NCV896530EVB

NCV896530 Evaluation Board User's Manual

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EVAL BOARD USER'S MANUAL

Description

The NCV896530EVB evaluation board provides an opportunity to evaluate the NCV896530 in a convenient form factor with an adjustable output. The board contains four potentiometers, allowing the user to coarsely and finely adjust each output independently. The outputs are capability of providing up to 1 A each and 1.6 A total. The two enable pins allow each switcher to be used independently, while the SYNC pin allows you to synchronize the oscillator to an external clock up to 2.7 MHz and the POR pin reports the state of the outputs.

Key Features

- Dual 0.9 V – 3.3 V Adjustable Output
- 1 A Output Current Per Channel, 1.6 A Total
- Fixed Frequency Operation at 2.1 MHz
- 2.7 V –5.5 V Input Voltage Range
- External Clock Synchronization up to 2.7 MHz
- Output Monitoring
- Automotive Grade



Figure 1. NCV896530EVB Evaluation Board

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Table 1. EVALUATION BOARD TERMINAL DESCRIPTION

Terminal	Function
VIN	Positive dc input voltage.
GND	Common dc return.
VOUT1	Dc output voltage for SMPS1.
EN1	Dc enable voltage for SMPS1. A dc logic high enables the device.
VOUT2	Dc output voltage for SMPS2.
EN2	Dc enable voltage for SMPS2. A dc logic high enables the device.
SYNC	External clock synchronization.
POR	Power on reset pin. Pulls low if either output is out of regulation. By default this pin is pulled up to VIN

Table 2. EVALUATION BOARD POTENTIOMETER DESCRIPTIONS

Potentiometer name	Function
V1 ADJ F	Fine adjust for SMPS1 output.
V1 ADJ C	Coarse adjust for SMPS1 output.
V2 ADJ F	Fine adjust for SMPS2 output.
V2 ADJ C	Coarse adjust for SMPS2 output.

Table 3. ABSOLUTE MAXIMUM RATINGS (Voltages are with respect to GND unless otherwise noted)

Rating	Value	Unit
Dc Supply Voltage (VIN)	−0.3 to 6	V
Dc Supply Voltage (EN1,EN2,SYNC)	−0.3 to 6, VIN + 0.3	V
Ambient Temperature	−40 to 105	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Table 4. ELECTRICAL CHARACTERSITICS (TA = 25°C, 4.5 ≤ VIN ≤ 18 V, IOUT ≤ 2 A, unless otherwise specified)

Characteristic	Conditions	Typical Value	Unit
OUTPUT VOLTAGE			
Output Voltage	–	0.9 to 3.3	V
Soft−start Time	–	700	μs
SWITCHING REGULATOR			
Switching Frequency	–	2.2	MHz
SYNC Frequency	–	1.8 to 2.7	MHz
CURRENT LIMIT			
Current limit		1.7	A
GENERAL			
Input Undervoltage Lockout (UVLO)	V_{IN} falling	2.4	V
Efficiency	V_{IN} = 5 V, I_{OUT} = 1 A	70	%
Thermal Shutdown		170	°C

TYPICAL WAVEFORMS

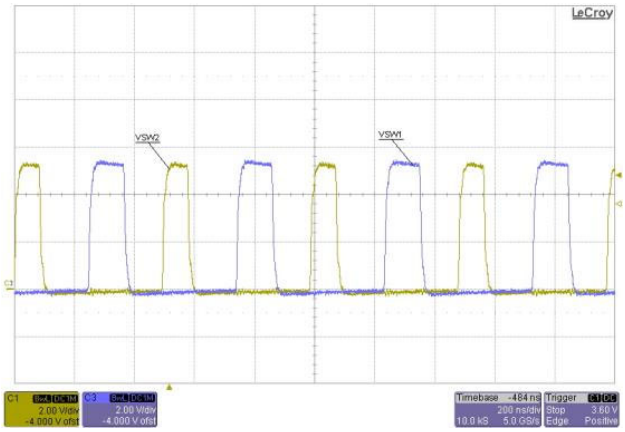


Figure 2. Normal Operation

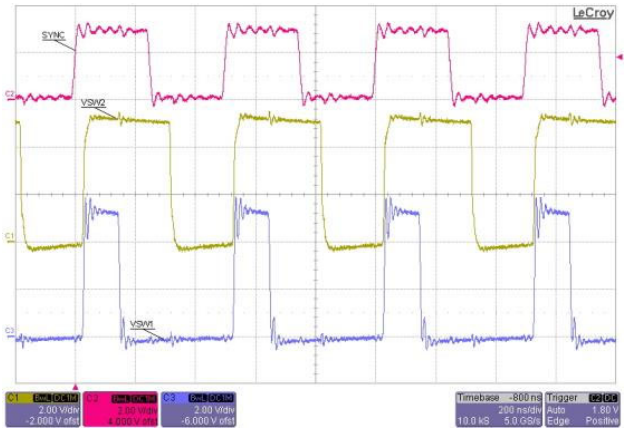


Figure 3. Synchronization

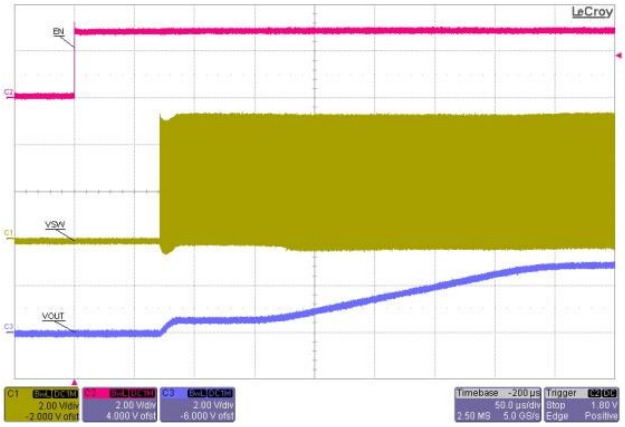


Figure 4. Start Up

SCHEMATIC

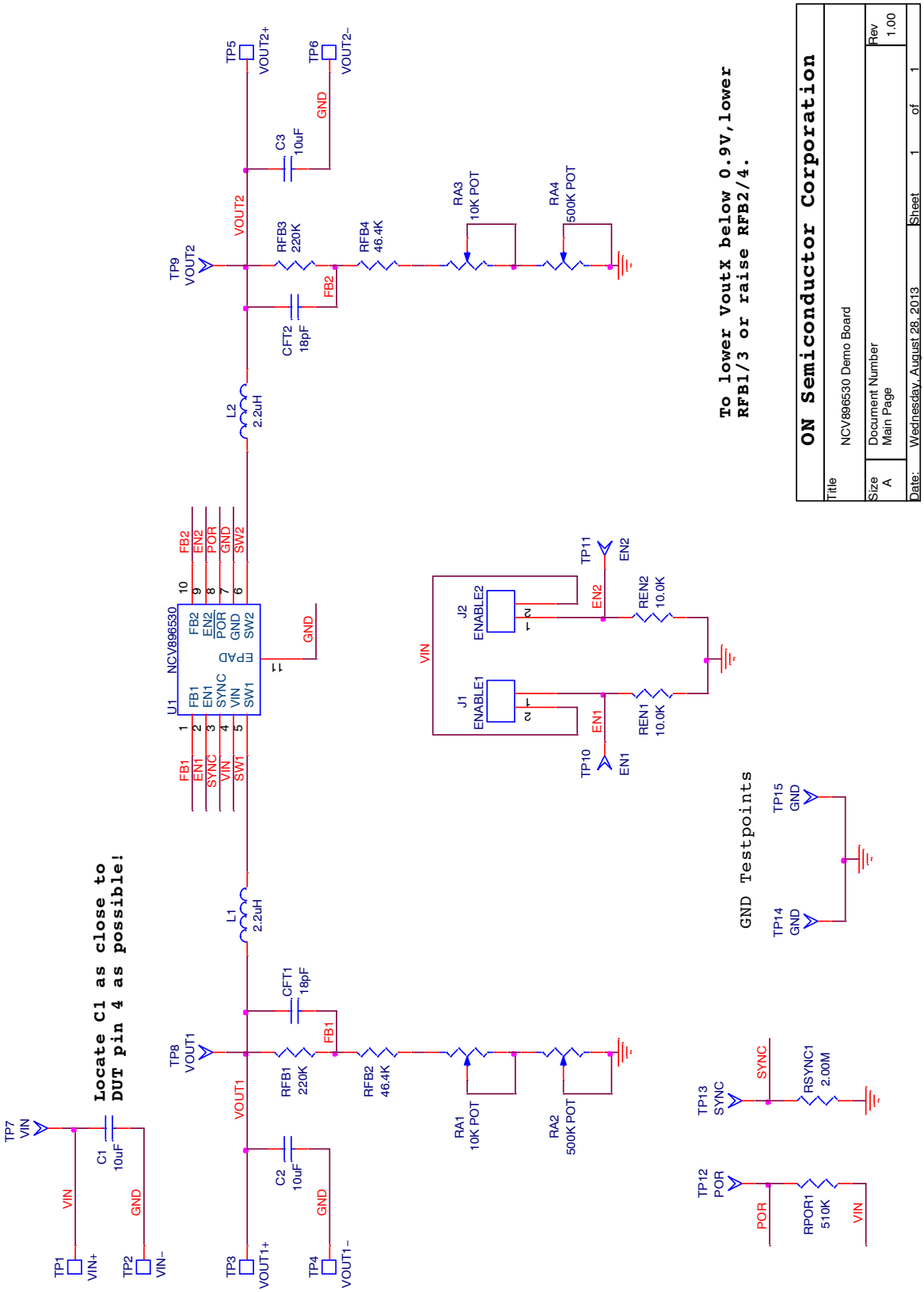


Figure 5. Evaluation Board Schematic

PCB LAYOUT

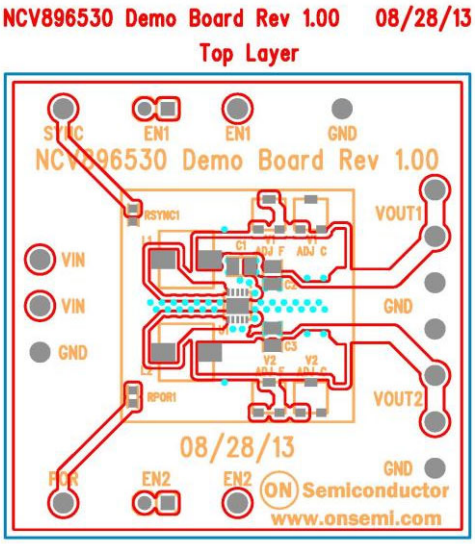


Figure 6. Top Layout

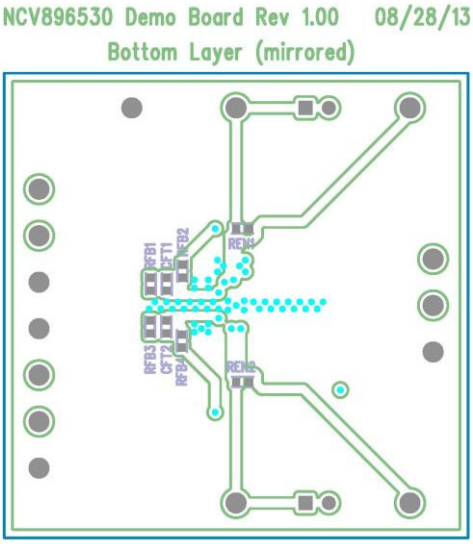


Figure 7. Bottom Layout

BILL OF MATERIALS

Table 5. BILL OF MATERIALS

Reference	Value	PCB Footprint	Manufacturer's Part Number	Digi−Key Part Number
CFT1	18 pF	603	GRM1885C1H180JA01D	490−1409−1−ND
CFT2	18 pF	603	GRM1885C1H180JA01D	490−1409−1−ND
C1	10 μF	805	GRM21BR71A106KE51L	490−3905−1−ND
C2	10 μF	805	GRM21BR71A106KE51L	490−3905−1−ND
C3	10 μF	805	GRM21BR71A106KE51L	490−3905−1−ND
J1	ENABLE1	JMP	22−28−4023	WM6502−ND
J2	ENABLE2	JMP	22−28−4023	WM6502−ND
L1	2.2 μH	WE−PD−S	7447785002	Wurth Samples
L2	2.2 μH	WE−PD−S	7447785002	Wurth Samples
RA1	10K POT	PVG3A_POT	PVG3A103C01R00	490−2644−1−ND
RA3	10K POT	PVG3A_POT	PVG3A103C01R00	490−2644−1−ND
RA2	500K POT	PVG3A_POT	PVG3A504C01R00	490−2657−1−ND
RA4	500K POT	PVG3A_POT	PVG3A504C01R00	490−2657−1−ND
REN1	10.0 K	603	CRCW060310K0FKEA	541−10.0KHCT−ND
REN2	10.0 K	603	CRCW060310K0FKEA	541−10.0KHCT−ND
RFB1	220 K	603	CRCW0603220KFKEA	541−220KHCT−ND
RFB3	220 K	603	CRCW0603220KFKEA	541−220KHCT−ND
RFB2	46.4 K	603	CRCW060346K4FKEA	541−46.4KHCT−ND
RFB4	46.4 K	603	CRCW060346K4FKEA	541−46.4KHCT−ND
RPOR1	510 K	603	CRCW0603510KFKEA	541−510KHCT−ND
RSYNC1	2.00 M	603	CRCW06032M00FKEA	541−2.00MHCT−ND
TP1	VIN+	TP		
TP2	VIN−	TP		
TP3	VOUT1+	TP		
TP4	VOUT1−	TP		
TP5	VOUT2+	TP		
TP6	VOUT2−	TP		
TP7	VIN	TP		
TP8	VOUT1	TP		
TP9	VOUT2	TP		
TP10	EN1	TP		
TP11	EN2	TP		
TP12	POR	TP		
TP13	SYNC	TP		
TP14	GND	TP		
TP15	GND	TP		
U1	NCV896530	10PINDFNP5		

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