

CMOS090 technology SVT25 MOS transistor models Release DK_MIKRON



SPICE Model Characteristics : L/W/T scalings -

Crosscheck NMOS/PMOS

June 2010

TR&D / STD / T2D /

Modeling / CM2A

General information on SVT25 MOS transistor models

Supply voltage (V_{dd}) is 2.5 V.

Validity domain is defined as follows:

Drawn gate length varies from 0.28 μm to 10 μm .

Drawn transistor width varies from 0.4 μm to 10 μm .

Device temperature varies from $-40\text{ }^{\circ}\text{C}$ to $+150\text{ }^{\circ}\text{C}$.

V_{gs} , V_{ds} and V_{bs} vary from 0 V to 2.75 V (i.e. $V_{dd} + 10\%$).

Conditions of simulation

Simulations were done with Bench v3.6.3sram using Eldo simulator v6.7_1.2.

If not explicitly mentioned elsewhere, temperature is set to temp ° C and Vbs to 0 V.

Extra global parameters used:

- svt25_dev = 0

Output parameters definition

In what follows, M, W and L (all default to 1) designate the number of devices in parallel (i.e. multiplication factor), the total drawn gate width and the drawn gate length, respectively.

- **Vt_lin**: Threshold voltage defined as V_{gs} value for which drain current is $100e-9 \text{ A/sq} \cdot M \cdot W / L$ at $V_{ds} = 0.1 \text{ V}$.
- **Vt_sat**: Threshold voltage defined as V_{gs} value for which drain current is $100e-9 \text{ A/sq} \cdot M \cdot W / L$ at $V_{ds} = 2.5 \text{ V}$.
- **Ilow**: Drain current at $V_{gs} = 1.25 \text{ V}$, $V_{ds} = 2.5 \text{ V}$.
- **Ihigh**: Drain current at $V_{gs} = 2.5 \text{ V}$, $V_{ds} = 1.25 \text{ V}$.
- **Ieff**: Average drain current $(I_{low} + I_{high}) / 2$.
- **Ilin**: Drain current at $V_{gs} = 2.5 \text{ V}$, $V_{ds} = 0.1 \text{ V}$.
- **Isat**: Drain current at $V_{gs} = 2.5 \text{ V}$, $V_{ds} = 2.5 \text{ V}$.
- **Ioffsat**: Drain current at $V_{gs} = 0 \text{ V}$, $V_{ds} = 2.5 \text{ V}$.
- **Slp_sat**: Sub-threshold slope at $V_{ds} = 2.5 \text{ V}$, extracted from drain current vs. V_{gs} curve between its minimum and $100e-9 \text{ A/sq} \cdot M \cdot W / L$.
- **Ioff_s**: Source current at $V_{gs} = 0 \text{ V}$, $V_{ds} = 2.5 \text{ V}$.
- **Ioff_b**: Bulk current at $V_{gs} = 0 \text{ V}$, $V_{ds} = 2.5 \text{ V}$.
- **Cgg_inv**: Total gate capacitance at $V_{gs} = 2.5 \text{ V}$, $V_{ds} = 0 \text{ V}$, $f = 100 \text{ kHz}$.

- **Cggmean:** Average total gate capacitance for V_{gs} values between 0 V and 2.5 V, $V_{ds} = 0$ V, $f = 100$ kHz.
- **Cgd_0V:** Gate-to-Drain capacitance at $V_{gs} = 0$ V, $V_{ds} = 0$ V, $f = 100$ kHz.
- **Cbd_off:** Bulk-to-Drain capacitance at $V_{gs} = 0$ V, $V_{ds} = 0$ V, $f = 100$ kHz.
- **Gm_c:** Drain transconductance at $V_{gs} = V_{t_lin} + 0.2$ V, $V_{ds} = 1.25$ V, $f = 100$ kHz.
- **Gd_c:** Drain conductance at $V_{gs} = V_{t_lin} + 0.2$ V, $V_{ds} = 1.25$ V, $f = 100$ kHz.
- **Gain_c:** Voltage gain defined as Gm_c / Gd_c .
- **VtGmmax:** Threshold voltage at $V_{ds} = 0.1$ V derived from Gm max method.

NSVT25

Electrical characteristics per geometry

**nsvt25 W=10e-6 L=0.28e-6 po2act=0.82e-6 tometer=1 lpe=0 @
temp=25**

	SVT25_SSA	SVT25_TT	FFA_SSA_SSA_SS A
Vt_lin [mV]	548	482	472
Vt_sat [mV]	497	426	417
Ilin [uA]	821.84	908.23	916.25
Isat [mA]	5.1635	5.7535	5.6168
Ioffsat [pA]	9.2796	45.894	59.651
Slp_sat [mV/dec]	88.31	86.52	86.76
Ioff_s [pA]	-9.2487	-45.739	-59.429
Ioff_b [fA]	-30.824	-154.83	-222.52
Cgg_inv [fF]	18.669	18.77	18.673
Cggmean [fF]	16.964	17.236	17.121
Cgd_0V [fF]	4.6556	4.8124	4.6695
Cbd_off [fF]	5.6228	5.005	4.1422
Gm_c [mS]	1.1007	1.2272	1.1616
Gain_c []	43.951	37.98	39.652
VtGmmax [mV]	601	538	530

nsvt25 W=0.4e-6 L=0.28e-6 po2act=0.82e-6 tometer=1 lpe=0 @ temp=25

	SVT25_SSA	SVT25_TT	FFA_SSA_SSA_SS A
Vt_lin [mV]	500	432	424
Vt_sat [mV]	448	375	369
Ilin [uA]	31.253	35.868	34.903
Isat [uA]	196.63	228.02	214.66
Ioffsat [pA]	1.3605	7.2455	8.9842
Slp_sat [mV/dec]	88.59	86.85	87.12
Ioff_s [pA]	-1.356	-7.2211	-8.9528
Ioff_b [fA]	-4.5452	-24.441	-31.448
Cgg_inv [aF]	798.05	827.54	798.18
Cggmean [aF]	741.07	774.69	746.9
Cgd_0V [aF]	217.2	229.9	218.16
Cbd_off [aF]	236.72	217.97	172.98
Gm_c [uS]	39.036	45.014	41.274
Gain_c []	43.966	38.038	39.687
VtGmmax [mV]	552	488	481

nsvt25 W=10e-6 L=10e-6 po2act=0.82e-6 tometer=1 lpe=0 @ temp=25

	SVT25_SSA	SVT25_TT	FFA_SSA_SSA_SS A
Vt_lin [mV]	486	454	424
Vt_sat [mV]	483	451	421
Ilin [uA]	31.72	33.973	35.081
Isat [uA]	258.97	283.36	298.45
Ioffsat [fA]	371.97	651.52	1546.1
Slp_sat [mV/dec]	87.98	86.07	86.57
Ioff_s [pA]	-0.37059	-0.64701	-1.5162
Ioff_b [fA]	-1.3871	-4.5104	-29.891
Cgg_inv [fF]	578.21	603.98	578.32
Cggmean [fF]	484.98	510.57	493.01
Cgd_0V [fF]	6.3125	6.8045	7.5118
Cbd_off [fF]	6.1639	5.6556	5.0856
Gm_c [uS]	19.207	20.495	20.597
Gain_c [k]	1.0331	1.0423	1.0343
VtGmmax [mV]	574	543	514

PSVT25

Electrical characteristics per geometry

**psvt25 W=10e-6 L=0.28e-6 po2act=0.82e-6 tometer=1 lpe=0 @
temp=25**

	SVT25_SSA	SVT25_TT	FFA_SSA_SSA_SS A
Vt_lin [mV]	519	459	418
Vt_sat [mV]	485	421	381
Ilin [uA]	274.68	306.44	313.03
Isat [mA]	2.4519	2.8234	2.9083
Ioffsat [pA]	15.877	62.645	178.63
Slp_sat [mV/dec]	89.39	87.56	87.65
Ioff_s [pA]	-15.873	-62.629	-178.57
Ioff_b [fA]	-3.5489	-15.63	-62.248
Cgg_inv [fF]	18.508	18.59	18.511
Cggmean [fF]	16.652	16.89	16.875
Cgd_0V [fF]	4.0733	4.1971	4.0846
Cbd_off [fF]	5.922	5.292	4.3907
Gm_c [uS]	454.93	515.22	505.39
Gain_c []	59.989	53.974	55.095
VtGmmax [mV]	510	455	415

psvt25 W=0.4e-6 L=0.28e-6 po2act=0.82e-6 tometer=1 lpe=0 @ temp=25

	SVT25_SSA	SVT25_TT	FFA_SSA_SSA_SS A
Vt_lin [mV]	524	462	423
Vt_sat [mV]	490	424	386
Ilin [uA]	9.2567	10.736	10.569
Isat [uA]	83.643	100.37	99.748
Ioffsat [fA]	597.68	2468	6761.2
Slp_sat [mV/dec]	89.72	87.79	88.08
Ioff_s [pA]	-0.5975	-2.4672	-6.7581
Ioff_b [fA]	-0.18169	-0.8371	-3.1722
Cgg_inv [aF]	809.9	838.5	810.02
Cggmean [aF]	741.2	773.2	749.57
Cgd_0V [aF]	198.69	209.13	199.15
Cbd_off [aF]	251.93	232.54	185.04
Gm_c [uS]	15.347	17.997	17.114
Gain_c []	58.902	53.201	54.182
VtGmmax [mV]	506	451	411

psvt25 W=10e-6 L=10e-6 po2act=0.82e-6 tometer=1 lpe=0 @ temp=25

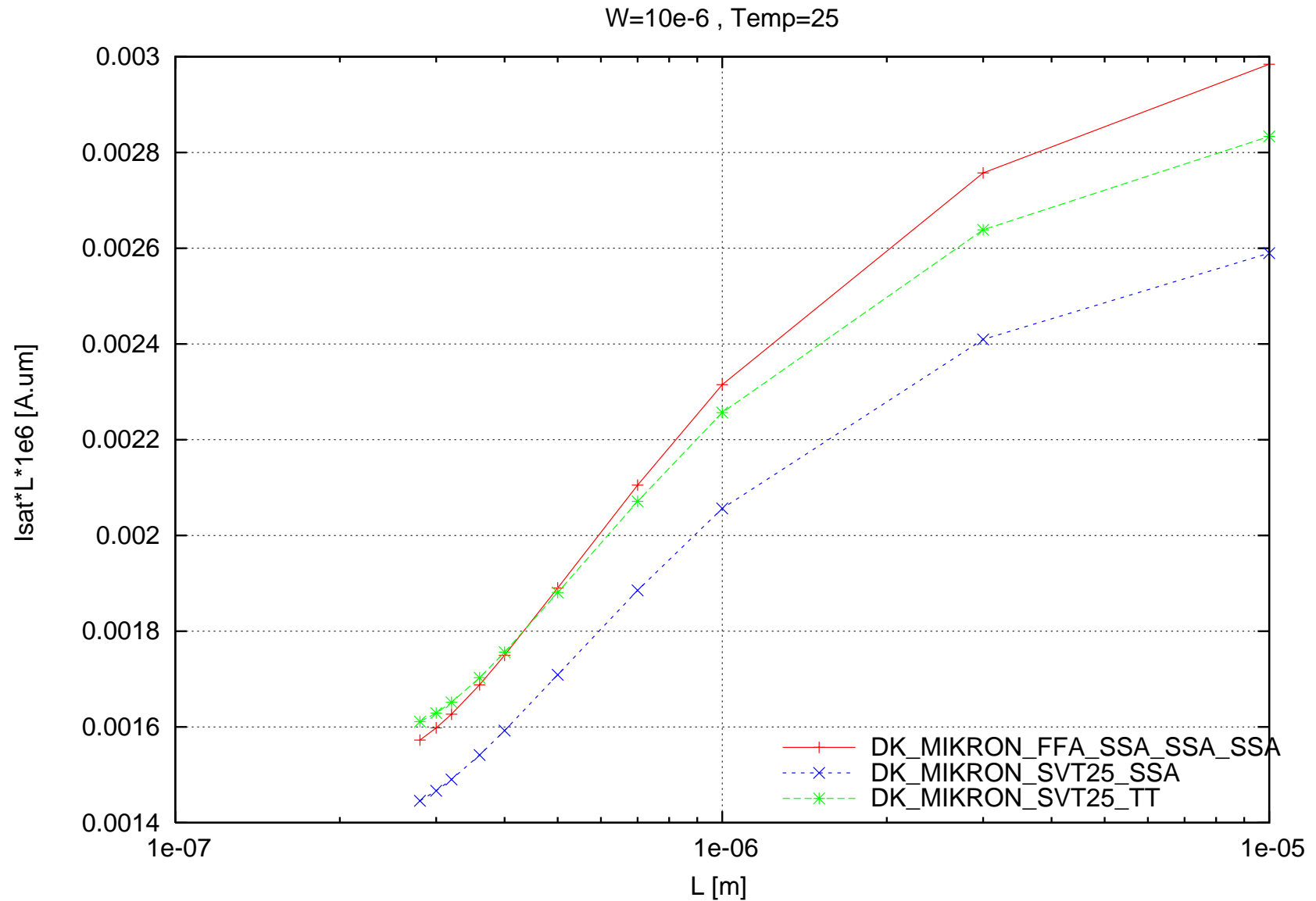
	SVT25_SSA	SVT25_TT	FFA_SSA_SSA_SS A
Vt_lin [mV]	587	538	491
Vt_sat [mV]	585	537	489
Ilin [uA]	6.7304	7.2414	7.7044
Isat [uA]	54.237	60.315	66.511
Ioffsat [fA]	29.583	73.664	271.4
Slp_sat [mV/dec]	87.92	85.72	85.83
Ioff_s [fA]	-29.325	-71.116	-246.05
Ioff_b [fA]	-0.25829	-2.5486	-25.345
Cgg_inv [fF]	564.37	588.27	564.5
Cggmean [fF]	456.66	481.64	467.85
Cgd_0V [fF]	4.549	4.7482	4.8626
Cbd_off [fF]	6.0102	5.4066	4.5937
Gm_c [uS]	7.4679	8.0397	8.3242
Gain_c [k]	2.4536	2.4998	2.4859
VtGmmax [mV]	576	530	486

NSVT25

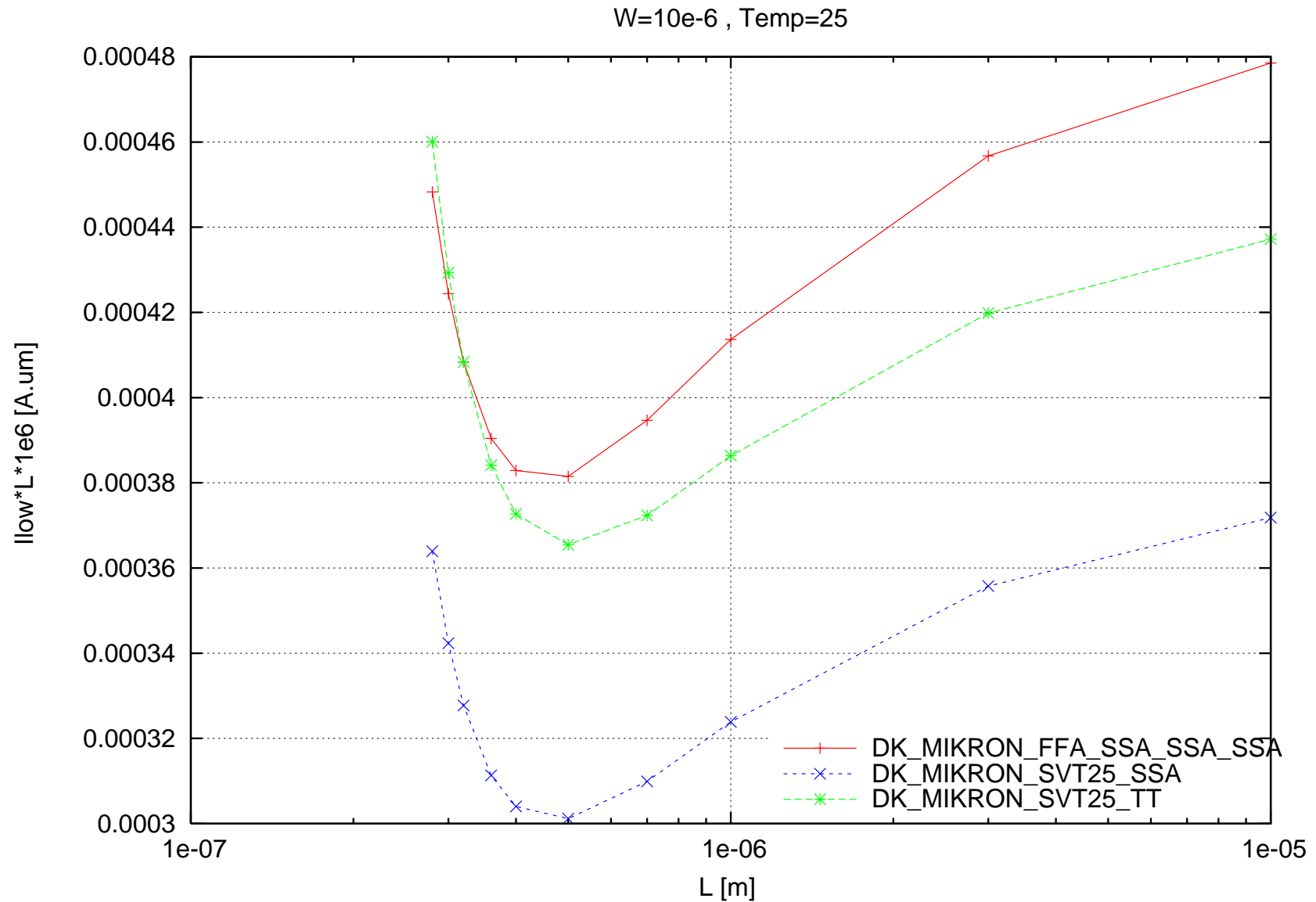
Electrical characteristics scaling

Scaling versus Length for NMOS ($W=10\text{e-}6$, Temp=25, $\text{po2act}=0.82\text{e-}6$, LPE=0)

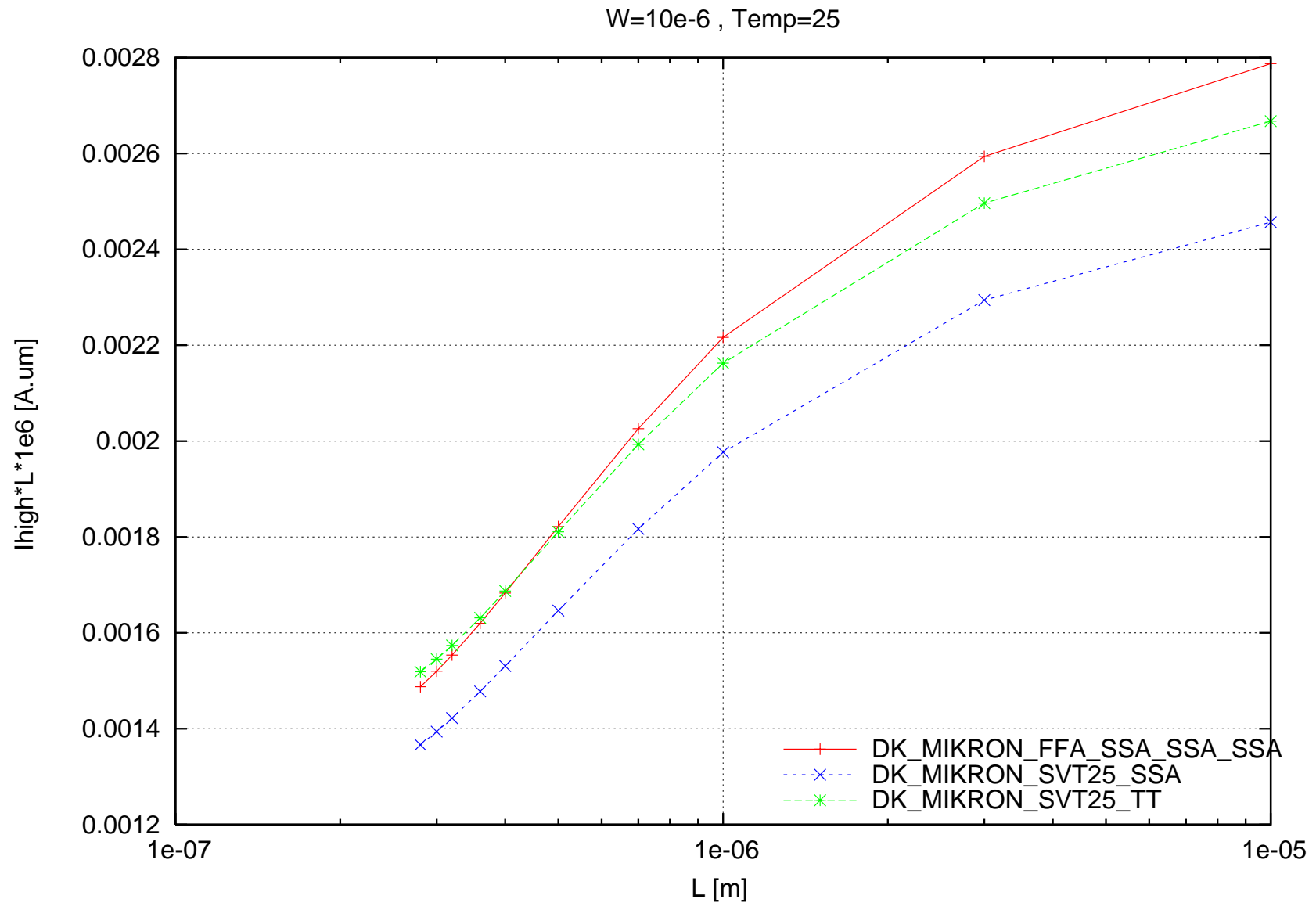
nsvt25 Isat*L*1e6 [A.um] vs. L [m] , W=10e-6 , Temp=25



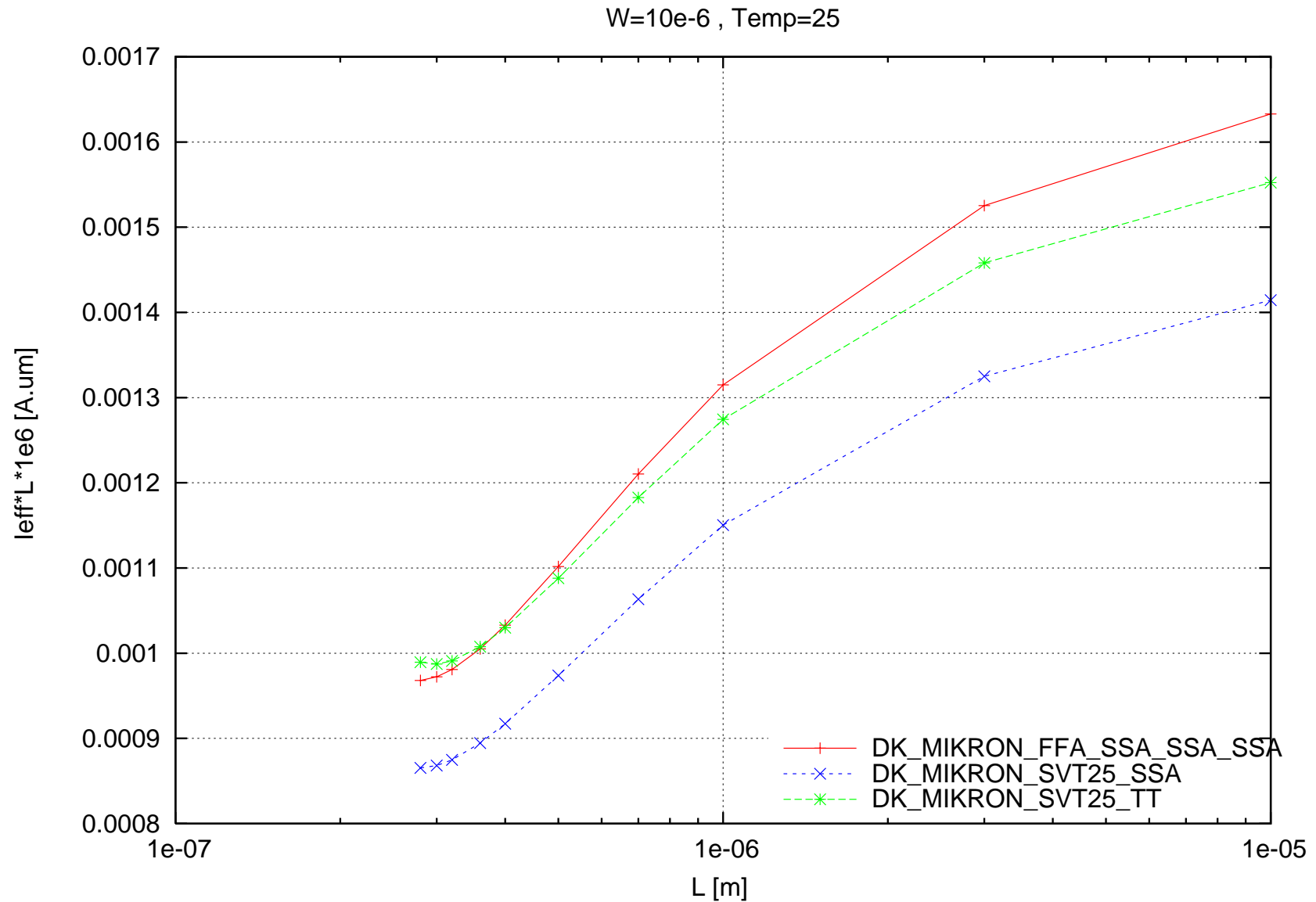
nsvt25 $I_{low} \cdot L \cdot 1e6$ [A.um] vs. L [m] , $W=10e-6$, Temp=25



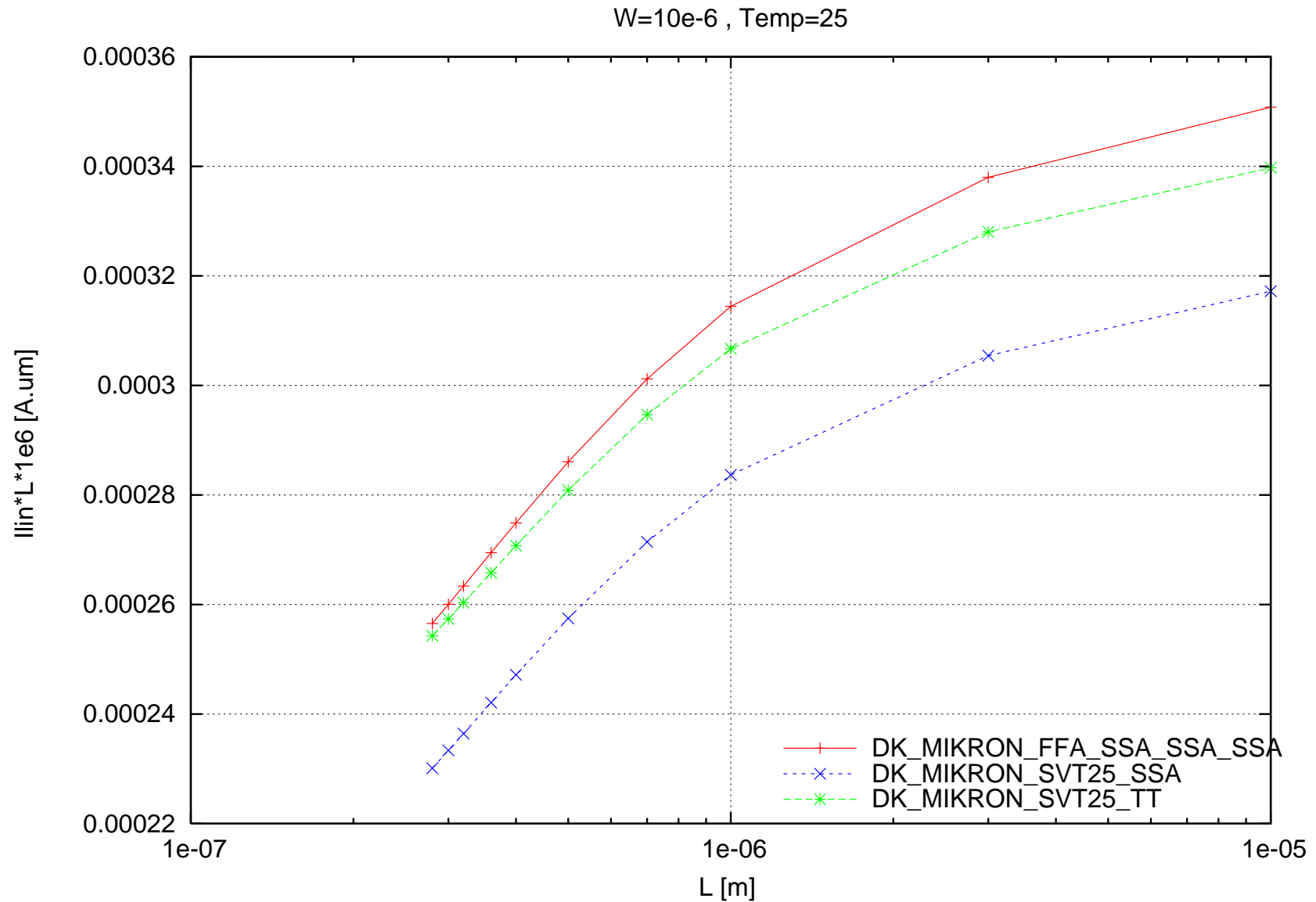
nsvt25 I_{high}*L*1e6 [A.um] vs. L [m] , W=10e-6 , Temp=25



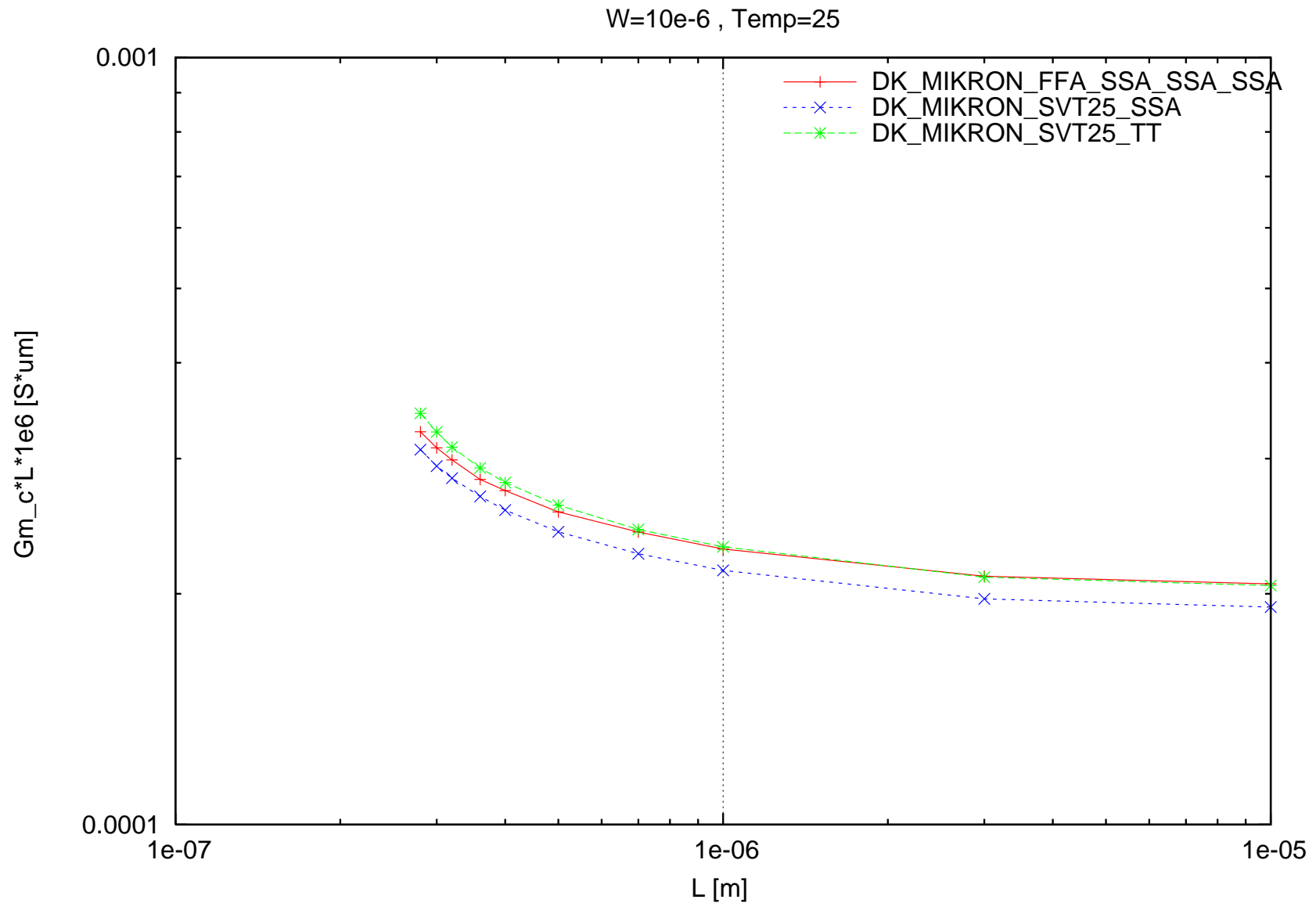
nsvt25 $l_{eff} \cdot L \cdot 1e6$ [A.um] vs. L [m] , $W=10e-6$, Temp=25



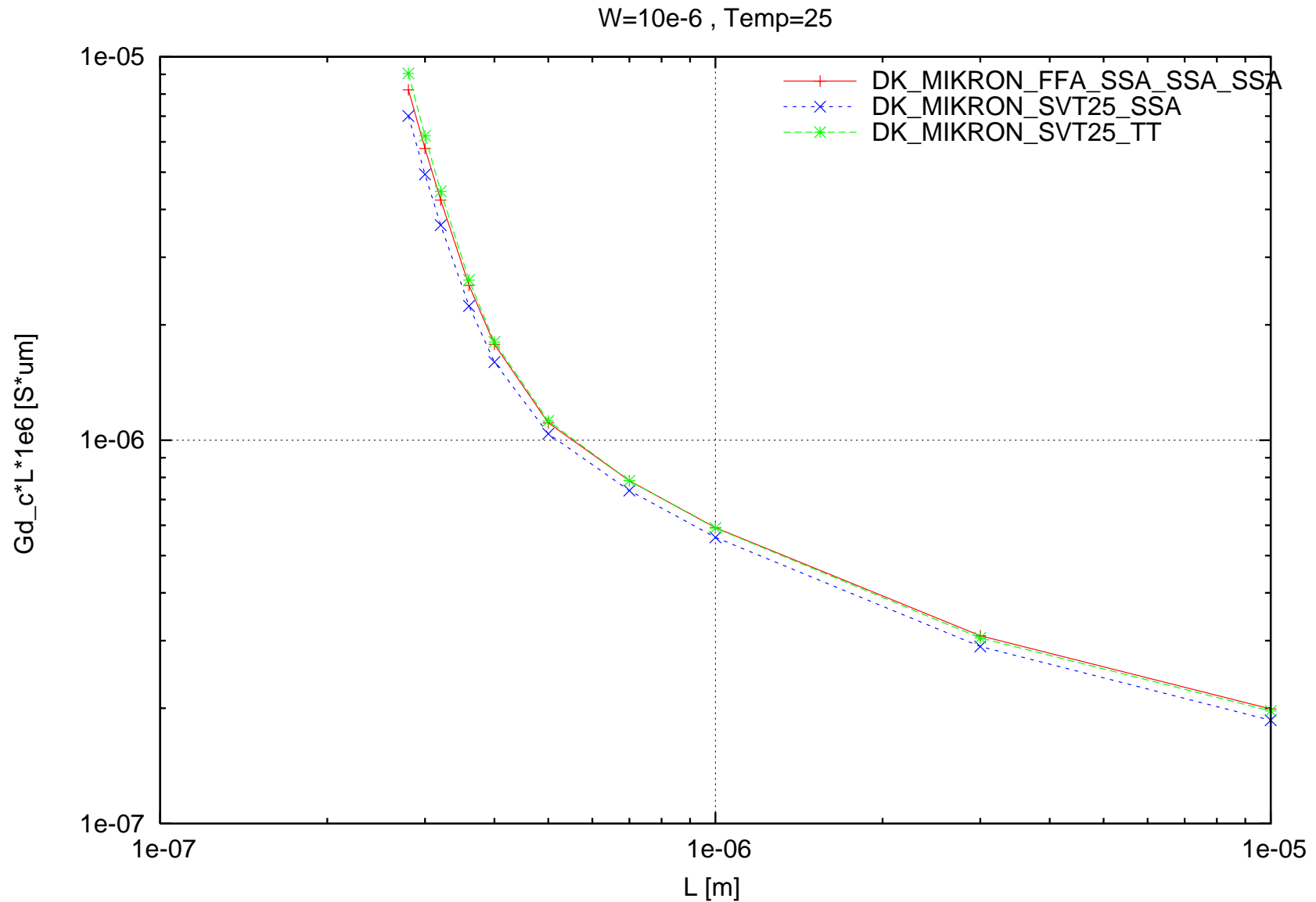
nsvt25 I_{lin}*L*1e6 [A.um] vs. L [m] , W=10e-6 , Temp=25



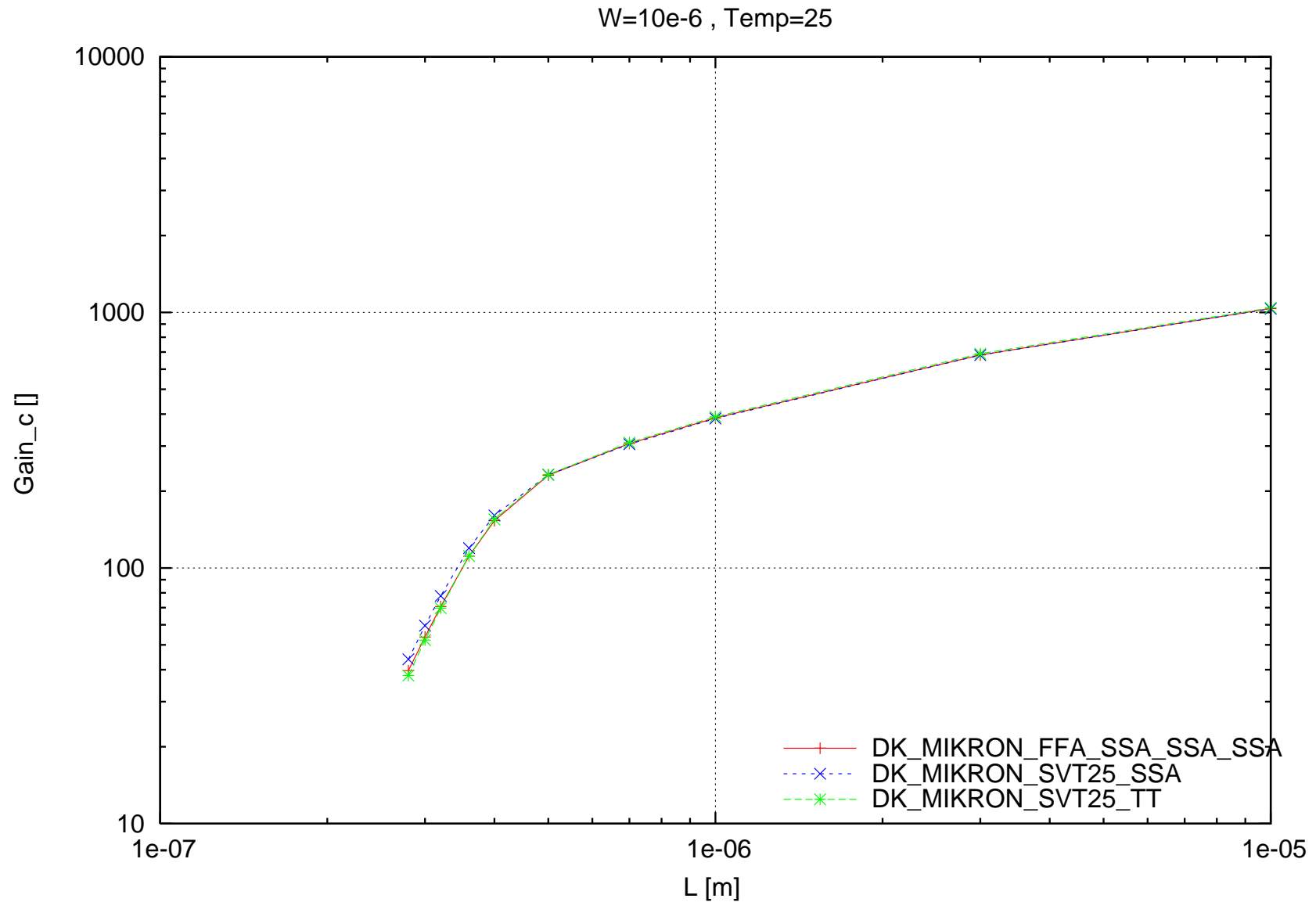
nsvt25 $G_m_c \cdot L \cdot 1e6$ [S $\cdot\mu$ m] vs. L [m] , $W=10e-6$, Temp=25



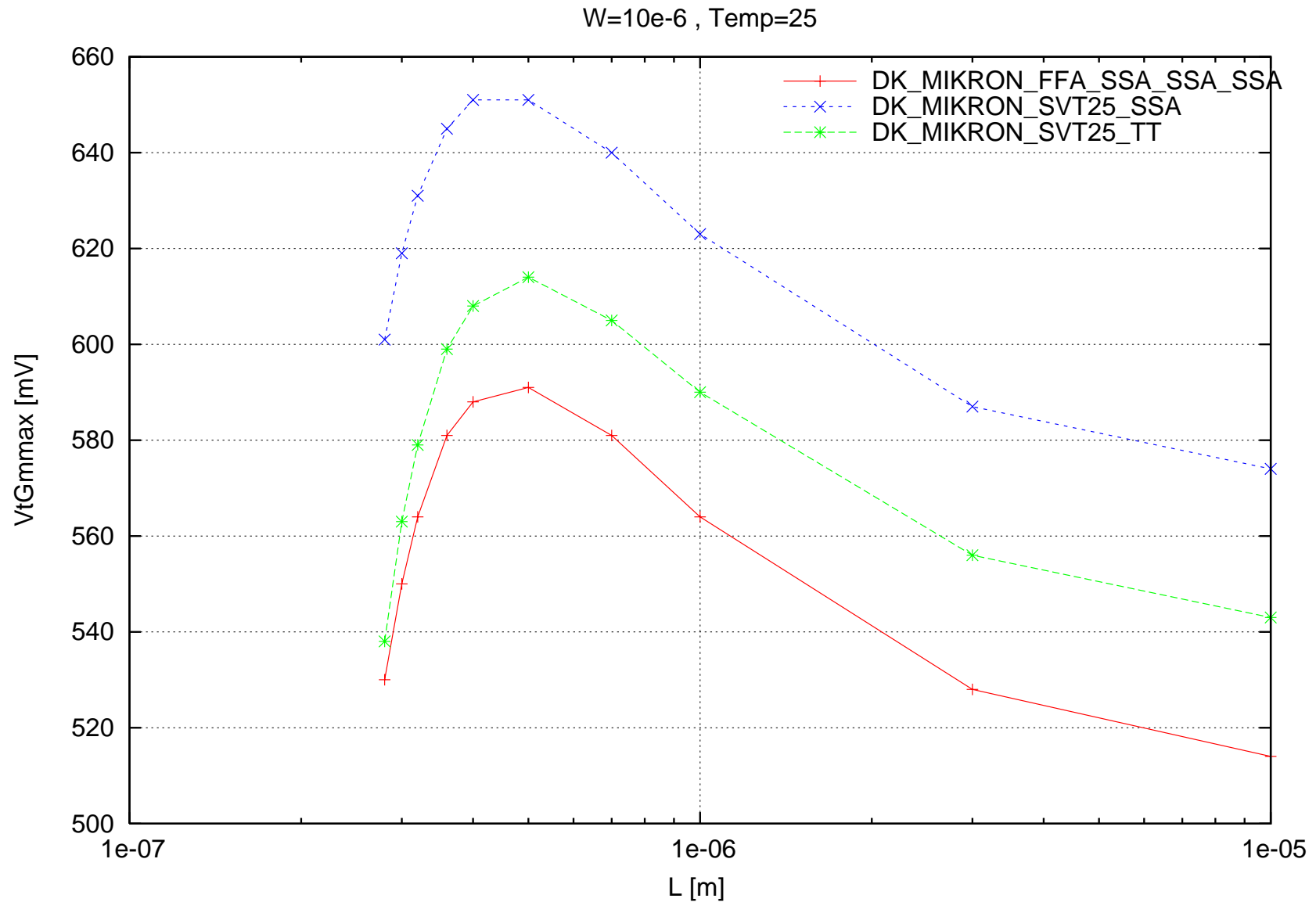
nsvt25 Gd_c*L*1e6 [S*um] vs. L [m] , W=10e-6 , Temp=25



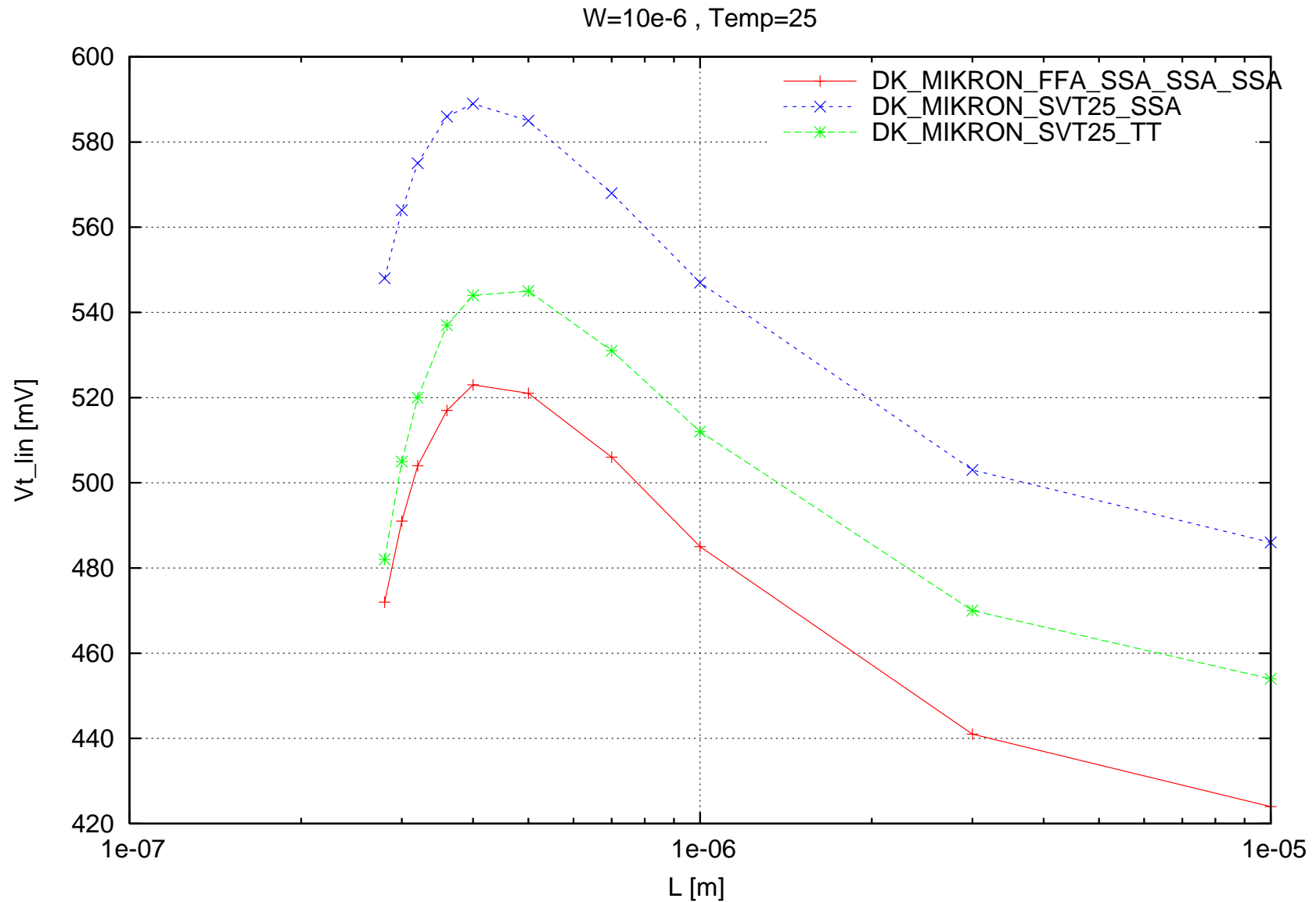
nsvt25 Gain_c [] vs. L [m] , W=10e-6 , Temp=25



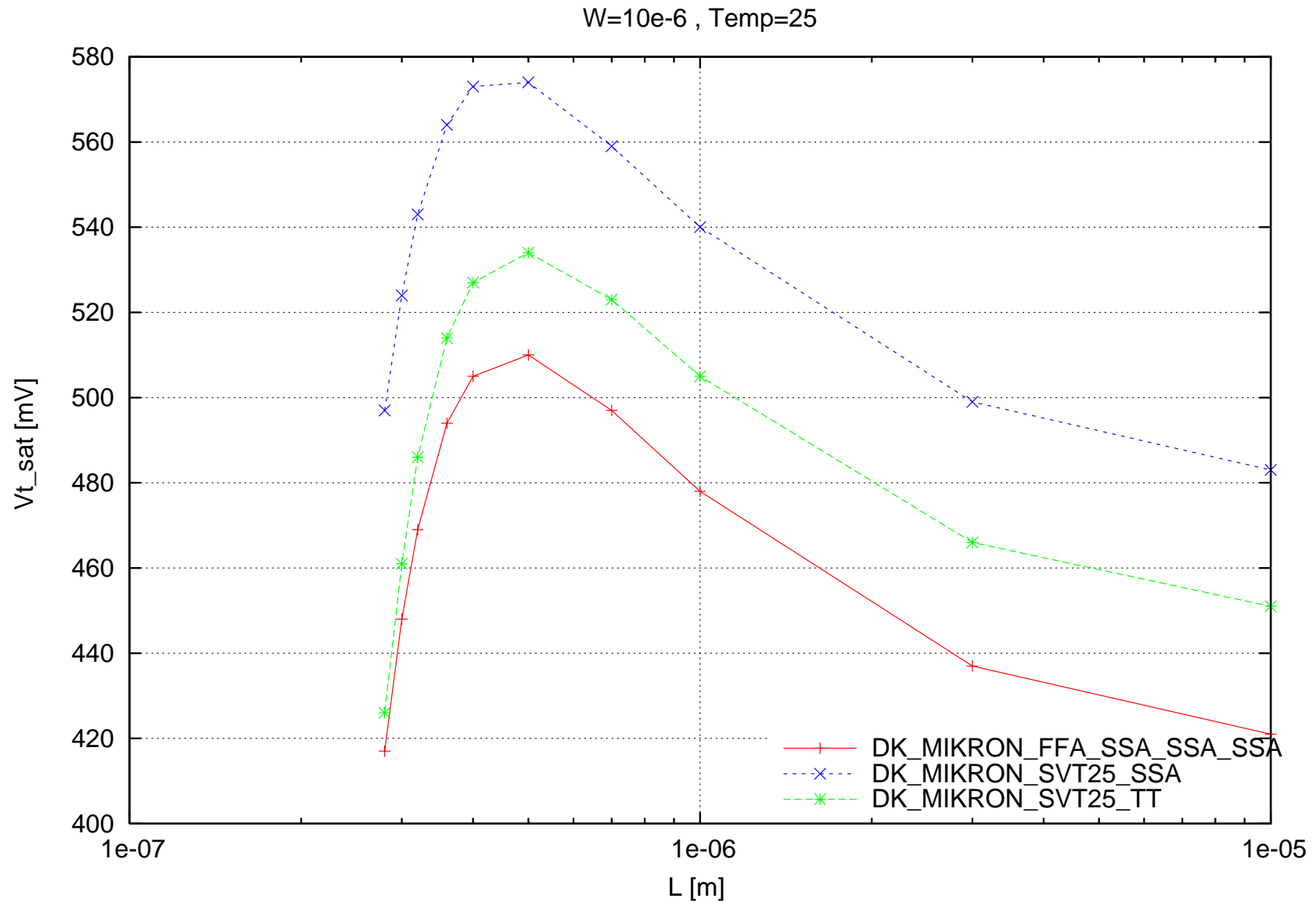
nsvt25 VtGmmax [mV] vs. L [m] , W=10e-6 , Temp=25



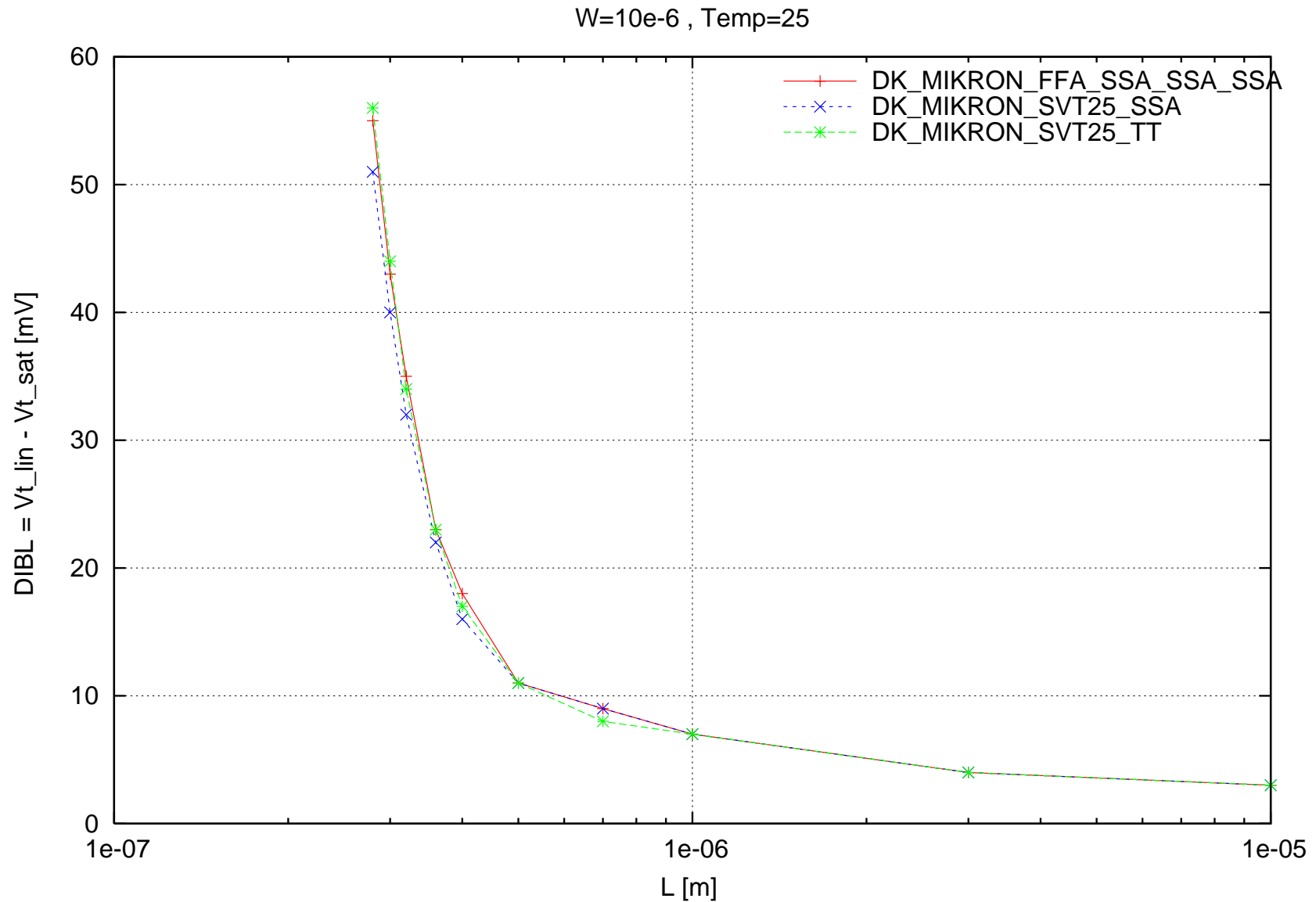
nsvt25 Vt_lin [mV] vs. L [m] , W=10e-6 , Temp=25



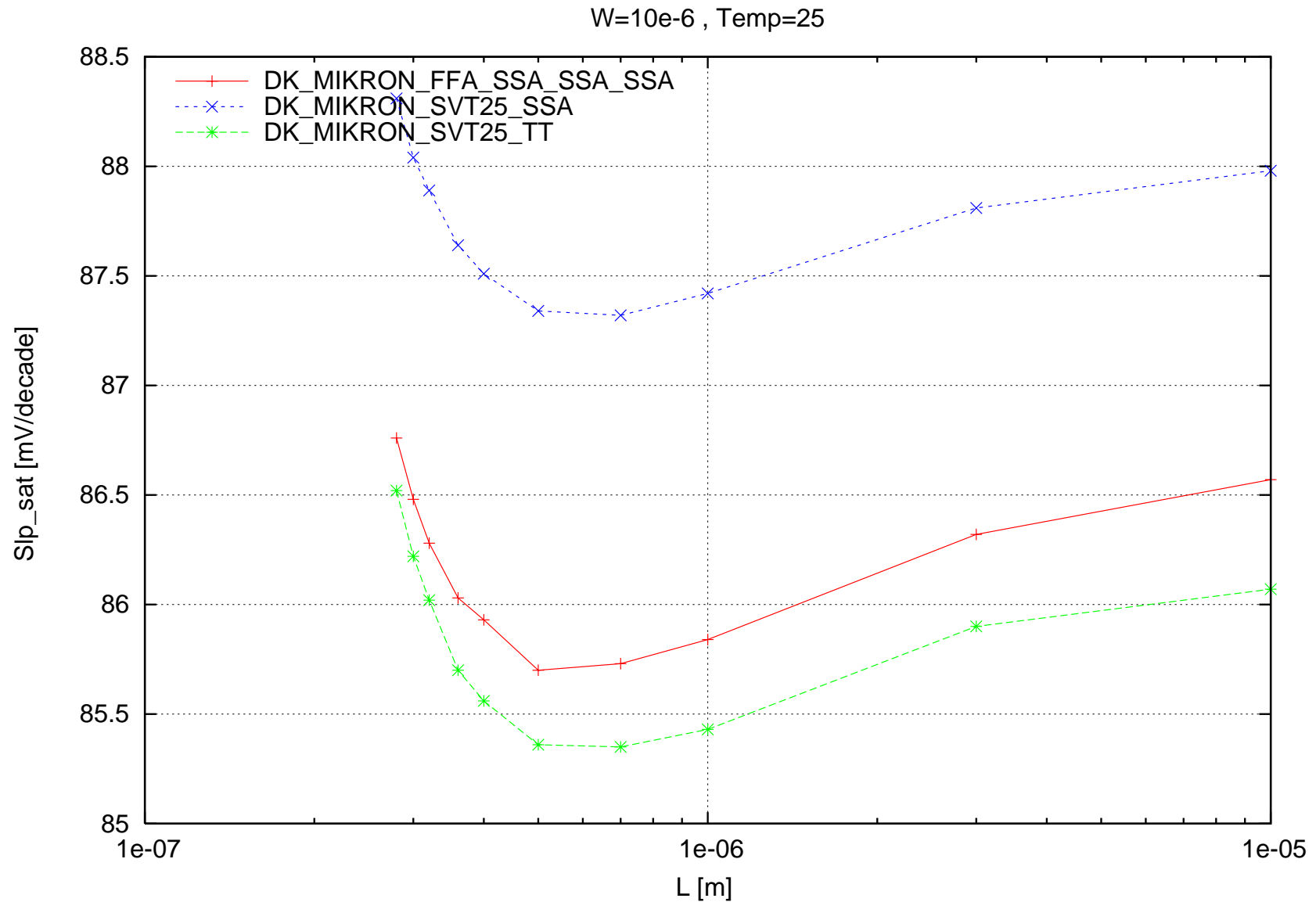
nsvt25 Vt_sat [mV] vs. L [m] , W=10e-6 , Temp=25



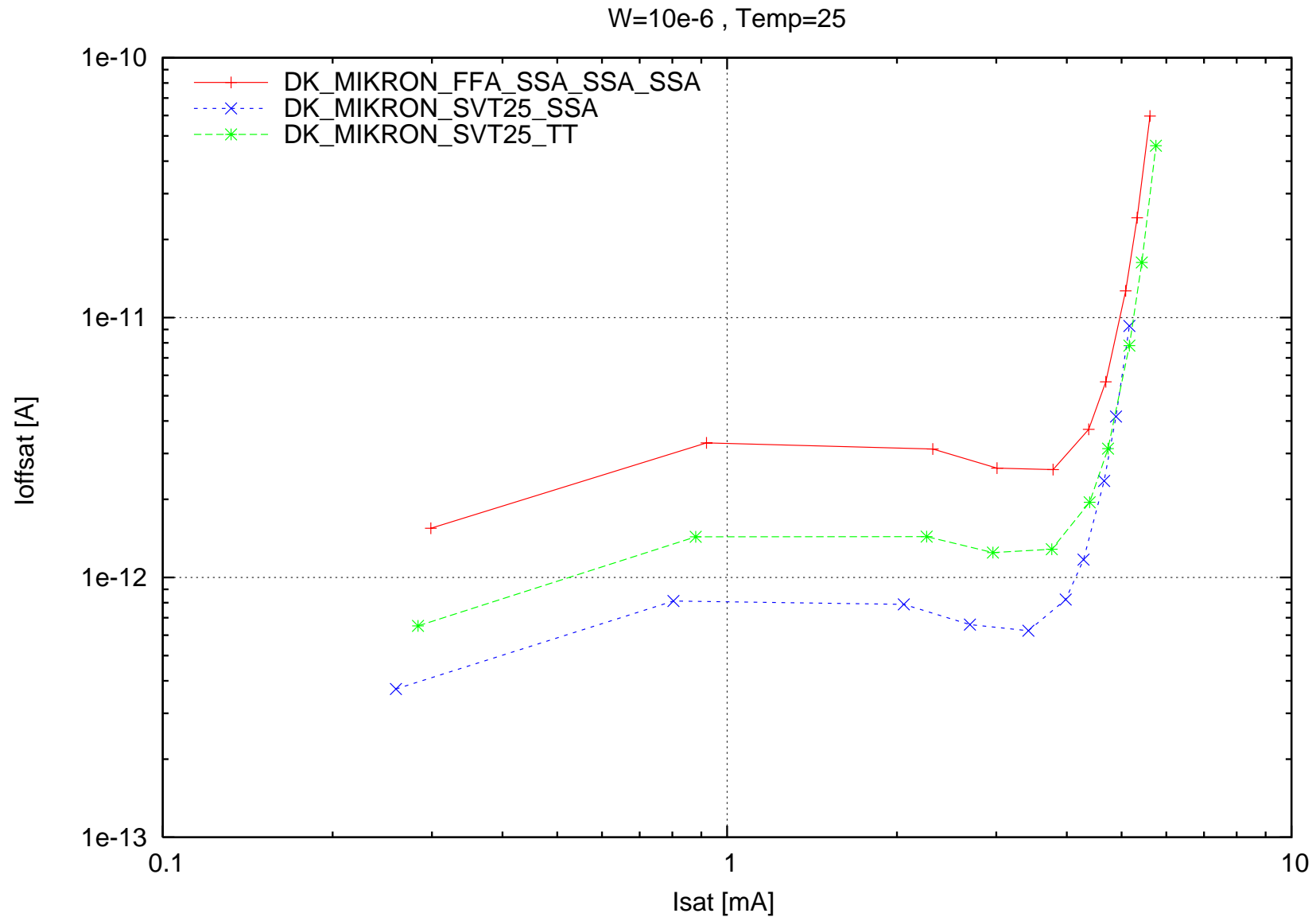
nsvt25 DIBL = $V_{t_lin} - V_{t_sat}$ [mV] vs. L [m] , $W=10e-6$, Temp=25



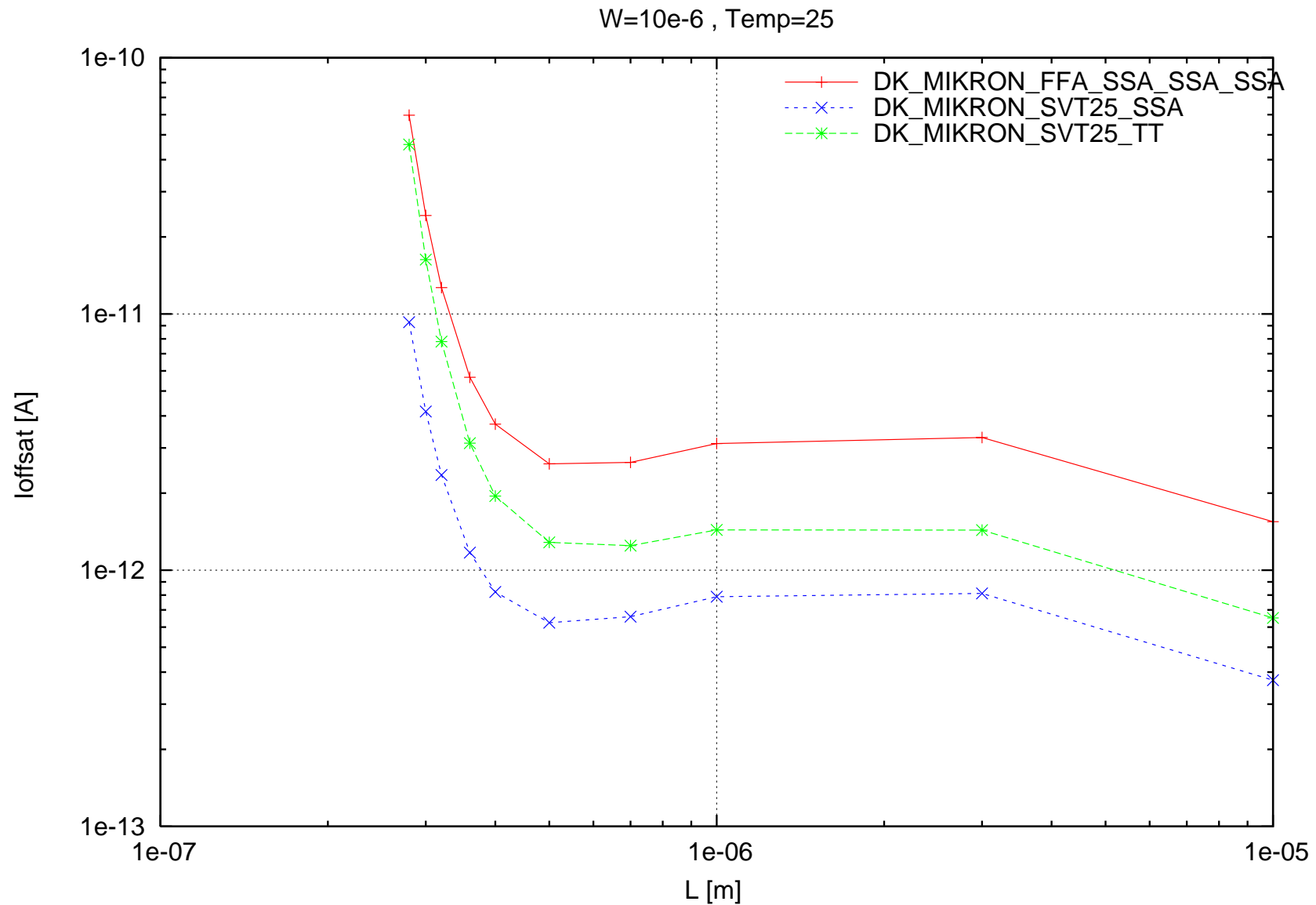
nsvt25 Slp_sat [mV/decade] vs. L [m] , W=10e-6 , Temp=25



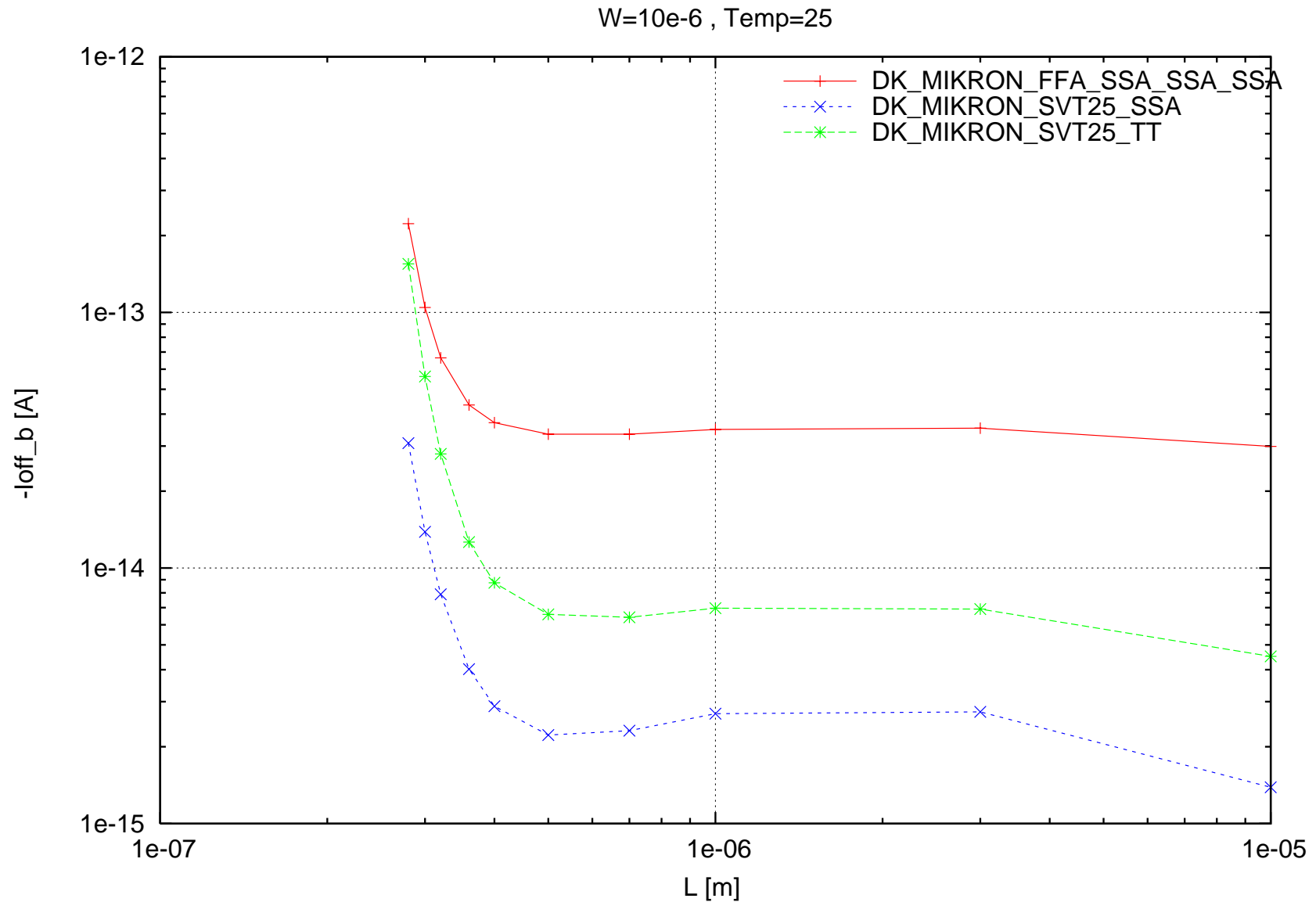
nsvt25 loffsat [A] vs. Isat [mA] , W=10e-6 , Temp=25



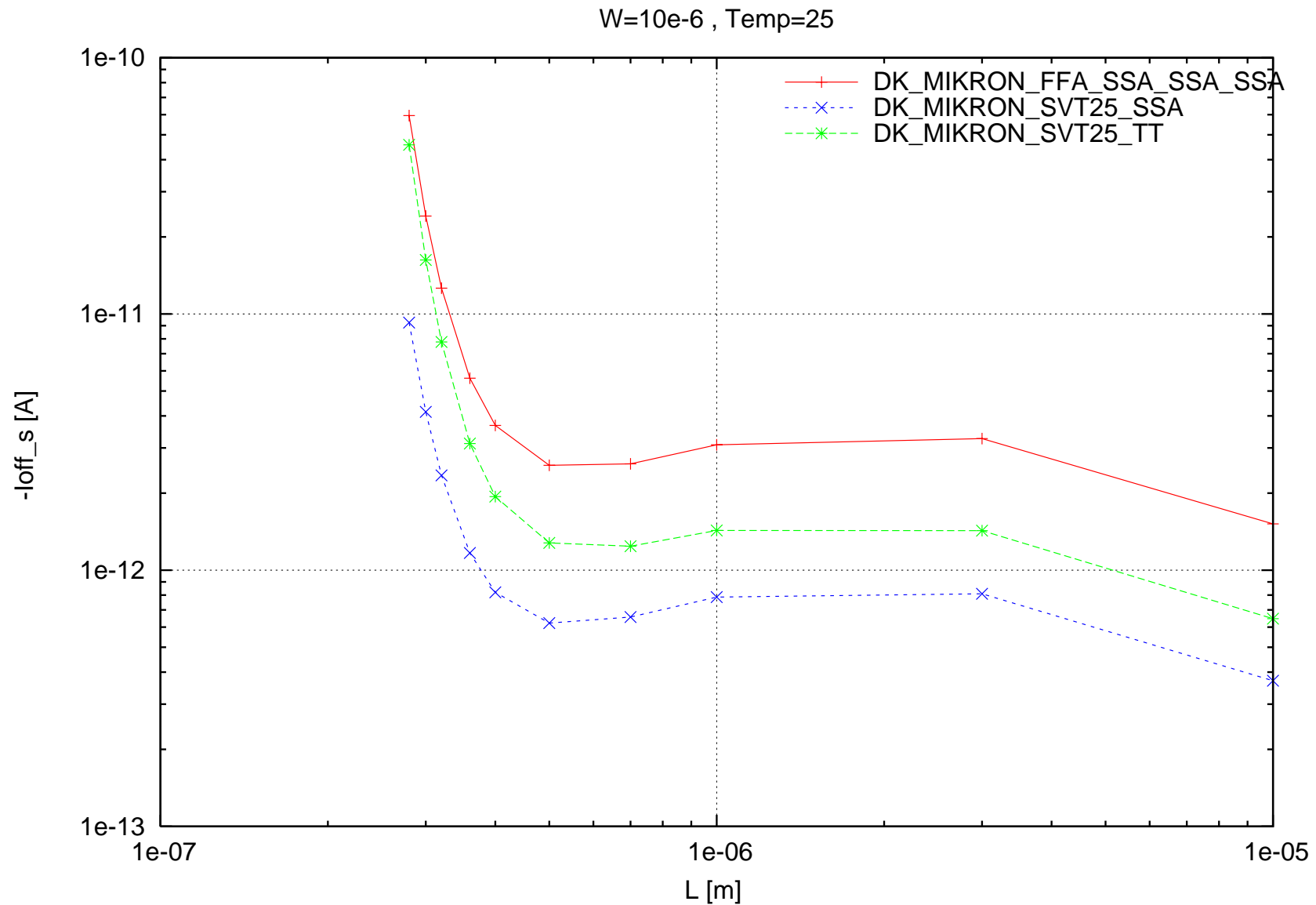
nsvt25 loffsat [A] vs. L [m] , W=10e-6 , Temp=25



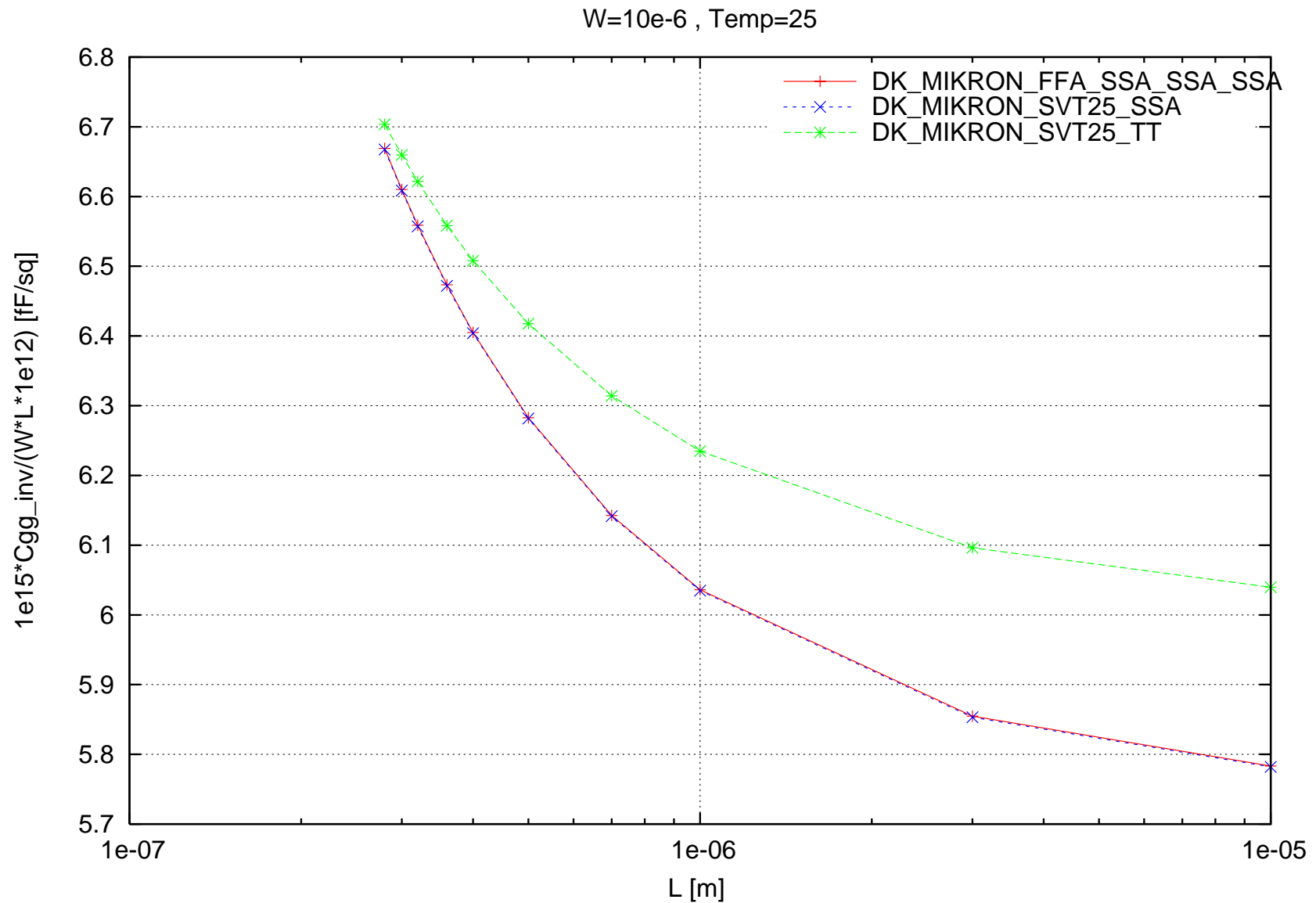
nsvt25 -loff_b [A] vs. L [m] , W=10e-6 , Temp=25



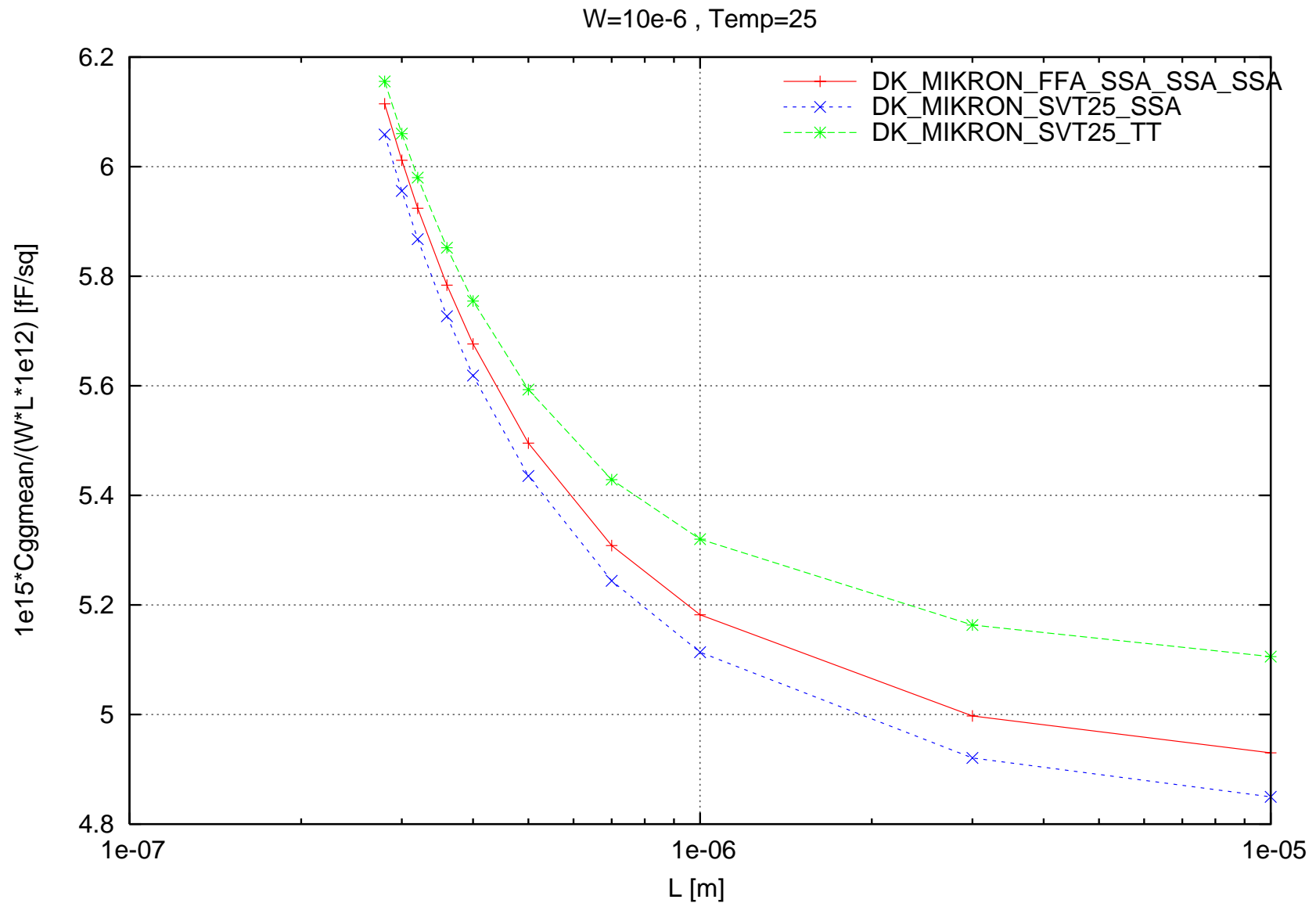
nsvt25 -loff_s [A] vs. L [m] , W=10e-6 , Temp=25



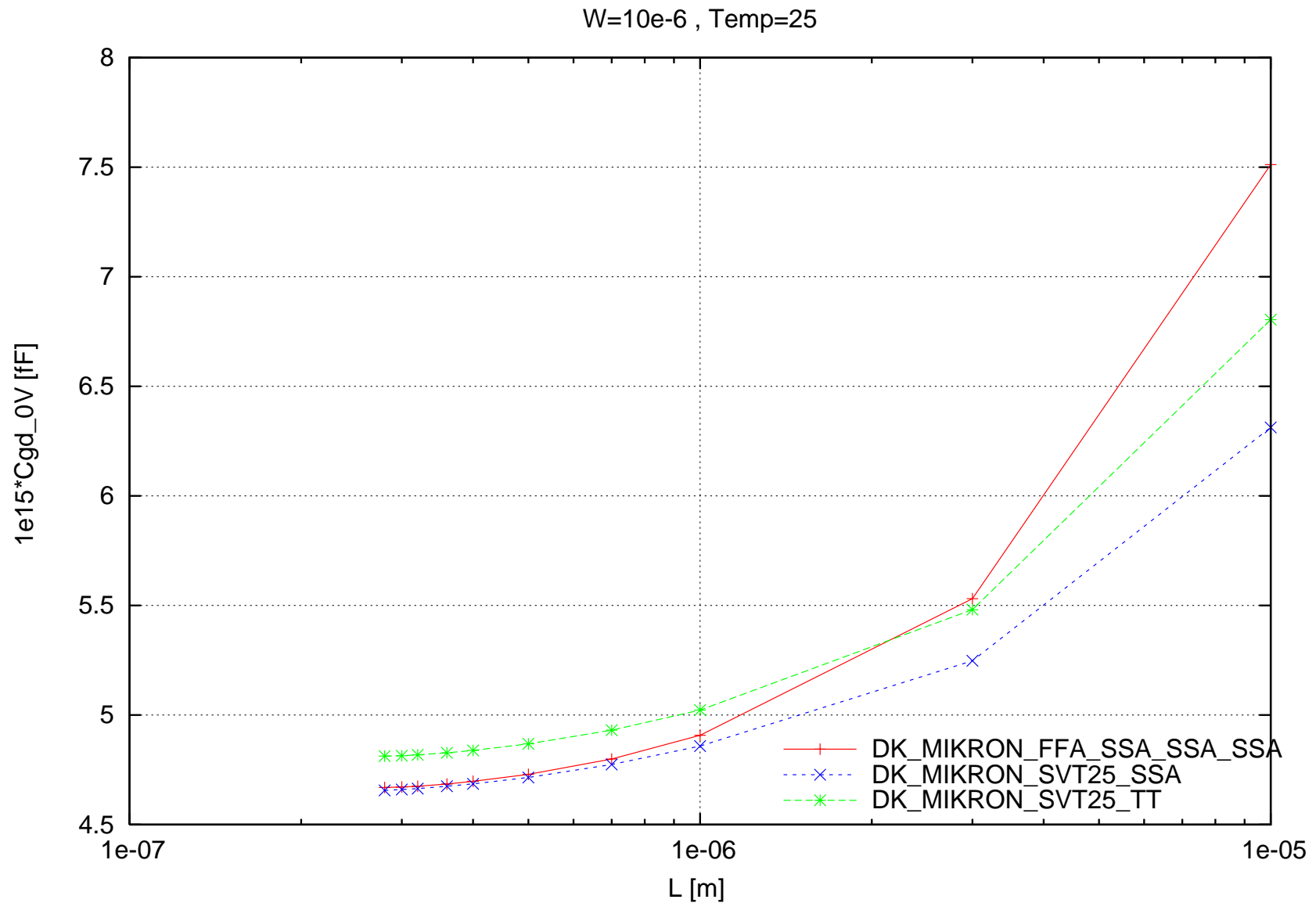
$\text{nsvt25 } 1\text{e15} \cdot \text{C}_{\text{gg_inv}} / (\text{W} \cdot \text{L} \cdot 1\text{e12}) \text{ [fF/sq]} \text{ vs. } \text{L [m]}, \text{W} = 10\text{e-6}, \text{Temp} = 25$



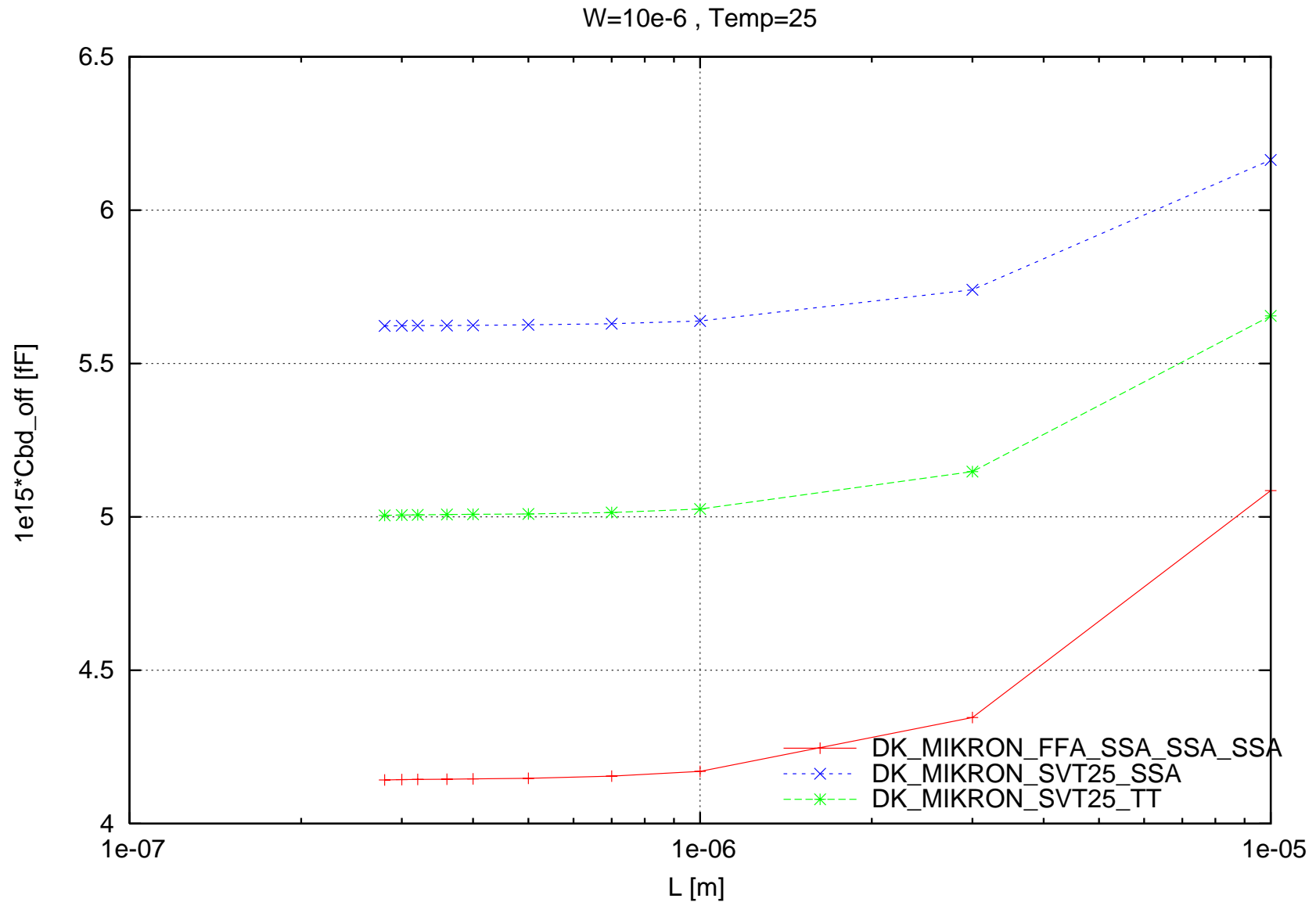
$nsvt25 \ 1e15 * C_{ggmean} / (W * L * 1e12) \text{ [fF/sq]} \text{ vs. } L \text{ [m]} , W=10e-6 , \text{Temp}=25$



nsvt25 1e15*Cgd_0V [fF] vs. L [m] , W=10e-6 , Temp=25

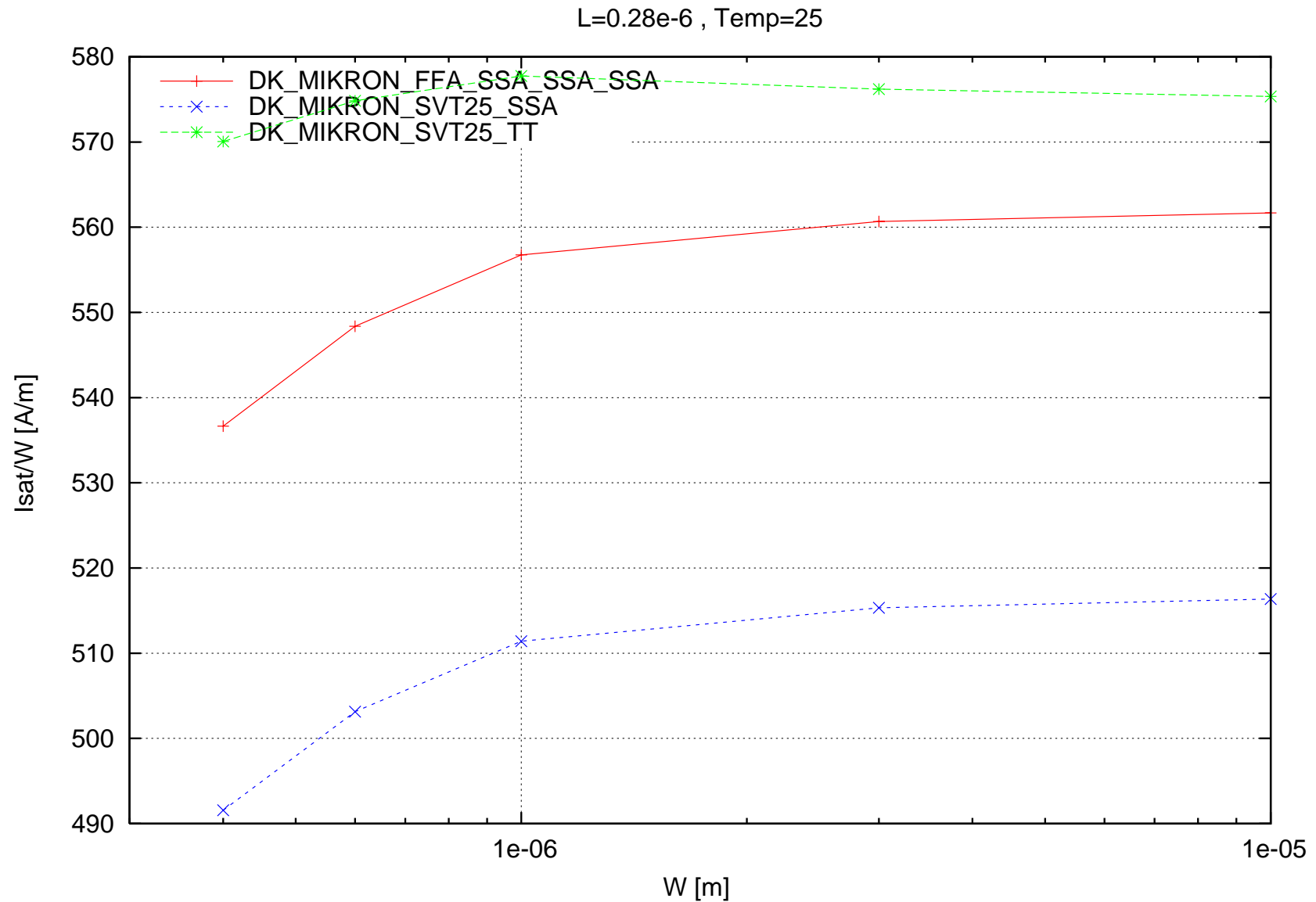


nsvt25 1e15*Cbd_off [fF] vs. L [m] , W=10e-6 , Temp=25

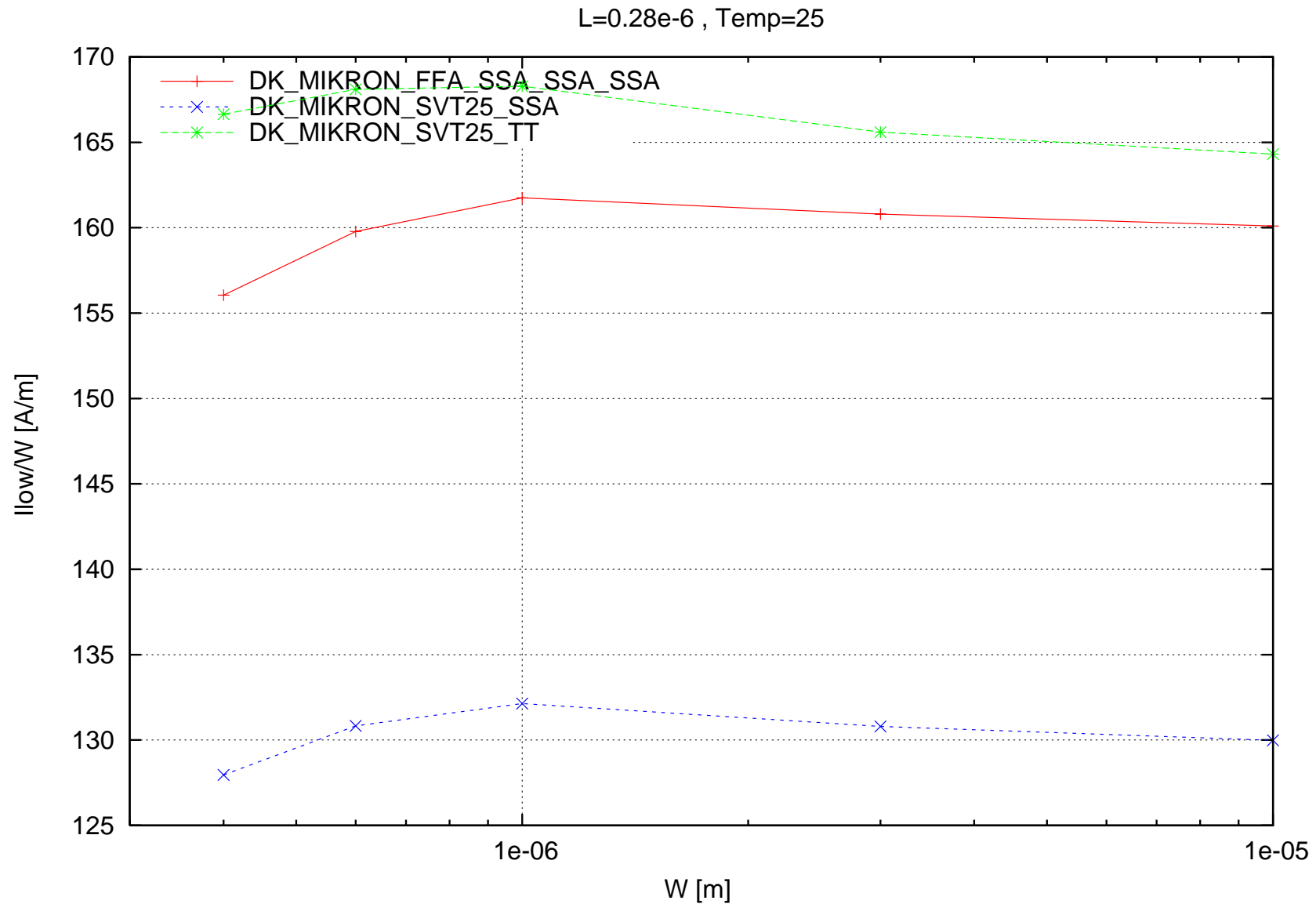


Scaling versus Width for NMOS ($L=0.28\text{e-}6$, Temp=25, $\text{po2act}=0.82\text{e-}6$, LPE=0)

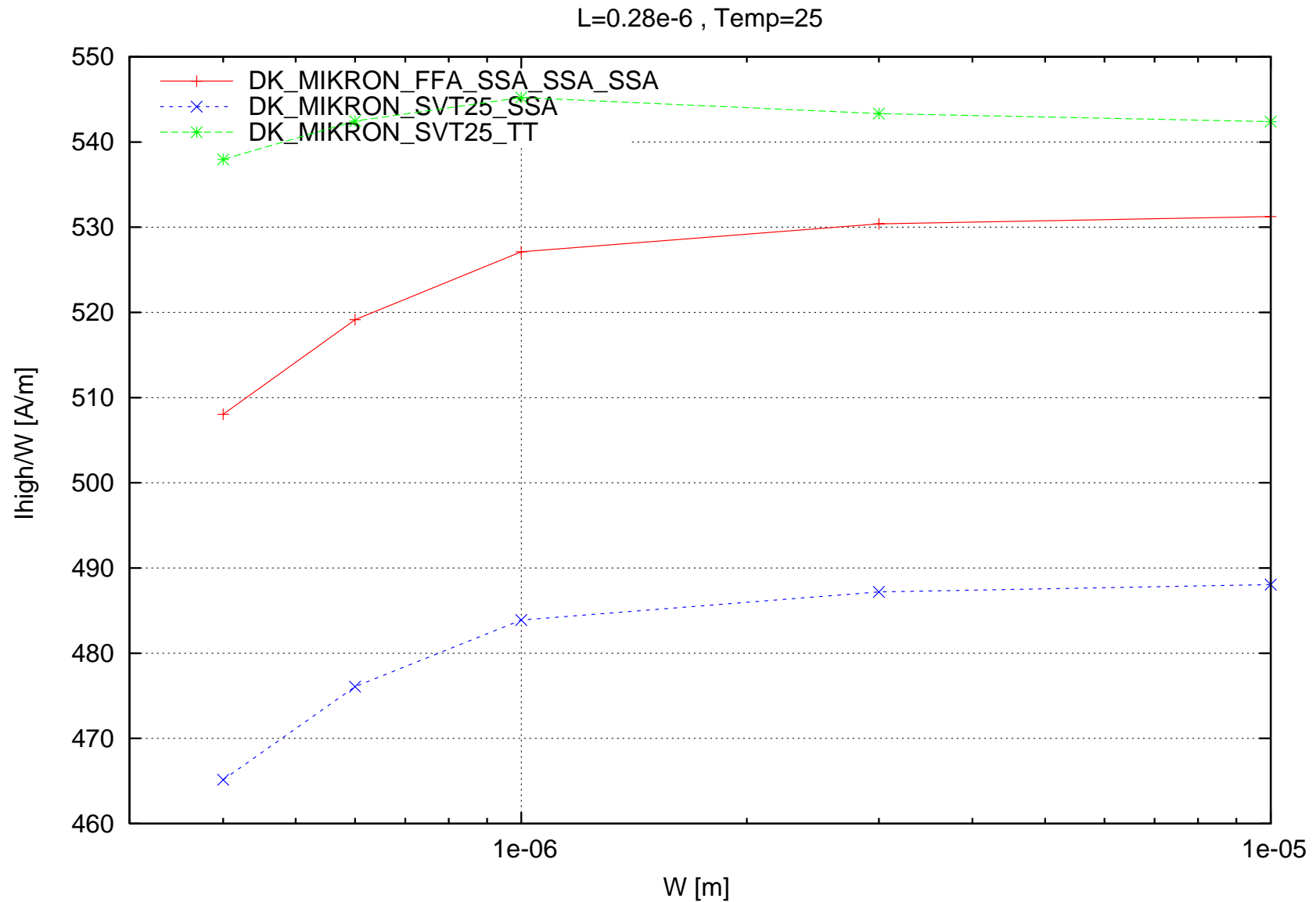
nsvt25 Isat/W [A/m] vs. W [m] , L=0.28e-6 , Temp=25



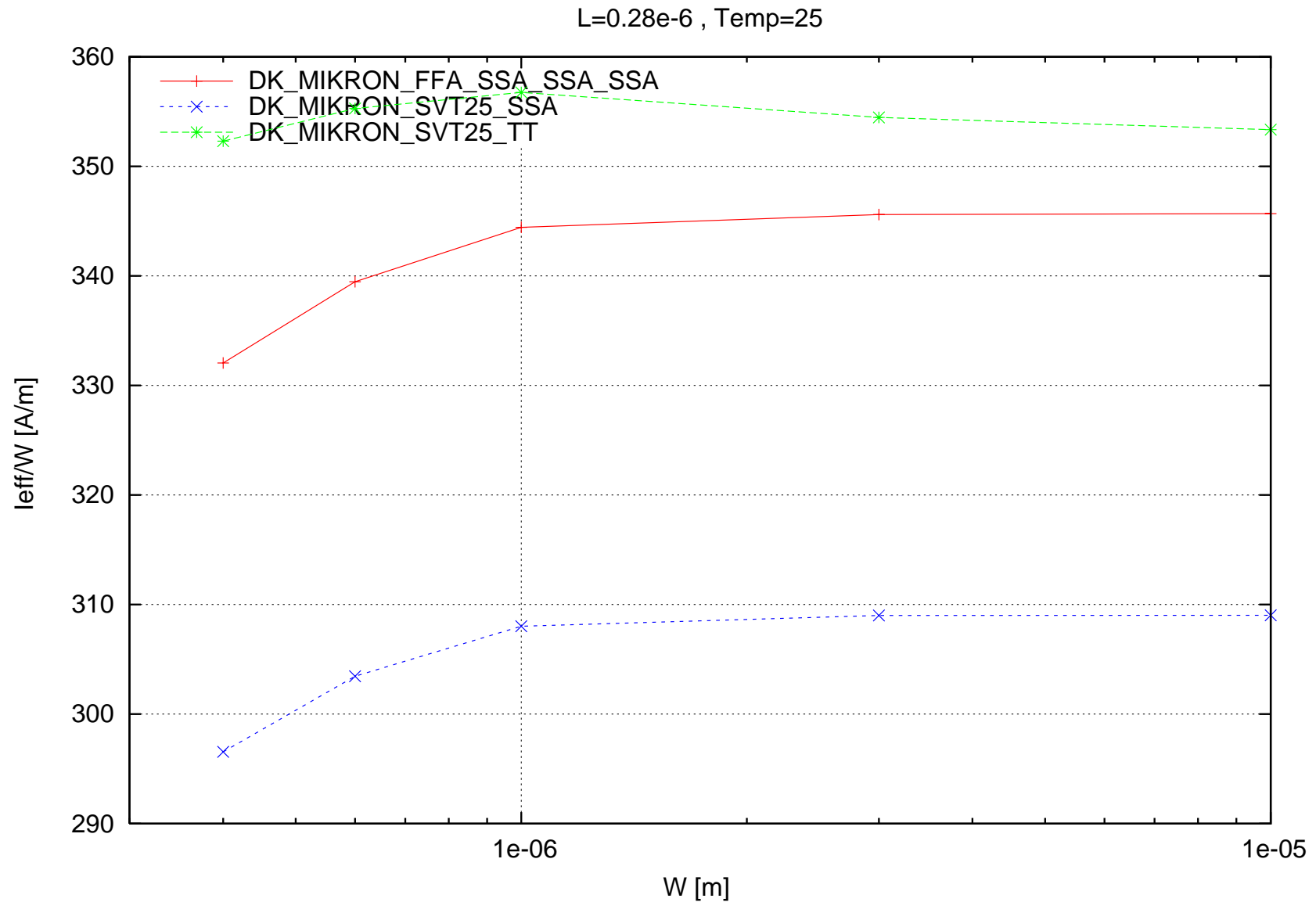
nsvt25 I_{low}/W [A/m] vs. W [m] , L=0.28e-6 , Temp=25



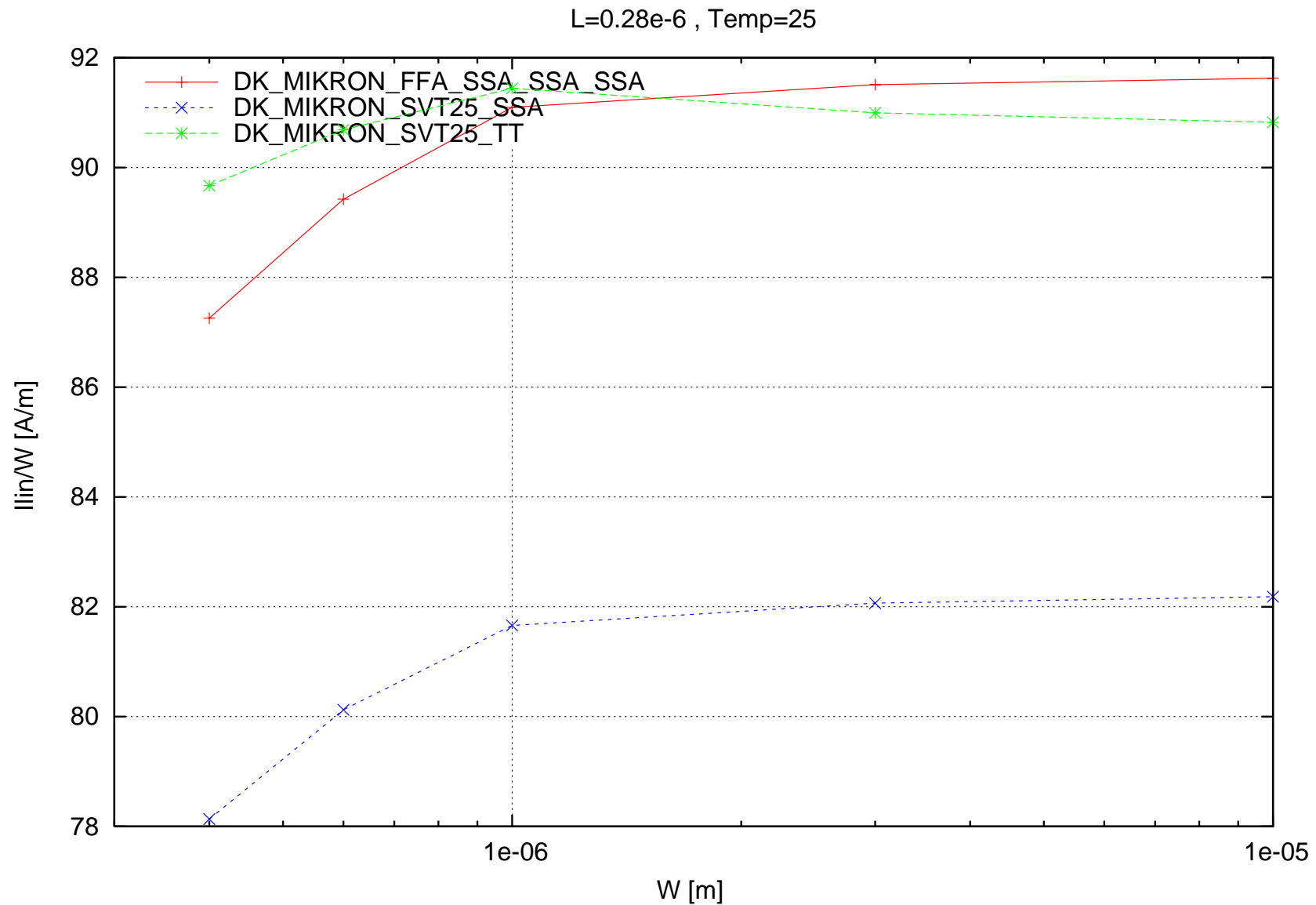
nsvt25 I_{high}/W [A/m] vs. W [m] , L=0.28e-6 , Temp=25



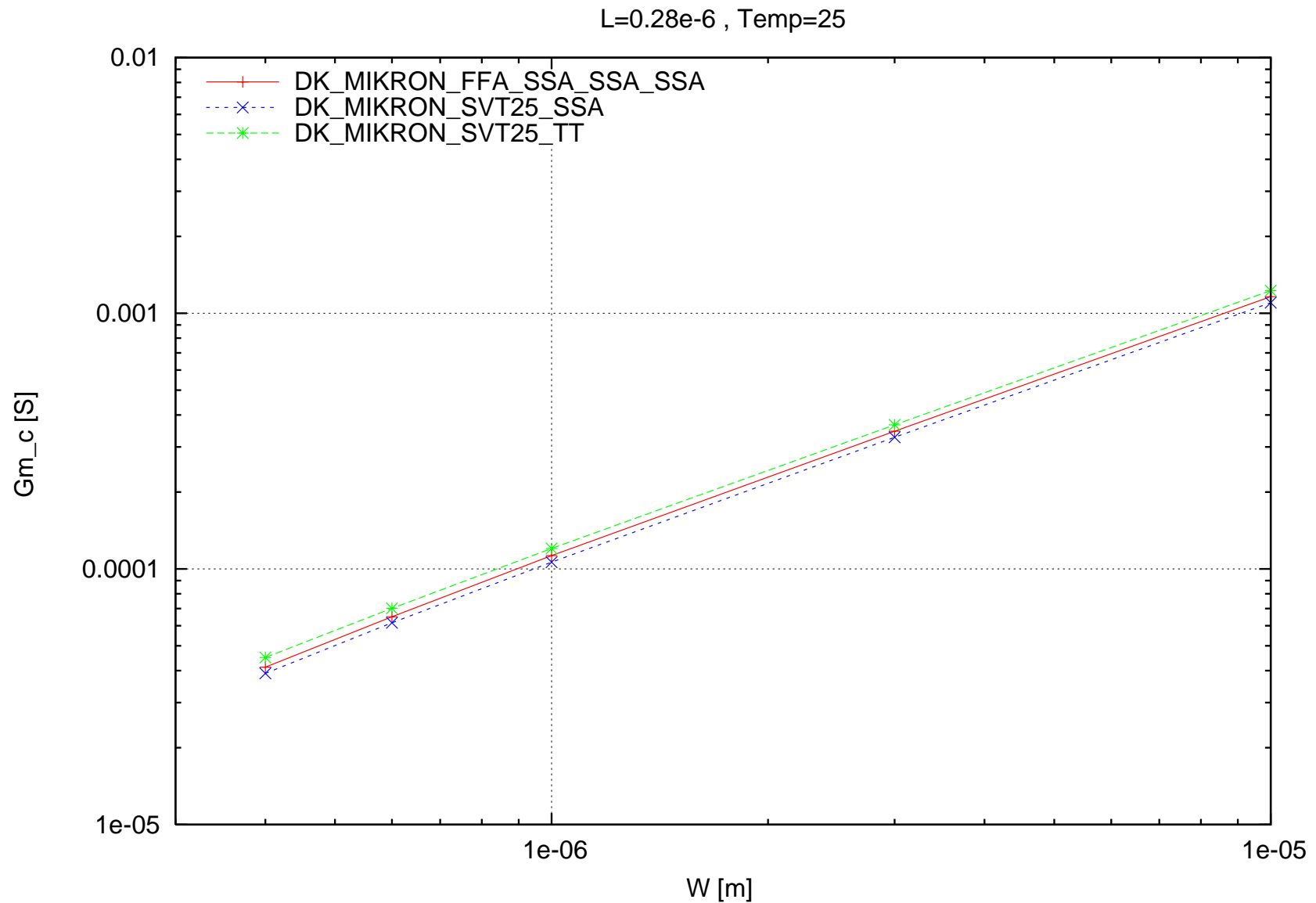
nsvt25 I_{eff}/W [A/m] vs. W [m] , $L=0.28e-6$, Temp=25



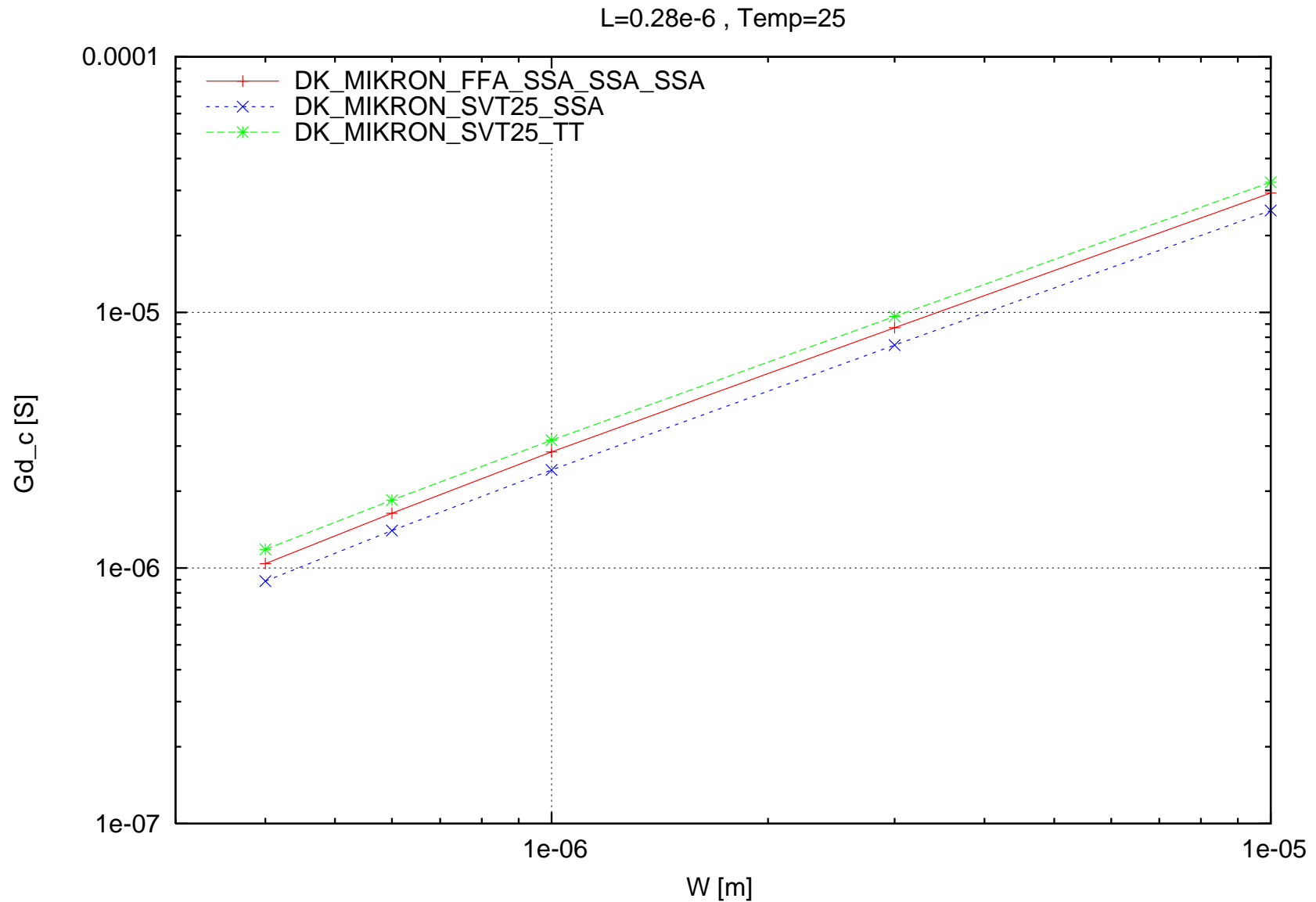
nsvt25 I_{lin}/W [A/m] vs. W [m] , L=0.28e-6 , Temp=25



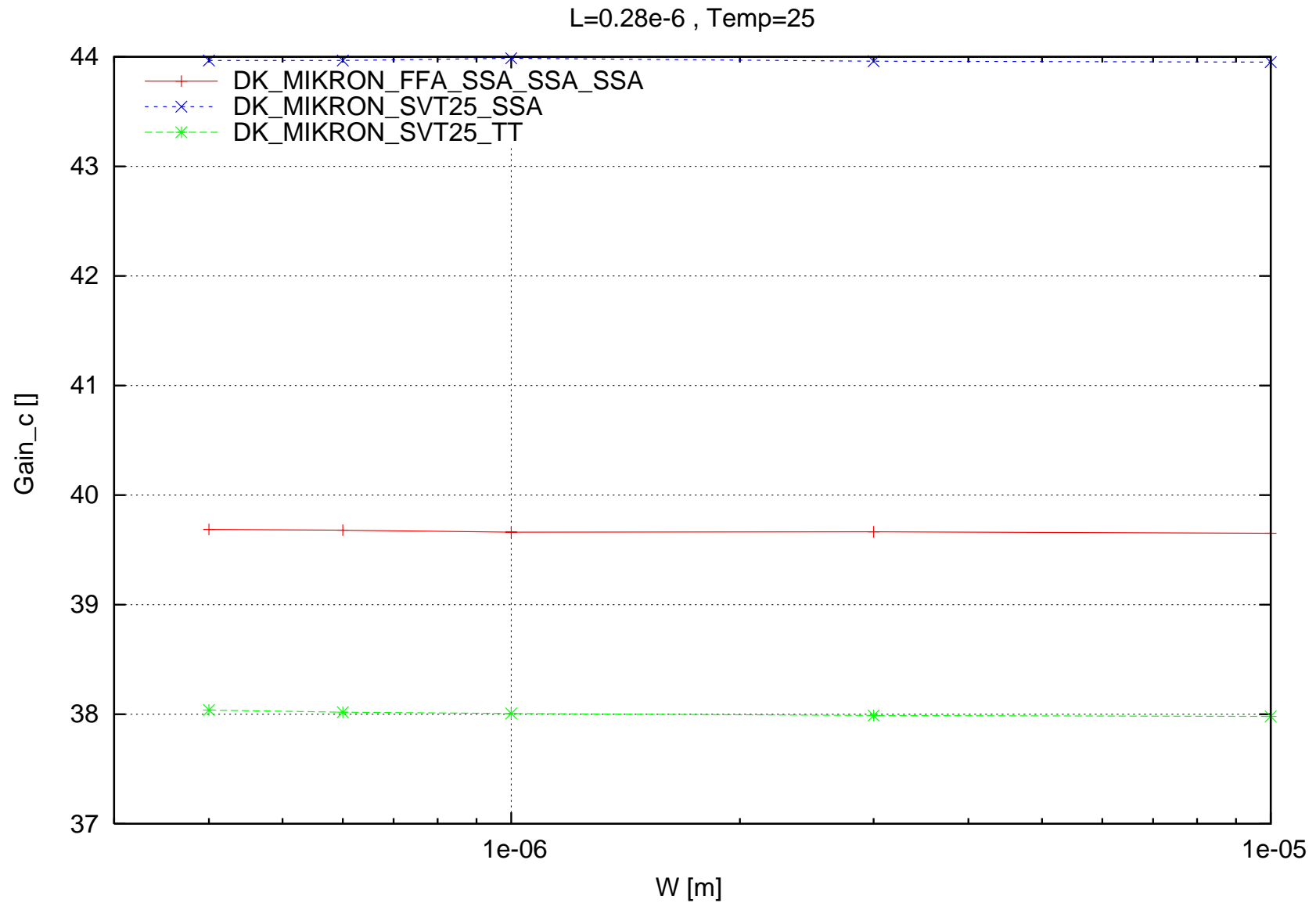
nsvt25 Gm_c [S] vs. W [m] , L=0.28e-6 , Temp=25



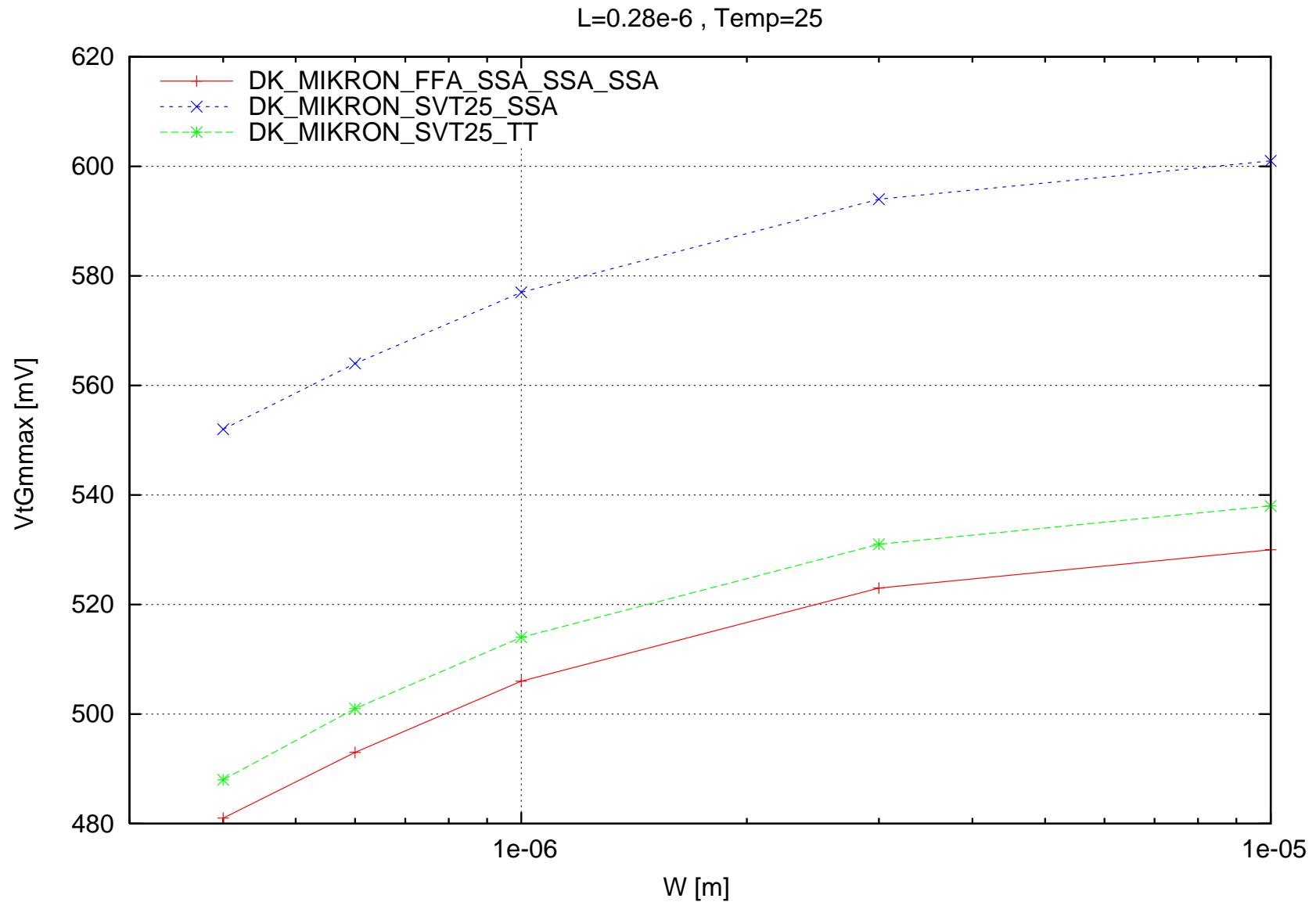
nsvt25 Gd_c [S] vs. W [m] , L=0.28e-6 , Temp=25



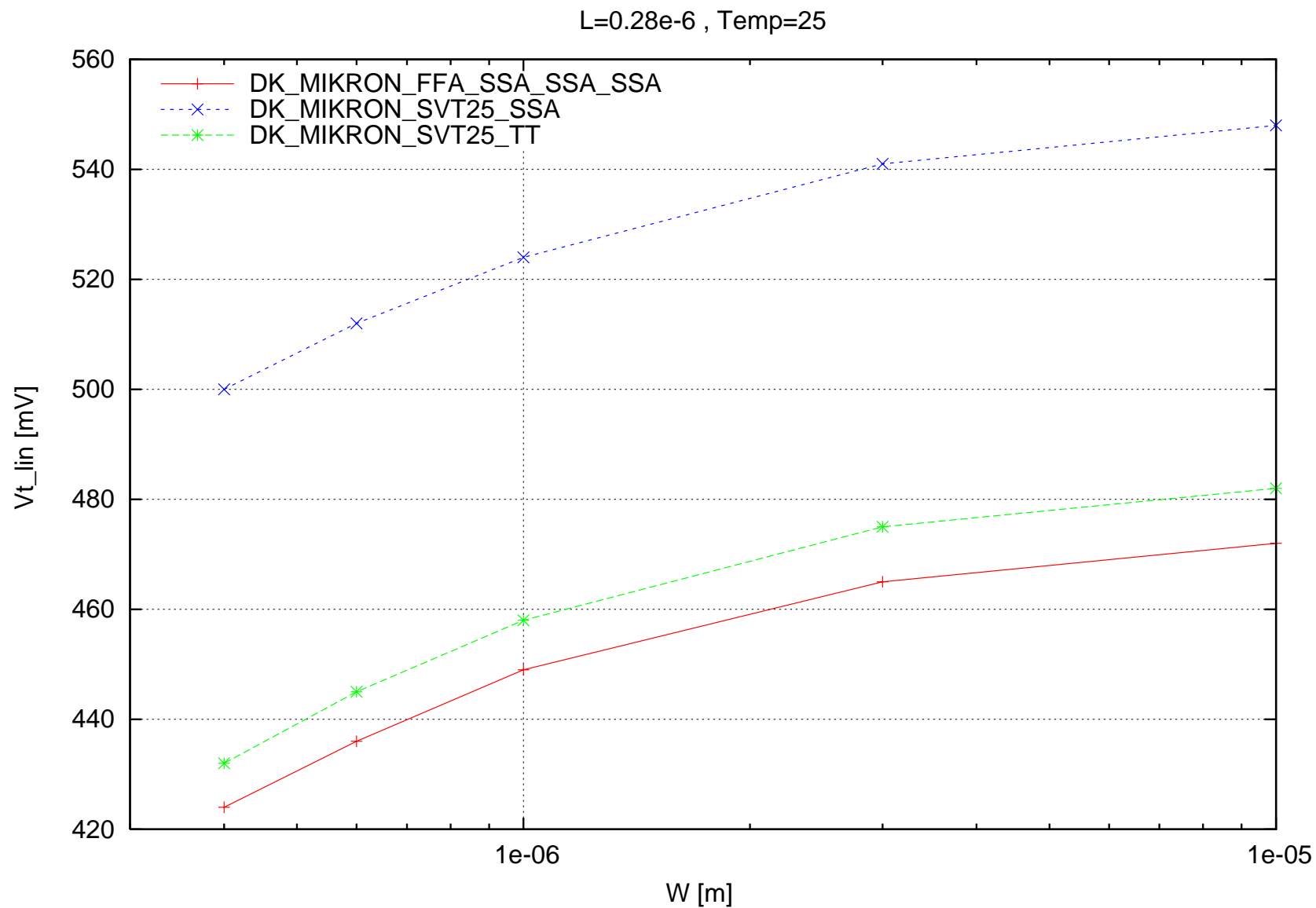
nsvt25 Gain_c [] vs. W [m] , L=0.28e-6 , Temp=25



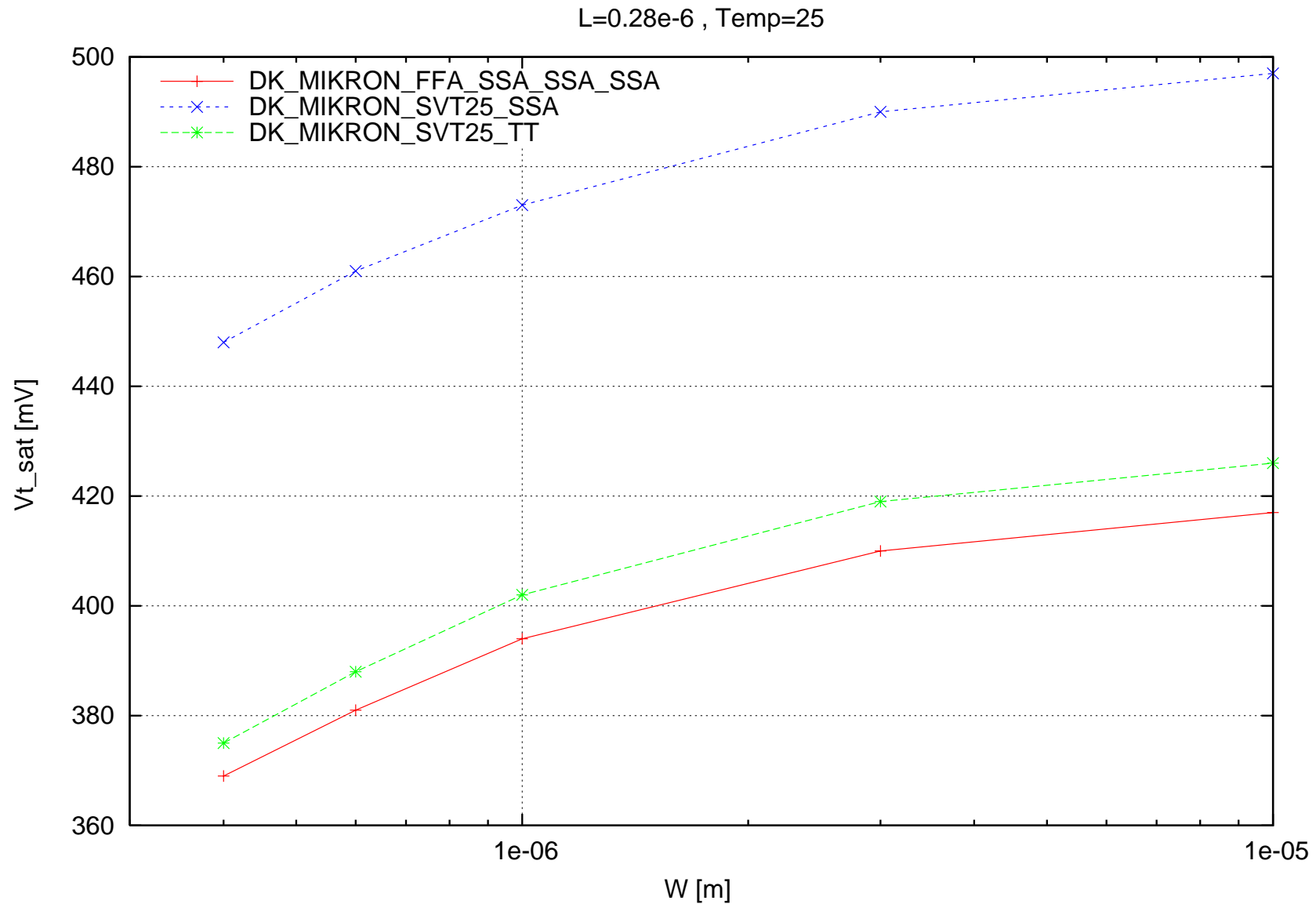
nsvt25 V_tG_{max} [mV] vs. W [m] , $L=0.28e-6$, Temp=25



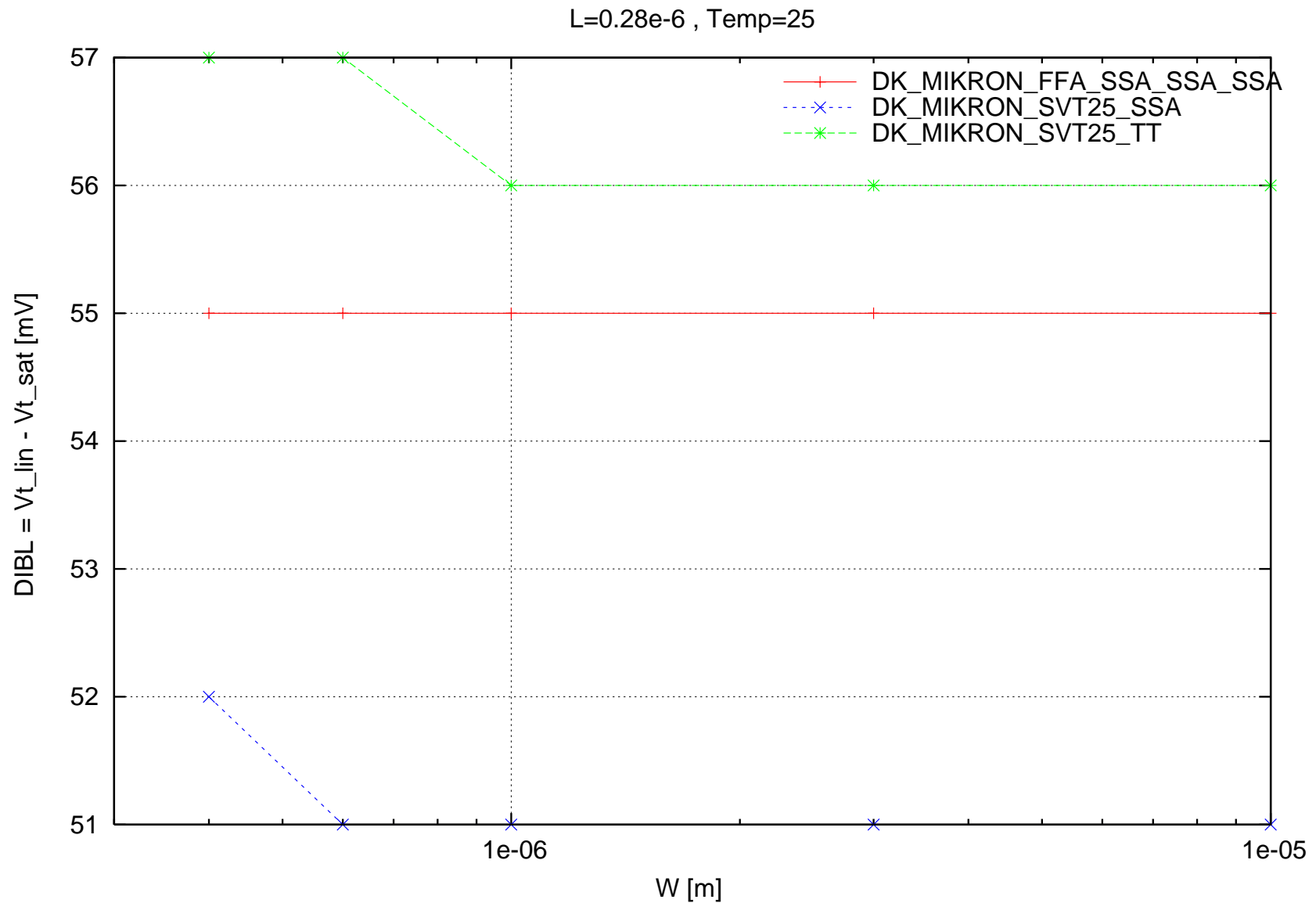
nsvt25 Vt_lin [mV] vs. W [m] , L=0.28e-6 , Temp=25



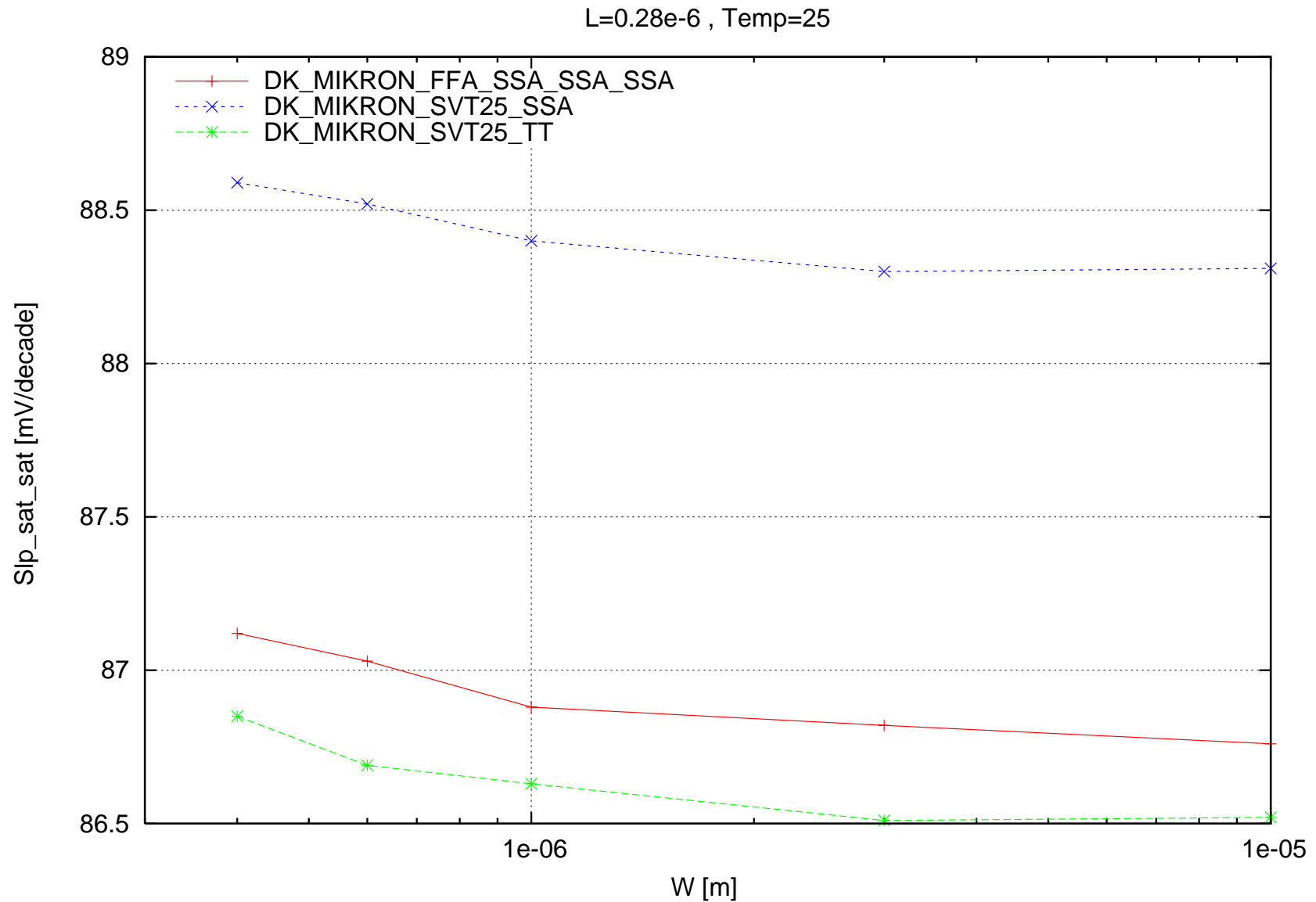
nsvt25 Vt_sat [mV] vs. W [m] , L=0.28e-6 , Temp=25



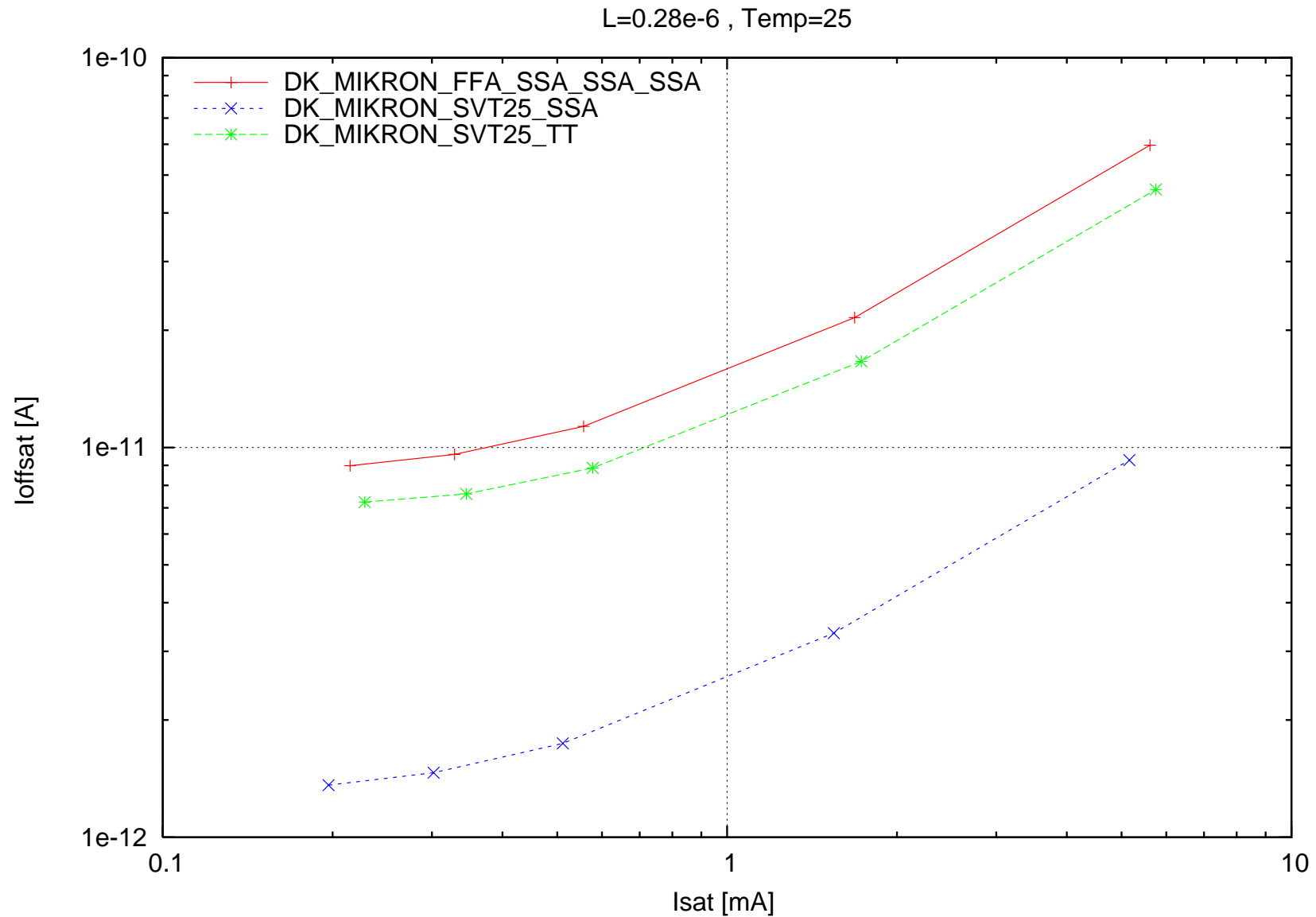
nsvt25 DIBL = $V_{t_lin} - V_{t_sat}$ [mV] vs. W [m] , $L=0.28e-6$, Temp=25



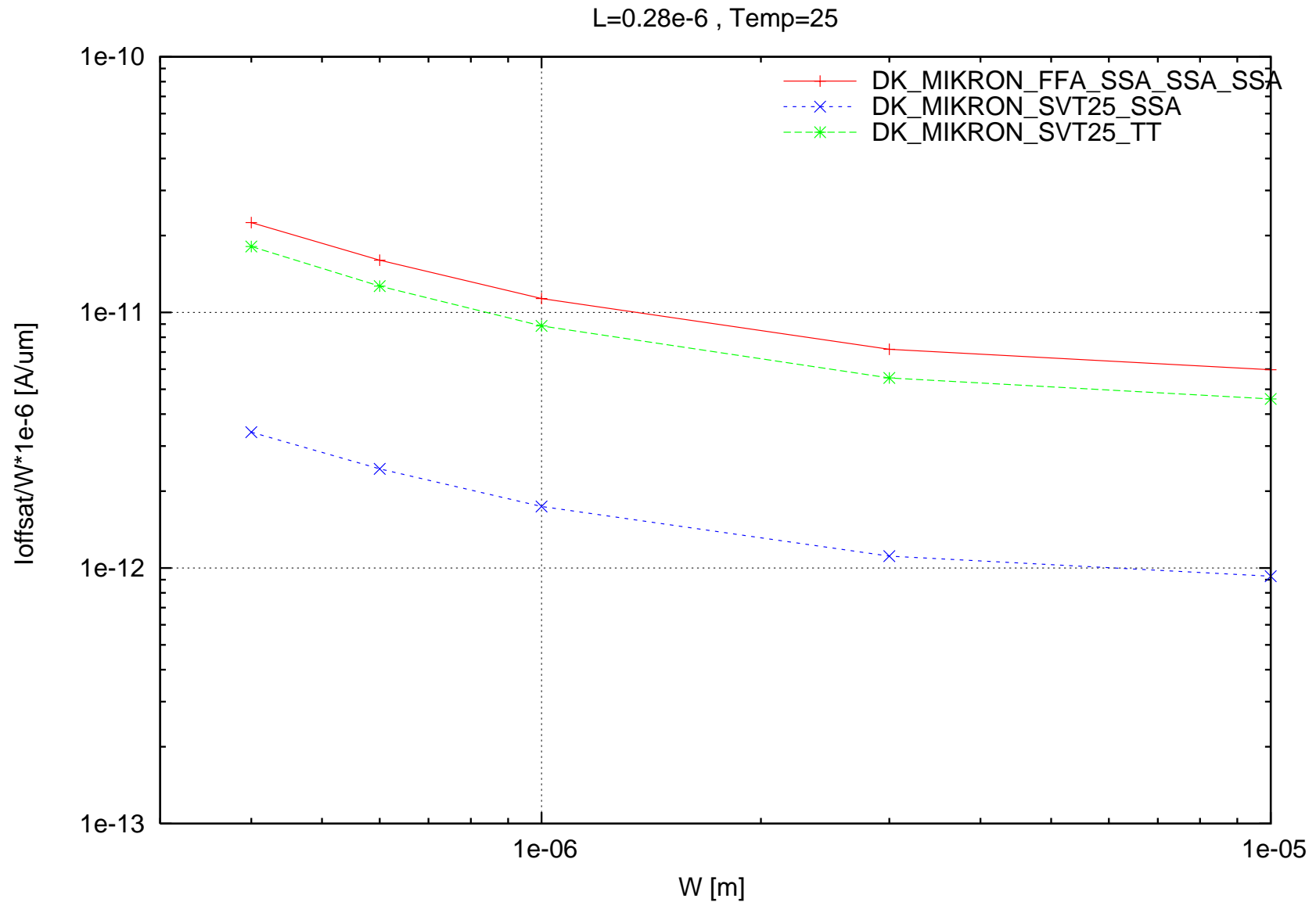
nsvt25 Slp_sat_sat [mV/decade] vs. W [m] , L=0.28e-6 , Temp=25



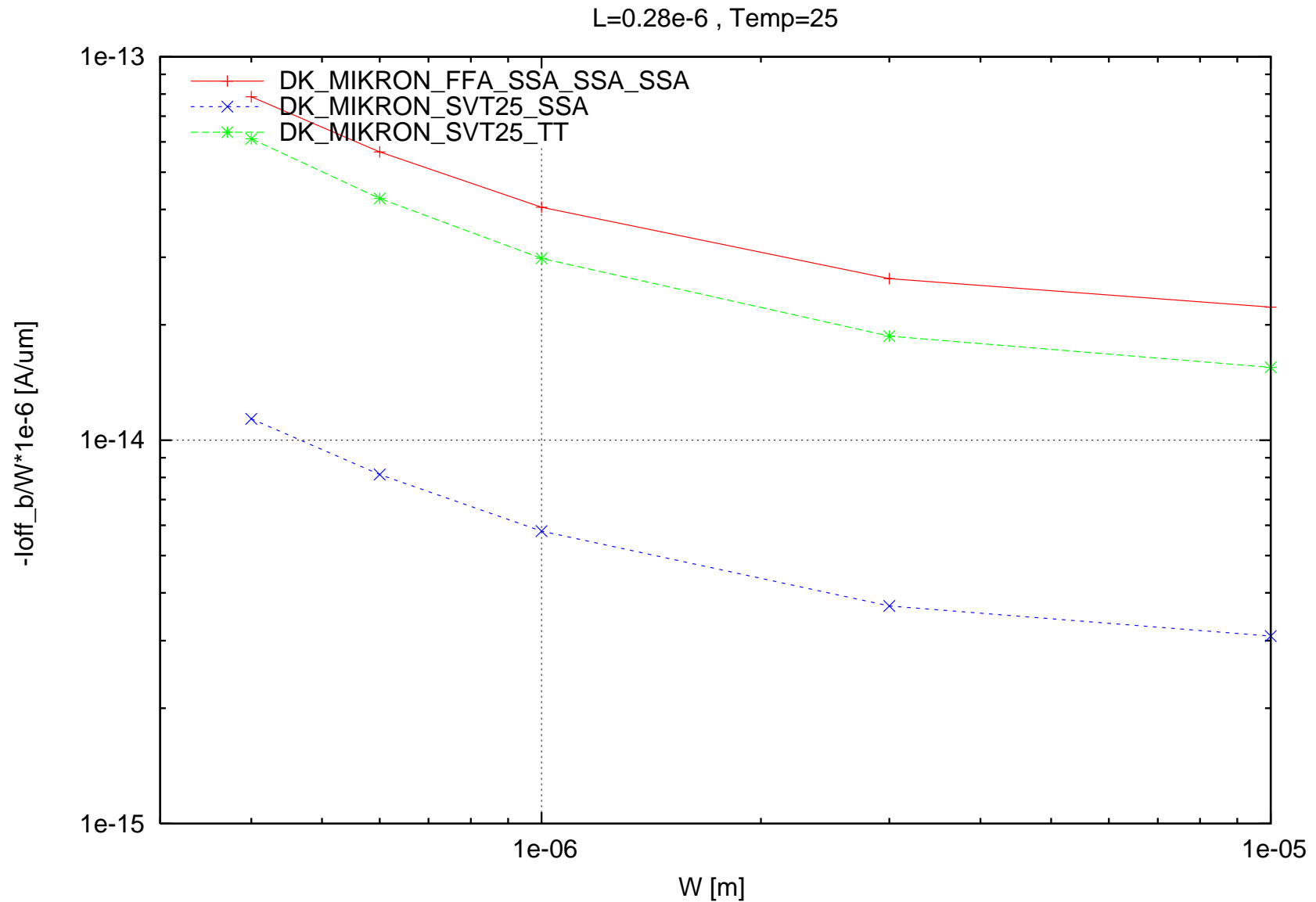
nsvt25 loffsat [A] vs. Isat [mA] , L=0.28e-6 , Temp=25



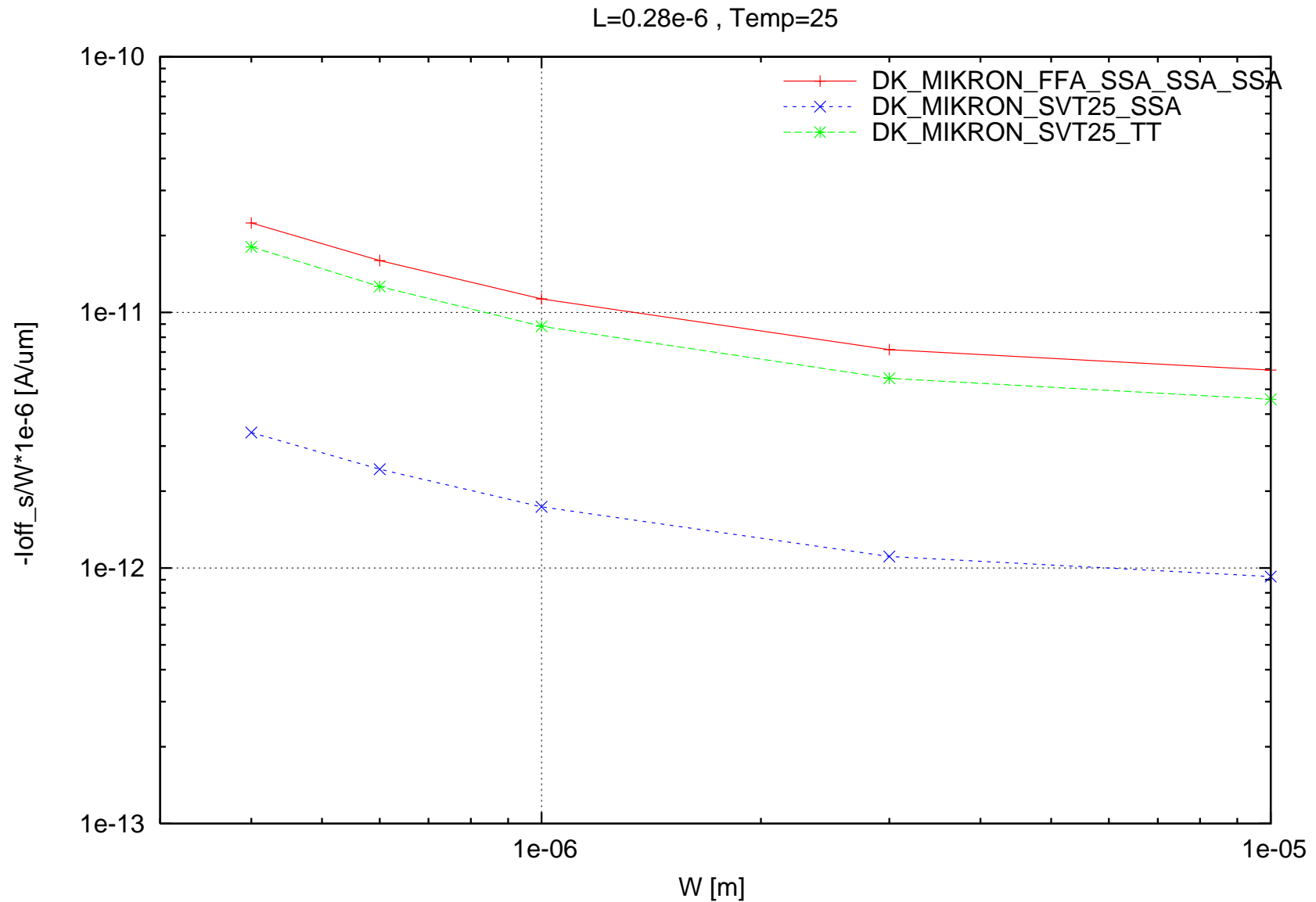
nsvt25 loffsat/W*1e-6 [A/um] vs. W [m] , L=0.28e-6 , Temp=25



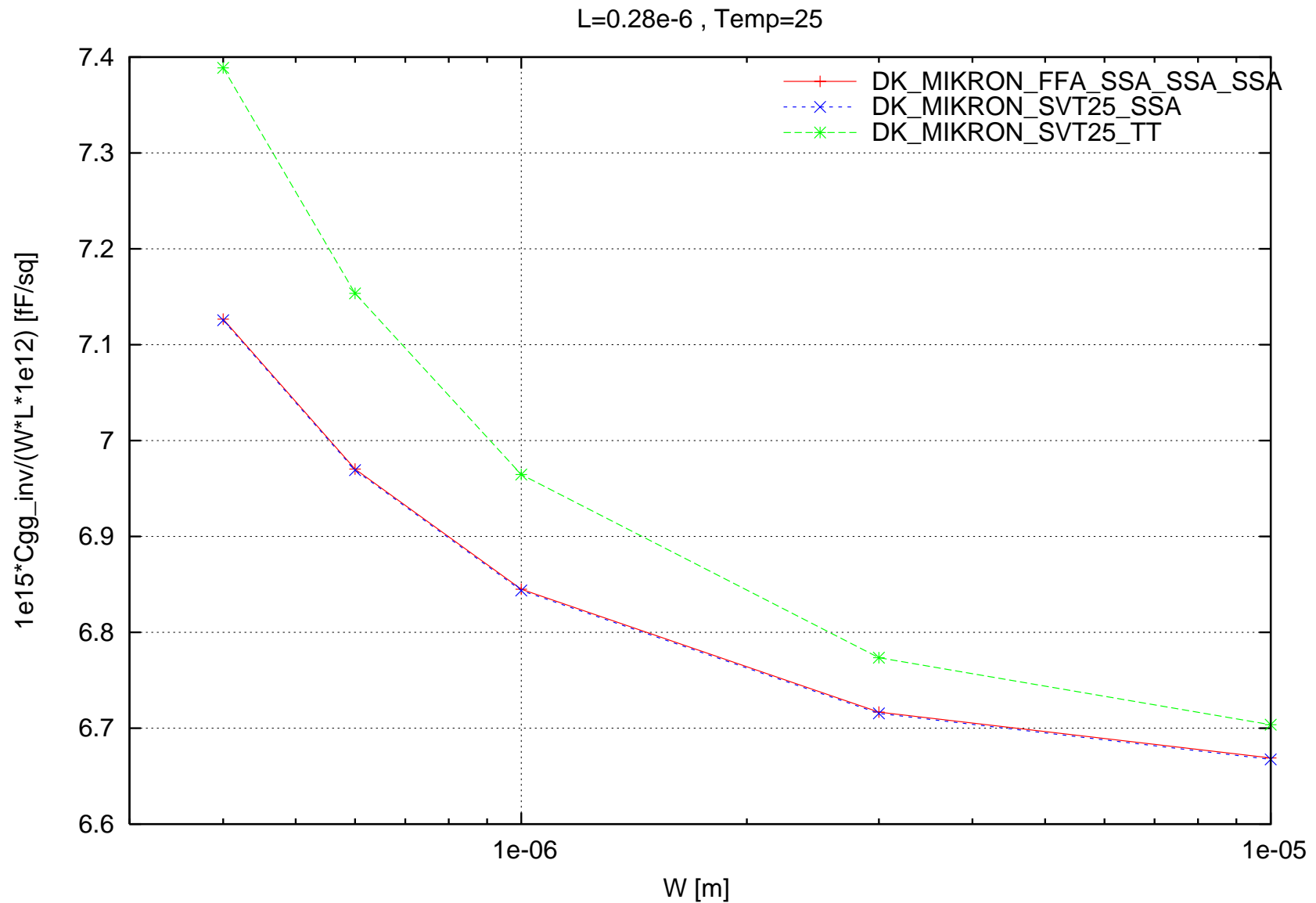
nsvt25 -loff_b/W*1e-6 [A/um] vs. W [m] , L=0.28e-6 , Temp=25



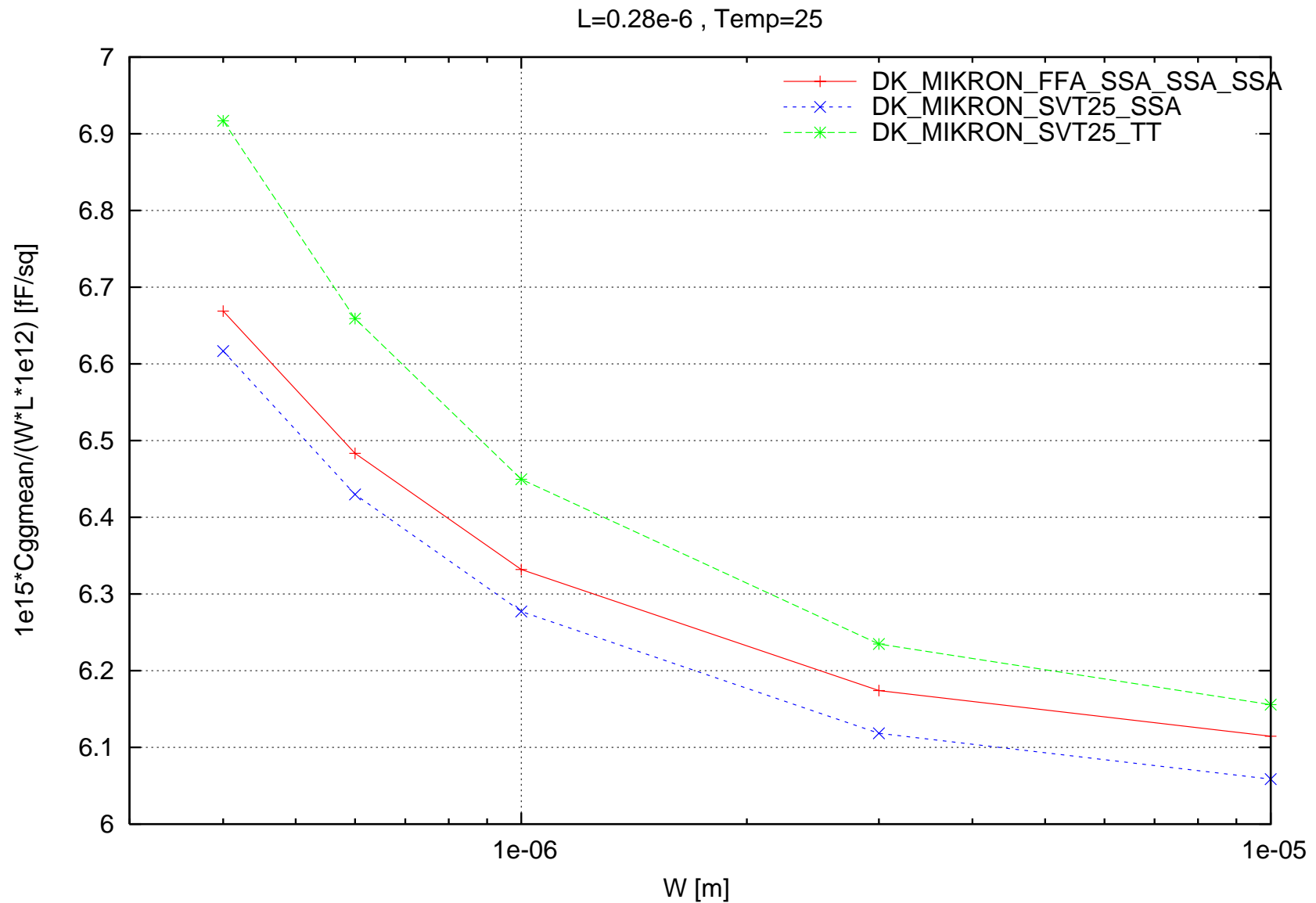
nsvt25 -loff_s/W*1e-6 [A/um] vs. W [m] , L=0.28e-6 , Temp=25



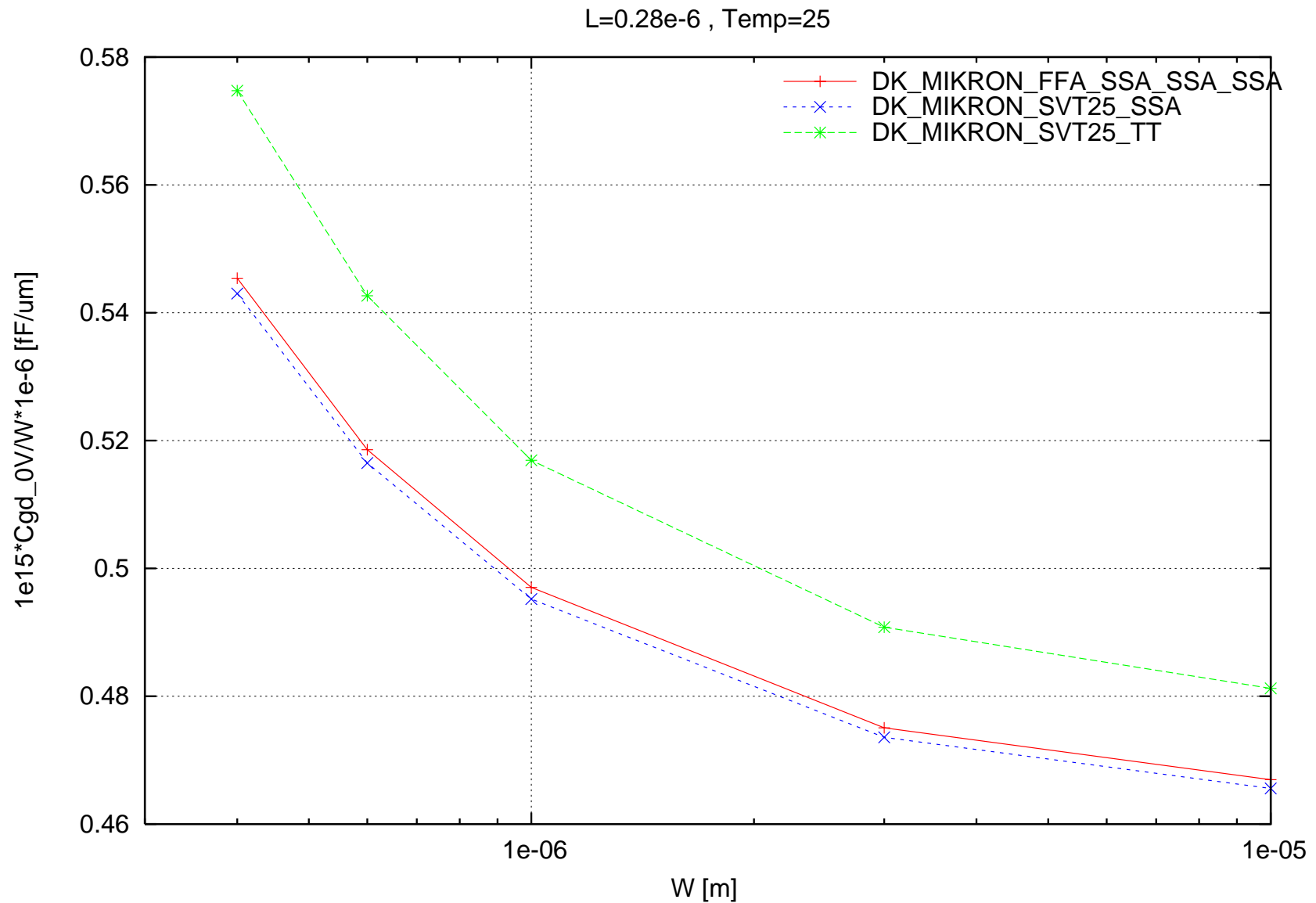
$\text{nsvt25 } 1\text{e15} \cdot C_{\text{gg_inv}} / (W \cdot L \cdot 1\text{e12}) \text{ [fF/sq]} \text{ vs. } W \text{ [m]}, L=0.28\text{e-6}, \text{Temp}=25$



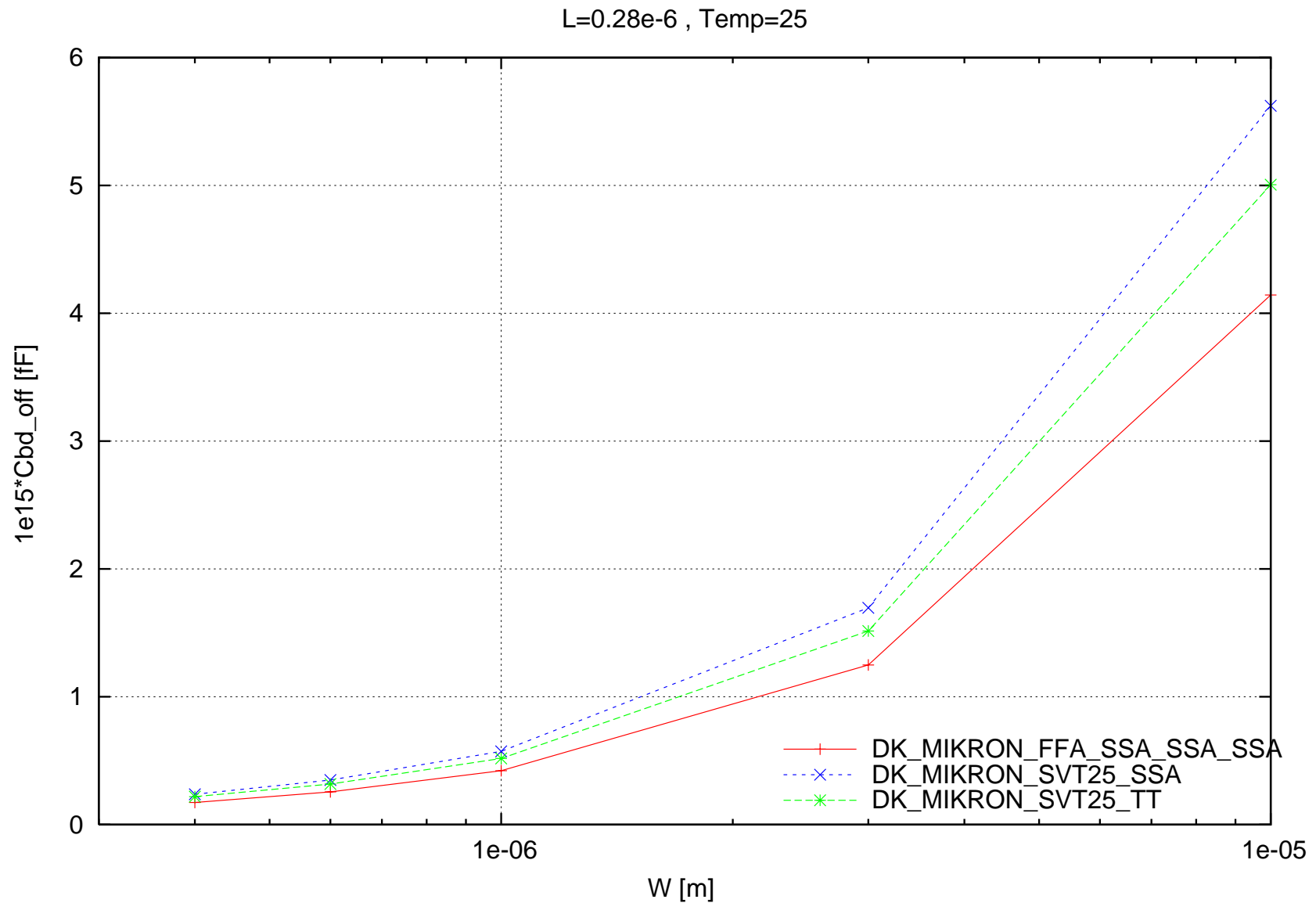
$\text{nsvt25 } 1\text{e}15 \cdot C_{\text{ggmean}} / (W \cdot L \cdot 1\text{e}12) \text{ [fF/sq]} \text{ vs. } W \text{ [m]}, L=0.28\text{e-6}, \text{Temp}=25$



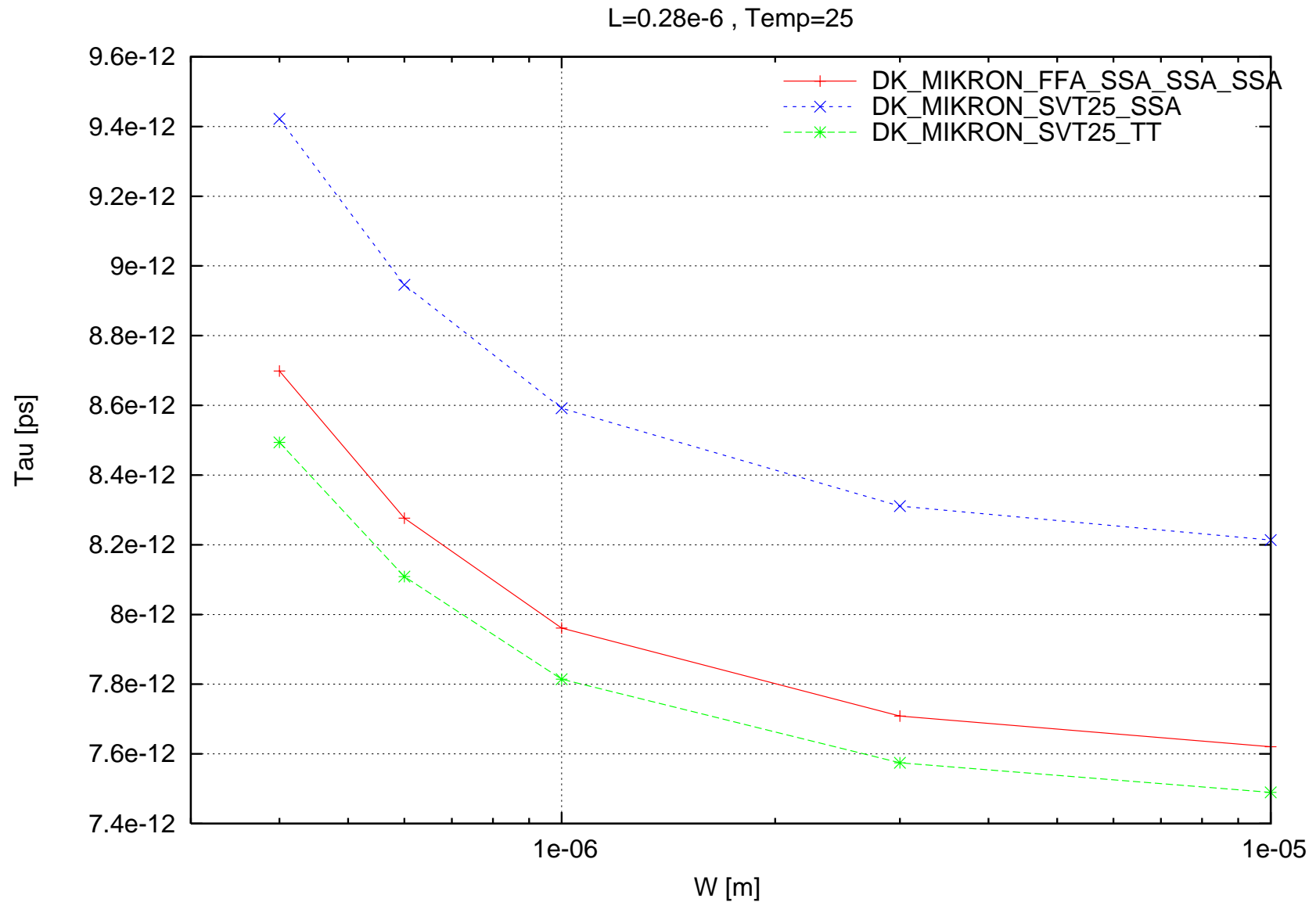
nsvt25 1e15*Cgd_0V/W*1e-6 [fF/um] vs. W [m] , L=0.28e-6 , Temp=25



nsvt25 1e15*Cbd_off [fF] vs. W [m] , L=0.28e-6 , Temp=25

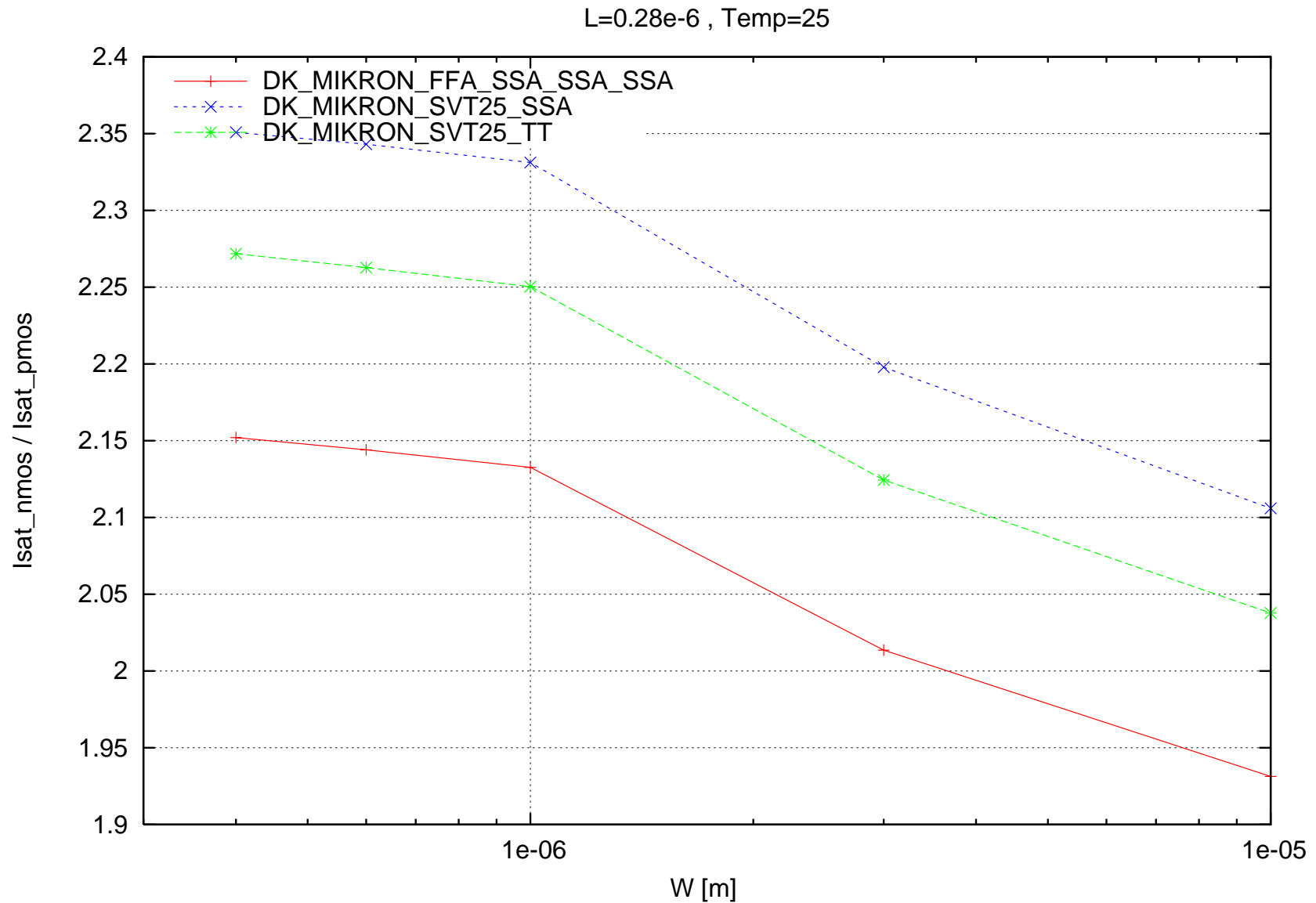


nsvt25 Tau [ps] vs. W [m] , L=0.28e-6 , Temp=25

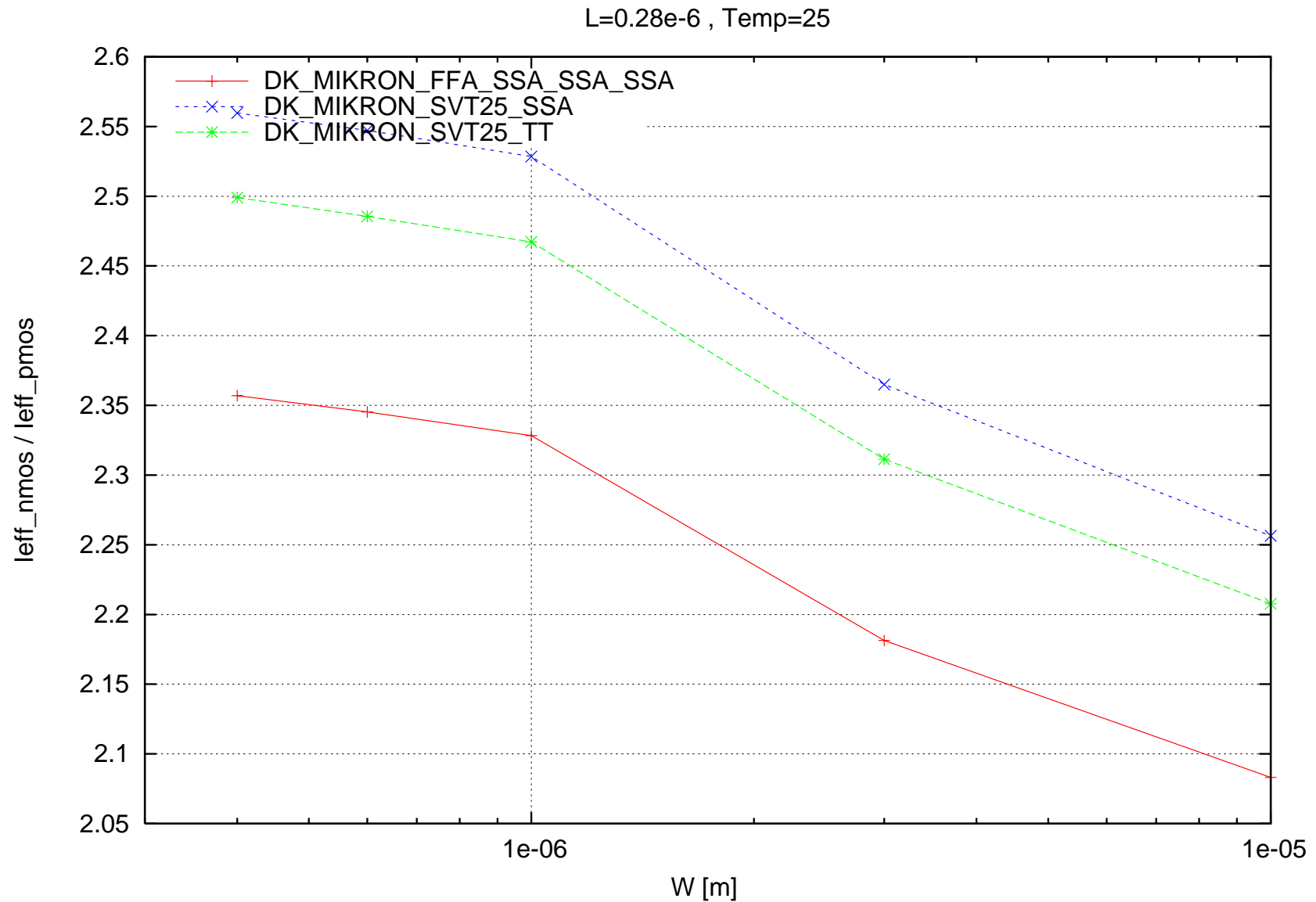


Crosscheck NMOS/PMOS ($L=0.28\text{e-}6$, Temp=25, po2act=0.82e-6, LPE=0)

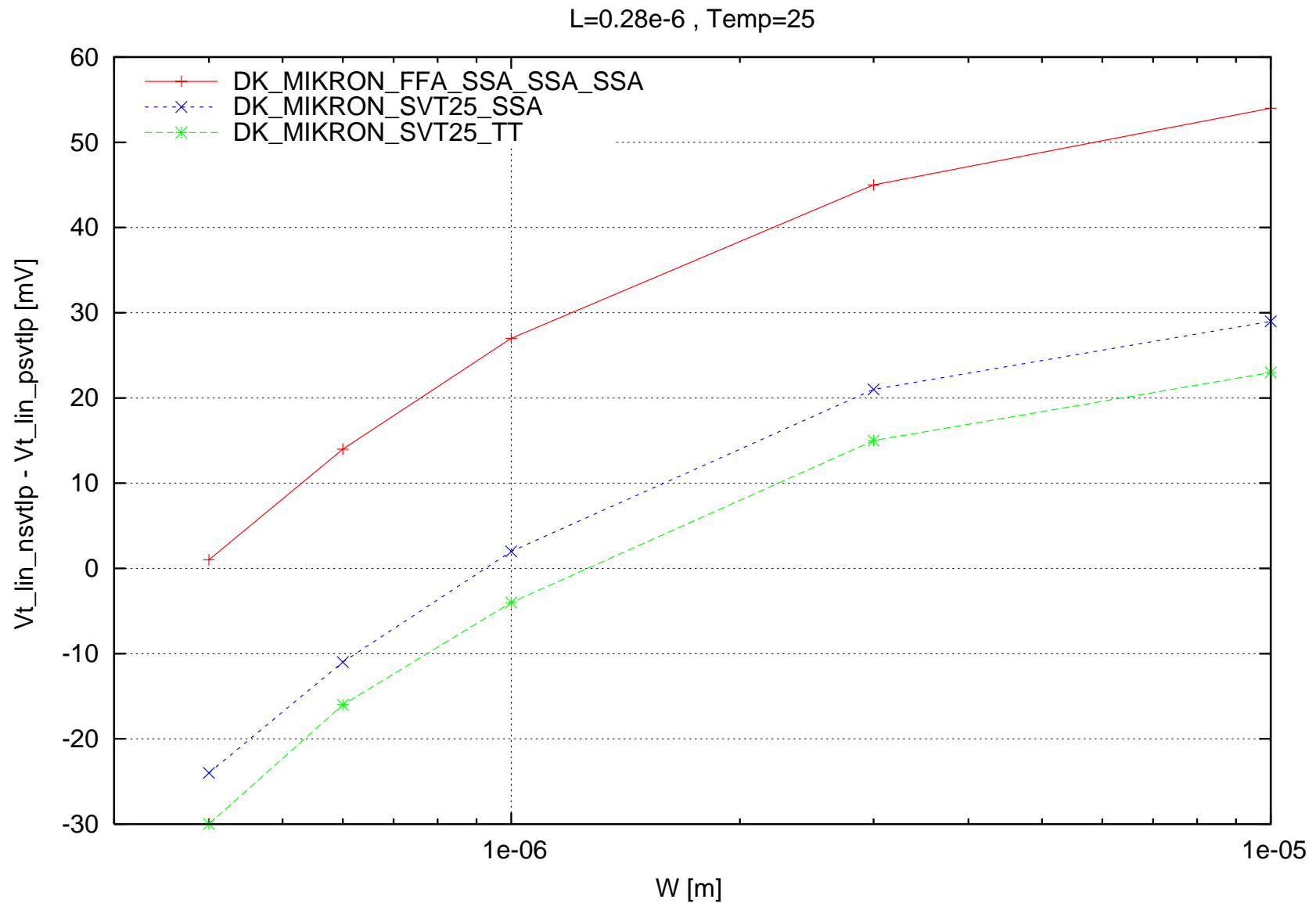
nsvt25 Isat_nmos / Isat_pmos vs. W [m] , L=0.28e-6 , Temp=25



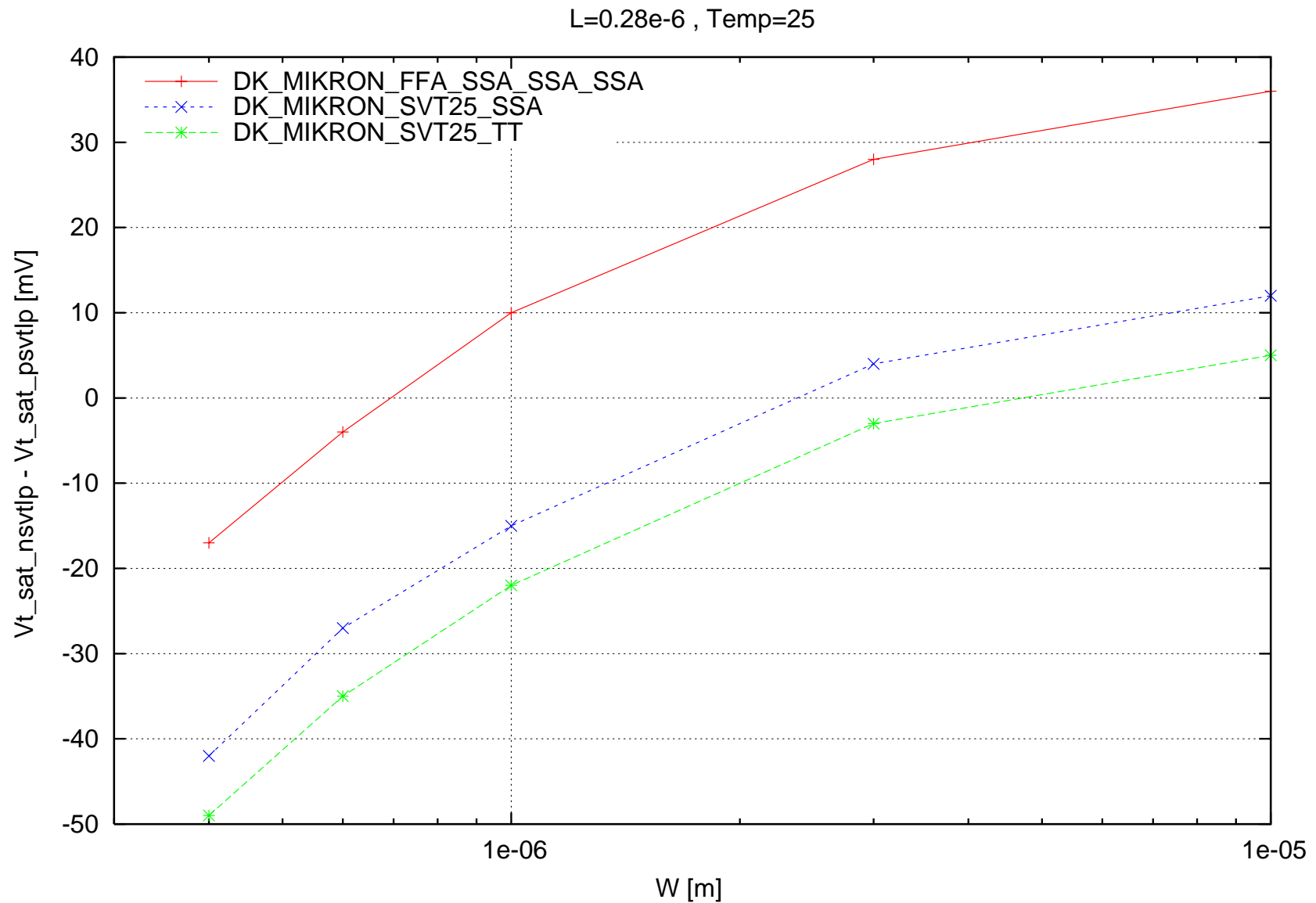
nsvt25 leff_nmos / leff_pmos vs. W [m] , L=0.28e-6 , Temp=25



nsvt25 Vt_lin_nsvt1p - Vt_lin_psvt1p [mV] vs. W [m] , L=0.28e-6 , Temp=25

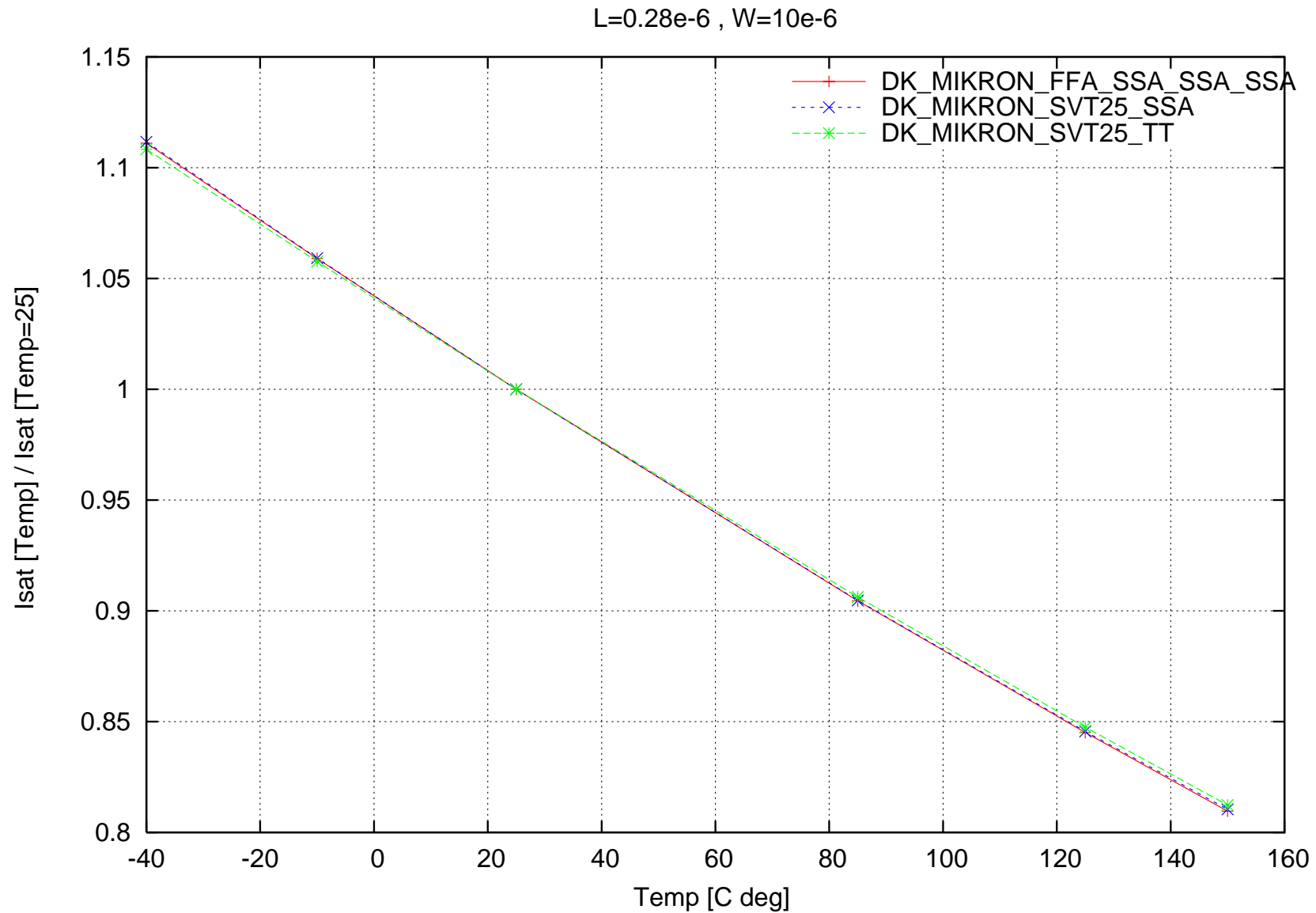


nsvt25 $V_{t_sat_nsvt1p} - V_{t_sat_psvt1p}$ [mV] vs. W [m] , $L=0.28e-6$, Temp=25

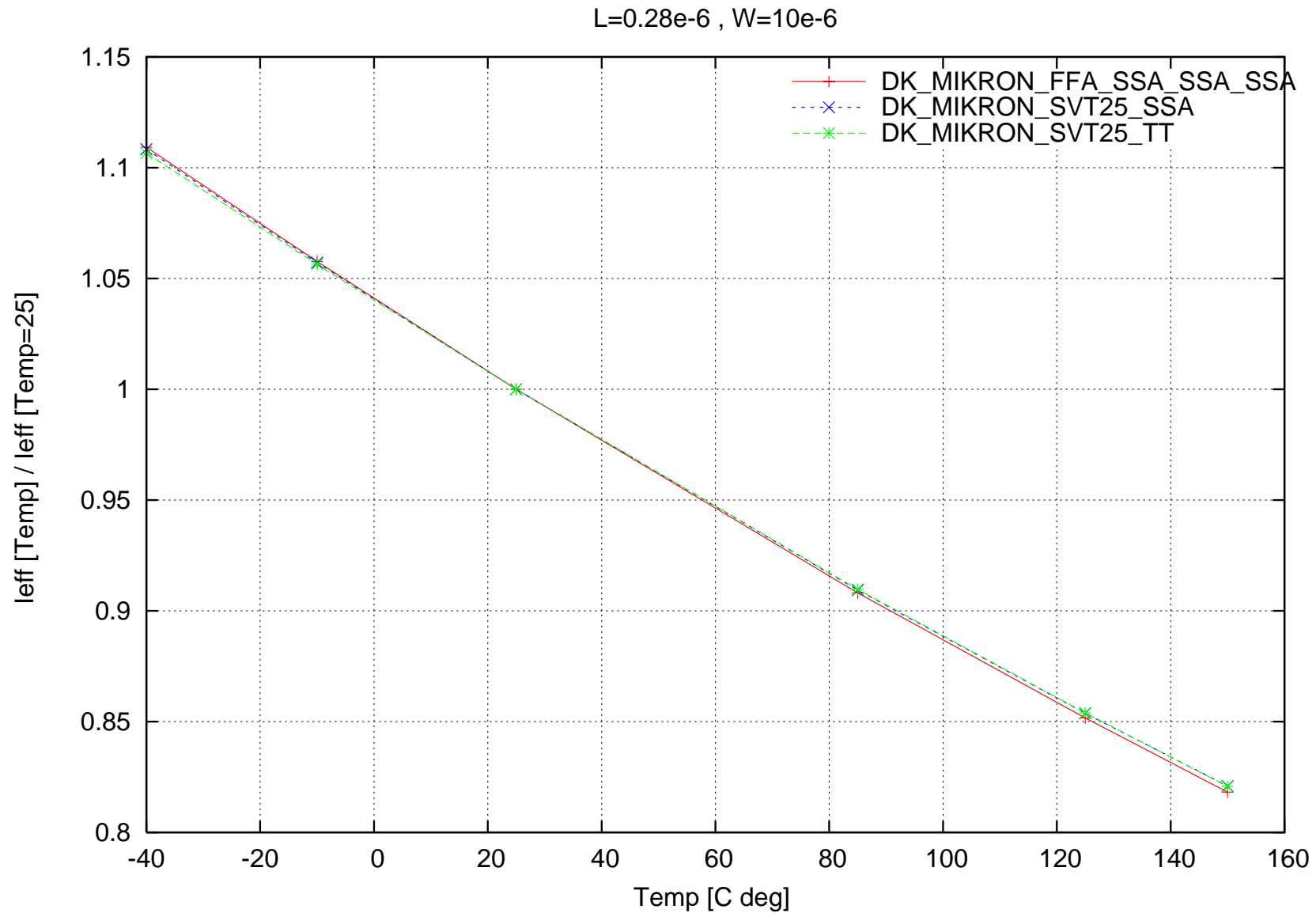


Scaling versus Temp for NMOS ($L=0.28\mu\text{m}$, $W=10\mu\text{m}$, $p_{o2act}=0.82\mu\text{m}$, $LPE=0$)

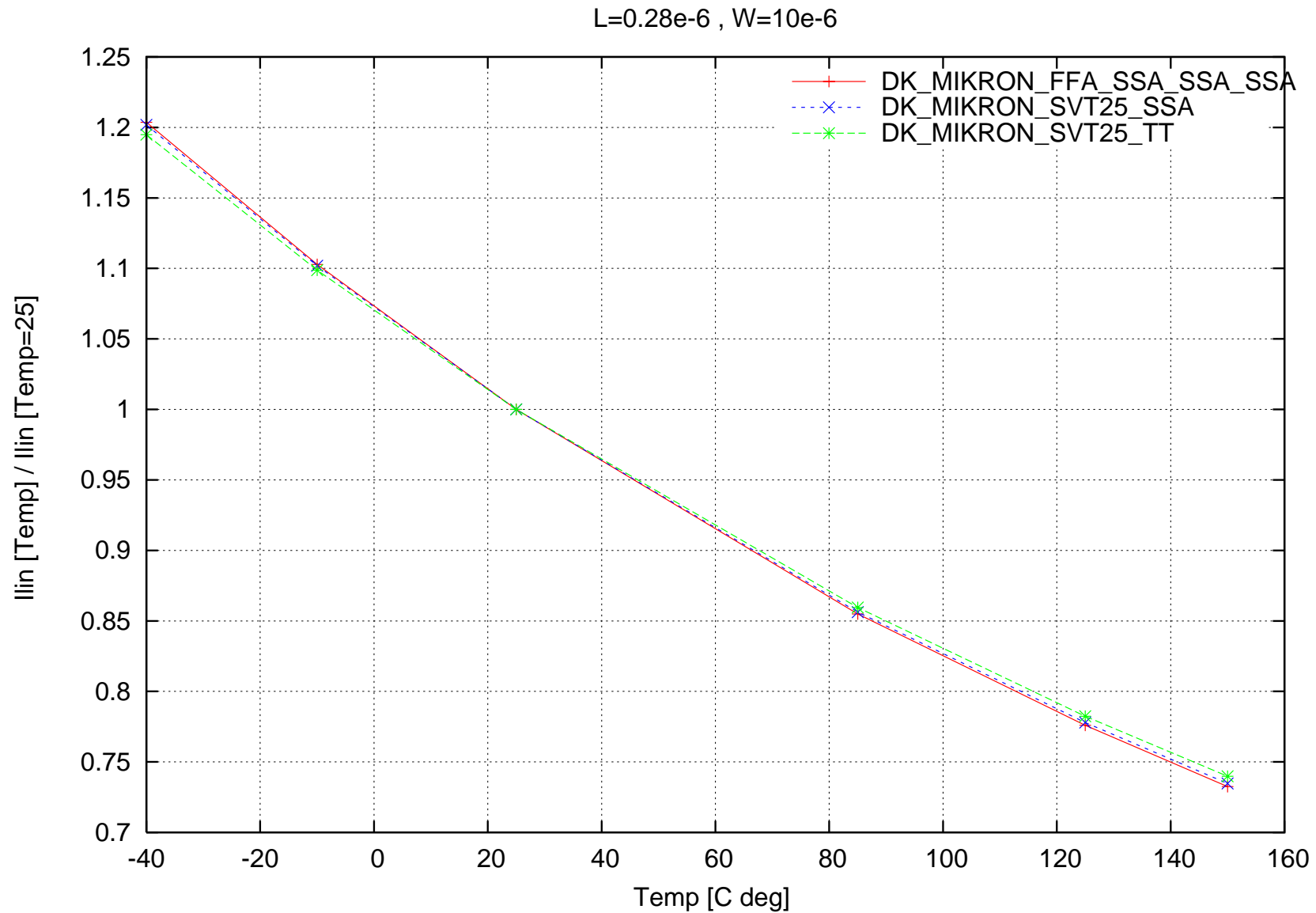
nsvt25 Isat [Temp] / Isat [Temp=25] vs. Temp [C deg] , L=0.28e-6 , W=10e-6



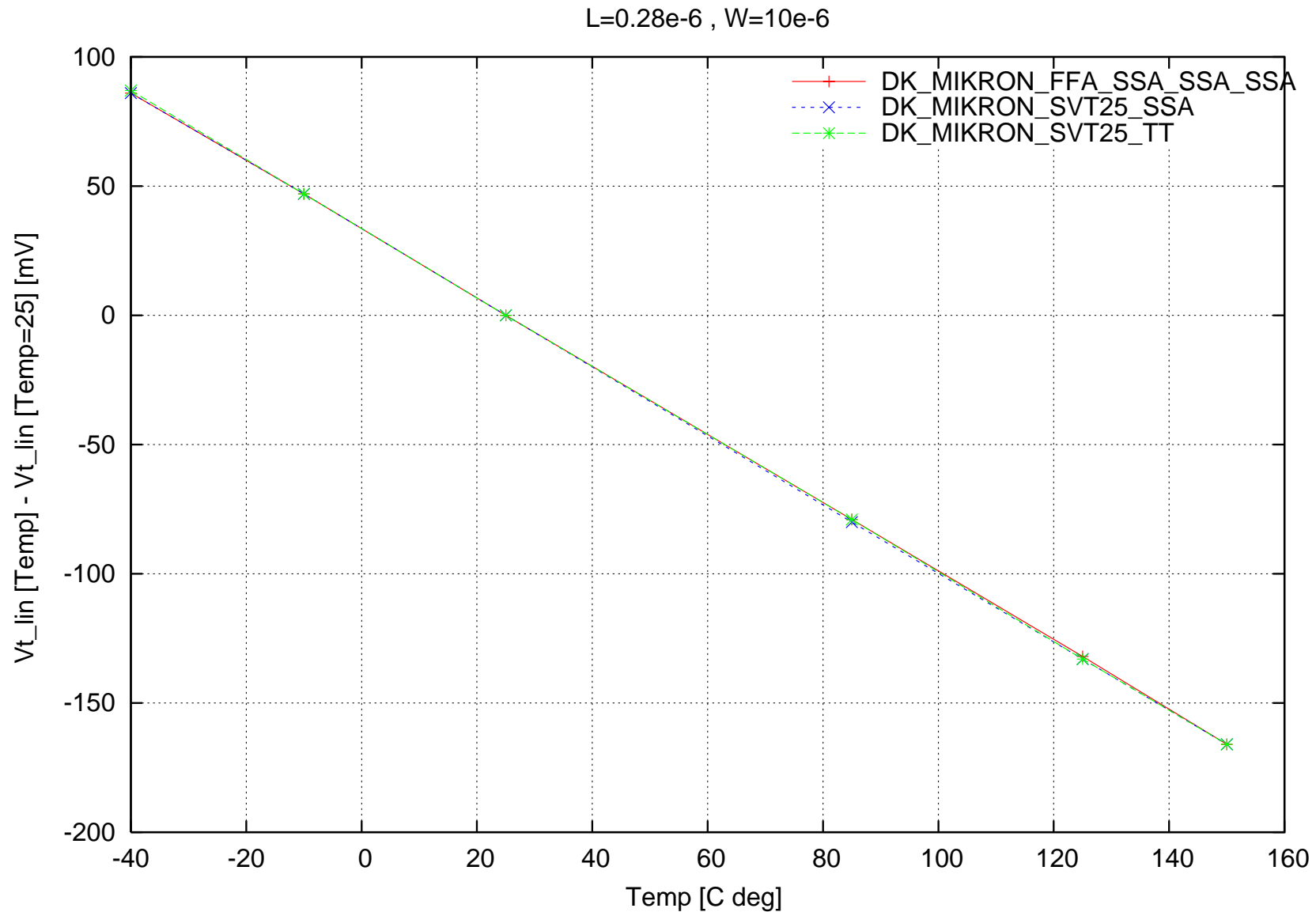
nsvt25 $I_{eff} [Temp] / I_{eff} [Temp=25]$ vs. Temp [C deg] , $L=0.28e-6$, $W=10e-6$



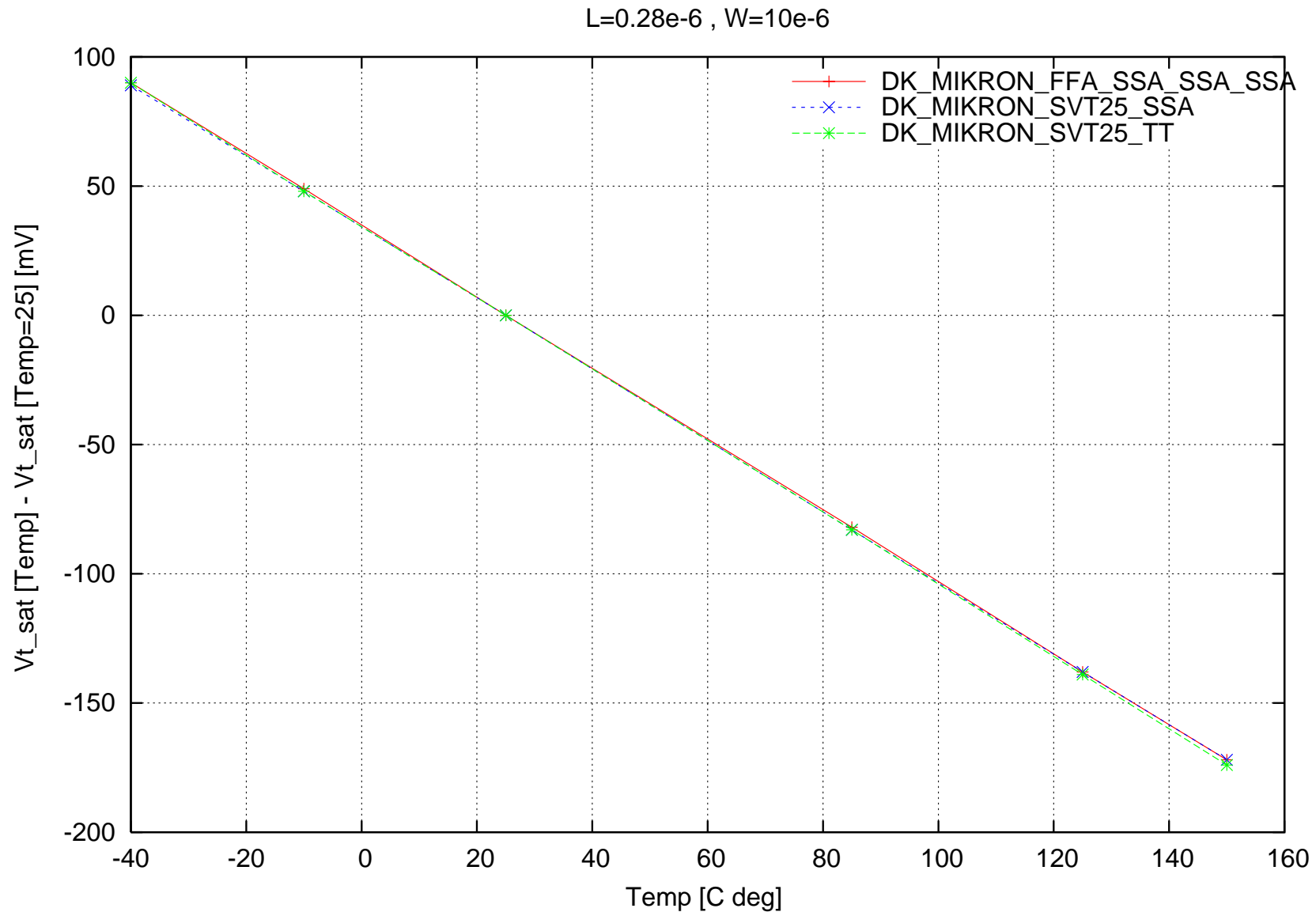
nsvt25 Ilin [Temp] / Ilin [Temp=25] vs. Temp [C deg] , L=0.28e-6 , W=10e-6



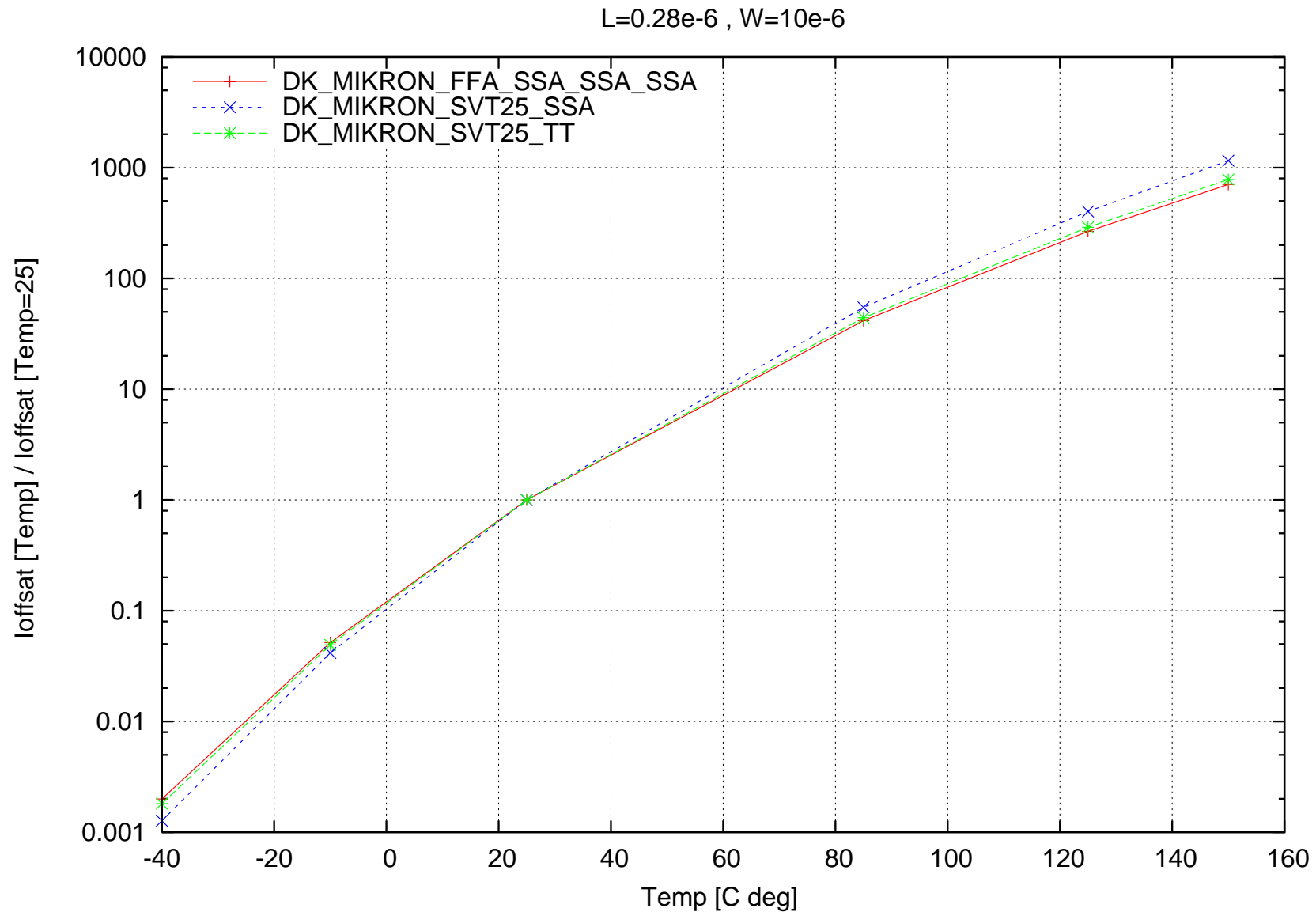
nsvt25 Vt_lin [Temp] - Vt_lin [Temp=25] [mV] vs. Temp [C deg] , L=0.28e-6 , W=10e-6



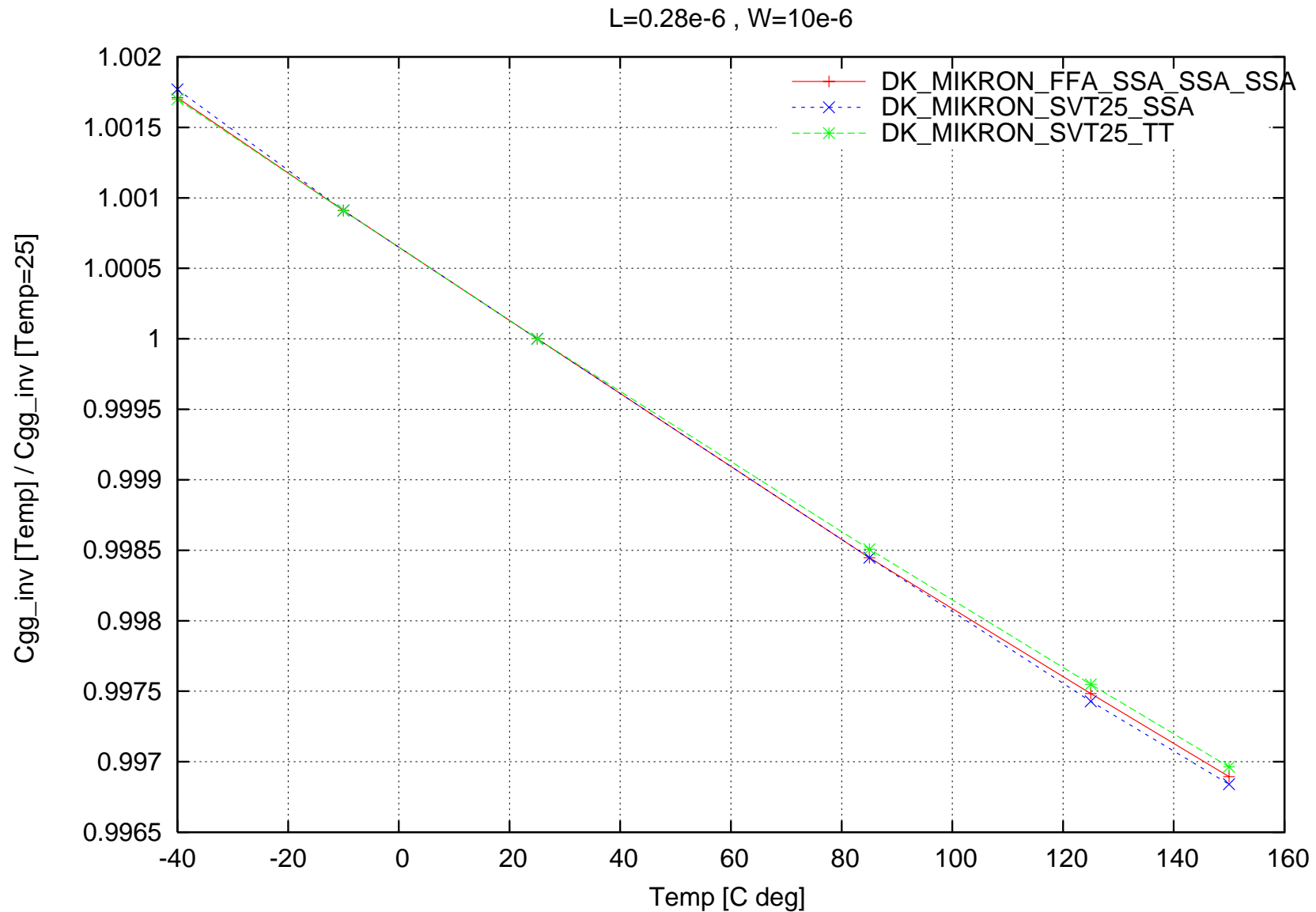
nsvt25 $V_{t_sat} [Temp] - V_{t_sat} [Temp=25] [mV]$ vs. Temp [C deg] , $L=0.28e-6$, $W=10e-6$



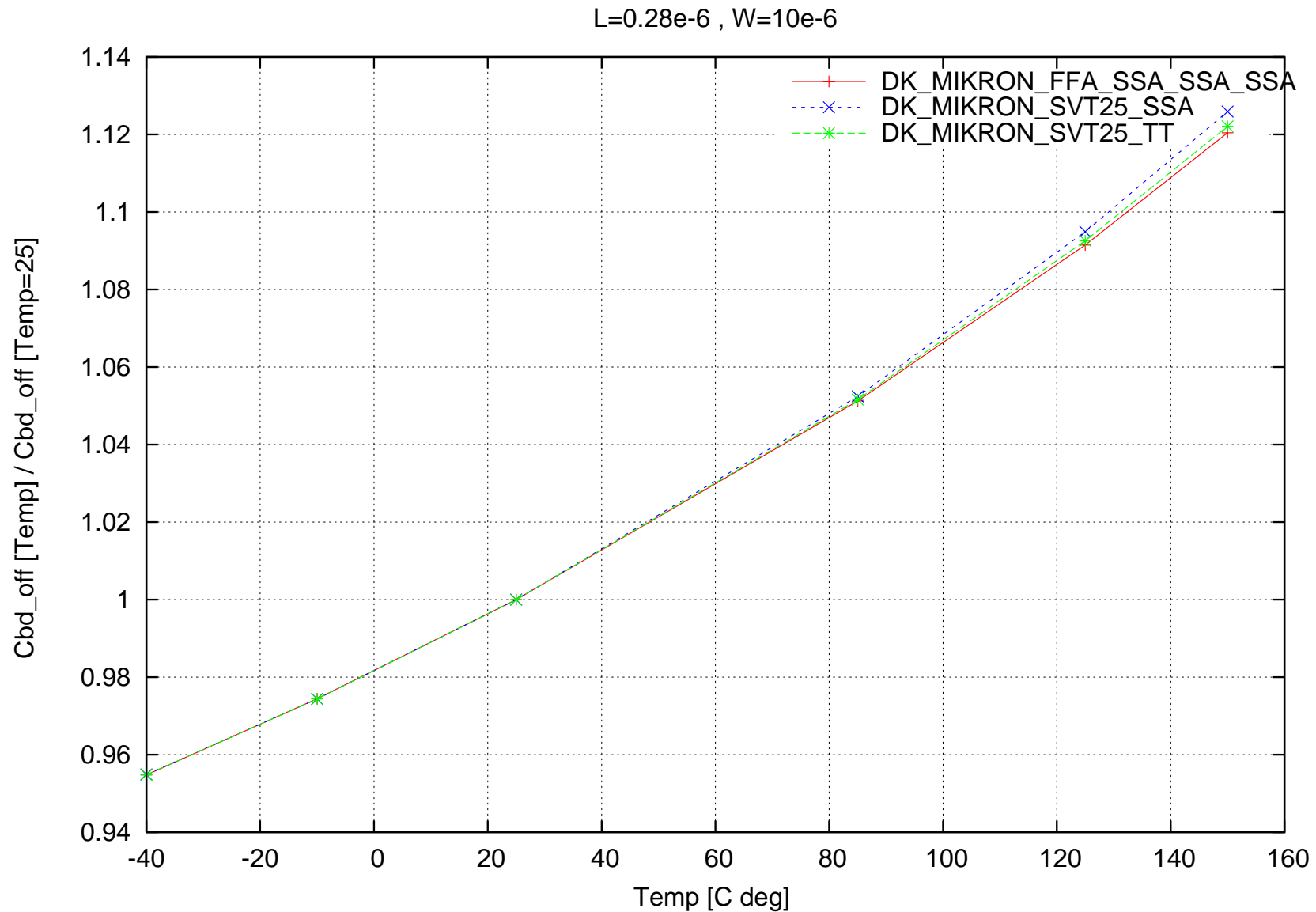
nsvt25 loffsat [Temp] / loffsat [Temp=25] vs. Temp [C deg] , L=0.28e-6 , W=10e-6



nsvt25 Cgg_inv [Temp] / Cgg_inv [Temp=25] vs. Temp [C deg] , L=0.28e-6 , W=10e-6



nsvt25 Cbd_off [Temp] / Cbd_off [Temp=25] vs. Temp [C deg] , L=0.28e-6 , W=10e-6

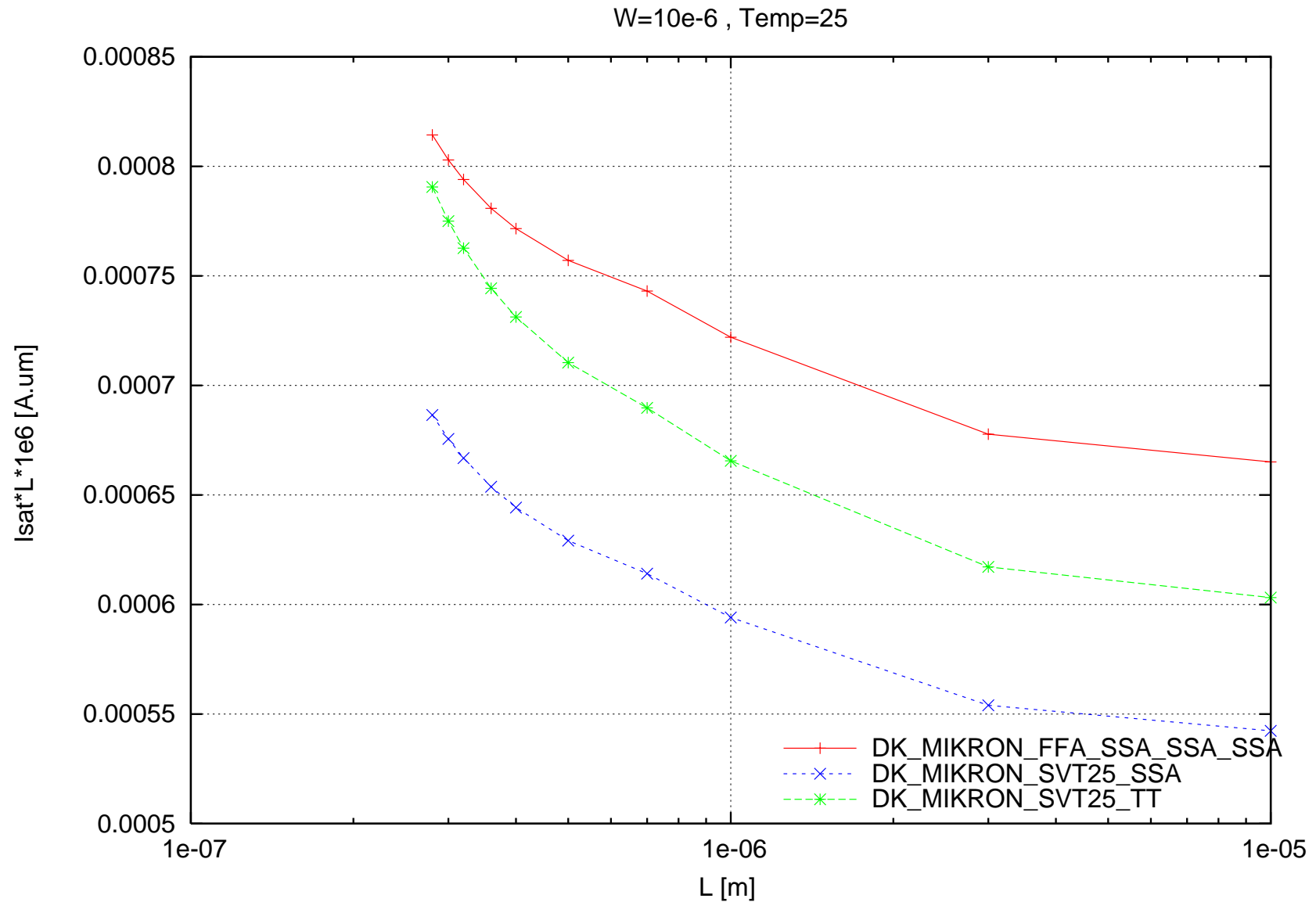


PSVT25

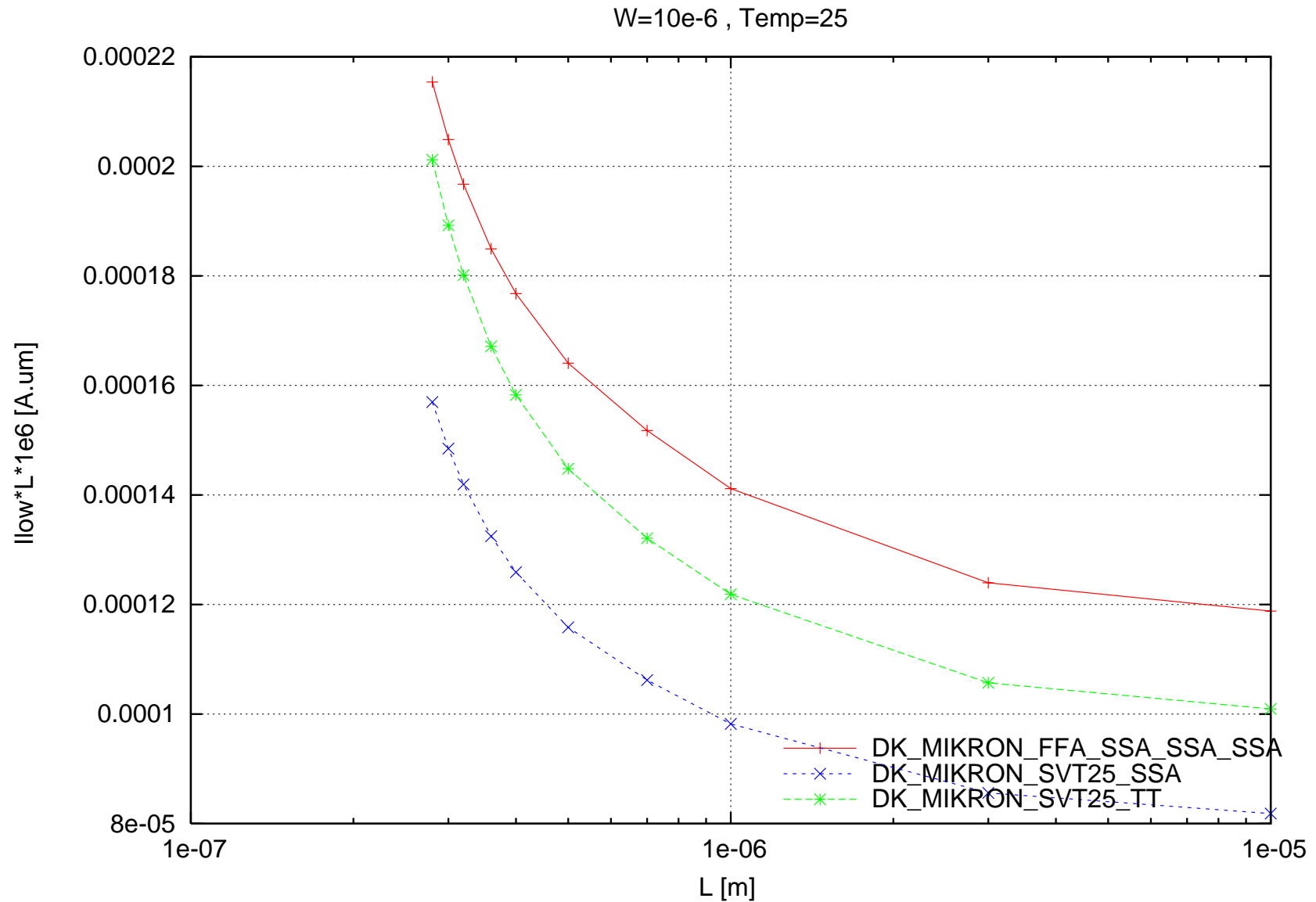
Electrical characteristics scaling

Scaling versus Length for PMOS ($W=10\text{e-}6$, Temp=25, po2act=0.82e-6, LPE=0)

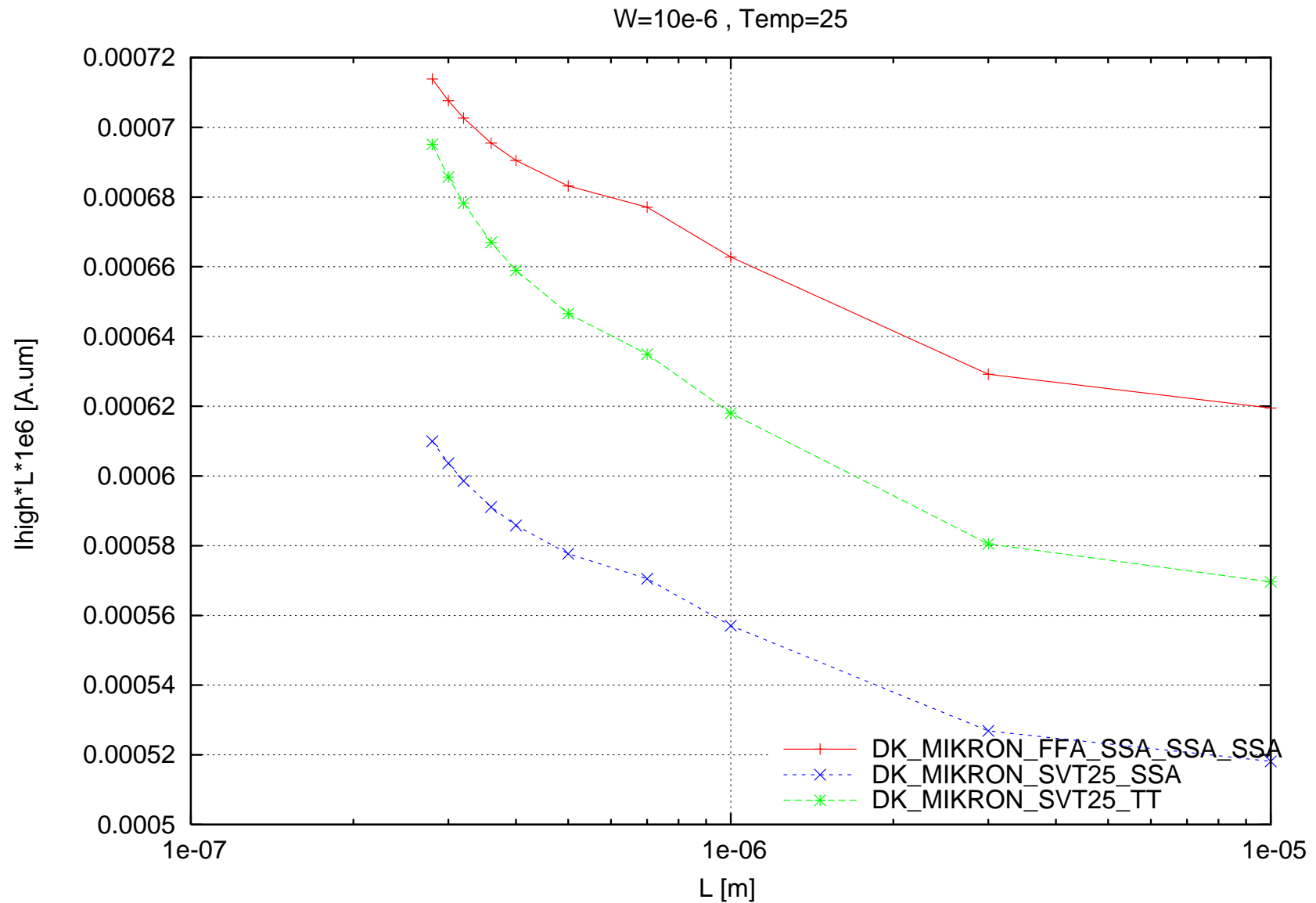
psvt25 Isat*L*1e6 [A.um] vs. L [m] , W=10e-6 , Temp=25



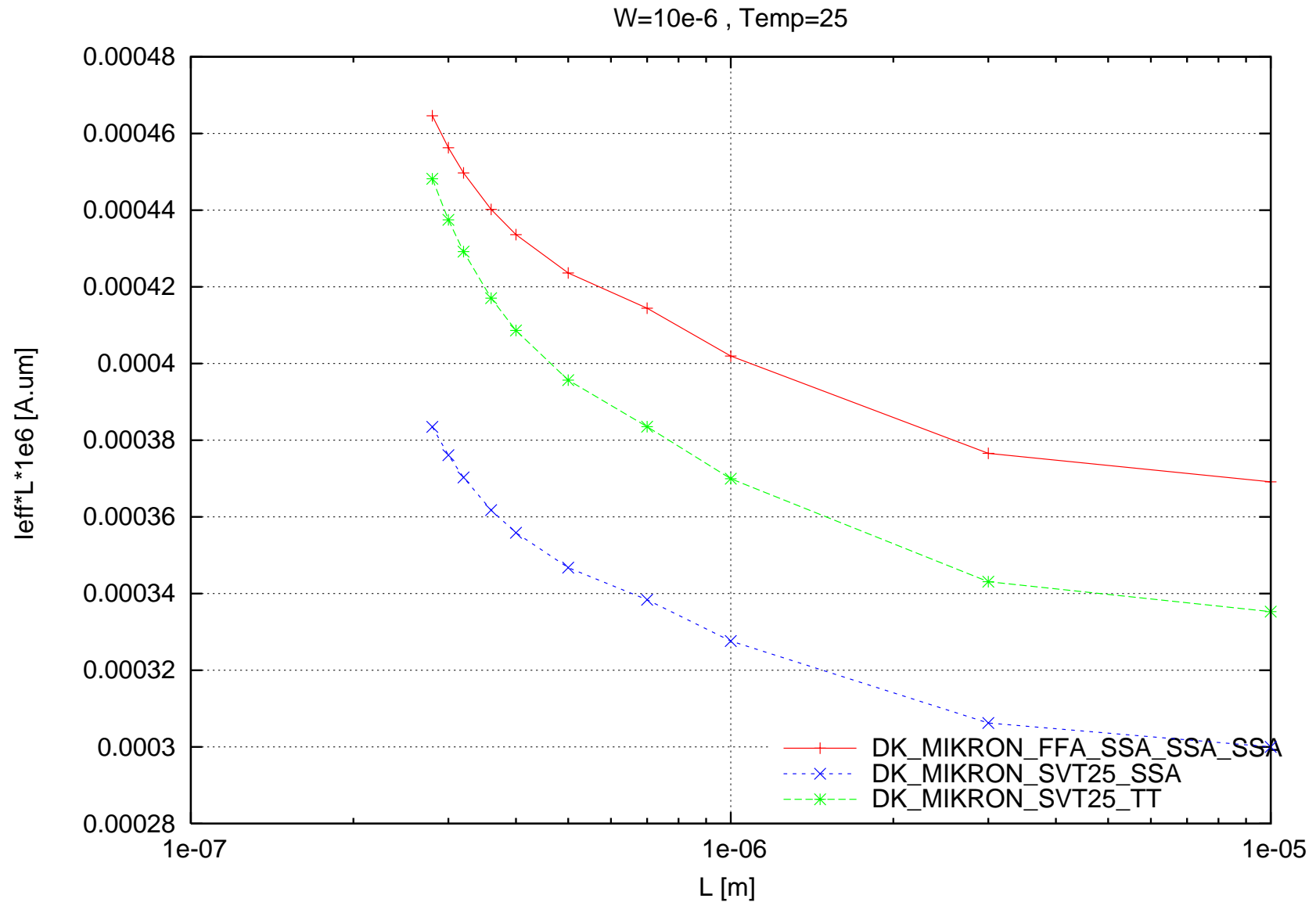
psvt25 $I_{low} \cdot L \cdot 1e6$ [A.um] vs. L [m] , $W=10e-6$, Temp=25



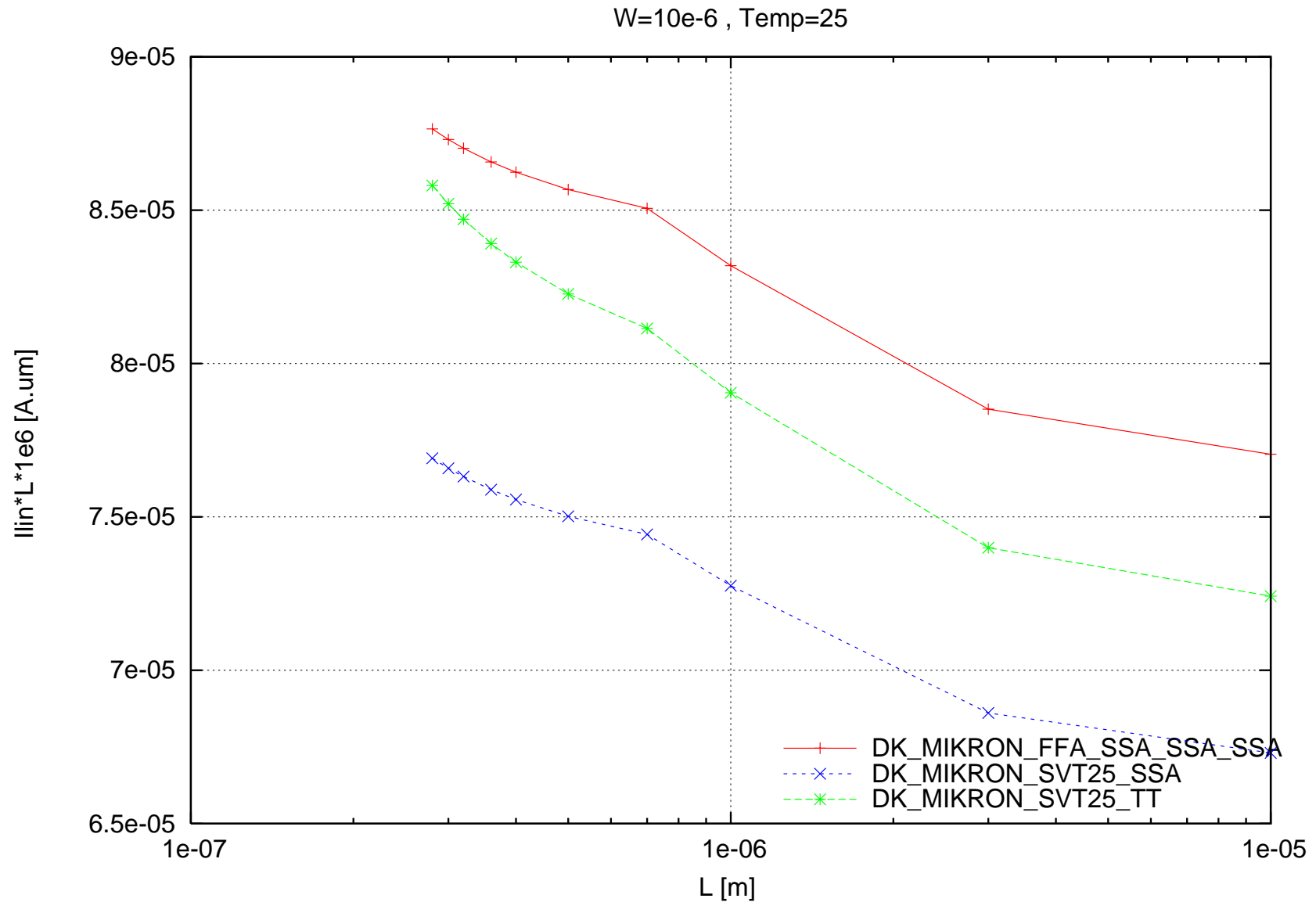
psvt25 I_{high}*L*1e6 [A.um] vs. L [m] , W=10e-6 , Temp=25



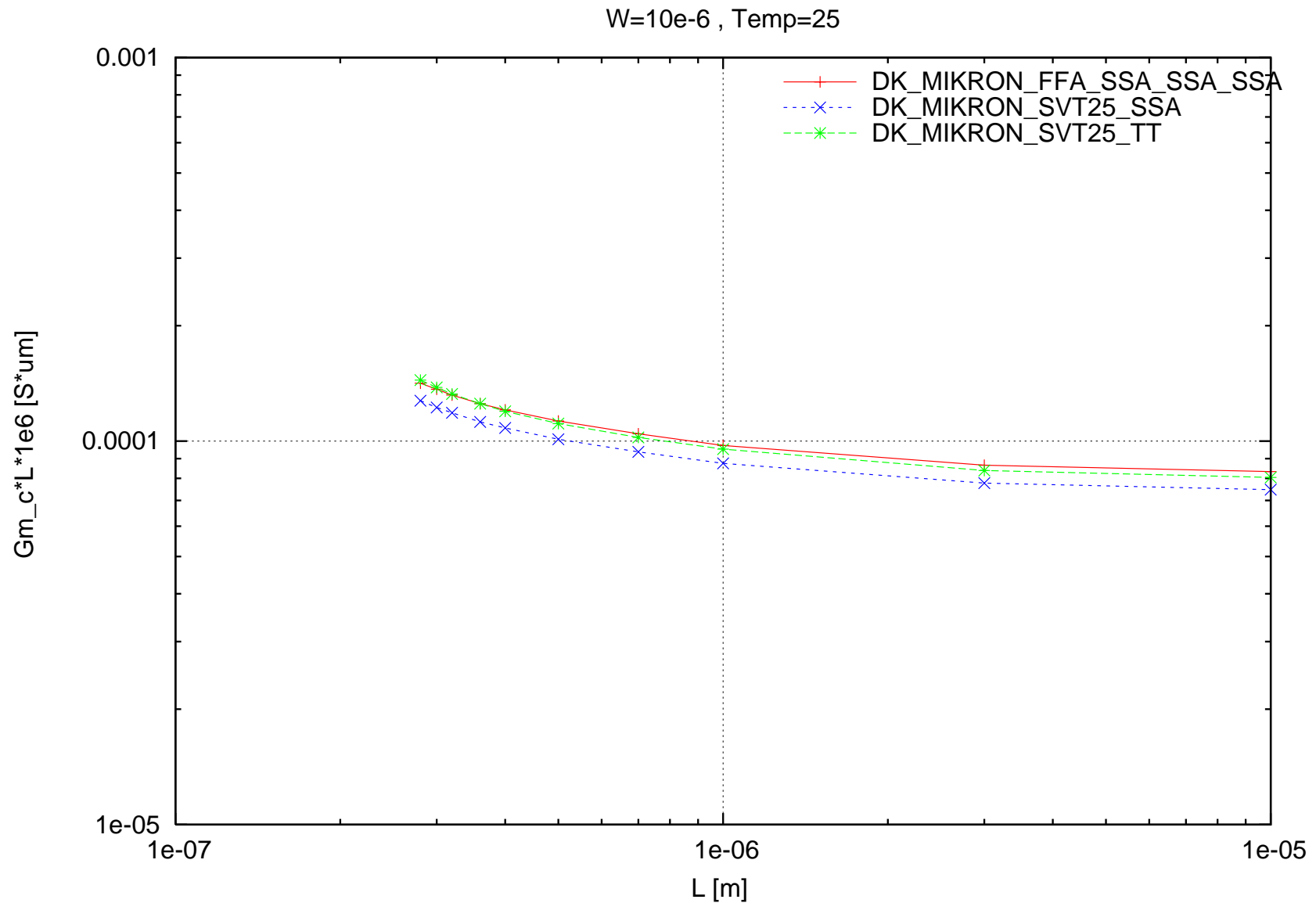
psvt25 $l_{eff} \cdot L \cdot 1e6$ [A.um] vs. L [m] , $W=10e-6$, Temp=25



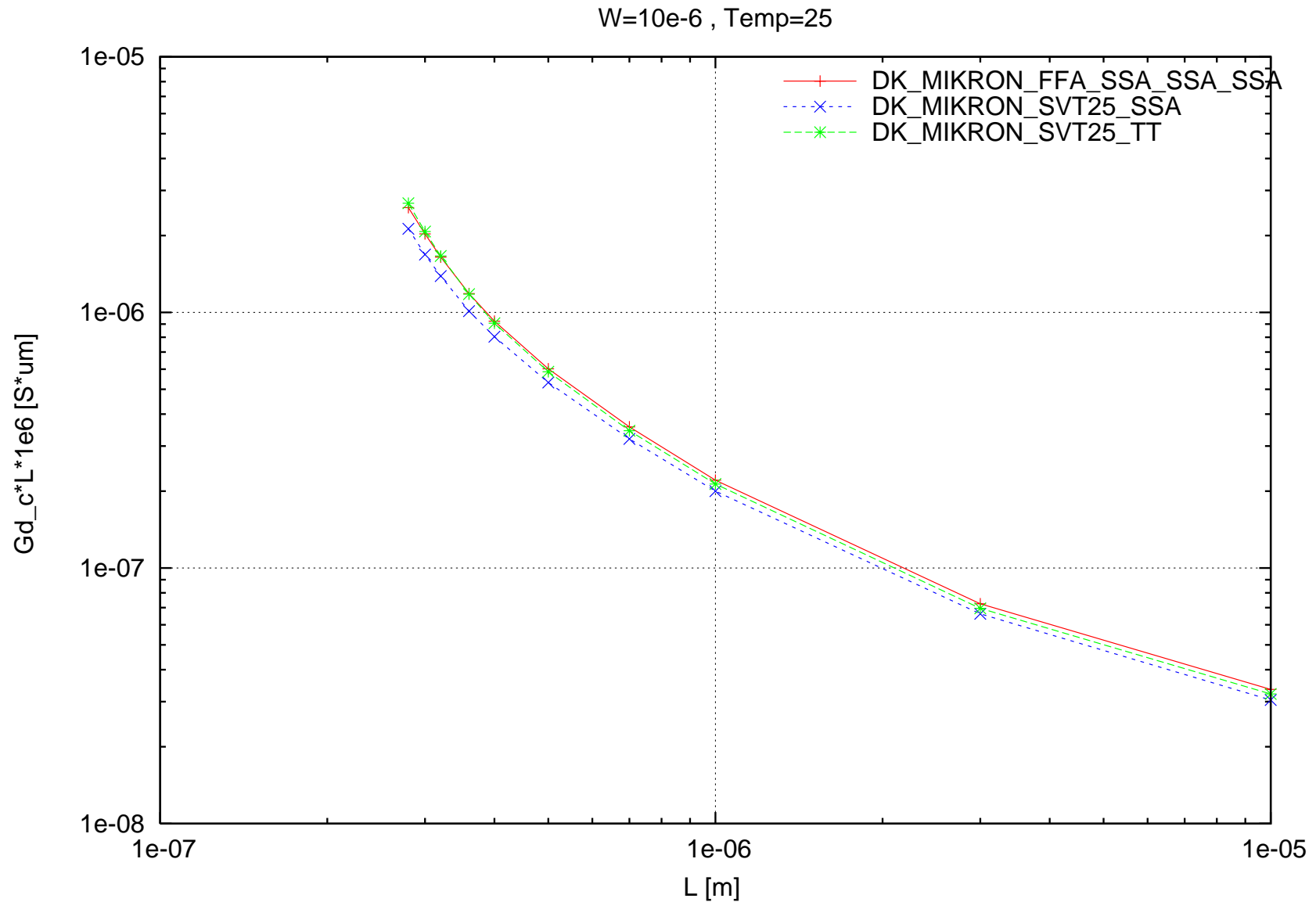
psvt25 Ilin*L*1e6 [A.um] vs. L [m] , W=10e-6 , Temp=25



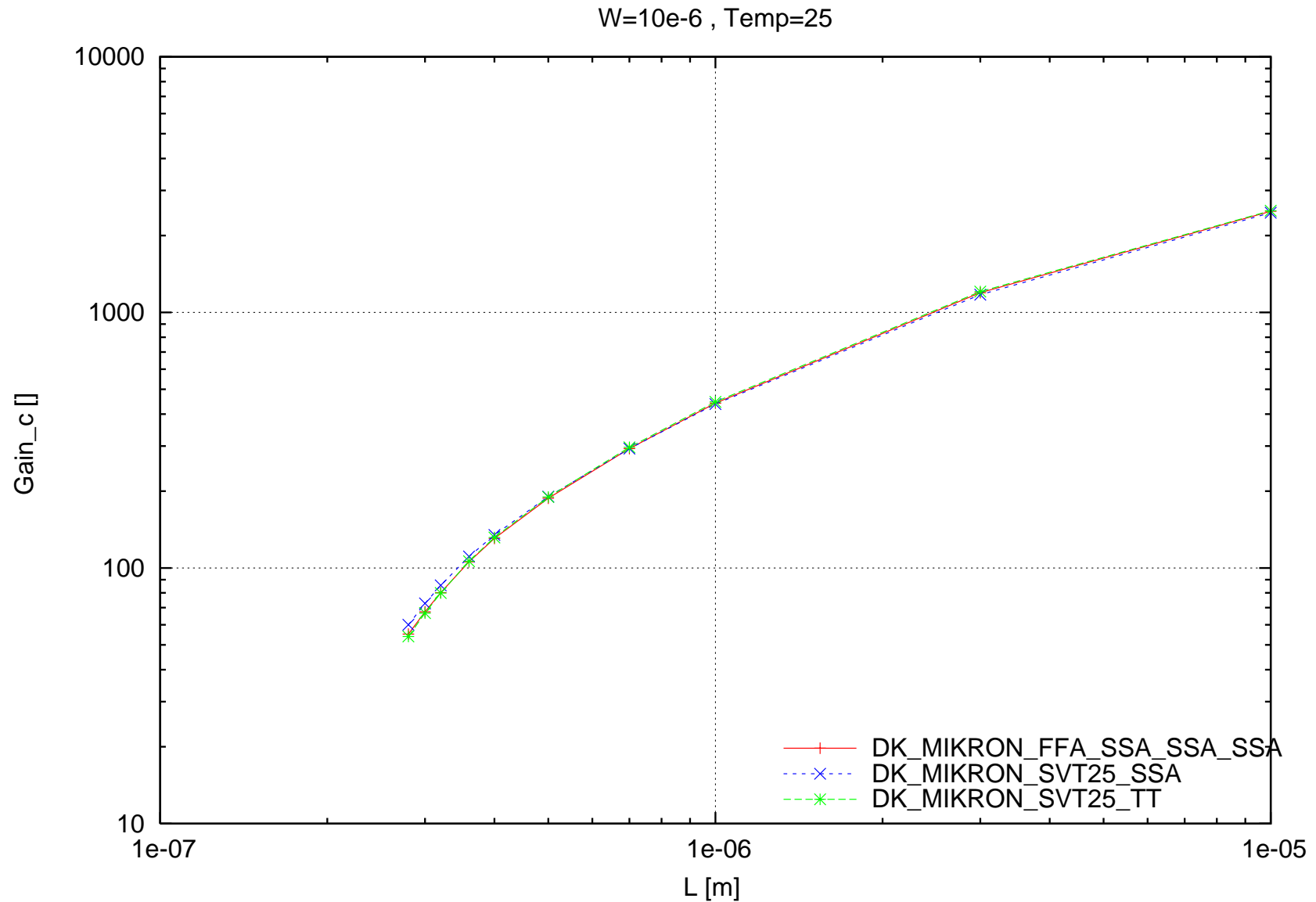
psvt25 Gm_c*L*1e6 [S*um] vs. L [m] , W=10e-6 , Temp=25



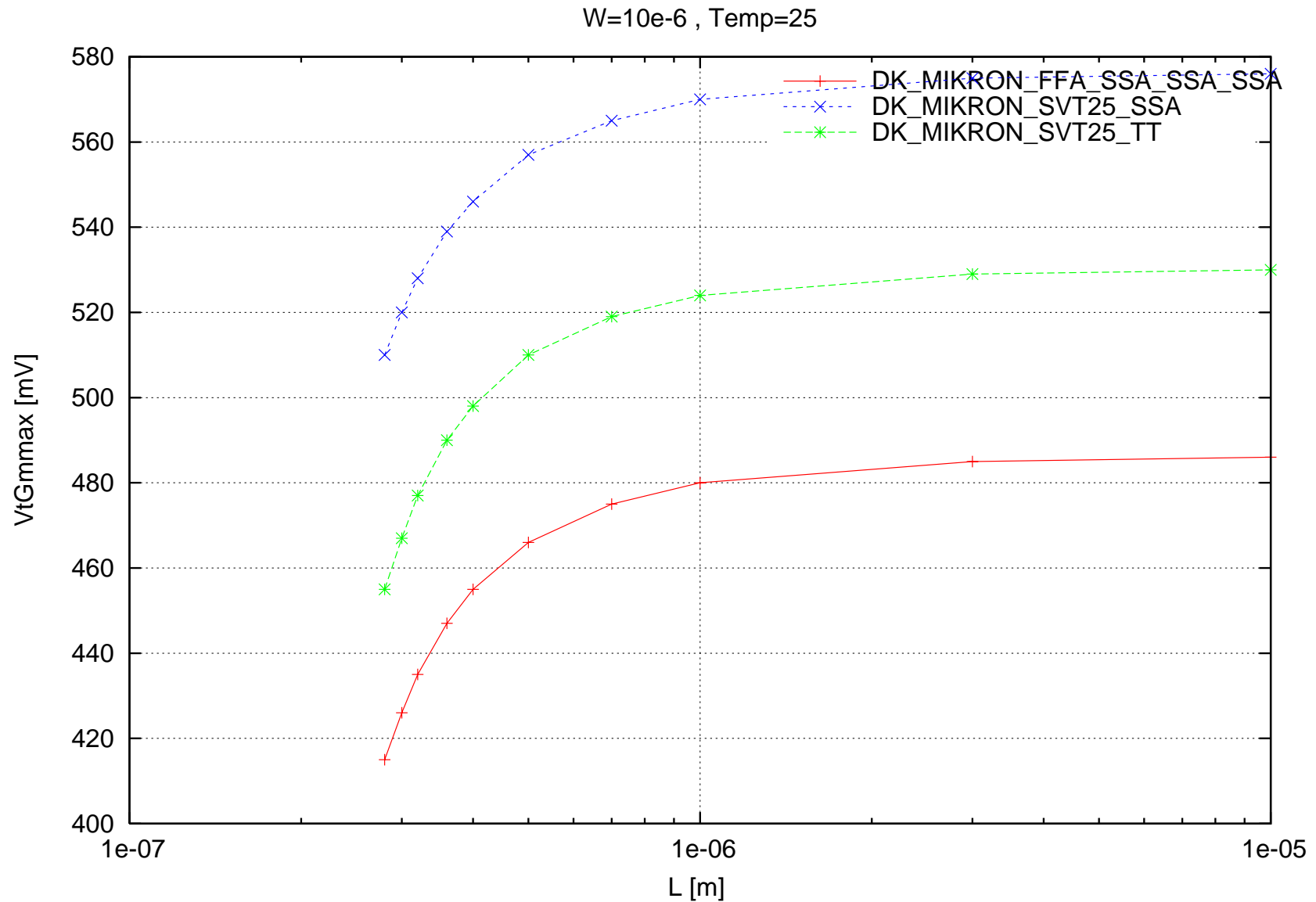
psvt25 Gd_c*L*1e6 [S*um] vs. L [m] , W=10e-6 , Temp=25



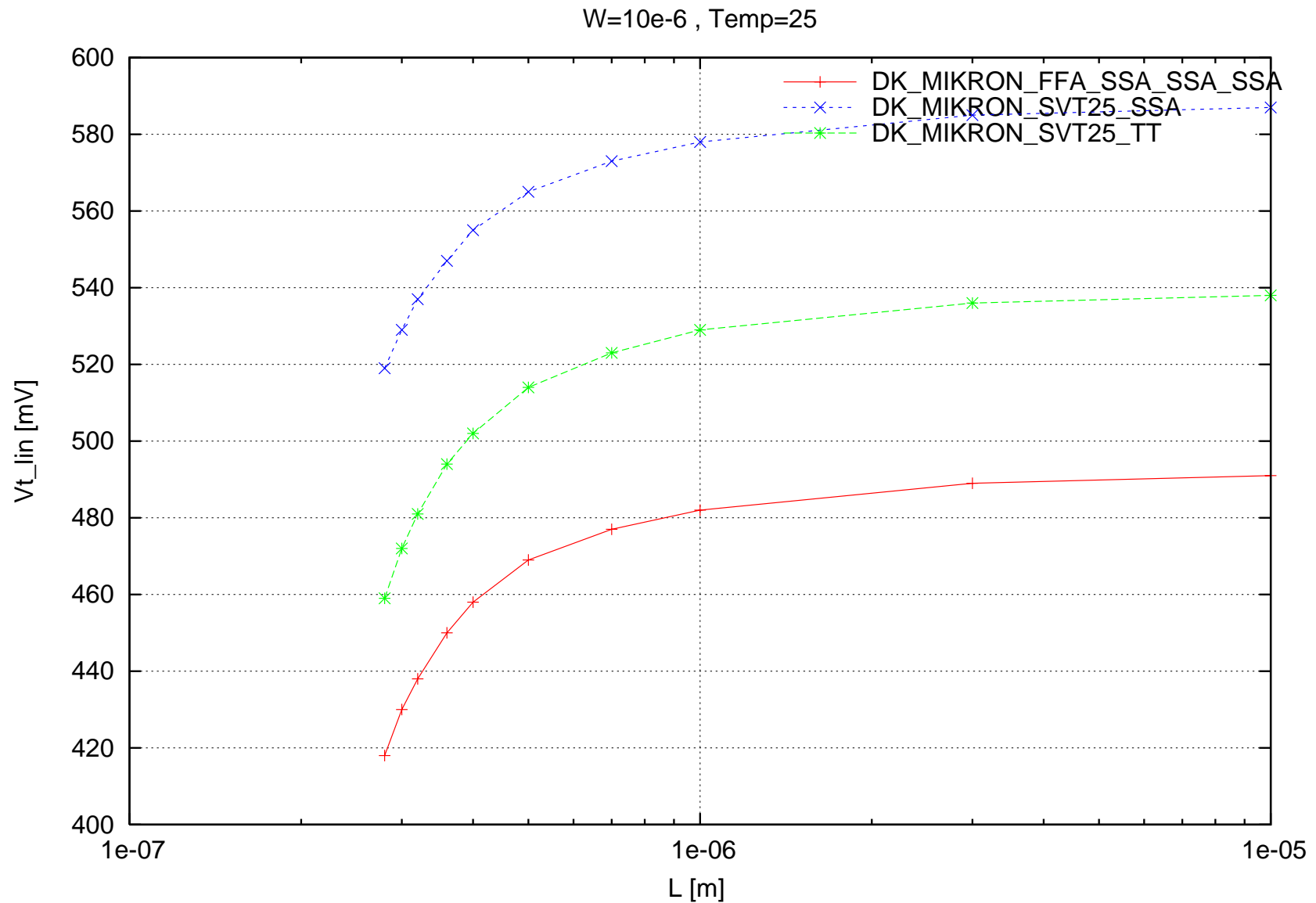
psvt25 Gain_c [] vs. L [m] , W=10e-6 , Temp=25



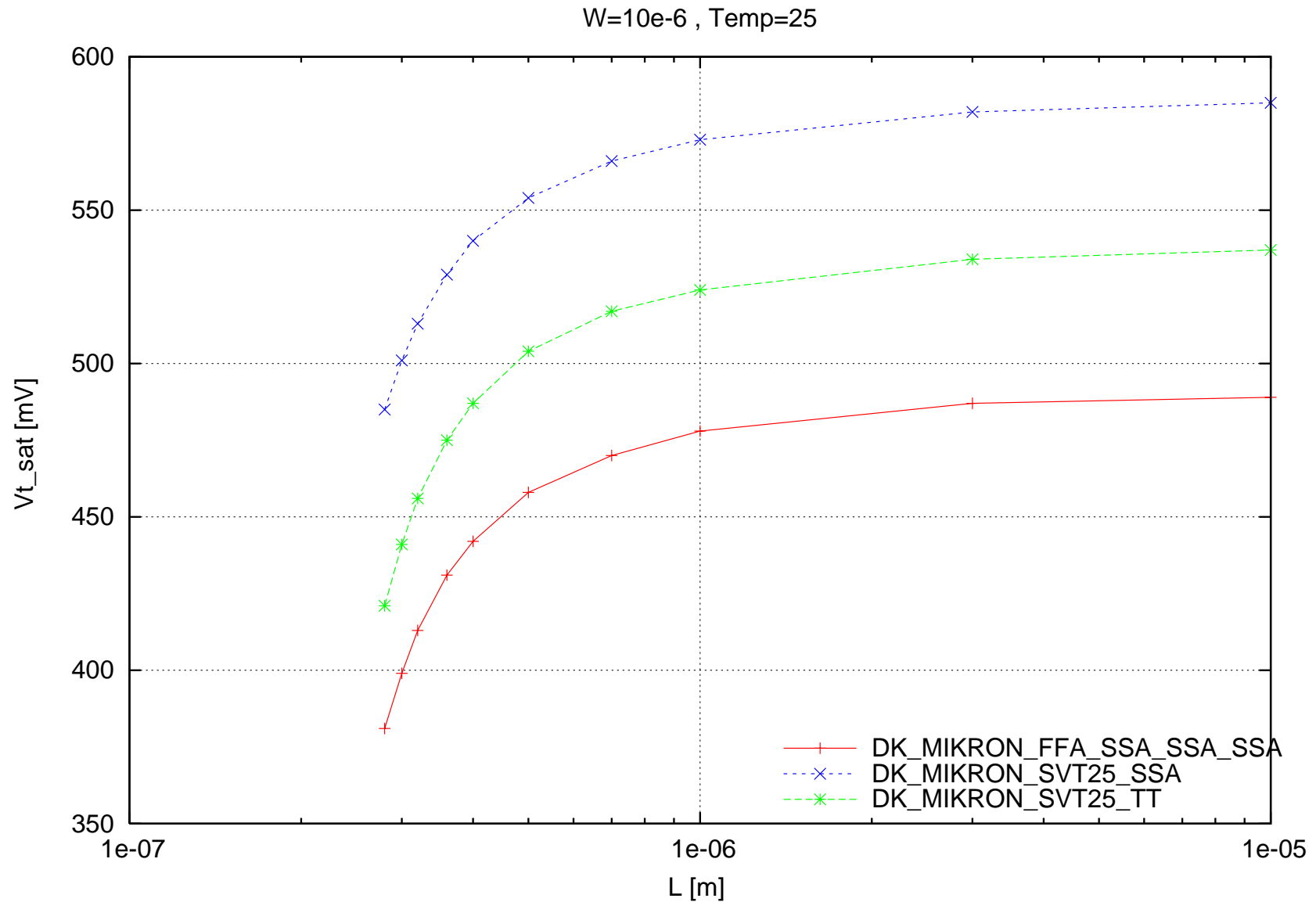
psvt25 V_{tGmax} [mV] vs. L [m] , $W=10e-6$, $Temp=25$



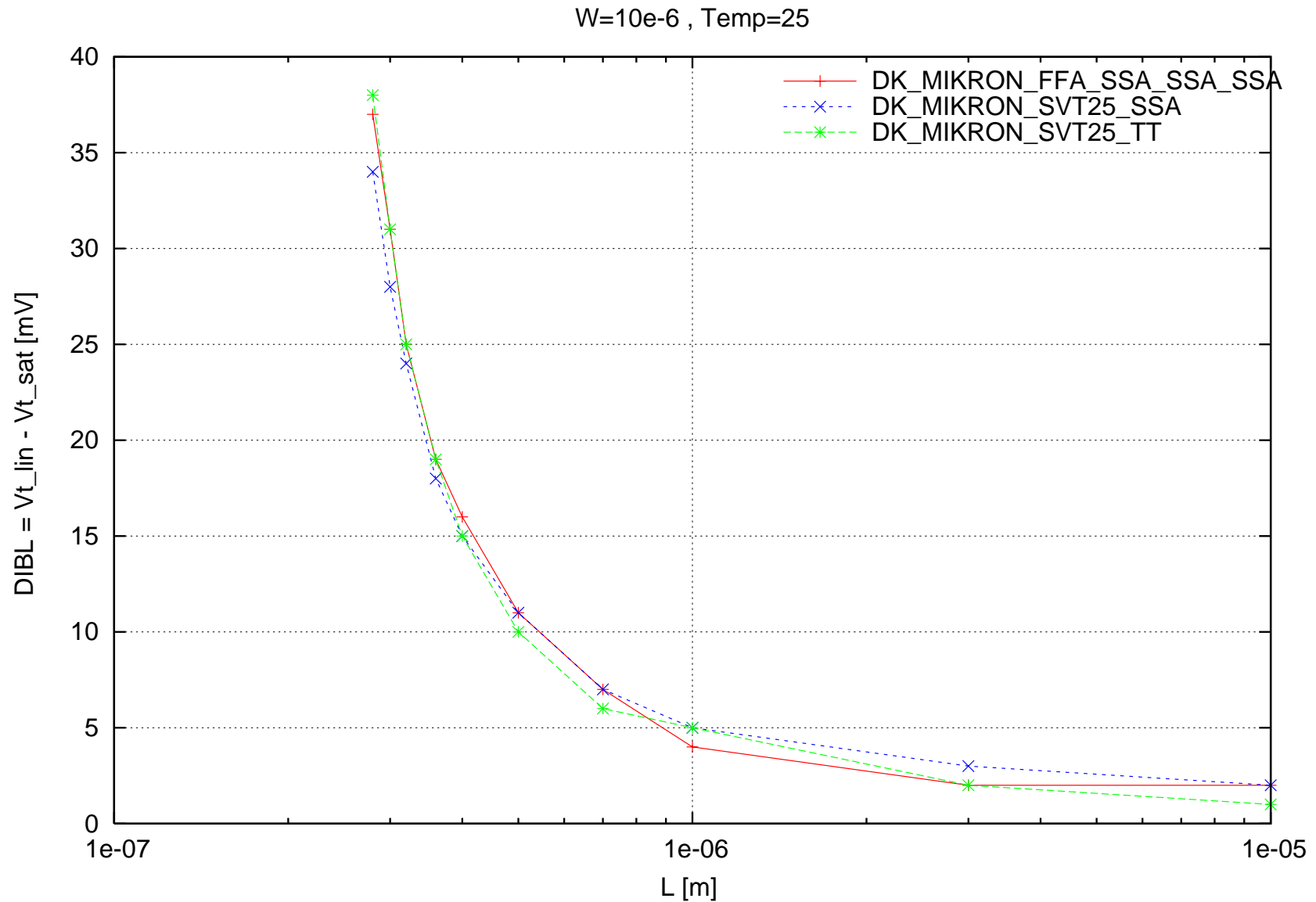
psvt25 Vt_lin [mV] vs. L [m] , W=10e-6 , Temp=25



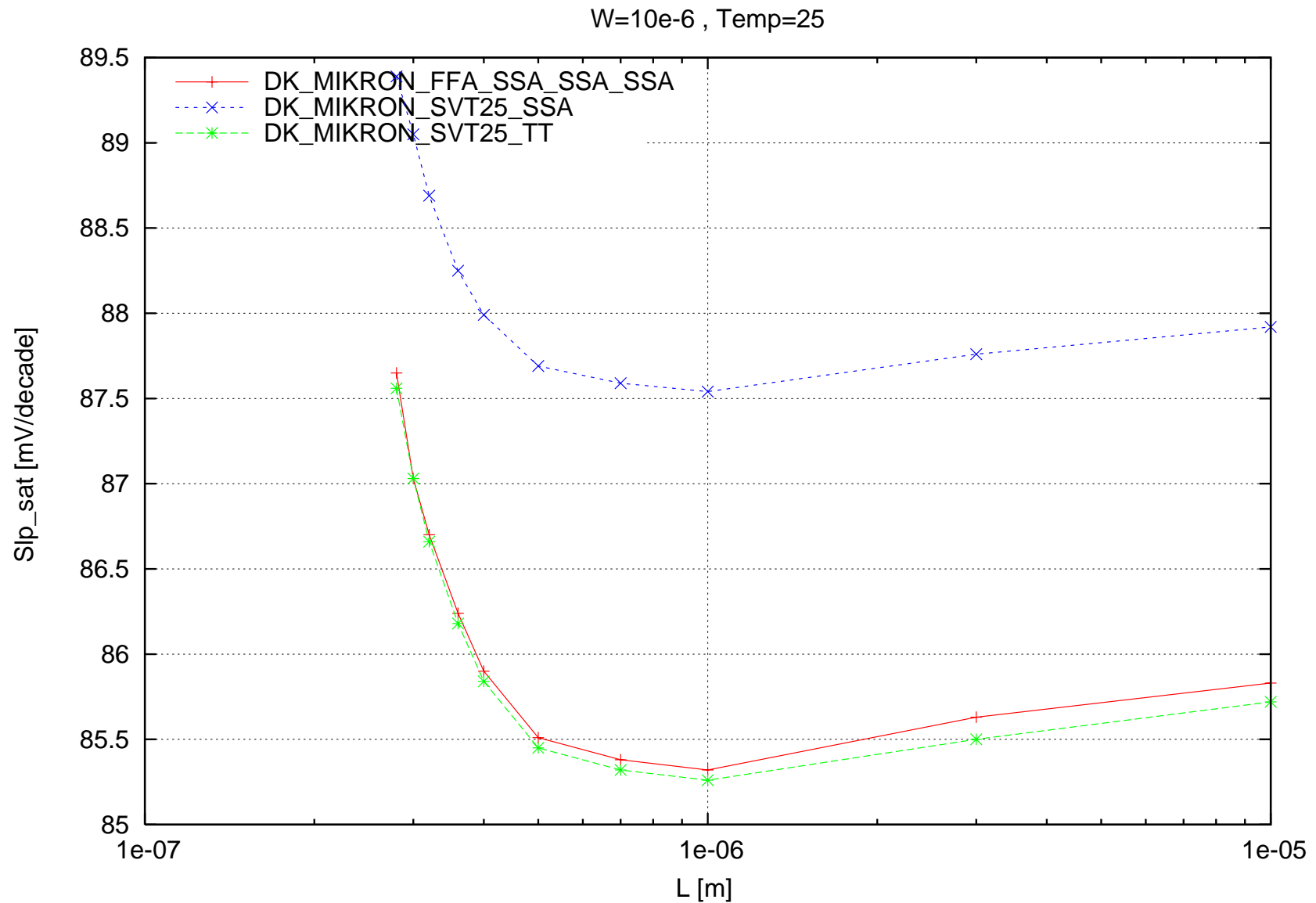
psvt25 Vt_sat [mV] vs. L [m] , W=10e-6 , Temp=25



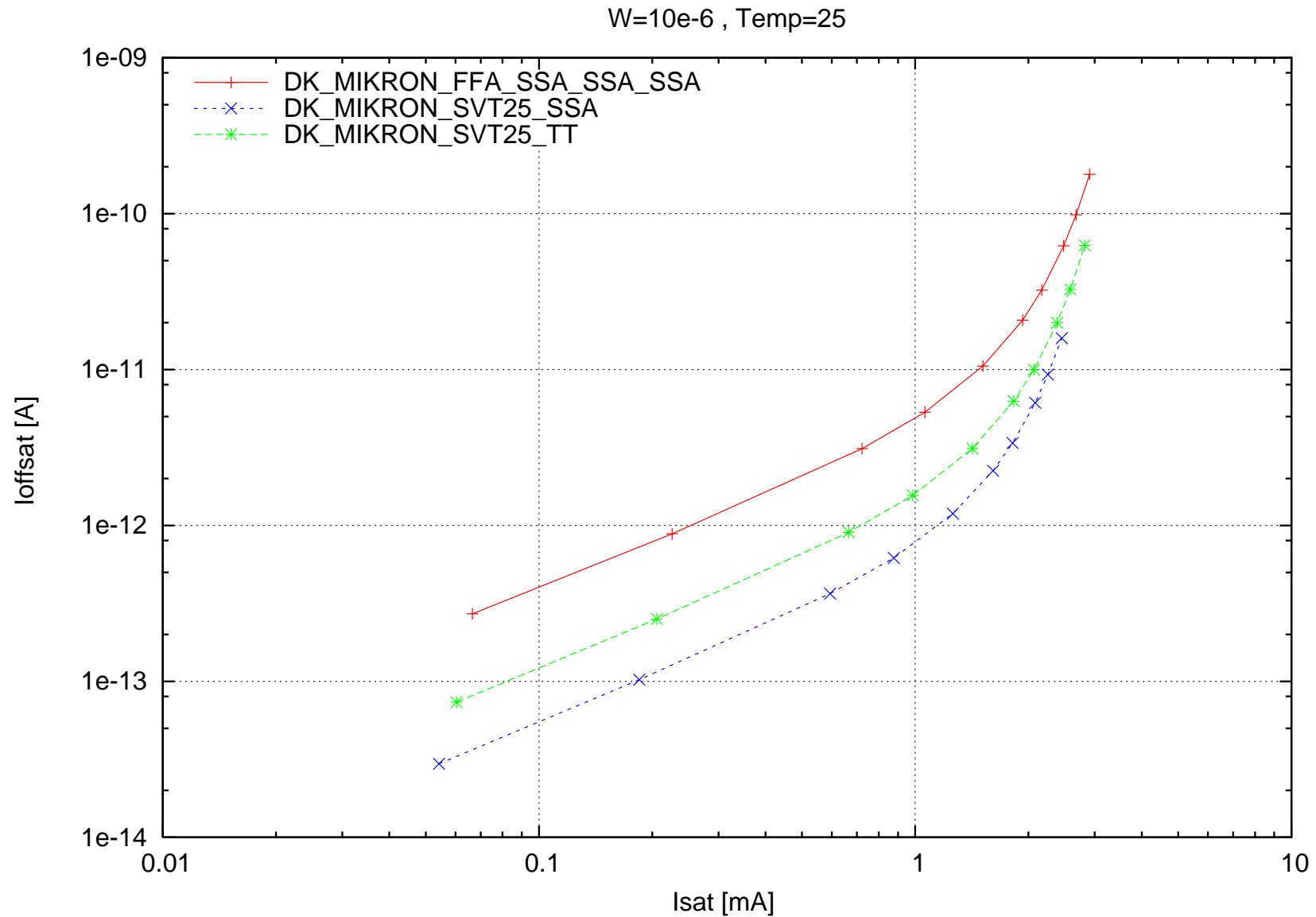
psvt25 DIBL = $V_{t_lin} - V_{t_sat}$ [mV] vs. L [m] , $W=10e-6$, Temp=25



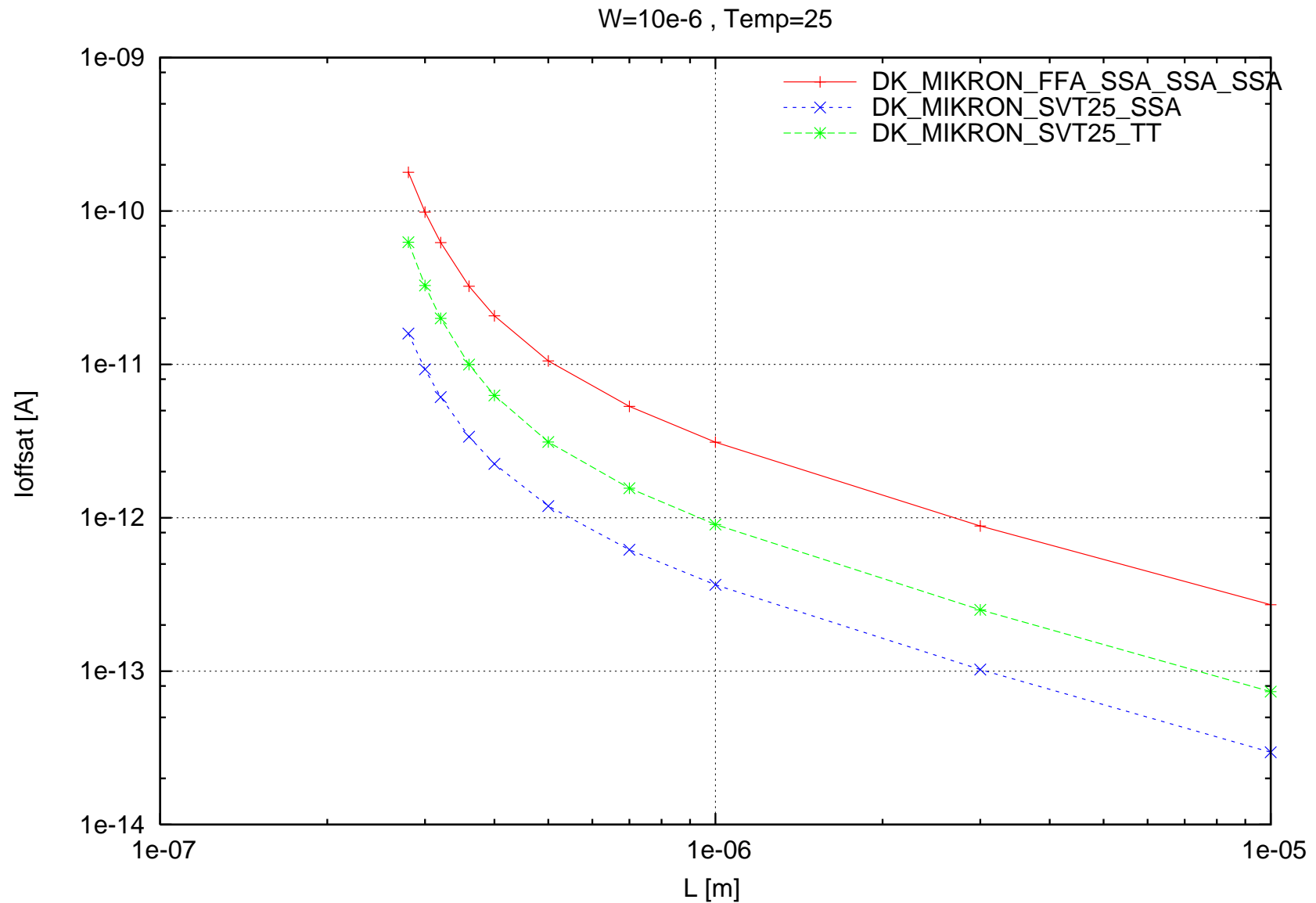
psvt25 Slp_sat [mV/decade] vs. L [m] , W=10e-6 , Temp=25



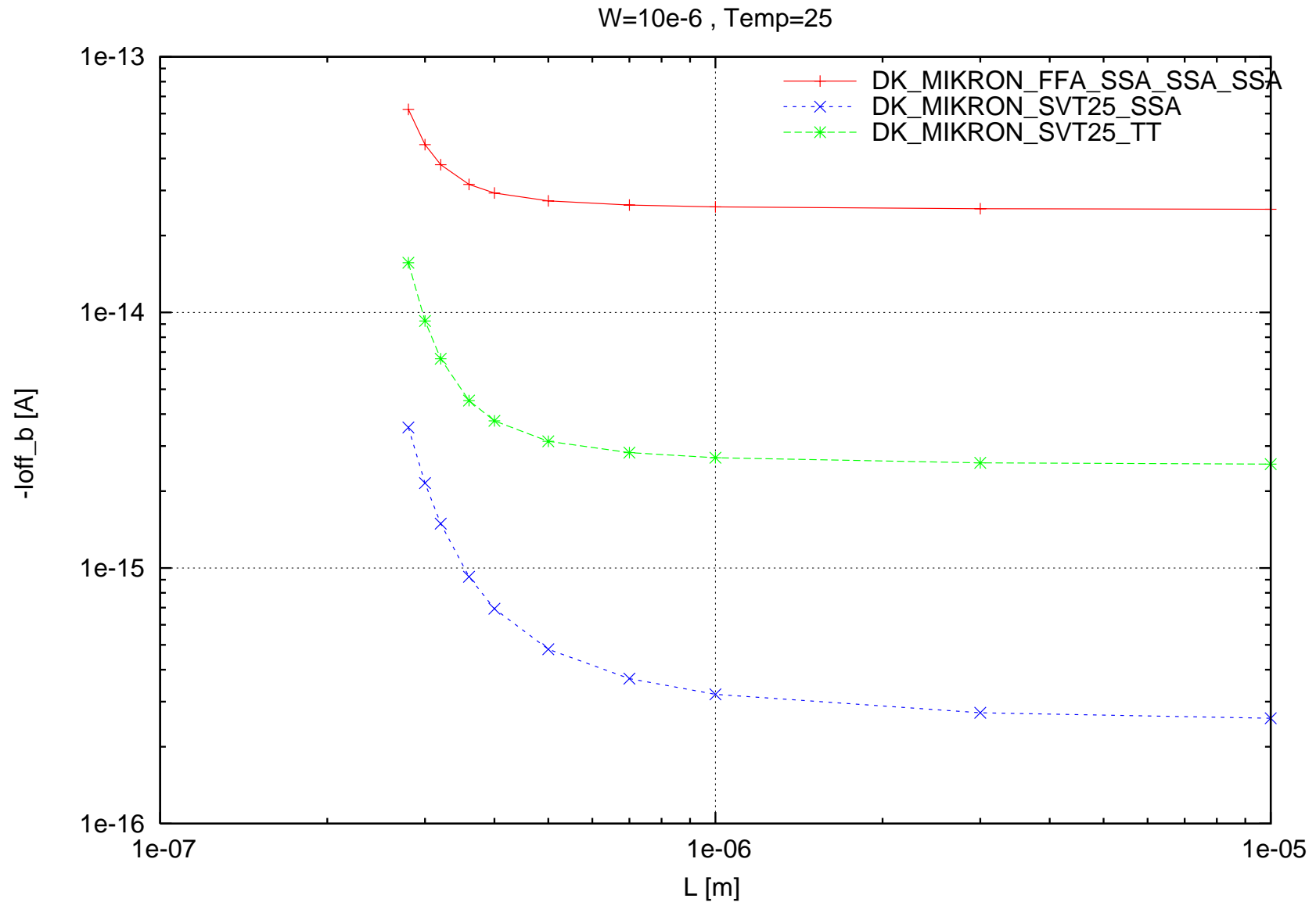
psvt25 loffsat [A] vs. Isat [mA] , W=10e-6 , Temp=25



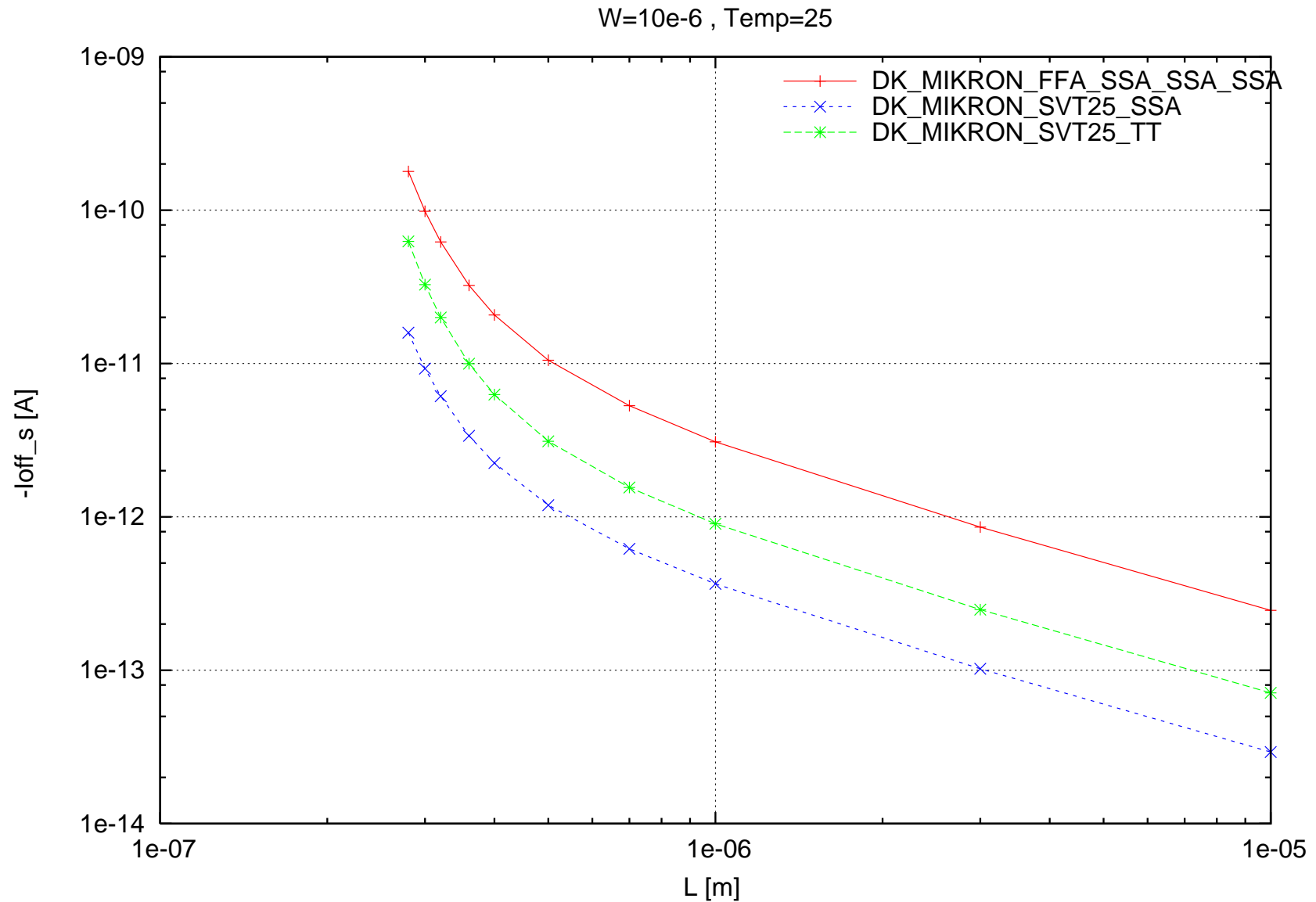
psvt25 loffsat [A] vs. L [m] , W=10e-6 , Temp=25



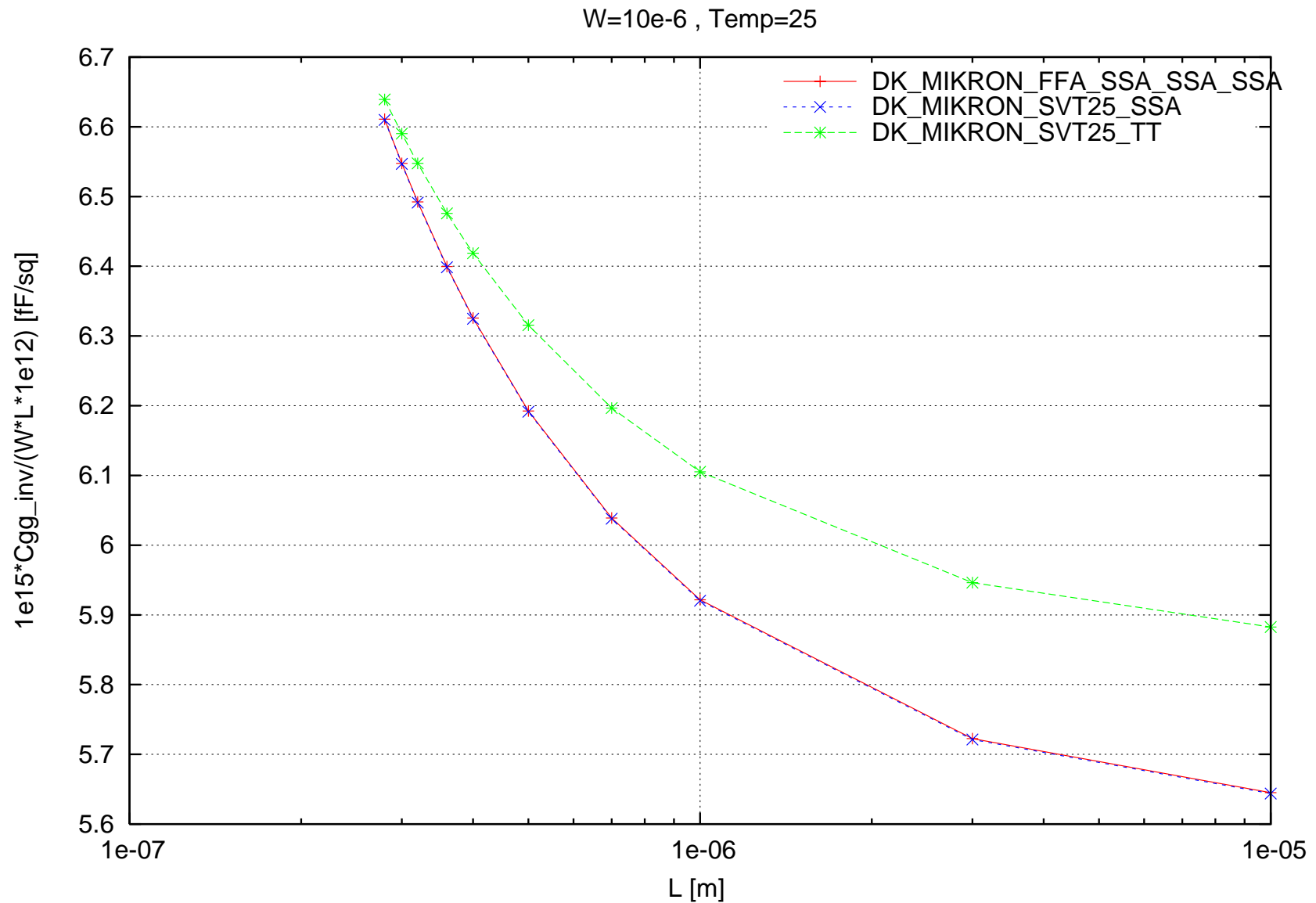
psvt25 -loff_b [A] vs. L [m] , W=10e-6 , Temp=25



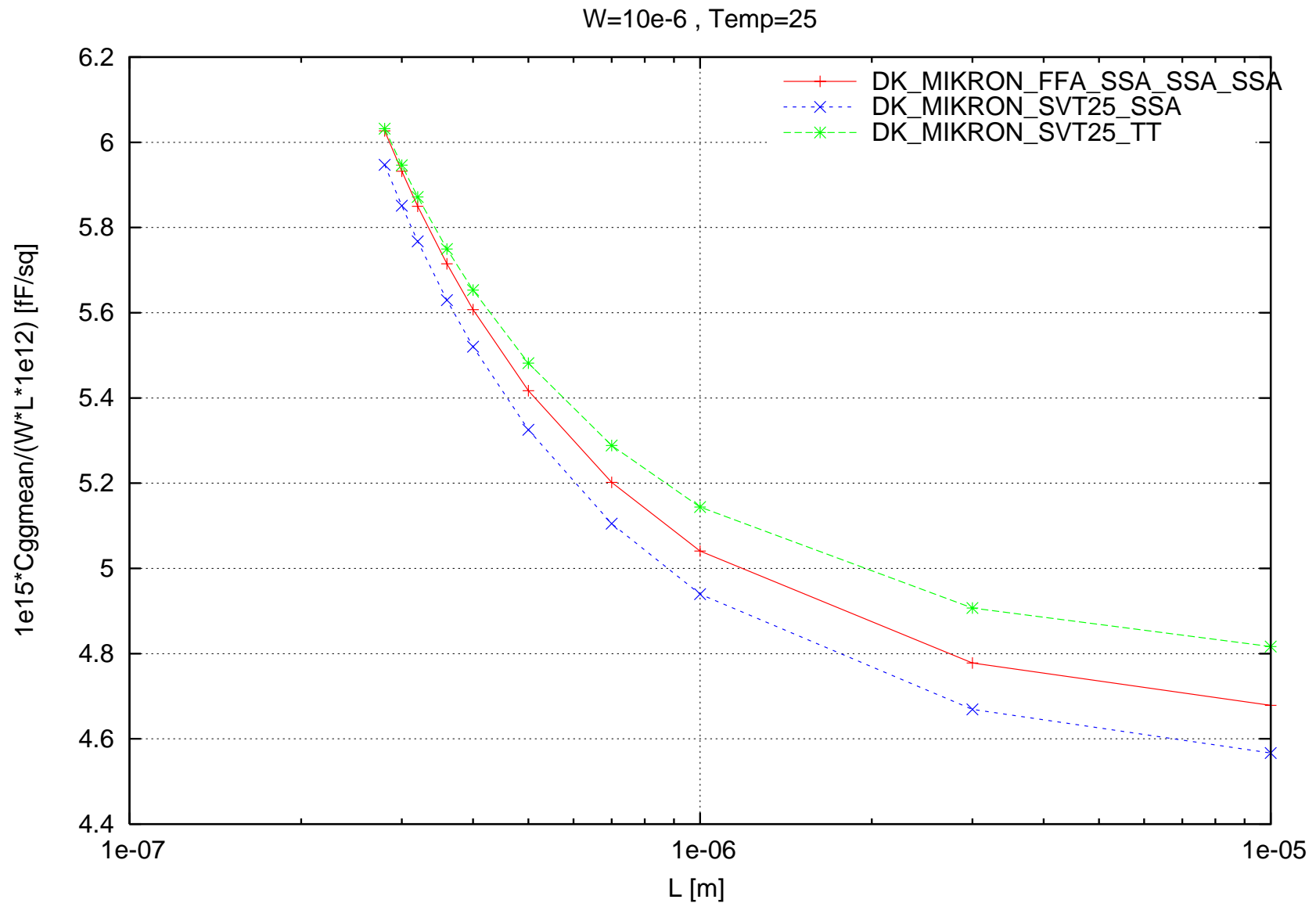
psvt25 -loff_s [A] vs. L [m] , W=10e-6 , Temp=25



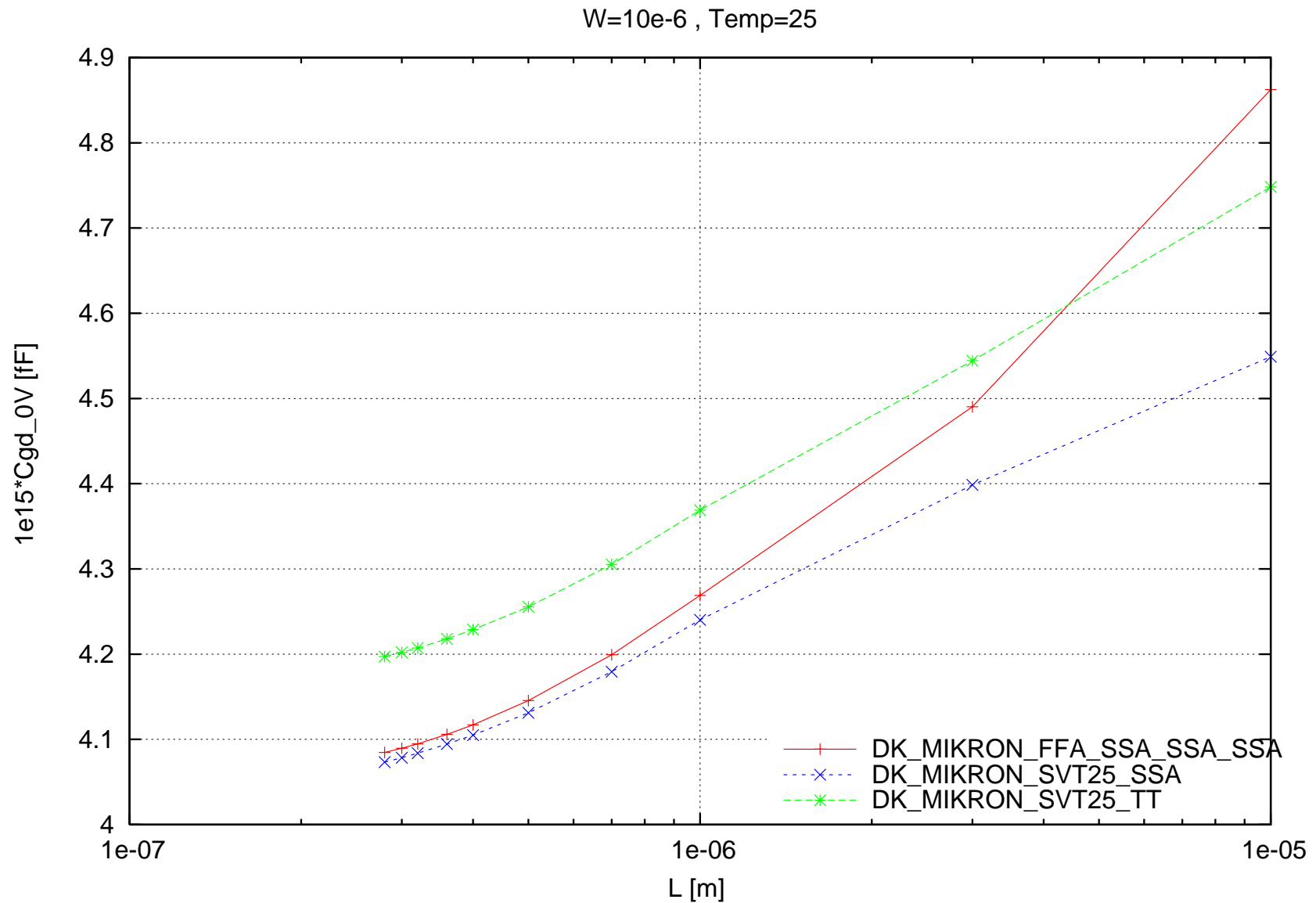
psvt25 1e15*Cgg_inv/(W*L*1e12) [fF/sq] vs. L [m] , W=10e-6 , Temp=25



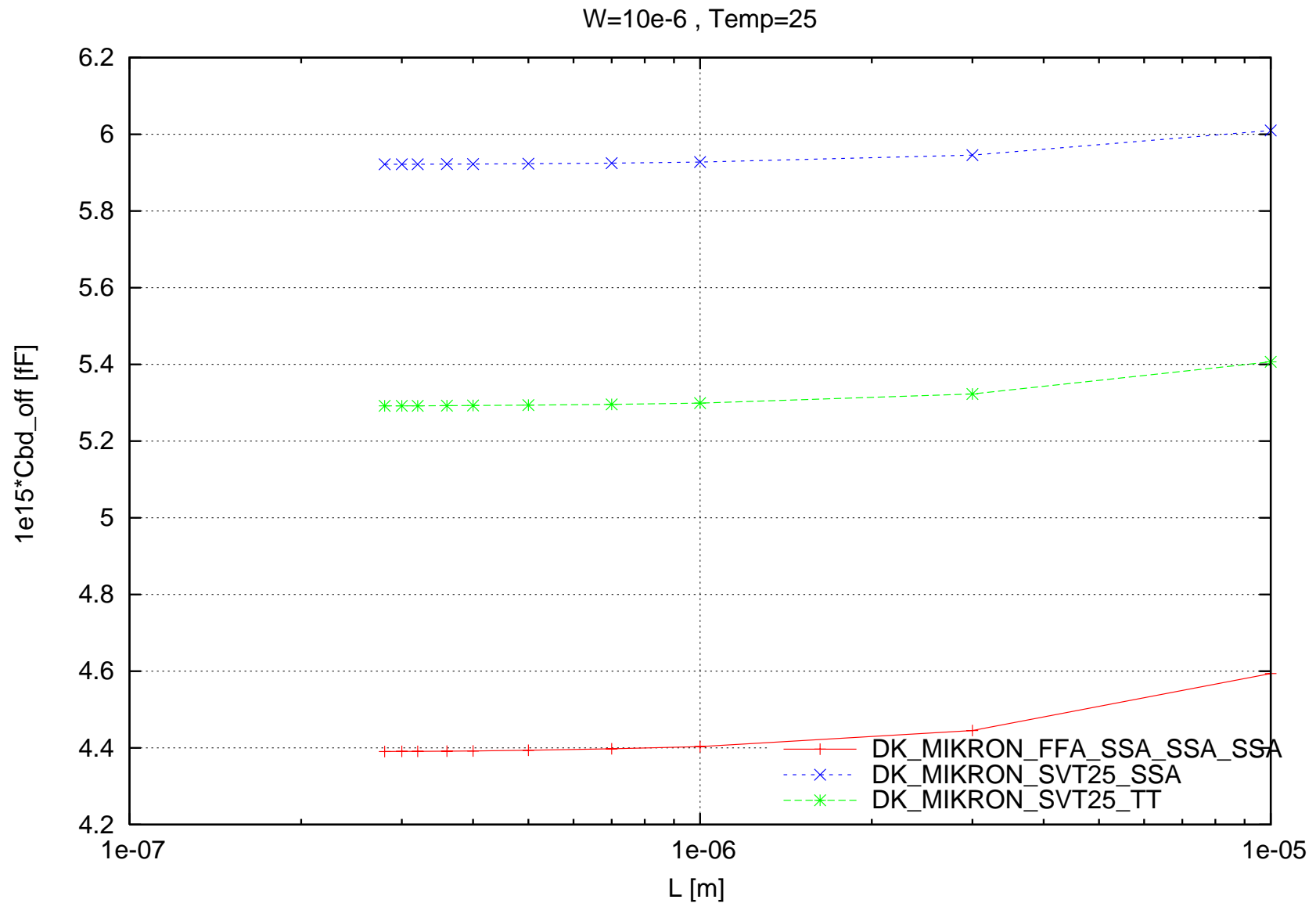
psvt25 $1e15 \cdot C_{ggmean} / (W \cdot L \cdot 1e12)$ [fF/sq] vs. L [m] , W=10e-6 , Temp=25



psvt25 1e15*Cgd_0V [fF] vs. L [m] , W=10e-6 , Temp=25

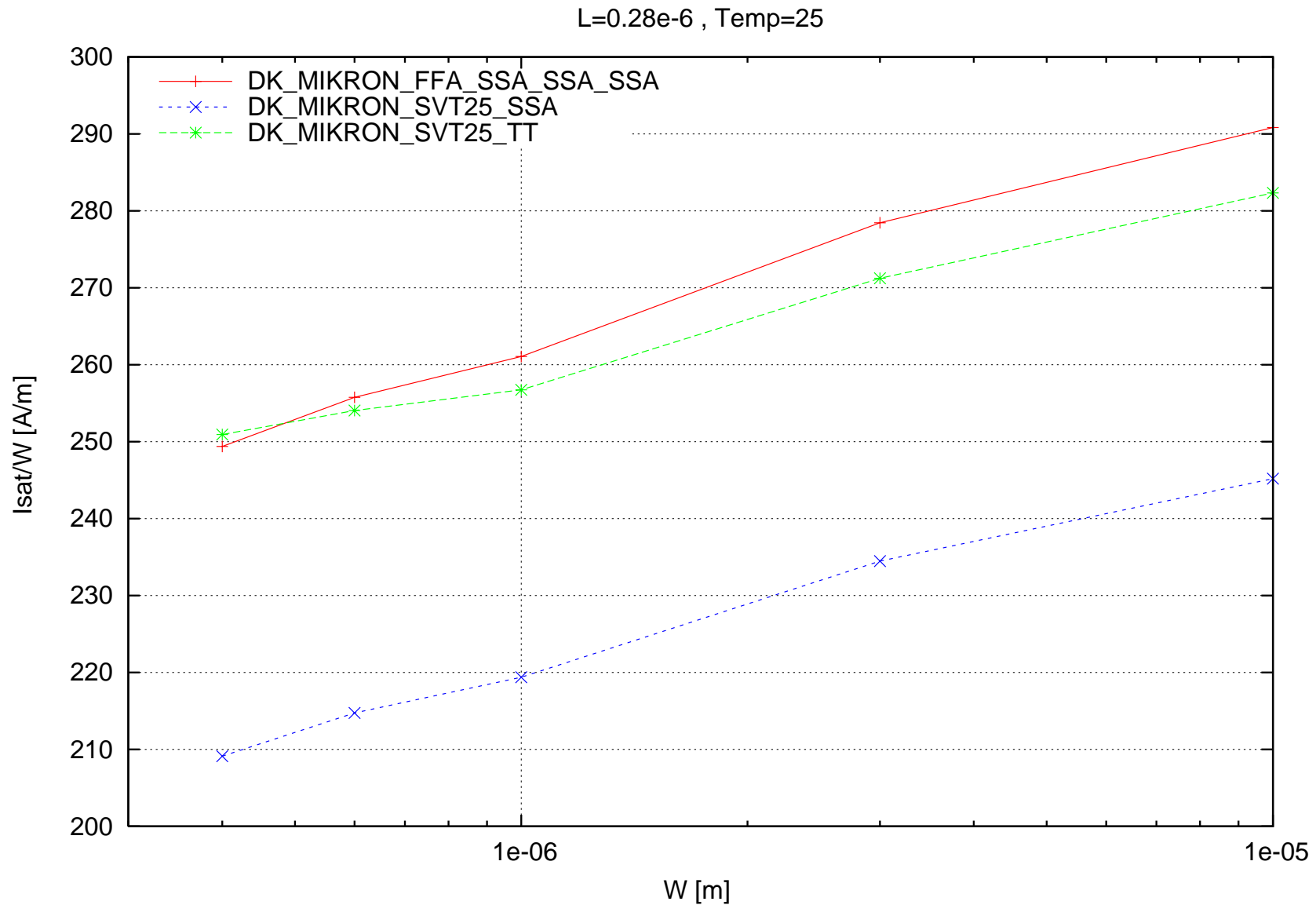


psvt25 1e15*Cbd_off [fF] vs. L [m] , W=10e-6 , Temp=25

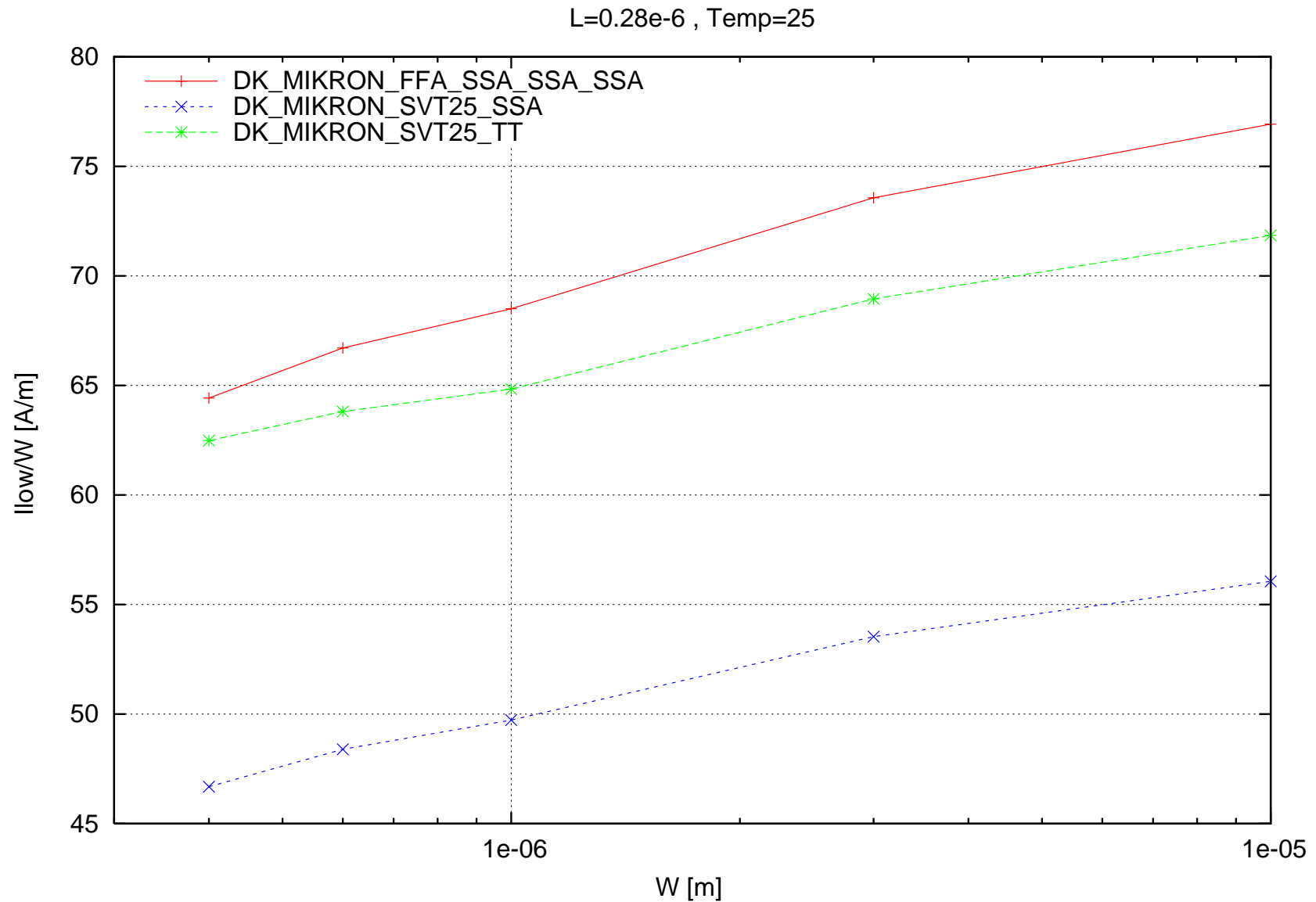


Scaling versus Width for PMOS ($L=0.28\text{e-}6$, Temp=25, po2act=0.82e-6, LPE=0)

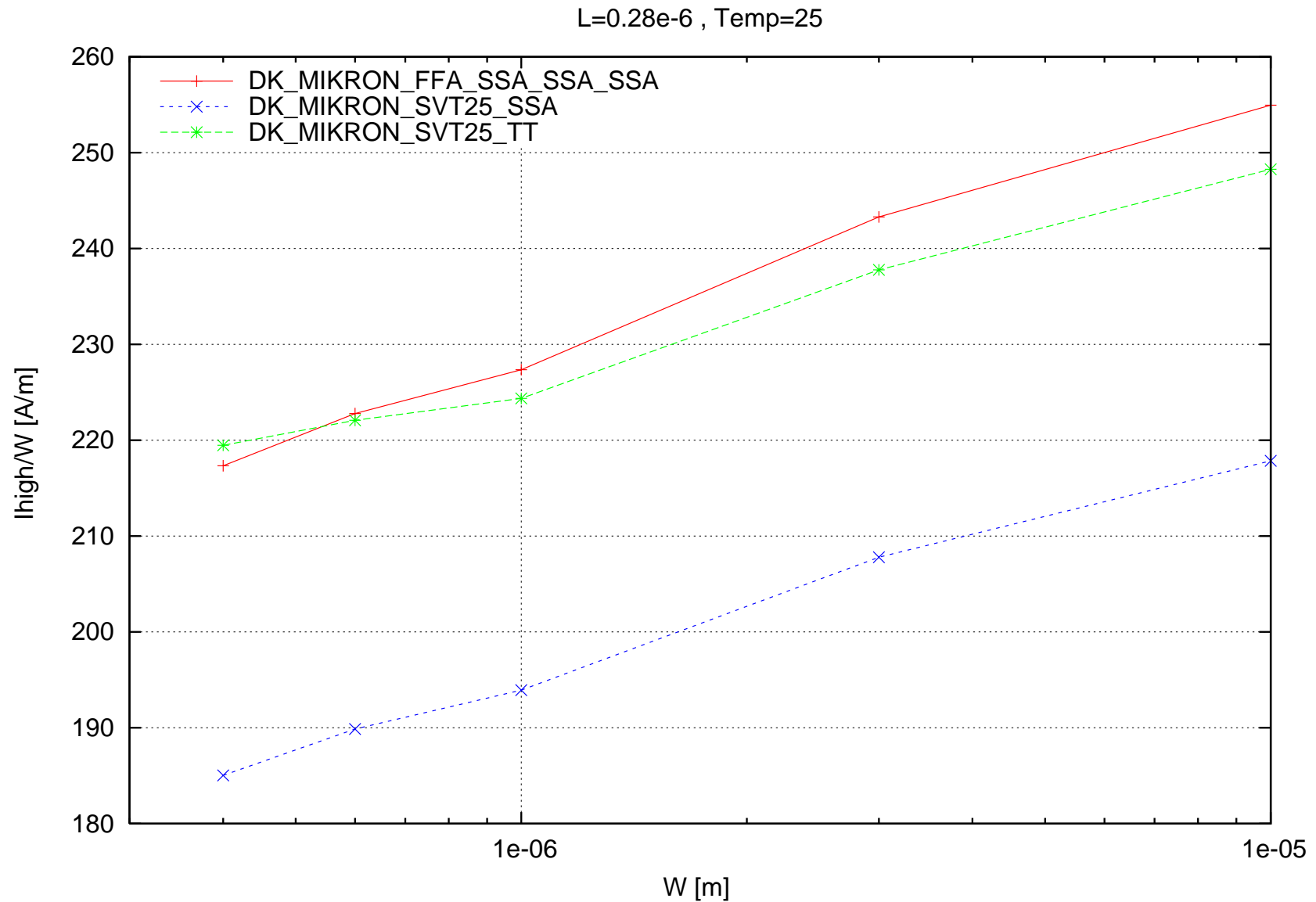
psvt25 Isat/W [A/m] vs. W [m] , L=0.28e-6 , Temp=25



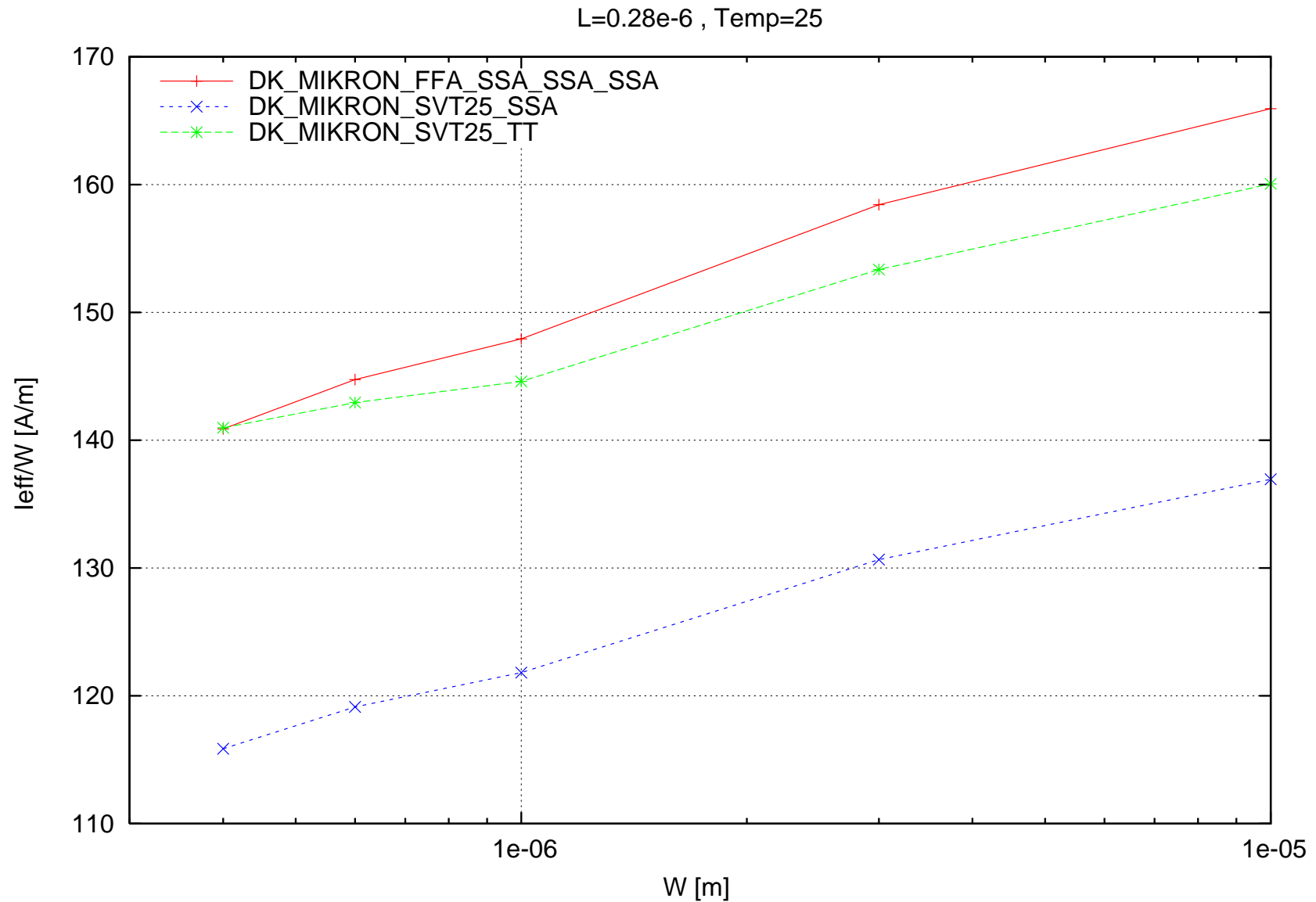
psvt25 I_{low}/W [A/m] vs. W [m] , L=0.28e-6 , Temp=25



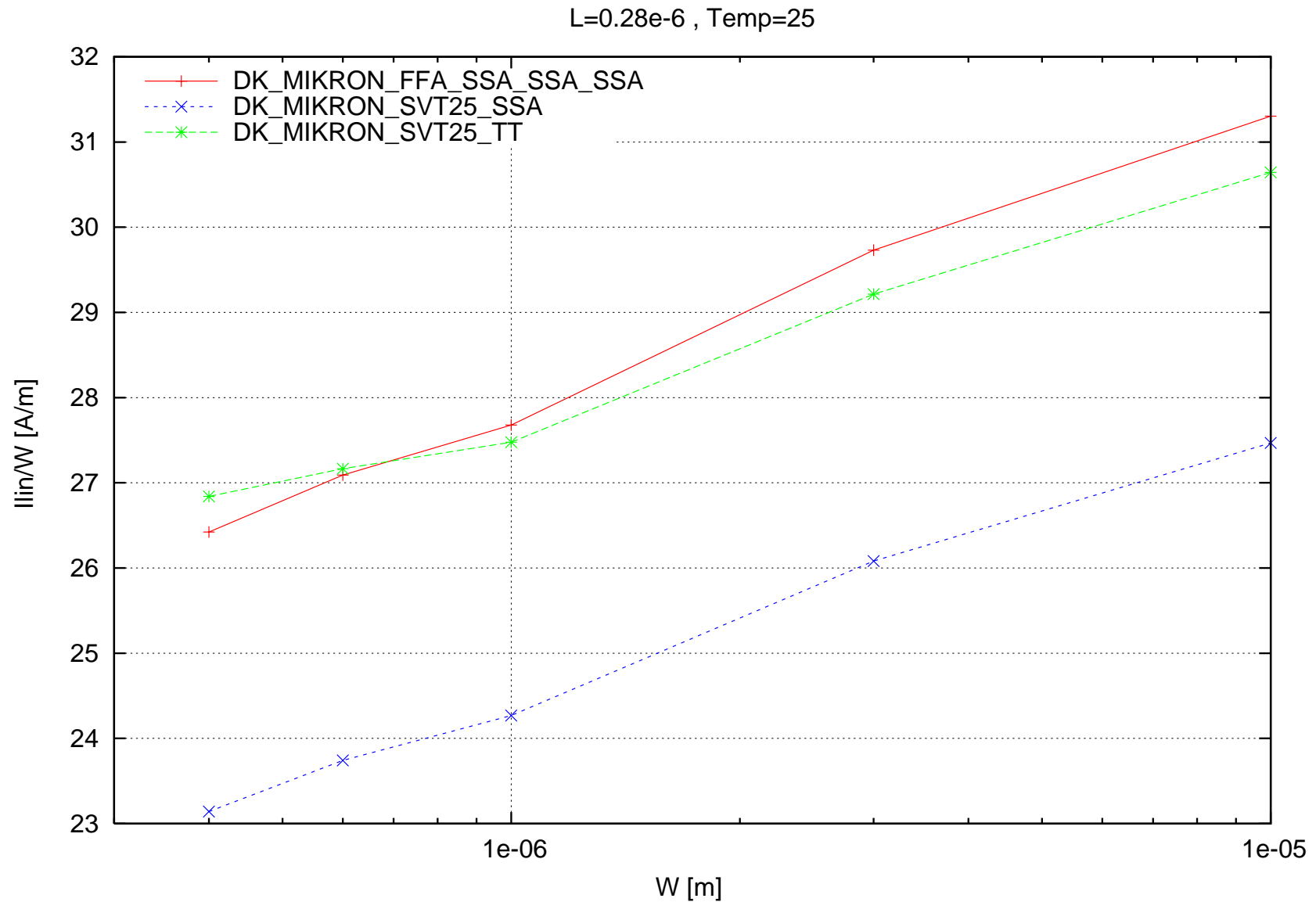
psvt25 I_{high}/W [A/m] vs. W [m] , L=0.28e-6 , Temp=25



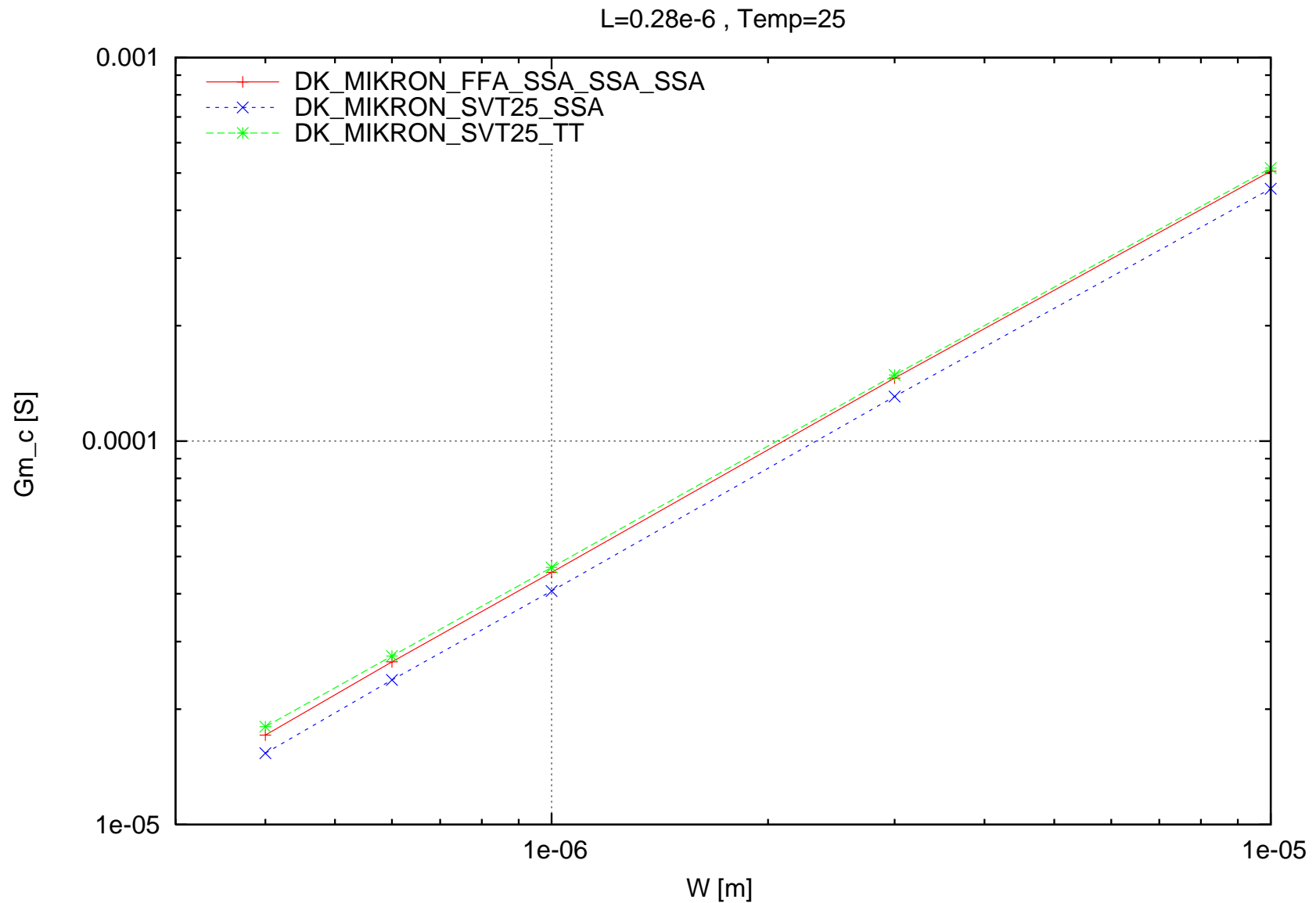
psvt25 I_{eff}/W [A/m] vs. W [m] , $L=0.28e-6$, Temp=25



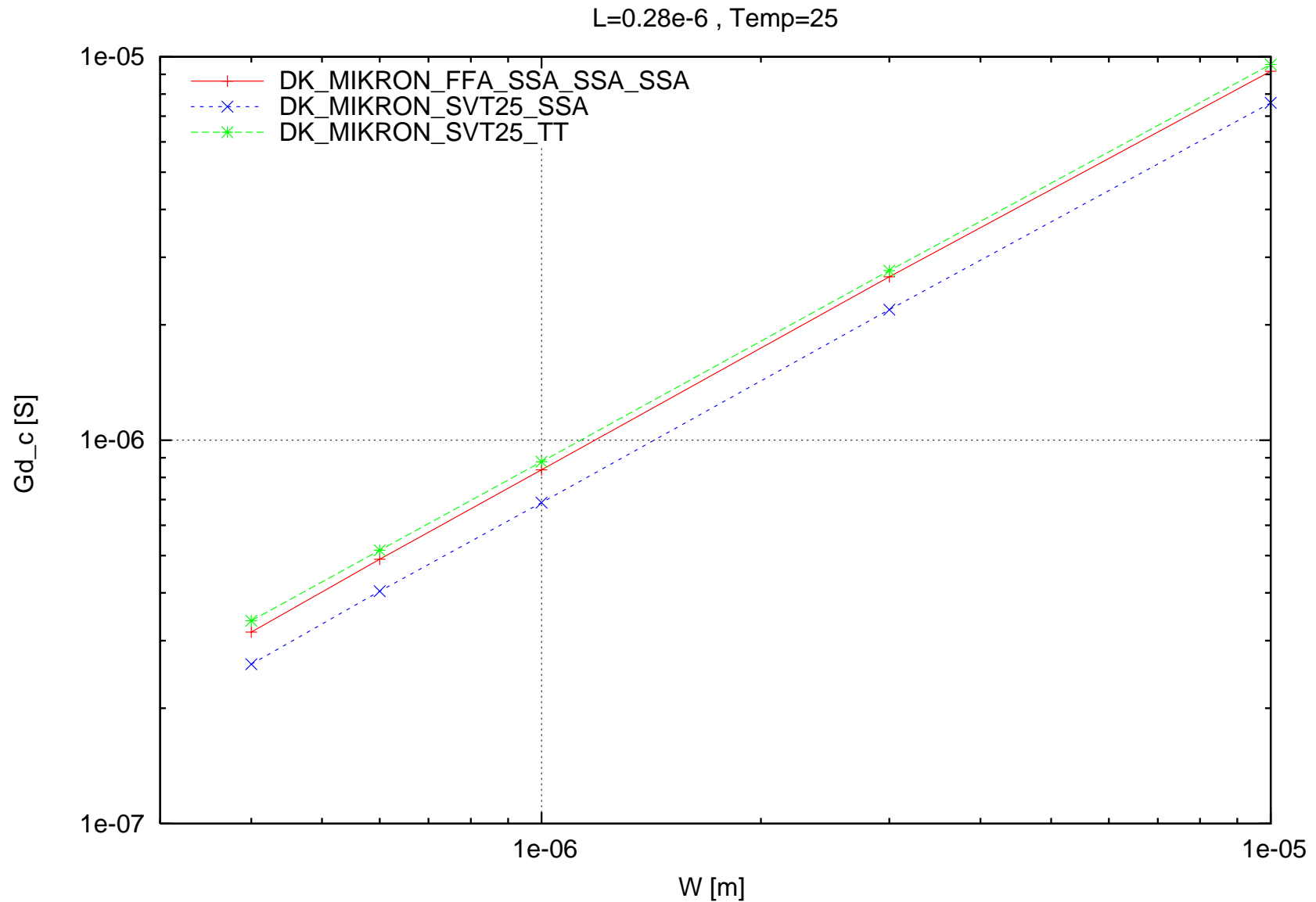
psvt25 Ilin/W [A/m] vs. W [m] , L=0.28e-6 , Temp=25



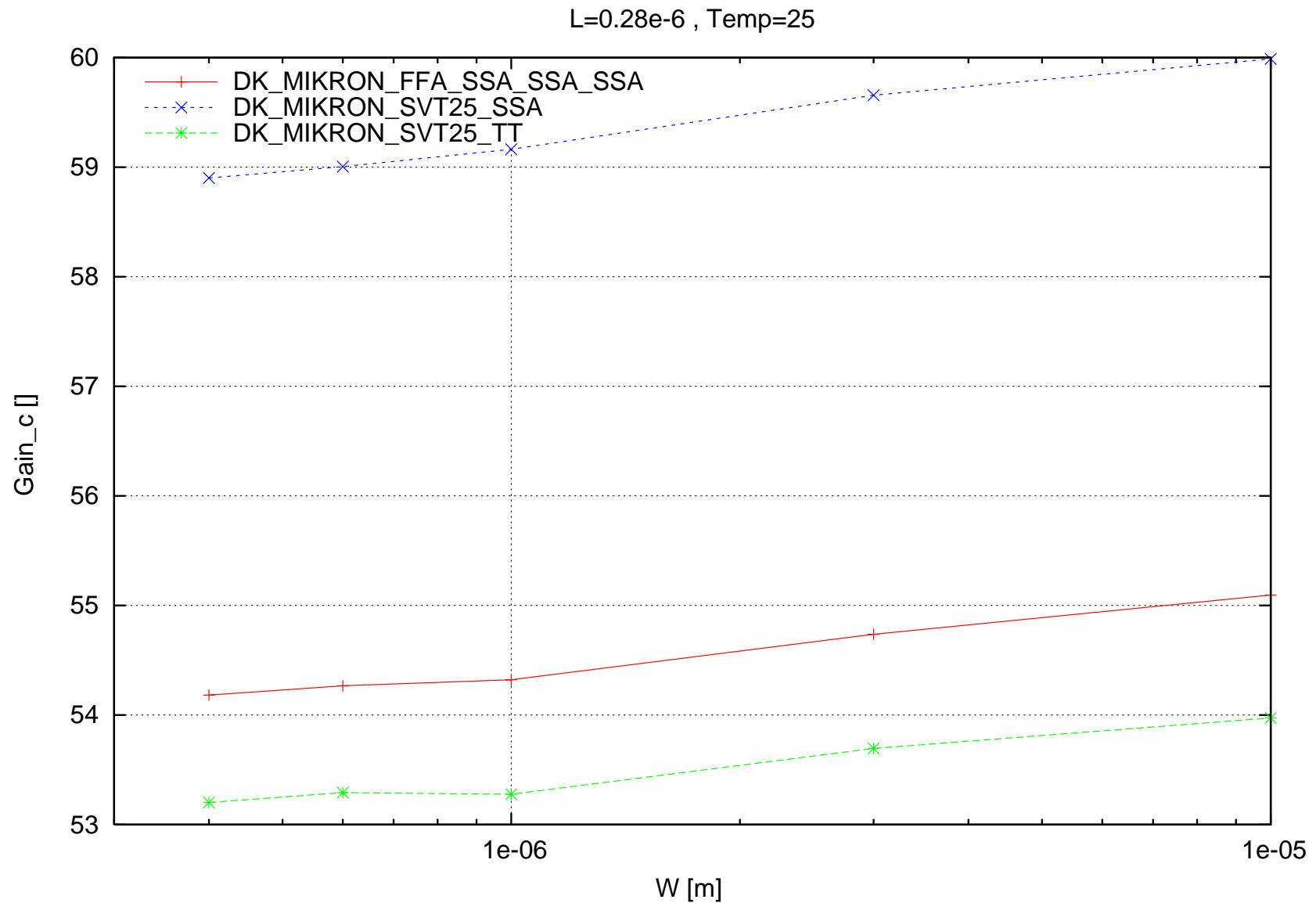
psvt25 Gm_c [S] vs. W [m] , L=0.28e-6 , Temp=25



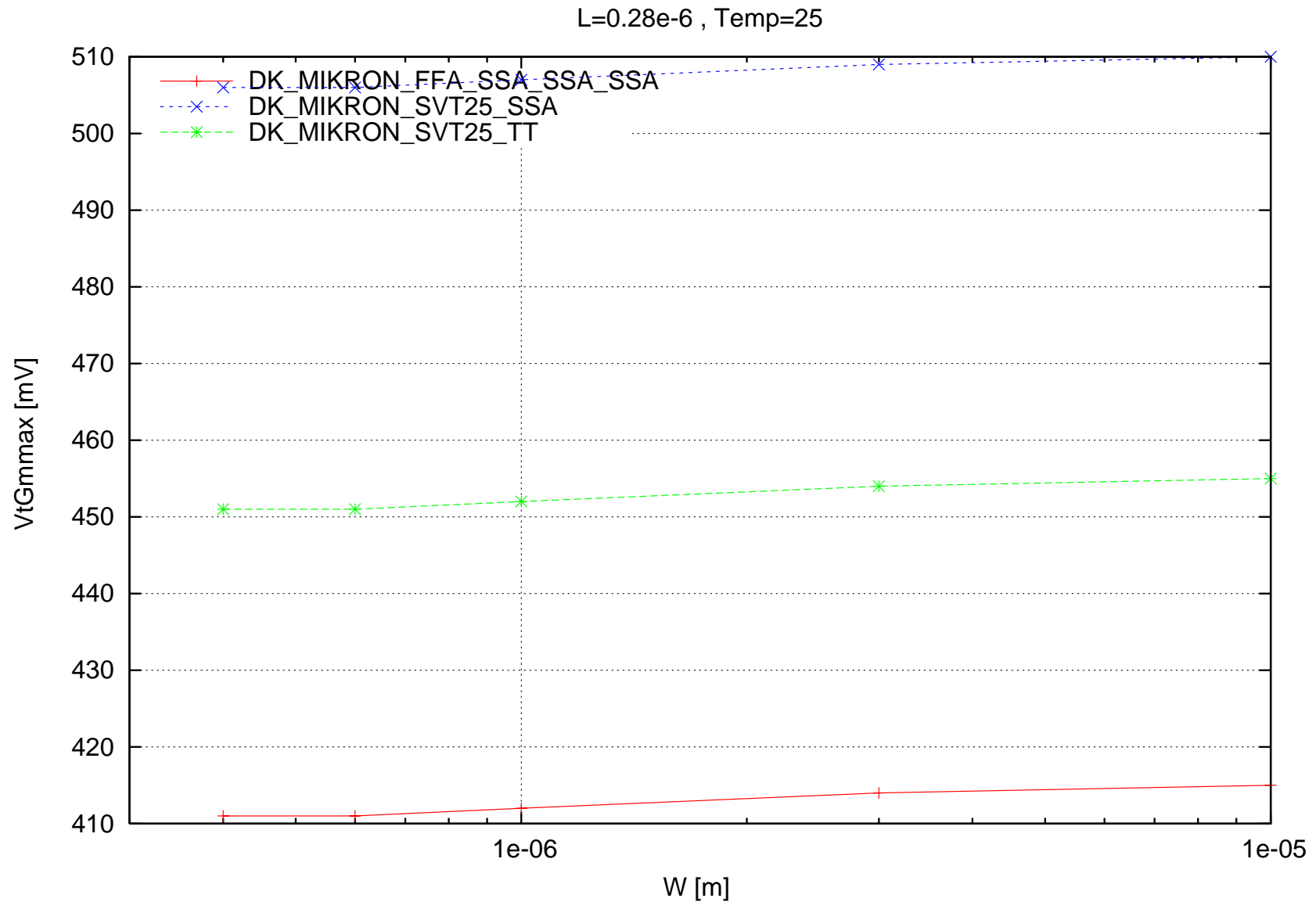
psvt25 Gd_c [S] vs. W [m] , L=0.28e-6 , Temp=25



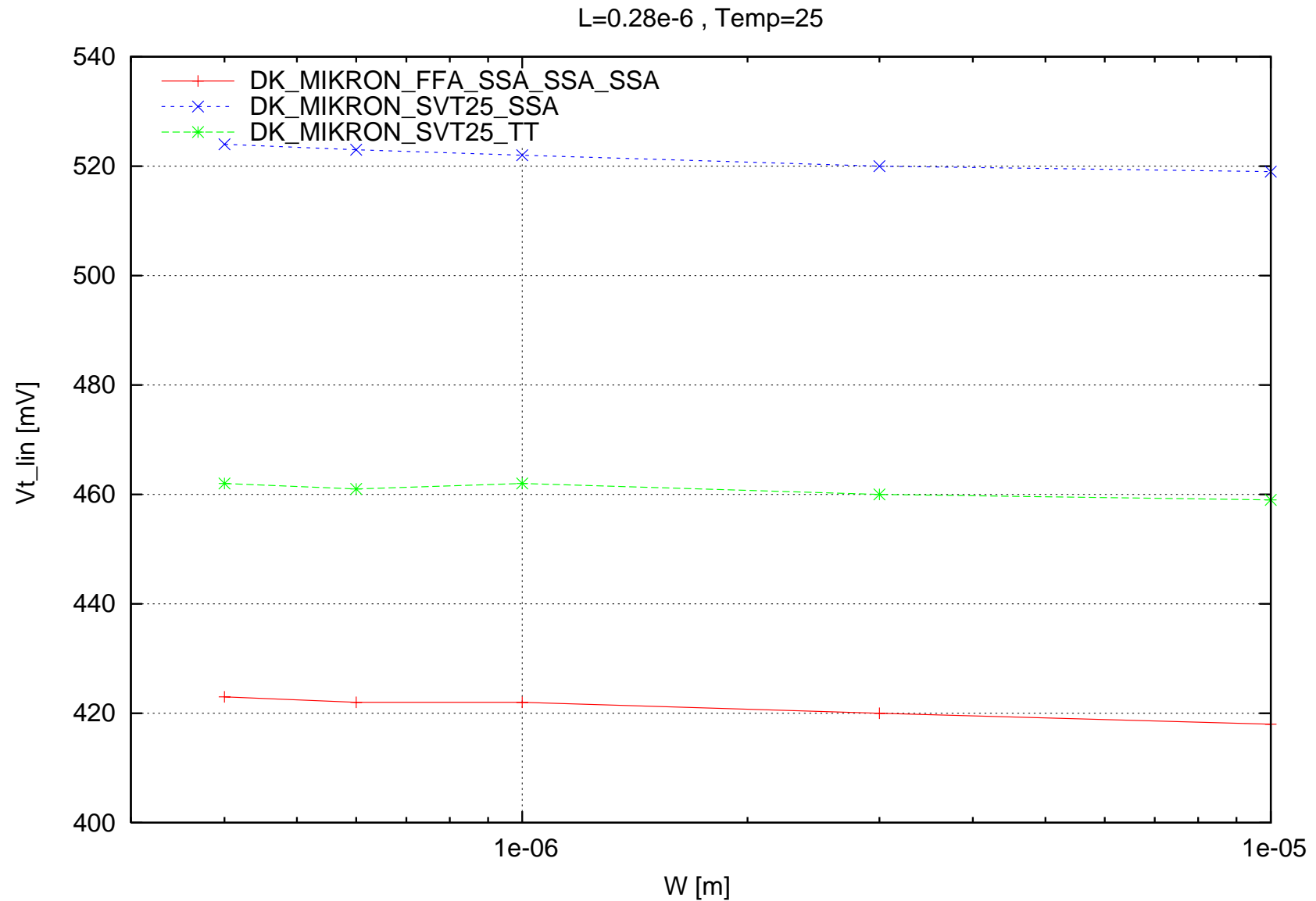
psvt25 Gain_c [] vs. W [m] , L=0.28e-6 , Temp=25



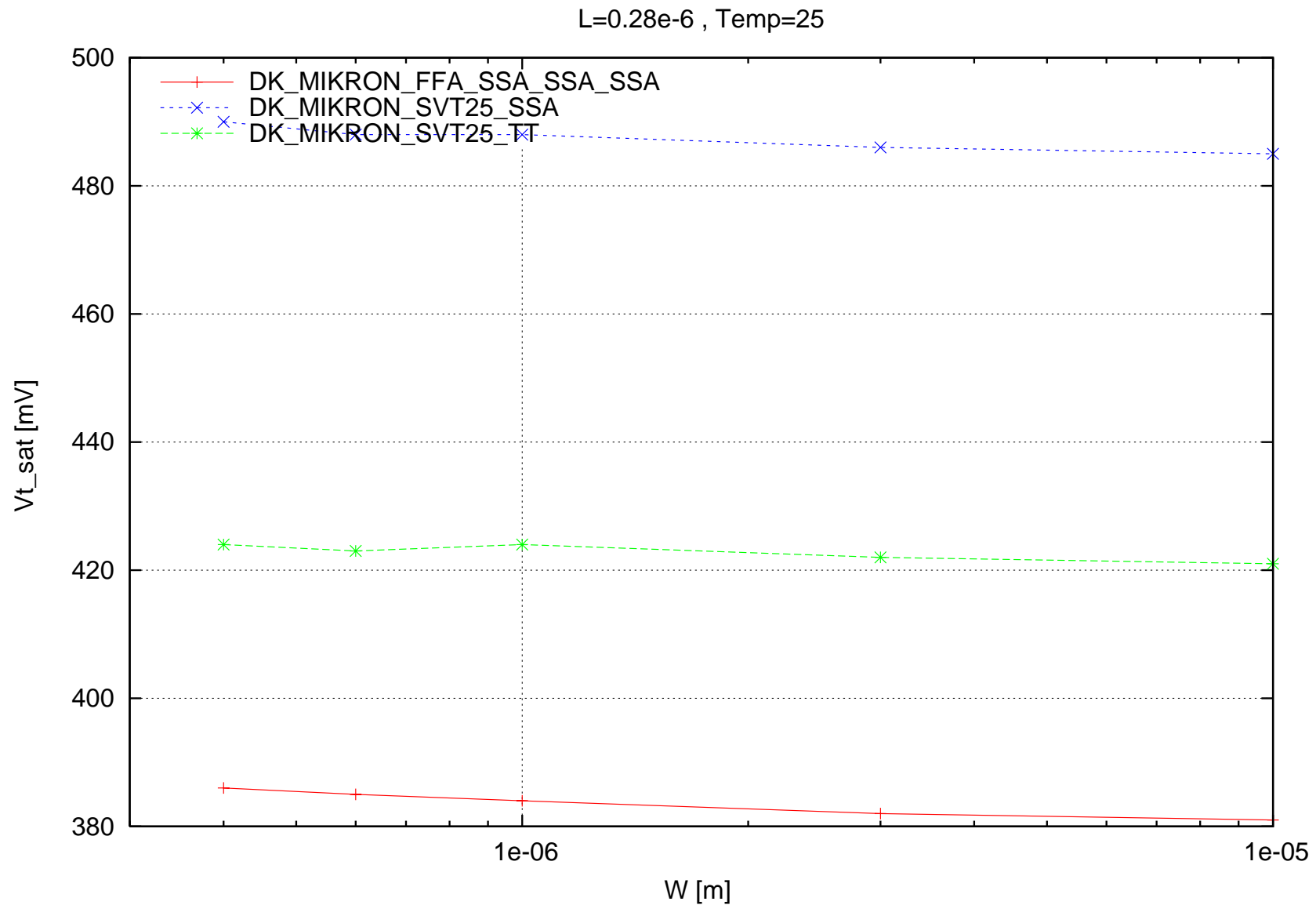
psvt25 V_tG_{max} [mV] vs. W [m] , $L=0.28e-6$, Temp=25



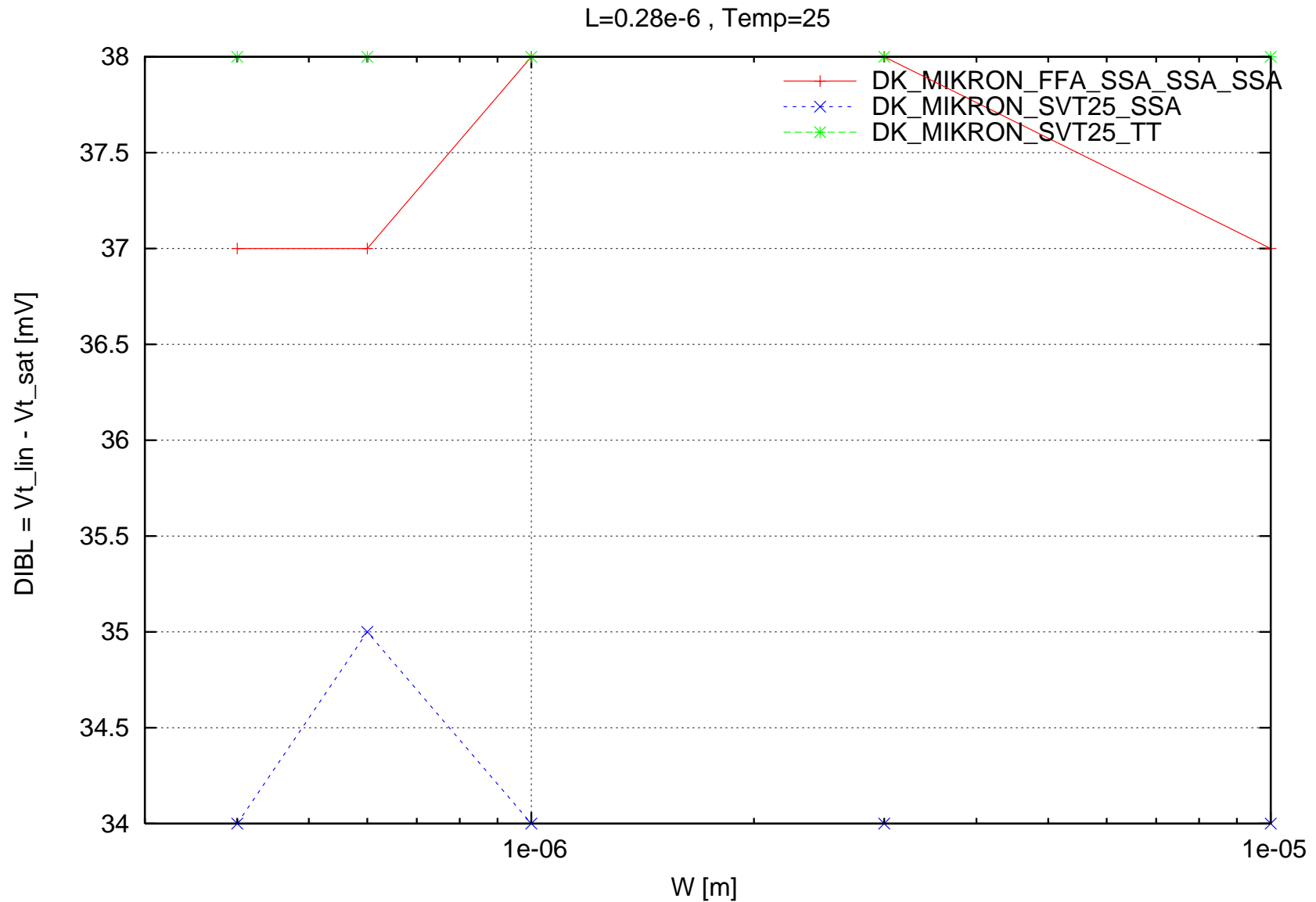
psvt25 Vt_lin [mV] vs. W [m] , L=0.28e-6 , Temp=25



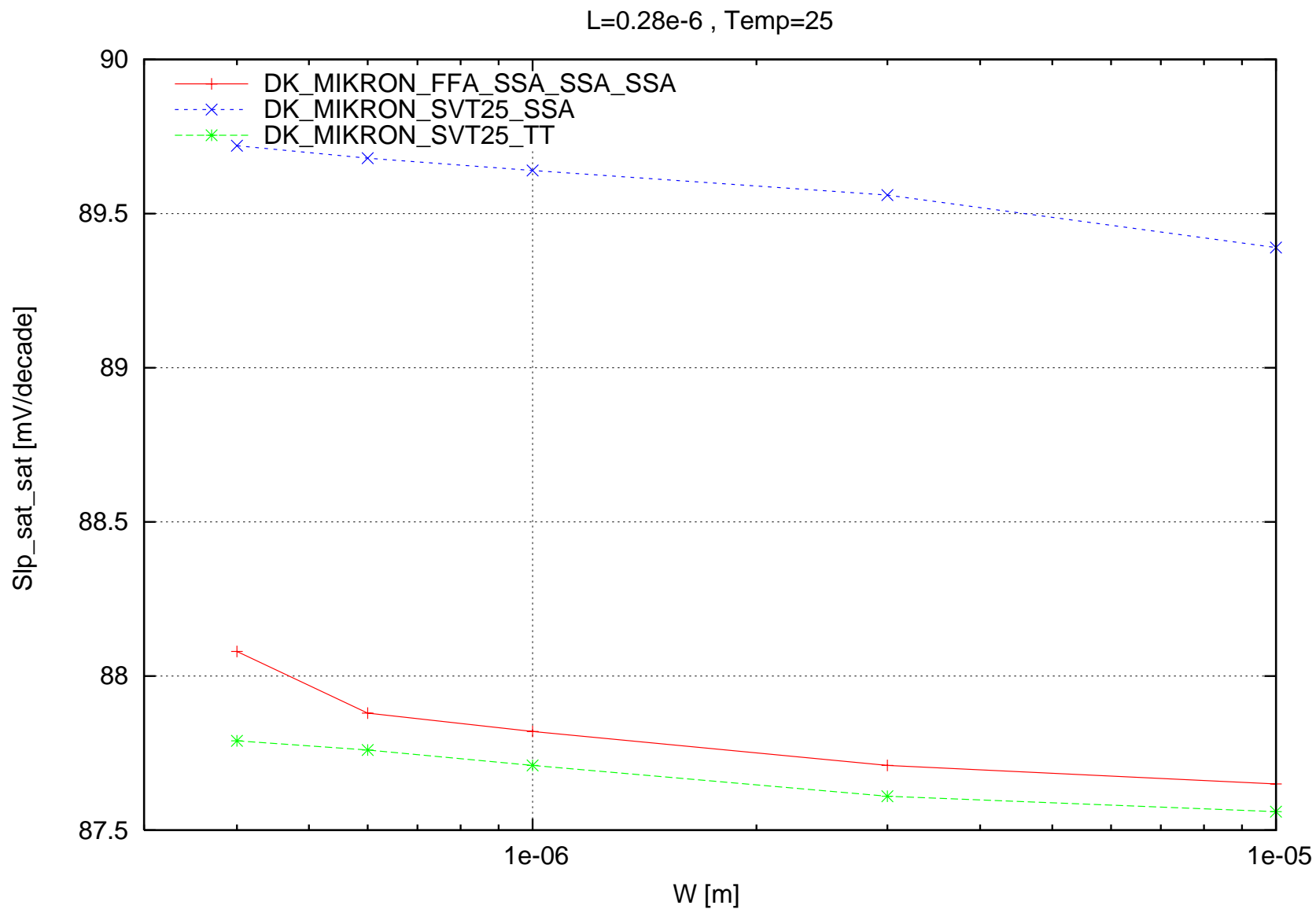
psvt25 Vt_sat [mV] vs. W [m] , L=0.28e-6 , Temp=25



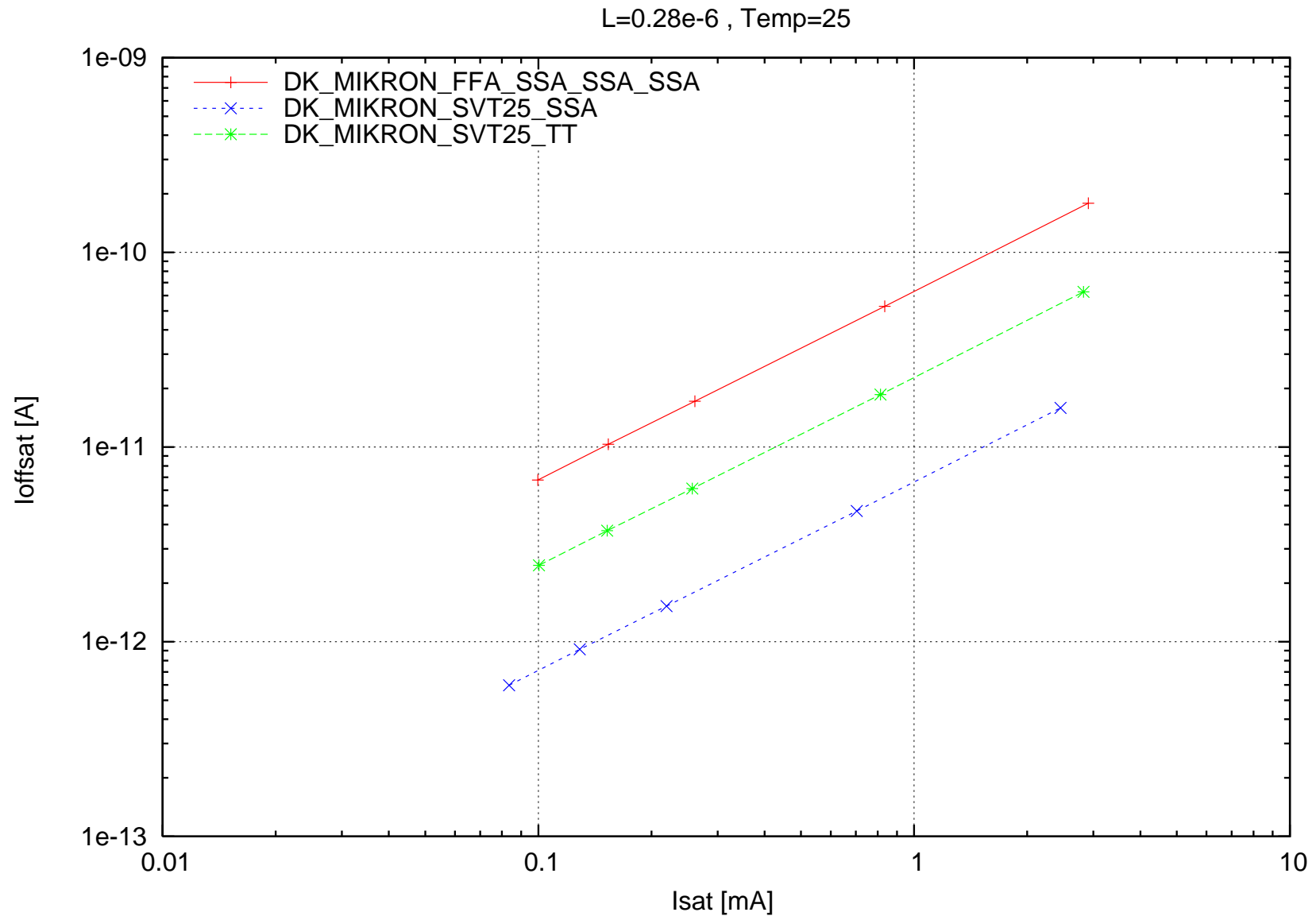
psvt25 DIBL = $V_{t_lin} - V_{t_sat}$ [mV] vs. W [m] , $L=0.28e-6$, Temp=25



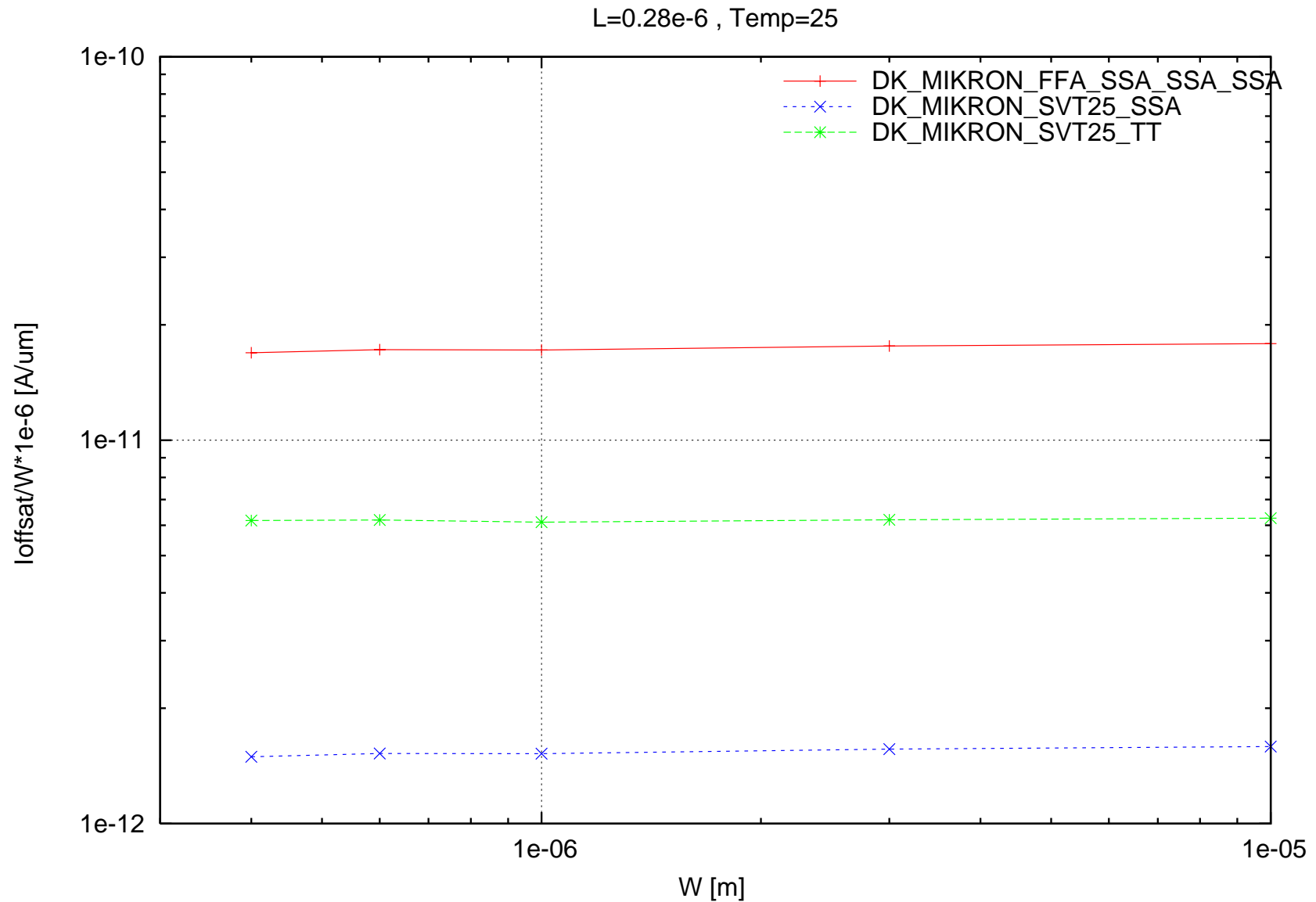
psvt25 SIp_sat_sat [mV/decade] vs. W [m] , L=0.28e-6 , Temp=25



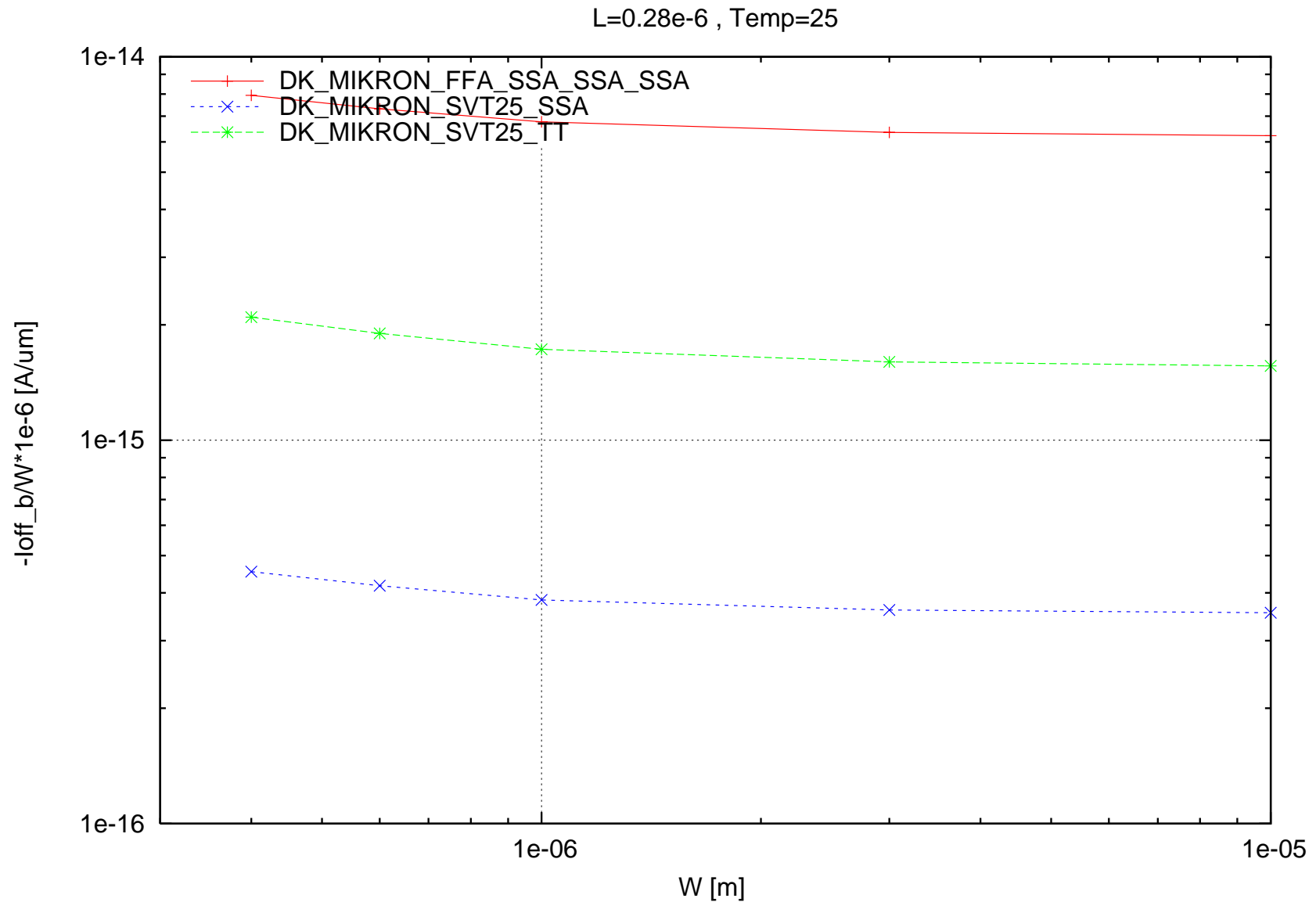
psvt25 loffsat [A] vs. Isat [mA] , L=0.28e-6 , Temp=25



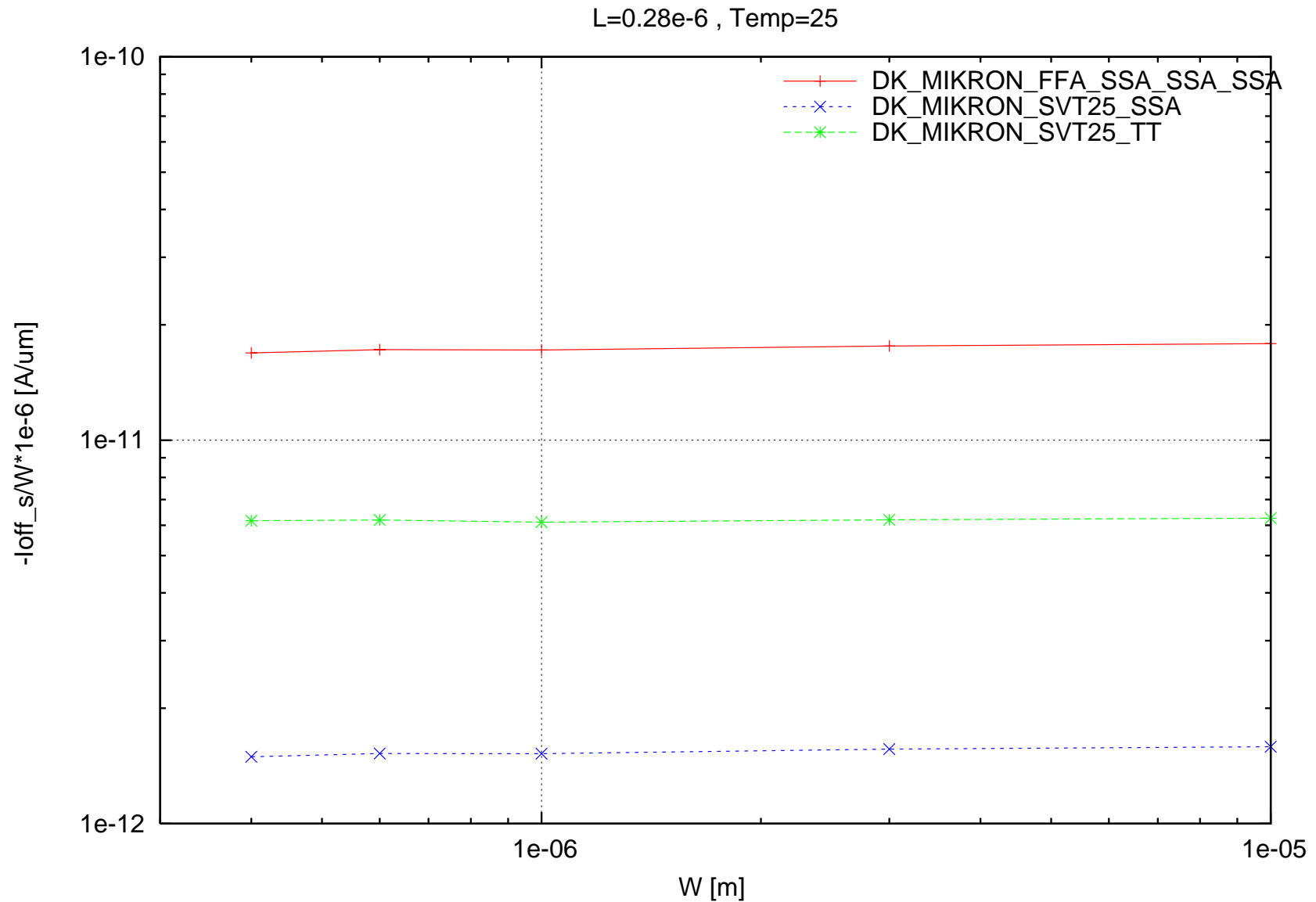
psvt25 loffsat/W*1e-6 [A/um] vs. W [m] , L=0.28e-6 , Temp=25



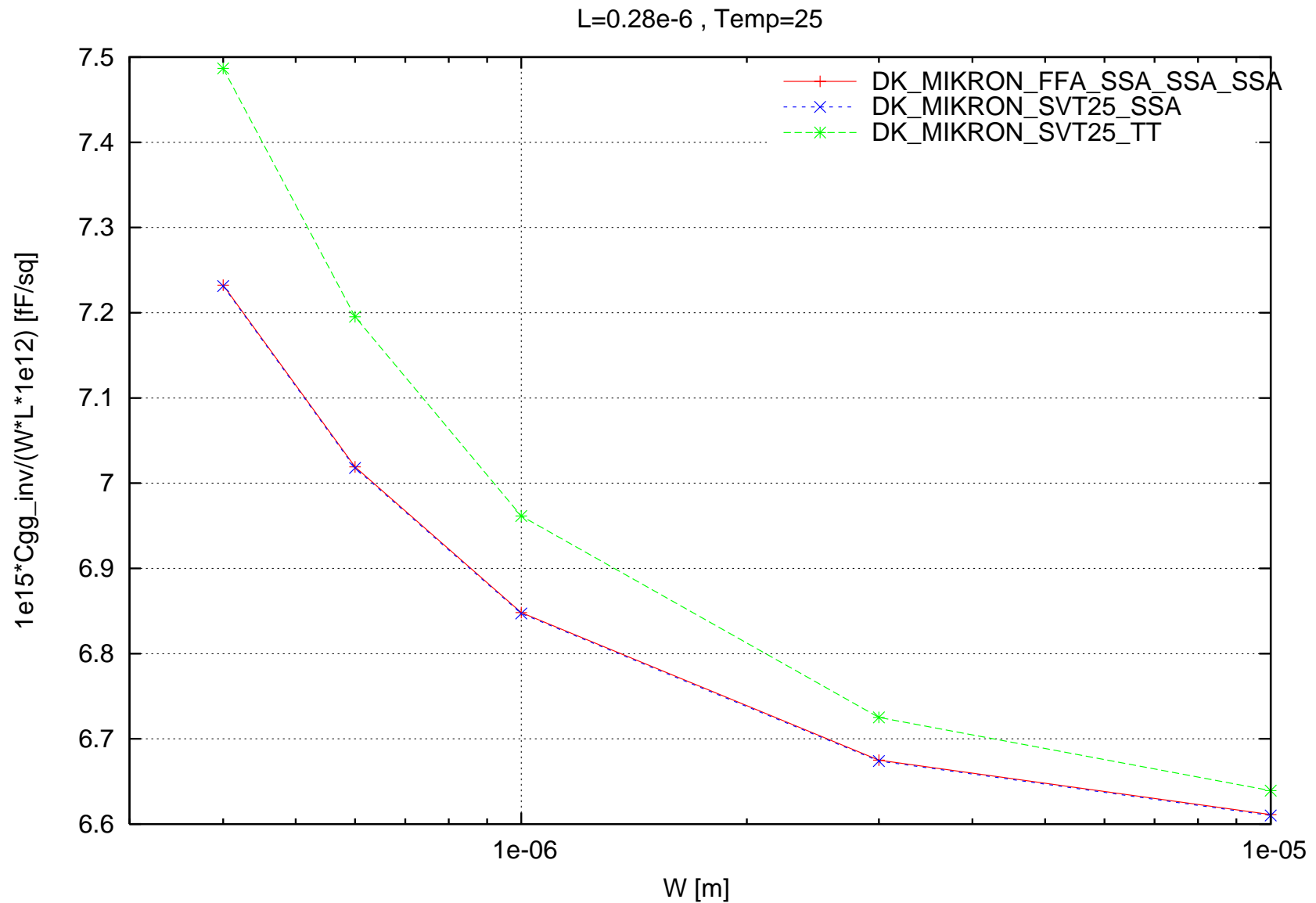
psvt25 -loff_b/W*1e-6 [A/um] vs. W [m] , L=0.28e-6 , Temp=25



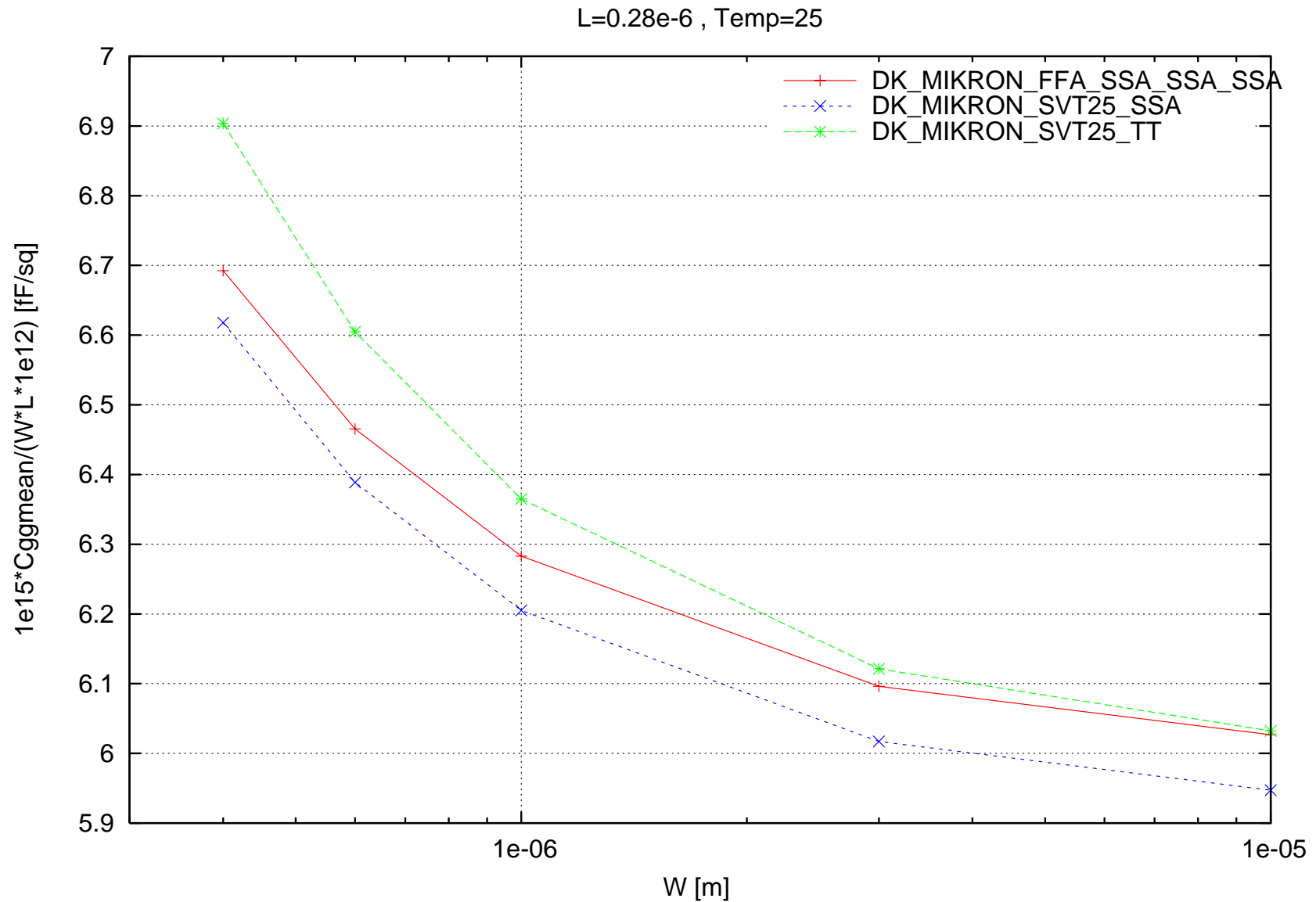
psvt25 -loff_s/W*1e-6 [A/um] vs. W [m] , L=0.28e-6 , Temp=25



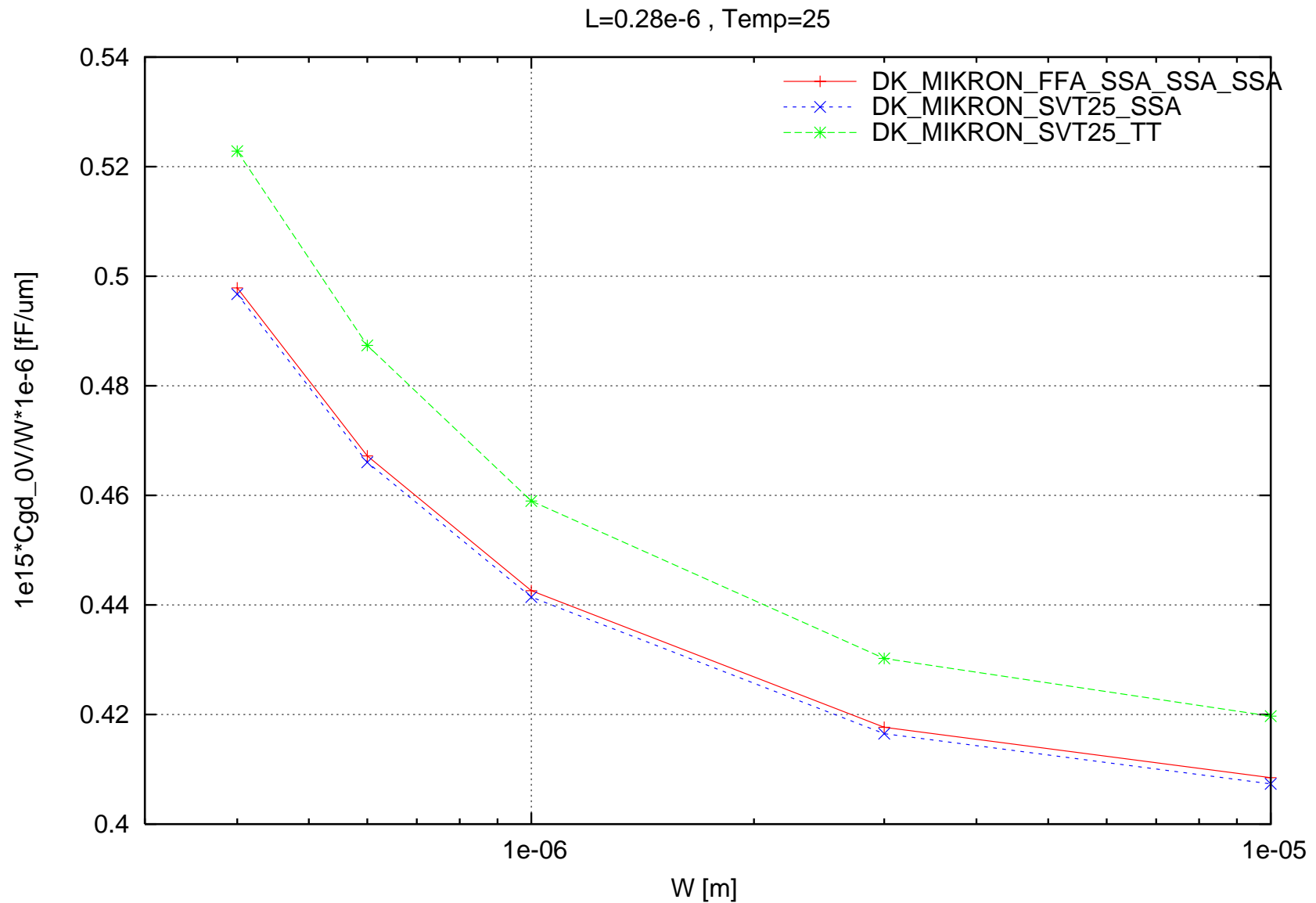
psvt25 1e15*Cgg_inv/(W*L*1e12) [fF/sq] vs. W [m] , L=0.28e-6 , Temp=25



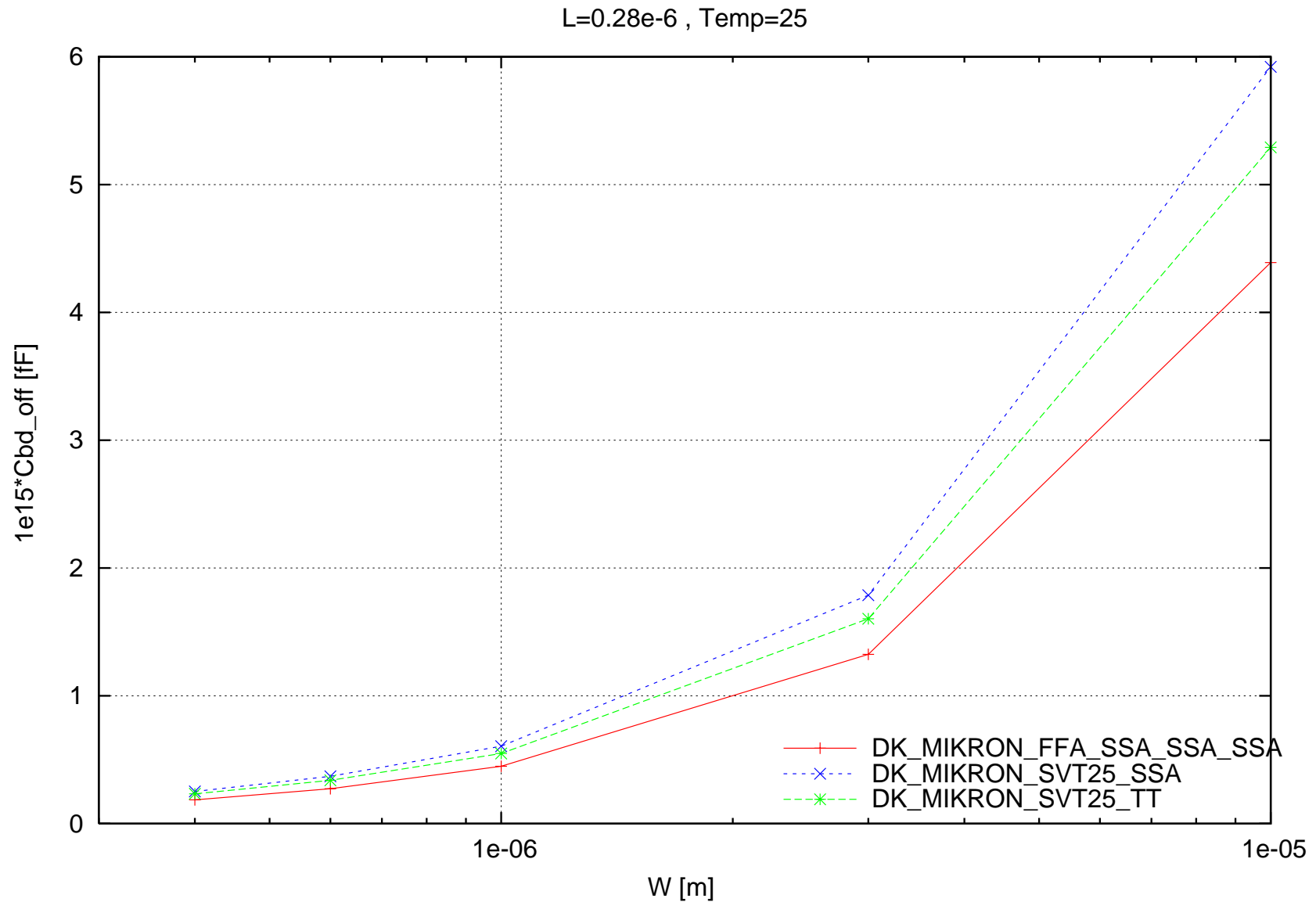
psvt25 $1e15 \cdot C_{ggmean} / (W \cdot L \cdot 1e12)$ [fF/sq] vs. W [m] , L=0.28e-6 , Temp=25



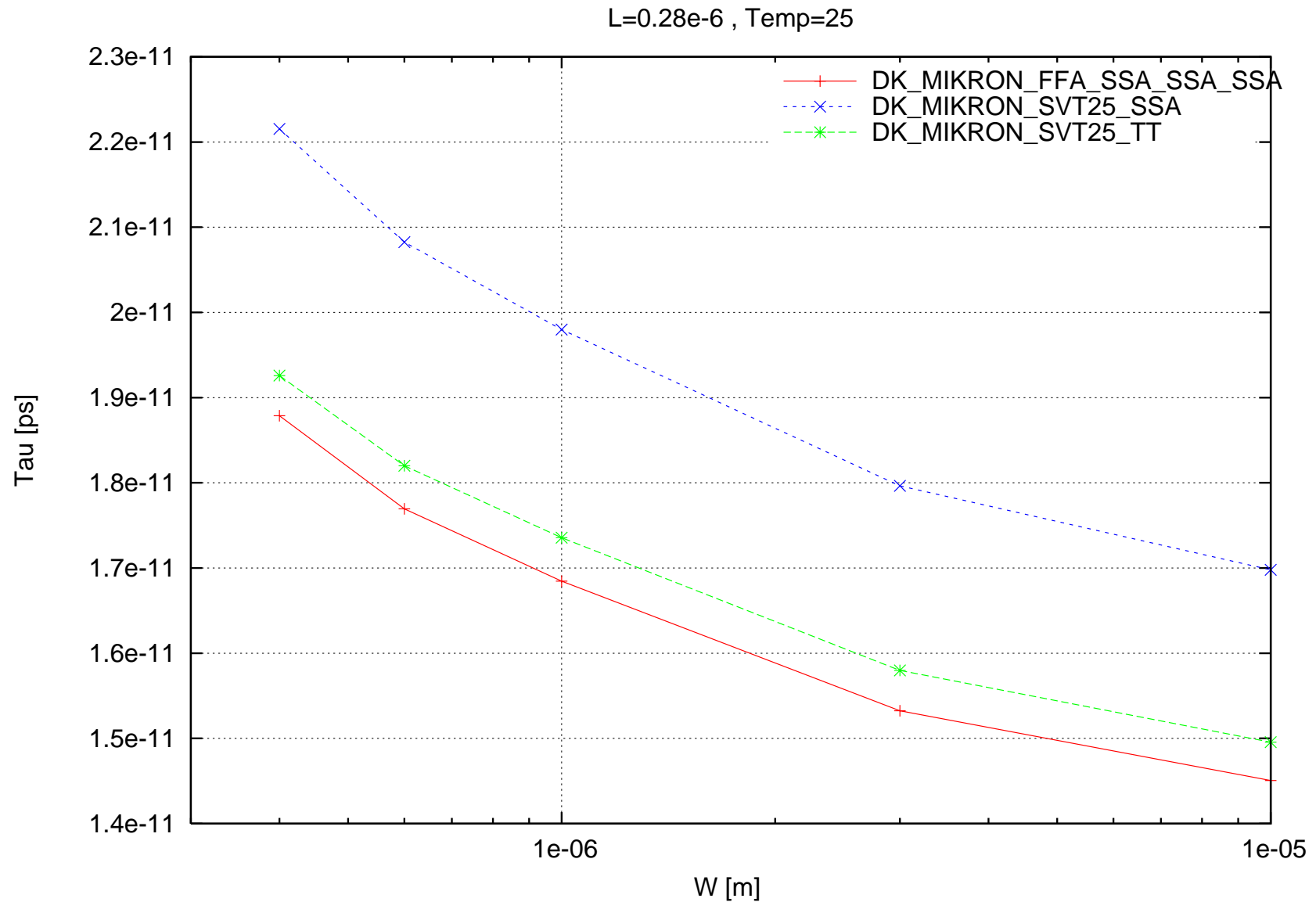
psvt25 1e15*Cgd_0V/W*1e-6 [fF/um] vs. W [m] , L=0.28e-6 , Temp=25



psvt25 1e15*Cbd_off [fF] vs. W [m] , L=0.28e-6 , Temp=25

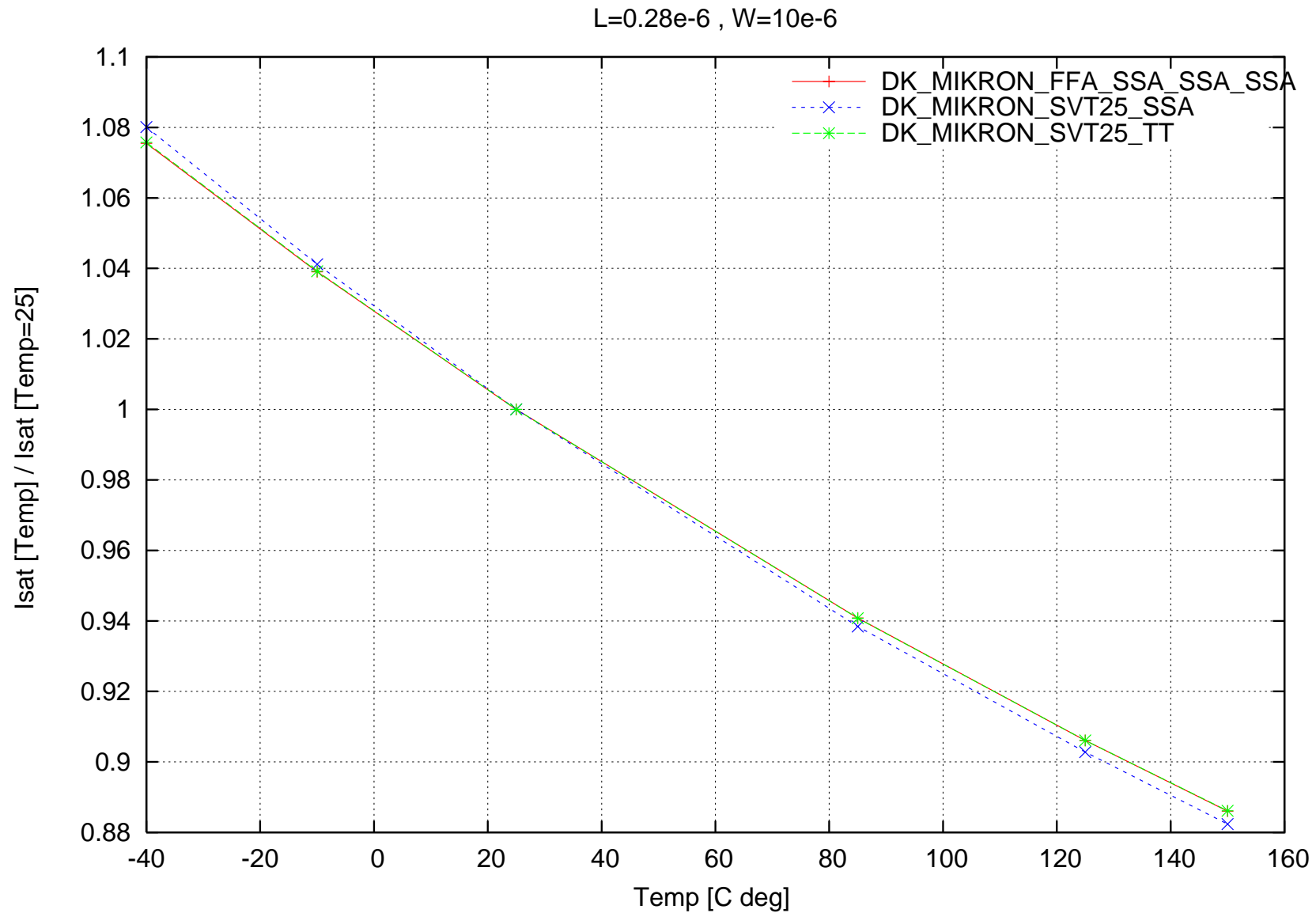


psvt25 Tau [ps] vs. W [m] , L=0.28e-6 , Temp=25

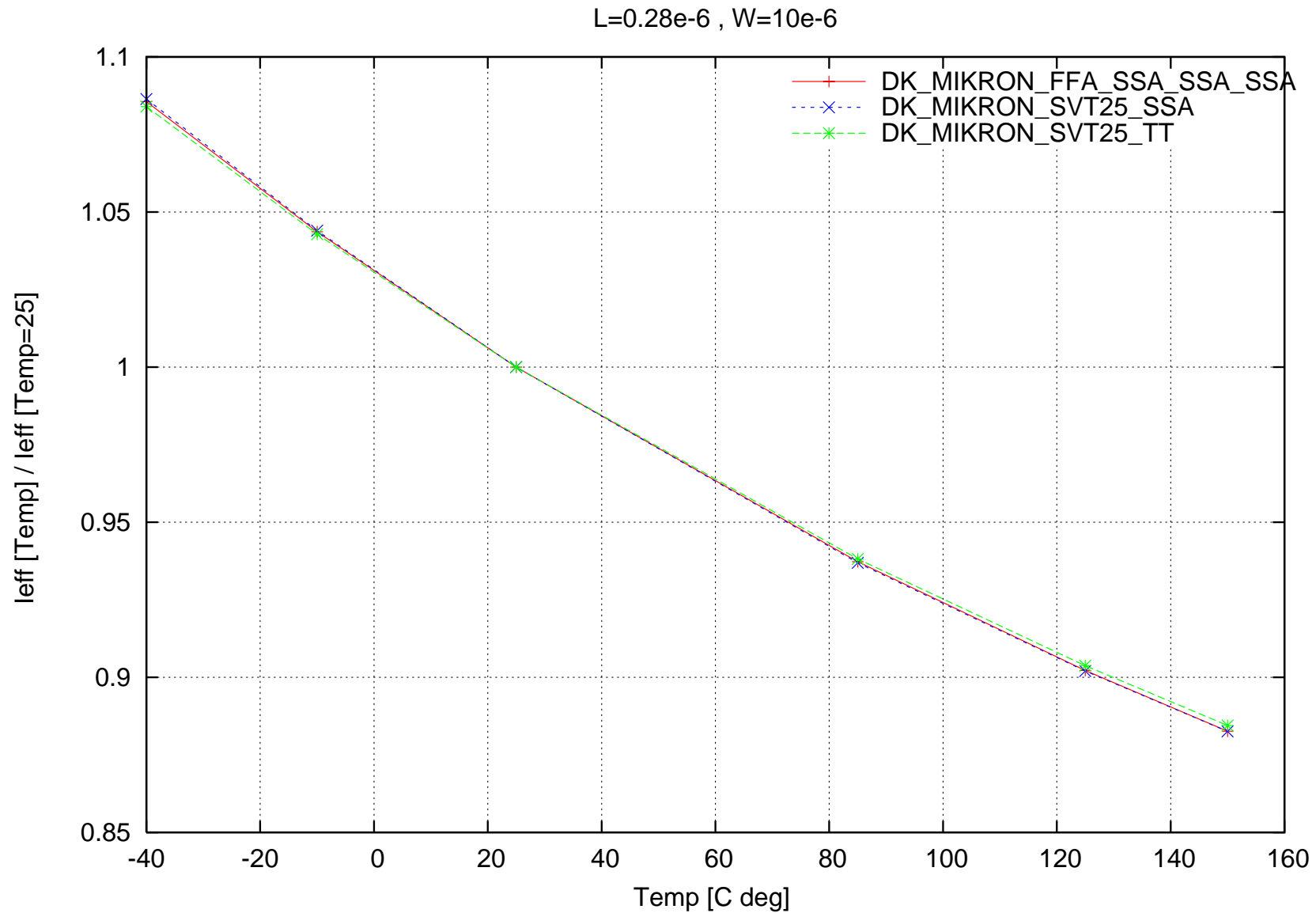


Scaling versus Temp for PMOS ($L=0.28\mu\text{m}$, $W=10\mu\text{m}$, $p_{o2act}=0.82\mu\text{m}$, $LPE=0$)

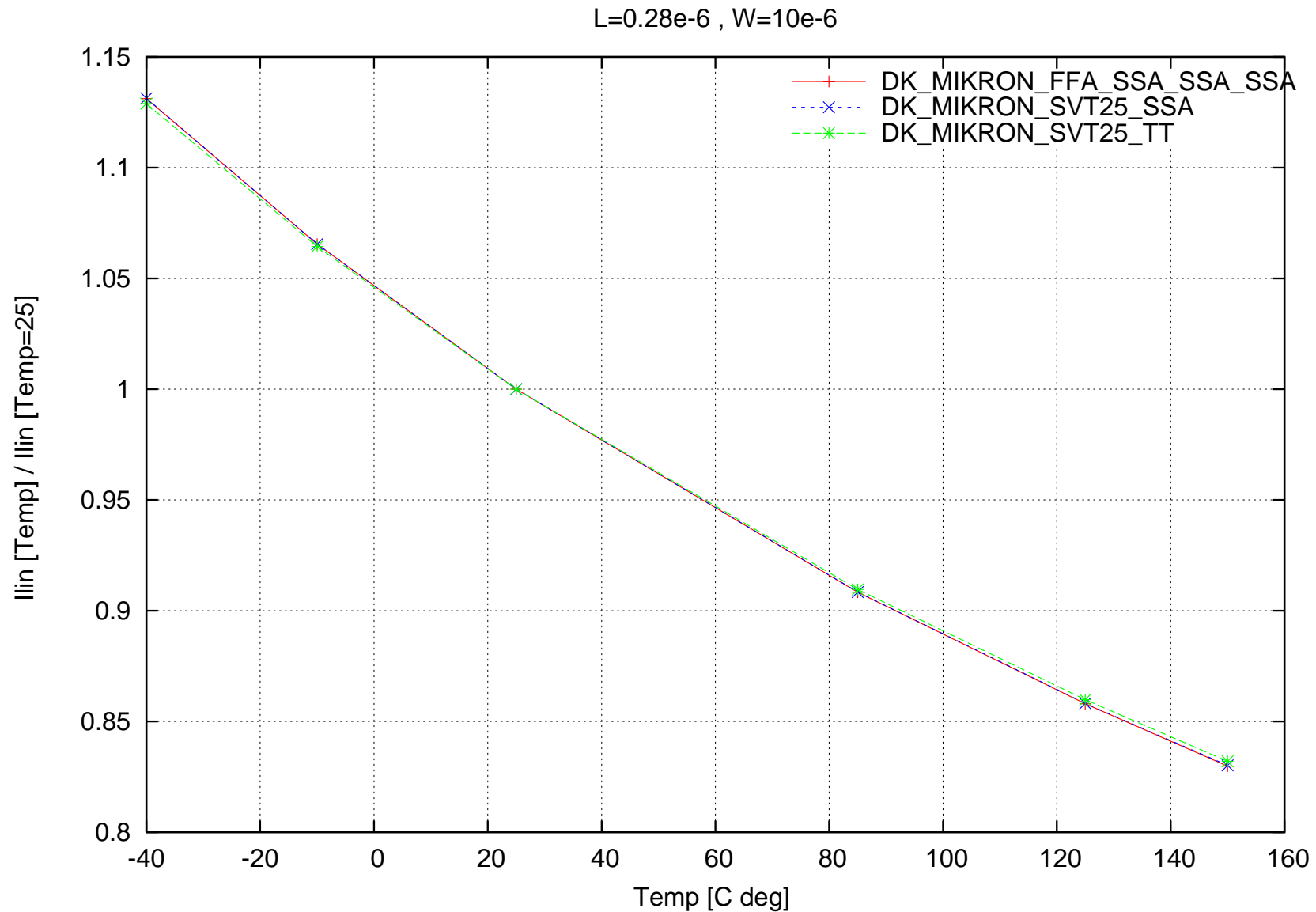
psvt25 Isat [Temp] / Isat [Temp=25] vs. Temp [C deg] , L=0.28e-6 , W=10e-6



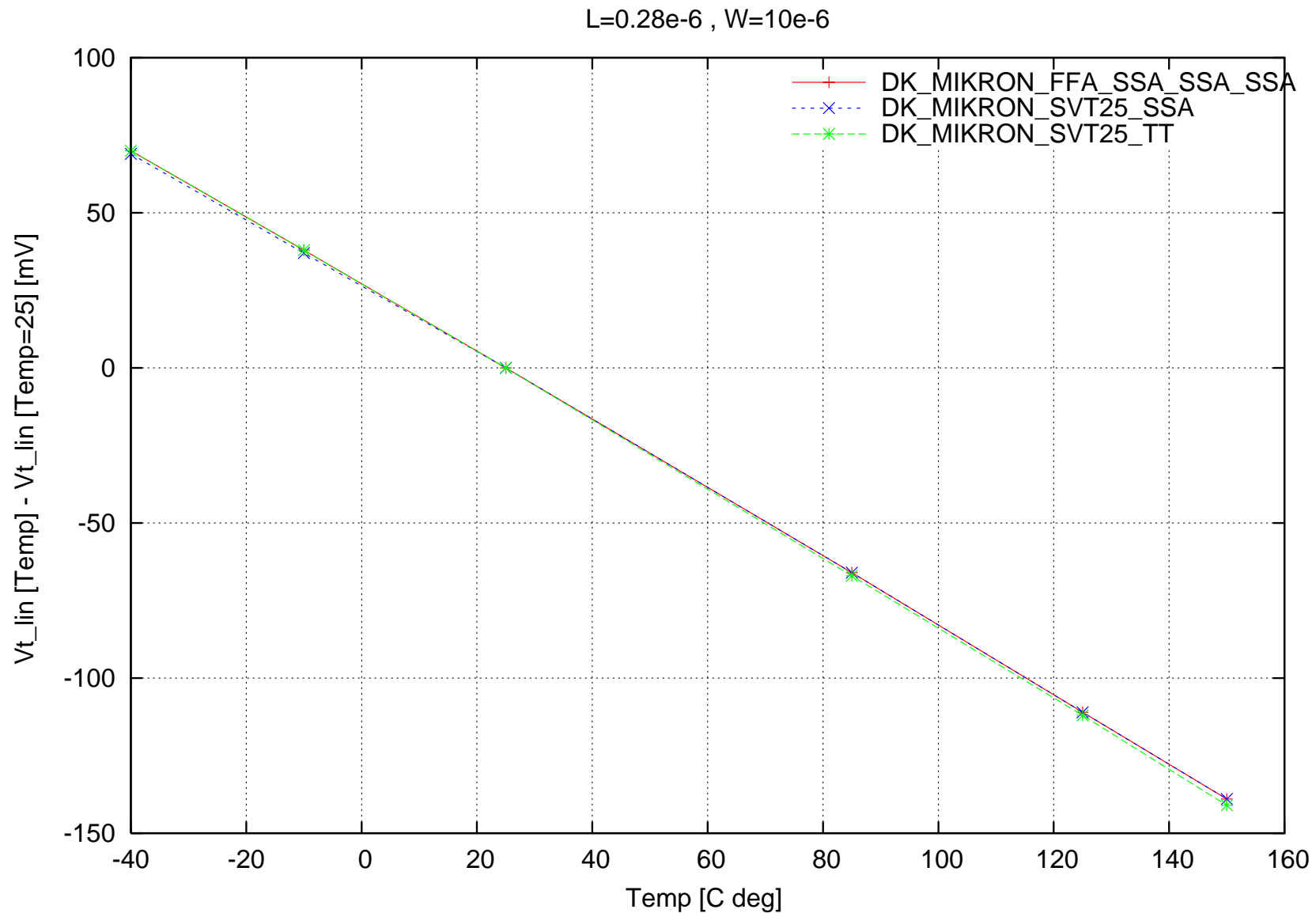
psvt25 l_{eff} [Temp] / l_{eff} [Temp=25] vs. Temp [C deg] , $L=0.28e-6$, $W=10e-6$



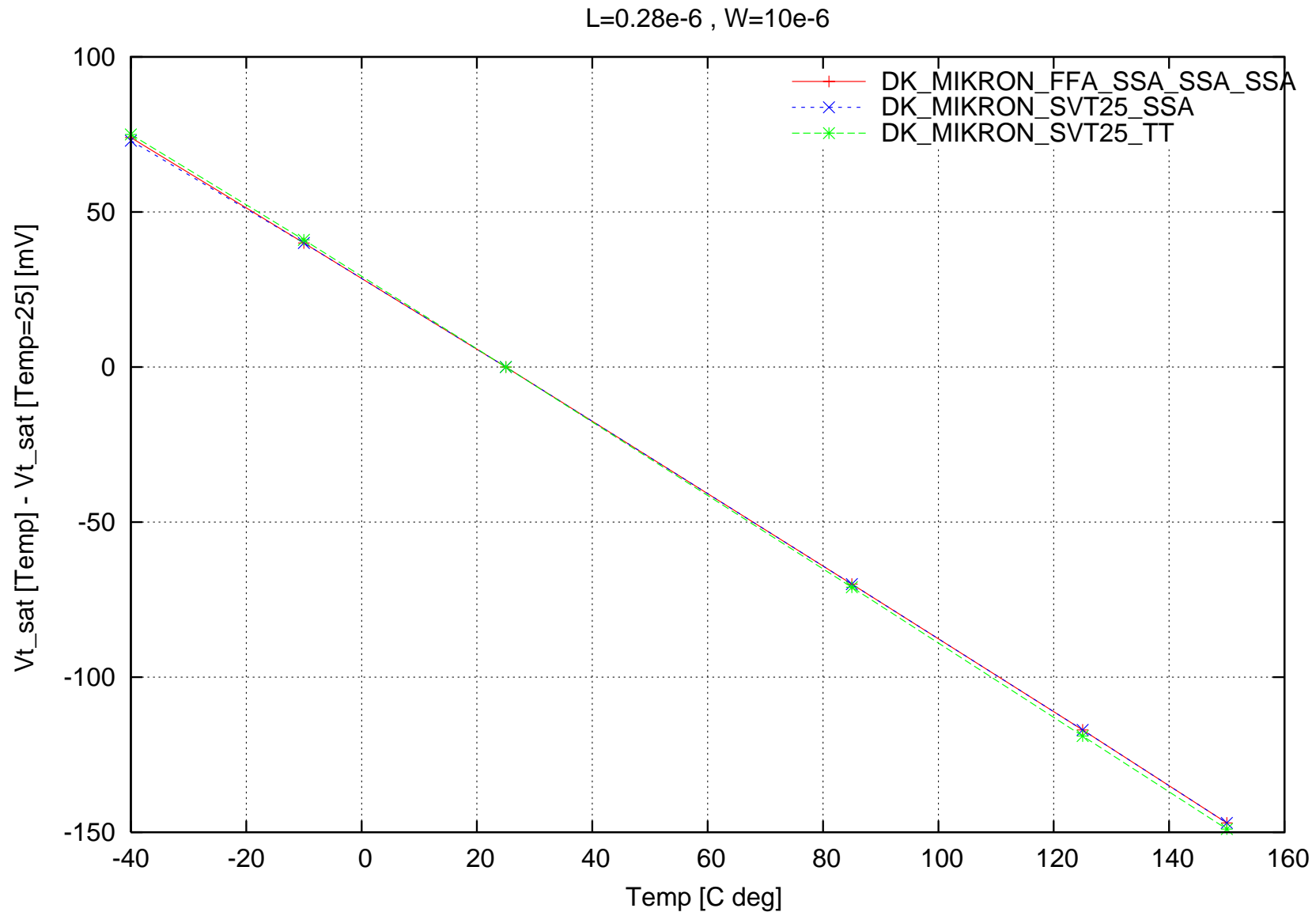
psvt25 Ilin [Temp] / Ilin [Temp=25] vs. Temp [C deg] , L=0.28e-6 , W=10e-6



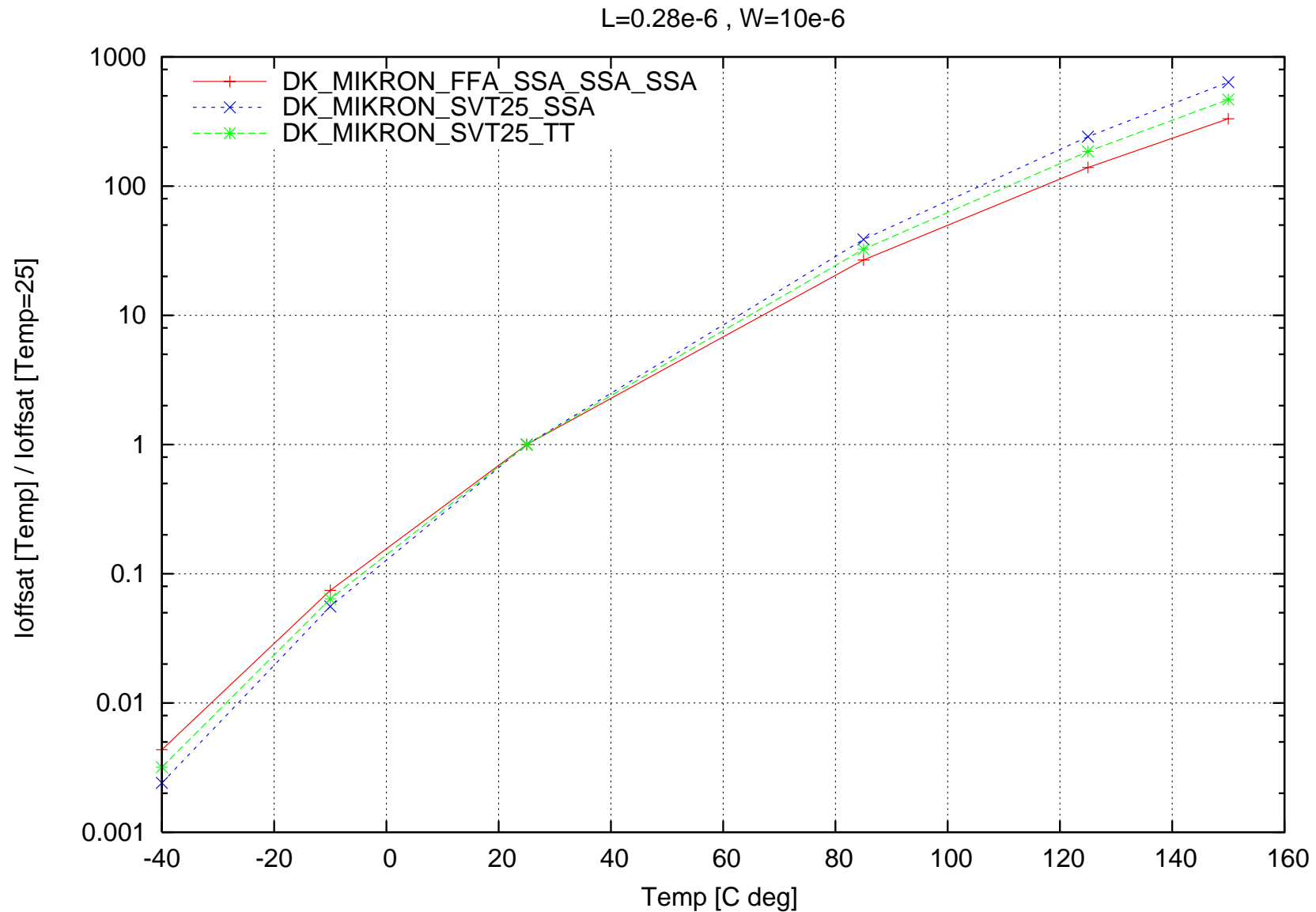
psvt25 $V_{t_lin} [Temp] - V_{t_lin} [Temp=25] [mV]$ vs. Temp [C deg] , $L=0.28e-6$, $W=10e-6$



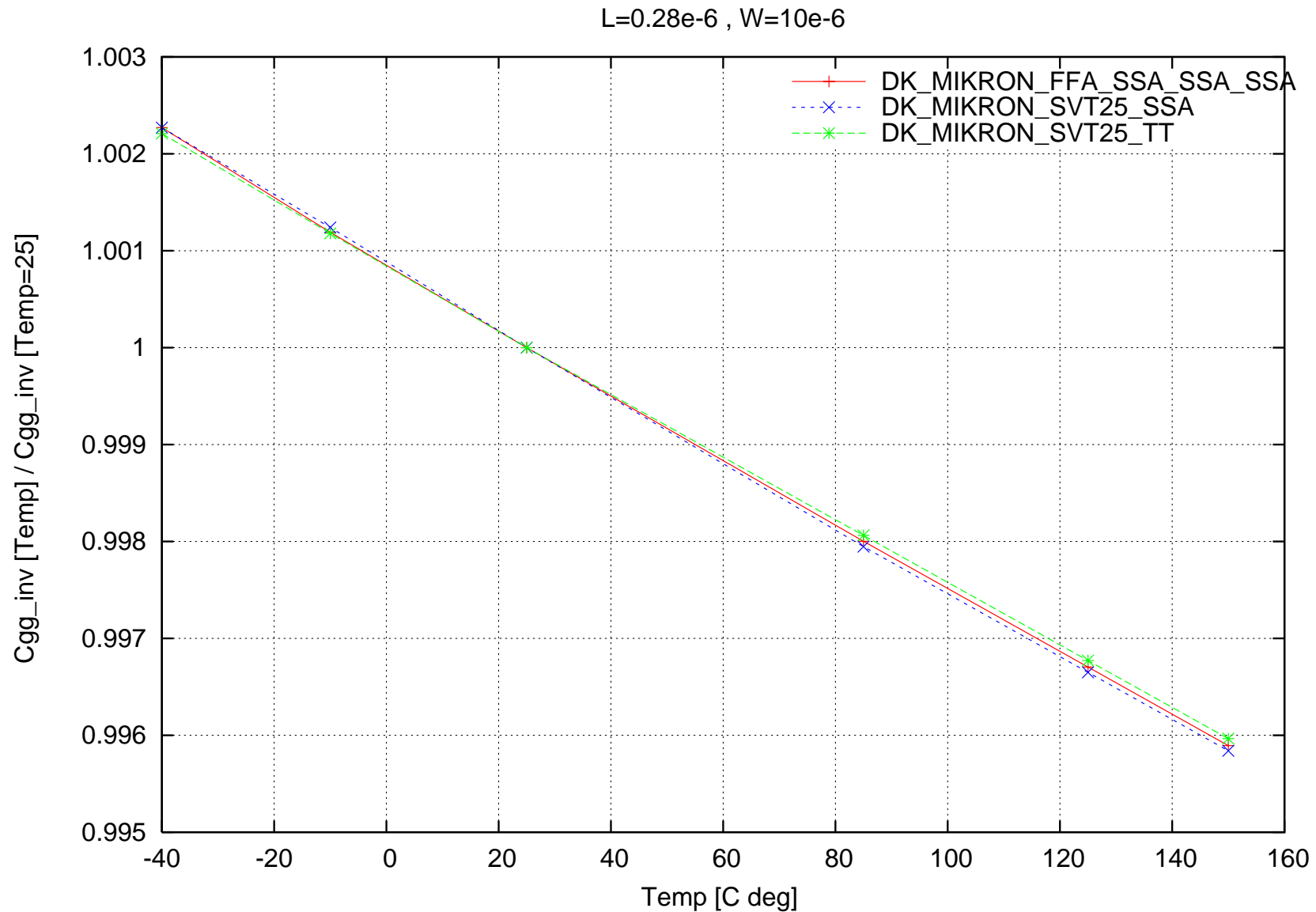
psvt25 $V_{t_sat} [Temp] - V_{t_sat} [Temp=25] [mV]$ vs. Temp [C deg] , $L=0.28e-6$, $W=10e-6$



psvt25 loffsat [Temp] / loffsat [Temp=25] vs. Temp [C deg] , L=0.28e-6 , W=10e-6



psvt25 Cgg_inv [Temp] / Cgg_inv [Temp=25] vs. Temp [C deg] , L=0.28e-6 , W=10e-6



psvt25 Cbd_off [Temp] / Cbd_off [Temp=25] vs. Temp [C deg] , L=0.28e-6 , W=10e-6

