

NIS5420 Evaluation Board User's Manual

EVBUM2760/D

Instructions

- Remove all jumpers from the headers if there are any in place
- Connect an ohmmeter across the Rlim measurement test points and set it to 20 Ω with a small screwdriver
- Connect a DC supply from Vin to GND and apply 12 V
- Check that Vout = 12 V, Ven ~ 4.5 V and the green LEDs are on
- Connect oscilloscope voltage probes to Vin (Ch1), Vout (Ch2), and EN (Ch4). For Ch3 connect a current probe from the power supply to Vin

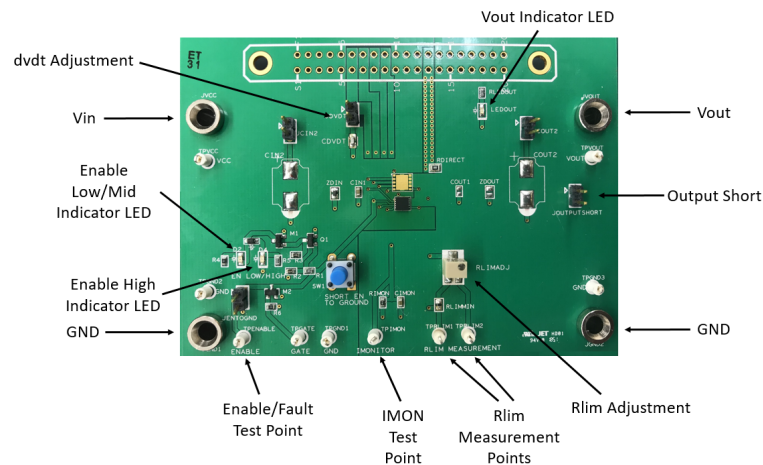


Figure 2. Features of the Evaluation Board



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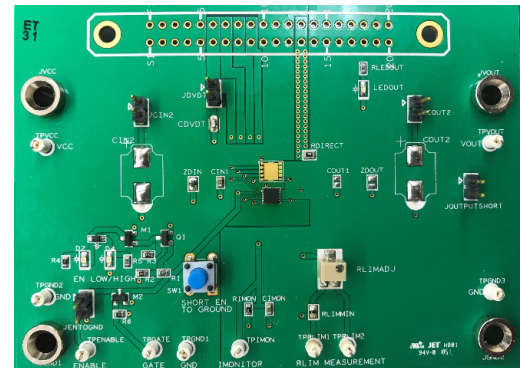


Figure 1. The Evaluation Board

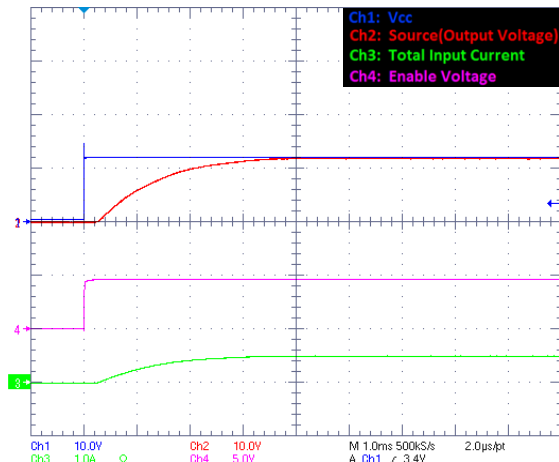


Figure 3. Hot Plug with dvdt Open into 24 Ω Load (1 ms/Division Timescale)

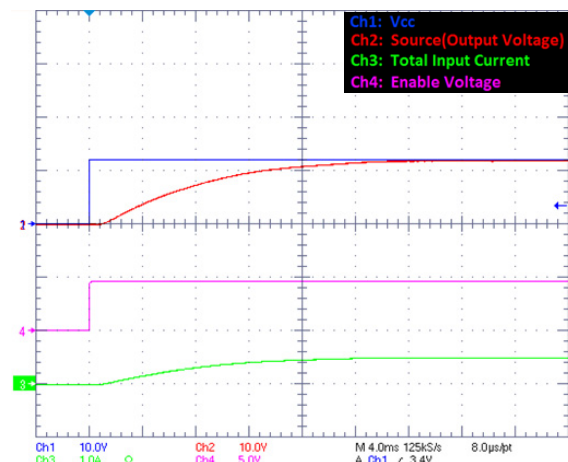


Figure 4. Hot Plug with 180 pF dvdt Capacitor Selected into 24 Ω Load (4 ms/Division Timescale)

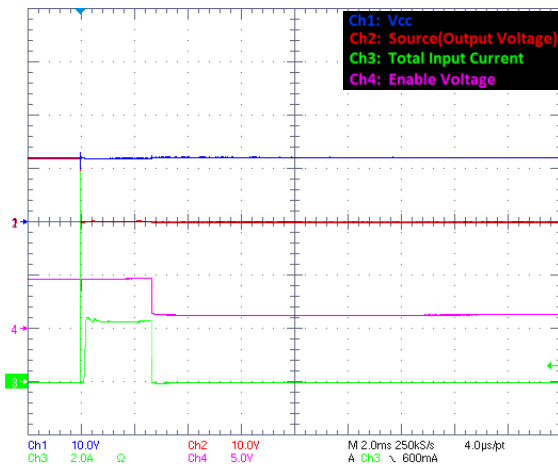


Figure 5. Sudden Short Circuit from Output to GND Showing ILIM_SC and Thermal Shutdown (NIS5420MT1, Latching)

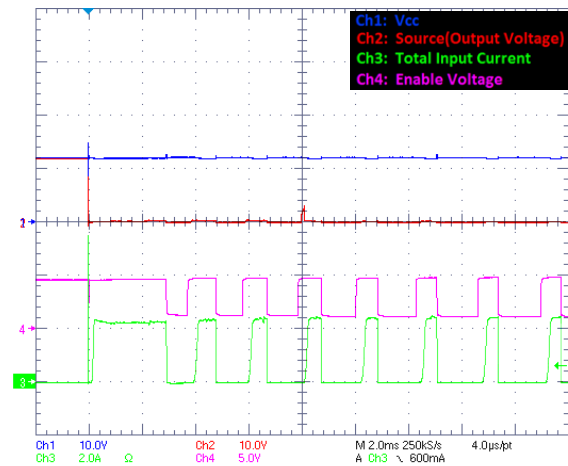


Figure 6. Sudden Short Circuit from Output to GND Showing ILIM_SC and Thermal Shutdown (NIS5420MT6, Auto-Retry)

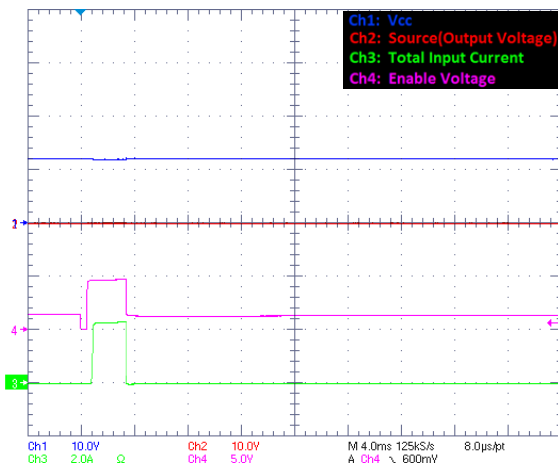


Figure 7. Toggling the EN/Fault Pin with a Pulse Generator to Reset from Thermal Shutdown with Vout Still Shorted to GND

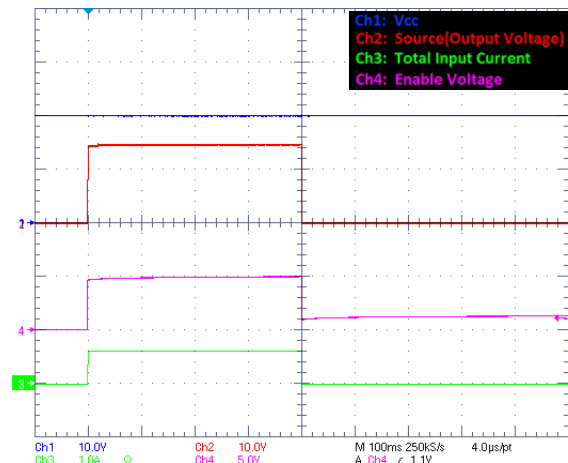


Figure 8. Turning on by Releasing EN from GND into a Situation with Excessive Input Voltage. The Vclamp Feature Limits the Output Voltage. There is a 24 Ω Load. The Load Current and the Voltage Drop across the eFuse from Input to Output Cause the eFuse to Enter Thermal Shutdown

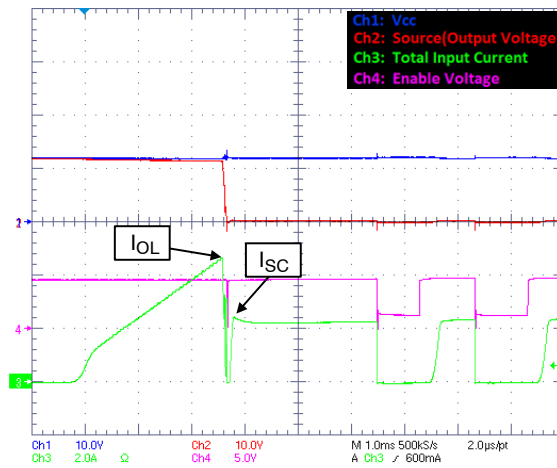


Figure 9. Drawing Current with an Electronic Load, Showing the Overload (I_{OL}) and Short Circuit (I_{SC}) Current Limits

EVALUATION BOARD SCHEMATIC

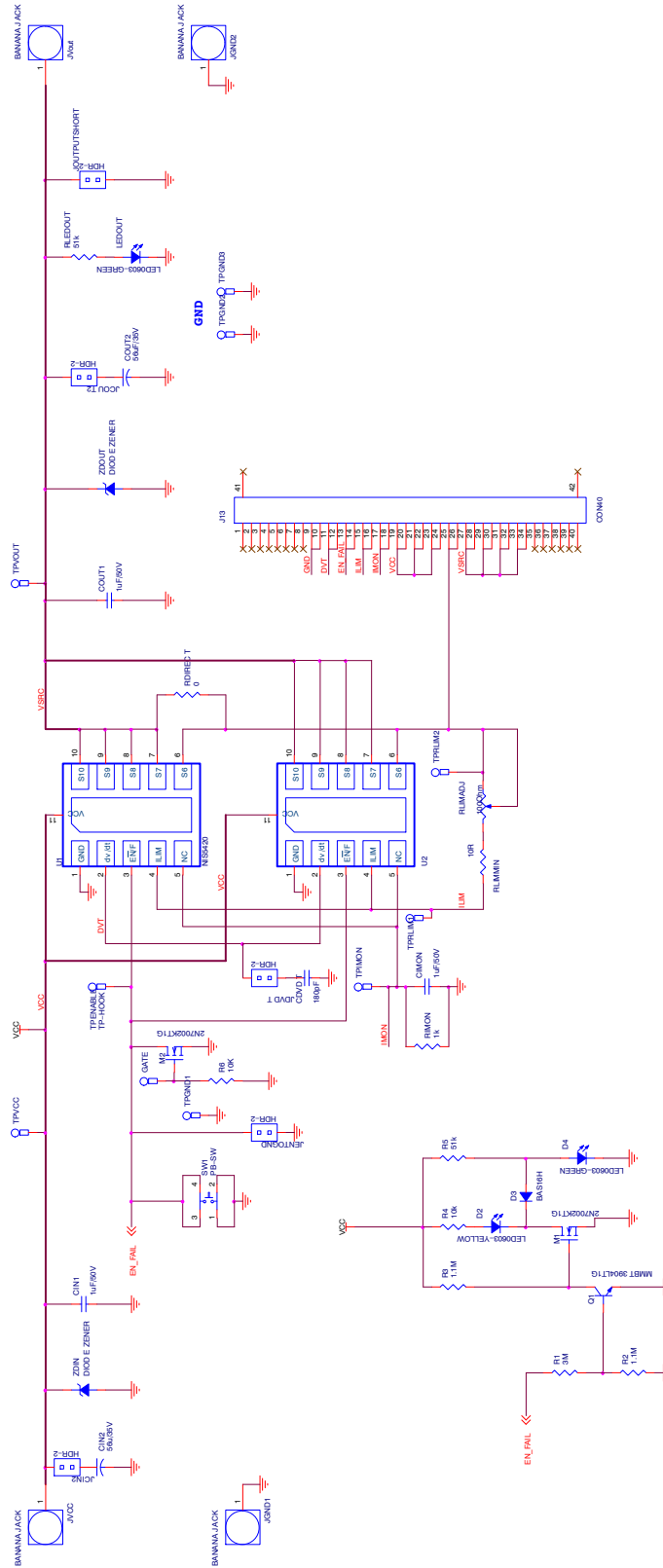


Figure 10. The NIS5420 Evaluation Board Schematic

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BILL OF MATERIALS

Table 1. BILL OF MATERIALS

Item	Qty	Reference	Part	Digikey Part Number	Manufacturer	Manufacturer Part Number	DNP
1	1	CDVDT	180 pF	311-3890-1-ND	Yageo	CC0603FRNPO9BN181	
2	3	CIMON, COUT1, CIN	1 μ F/50 V	587-2400-1-ND	Taiyo Yuden	UMK107BJ105KA-T	
3	0	COUT2, CIN2	56 μ F/35 V	493-4385-1-ND	Nichicon	PCV1V560MCL1GS	DNP
4	1	D2	LED0603-YELLOW	160-1448-1-ND	Lite-On Inc	LTST-C191KSKT	
5	1	D3	BAS16H	BAS16HT1GOSCT-ND	ON Semiconductor	BAS16HT1G	
6	2	D4, LEDOUT	LED0603-GREEN	160-1888-1-ND	Lite-On Inc	LTST-C191TGKT	
7	0	J13	CON40	S3314-ND	Sullins Connector Solutions	EBC20DRTH	DNP
8	5	JCOUT2, JCIN2, JOUTPUTSHORT, JENTOGND, JDVDT	HDR-2	3M9447-ND	3M	961102-6404-AR	
9	4	JGND1, JGND2, JVout, JVCC	BANANA JACK	36-575-8-ND	Keystone Electronics	575-8	
10	2	M1, M2	2N7002KT1G	2N7002KT1GOSCT-ND	ON Semiconductor	2N7002KT1G	
11	1	Q1	MMBT3904LT1G	MMBT3904LT1GOSCT-ND	ON Semiconductor	MMBT3904LT1G	
12	1	R1	3 M Ω	P3.0MGCT-ND	Panasonic Electronic Components	ERJ-3GEYJ305V	
13	2	R2, R3	1.1 M Ω	P1.1MGCT-ND	Panasonic Electronic Components	ERJ-3GEYJ115V	
14	2	R4, R6	10 k Ω	P10KGCT-ND	Panasonic Electronic Components	ERJ-3GEYJ103V	
15	2	R5, RLEDOUT	51 k Ω	P51KGCT-ND	Panasonic Electronic Components	ERJ-3GEYJ513V	
16	1	RDIRECT	0 Ω	P0.0ACT-ND	Panasonic Electronic Components	ERJ-6GEY0R00V	
17	1	RIMON	1 k Ω	P1.0KDBTR-ND	Panasonic Electronic Components	ERA-3AEB102V	
18	1	RLIMADJ	100 Ω	3214X-1-101ECT-ND	Bourns Inc.	3214X-1-101E	
19	1	RLIMMIN	10 Ω	311-10.0HRCT-ND	Yageo	RC0603FR-0710RL	
20	1	SW1	PB-SW	EG4369-ND	E-Switch	TL1105FF160Q	
21	10	TPRLIM1, TPGND1, TPRLIM2, TPGND2, TPGND3, TPVOUT, TPVCC, TPIMON, TPENABLE, GATE	TP-HOOK	36-5002-ND	Keystone Electronics	5002	
22	1	U1	NIS5420MTx		ON Semiconductor		
23	0	U2					DNP
24	1	ZDIN	33 Vz	MM5Z33VT1GOSTR-ND	ON Semiconductor	MM5Z33VT1G	
25	0	ZDOUT	33 Vz	MM5Z33VT1GOSTR-ND	ON Semiconductor	MM5Z33VT1G	DNP

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