1 Scope

This document describes the proper software debouncing by the MCU interface to the RxD line during local wake-up.

2 Debouncing RxD Under Local Wakeup Conditions

The signals received from the CANH pins are debounced internal. Both edges are debounced separately. The combination of both signals via RS flipflop (RS-FF) represents the receiver output.
A multiplexer controlled by the internal standby signal (debounced MODE0/1 signals), provides either the standby or the active receiver signal to the gate of the RxD driver.

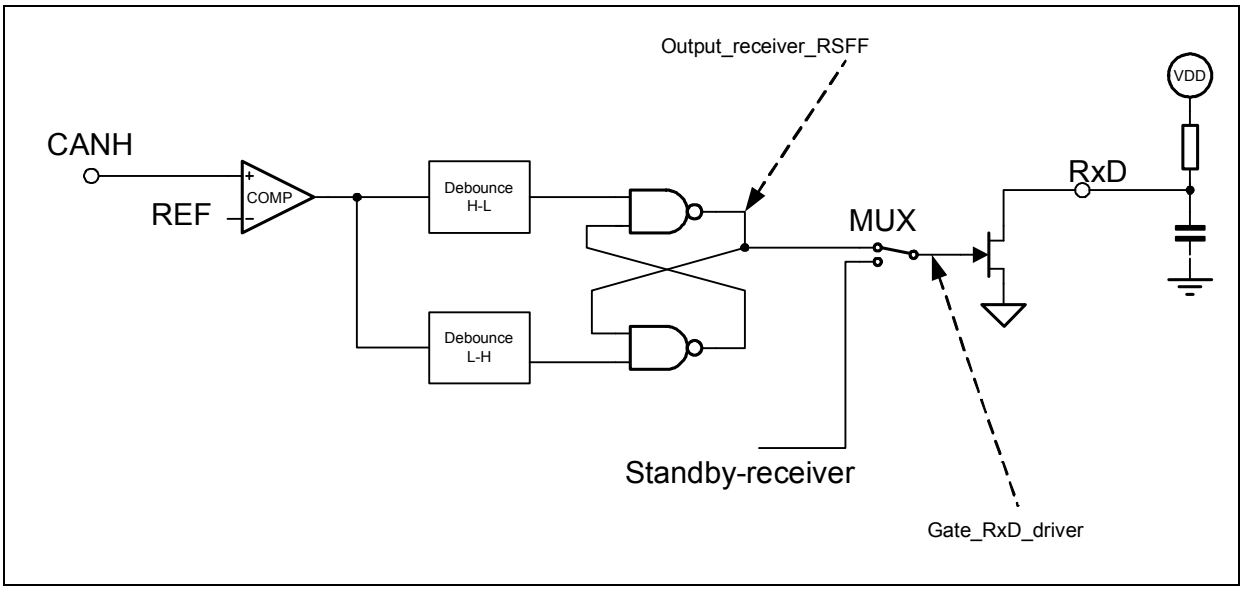

Figure 1 – Internal circuitry of CANH and RxD pin

After wake up via MODEx, the internal 5V regulator has to start up. At the beginning of the regulator start-up both inputs of the RS-FF are logic low (0V). The output of this RS-FF can generate a brief pulse before it switches into the right position.

The simulated RxD pulse (using a forced asymmetry in the above FF) occurs approximately 10us after the INH pins low to high transition. The RxD pulse occurs 16us after a wake up via MODEx pins (This result corresponds exactly to real world measurements, see Figure 3 – Measurement on Real Hardware). The only reason for the pulse is the regulator start up and the preferred switching of the RS- FF.

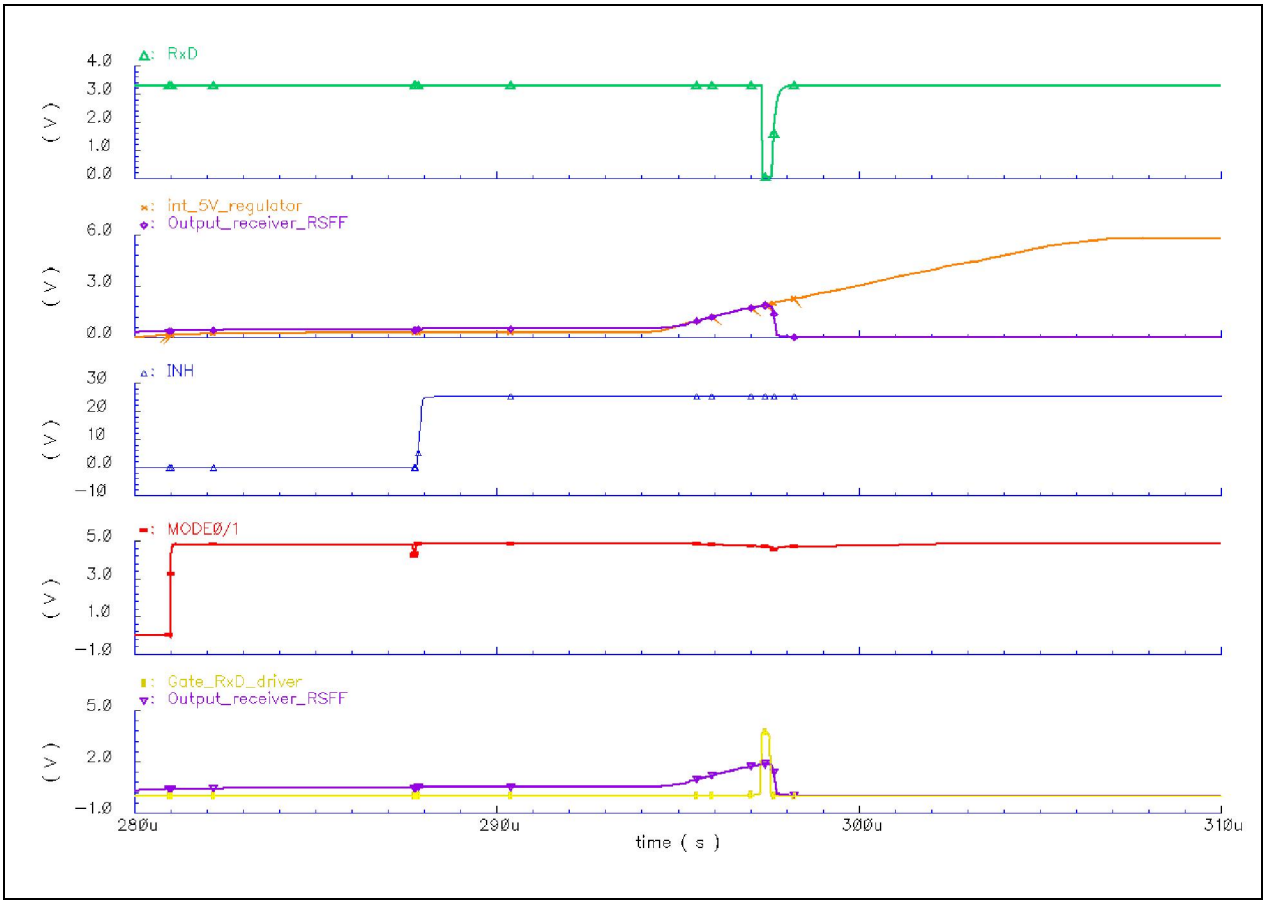

Figure 2 - Simulation Result of local wake-up

This pulse duration and time of occurence is dependent on voltage, chip parameters and temperature. Under worst case conditions (27V voltage, -50°C temperature, worst case speed) the RxD pulse shifts to 43us after wake up and the pulse width can increase up to 10us.

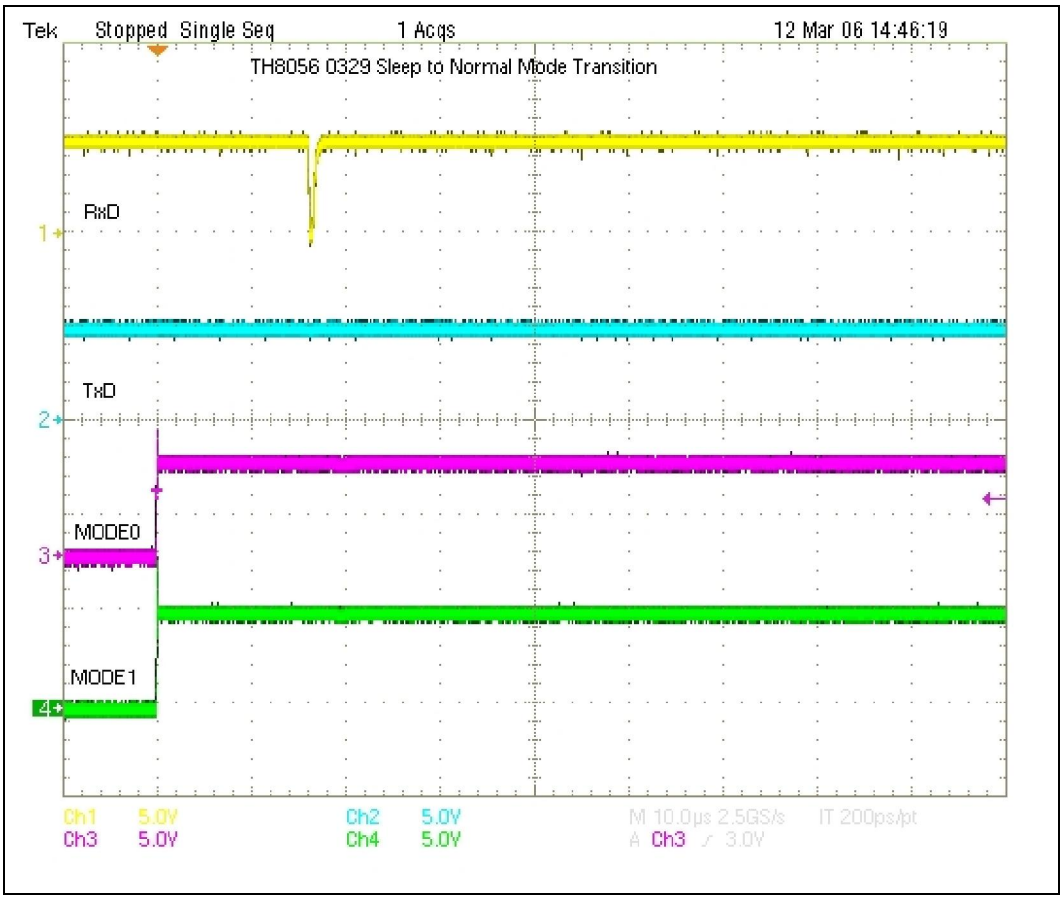

Figure 3 – Measurement on Actual Hardware

3 Consequence for Application

By adding a guard band of 100% to the worst case simulation result (approx. 50µs) it is guaranteed that 100us after local wake up no unintended RxD pulse occurs.

Normally the RxD interrupt is only be used in case of bus wake-up. During active bus wake-up the RXD line is at low level and therefore no pulse will be observed. This active low level can be used as interrupt in case INH pin is not used for regulator control.

In case of local wake up by the MCU itself (the regulator is already active), the RxD interrupt should be ignored by the MCU.

In order to guarantee proper start-up, the RxD line has to be debounced by 100µs via software.

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