



cmos028fdsoi Technology

EGRVT models

DK1.2\_RF\_mmW

Comparison with DK1.1\_RF\_mmW model(s)

Please use the bookmark to navigate

Sep 21, 2018

Technology R&D Crolles Site – TDP/TDS/SPICE Modeling

Unauthorized reproduction and communication strictly prohibited

dormieub

**ST Confidential**

## General information on EGRVT models

- Maximum supply voltage is 1.8 V.
- Validity domain is defined as follows:
  - ✓ Drawn gate length varies from 150nm to 10um.
  - ✓ Drawn transistor width varies from 0.16um to 10um.
  - ✓ Device temperature varies from -40 °C to 125 °C.

## Output parameters definitions

- Model(s): egnfet\_acc, egpfet\_acc
  - ✓  $V_{t\_lin}$  : Threshold voltage defined as  $V_{gs}$  value for which drain current is  $i_{vt} \cdot M^* \cdot 1 \cdot W / (1 \cdot L + 0 + 1 \cdot p\_la)$  at  $V_{ds} = 0.05V$ .
  - ✓  $I_{g\_on}$  : Gate current at  $V_{ds} = 0V$  and  $V_{gs} = 1.8V$ .
  - ✓  $G_{m\_c}$  : Drain transconductance at  $V_{gs} = V_{t\_lin} + 0.2$ ,  $V_{ds} = V_{dd}/2V$ ,  $f = 100kHz$ .
  - ✓  $G_{d\_c}$  : Drain conductance at  $V_{gs} = V_{t\_lin} + 0.2$ ,  $V_{ds} = V_{dd}/2V$ ,  $f = 100kHz$ .
  - ✓  $I_{g\_off}$  : Gate current at  $V_{ds} = V_{dd}V$ ,  $V_{gs} = 0V$ .
  - ✓  $Logioff$  :  $\log_{10}(I_{offsat})$ .
  - ✓  $Gain\_c$  : Voltage gain defined as  $G_{m\_c} / G_{d\_c}$ .
  - ✓  $I_{eff}$  : Average drain current  $(I_{low} + I_{high}) / 2$ .
  - ✓  $I_{lin}$  : Drain current at  $V_{gs} = 1.8V$ ,  $V_{ds} = 0.05V$ .
  - ✓  $D_{ibl}$  :  $V_{t\_lin} - V_{t\_sat}$ .
  - ✓  $I_{off\_s}$  : Source current at  $V_{gs} = 0V$ ,  $V_{ds} = v_{ds\_sat}V$ .
  - ✓  $I_{offsat}$  : Drain current at  $V_{gs} = 0V$ ,  $V_{ds} = v_{ds\_sat}V$ .
  - ✓  $I_{off\_g}$  : Gate current at  $V_{gs} = 0V$ ,  $V_{ds} = v_{ds\_sat}V$ .
  - ✓  $V_{t\_sat}$  : Threshold voltage defined as  $V_{gs}$  value for which drain current is  $i_{vt} \cdot M^* \cdot 1 \cdot W / (1 \cdot L + 0 + 1 \cdot p\_la)$  at  $V_{ds} = v_{ds\_sat}V$ .
  - ✓  $C_{gg\_inv}$  : Total gate capacitance at  $V_{gs} = 1.8V$ ,  $V_{ds} = 0V$ ,  $f = 100kHz$ .
  - ✓  $I_{sat}$  : Drain current at  $V_{gs} = 1.8V$ ,  $V_{ds} = V_{dd}V$ .
  - ✓  $C_{gd\_0v}$  : Gate-to-Drain capacitance at  $V_{gs} = 0V$ ,  $V_{ds} = 0V$ ,  $f = 100kHz$ .
  - ✓  $V_{tgmmax}$  : Threshold voltage at  $V_{ds} = 0.05$  derived from  $G_m$  max method.

# egnfet\_acc

## Electrical characteristics per geometry

**egnfet\_acc @ w=2e-06, l=1.5e-07, swshe=0, pre\_layout\_local=1, sa=1.86e-6,  
sb=1.86e-6, devtype=PT, as=3.72e-12, ad=3.72e-12, ps=7.72e-06, pd=7.72e-06,  
vbs=0, vdd=1.8, temp=25.0**

DK1.2\_RF\_mmW wrt DK1.1\_RF\_mmW

	SSF	SS	TT	FF	FFF
<b>Vt_lin [mV]</b>	598.6 0.0mV	580.3 0.0mV	519.7 0.0mV	459.5 0.0mV	442.8 0.0mV
<b>Vt_sat [mV]</b>	576.7 0.0mV	559.6 0.0mV	498.8 0.0mV	438.6 0.0mV	422.8 0.0mV
<b>Isat [mA]</b>	1.05 0.0%	1.09 0.0%	1.19 0.0%	1.28 0.0%	1.33 0.0%
<b>Ilin [μA]</b>	139.2 0.0%	156.9 0.0%	166.8 0.0%	175.8 0.0%	191 0.0%
<b>Gm_c [μS]</b>	600.2 0.0%	648.8 0.0%	681.5 0.0%	715.1 0.0%	758.3 0.0%
<b>Gd_c [μS]</b>	4.78 0.0%	5.12 0.0%	5.81 0.0%	6.49 0.0%	6.75 0.0%
<b>Gain_c []</b>	125.5 0.0%	126.7 0.0%	117.3 0.0%	110.3 0.0%	112.3 0.0%
<b>VtGmmax [mV]</b>	571.7 0.0mV	559 0.0mV	500 0.0mV	441.2 0.0mV	428.1 0.0mV
<b>Cgd_0v [aF]</b>	439.8 0.0%	464.4 0.0%	464.6 0.0%	457.3 0.0%	488.7 0.0%
<b>Cgg_inv [fF]</b>	3.21 0.0%	3.32 0.0%	3.33 0.0%	3.34 0.0%	3.48 0.0%
<b>Ieff [μA]</b>	585.5 0.0%	619.7 0.0%	698.1 0.0%	781.2 0.0%	820.4 0.0%
<b>Ig_on [fA]</b>	0.47 0.0%	1.22 0.0%	4.36 0.0%	26.45 0.0%	50.13 0.0%
<b>Ioffsat [pA]</b>	0.58 0.0%	0.98 0.0%	4.54 0.0%	28.45 0.0%	49.69 0.0%
<b>Ioff_g [aA]</b>	-0.18 -0.0%	-0.45 -0.0%	-1.49 -0.0%	-5.25 -0.0%	-12.95 -0.0%
<b>Ioff_s [pA]</b>	-0.58 -0.0%	-0.98 -0.0%	-4.54 -0.0%	-28.45 -0.0%	-49.69 -0.0%

**egnfet\_acc @ w=2e-06, l=2.0e-06, swshe=0, pre\_layout\_local=1, sa=2.26e-6,  
sb=2.26e-6, devtype=PT, as=4.52e-12, ad=4.52e-12, ps=8.52e-06, pd=8.52e-06,  
vbs=0, vdd=1.8, temp=25.0**

DK1.2\_RF\_mmW wrt DK1.1\_RF\_mmW

	SSF	SS	TT	FF	FFF
<b>Vt_lin [mV]</b>	603.6 0.0mV	592.1 0.0mV	532.3 0.0mV	473 0.0mV	460.6 0.0mV
<b>Vt_sat [mV]</b>	593.2 0.0mV	582 0.0mV	522.3 0.0mV	463.1 0.0mV	451 0.0mV
<b>Isat [μA]</b>	192.3 0.0%	201 0.0%	225.5 0.0%	251.3 0.0%	261.7 0.0%
<b>Ilin [μA]</b>	17.49 0.0%	18.14 0.0%	19.33 0.0%	20.46 0.0%	21.06 0.0%
<b>Gm_c [μS]</b>	57.88 0.0%	59.79 0.0%	61.72 0.0%	63.7 0.0%	65.52 0.0%
<b>Gd_c [nS]</b>	30.89 0.0%	31.79 0.0%	34.64 0.0%	37.15 0.0%	38.01 0.0%
<b>Gain_c []</b>	1874 0.0%	1880 0.0%	1782 0.0%	1715 0.0%	1724 0.0%
<b>VtGmmax [mV]</b>	607.8 0.0mV	597.5 0.0mV	539.4 0.0mV	481.3 0.0mV	470 0.0mV
<b>Cgd_0v [aF]</b>	439.5 0.0%	464 0.0%	464.2 0.0%	456.8 0.0%	488.2 0.0%
<b>Cgg_inv [fF]</b>	30.45 0.0%	31.22 0.0%	31.78 0.0%	32.44 0.0%	33.24 0.0%
<b>Ieff [μA]</b>	100.6 0.0%	105.5 0.0%	119.7 0.0%	134.8 0.0%	140.8 0.0%
<b>Ig_on [fA]</b>	4.61 0.0%	11.81 0.0%	42.32 0.0%	260.3 0.0%	480.2 0.0%
<b>Ioffsat [pA]</b>	0.17 0.0%	0.29 0.0%	1.26 0.0%	7.67 0.0%	13.7 0.0%
<b>Ioff_g [aA]</b>	-2.12 -0.0%	-5.48 -0.0%	-18.05 -0.0%	-63.52 -0.0%	-156.7 -0.0%
<b>Ioff_s [pA]</b>	-0.17 -0.0%	-0.29 -0.0%	-1.26 -0.0%	-7.67 -0.0%	-13.7 -0.0%

# egpfet\_acc

## Electrical characteristics per geometry



**egpfet\_acc @ w=2e-06, l=1.5e-07, swshe=0, pre\_layout\_local=1, sa=1.86e-6,  
sb=1.86e-6, devtype=PT, as=3.72e-12, ad=3.72e-12, ps=7.72e-06, pd=7.72e-06,  
vbs=0, vdd=1.8, temp=25.0**

DK1.2\_RF\_mmW wrt DK1.1\_RF\_mmW

	SSF	SS	TT	FF	FFF
<b>Vt_lin [mV]</b>	604.8 0.0mV	585.7 0.0mV	482.4 0.0mV	385.6 0.0mV	362.8 0.0mV
<b>Vt_sat [mV]</b>	550.8 0.0mV	533.6 0.0mV	434.4 0.0mV	340.8 0.0mV	319 0.0mV
<b>Isat [μA]</b>	474.2 0.0%	486.6 0.0%	555.9 0.0%	621.4 0.0%	637.5 0.0%
<b>Ilin [μA]</b>	44.34 0.0%	46.04 0.0%	48.05 0.0%	49.49 0.0%	51.95 0.0%
<b>Gm_c [μS]</b>	125.9 0.0%	128.2 0.0%	127.3 0.0%	124.7 0.0%	124.2 0.0%
<b>Gd_c [μS]</b>	2.47 0.0%	2.42 0.0%	2.2 0.0%	1.96 0.0%	1.88 0.0%
<b>Gain_c []</b>	50.96 0.0%	52.98 0.0%	57.89 0.0%	63.47 0.0%	66.17 0.0%
<b>VtGmmax [mV]</b>	677.6 0.0mV	660 0.0mV	556.6 0.0mV	461.4 0.0mV	446.5 0.0mV
<b>Cgd_0v [aF]</b>	543.4 0.0%	573.5 0.0%	568.1 0.0%	556 0.0%	596.1 0.0%
<b>Cgg_inv [fF]</b>	3.2 0.0%	3.3 0.0%	3.32 0.0%	3.33 0.0%	3.45 0.0%
<b>Ieff [μA]</b>	231.2 0.0%	239.9 0.0%	280.2 0.0%	319.3 0.0%	332.3 0.0%
<b>Ig_on [aA]</b>	7.62 0.0%	29.81 0.0%	83.07 0.0%	276.3 0.0%	943.6 0.0%
<b>Ioffsat [pA]</b>	1.96 0.0%	4.22 0.0%	18.34 0.0%	115.2 0.0%	234.9 0.0%
<b>Ioff_g [fA]</b>	-0.12 -0.0%	-0.36 -0.0%	-0.94 -0.0%	-2.7 -0.0%	-7.32 -0.0%
<b>Ioff_s [pA]</b>	-1.96 -0.0%	-4.22 -0.0%	-18.34 -0.0%	-115.2 -0.0%	-234.9 -0.0%

**egpfet\_acc @ w=2e-06, l=2.0e-06, swshe=0, pre\_layout\_local=1, sa=2.26e-6,  
sb=2.26e-6, devtype=PT, as=4.52e-12, ad=4.52e-12, ps=8.52e-06, pd=8.52e-06,  
vbs=0, vdd=1.8, temp=25.0**

DK1.2\_RF\_mmW wrt DK1.1\_RF\_mmW

	SSF	SS	TT	FF	FFF
<b>Vt_lin [mV]</b>	604.8 0.0mV	586.5 0.0mV	484.7 0.0mV	389 0.0mV	367.8 0.0mV
<b>Vt_sat [mV]</b>	584.2 0.0mV	566.4 0.0mV	465.1 0.0mV	369.7 0.0mV	348.8 0.0mV
<b>Isat [μA]</b>	42.04 0.0%	44.19 0.0%	51.65 0.0%	58.76 0.0%	61.29 0.0%
<b>Ilin [μA]</b>	4.05 0.0%	4.16 0.0%	4.42 0.0%	4.65 0.0%	4.77 0.0%
<b>Gm_c [μS]</b>	9.22 0.0%	9.44 0.0%	9.52 0.0%	9.47 0.0%	9.57 0.0%
<b>Gd_c [nS]</b>	6.84 0.0%	6.84 0.0%	6.84 0.0%	6.63 0.0%	6.49 0.0%
<b>Gain_c []</b>	1348 0.0%	1380 0.0%	1392 0.0%	1429 0.0%	1476 0.0%
<b>VtGmmax [mV]</b>	690.2 0.0mV	670.9 0.0mV	567.9 0.0mV	474.7 0.0mV	454.9 0.0mV
<b>Cgd_0v [aF]</b>	541.9 0.0%	571.9 0.0%	566.2 0.0%	553.9 0.0%	593.9 0.0%
<b>Cgg_inv [fF]</b>	29.57 0.0%	30.34 0.0%	31.05 0.0%	31.77 0.0%	32.54 0.0%
<b>Ieff [μA]</b>	21.51 0.0%	22.64 0.0%	26.65 0.0%	30.51 0.0%	31.86 0.0%
<b>Ig_on [fA]</b>	1.45e-02 0.0%	6.08e-02 0.0%	0.22 0.0%	0.98 0.0%	3.53 0.0%
<b>Ioffsat [pA]</b>	1.8 0.0%	3.98 0.0%	14.46 0.0%	55.37 0.0%	122.6 0.0%
<b>Ioff_g [fA]</b>	-1.44 -0.0%	-4.37 -0.0%	-11.32 -0.0%	-32.69 -0.0%	-88.59 -0.0%
<b>Ioff_s [pA]</b>	-1.8 -0.0%	-3.98 -0.0%	-14.45 -0.0%	-55.34 -0.0%	-122.5 -0.0%

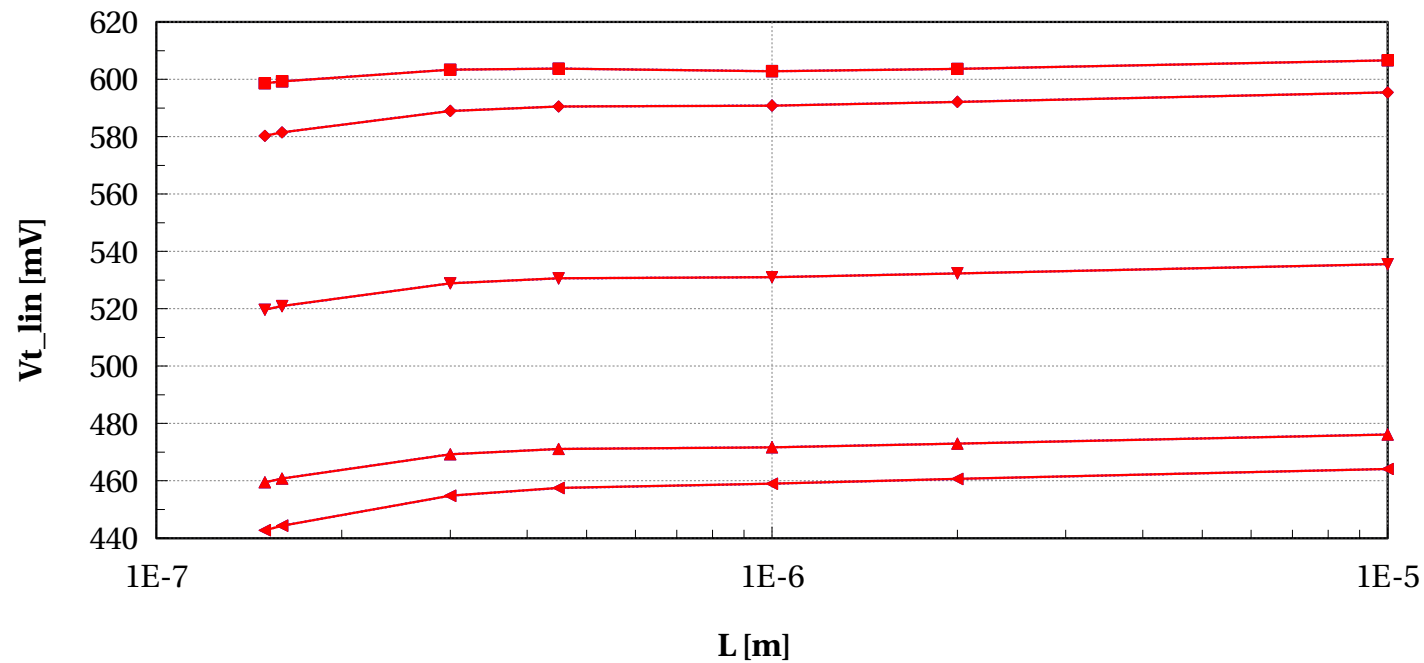
# egnfet\_acc

## Electrical characteristics scaling

## Scaling versus Length ( $W=2e-6$ , Temp=25)

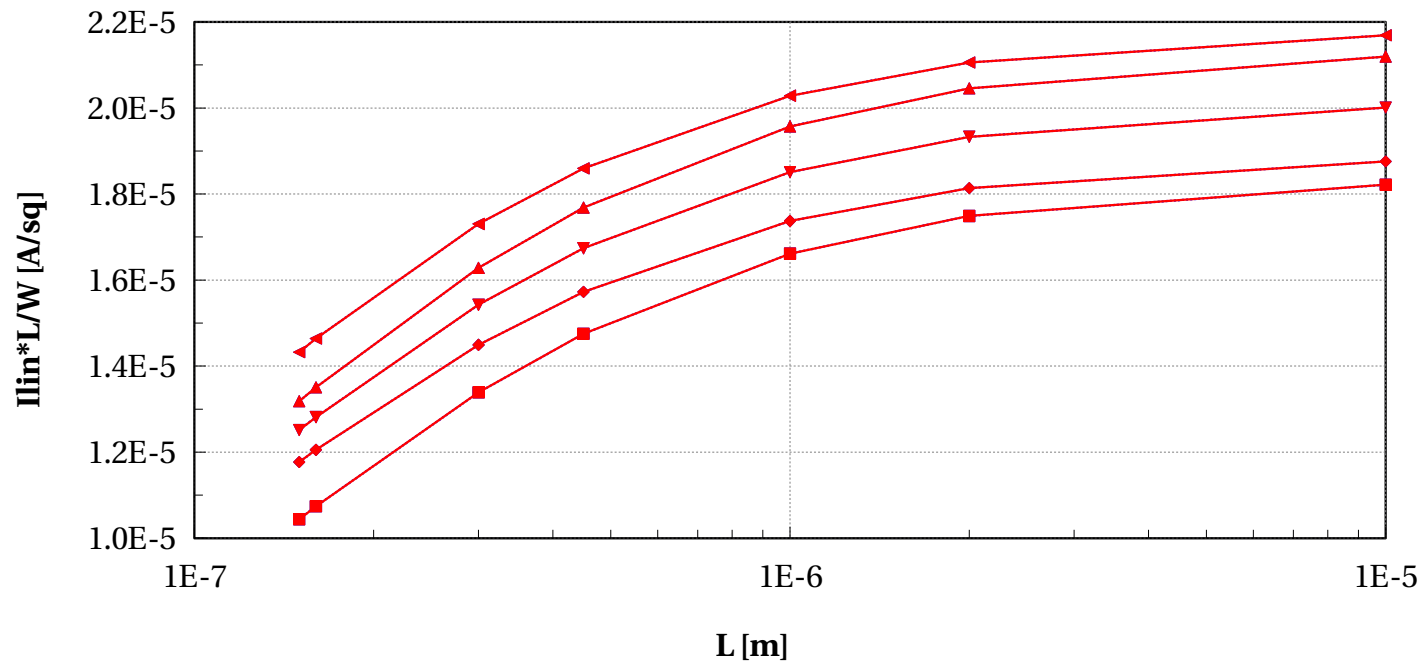
# egnfet\_acc, Vt\_lin [mV] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



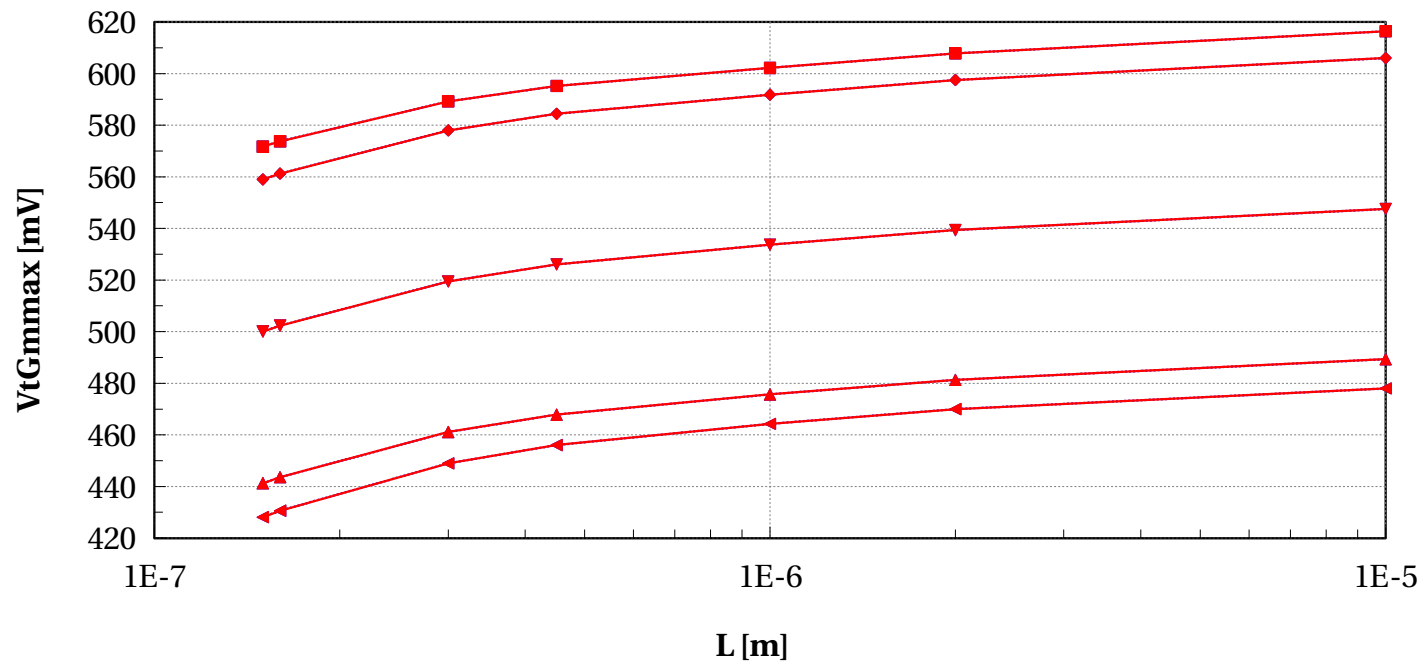
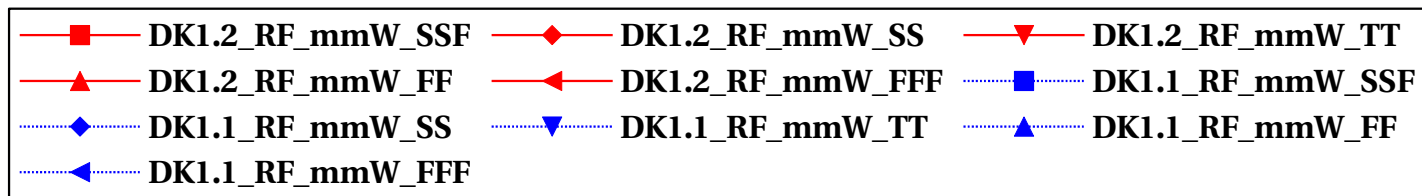
# egnfet\_acc, $I_{lin} * L / W$ [A/sq] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



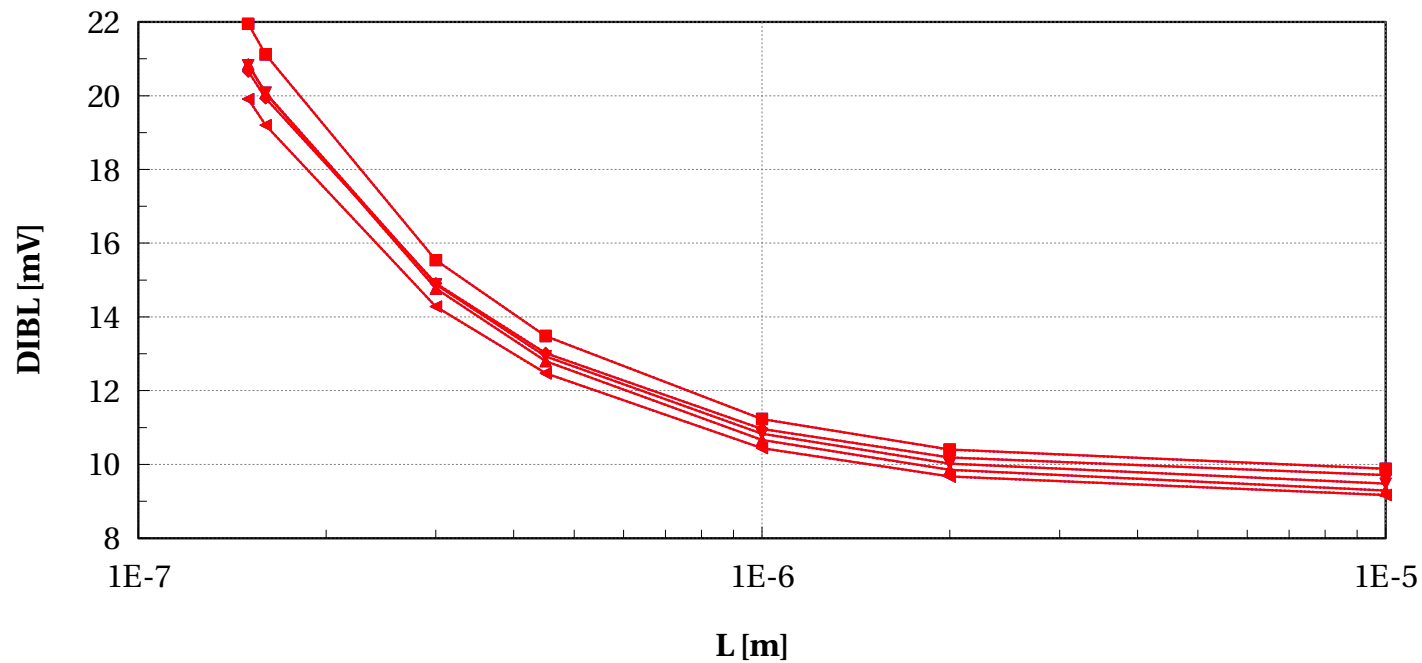
# egnfet\_acc, VtGmmax [mV] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



# egnfet\_acc, DIBL [mV] vs L [m]

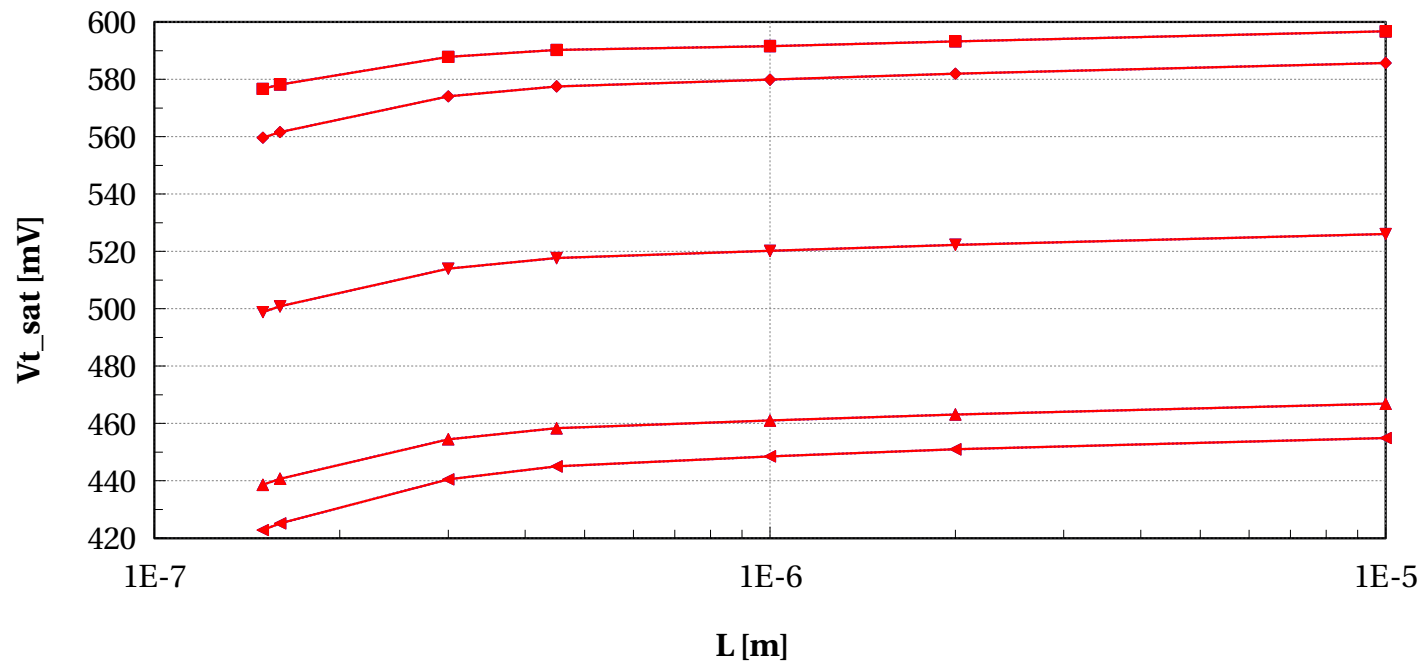
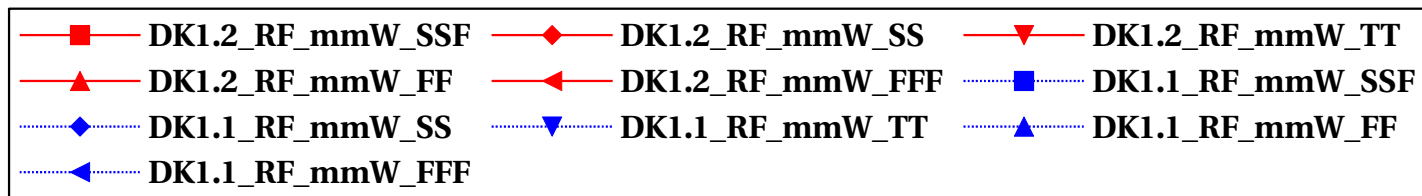
Temp==25 and w==2e-6 and devType=="PCELLwoWPE"





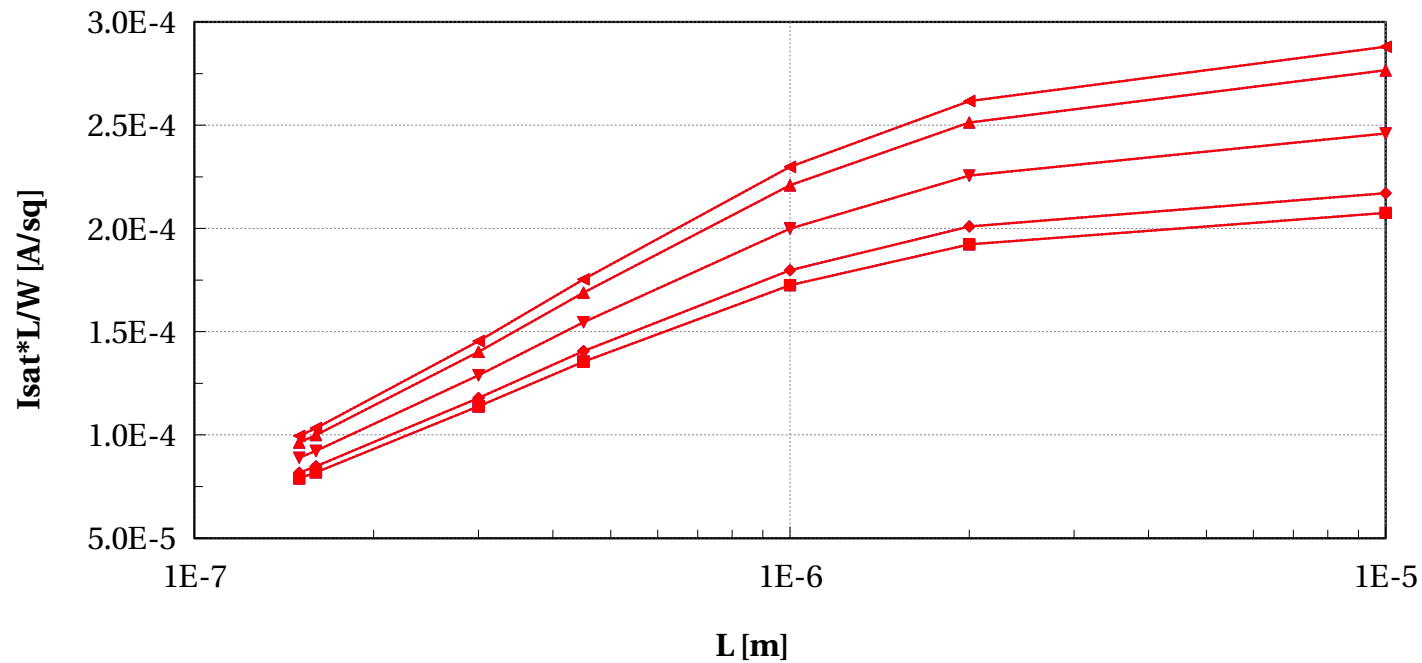
# egnfet\_acc, Vt\_sat [mV] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



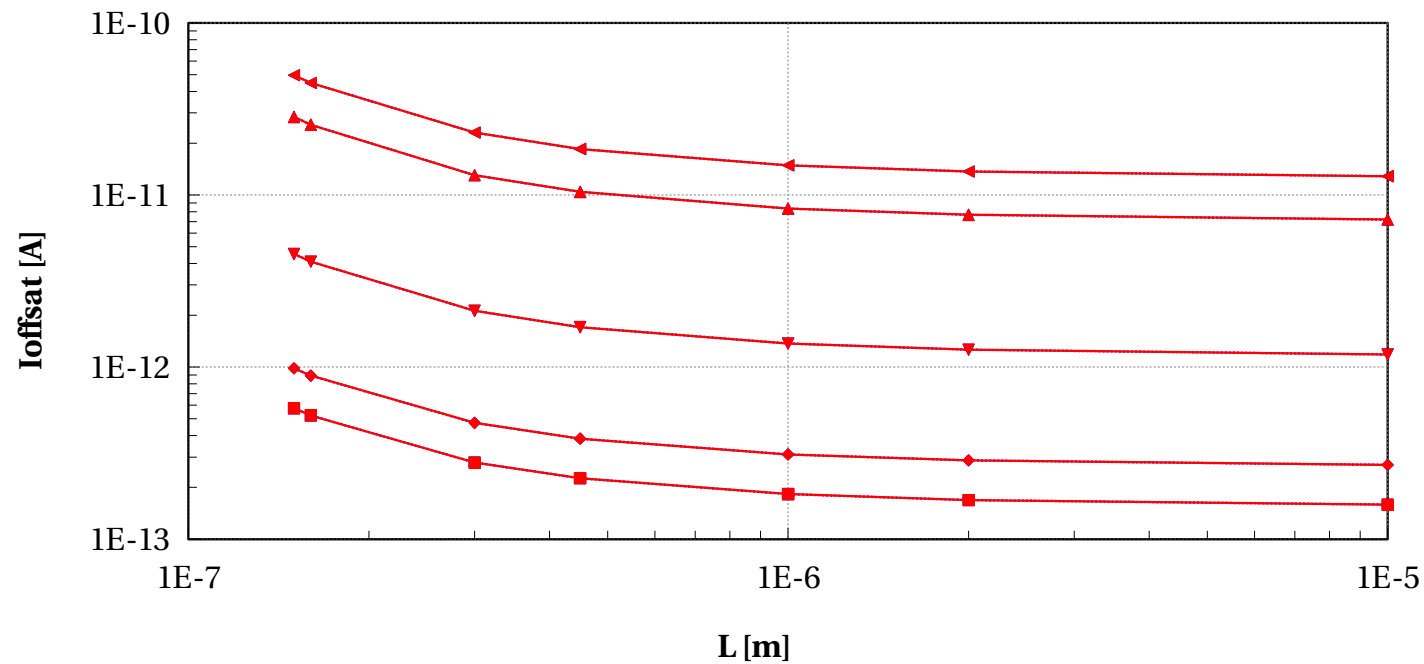
## egnfet\_acc, Isat\*L/W [A/sq] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



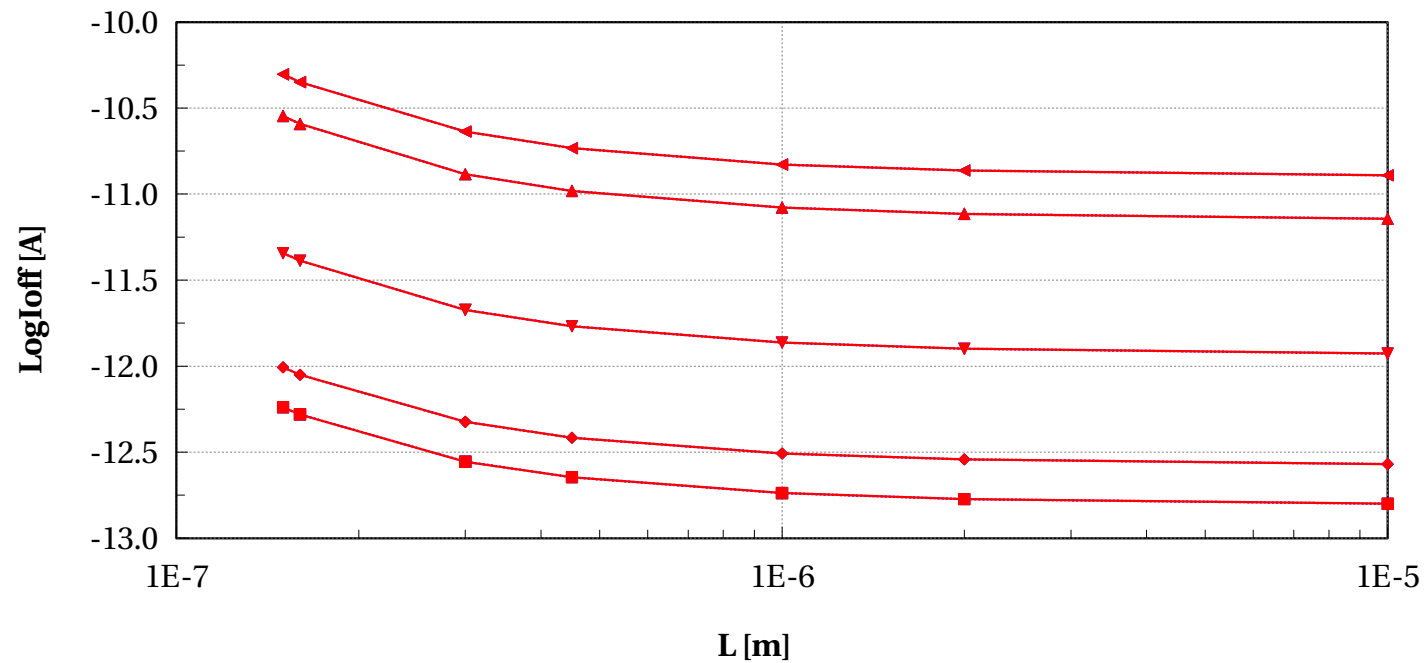
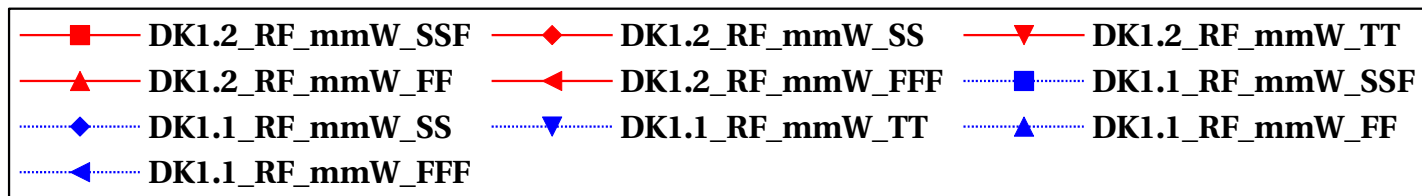
# egnfet\_acc, Ioffsat [A] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



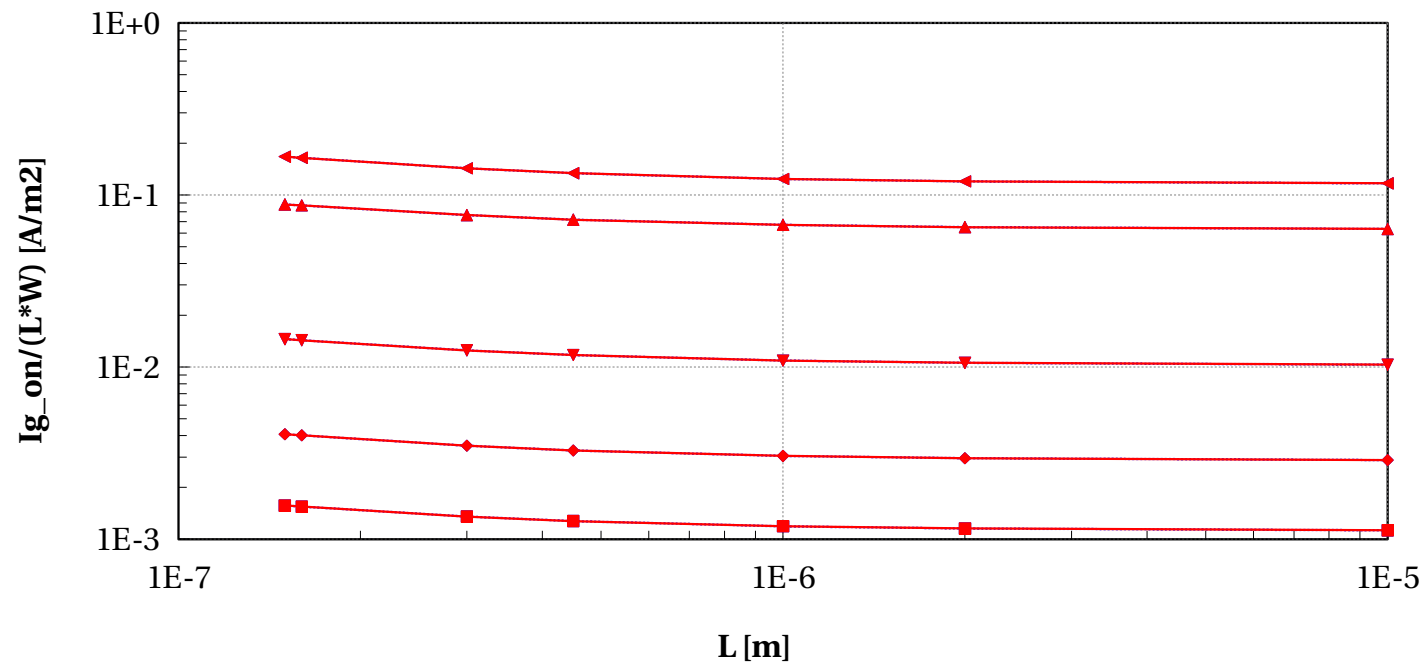
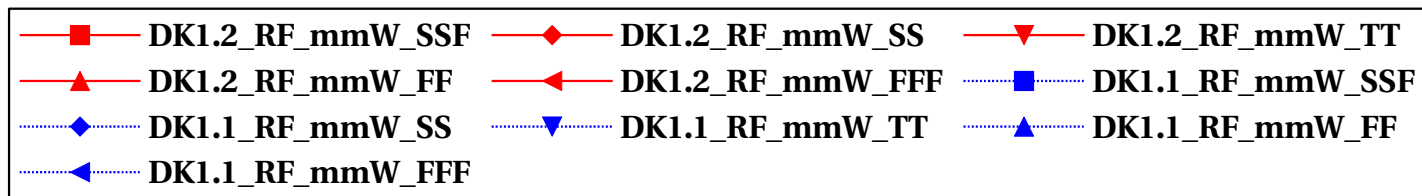
# egnfet\_acc, LogIoff [A] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



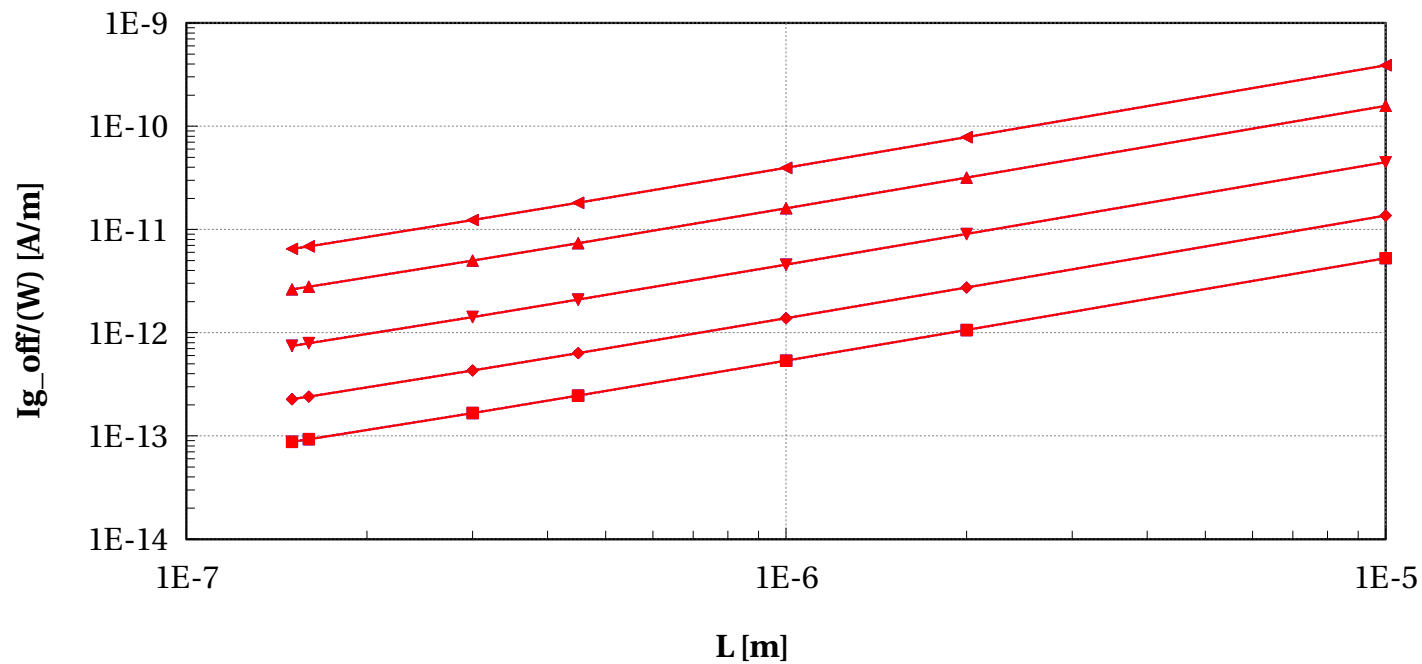
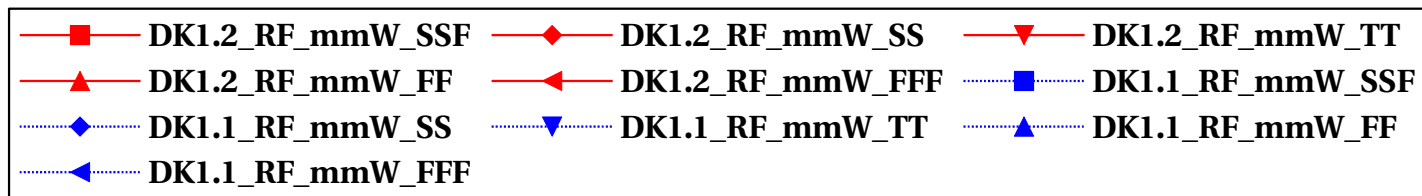
# egnfet\_acc, Ig\_on/(L\*W) [A/m2] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



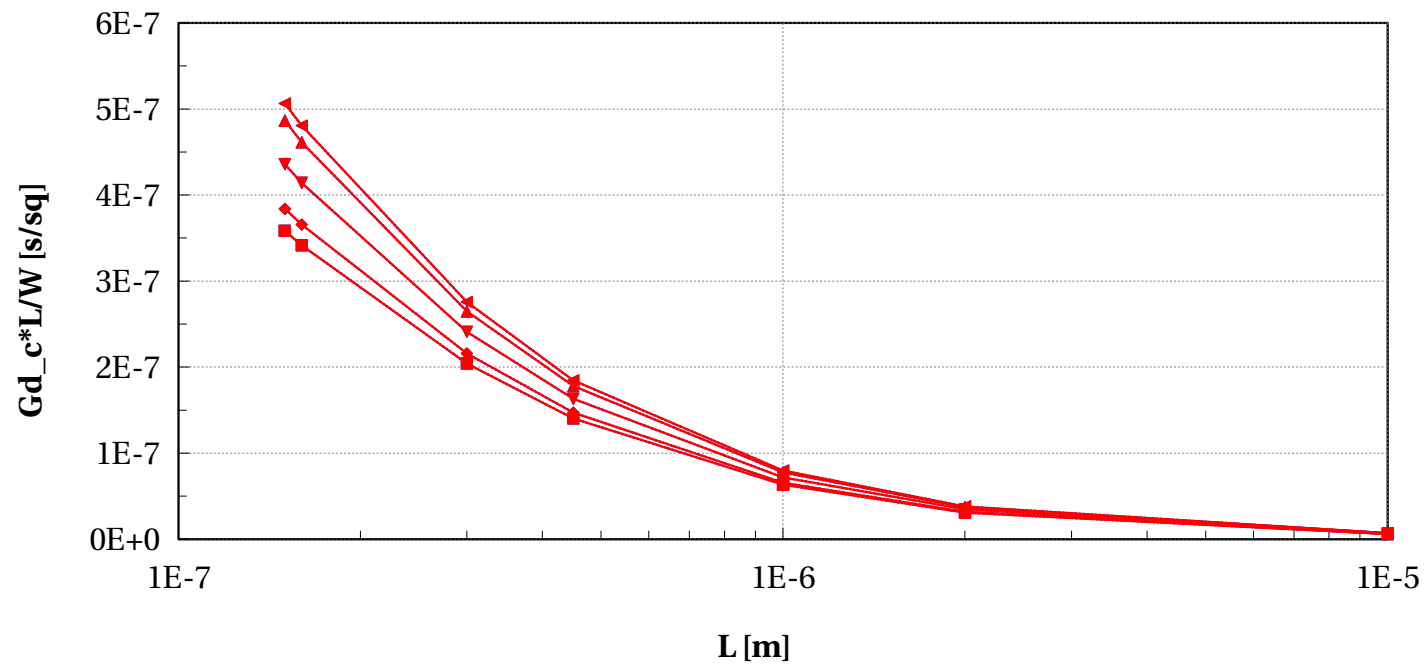
# egnfet\_acc, Ig\_off/(W) [A/m] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



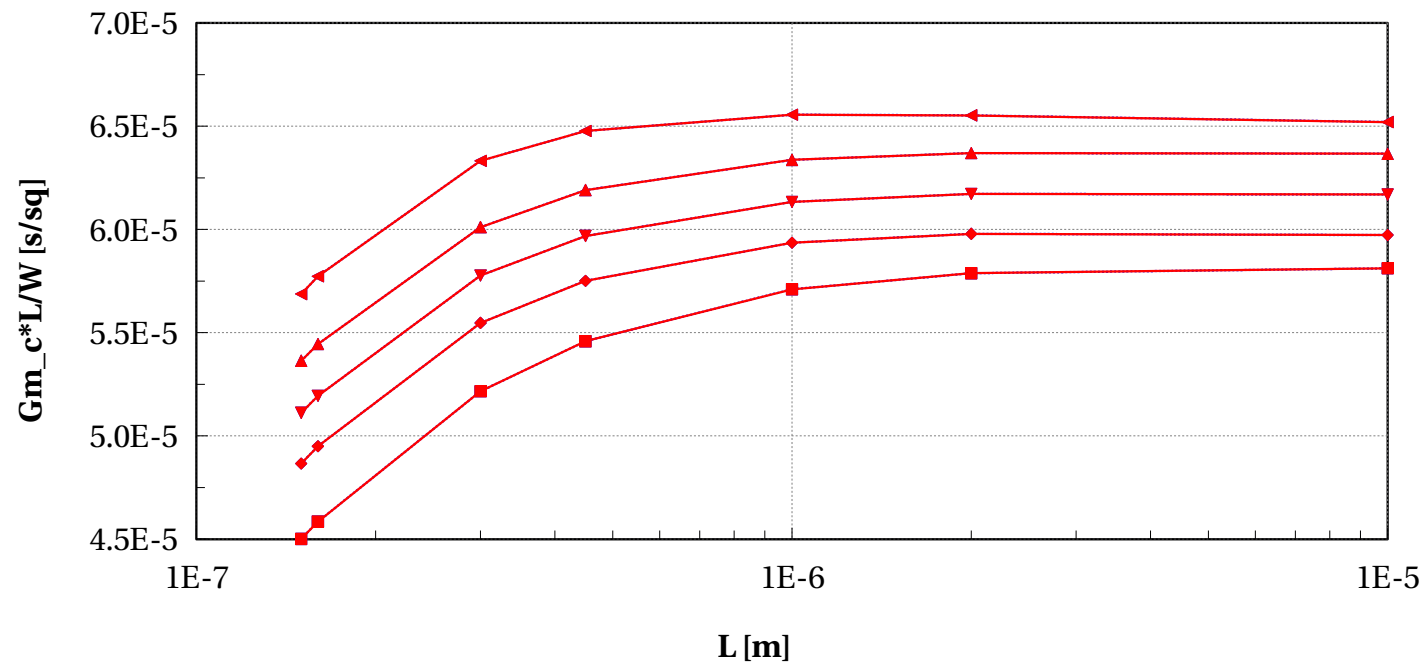
# egnfet\_acc, Gd\_c\*L/W [s/sq] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



# egnfet\_acc, $Gm_c \cdot L/W$ [s/sq] vs L [m]

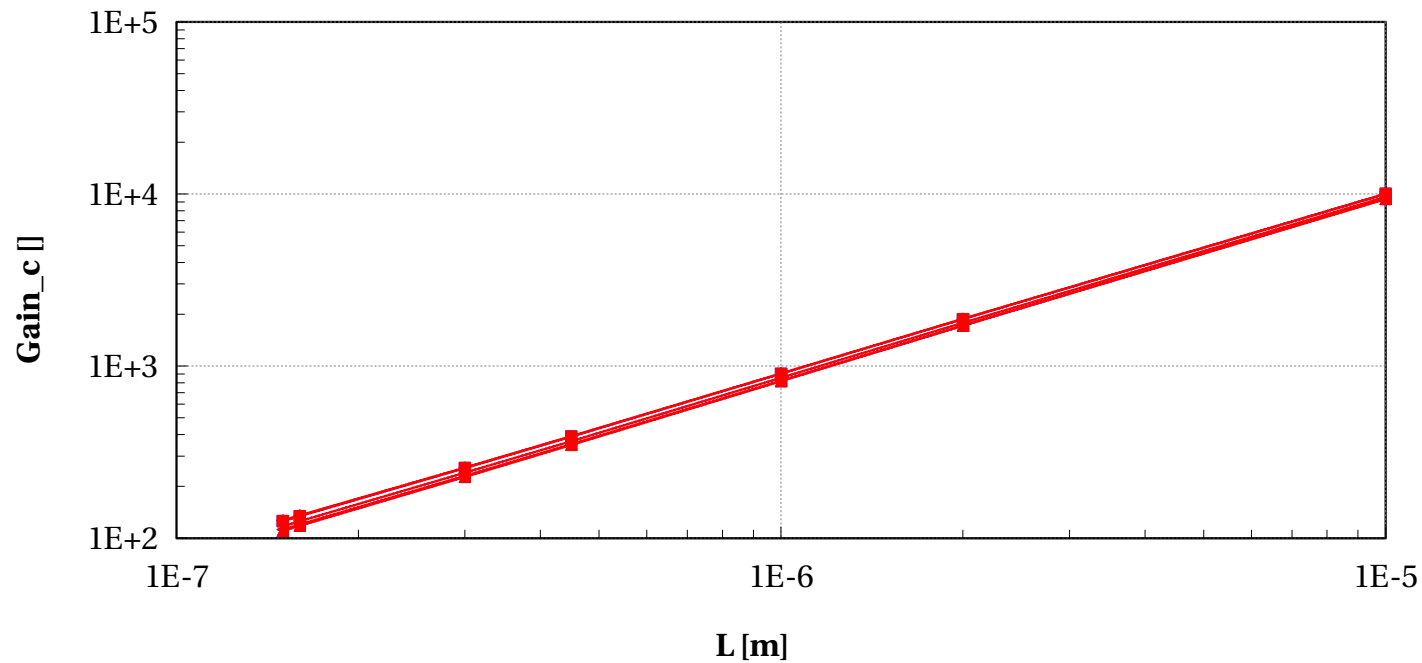
Temp==25 and w==2e-6 and devType=="PCELLwoWPE"





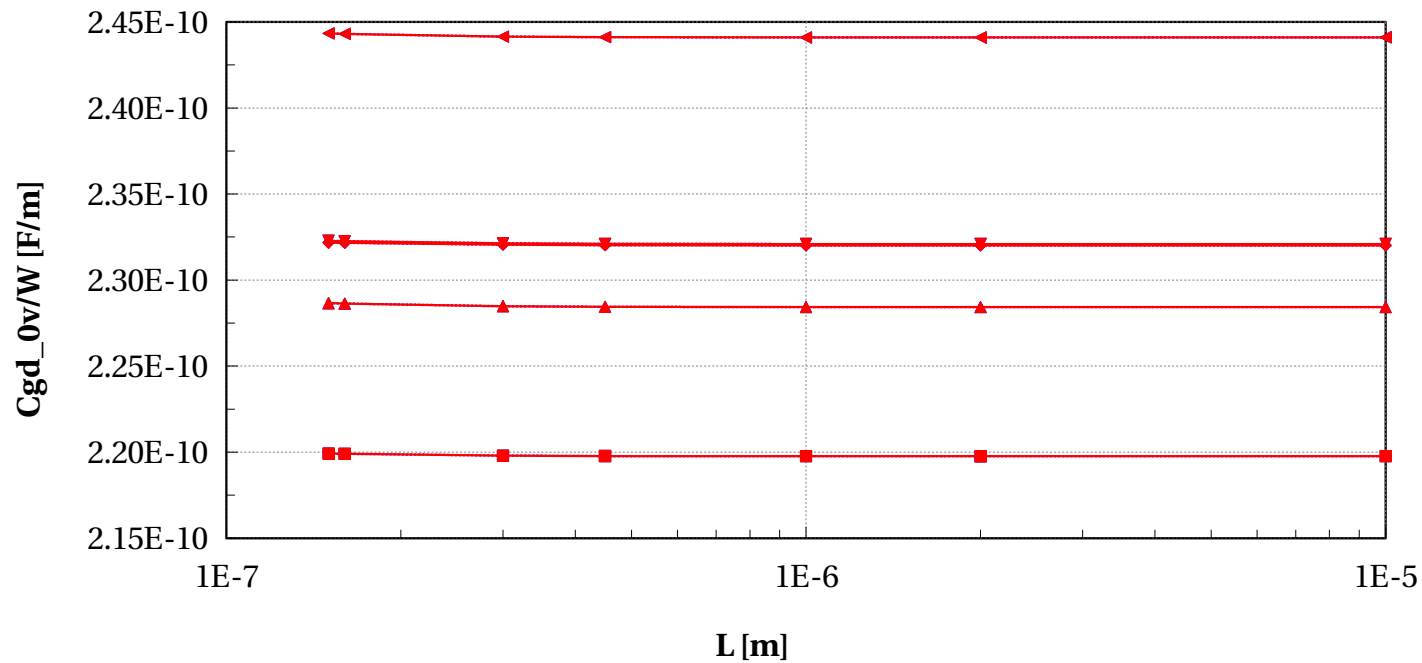
# egnfet\_acc, Gain\_c [] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



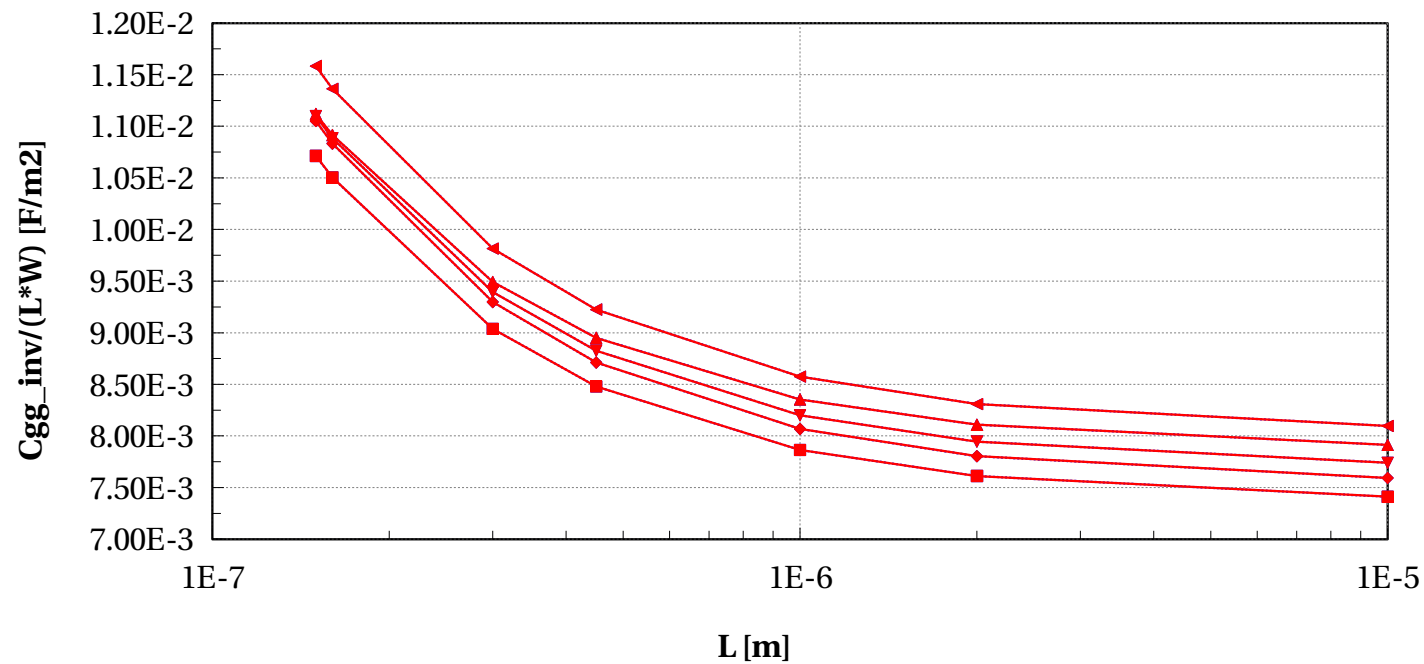
# egnfet\_acc, Cgd\_0v/W [F/m] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



# egnfet\_acc, Cgg\_inv/(L\*W) [F/m2] vs L [m]

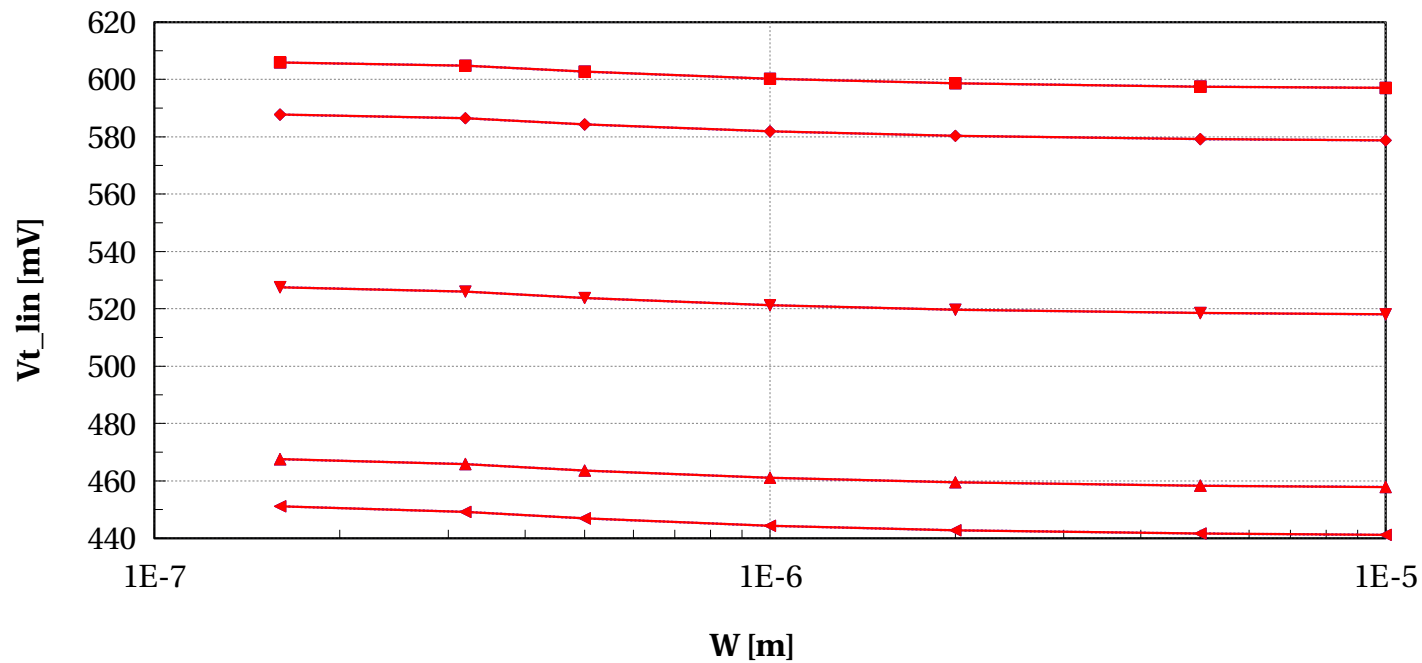
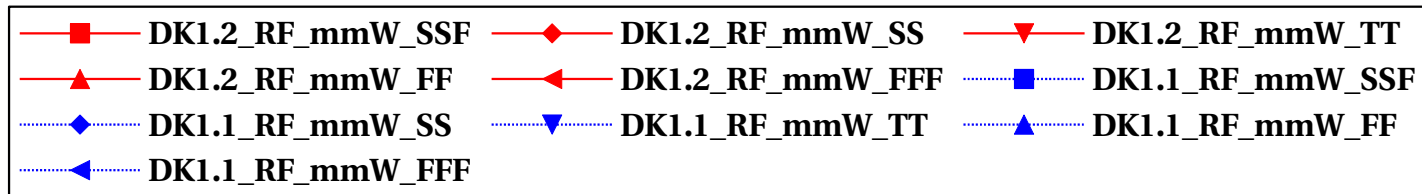
Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



## Scaling versus Width ( $L=0.15\text{e-}6$ , Temp=25)

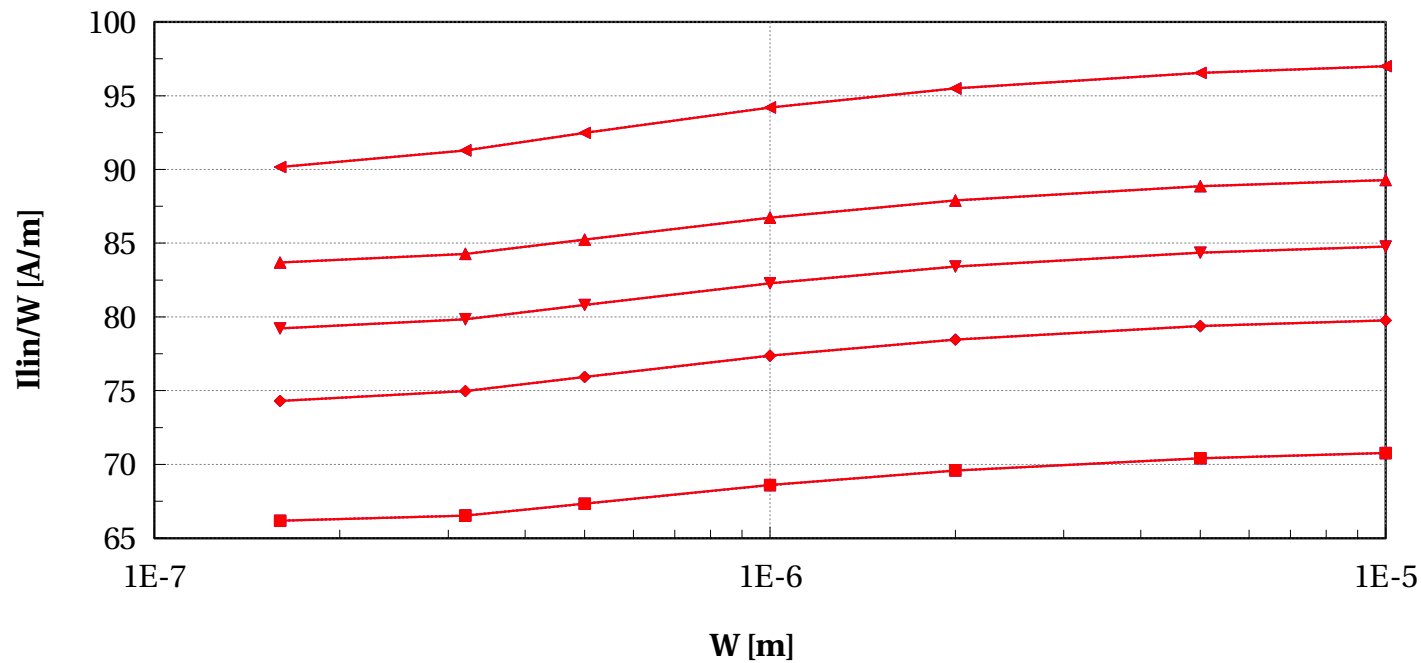
# egnfet\_acc, Vt\_lin [mV] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



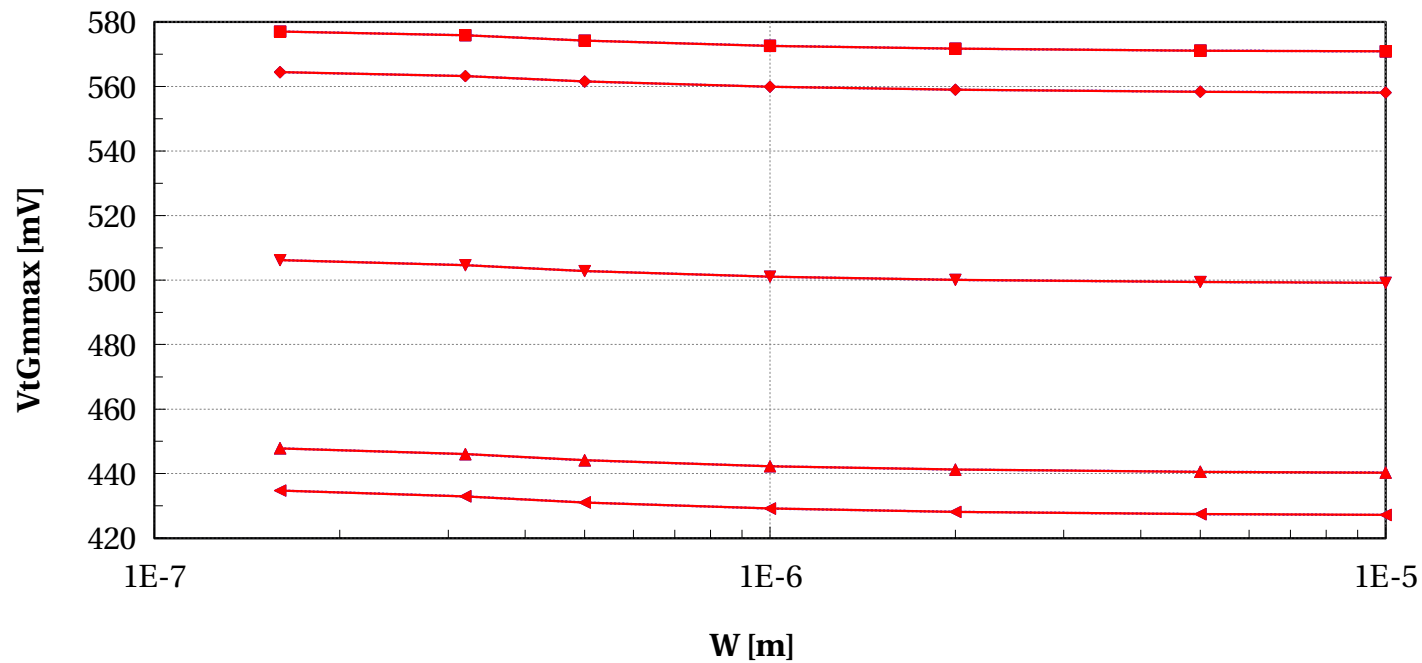
# egnfet\_acc, Ilin/W [A/m] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



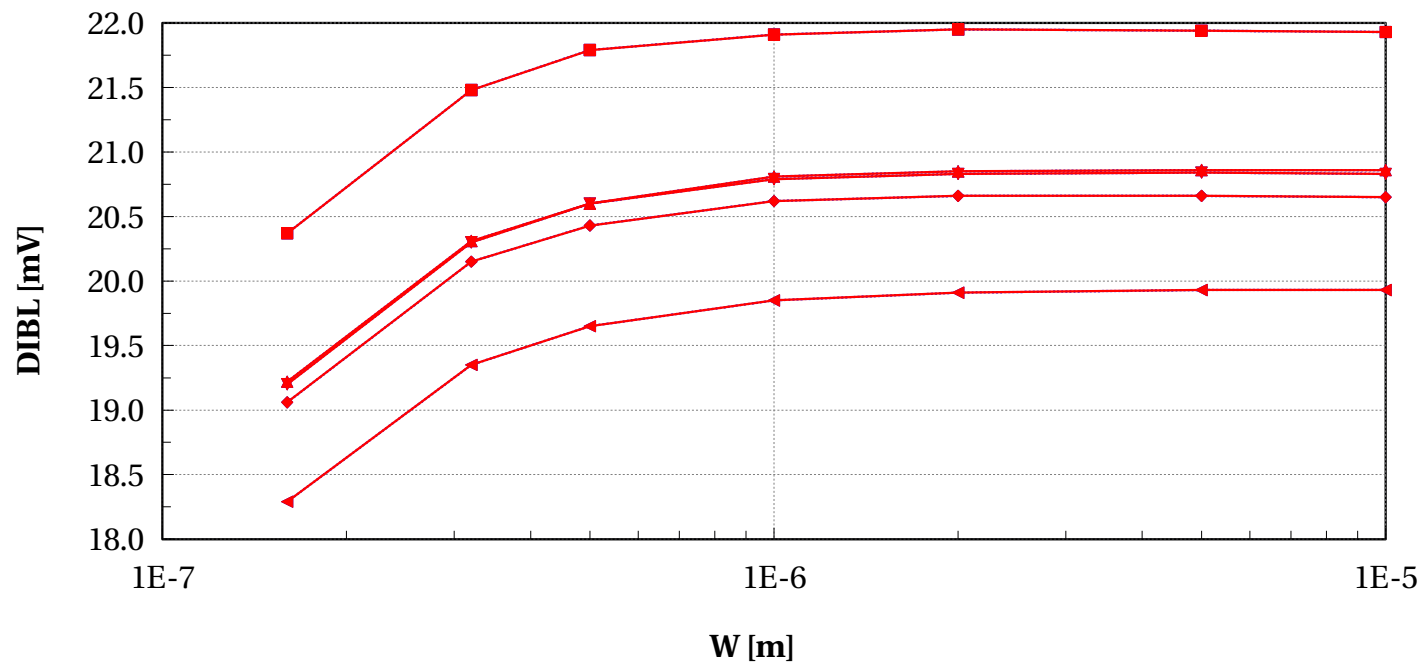
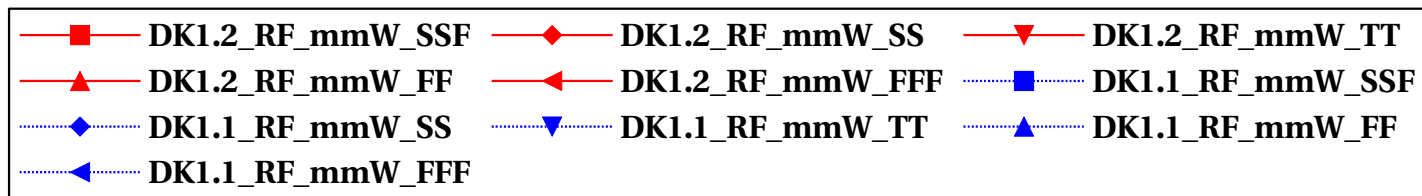
# egnfet\_acc, VtGmmax [mV] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



# egnfet\_acc, DIBL [mV] vs W [m]

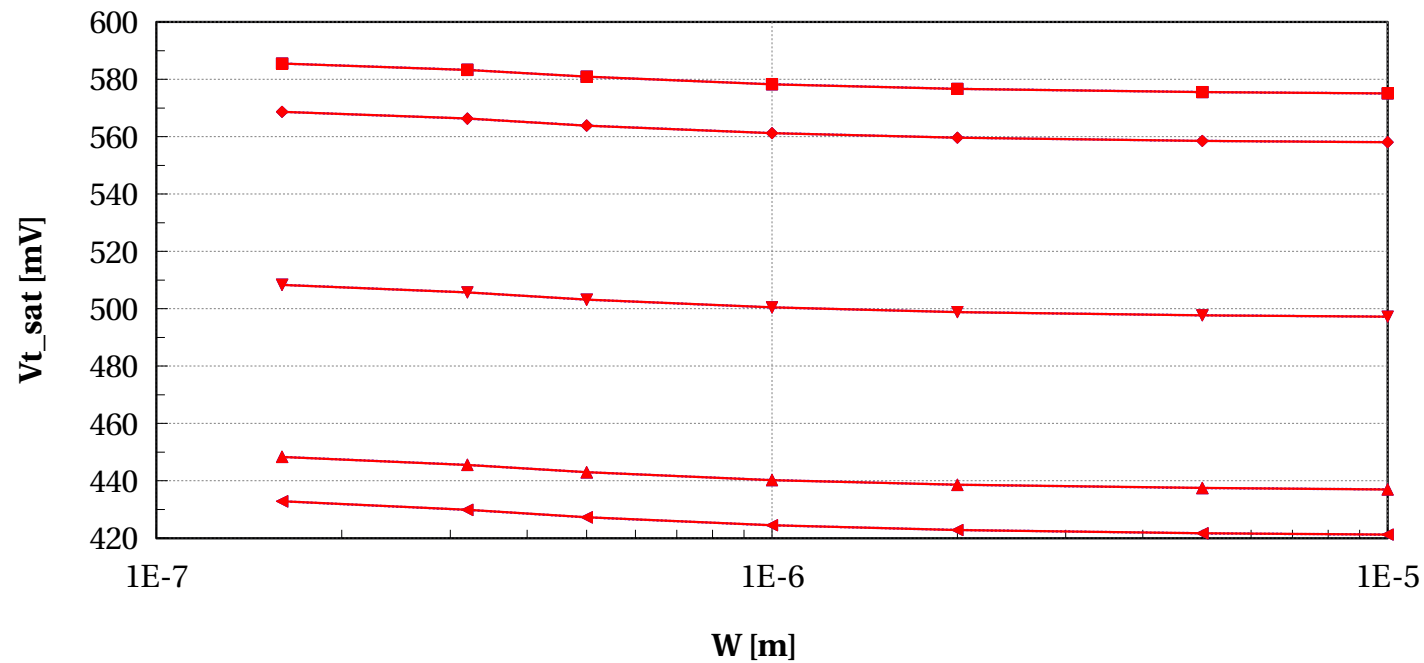
Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"





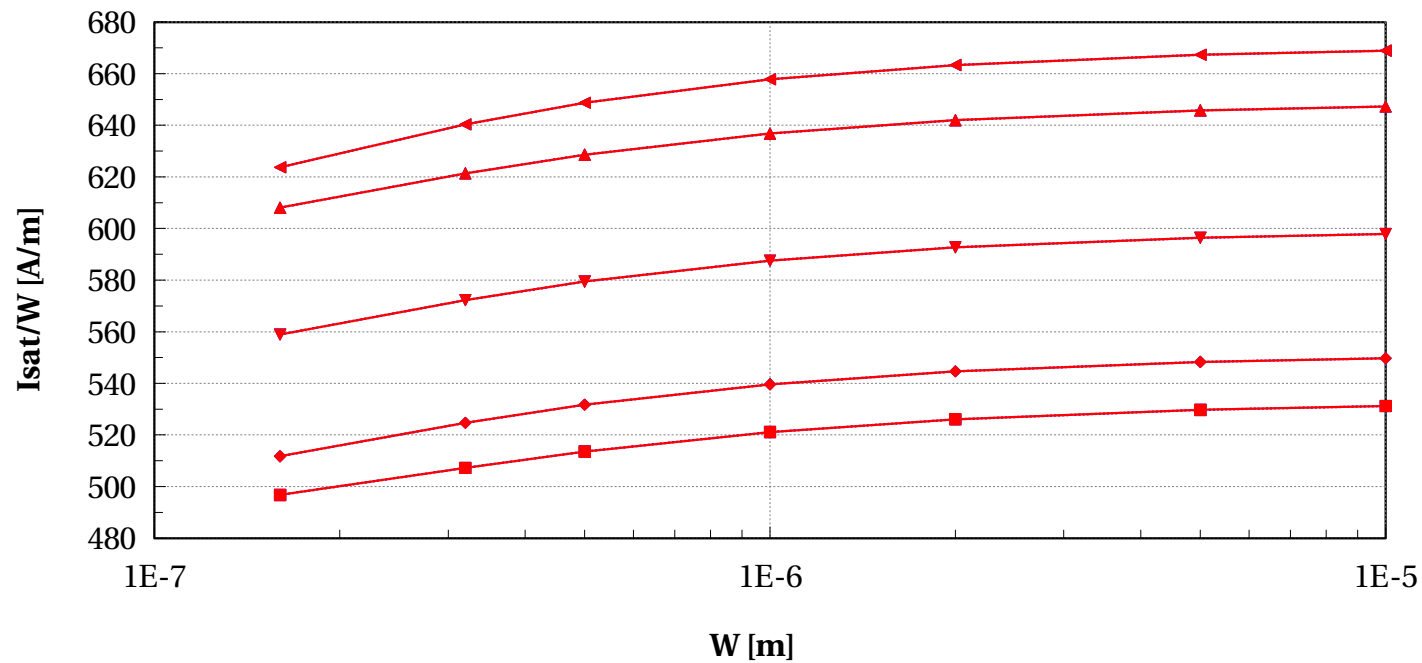
# egnfet\_acc, Vt\_sat [mV] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



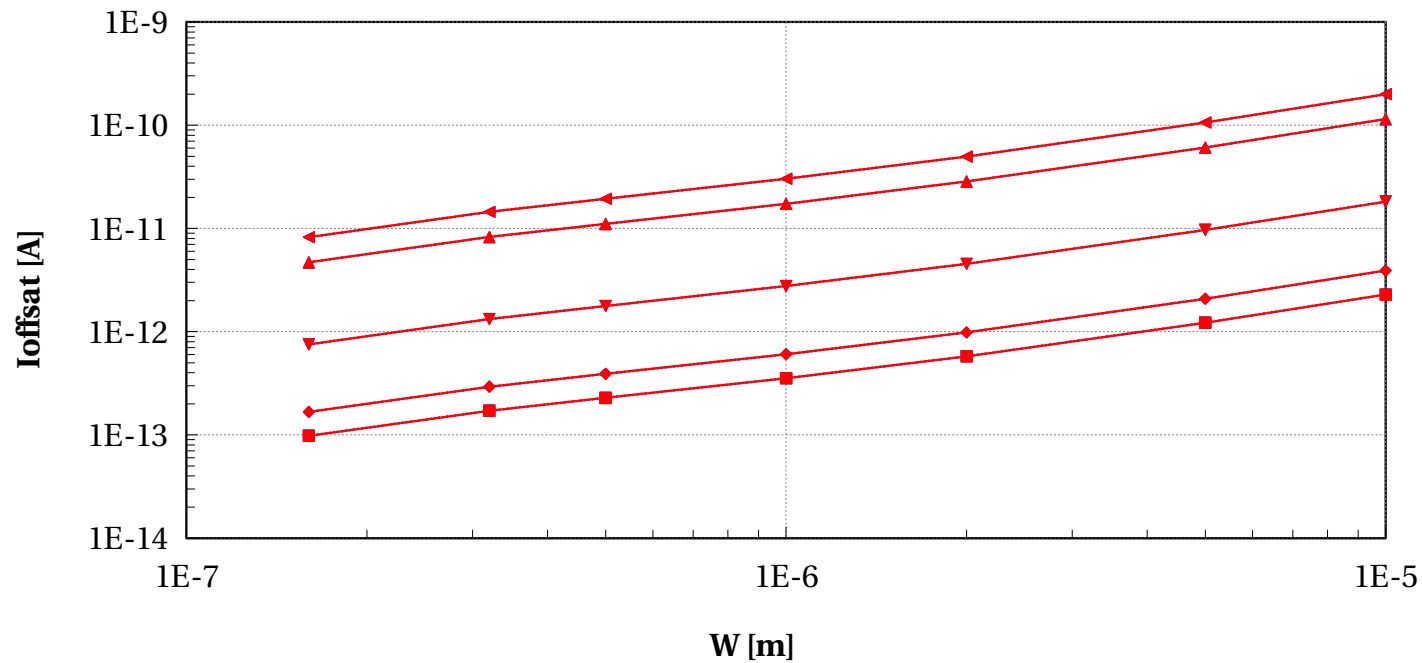
# egnfet\_acc, Isat/W [A/m] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



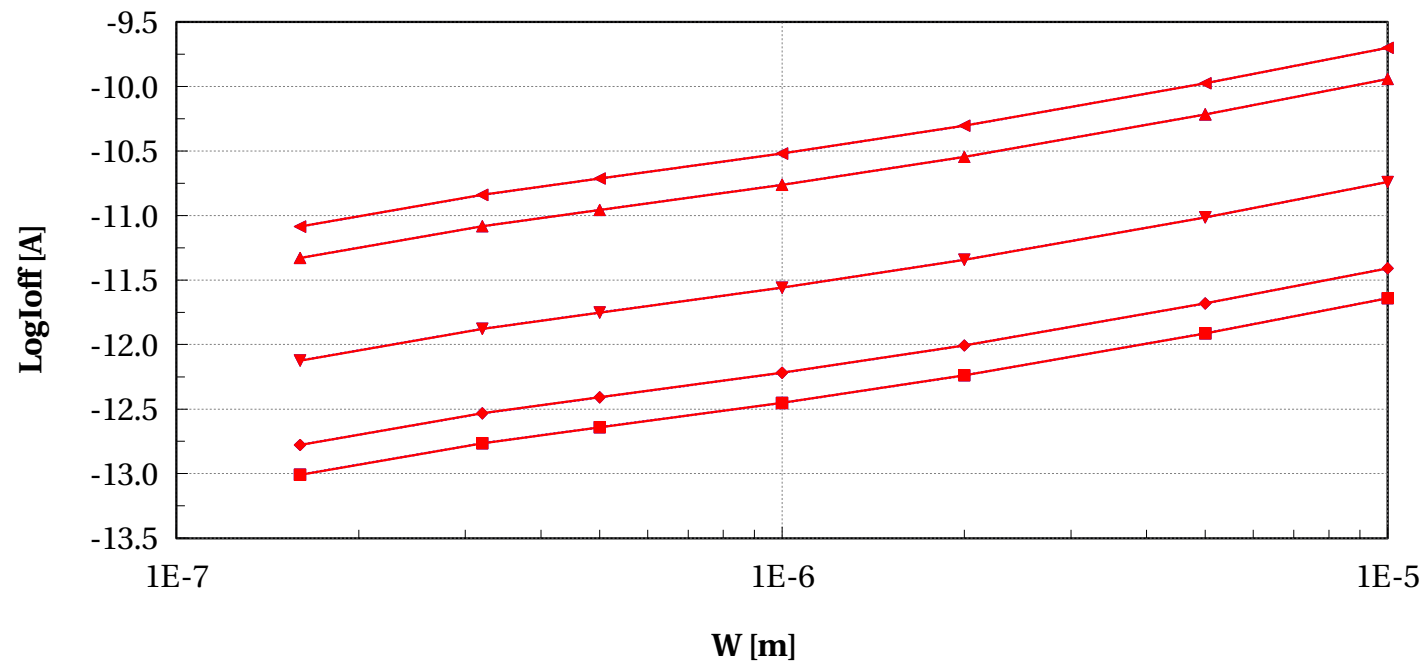
# egnfet\_acc, Ioffsat [A] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



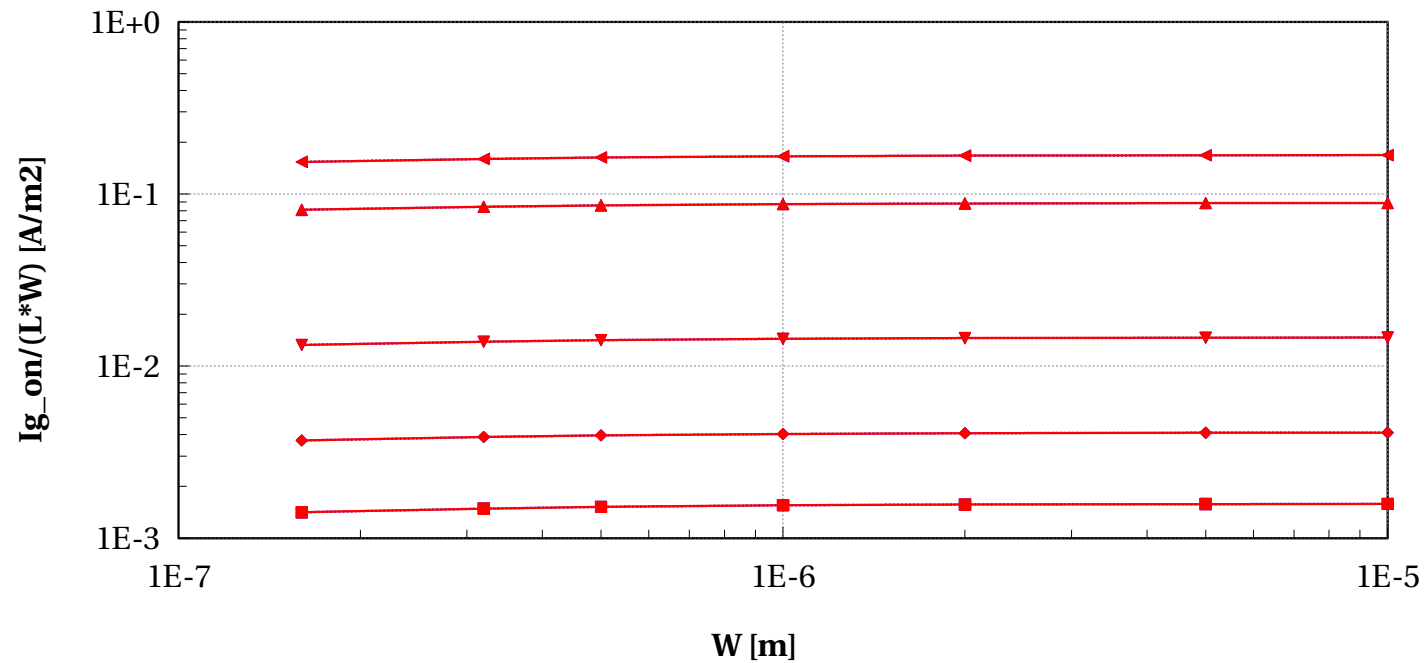
# egnfet\_acc, LogIoff [A] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



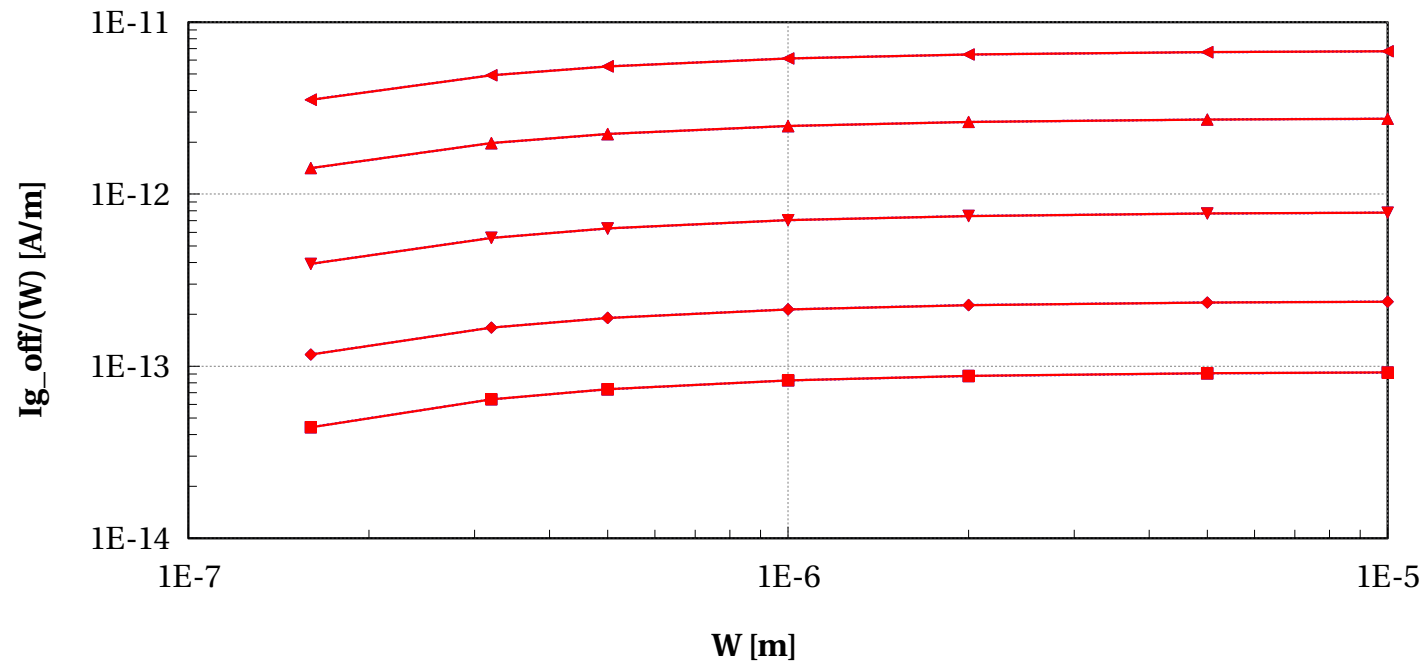
# egnfet\_acc, Ig\_on/(L\*W) [A/m2] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



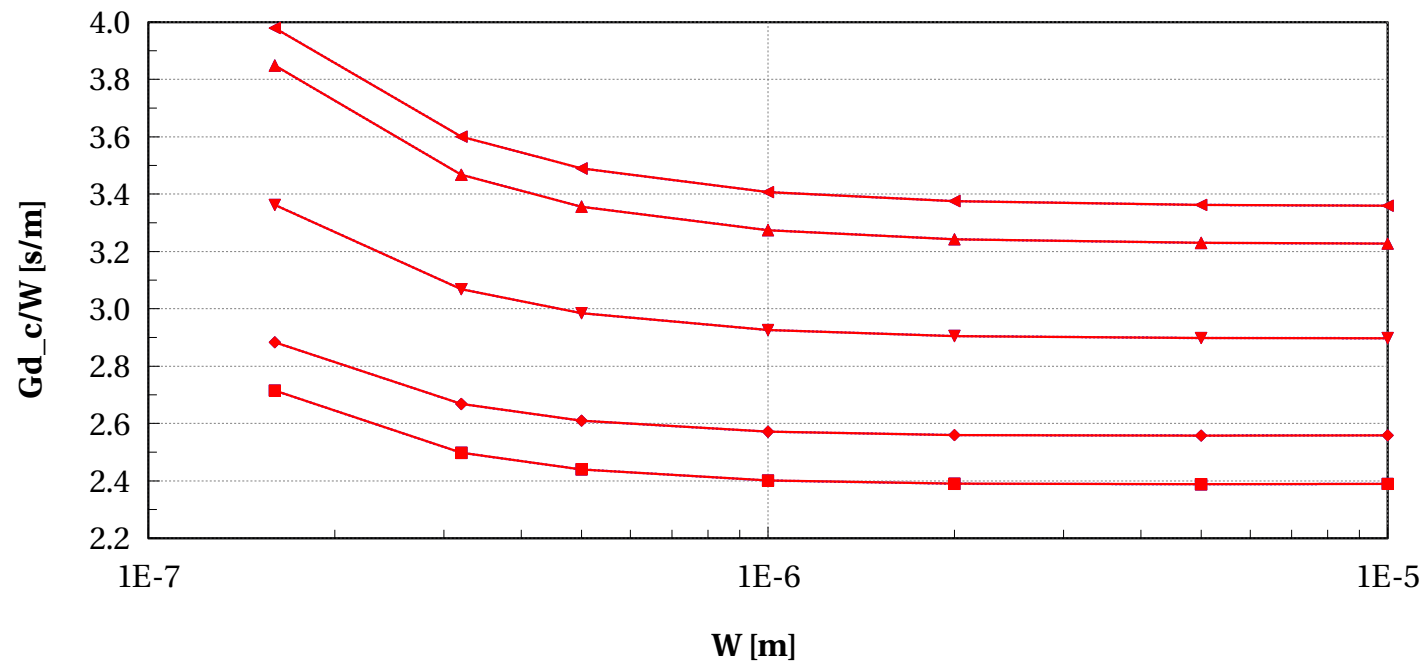
# egnfet\_acc, Ig\_off/(W) [A/m] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



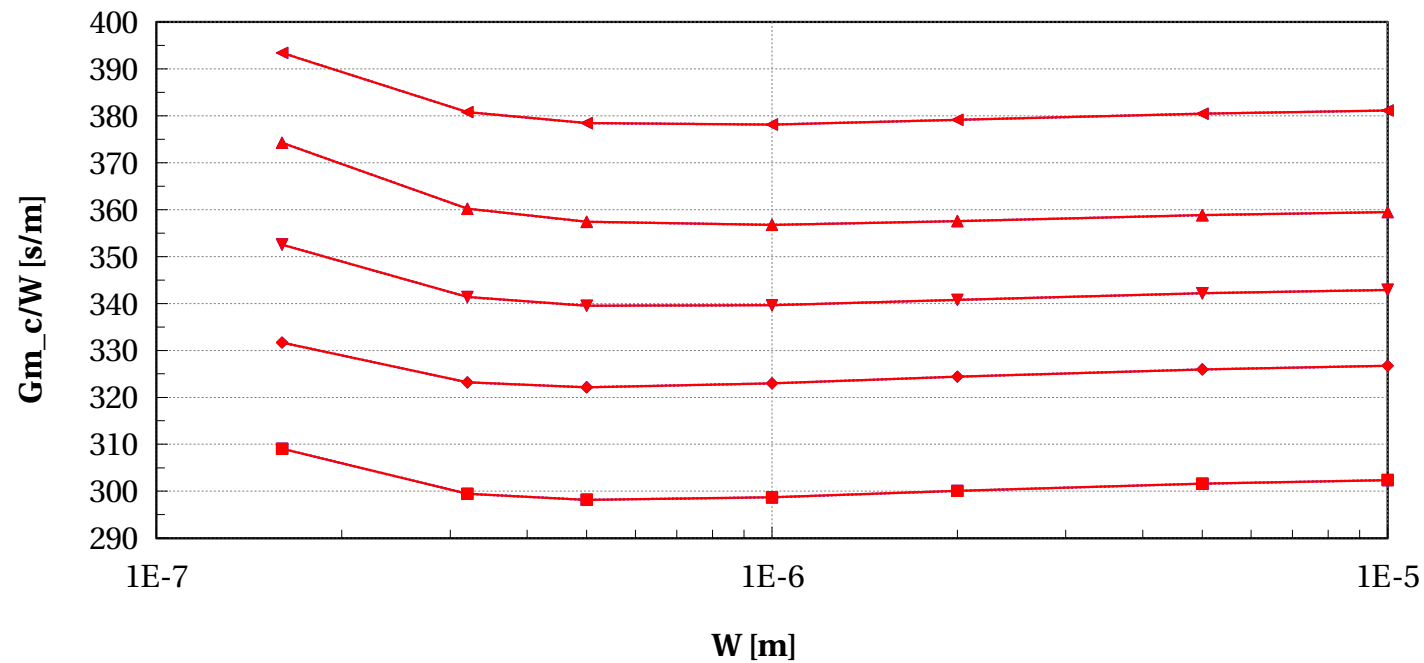
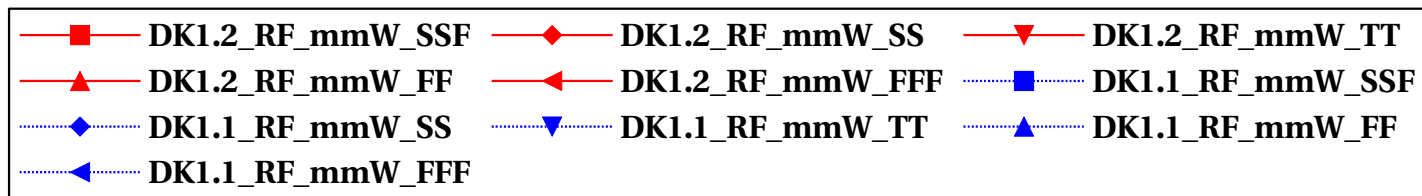
# egnfet\_acc, Gd\_c/W [s/m] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



# egnfet\_acc, Gm\_c/W [s/m] vs W [m]

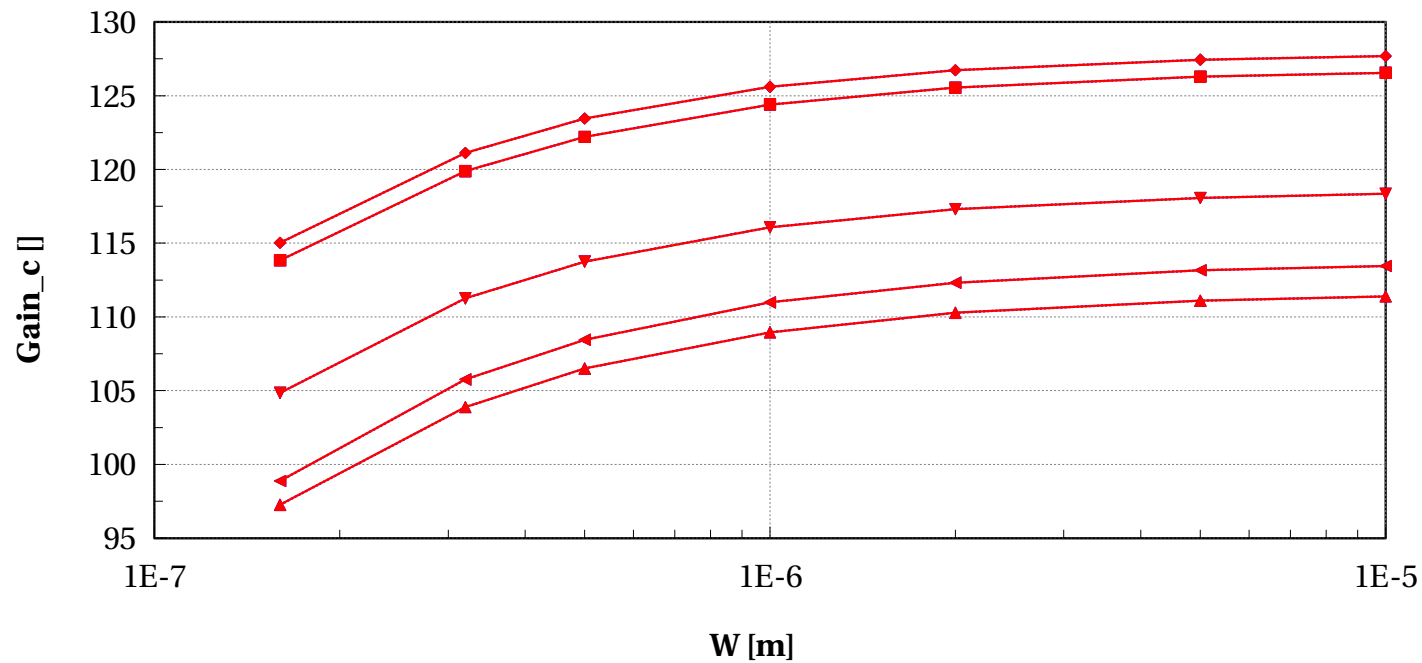
Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"





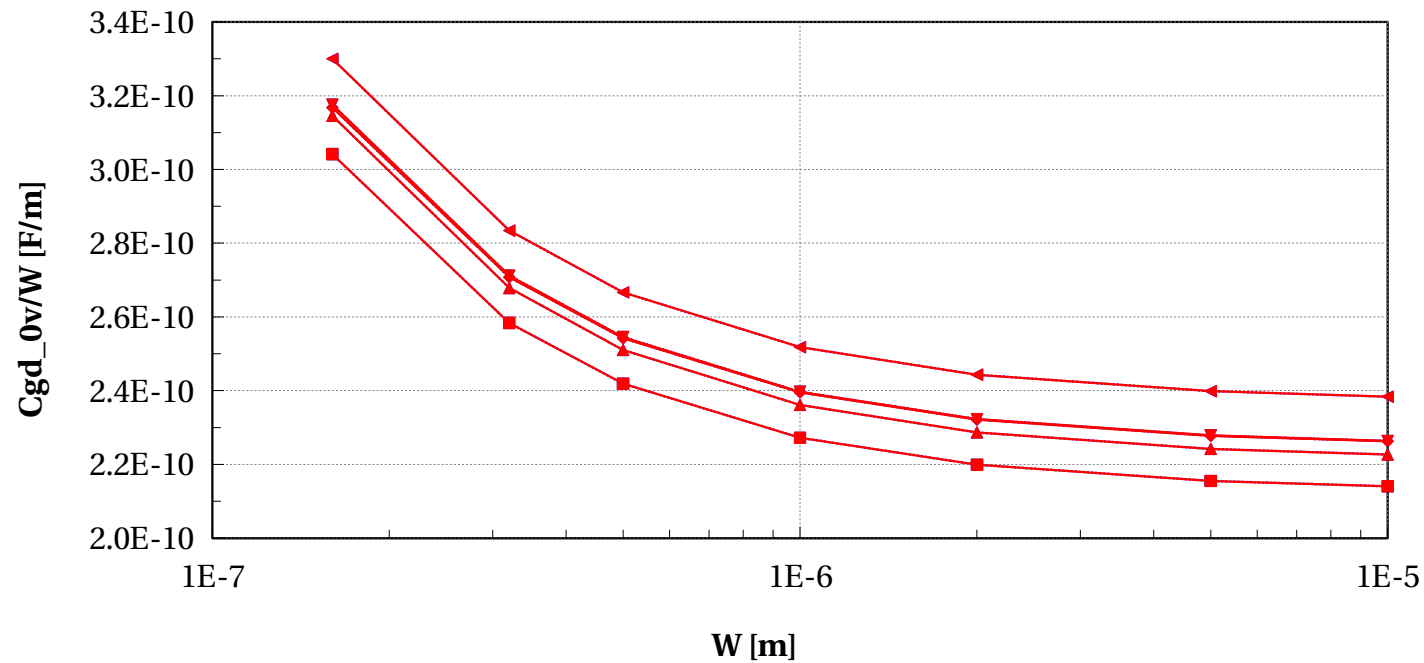
# egnfet\_acc, Gain\_c [] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



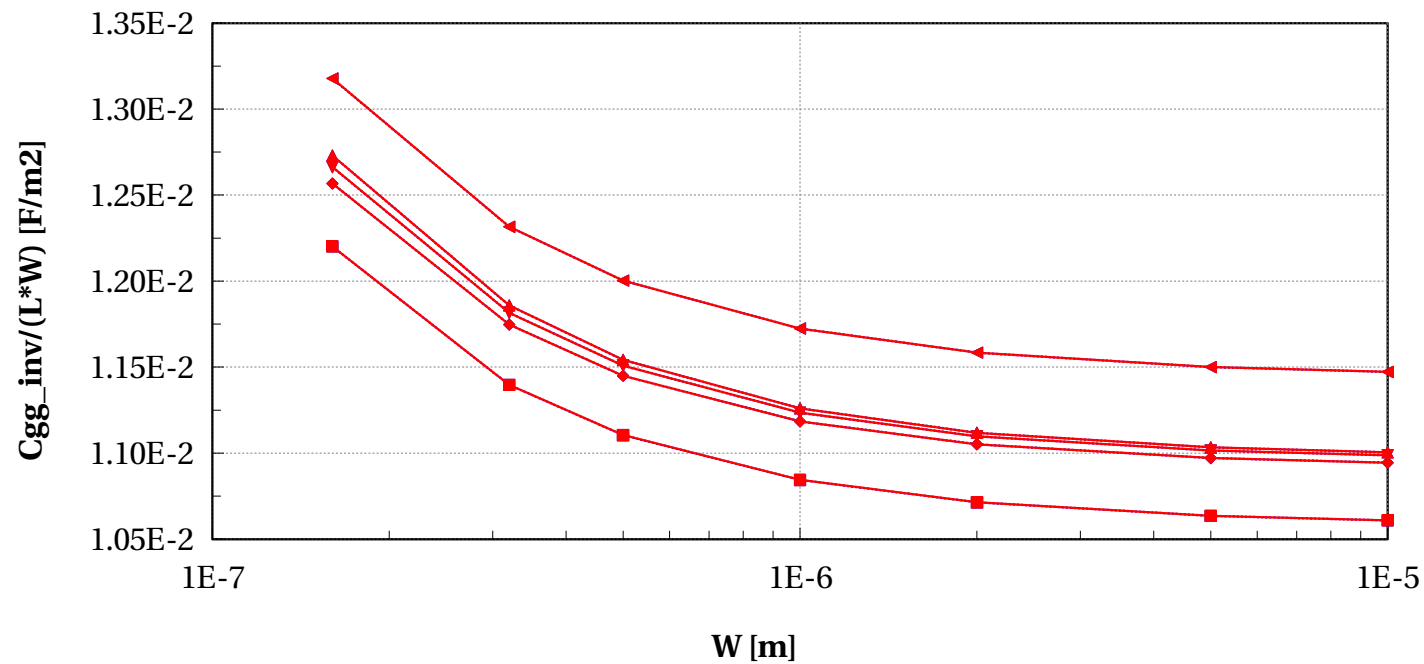
# egnfet\_acc, Cgd\_0v/W [F/m] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



# egnfet\_acc, Cgg\_inv/(L\*W) [F/m2] vs W [m]

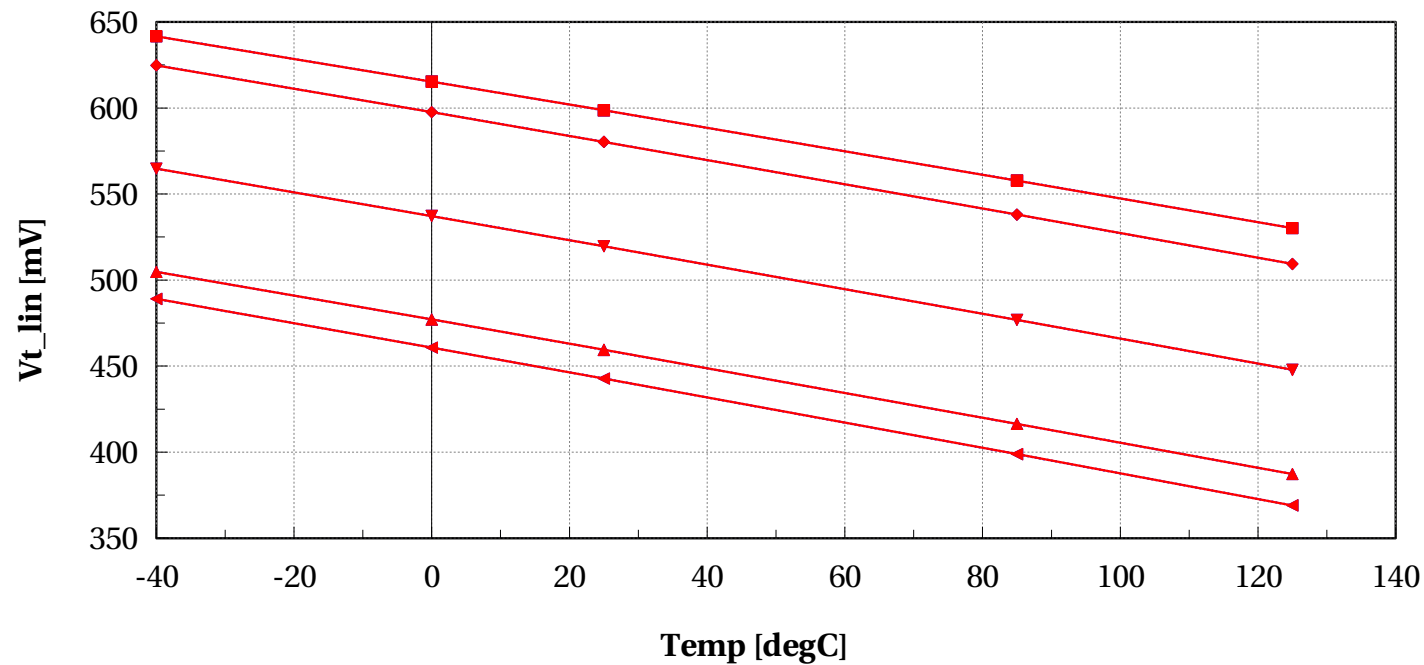
Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



## Scaling versus Temp @ $L=0.15\mu$ , $W=2\mu$

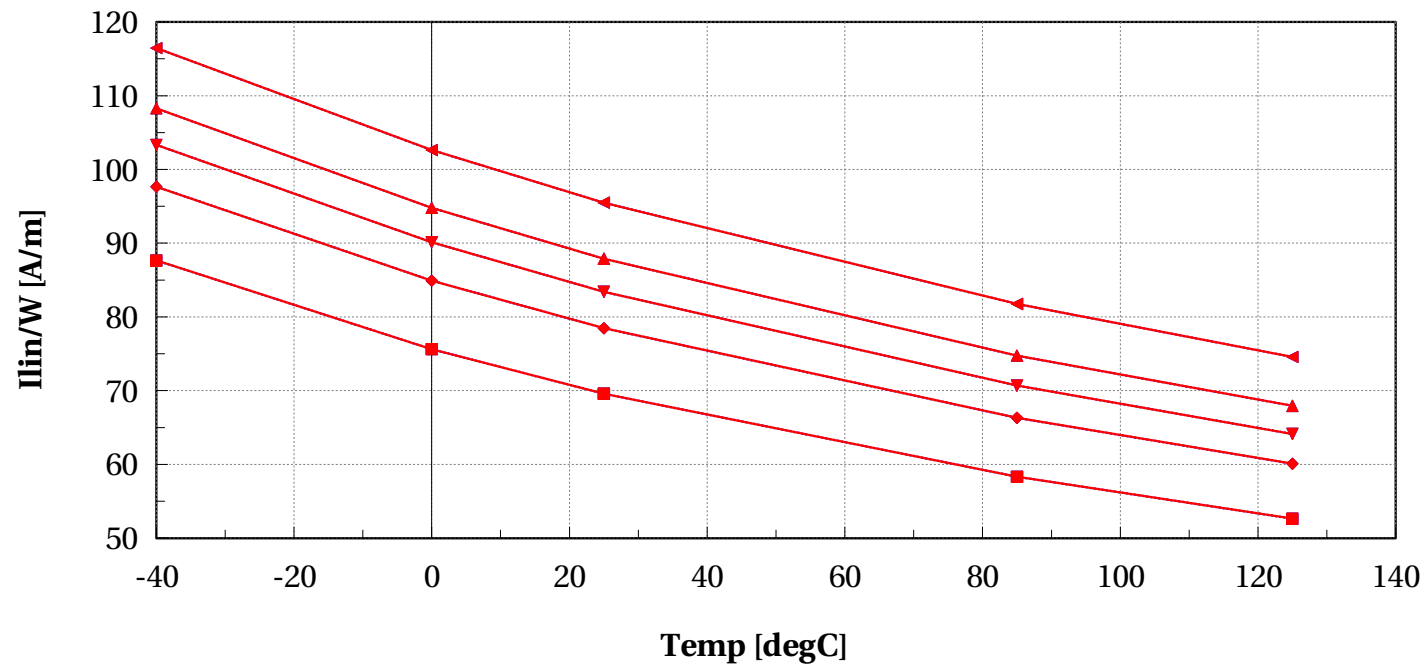
# egnfet\_acc, Vt\_lin [mV] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



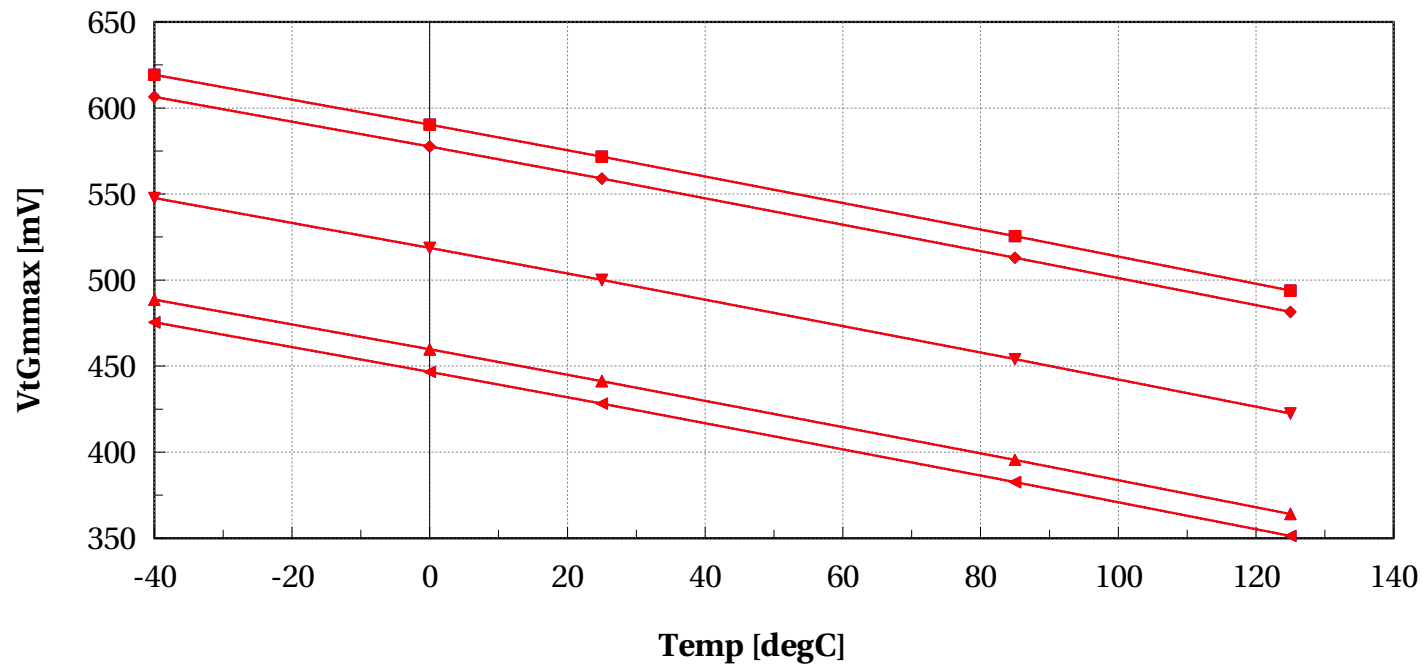
# egnfet\_acc, Ilin/W [A/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



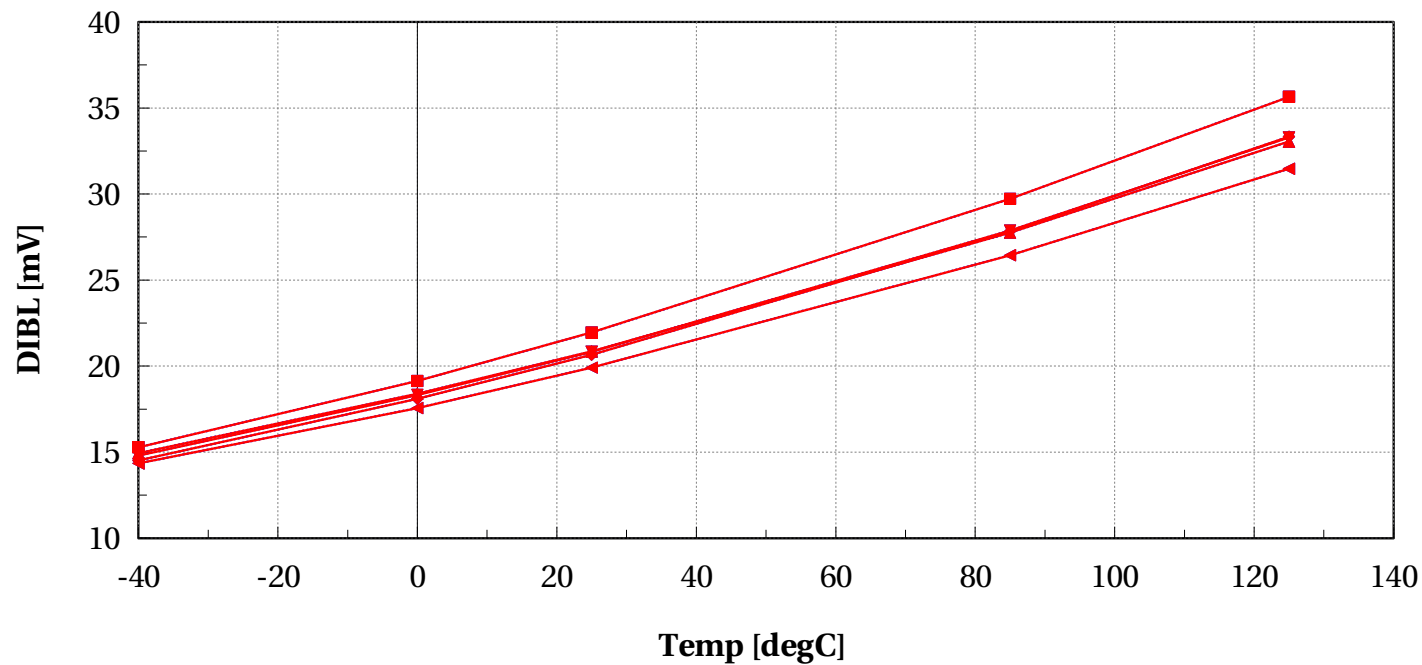
# egnfet\_acc, VtGmmax [mV] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egnfet\_acc, DIBL [mV] vs Temp [degC]

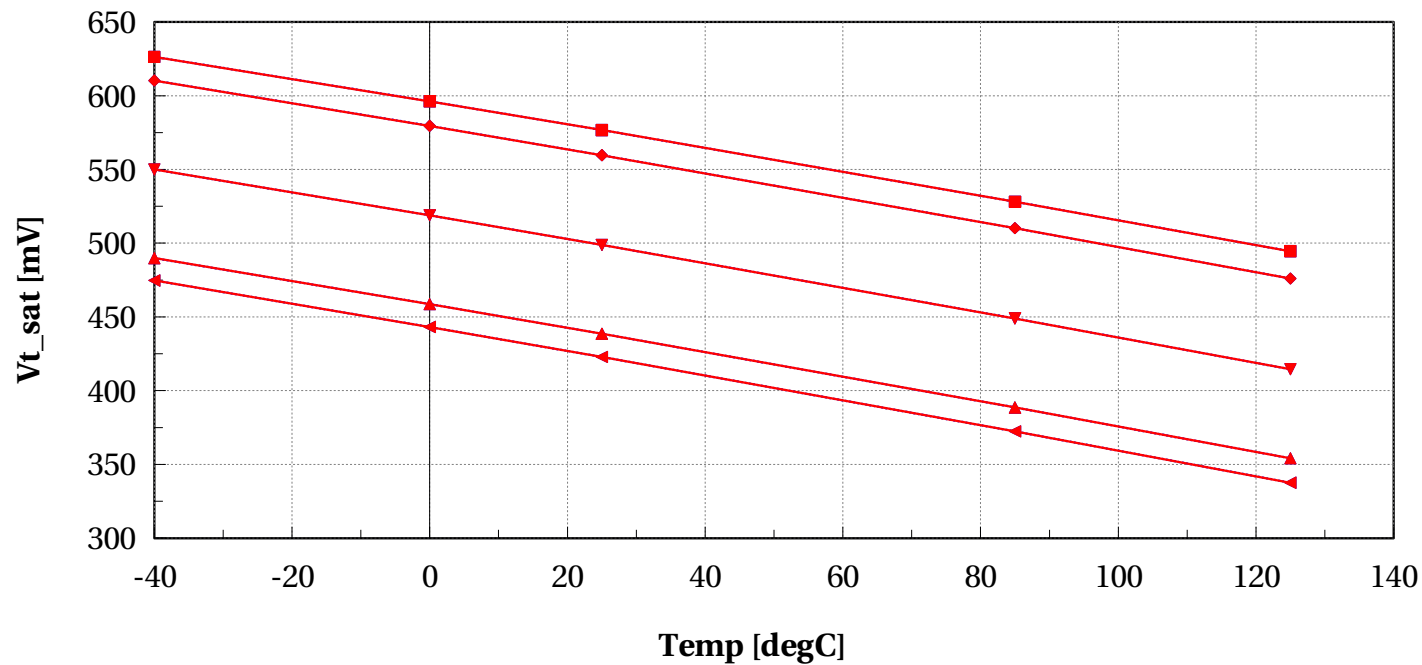
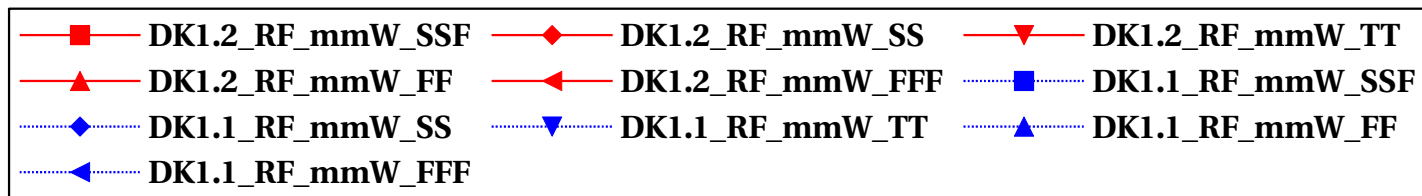
$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"





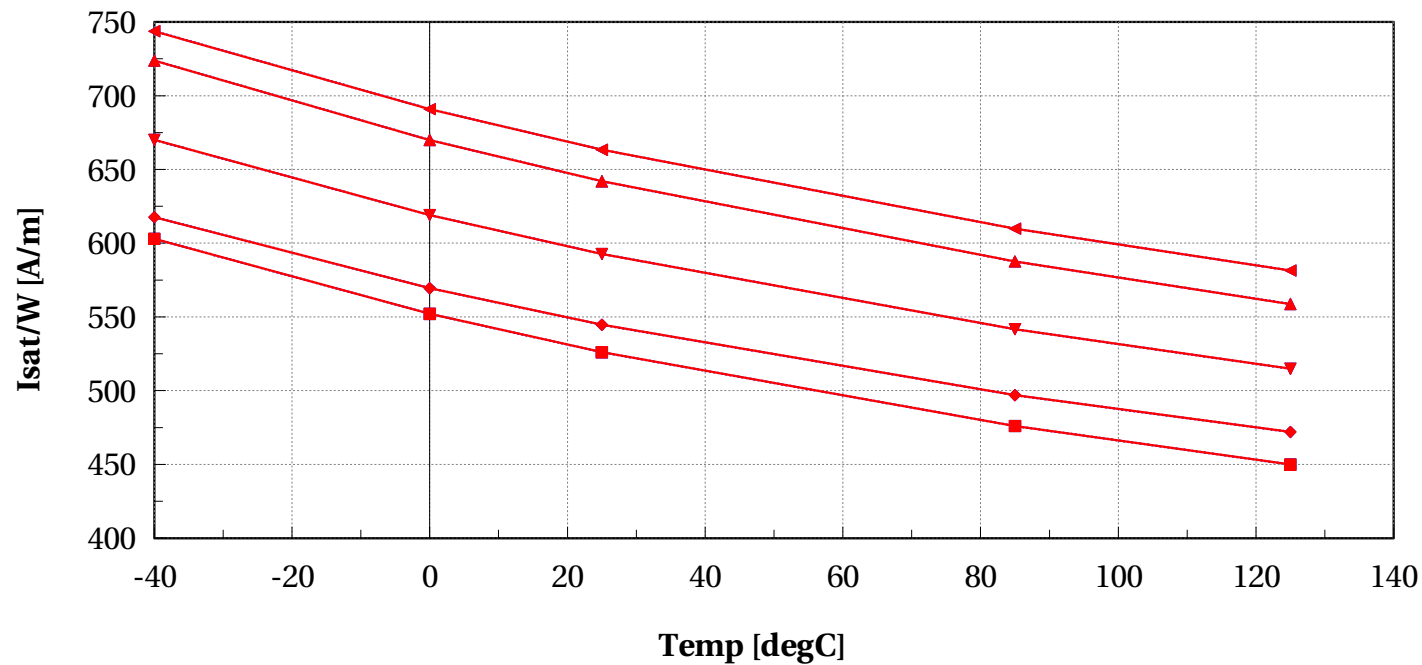
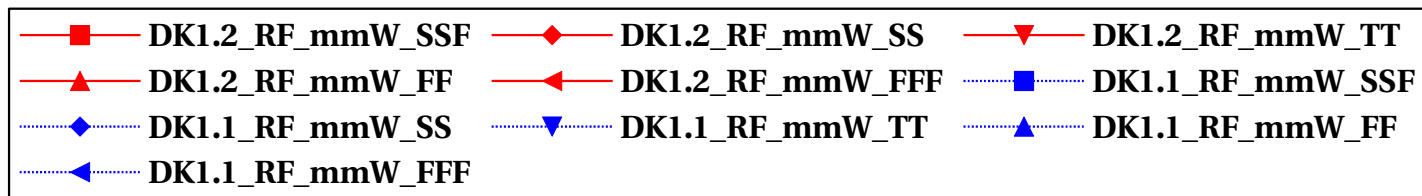
# egnfet\_acc, Vt\_sat [mV] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



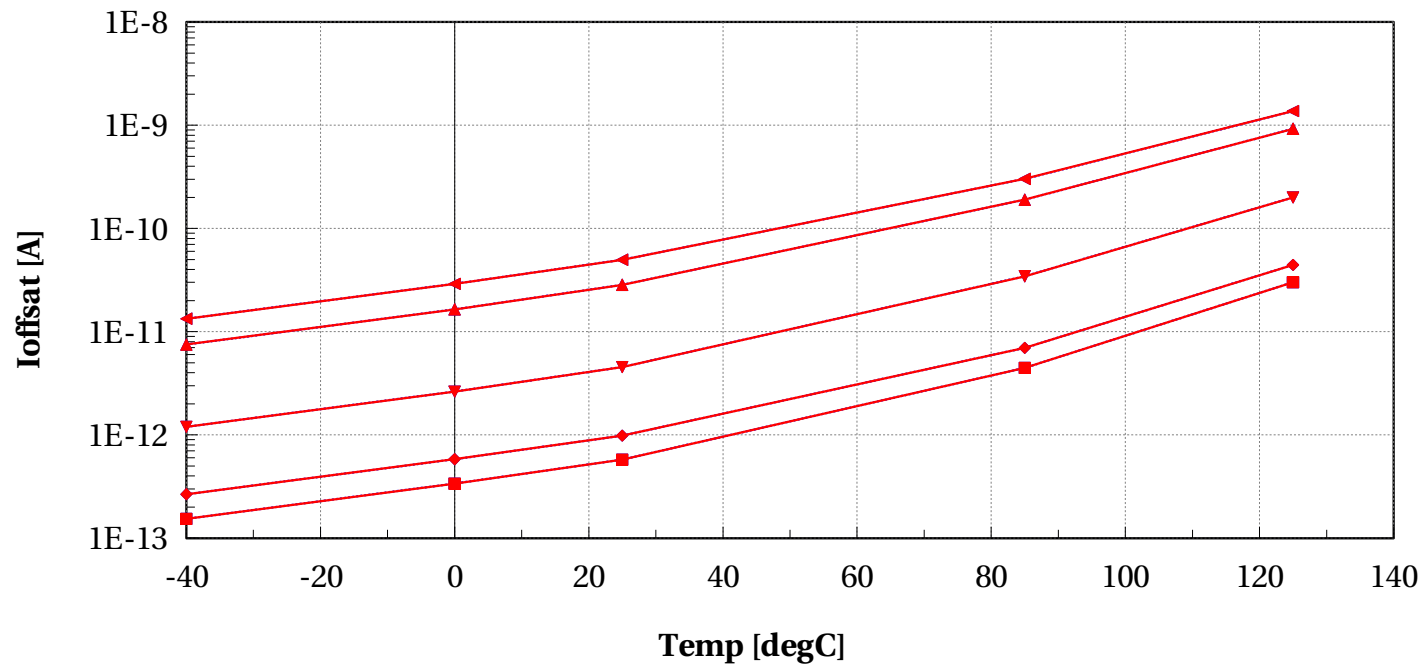
# egnfet\_acc, Isat/W [A/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



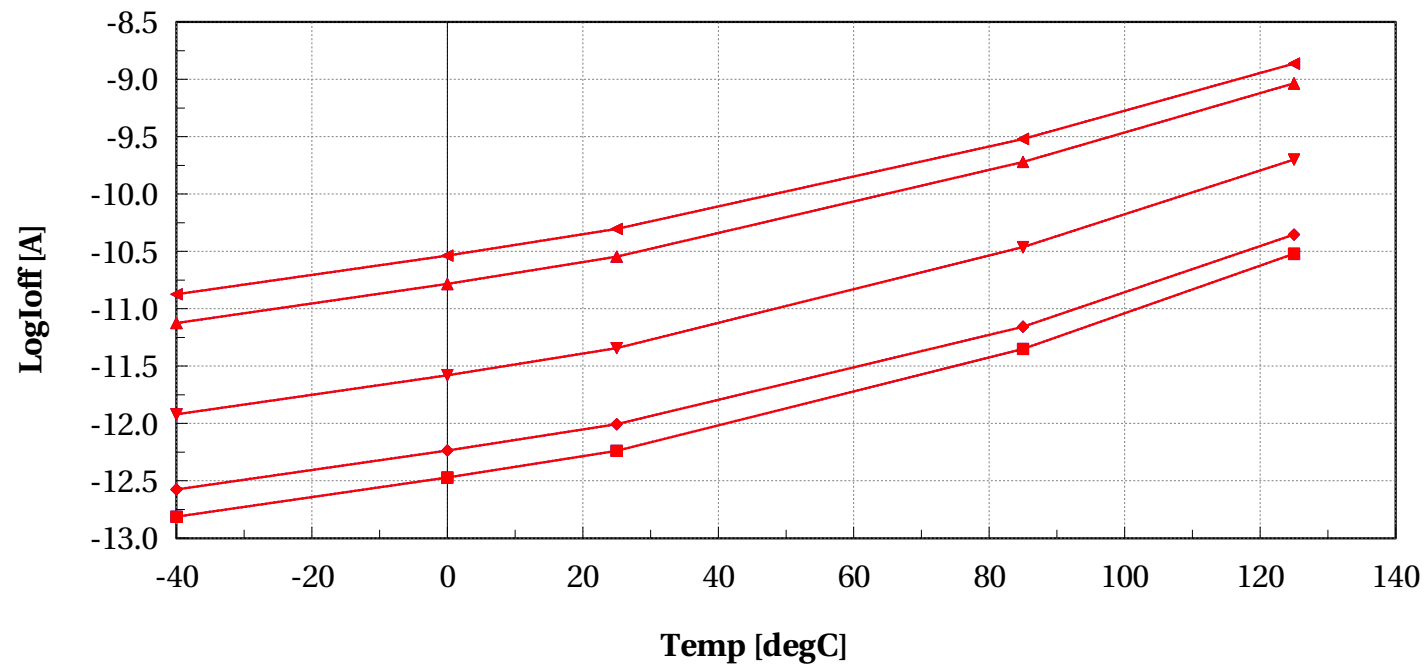
# egnfet\_acc, Ioffsat [A] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



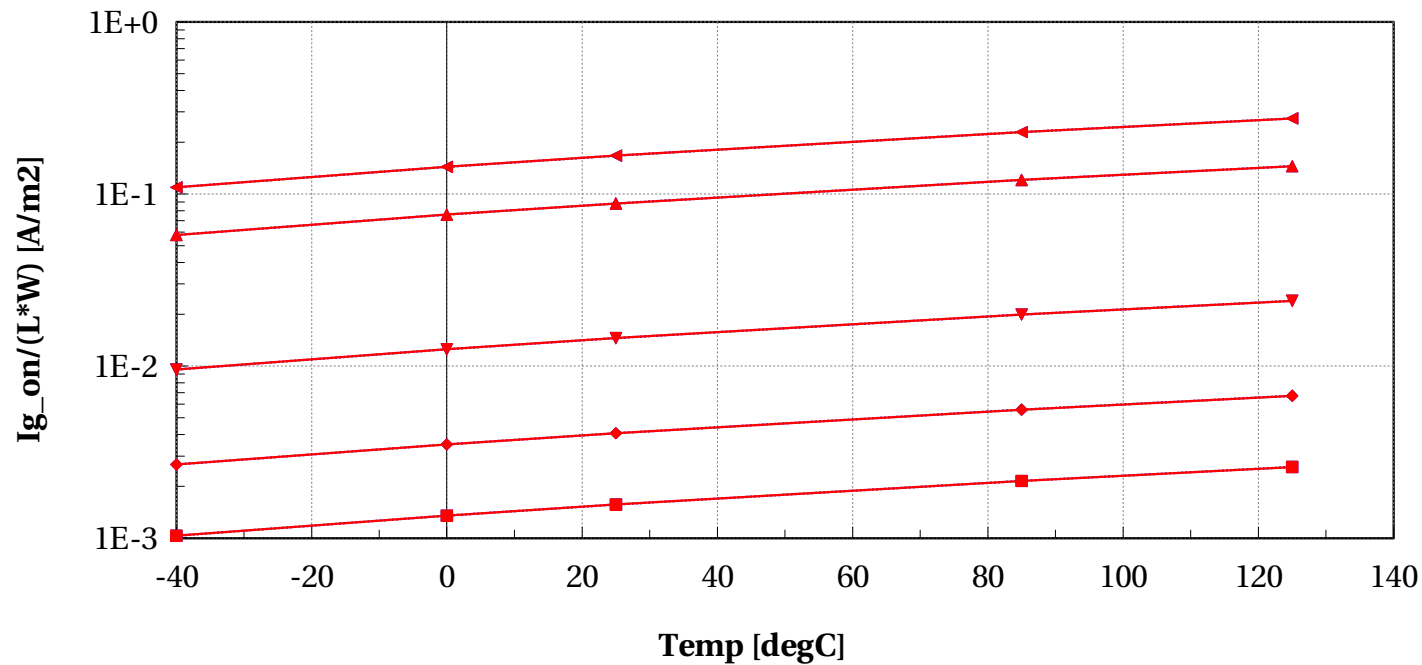
# egnfet\_acc, LogIoff [A] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



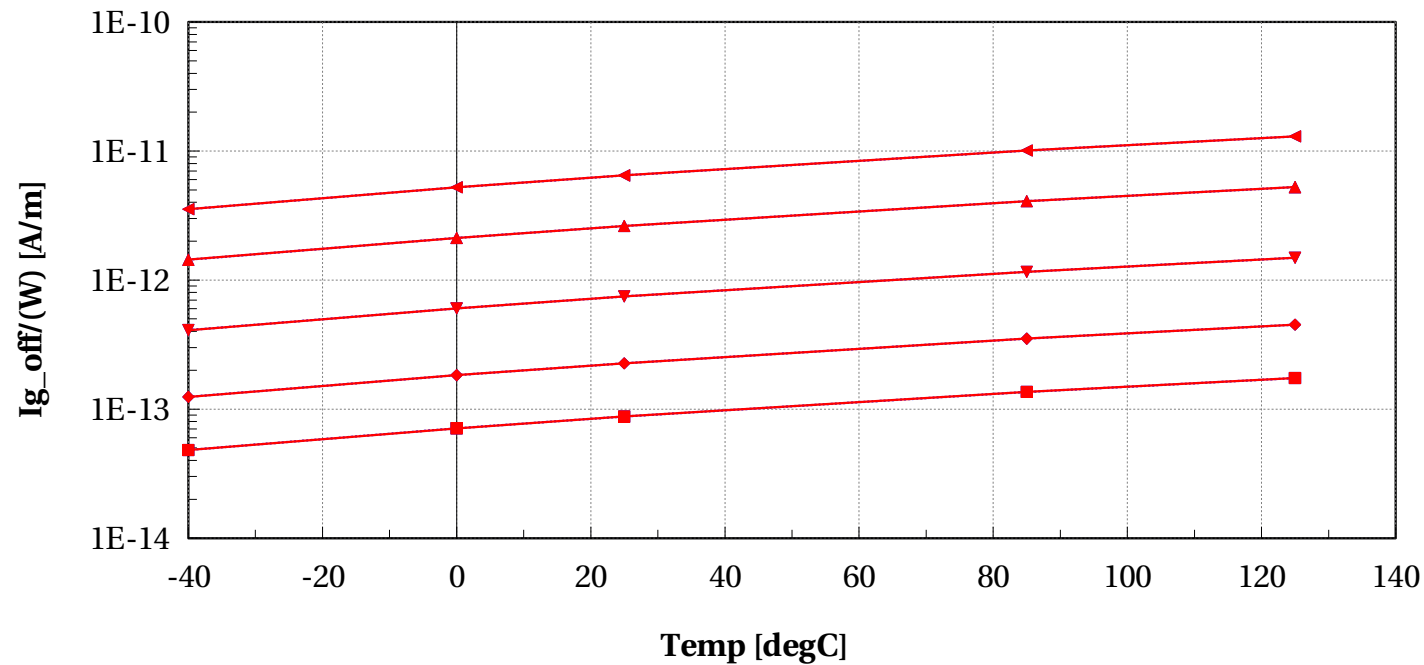
# egnfet\_acc, Ig\_on/(L\*W) [A/m2] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



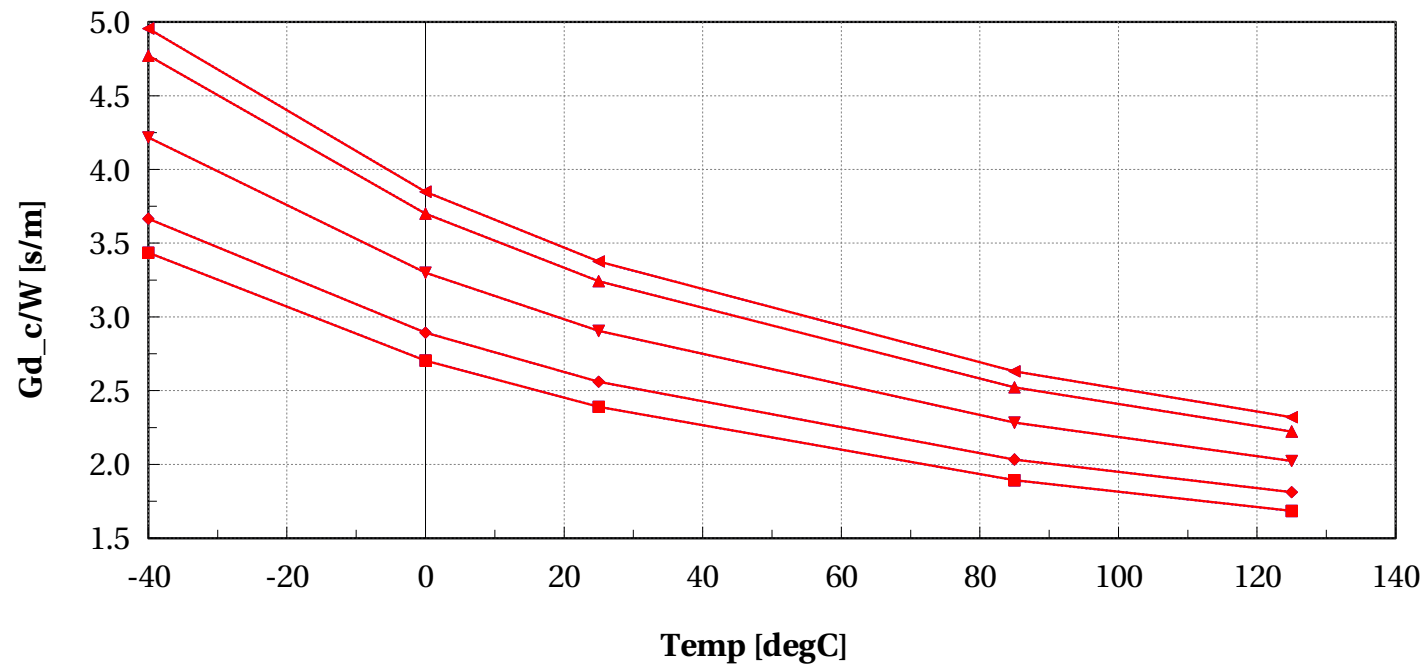
# egnfet\_acc, Ig\_off/(W) [A/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



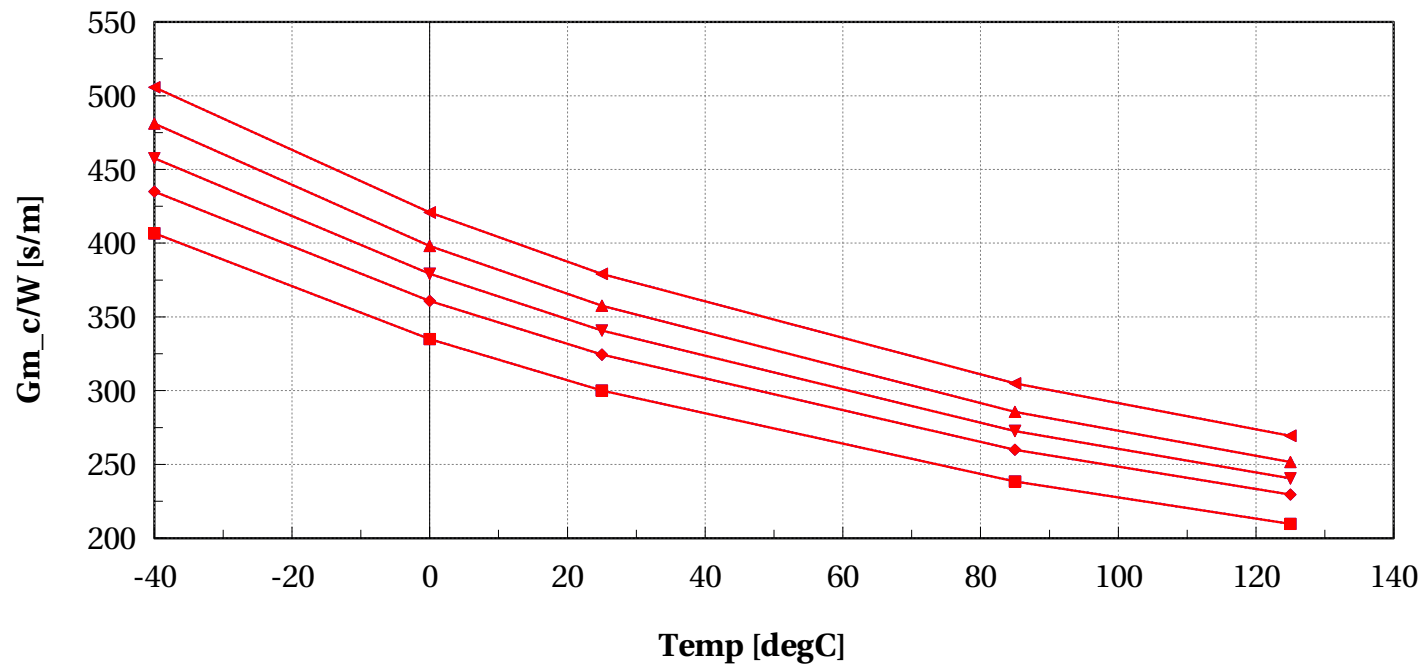
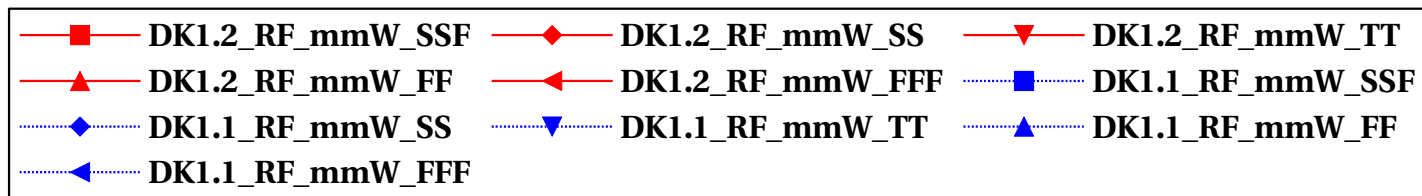
# egnfet\_acc, Gd\_c/W [s/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egnfet\_acc, Gm\_c/W [s/m] vs Temp [degC]

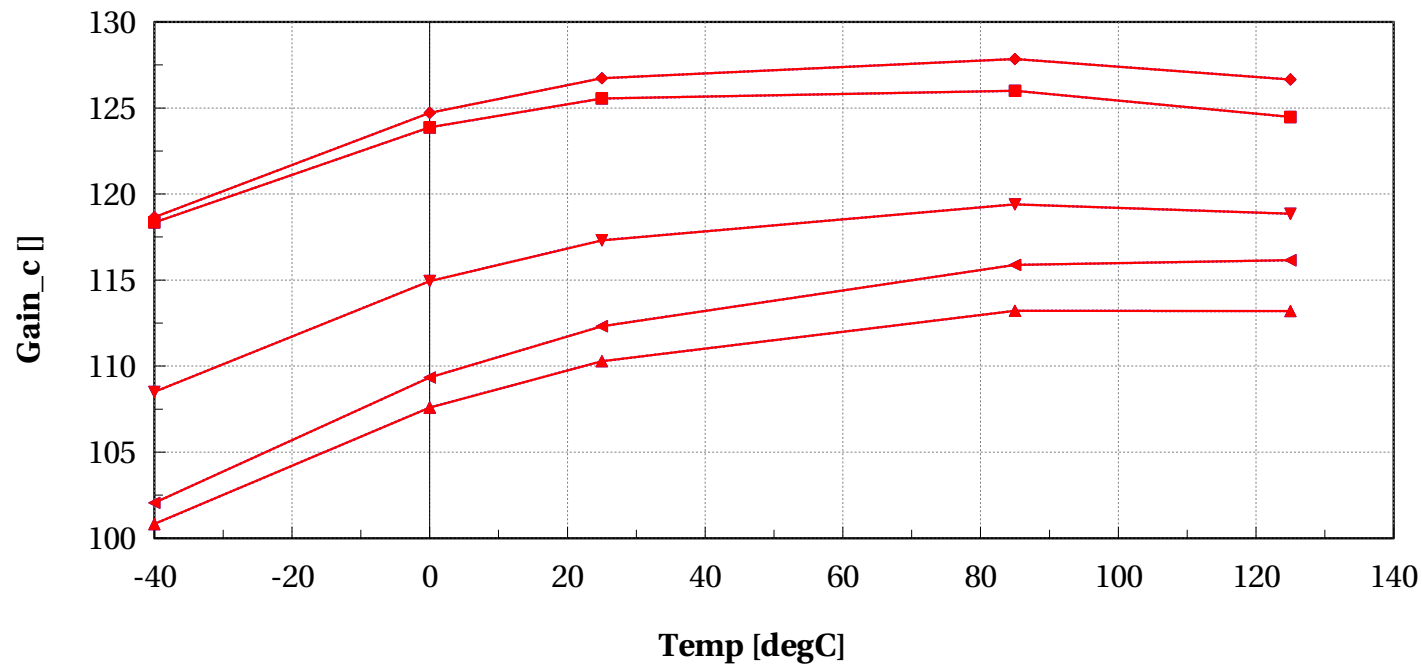
$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"





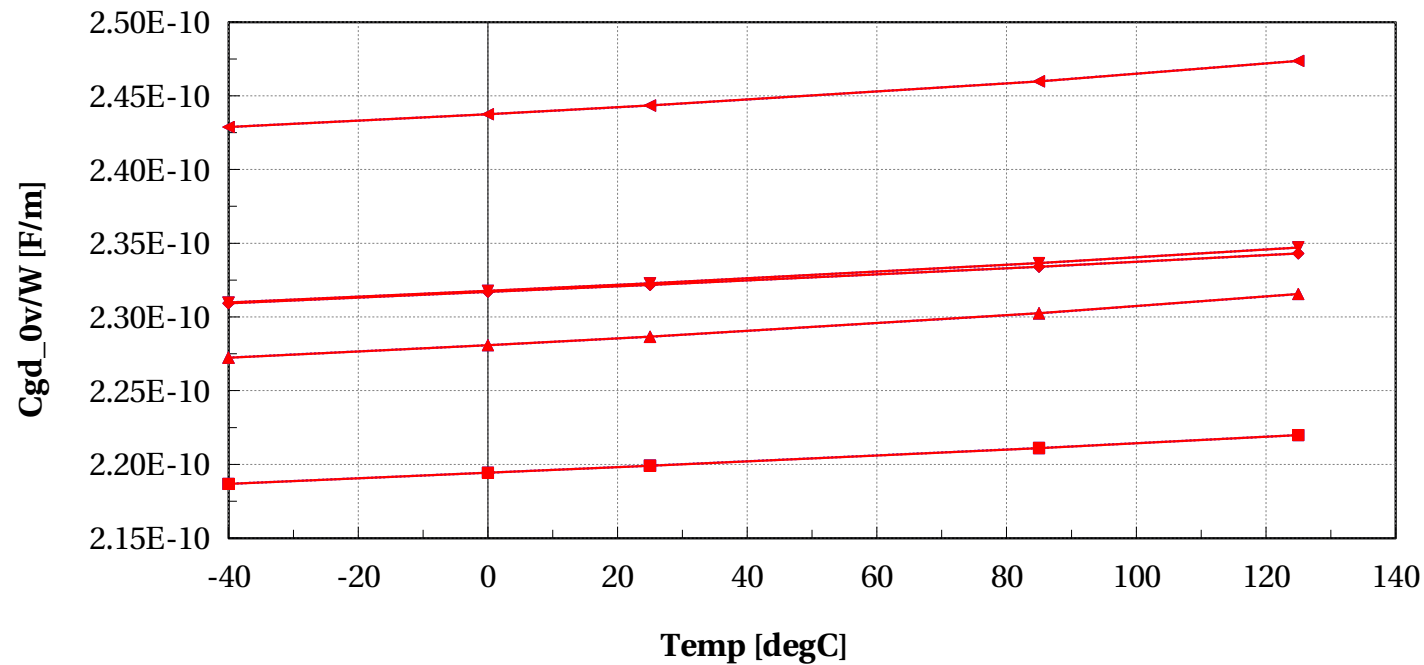
# egnfet\_acc, Gain\_c [] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



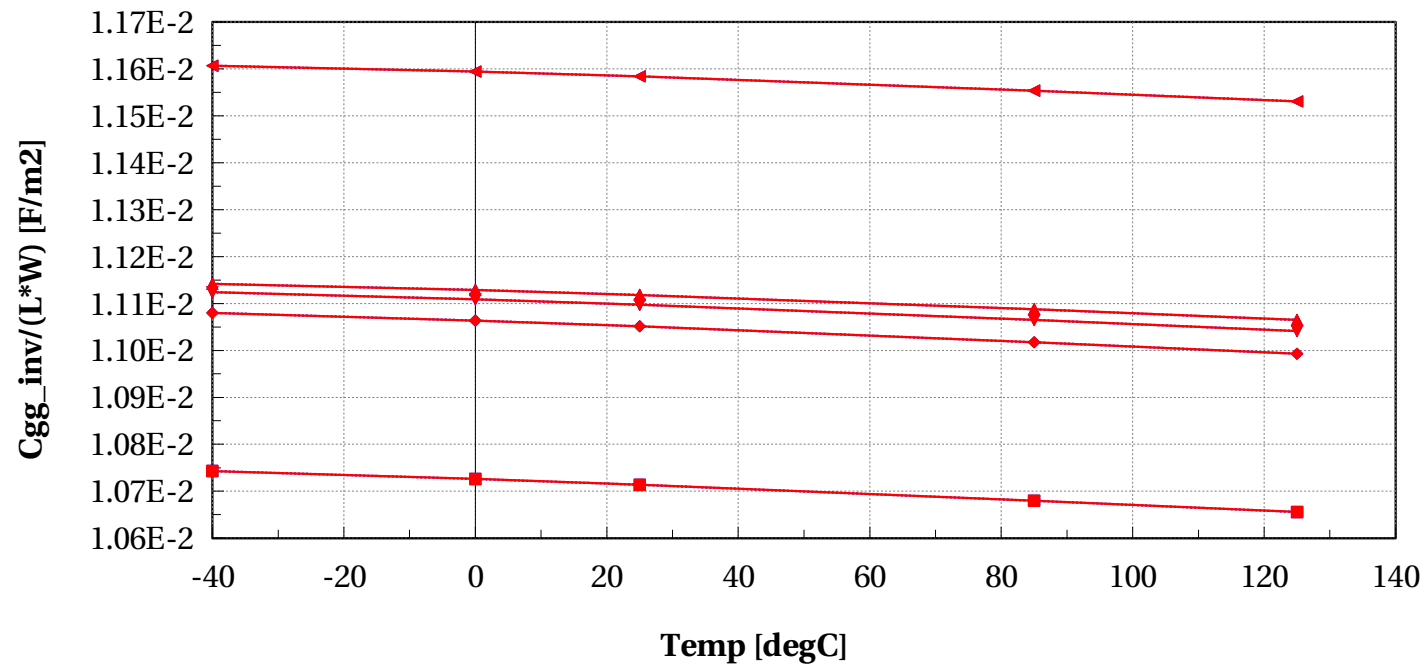
# egnfet\_acc, Cgd\_0v/W [F/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egnfet\_acc, Cgg\_inv/(L\*W) [F/m2] vs Temp [degC]

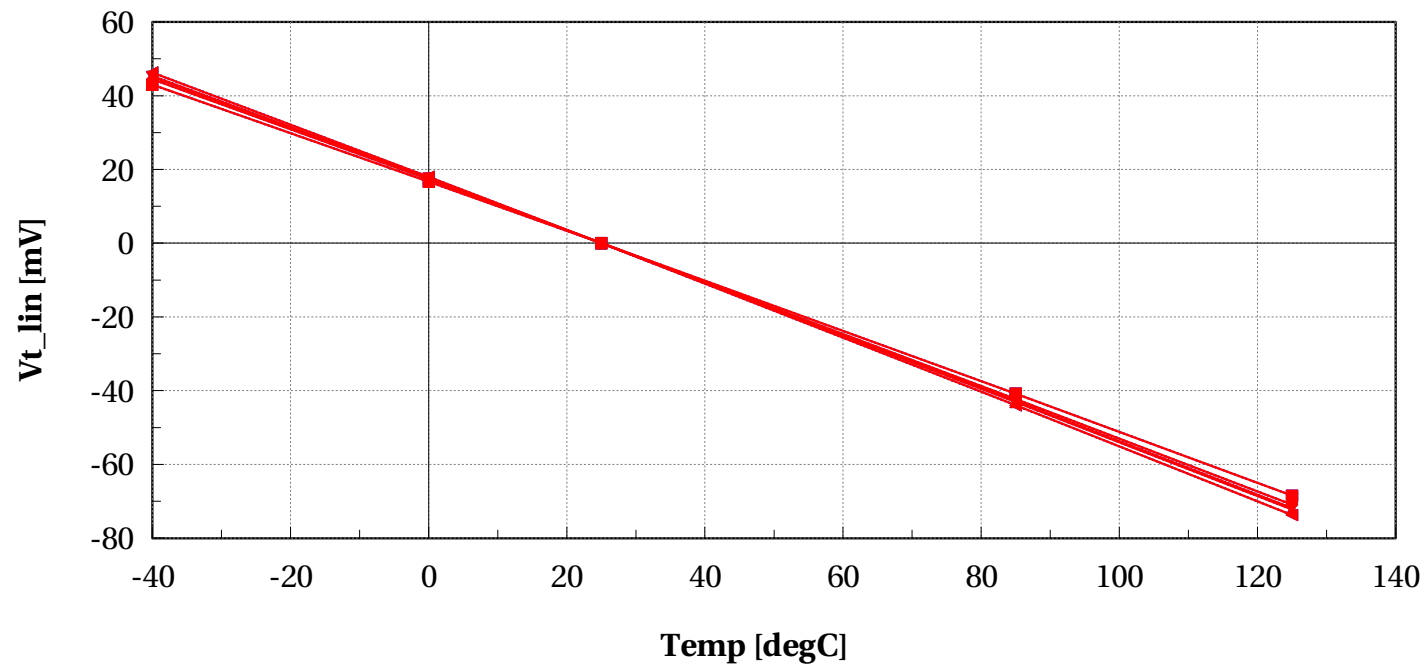
$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



## Normalized scaling versus Temp @ $L=0.15\mu$ , $W=2\mu$

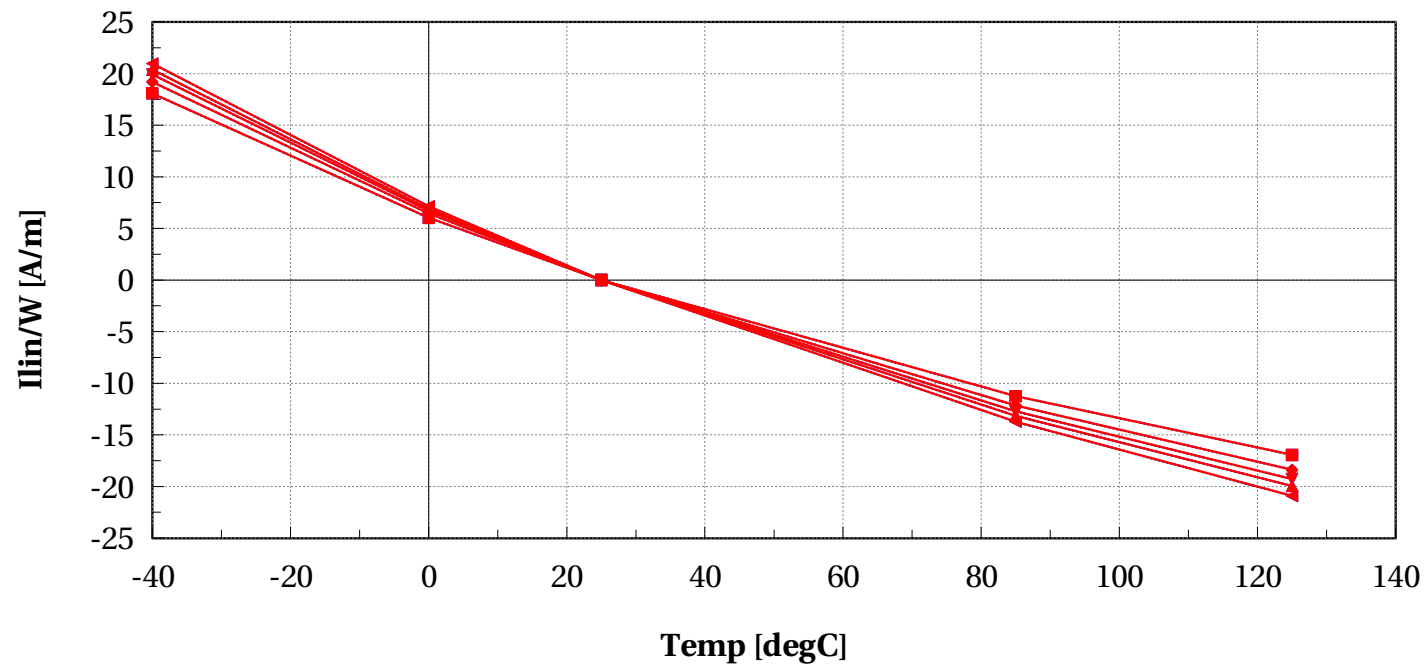
# egnfet\_acc, Vt\_lin [mV] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



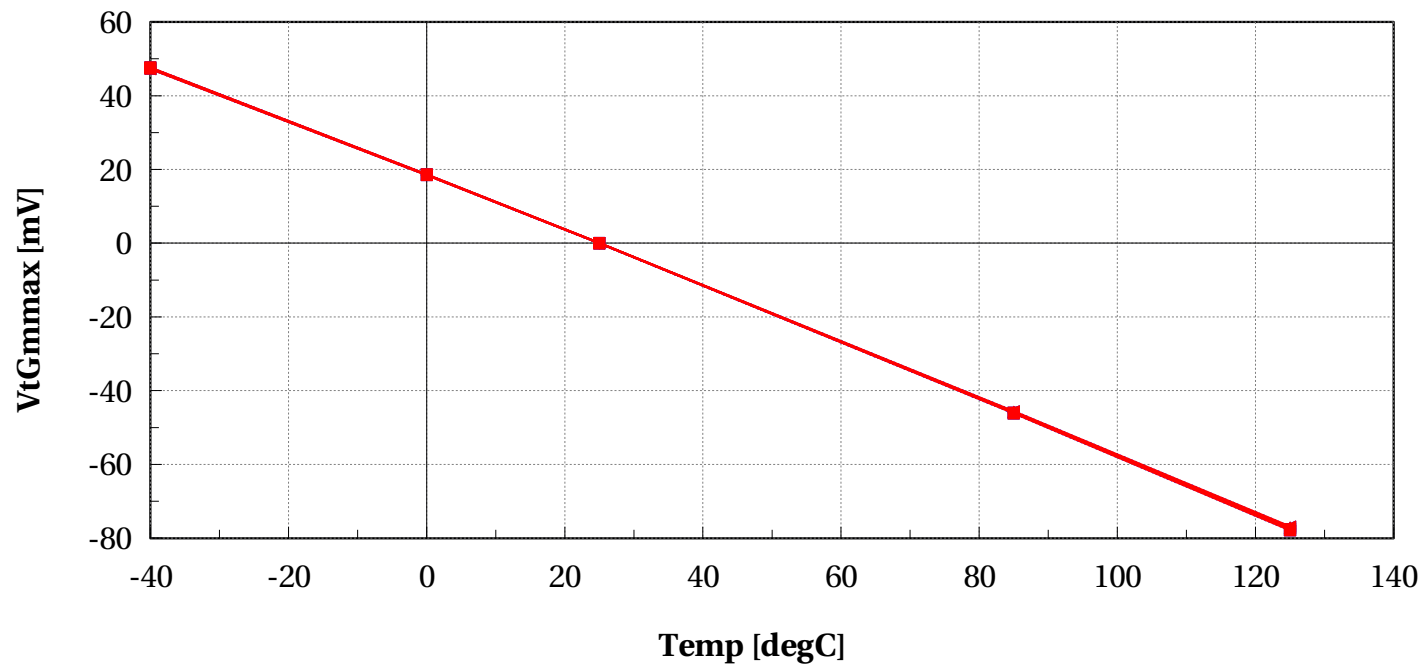
# egnfet\_acc, I<sub>lin</sub>/W [A/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



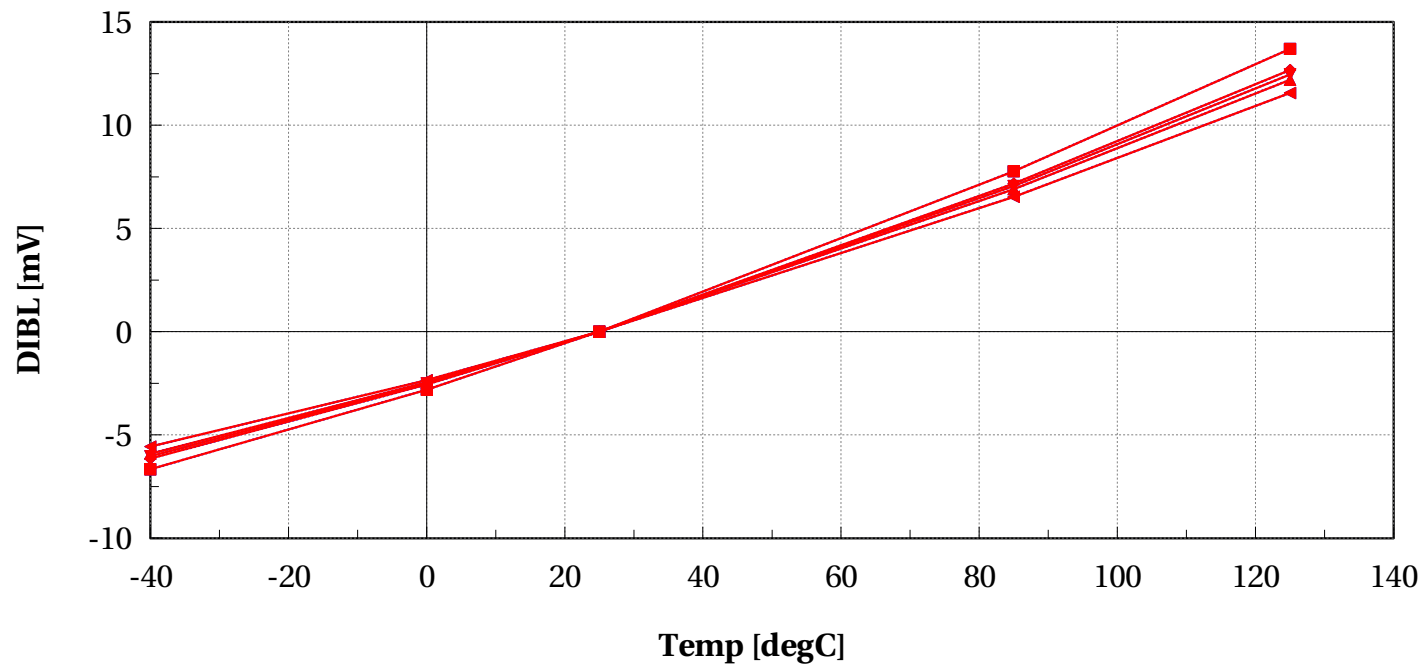
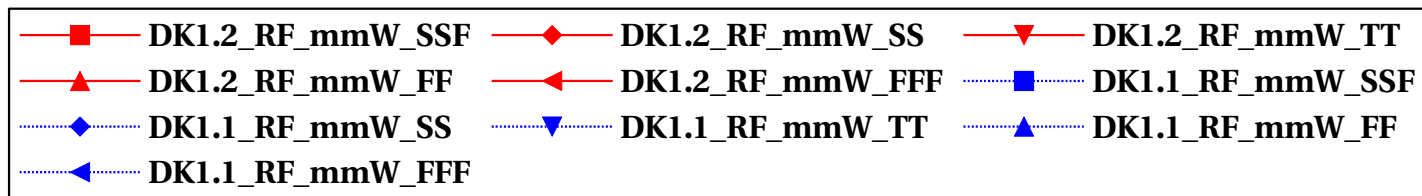
# egnfet\_acc, VtGmmax [mV] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egnfet\_acc, DIBL [mV] vs Temp [degC]

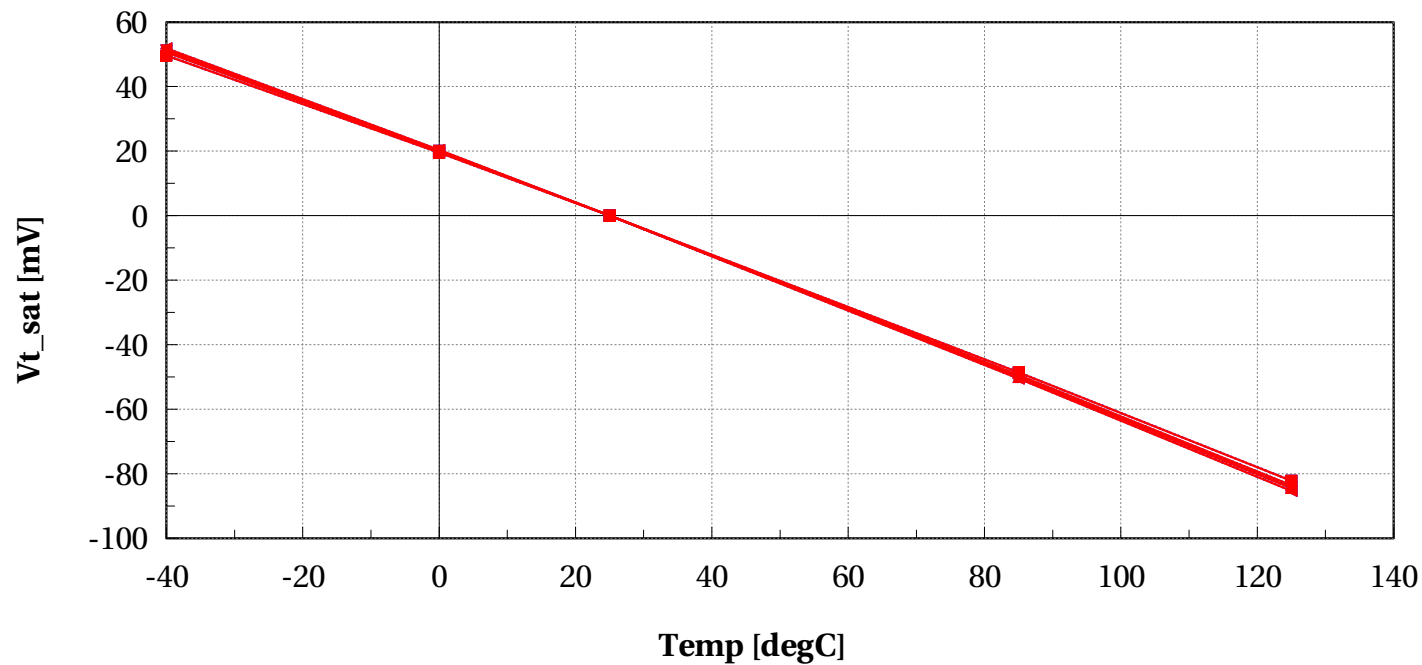
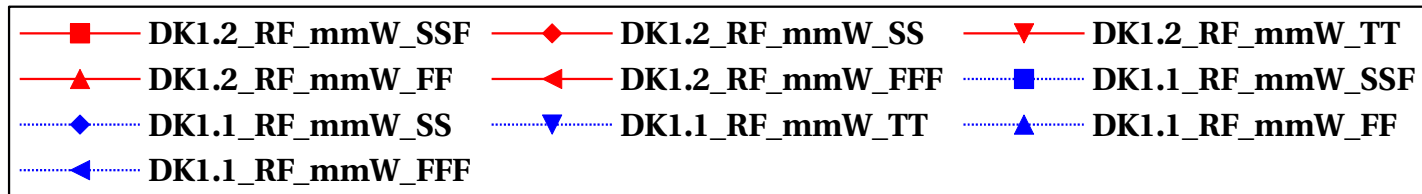
$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"





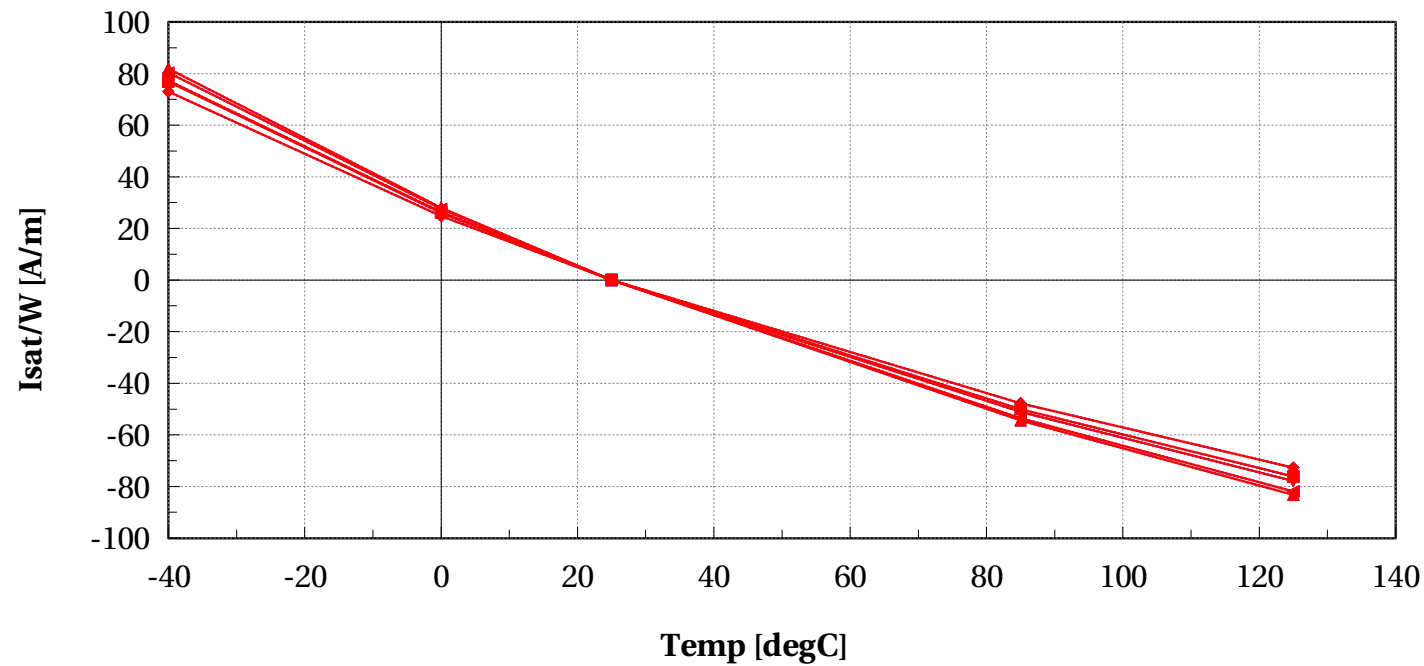
# egnfet\_acc, Vt\_sat [mV] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



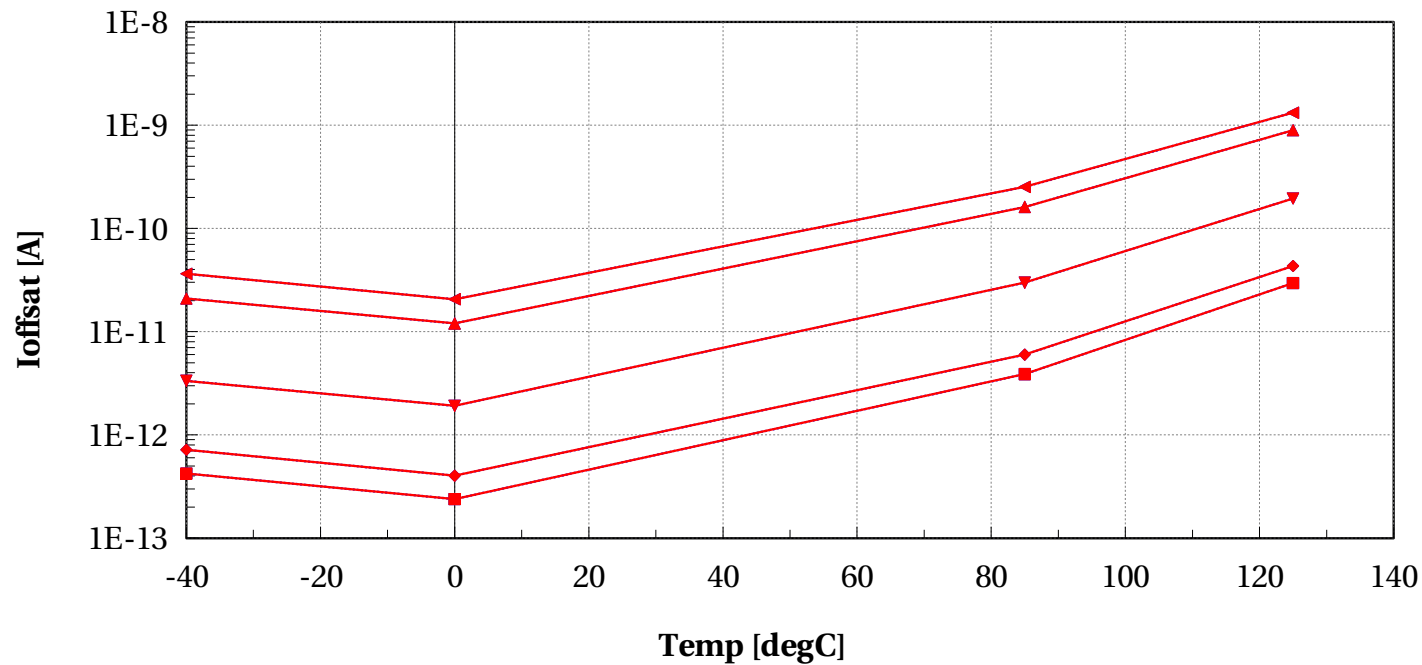
# egnfet\_acc, Isat/W [A/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



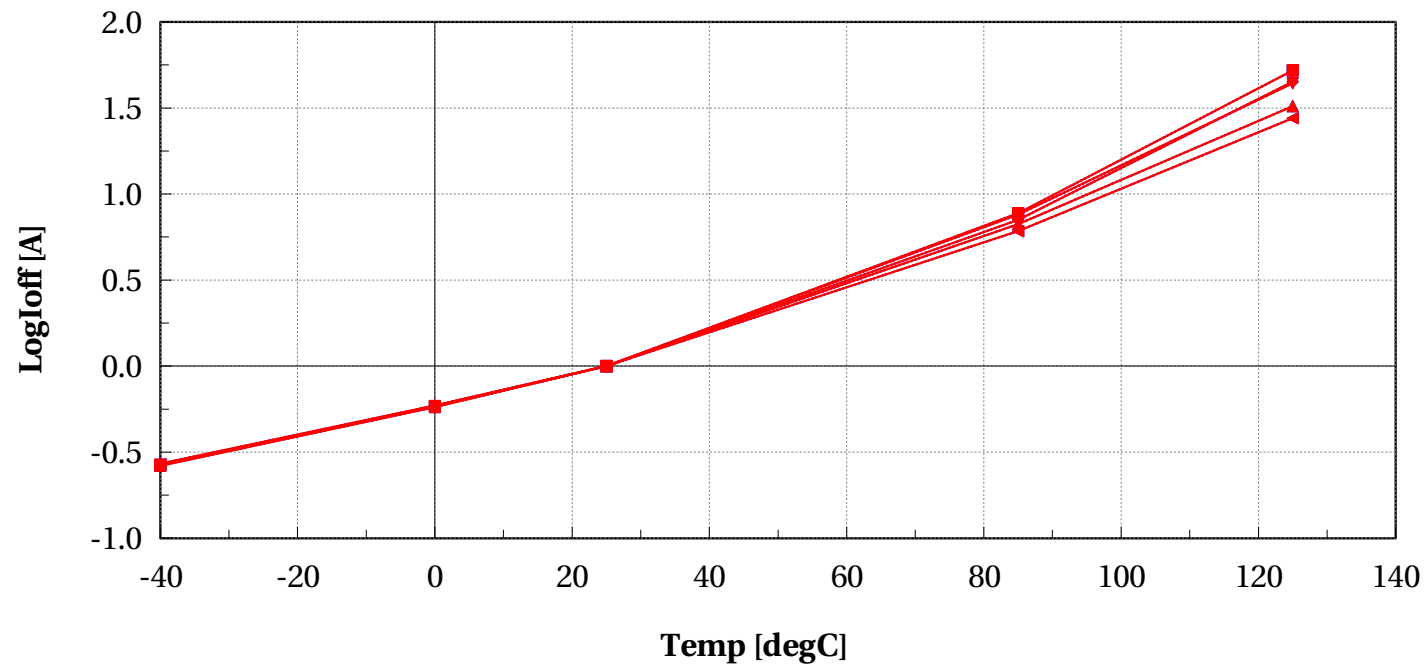
# egnfet\_acc, Ioffsat [A] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



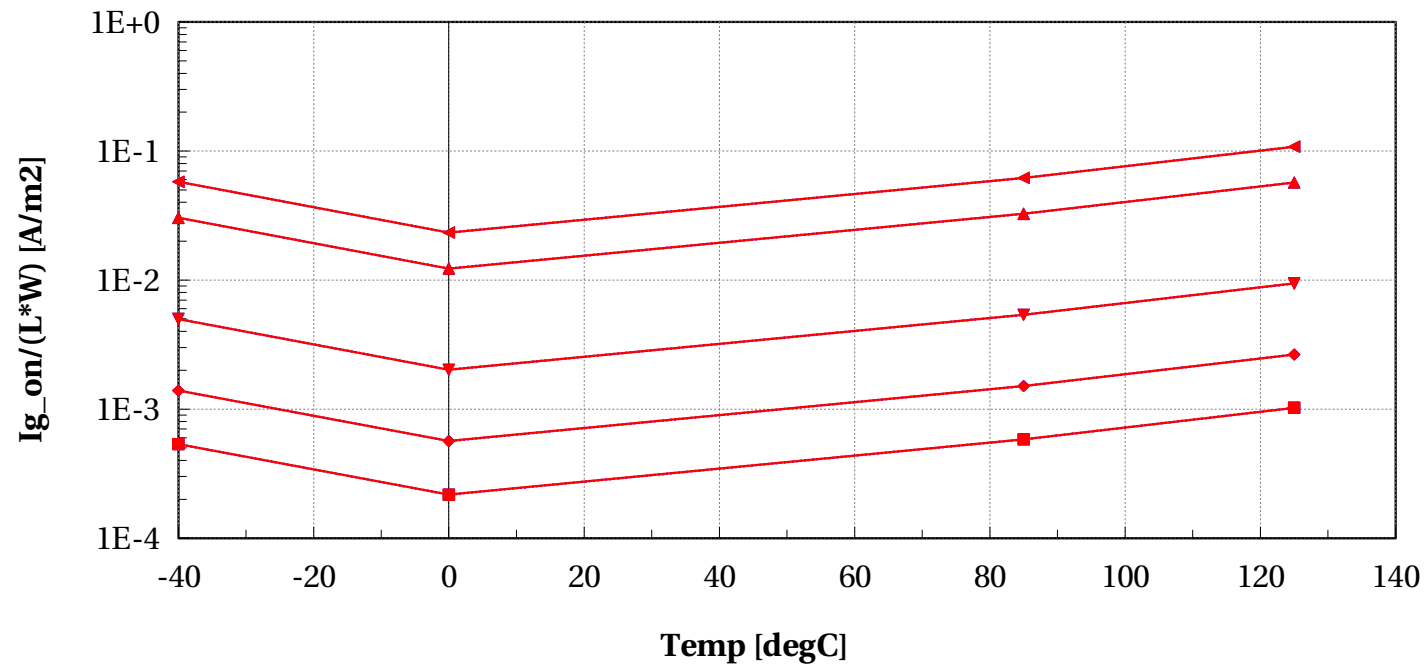
# egnfet\_acc, LogIoff [A] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



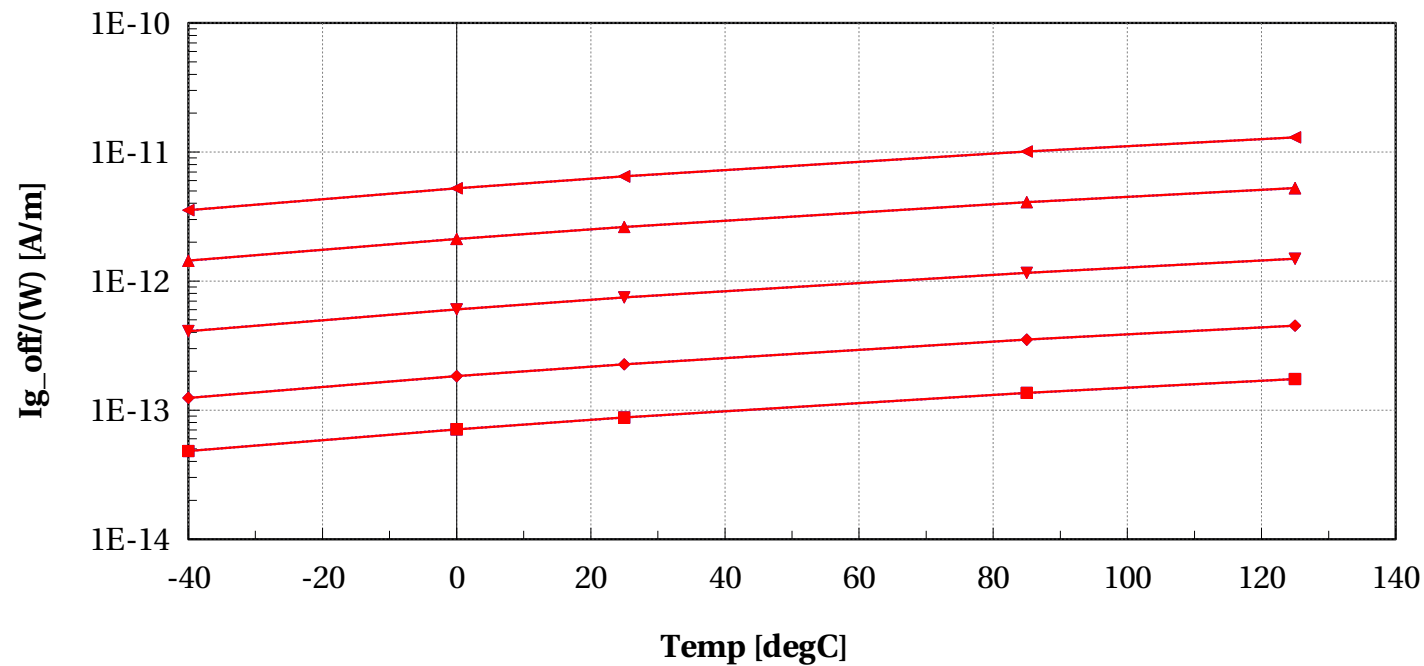
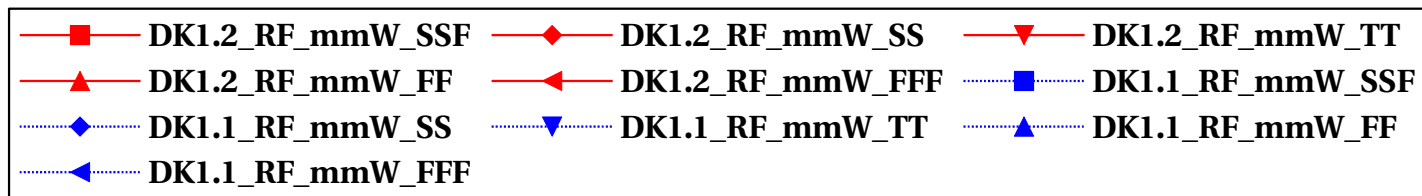
# egnfet\_acc, Ig\_on/(L\*W) [A/m2] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



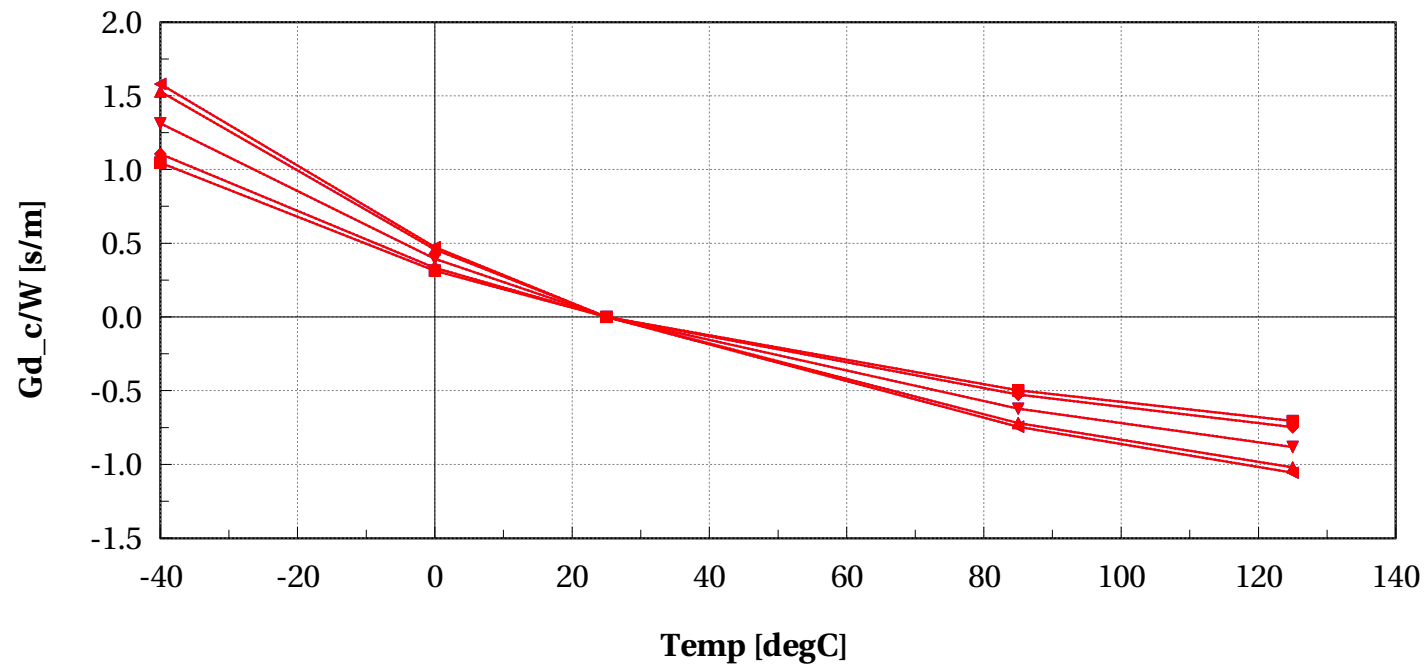
# egnfet\_acc, Ig\_off/(W) [A/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



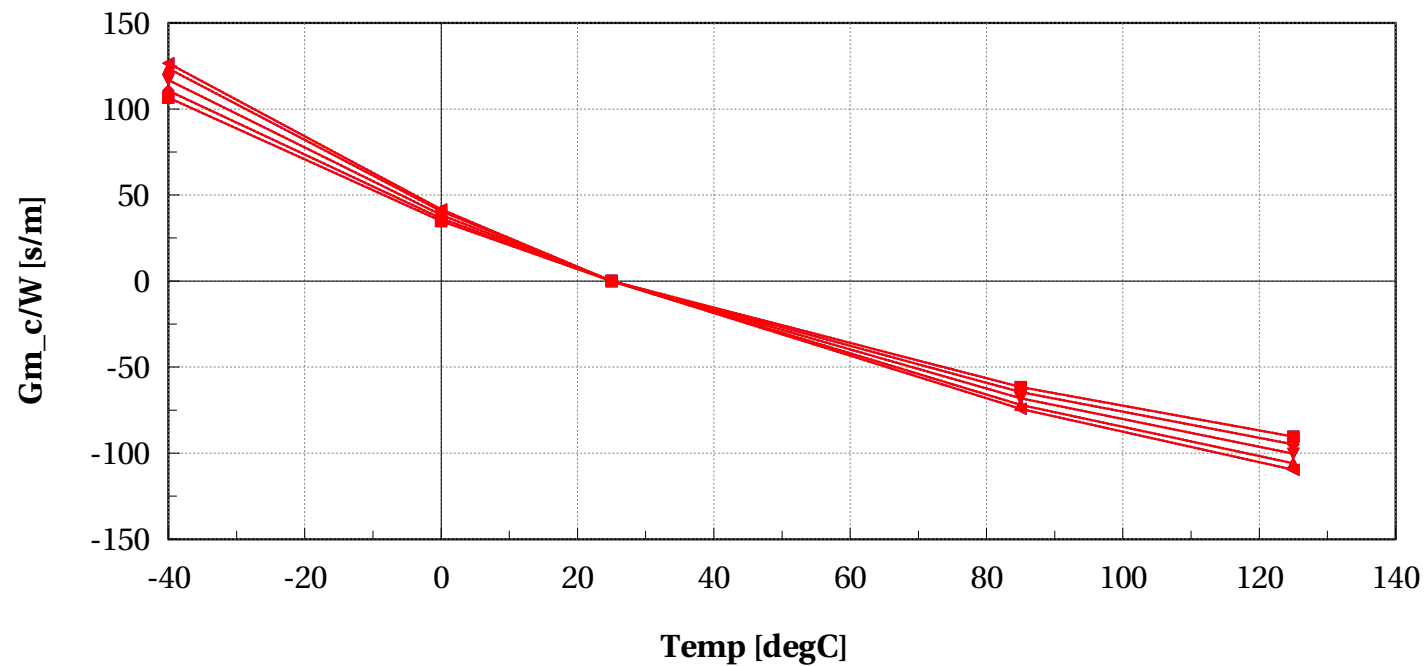
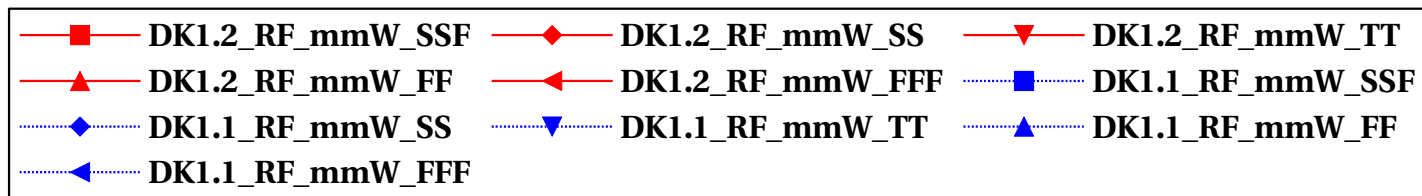
# egnfet\_acc, Gd\_c/W [s/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egnfet\_acc, Gm\_c/W [s/m] vs Temp [degC]

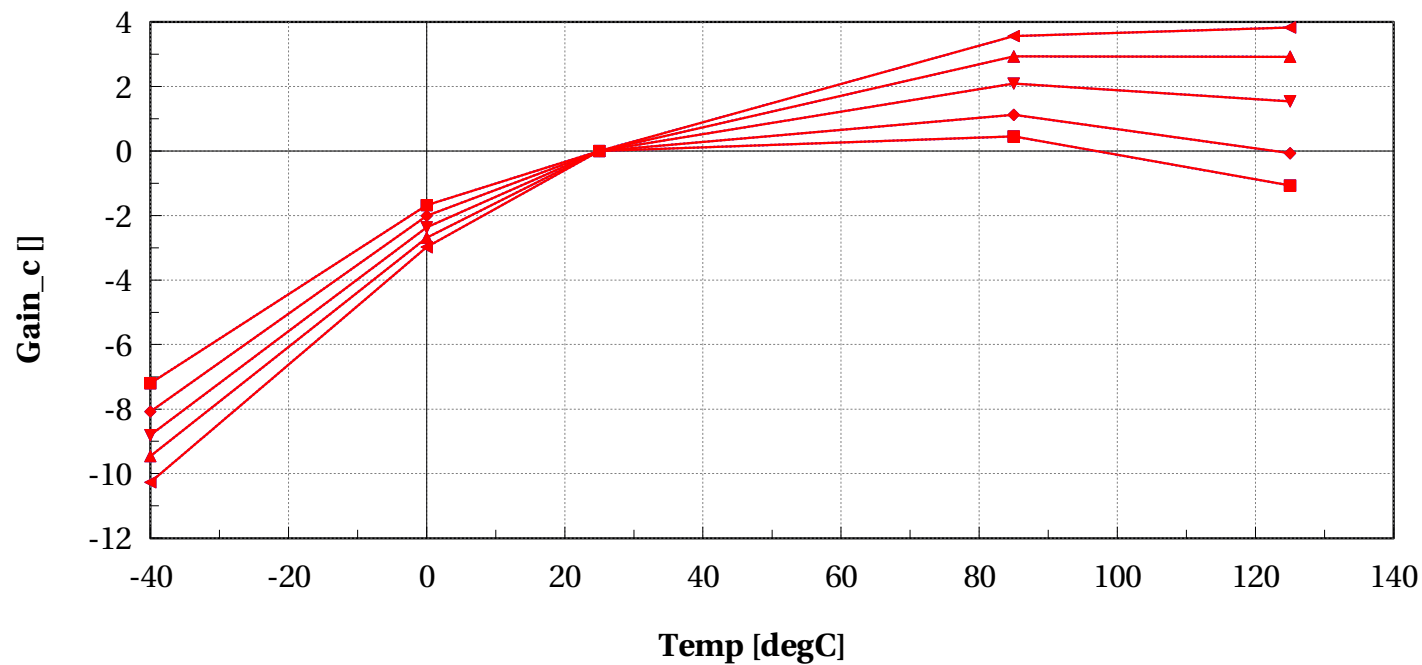
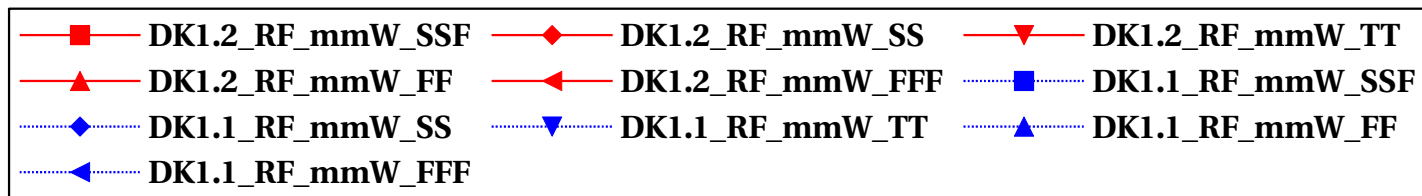
$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"





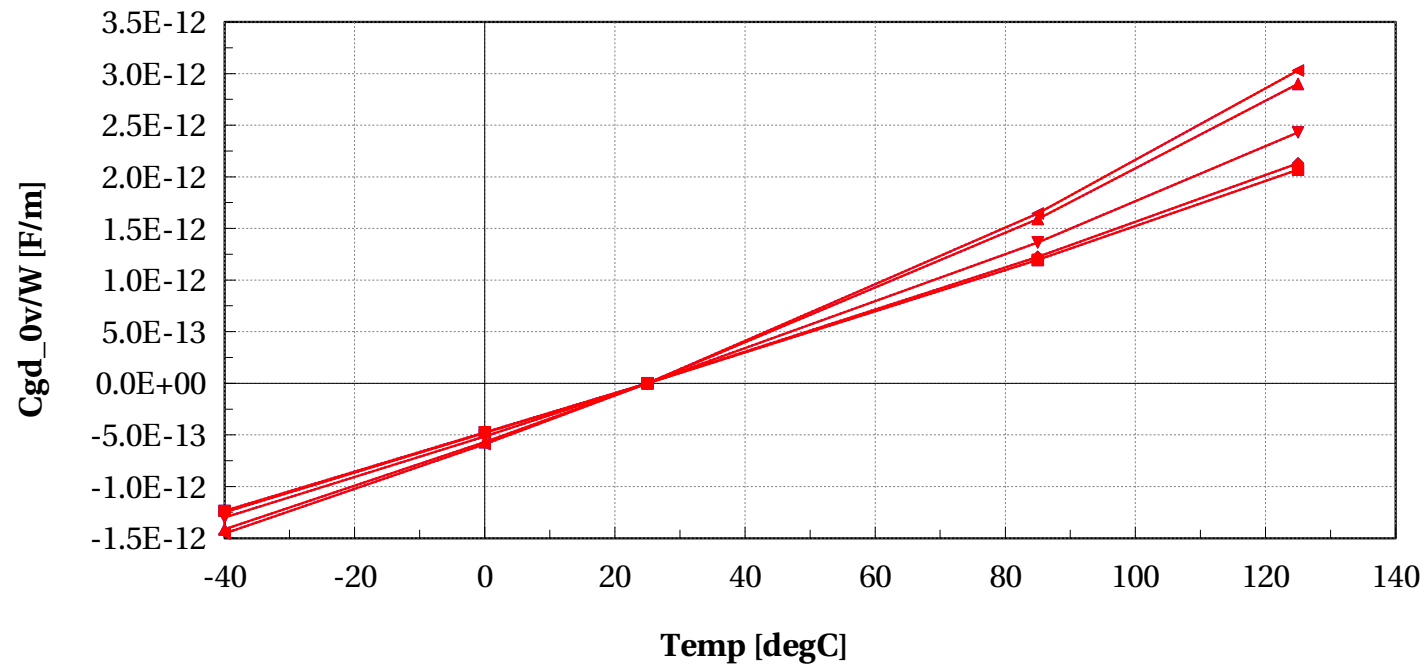
# egnfet\_acc, Gain\_c [] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



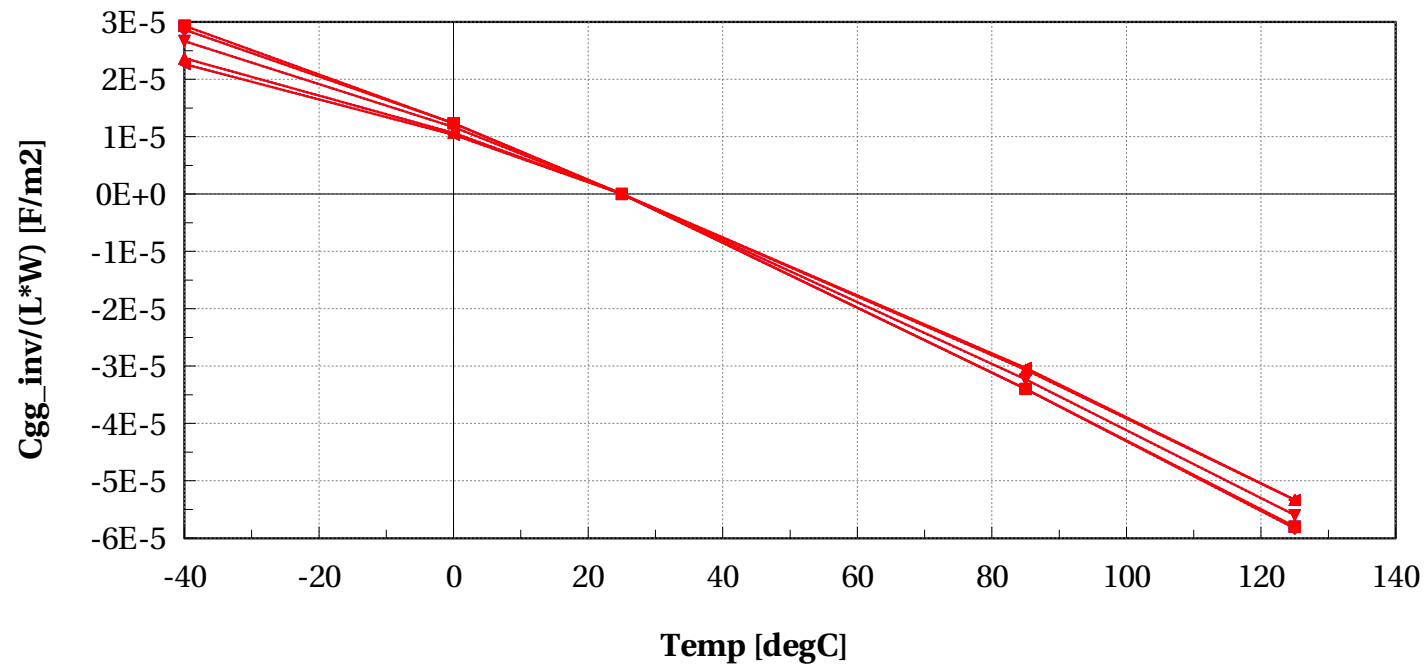
# egnfet\_acc, Cgd\_0v/W [F/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egnfet\_acc, Cgg\_inv/(L\*W) [F/m2] vs Temp [degC]

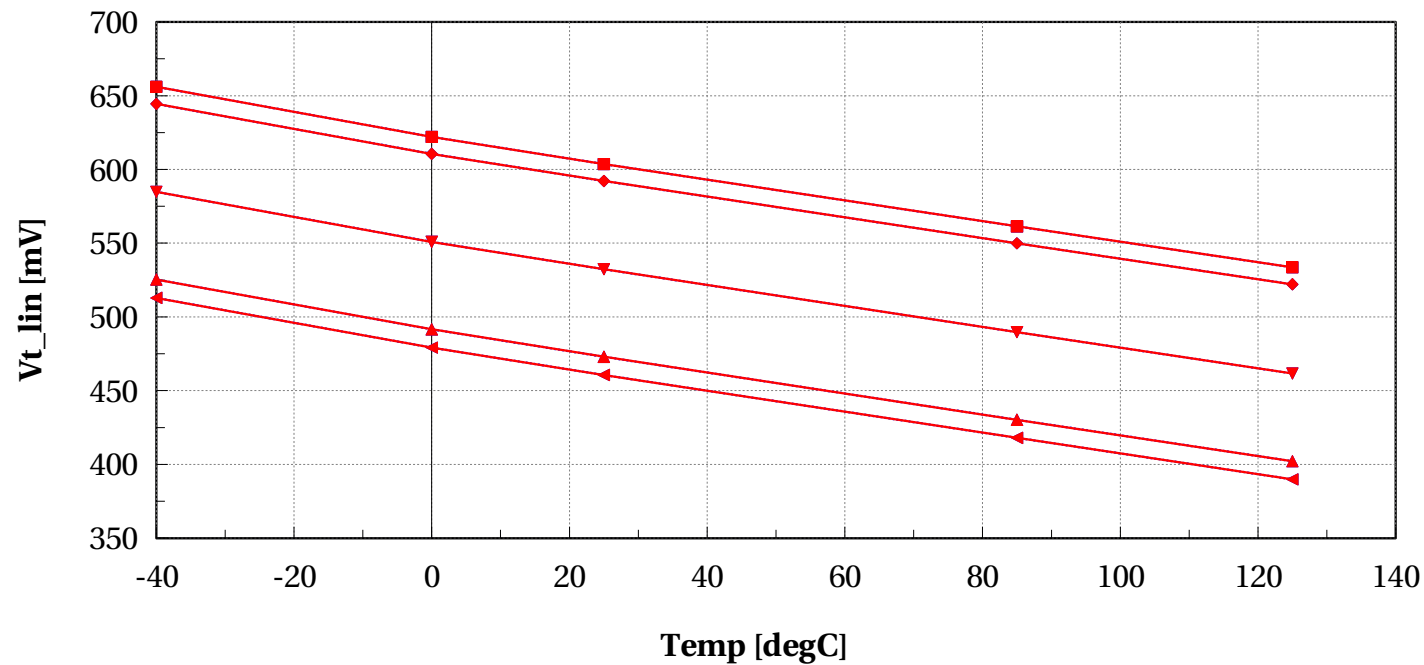
$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



## Scaling versus Temp @ $L=2u$ , $W=2u$

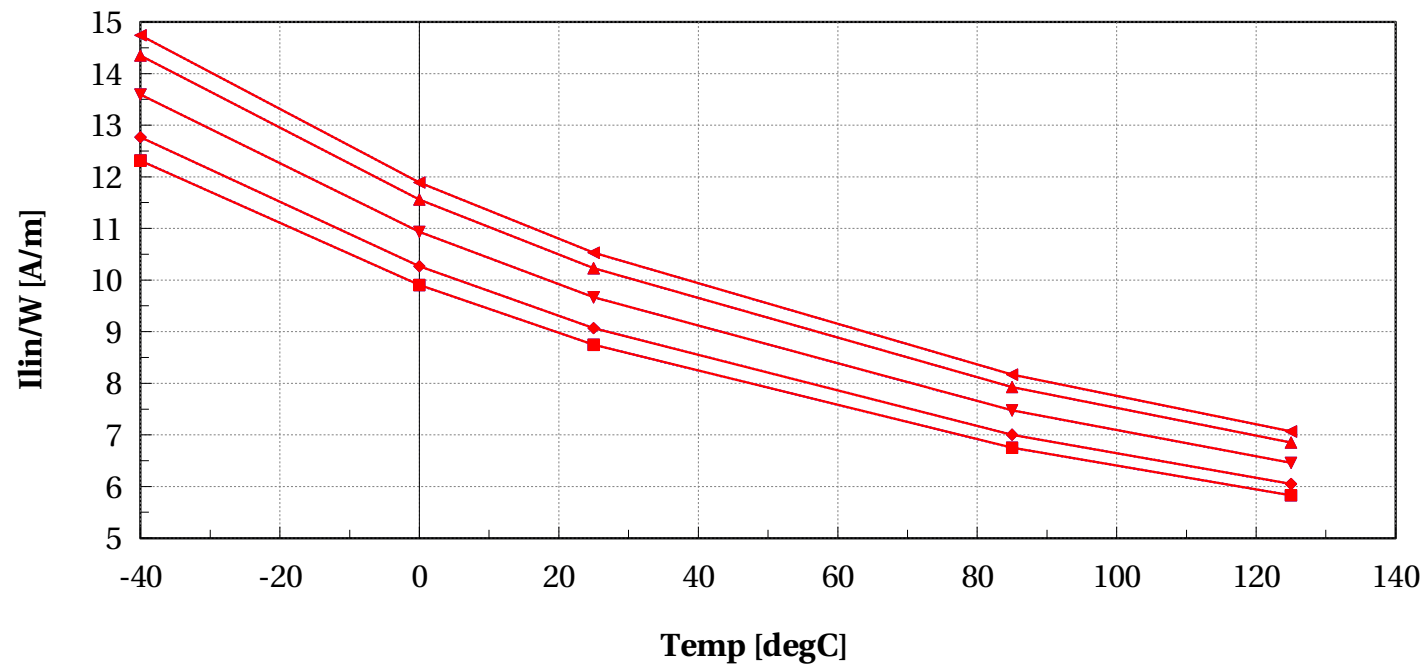
# egnfet\_acc, Vt\_lin [mV] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



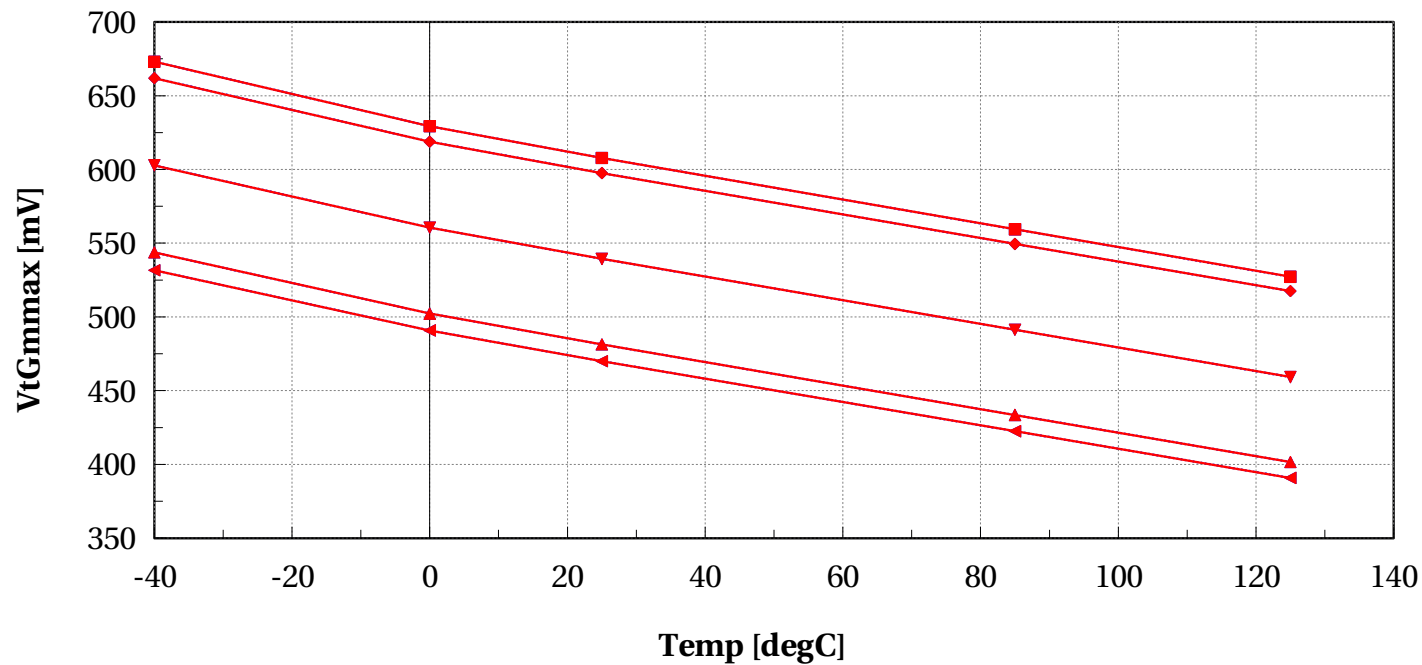
# egnfet\_acc, I<sub>lin</sub>/W [A/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



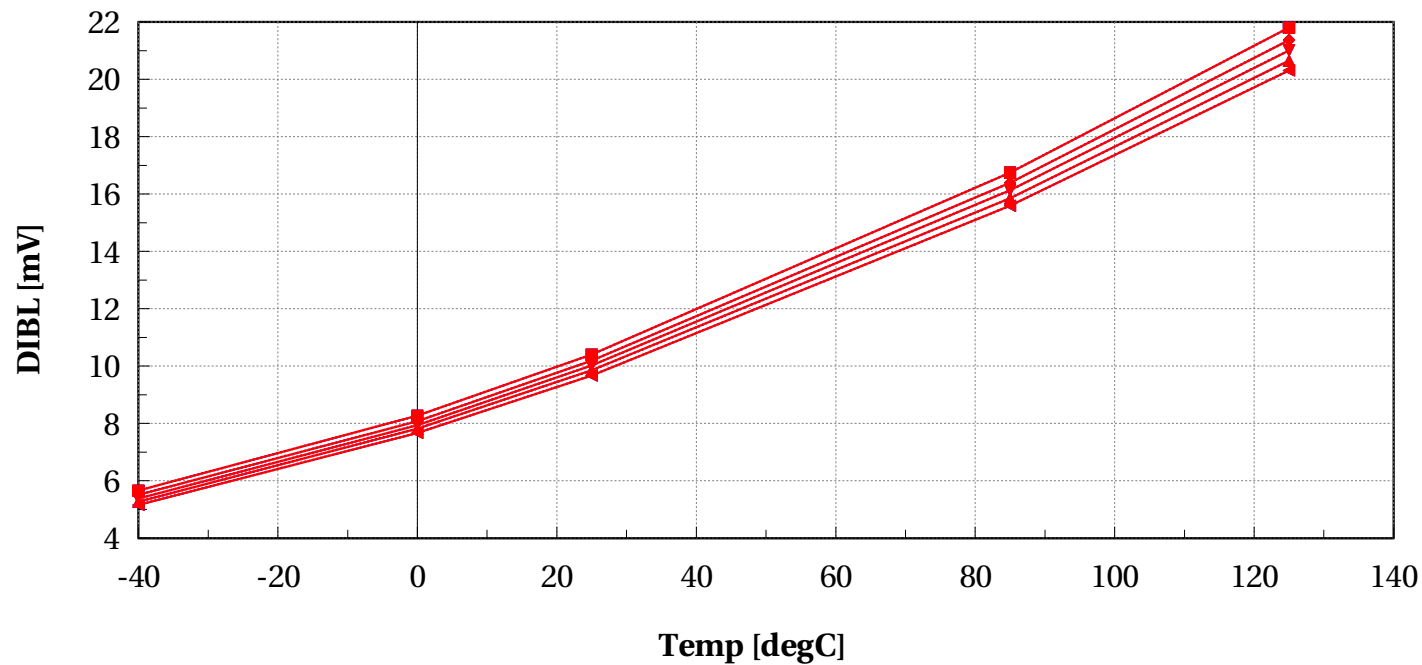
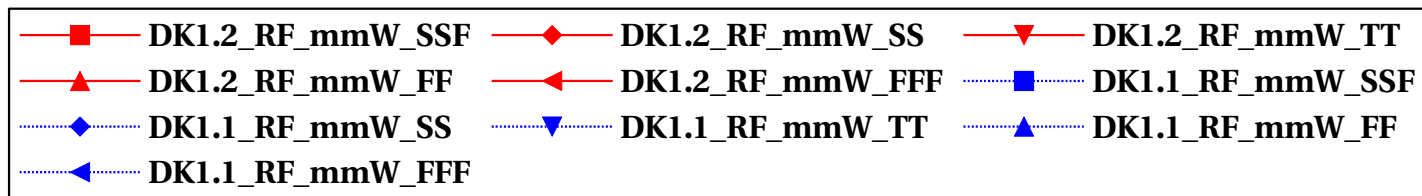
# egnfet\_acc, VtGmmax [mV] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egnfet\_acc, DIBL [mV] vs Temp [degC]

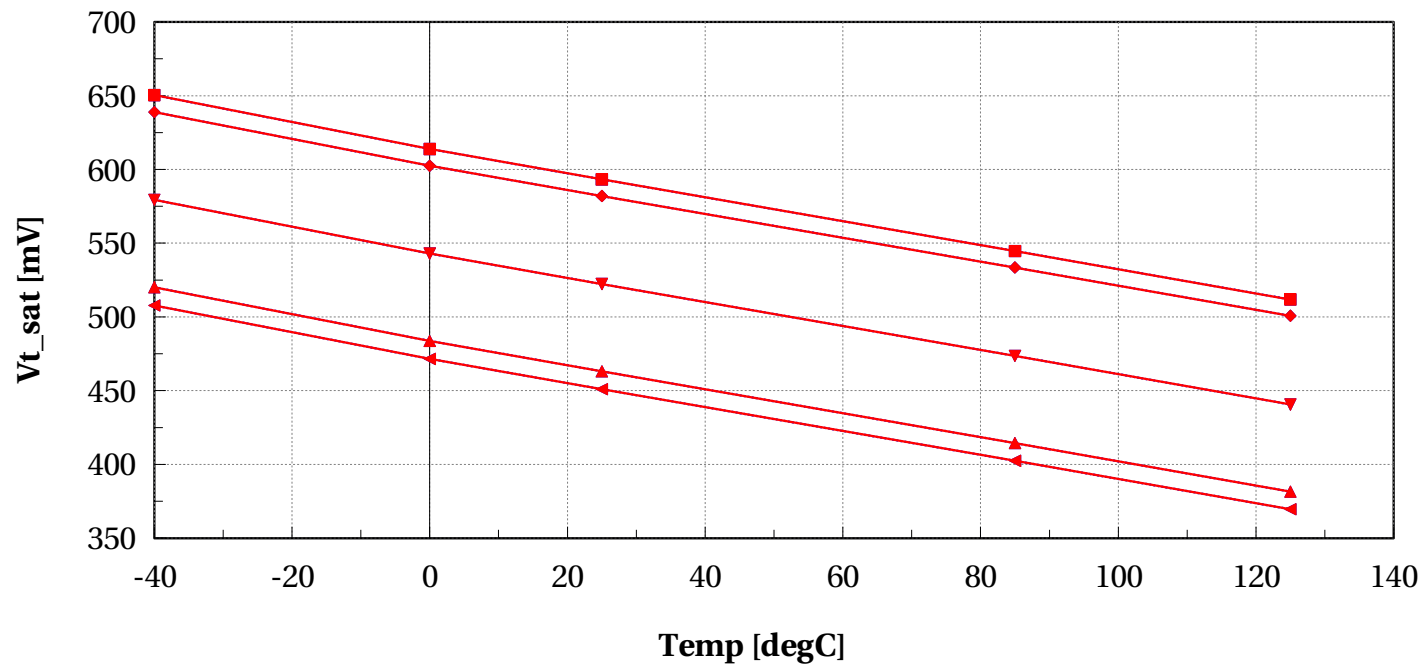
$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"





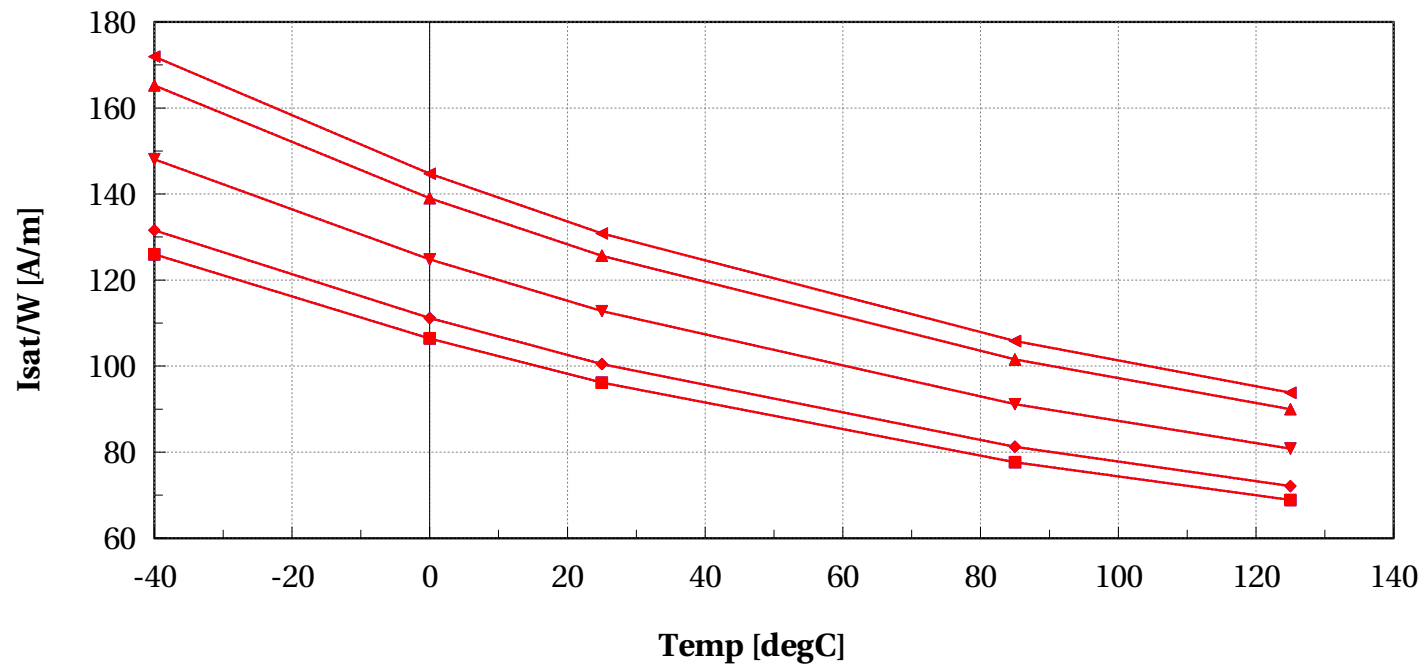
# egnfet\_acc, Vt\_sat [mV] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



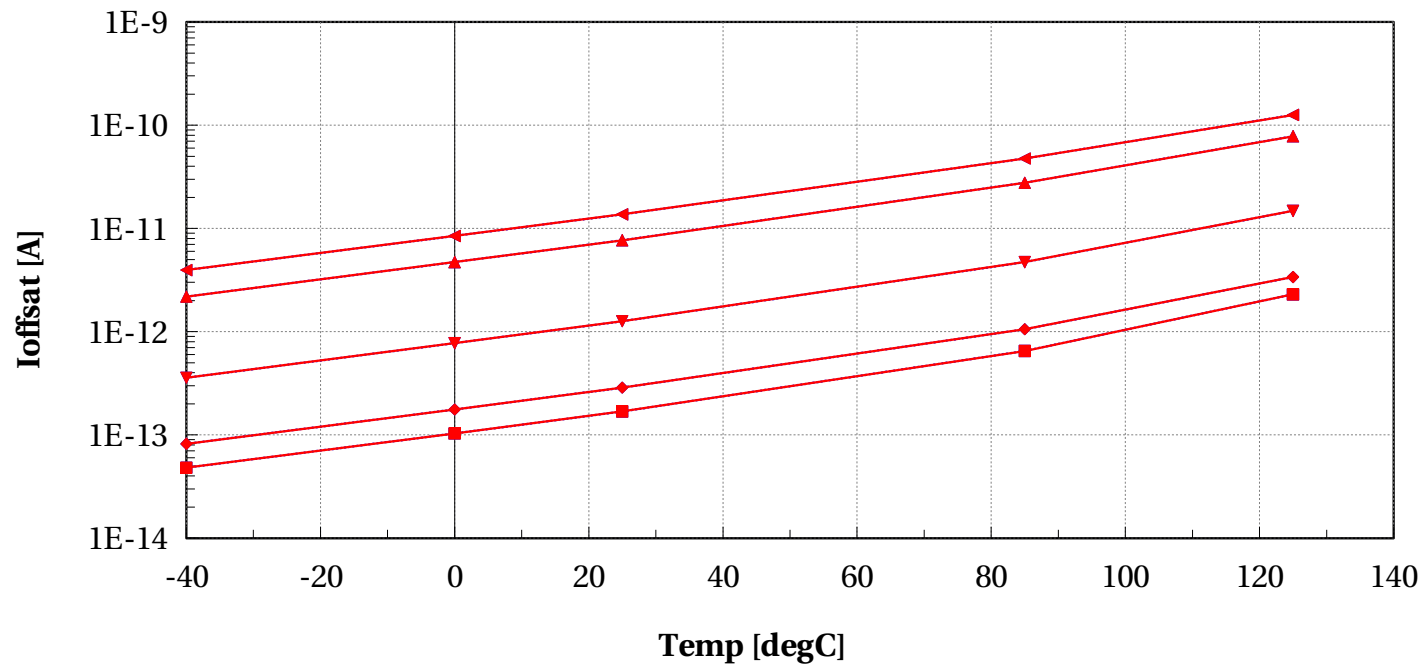
# egnfet\_acc, Isat/W [A/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



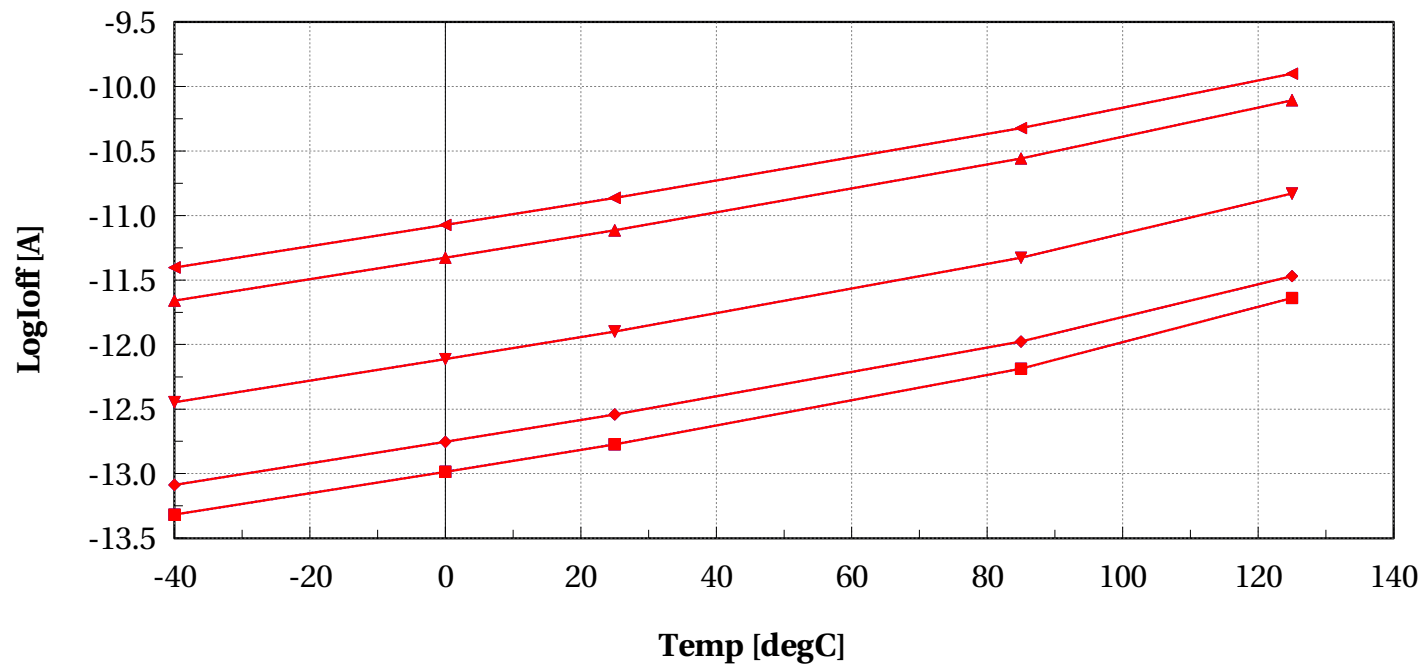
# egnfet\_acc, Ioffsat [A] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



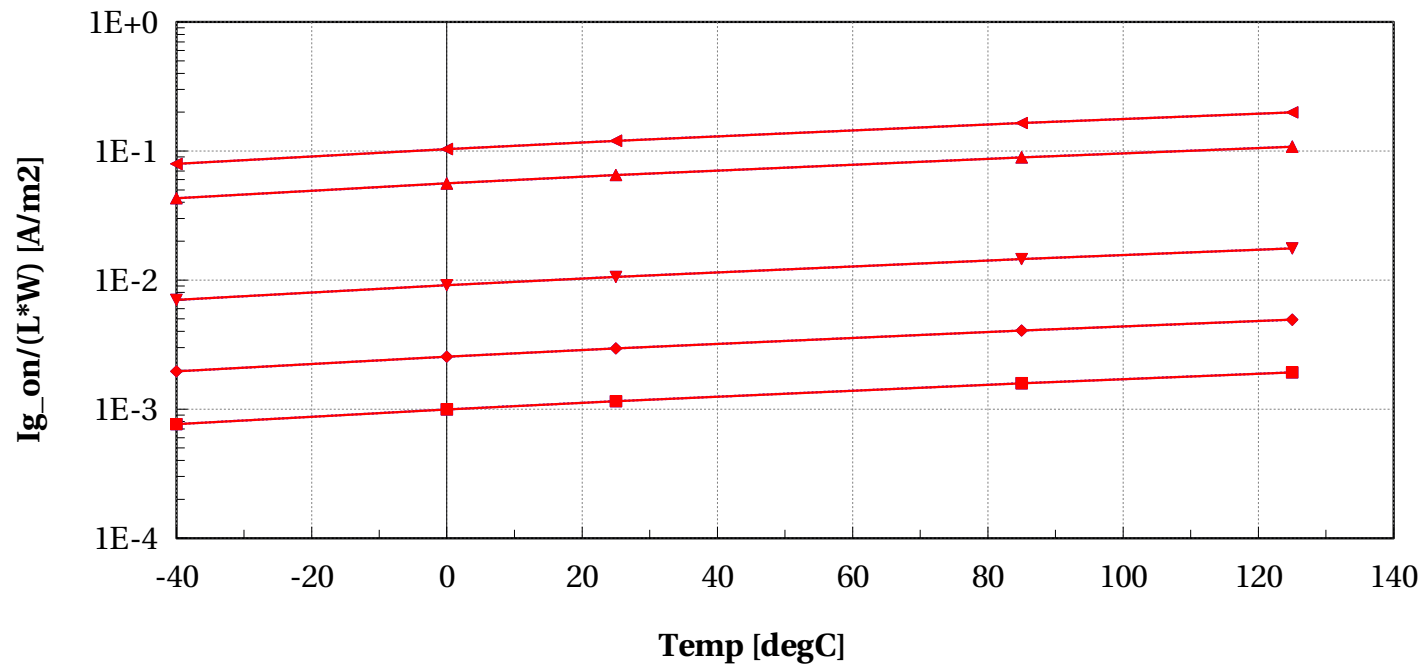
# egnfet\_acc, LogIoff [A] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



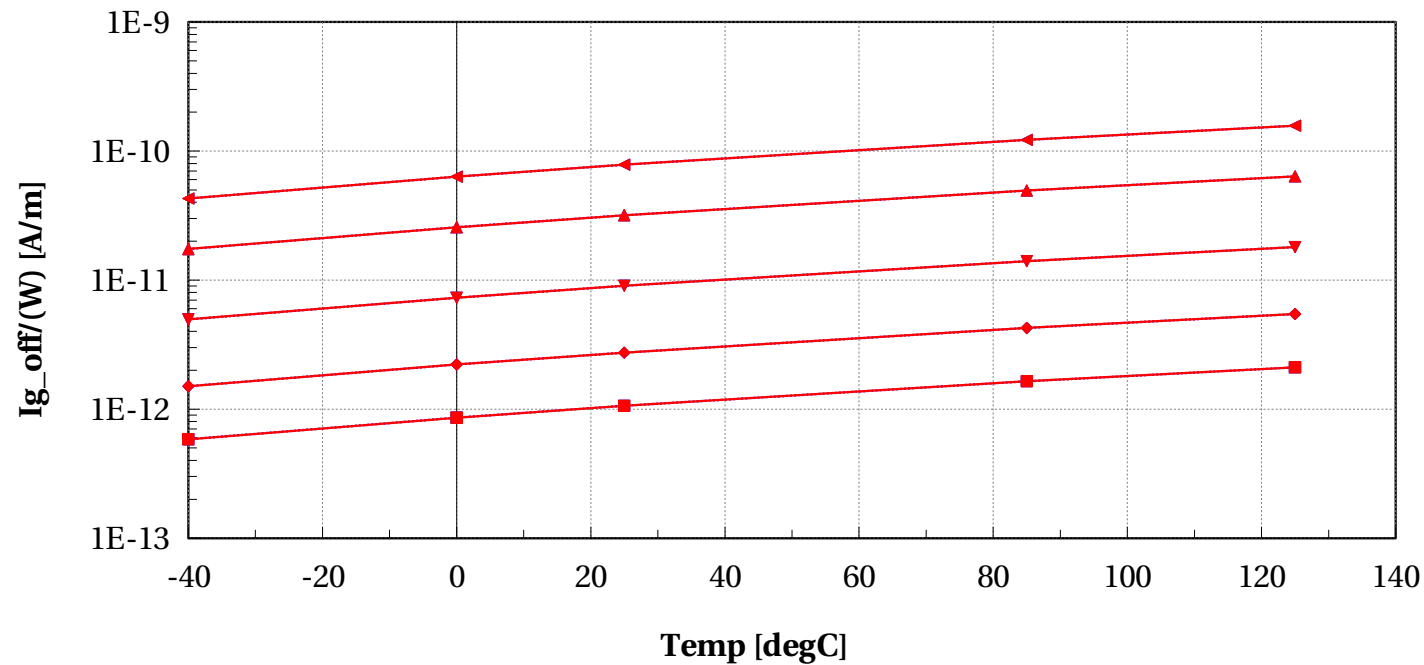
# egnfet\_acc, Ig\_on/(L\*W) [A/m2] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



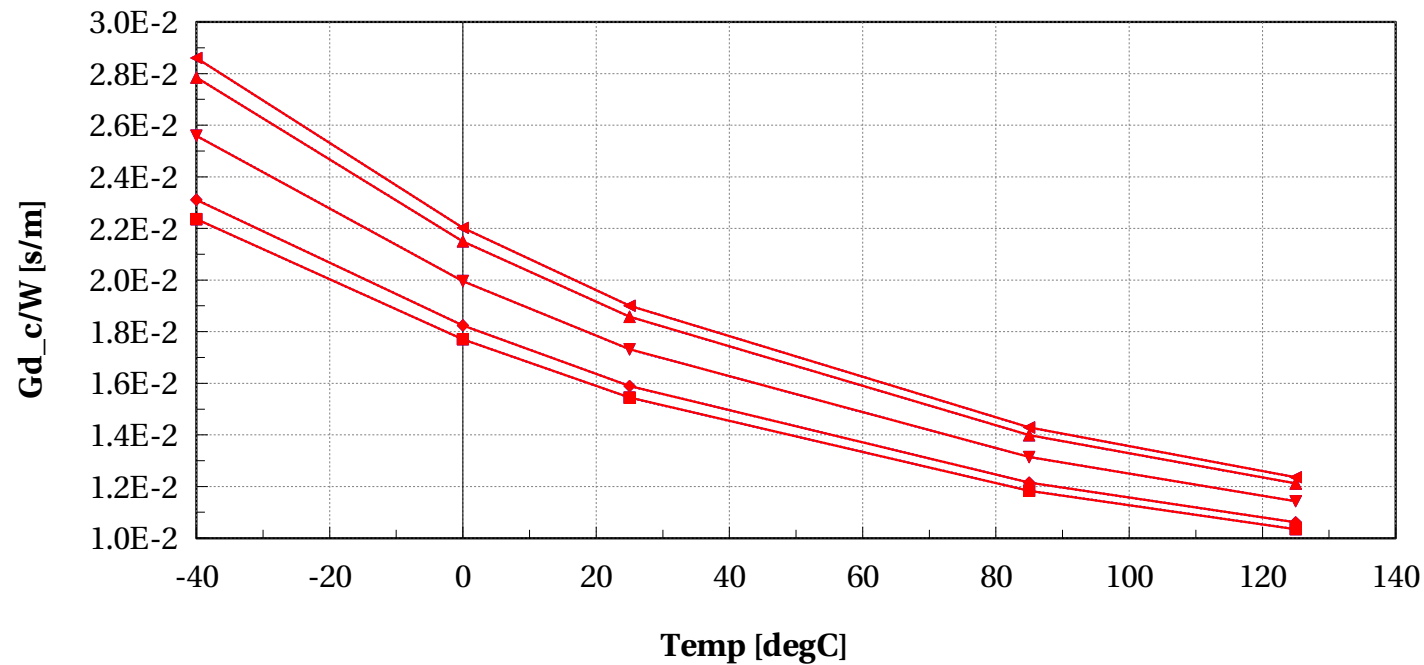
# egnfet\_acc, Ig\_off/(W) [A/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



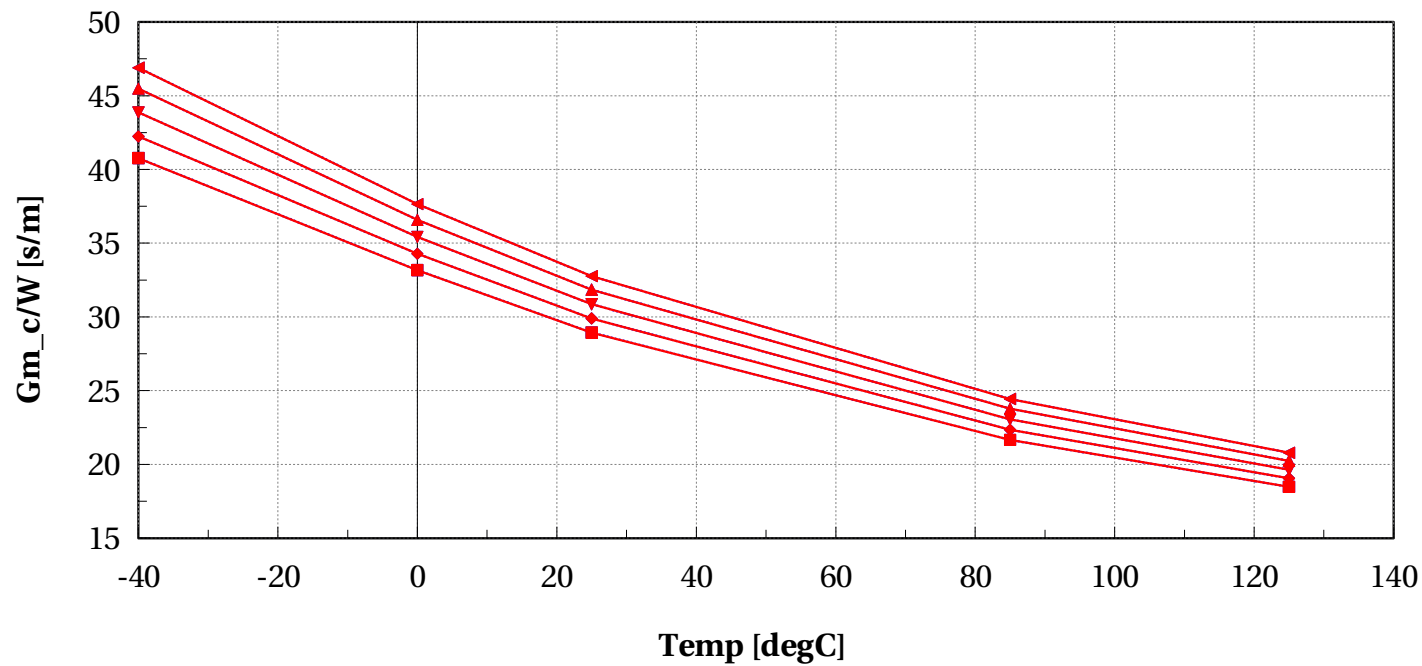
# egnfet\_acc, Gd\_c/W [s/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egnfet\_acc, Gm\_c/W [s/m] vs Temp [degC]

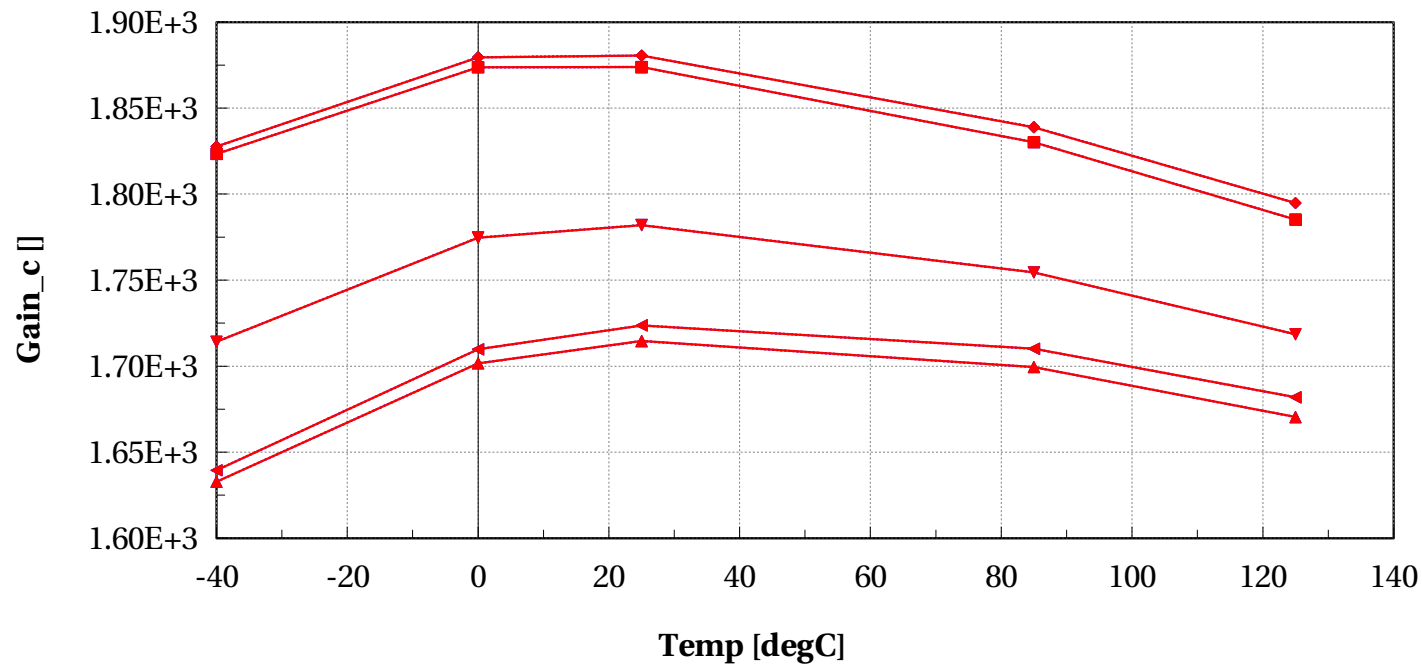
$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"





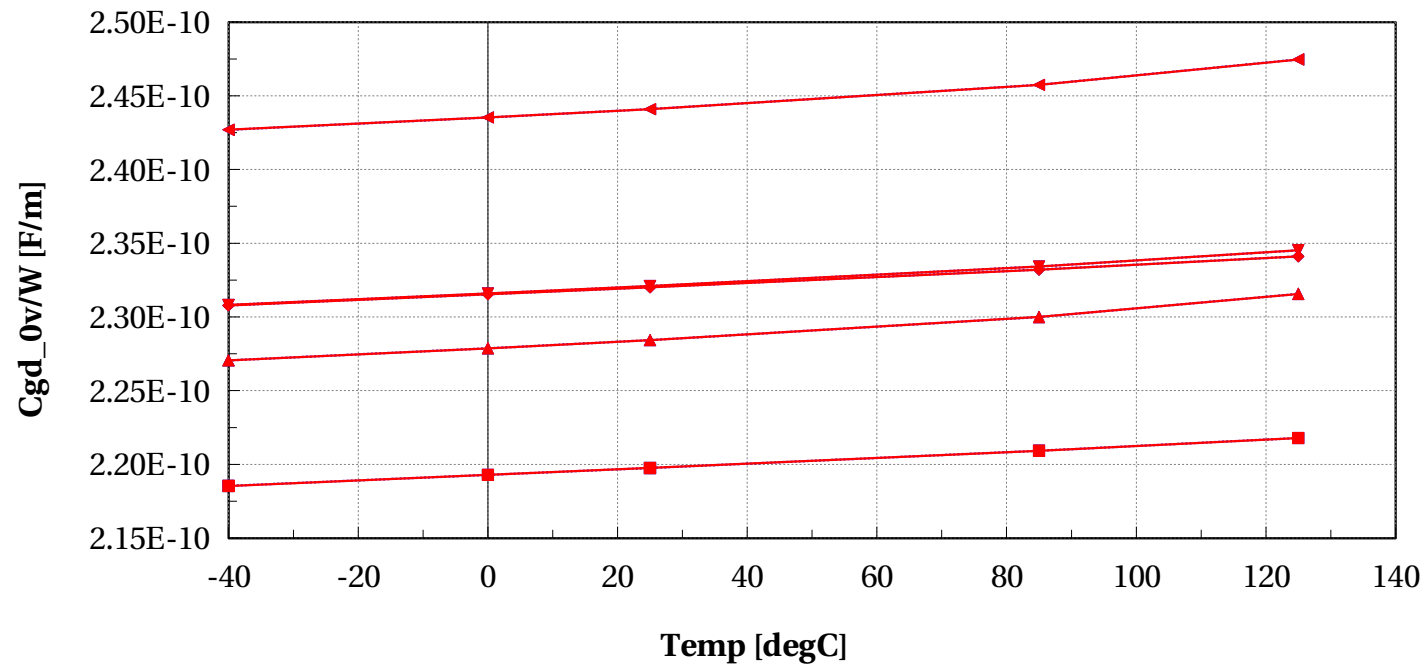
# egnfet\_acc, Gain\_c [] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



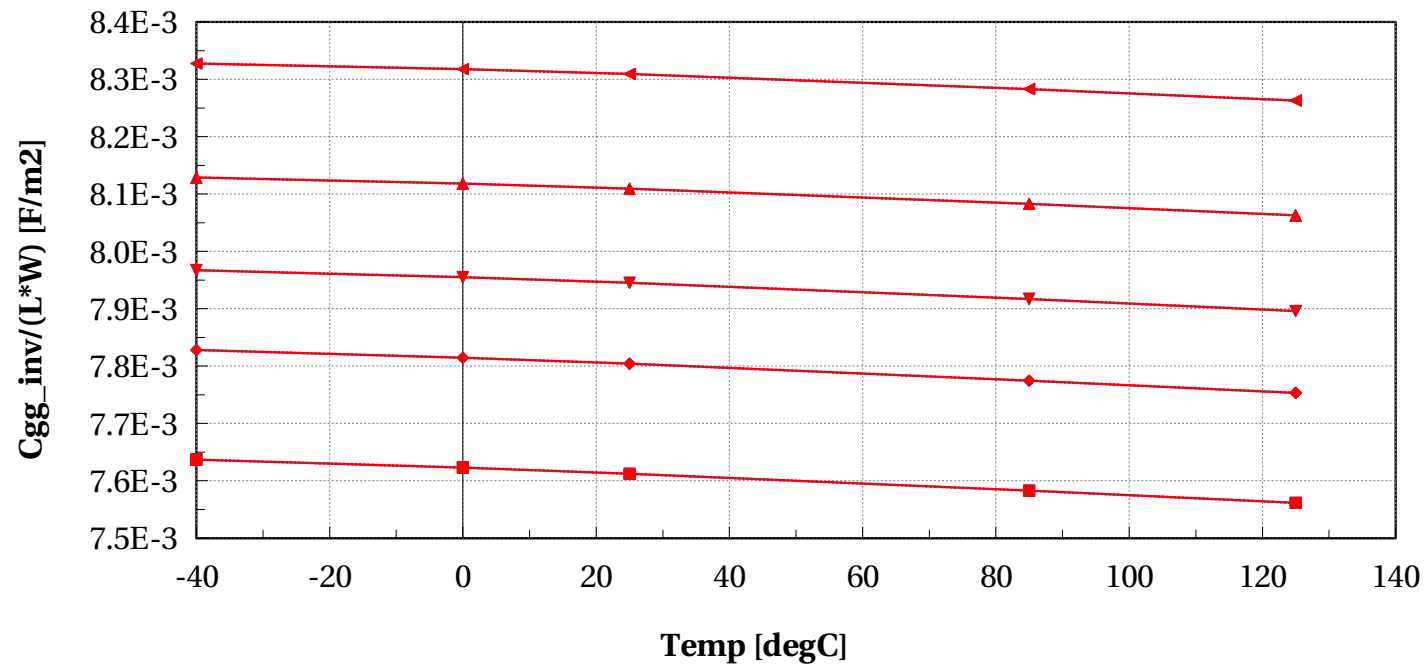
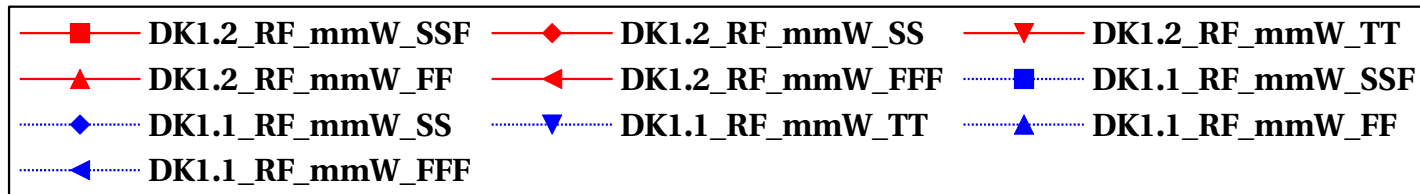
# egnfet\_acc, Cgd\_0v/W [F/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egnfet\_acc, Cgg\_inv/(L\*W) [F/m2] vs Temp [degC]

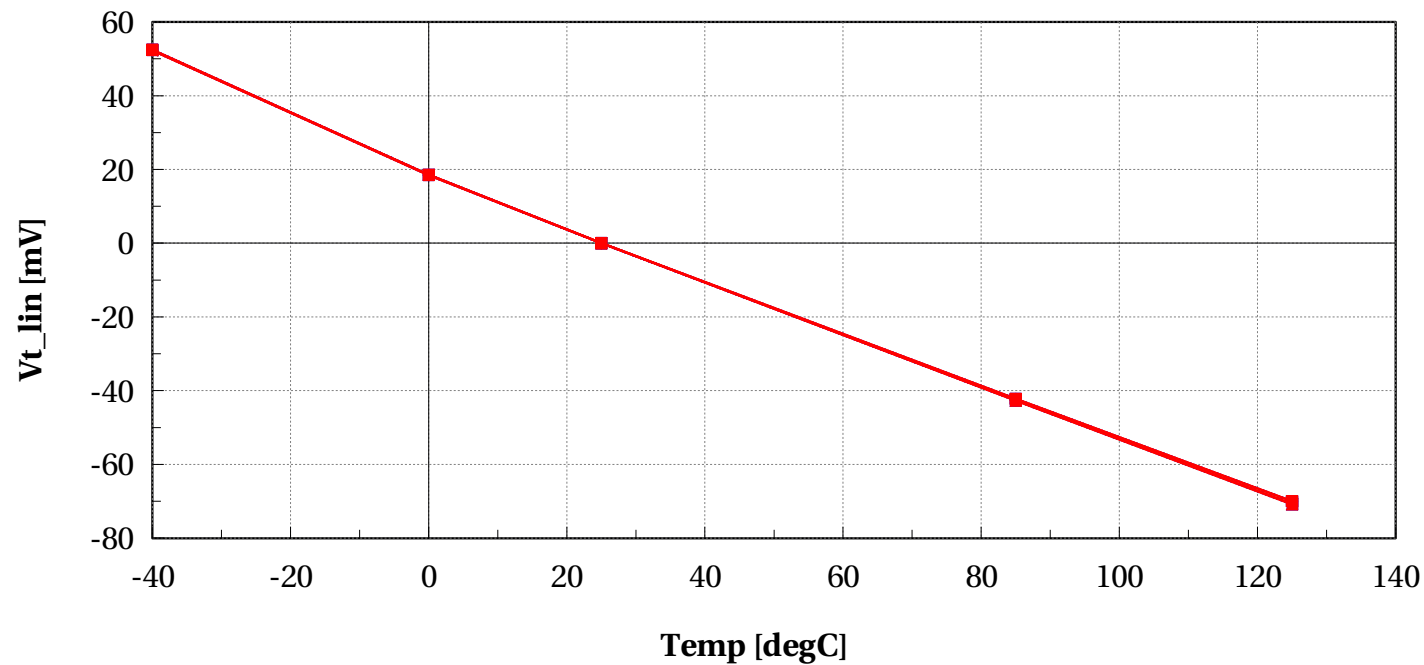
$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# Normalized scaling versus Temp @ L=2u, W=2u

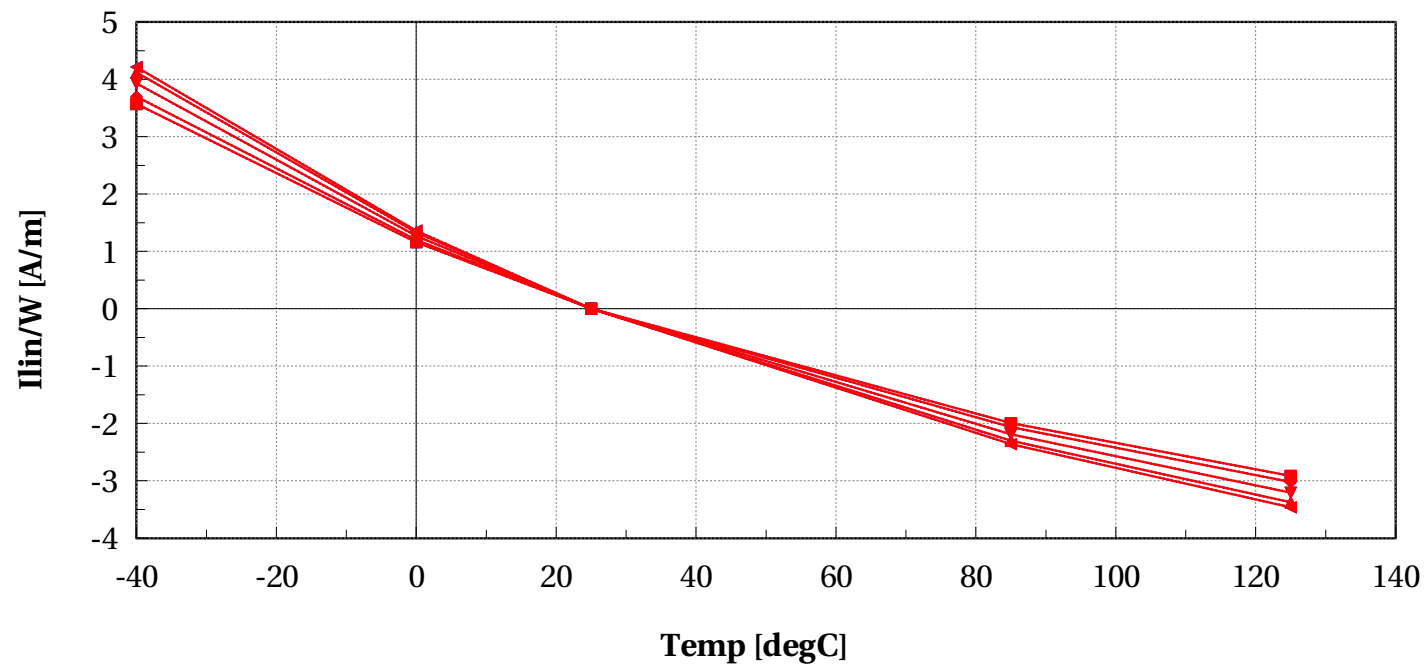
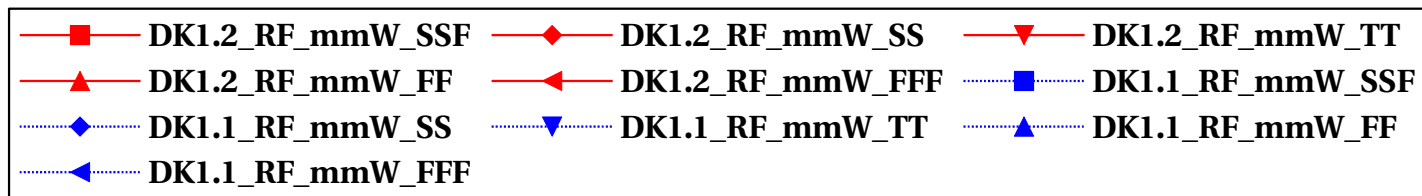
# egnfet\_acc, Vt\_lin [mV] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



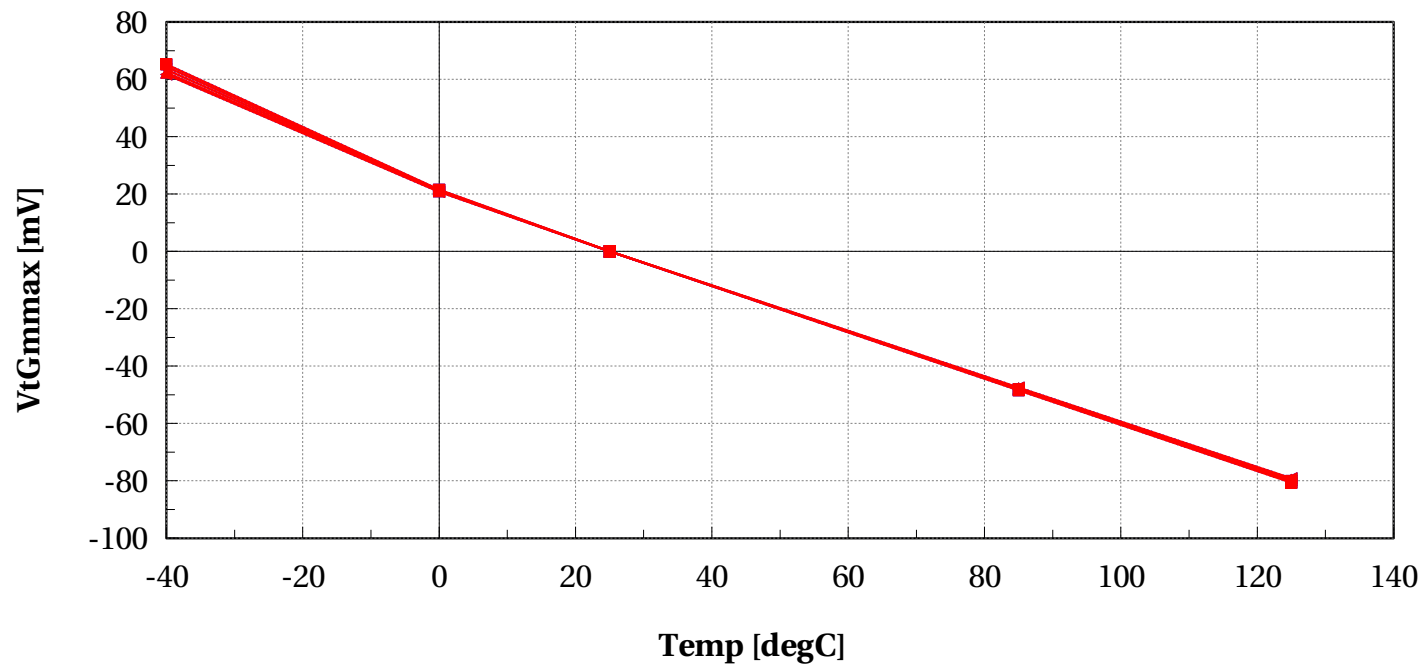
# egnfet\_acc, Ilin/W [A/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



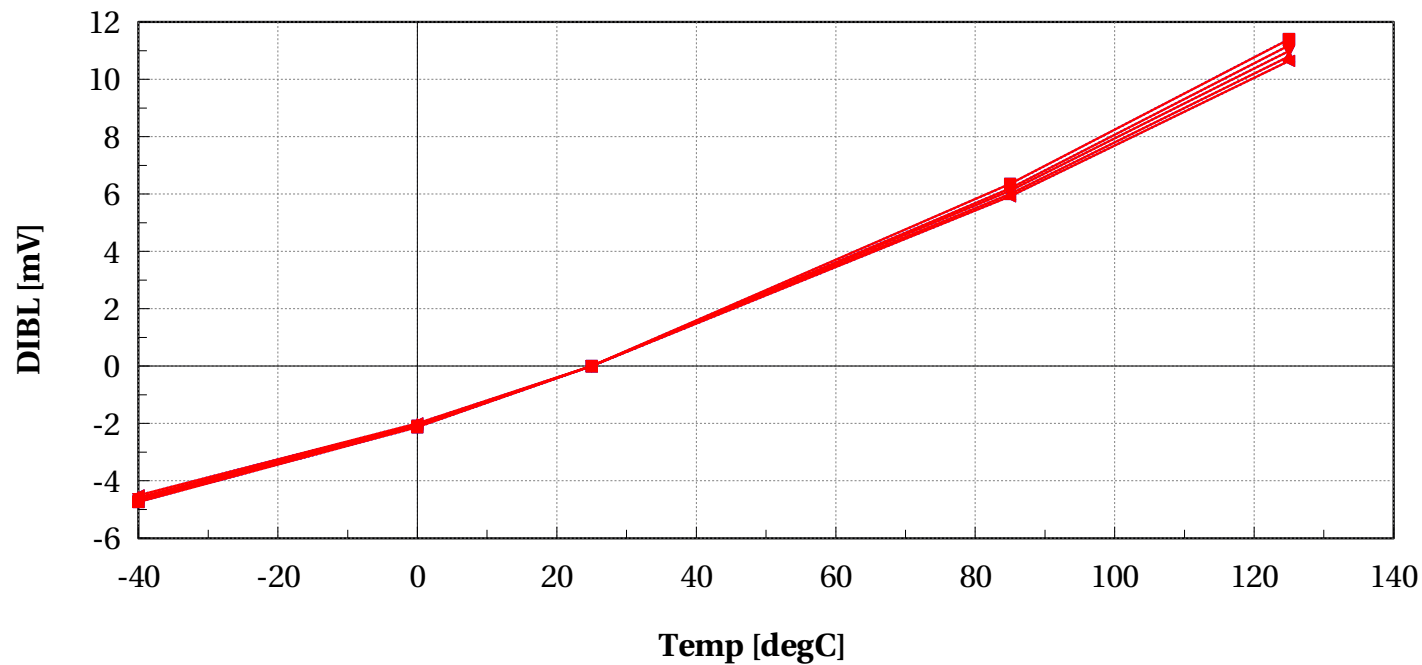
# egnfet\_acc, VtGmmax [mV] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egnfet\_acc, DIBL [mV] vs Temp [degC]

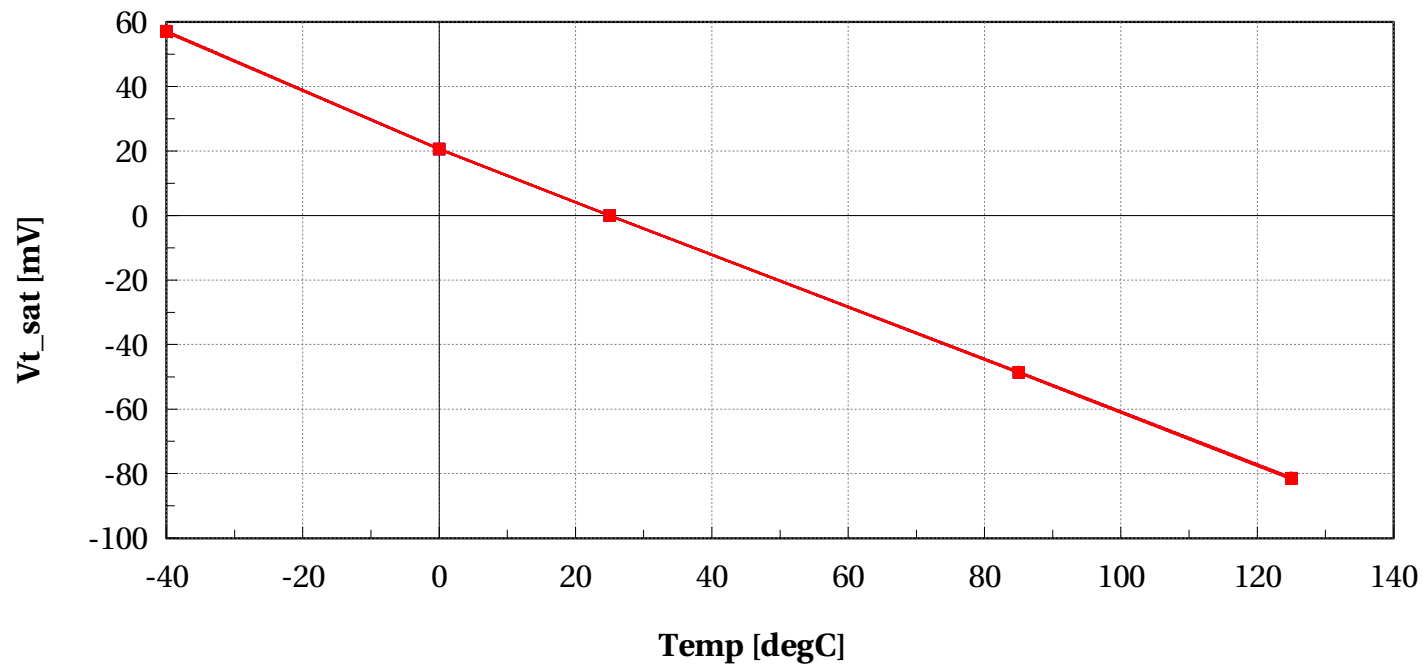
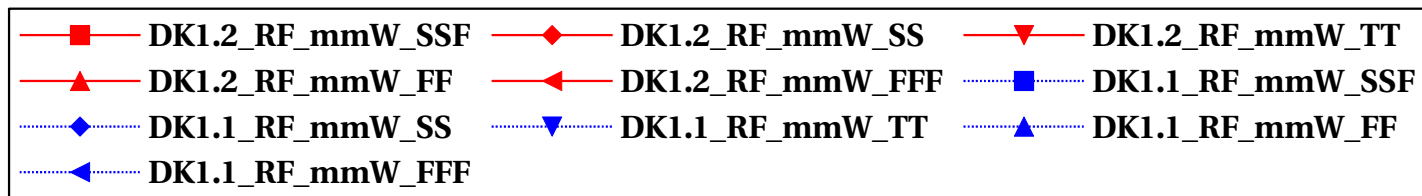
$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"





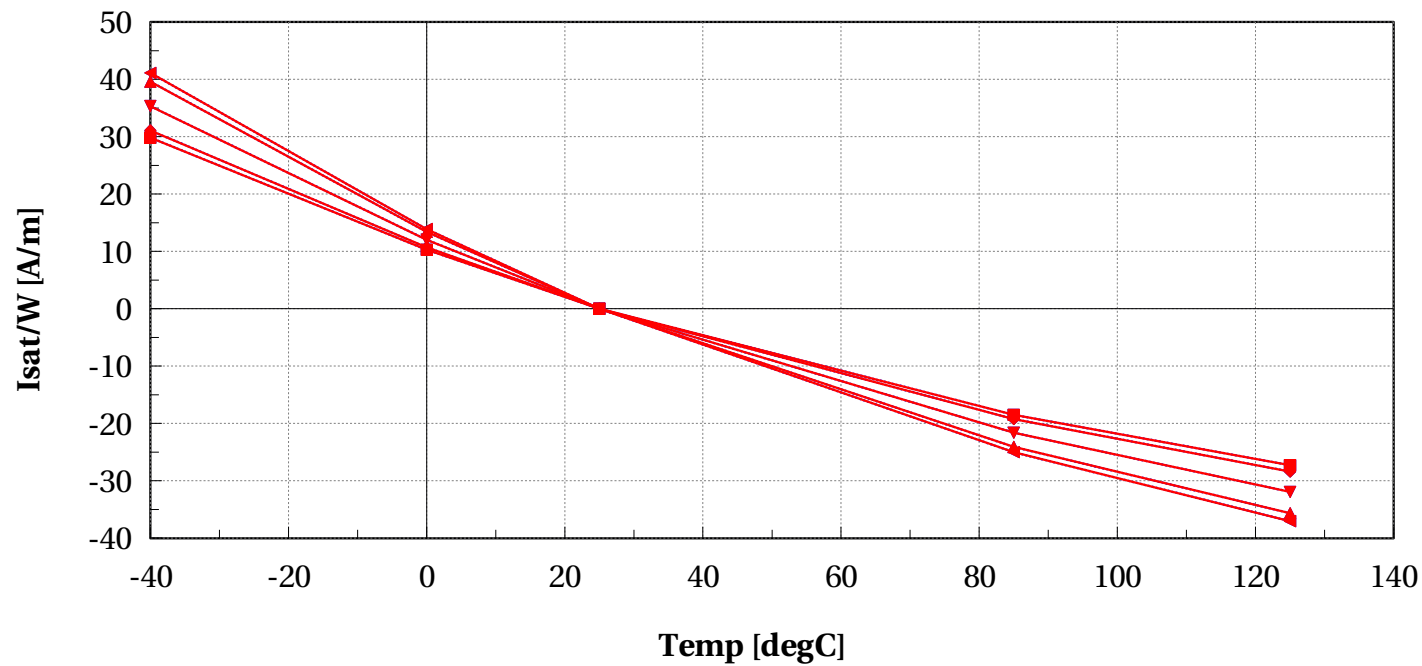
# egnfet\_acc, Vt\_sat [mV] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



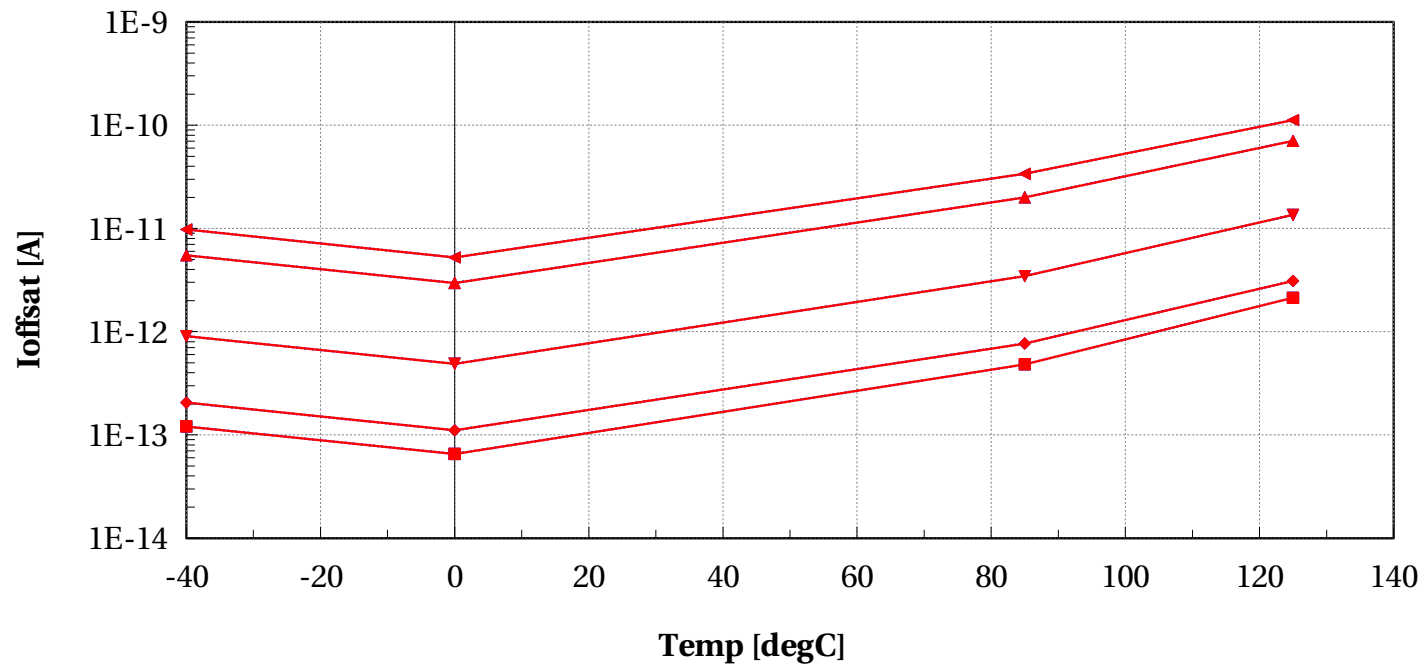
# egnfet\_acc, Isat/W [A/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



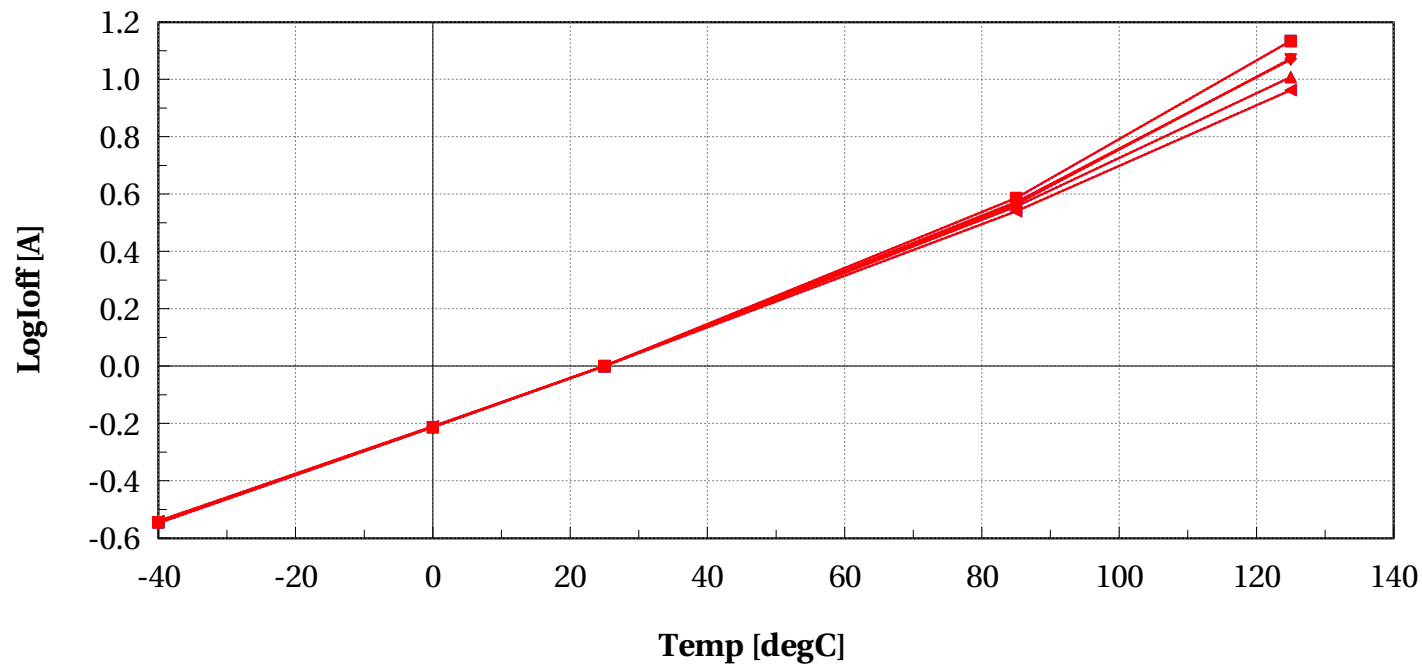
# egnfet\_acc, Ioffsat [A] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



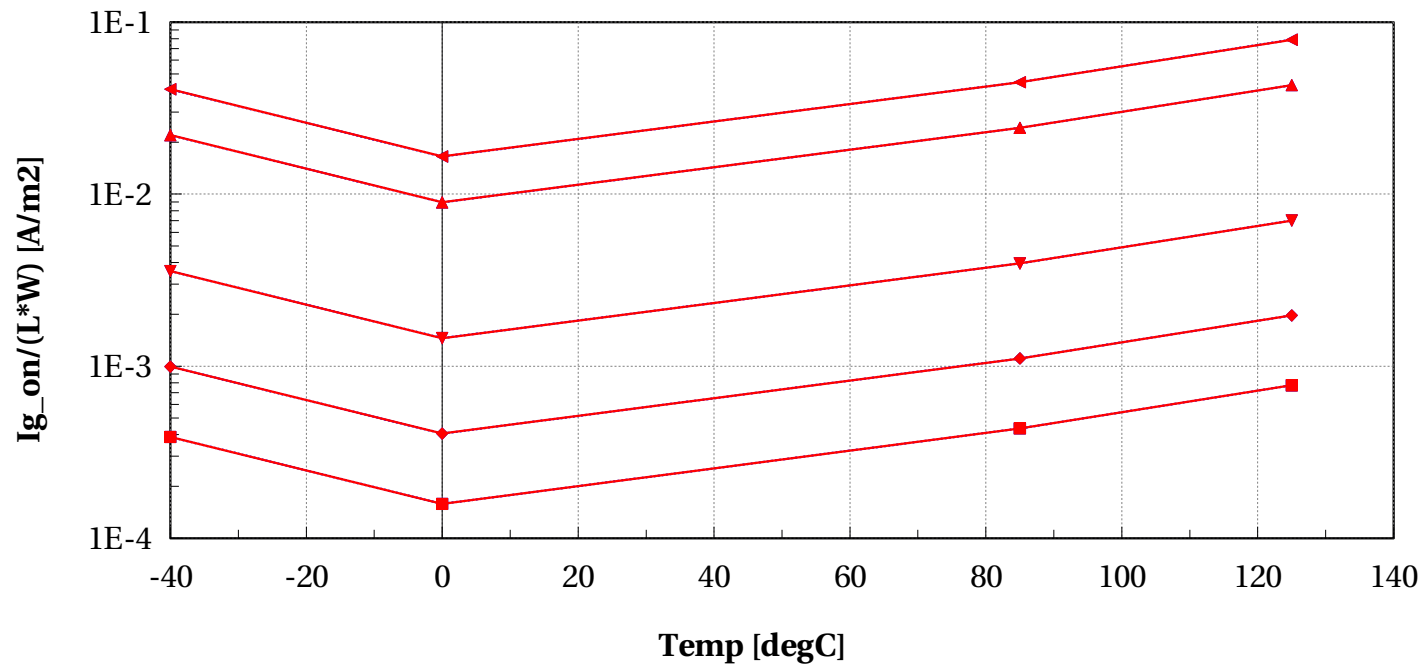
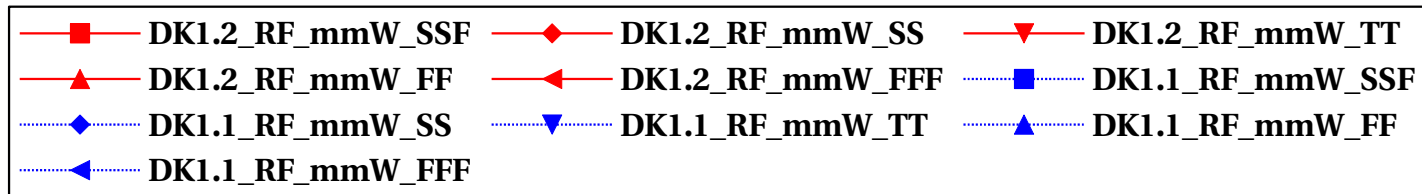
# egnfet\_acc, LogIoff [A] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



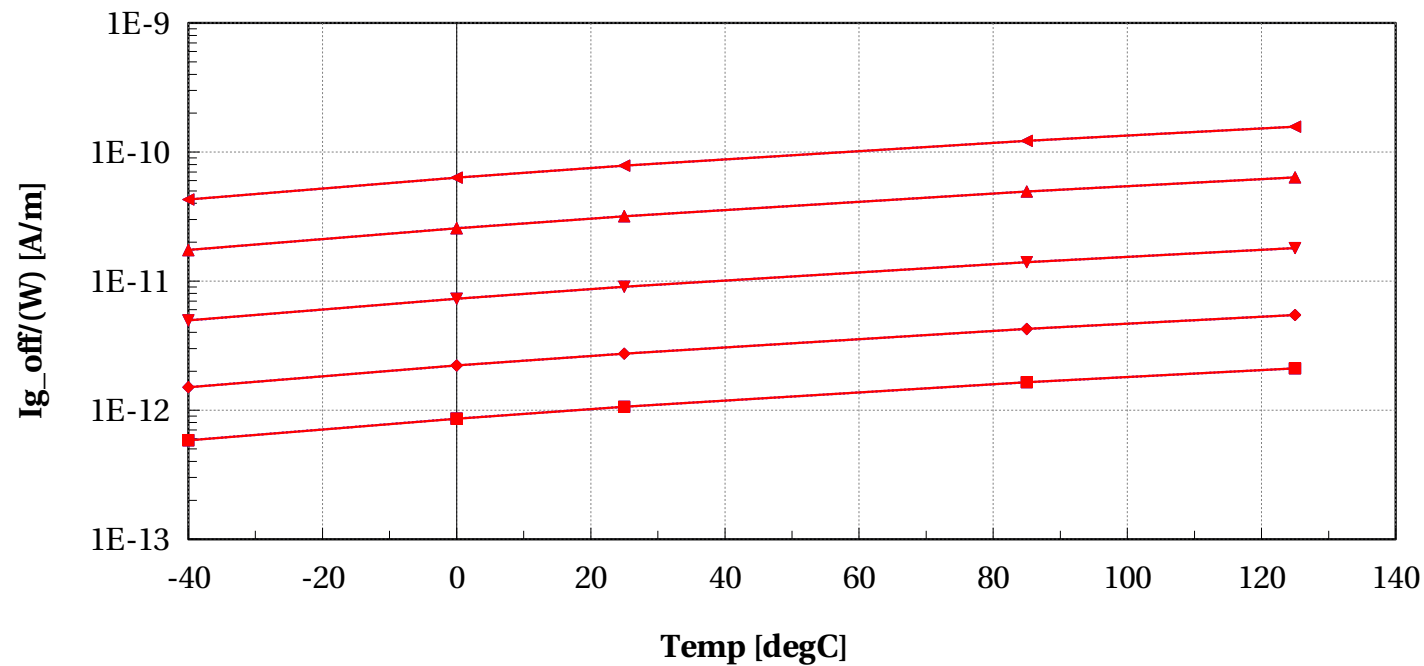
# egnfet\_acc, Ig\_on/(L\*W) [A/m2] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



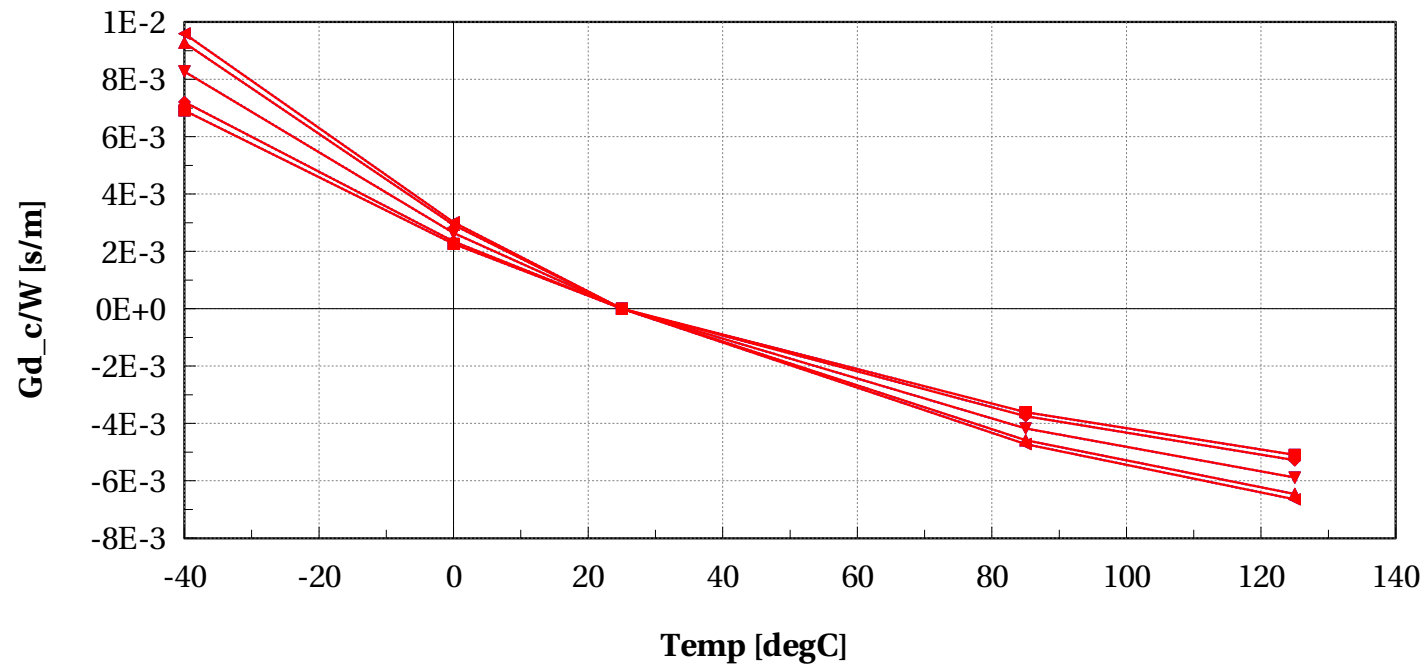
# egnfet\_acc, Ig\_off/(W) [A/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



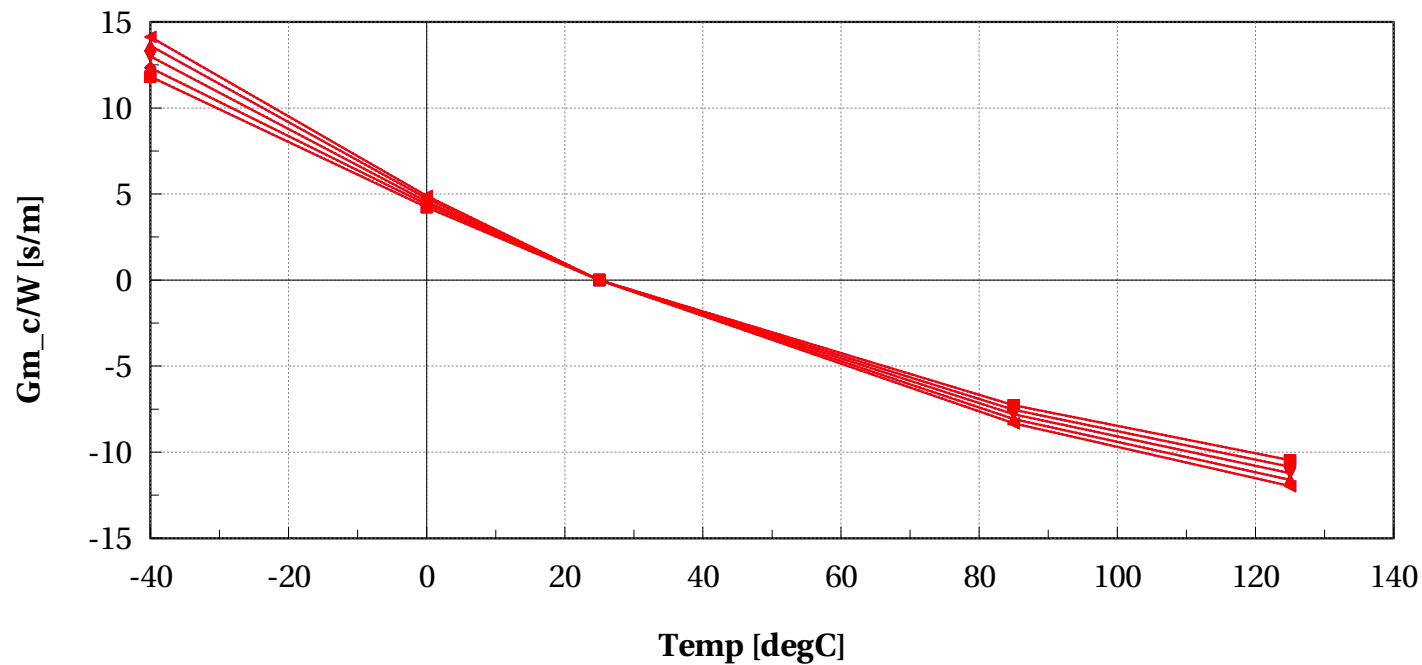
# egnfet\_acc, Gd\_c/W [s/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egnfet\_acc, Gm\_c/W [s/m] vs Temp [degC]

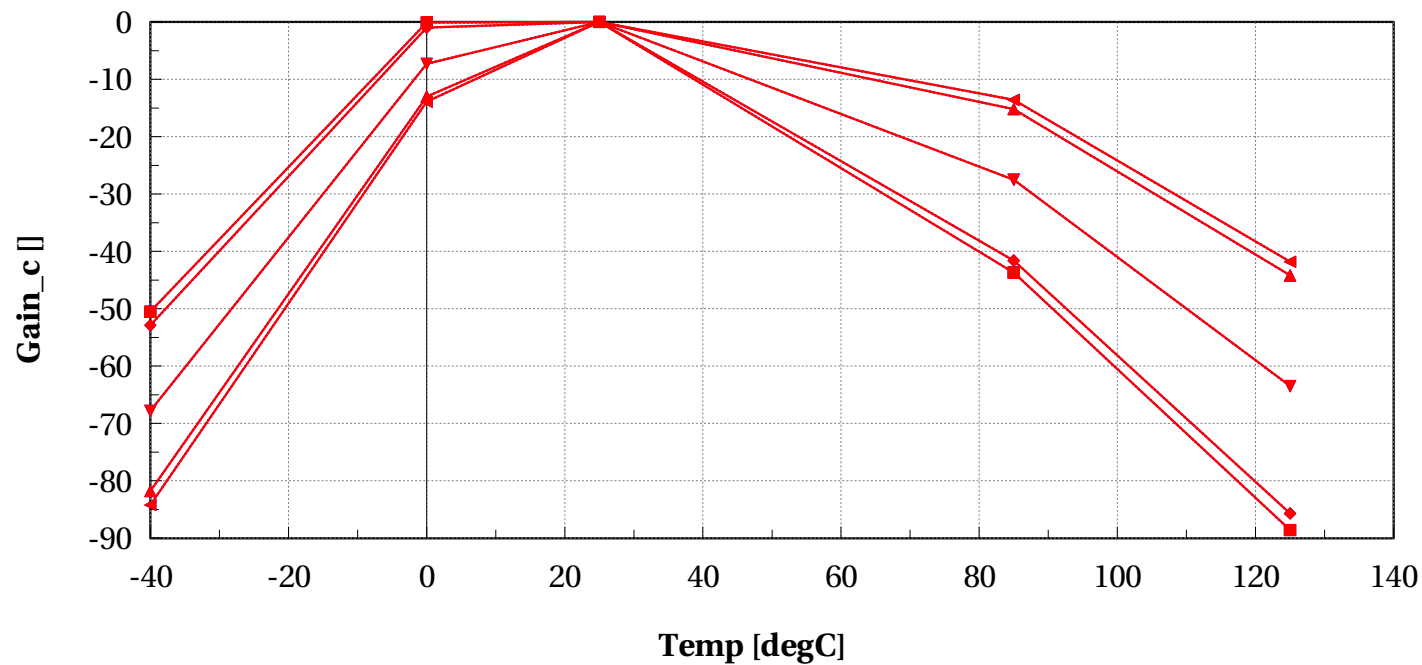
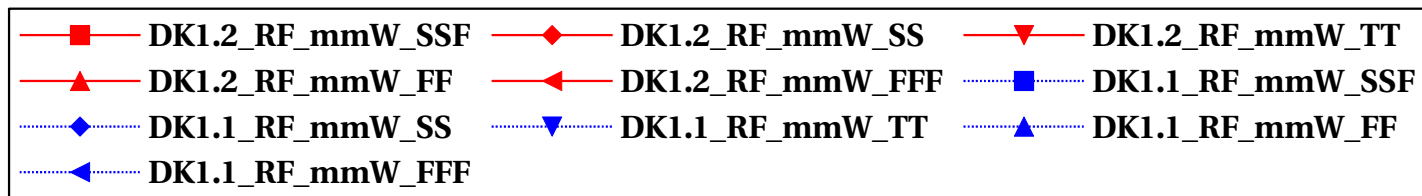
$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"





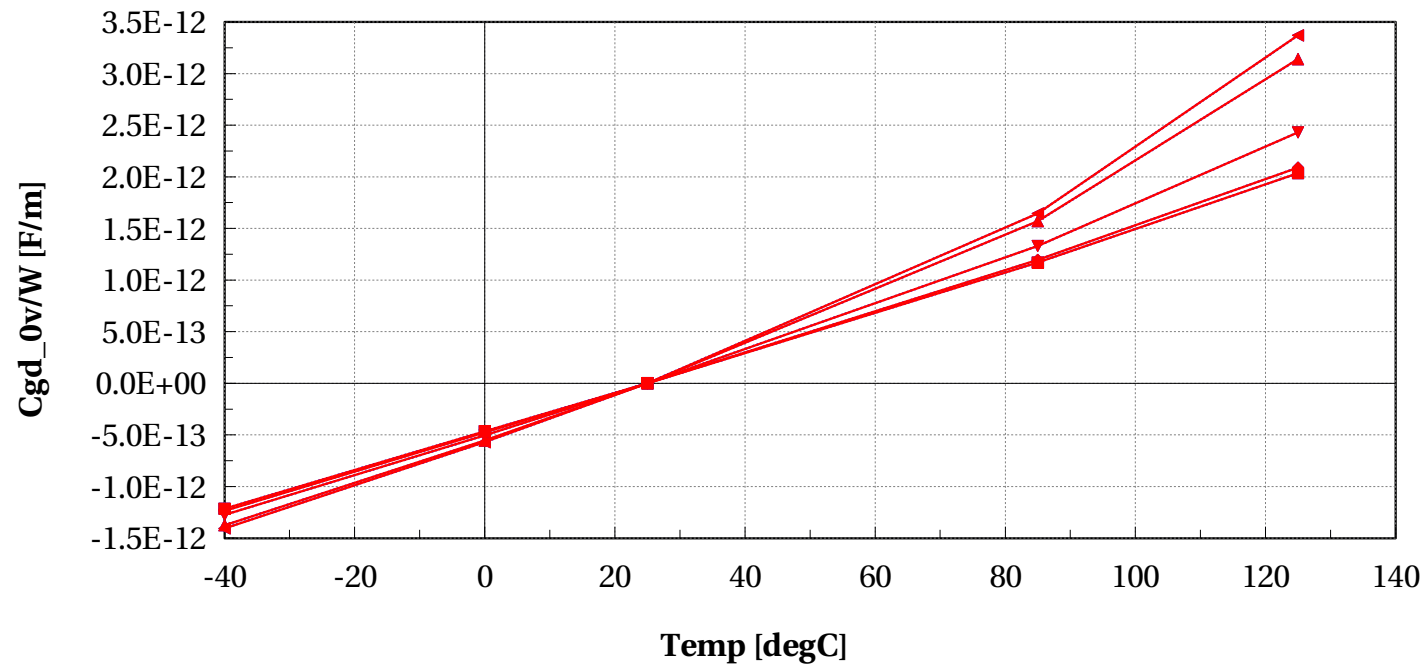
# egnfet\_acc, Gain\_c [] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



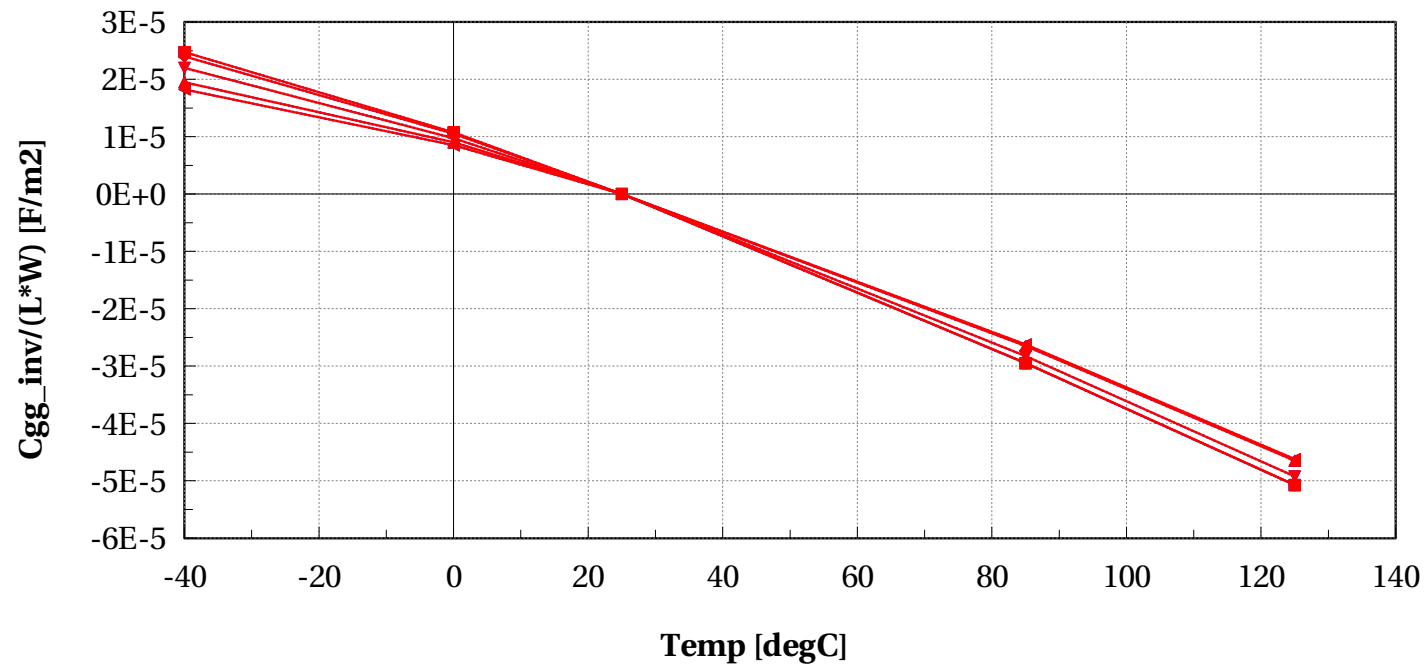
# egnfet\_acc, Cgd\_0v/W [F/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egnfet\_acc, Cgg\_inv/(L\*W) [F/m2] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



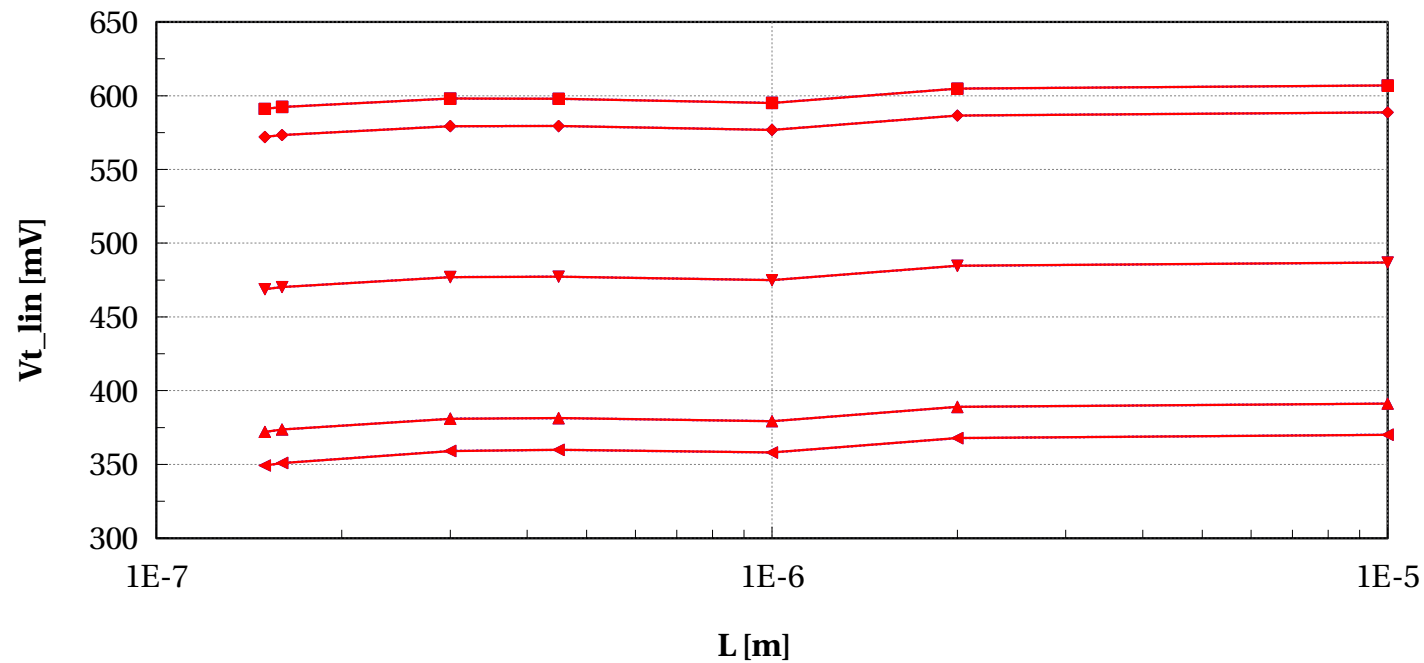
# egpfet\_acc

## Electrical characteristics scaling

## Scaling versus Length ( $W=2e-6$ , Temp=25)

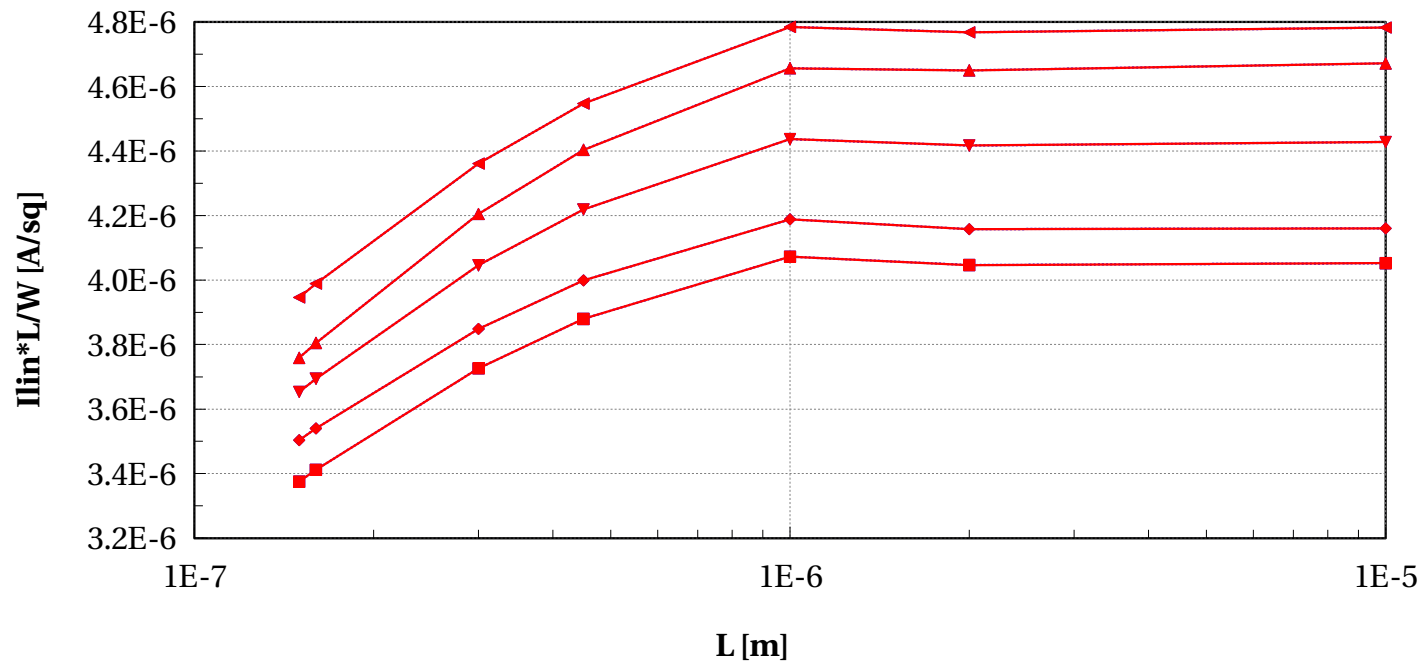
# egpfet\_acc, Vt\_lin [mV] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



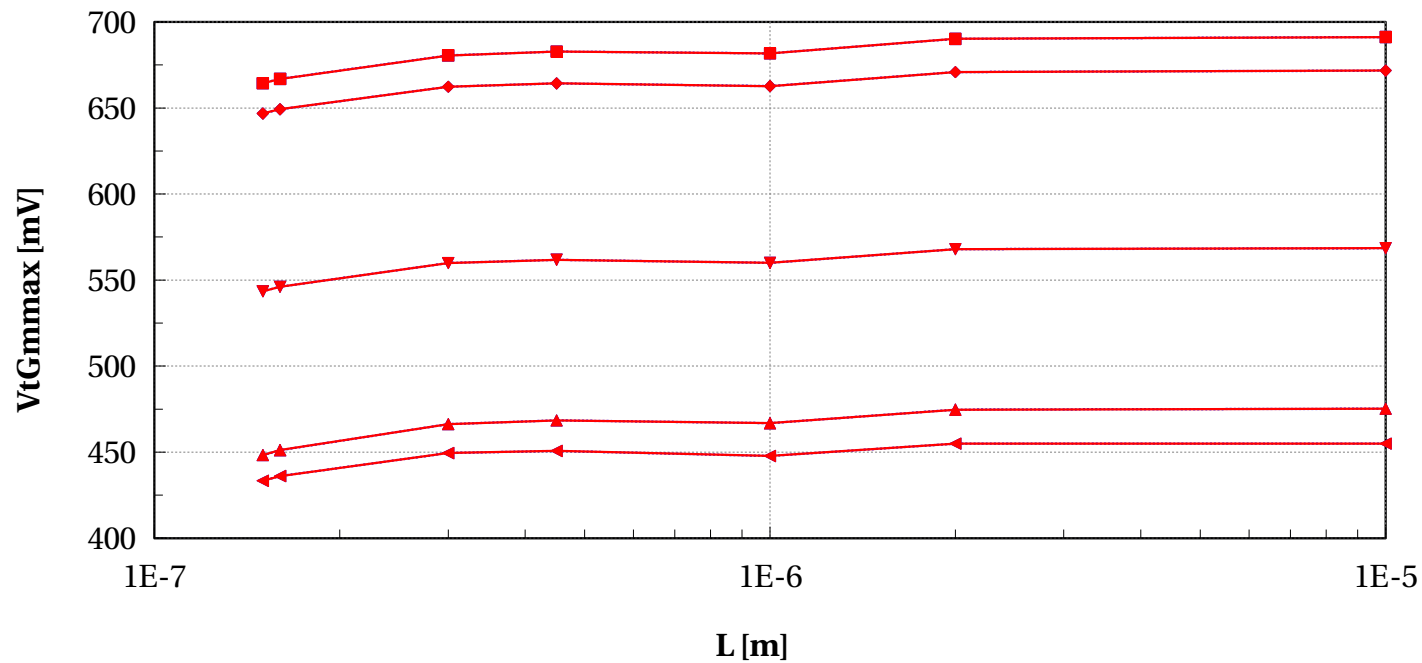
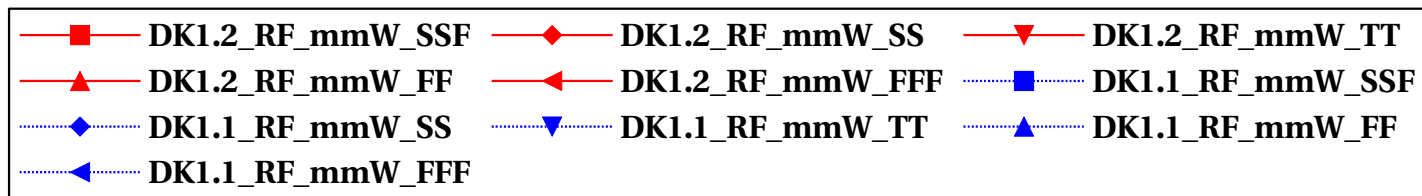
# egpfet\_acc, $I_{lin} \cdot L/W$ [A/sq] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



# egpfet\_acc, VtGmmax [mV] vs L [m]

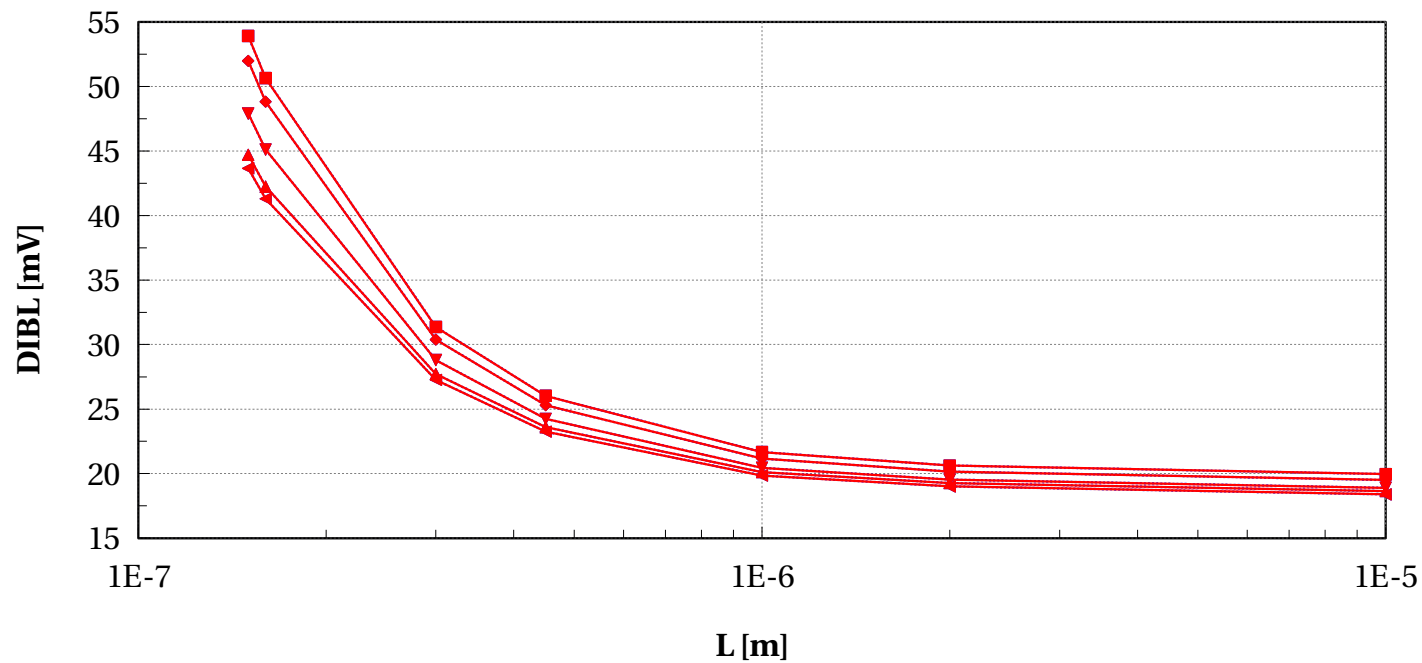
Temp==25 and w==2e-6 and devType=="PCELLwoWPE"





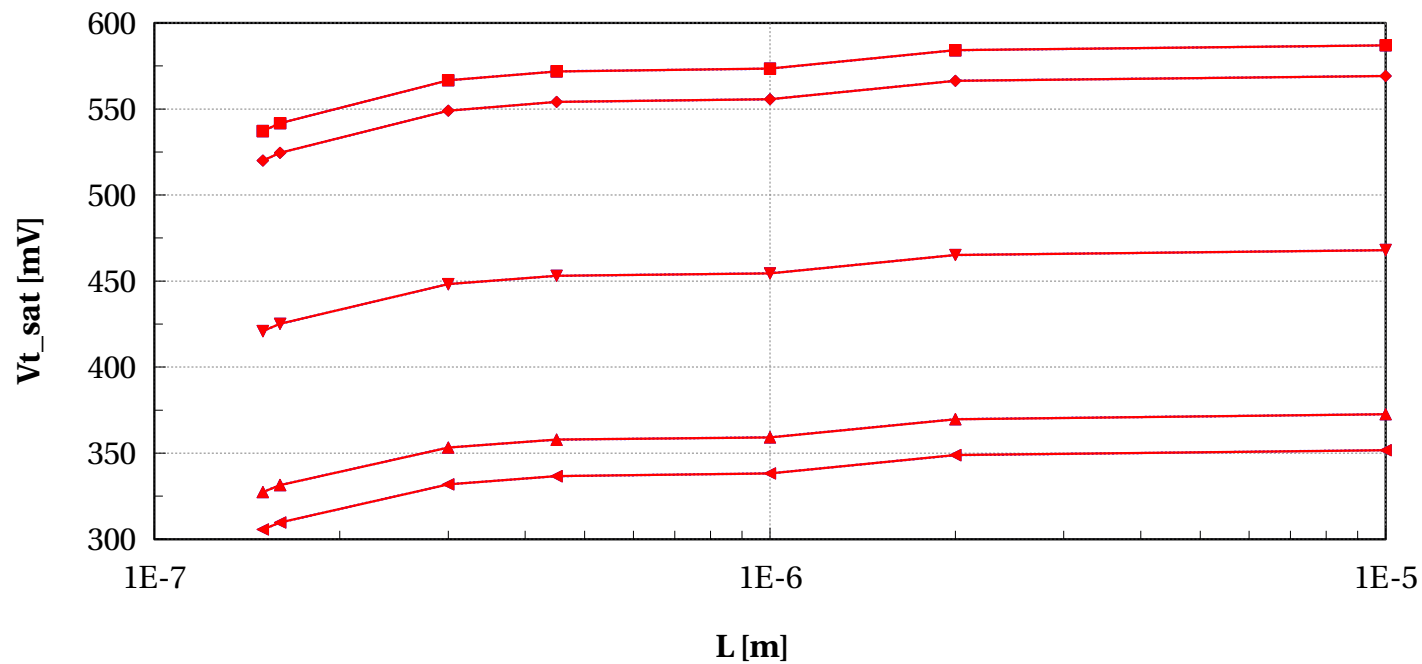
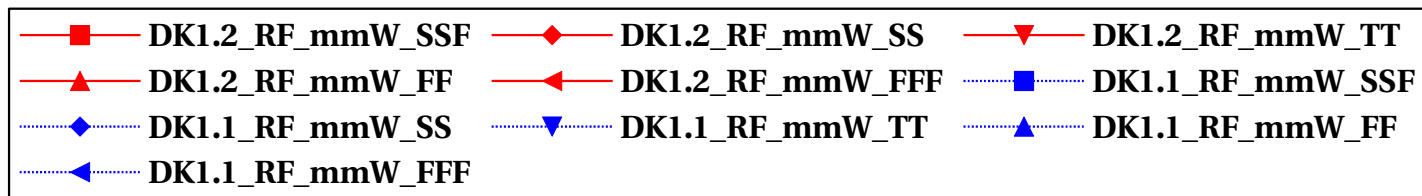
# egpfet\_acc, DIBL [mV] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



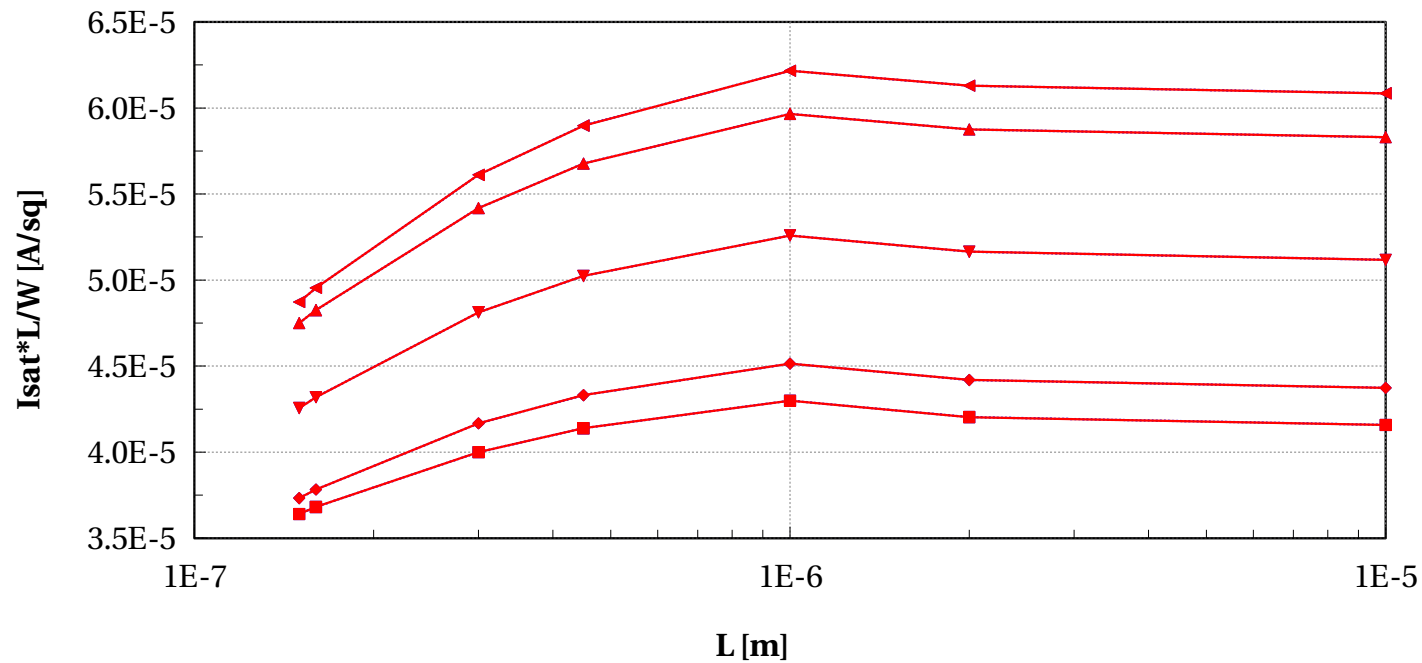
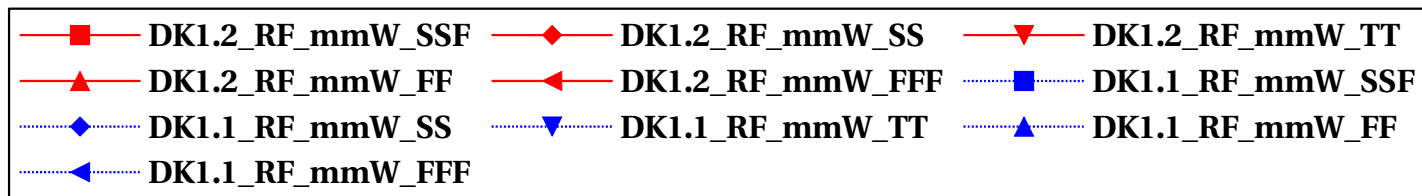
# egpfet\_acc, Vt\_sat [mV] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



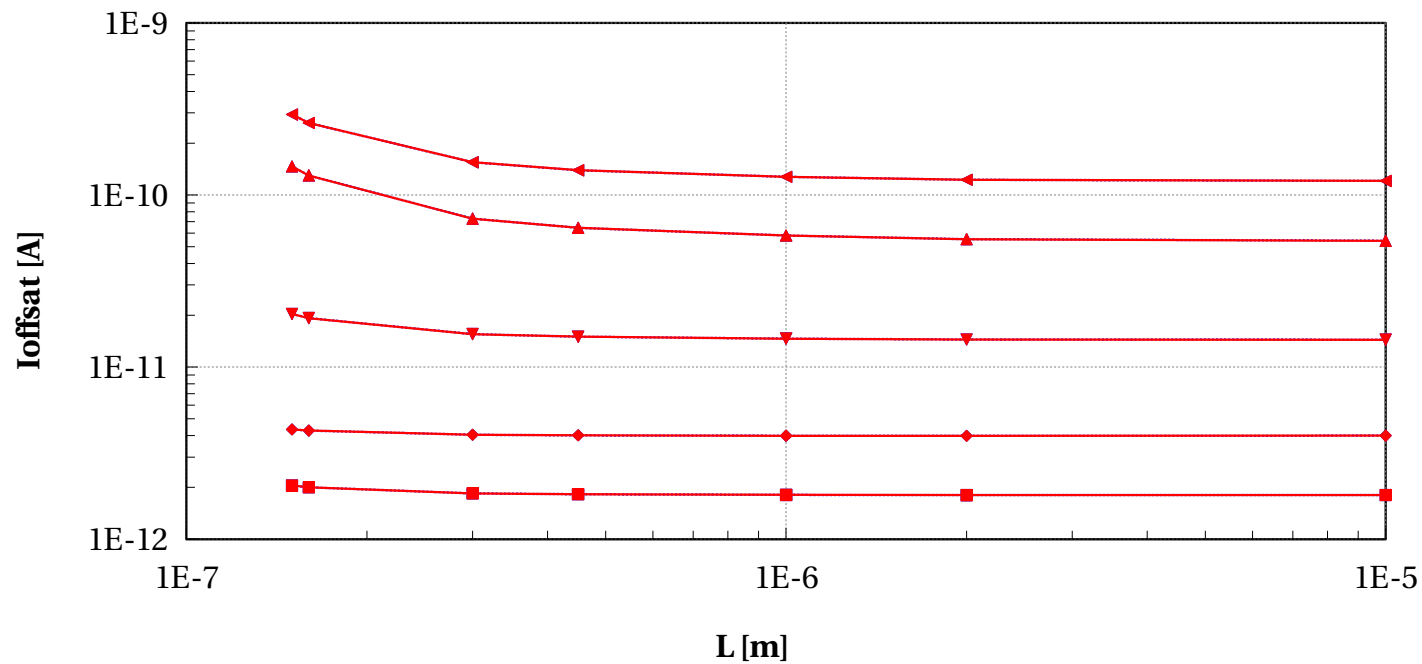
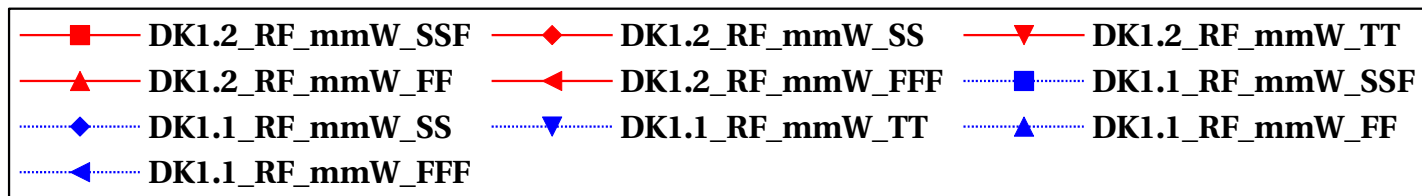
# egpfet\_acc, Isat\*L/W [A/sq] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



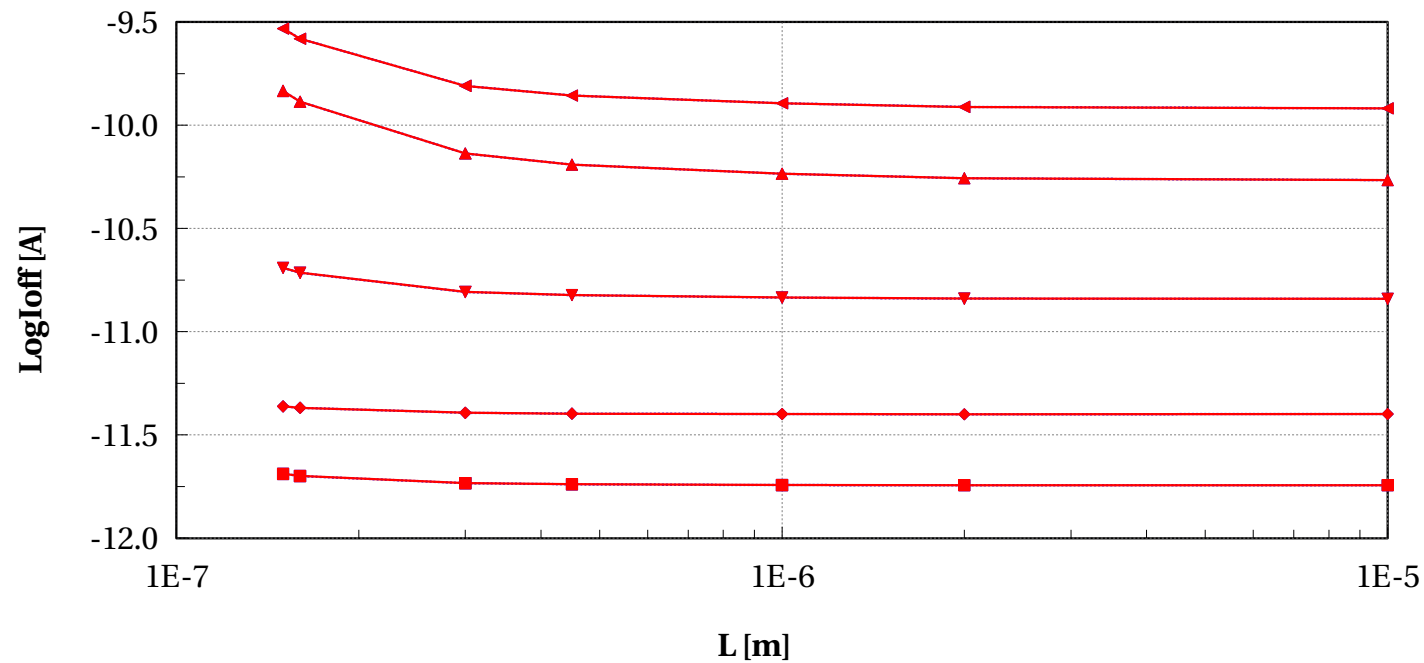
# egpfet\_acc, Ioffsat [A] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



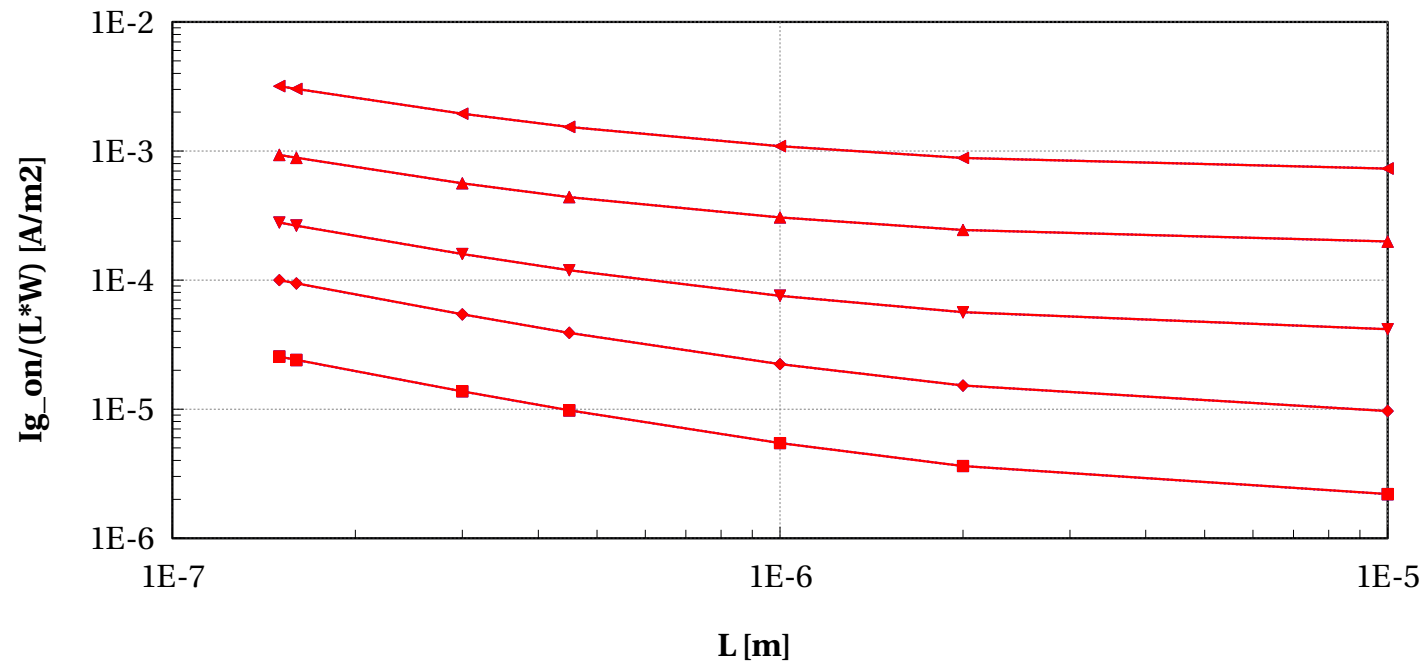
# egpfet\_acc, LogIoff [A] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



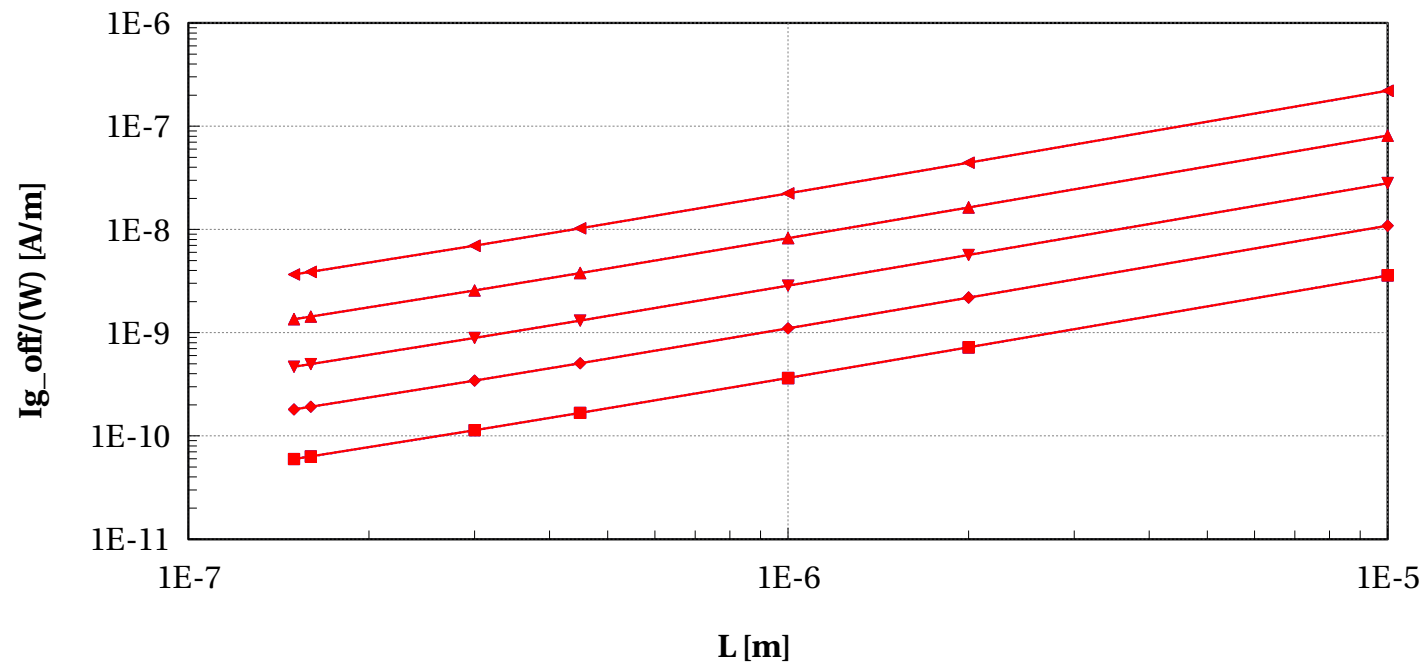
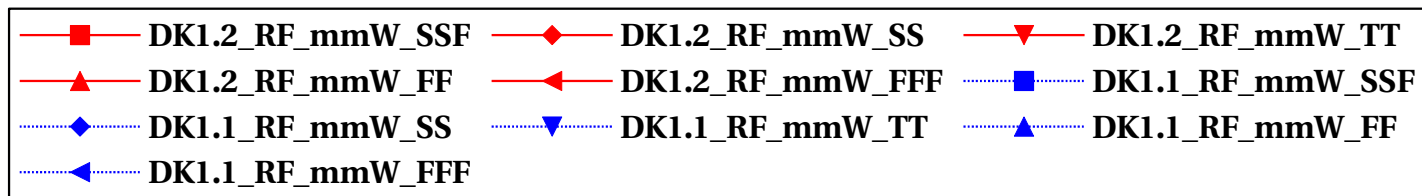
# egpfet\_acc, Ig\_on/(L\*W) [A/m2] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



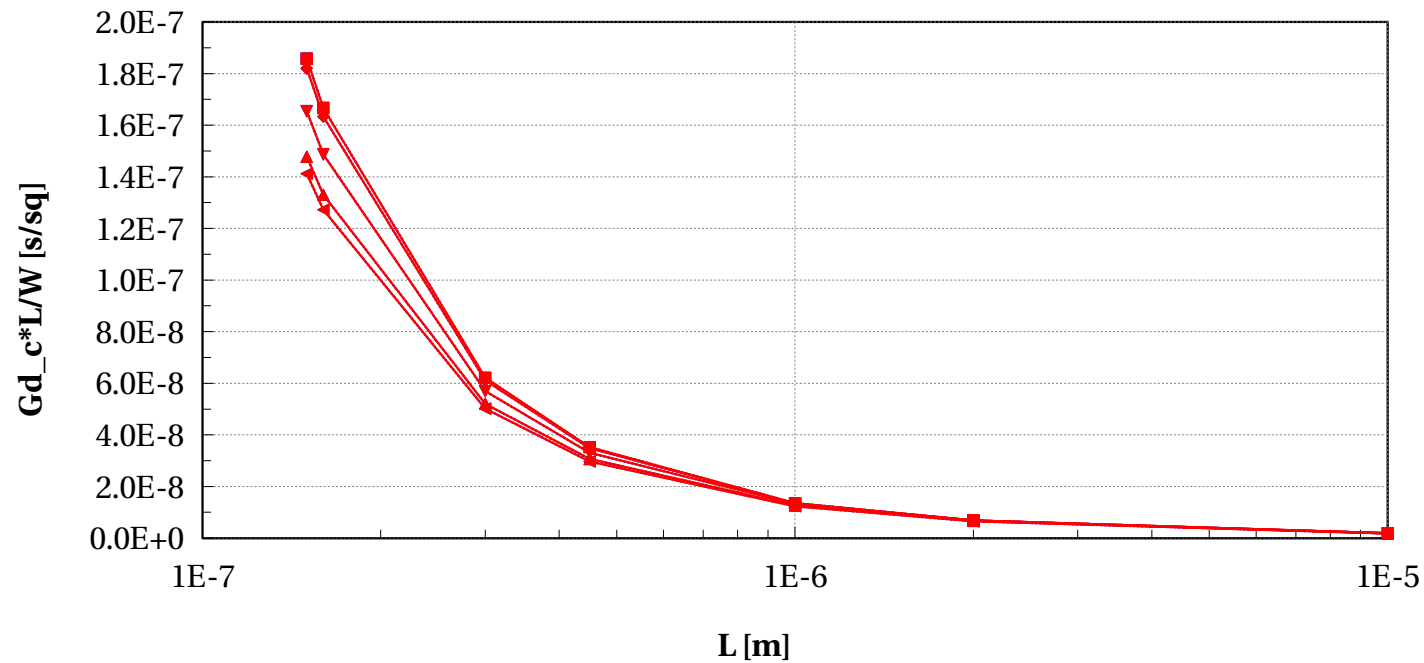
# egpfet\_acc, Ig\_off/(W) [A/m] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



# egpfet\_acc, Gd\_c\*L/W [s/sq] vs L [m]

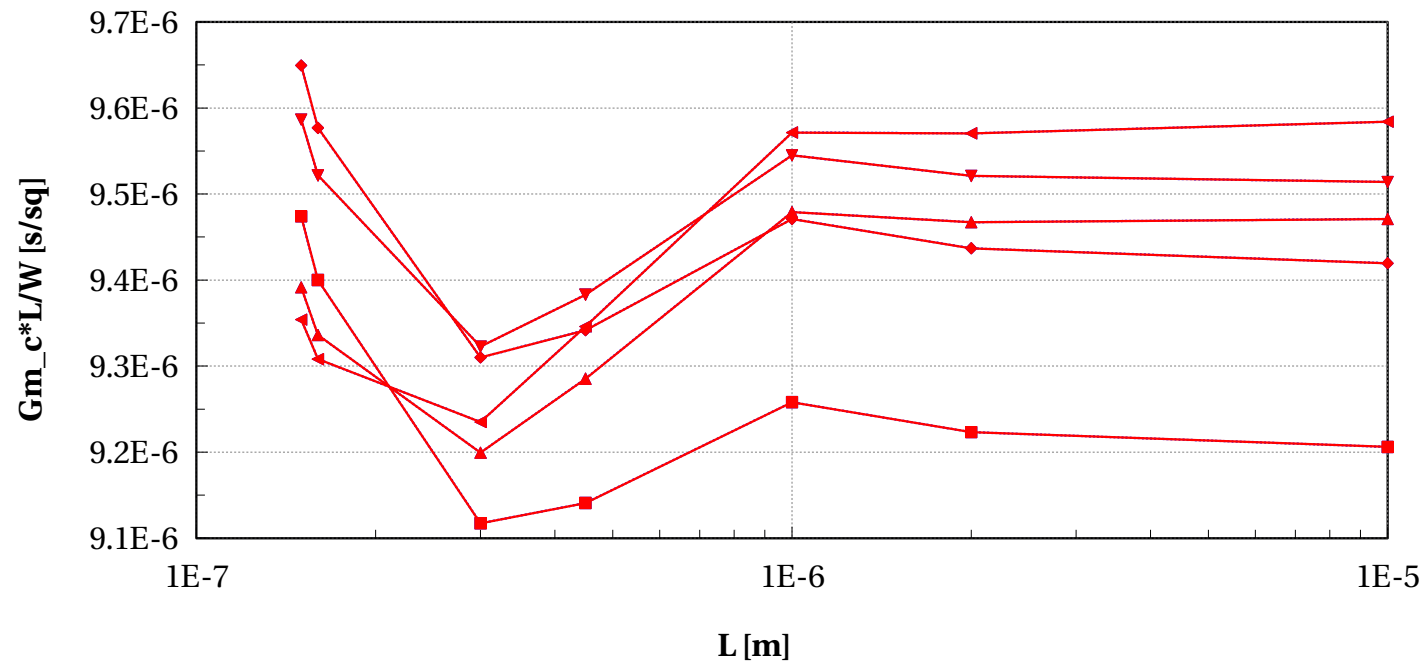
Temp==25 and w==2e-6 and devType=="PCELLwoWPE"





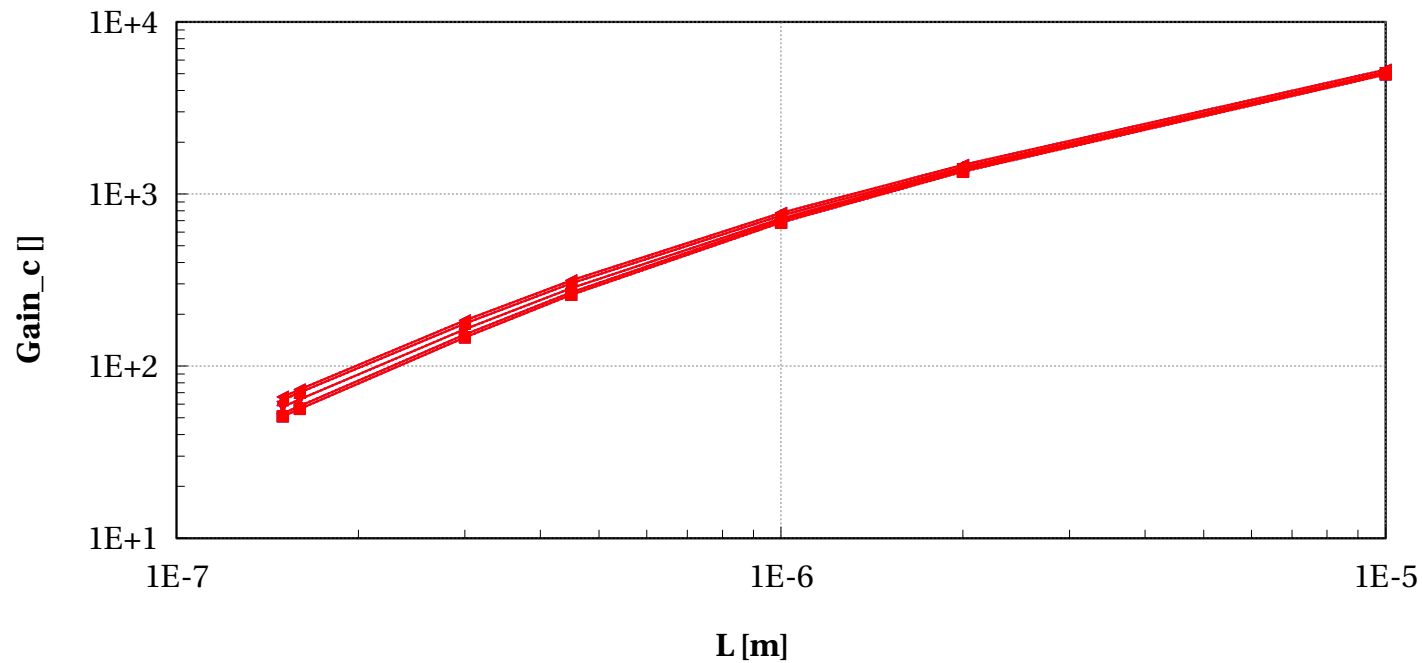
# egpfet\_acc, Gm\_c\*L/W [s/sq] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



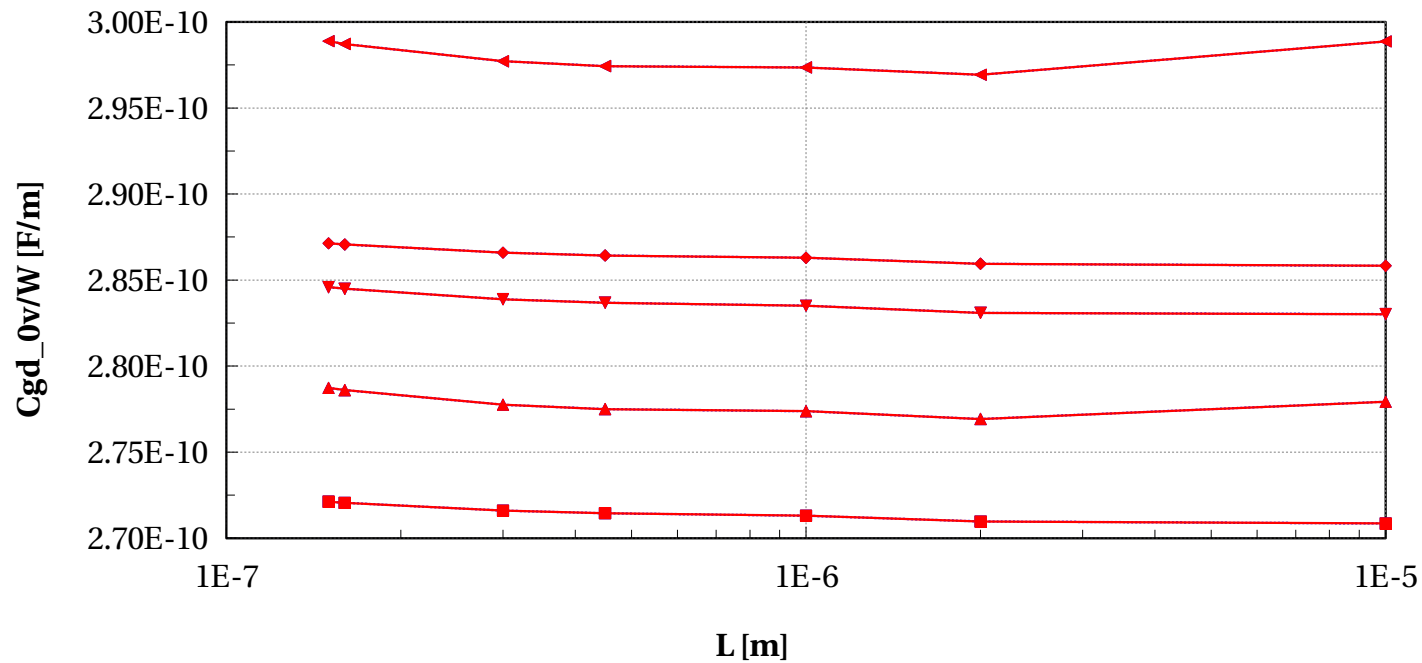
# egpfet\_acc, Gain\_c [] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



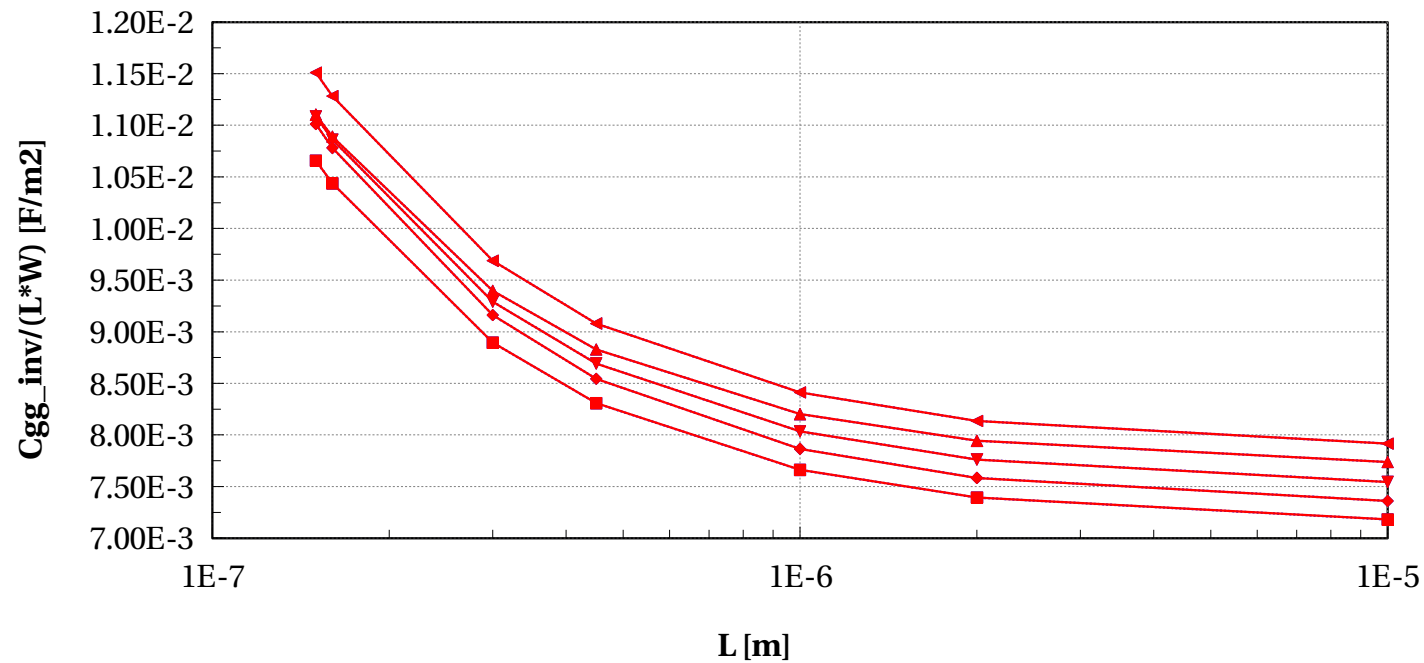
# egpfet\_acc, Cgd\_0v/W [F/m] vs L [m]

Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



# egpfet\_acc, Cgg\_inv/(L\*W) [F/m2] vs L [m]

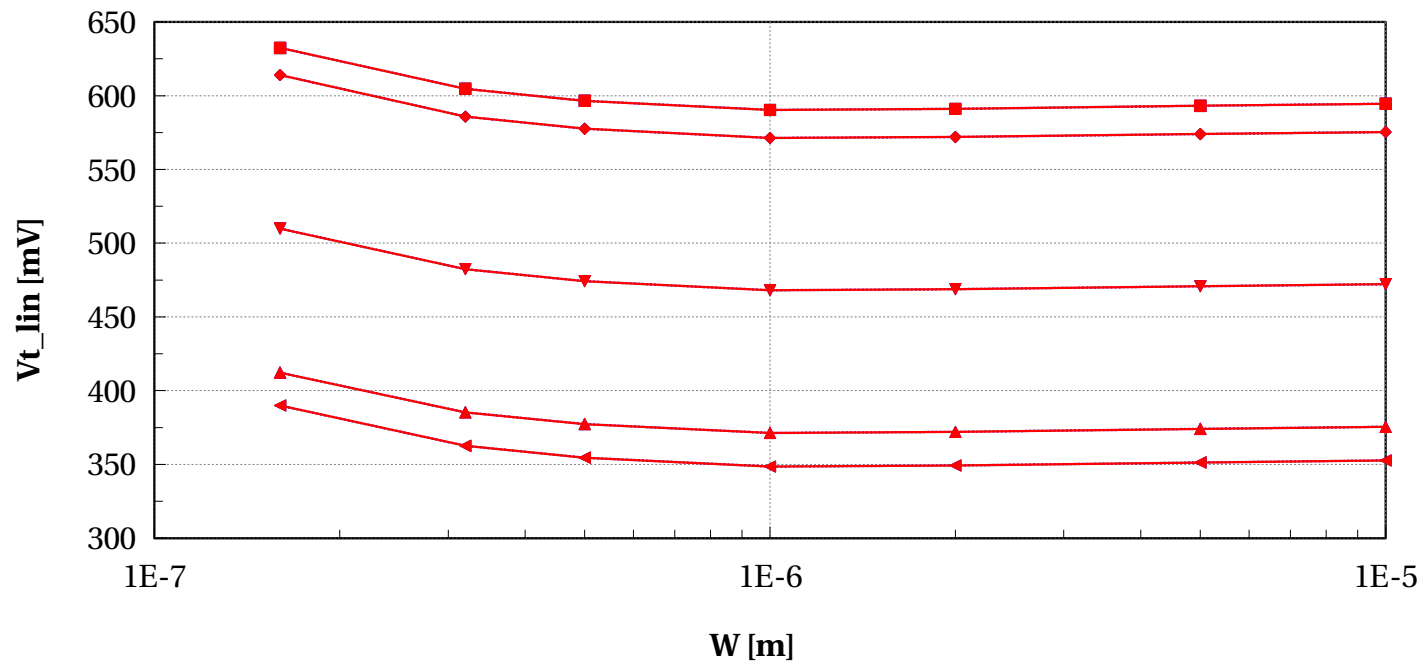
Temp==25 and w==2e-6 and devType=="PCELLwoWPE"



## Scaling versus Width ( $L=0.15\text{e-}6$ , Temp=25)

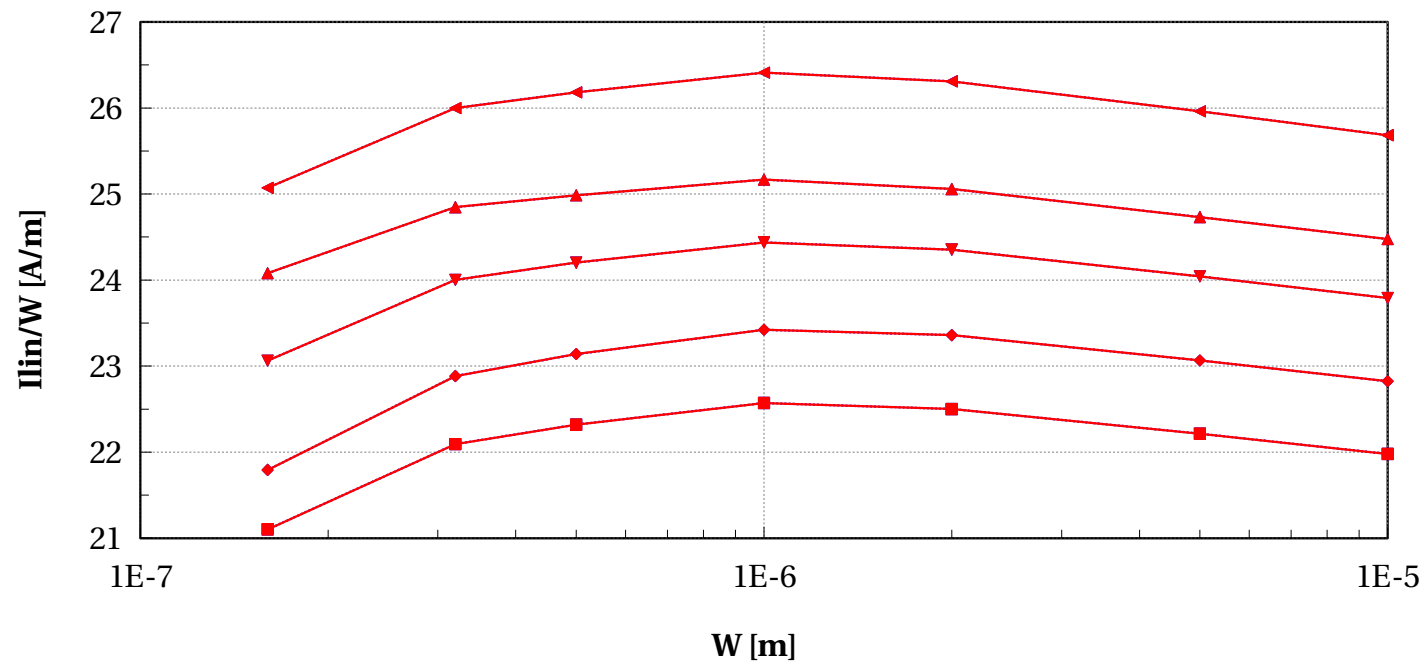
# egpfet\_acc, Vt\_lin [mV] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



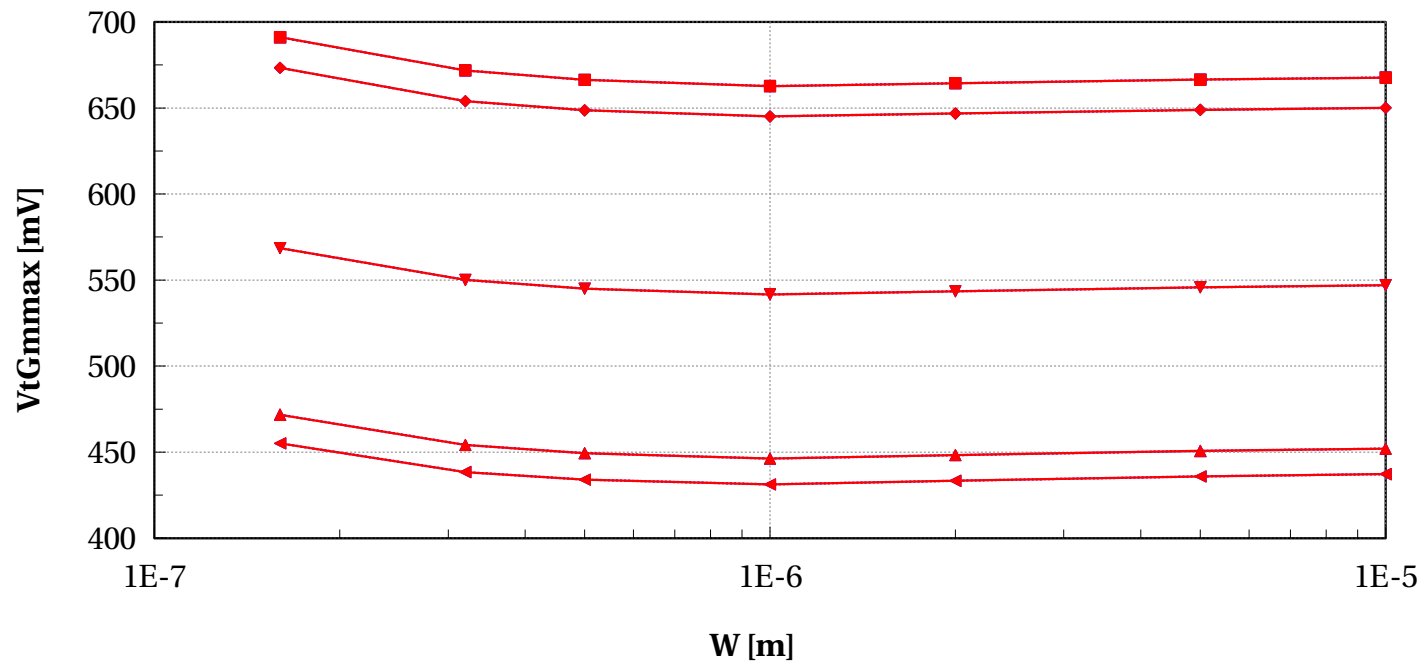
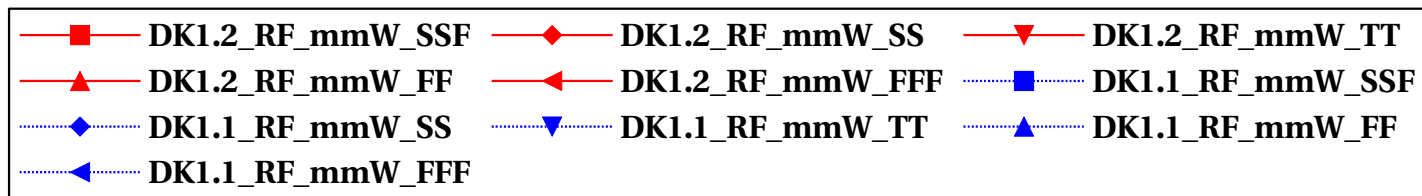
# egpfet\_acc, I<sub>lin</sub>/W [A/m] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



# egpfet\_acc, VtGmmax [mV] vs W [m]

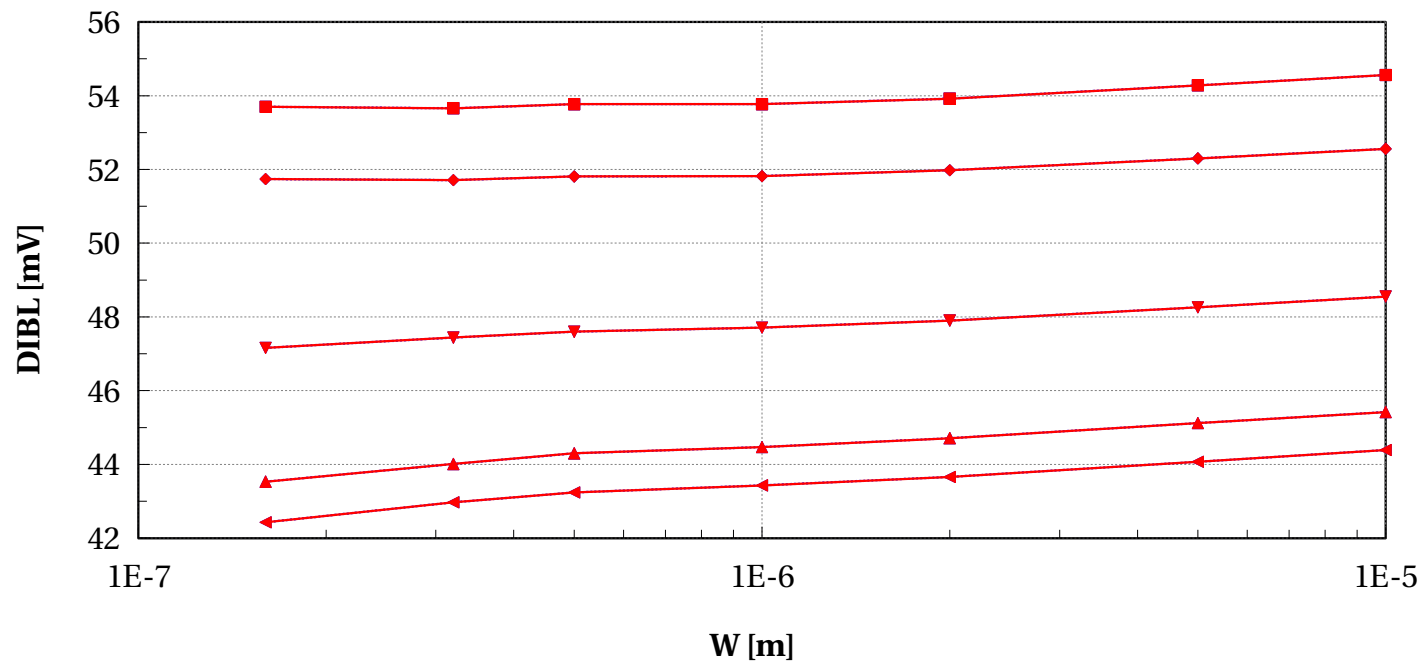
Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"





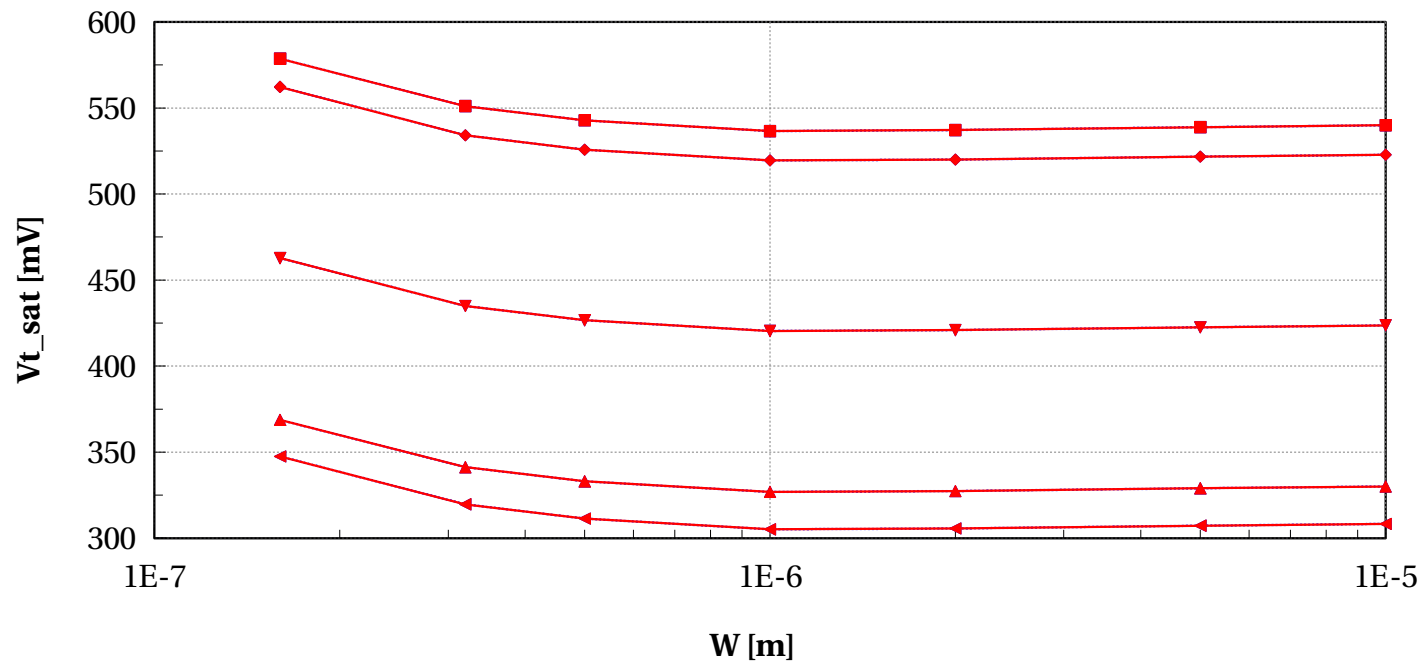
# egpfet\_acc, DIBL [mV] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



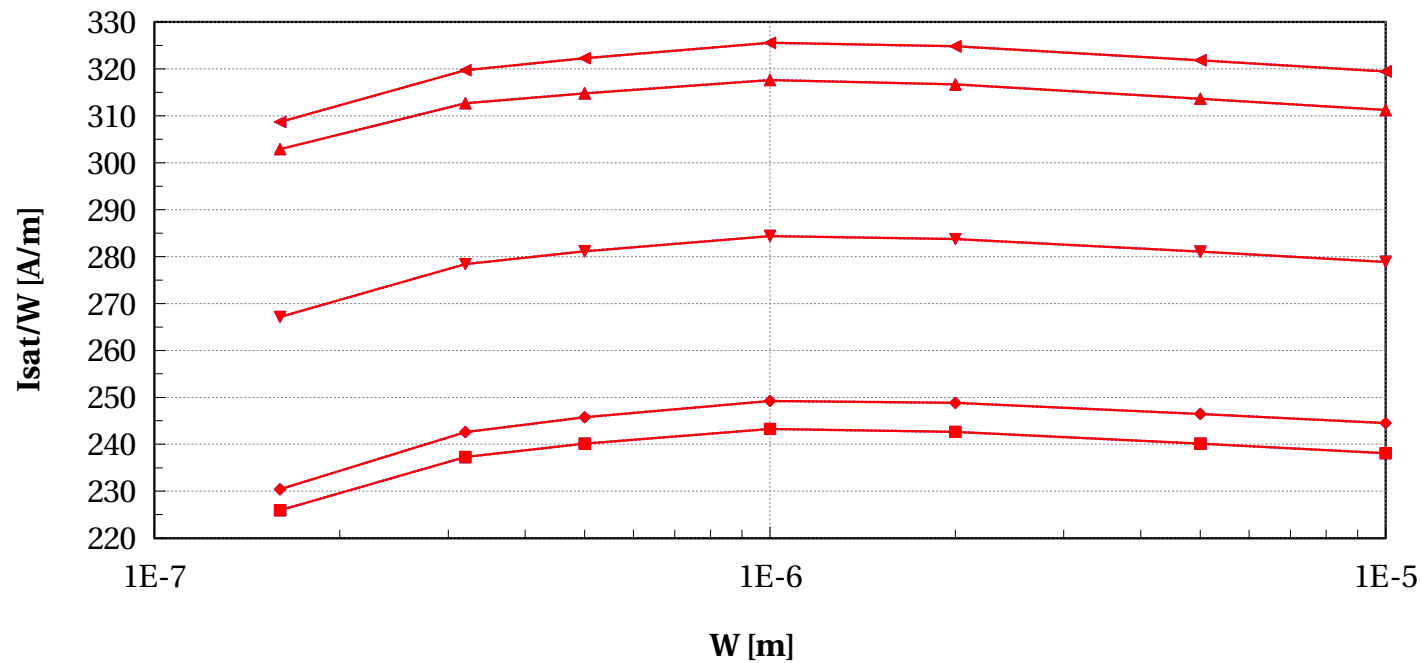
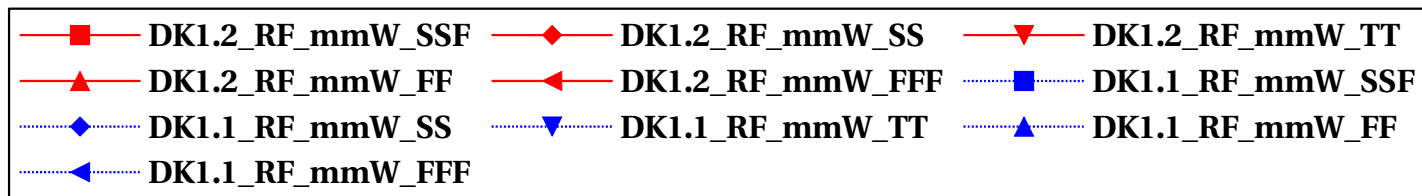
# egpfet\_acc, Vt\_sat [mV] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



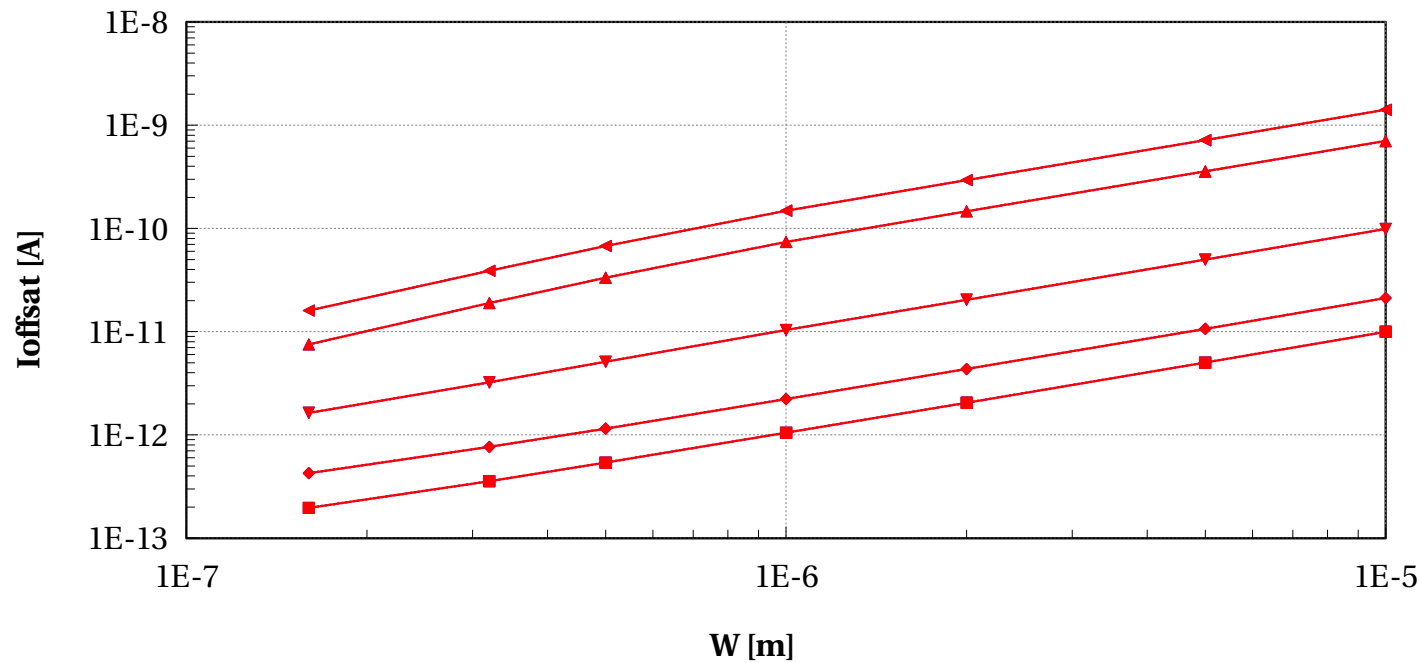
# egpfet\_acc, Isat/W [A/m] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



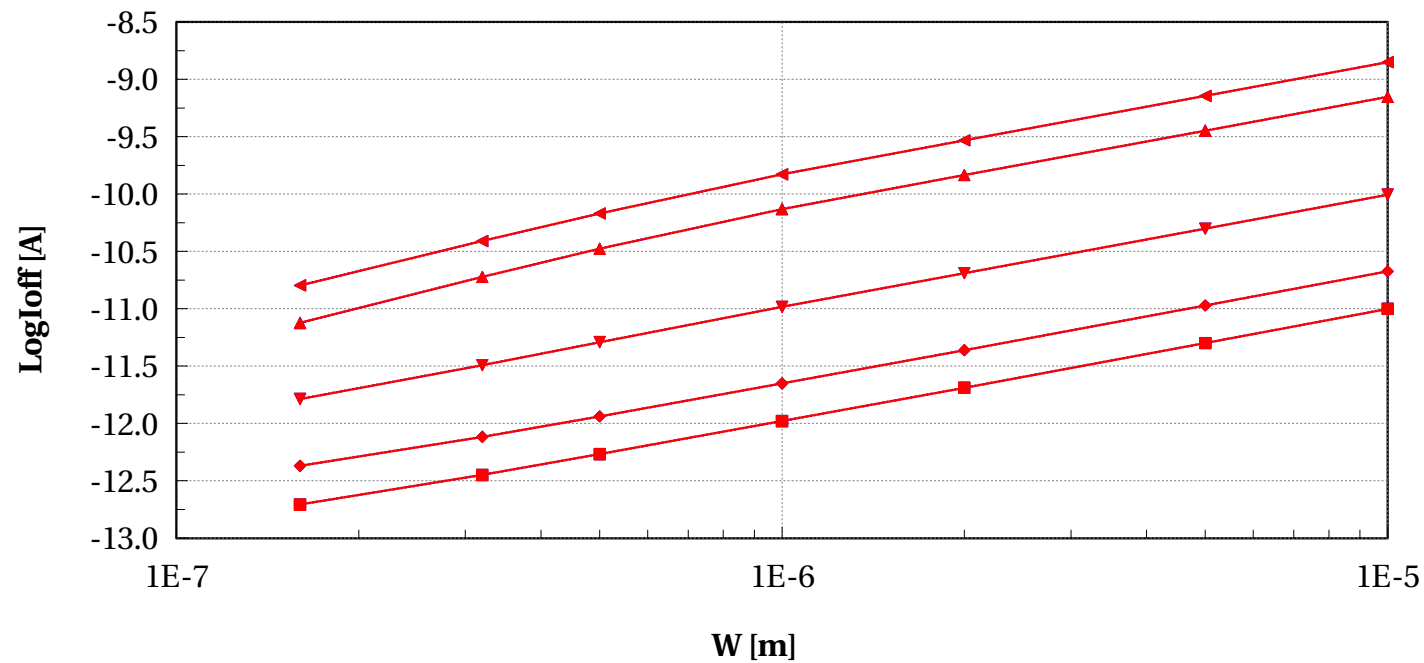
# egpfet\_acc, Ioffsat [A] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



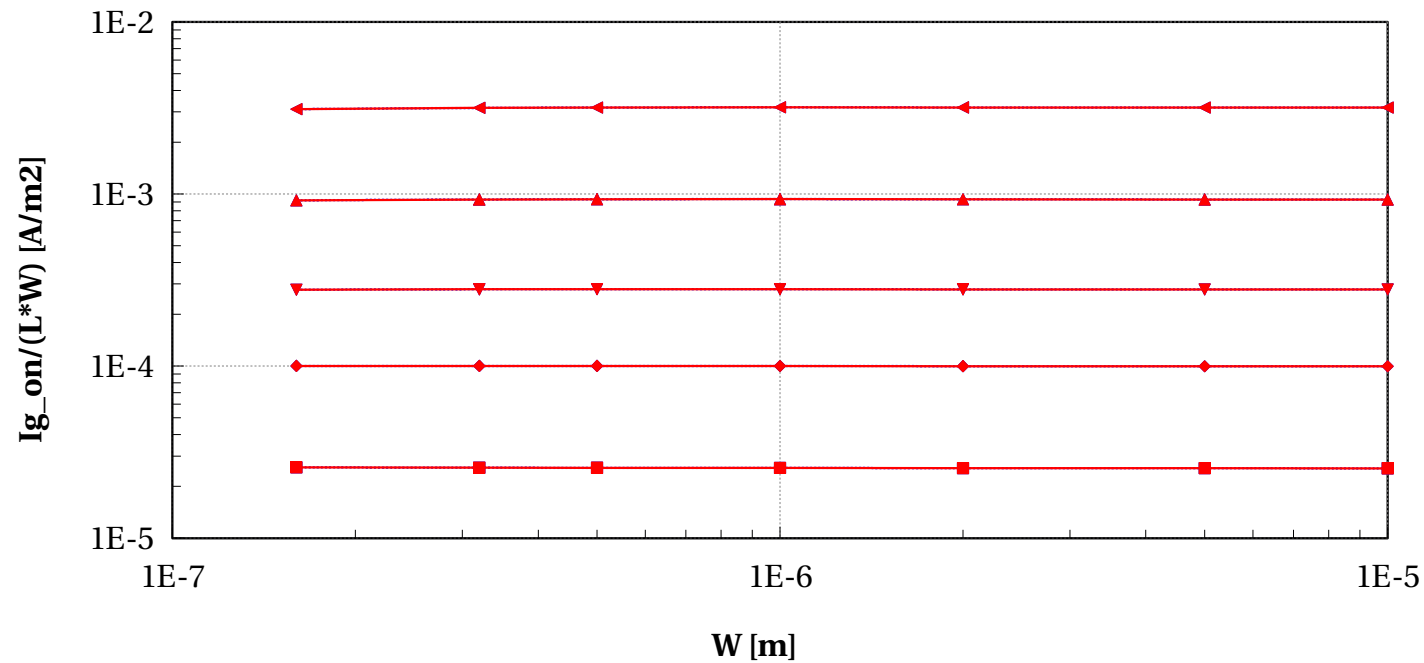
# egpfet\_acc, LogIoff [A] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



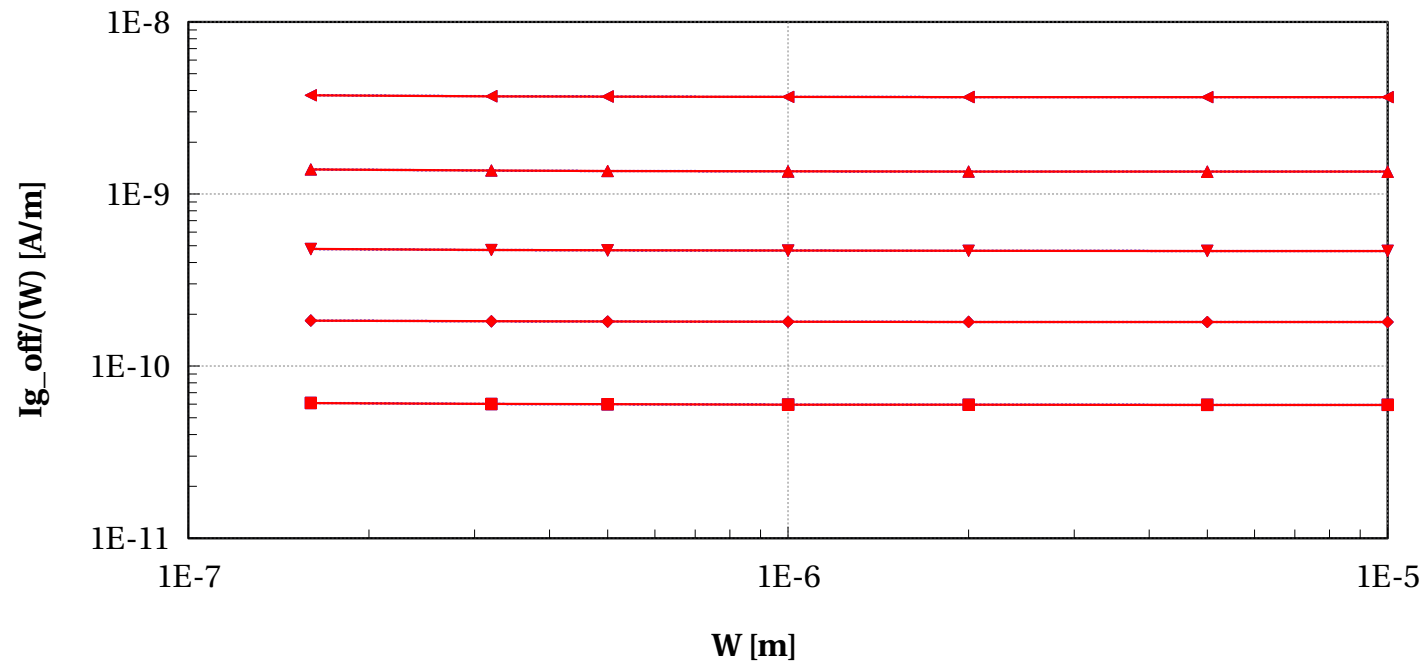
# egpfet\_acc, Ig\_on/(L\*W) [A/m2] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



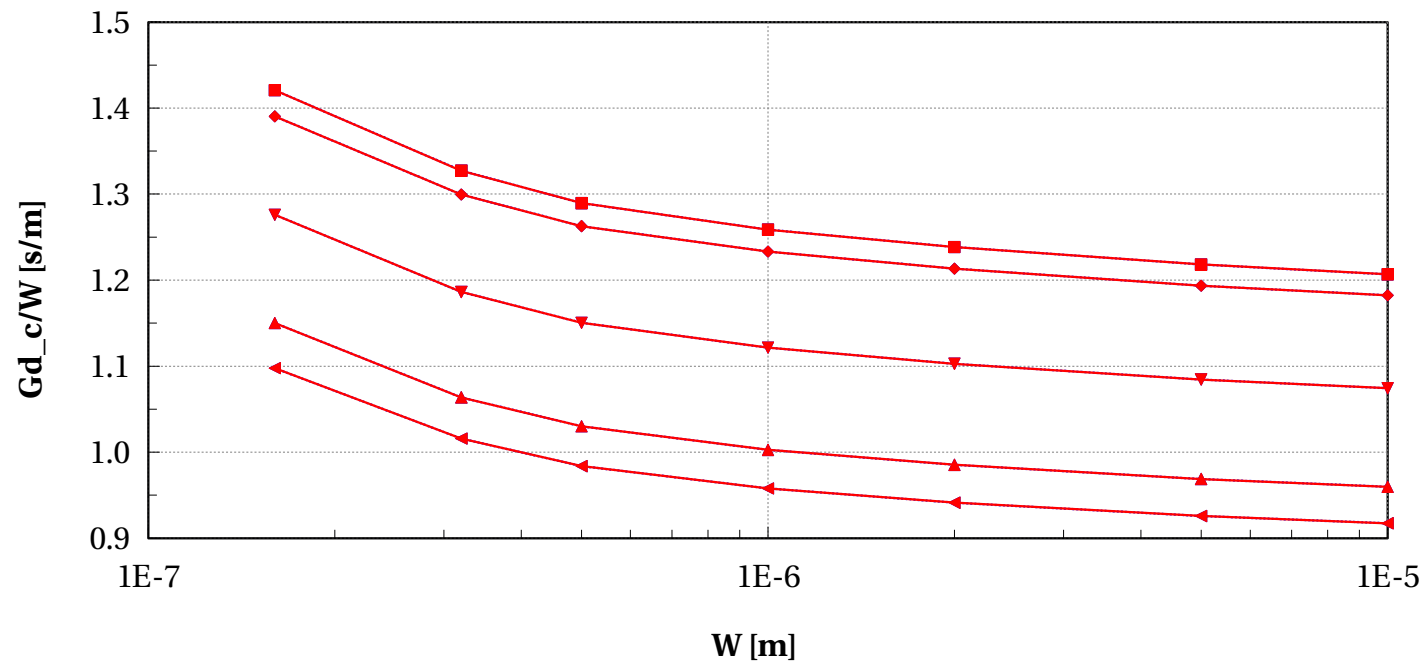
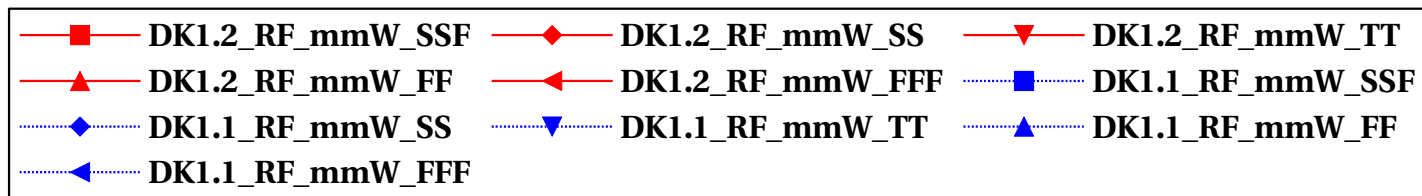
# egpfet\_acc, Ig\_off/(W) [A/m] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



# egpfet\_acc, Gd\_c/W [s/m] vs W [m]

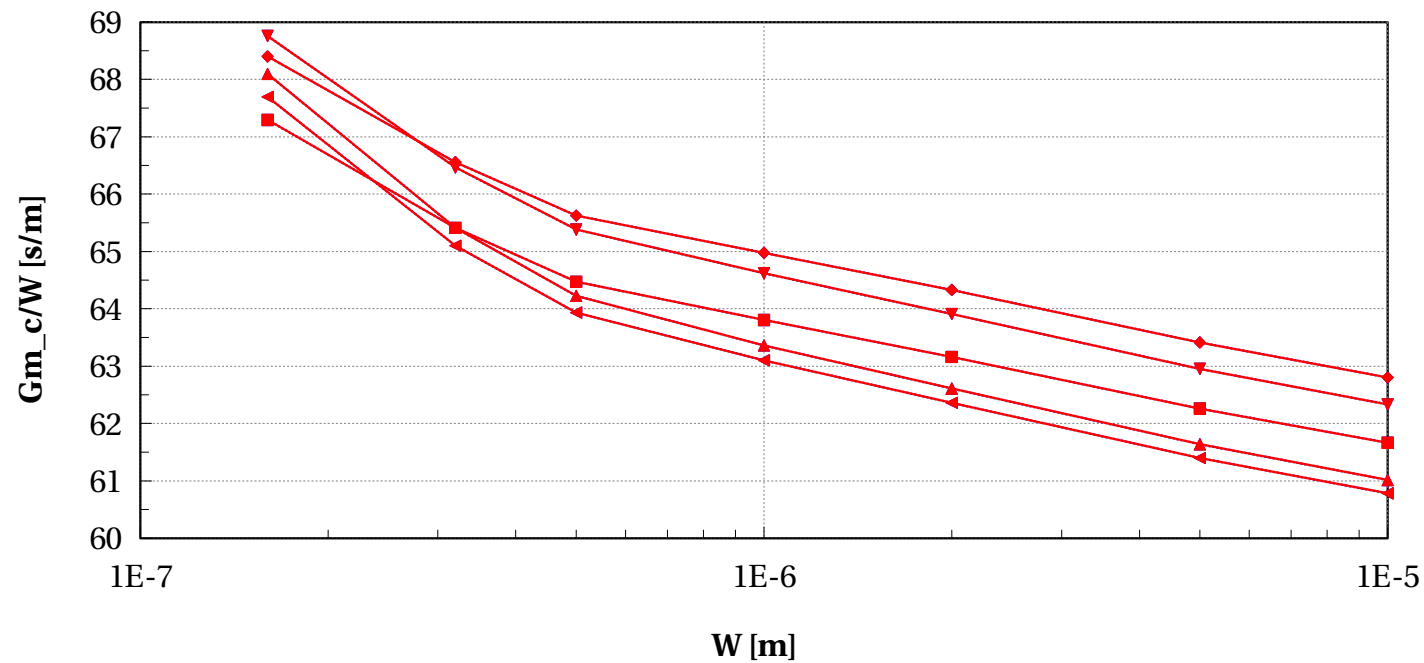
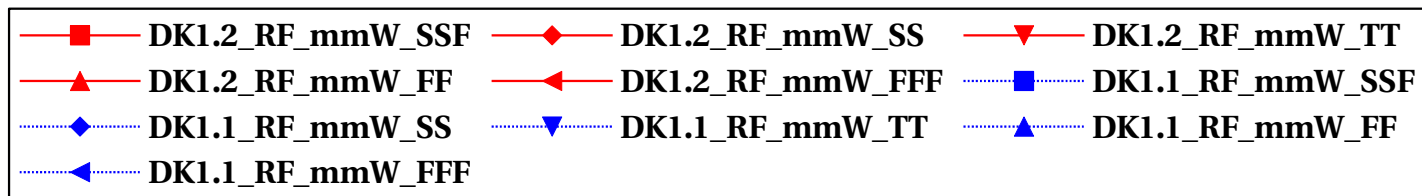
Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"





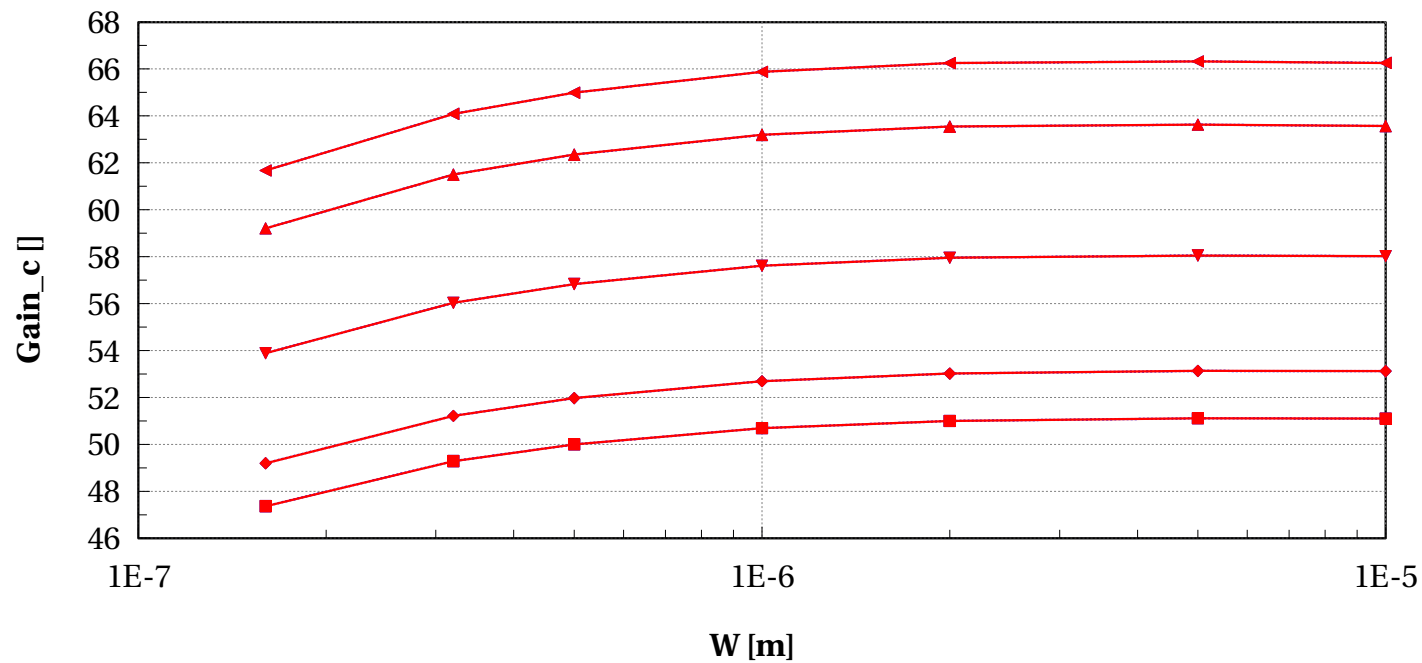
# egpfet\_acc, Gm\_c/W [s/m] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



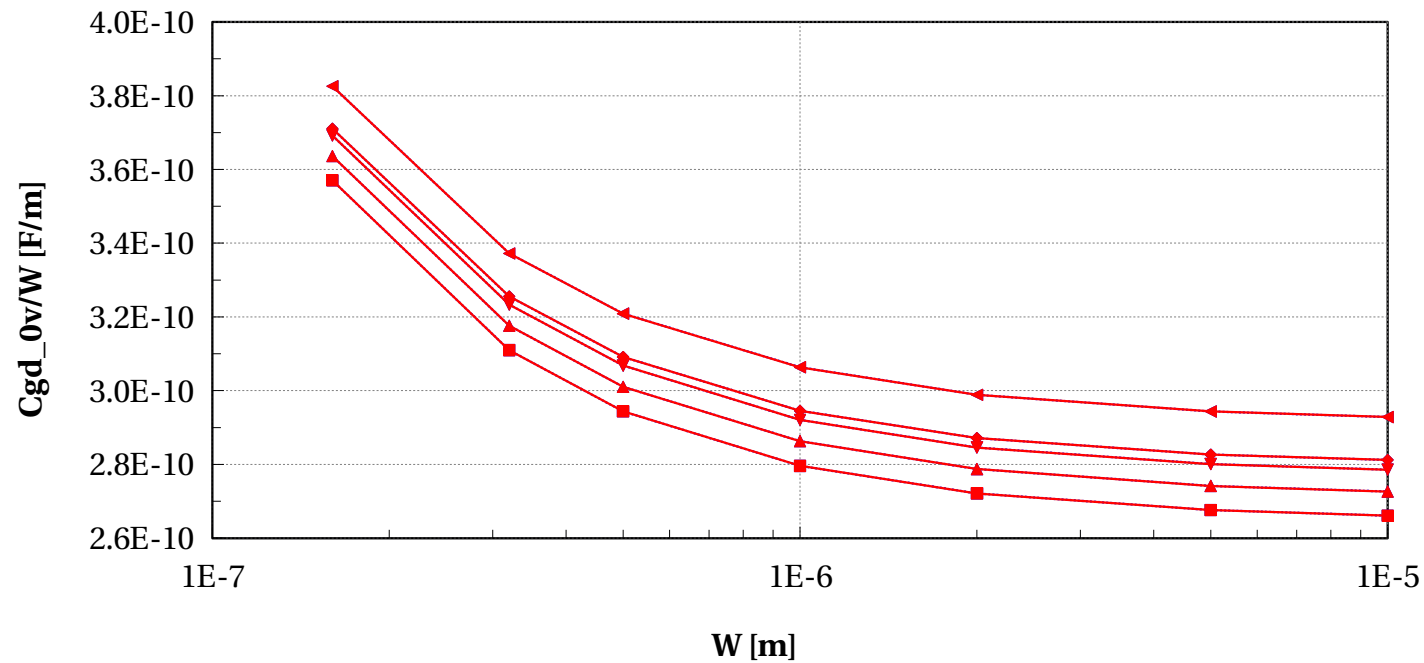
# egpfet\_acc, Gain\_c [] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



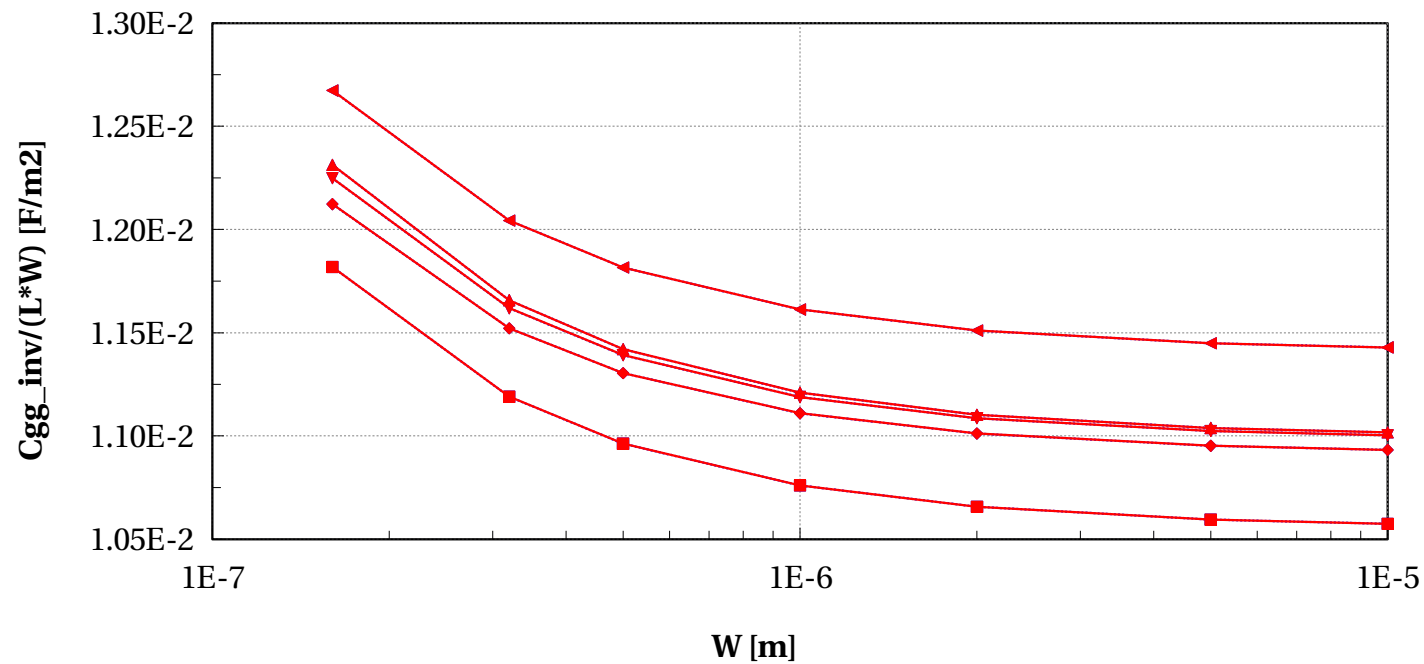
# egpfet\_acc, Cgd\_0v/W [F/m] vs W [m]

Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



# egpfet\_acc, Cgg\_inv/(L\*W) [F/m2] vs W [m]

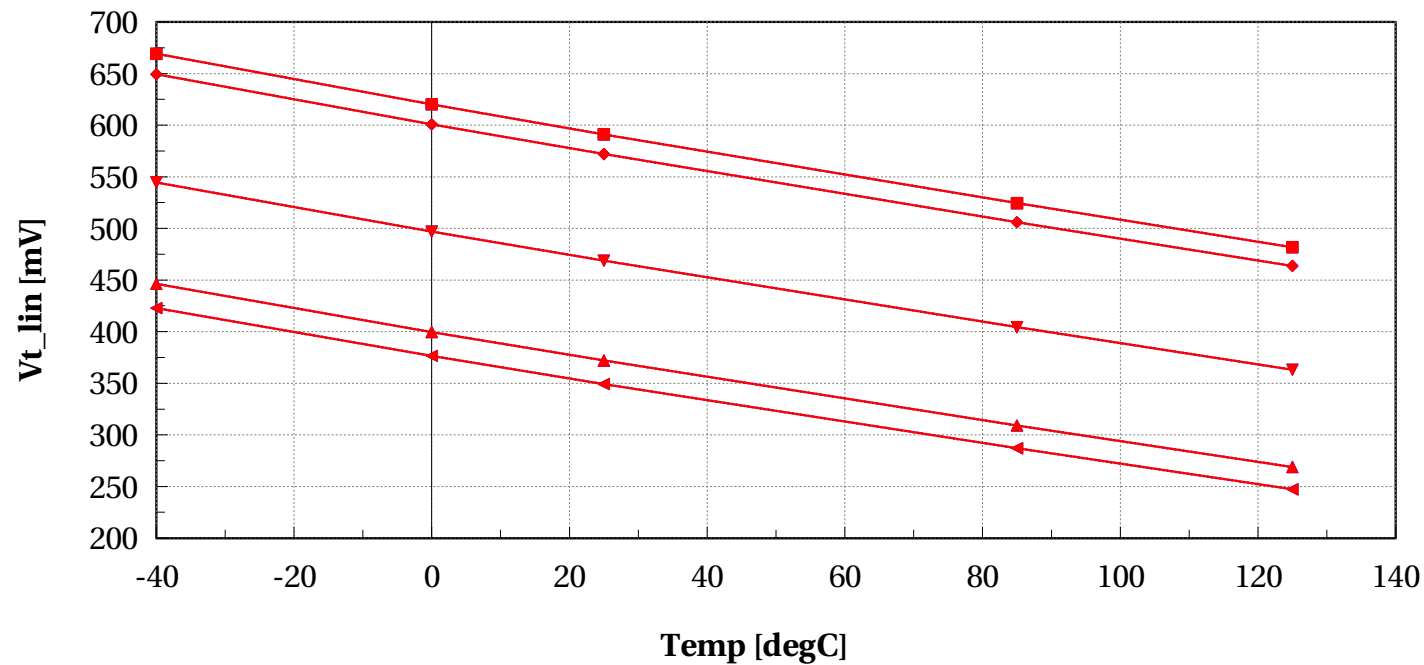
Temp==25 and l==0.15e-6 and devType=="PCELLwoWPE"



## Scaling versus Temp @ $L=0.15\mu$ , $W=2\mu$

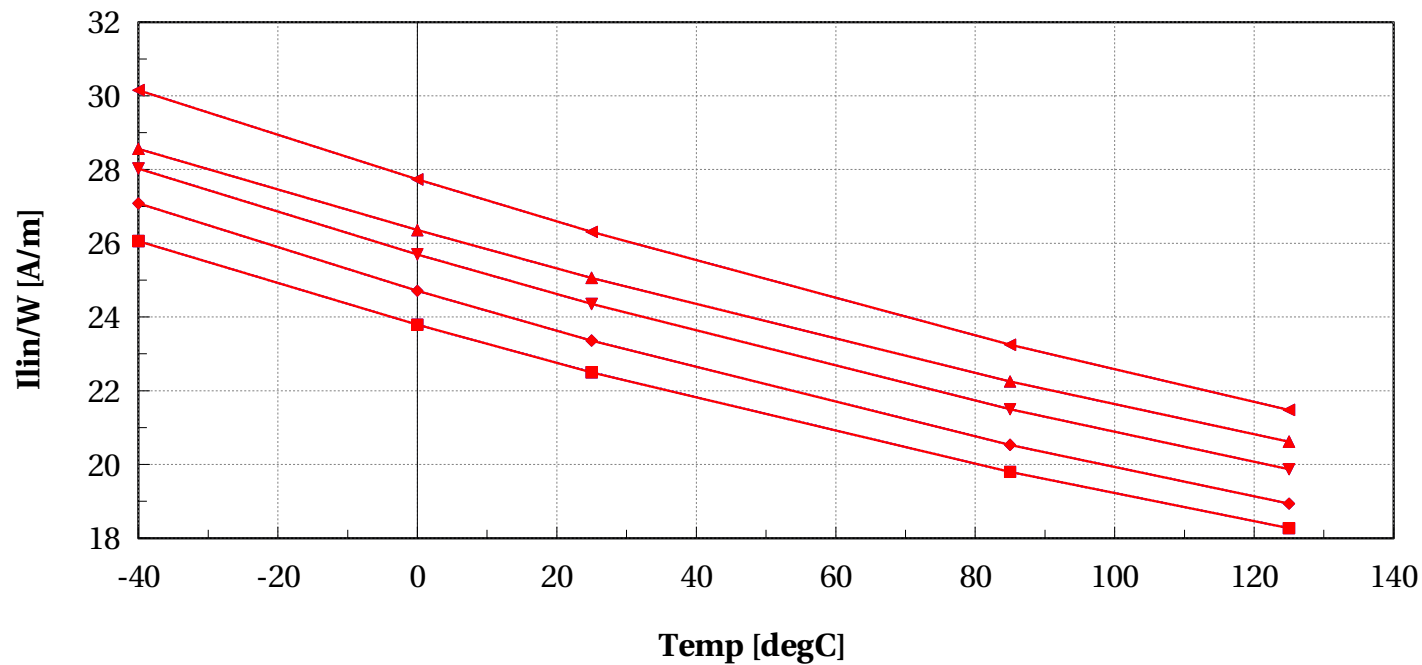
# egpfet\_acc, Vt\_lin [mV] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



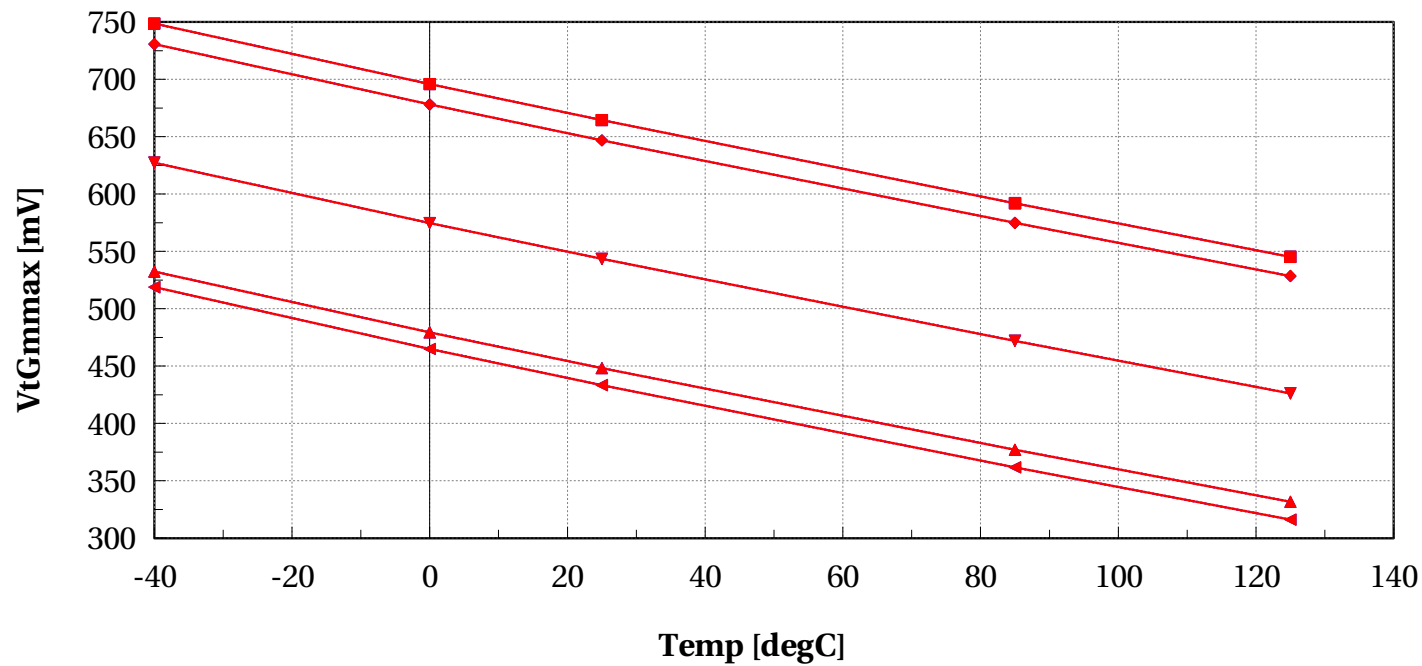
# egpfet\_acc, I<sub>lin</sub>/W [A/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egpfet\_acc, VtGmmax [mV] vs Temp [degC]

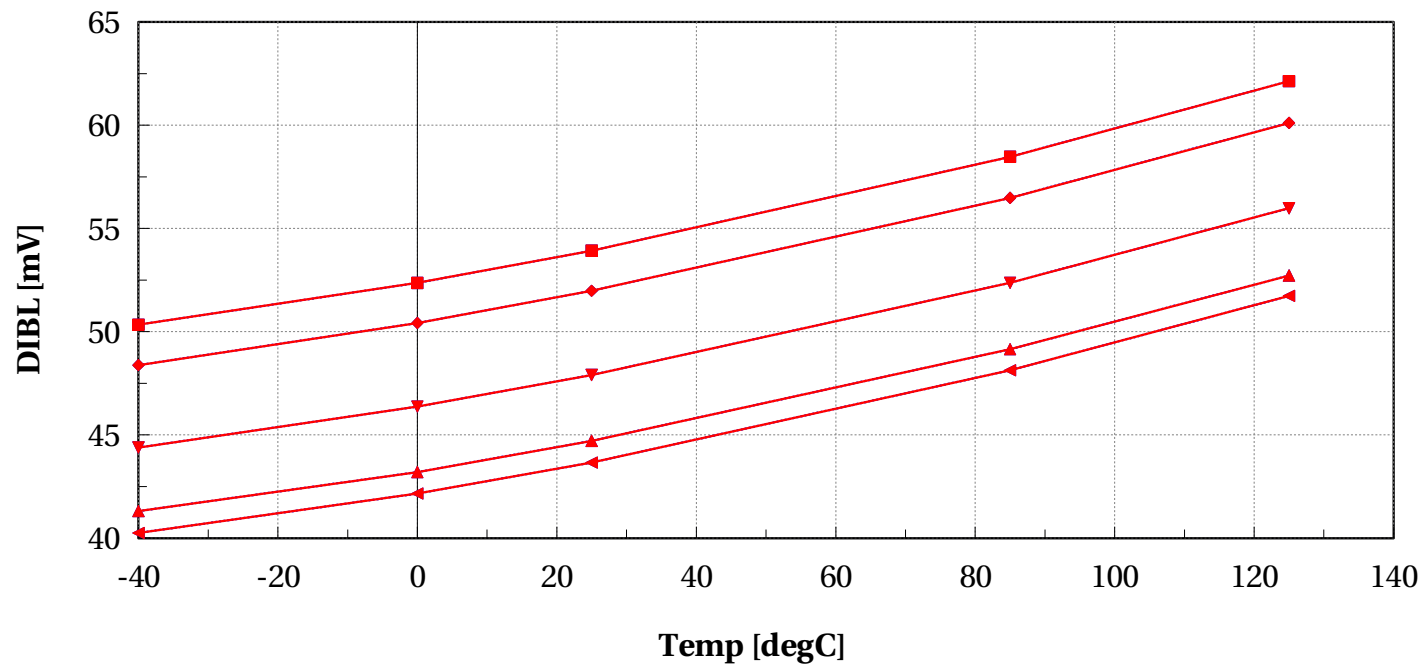
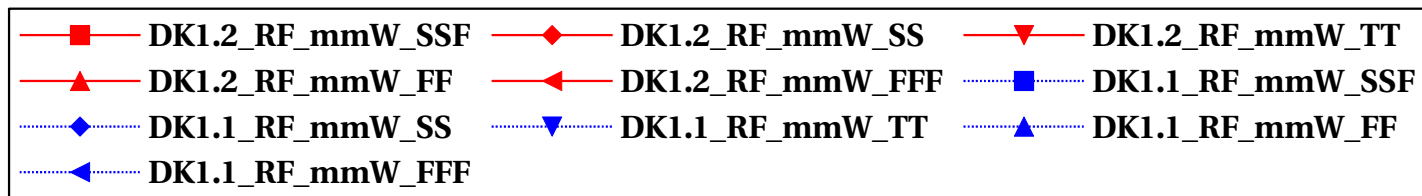
$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"





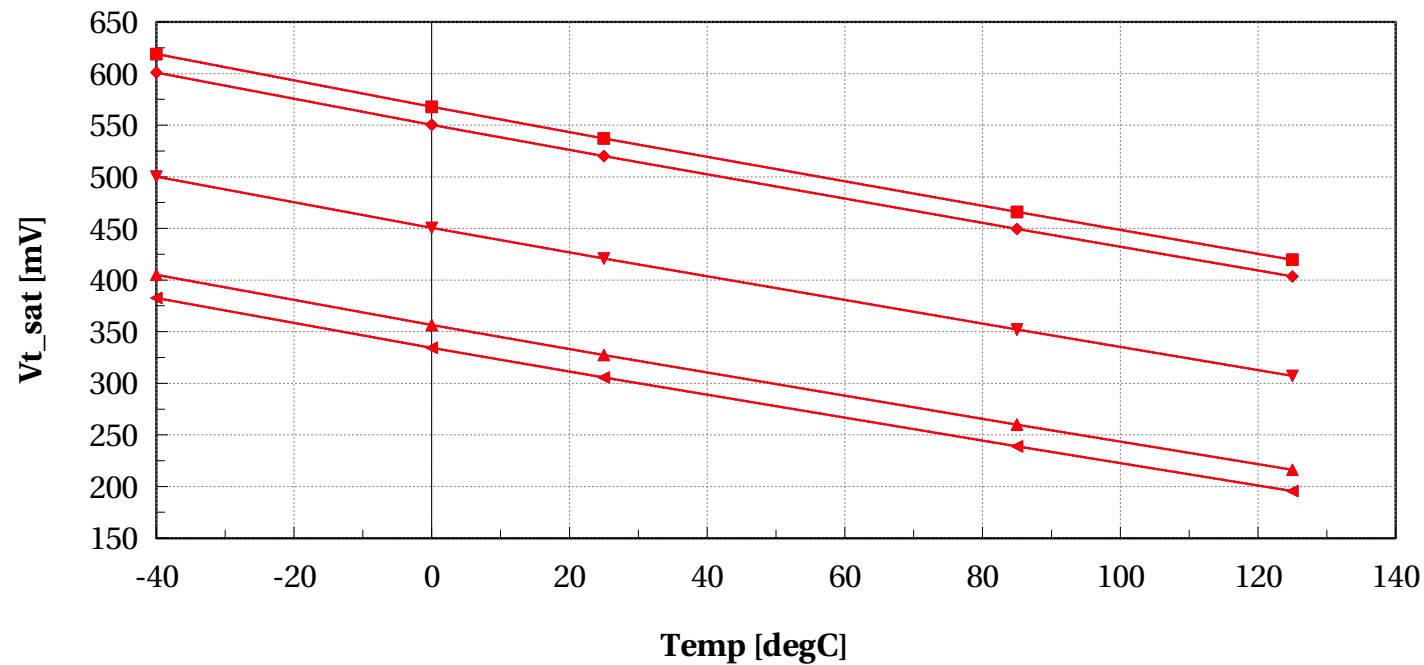
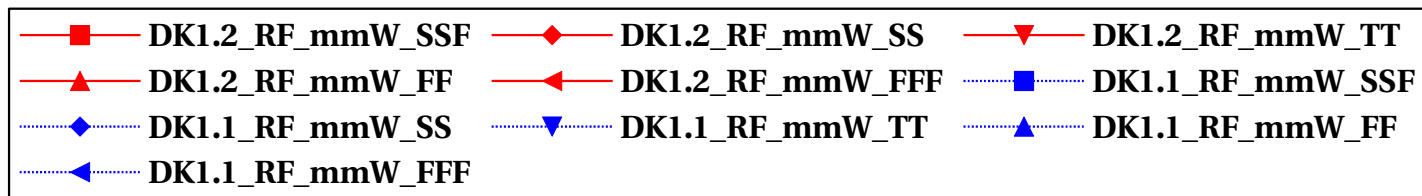
# egpfet\_acc, DIBL [mV] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



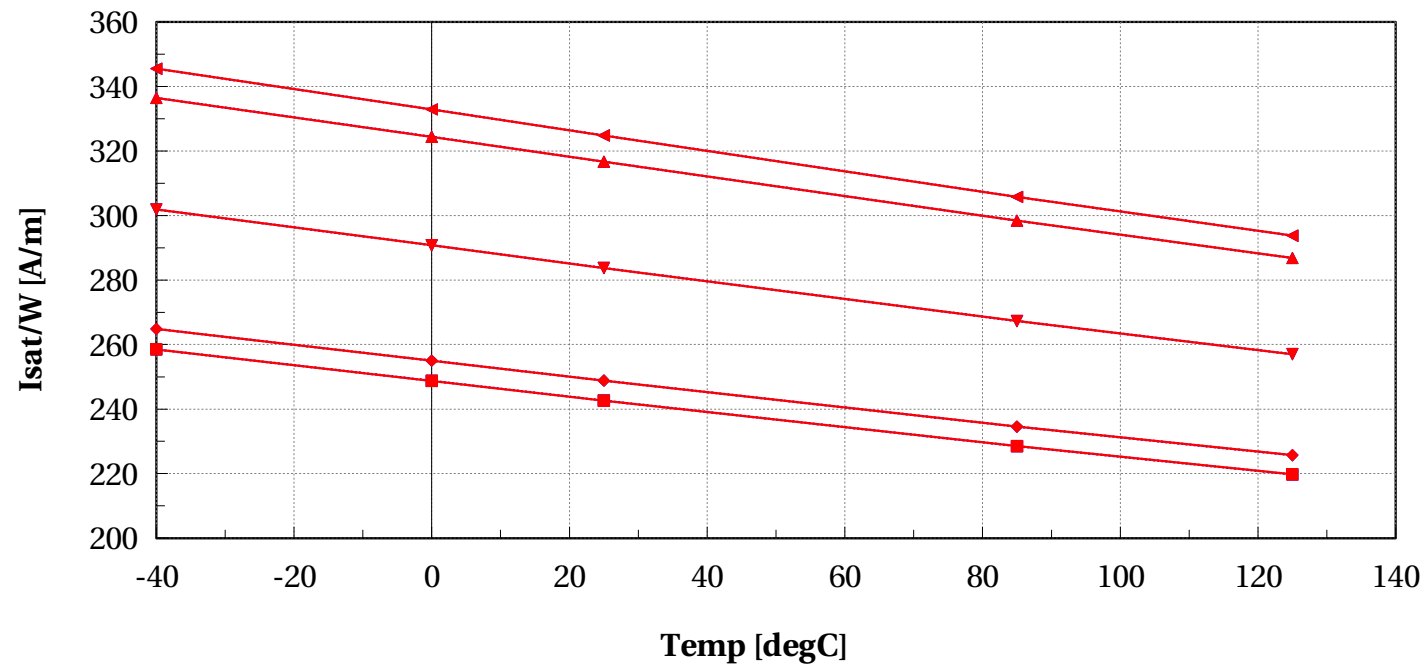
# egpfet\_acc, Vt\_sat [mV] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



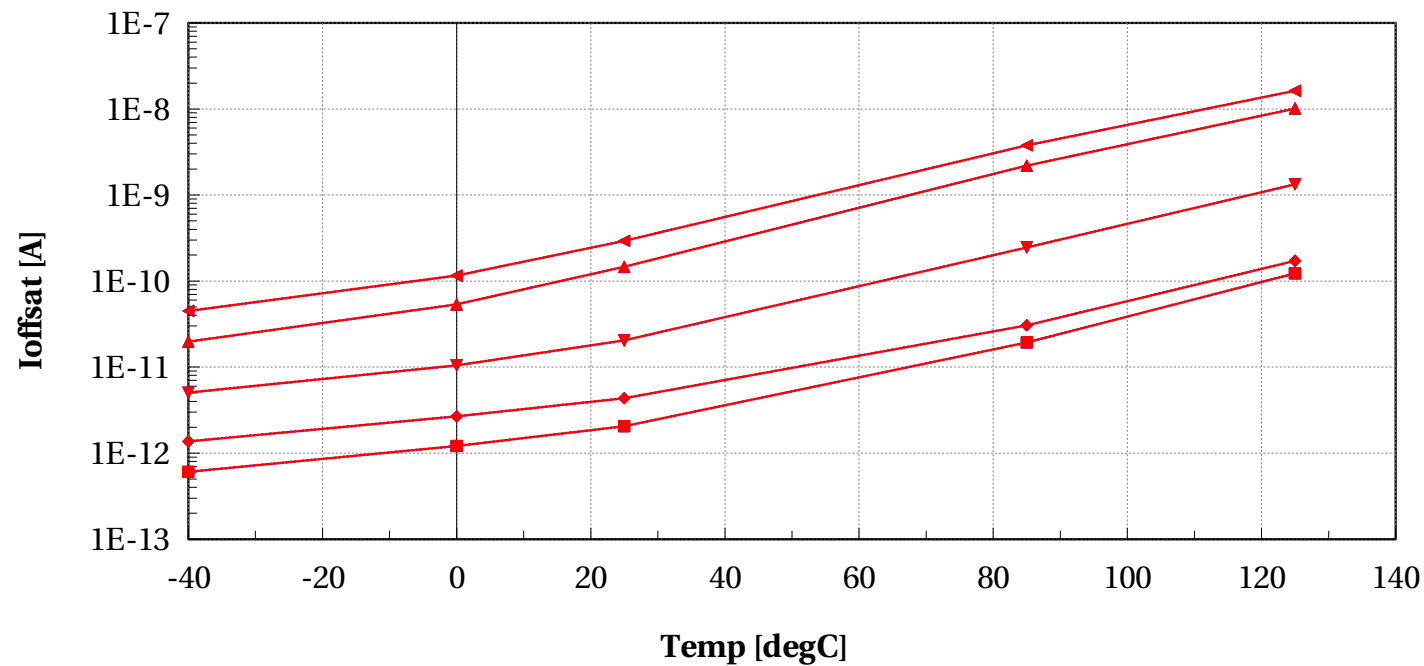
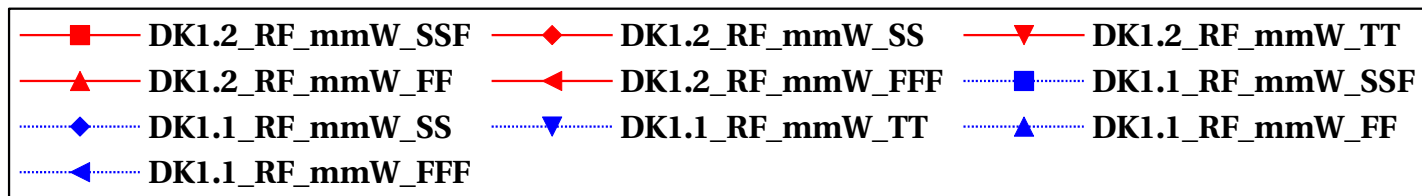
# egpfet\_acc, Isat/W [A/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



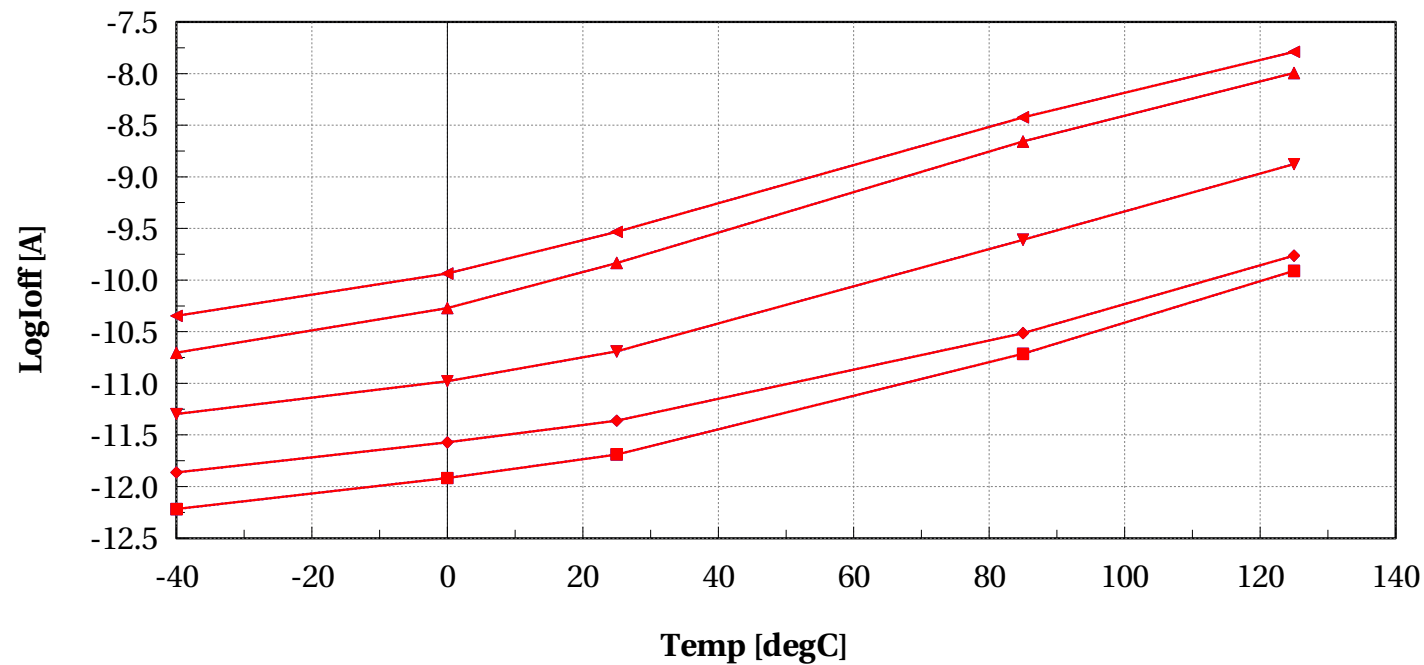
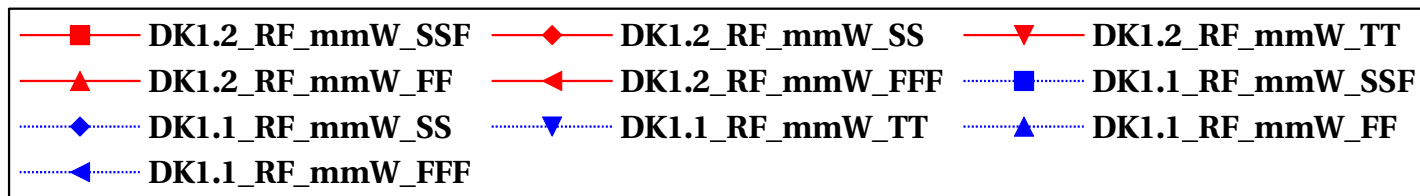
# egpfet\_acc, Ioffsat [A] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



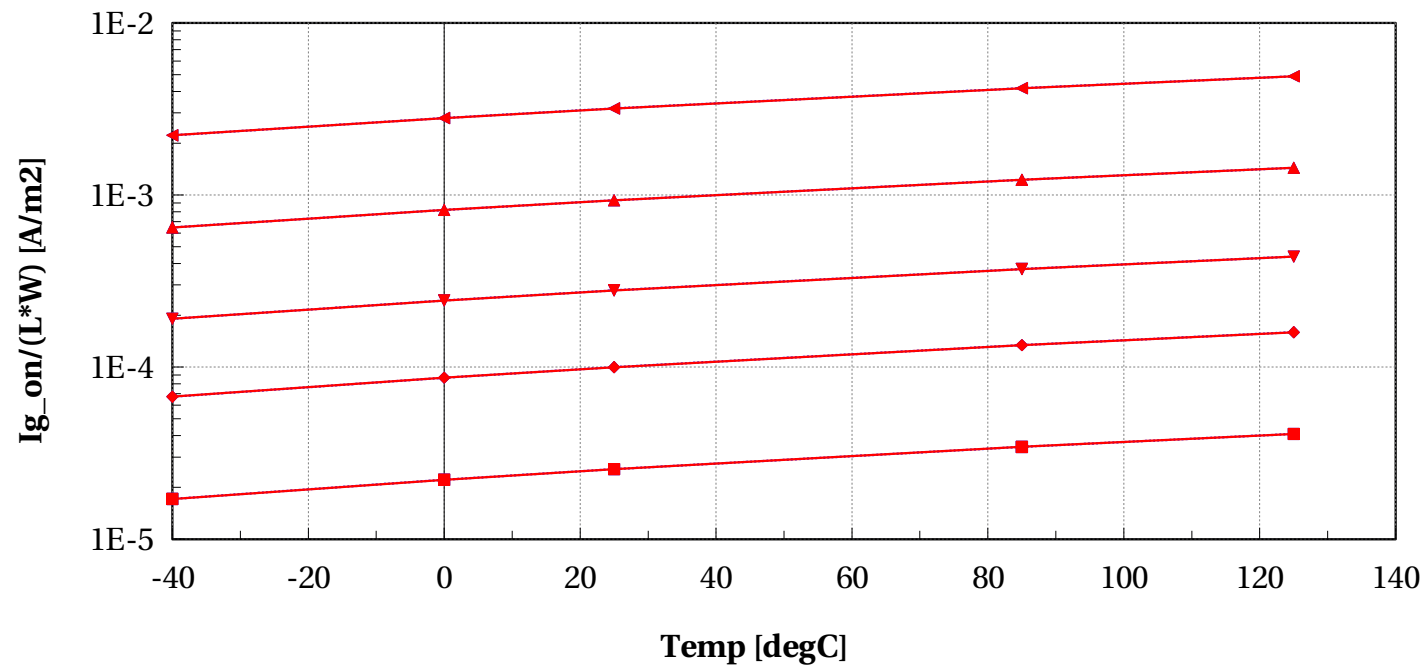
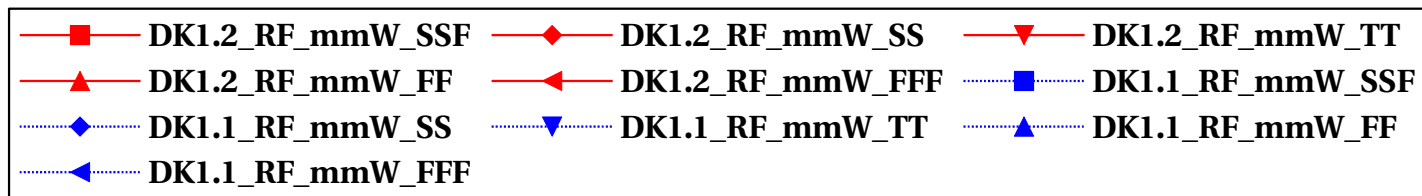
# egpfet\_acc, LogIoff [A] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



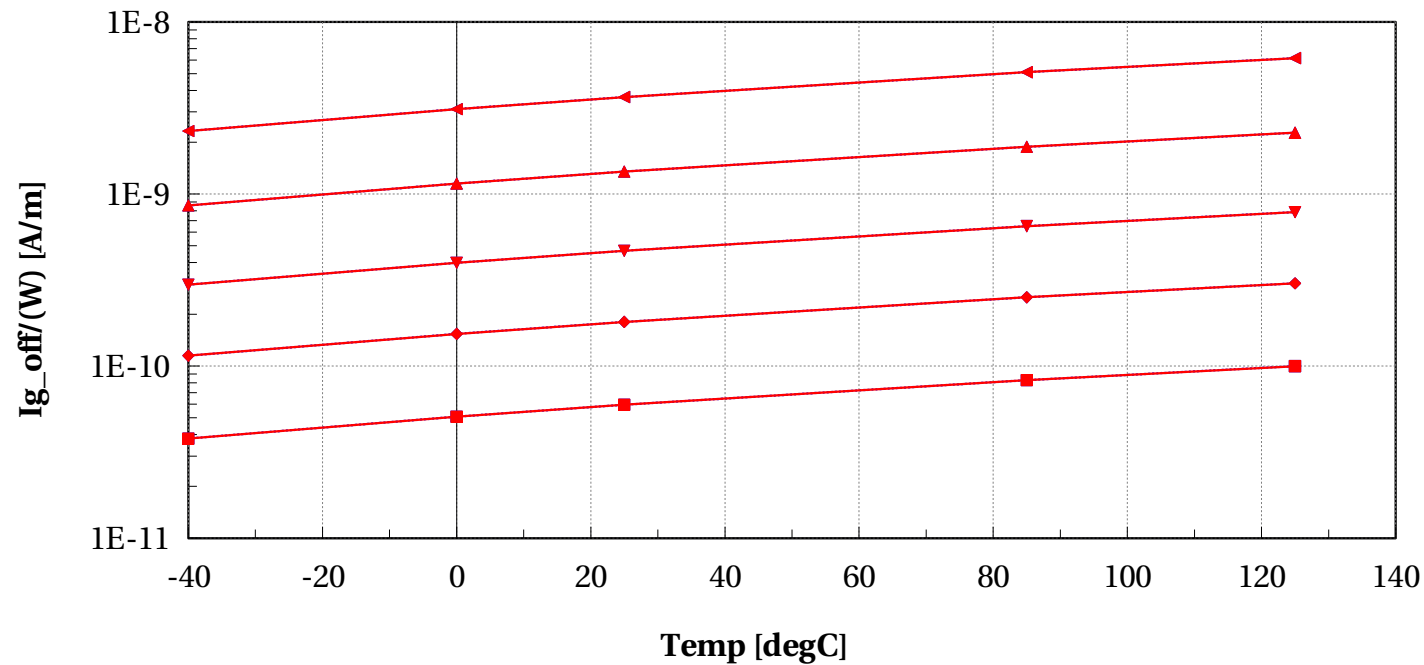
# egpfet\_acc, Ig\_on/(L\*W) [A/m2] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



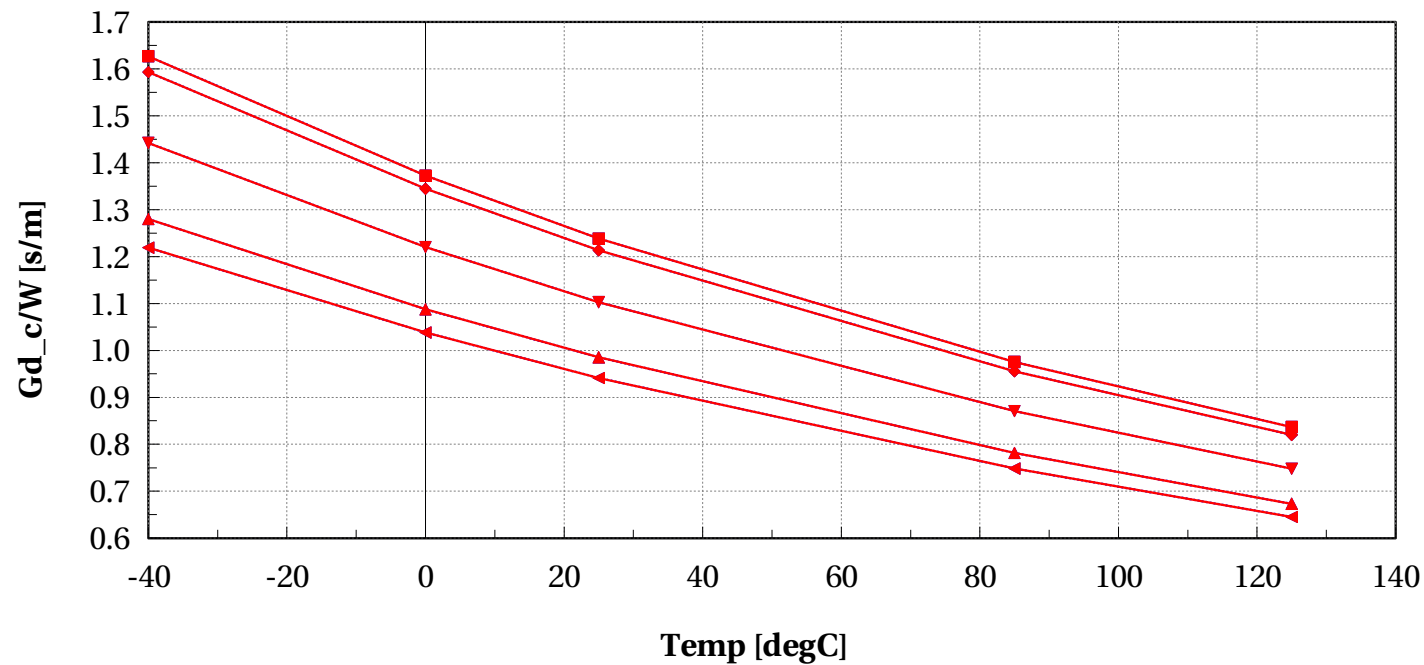
# egpfet\_acc, Ig\_off/(W) [A/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egpfet\_acc, Gd\_c/W [s/m] vs Temp [degC]

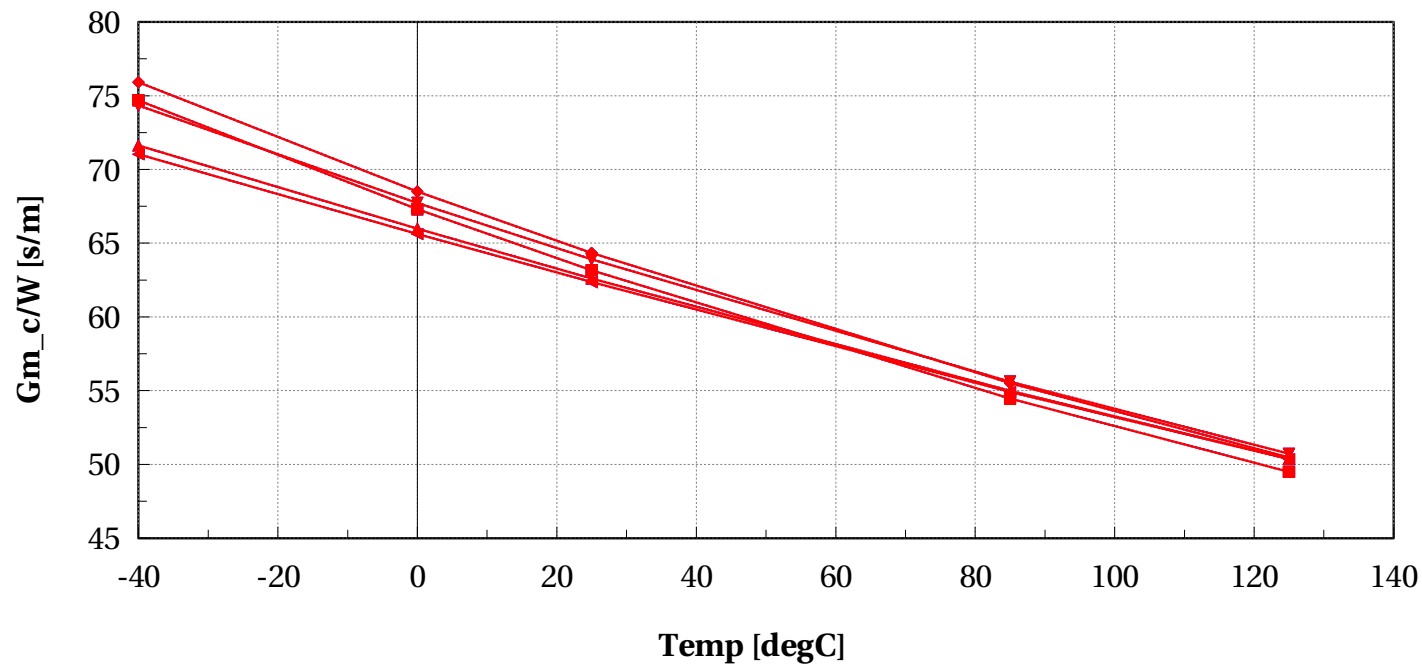
$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"





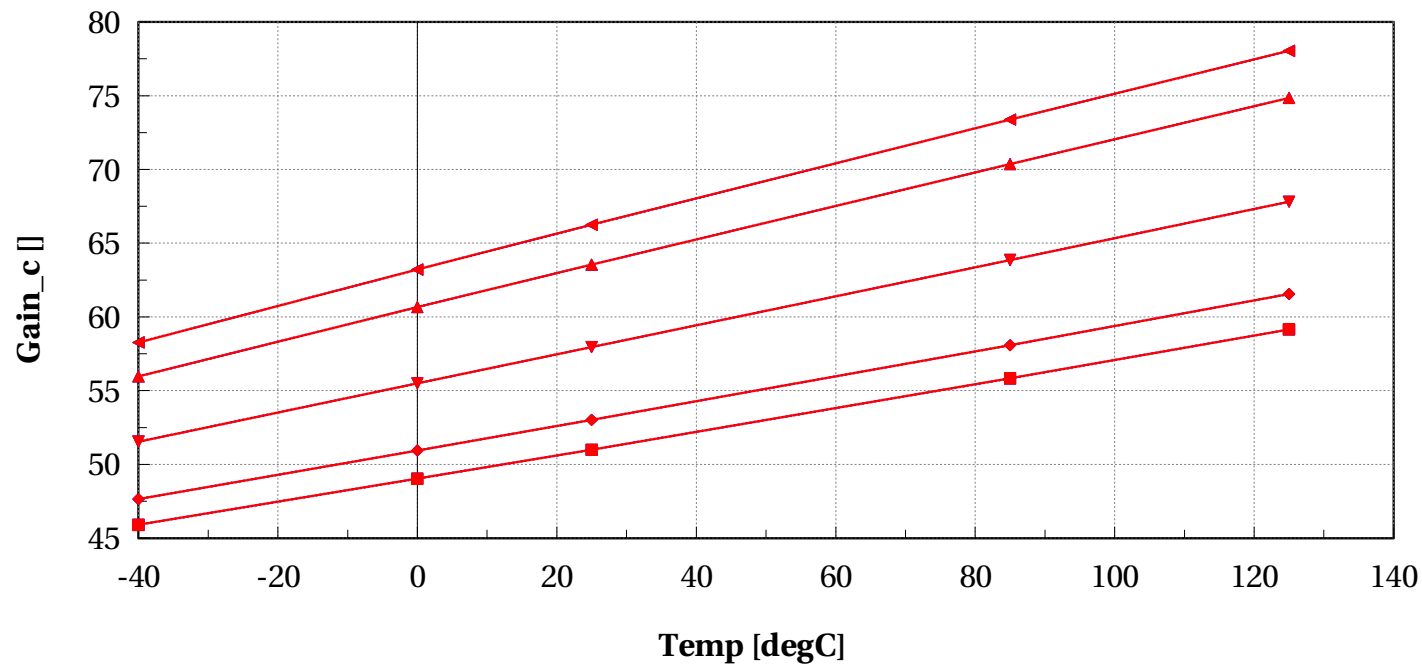
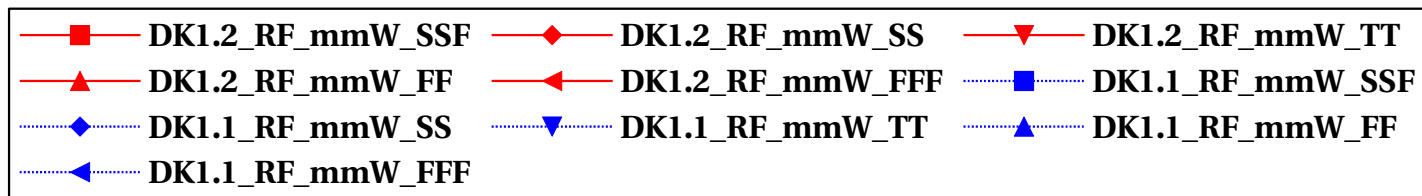
# egpfet\_acc, Gm\_c/W [s/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



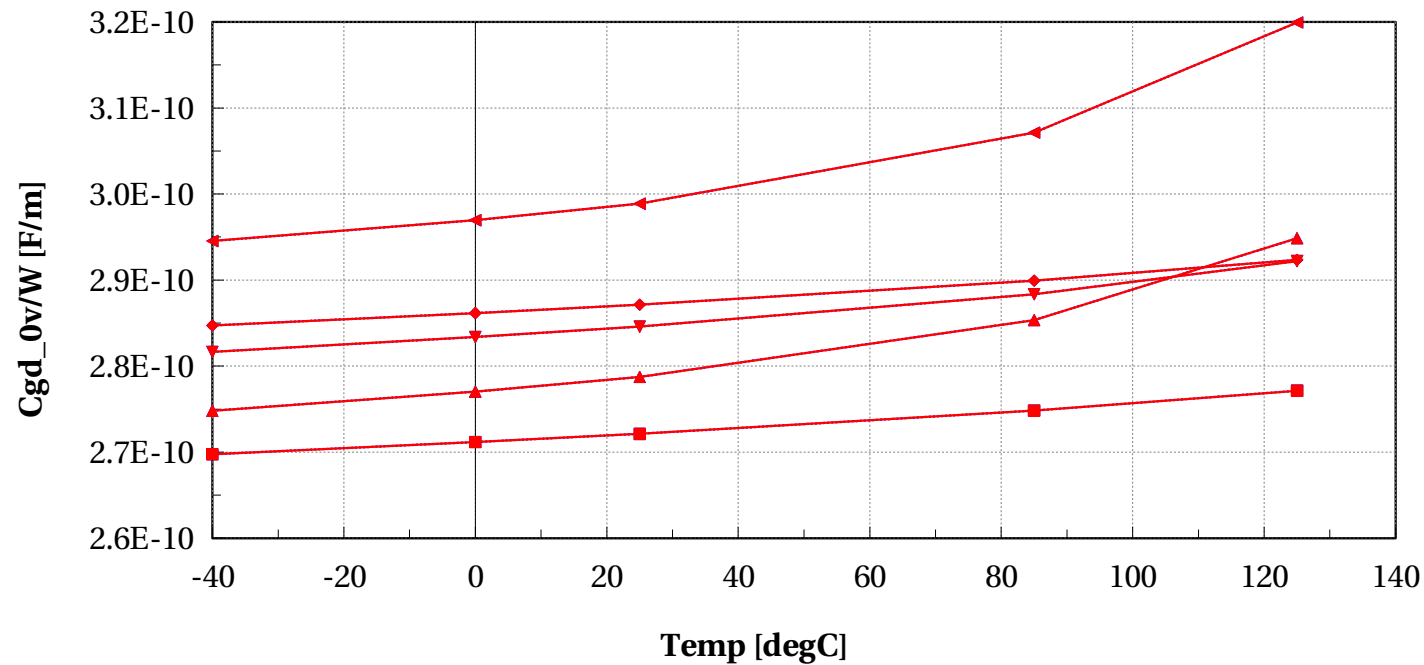
# egpfet\_acc, Gain\_c [] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



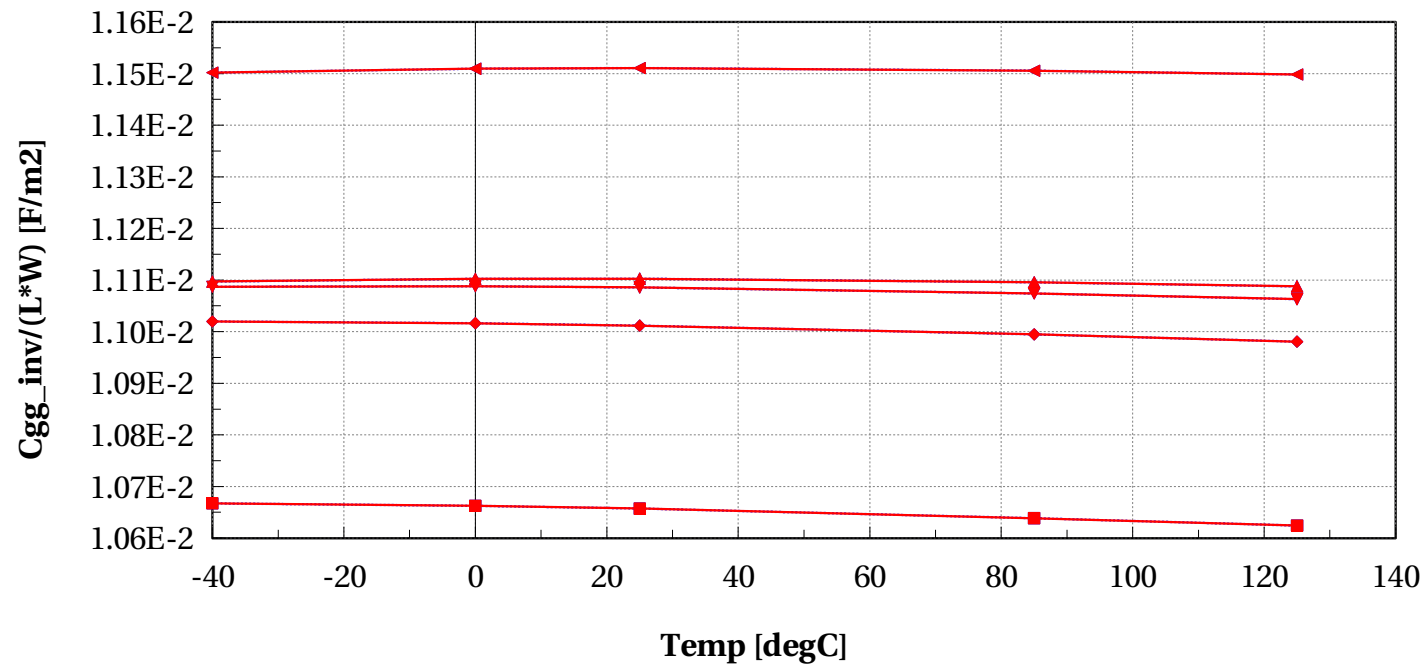
# egpfet\_acc, Cgd\_0v/W [F/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egpfet\_acc, Cgg\_inv/(L\*W) [F/m2] vs Temp [degC]

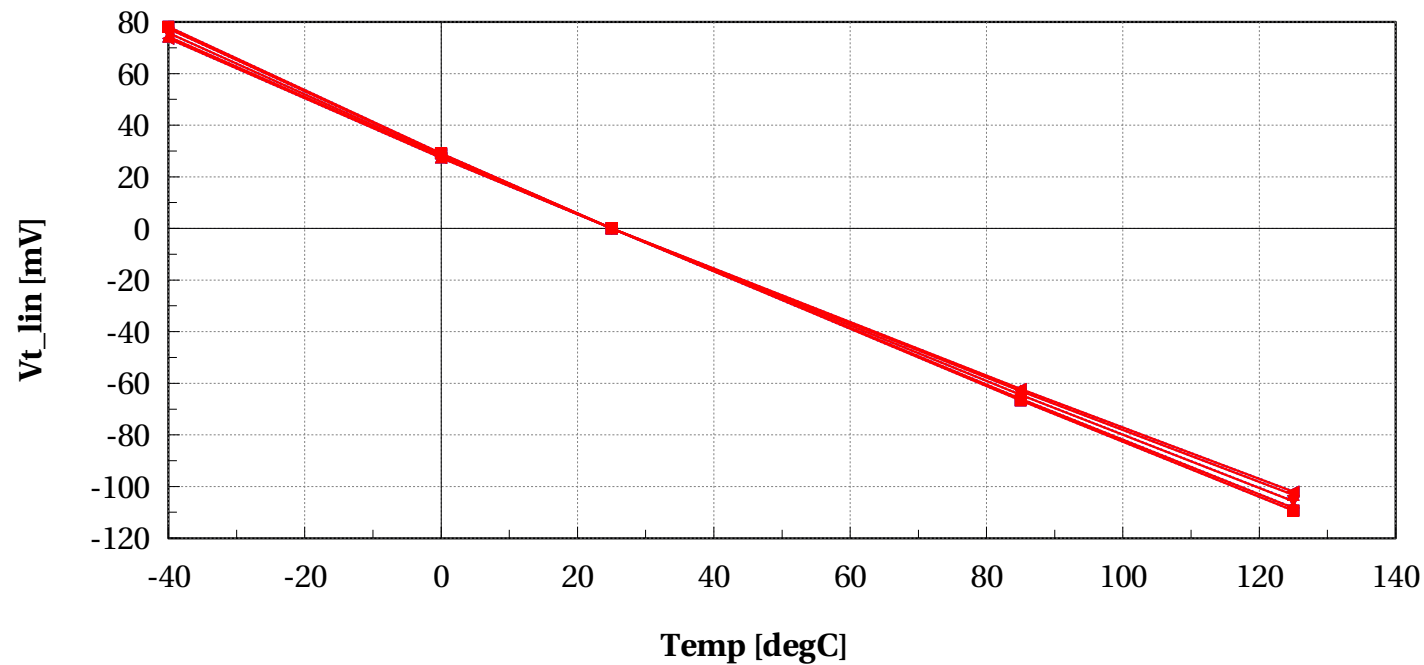
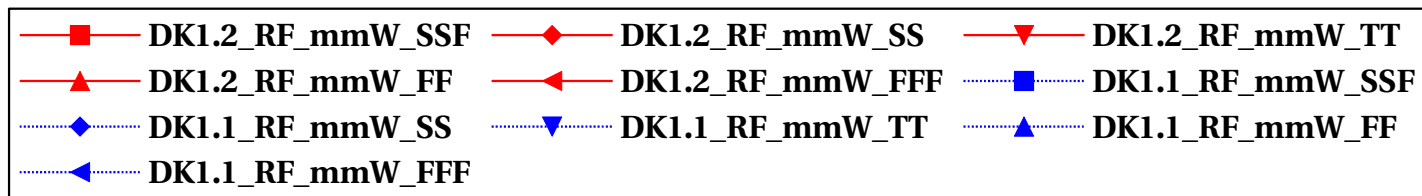
$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



## Normalized scaling versus Temp @ $L=0.15\mu$ , $W=2\mu$

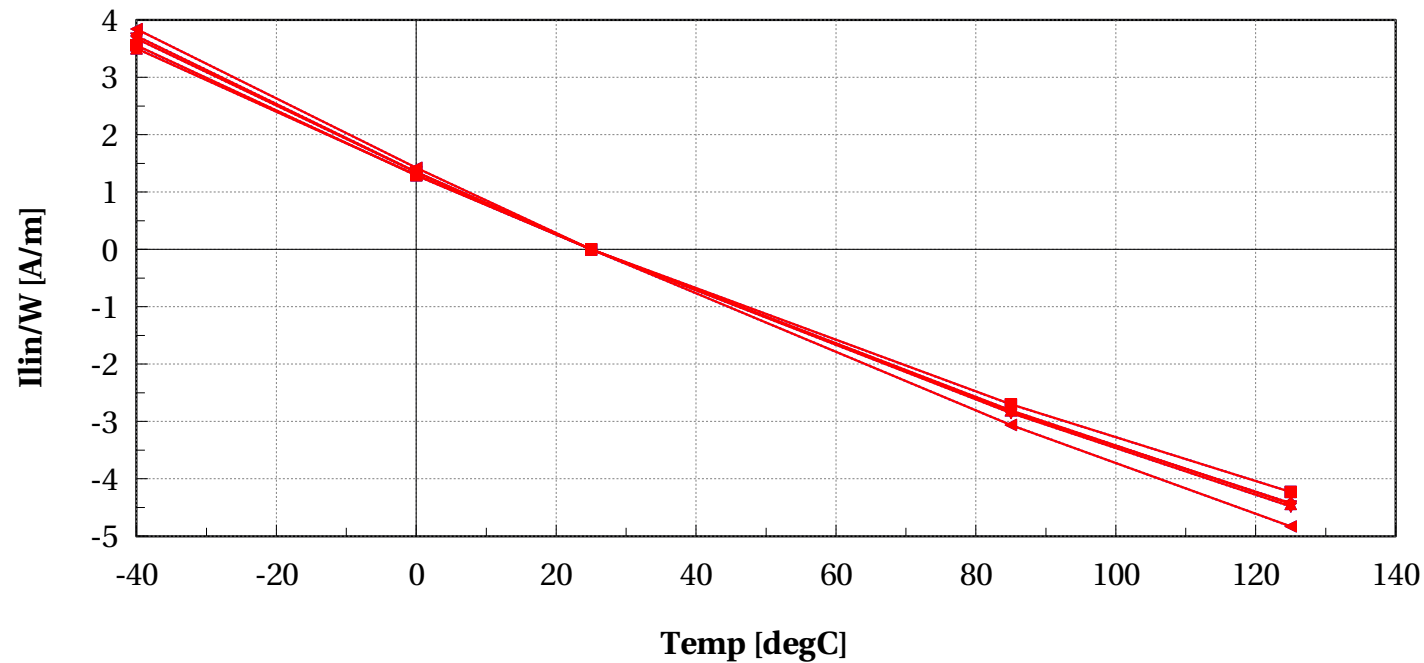
# egpfet\_acc, Vt\_lin [mV] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



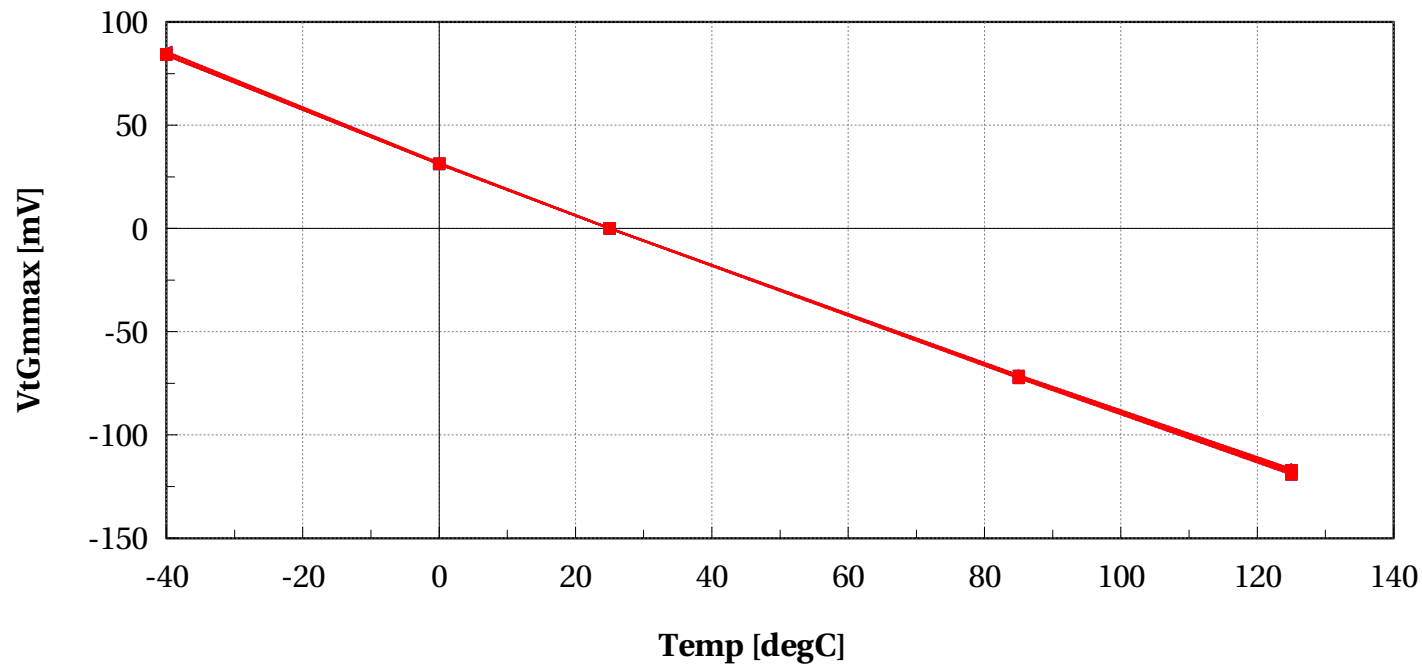
# egpfet\_acc, Ilin/W [A/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egpfet\_acc, VtGmmax [mV] vs Temp [degC]

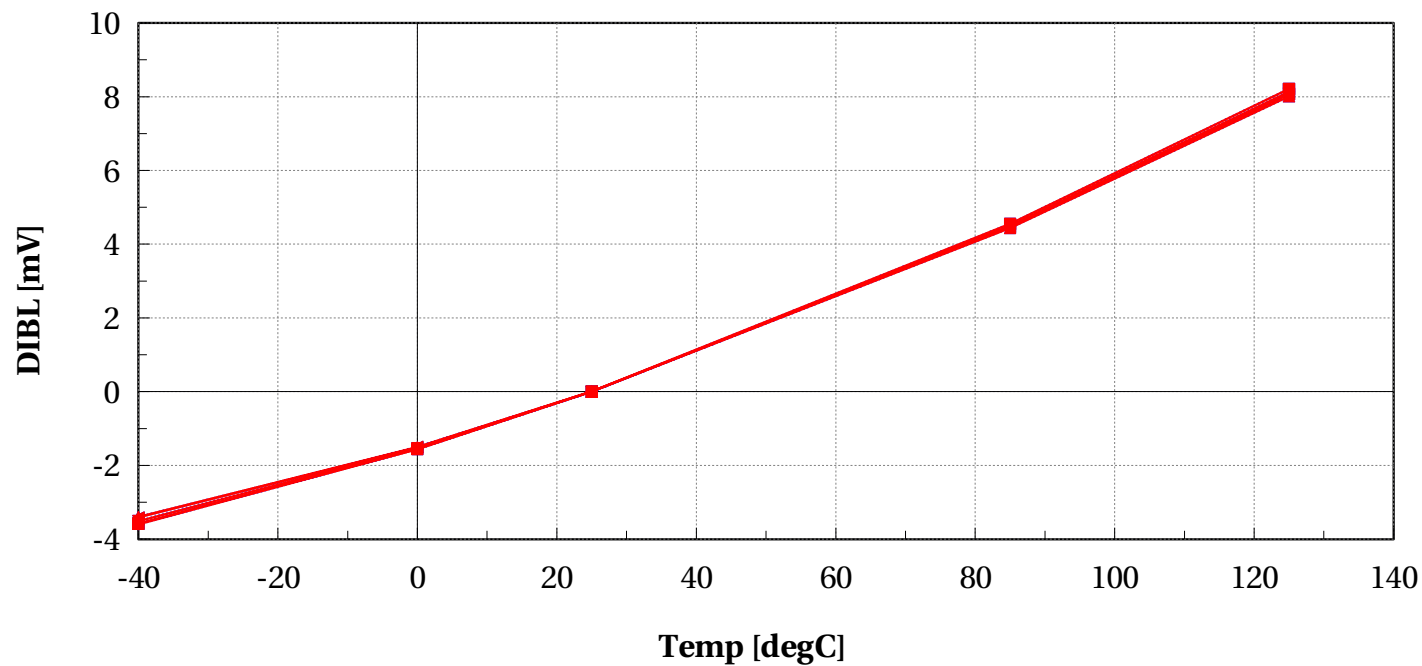
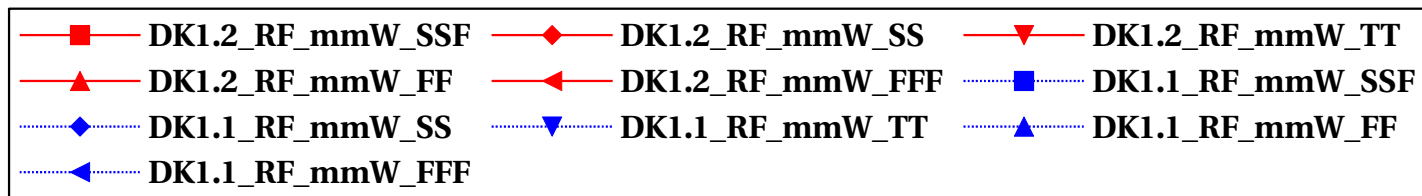
$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"





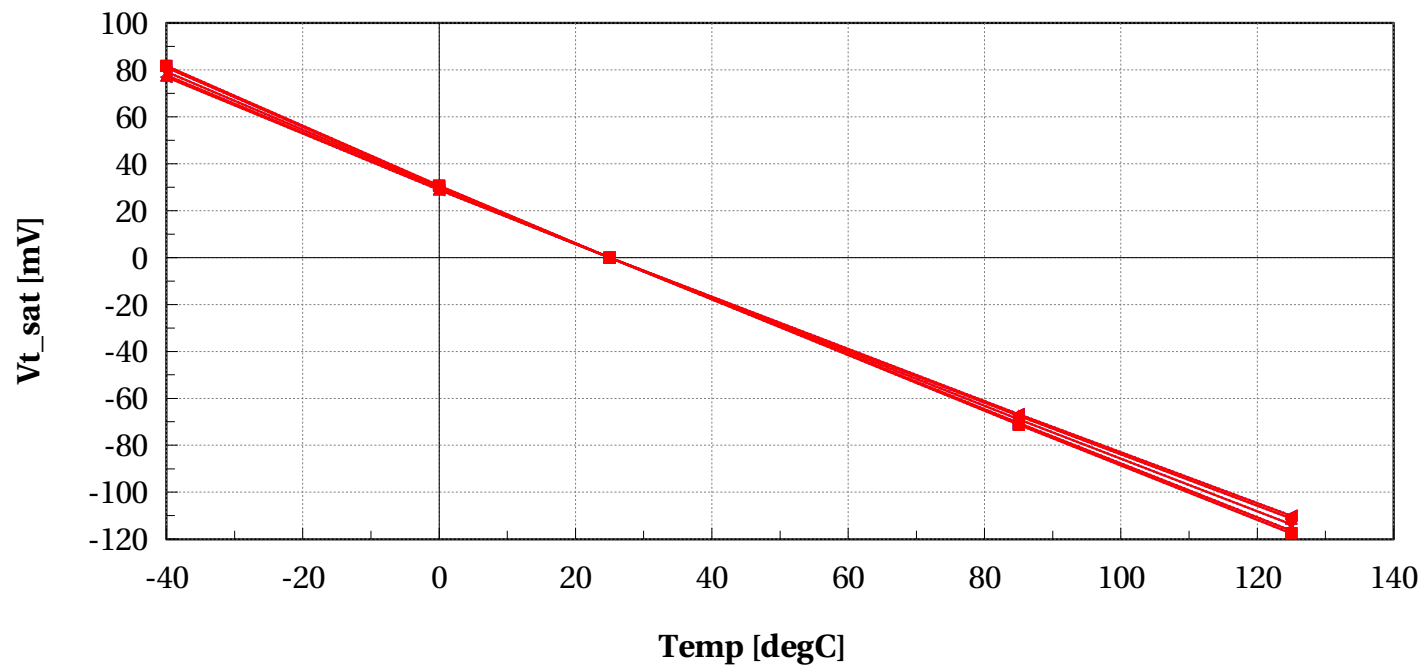
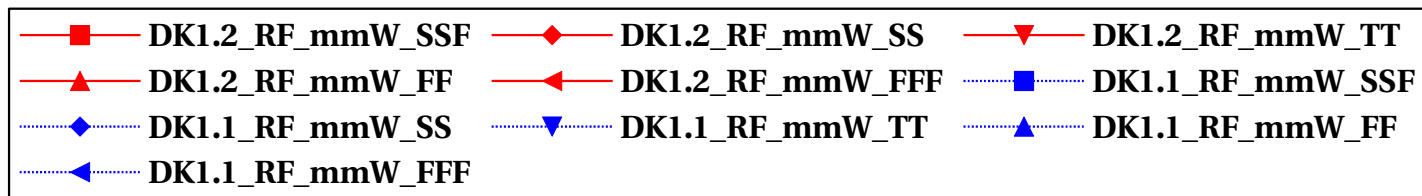
## egpfet\_acc, DIBL [mV] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



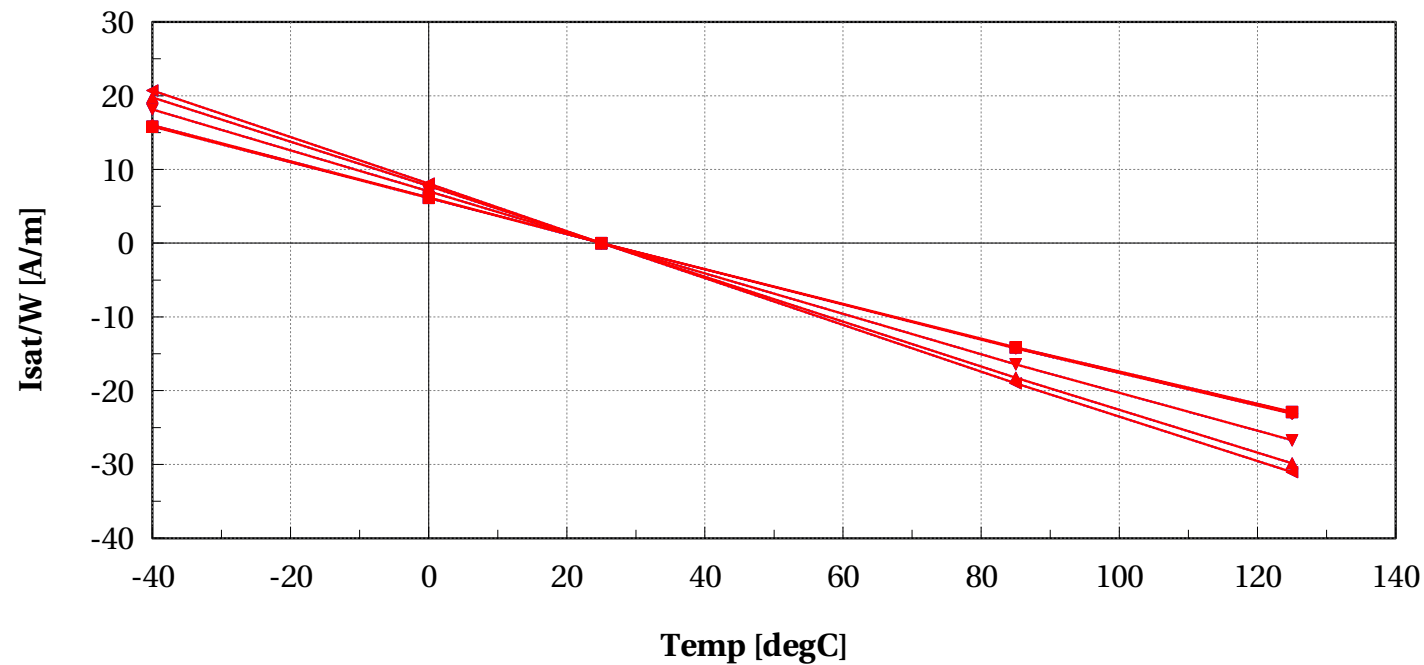
# egpfet\_acc, Vt\_sat [mV] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



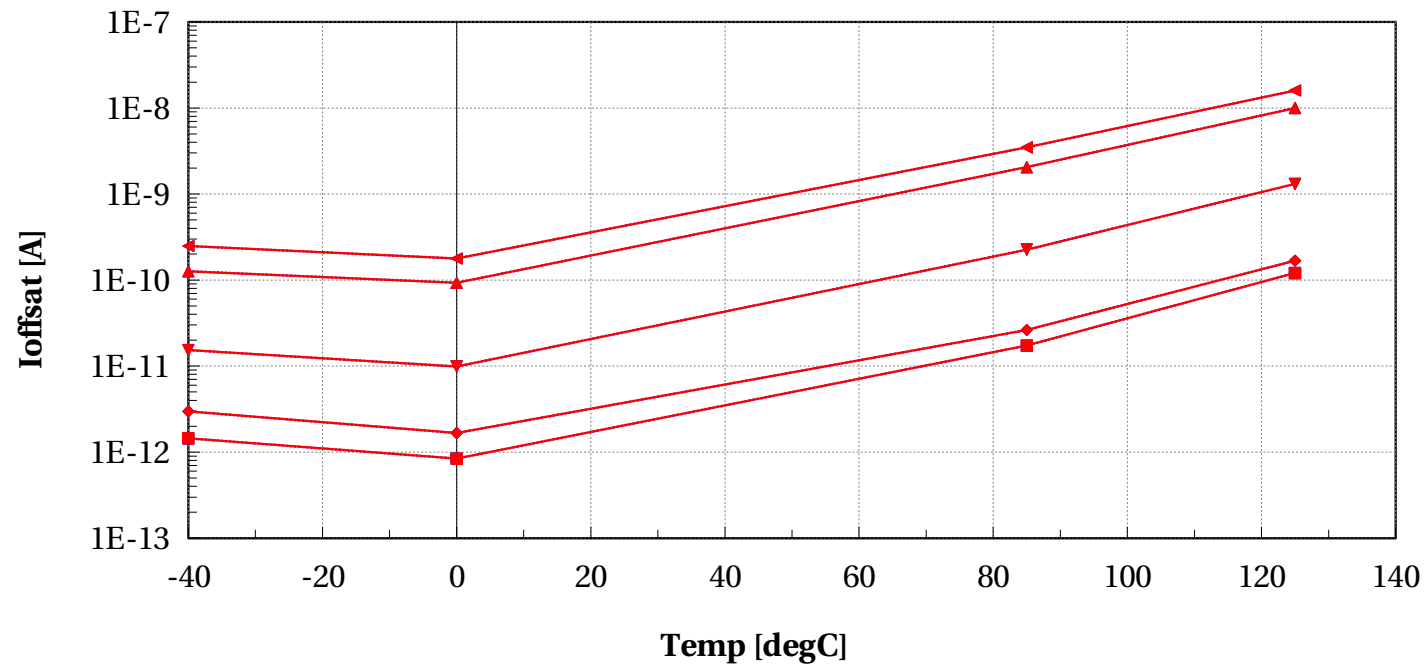
# egpfet\_acc, Isat/W [A/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



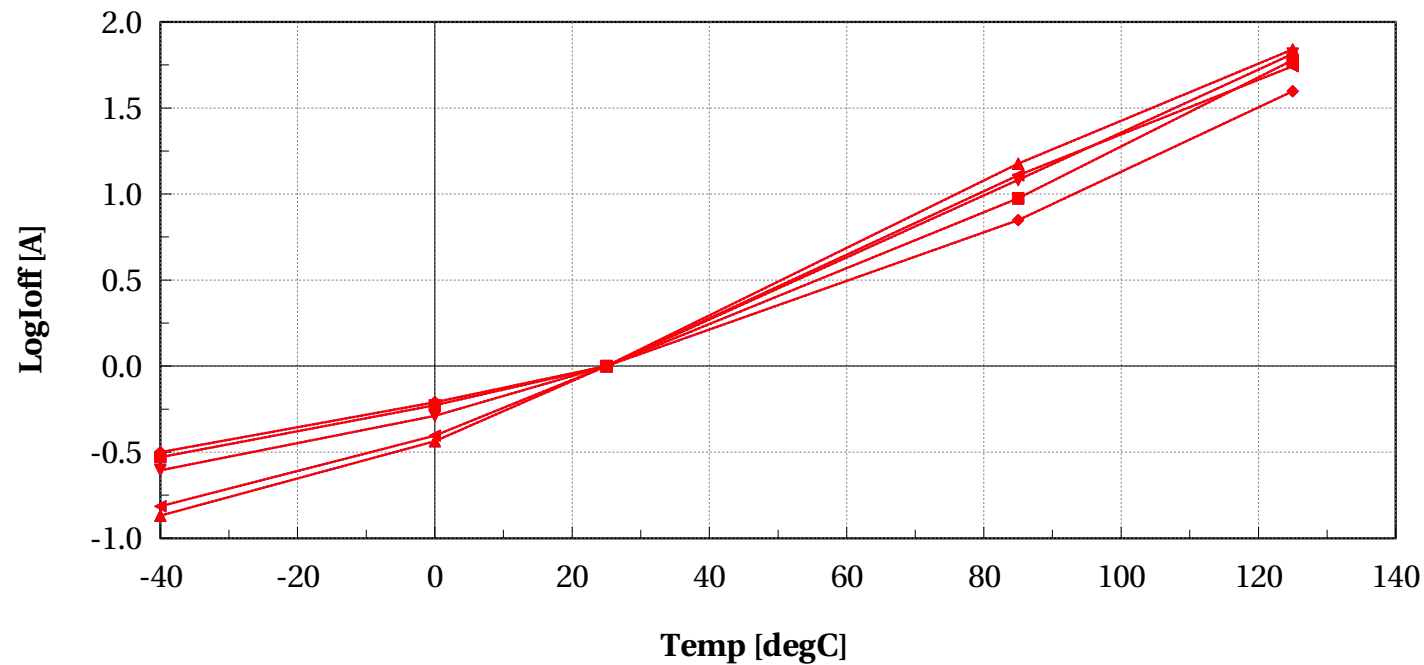
# egpfet\_acc, Ioffsat [A] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



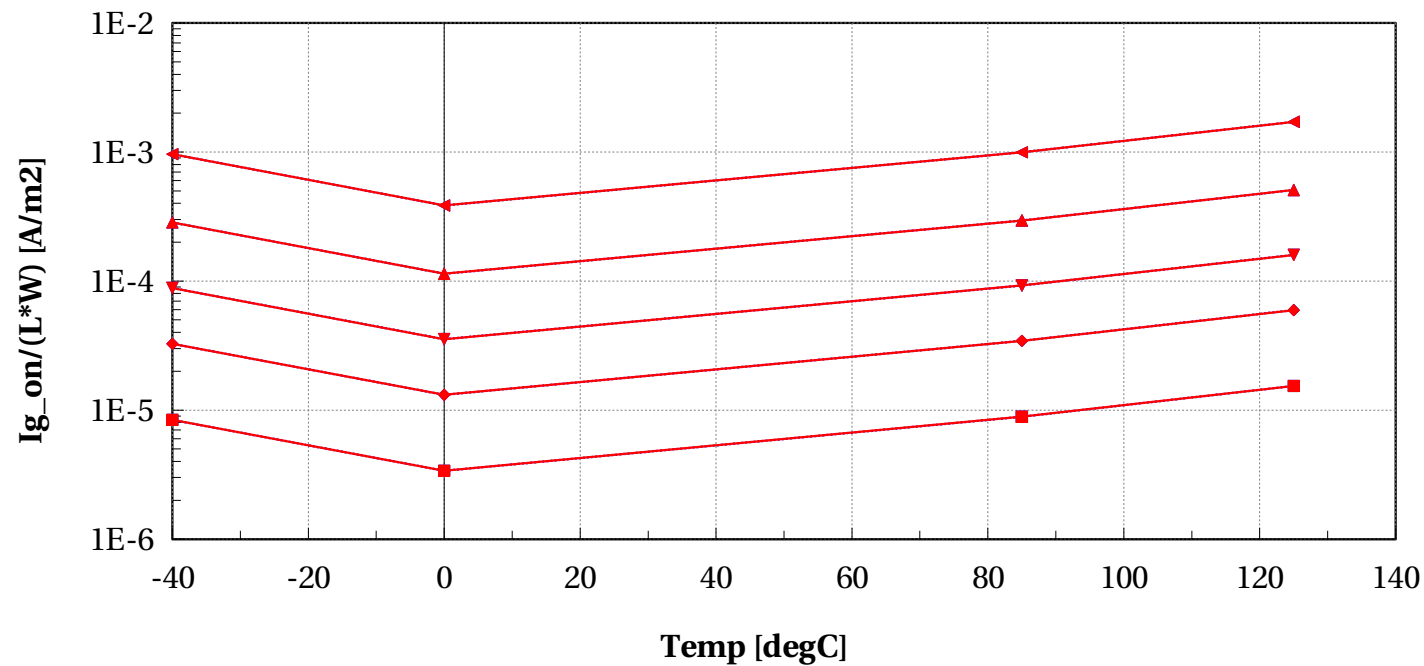
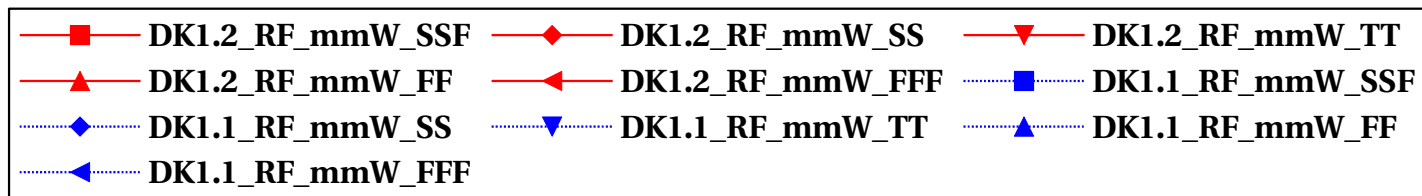
# egpfet\_acc, LogIoff [A] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



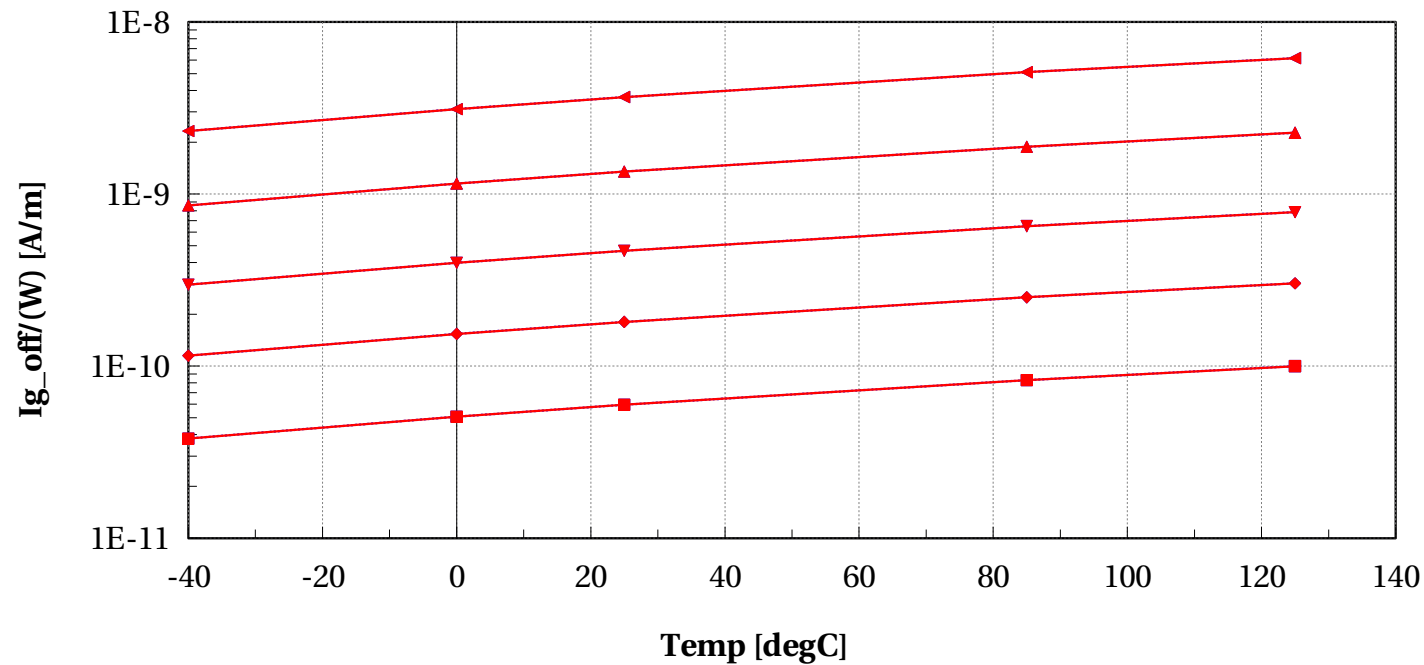
# egpfet\_acc, Ig\_on/(L\*W) [A/m2] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



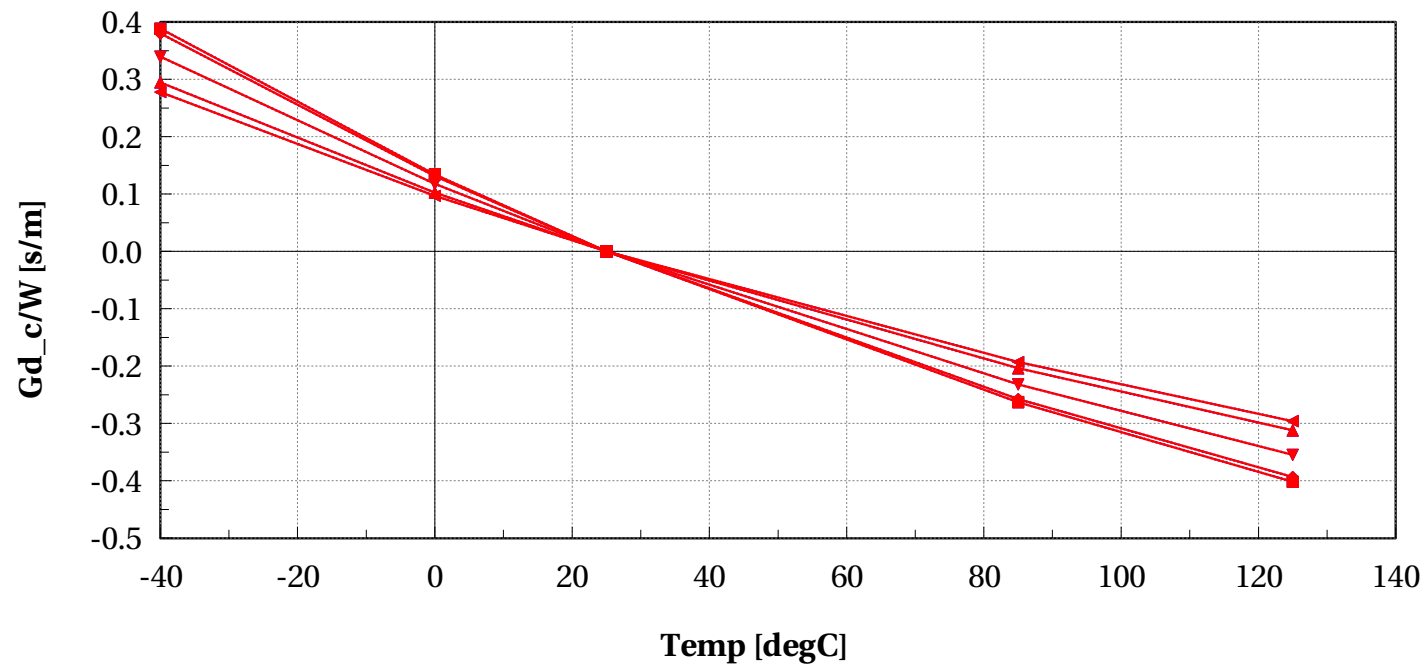
# egpfet\_acc, Ig\_off/(W) [A/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egpfet\_acc, Gd\_c/W [s/m] vs Temp [degC]

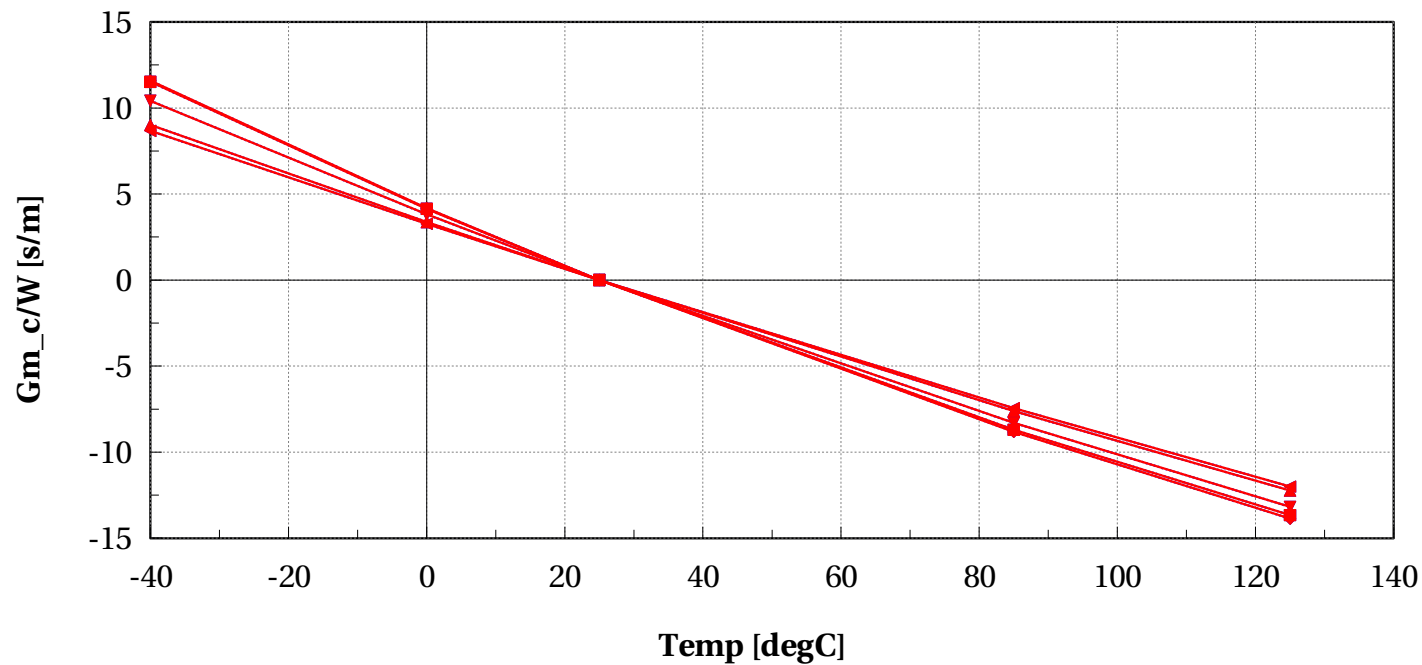
$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"





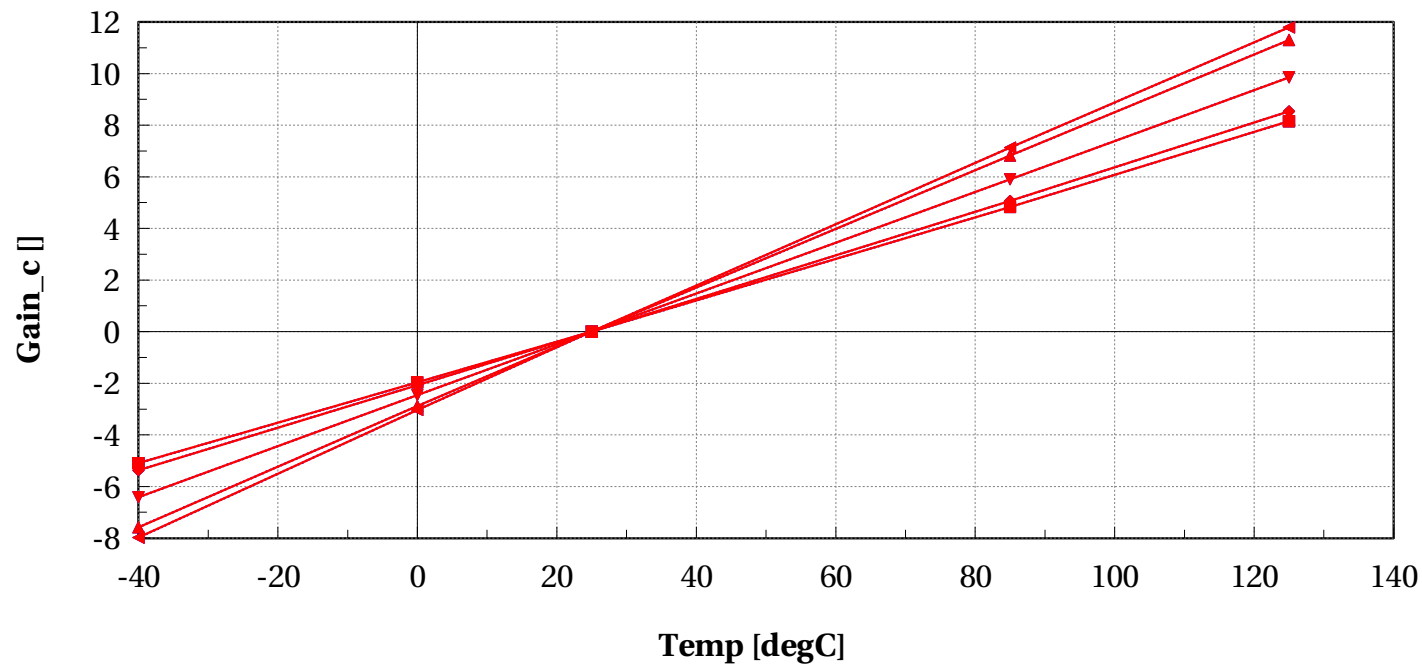
# egpfet\_acc, Gm\_c/W [s/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



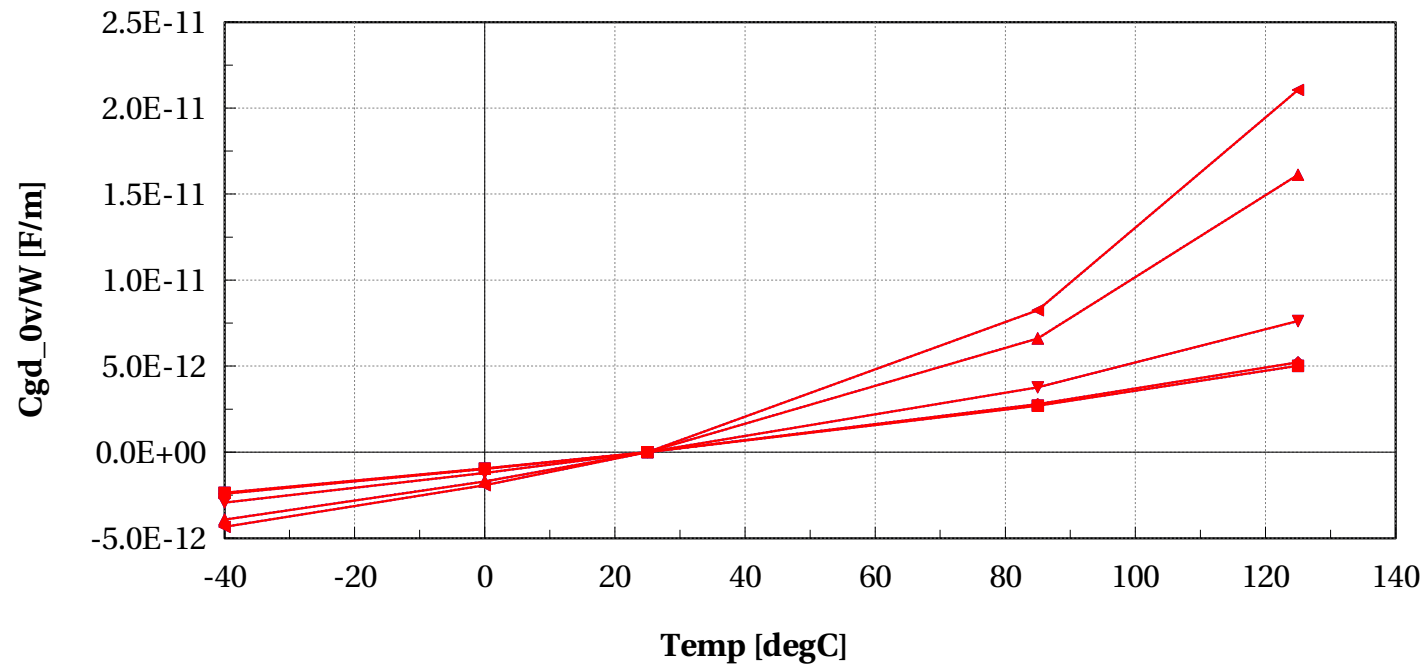
# egpfet\_acc, Gain\_c [] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



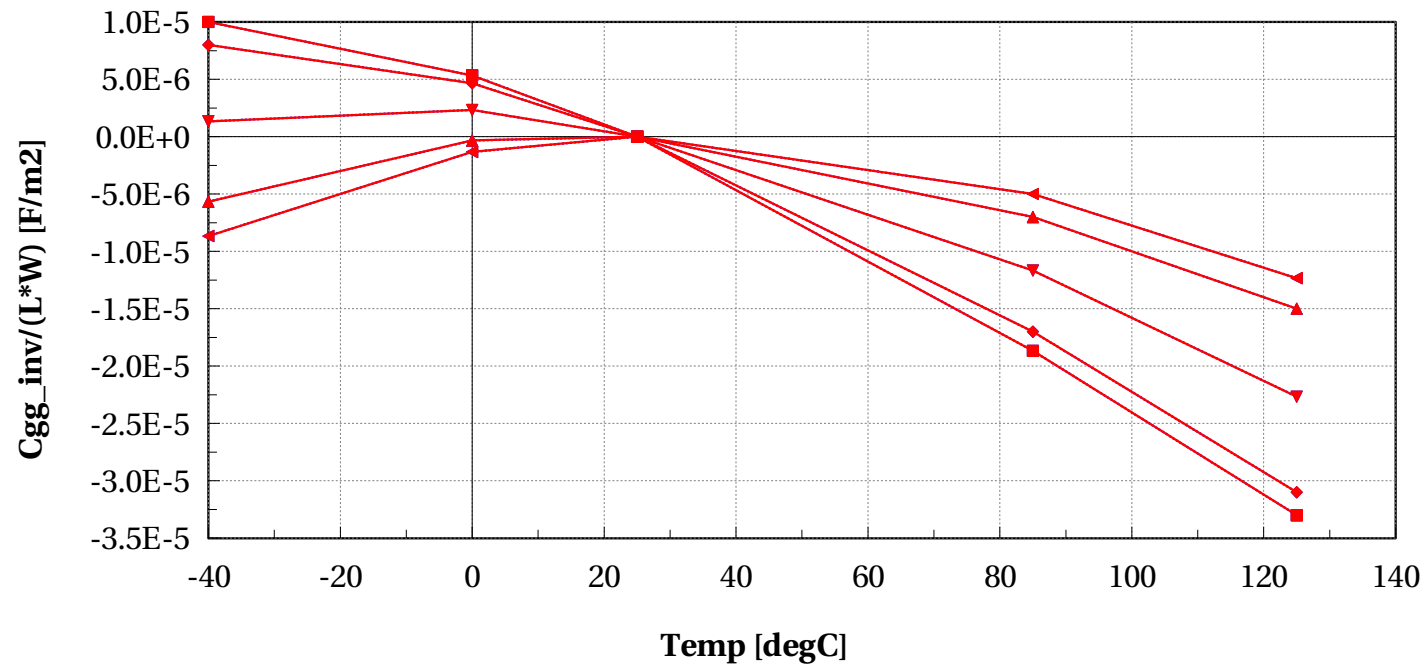
# egpfet\_acc, Cgd\_0v/W [F/m] vs Temp [degC]

$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egpfet\_acc, Cgg\_inv/(L\*W) [F/m2] vs Temp [degC]

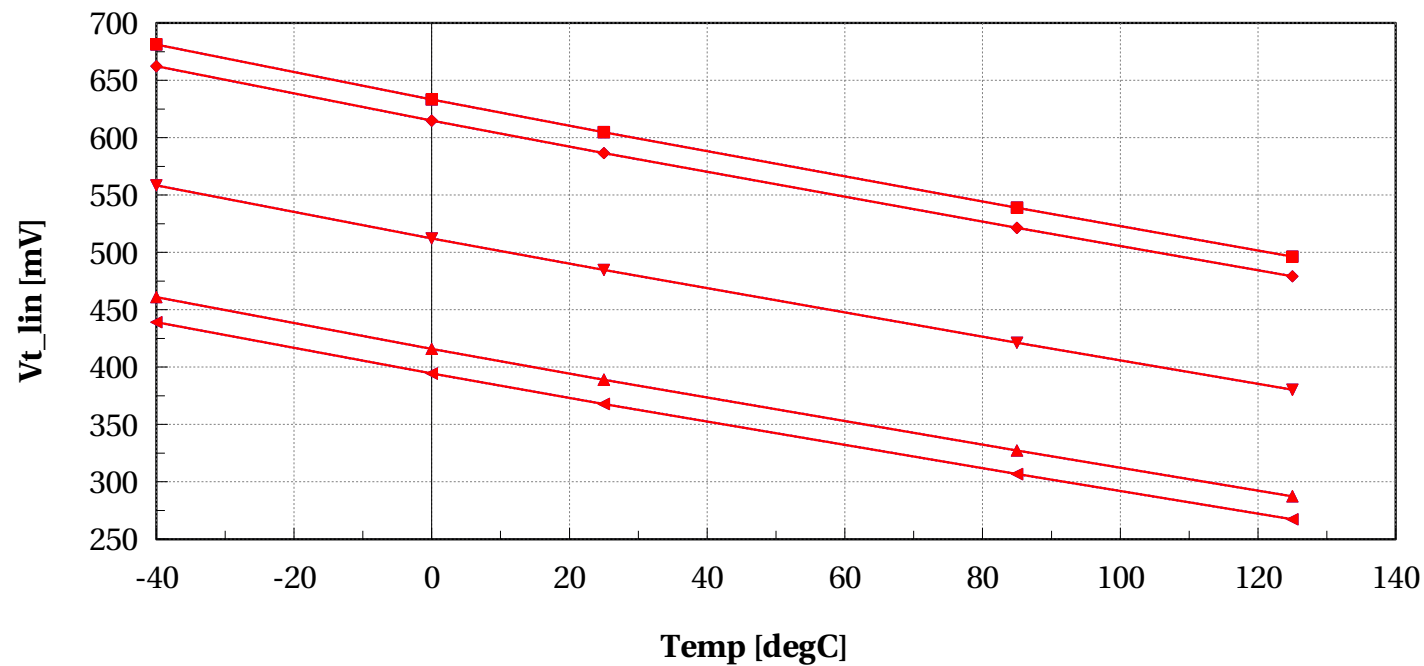
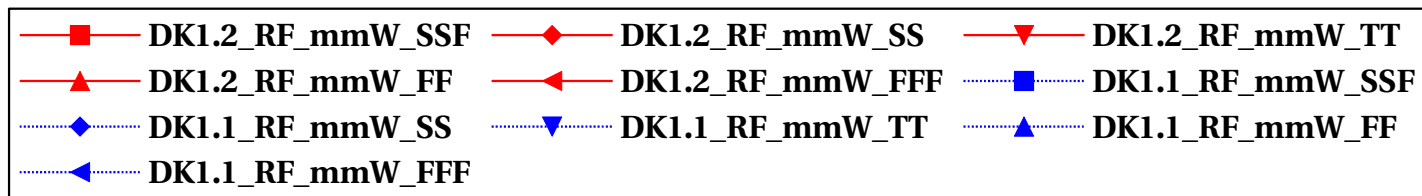
$l=0.15e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



## Scaling versus Temp @ $L=2u$ , $W=2u$

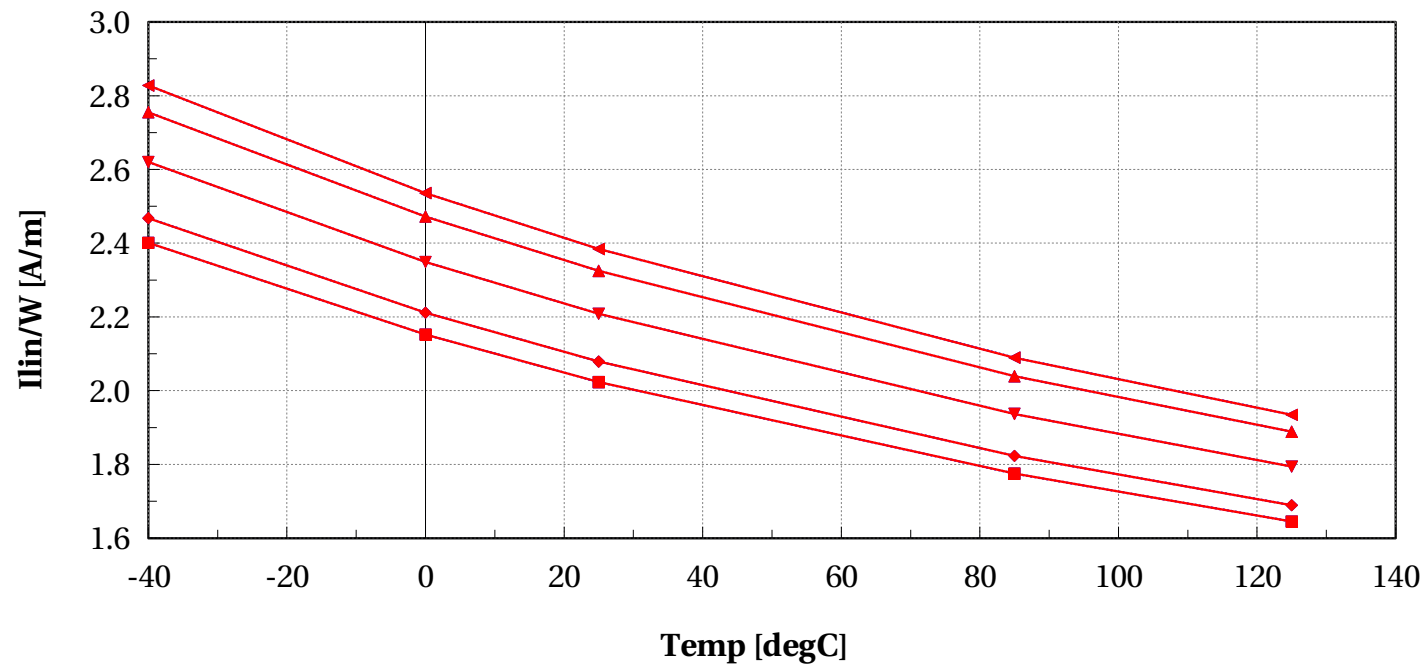
# egpfet\_acc, Vt\_lin [mV] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



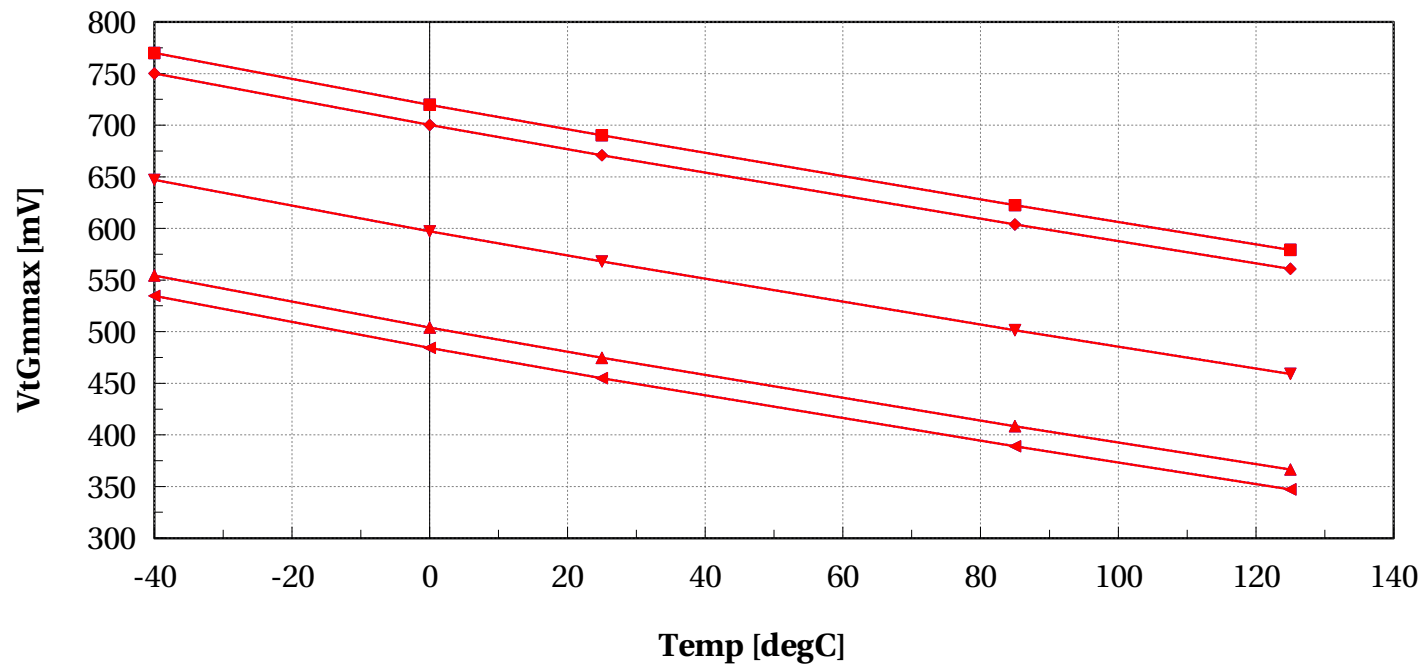
# egpfet\_acc, I<sub>lin</sub>/W [A/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egpfet\_acc, VtGmmax [mV] vs Temp [degC]

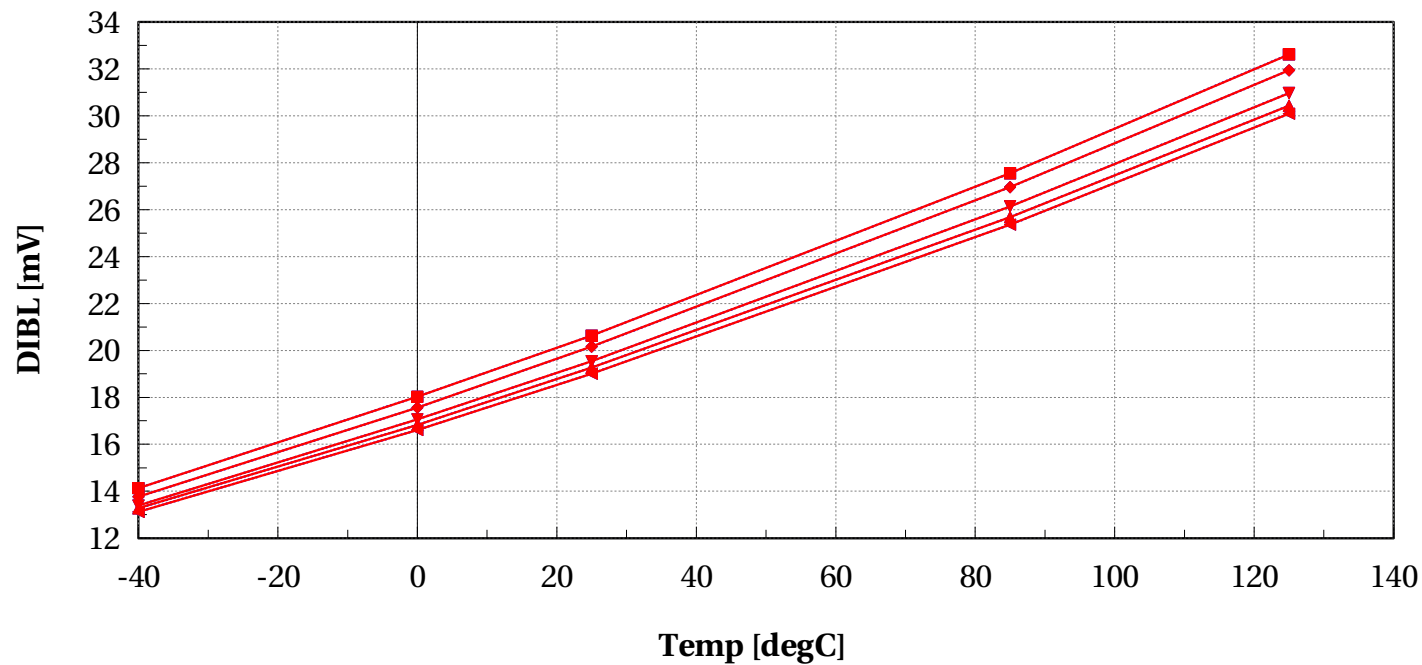
$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"





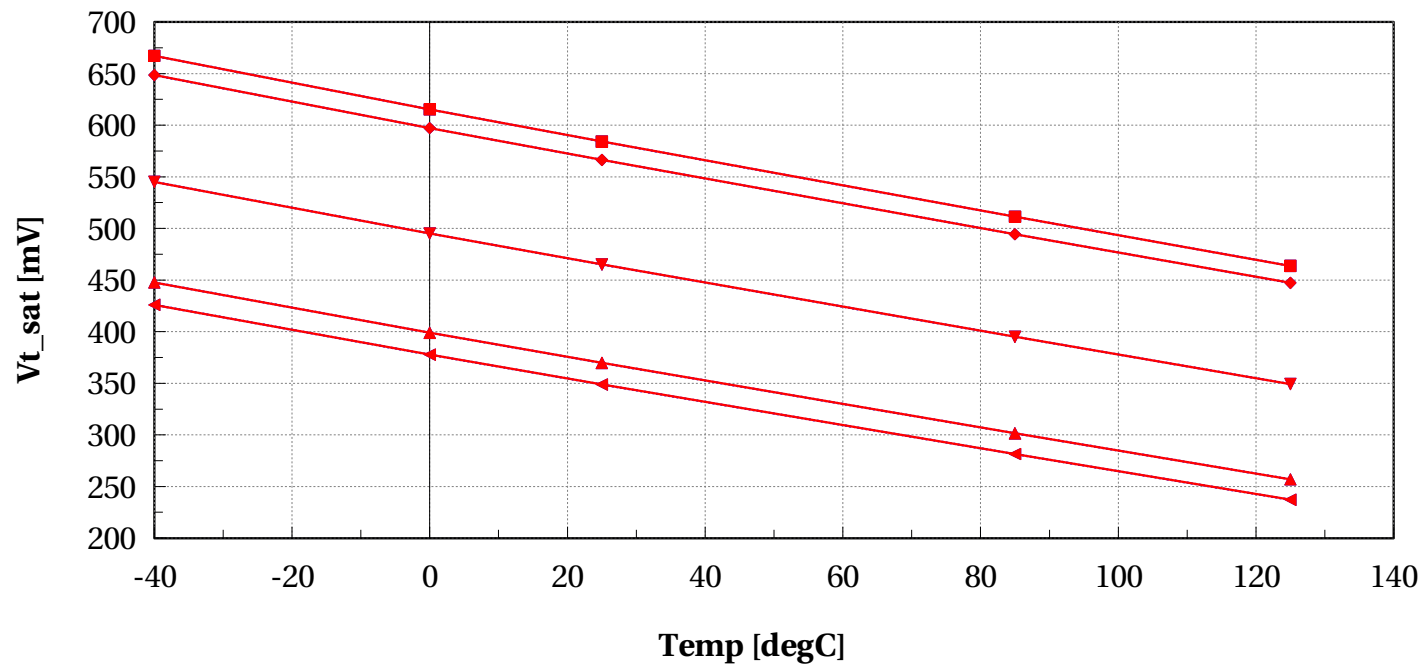
# egpfet\_acc, DIBL [mV] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



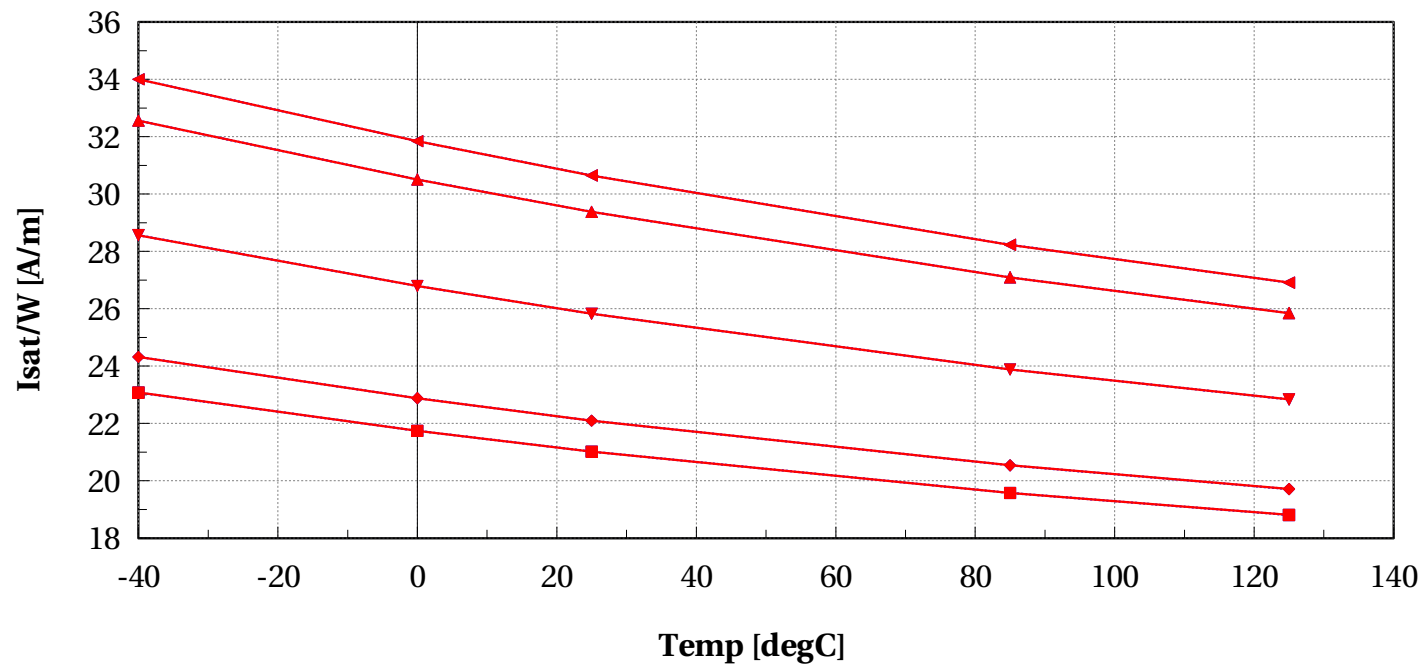
# egpfet\_acc, Vt\_sat [mV] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



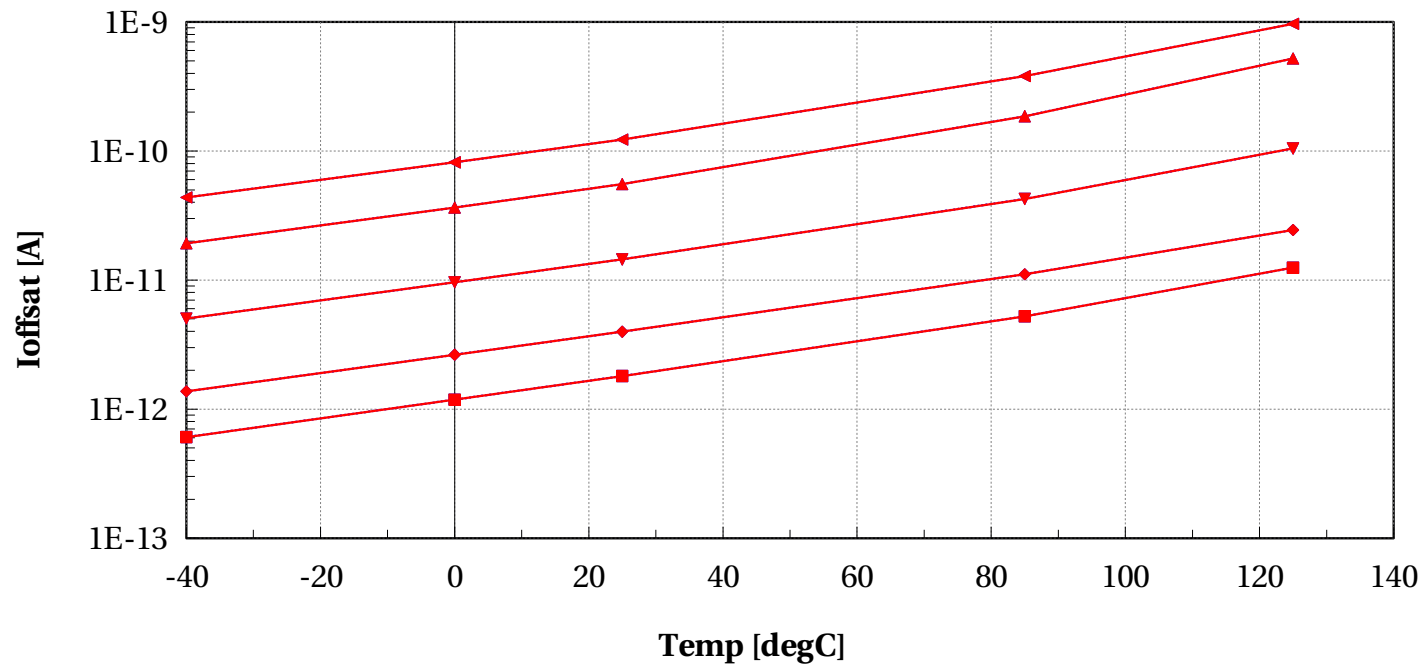
# egpfet\_acc, Isat/W [A/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



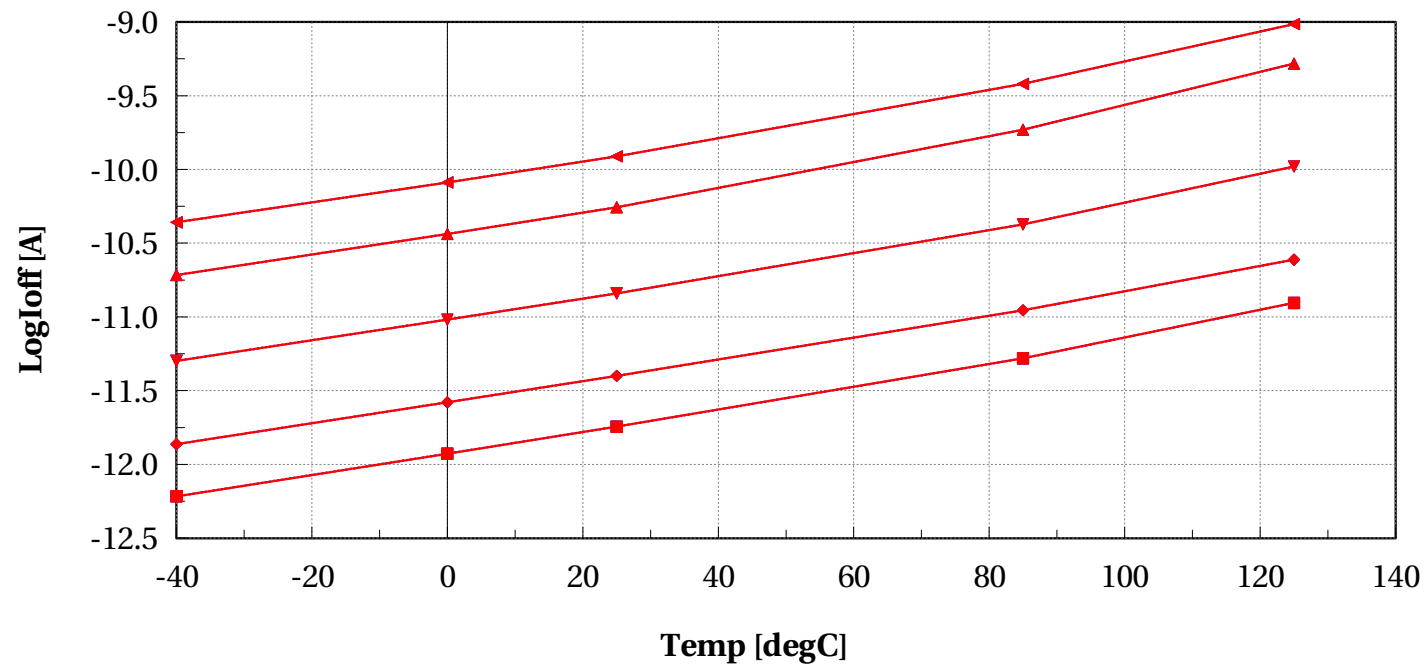
# egpfet\_acc, Ioffsat [A] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



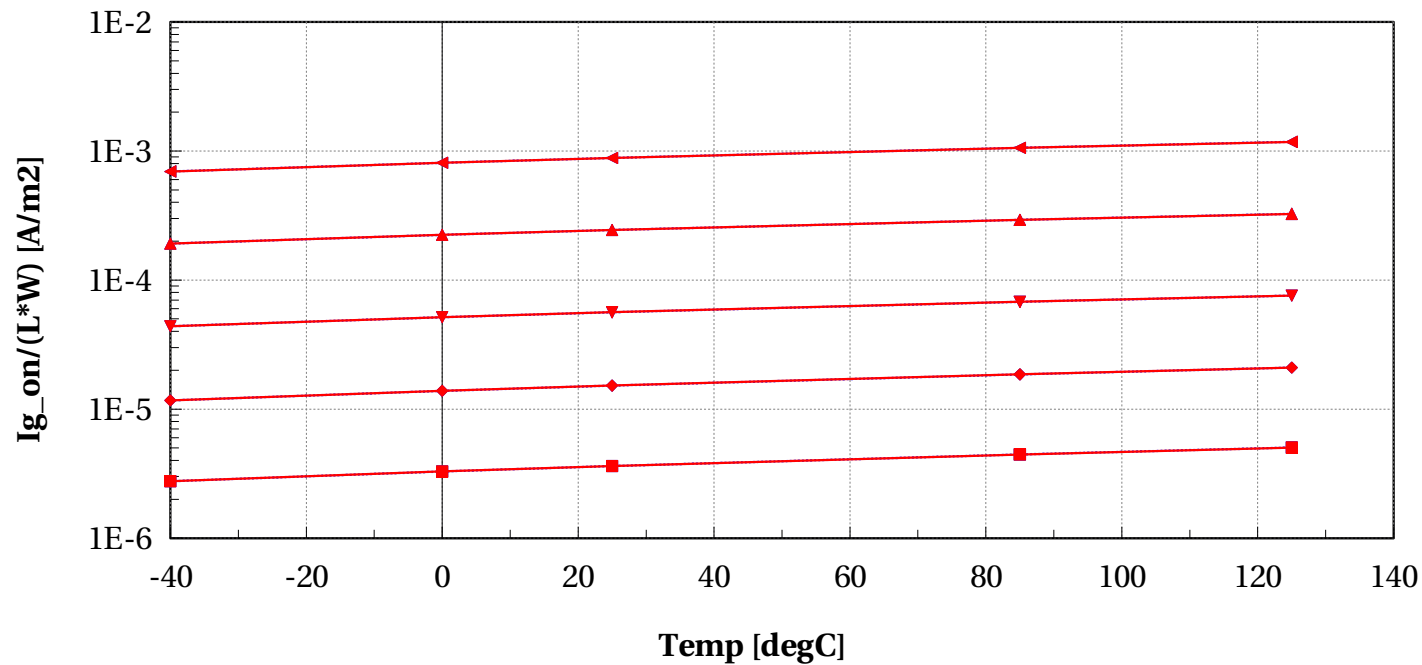
# egpfet\_acc, LogIoff [A] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



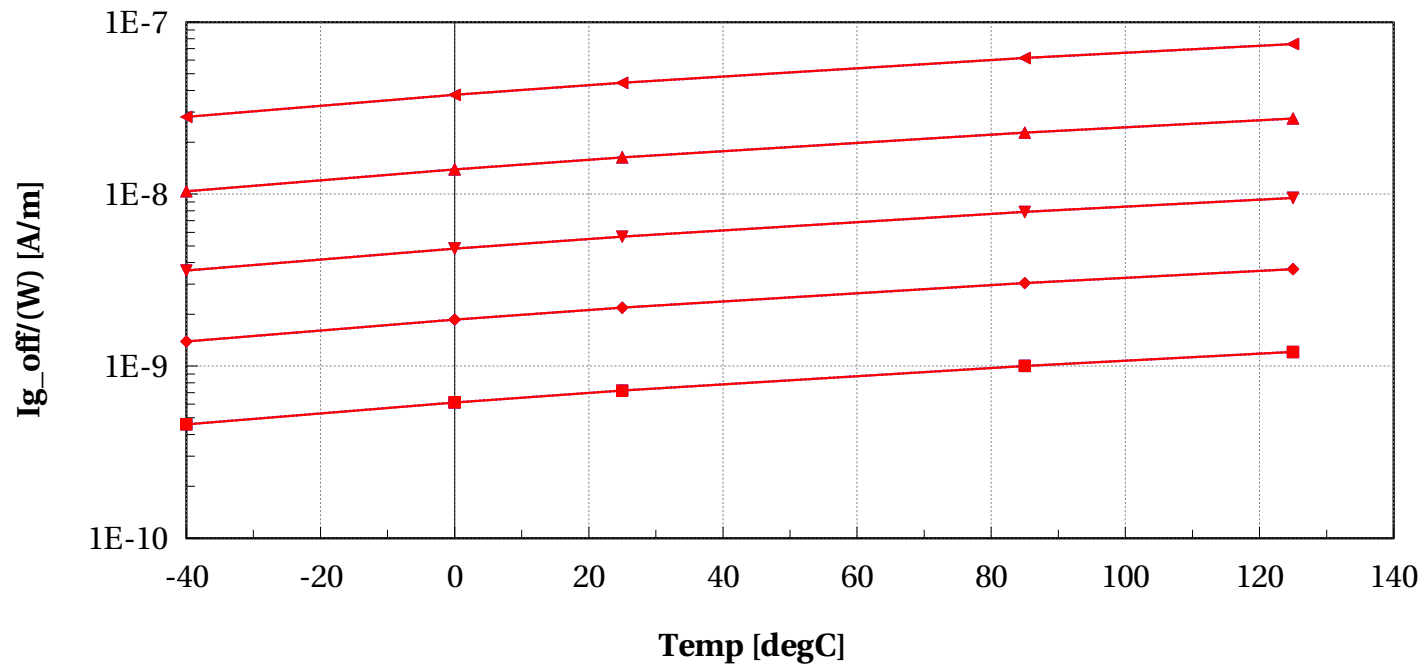
# egpfet\_acc, Ig\_on/(L\*W) [A/m2] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



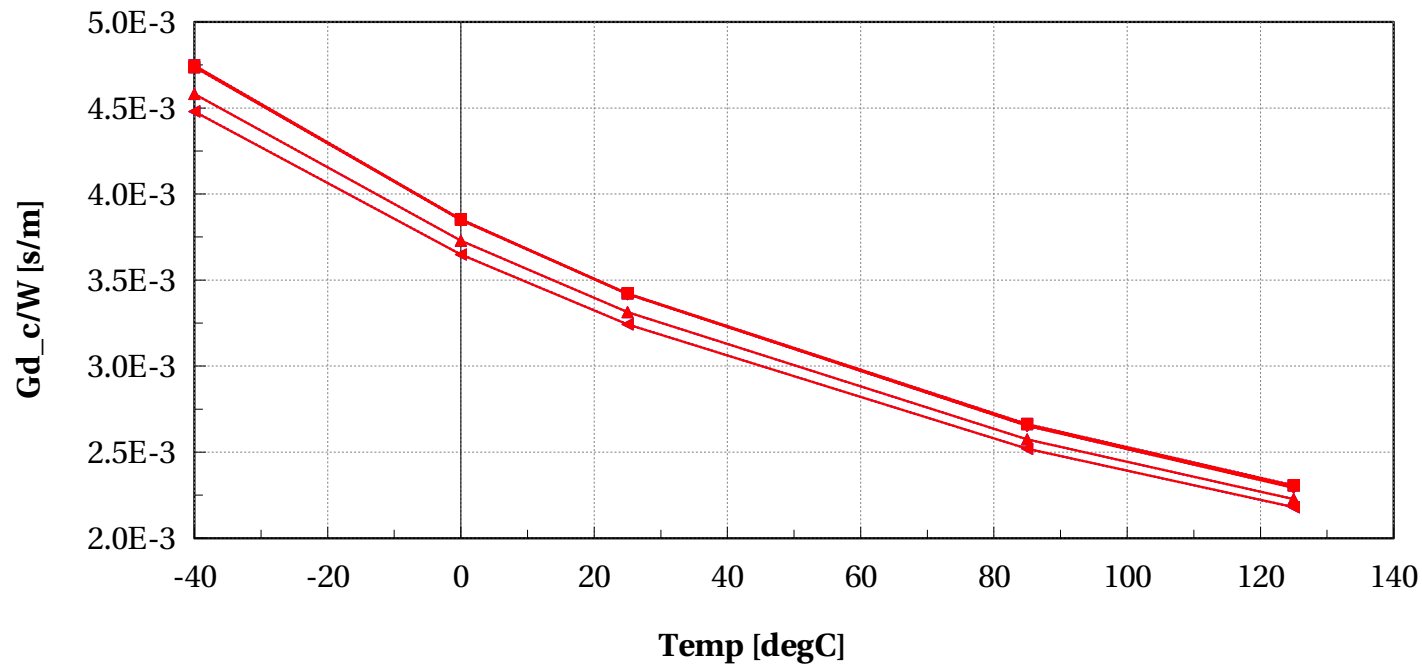
# egpfet\_acc, Ig\_off/(W) [A/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egpfet\_acc, Gd\_c/W [s/m] vs Temp [degC]

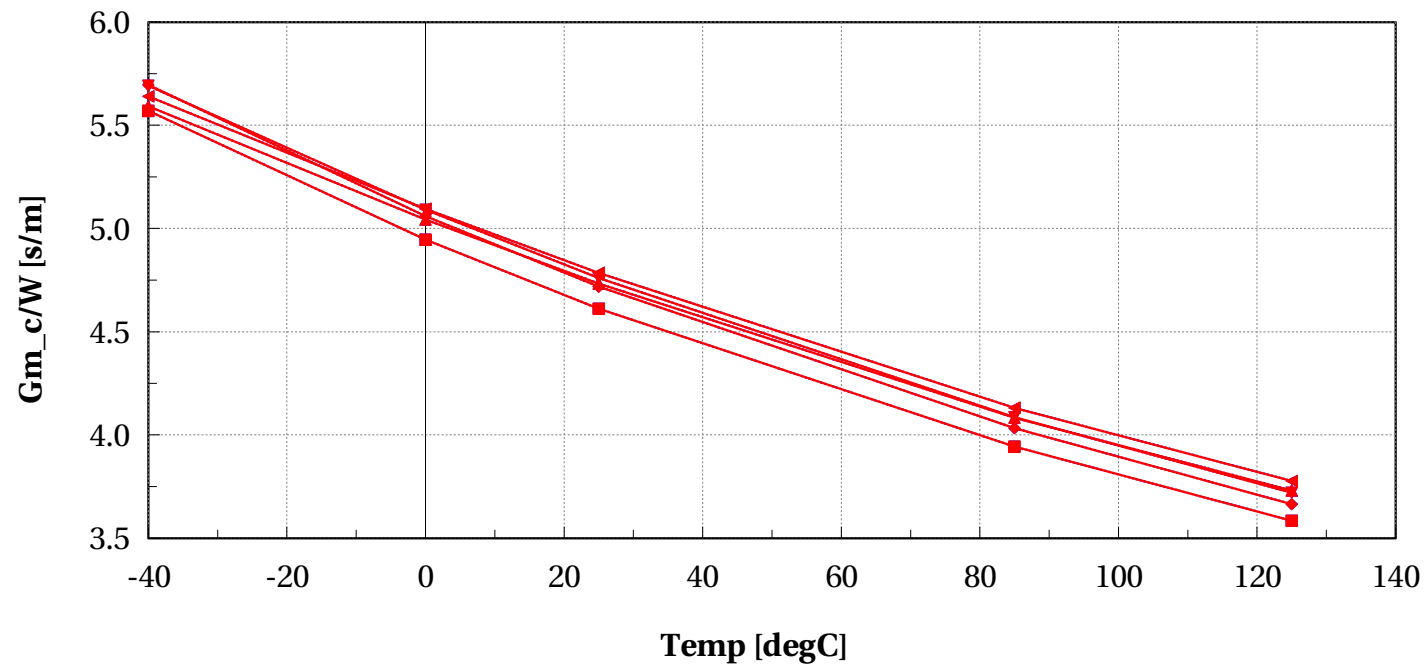
$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"





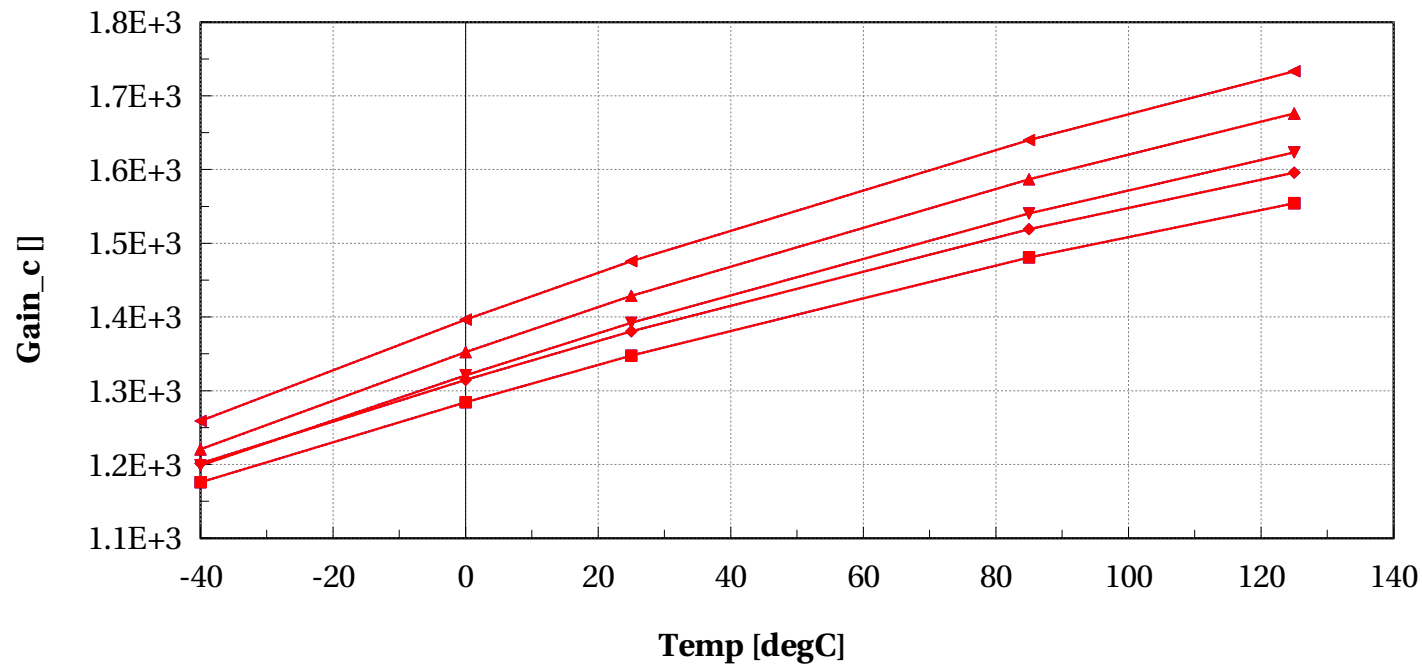
# egpfet\_acc, Gm\_c/W [s/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



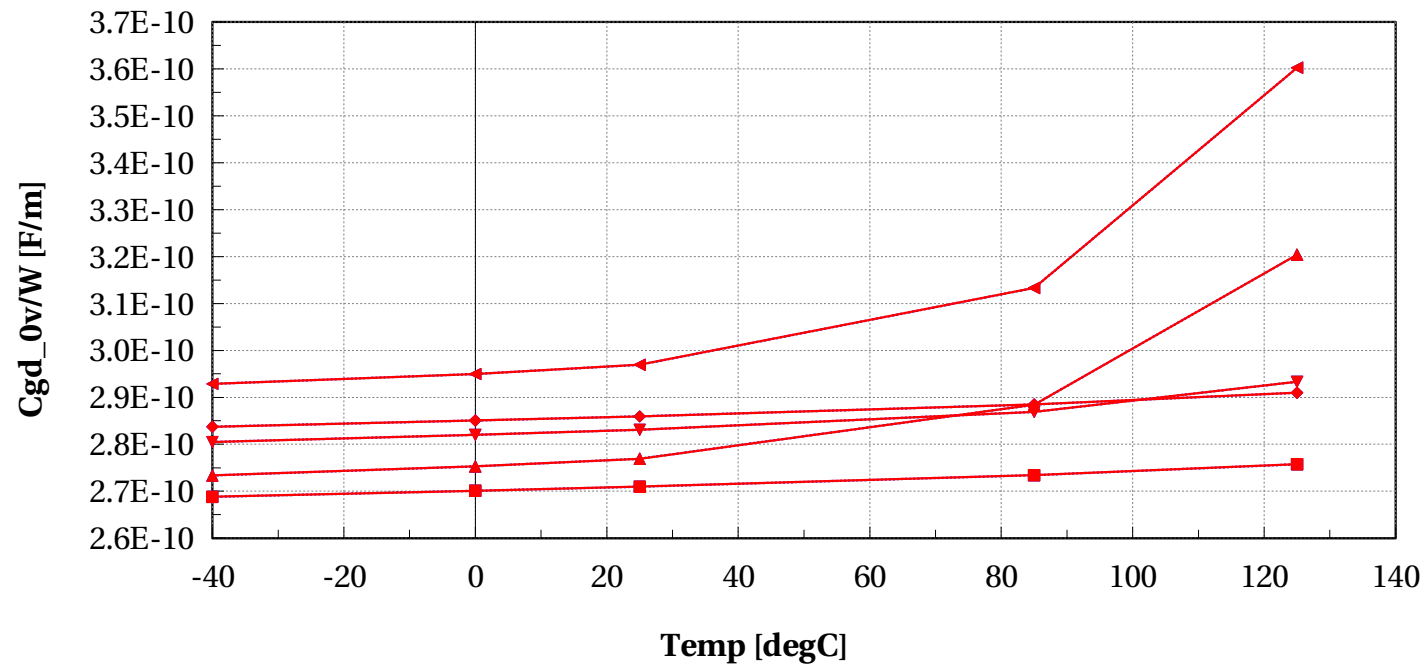
# egpfet\_acc, Gain\_c [] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



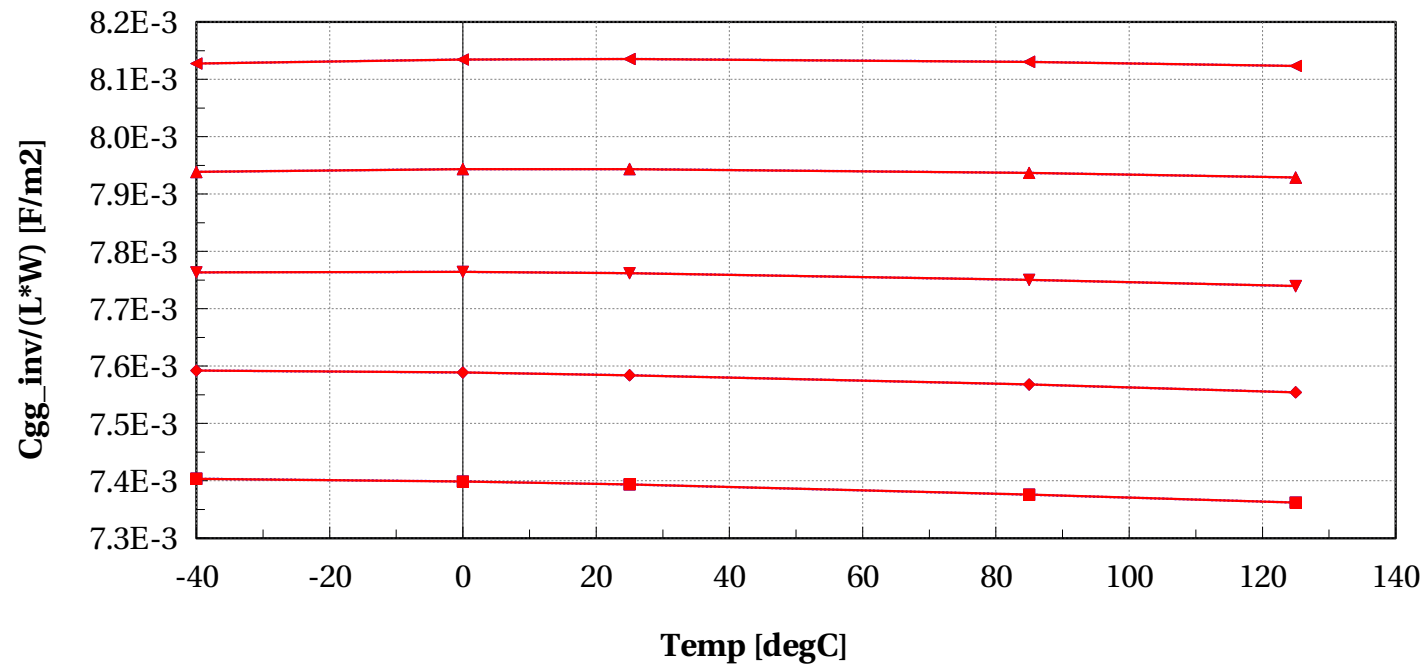
# egpfet\_acc, Cgd\_0v/W [F/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egpfet\_acc, Cgg\_inv/(L\*W) [F/m2] vs Temp [degC]

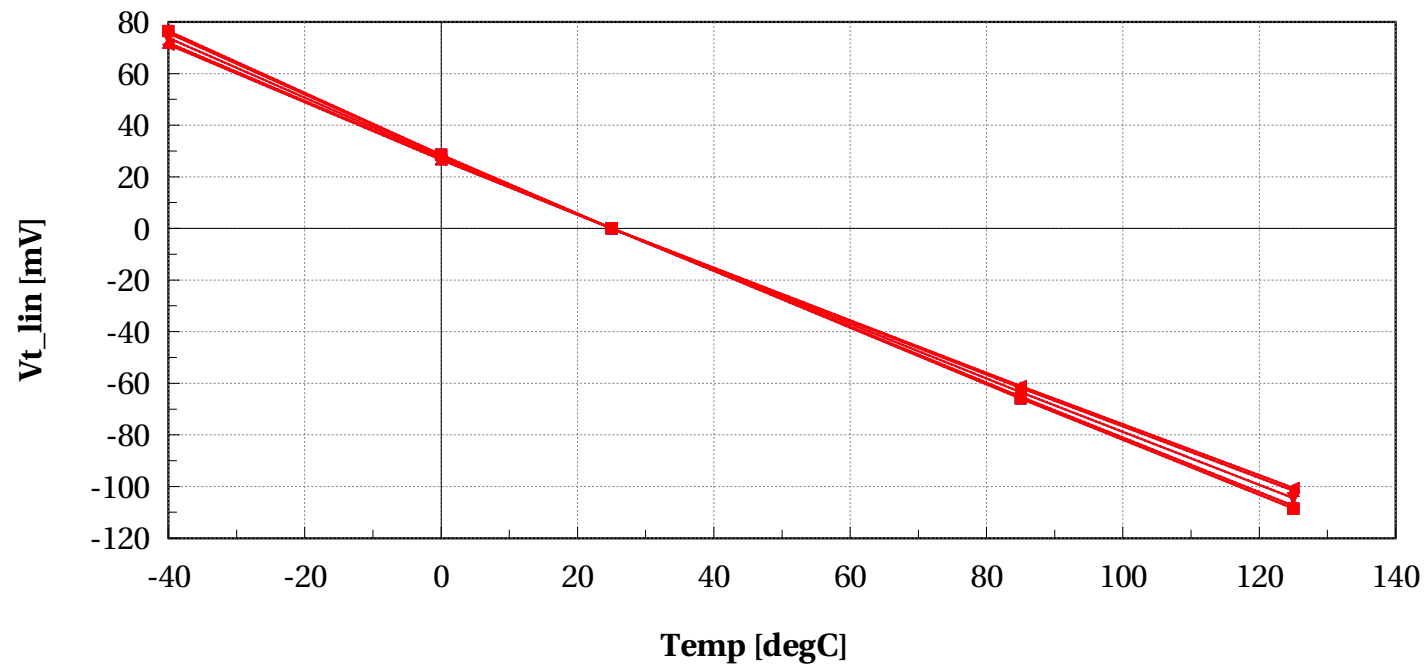
$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# Normalized scaling versus Temp @ L=2u, W=2u

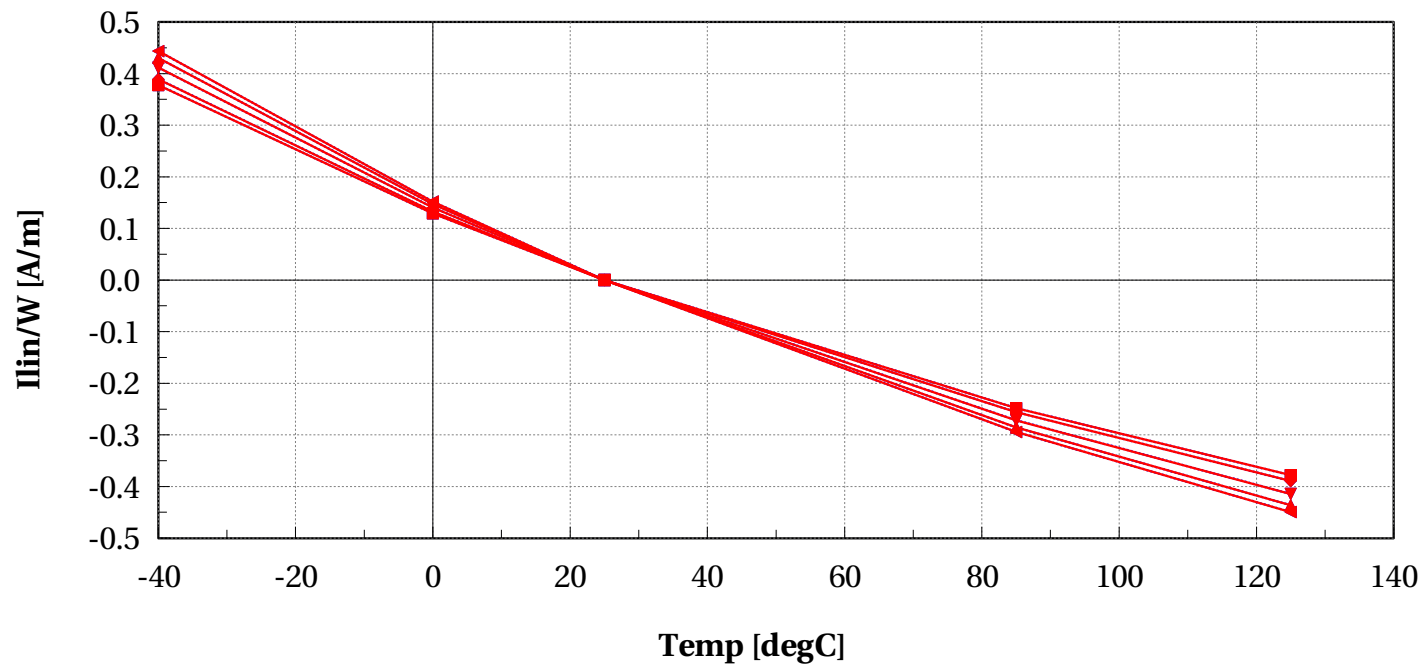
# egpfet\_acc, Vt\_lin [mV] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



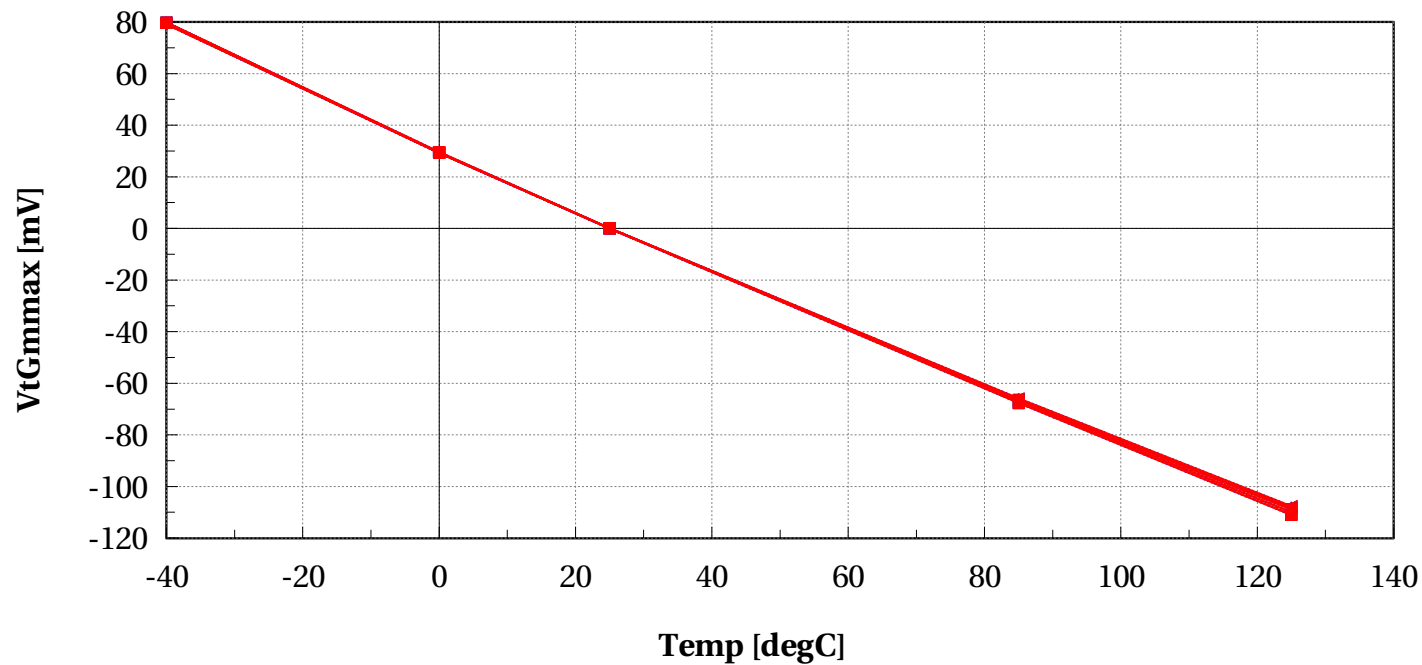
# egpfet\_acc, I<sub>lin</sub>/W [A/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egpfet\_acc, VtGmmax [mV] vs Temp [degC]

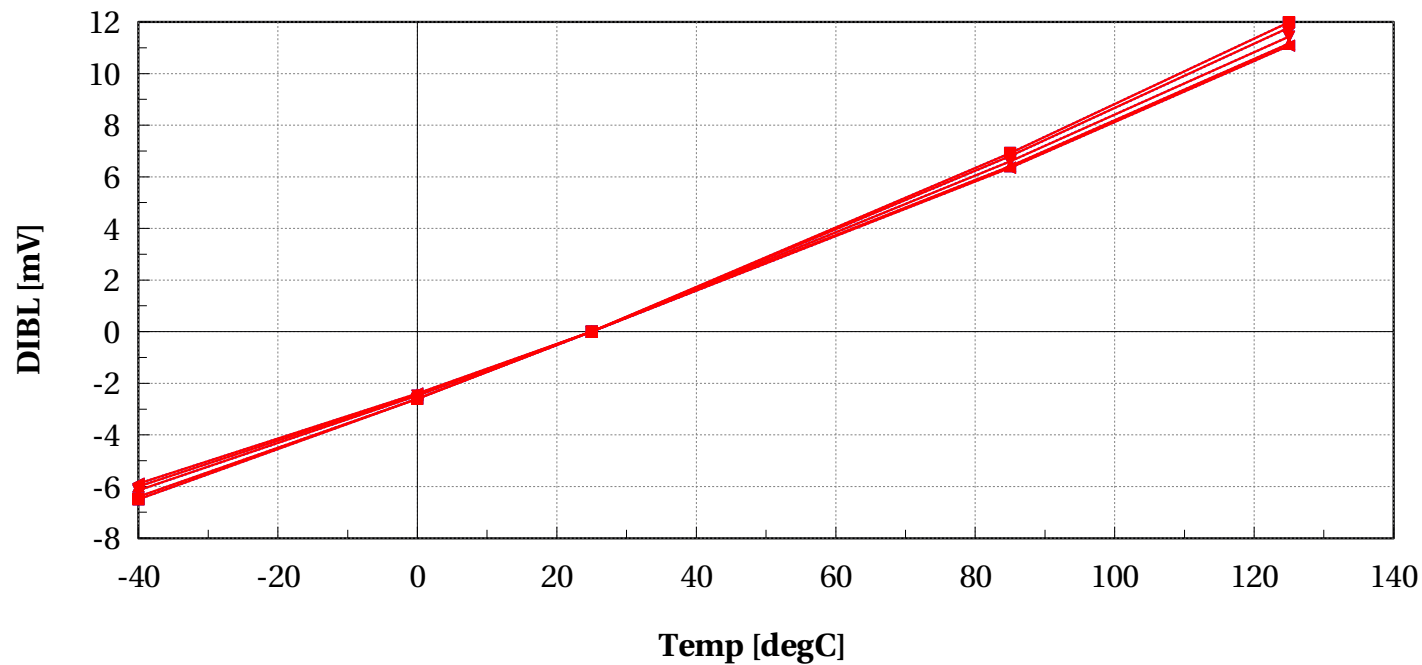
$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"





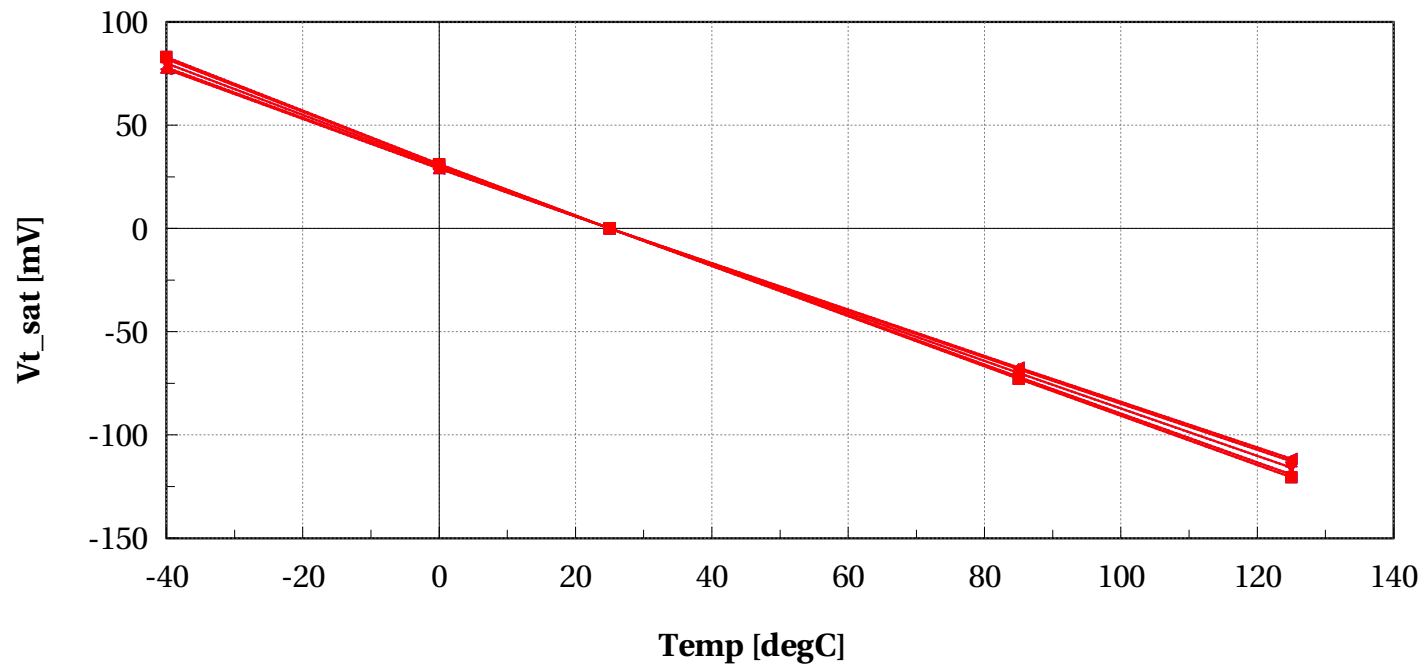
# egpfet\_acc, DIBL [mV] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



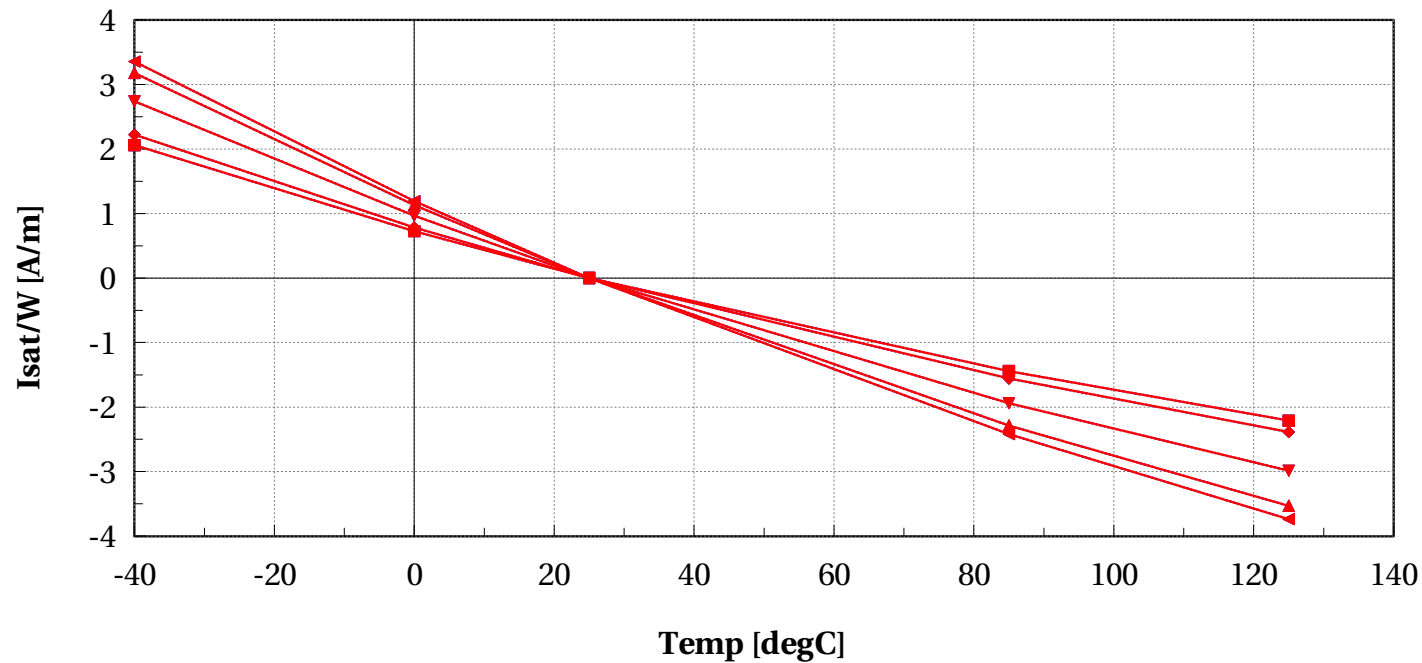
# egpfet\_acc, Vt\_sat [mV] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



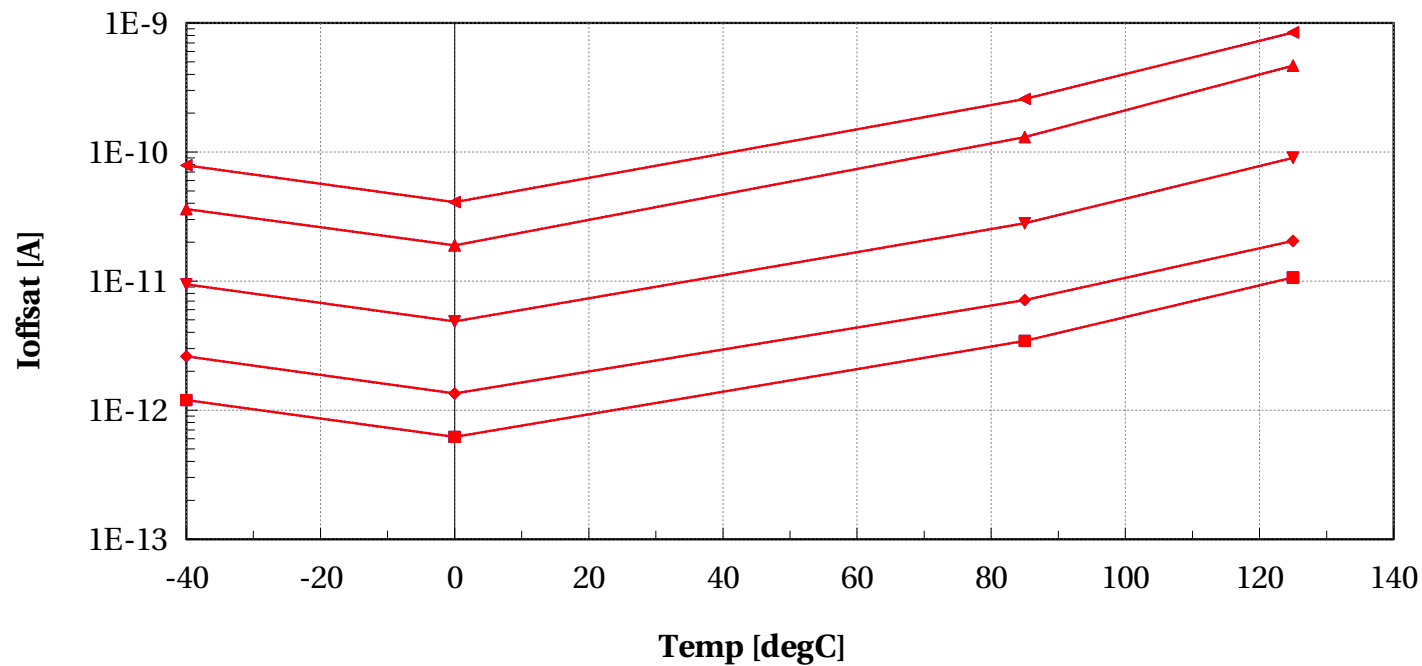
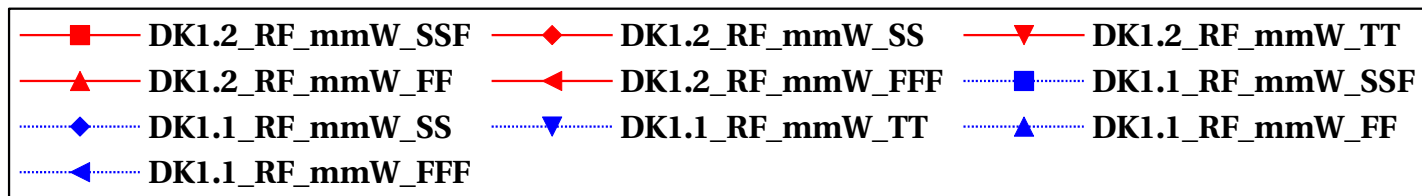
# egpfet\_acc, Isat/W [A/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



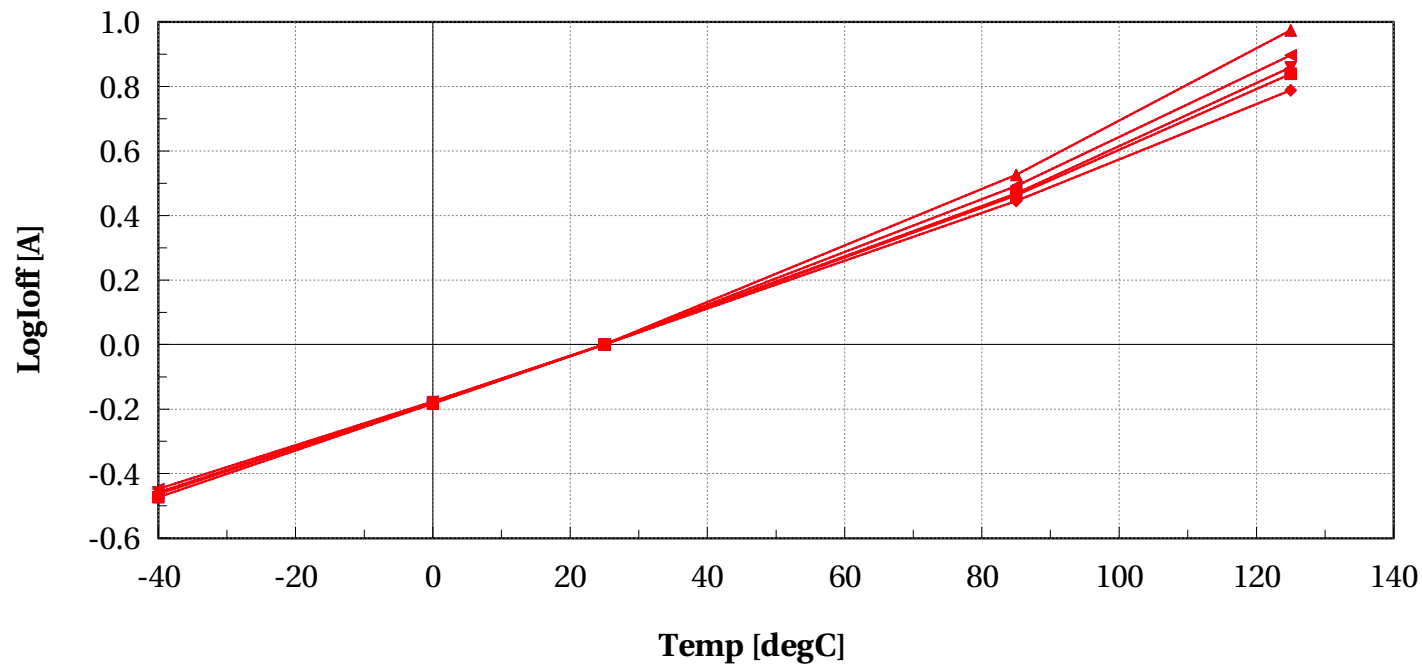
# egpfet\_acc, Ioffsat [A] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



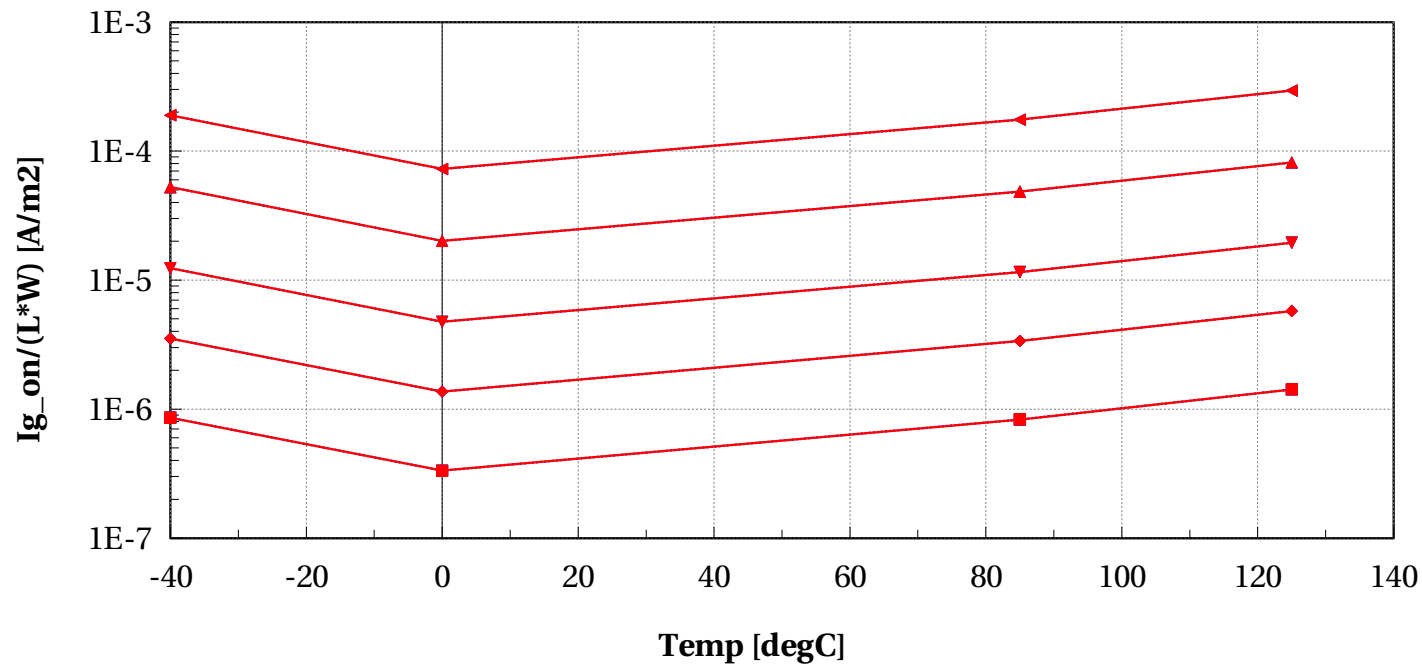
# egpfet\_acc, LogIoff [A] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



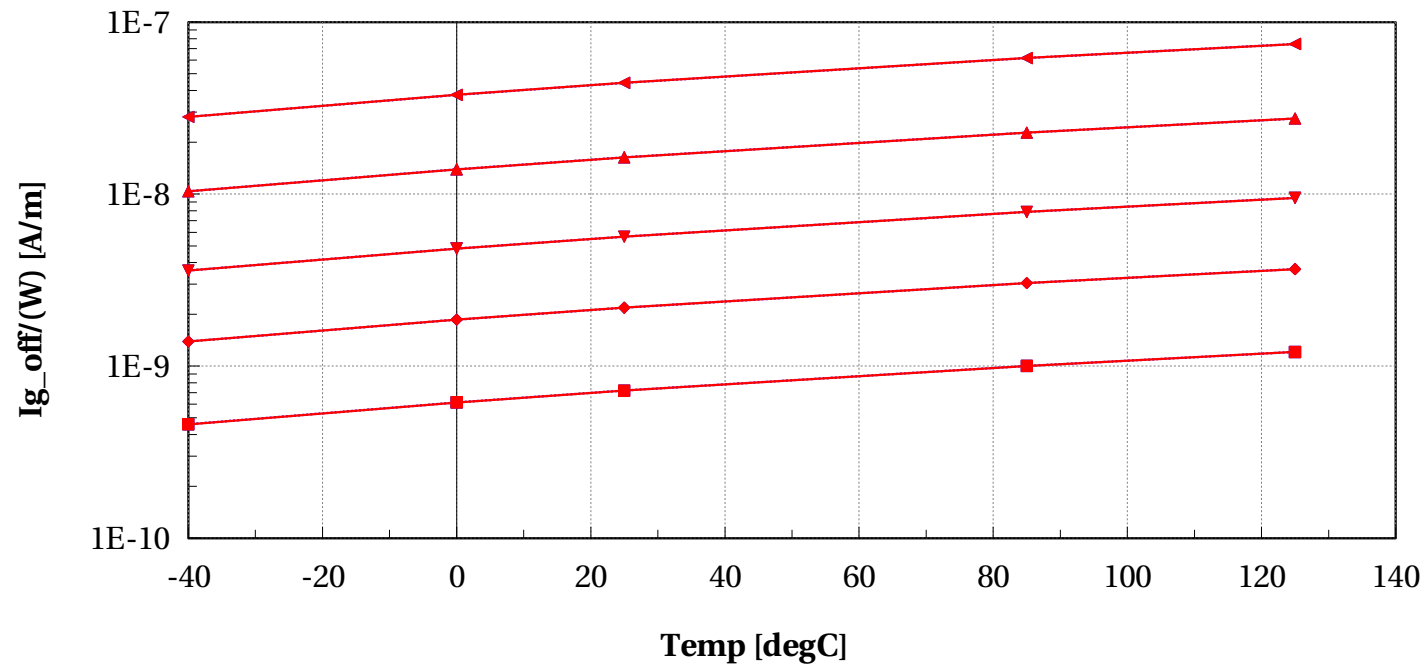
# egpfet\_acc, Ig\_on/(L\*W) [A/m2] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



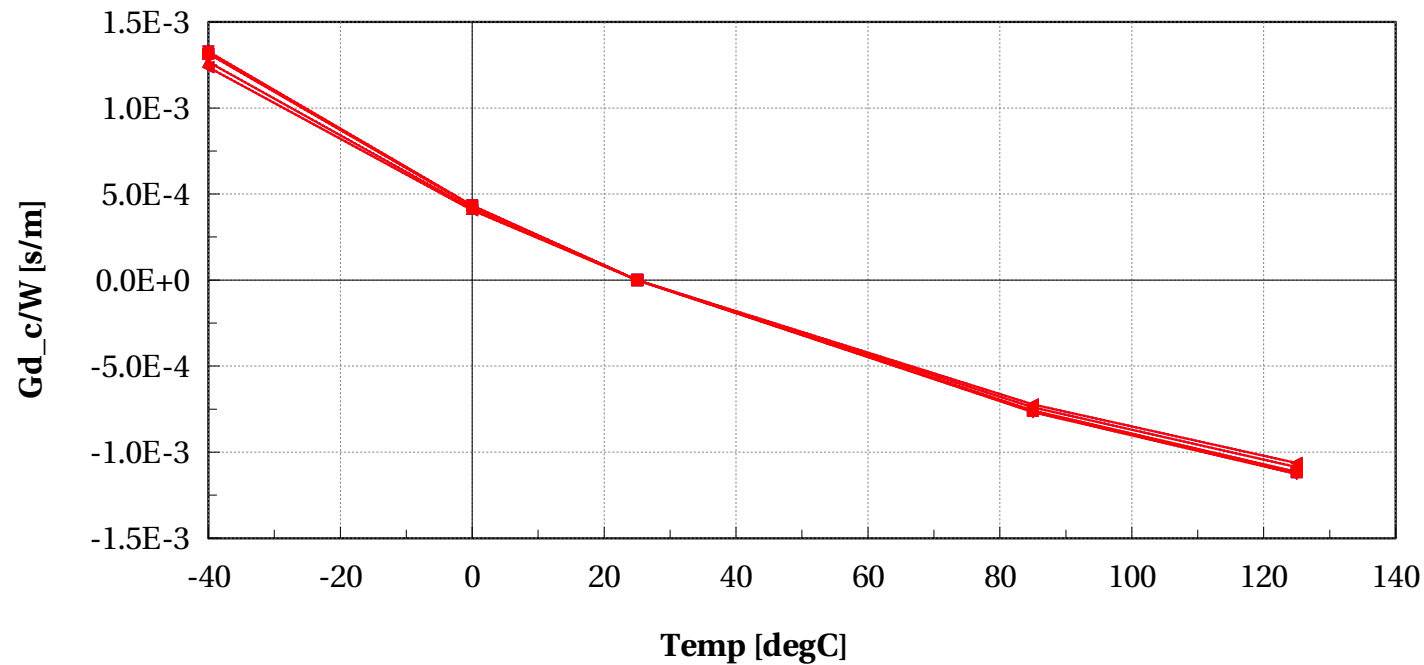
# egpfet\_acc, Ig\_off/(W) [A/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egpfet\_acc, Gd\_c/W [s/m] vs Temp [degC]

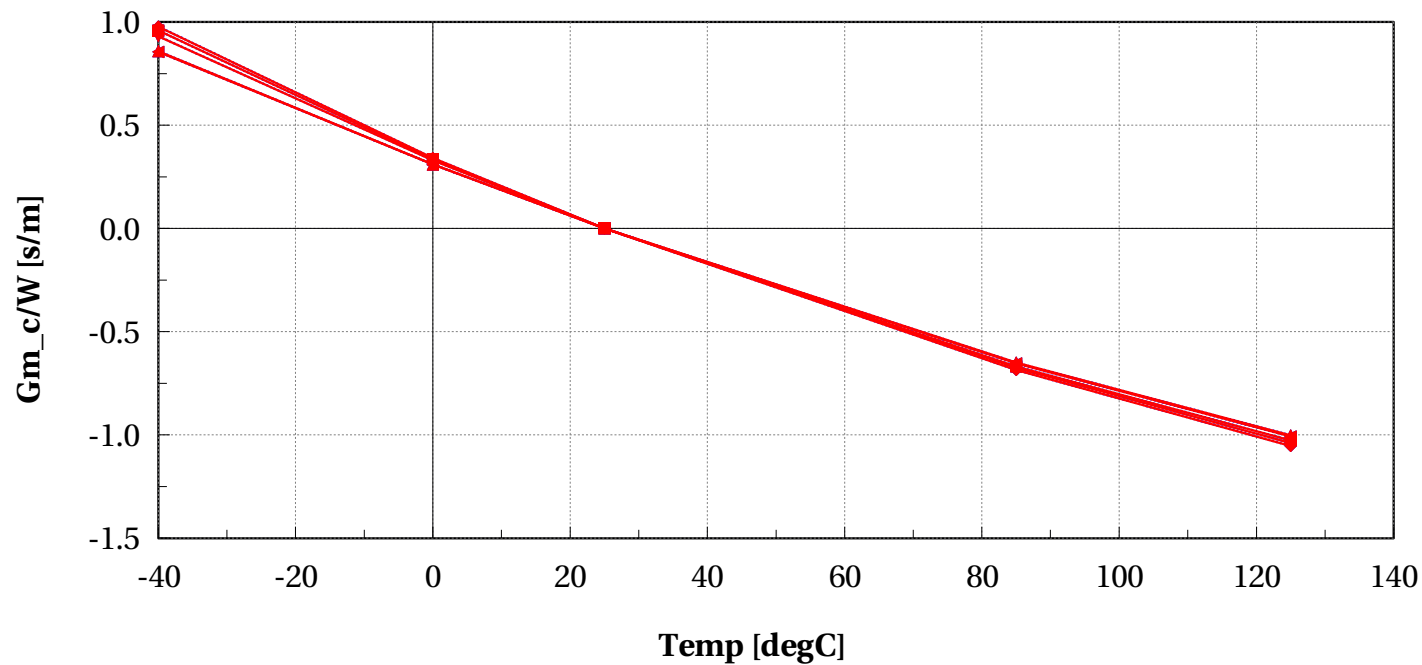
$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"





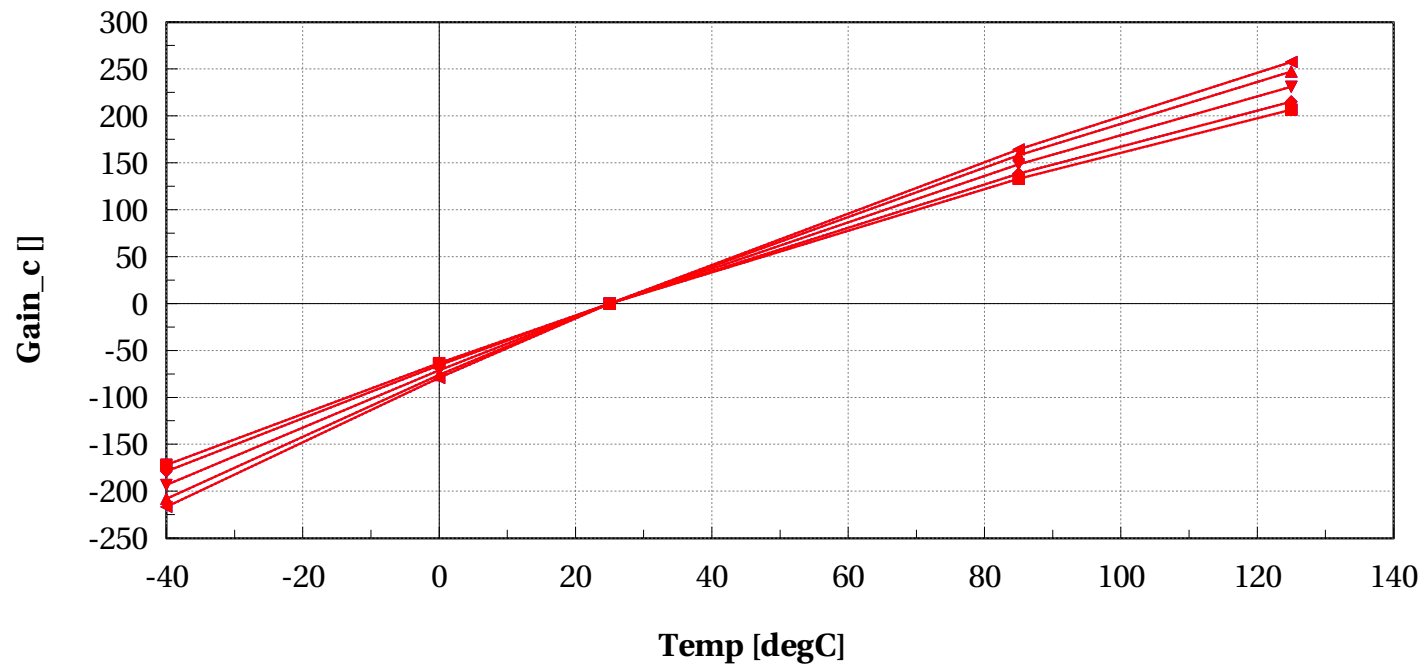
# egpfet\_acc, Gm\_c/W [s/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



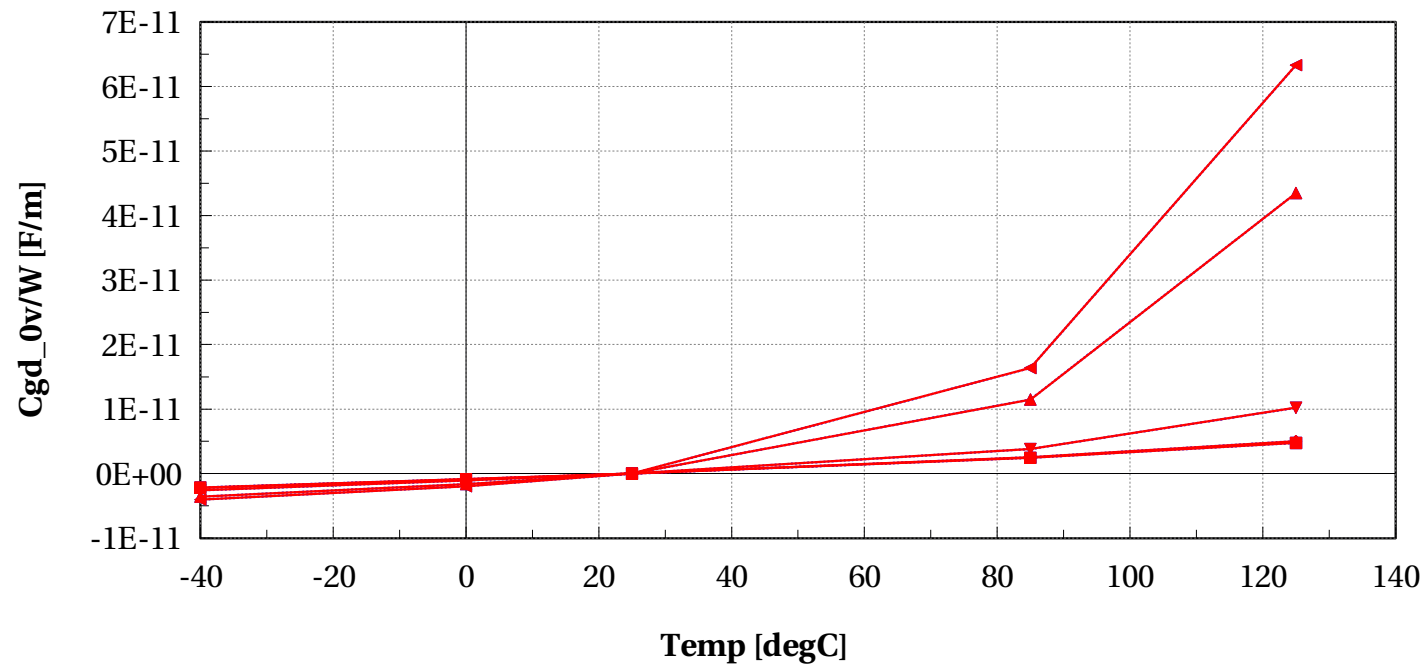
# egpfet\_acc, Gain\_c [] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



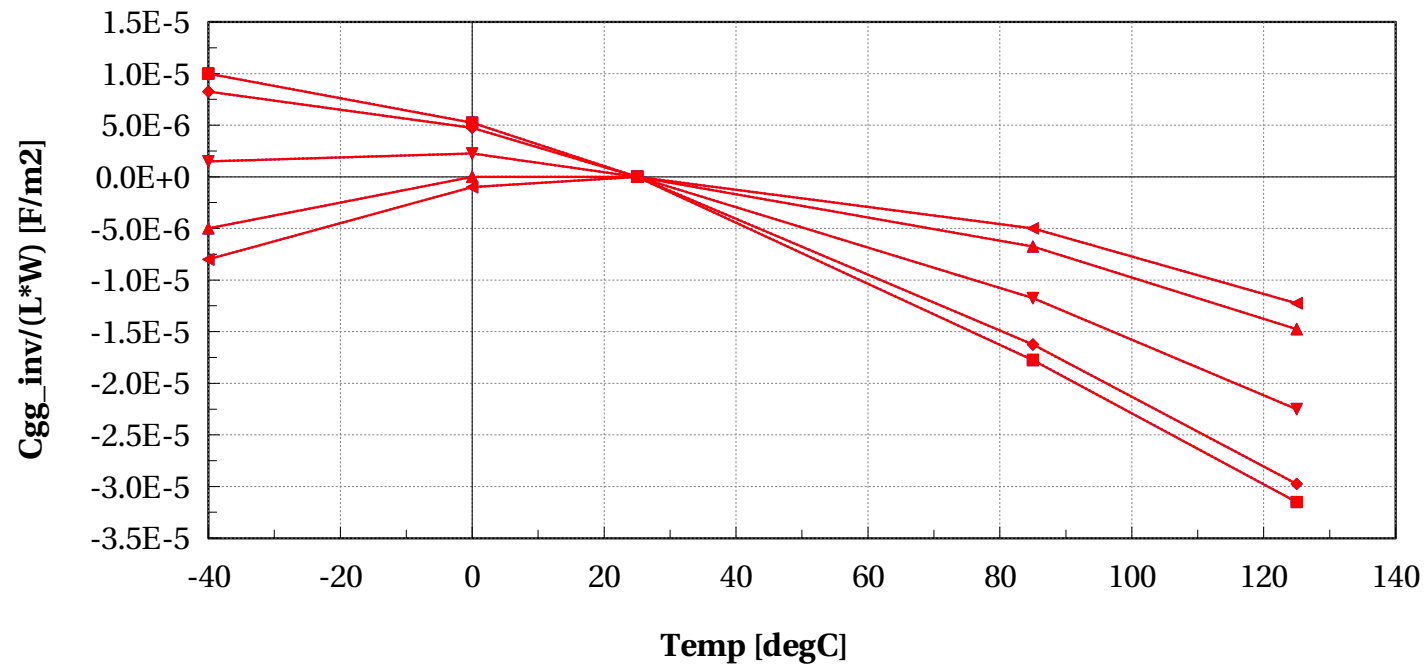
# egpfet\_acc, Cgd\_0v/W [F/m] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# egpfet\_acc, Cgg\_inv/(L\*W) [F/m2] vs Temp [degC]

$l=2e-6$  and  $w=2e-6$  and devType=="PCELLwoWPE"



# Annex

## Conditions of simulations

The simulations were done with SBenchLSF Alpha using Eldo simulator 2018.3.

- Model egfet\_acc (DK1.2\_RF\_mmW)

- ✓ Input Parameters

- ✗ vds\_off = vds\_sat V
    - ✗ vds\_cgd = 0 V
    - ✗ vds\_cgg = 0 V
    - ✗ mc\_sens = 0
    - ✗ vds\_lin = 0.05 V
    - ✗ ivt = 300e-9 A
    - ✗ model\_version = 1.2.c
    - ✗ ams\_release = 2018.3
    - ✗ vgs\_stop = vdd V
    - ✗ dlshrink\_ivt = 0
    - ✗ sbenchlsf\_release = Alpha
    - ✗ vds\_sat = Vdd V
    - ✗ mc\_nsigma = 3
    - ✗ shrink\_ivt = 1

- ✗  $\text{dlshrink\_tinv} = 0$
- ✗  $\text{vgs\_start} = -0.5 \text{ V}$
- ✗  $\text{plashrink\_ivt} = 1$
- ✗  $\text{ithslwi} = 10\text{e-}9 \text{ A}$
- ✗  $\text{vds\_cbd} = 0 \text{ V}$
- ✗  $\text{vddmax} = \text{vdd}$
- ✗  $\text{voffset} = 0.2 \text{ V}$
- ✗  $\text{mc\_runs} = 1000$
- ✗  $\text{vstep\_ivt} = 0.005 \text{ V}$
- ✗  $\text{vgs\_off} = 0 \text{ V}$
- ✗  $\text{temp} = 25 \text{ }^\circ\text{C}$
- ✗  $\text{f\_ext} = 100\text{k Hz}$
- ✗  $\text{vbs} = 0 \text{ V}$
- ✗  $\text{vdd} = 1.8 \text{ V}$
- ✗  $\text{shrink\_tinv} = 0.9$
- ✗  $\text{vds\_gmgd} = \text{Vdd}/2 \text{ V}$
- ✓ Sweep Parameters
  - ✗  $\text{temp} = -40.0, 0.0, 25.0, 85.0, 125.0$
- ✓ Extra parameters
  - ✗  $\text{eg\_dev} = 0$
  - ✗  $\text{eglvt\_dev} = 0$
  - ✗  $\text{gflag\_noisedev\_eg\_cmos028fdsoi} = 0$
  - ✗  $\text{gflag\_noisedev\_eglvt\_cmos028fdsoi} = 0$
- Model  $\text{egpfet\_acc}$  (DK1.2\_RF\_mmW)
  - ✓ Input Parameters

- ✗  $vds\_off = vds\_sat$  V
- ✗  $vds\_cgd = 0$  V
- ✗  $vds\_cgg = 0$  V
- ✗  $mc\_sens = 0$
- ✗  $vds\_lin = 0.05$  V
- ✗  $ivt = 70e-9$  A
- ✗  $model\_version = 1.2.c$
- ✗  $ams\_release = 2018.3$
- ✗  $vgs\_stop = vdd$  V
- ✗  $dlshrink\_ivt = 0$
- ✗  $sbenchlsf\_release = Alpha$
- ✗  $vds\_sat = Vdd$  V
- ✗  $mc\_nsigma = 3$
- ✗  $shrink\_ivt = 1$
- ✗  $dlshrink\_tinv = 0$
- ✗  $vgs\_start = -0.5$  V
- ✗  $plashrink\_ivt = 1$
- ✗  $ithslwi = 10e-9$  A
- ✗  $vds\_cbd = 0$  V
- ✗  $vddmax = vdd$
- ✗  $voffset = 0.2$  V
- ✗  $mc\_runs = 1000$
- ✗  $vstep\_ivt = 0.005$  V
- ✗  $vgs\_off = 0$  V
- ✗  $temp = 25$  °C



- ✗  $f_{\text{ext}} = 100\text{k Hz}$
- ✗  $v_{\text{bs}} = 0\text{ V}$
- ✗  $v_{\text{dd}} = 1.8\text{ V}$
- ✗  $\text{shrink\_tinv} = 0.9$
- ✗  $v_{\text{ds\_gm}} = V_{\text{dd}}/2\text{ V}$
- ✓ Sweep Parameters
  - ✗  $\text{temp} = -40.0, 0.0, 25.0, 85.0, 125.0$
- ✓ Extra parameters
  - ✗  $\text{eg\_dev} = 0$
  - ✗  $\text{eglv\_dev} = 0$
  - ✗  $\text{gflag\_noisedev\_eg\_cmos028fdsoi} = 0$
  - ✗  $\text{gflag\_noisedev\_eglv\_cmos028fdsoi} = 0$
- Model `egnfet_acc` (DK1.1\_RF\_mmW)
  - ✓ Input Parameters
    - ✗  $v_{\text{ds\_off}} = v_{\text{ds\_sat}}\text{ V}$
    - ✗  $v_{\text{ds\_cg}} = 0\text{ V}$
    - ✗  $v_{\text{ds\_cg}} = 0\text{ V}$
    - ✗  $\text{mc\_sens} = 0$
    - ✗  $v_{\text{ds\_lin}} = 0.05\text{ V}$
    - ✗  $i_{\text{vt}} = 300\text{e-9 A}$
    - ✗  $\text{model\_version} = 1.2.\text{b}$
    - ✗  $\text{ams\_release} = 2018.3$
    - ✗  $v_{\text{gs\_stop}} = v_{\text{dd}}\text{ V}$
    - ✗  $\text{dlshrink\_ivt} = 0$
    - ✗  $\text{sbenchlsf\_release} = \text{Alpha}$

- ✗  $v_{ds\_sat} = V_{dd}$  V
- ✗  $mc\_nsigma = 3$
- ✗  $shrink\_ivt = 1$
- ✗  $dlshrink\_tinv = 0$
- ✗  $v_{gs\_start} = -0.5$  V
- ✗  $plashrink\_ivt = 1$
- ✗  $ithslwi = 10e-9$  A
- ✗  $v_{ds\_cbd} = 0$  V
- ✗  $v_{ddmax} = v_{dd}$
- ✗  $v_{offset} = 0.2$  V
- ✗  $mc\_runs = 1000$
- ✗  $v_{step\_ivt} = 0.005$  V
- ✗  $v_{gs\_off} = 0$  V
- ✗  $temp = 25$  °C
- ✗  $f_{ext} = 100k$  Hz
- ✗  $v_{bs} = 0$  V
- ✗  $v_{dd} = 1.8$  V
- ✗  $shrink\_tinv = 0.9$
- ✗  $v_{ds\_gmgd} = V_{dd}/2$  V
- ✓ Sweep Parameters
  - ✗  $temp = -40.0, 0.0, 25.0, 85.0, 125.0$
- ✓ Extra parameters
  - ✗  $eg\_dev = 0$
  - ✗  $eglvt\_dev = 0$
  - ✗  $gflag\_noisedev\_eg\_cmos028fdsoi = 0$

- ✗ gflag\_\_noisedev\_\_eglv\_\_cmos028fdsoi = 0
- Model egpfet\_acc (DK1.1\_RF\_mmW)
  - ✓ Input Parameters
    - ✗ vds\_off = vds\_sat V
    - ✗ vds\_cgd = 0 V
    - ✗ vds\_cgg = 0 V
    - ✗ mc\_sens = 0
    - ✗ vds\_lin = 0.05 V
    - ✗ ivt = 70e-9 A
    - ✗ model\_version = 1.2.b
    - ✗ ams\_release = 2018.3
    - ✗ vgs\_stop = vdd V
    - ✗ dlshrink\_ivt = 0
    - ✗ sbenchlsf\_release = Alpha
    - ✗ vds\_sat = Vdd V
    - ✗ mc\_nsigma = 3
    - ✗ shrink\_ivt = 1
    - ✗ dlshrink\_tinv = 0
    - ✗ vgs\_start = -0.5 V
    - ✗ plashrink\_ivt = 1
    - ✗ ithslwi = 10e-9 A
    - ✗ vds\_cbd = 0 V
    - ✗ vddmax = vdd
    - ✗ voffset = 0.2 V
    - ✗ mc\_runs = 1000

- ✗  $v_{step\_ivt} = 0.005 \text{ V}$
- ✗  $v_{gs\_off} = 0 \text{ V}$
- ✗  $temp = 25 \text{ }^{\circ}\text{C}$
- ✗  $f_{ext} = 100\text{k Hz}$
- ✗  $v_{bs} = 0 \text{ V}$
- ✗  $v_{dd} = 1.8 \text{ V}$
- ✗  $shrink\_tinv = 0.9$
- ✗  $v_{ds\_gmgd} = V_{dd}/2 \text{ V}$
- ✓ Sweep Parameters
  - ✗  $temp = -40.0, 0.0, 25.0, 85.0, 125.0$
- ✓ Extra parameters
  - ✗  $eg\_dev = 0$
  - ✗  $eg_{lvt\_dev} = 0$
  - ✗  $gflag\_noisedev\_eg\_cmos028fdsoi = 0$
  - ✗  $gflag\_noisedev\_eglvt\_cmos028fdsoi = 0$