Figure 127: IEEE 802.15.4 transmit sequence

The receiver will ramp up and enter the RXIDLE state where the READY event is generated. Upon receiving the READY event, the CCA is started by triggering the CCASTART task. The chosen mode of assessment (register CCACTRL.CCAMODE) will be performed and signal the CCAIDLE event or CCABUSY event 128 μs later. If the event CCABUSY is received, RADIO will have to retry the CCA after a specific back-off period. This is outlined in the *IEEE 802.15.4 standard, Figure 69 in section 7.5.1.4 The CSMA-CA algorithm*.

If the event CCAIDLE is generated, a write to the task register TXEN enters RADIO in TXRU state. The READY event will be generated when RADIO is in the TXIDLE state and ready to transmit. With the PACKETPTR pointing to the length (PHR) field of the frame, the START task can be written. RADIO will send the four octet preamble sequence followed by the start of frame delimiter (register SFD). The first byte read from RAM is the length field (PHR) followed by the transmission of the number of bytes indicated as the frame length. If the CRC module is configured, it will run for PHR-2 octets. The last two octets will be substituted with the results from running the CRC. The necessary CRC parameters are sampled on the START task. The FCS field of the frame is little endian.

In addition to the available shortcuts, one is provided between the READY event and the CCASTART task so that a CCA can automatically start when the receiver is ready. A second shortcut has been added between the CCAIDLE event and the TXEN task, when a clear channel is detected, RADIO can immediately enter TX mode.

8.17.12.7 Receive sequence

RADIO must be in RX mode before the receive sequence can begin. After writing to the RXEN task, RADIO will start ramping up and enter the RXRU state.

When the READY event is generated, RADIO enters the RXIDLE mode. For the baseband processing to be enabled, the START task must be written. An outline of the IEEE 802.15.4 receive sequence can be found in the following figure.

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