

# Maximum Toggle Frequency

From datasheet numbers and lab measurements:

$$f_{toggle} \cong (t_r + t_f + t_{P(LH)} + t_{P(HL)})^{-1}$$

Using **TLV3501** datasheet typical timings:

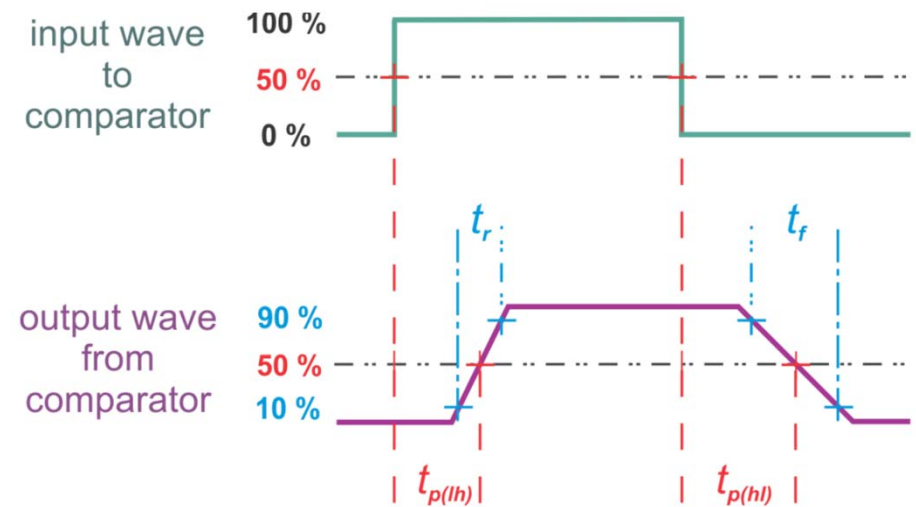
$$f_{toggle} \cong (1.5 \text{ ns} + 1.5 \text{ ns} + 4.5 \text{ ns} + 4.5 \text{ ns})^{-1} = \mathbf{83.3 \text{ MHz}}$$

- Datasheet lists  $f_{max(toggle)}$  as 80 MHz typical

Using **TLV3201** datasheet typical timings:

$$f_{toggle} \cong (2.9 \text{ ns} + 3.7 \text{ ns} + 43 \text{ ns} + 42 \text{ ns})^{-1} = \mathbf{10.9 \text{ MHz}}$$

- Verified in lab to be about 10 MHz
- Recommend adding a 20-30% margin to allow for device to device variations.



Comparator input to output timing relationships