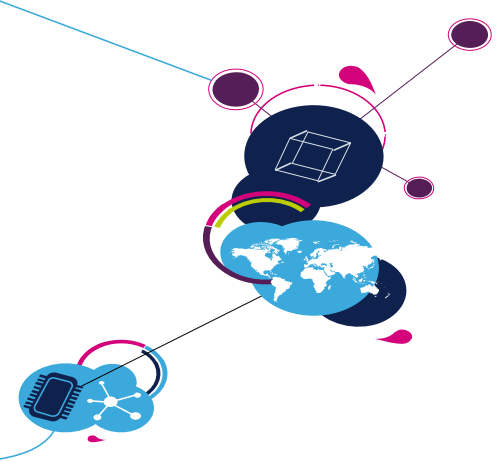
cmos028fdsoi Technology

EGLVTV models

DK1.2_RF_mmW

Comparison with DK1.1_RF_mmW model(s)



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General information on EGLVTV models

- Maximum supply voltage is 1.5 V.
- Validity domain is defined as follows:
  - ✔ Drawn gate length varies from 100nm 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): eglvtvnfet_acc, eglvtvpfet_acc
  - ✔ Gm_ana : Drain transconductance at Ids = iana*M*W/L, Vds = Vdd/4V, f = 100kHz.
  - ✔ Sv@1hz : Gate noise voltage spectral density at 1Hz, Vgs = Vgs_ana, Vds = Vdd/4V
  - ✔ Aid : delta_Id/Id * sqrt(W.L)
  - ✔ Gds_ana : Drain conductance at Ids = iana*M*W/L, Vds = Vdd/4, f = 100k
  - ✔ Vgs_ana : Vgs value for which drain current is iana*M*shrink_iana*W/(shrink_iana*L+dlshrink_iana+plashrink_iana*p_la) at Vds=Vdd/4V.
  - ✔ Avt : delta_Vt * sqrt(W.L)
  - ✔ Id_sv : Drain current at Vgs = Vgs_ana and Vds = Vdd/4V for which noise voltage and current spectral densities Sv, Si are extracted.
  - ✔ Cbd_off : Bulk-to-Drain capacitance at Vgs = 0V, Vds = 0V, f = 100kHz.
  - ✔ Cdg_ana : Drain-to-Gate transcapacitance at Ids = iana*M*W/L, Vds = Vdd/4V, f = 100kHz.
  - ✔ Ft_ana : Transition frequency at Ids = iana*M*W/L, Vds = Vdd/4V
  - ✔ Sv@th : Gate thermal noise voltage spectral density, Vgs = Vgs_ana, Vds = Vdd/4V
  - ✔ Abeta : delta_GmMax/GmMax * sqrt(w/L)
  - ✔ Cdd_ana : Total drain capacitance at Ids = iana*M*W/L, Vds = Vdd/4V, f = 100kHz.
  - ✔ Gdc_ana : Voltage gain at Ids = iana*M*W/L, Vds = Vdd/4V, f = 100kHz
  - ✔ Cgg_ana : Total gate capacitance at Ids = iana*M*W/L, Vds = Vdd/4V, f = 100kHz
  - ✔ Cgd_0v : Gate-to-Drain capacitance at Vgs = 0V, Vds = vds_cggV, f = 100kHz.
  - ✔ Vtgmmax : Threshold voltage at Vds = 0.05 derived from Gm max method.

eglvtvnfet_acc
Electrical characteristics per geometry

eglvtvnfet_acc @ w=2e-6, l=0.10e-6, swshe=0, pre_layout_local=1, nf=2, sa=1.2e-07, sb=1.2e-07, sd=1.4e-07, devtype=PCELLwoWPE, as=1.2e-13, ad=1.2e-13, ps=2.24e-06, pd=2.24e-06, vbs=0, vdd=1.5, temp=25

DK1.2_RF_mmW wrt DK1.1_RF_mmW

	SSF	TT	FFF
VtGmmax [mV]	401.7 0.0mV	351.3 0.0mV	301.9 0.0mV
Vgs_ana [mV]	637.4 0.0mV	562.7 0.0mV	492.9 0.0mV
GDC_ana []	24.1 0.0%	26.77 0.0%	28.83 0.0%
GBW_QS [GHz]	149.1 0.0%	162.7 0.0%	173.1 0.0%
Ft_ana [GHz]	60.99 0.0%	65.63 0.0%	70.14 0.0%
Gm_ana [µS]	707.6 0.0%	771.8 0.0%	837.7 0.0%
Gds_ana [µS]	29.37 0.0%	28.83 0.0%	29.05 0.0%
Cgg_ana [fF]	1.85 0.0%	1.87 0.0%	1.9 0.0%
Cdg_ana [fF]	1.09 0.0%	1.06 0.0%	1.09 0.0%
Cdd_ana [aF]	751 0.0%	751.6 0.0%	766.9 0.0%
Avt [mV.µm]	1.77 -0.9%	1.73 -0.9%	1.72 -0.8%
Abeta [%.µm]	0.63 1.3%	0.52 1.2%	0.44 1.1%
AId [%.µm]	0.56 1.2%	0.47 1.1%	0.41 1.0%
Sv@1Hz [V/√Hz]	5.77e-06 0.0%	3.23e-05 0.0%	1.84e-04 0.0%
Sv@th [V/√Hz]	4.84e-09 0.0%	4.56e-09 0.0%	4.35e-09 0.0%

eglvtvnfet_acc @ w=2e-6, l=2.0e-6, swshe=0, pre_layout_local=1, nf=2, sa=1.2e-07, sb=1.2e-07, sd=1.4e-07, devtype=PCELLwoWPE, as=1.2e-13, ad=1.2e-13, ps=2.24e-06, pd=2.24e-06, vbs=0, vdd=1.5, temp=25

DK1.2_RF_mmW wrt DK1.1_RF_mmW

	SSF	TT	FFF
VtGmmax [mV]	436.1 0.0mV	398.4 0.0mV	359.9 0.0mV
Vgs_ana [mV]	599.4 0.0mV	555.2 0.0mV	510.3 0.0mV
GDC_ana []	472.1 0.0%	452.4 0.0%	436 0.0%
GBW_QS [GHz]	13.42 0.0%	13.55 0.0%	13.67 0.0%
Ft_ana [GHz]	0.43 0.0%	0.44 0.0%	0.44 0.0%
Gm_ana [µS]	49.05 0.0%	50.75 0.0%	52.39 0.0%
Gds_ana [nS]	103.9 0.0%	112.2 0.0%	120.2 0.0%
Cgg_ana [fF]	18.09 0.0%	18.43 0.0%	18.9 0.0%
Cdg_ana [fF]	6.8 0.0%	6.95 0.0%	7.16 0.0%
Cdd_ana [aF]	582.2 0.0%	596.2 0.0%	610.4 0.0%
Avt [mV.µm]	3.89 -0.3%	3.71 -0.3%	3.62 -0.3%
Abeta [%.µm]	0.92 0.3%	0.89 0.3%	0.86 0.3%
AId [%.µm]	0.88 0.1%	0.85 0.2%	0.83 0.2%
Sv@1Hz [V/√Hz]	2.91e-06 0.0%	5.32e-06 0.0%	9.57e-06 0.0%
Sv@th [V/√Hz]	1.49e-08 0.0%	1.46e-08 0.0%	1.43e-08 0.0%

eglvtvpfet_acc
Electrical characteristics per geometry

eglvtvpfet_acc @ w=2e-6, l=0.10e-6, swshe=0, pre_layout_local=1, nf=2, sa=1.2e-07, sb=1.2e-07, sd=1.4e-07, devtype=PCELLwoWPE, as=1.2e-13, ad=1.2e-13, ps=2.24e-06, pd=2.24e-06, vbs=1.5, vdd=1.5, temp=25

DK1.2_RF_mmW wrt DK1.1_RF_mmW

	SSF	TT	FFF
VtGmmax [mV]	389 0.0mV	334.7 0.0mV	278.6 0.0mV
Vgs_ana [mV]	677.9 0.0mV	583.3 0.0mV	498 0.0mV
GDC_ana []	11.18 0.0%	13.31 0.0%	14.65 0.0%
GBW_QS [GHz]	56.47 0.0%	65.55 0.0%	70.82 0.0%
Ft_ana [GHz]	23.2 0.0%	26.31 0.0%	28.79 0.0%
Gm_ana [µS]	233.5 0.0%	264 0.0%	288.8 0.0%
Gds_ana [µS]	20.88 0.0%	19.83 0.0%	19.71 0.0%
Cgg_ana [fF]	1.6 0.0%	1.6 0.0%	1.6 0.0%
Cdg_ana [aF]	868.3 0.0%	804.1 0.0%	809.4 0.0%
Cdd_ana [aF]	652.7 0.0%	639.2 0.0%	647 0.0%
Avt [mV.µm]	2.36 -0.9%	2.3 -0.9%	2.27 -0.9%
Abeta [%.µm]	0.68 1.1%	0.57 0.8%	0.5 0.3%
AId [%.µm]	0.69 0.9%	0.56 0.8%	0.48 0.6%
Sv@1Hz [V/√Hz]	6.1e-06 0.0%	2.18e-05 0.0%	8.06e-05 0.0%
Sv@th [V/√Hz]	8.08e-09 0.0%	7.38e-09 0.0%	7.05e-09 0.0%

eglvtvpfet_acc @ w=2e-6, l=2.0e-6, swshe=0, pre_layout_local=1, nf=2, sa=1.2e-07, sb=1.2e-07, sd=1.4e-07, devtype=PCELLwoWPE, as=1.2e-13, ad=1.2e-13, ps=2.24e-06, pd=2.24e-06, vbs=1.5, vdd=1.5, temp=25

DK1.2_RF_mmW wrt DK1.1_RF_mmW

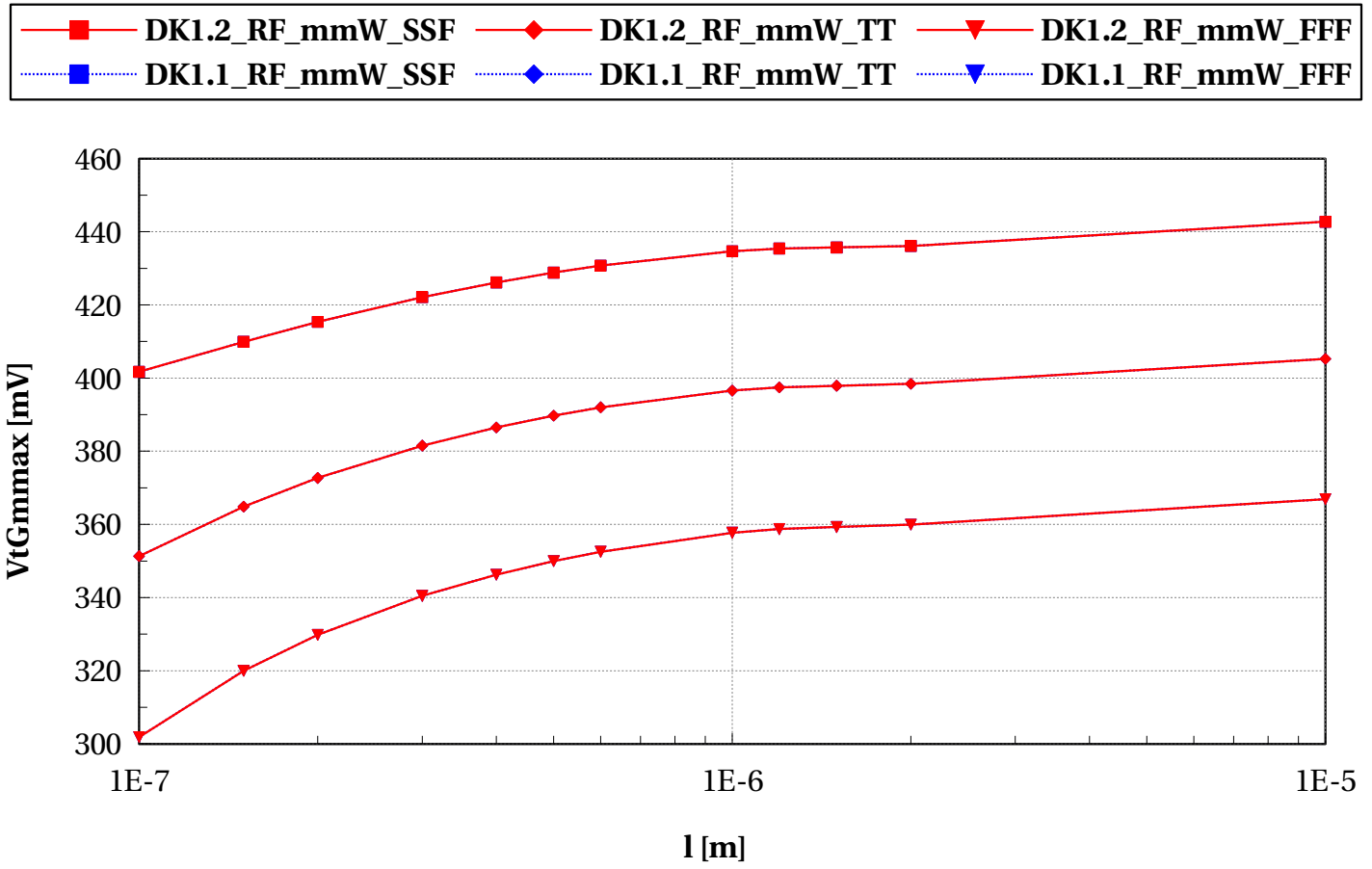
	SSF	TT	FFF
VtGmmax [mV]	410.2 0.0mV	375.5 0.0mV	340.5 0.0mV
Vgs_ana [mV]	584.1 0.0mV	542.2 0.0mV	500.3 0.0mV
GDC_ana []	258.1 0.0%	233.7 0.0%	213 0.0%
GBW_QS [GHz]	5.55 0.0%	5.53 0.0%	5.48 0.0%
Ft_ana [GHz]	0.17 0.0%	0.17 0.0%	0.17 0.0%
Gm_ana [µS]	17.41 0.0%	17.72 0.0%	17.96 0.0%
Gds_ana [nS]	67.45 0.0%	75.8 0.0%	84.32 0.0%
Cgg_ana [fF]	16.56 0.0%	16.58 0.0%	16.57 0.0%
Cdg_ana [fF]	6.32 0.0%	6.32 0.0%	6.32 0.0%
Cdd_ana [aF]	499.3 0.0%	510.5 0.0%	522.3 0.0%
Avt [mV.µm]	5.23 -0.3%	5 -0.3%	4.87 -0.3%
Abeta [%.µm]	0.91 0.2%	0.94 0.4%	0.97 0.4%
AId [%.µm]	0.91 0.3%	0.9 0.4%	0.9 0.5%
Sv@1Hz [V/√Hz]	3.26e-06 0.0%	5.7e-06 0.0%	9.96e-06 0.0%
Sv@th [V/√Hz]	2.58e-08 0.0%	2.55e-08 0.0%	2.52e-08 0.0%

eglvtvnfet_acc
Electrical characteristics scaling

Scaling versus Length (T=25C,vbs=0V)

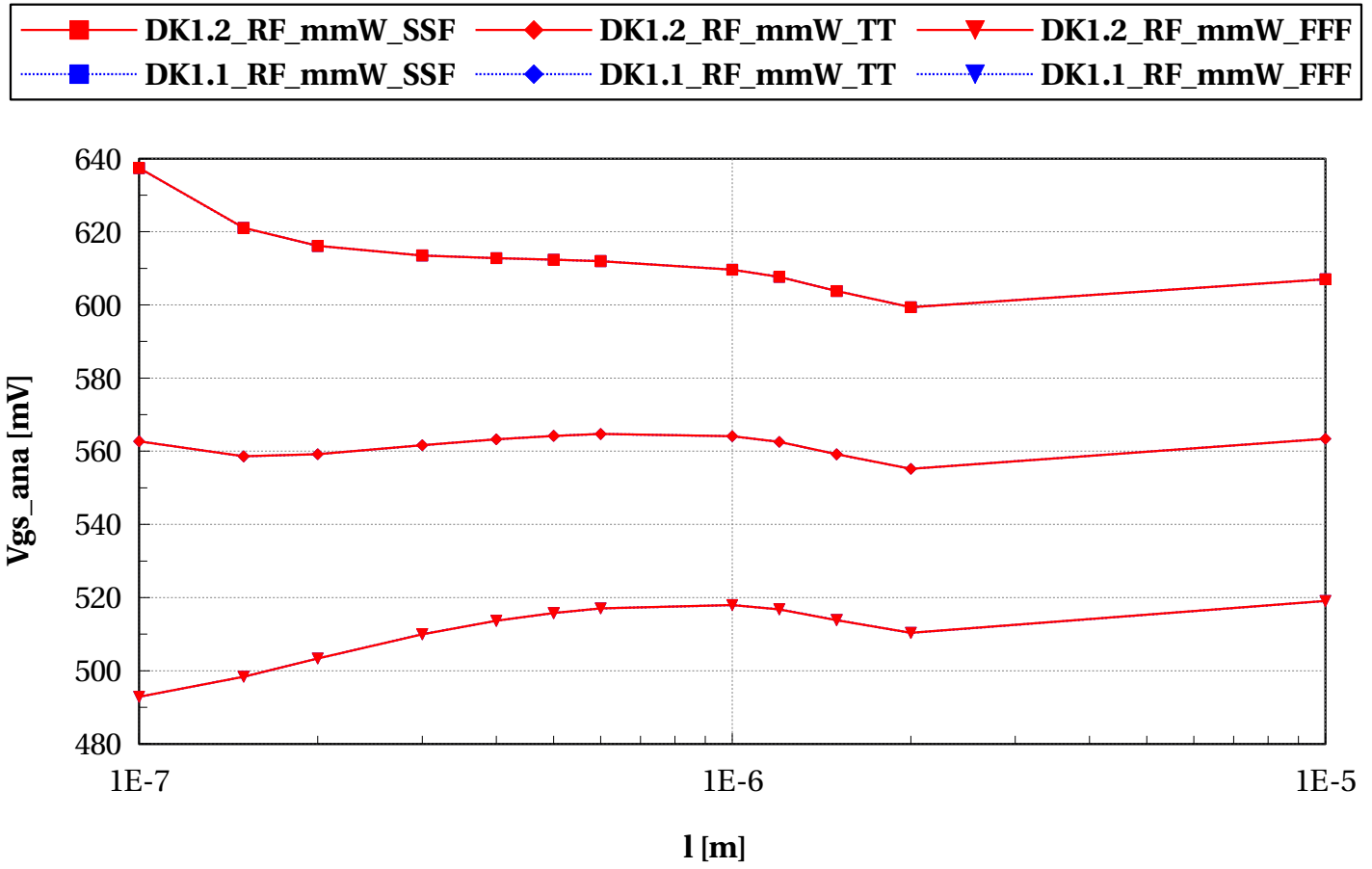
eglvtvnfet_acc, VtGmmax [mV] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



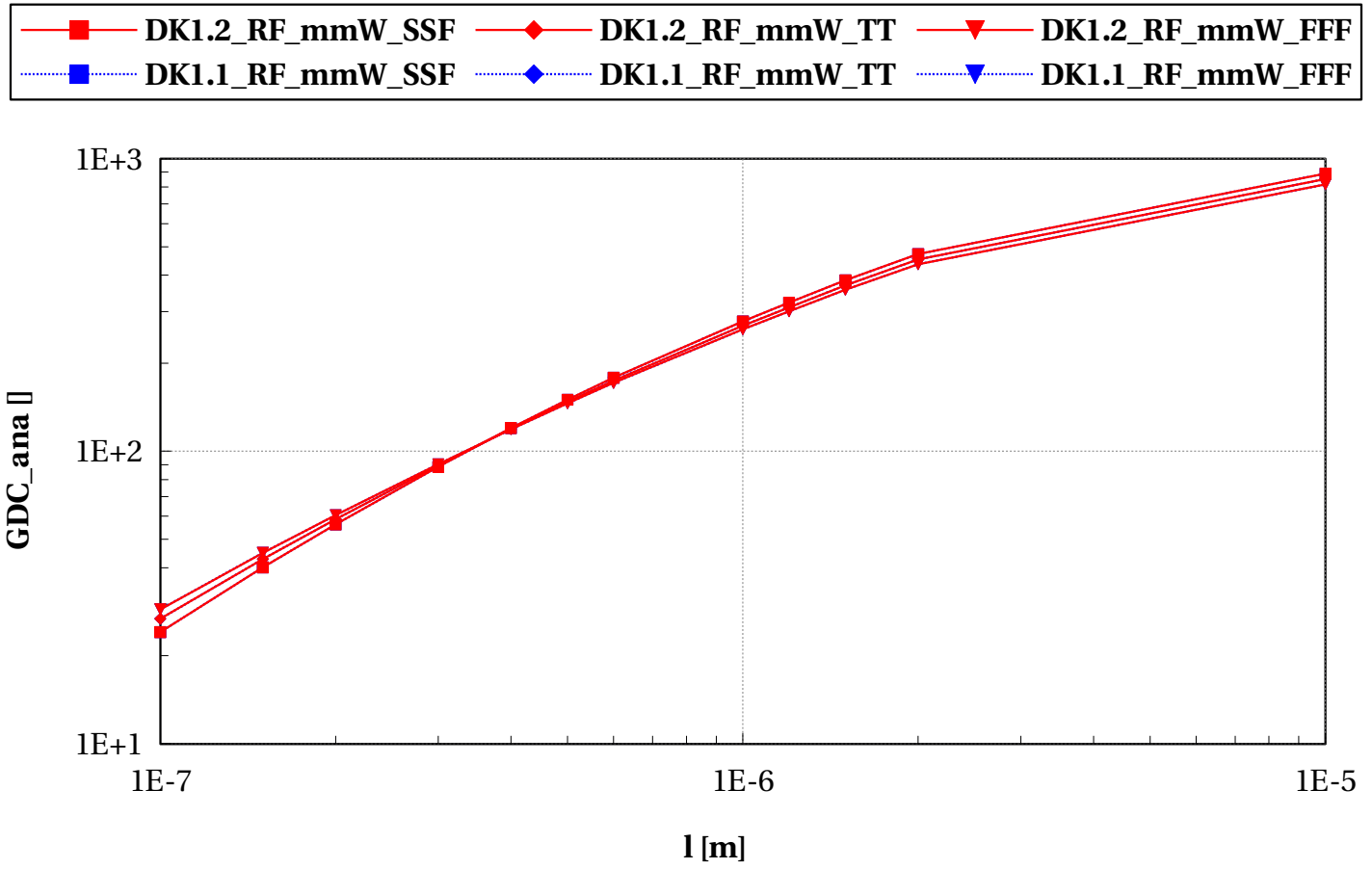
eglvtvnfet_acc, Vgs_ana [mV] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



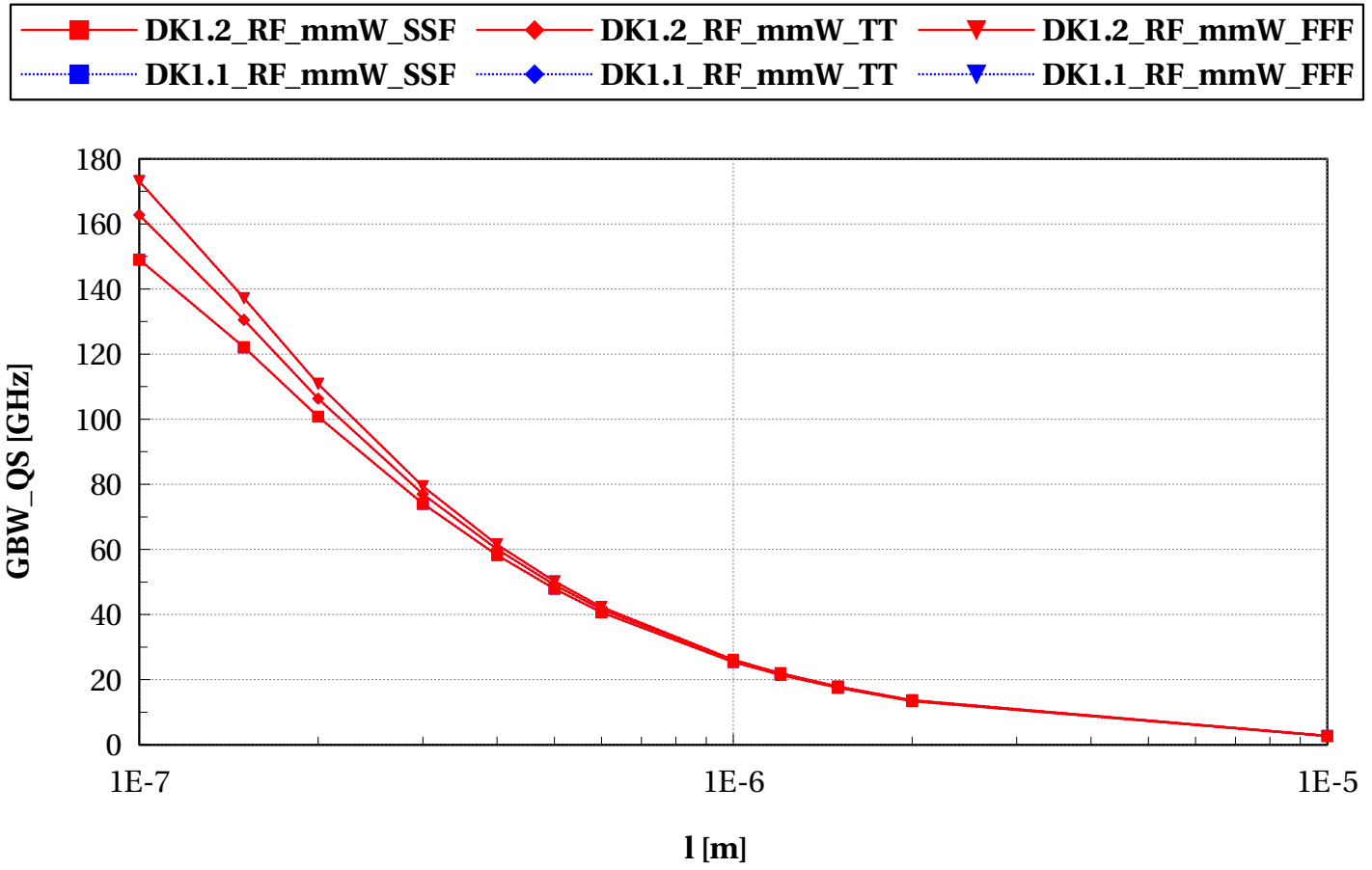
eglvtvnfet_acc, GDC_ana [] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



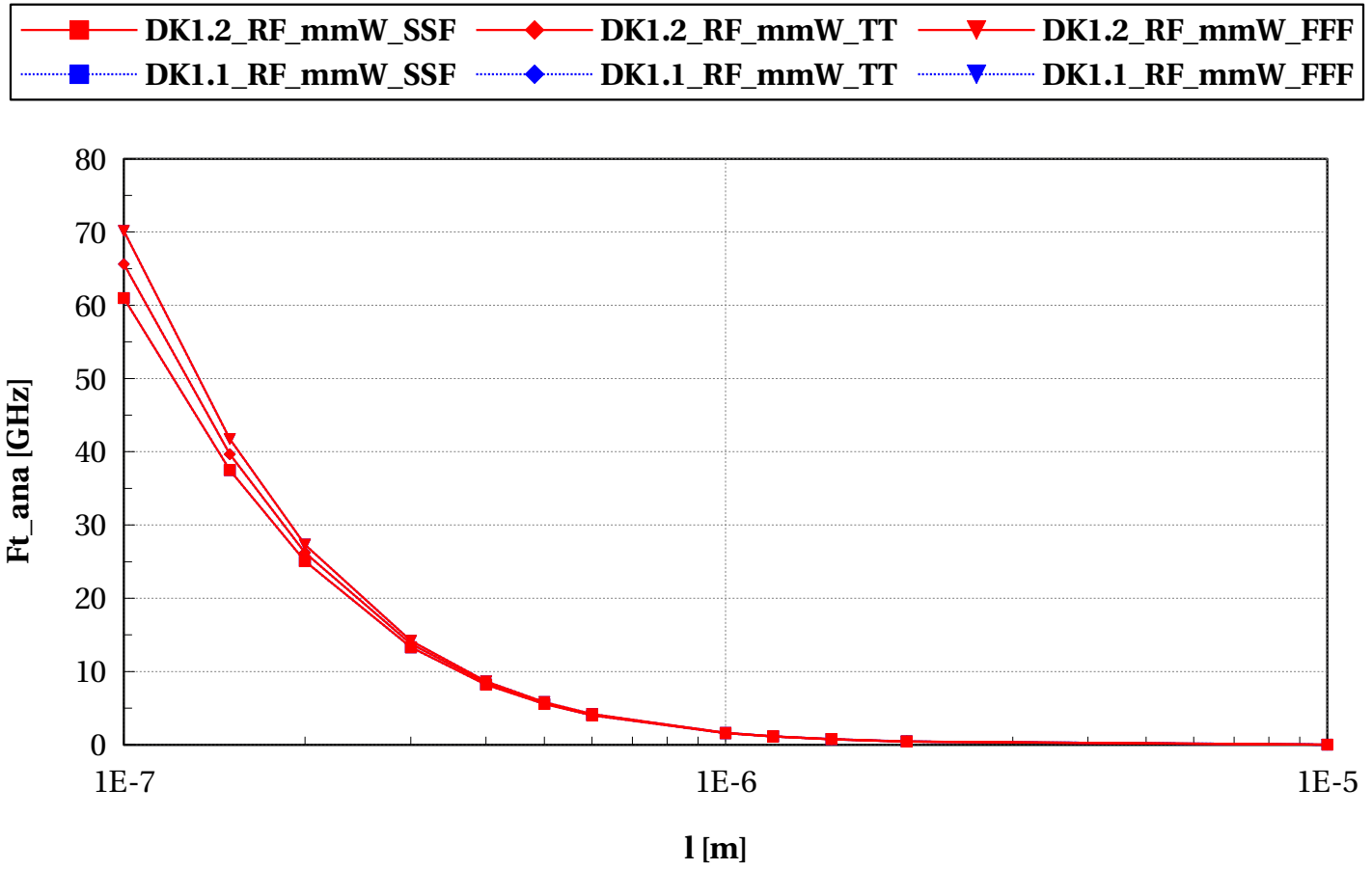
eglvtvnfet_acc, GBW_QS [GHz] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



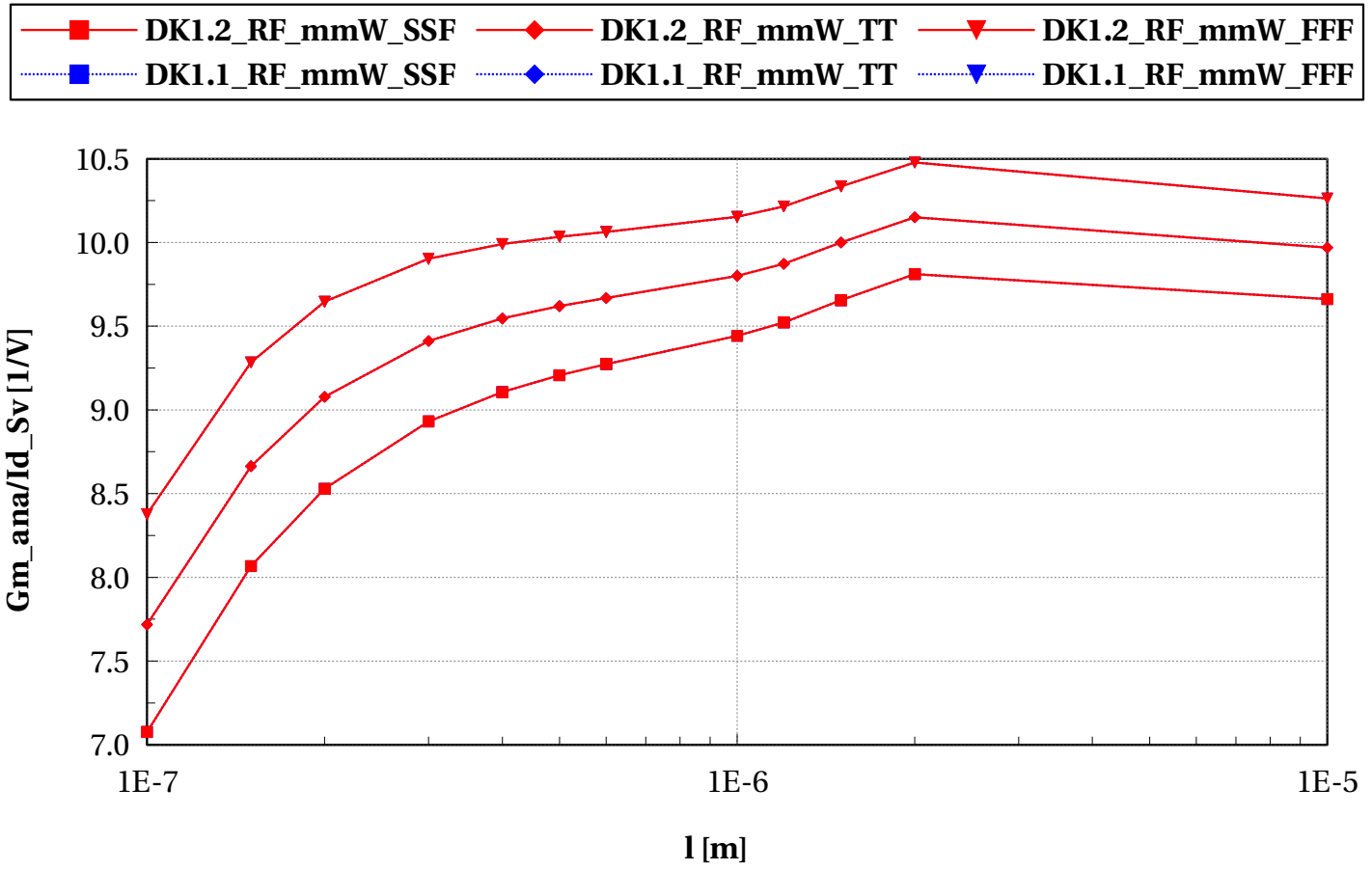
eglvtvnfet_acc, Ft_ana [GHz] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



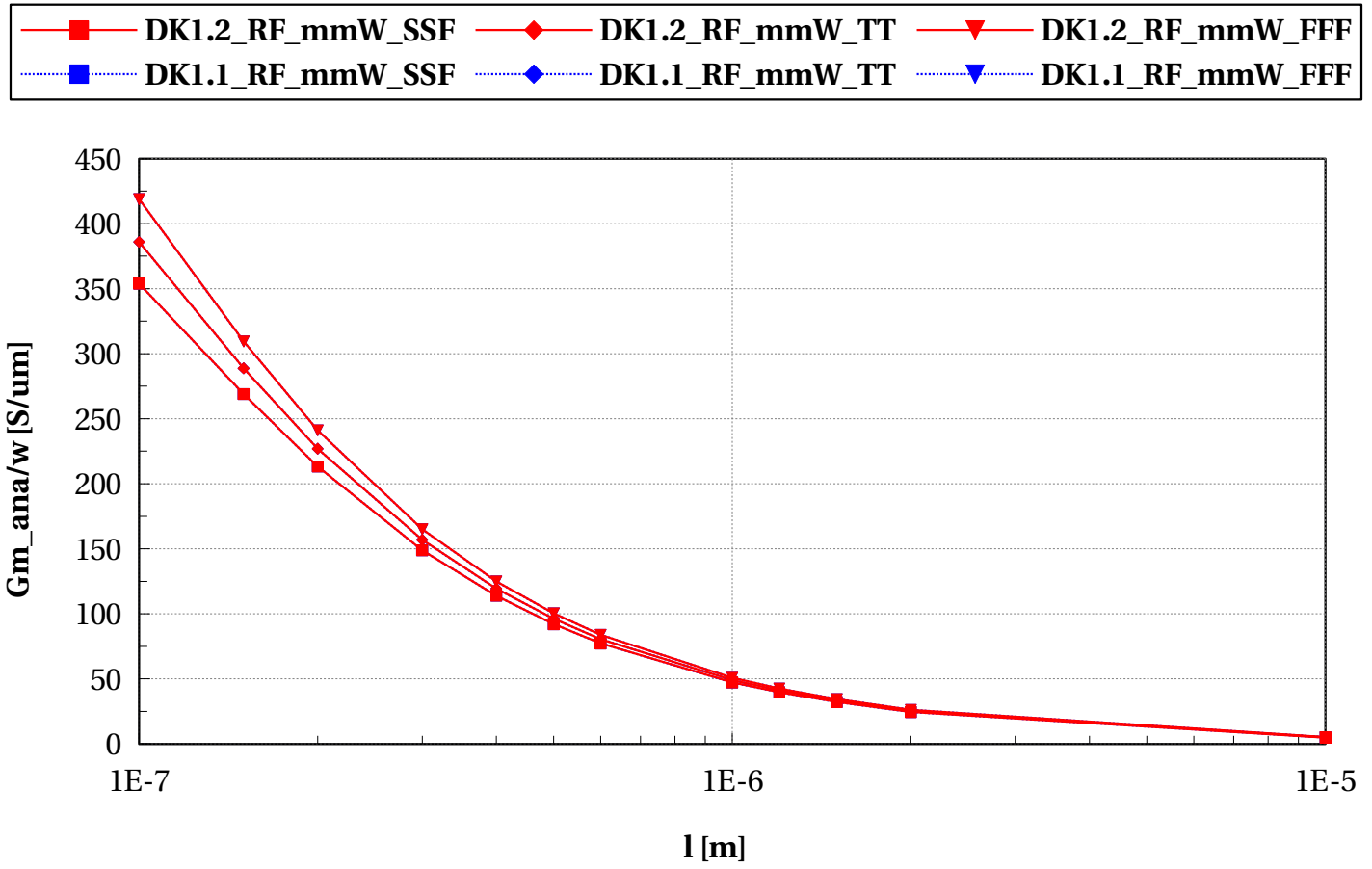
eglvtvnfet_acc, Gm_ana/Id_Sv [1/V] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



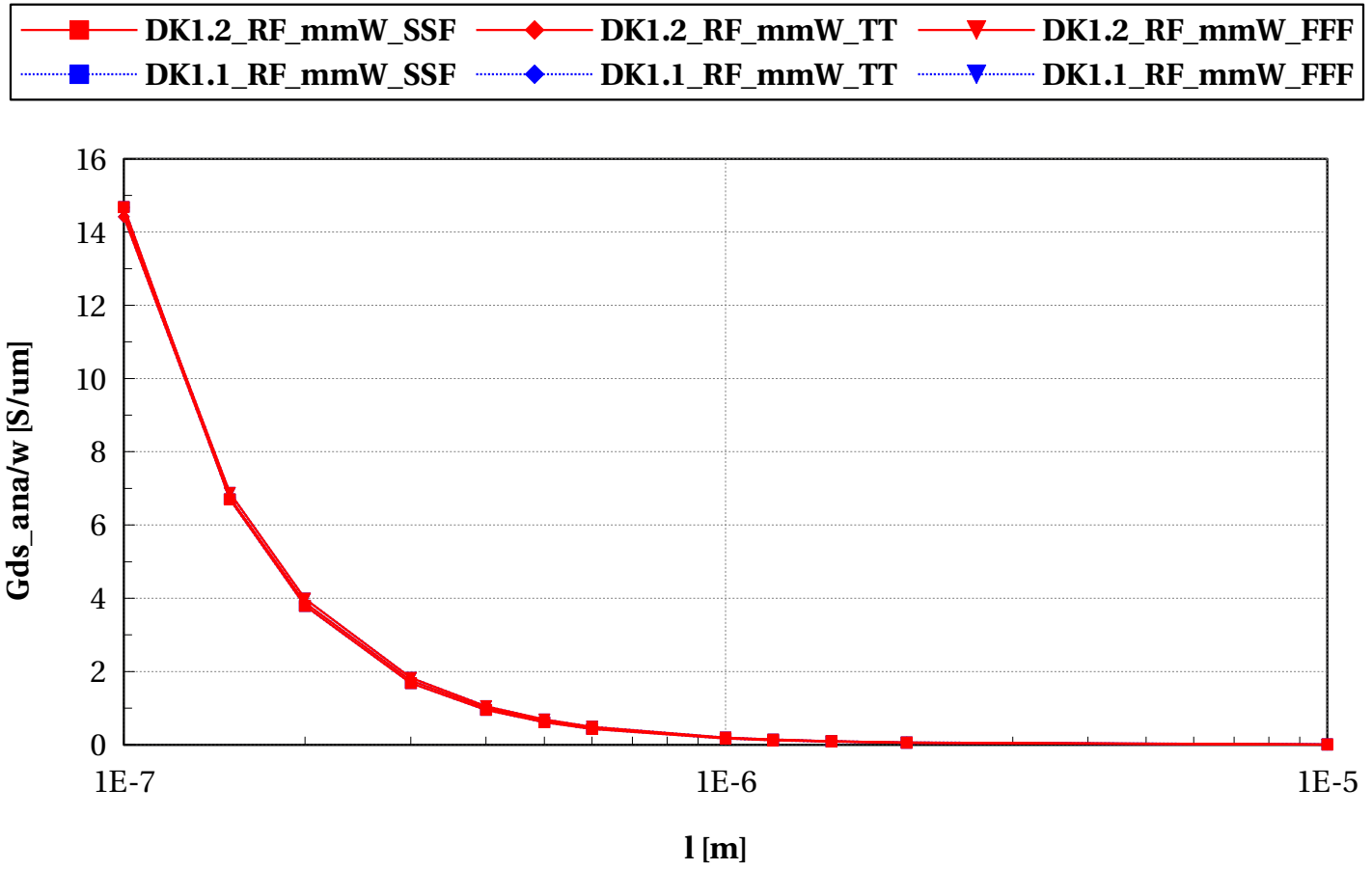
eglvtvnfet_acc, Gm_ana/w [S/um] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



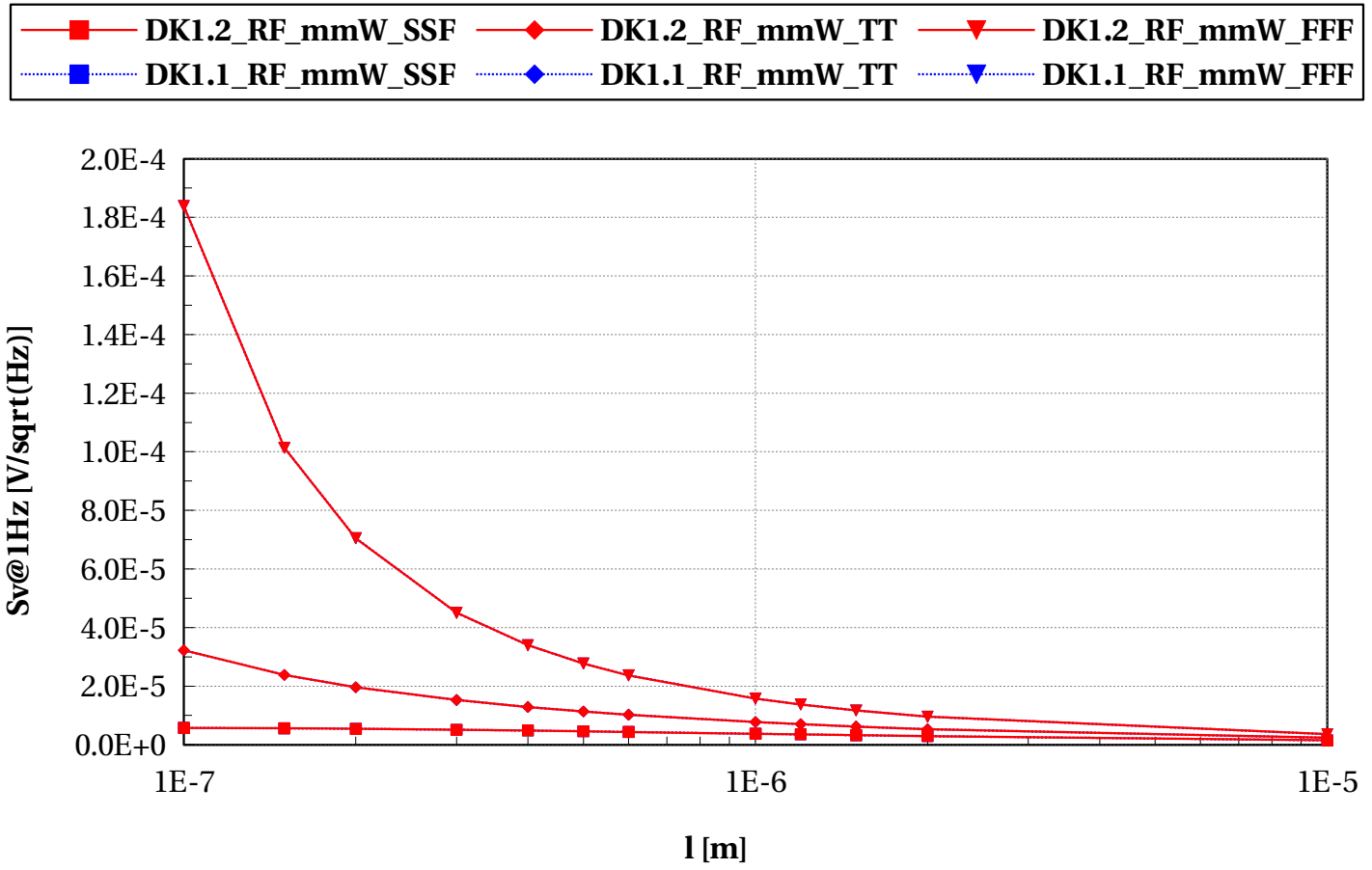
eglvtvnfet_acc, Gds_ana/w [S/um] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



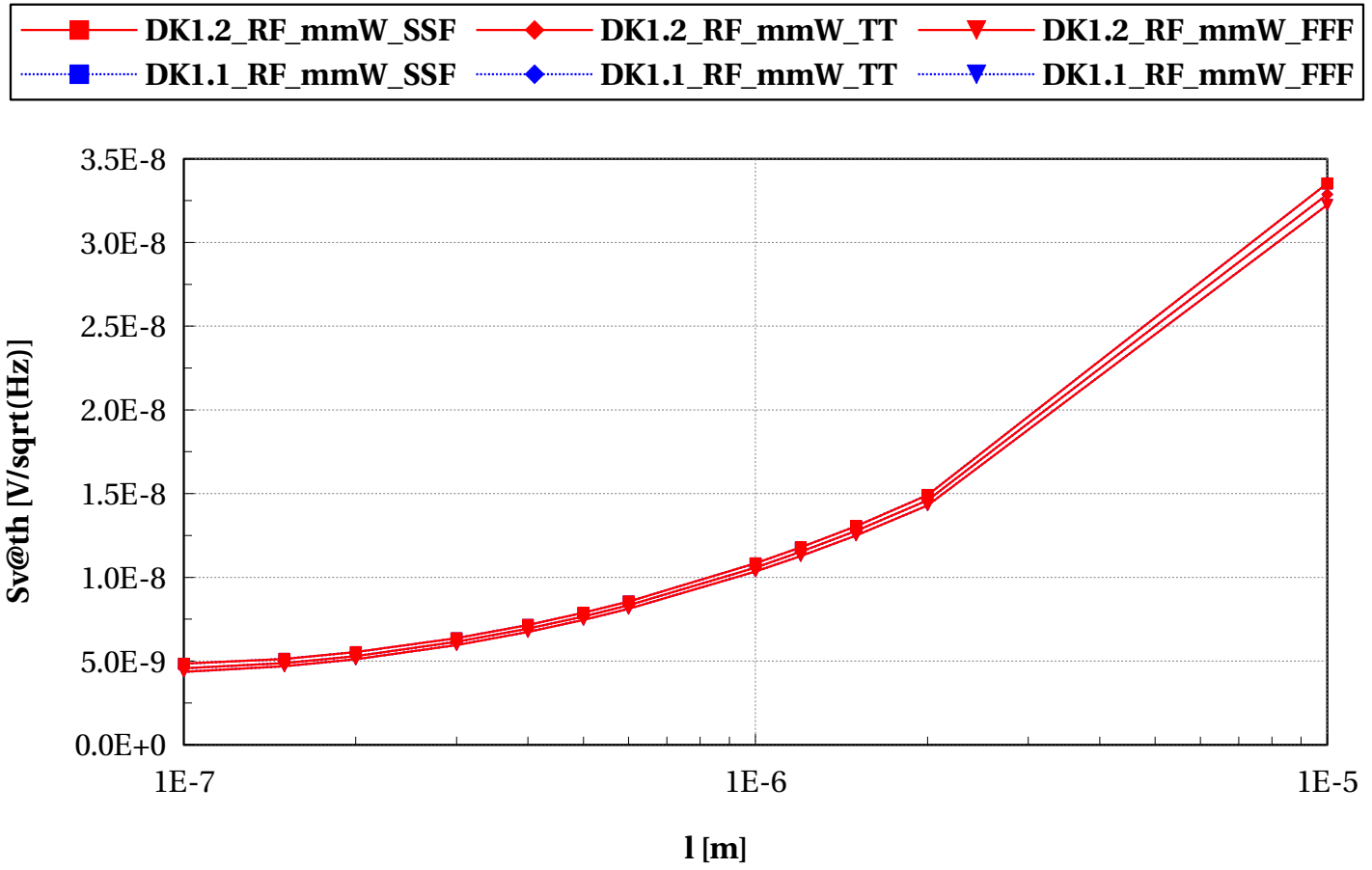
eglvtvnfet_acc, Sv@1Hz [V/sqrt(Hz)] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



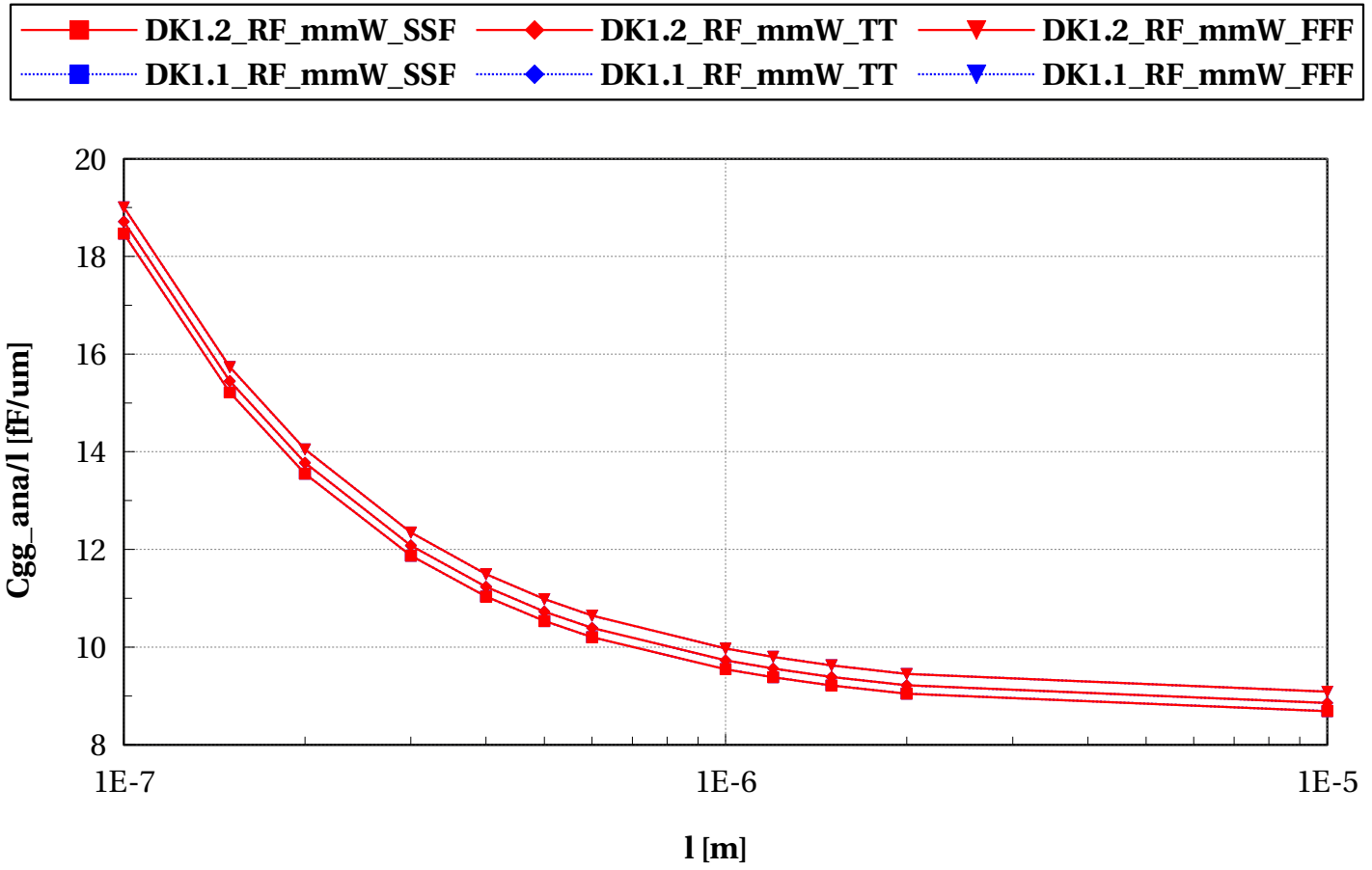
eglvtvnfet_acc, Sv@th [V/sqrt(Hz)] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



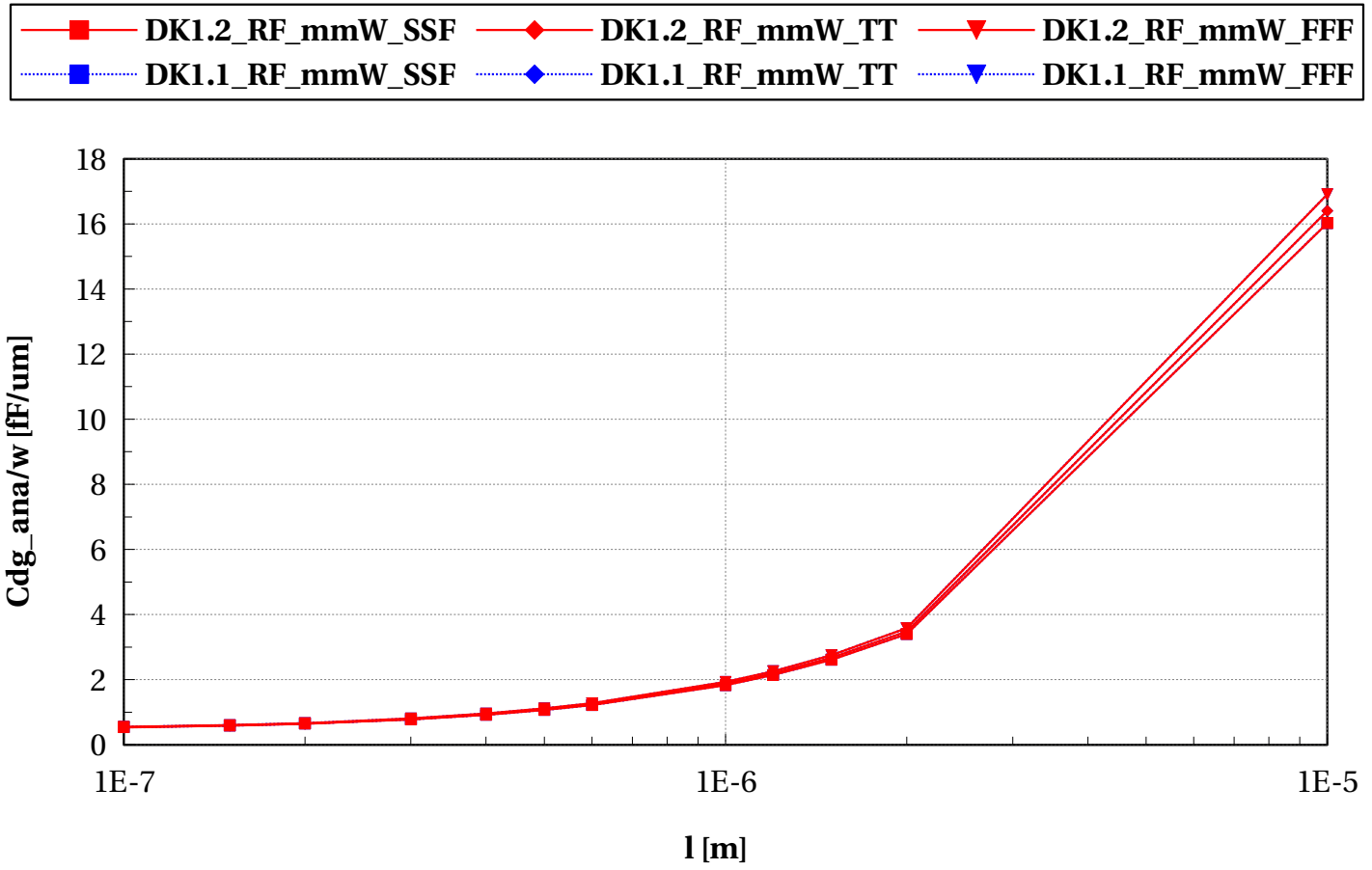
eglvtvnfet_acc, Cgg_ana/l [fF/um] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



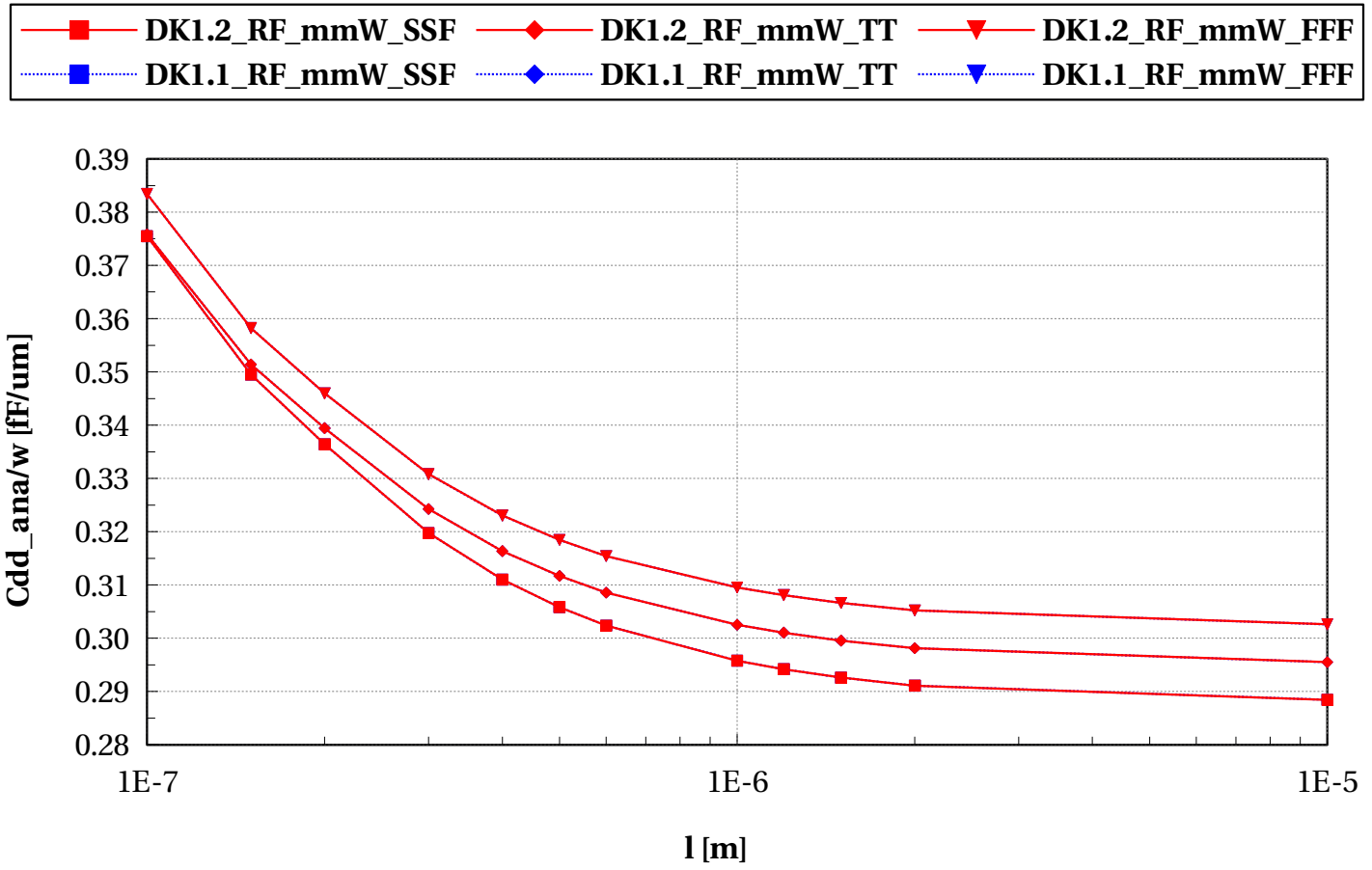
eglvtvnfet_acc, Cdg_ana/w [fF/um] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



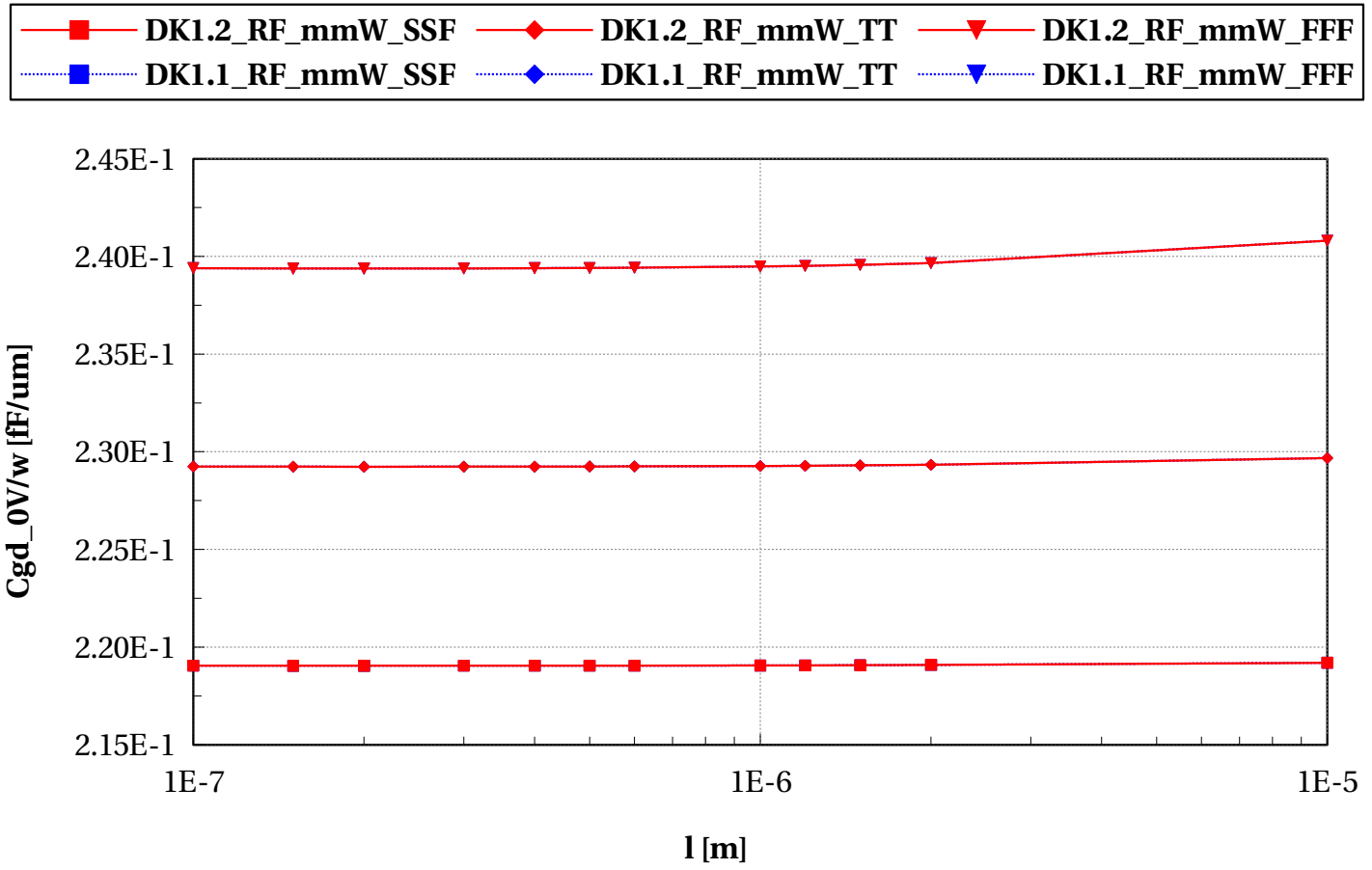
eglvtvnfet_acc, Cdd_ana/w [fF/um] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



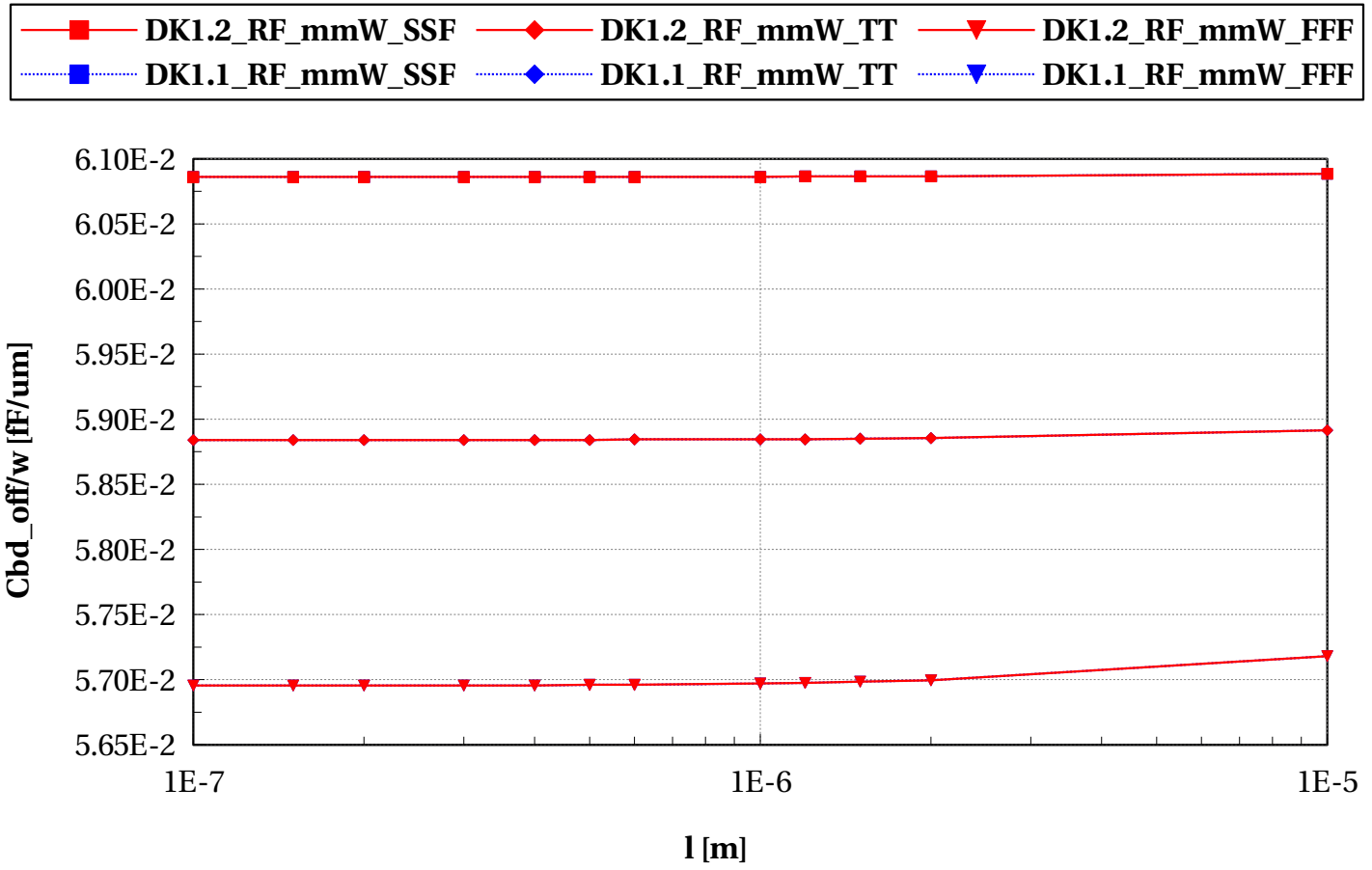
eglvtvnfet_acc, Cgd_0V/w [fF/um] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



eglvtvnfet_acc, Cbd_off/w [fF/um] vs l [m]

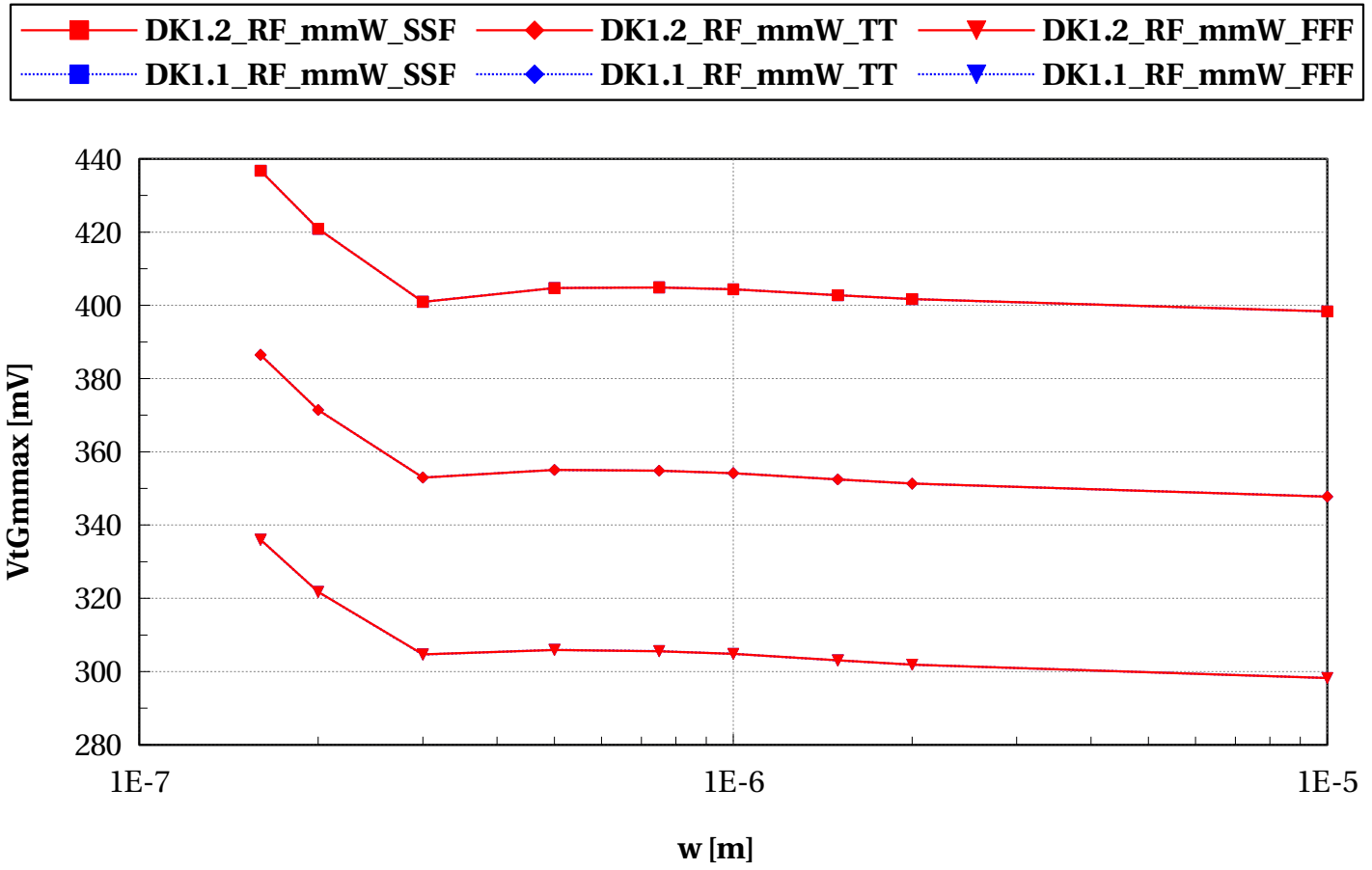
W==2e-6 and nf==2 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



Scaling versus Width (T=25C,vbs=0V)

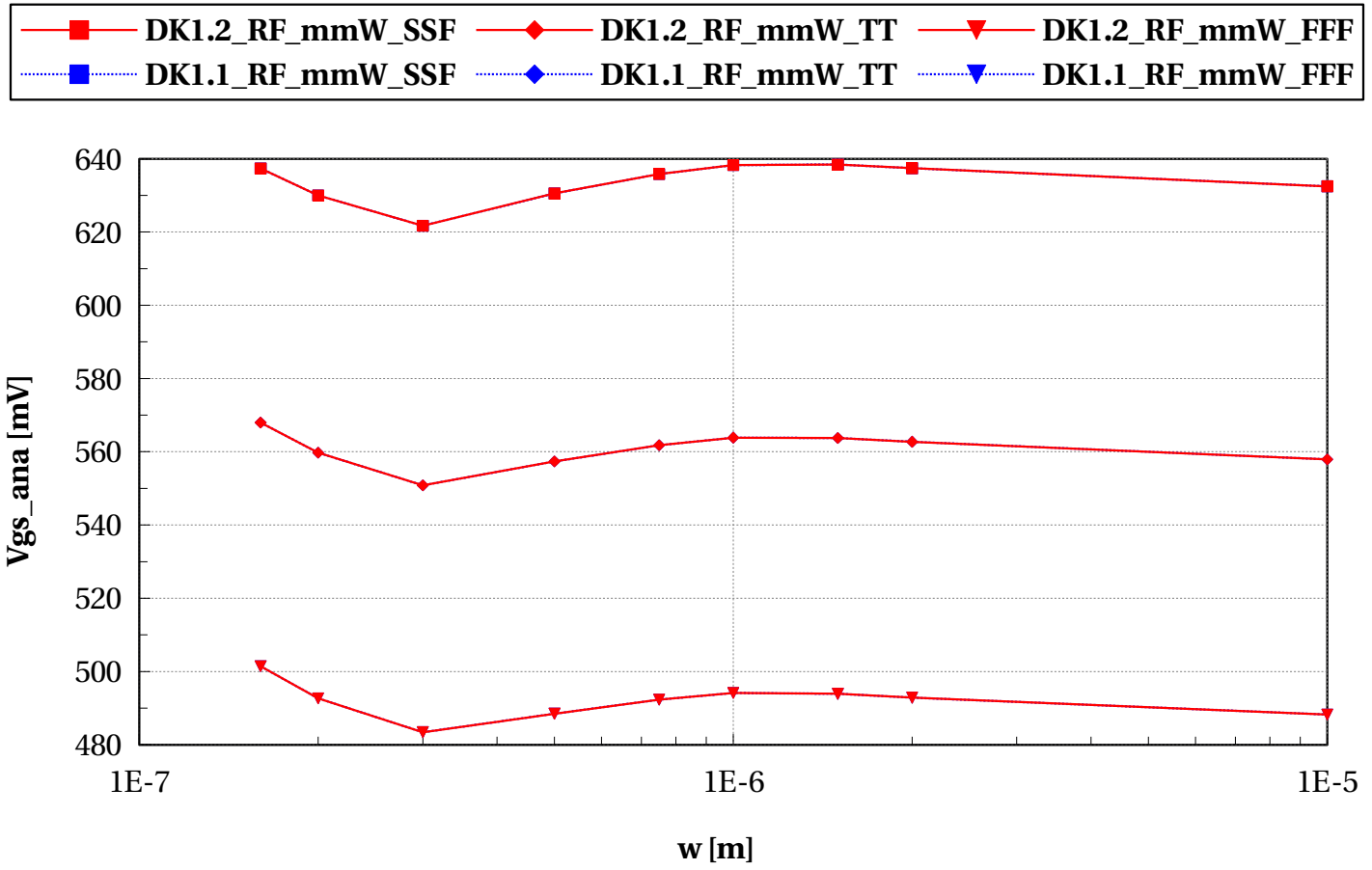
eglvtvnfet_acc, VtGmmax [mV] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==0 and devType=="PCELLwoWPE"



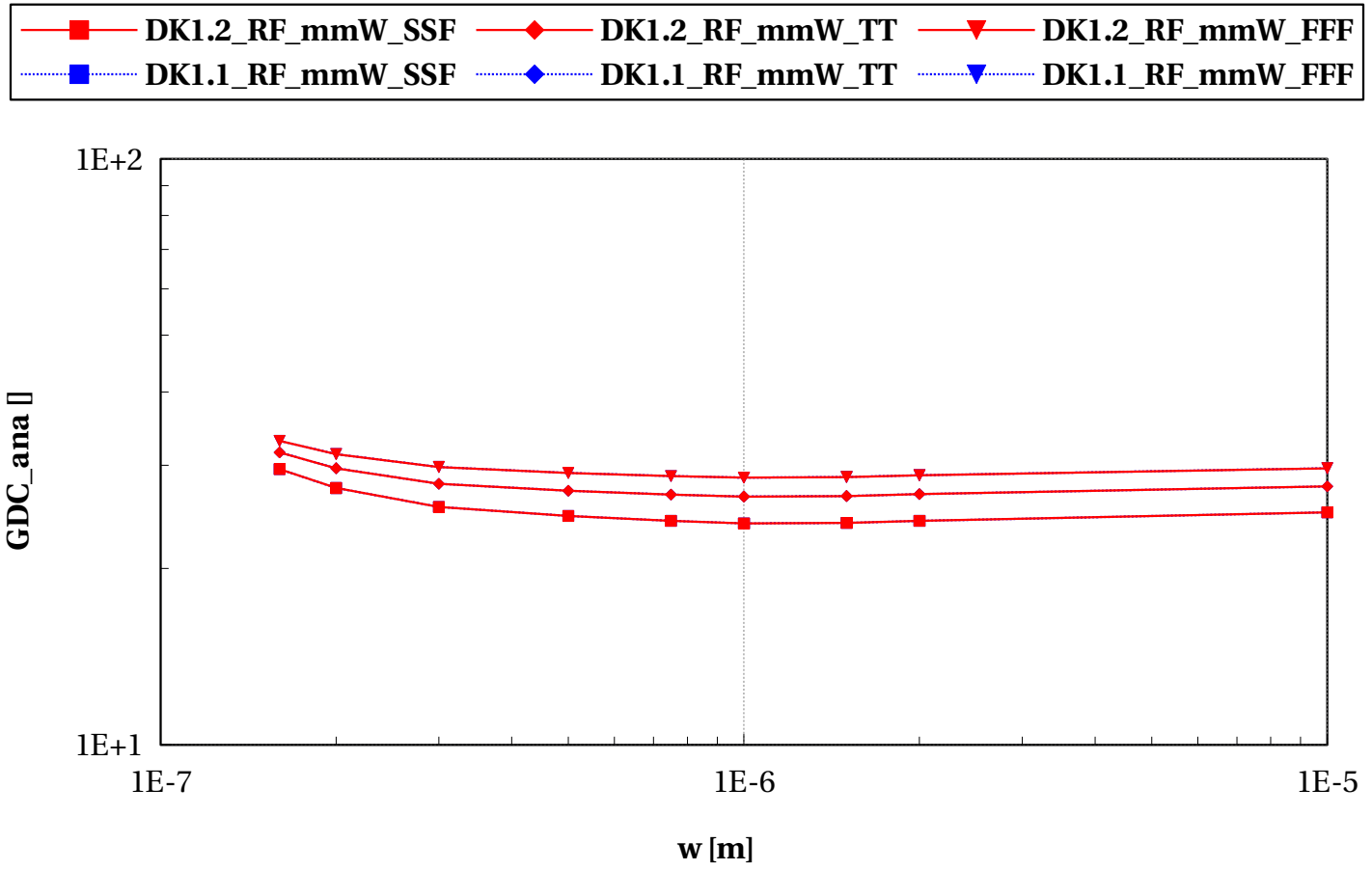
eglvtvnfet_acc, Vgs_ana [mV] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==0 and devType=="PCELLwoWPE"



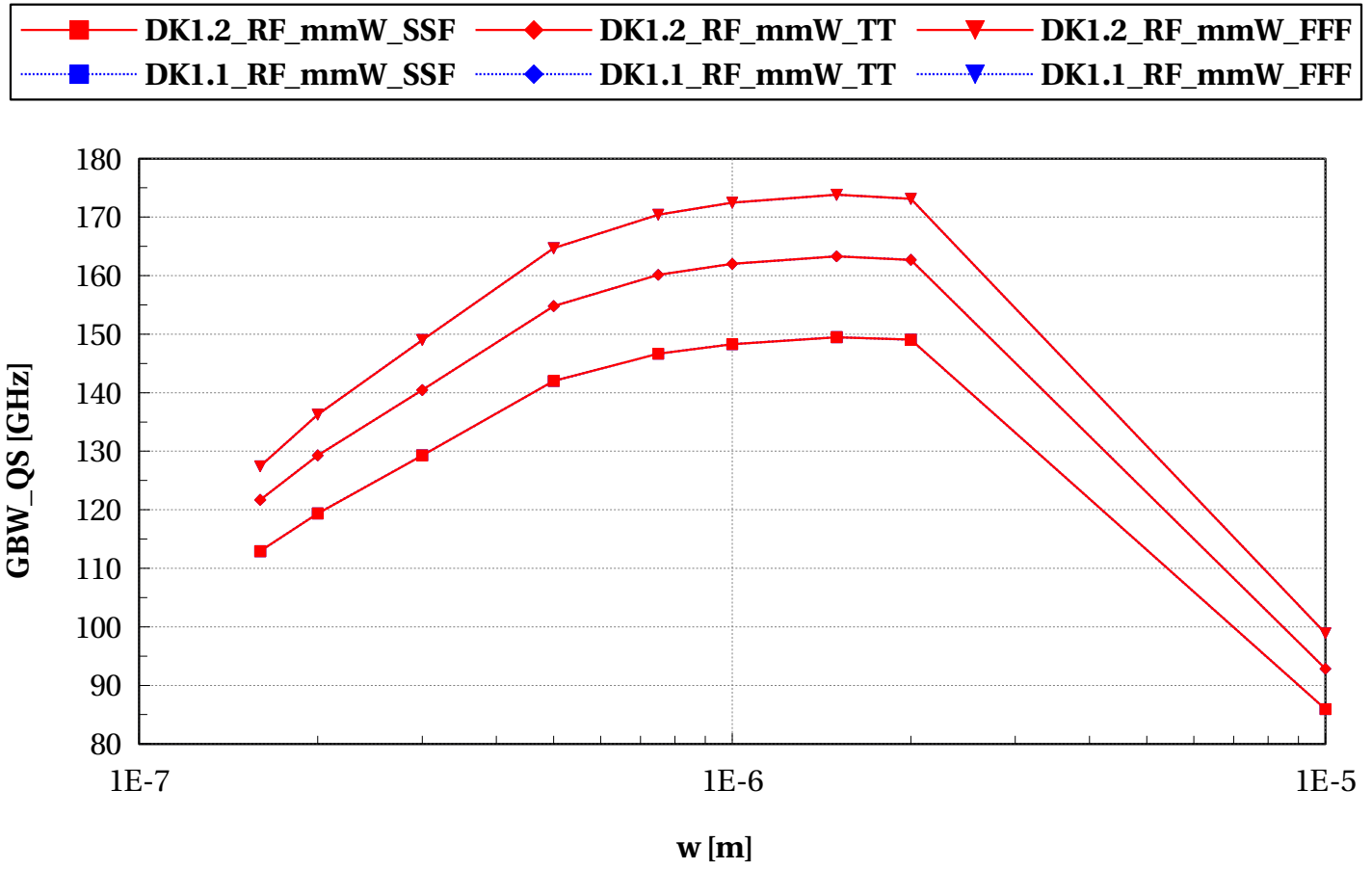
eglvtvnfet_acc, GDC_ana [] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==0 and devType=="PCELLwoWPE"



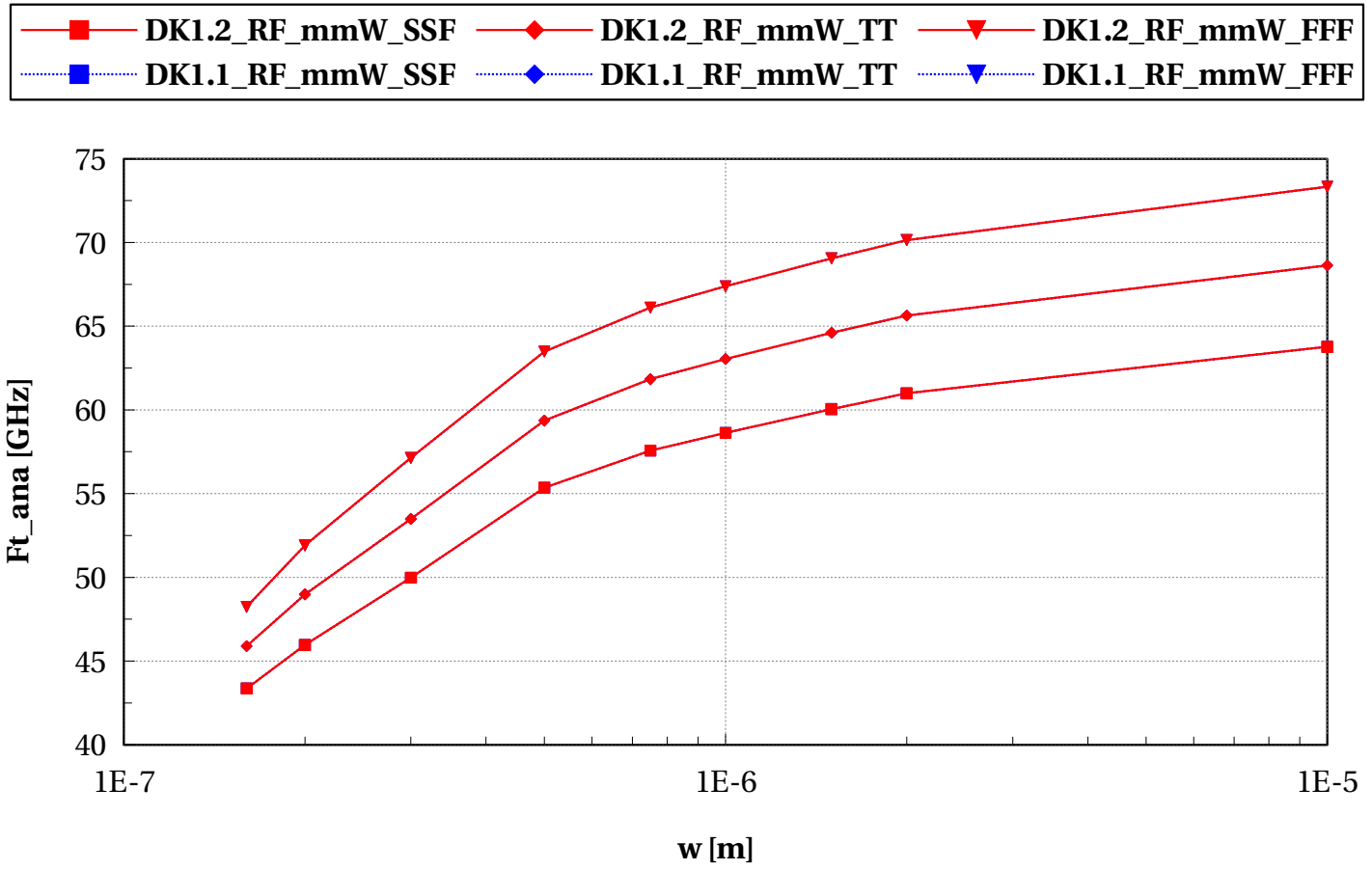
eglvtvnfet_acc, GBW_QS [GHz] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==0 and devType=="PCELLwoWPE"



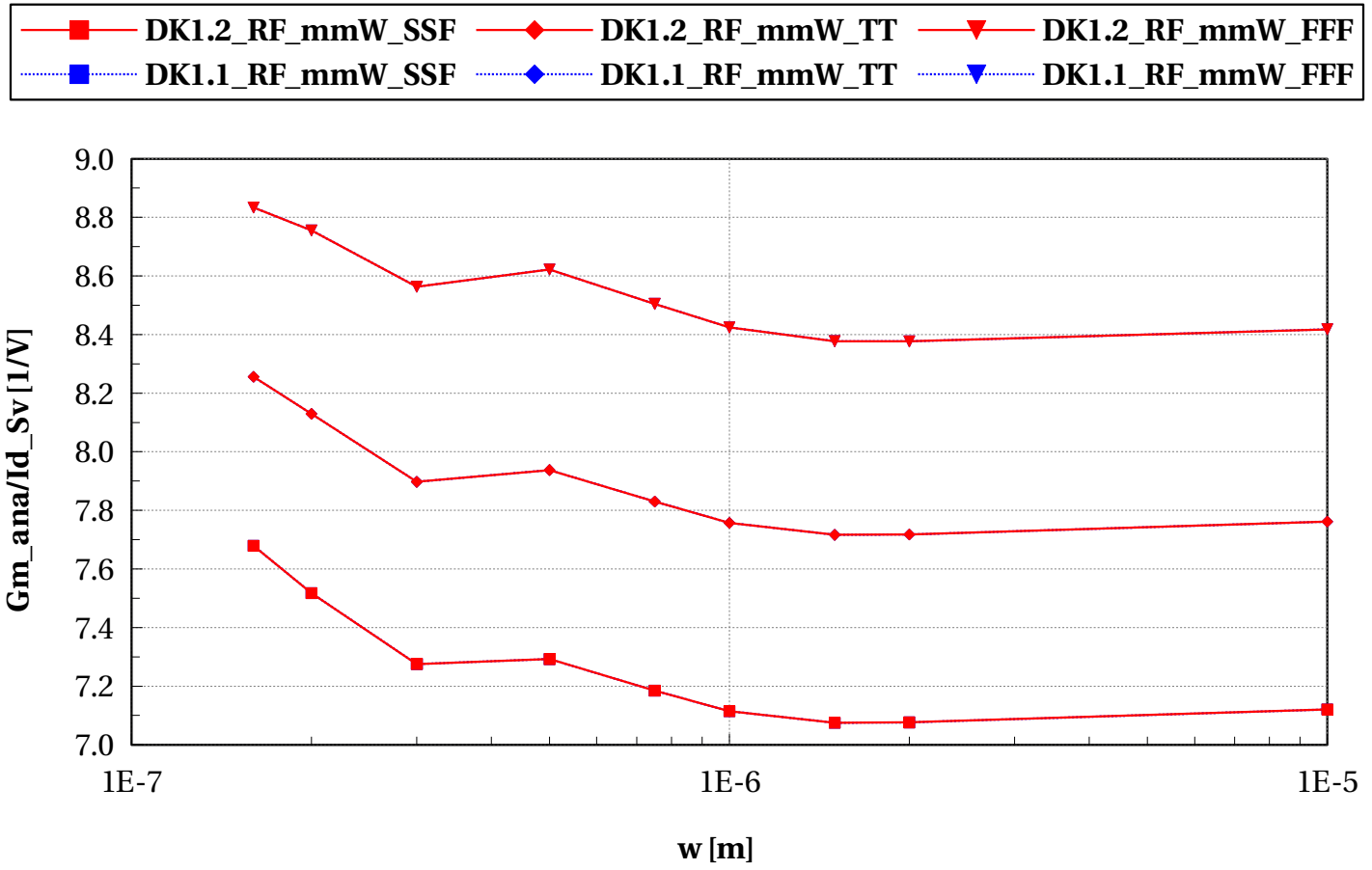
eglvtvnfet_acc, Ft_ana [GHz] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==0 and devType=="PCELLwoWPE"



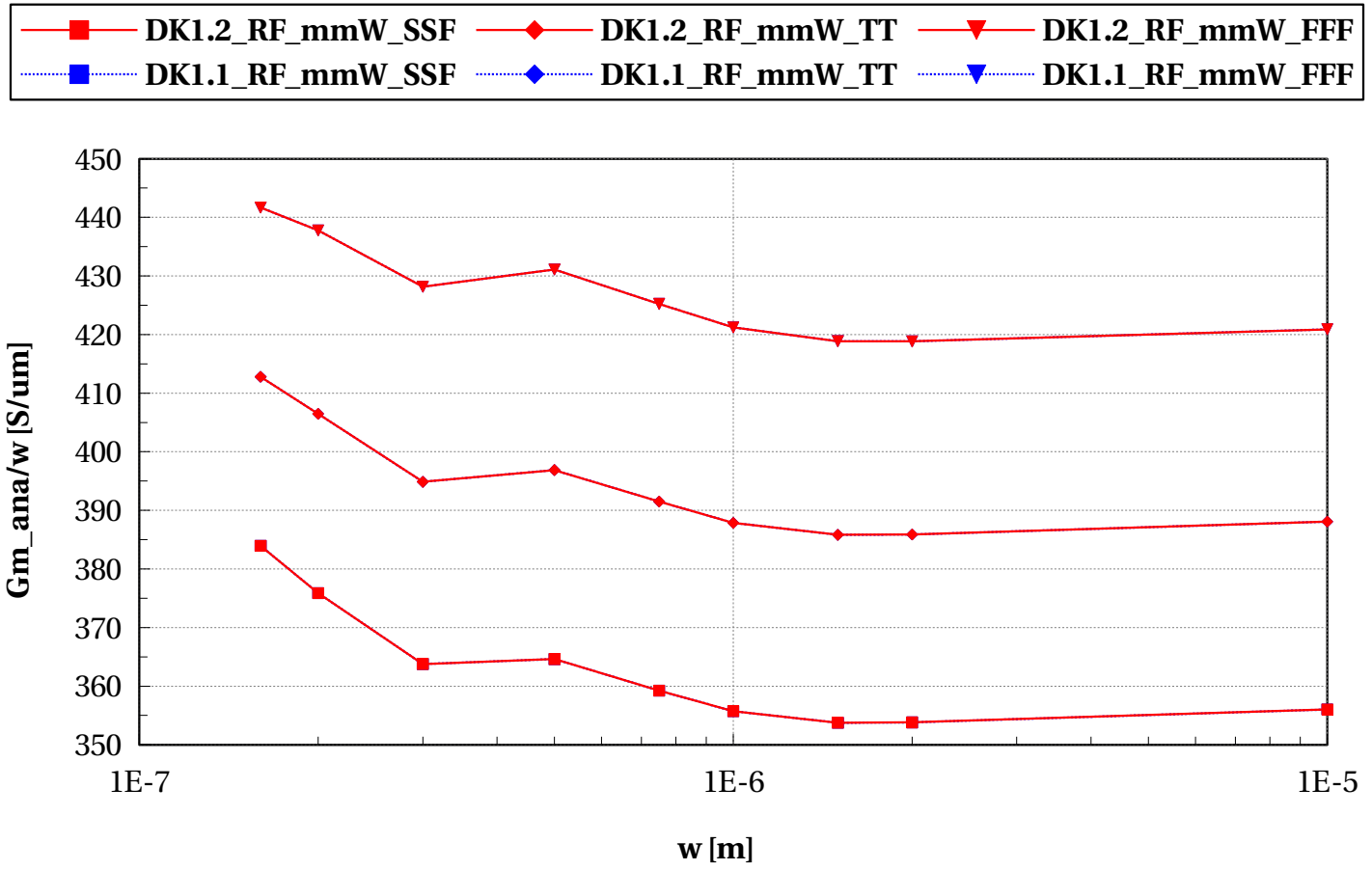
eglvtvnfet_acc, Gm_ana/Id_Sv [1/V] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==0 and devType=="PCELLwoWPE"



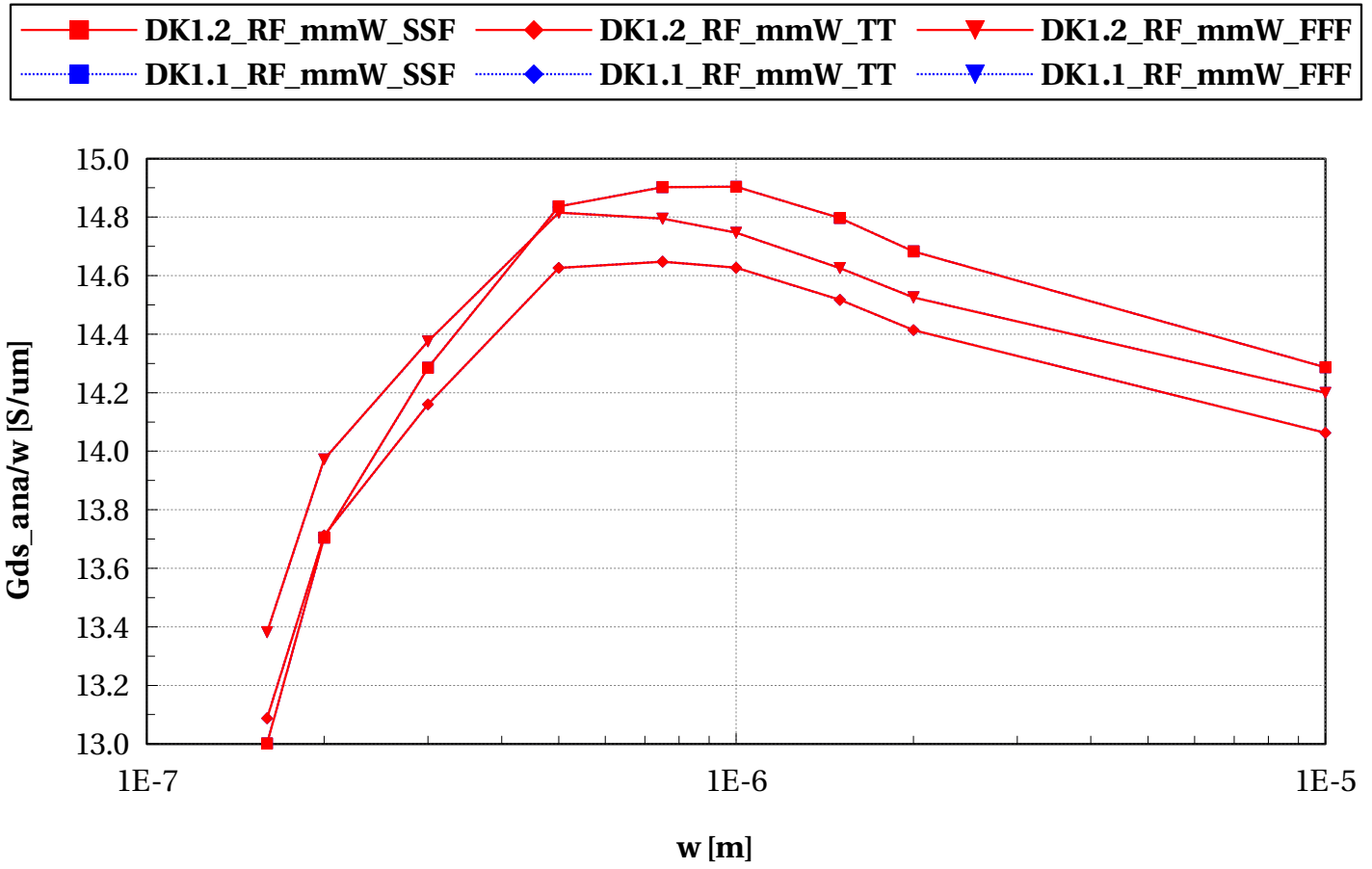
eglvtvnfet_acc, Gm_ana/w [S/um] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==0 and devType=="PCELLwoWPE"



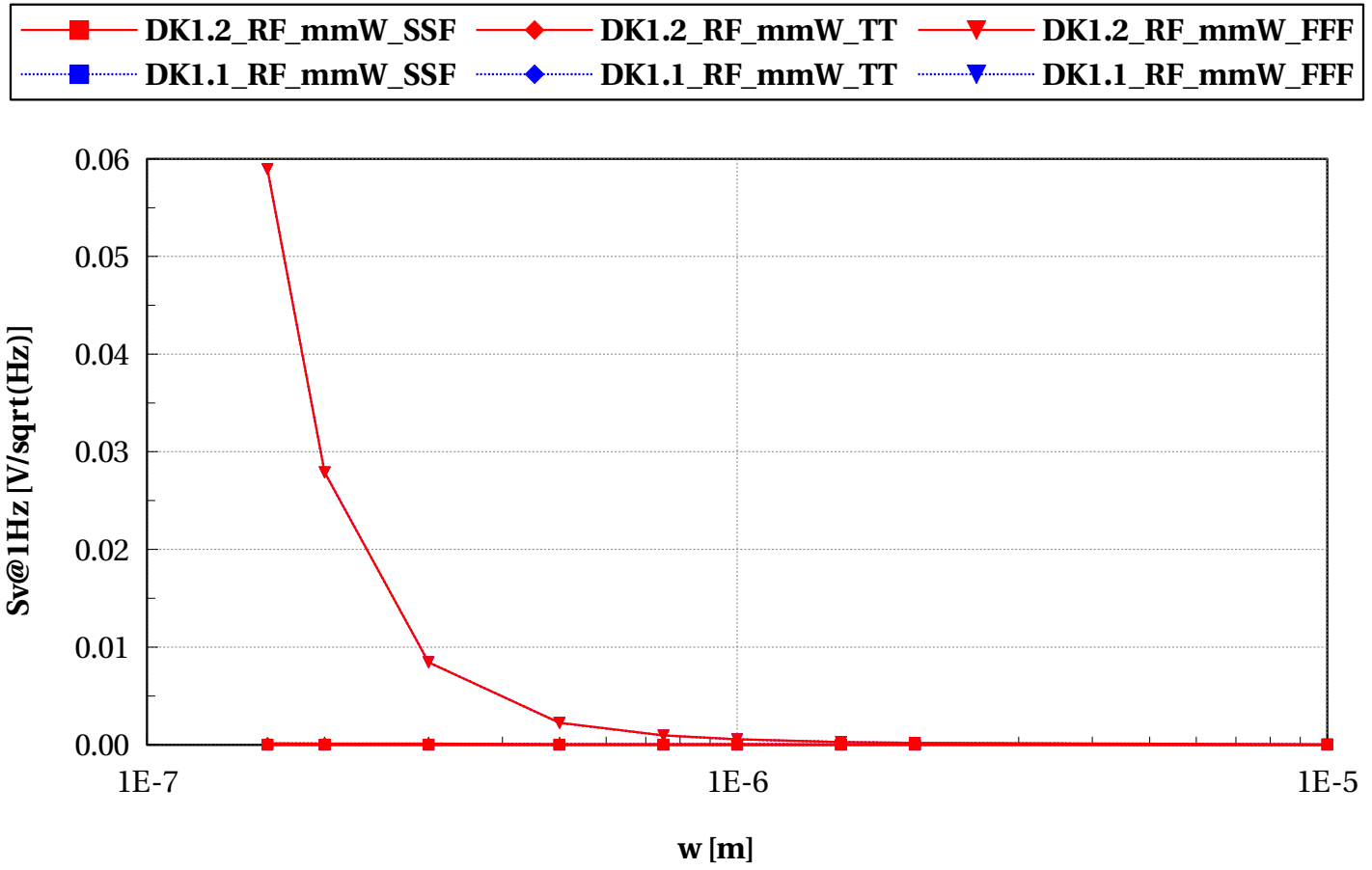
eglvtvnfet_acc, Gds_ana/w [S/um] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==0 and devType=="PCELLwoWPE"



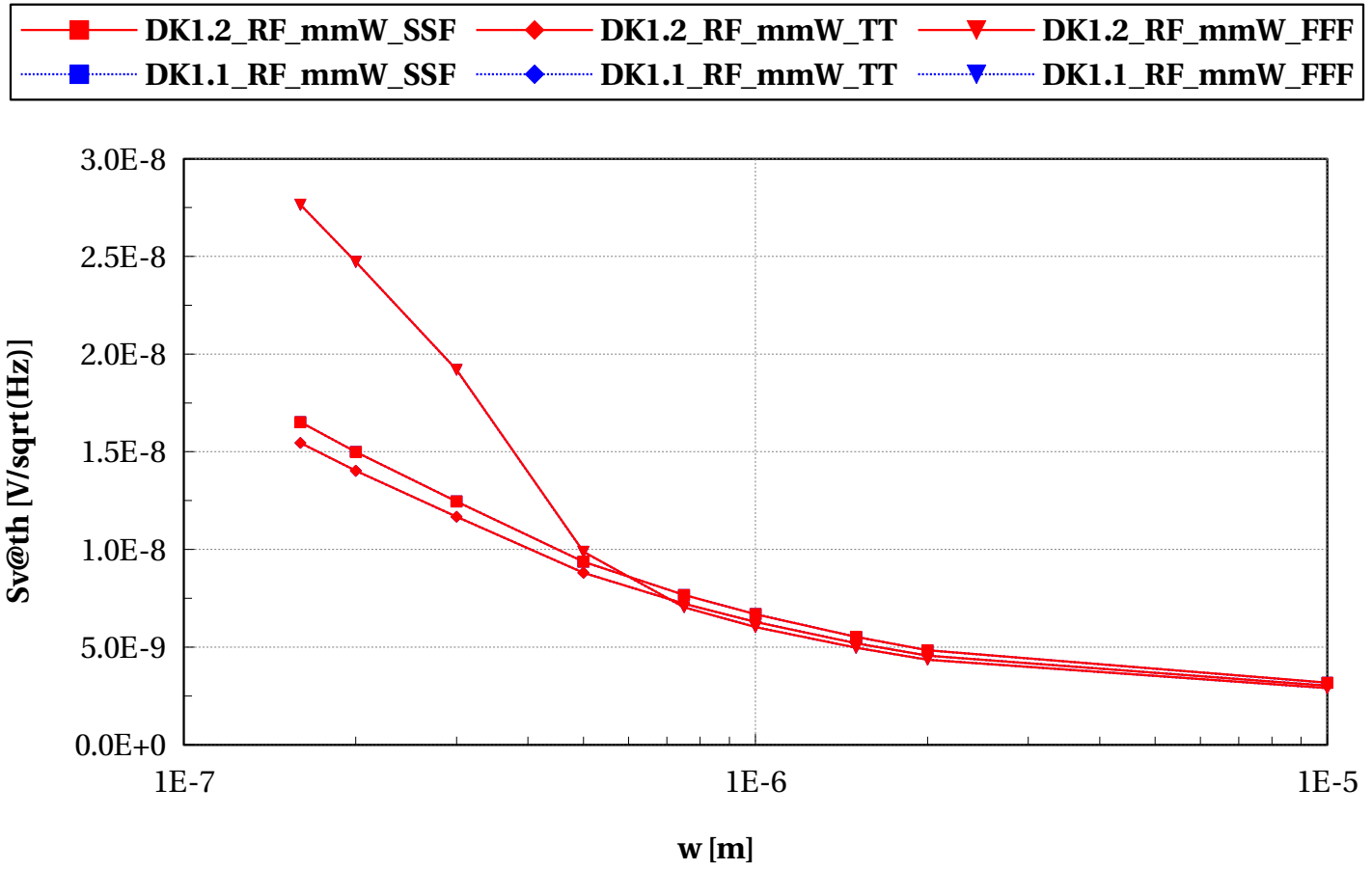
eglvtvnfet_acc, Sv@1Hz [V/sqrt(Hz)] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==0 and devType=="PCELLwoWPE"



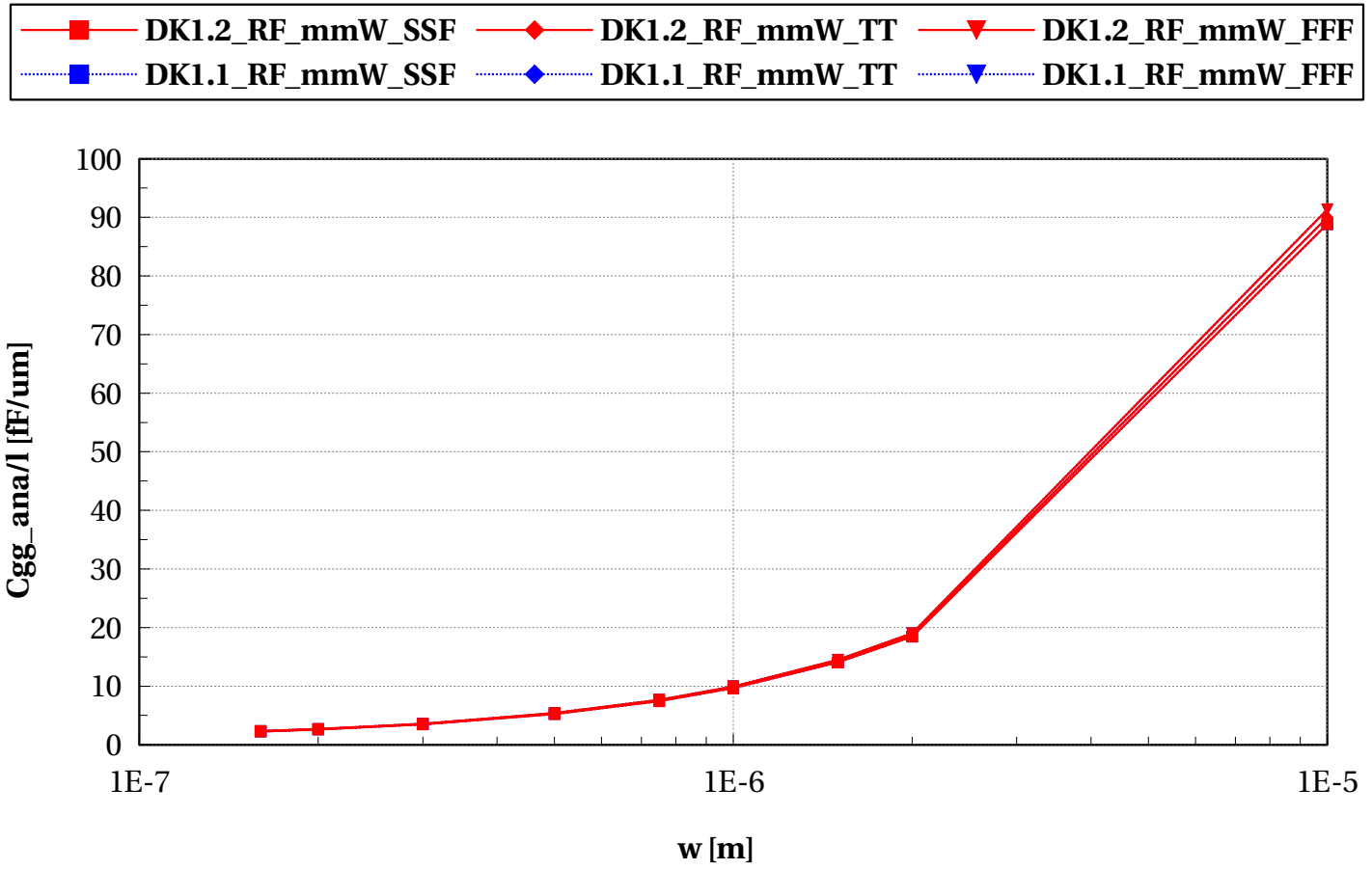
eglvtvnfet_acc, Sv@th [V/sqrt(Hz)] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==0 and devType=="PCELLwoWPE"



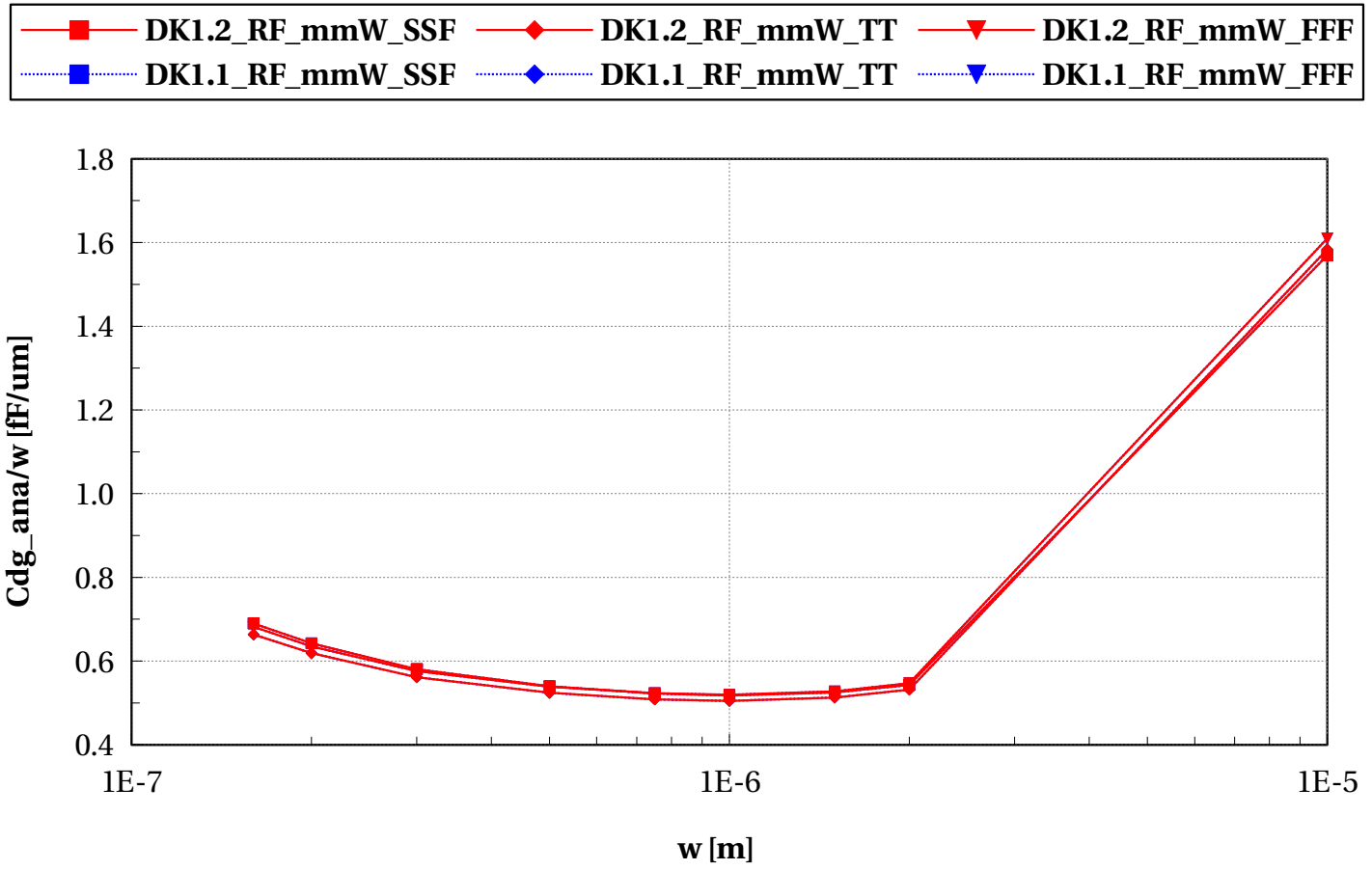
eglvtvnfet_acc, Cgg_ana/l [fF/um] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==0 and devType=="PCELLwoWPE"



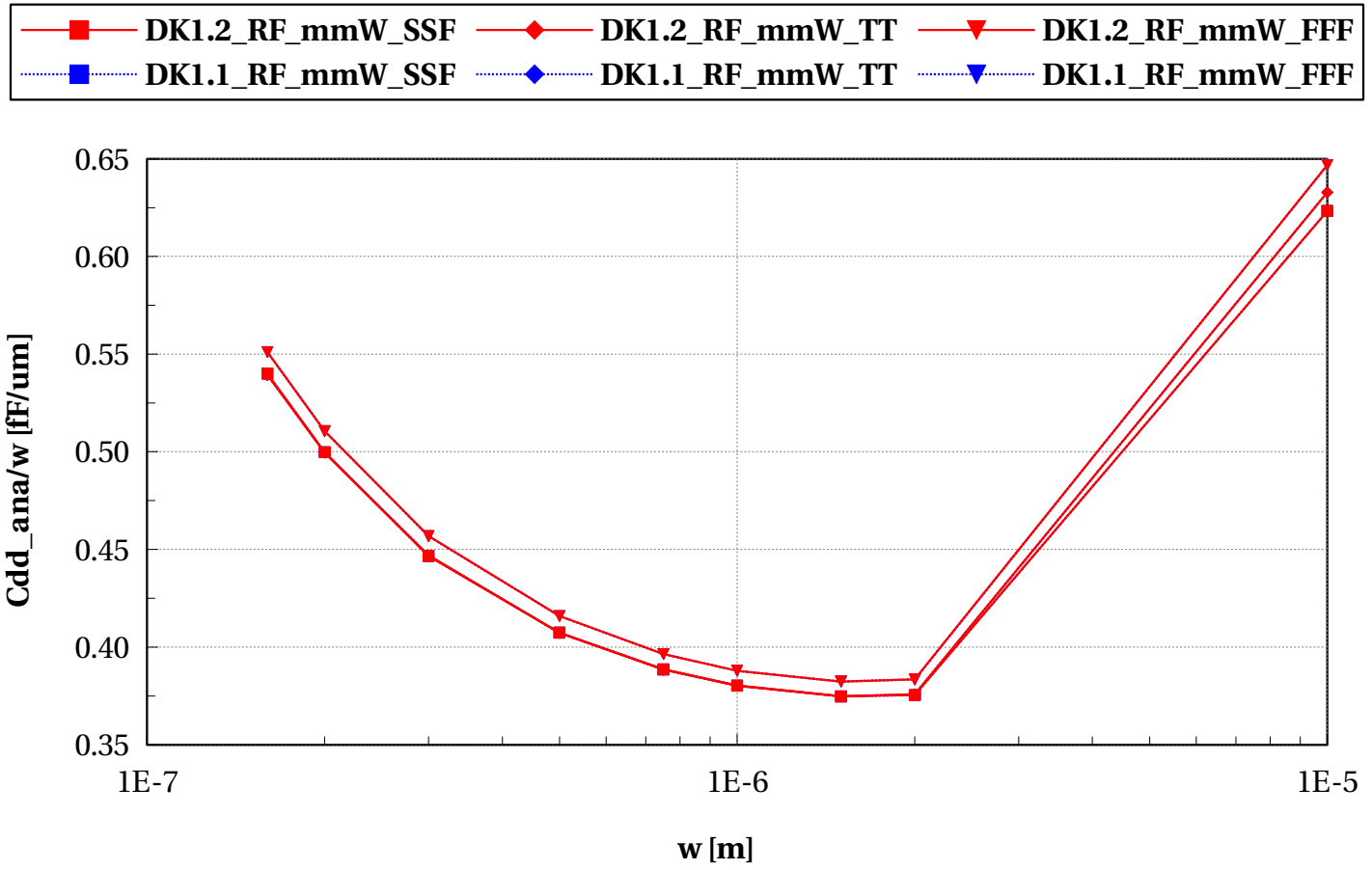
eglvtvnfet_acc, Cdg_ana/w [fF/um] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==0 and devType=="PCELLwoWPE"



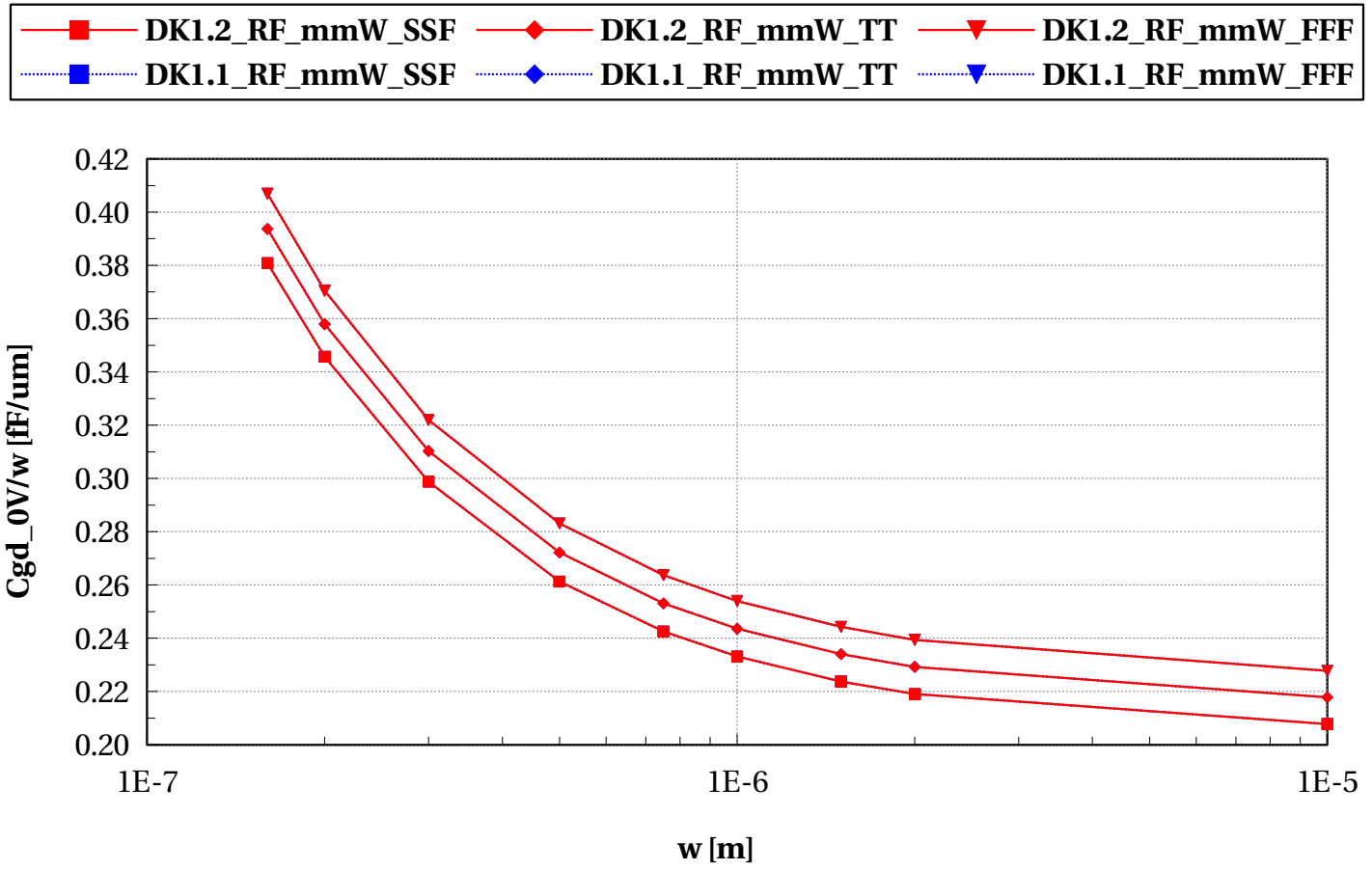
eglvtvnfet_acc, Cdd_ana/w [fF/um] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==0 and devType=="PCELLwoWPE"



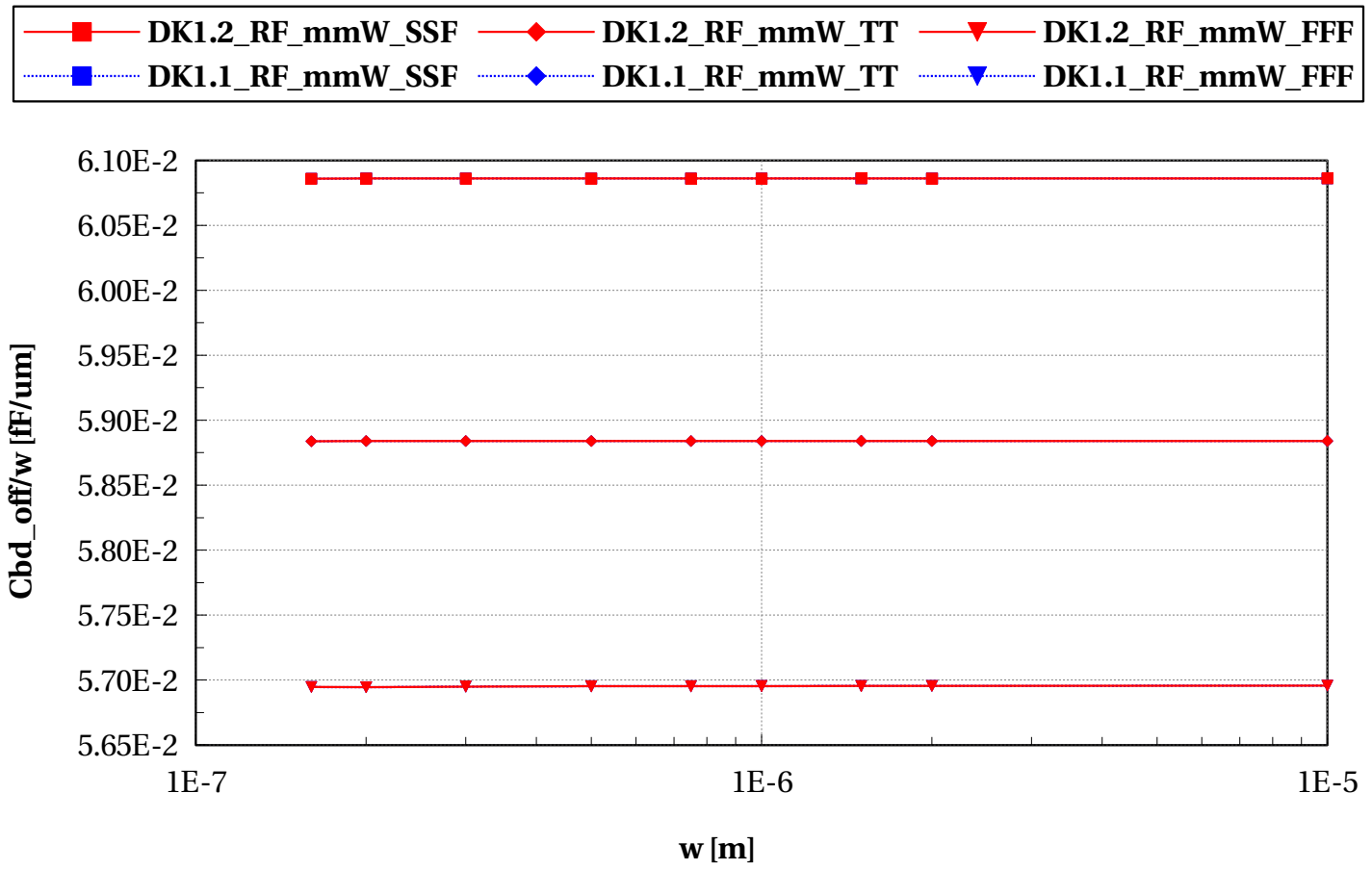
eglvtvnfet_acc, Cgd_0V/w [fF/um] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==0 and devType=="PCELLwoWPE"



eglvtvnfet_acc, Cbd_off/w [fF/um] vs w [m]

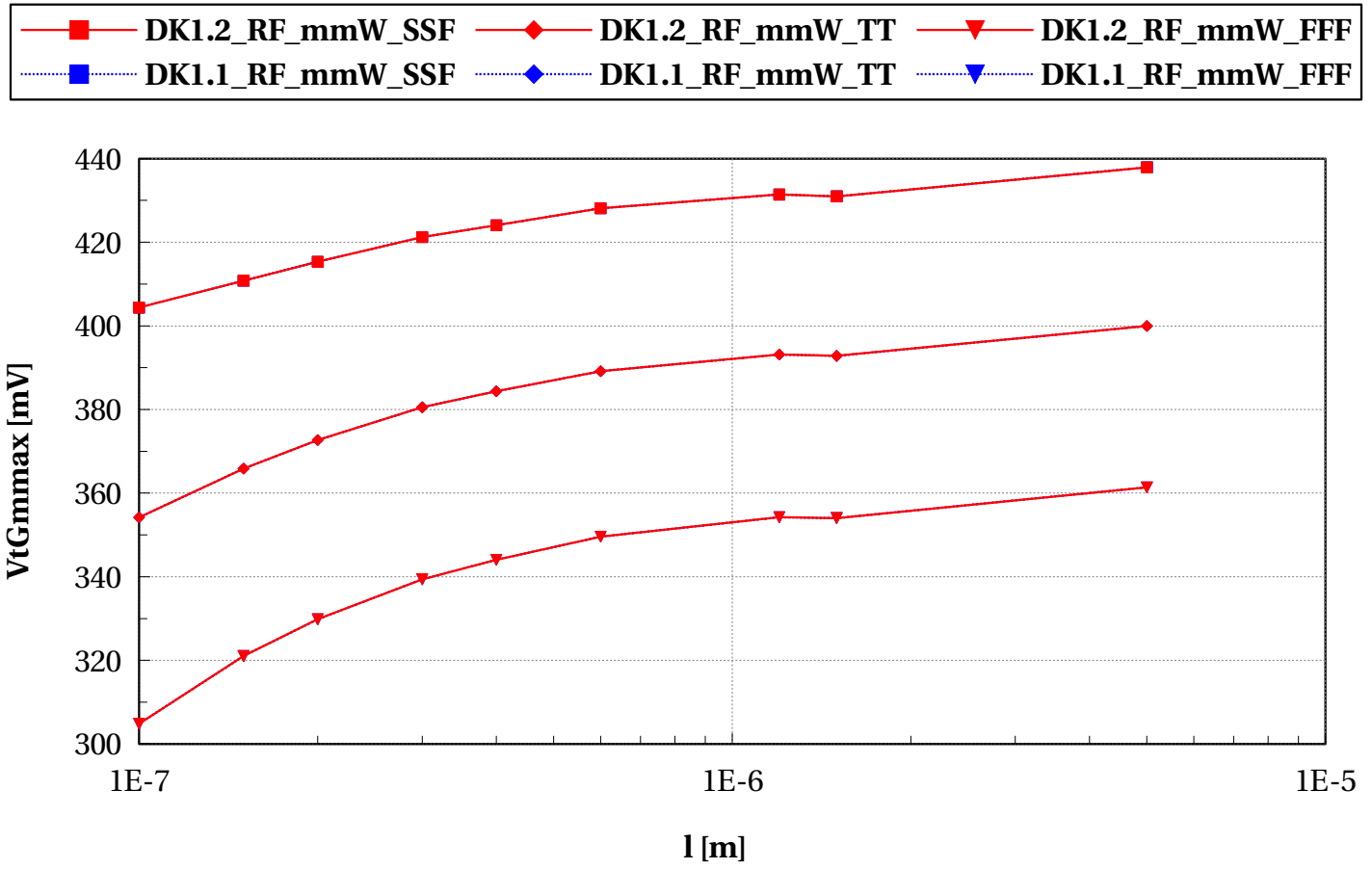
L==0.10e-6 and nf==2 and Temp==25 and Vbs==0 and devType=="PCELLwoWPE"



Scaling versus Length @ W/L=10&&W/nf<5um (vbs=0V)

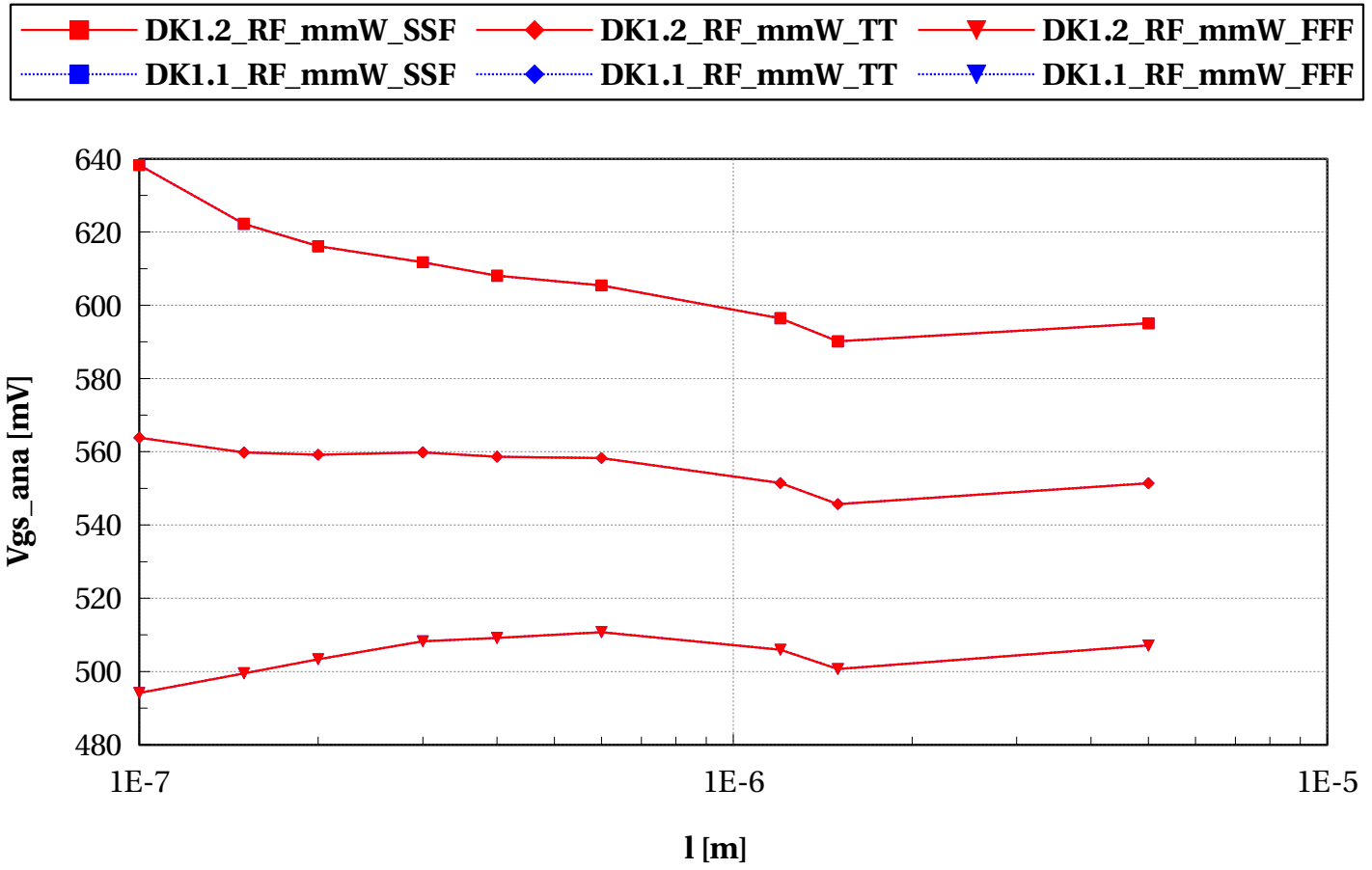
eglvtvnfet_acc, VtGmmax [mV] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



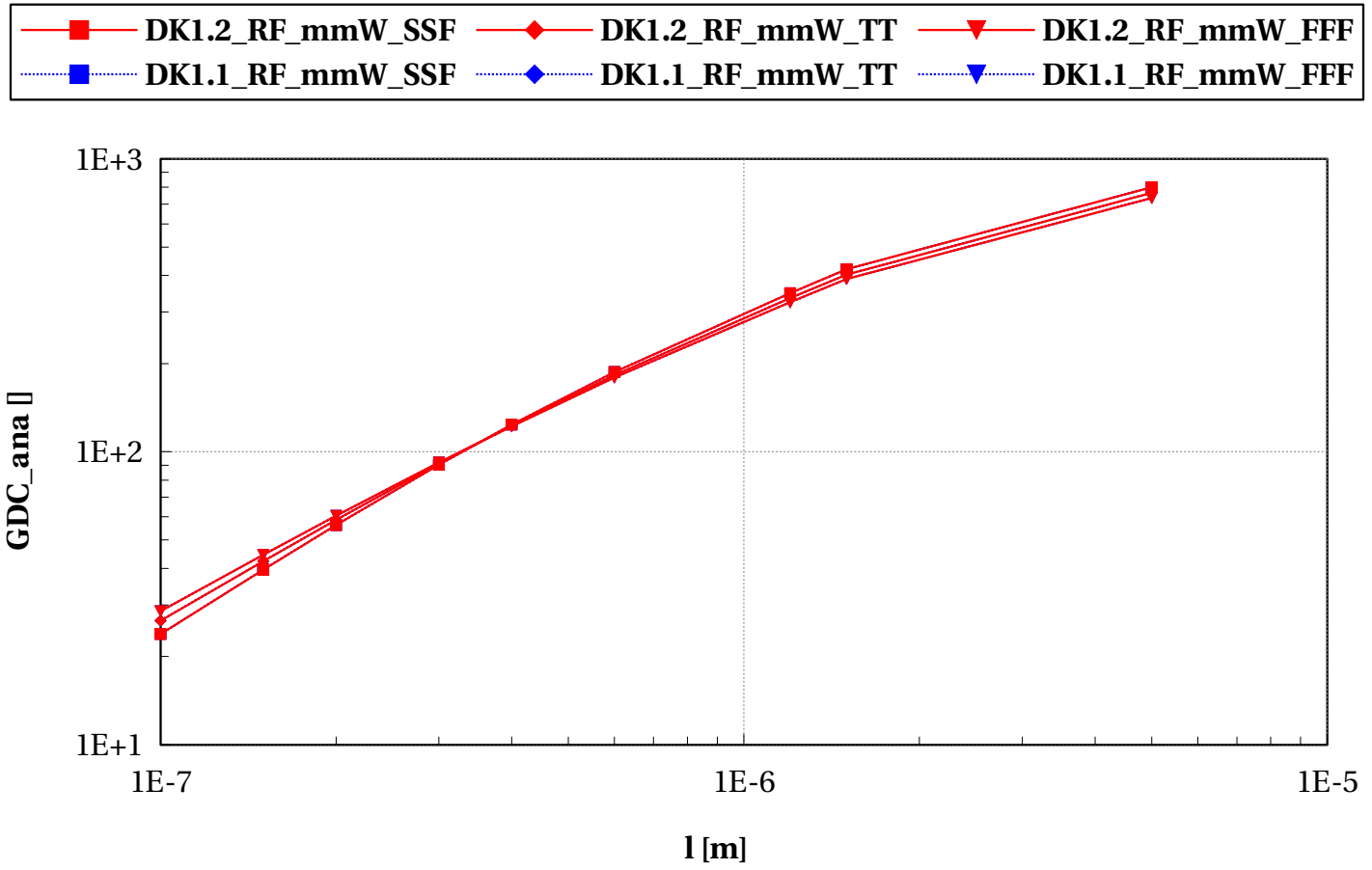
eglvtvnfet_acc, Vgs_ana [mV] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



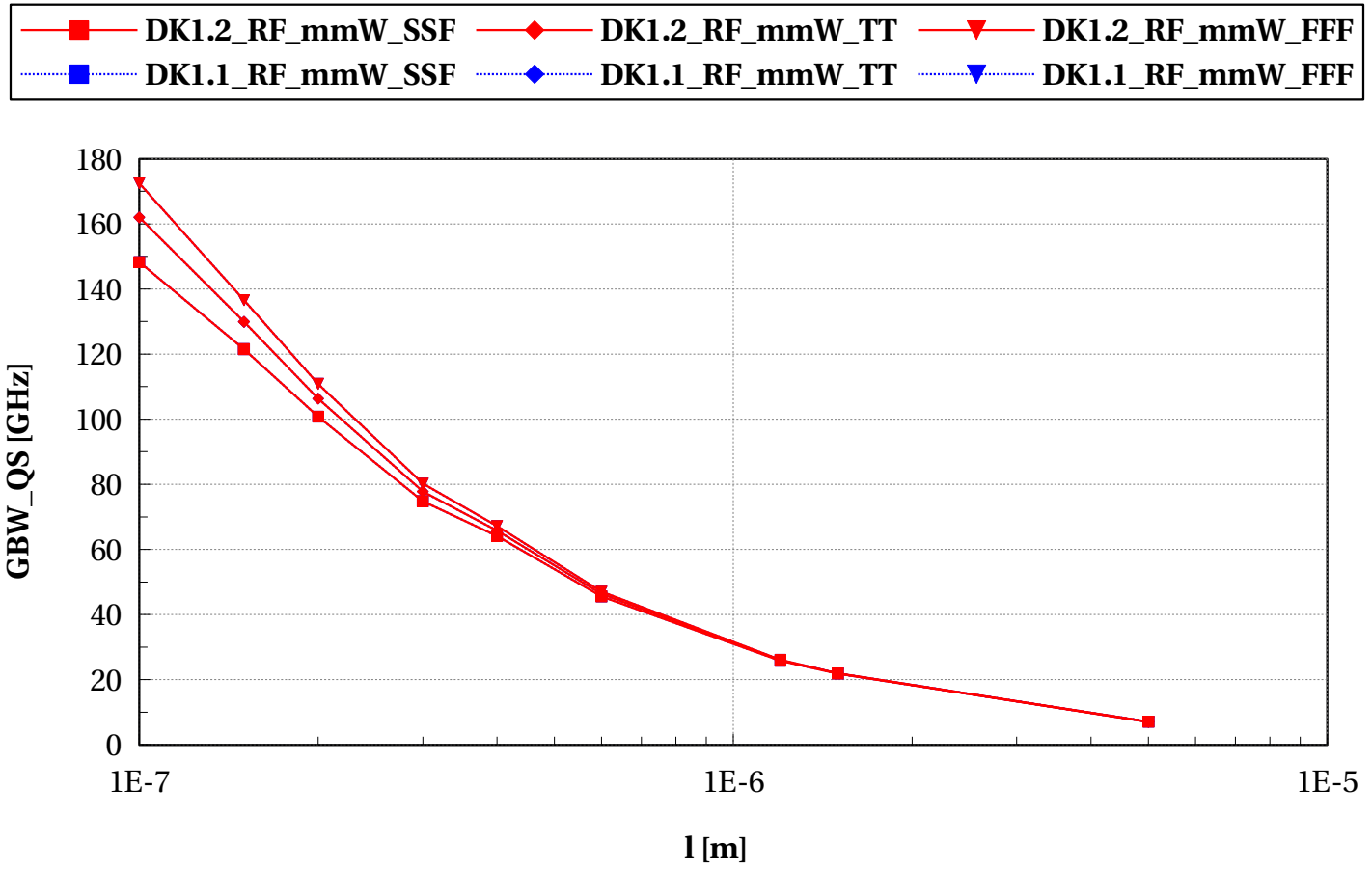
eglvtvnfet_acc, GDC_ana [] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



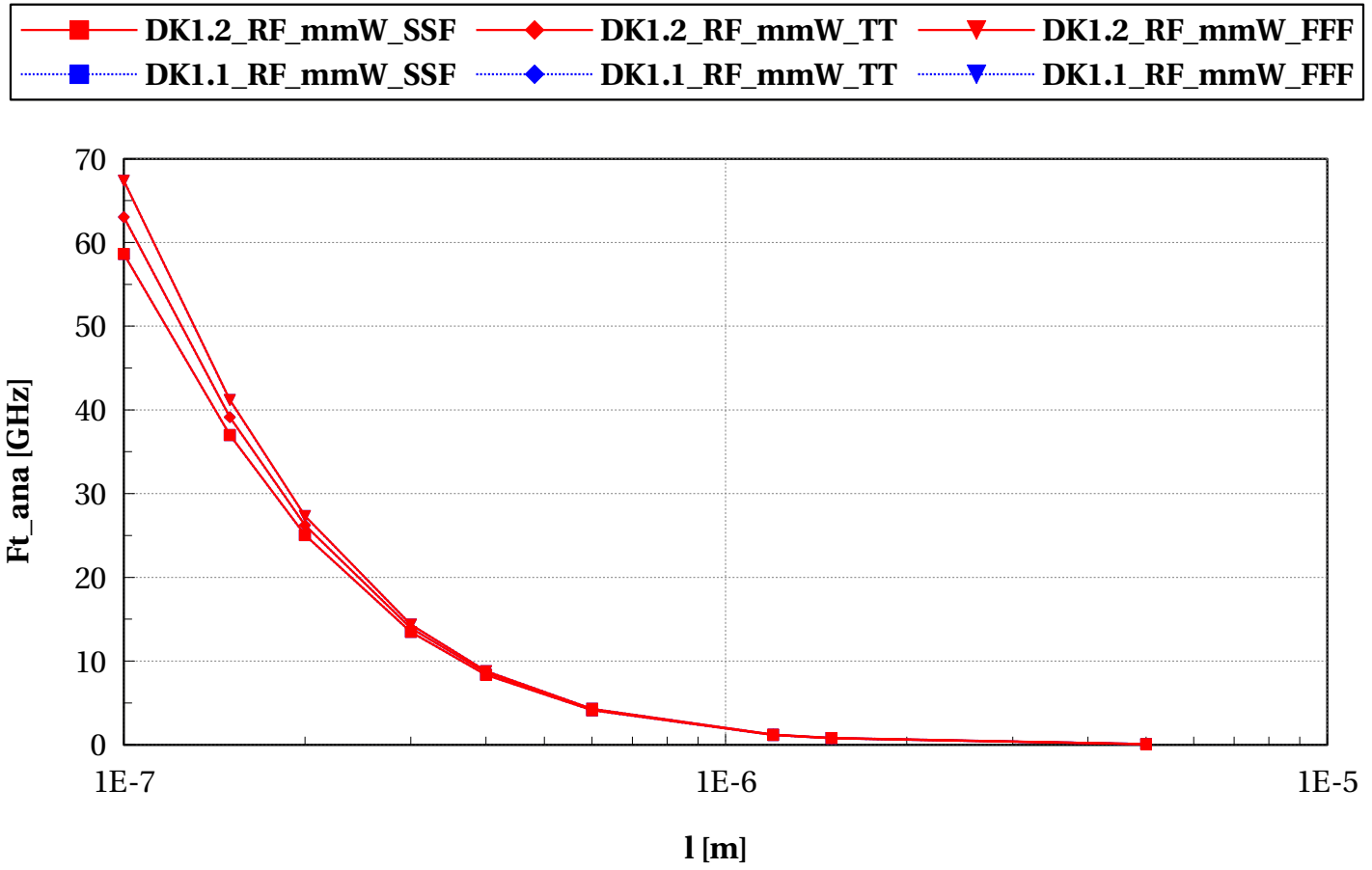
eglvtvnfet_acc, GBW_QS [GHz] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



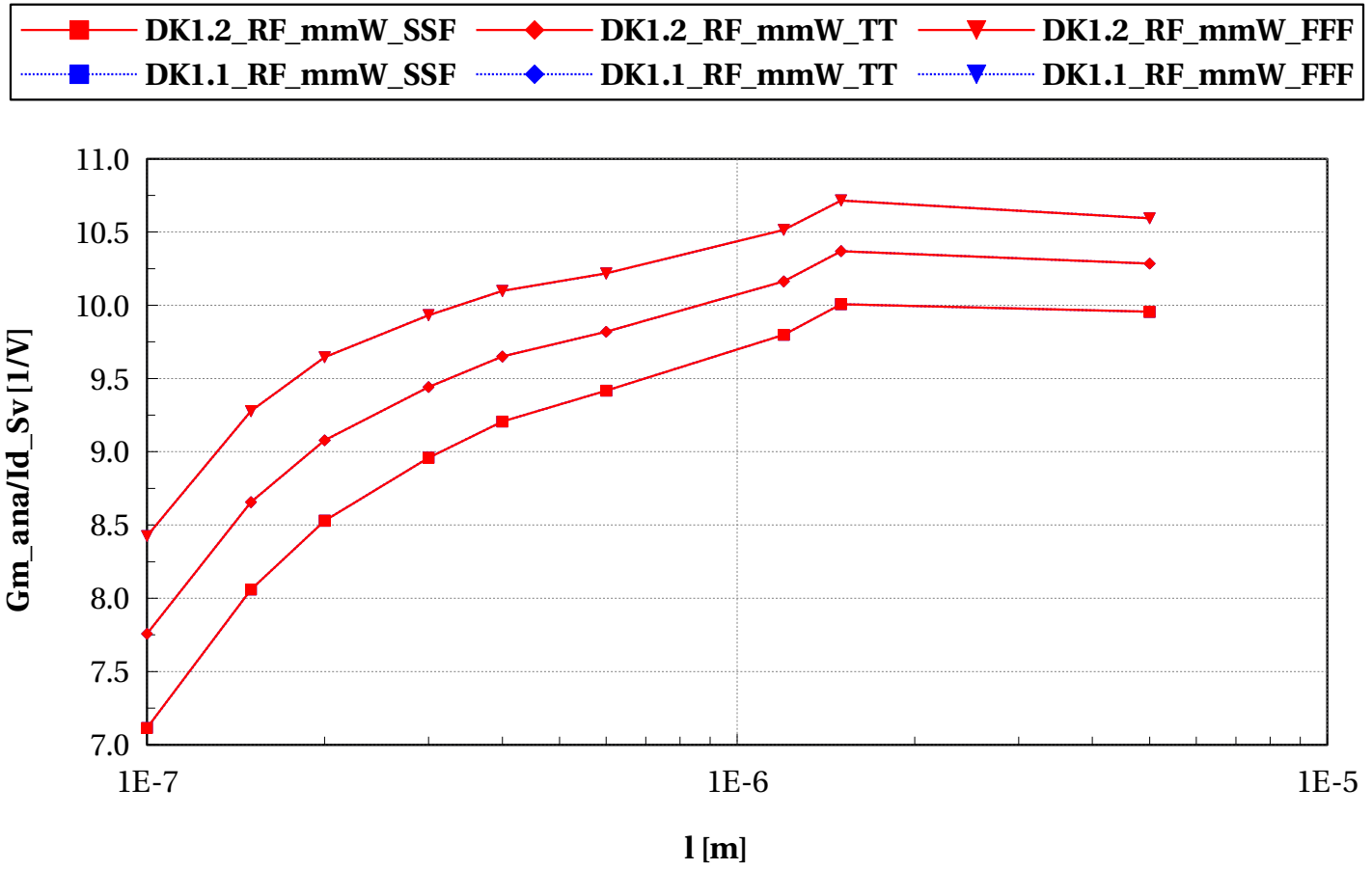
eglvtvnfet_acc, Ft_ana [GHz] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



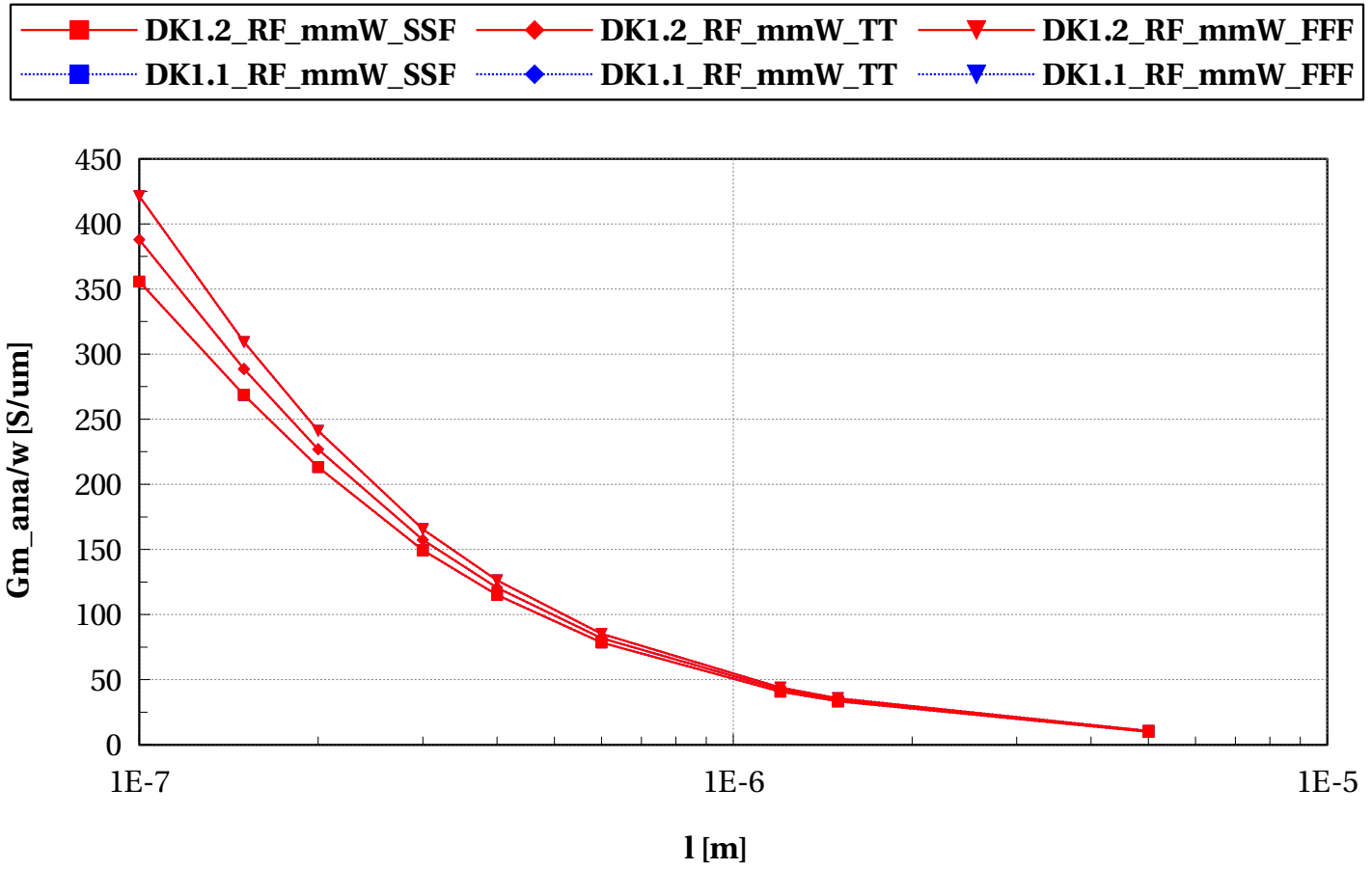
eglvtvnfet_acc, Gm_ana/Id_Sv [1/V] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



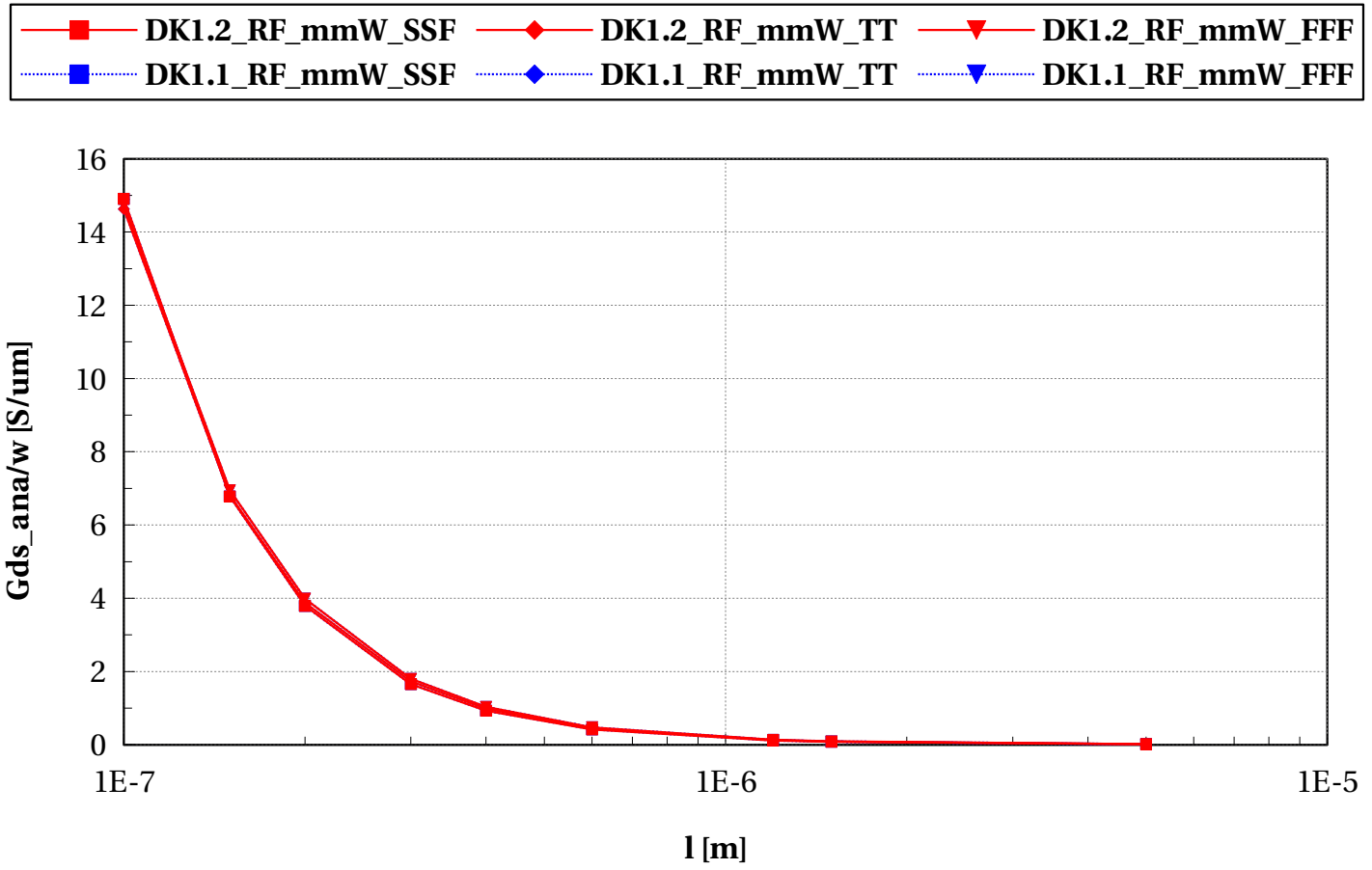
eglvtvnfet_acc, Gm_ana/w [S/um] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



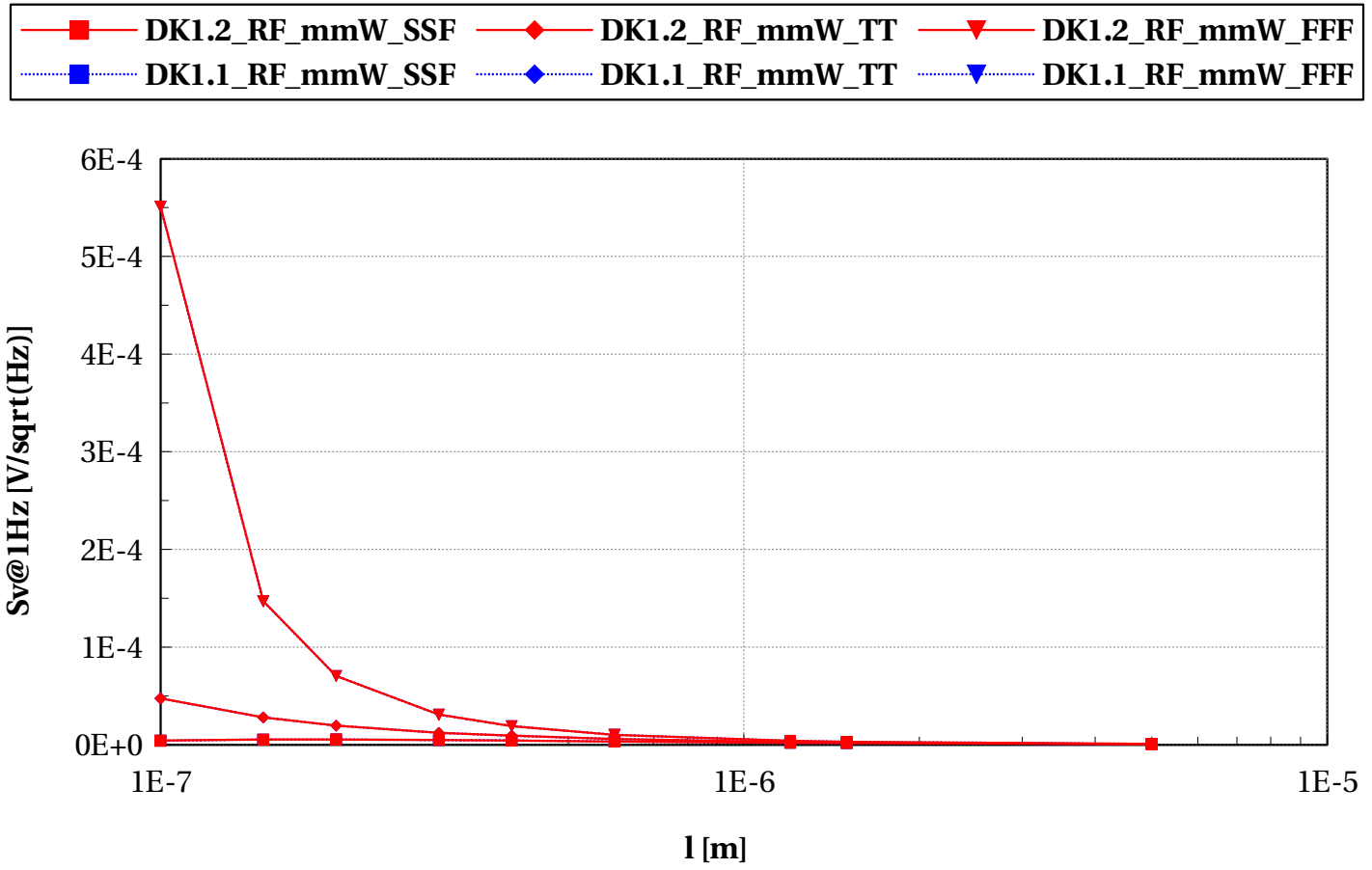
eglvtvnfet_acc, Gds_ana/w [S/um] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



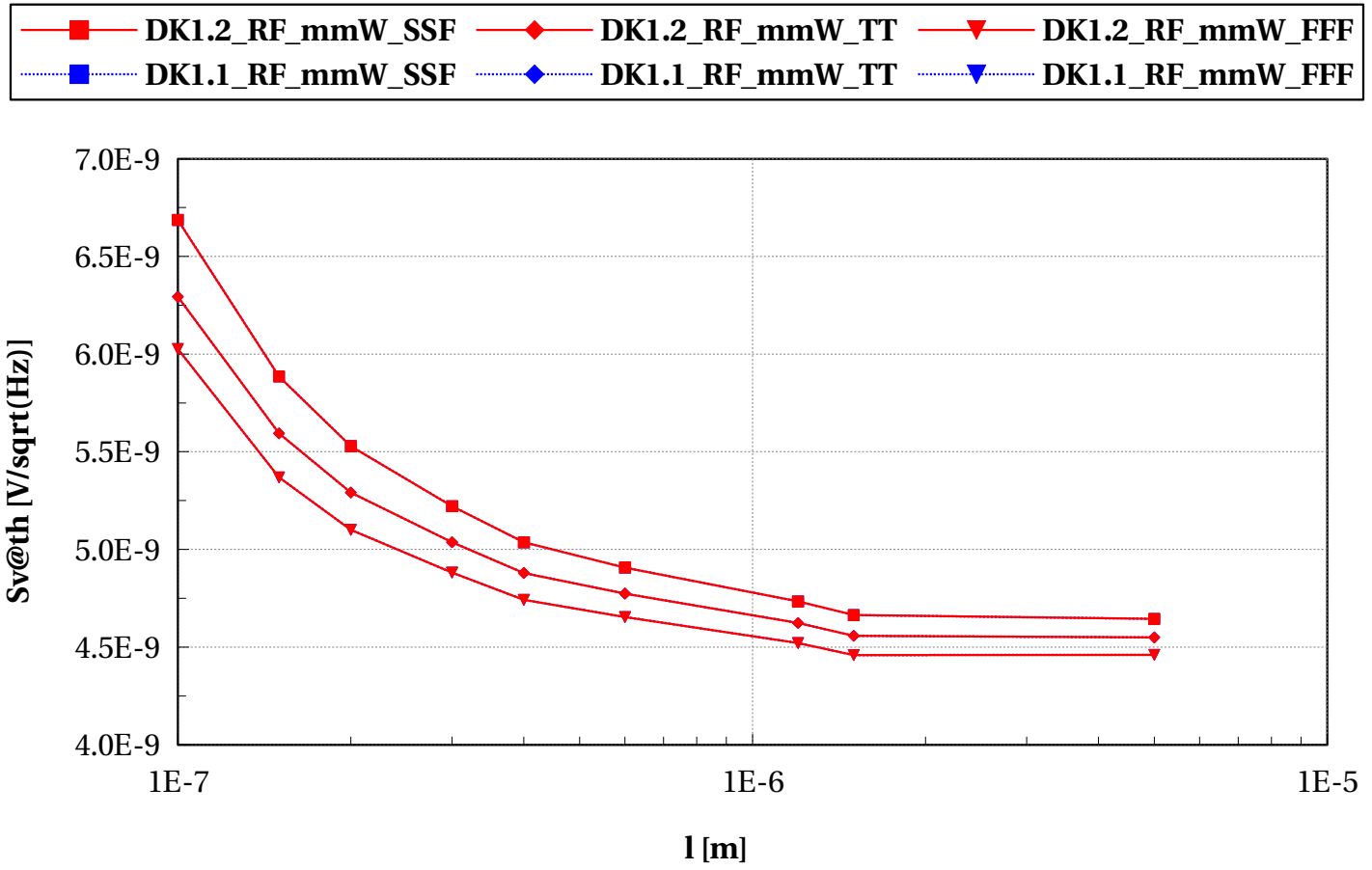
eglvtvnfet_acc, Sv@1Hz [V/sqrt(Hz)] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



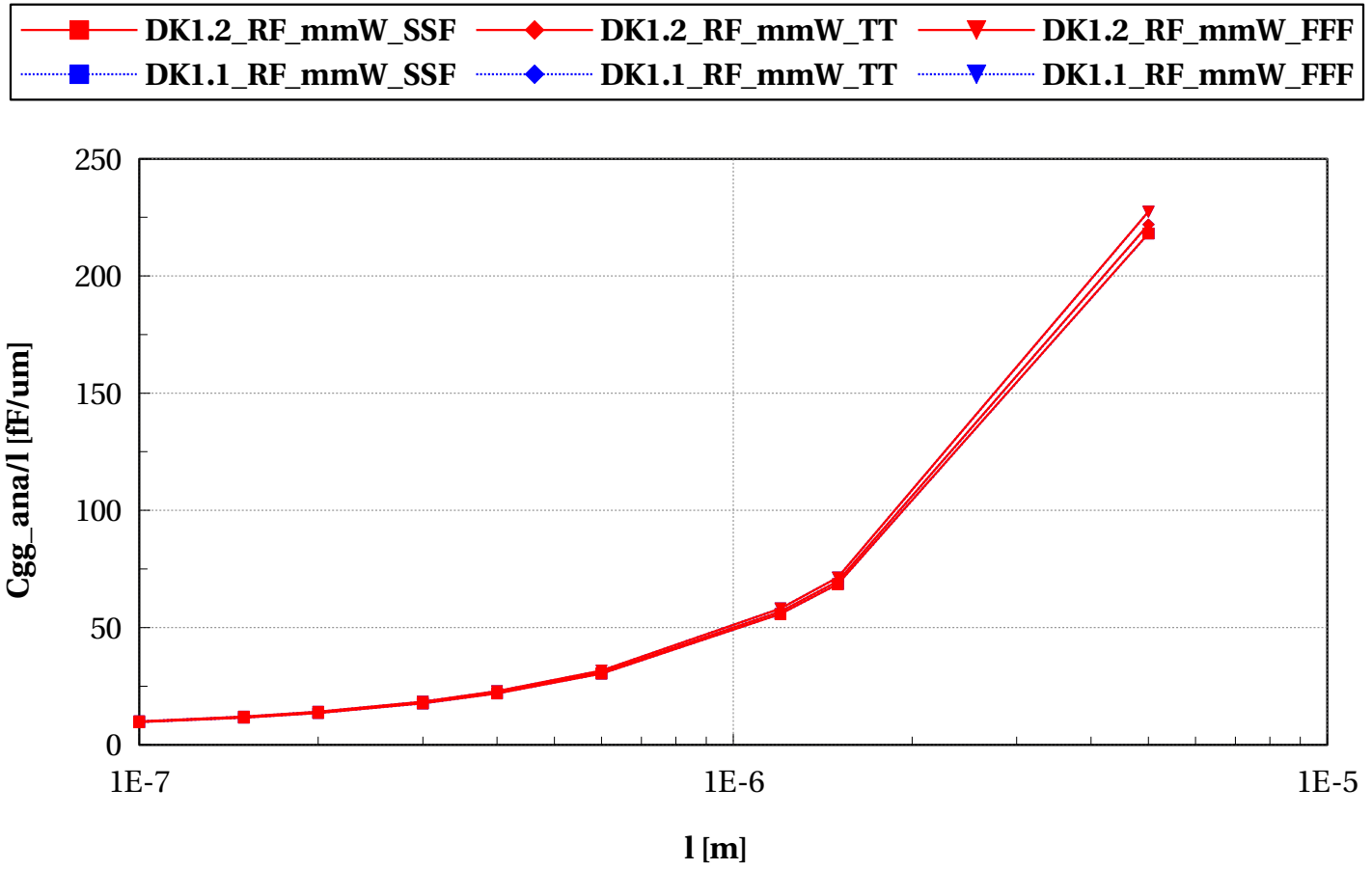
eglvtvnfet_acc, Sv@th [V/sqrt(Hz)] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



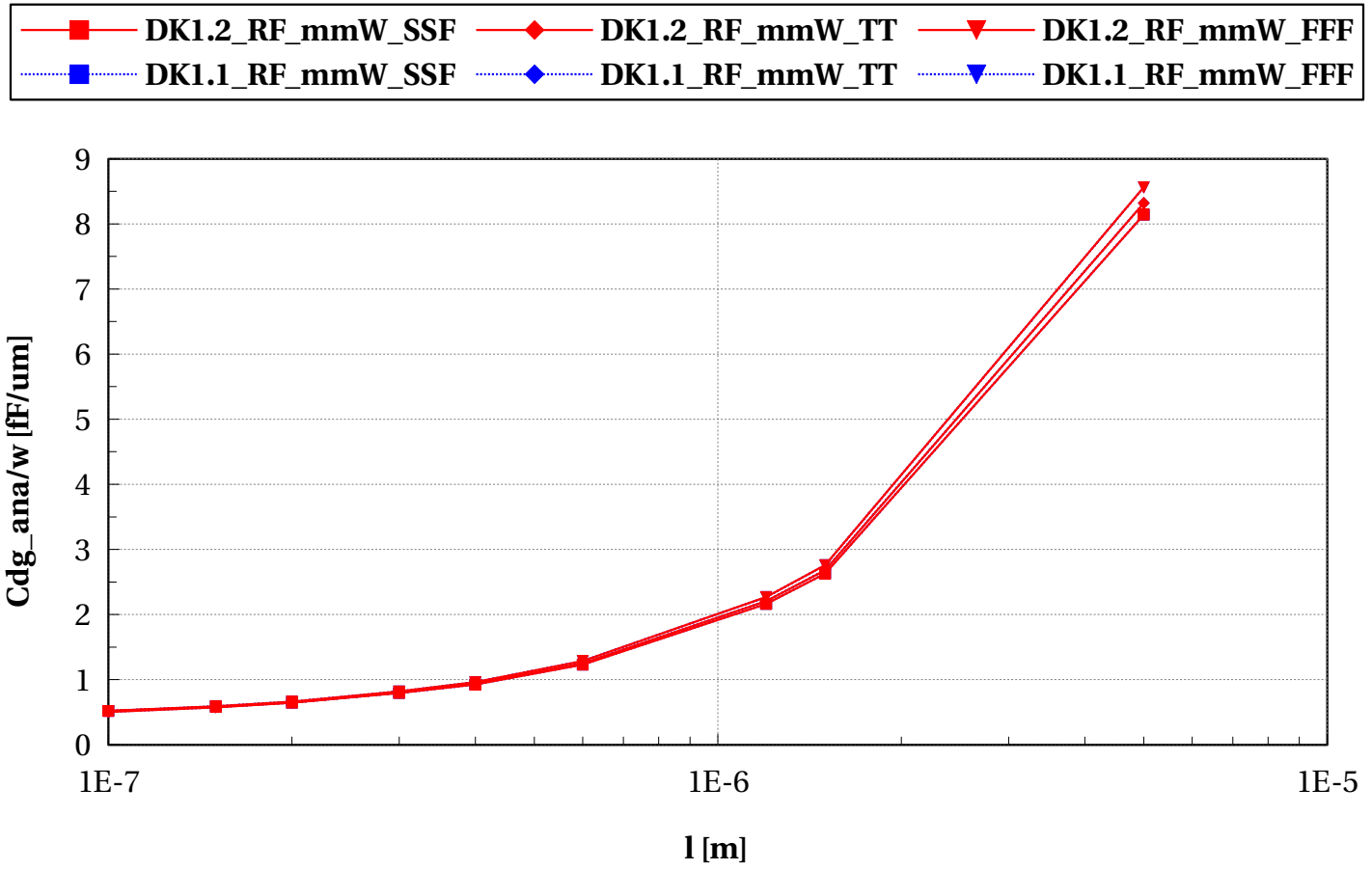
eglvtvnfet_acc, Cgg_ana/l [fF/um] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



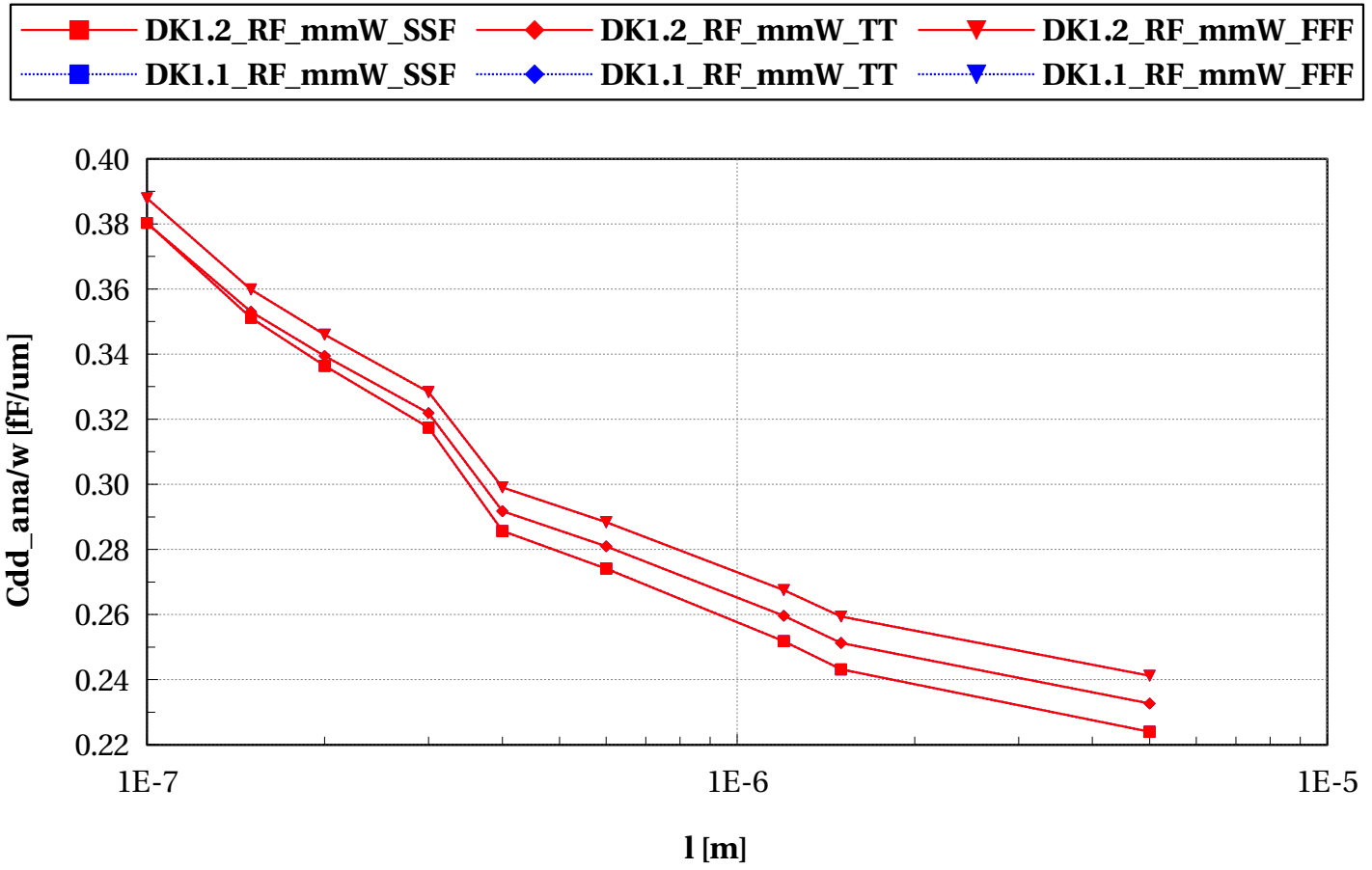
eglvtvnfet_acc, Cdg_ana/w [fF/um] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



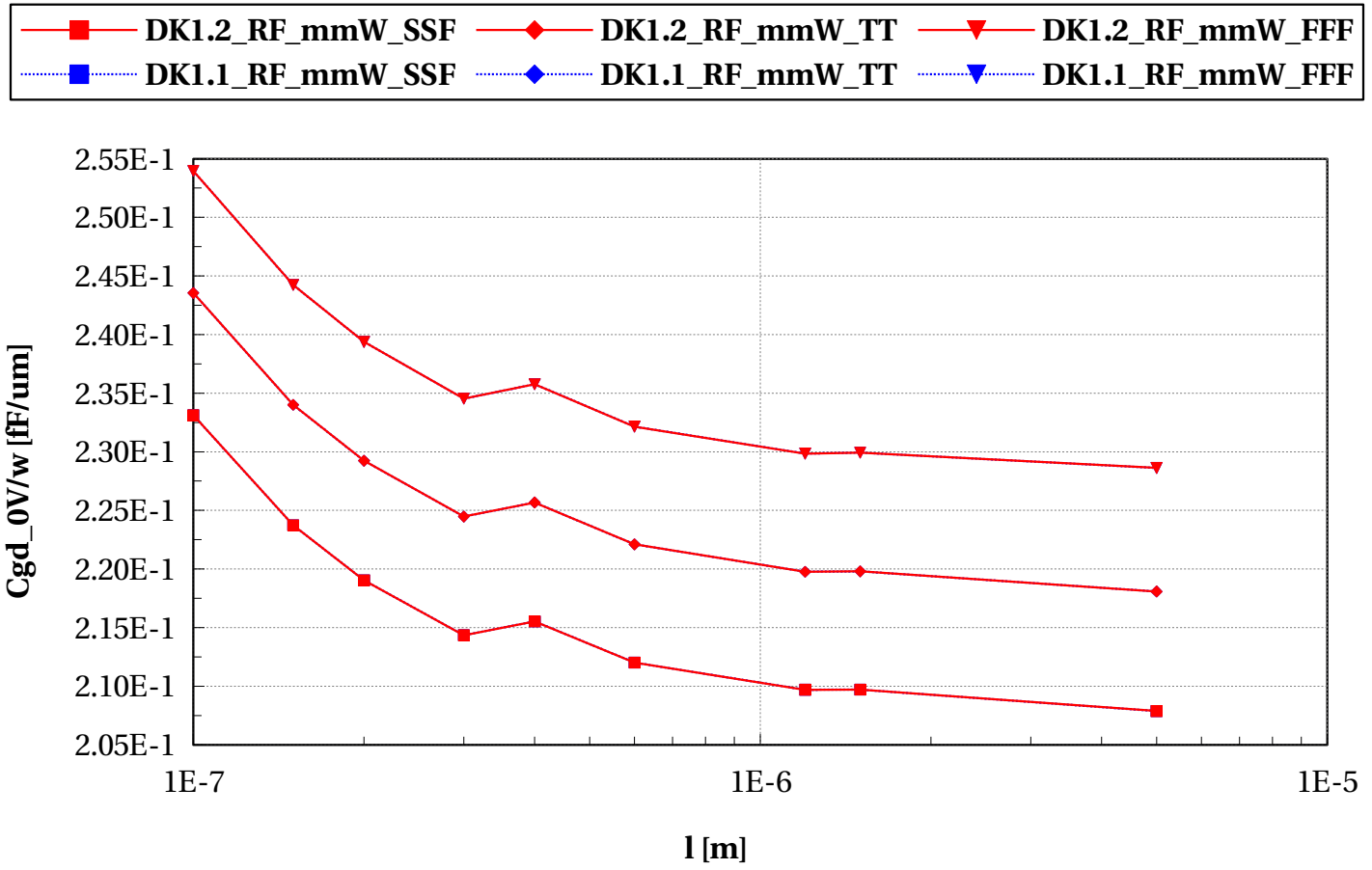
eglvtvnfet_acc, Cdd_ana/w [fF/um] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



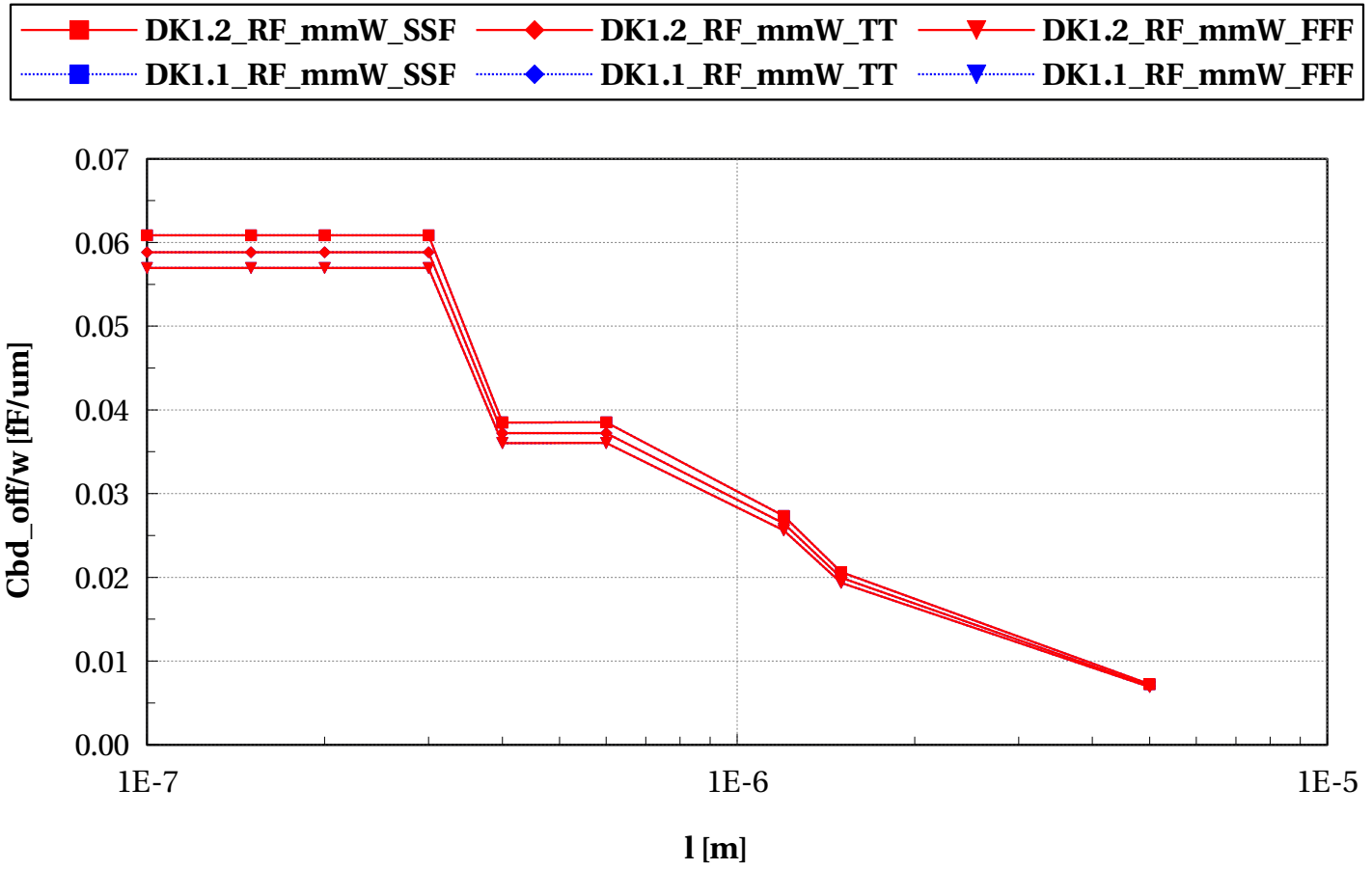
eglvtvnfet_acc, Cgd_0V/w [fF/um] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



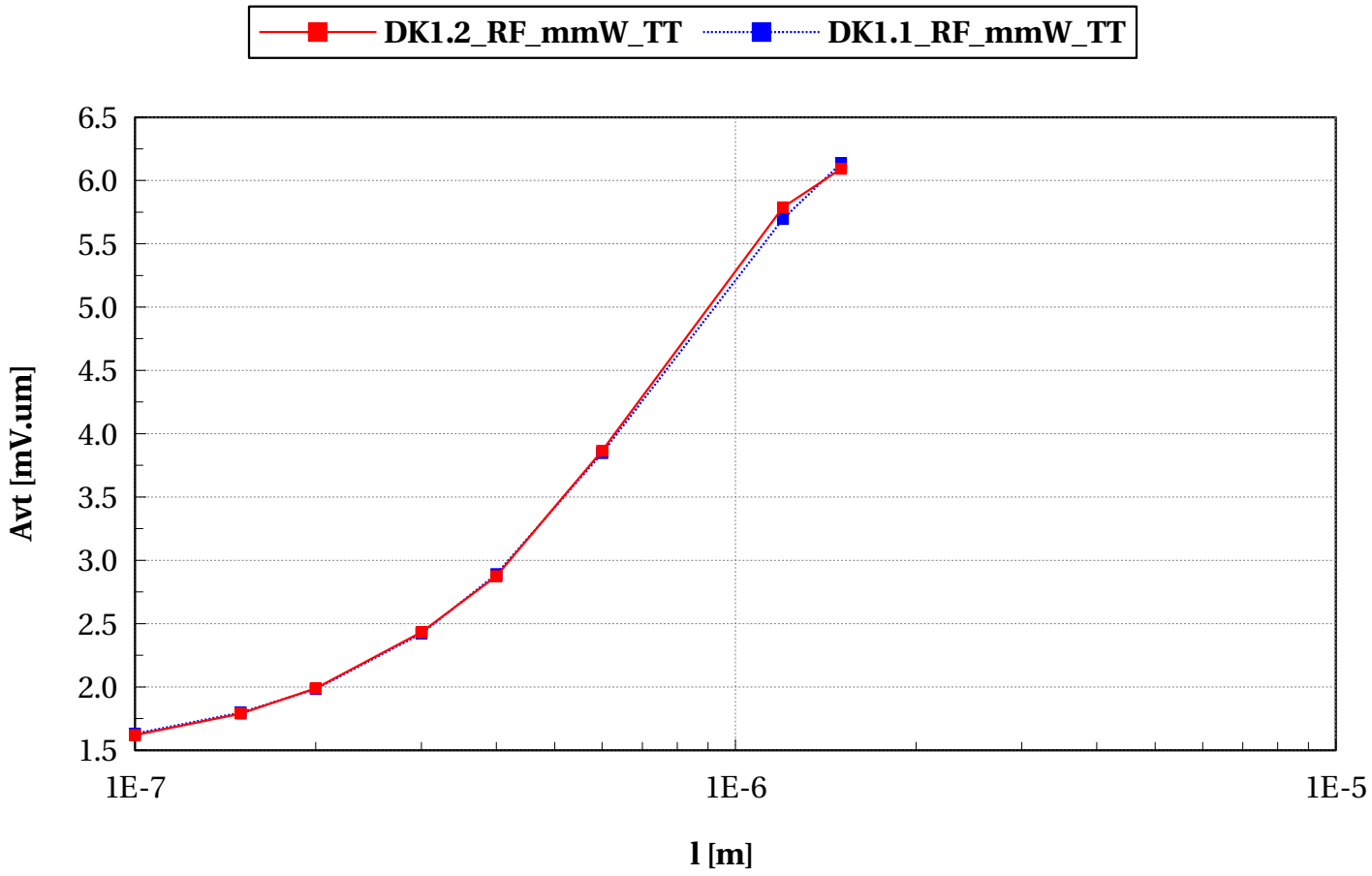
eglvtvnfet_acc, Cbd_off/w [fF/um] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==0 and devType=="PCELLwoWPE"



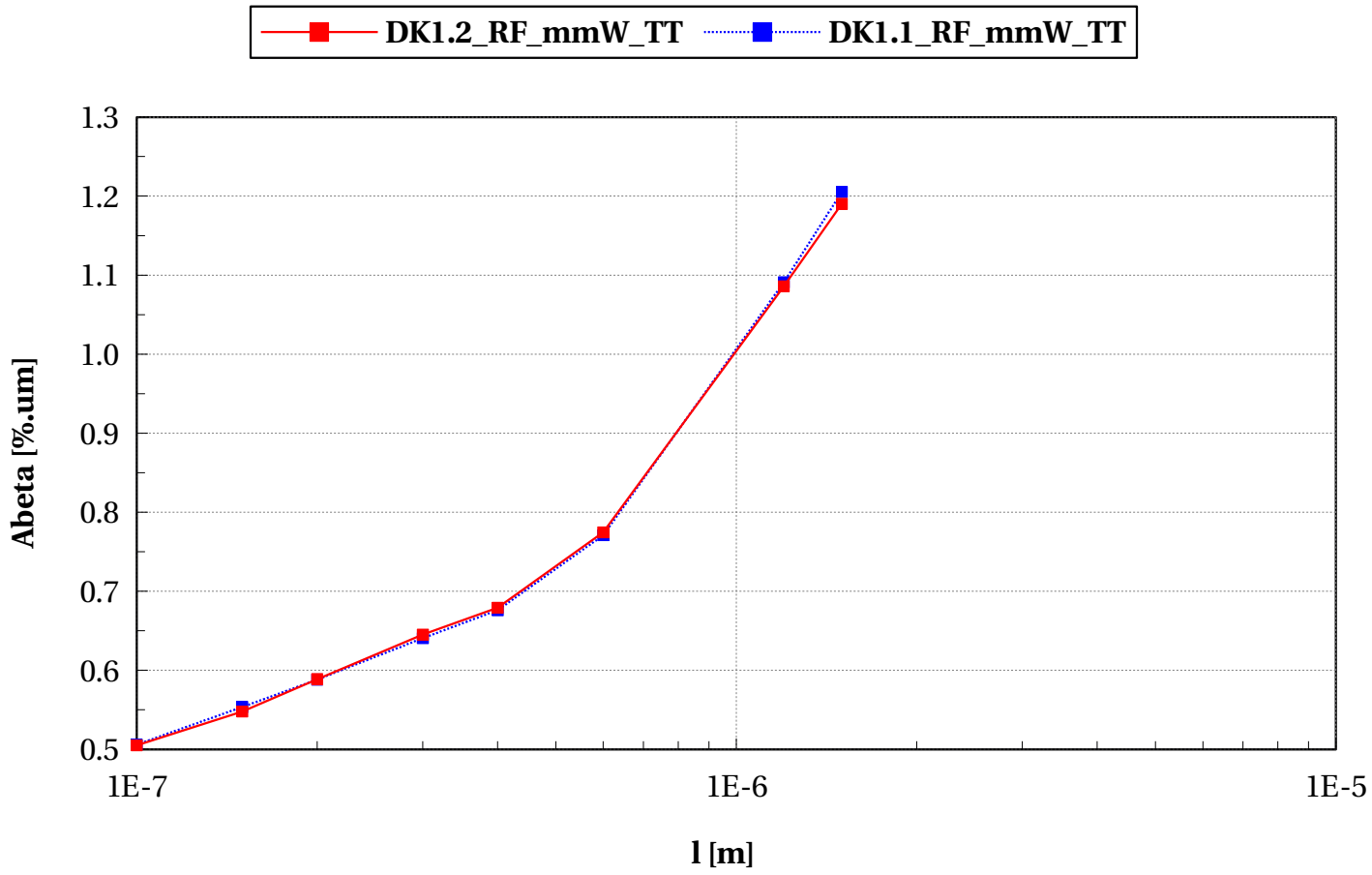
eglvtvnfet_acc, Avt [mV.um] vs l [m]

/L==10 and w/nf<5 and Temp==25 and vbs==0 and stratn==2 and l<5e-6 and devType=="PCELLwoWP



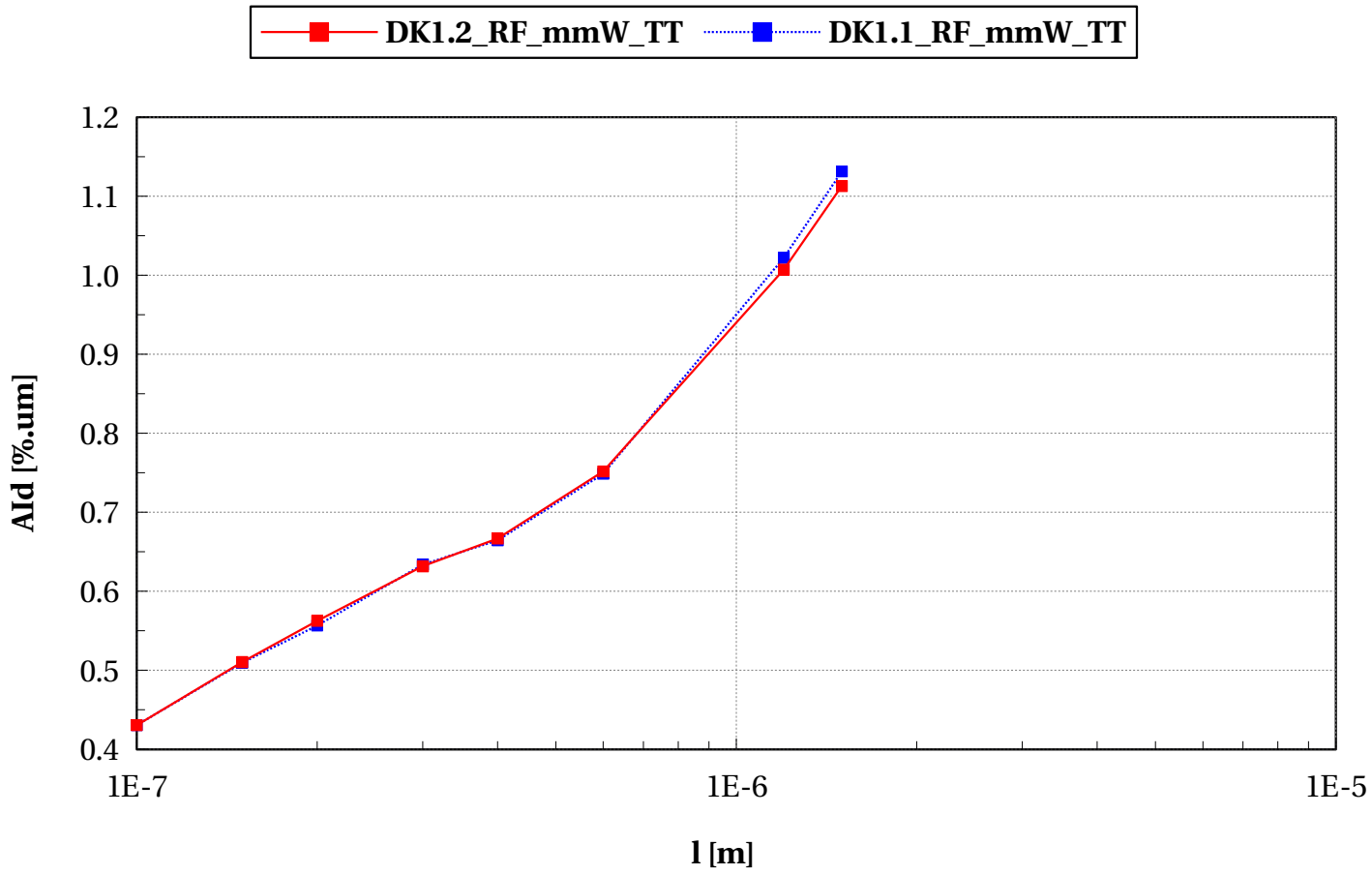
eglvtvnfet_acc, Abeta [%.um] vs l [m]

/L==10 and w/nf<5 and Temp==25 and vbs==0 and stratn==2 and l<5e-6 and devType=="PCELLwoWP



eglvtvnfet_acc, AId [%.um] vs l [m]

/L==10 and w/nf<5 and Temp==25 and vbs==0 and stratn==2 and l<5e-6 and devType=="PCELLwoWP

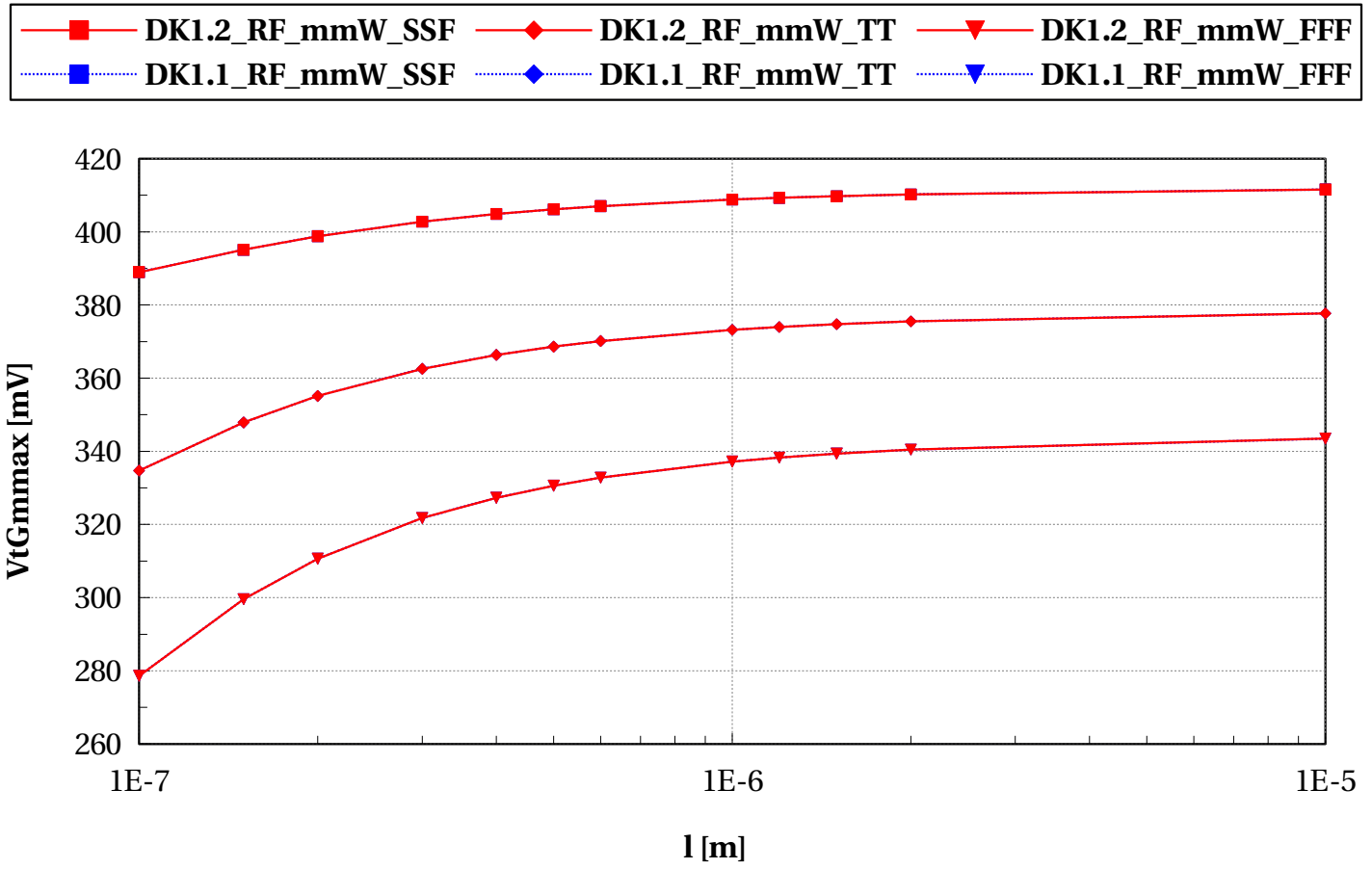


eglvtvpfet_acc
Electrical characteristics scaling

Scaling versus Length (T=25C,vbs=1.5V-FBB)

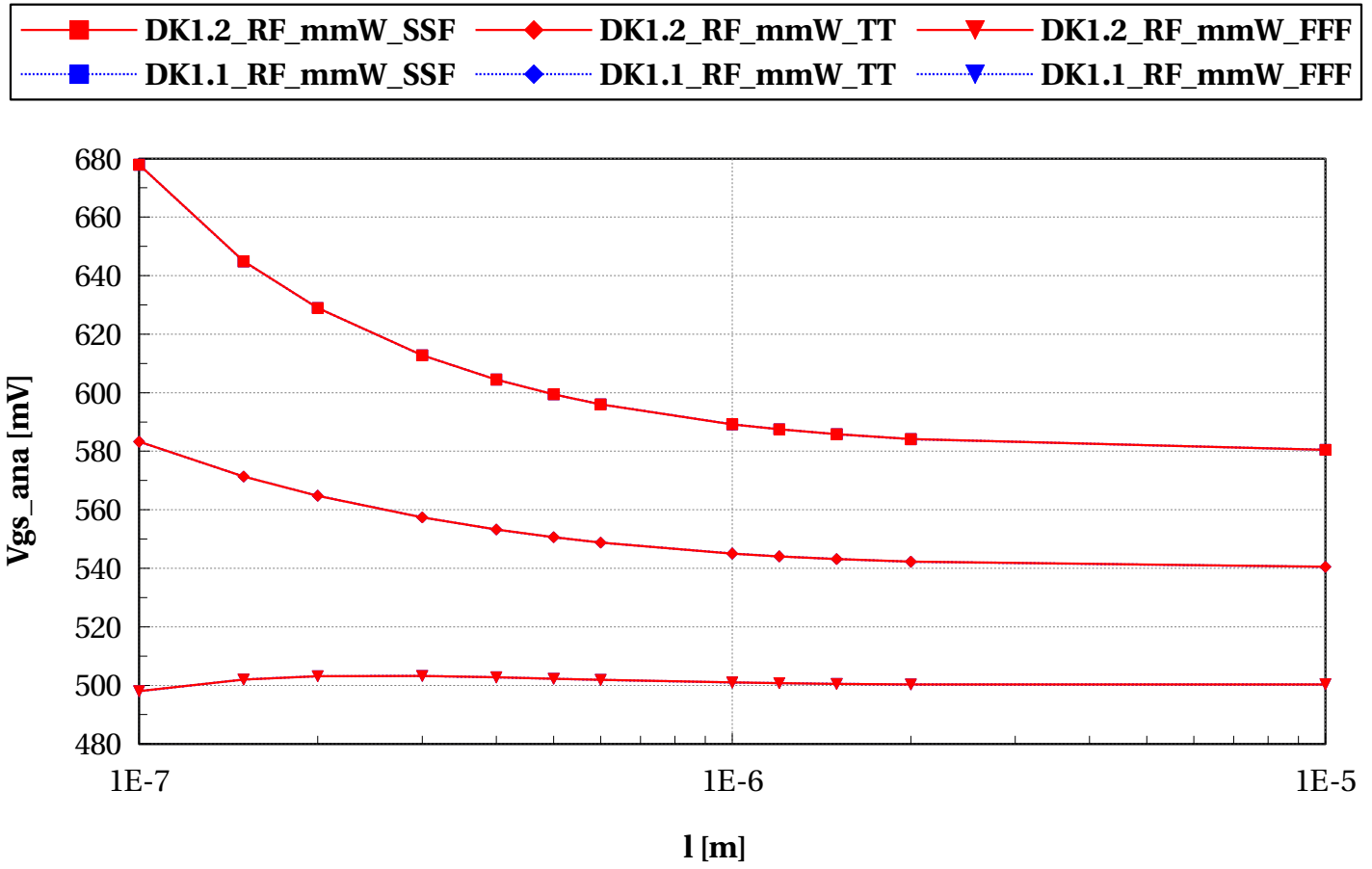
eglvtvpfet_acc, VtGmmax [mV] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



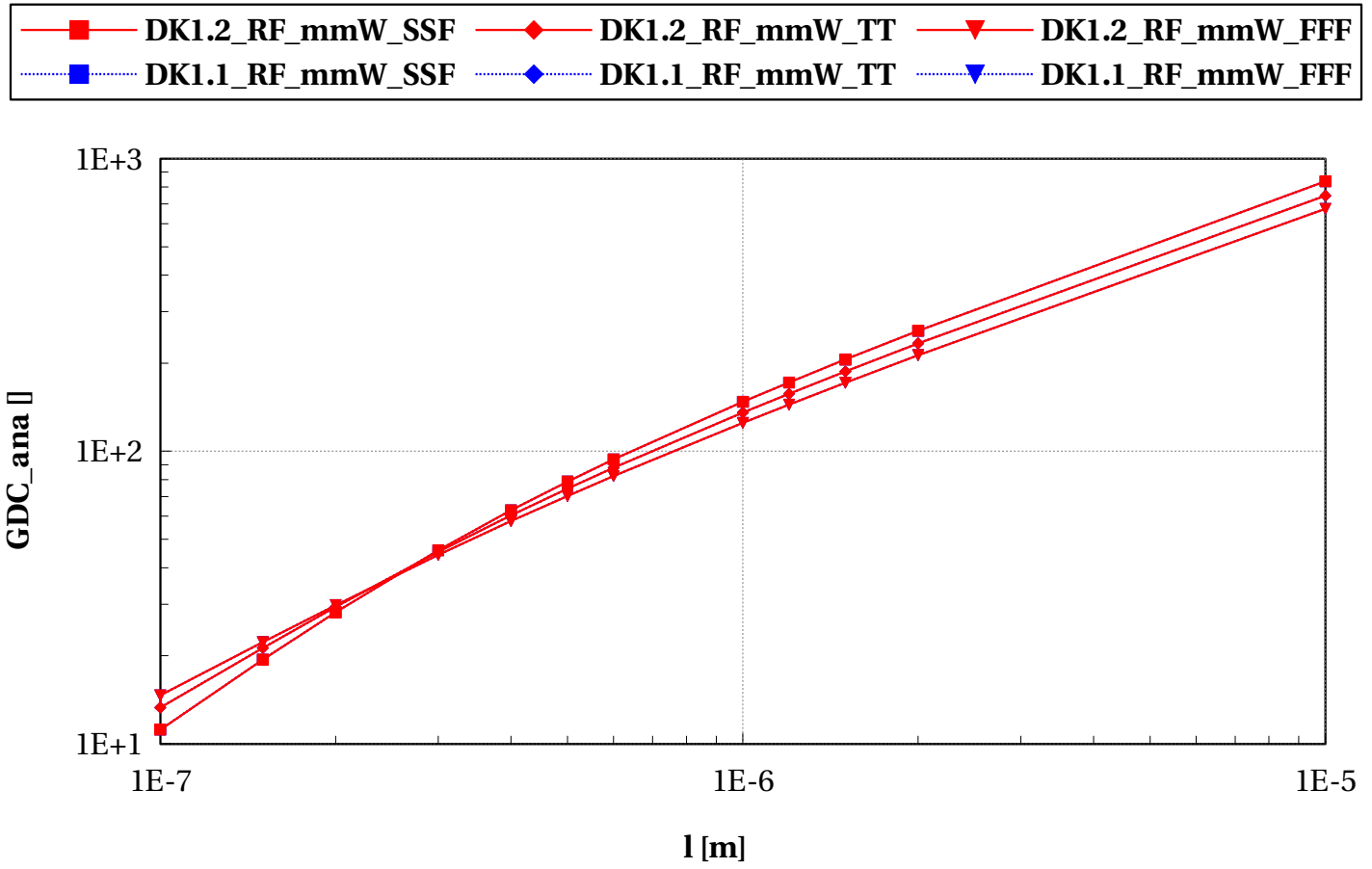
eglvtvpfet_acc, Vgs_ana [mV] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



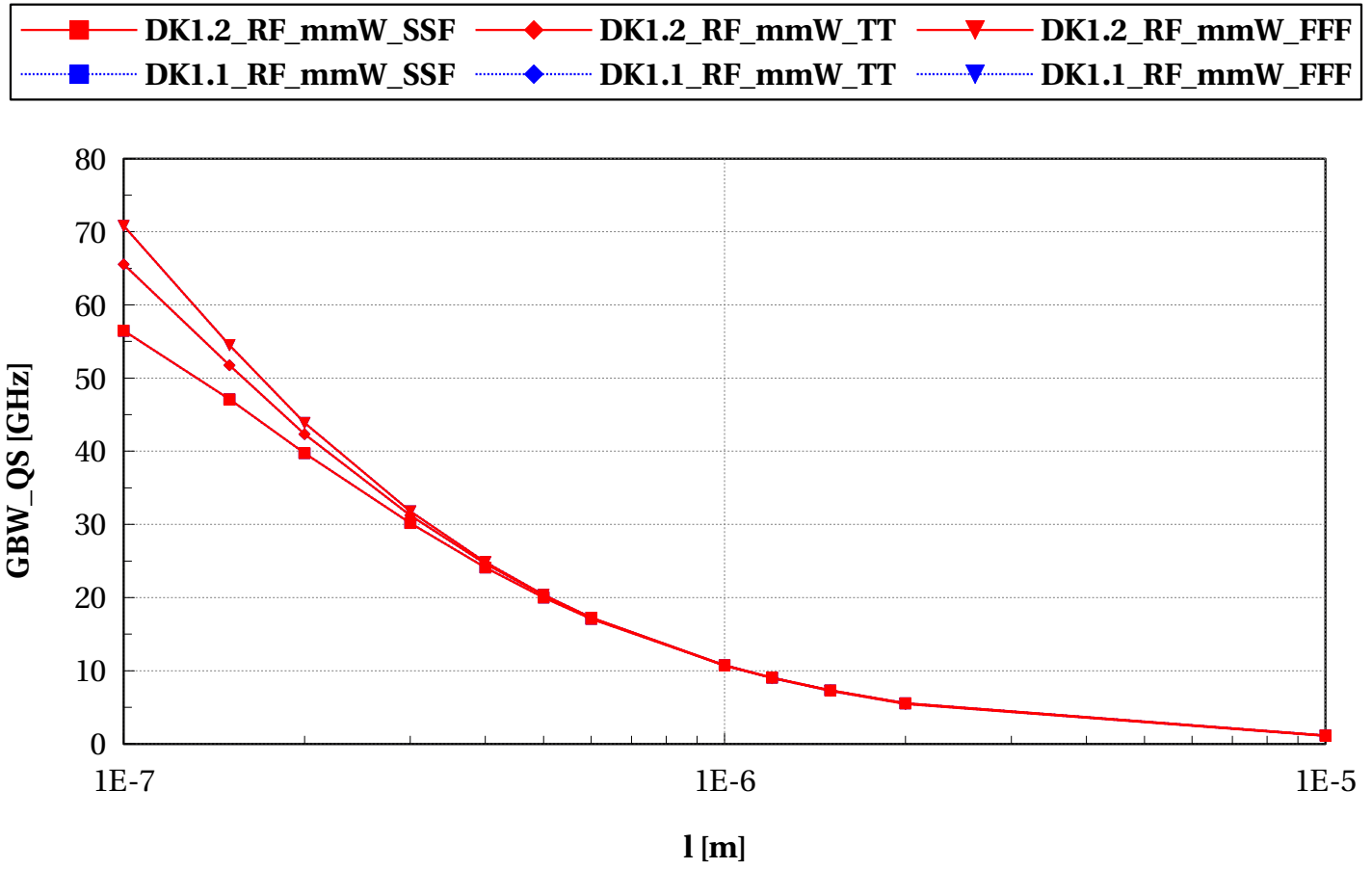
eglvtvpfet_acc, GDC_ana [] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



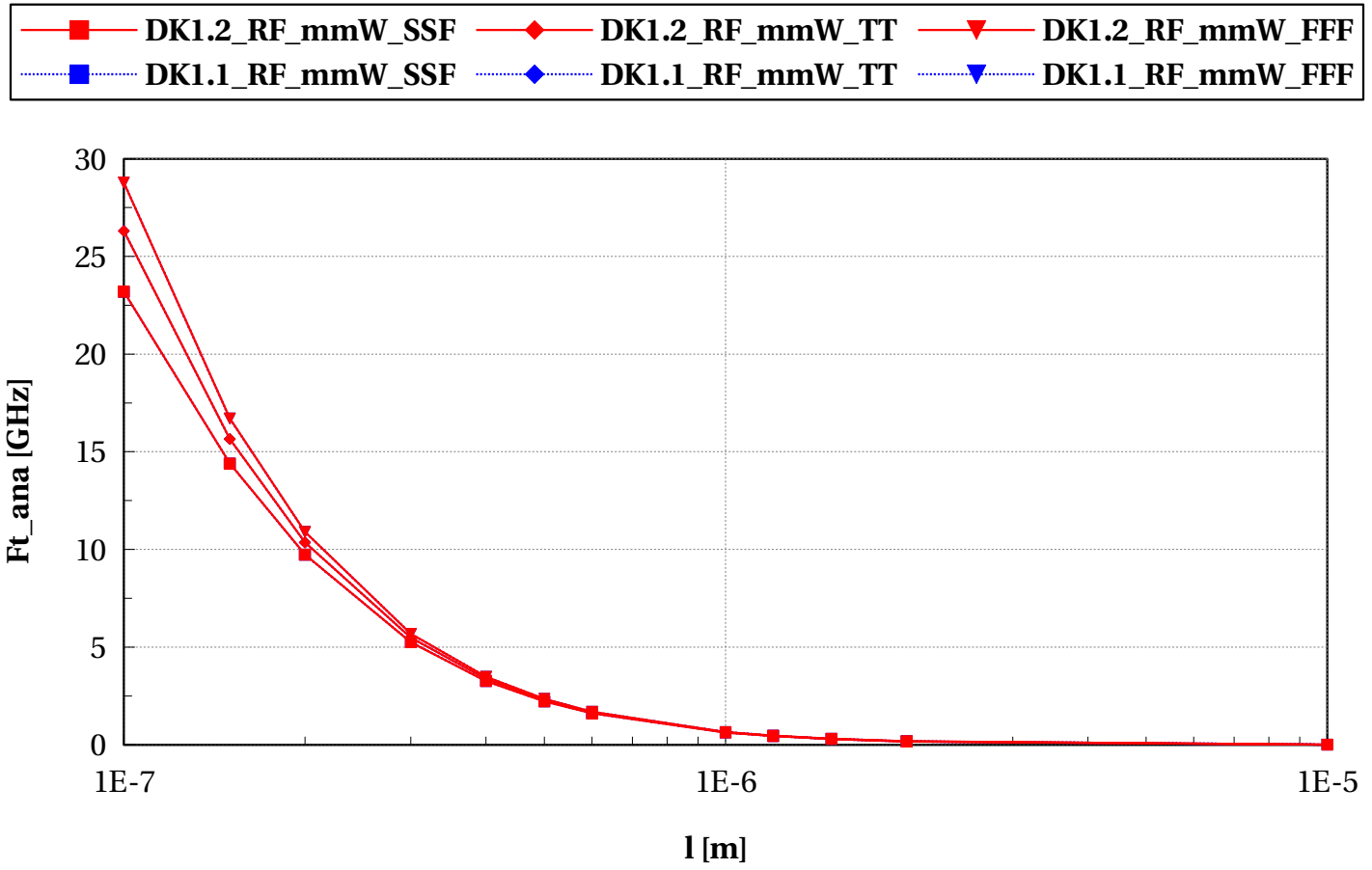
eglvtvpfet_acc, GBW_QS [GHz] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



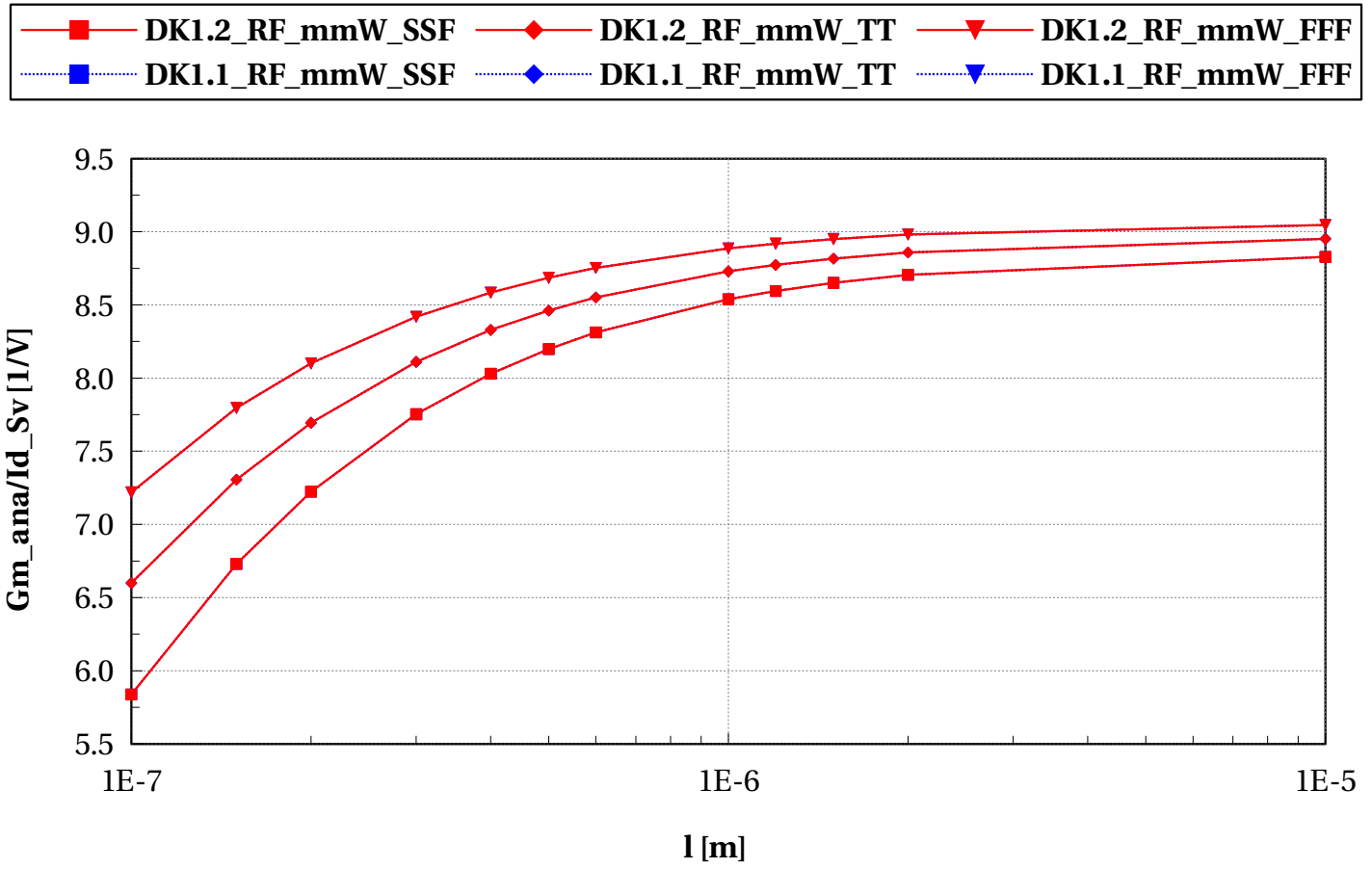
eglvtvpfet_acc, Ft_ana [GHz] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



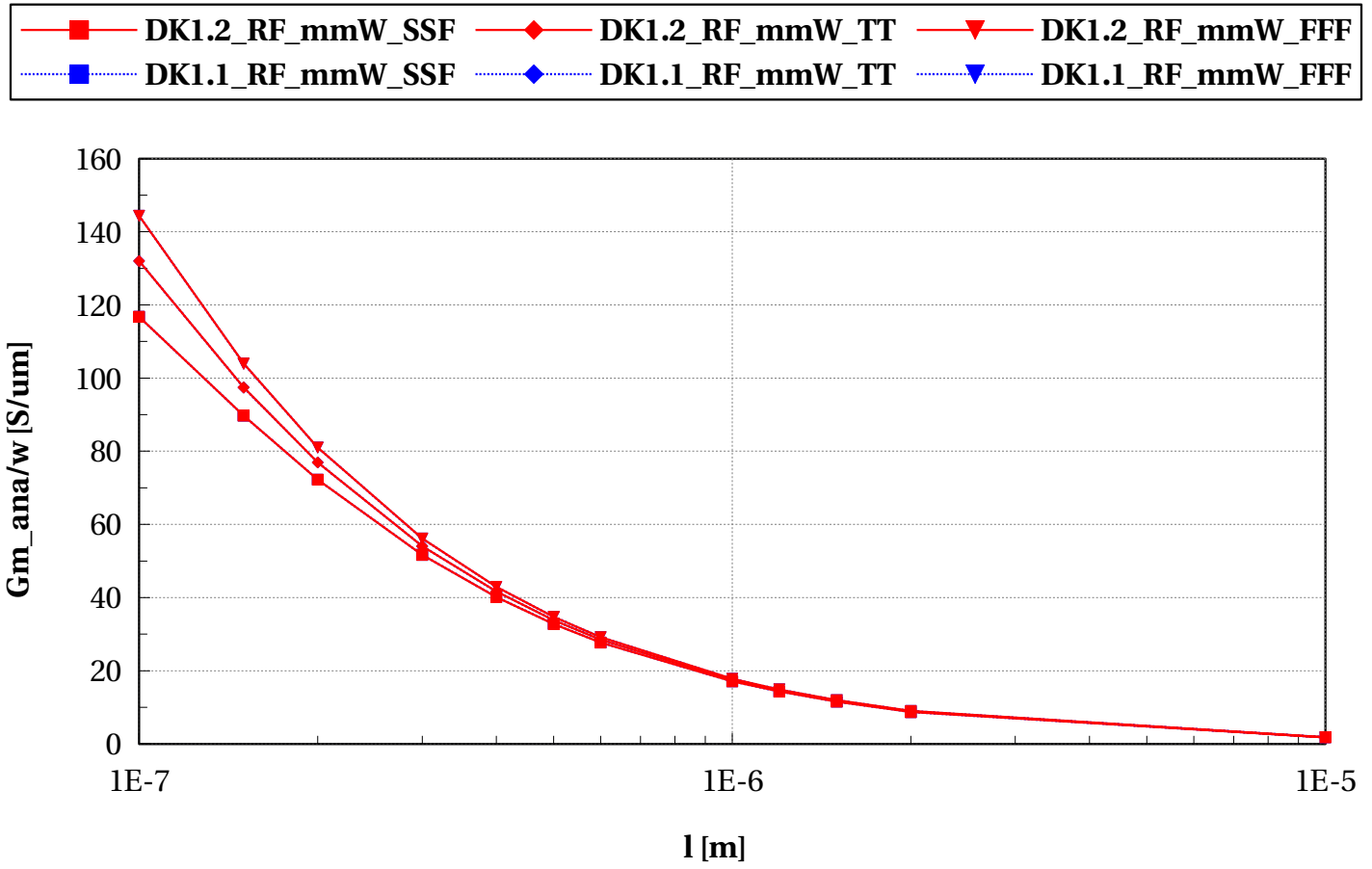
eglvtvpfet_acc, Gm_ana/Id_Sv [1/V] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



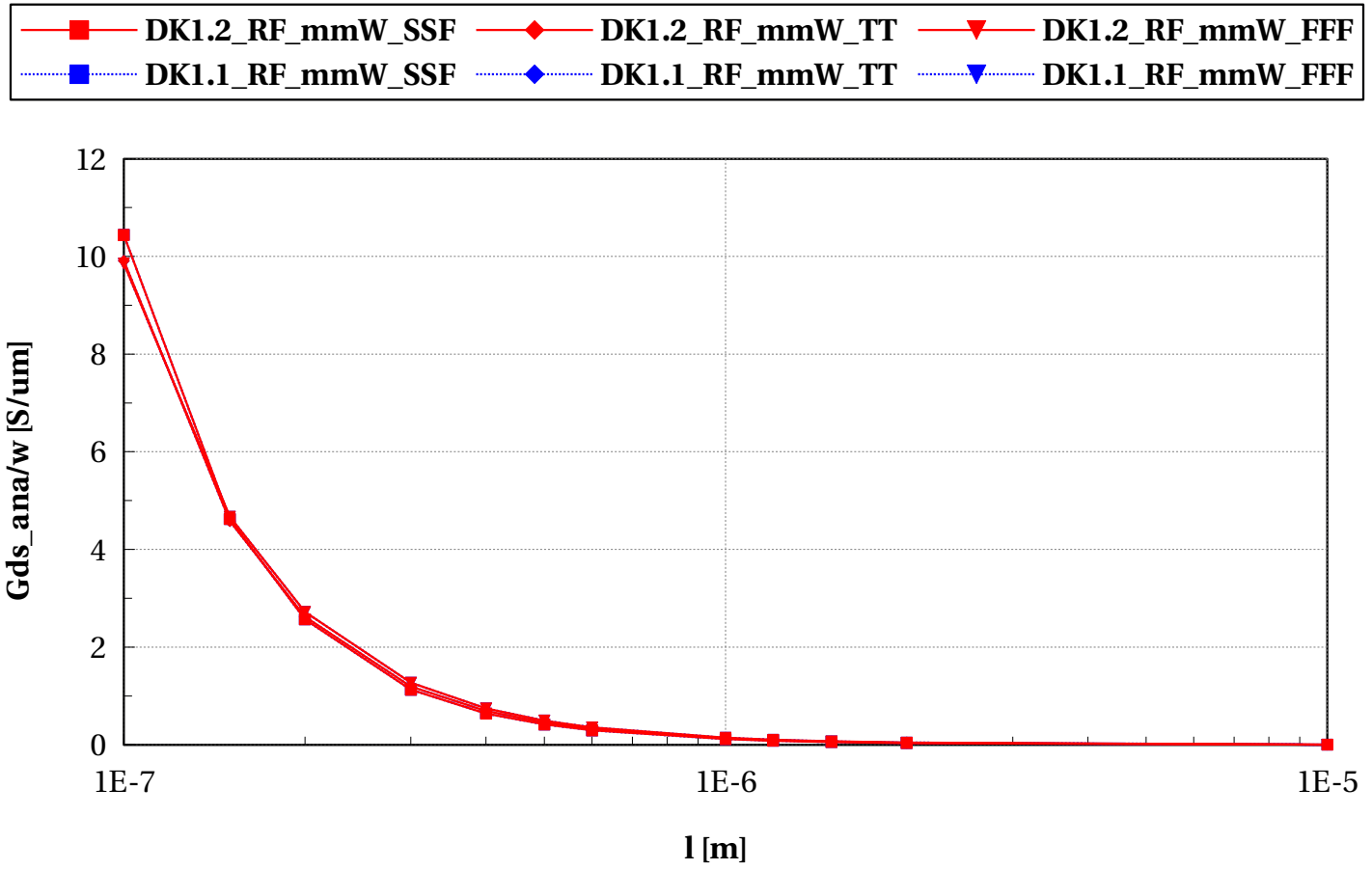
eglvtvpfet_acc, Gm_ana/w [S/um] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



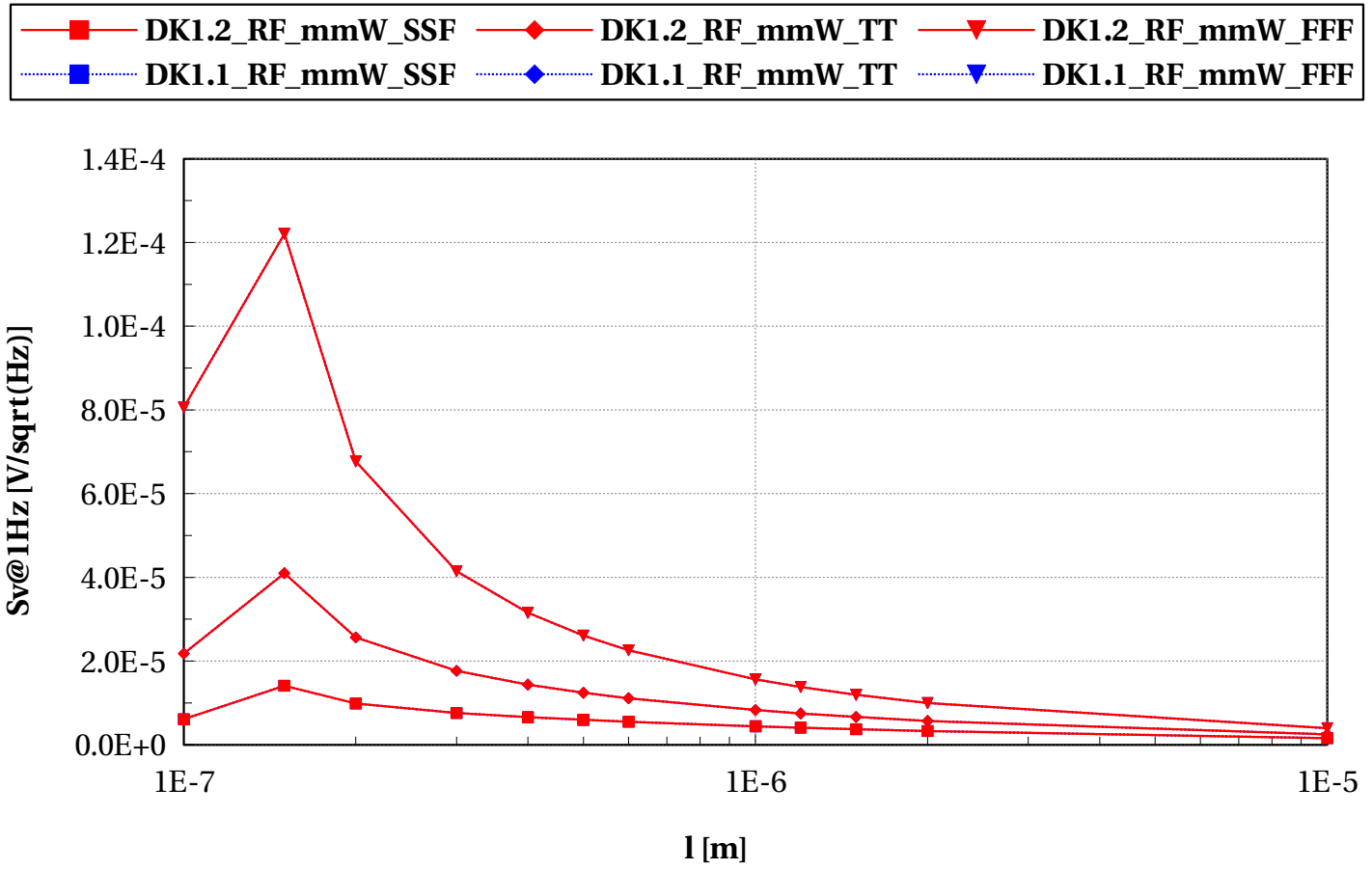
eglvtvpfet_acc, Gds_ana/w [S/um] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



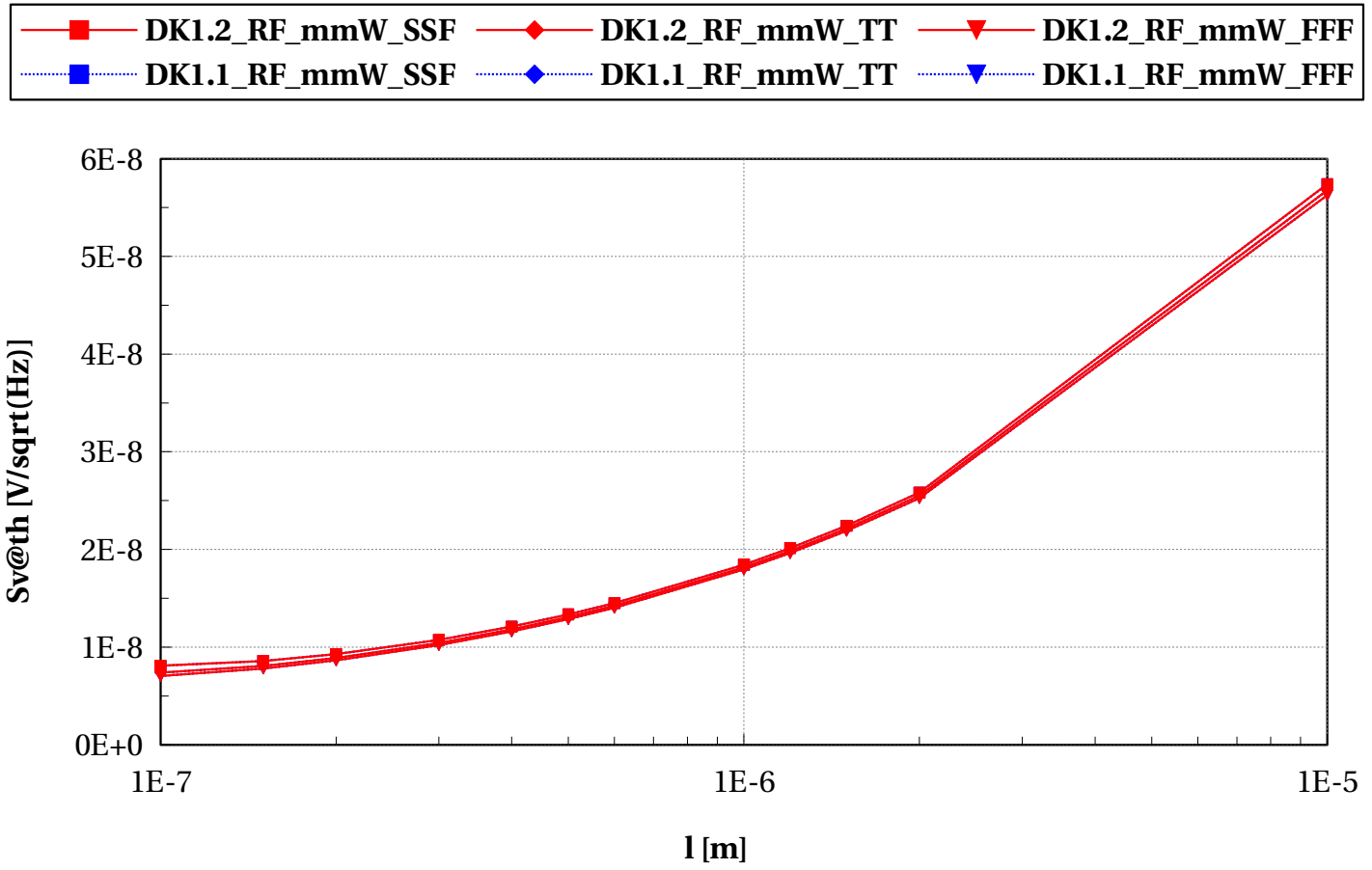
eglvtvpfet_acc, Sv@1Hz [V/sqrt(Hz)] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



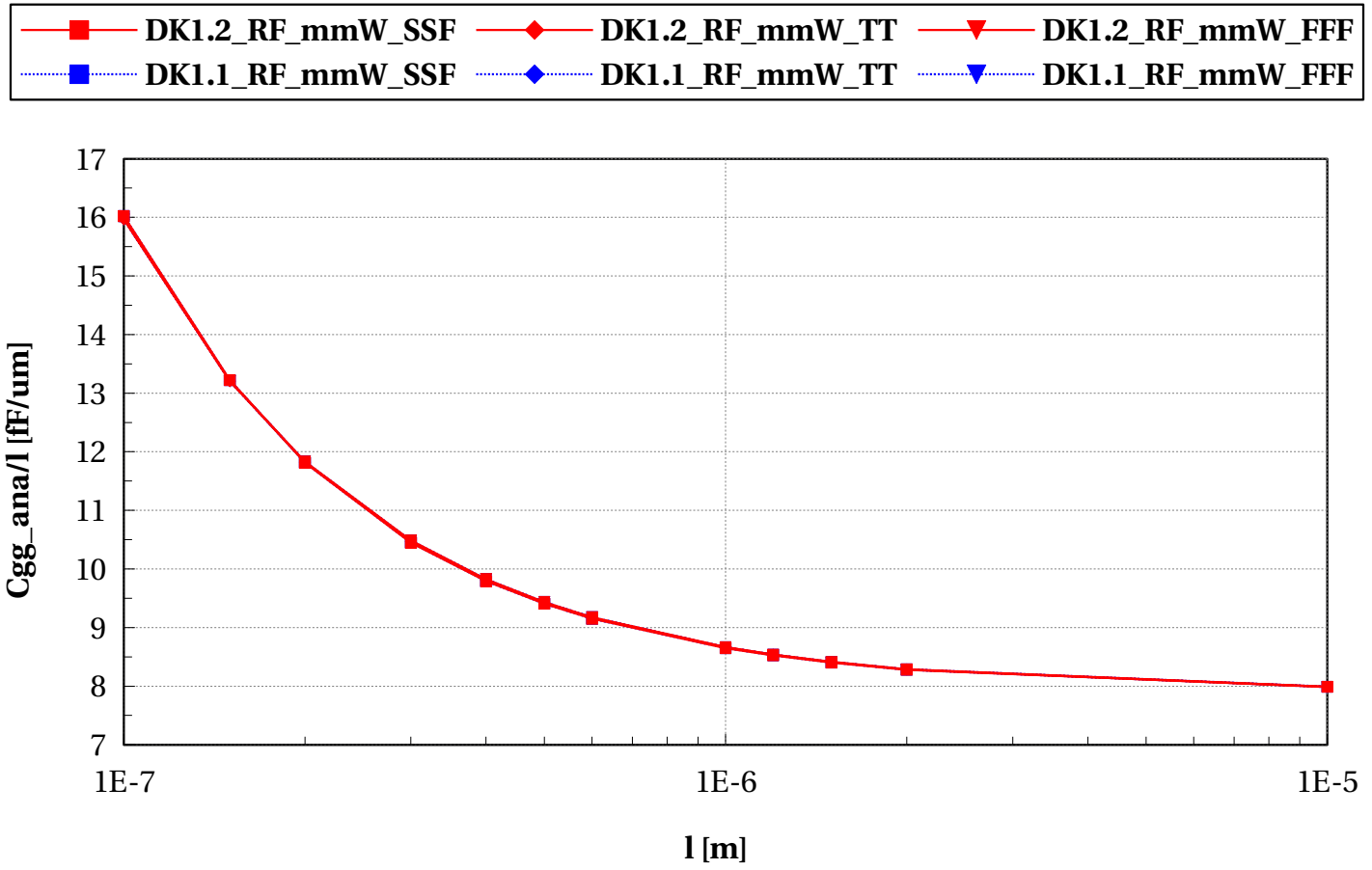
eglvtvpfet_acc, Sv@th [V/sqrt(Hz)] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



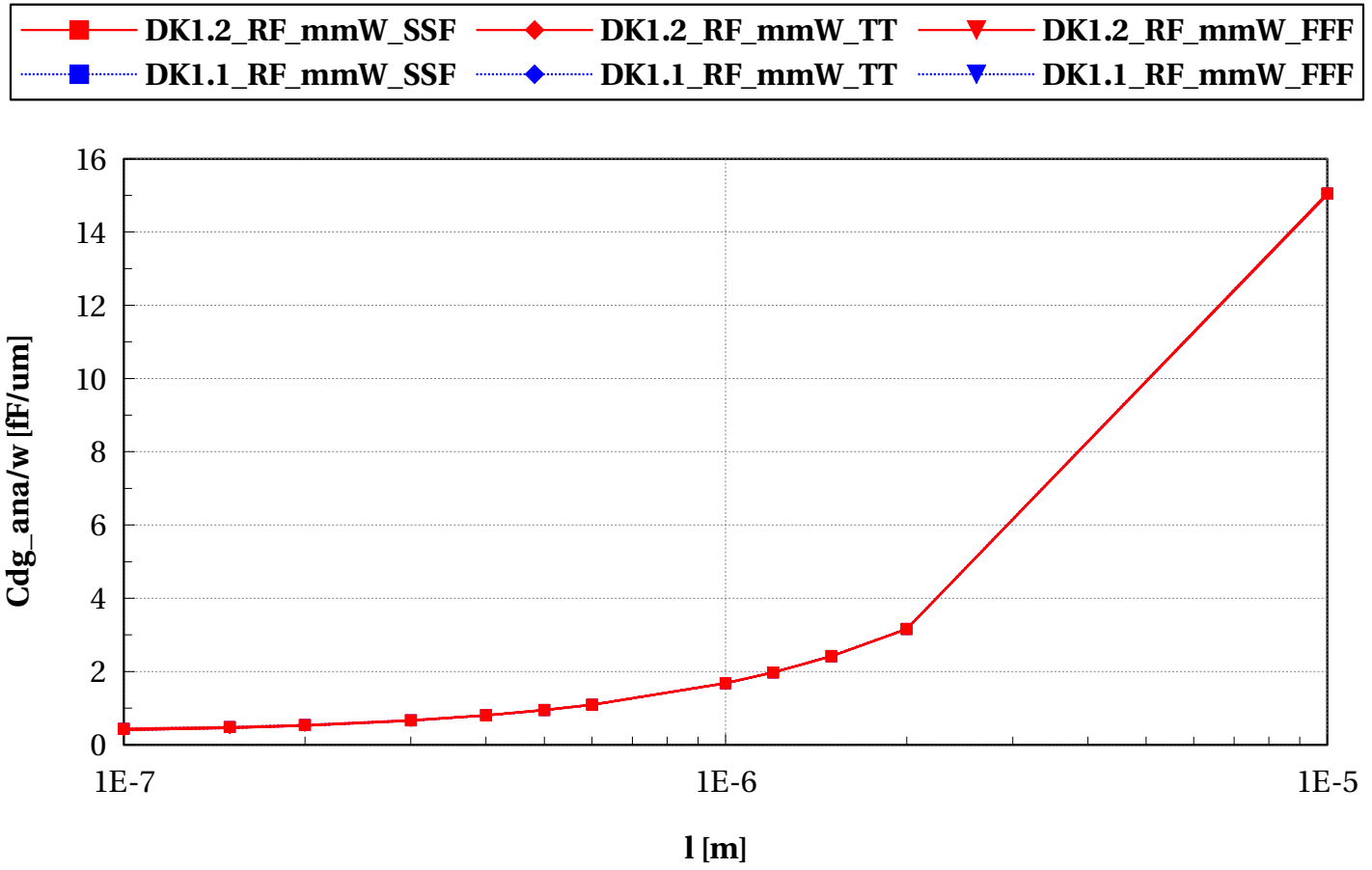
eglvtvpfet_acc, Cgg_ana/l [fF/um] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



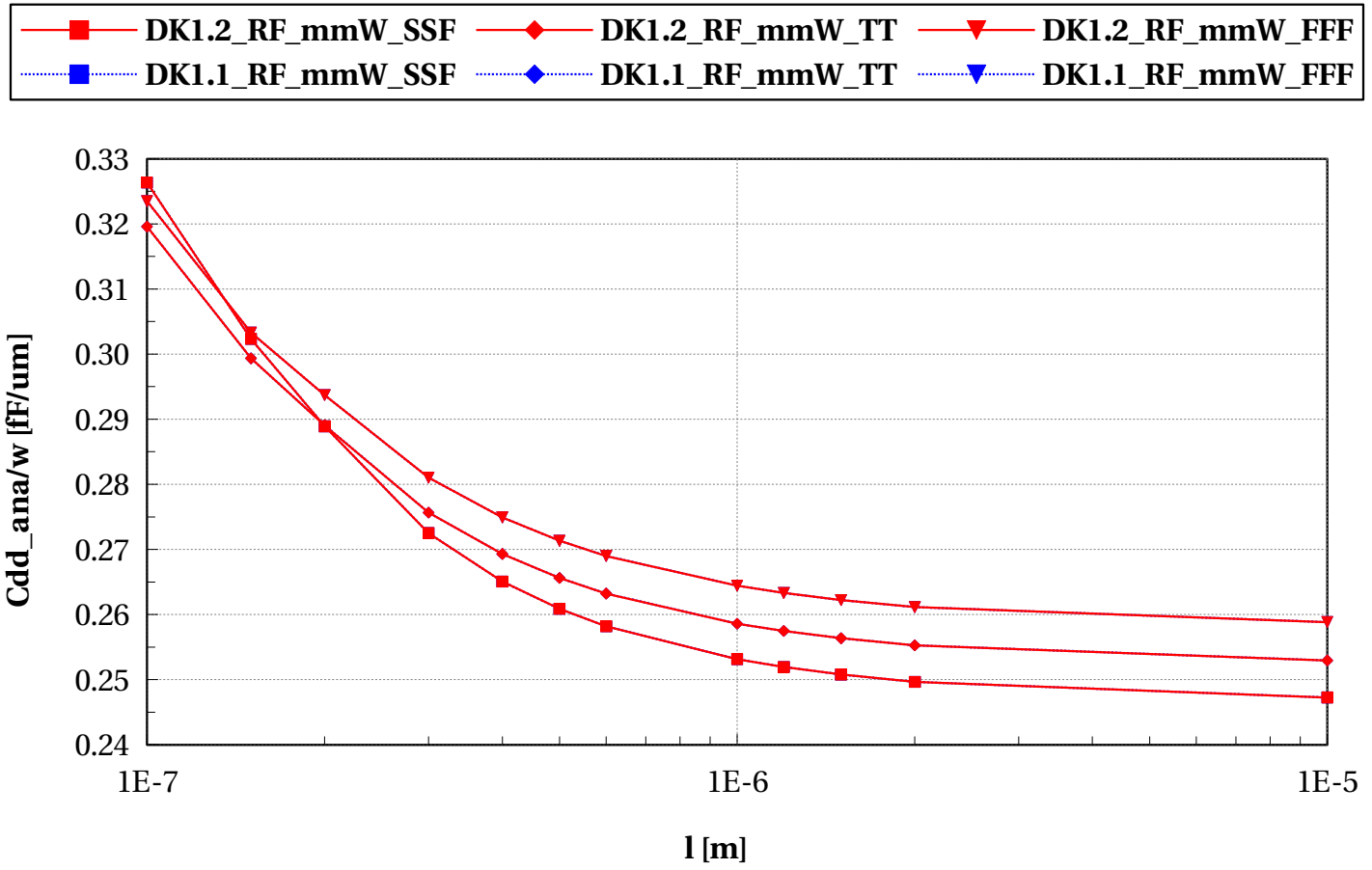
eglvtvpfet_acc, Cdg_ana/w [fF/um] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



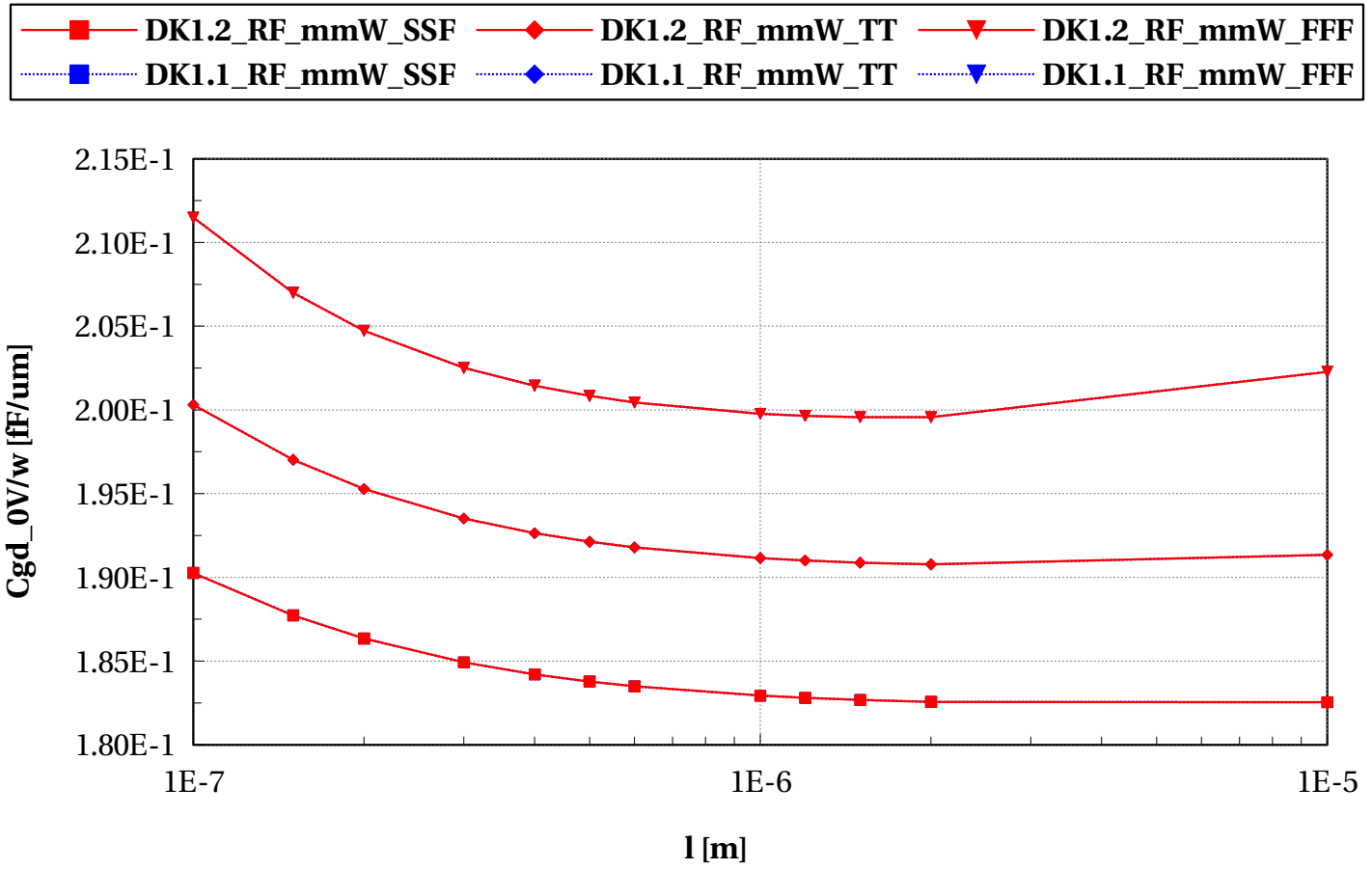
eglvtvpfet_acc, Cdd_ana/w [fF/um] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



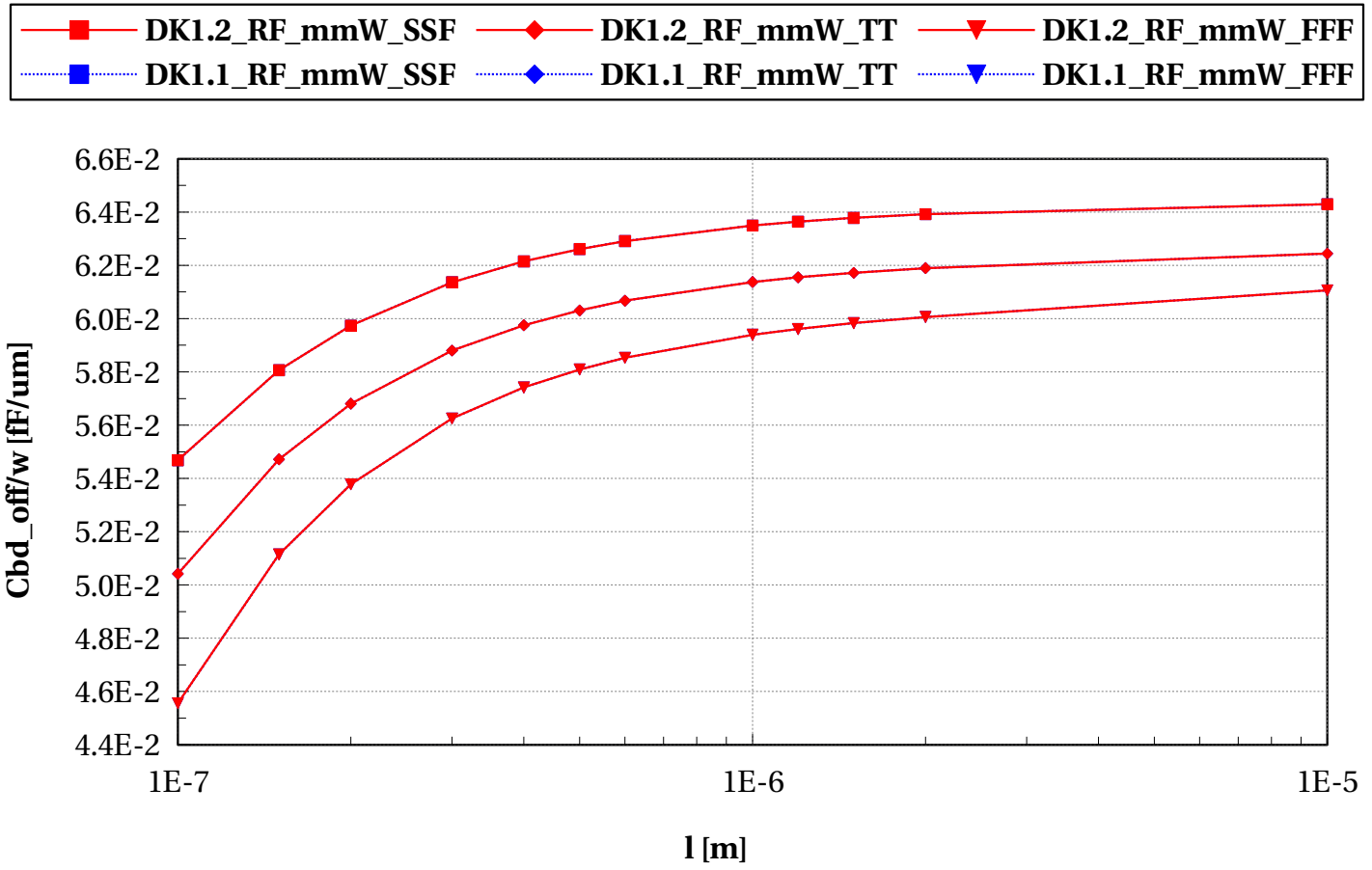
eglvtvpfet_acc, Cgd_0V/w [fF/um] vs l [m]

W==2e-6 and nf==2 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



eglvtvpfet_acc, Cbd_off/w [fF/um] vs l [m]

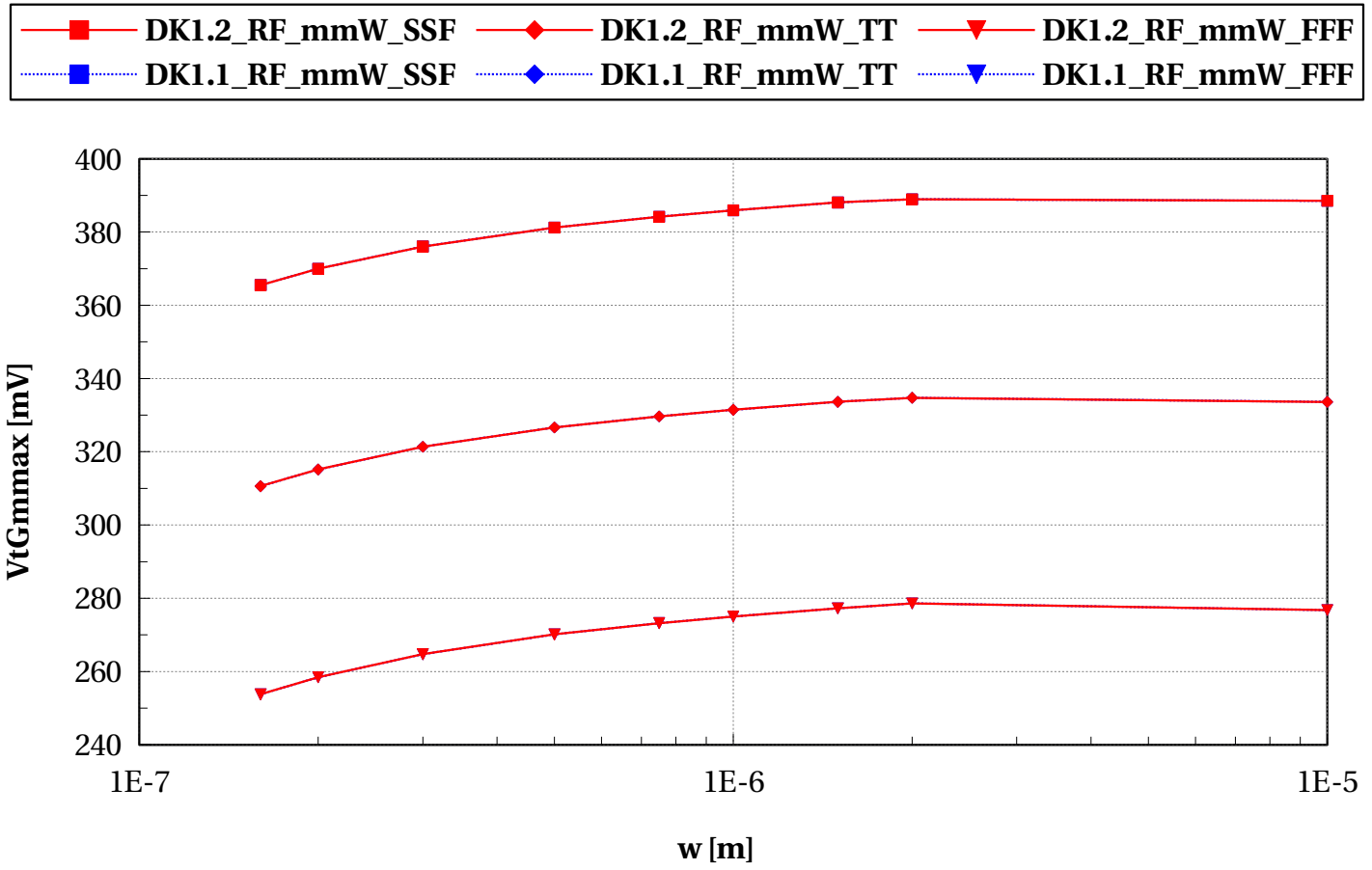
W==2e-6 and nf==2 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



Scaling versus Width (T=25C,vbs=1.5V-FBB)

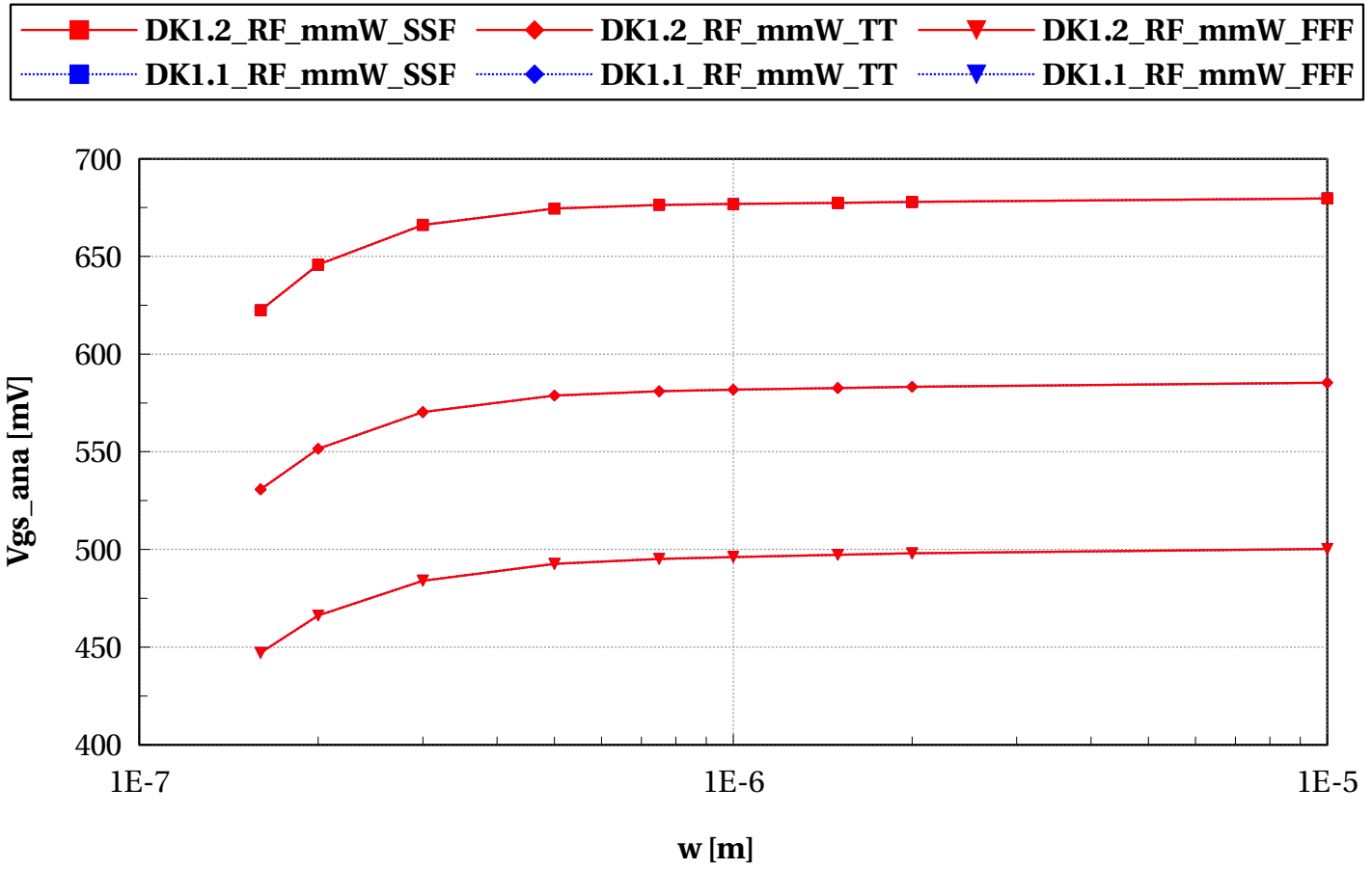
eglvtvpfet_acc, VtGmmax [mV] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==1.5 and devType=="PCELLwoWPE"



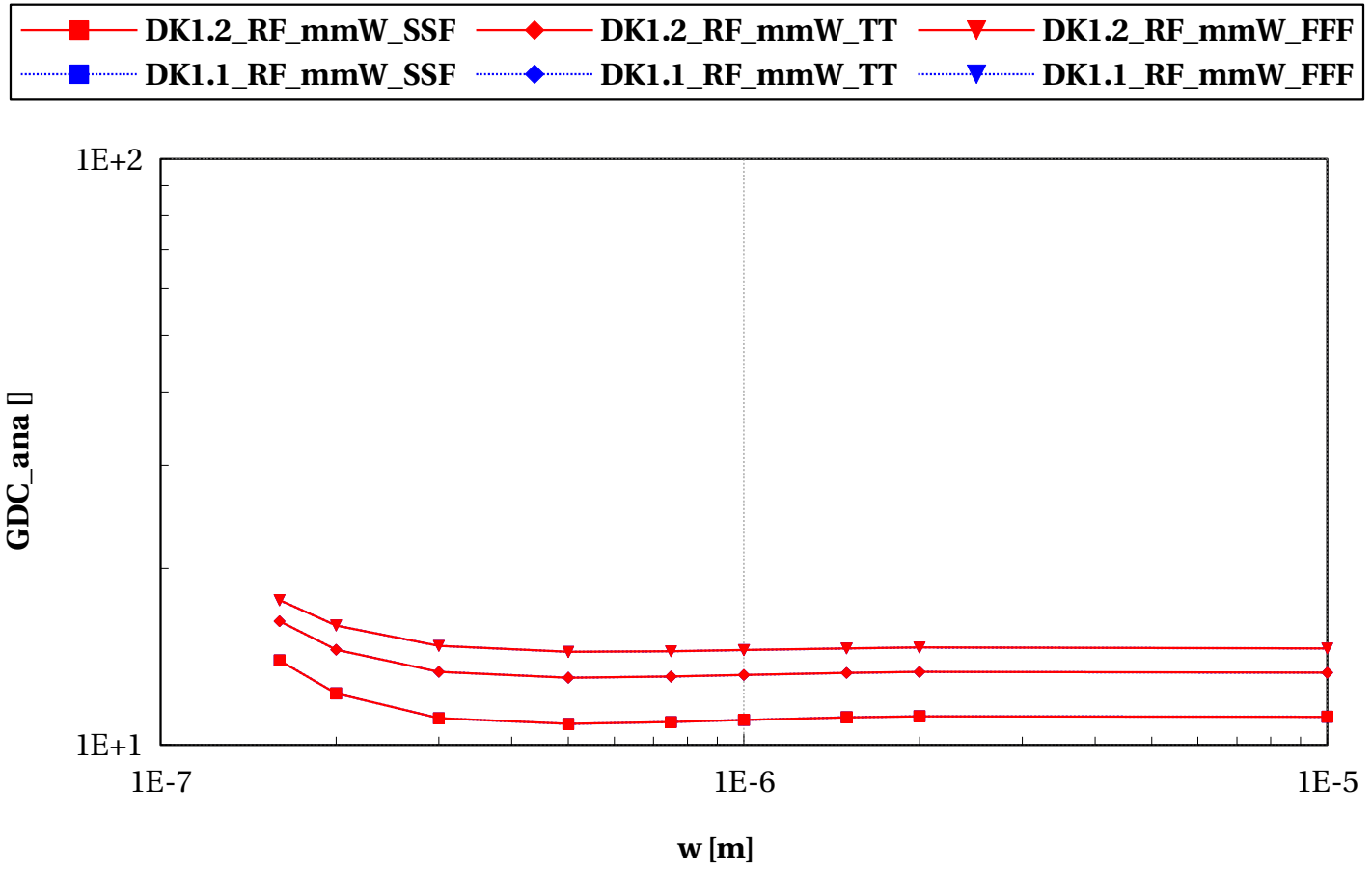
eglvtvpfet_acc, Vgs_ana [mV] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==1.5 and devType=="PCELLwoWPE"



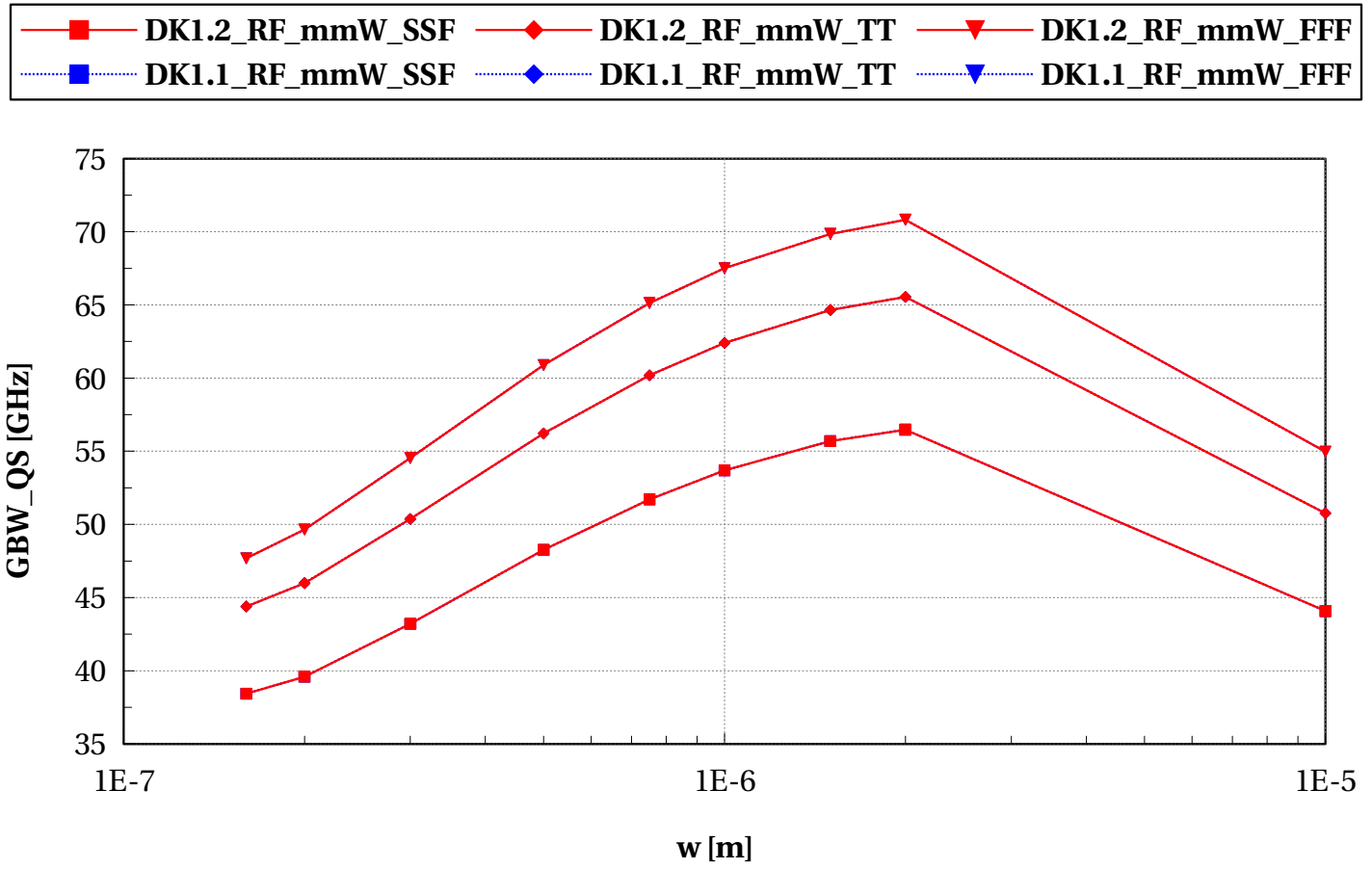
eglvtvpfet_acc, GDC_ana [] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==1.5 and devType=="PCELLwoWPE"



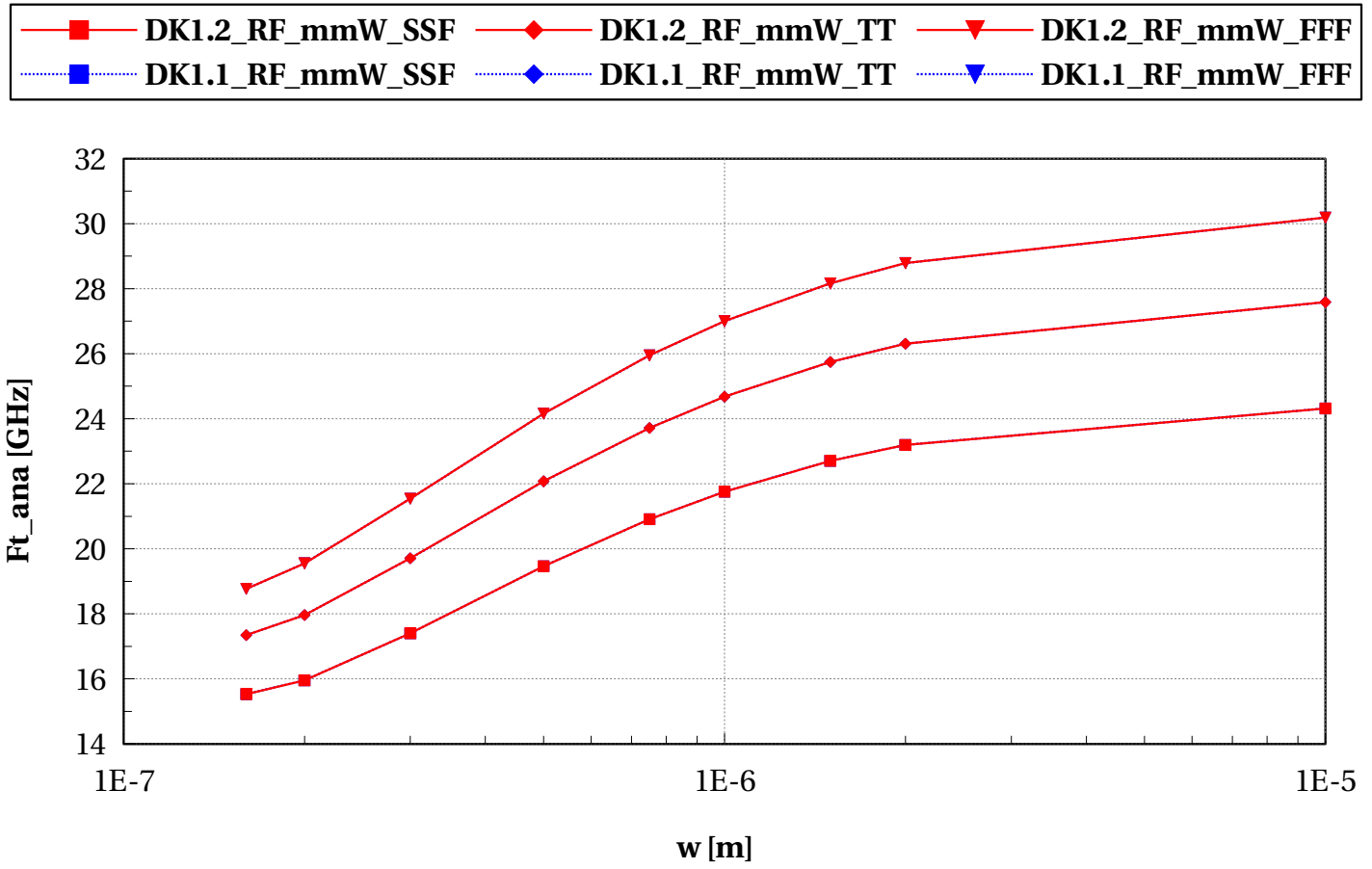
eglvtvpfet_acc, GBW_QS [GHz] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==1.5 and devType=="PCELLwoWPE"



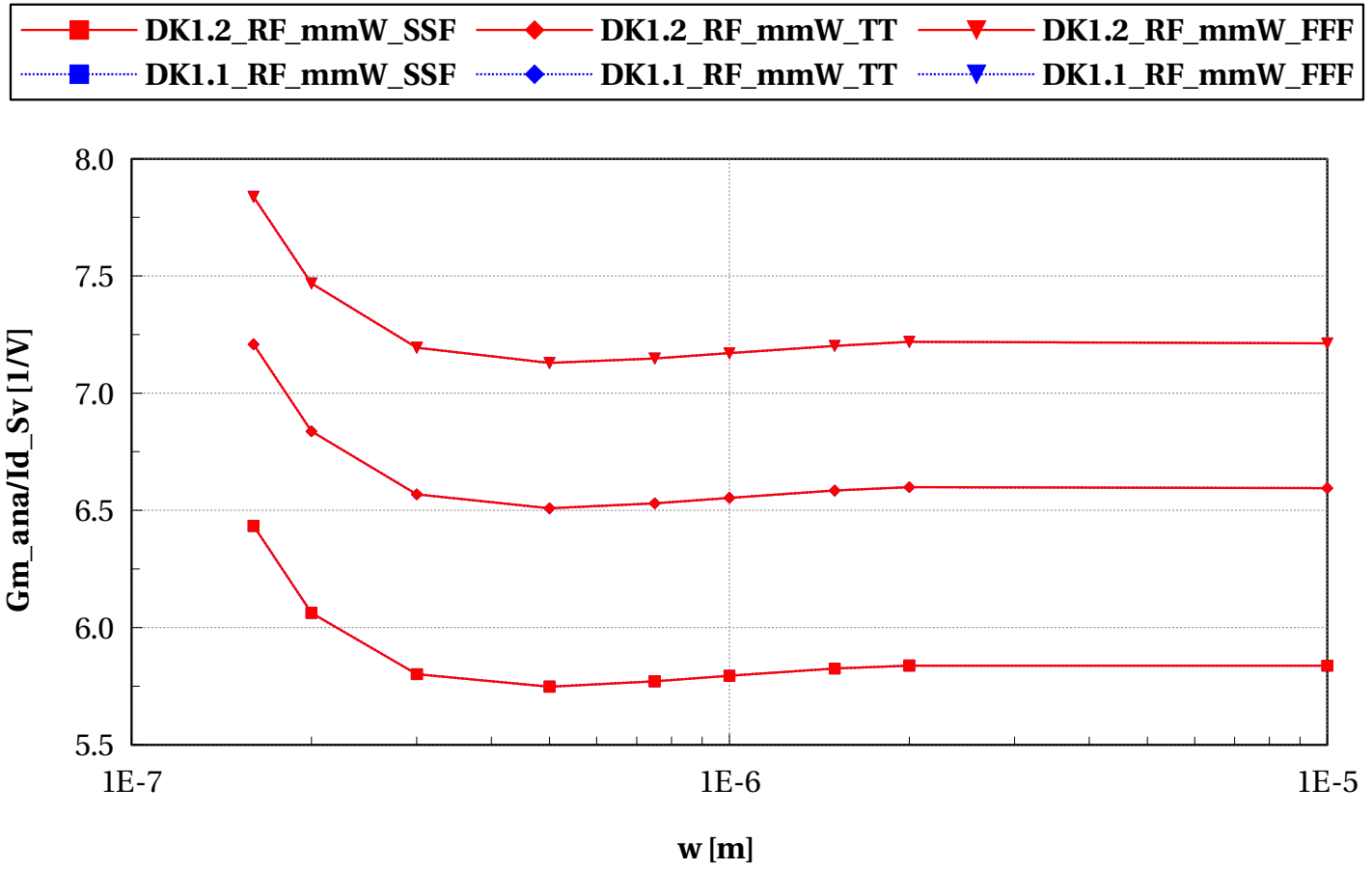
eglvtvpfet_acc, Ft_ana [GHz] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==1.5 and devType=="PCELLwoWPE"



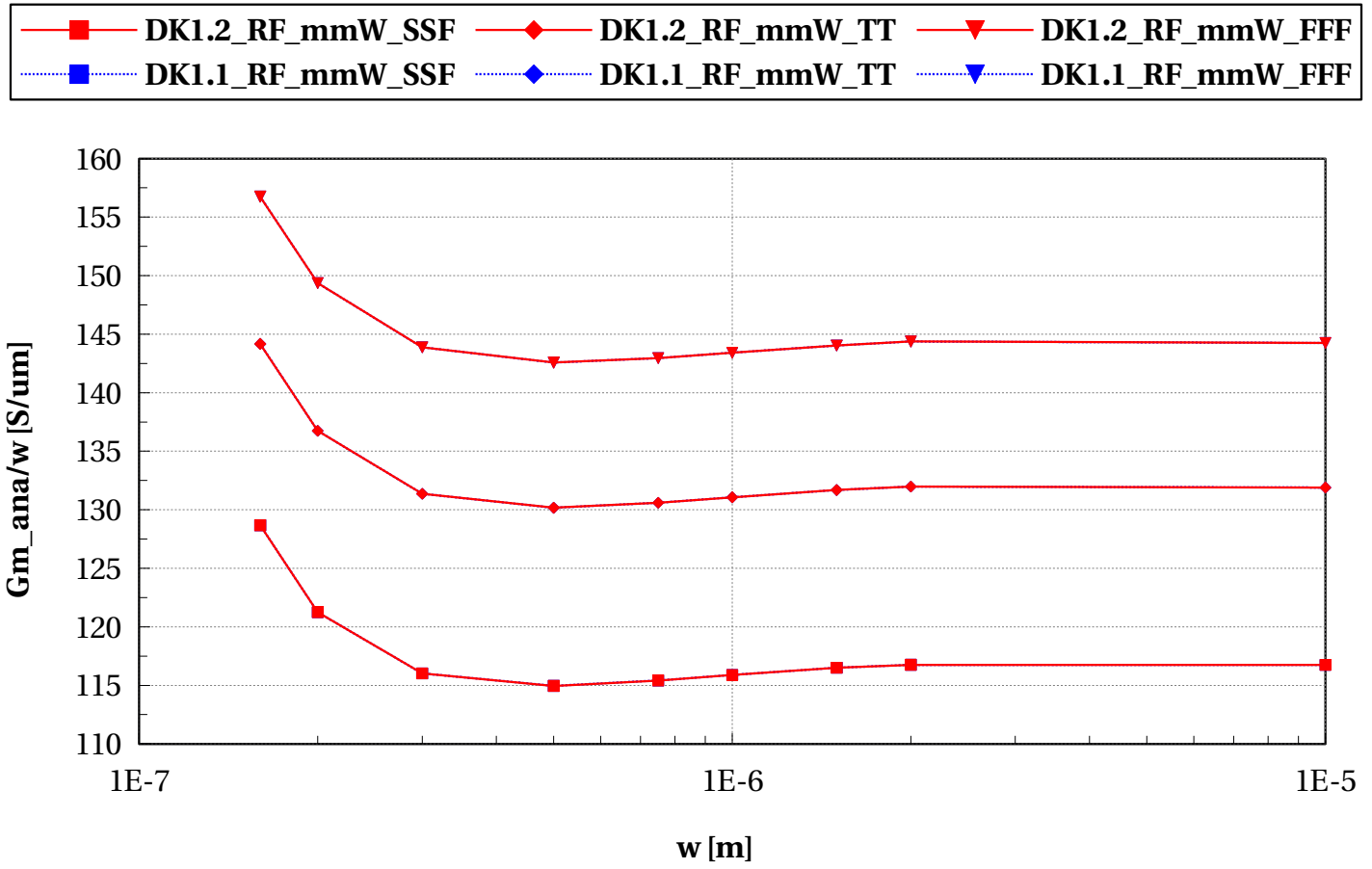
eglvtvpfet_acc, Gm_ana/Id_Sv [1/V] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==1.5 and devType=="PCELLwoWPE"



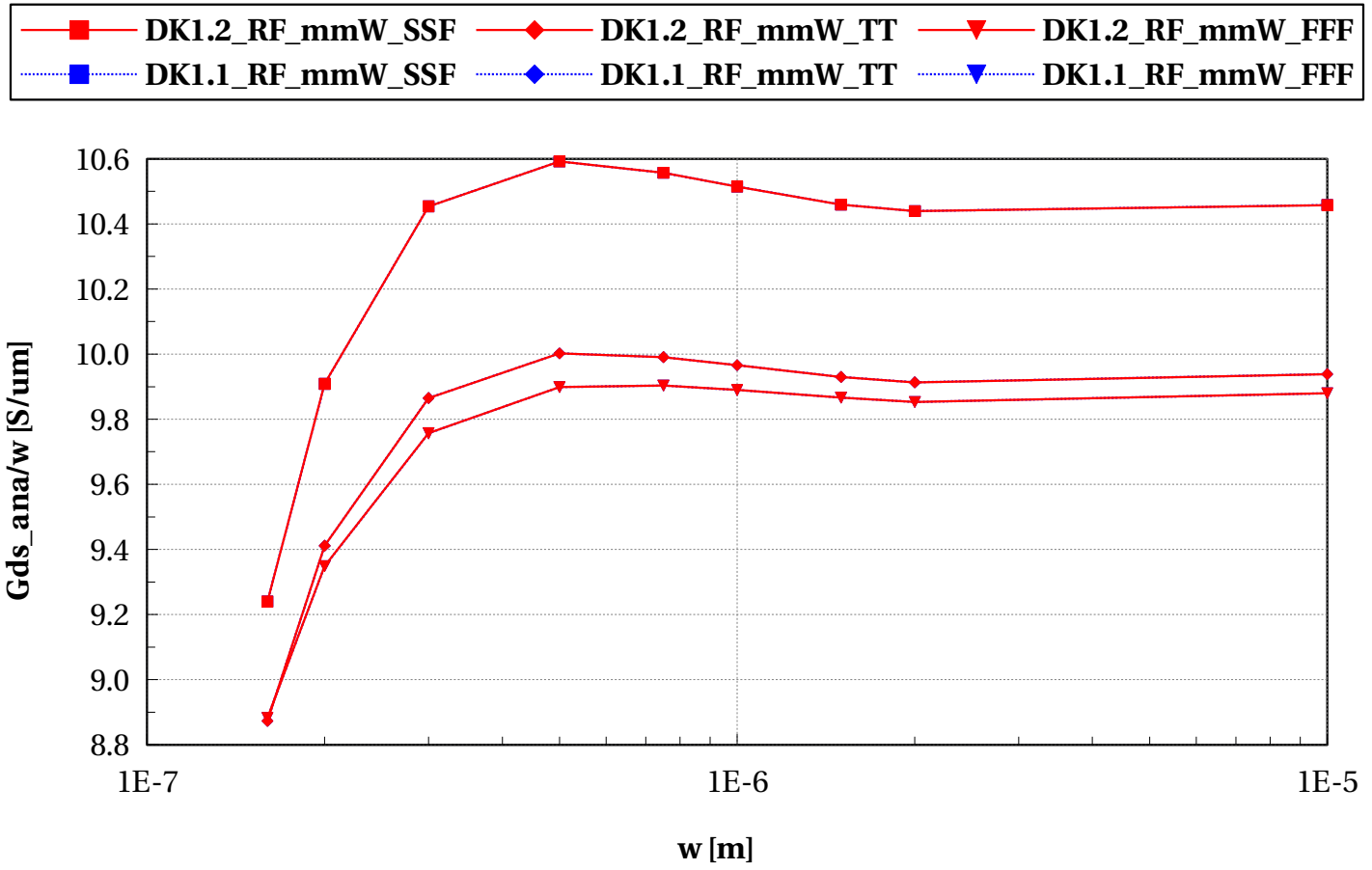
eglvtvpfet_acc, Gm_ana/w [S/um] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==1.5 and devType=="PCELLwoWPE"



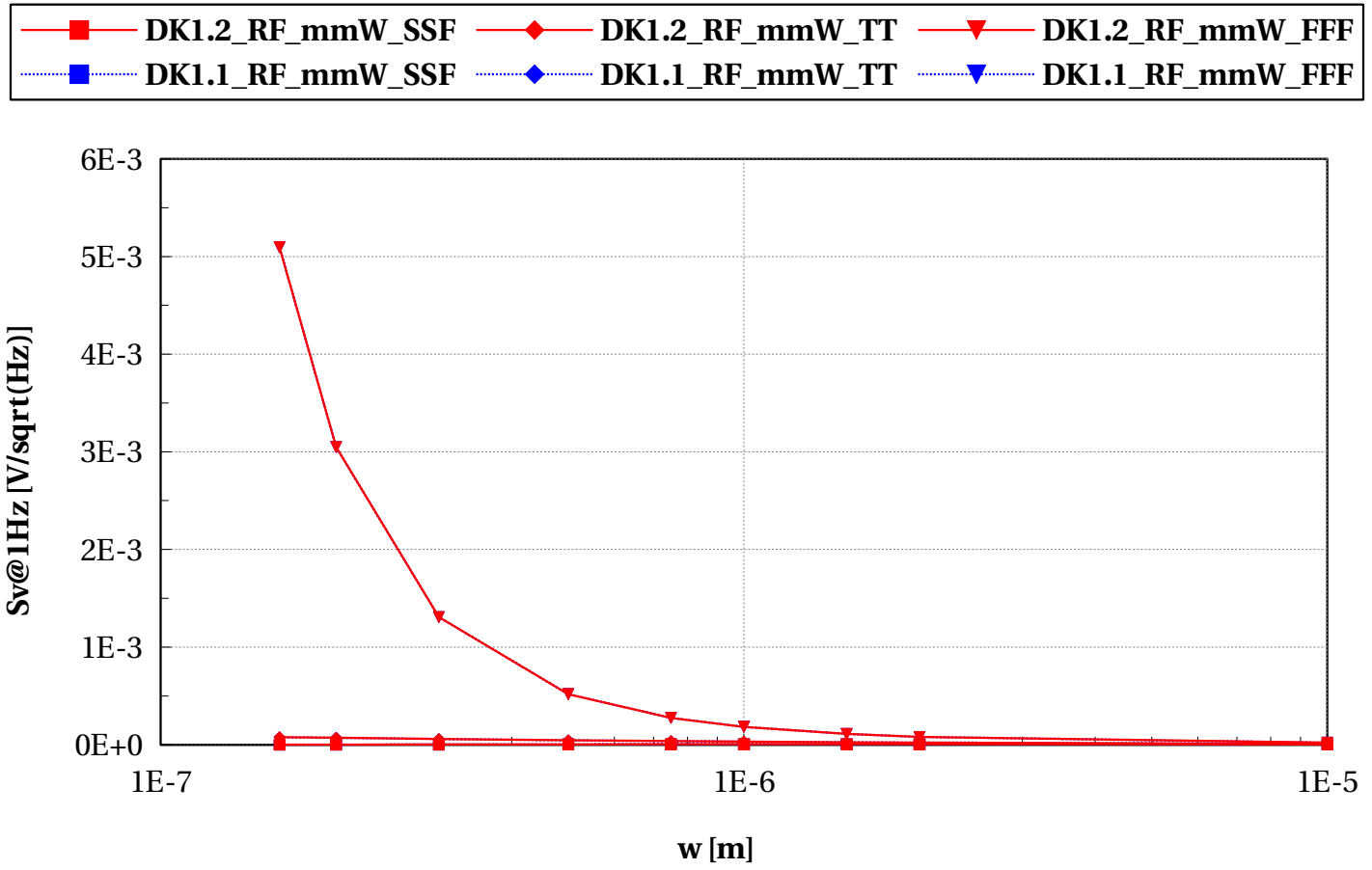
eglvtvpfet_acc, Gds_ana/w [S/um] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==1.5 and devType=="PCELLwoWPE"



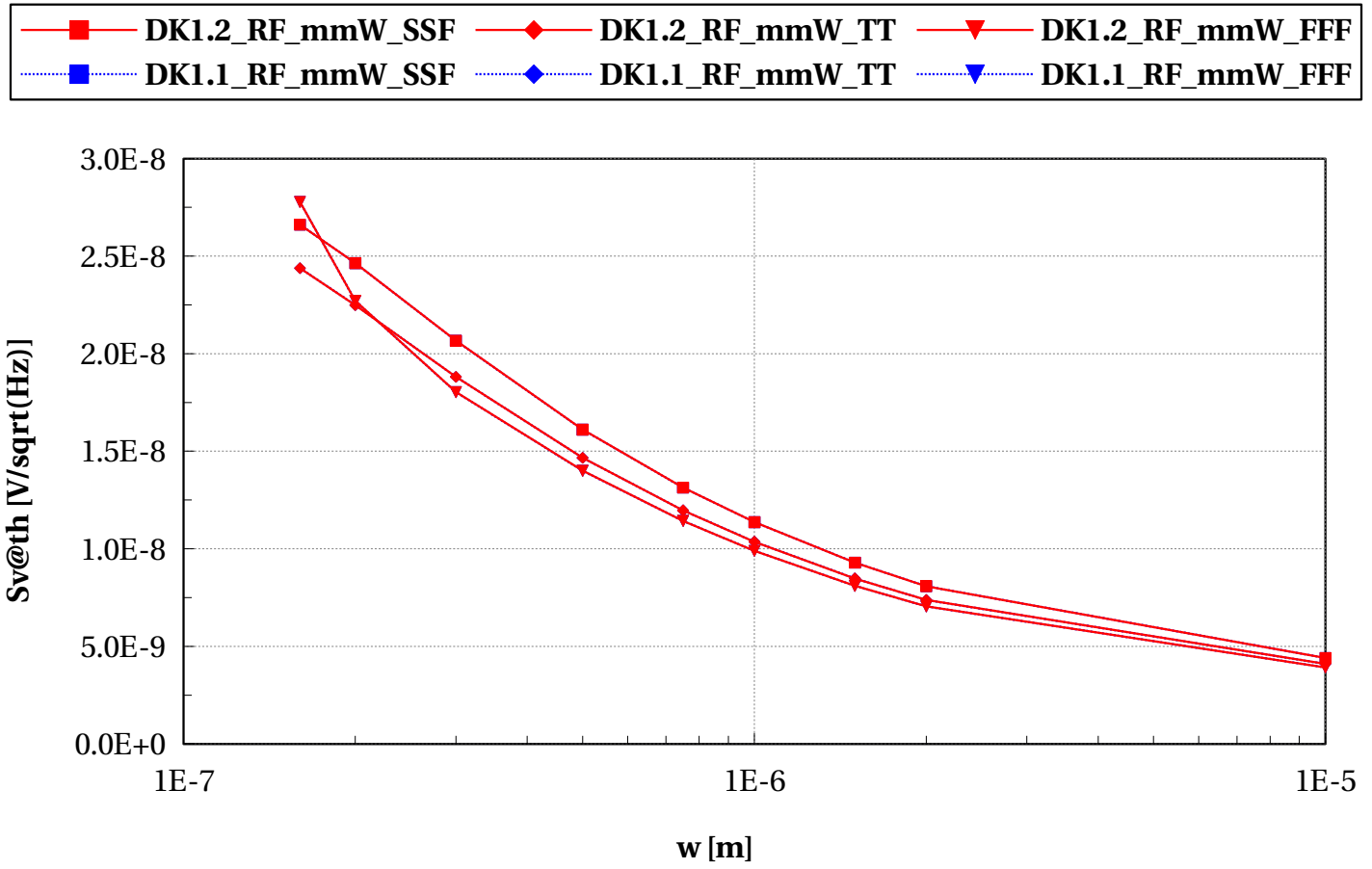
eglvtvpfet_acc, Sv@1Hz [V/sqrt(Hz)] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==1.5 and devType=="PCELLwoWPE"



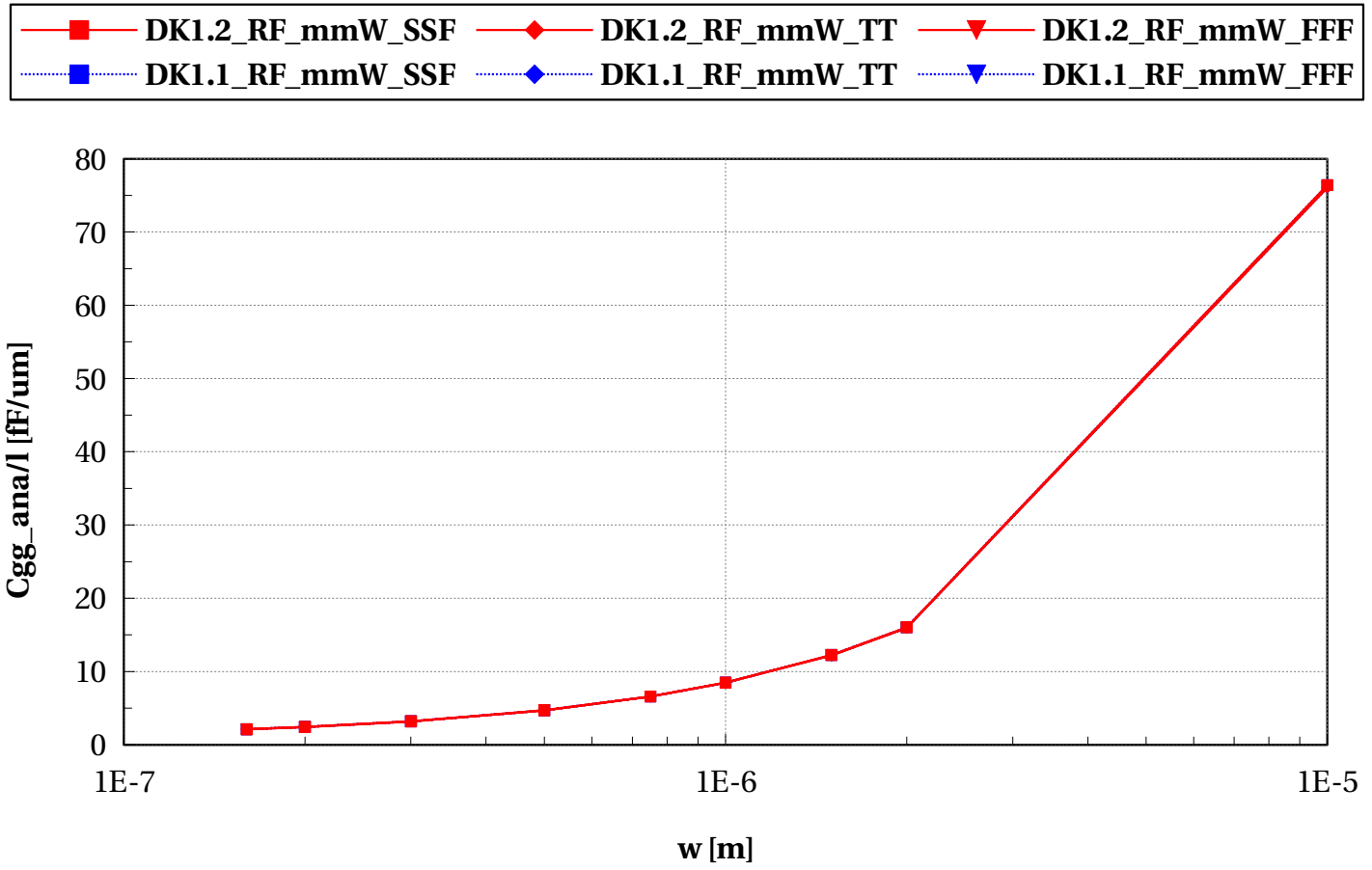
eglvtvpfet_acc, Sv@th [V/sqrt(Hz)] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==1.5 and devType=="PCELLwoWPE"



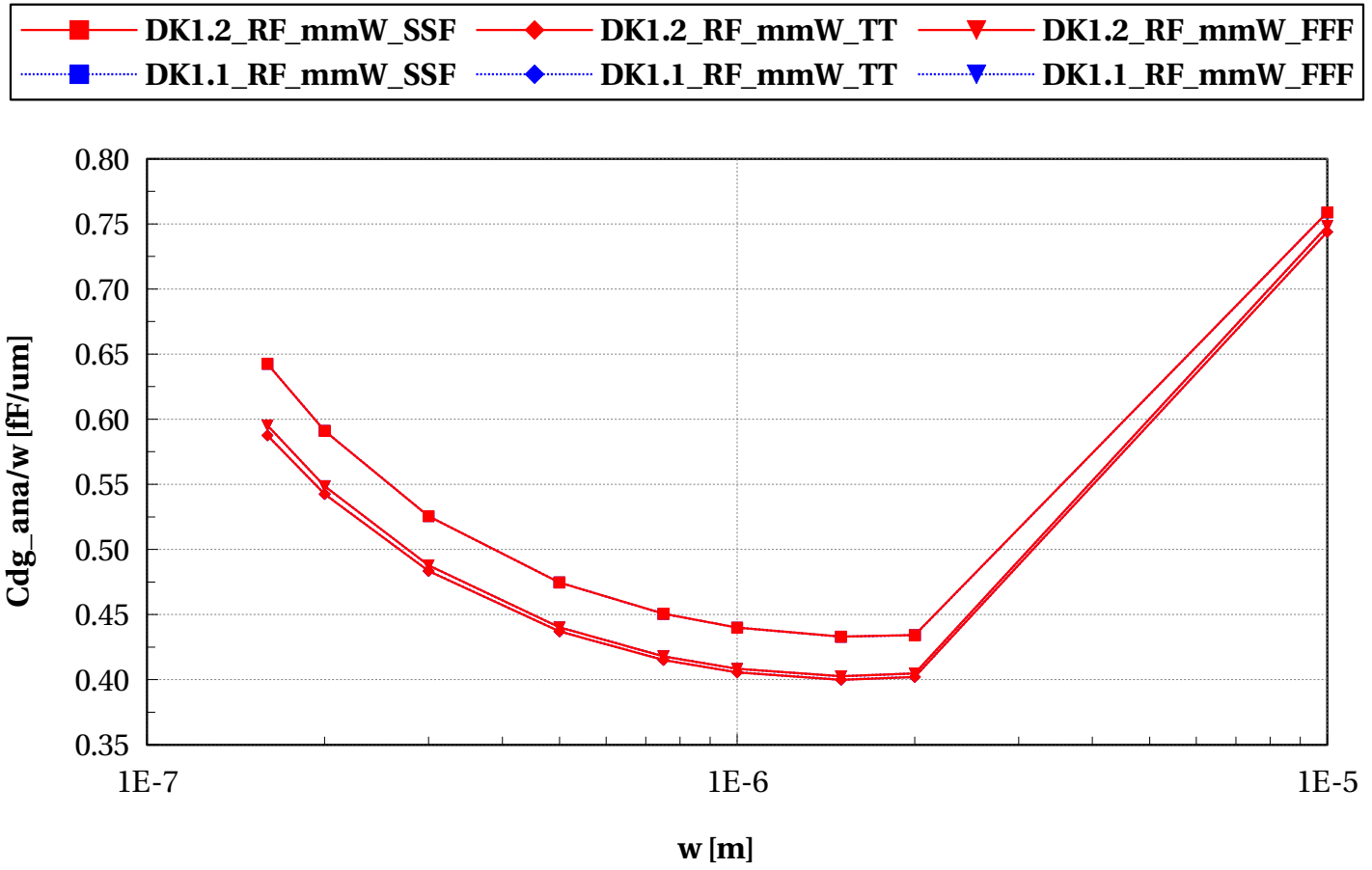
eglvtvpfet_acc, Cgg_ana/l [fF/um] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==1.5 and devType=="PCELLwoWPE"

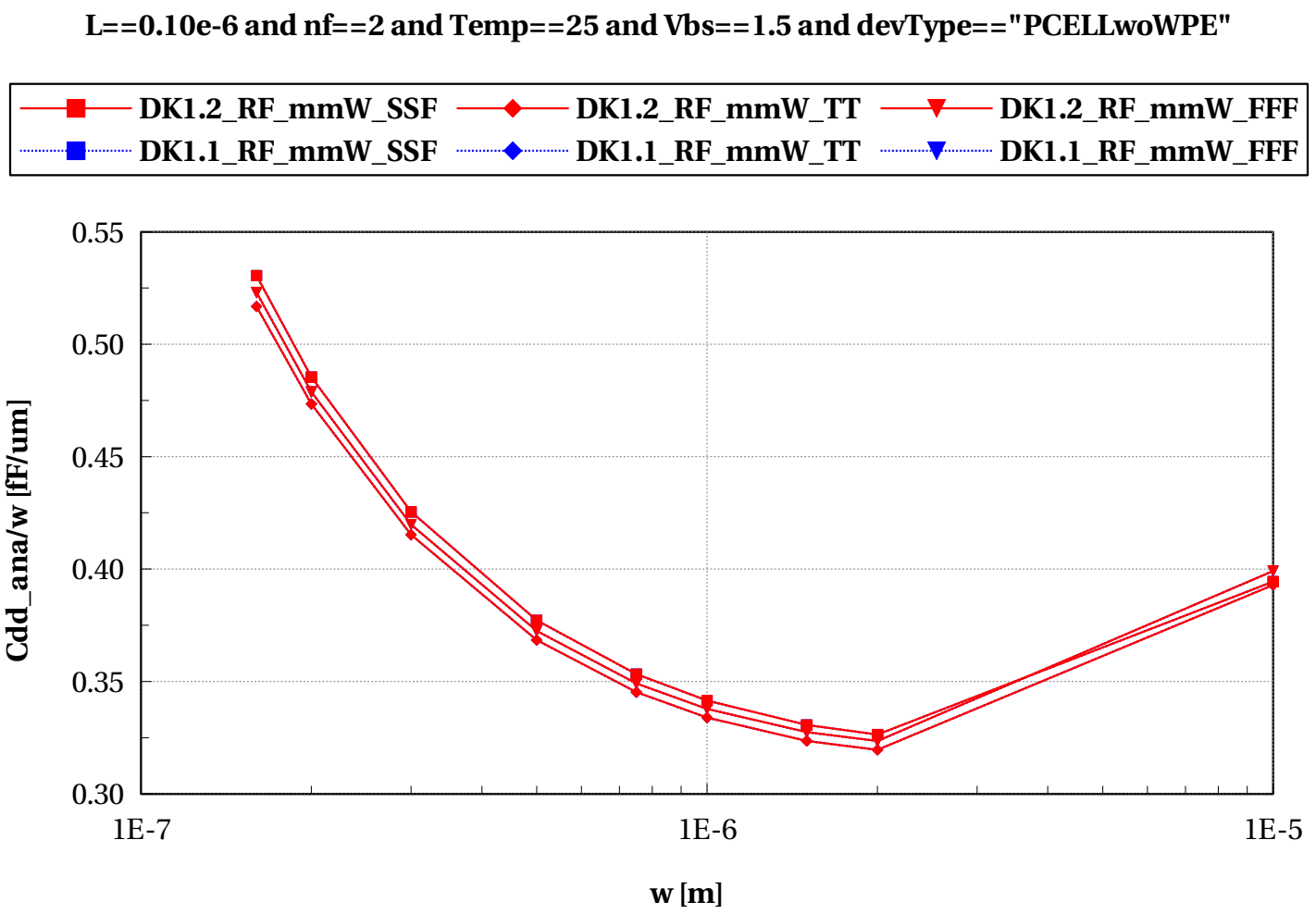


eglvtvpfet_acc, Cdg_ana/w [fF/um] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==1.5 and devType=="PCELLwoWPE"

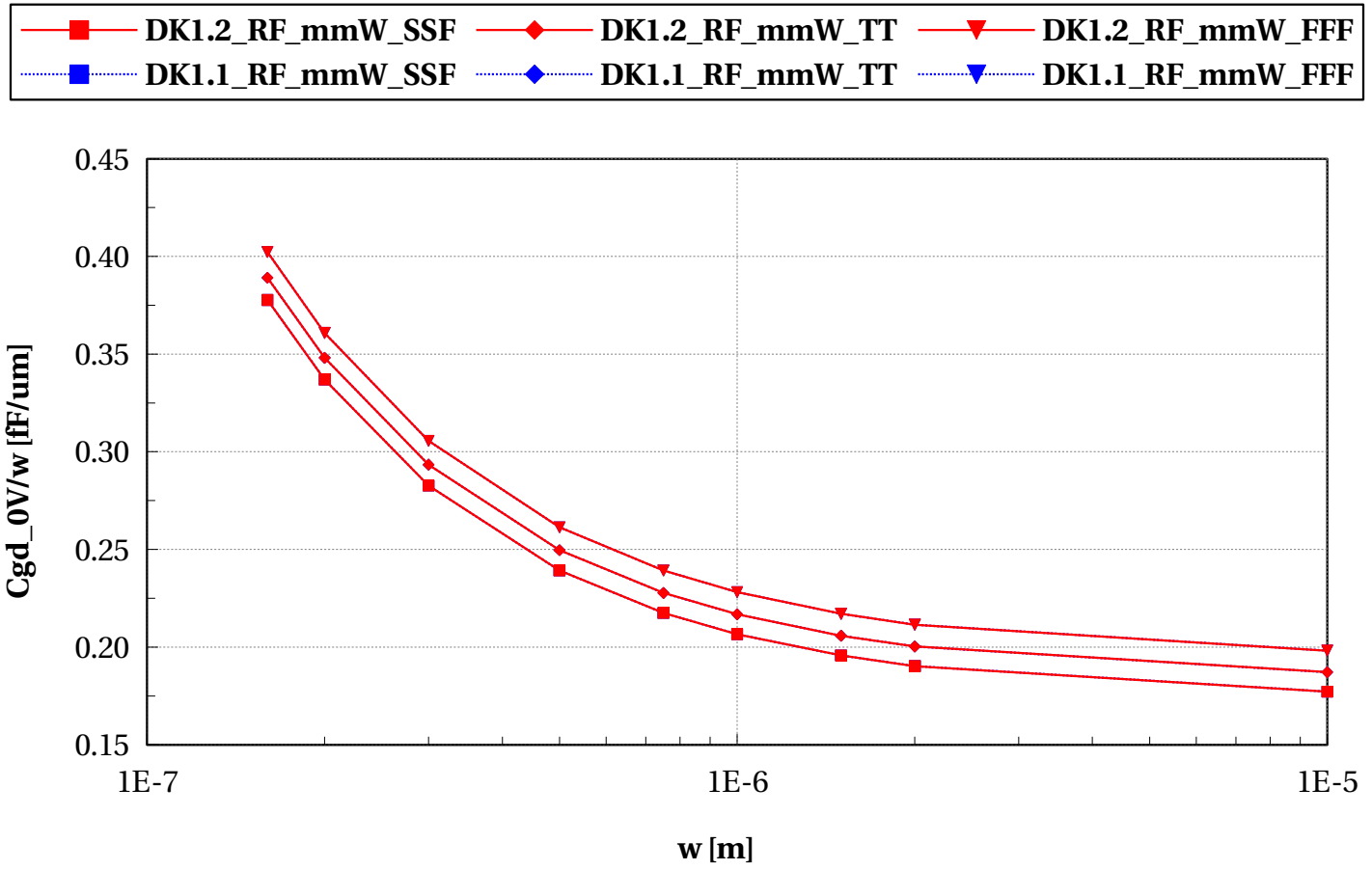


eglvtvpfet_acc, Cdd_ana/w [fF/um] vs w [m]



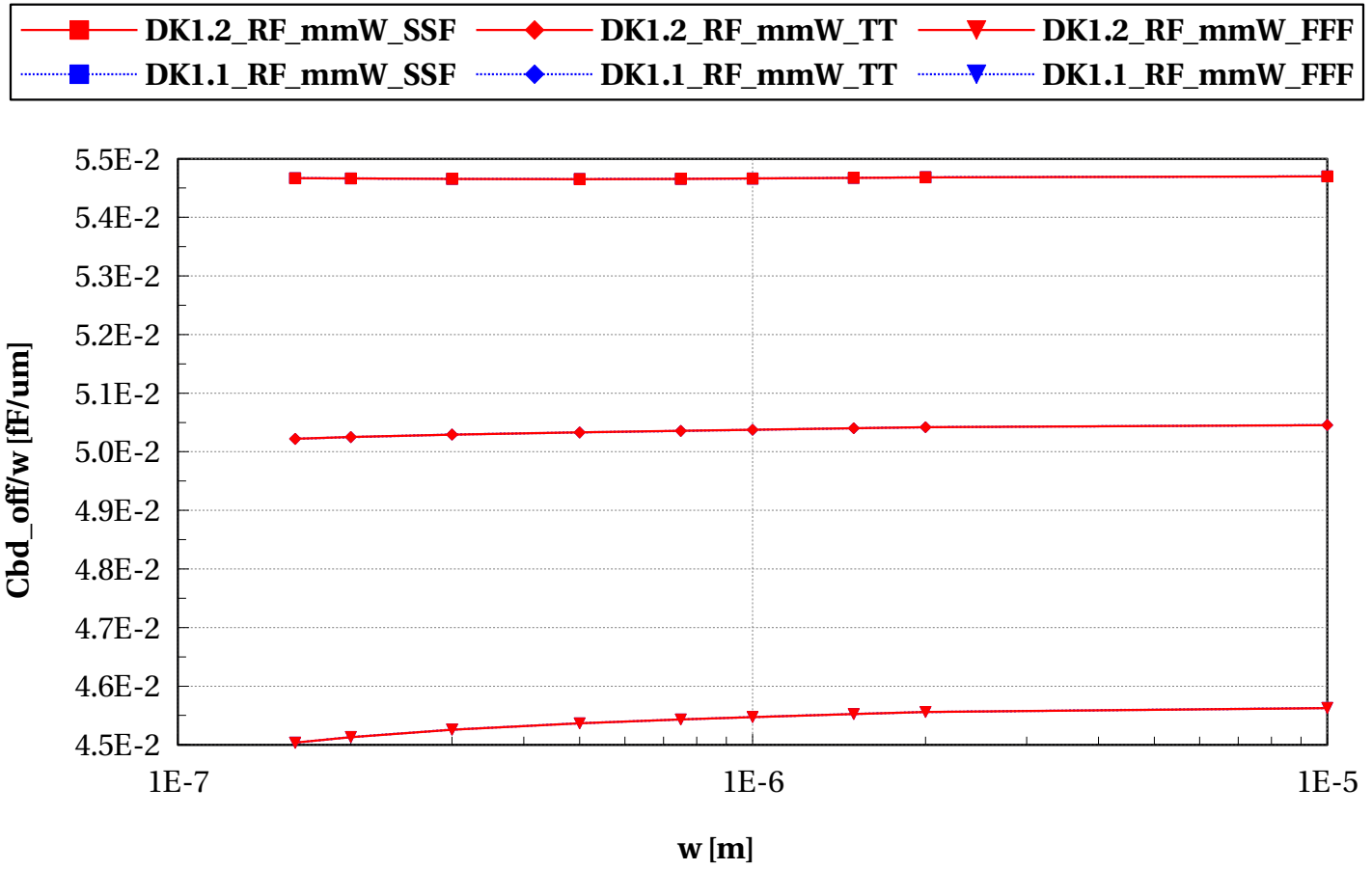
eglvtvpfet_acc, Cgd_0V/w [fF/um] vs w [m]

L==0.10e-6 and nf==2 and Temp==25 and Vbs==1.5 and devType=="PCELLwoWPE"



eglvtvpfet_acc, Cbd_off/w [fF/um] vs w [m]

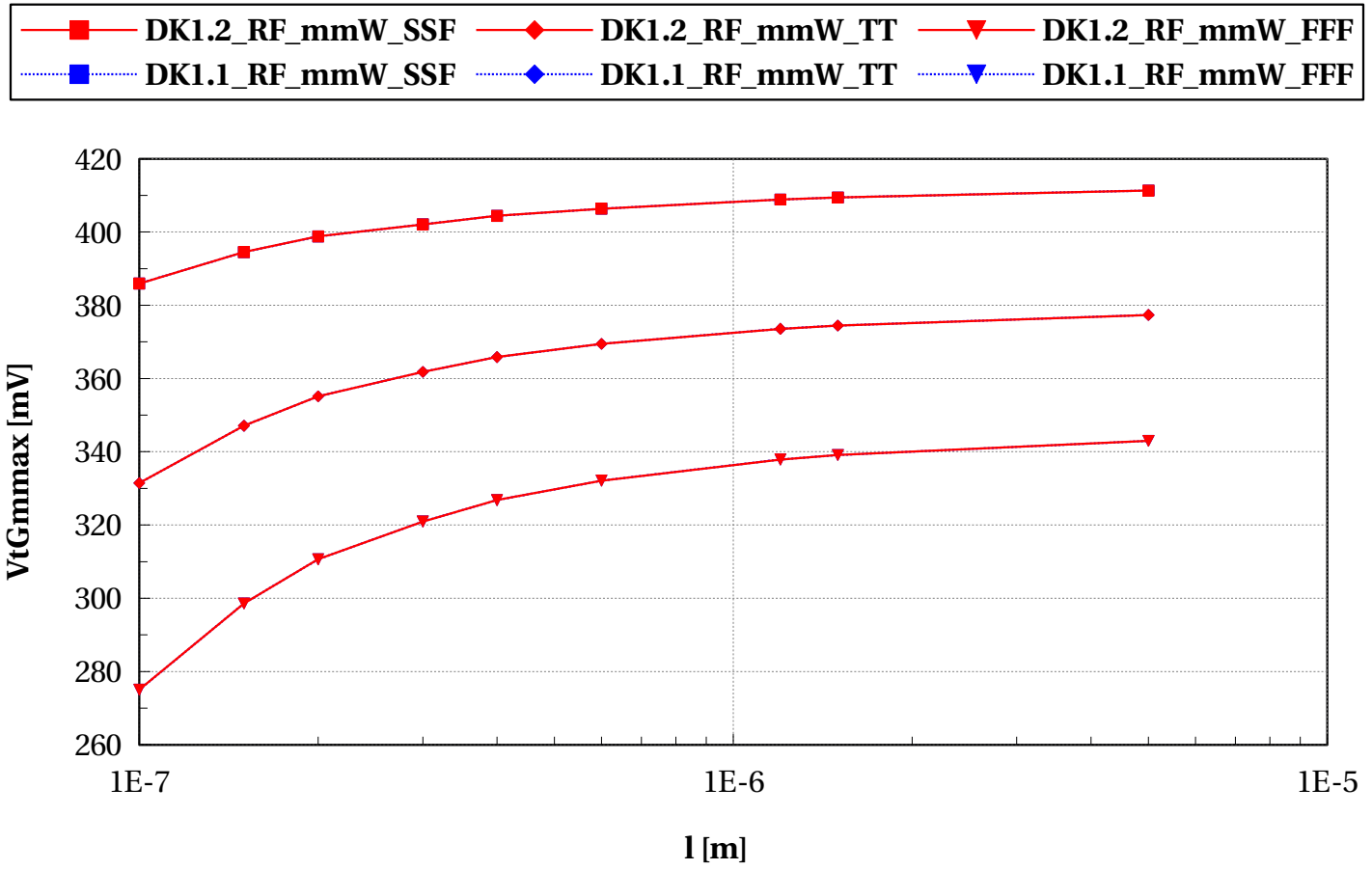
L==0.10e-6 and nf==2 and Temp==25 and Vbs==1.5 and devType=="PCELLwoWPE"



Scaling versus Length @ W/L=10&&W/nf<5um (vbs=1.5V-FBB)

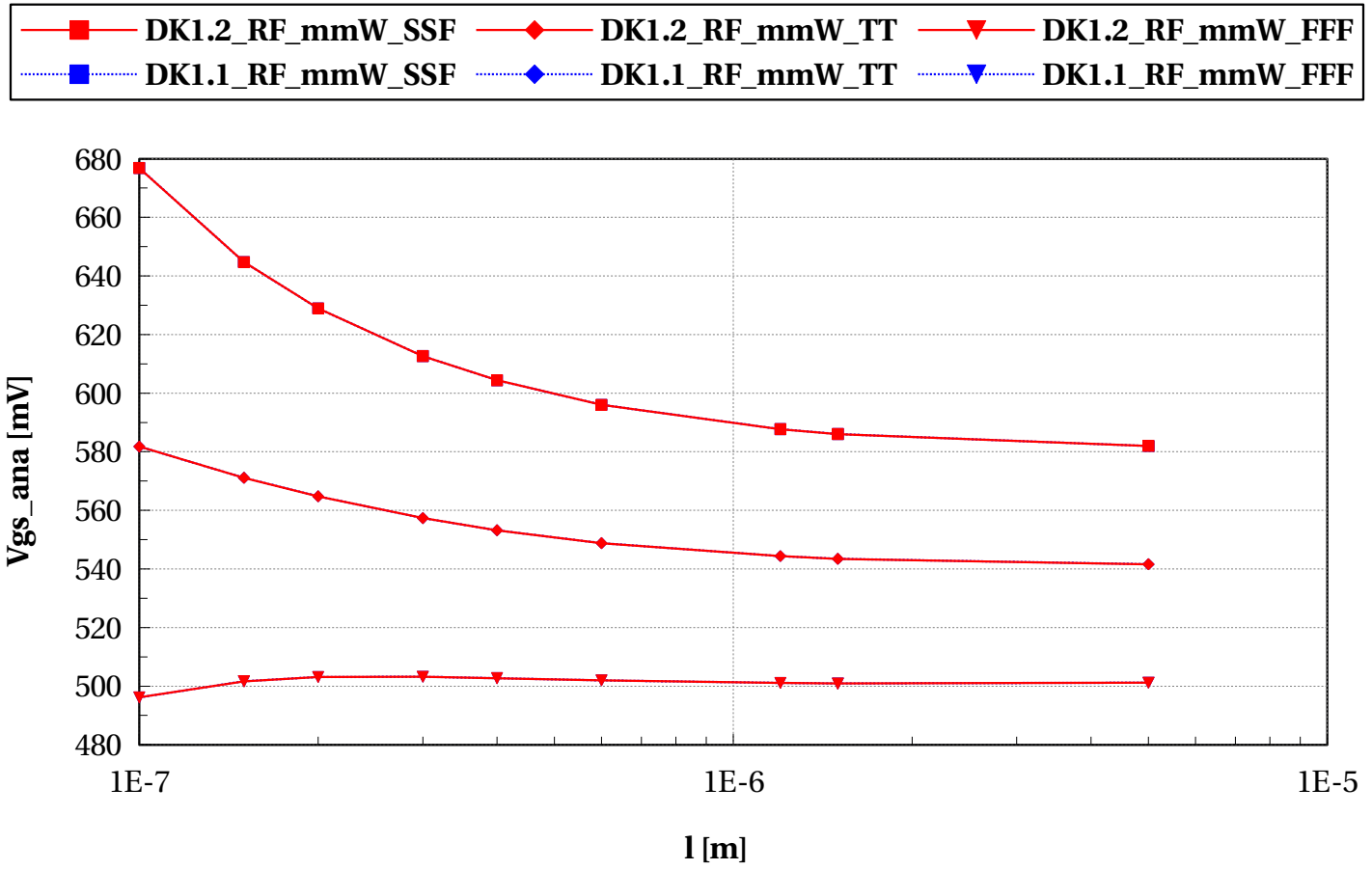
eglvtvpfet_acc, VtGmmax [mV] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



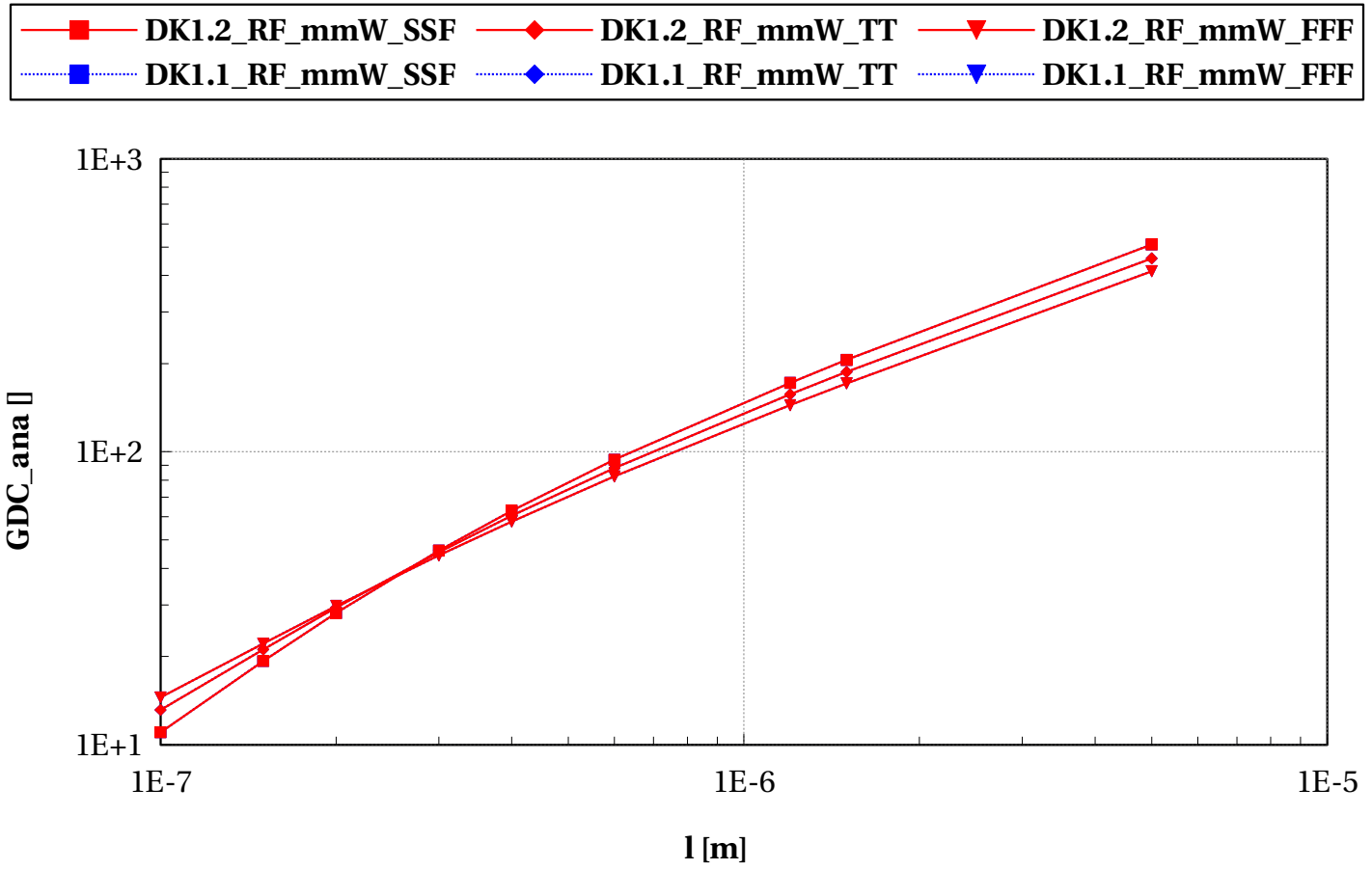
eglvtvpfet_acc, Vgs_ana [mV] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



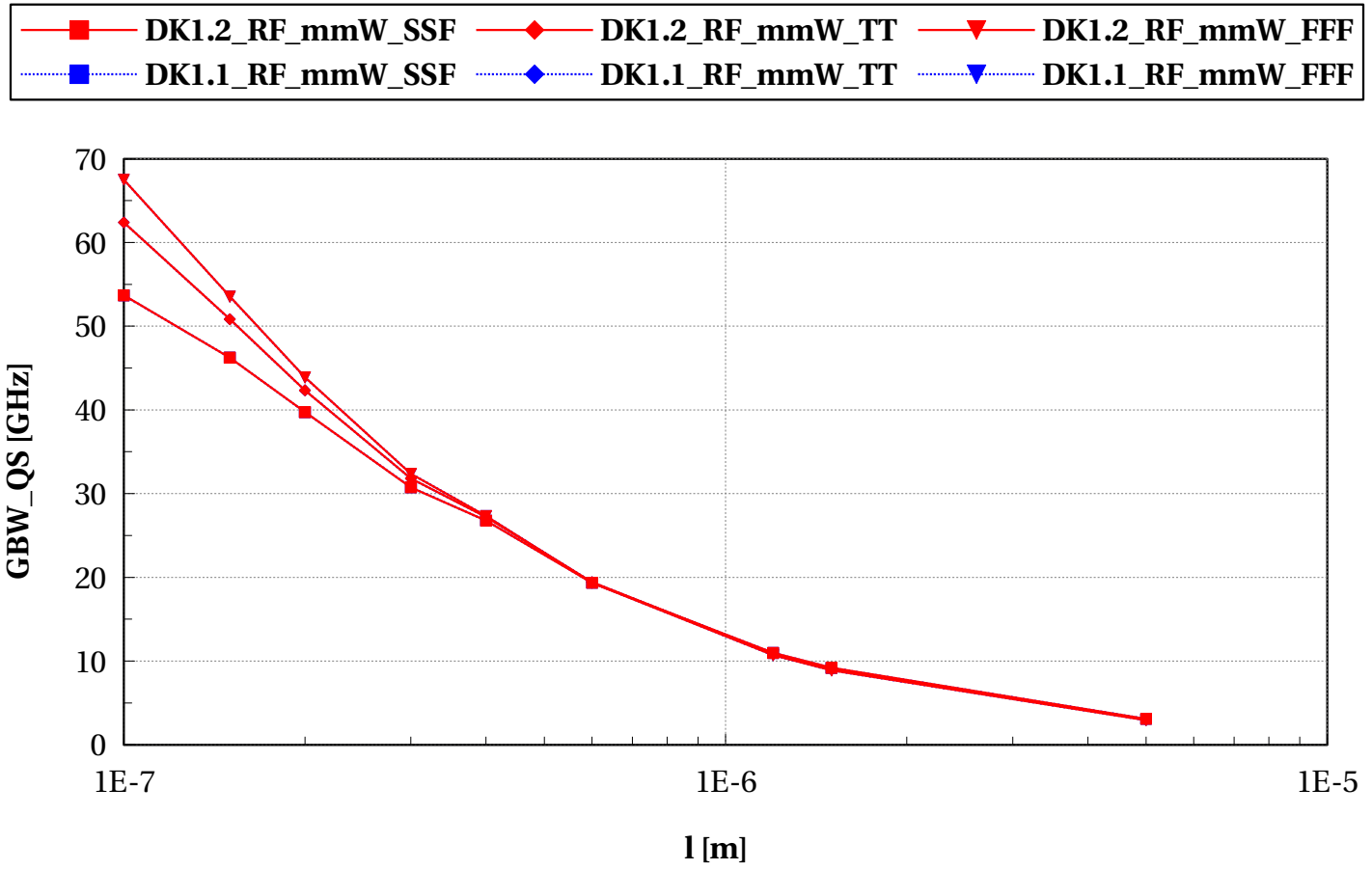
eglvtvpfet_acc, GDC_ana [] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



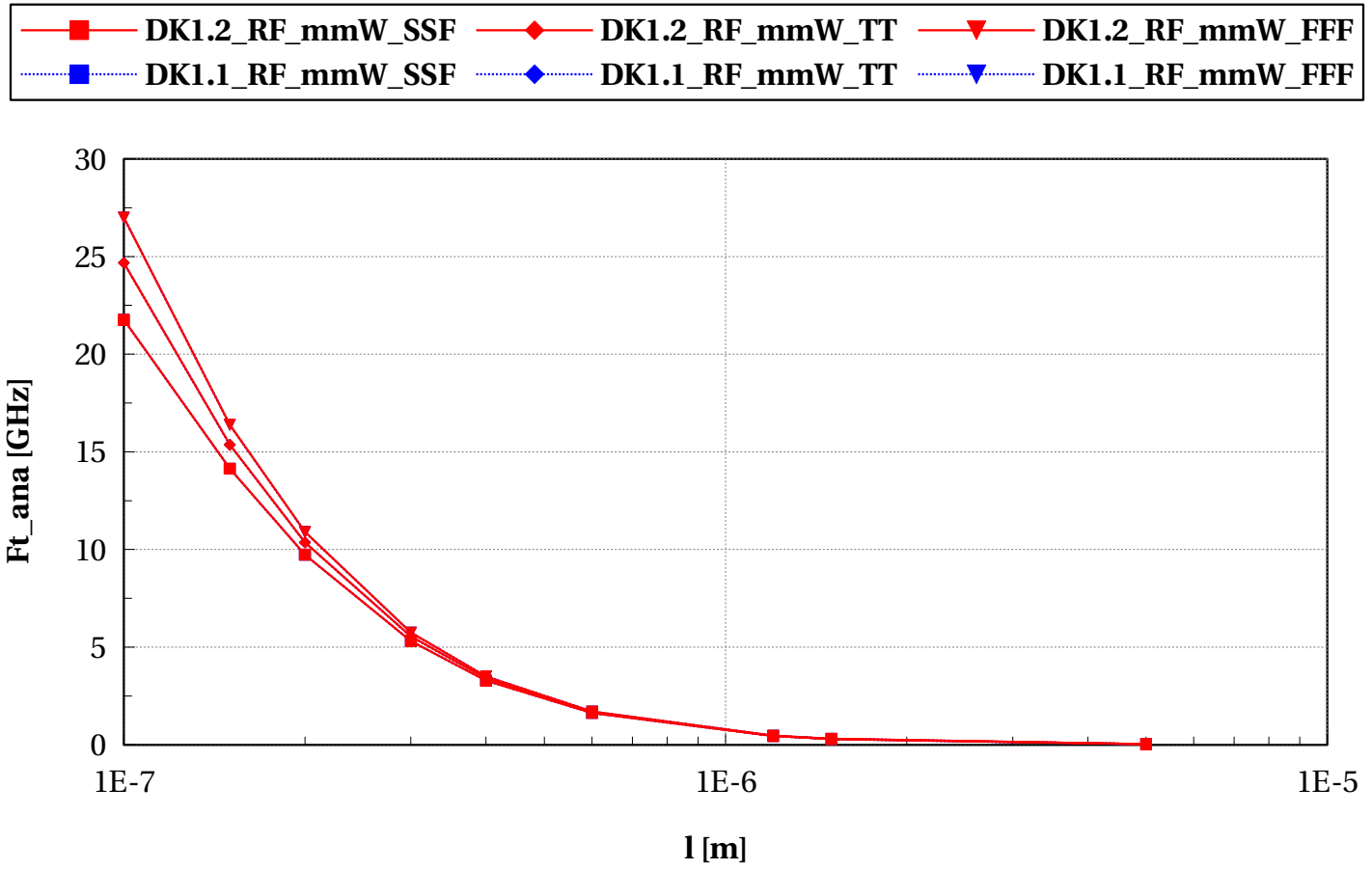
eglvtvpfet_acc, GBW_QS [GHz] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



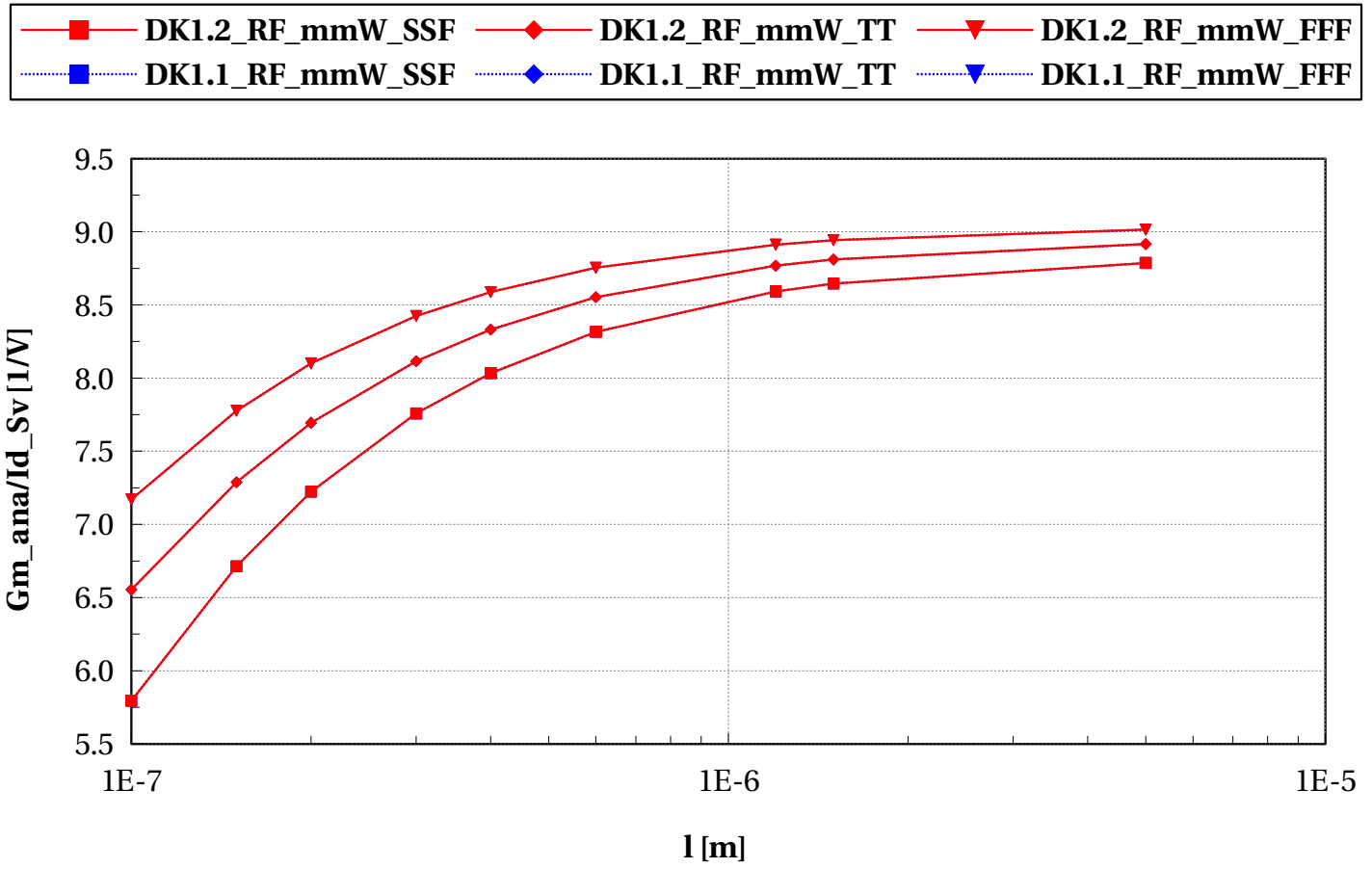
eglvtvpfet_acc, Ft_ana [GHz] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



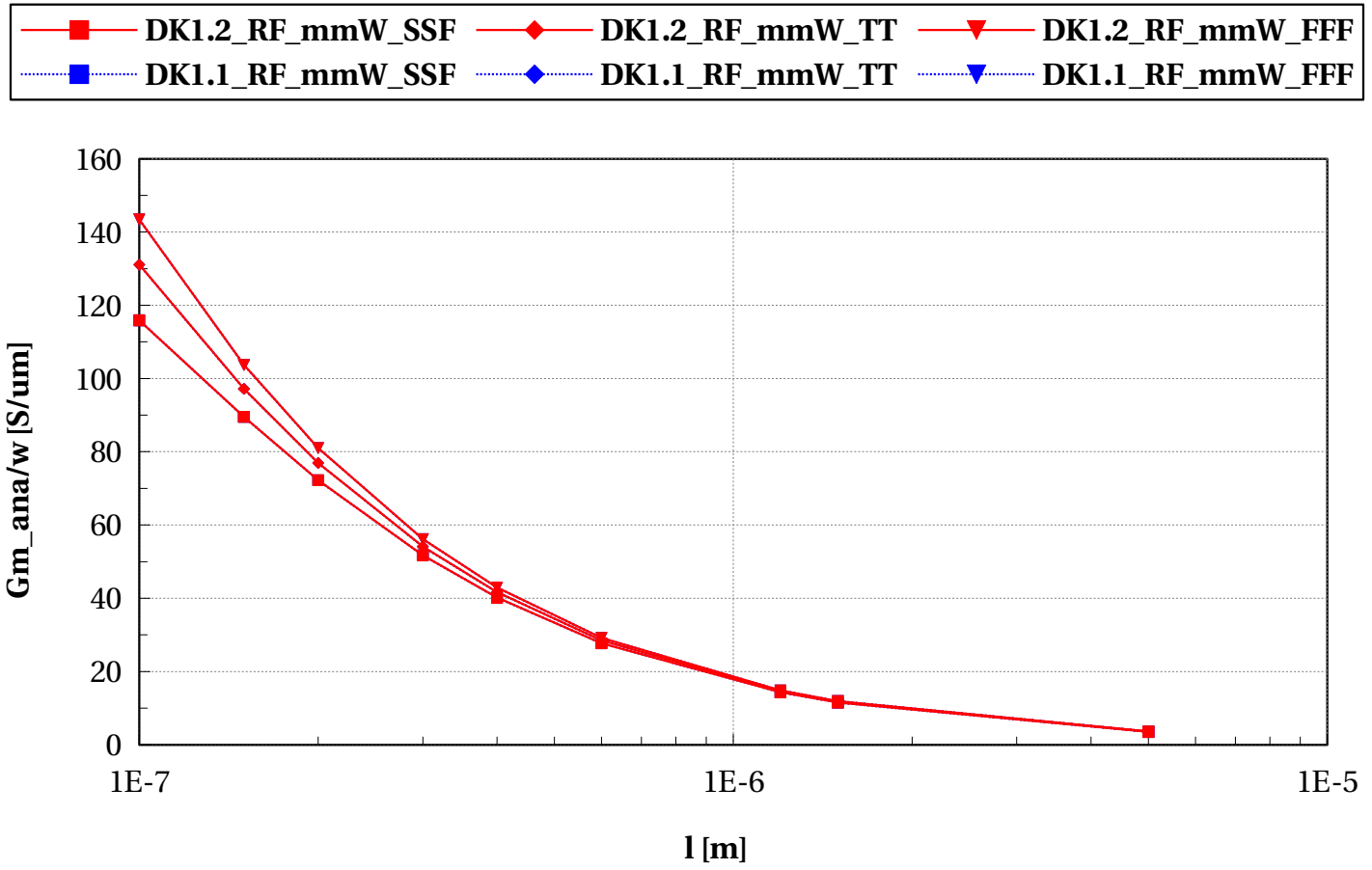
eglvtvpfet_acc, Gm_ana/Id_Sv [1/V] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



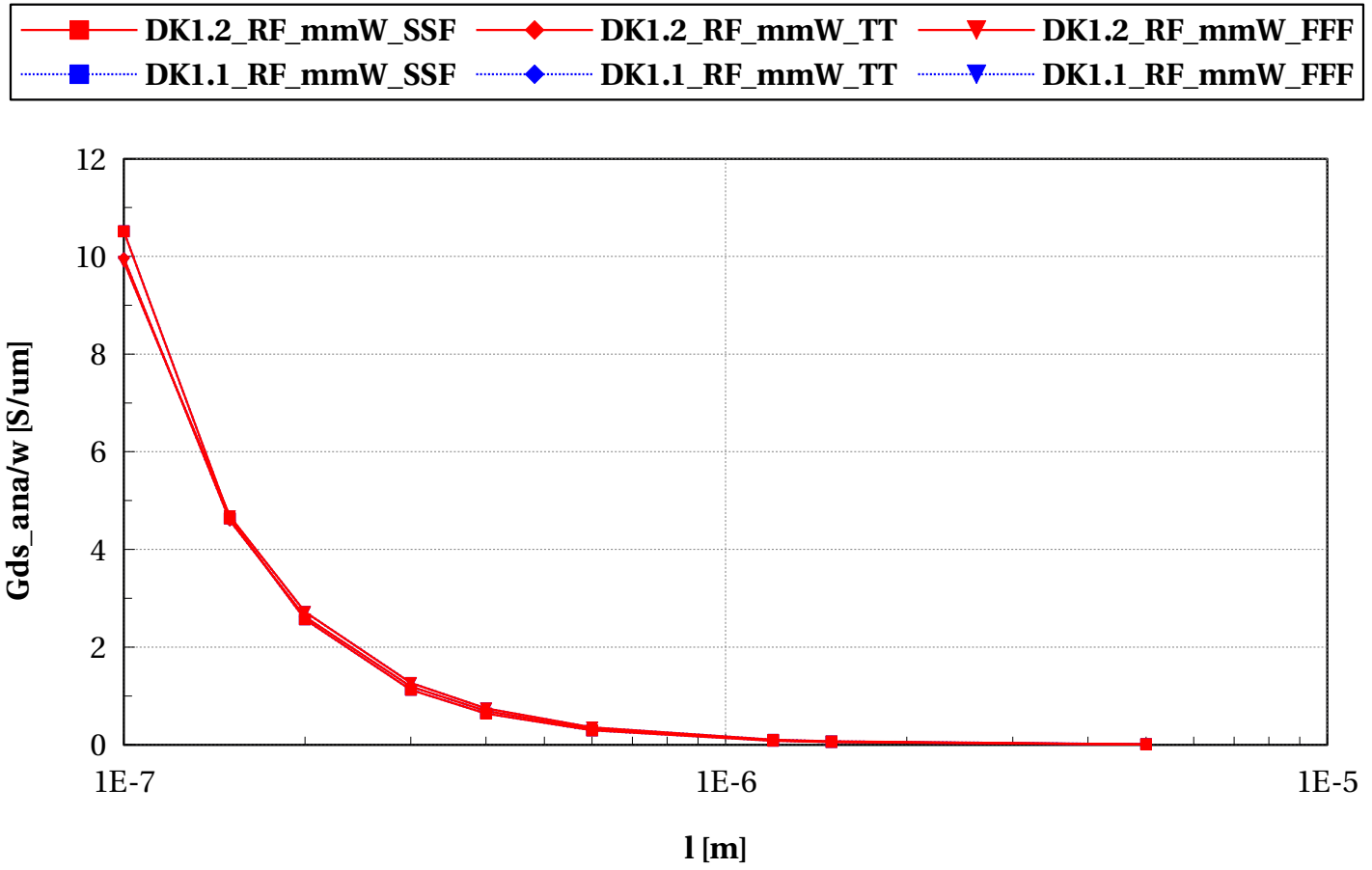
eglvtvpfet_acc, Gm_ana/w [S/um] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



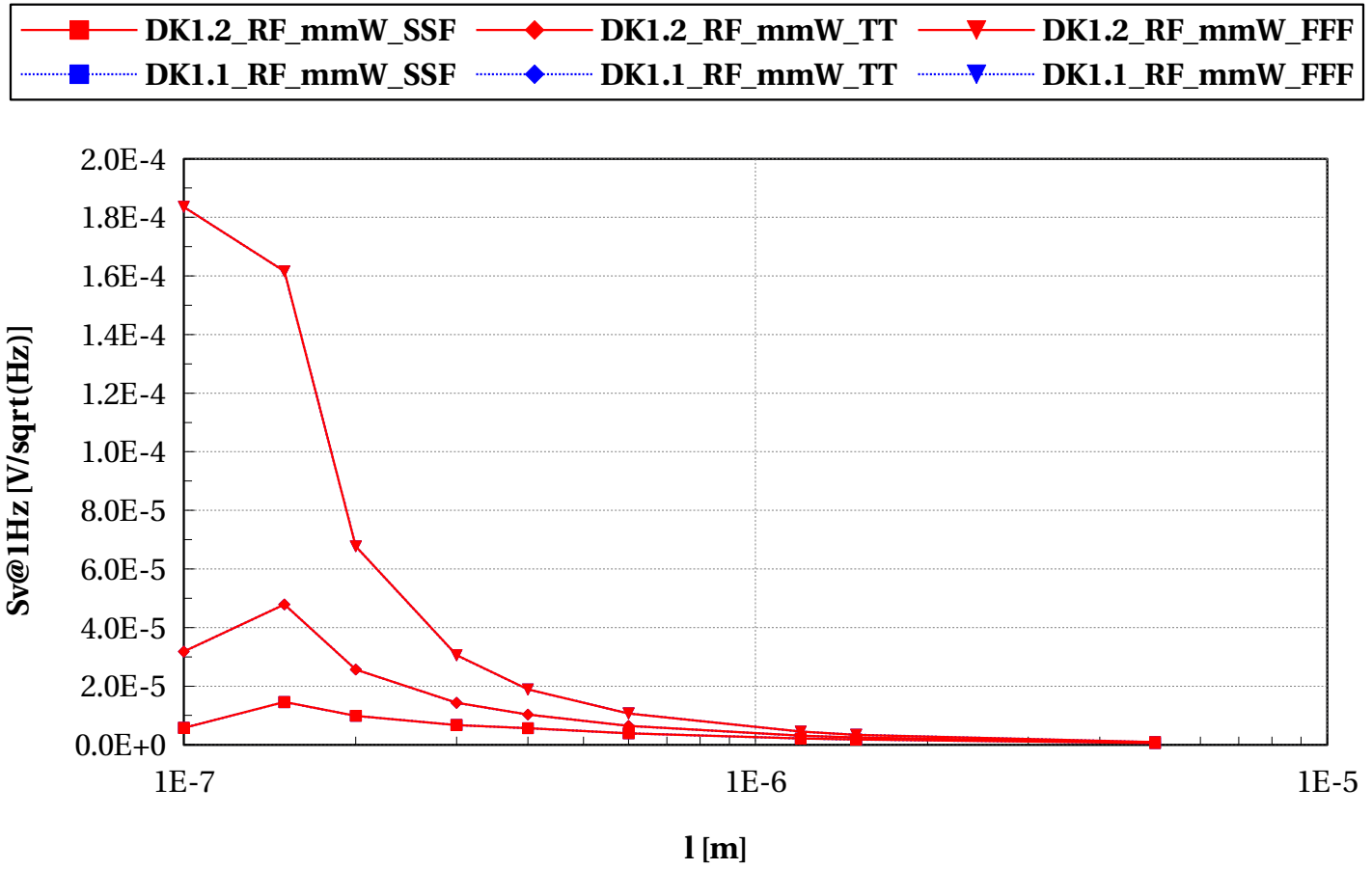
eglvtvpfet_acc, Gds_ana/w [S/um] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



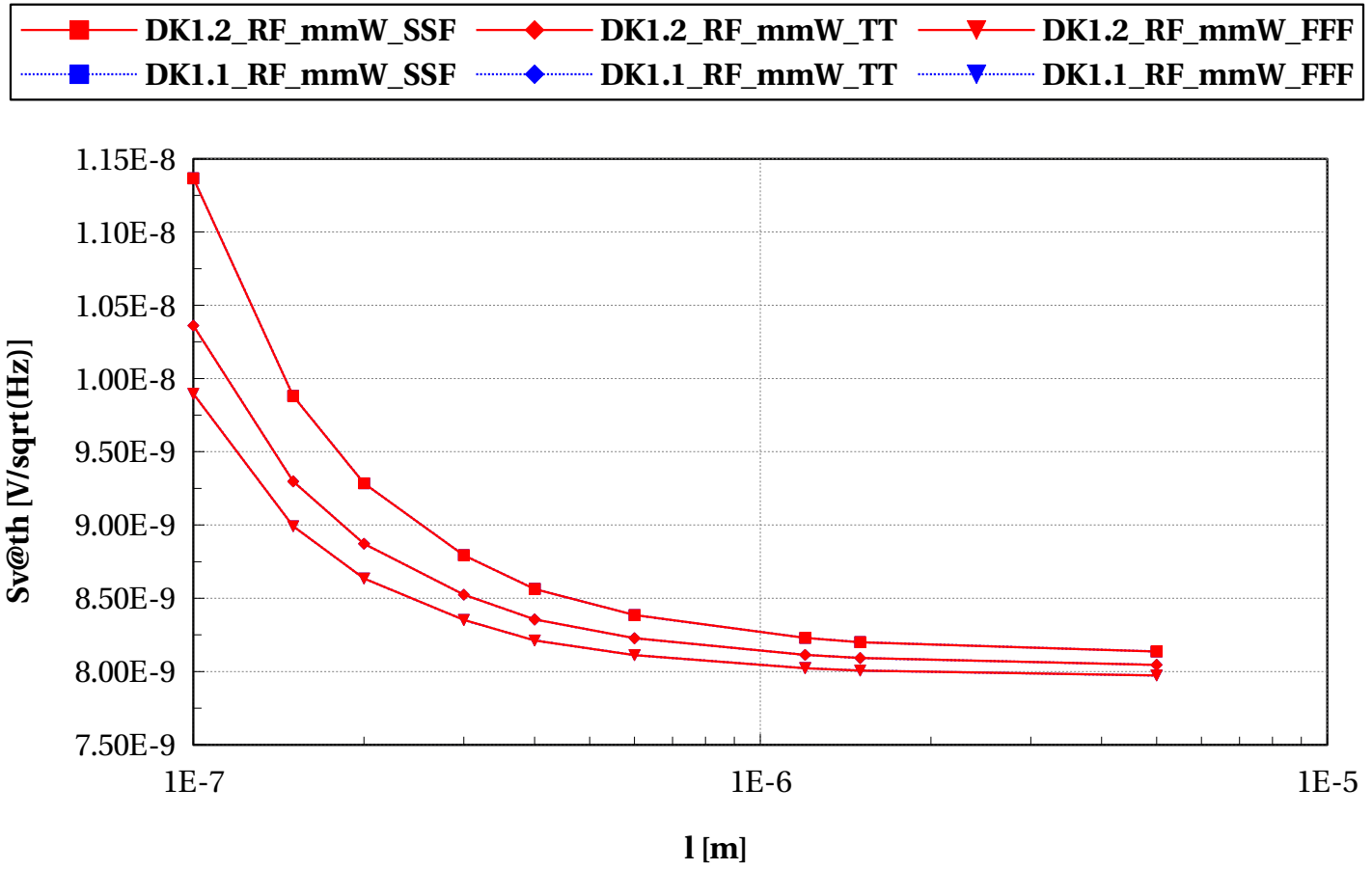
eglvtvpfet_acc, Sv@1Hz [V/sqrt(Hz)] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



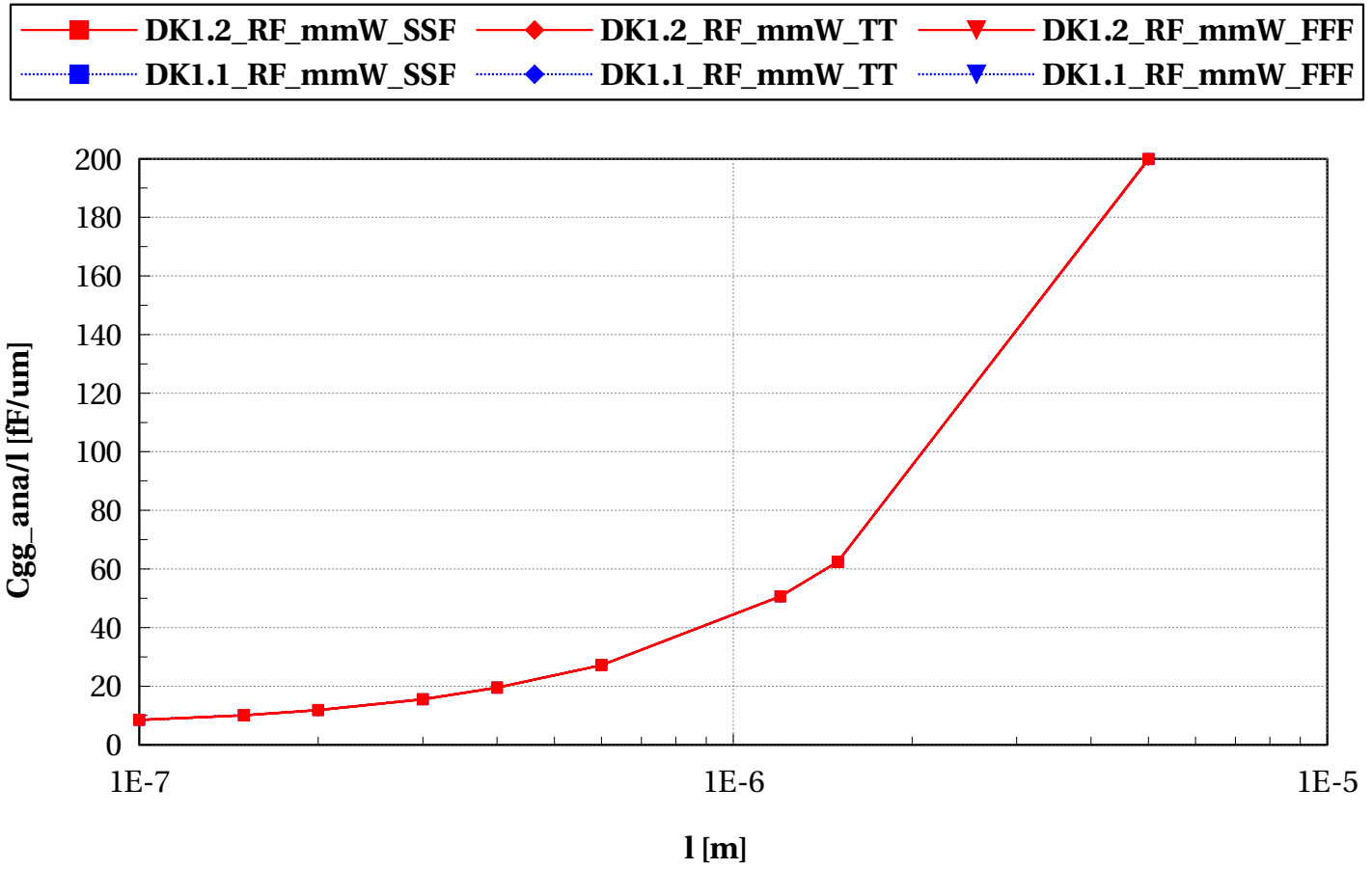
eglvtvpfet_acc, Sv@th [V/sqrt(Hz)] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



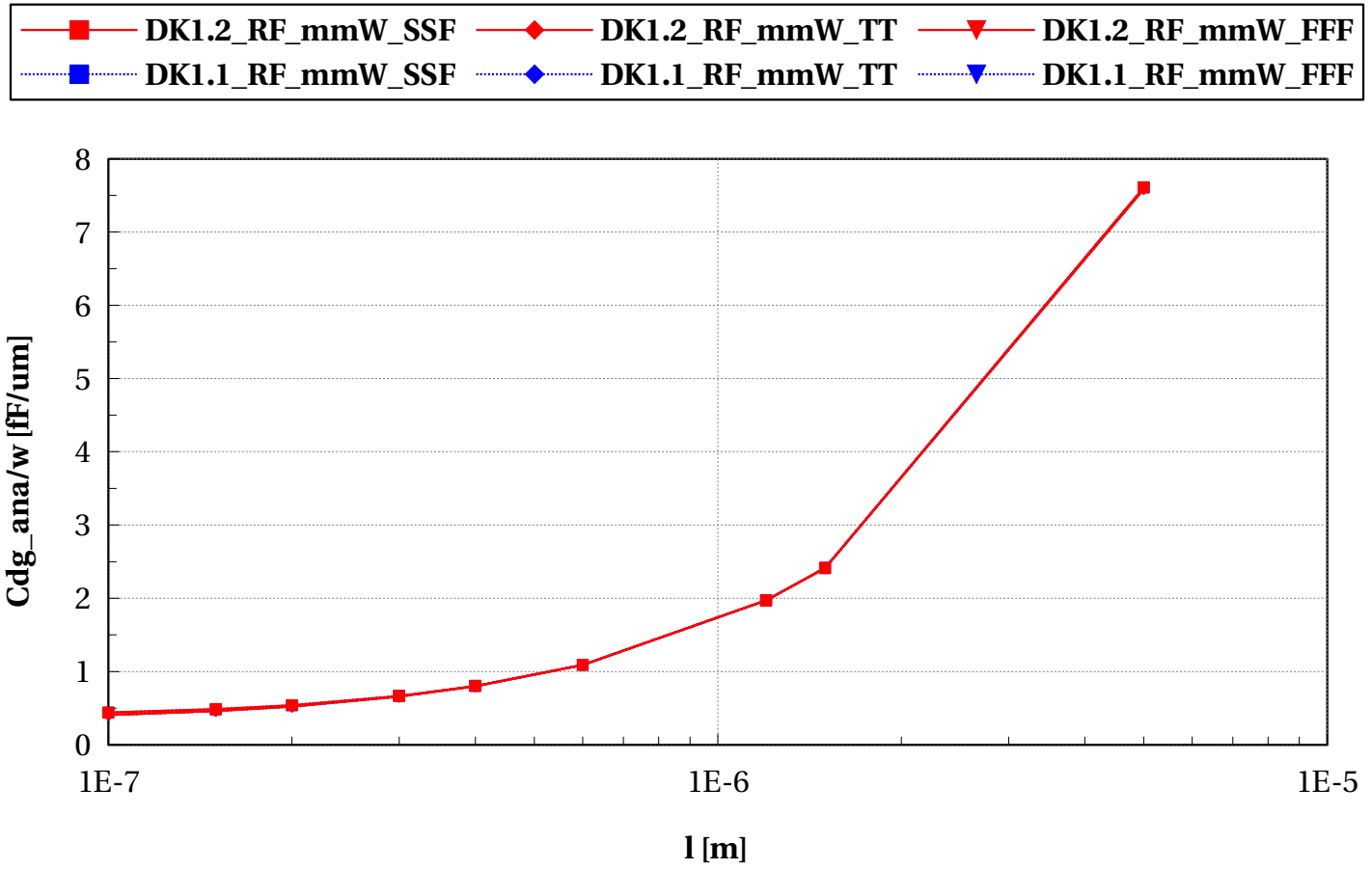
eglvtvpfet_acc, Cgg_ana/l [fF/um] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"

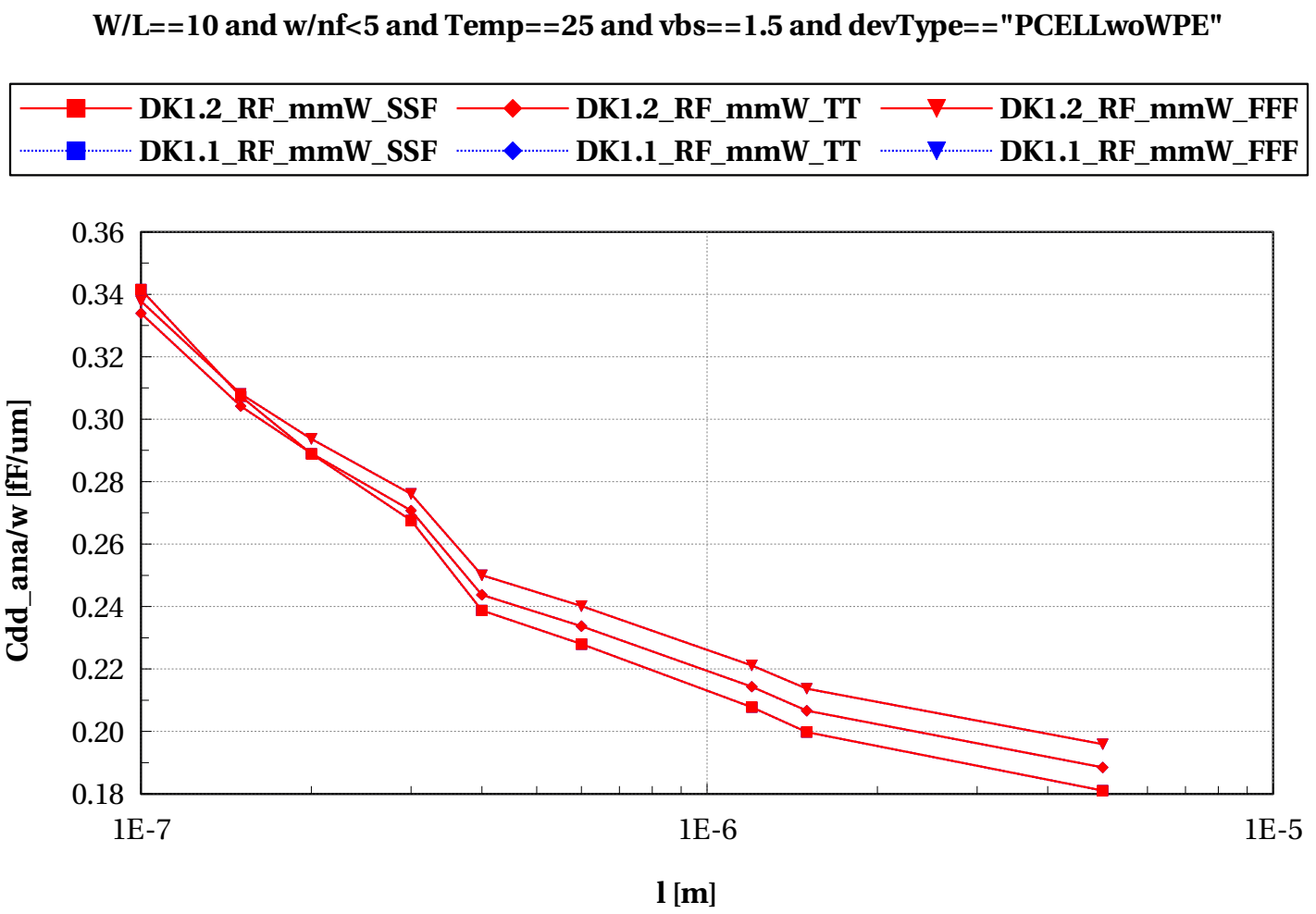


eglvtvpfet_acc, Cdg_ana/w [fF/um] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"

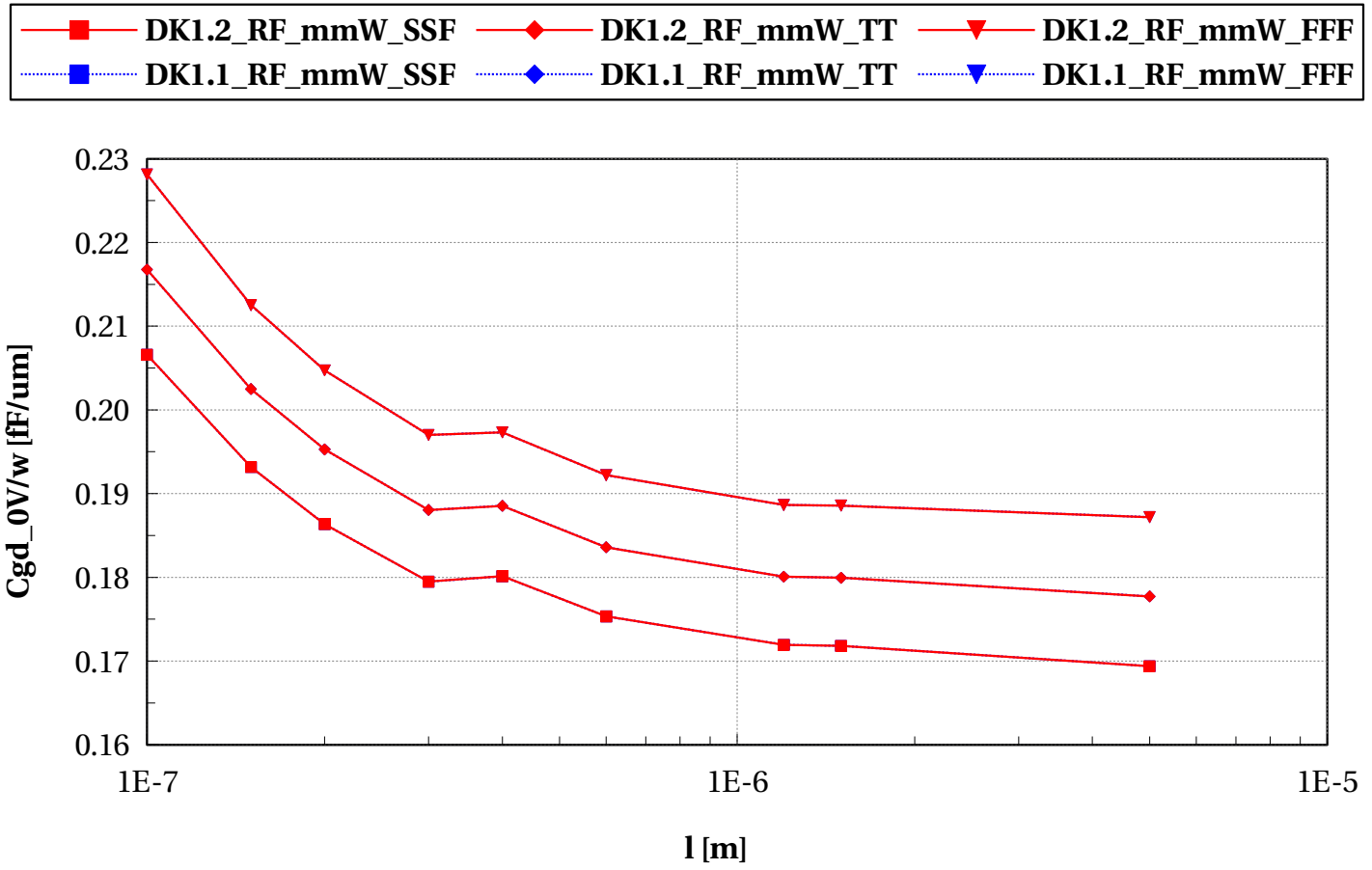


eglvtvpfet_acc, Cdd_ana/w [fF/um] vs l [m]



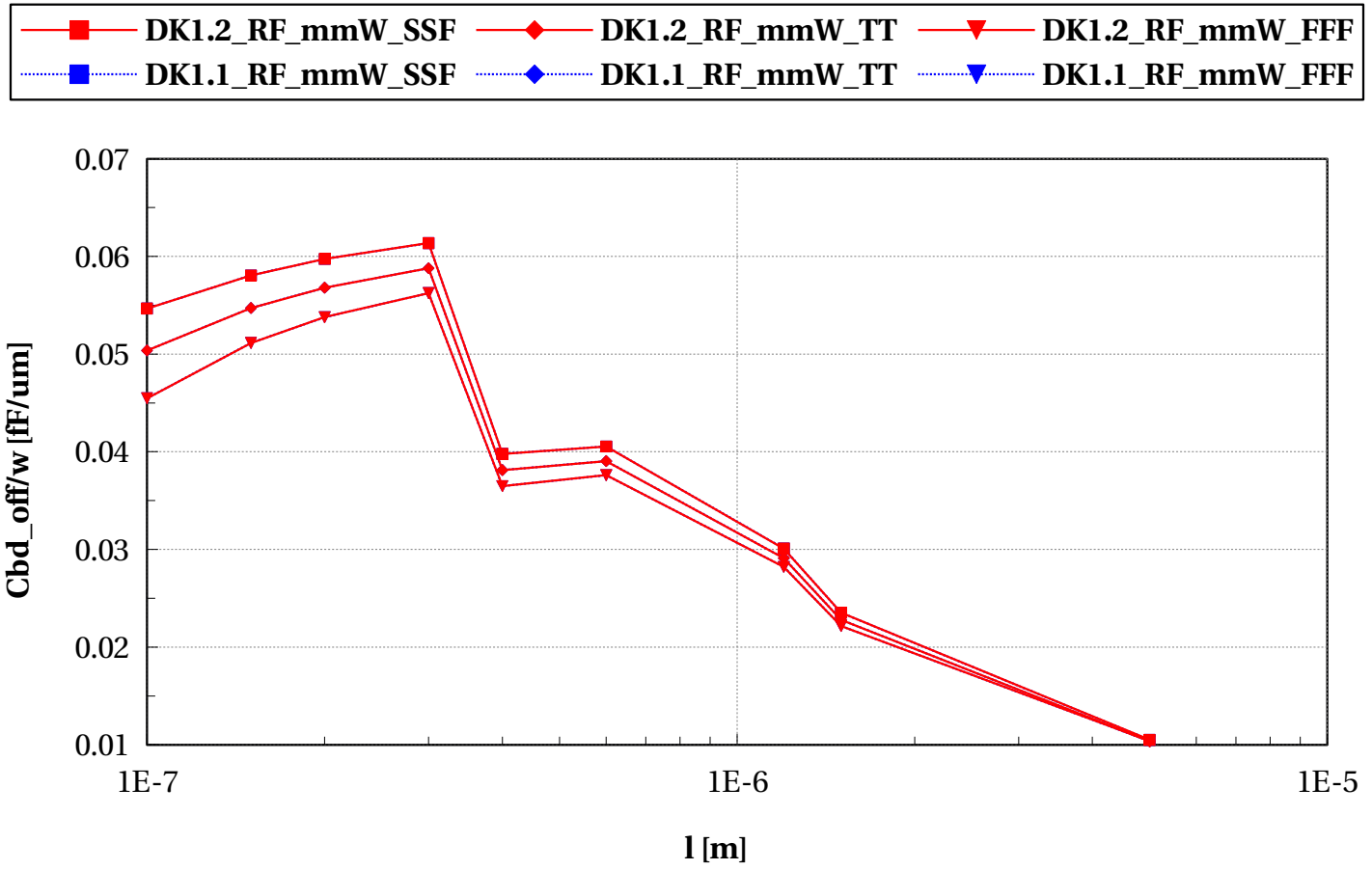
eglvtvpfet_acc, Cgd_0V/w [fF/um] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



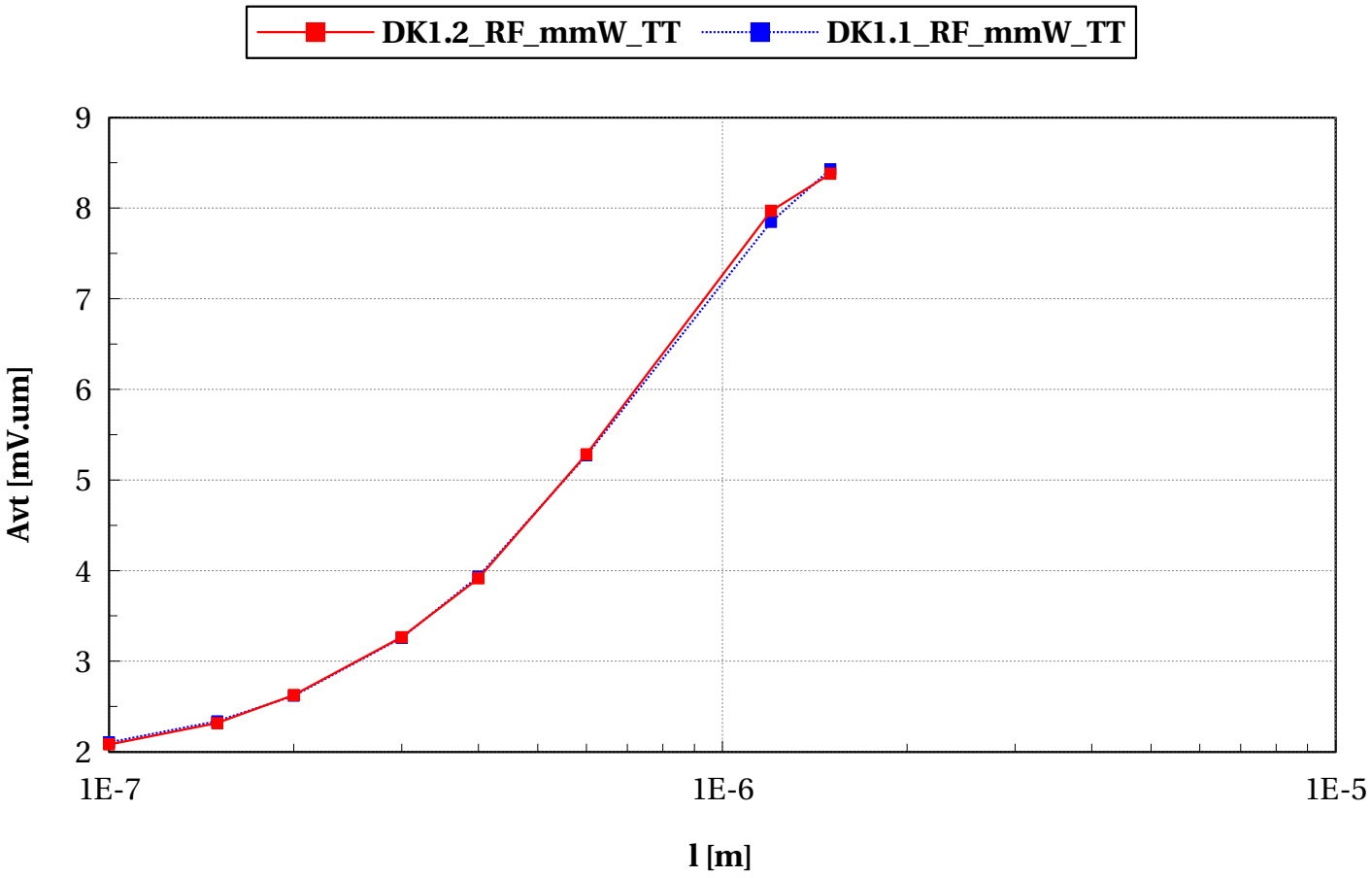
eglvtvpfet_acc, Cbd_off/w [fF/um] vs l [m]

W/L==10 and w/nf<5 and Temp==25 and vbs==1.5 and devType=="PCELLwoWPE"



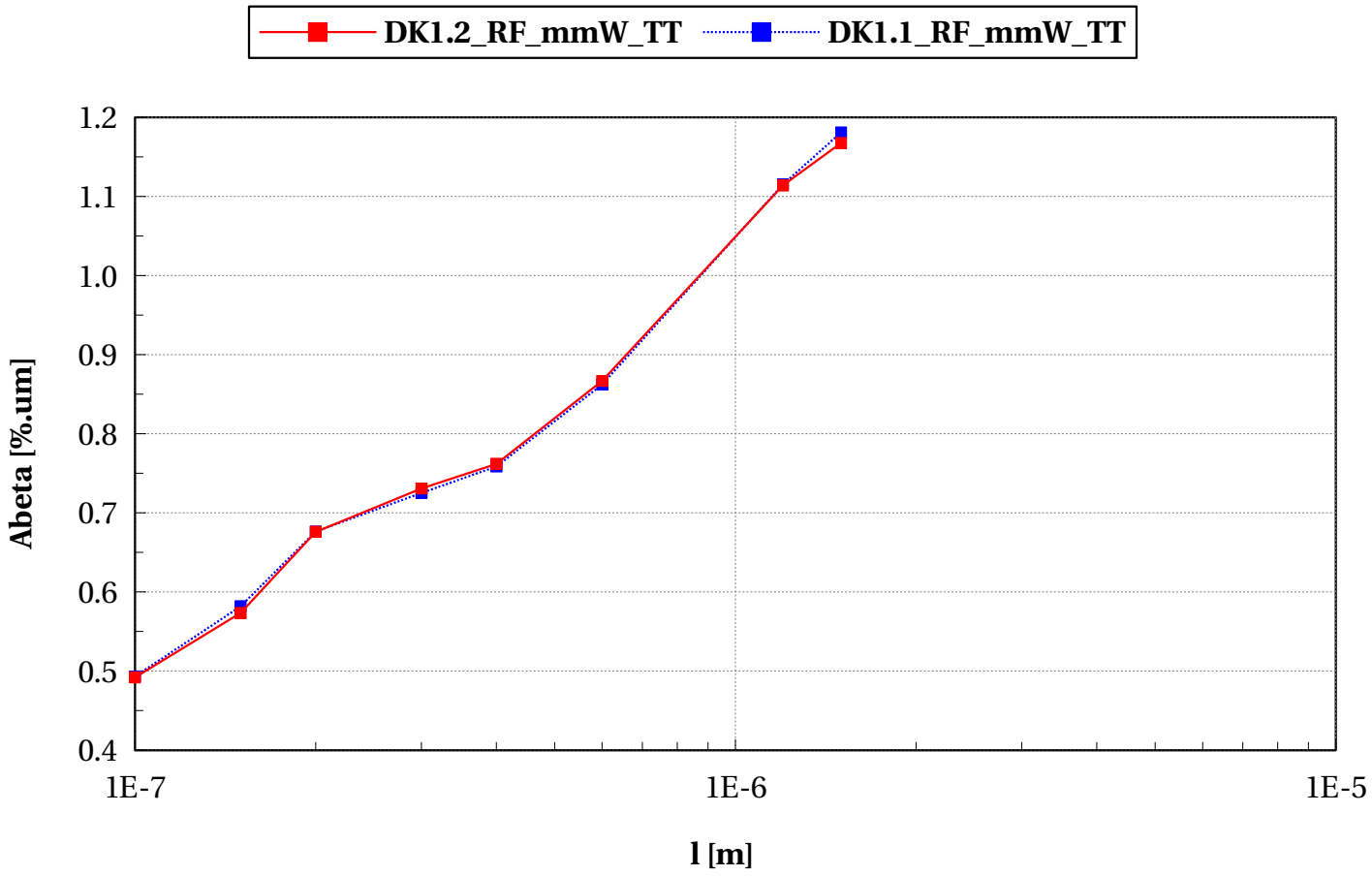
eglvtvpfet_acc, Avt [mV.um] vs l [m]

L==10 and w/nf<5 and Temp==25 and vbs==1.5 and stratn==2 and l<5e-6 and devType=="PCELLwoWI



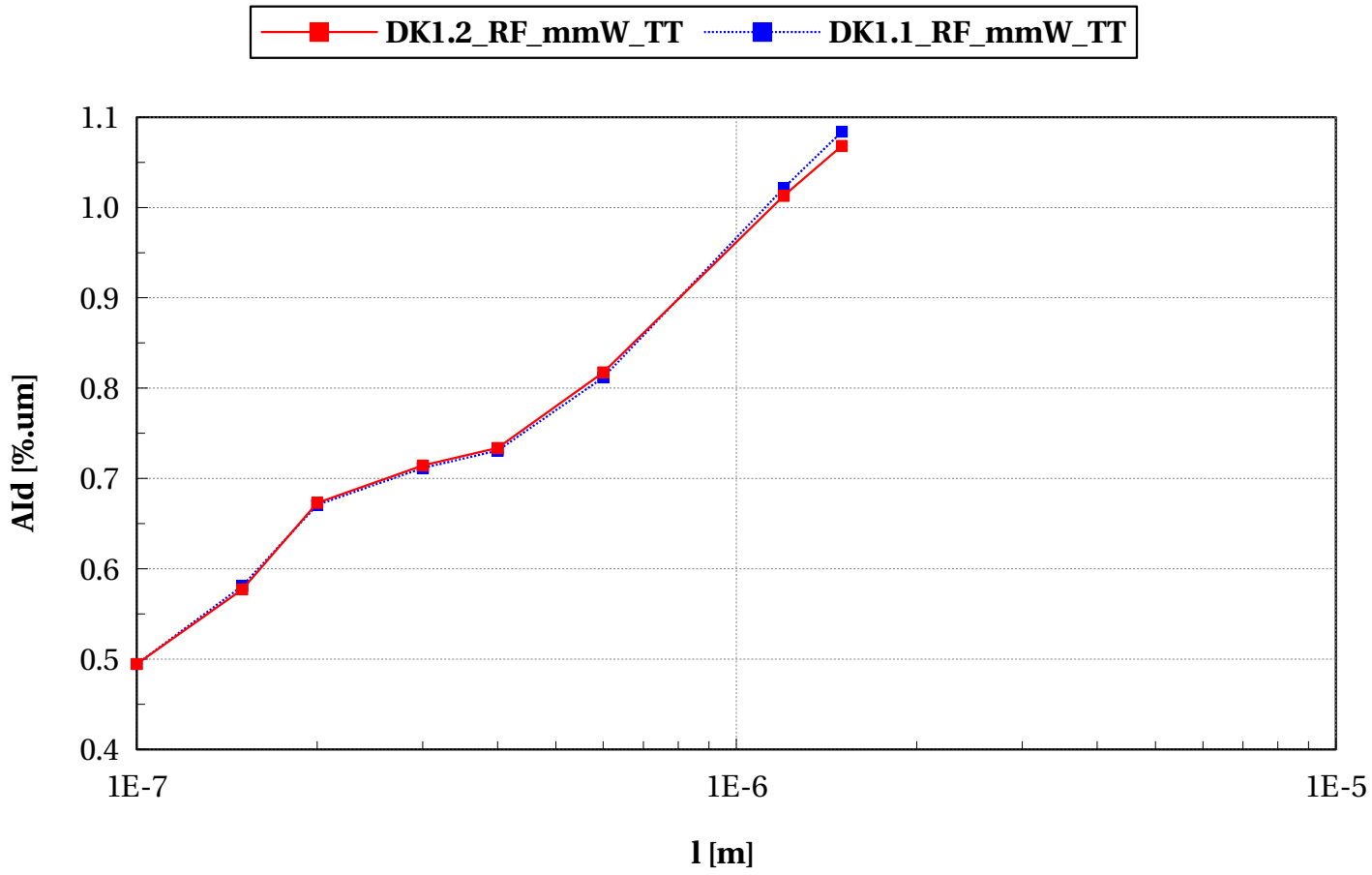
eglvtvpfet_acc, Abeta [%.um] vs l [m]

L==10 and w/nf<5 and Temp==25 and vbs==1.5 and stratn==2 and l<5e-6 and devType=="PCELLwoWI



eglvtvpfet_acc, AId [%.um] vs l [m]

L==10 and w/nf<5 and Temp==25 and vbs==1.5 and stratn==2 and l<5e-6 and devType=="PCELLwoWI



Annex

Conditions of simulations

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

- Model eglvtvnfet_acc (DK1.2_RF_mmW)
  - ✔ Input Parameters
    - ✘ vds_off = vds_sat V
    - ✘ vds_cgd = 0 V
    - ✘ mc_sens = 0
    - ✘ vds_lin = 0.05 V
    - ✘ ivt = 300e-9 A
    - ✘ model_version = 1.2.e
    - ✘ vstep_ivt = 0.005 V
    - ✘ iana = 5e-6 A
    - ✘ vds_mm = 0.05 V
    - ✘ ams_release = 2018.3
    - ✘ vgs_stop = vdd V
    - ✘ dlshrink_ivt = 0
    - ✘ sbenchlsf_release = Alpha
    - ✘ vds_sat = Vdd V

- ✘ mc_nsigma = 3
- ✘ vgs_start = 0 V
- ✘ plashrink_ivt = 1
- ✘ ithslwi = 10e-9 A
- ✘ vds_ana = Vdd/4 V
- ✘ vds_cbd = 0 V
- ✘ vddmax = vdd
- ✘ mc_runs = 5000
- ✘ shrink_ivt = 1
- ✘ vgs_off = 0 V
- ✘ temp = 25 °C
- ✘ f_ext = 100k Hz
- ✘ vbs = 0 V
- ✘ vdd = 1.5 V

✔ Sweep Parameters

✔ Extra parameters

- ✘ eglvt_dev = 1

● Model eglvtvpfet_acc (DK1.2_RF_mmW)

✔ Input Parameters

- ✘ vds_off = vds_sat V
- ✘ vds_cgd = 0 V
- ✘ mc_sens = 0
- ✘ vds_lin = 0.05 V
- ✘ ivt = 70e-9 A
- ✘ model_version = 1.2.e

- ✘ vstep_ivt = 0.005 V
- ✘ iana = 2e-6 A
- ✘ vds_mm = 0.05 V
- ✘ ams_release = 2018.3
- ✘ vgs_stop = vdd V
- ✘ dlshrink_ivt = 0
- ✘ sbenchlsf_release = Alpha
- ✘ vds_sat = Vdd V
- ✘ mc_nsigma = 3
- ✘ vgs_start = 0 V
- ✘ plashrink_ivt = 1
- ✘ ithslwi = 10e-9 A
- ✘ vds_ana = Vdd/4 V
- ✘ vds_cbd = 0 V
- ✘ vddmax = vdd
- ✘ mc_runs = 5000
- ✘ shrink_ivt = 1
- ✘ vgs_off = 0 V
- ✘ temp = 25 °C
- ✘ f_ext = 100k Hz
- ✘ vbs = 1.5 V
- ✘ vdd = 1.5 V

✔ Sweep Parameters

✔ Extra parameters

- ✘ eglvt_dev = 1

- Model eglvtvnfet_acc (DK1.1_RF_mmW)
  - ✔ Input Parameters
    - ✘ vds_off = vds_sat V
    - ✘ vds_cgd = 0 V
    - ✘ mc_sens = 0
    - ✘ vds_lin = 0.05 V
    - ✘ ivt = 300e-9 A
    - ✘ model_version = 1.2.d
    - ✘ vstep_ivt = 0.005 V
    - ✘ iana = 5e-6 A
    - ✘ vds_mm = 0.05 V
    - ✘ ams_release = 2018.3
    - ✘ vgs_stop = vdd V
    - ✘ dlshrink_ivt = 0
    - ✘ sbenchlsf_release = Alpha
    - ✘ vds_sat = Vdd V
    - ✘ mc_nsigma = 3
    - ✘ vgs_start = 0 V
    - ✘ plashrink_ivt = 1
    - ✘ ithslwi = 10e-9 A
    - ✘ vds_ana = Vdd/4 V
    - ✘ vds_cbd = 0 V
    - ✘ vddmax = vdd
    - ✘ mc_runs = 5000
    - ✘ shrink_ivt = 1

- ✘ vgs_off = 0 V
- ✘ temp = 25 °C
- ✘ f_ext = 100k Hz
- ✘ vbs = 0 V
- ✘ vdd = 1.5 V

✔ Sweep Parameters

✔ Extra parameters

- ✘ eglvt_dev = 1

● Model eglvtvpfet_acc (DK1.1_RF_mmW)

✔ Input Parameters

- ✘ vds_off = vds_sat V
- ✘ vds_cgd = 0 V
- ✘ mc_sens = 0
- ✘ vds_lin = 0.05 V
- ✘ ivt = 70e-9 A
- ✘ model_version = 1.2.d
- ✘ vstep_ivt = 0.005 V
- ✘ iana = 2e-6 A
- ✘ vds_mm = 0.05 V
- ✘ ams_release = 2018.3
- ✘ vgs_stop = vdd V
- ✘ dlshrink_ivt = 0
- ✘ sbenchlsf_release = Alpha
- ✘ vds_sat = Vdd V
- ✘ mc_nsigma = 3

- ✘ vgs_start = 0 V
- ✘ plashrink_ivt = 1
- ✘ ithslwi = 10e-9 A
- ✘ vds_ana = Vdd/4 V
- ✘ vds_cbd = 0 V
- ✘ vddmax = vdd
- ✘ mc_runs = 5000
- ✘ shrink_ivt = 1
- ✘ vgs_off = 0 V
- ✘ temp = 25 °C
- ✘ f_ext = 100k Hz
- ✘ vbs = 1.5 V
- ✘ vdd = 1.5 V

✔ Sweep Parameters

✔ Extra parameters

- ✘ eglvt_dev = 1