Power Controller

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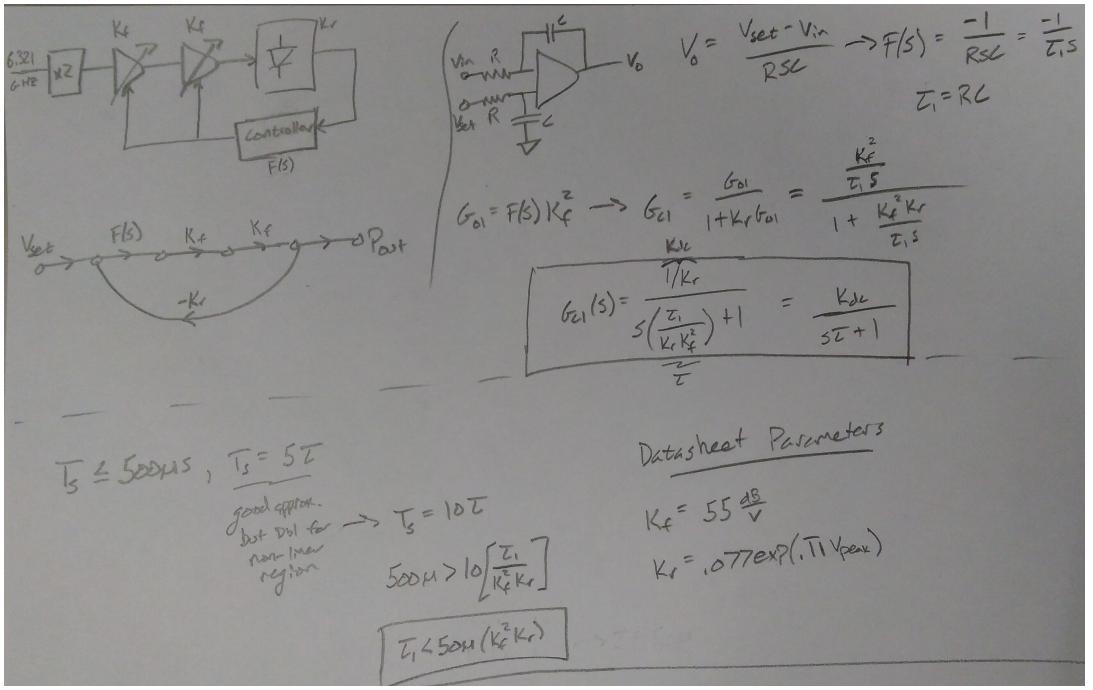
In [1]:
```
# Imports↔
```



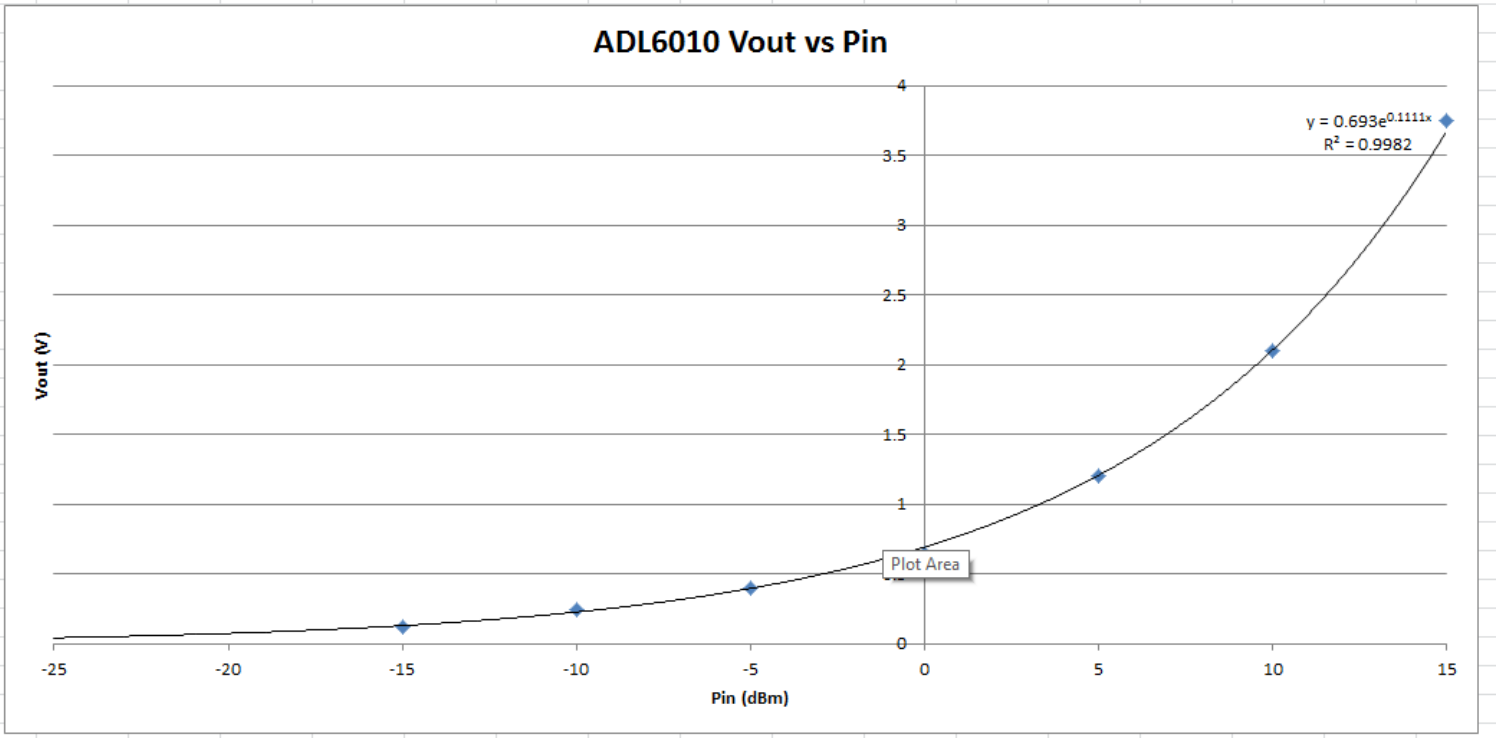
In [38]:
```
# Designing the Controller using the slowest response for Kr so that the settling time spec is always met↔
```

Due to long lead times of the ADL6010, an alternative envelope detector was used until the ADL6010 arrived. The LTC5564 had a similar response to the ADL6010, but could not be used due to its high temperature dependency. The same PI filter was used with little consequence, just a slower response, but worked well enough until the ADL6010 arrived.

ADL6010

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



In [37]:
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# ADL6010↔
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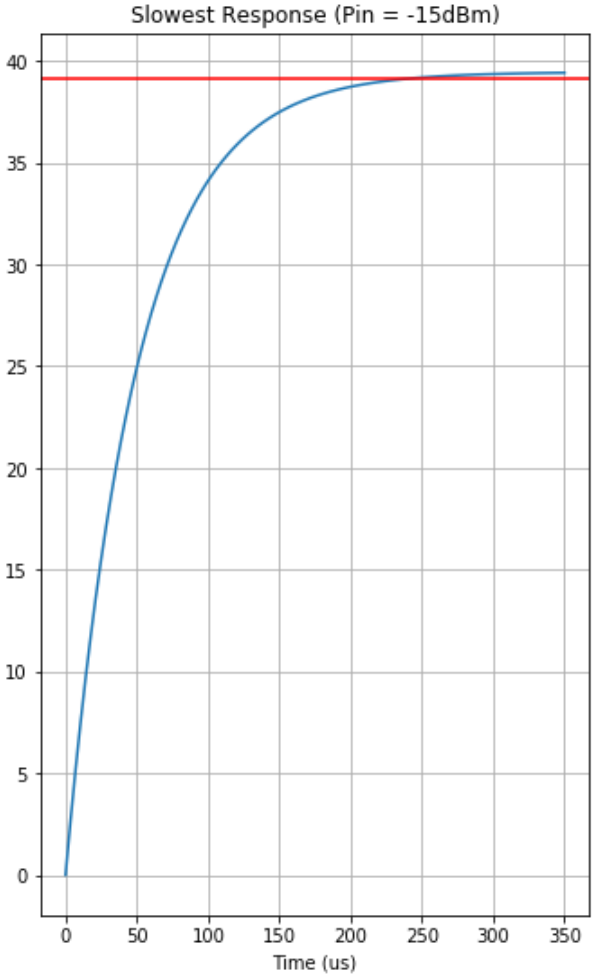
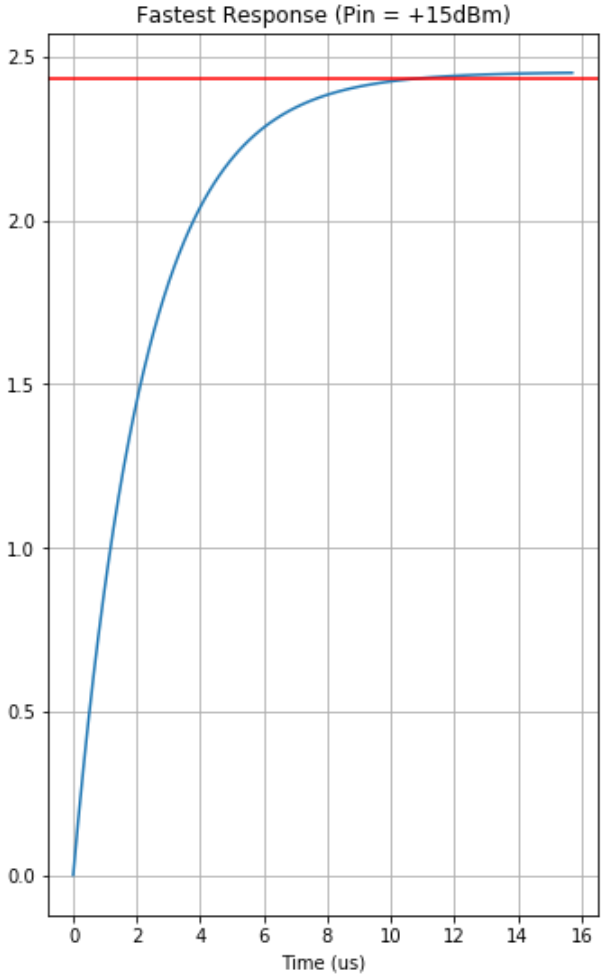
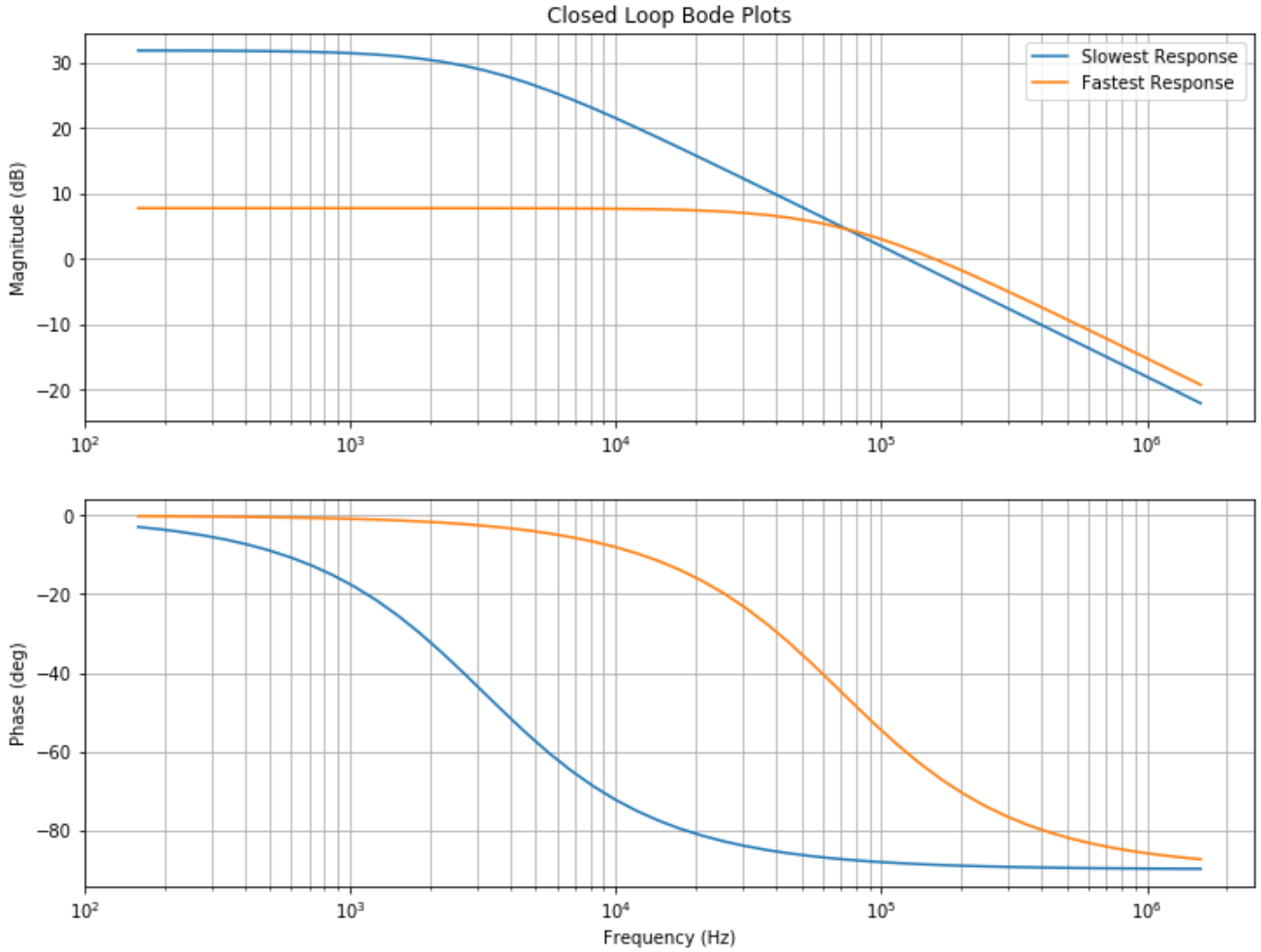
R=3833.9 Ohms    C=1.0e-06 uF
```



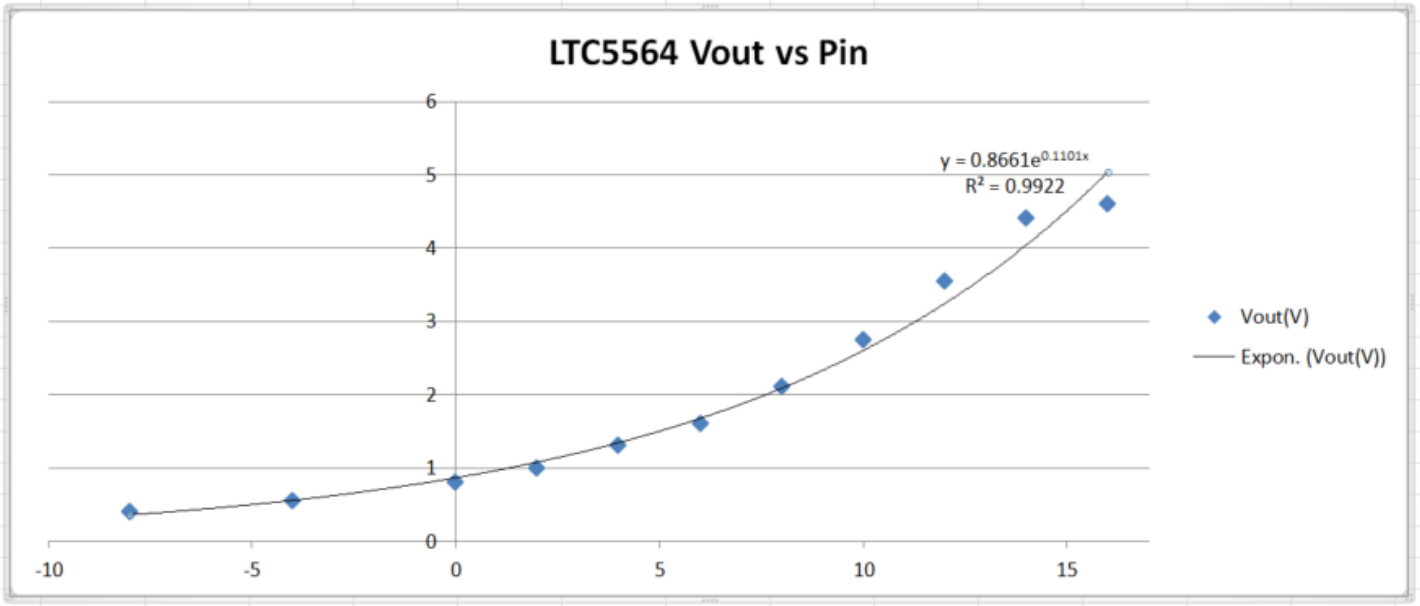




LTC5564

Due to the long lead time 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



In [39]:
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# LTC5564↔
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R=2767.0 Ohms    C=1.0e-06 uF
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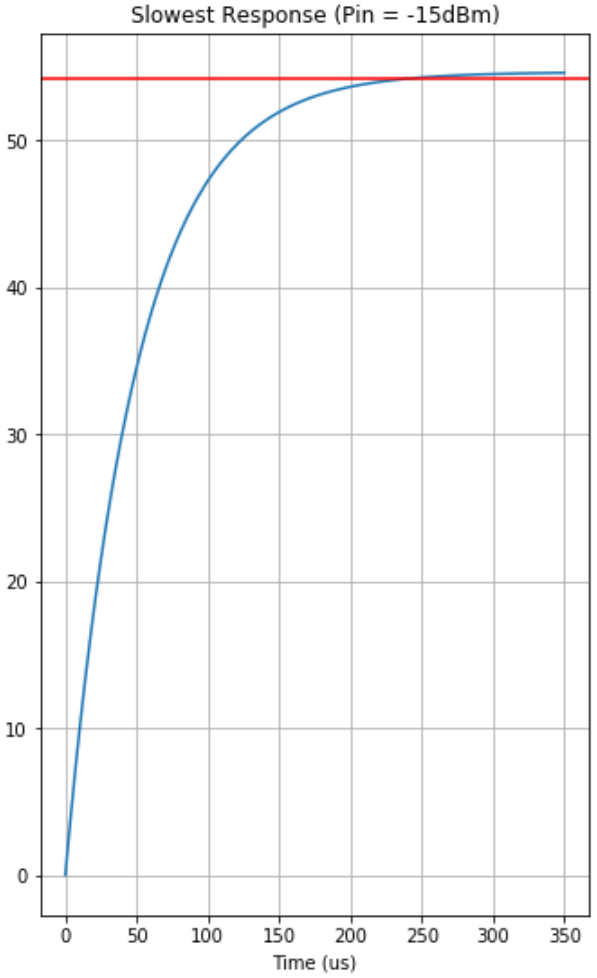

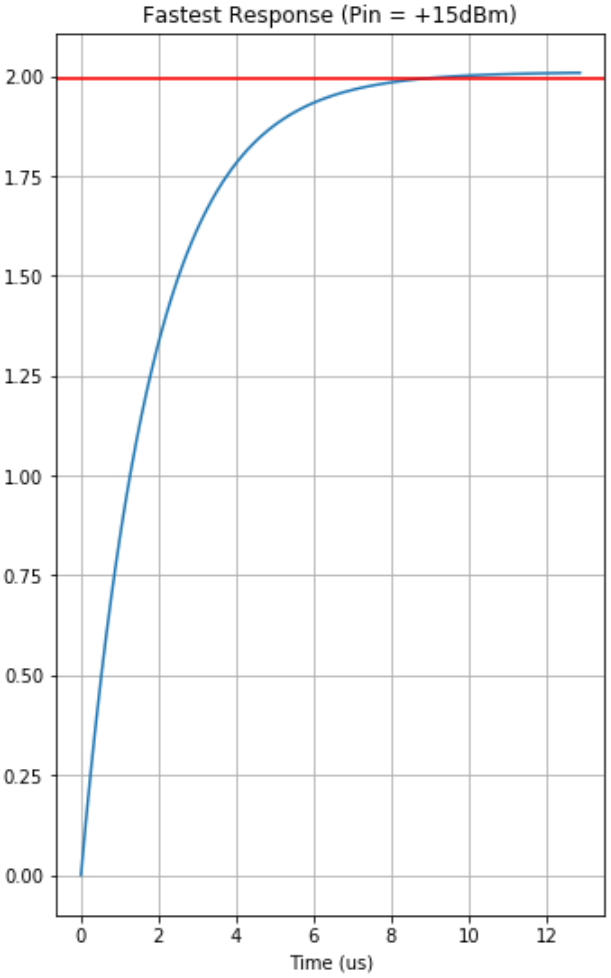

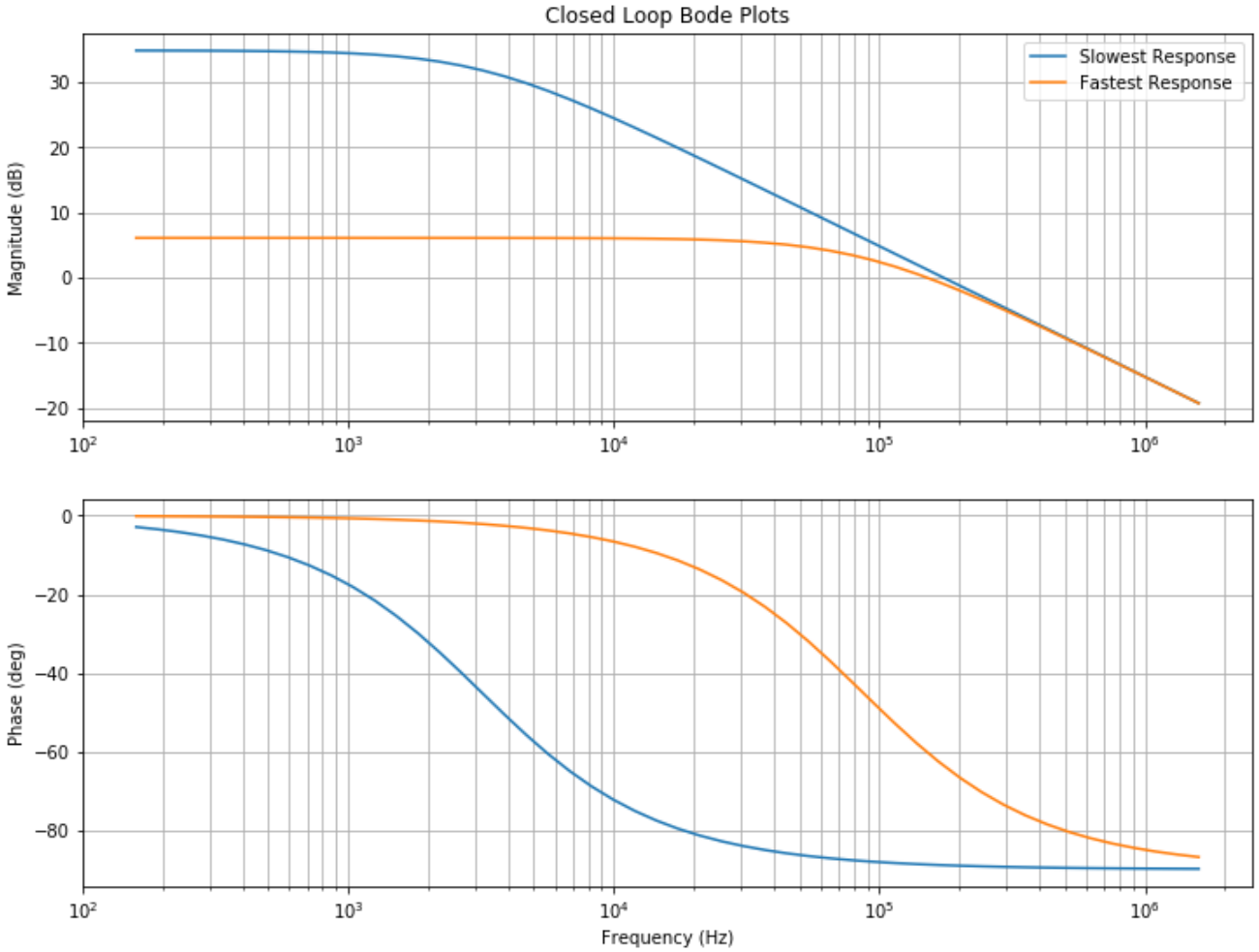
Closed Loop Bode Plots
Slowest Response
Fastest Response
Magnitude (dB)
30
20
10
0
−10
−20
10^2
10^3
10^4
10^5
10^6
Phase (deg)
0
−20
−40
−60
−80
Frequency (Hz)