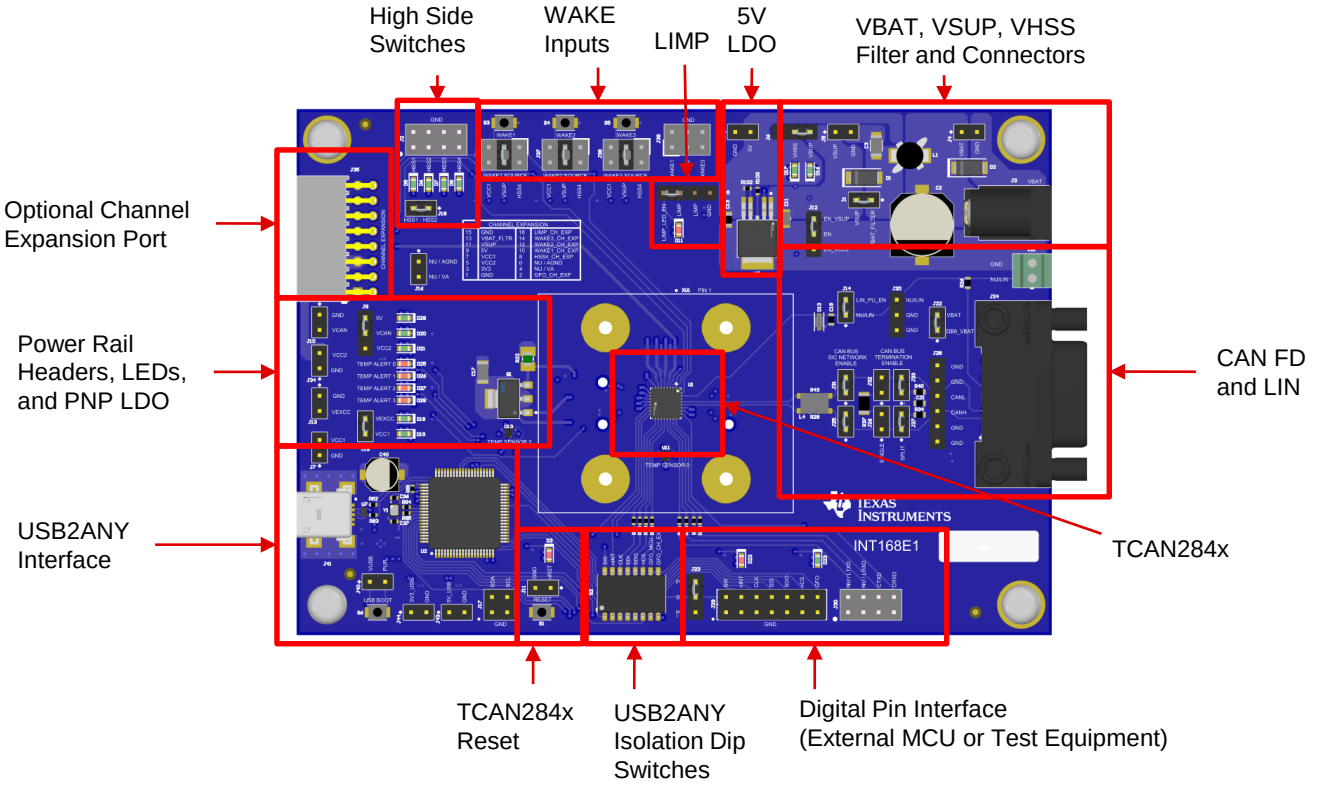
TCAN284x EVM Rev E1

Quick Start Guide

Transceiver Interface

September 21, 2022

TCAN284x EVM Layout



Power / LDOs

VBAT is the external power supply for the board (12V typical). It can be connected to the DC Barrel Jack J3, the header J4, or pin 9 of the DB9 connector from a wiring harness.

After VBAT is filtered and passed through a reverse polarity protection diode, it is called VSUP. The polarity protection diode can be bypassed by placing a shunt on J1 or the VSUP supply connected directly to header J5.

VHSS can be shunted to VSUP, or applied to header J6.

VSUP supplies a 5V LDO that is a utility voltage for the board peripherals like LEDs, and can also supply VCAN. This LDO can be disabled, or select either VSUP or VCC2 as the enable source with a shunt on header J12. The 5V LDO voltage is available on header J8.

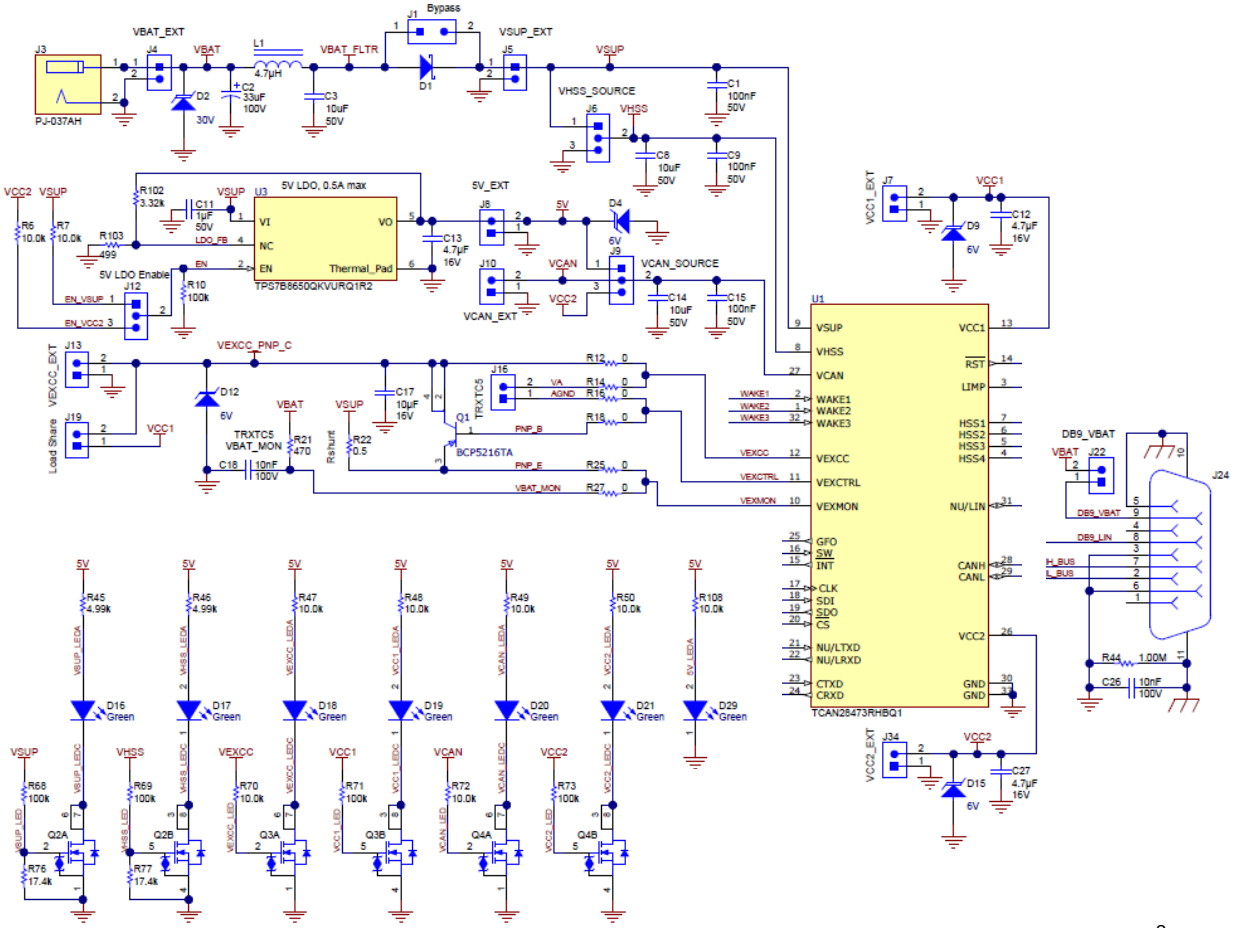
VCAN can be shunted to the 5V LDO, or VCC2 using header J9, or externally supplied header J10.

VCC1 LDO is available on header J7.

VCC2 LDO is available on header J34.

VEXCC is an external PNP LDO that is available on header J13. It can be configured to share the current load with VCC1 by placing a shunt on J19. Some register configuration is also required for load sharing.

Each power rail has an LED indicator that is sourced though the 5V utility LDO to prevent additional current load on the various supplies.



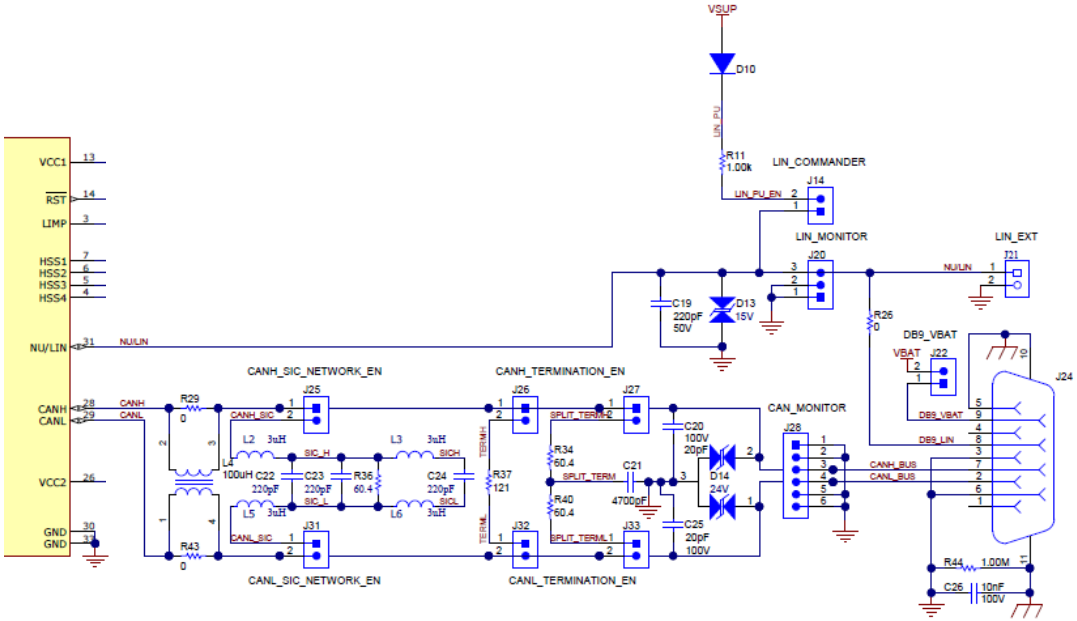
CAN FD / LIN

The CAN FD transceiver has a configurable interface circuit consisting of optional features:

- Common mode choke or 0Ω bypass resistors
- Single 120Ω or Split Termination. Use both for a single board operation by placing shunts on headers J26, J27, J32 and J33.
- 20pF filter caps
- TVS diode
- Monitor header (J28)
- DB9 Wiring harness (J24)
- SIC bus emulator test network enabled by placing shunts on headers J25 and J31. (Should only be used with SIC devices)

The LIN transceiver has the following features:

- Wiring harness terminal block (J21)
- Monitor header (J20)
- TVS Diode
- 220pF filter cap
- LIN Commander Diode and 1kΩ pullup resistor. Commander mode can be enabled by placing a shunt on header J14.



HSS, Limp, Reset

The High Side Switches are available on header J2. Each switch has an LED indicator and a 0.1uF load cap.

HSS1 and HSS2 can be synchronized and configured to share a larger current load by placing a shunt on header J18. Some register configuration is required for load sharing.

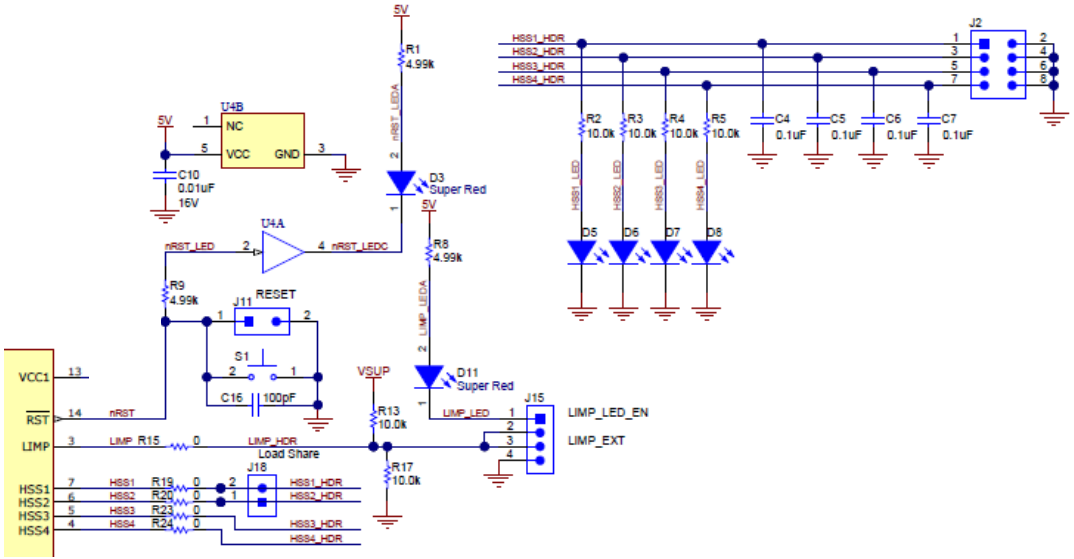
LIMP is available on header J15 and can be configured to be Active High or Active Low. Both a 10kΩ pullup and pulldown resistor is available, but by default only R13 is installed and R17 is not installed.

An optional LED indicator can be enabled by placing a shunt between pins 1 and 2 on header J15.

The RST pin is a dual use pin that functions as an Input pin for an external reset signal, or as an LDO monitor output to indicate under-voltage and reset events.

An external reset signal can be applied through header J11 or by pressing the pushbutton S1.

A LED is added to the RST pin through and inverter to indicate an under-voltage or reset event.

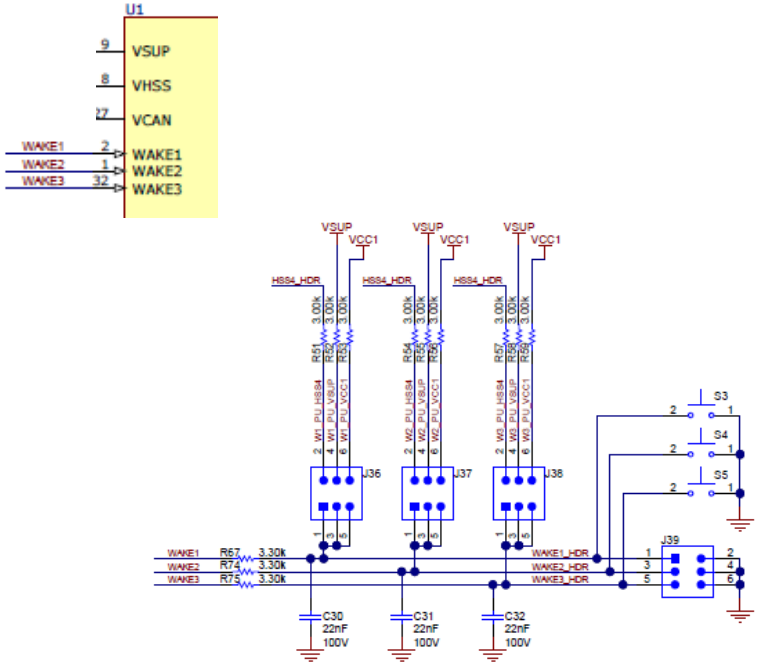


WAKE

The WAKE inputs are available on header J39 or by pressing push buttons S3, S4, and S5.

The WAKE inputs can be configured with a pullup resistor to either VSUP, VCC1, or for Cyclic Sensing Wake using HSS4 by placing a shunt in the desired location on headers J36, J37, and J38.

Cyclic Sensing Wake with HSS4 requires some additional register configuration.



Digital Interface

The digital signals are available on header J29 and the USB2ANY Interface by closing the Dip Switches on S2. If an external MCU is used, the USB2ANY can be isolated by opening the Dip Switches on S2.

The Software Development pin SW can be configured to be Active High, or Active Low. The pin can be pulled high or low by placing a shunt in the appropriate location on header J23. The SW pin is also connected to a USB2ANY GPIO pin (GPIO12).

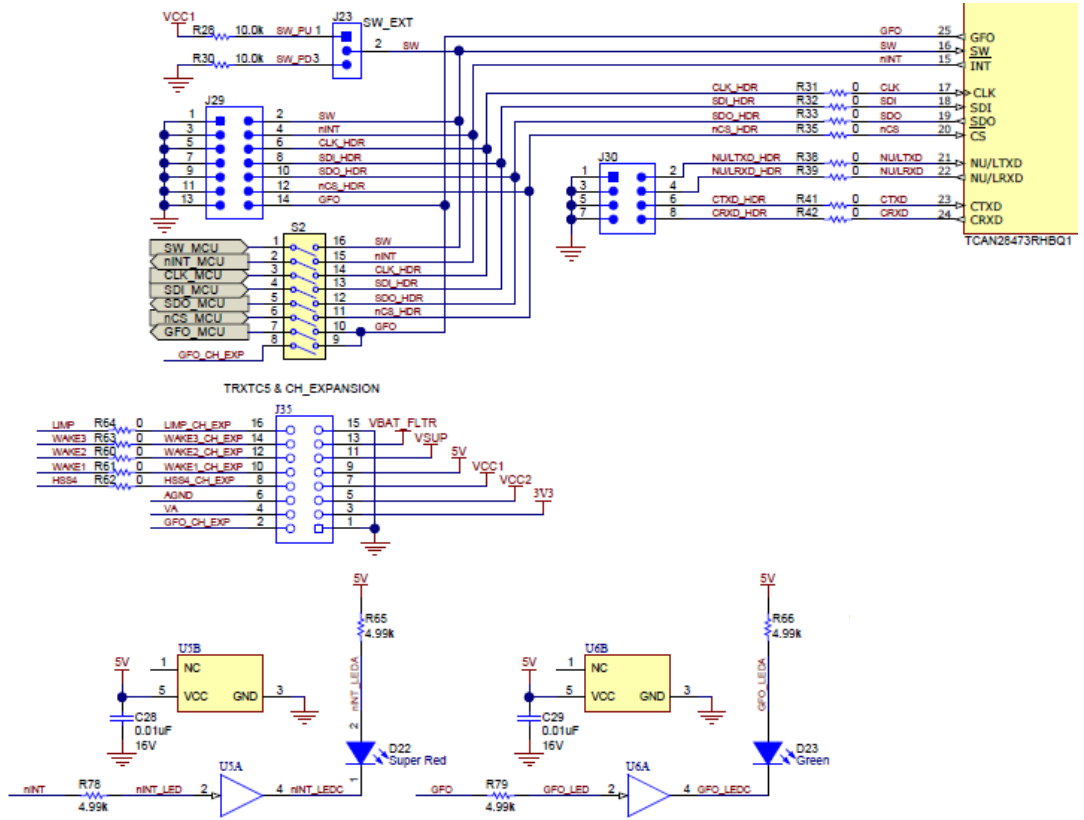
By default the SW pin is active High and it is recommended to pull the SW pin high when starting to work with the EVM to prevent watchdog errors from causing the device to repeatedly enter Restart Mode.

The SPI signals CLK, SDI, SDO and nCS can be monitored from the USB2ANY or supplied from an external MCU on header J29.

The nINT and GFO pins can be used for interrupts and have LED indicators on them through inverters. These signals are available on header J29 and the USB2ANY. nINT is connected to GPIO3, and GFO is connected to GPIO7 of the USB2ANY MCU.

The USB2ANY does not have CAN or LIN controllers, so the TXD and RXD signals for the transceivers must be supplied through header J30.

Many signals and voltage rails are connected to a port connector that would allow an additional board to be mated.



USB2ANY and Temp Sensors

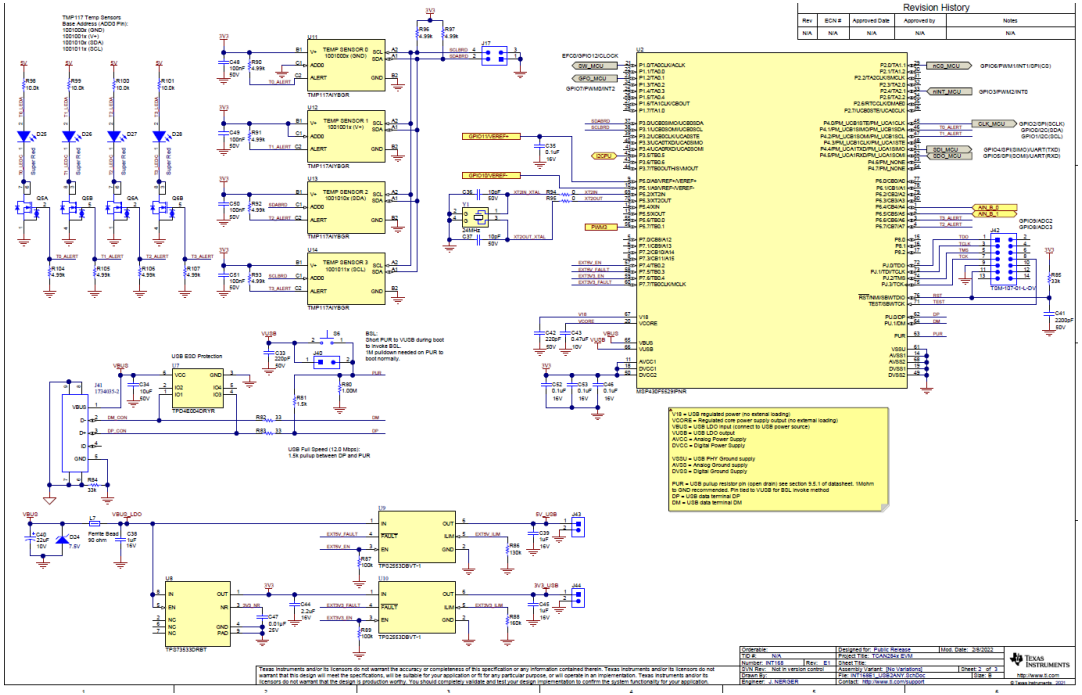
The USB2ANY is the standard circuit microcontroller circuit found in the standalone module with various TCAN284x signals connected to the appropriate MCU pins.

Note: Four temp sensors were added to this EVM but they are currently not compatible with the current version of the USB2ANY firmware and pin definitions. This will be corrected in the next hardware revision of the board

Currently these temp sensors are connected to the I2C bus used for the USB2ANY DAC functions (not used with this application) and would either require a non-standard custom firmware or a hardware change to adjust the I2C bus connection.

Because the board is already planned for a revision, this will be addressed in hardware to prevent a custom firmware version.

Note: The TPS32553 DBVT current limiting devices used for the USB2ANY 5V and 3.3V rails have a supply chain limitation and have been left off this first version of the board. These power rails are not used for the board and therefore headers J43 and J44 do not have power on them and are not used.



Software

- A GUI is being developed for this EVM with a final completion date near the end of October 2022.
- Using the USB2ANY SDK (Software Developers Kit) version 2.8.2.0, will install the USB2ANY.dll allowing a custom program access to the TCAN284x device through the USB2ANY SPI functions.
  - Note, the USB2ANY is a 32-bit interface and does not support 64-bit applications. This may be a limitation to some programming platforms. For example, Python 3.7.4 (32-bit) version could be used, but Python 3.7.4 (64-bit) version could not.
  - The SDK can be found online at various links both internal and external to TI. If you need help getting access to the download files, let me know (Jonathan Nerger).
- There is a USB2ANY Explorer Software tool available on the TI.com's USB2ANY product folder (Link)
- The EVM GUI will use a modified USB2ANY firmware that is not publicly released as an SDK. If an SDK is used with the EVM, the USB2ANY firmware should be replaced with the SDK version. A USB2ANY firmware loader tool is installed with the USB2ANY Explorer Software and firmware version 2.8.2.0 is the highest publicly released version.
- Any 3rd party SPI Interface tool such as the Aardvark by Total Phase or the Analog Discovery 2 by Digilent can be used through the digital input headers to read and write registers through SPI.