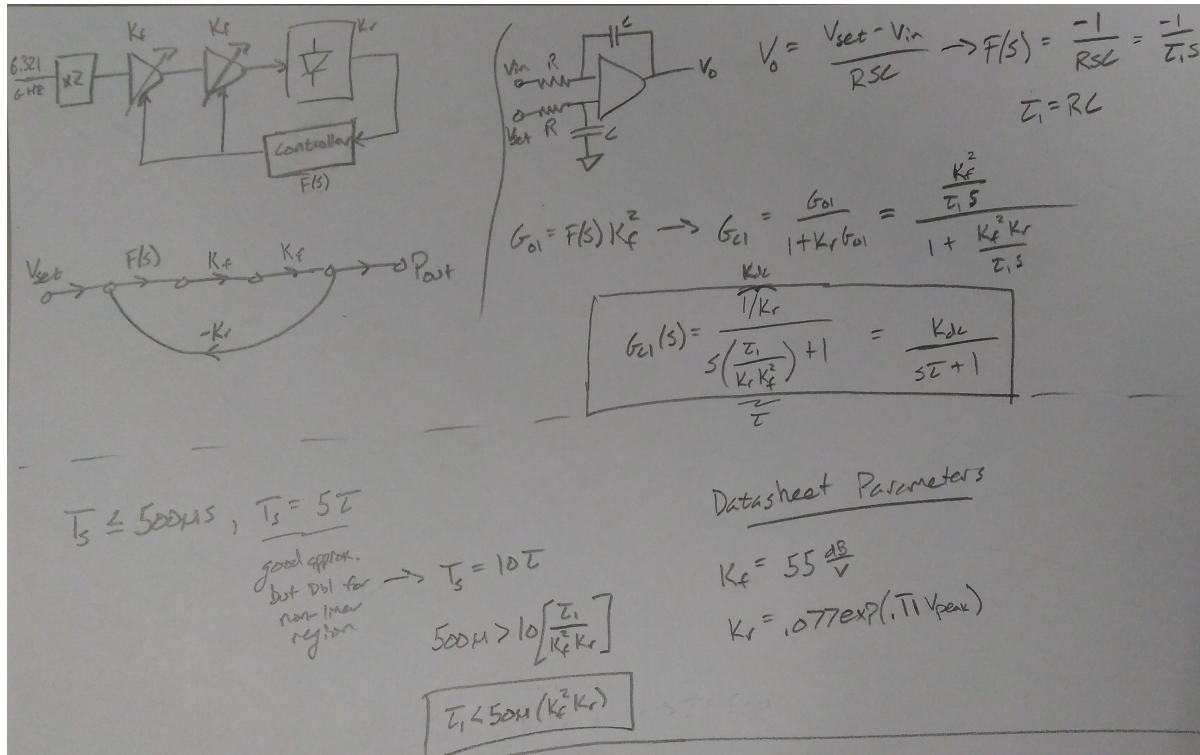# Power Controller
Josh Wilkins -- 9/19/2019
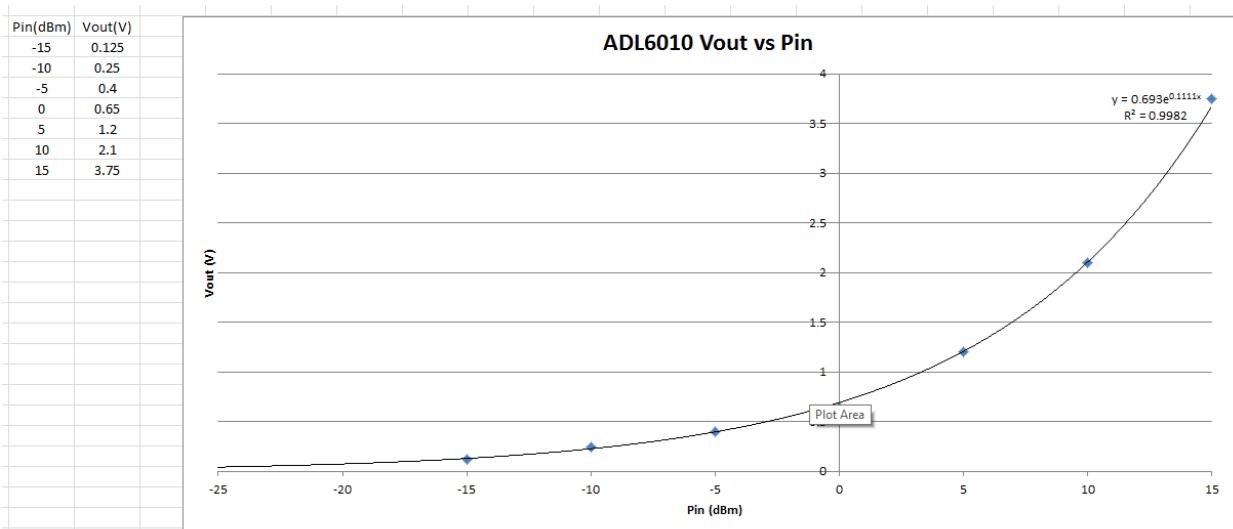
▸ `# Imports`↔

▸ `#CSS`↔

ADL6010 with HMC694 VGAs

From the ADL6010 Datasheet, Kr is given as a linear value in V/V. But in the V/dBm units needed, it is very nonlinear as shown below. Taking the derivative of the graph below, the value of kr in units of V/dBm can be approximated.
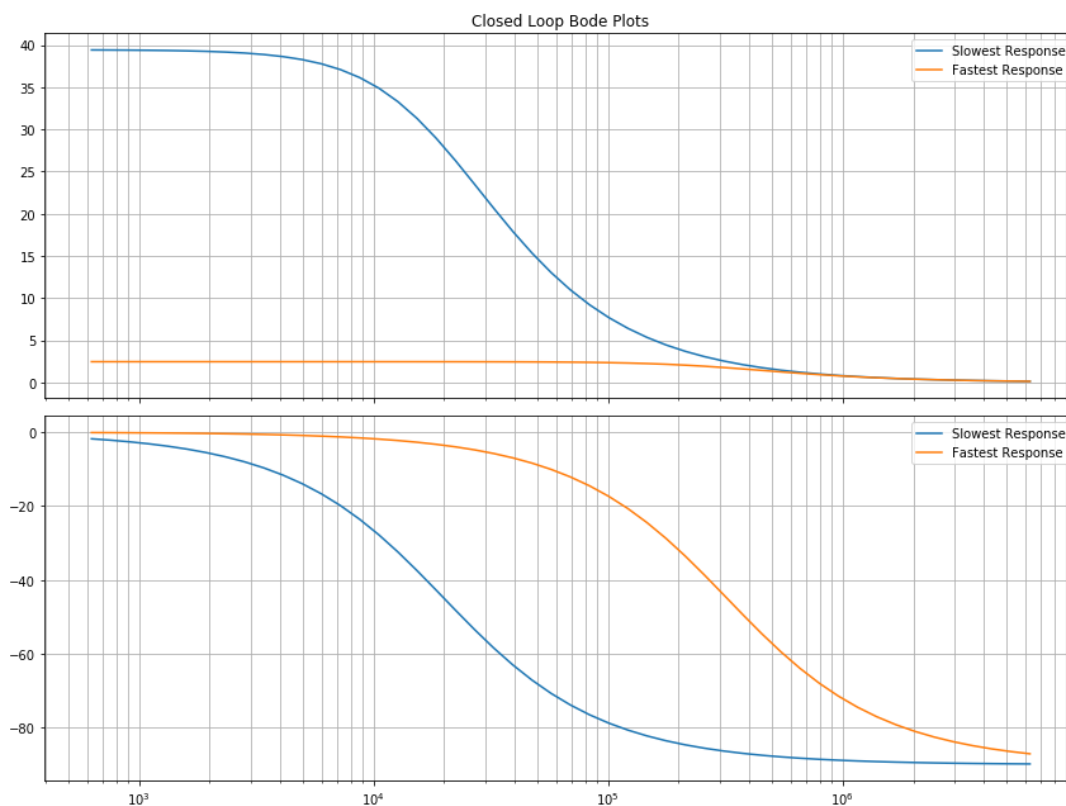
Pin(dBm)	Vout(V)
-15	0.125
-10	0.25
-5	0.4
0	0.65
5	1.2
10	2.1
15	3.75

ADL6010 Vout vs Pin

$y = 0.693e^{0.1111x}$
$R^2 = 0.9982$

▶ *# Designing the Controller using the slowest response for Kr so that the settling*

R=3833.9 Ohms   C=1.0e-06 uF

Slowest Response (Pin = -15dBm) / Fastest Response (Pin = +15dBm)
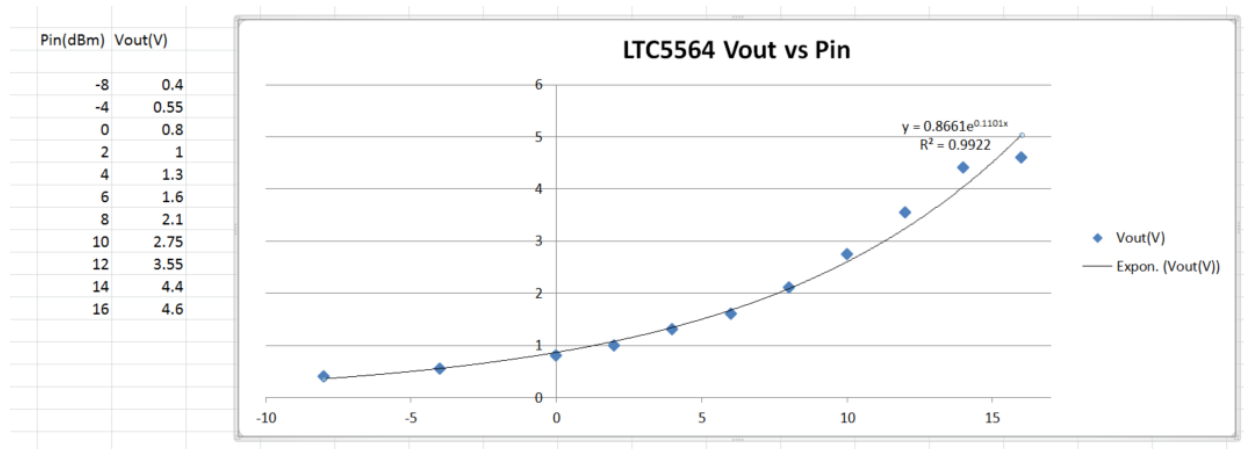
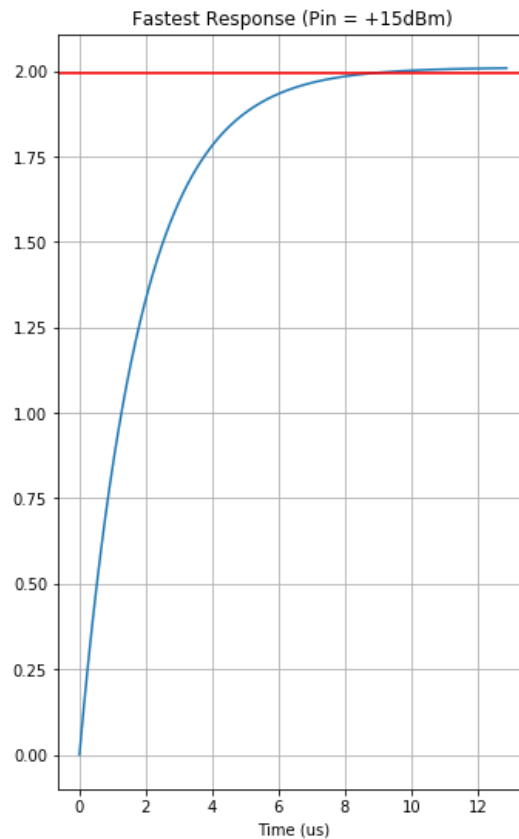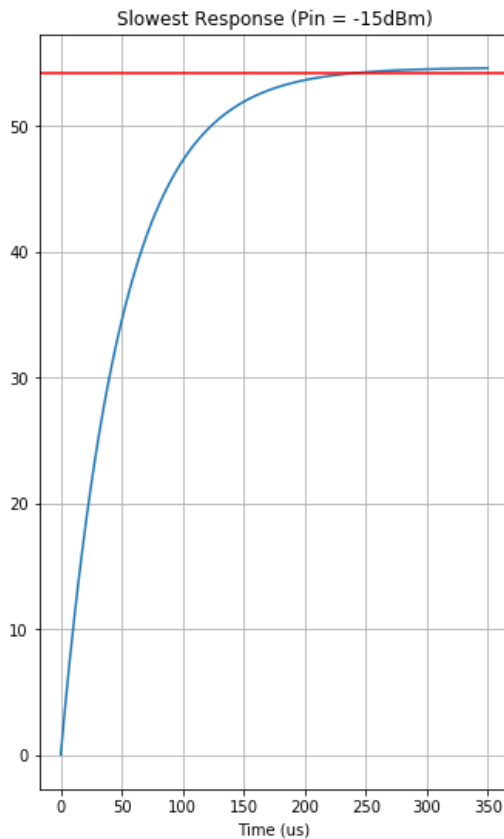▶ *# Bode Plots↔*
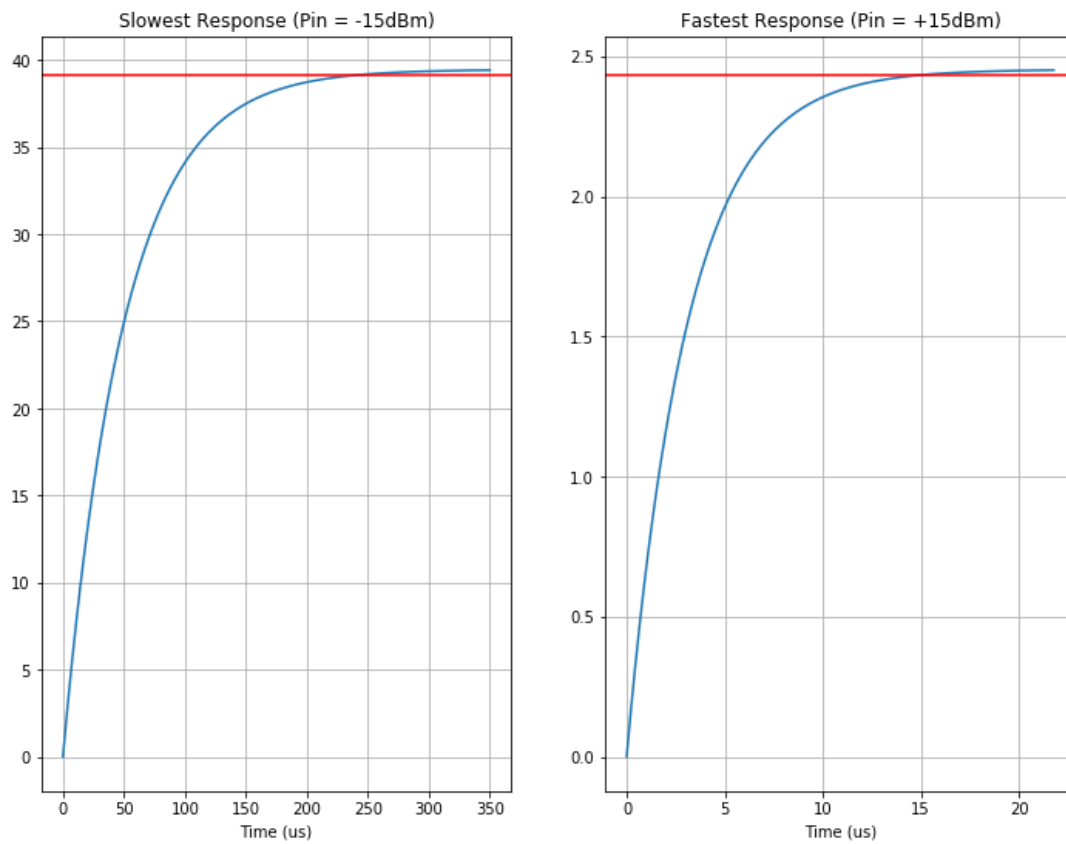
Closed Loop Bode Plots

LTC5564 with HMC694 VGAs

Due to the long lead tim of the From the ADL6010, the LTC5564 was also examined for use. It appears to have a similar response, however it looks like it will be unusable due to its temperature dependency. Again, using the data from the datasheet to estimate kr:
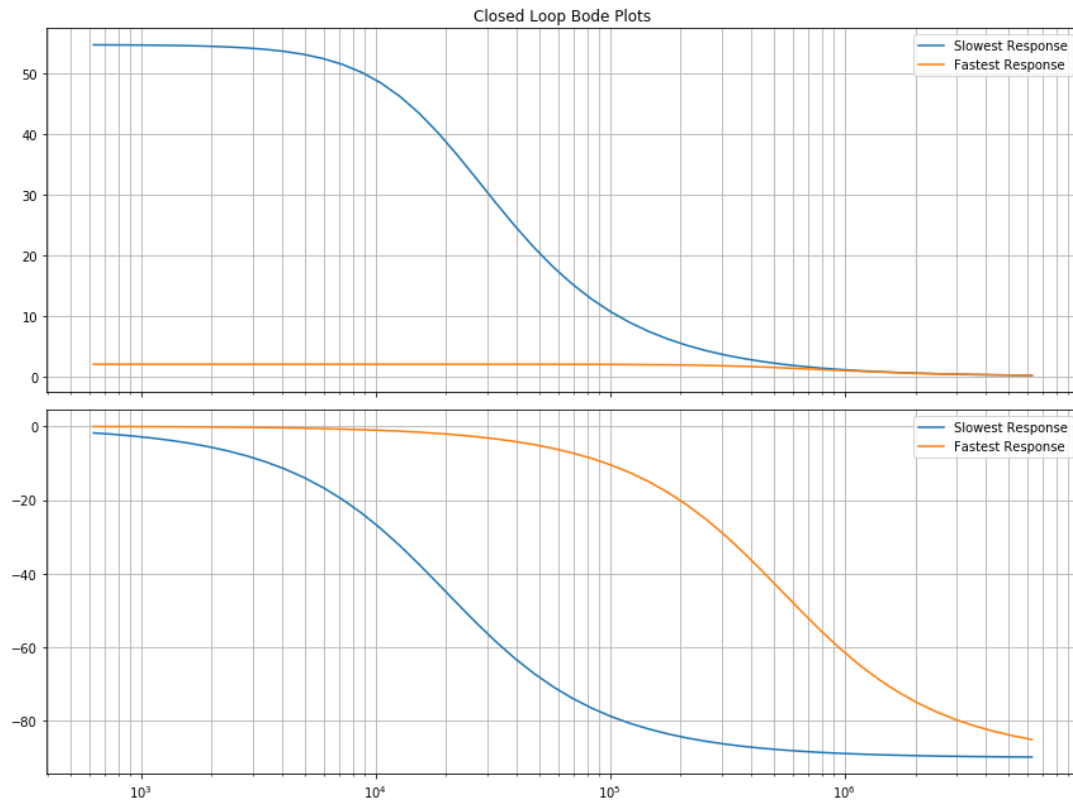
Pin(dBm)	Vout(V)
-8	0.4
-4	0.55
0	0.8
2	1
4	1.3
6	1.6
8	2.1
10	2.75
12	3.55
14	4.4
16	4.6

LTC5564 Vout vs Pin

$y = 0.8661e^{0.1101x}$
$R^2 = 0.9922$

◆ Vout(V)
— Expon. (Vout(V))

```
# Designing the Controller using the slowest response for Kr so that the settling
```

R=1844.7 Ohms   C=1.5e-06 uF

Slowest Response (Pin = -15dBm)

Fastest Response (Pin = +15dBm)

Closed Loop Bode Plots

ADL6010 with HMC712 VVA

R=3976.6 Ohms   C=1.8e-09 uF

Slowest Response (Pin = -15dBm) Fastest Response (Pin = +15dBm)

▾ # Bode Plots↔

Closed Loop Bode Plots