Note

When the device enters fail-safe mode, the SWE timer automatically starts.
- If SWE timer times out, the device enters sleep mode
- If a wake event takes place prior to the SWE timer timing out, the device determines if fault is still present.
  - If fault is present, the device enters sleep mode.
  - If fault has cleared, the device enters restart mode.

When fail-safe mode is entered due to a thermal shutdown (TSD), V_{CC} over-voltage (OV_{CC}) or a V_{CC} short circuit (V_{CCSC}) event the following takes place:
- LDO is turned off
- If the device receives a wake event, the LDO is turned on for t_{LDOON} to determine if the TSD, OV_{CC} or V_{CCSC} event is still present.
  - During this window, if a TSD or OV_{CC} is detected the device immediately enters sleep mode.
  - At the end of t_{LDOON} window, if a V_{CCSC} is detected the device enters sleep mode.
- If fault is cleared, the device enters restart mode.

If the device enters fail-safe mode and V_{CC} is on, the t_{LDOON} timer is started and expires before the device transitions to restart mode.

8.4.8 Wake Up Events

There are three ways to wake-up from sleep mode depending upon control mode, pin or SPI:

1. Remote wake up initiated by the falling edge of a recessive (high) to dominant (low) state transition on the LIN bus where the dominant state is held for t_{LINBUS} filter time. After this t_{LINBUS} filter time has been met and a rising edge on the LIN bus going from dominant state to recessive state initiates a remote wake-up event eliminating false wake ups from disturbances on the LIN bus or if the bus is shorted to ground. Active for both pin and SPI control modes.
2. Local wake up through EN being set high for longer than t_{MODE_CHANGE}. Active for pin control mode.
3. Local wake up through WAKE pin
   - Being set high or low for longer than t_{MODE_CHANGE}. Active for both pin and SPI mode.
   - Only active during on-time cyclic sense period. Active for SPI mode.

Note
- Remote and local wake up are also valid wake events when the device enters fail-safe mode. The EN pin will not wake the device if it has entered fail-safe mode.
- When a wake event takes place and INH is selected, it is turned on with in t_{INH_SLP}.
- When WKRQ is used, a wake event requires the LDO to be on and the voltage level to exceed 2 V. Once this happens, the WKRQ pin ramps with V_{CC} until it expected voltage level.

8.4.8.1 Wake Up Request (RXD)

When the TLIN1431x-Q1 encounters a wake up event from the LIN bus the device transitions to restart mode. In restart mode, the LDO is turned on and ramps until $V_{CC} > UV_{CC}$ at which time the device enters either Normal mode, Fast mode or Standby mode depending upon the device control method. In Restart mode, RXD is pulled high. After V_{CC} has exceeded UV_{CC} for t_{RSTN_act}, the device transitions to standby mode and RXD is latched low. Once the device enters normal mode, the $\overline{RXD}$ pin releases the wake up request signal and the RXD pin then reflects the receiver output from the LIN bus. RXD can be programmed to toggle low or high when in standby mode from a wake event.

8.4.8.2 Local Wake Up (LWU) via WAKE Terminal

The WAKE terminal is a ground referenced input terminal supporting high voltage wake inputs used for local wake up (LWU) request via a voltage transition. The terminal triggers an LWU event on either a low to high or high to low transition as it has bi-directional input thresholds. This terminal may be used with a switch to VSUP