

0.0.0.1 MAC-PHY RATE ADAPTATION state diagrams

0.0.0.1.1 MAC-PHY RATE ADAPTATION state diagram variables

crs_rx is asserted by the MAC-PHY rate matching receive state machine to control CRS

TX_EN is the TX_EN signal of the MII as specified in Clause 22

tx_buffer_empty is set when the PHY's transmit FIFO has space to receive a maximum length frame from the MAC.

crs_tx is asserted by the MAC-PHY rate matching transmit state machine to control CRS

CRS is CRS signal of the MII as specified in Clause 22. It is asserted when either of crs_tx or crs_rx are true.

$CRS \leq crs_tx + crs_rx$

rx_frame_available is set when the PHY's receive FIFO contains one or more complete frames

RX_DV is the RX_DV signal of the MII as specified in Clause 22

tx_rx_simultaneously is true if the MAC is capable of transmitting and receiving simultaneously in half duplex mode.

crs_and_tx_en_infer_col is true if the MAC-PHY interface infers a collision when TX_EN and CRS are both true simultaneously.

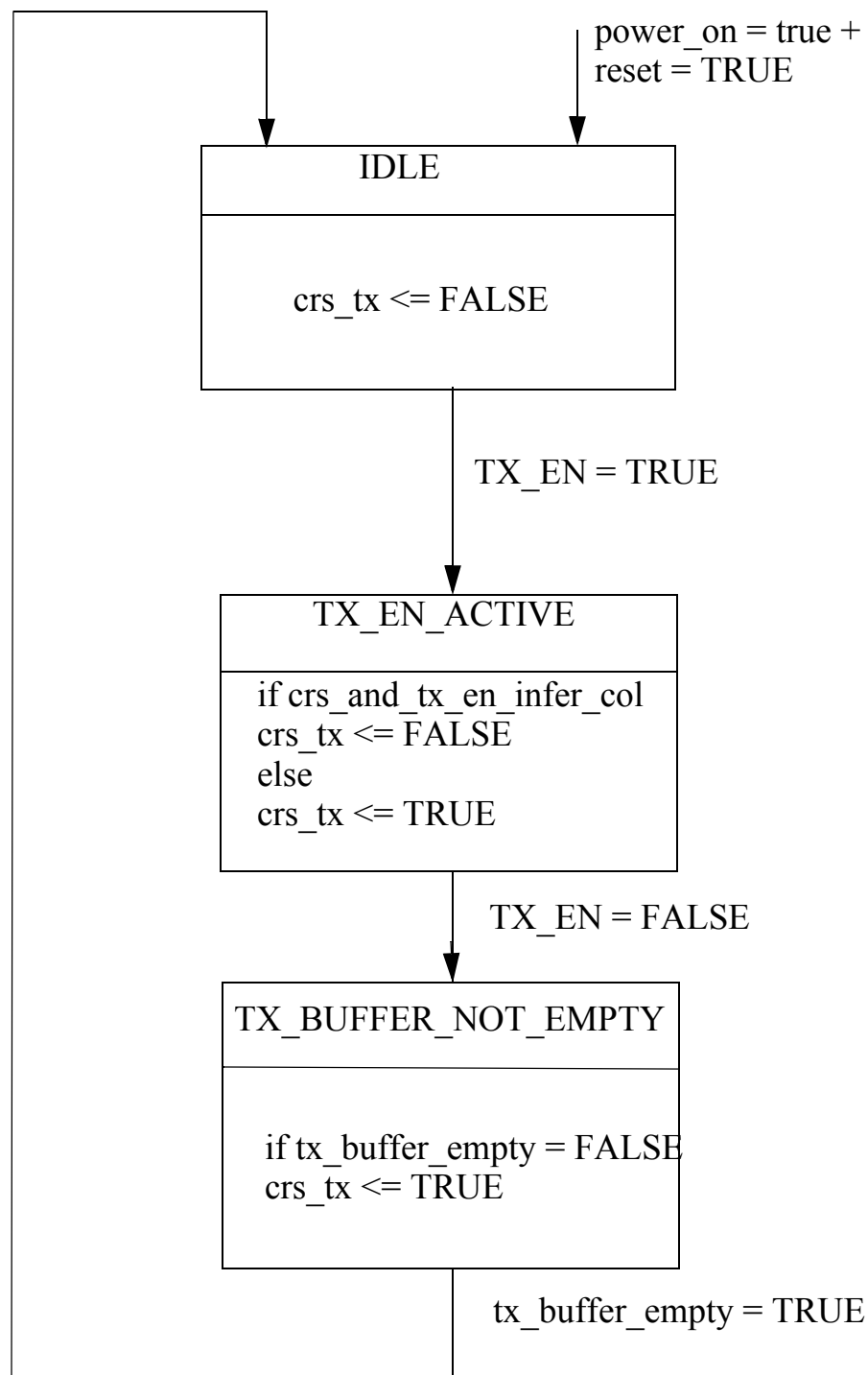
0.0.0.1.2 MAC-PHY RATE ADAPTATION state diagram timer

rate_matching_timer

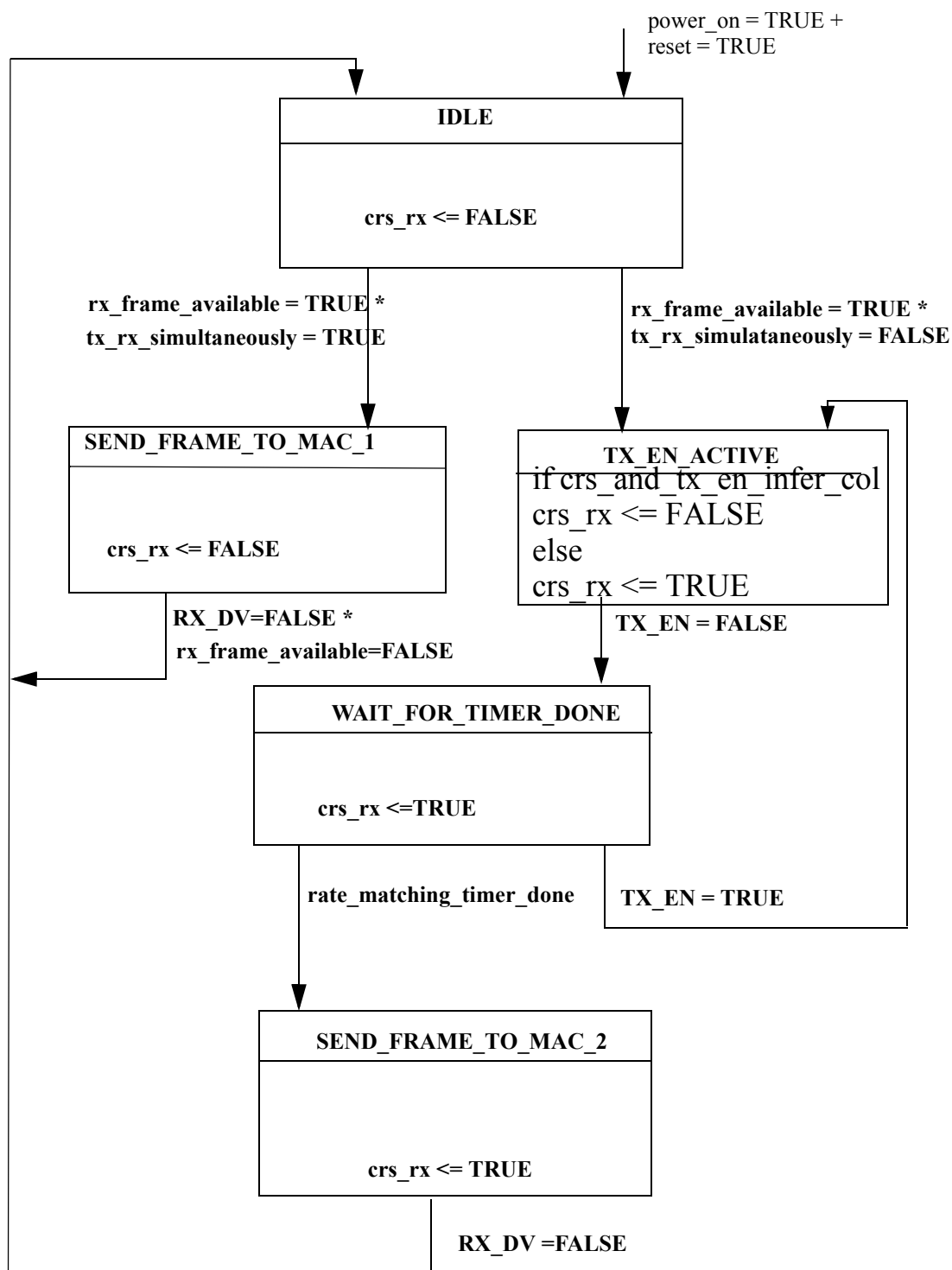
Timer used in rate matching state machine
Duration: 1120 ns, tolerance +/- 100 ppm.

The timer is restarted on entry to the WAIT_FOR_TIMER_DONE state with the action: 'Start rate_matching_timer'. It is then tested in the exit condition with the expression 'rate_matching_timer_done'.

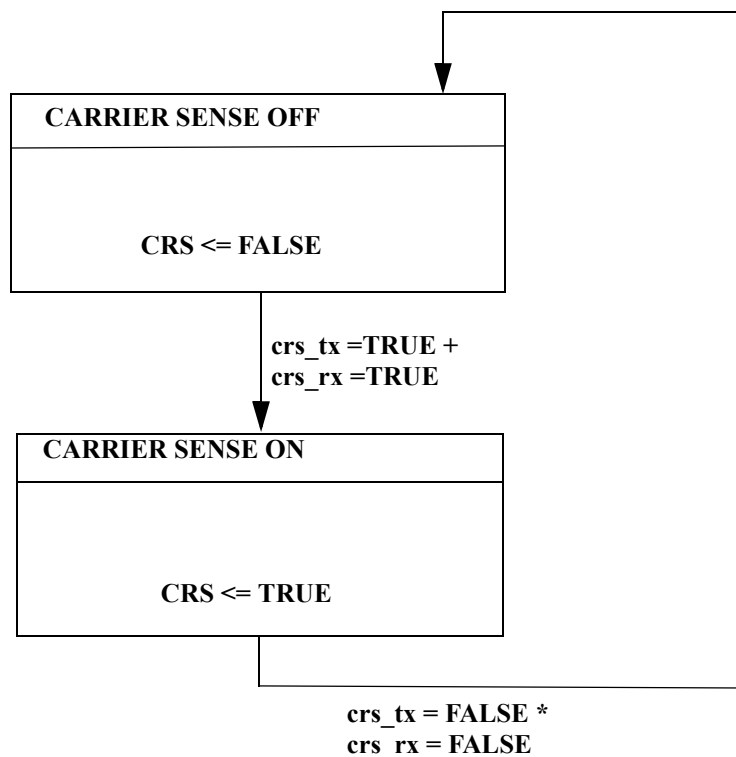
The duration is set to 1120 ns to allow 960 ns for the inter frame gap plus time for the MAC to recognize CRS.



MAC-PHY rate matching transmit state machine



MAC-PHY rate matching receive state machine



Carrier Sense state diagram