

Preethis ROIC analysis

Kees Kroep 4246373

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1 setup

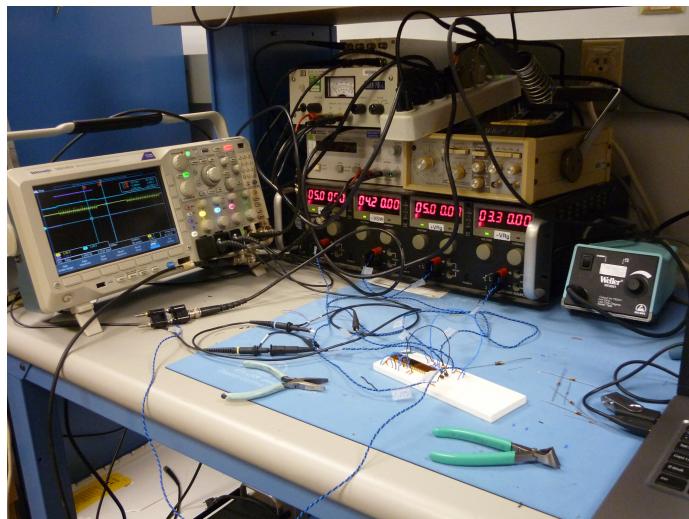


Figure 1: setup overview

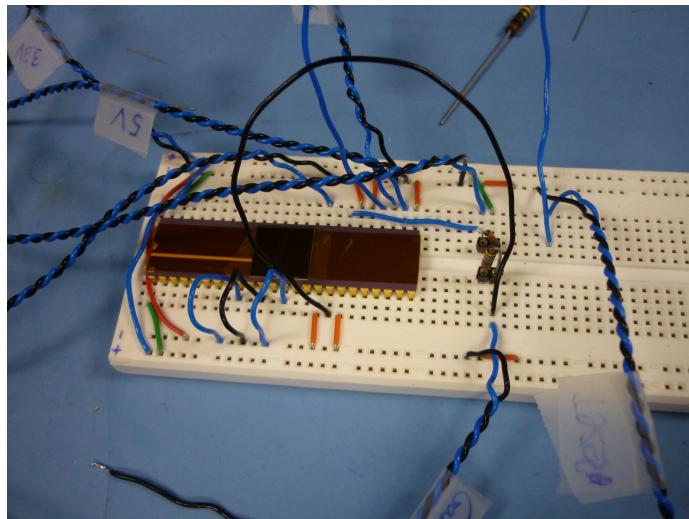


Figure 2: close-up

2 grounded versus floating

This test addresses the effect of a grounded input versus a floating input. Rst1=Rst2=0. The behavior of the floating channel changes dramatically based on the voltage used to power VDD_{HV} . When the input is grounded, the output is not affected by the voltage on the VDD_{HV} . This is illustrated below.

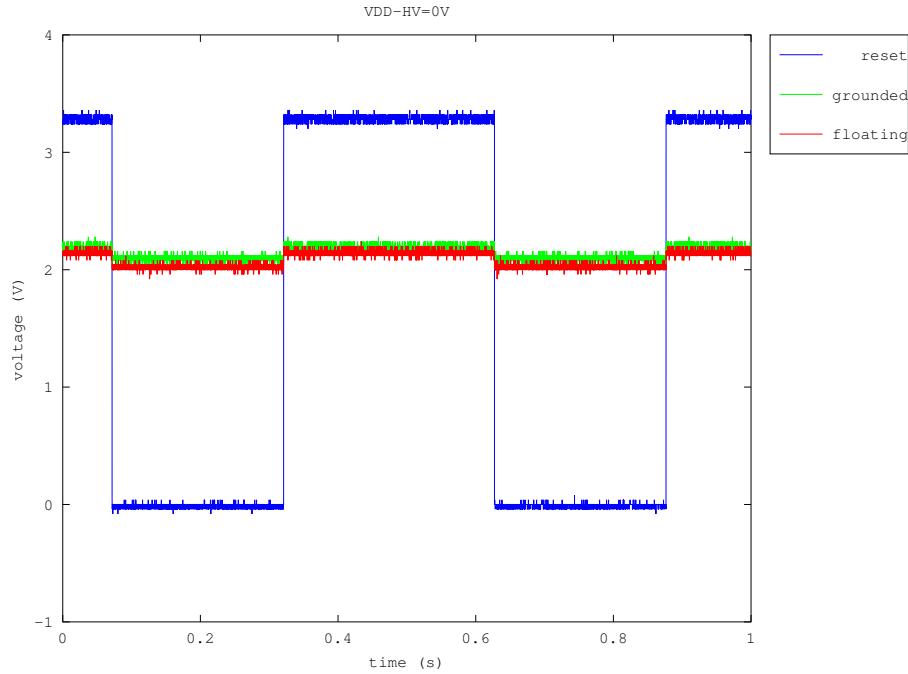


Figure 3: floating versus grounded. $VDD_{HV} = 0 V$

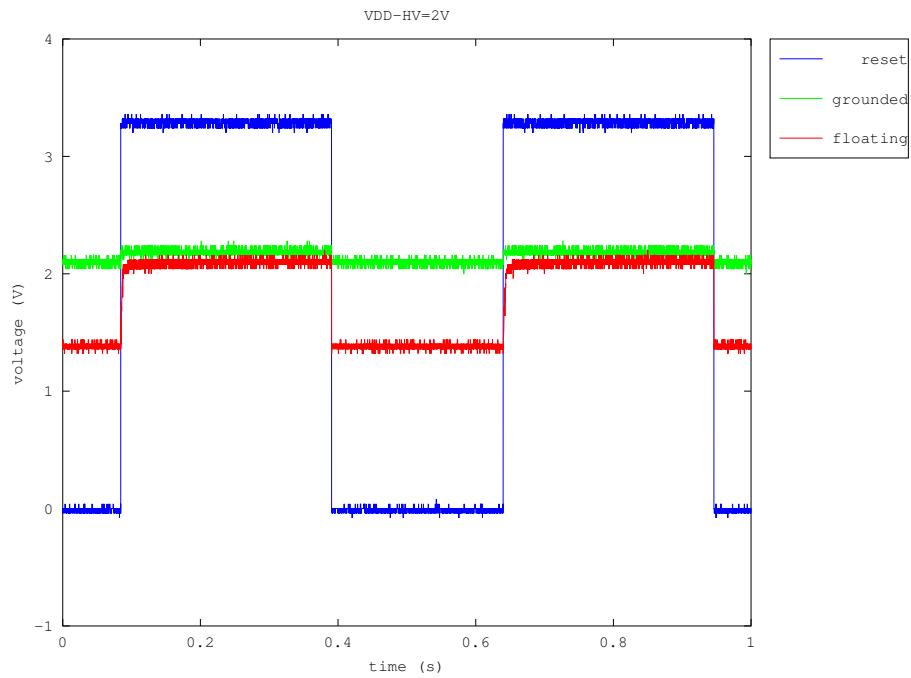


Figure 4: floating versus grounded. $VDD_HV = 2\text{ V}$

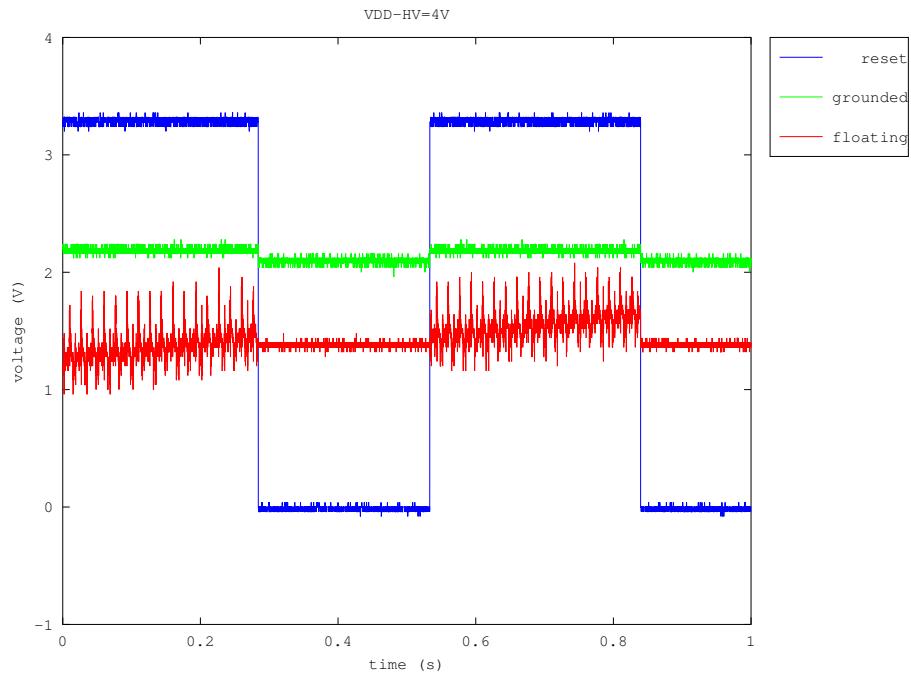


Figure 5: floating versus grounded. $VDD_HV = 4\text{ V}$

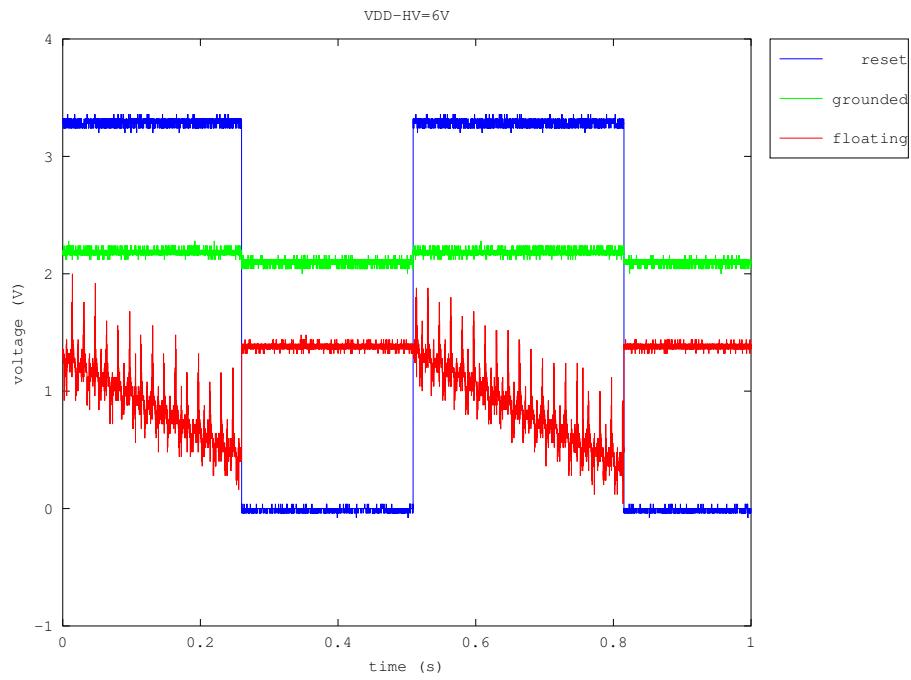


Figure 6: floating versus grounded. $VDD_HV = 6\text{ V}$

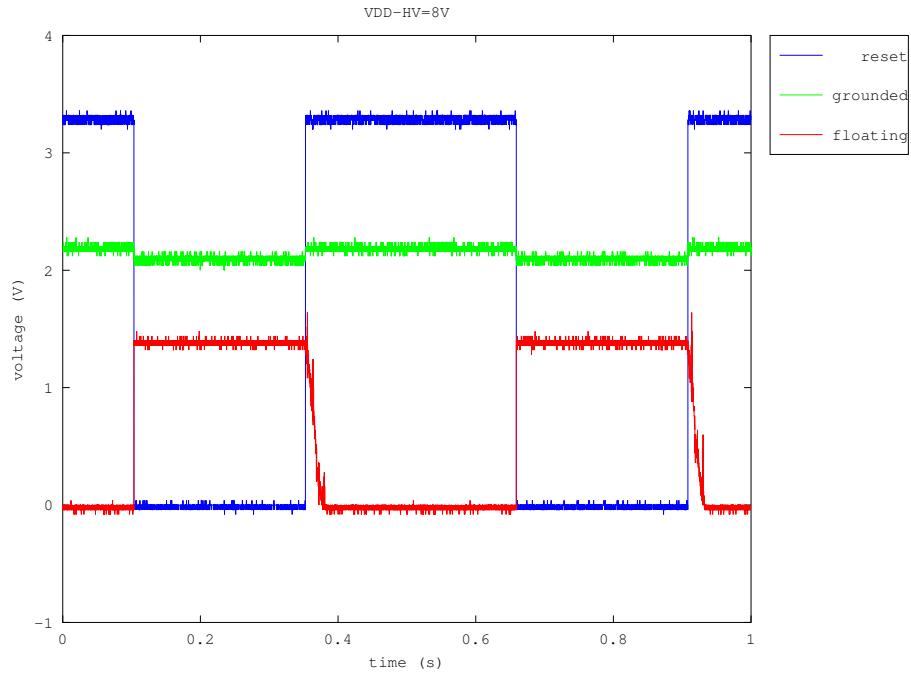


Figure 7: floating versus grounded. $VDD_HV = 8\text{ V}$

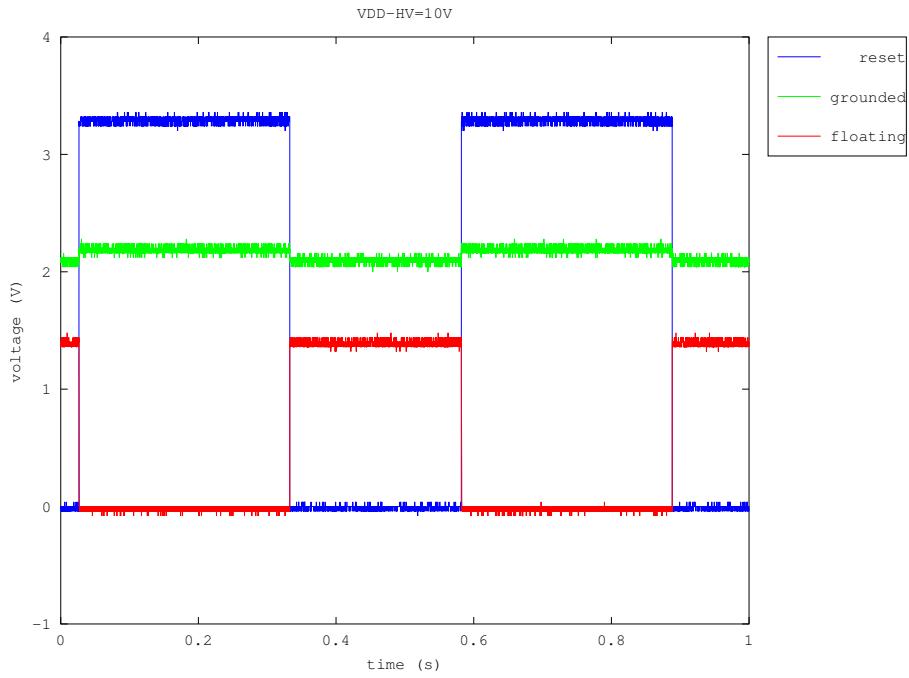


Figure 8: floating versus grounded. $VDD_HV = 10V$

3 input vs output

This test addresses the relationship between input and output. $Rst1=Rst2=0$ V. The input is a voltage source in series with a transistor of $20 M\Omega$. The $VDD_HV = 4.5V$. In this particular set-up the relationship between the input and output does not behave as (I) expected. There is no difference in performance for the input voltage $< 2.2V$ and $> 2.6V$. The performance of the input voltage between 2.2 and $2.6V$ are shown below.

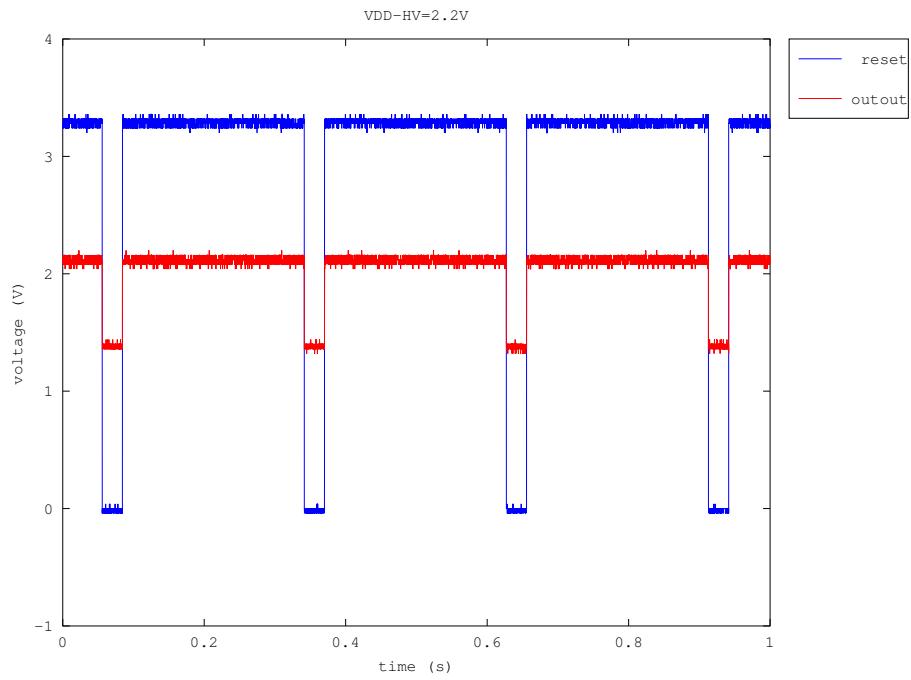


Figure 9: output of channel with constant input current. $VDD_HV = 2.2\text{ V}$

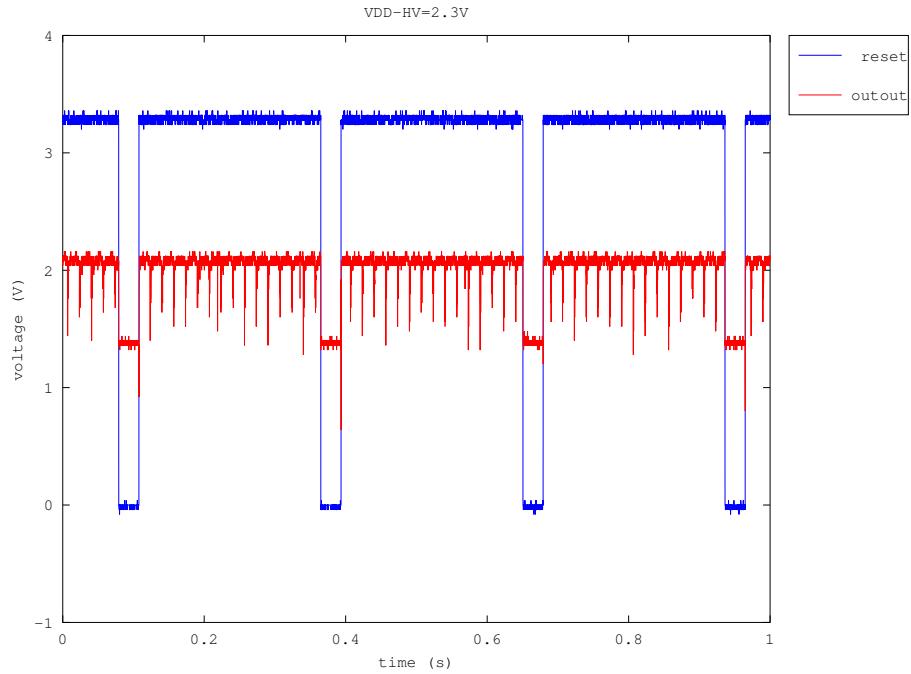


Figure 10: output of channel with constant input current. $VDD_HV = 2.3\text{ V}$

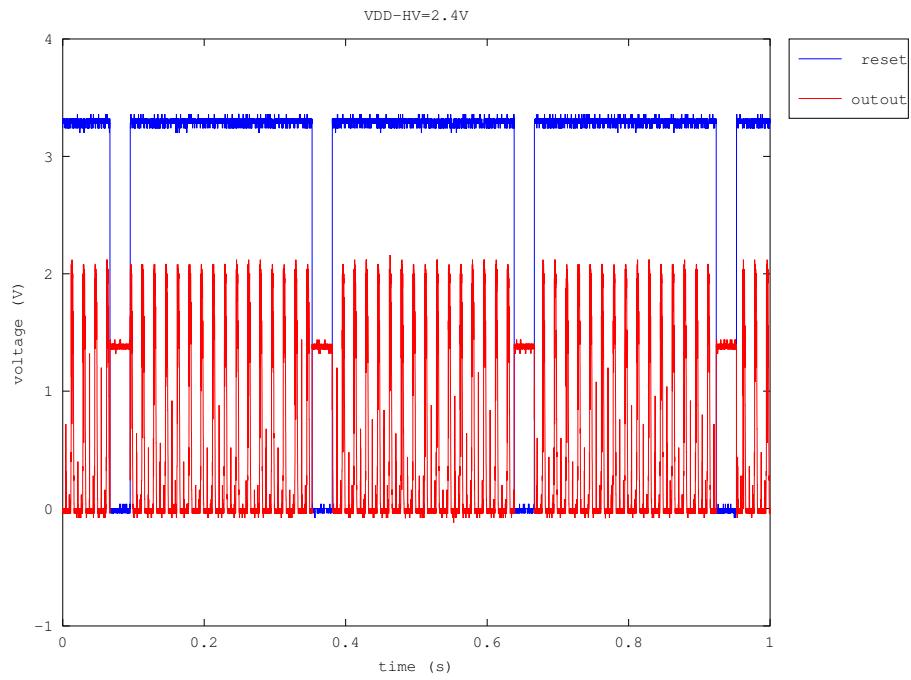


Figure 11: output of channel with constant input current. $VDD_HV = 2.4\text{ V}$

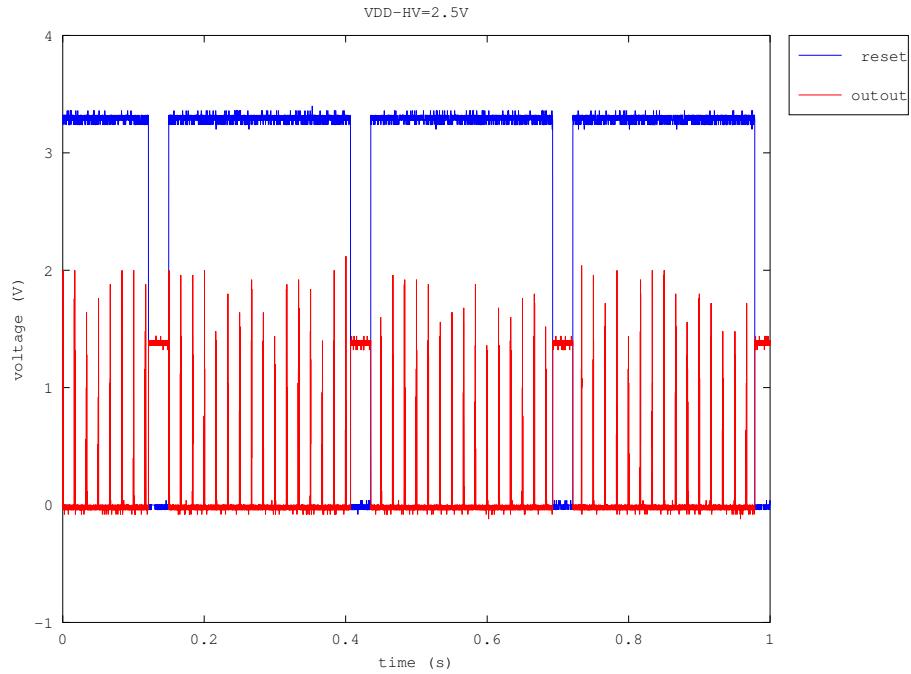


Figure 12: output of channel with constant input current. $VDD_HV = 2.5\text{ V}$

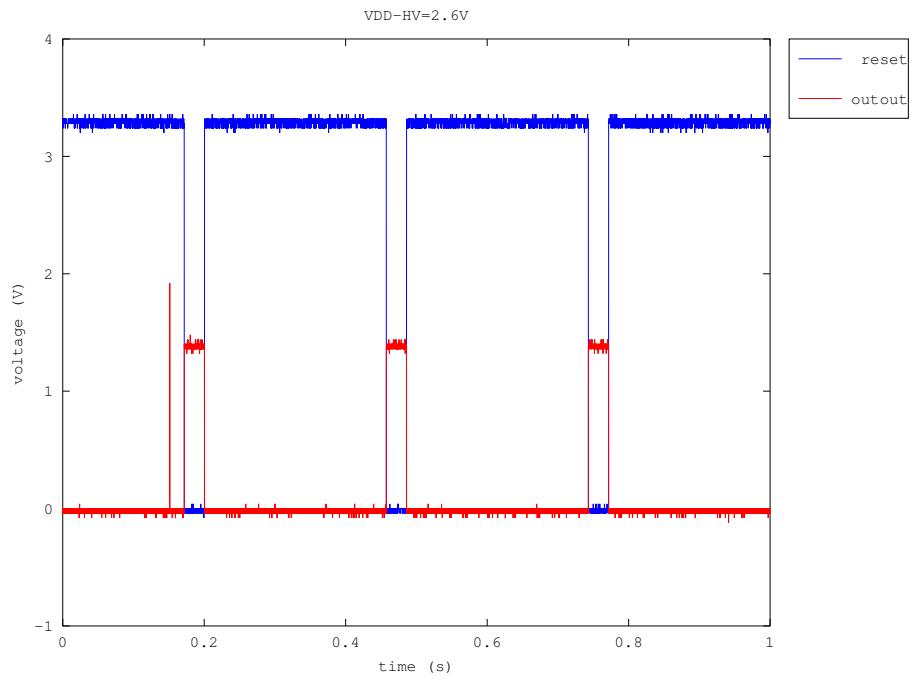


Figure 13: output of channel with constant input current. $VDD_HV = 2.6\text{ V}$

4 VB

This test addresses the effect of the voltage limiter. Both the output and VB of a channel are observed under varying input voltages. The test results show that the VB rises to approximately 2 V and then stops rising.

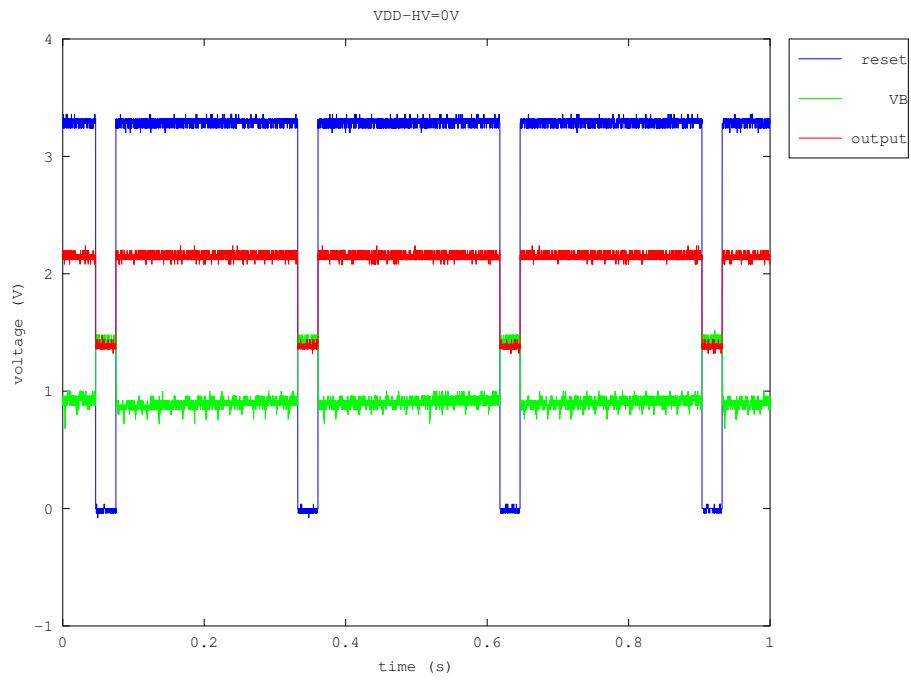


Figure 14: VB and output for $VDD_HV = 0V$

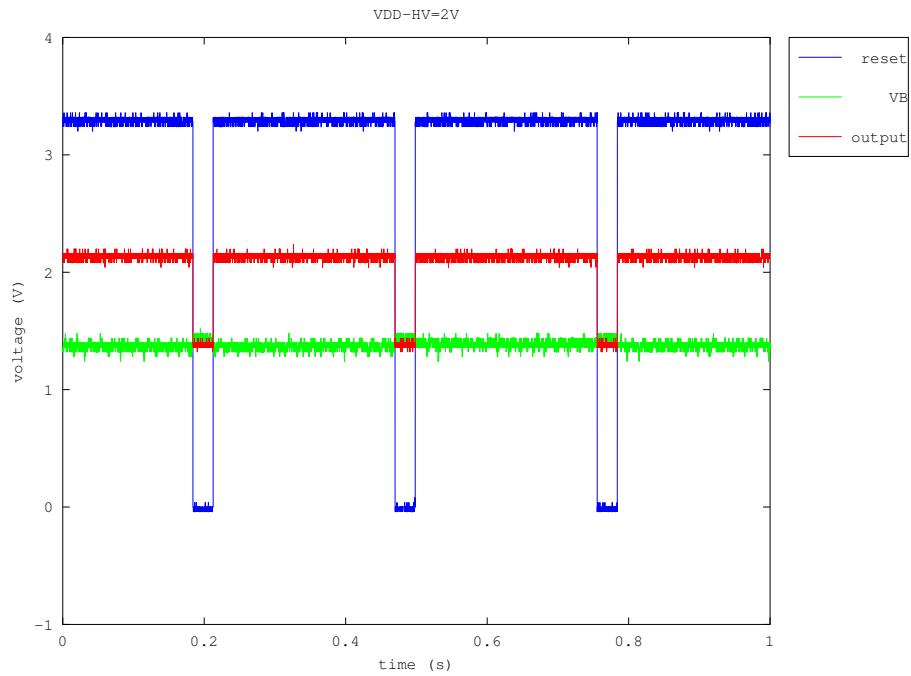


Figure 15: VB and output for $VDD_HV = 2V$

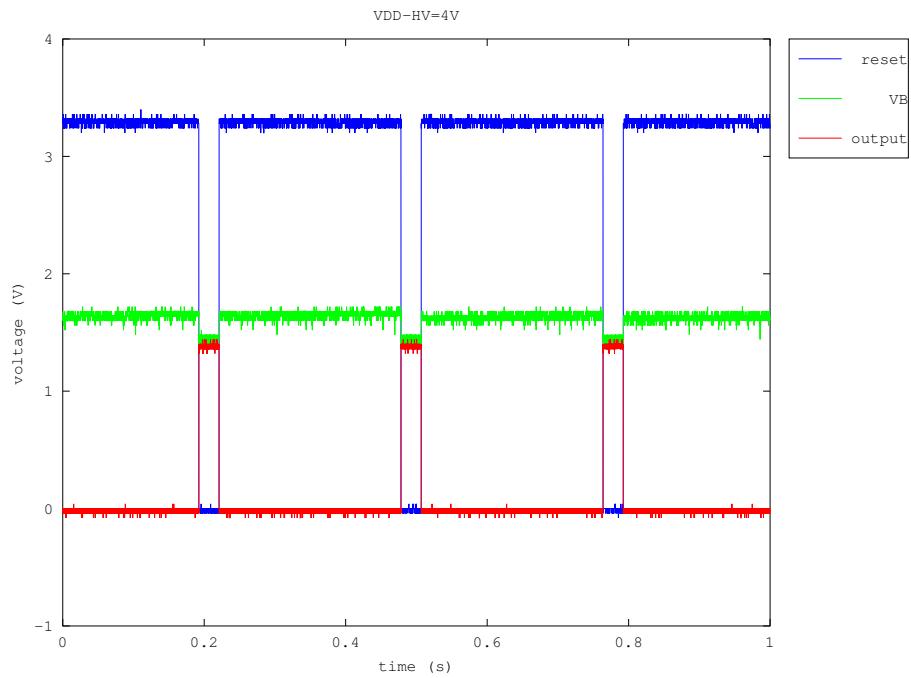


Figure 16: VB and output for $VDD_HV = 4\text{ V}$

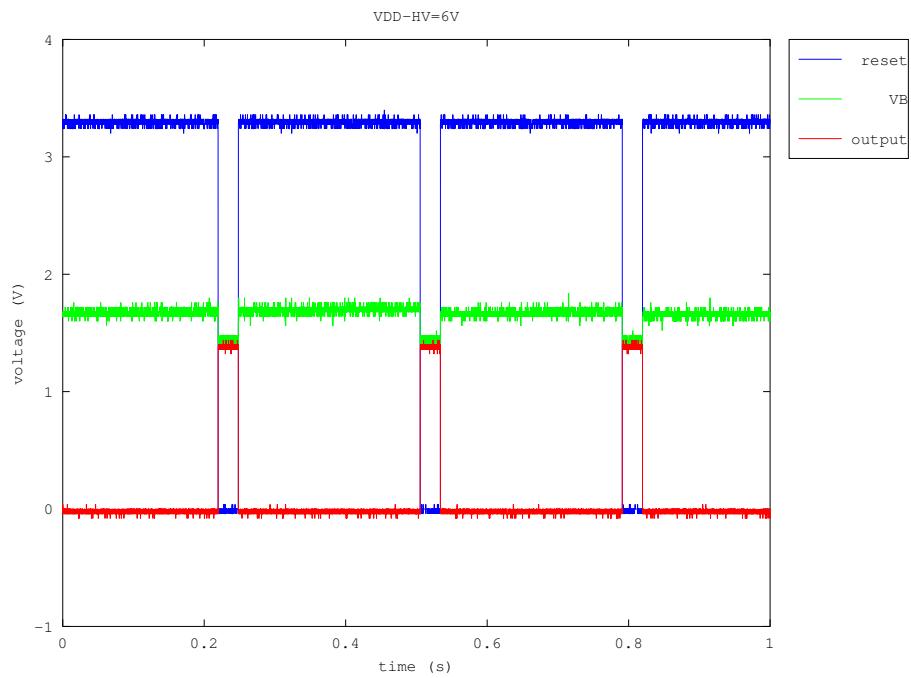


Figure 17: VB and output for $VDD_HV = 6\text{ V}$

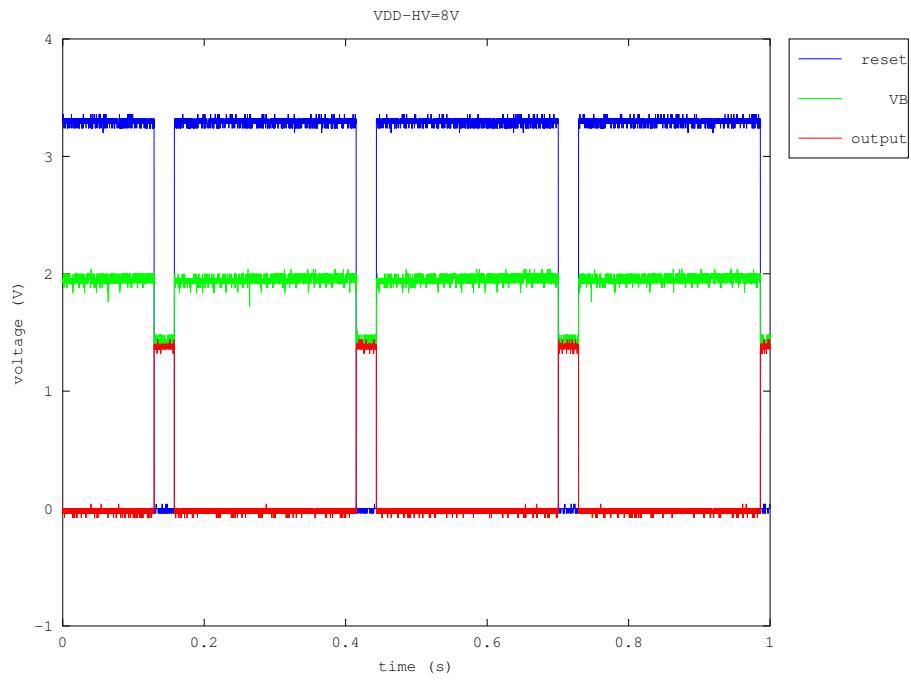


Figure 18: VB and output for $VDD_HV = 8V$

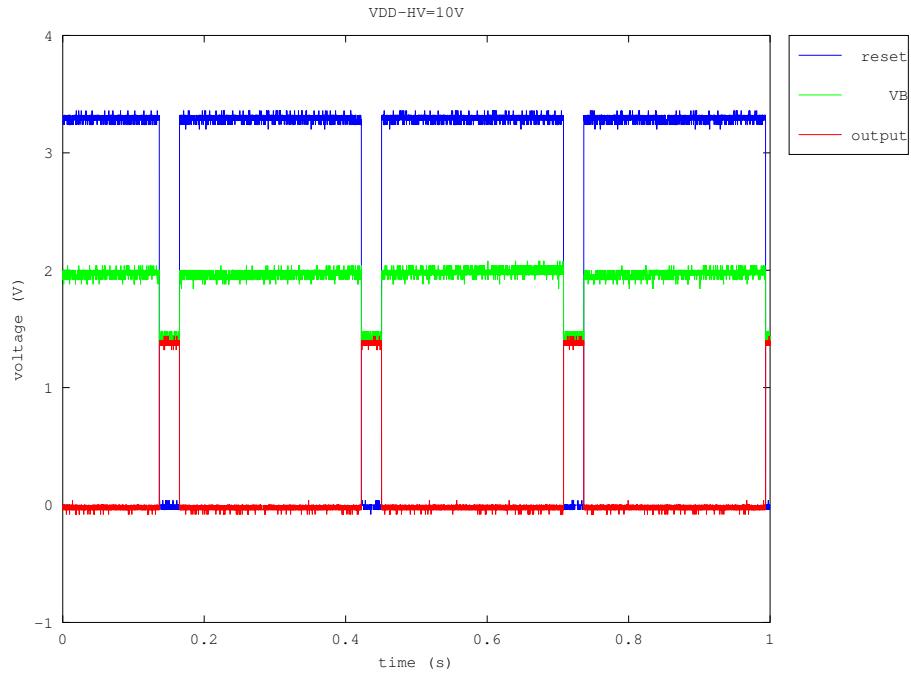


Figure 19: VB and output for $VDD_HV = 10V$

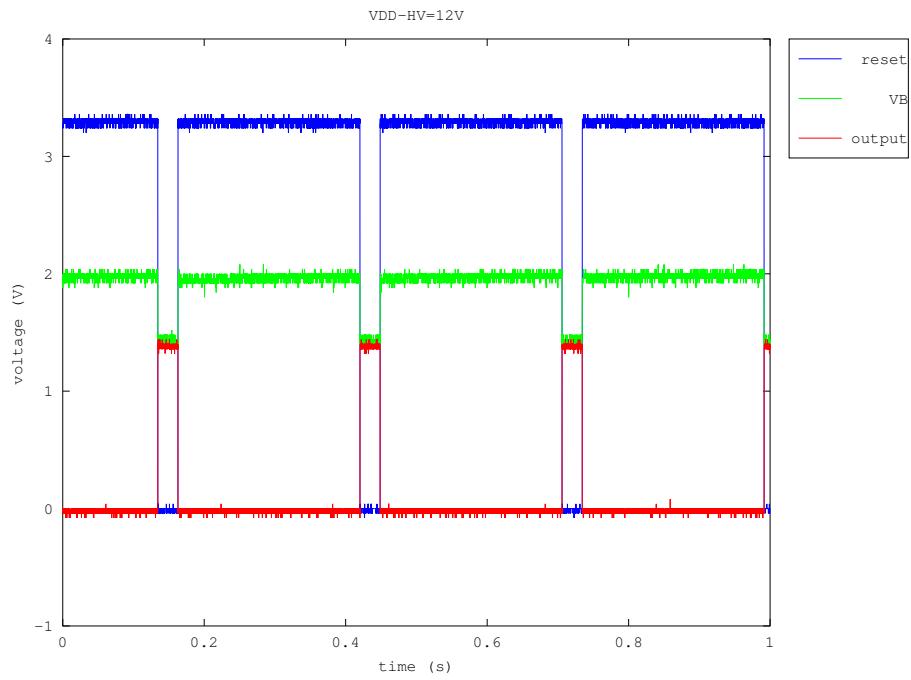


Figure 20: VB and output for $VDD_HV = 12\text{ V}$

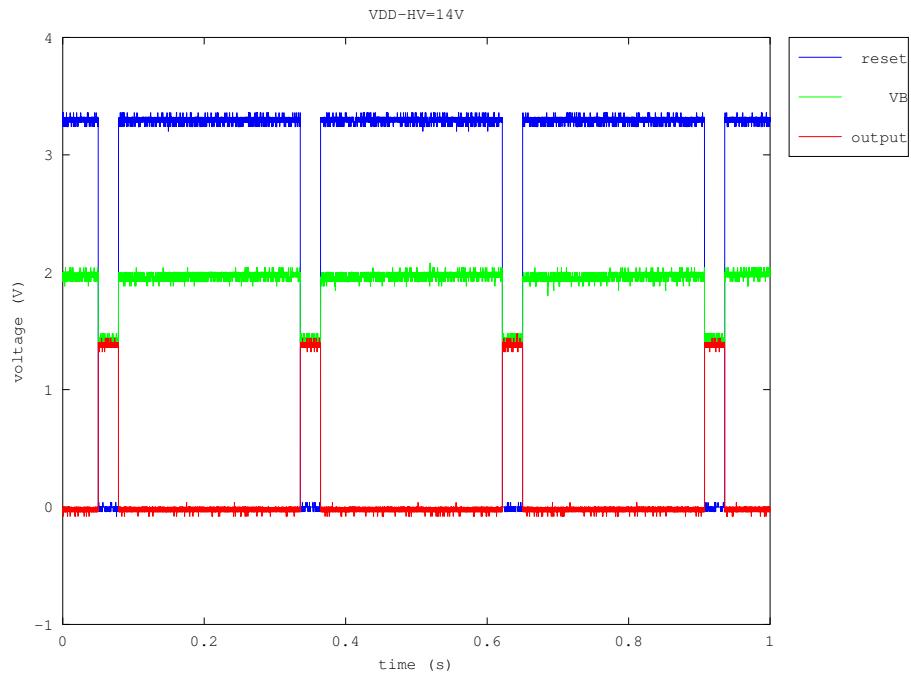


Figure 21: VB and output for $VDD_HV = 14\text{ V}$