MODULE *Channel*

EXTENDS *Integers*

CONSTANT *Data*
VARIABLE *chan*

$$\begin{array}{l}
\mathit{TypeInvariant} \;\triangleq \\
\quad \mathit{chan} \in \\
\qquad [\mathit{val} \;\; : \mathit{Data} \\
\qquad ,\ \mathit{rdy} : \{0,\ 1\} \\
\qquad ,\ \mathit{ack} : \{0,\ 1\} \\
\qquad]
\end{array}$$

$$\begin{array}{l}
\mathit{Init} \;\triangleq \\
\quad \land\ \mathit{TypeInvariant} \\
\quad \land\ \mathit{chan.ack} = \mathit{chan.rdy}
\end{array}$$

$$\begin{array}{l}
\mathit{Send}(d) \;\triangleq \\
\quad \land\ \mathit{chan.rdy} = \mathit{chan.ack} \\
\quad \land\ \mathit{chan}' = \\
\qquad\quad [\mathit{chan}\ \text{EXCEPT} \\
\qquad\quad\ \ !.\mathit{val} \;\; = d \\
\qquad\quad ,\ !.\mathit{rdy} = 1 - @ \\
\qquad\quad]
\end{array}$$

$$\begin{array}{l}
\mathit{Rcv} \;\triangleq \\
\quad \land\ \mathit{chan.rdy} \neq \mathit{chan.ack} \\
\quad \land\ \mathit{chan}' = [\mathit{chan}\ \text{EXCEPT}\ !.\mathit{ack} = 1 - @]
\end{array}$$

$$\mathit{Next} \;\triangleq\; (\exists\, d \in \mathit{Data} : \mathit{Send}(d)) \lor \mathit{Rcv}$$

$$\mathit{Spec} \;\triangleq\; \mathit{Init} \land \Box[\mathit{Next}]_{\mathit{chan}}$$

THEOREM $\mathit{Spec} \Rightarrow \Box\, \mathit{TypeInvariant}$

* Modification History
* Last modified *Fri Feb* 02 10:40:16 *CET* 2018 by *jordy*
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