



EE254

Project 3

11/18/13

Schmitt Trigger Design and Testing

The design
LM741 Op
given then

Specificati

V
V

The values
detection te

section. V_{REF} was also calculated and used to obtain the required results. The circuit was simulated in microcap and results run in matlab and then plotted as shown in figure 2 were obtained.

The input and output waveforms for the circuit shown in figure 1 were saved and are shown in figure 3.

mod
7.32

V_{TH}
 V_{RE}

dow

The
calc
volt

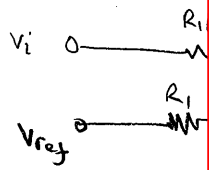
scilloscope
 $-V_{TL} =$
e expected

V was noted

gn
he required

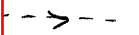
From the zero crossing detection test, the values of $V_H = 8.14V$ and $V_L = -6.8$ were obtained which matched the values obtained from the experimental values shown in figure 5.

CALCULATION SECTION



age transfer

$V_{TH} = 6V$ V_I



$$V_{TH} = 8.14V$$

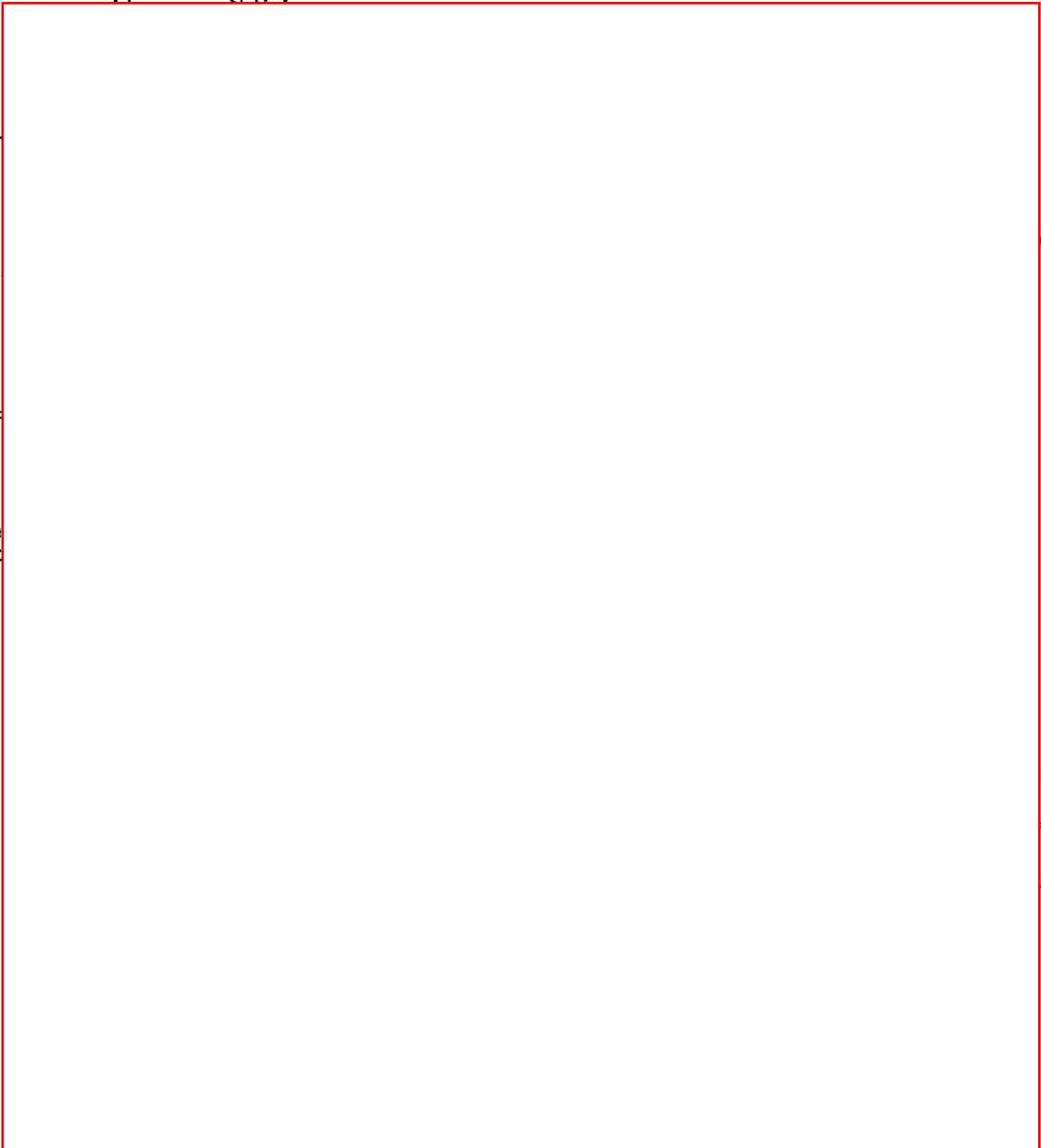
$$V_{I} = -6.8V$$

V_{TH}

V_{I}

$V_i =$

① - ②



V_o

R_{TH}



Simulation and Plots

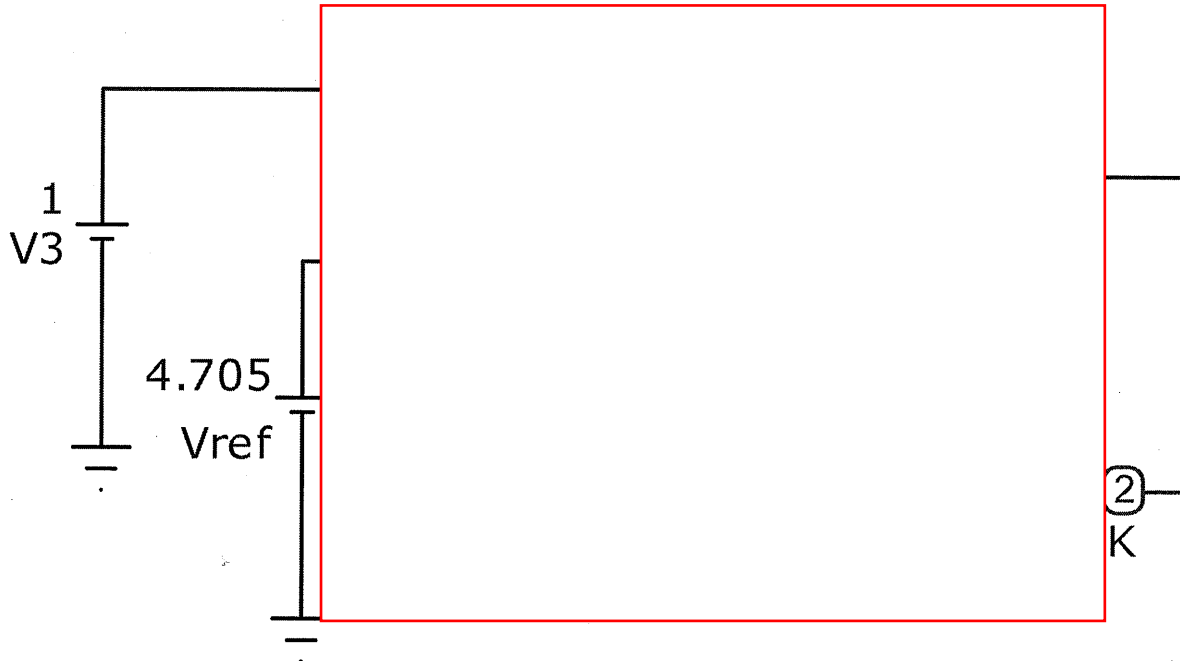


Figure 1: Schmitt trigger positive feedback circuit design

clear all



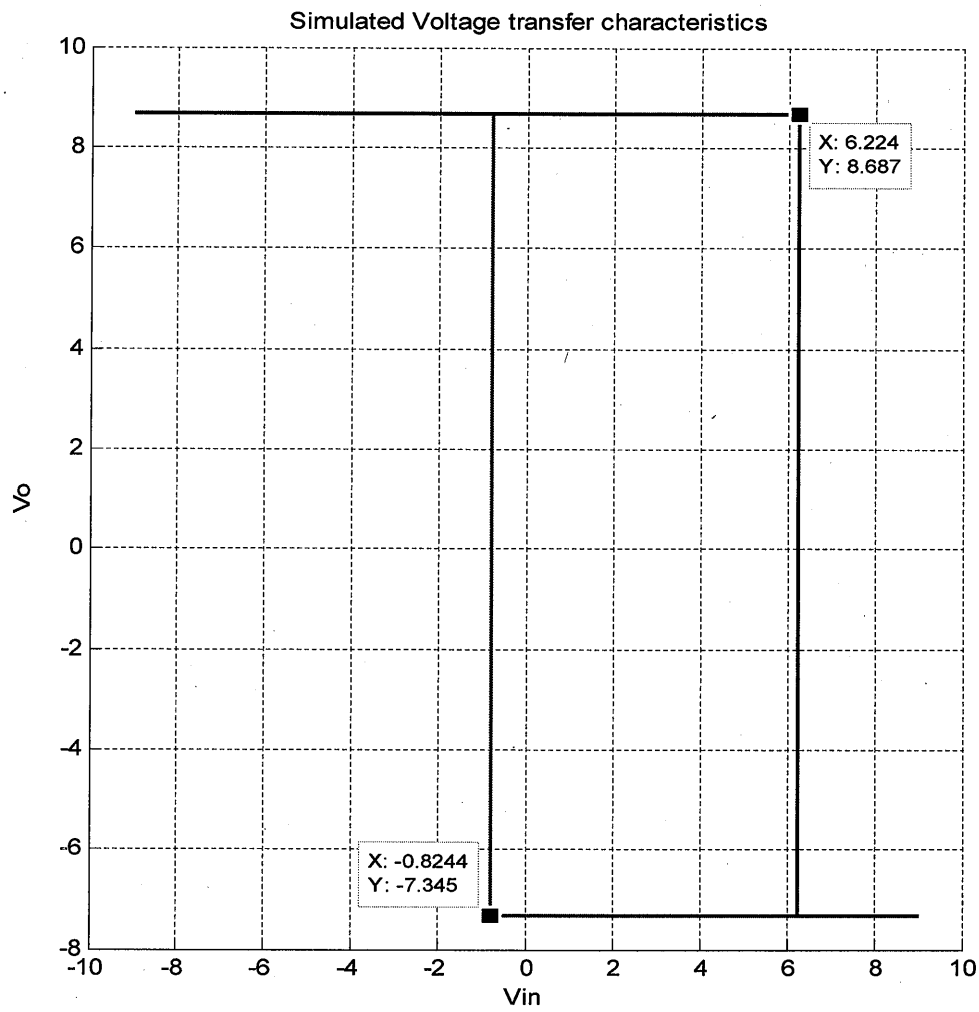


Figure 2: Simulated voltage transfer characteristics

RESULTS AND PLOTS

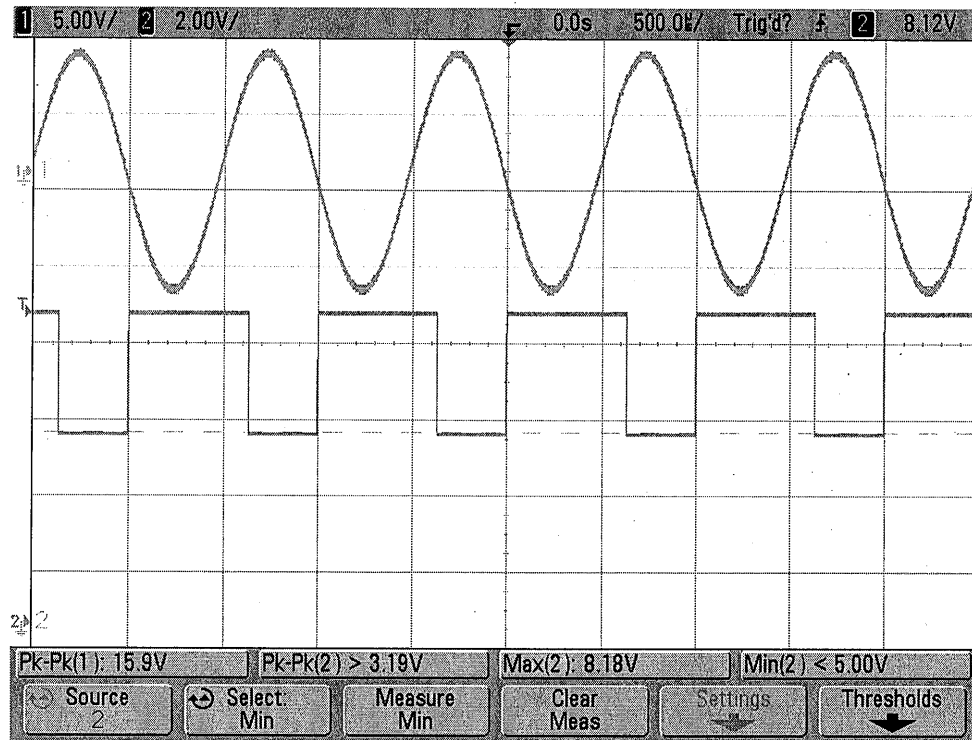


Figure 3: Schmitt trigger input and output measurements

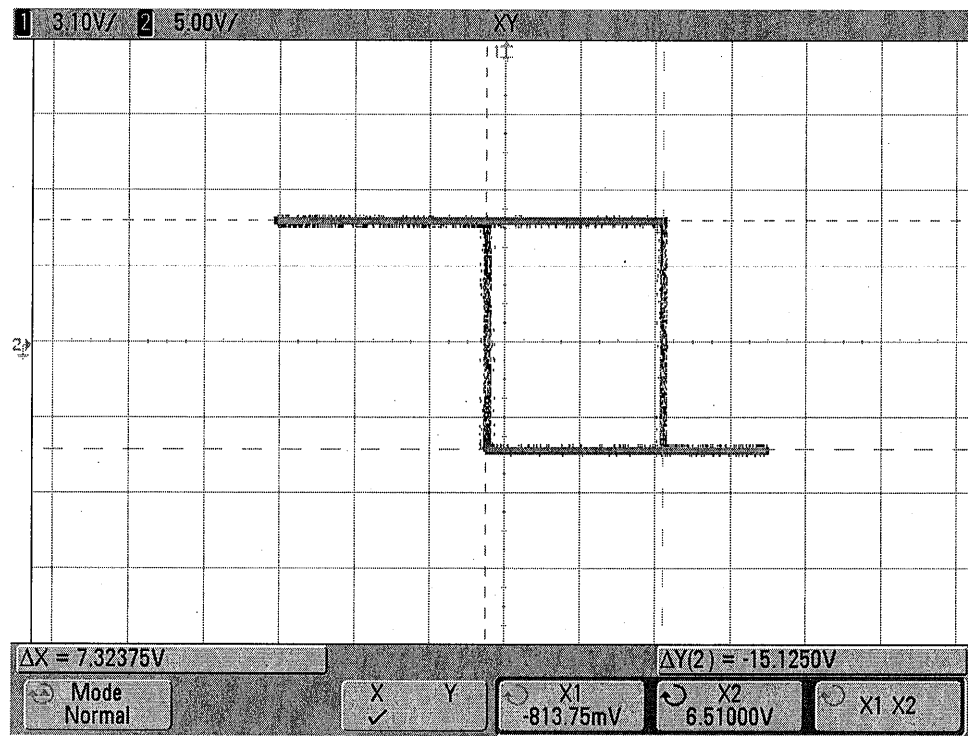


Figure 4: Schmitt trigger operation using the X-Y oscilloscope mode

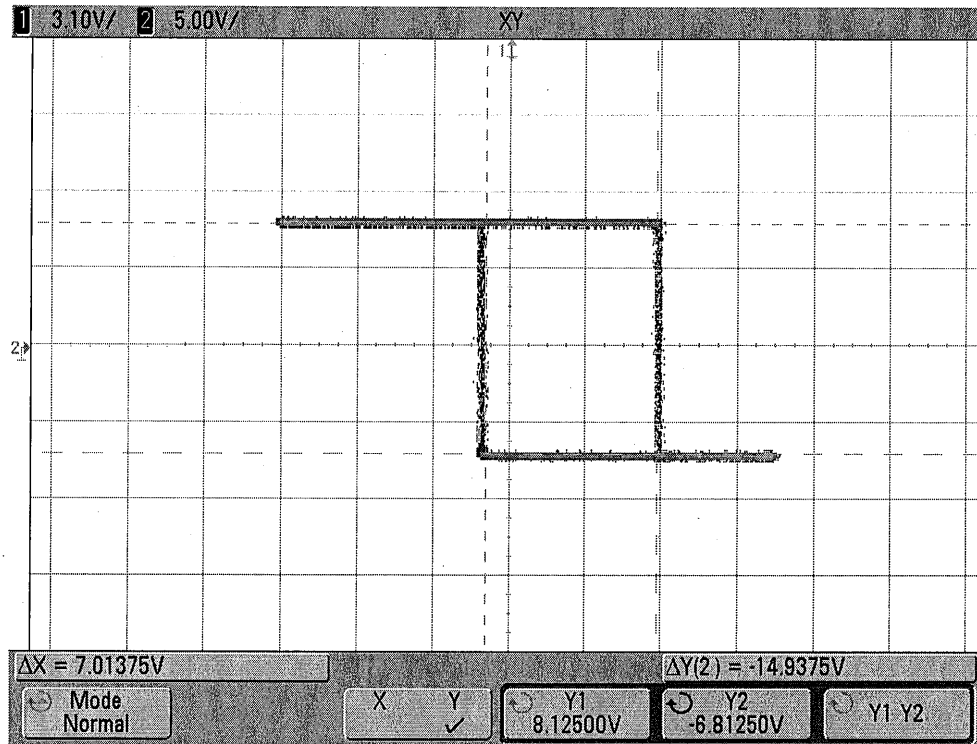


Figure 5: The V_H and V_L were obtained as 8.1250V and -6.8125V respectively

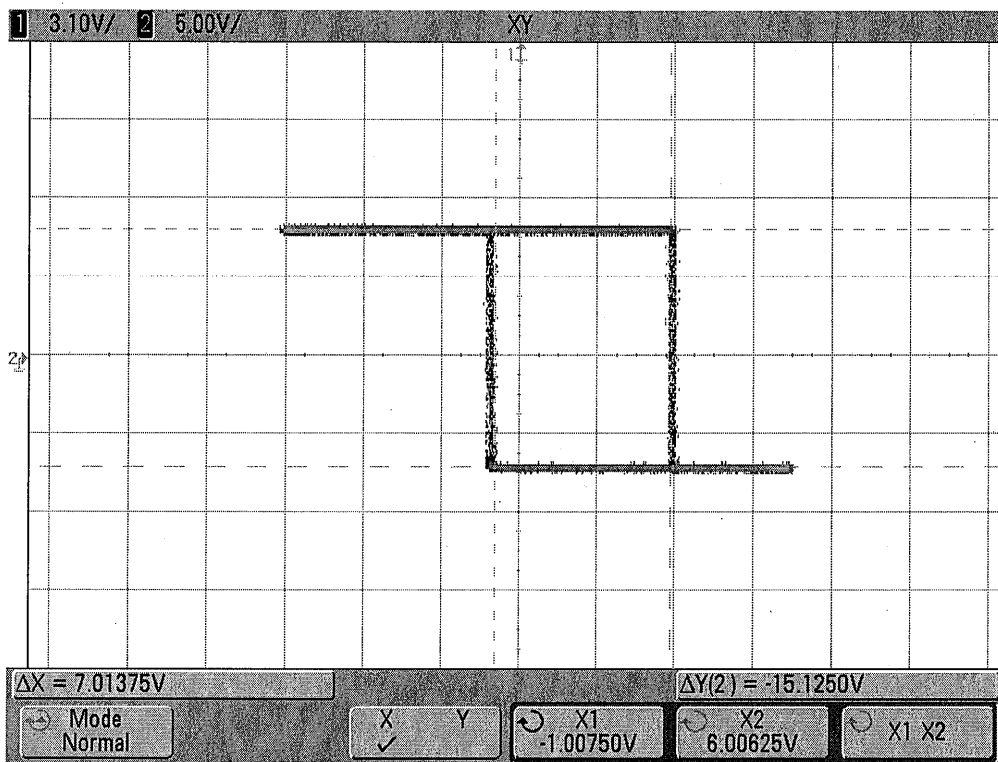


Figure 6: The V_{REF} was adjusted to 4.0V and the expected V_{TH} and V_{TL} values of 6.0V and -1.0V respectively were observed