

NCV7451 System Basis Chip Evaluation Board User's Manual



ON Semiconductor®

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NCV7451V1GEVB

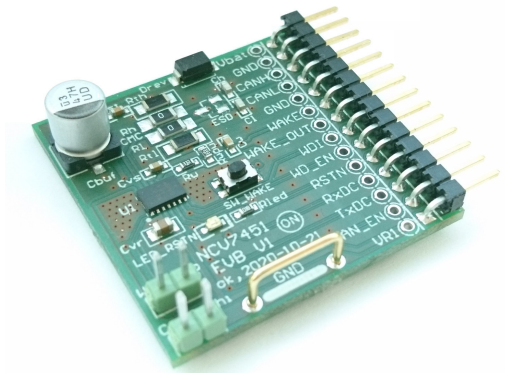
Introduction

This document describes the evaluation board for the ON Semiconductor system basis chip (SBC) NCV7451 containing a CAN-FD transceiver, 5 V / 250 mA LDO regulator and local wakeup comparator. 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
- Standard CAN Termination
- Position for Optional ESD Protection
- WAKE Pin External Components
- LED for RSTN Signal Activity Indication
- Jumpers for Configuration Signals

EVAL BOARD USER'S MANUAL



SCHEMATIC

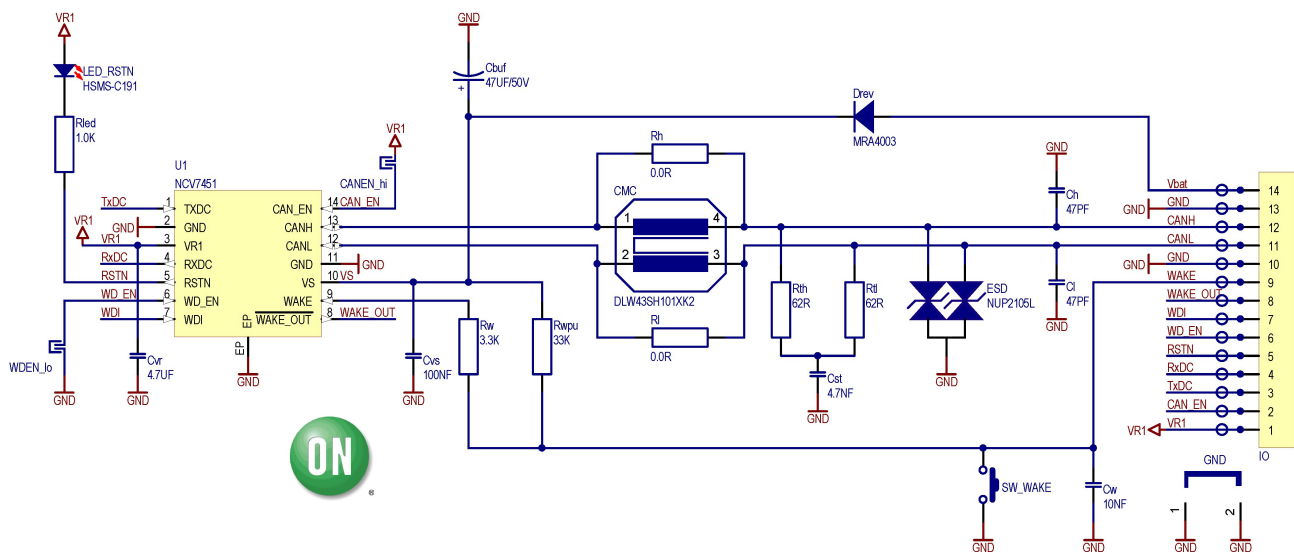


Figure 1. NCV7451 Evaluation Board Schematic

NCV7451V1GEVB

ABSOLUTE MAXIMUM RATINGS AND OPERATING RANGES

Table 1. ABSOLUTE MAXIMUM RATINGS

| Rating | Pins | Min | Max | Unit |
|----------------------------------|---|------|---------------------------------------|------|
| Battery Supply Voltage | Vbat | -40 | 40 | V |
| LDO Regulator Output Voltage | VR1 | -0.3 | 6 or VS+0.5 V (whichever is lower) | V |
| Digital Inputs / Outputs Voltage | TxDC, RxDC, EN_WD, EN_CAN, WAKE_OUT, WDI, RSTN | -0.3 | VR1+0.3 V | V |
| CAN Bus Line Voltage | CANH, CANL | -40 | 40 | V |
| Local Wakeup Input | WAKE | -40 | 40 | V |
| NCV7451 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 | Vbat | 6 | 18 | V |
| LDO Regulator Output Voltage | VR1 | 4.9 | 5.1 | V |
| LDO Regulator Output Current | I(VR1) | 0 | 250 | mA |
| Digital Inputs / Outputs Voltage | TxDC, RxDC, EN_WD, EN_CAN, WAKE_OUT, WDI, RSTN | 0 | 5 | V |
| CAN Bus Line Voltage | CANH, CANL | 0 | 5 | V |
| Local Wakeup Input | WAKE | 0 | Vbat | V |
| NCV7451 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

NCV7451 evaluation board allows easy evaluation of NCV7451 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 NCV7451 transceiver datasheet at www.onsemi.com.

Table 3. ASSEMBLY OPTIONS AND CONFIGURATIONS

| Component | Default | Function |
|---------------|----------------|---|
| Rth, Rtl, Cst | 2x 62R, 4.7 nF | CAN bus termination |
| ESD | - | 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 | 0 R | Bypass of CMC |
| CANEN_hi | Close | CAN_EN pin connection Open = CAN_EN weak internal pull-down = CAN transceiver disabled Close = CAN_EN connected to VR1 = CAN transceiver enabled |
| WDNEN_lo | Close | WD_EN pin connection Open = WD_EN weak internal pull-up current source (periodically activated) = watchdog enabled Close = WD_EN shorted to GND = watchdog disabled |

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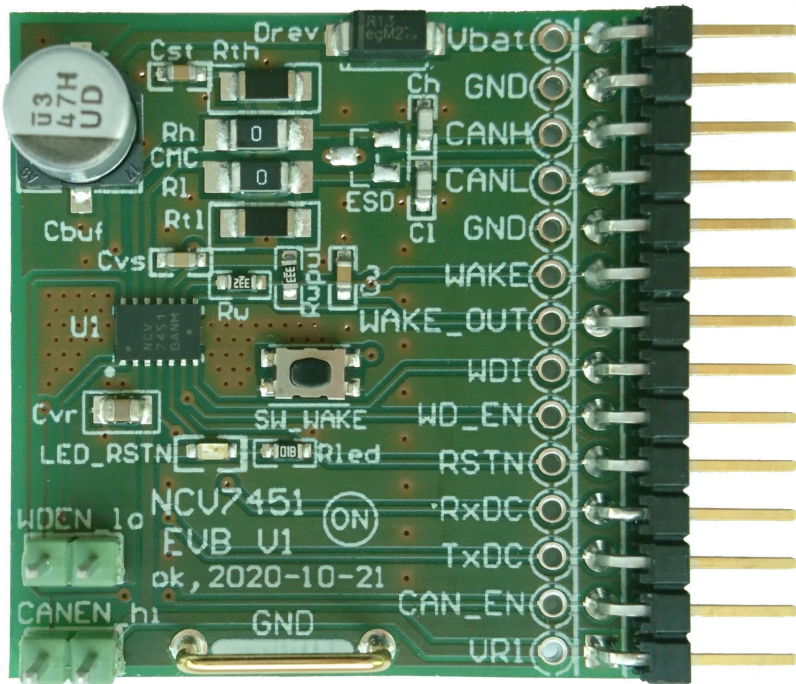


Figure 2. NCV7451 Evaluation Board Picture, Top Side

PCB DRAWINGS

Composite Drawings

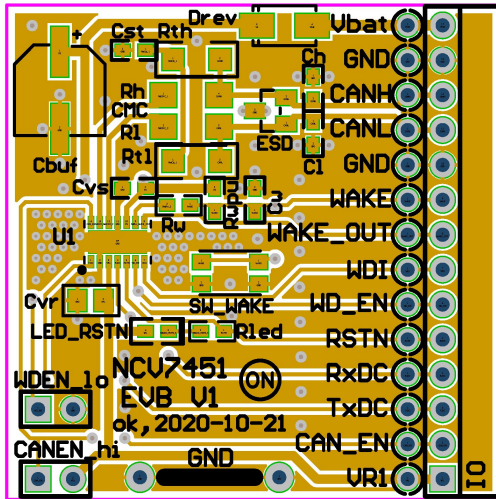


Figure 3. NCV7451 EVB PCB Top Drawing

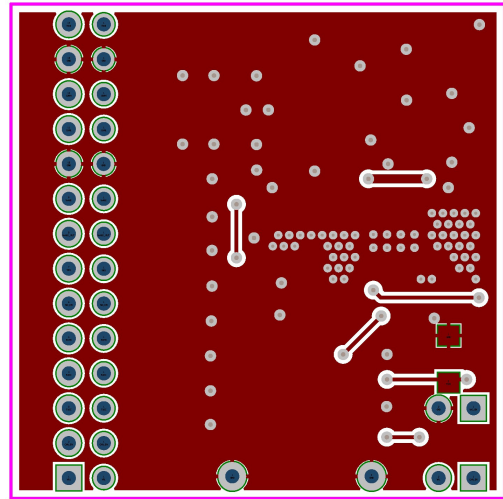


Figure 4. NCV7451 EVB PCB Bottom Drawing (Bottom View)

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