8.3.22.9.3 Low-Voltage Tracking

At low input voltages, the regulator drops out of regulation and the output voltage tracks input minus a voltage based on the load current (IL) and switch resistor. This tracking allows for a smaller input capacitance and can possibly eliminate the need for a boost converter during cold-crank conditions.

8.3.22.9.4 Power Supply Recommendation

The device is designed to operate from an input-voltage supply range between 5.5 V and 28 V. This input supply must be well regulated, if the input supply is located more than a few inches from the device. The recommended minimum capacitance at the pin is 100 nF. The max voltage range is for the LIN functionality. Exceeding 24 V for the LDO reduces the effective current sourcing capability due to thermal considerations.

8.3.22.10 Watchdog

The TLIN1431x-Q1 has an integrated watchdog function. This can be programmed by pin control or SPI communication control based upon the state of the PIN or nCS pin at power up. The device defaults to windows based watchdog at power up. When entering normal and fast modes, the programmed watchdog timer starts based upon the pin configuration for pin mode or register configuration in SPI control mode. When entering standby mode from restart mode, there is a nRST transition from low to high. This transition starts the t_{INITWD} timer. A WD trigger input must take place prior to this initial long window times out. If WD is disabled in standby mode the same long window is implemented in normal mode. The LIMP pin provides a limp home capability when connected to external circuitry. When in sleep mode, the limp pin is off. When the error counter reaches the watchdog trigger event level, the LIMP pin turns on connecting V_{SUP} to the pin as described in the LIMP pin section and the device transitions to restart mode at which time the nRST pin will be pulled low.

8.3.22.10.1 Watchdog in Pin Control Mode

The state of the WDT pin determines the window watchdog timing for three different windows. Timeout watchdog is not available in pin control. The watchdog timer starts once the device has entered standby. The mode the device enters is based upon other pins, EN and TXD. Fast mode can be used as a software development mode as the WD is enabled but does not cause any action to take place. The watchdog feature cannot be disabled in pin control mode. See Figure 8-16 for state diagrams on how the WD behaves.

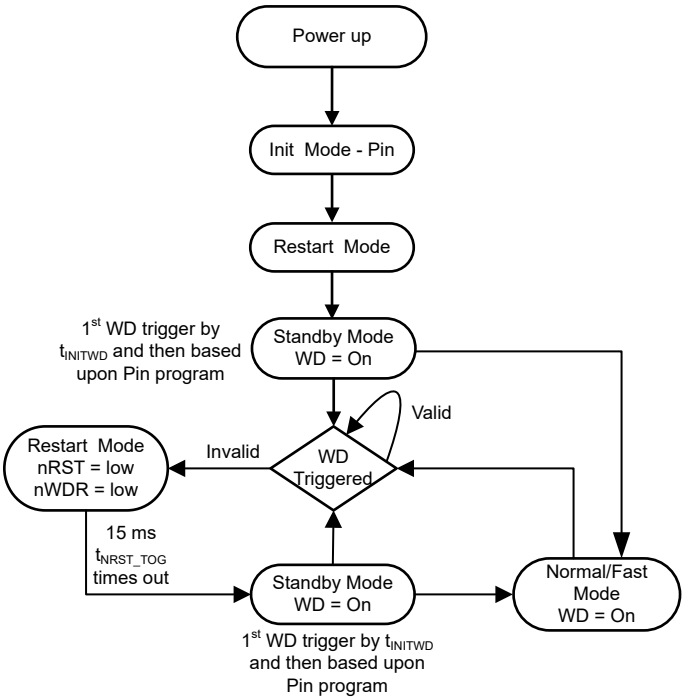

Figure 8-16. Watchdog state diagram in pin mode