

Dynamic go/no-go checker gauges pulse-width range

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Because it can determine if the width of a pulse falls between two specified limits, this circuit is useful in tasks like testing the dynamic performance of circuit cards. Using three integrated circuits—one dual monostable, one dual flip-flop, and a quad NAND gate—the circuit can be built for \$5. Three light-emitting diodes indicate instantly whether the pulse width is less than, within, or greater than the specified width, making the circuit ideal for the production line.

The positive edge of the pulse to be measured triggers one-shots A_1 and A_2 , whose resistor-capacitor time constants are set to provide a pulse equal to τ_{min} and τ_{max} , respectively. The input pulse, having width τ , is also

applied to the data (D) input of flip-flop A_3 .

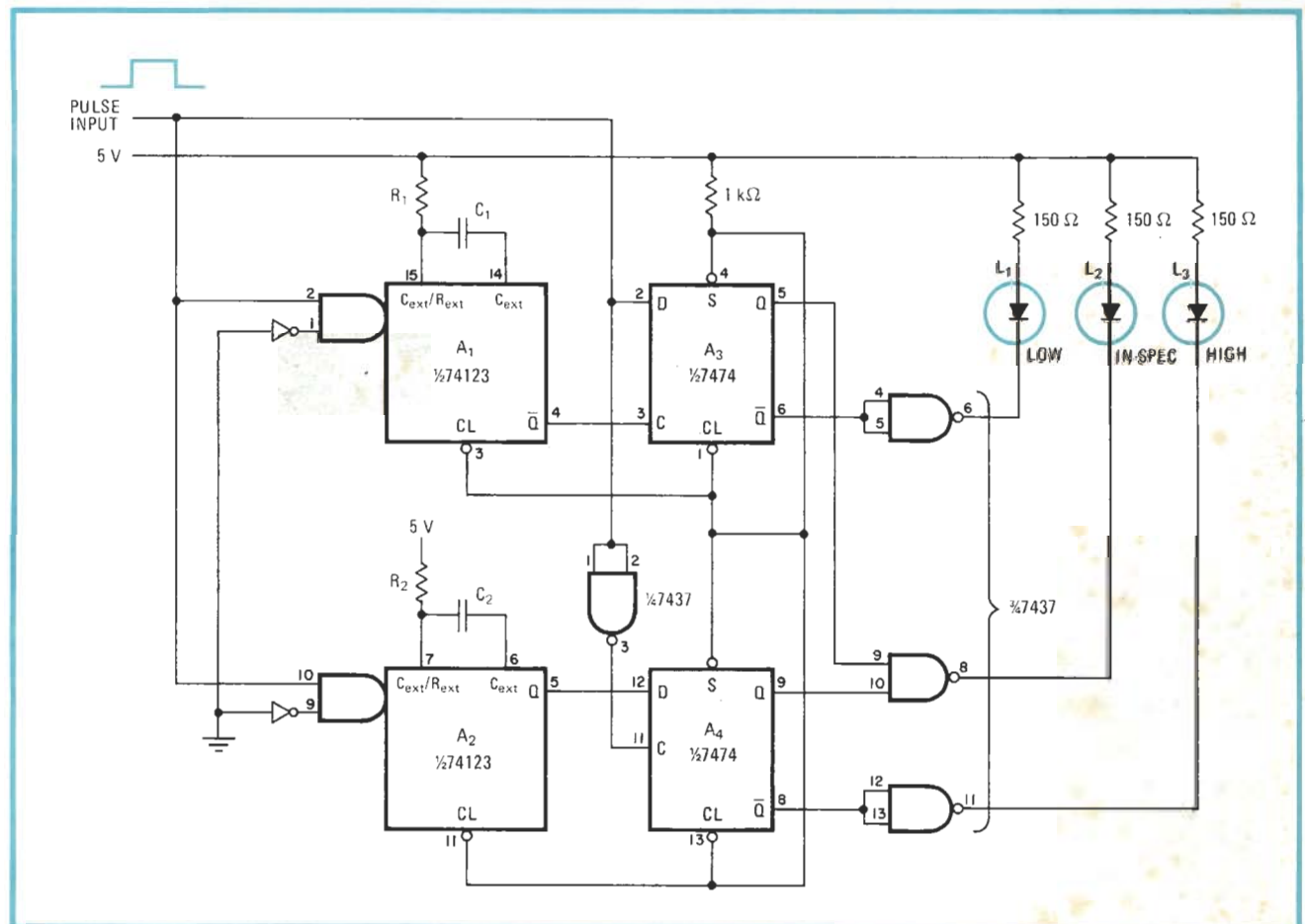
A_3 's clock input is driven by the \bar{Q} output of A_1 . Thus if $\tau < \tau_{min}$, there will be a logic 0 at the D input of A_3 at the time the rising edge of the \bar{Q} output of A_1 clocks A_3 . LED L_1 will then light, indicating the input pulse width is below the minimum value set, τ_{min} .

Similarly, the D input of flip-flop A_4 is driven by the Q output of one-shot A_2 , while the inverted pulse input serves to clock A_4 's C input. If $\tau > \tau_{max}$, LED L_3 will light, indicating the input pulse width is greater than the maximum value set, τ_{max} .

If τ lies between τ_{min} and τ_{max} , the Q outputs of both A_3 and A_4 will move high, activating the NAND gate connected to LED L_2 . This LED will then light. Note that it is not possible for more than one LED to be on at any given instant.

The circuit is self-resetting and can accept the next input pulse to be measured as soon as the one-shots time out. □

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Within limits. Circuit checks if width of test pulse is less than, within, or greater than two specified values, τ_{min} and τ_{max} . RC elements of one-shot A_1 set τ_{min} ; corresponding components of A_2 set τ_{max} . Three LED's provide instant and direct indication of pulse width range.