NCV7450V1GEVB

NCV7450 System Basis Chip Evaluation Board User's Manual

ON Semiconductor®

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EVAL BOARD USER'S MANUAL

Introduction

This document describes the evaluation board for the ON Semiconductor system basis chip (SBC) NCV7450, which contains a CAN−FD transceiver, 5 V / 250 mA LDO regulator and HS driver. The board provides basic connections for a device evaluation.

Evaluation Board Features

- One−row pin header providing access to all the device pins, enables easy insertion of the evaluation board into a more complex application setup
- Separated supply path for VS1 and VS2
- Standard CAN termination
- Position for optional ESD protection
- LED for RSTN signal activity indication
- Jumpers for enable signals

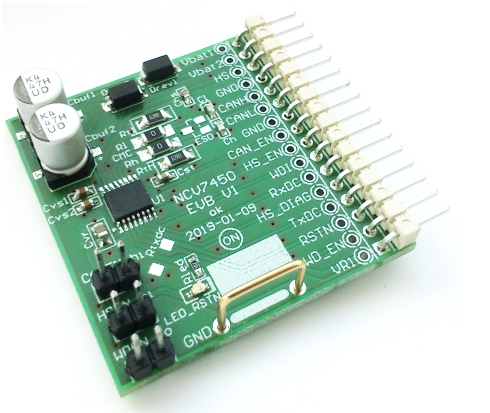

Figure 1. NCV7450V1GEVB Evaluation Board

SCHEMATIC

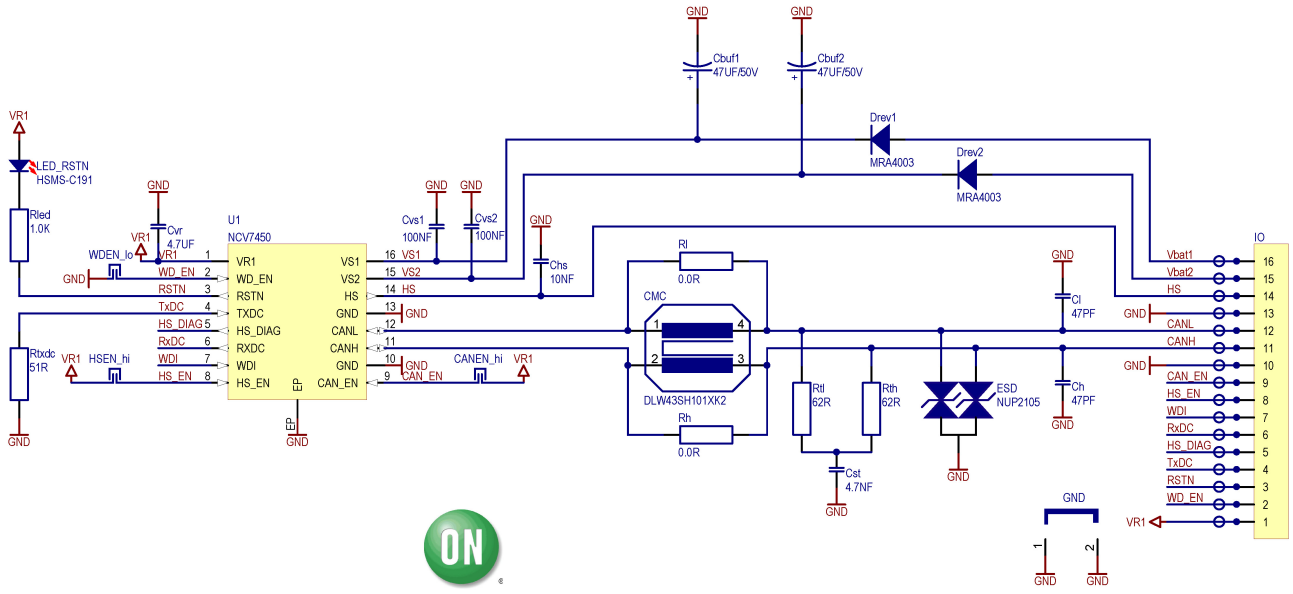

Figure 2. NCV7450 Evaluation Board Schematic

Table 1. ABSOLUTE MAXIMUM RATINGS

Rating	Pins	Min	Max	Unit
Battery supply voltage	Vbat1, Vbat2	−40	40	V
LDO Regulator output voltage	VR1	−0.3	6 or VS1 + 0.5 V (whichever is lower)	V
Digital inputs/outputs voltage	TxDC, RxDC, EN_WD, EN_CAN, EN_HS, HS_DIAG, WDI, $\overline{\text{RSTN}}$	−0.3	VR1 + 0.3 V	V
CAN bus line voltage	CANH, CANL	−40	40	V
HS Driver output voltage	HS – with Cbuf2 – without Cbuf2	 −0.3 −0.3	 Vbat2 40	 V V
NCV7450 junction temperature		−40	+150	°C
Board temperature		−40	+125	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

Table 2. RECOMMENDED BOARD OPERATING CONDITIONS

Rating	Pins	Min	Max	Unit
Battery supply voltage	Vbat1, Vbat2	6	18	V
LDO Regulator output current (thermally limited)	VR1	−0.1	250	mA
Digital inputs/outputs voltage	TxDC, RxDC, EN_WD, EN_CAN, EN_HS, HS_DIAG, WDI, $\overline{\text{RSTN}}$	0	5	V
CAN bus line voltage	CANH, CANL	0	5	V
HS Driver output voltage	HS	0	VS2	V
HS Driver output current	HS	0	1.7	A
NCV7450 junction temperature		−40	+150	°C
Board temperature		−40	+125	°C

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

OPERATIONAL GUIDELINES

NCV7450 evaluation board allows easy evaluation of NCV7450 system basis chip. It provides connection to all the device's pins as well as positions for all the necessary CAN bus external components.

Configurations and assembly options are listed in Table 3.

For more information please check NCV7450 transceiver datasheet at www.onsemi.com.

Table 3. ASSEMBLY OPTIONS AND CONFIGURATIONS

Component	Default	Function
Rth, Rtl, Cst	2x 62R, 4.7nF	CAN bus termination
ESD	– (optional)	Position for optional NUP2105 ESD protection
Ch, Cl	47 pF	ESD capacitors. Should be selected per application needs and ESD used
CMC	–	Optional common−mode choke
Rl, Rh	0R	Bypass of CMC
Rtxdc	–	Not used
Cbuf2	– (optional 47 μF)	HS driver supply buffer capacitor for, optional • Should be used for HS driver PWM operation • Should not be used if short to voltage higher than Vbat2 can occur
CANEN_hi	–	CAN_EN pin connection Open = CAN_EN weak internal pull−down = CAN transceiver disabled Closed = CAN_EN connected to VR1 = CAN transceiver enabled
HSEN_hi	–	HS_EN pin connection Open = HSN_EN weak internal pull−down = HS driver disabled Closed = HSN_EN connected to VR1 = HS driver enabled
WDEN_lo	–	WD_EN pin connection Open = WD_EN weak internal pull−up current source (periodically activated) = watchdog enabled Closed = WD_EN shorted to GND = watchdog disabled

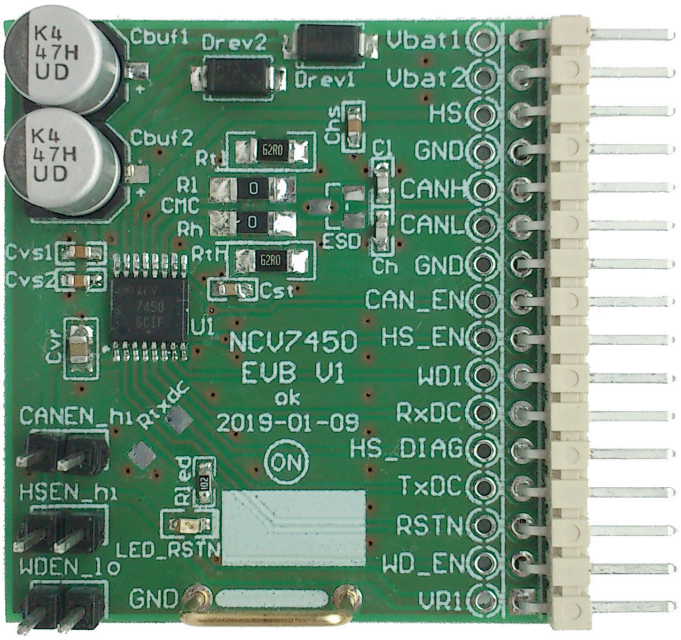

Figure 3. NCV7450 Evaluation Board Picture, Top Side

PCB DRAWINGS

Composite Drawings

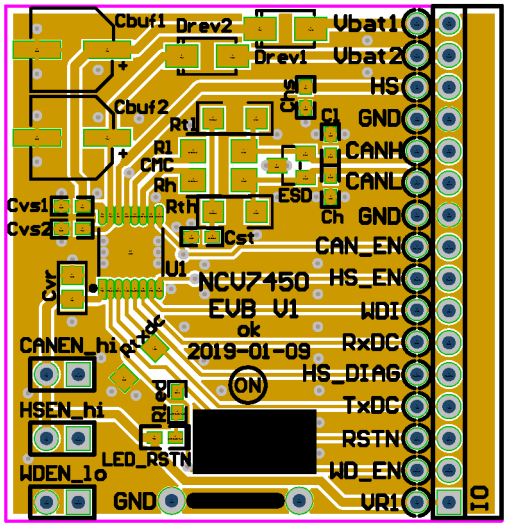

Figure 4. NCV7450 EVB PCB Top Drawing

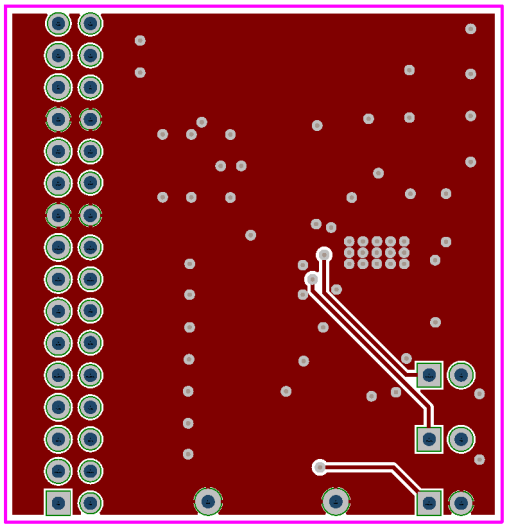

Figure 5. NCV7450 EVB PCB Bottom Drawing (Bottom View)

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