

# TRANSMISSION GATE DESIGN, SIMULATION AS WELL AS ANALYSIS

Jesus Adame and Ridge Tejuco

California State University, Northridge, College of Engineering and  
Computer Science, Electrical and Computer Engineering Department  
jesus.adame.846@my.csun.edu, ridge.tejuco.881@my.csun.edu

## Abstract:

In this experiment, we will be exploring how a transmission gate works and how it behaves like a switch. We will build a transmission gate with CMOS and create sample inputs and hold the inputs. Cases with sinusoidal ramp, and triangle inputs will be implemented.

## Keywords:

CMOS, NMOS, PMOS, Transmission Gate

## 4.1 INTRODUCTION

Transmission gates are created by having PMOS and NMOS in parallel. It allows data to pass through, or block, like a switch.

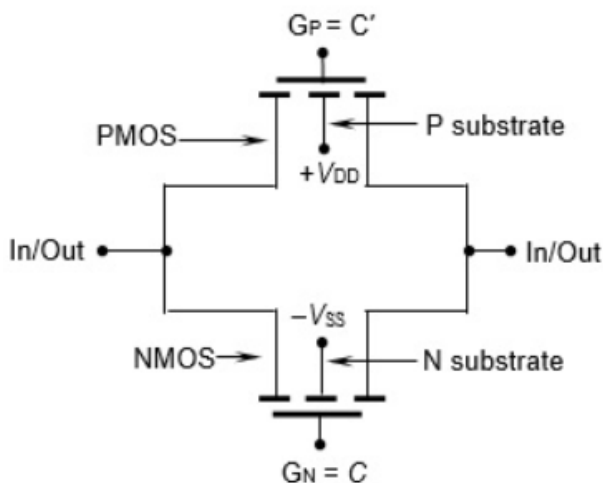


Fig. 4.1 CMOS transmission gate Circuit

## 4.2 PROCEDURES, SIMULATION AND EXPERIMENTAL SET-UP

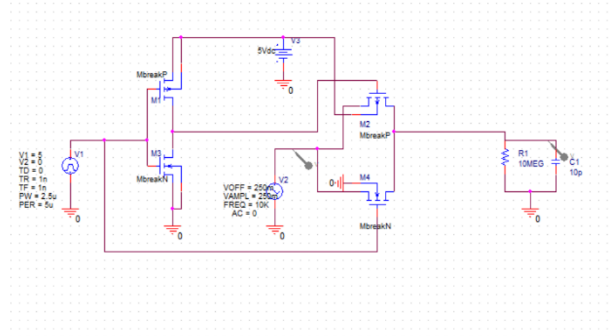


Fig. 4.2 Case 1: 10KHz Sinusoidal Transmission Gate

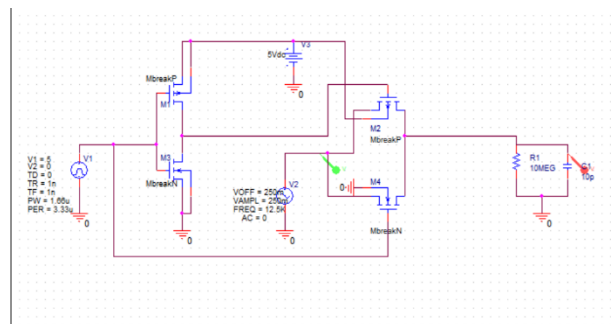


Fig. 4.3 Case 2: 12.5KHz Sinusoidal Transmission Gate

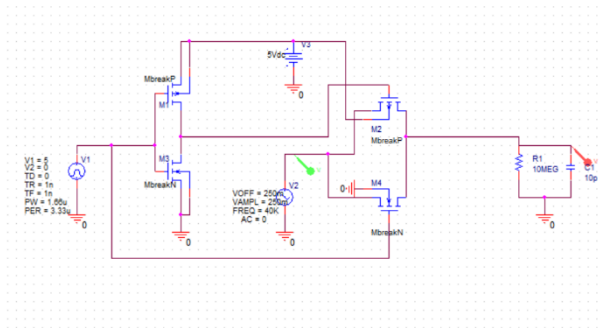


Fig. 4.4 Case 3: 40KHz Sinusoidal Transmission Gate

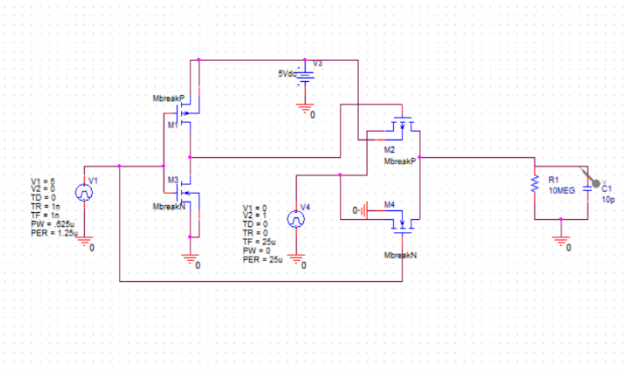


Fig. 4.5 Case 4: Ramp Transmission Gate

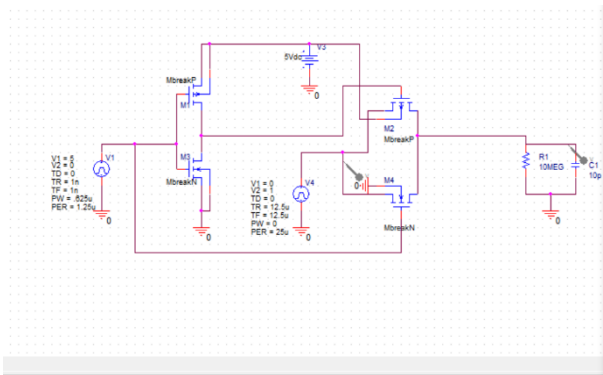


Fig. 4.6 Case 4: Triangle Transmission Gate

## 4.3 SIMULATION AND EXPERIMENTAL RESULTS

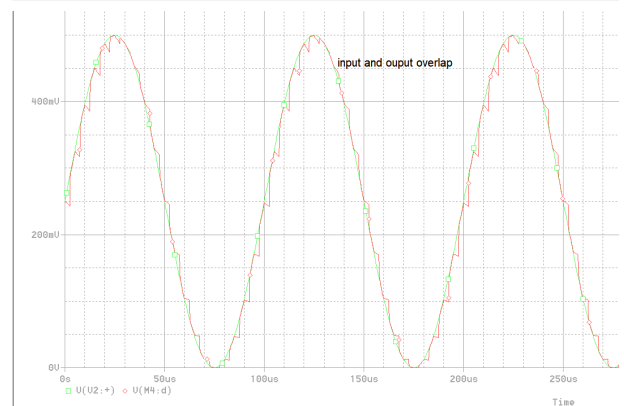
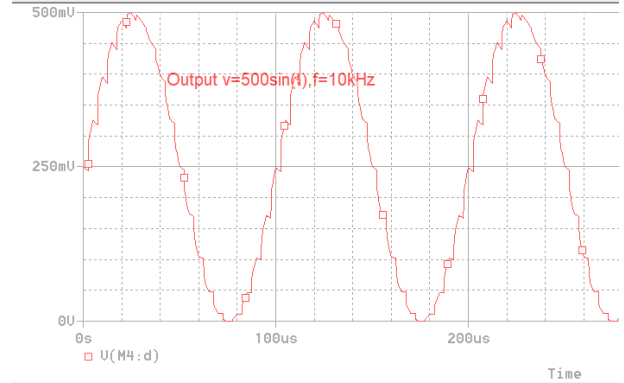
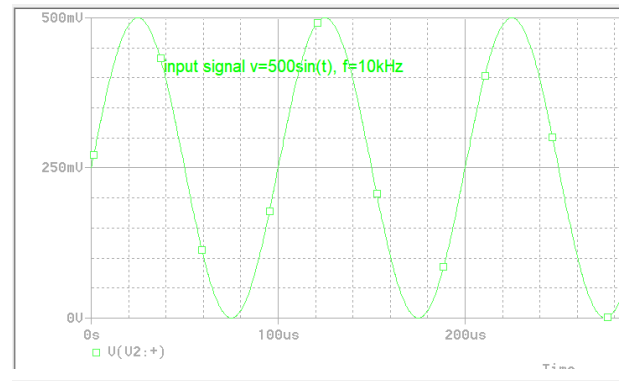


Fig. 4.7 Case 1: 10KHz Sinusoidal Transmission Gate

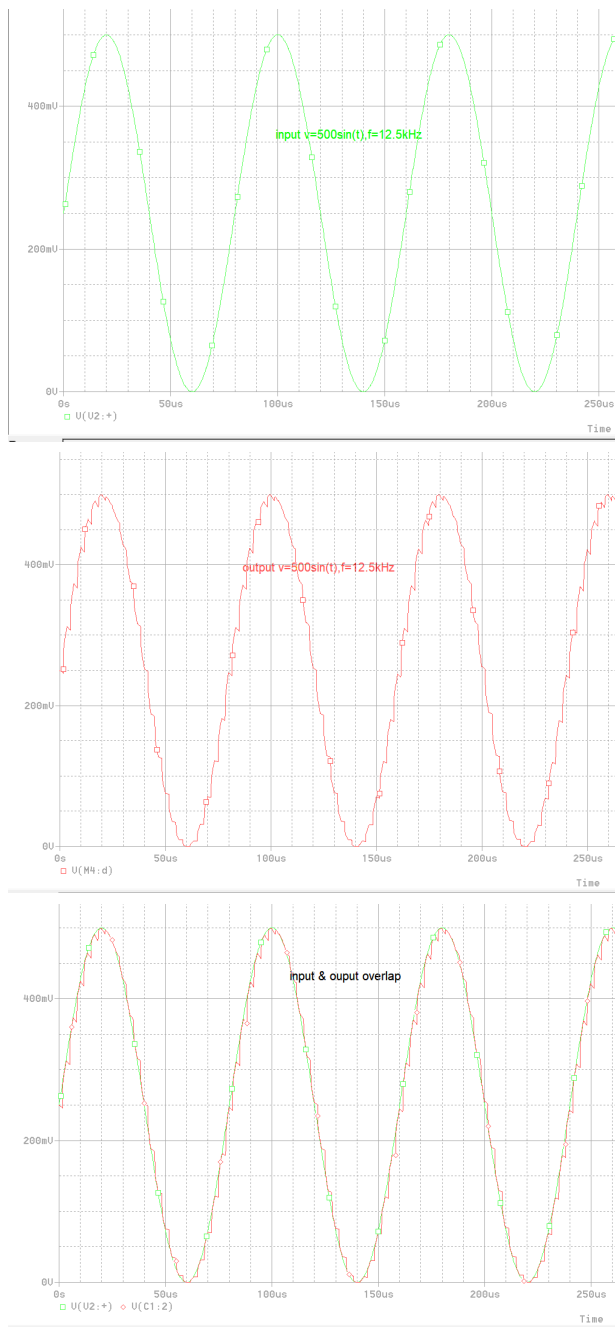


Fig. 4.8 Case 2: 12.5KHz Sinusoidal Transmission Gate

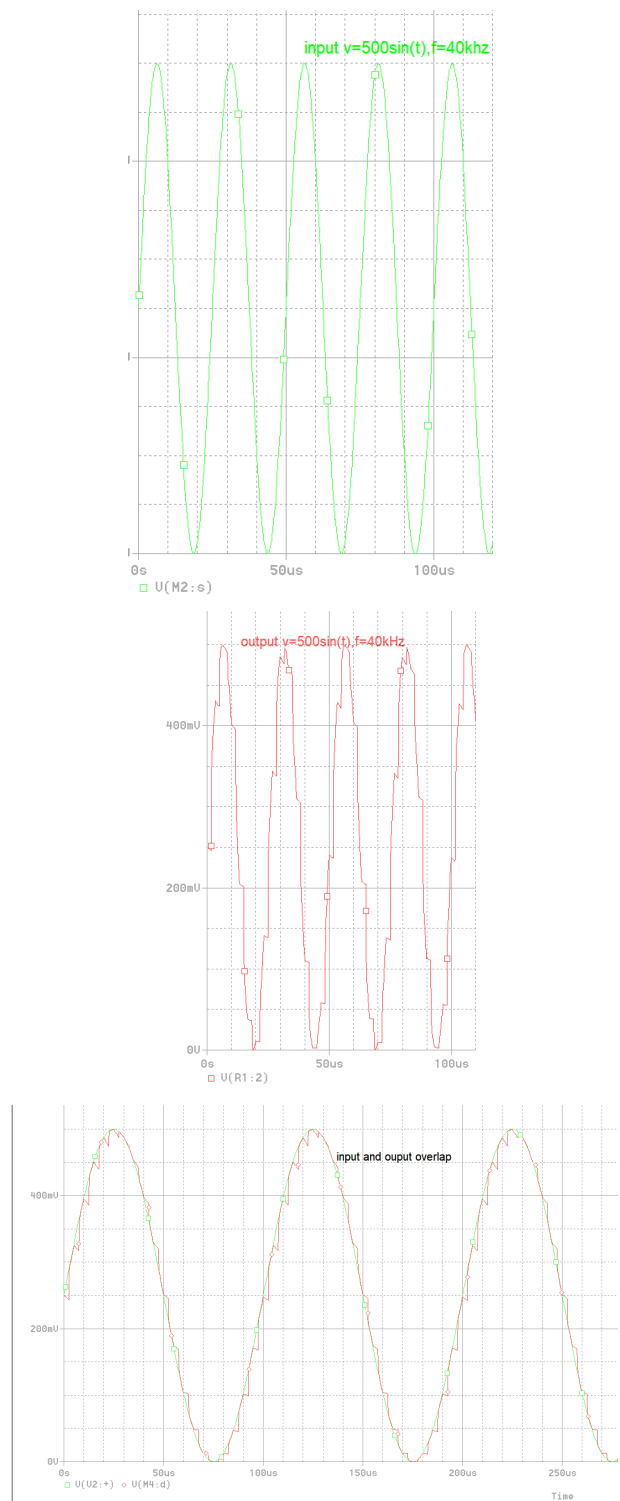


Fig. 4.9 Case 3: 40KHz Sinusoidal Transmission Gate

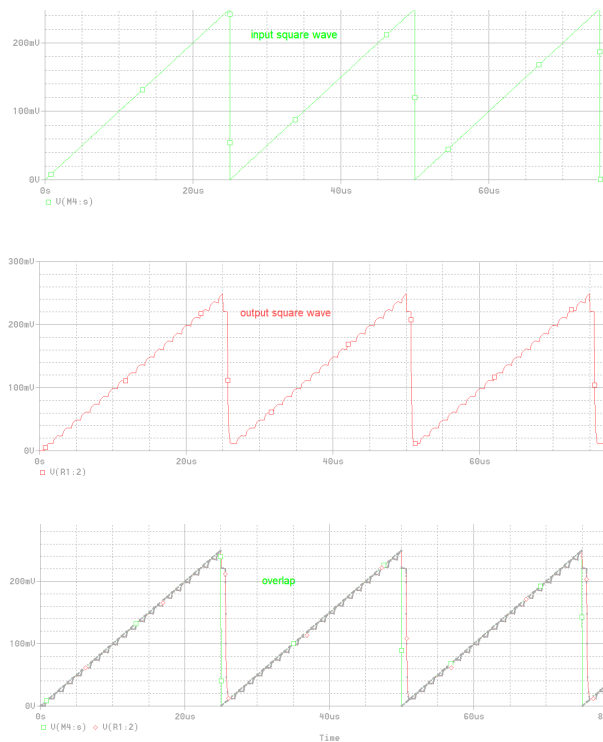


Fig. 4.10 Case 4: Ramp Transmission Gate

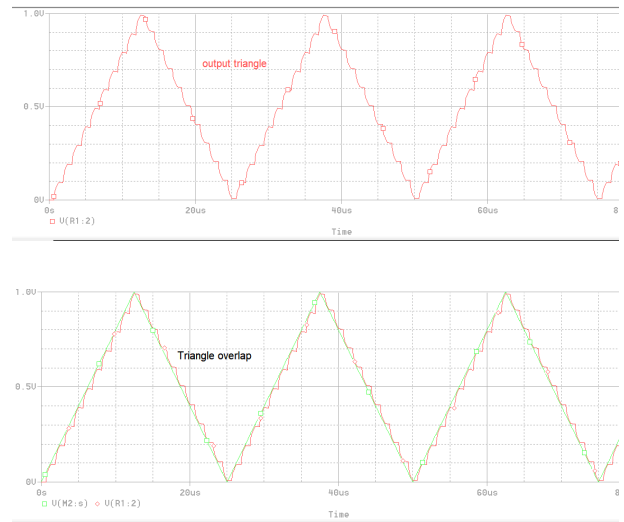
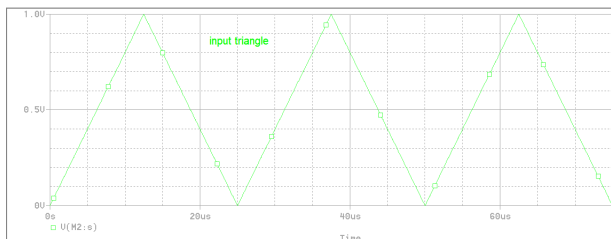


Fig. 4.11 Case 5: Triangle Transmission Gate

#### 4.4. DISCUSSION AND CONCLUSION:

All in all, the fourth lab utilized a transmission gate where it can be used as a pseudo switch. Sample data was allowed to pass through the circuit and other data was to be blocked. When different voltage sources were used then we were able to see different outputs and their functionality.

#### REFERENCES

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