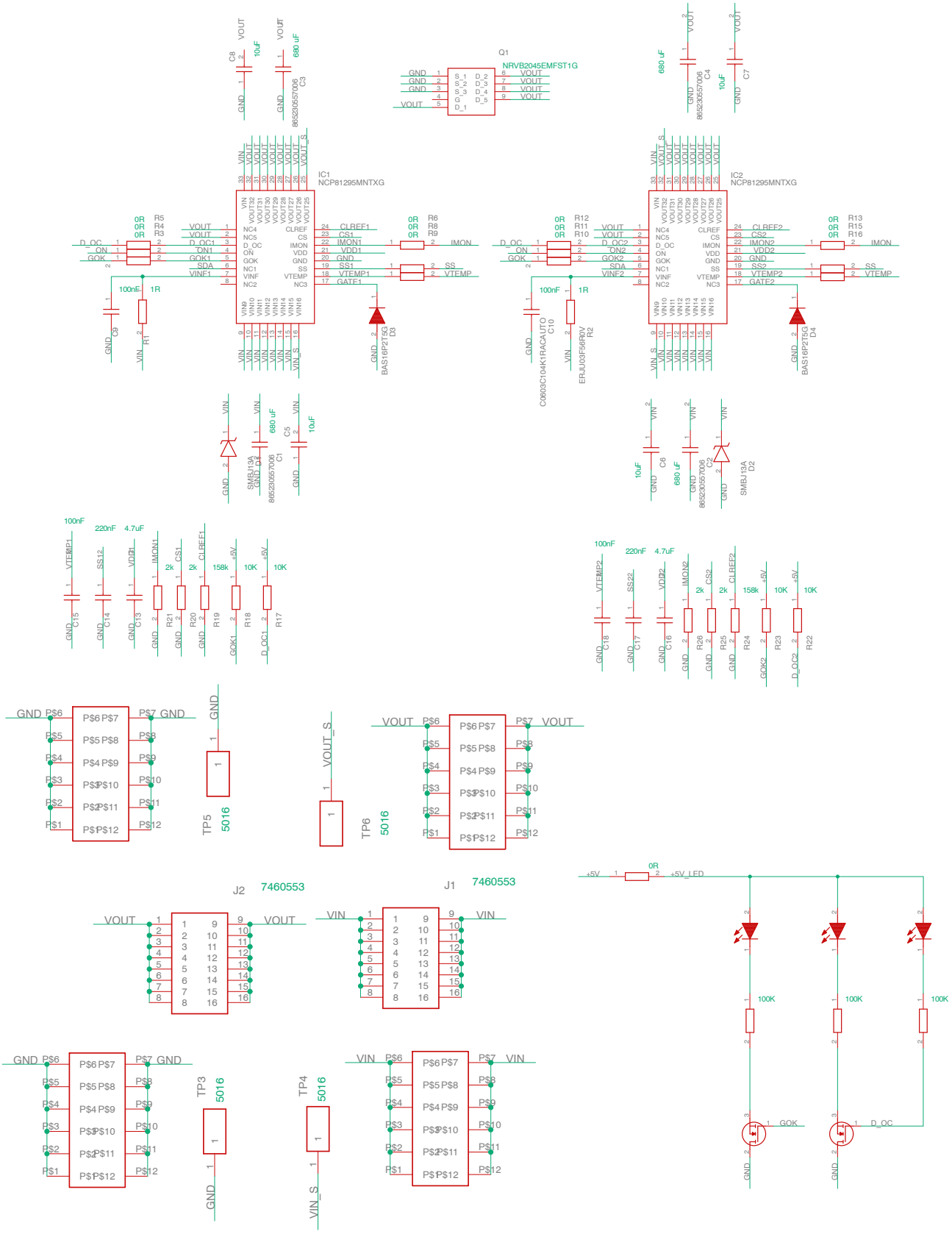

Figure 2. NCP81295GEVB Evaluation Board Schematic, Part 1

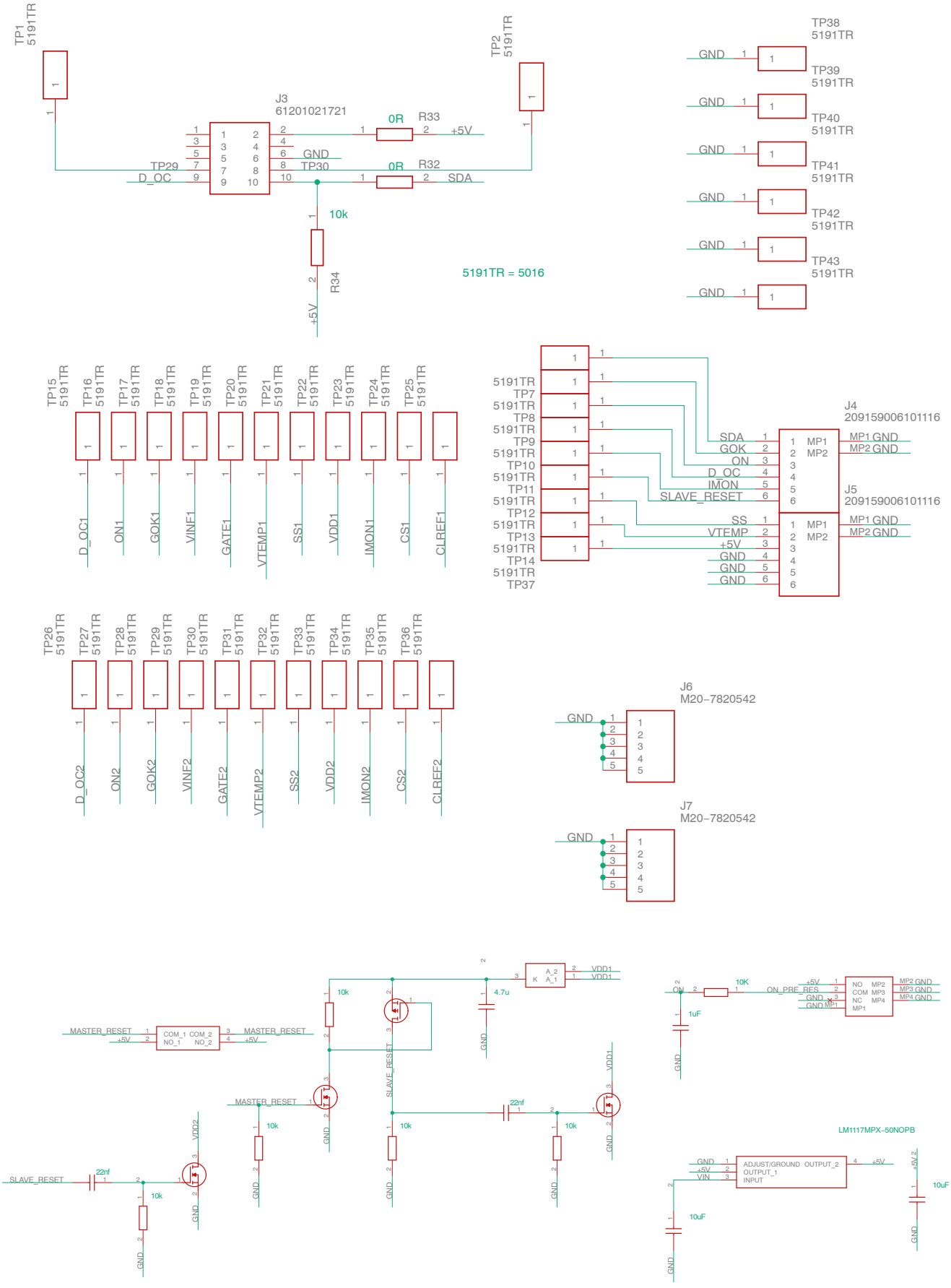

Figure 3. NCP81295GEVB Evaluation Board Schematic, Part 2

BILL OF MATERIALS

NCP81295GEVB MASTER BOM

Designator	Quantity	Value	Footprint	Manufacture #	Part Number	Substitution Allowed?
IC1, IC2	2	N/A	QFN-32	**onsemi**	NCP81295MNTXG	NO
D3, D4	2	N/A	SOD-923	**onsemi**	BAS16P2T5G	NO
Q1	1	N/A	SO-8 FL	**onsemi**	NRVB2045EMFST1G	NO
D1, D2	2	N/A	DO-214AA	Littlefuse	SMBJ13A	NO
Q5, Q6, Q7	3	N/A	TO-236-3	**onsemi**	NTR3C21NZT1G	NO
Q4	1	N/A	TO-236-3	**onsemi**	NTR1P02LT1G	NO
D5	1	N/A	SOT-23	Vishay	BAT54C-G3-08	NO
Q2, Q3	2	N/A	SOT-23	**onsemi**	2N7002LT1	NO
IC3	1	N/A	SOT223	**onsemi**	LM1117MPX-50NOPB	NO
S1	1	N/A	–	C&K Components	ET01MD1SAPE	NO
S2	1	N/A	–	Wurth Electronik	430182043816	NO
C1, C2, C3, C4	4	680 μF, 35 V	0.406" L x 0.406" W (10.30 mm x 10.30 mm)	Panasonic	EEE-FT1V681UP	YES
C5, C6, C7, C8, C11, C12	6	10 μF, 35 V	805	–	–	YES
R3, R4, R5, R6, R8, R9, R10, R11, R12, R13, R15, R16, R31, R32, R33	15	0 Ω	603	–	–	YES
R1, R2	2	1 Ω	603	–	–	YES
R20, R21, R25, R26	4	2 kΩ, 0.05%	603	–	–	YES
R17, R18, R22, R23, R27, R34, R36, R37, R38, R100	10	10 kΩ	603	–	–	YES
R28, R29, R30	3	100 kΩ	603	–	–	YES
R19, R24	2	158 kΩ	603	–	–	YES
C21, C22	2	22 nF	603	–	–	YES
C9, C10, C15, C18	4	100 nF	603	–	–	YES
C14, C17	2	220 nF	603	–	–	YES
C19	1	1 μF	603	–	–	YES
C13, C16, C20	3	4.7 μF	603	–	–	YES
LED1, LED2	2	N/A	805	Wurth Elektronik	150080GS75000	YES
LED3	1	N/A	805	Wurth Elektronik	150080RS75000	YES
VIN Connector	1	N/A	–	Wurth Elektronik	7464000	NO
VOUT Connector	1	N/A	–	Wurth Elektronik	7464000	NO
GND connector	2	N/A	–	Wurth Elektronik	7464100	NO
J1, J2	2	N/A	–	Wurth Elektronik	7461059	NO
TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP12, TP13, TP14, TP15, TP16, TP17, TP18, TP19, TP20, TP21, TP22, TP23, TP24, TP25, TP26, TP27, TP28, TP29, TP30, TP31, TP32, TP33, TP34, TP35, TP36, TP37	37	N/A	–	Keystone Electronics	5197TR	NO
J4, J5	2	N/A	–	Kyocera AVX	209159006101116	NO
J6, J7	2	N/A	–	Harwin	M20-7820542	YES
J3	1	N/A	–	Wurth Elektronik	61201021721	NO

REVISION HISTORY

Revision	Description of Changes	Date
P0	Initial document release.	5/20/2026

ADDITIONAL INFORMATION

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