

## EE232 Exp. #3 Diode Applications Report #3

## COURSE LECTURER:

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Prepared by

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## CAUTIONARY REMARK: All questions will be answered in the assigned blanks. Don't use extra place for the answers due to the fact that they are not guaranteed to be evaluated.

Part 1--Introduction: Explain the main objective of the first experiment on your own words. (10pt)

**Part 2--Procedure: a) Rectifier Basics:** Consider the following circuits in Figure.1 and 2. Plot outputs for each circuit. (Assume that sinusoidal input with period T.) Give mathematical expressions of average and rms values of the outputs. Compare these values between each other. Which one of the following circuits is more efficient? Explain (25pt)



Figure.2

**b)** Solve the following circuit using linear diode model. Take as  $r_d = 30\Omega$ ,  $V_{on} = 0.7V$ ,  $R_1 = 1k$ ,  $V_{in} = 8V_{pp}@1kHz$  and  $V_{S1} = 1.5V$ . Compare your calculation result with measured result in the 6.step during the lab by giving your oscilloscope screen output. If there are some differences, explain them. (15pt)



Figure.3

c) Solve the following circuit using linear diode model. Take as  $r_d = 30\Omega$ ,  $V_{on} = 0.7V$ ,  $R_1 = 2.2k$ ,  $V_{in} = 8V_{pp}@1kHz$  and  $C_1 = 1uF$ . Compare your calculation result with measured result in the 11.step during the lab by giving your oscilloscope screen output. If there are some differences, explain them. (15pt)







d) Consider Figure.5 below. Plot output. Assume that diode is linear diode with  $r_D$  inner resistance. Which conditions should be satisfied regarding ' $\tau$ ' time constant during charging and discharging mode of the capacitance to obtain clean output without perceivable distortion? (Assume that input in the Figure 5 is square wave between +4V and -6V with T period.(15pt)



Figure.5



**Part-3--Conclusion:** Conclude your report with your learning from this experiment on your own words. Moreover, you can discuss or criticize some over-expected or under-expected sides of the experiment. (10pt)

Part-4--References: If you have referred parts, specify their references below. (10pt)