

PK_techsweep_plots_from_mat

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1 Reviewing Gm/ID in gf180mcuD

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Based on Boris Murmann's script.

```
[1]: import numpy as np
import scipy.constants as sc
import matplotlib.pyplot as plt
from pygmid import Lookup as lk
%matplotlib widget
```

```
[21]: choice = 1 #set to 0 for nmos and 1 for pmos
devices = ['nfet_03v3', 'pfet_03v3']
fet = lk('./simulation/'+devices[choice]+'.mat')
```

```
[3]: # Current Density Reference Current
# weak inversion
K_wi = np.array([ 28, 27 ]) # S/A
# strong inversion
K_si = np.array([10*np.sqrt(2e-6) , 6*np.sqrt(1.7e-6) ]) # S/A/sqrt(A)
# reference current
IO = (K_si/K_wi)**2
```

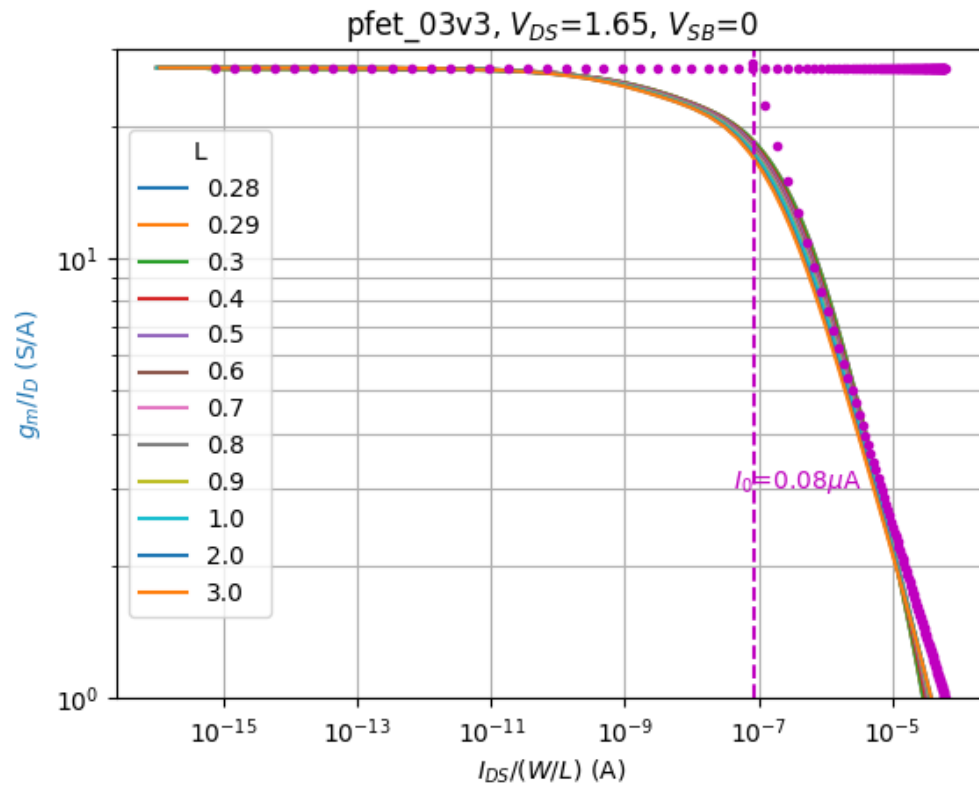
```
[4]: # sweep variable vectors
w = fet['W']
l = fet['L']
vgs = fet['VGS']
vds = fet['VDS']
vsb = fet['VSB']
```

```
[5]: print(f'Transistor Width is {w} and Lengths are {l}')
```

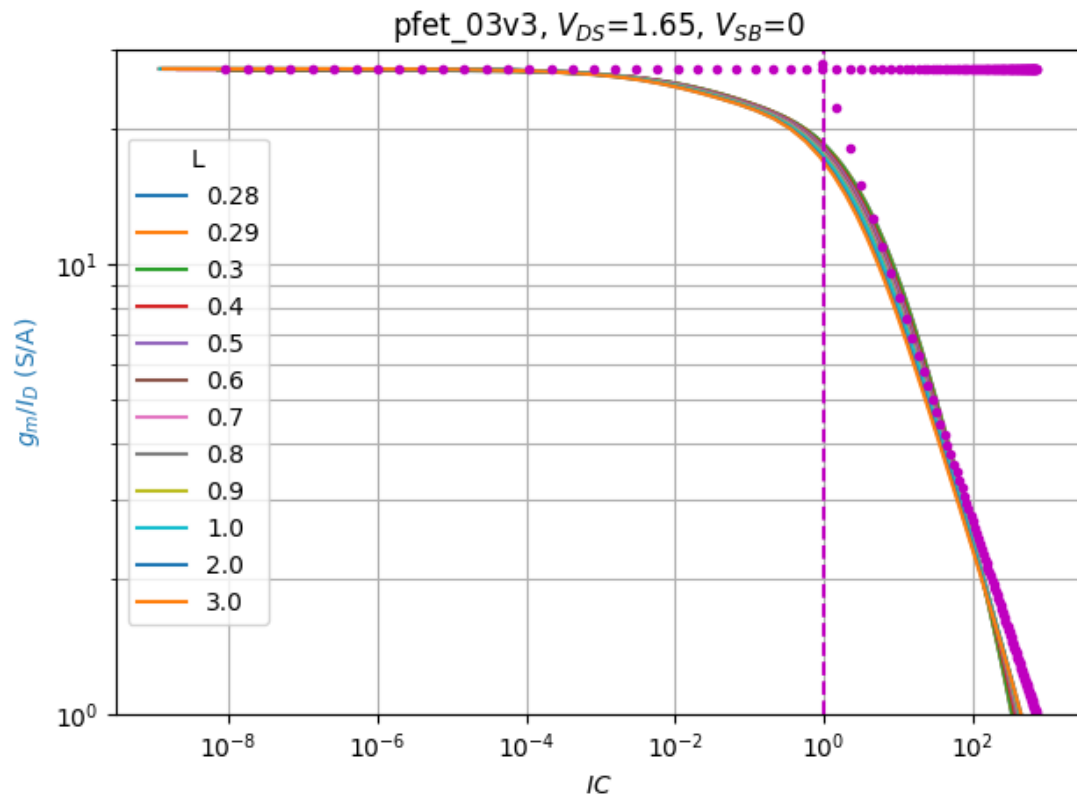
```
Transistor Width is 5.0 and Lengths are [0.28 0.29 0.3  0.4  0.5  0.6  0.7  0.8
0.9  1.  2.  3. ]
```

```
[6]: VDS1=1.65; VSB1=0
```

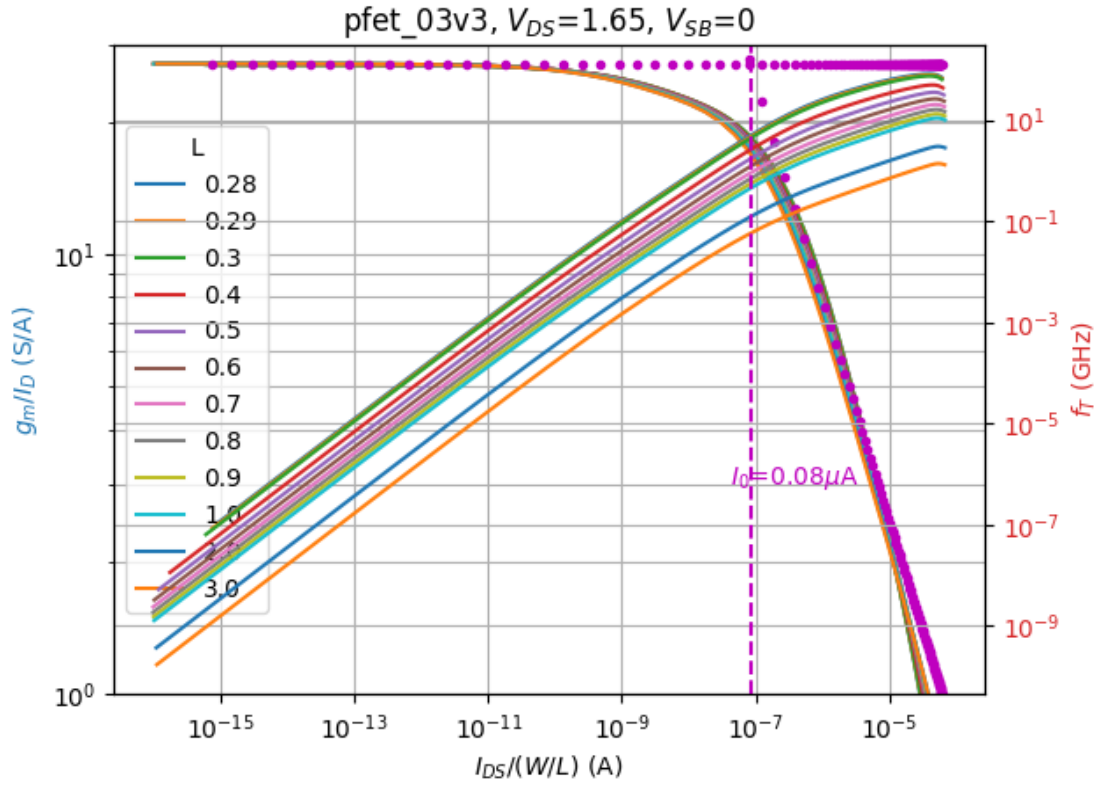
1.1 G_m/I_D versus $I_D/(W/L)$



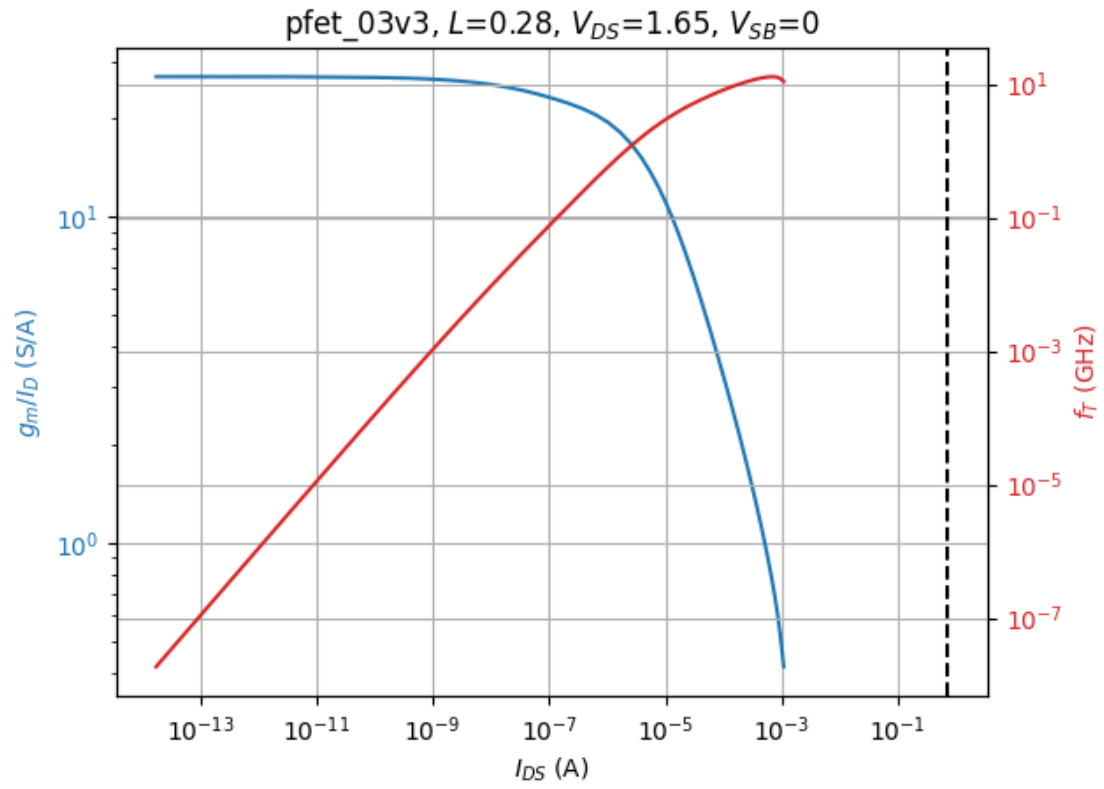
1.2 Gm/ID versus Current Density

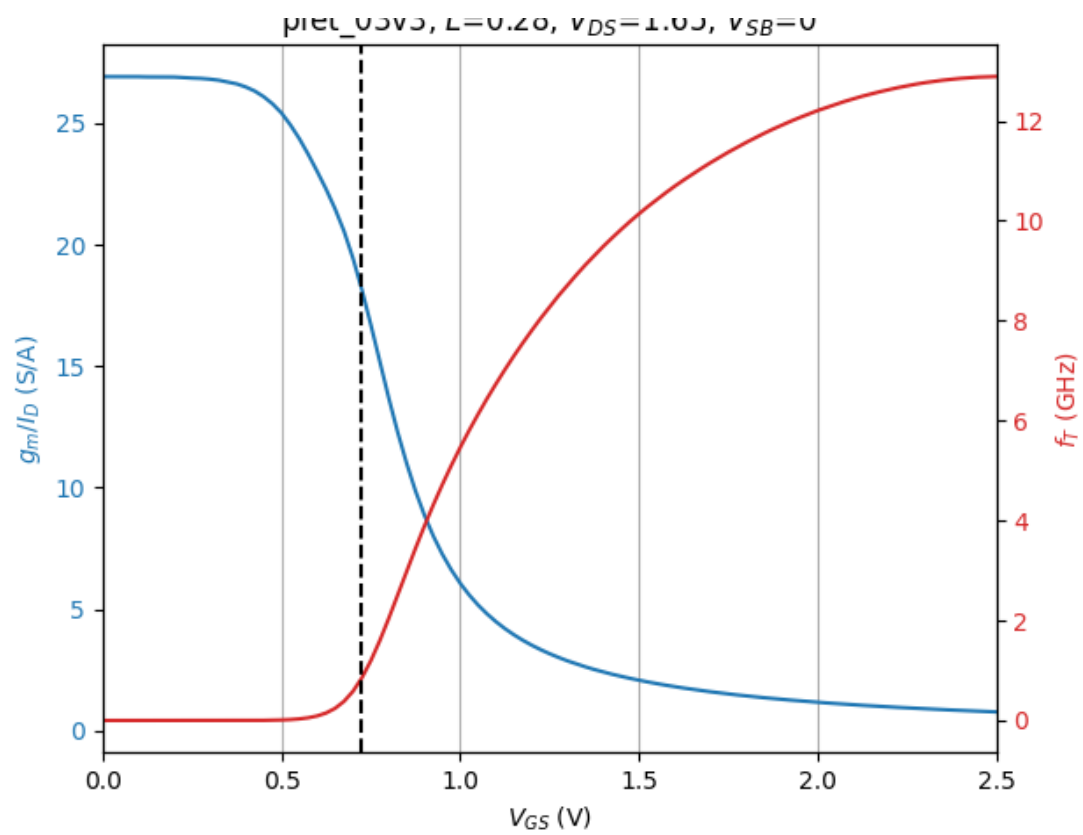


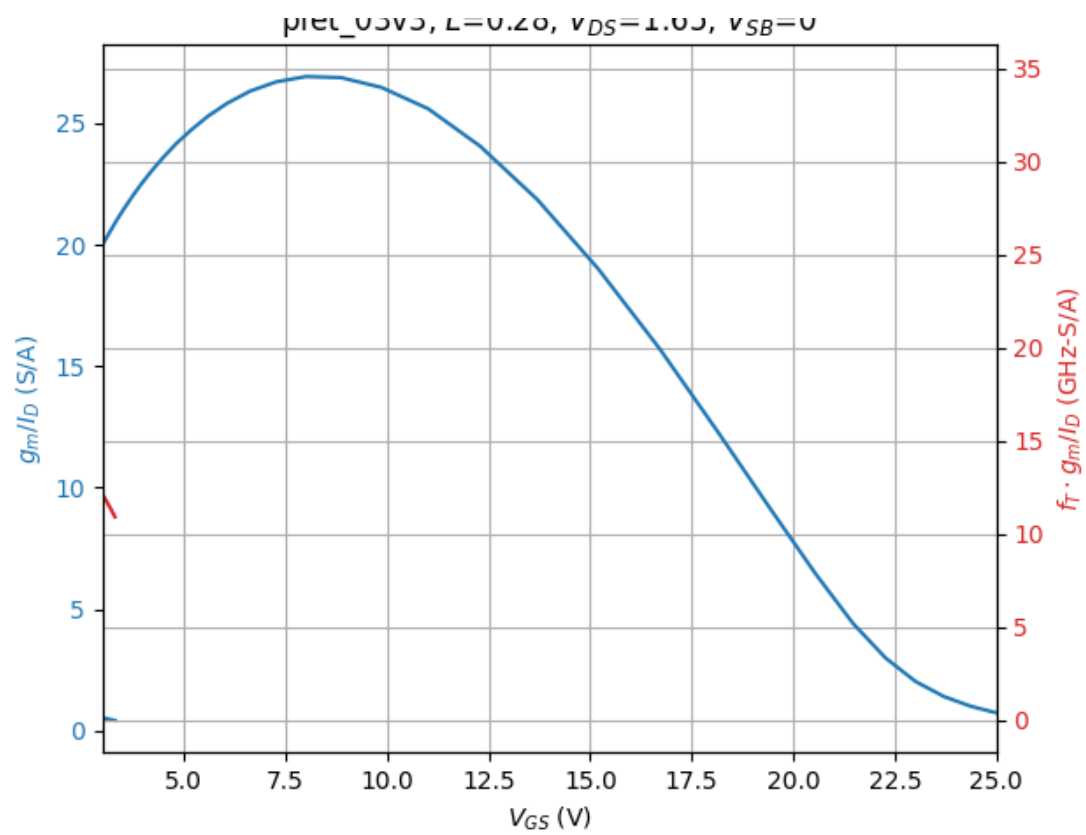
1.3 G_m/I_D and f_T versus $I_D/(W/L)$

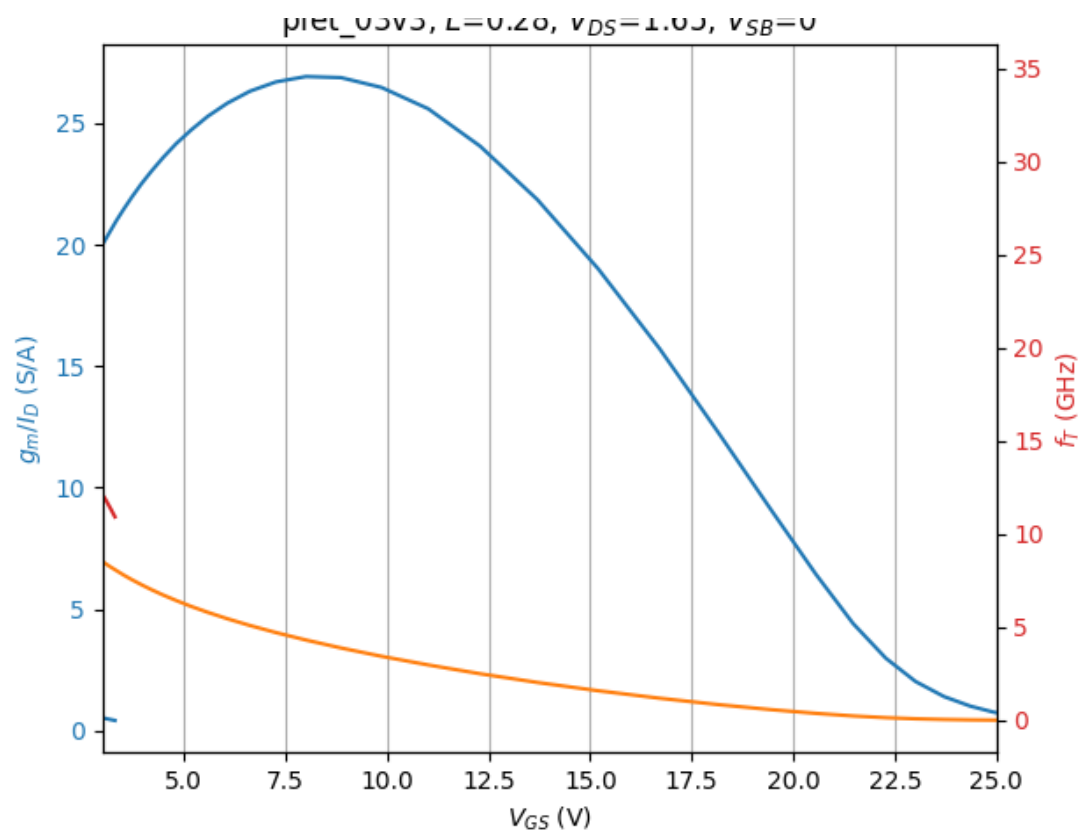


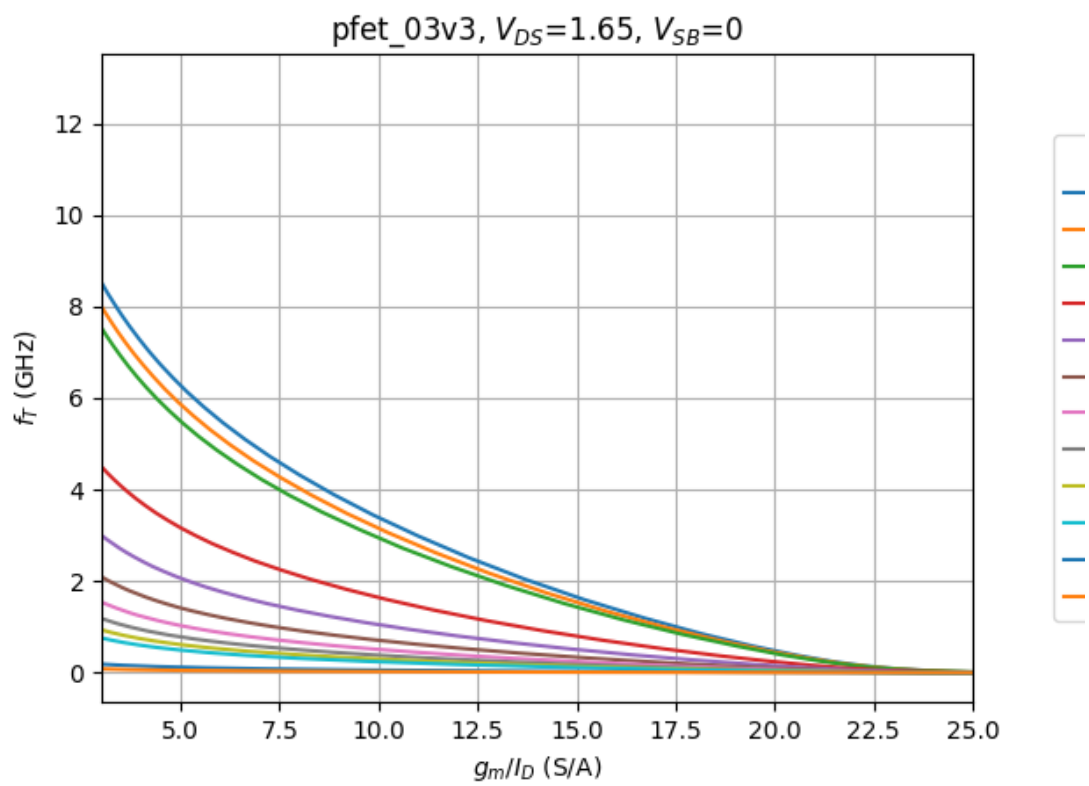
1.4 Other Plots

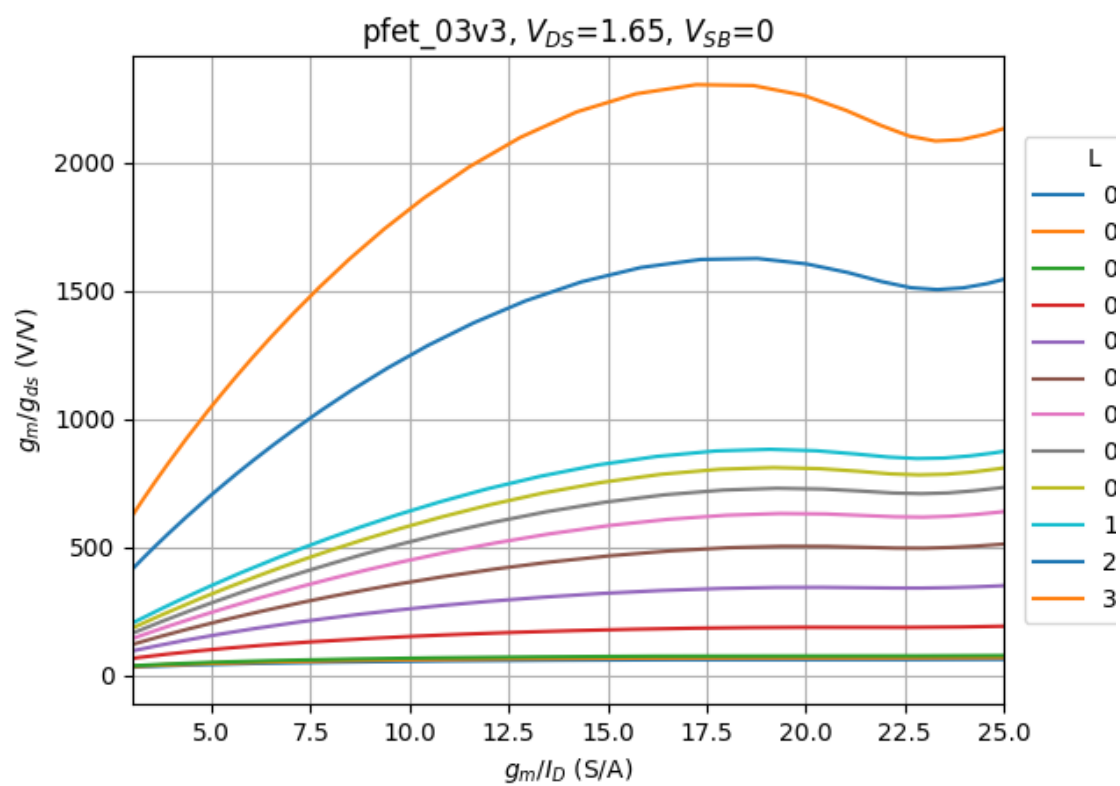


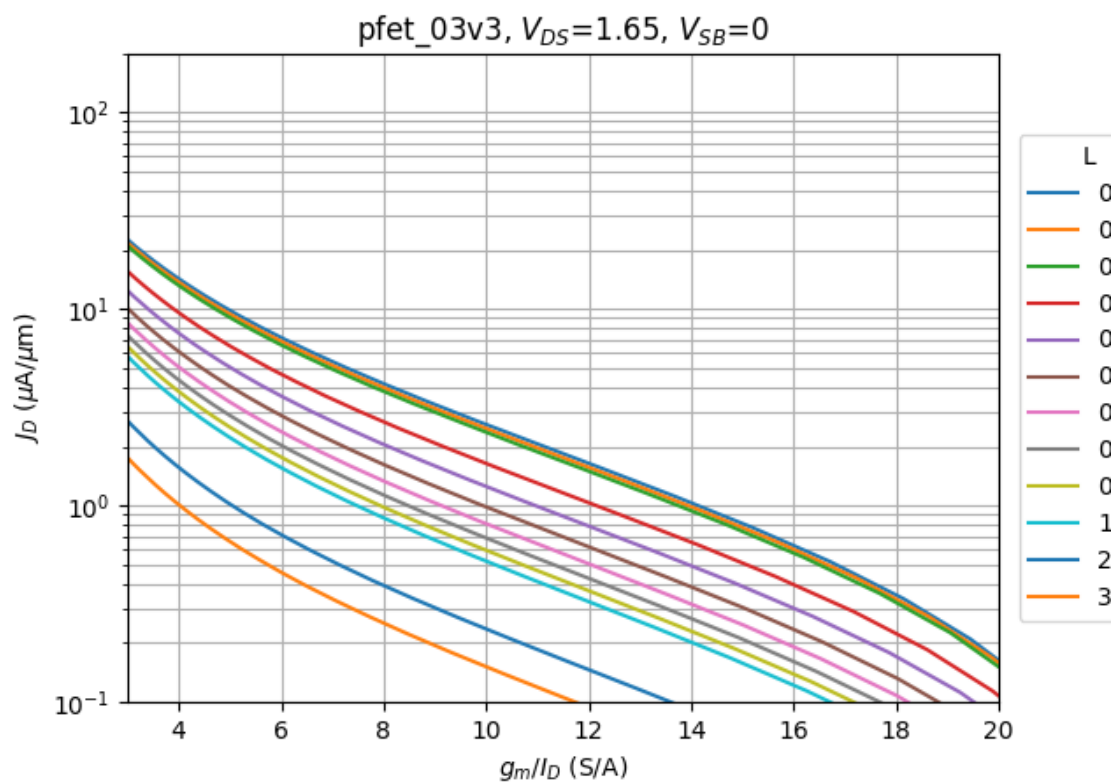


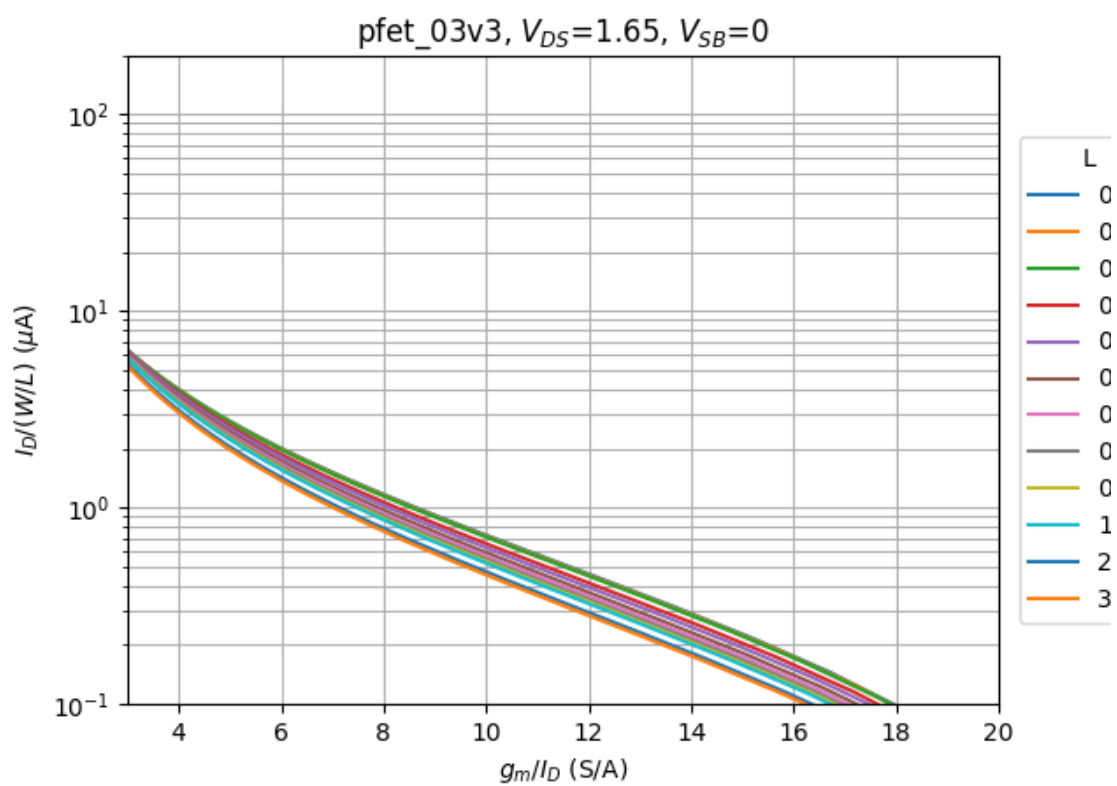


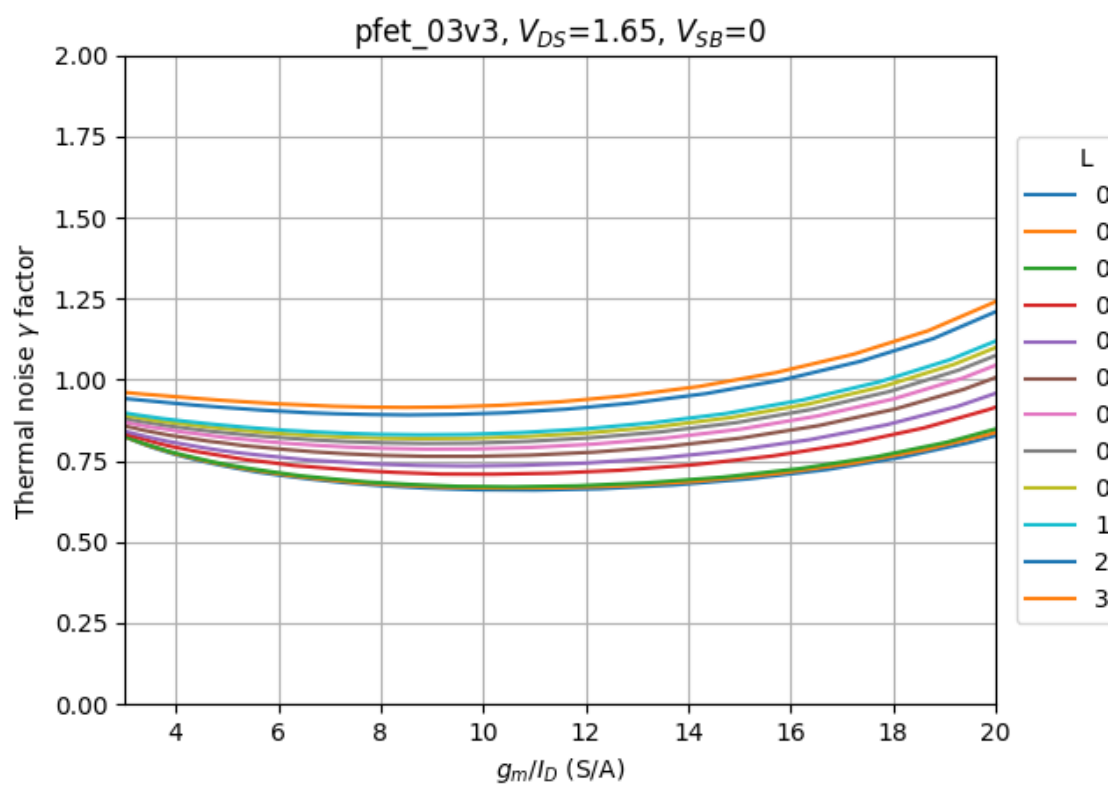


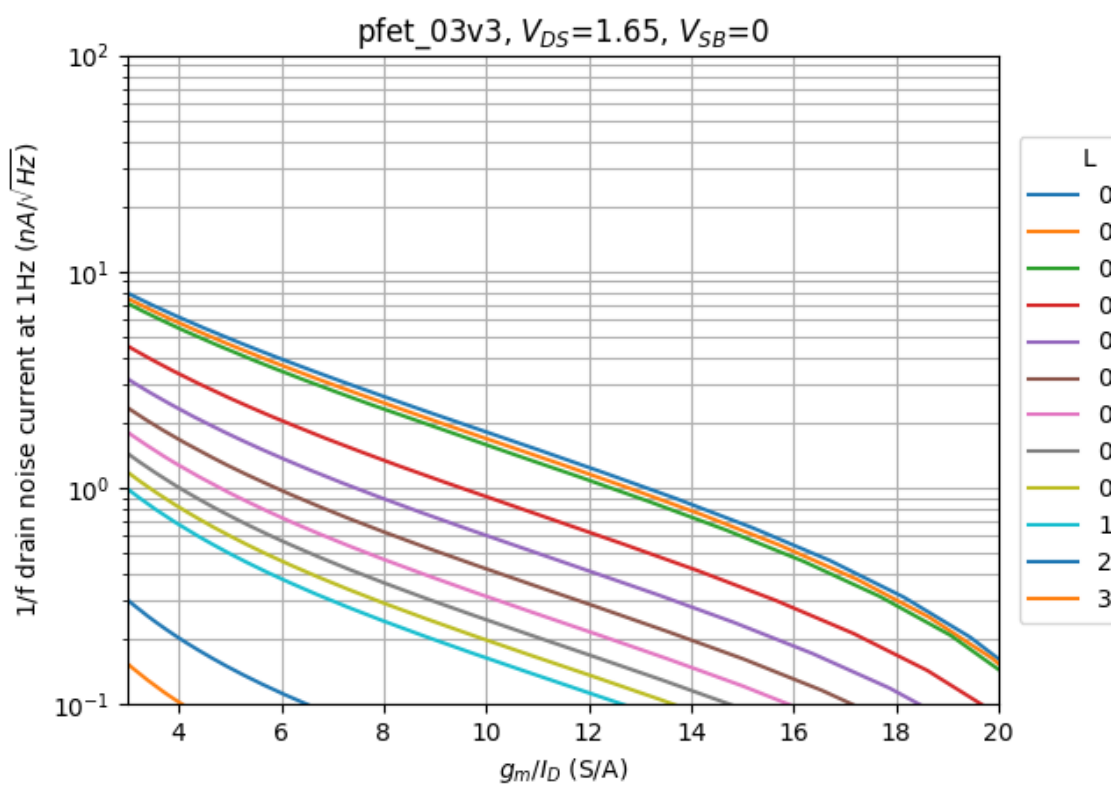


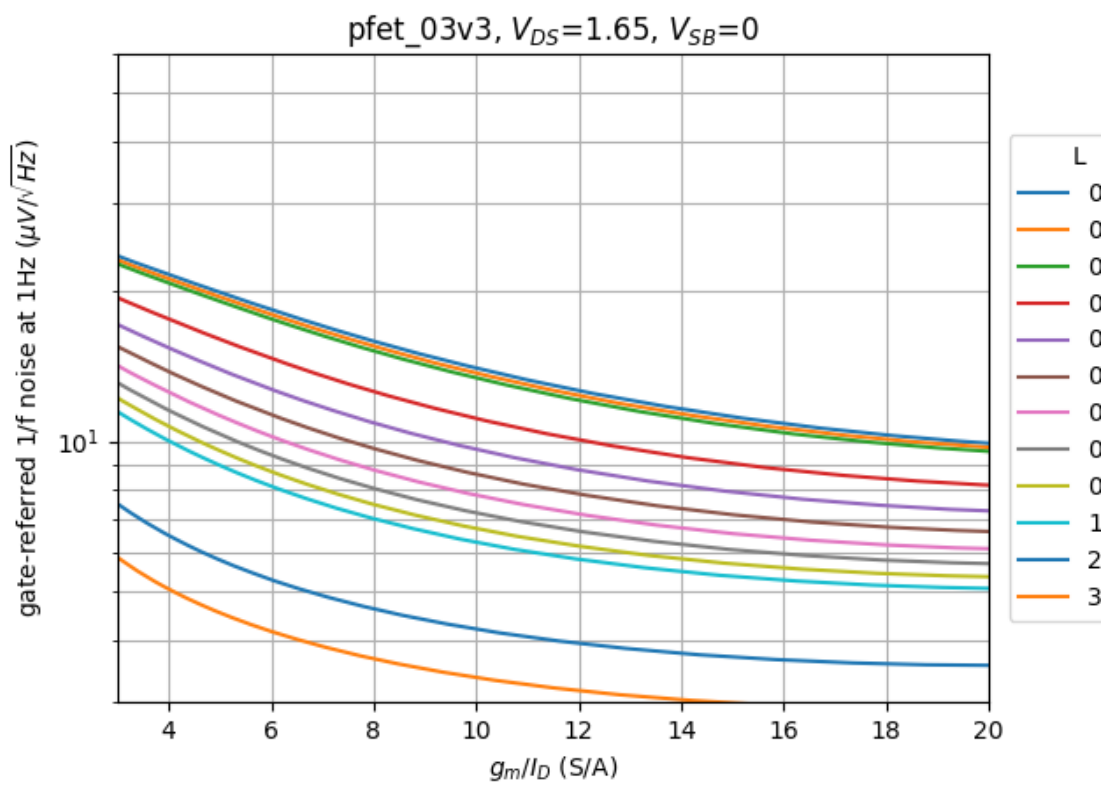












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