

IHP
SG13G2
SG13G2 DC CV PMOS LV

Rev. 1.2 (190924)

Date: February 4, 2023

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1 Documentation

1.1 Included Effects in Simulation Model

| | | |
|---------|--------------------|---------------------------|
| General | Date, Version | 24.09.2019 |
| | Processversion | SG13G2 |
| | Simulator | ADS 2019, Spectre 18.1 |
| | Simulation model | PSP 103.6 |
| | Warning Boundaries | On |

| | | |
|-------------|--|----------------|
| Statistic | Corner | x |
| | Process variations for Monte Carlo Simulation | e |
| | Mismatch | x |
| | | |
| | | |
| Transistor | DC behavior | x |
| | Drain diode | x |
| | Overlap cap. | x |
| | Junction cap. | x |
| | 1/f Noise | x ₁ |
| | HF / Thermal Noise | - |
| | Substrate resistance (RF) | x ₂ |
| | Gate resistance (RF) | x ₂ |
| | | |
| Temperature | -40°C, 25°C, 70°C, 125°C | x |

x measured and modelled

x₁ parameters taken from SG13

x₂ measurements are done from a different wafer run than DC model which leads to slight offsets

e estimated and modelled

o not included

- not applicable

1.2 Time range measurement

The verification of the time range measurements is done by the standard IHP verification procedure.

2 Setup

2.1 Measurement Conditions

2.1.1 Measurement Conditions for Transistors

| | Sweep | Start[V] | Stop[V] | No. Points | List or f(Vth) |
|----------------|-------|-------------|---------|------------|--|
| idvg | vg | -500m | 1.35 | 38 | |
| | vb | 0 | -1.2 | 7 | |
| | vd | List | | 3 | 0.05, 0.6, 1.2 |
| | vs | 0 | | 1 | |
| idvd | vd | 0 | 1.35 | 28 | |
| | vg | Lin f(Vth) | 1.35 | 5 | Ref. Setup: idvg Idref: 100.0n Offset: 100.0m Resolution: 1.000m |
| | vb | 0 | | 1 | |
| | vs | 0 | | 1 | |
| idvd_vbmin | vd | 0 | 1.35 | 28 | |
| | vg | Lin f(Vth) | 1.35 | 5 | Ref. Setup: idvg Idref: 100.0n Offset: 100.0m Resolution: 1.000m |
| | vb | -1.2 | | 1 | |
| | vs | 0 | | 1 | |
| idvd_vth | vd | 0 | 1.35 | 28 | |
| | vg | List f(Vth) | | 3 | Ref. Setup: idvg Idref: 100.0n Offset: -200.0m Resolution: 1.000m Steps: 200.0m 200.0m |
| | vb | 0 | | 1 | |
| | vs | 0 | | 1 | |
| idvd_vth_vbmin | vd | 0 | 1.35 | 28 | |
| | vg | List | | 3 | Ref. Setup: idvg |

| | | | | | |
|---------|------|--------|-------|----|--|
| | | f(Vth) | | | Idref: 100.0n Offset: -200.0m Resolution: 1.000m Steps: 200.0m 200.0m |
| | vb | -1.2 | | 1 | |
| | vs | 0 | | 1 | |
| RF idvg | vg | 0 | 1.35 | 28 | |
| | vd | List | | 3 | 0.05, 0.6, 1.2 |
| RF idvd | vd | 0 | 1.35 | 28 | |
| | vg | 0 | 1.35 | 5 | |
| RF sdut | freq | 100MEG | 47.6G | 31 | |
| | vd | 0 | 1.35 | 10 | |
| | vg | 0 | 1.35 | 10 | |

2.1.2 Measurement Conditions for Capacitance

| | Sweep | Start[V] | Step[V] | Stop[V] | High Node | Low Node |
|----------------------|-------|----------|---------|---------|-----------|----------|
| Junction Bulk-Drain | 1 VHI | 5 | -200m | -200m | B | D |
| Junction Bulk-Source | 1 VHI | 1 | -20m | -300m | B | S |
| Oxide | 1 VHI | -1.35 | 50m | 1.35 | B | G |
| Overlap | 1 VHI | 1.35 | -50m | -1.35 | G | D |

2.2 Devices

2.2.1 Setup of DC Test Devices

| Name | W[um] | L[um] | AD[um ²] | AS[um ²] | PD[um] | PS[um] | NRD | NRS | NF | Comment | Size Category |
|--------------------|-------|-------|----------------------|----------------------|----------|----------|-----|-----|----|---------|---------------|
| W10u0_L10u0_S549_5 | 10 | 10 | 3.4 | 3.4 | 20. 7 | 20. 7 | 0 | 0 | 1 | | Large |

| | | | | | | | | | | | |
|--------------------|----------|----------|----------|----------|----------|----------|---|---|---|--|----------|
| W0u15_L10u0_S555_3 | 150 m | 10 | 101 m | 101 m | 1.3 4 | 1.3 4 | 0 | 0 | 1 | | Narrow |
| W10u0_L0u13_S548_2 | 10 | 130 m | 3.4 | 3.4 | 20. 7 | 20. 7 | 0 | 0 | 1 | | Short |
| W0u15_L0u13_S554_3 | 150 m | 130 m | 101 m | 101 m | 1.3 4 | 1.3 4 | 0 | 0 | 1 | | Small |
| W10u0_L0u14_S548_3 | 10 | 140 m | 3.4 | 3.4 | 20. 7 | 20. 7 | 0 | 0 | 1 | | L Scale |
| W10u0_L0u18_S548_5 | 10 | 180 m | 3.4 | 3.4 | 20. 7 | 20. 7 | 0 | 0 | 1 | | L Scale |
| W10u0_L0u5_S549_1 | 10 | 500 m | 3.4 | 3.4 | 20. 7 | 20. 7 | 0 | 0 | 1 | | L Scale |
| W10u0_L1u2_S549_2 | 10 | 1.2 | 3.4 | 3.4 | 20. 7 | 20. 7 | 0 | 0 | 1 | | L Scale |
| W10u0_L5u0_S549_4 | 10 | 5 | 3.4 | 3.4 | 20. 7 | 20. 7 | 0 | 0 | 1 | | L Scale |
| W10u0_L2u0_S549_3 | 10 | 2 | 3.4 | 3.4 | 20. 7 | 20. 7 | 0 | 0 | 1 | | L Scale |
| W10u0_L0u15_S548_4 | 10 | 150 m | 3.4 | 3.4 | 20. 7 | 20. 7 | 0 | 0 | 1 | | L Scale |
| W0u6_L10u0_S552_1 | 600 m | 10 | 204 m | 204 m | 1.8 8 | 1.8 8 | 0 | 0 | 1 | | W Scale |
| W0u18_L10u0_S554_1 | 180 m | 10 | 103 m | 103 m | 1.3 4 | 1.3 4 | 0 | 0 | 1 | | W Scale |
| W0u3_L10u0_S553_2 | 300 m | 10 | 102 m | 102 m | 1.2 8 | 1.2 8 | 0 | 0 | 1 | | W Scale |
| W05u0_L10u0_S550_3 | 5 | 10 | 1.7 | 1.7 | 10. 7 | 10. 7 | 0 | 0 | 1 | | W Scale |
| W02u0_L10u0_S551_1 | 2 | 10 | 680 m | 680 m | 4.6 8 | 4.6 8 | 0 | 0 | 1 | | W Scale |
| W02u0_L2u0_S550_5 | 2 | 2 | 680 m | 680 m | 4.6 8 | 4.6 8 | 0 | 0 | 1 | | LW Scale |
| W0u18_L0u14_S553_4 | 180 m | 140 | 103 m | 103 m | 1.3 4 | 1.3 4 | 0 | 0 | 1 | | LW Scale |
| W0u18_L0u15_S553_5 | 180 m | 150 | 103 m | 103 m | 1.3 4 | 1.3 4 | 0 | 0 | 1 | | LW Scale |
| W0u6_L0u5_S551_4 | 600 m | 500 | 204 m | 204 m | 1.8 8 | 1.8 8 | 0 | 0 | 1 | | LW Scale |
| W0u6_L1u2_S551_5 | 600 m | 1.2 | 204 m | 204 m | 1.8 8 | 1.8 8 | 0 | 0 | 1 | | LW Scale |
| W0u3_L0u14_S552_3 | 300 | 140 | 102 | 102 | 1.2 | 1.2 | 0 | 0 | 1 | | LW |

| | m | m | m | m | 8 | 8 | | | | | Scale |
|-----------------------------|----------|----------|----------|----------|----------|----------|---|---|---|--|----------------|
| W0u6_L0u13_S551_2 | 600 m | 130 m | 204 m | 204 m | 1.8 8 | 1.8 8 | 0 | 0 | 1 | | LW Scale |
| W0u6_L0u18_S551_3 | 600 m | 180 m | 204 m | 204 m | 1.8 8 | 1.8 8 | 0 | 0 | 1 | | LW Scale |
| W0u3_L0u15_S552_4 | 300 m | 150 m | 102 m | 102 m | 1.2 8 | 1.2 8 | 0 | 0 | 1 | | LW Scale |
| W02u0_L0u13_S550_4 | 2 | 130 m | 680 m | 680 m | 4.6 8 | 4.6 8 | 0 | 0 | 1 | | LW Scale |
| W0u15_L0u14_S554_4 | 150 m | 140 m | 101 m | 101 m | 1.3 4 | 1.3 4 | 0 | 0 | 1 | | LW Scale |
| W05u0_L0u13_S550_1 | 5 | 130 m | 1.7 | 1.7 | 10. 7 | 10. 7 | 0 | 0 | 1 | | LW Scale |
| W0u15_L0u15_S554_5 | 150 m | 150 m | 101 m | 101 m | 1.3 4 | 1.3 4 | 0 | 0 | 1 | | LW Scale |
| W0u3_L0u18_S552_5 | 300 m | 180 m | 102 m | 102 m | 1.2 8 | 1.2 8 | 0 | 0 | 1 | | LW Scale |
| W0u3_L0u13_S552_2 | 300 m | 130 m | 102 m | 102 m | 1.2 8 | 1.2 8 | 0 | 0 | 1 | | LW Scale |
| W05u0_L5u0_S550_2 | 5 | 5 | 1.7 | 1.7 | 10. 7 | 10. 7 | 0 | 0 | 1 | | LW Scale |
| W0u15_L0u5_S555_2 | 150 m | 500 m | 101 m | 101 m | 1.3 4 | 1.3 4 | 0 | 0 | 1 | | LW Scale |
| W0u3_L0u5_S553_1 | 300 m | 500 m | 102 m | 102 m | 1.2 8 | 1.2 8 | 0 | 0 | 1 | | LW Scale |
| W0u15_L0u18_S555_1 | 150 m | 180 m | 101 m | 101 m | 1.3 4 | 1.3 4 | 0 | 0 | 1 | | LW Scale |
| W0u18_L0u13_S553_3 | 180 m | 130 m | 103 m | 103 m | 1.3 4 | 1.3 4 | 0 | 0 | 1 | | LW Scale |
| W0u15_L0u12_S554_2 | 150 m | 120 m | 101 m | 101 m | 1.3 4 | 1.3 4 | 0 | 0 | 1 | | Addition al |
| W10u0_L0u12_S548_1 | 10 | 120 m | 3.4 | 3.4 | 20. 7 | 20. 7 | 0 | 0 | 1 | | Addition al |
| W10u0_L0u13_S382_2 | 10 | 130 m | 3.4 | 3.4 | 20. 7 | 20. 7 | 0 | 0 | 1 | | Short |
| W10u0_L0u13_T356_S3 82_2 | 10 | 130 m | 0 | 0 | 0 | 0 | 0 | 0 | 1 | | Short |

2.2.2 Setup of CV Test Devices

| Name | W[um] | L[um] | NF | AD[um ²] | AS[um ²] | PD[um] | PS[um] | Comment | Size Category |
|------------------------------------|-------|-------|------|----------------------|----------------------|--------|--------|----------------------------|---------------|
| Junction Capacitance Bulk - Drain | | | | | | | | | |
| CJBDarea_S351B_1 | | | 1 | 37.5 K | | 850 | | B-High, S/D-Low | BD Area |
| CJBDperim_S351B_2 | | | 1 | 28.6 K | | 102K | | B-High, S/D-Low | BD Perim |
| Junction Capacitance Bulk - Source | | | | | | | | | |
| CJBSarea_S351B_1 | | | 1 | 0 | | 0 | | B-High, S/D-Low | BS Area |
| CJBSperim_S351B_2 | | | 1 | 0 | | 0 | | B-High, S/D-Low | BS Perim |
| Oxide Capacitance | | | | | | | | | |
| Cox_S346K_4 | 160 | 250 | 1 | | | | | B-High, G-Low | Oxide |
| Overlap Capacitance | | | | | | | | | |
| Cgds3_S351B_13 | 400 | 10 | 40 | 79.8 | 79.8 | 436 | 436 | G-High, S/D-Low, B+Sub-GND | Overlap 2 GDS |
| Cgds1_S351B_11 | 8K | 130 m | 80 0 | 1.52 K | 1.52 K | 8.32 K | 8.32 K | G-High, S/D-Low, B+Sub-GND | Overlap GDS |
| Cgds2_S351B_12 | 6.6 | 250 | 66 | 1.26 | 1.26 | 6.87 | 6.87 | G- | Overlap |

| | | | | | | | | | |
|-----------------|----------|----------|---------|-----------|-----------|-----------|-----------|--|-------------------|
| | K | m | 0 | K | K | K | K | High, S/D- Low, B+Sub -GND | 1 GDS |
| Cgdsb2_S351B_12 | 6.6 K | 250 m | 66 0 | 1.26 K | 1.26 K | 6.87 K | 6.87 K | G- High, S/D+B -Low | Overlap 1 GDSB |
| Cgdsb1_S351B_11 | 8K | 130 m | 80 0 | 1.52 K | 1.52 K | 8.32 K | 8.32 K | G- High, S/D+B -Low | Overlap GDSB |
| Cgdsb3_S351B_13 | 400 | 10 | 40 | 79.8 | 79.8 | 436 | 436 | G- High, S/D+B -Low | Overlap 2 GDSB |

3 Corner Devices

3.1 Target Values vs. Simulated Values

3.1.1 W = 10.00u, L = 130.0n, NF = 1

| | Slow | | | Typic. | | | Fast | | |
|-------------|--------|-----------|-----------|--------|-----------|-----------|--------|-----------|-----------|
| | Target | Sim. | Error [%] | Target | Sim. | Error [%] | Target | Sim. | Error [%] |
| VT | -520m | - 524m | -0.73 | -460m | - 460m | 0.1 | -410m | - 411m | -0.16 |
| Ron*W | - | - | - | 2.2 | 2.18 | -0.76 | - | - | - |
| Ion/W | -160 | -161 | -0.87 | -205 | -203 | 0.93 | -260 | -261 | -0.48 |
| log(Ioff/W) | -11.5 | -11.6 | 1.24 | -10.4 | -10.5 | 1.08 | -9.5 | -9.51 | 0.22 |

3.1.2 W = 10.00u, L = 10.00u, NF = 1

| | Slow | | | Typic. | | | Fast | | |
|-------|--------|-------|-----------|--------|-------|-----------|--------|-------|-----------|
| | Target | Sim. | Error [%] | Target | Sim. | Error [%] | Target | Sim. | Error [%] |
| VT | -400m | -403m | -0.67 | -350m | -352m | -0.72 | -300m | -303m | -0.86 |
| Ion/W | -2.45 | -2.45 | 0 | -2.7 | -2.69 | 0.36 | -2.95 | -2.96 | -0.37 |

3.1.3 W = 150.0n, L = 130.0n, NF = 1

| | Slow | | | Typic. | | | Fast | | |
|-------|--------|-------|-----------|--------|-------|-----------|--------|-------|-----------|
| | Target | Sim. | Error [%] | Target | Sim. | Error [%] | Target | Sim. | Error [%] |
| VT | -560m | -564m | -0.73 | -470m | -473m | -0.65 | -380m | -378m | 0.64 |
| Ion/W | -240 | -240 | 0.1 | -315 | -318 | -0.78 | -390 | -391 | -0.19 |

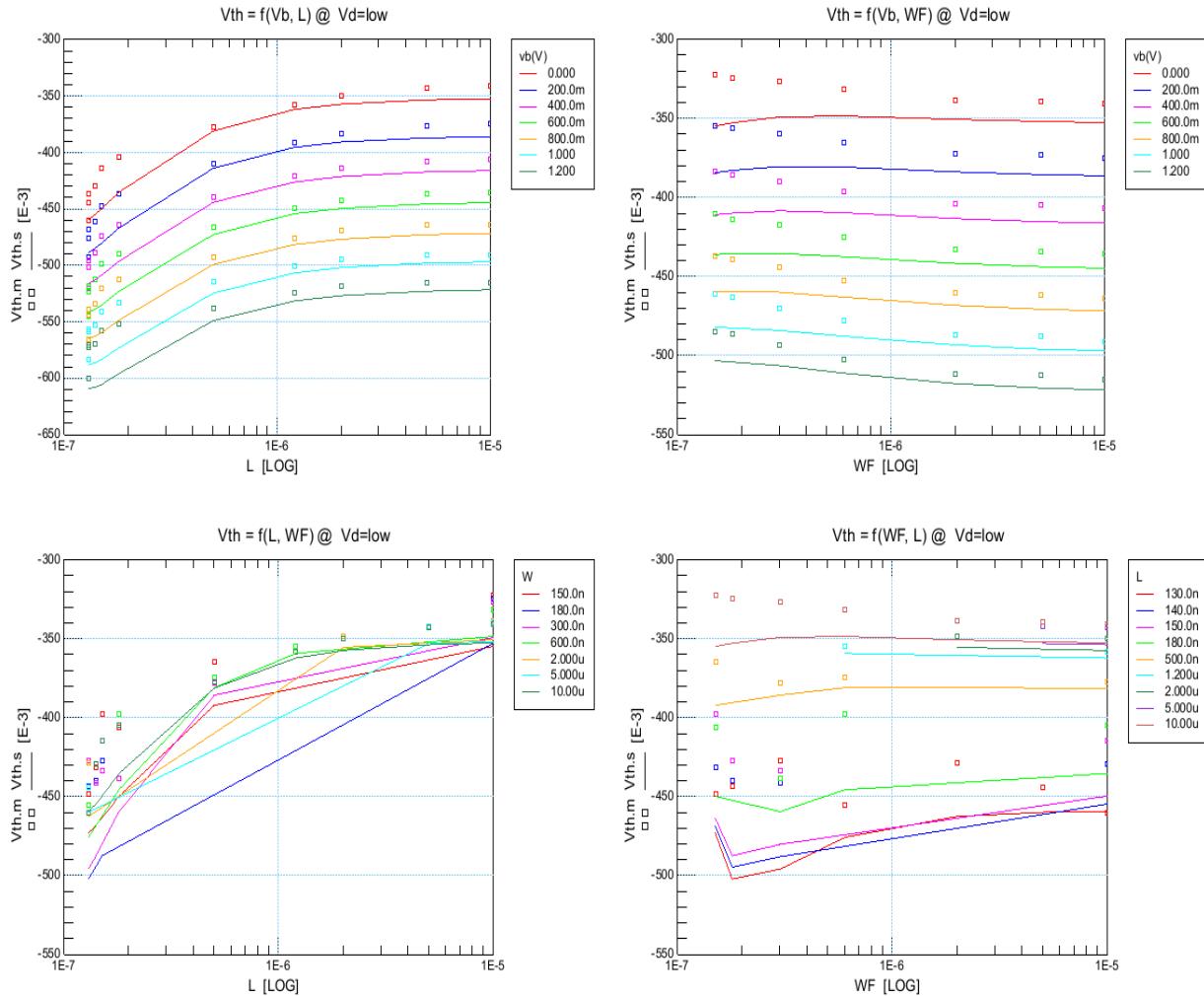
3.1.4 W = 150.0n, L = 10.00u, NF = 1

| | Slow | | | Typic. | | | Fast | | |
|-------|--------|-------|-----------|--------|-------|-----------|--------|-------|-----------|
| | Target | Sim. | Error [%] | Target | Sim. | Error [%] | Target | Sim. | Error [%] |
| Ion/W | -3.25 | -3.23 | 0.54 | -3.85 | -3.85 | 0.14 | -4.45 | -4.48 | -0.67 |

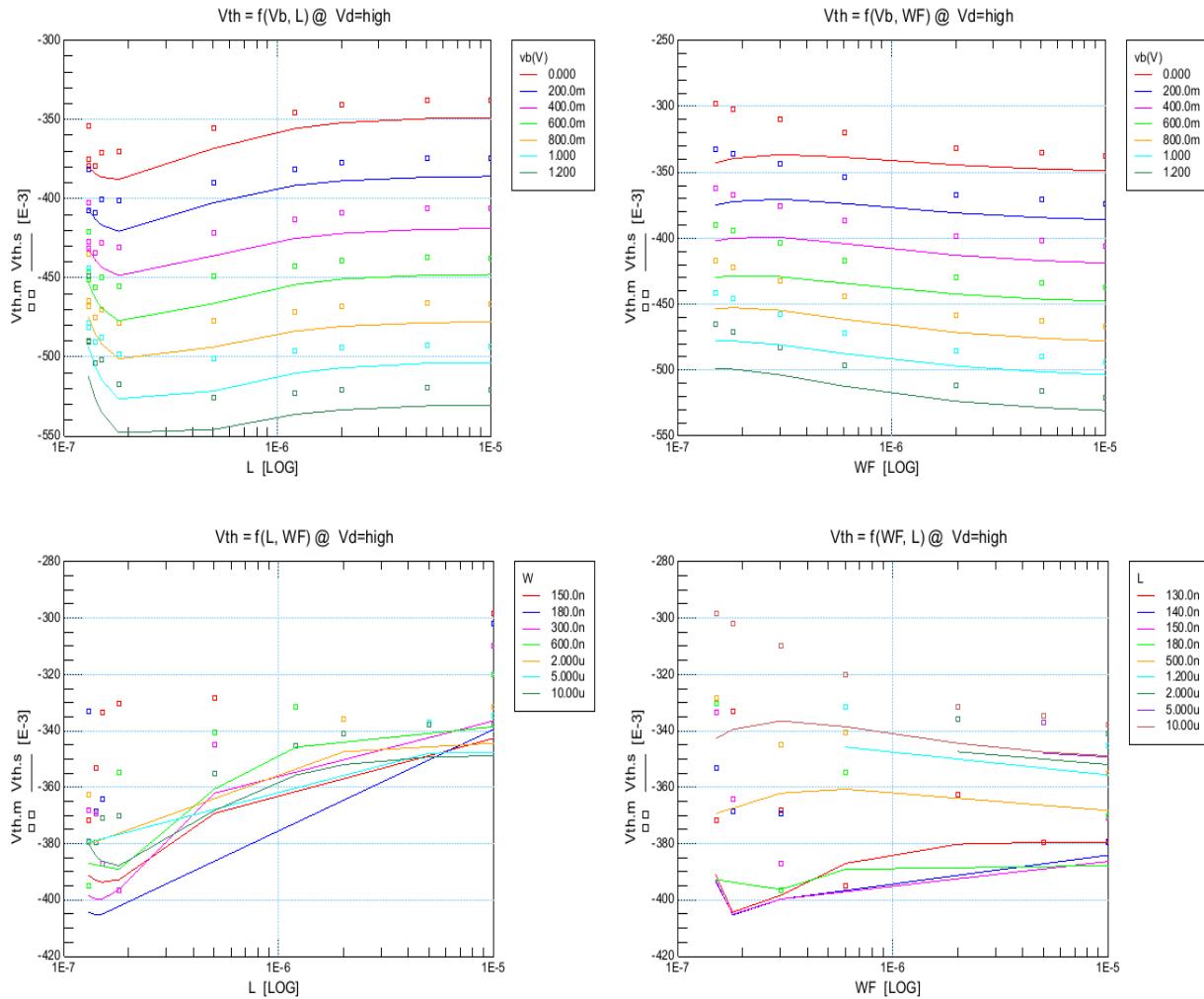
4 DC Transistors

4.1 Summarized Results

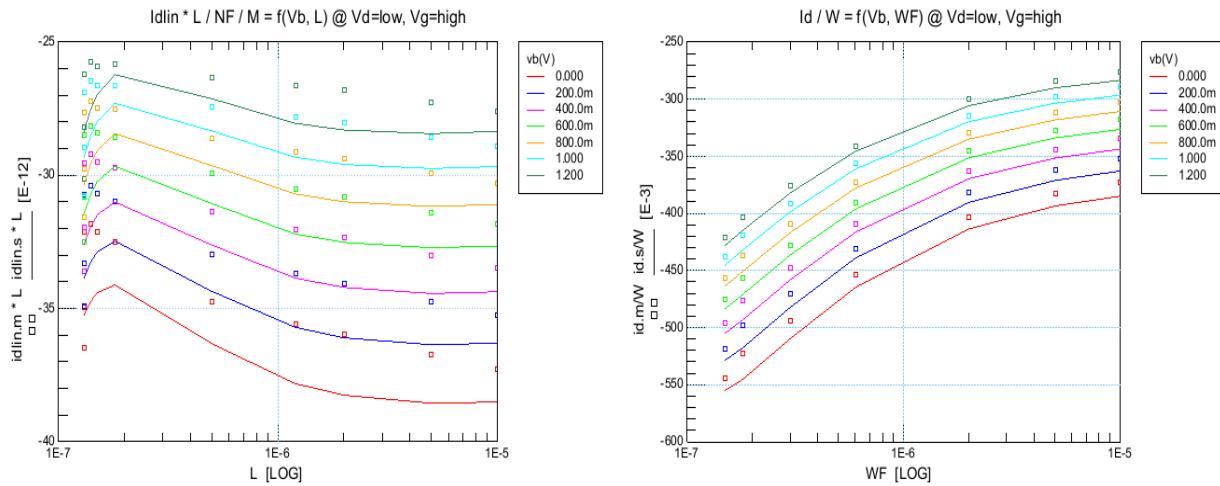
4.1.1 Threshold Voltage Linear Region

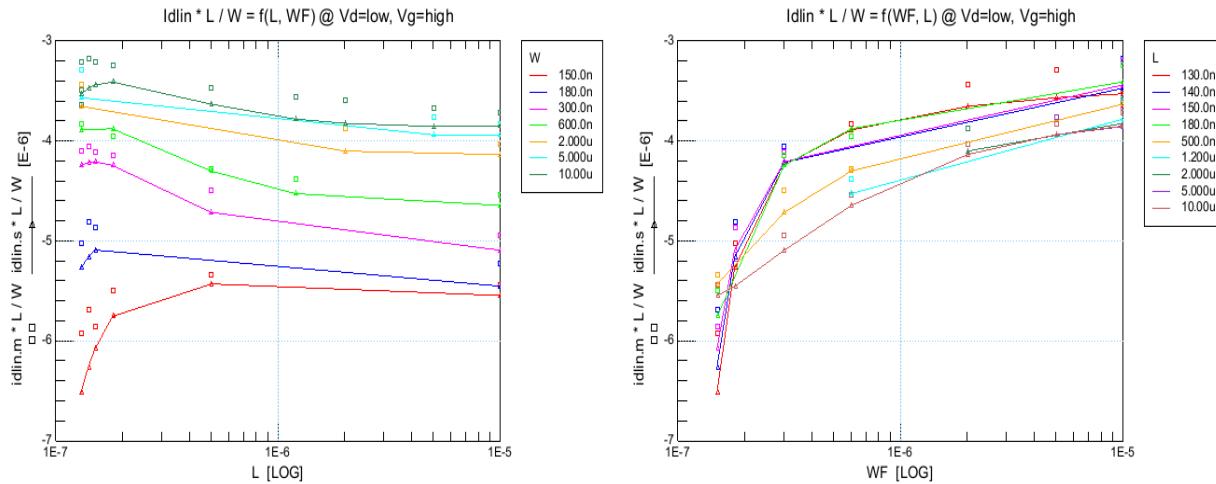


4.1.2 Threshold Voltage in Saturation

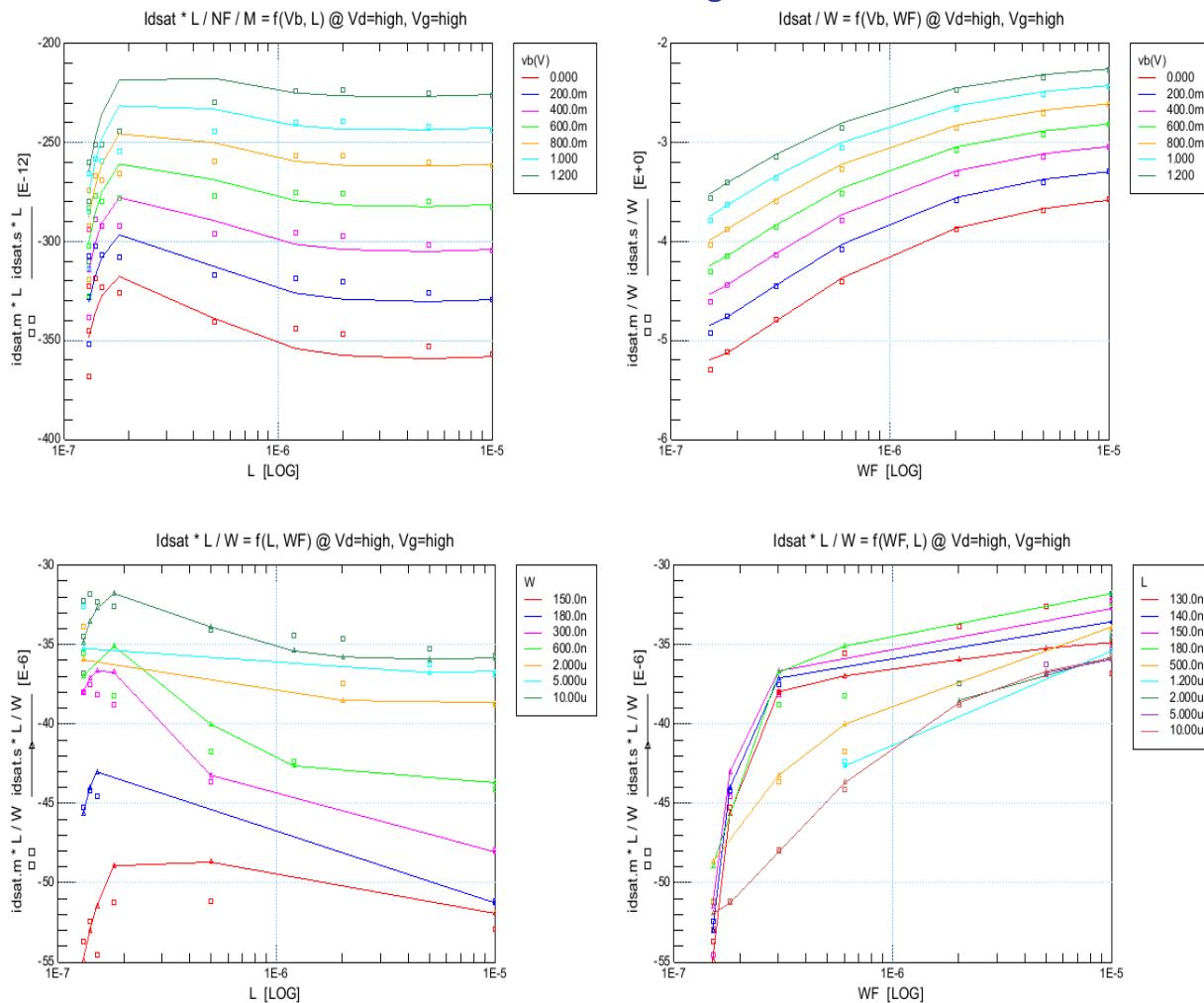


4.1.3 Maximum Drain Current in Linear Region



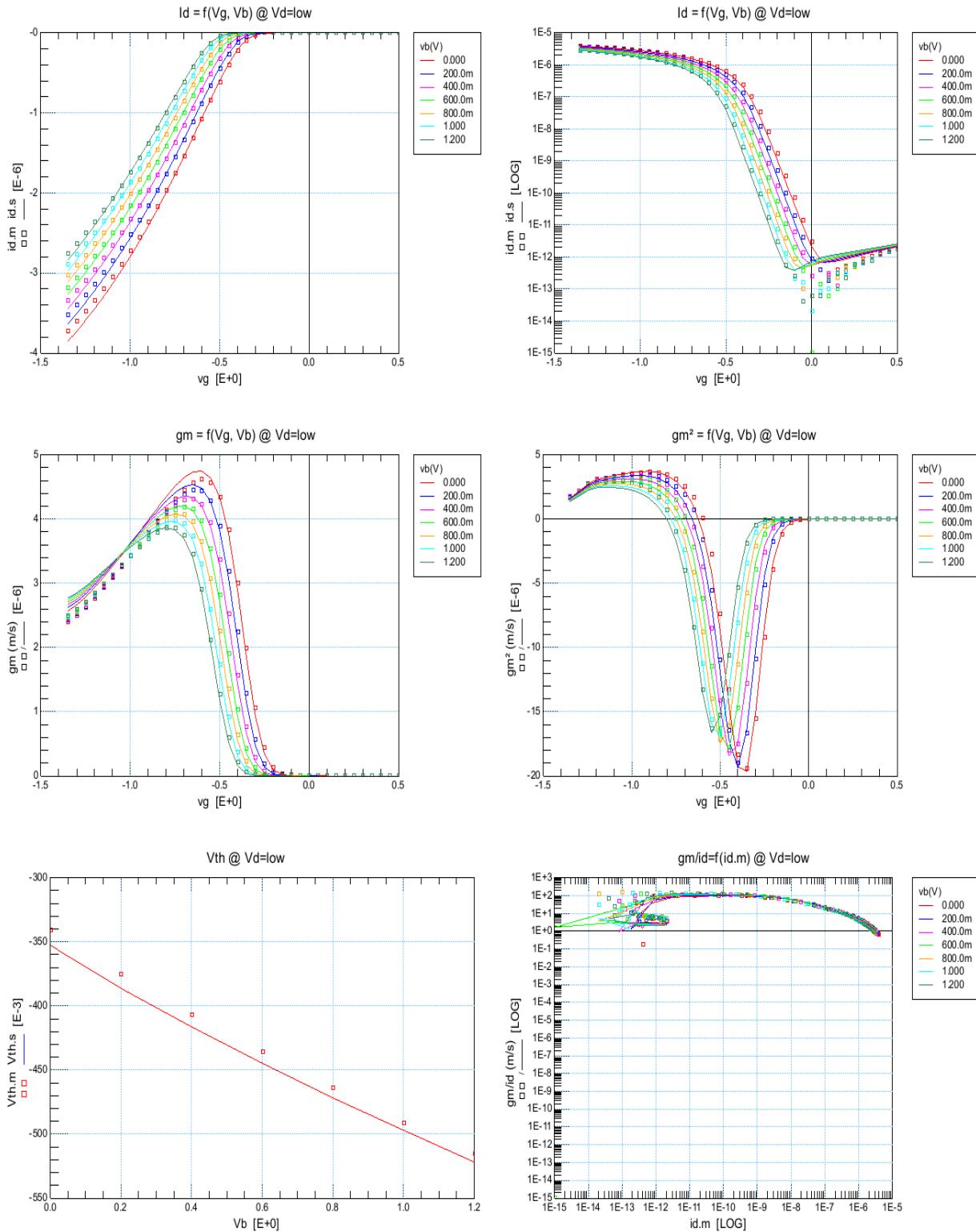


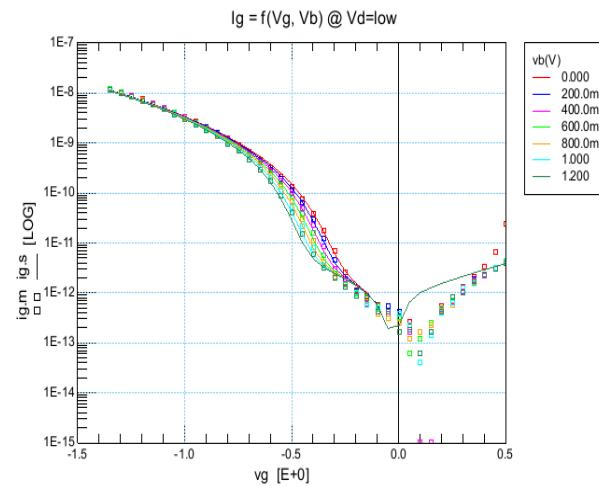
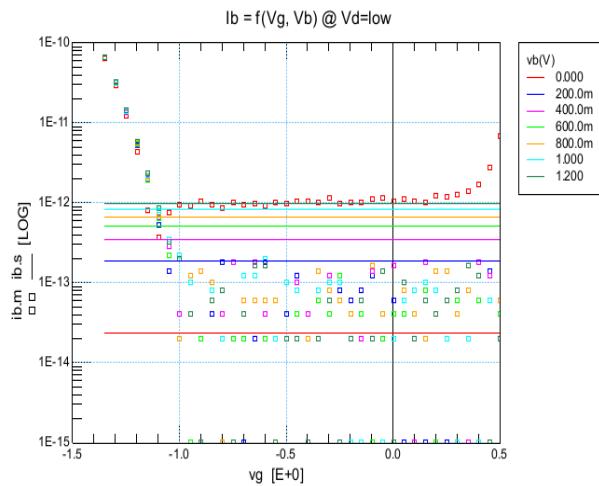
4.1.4 Maximum Drain Current in Saturation Region



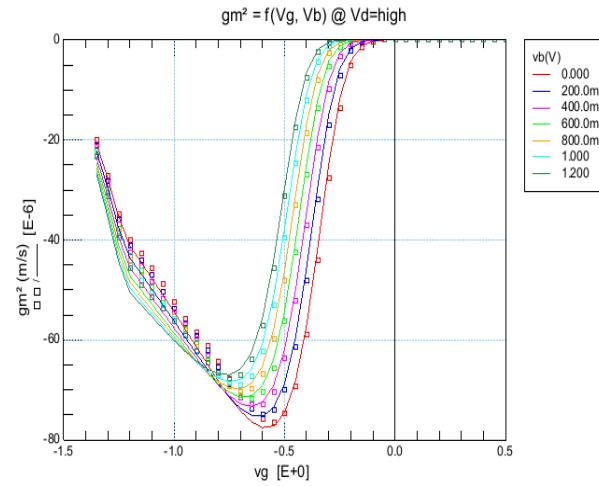
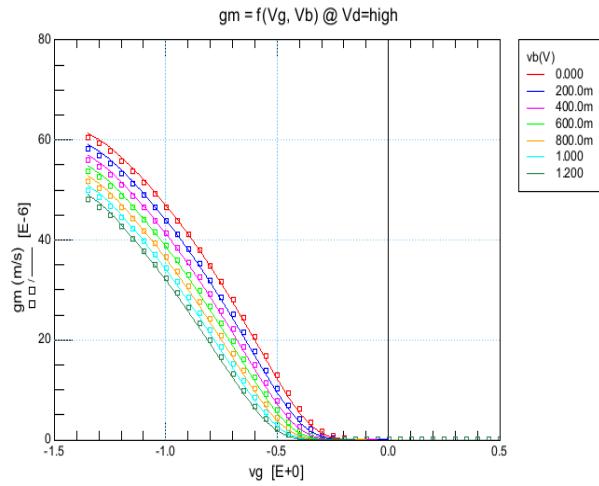
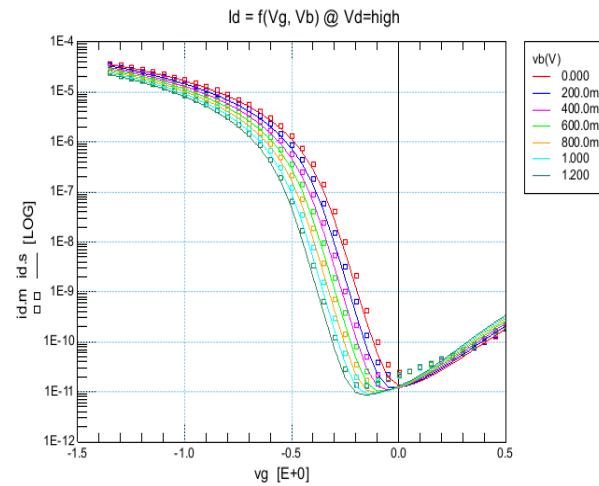
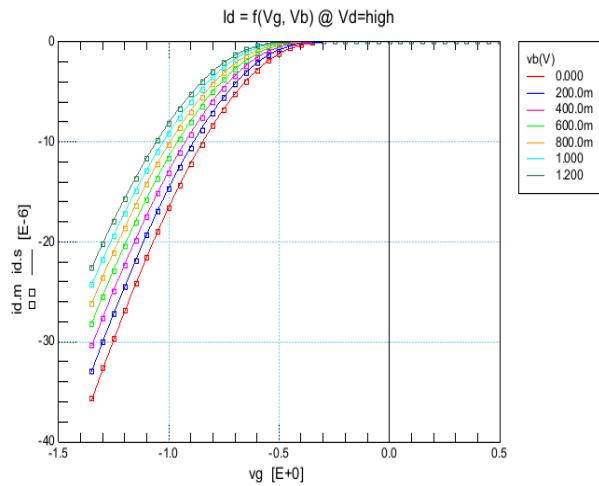
4.2 W10u0_L10u0_S549_5

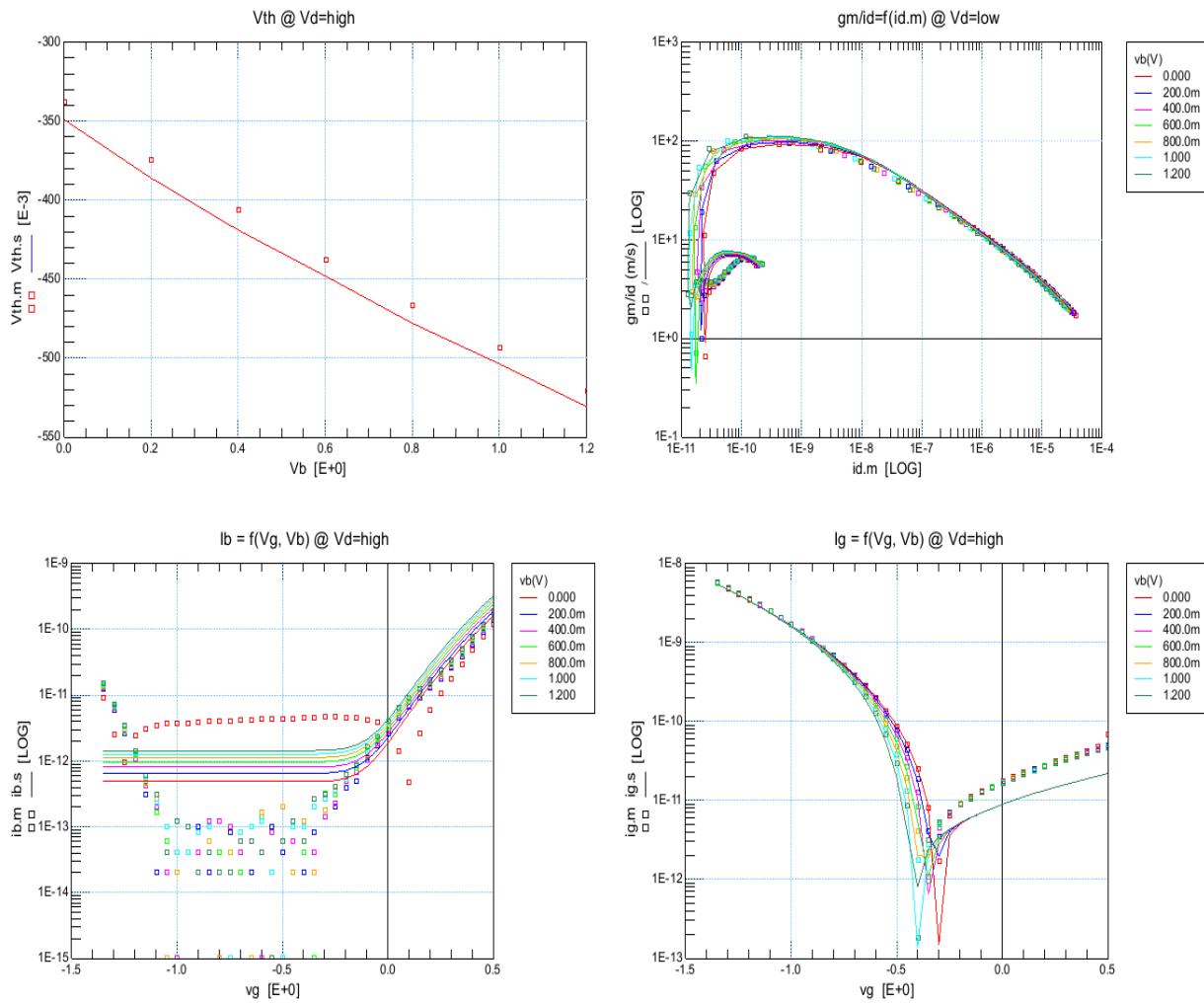
$idv_g, V_d = -0.05V, T = 27^\circ C$



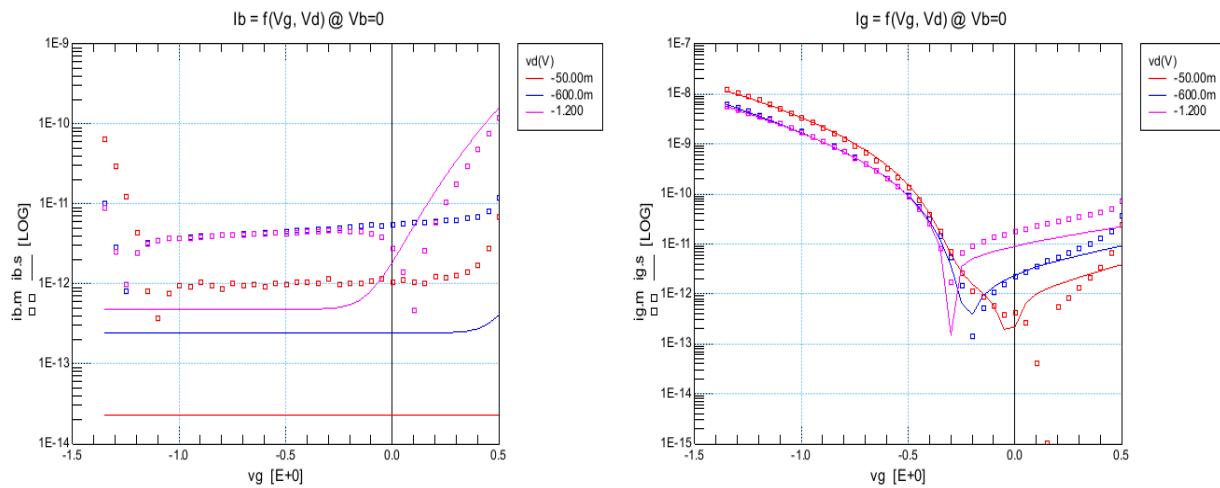


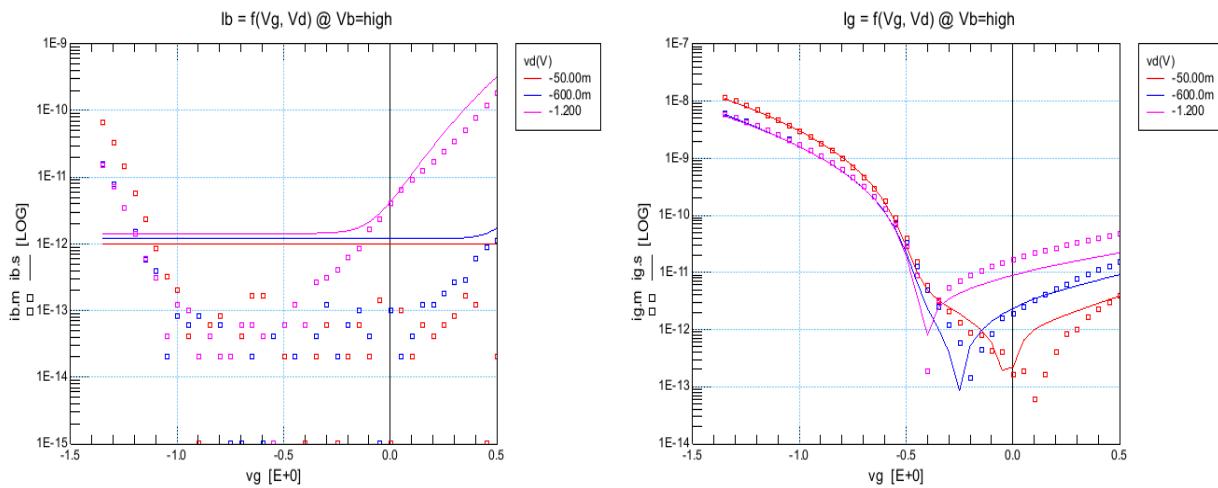
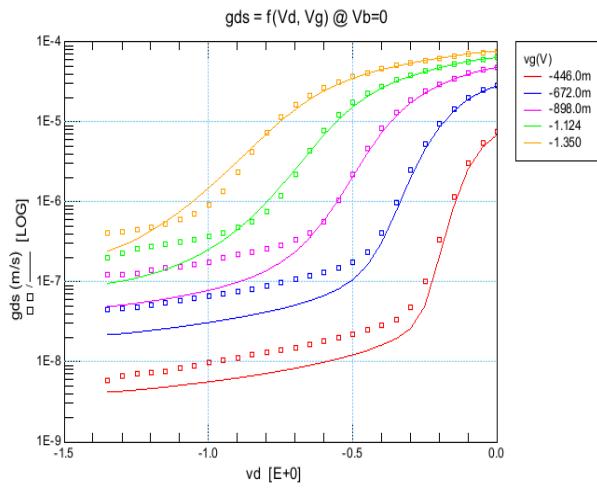
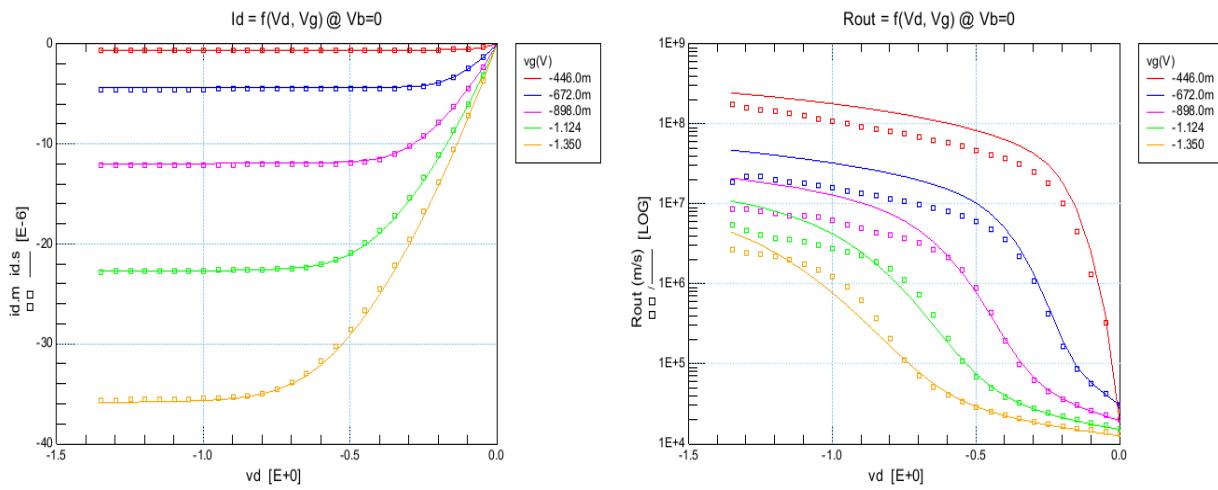
$i_{dvg}, V_d = -1.2V, T = 27^\circ C$

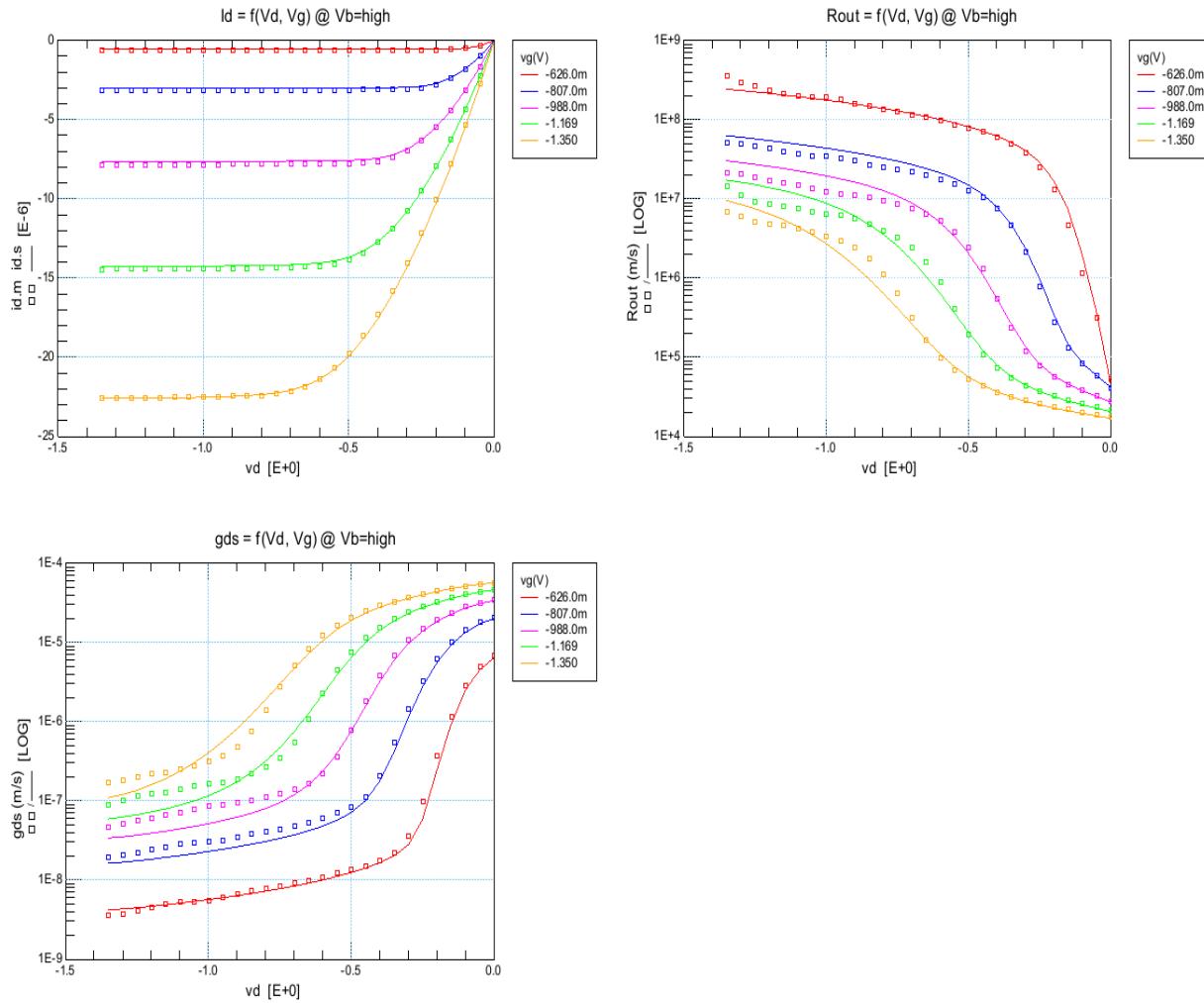
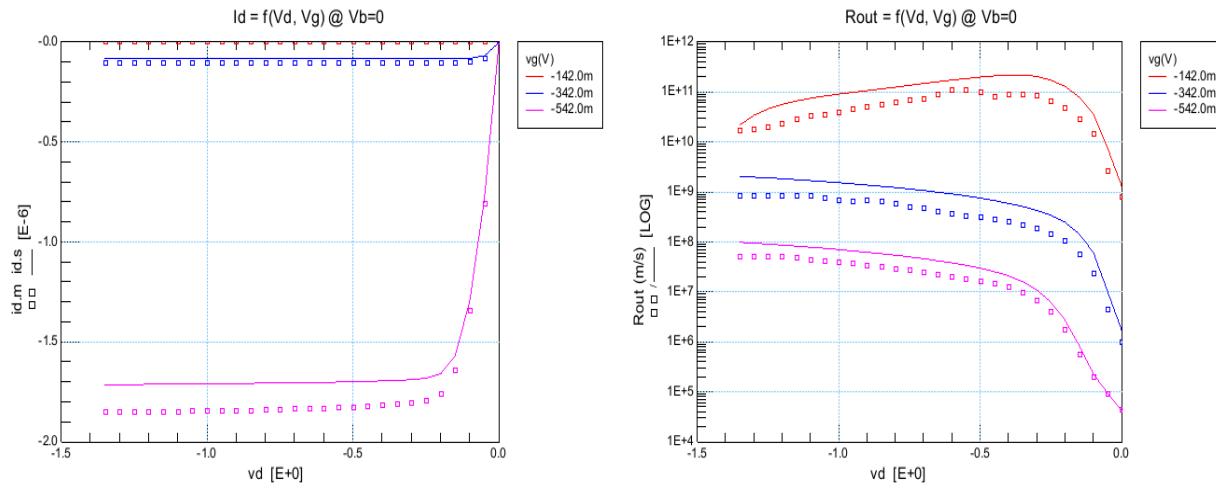


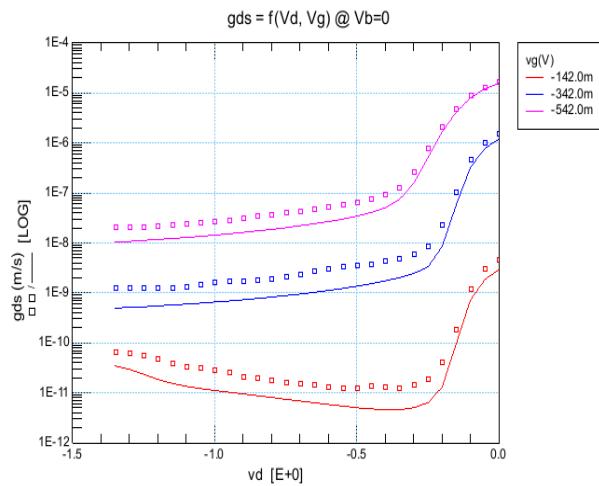


idvg, Ib,Ig, Vb = 0V, T = 27°C

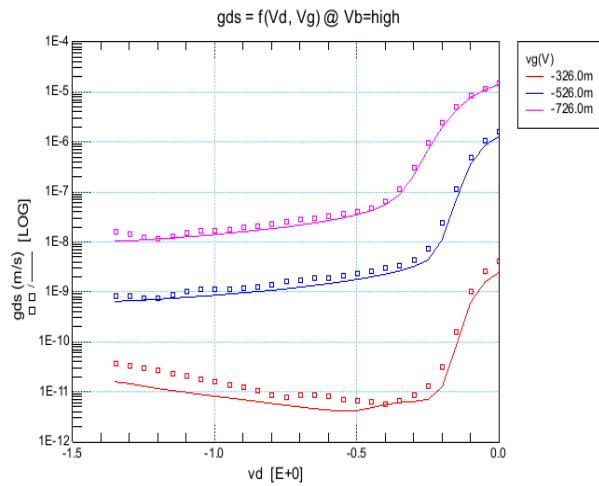
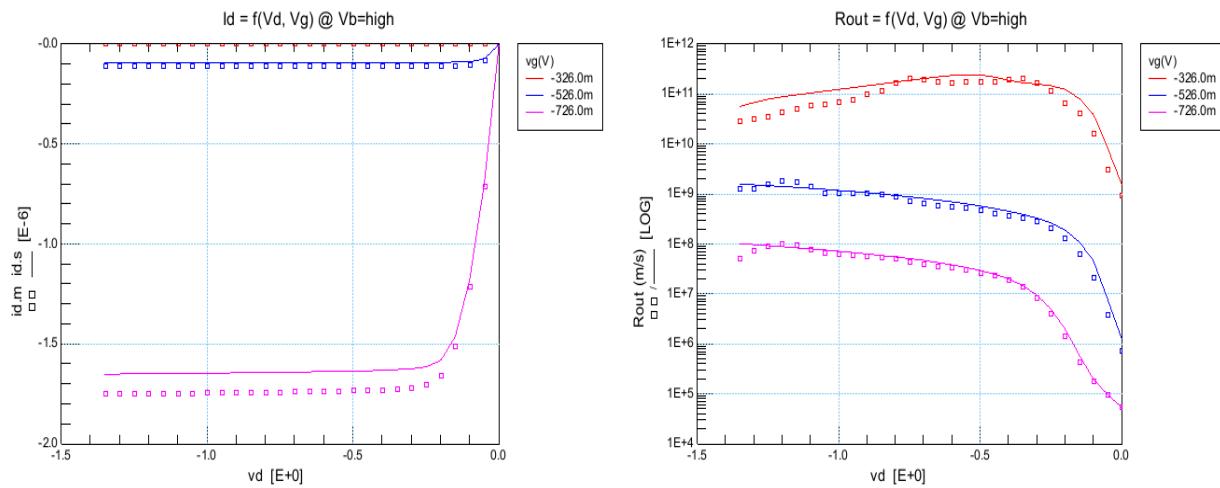


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


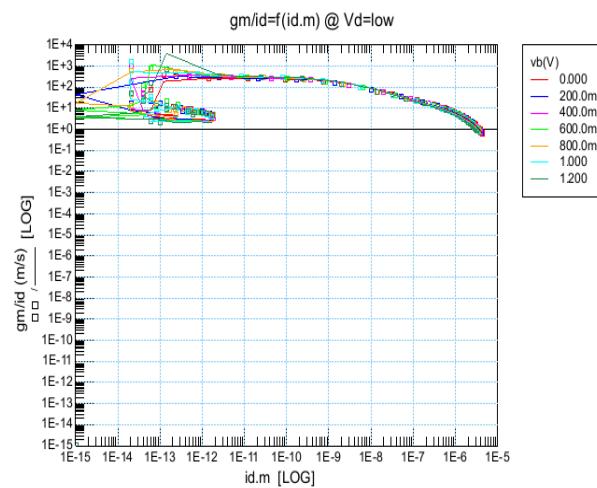
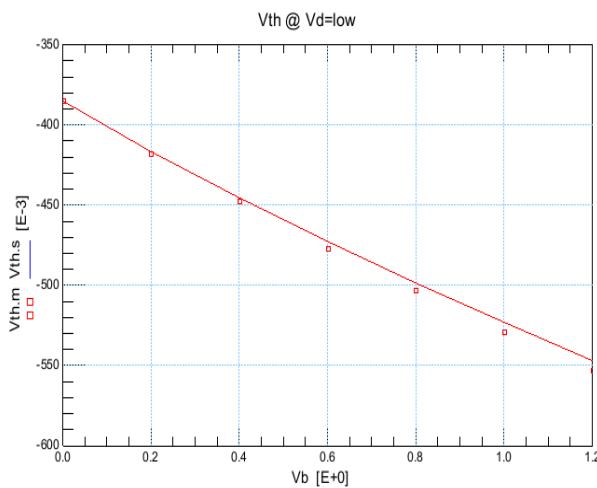
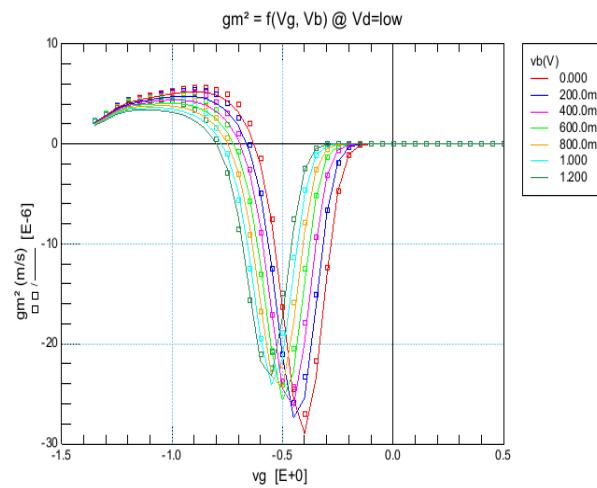
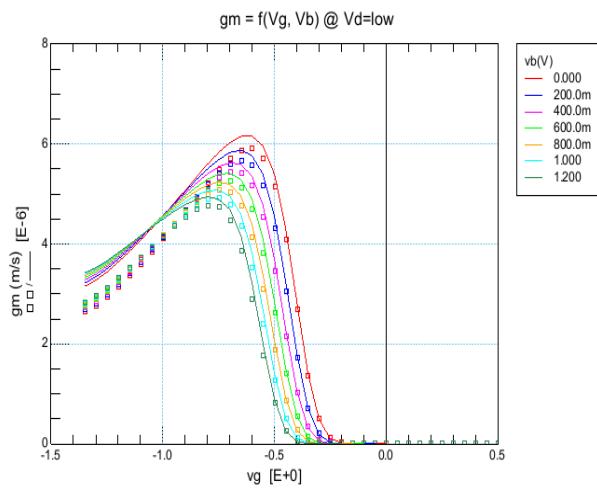
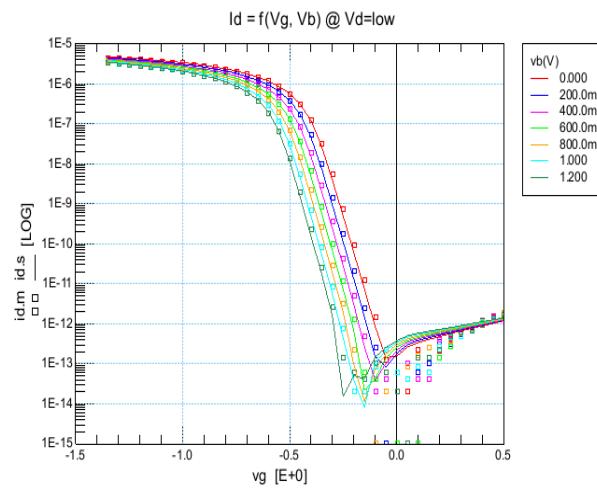
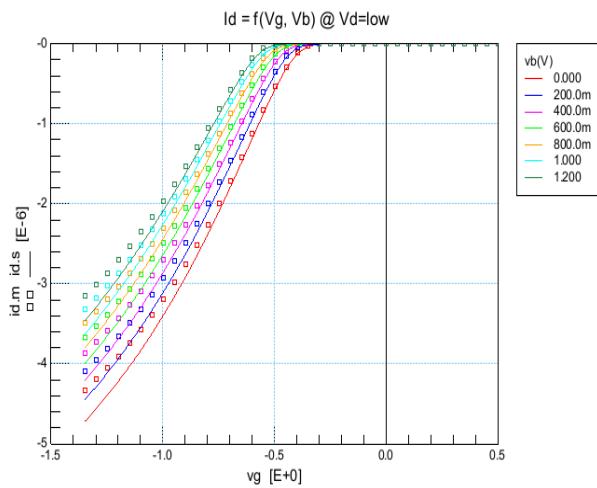
idvd_vbmin, Vb = 1.2V, T = 27°C**idvd_vth, Vb = 0V, T = 27°C**

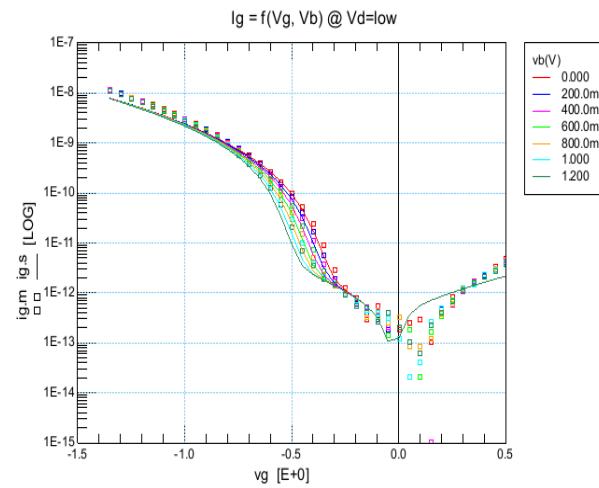
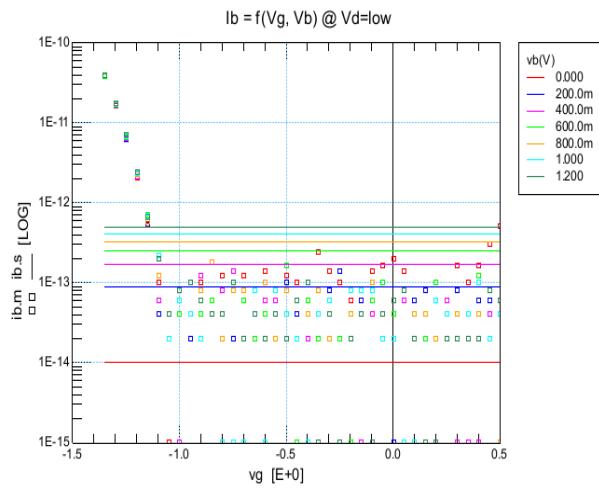


idvd_vth_vbmin, Vb = 1.2V, T = 27°C

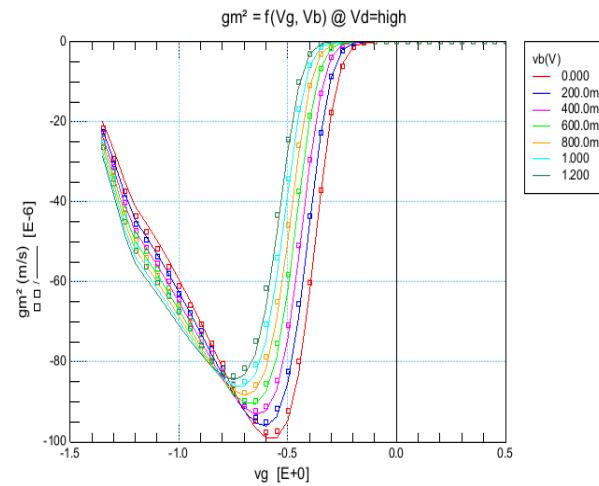
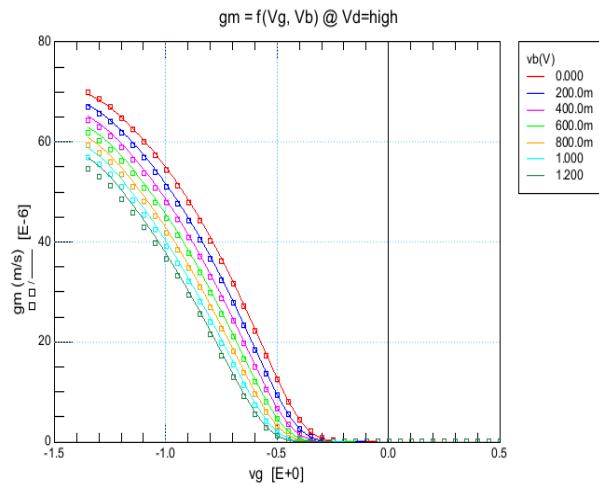
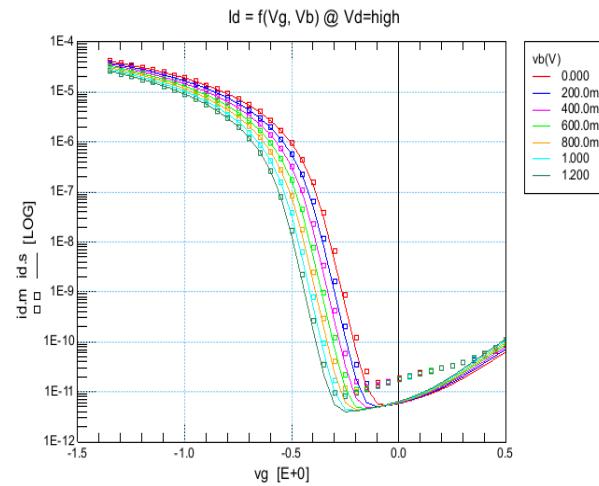
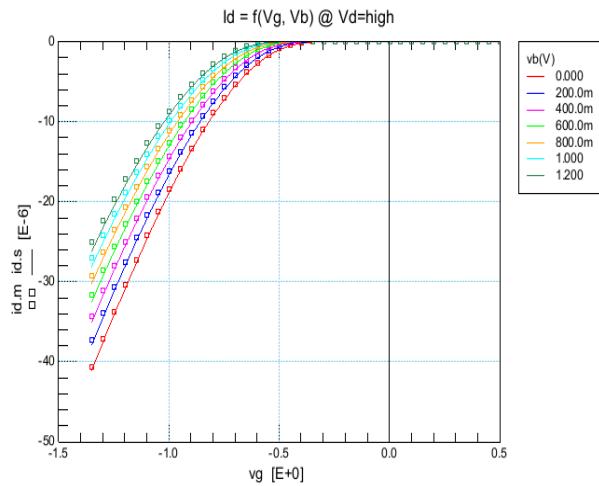


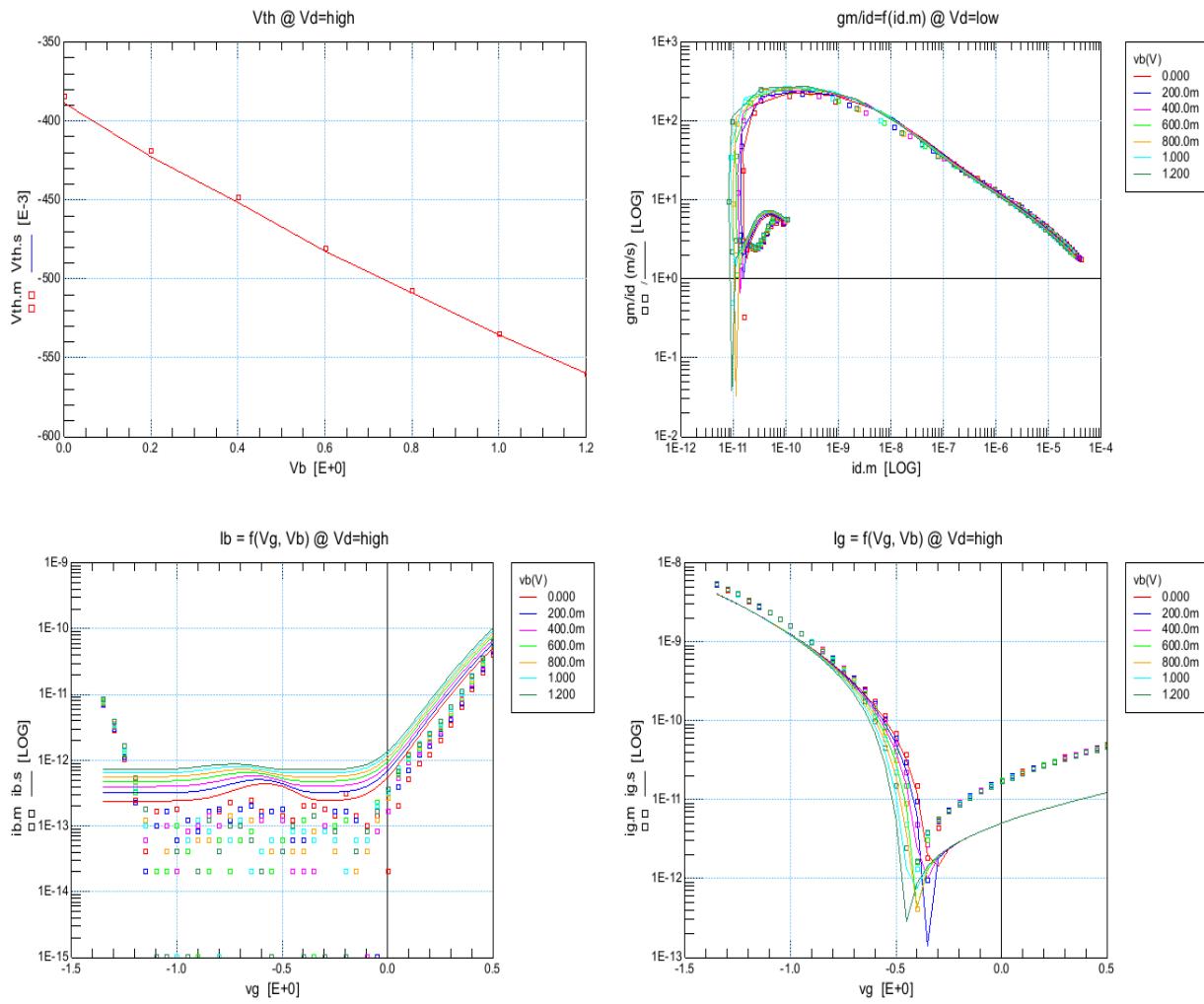
idvg, Vd = -0.05V, T = -40°C



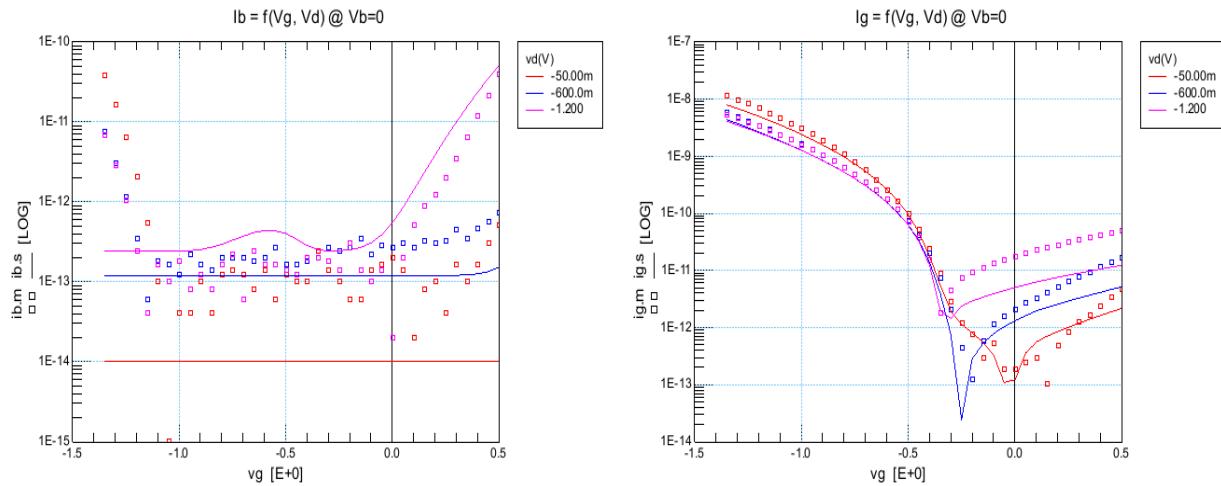


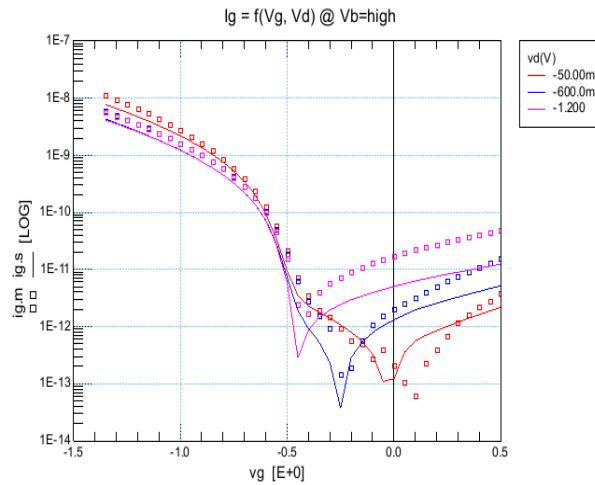
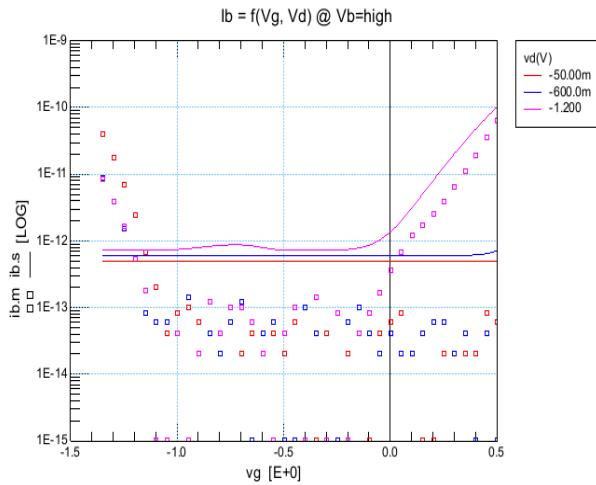
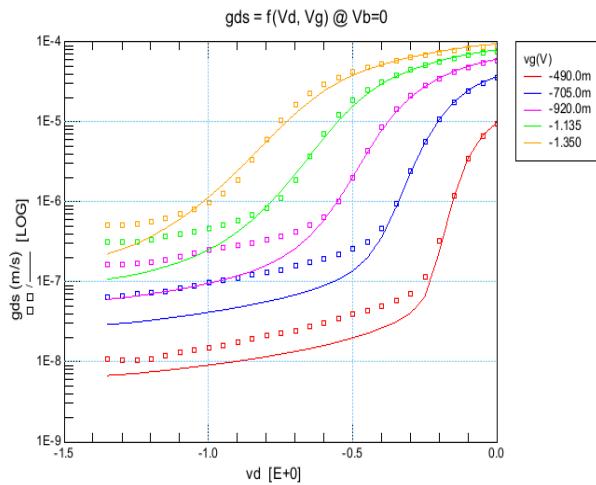
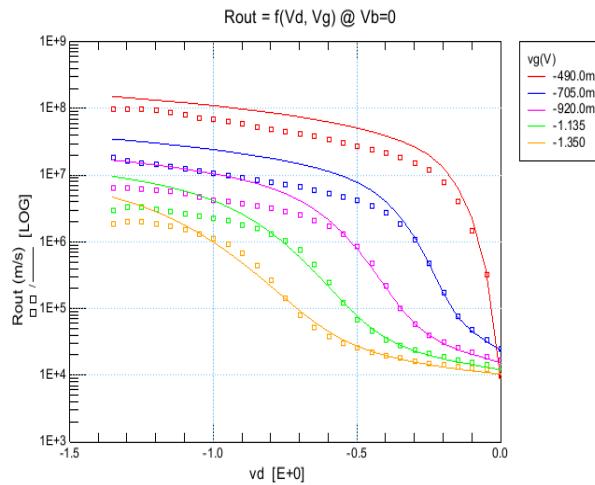
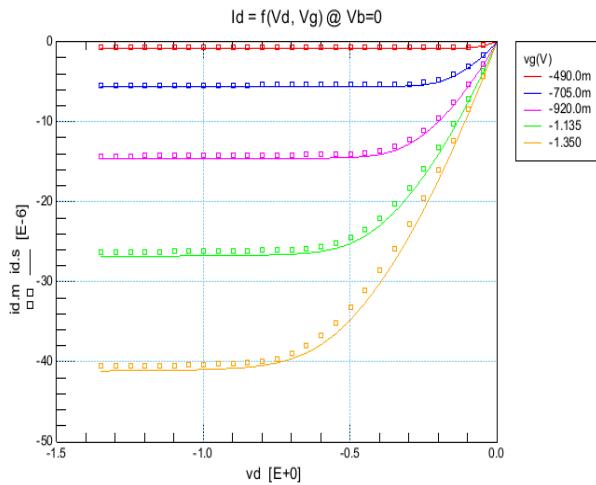
$idvg, Vd = -1.2V, T = -40^{\circ}C$

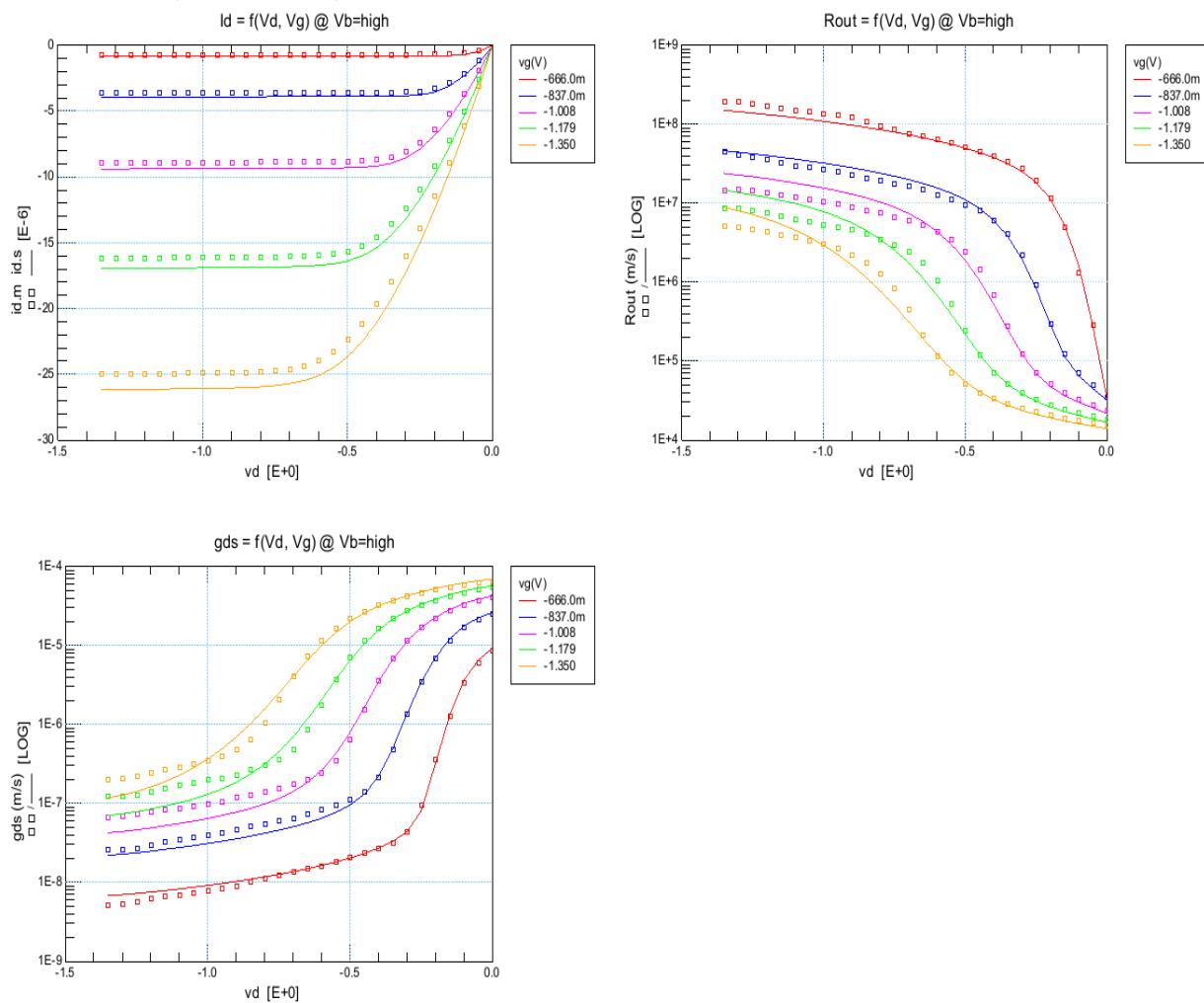
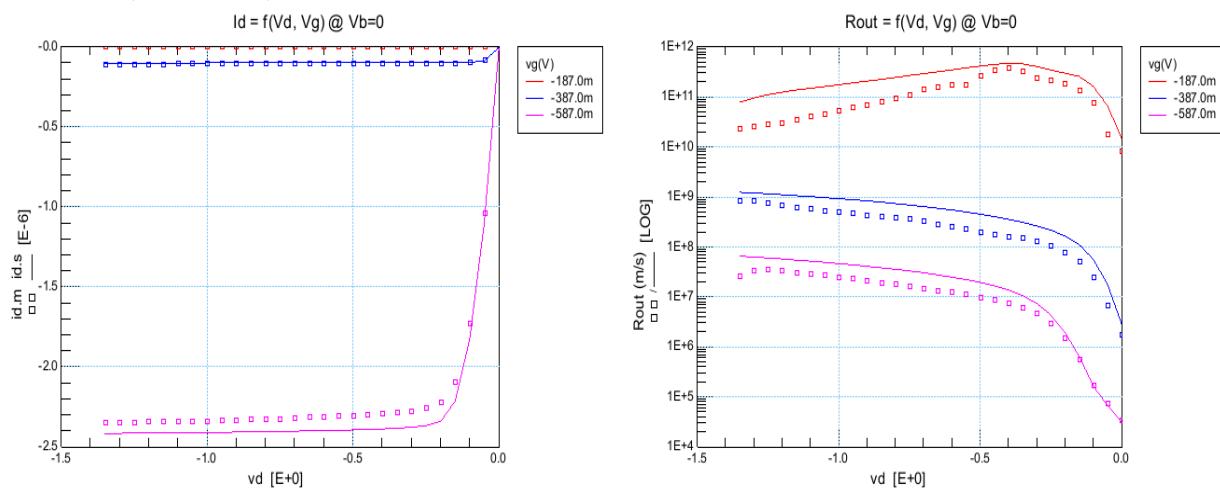


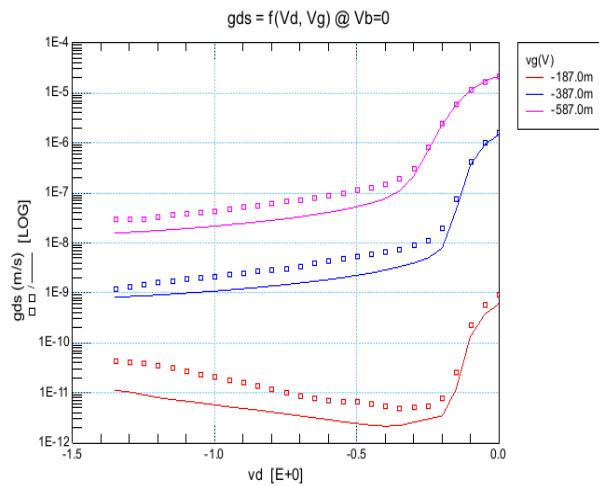


idvg, Ib, Ig, Vb = 0V, T = -40°C

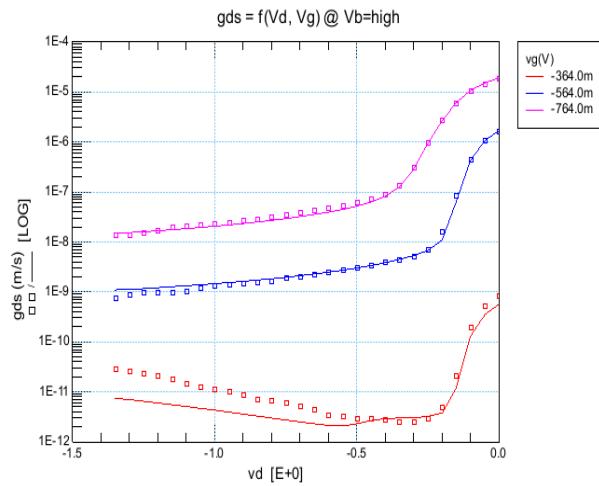
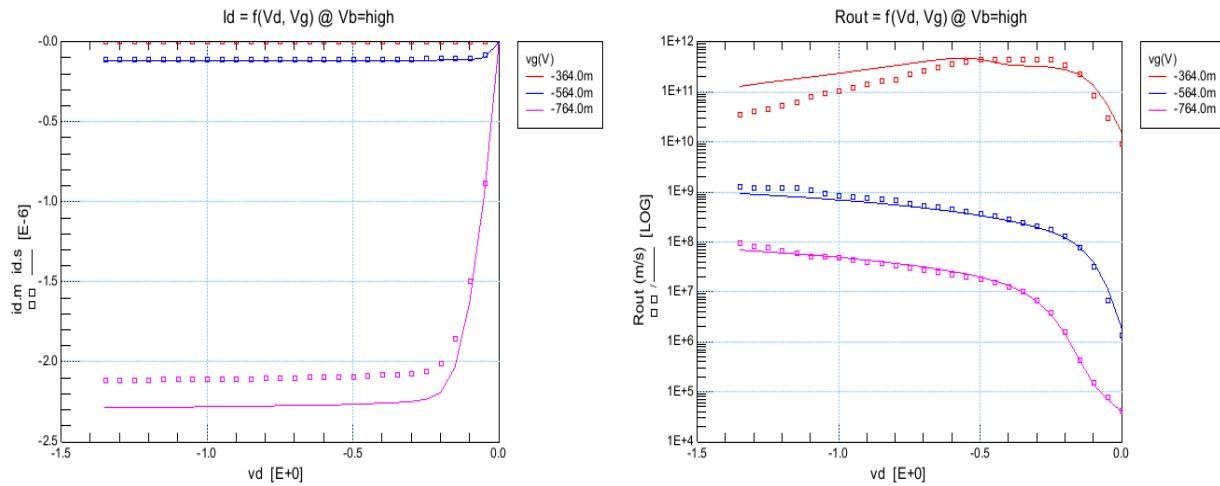


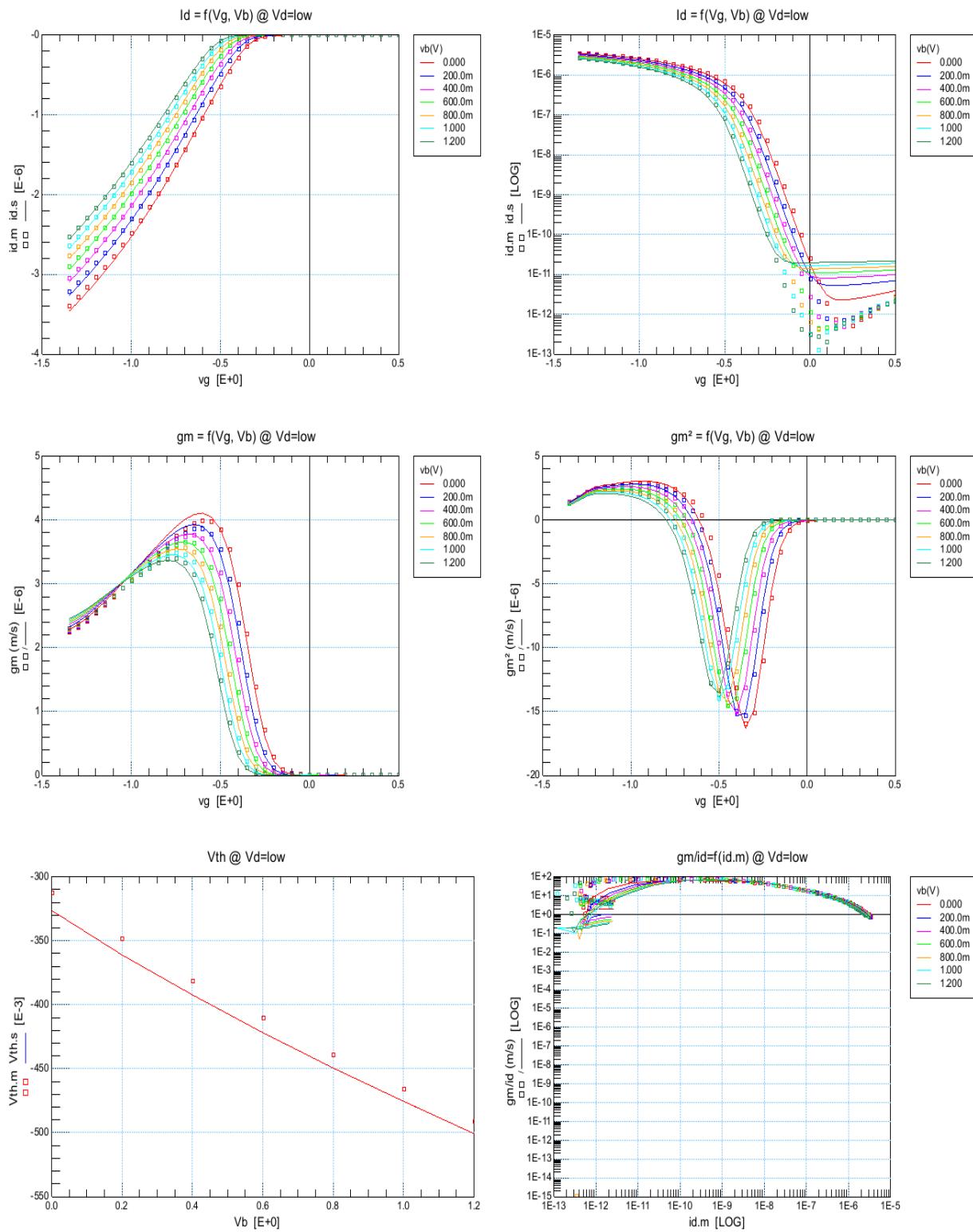
idvg, Ib,Ig, Vb = 1.2V, T = -40°C

idvd, Vb = 0V, T = -40°C


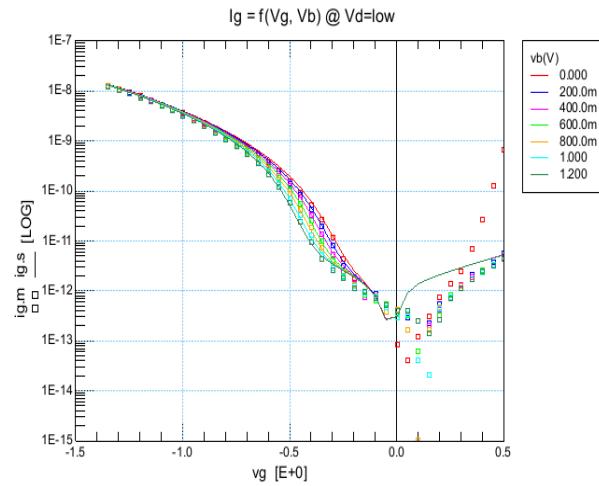
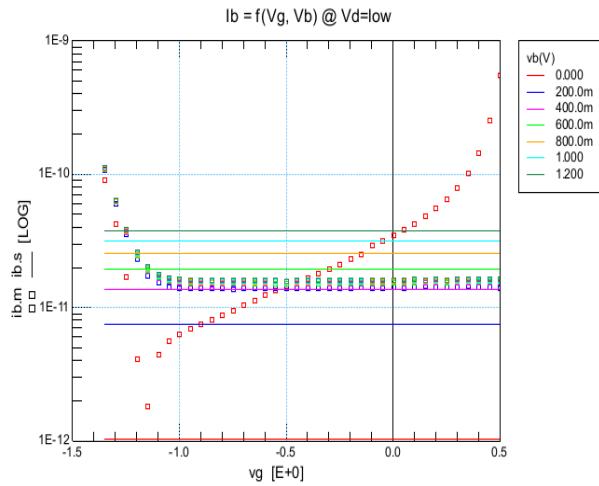
idvd_vbmin, Vb = 1.2V, T = -40°C

idvd_vth, Vb = 0V, T = -40°C




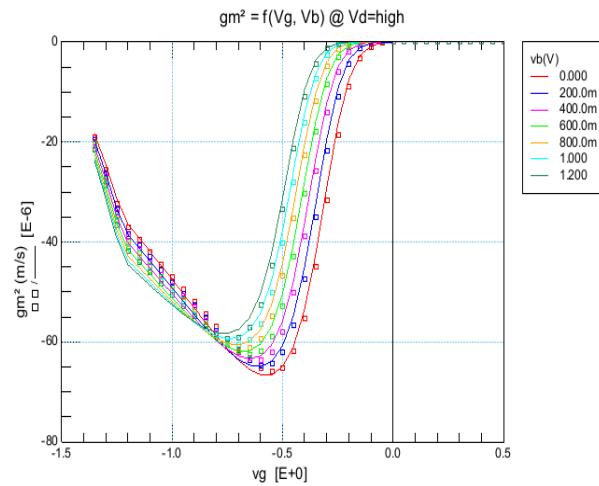
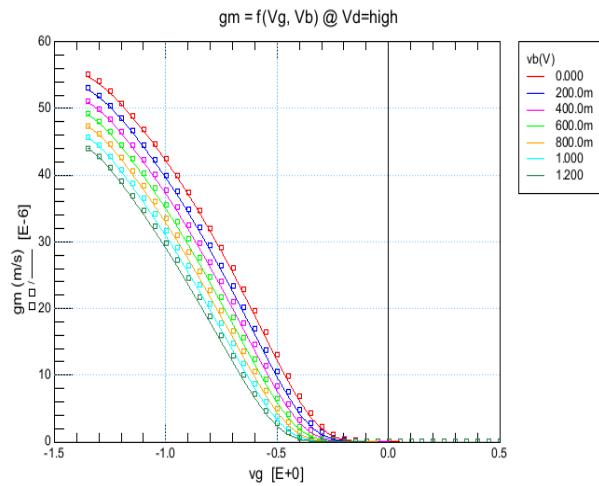
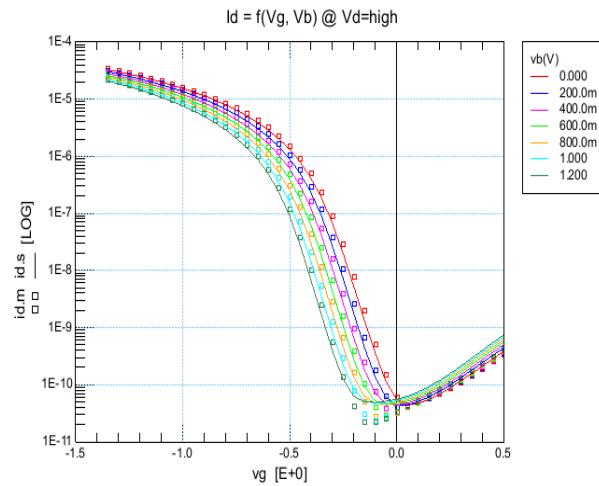
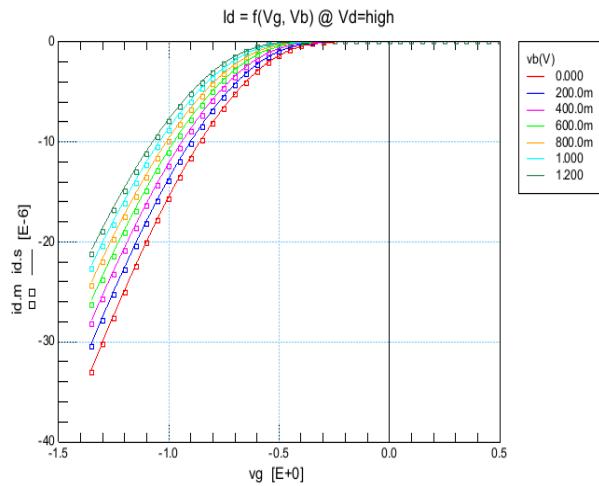
idvd_vth_vbmin, Vb = 1.2V, T = -40°C

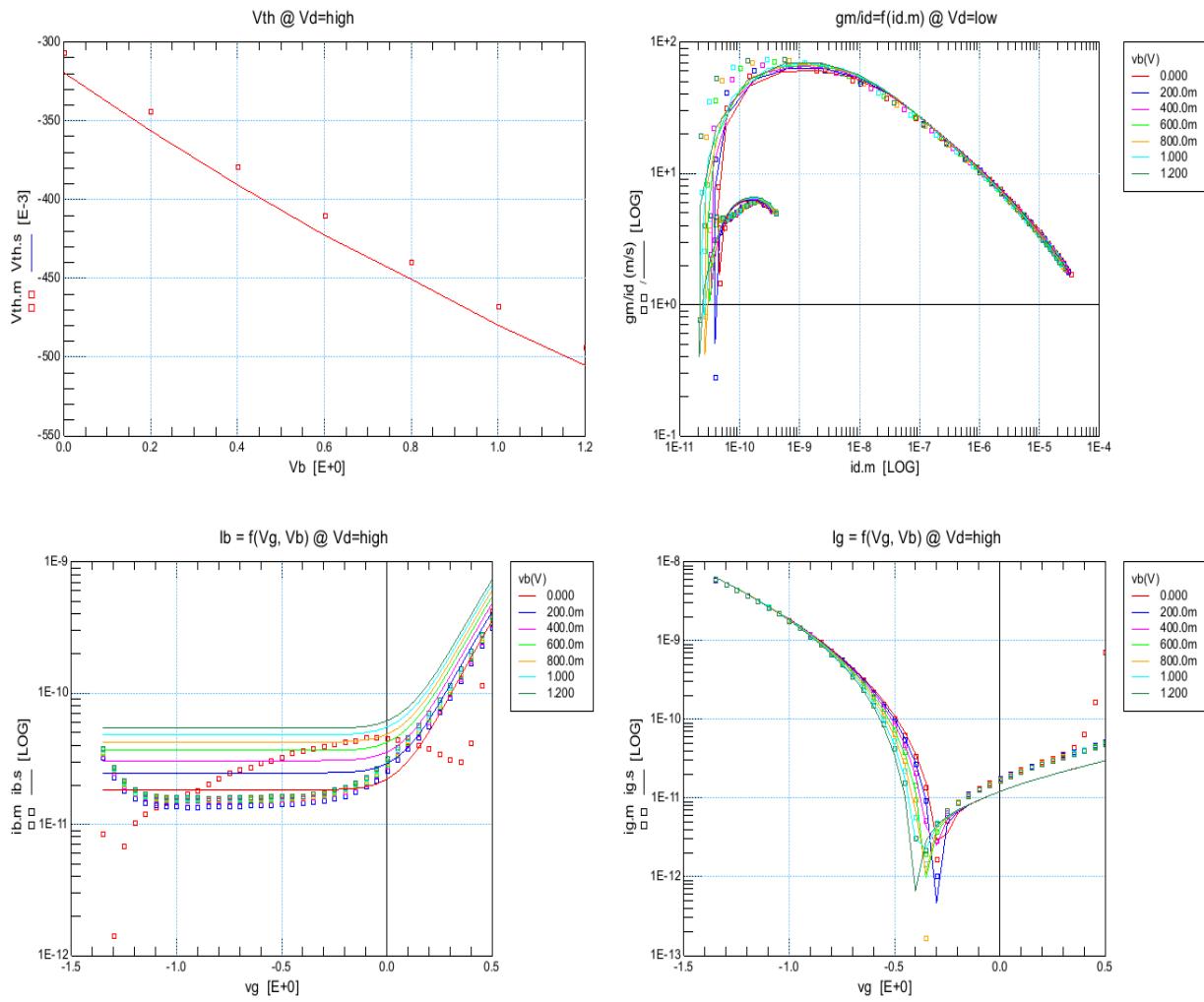


idvg, Vd = -0.05V, T = 70°C


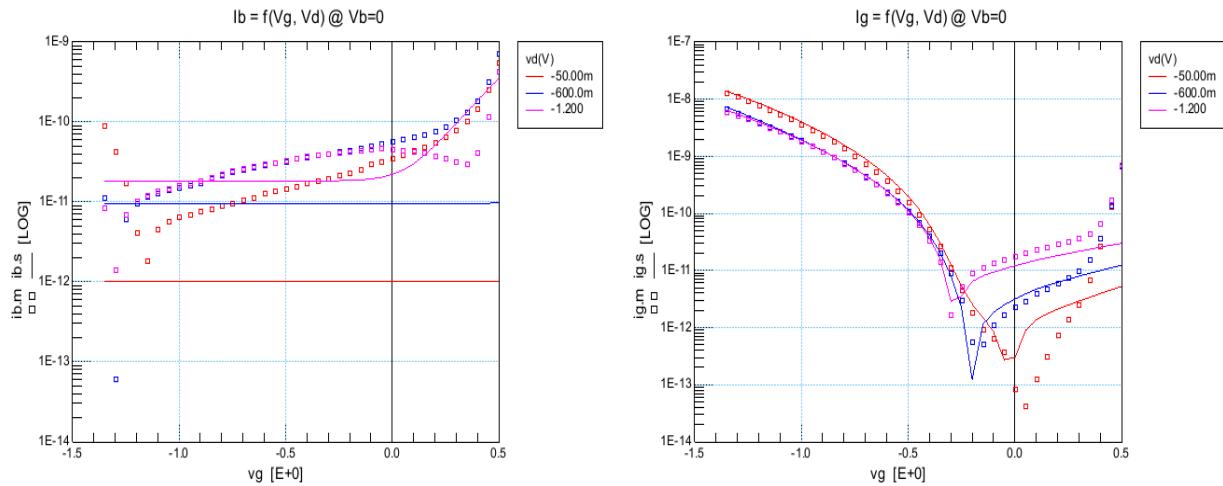


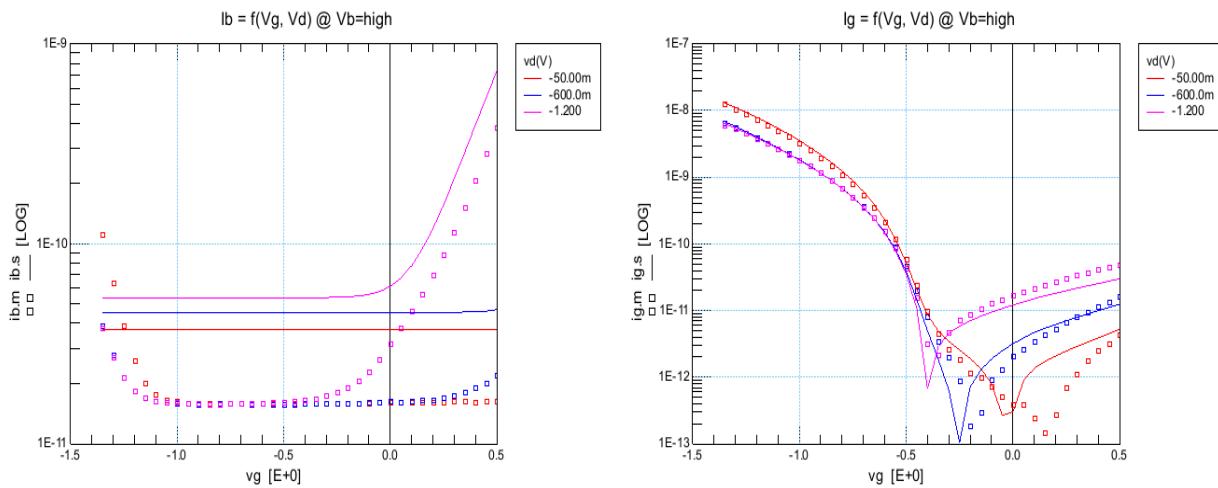
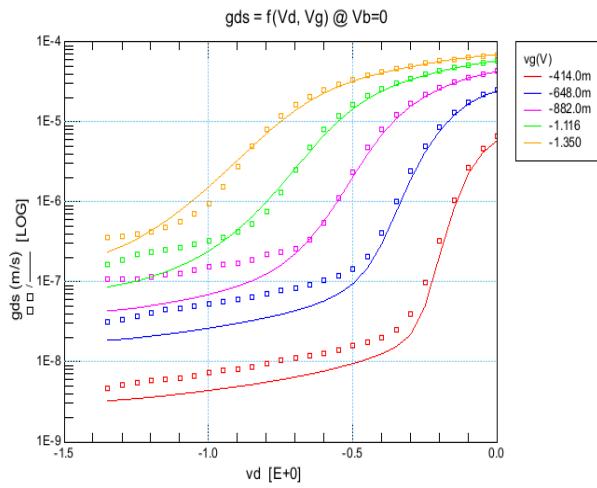
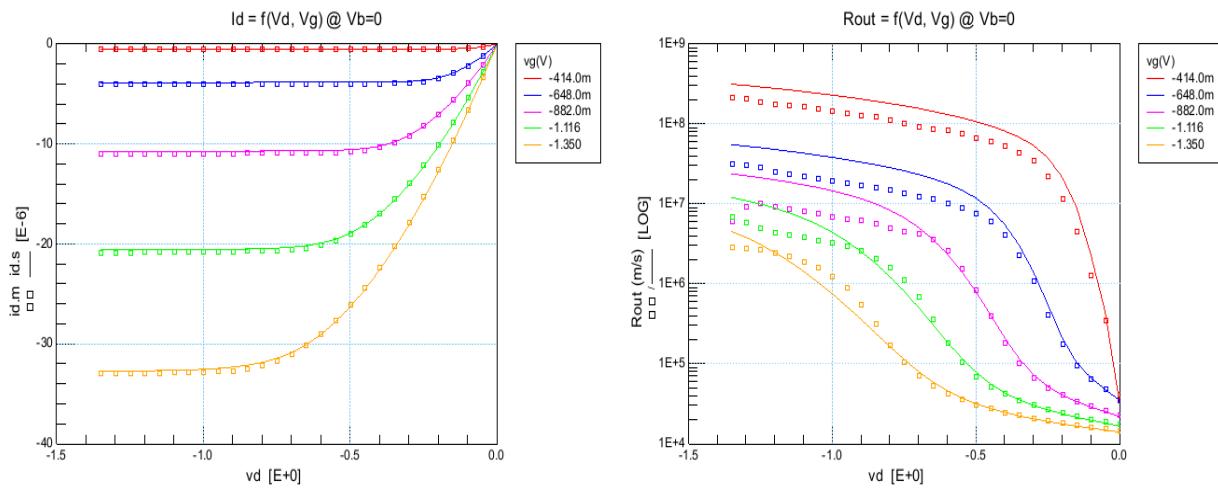
$i_d v_g, V_d = -1.2V, T = 70^\circ C$

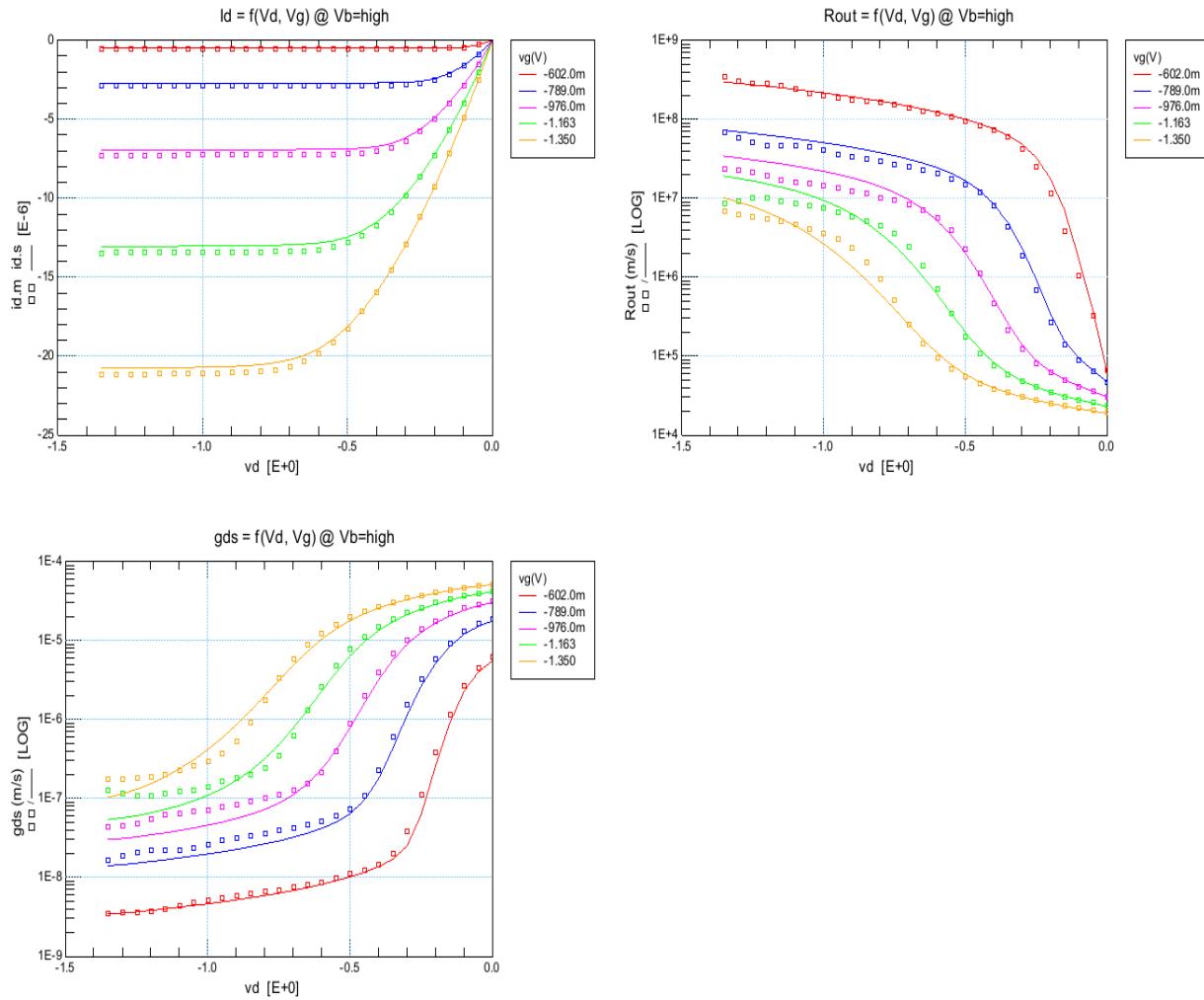
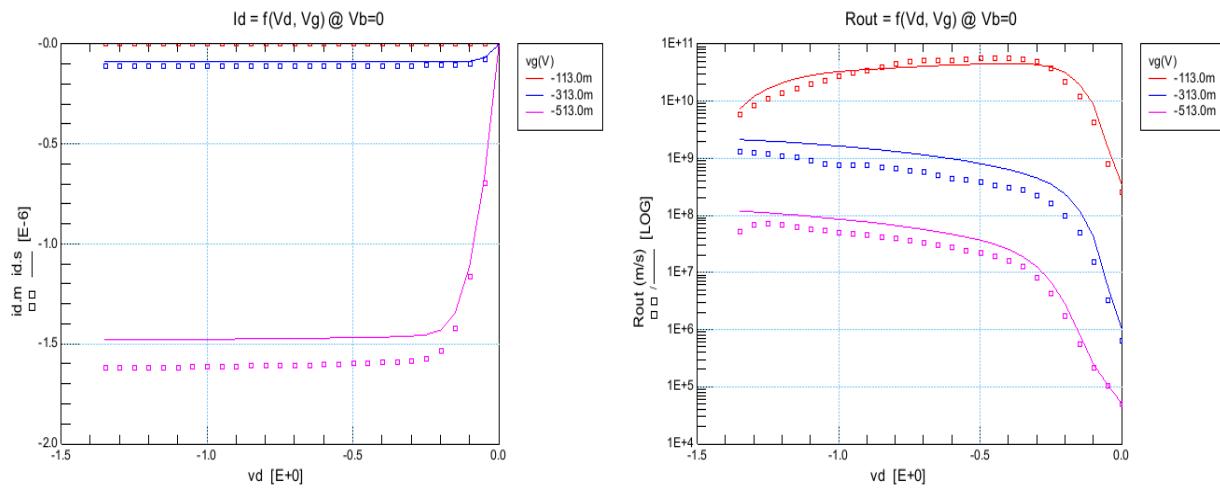


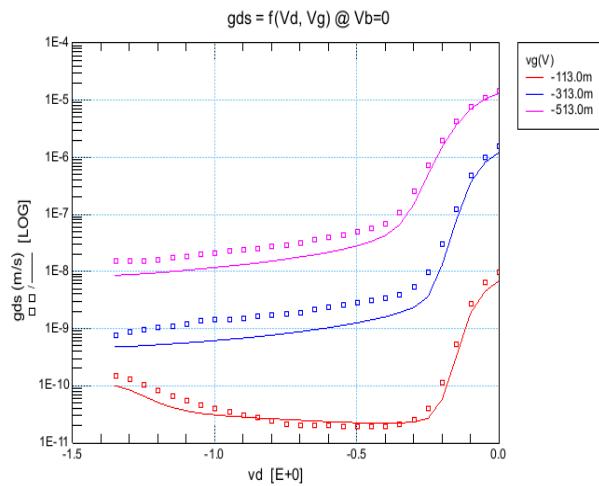


idvg, Ib,Ig, Vb = 0V, T = 70°C

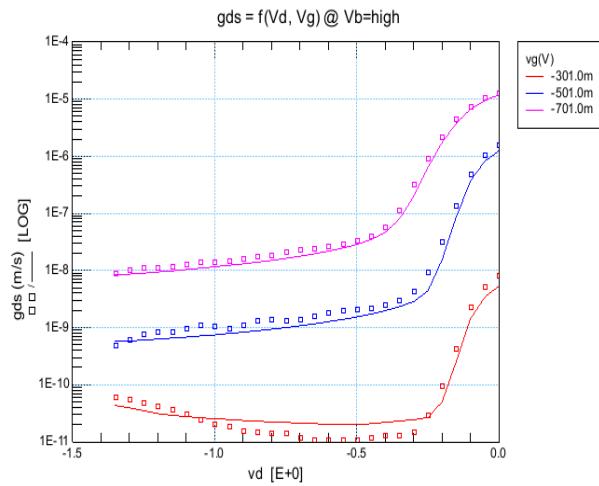
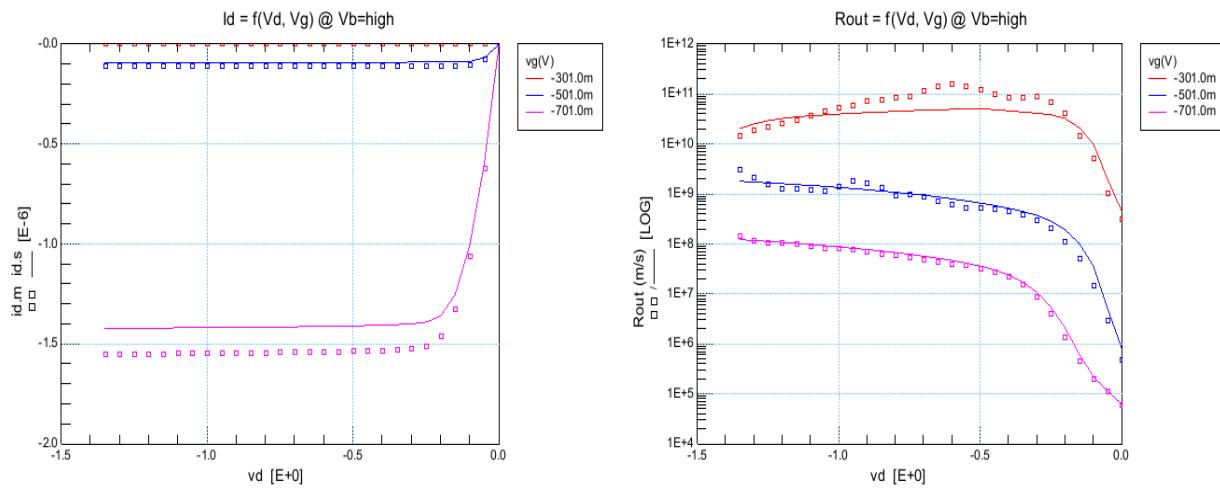


idvg, Ib,Ig, Vb = 1.2V, T = 70°C

idvd, Vb = 0V, T = 70°C


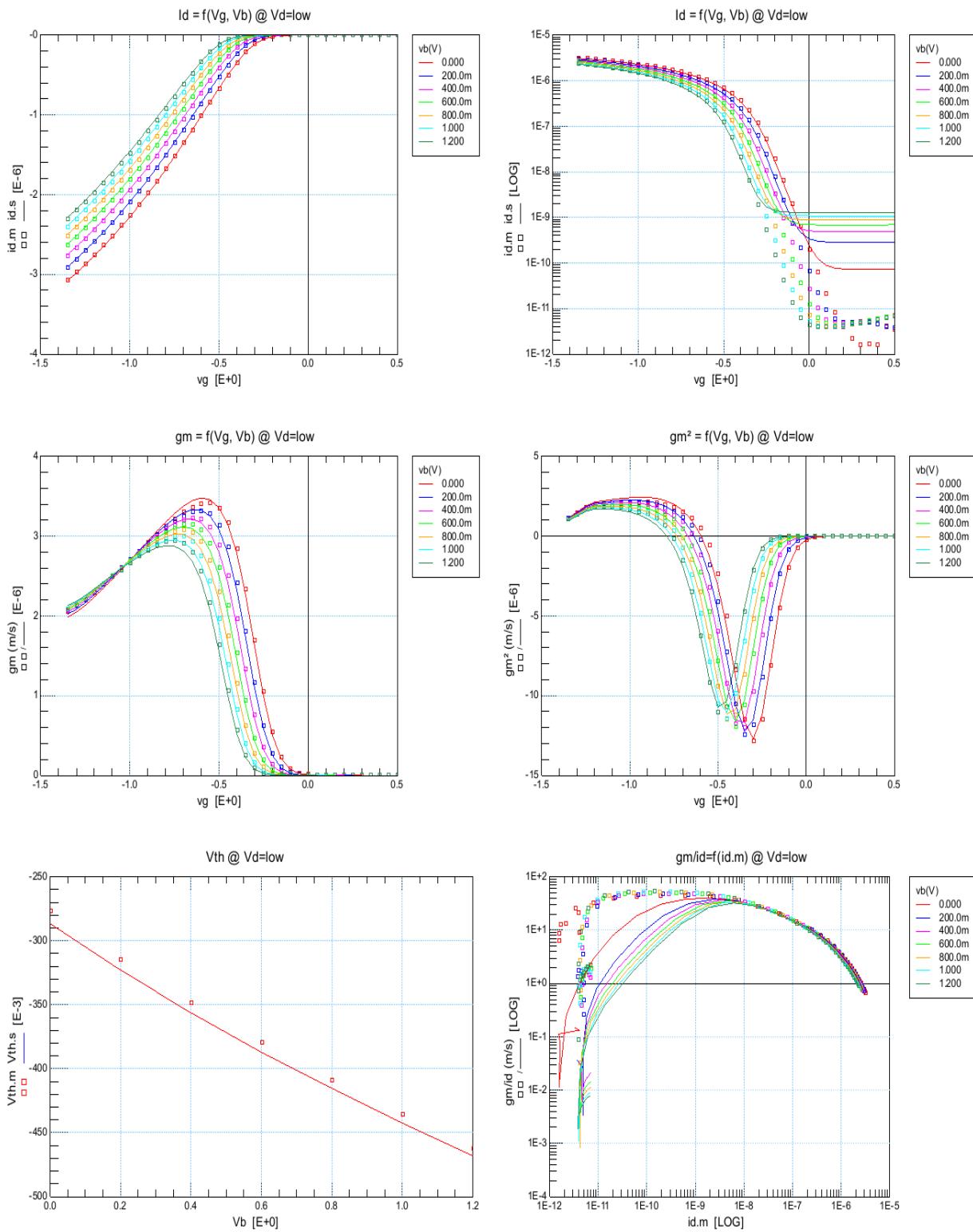
idvd_vbmin, Vb = 1.2V, T = 70°C

idvd_vth, Vb = 0V, T = 70°C


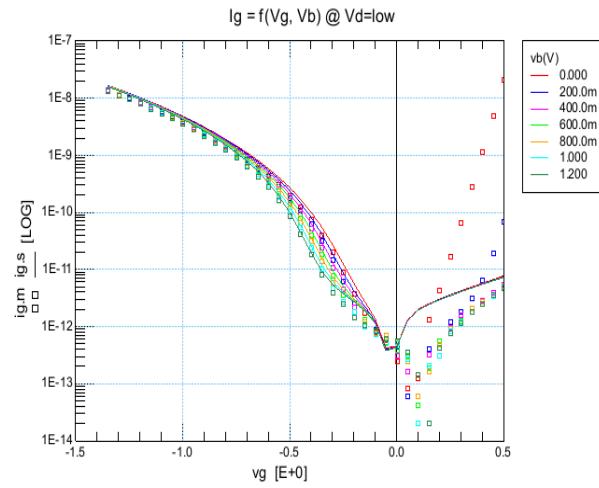
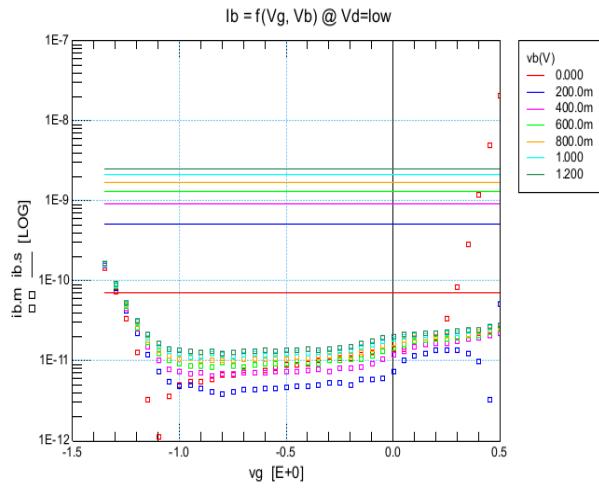


idvd_vth_vbmin, Vb = 1.2V, T = 70°C

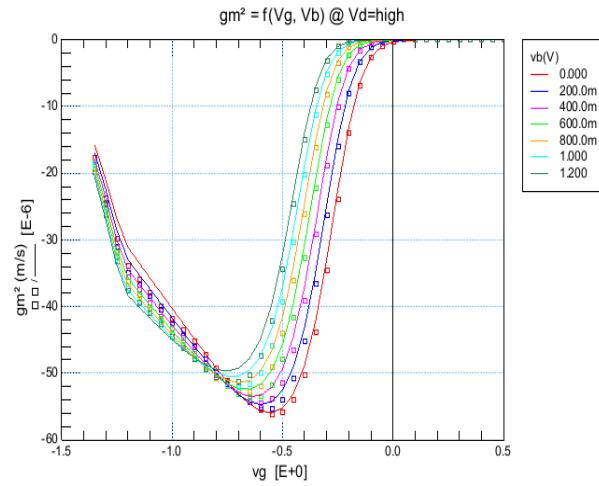
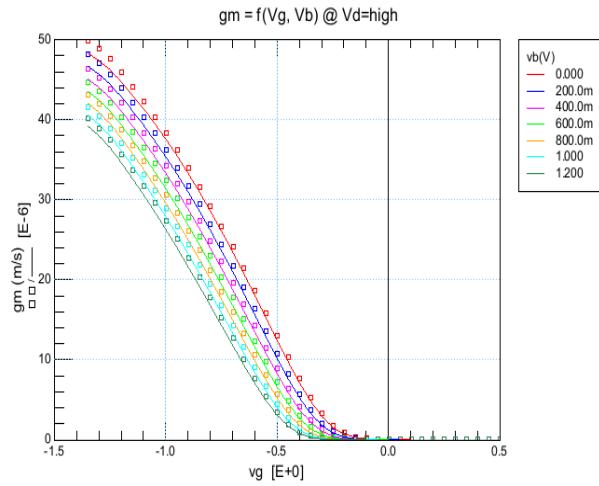
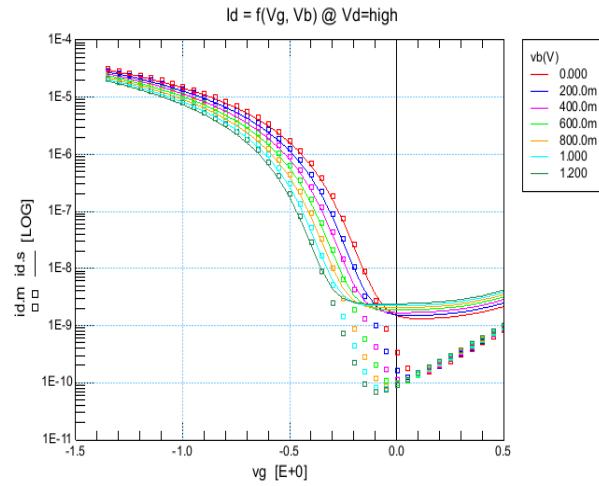
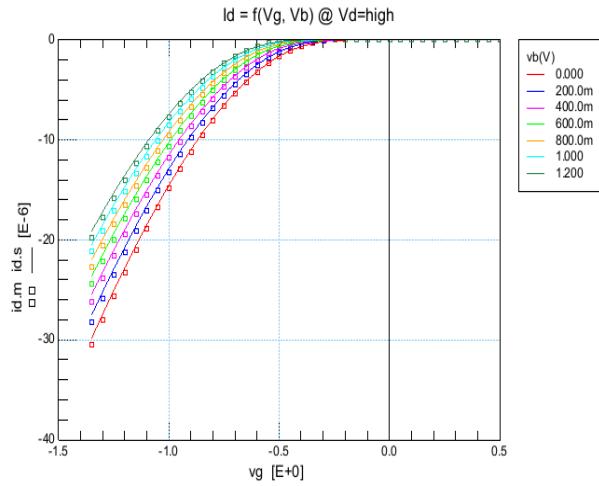


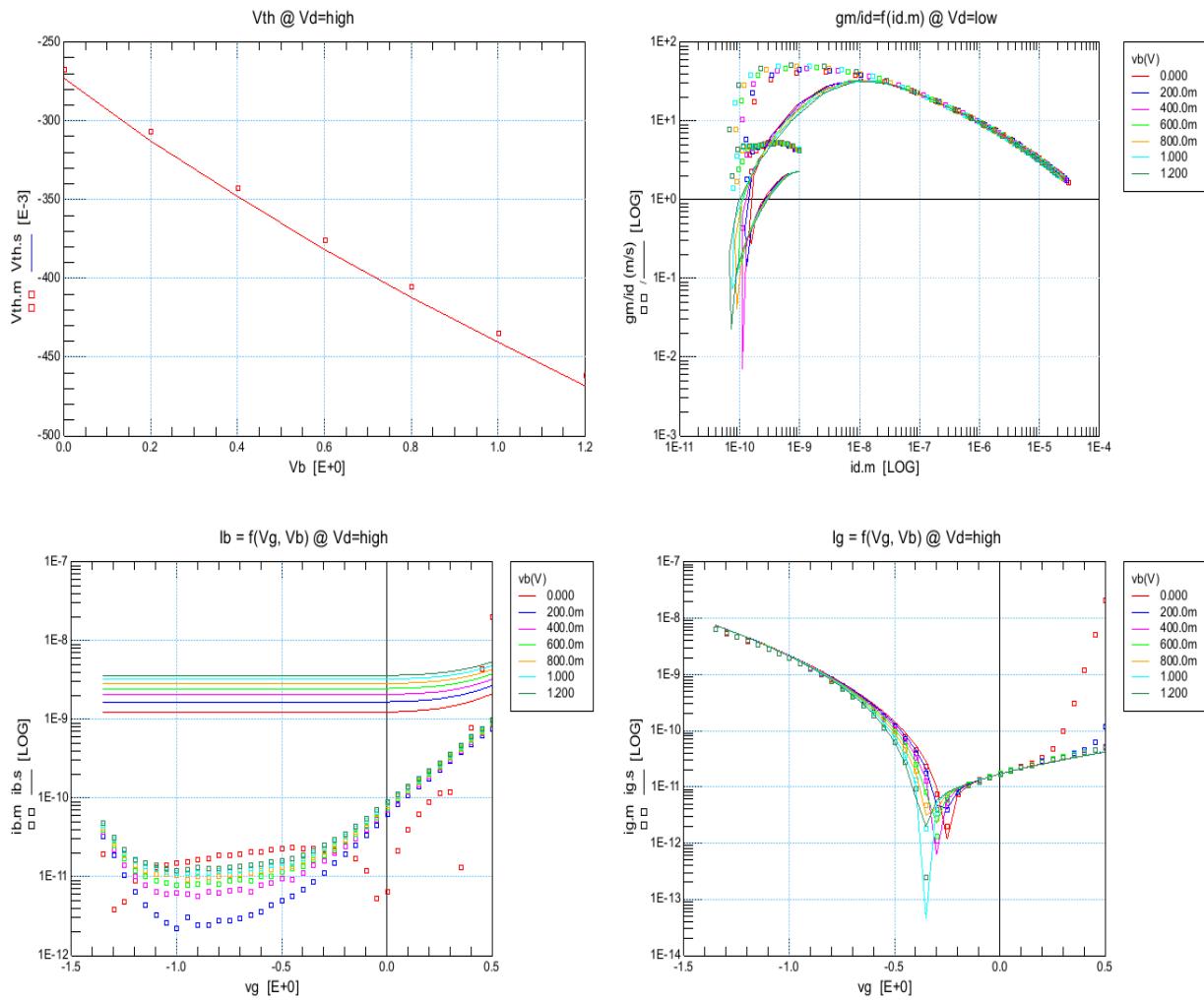
idvg, Vd = -0.05V, T = 125°C



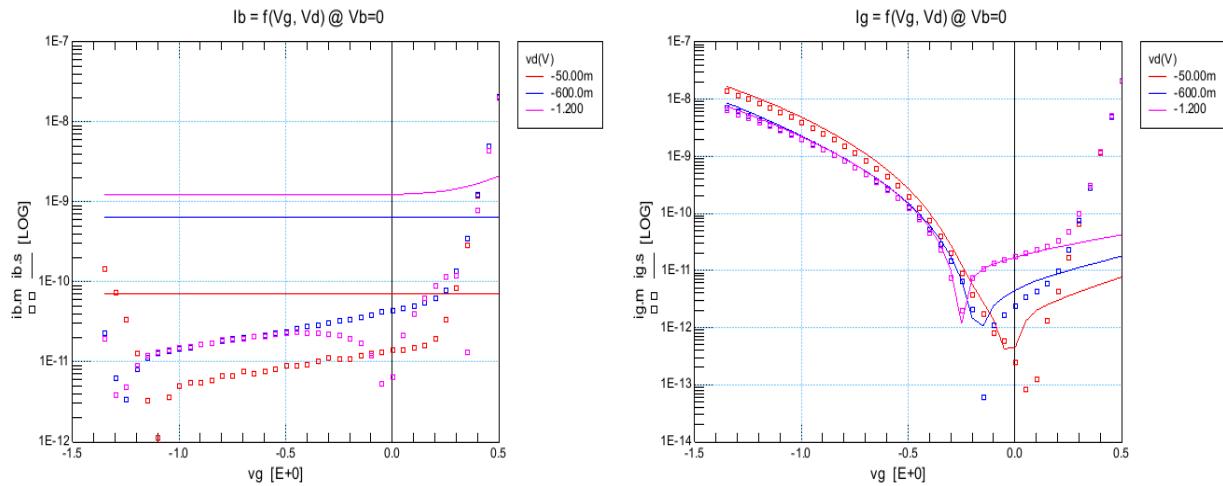


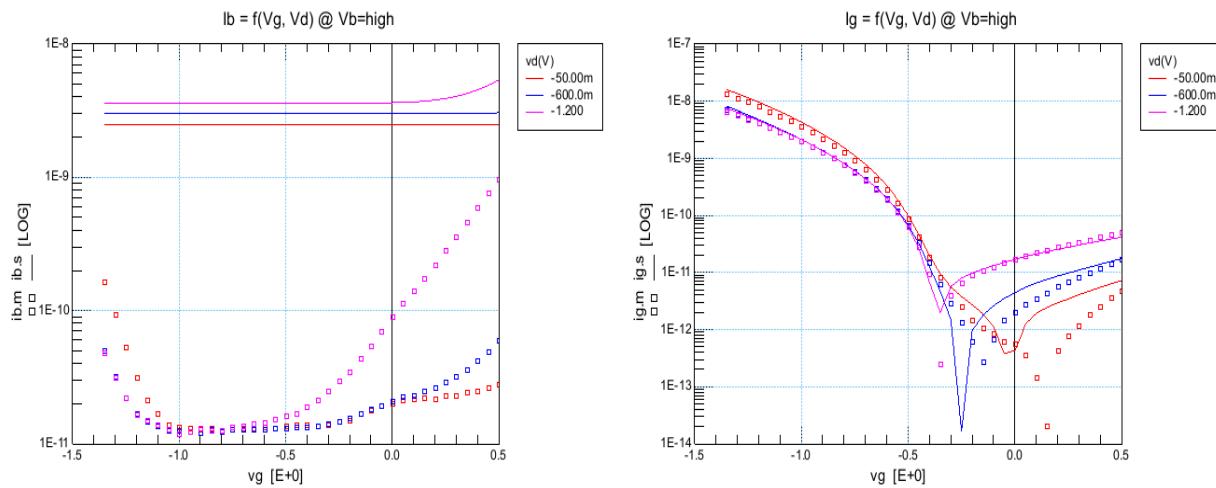
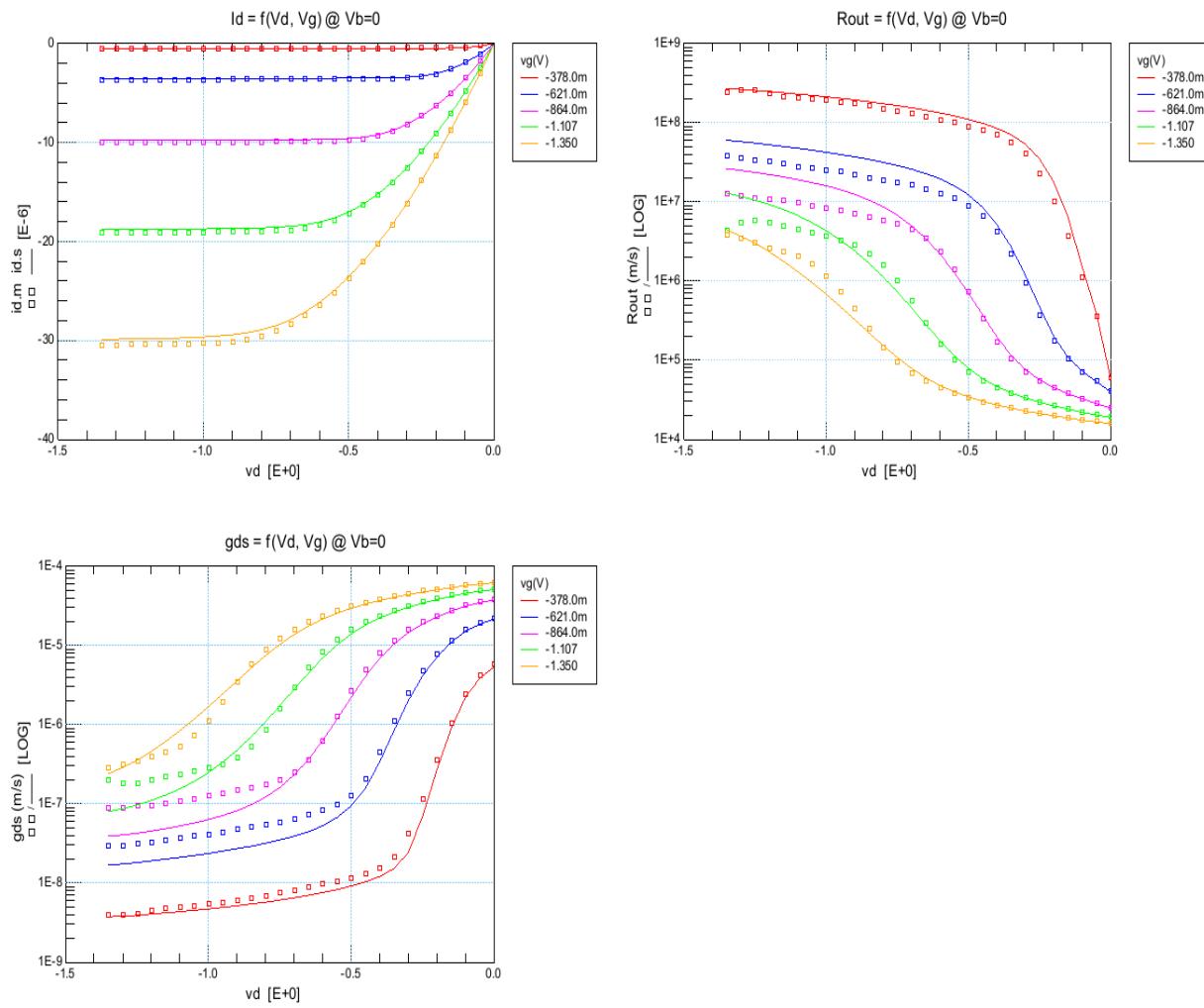
$i_{dvg}, V_d = -1.2V, T = 125^\circ\text{C}$

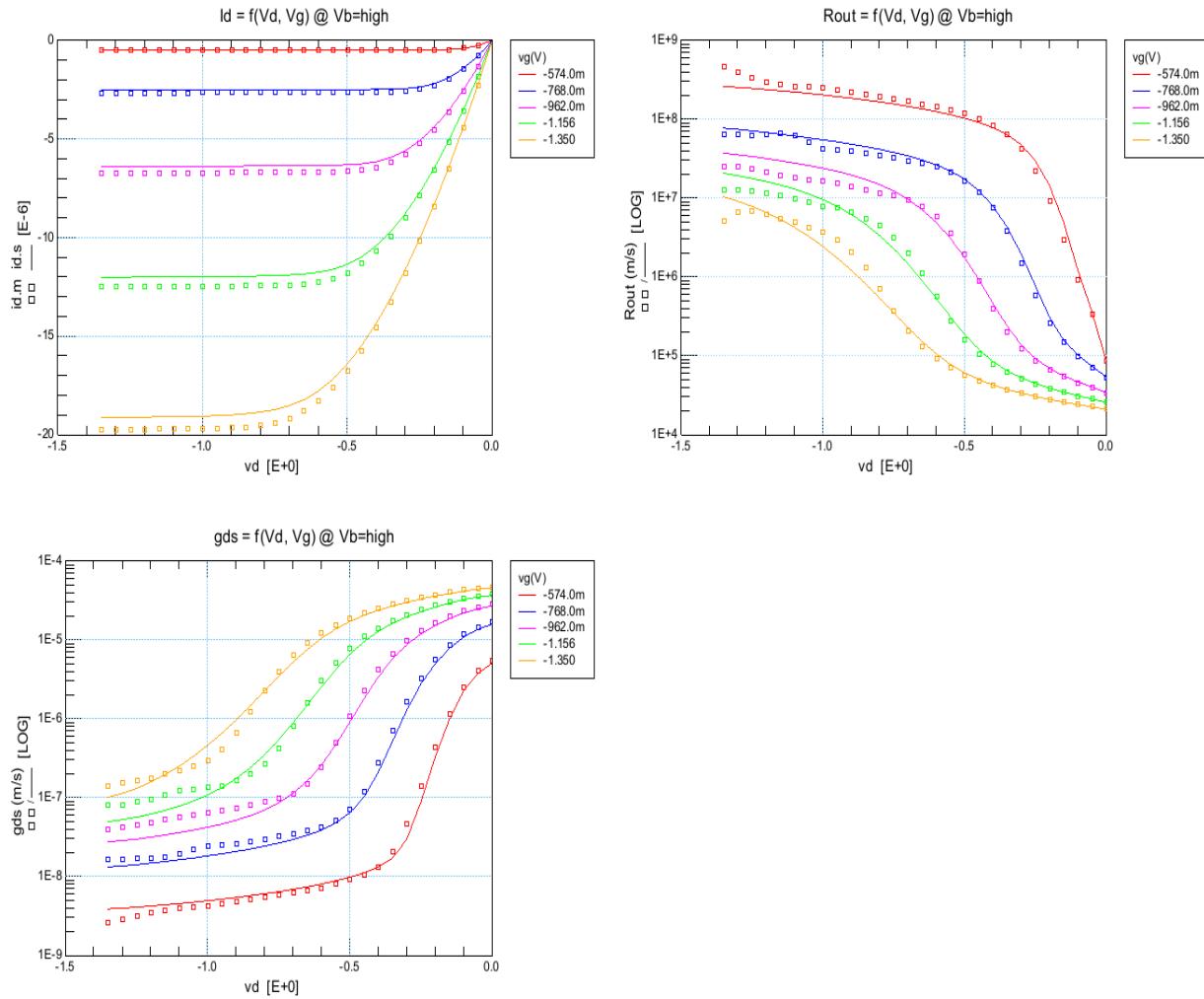
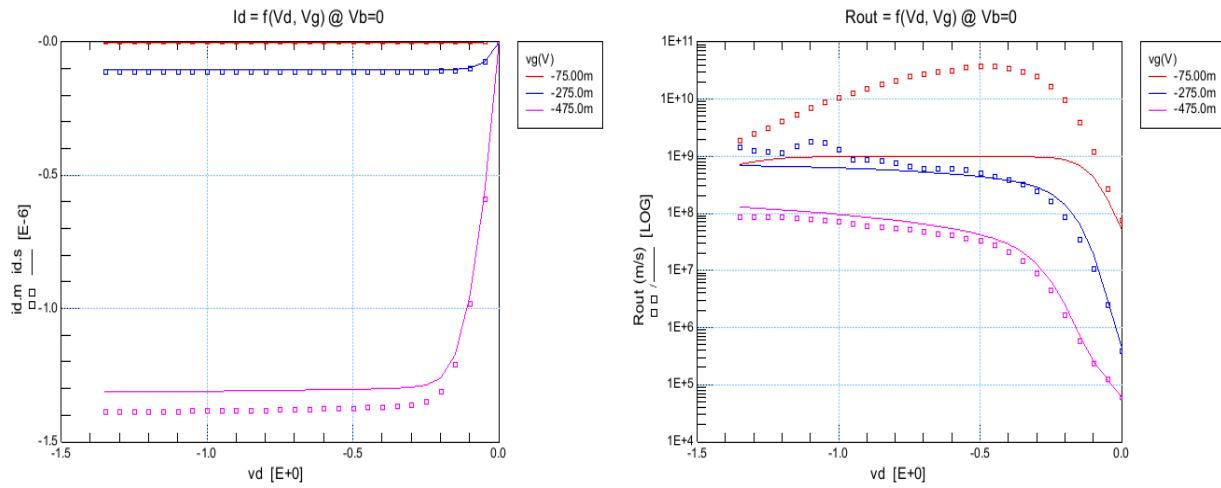


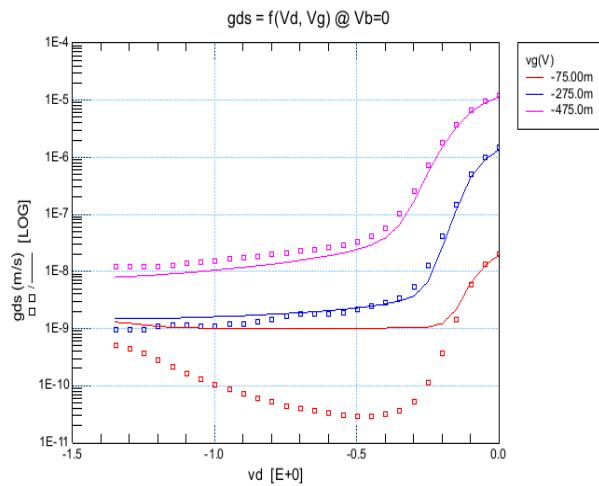


i_{dVg} , I_b , I_g , $V_b = 0V$, $T = 125^\circ C$

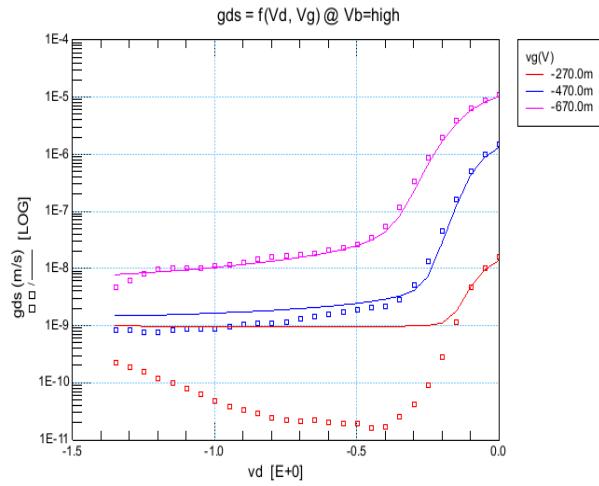
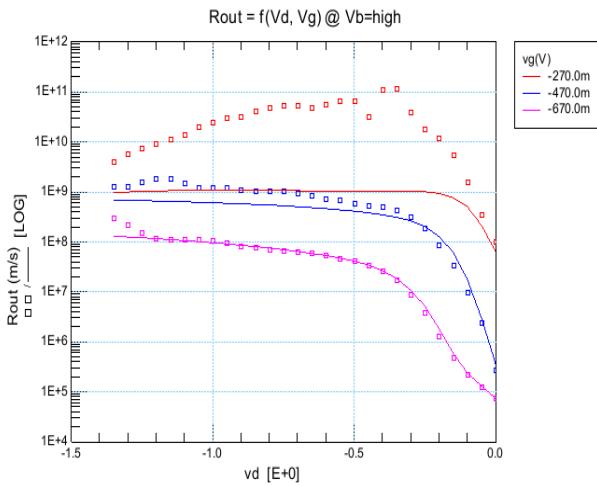
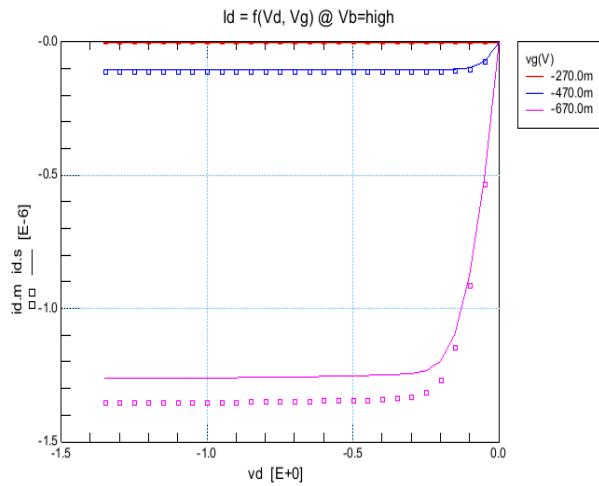


idvg, Ib,Ig, Vb = 1.2V, T = 125°C

idvd, Vb = 0V, T = 125°C


idvd_vbmin, Vb = 1.2V, T = 125°C

idvd_vth, Vb = 0V, T = 125°C


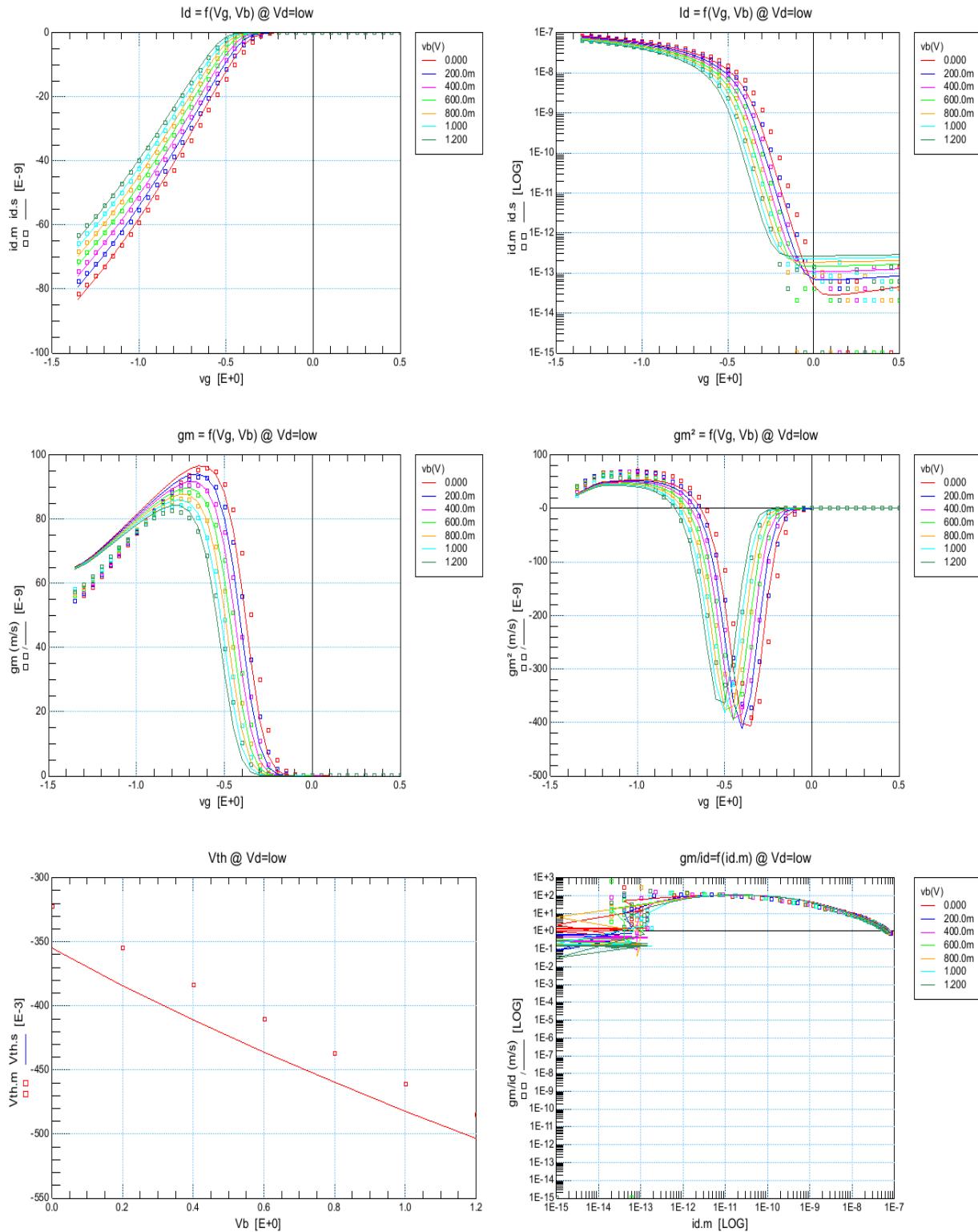


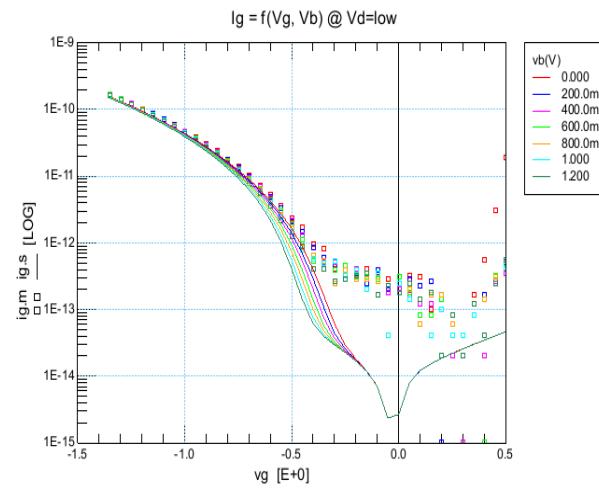
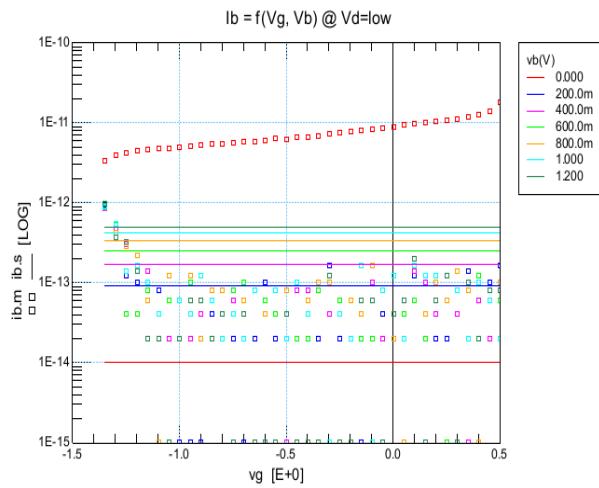
idvd_vth_vbmin, Vb = 1.2V, T = 125°C



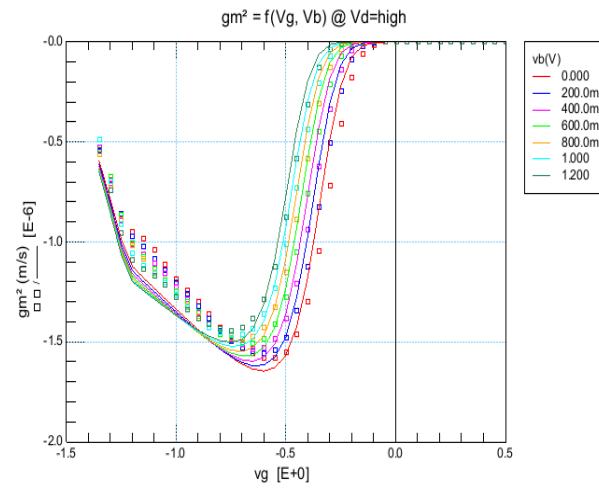
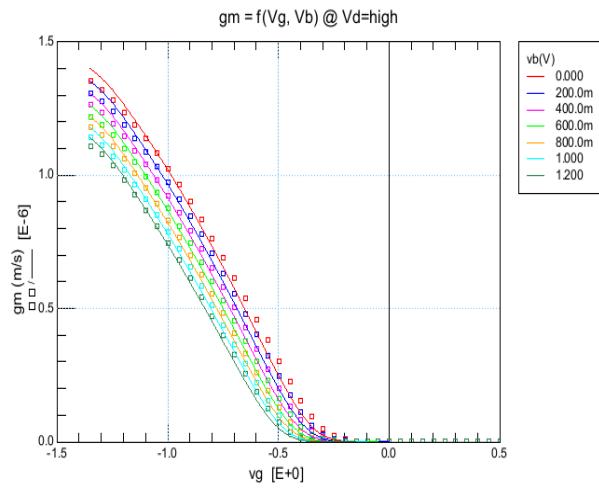
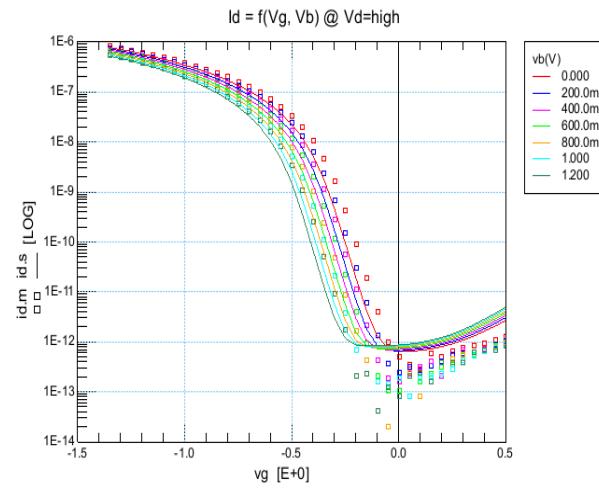
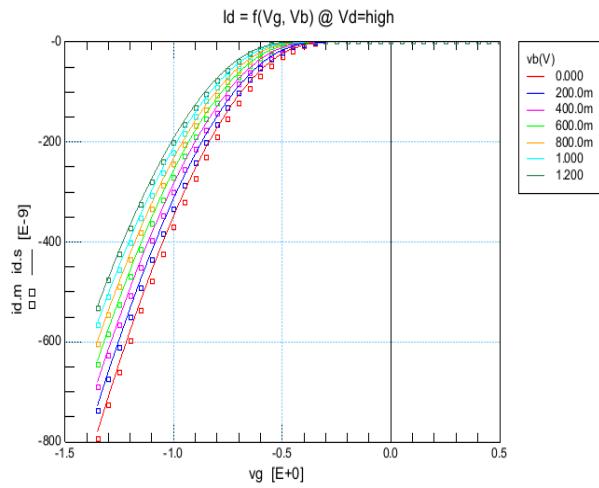
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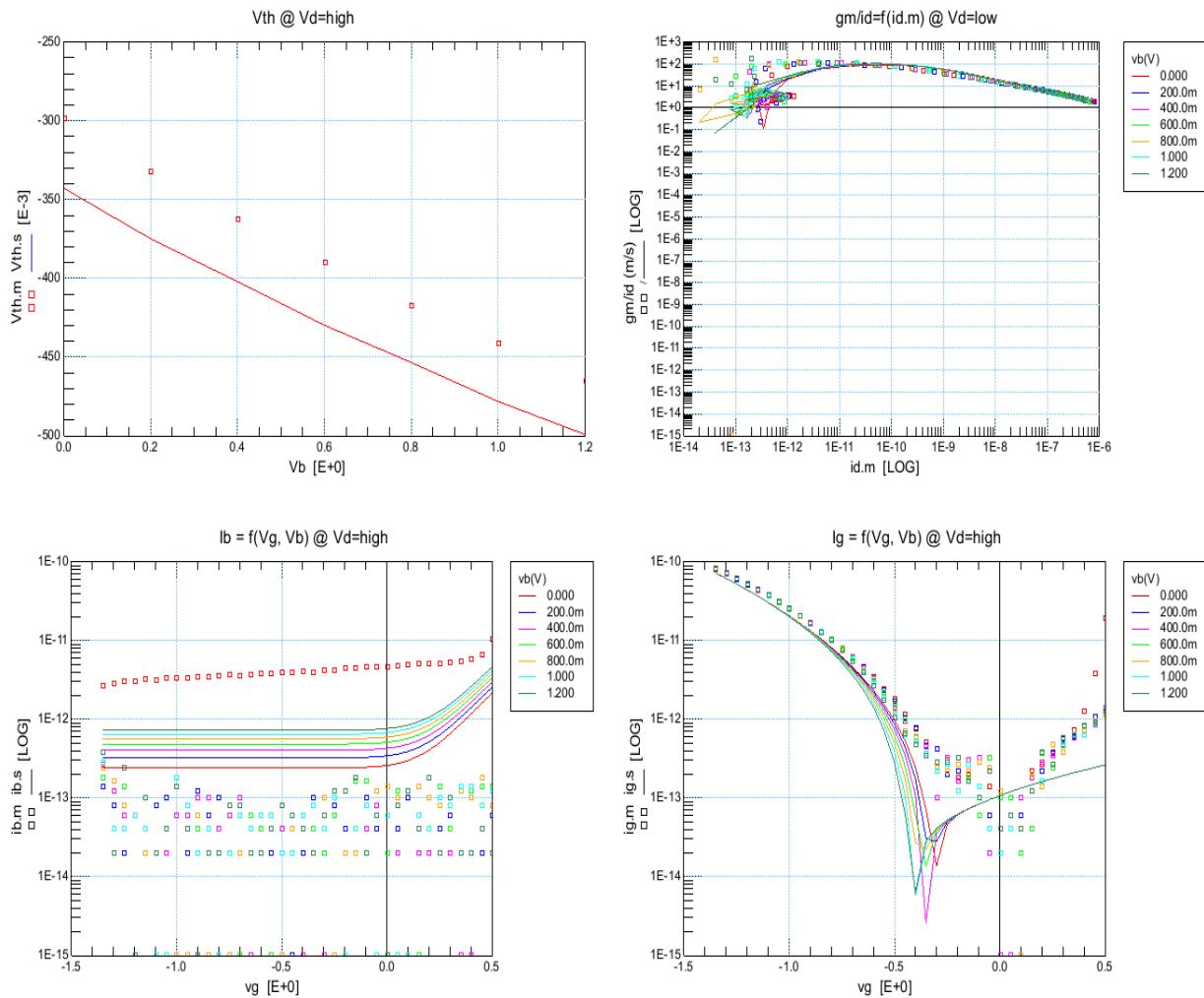
$idv_g, V_d = -0.05V, T = 27^\circ C$



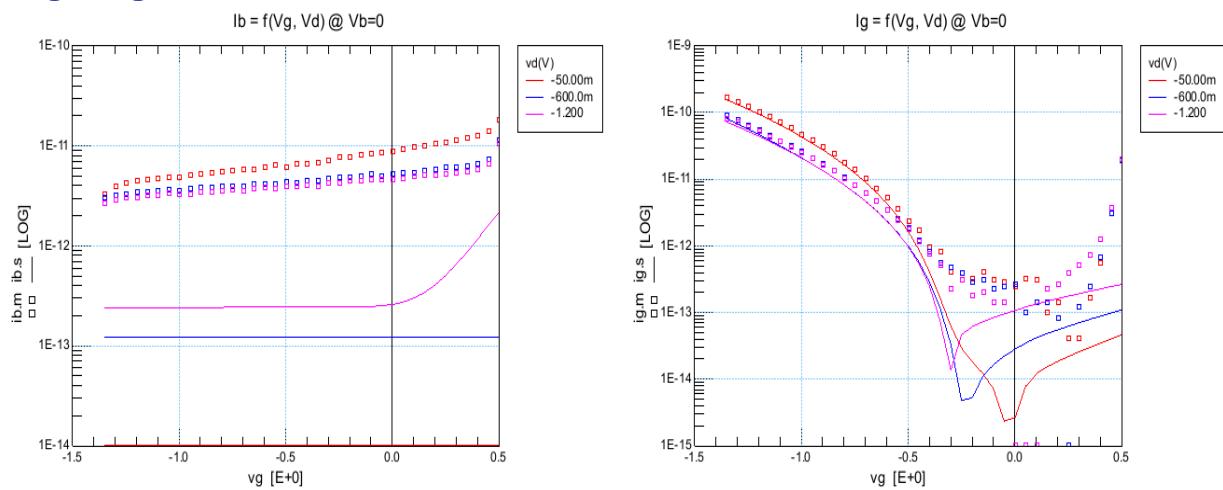


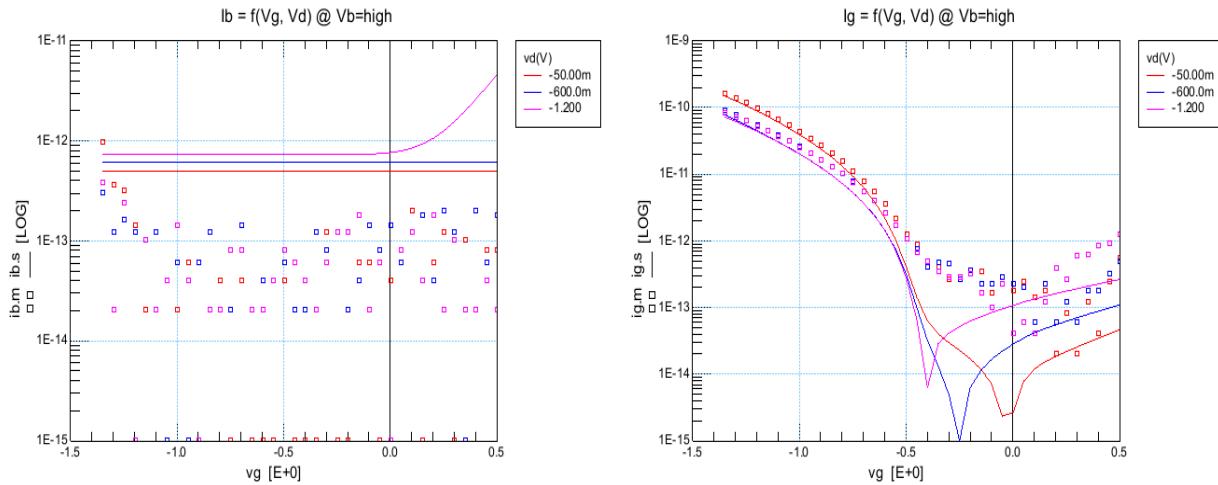
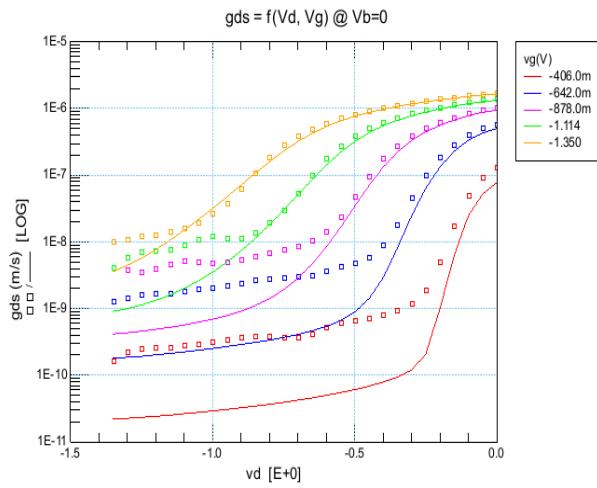
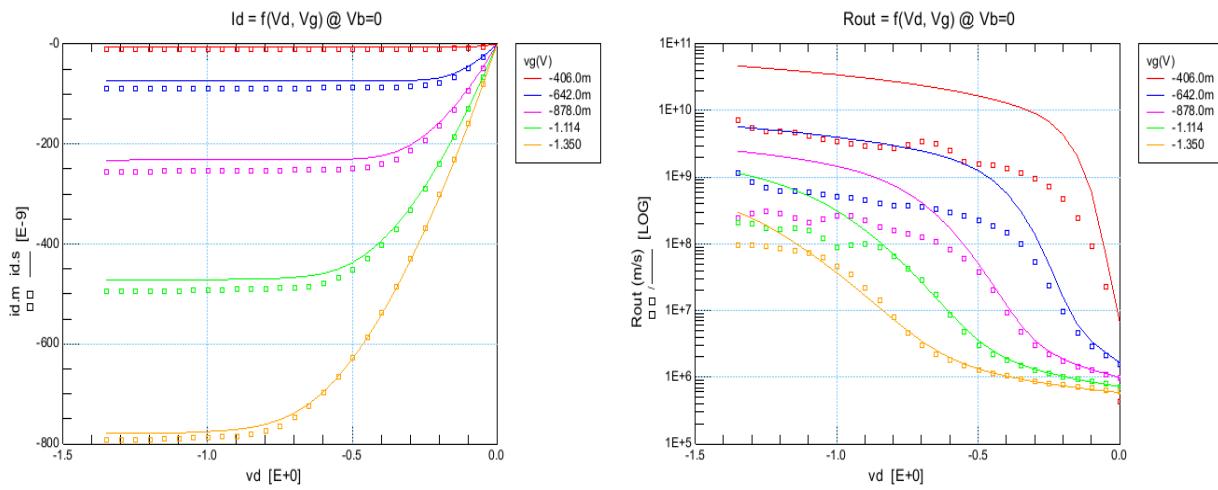
$i_d v_g, V_d = -1.2V, T = 27^\circ\text{C}$

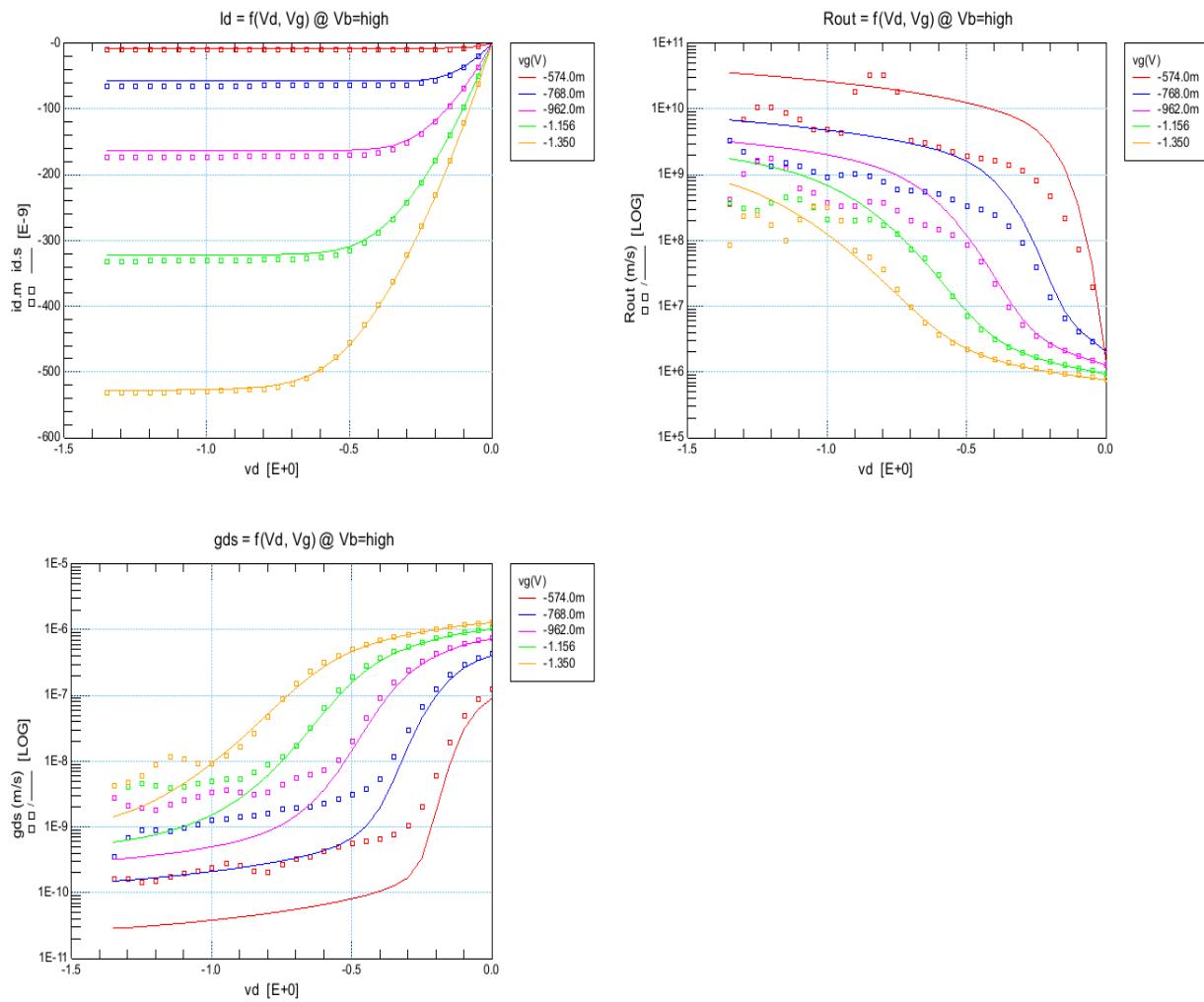
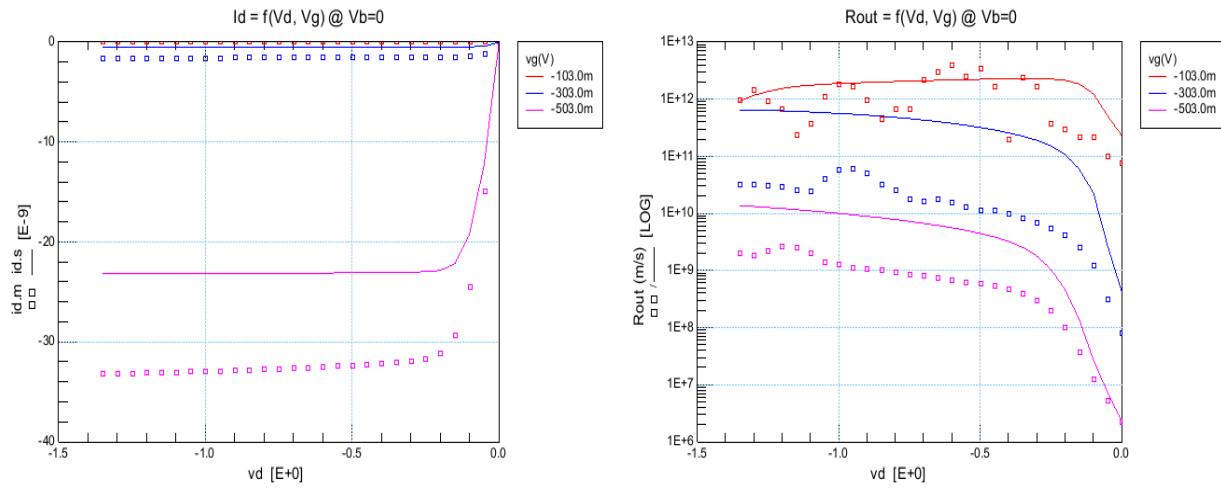


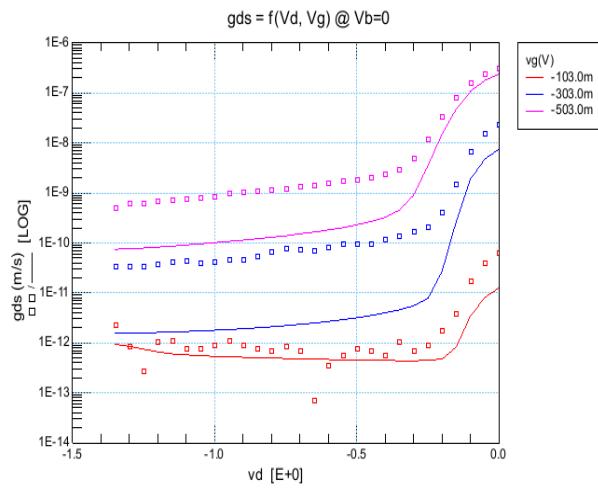


idvg, Ib,Ig, Vb = 0V, T = 27°C

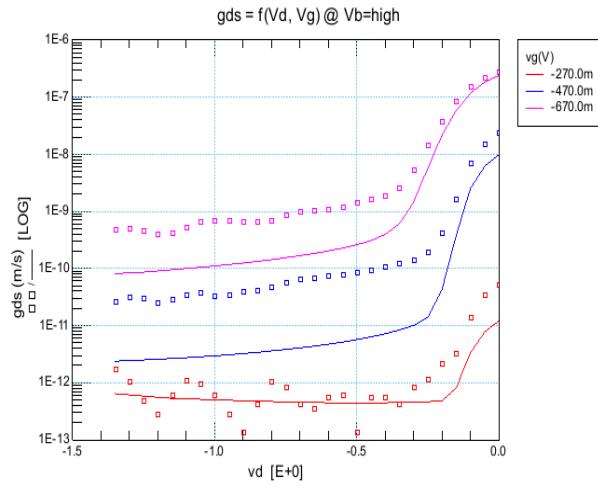
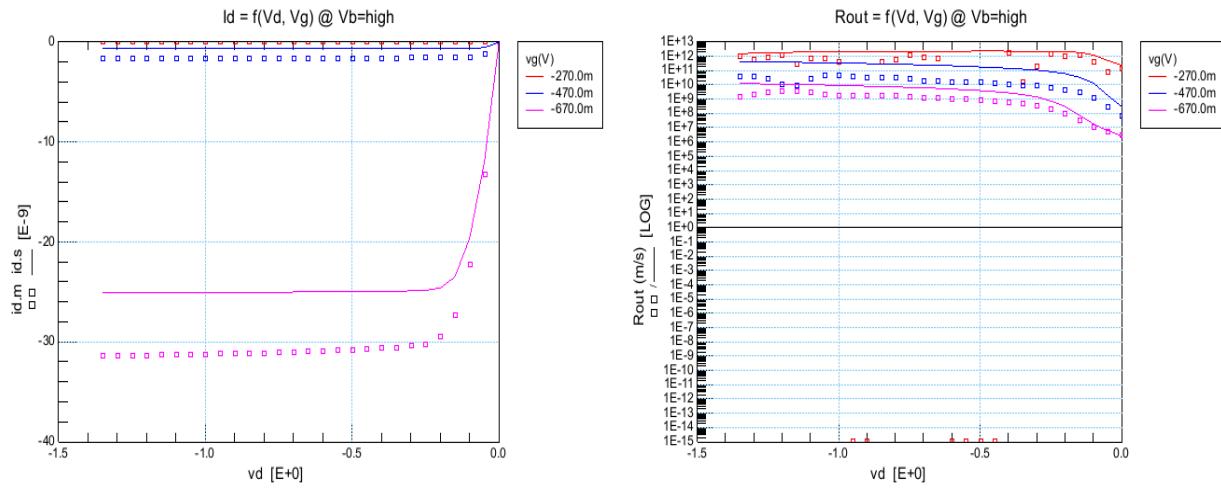


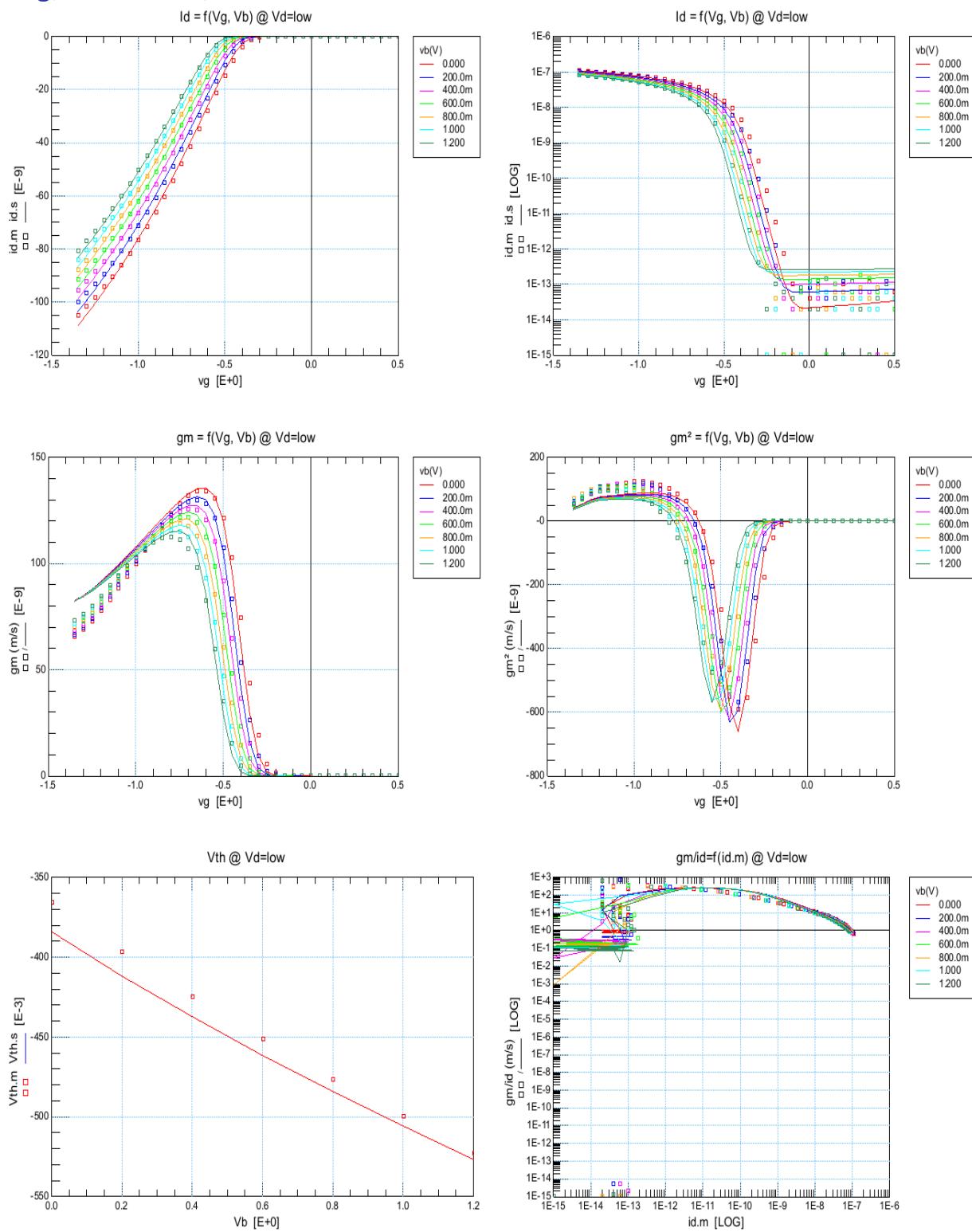
idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


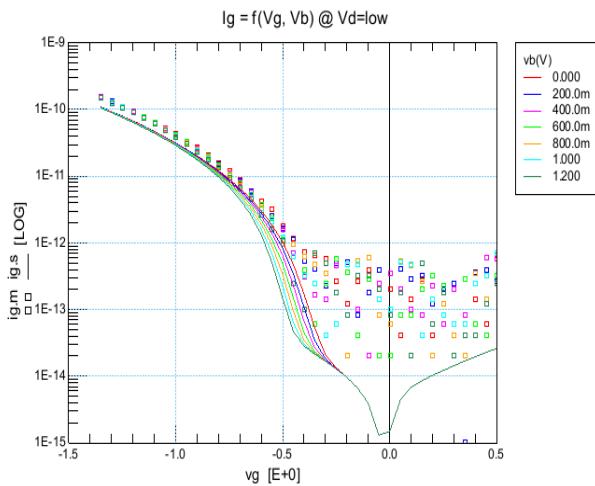
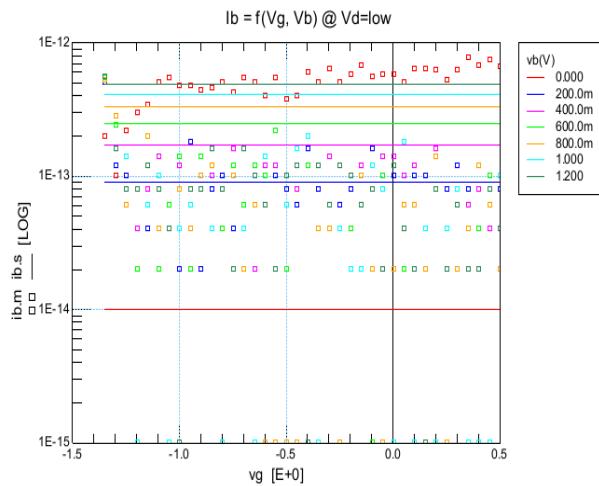
idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C




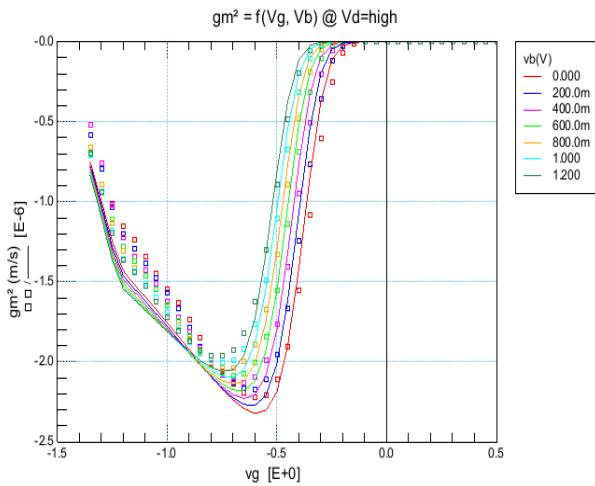
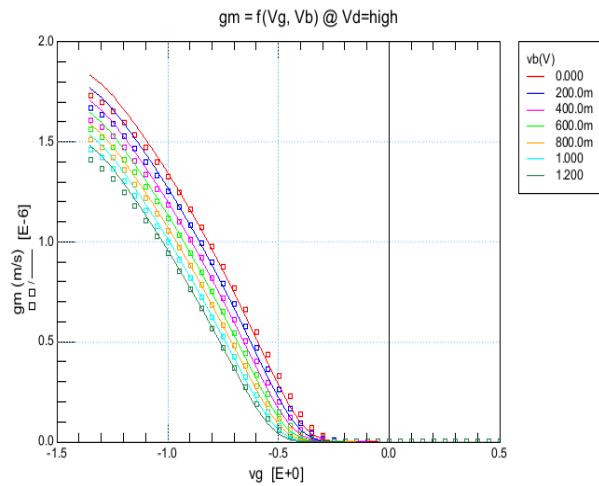
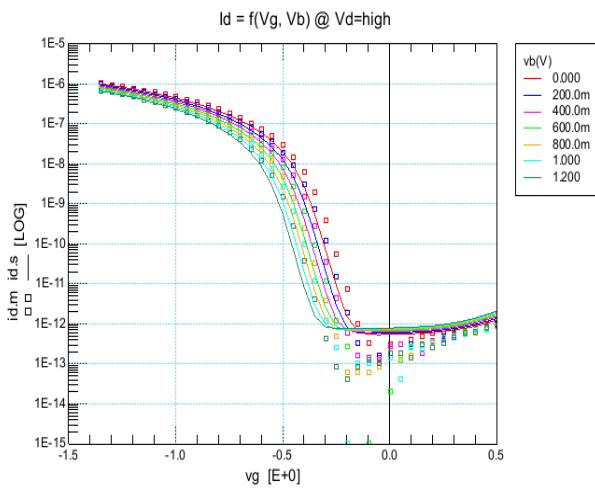
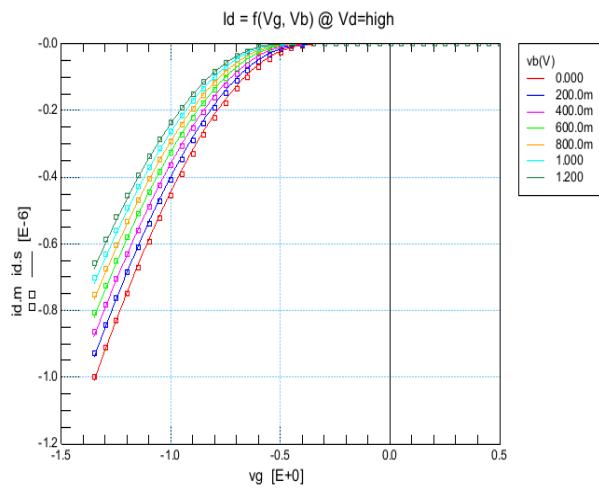
idvd_vth_vbmin, Vb = 1.2V, T = 27°C

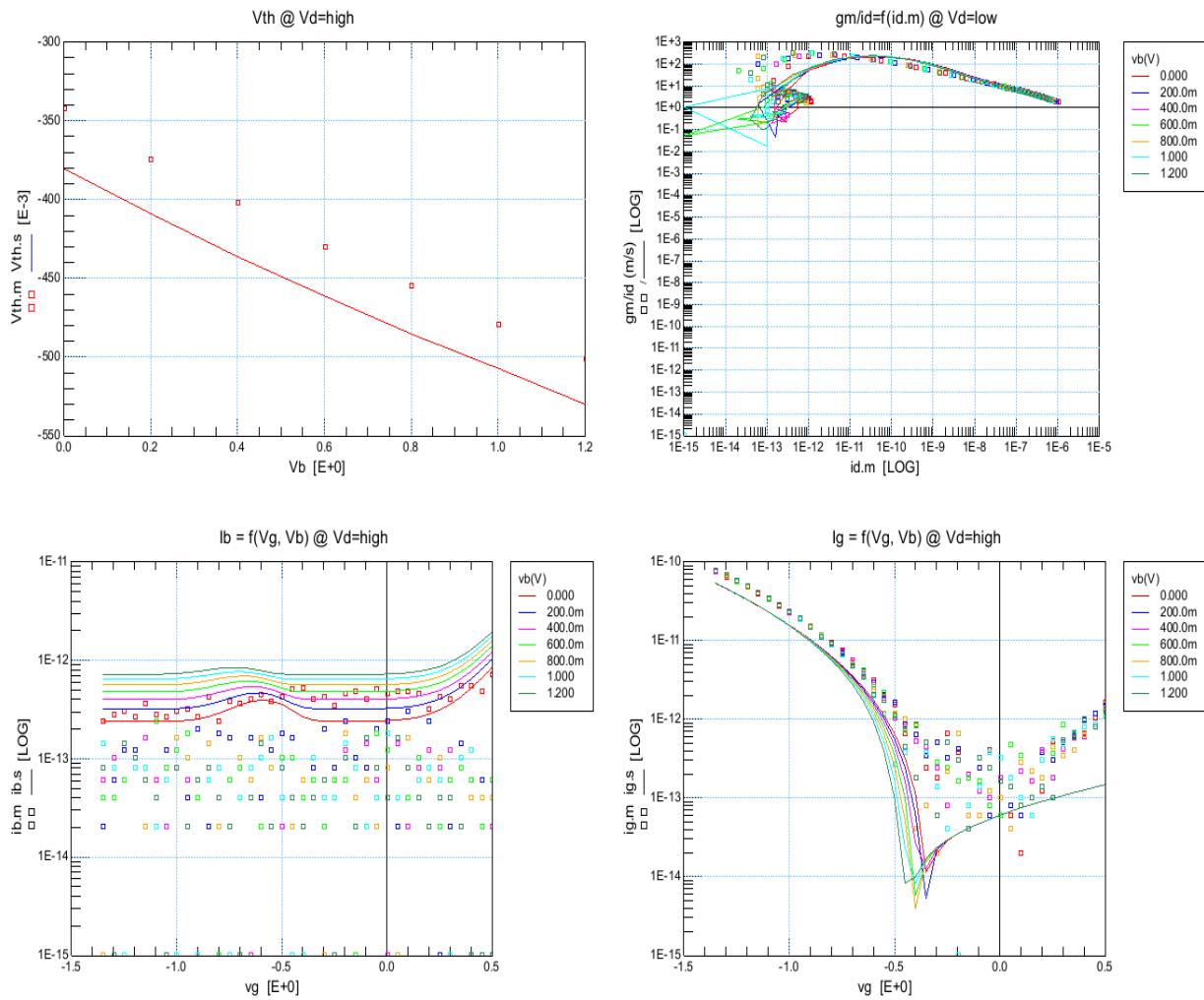


idvg, Vd = -0.05V, T = -40°C


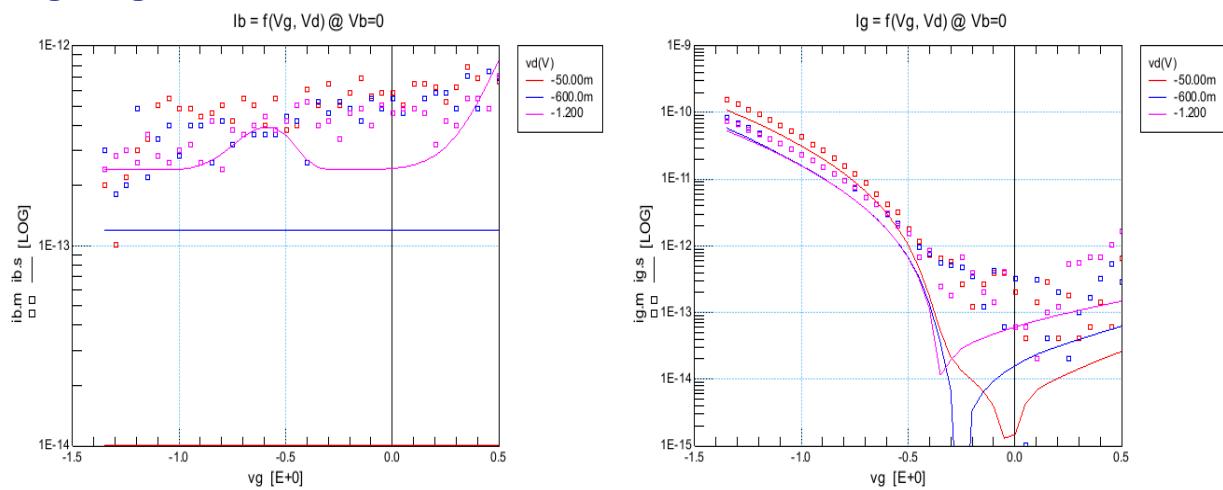


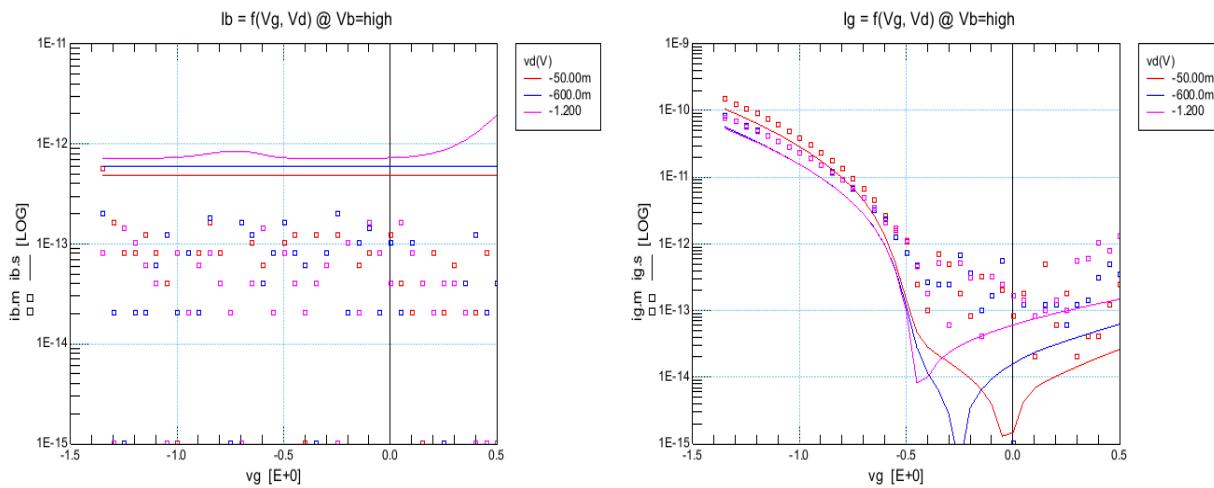
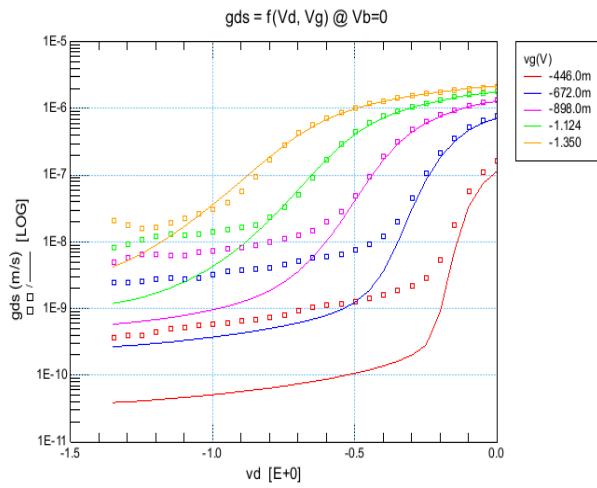
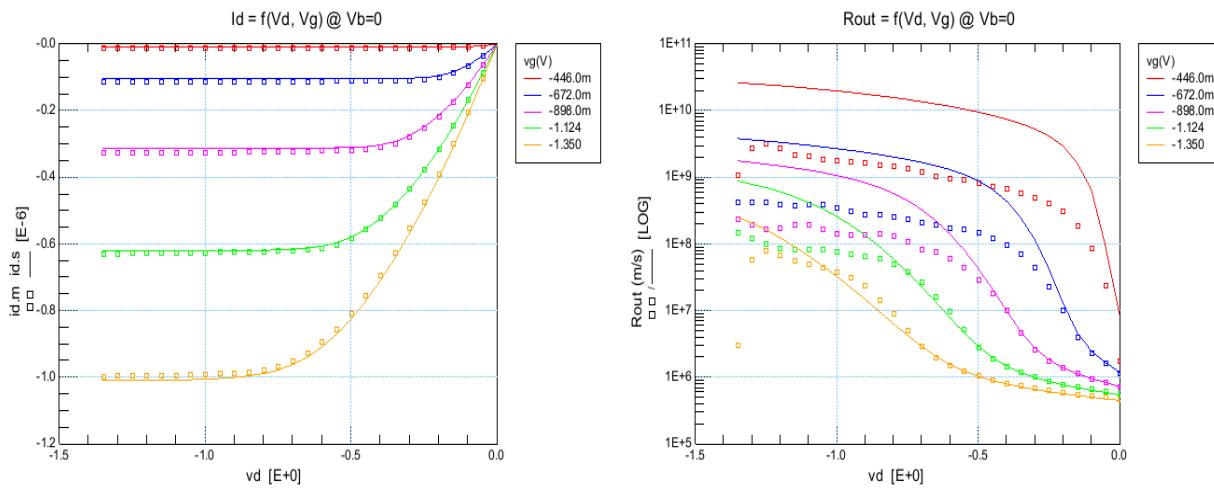
$i_{dvg}, V_d = -1.2V, T = -40^\circ\text{C}$

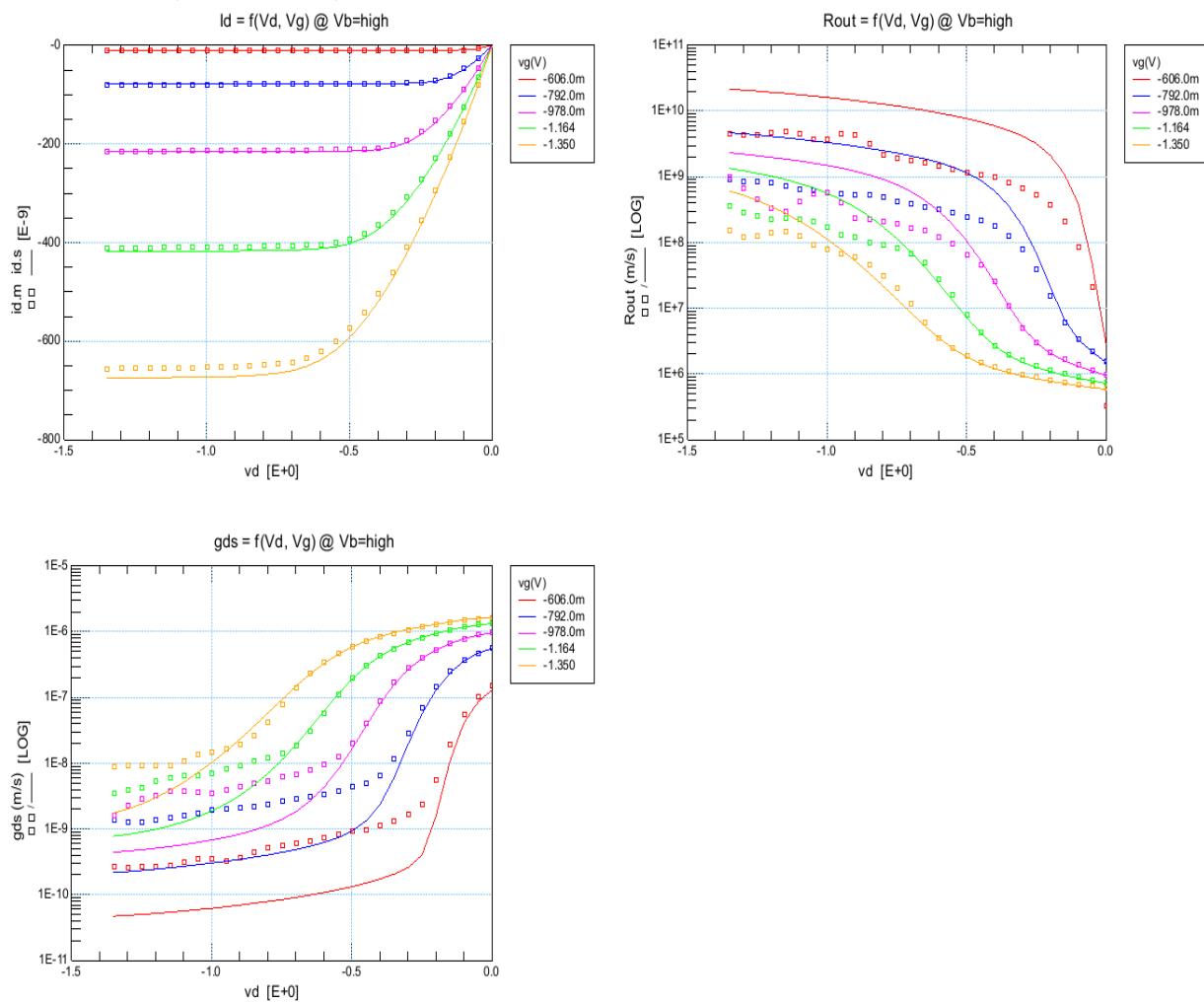
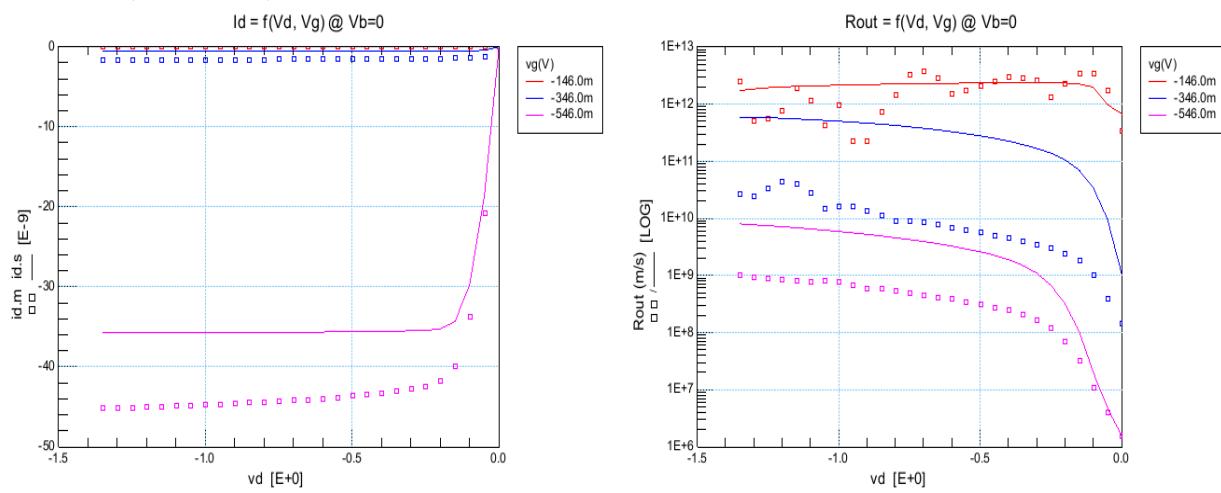


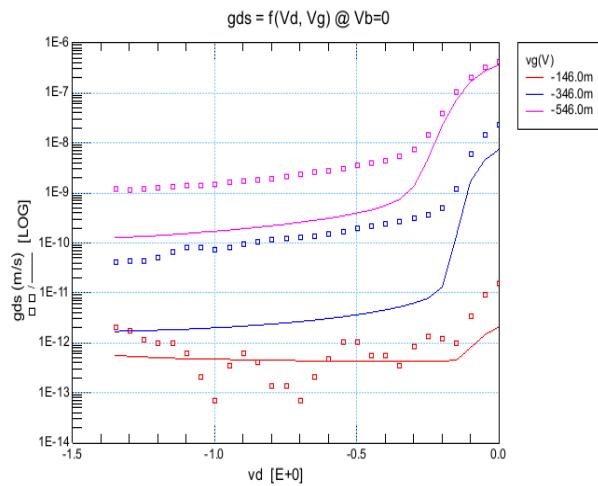


$idvg, lb, lg, Vb = 0V, T = -40^\circ C$

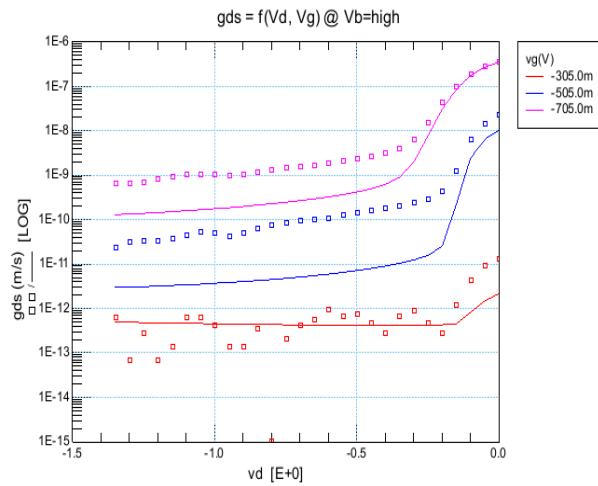
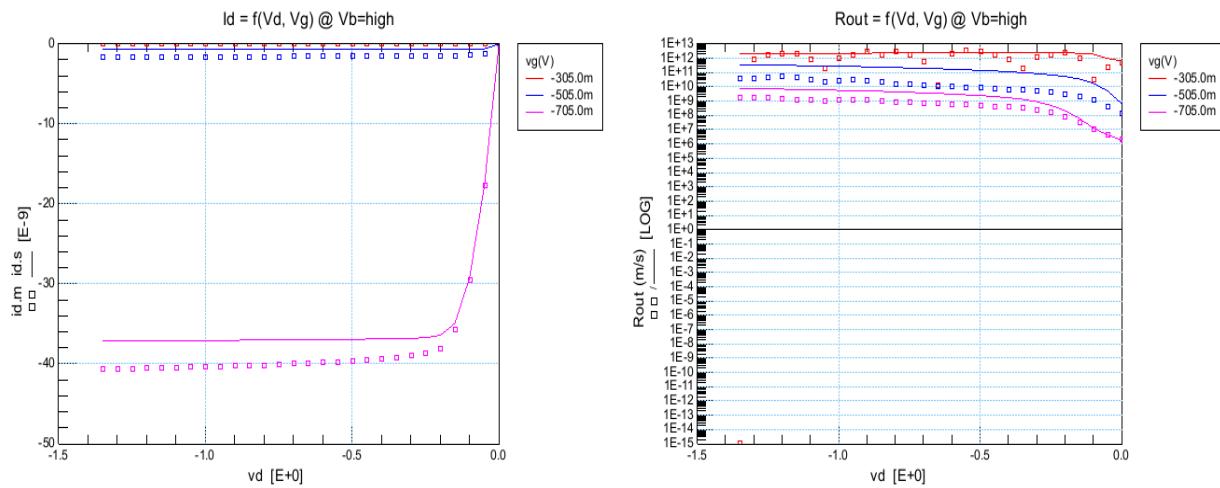


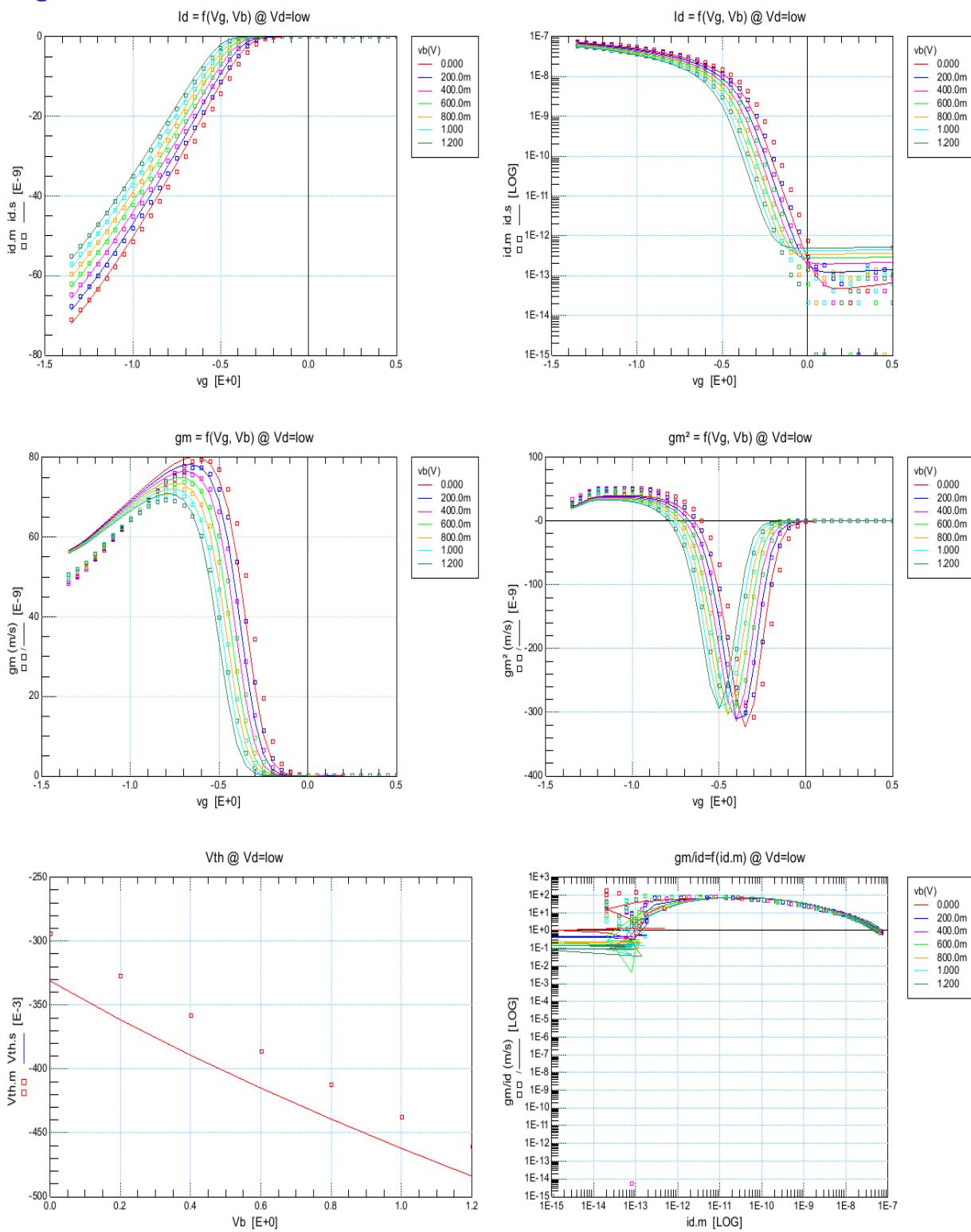
idvg, Ib,Ig, Vb = 1.2V, T = -40°C

idvd, Vb = 0V, T = -40°C


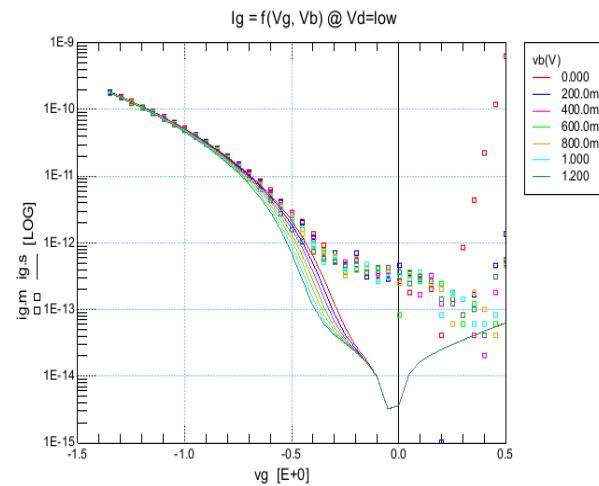
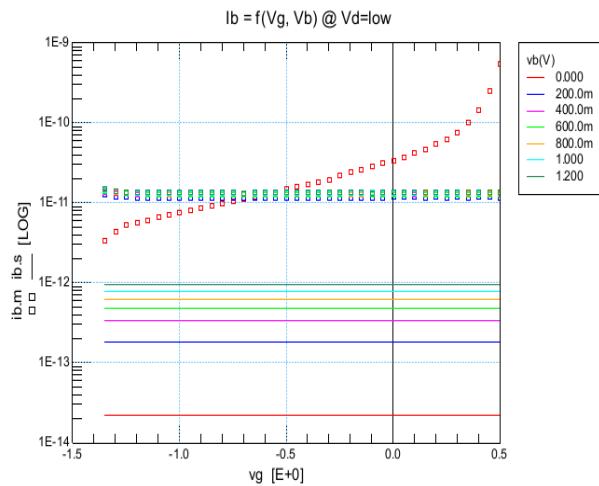
idvd_vbmin, Vb = 1.2V, T = -40°C

idvd_vth, Vb = 0V, T = -40°C




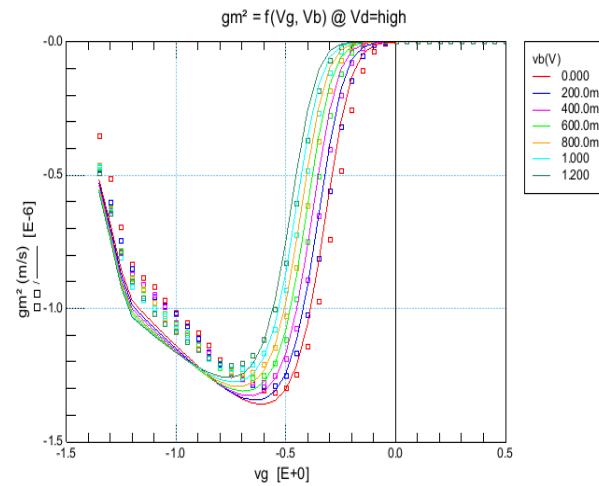
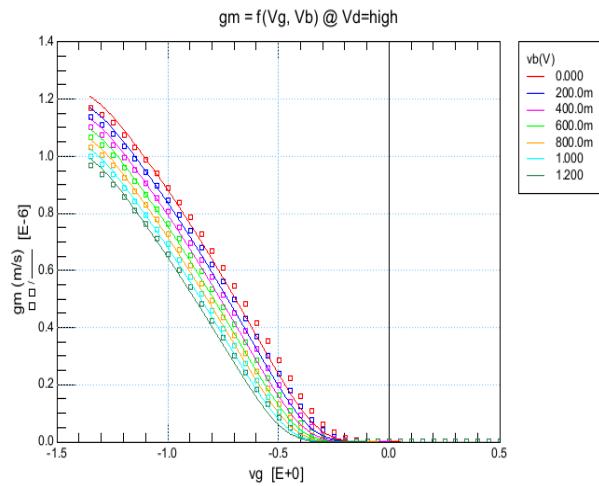
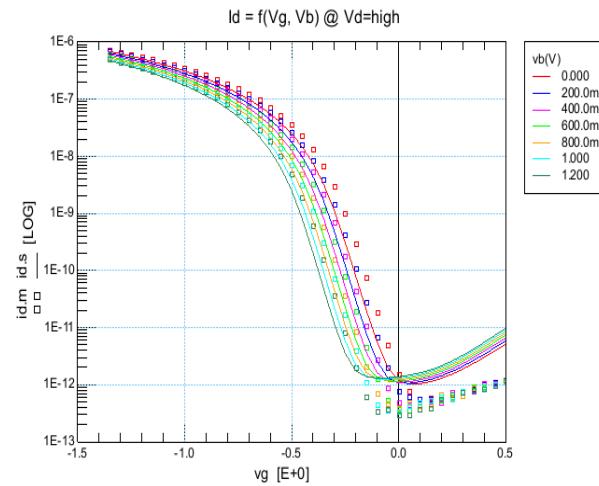
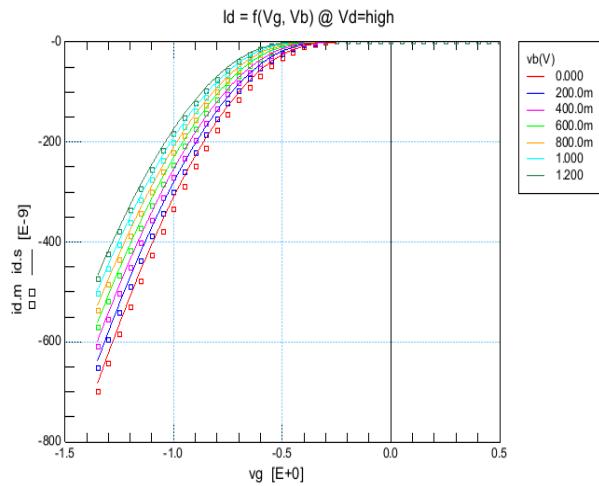
idvd_vth_vbmin, Vb = 1.2V, T = -40°C

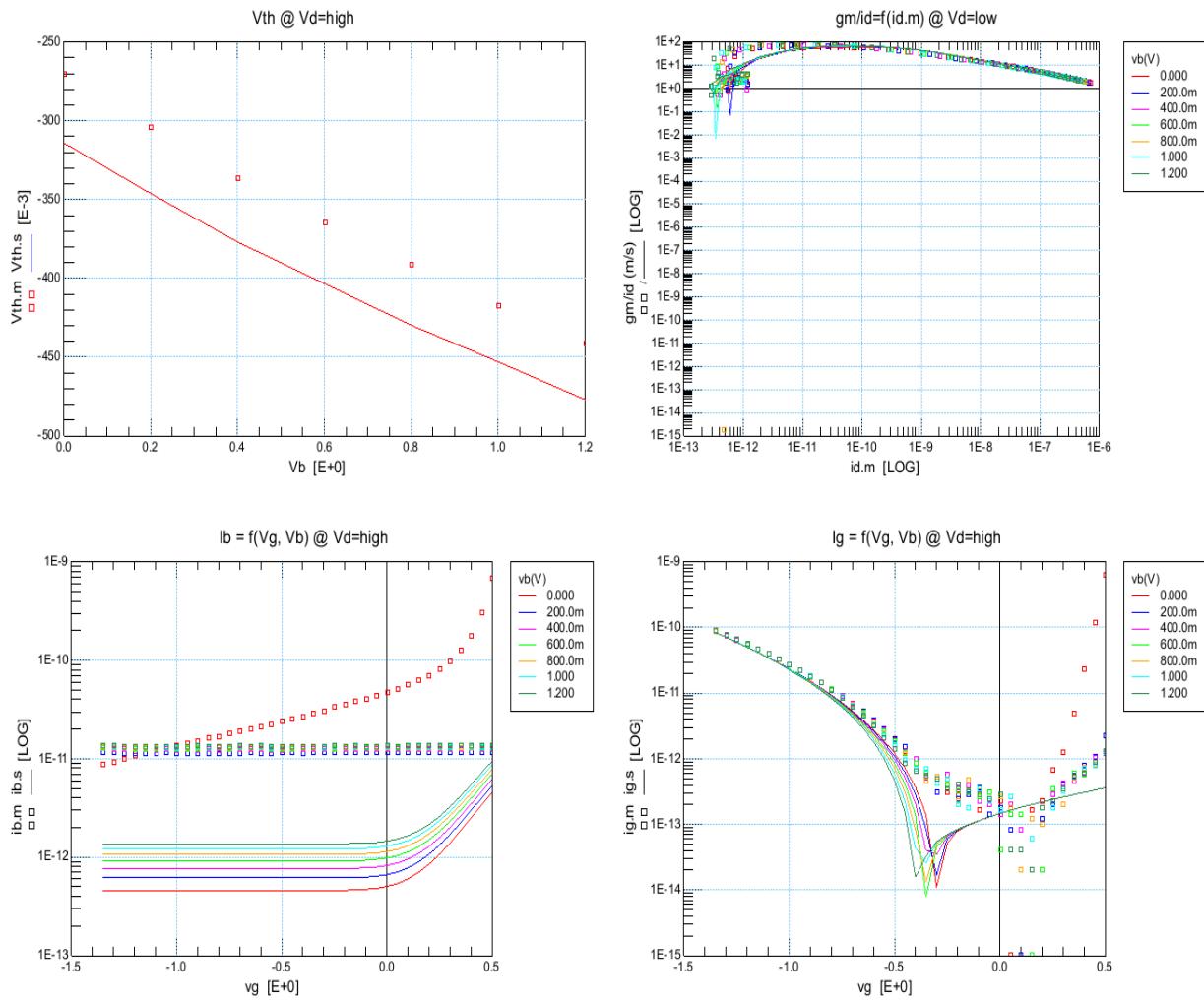


idvg, Vd = -0.05V, T = 70°C


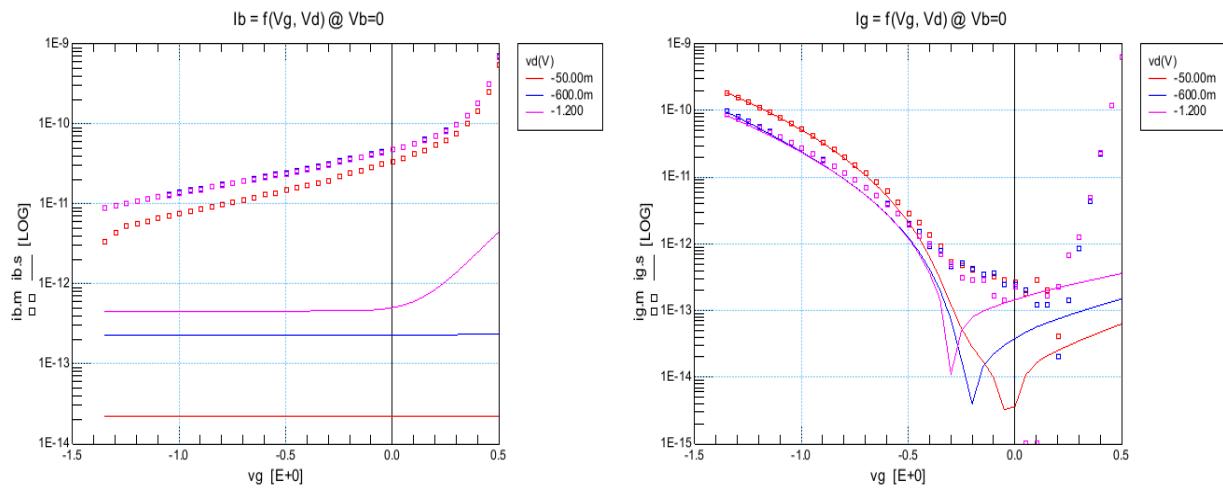


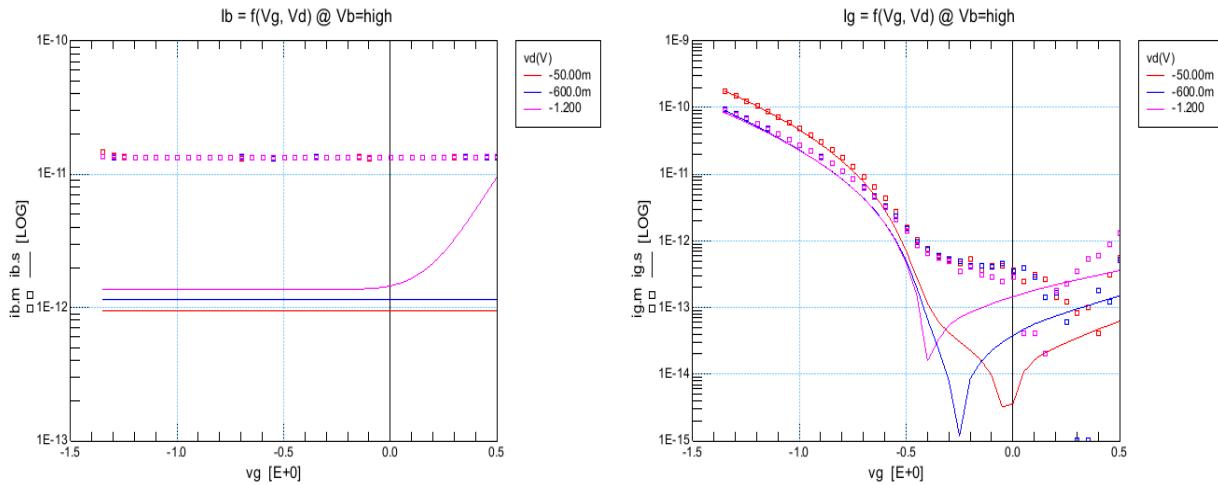
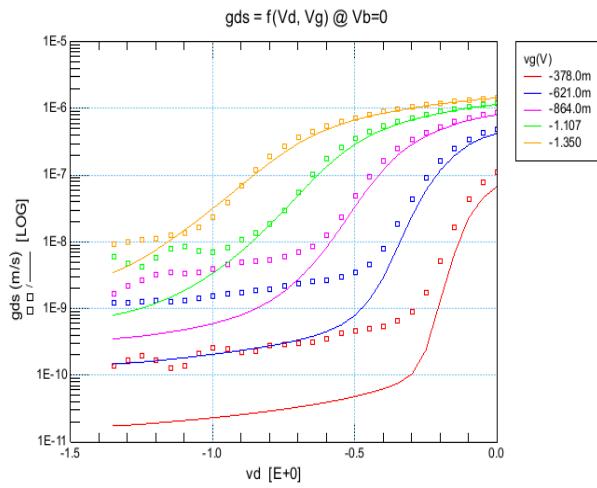
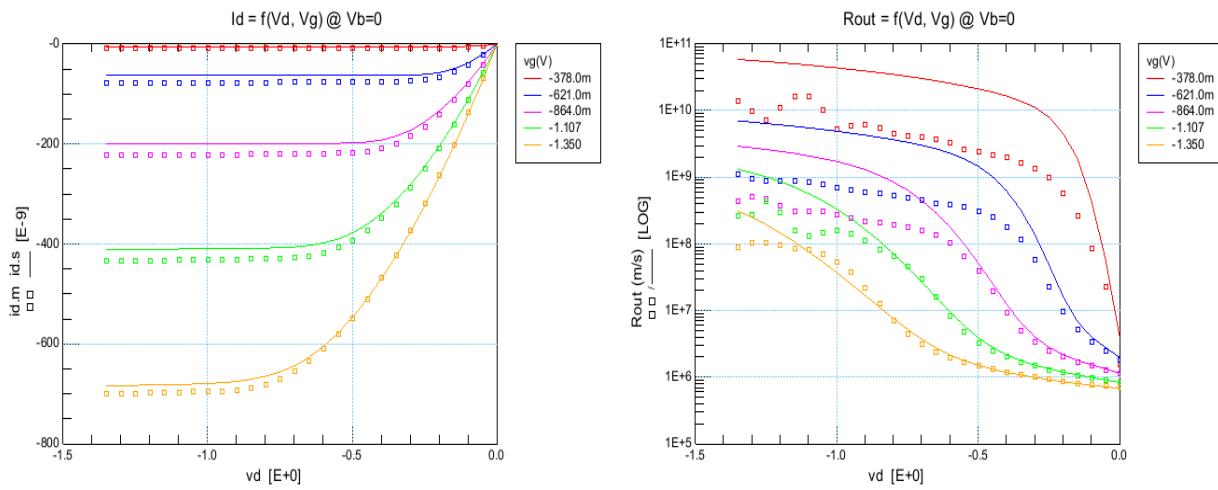
$i_{dvg}, V_d = -1.2V, T = 70^\circ C$

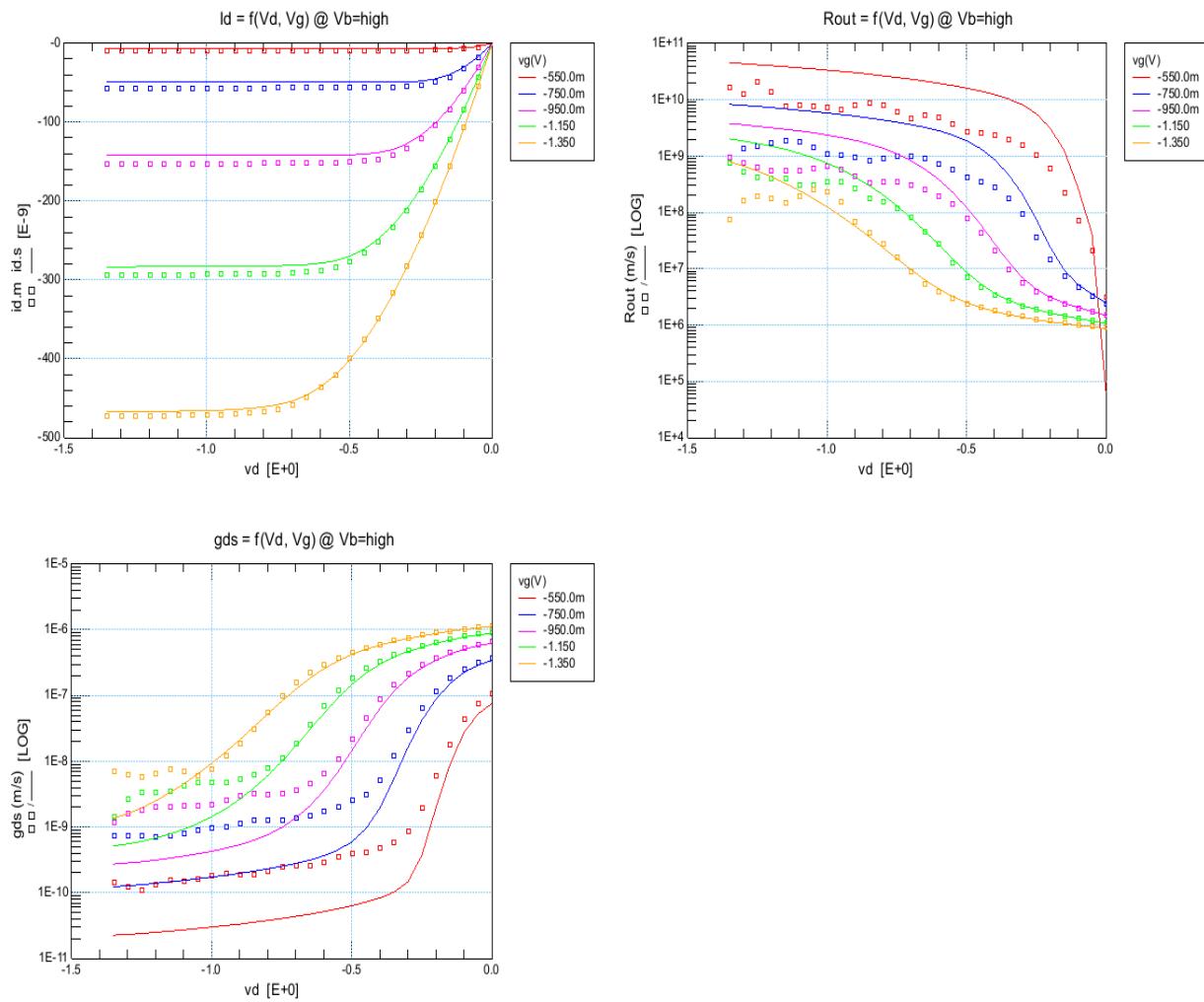
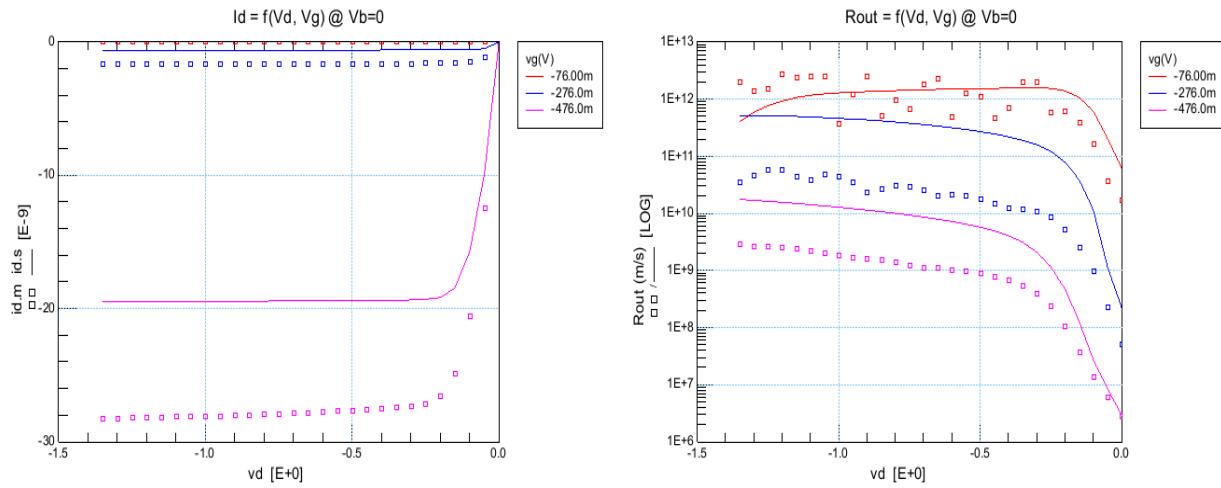


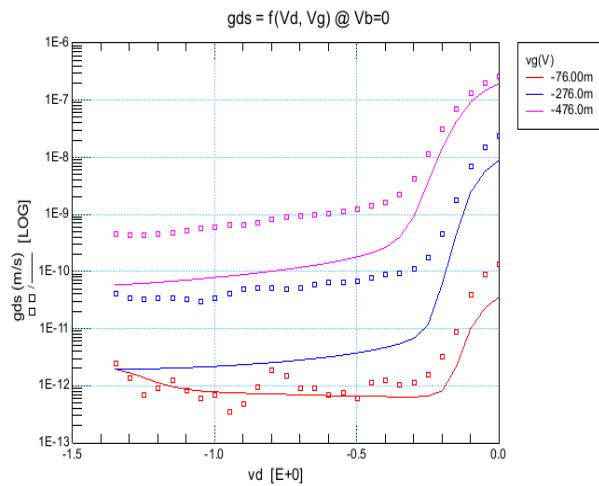


$i_{dvg}, I_b, I_g, V_b = 0V, T = 70^\circ C$

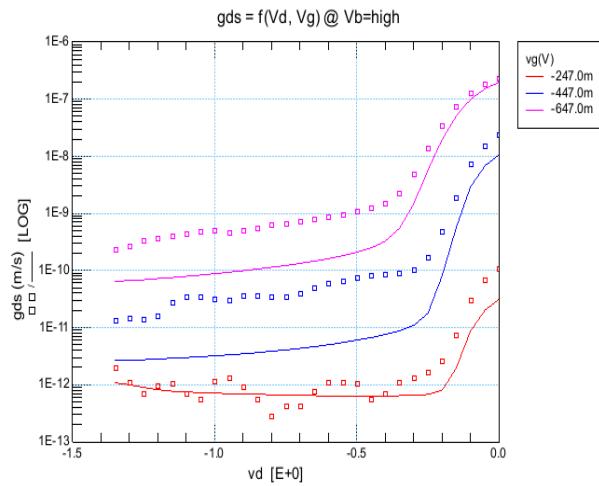
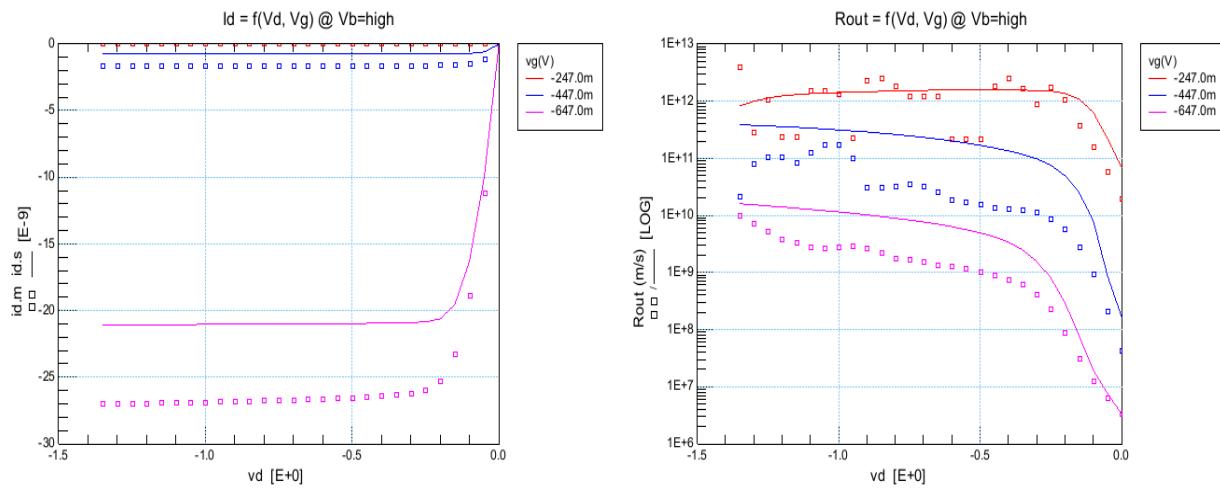


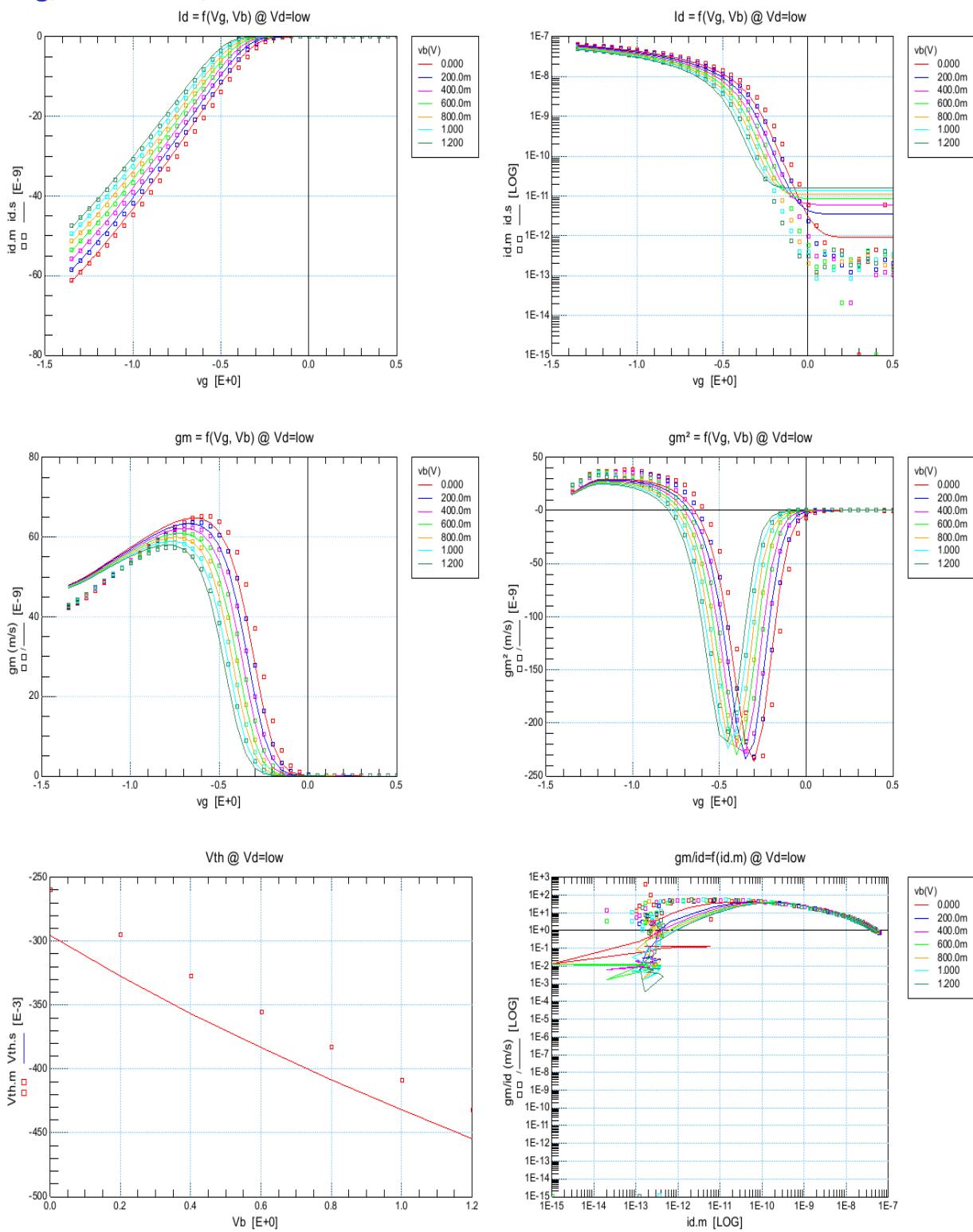
idvg, Ib,Ig, Vb = 1.2V, T = 70°C

idvd, Vb = 0V, T = 70°C


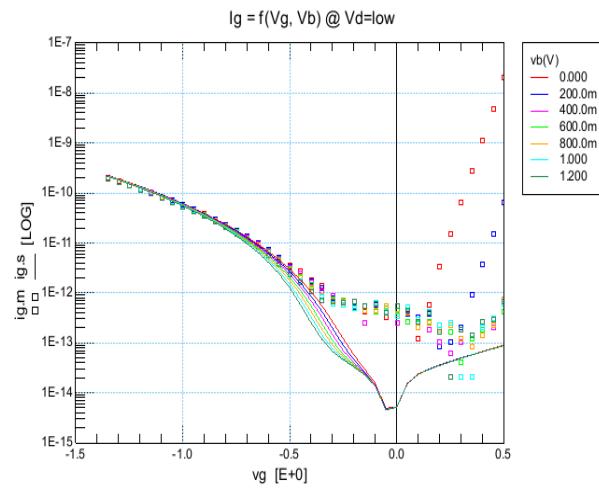
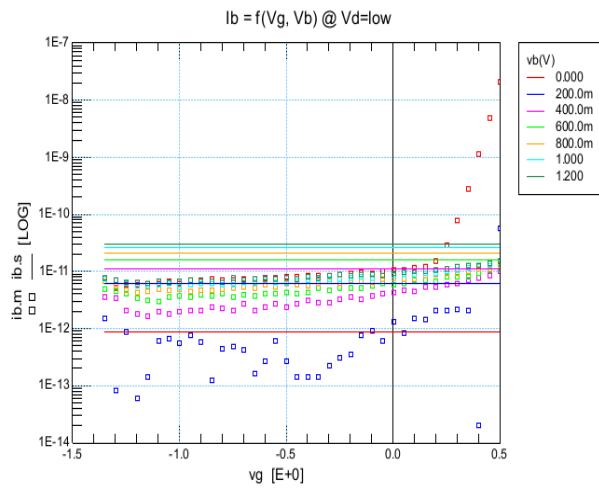
idvd_vbmin, Vb = 1.2V, T = 70°C**idvd_vth, Vb = 0V, T = 70°C**



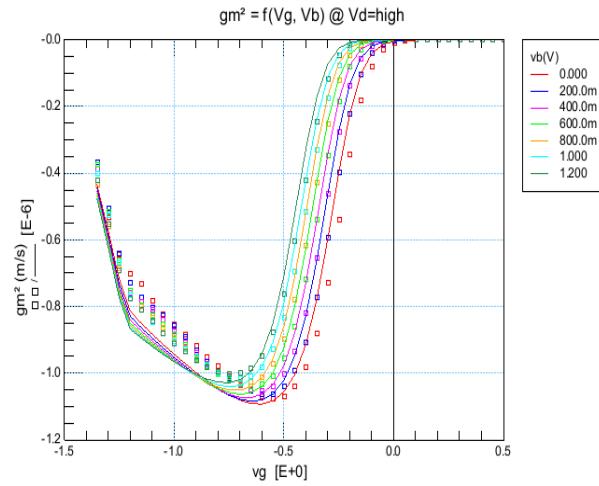
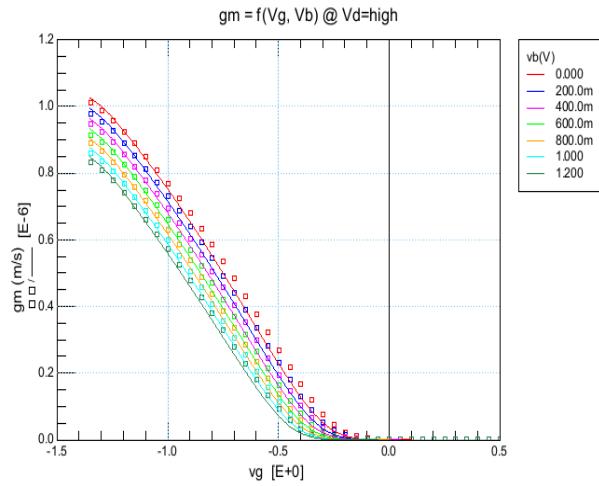
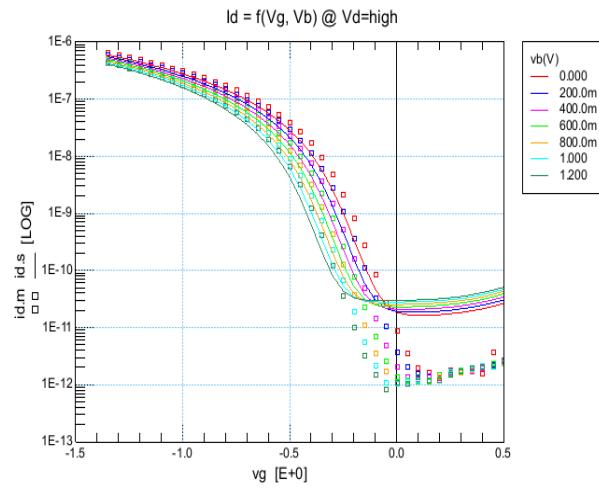
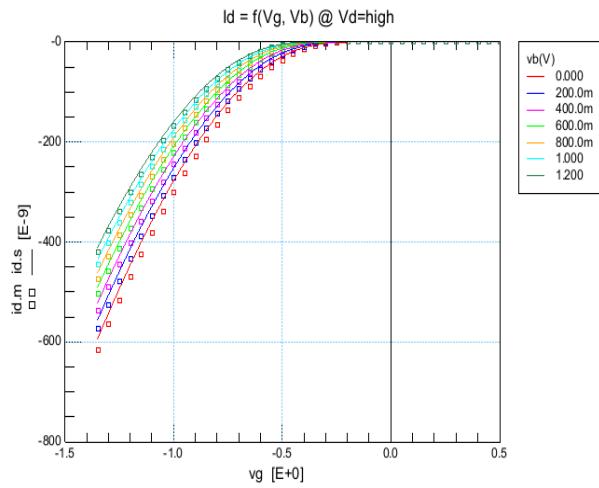
idvd_vth_vbmin, Vb = 1.2V, T = 70°C

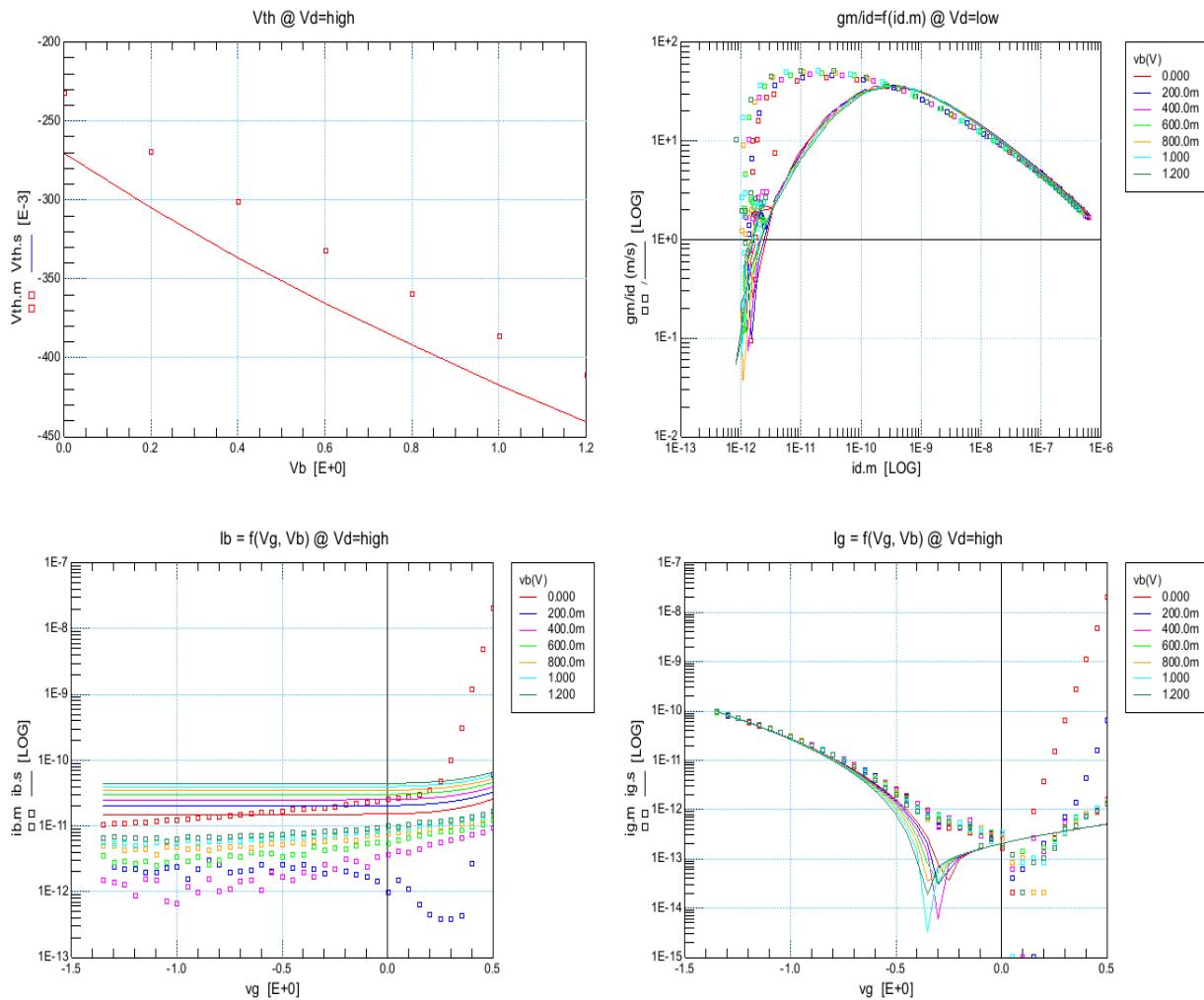


idvg, Vd = -0.05V, T = 125°C


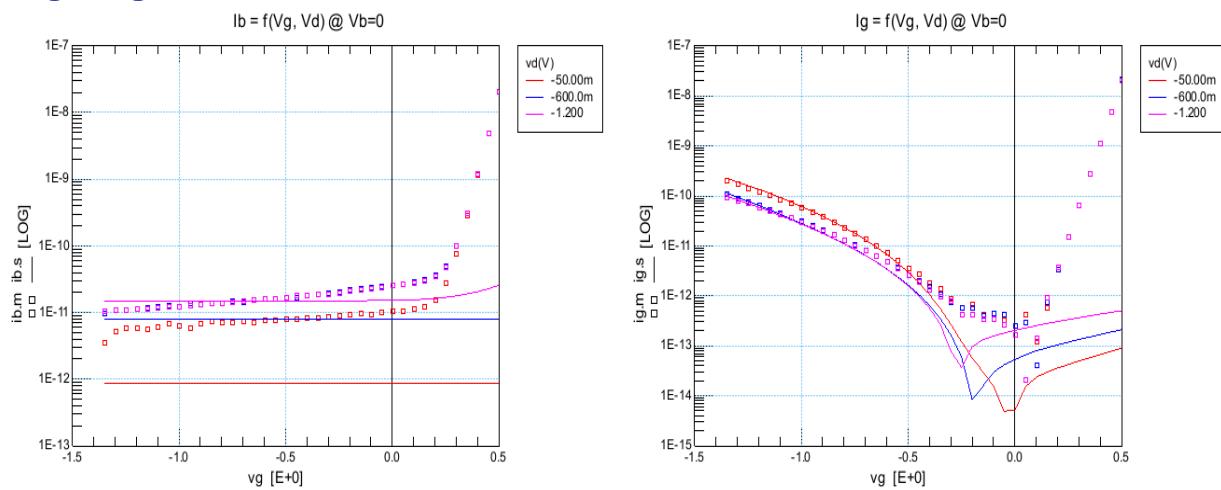


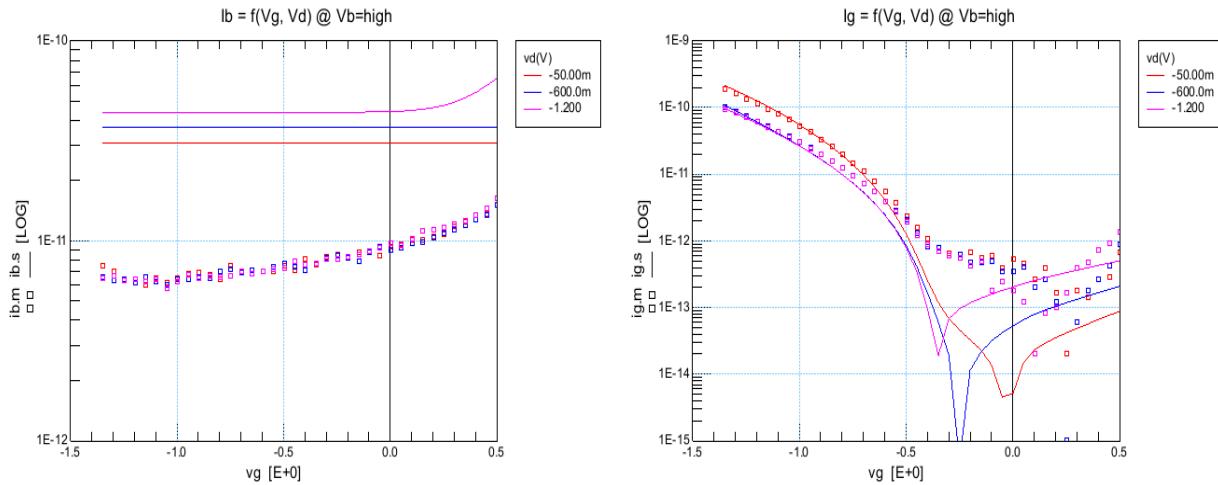
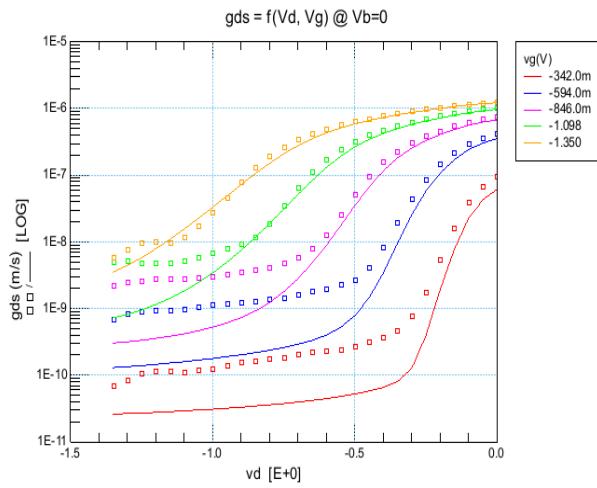
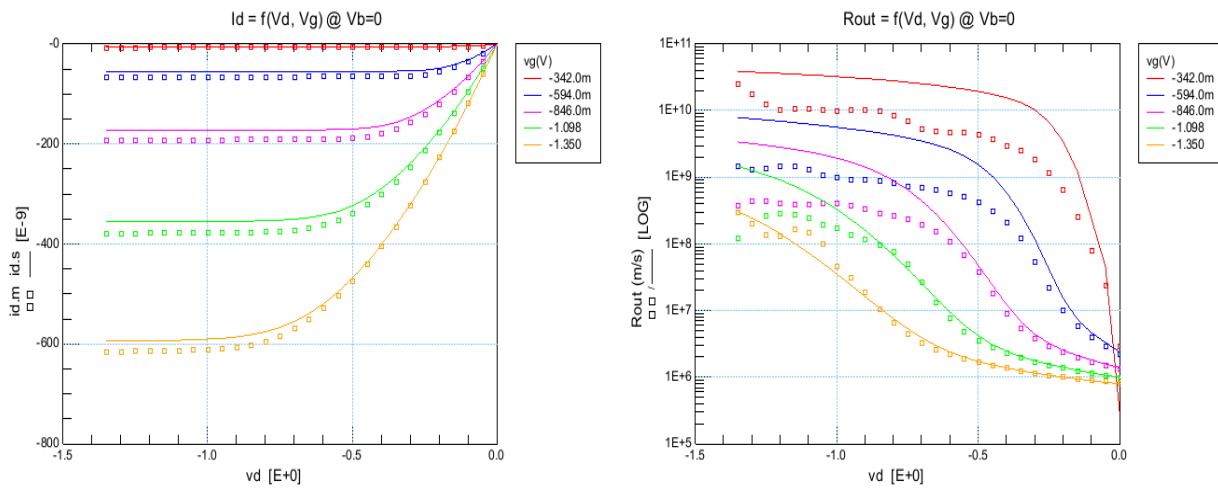
$i_{dvg}, V_d = -1.2V, T = 125^\circ C$

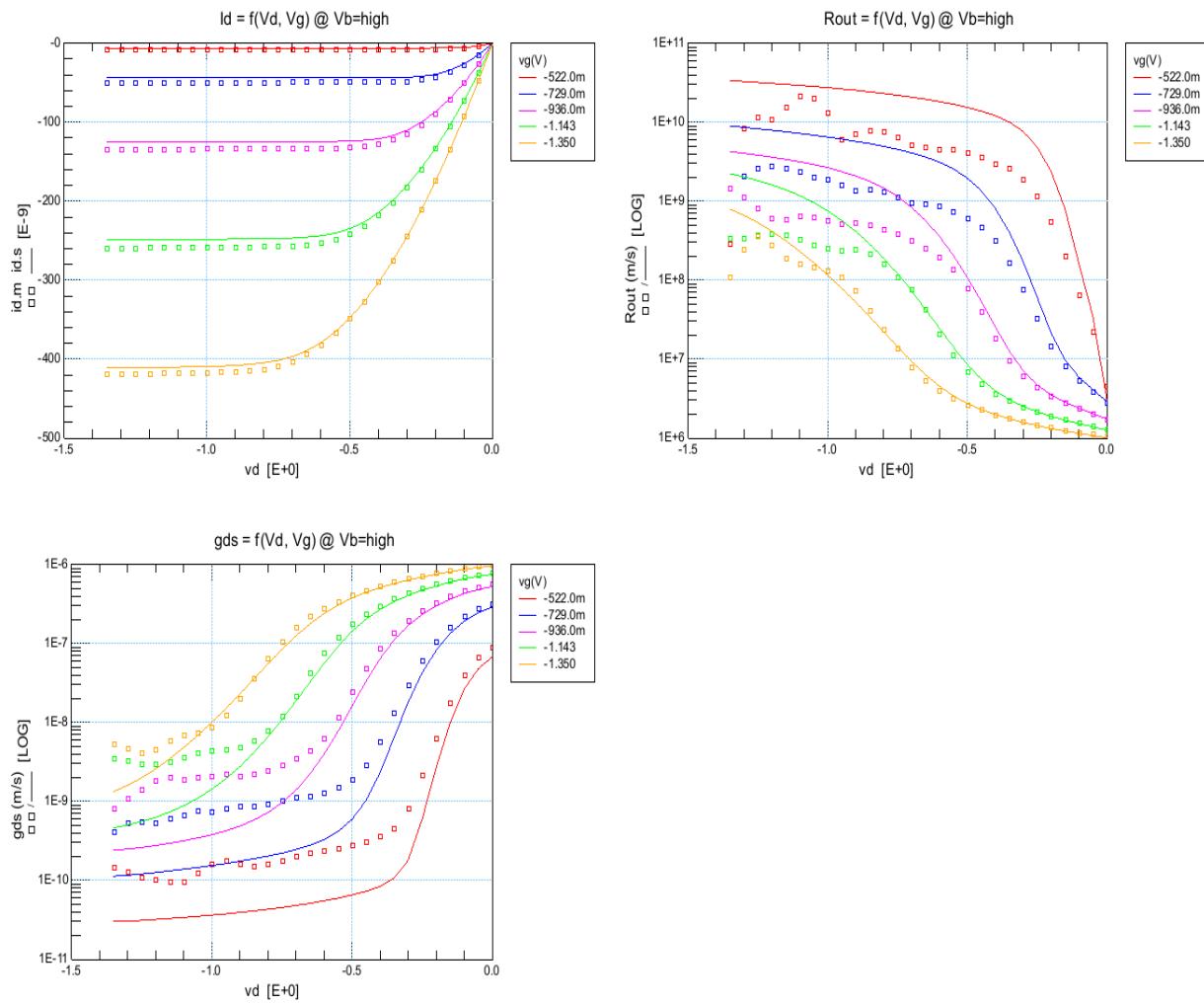
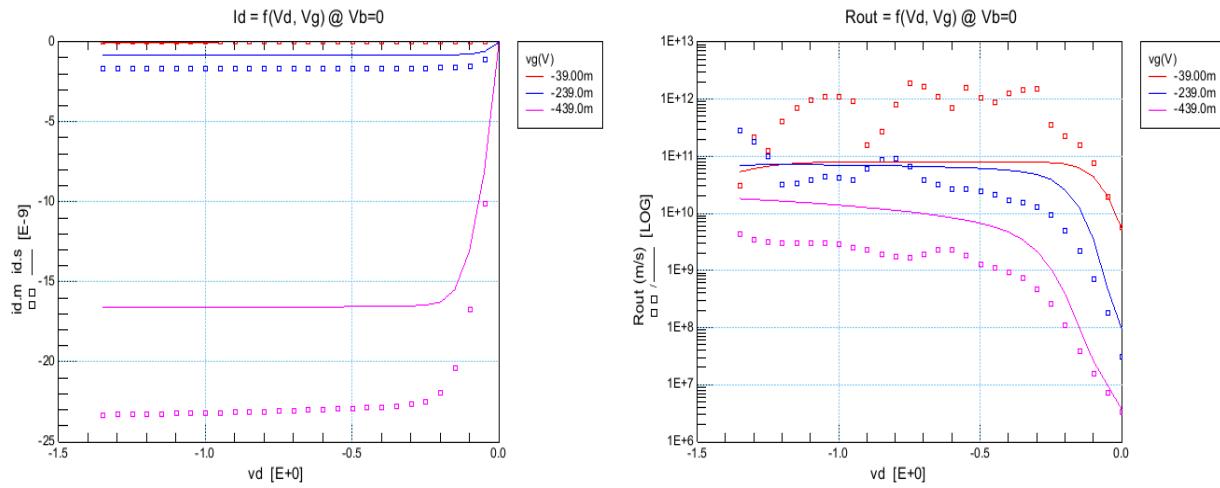


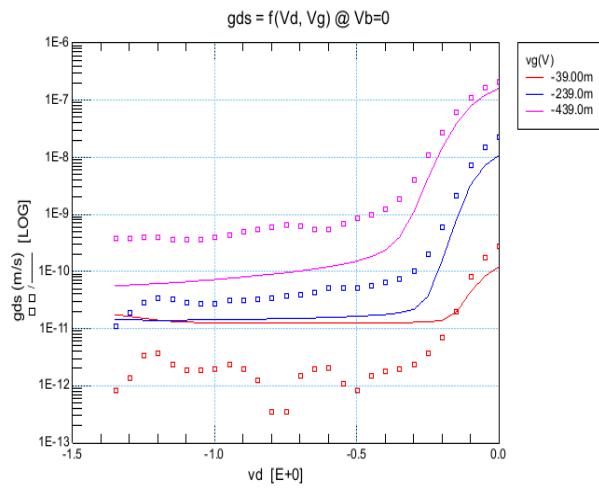


idvg, Ib,Ig, Vb = 0V, T = 125°C

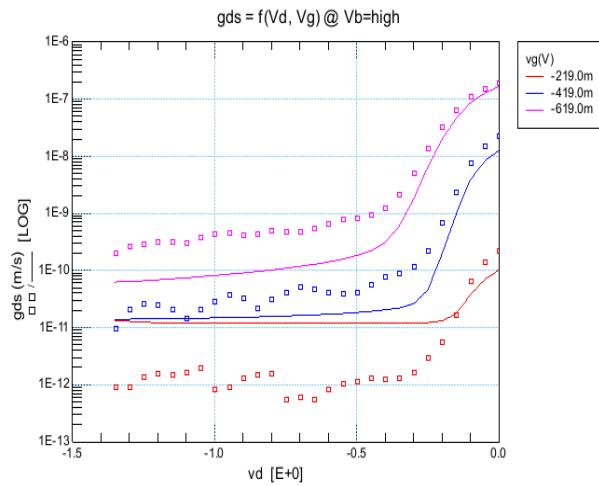
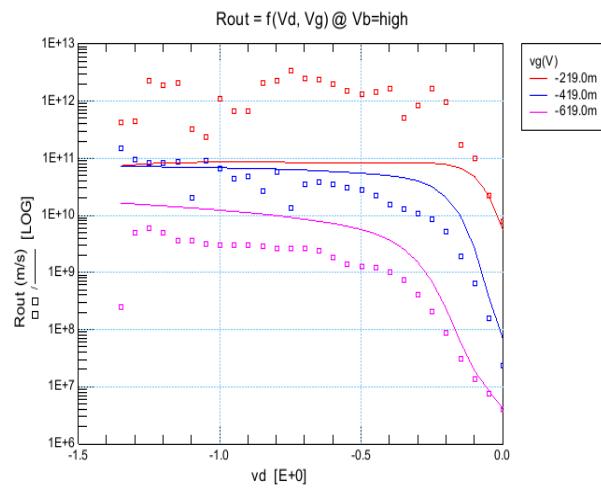
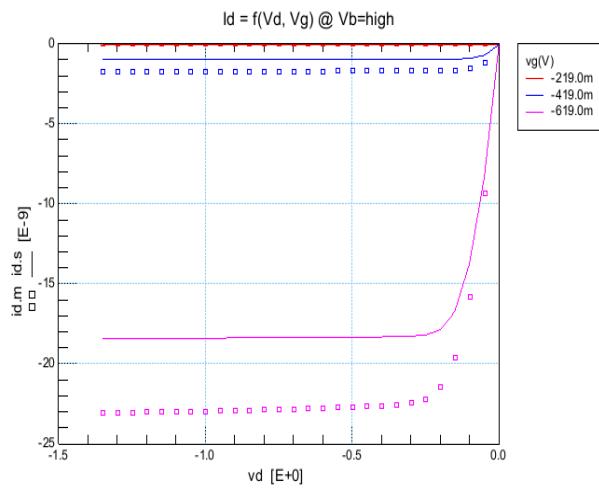


idvg, Ib,Ig, Vb = 1.2V, T = 125°C

idvd, Vb = 0V, T = 125°C


idvd_vbmin, Vb = 1.2V, T = 125°C

idvd_vth, Vb = 0V, T = 125°C


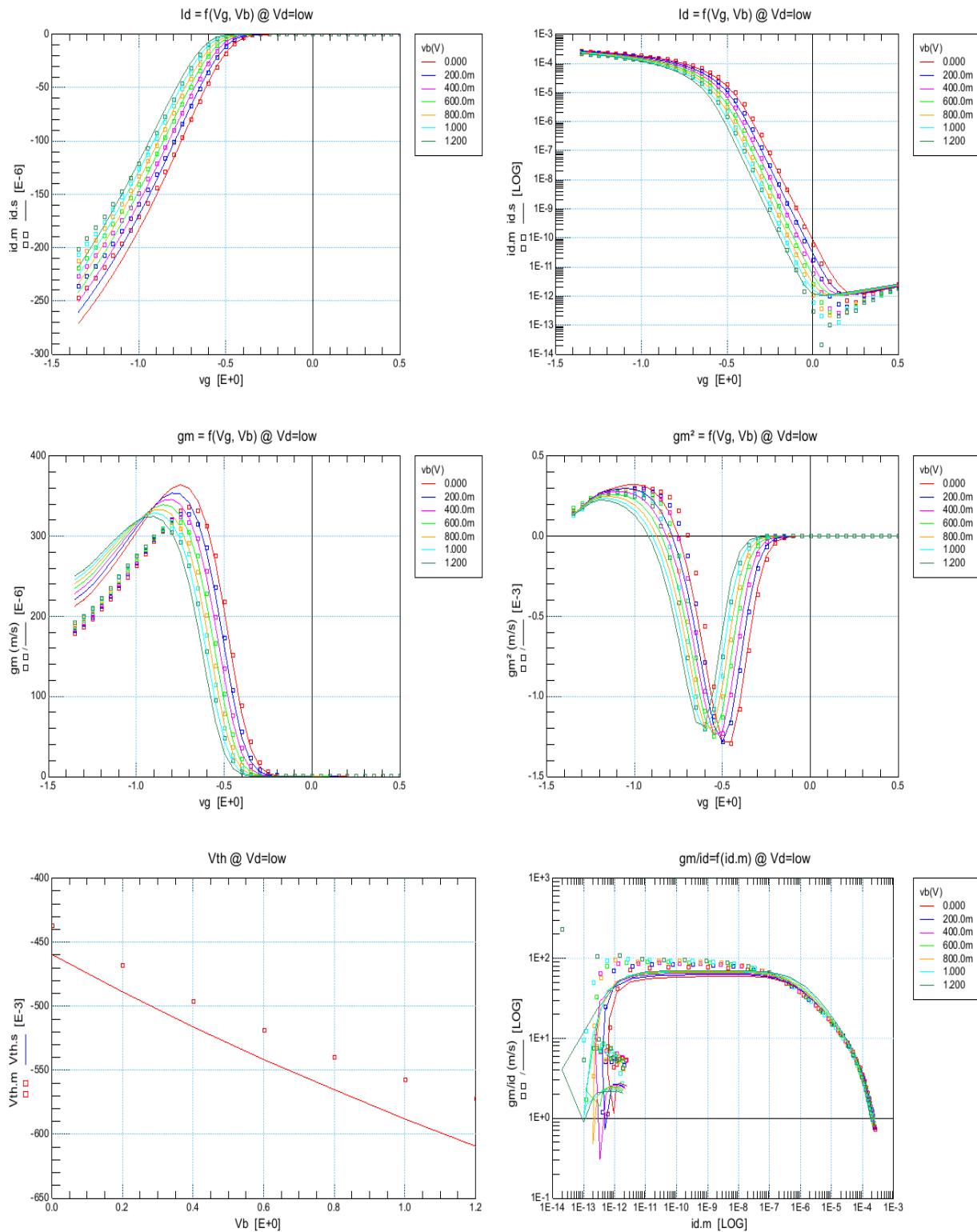


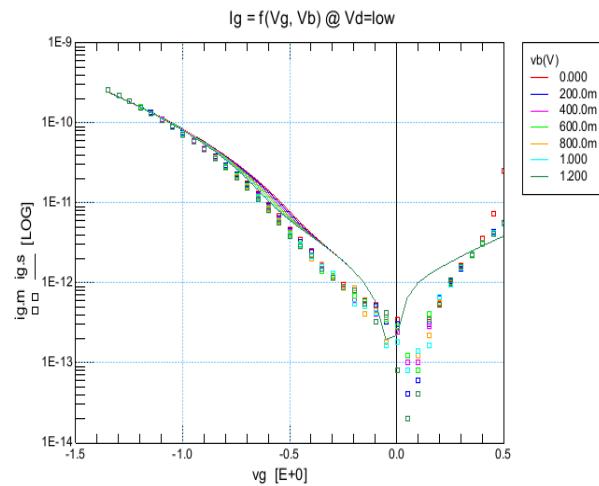
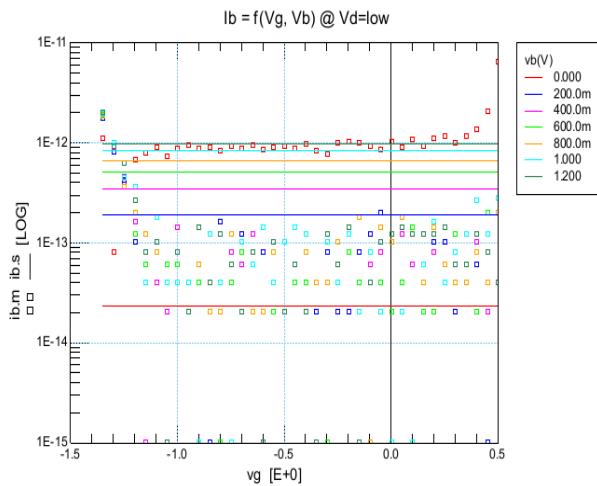
idvd_vth_vbmin, Vb = 1.2V, T = 125°C



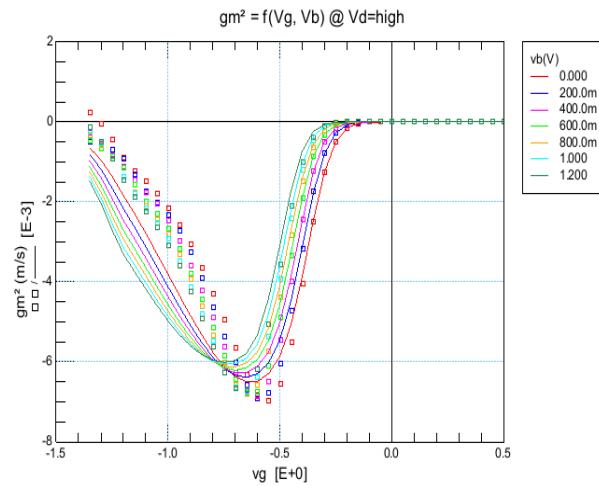
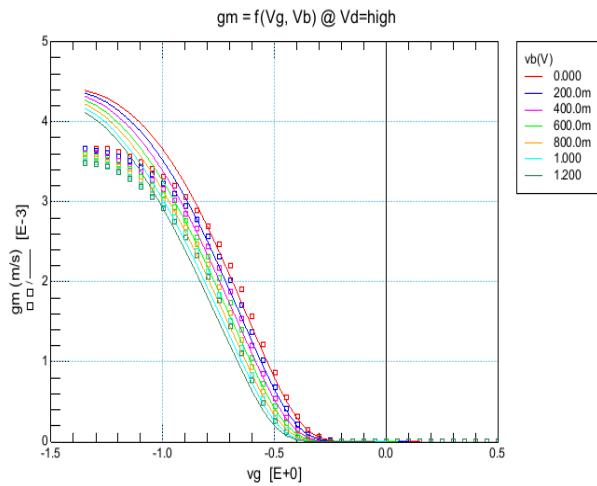
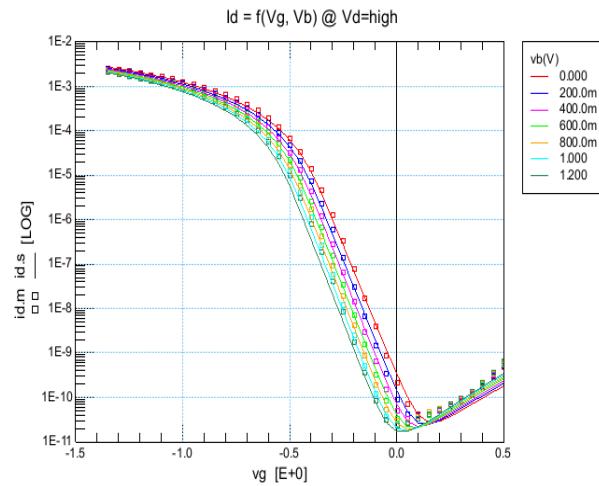
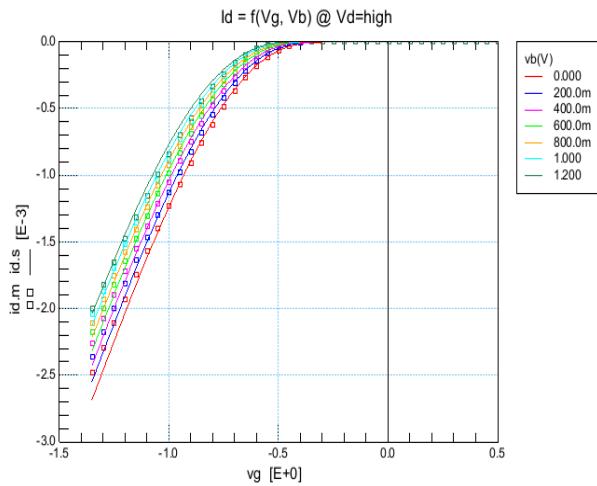
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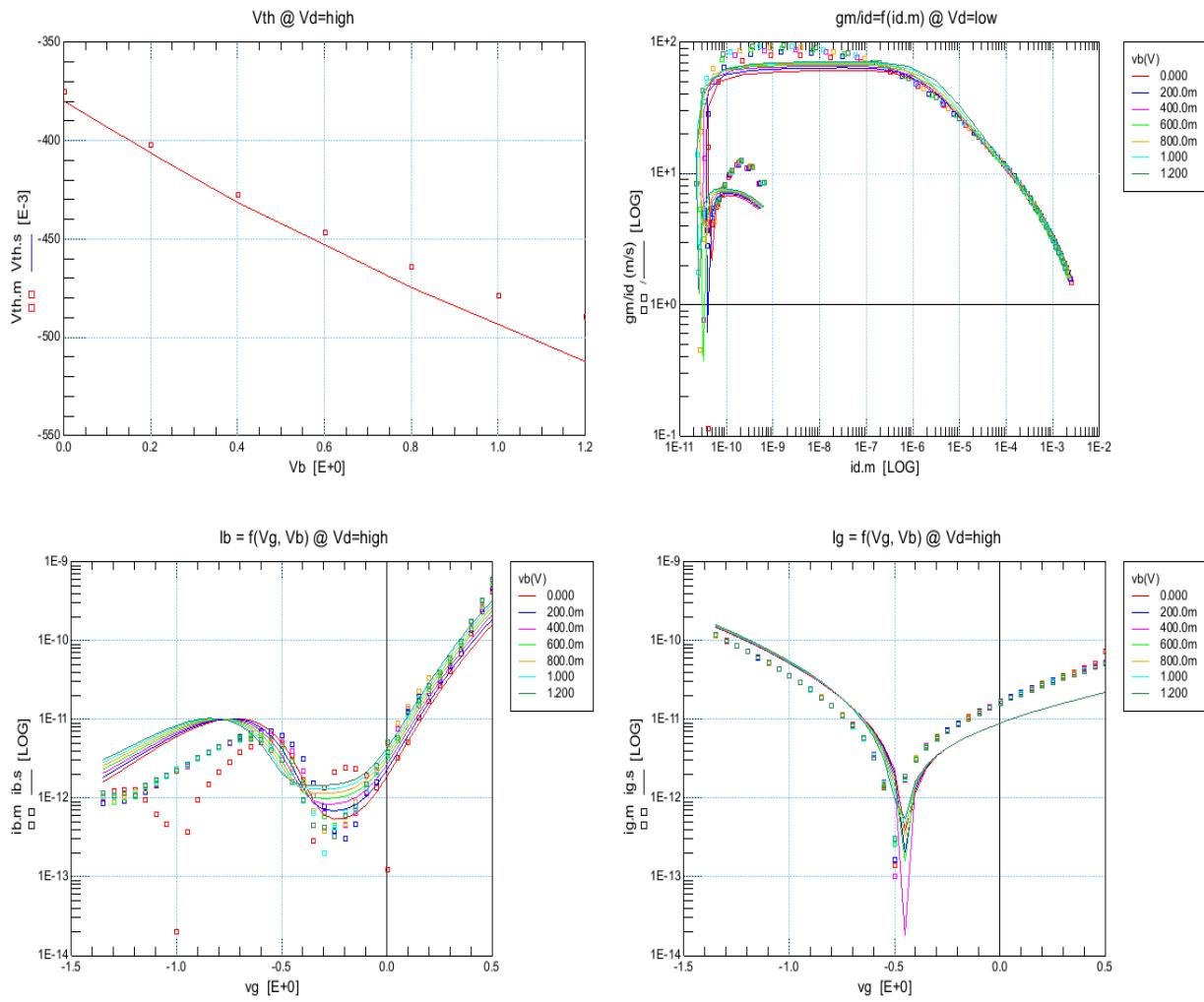
$idv_g, V_d = -0.05V, T = 27^\circ C$



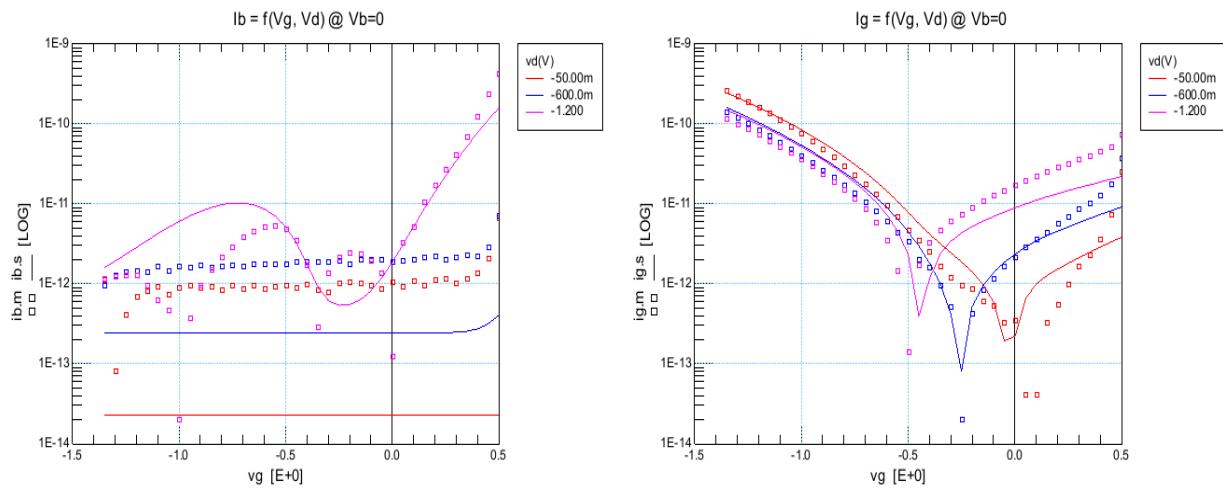


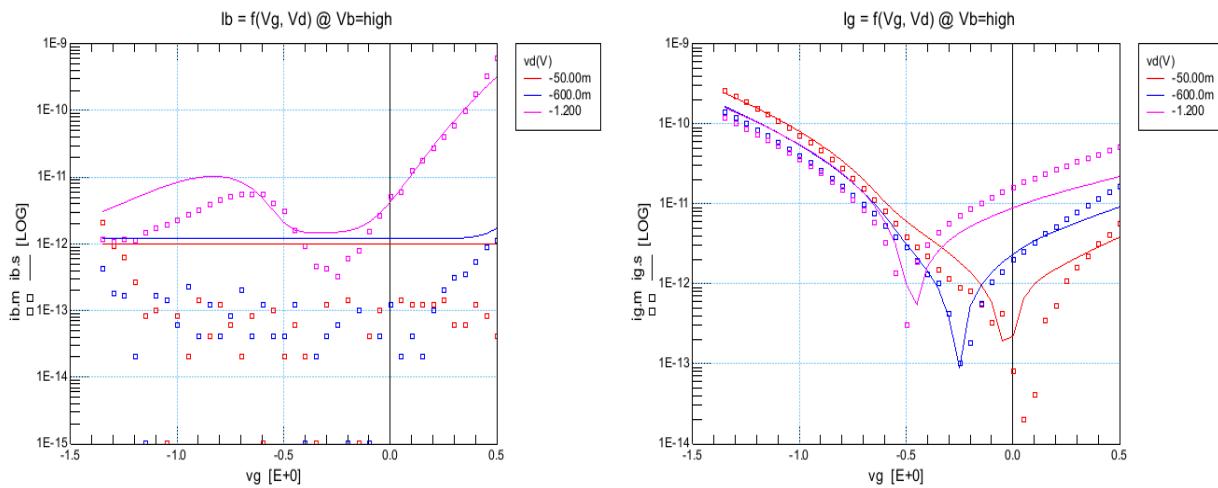
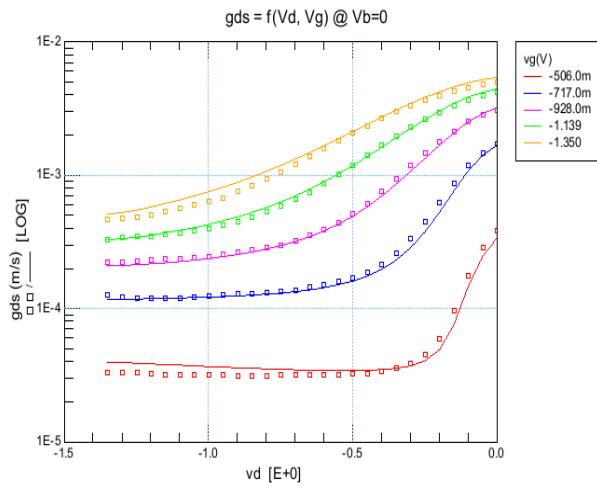
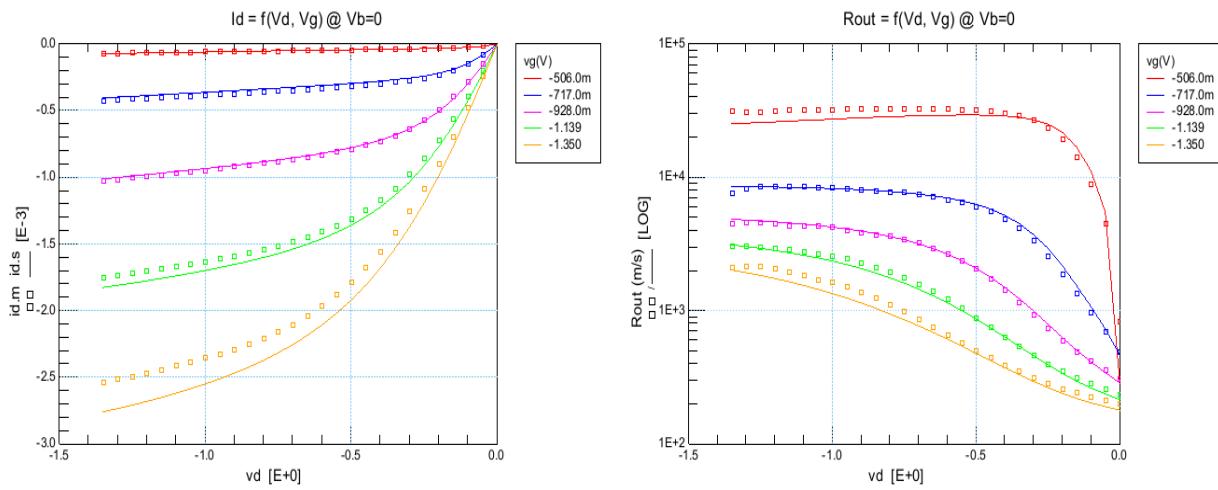
i_{dvg} , $V_d = -1.2V$, $T = 27^\circ\text{C}$

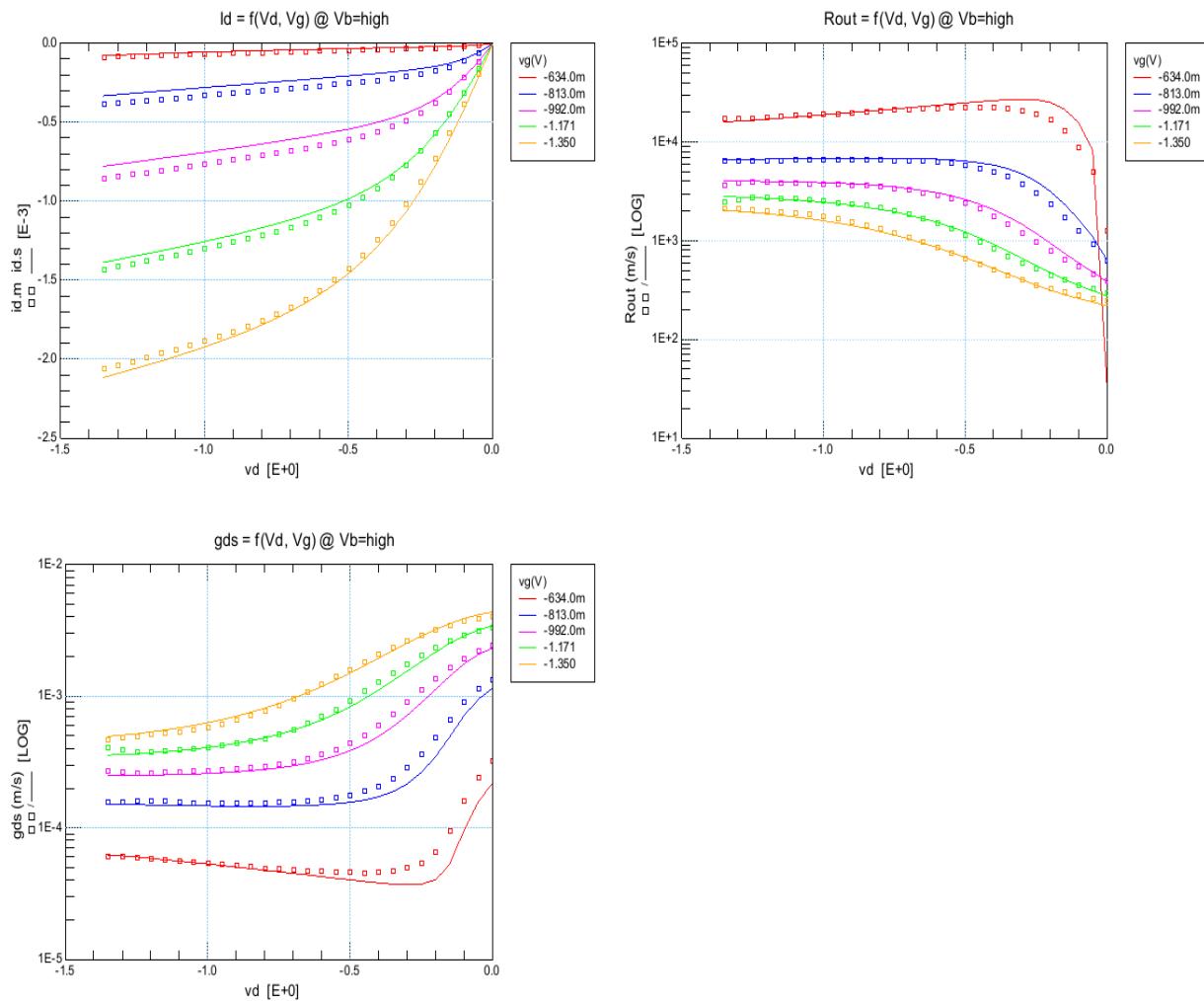
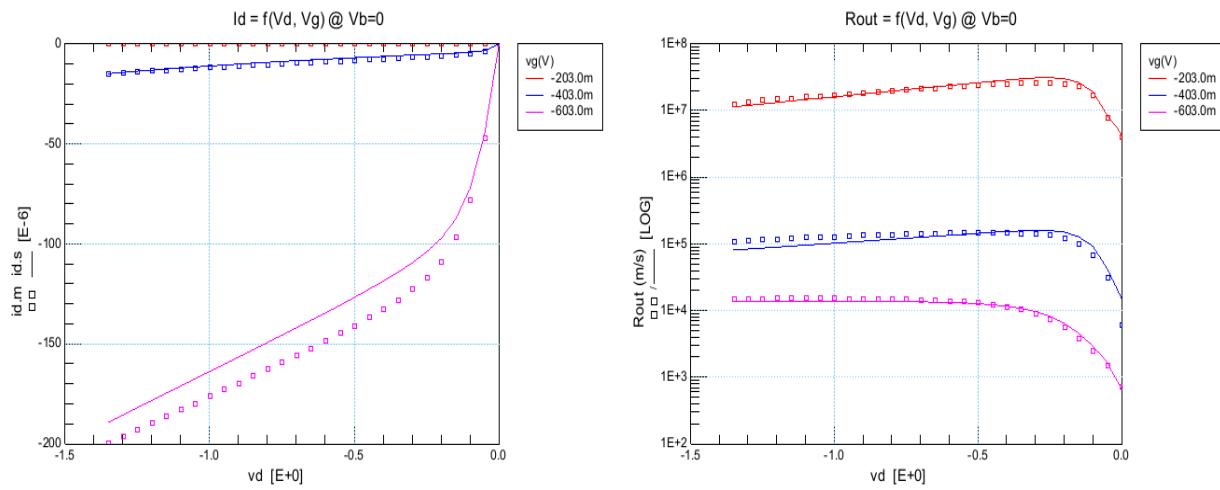


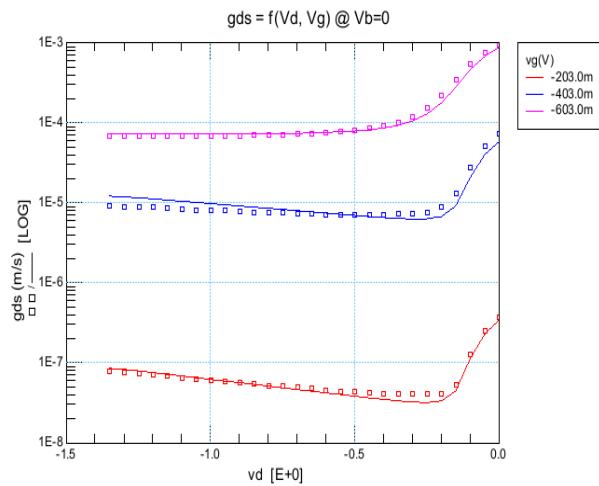


idvg, Ib,Ig, Vb = 0V, T = 27°C

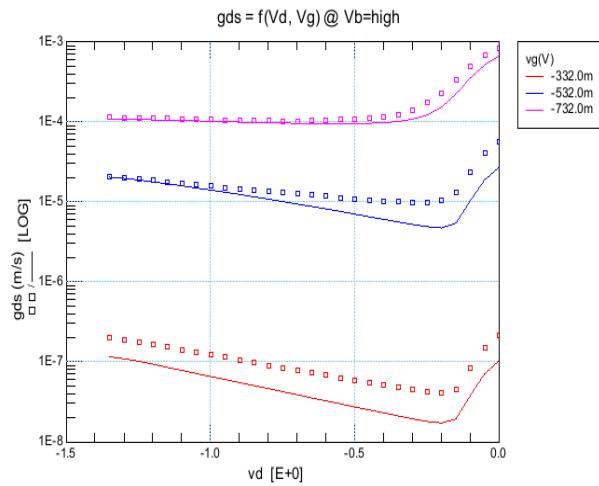
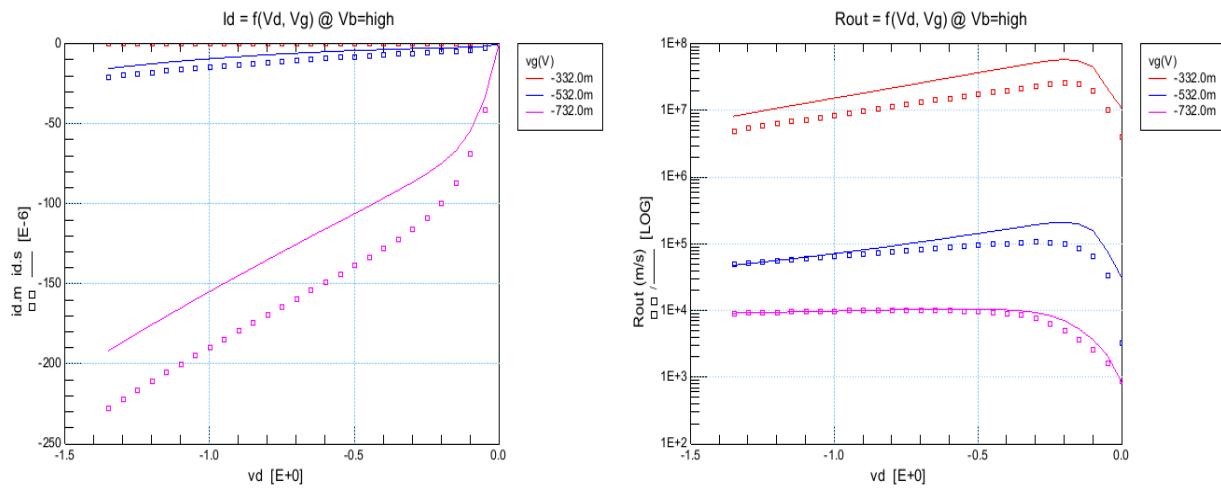


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


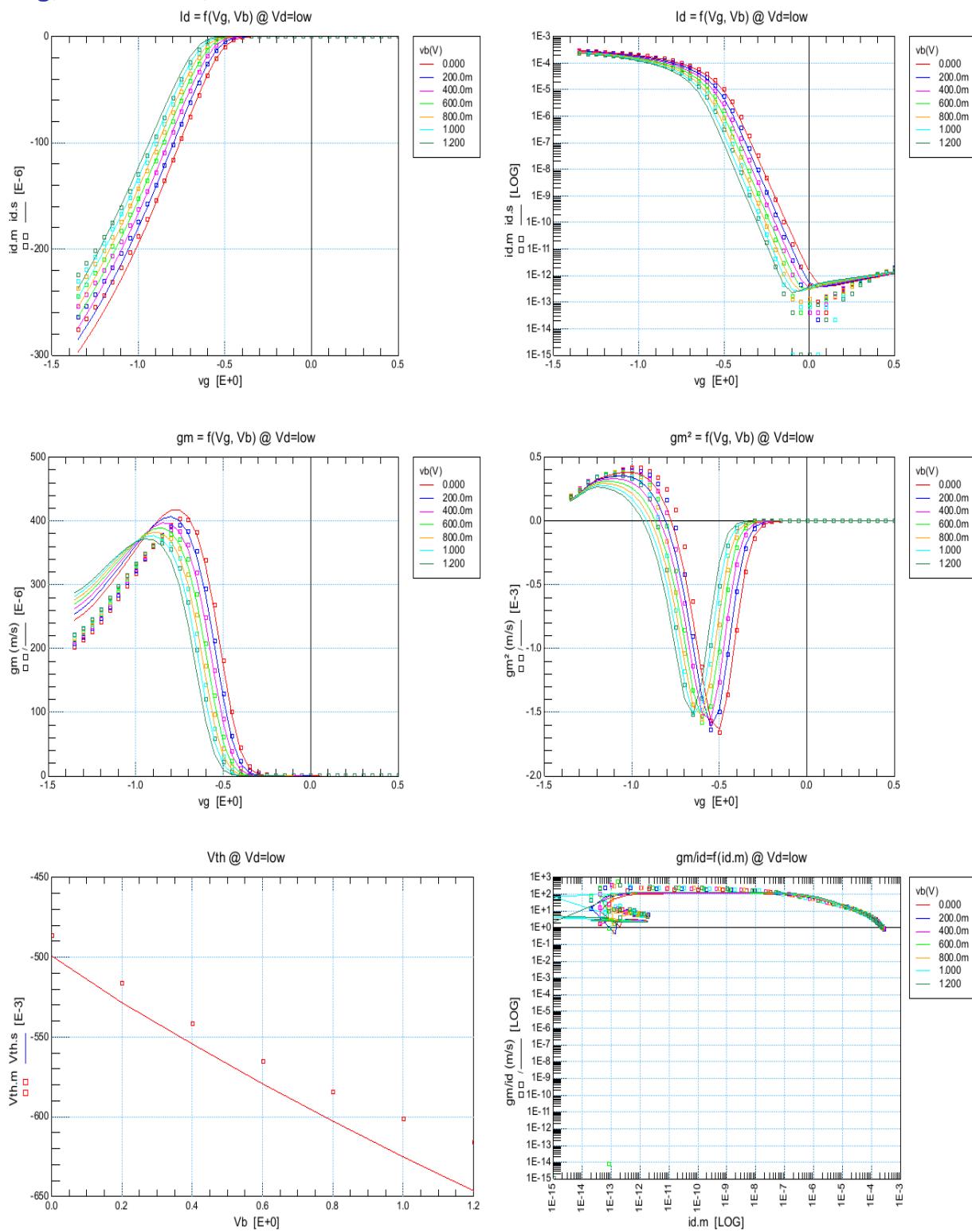
idvd_vbmin, Vb = 1.2V, T = 27°C**idvd_vth, Vb = 0V, T = 27°C**

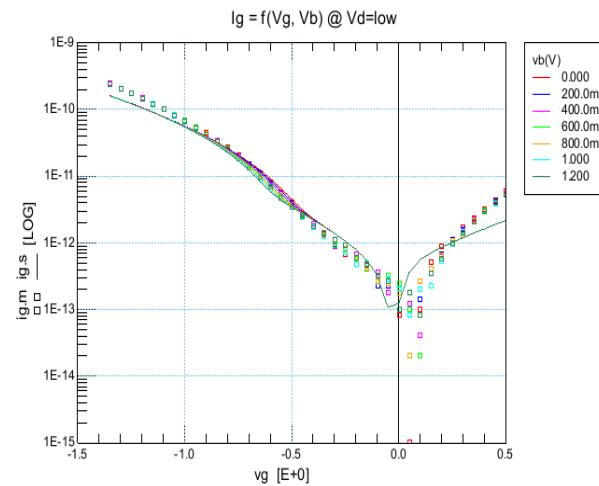
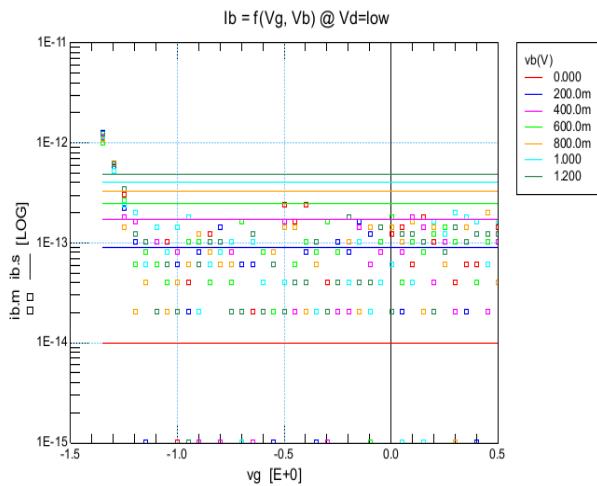


idvd_vth_vbmin, Vb = 1.2V, T = 27°C

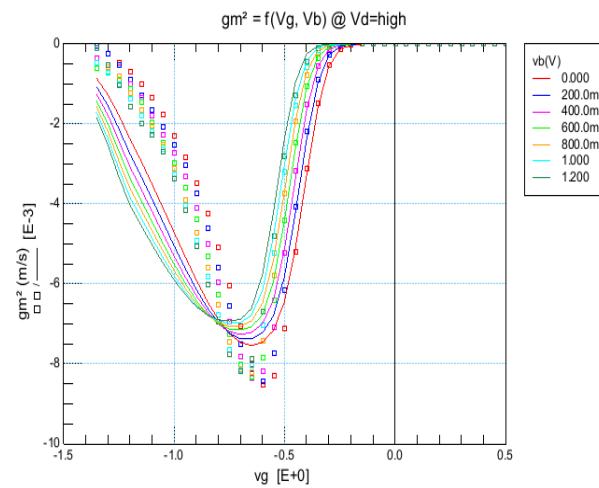
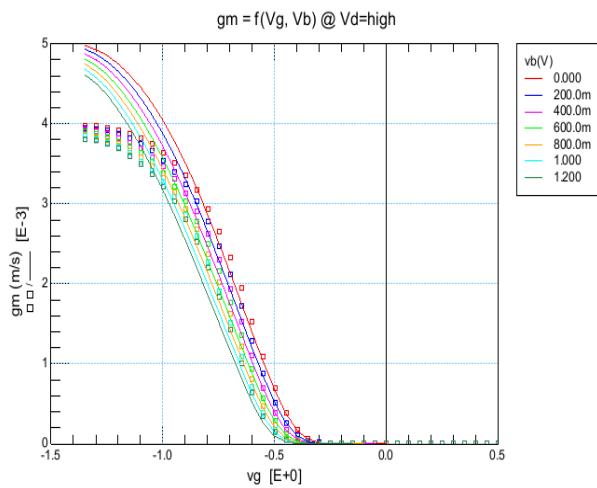
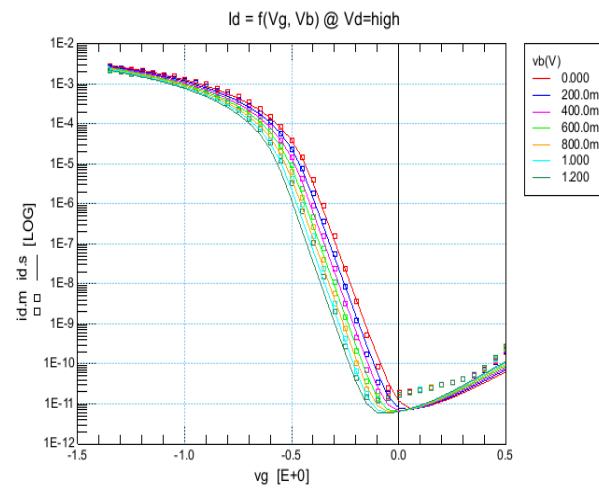
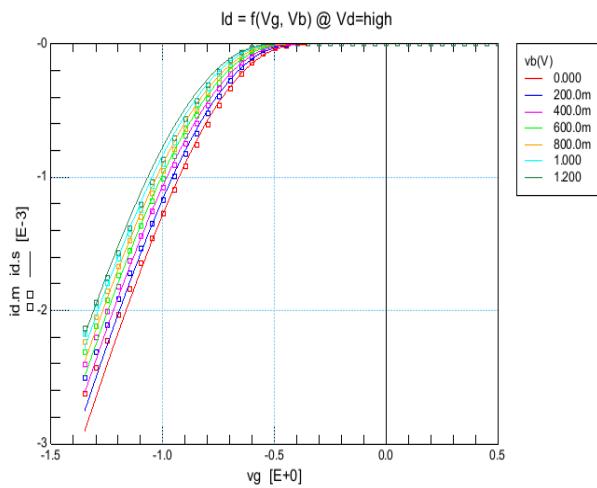


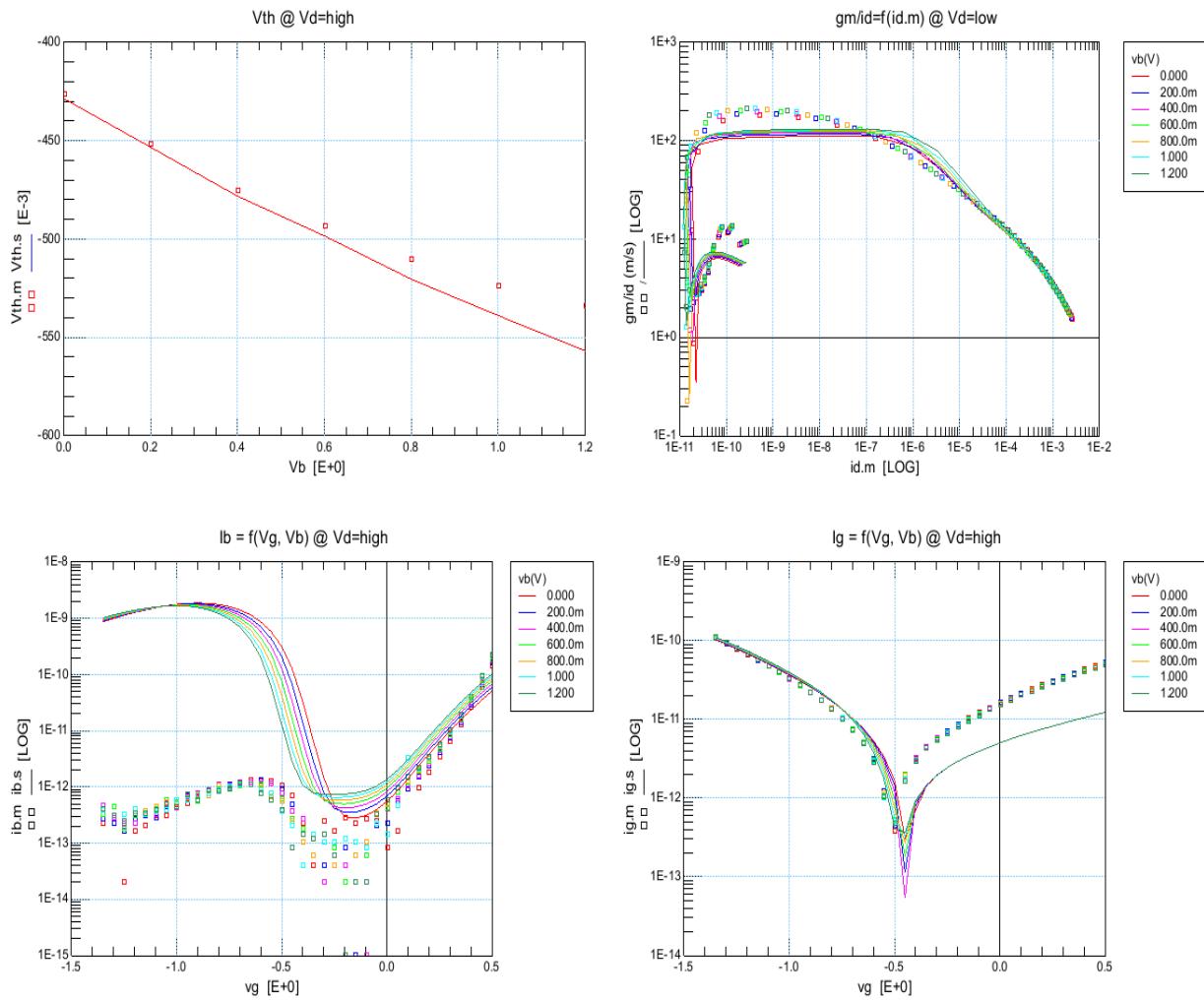
idvg, Vd = -0.05V, T = -40°C



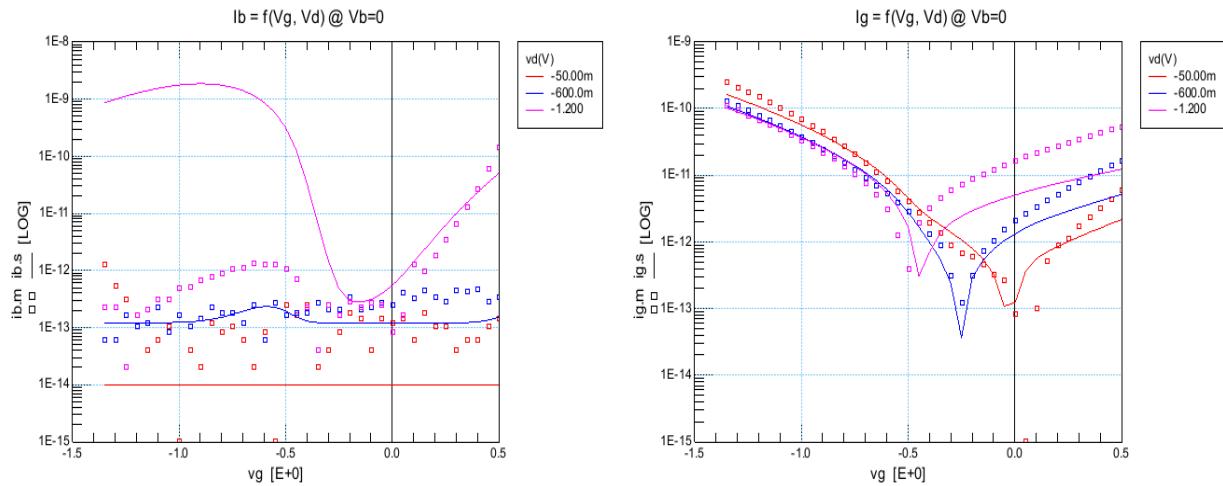


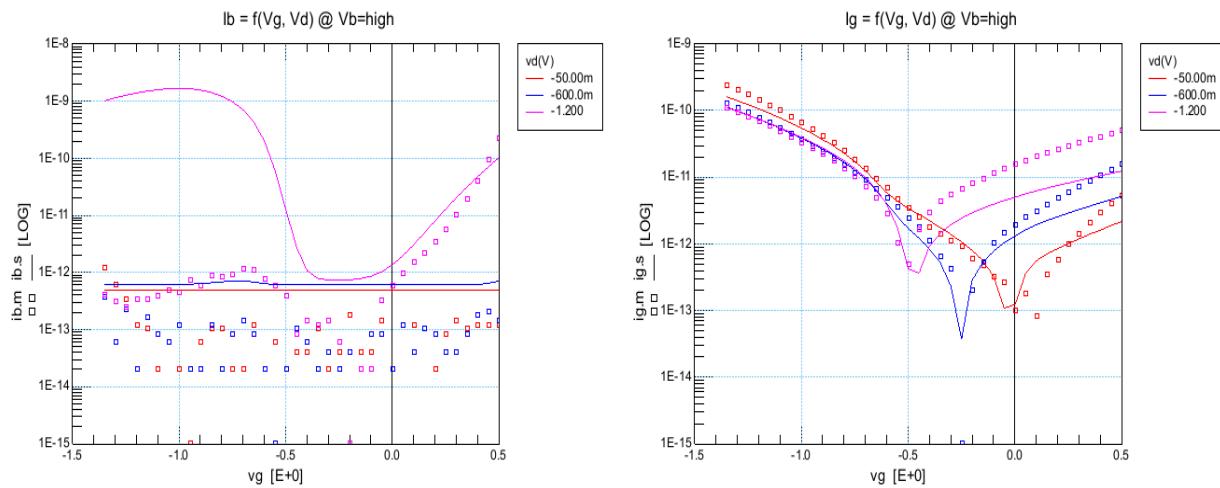
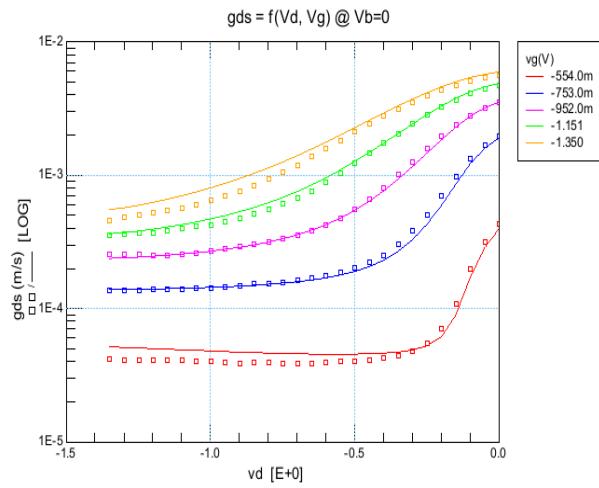
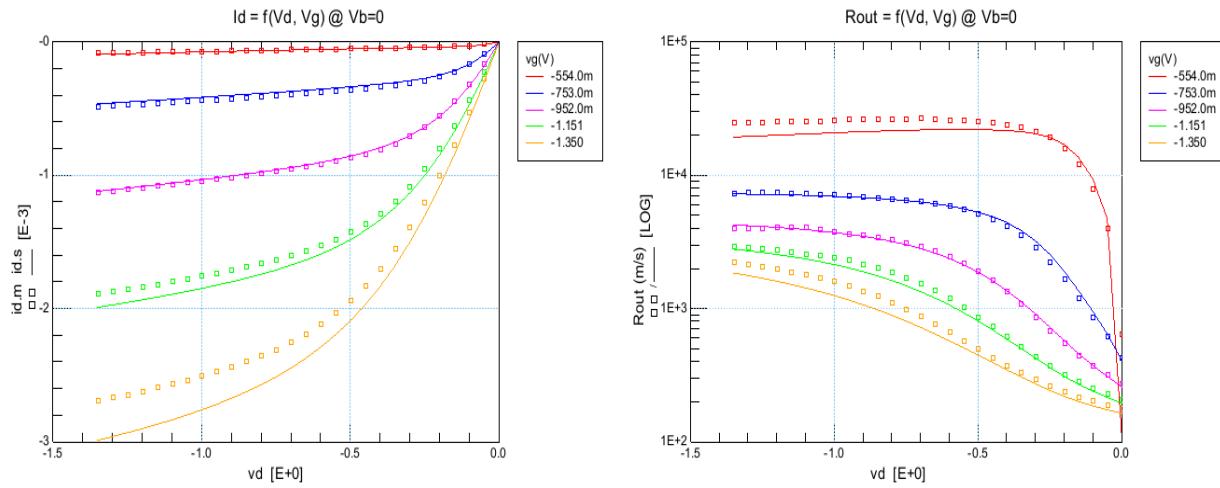
$i_{dvg}, V_d = -1.2V, T = -40^{\circ}C$

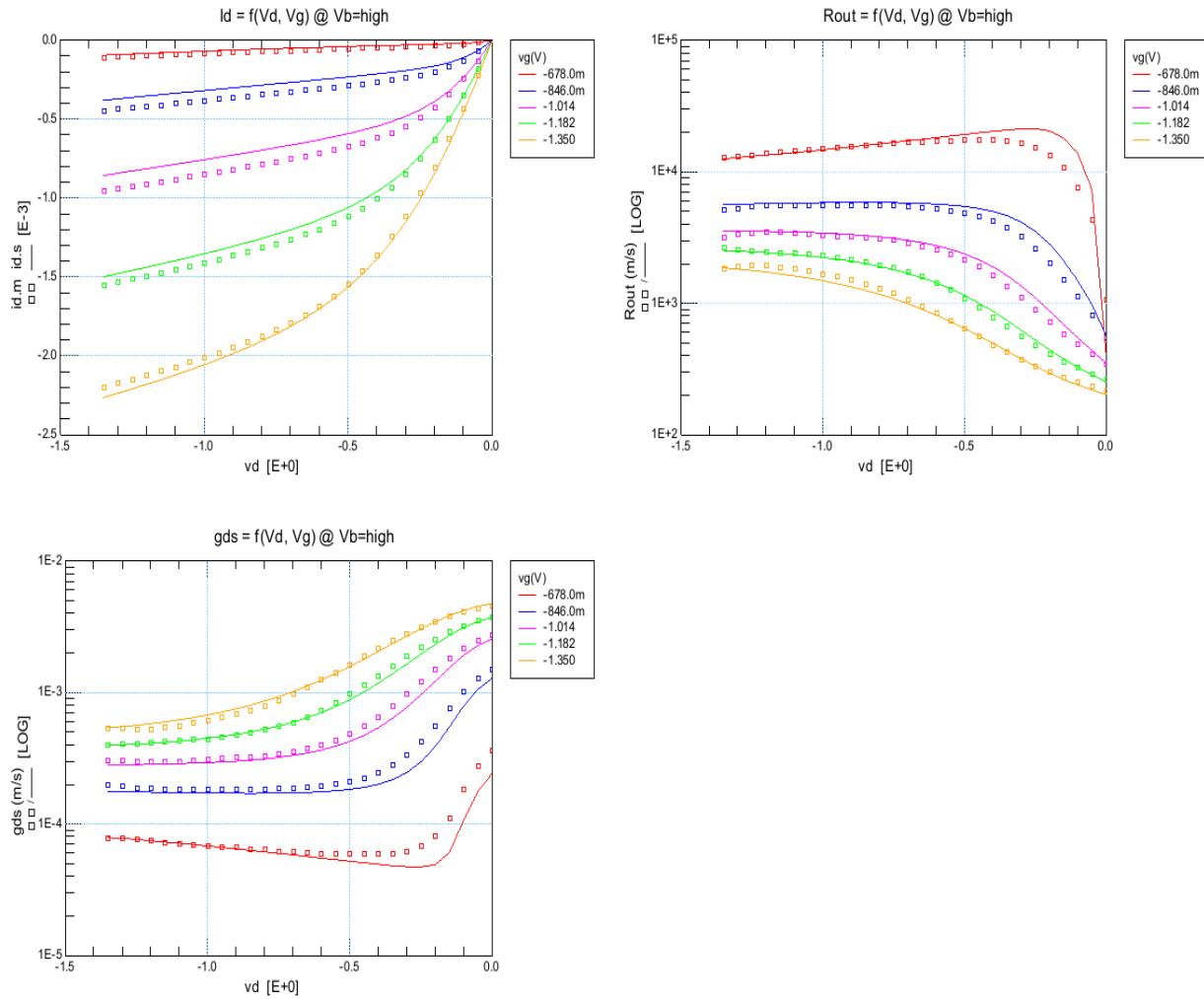
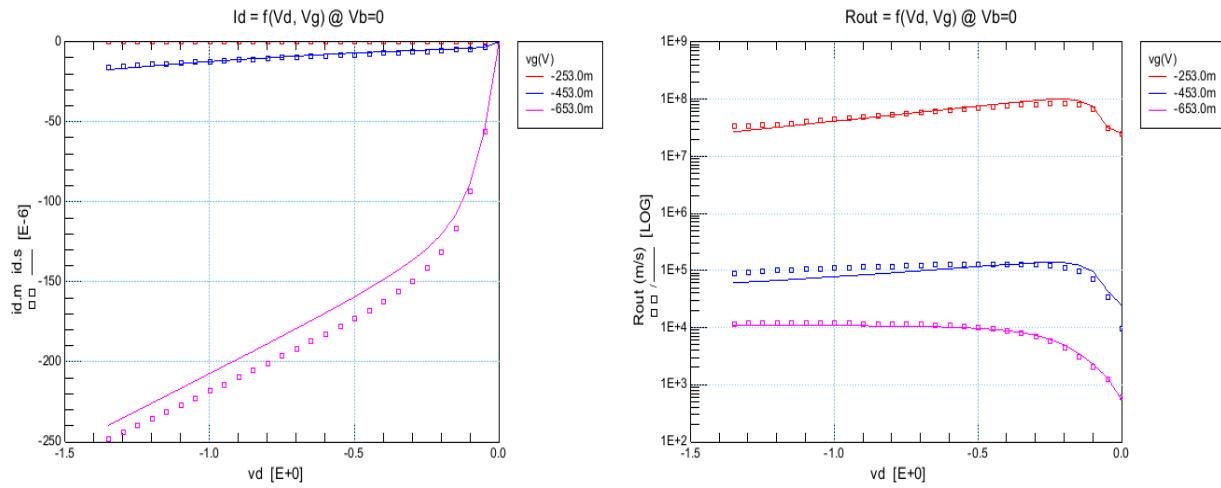


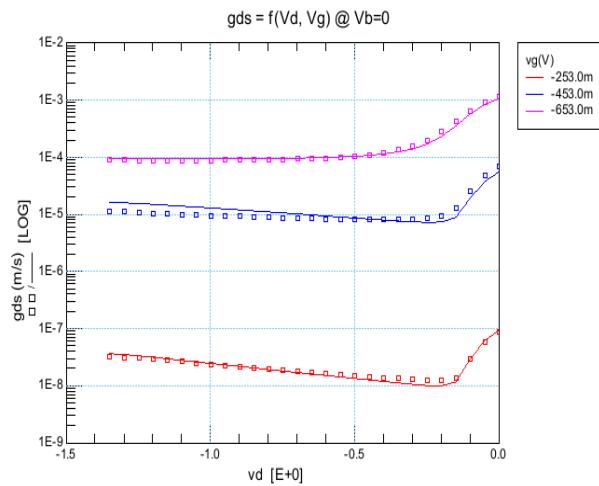


$idvg, Ib, Ig, Vb = 0V, T = -40^{\circ}C$

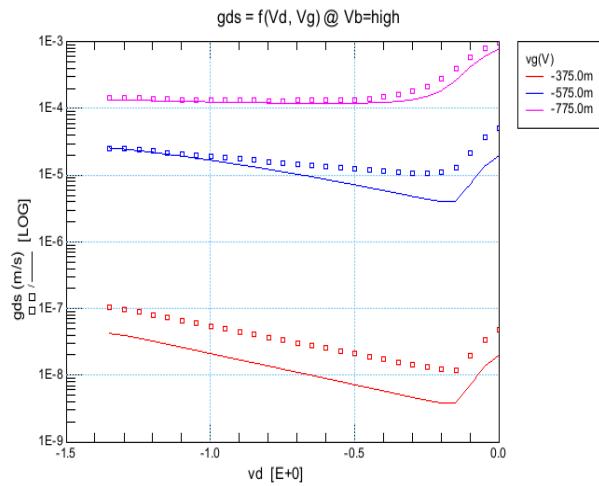
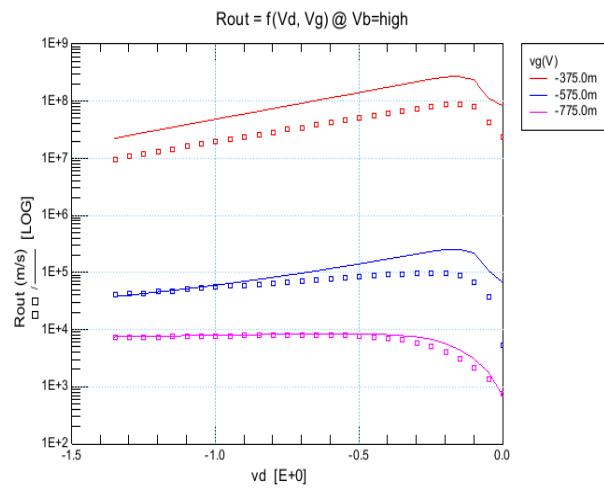
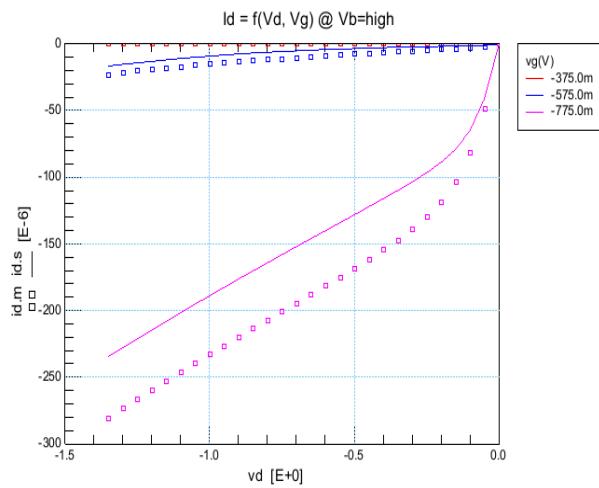


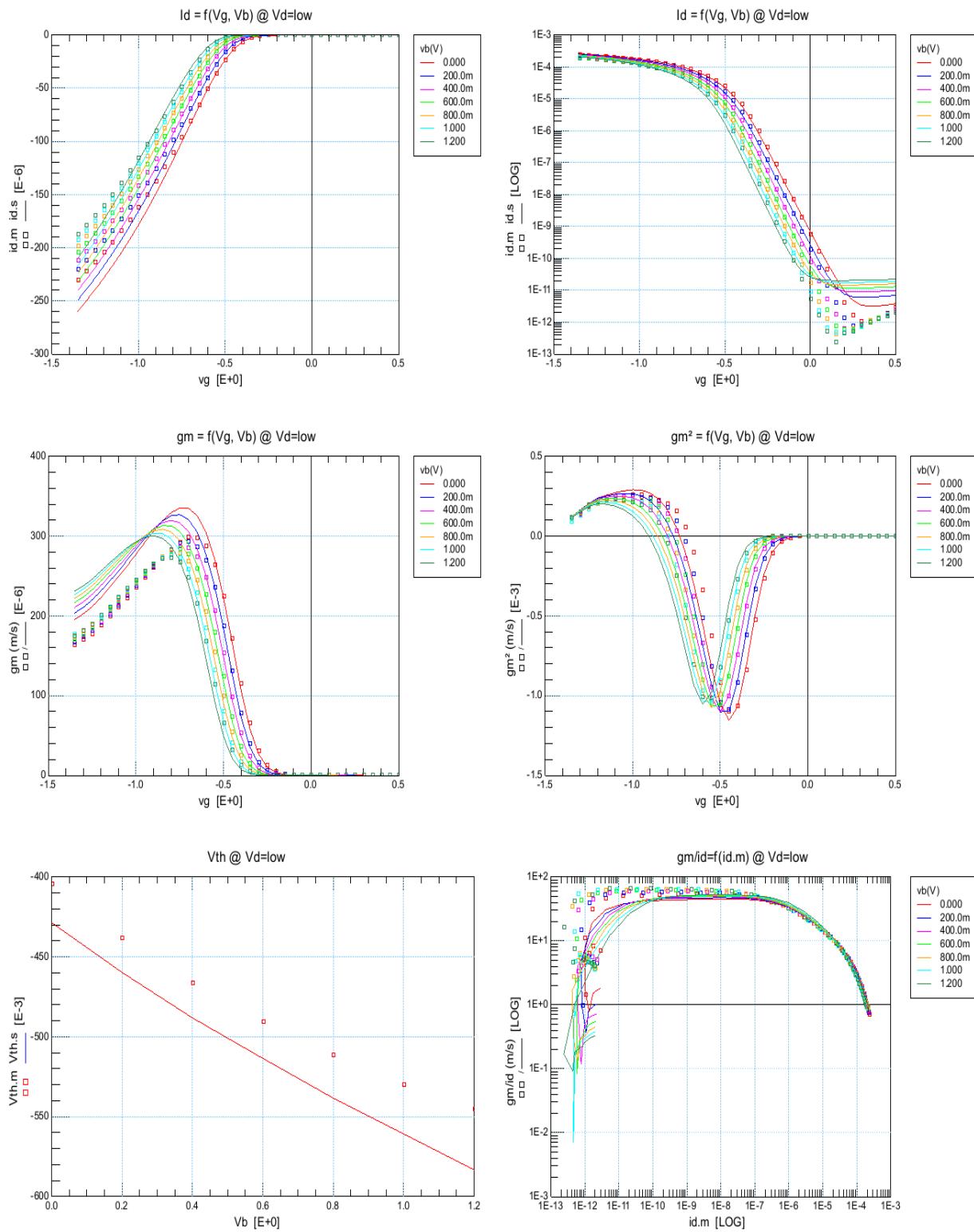
idvg, Ib,Ig, Vb = 1.2V, T = -40°C

idvd, Vb = 0V, T = -40°C


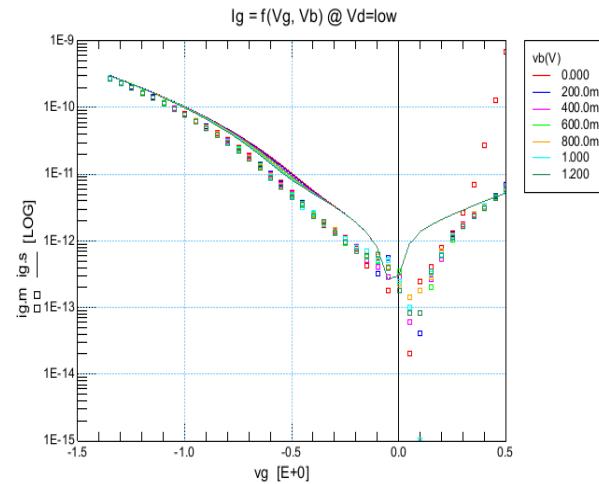
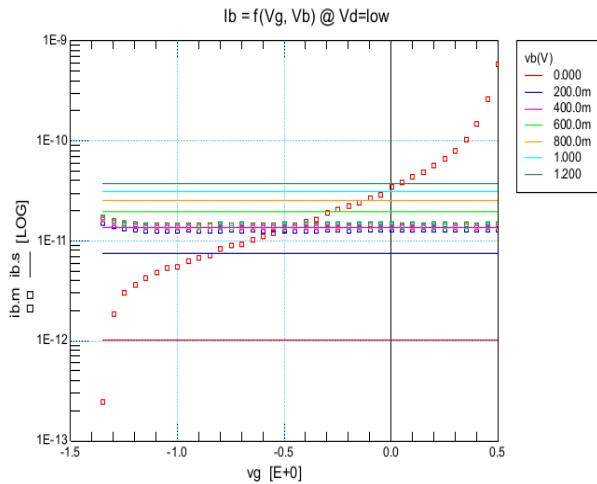
idvd_vbmin, Vb = 1.2V, T = -40°C

idvd_vth, Vb = 0V, T = -40°C




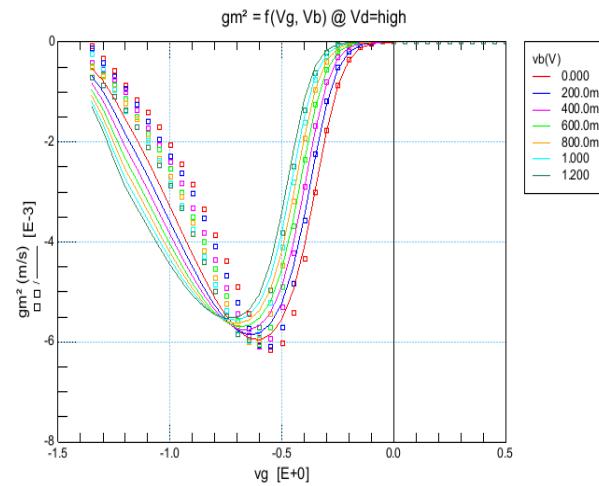
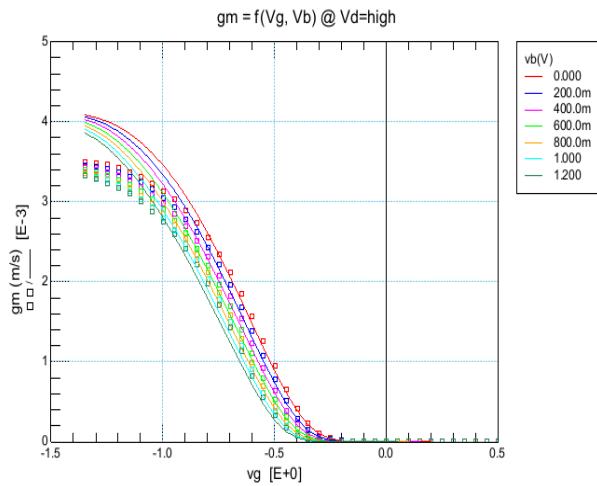
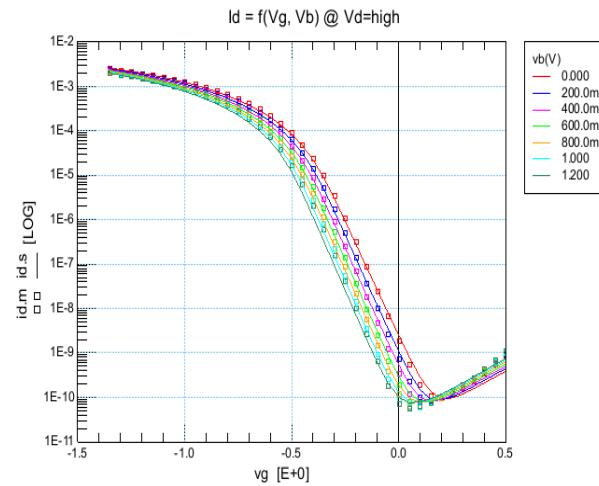
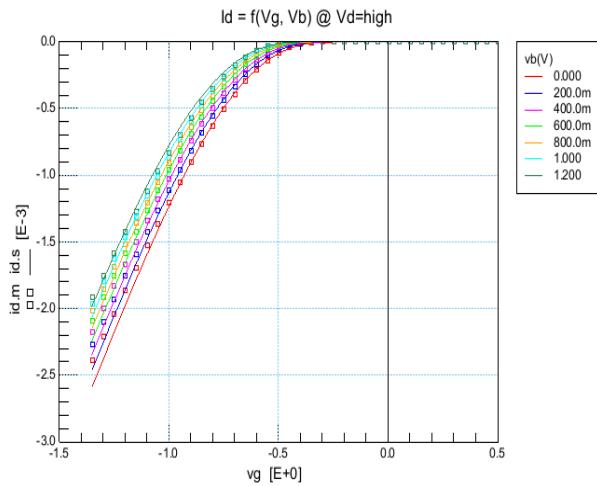
idvd_vth_vbmin, Vb = 1.2V, T = -40°C

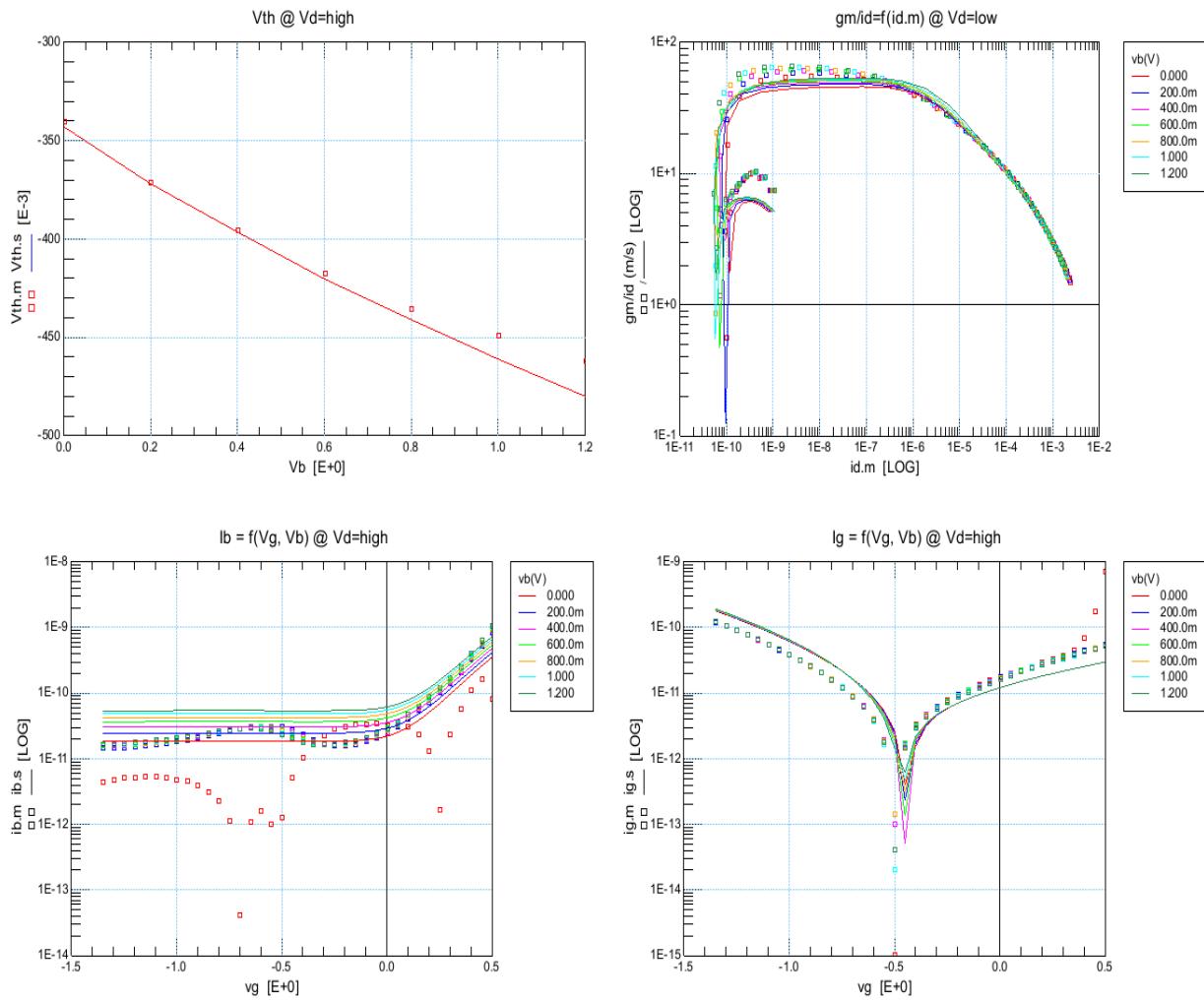


idvg, Vd = -0.05V, T = 70°C


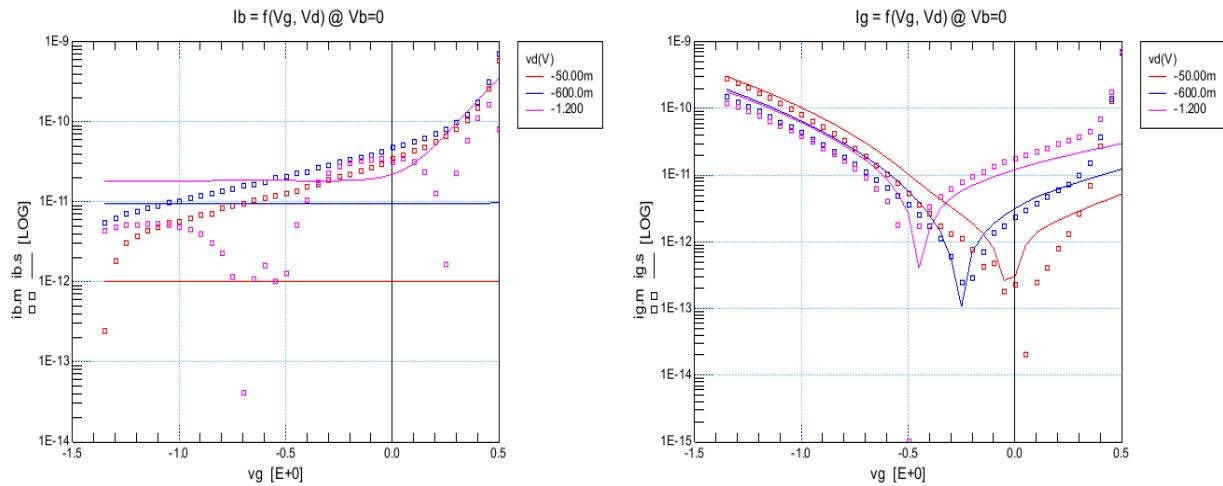


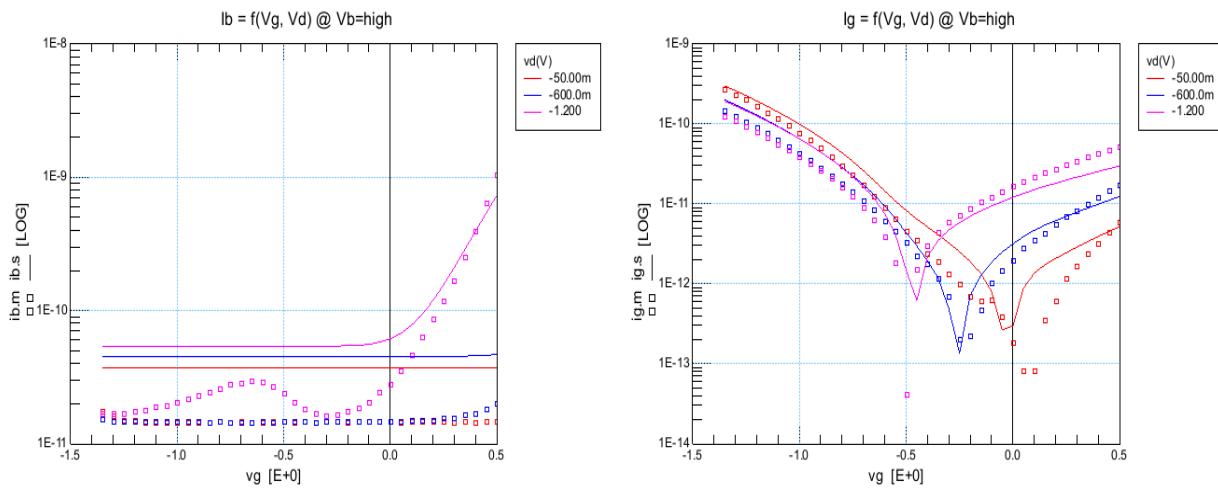
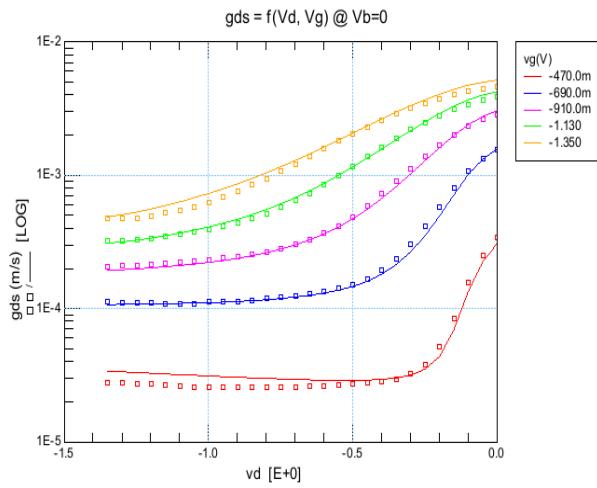
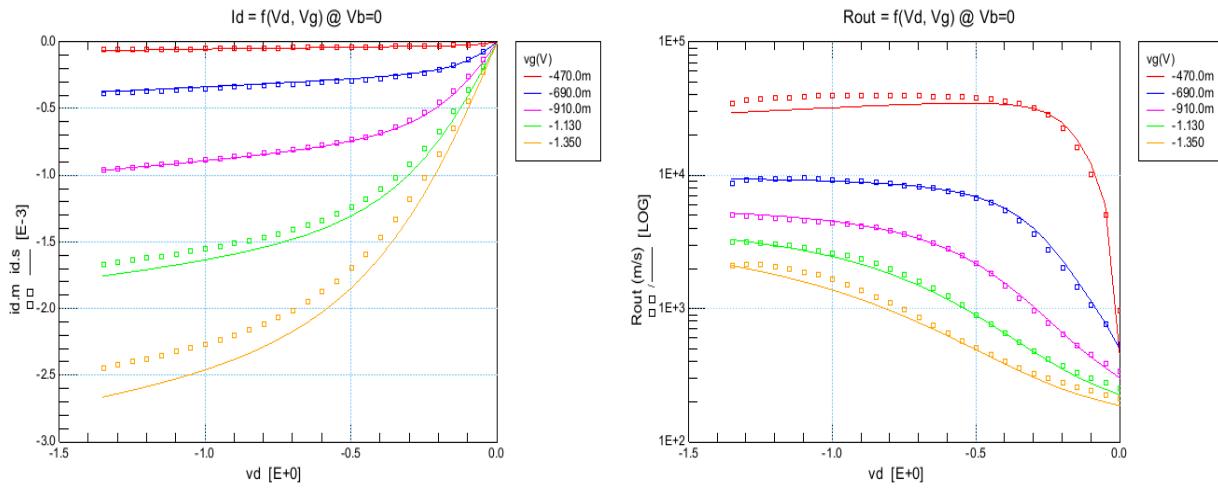
$i_d v_g, V_d = -1.2V, T = 70^\circ C$

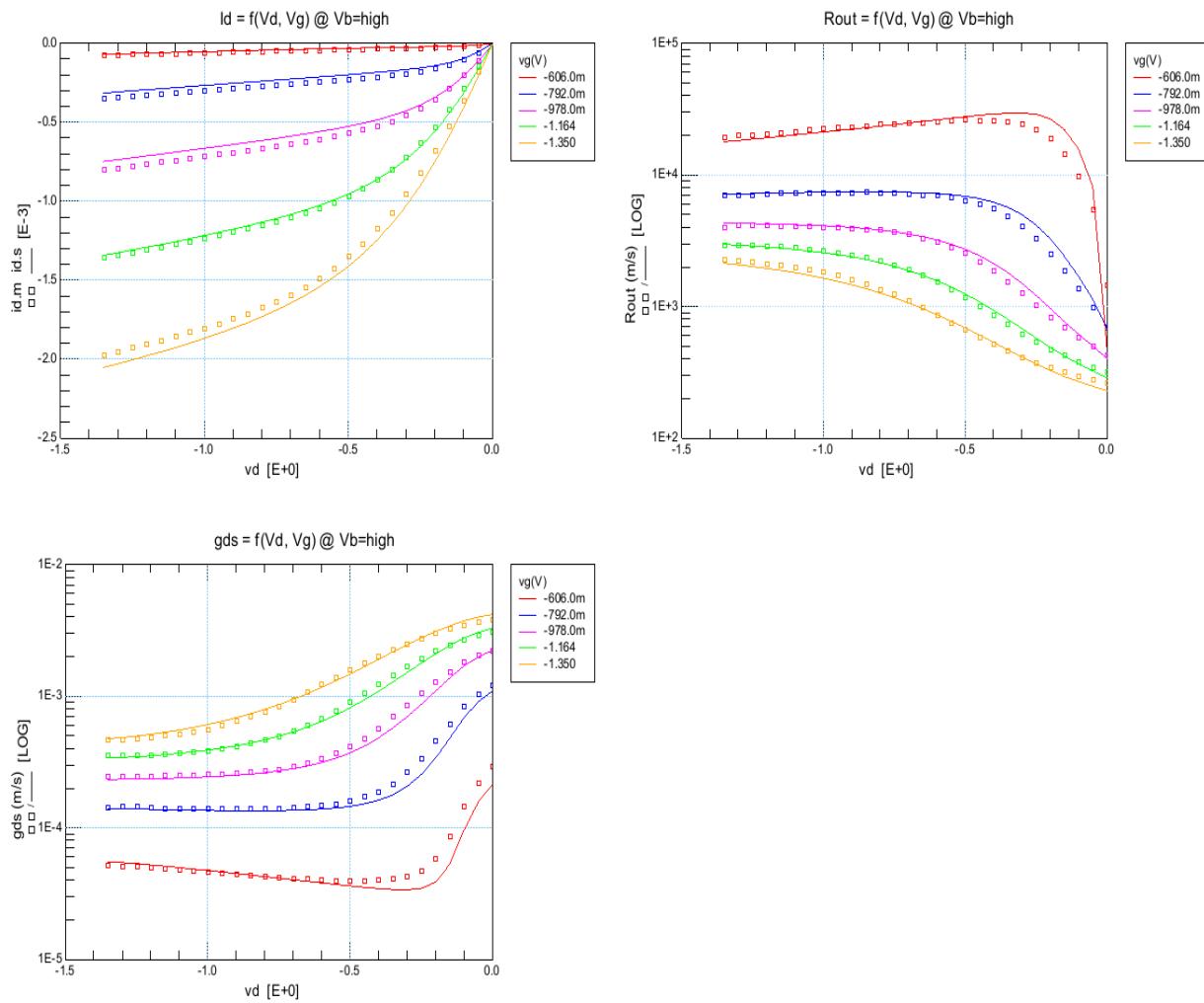
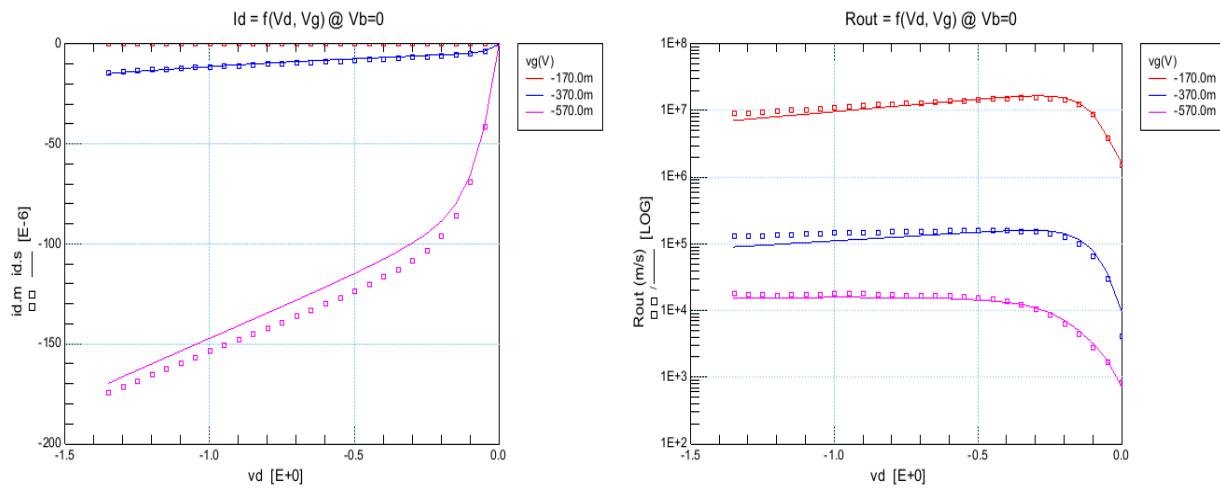


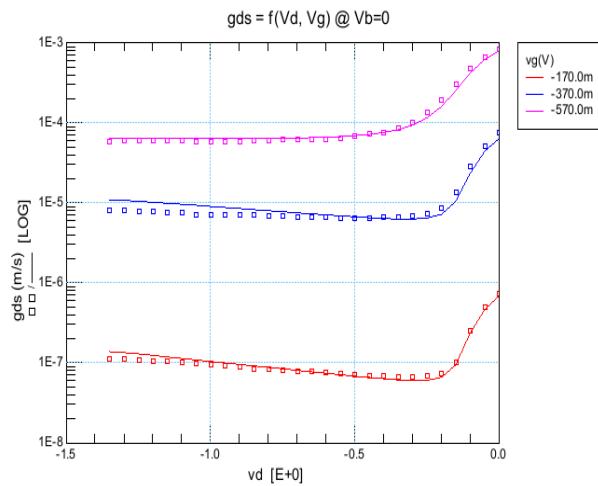


idvg, Ib,Ig, Vb = 0V, T = 70°C

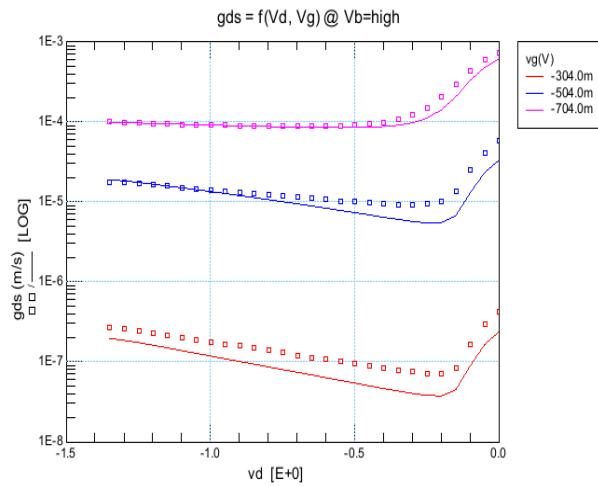
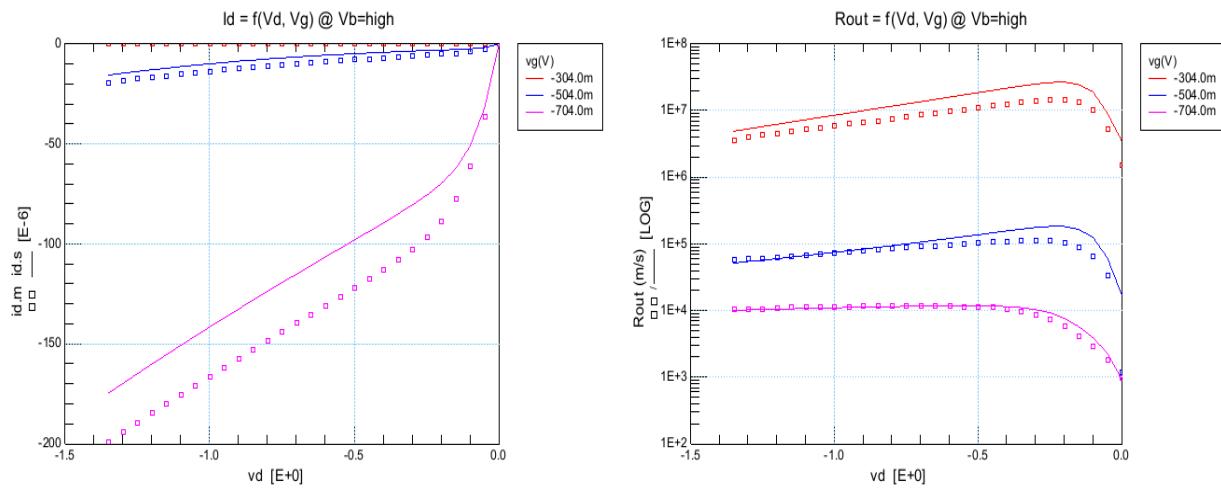


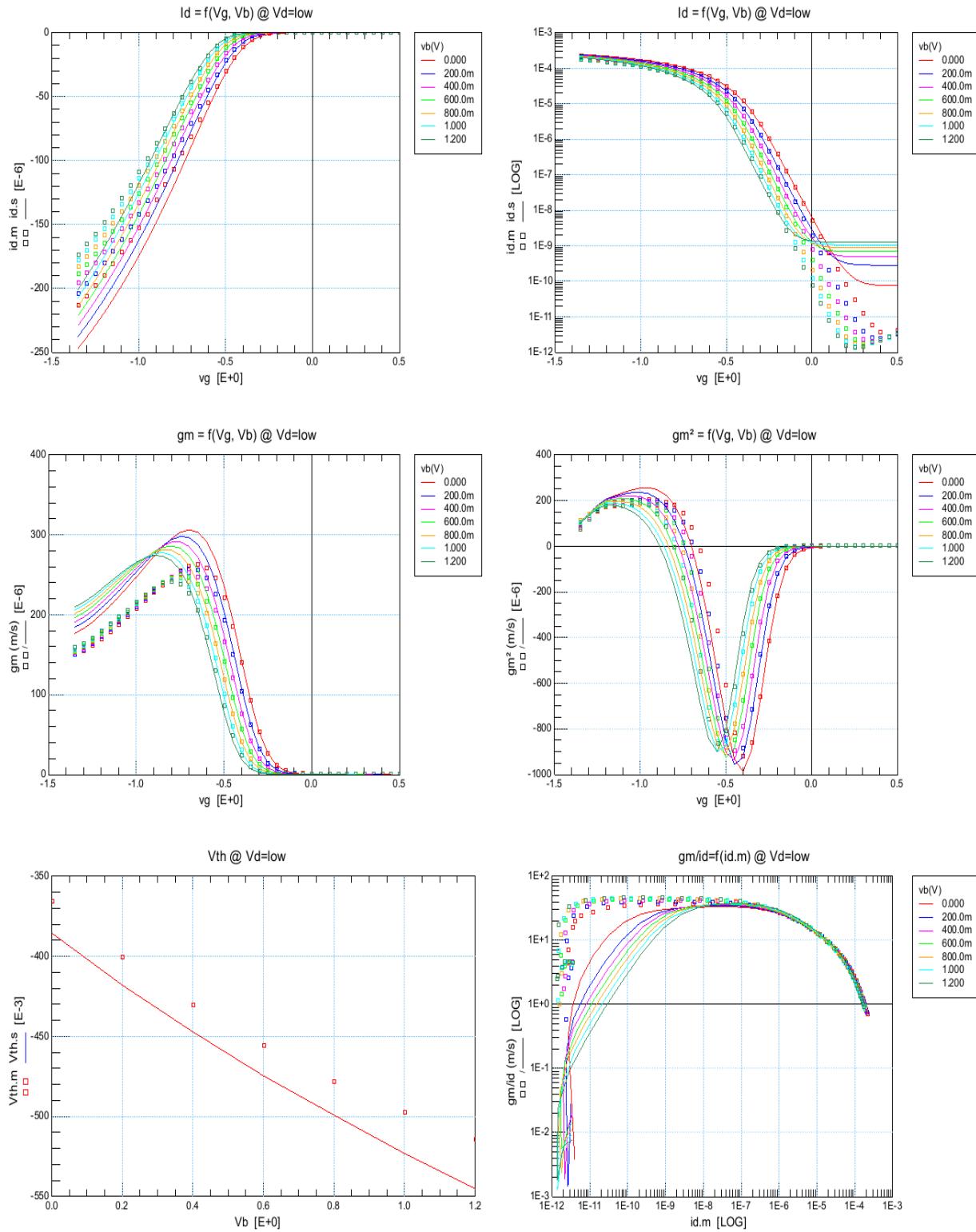
idvg, Ib,Ig, Vb = 1.2V, T = 70°C

idvd, Vb = 0V, T = 70°C


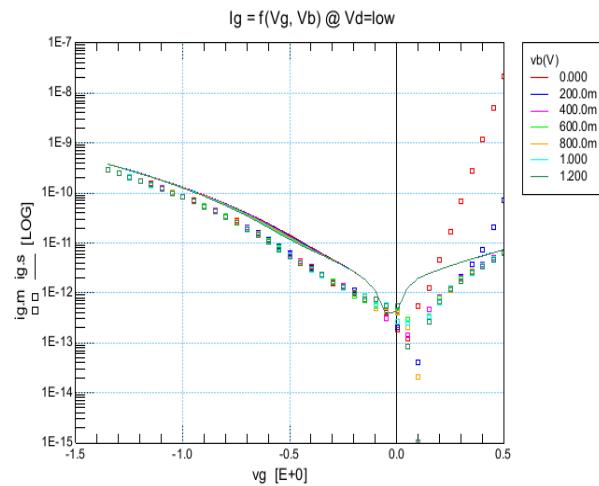
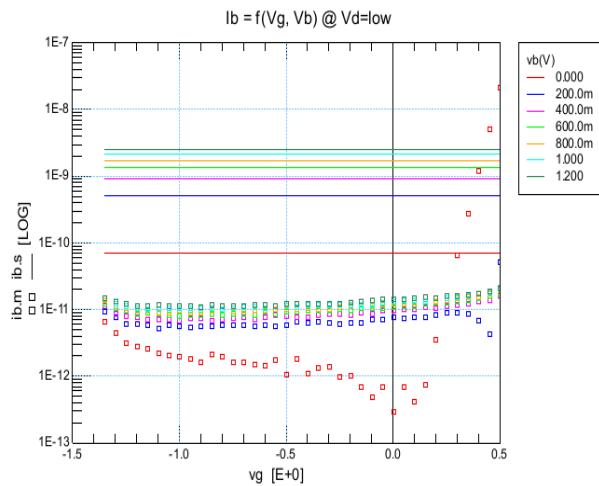
idvd_vbmin, Vb = 1.2V, T = 70°C

idvd_vth, Vb = 0V, T = 70°C




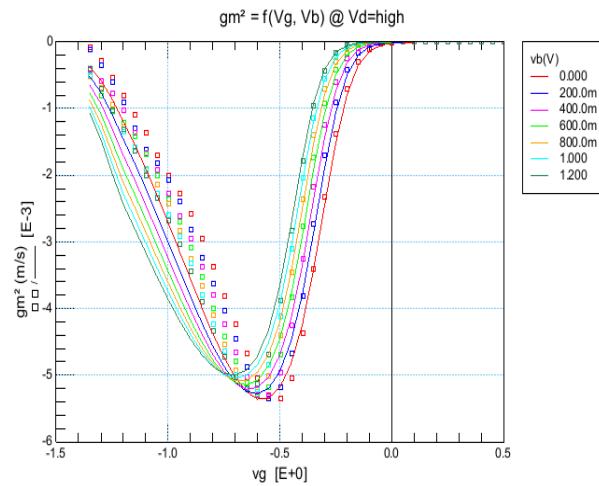
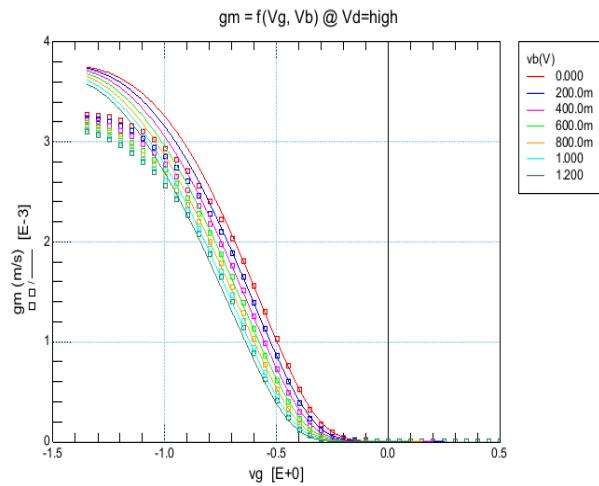
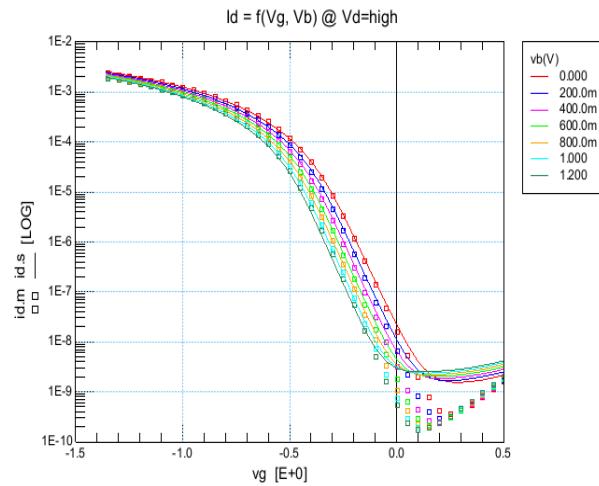
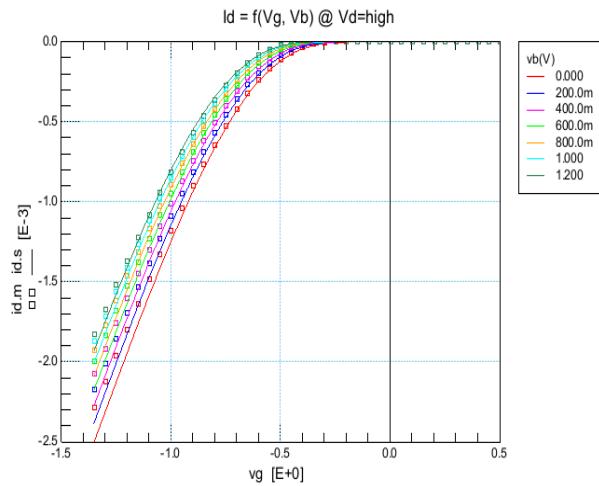
idvd_vth_vbmin, Vb = 1.2V, T = 70°C

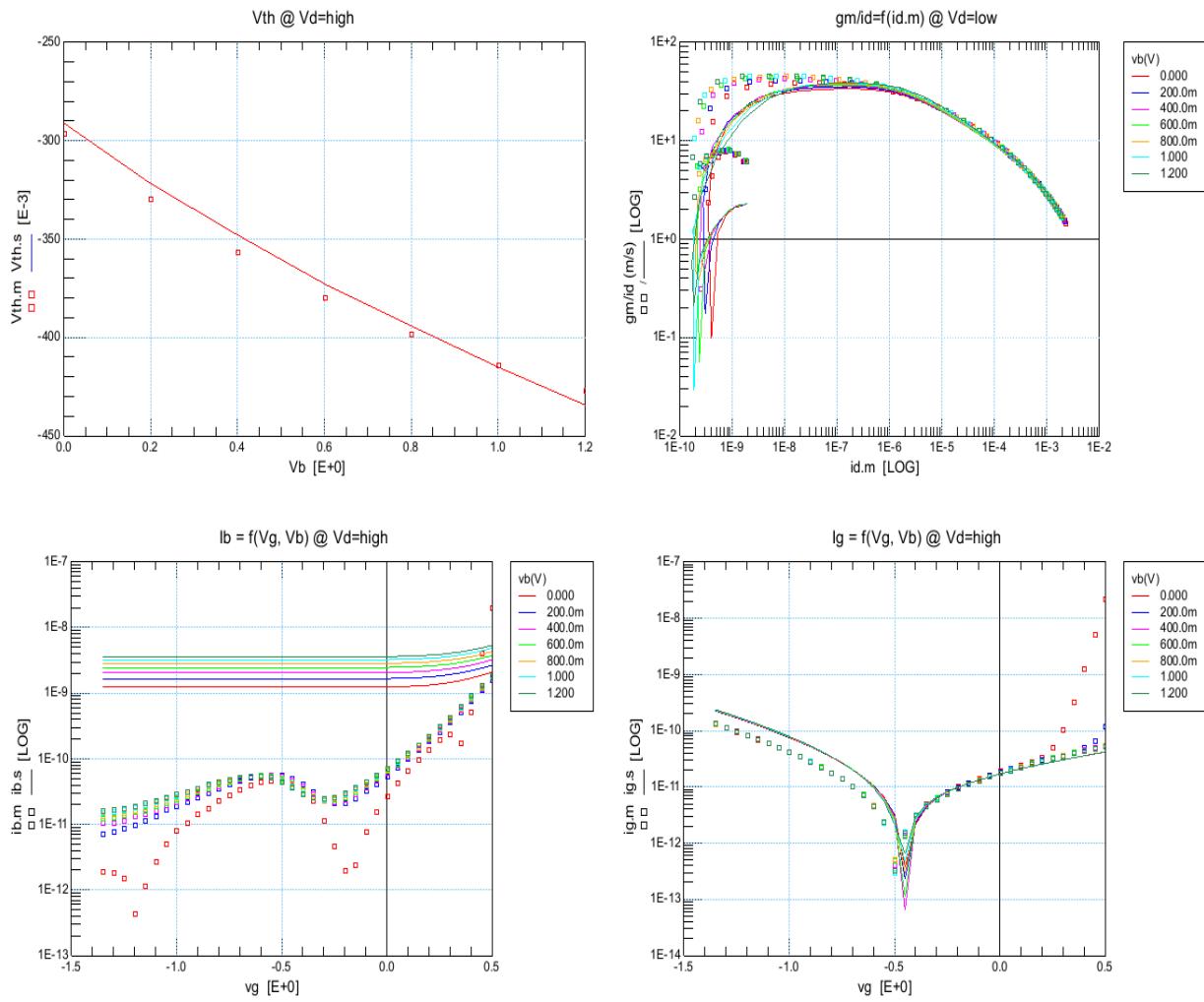


idvg, Vd = -0.05V, T = 125°C


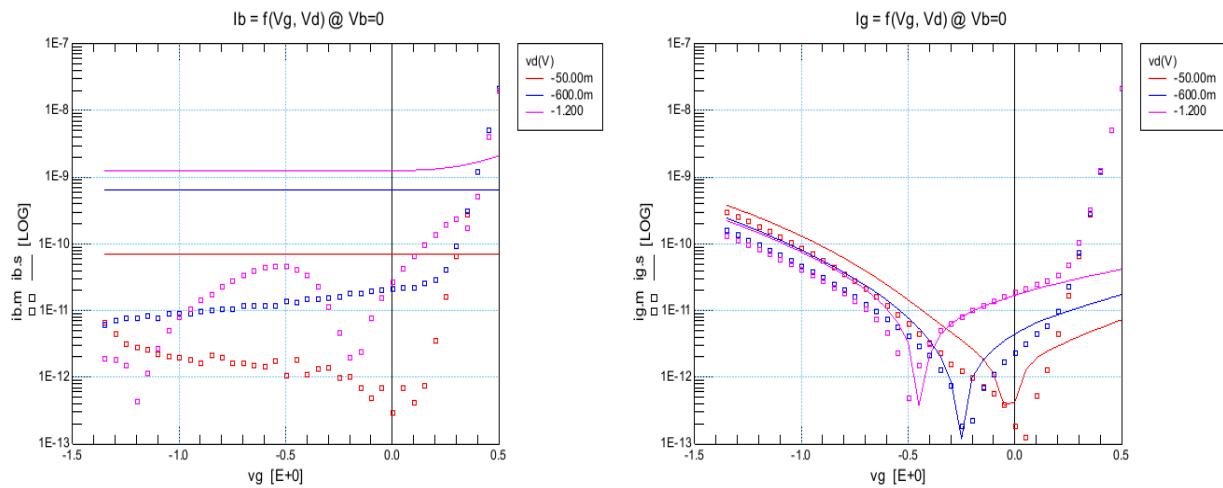


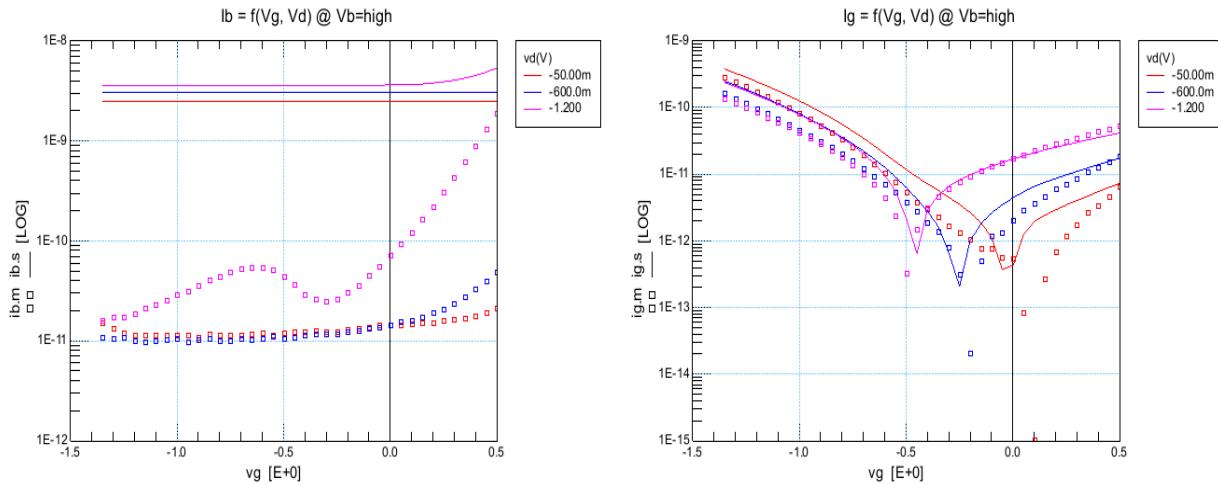
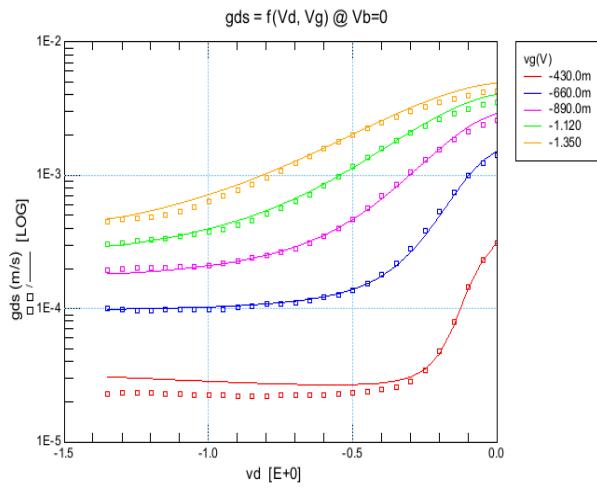
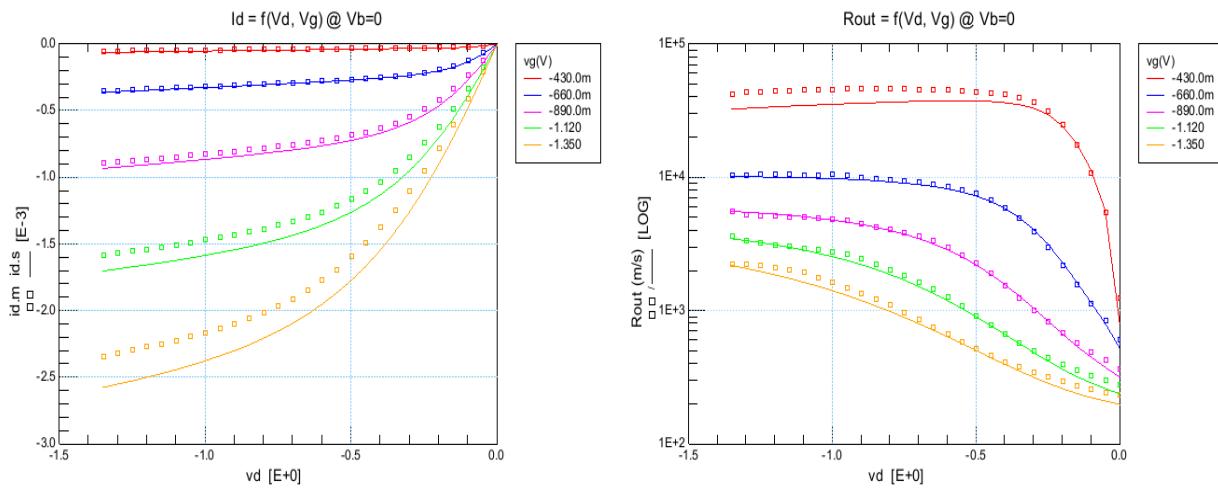
i_{dvg} , $V_d = -1.2V$, $T = 125^\circ\text{C}$

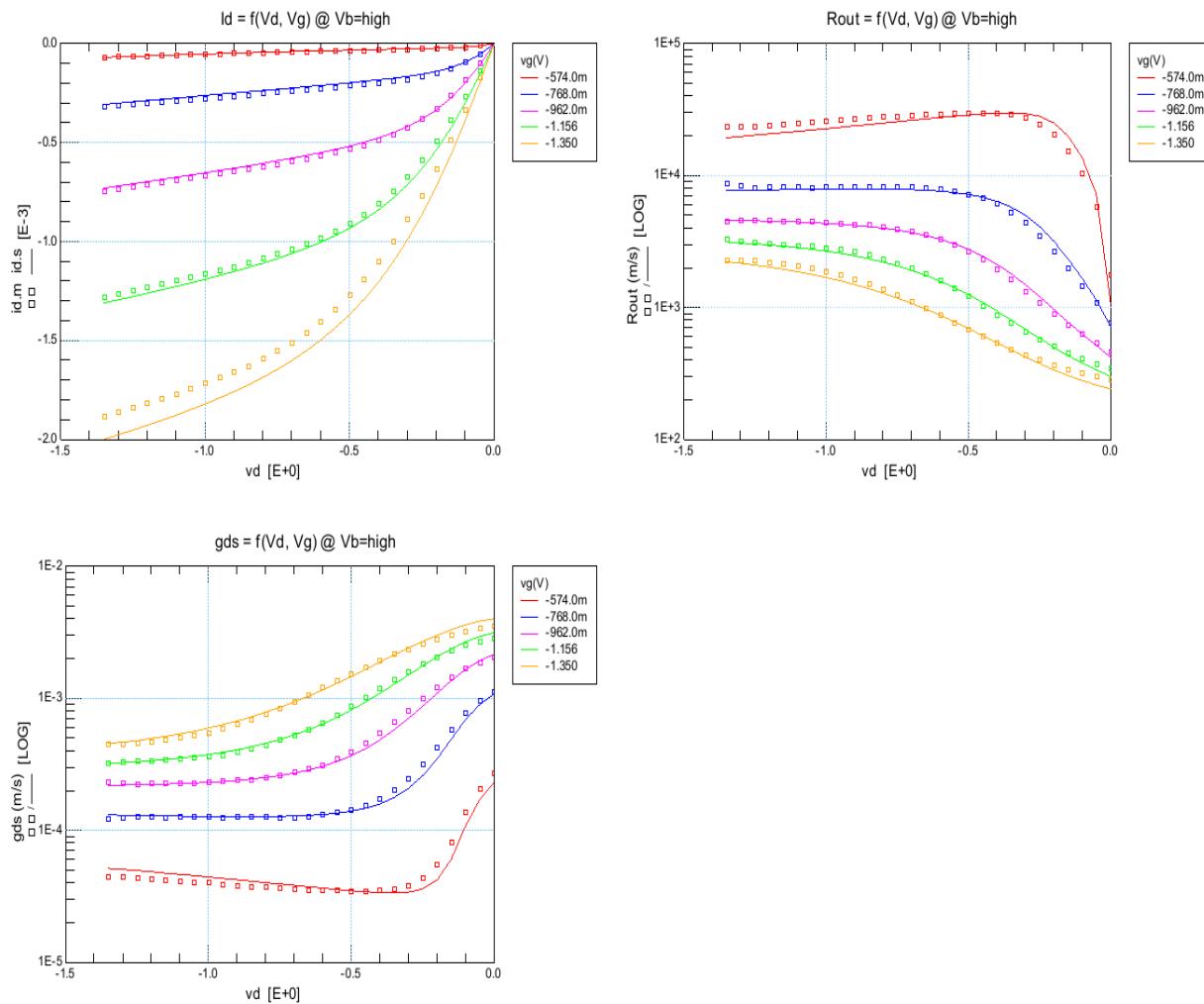
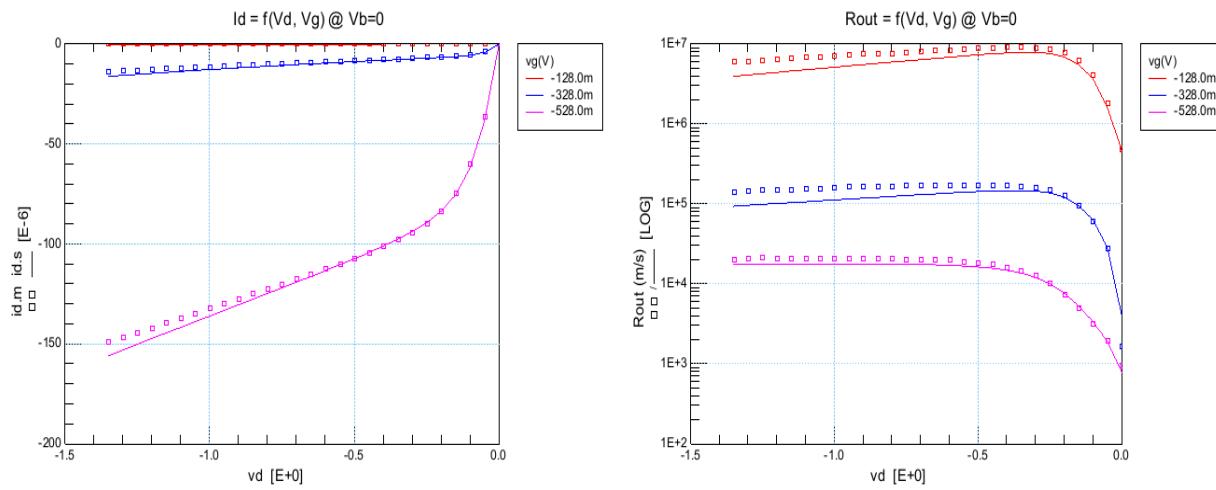


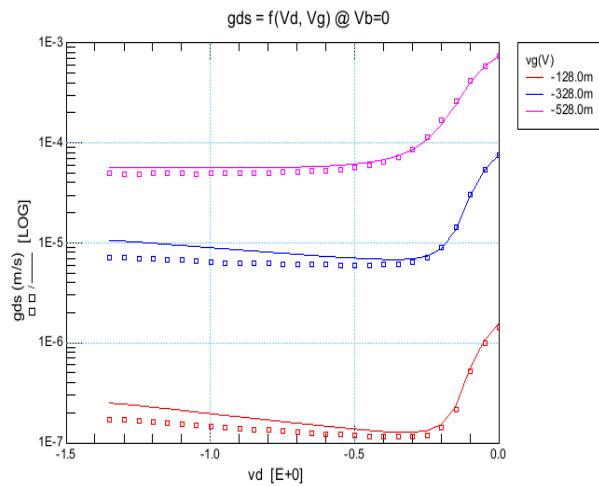


$i_{dvg}, I_b, I_g, V_b = 0V, T = 125^\circ C$

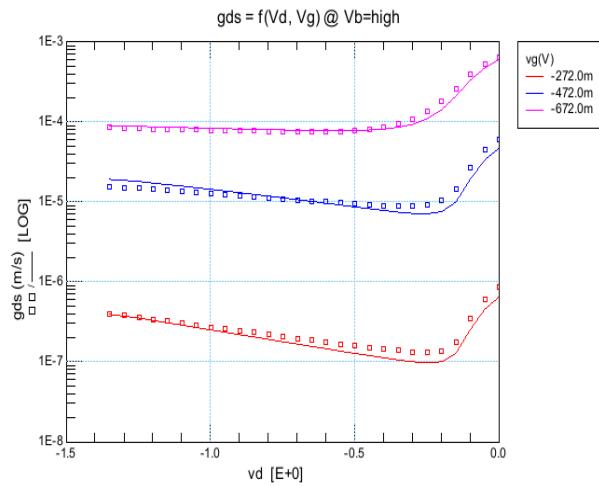
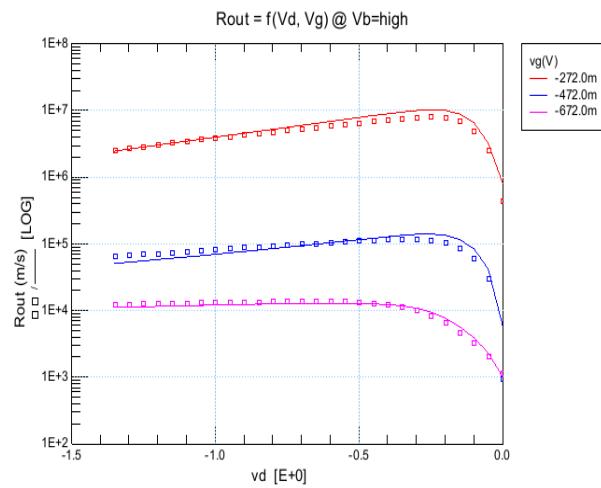
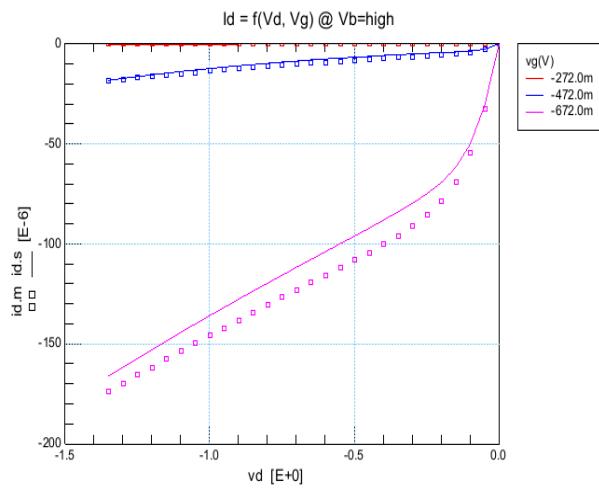


idvg, Ib,Ig, Vb = 1.2V, T = 125°C

idvd, Vb = 0V, T = 125°C


idvd_vbmin, Vb = 1.2V, T = 125°C**idvd_vth, Vb = 0V, T = 125°C**

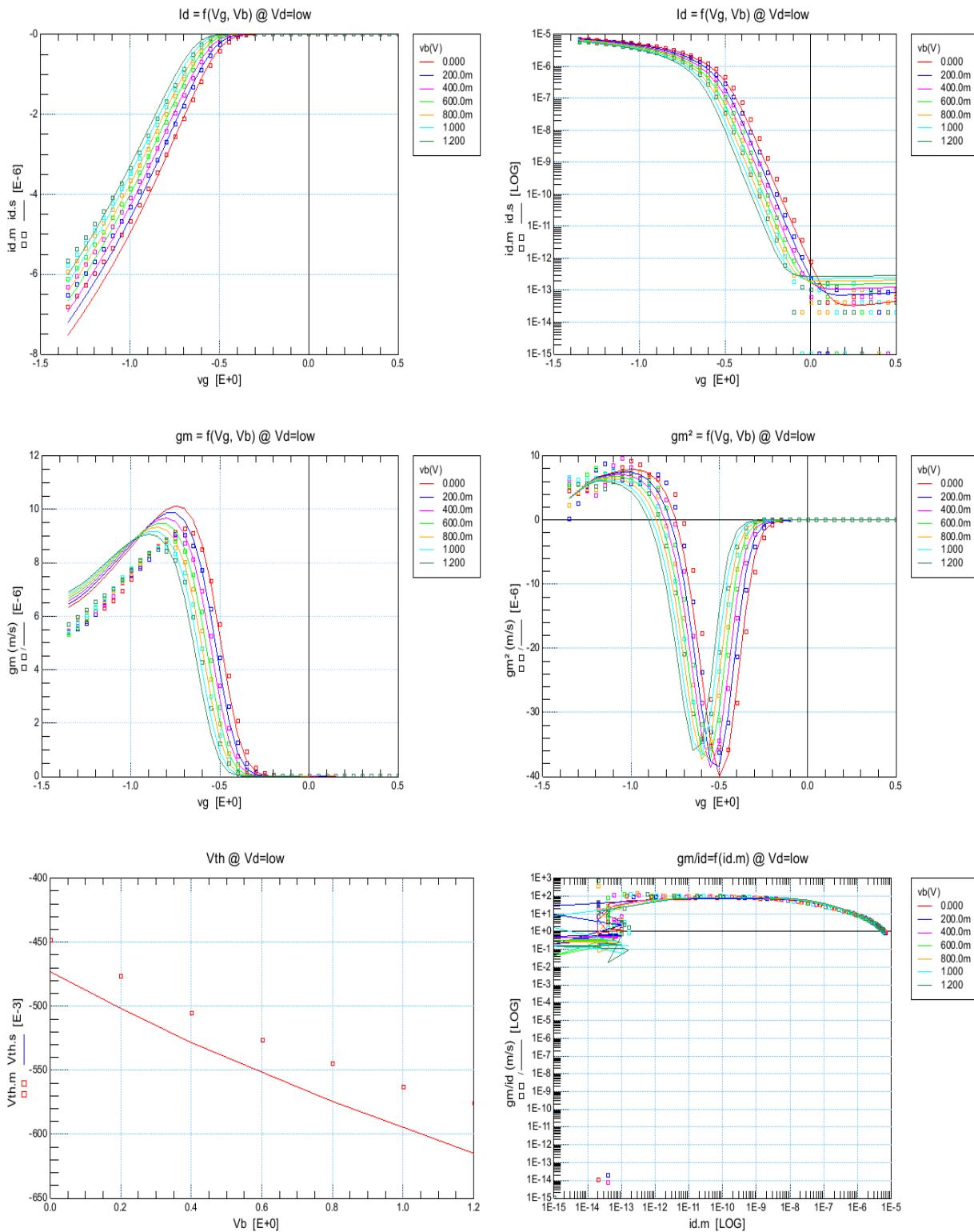


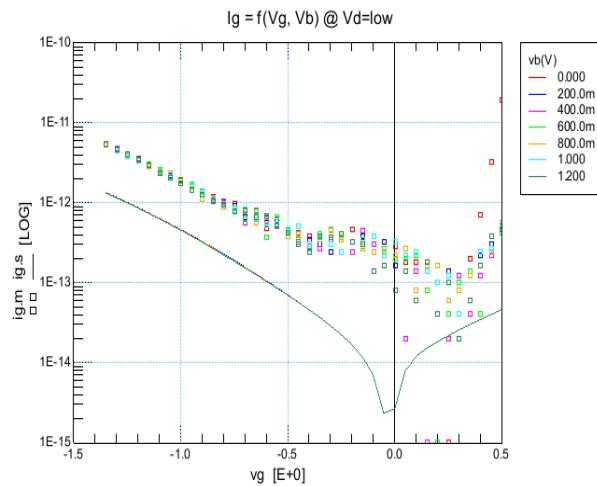
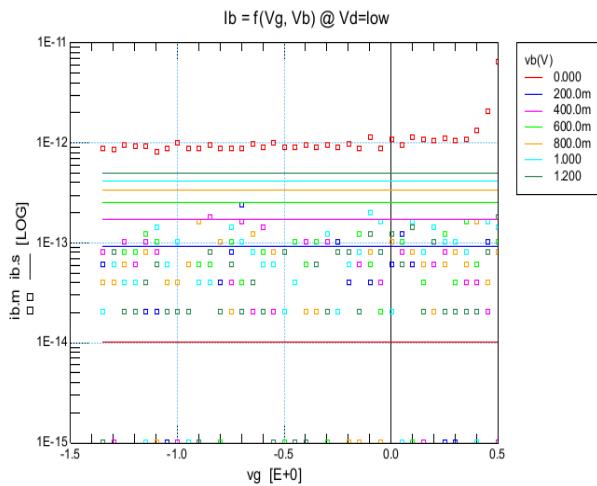
idvd_vth_vbmin, Vb = 1.2V, T = 125°C



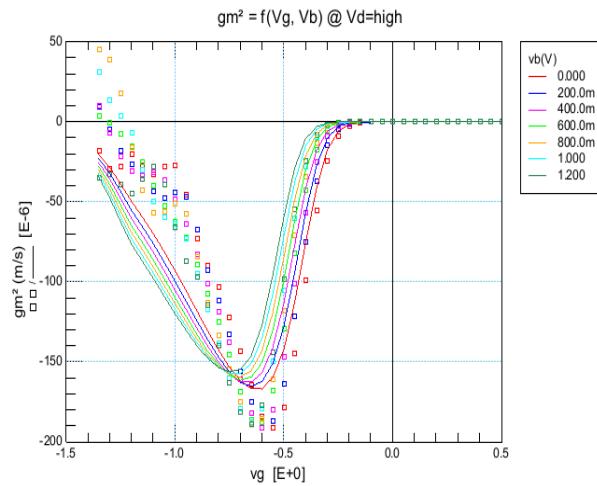
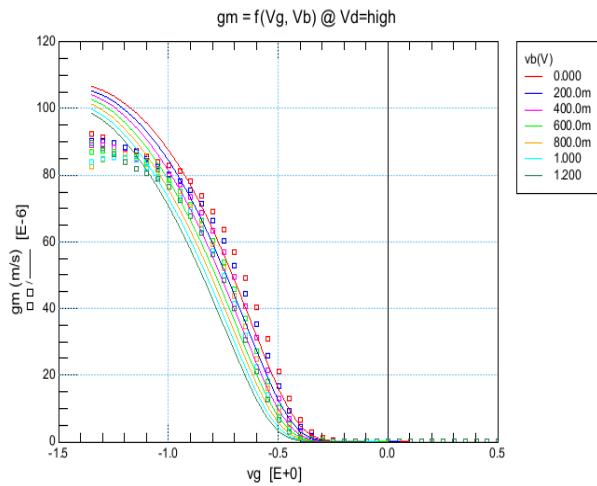
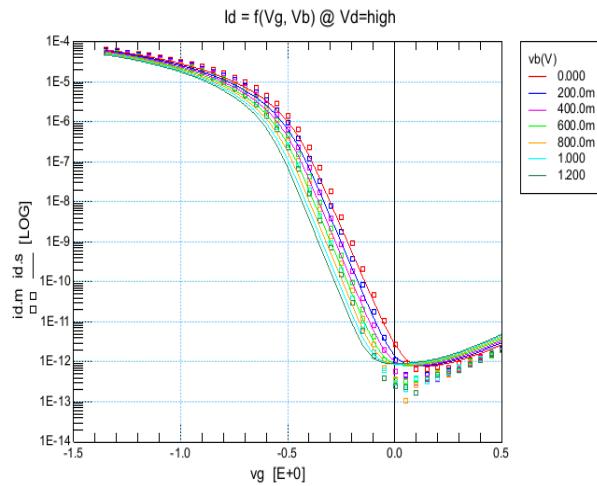
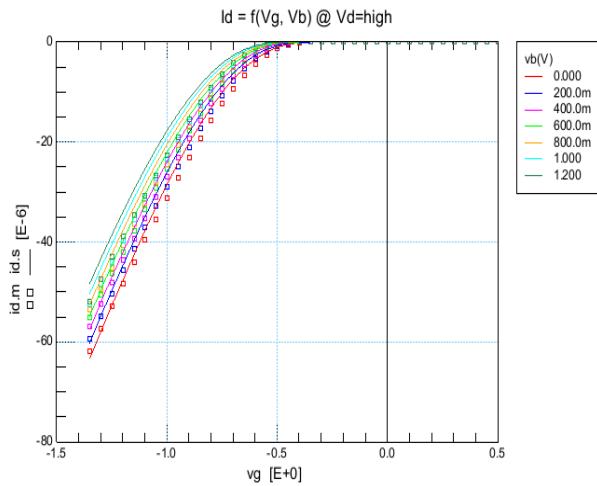
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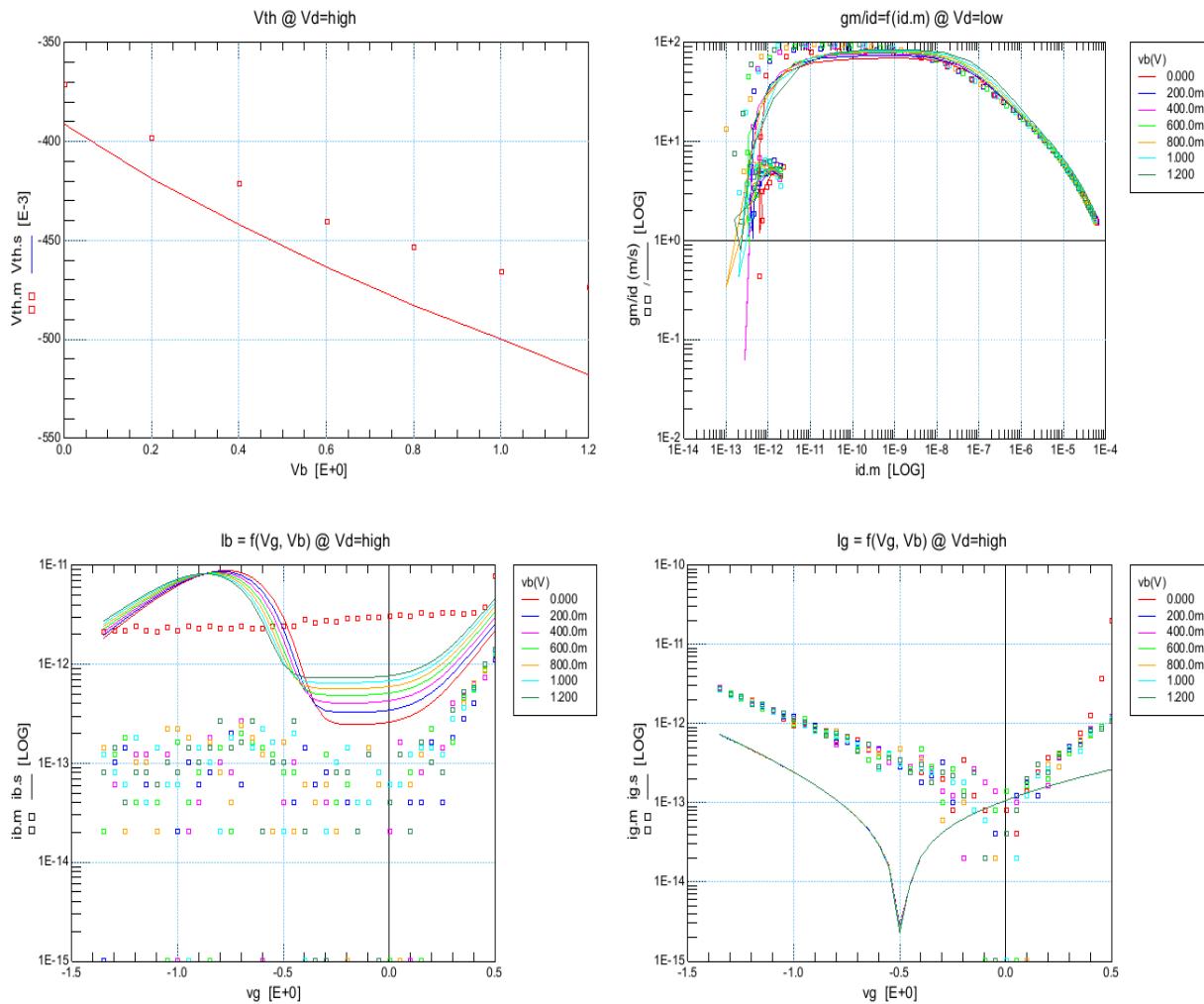
$idvg$, $Vd = -0.05V$, $T = 27^\circ C$



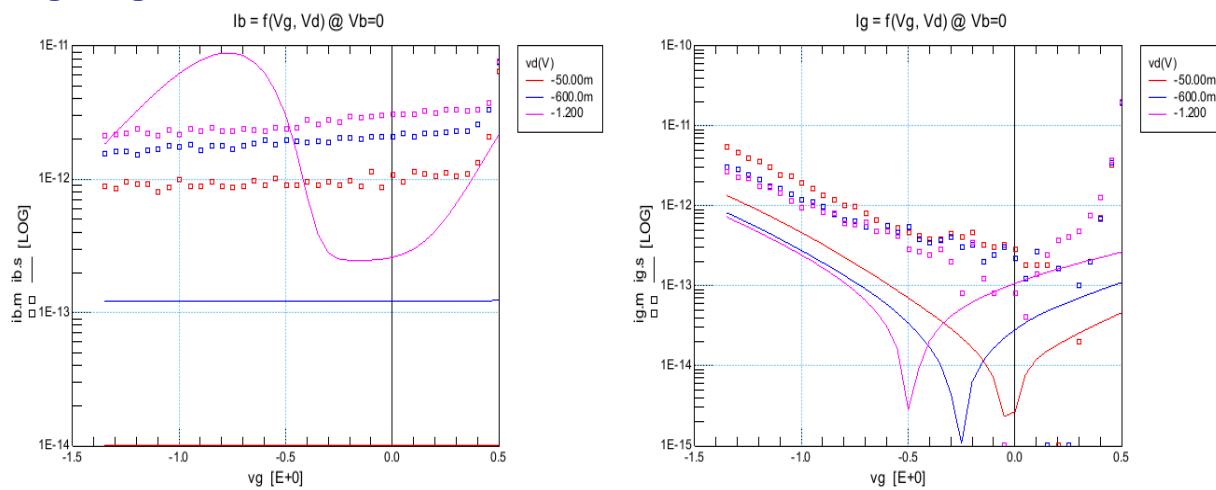


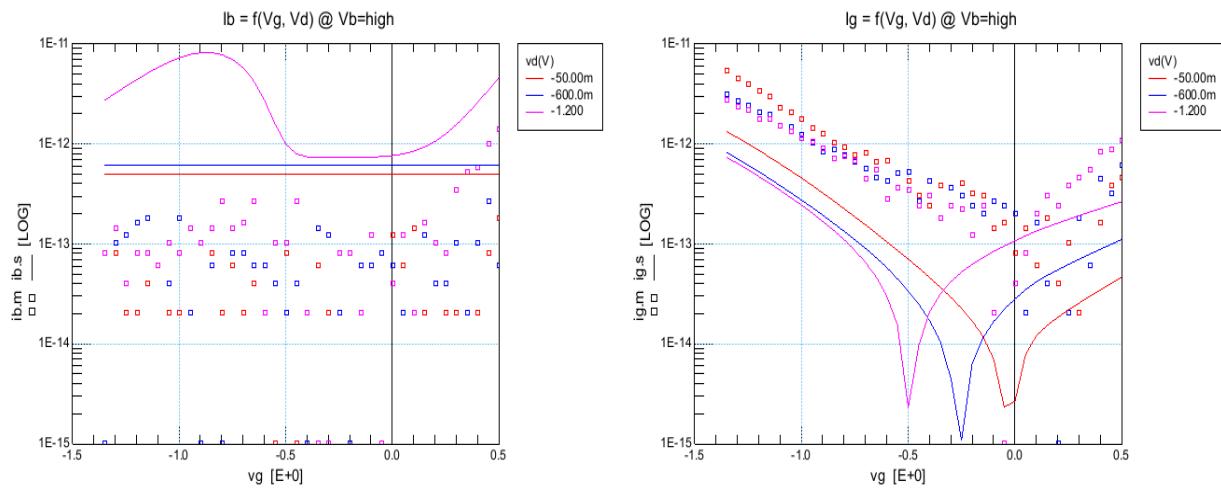
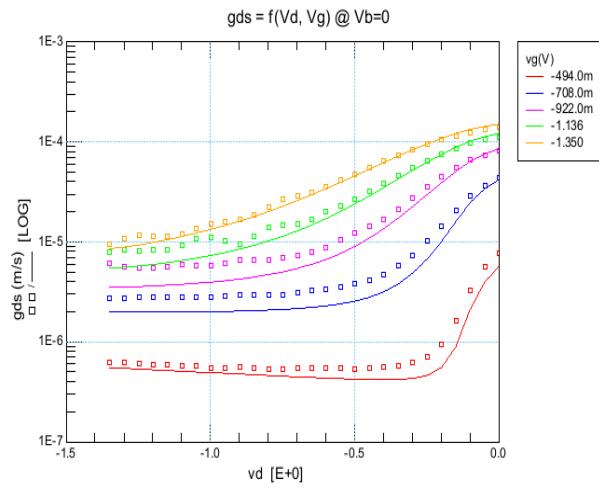
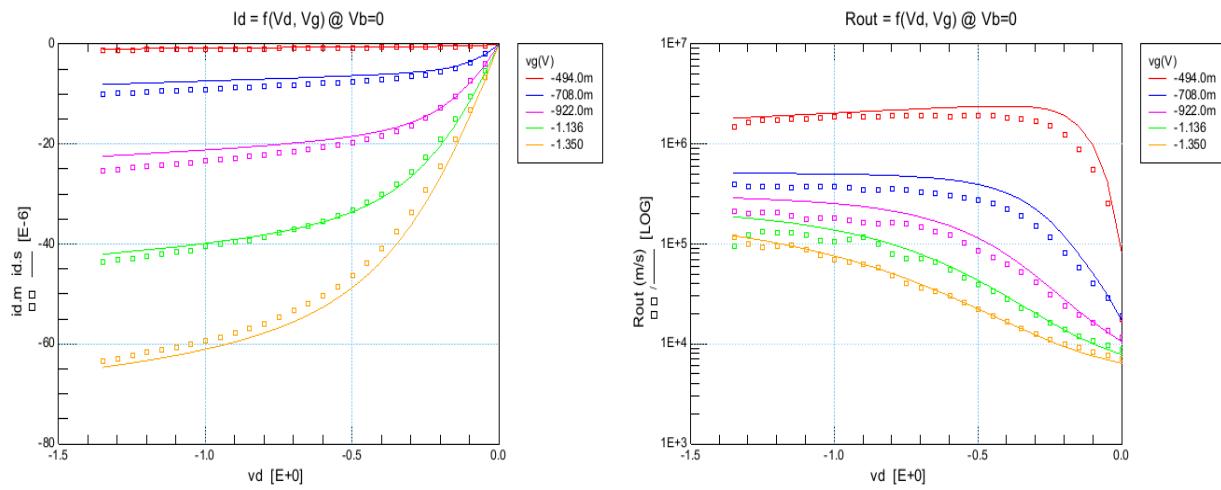
$i_{dvg}, V_d = -1.2V, T = 27^\circ C$

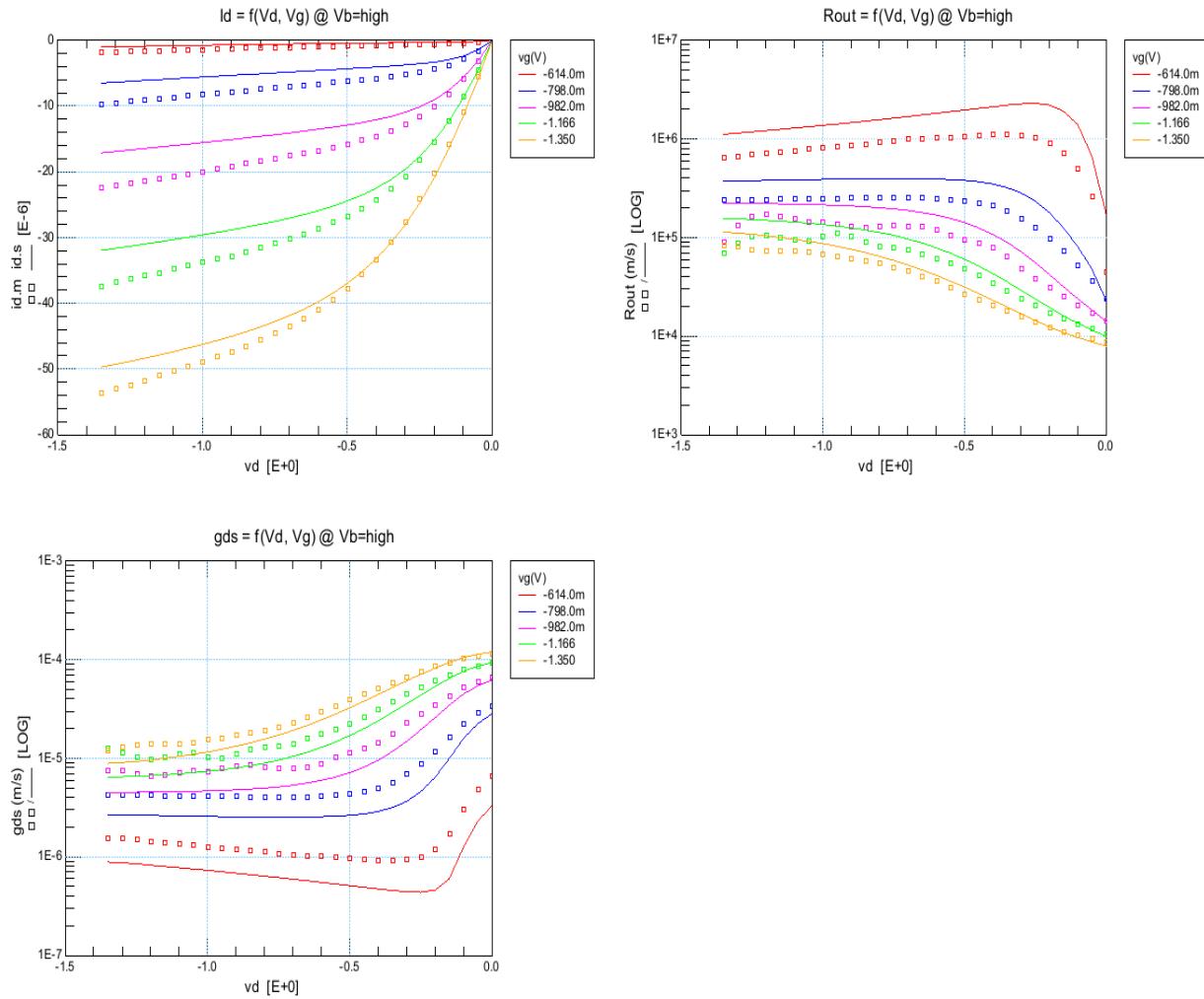
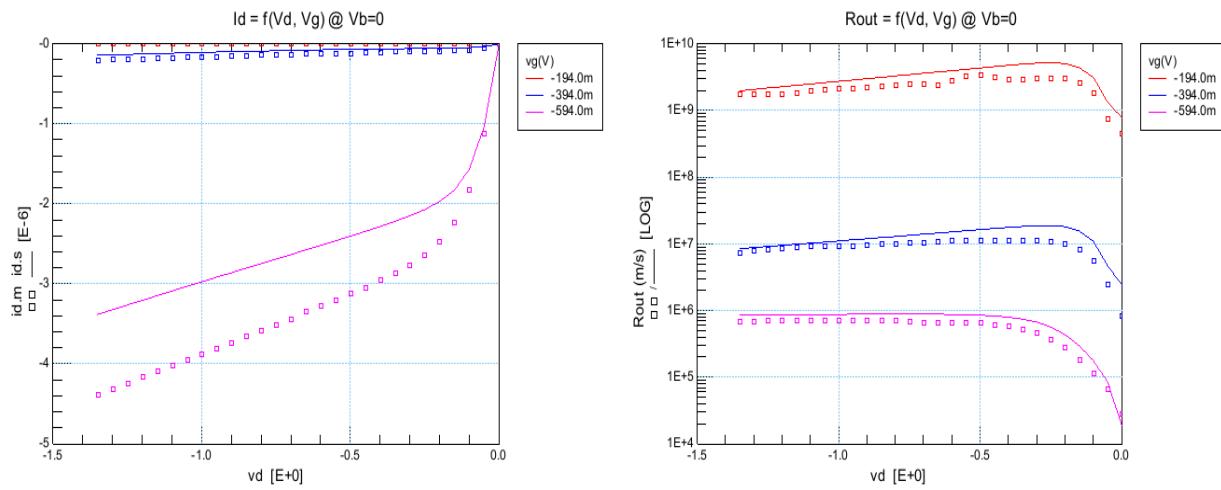


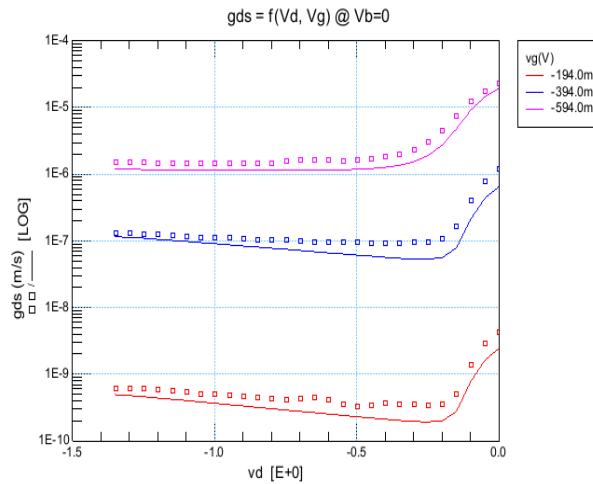


idvg, Ib, Ig, Vb = 0V, T = 27°C

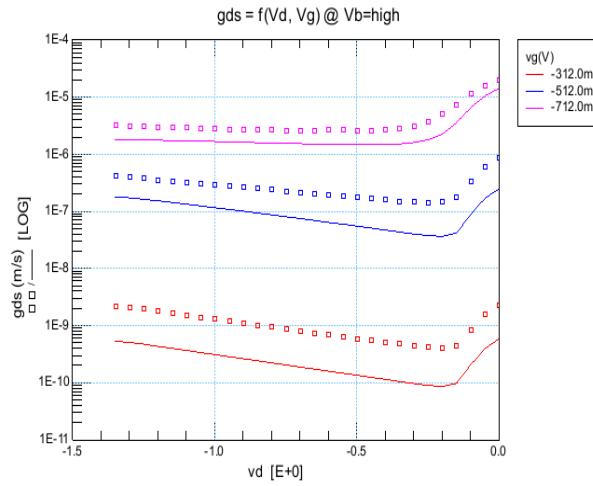
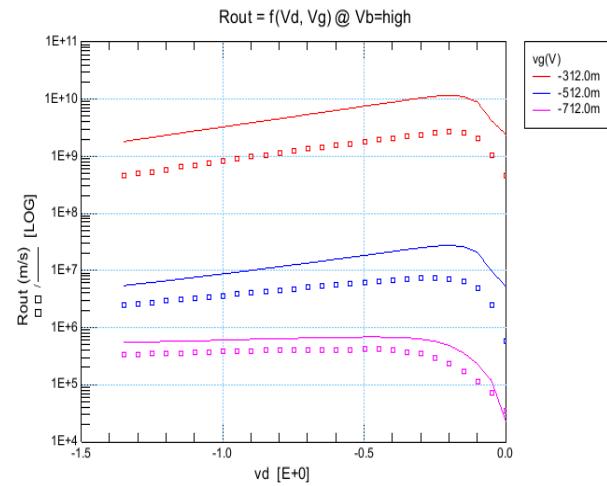
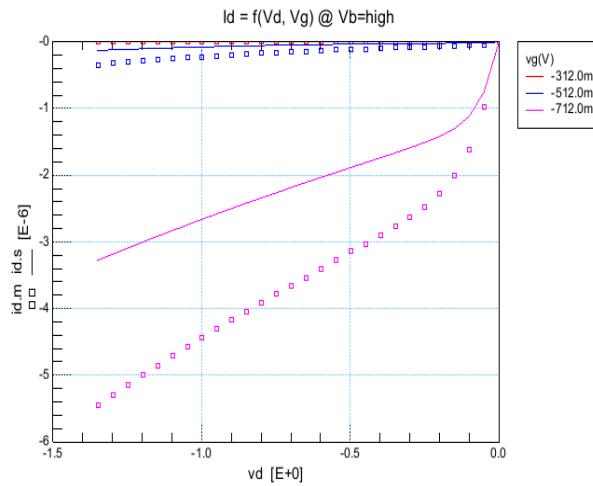


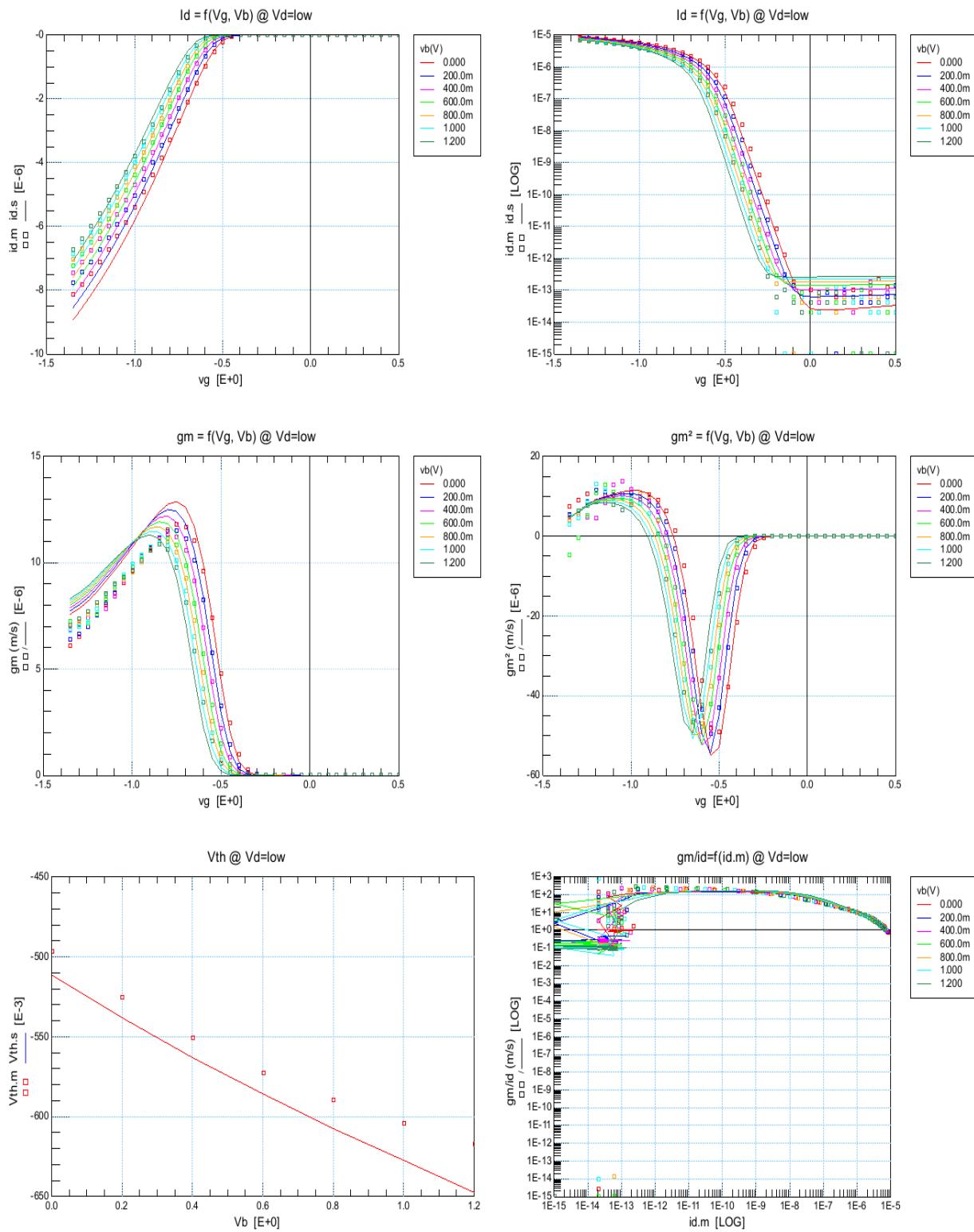
idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


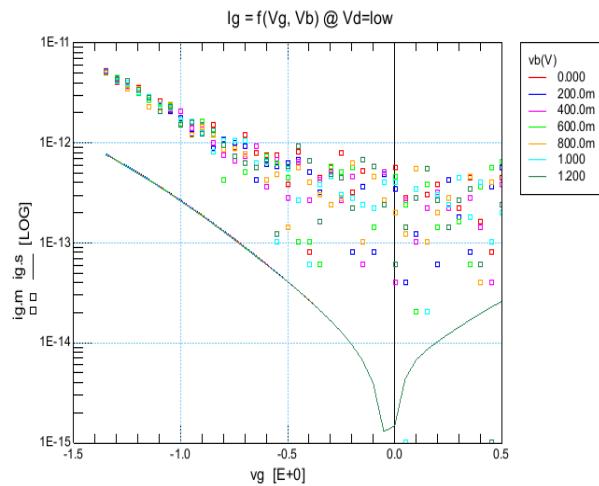
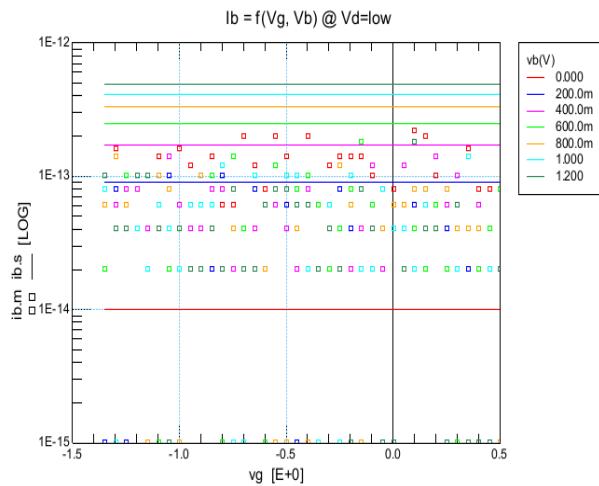
idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C




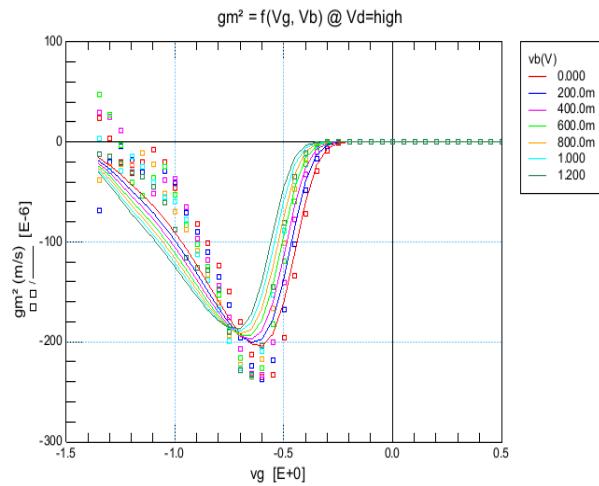
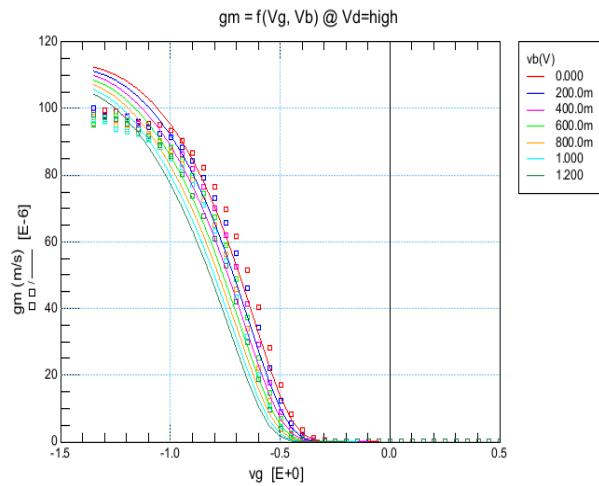
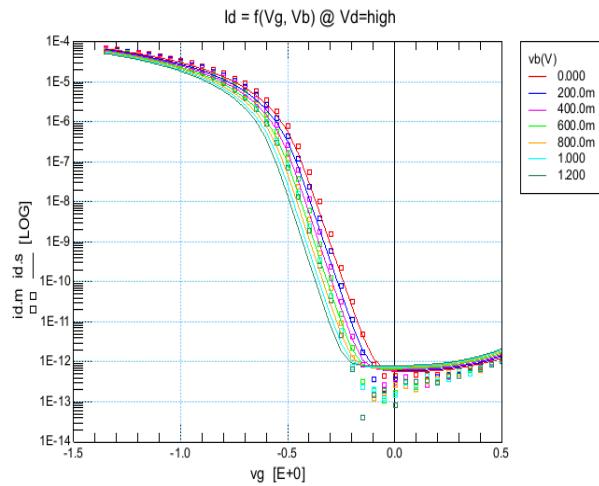
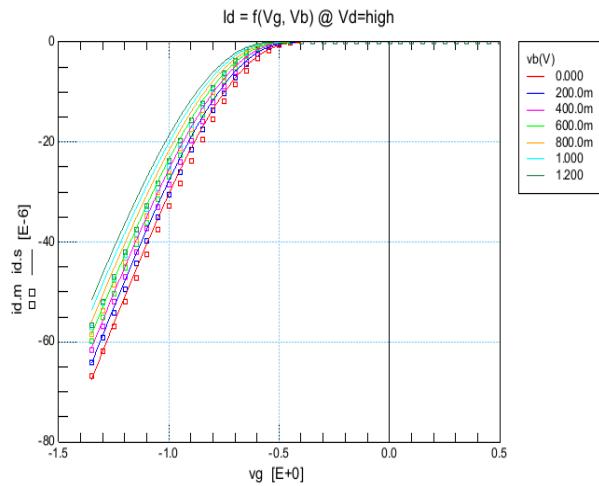
idvd_vth_vbmin, Vb = 1.2V, T = 27°C

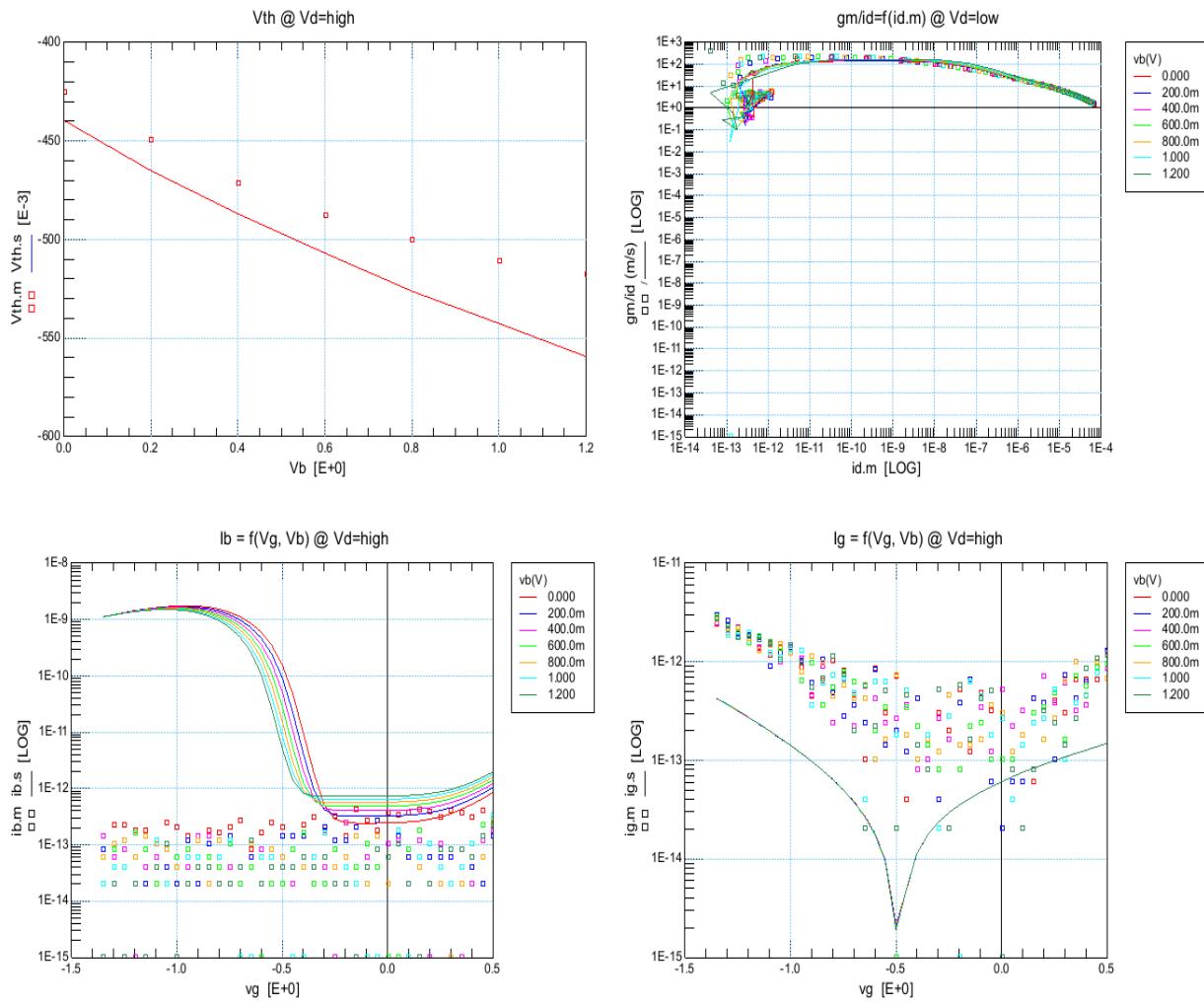


idvg, Vd = -0.05V, T = -40°C


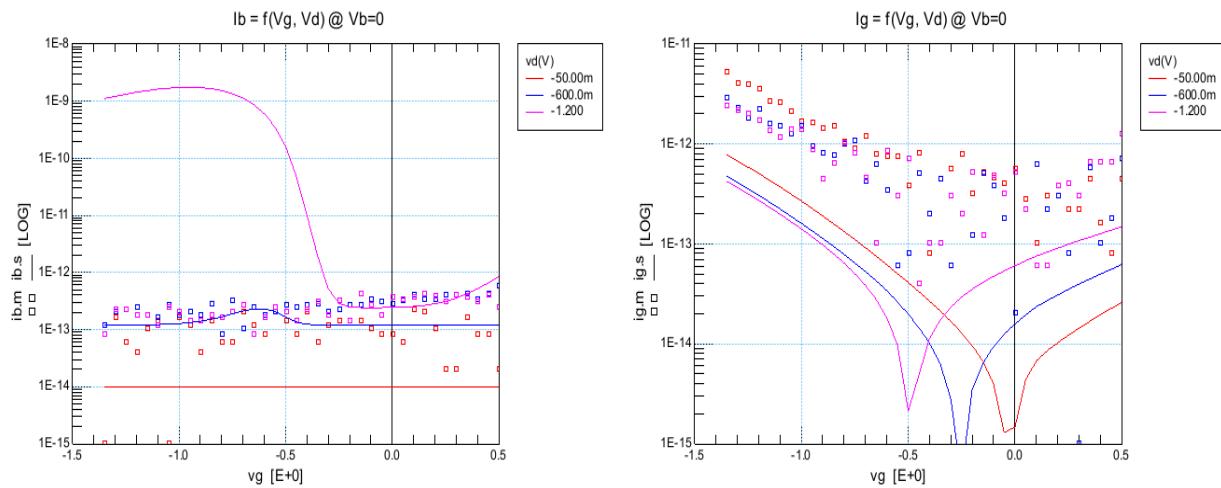


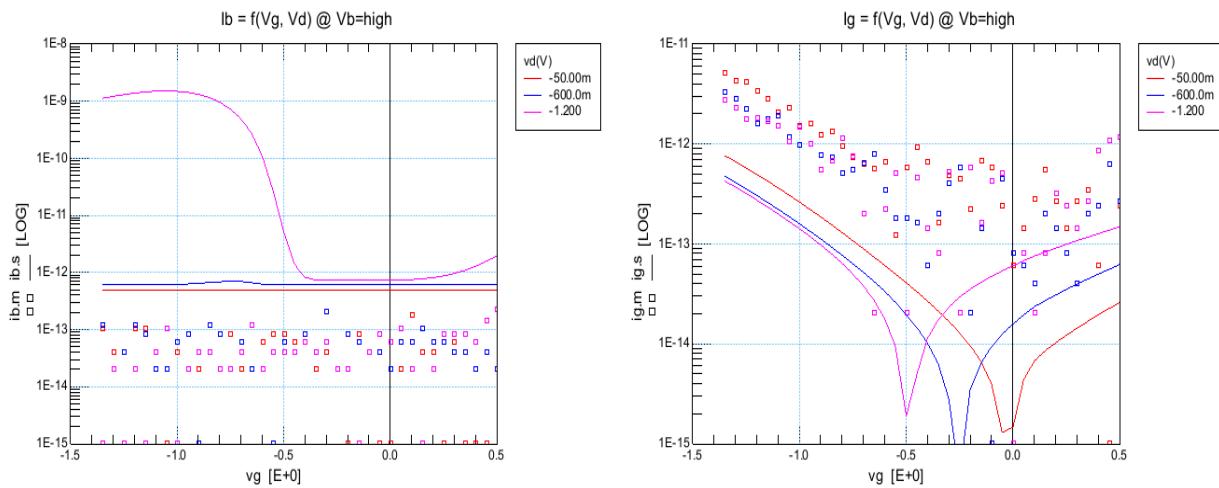
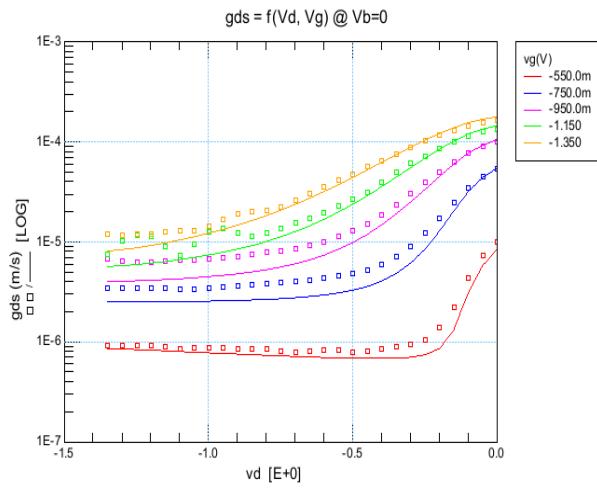
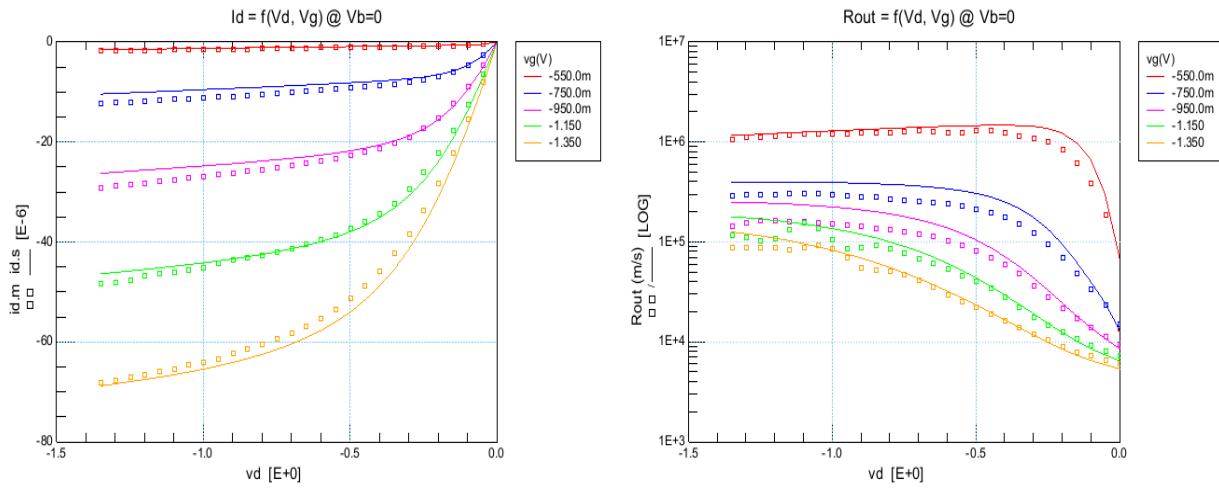
$i_{dvg}, V_d = -1.2V, T = -40^\circ\text{C}$

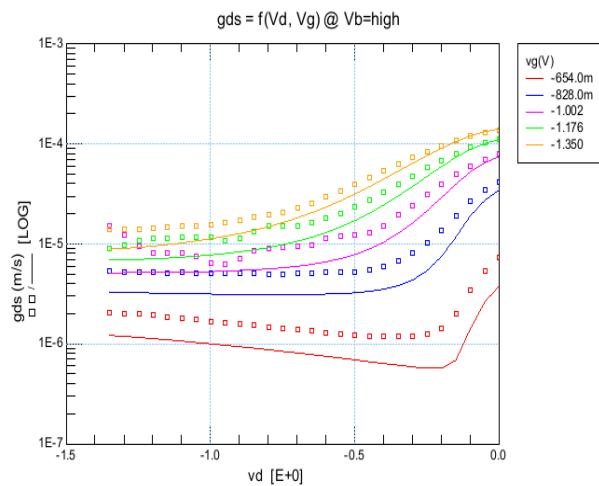
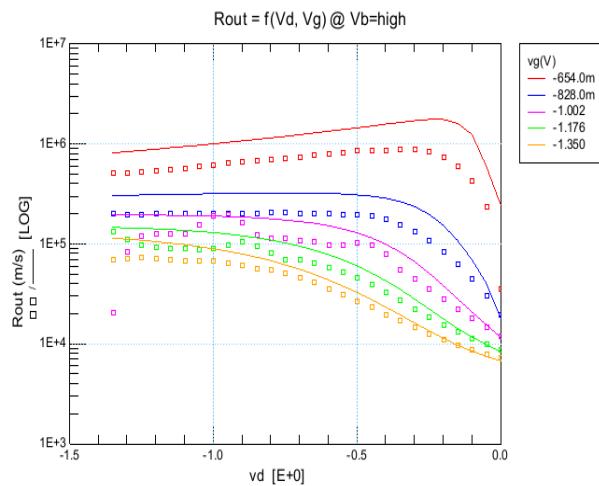
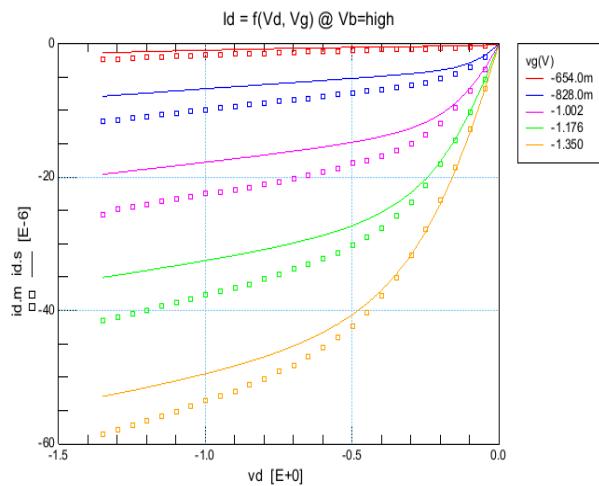
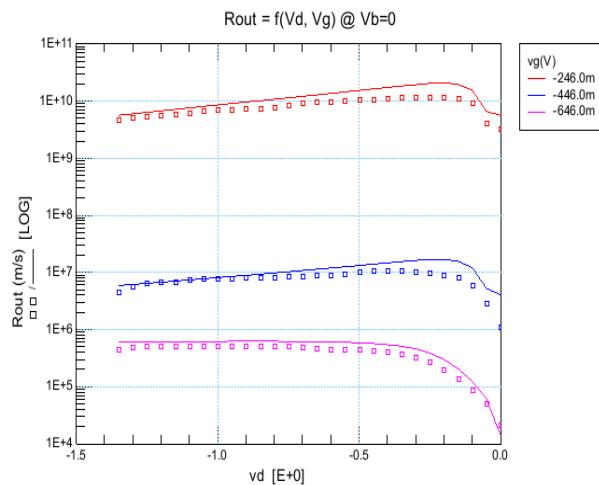
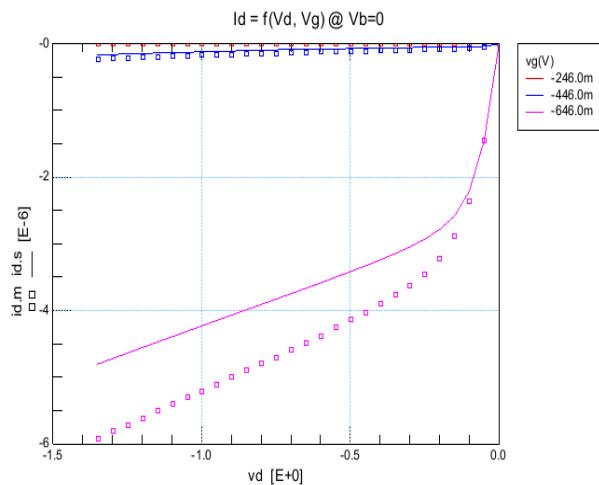


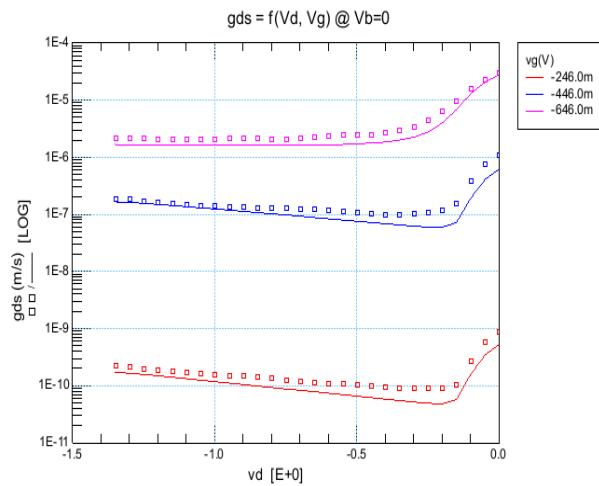


idvg, Ib, Ig, Vb = 0V, T = -40°C

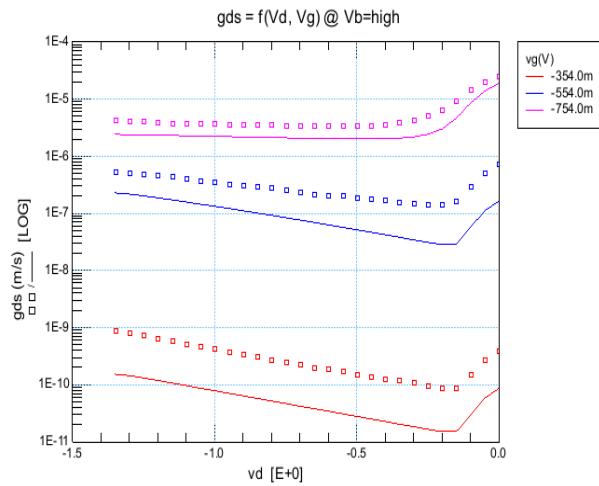
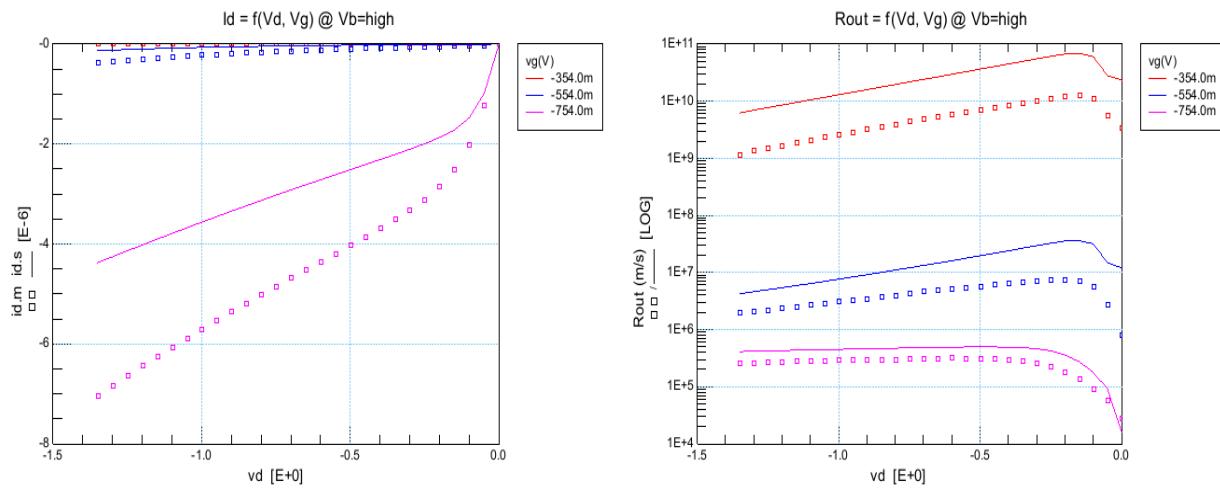


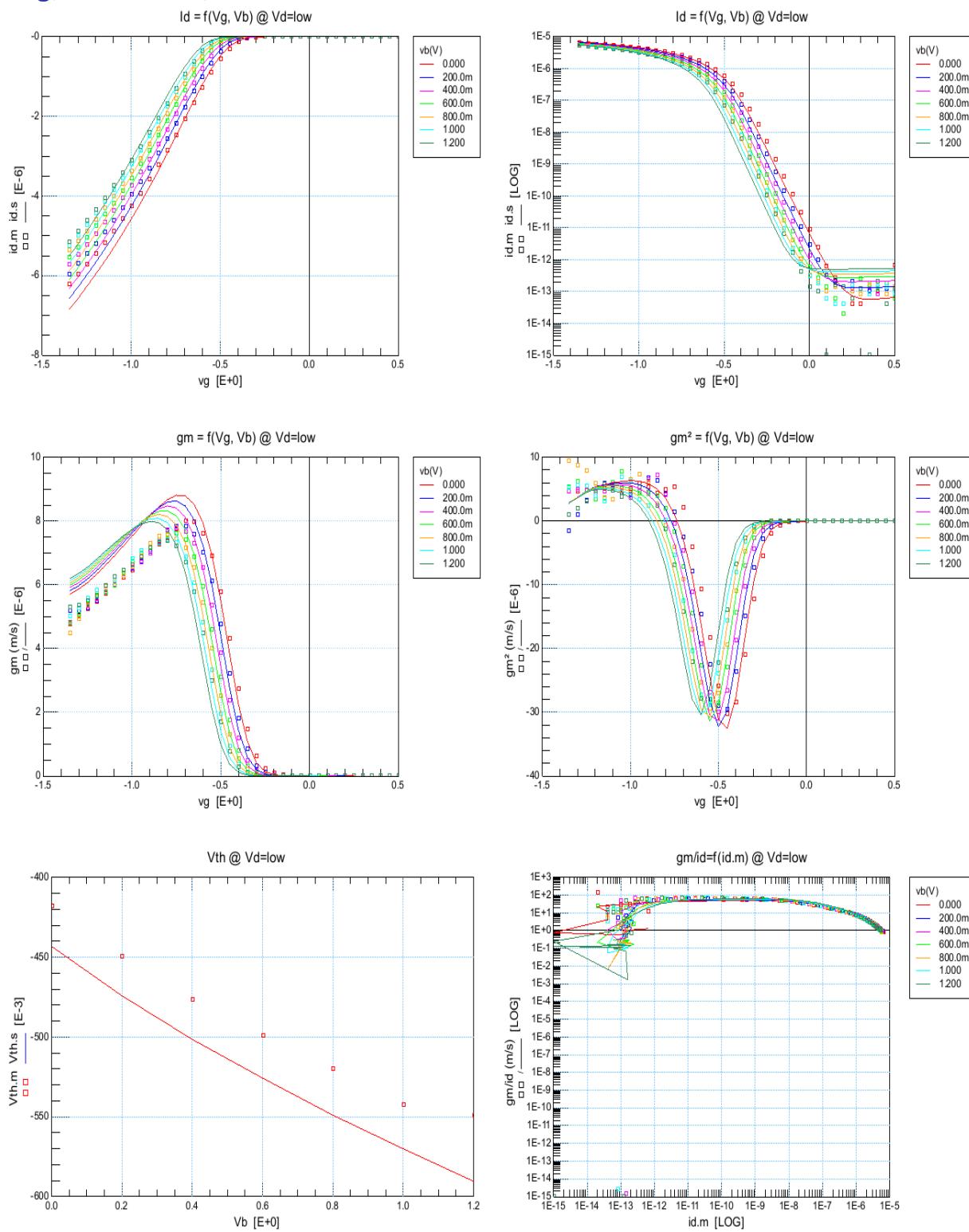
idvg, Ib,Ig, Vb = 1.2V, T = -40°C

idvd, Vb = 0V, T = -40°C


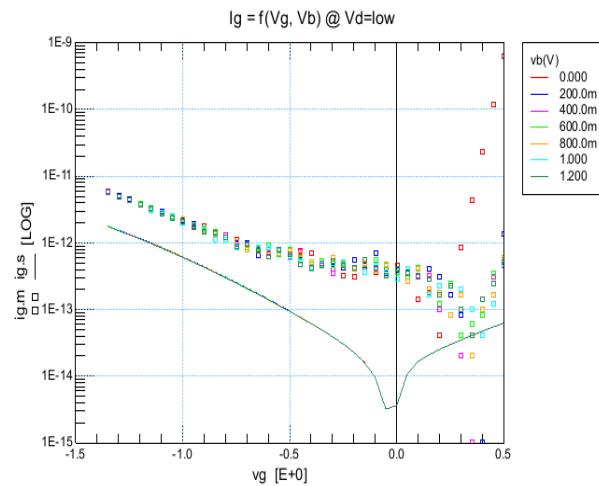
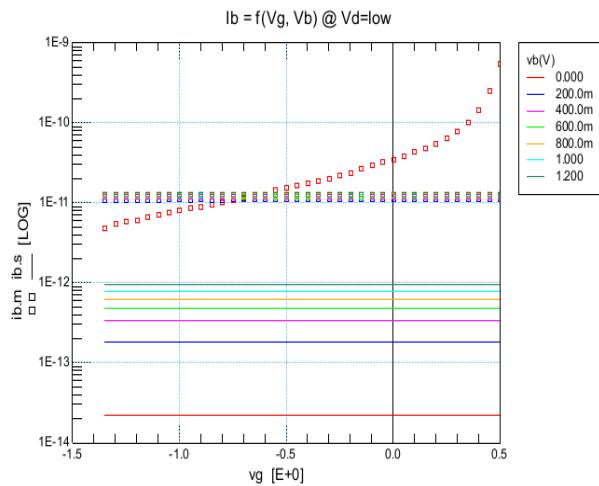
idvd_vbmin, Vb = 1.2V, T = -40°C**idvd_vth, Vb = 0V, T = -40°C**



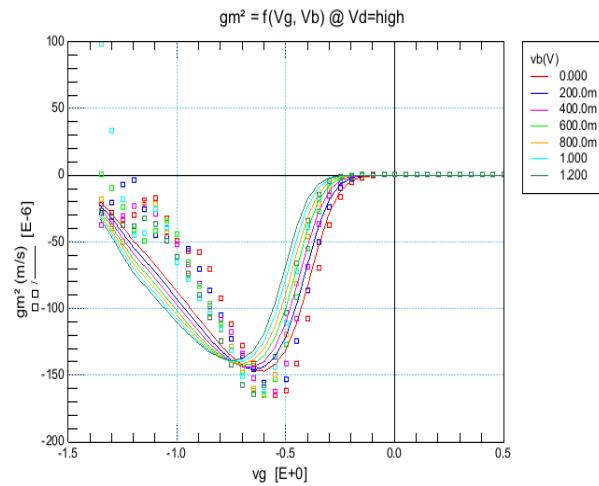
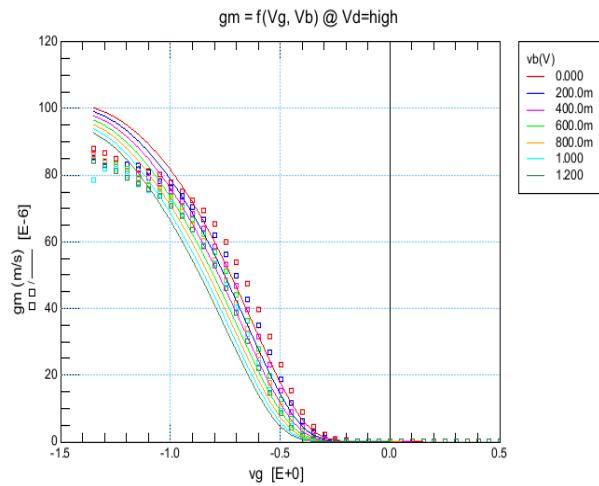
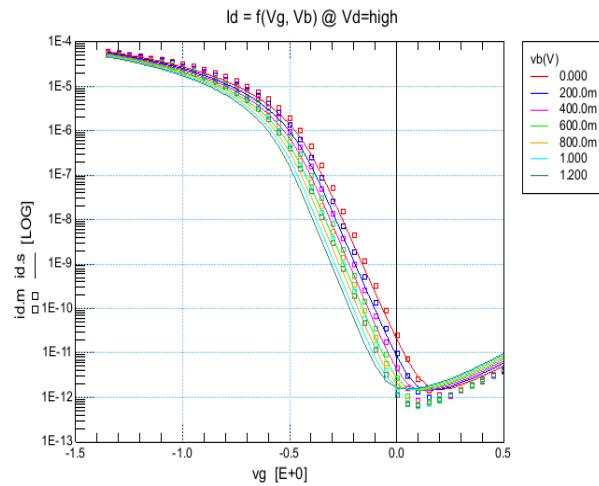
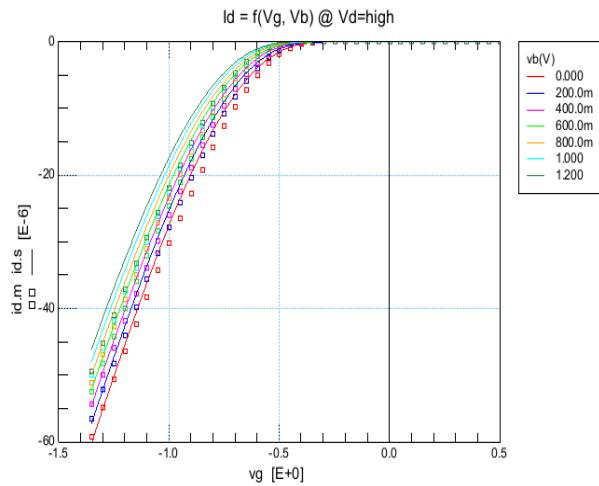
idvd_vth_vbmin, Vb = 1.2V, T = -40°C

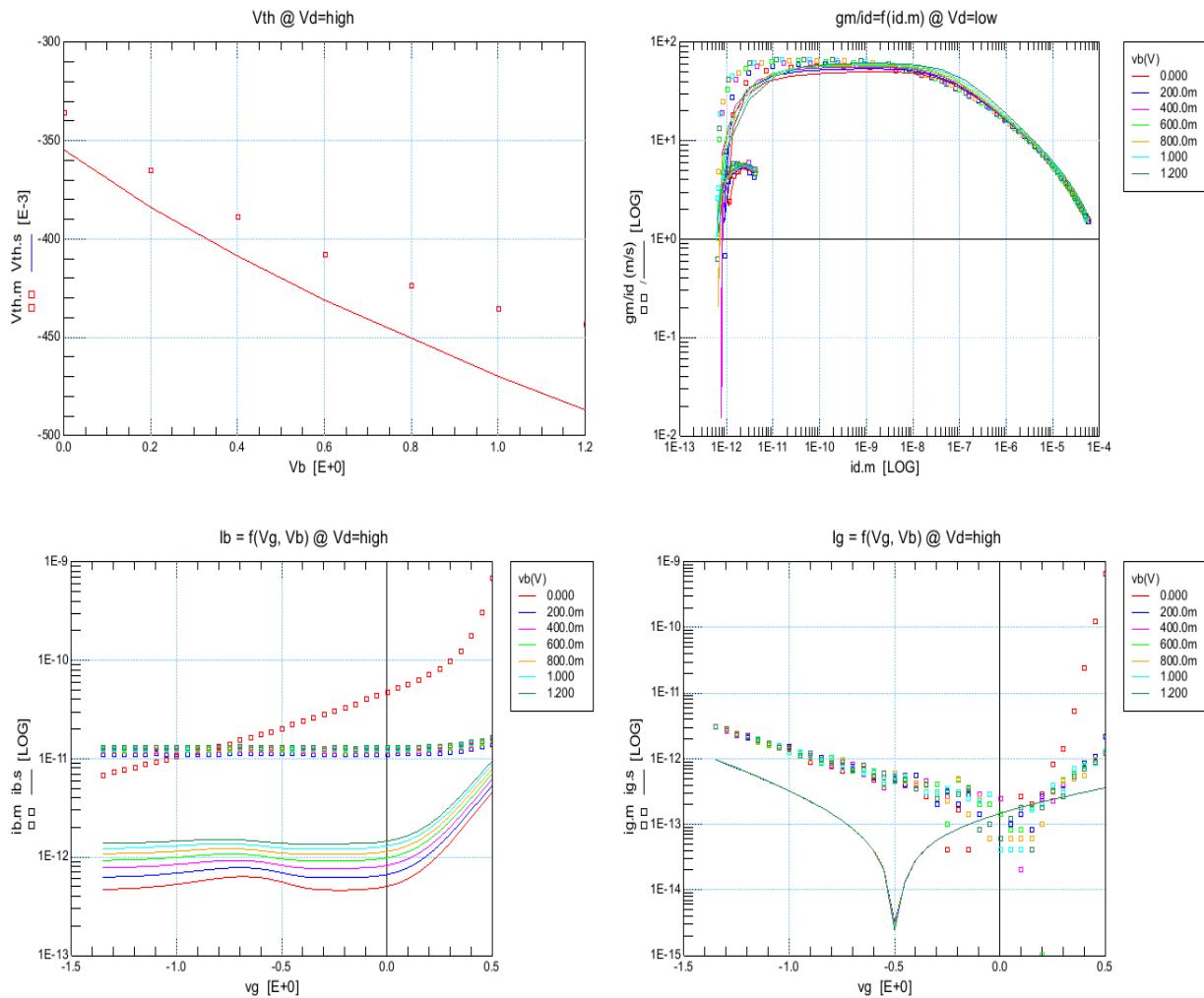


idvg, Vd = -0.05V, T = 70°C


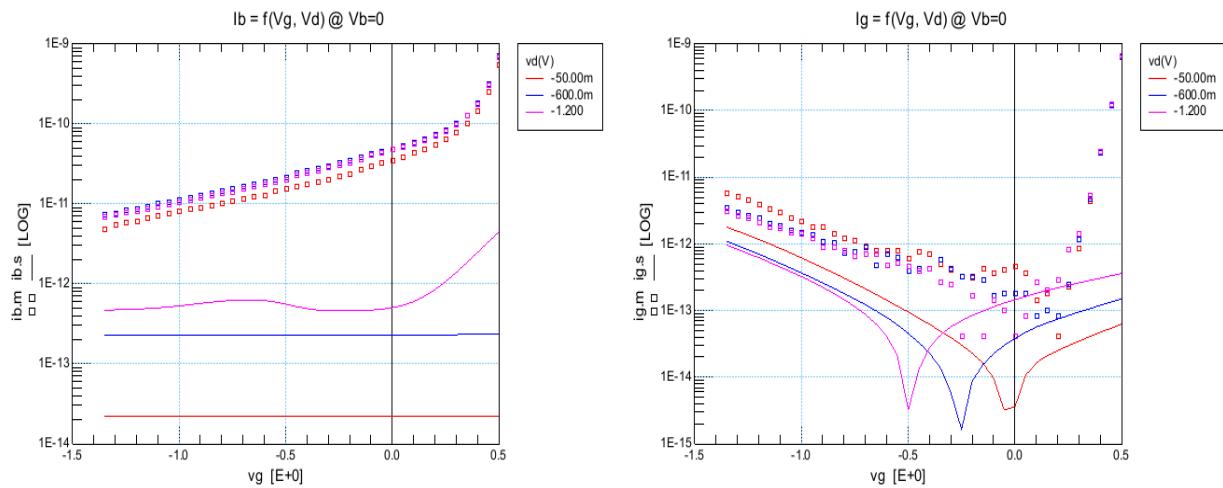


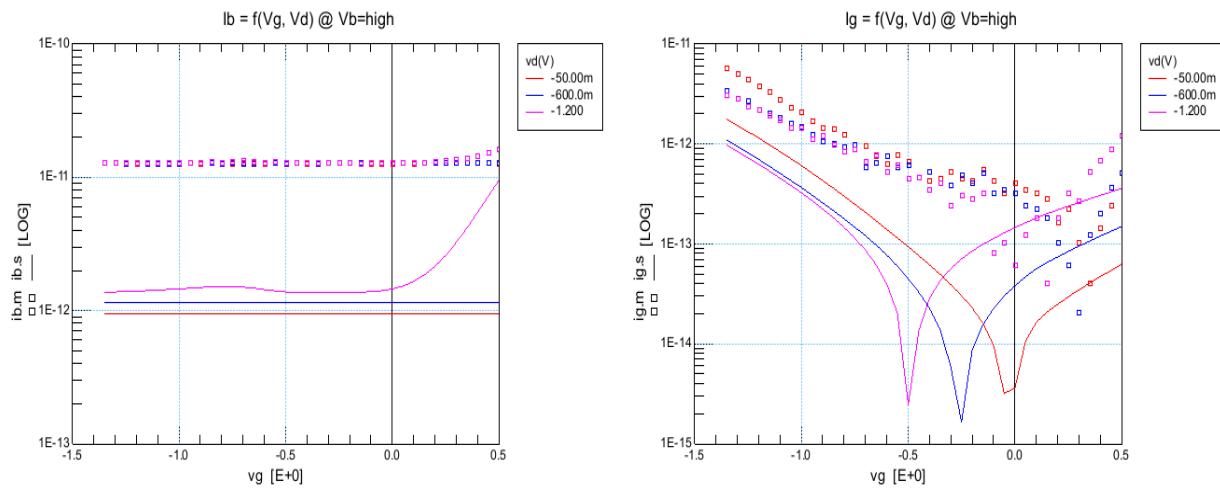
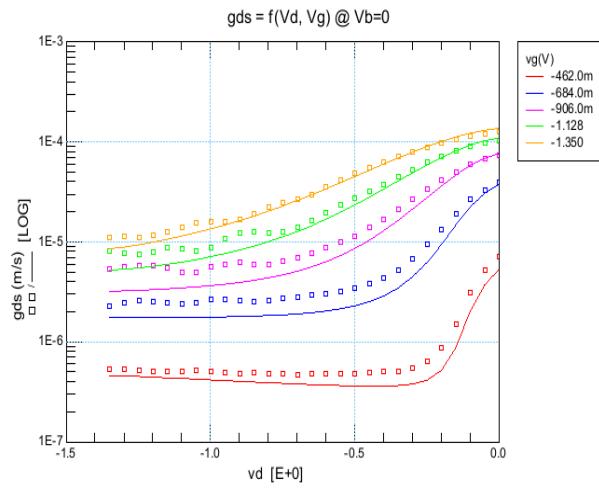
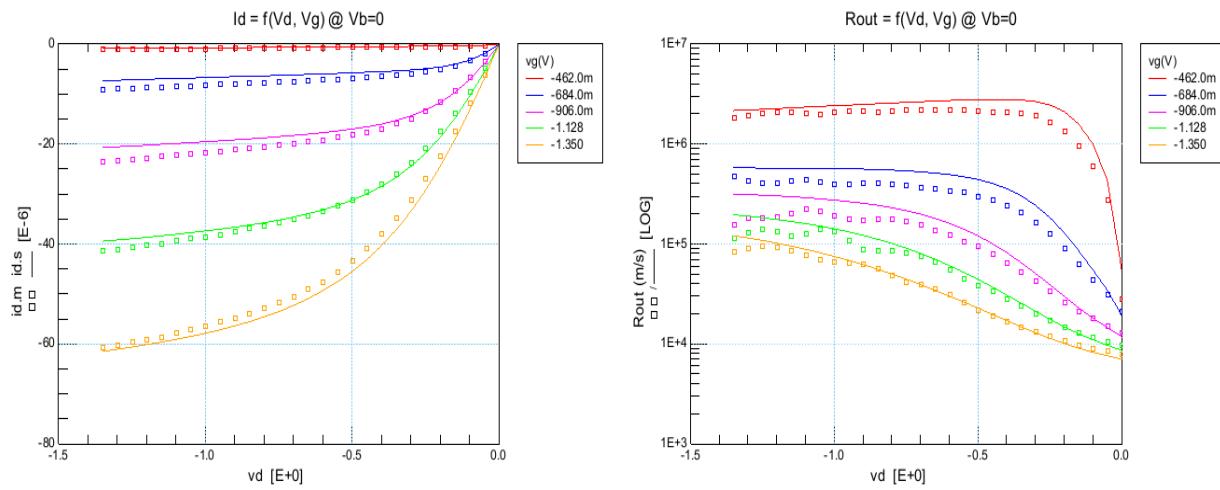
$i_{dvg}, V_d = -1.2V, T = 70^\circ\text{C}$

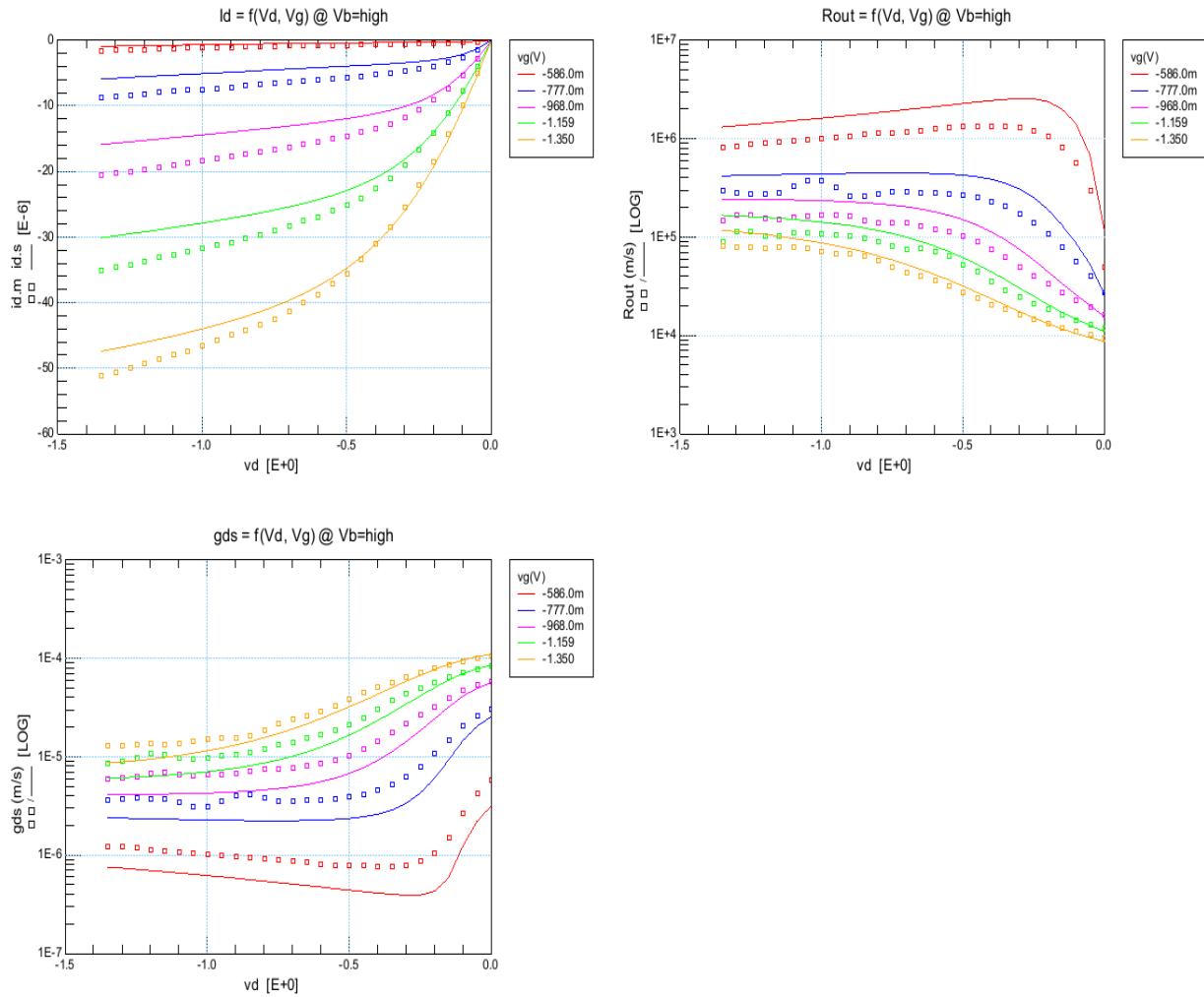
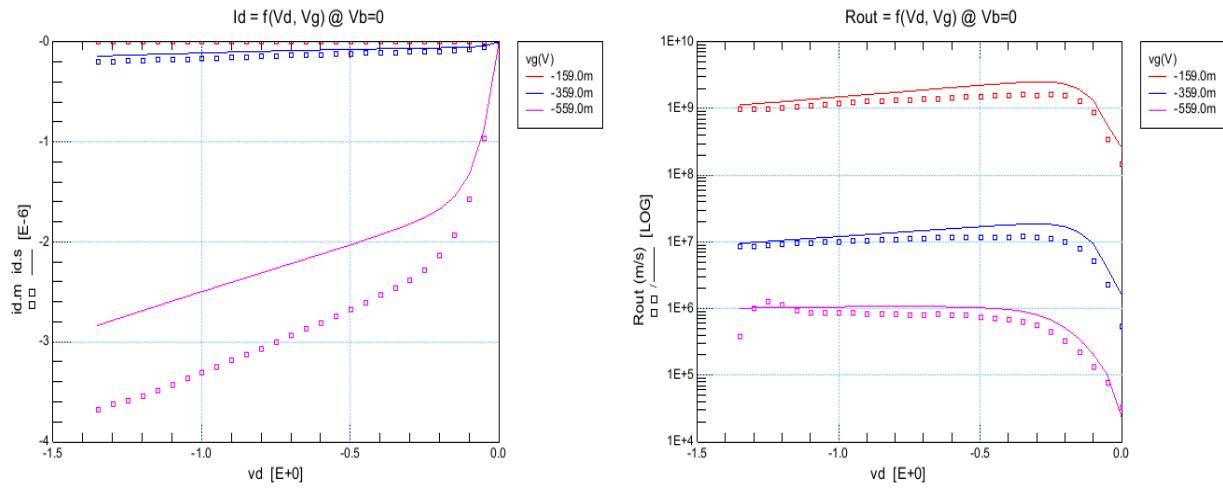


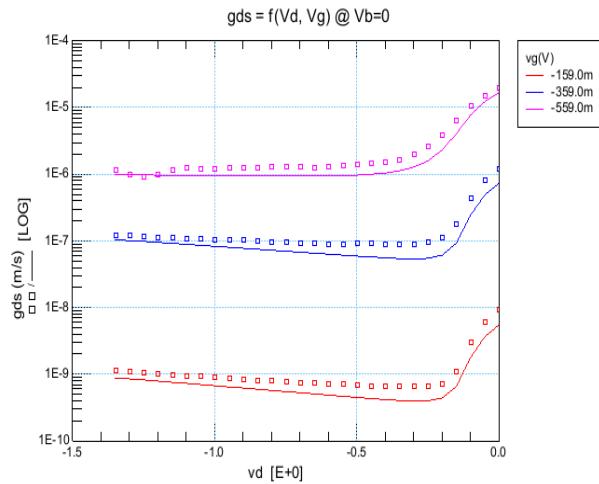


idvg, Ib,Ig, Vb = 0V, T = 70°C

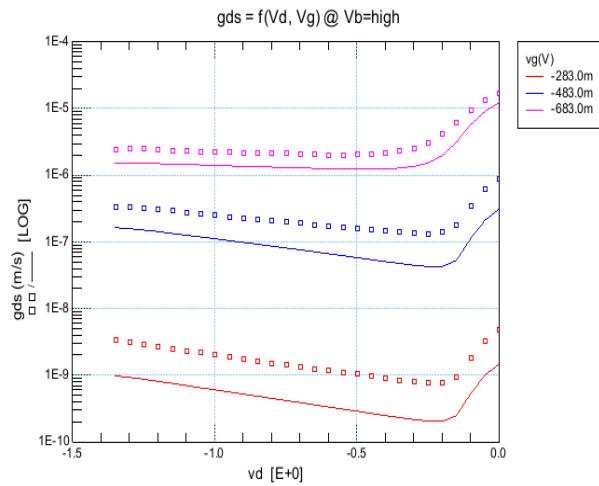
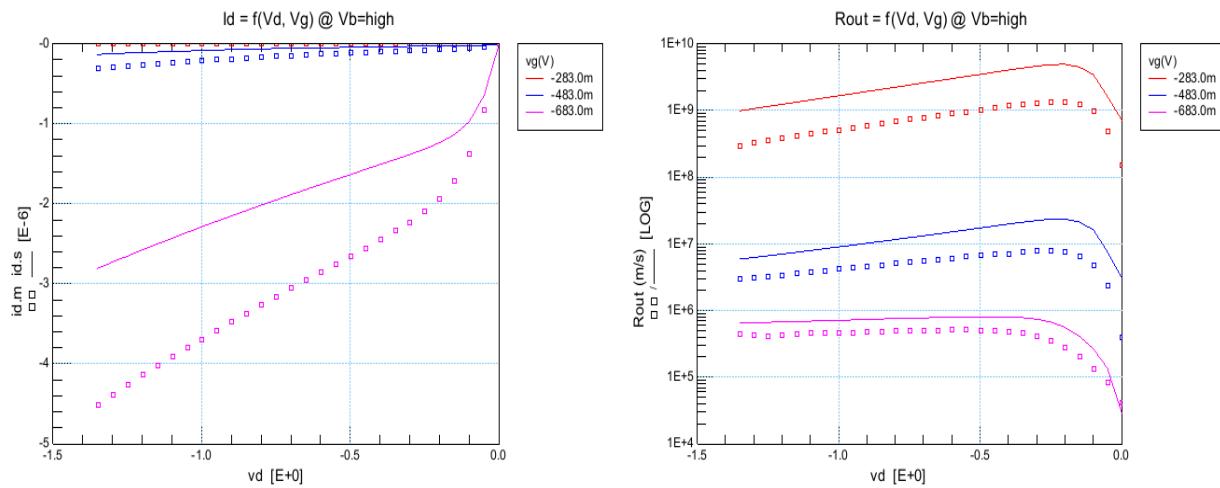


idvg, Ib,Ig, Vb = 1.2V, T = 70°C

idvd, Vb = 0V, T = 70°C


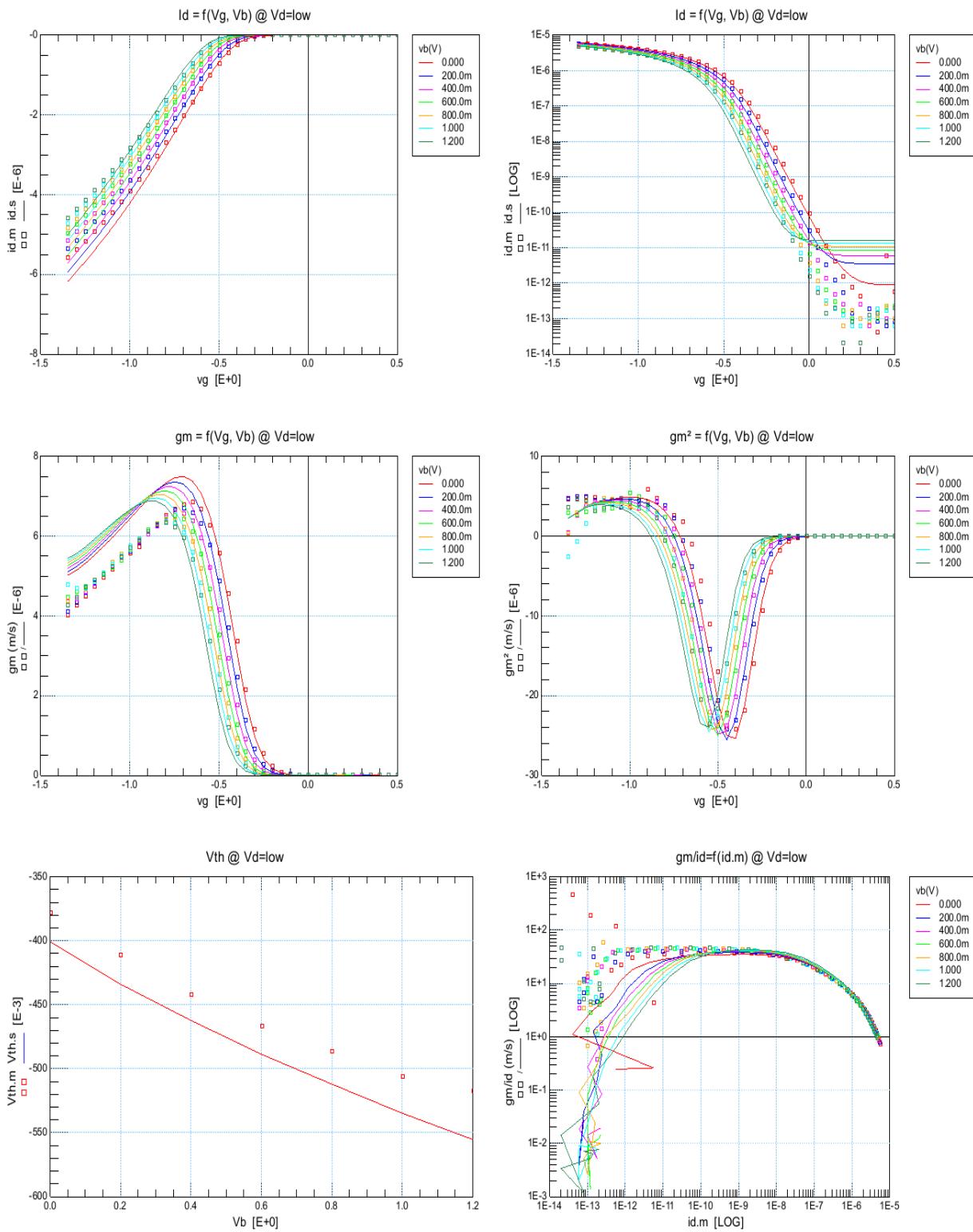
idvd_vbmin, Vb = 1.2V, T = 70°C

idvd_vth, Vb = 0V, T = 70°C


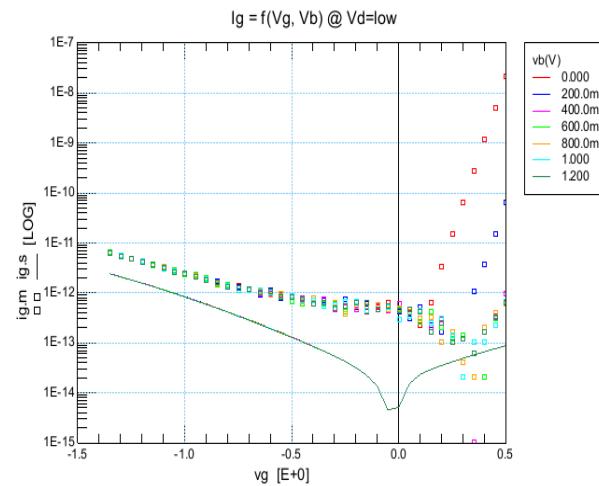
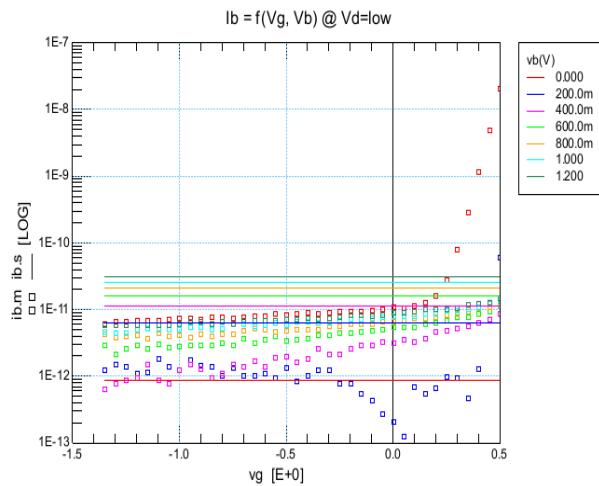


idvd_vth_vbmin, Vb = 1.2V, T = 70°C

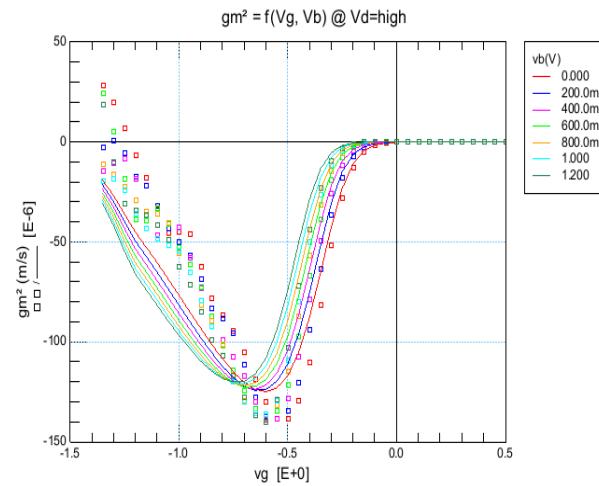
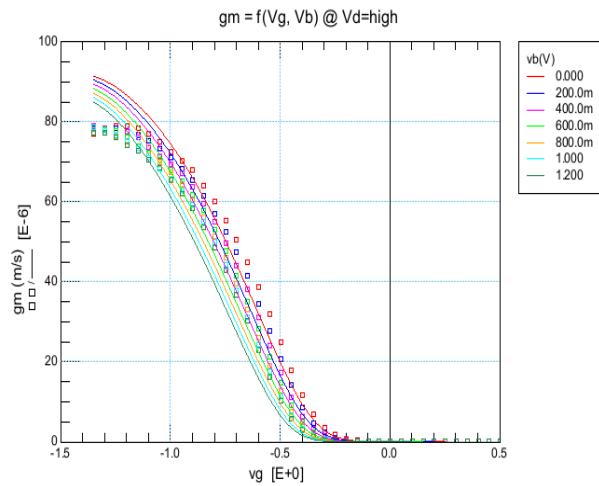
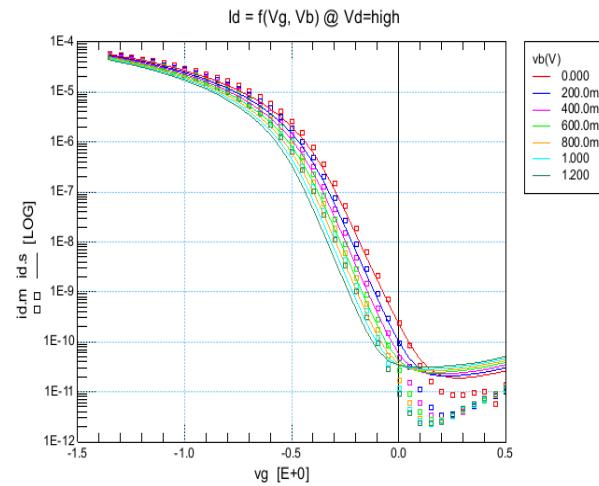
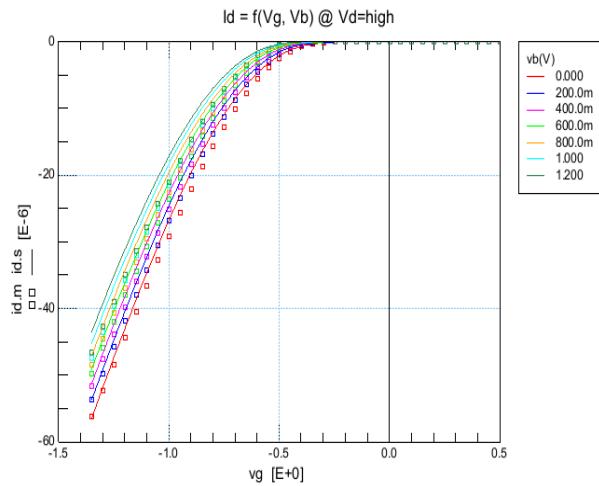


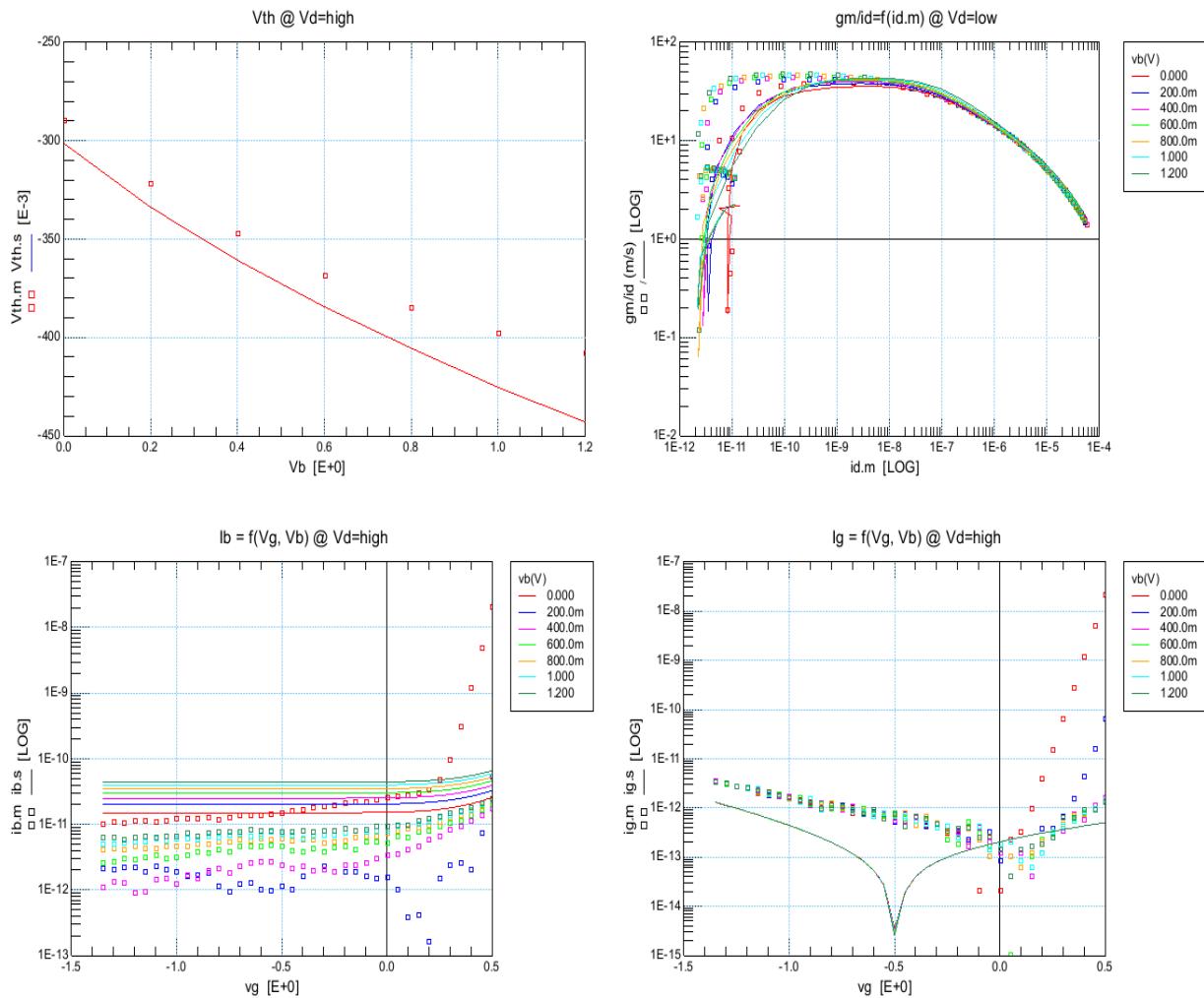
idvg, Vd = -0.05V, T = 125°C



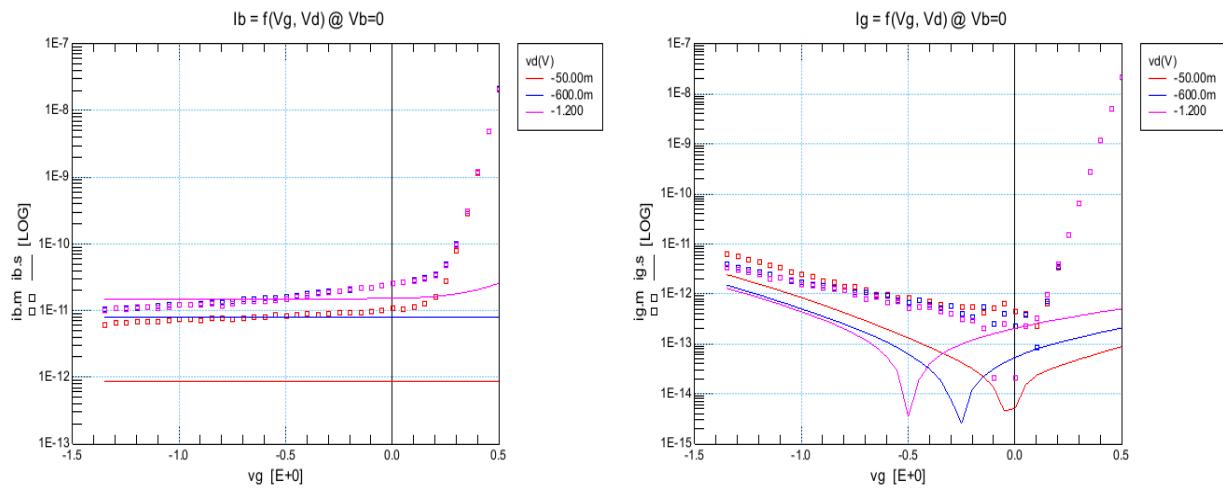


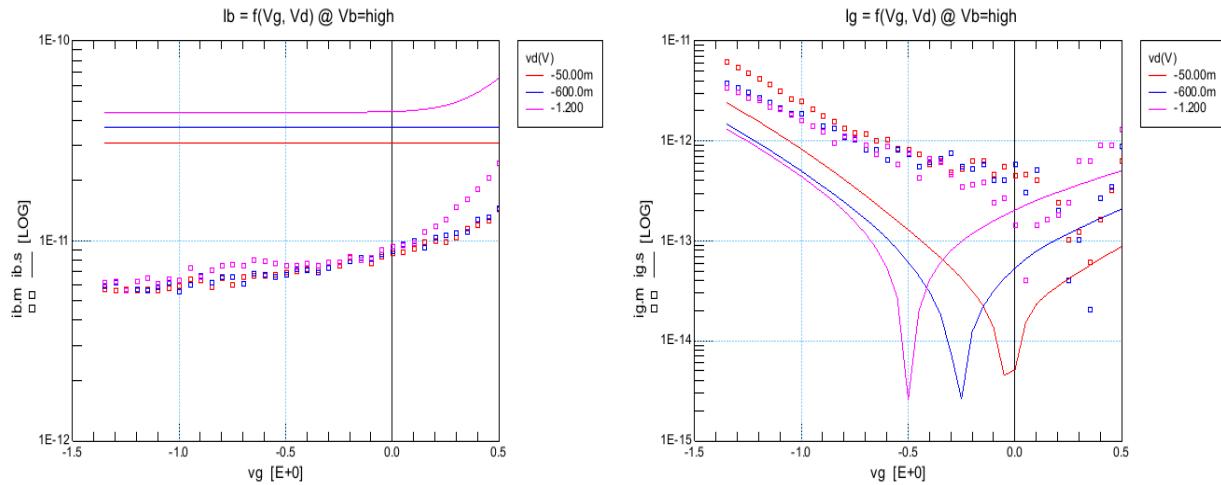
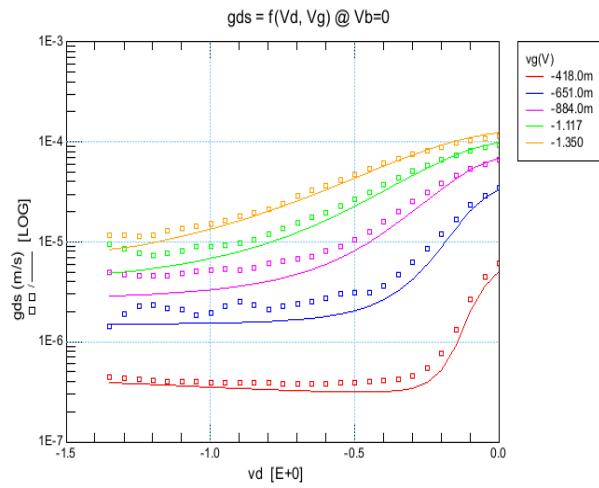
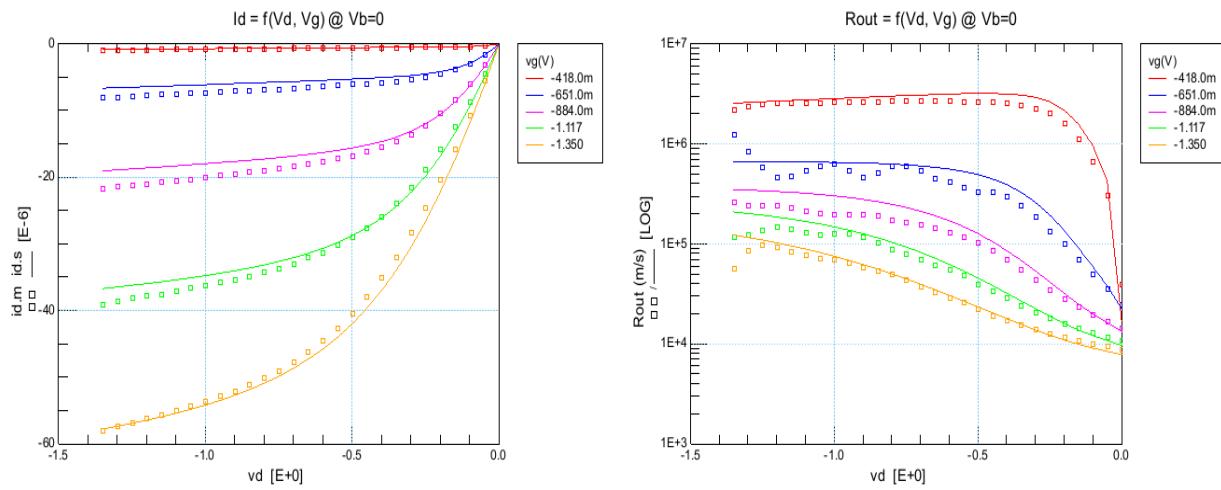
$i_{dVg}, V_d = -1.2V, T = 125^\circ\text{C}$

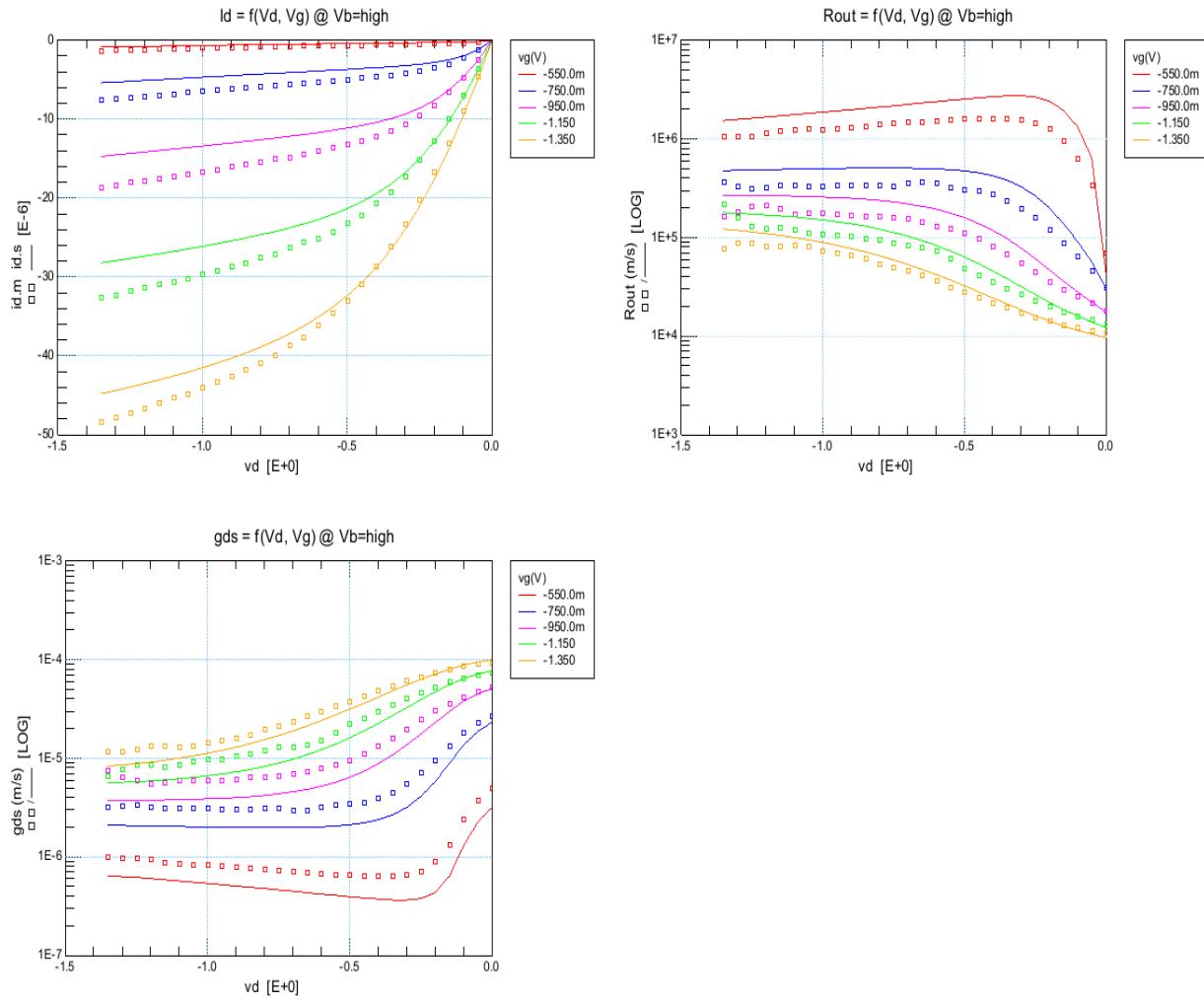
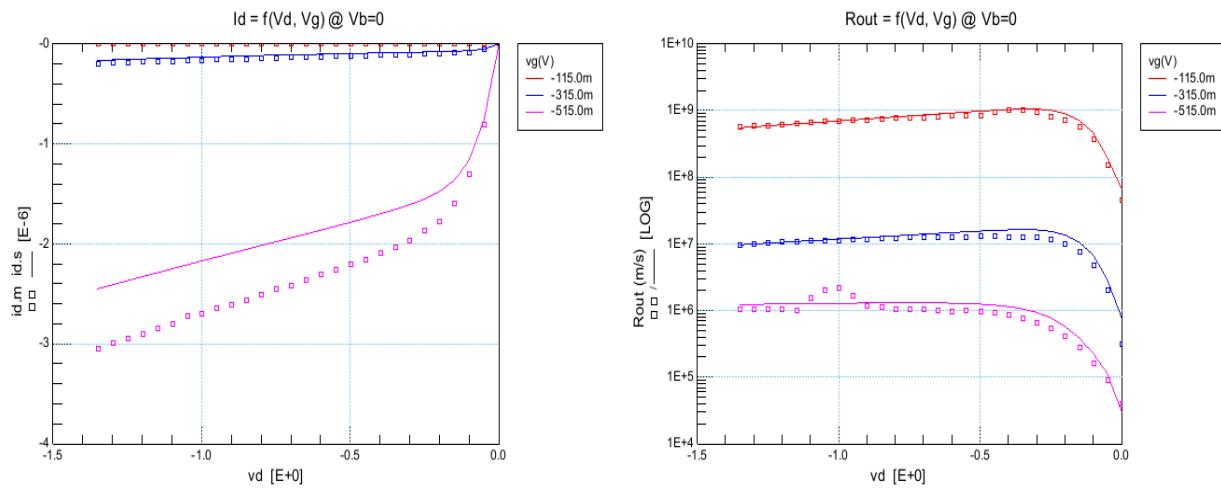


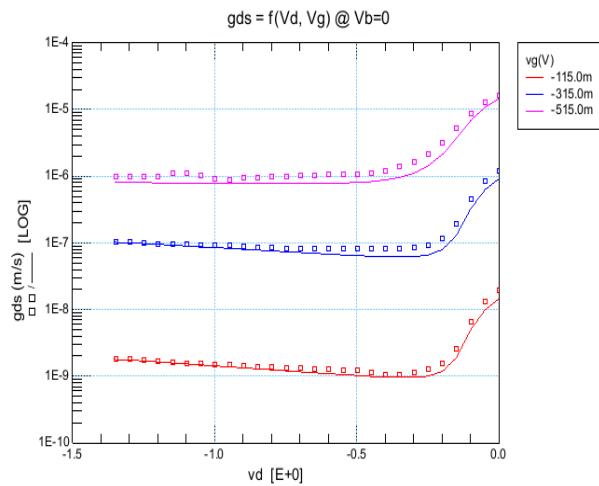


idvg, Ib,Ig, Vb = 0V, T = 125°C

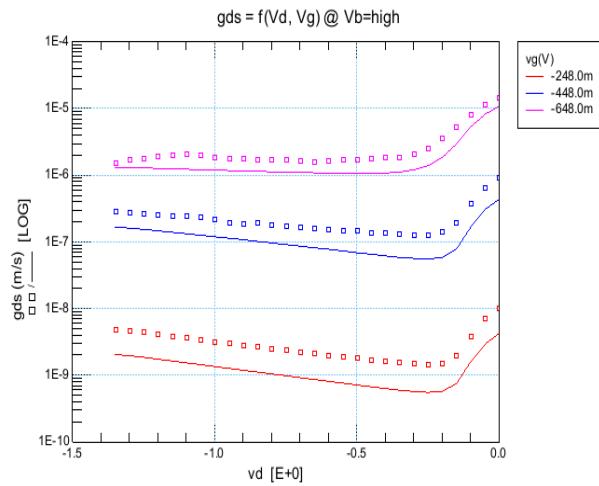
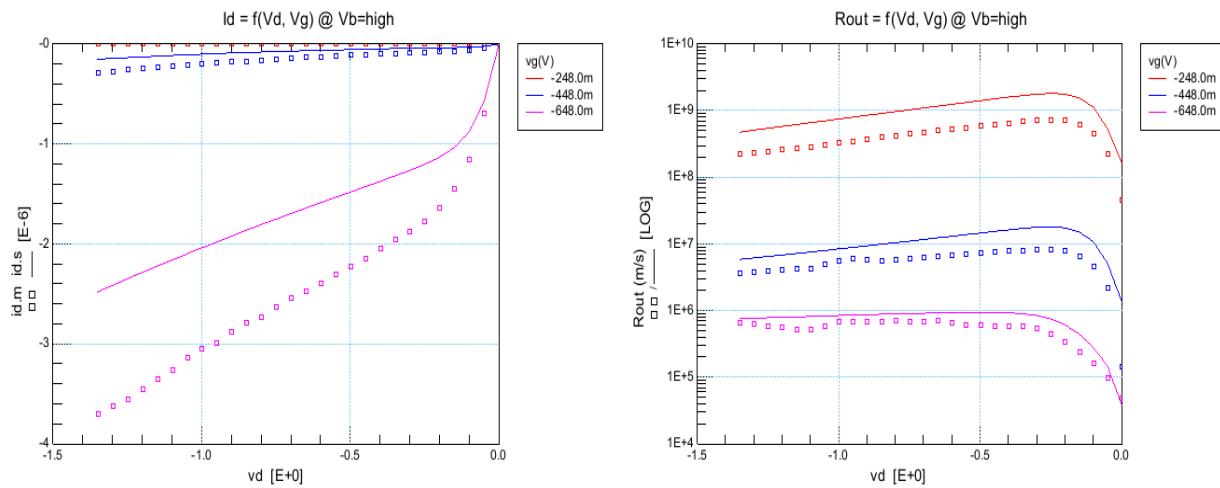


idvg, Ib,Ig, Vb = 1.2V, T = 125°C

idvd, Vb = 0V, T = 125°C


idvd_vbmin, Vb = 1.2V, T = 125°C

idvd_vth, Vb = 0V, T = 125°C


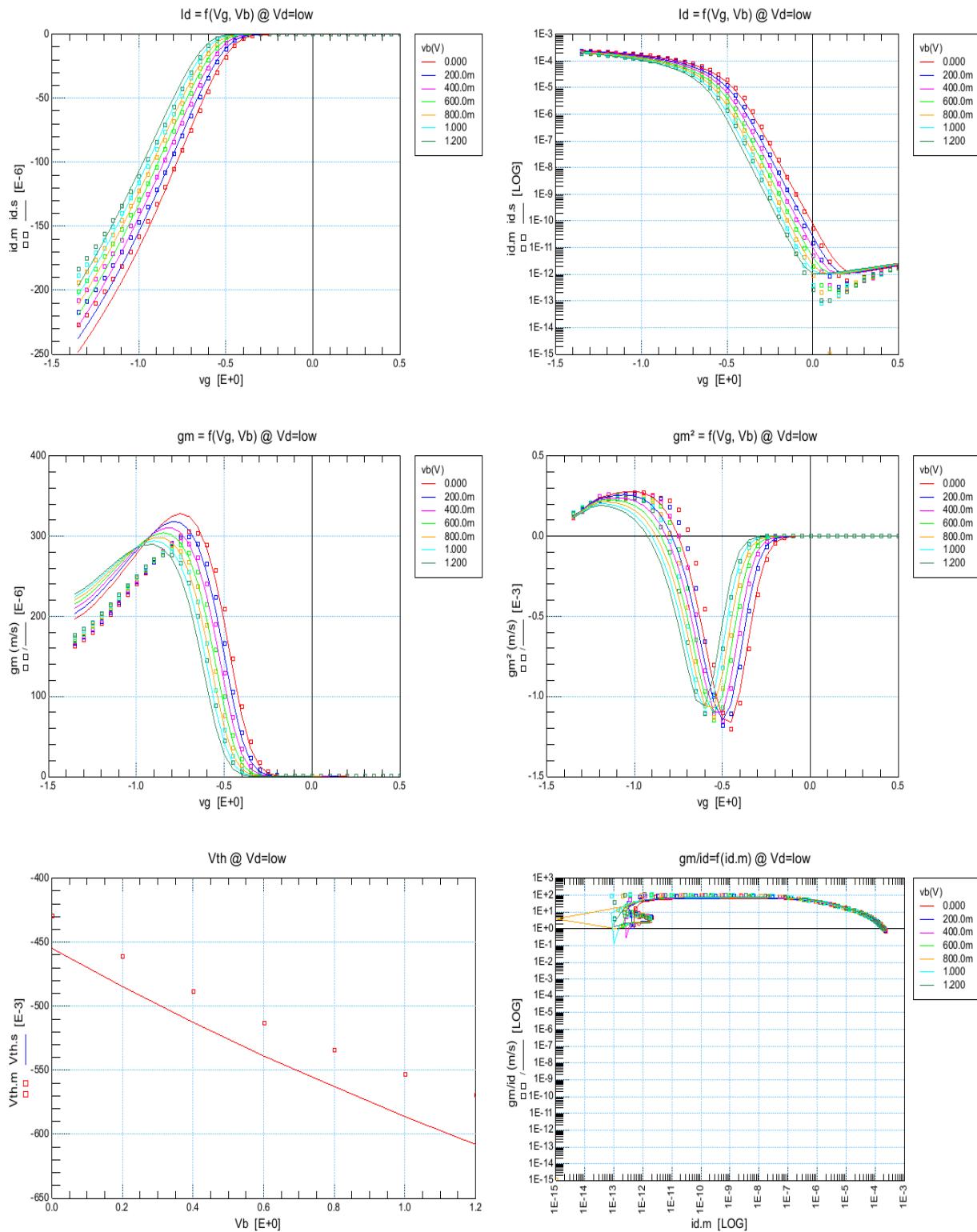


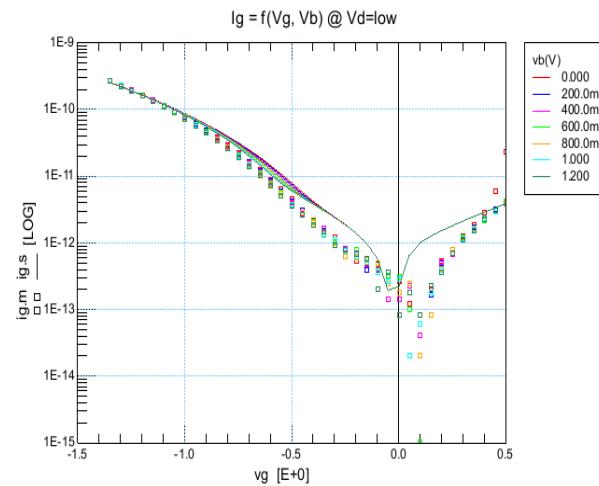
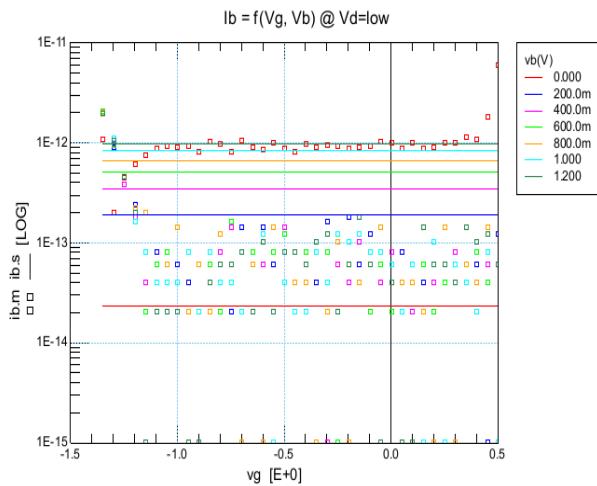
idvd_vth_vbmin, Vb = 1.2V, T = 125°C



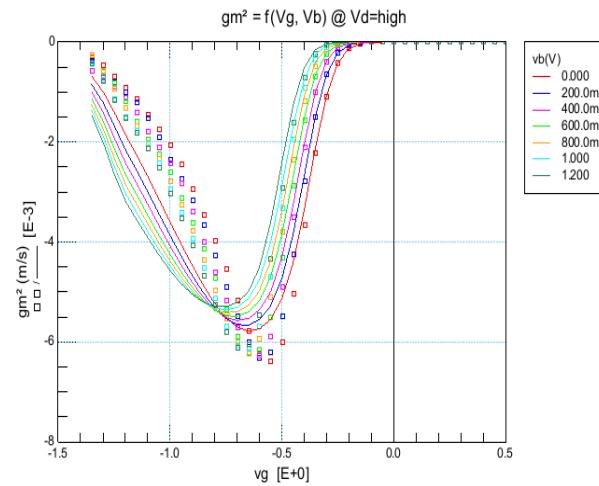
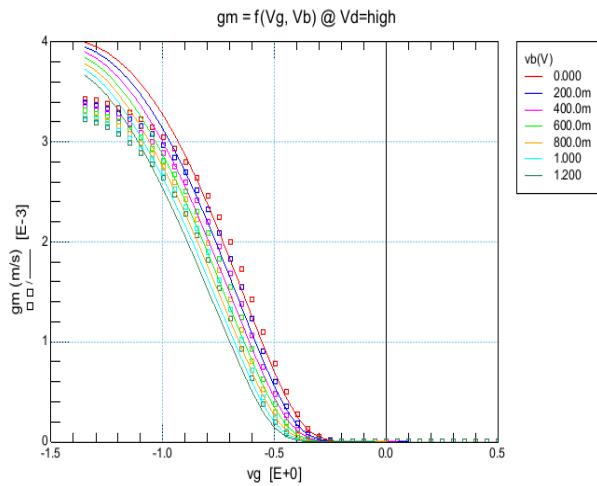
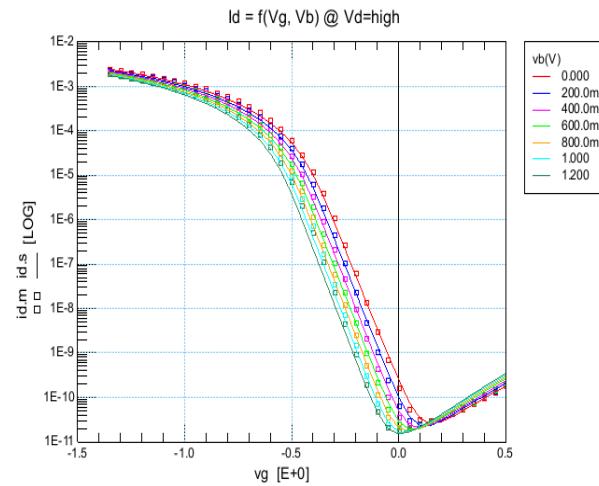
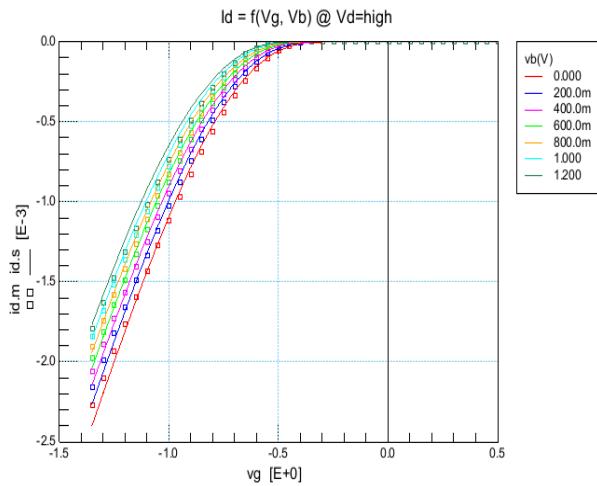
4.6 W10u0_L0u14_S548_3

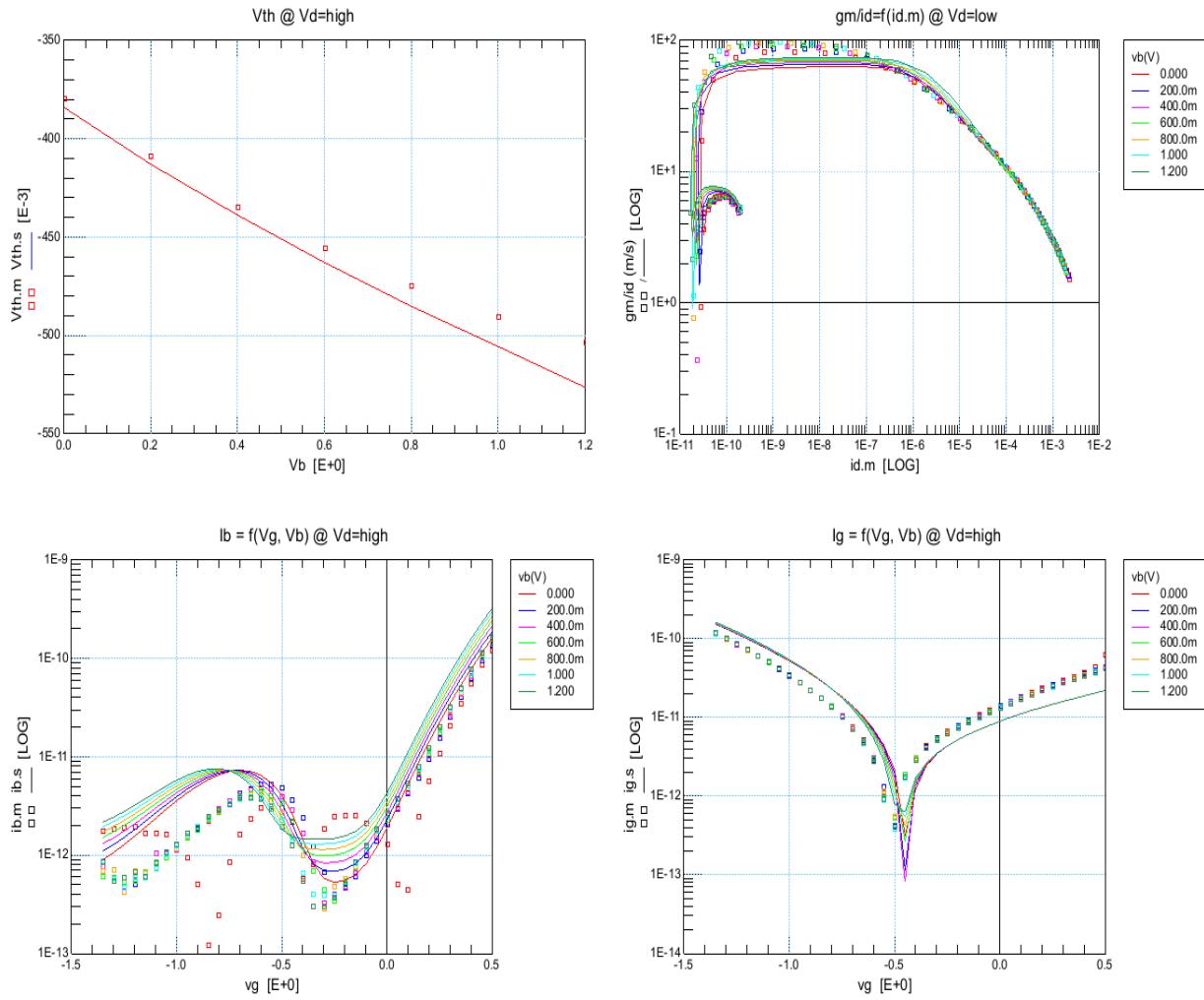
$idv_g, V_d = -0.05V, T = 27^\circ C$



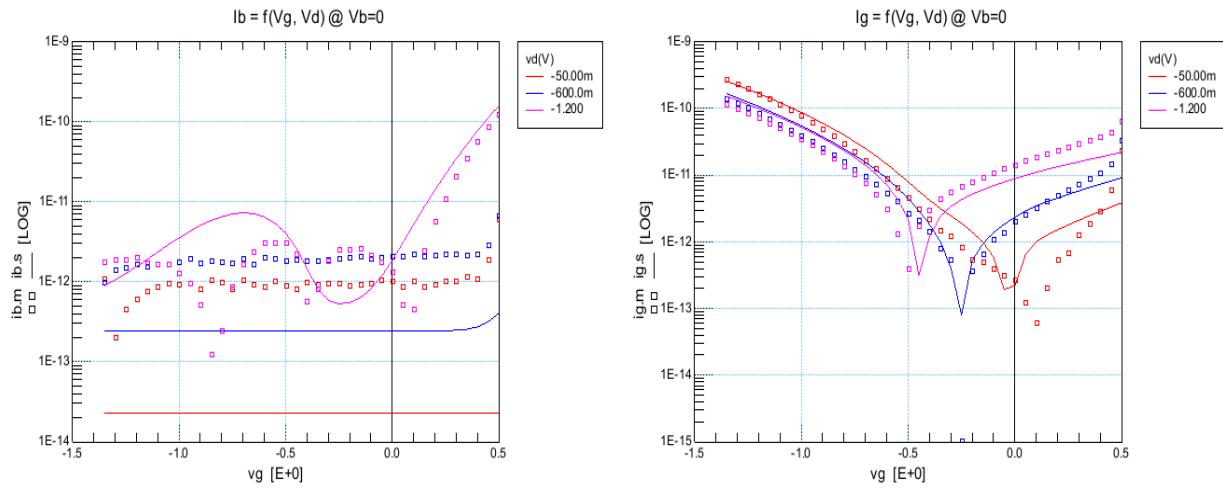


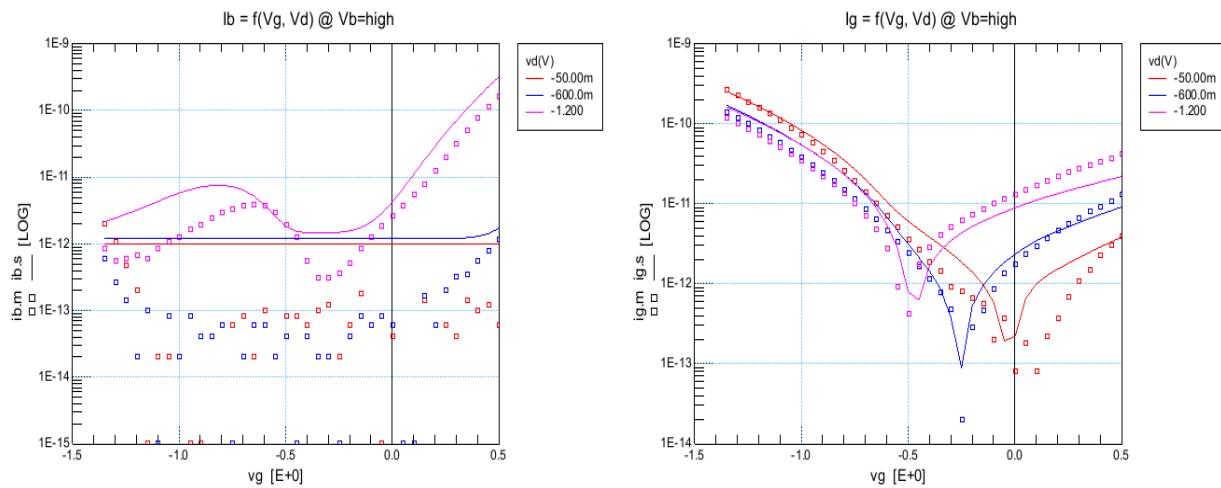
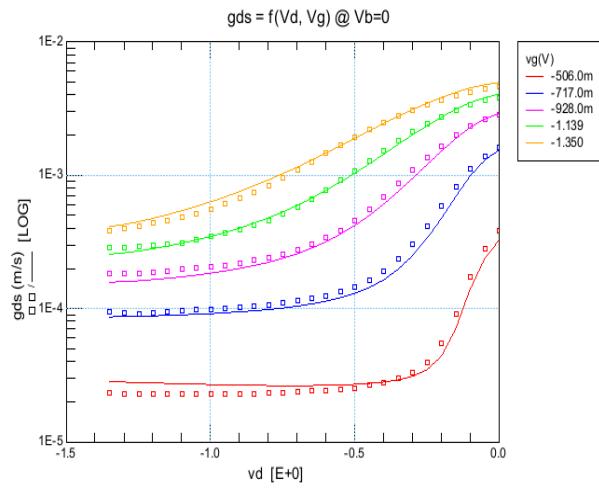
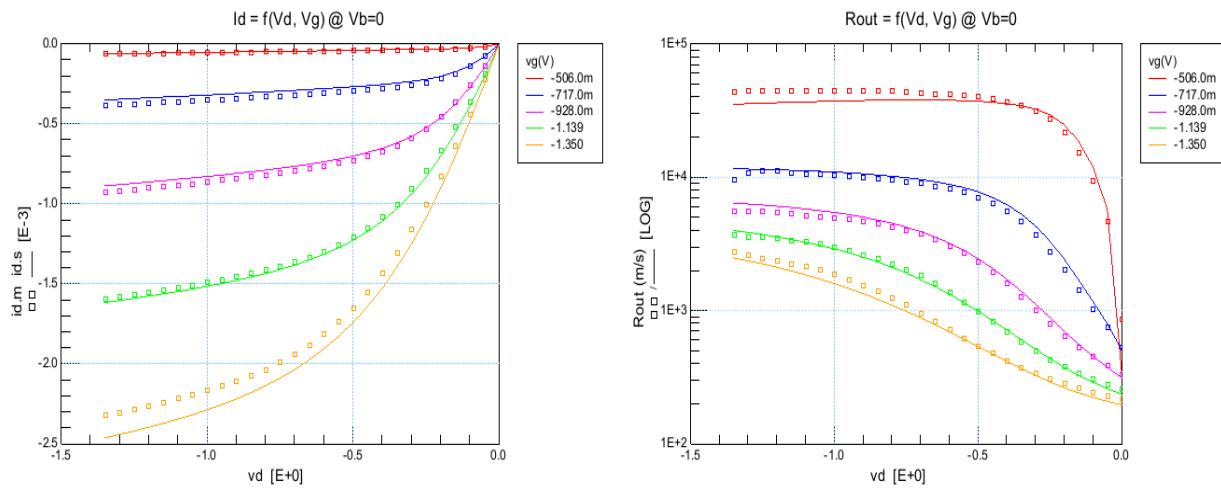
$i_{dvg}, V_d = -1.2V, T = 27^\circ\text{C}$

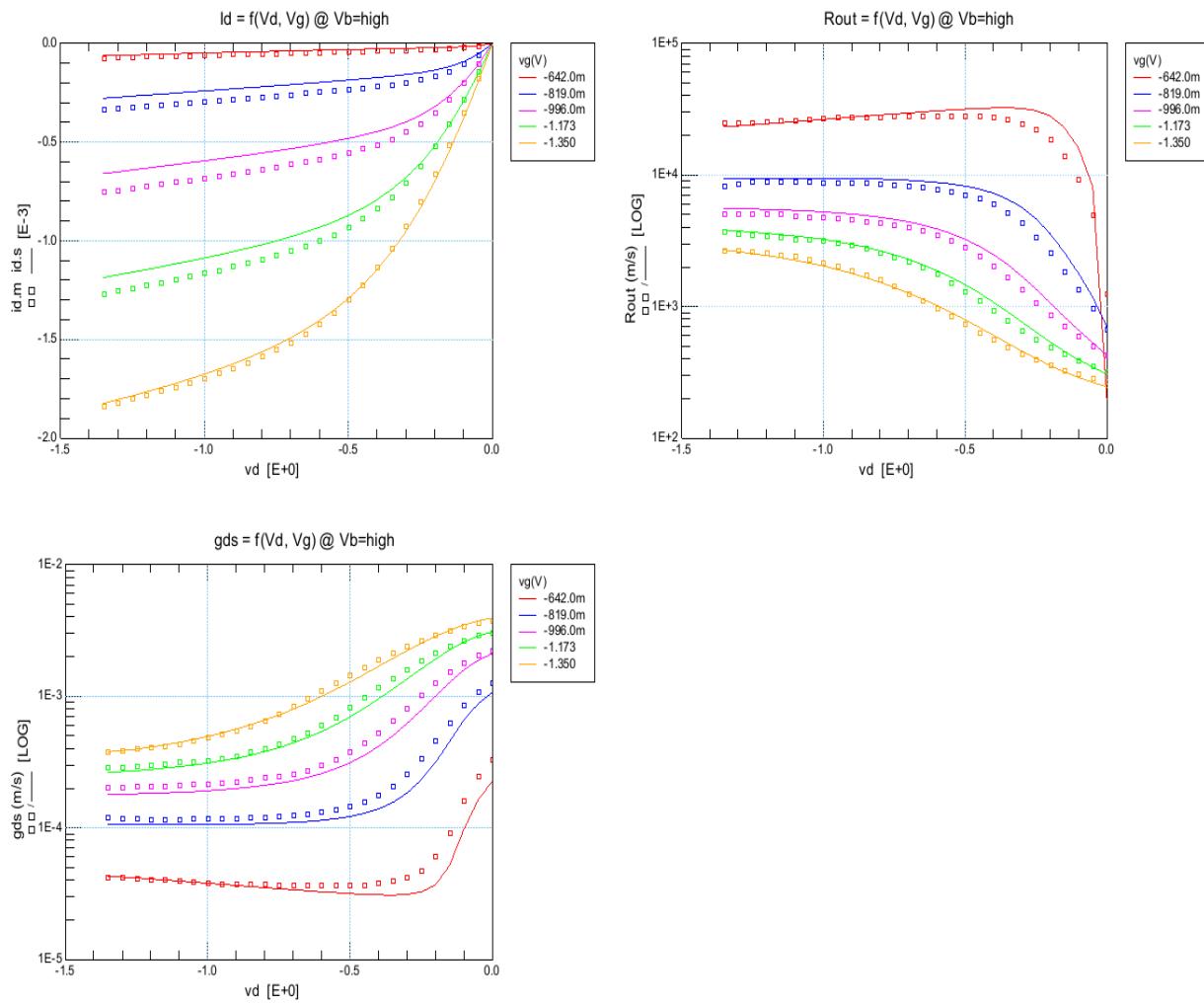
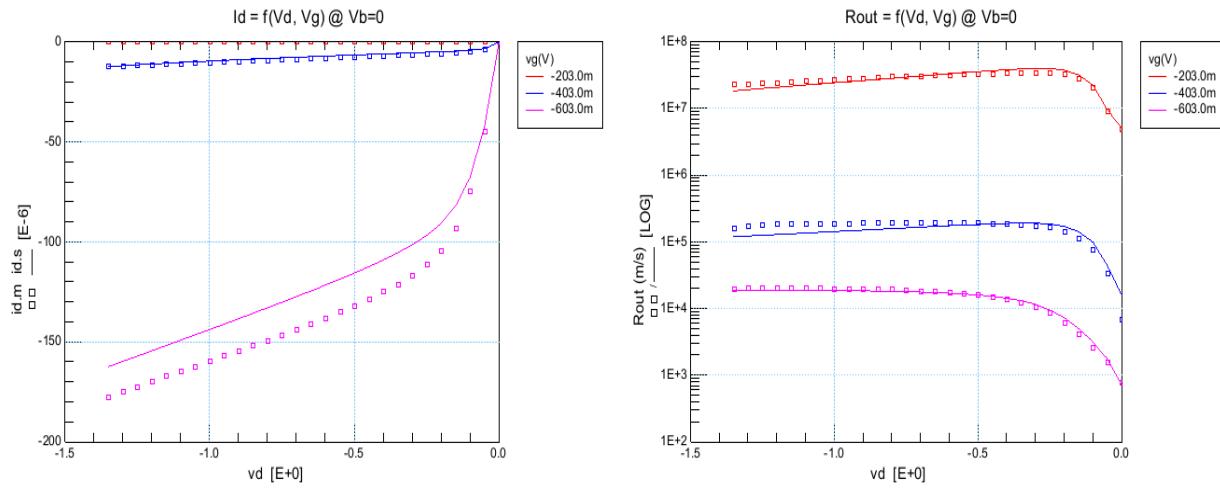


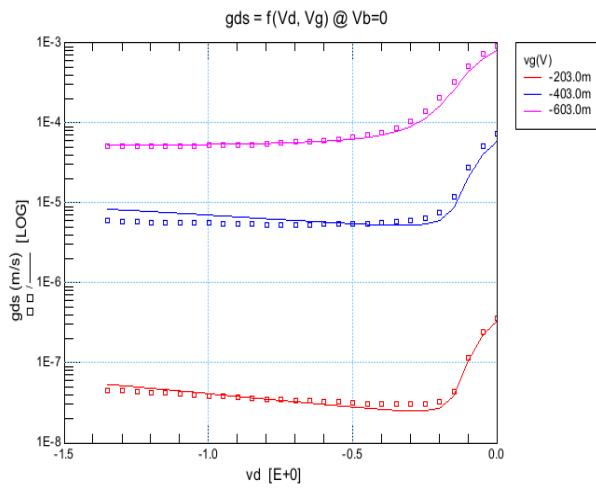


idvg, Ib,Ig, Vb = 0V, T = 27°C

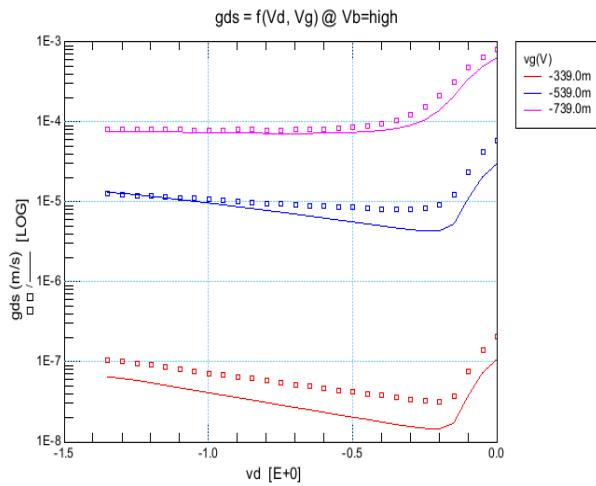
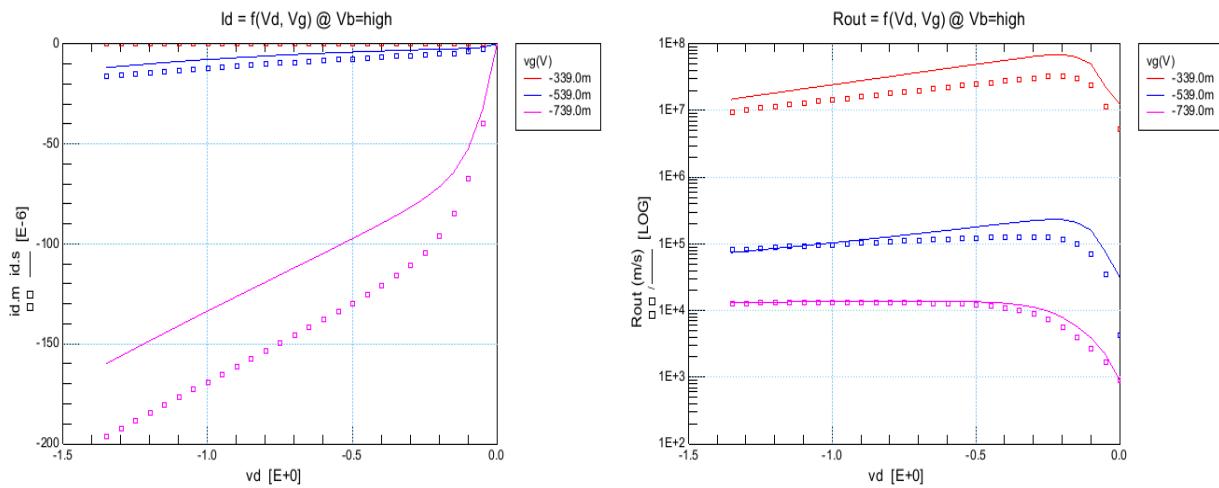


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C**idvd_vth, Vb = 0V, T = 27°C**

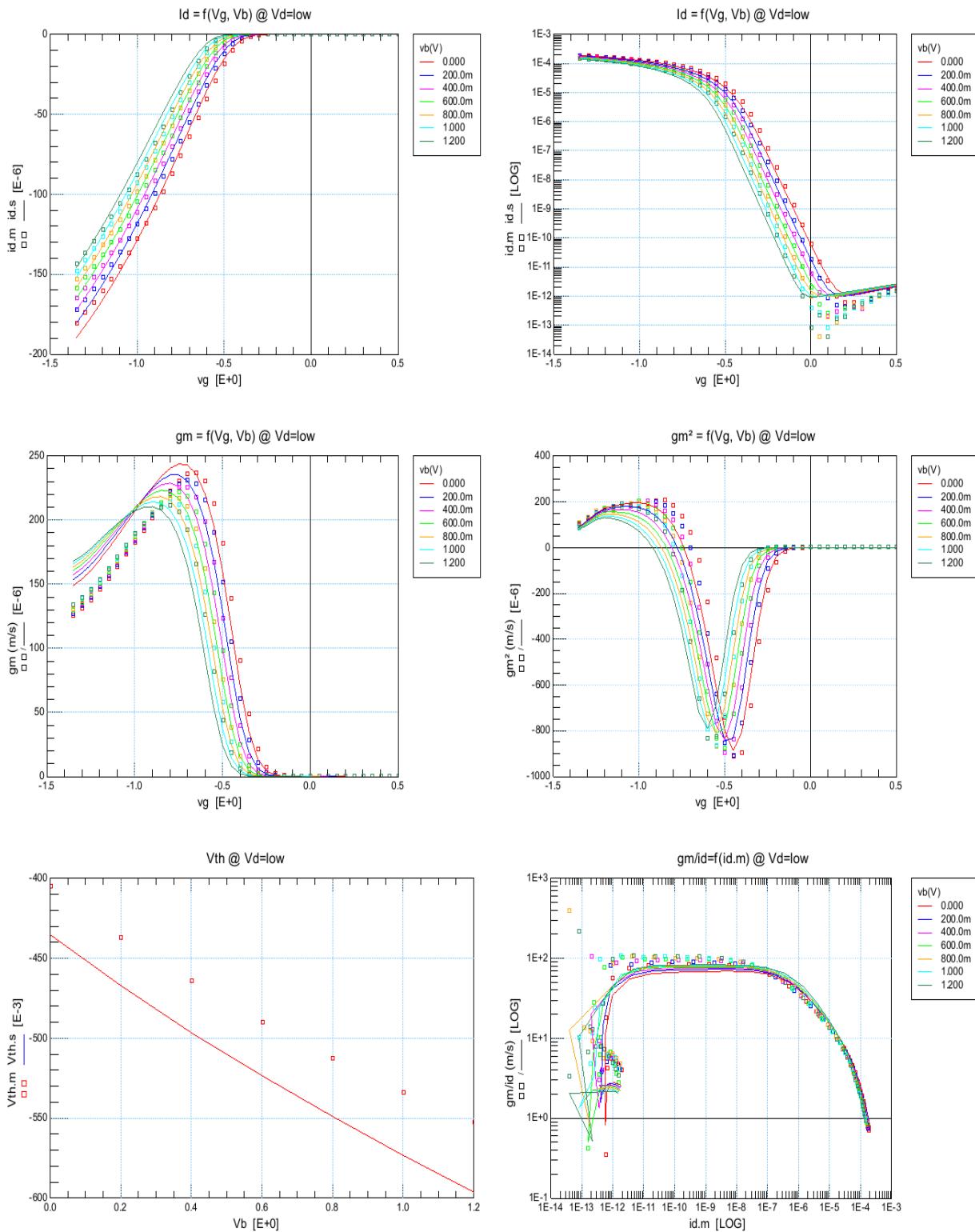


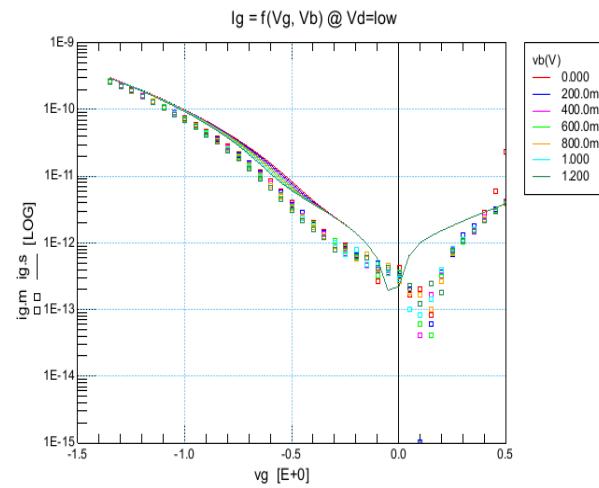
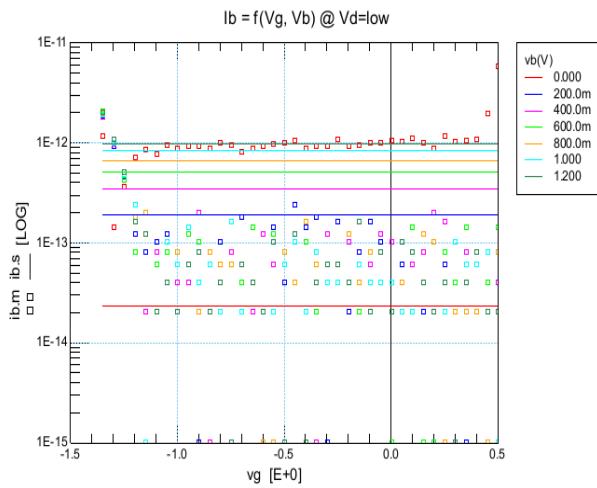
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



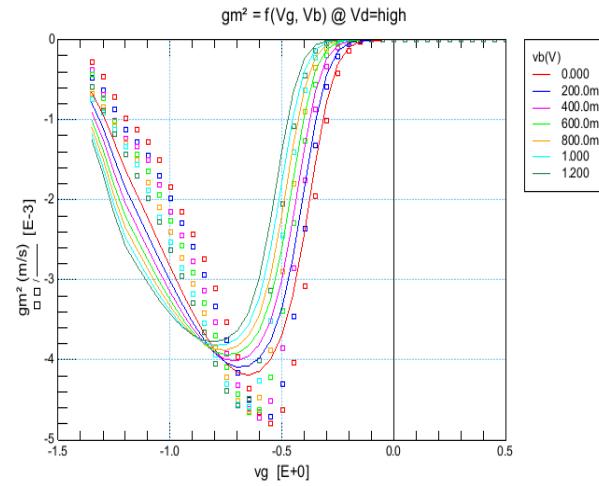
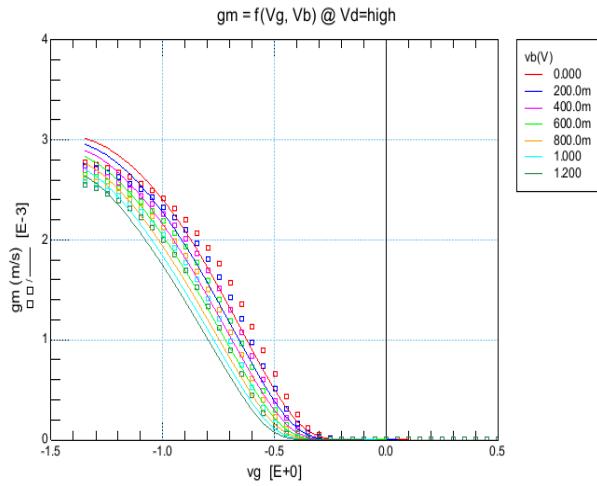
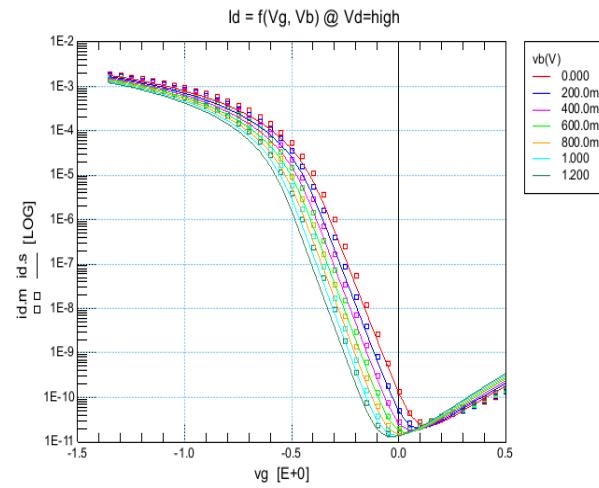
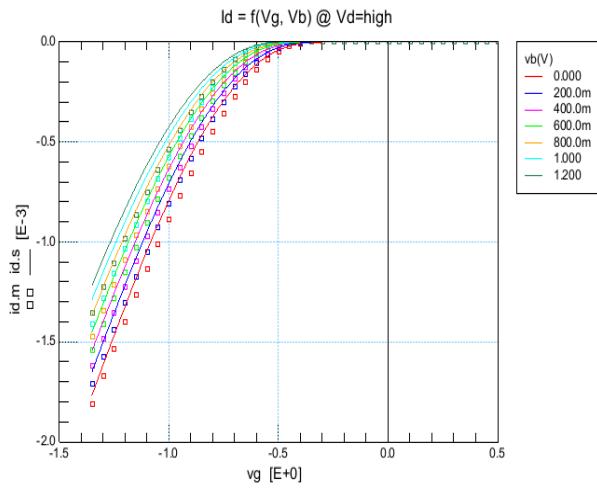
4.7 W10u0_L0u18_S548_5

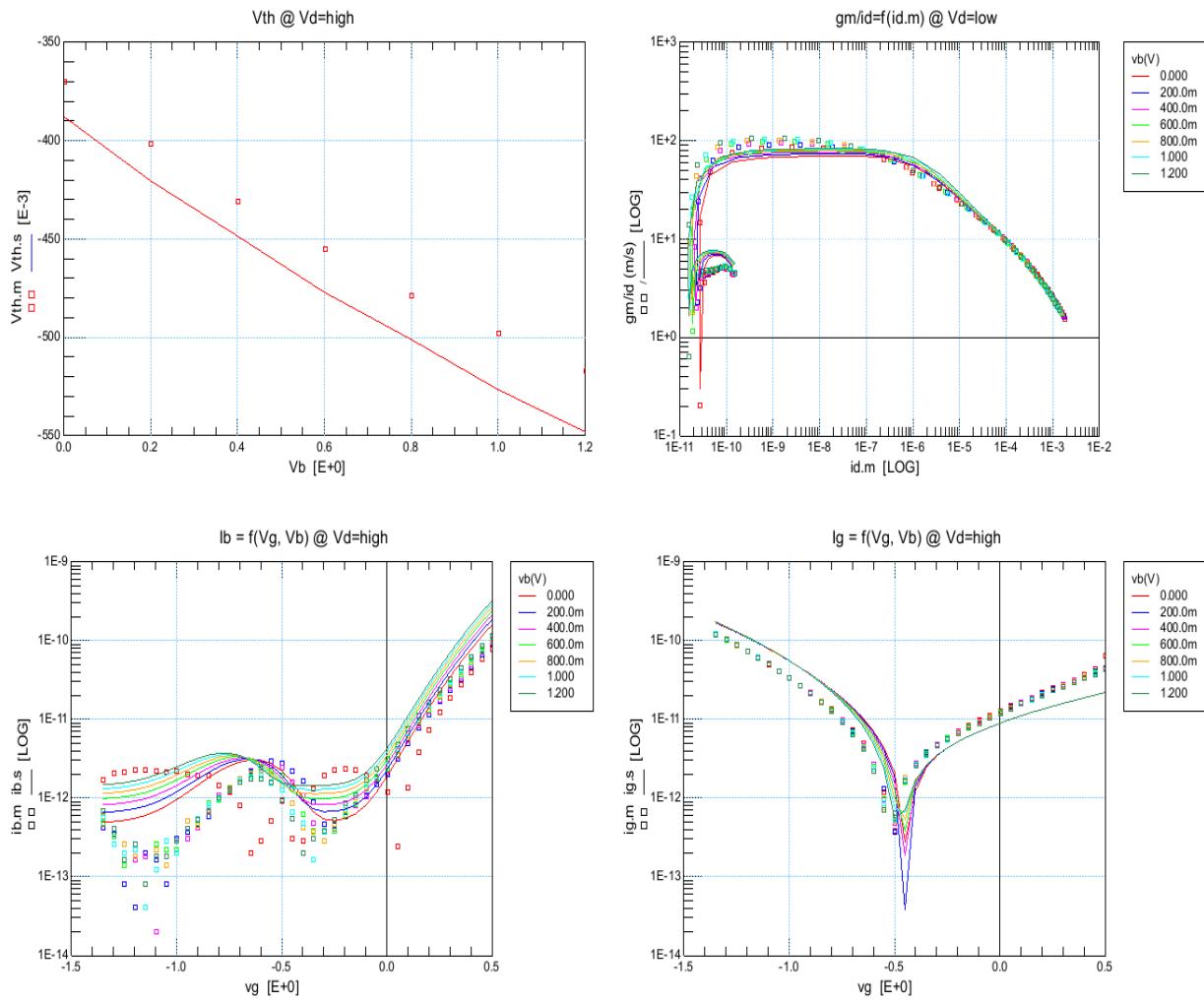
$idv_g, V_d = -0.05V, T = 27^\circ C$



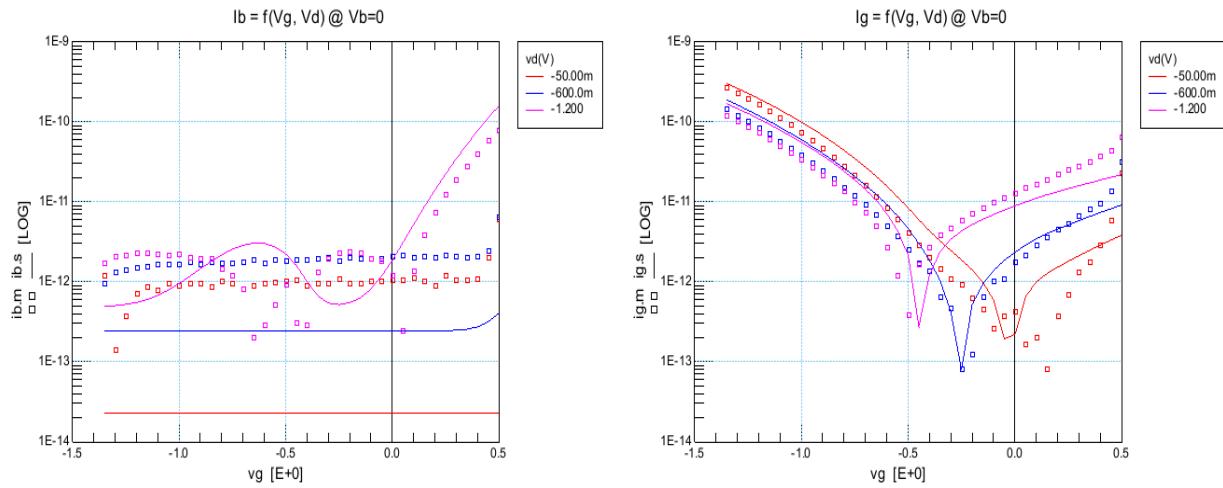


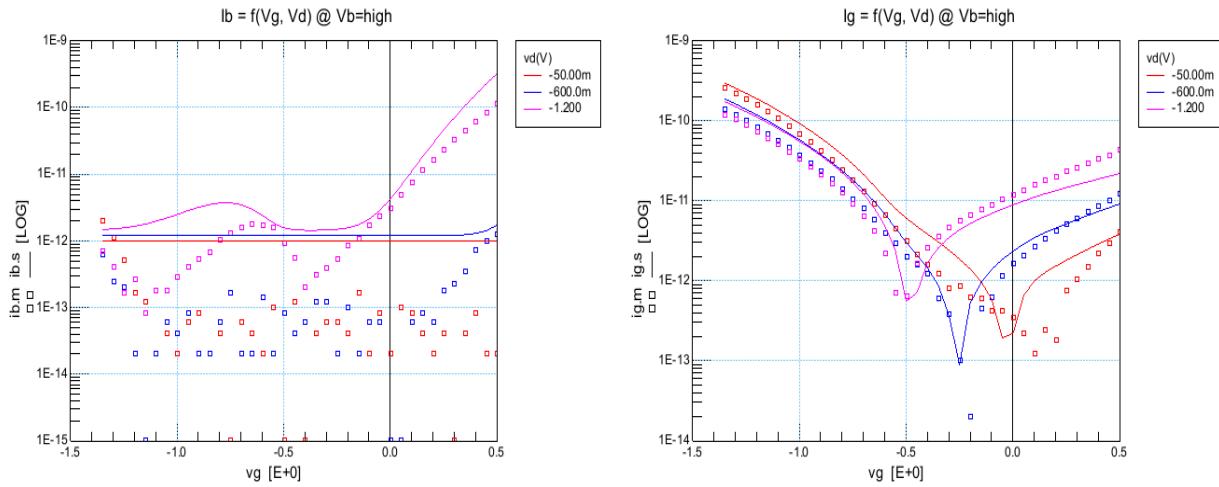
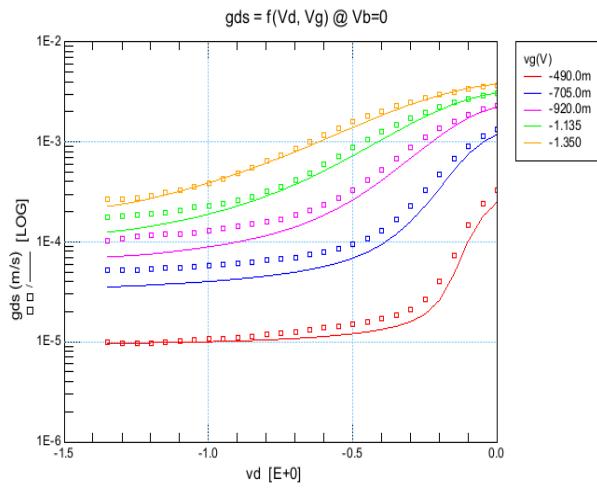
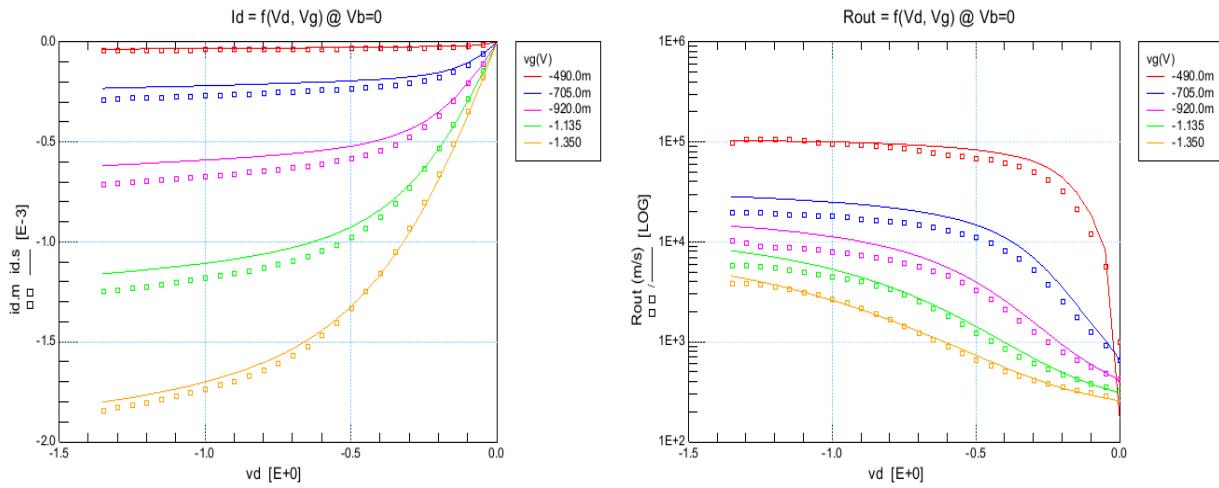
$i_{dvg}, V_d = -1.2V, T = 27^\circ\text{C}$

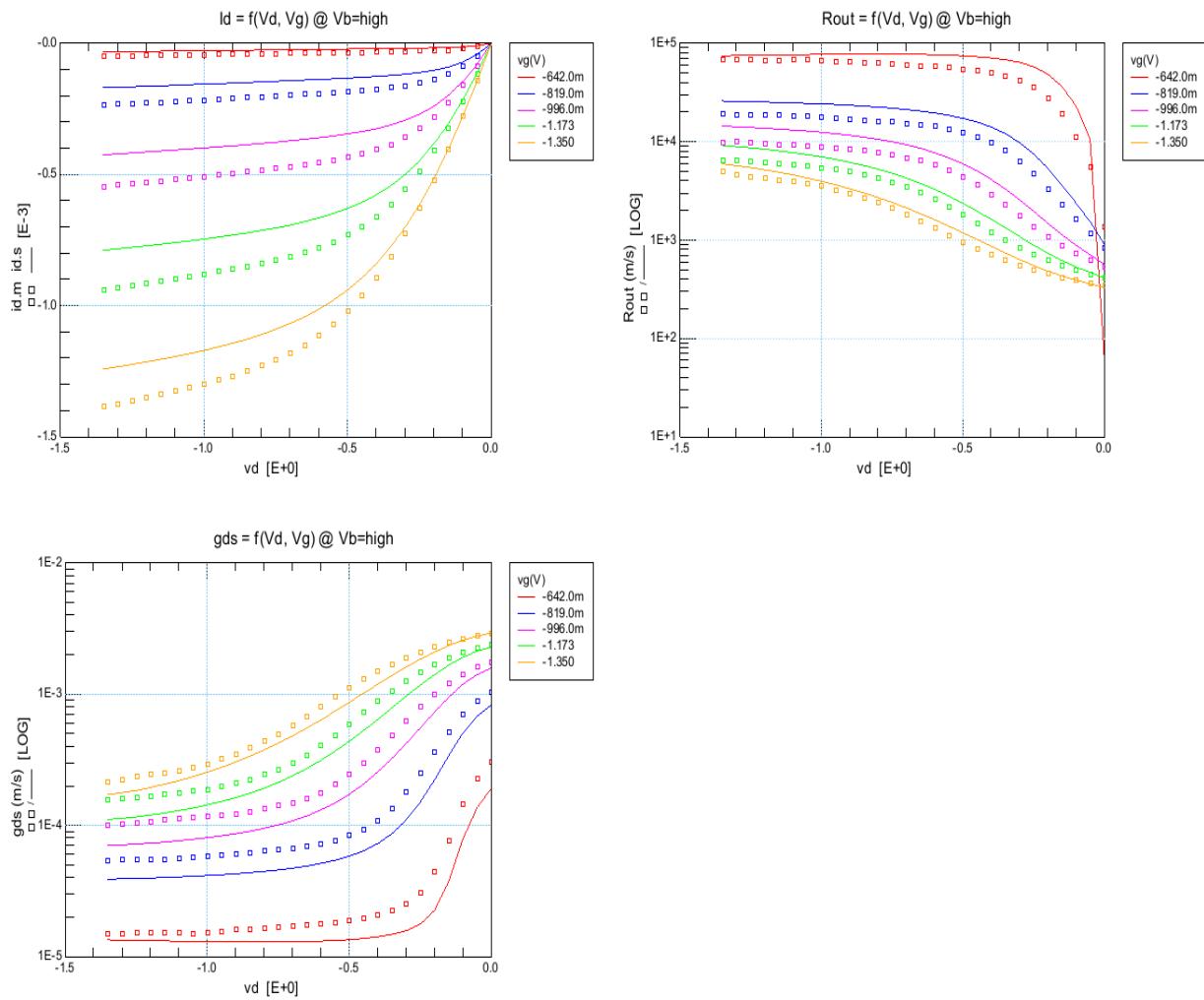
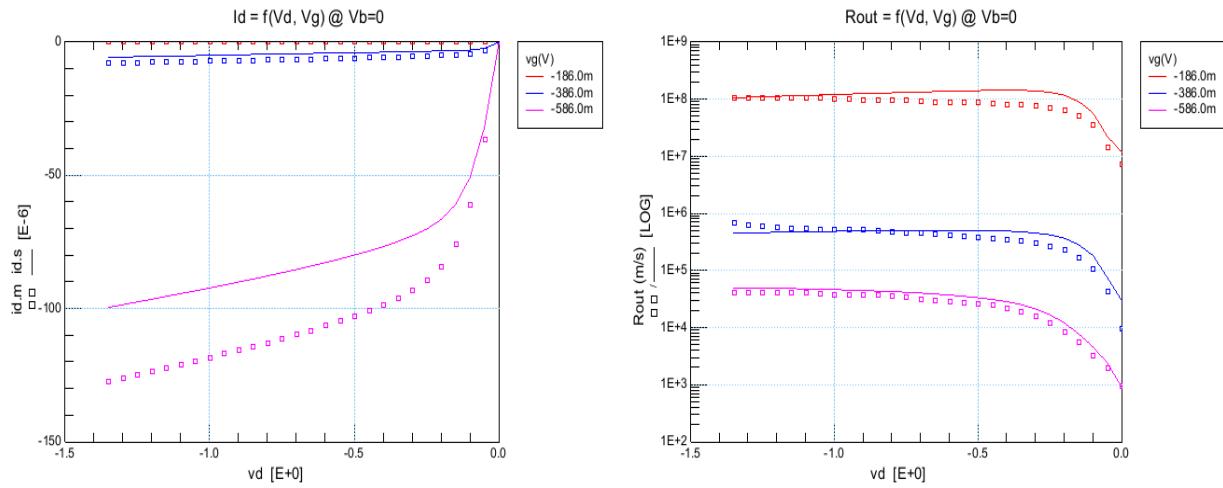


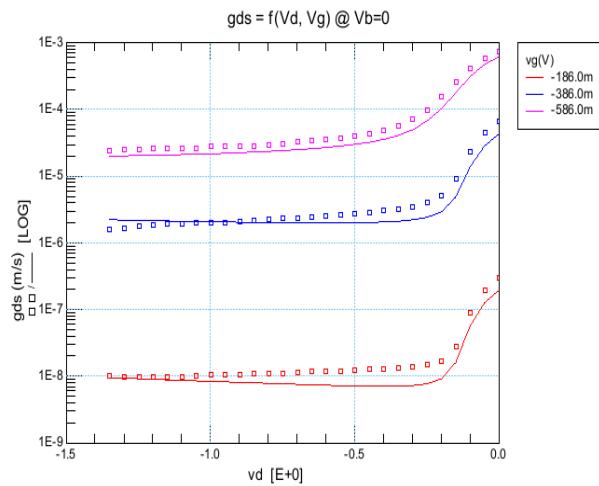


idvg, Ib,Ig, Vb = 0V, T = 27°C

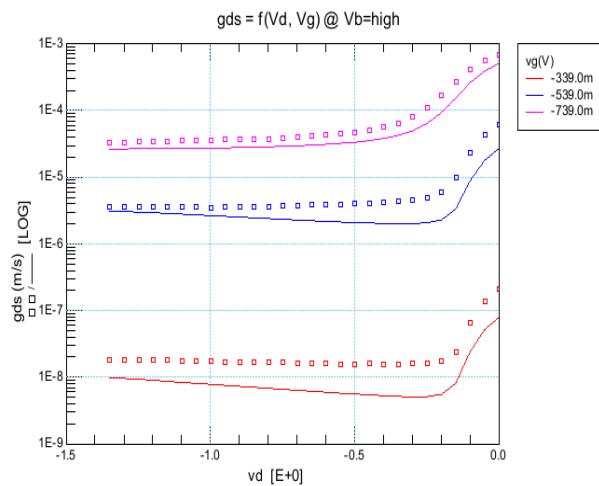
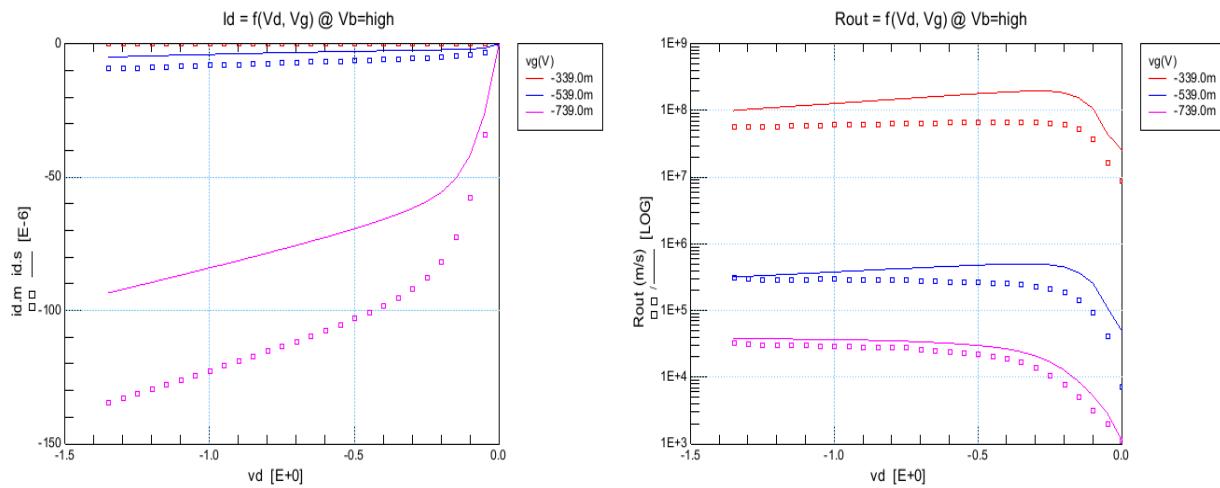


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


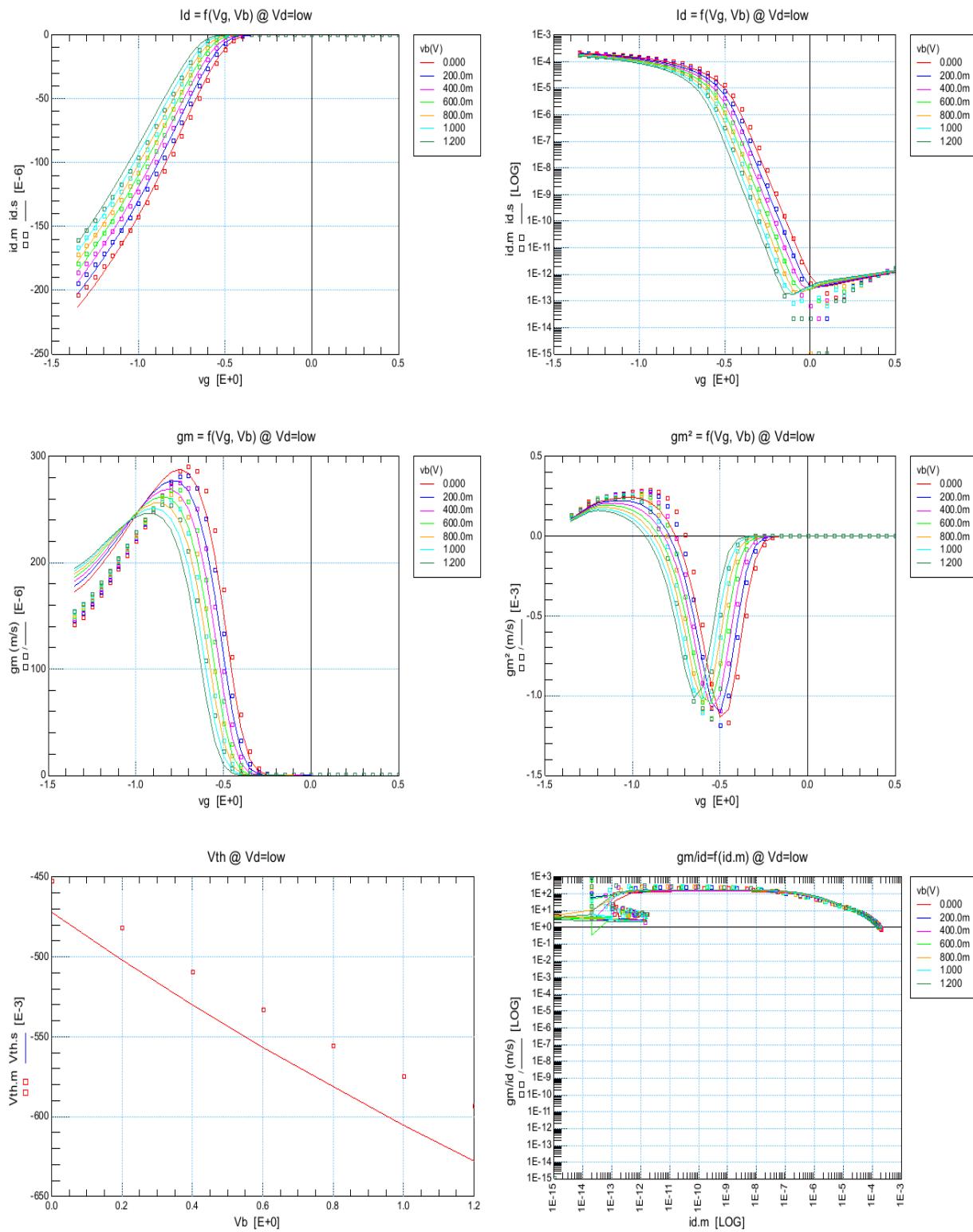
idvd_vbmin, Vb = 1.2V, T = 27°C**idvd_vth, Vb = 0V, T = 27°C**

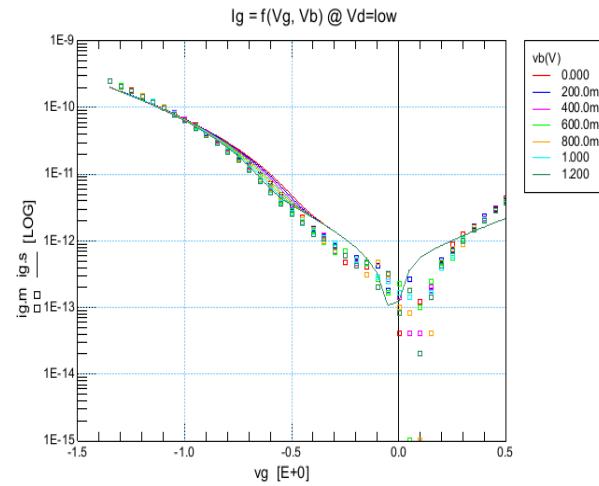
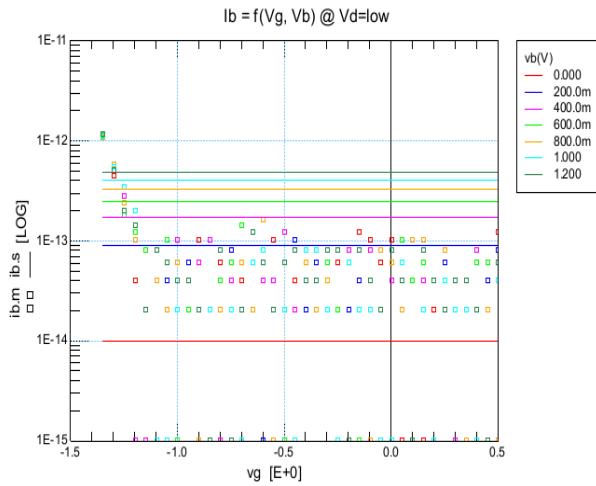


idvd_vth_vbmin, Vb = 1.2V, T = 27°C

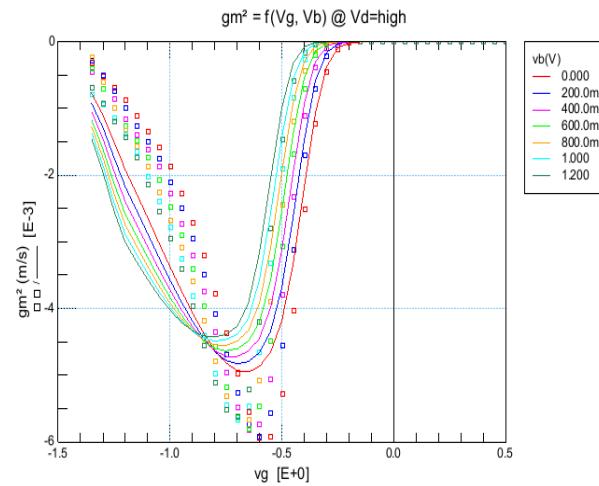
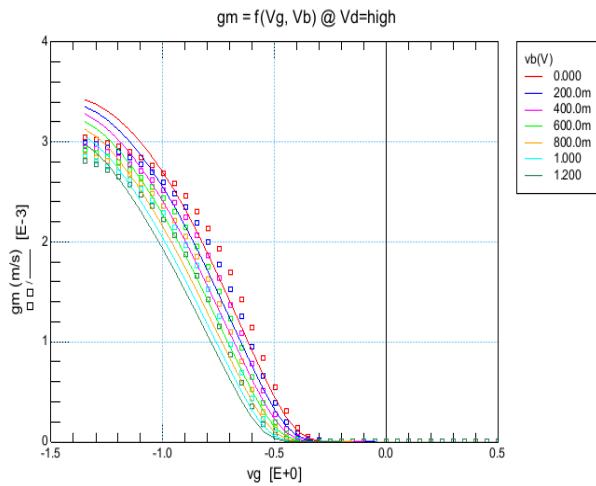
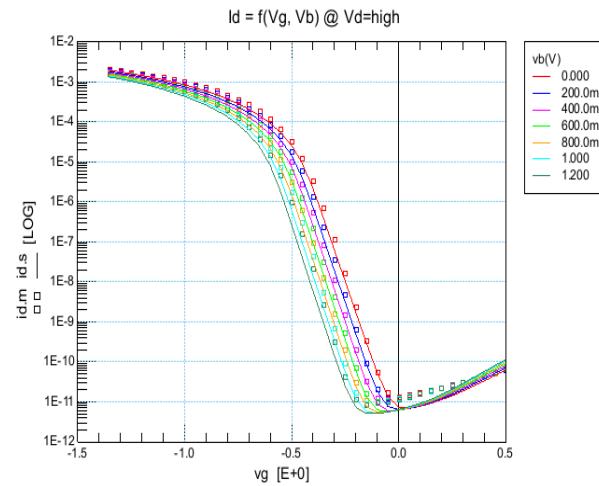
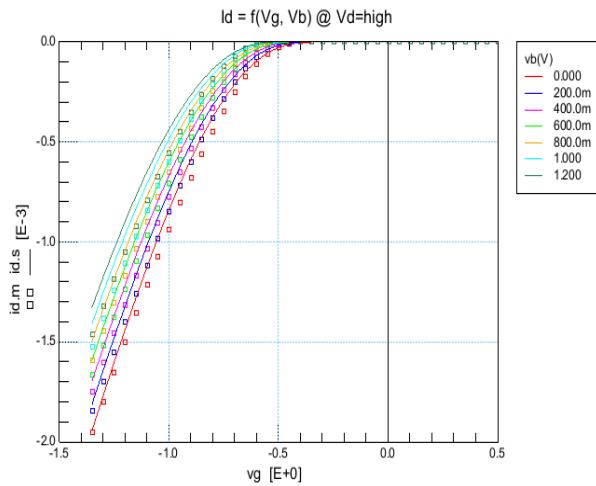


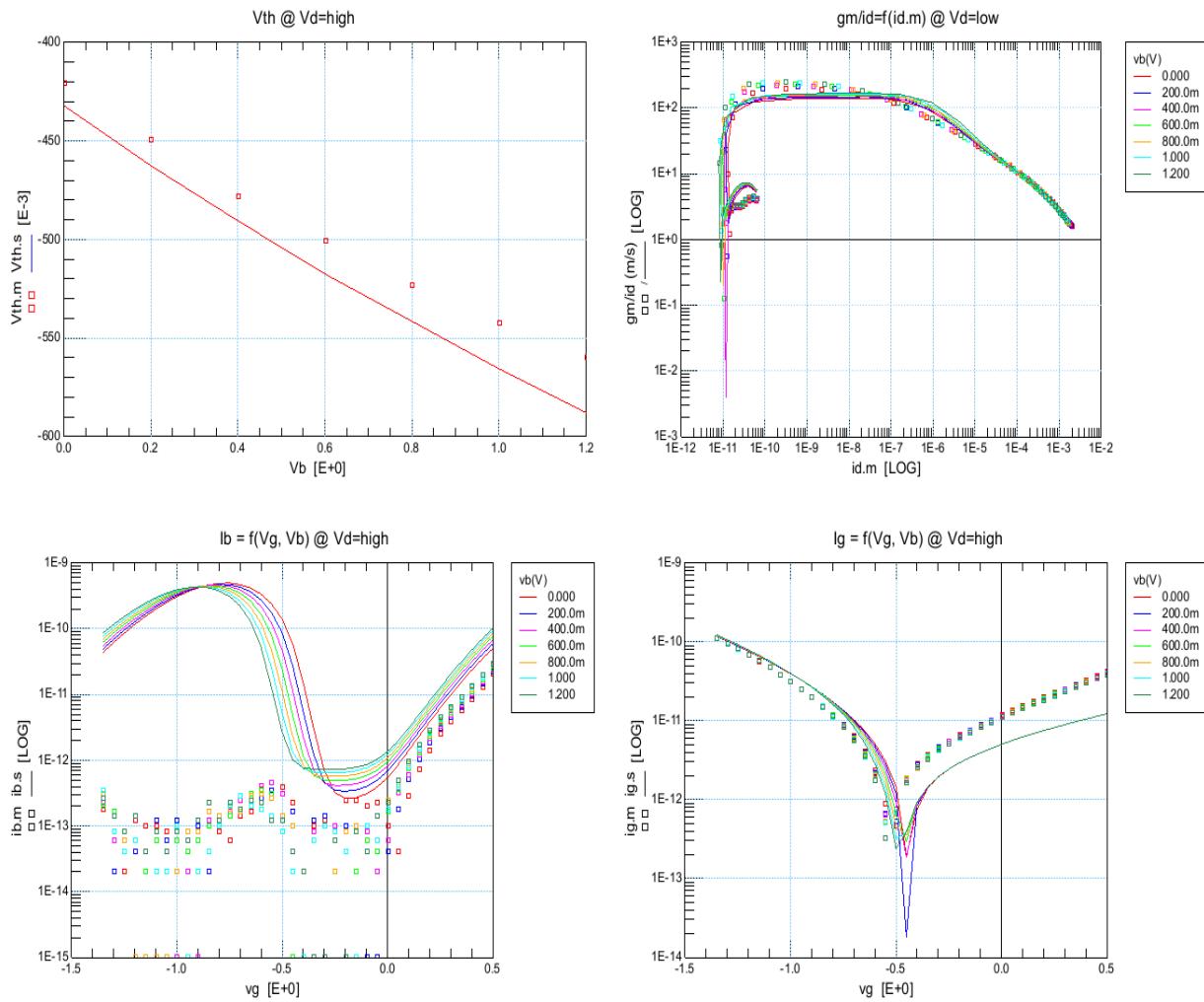
idvg, Vd = -0.05V, T = -40°C



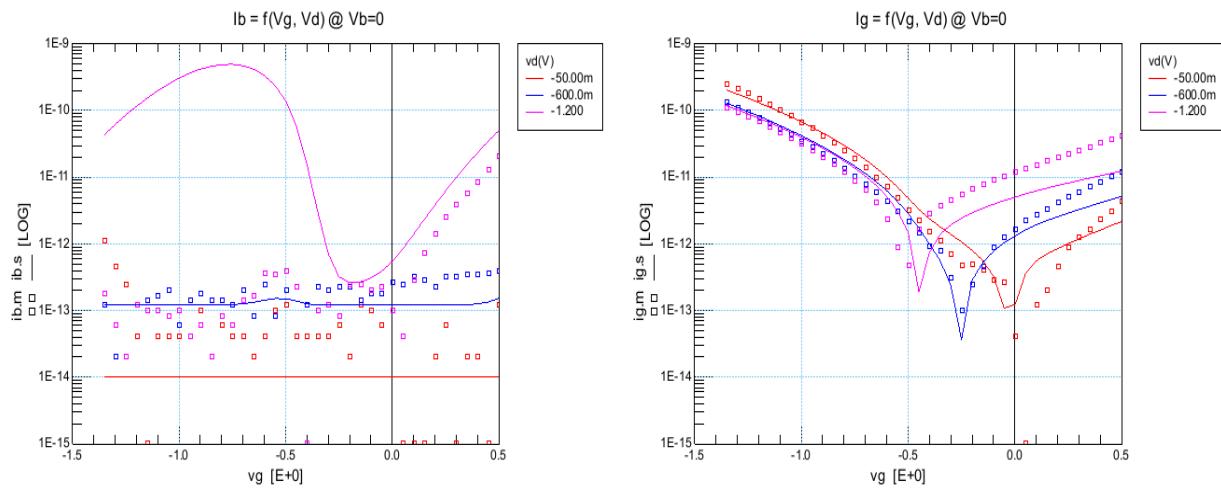


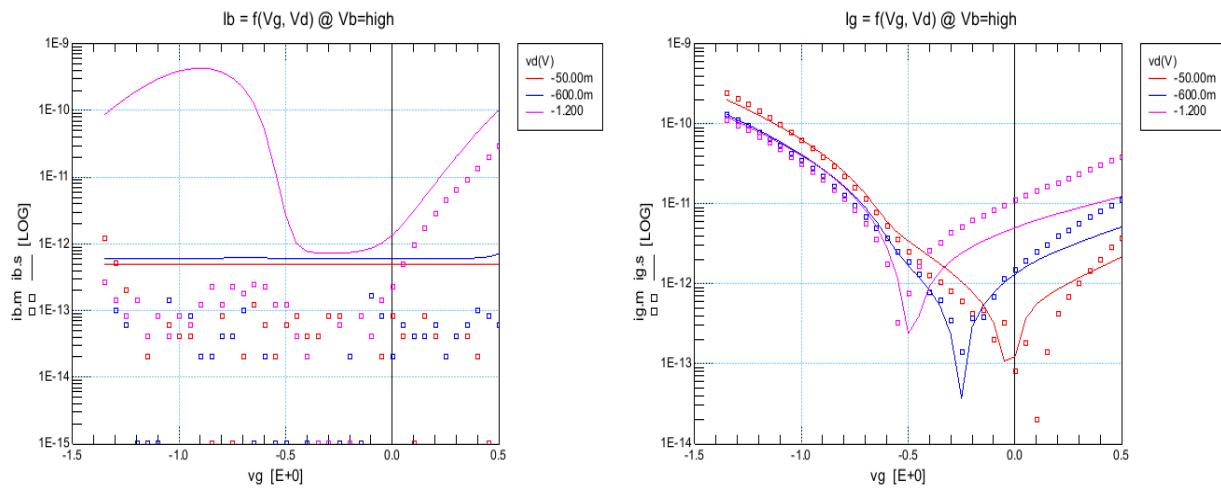
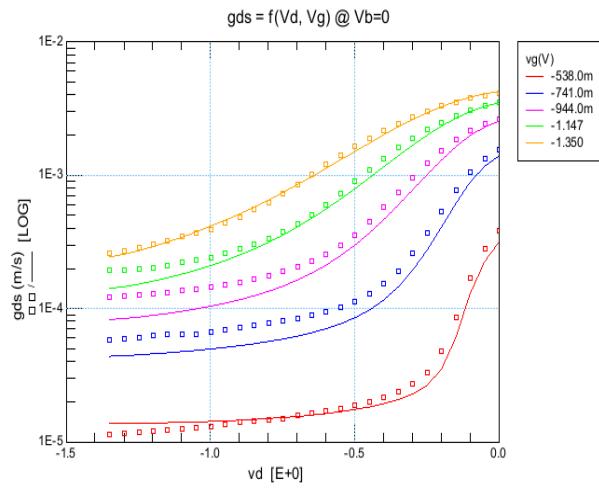
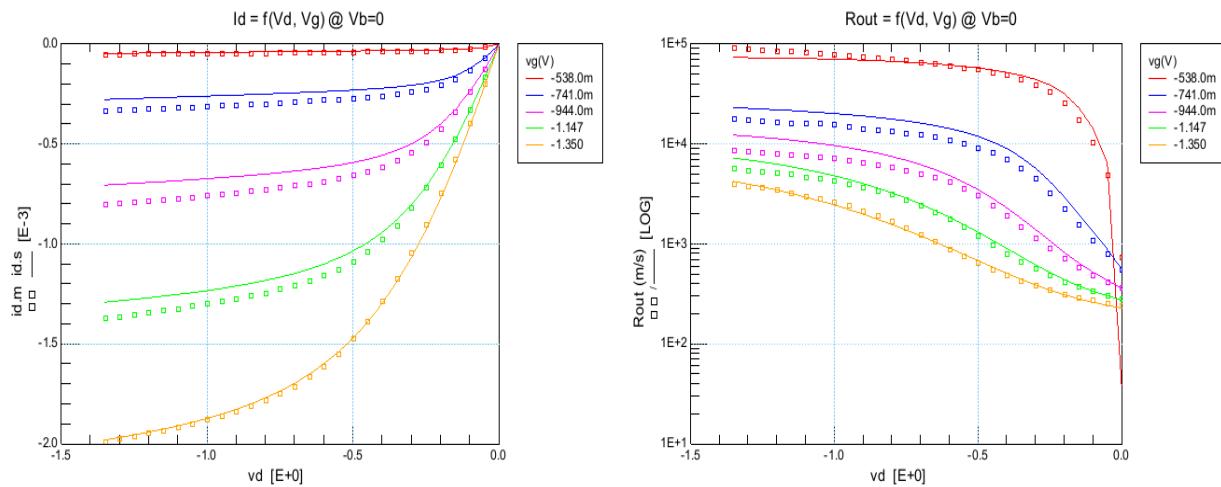
i_{dvg} , $V_d = -1.2V$, $T = -40^{\circ}C$

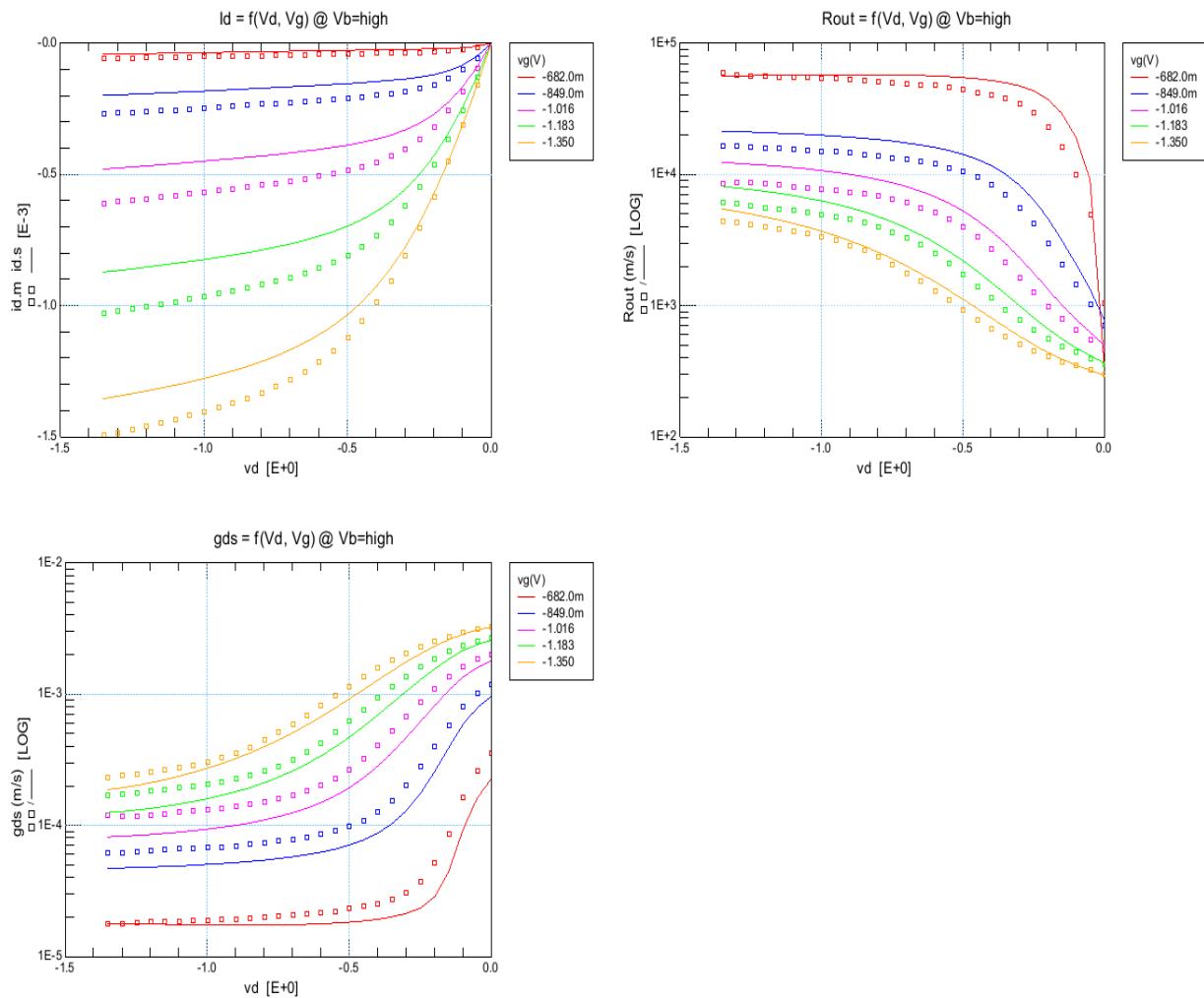
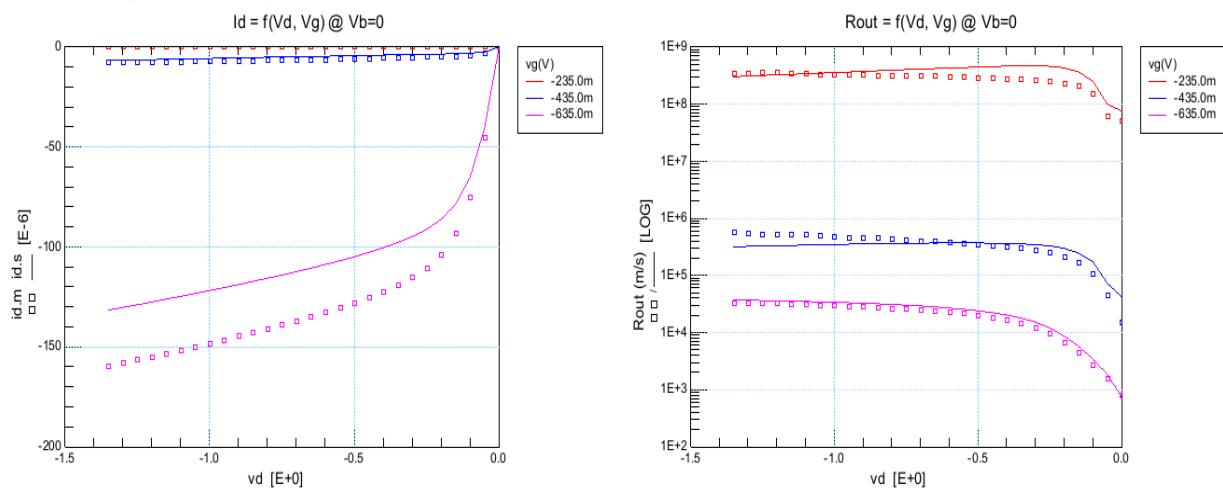


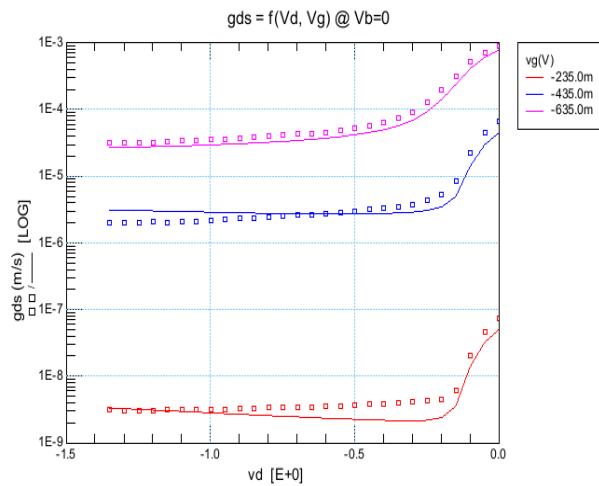


idvg, Ib,Ig, Vb = 0V, T = -40°C

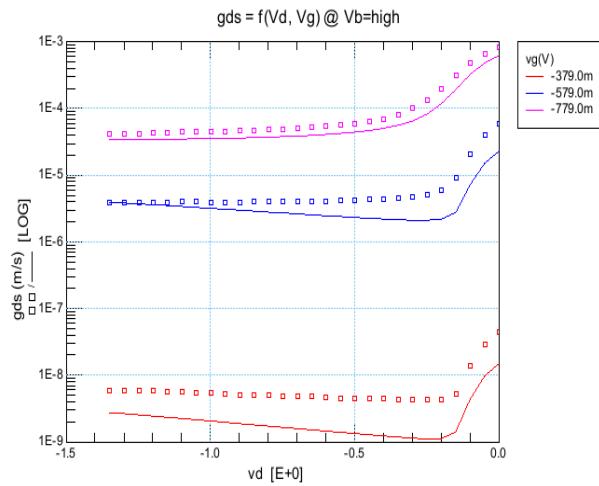
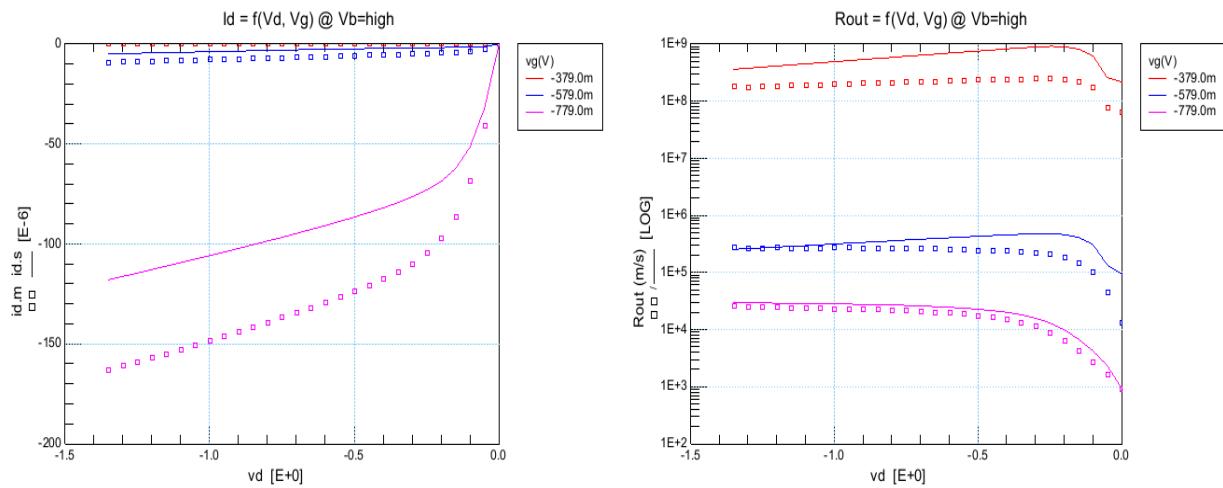


idvg, Ib,Ig, Vb = 1.2V, T = -40°C

idvd, Vb = 0V, T = -40°C


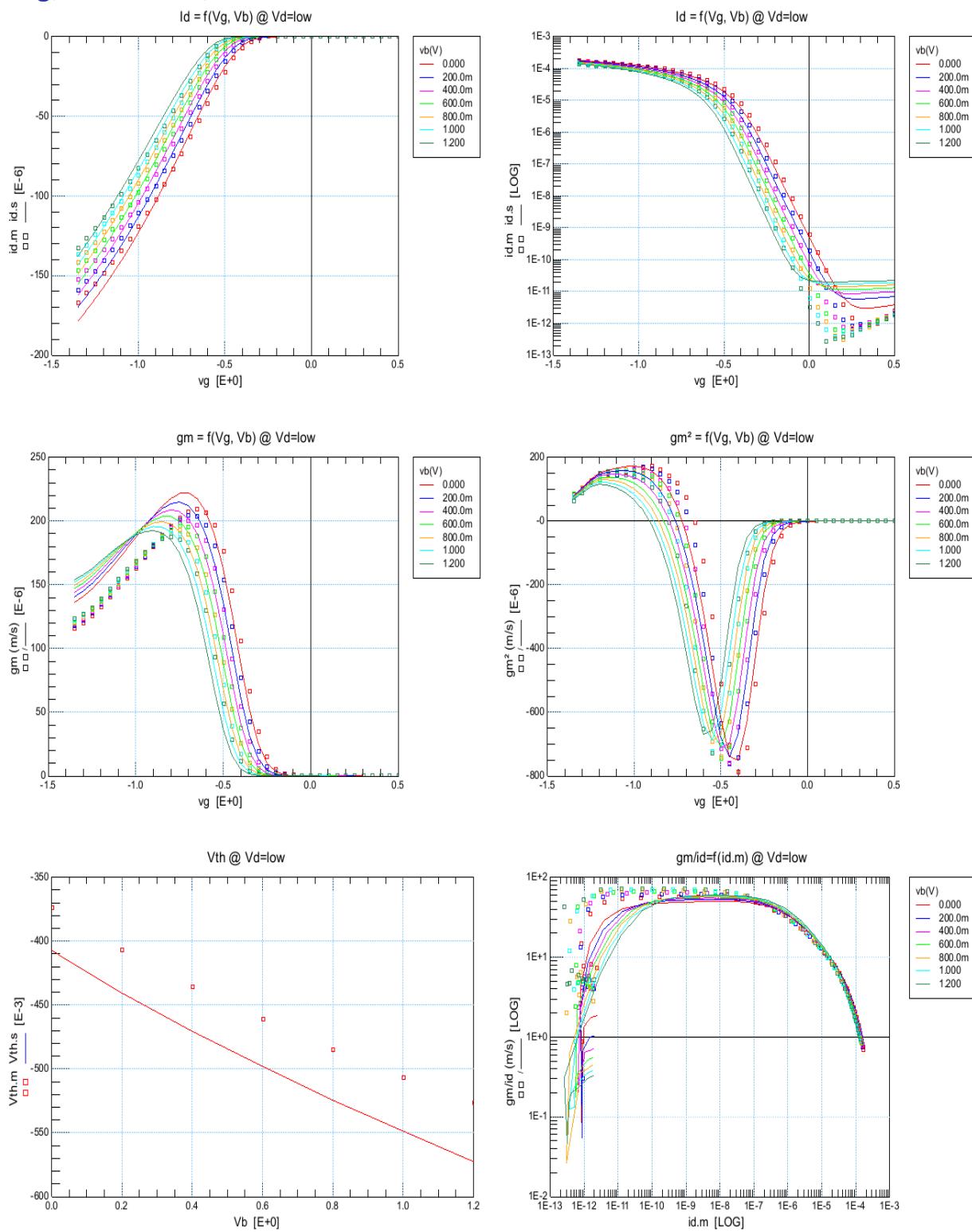
idvd_vbmin, Vb = 1.2V, T = -40°C**idvd_vth, Vb = 0V, T = -40°C**

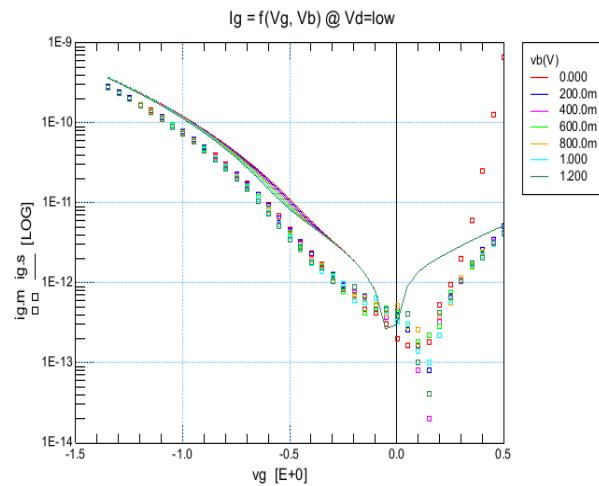
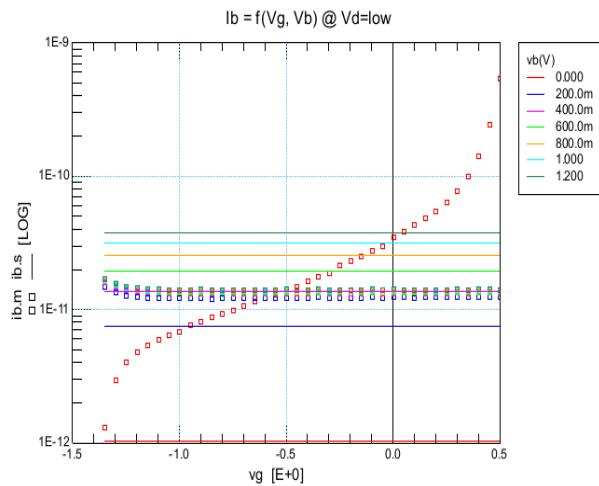


idvd_vth_vbmin, Vb = 1.2V, T = -40°C

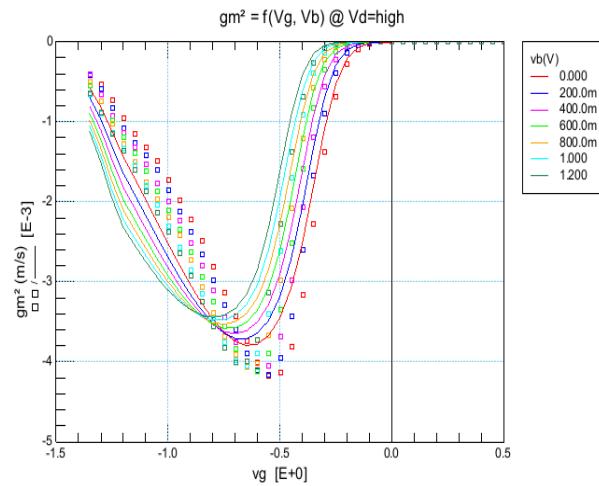
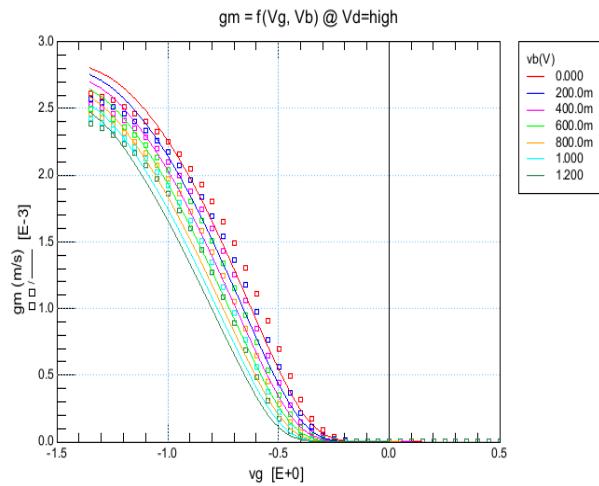
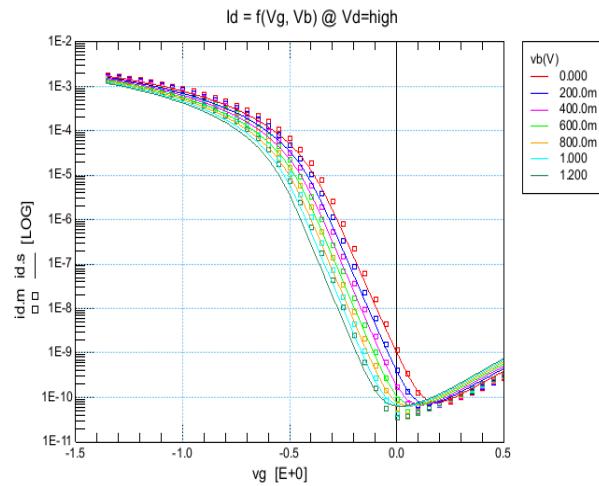
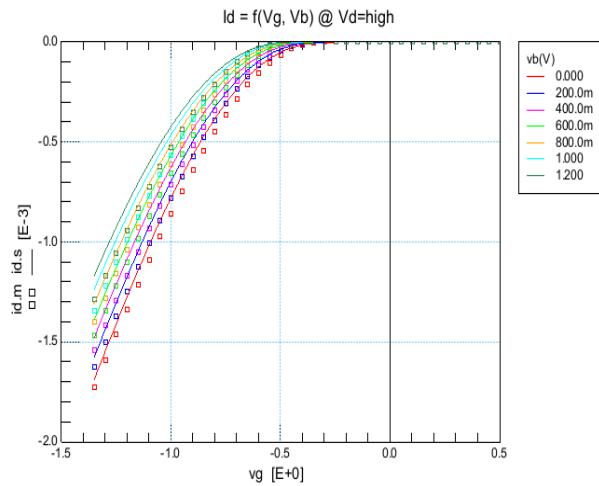


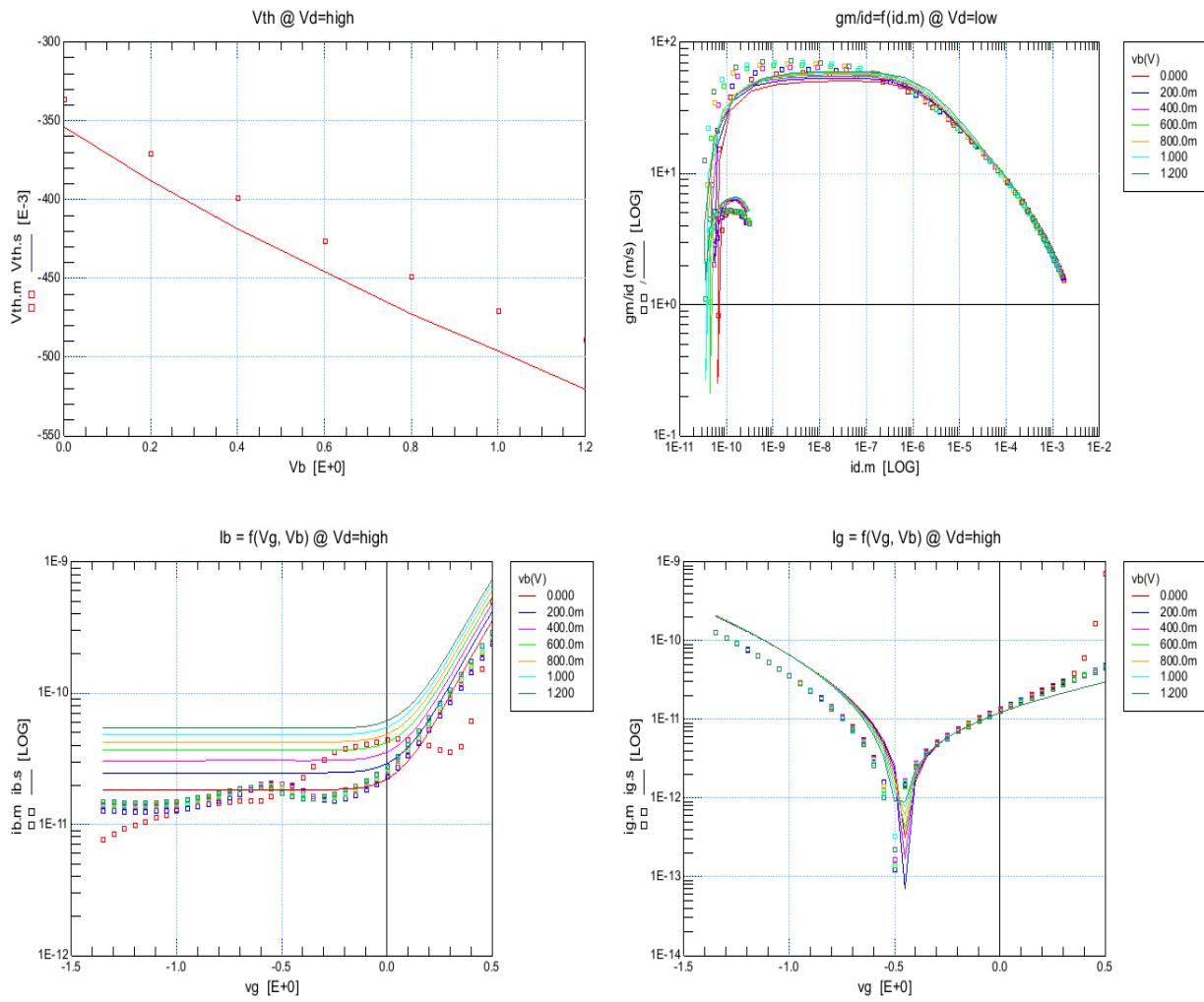
idvg, Vd = -0.05V, T = 70°C



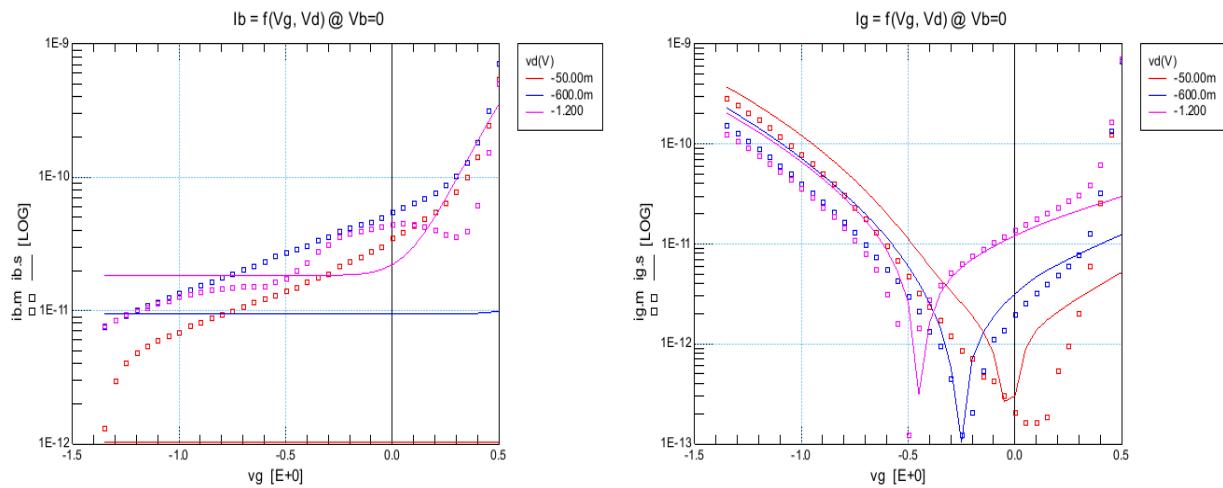


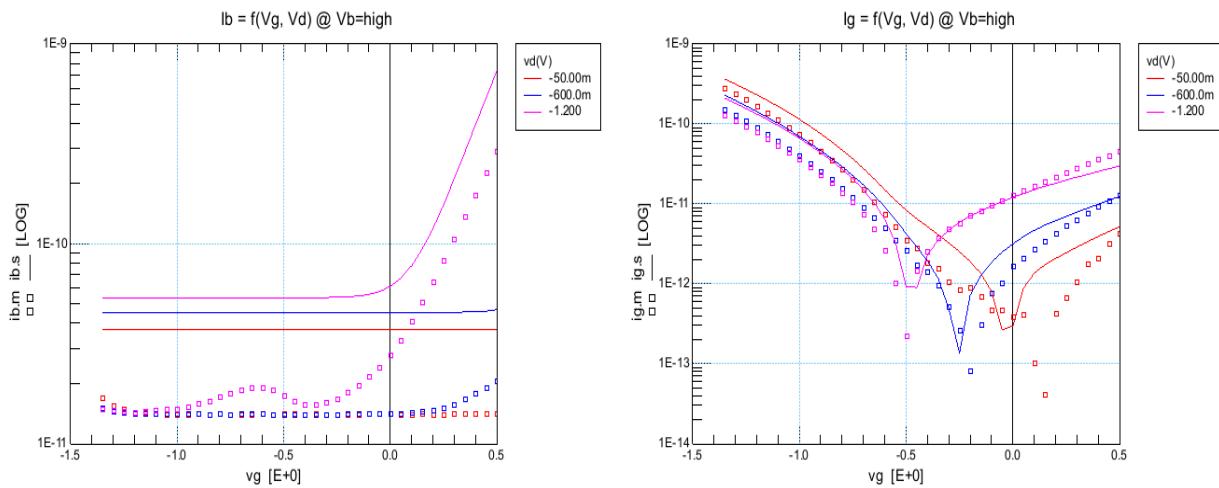
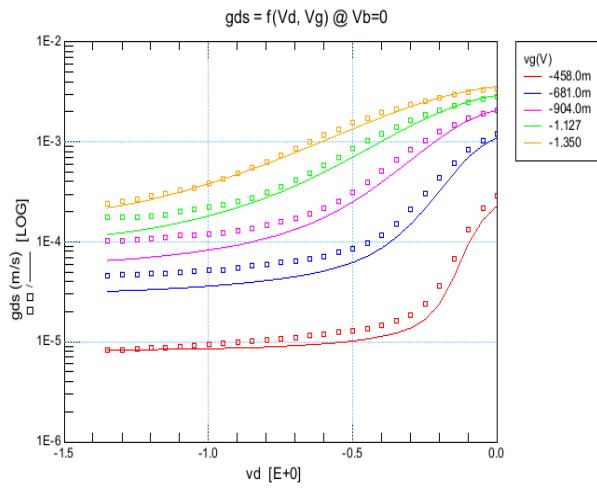
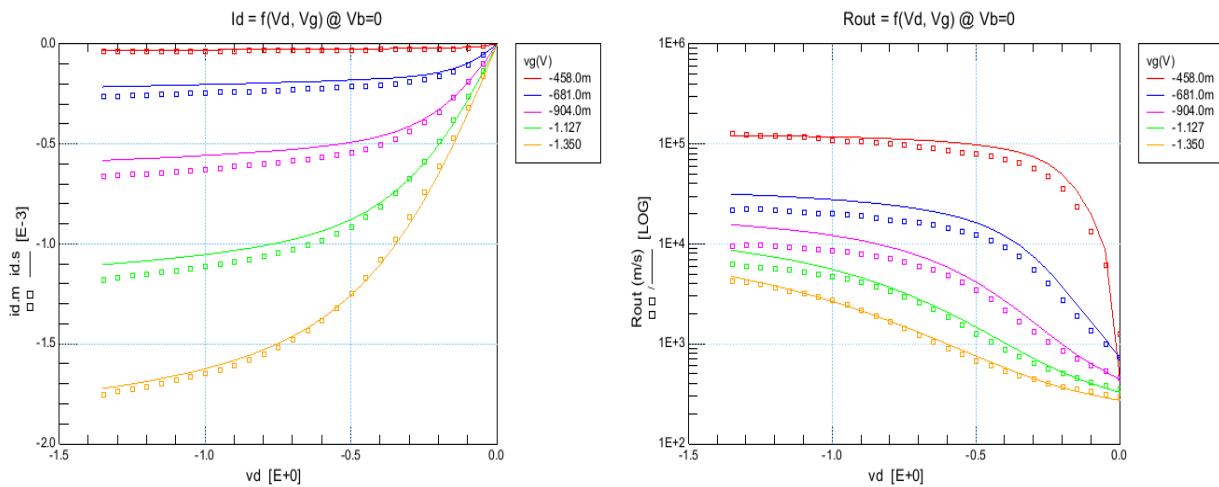
$i_{dvg}, V_d = -1.2V, T = 70^\circ\text{C}$

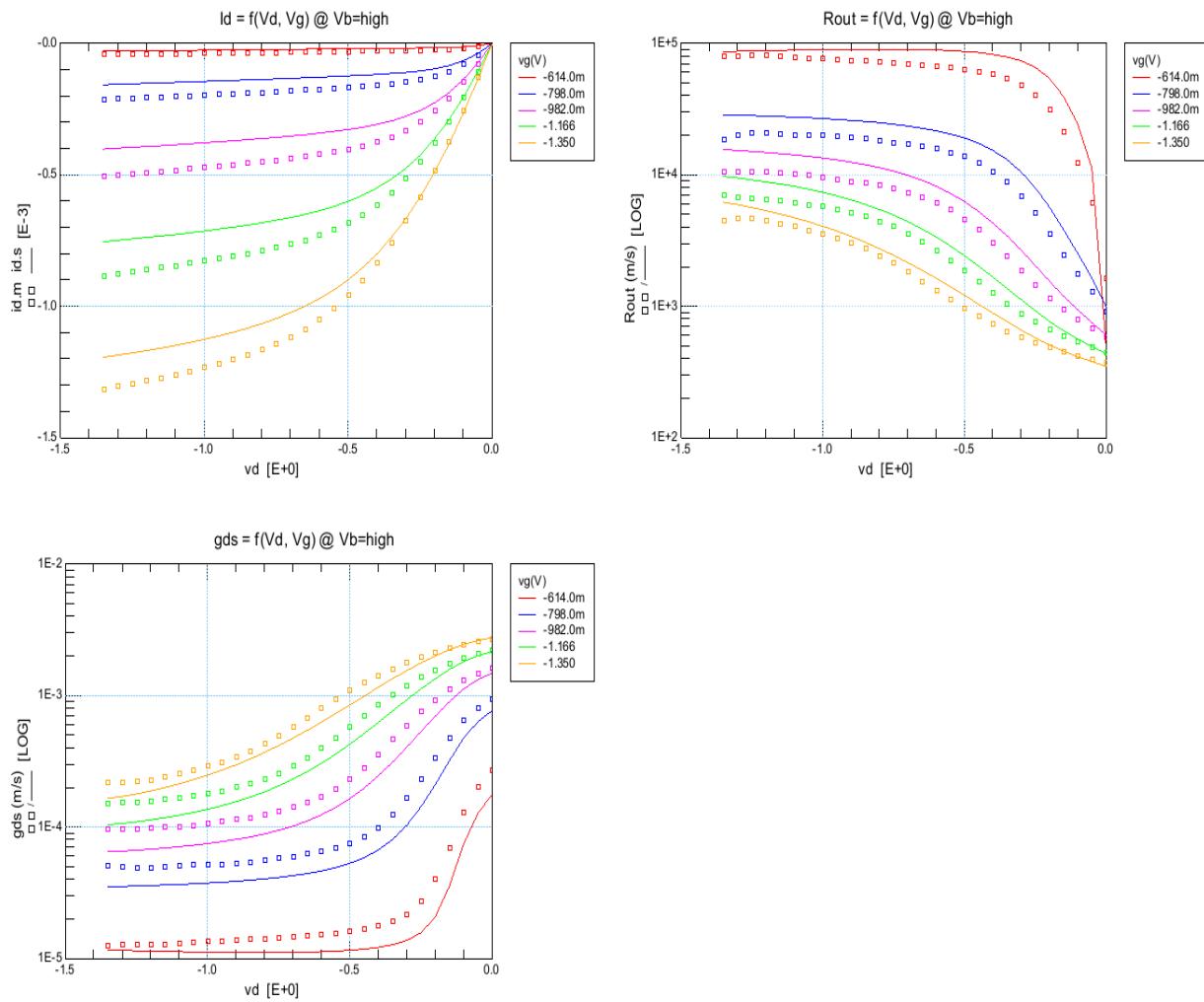
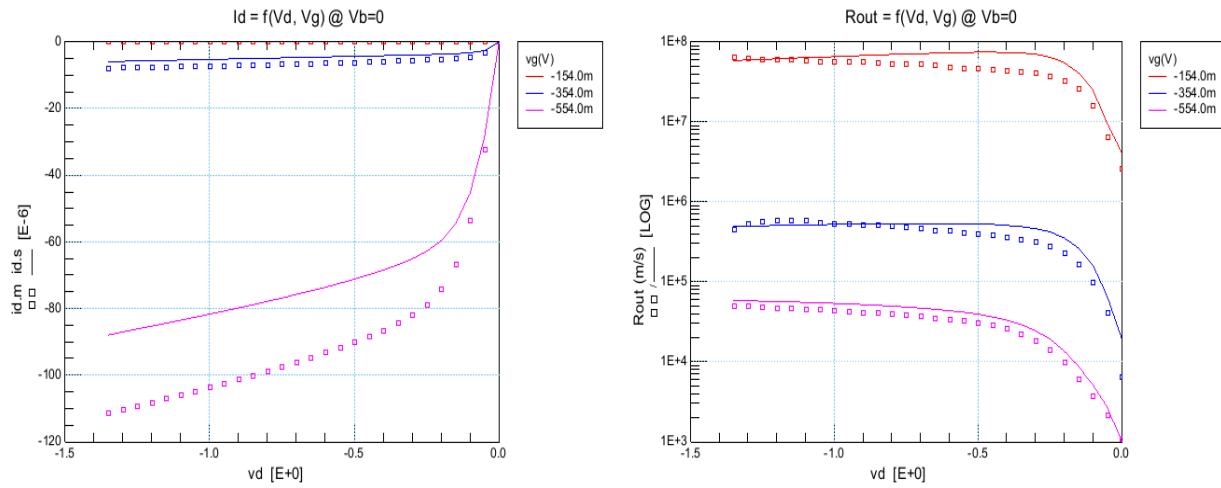


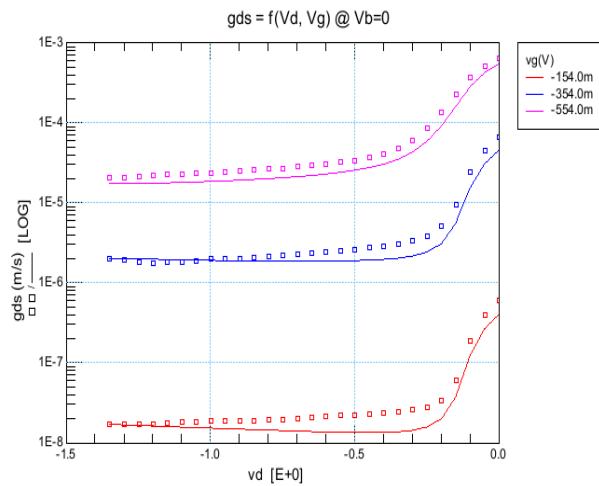


idvg, Ib, Ig, Vb = 0V, T = 70°C

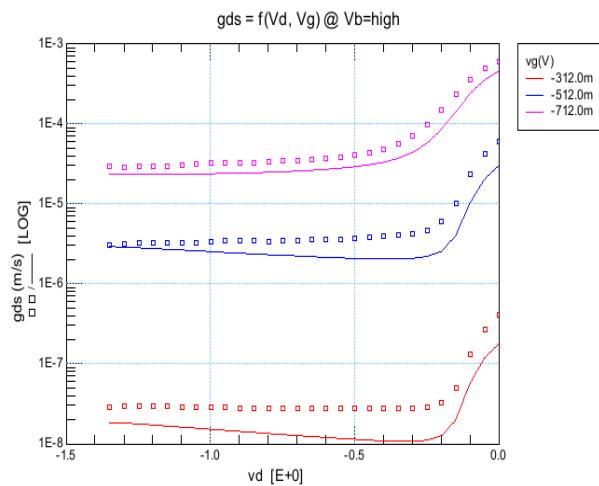
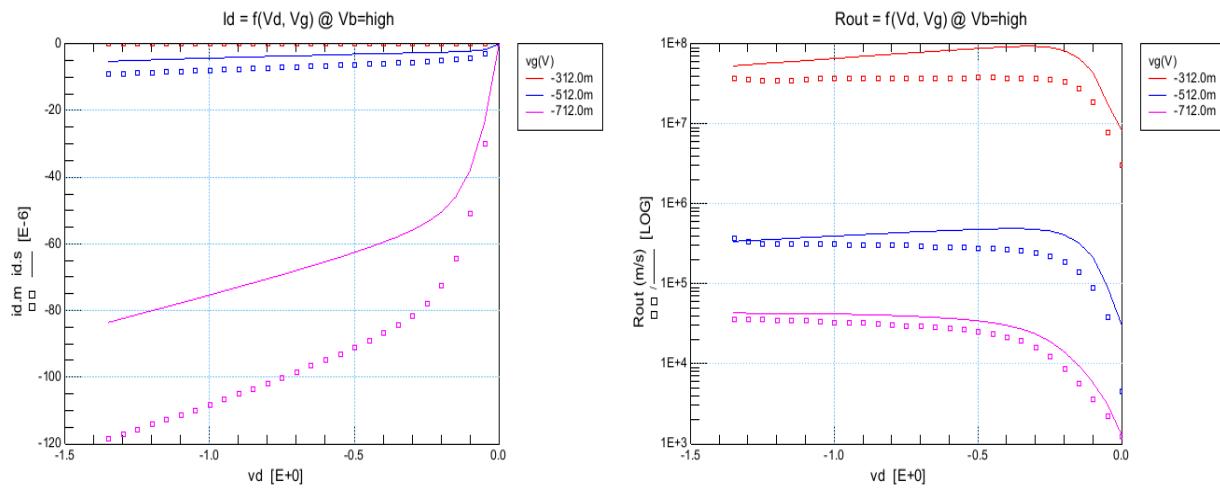


idvg, Ib,Ig, Vb = 1.2V, T = 70°C

idvd, Vb = 0V, T = 70°C


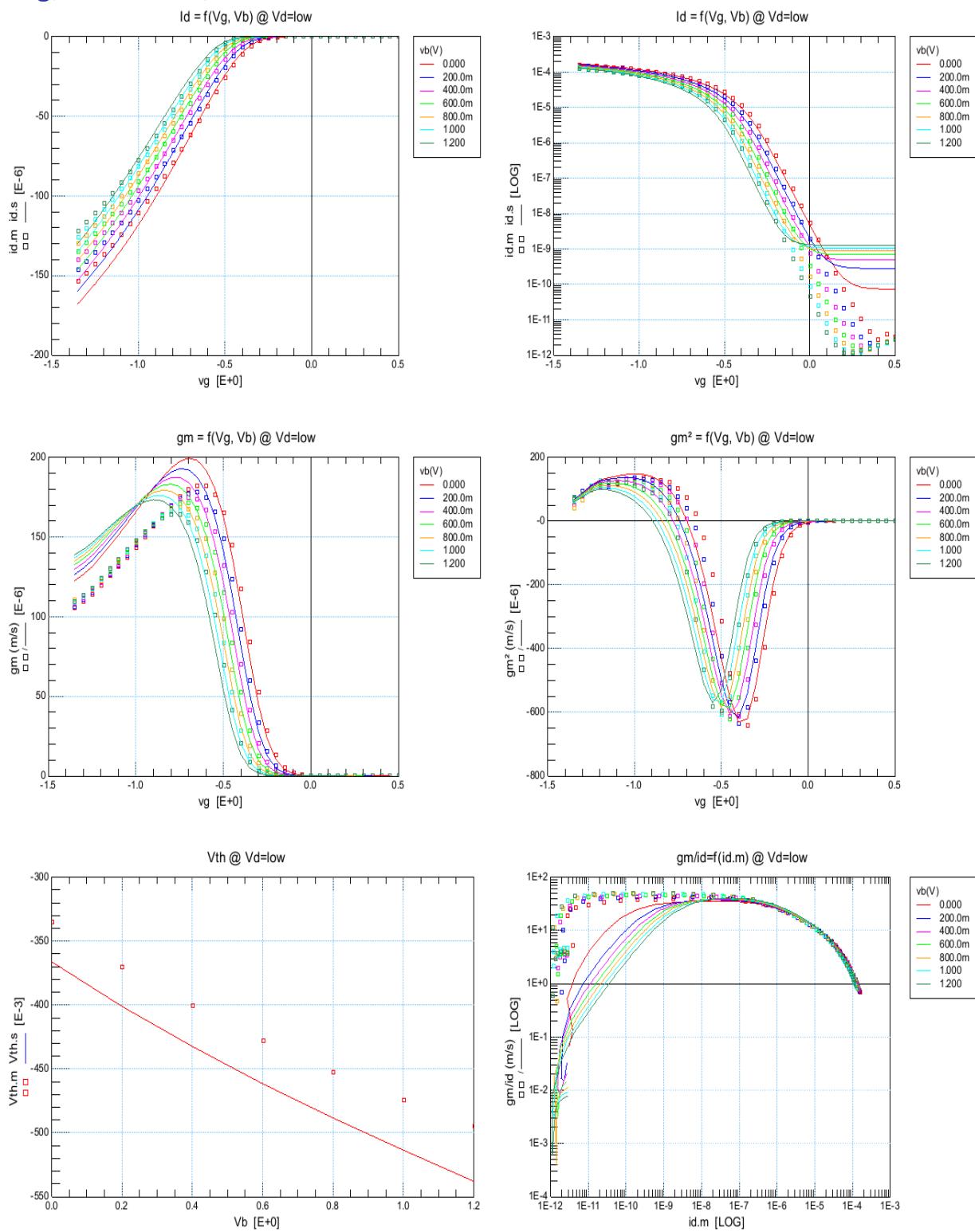
idvd_vbmin, Vb = 1.2V, T = 70°C**idvd_vth, Vb = 0V, T = 70°C**

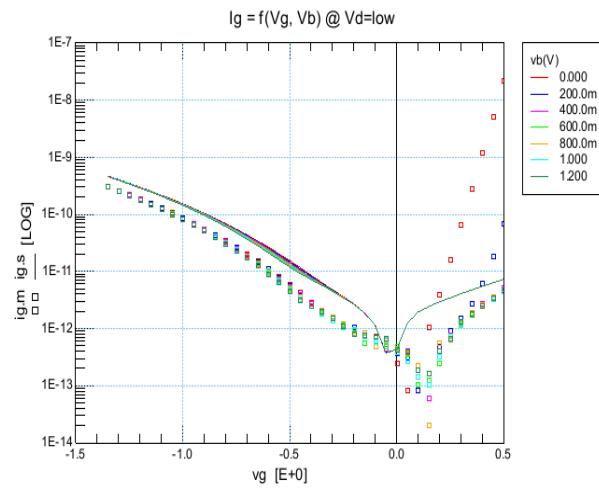
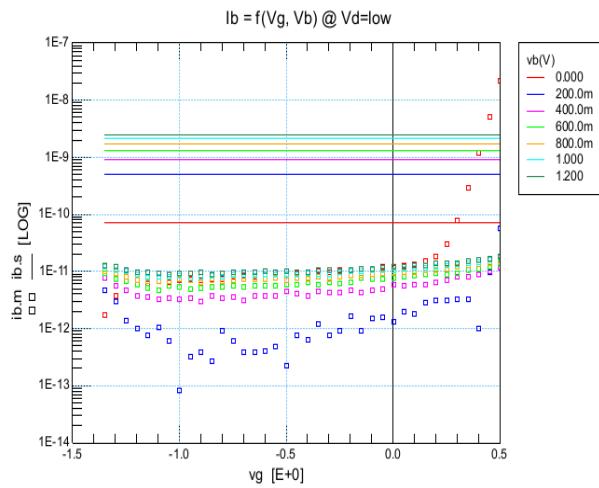


idvd_vth_vbmin, Vb = 1.2V, T = 70°C

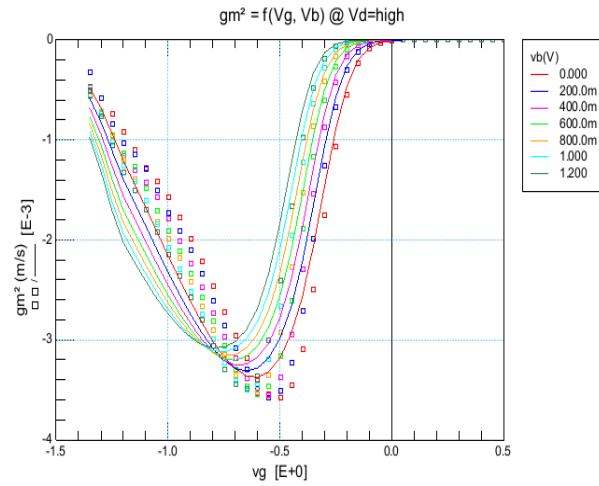
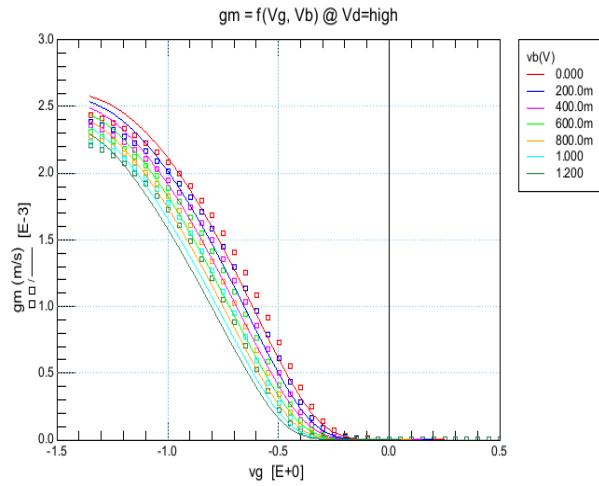
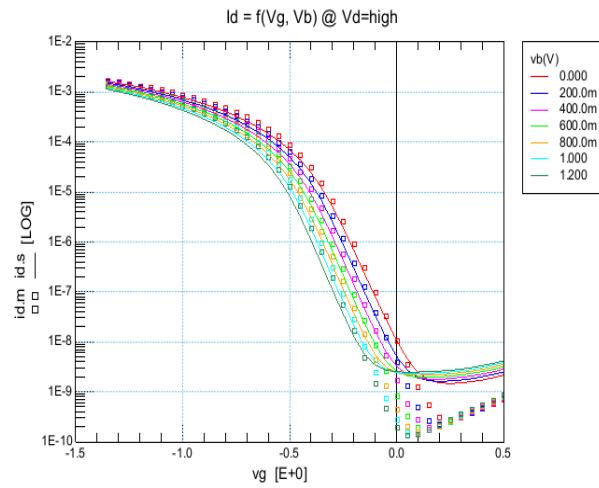
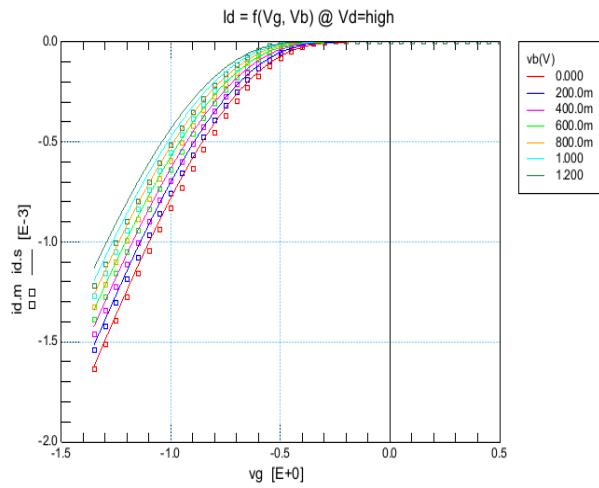


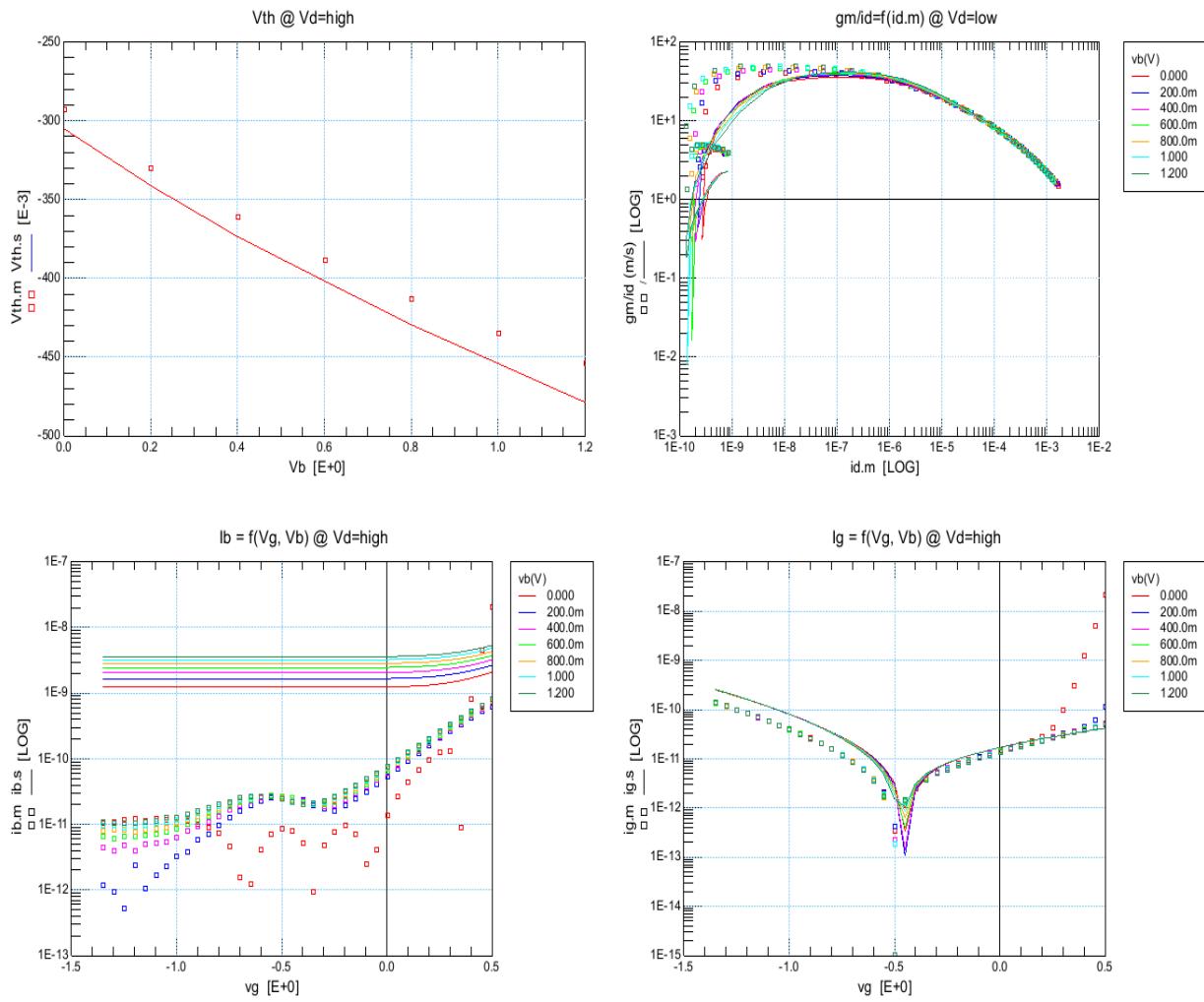
idvg, Vd = -0.05V, T = 125°C



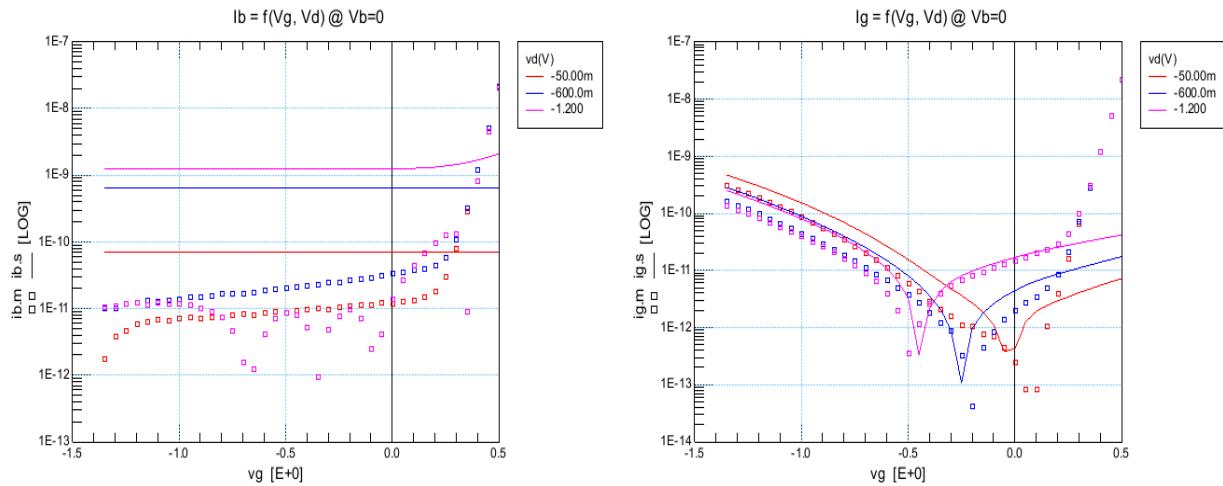


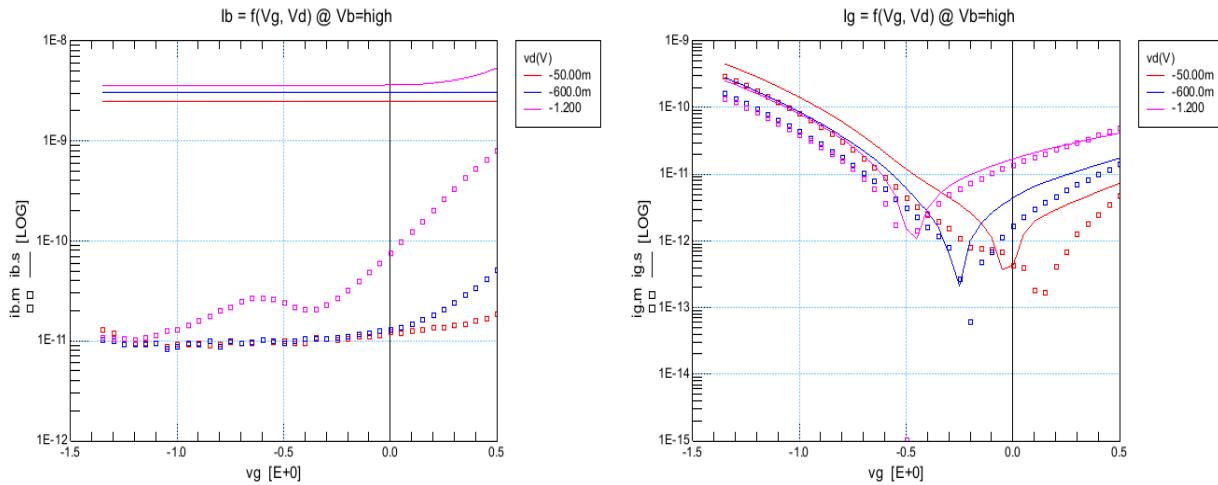
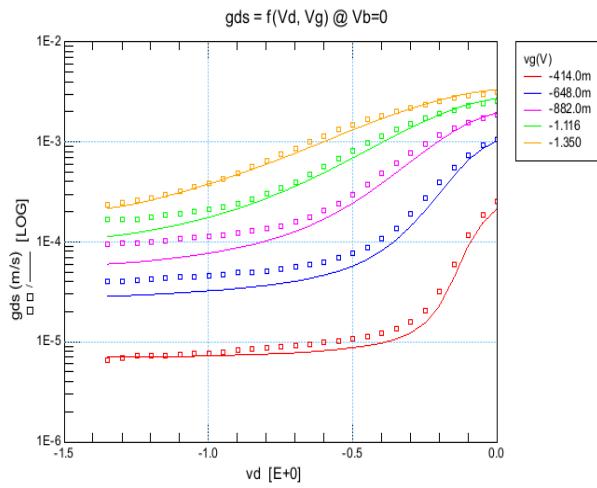
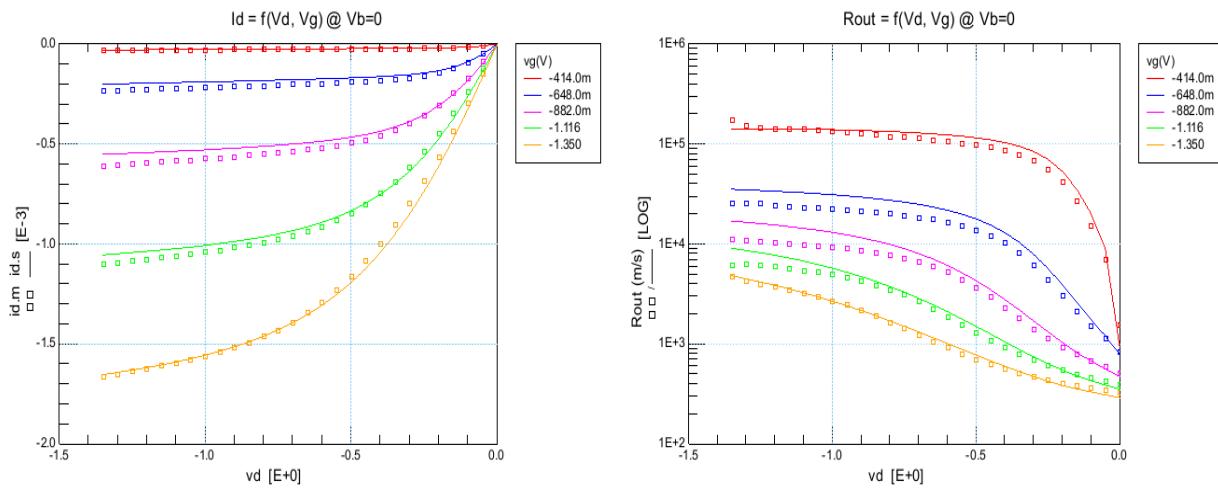
$i_{dvg}, V_d = -1.2V, T = 125^\circ\text{C}$

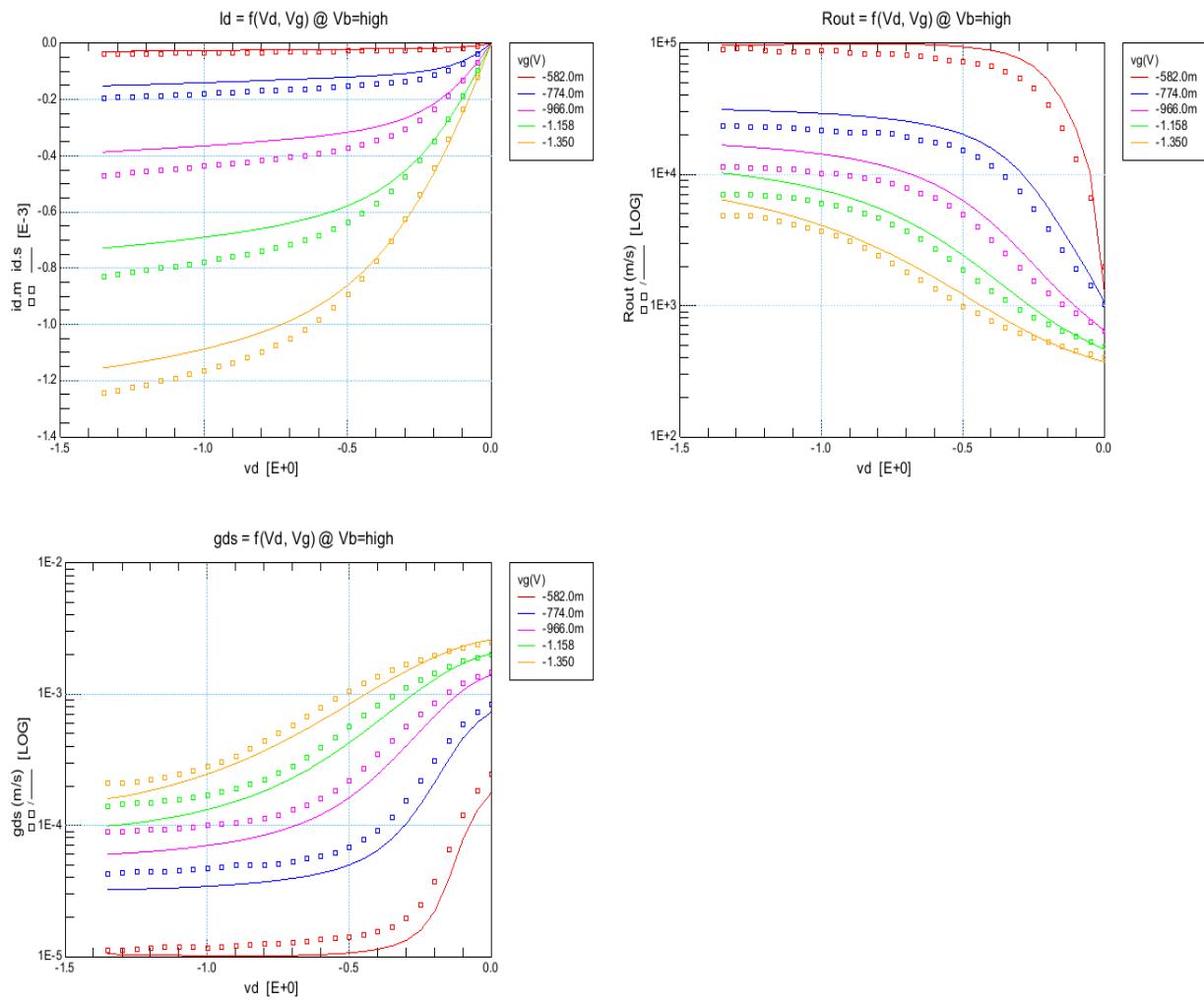
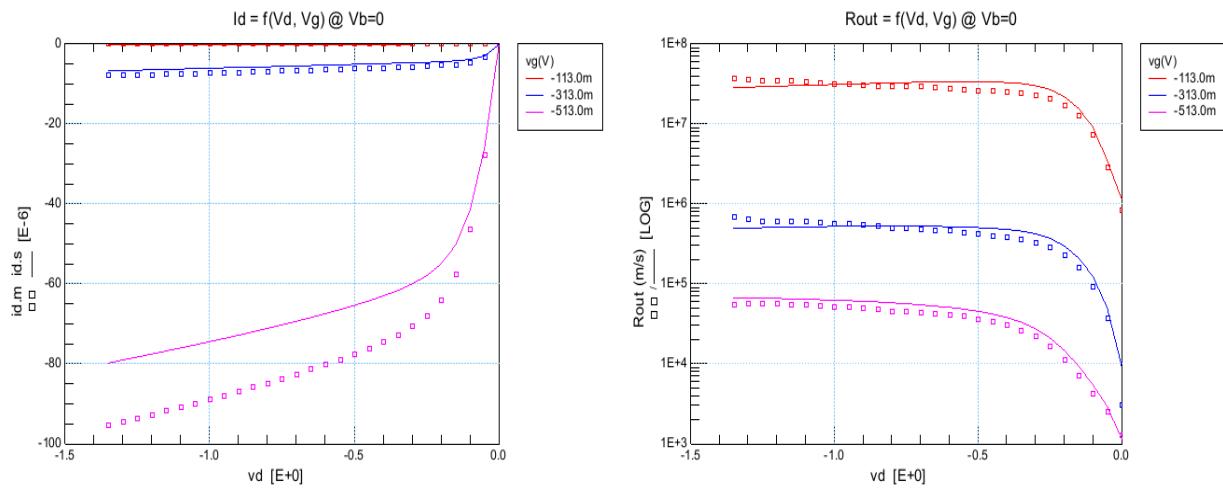


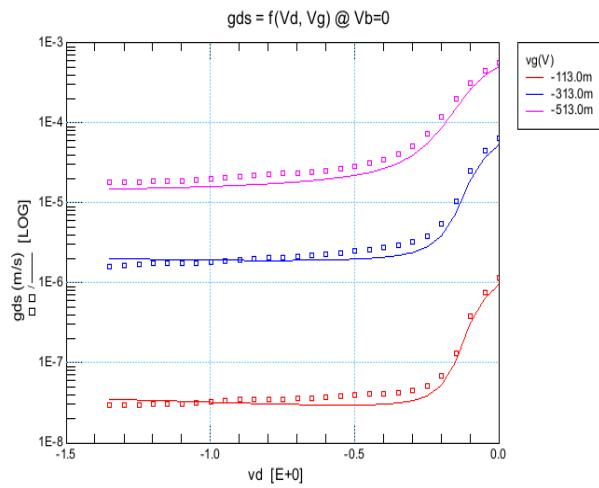


idvg, Ib,Ig, Vb = 0V, T = 125°C

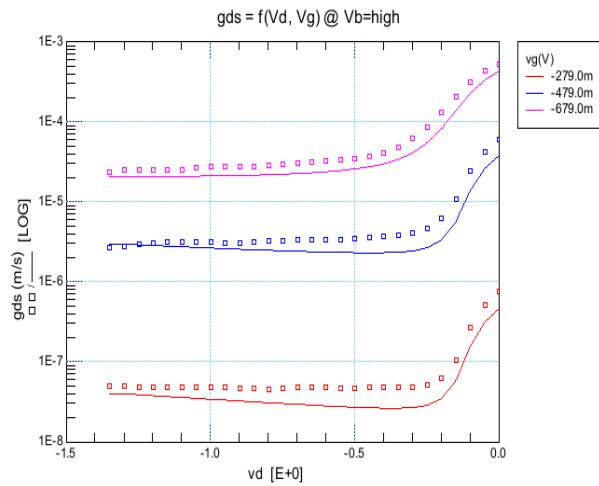
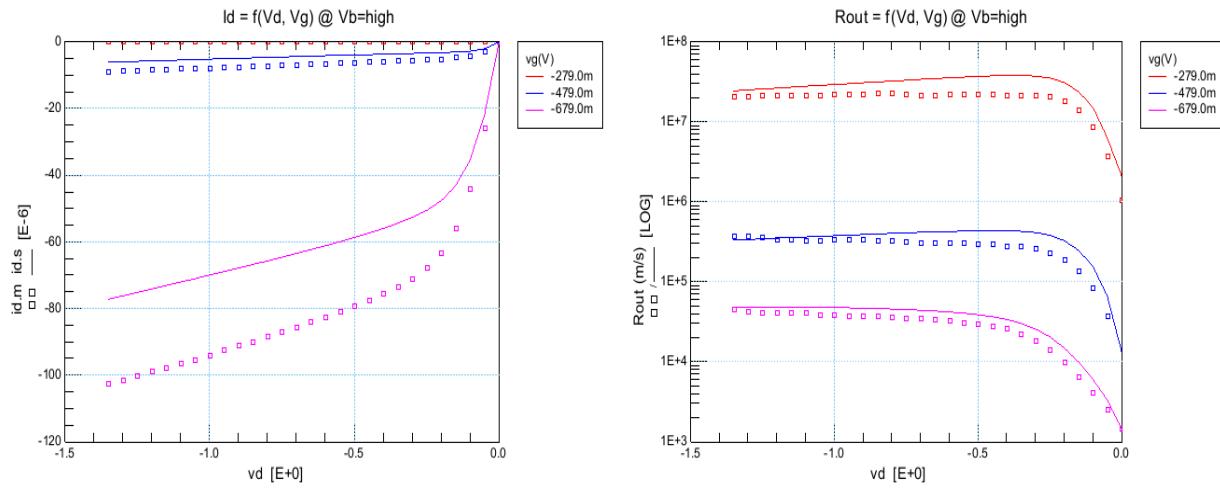


idvg, Ib,Ig, Vb = 1.2V, T = 125°C

idvd, Vb = 0V, T = 125°C


idvd_vbmin, Vb = 1.2V, T = 125°C**idvd_vth, Vb = 0V, T = 125°C**

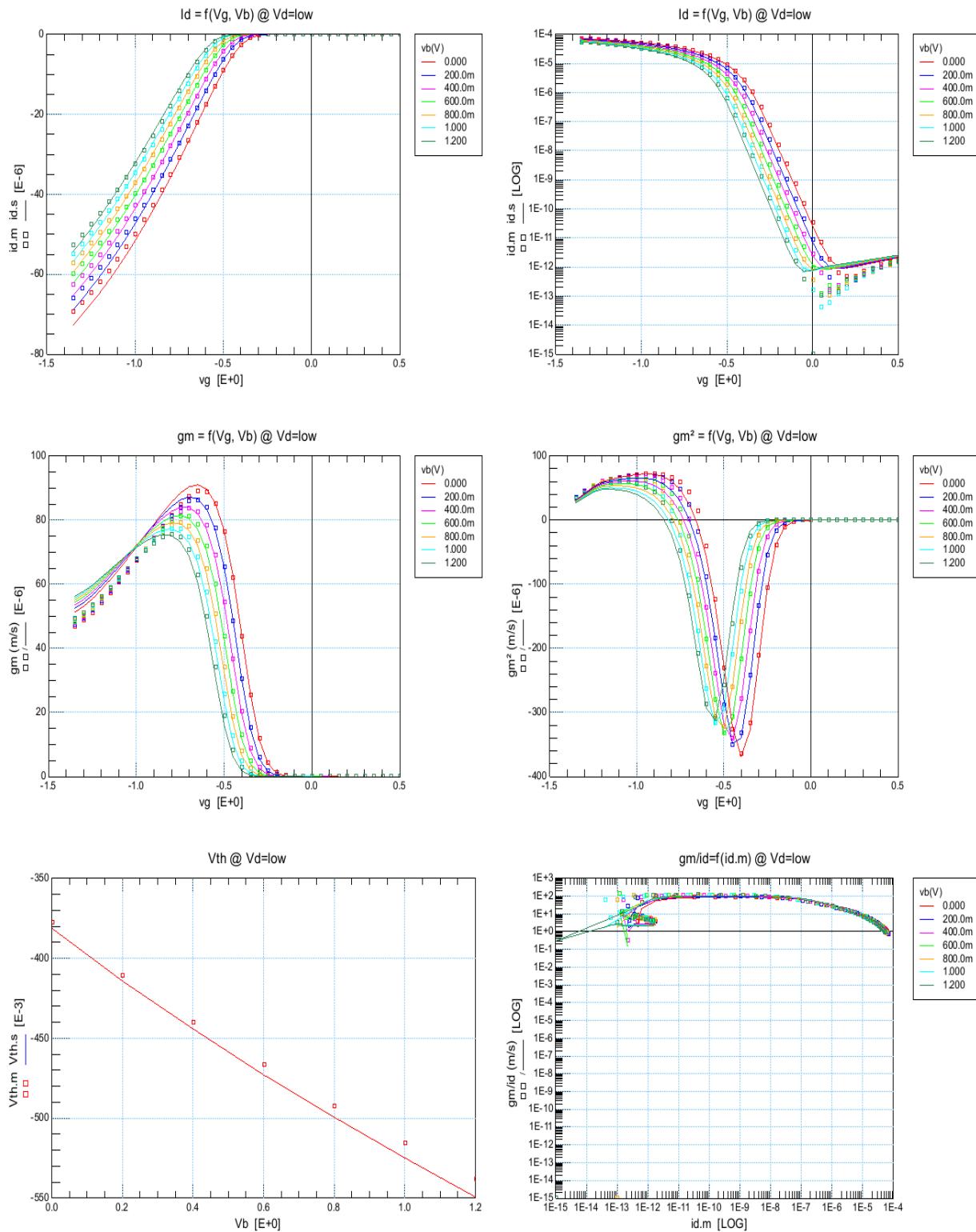


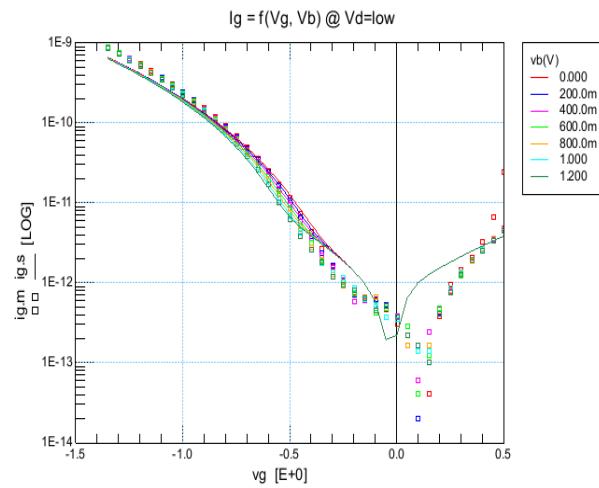
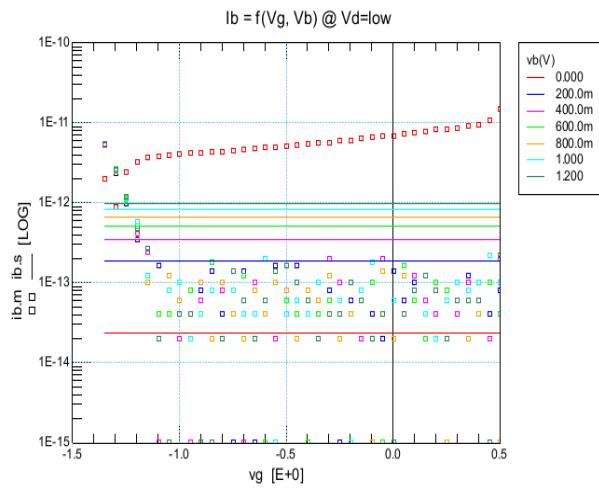
idvd_vth_vbmin, Vb = 1.2V, T = 125°C



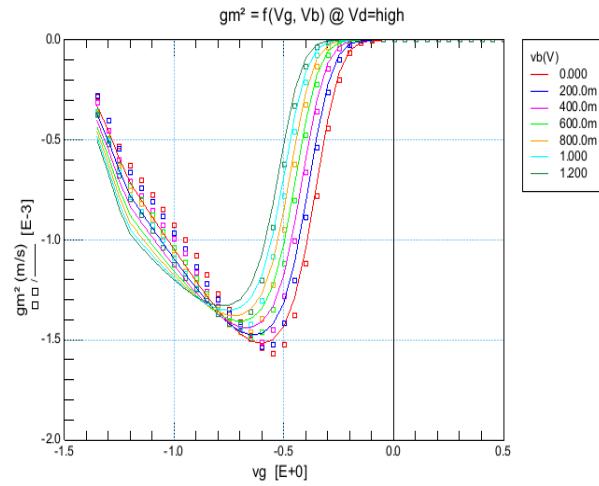
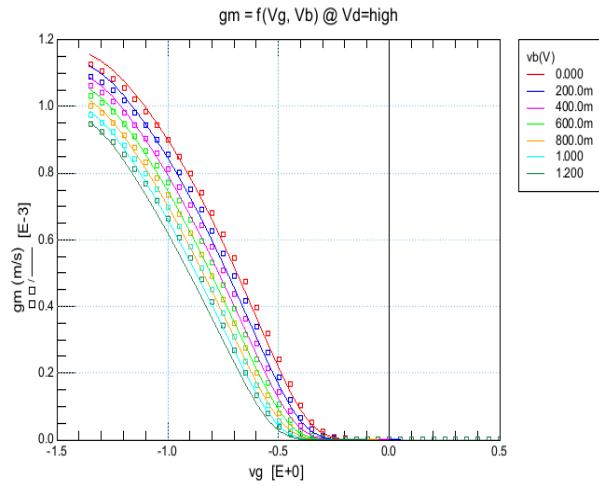
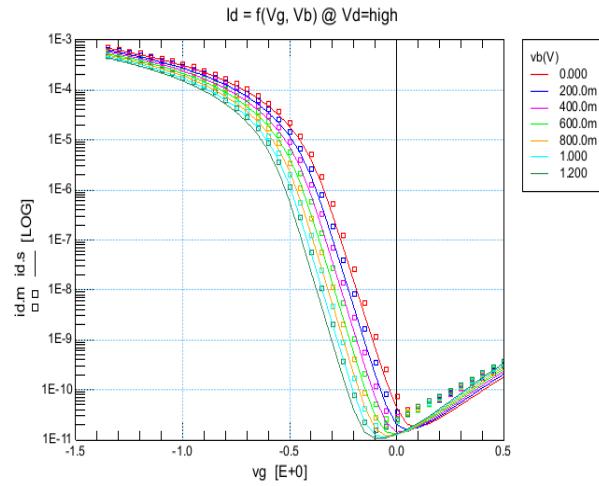
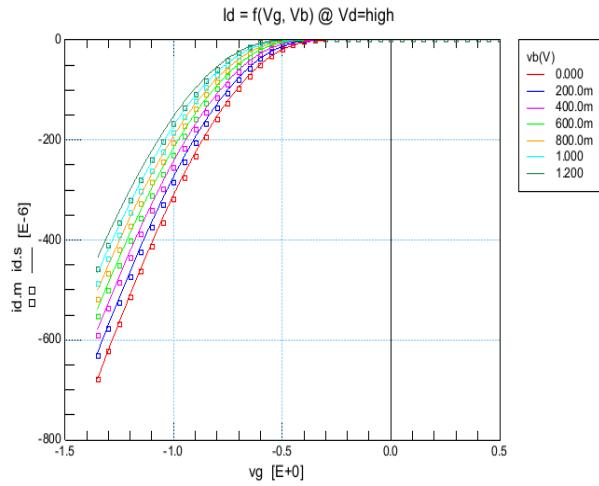
4.8 W10u0_L0u5_S549_1

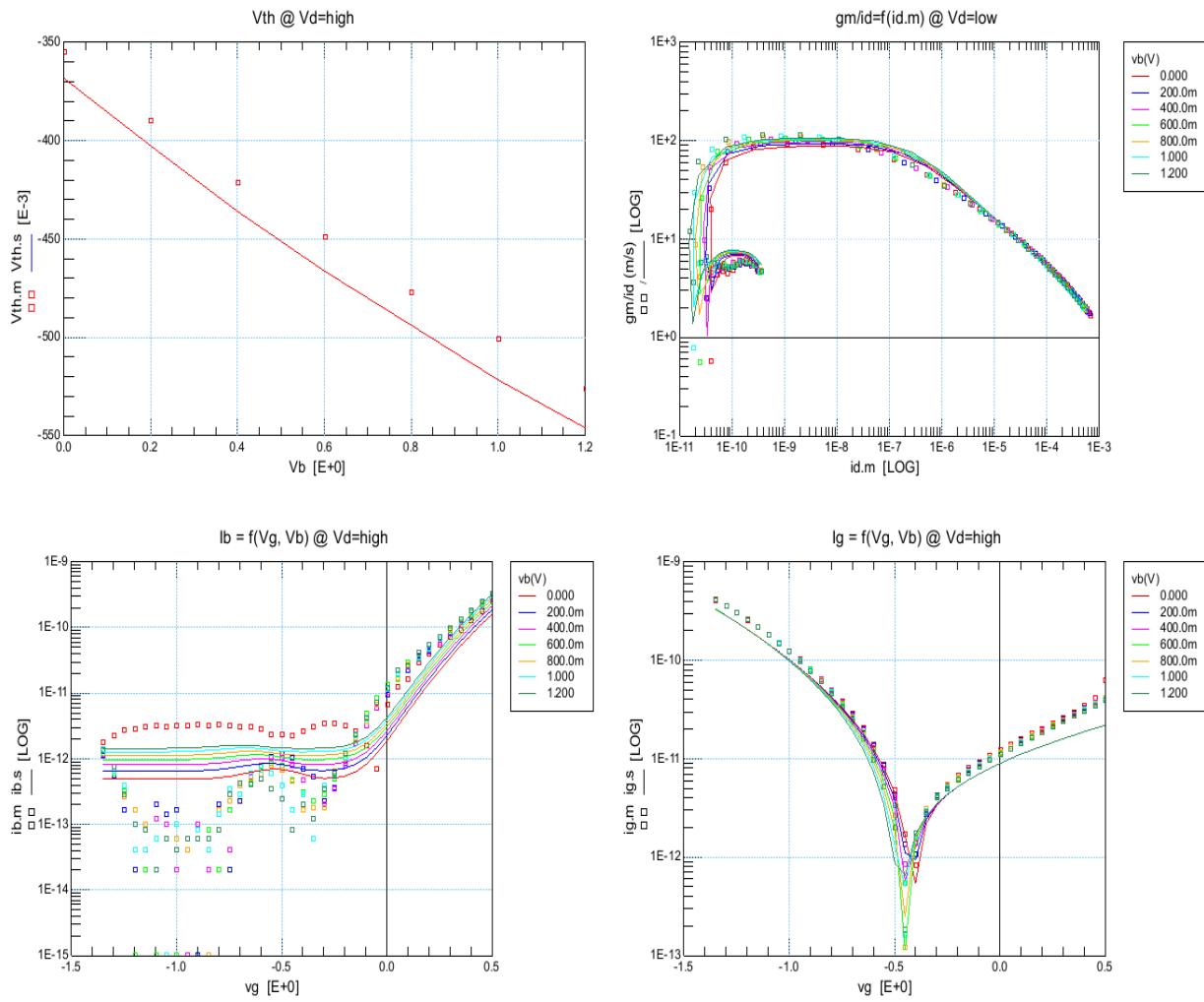
$idv_g, V_d = -0.05V, T = 27^\circ C$



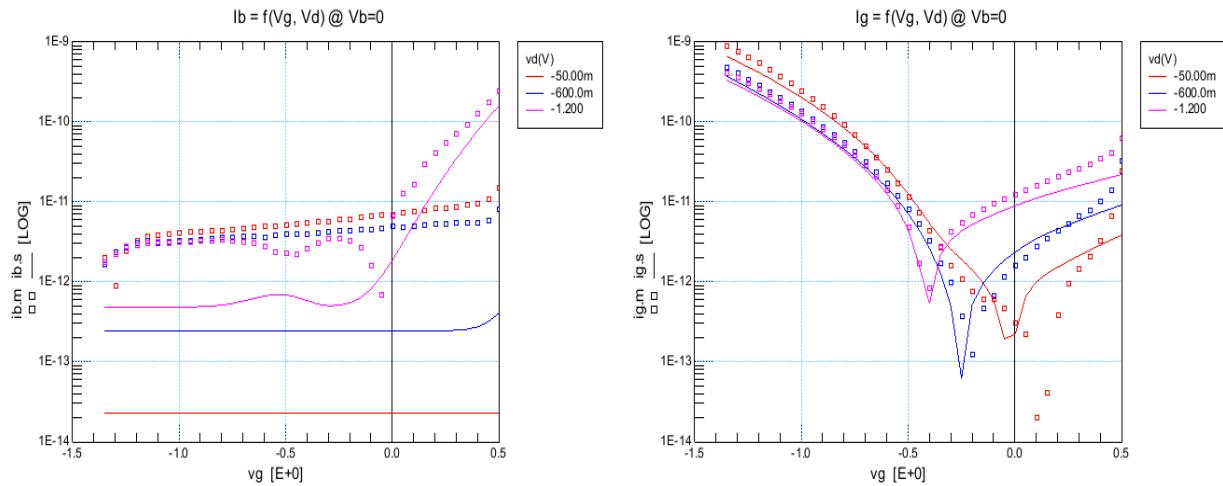


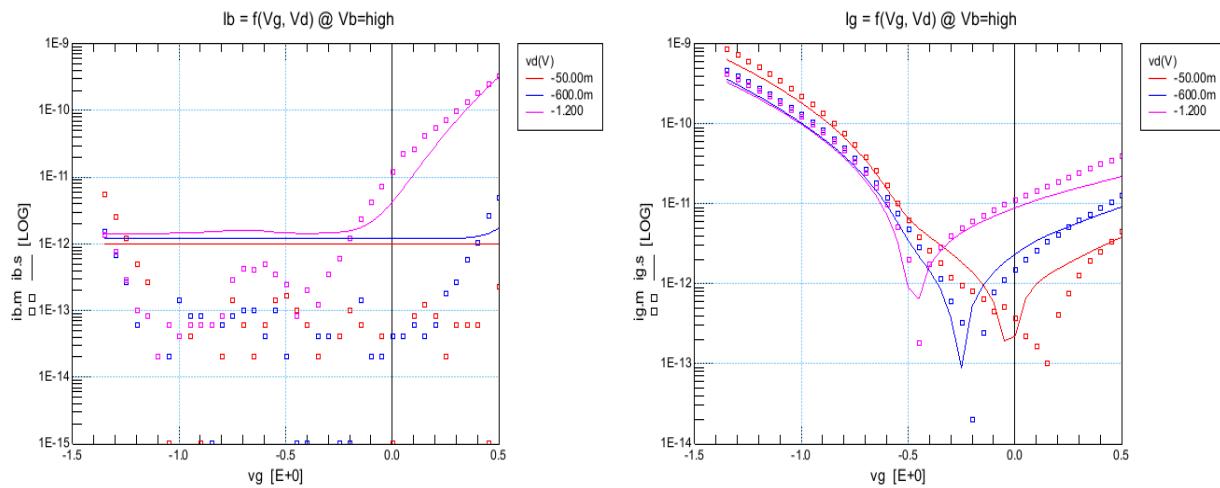
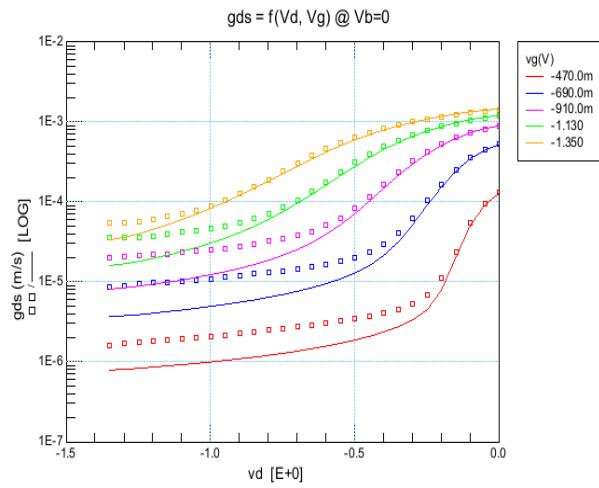
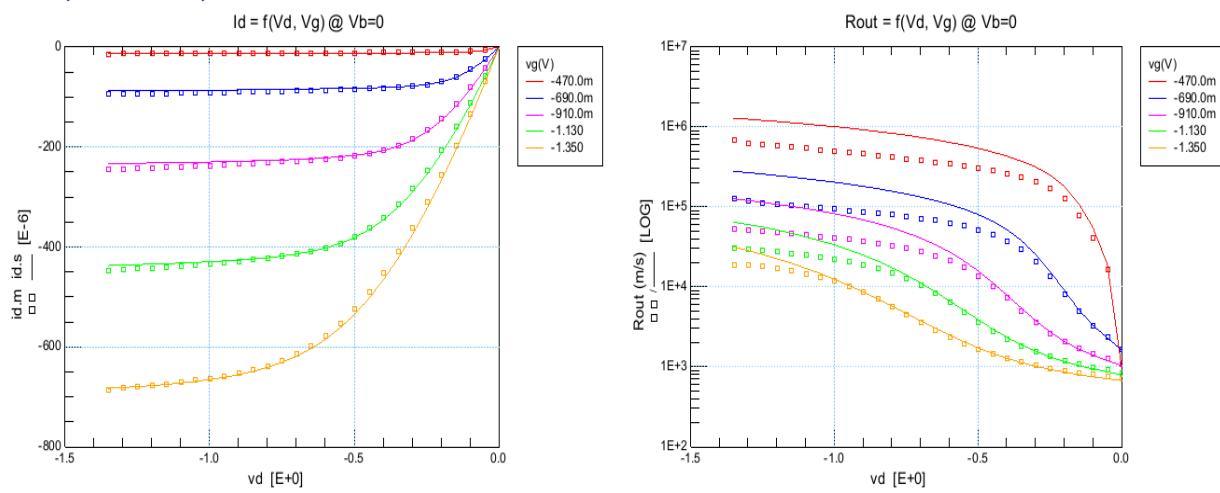
i_{dvg} , $V_d = -1.2V$, $T = 27^\circ\text{C}$

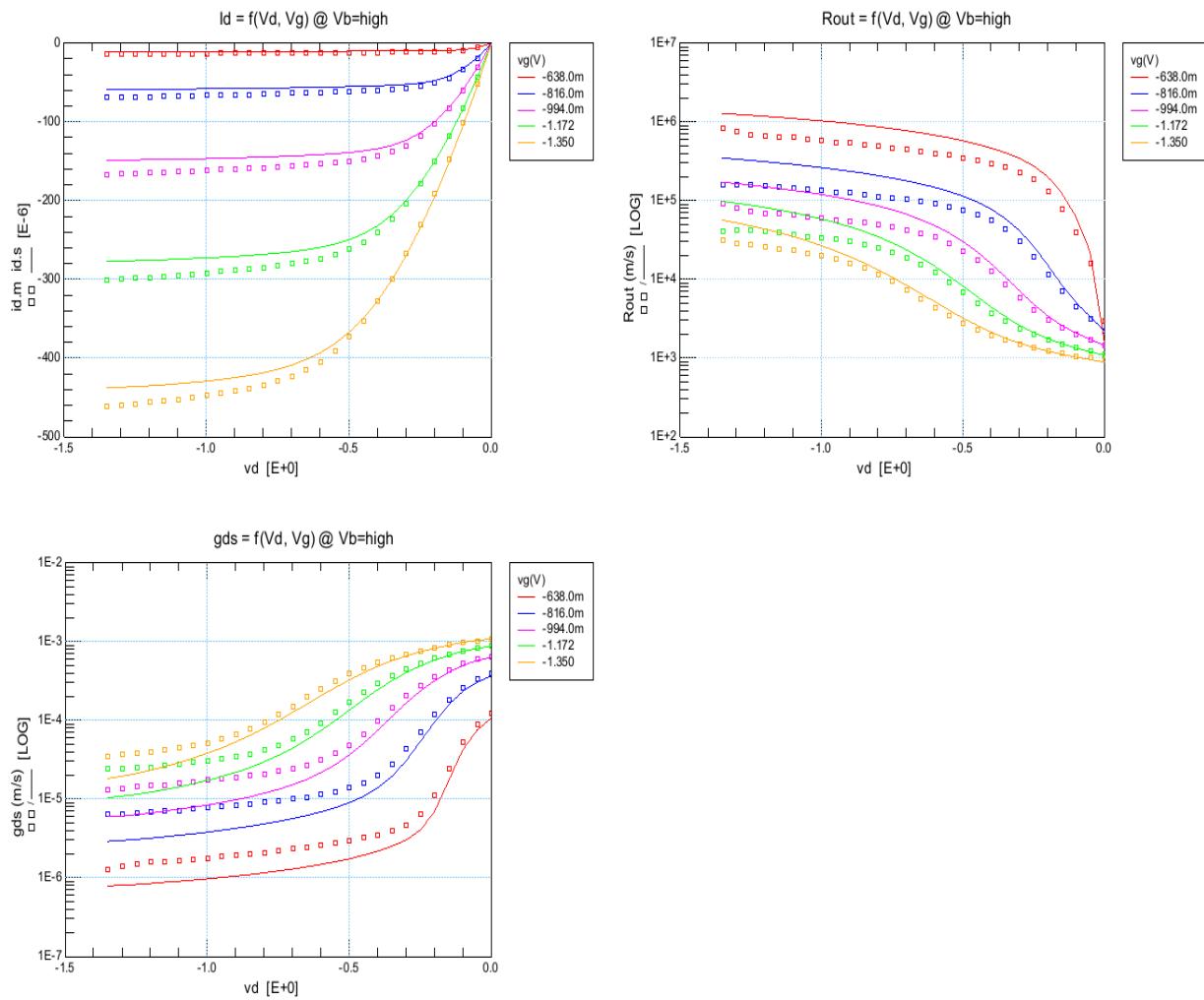
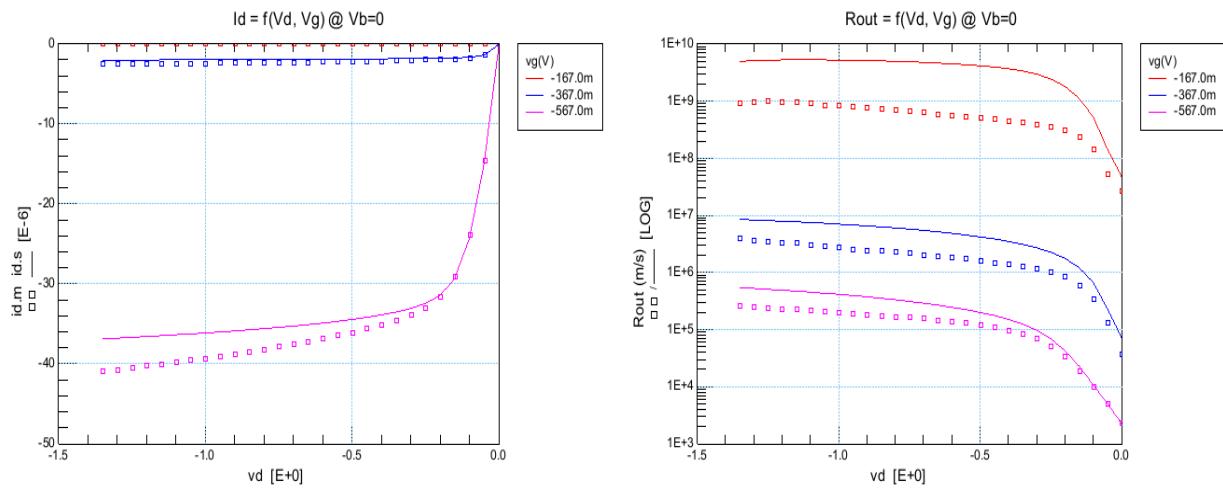


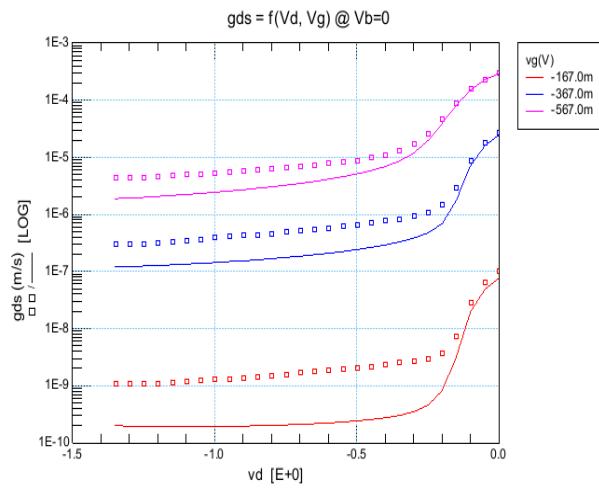


idvg, Ib,Ig, Vb = 0V, T = 27°C

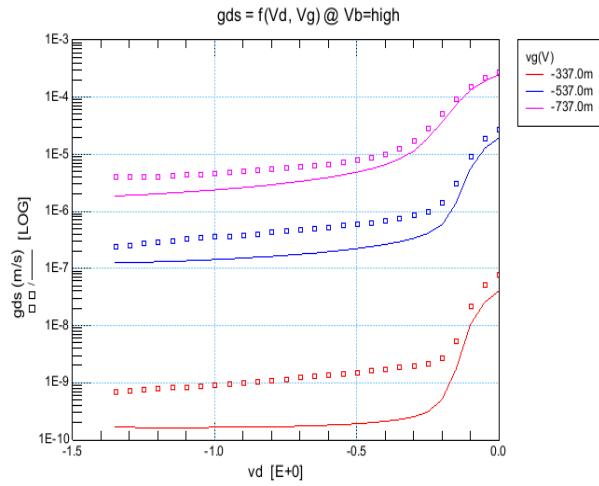
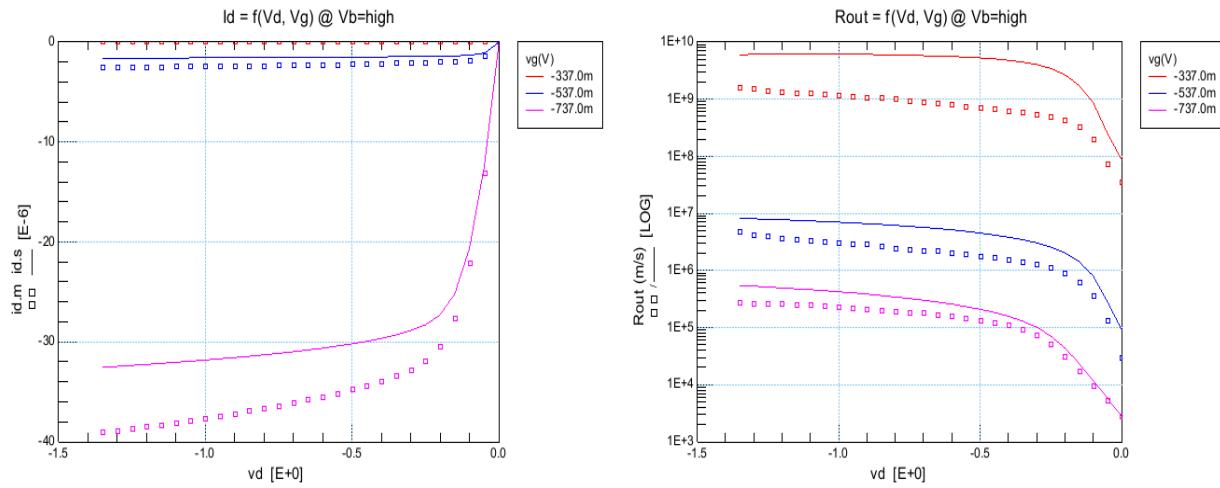


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C**idvd_vth, Vb = 0V, T = 27°C**

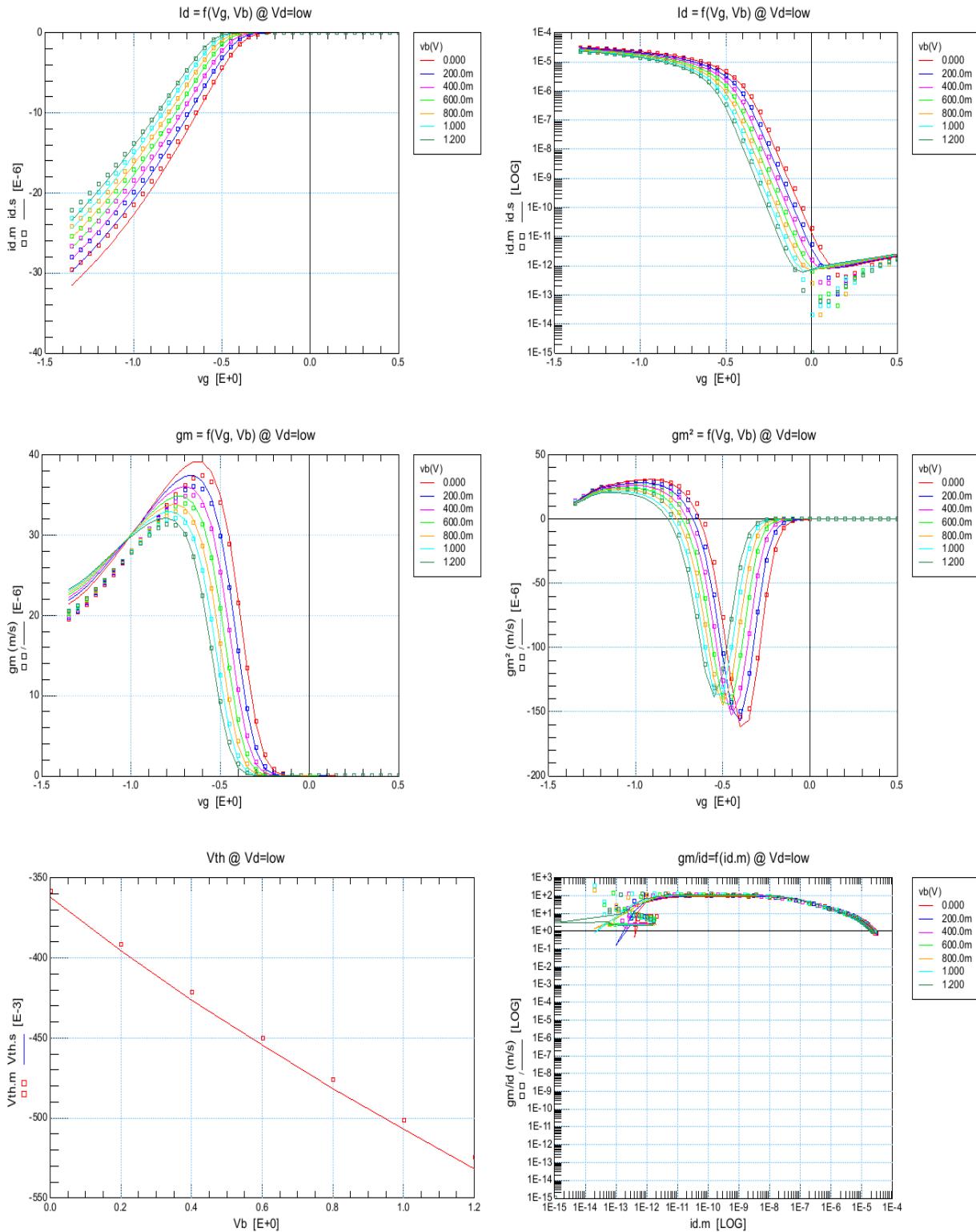


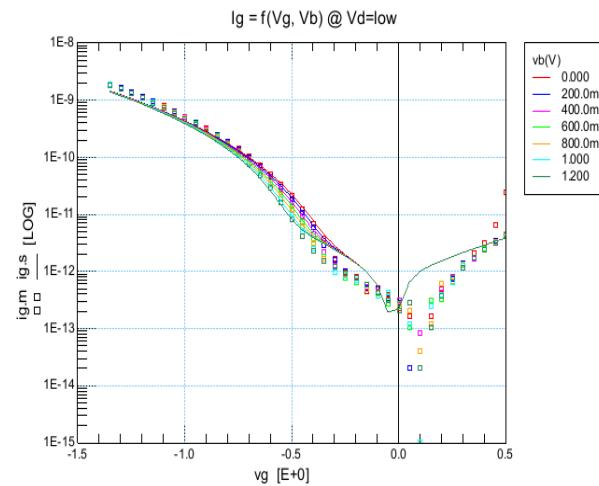
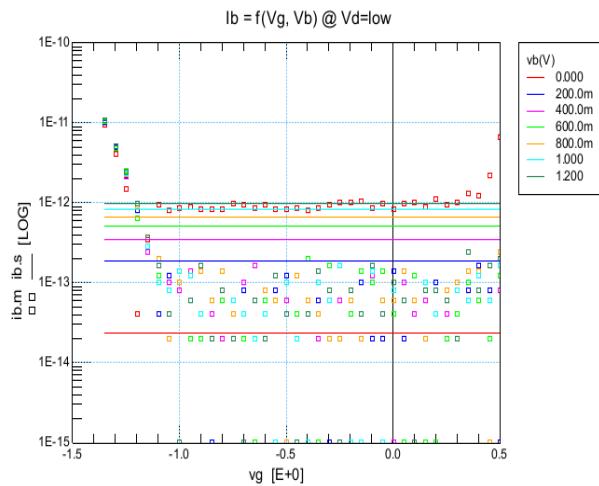
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



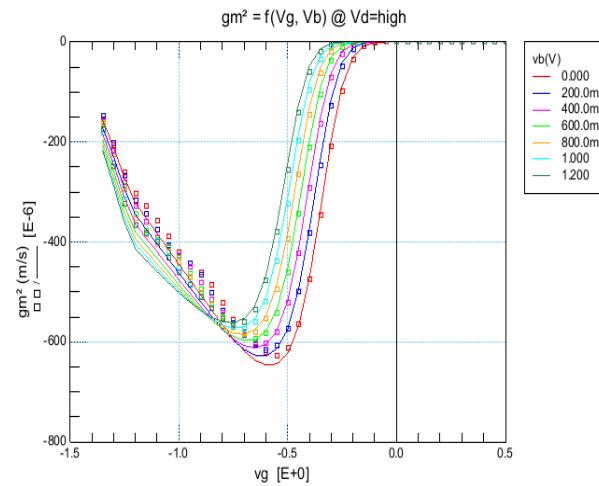
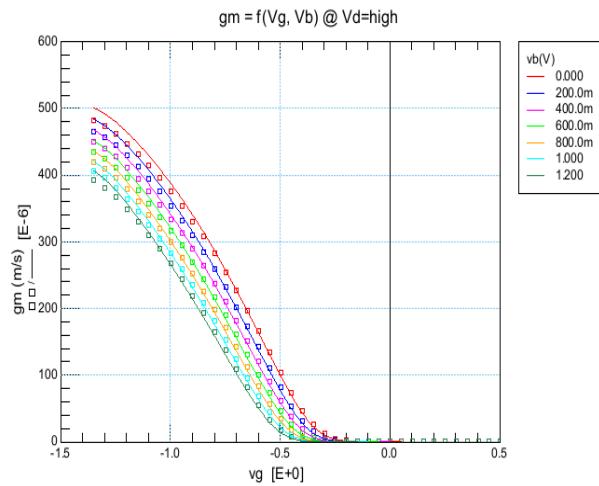
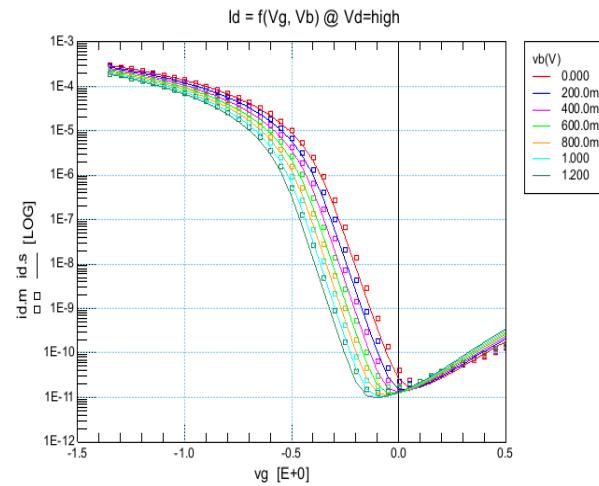
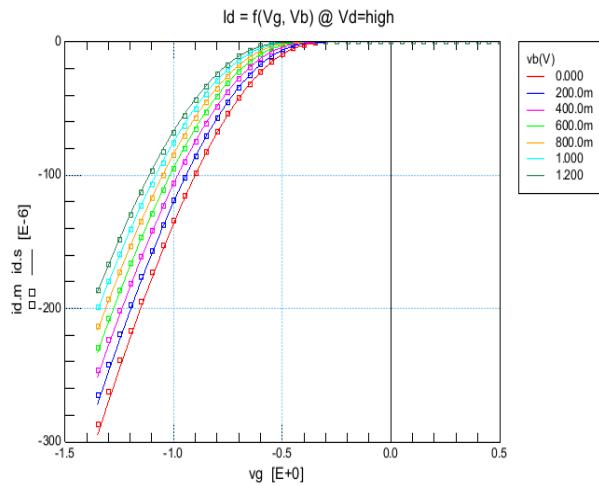
4.9 W10u0_L1u2_S549_2

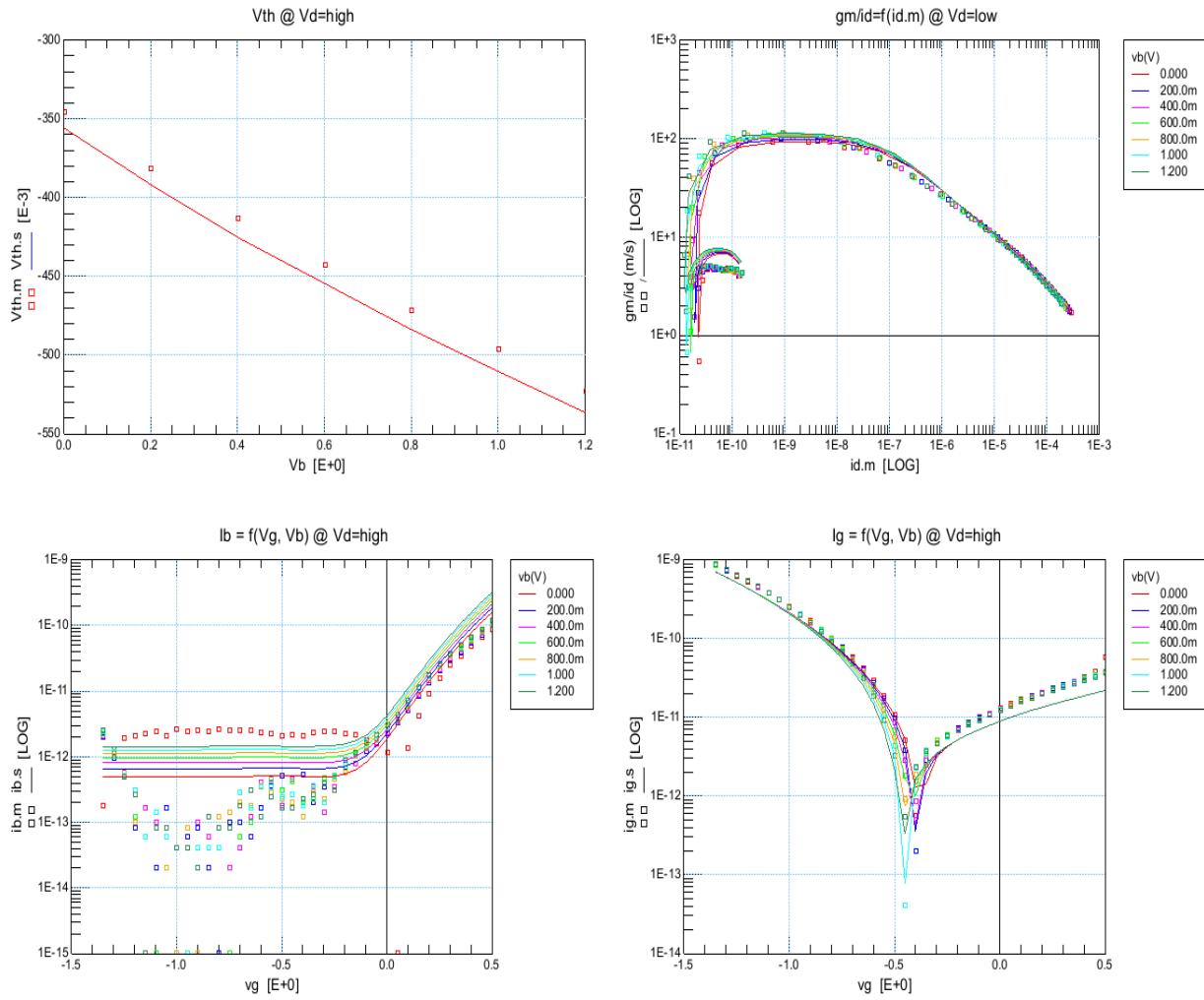
$idv_g, V_d = -0.05V, T = 27^\circ C$



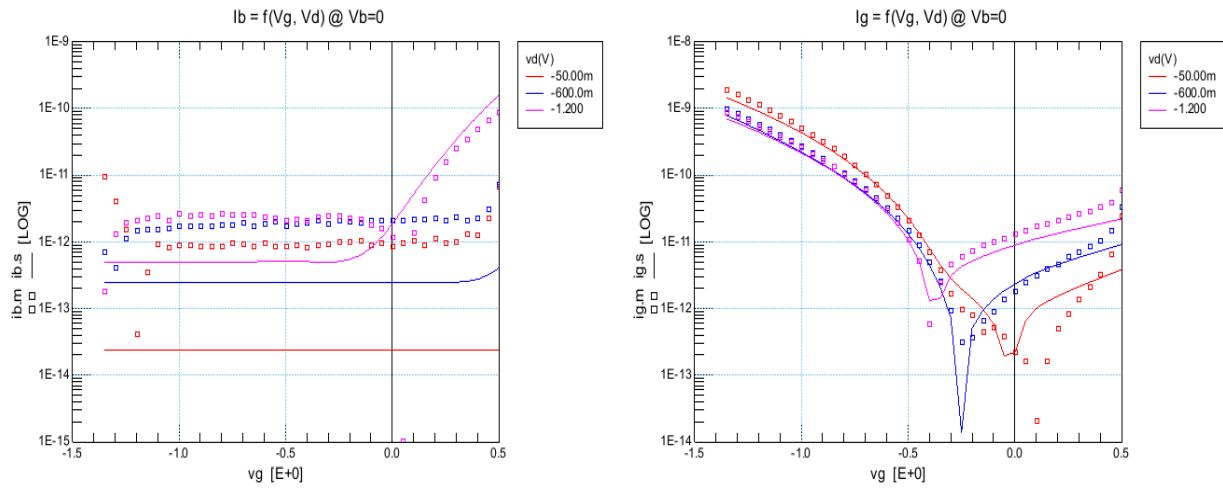


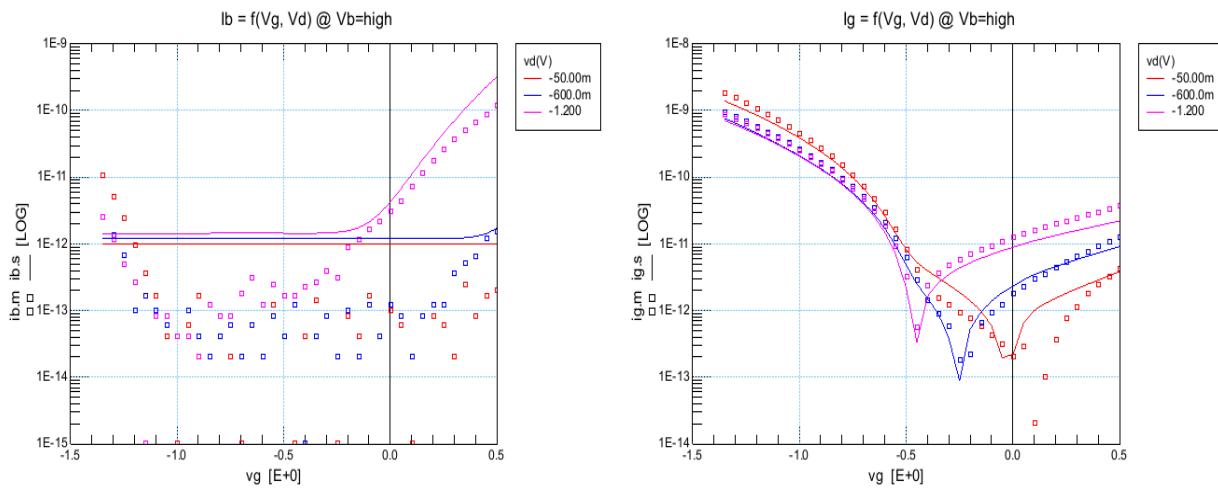
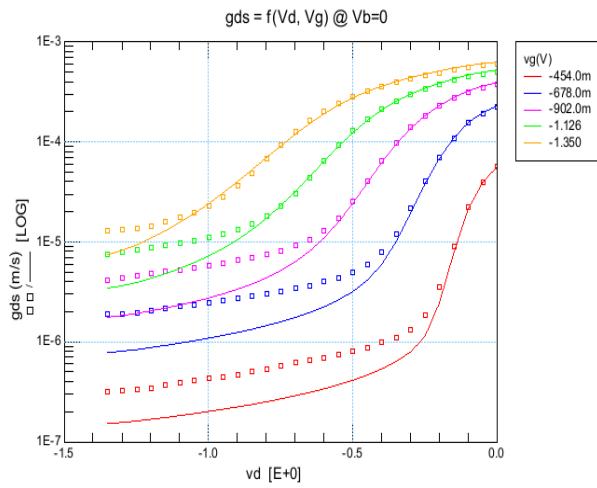
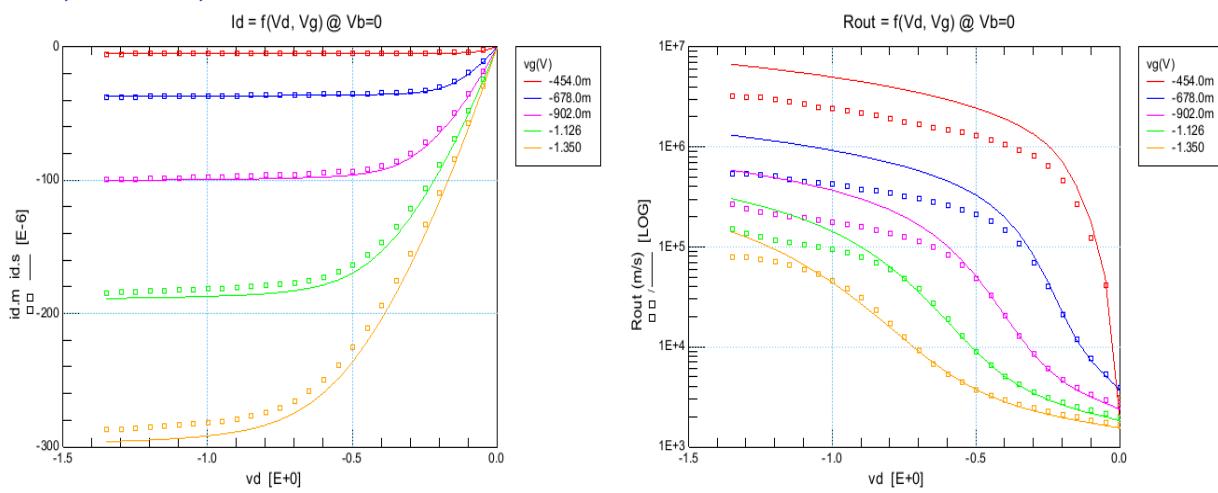
$i_{dvg}, V_d = -1.2V, T = 27^\circ C$

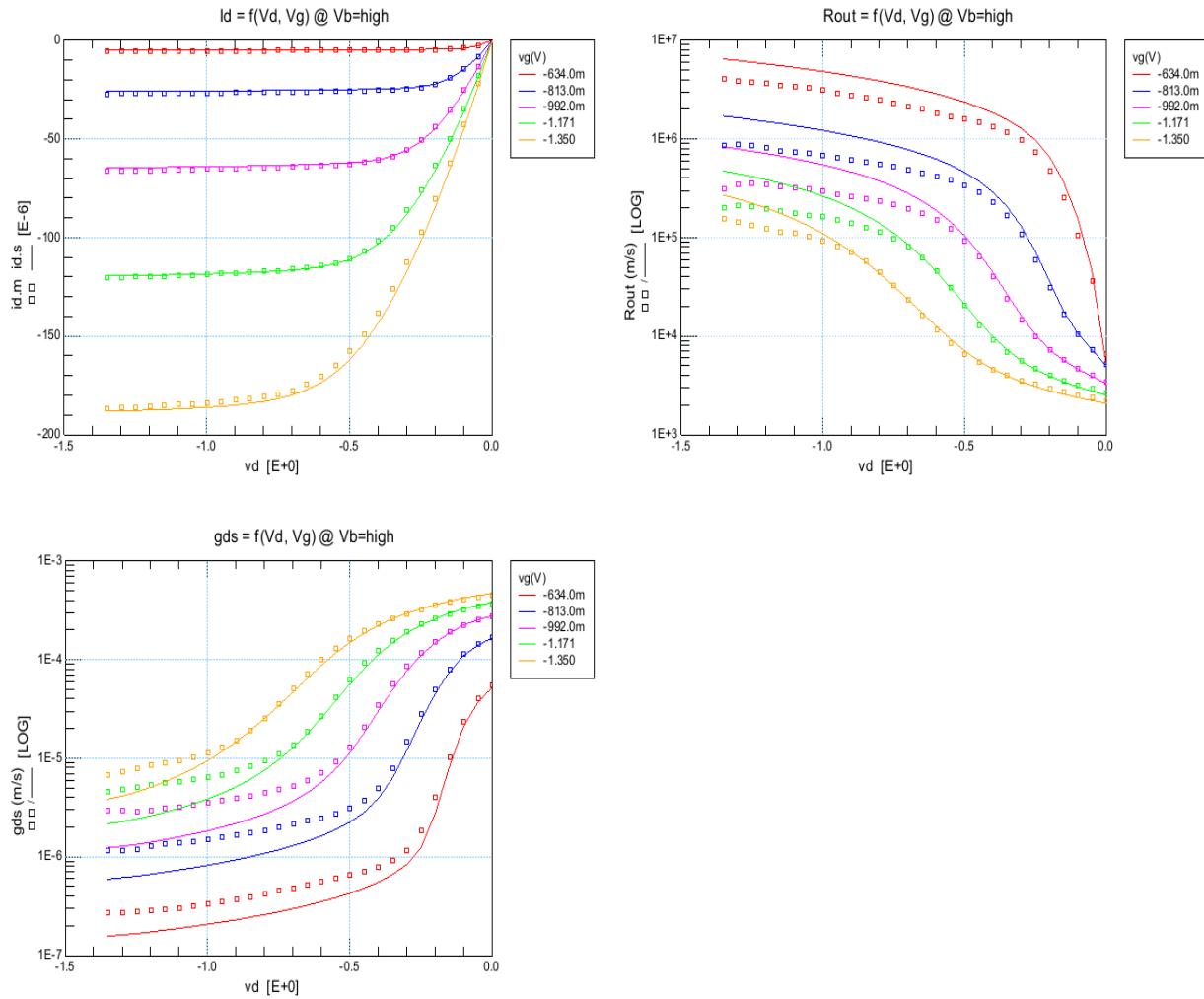
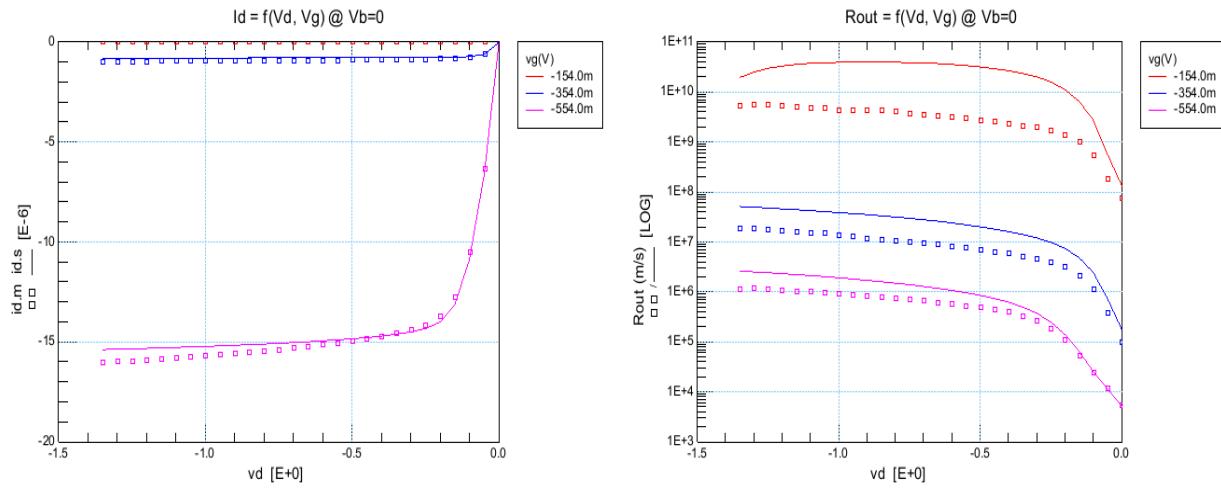


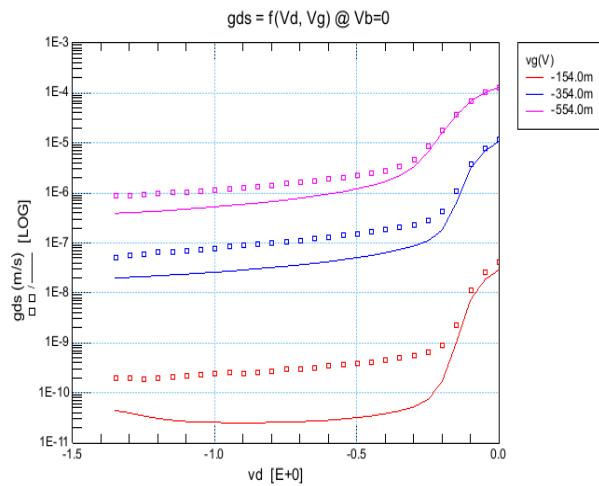


idvg, Ib, Ig, Vb = 0V, T = 27°C

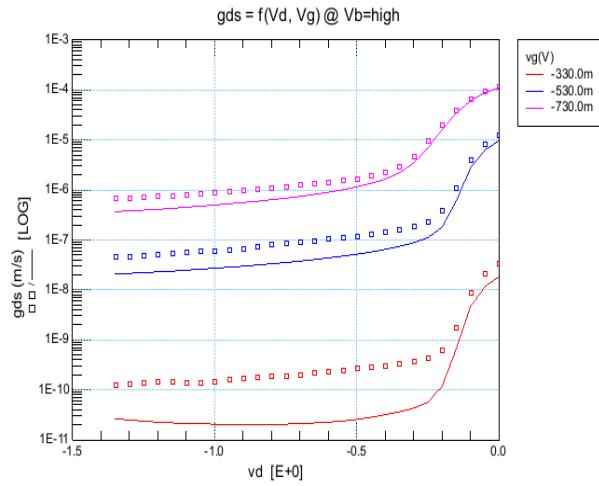
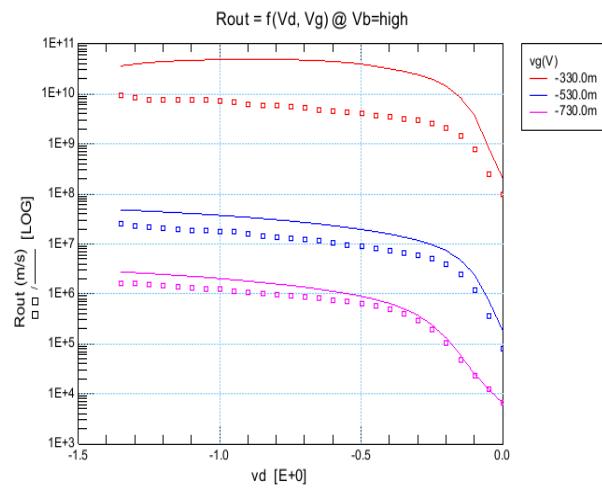
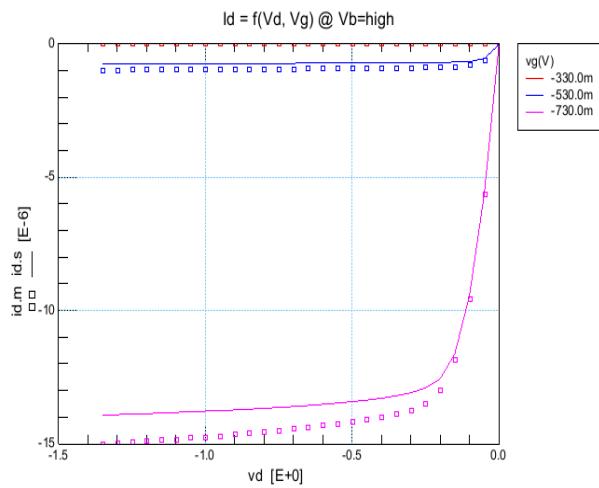


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C


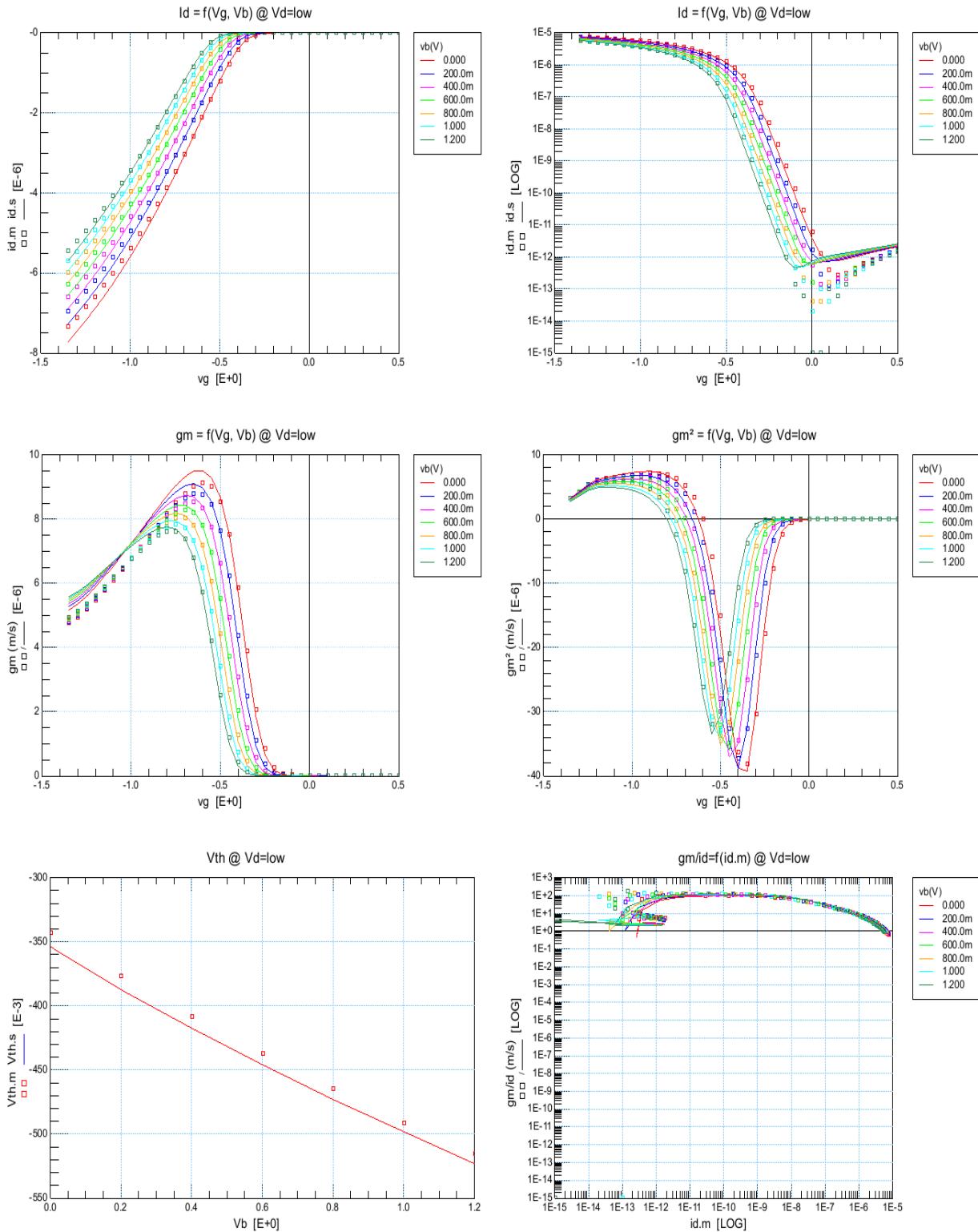


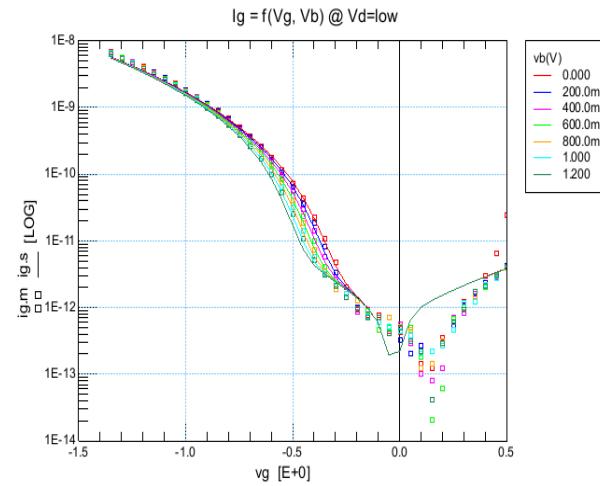
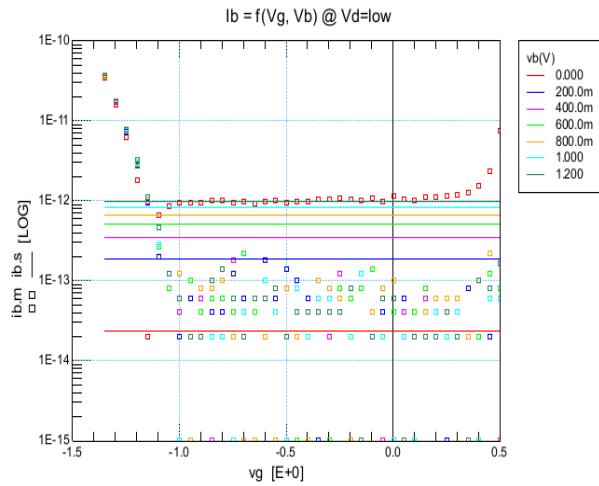
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



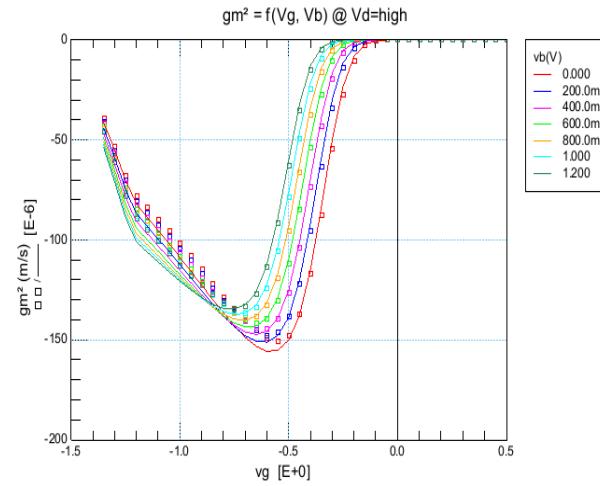
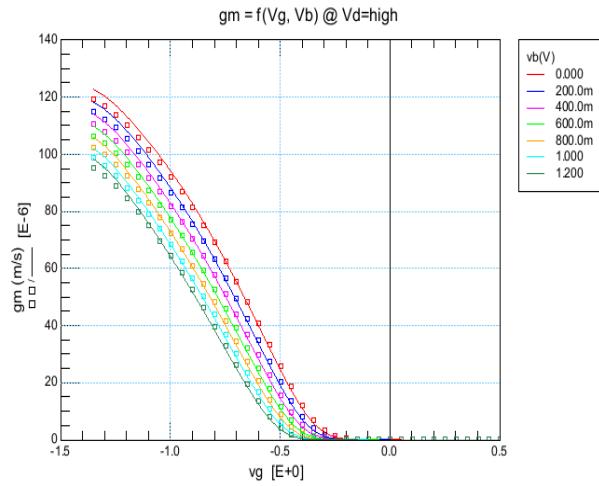
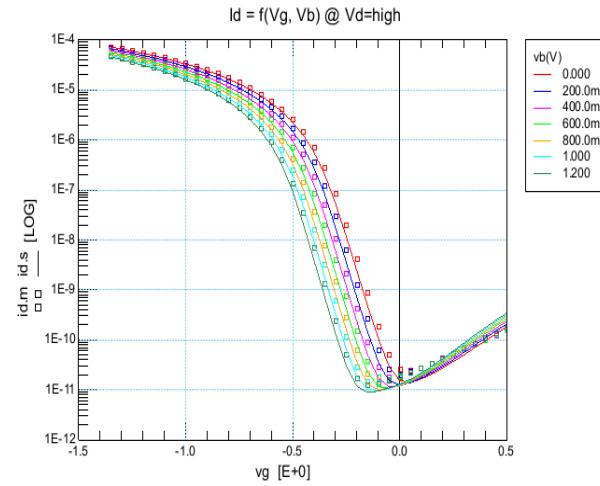
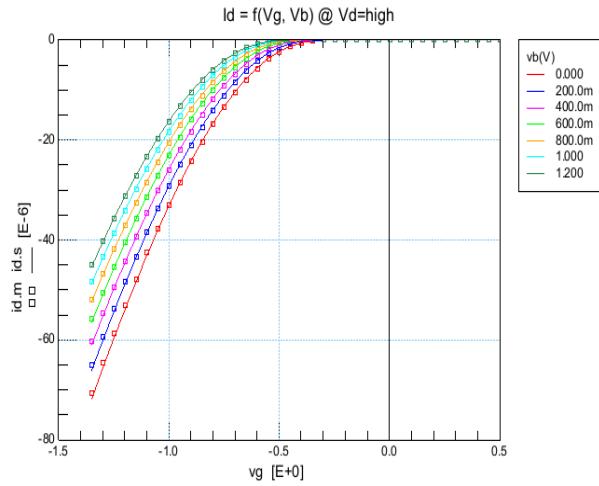
4.10W10u0_L5u0_S549_4

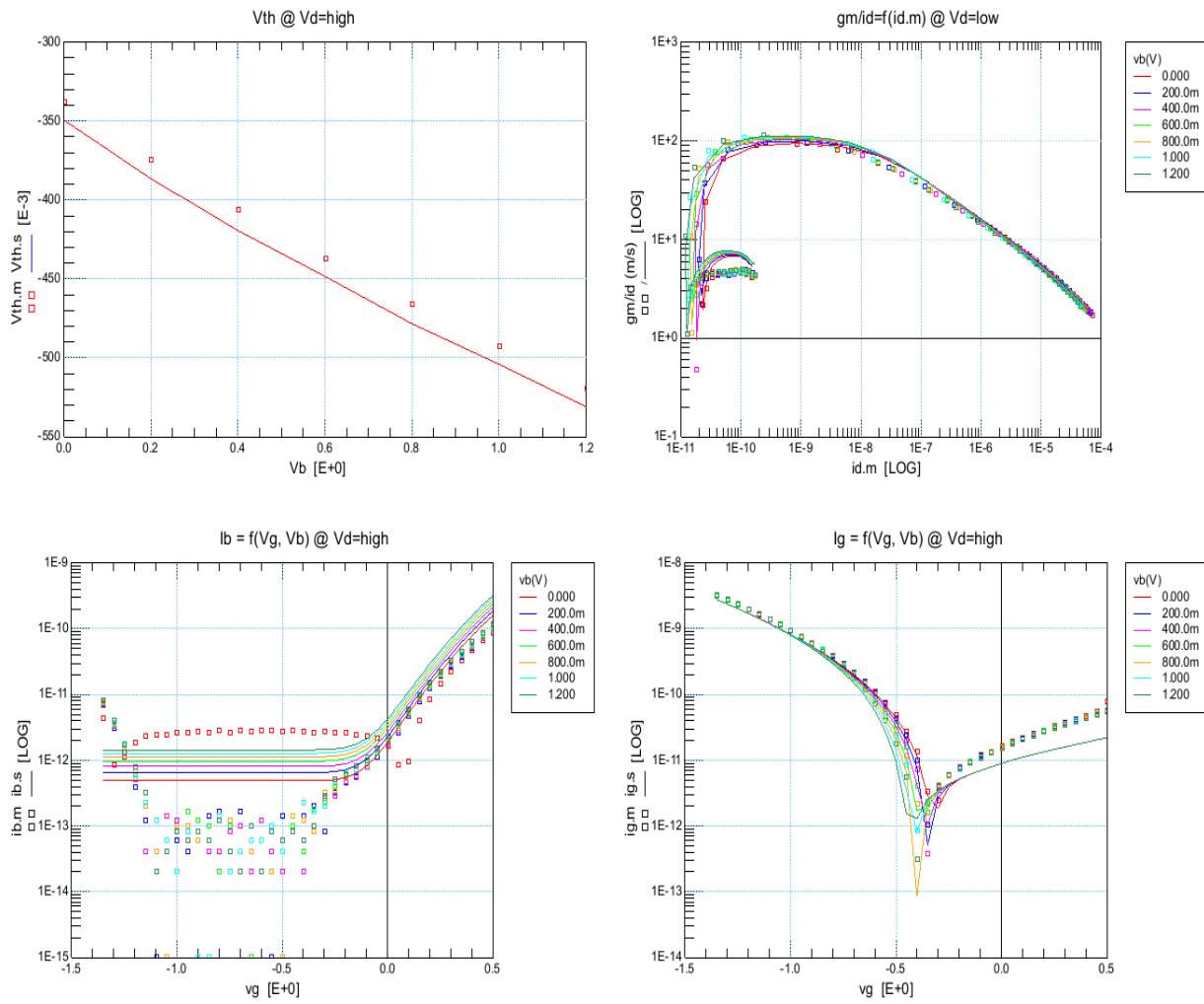
$idvg$, $Vd = -0.05V$, $T = 27^\circ C$



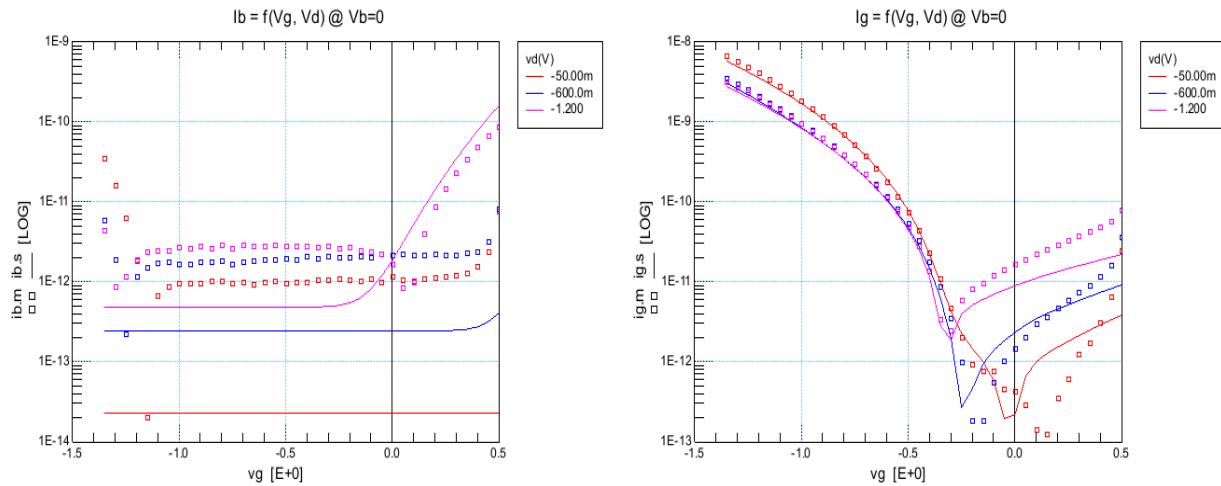


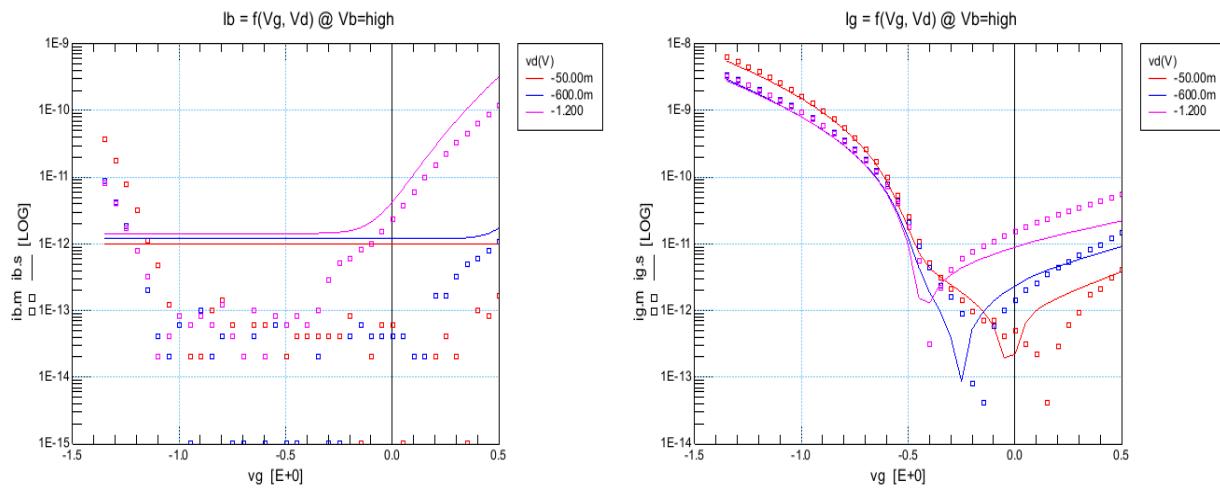
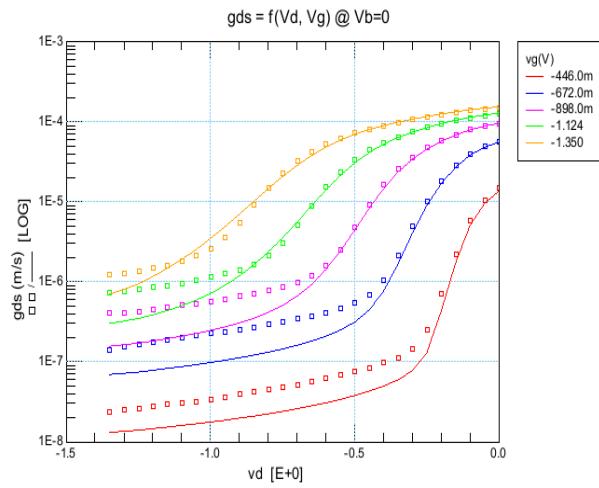
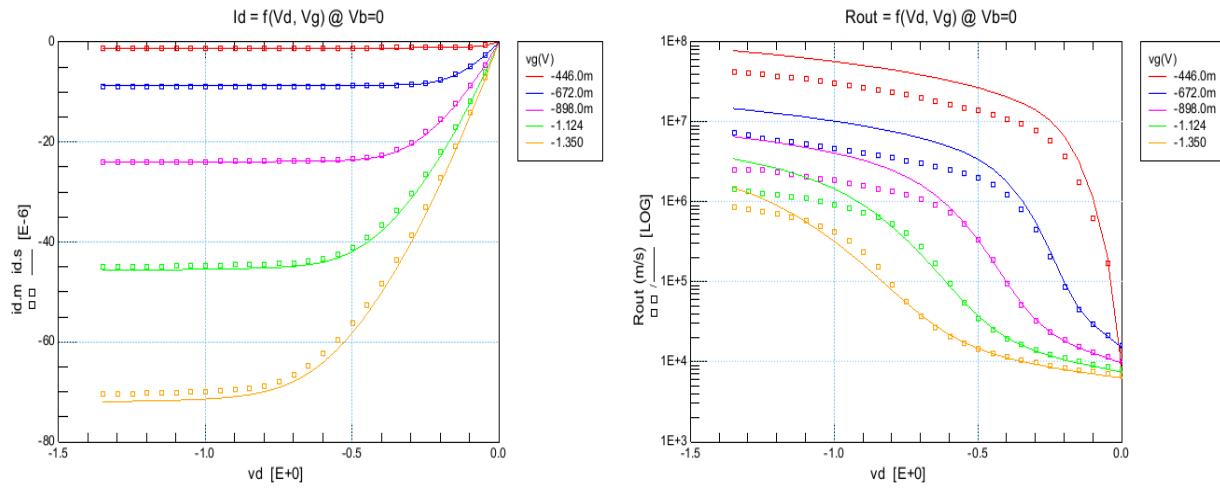
$i_{dvg}, V_d = -1.2V, T = 27^\circ\text{C}$

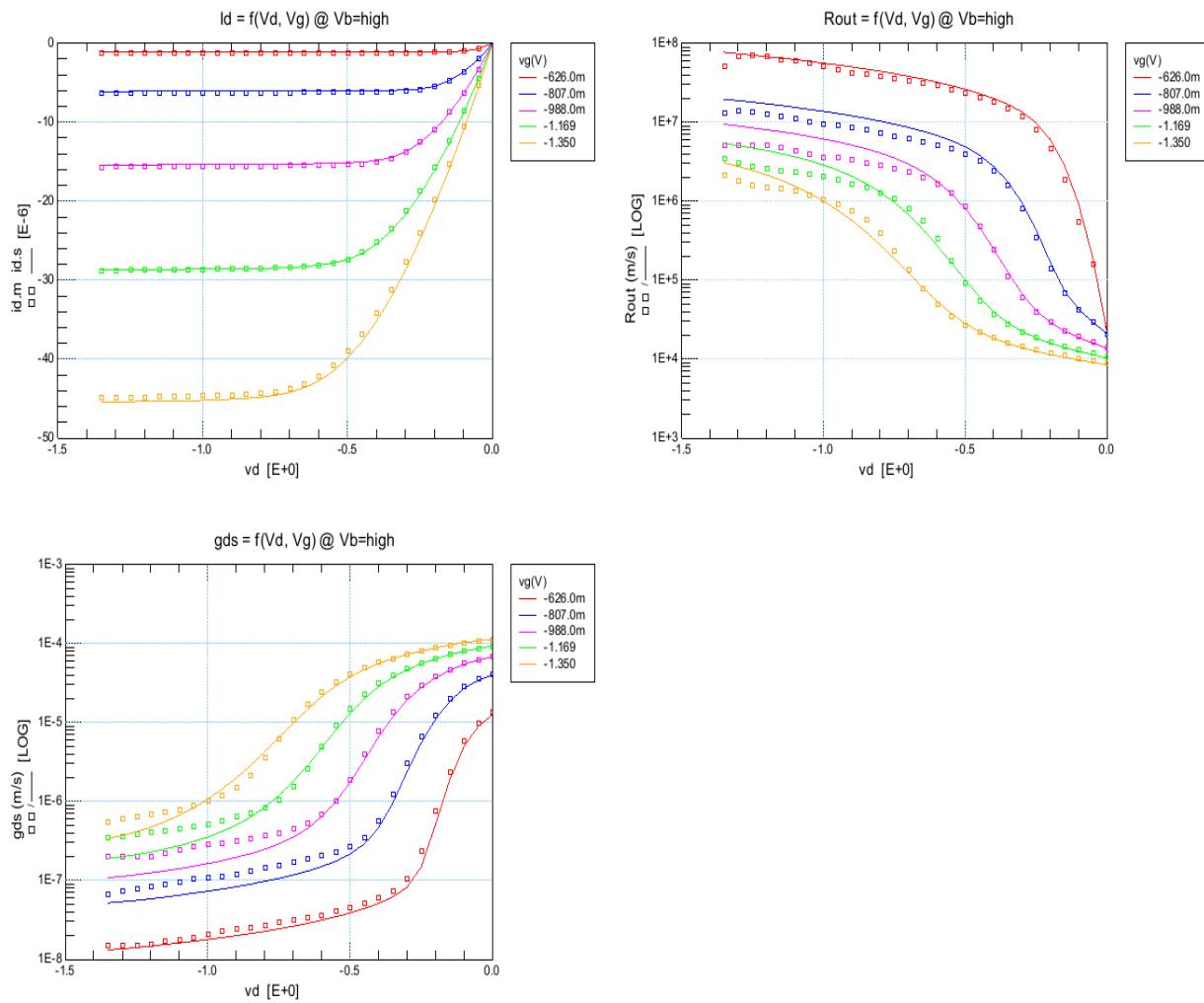
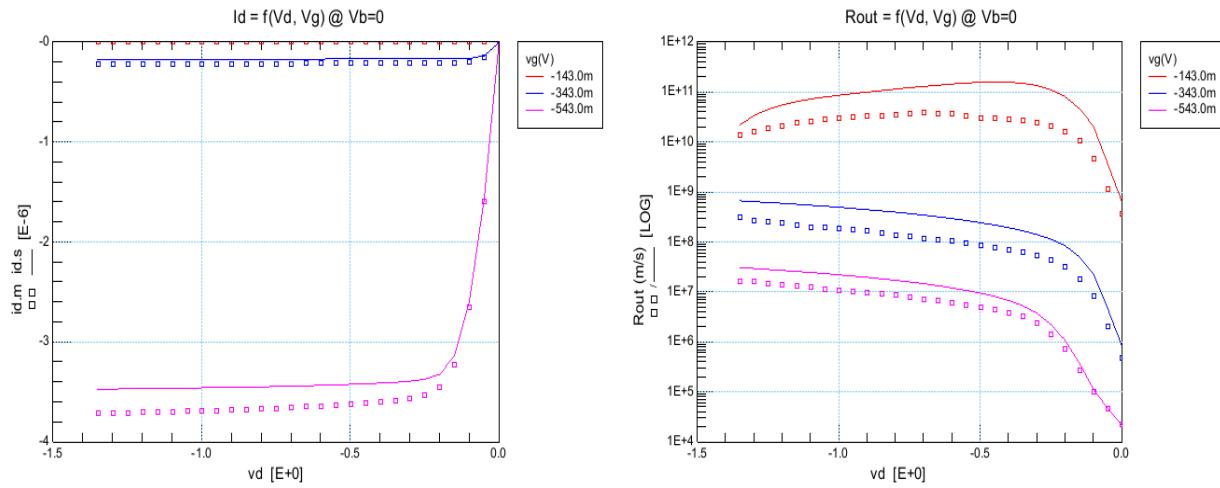


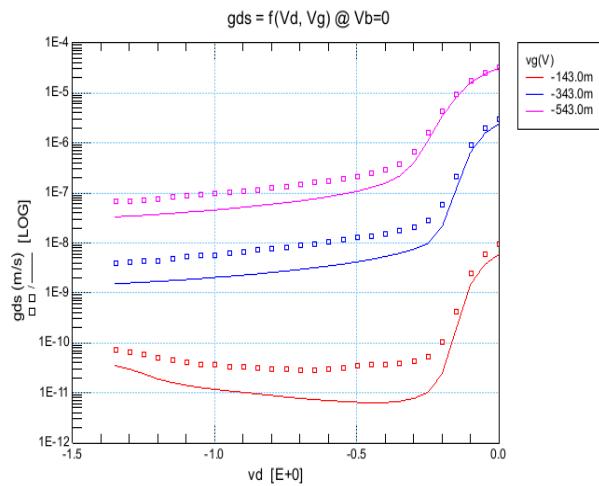


idvg, Ib,Ig, Vb = 0V, T = 27°C

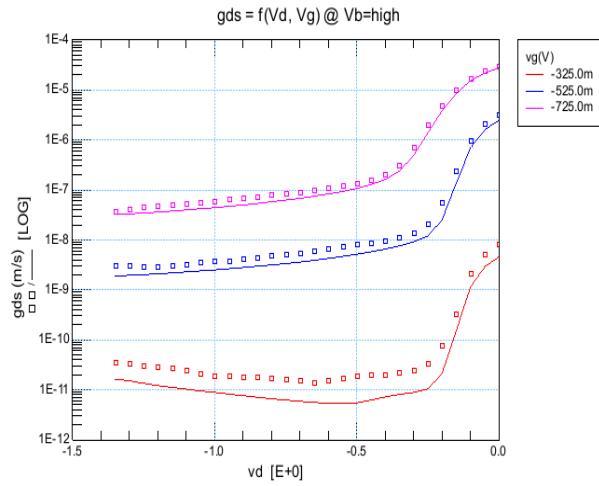
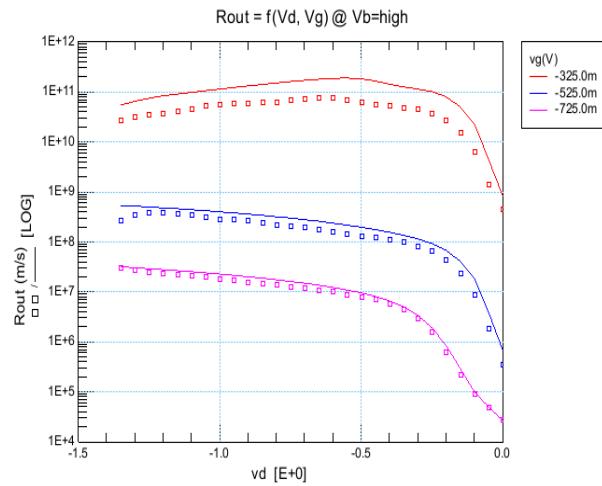
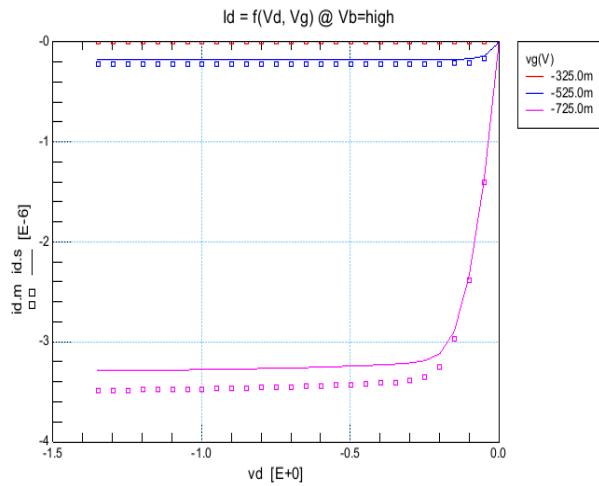


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C


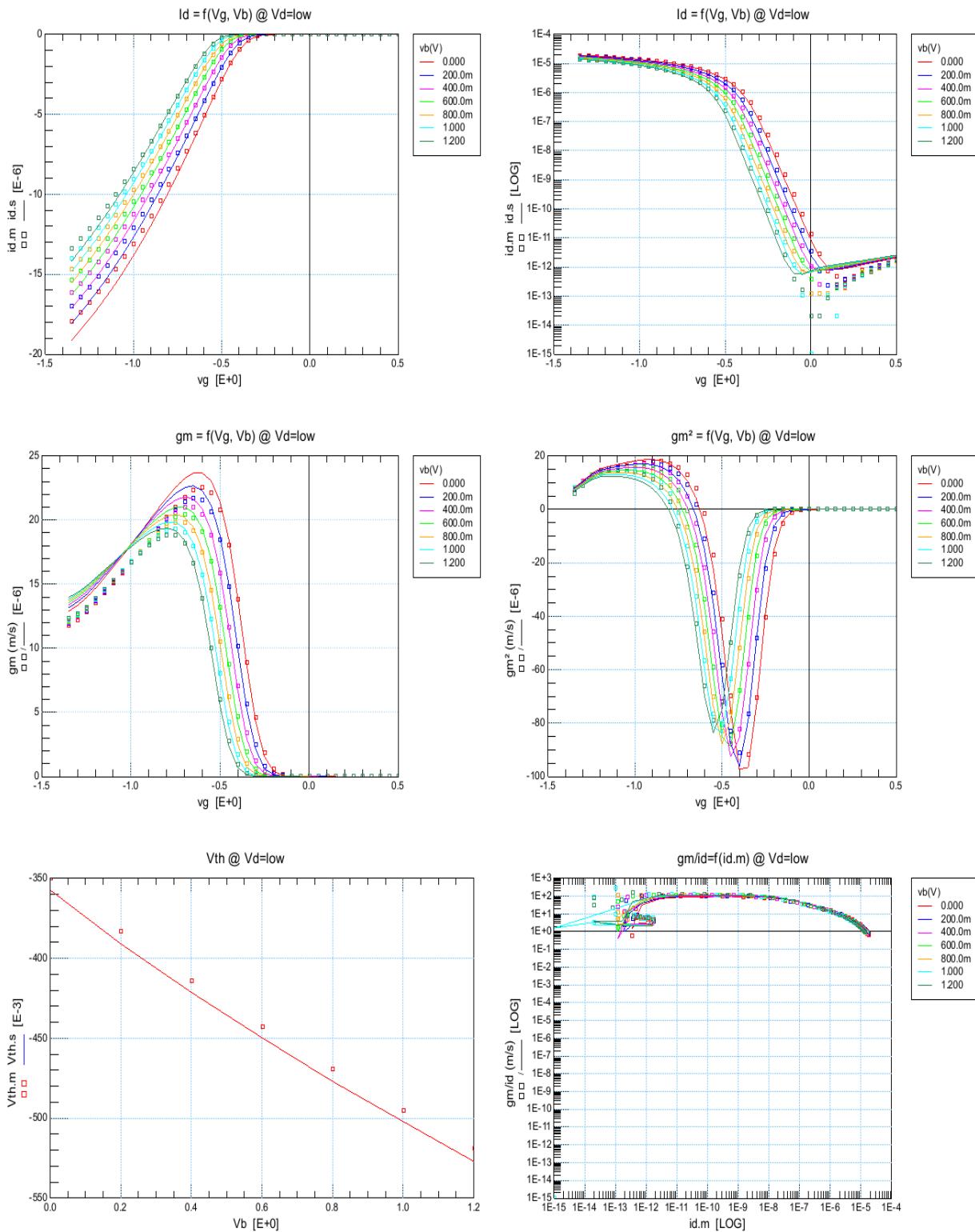


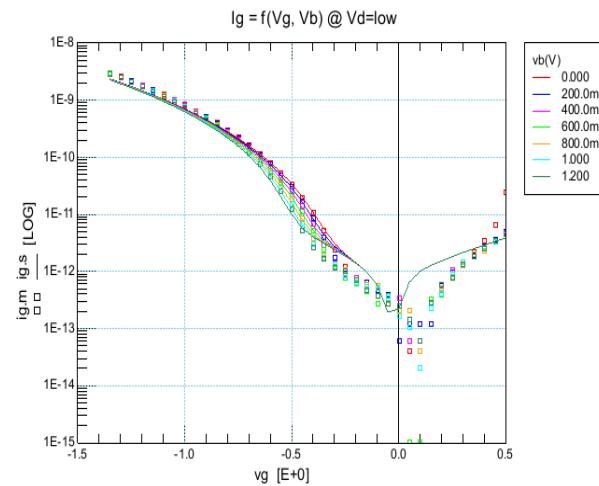
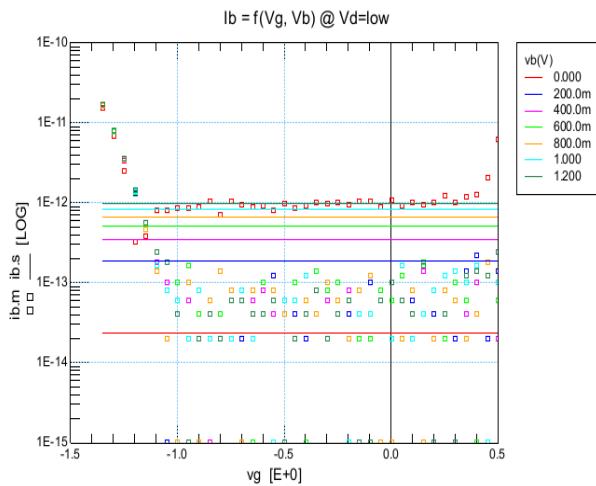
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



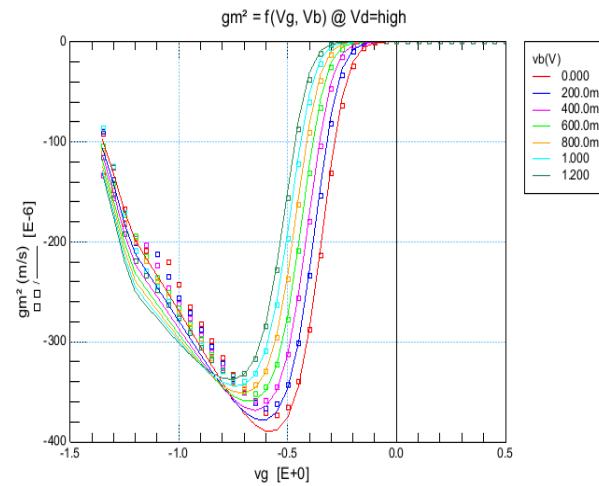
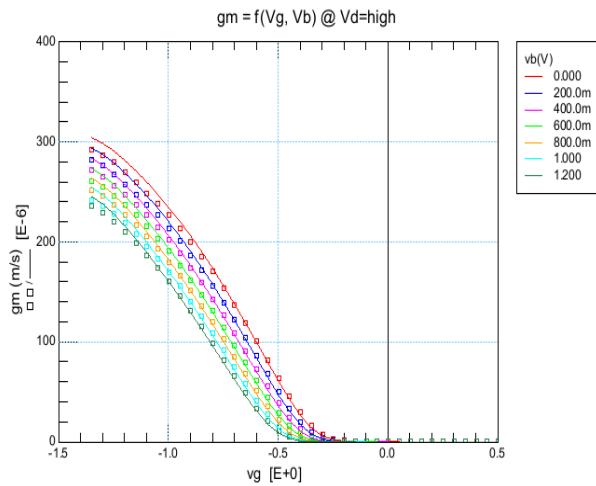
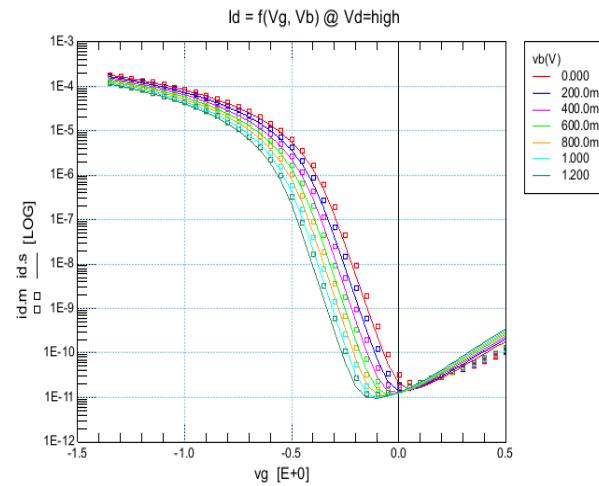
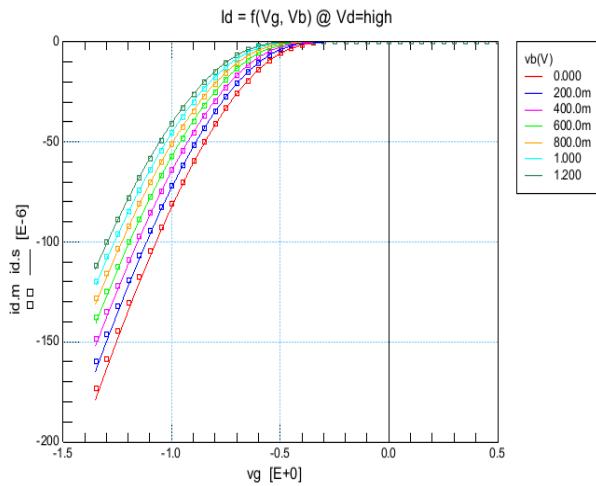
4.11 W10u0_L2u0_S549_3

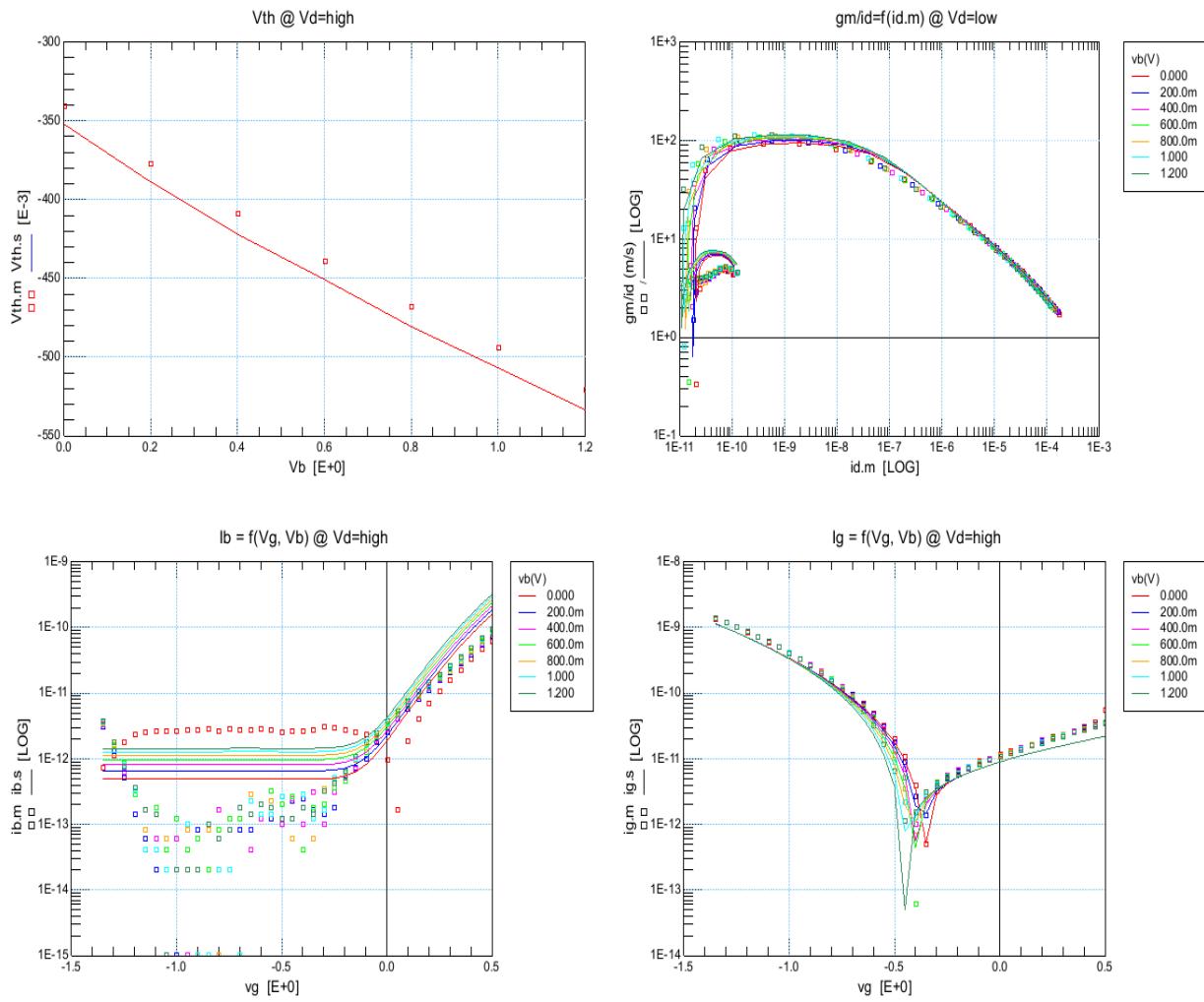
$idvg$, $Vd = -0.05V$, $T = 27^\circ C$



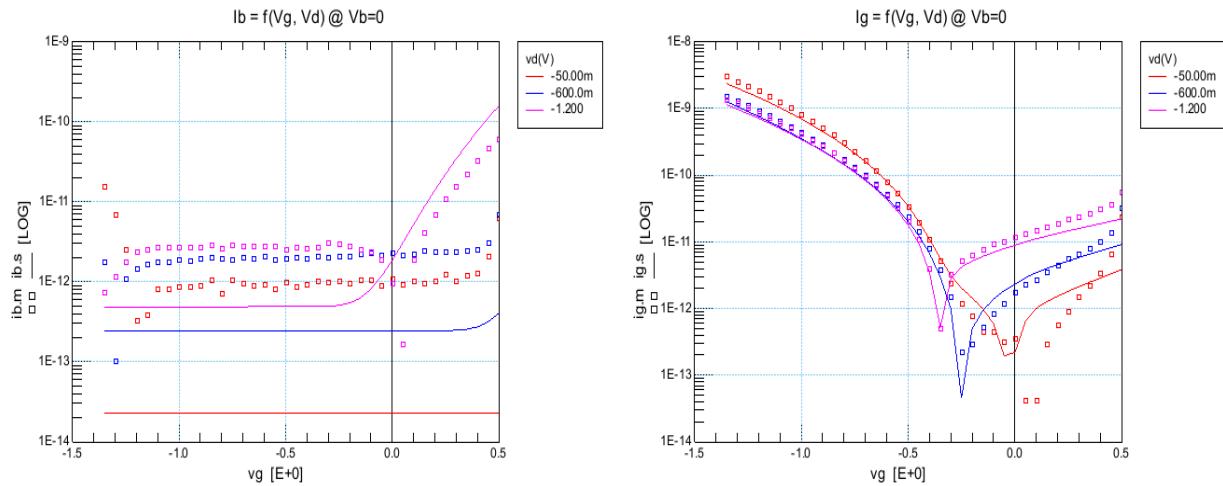


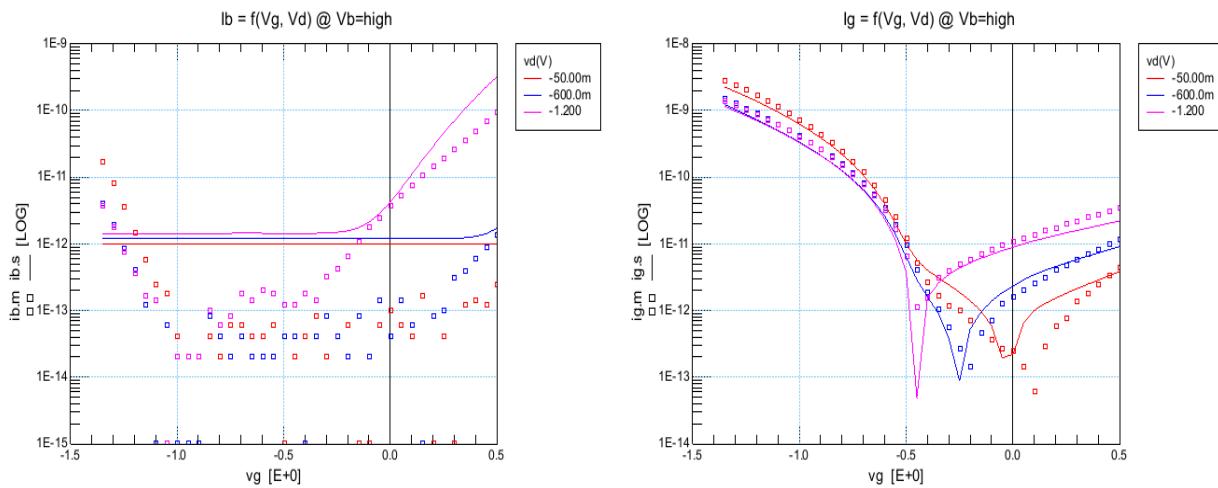
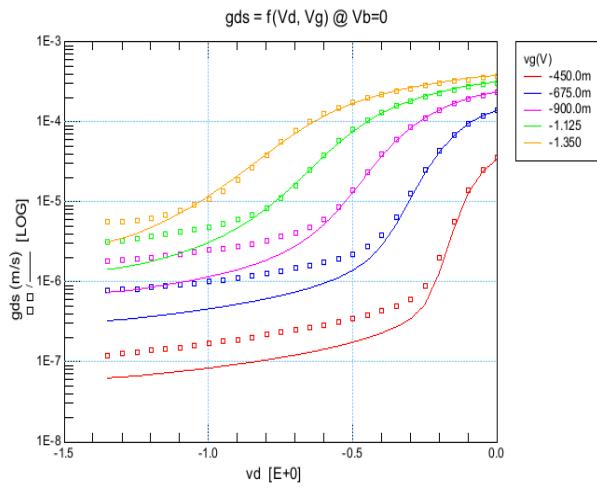
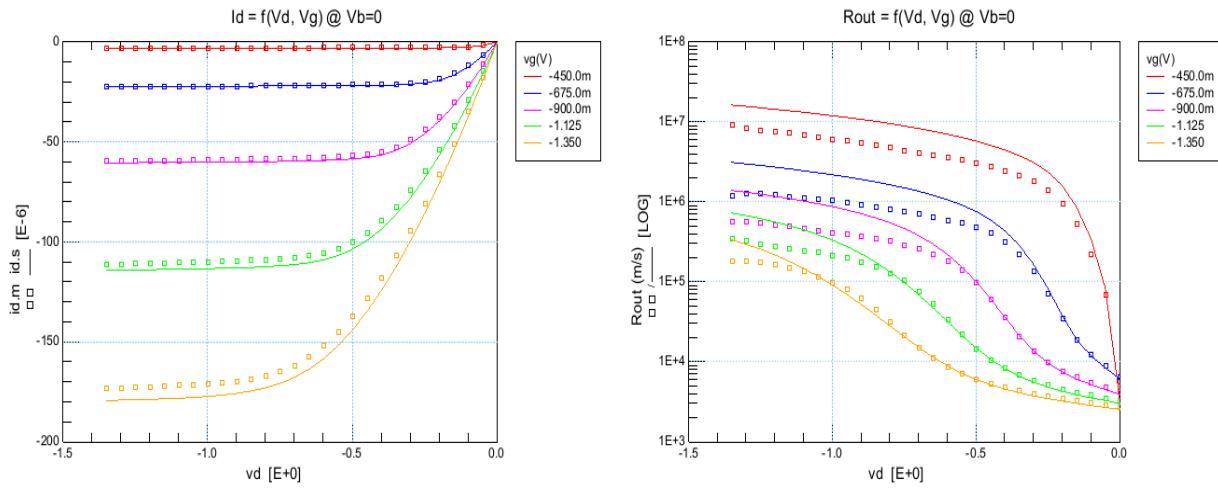
$i_{dvg}, V_d = -1.2V, T = 27^\circ\text{C}$

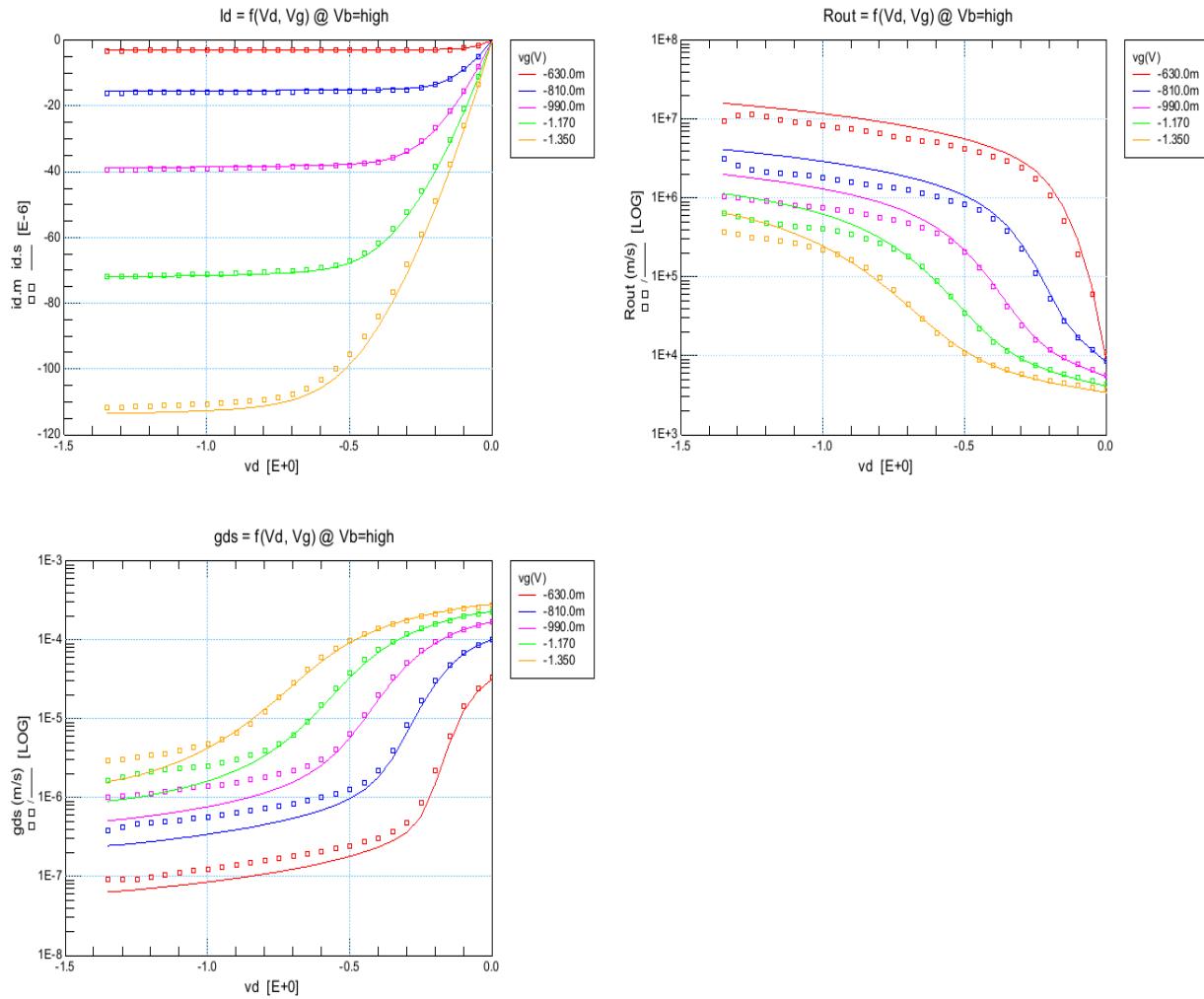
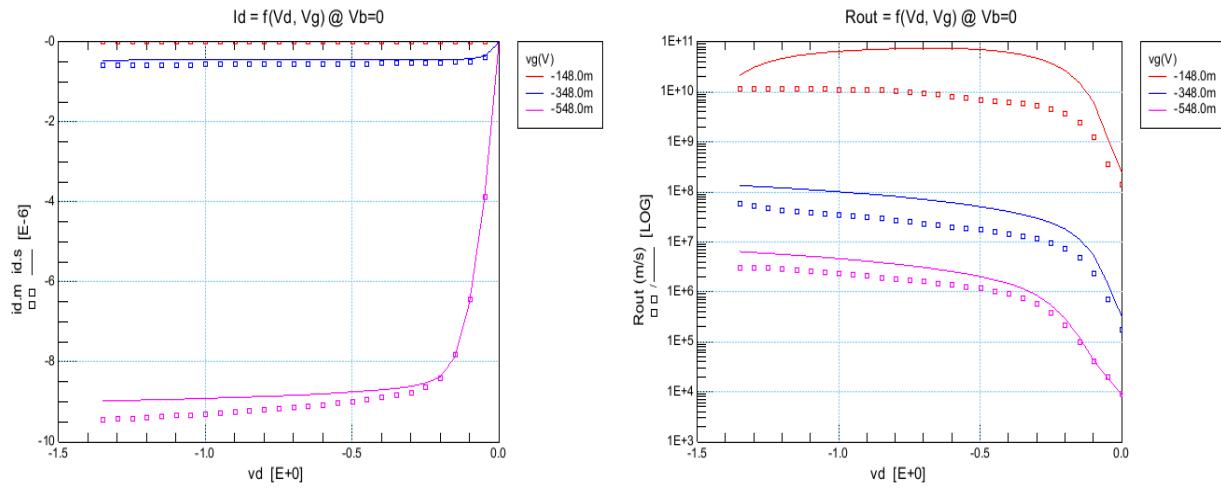


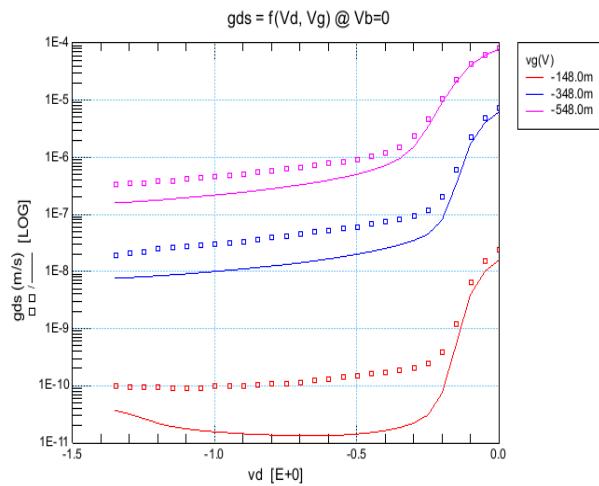


$I_d V_g, I_b, I_g, V_b = 0V, T = 27^\circ C$

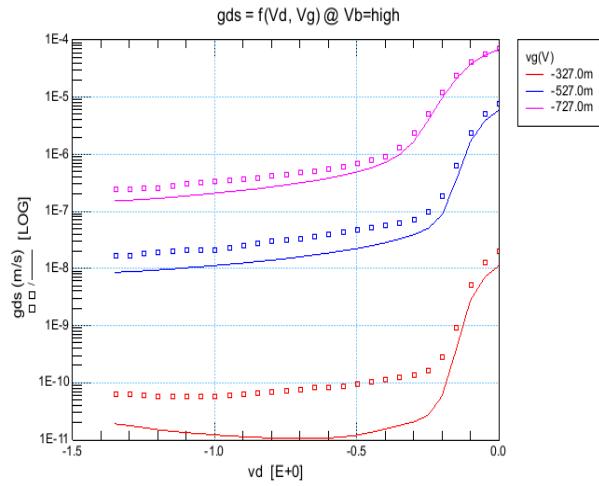
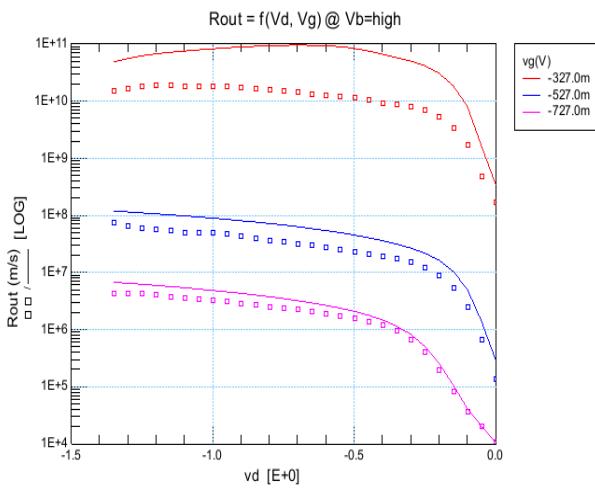
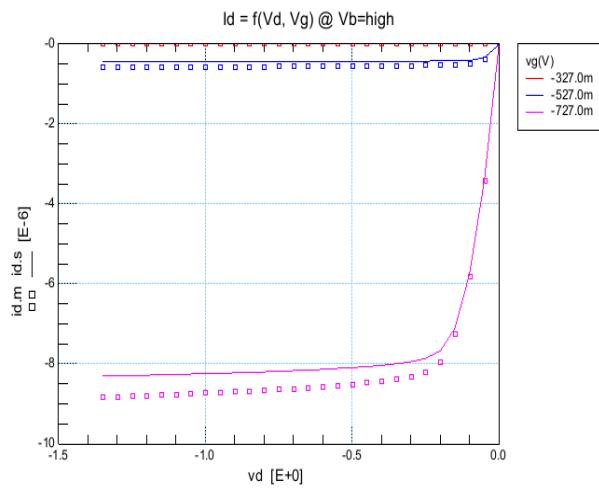


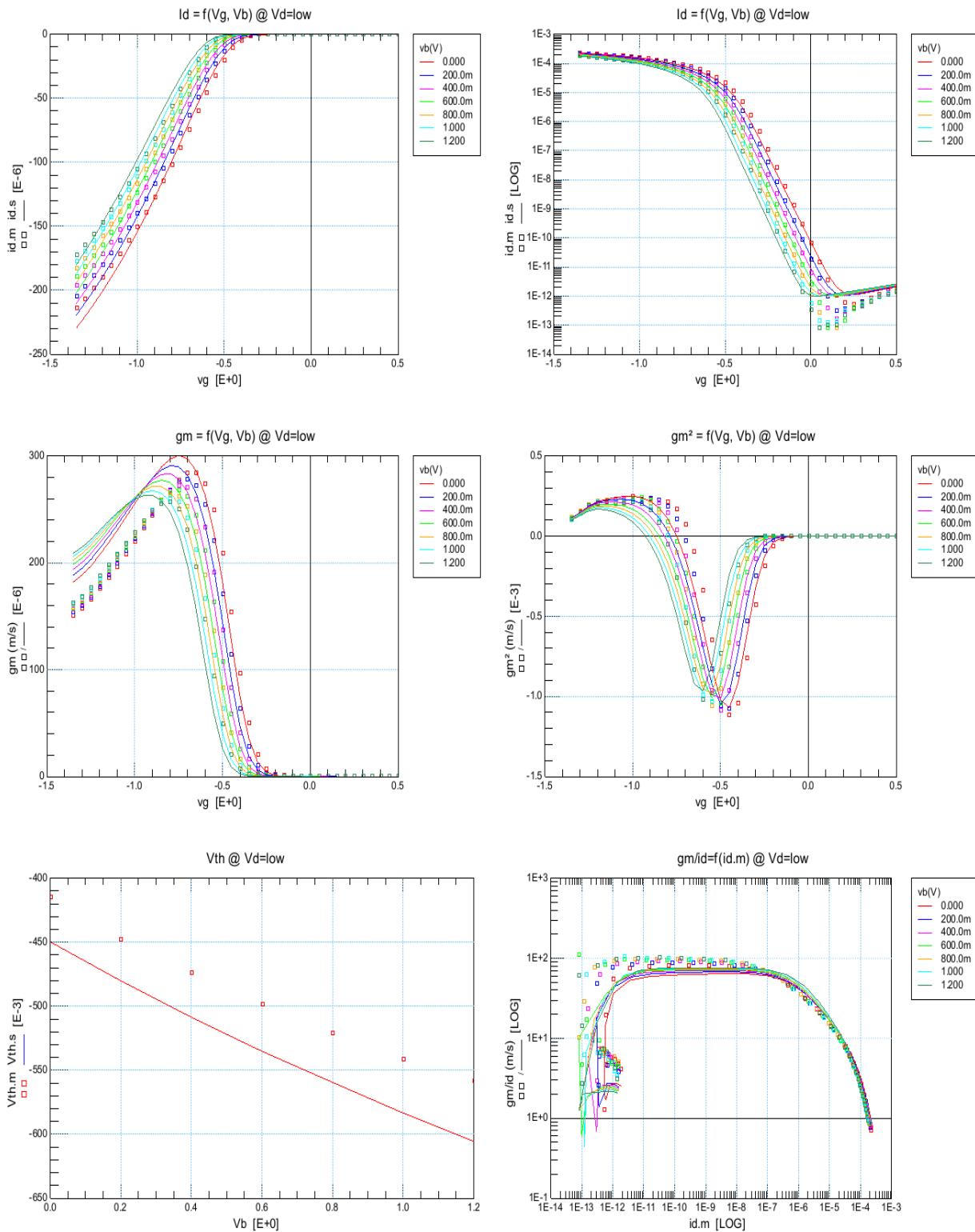
idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


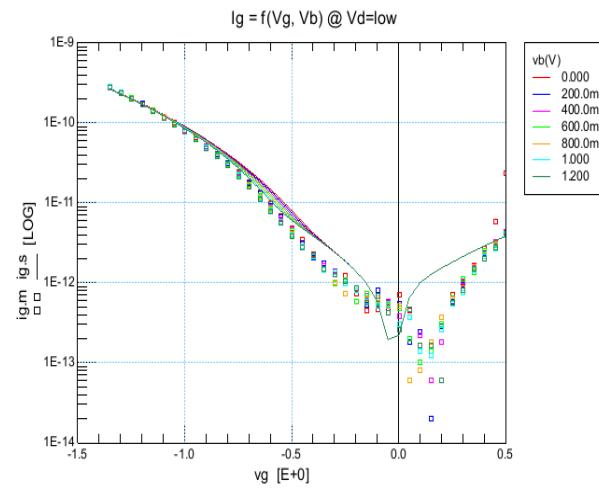
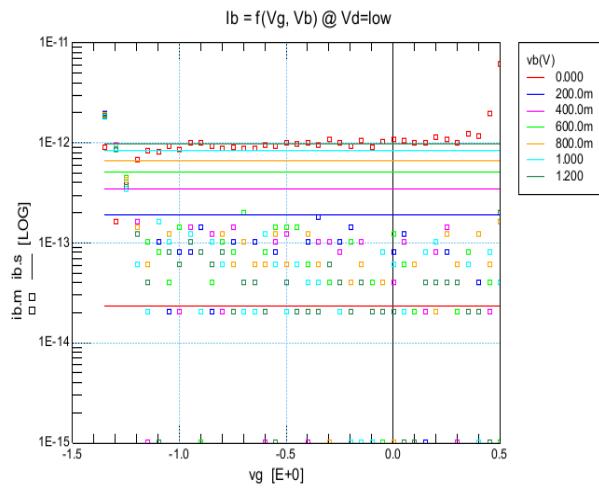
idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C




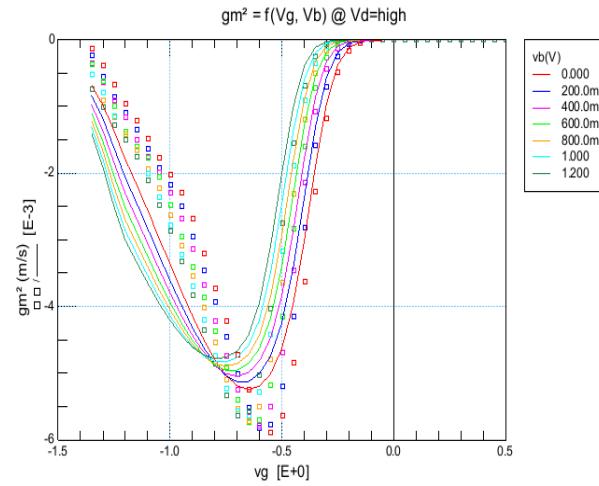
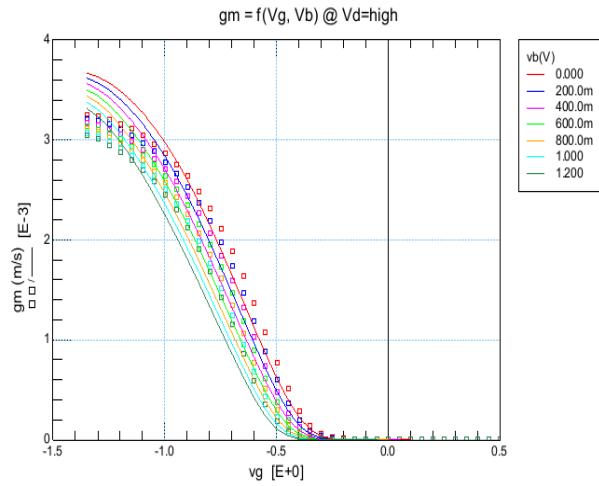
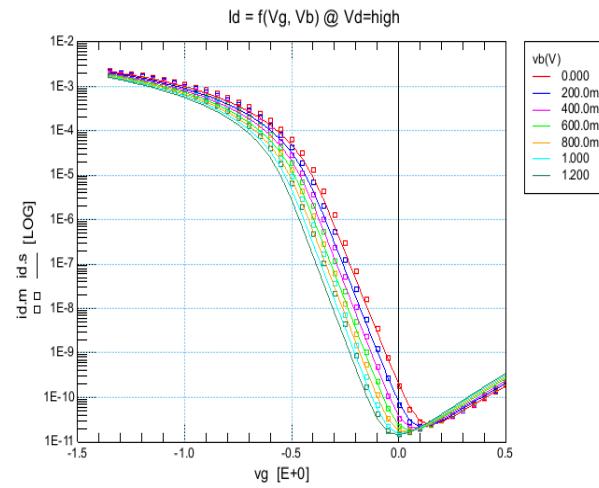
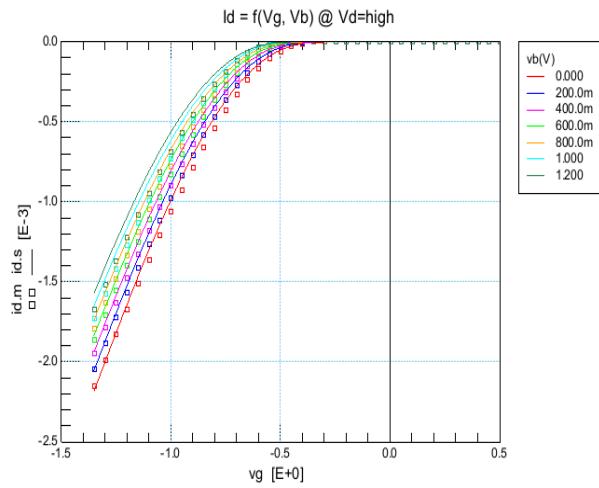
idvd_vth_vbmin, Vb = 1.2V, T = 27°C

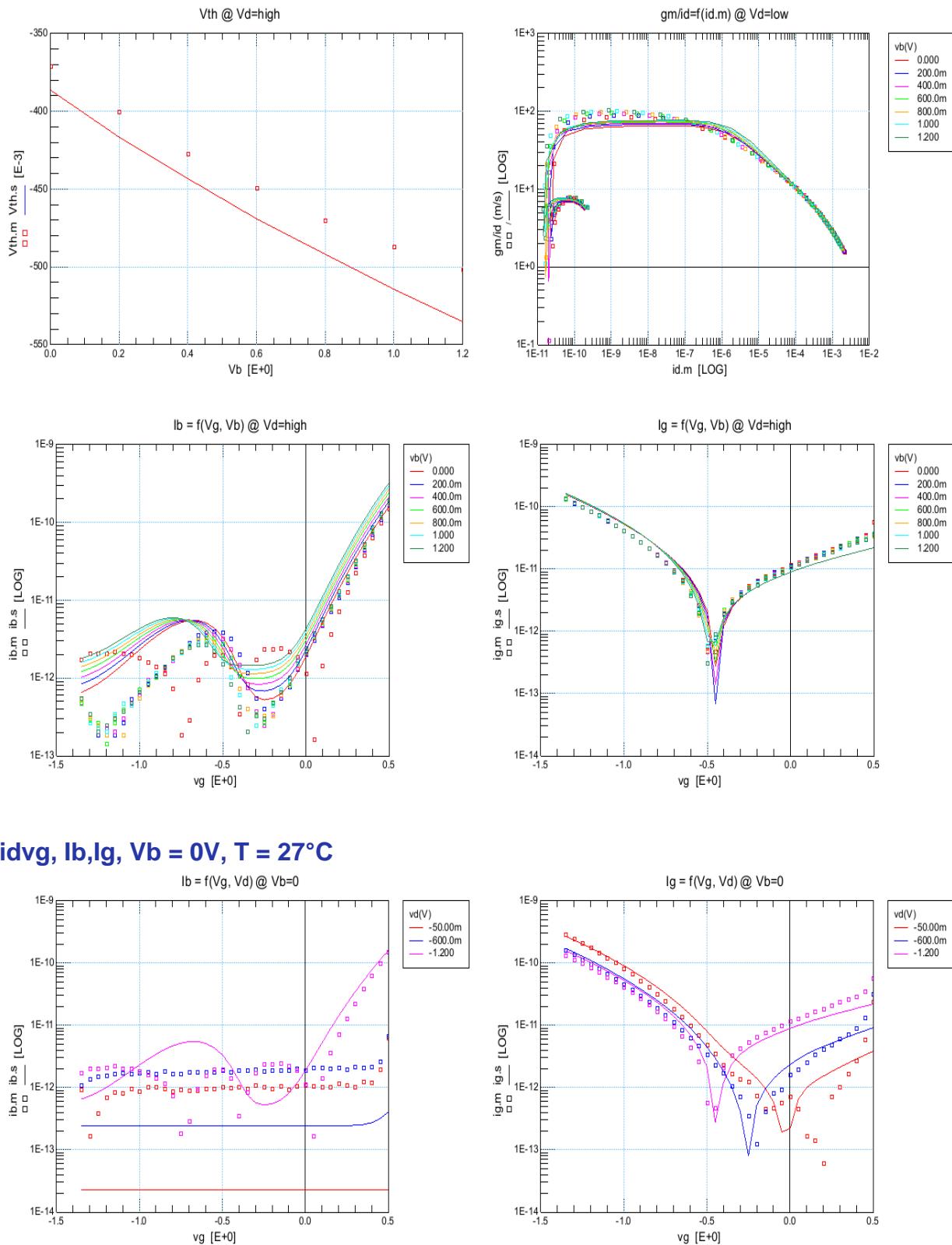


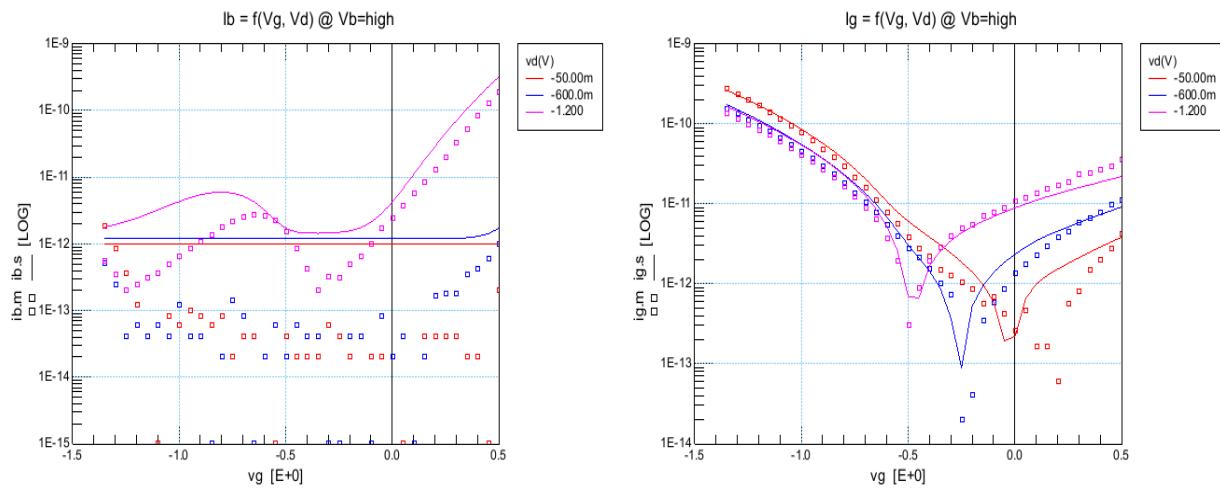
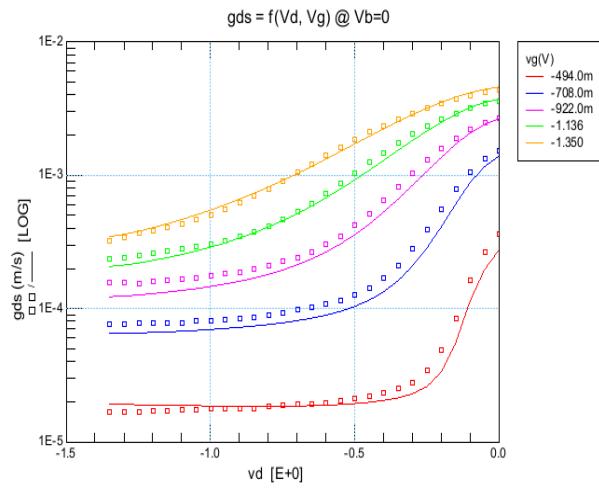
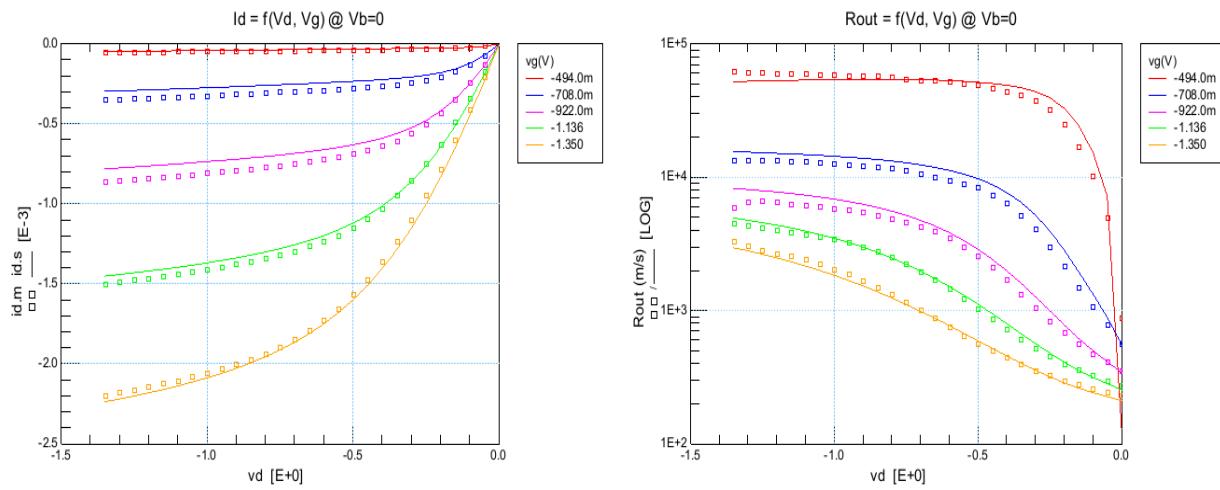
4.12 W10u0_L0u15_S548_4**idvg, Vd = -0.05V, T = 27°C**

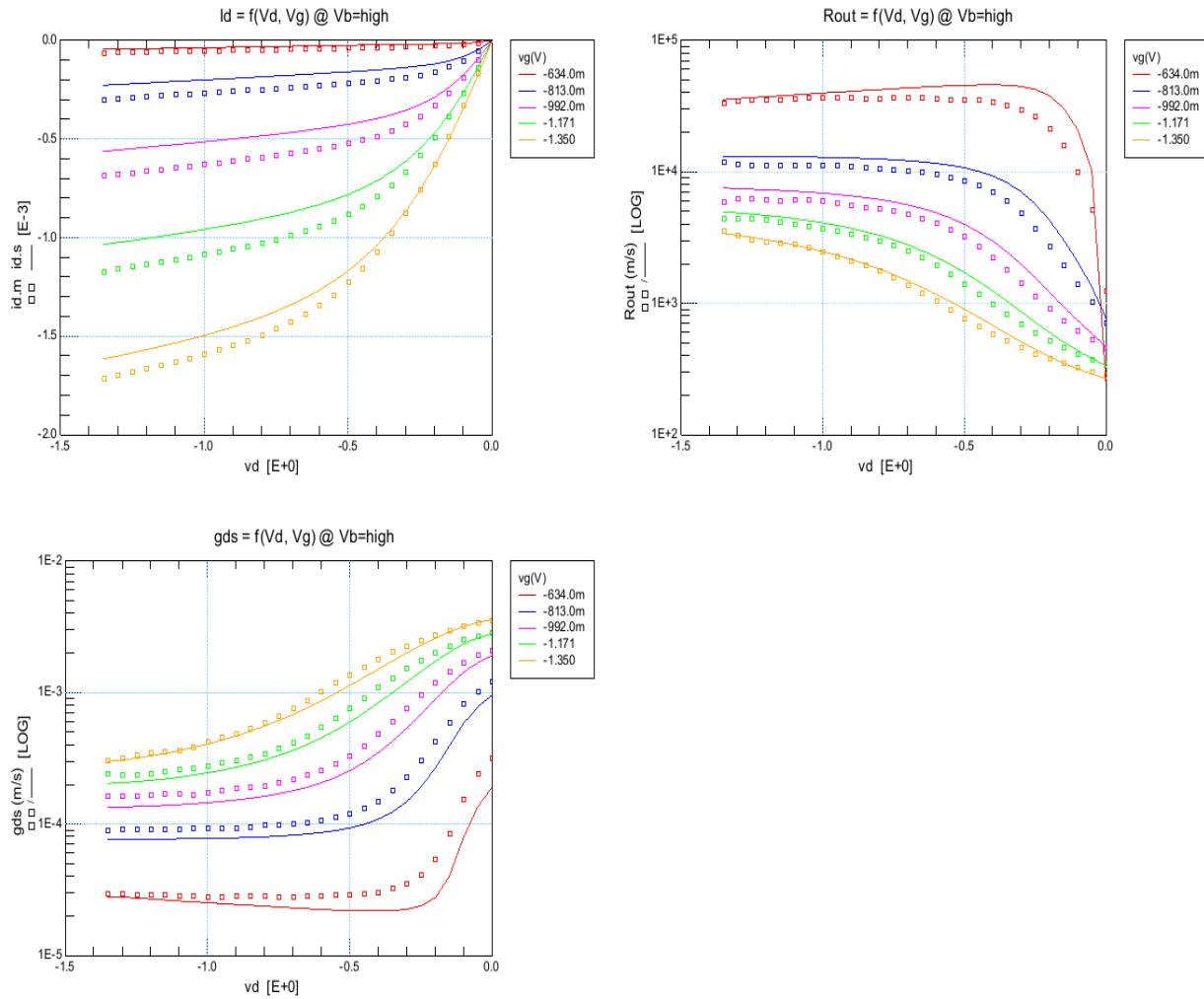
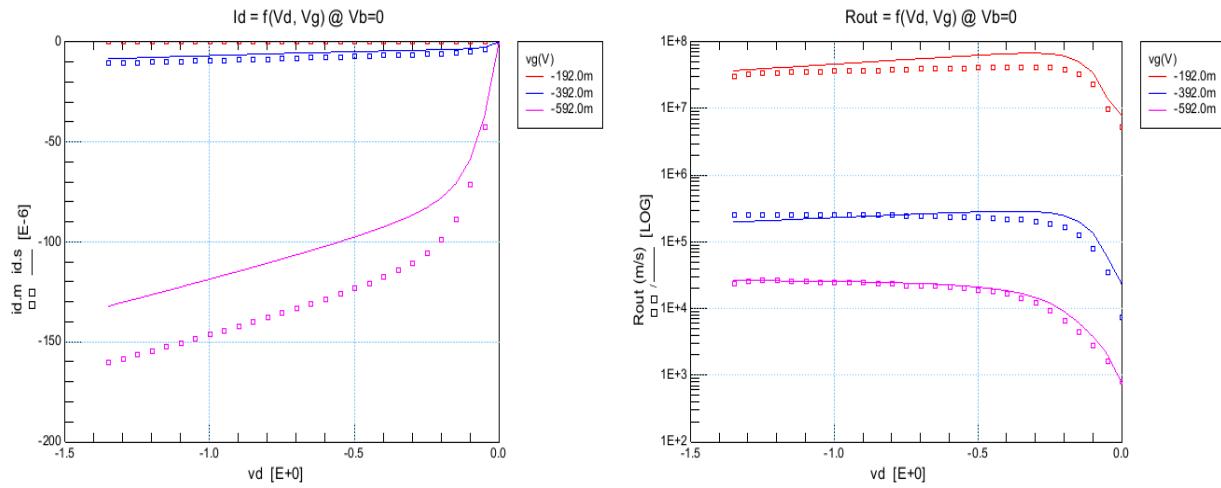


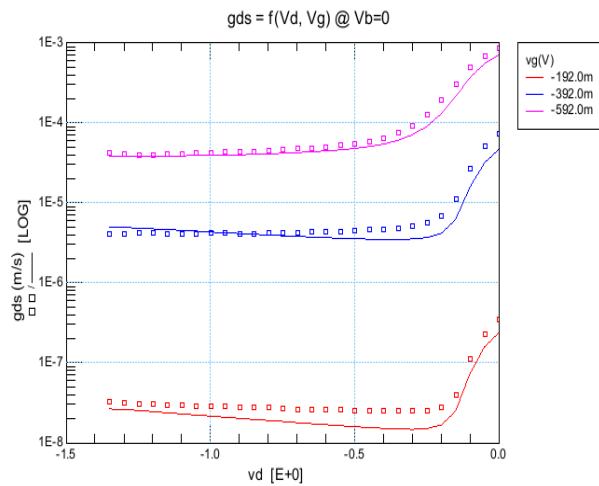
i_{dvg} , $V_d = -1.2V$, $T = 27^\circ\text{C}$



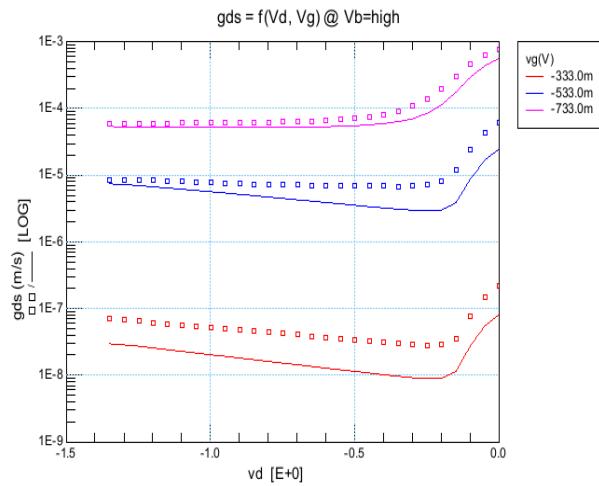
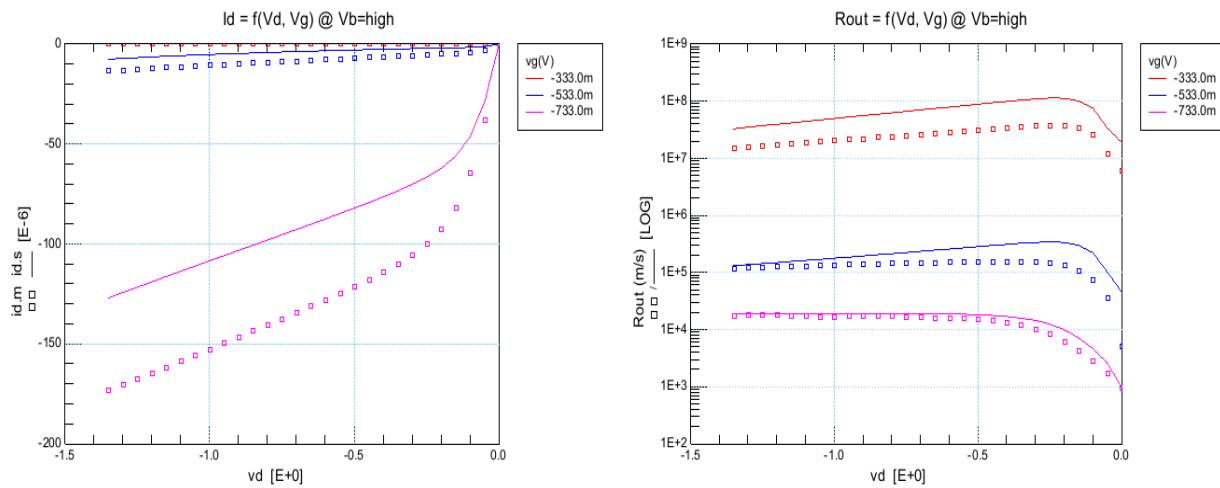


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C


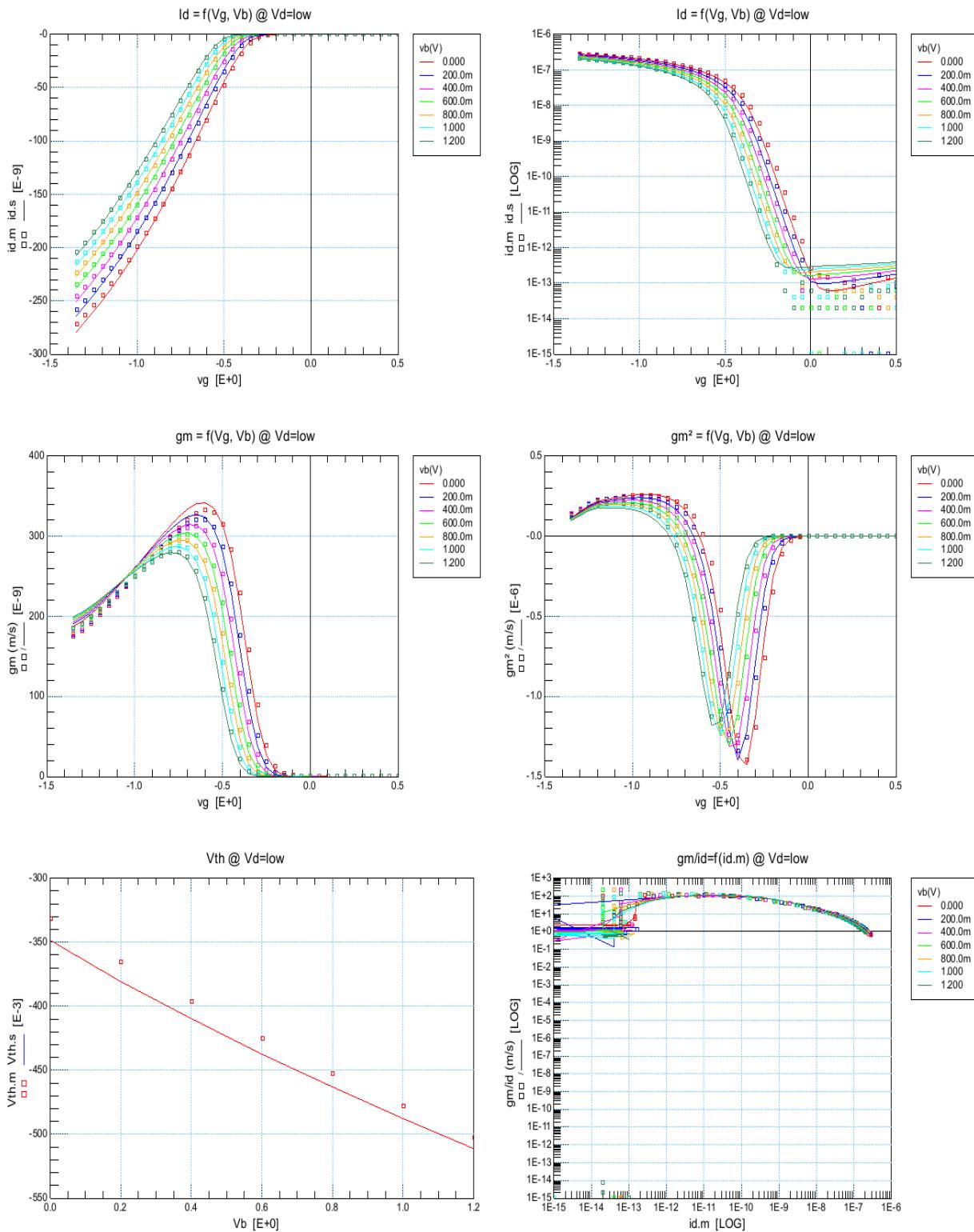


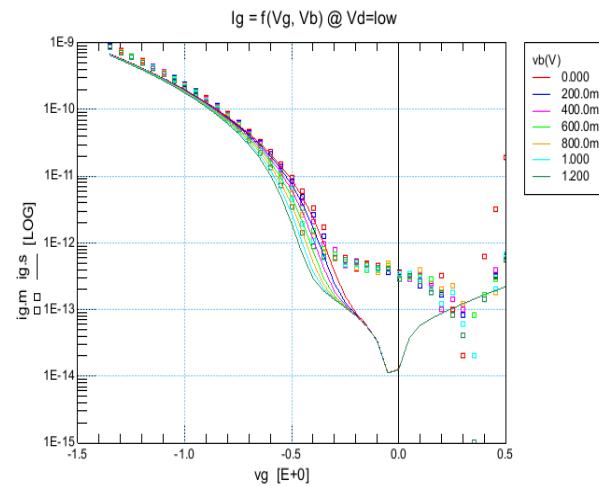
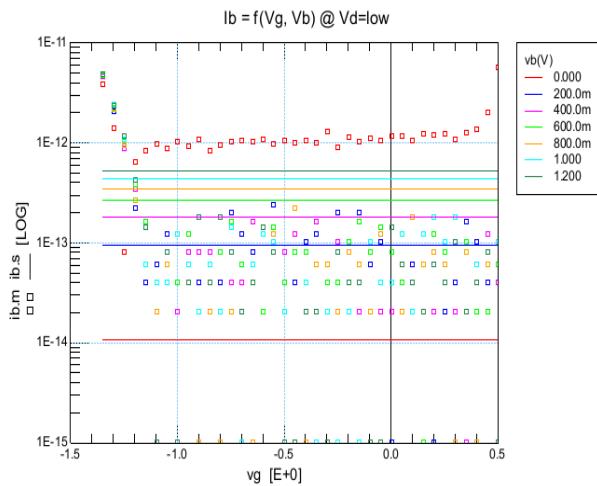
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



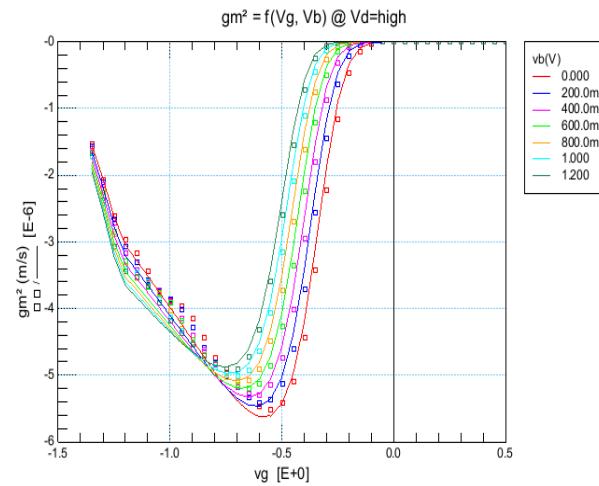
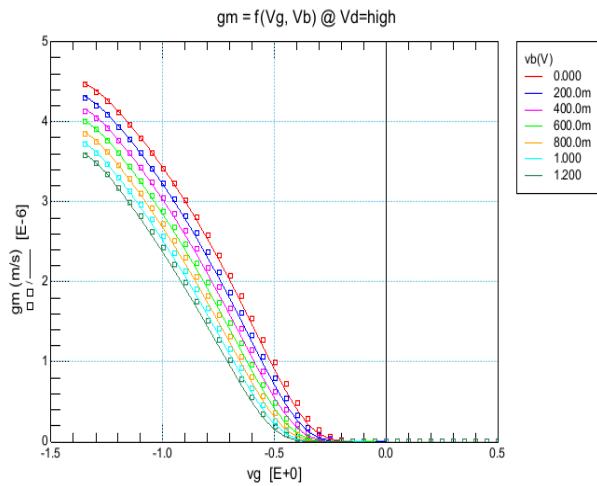
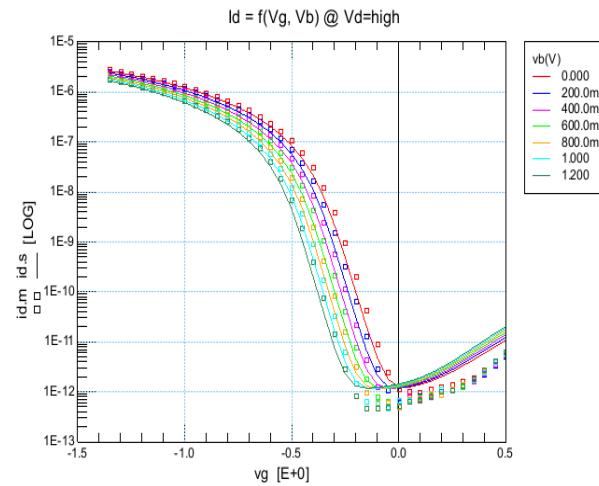
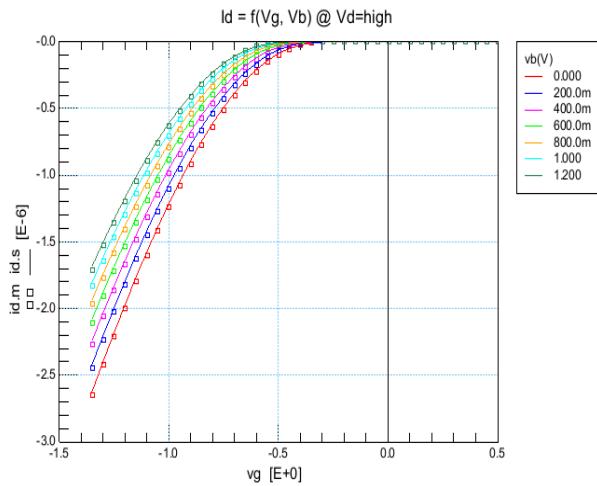
4.13 W0u6_L10u0_S552_1

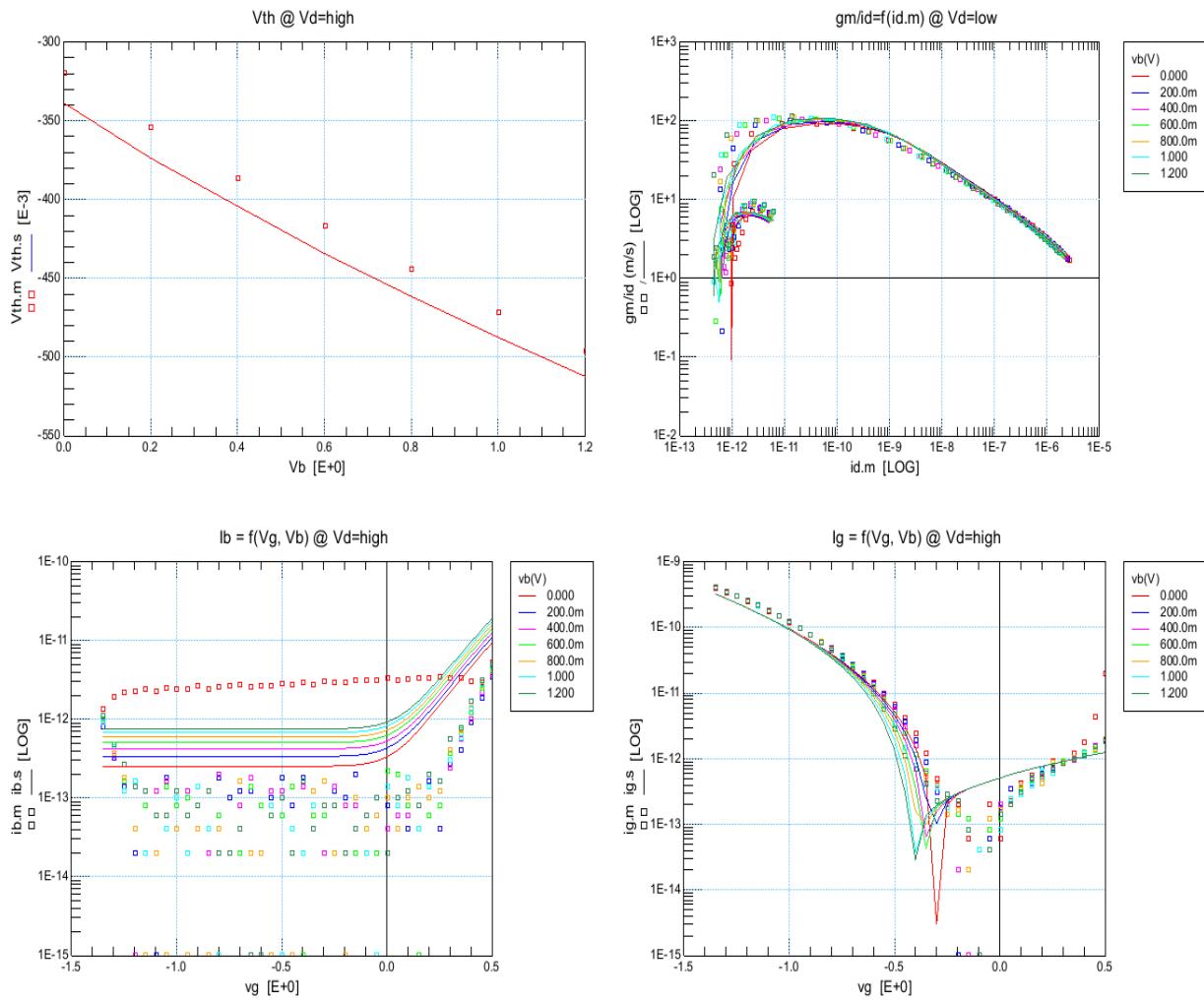
$idv_g, V_d = -0.05V, T = 27^\circ C$



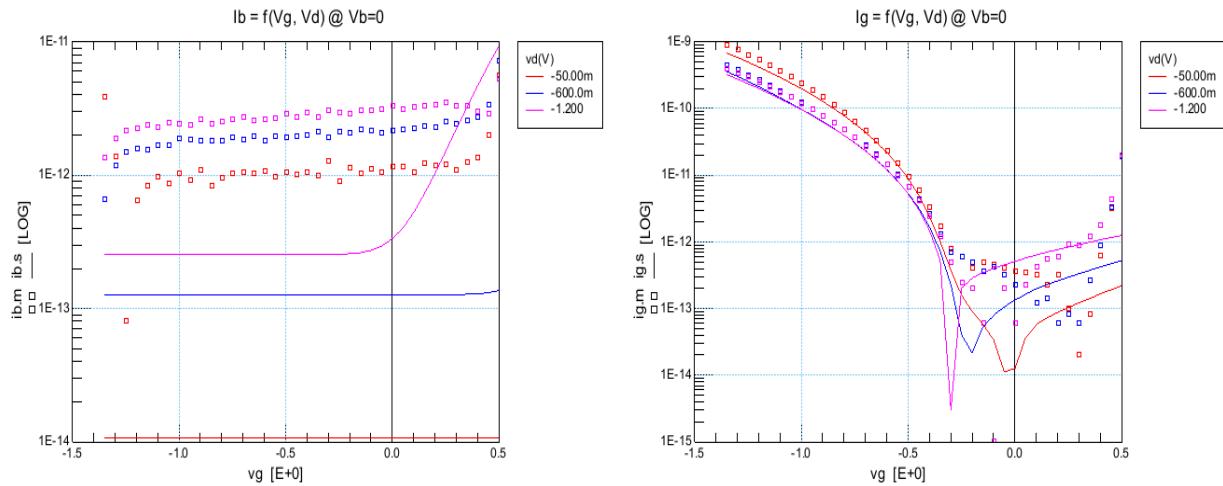


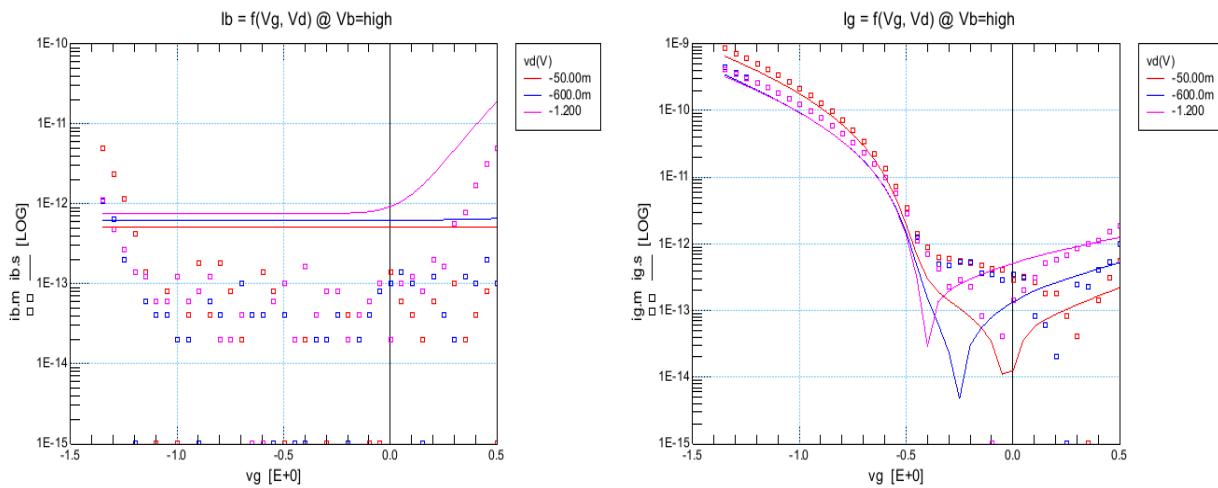
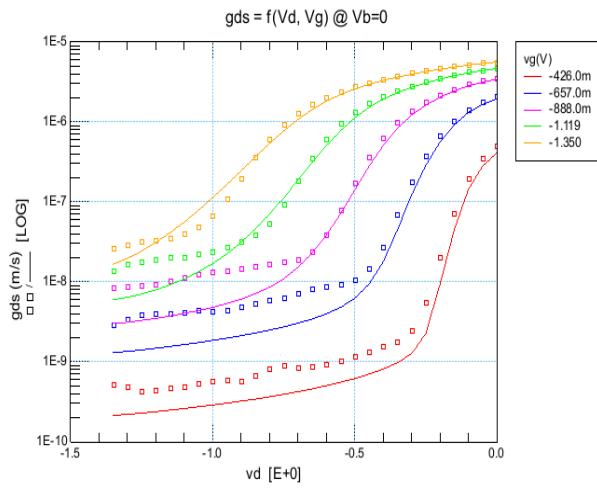
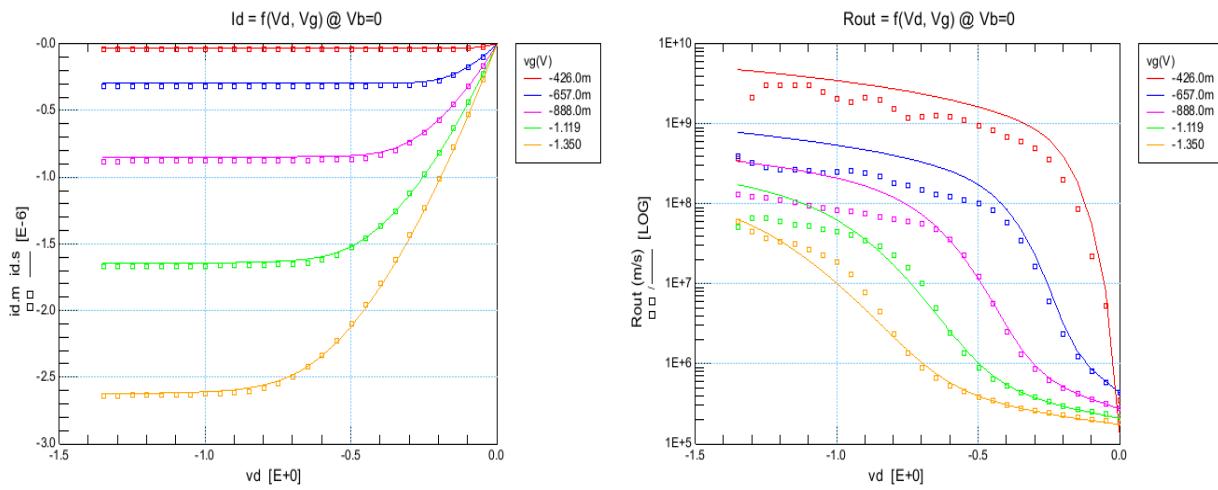
$i_{dvg}, V_d = -1.2V, T = 27^\circ C$

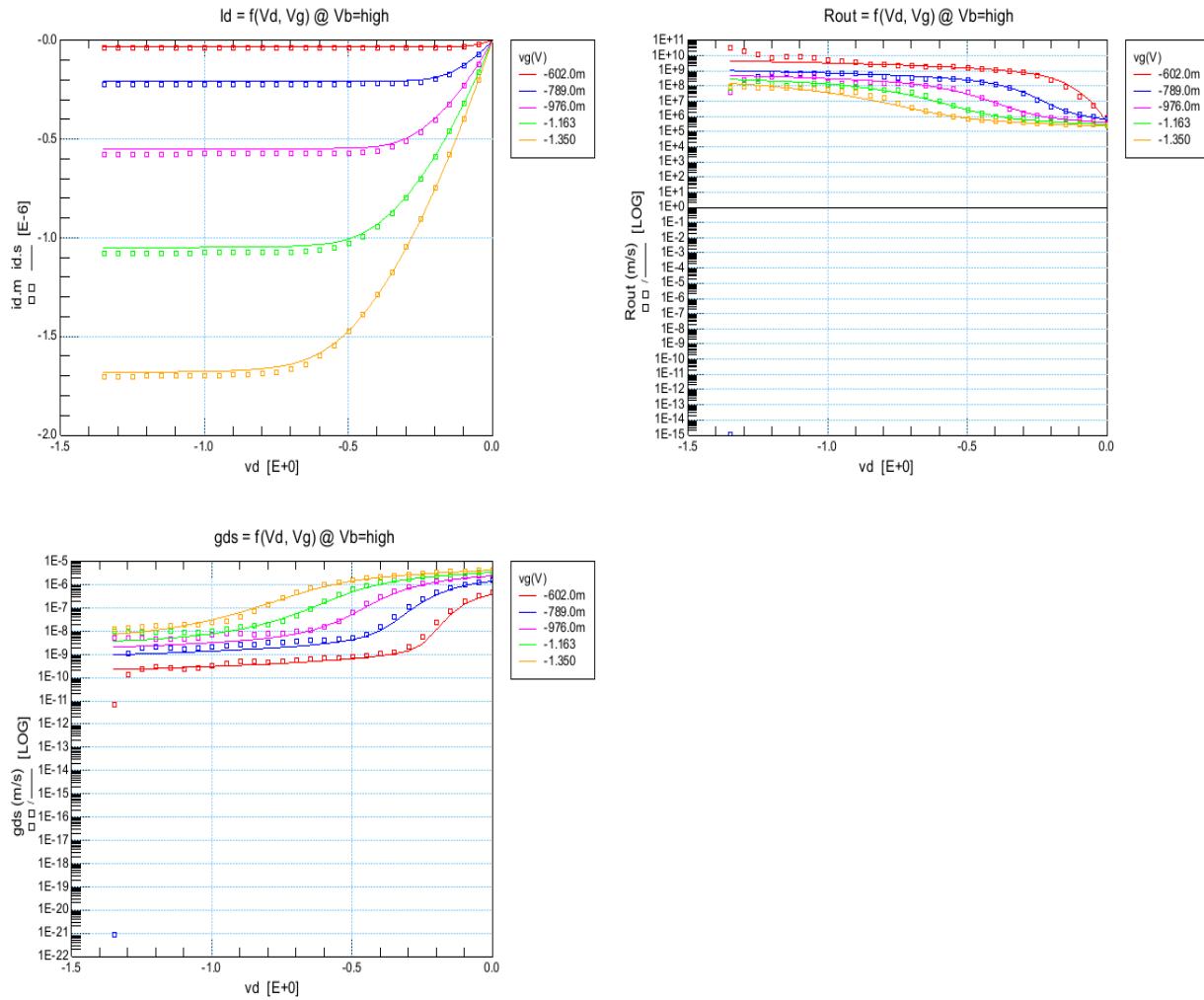
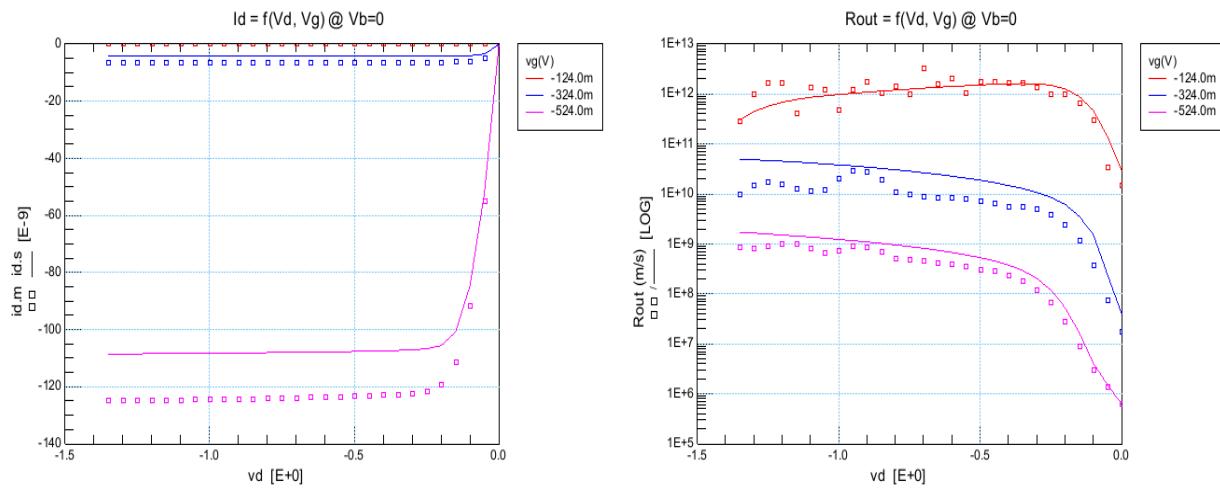


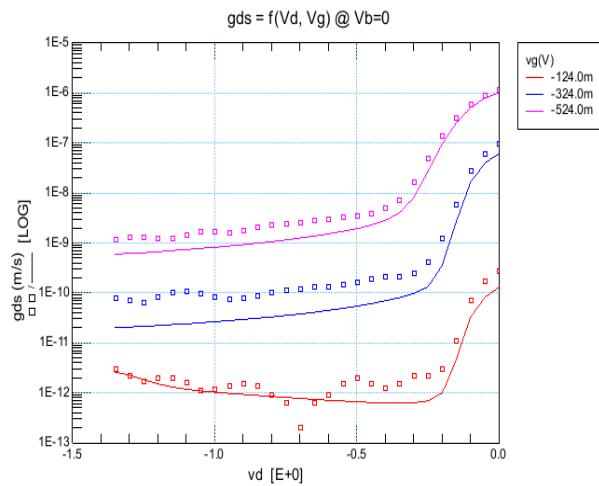


$I_{dVg}, I_b, I_g, V_b = 0V, T = 27^\circ C$

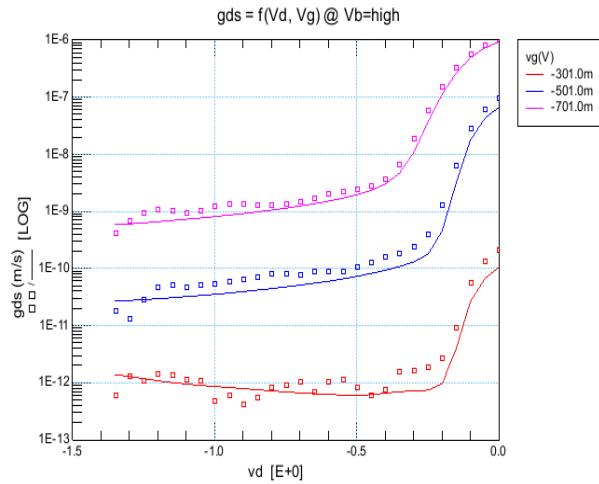
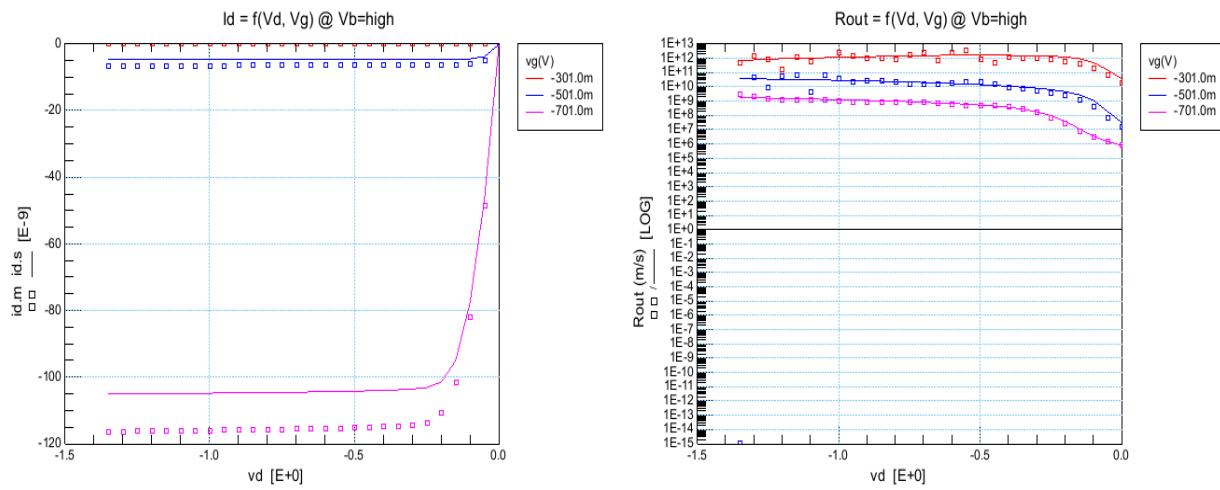


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C


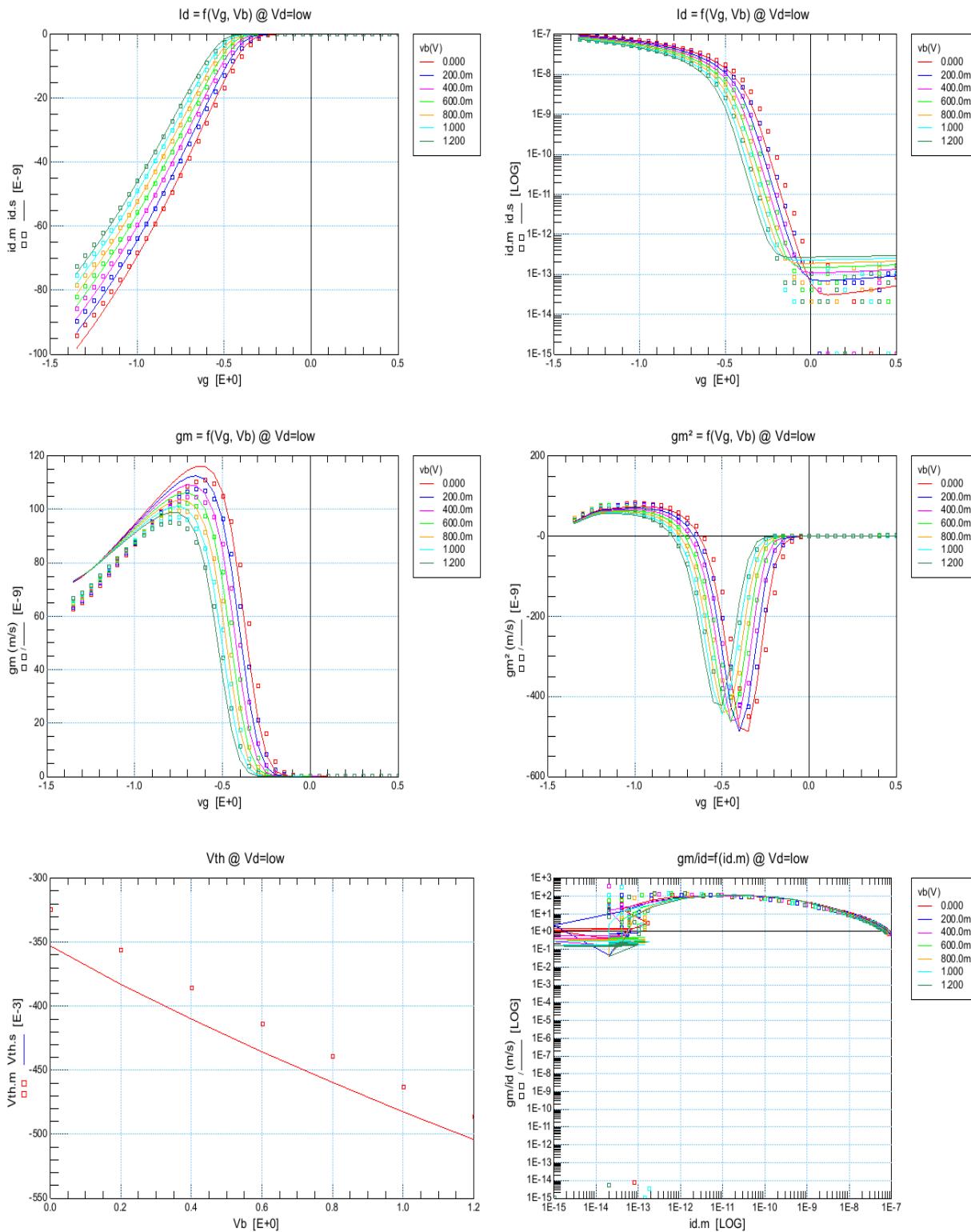


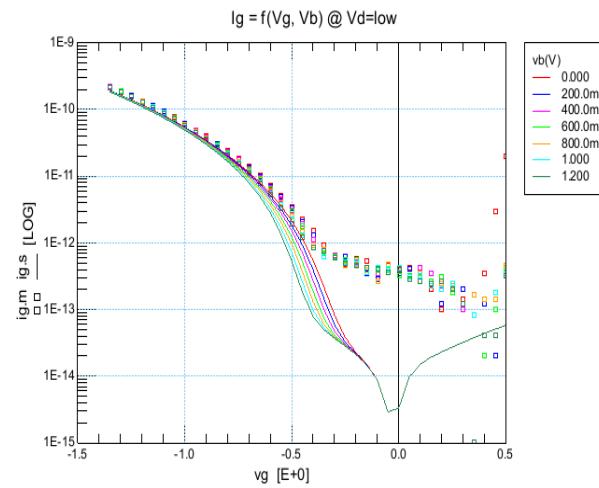
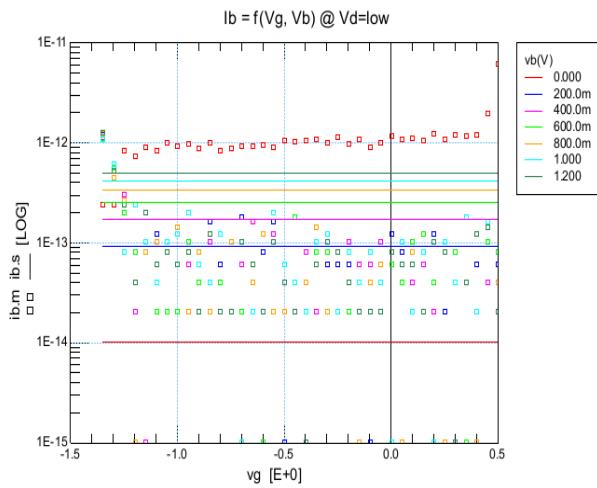
$idvd_vth_vbmin, Vb = 1.2V, T = 27^\circ C$



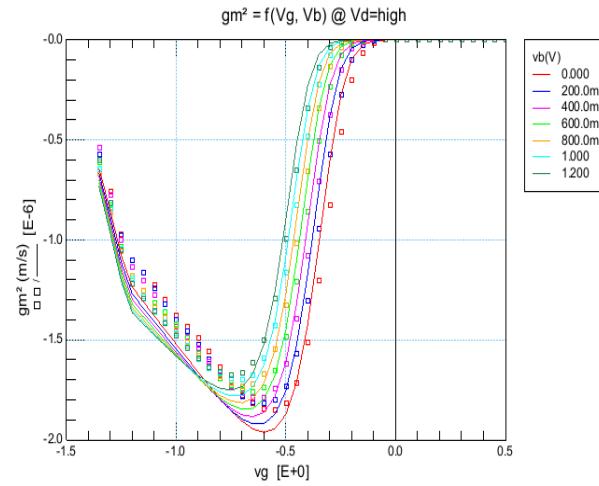
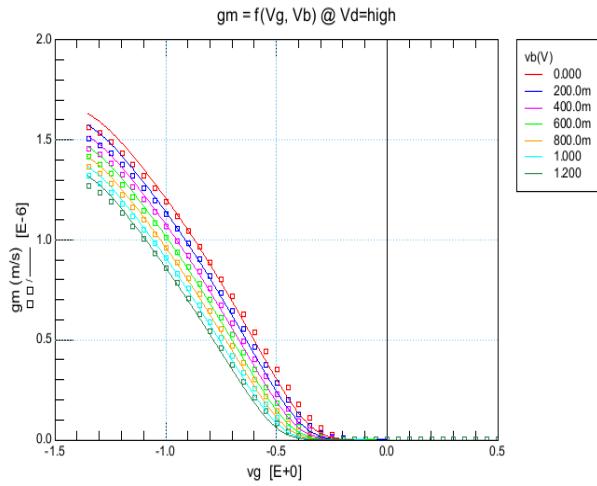
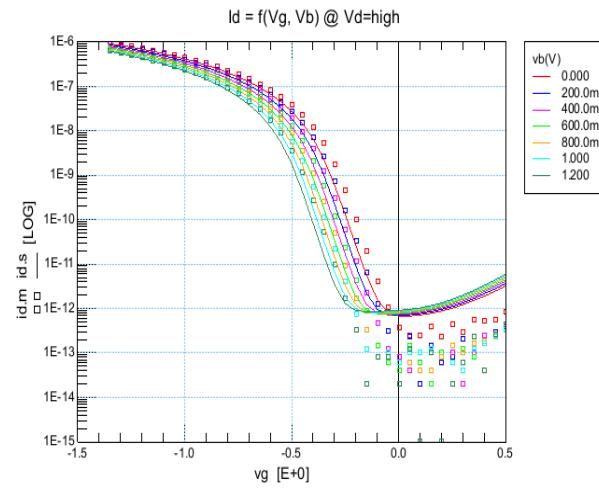
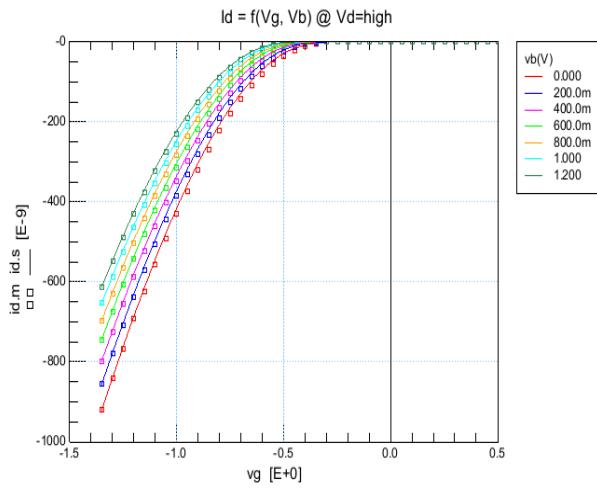
4.14 W0u18_L10u0_S554_1

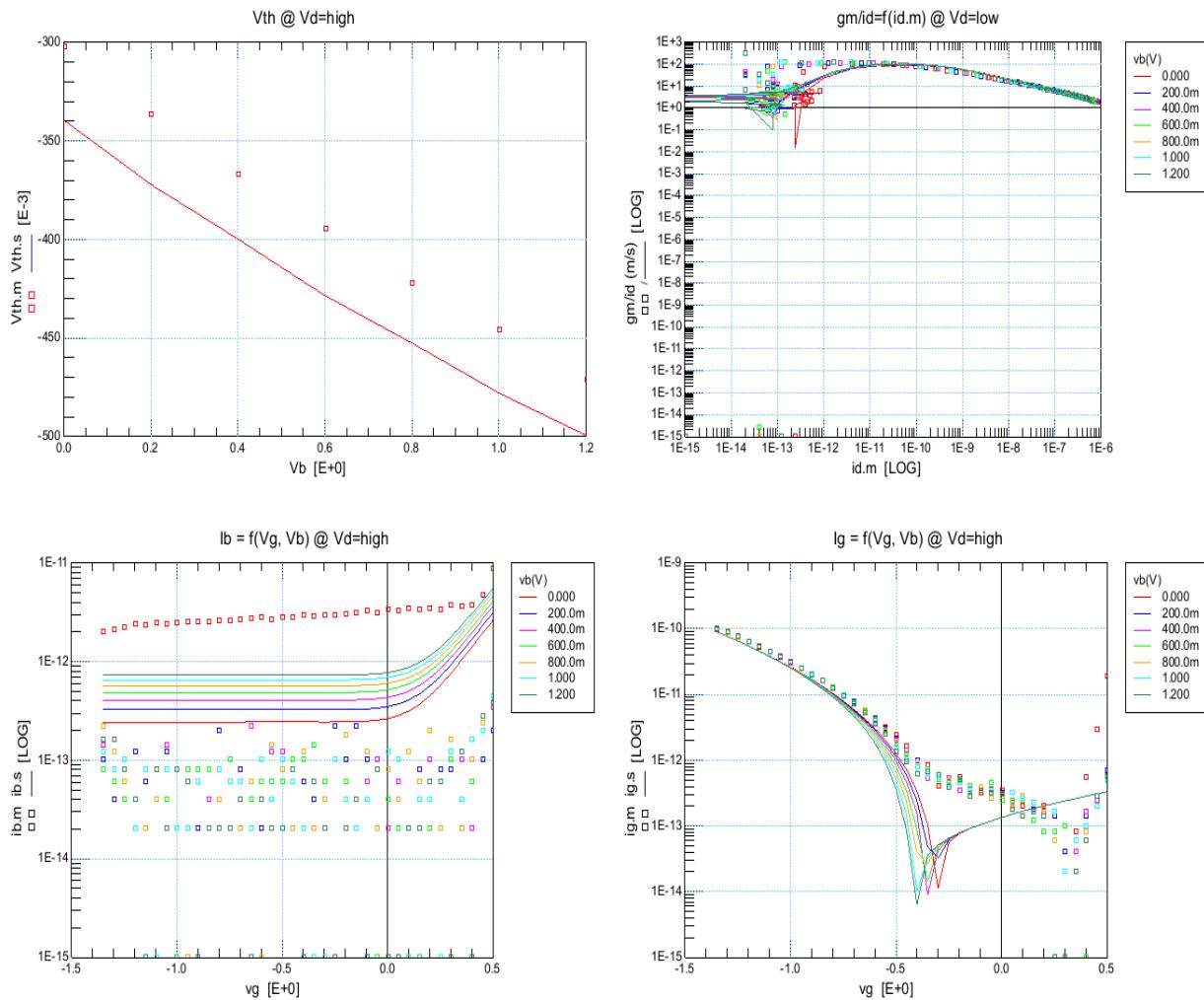
idv , $Vd = -0.05V$, $T = 27^\circ C$



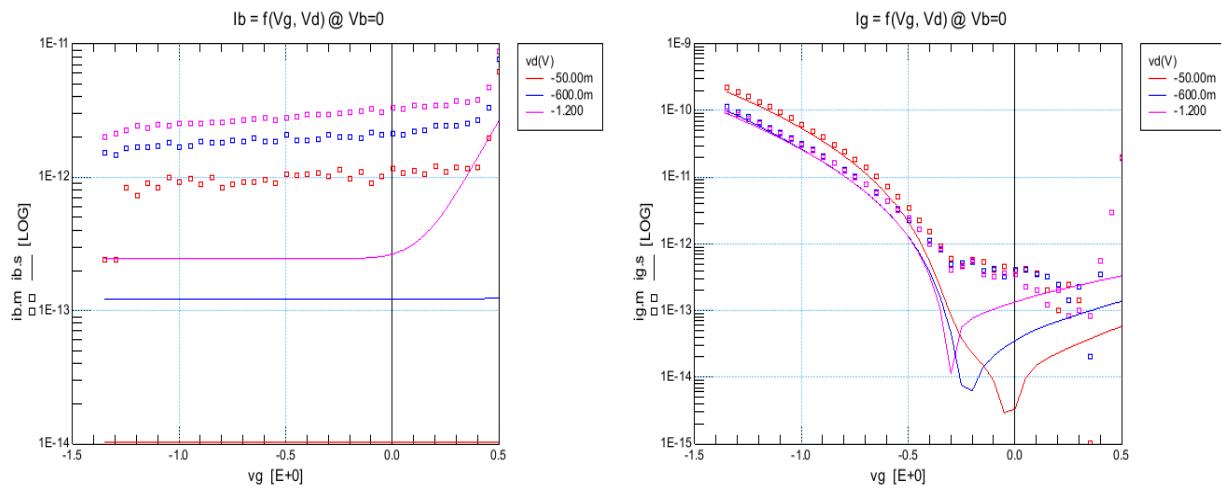


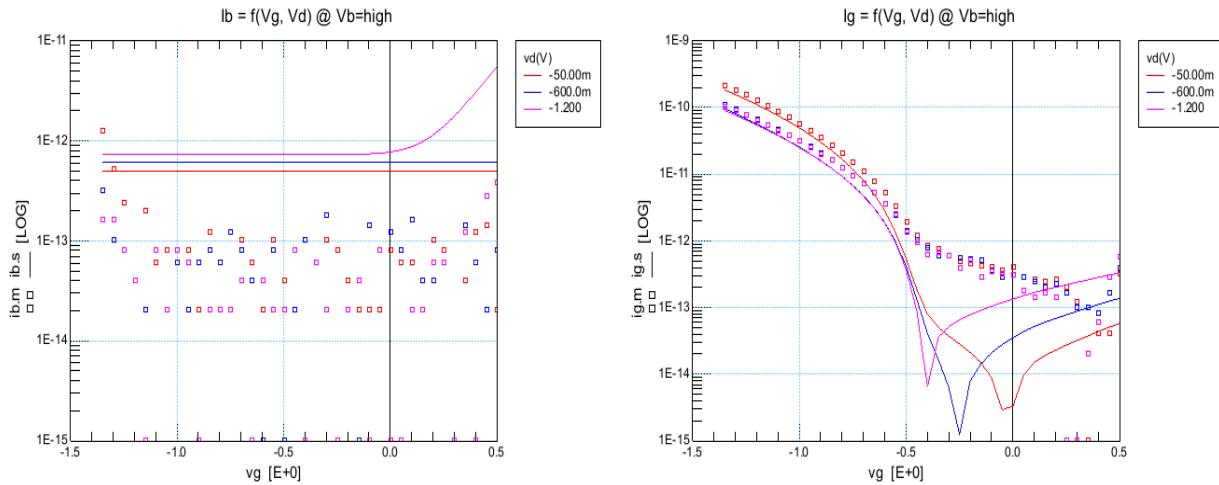
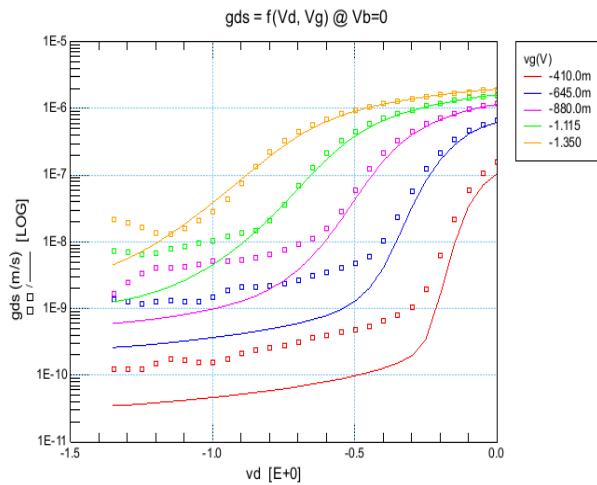
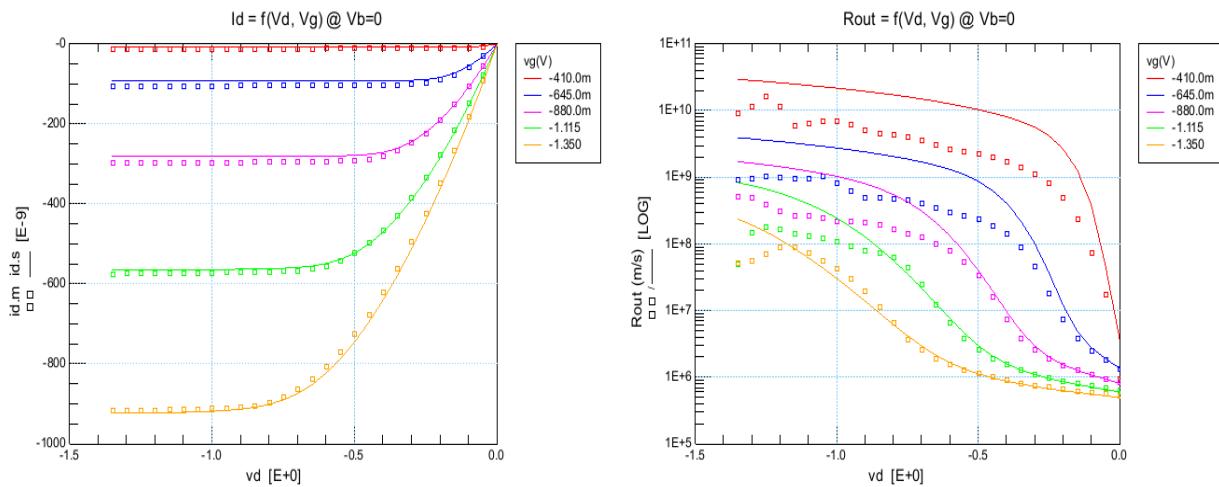
$i_{dvg}, V_d = -1.2V, T = 27^\circ\text{C}$

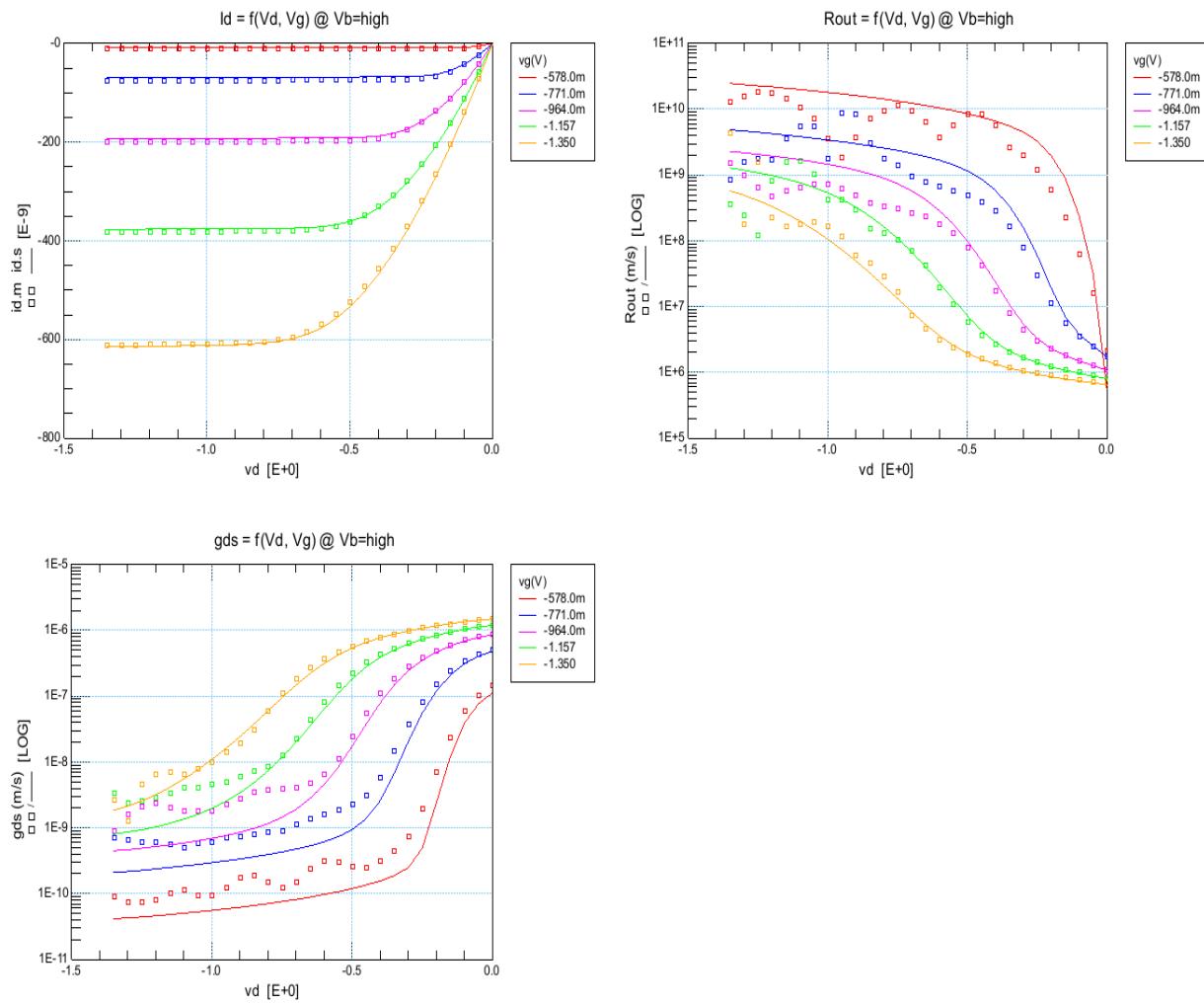
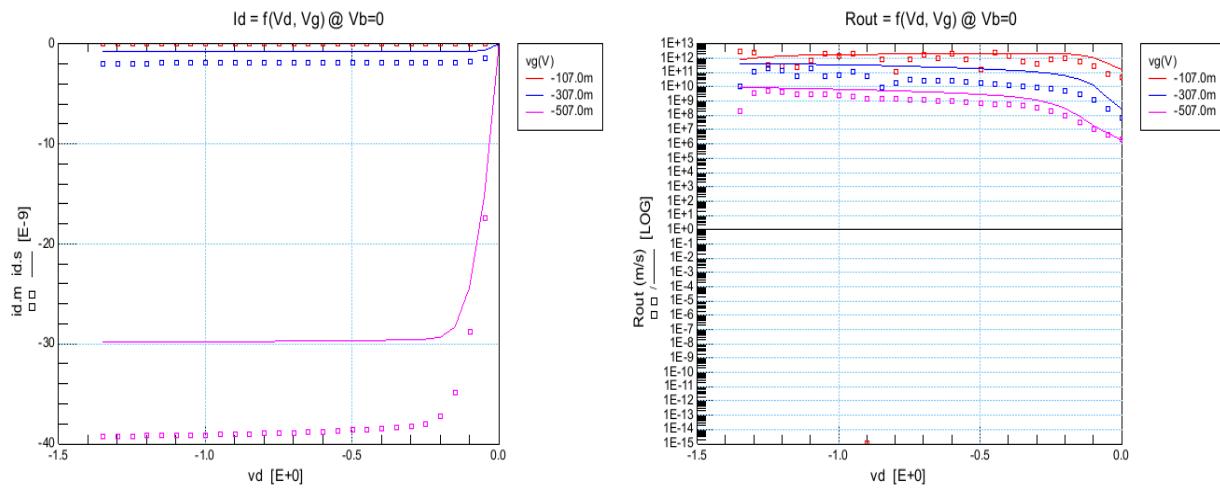


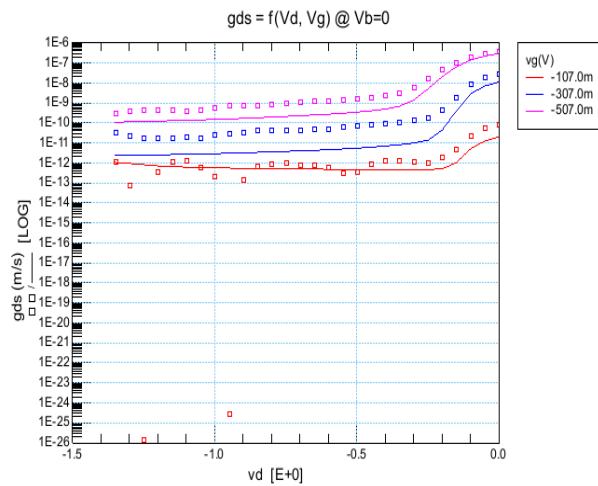


idvg, Ib, Ig, Vb = 0V, T = 27°C

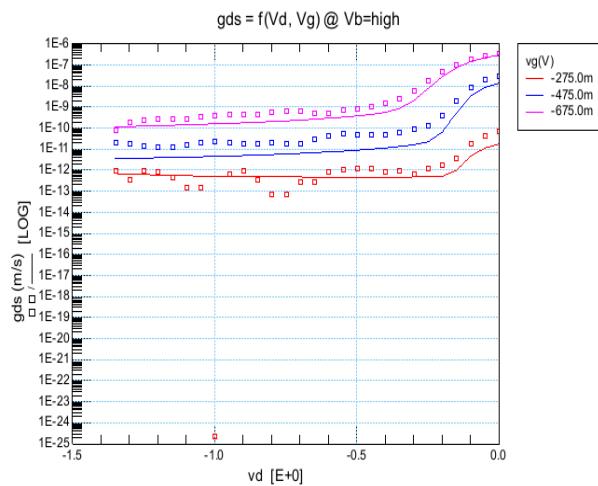
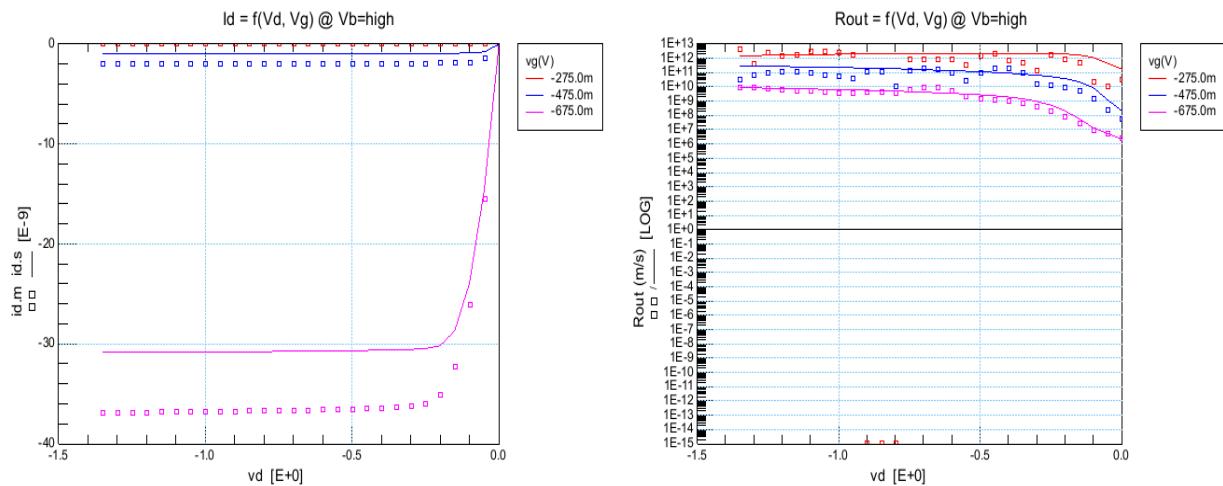


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C


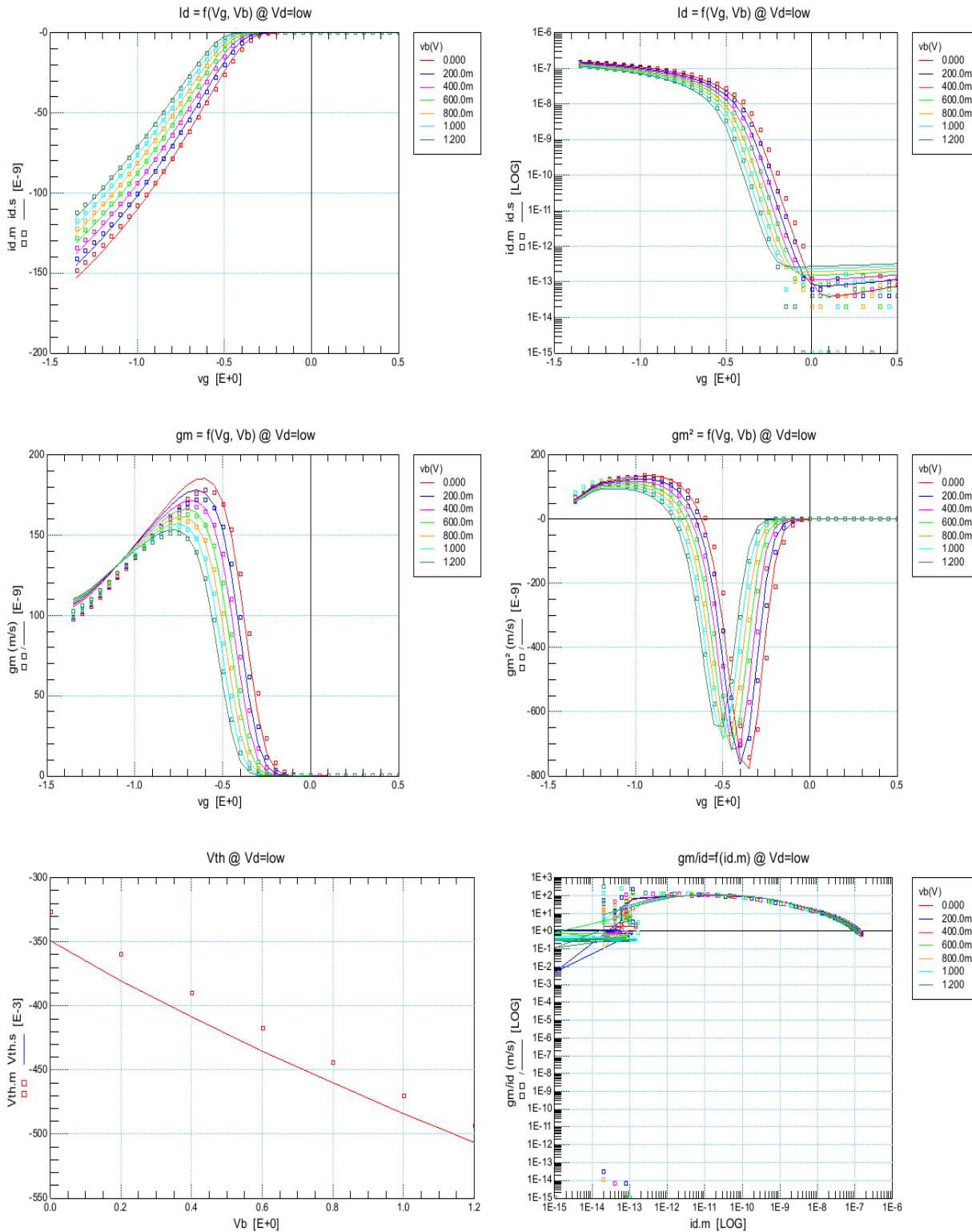


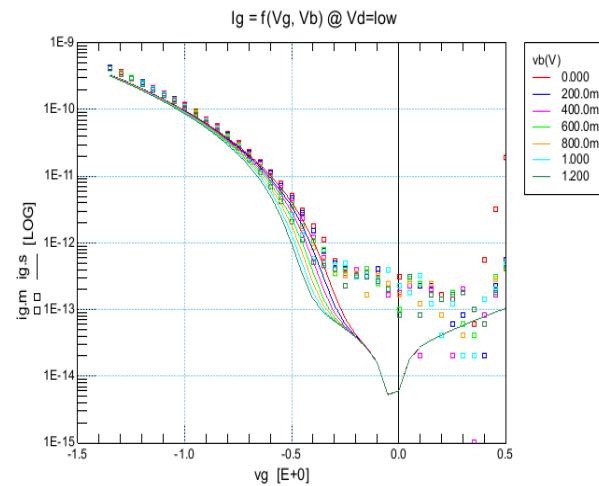
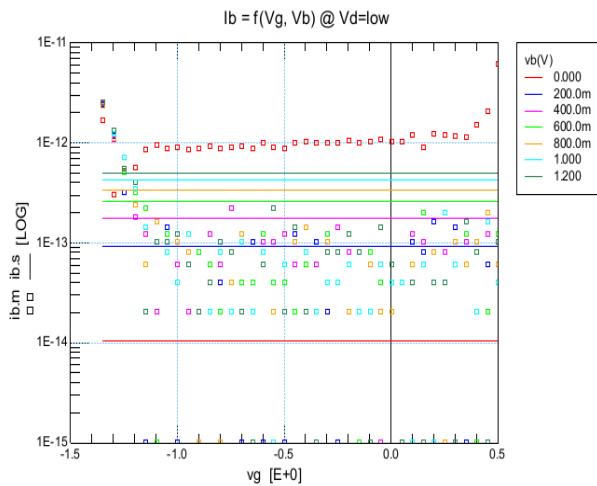
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



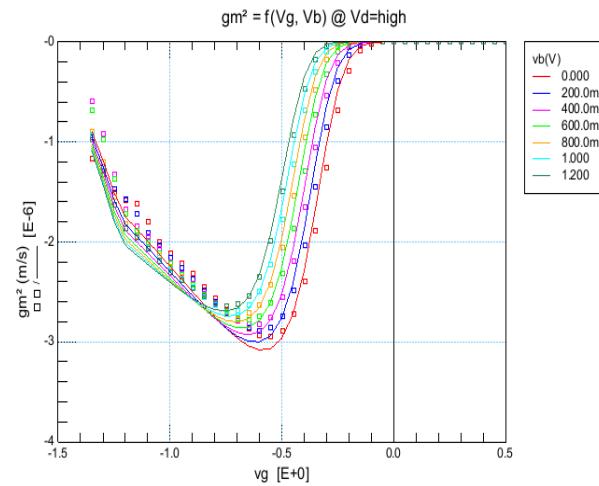
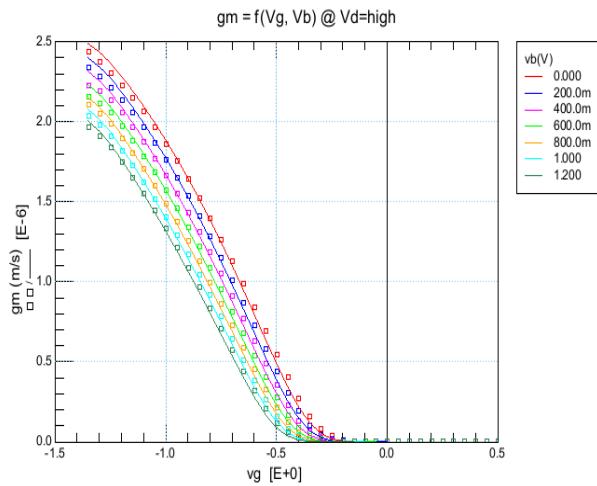
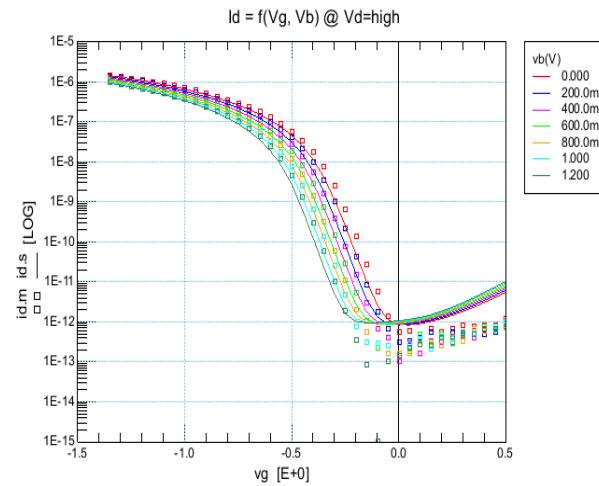
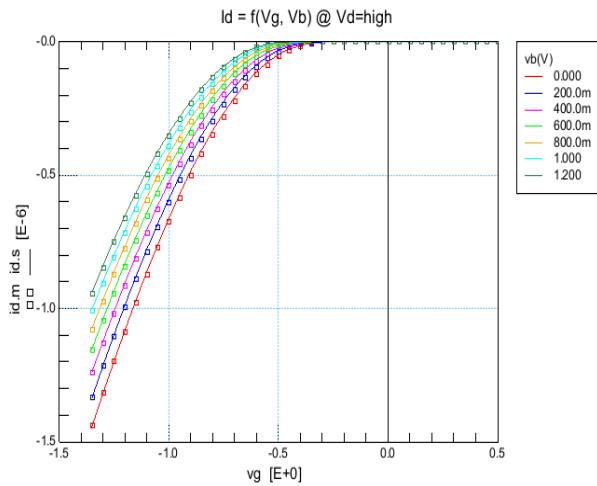
4.15 W0u3_L10u0_S553_2

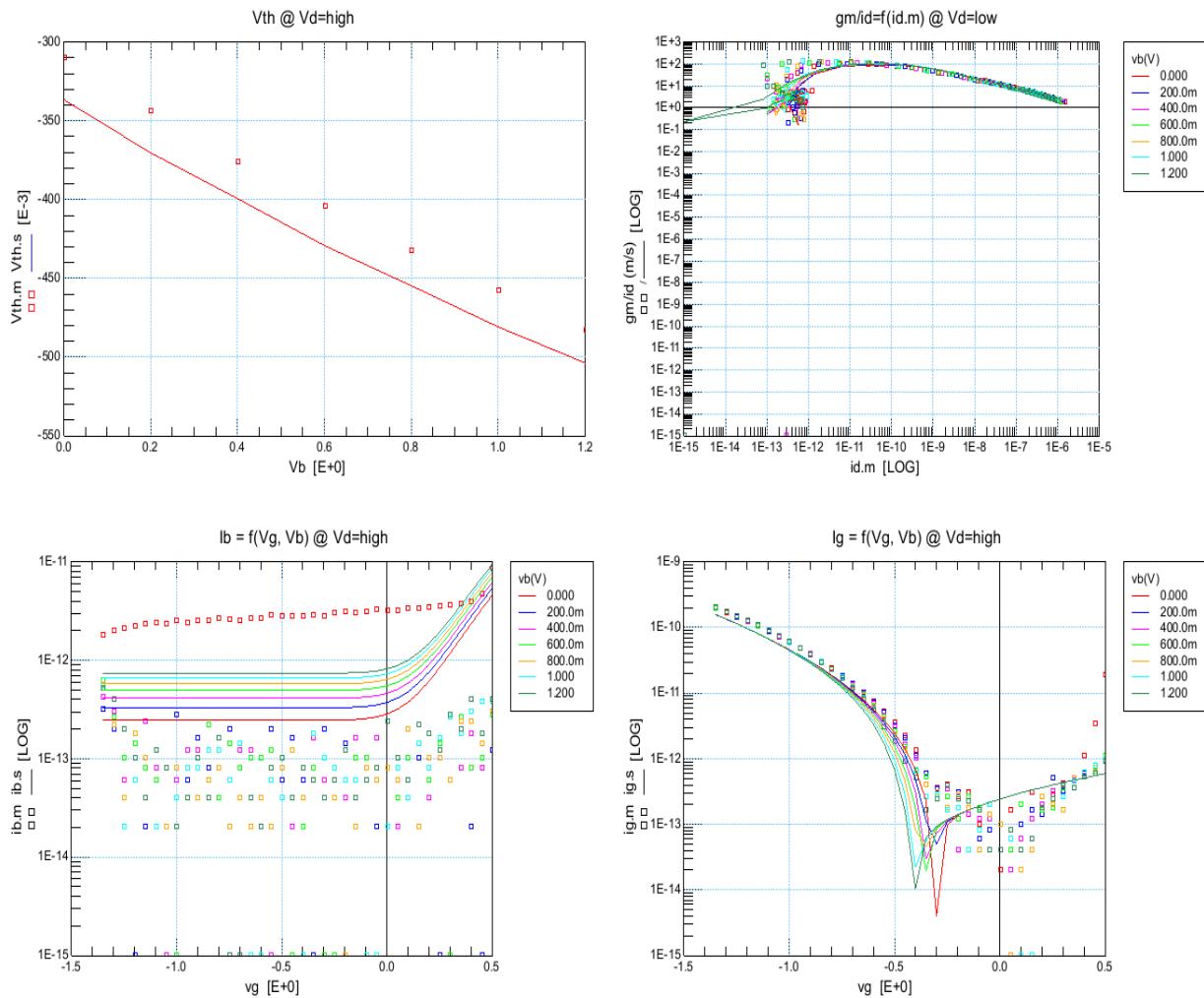
idv , $Vd = -0.05V$, $T = 27^\circ C$



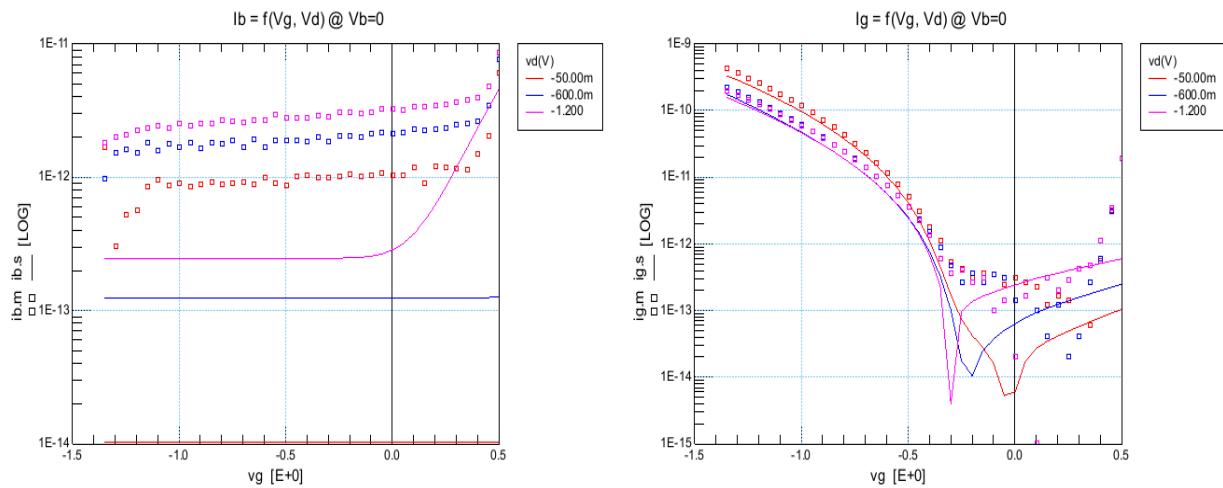


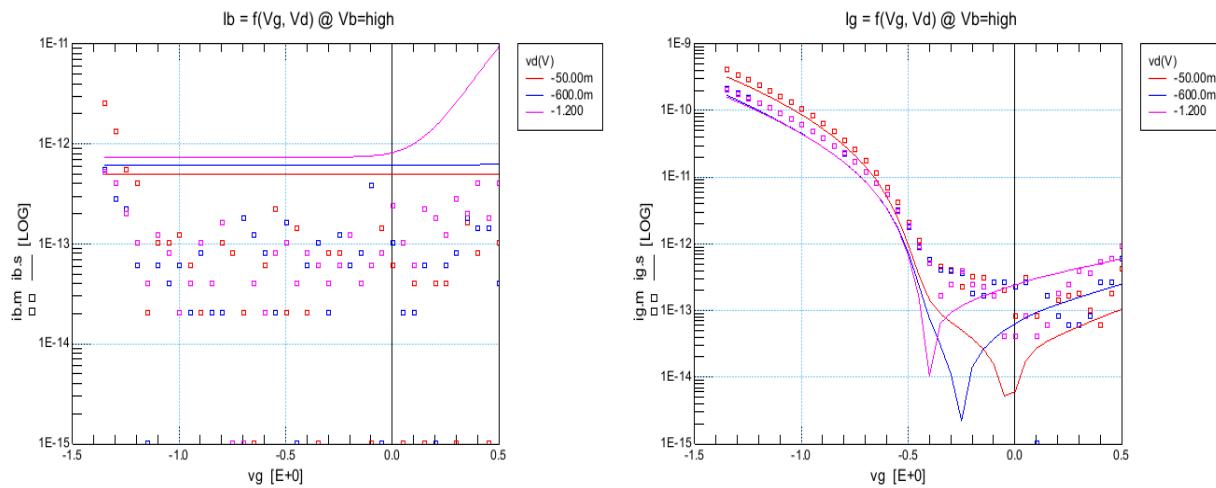
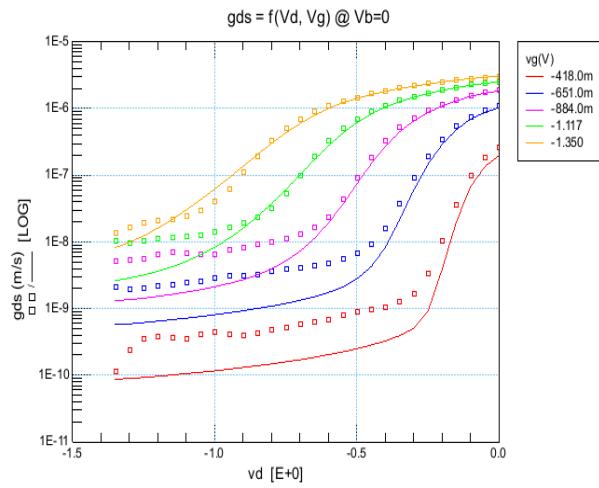
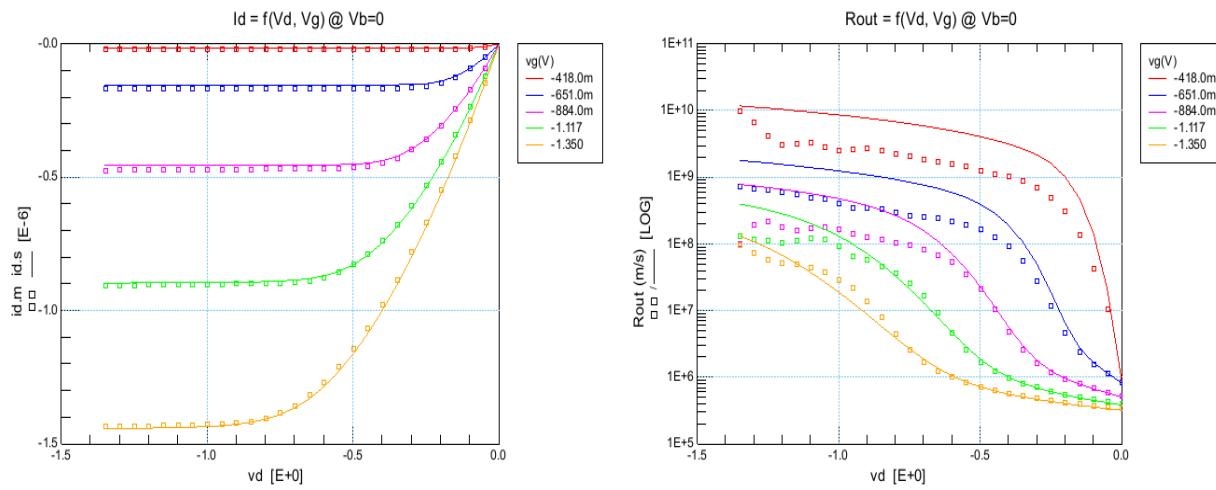
$i_{dvg}, V_d = -1.2V, T = 27^\circ C$

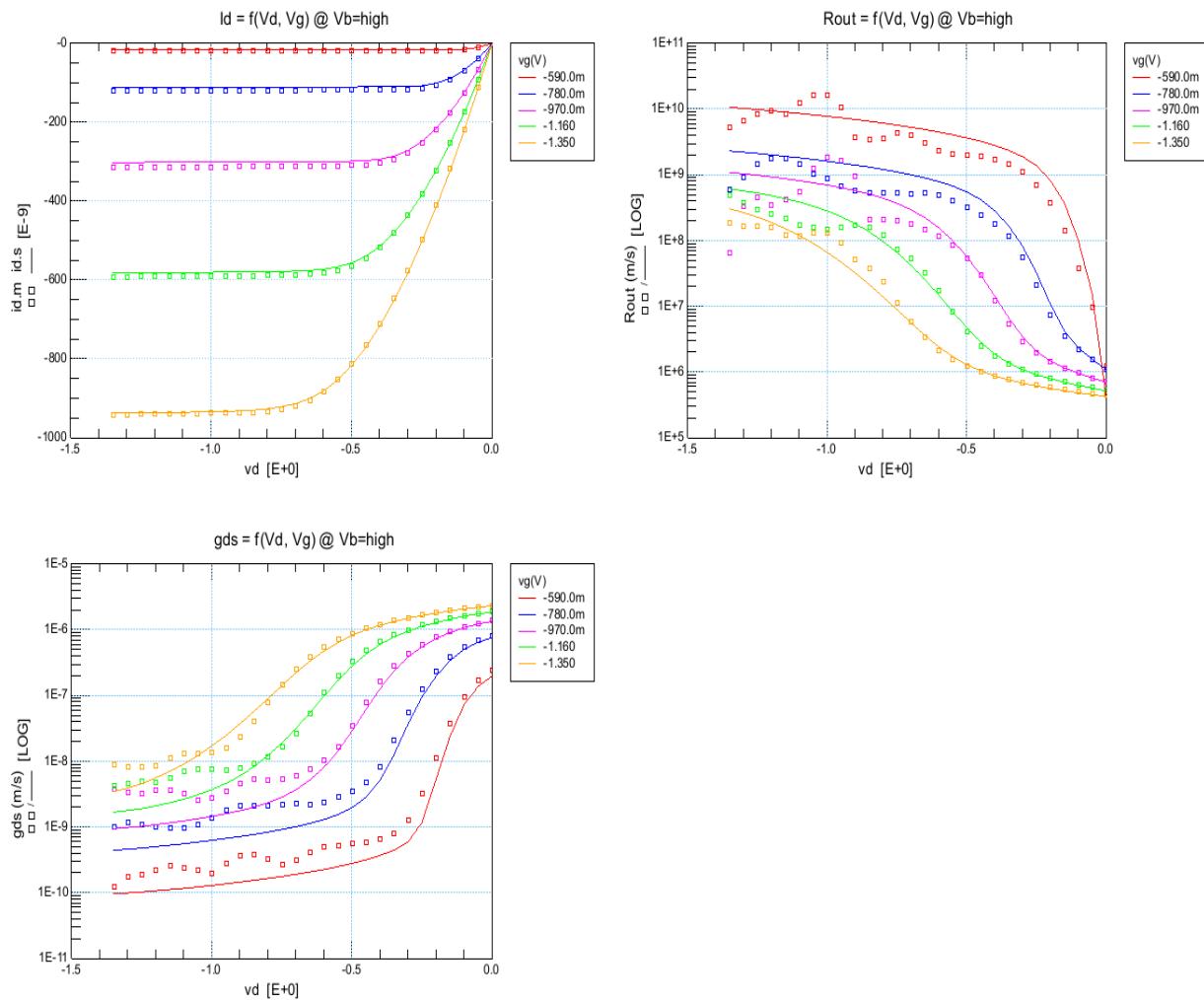
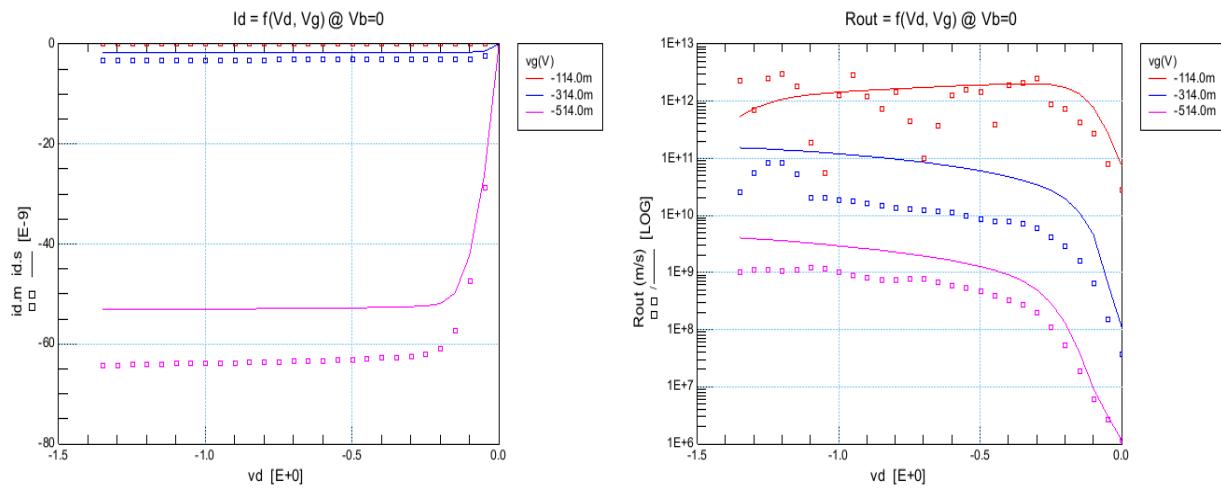


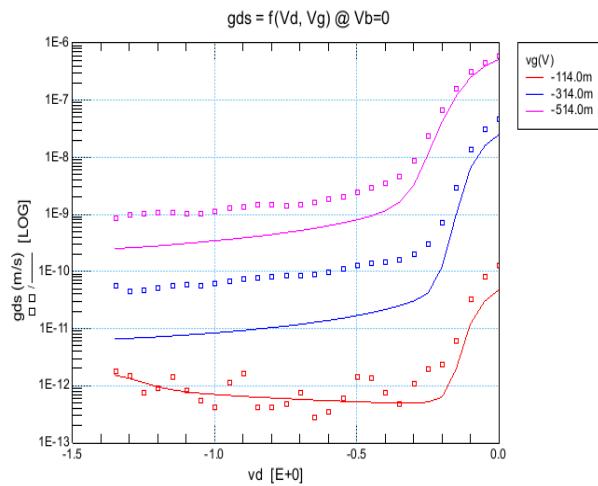


idvg, Ib, Ig, Vb = 0V, T = 27°C

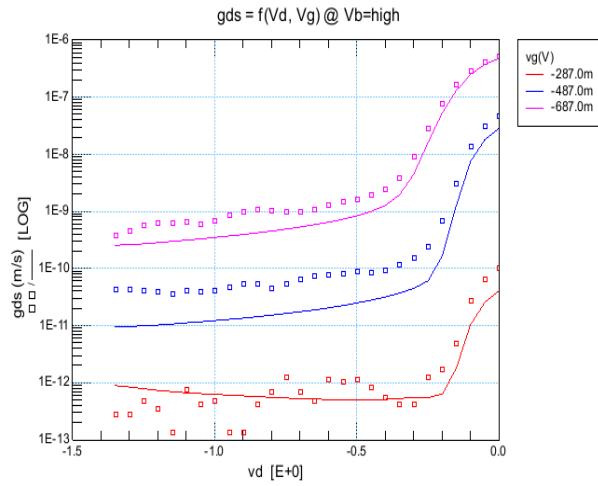
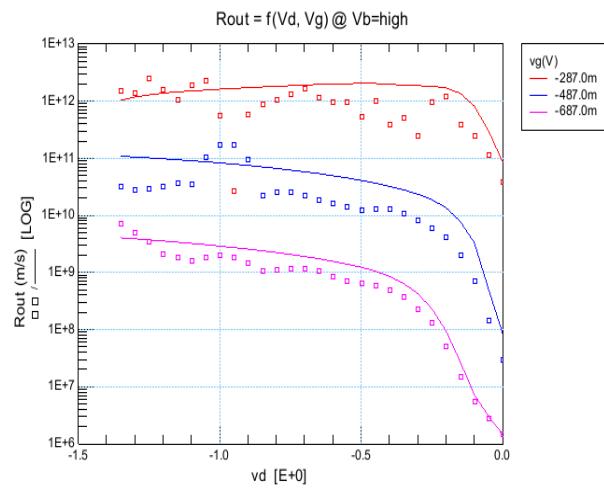
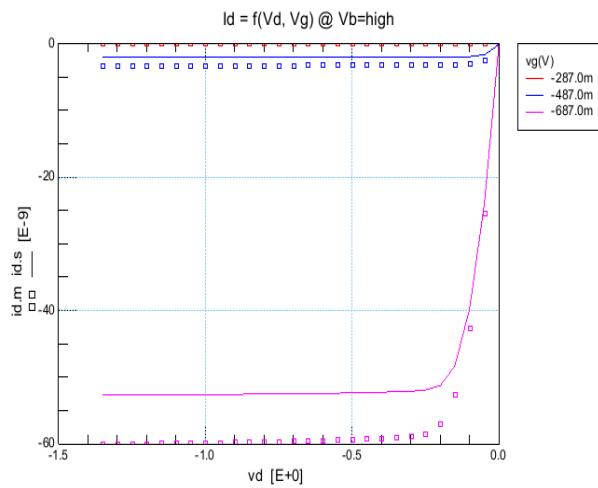


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


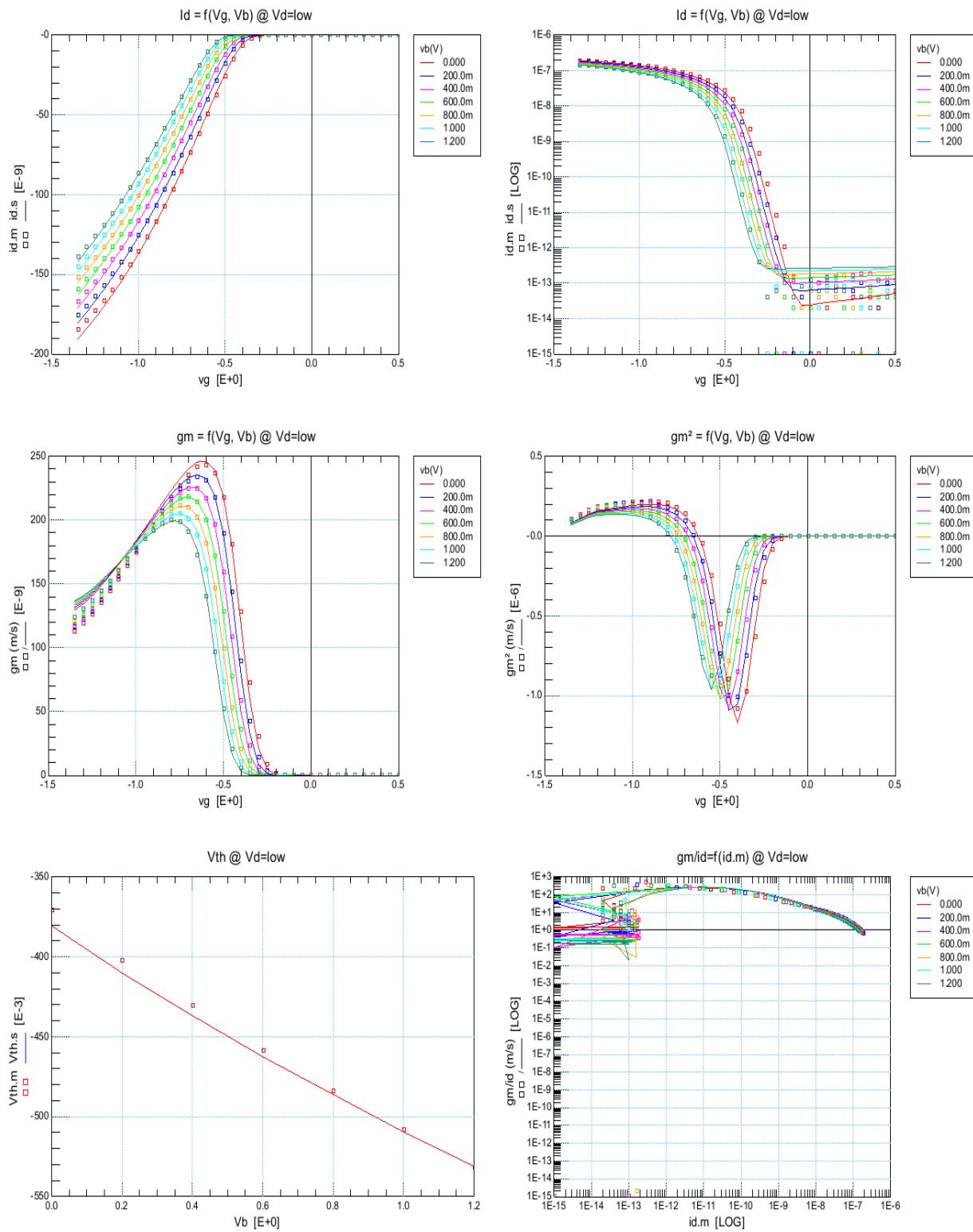
idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C


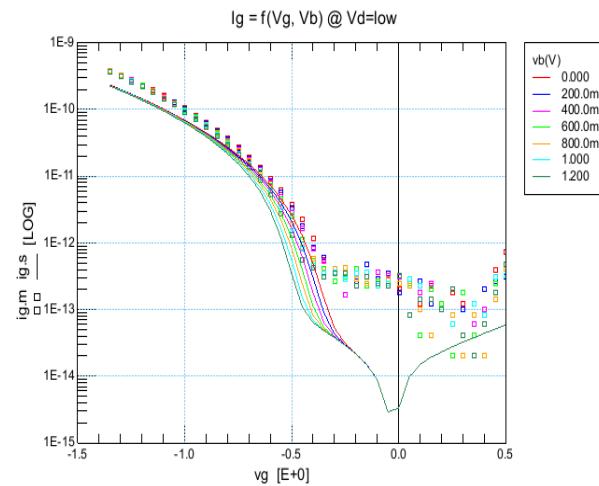
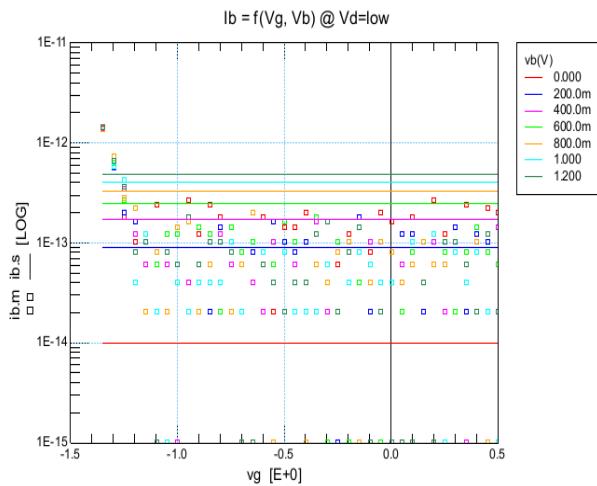


idvd_vth_vbmin, Vb = 1.2V, T = 27°C

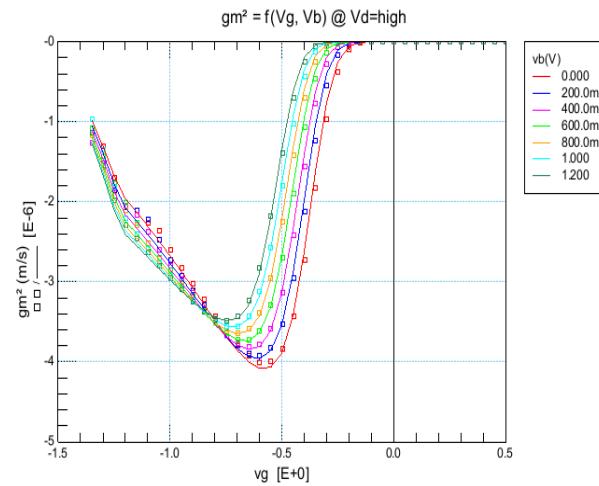
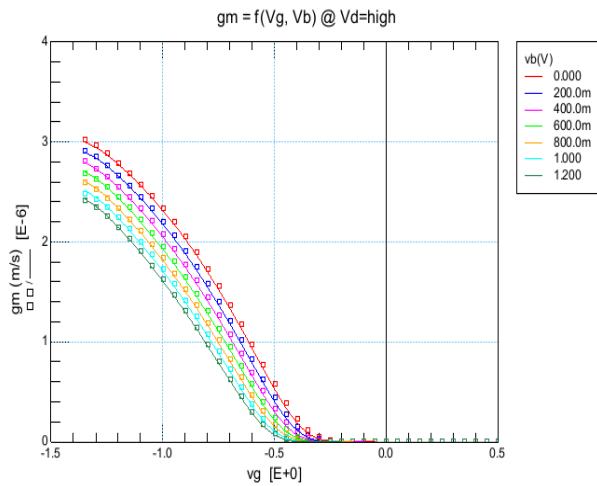
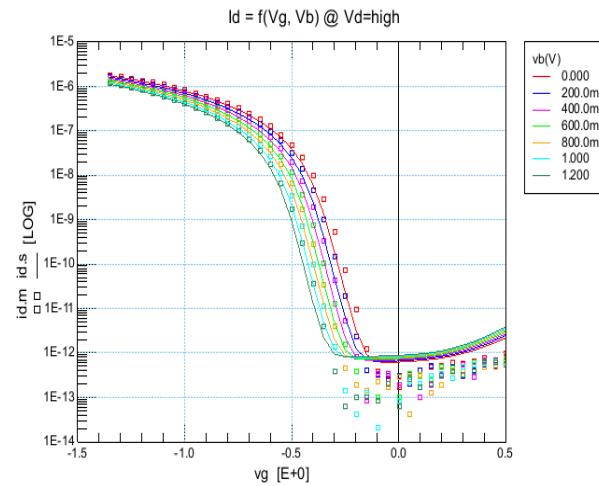
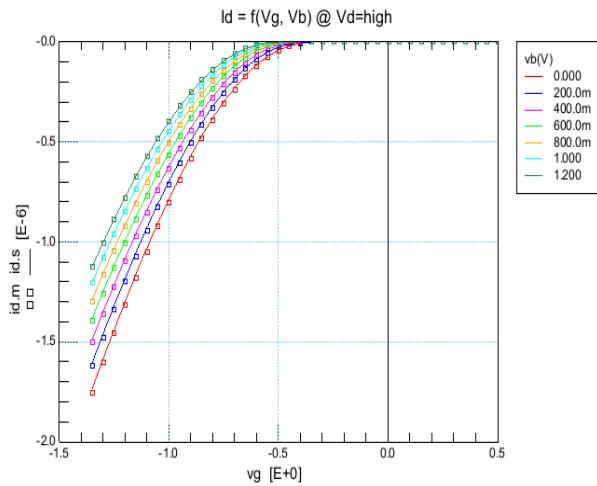


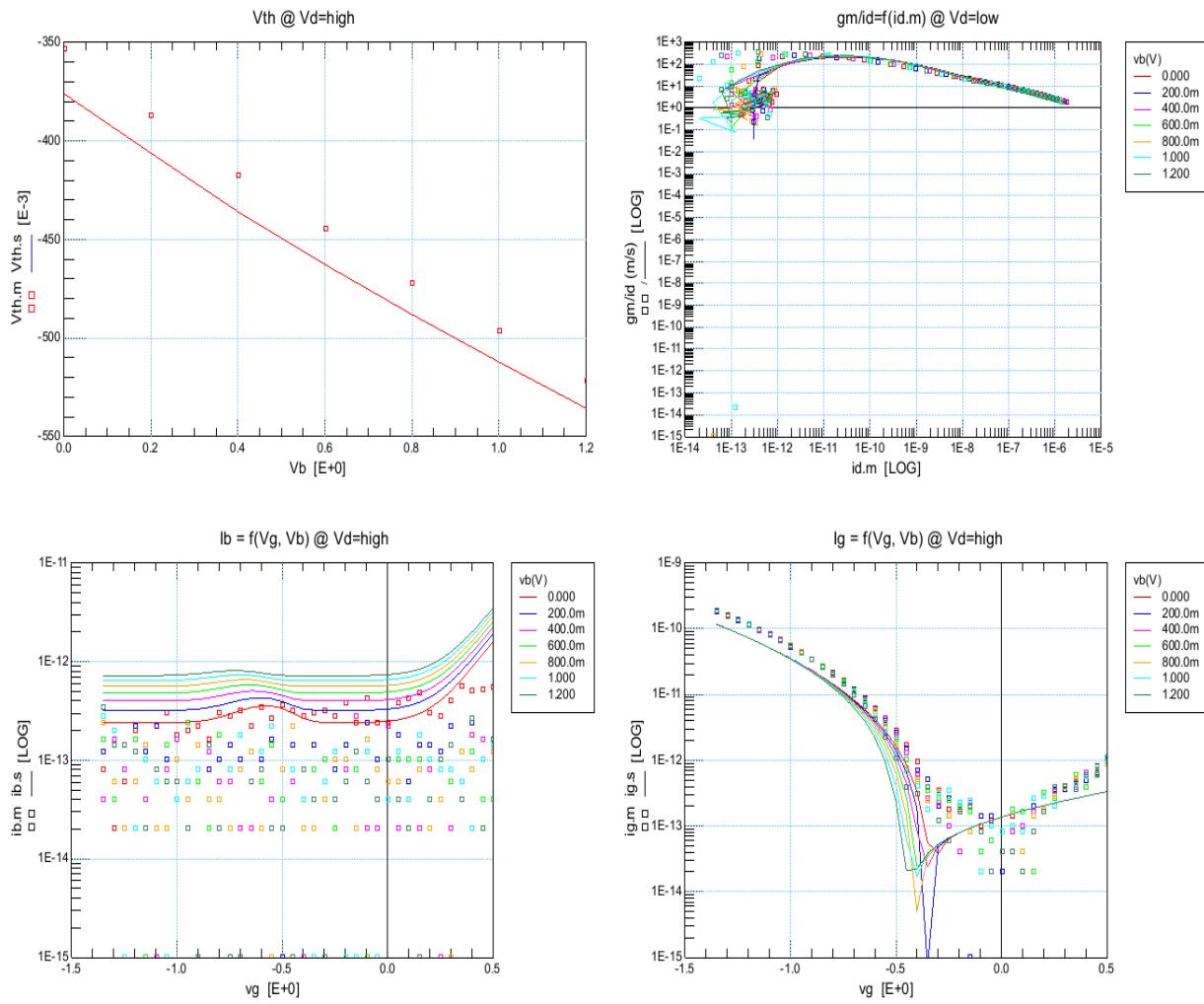
idvg, Vd = -0.05V, T = -40°C



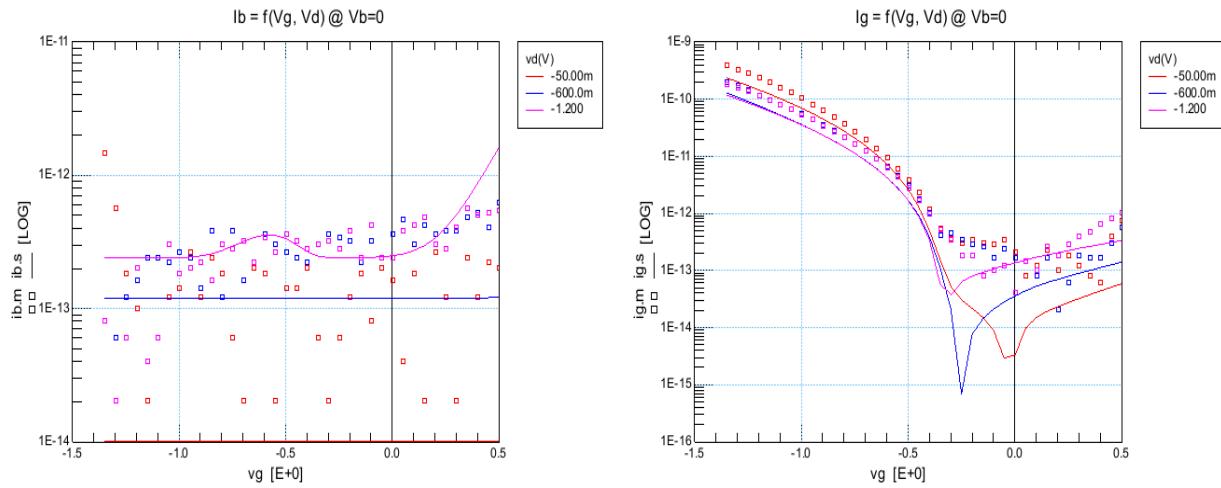


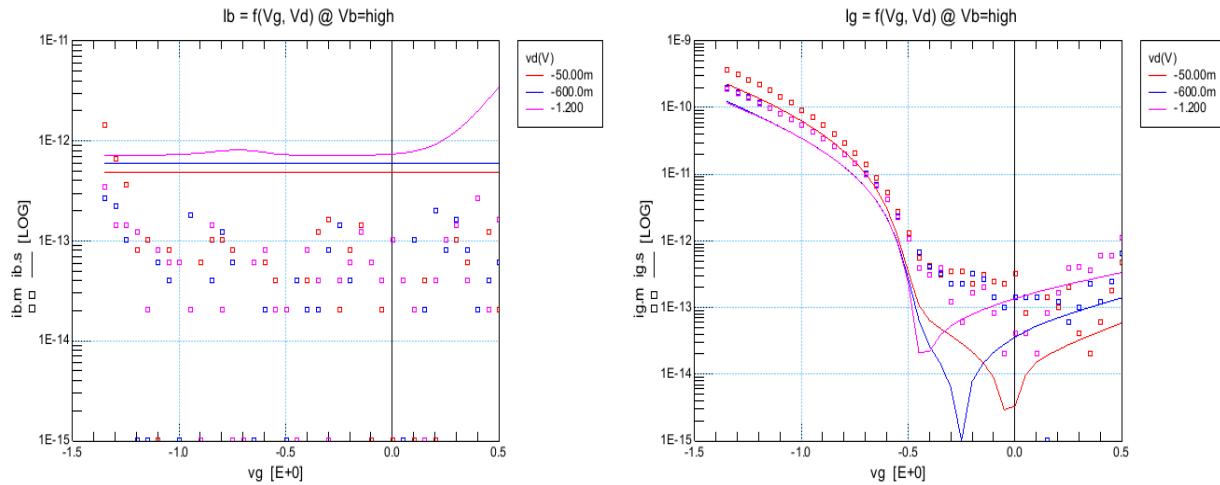
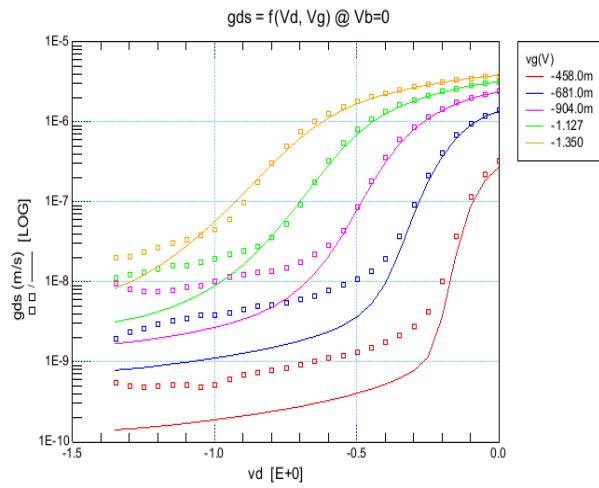
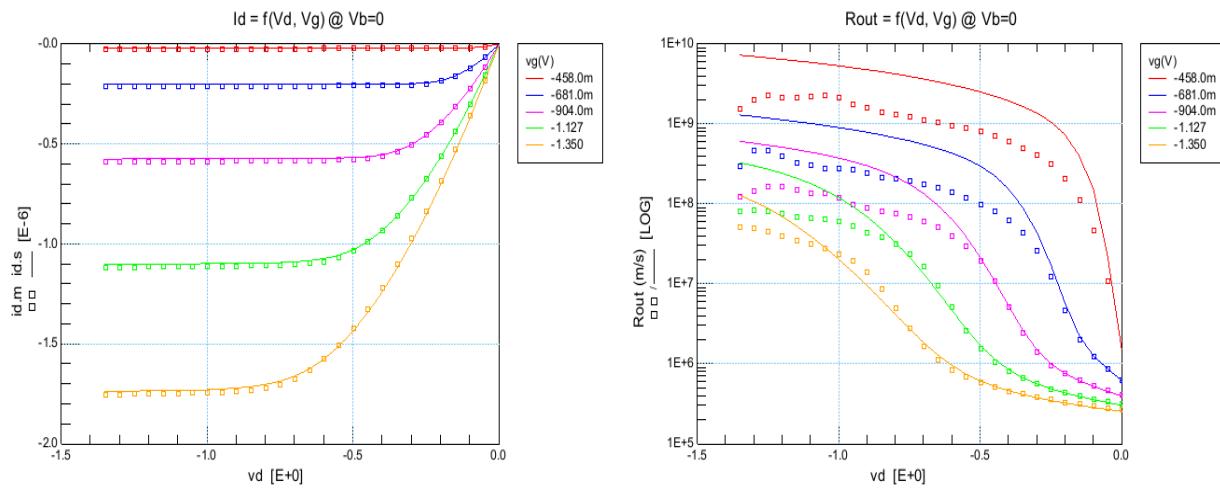
i_{dvg} , $V_d = -1.2V$, $T = -40^\circ C$

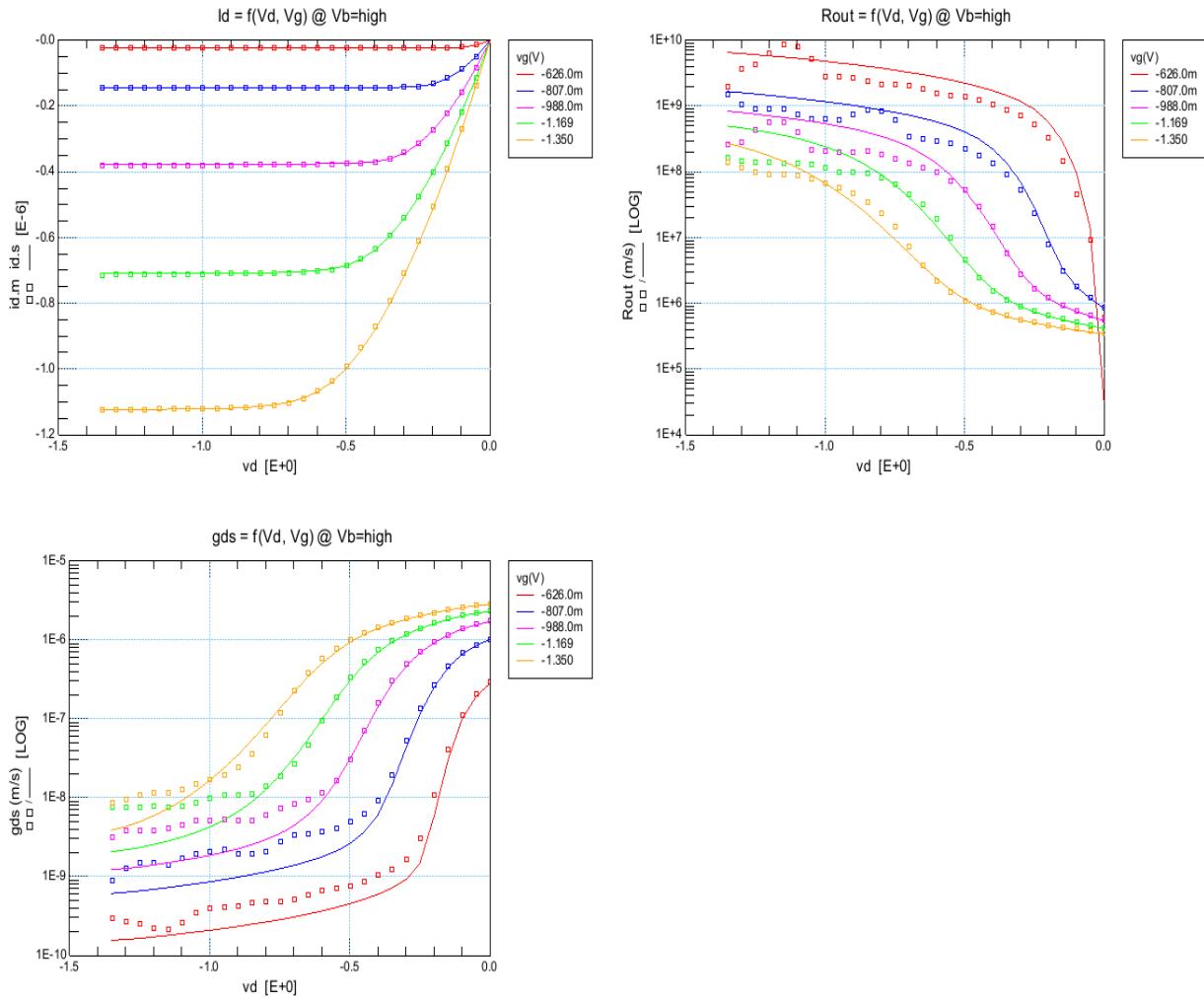
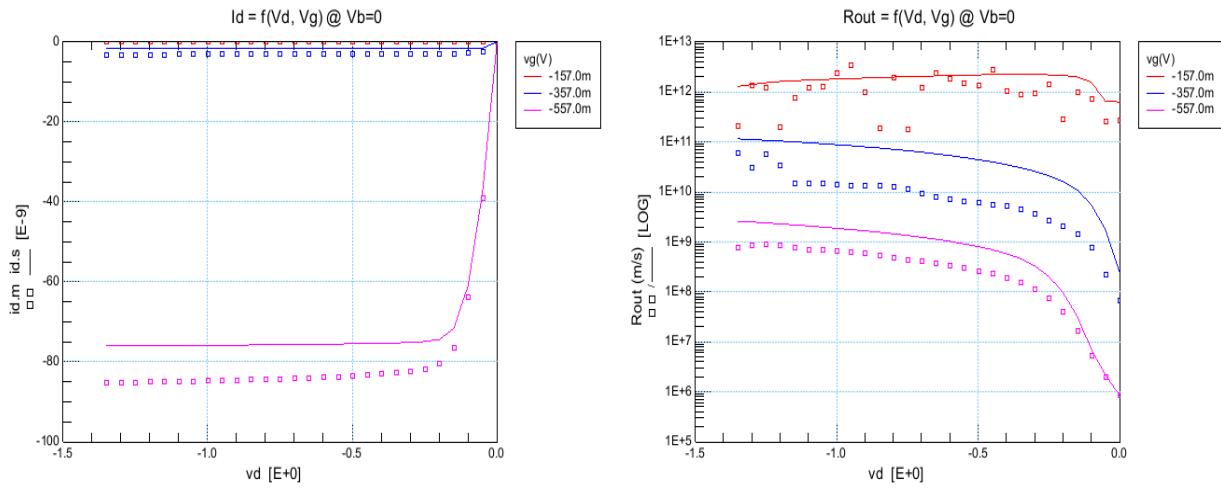


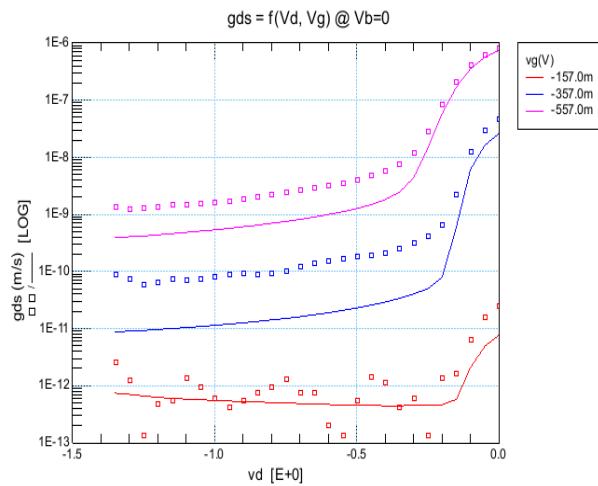


idvg, Ib,Ig, Vb = 0V, T = -40°C

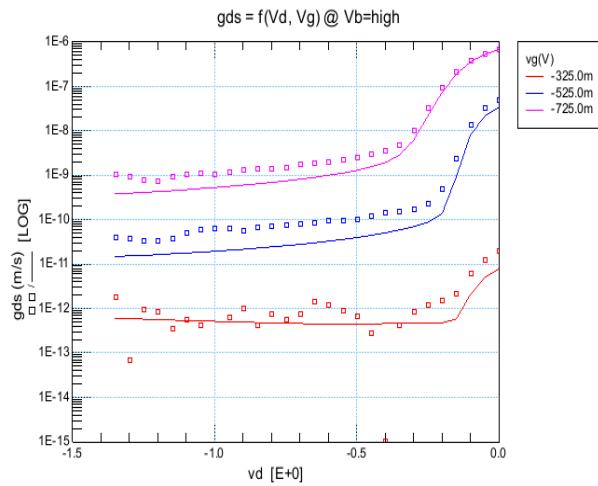
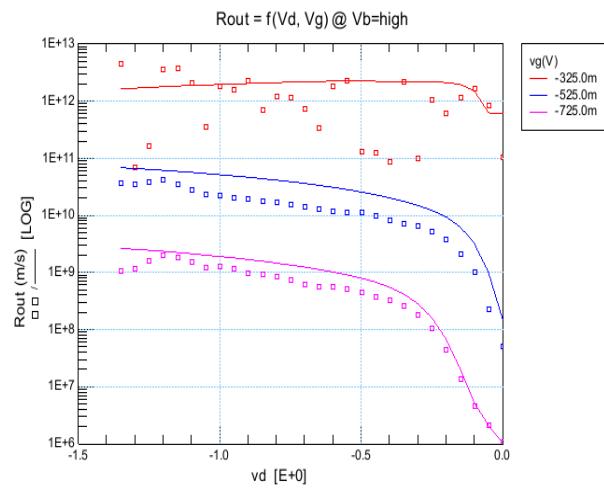
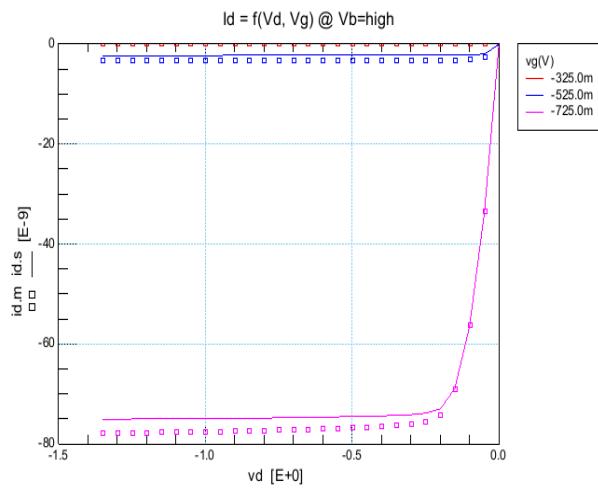


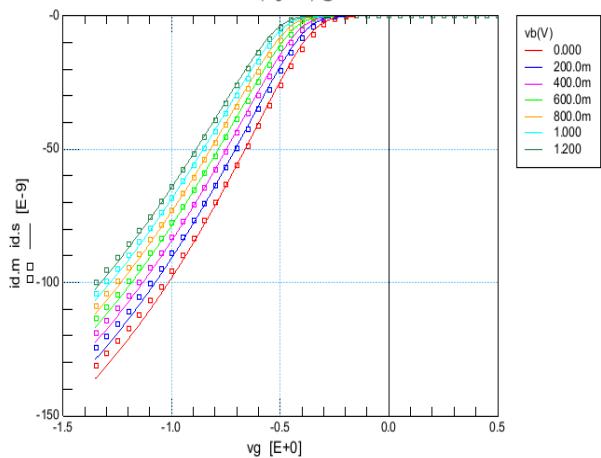
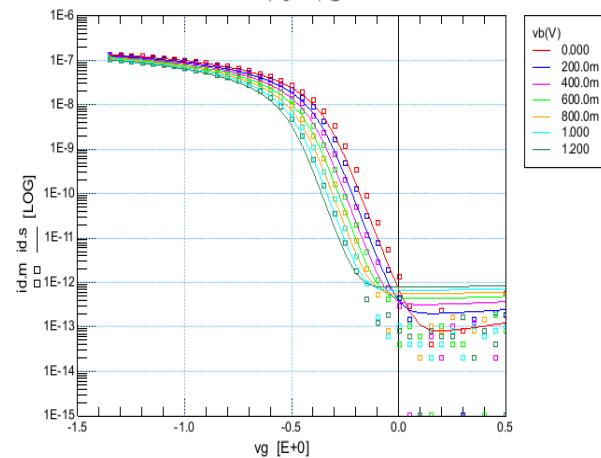
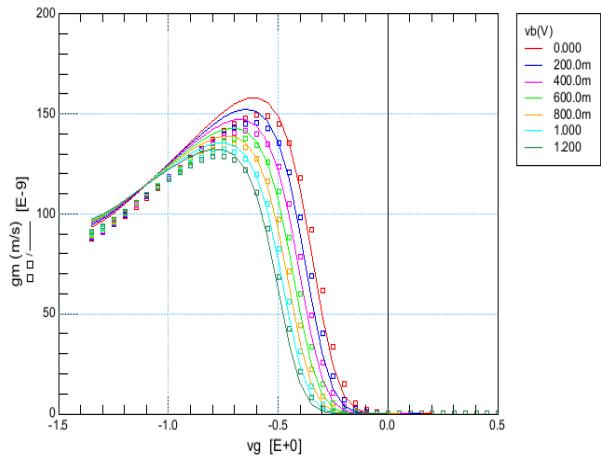
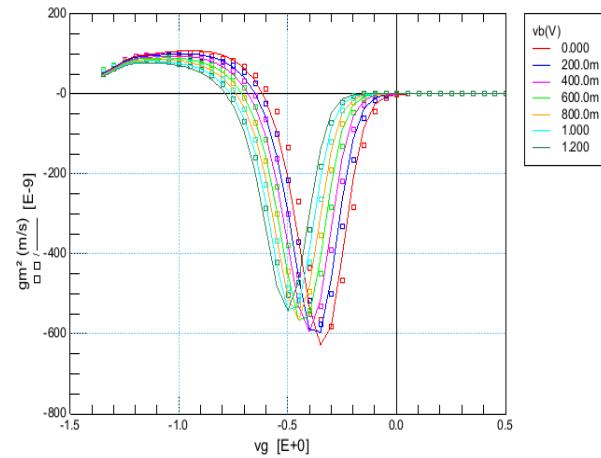
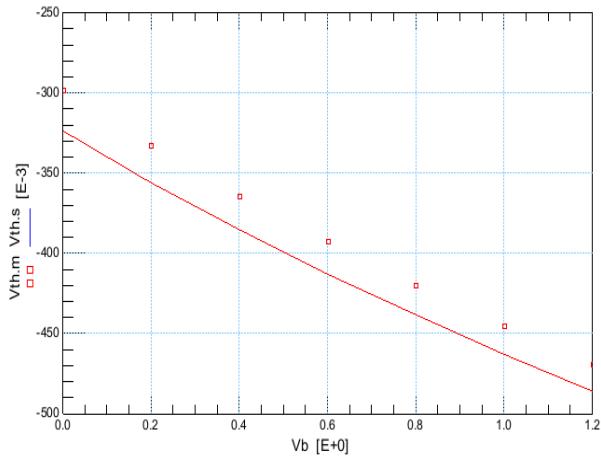
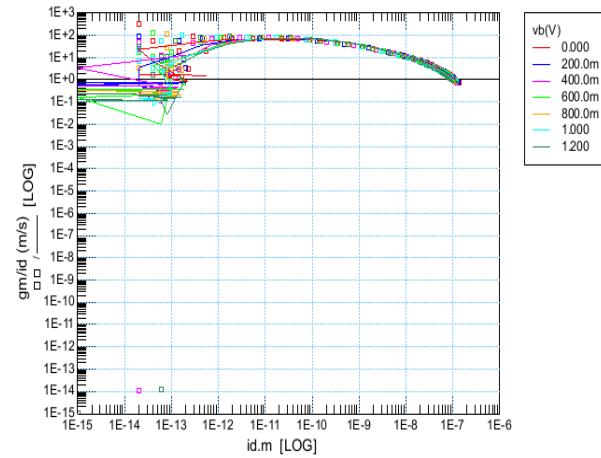
idvg, Ib,Ig, Vb = 1.2V, T = -40°C

idvd, Vb = 0V, T = -40°C


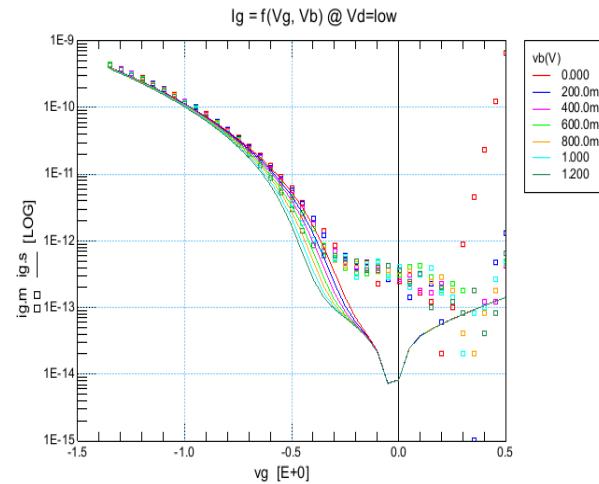
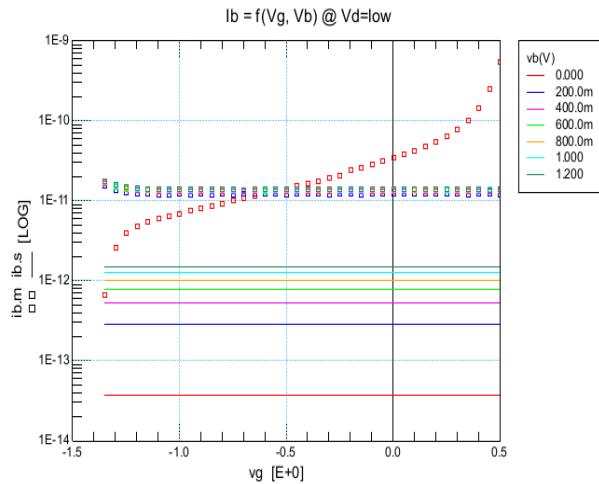
idvd_vbmin, Vb = 1.2V, T = -40°C

idvd_vth, Vb = 0V, T = -40°C




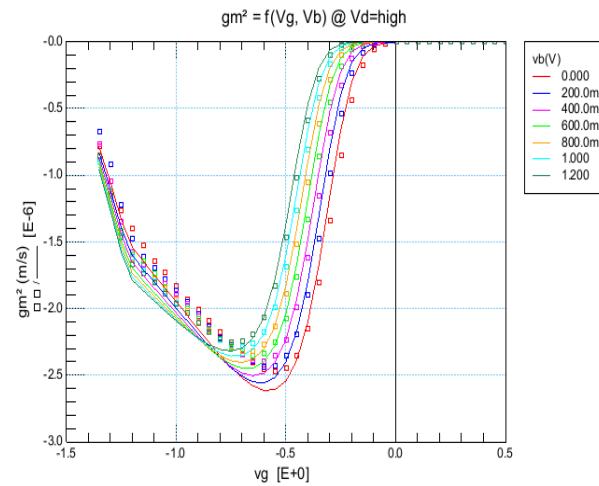
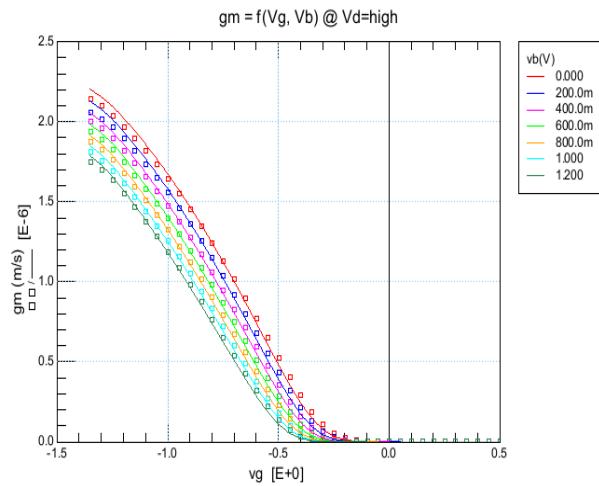
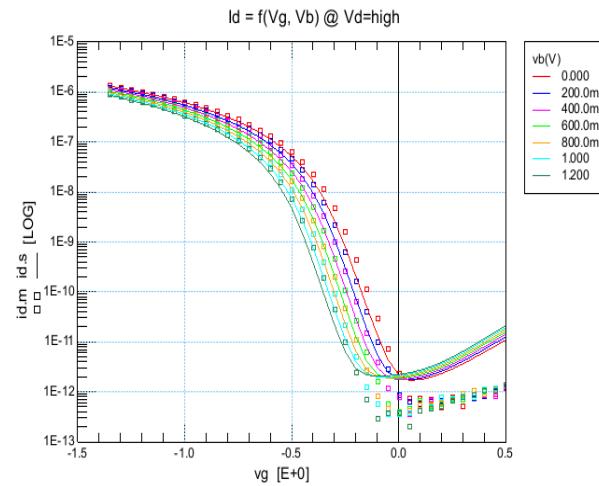
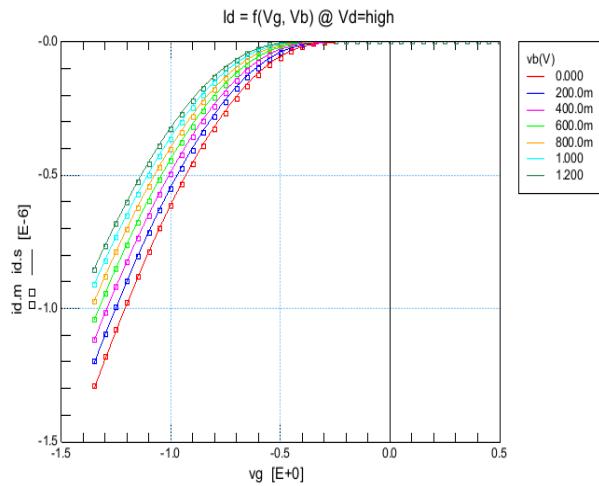
idvd_vth_vbmin, Vb = 1.2V, T = -40°C

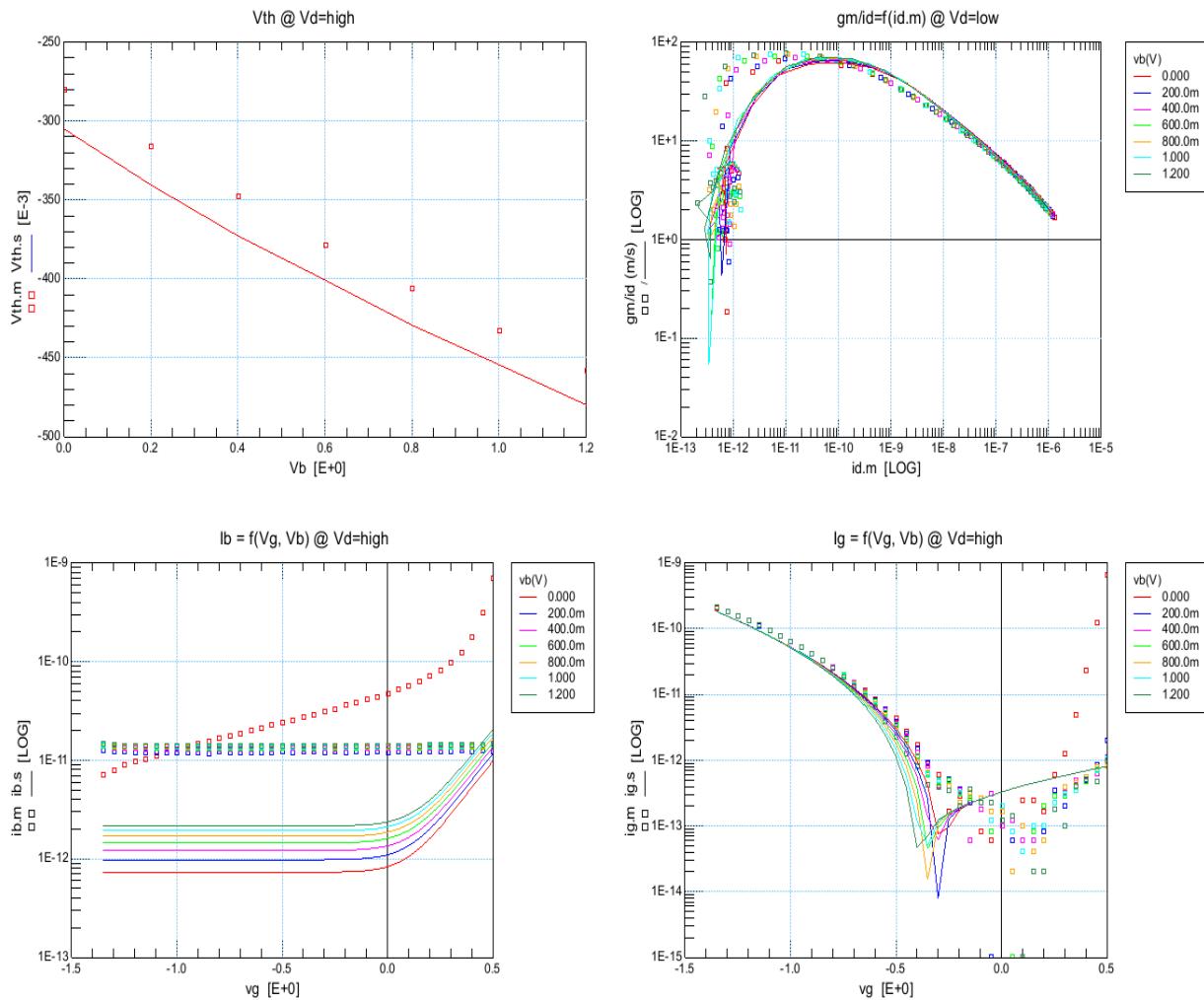


idvg, Vd = -0.05V, T = 70°C
 $Id = f(Vg, Vb) @ Vd=low$

 $Id = f(Vg, Vb) @ Vd=low$

 $gm = f(Vg, Vb) @ Vd=low$

 $gm^2 = f(Vg, Vb) @ Vd=low$

 $Vth @ Vd=low$

 $gm/id=f(id.m) @ Vd=low$


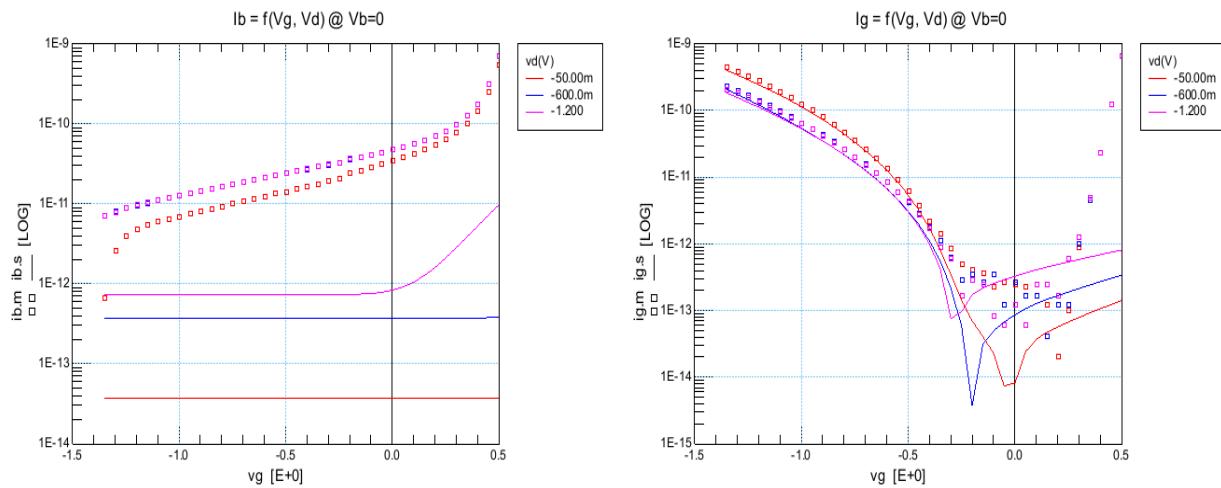


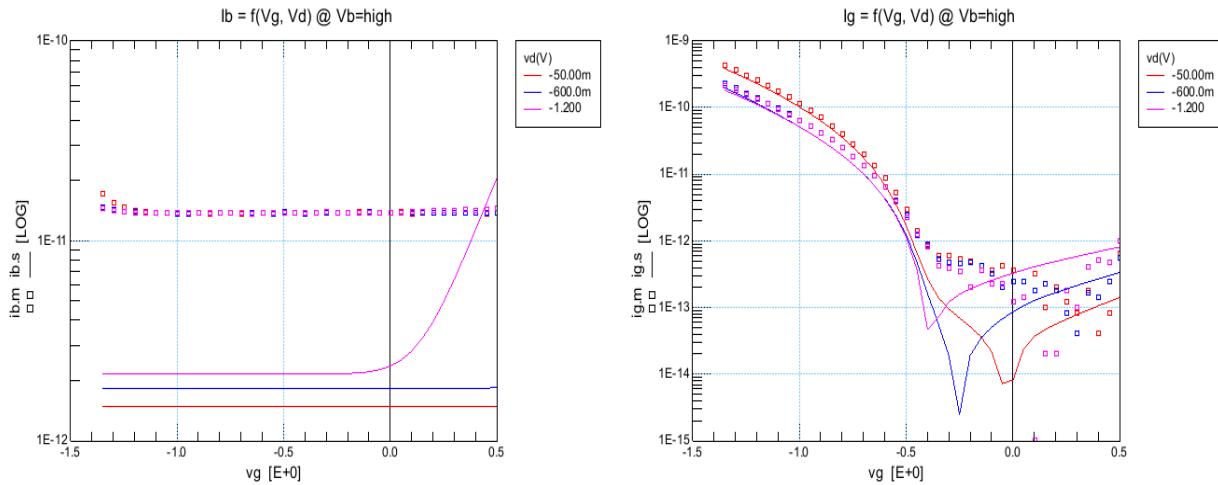
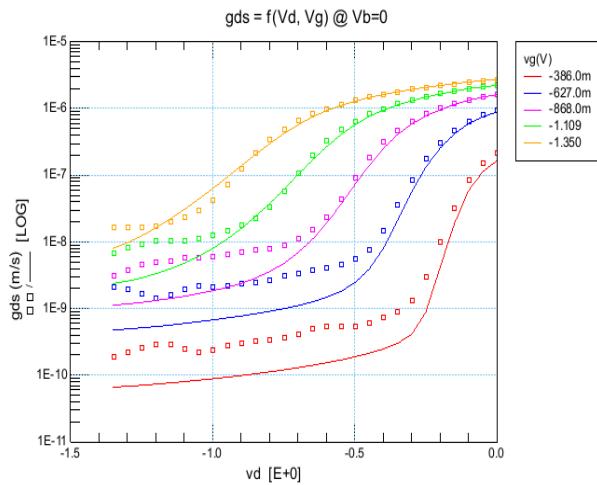
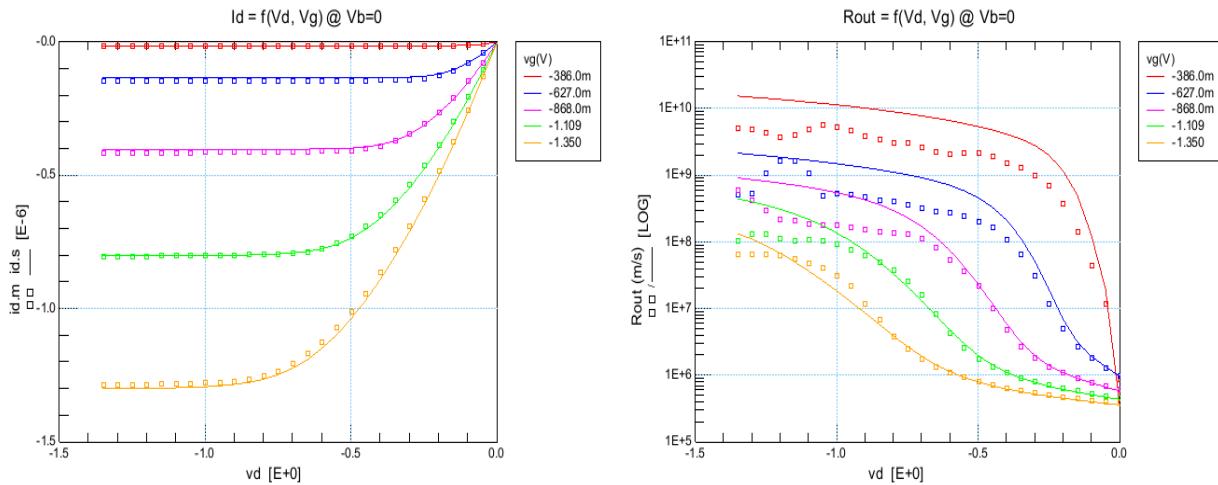
$i_{dvg}, V_d = -1.2V, T = 70^\circ C$

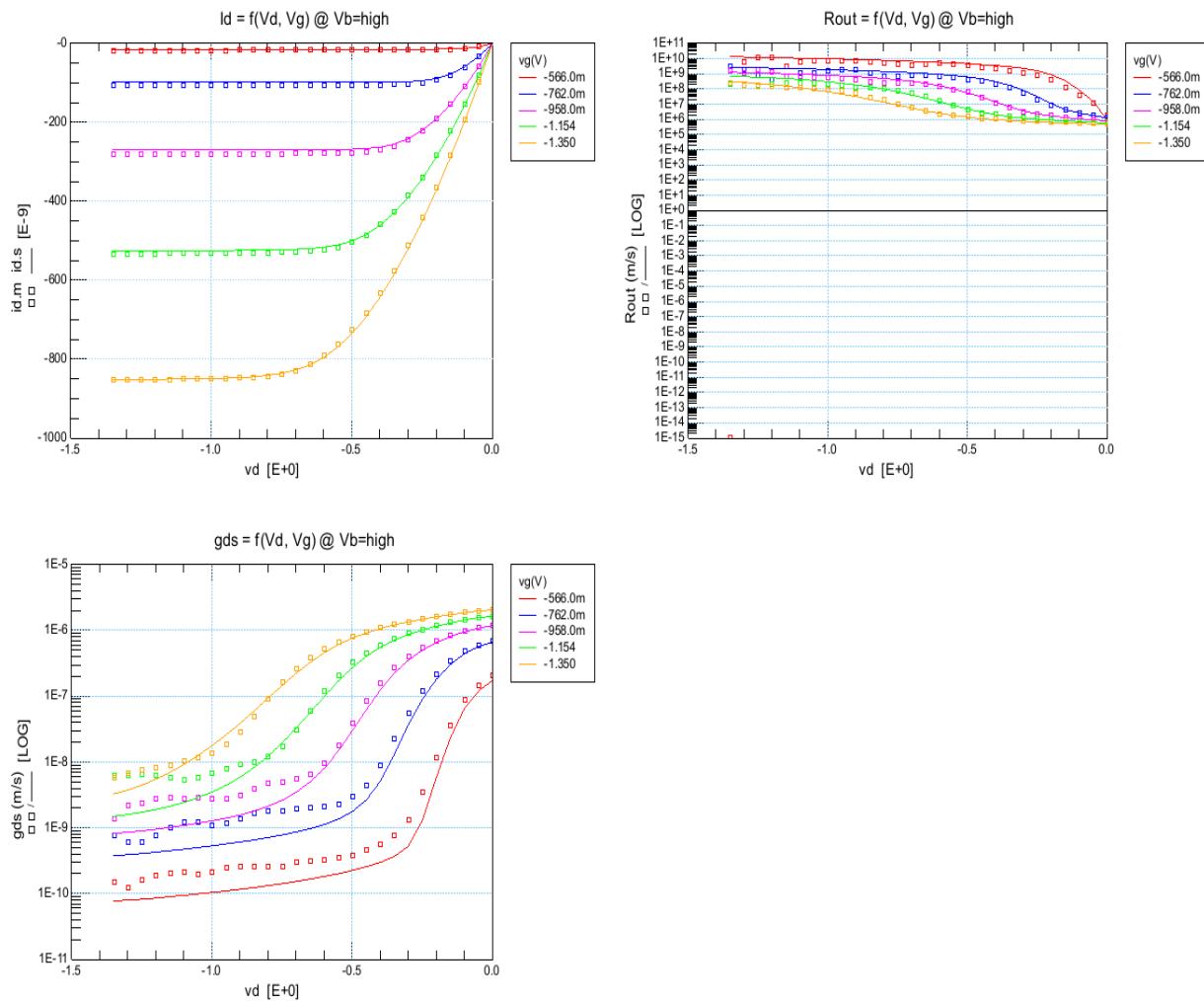
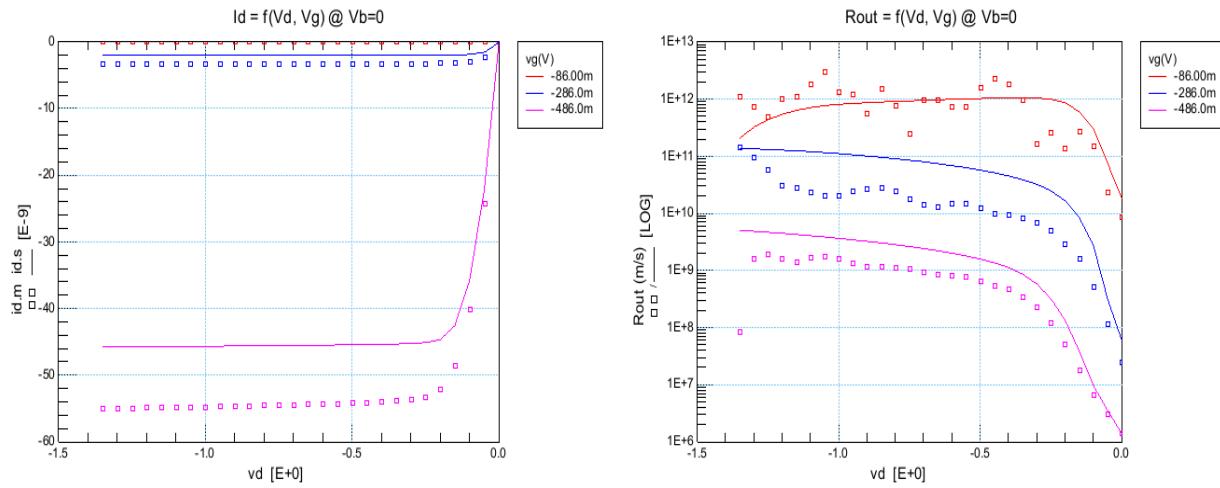


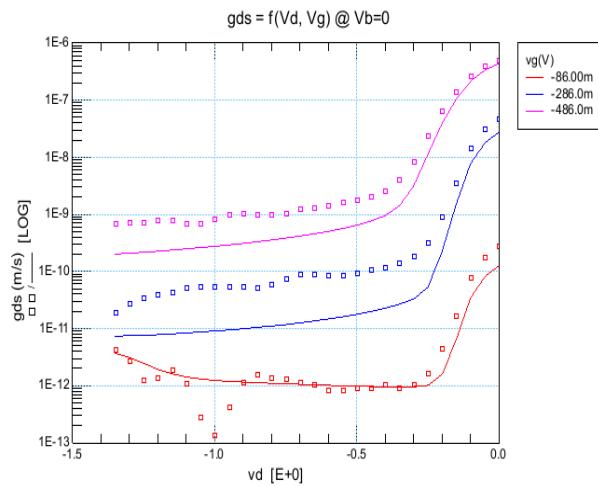


idvg, Ib, Ig, Vb = 0V, T = 70°C

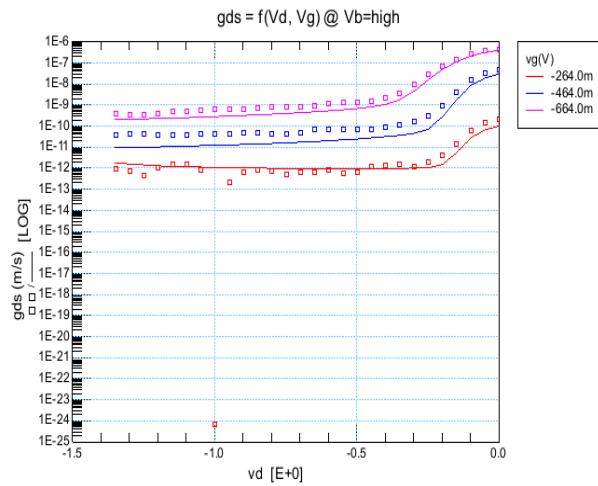
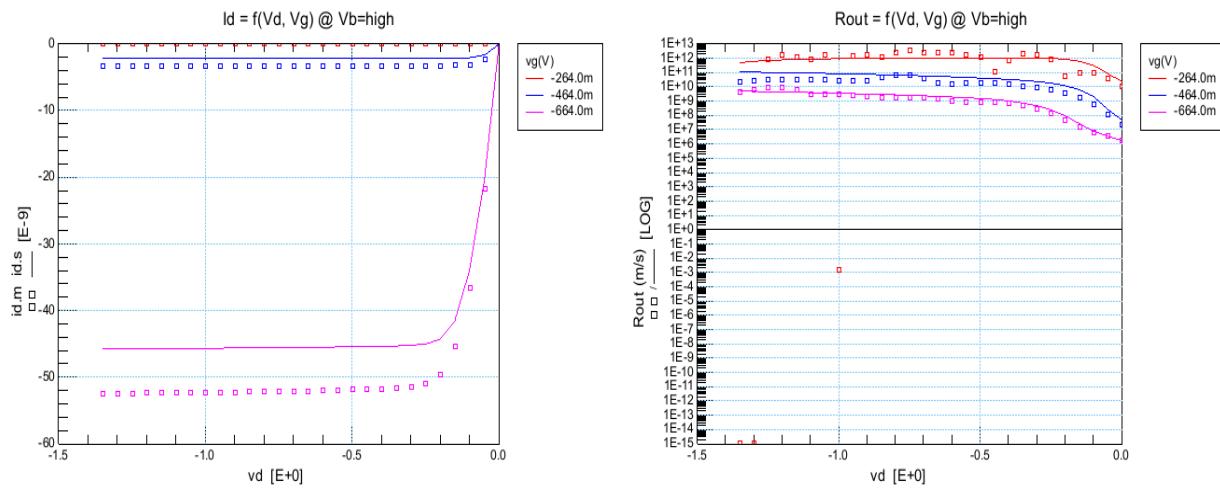


idvg, Ib,Ig, Vb = 1.2V, T = 70°C

idvd, Vb = 0V, T = 70°C


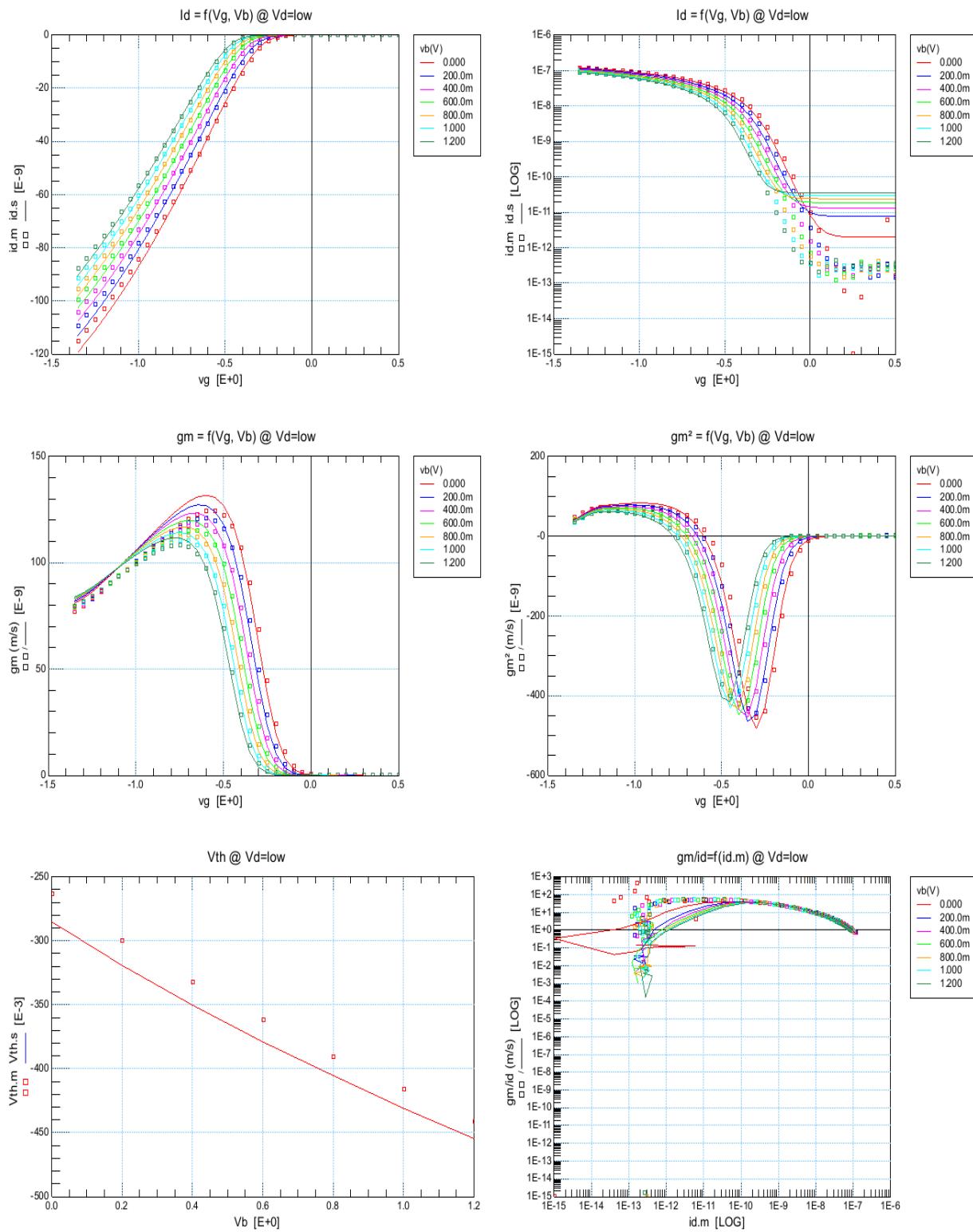
idvd_vbmin, Vb = 1.2V, T = 70°C**idvd_vth, Vb = 0V, T = 70°C**

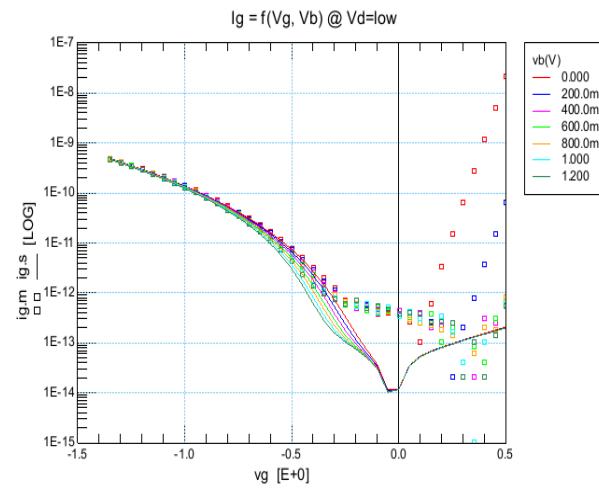
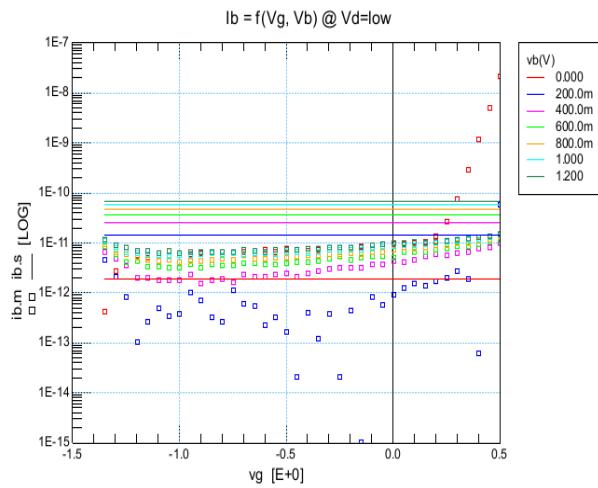


idvd_vth_vbmin, Vb = 1.2V, T = 70°C

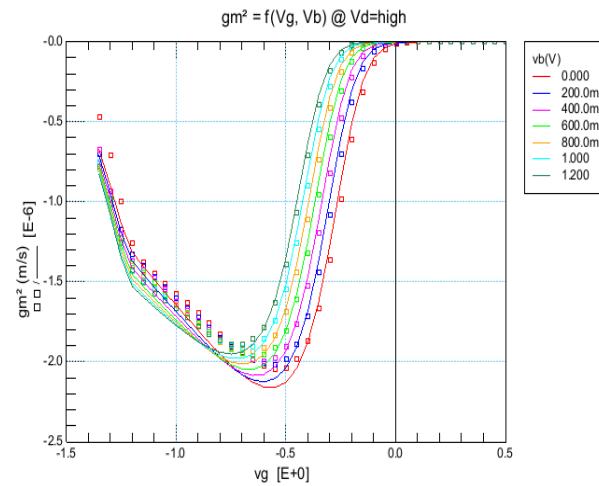
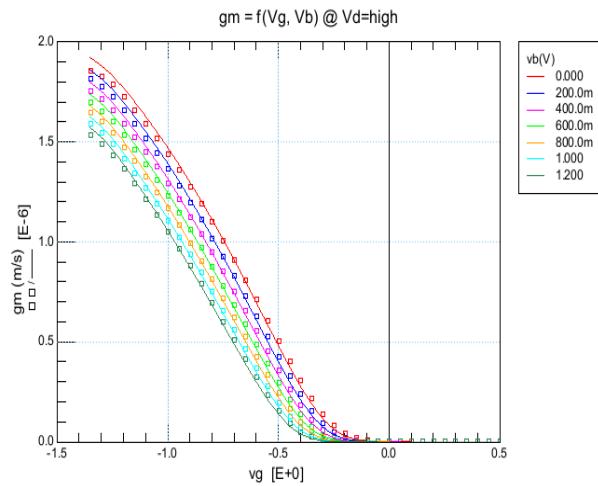
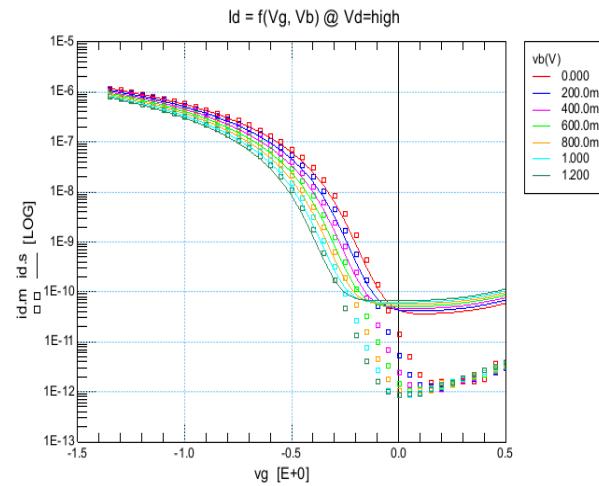
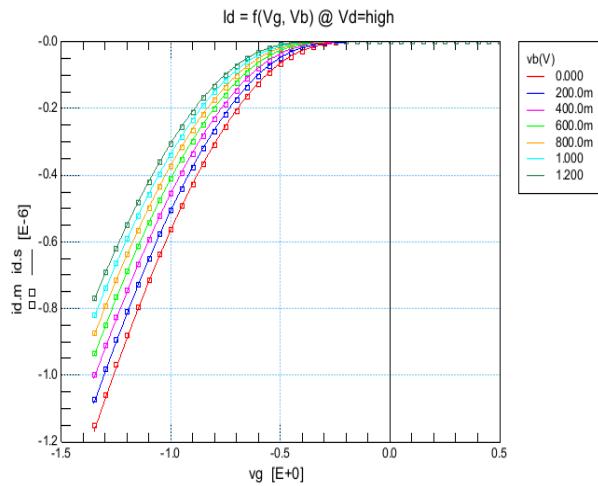


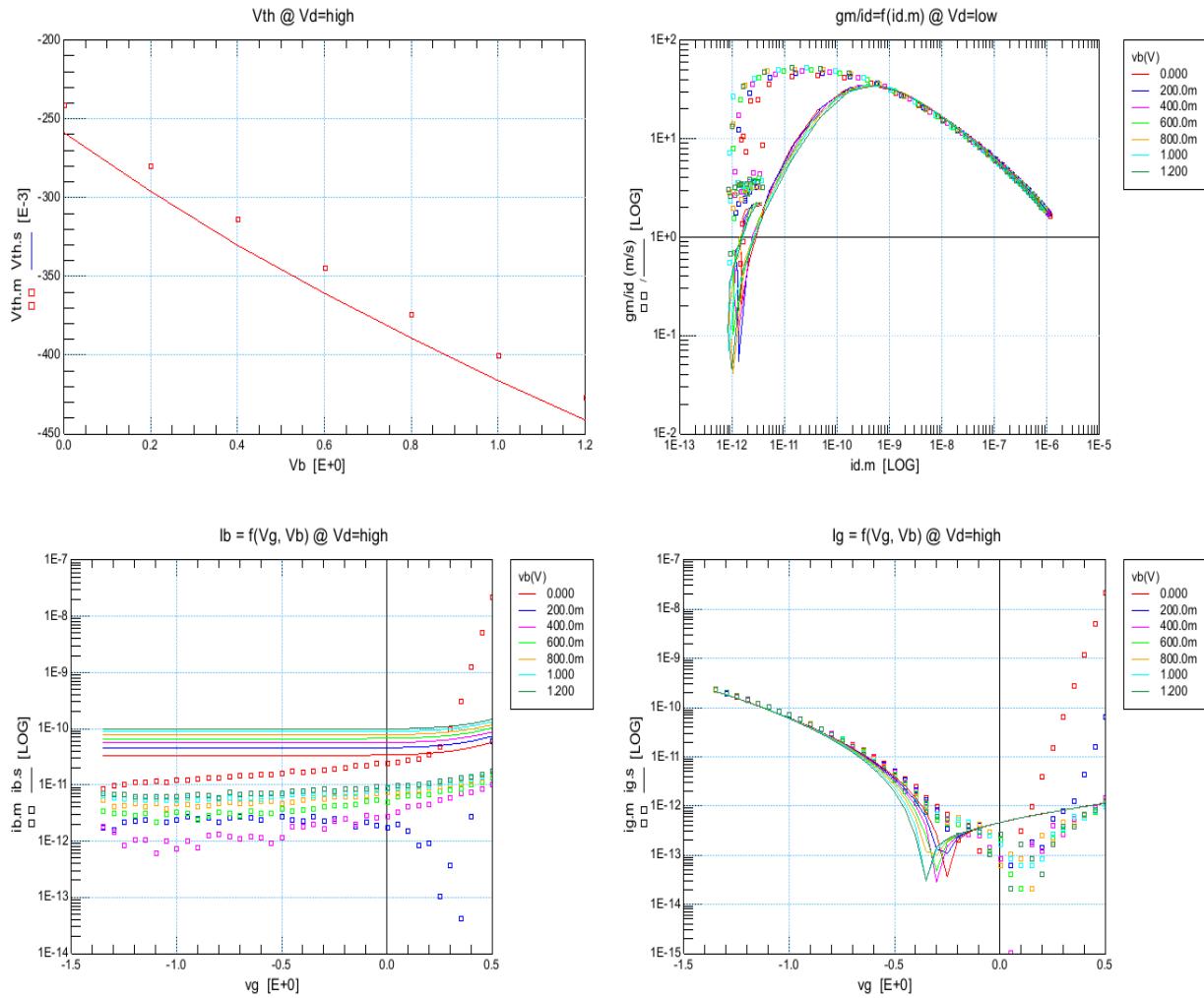
$idvg$, $Vd = -0.05V$, $T = 125^{\circ}C$



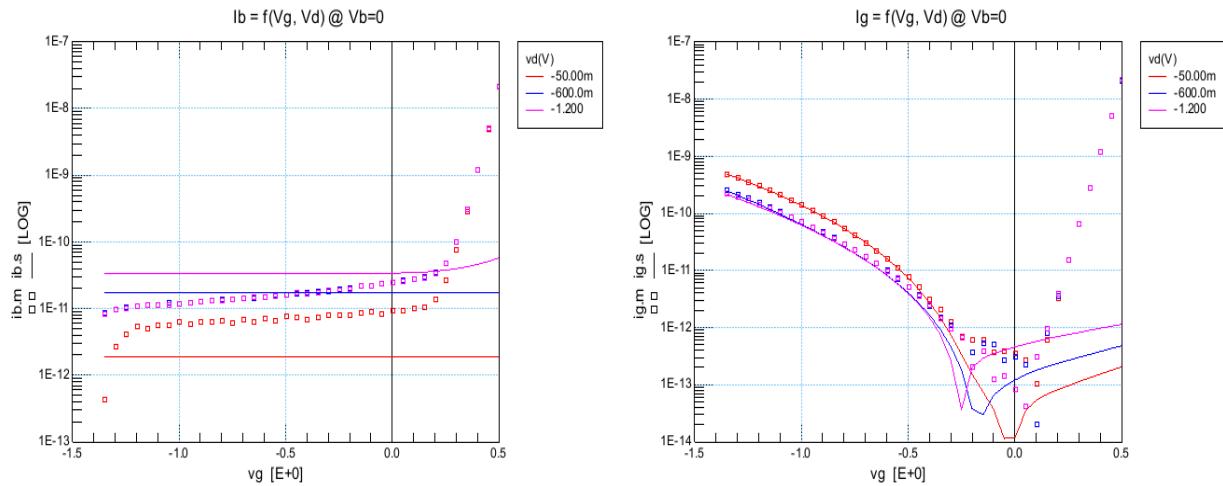


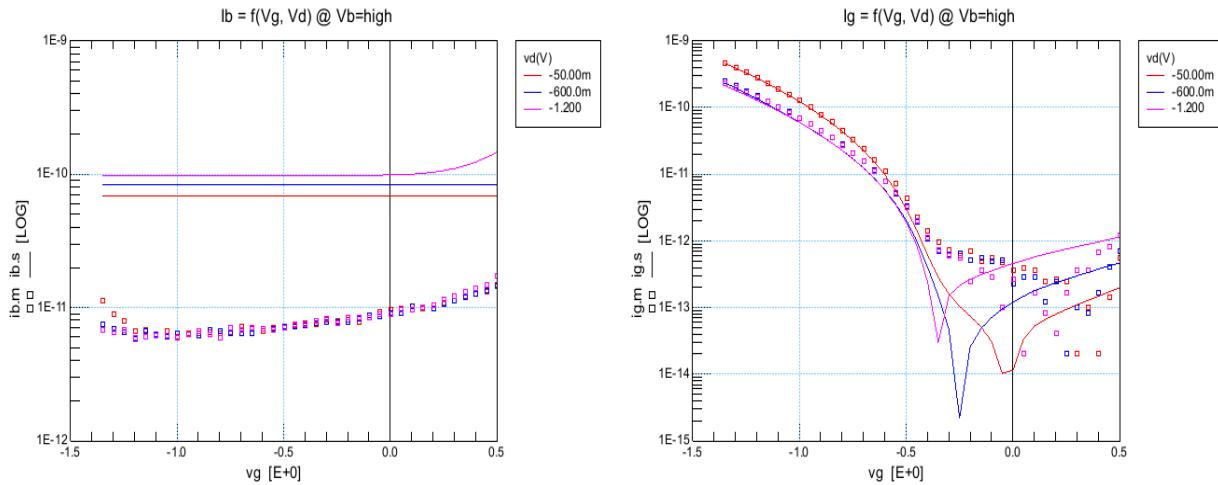
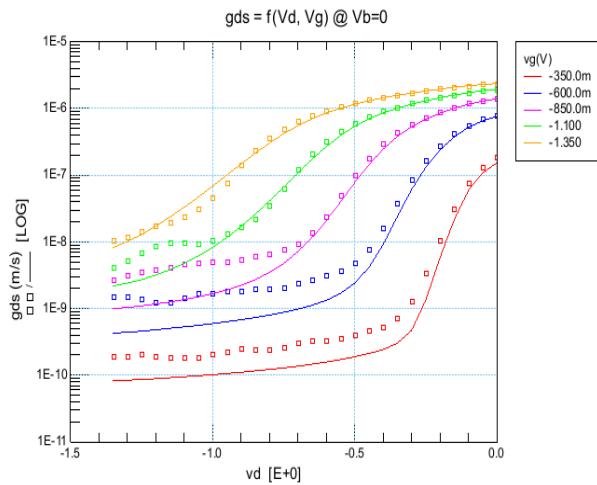
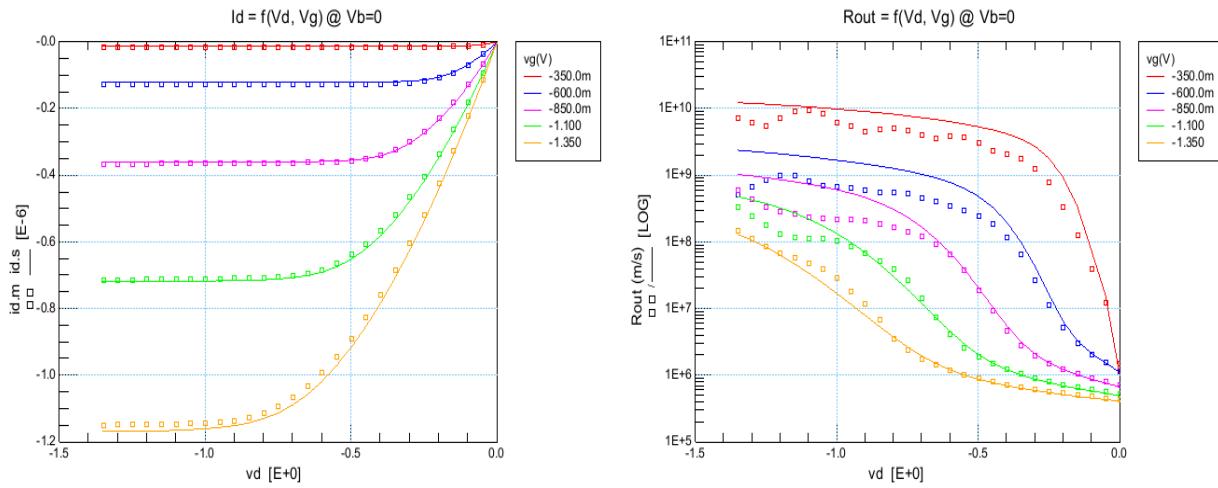
$i_{dvg}, V_d = -1.2V, T = 125^\circ\text{C}$

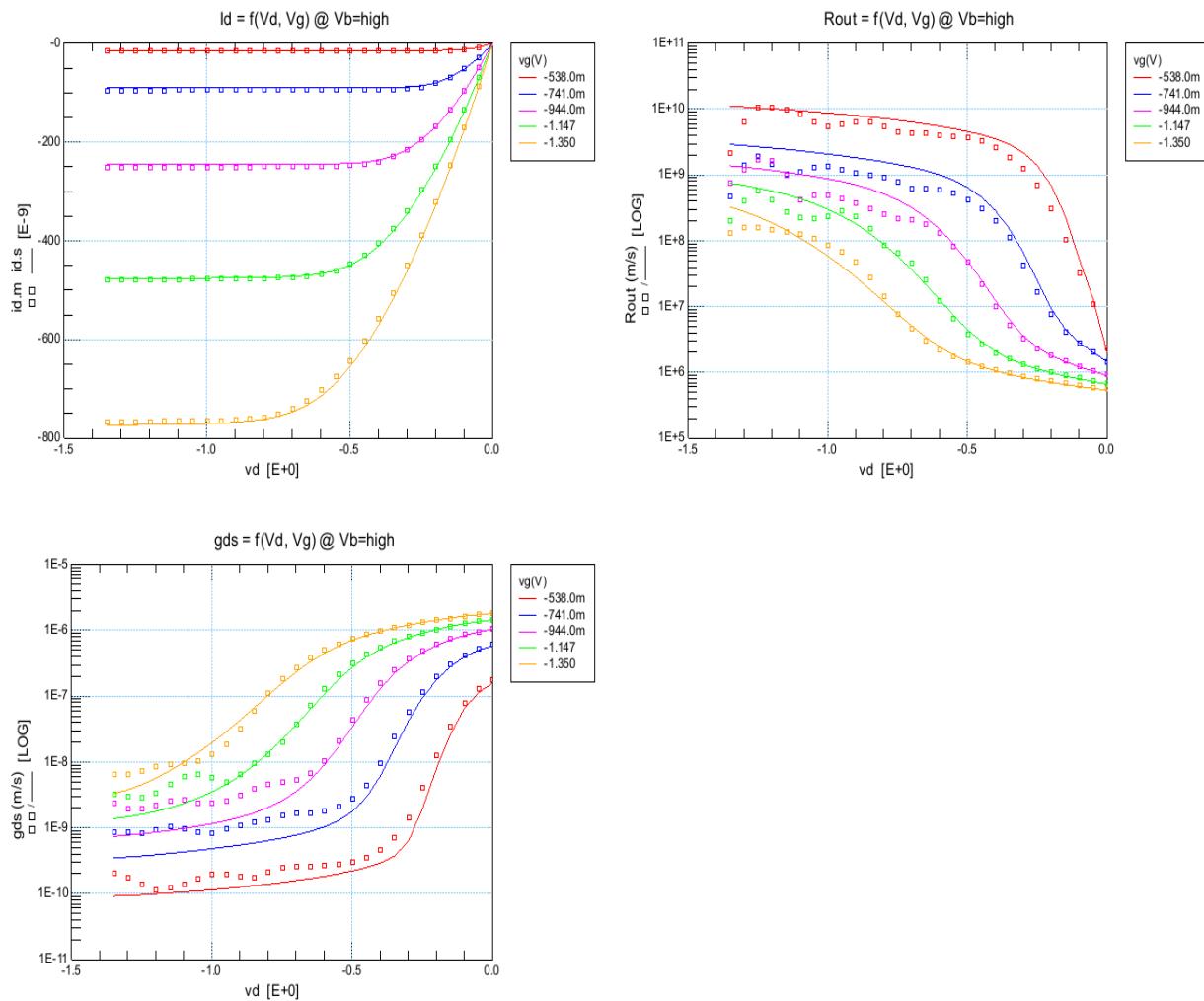
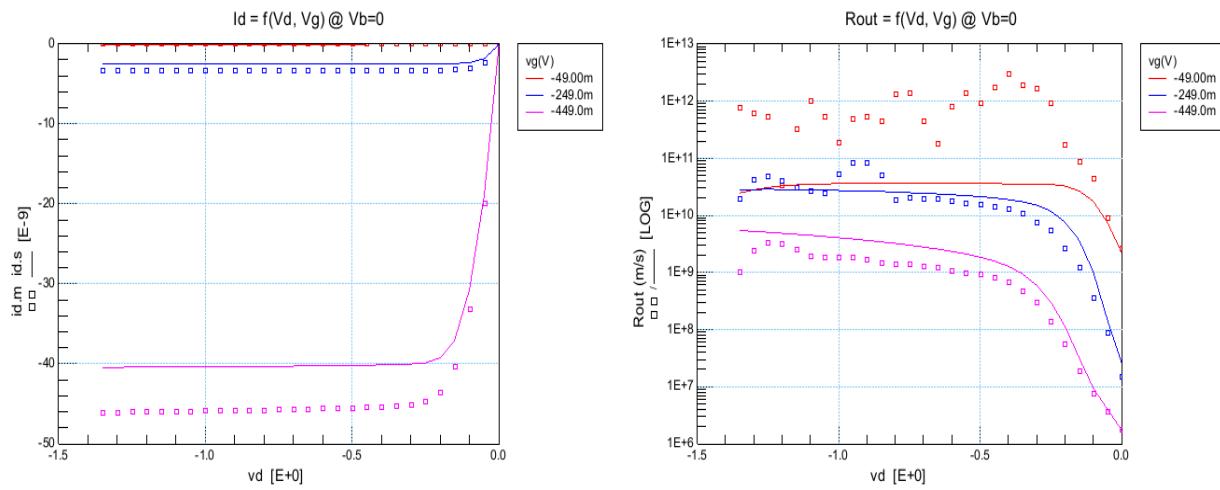


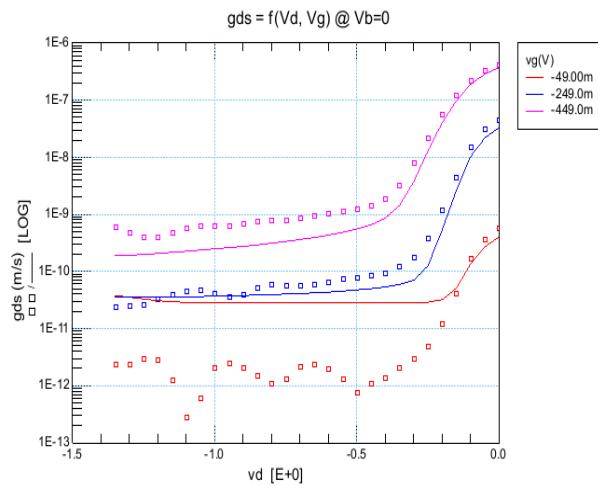


I_{dVg} , I_b , I_g , $V_b = 0V$, $T = 125^\circ C$

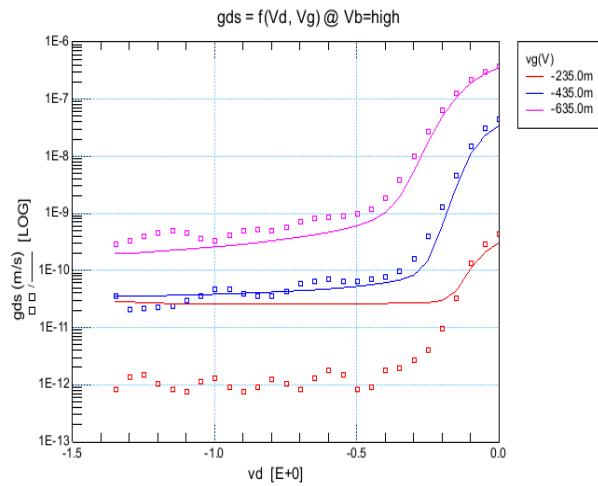
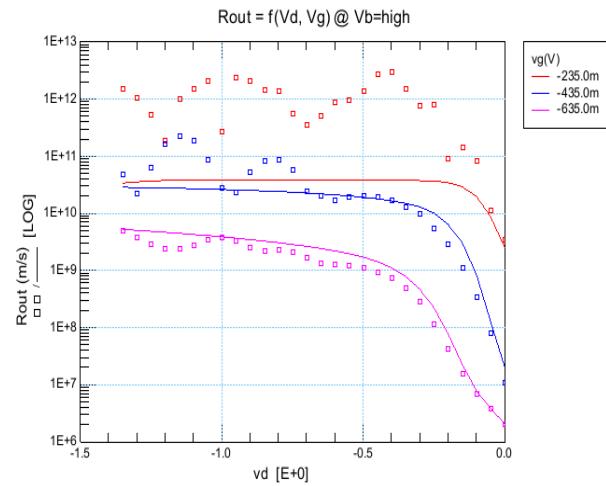
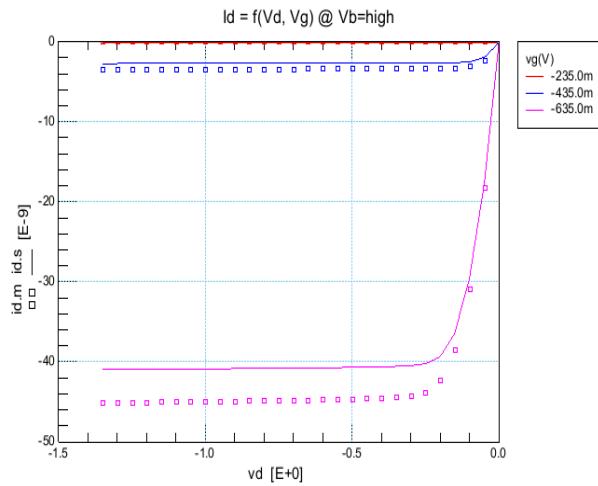


idvg, Ib,Ig, Vb = 1.2V, T = 125°C

idvd, Vb = 0V, T = 125°C


idvd_vbmin, Vb = 1.2V, T = 125°C

idvd_vth, Vb = 0V, T = 125°C


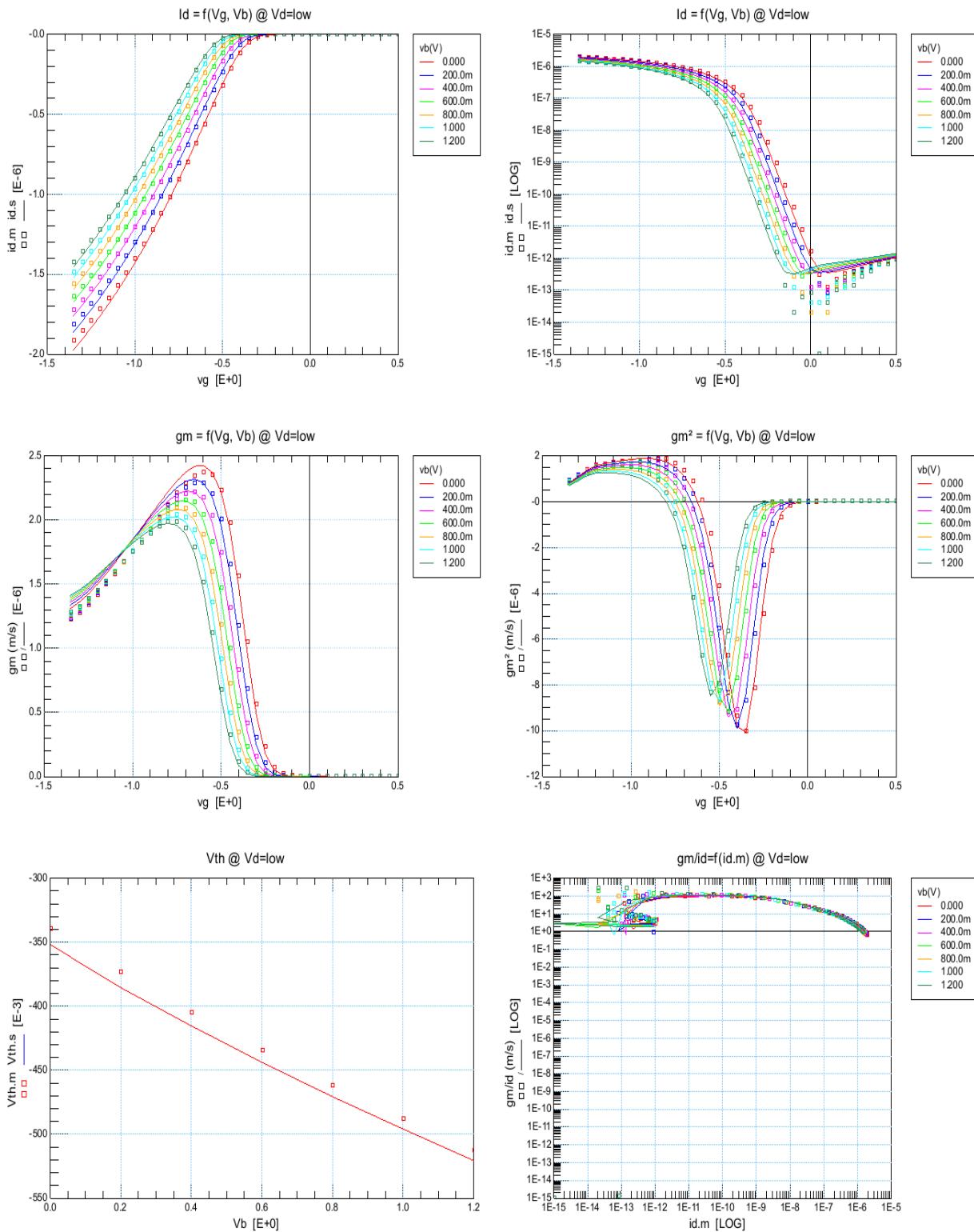


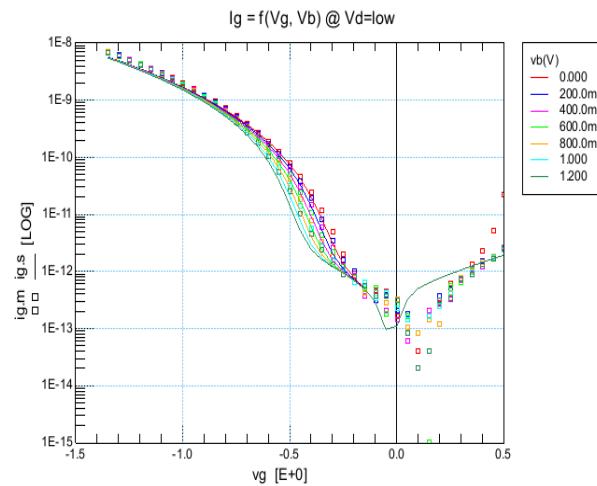
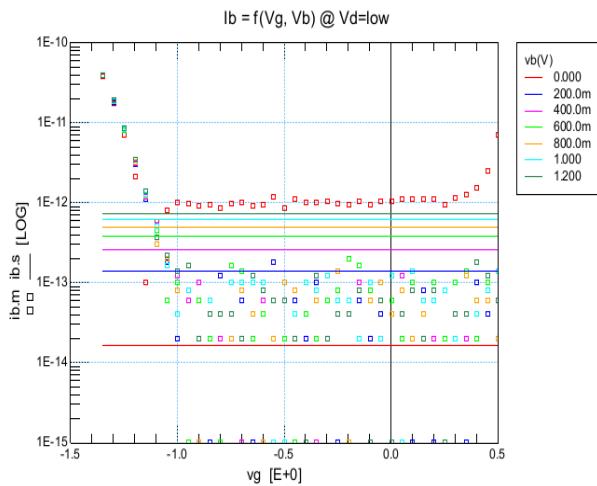
idvd_vth_vbmin, Vb = 1.2V, T = 125°C



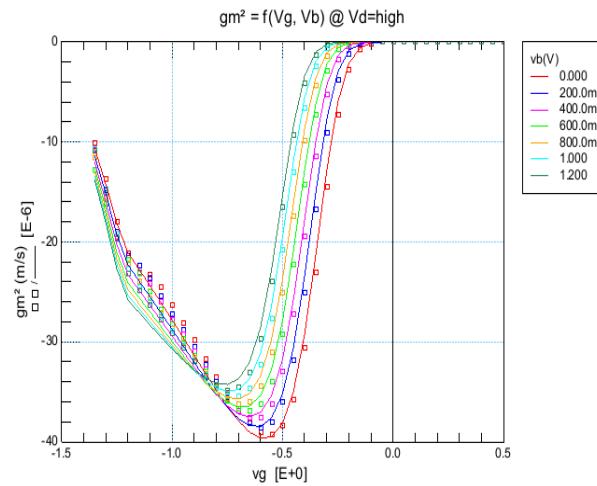
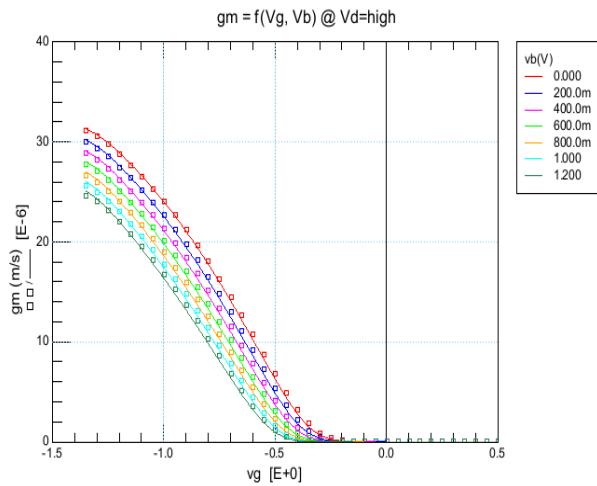
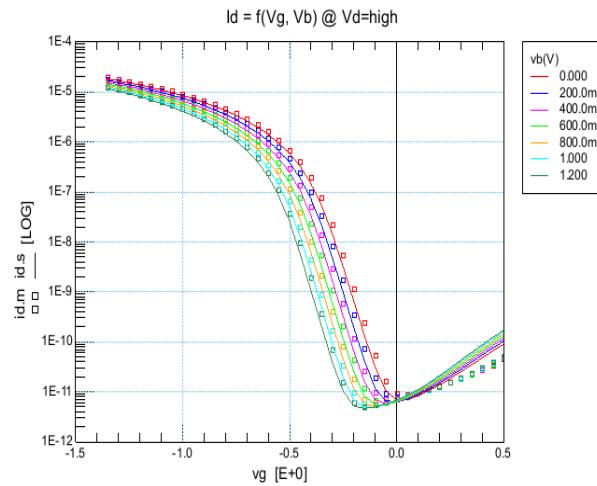
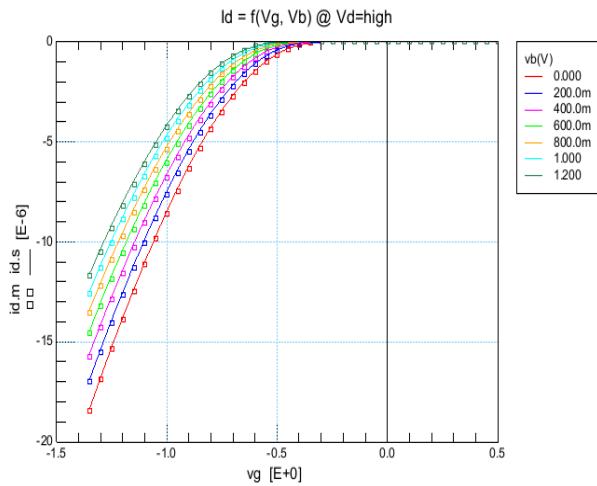
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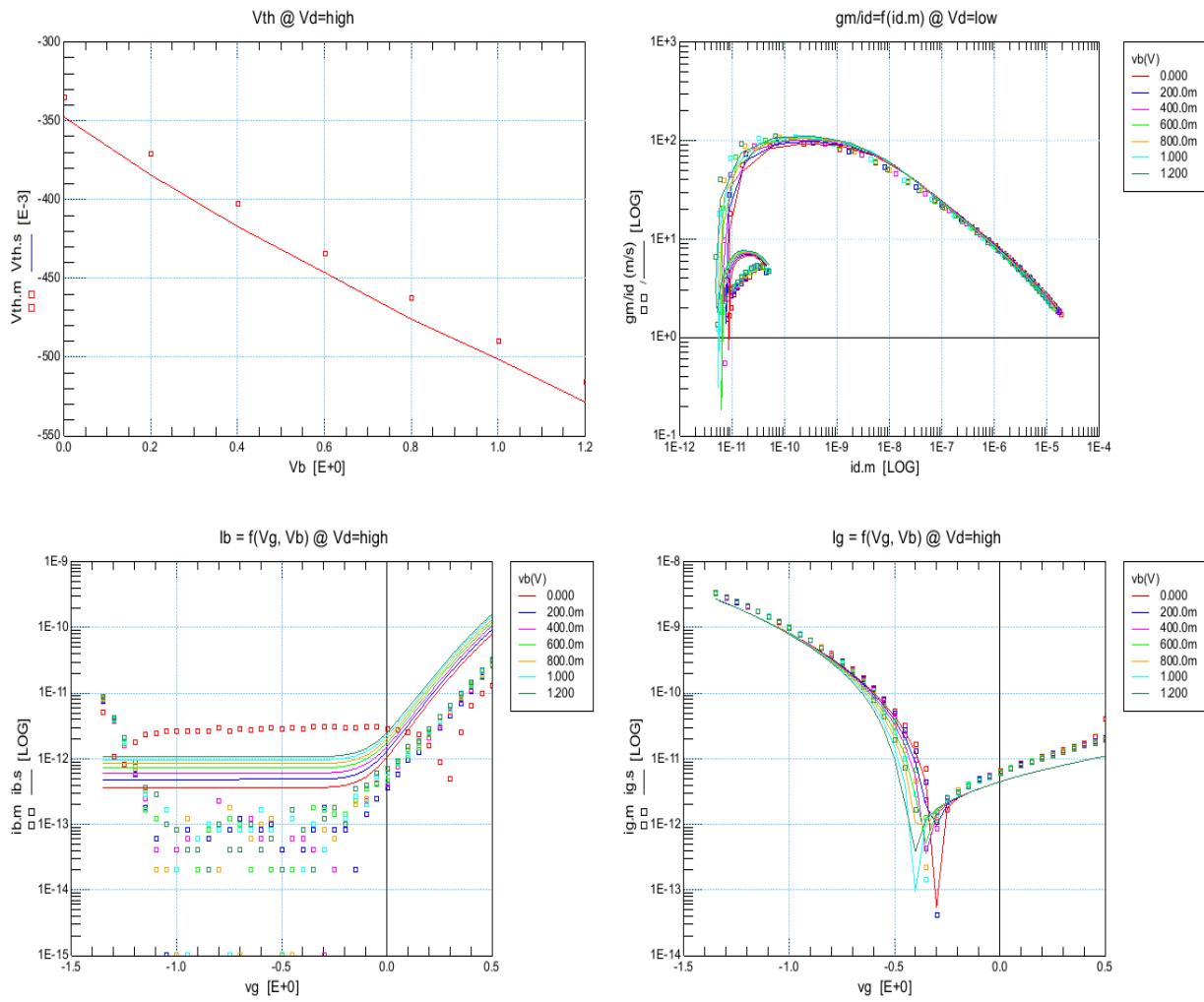
$idv_g, V_d = -0.05V, T = 27^\circ C$



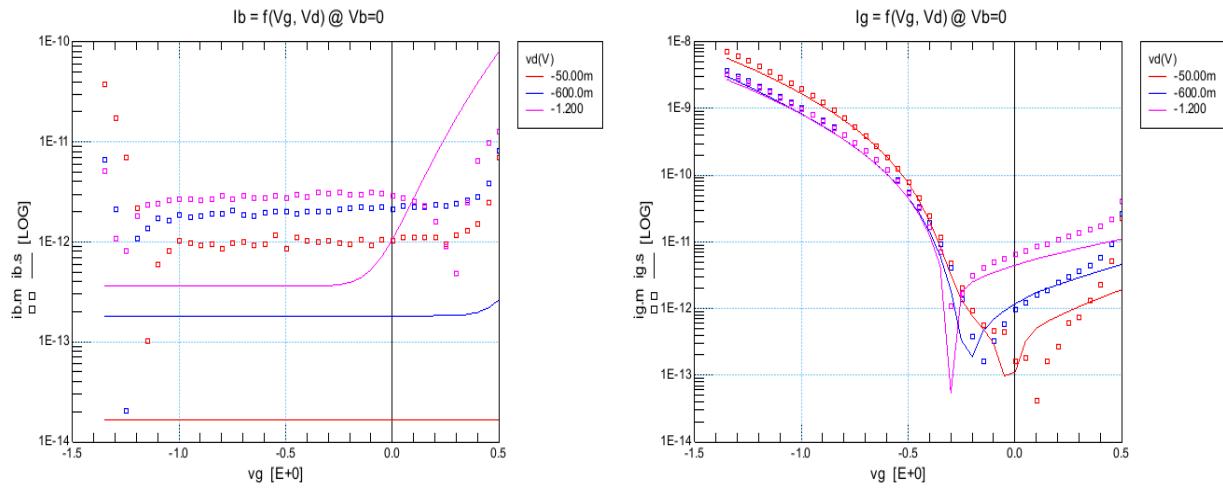


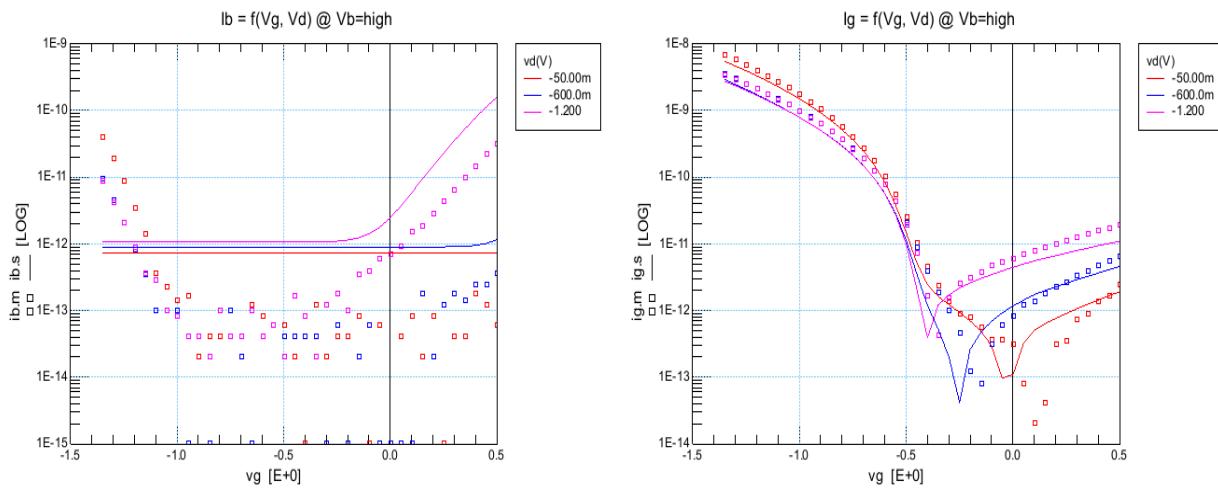
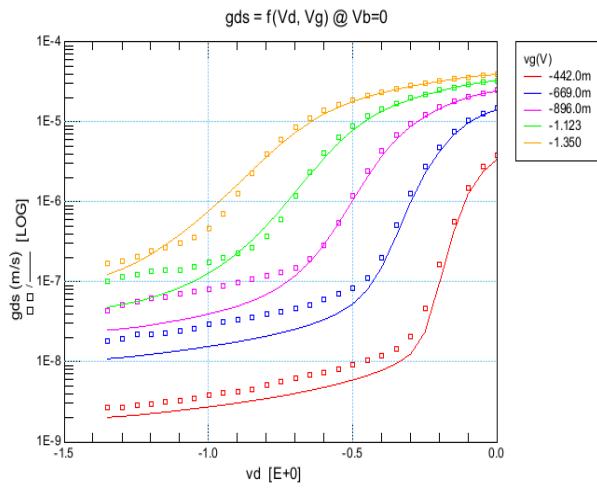
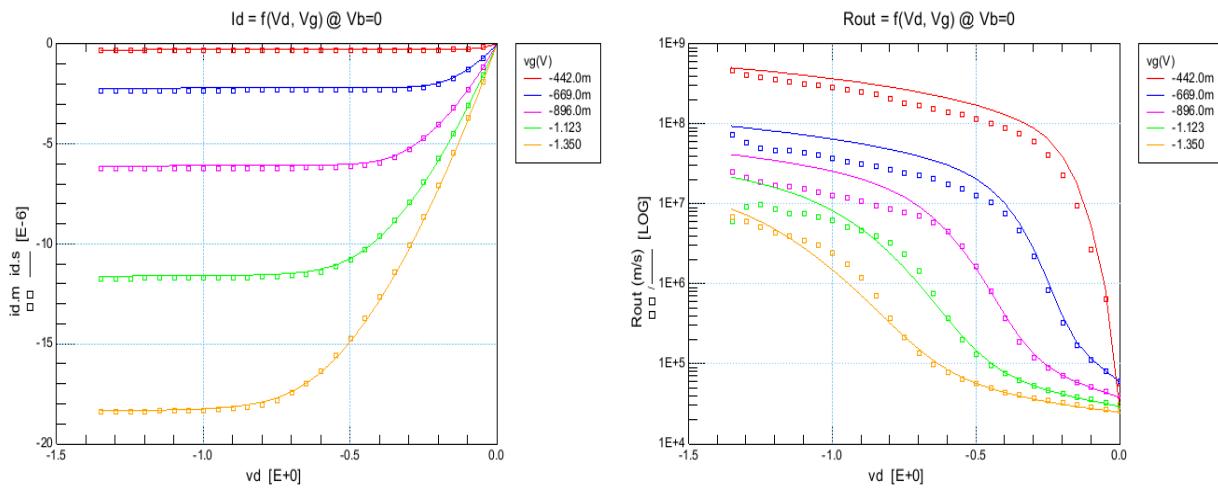
i_{dvg} , $V_d = -1.2V$, $T = 27^\circ C$

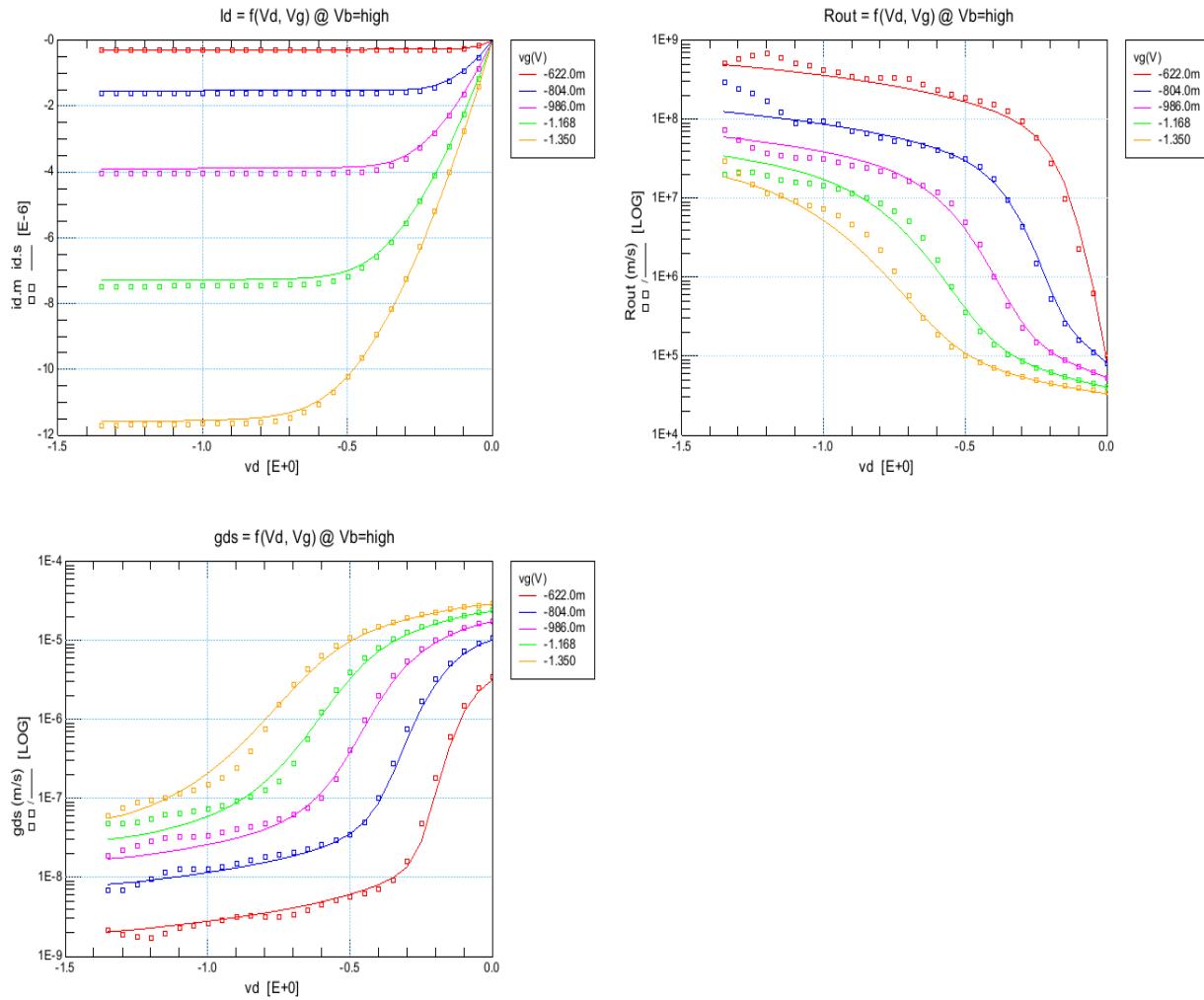
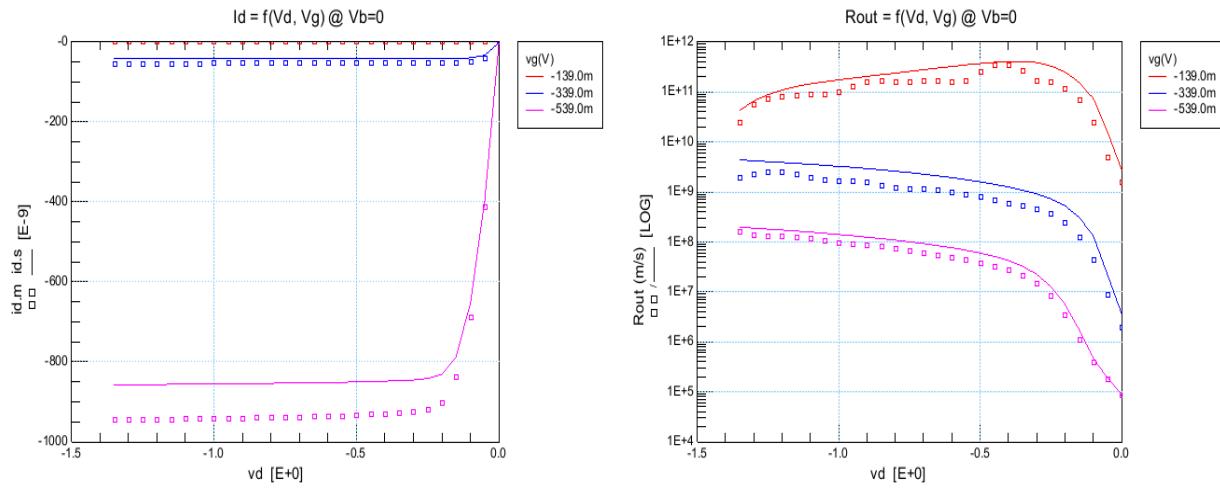


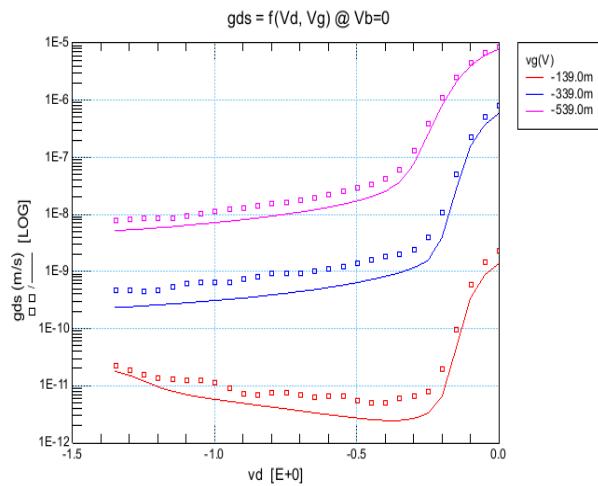


idvg, Ib,Ig, Vb = 0V, T = 27°C

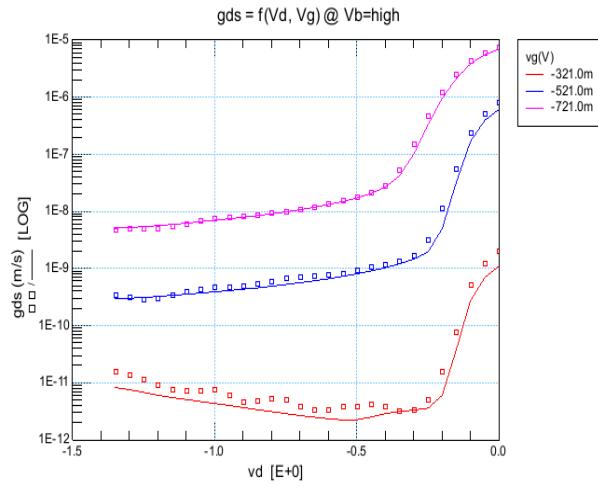
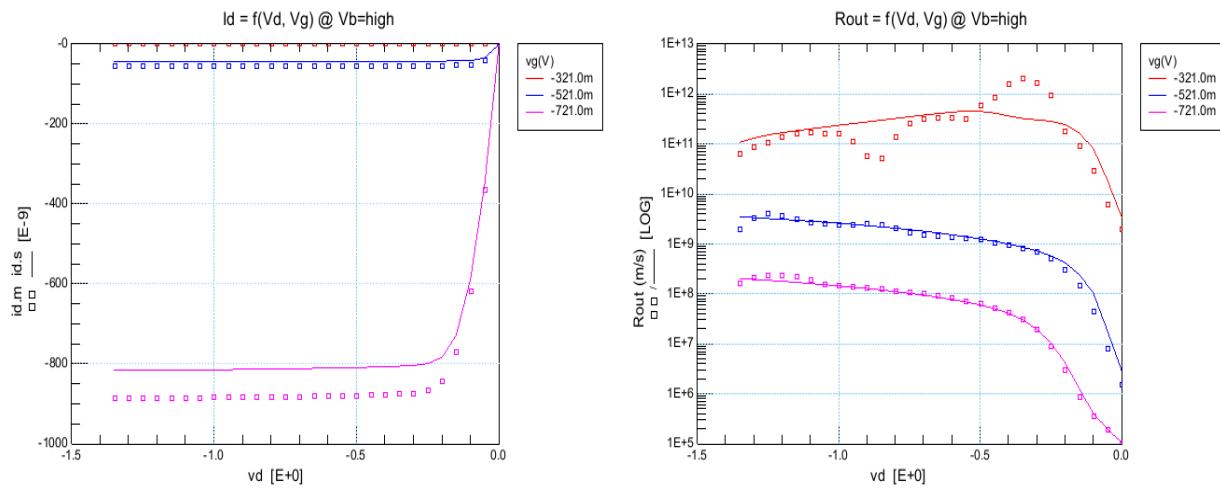


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C**idvd_vth, Vb = 0V, T = 27°C**

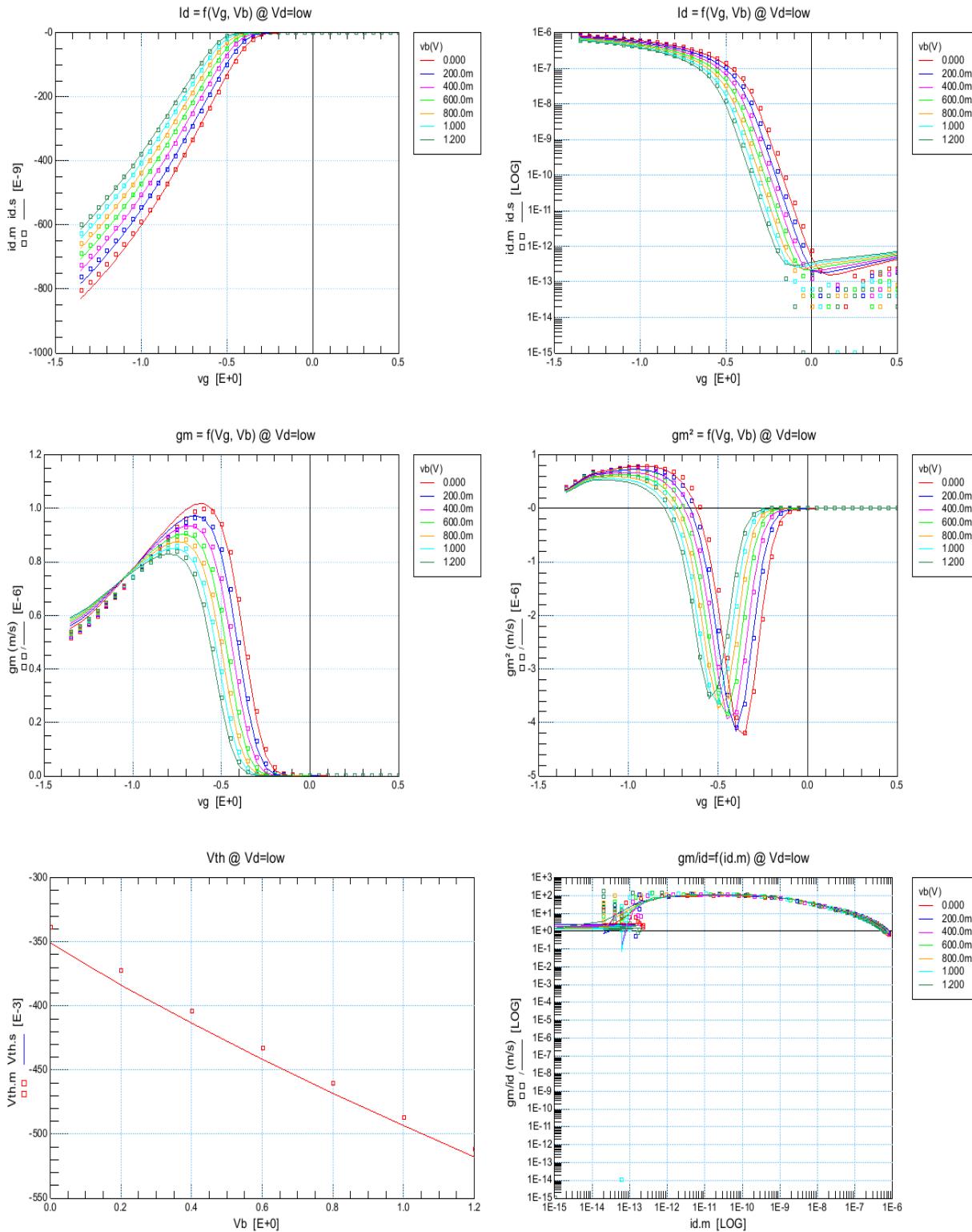


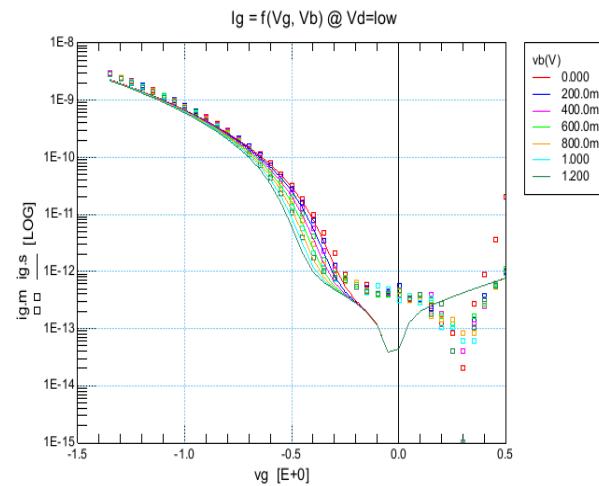
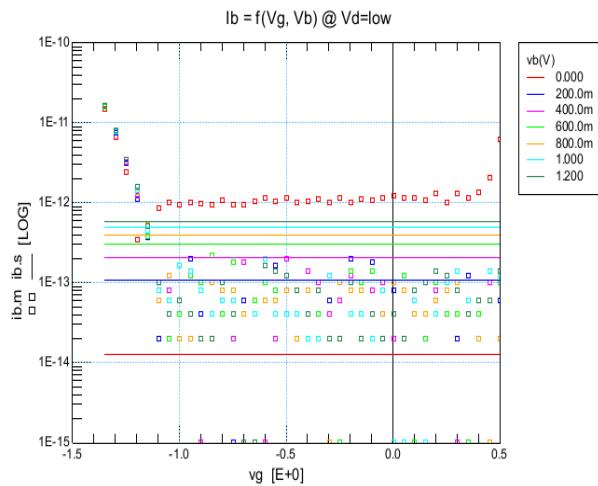
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



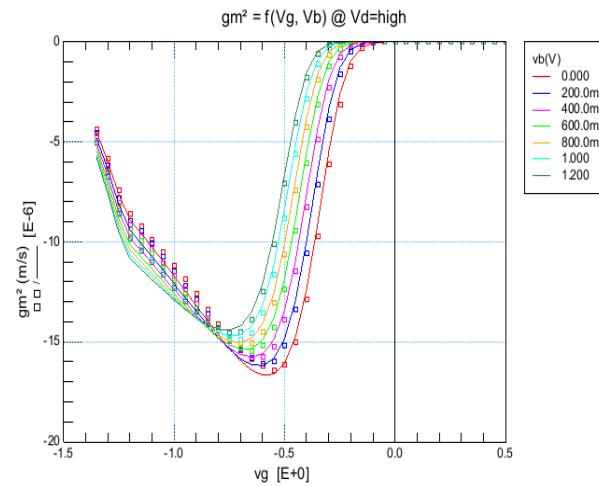
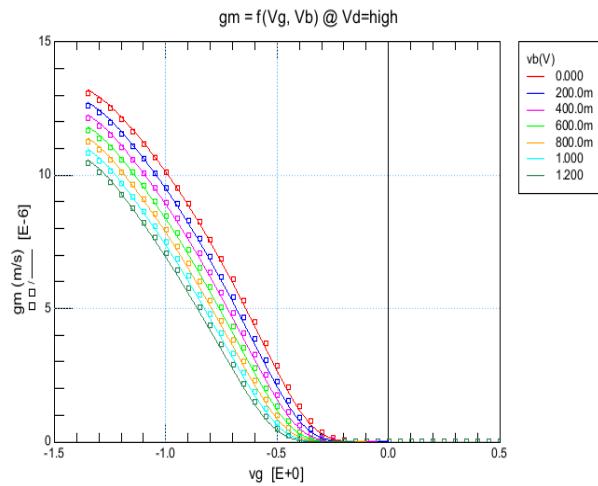
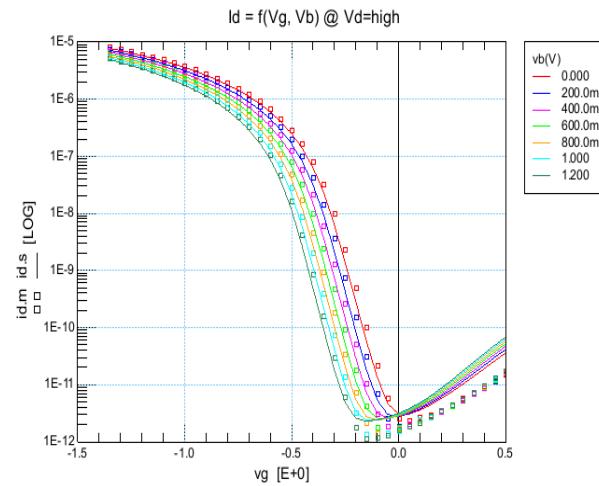
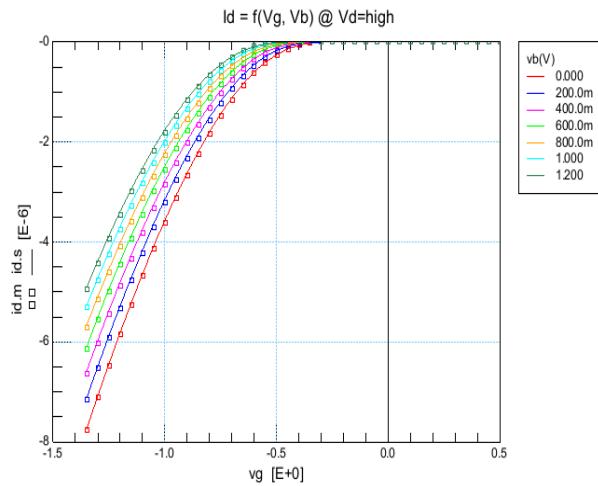
4.17W02u0_L10u0_S551_1

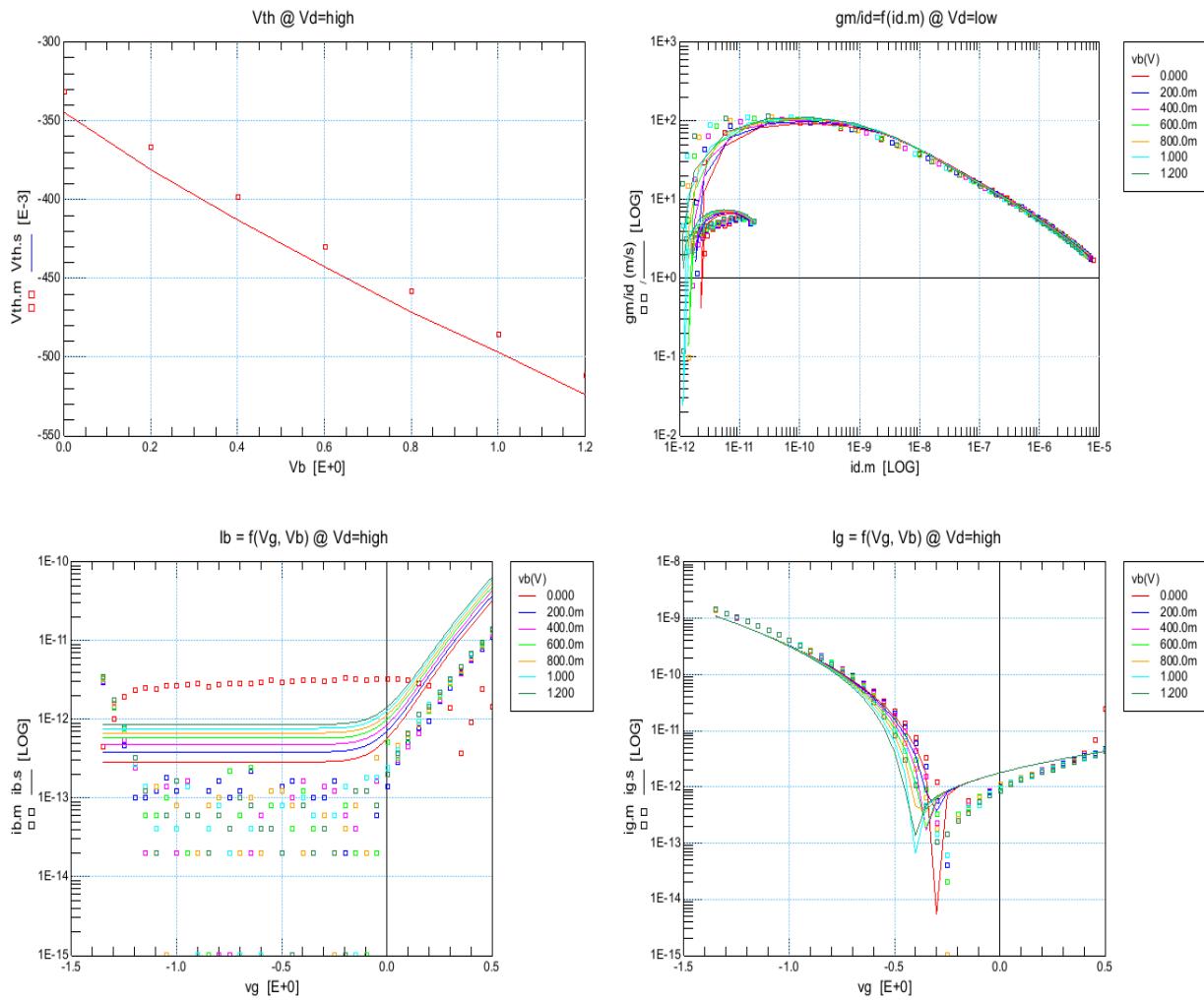
$idv_g, V_d = -0.05V, T = 27^\circ C$



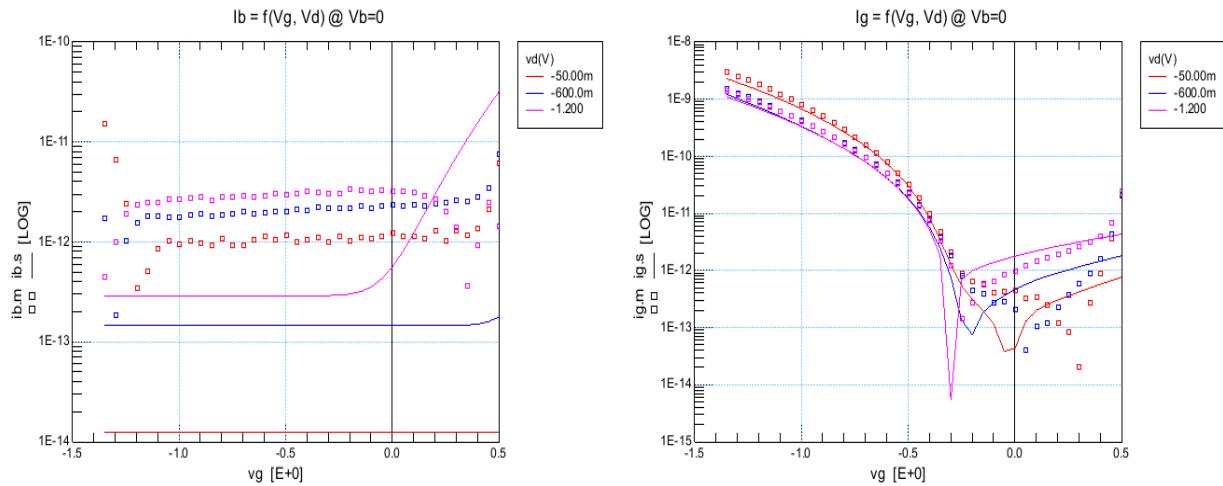


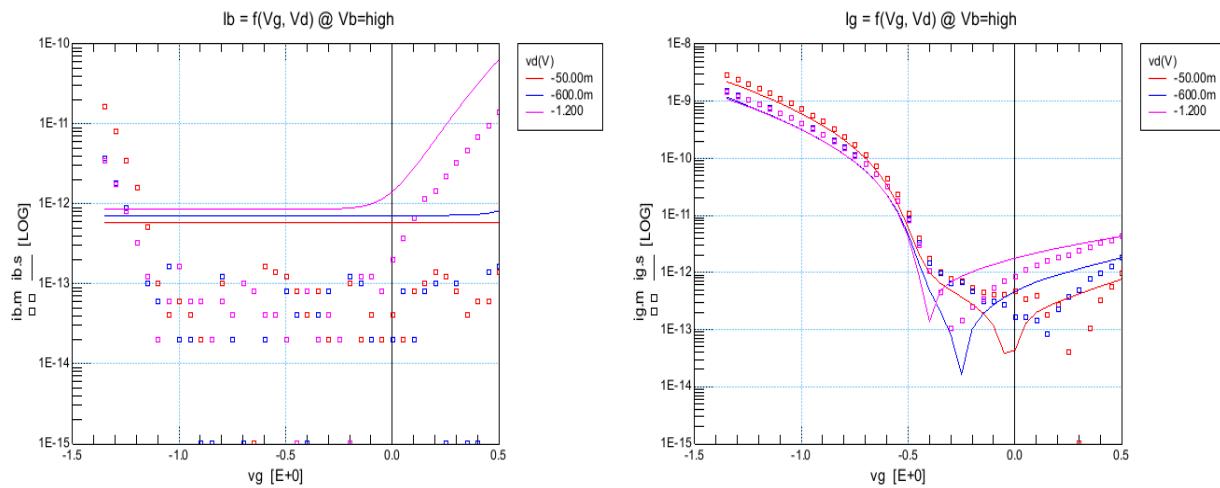
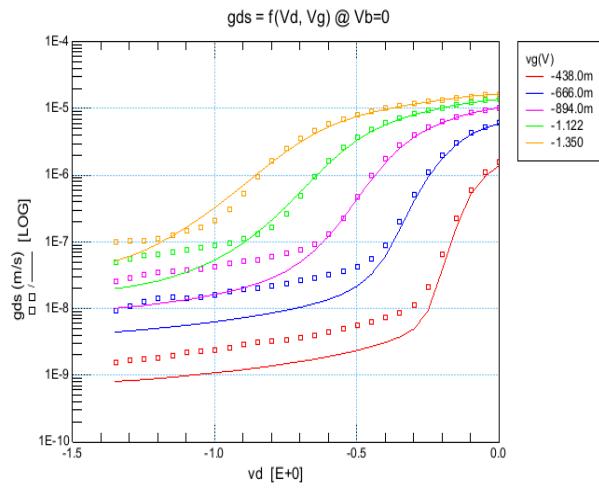
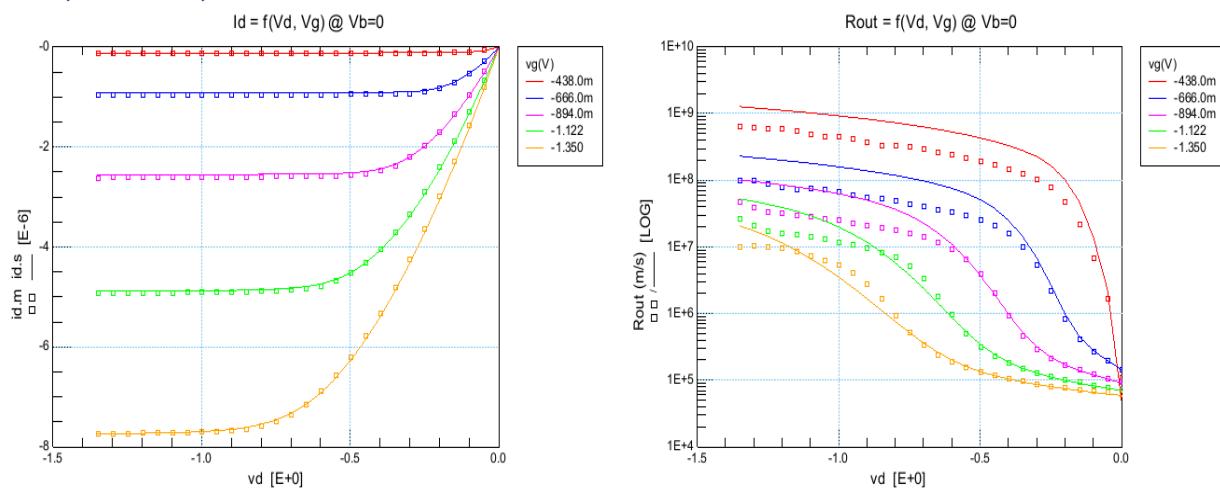
i_{dvg} , $V_d = -1.2V$, $T = 27^\circ C$

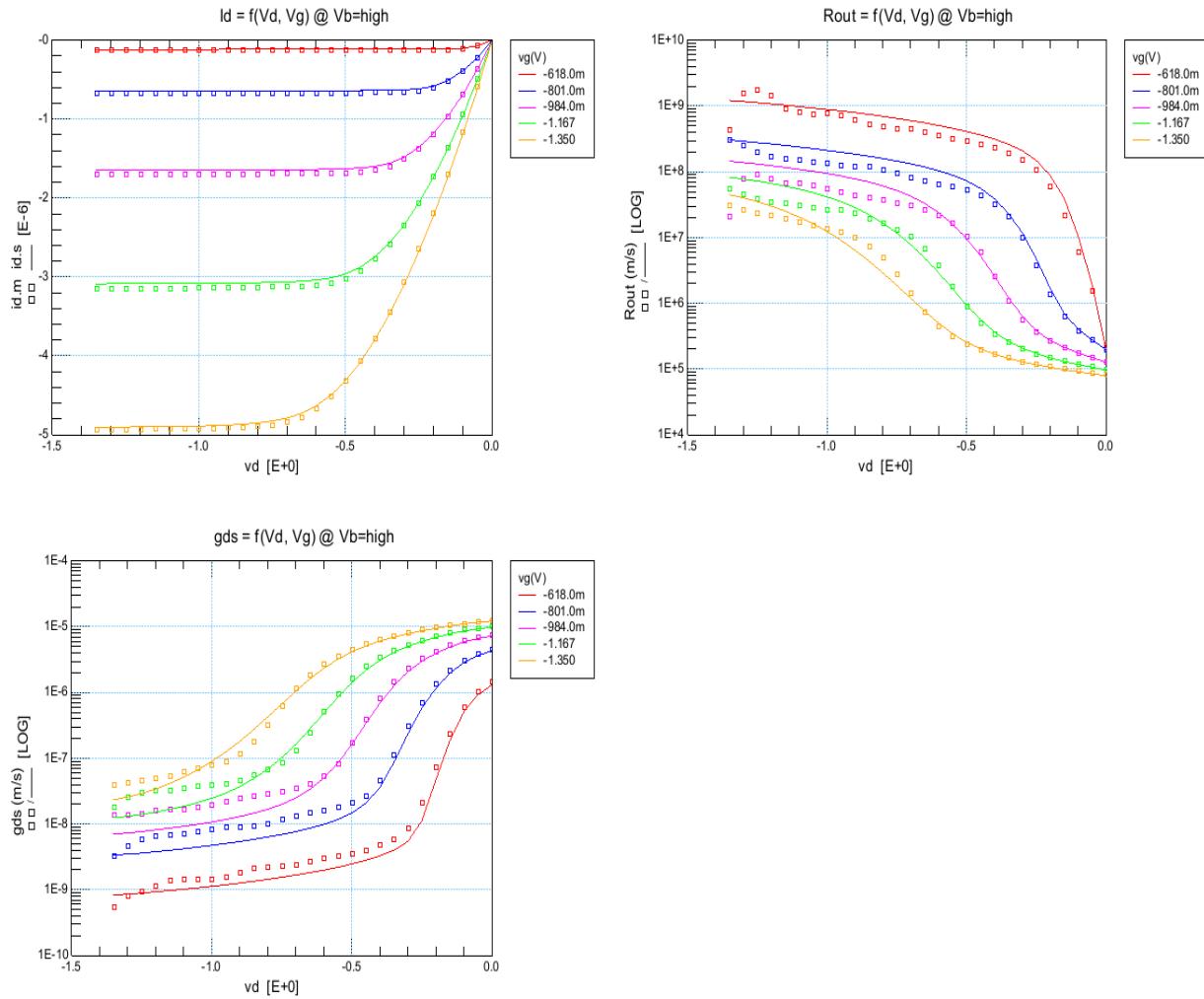
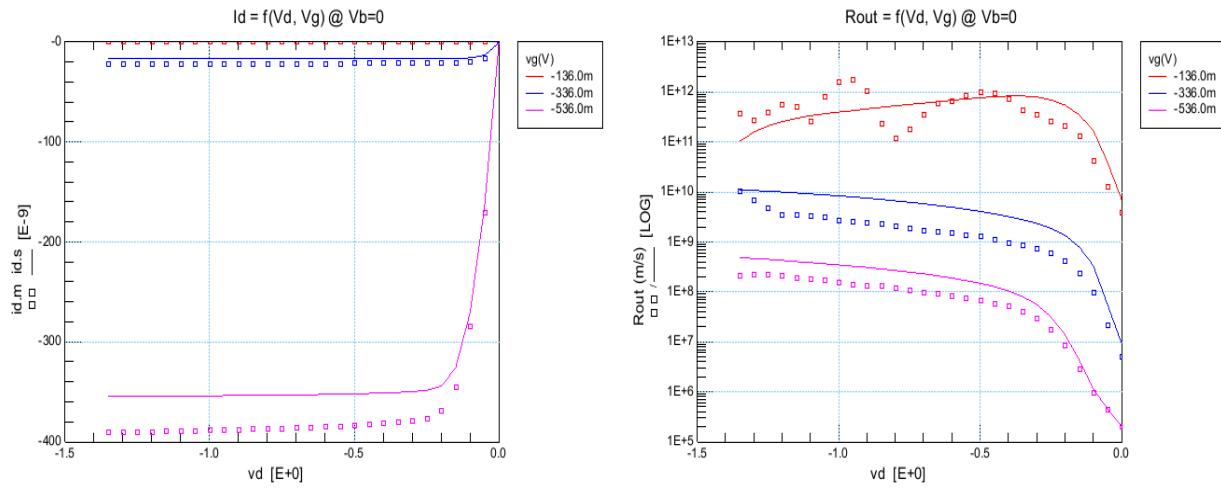


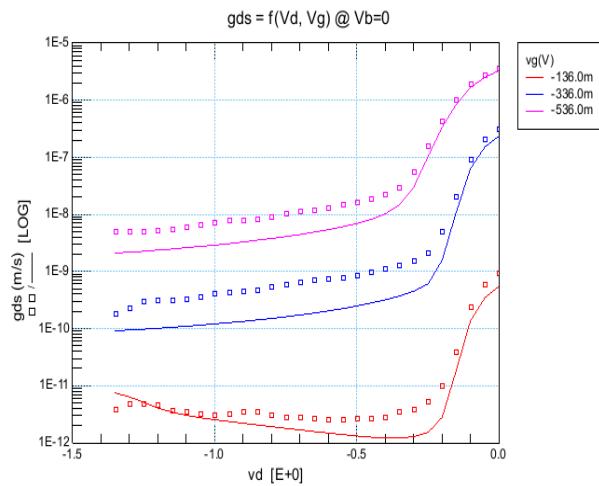
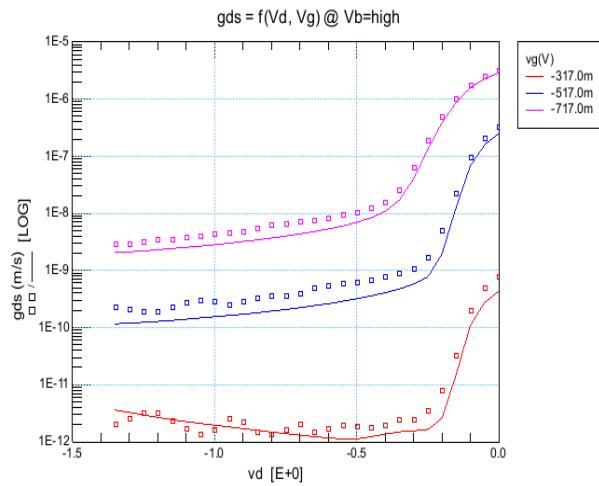
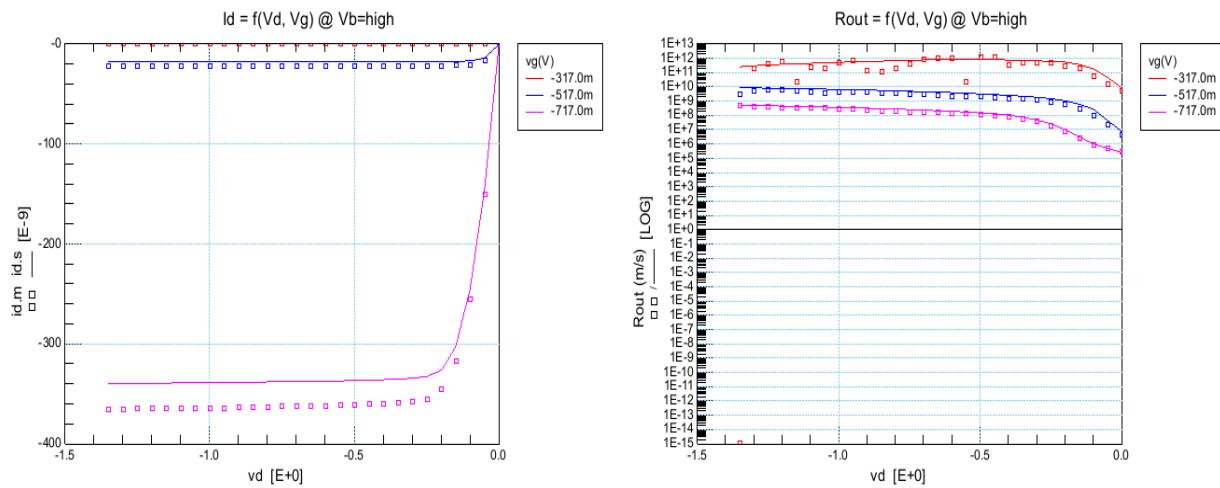


$I_{dVg}, I_b, I_g, V_b = 0V, T = 27^\circ C$



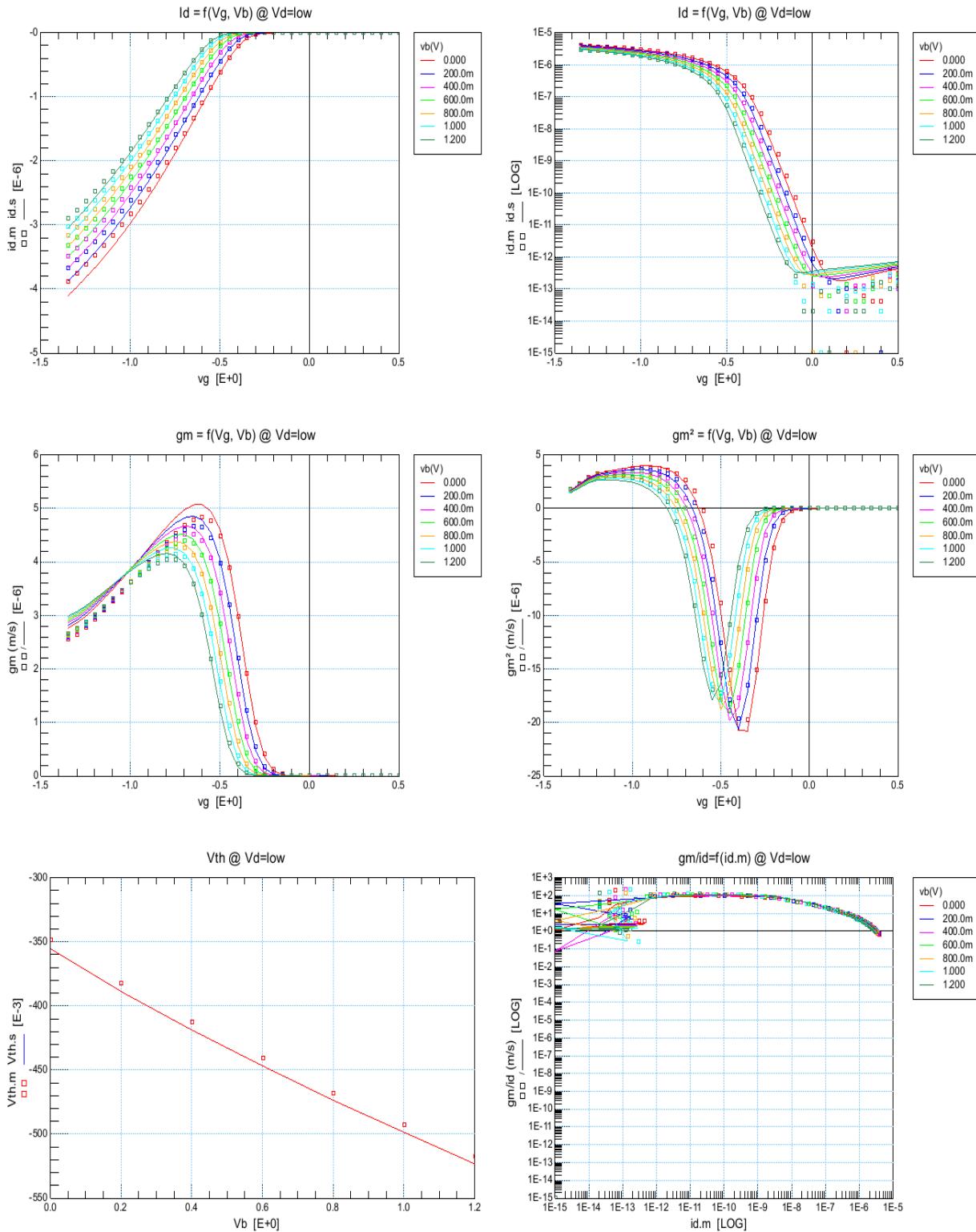
idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


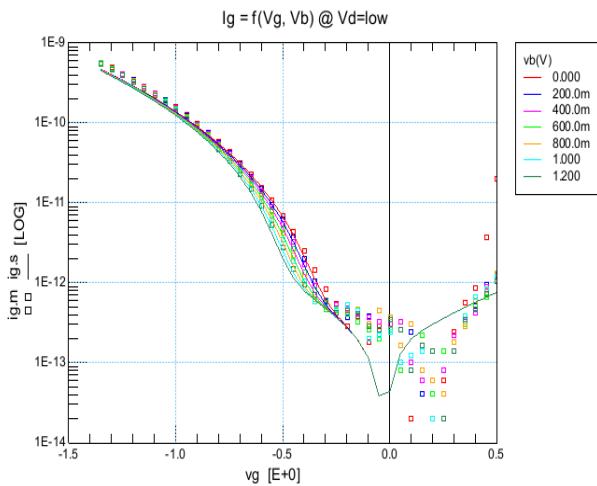
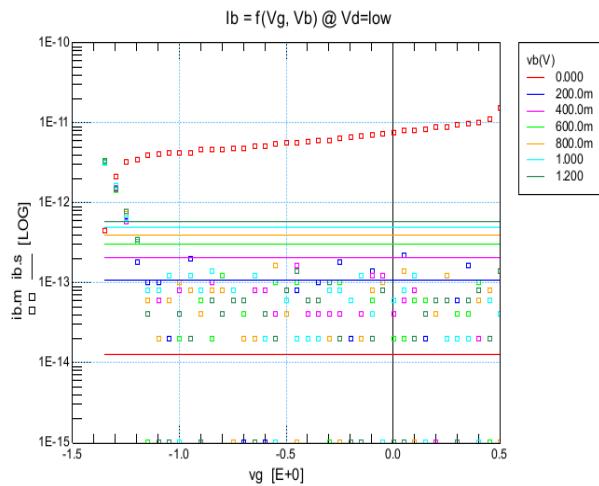
idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C



idvd_vth_vbmin, Vb = 1.2V, T = 27°C


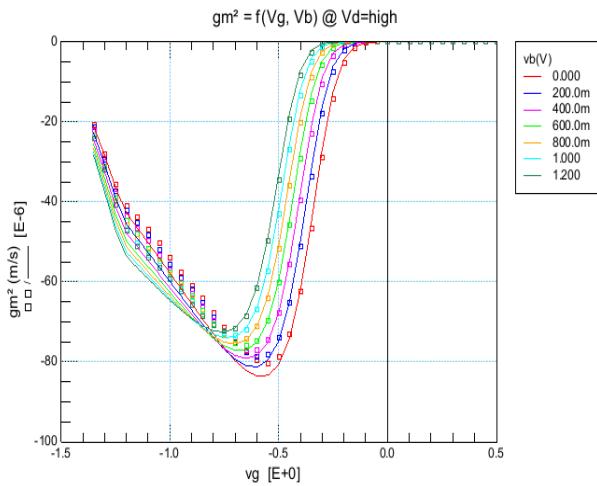
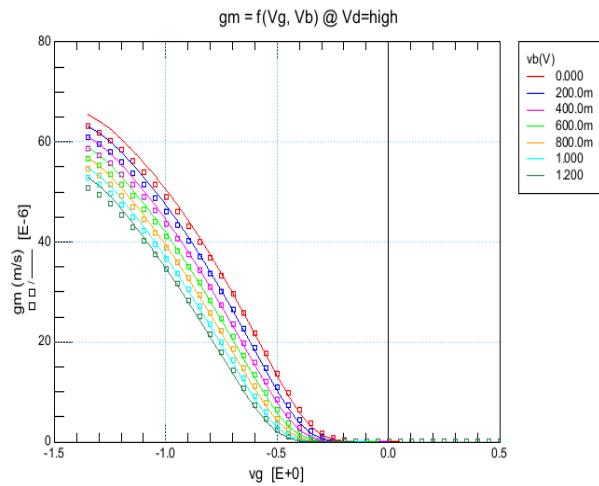
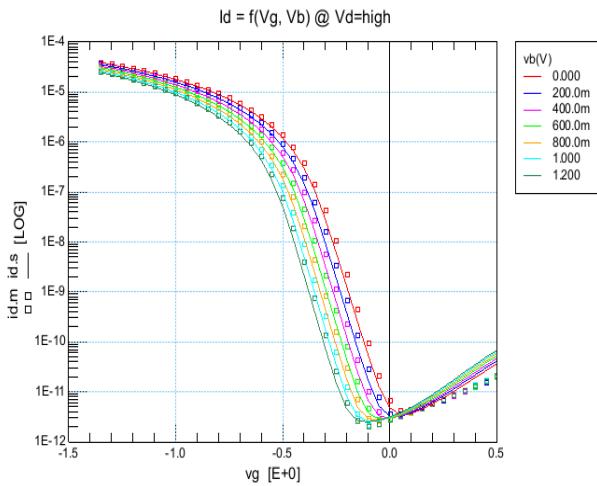
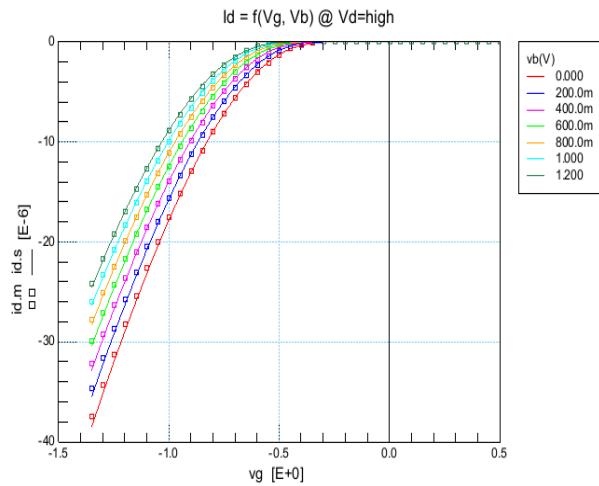
4.18 W02u0_L2u0_S550_5

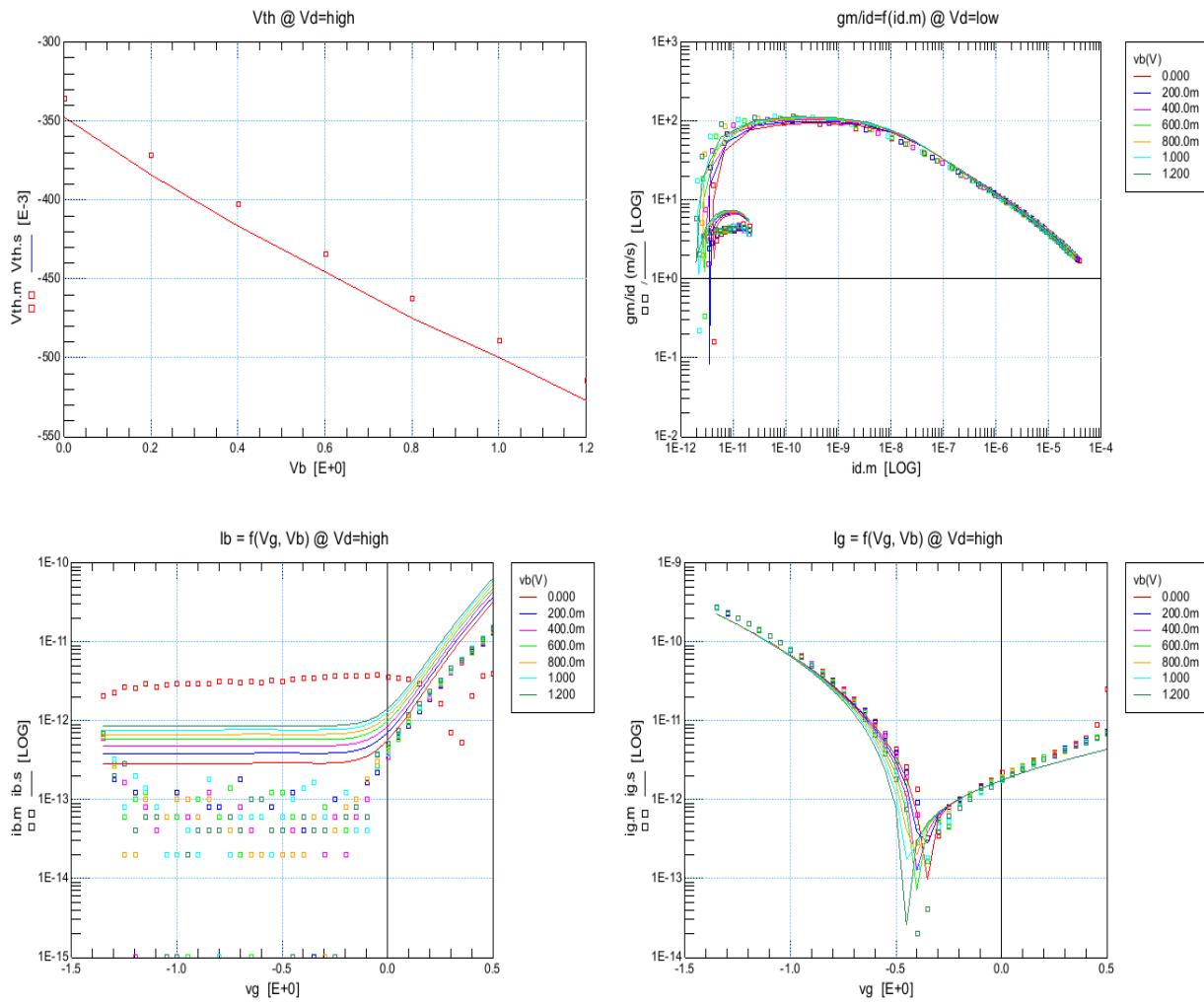
$idv_g, V_d = -0.05V, T = 27^\circ C$



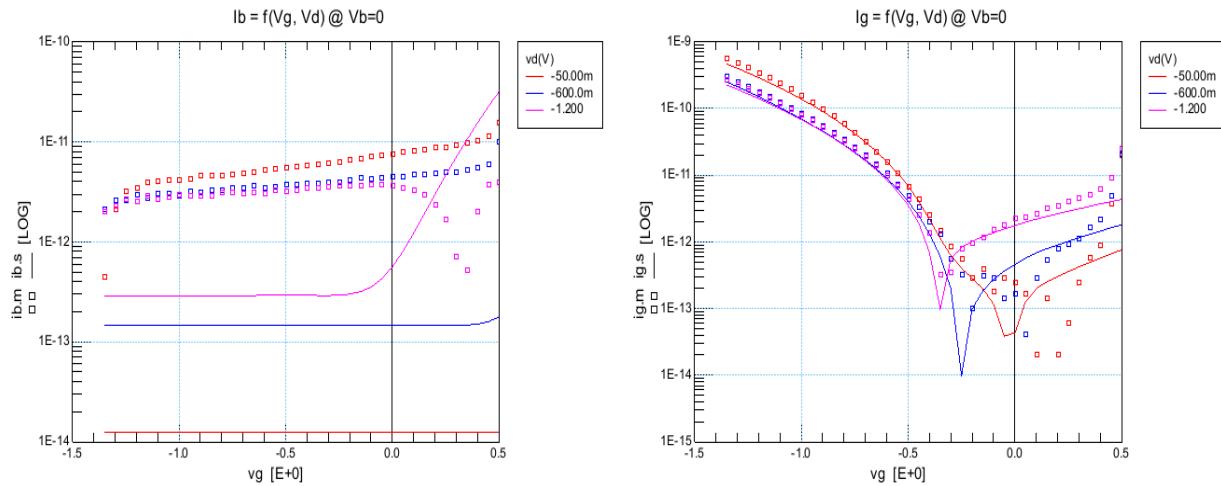


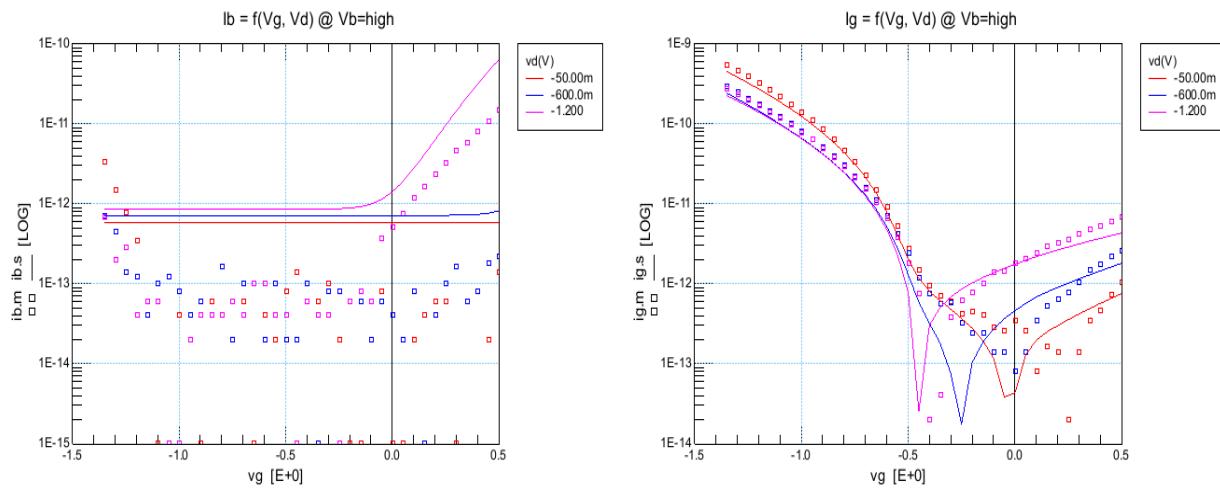
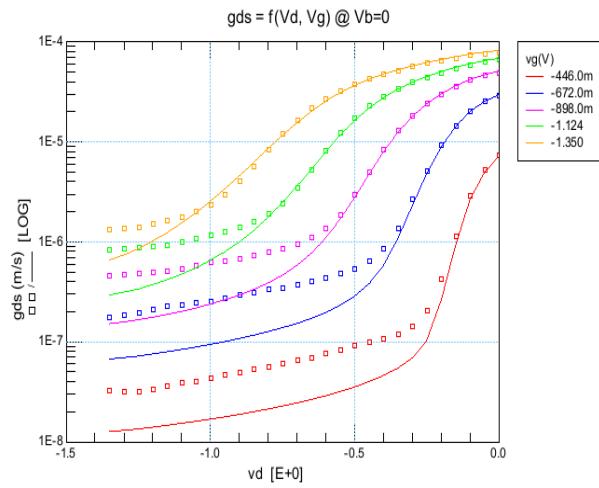
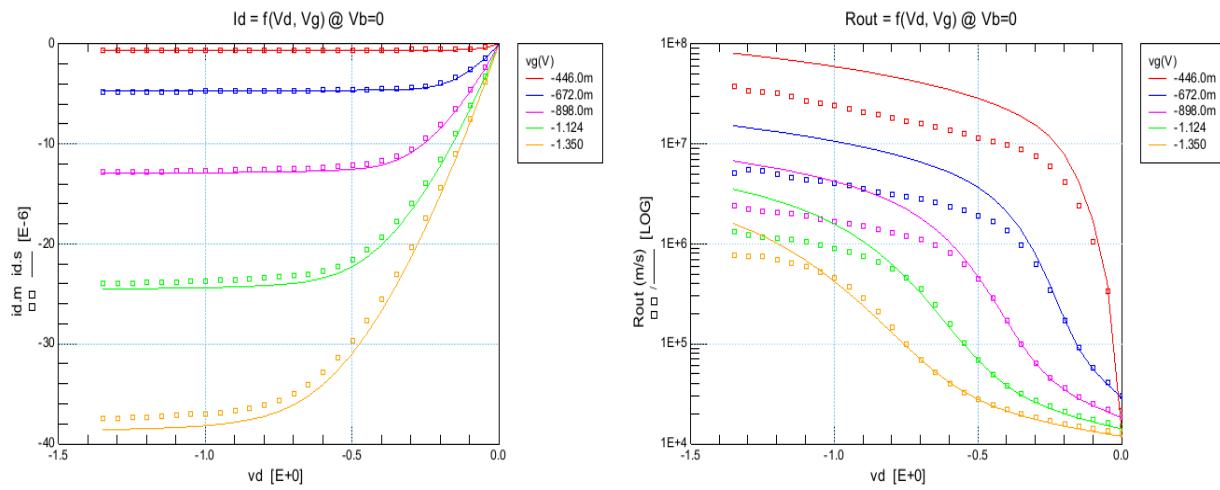
i_{dvg} , $V_d = -1.2V$, $T = 27^\circ C$

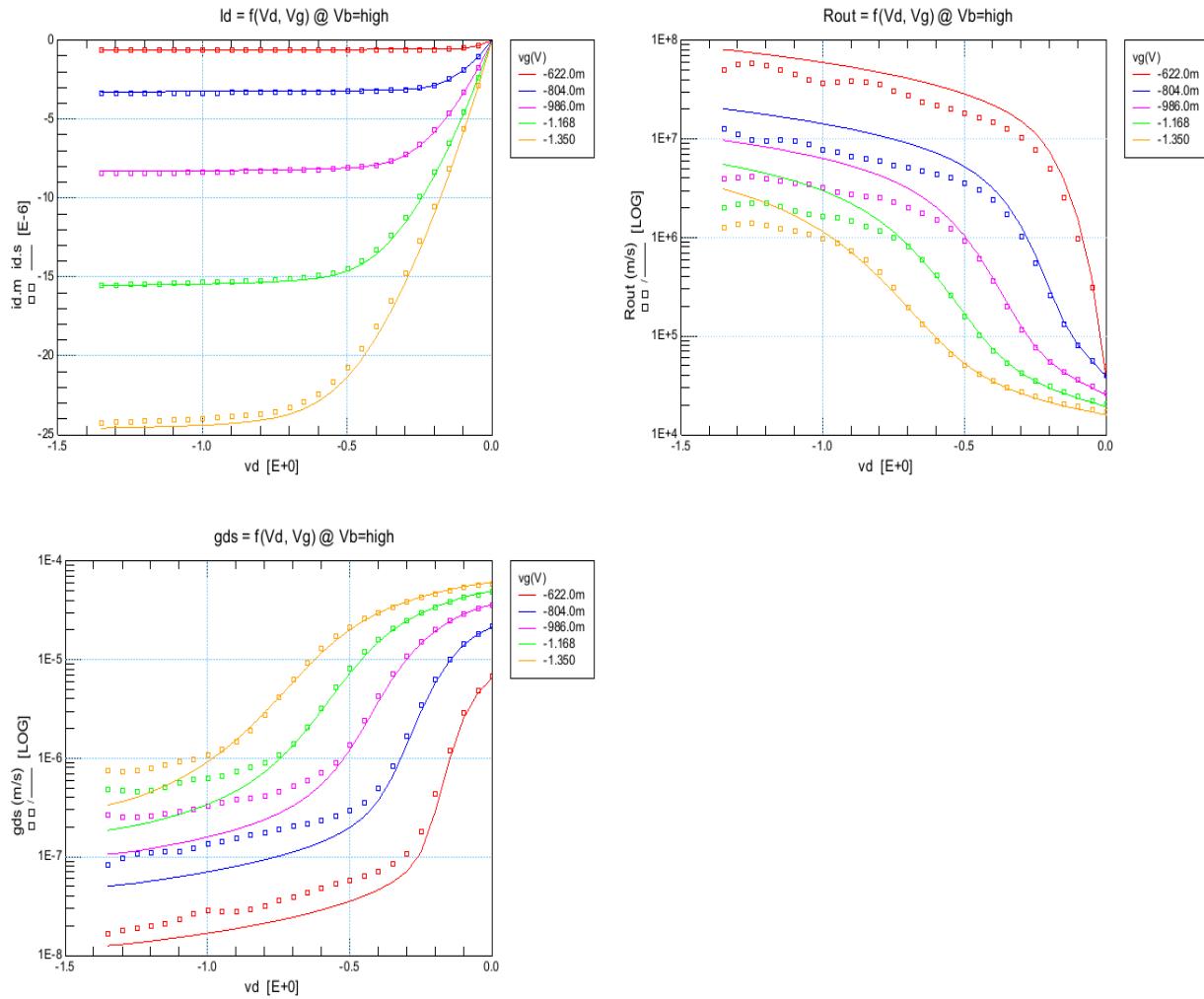
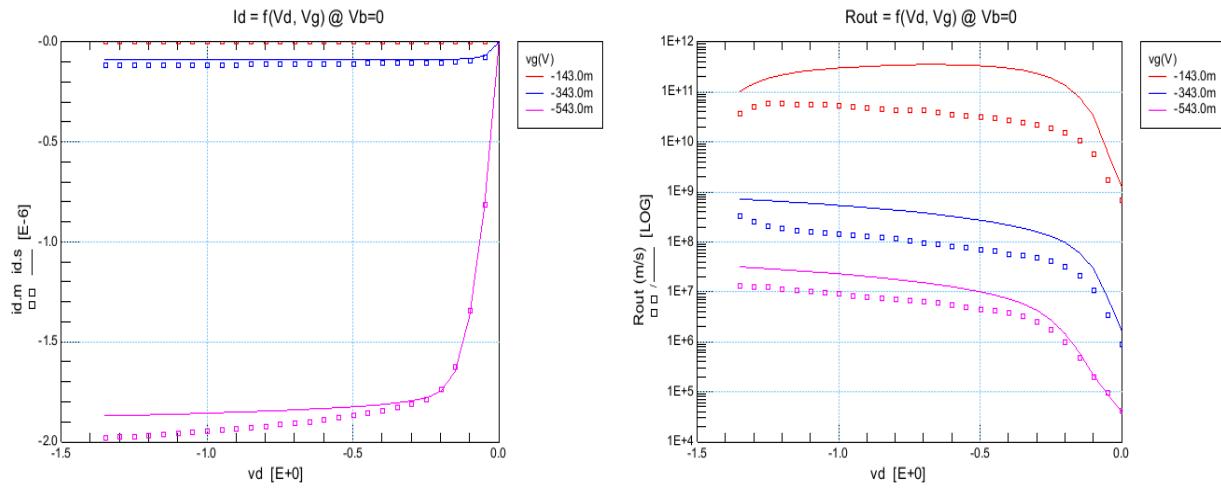


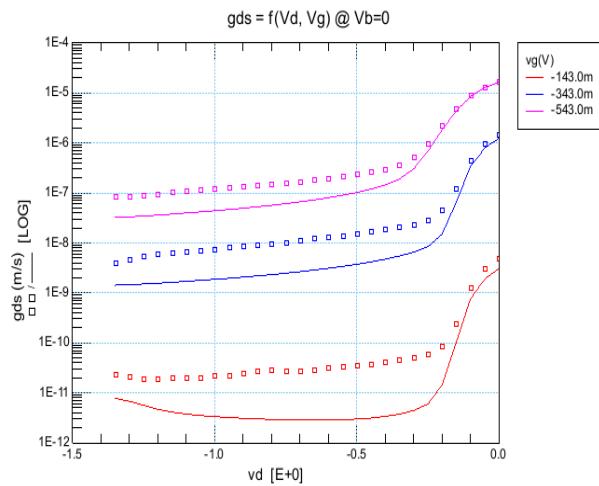


idvg, Ib, Ig, Vb = 0V, T = 27°C

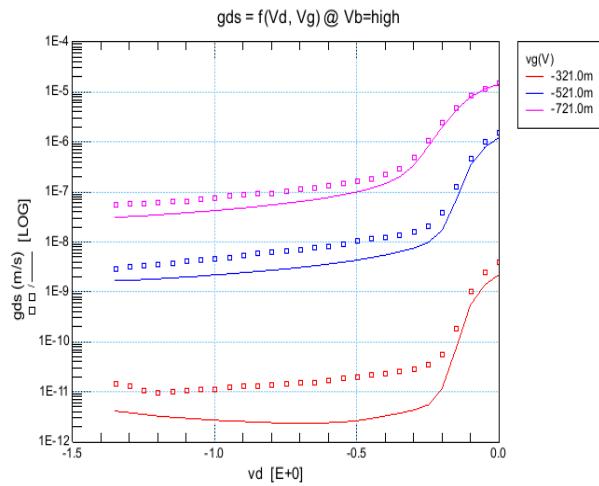
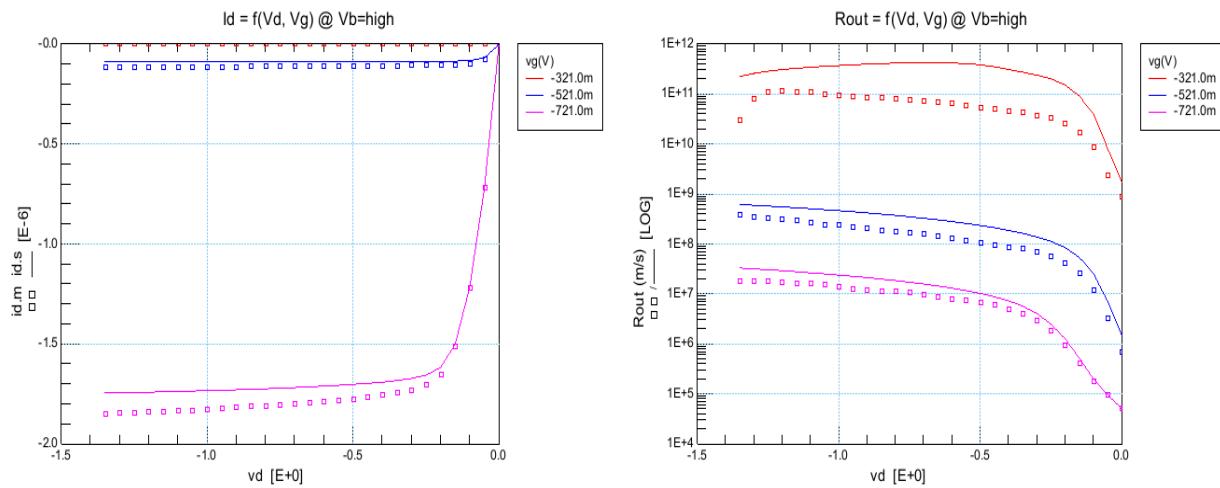


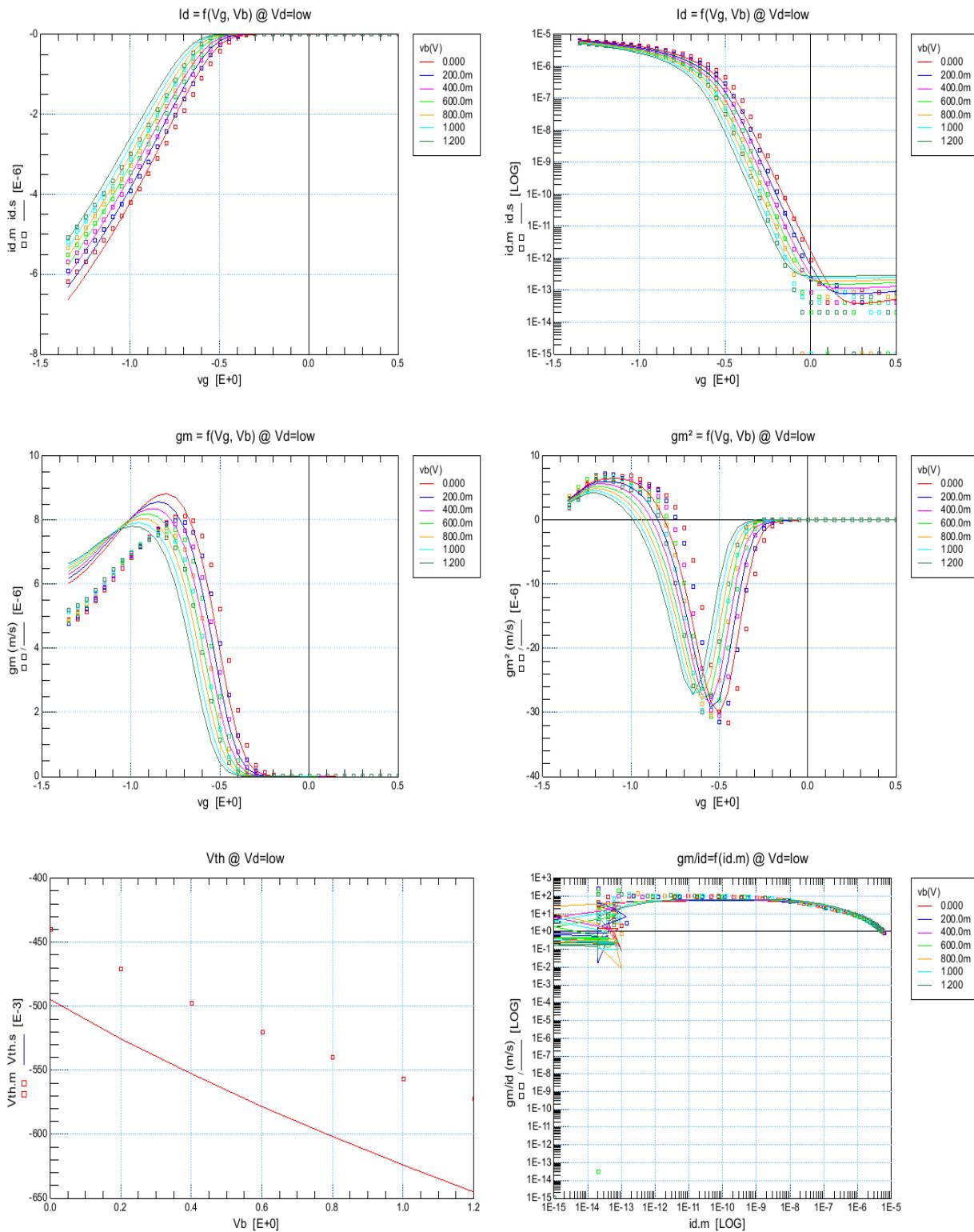
idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


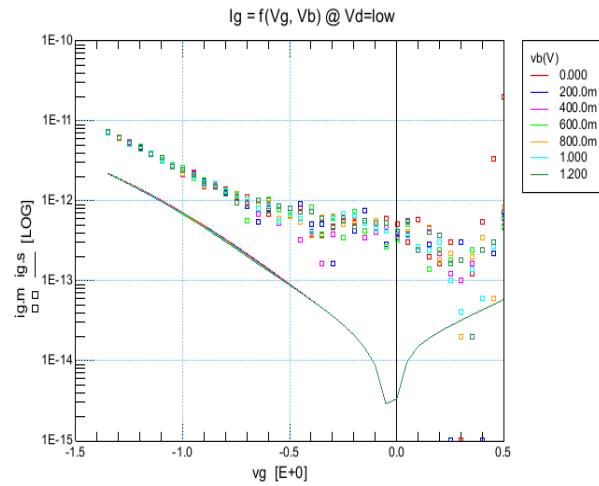
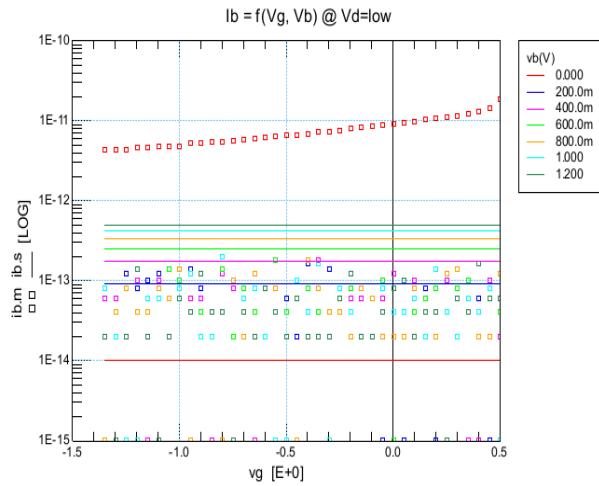
idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C




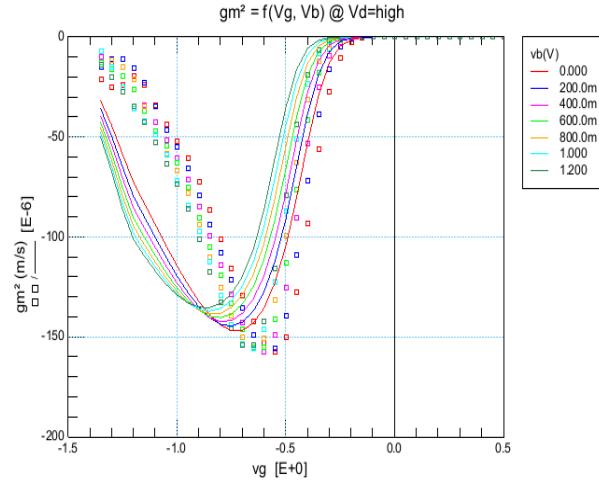
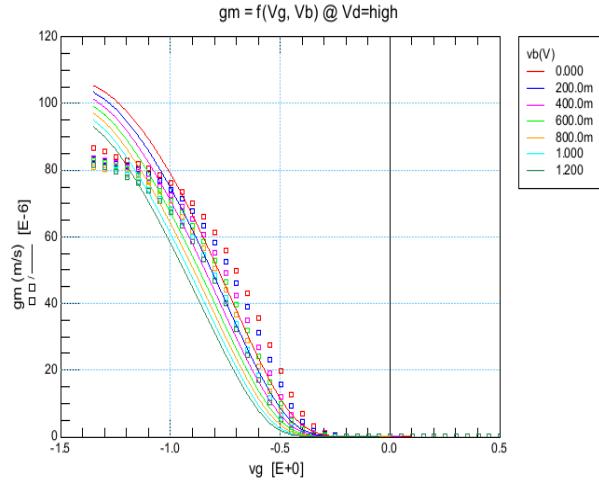
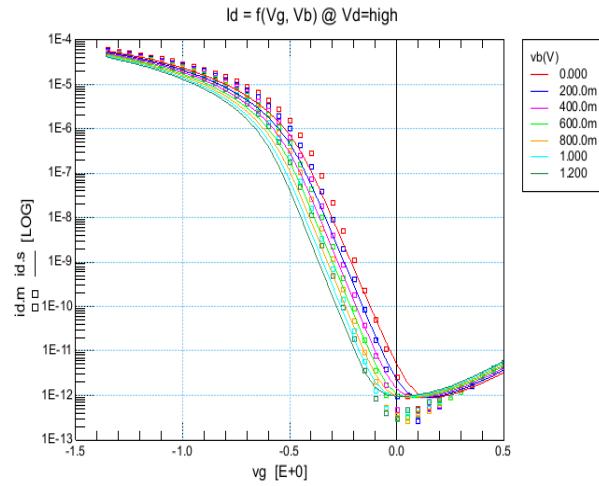
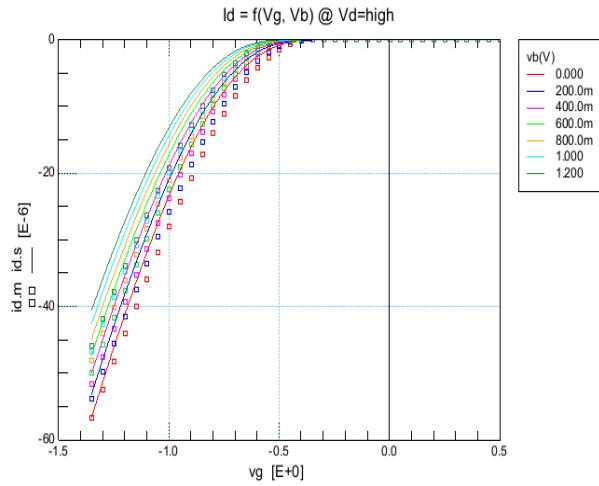
idvd_vth_vbmin, Vb = 1.2V, T = 27°C

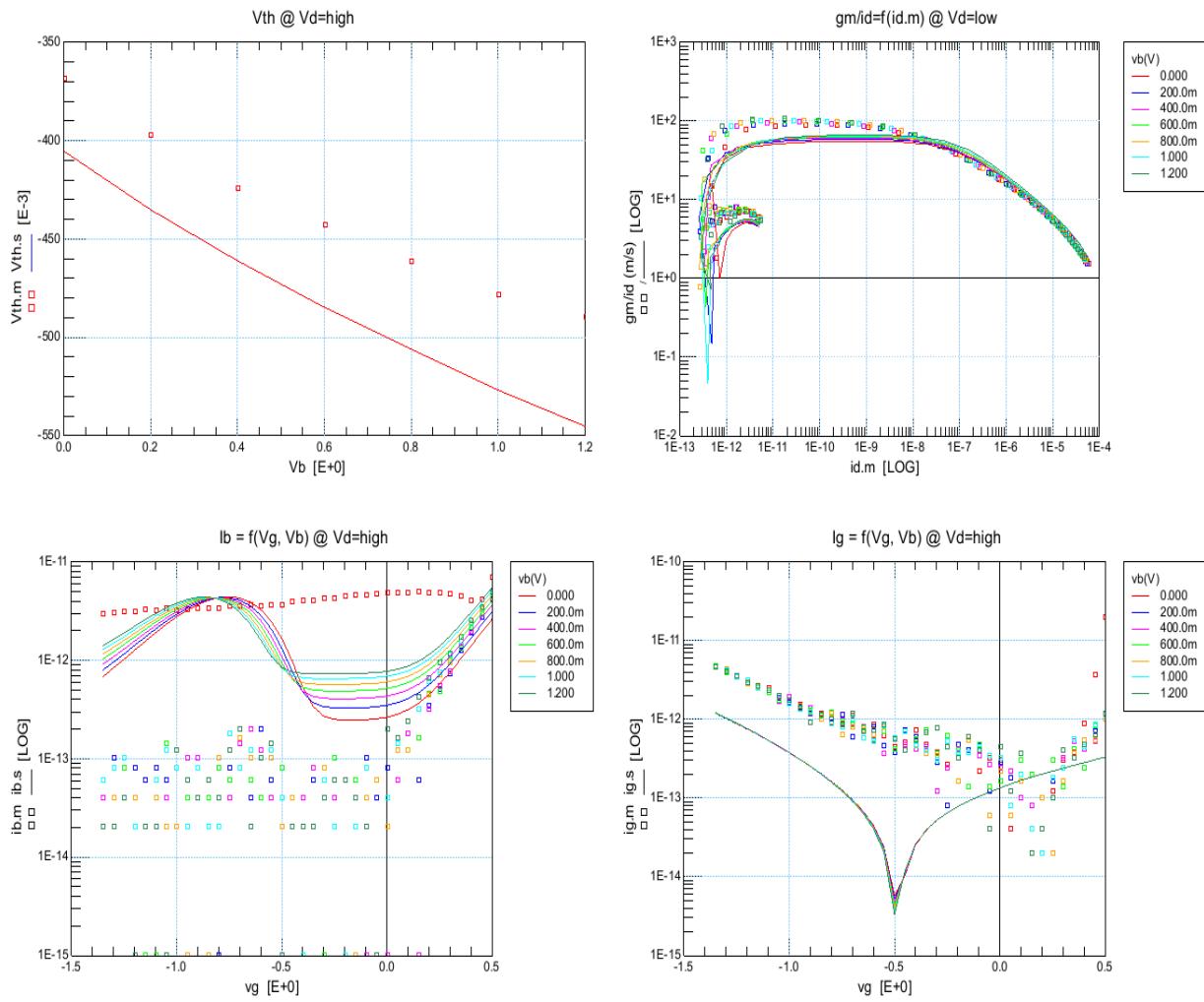


4.19 W0u18_L0u14_S553_4**idvg, Vd = -0.05V, T = 27°C**

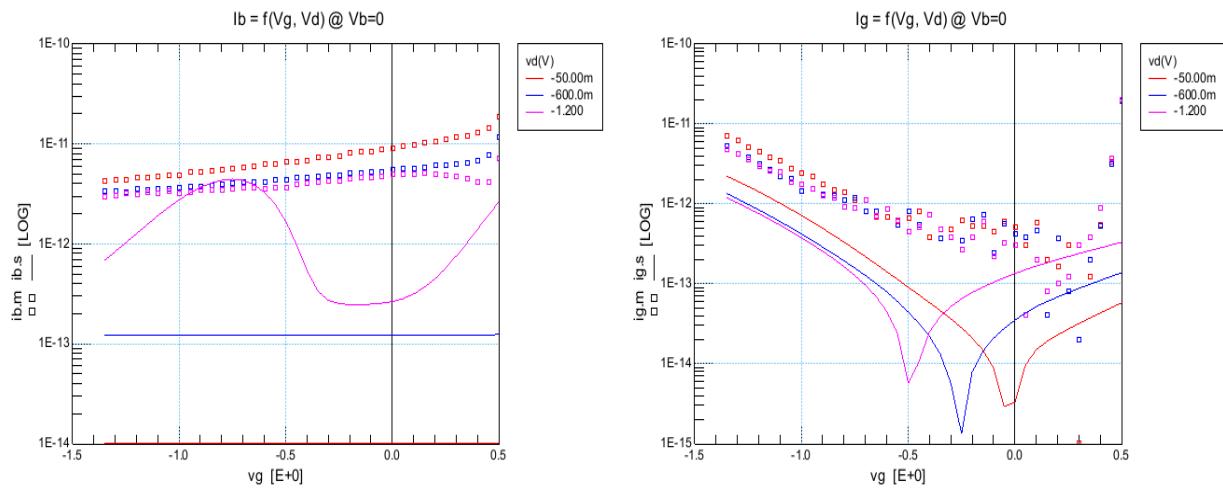


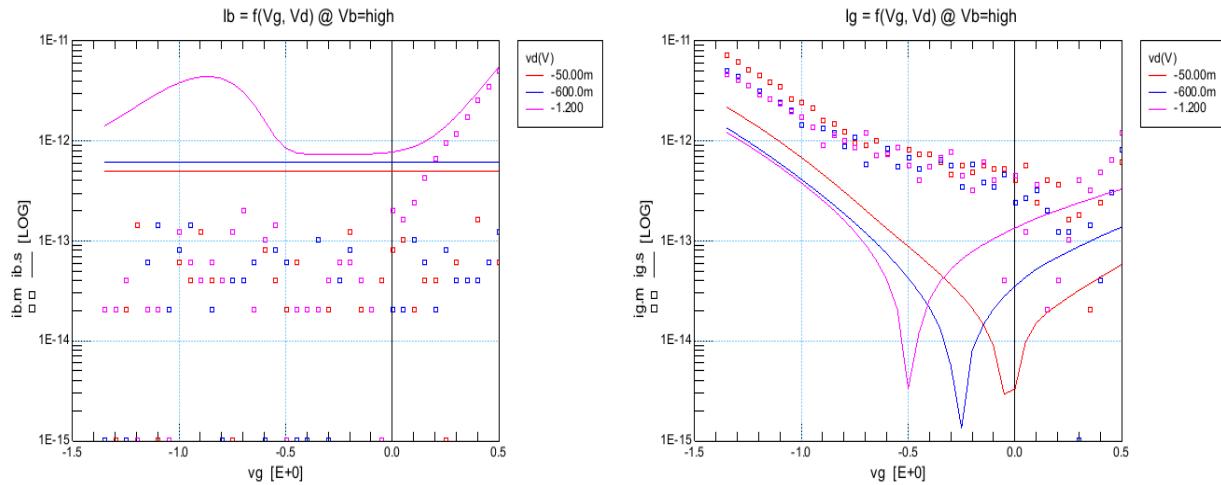
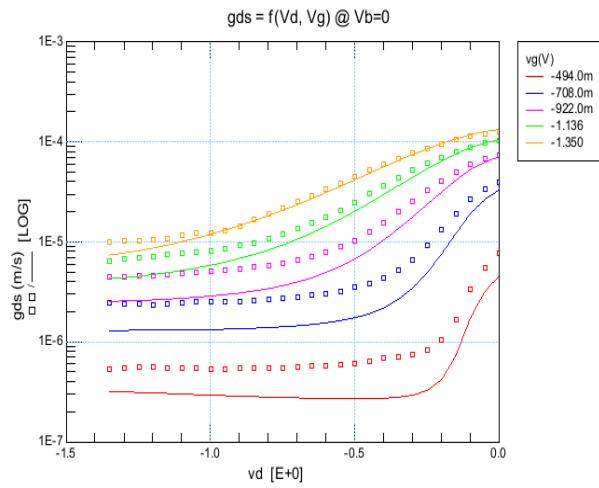
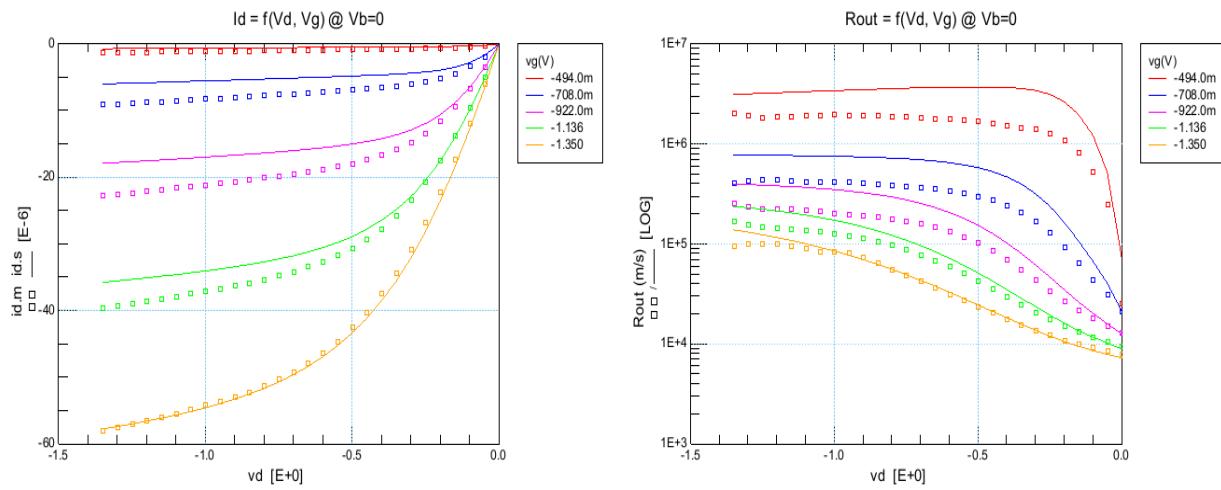
$i_{dvg}, V_d = -1.2V, T = 27^\circ C$

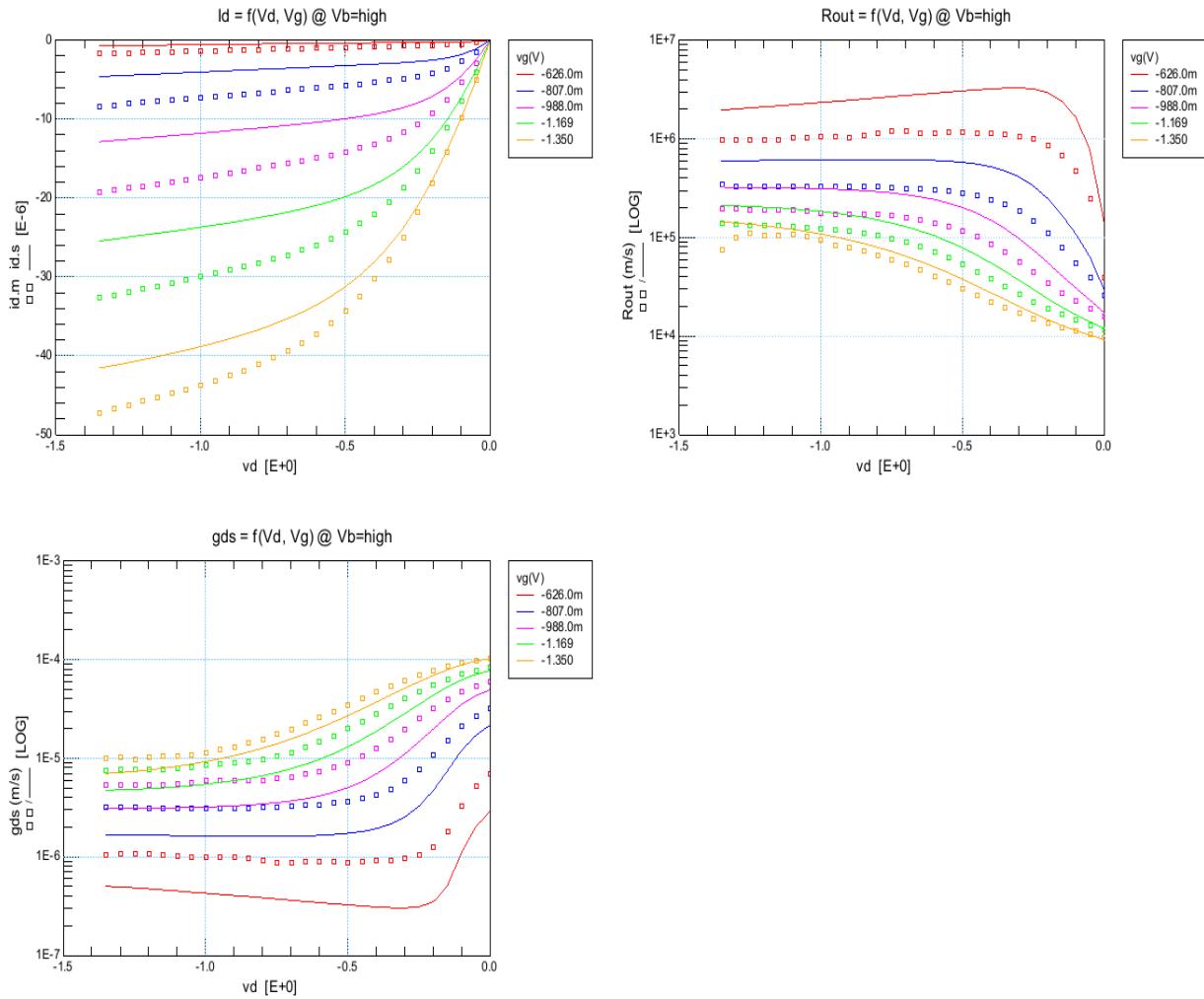
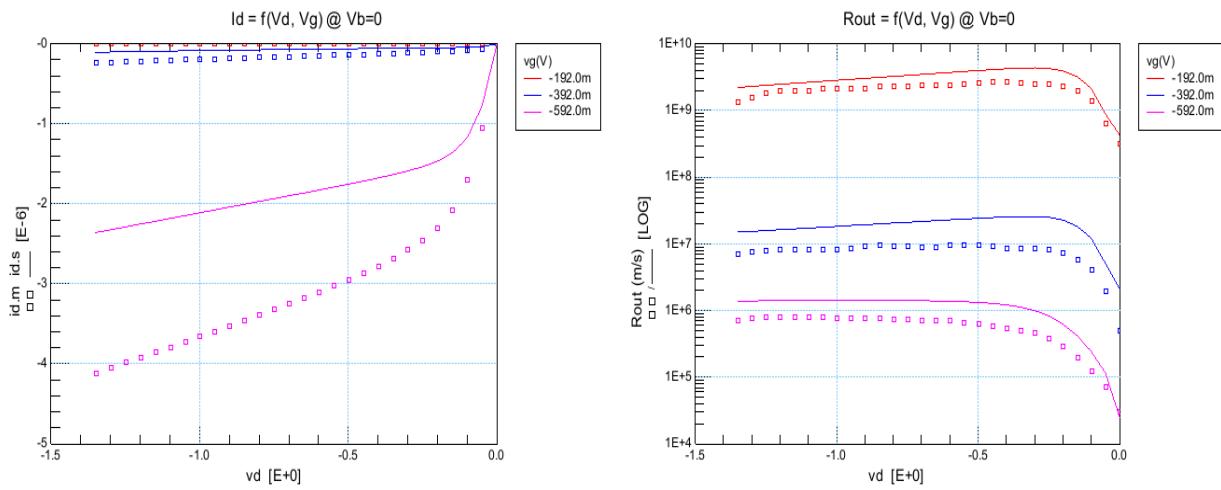


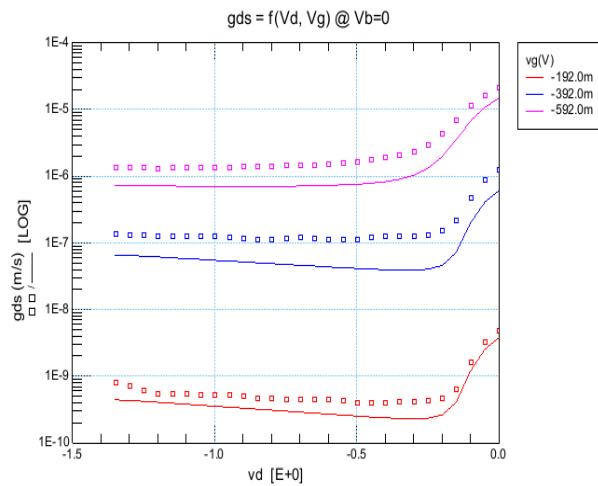


idvg, Ib,Ig, Vb = 0V, T = 27°C

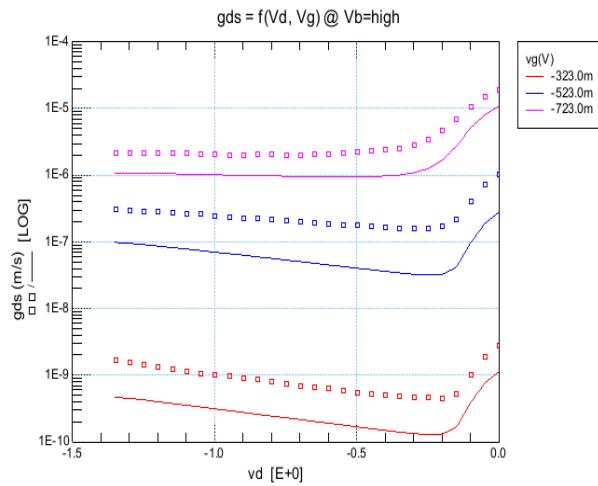
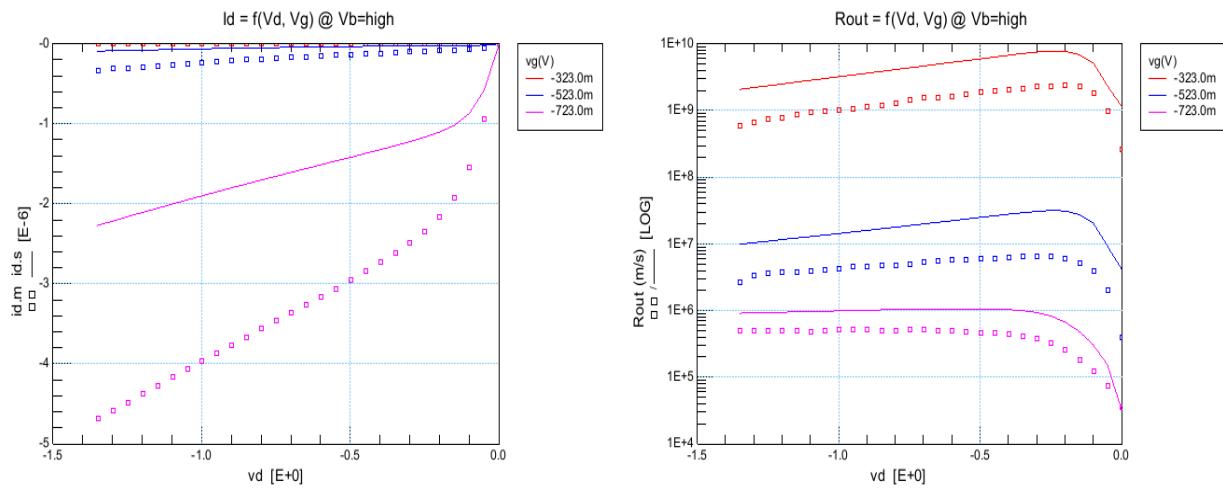


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C


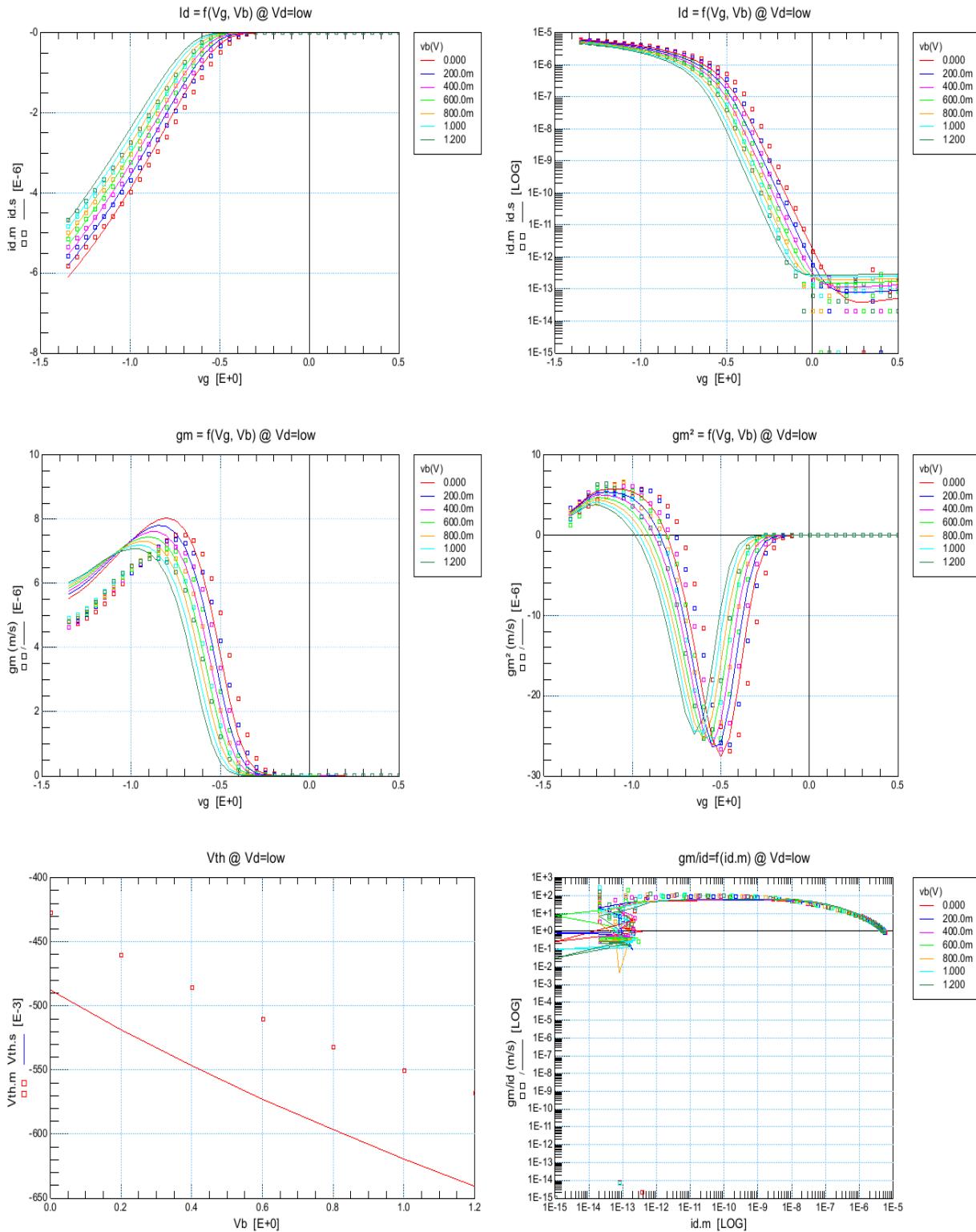


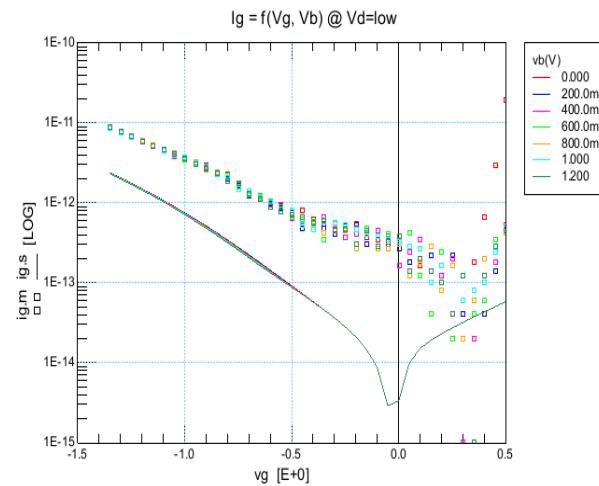
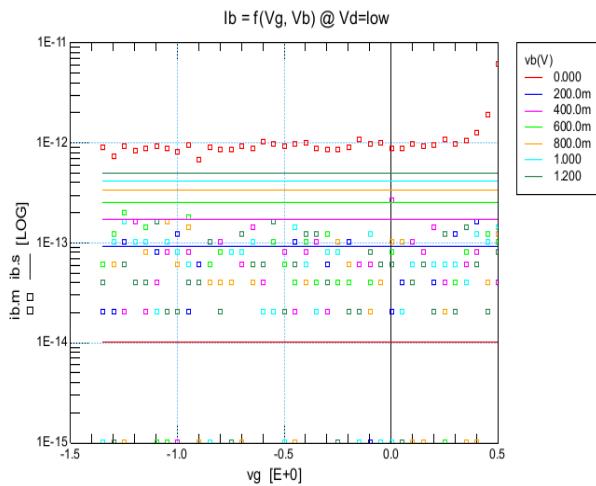
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



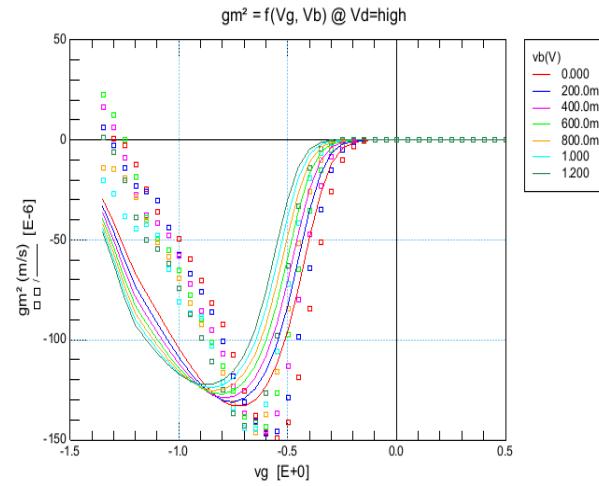
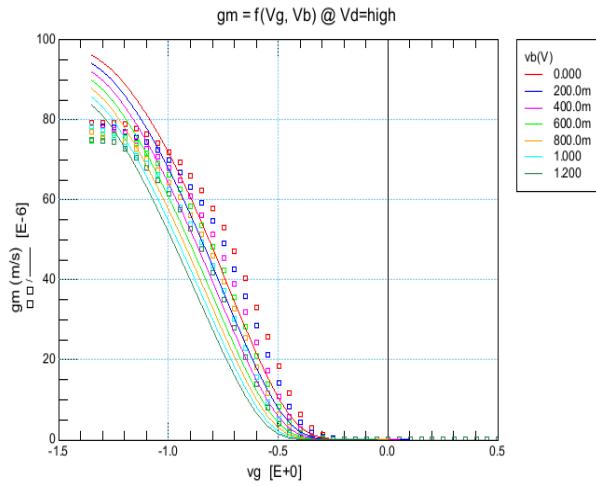
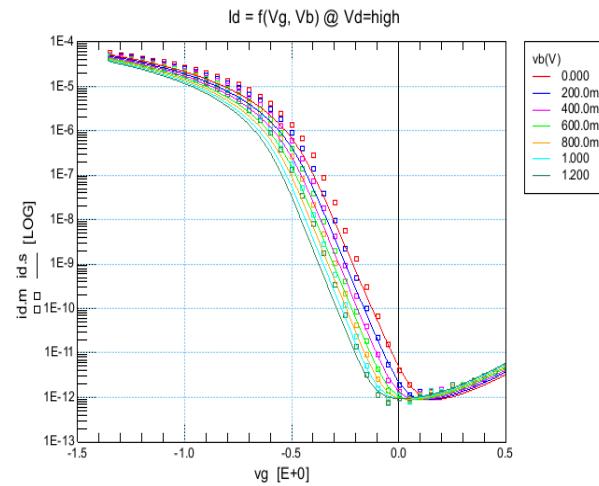
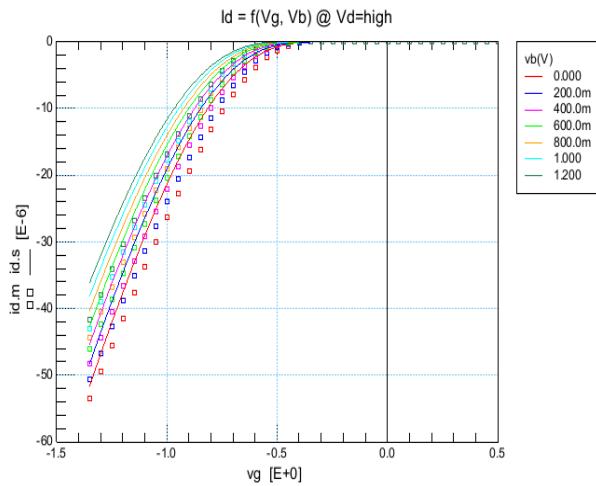
4.20 W0u18_L0u15_S553_5

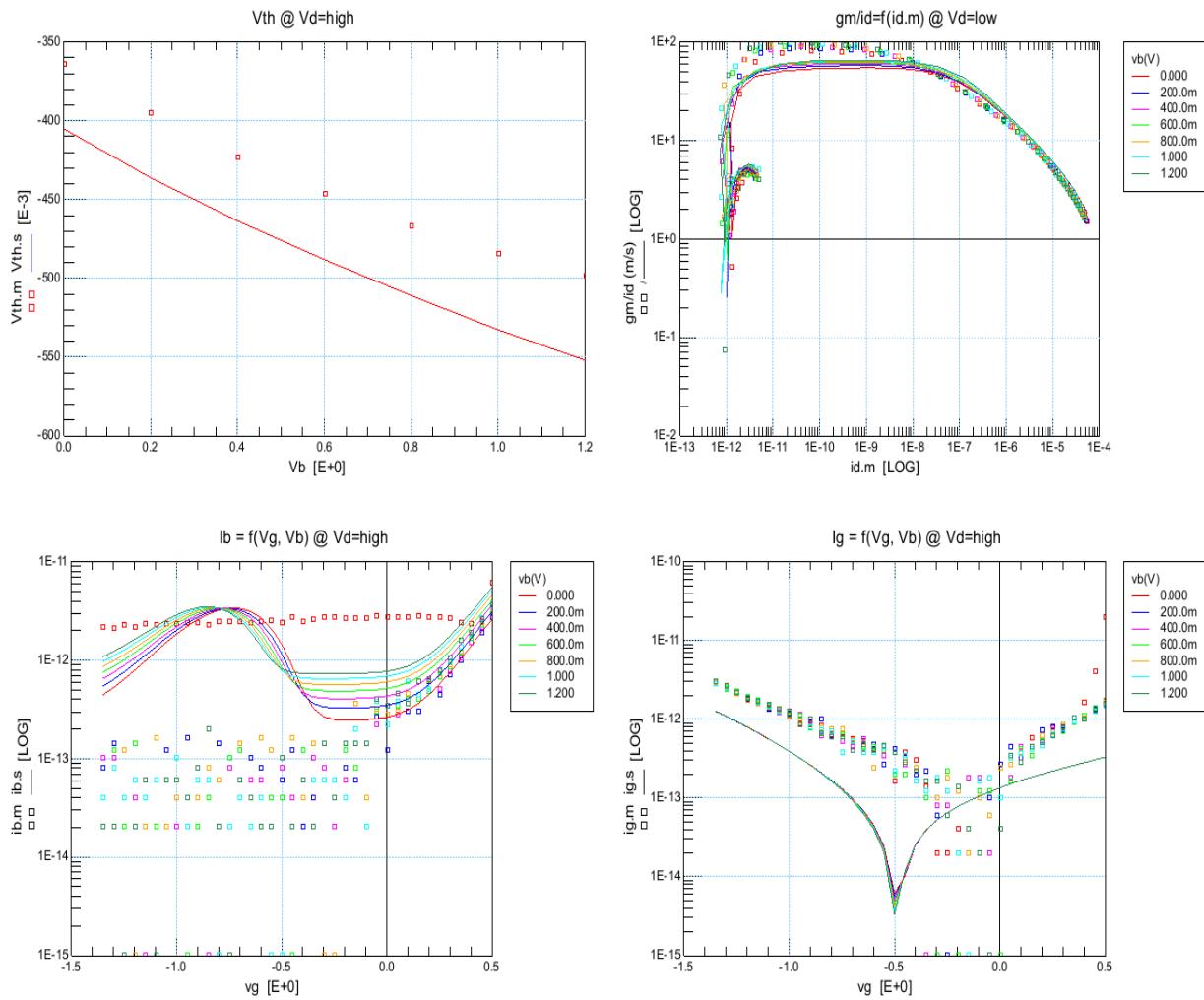
$idvg$, $Vd = -0.05V$, $T = 27^\circ C$



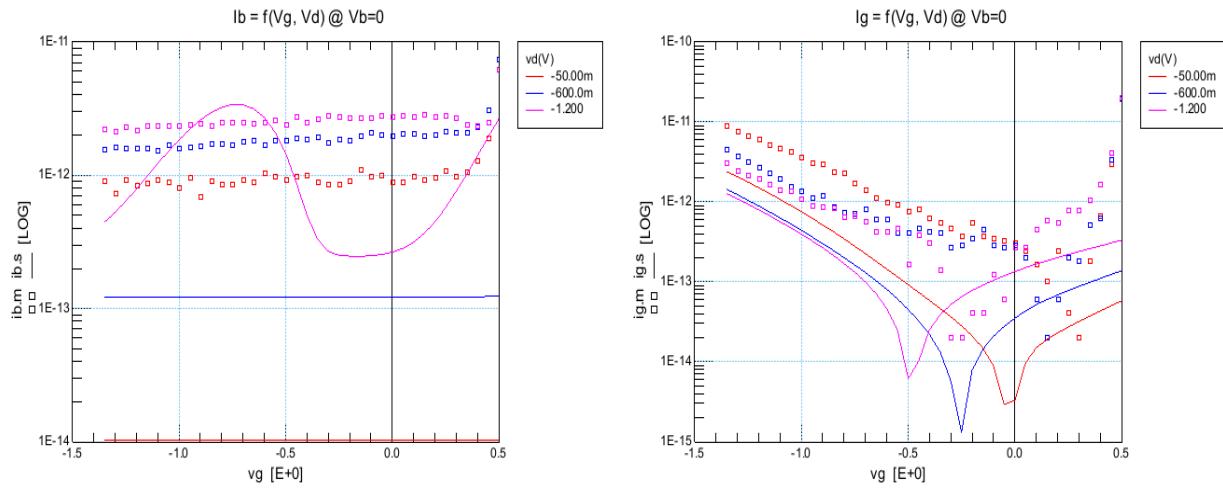


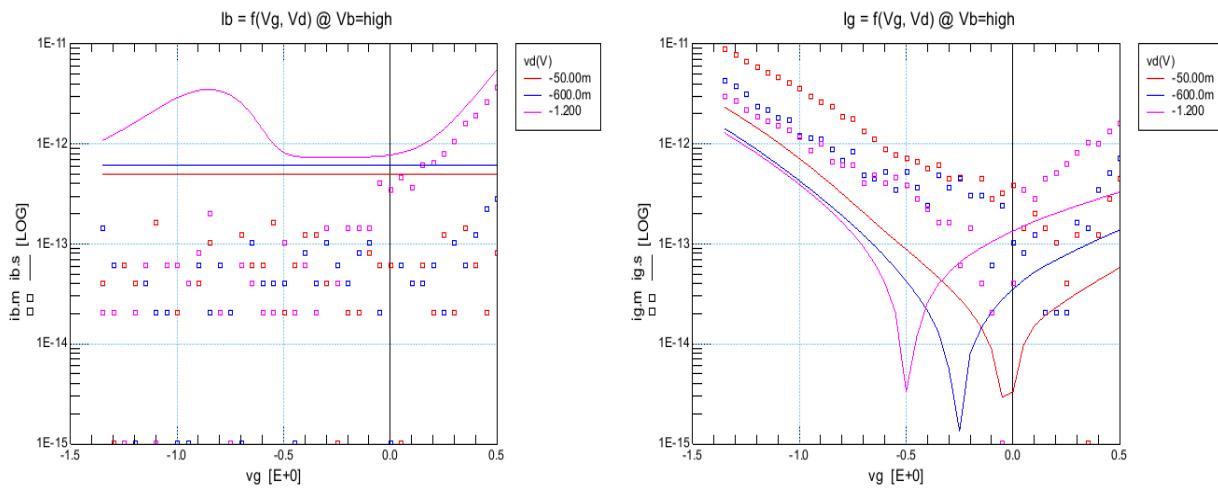
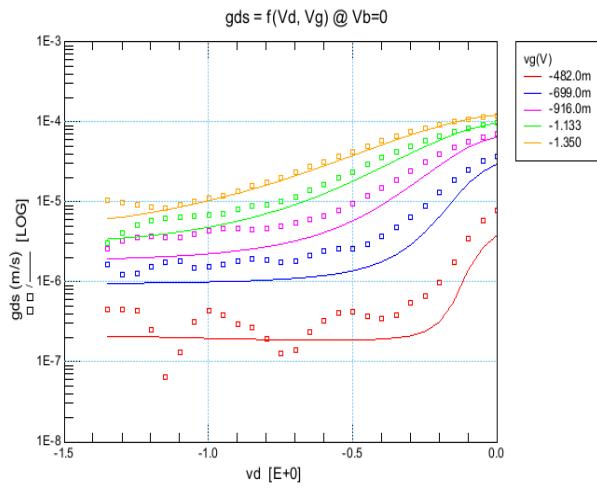
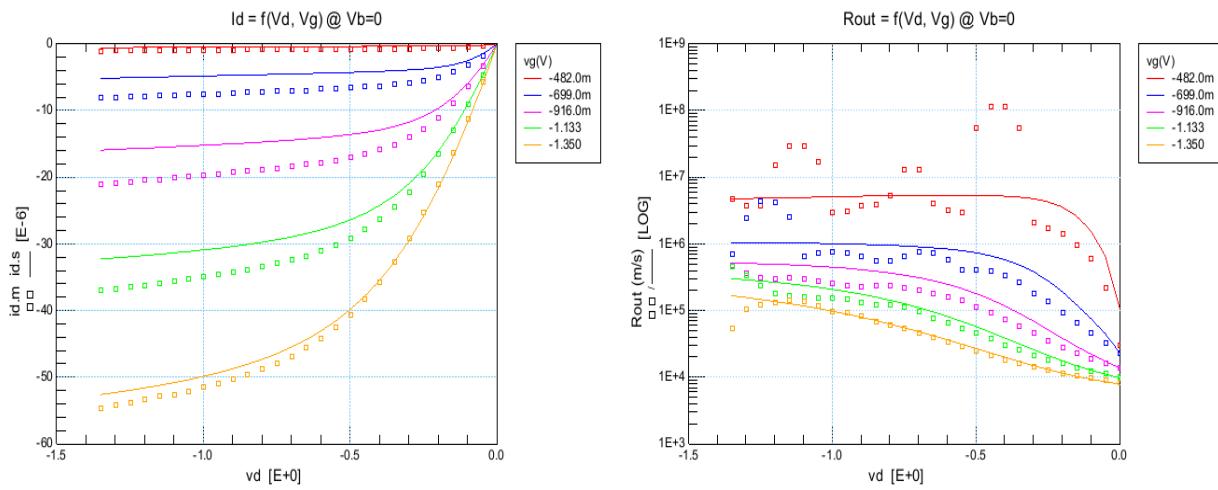
i_{dvg} , $V_d = -1.2V$, $T = 27^\circ C$

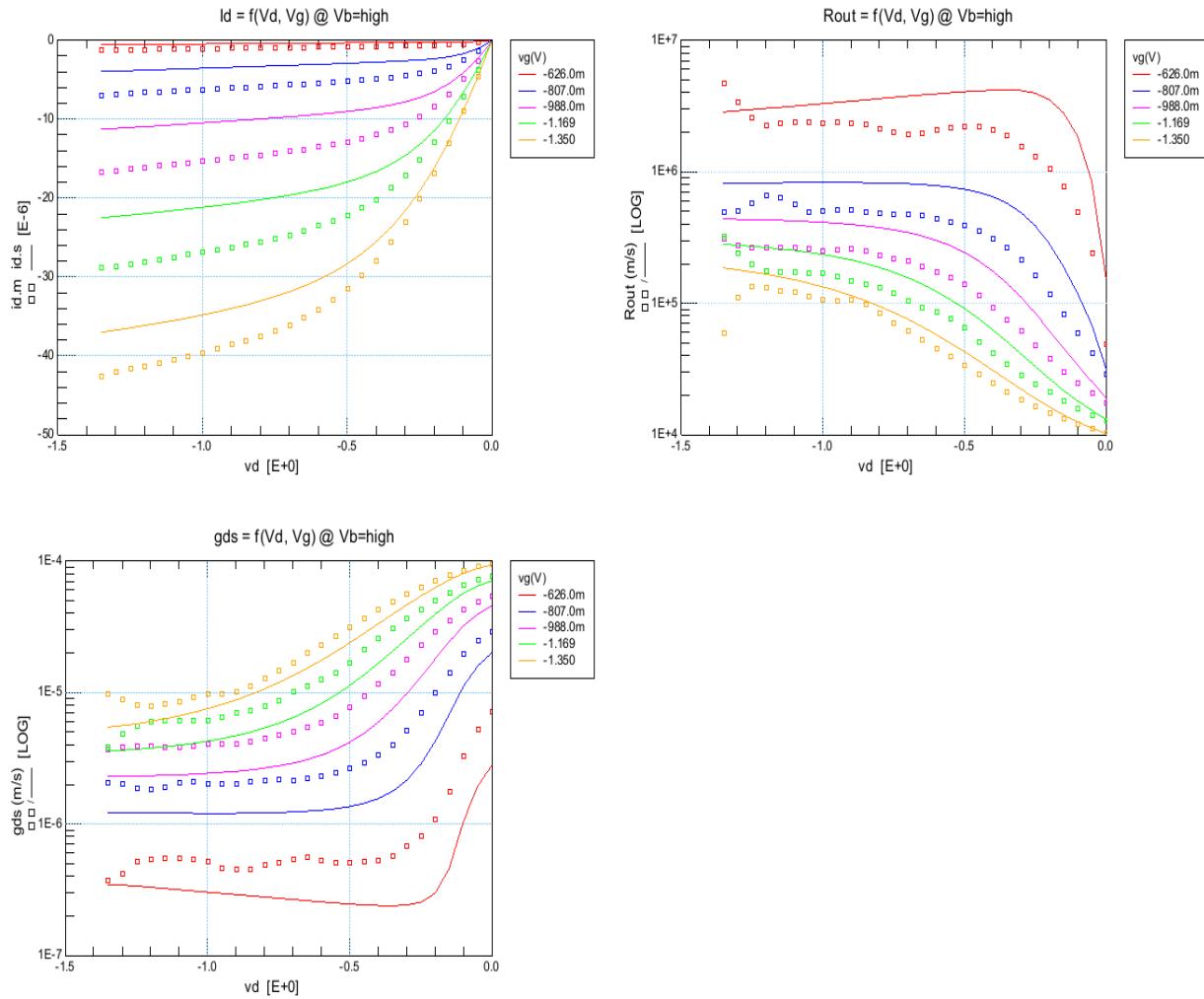
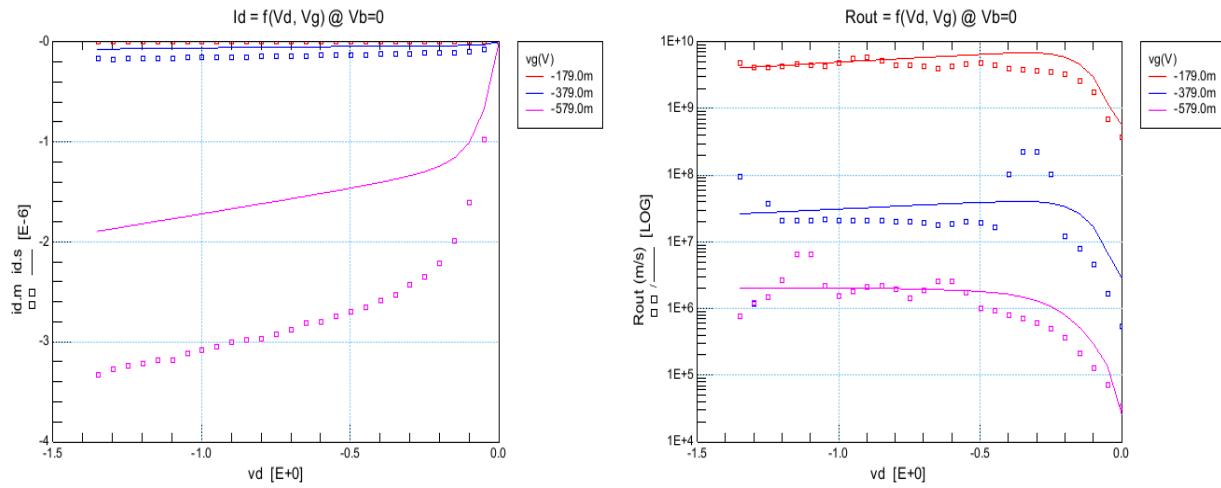


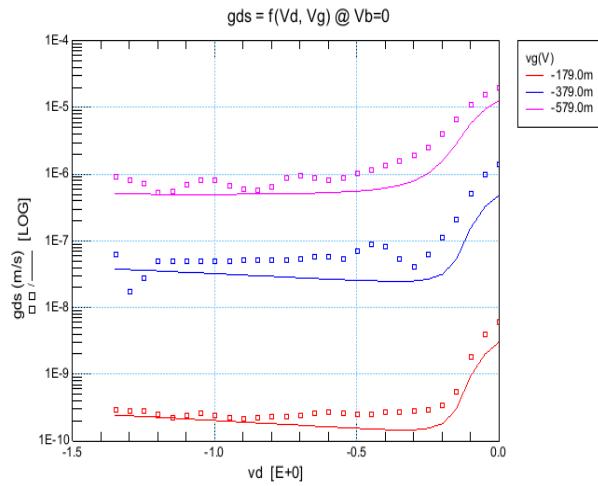


$i_{dvg}, I_b, I_g, V_b = 0V, T = 27^\circ C$

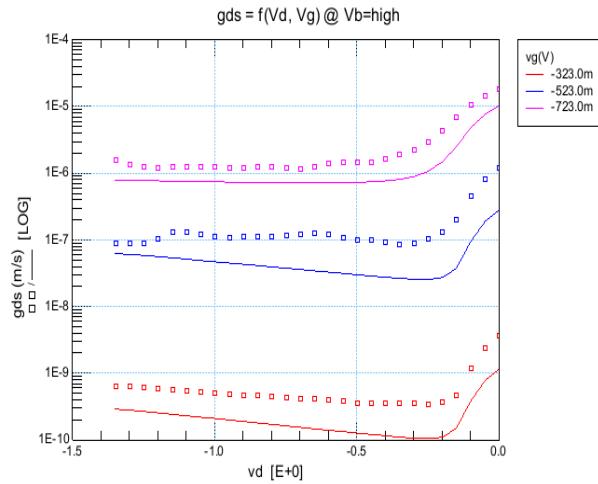
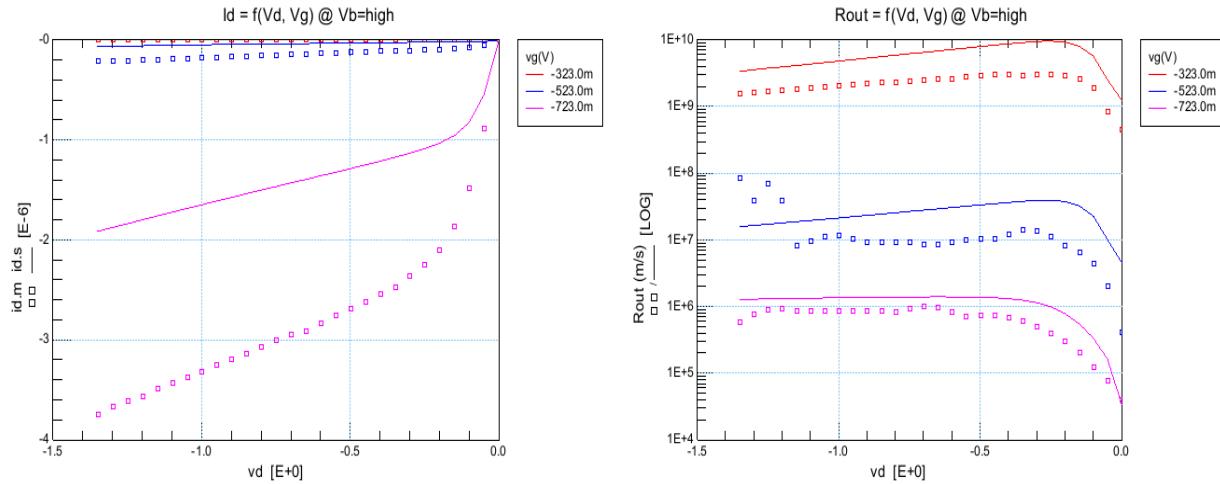


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C


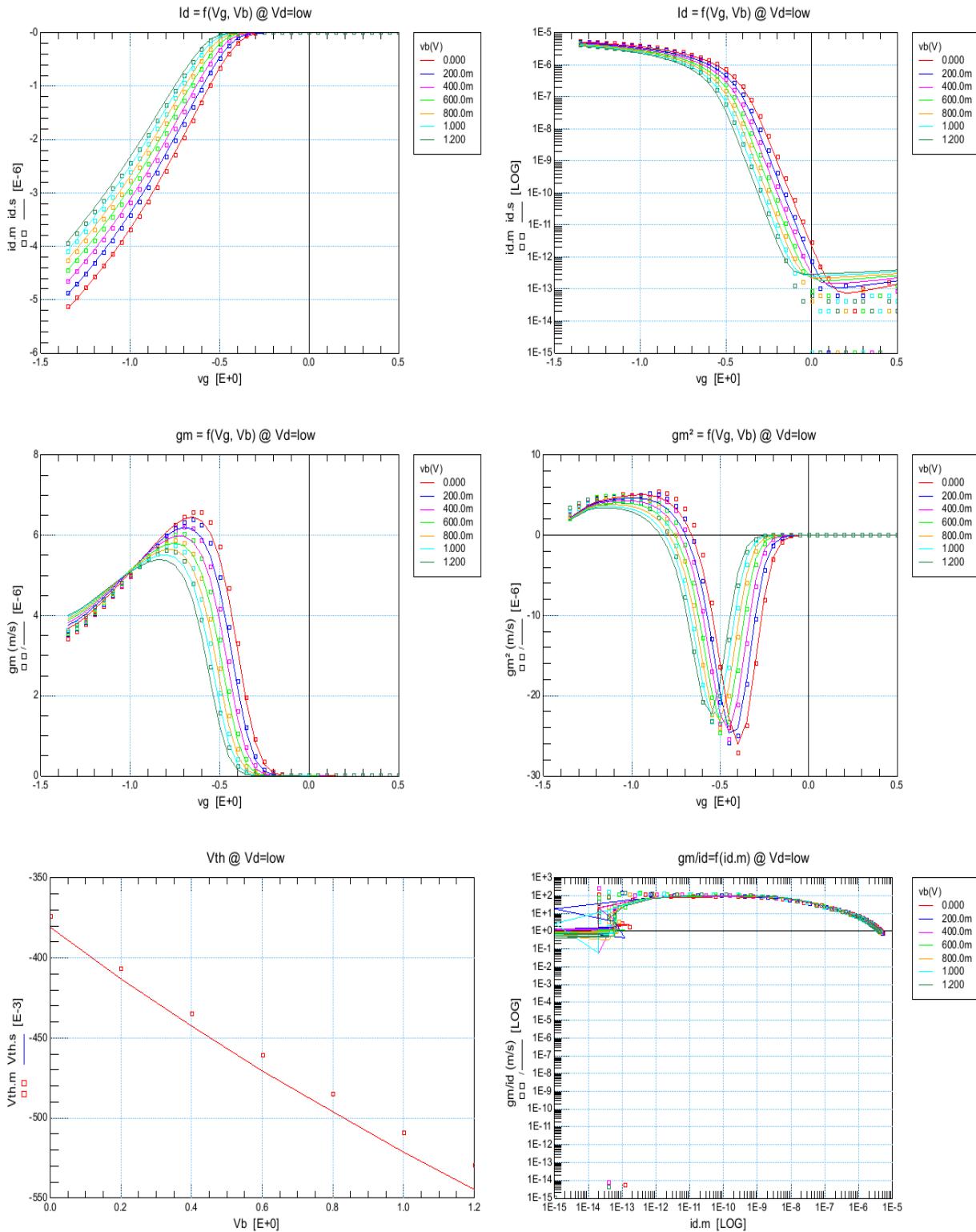


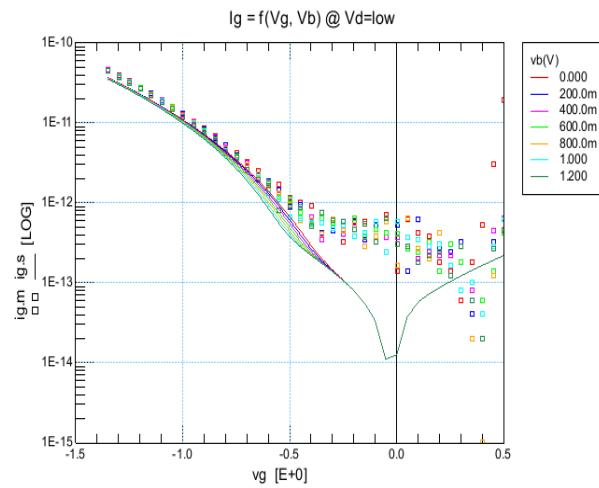
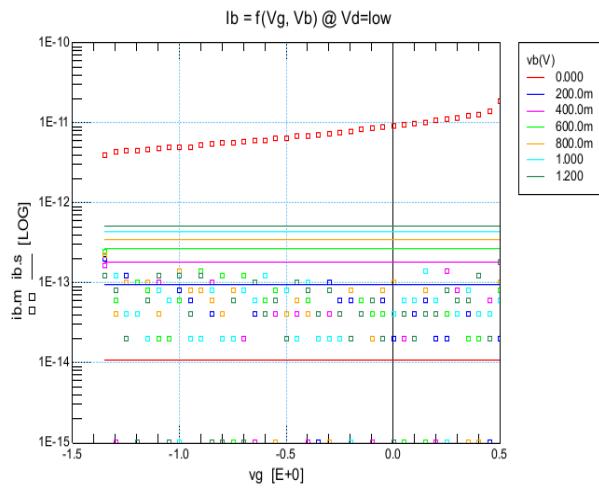
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



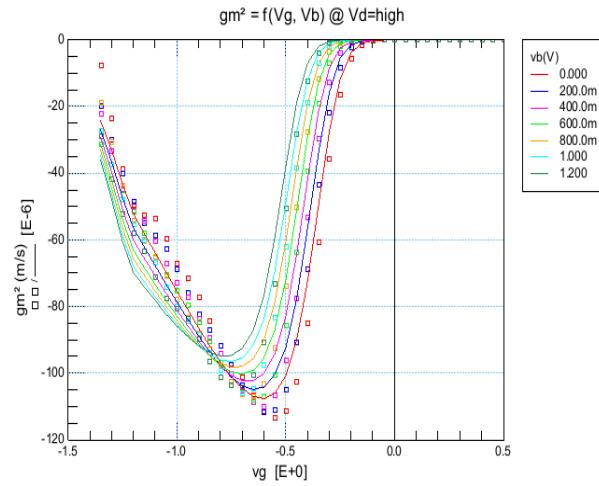
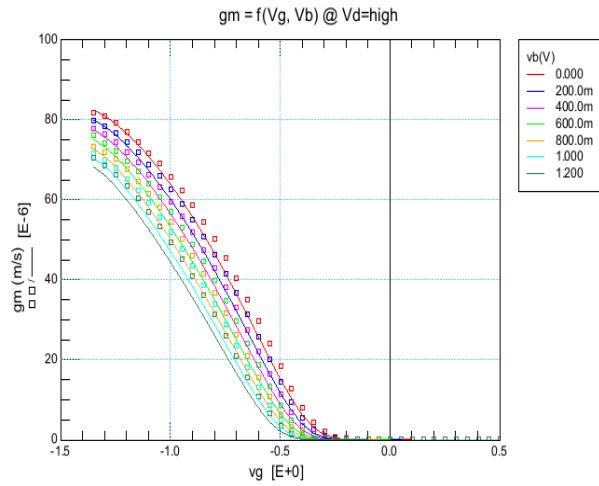
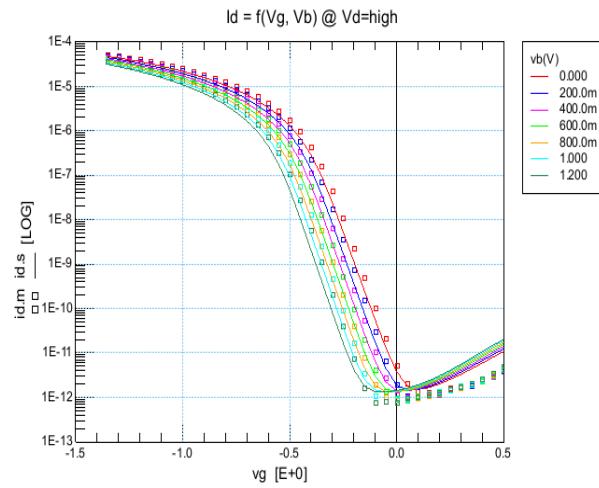
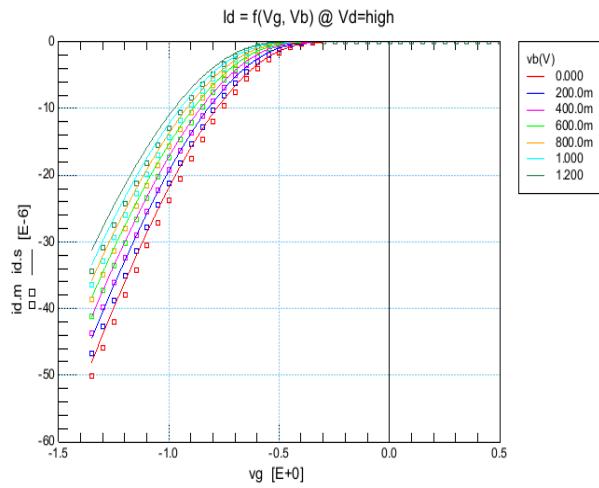
4.21 W0u6_L0u5_S551_4

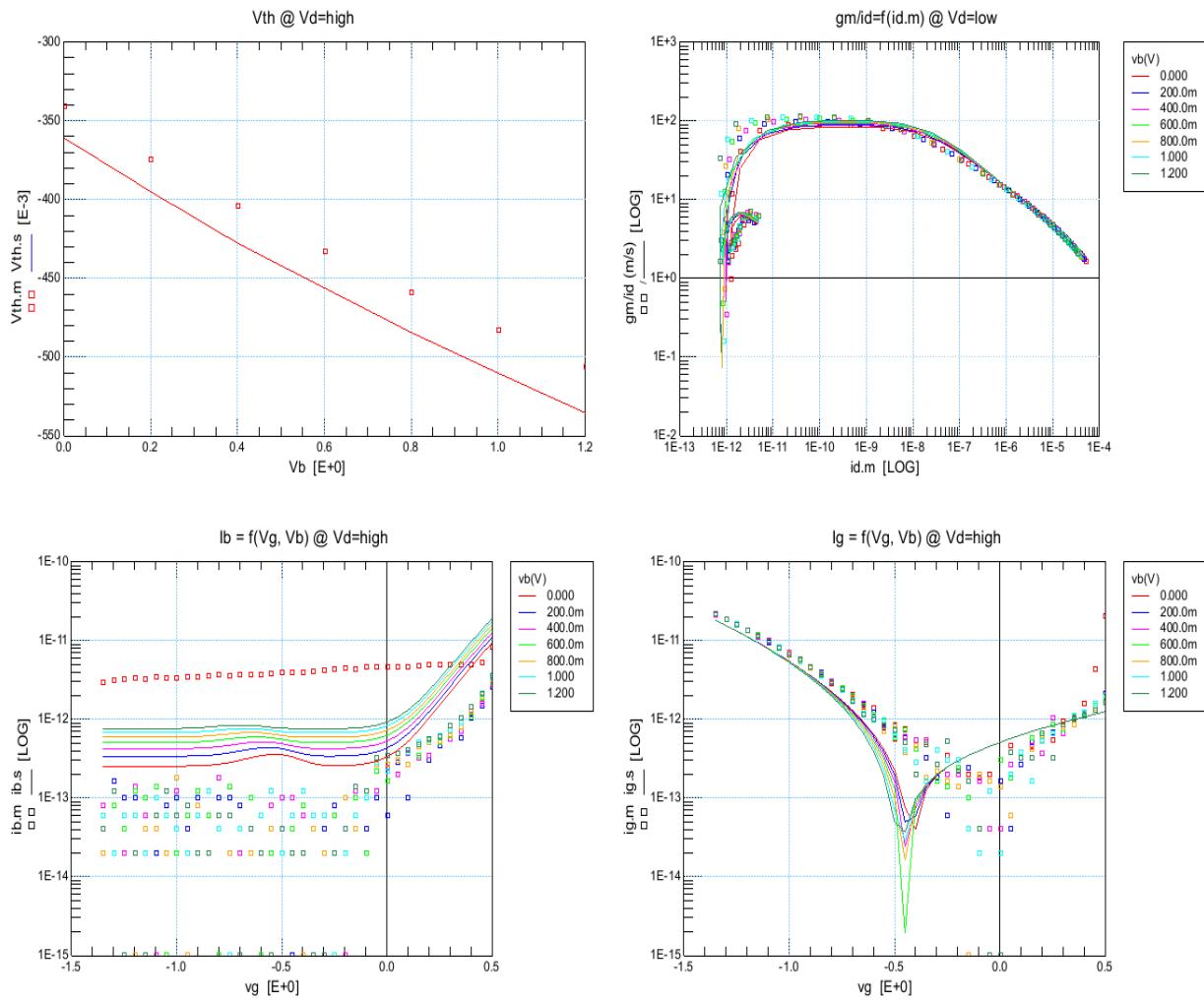
$idvg$, $Vd = -0.05V$, $T = 27^\circ C$



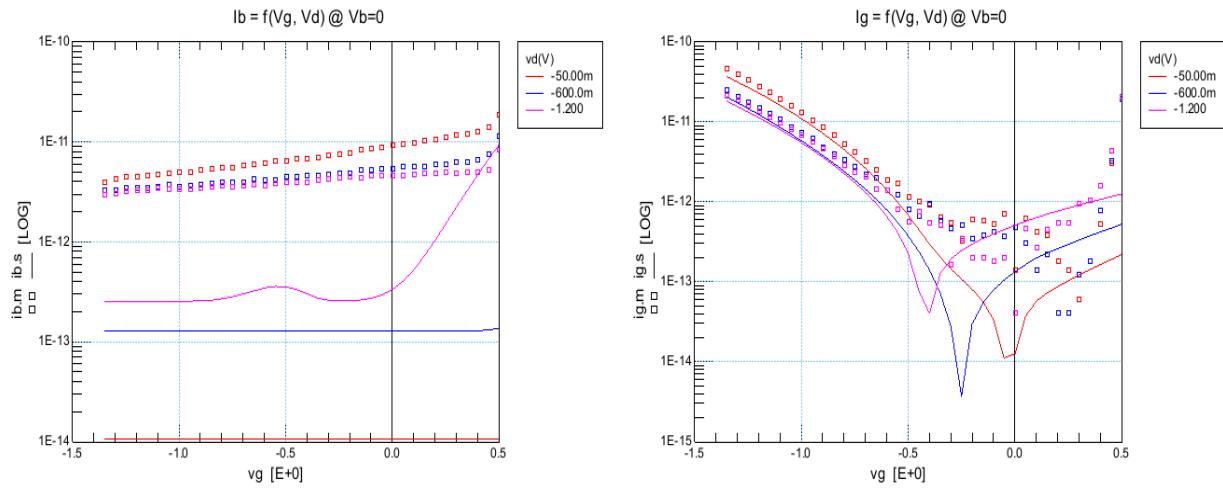


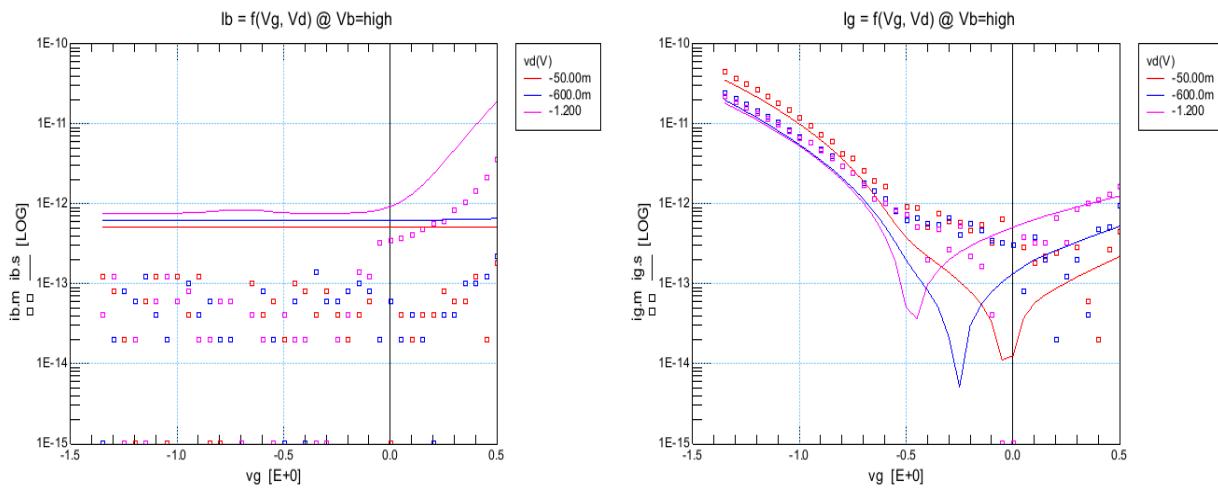
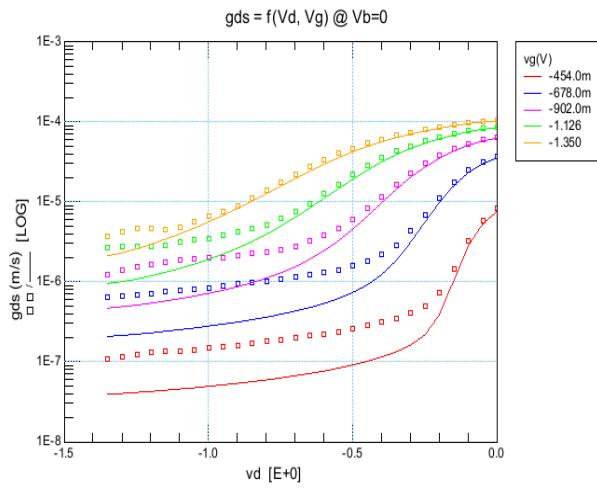
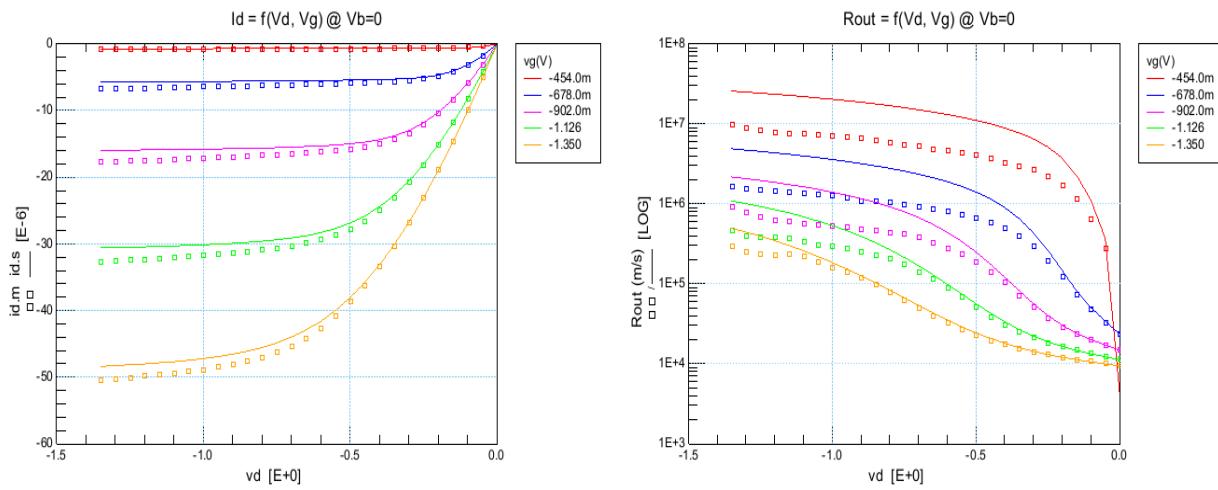
i_{dvg} , $V_d = -1.2V$, $T = 27^\circ C$

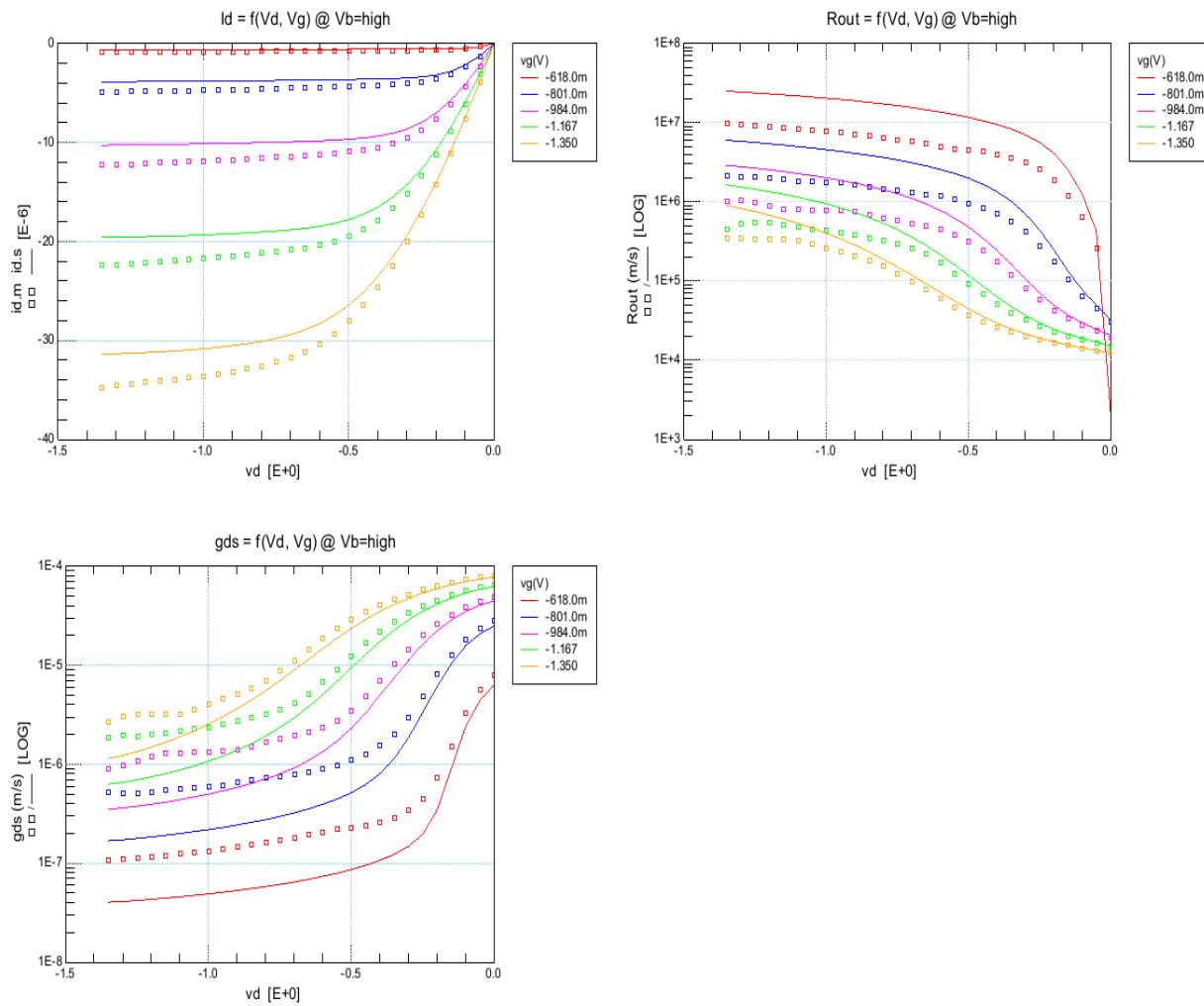
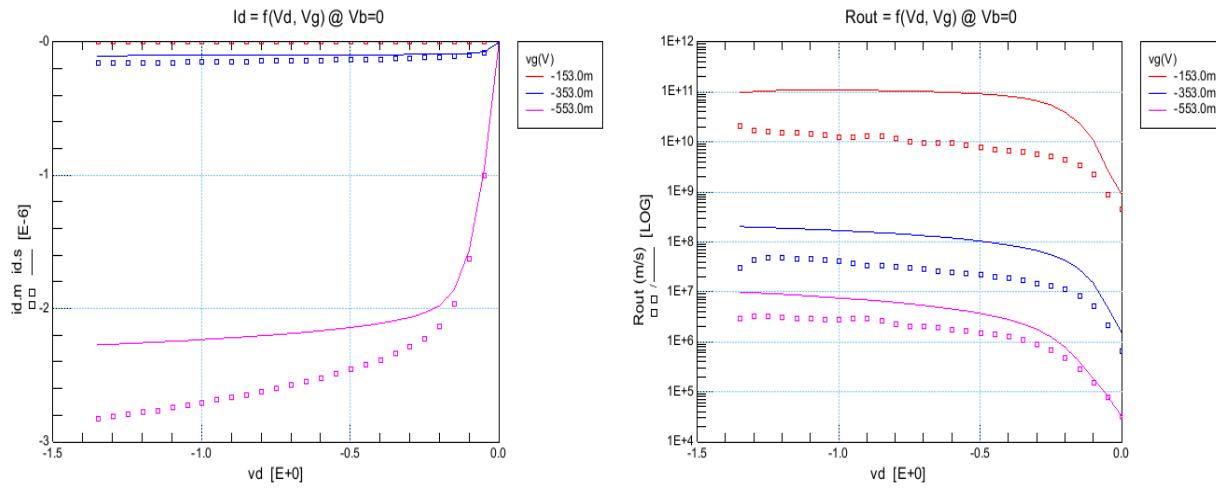


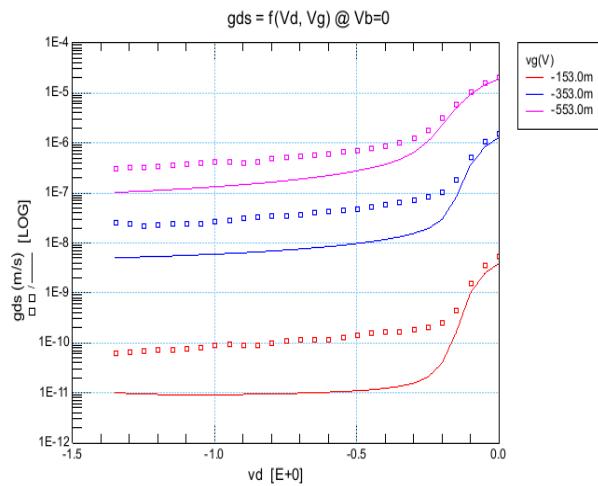


$I_d V_g, I_b, I_g, V_b = 0V, T = 27^\circ\text{C}$

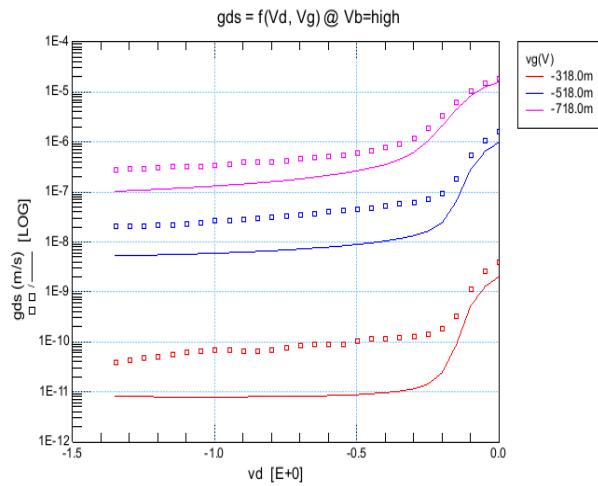
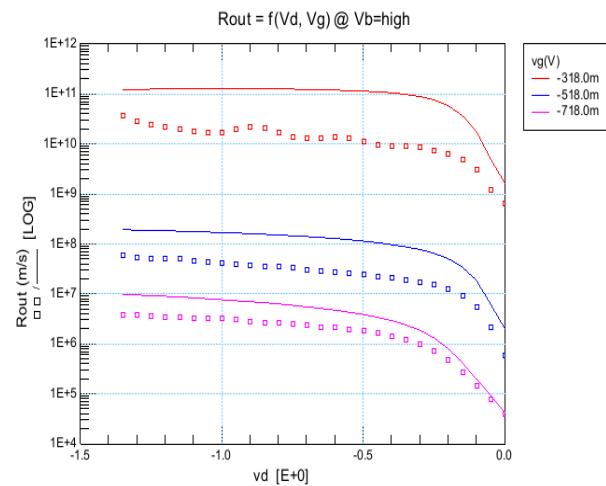
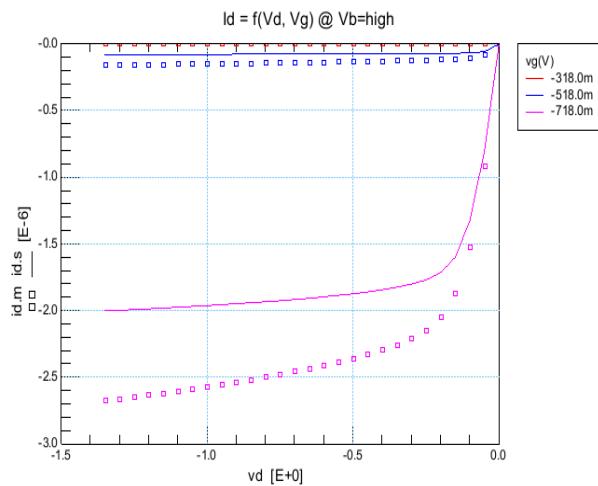


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C


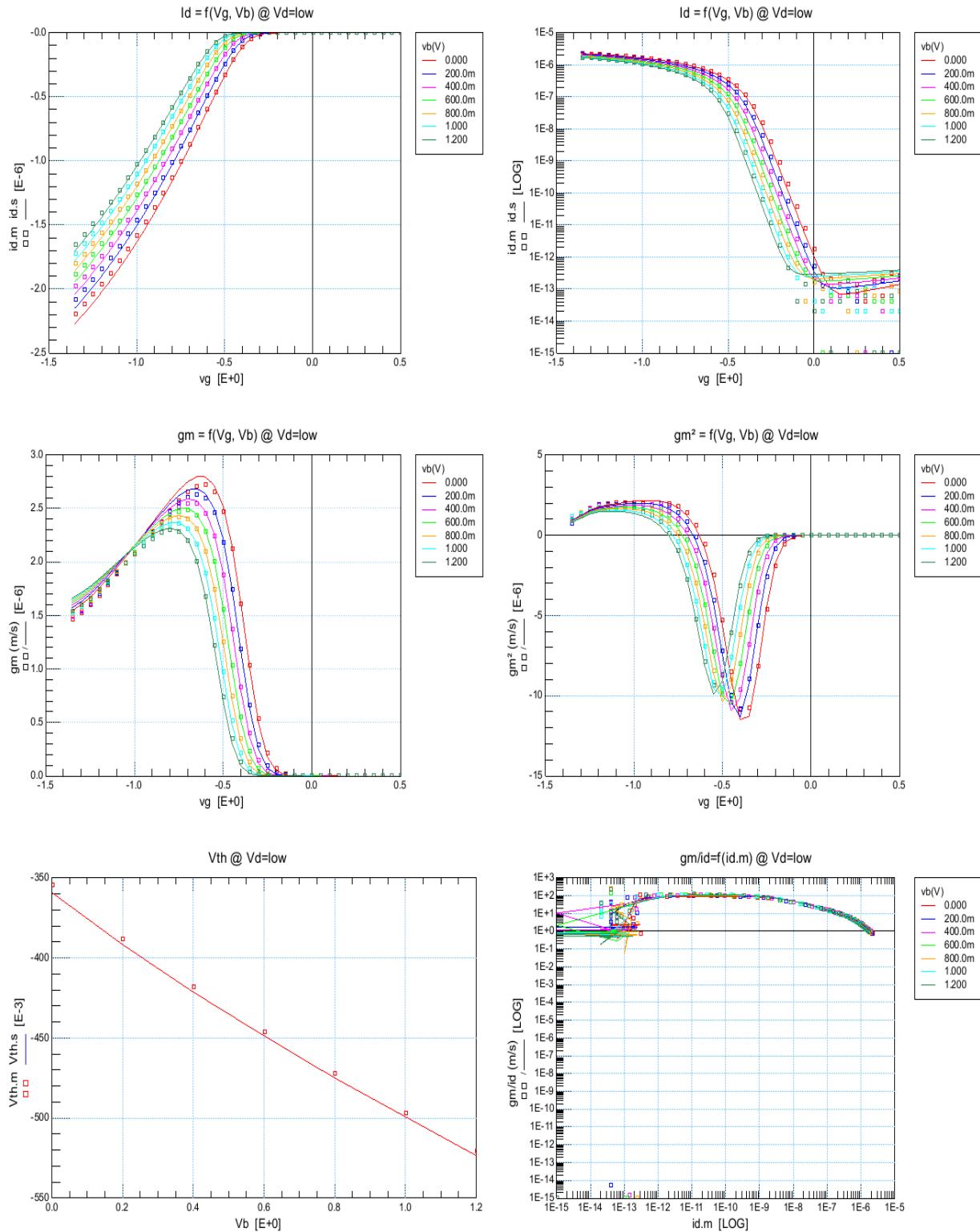


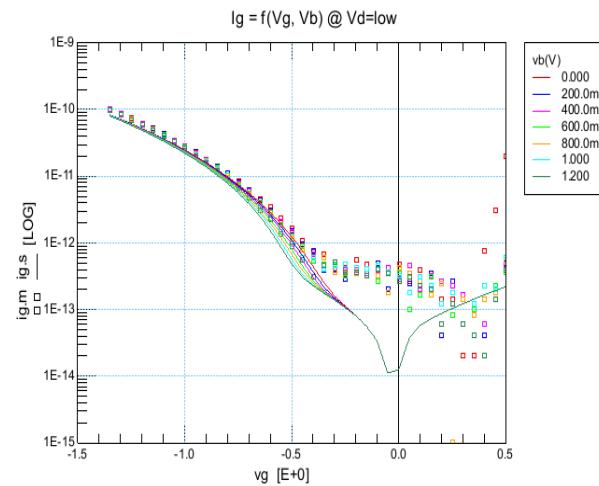
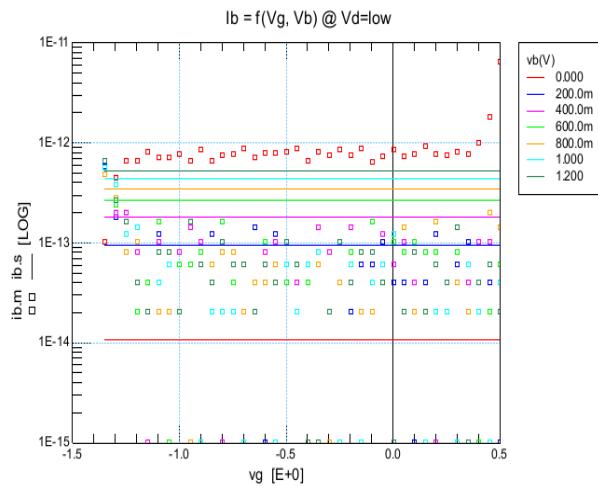
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



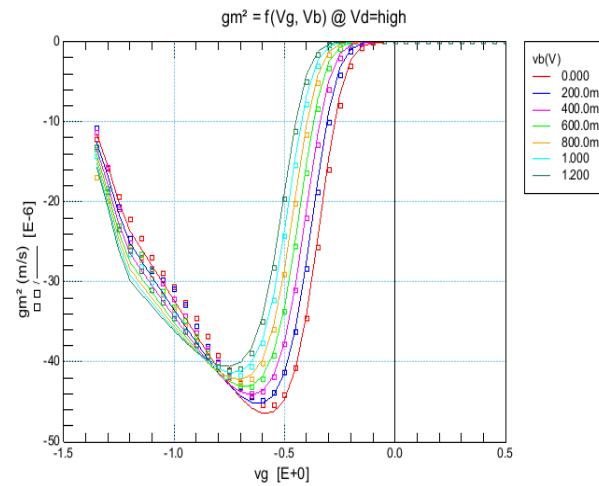
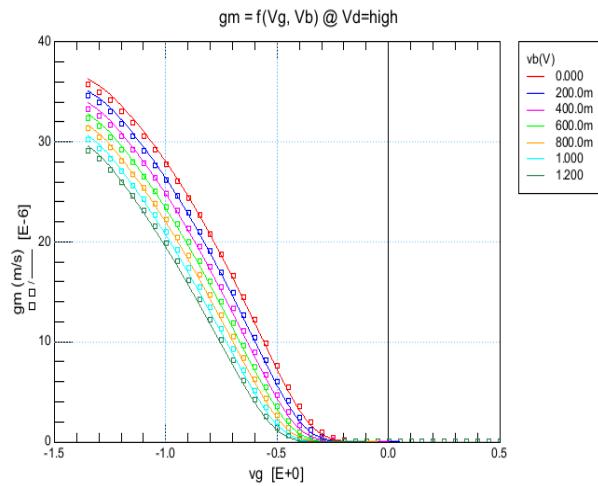
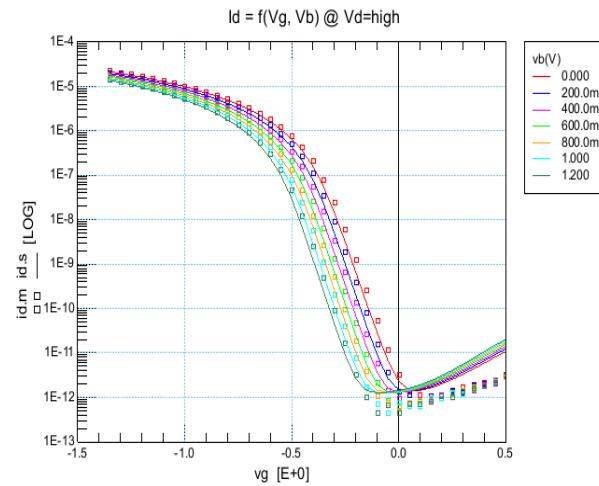
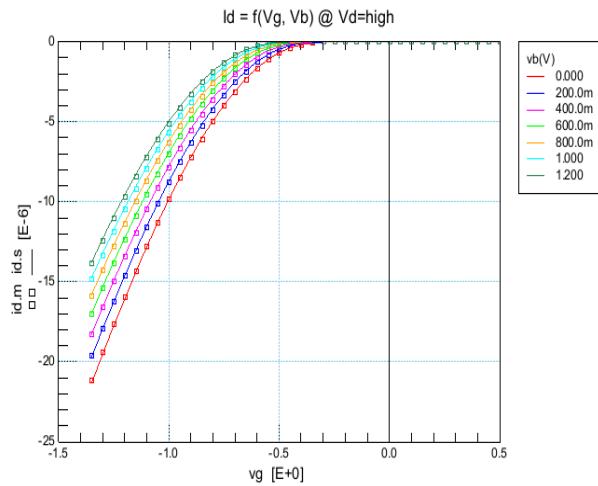
4.22 W0u6_L1u2_S551_5

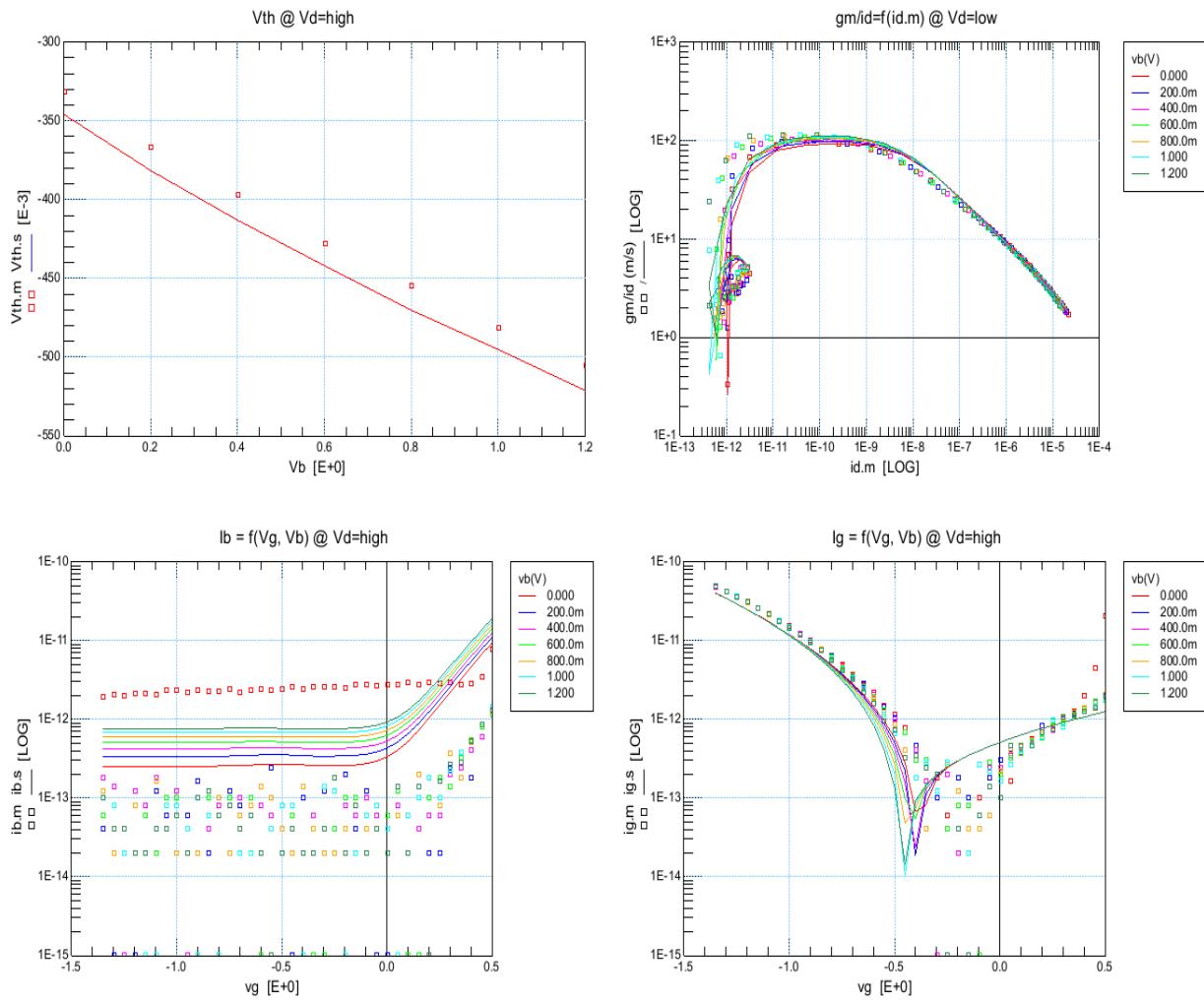
$idv_g, V_d = -0.05V, T = 27^\circ C$



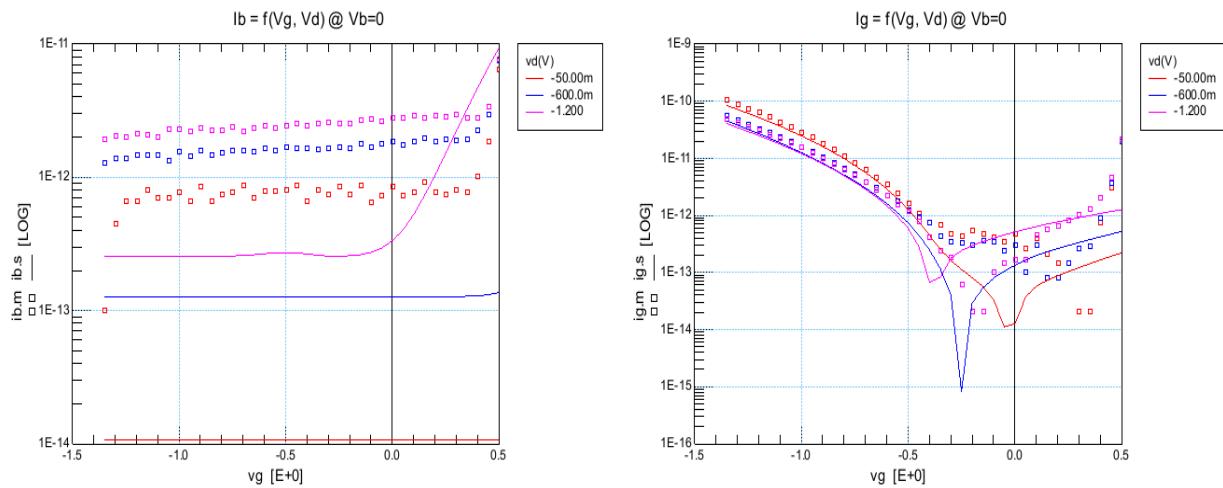


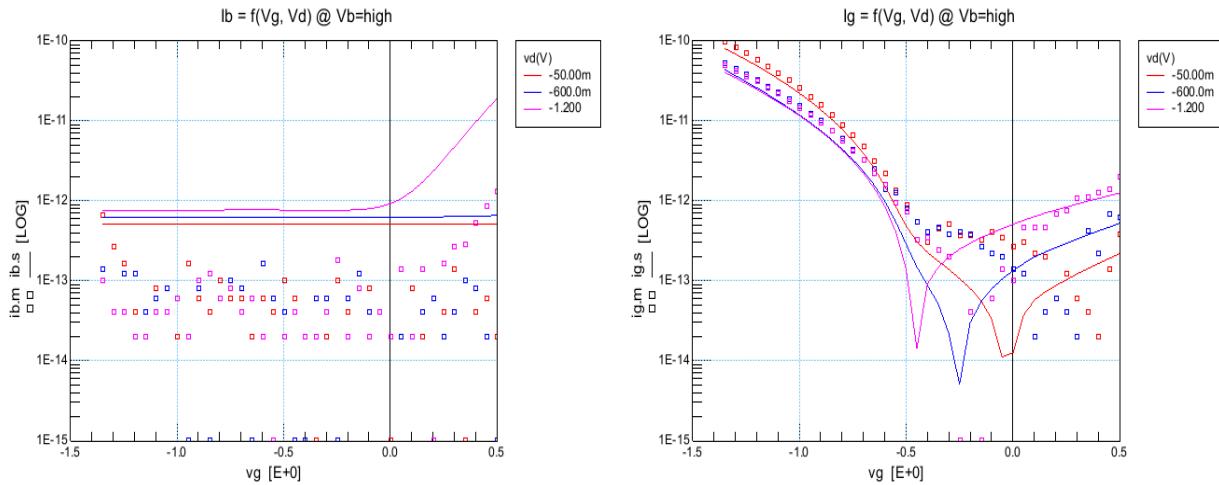
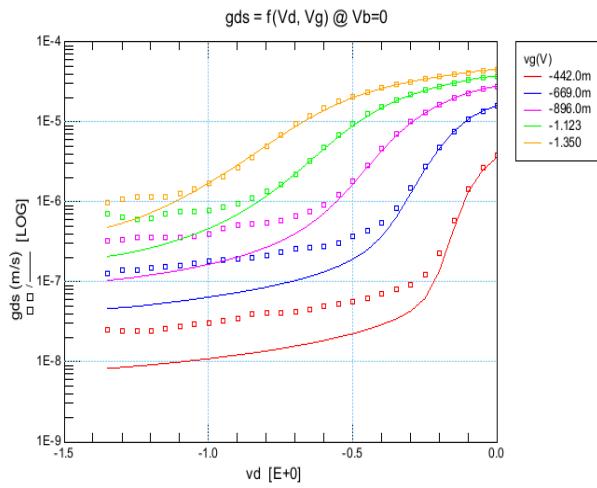
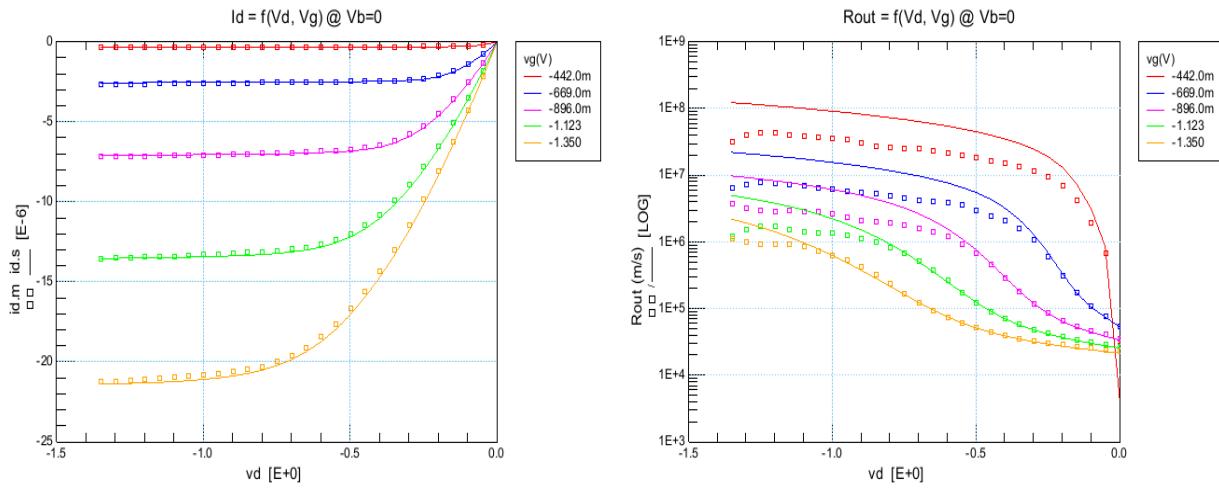
$i_{dvg}, V_d = -1.2V, T = 27^\circ C$

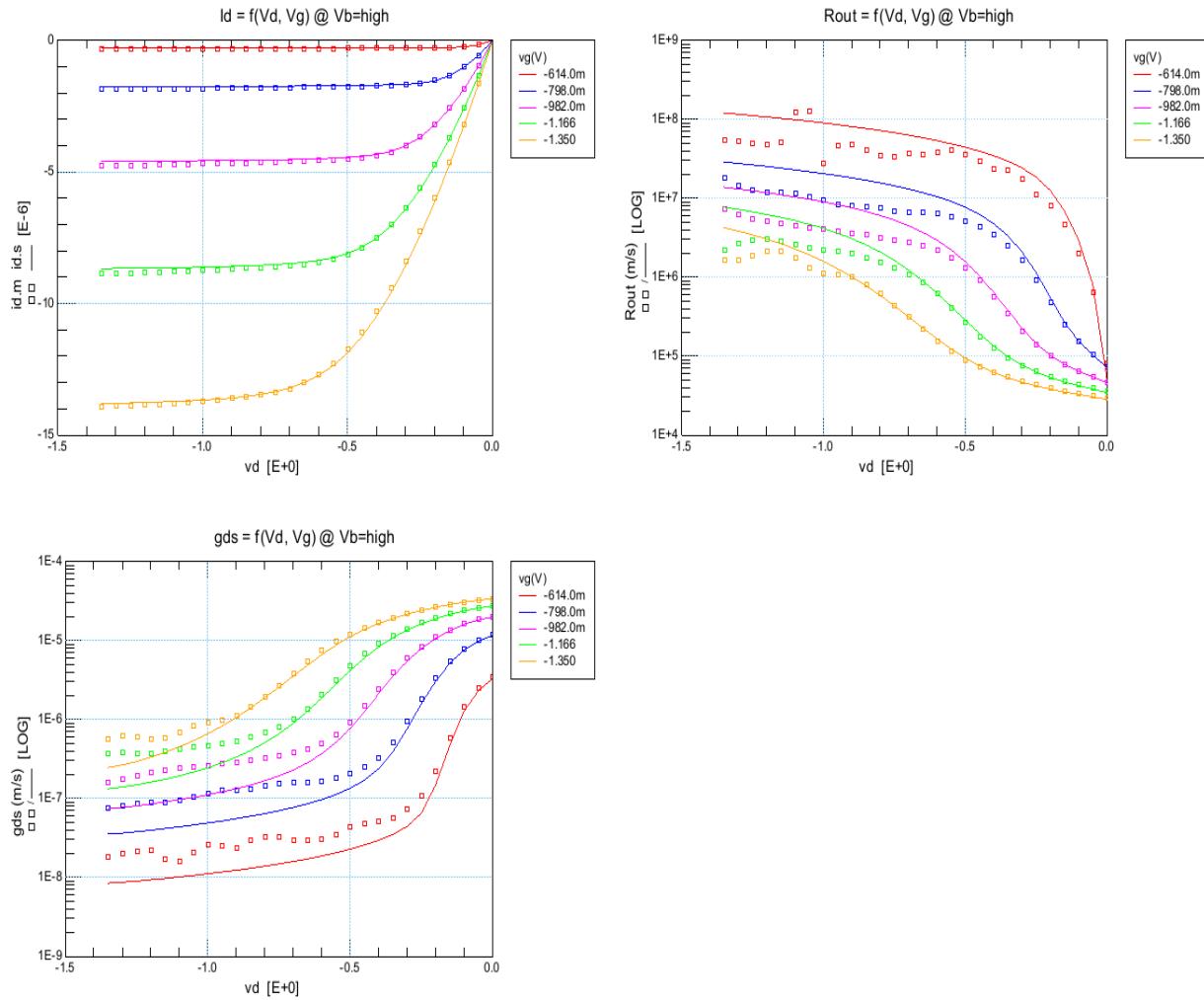
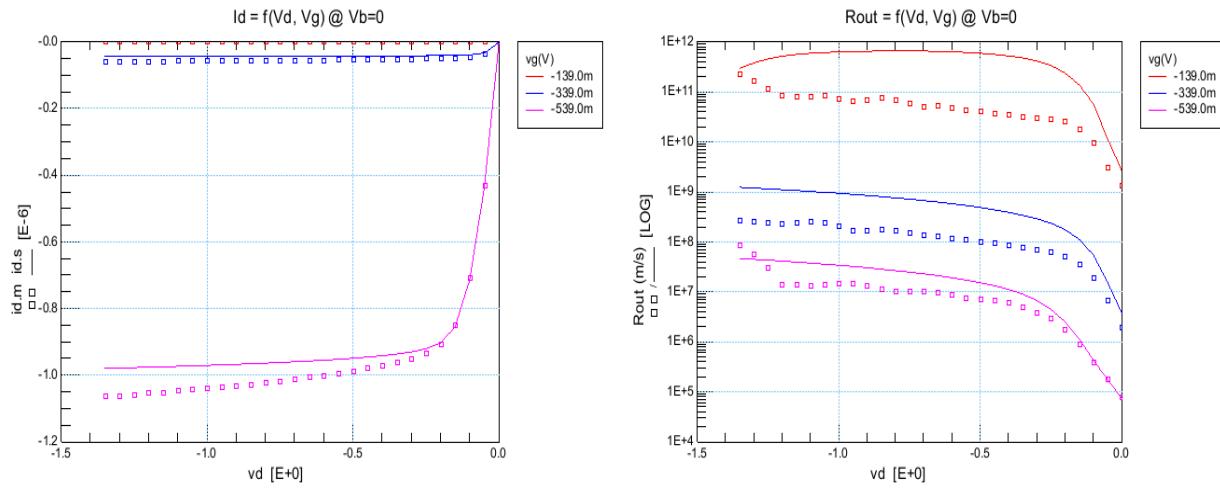


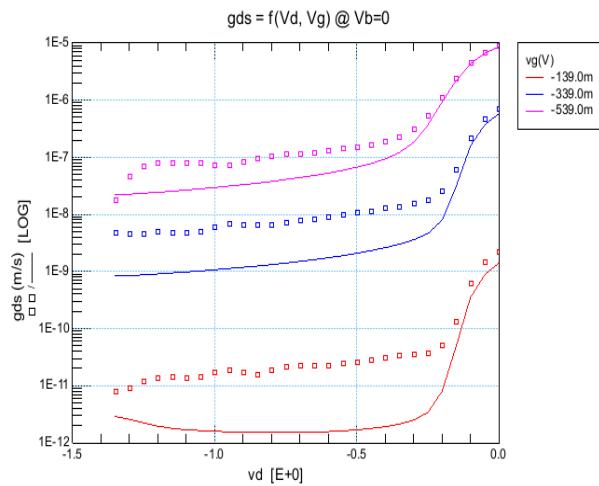


$idvg, Ib, Ig, Vb = 0V, T = 27^\circ C$

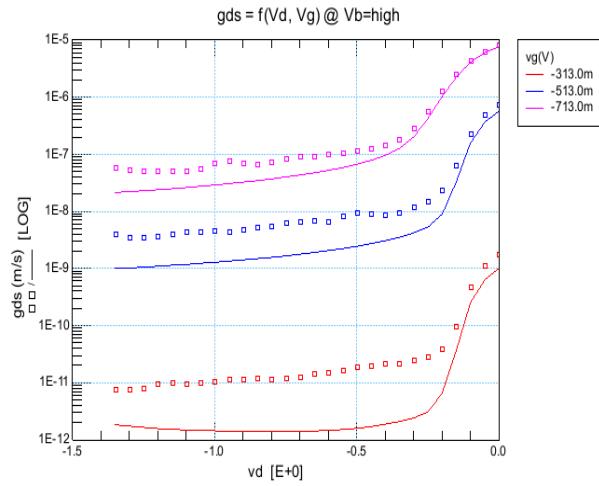
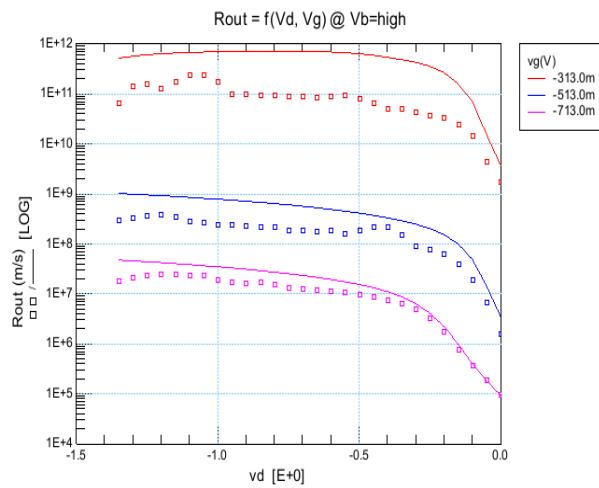
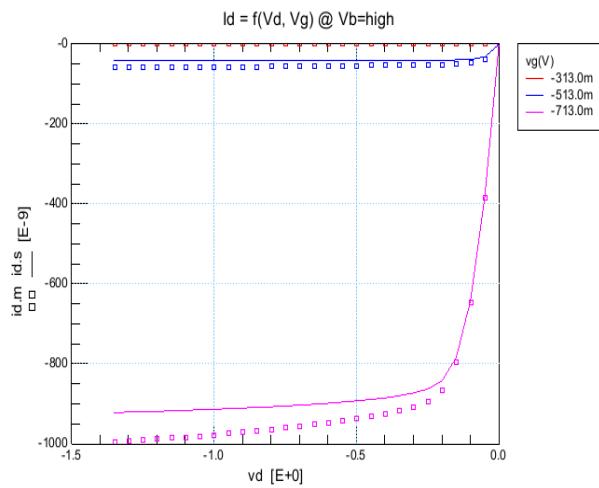


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C


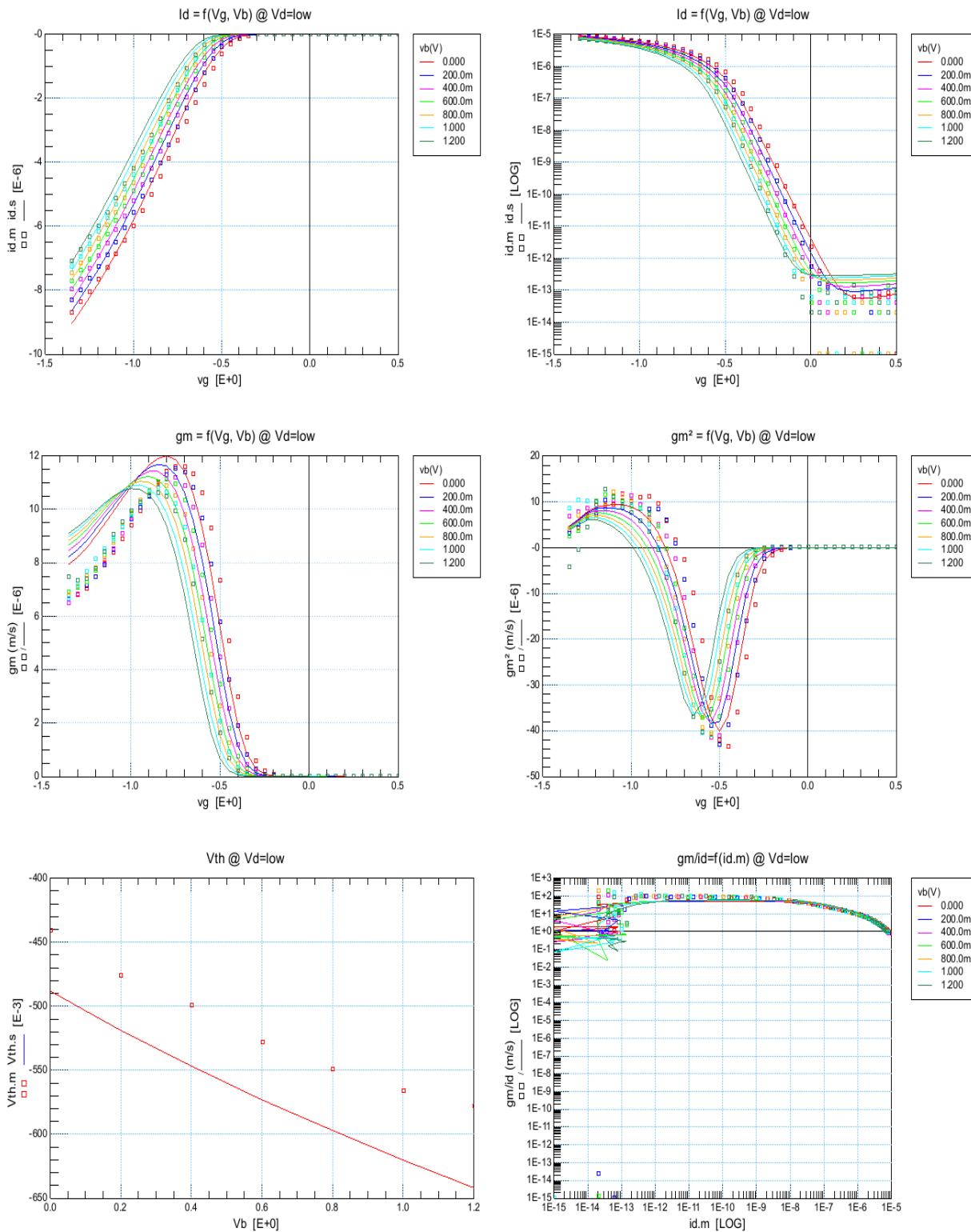


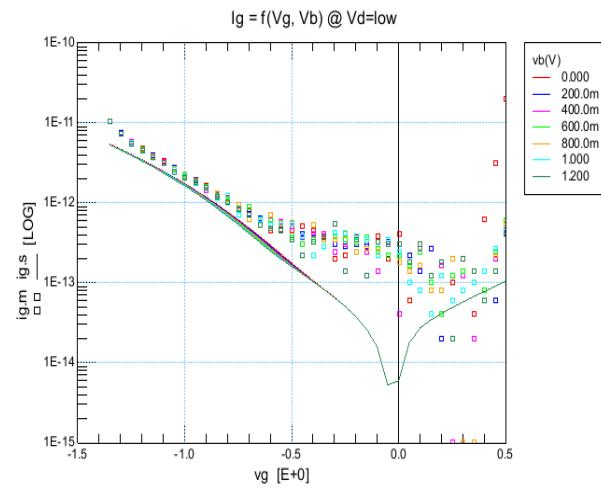
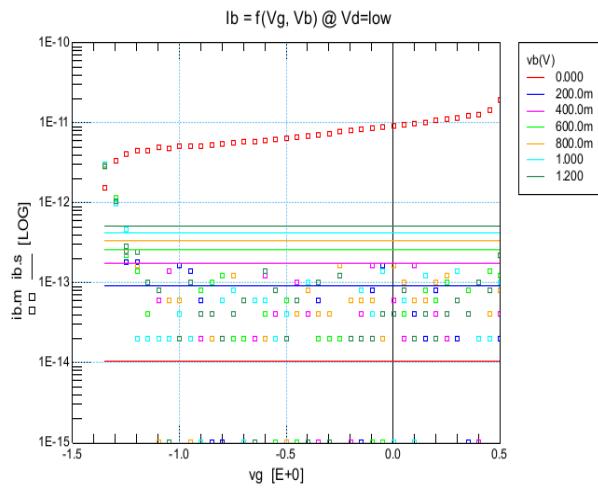
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



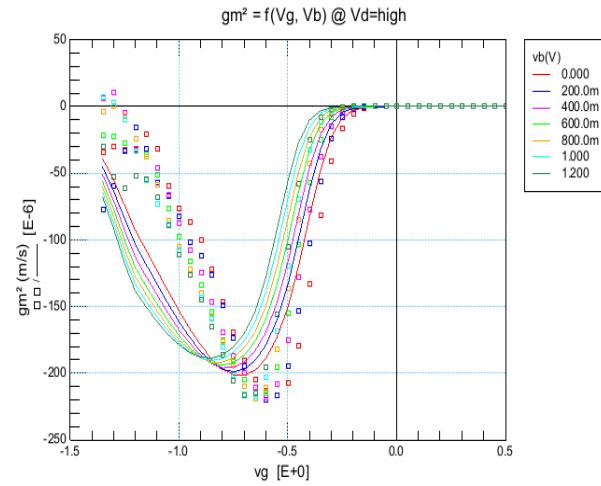
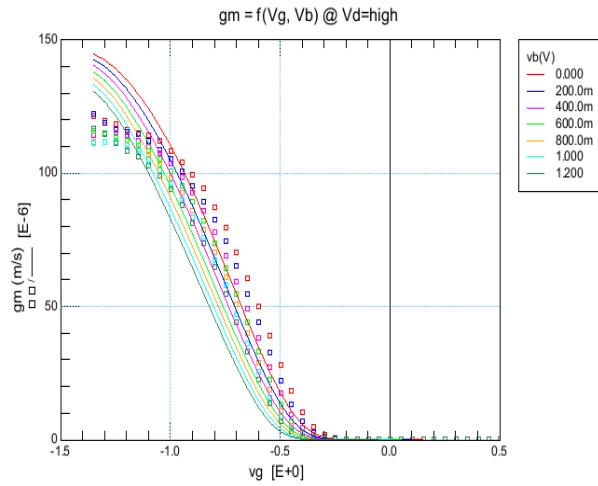
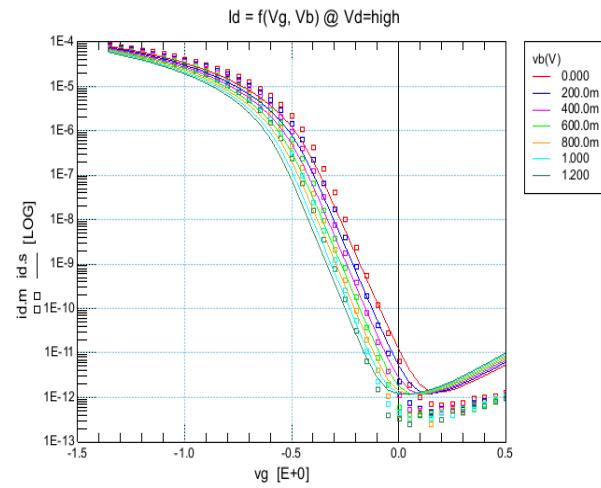
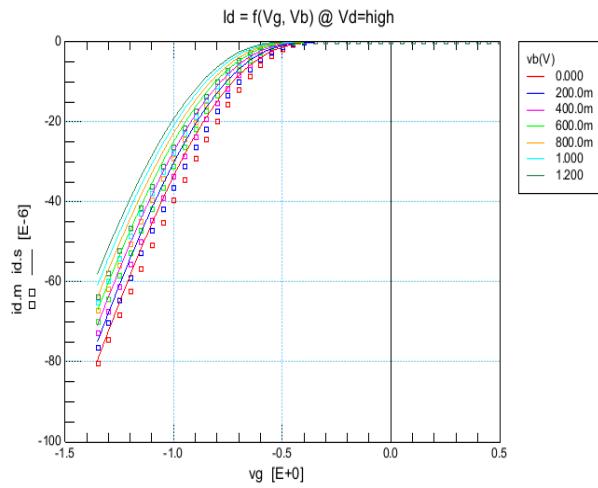
4.23 W0u3_L0u14_S552_3

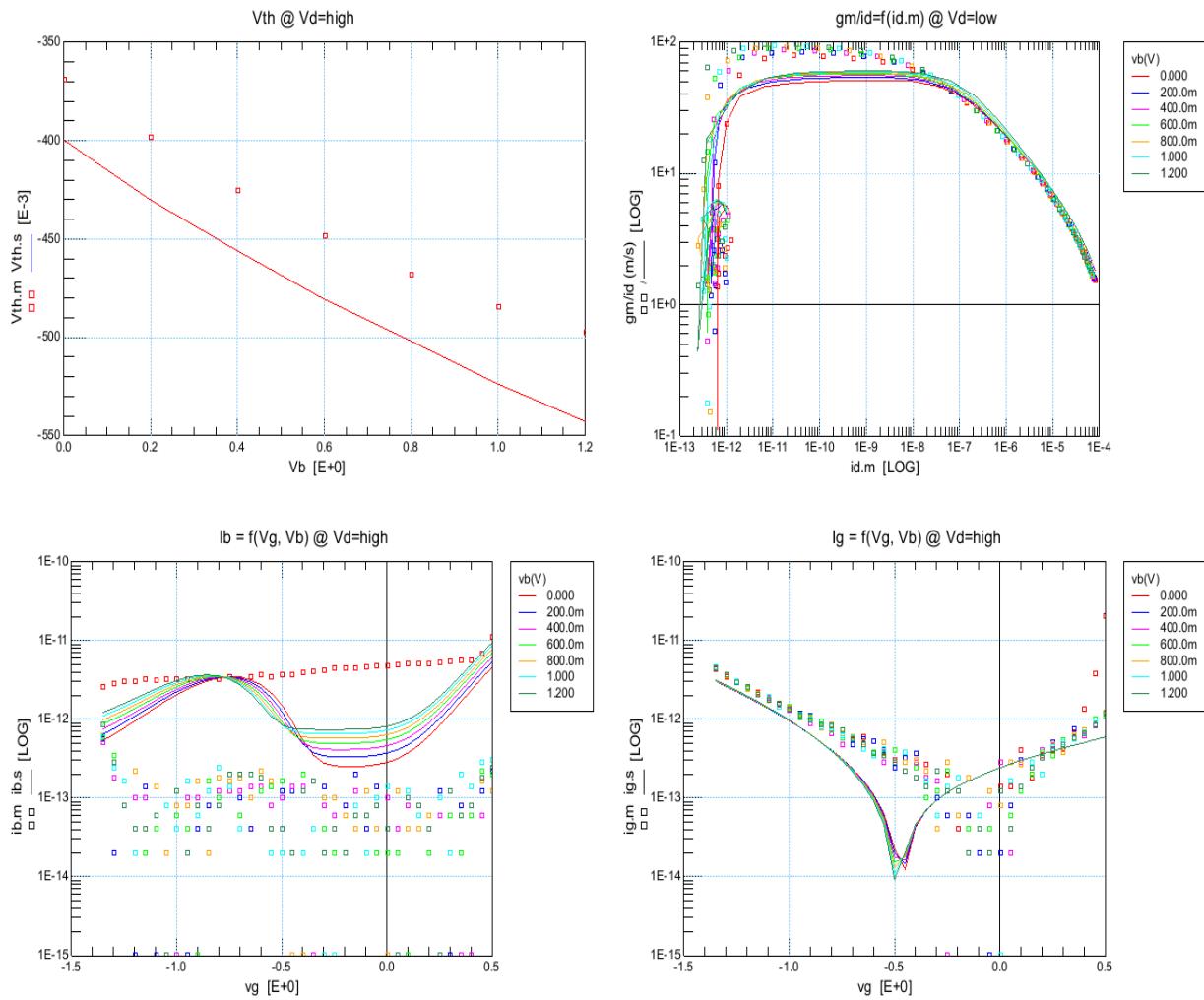
$idv_g, V_d = -0.05V, T = 27^\circ C$



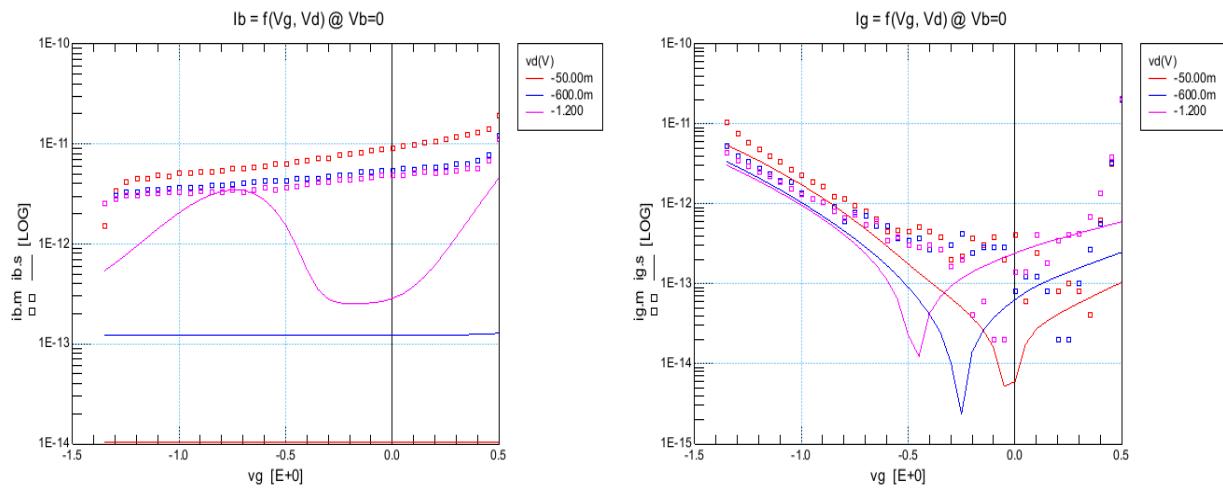


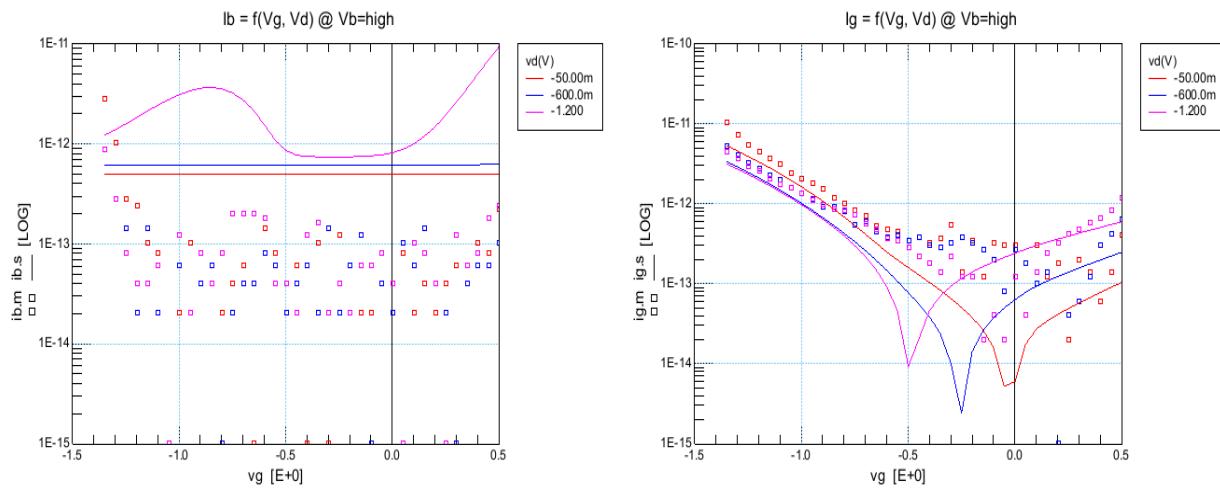
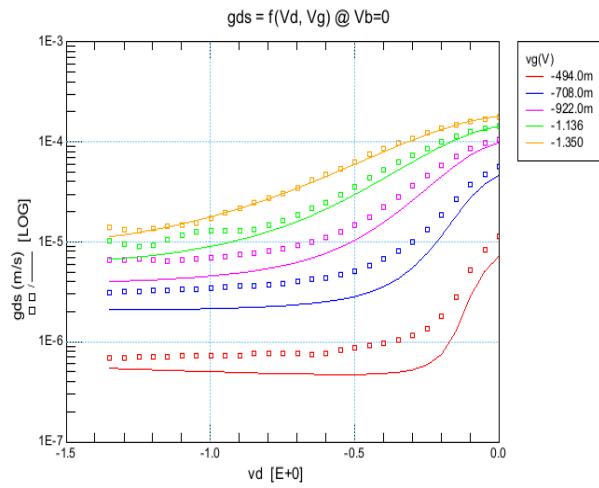
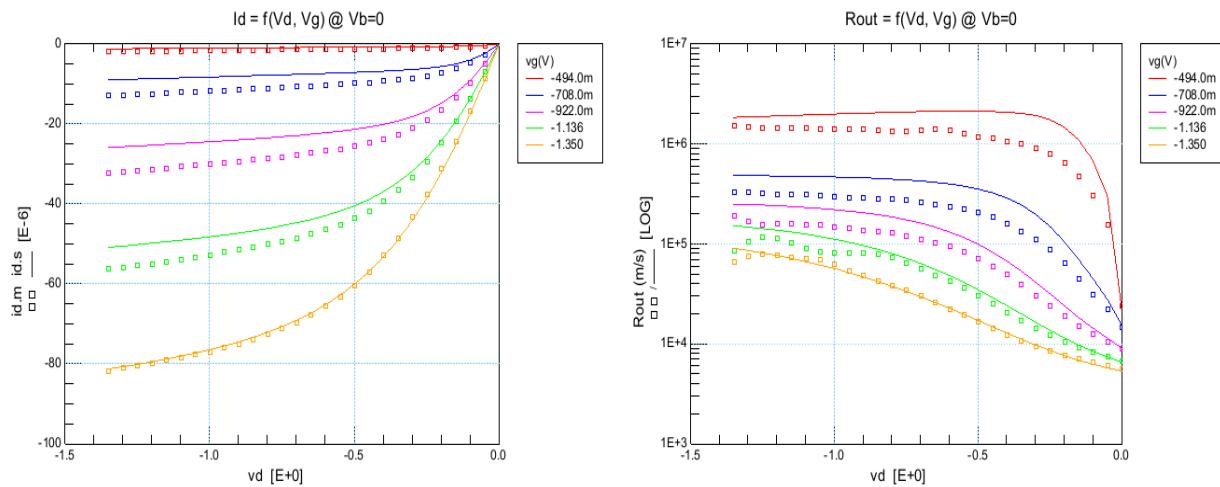
$i_{dvg}, V_d = -1.2V, T = 27^\circ\text{C}$

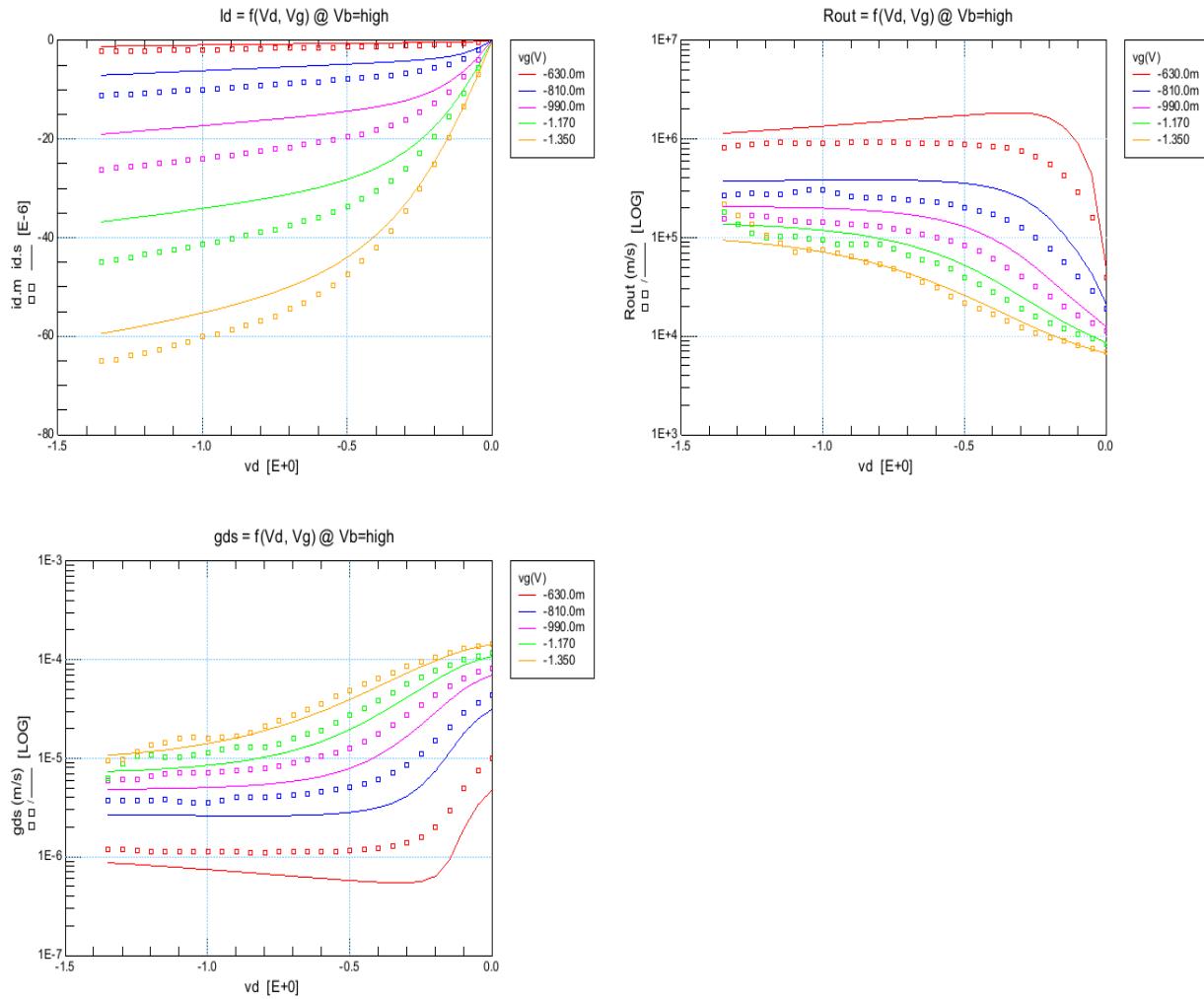
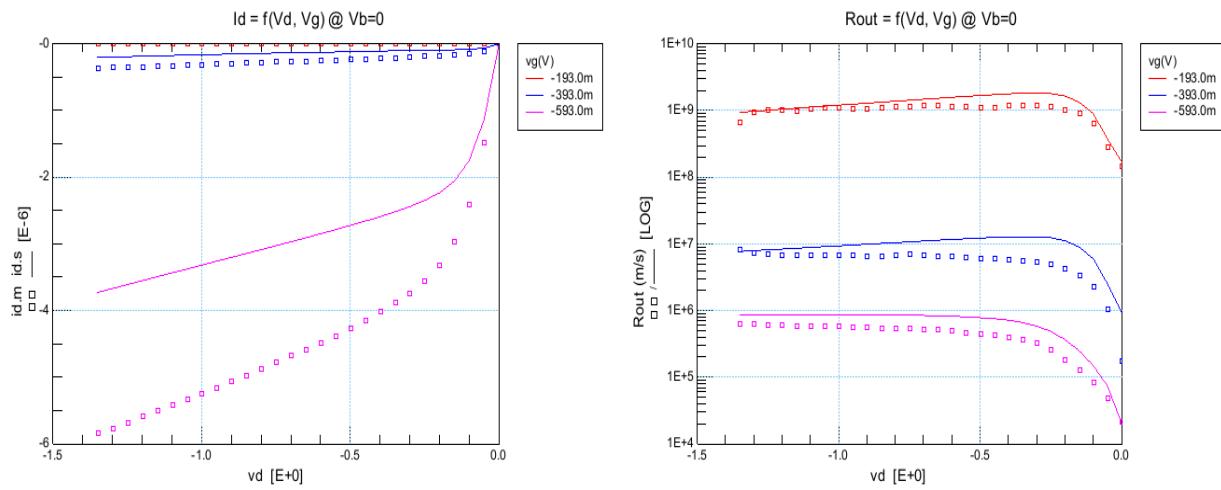


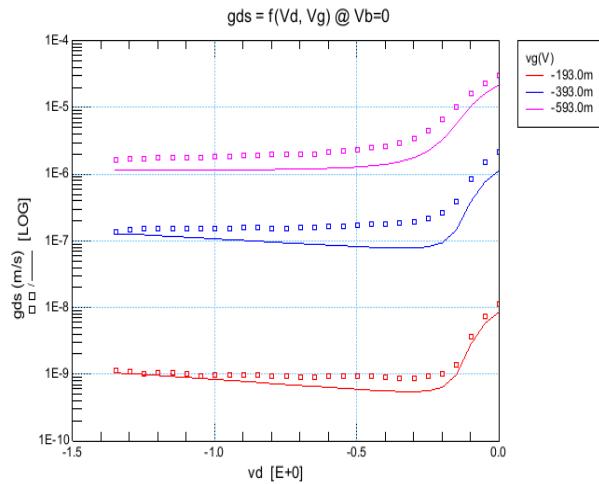


$idvg, I_b, I_g, V_b = 0V, T = 27^\circ C$

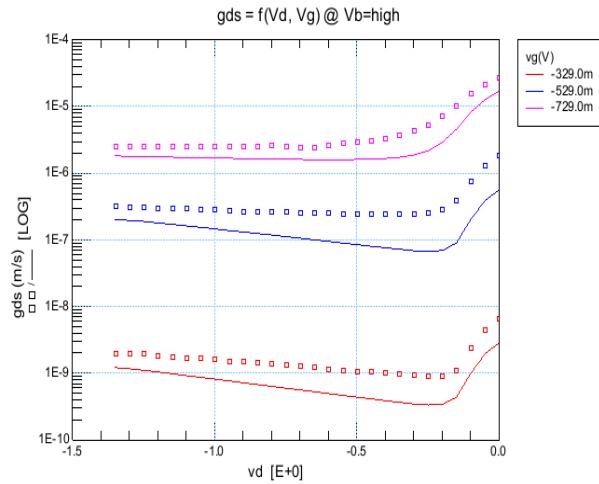
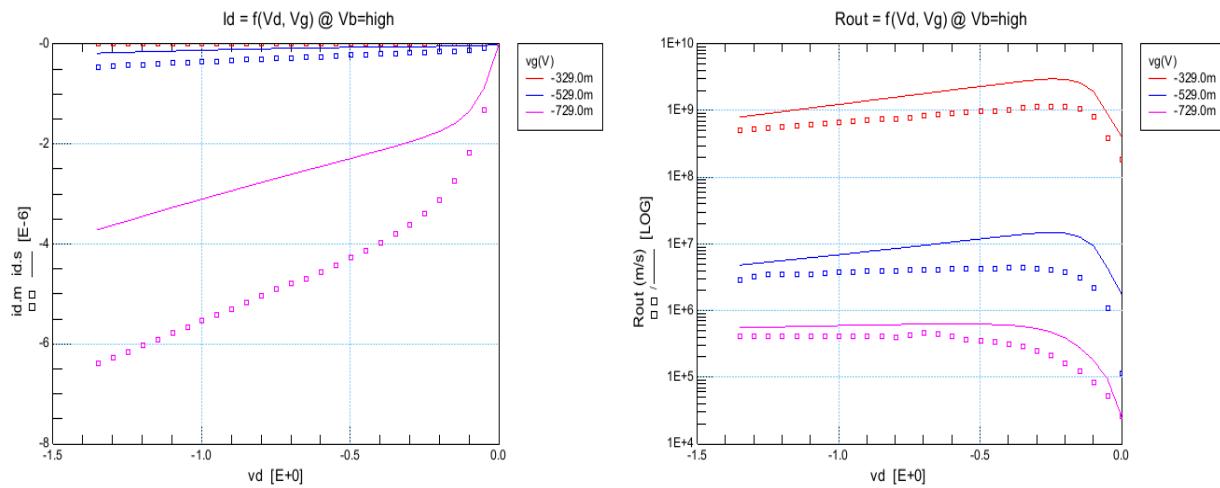


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C**idvd_vth, Vb = 0V, T = 27°C**

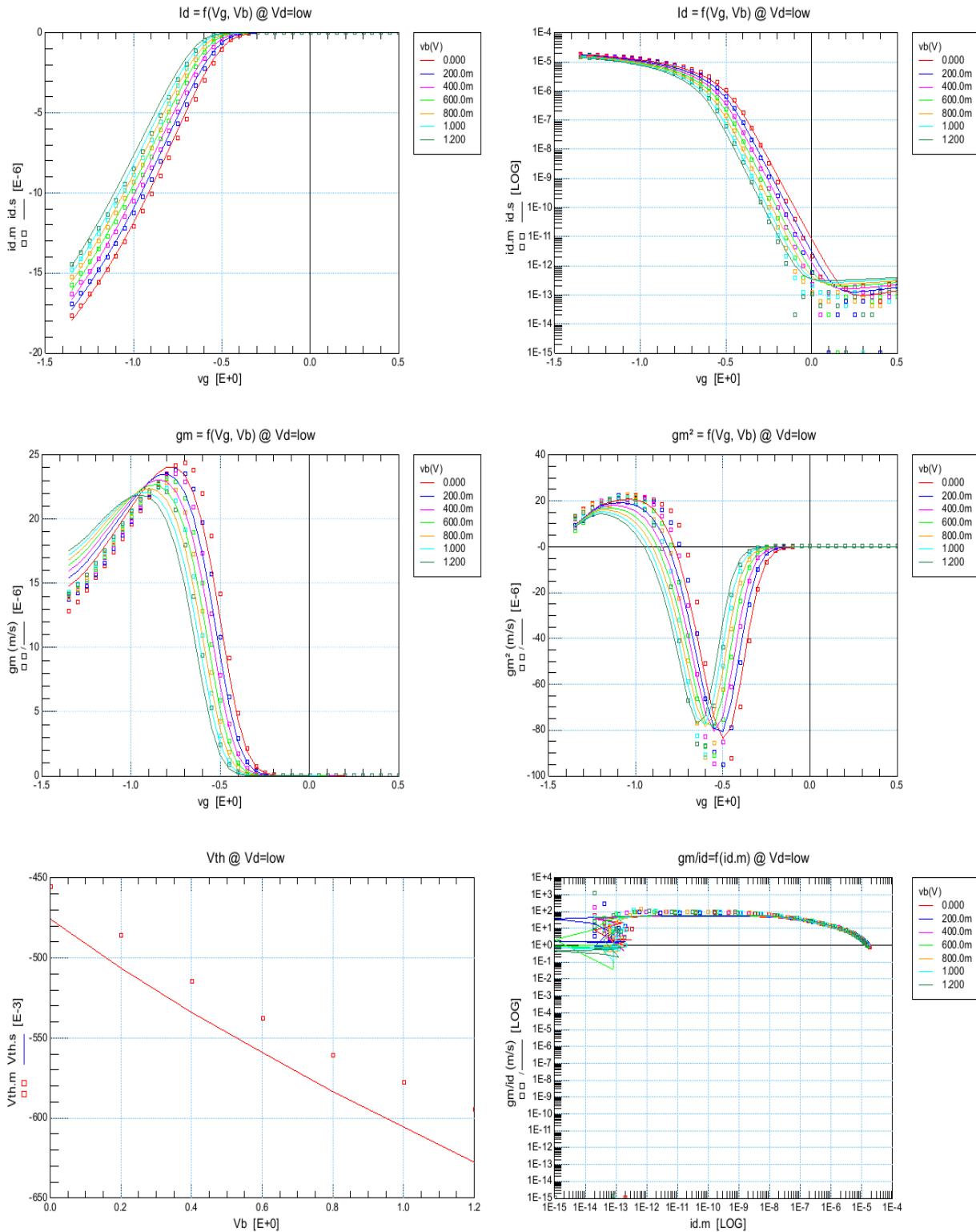


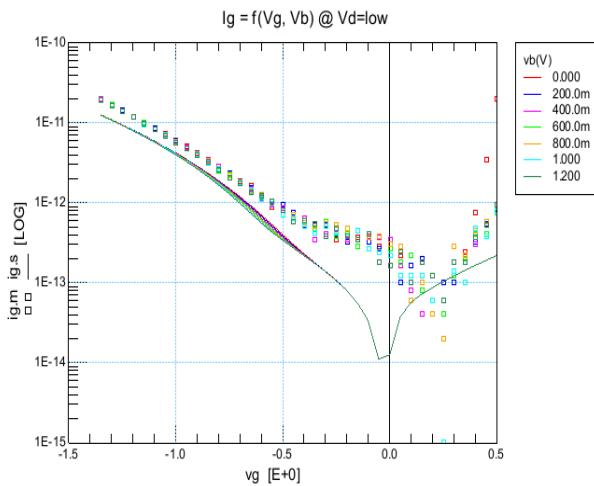
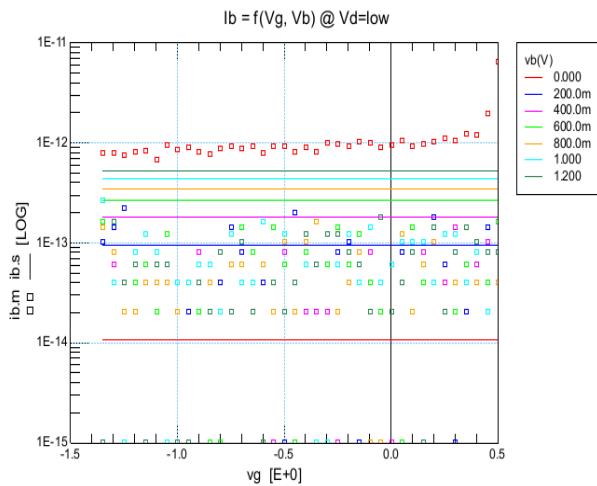
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



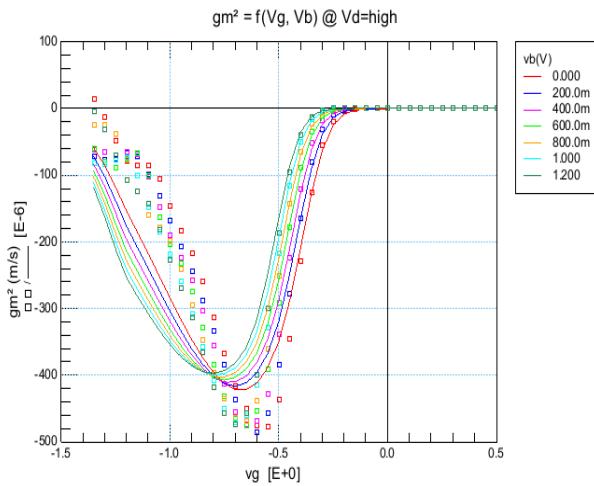
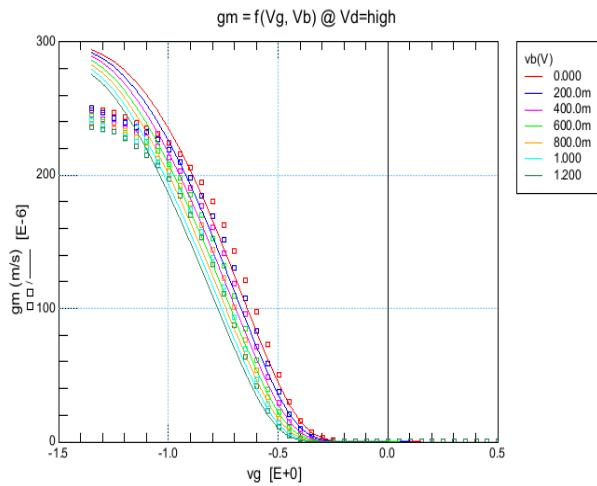
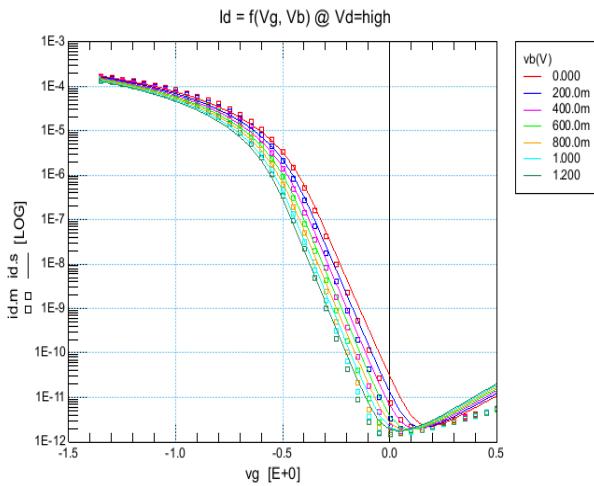
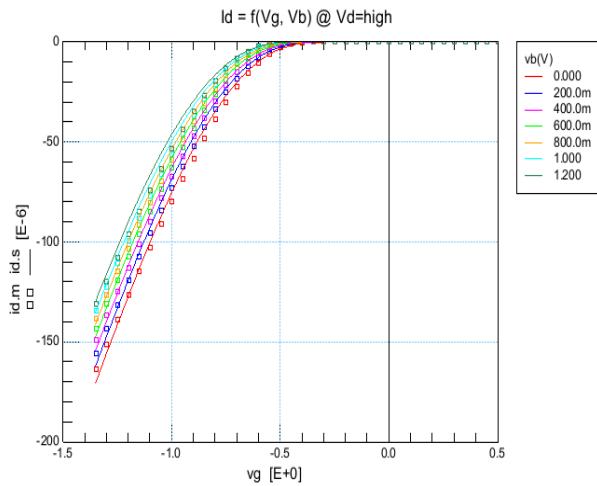
4.24 W0u6_L0u13_S551_2

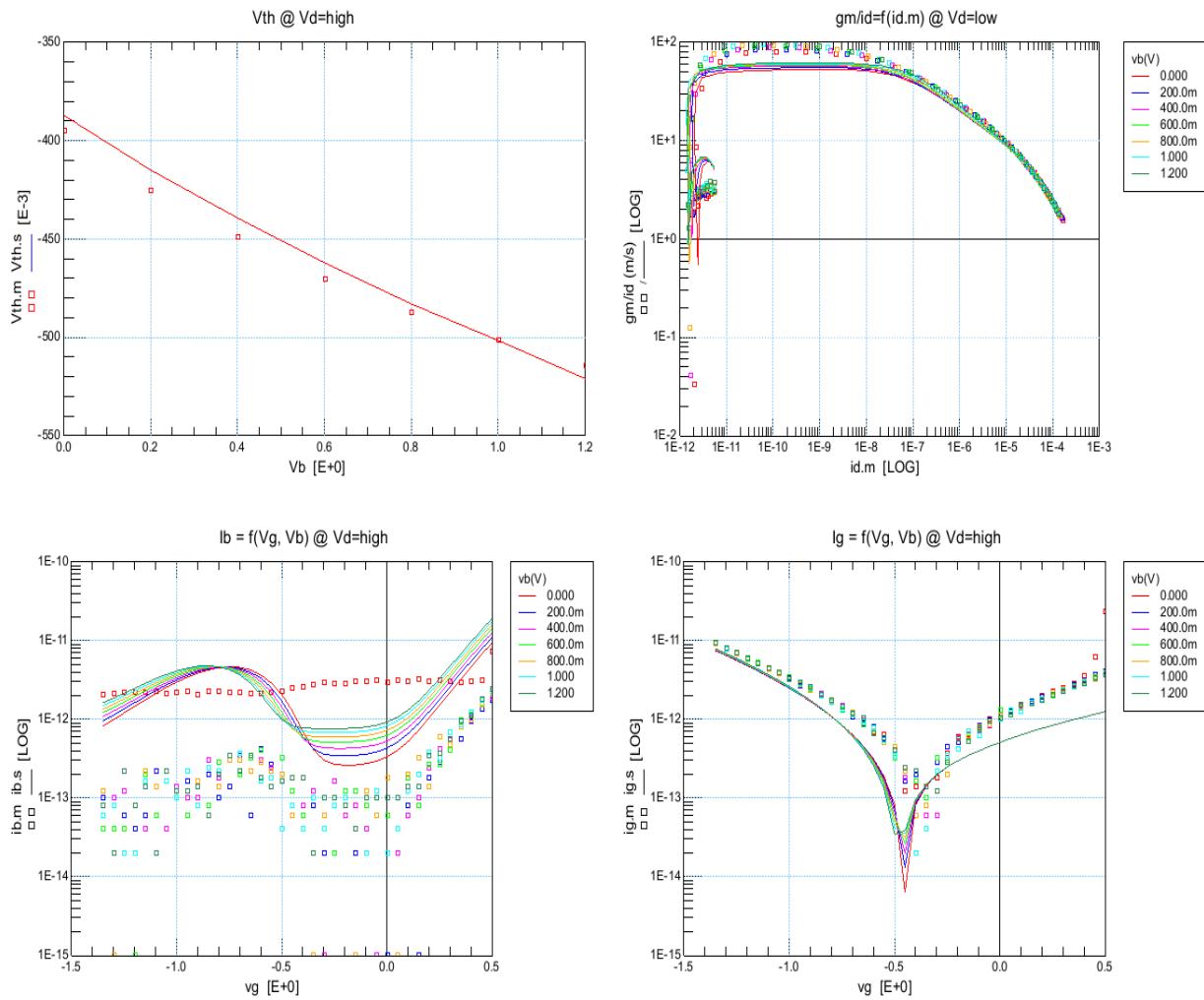
$idv_g, V_d = -0.05V, T = 27^\circ C$



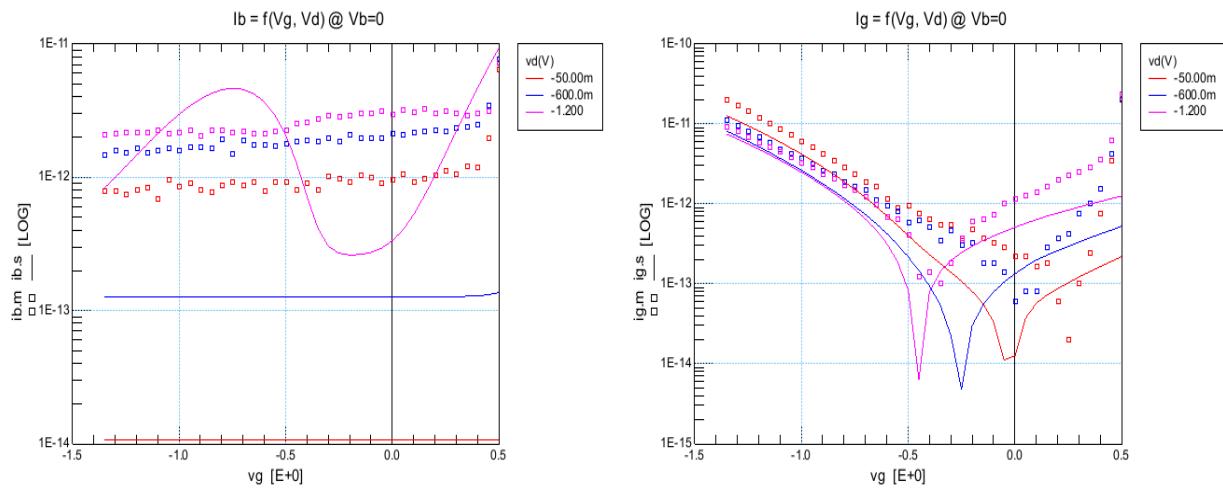


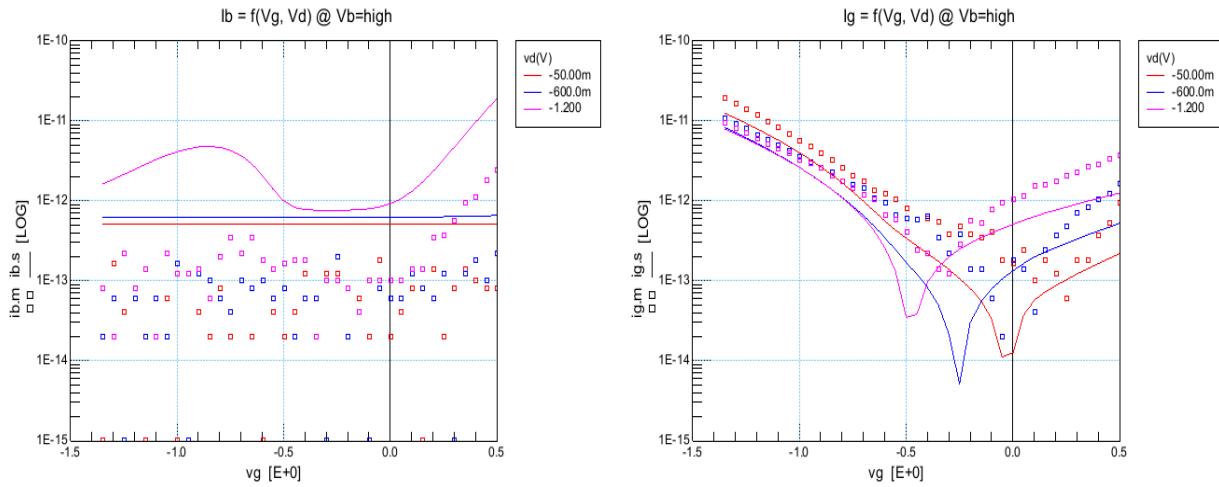
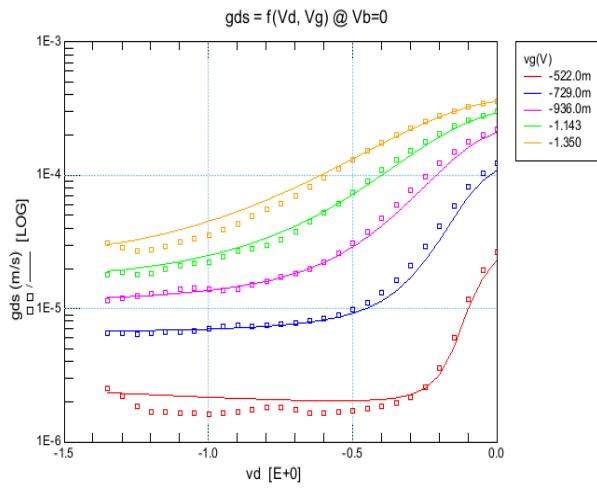
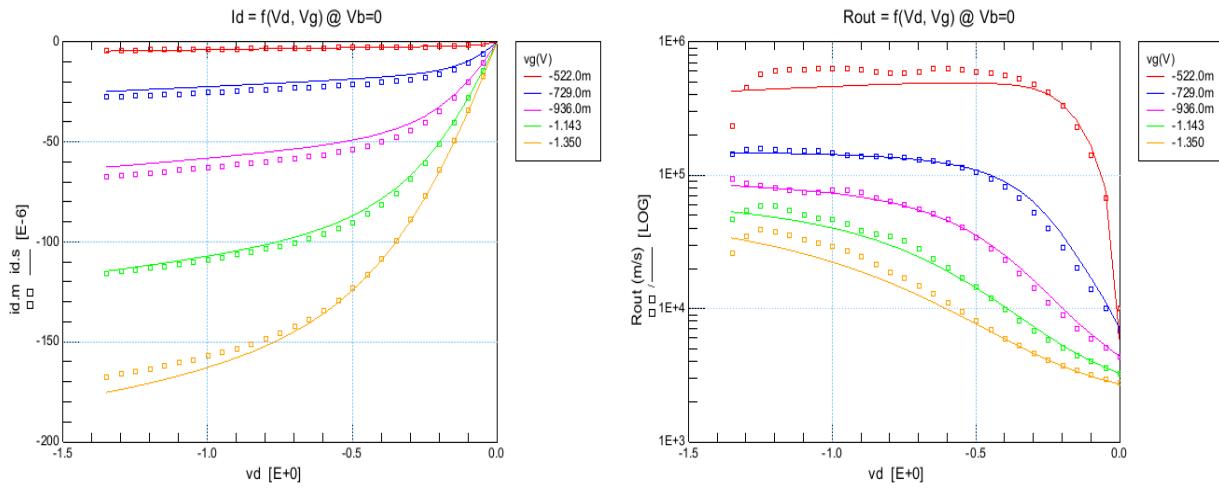
$i_{dvg}, V_d = -1.2V, T = 27^\circ\text{C}$

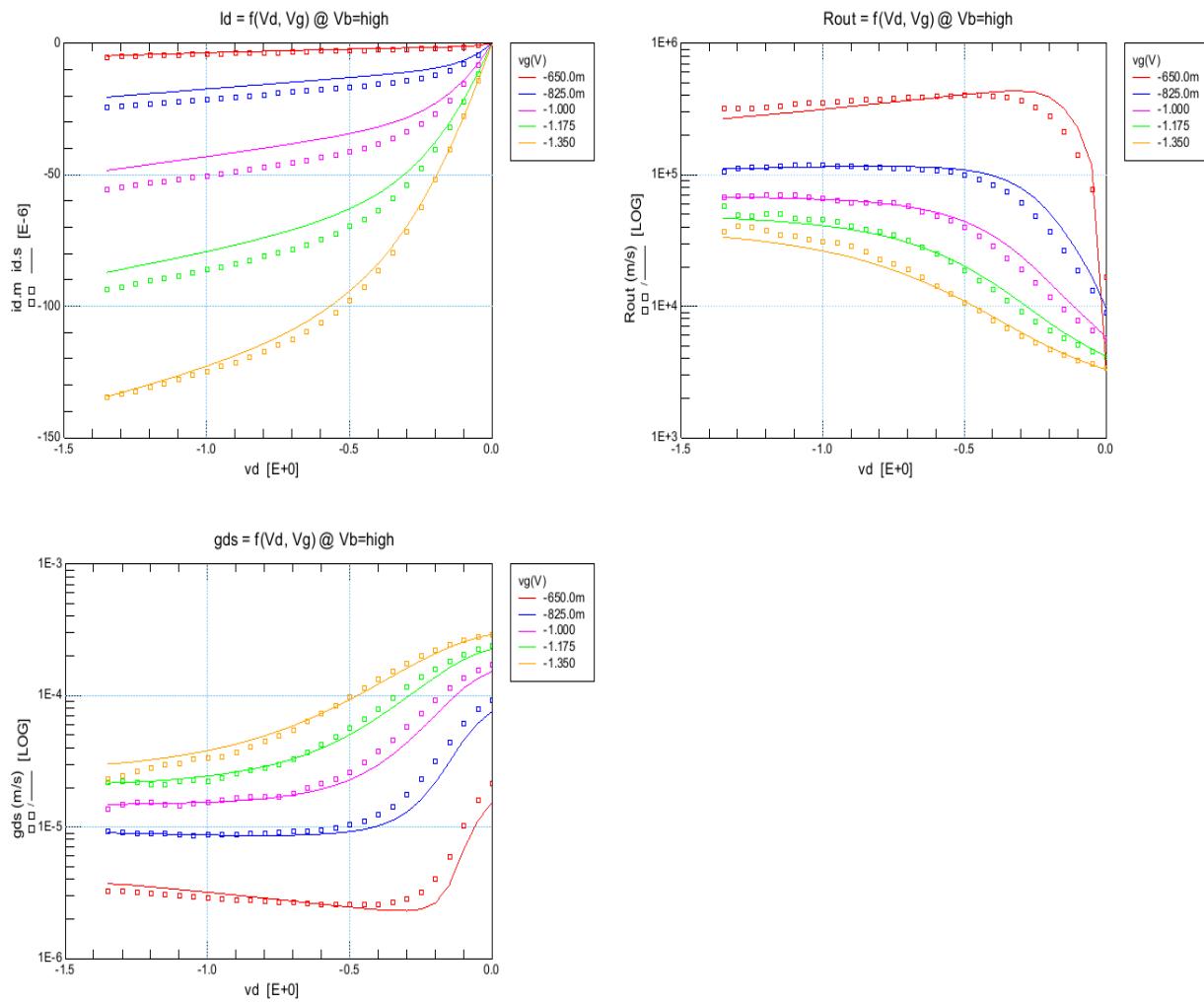
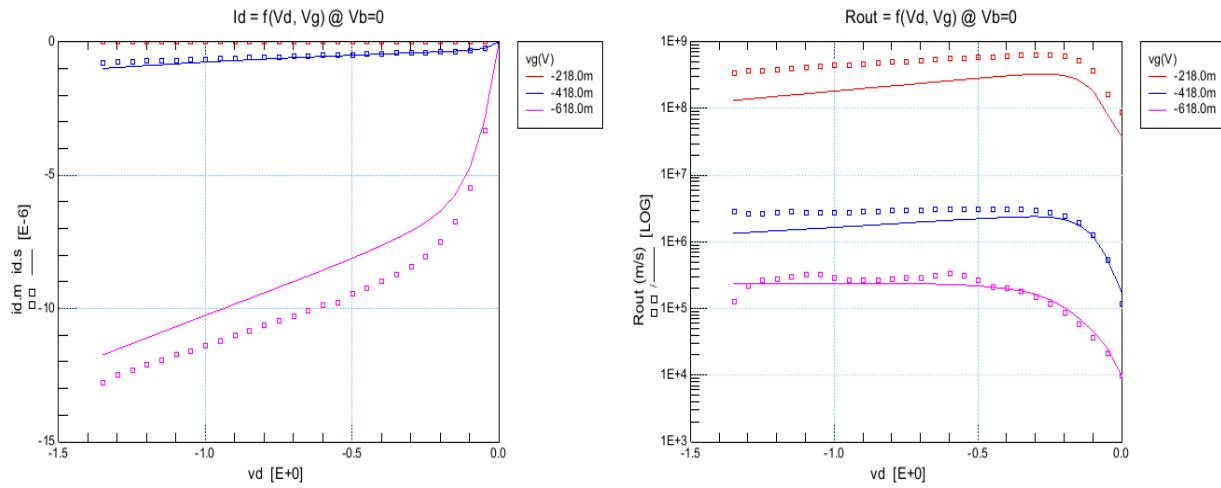


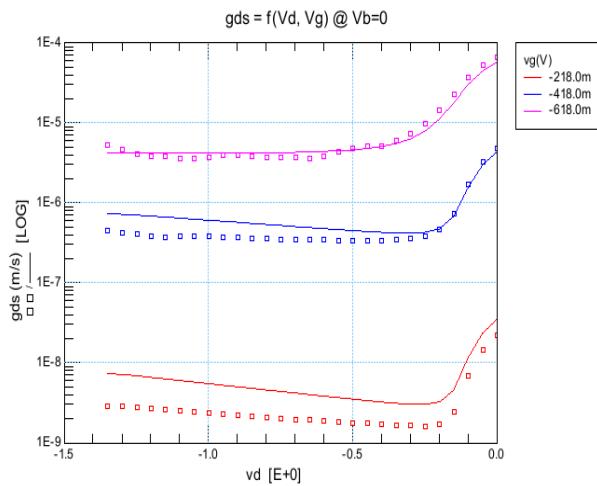


idvg, Ib, Ig, Vb = 0V, T = 27°C

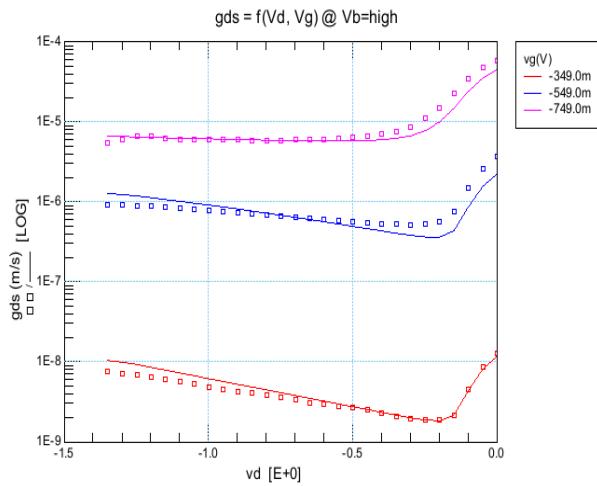
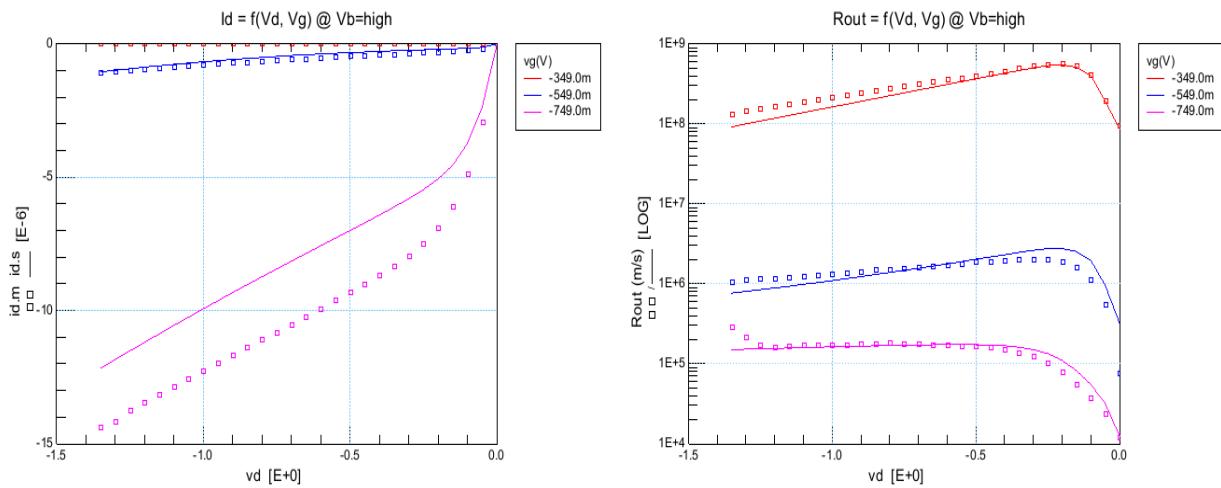


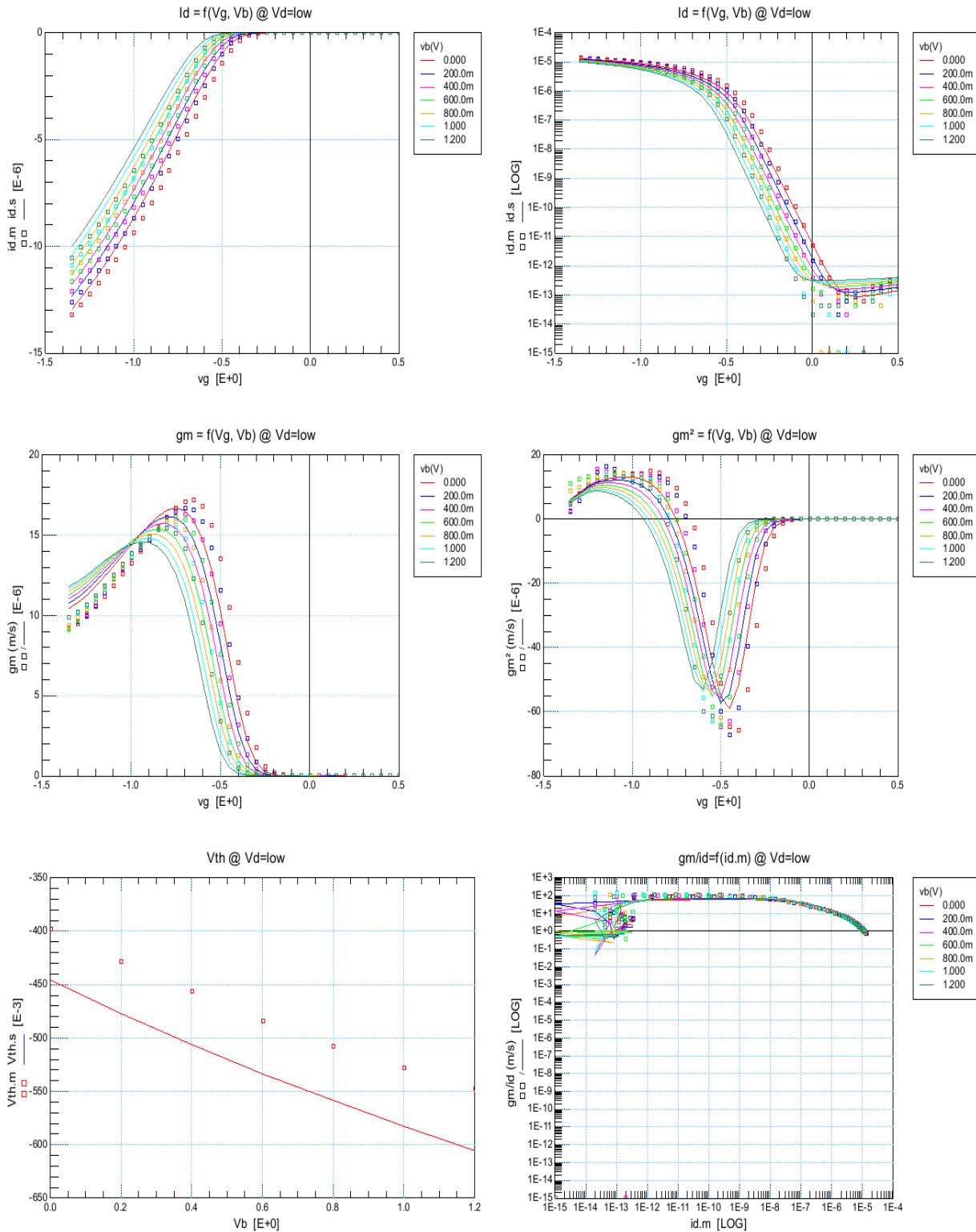
idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


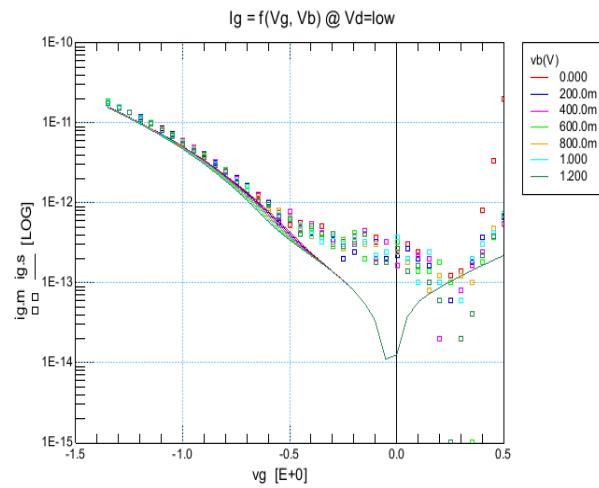
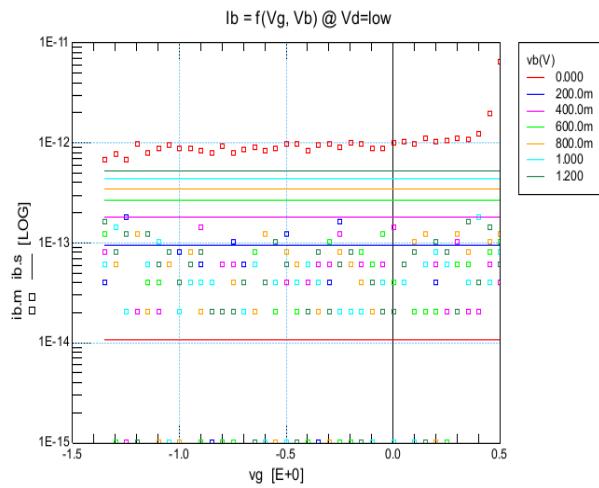
idvd_vbmin, Vb = 1.2V, T = 27°C**idvd_vth, Vb = 0V, T = 27°C**



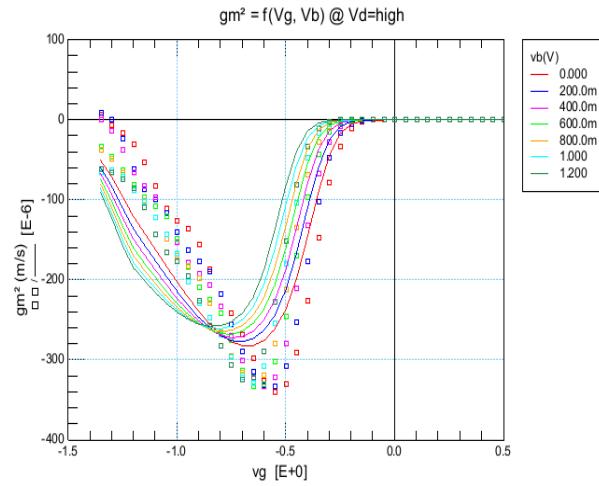
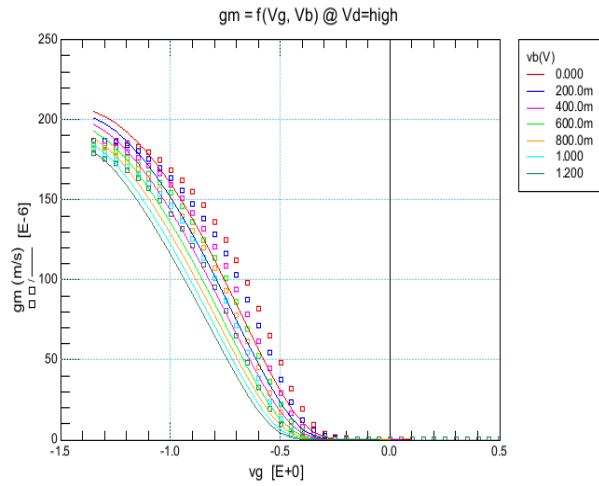
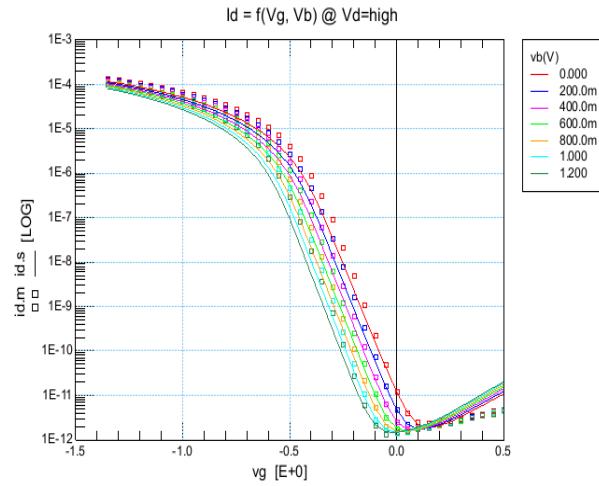
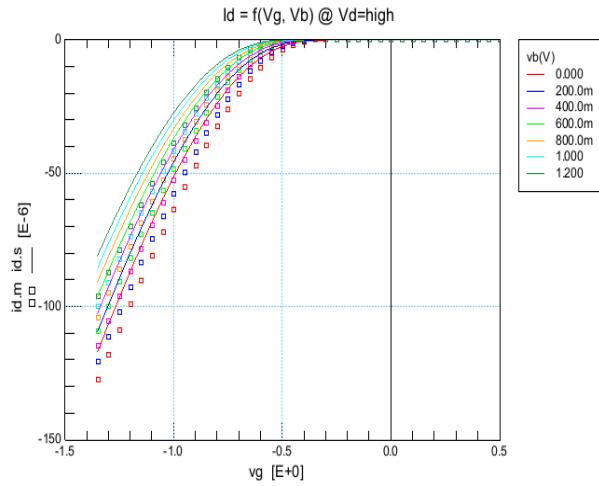
idvd_vth_vbmin, Vb = 1.2V, T = 27°C

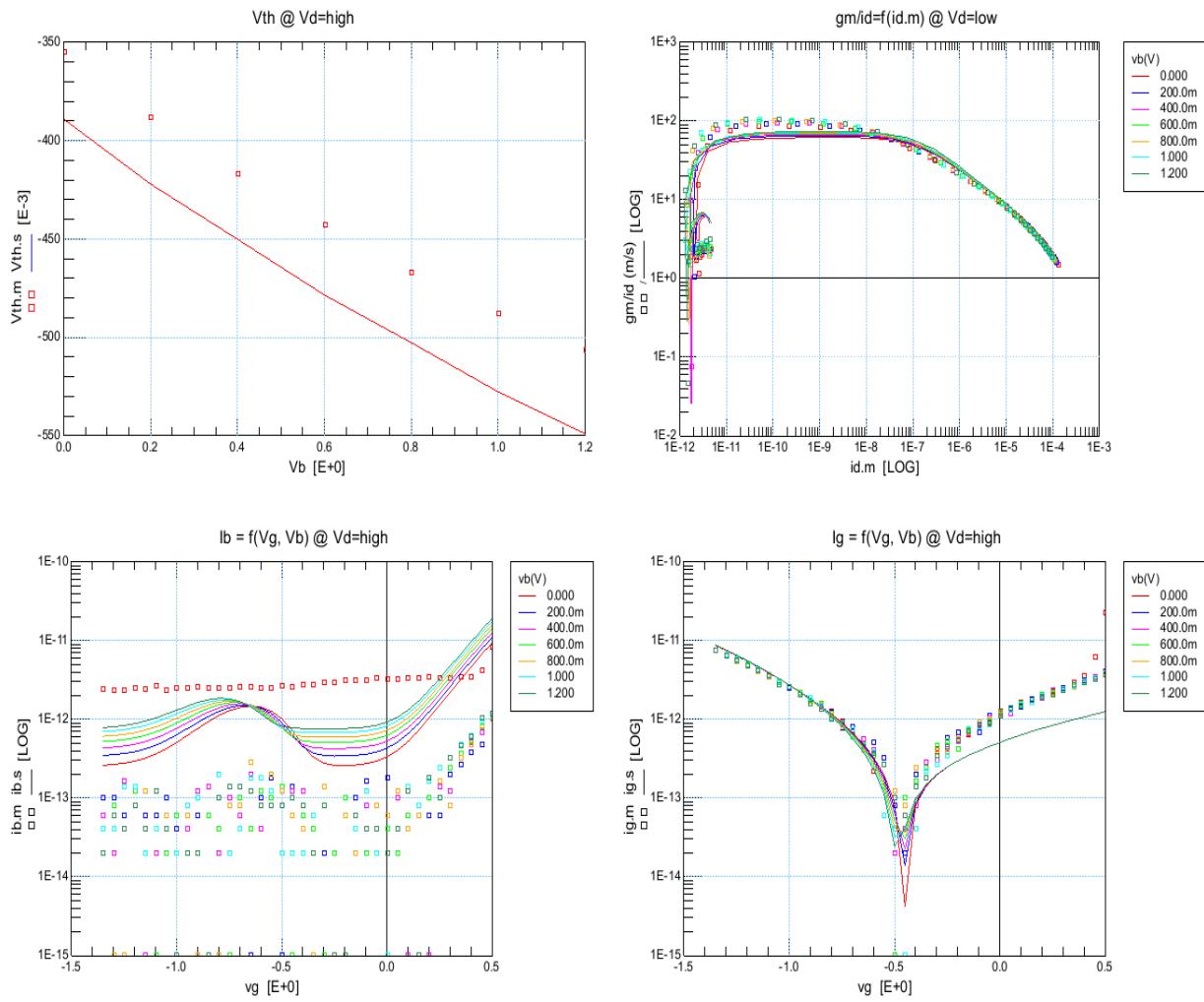


4.25 W0u6_L0u18_S551_3**idvg, Vd = -0.05V, T = 27°C**

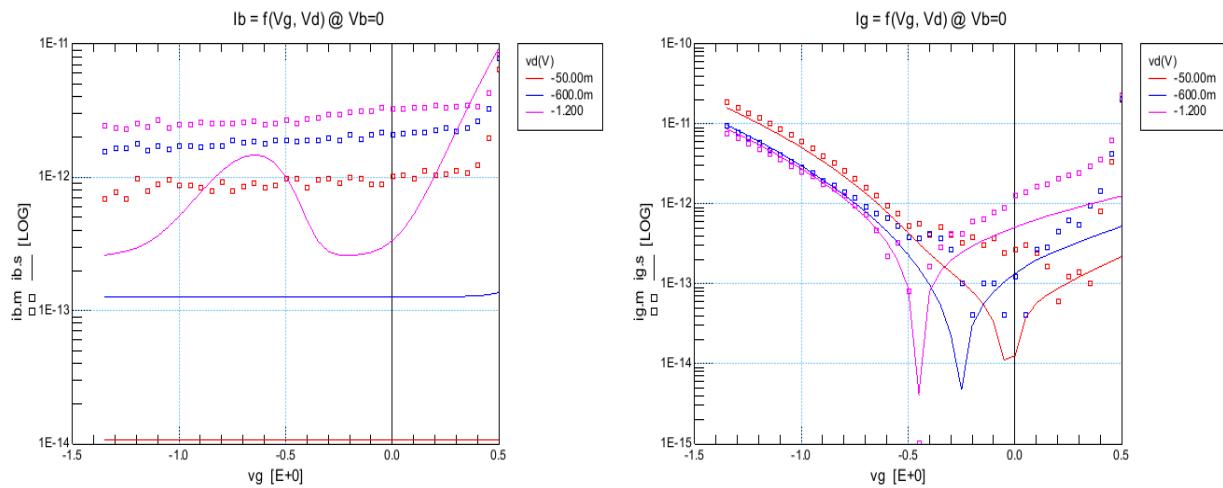


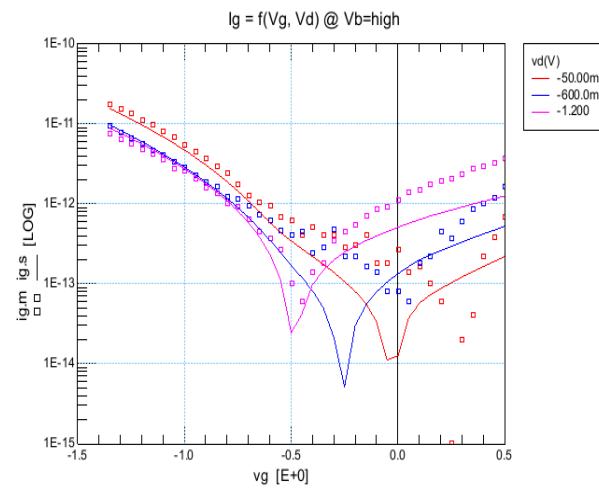
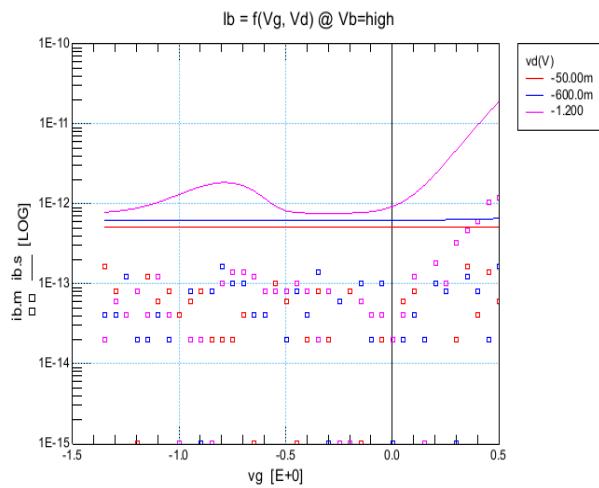
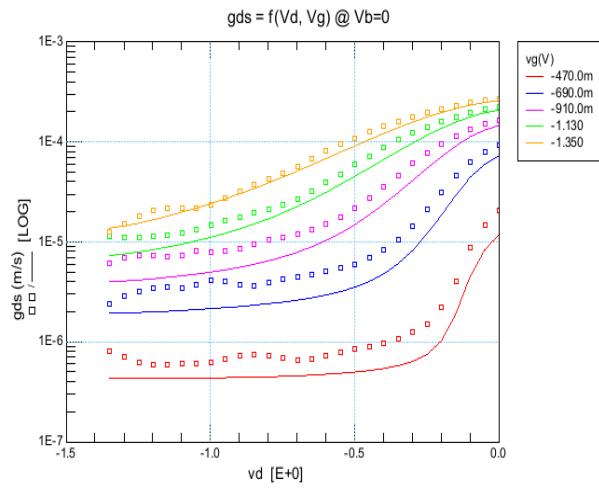
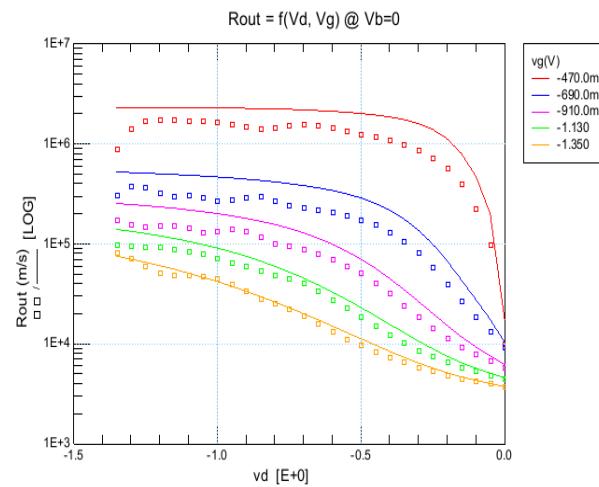
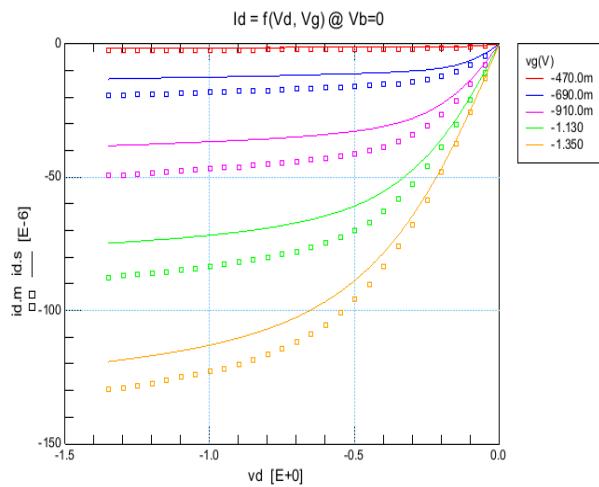
$i_{dvg}, V_d = -1.2V, T = 27^\circ\text{C}$

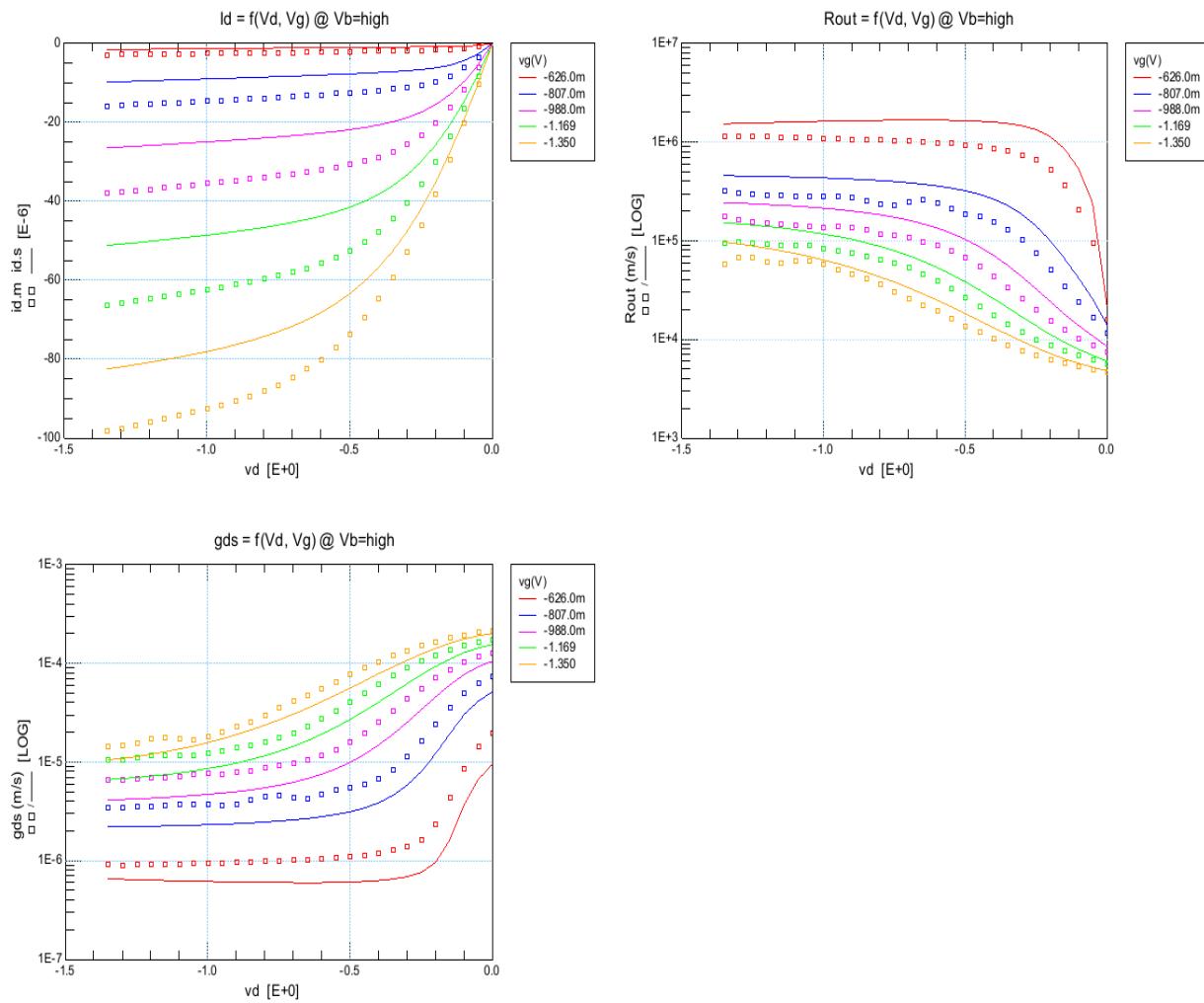
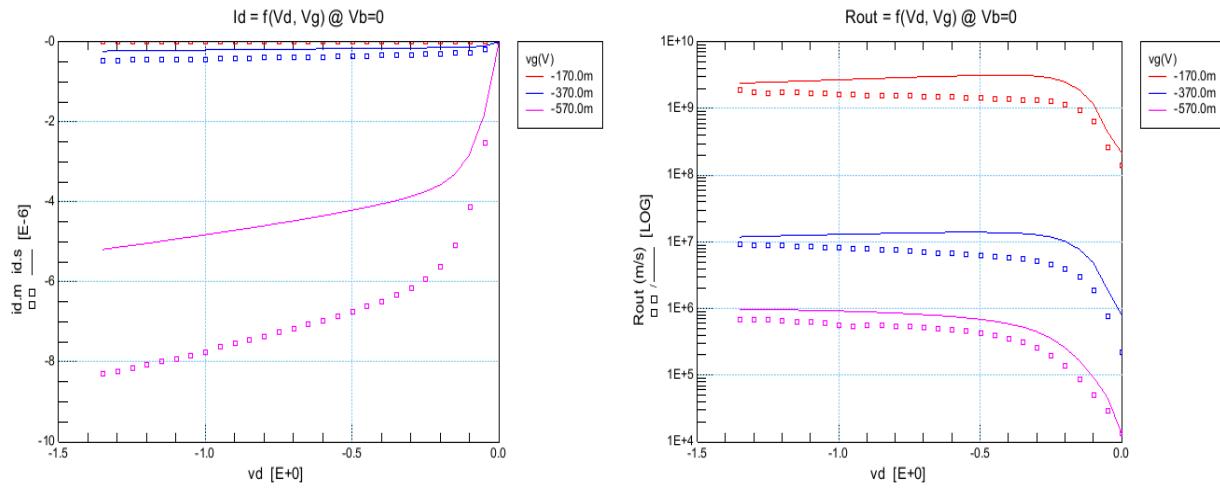


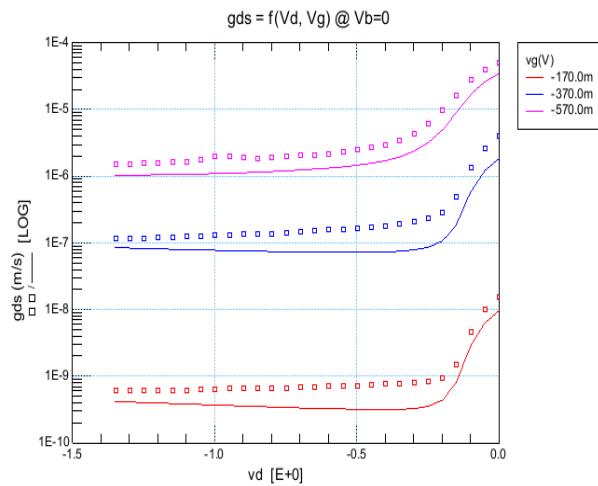


idvg, Ib,Ig, Vb = 0V, T = 27°C

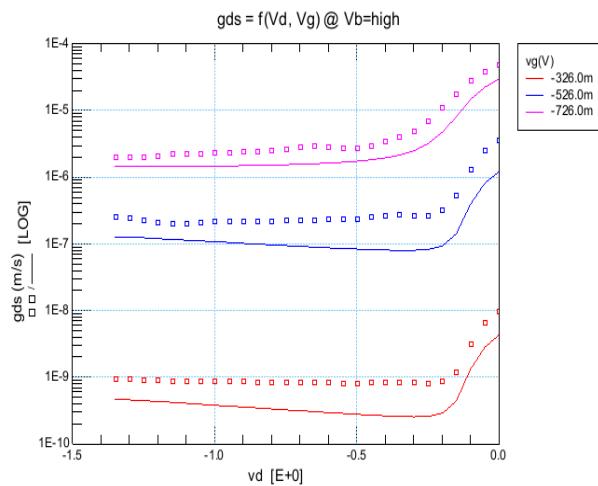
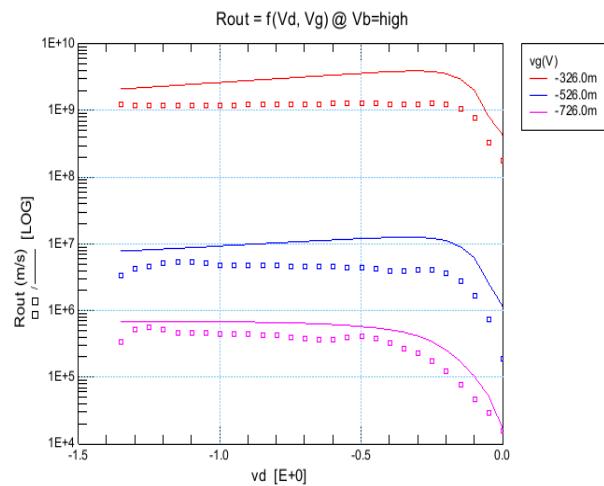
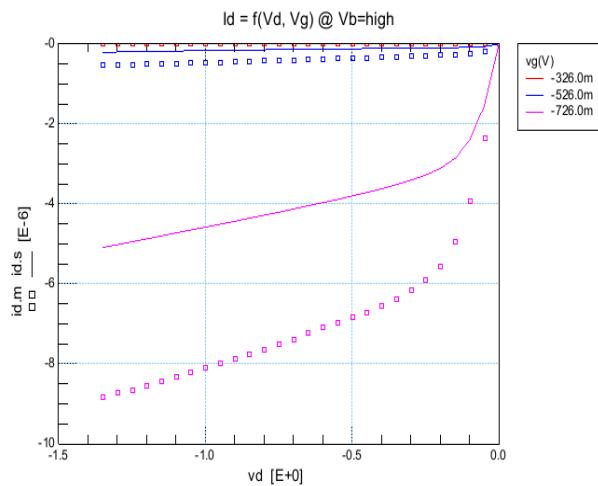


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C


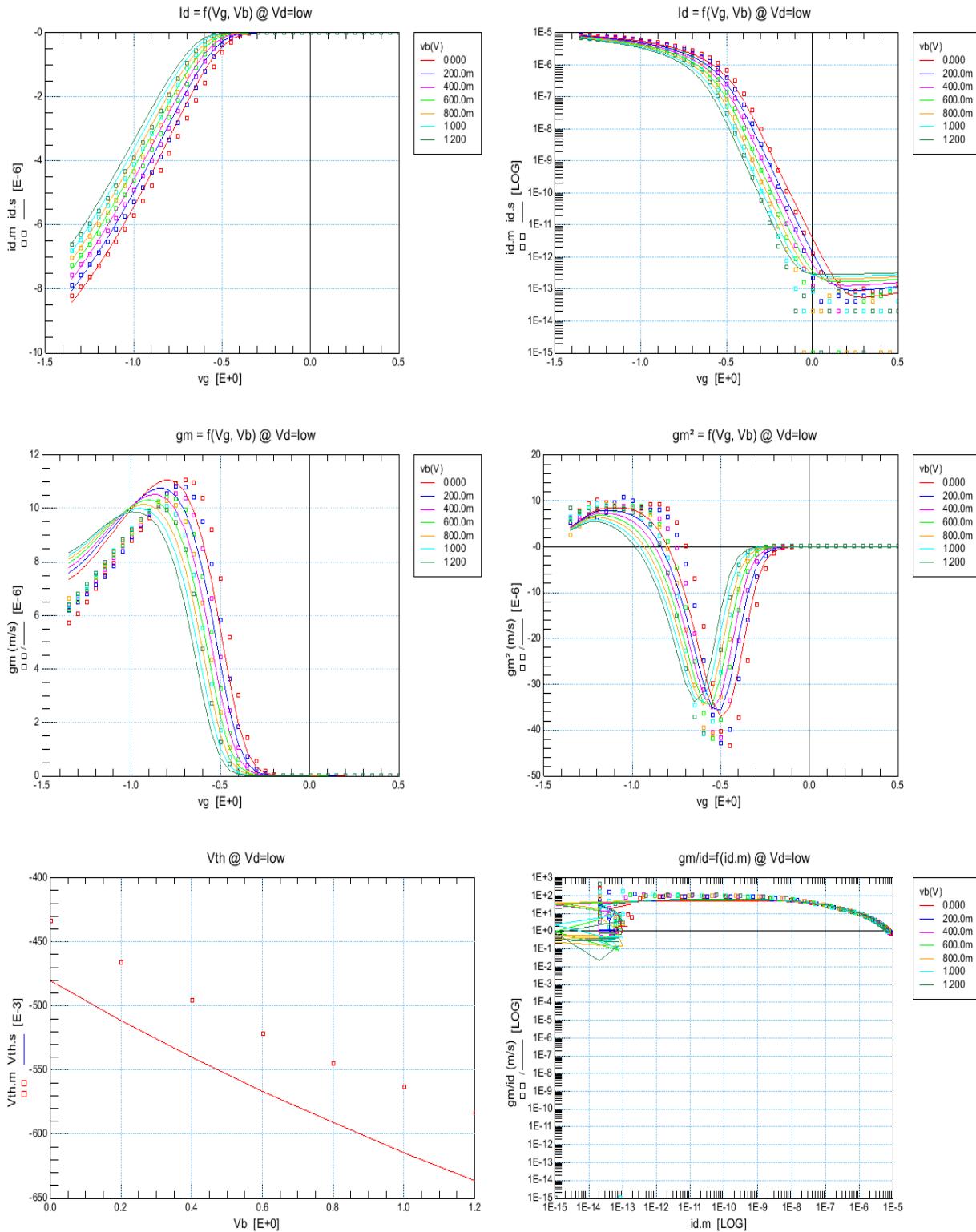


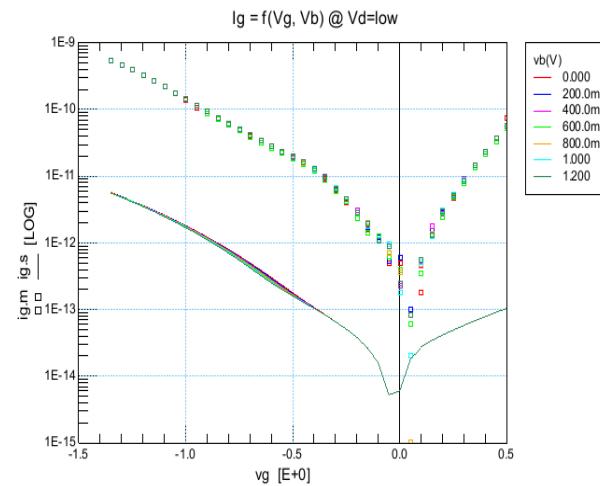
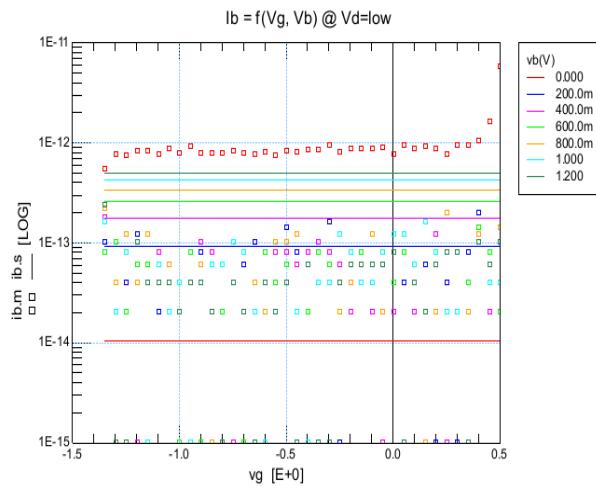
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



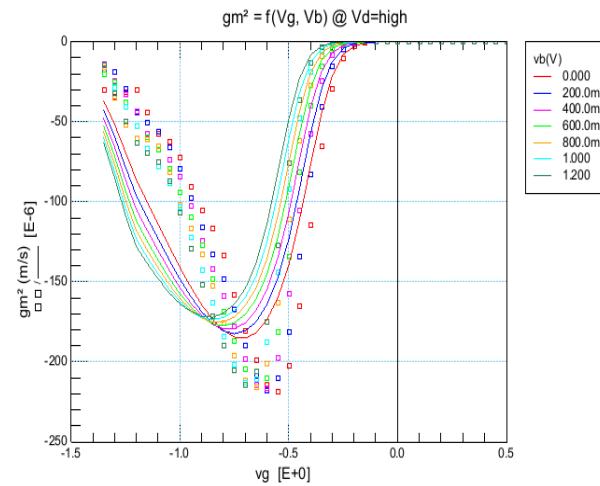
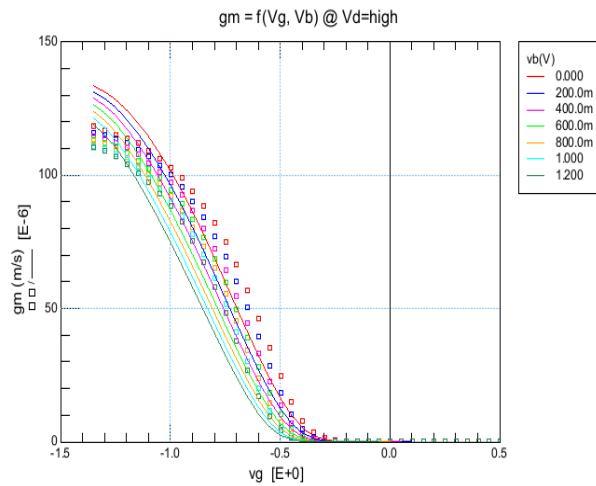
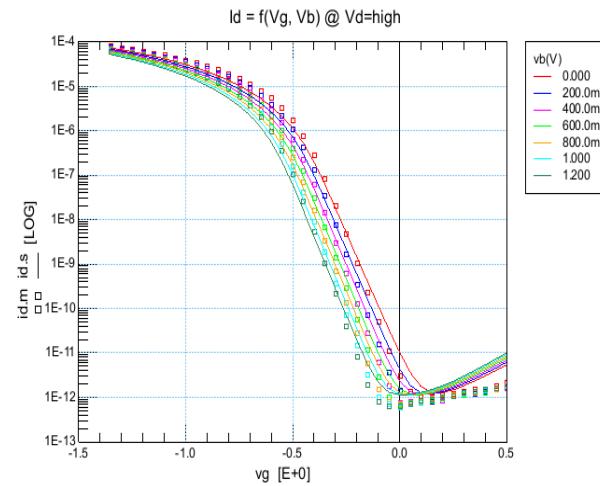
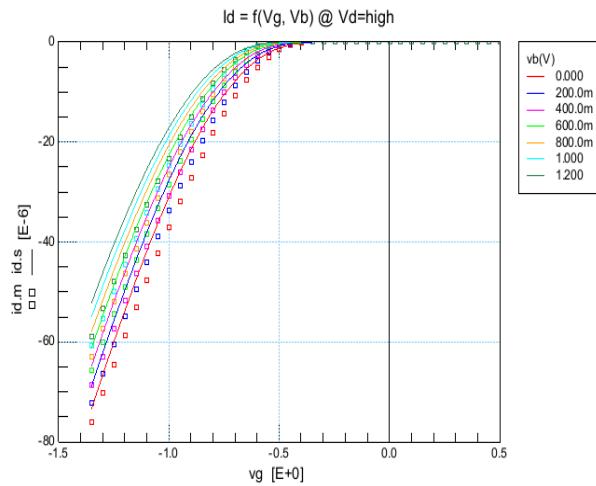
4.26 W0u3_L0u15_S552_4

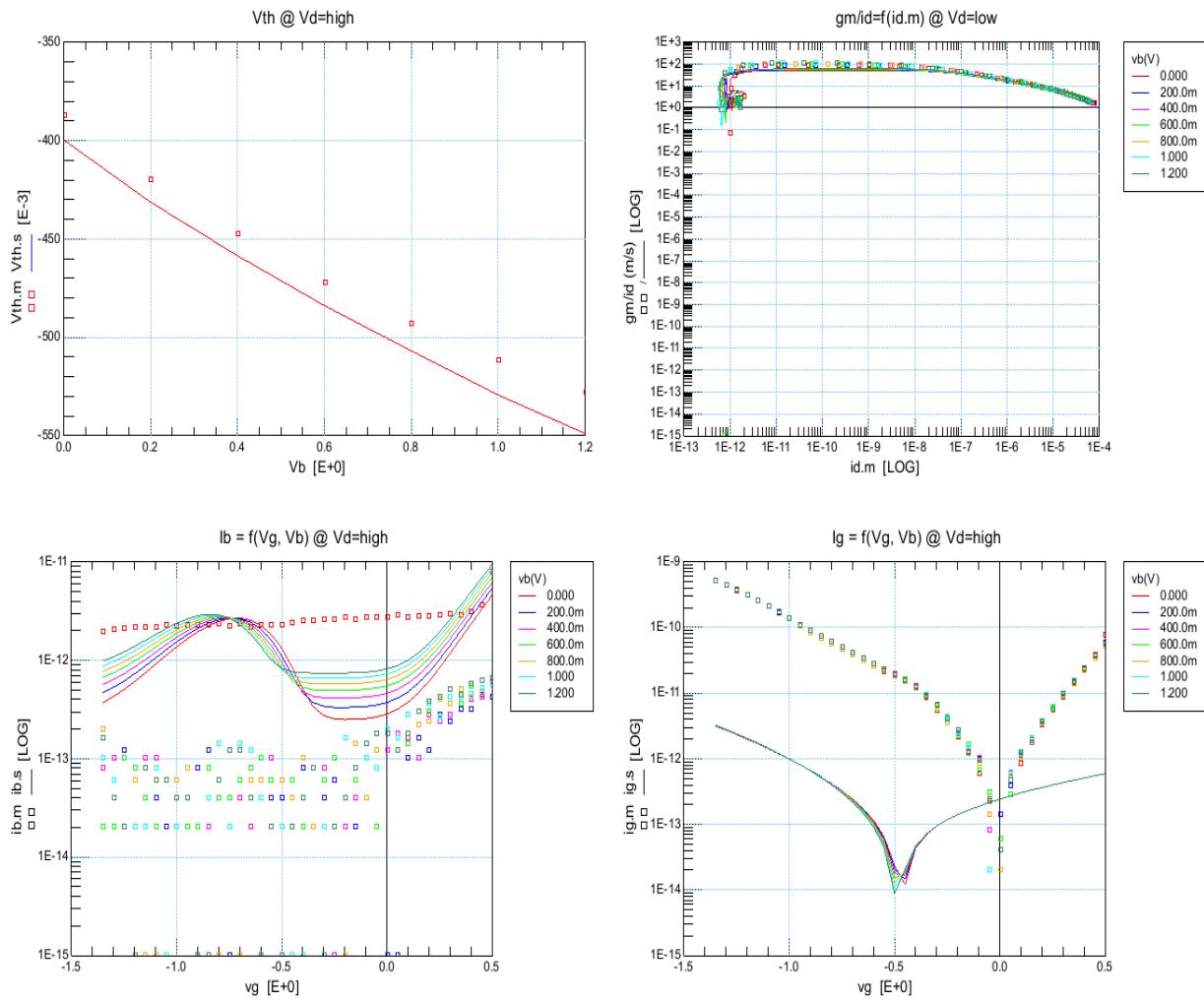
$idv_g, V_d = -0.05V, T = 27^\circ C$



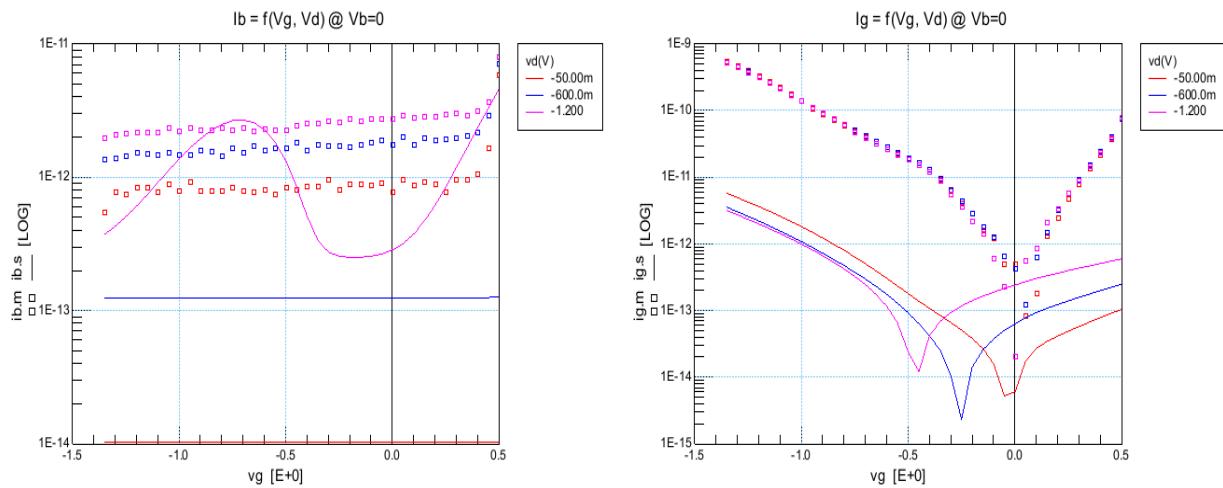


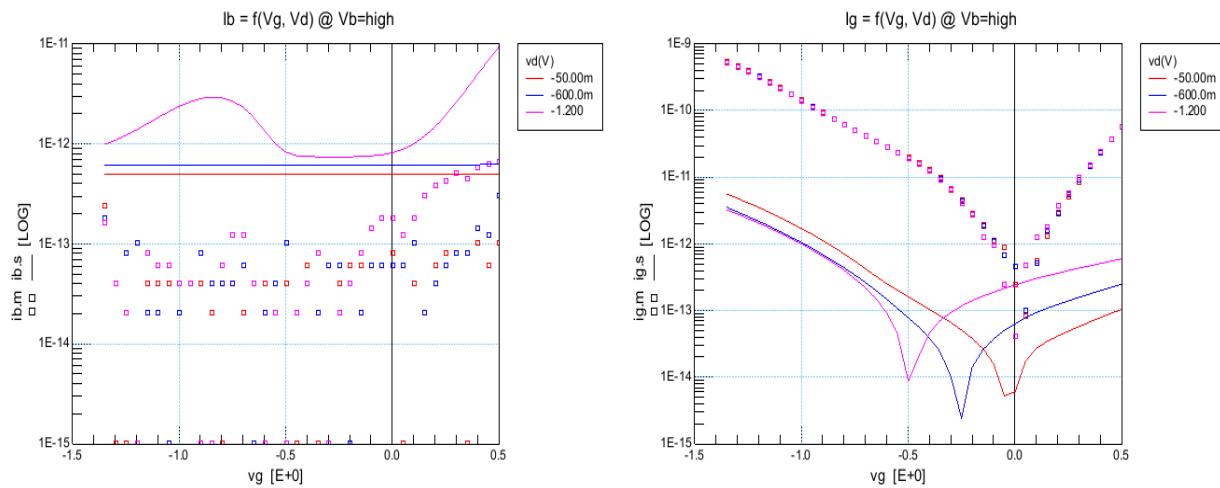
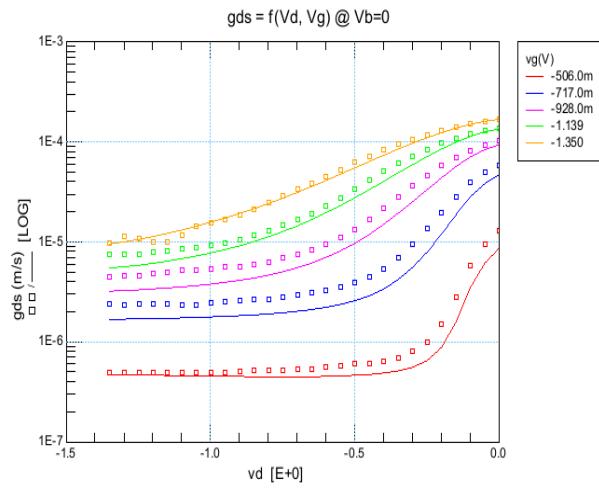
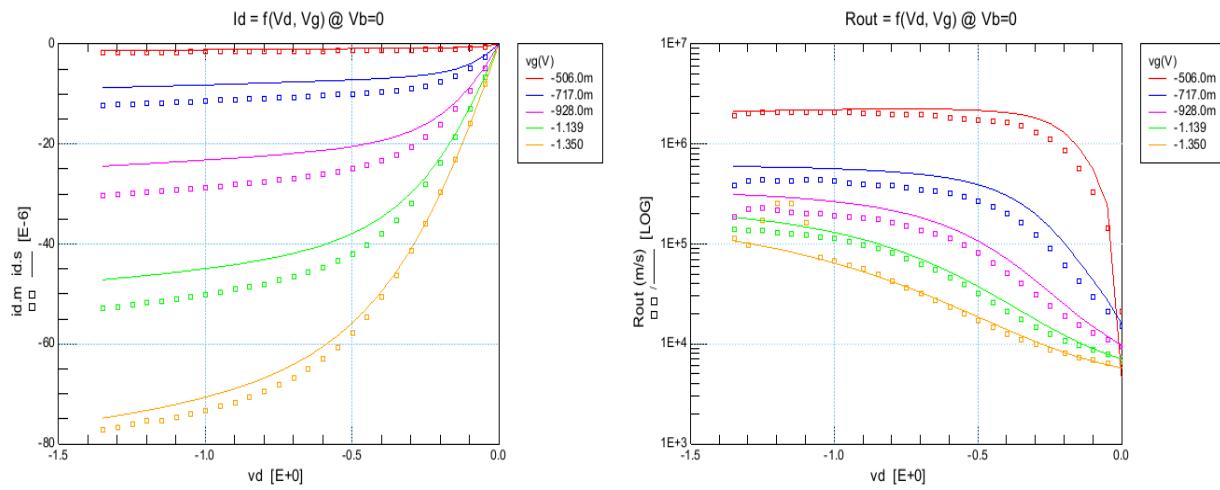
$i_{dvg}, V_d = -1.2V, T = 27^\circ\text{C}$

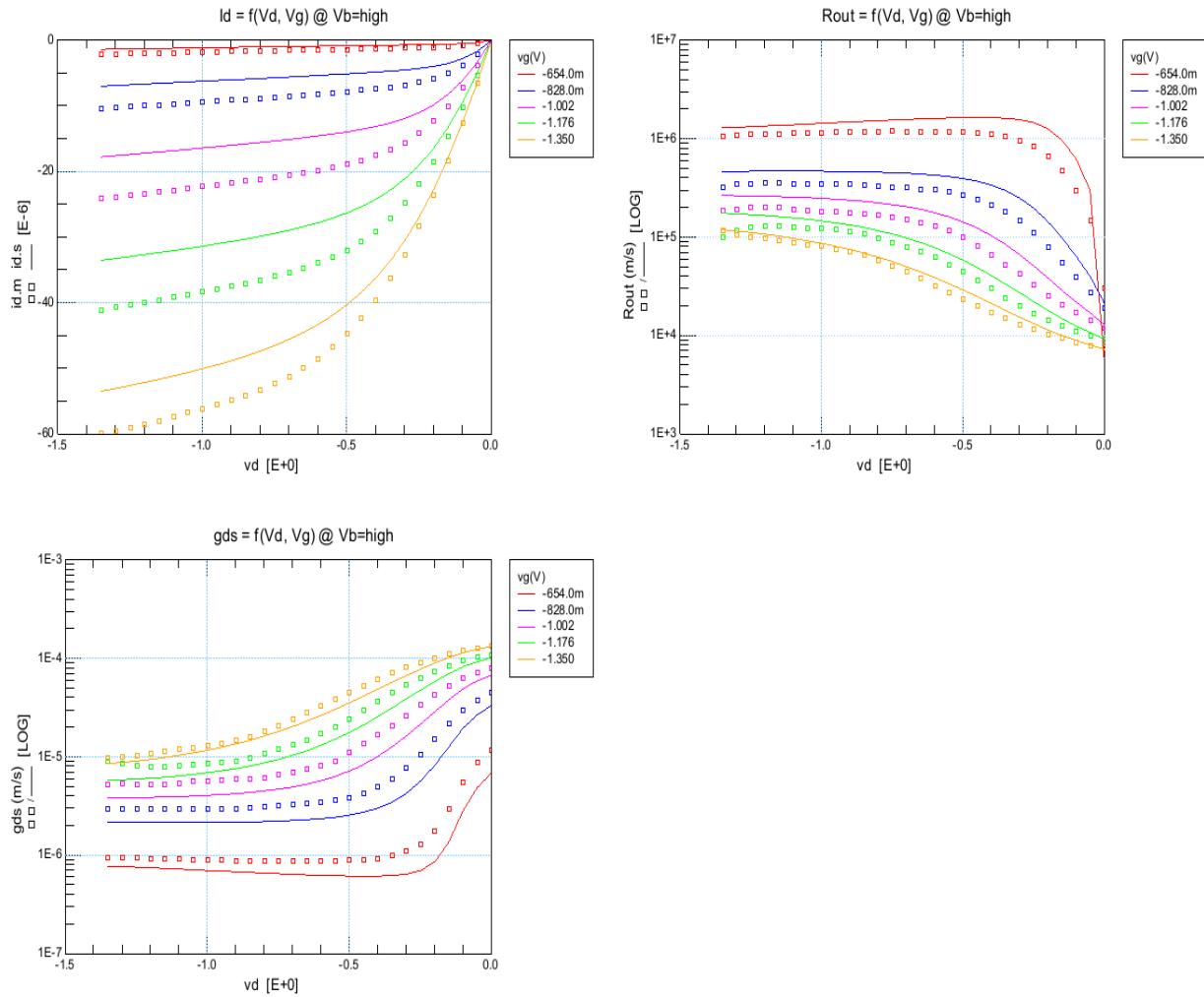
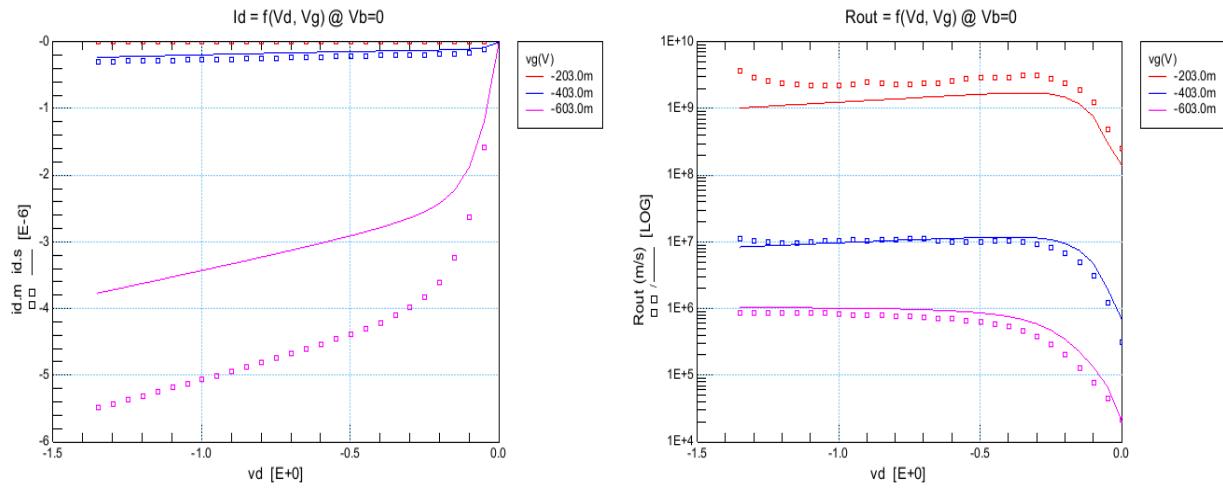


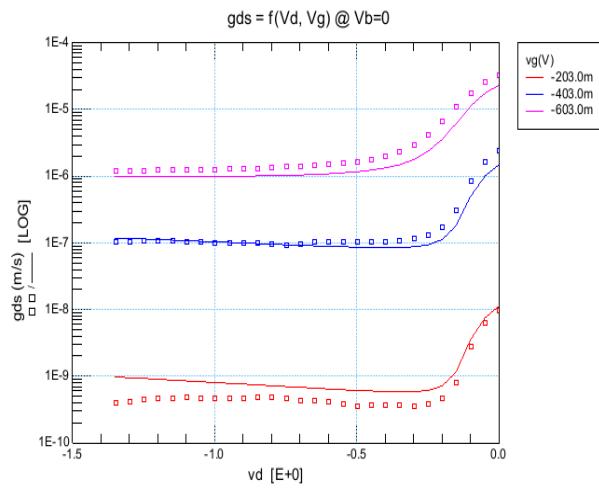


idvg, Ib,Ig, Vb = 0V, T = 27°C

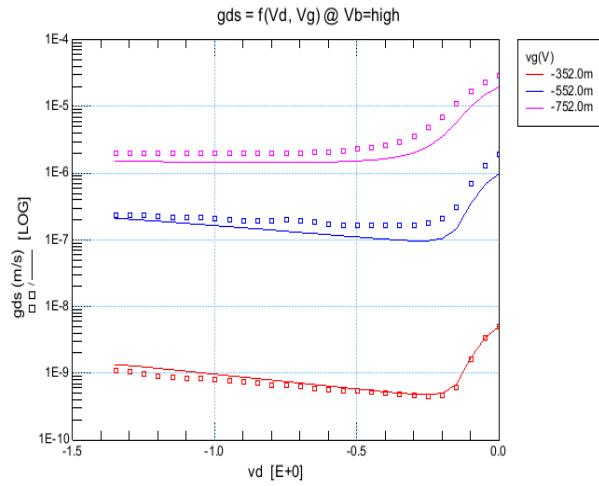
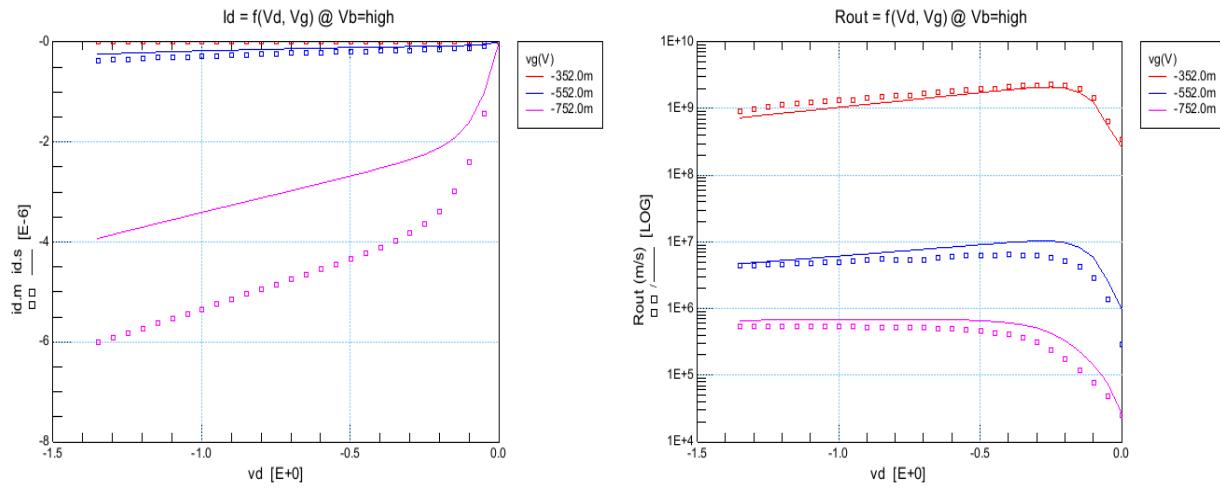


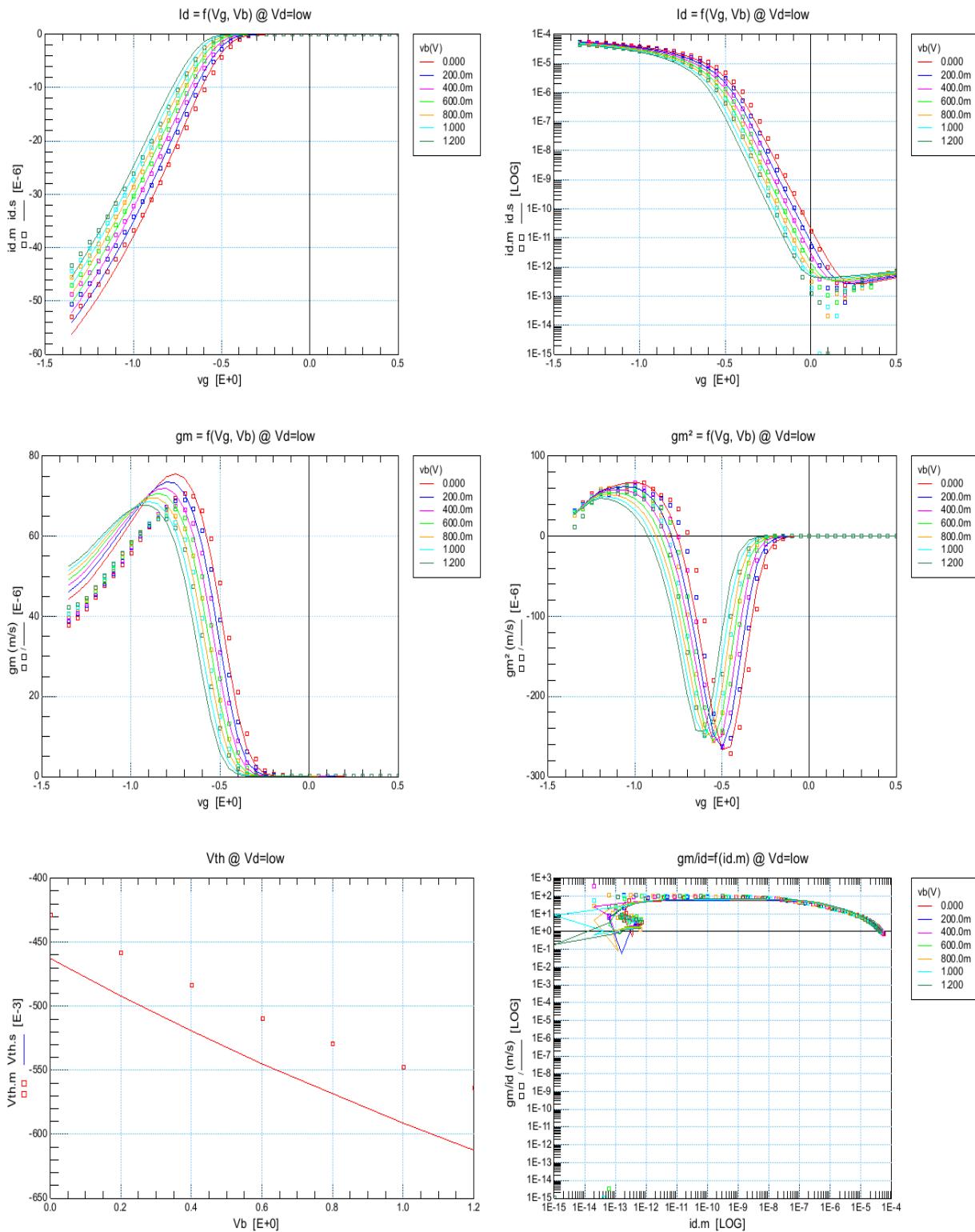
idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


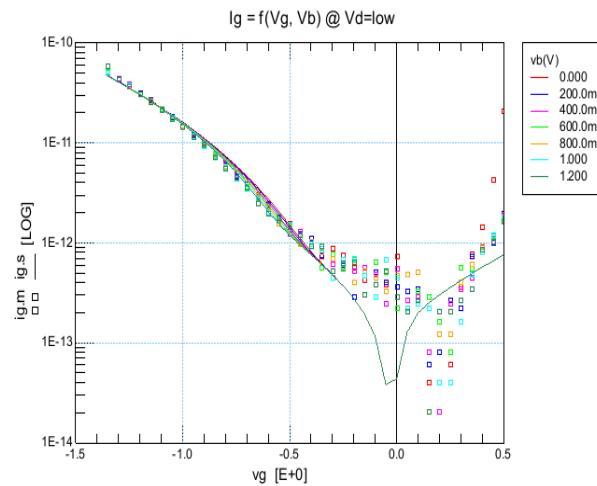
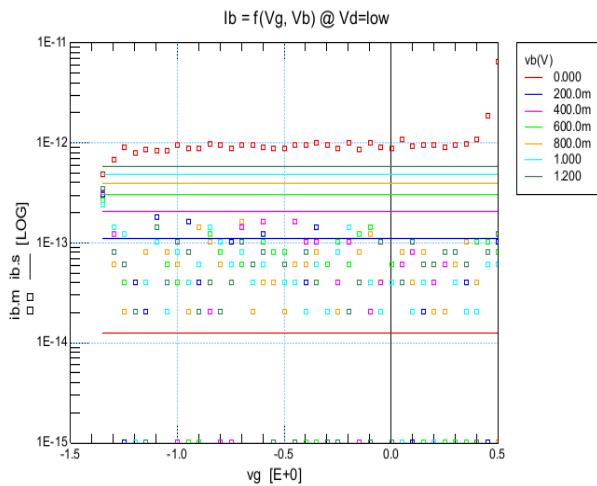
idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C




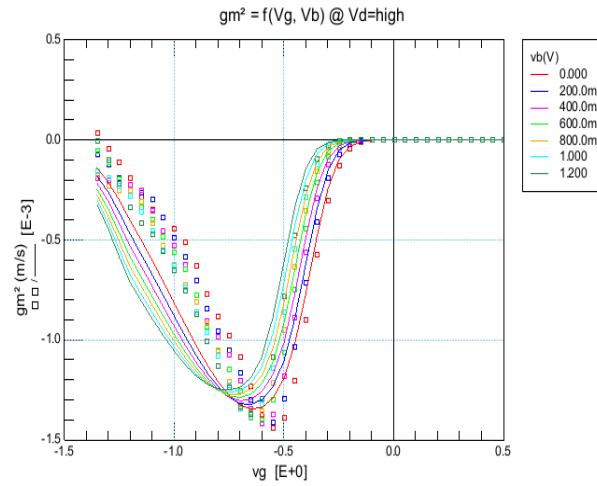
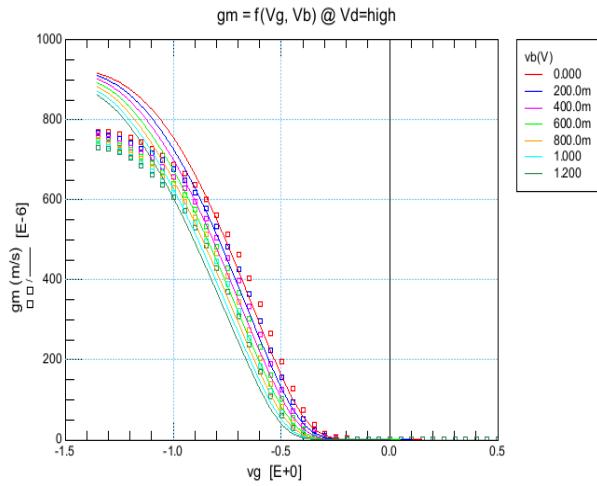
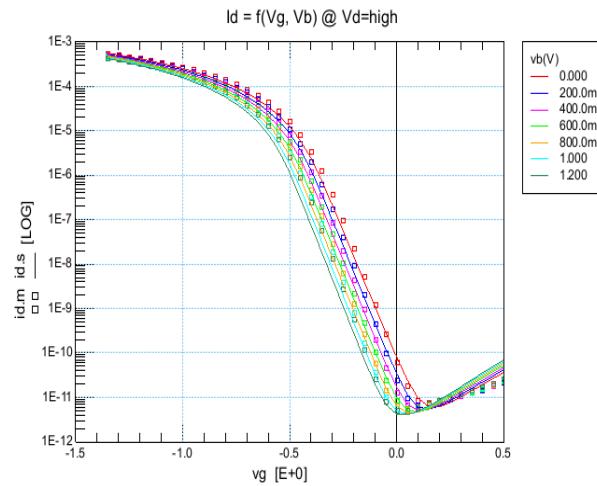
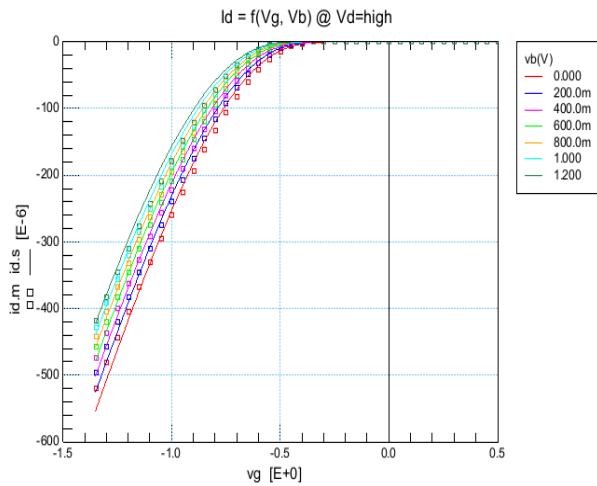
idvd_vth_vbmin, Vb = 1.2V, T = 27°C

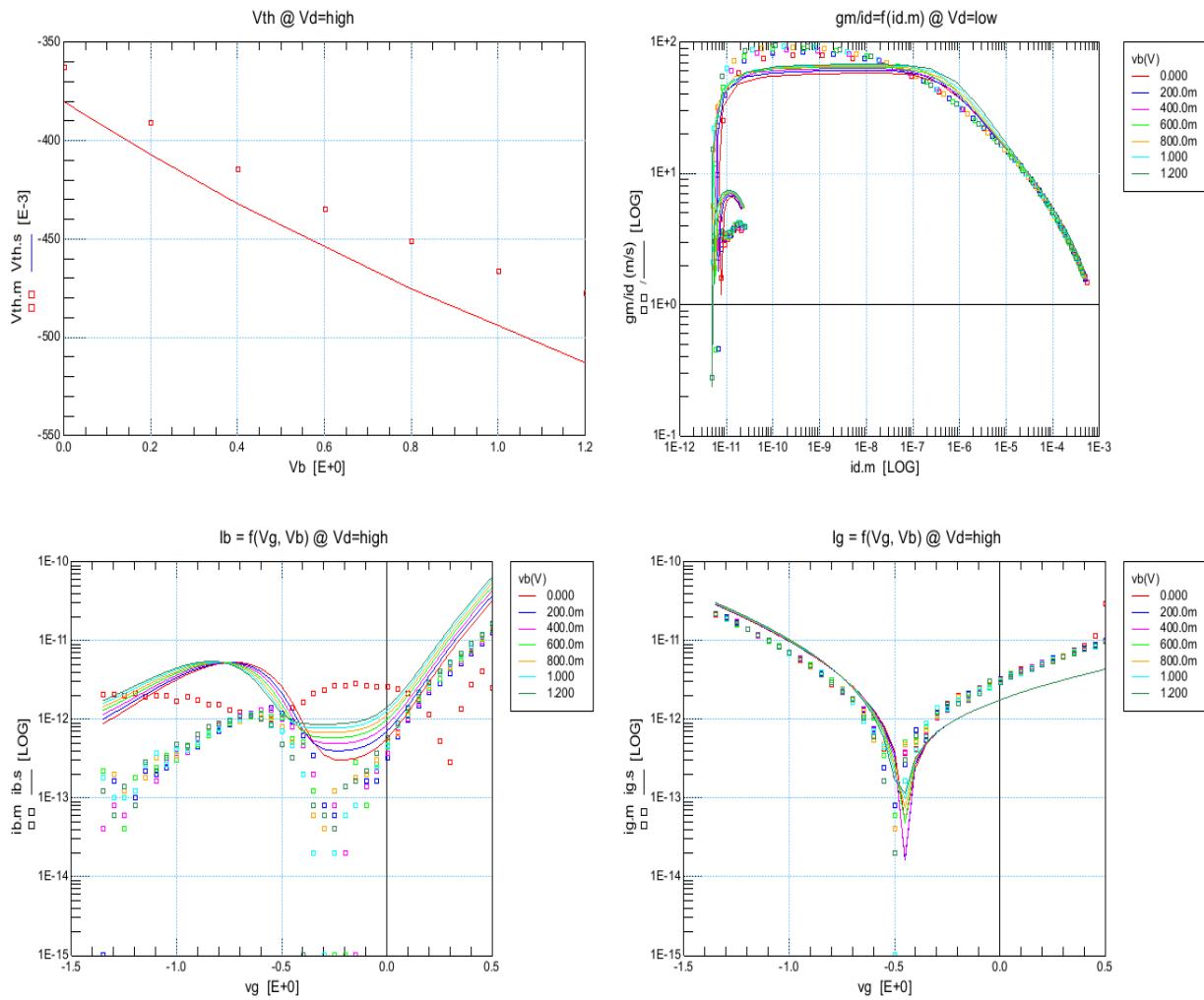


4.27W02u0_L0u13_S550_4**idvg, Vd = -0.05V, T = 27°C**

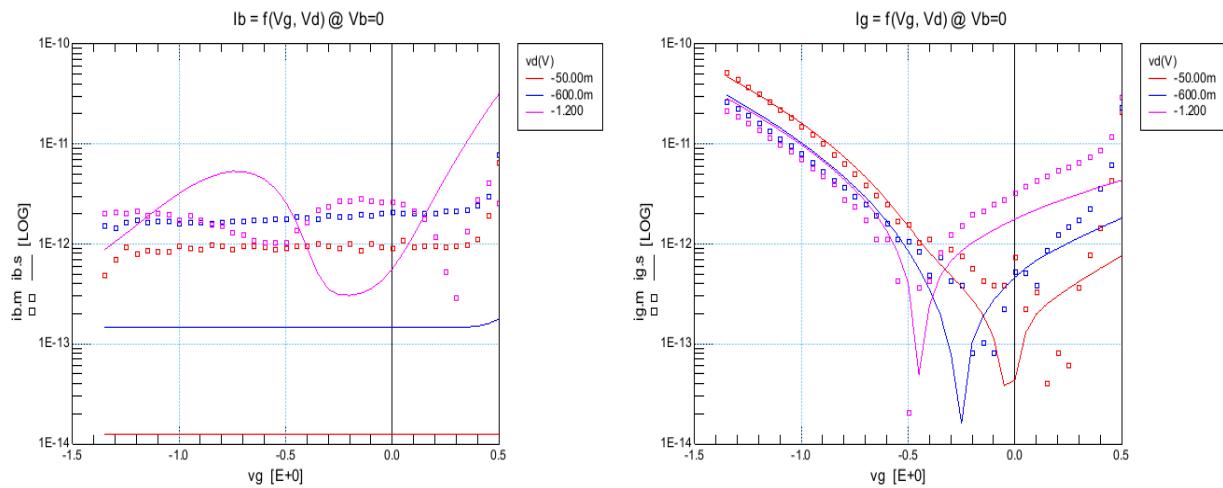


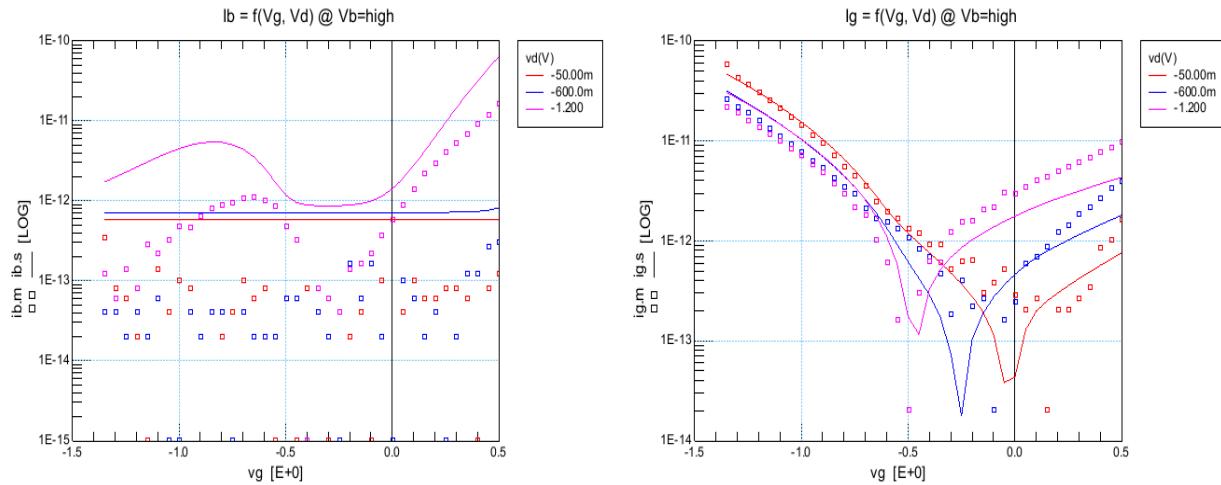
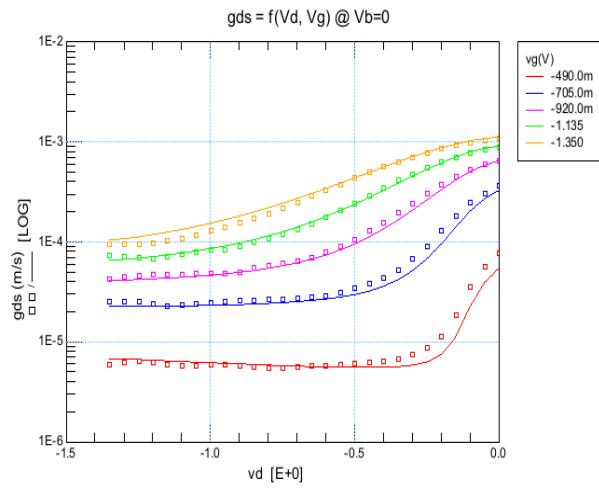
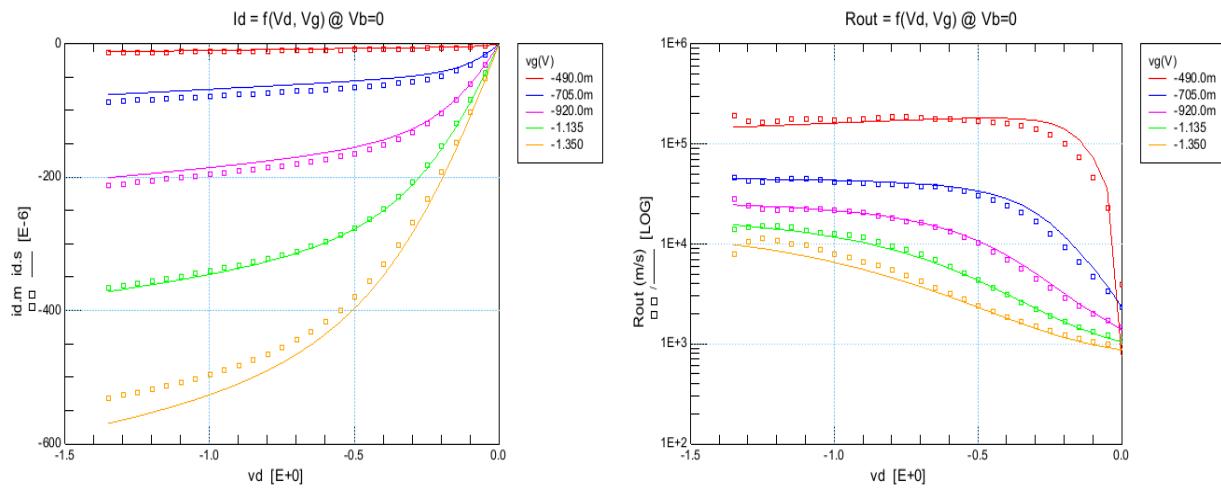
$i_{dvg}, V_d = -1.2V, T = 27^\circ C$

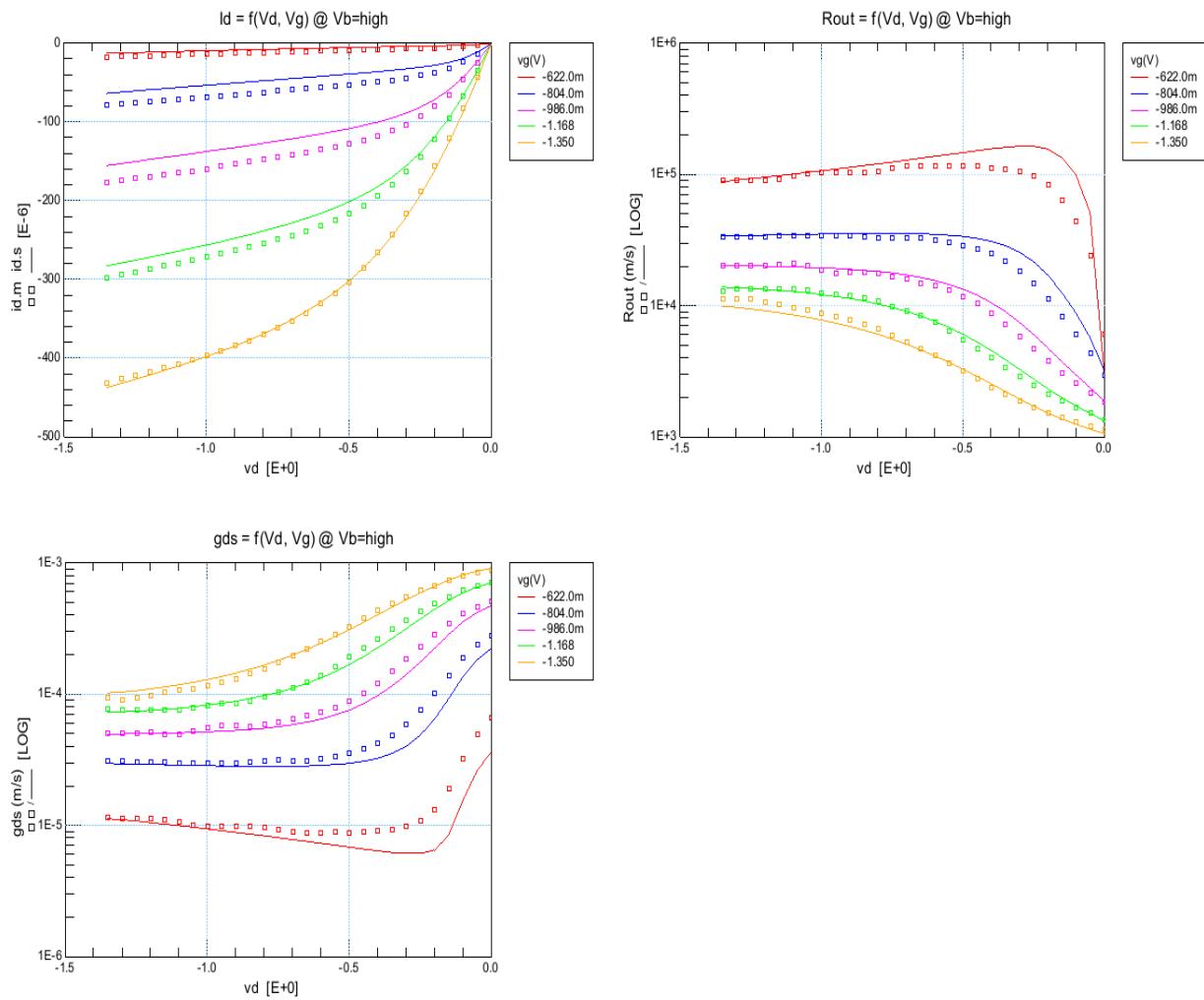
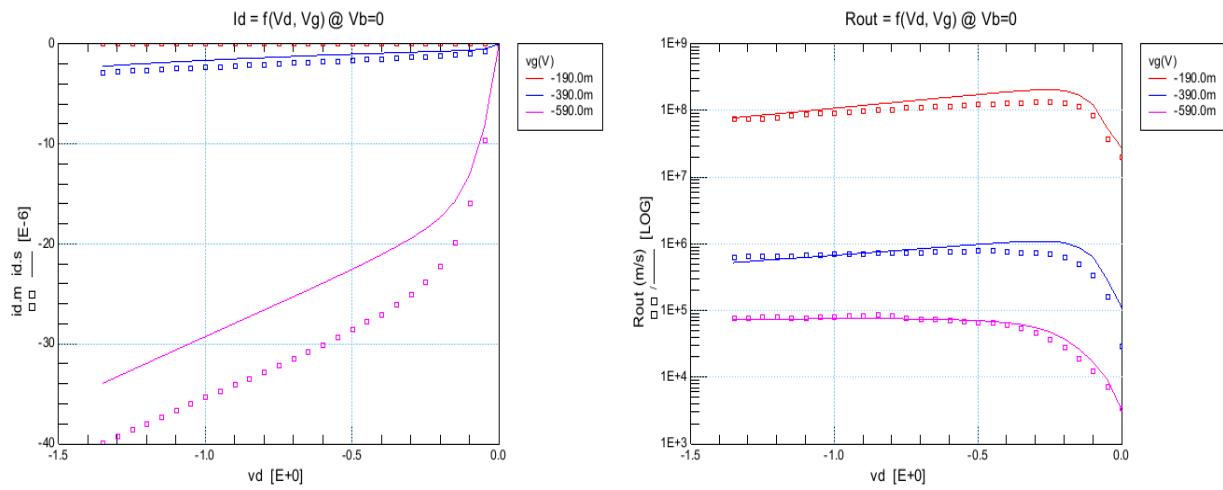


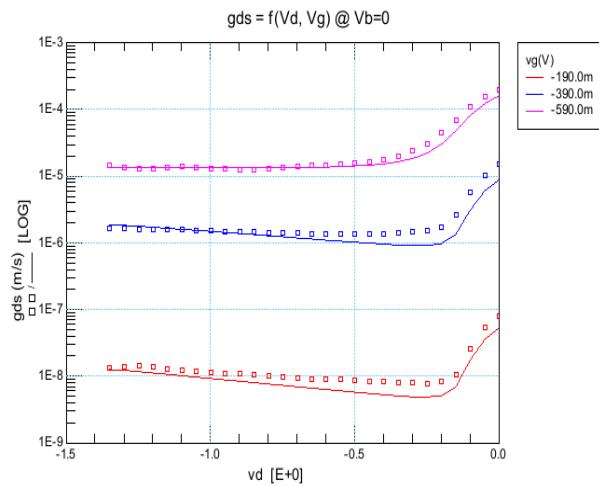


$id_{vg}, I_b, I_g, V_b = 0V, T = 27^\circ C$

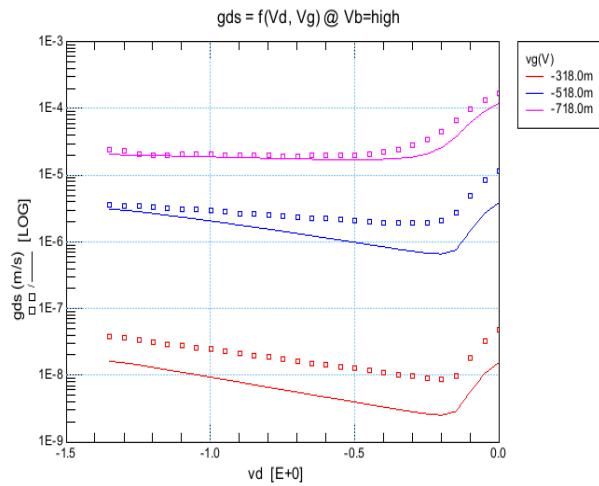
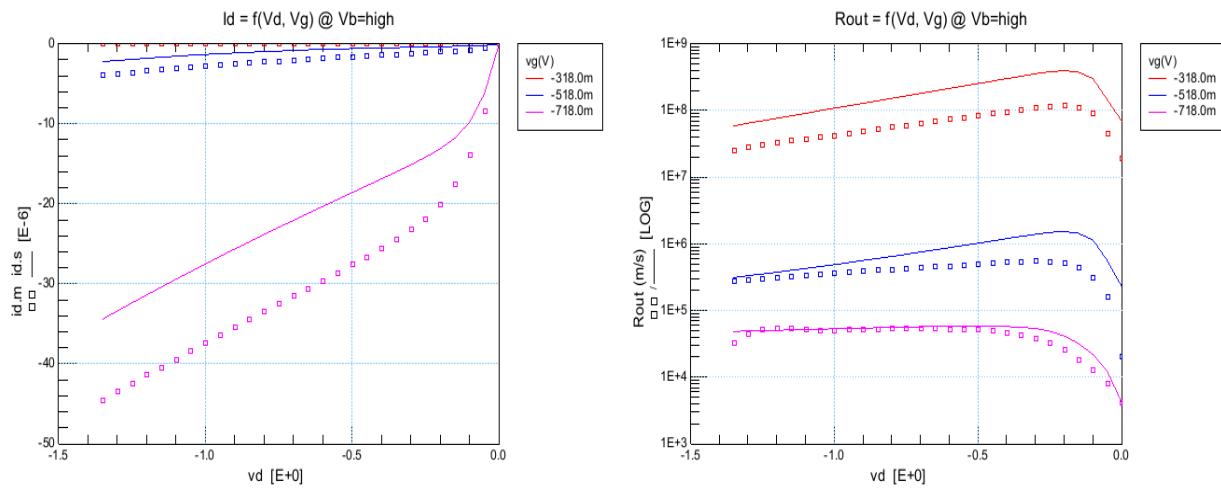


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C


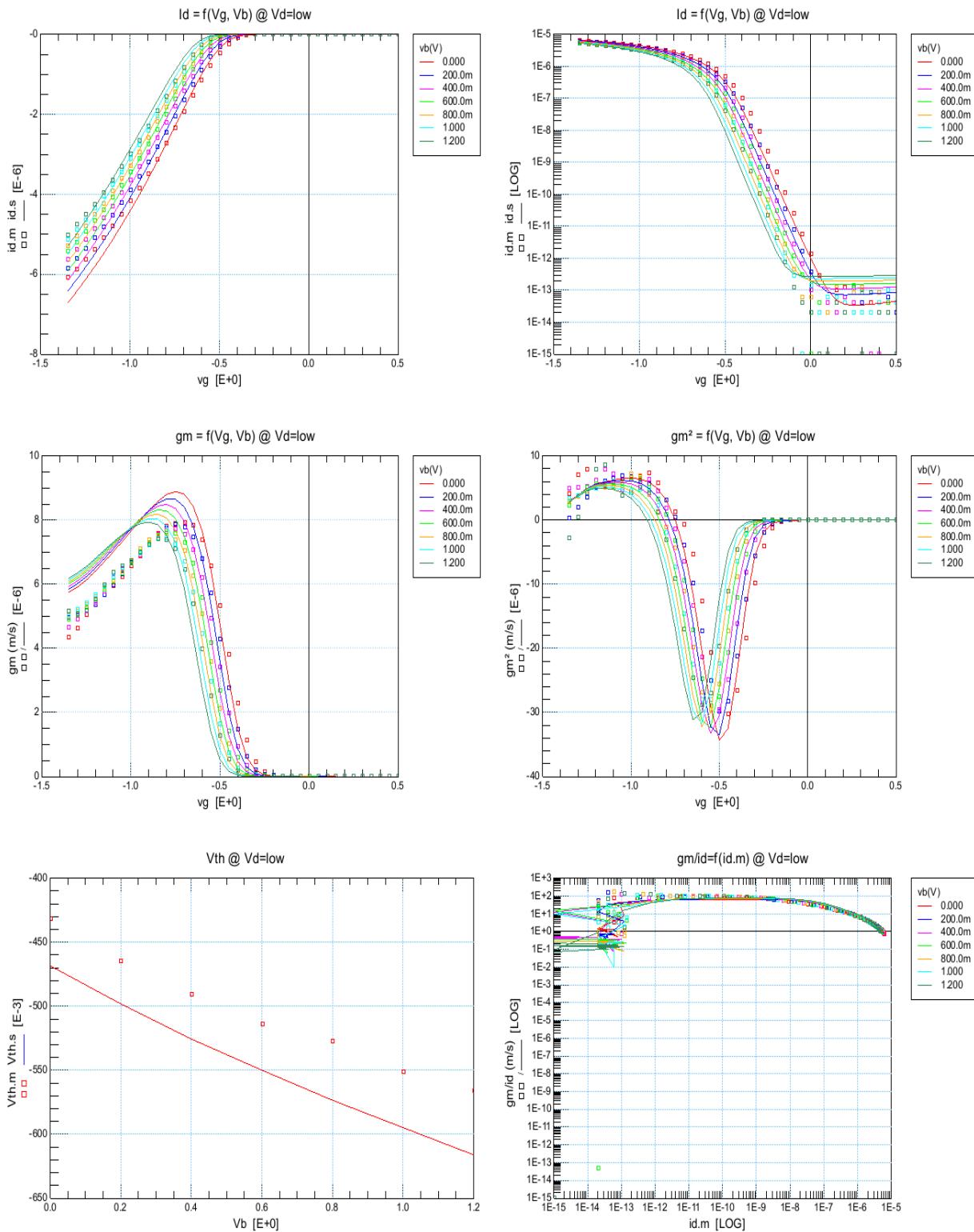


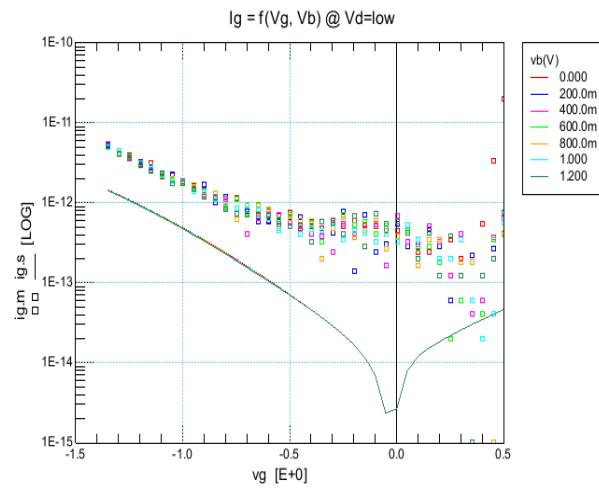
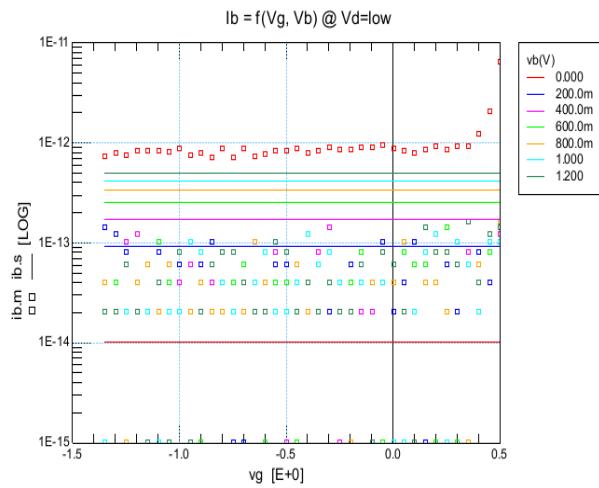
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



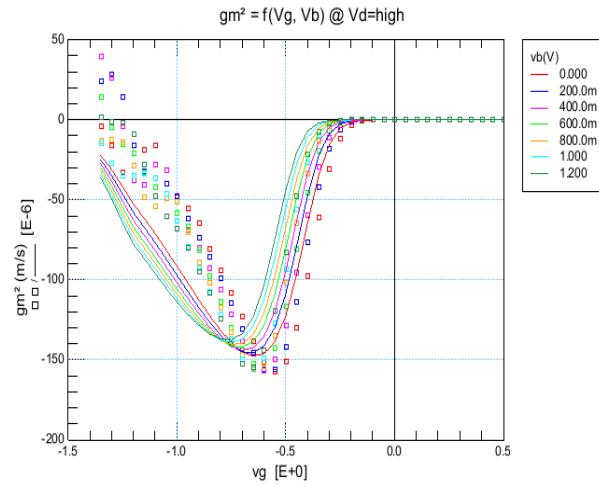
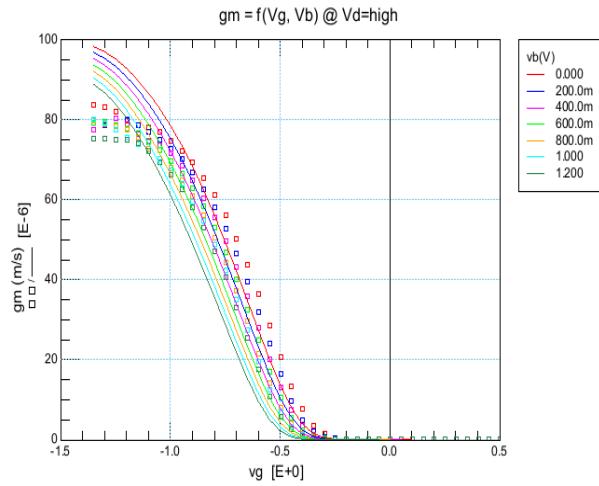
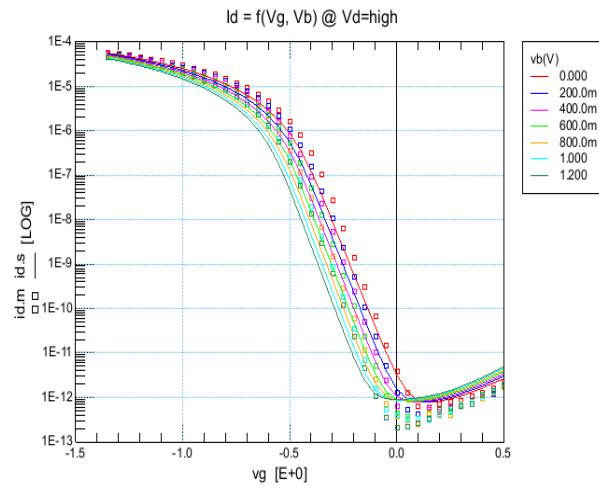
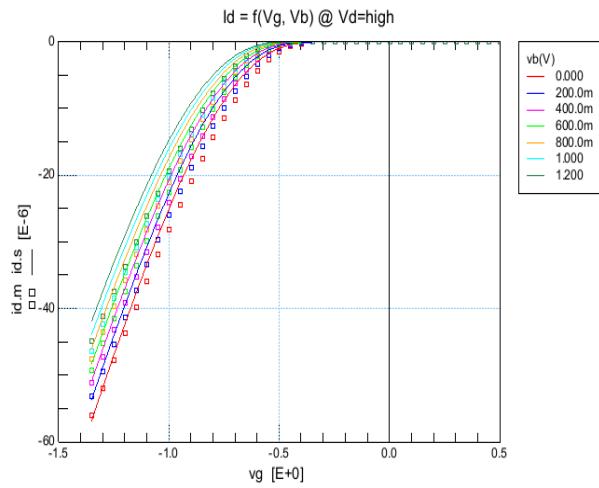
4.28 W0u15_L0u14_S554_4

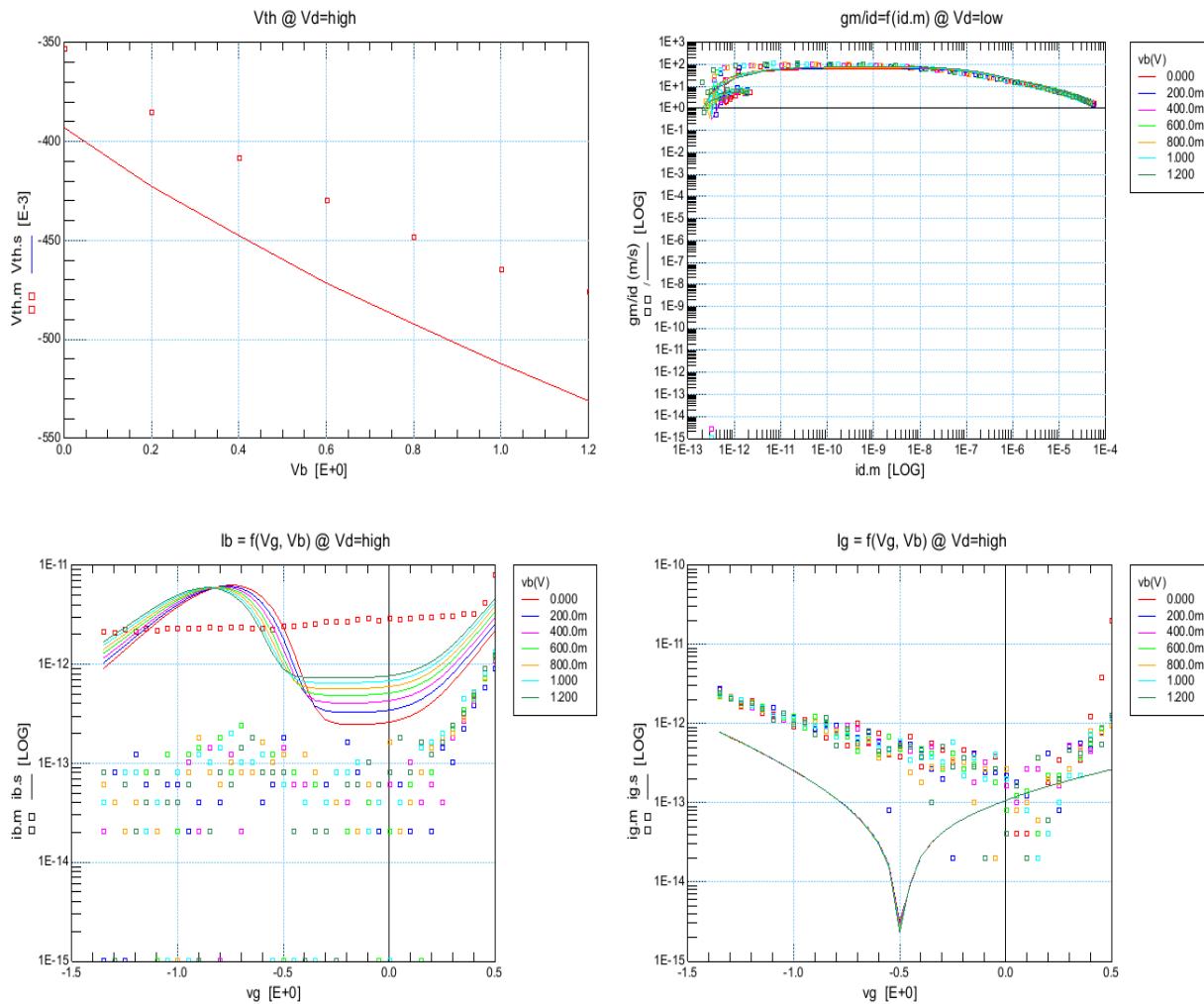
$idvg$, $Vd = -0.05V$, $T = 27^\circ C$



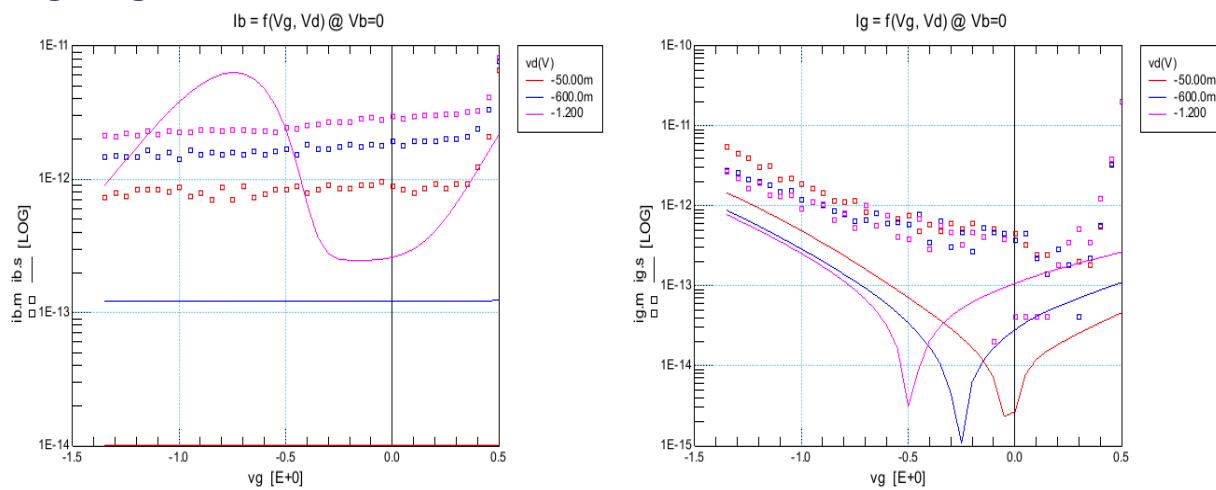


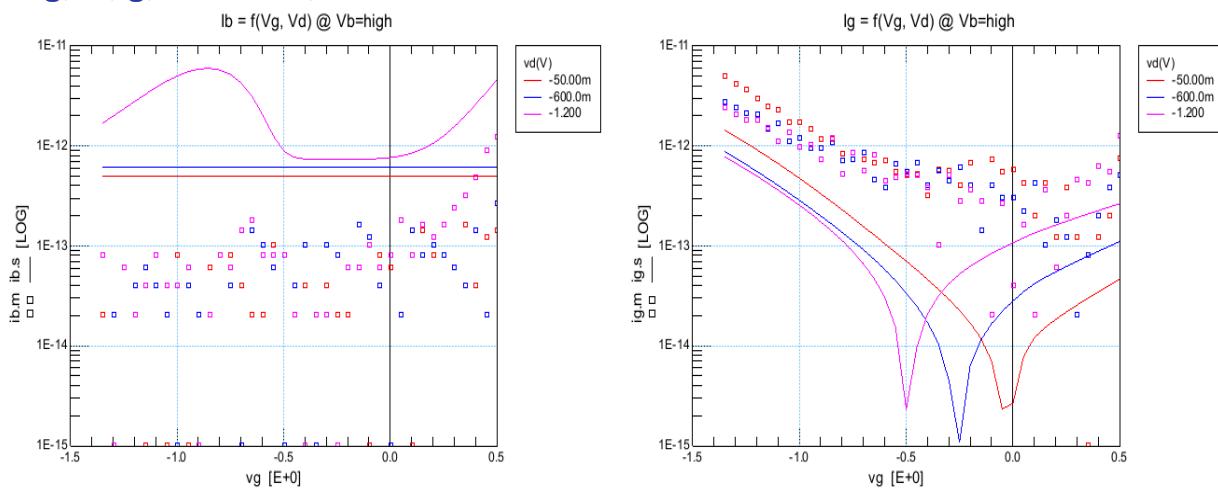
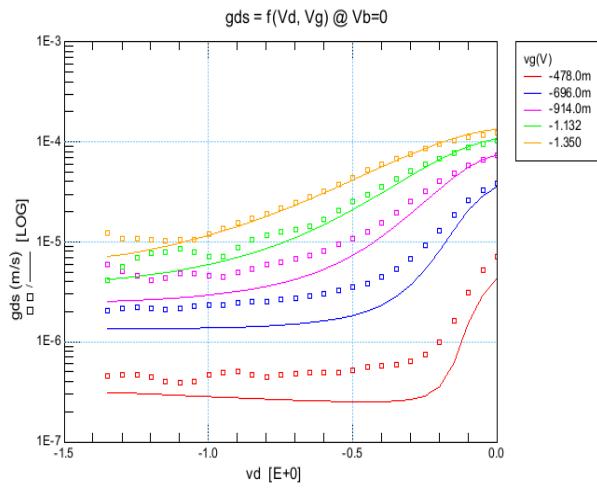
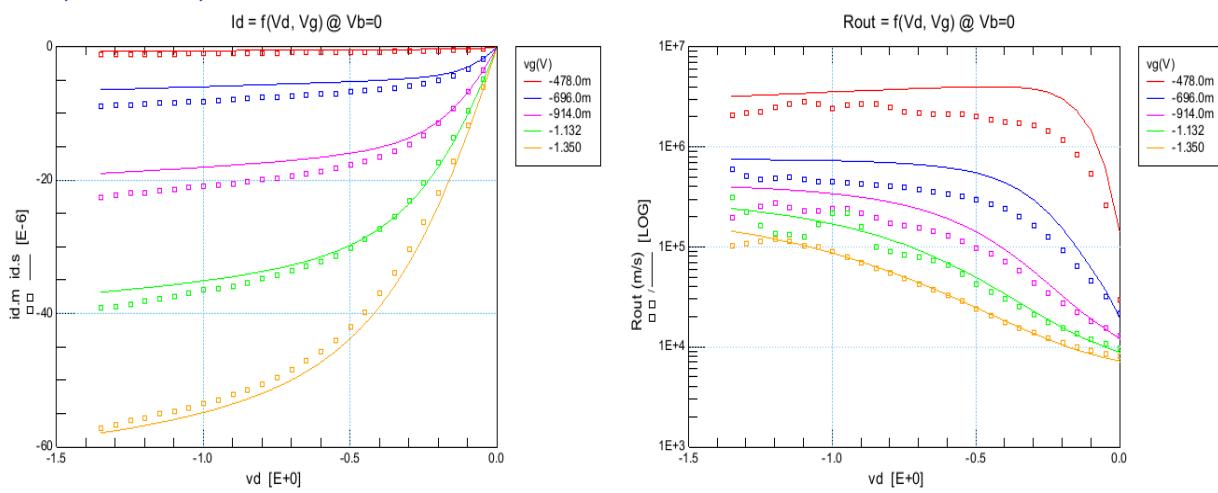
i_{dvg} , $V_d = -1.2V$, $T = 27^\circ C$

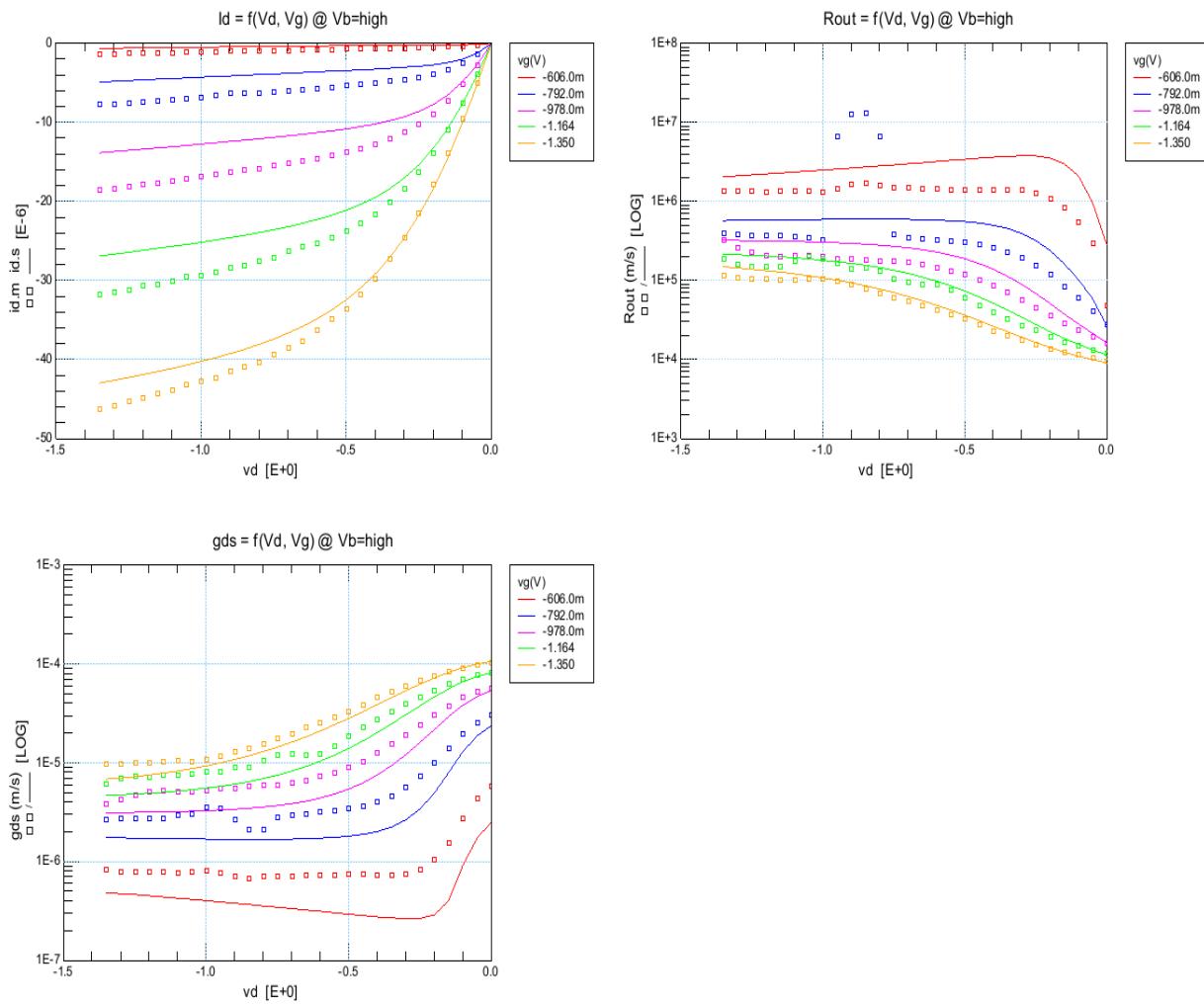
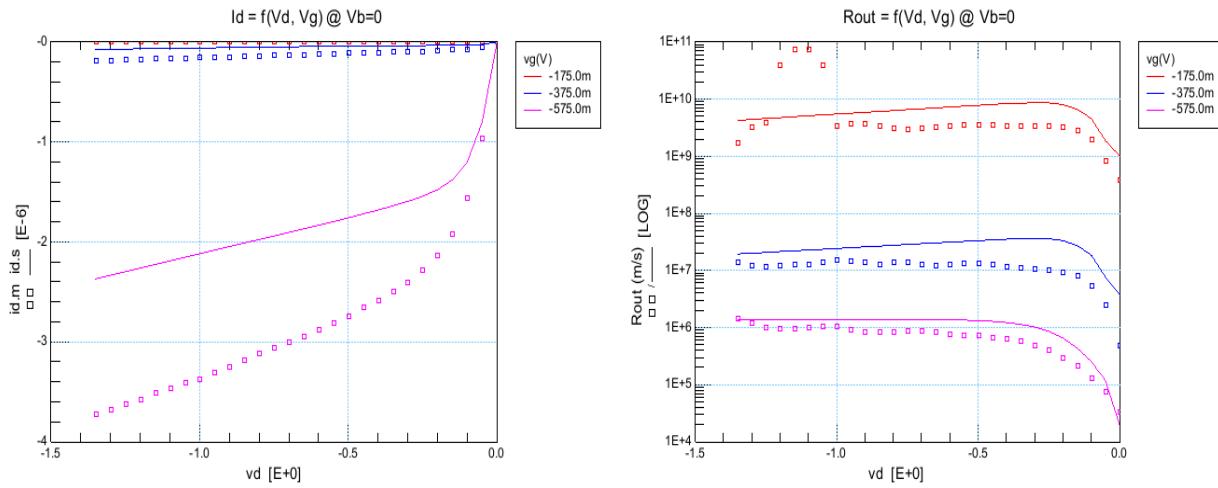


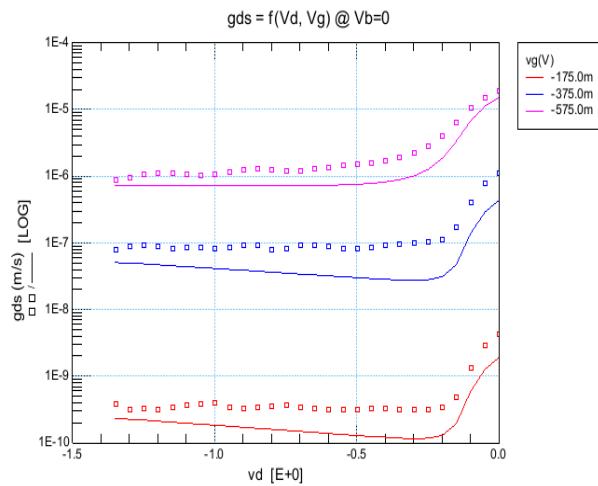


$i_{dvg}, I_b, I_g, V_b = 0V, T = 27^\circ C$

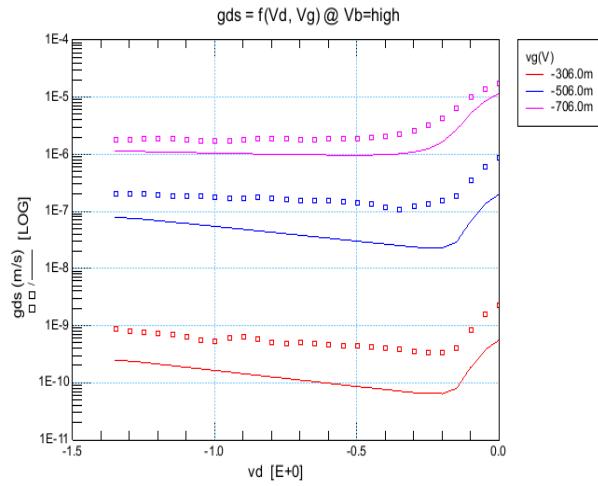
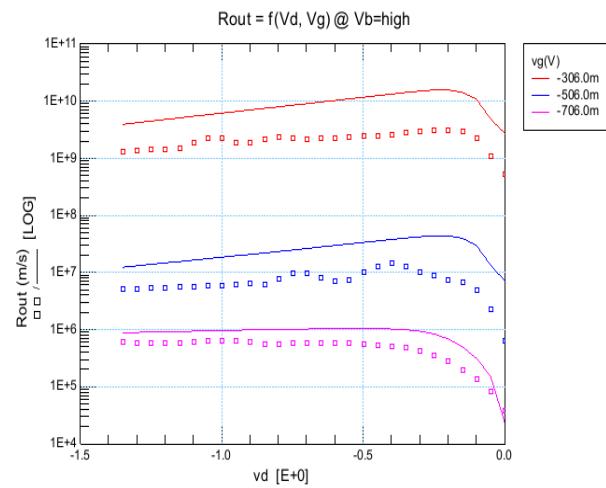
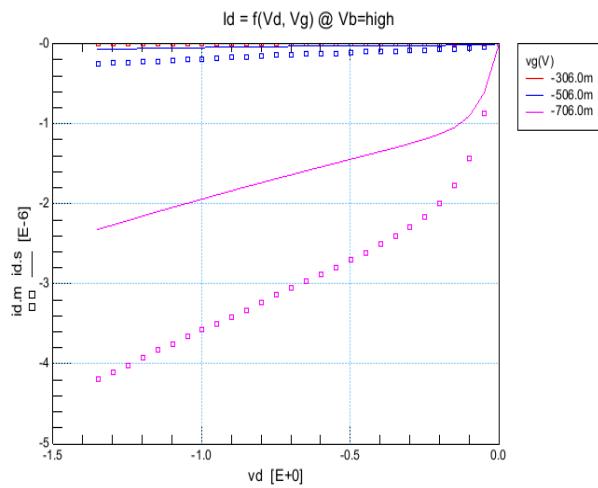


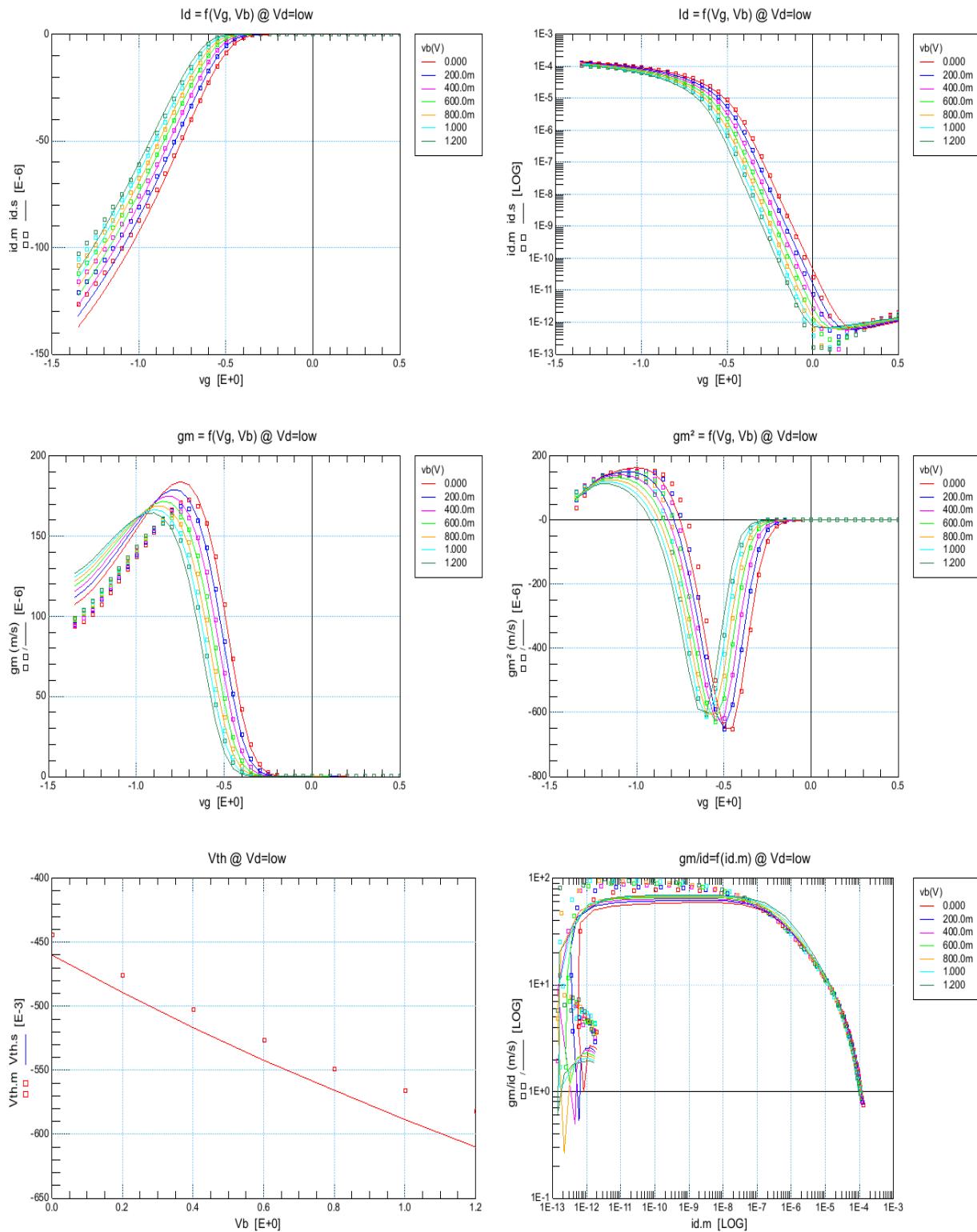
idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


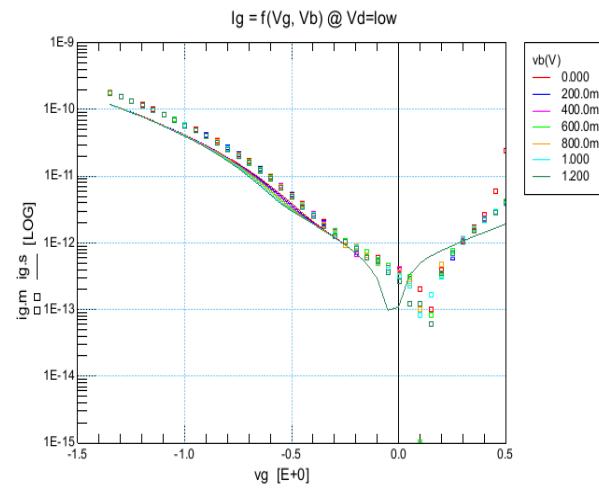
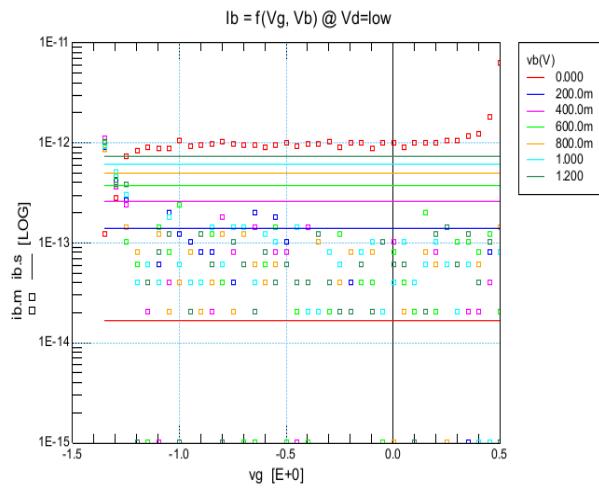
idvd_vbmin, Vb = 1.2V, T = 27°C**idvd_vth, Vb = 0V, T = 27°C**



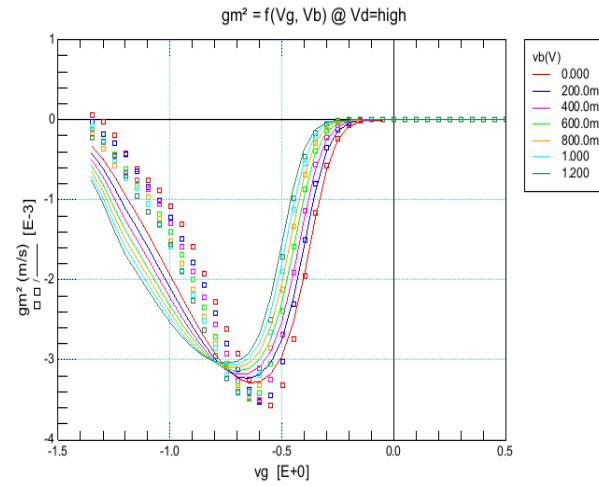
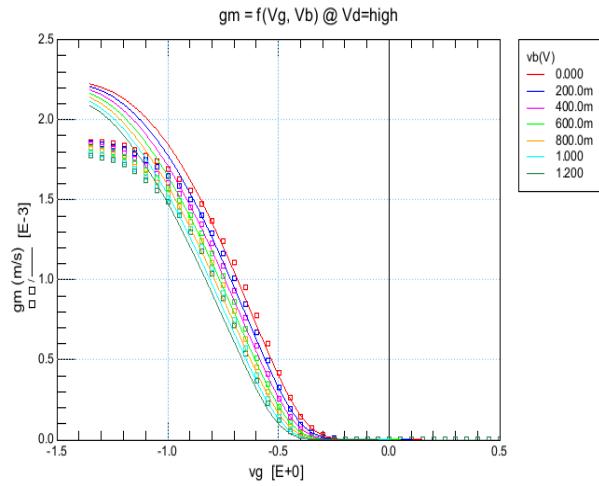
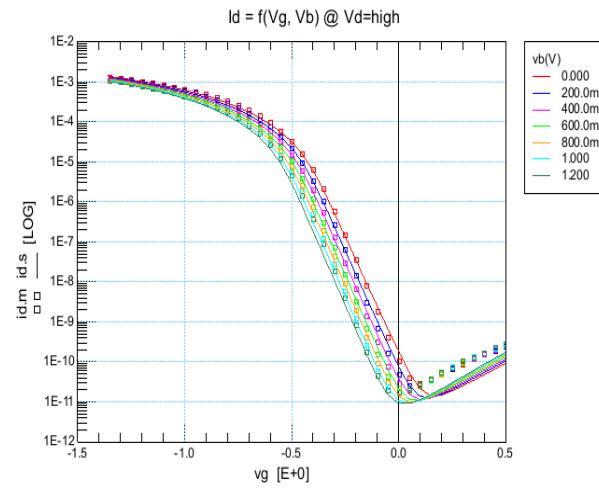
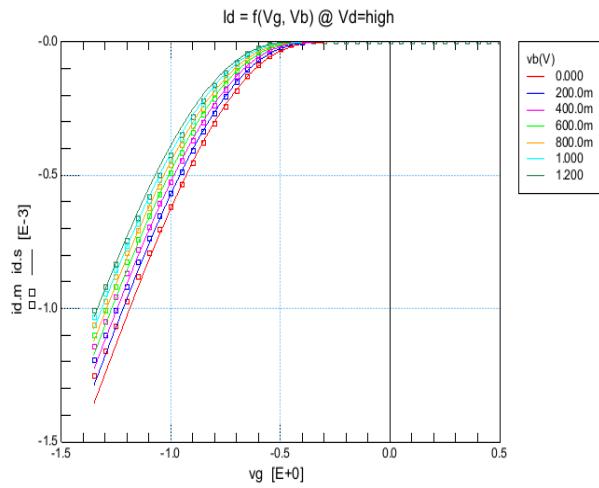
idvd_vth_vbmin, Vb = 1.2V, T = 27°C

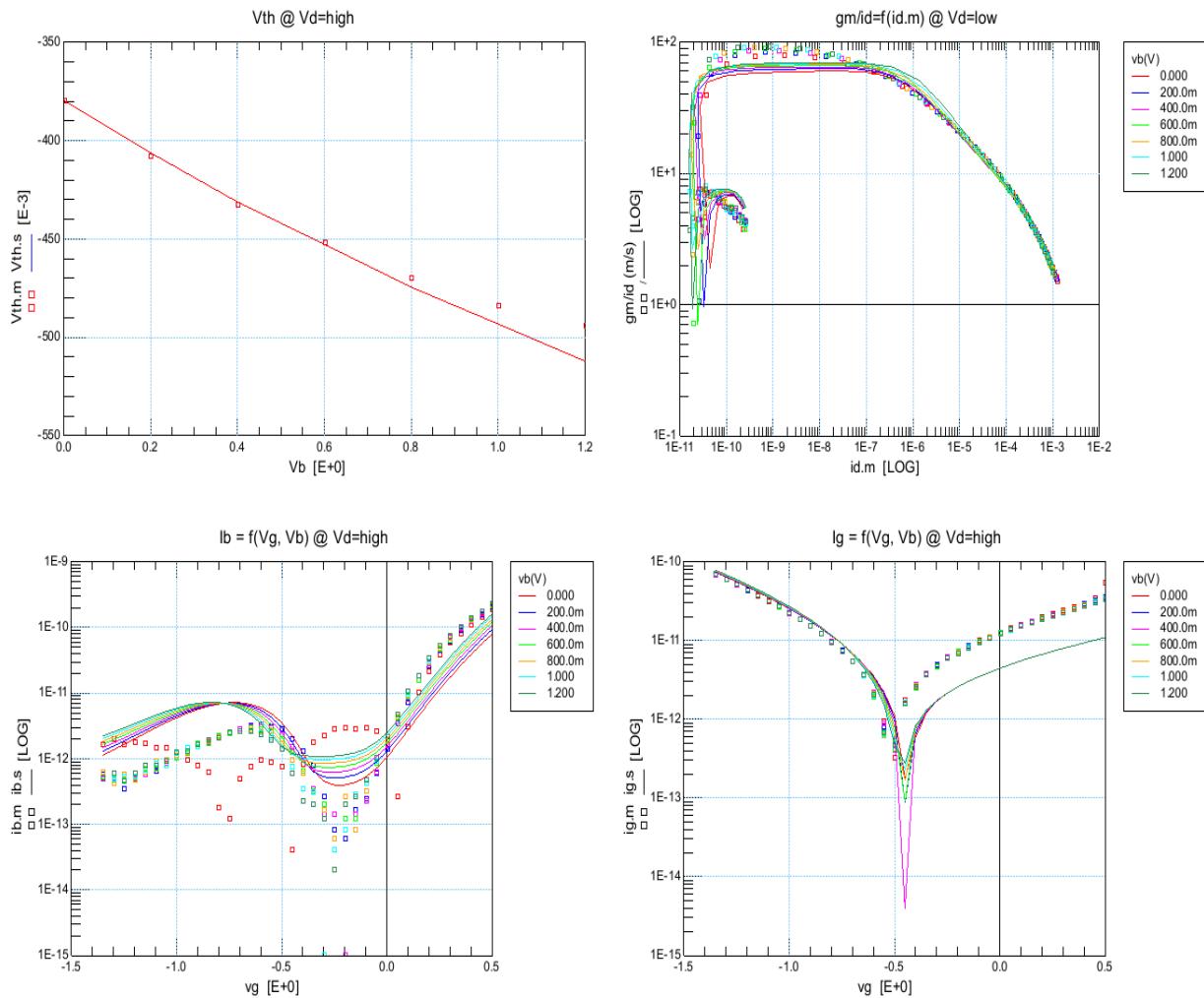


4.29 W05u0_L0u13_S550_1**idvg, Vd = -0.05V, T = 27°C**

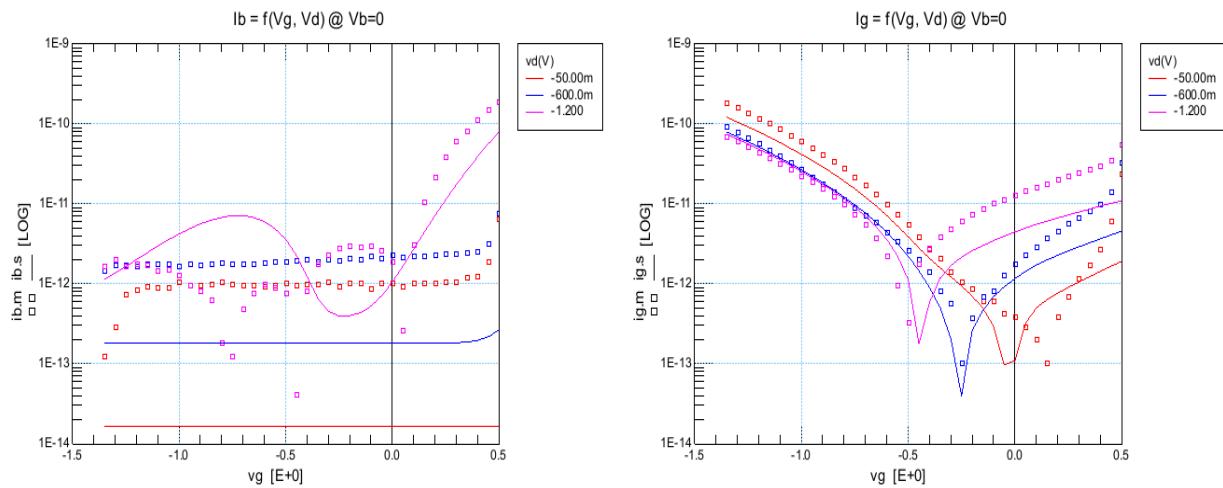


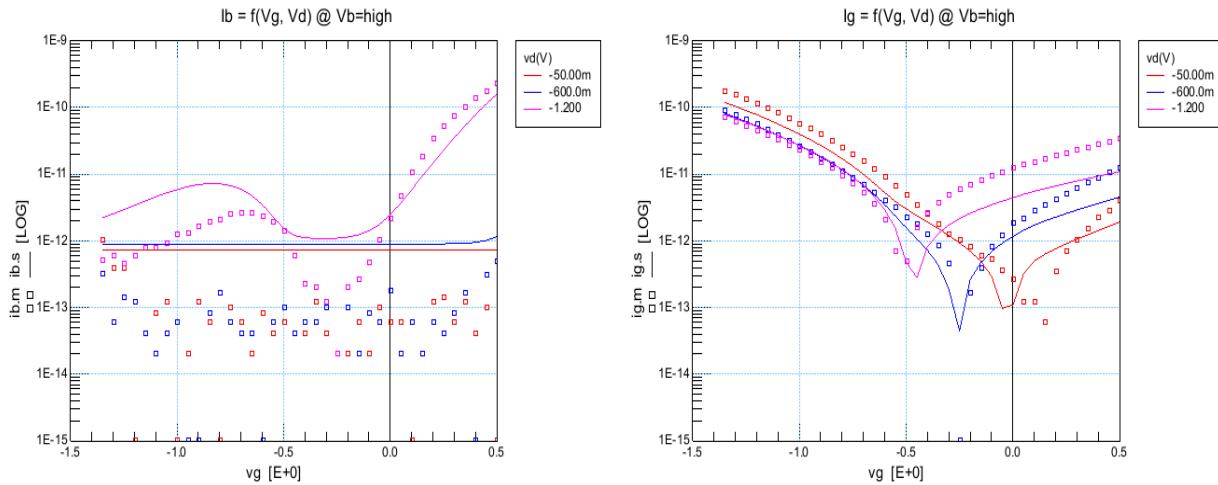
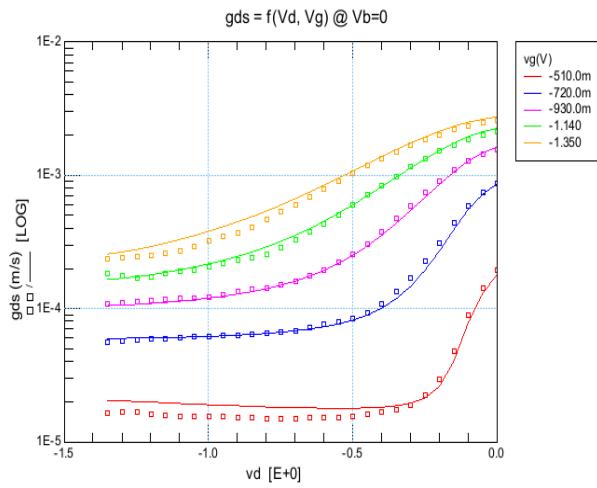
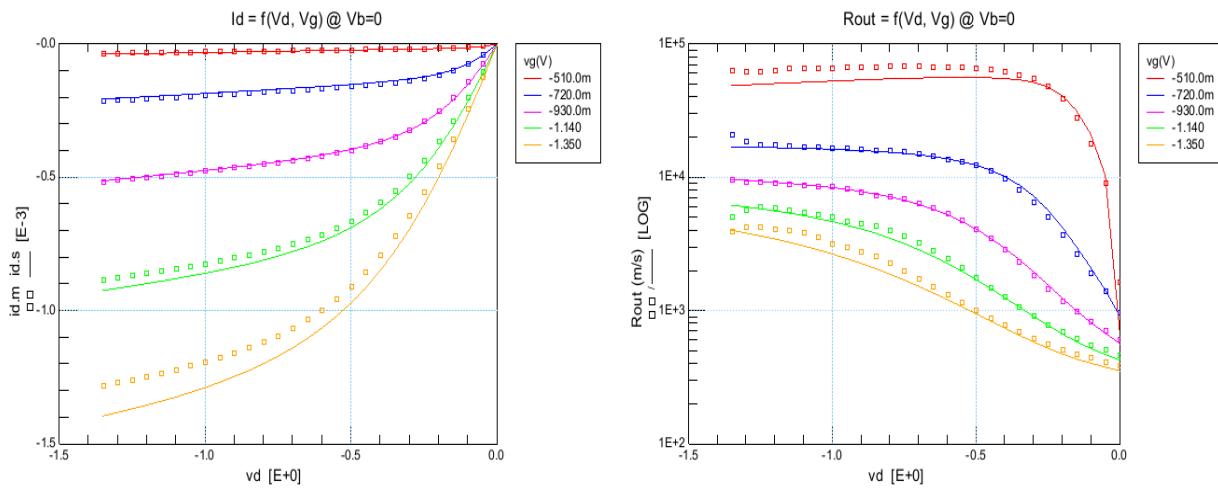
$i_{dvg}, V_d = -1.2V, T = 27^\circ C$

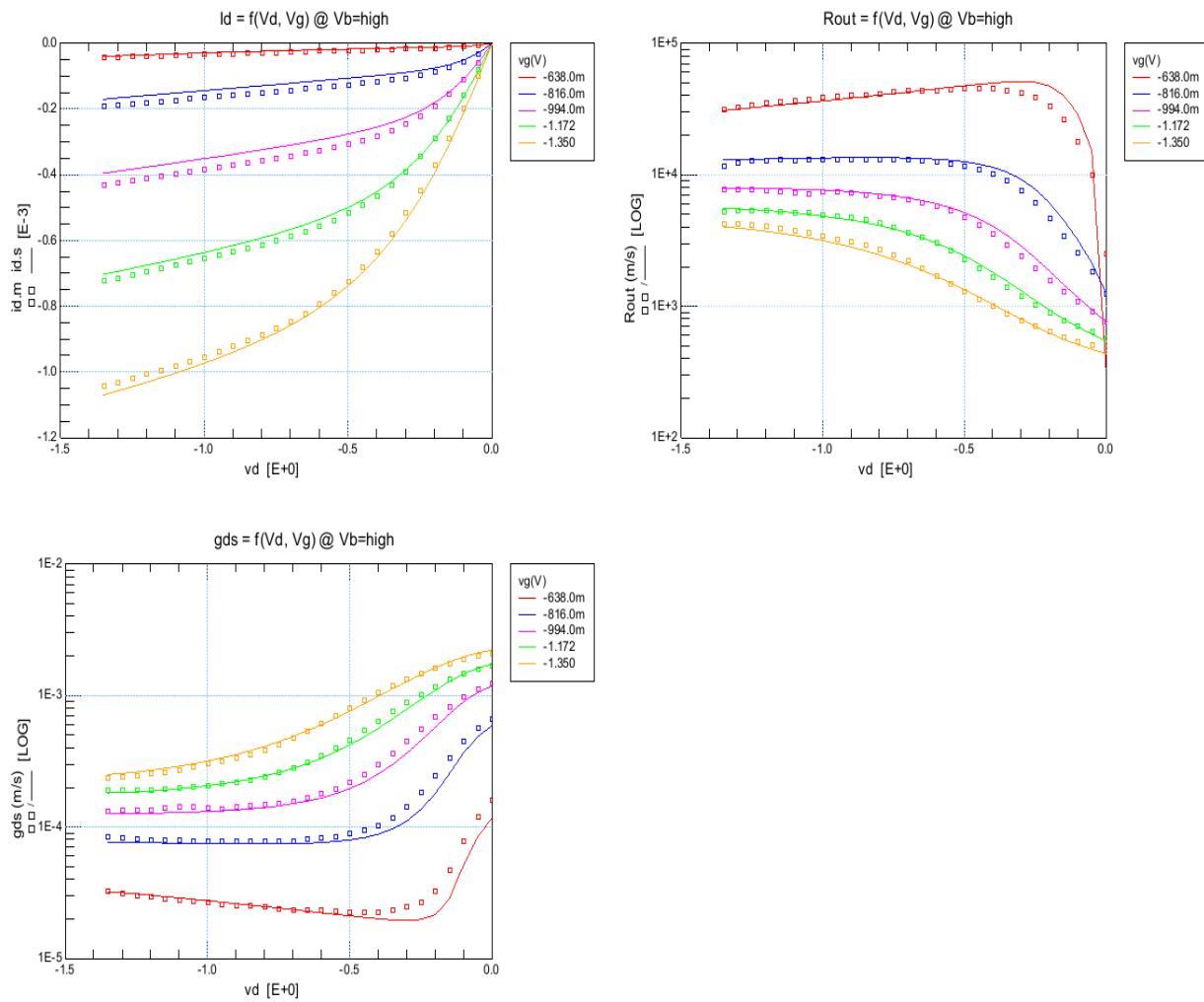
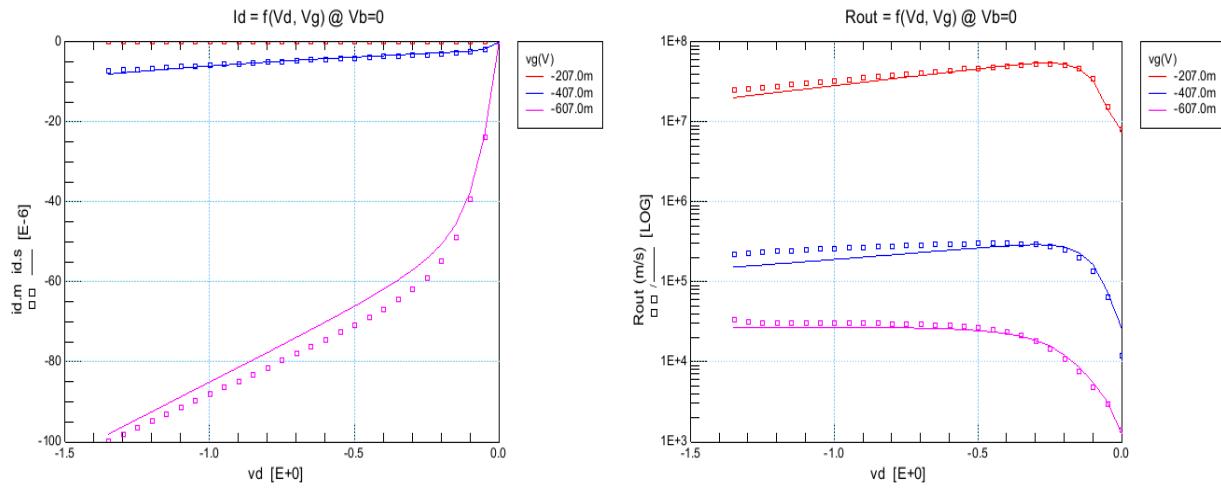


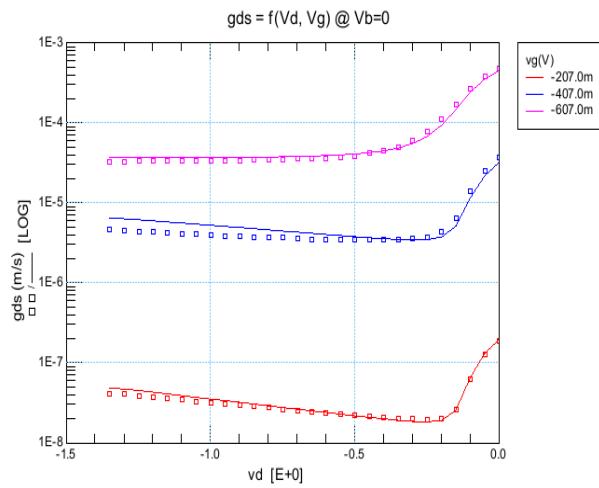


idvg, Ib,Ig, Vb = 0V, T = 27°C

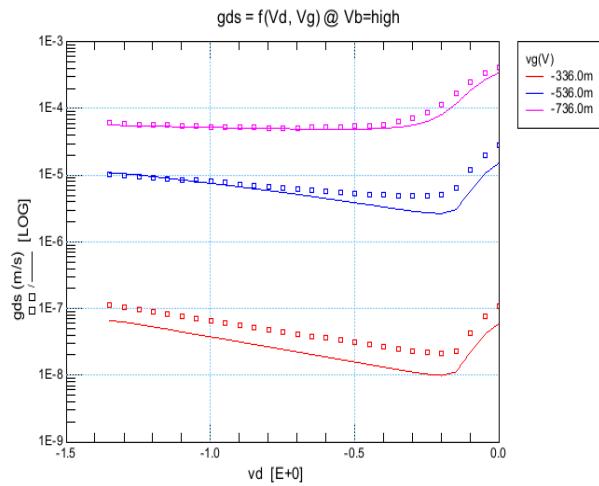
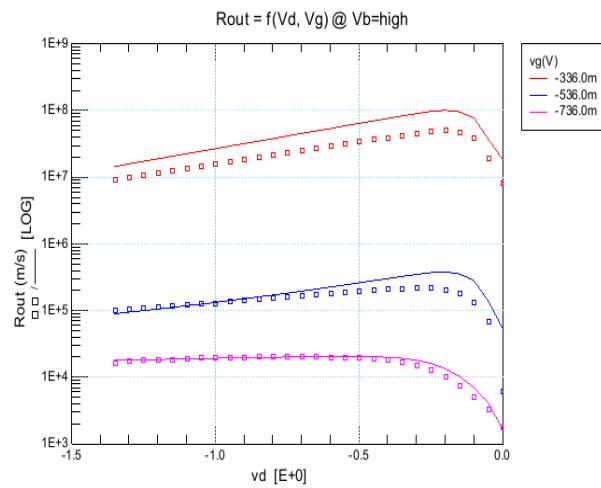
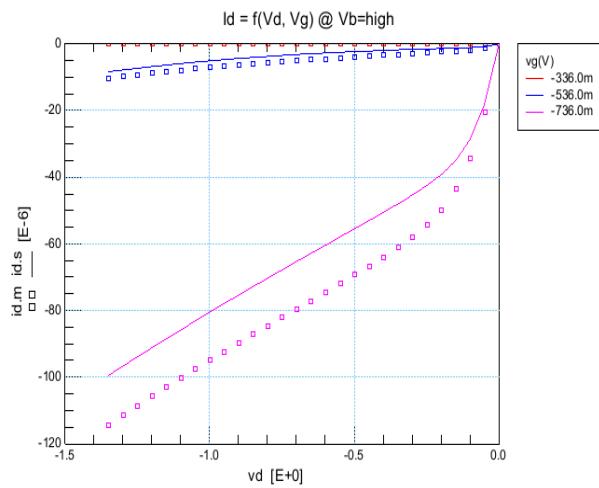


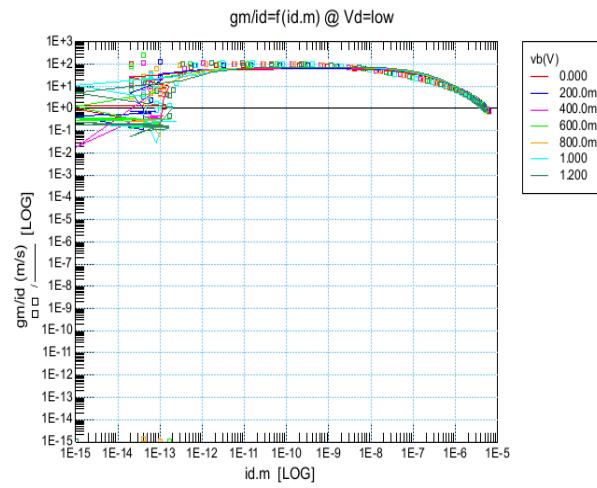
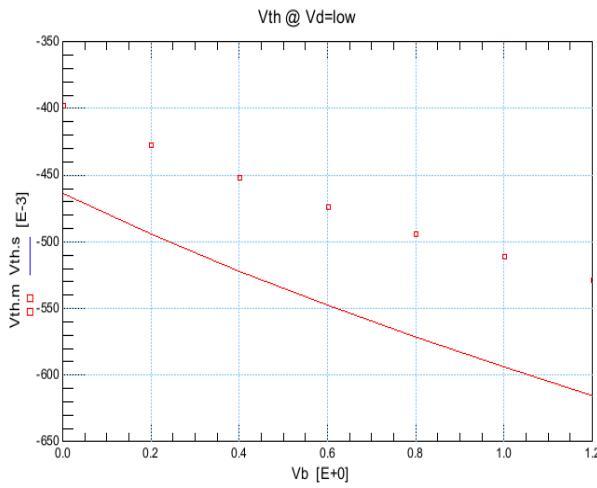
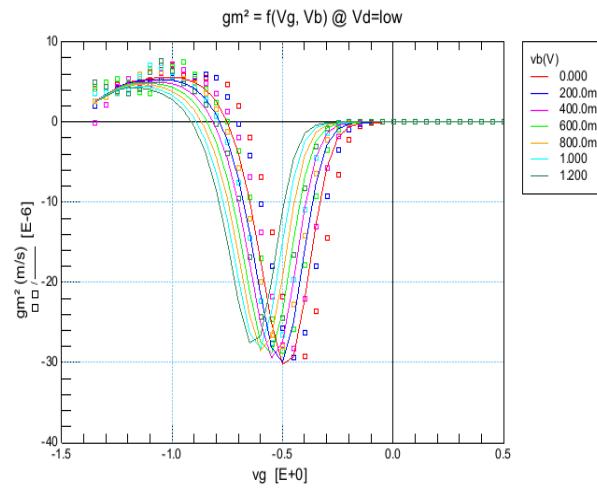
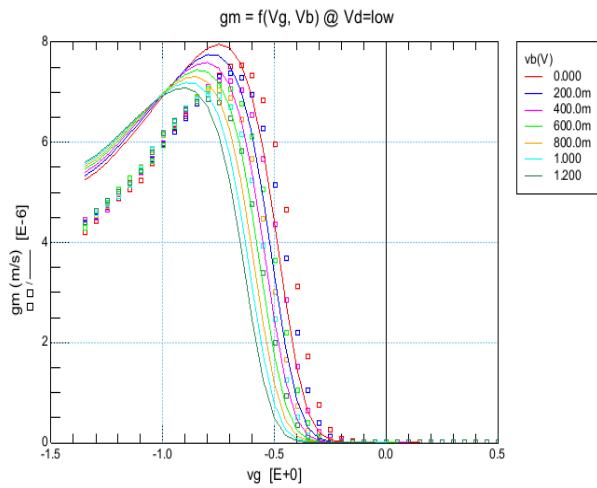
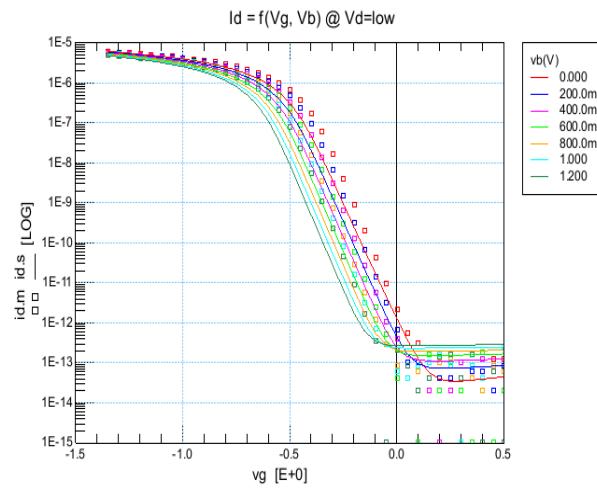
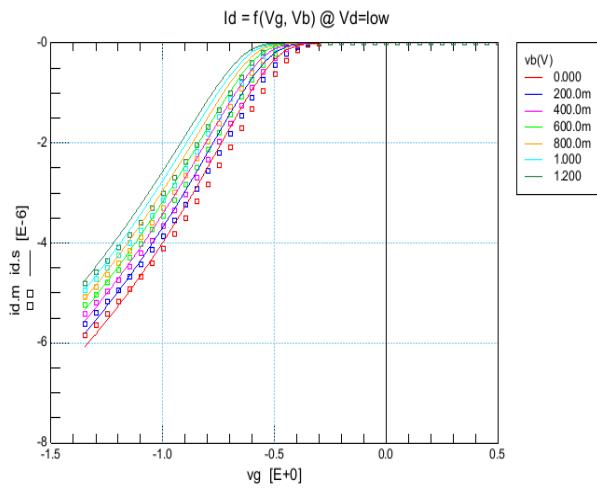
idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


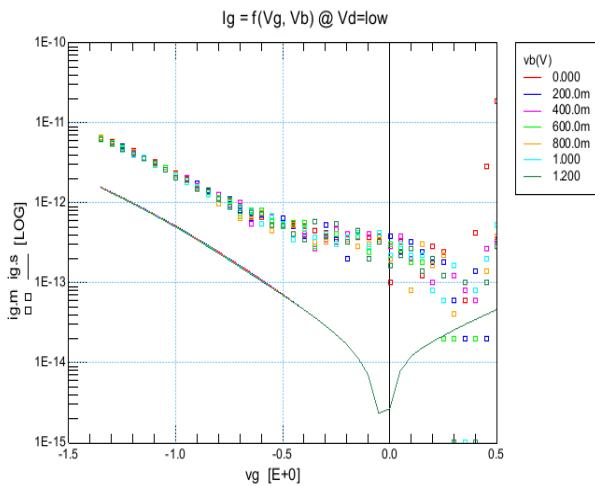
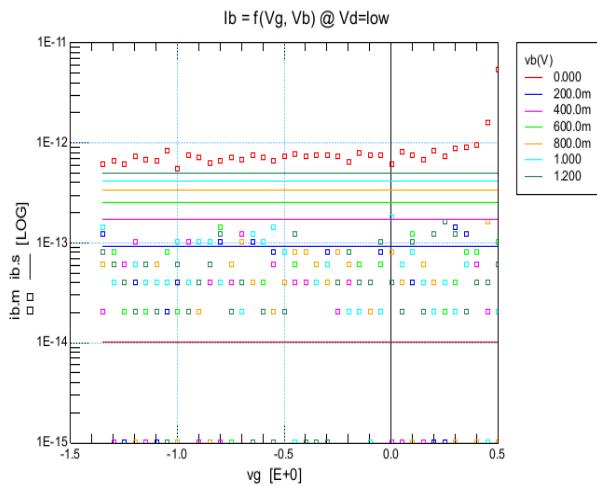
idvd_vbmin, Vb = 1.2V, T = 27°C**idvd_vth, Vb = 0V, T = 27°C**



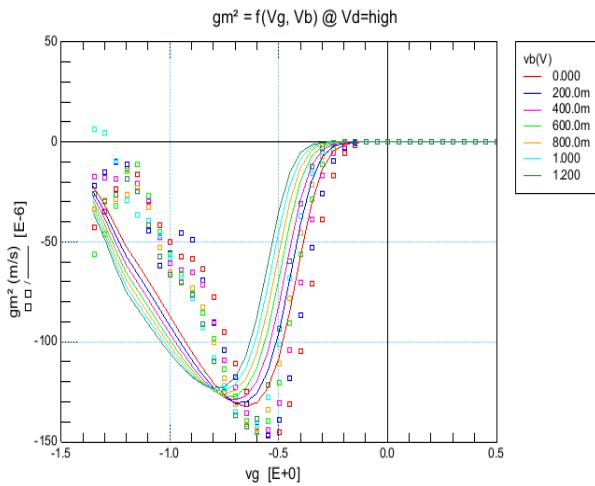
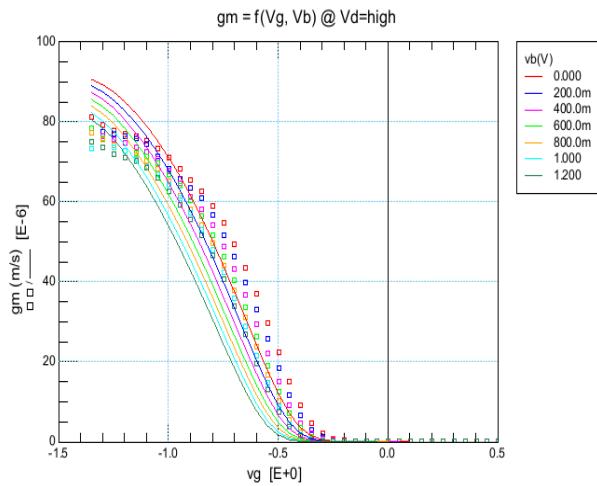
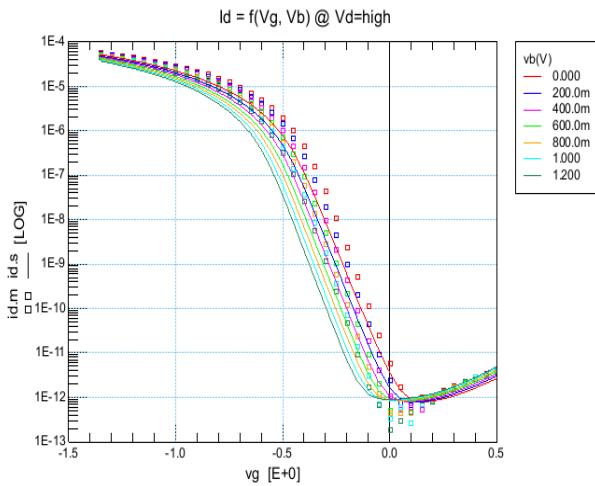
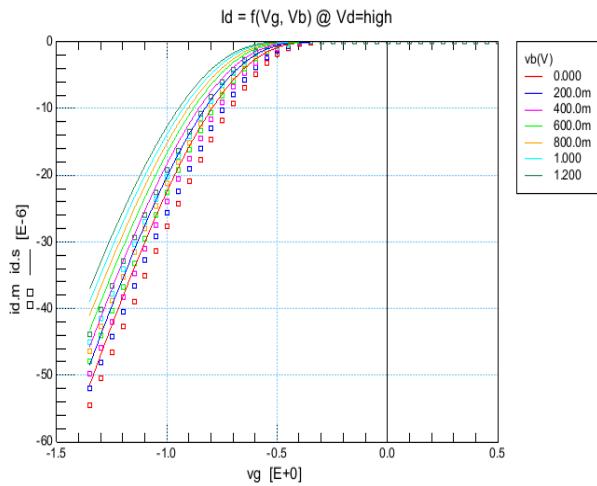
idvd_vth_vbmin, Vb = 1.2V, T = 27°C

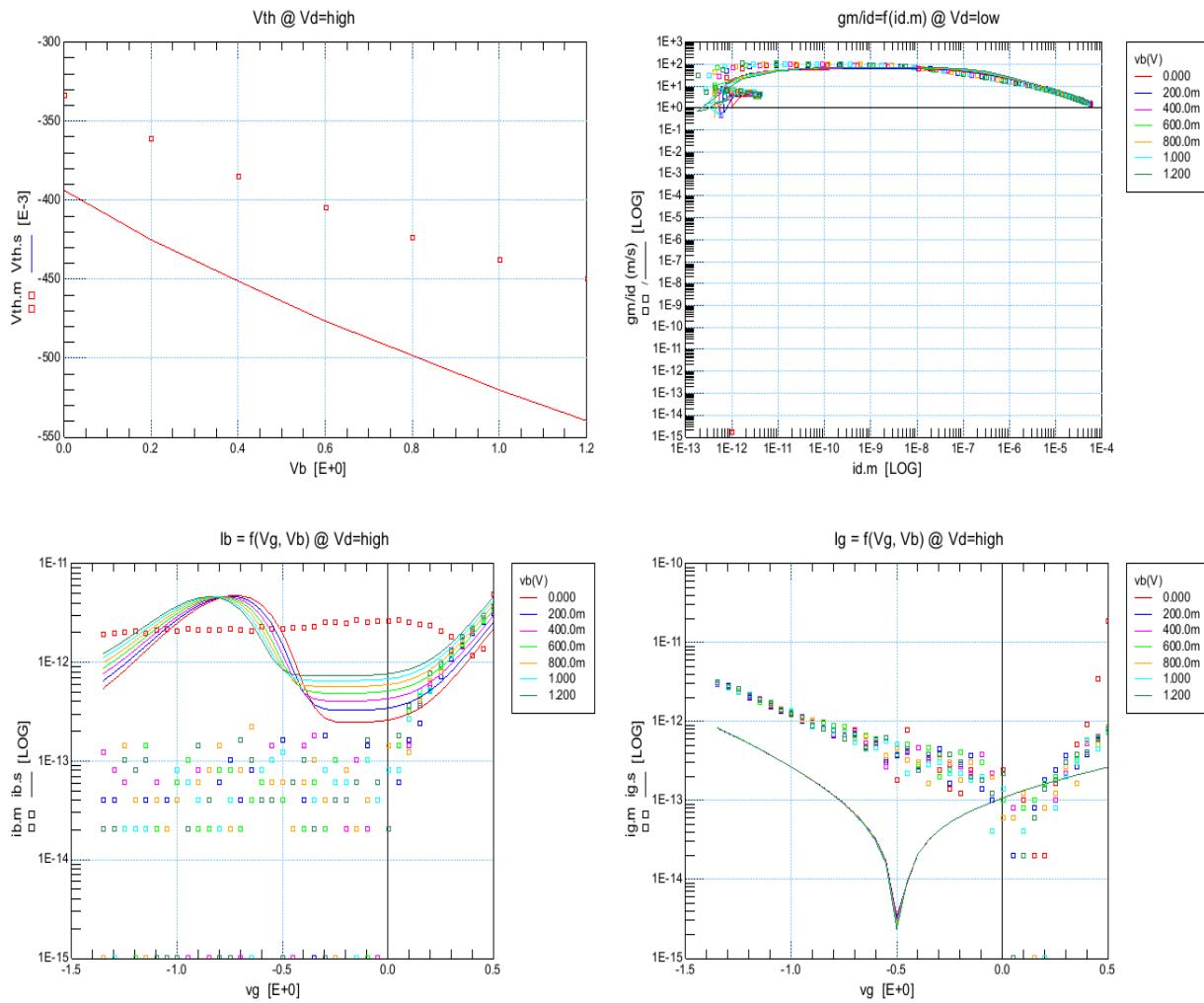


4.30 W0u15_L0u15_S554_5**idvg, Vd = -0.05V, T = 27°C**

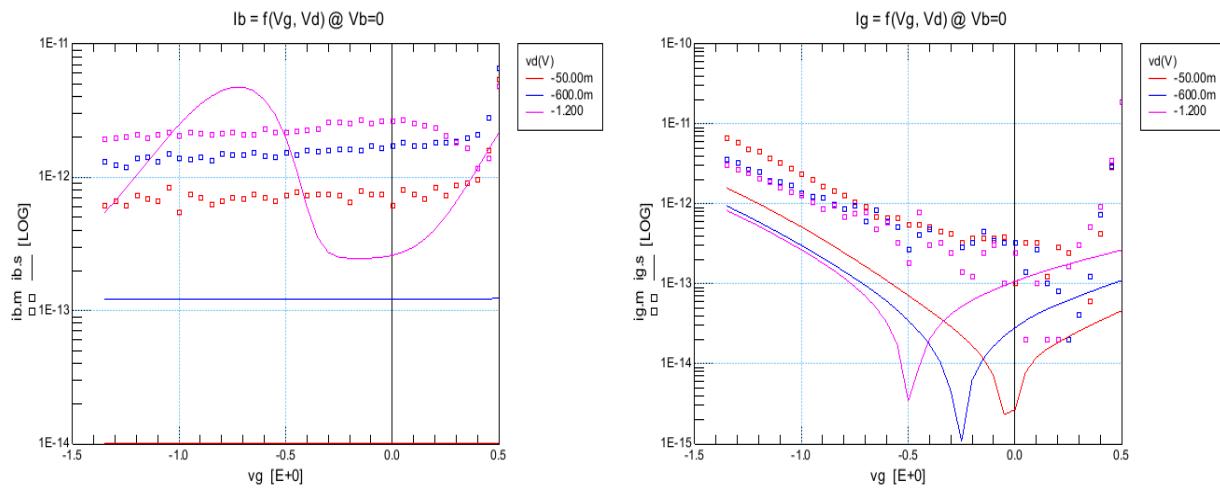


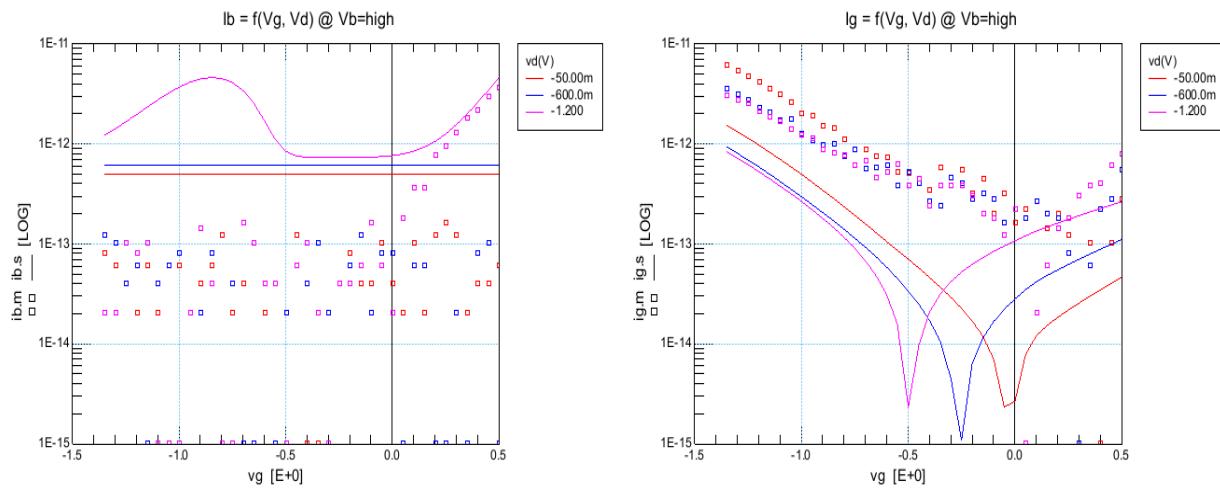
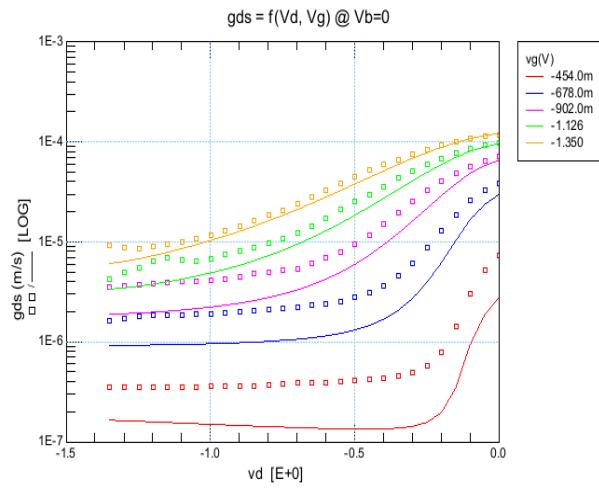
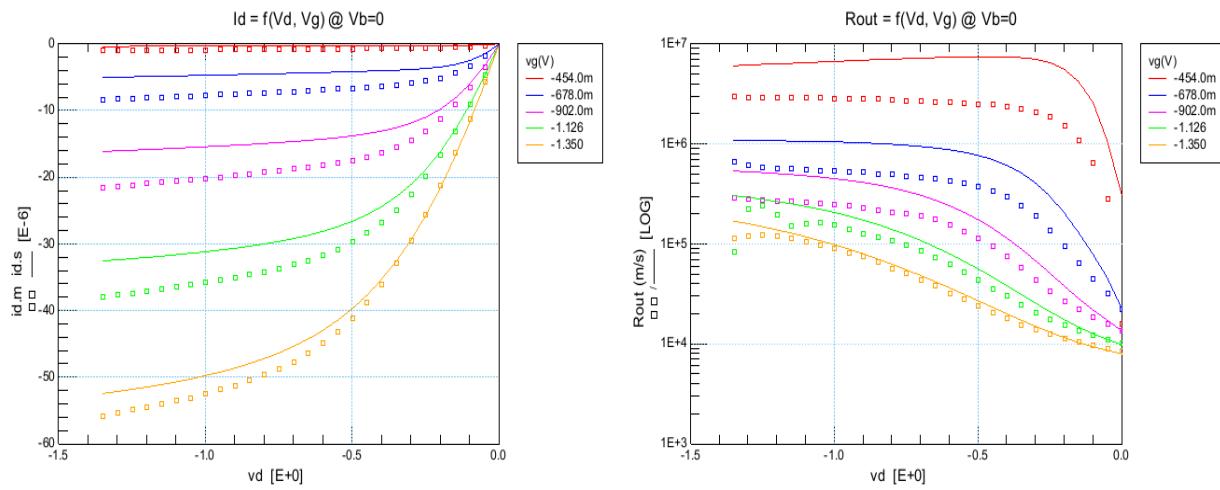
$i_{dvg}, V_d = -1.2V, T = 27^\circ\text{C}$

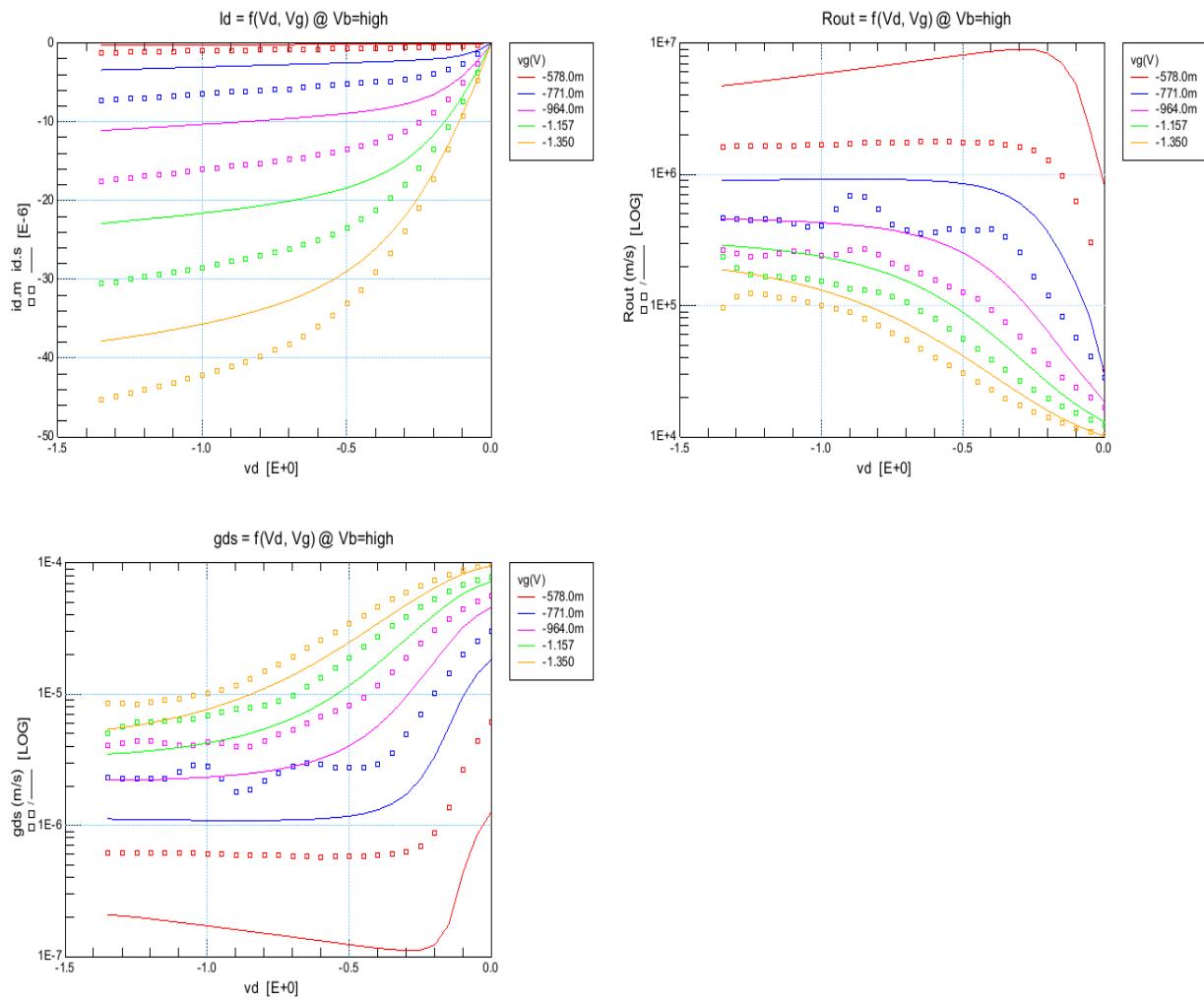
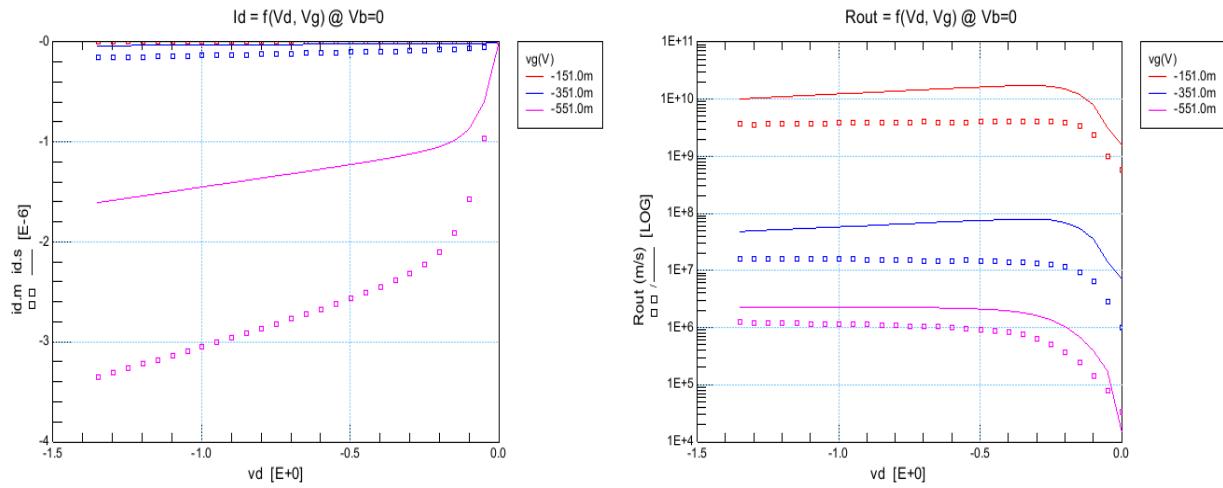


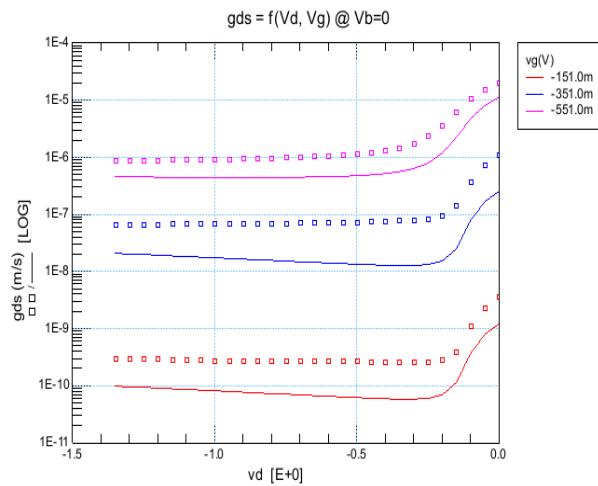


idvg, Ib,Ig, Vb = 0V, T = 27°C

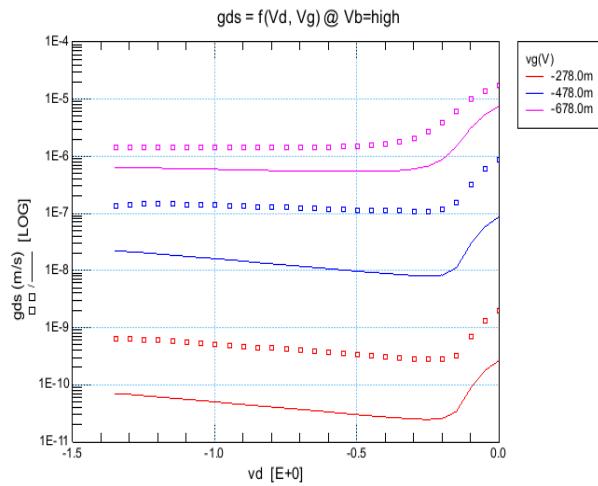
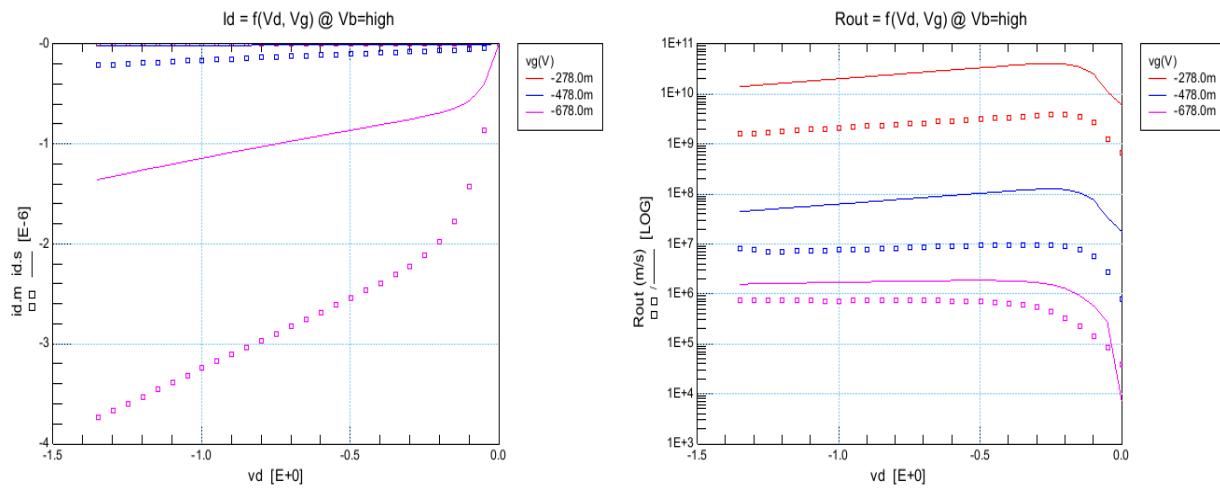


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C


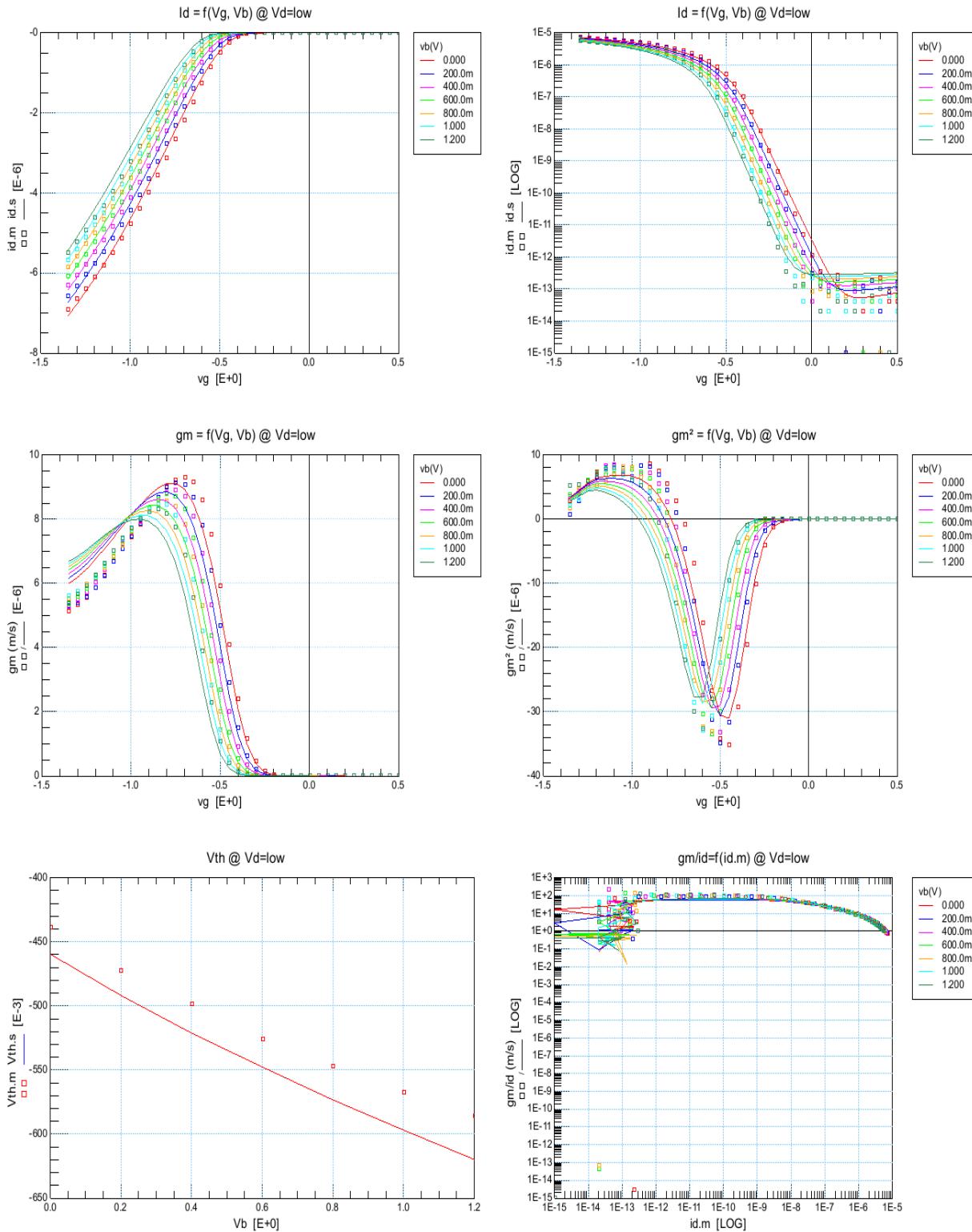


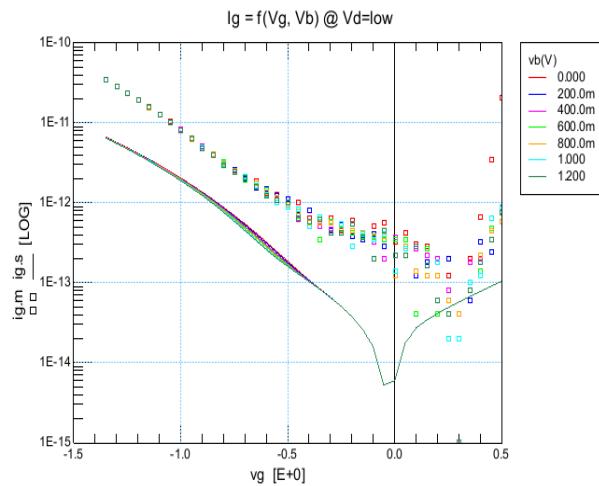
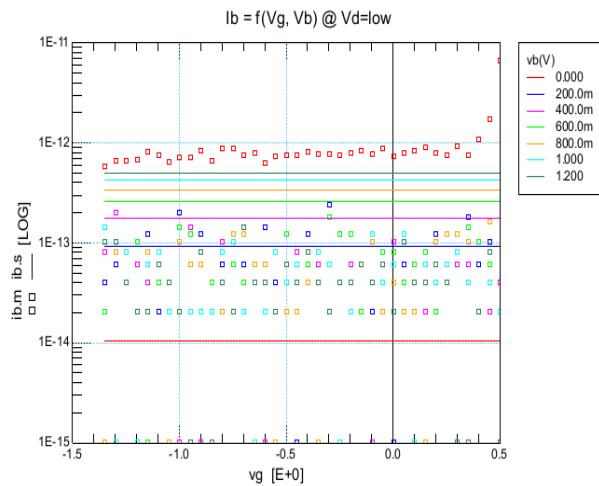
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



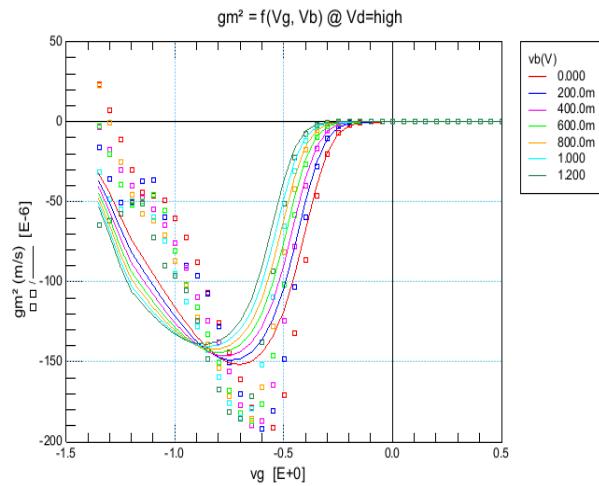
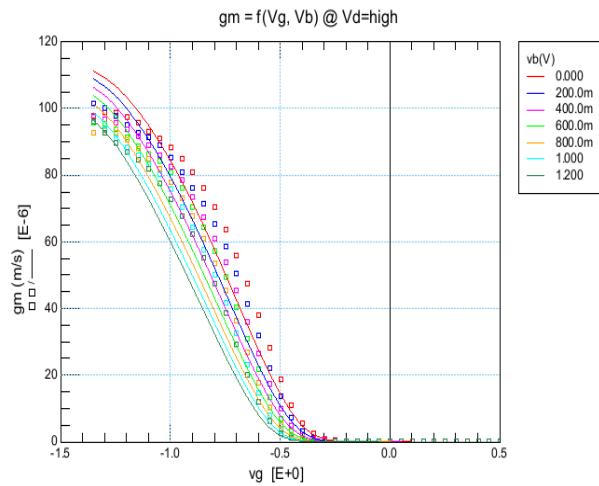
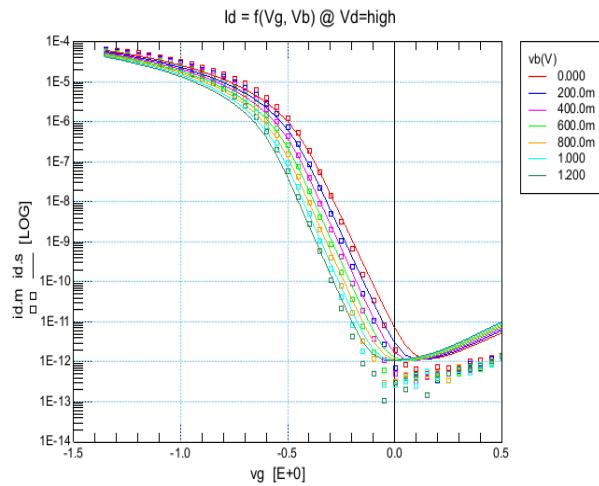
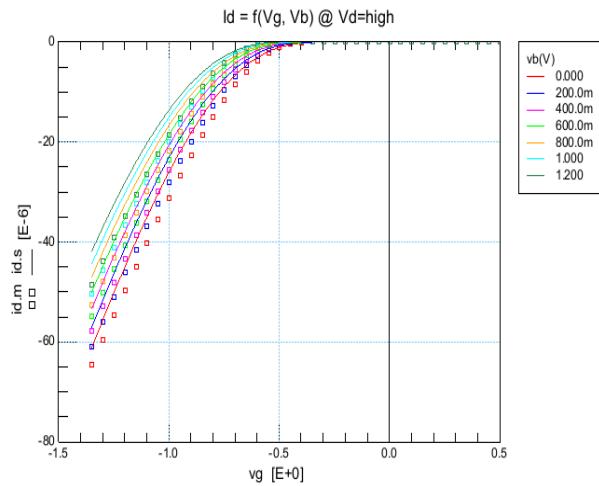
4.31 W0u3_L0u18_S552_5

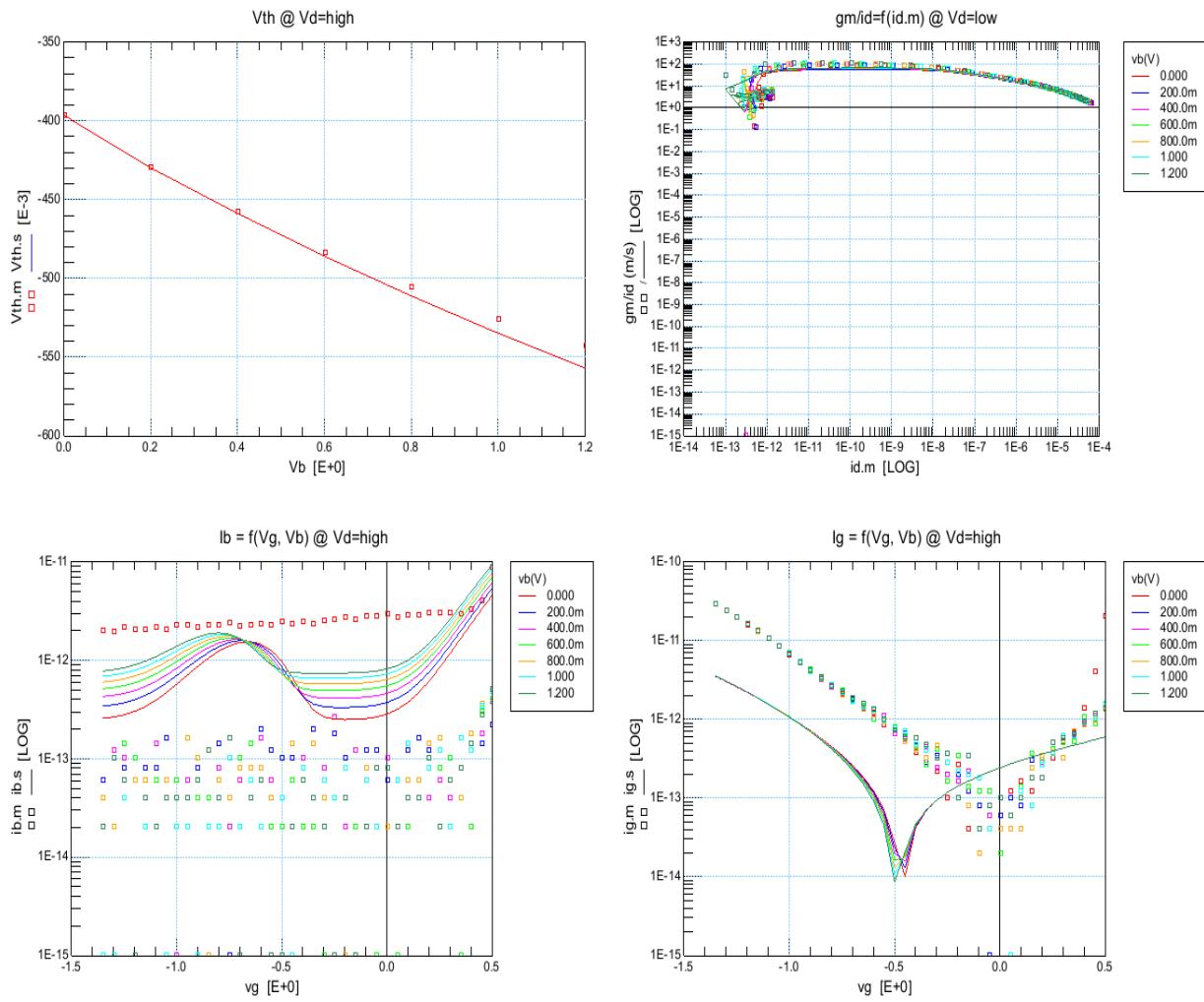
$idvg$, $Vd = -0.05V$, $T = 27^\circ C$



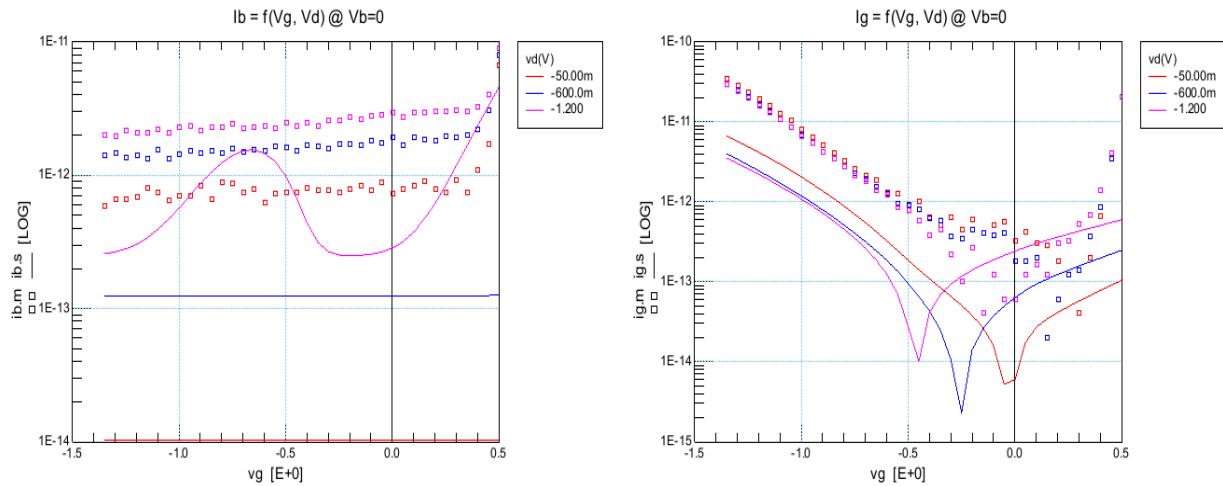


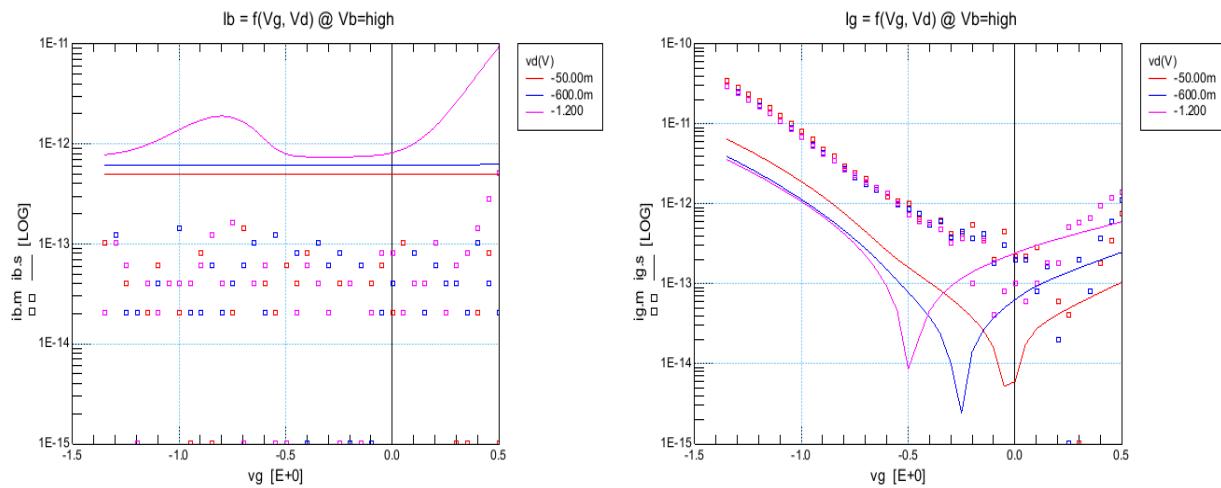
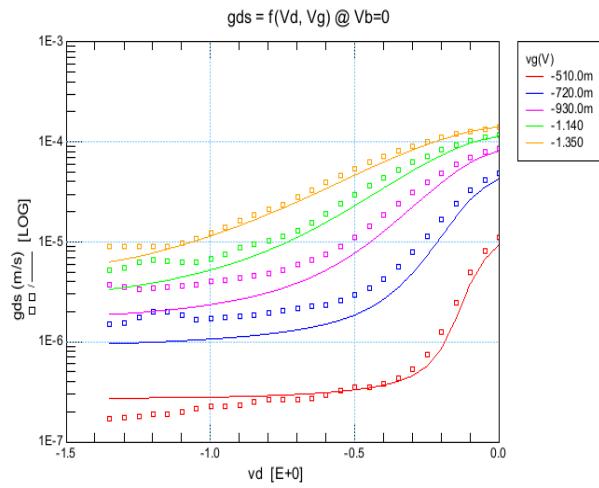
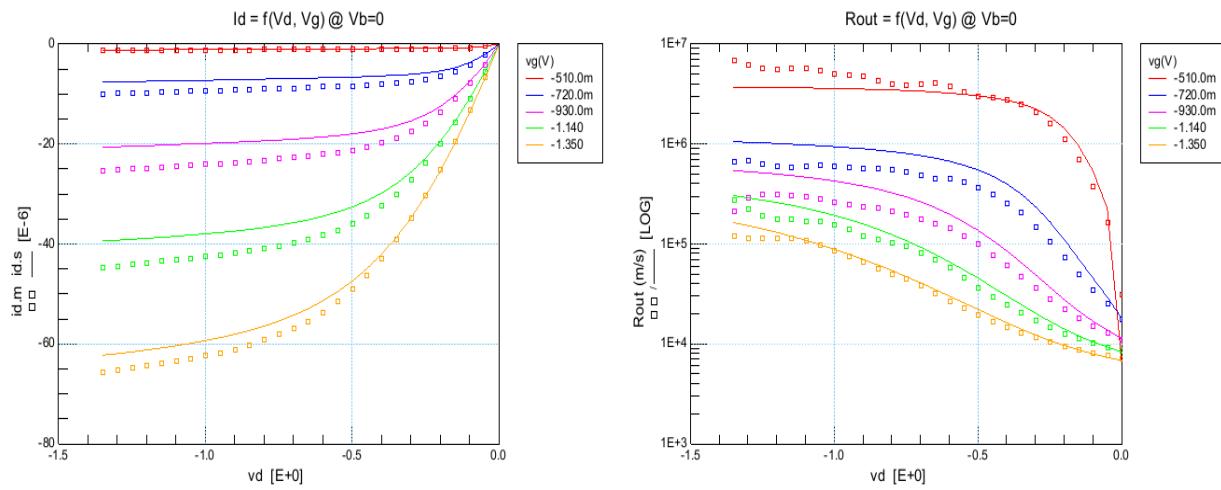
$i_{dvg}, V_d = -1.2V, T = 27^\circ C$

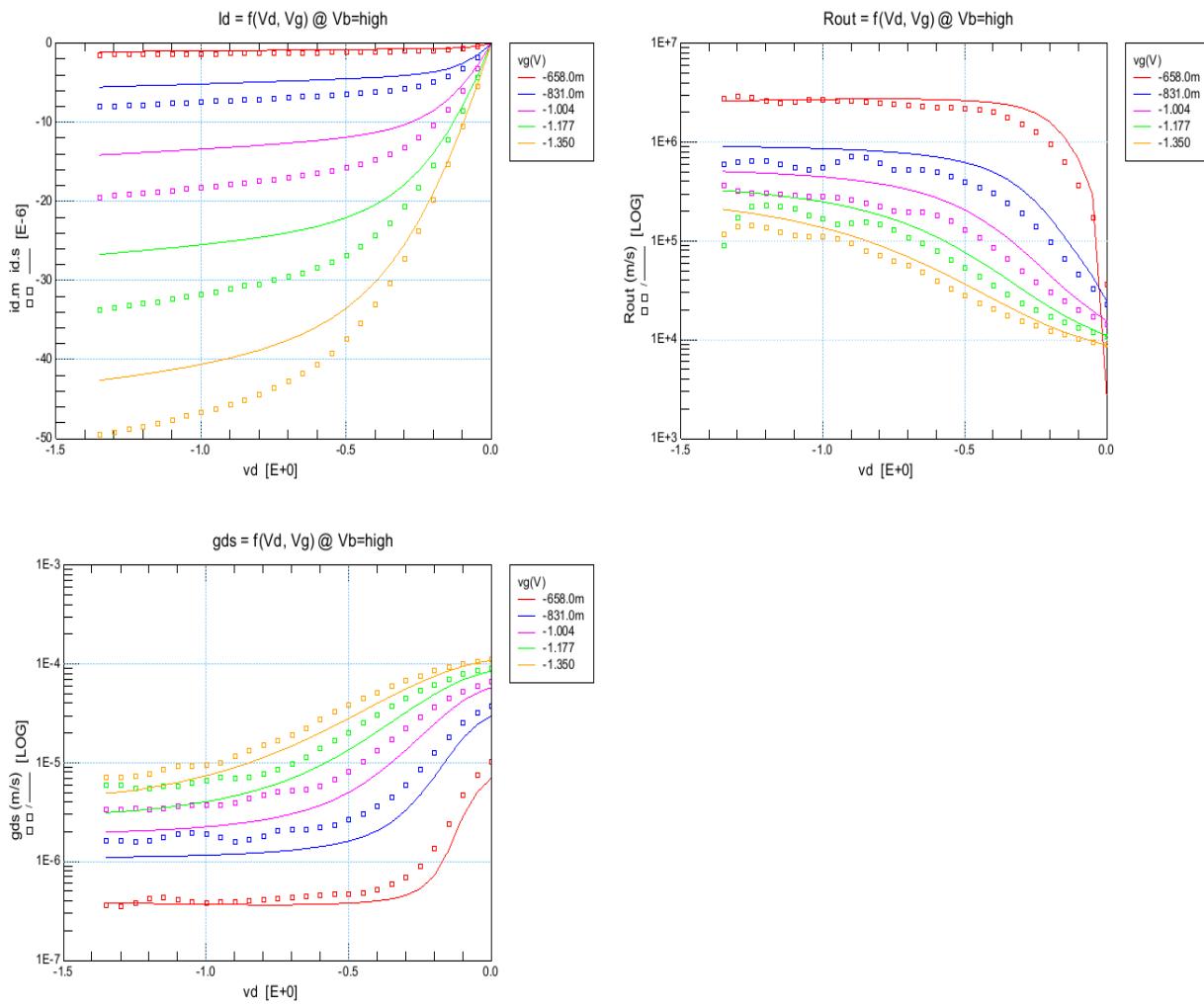
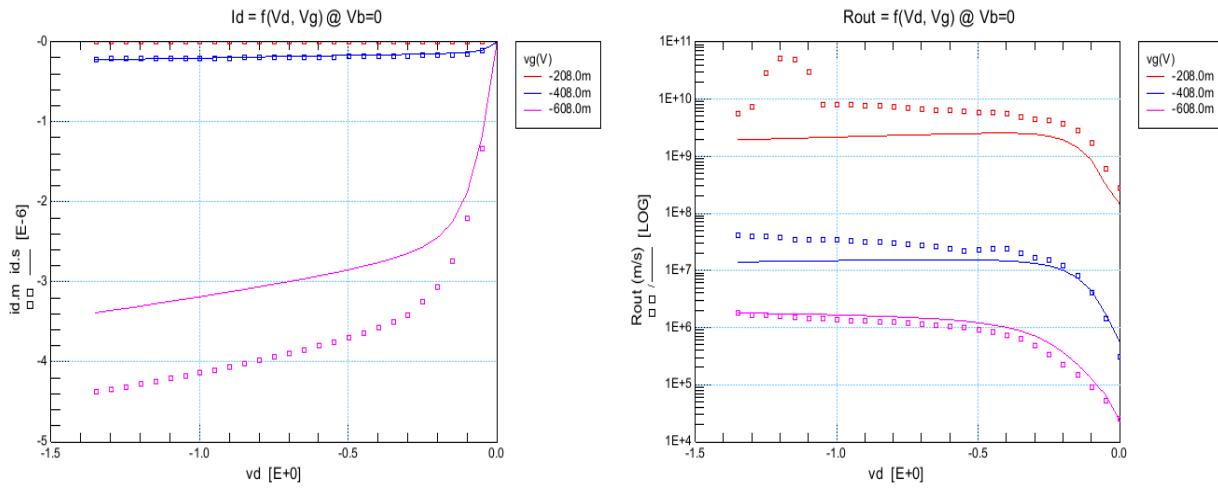


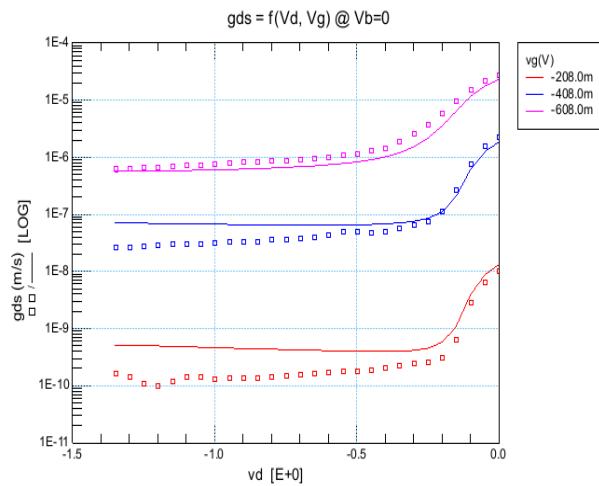


idvg, Ib, Ig, Vb = 0V, T = 27°C

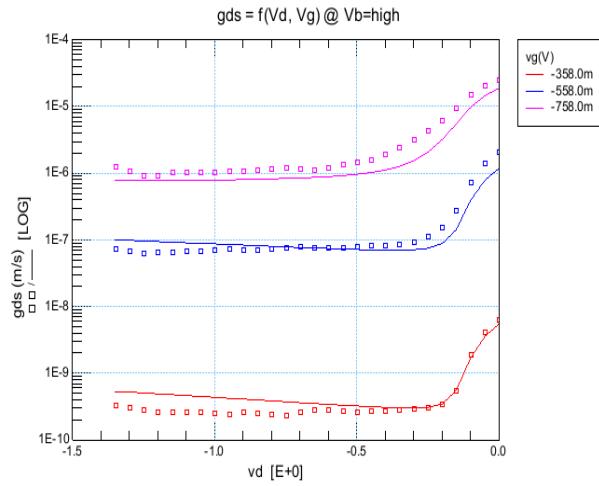
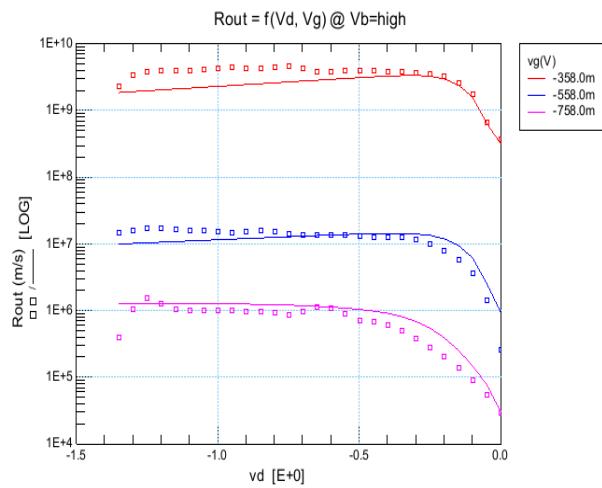
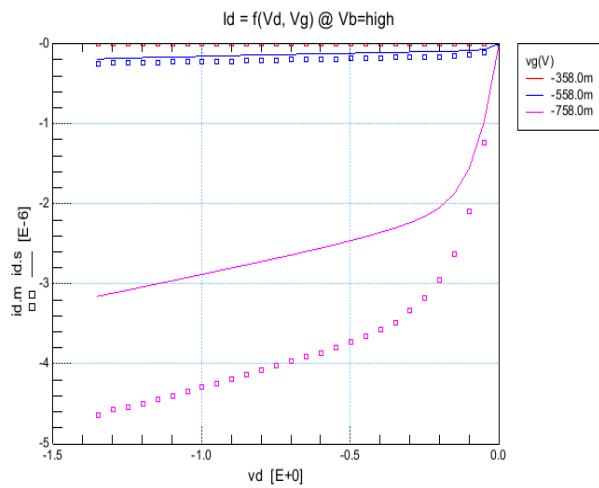


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C**idvd_vth, Vb = 0V, T = 27°C**

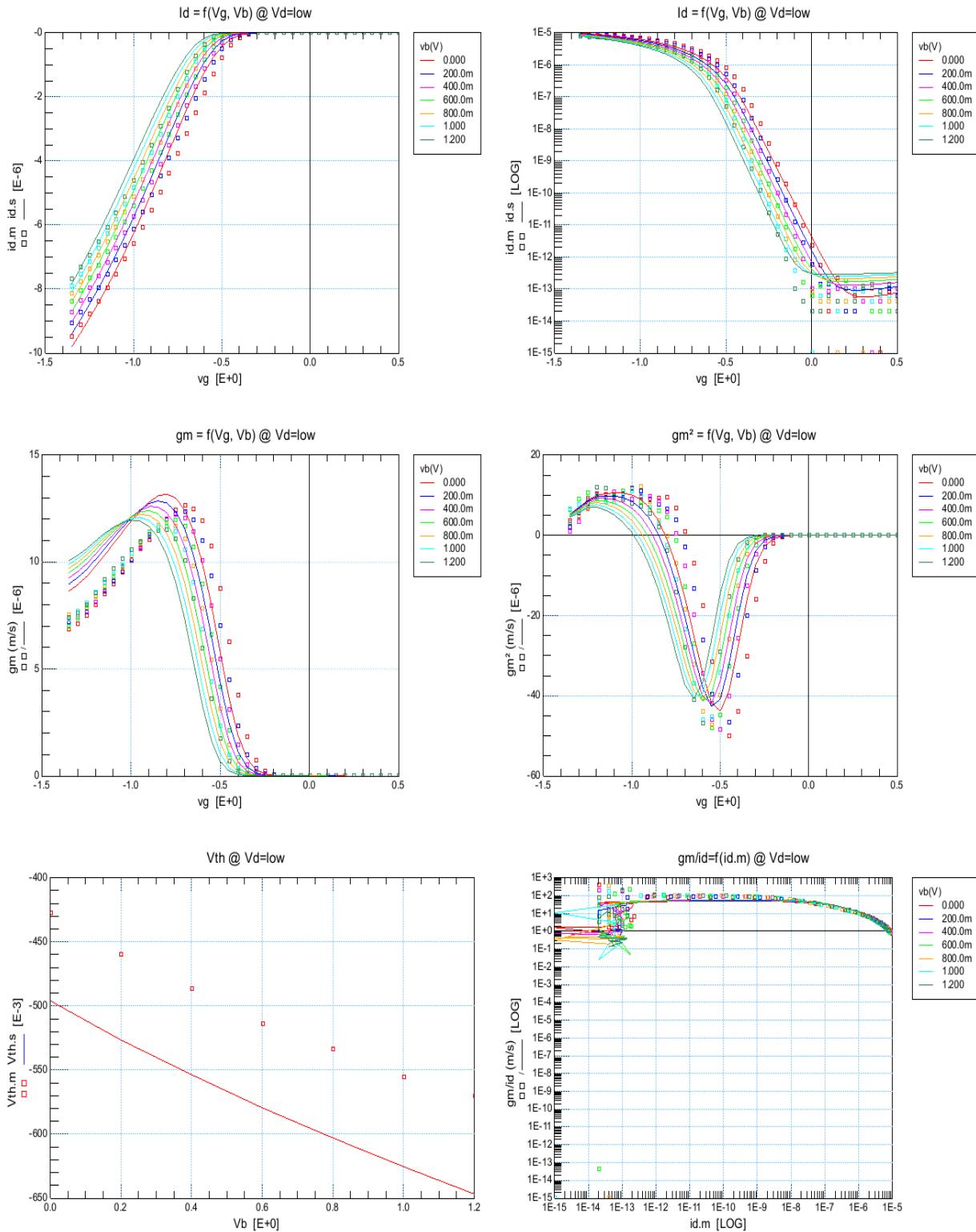


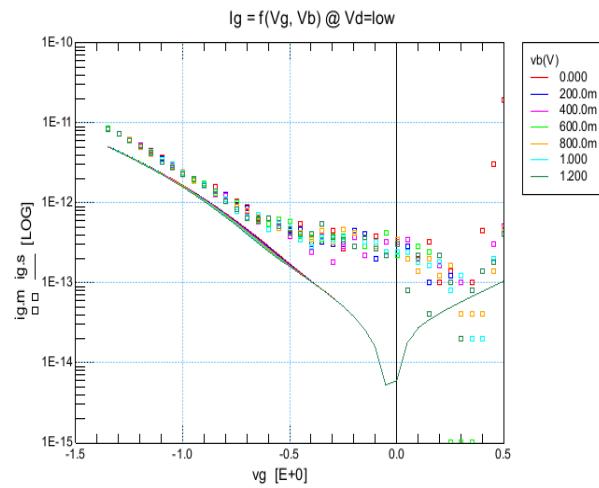
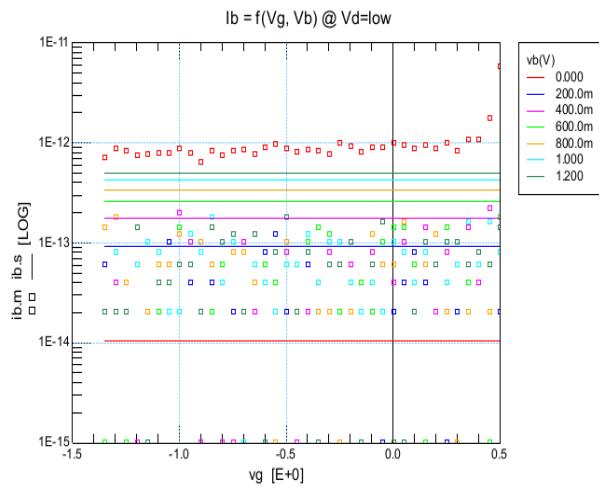
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



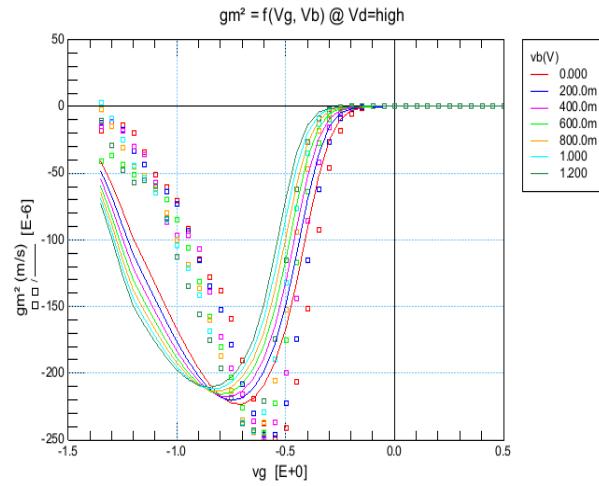
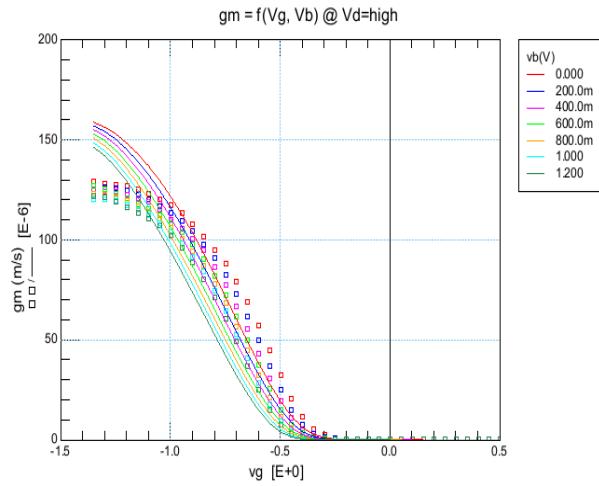
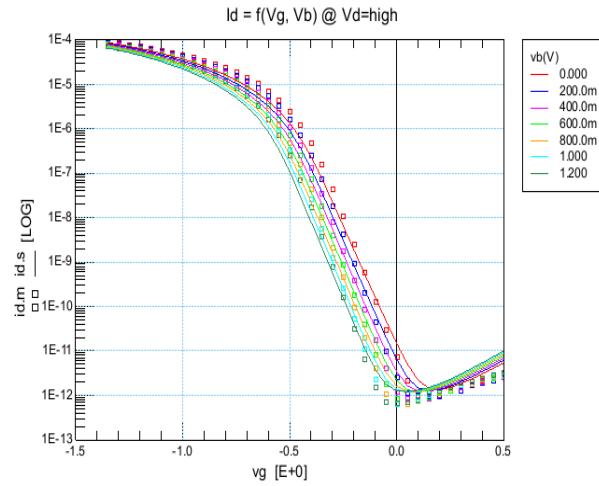
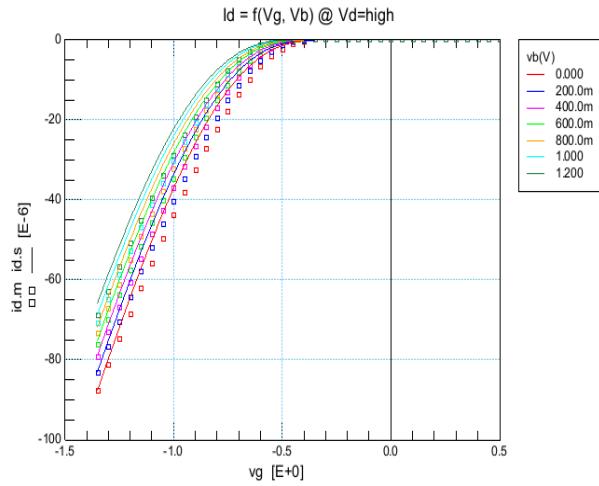
4.32 W0u3_L0u13_S552_2

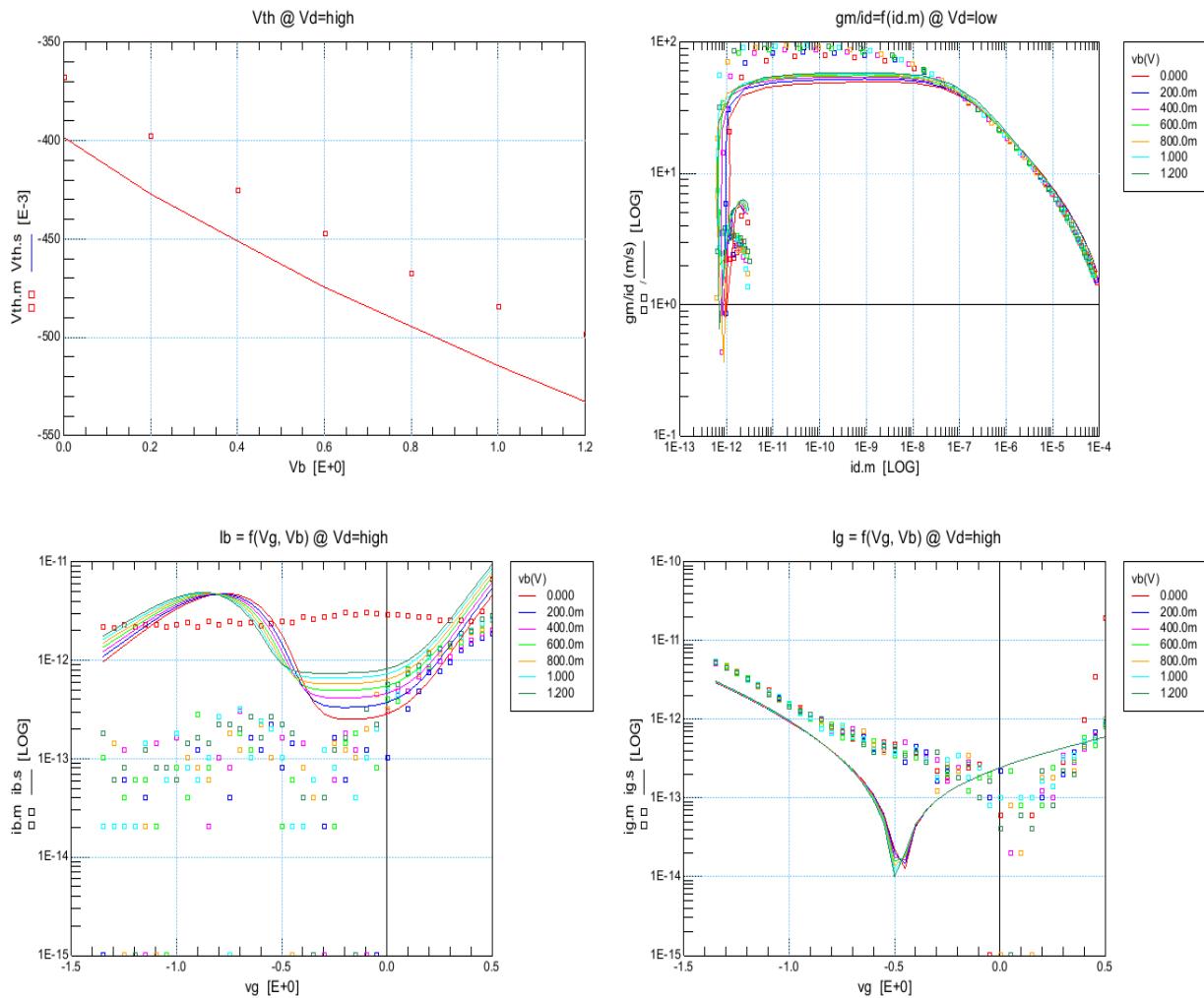
$idv_g, V_d = -0.05V, T = 27^\circ C$



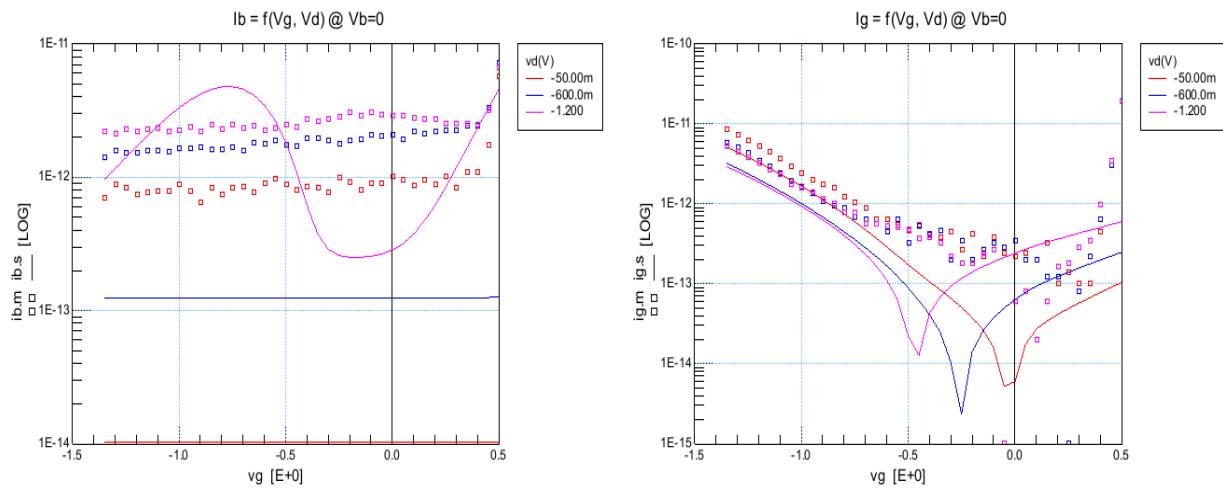


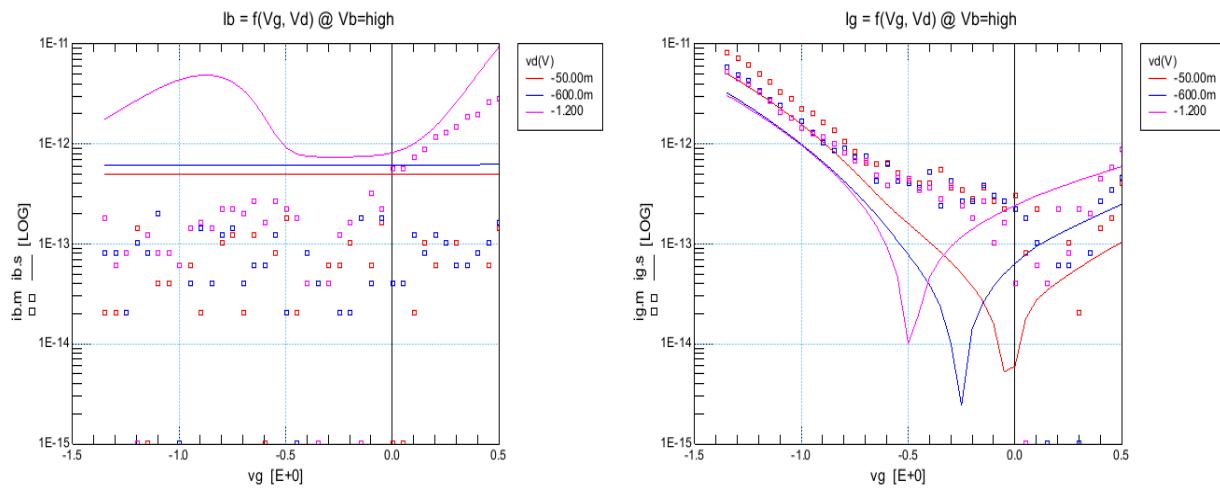
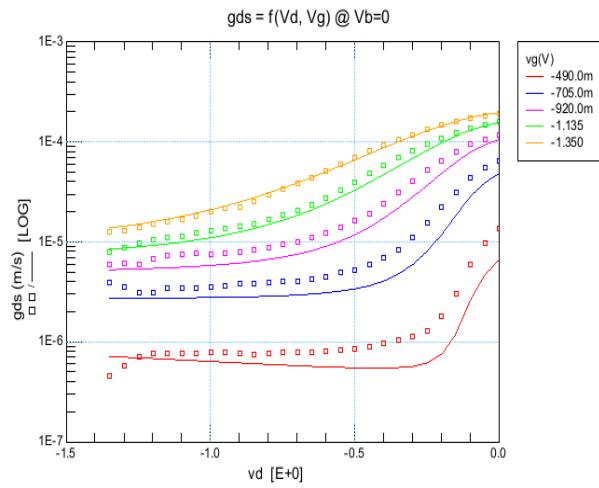
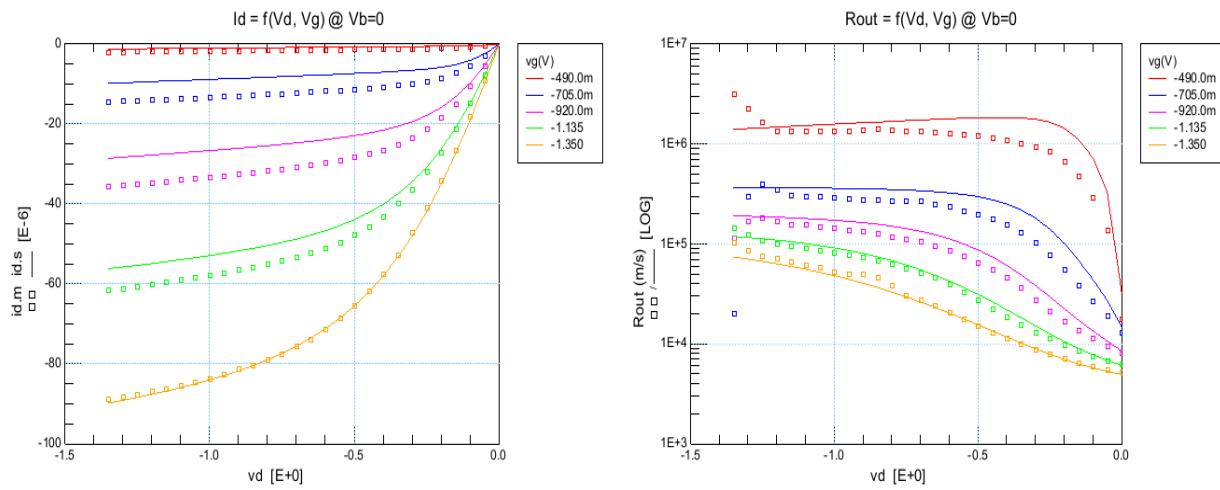
$idvg, Vd = -1.2V, T = 27^\circ C$

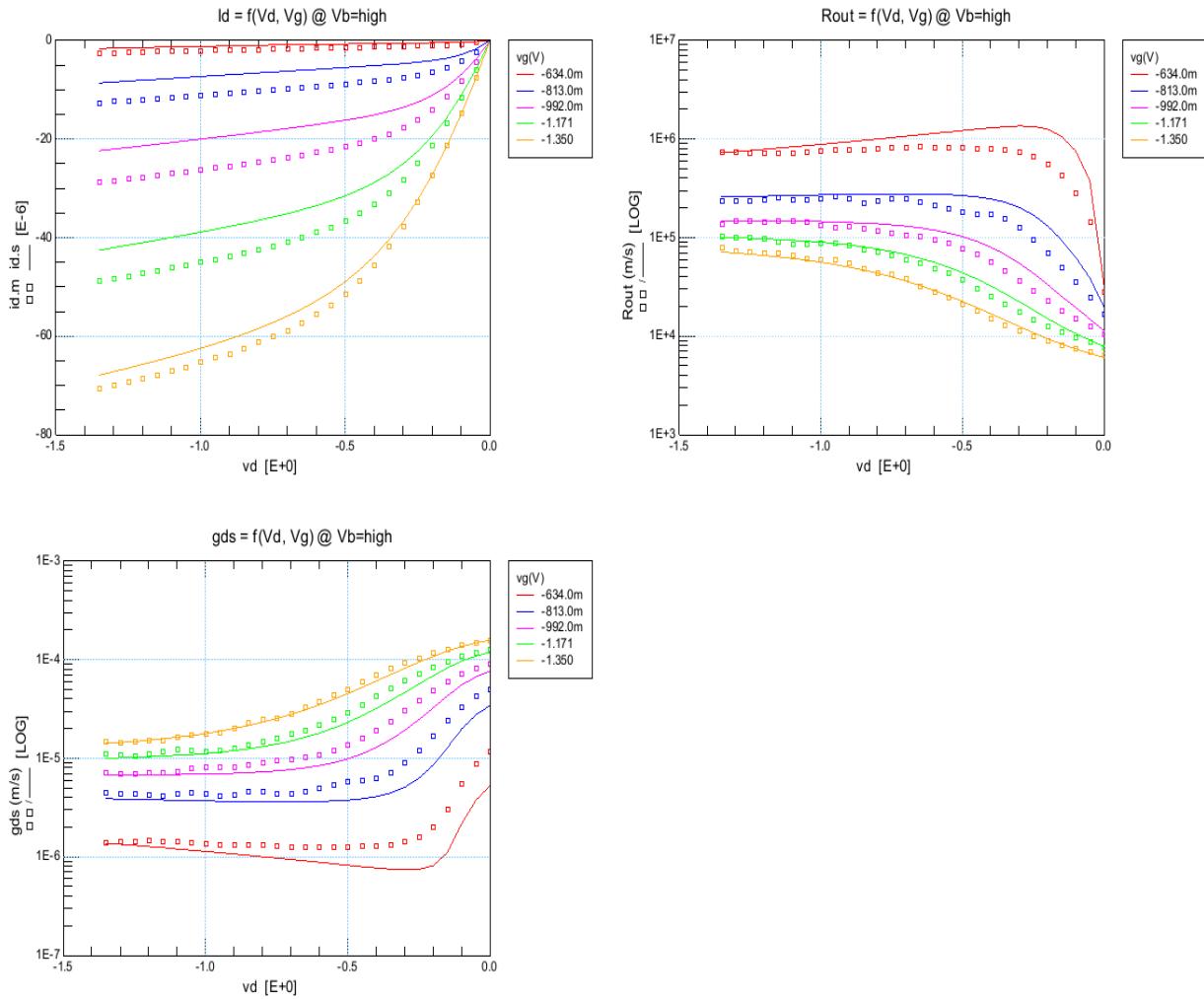
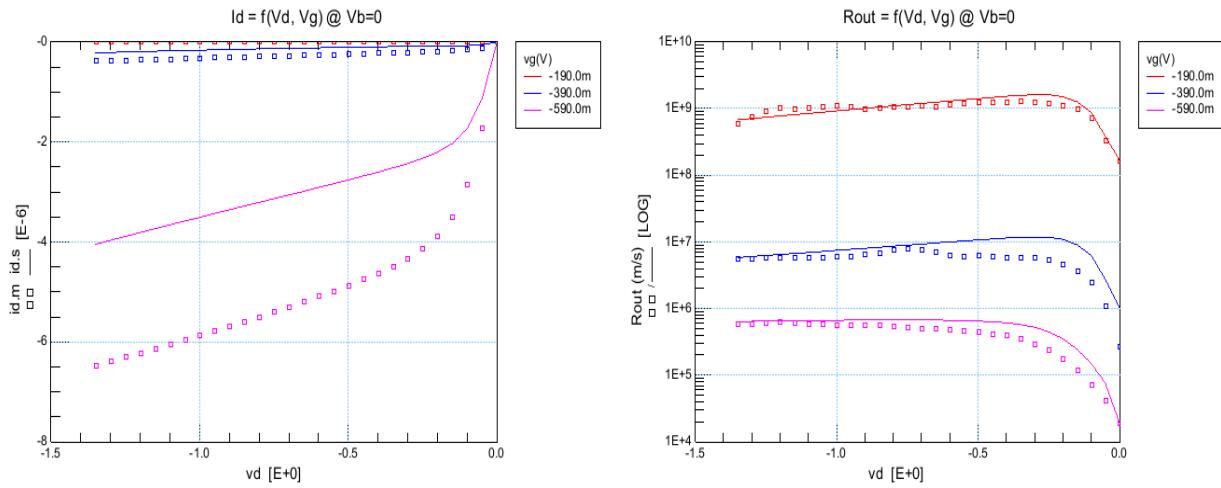


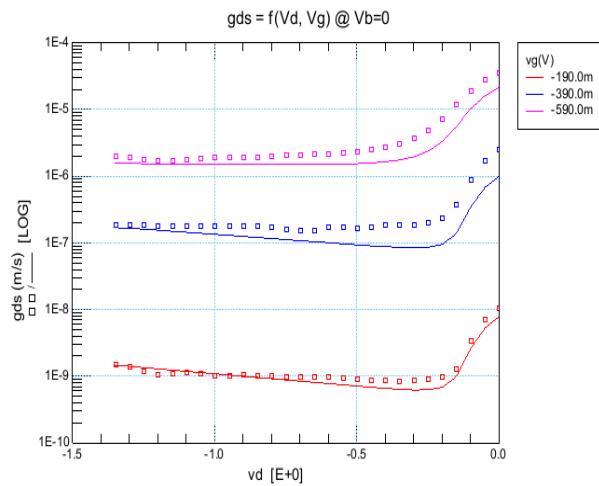


idvg, Ib,Ig, Vb = 0V, T = 27°C

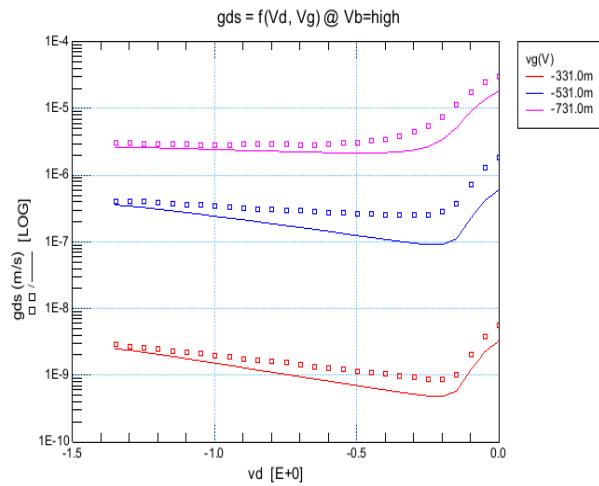
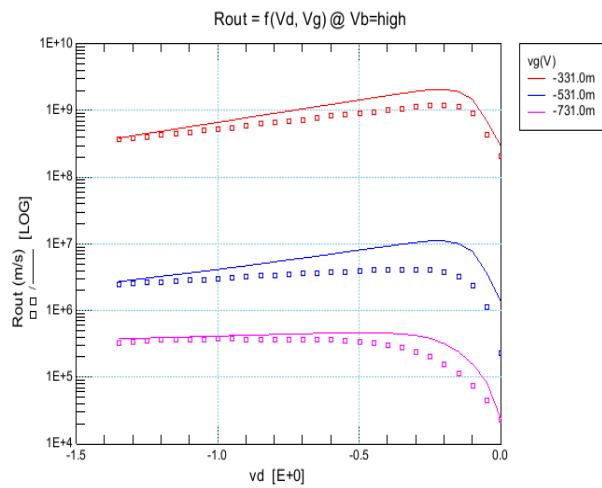
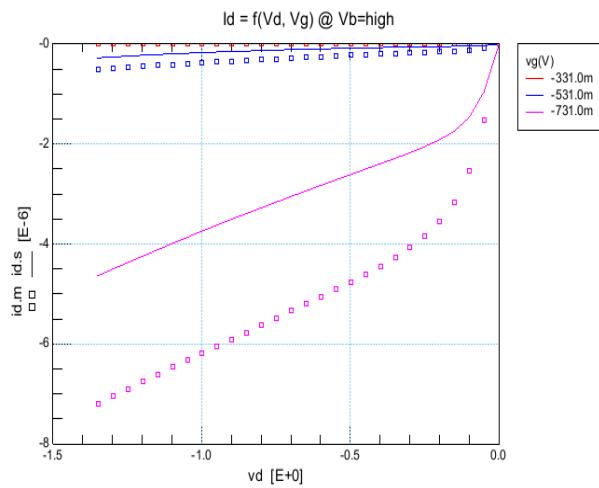


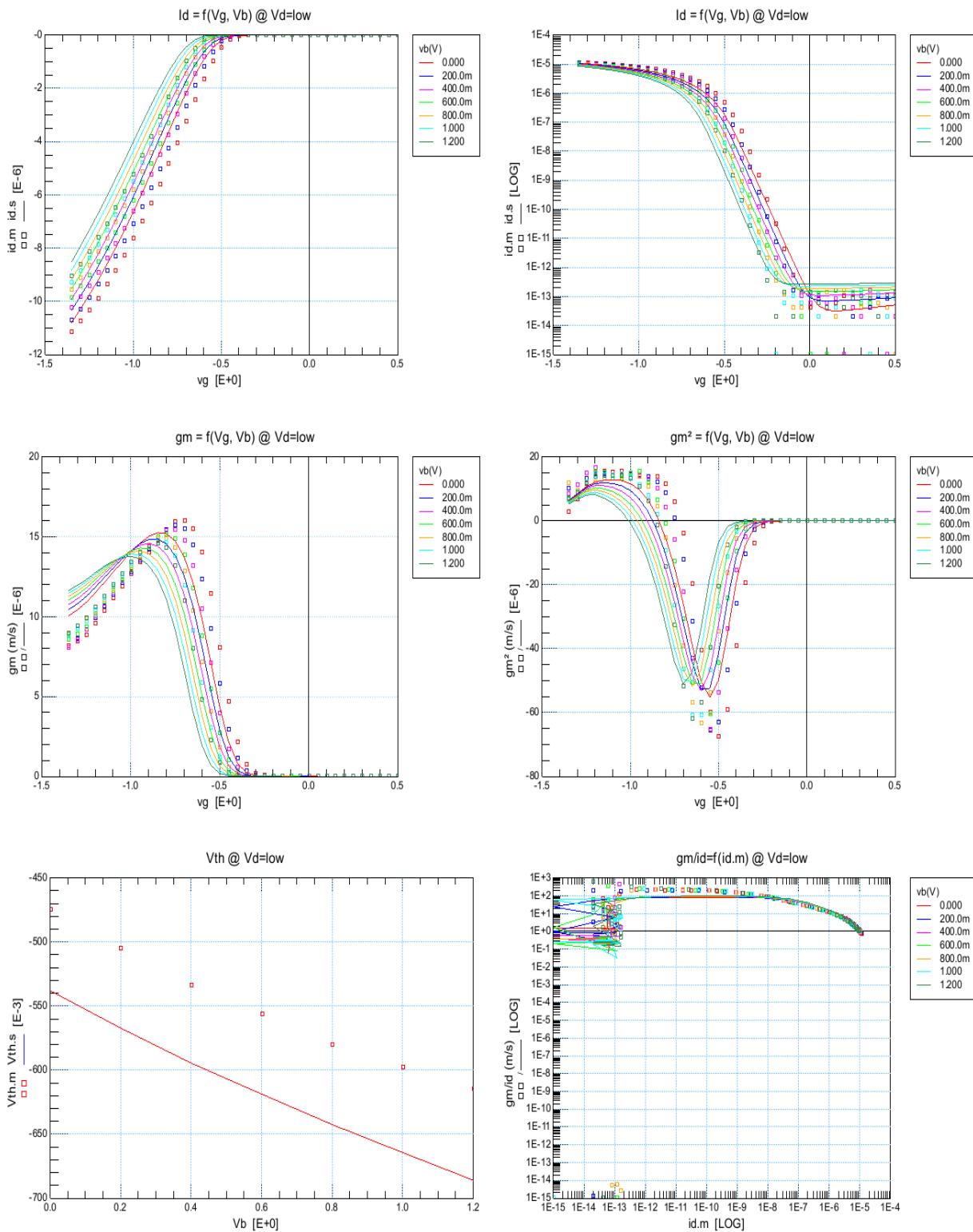
idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


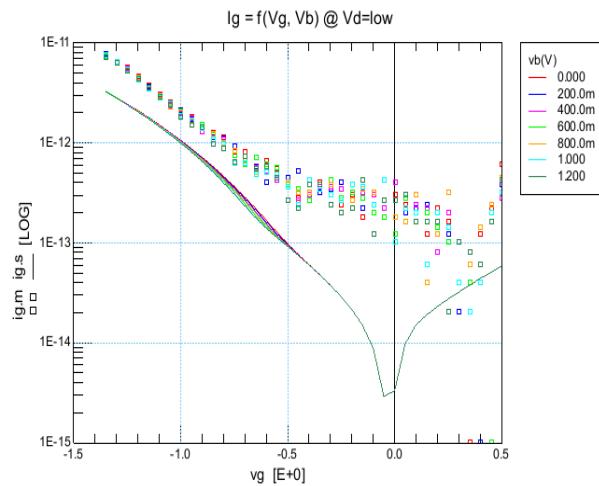
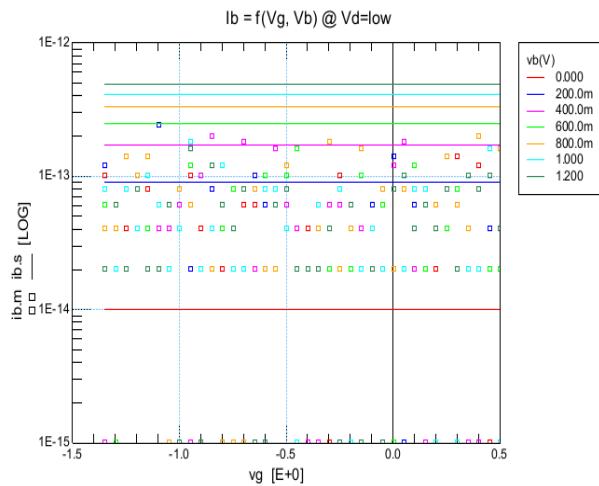
idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C




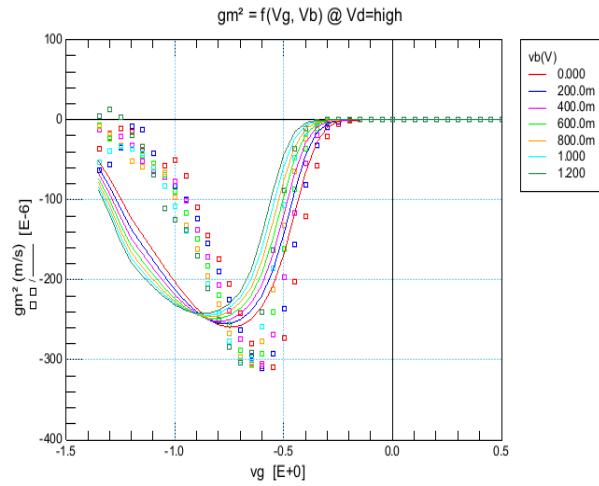
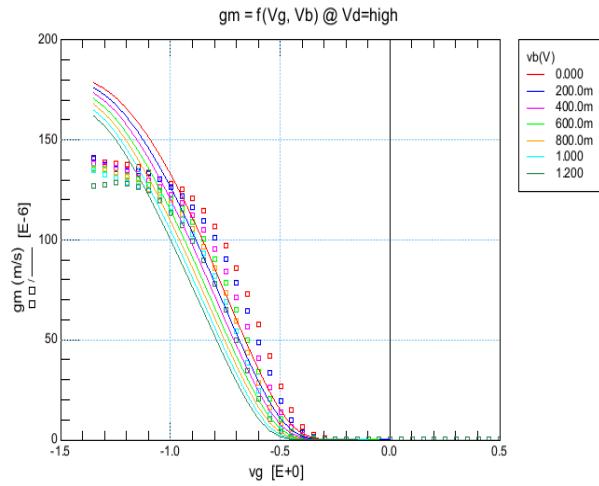
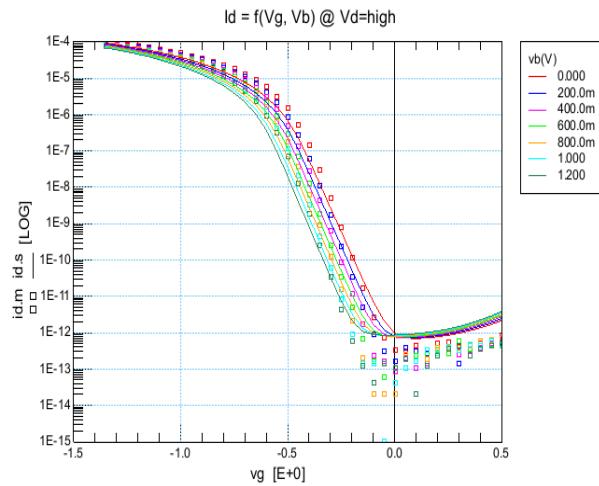
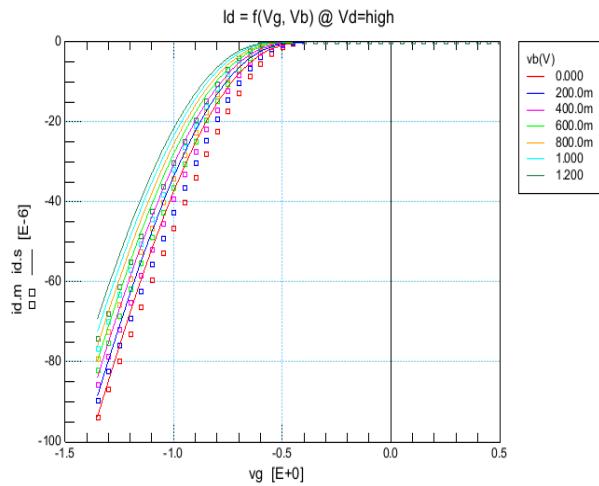
idvd_vth_vbmin, Vb = 1.2V, T = 27°C

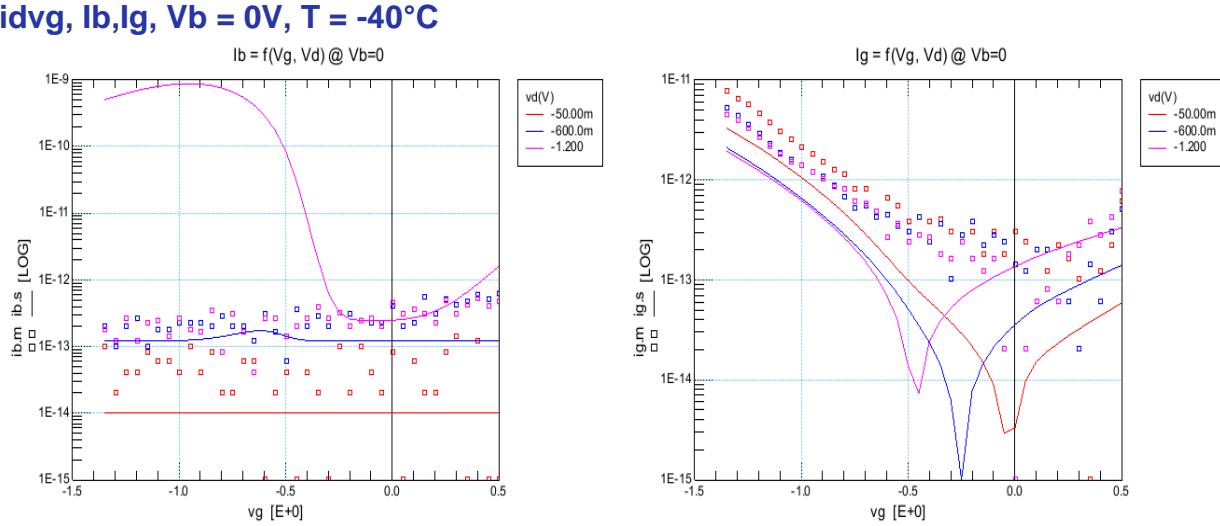
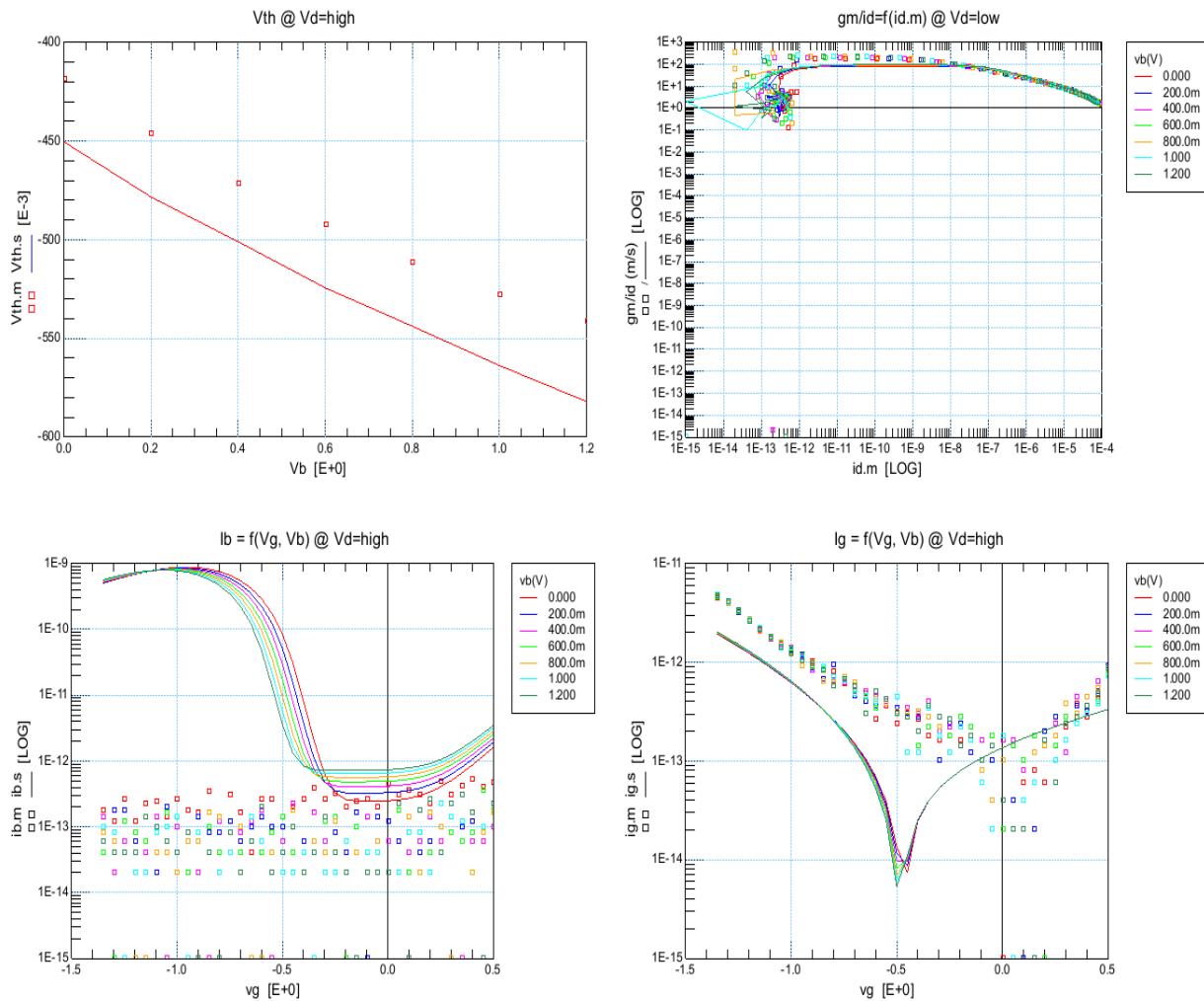


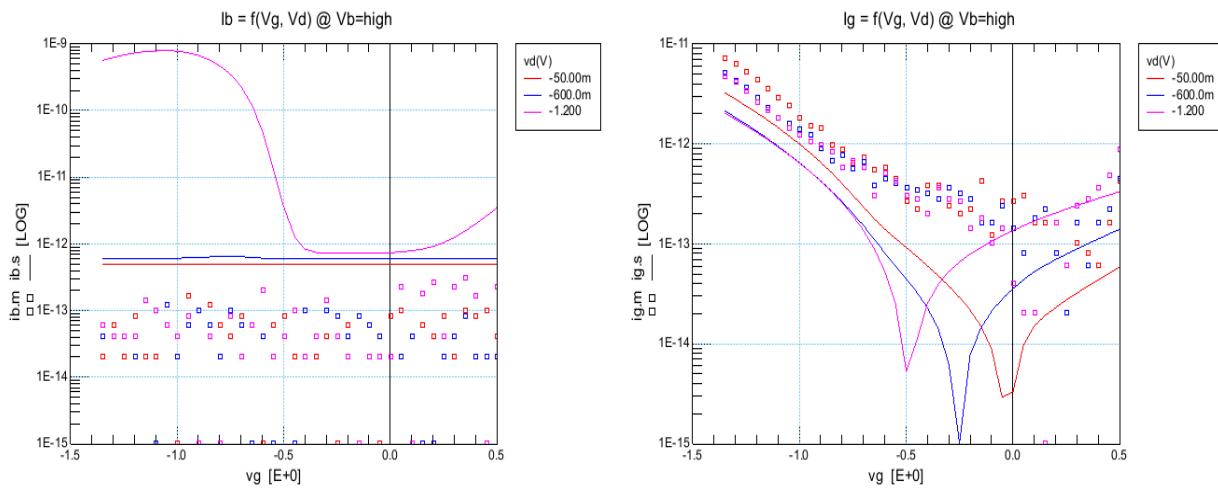
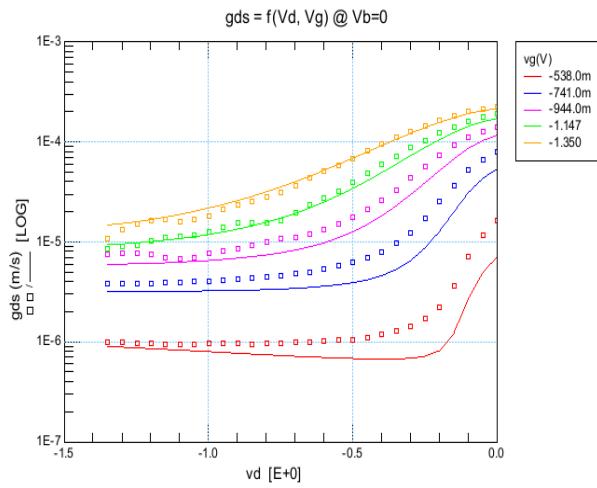
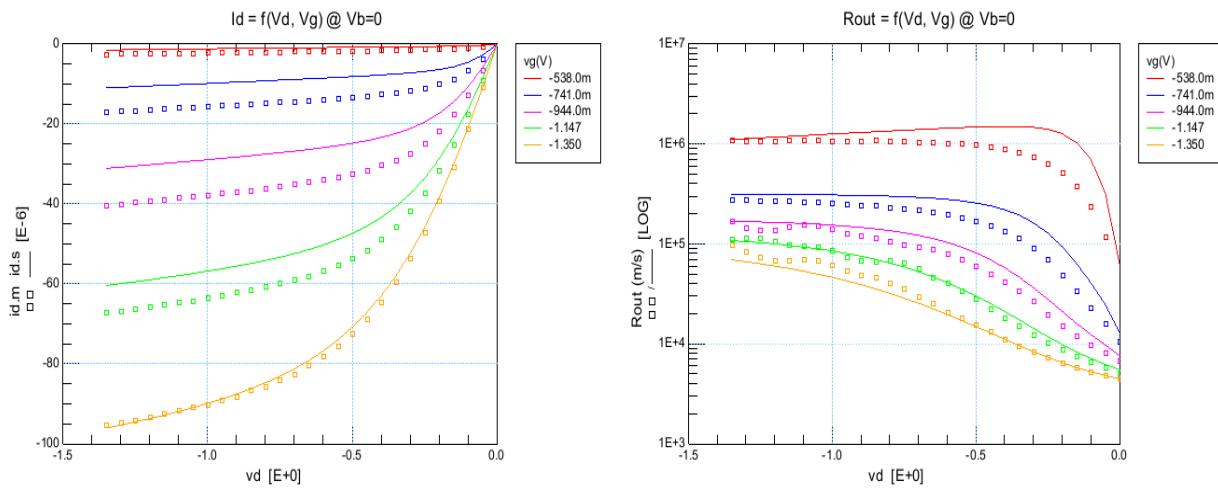
idvg, Vd = -0.05V, T = -40°C


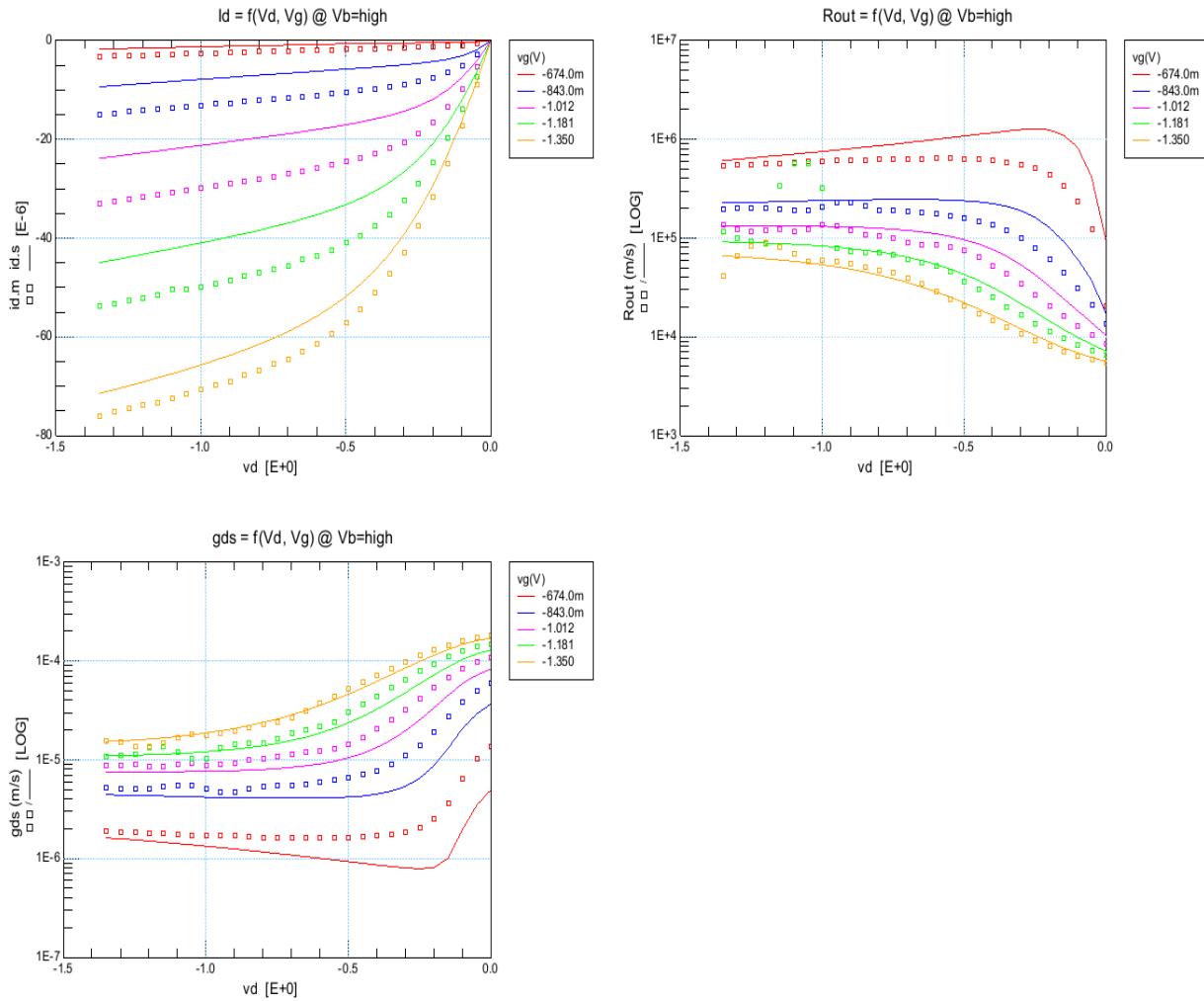
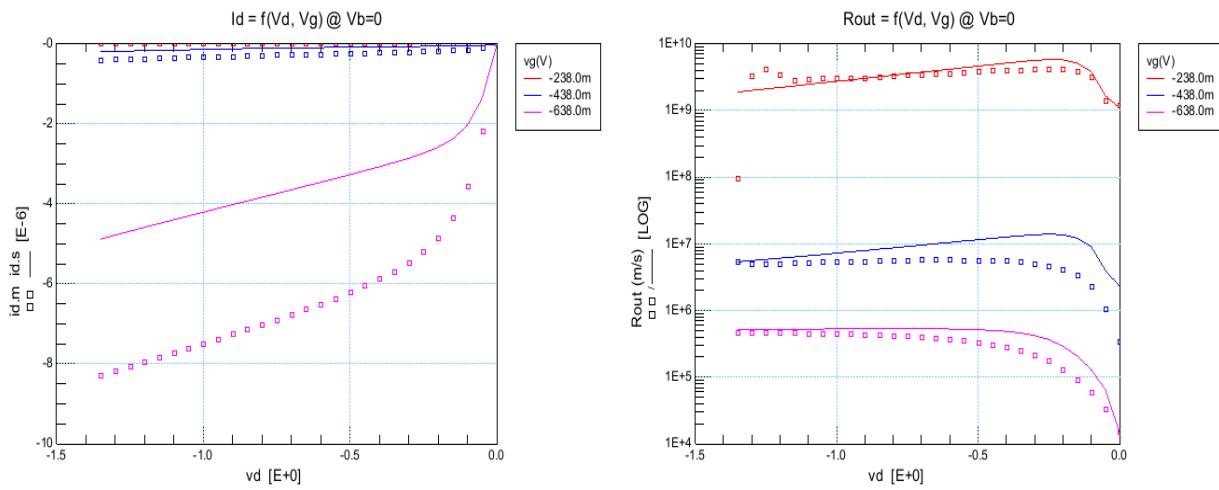


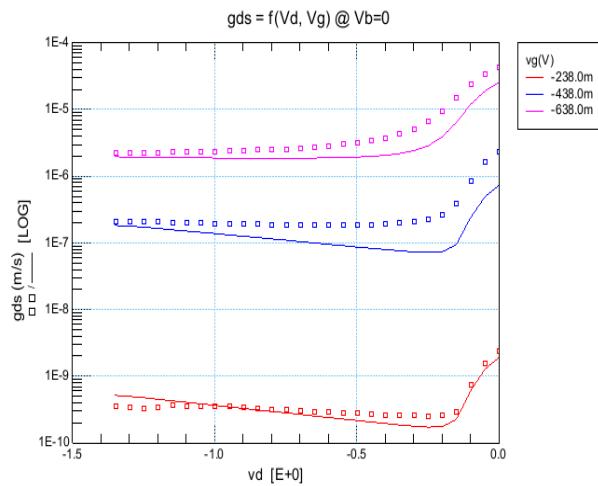
$i_{dvg}, V_d = -1.2V, T = -40^{\circ}C$



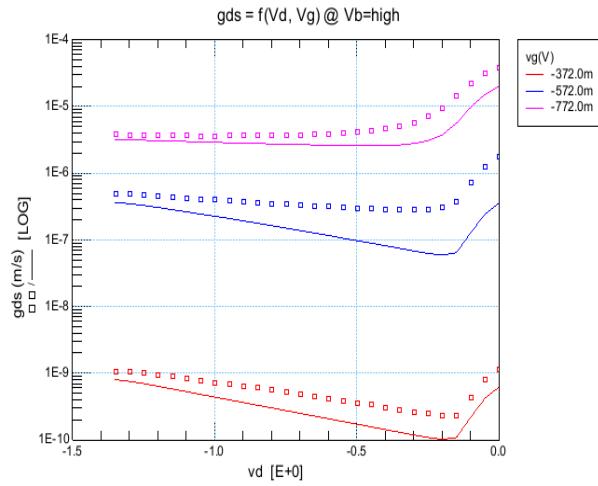
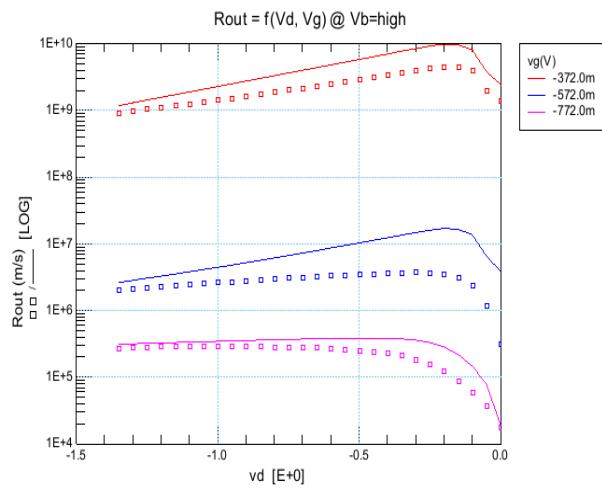
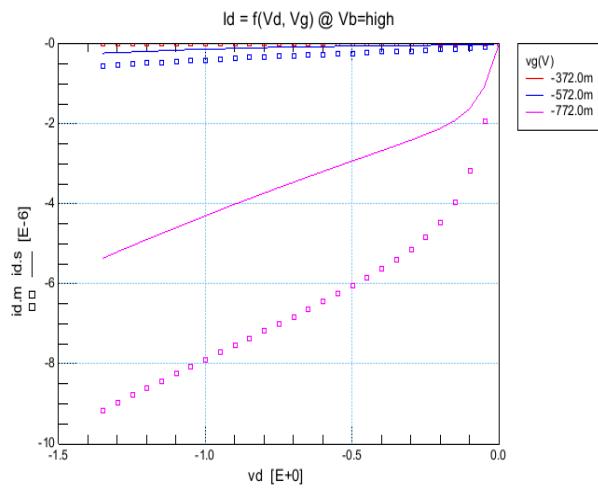


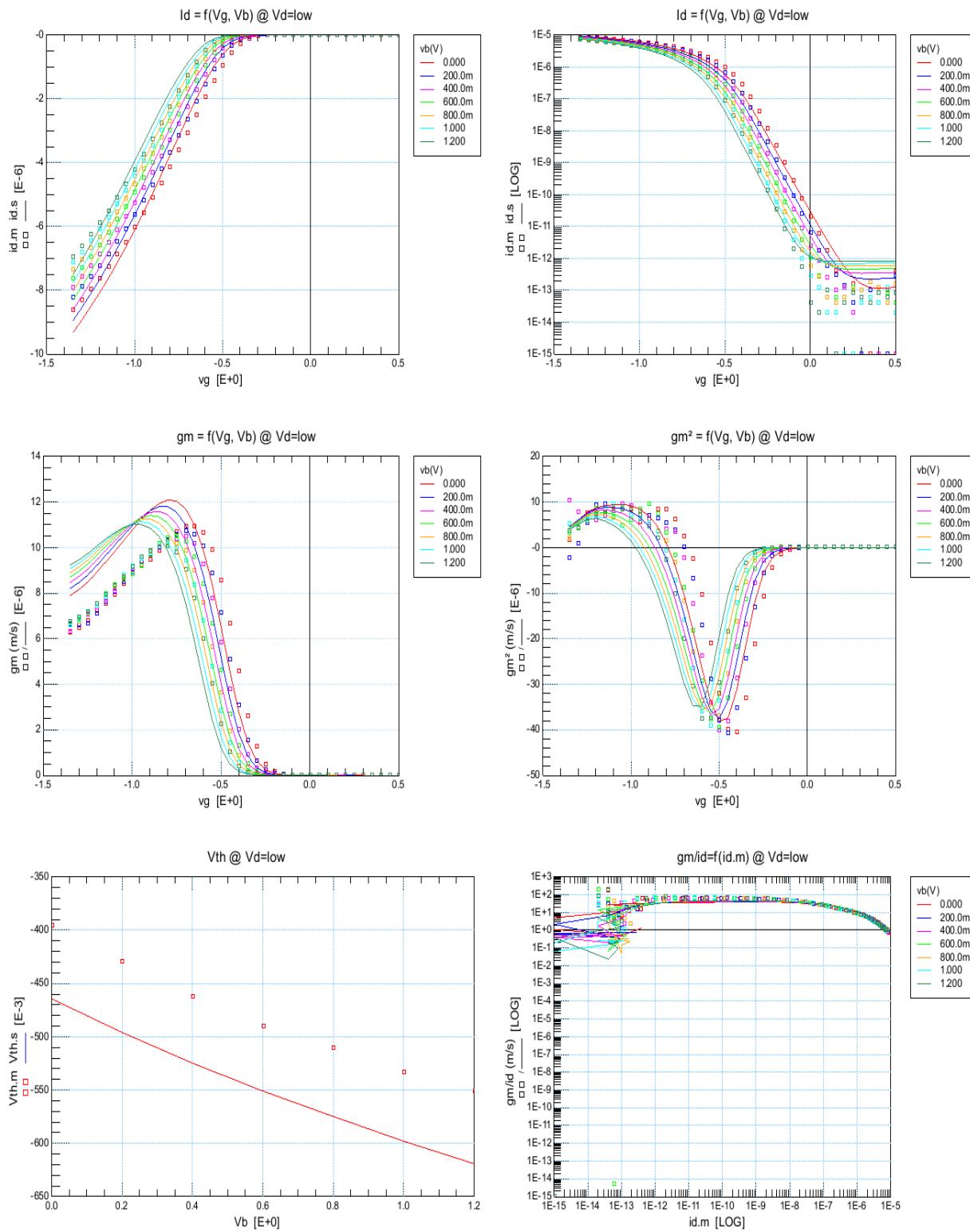
idvg, Ib,Ig, Vb = 1.2V, T = -40°C

idvd, Vb = 0V, T = -40°C


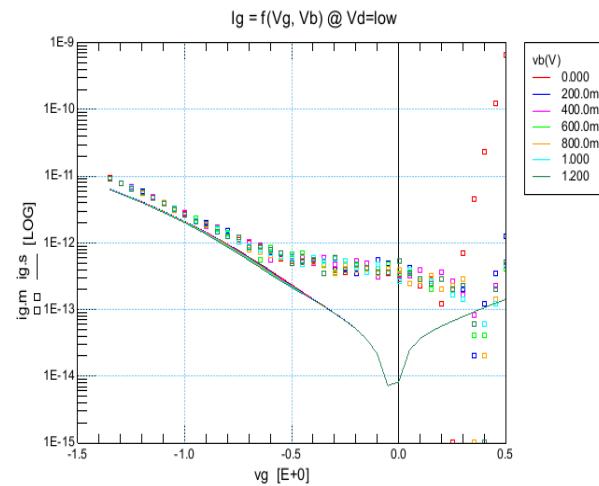
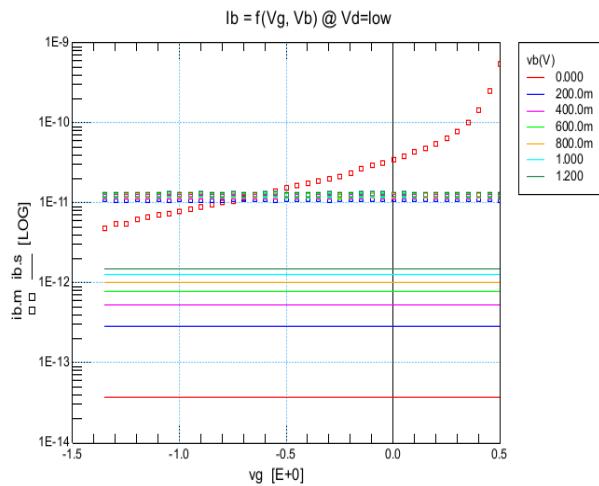
idvd_vbmin, Vb = 1.2V, T = -40°C

idvd_vth, Vb = 0V, T = -40°C




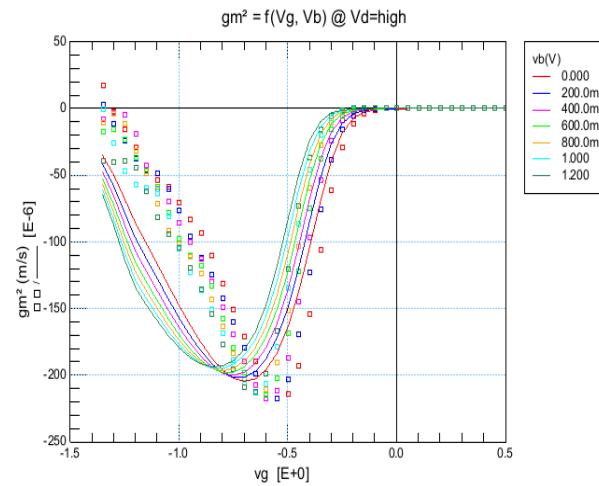
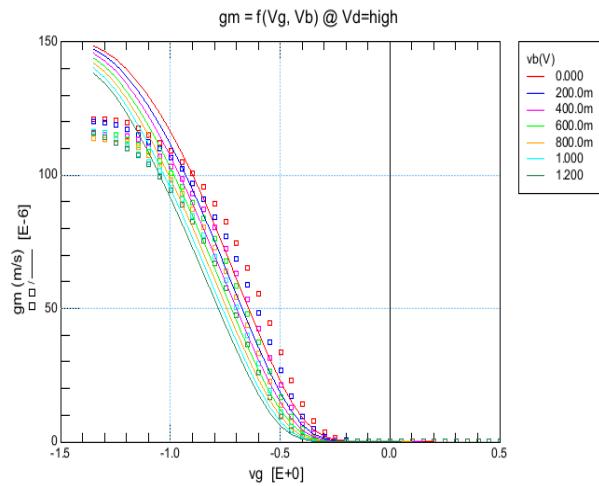
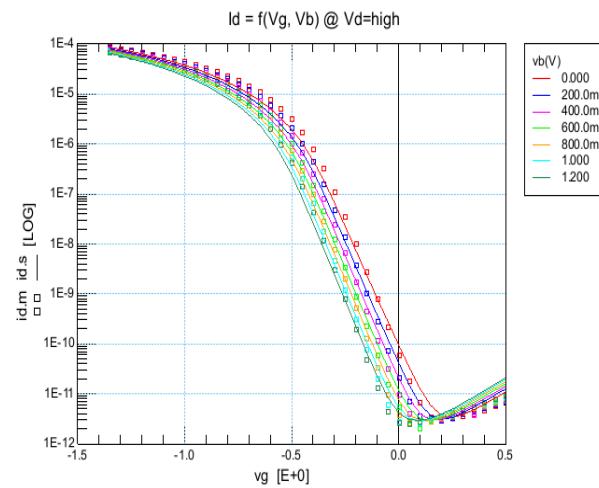
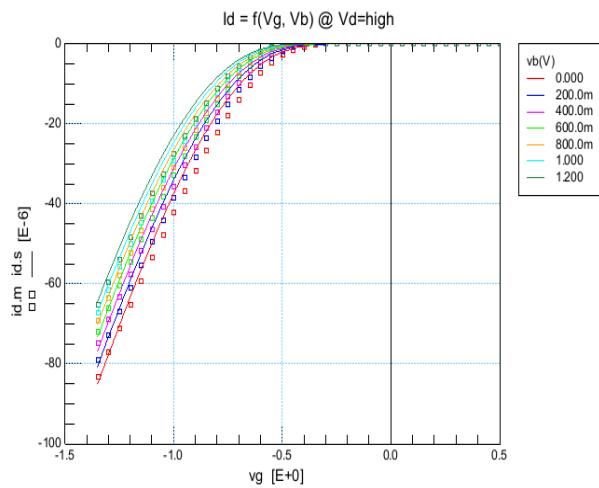
idvd_vth_vbmin, Vb = 1.2V, T = -40°C

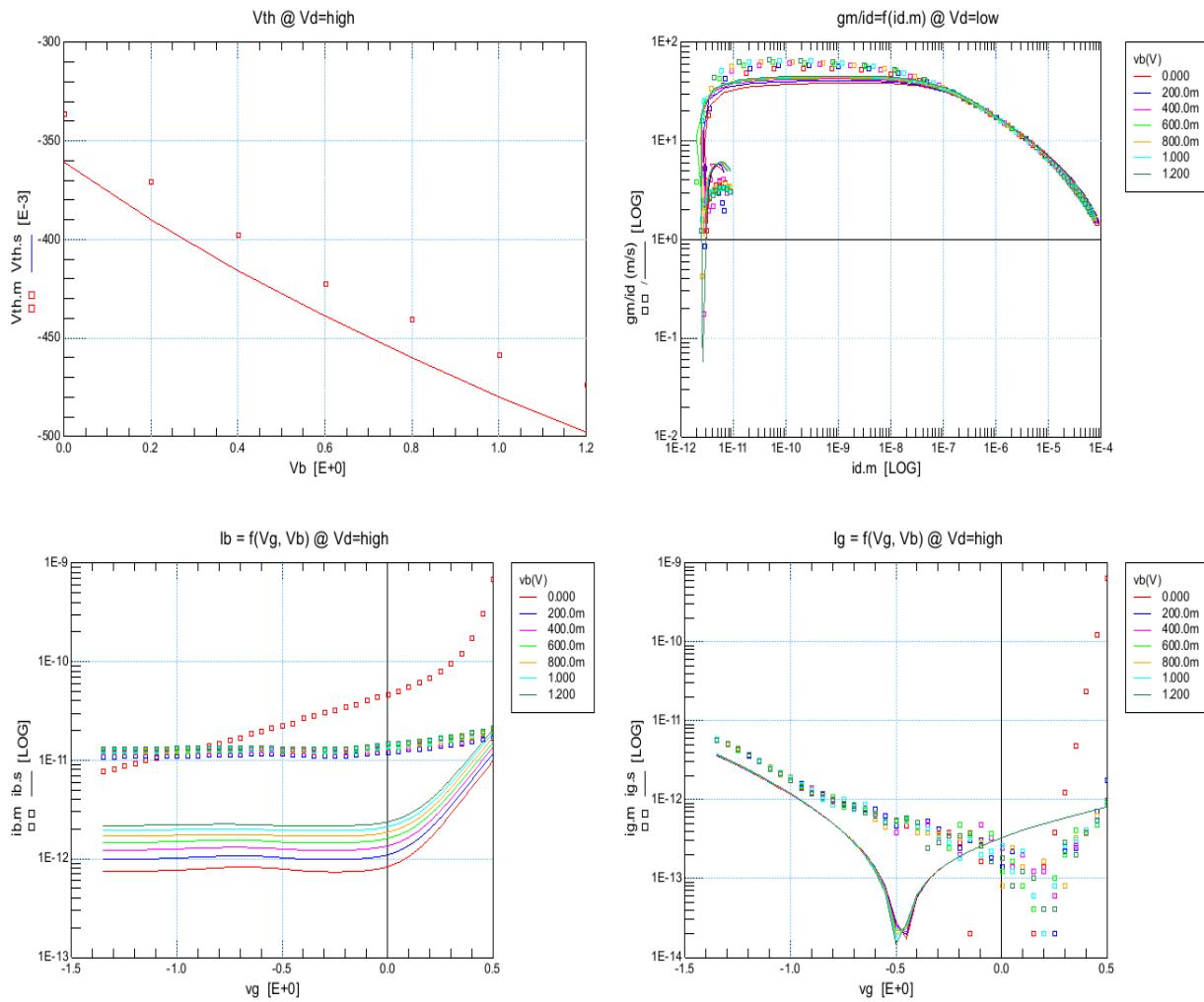


idvg, Vd = -0.05V, T = 70°C


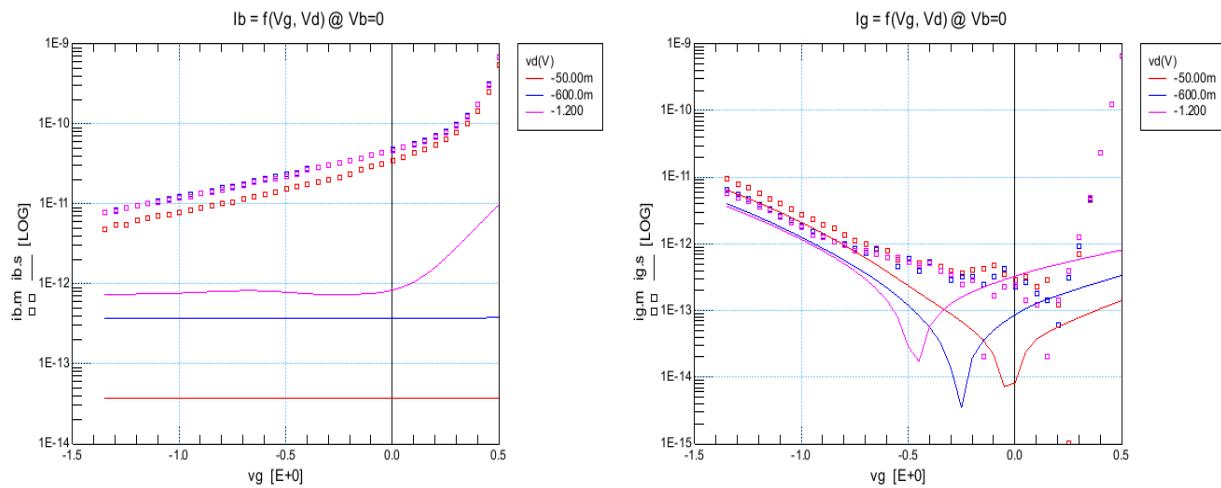


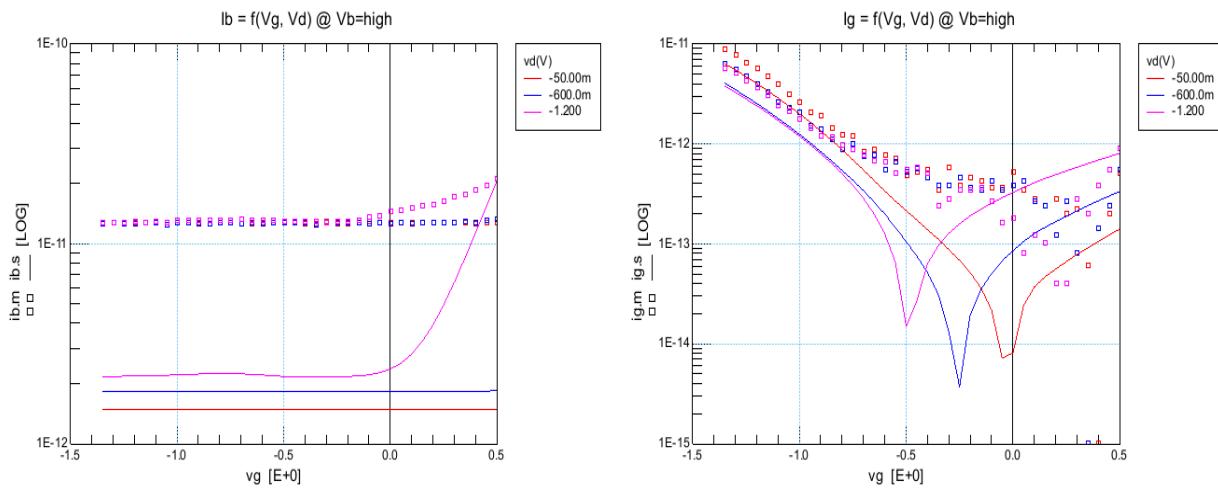
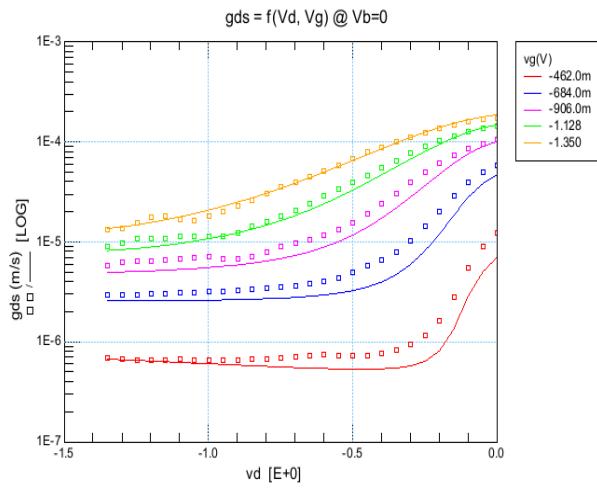
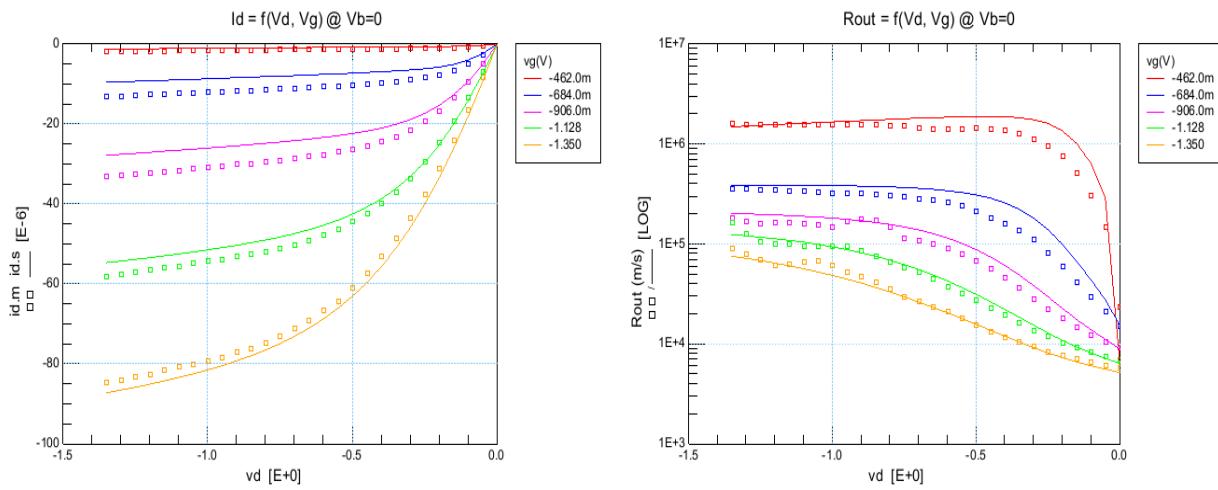
$i_{dvg}, V_d = -1.2V, T = 70^\circ\text{C}$

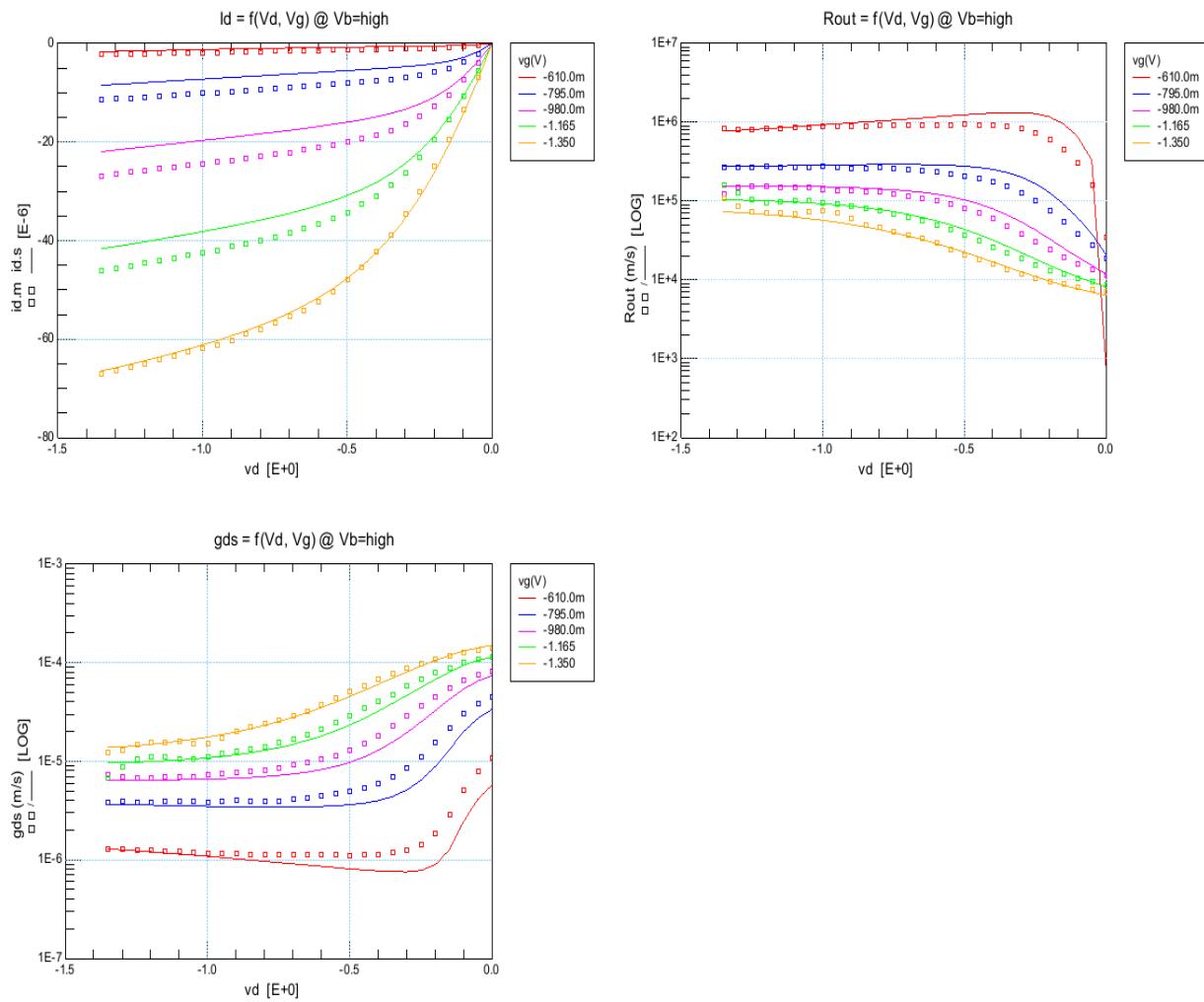
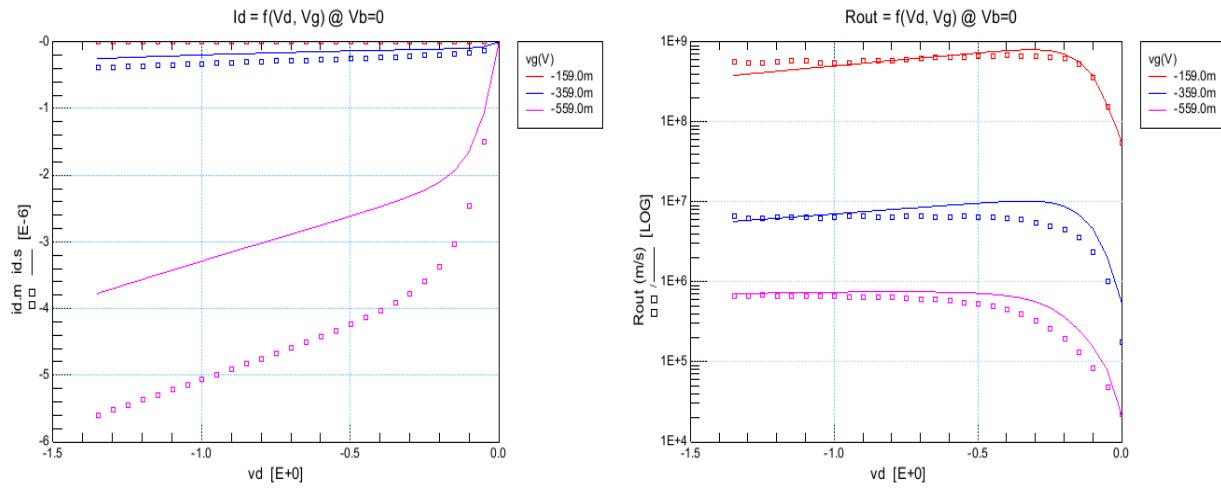


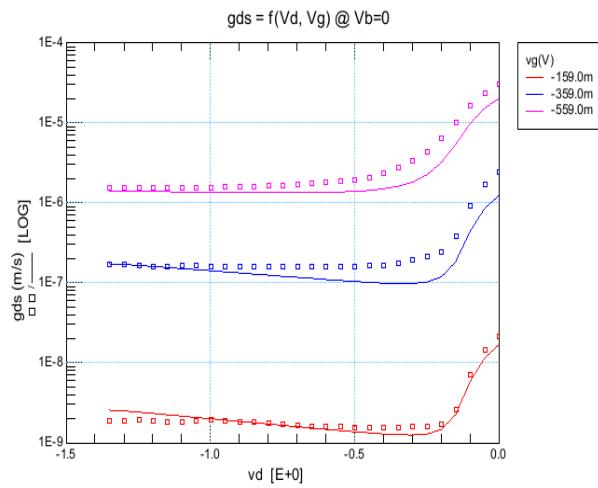


$i_{dVg}, I_b, I_g, V_b = 0V, T = 70^\circ C$

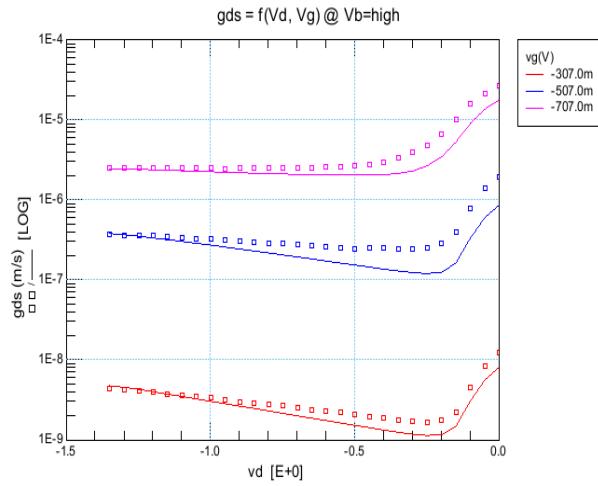
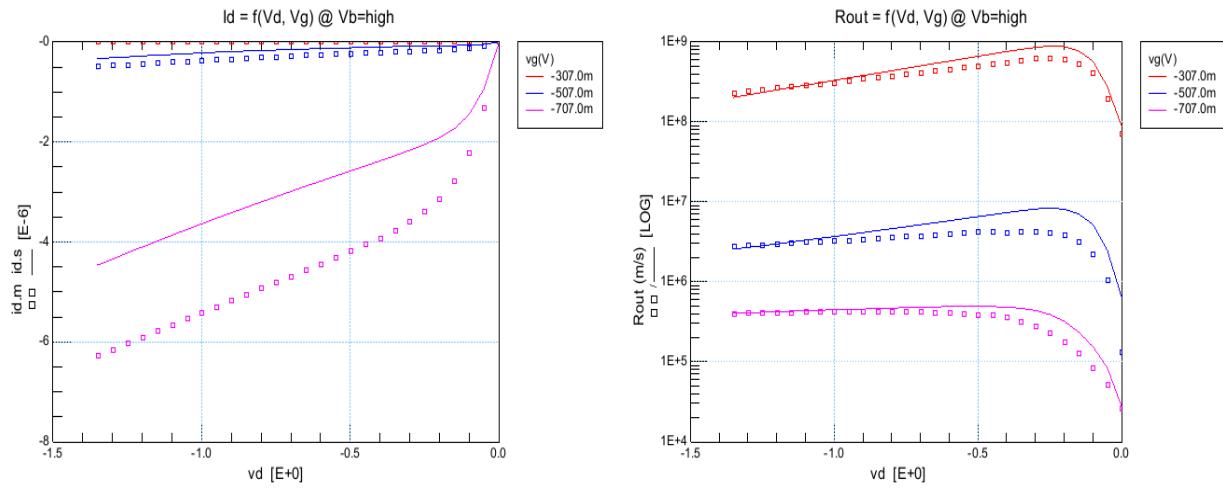


idvg, Ib,Ig, Vb = 1.2V, T = 70°C

idvd, Vb = 0V, T = 70°C


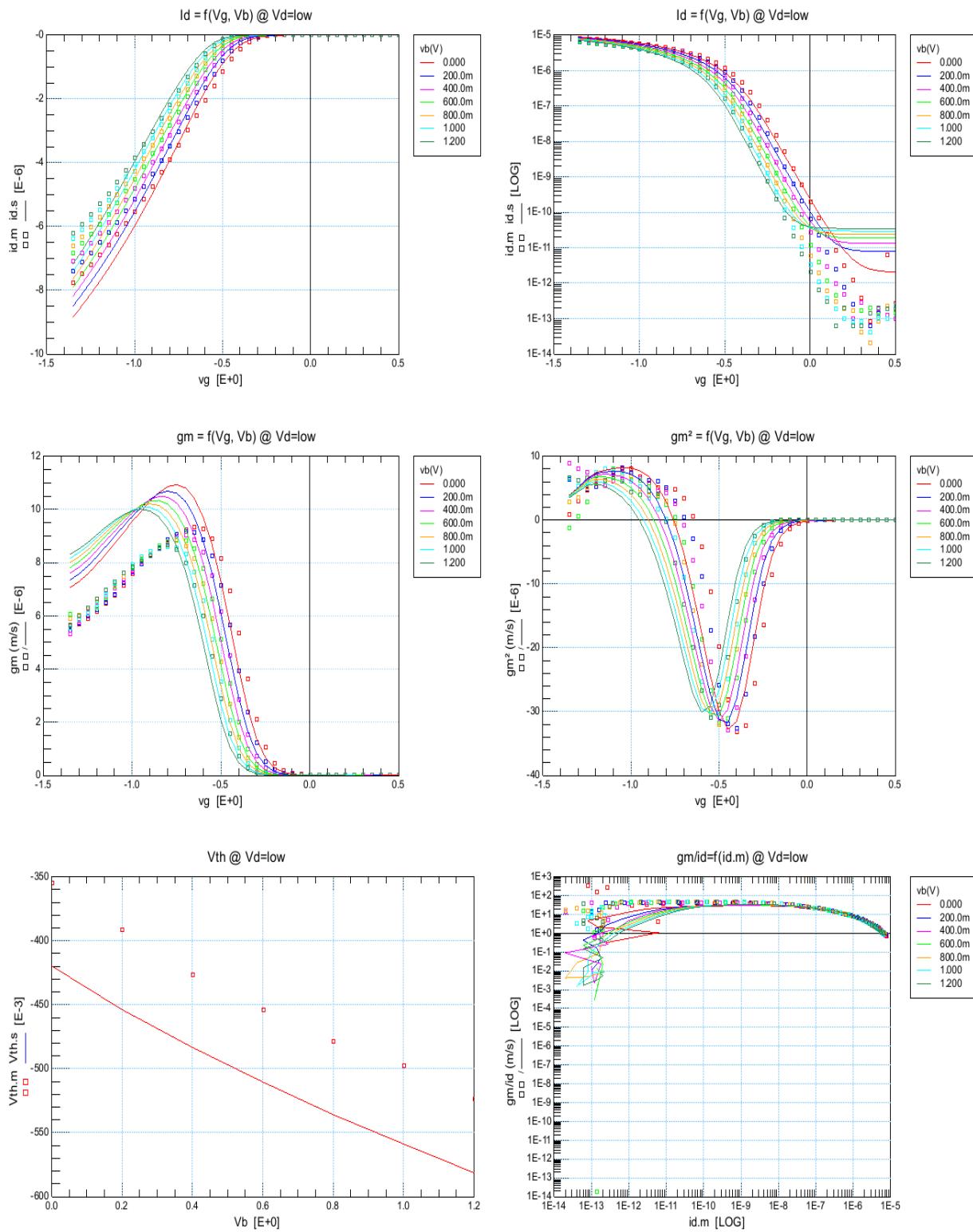
idvd_vbmin, Vb = 1.2V, T = 70°C**idvd_vth, Vb = 0V, T = 70°C**

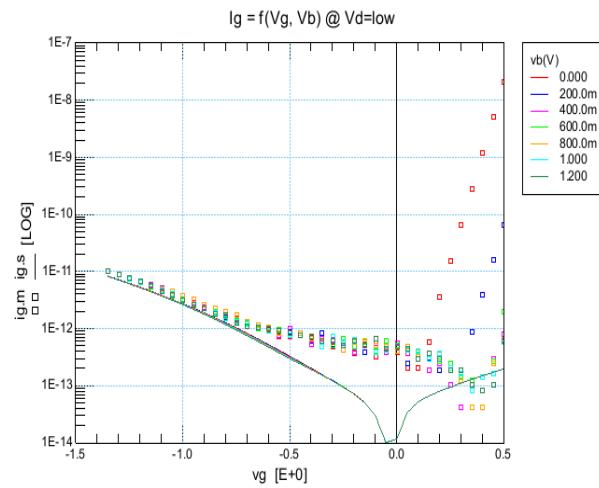
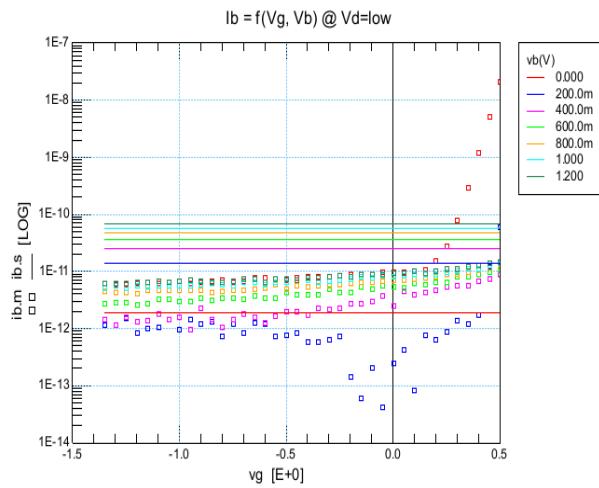


idvd_vth_vbmin, Vb = 1.2V, T = 70°C

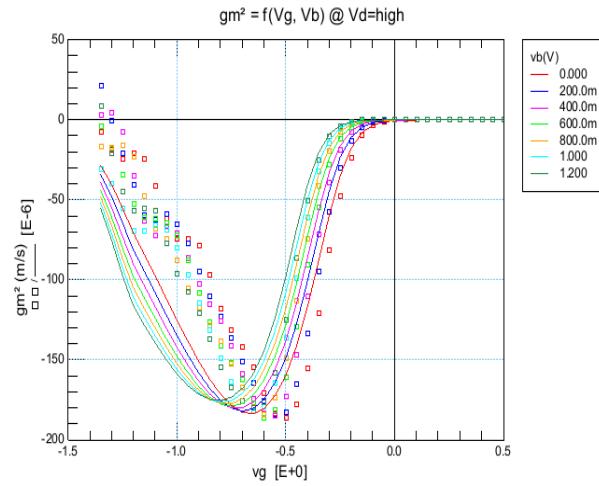
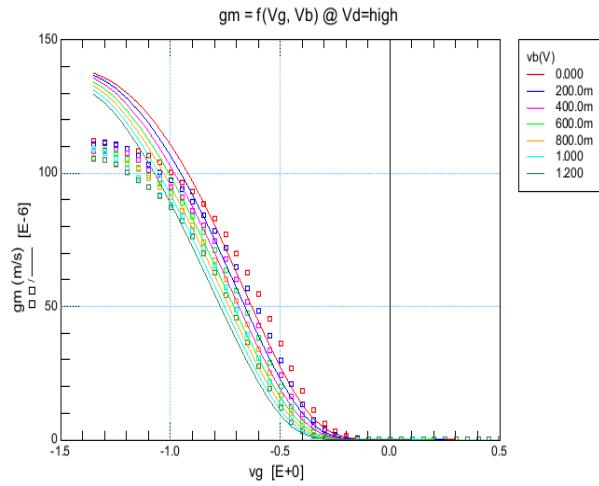
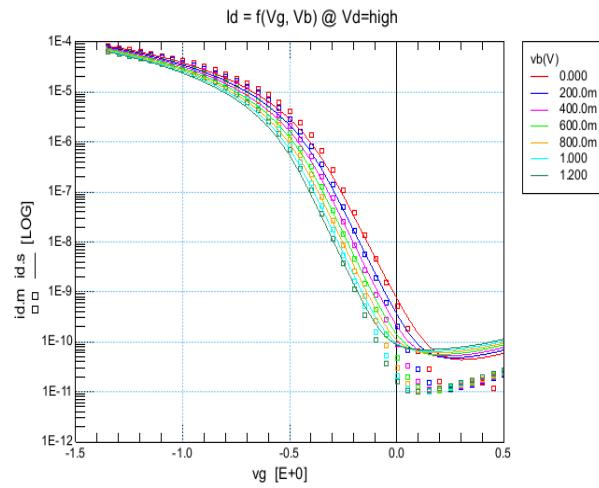
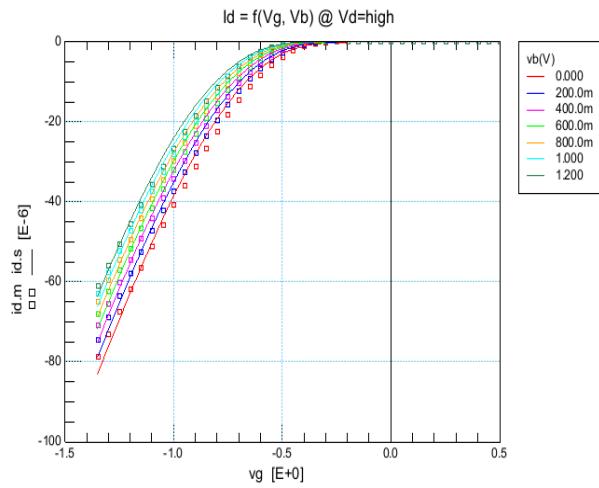


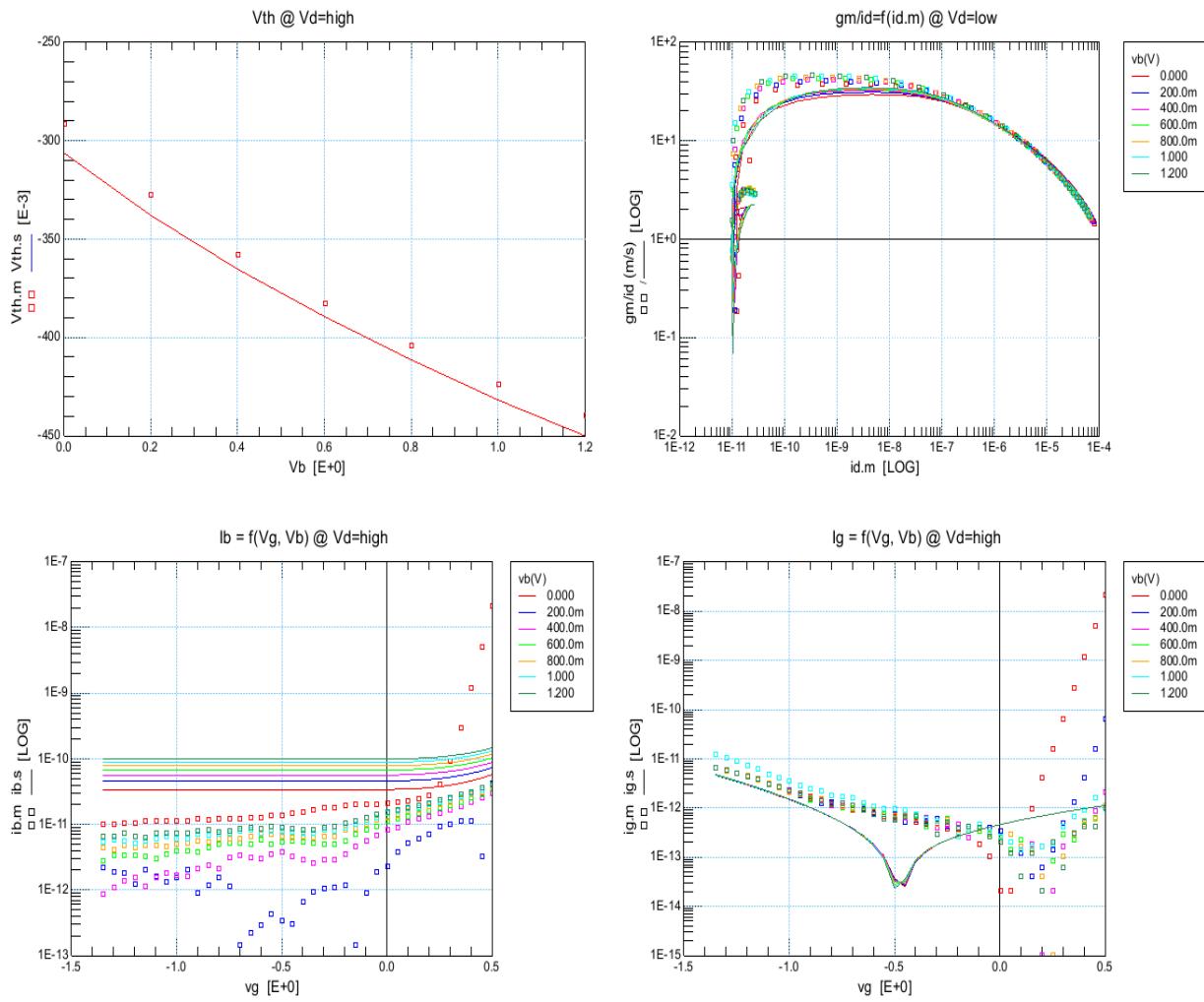
idvg, Vd = -0.05V, T = 125°C



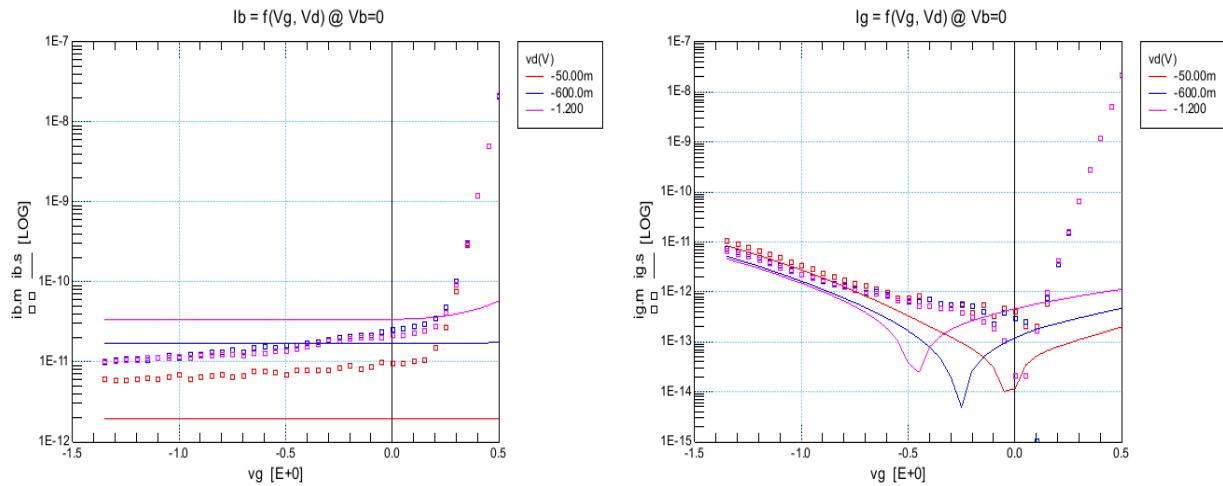


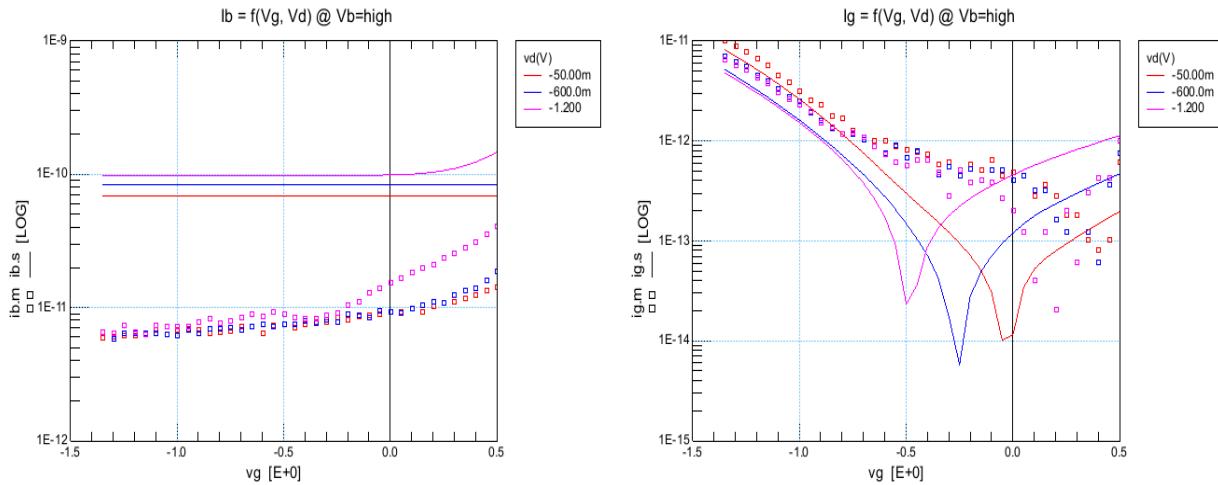
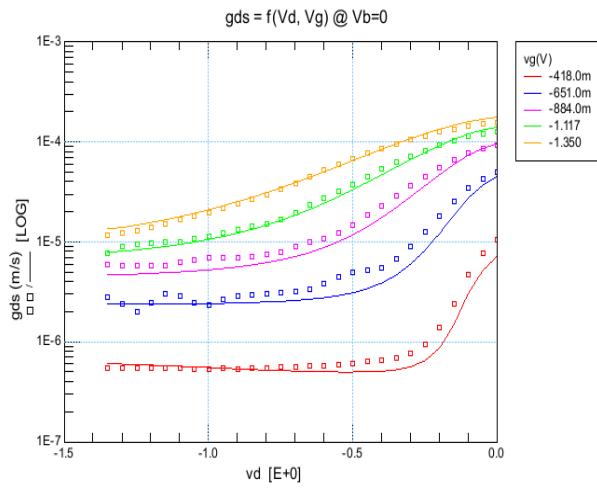
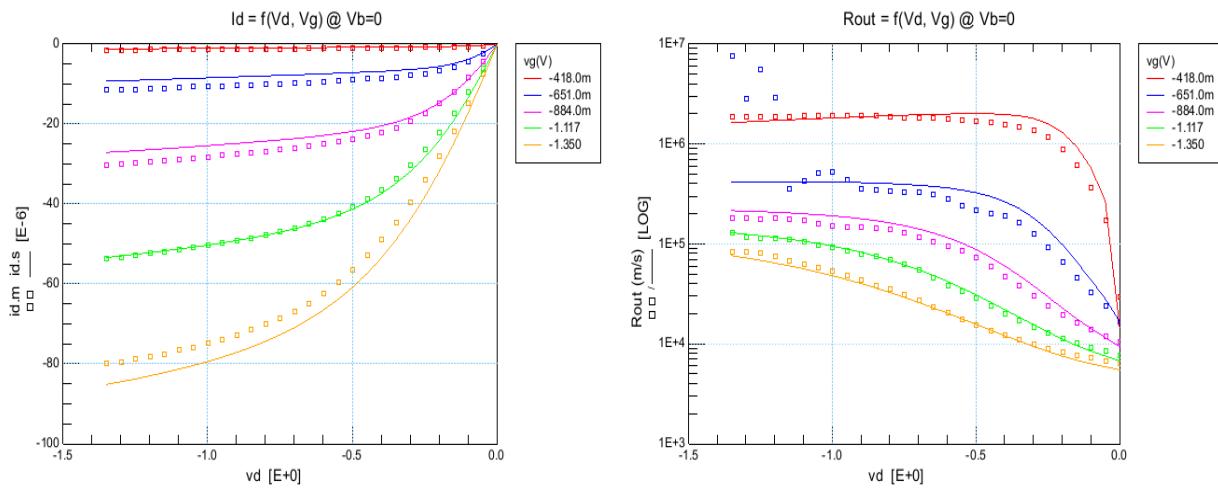
$i_{dvg}, V_d = -1.2V, T = 125^\circ\text{C}$

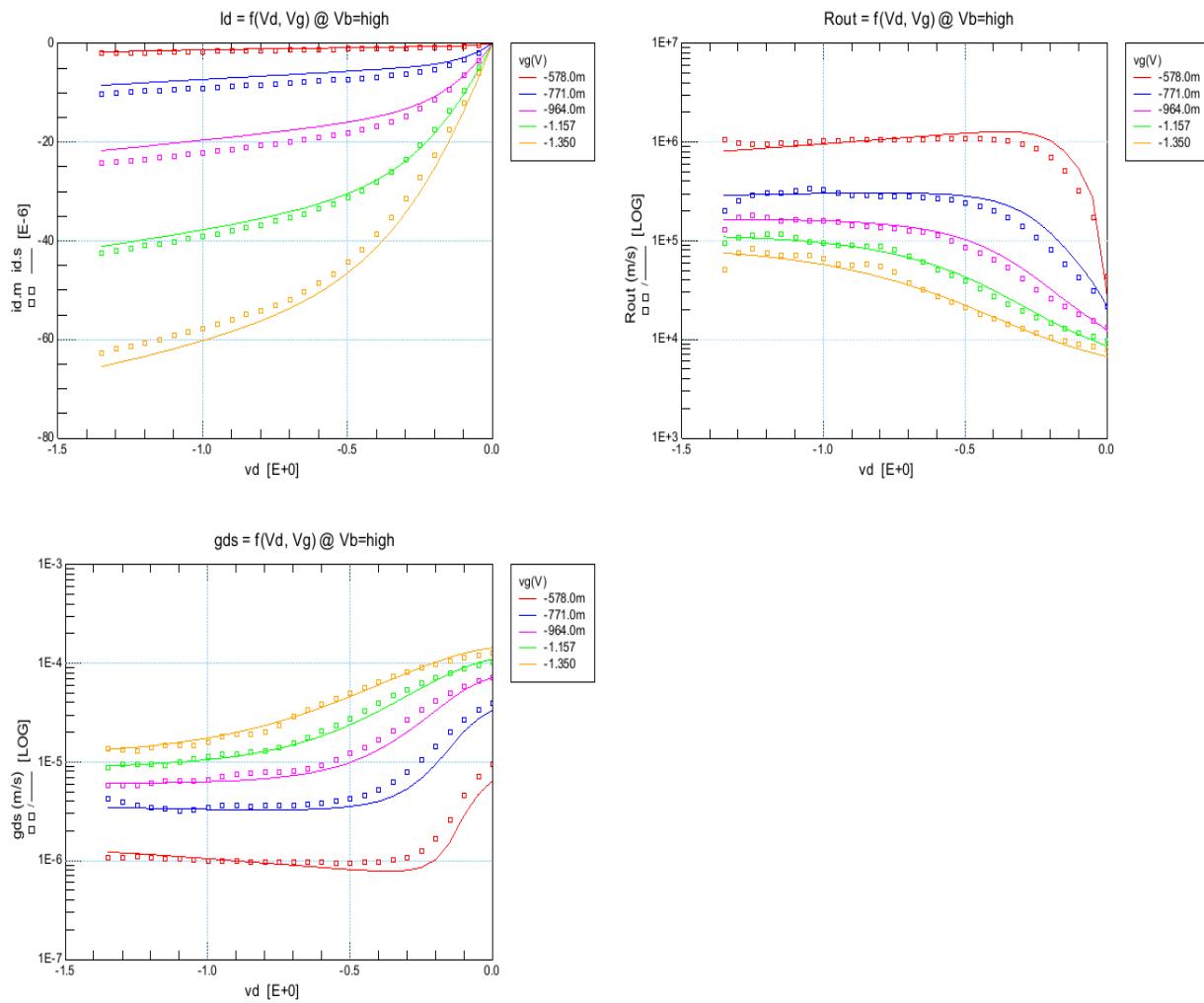
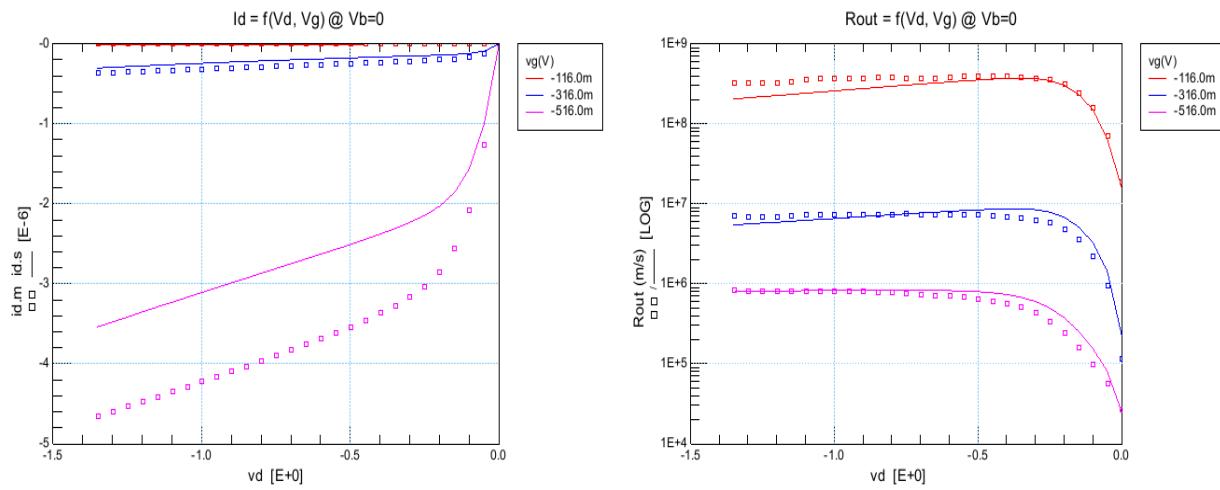


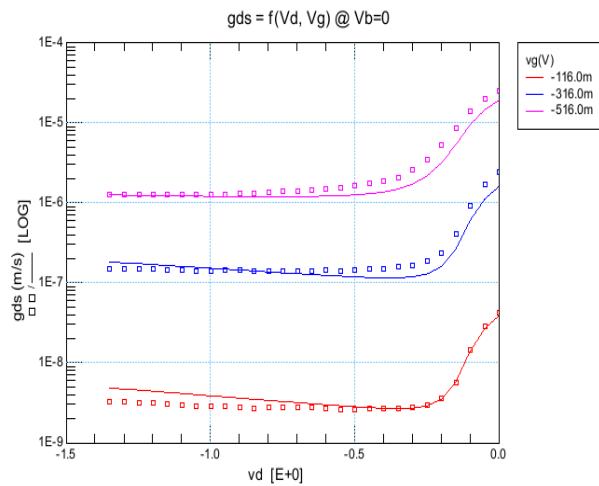


idvg, Ib,Ig, Vb = 0V, T = 125°C

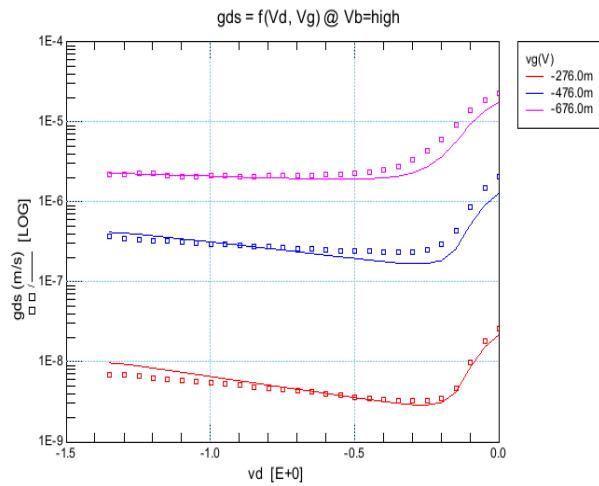
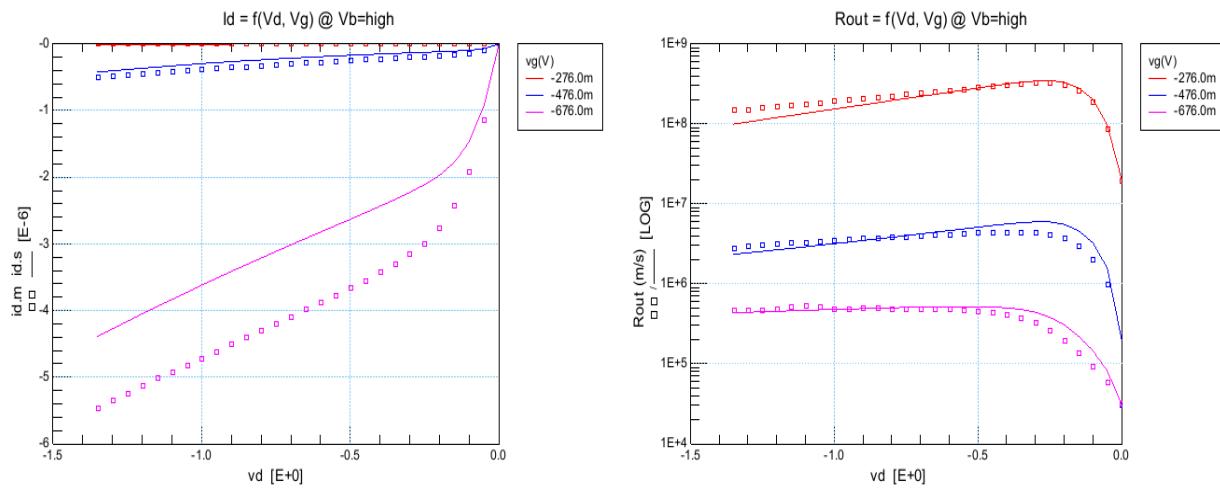


idvg, Ib,Ig, Vb = 1.2V, T = 125°C

idvd, Vb = 0V, T = 125°C


idvd_vbmin, Vb = 1.2V, T = 125°C

idvd_vth, Vb = 0V, T = 125°C


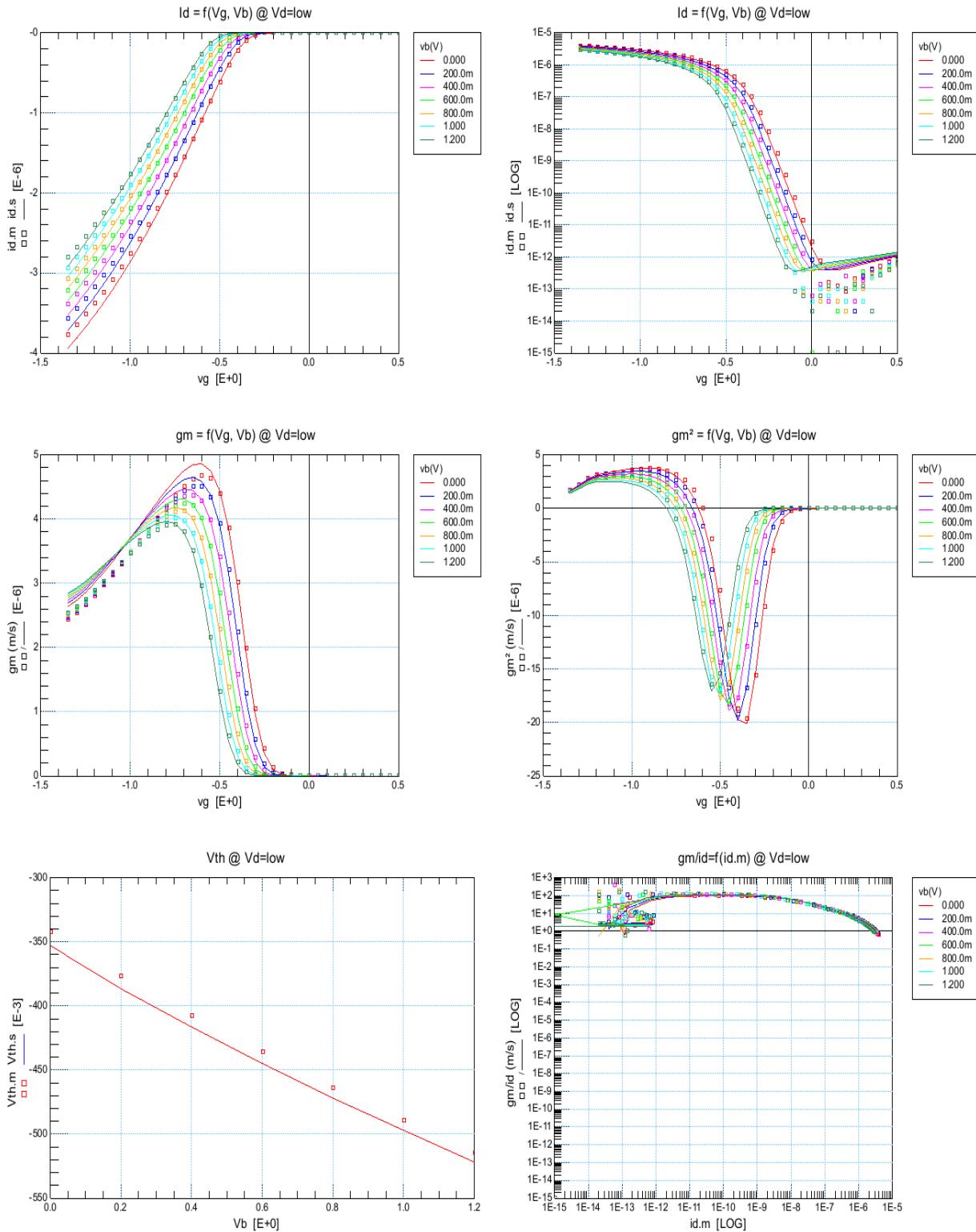


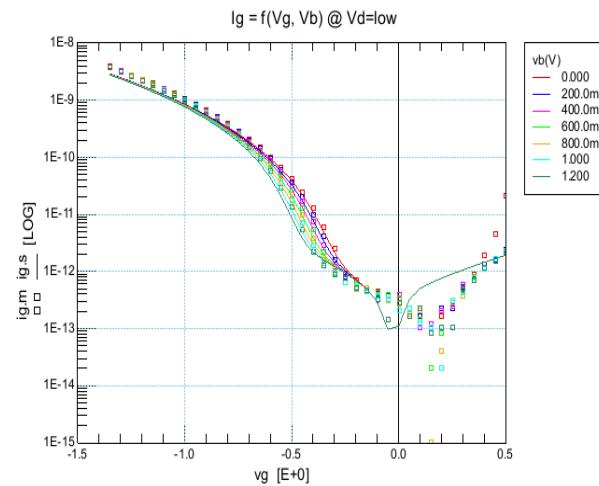
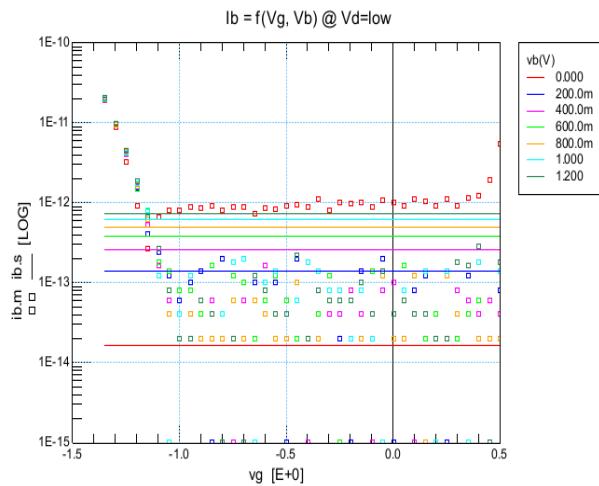
idvd_vth_vbmin, Vb = 1.2V, T = 125°C



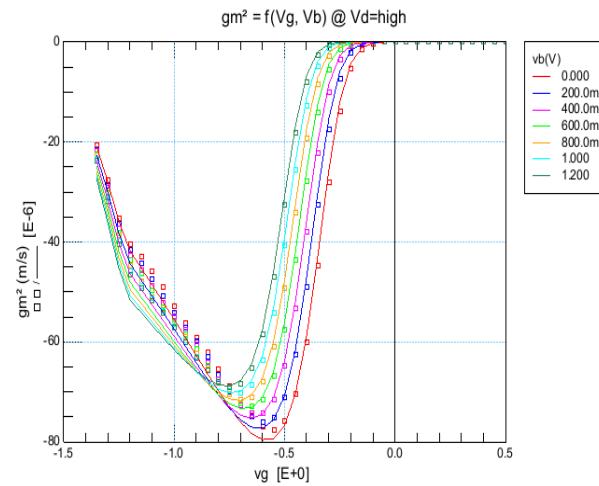
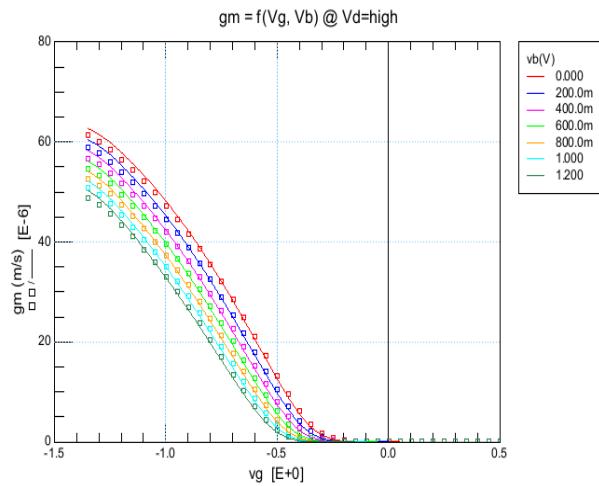
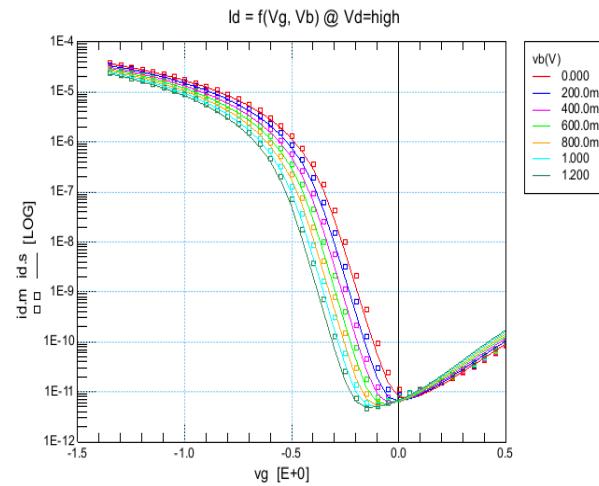
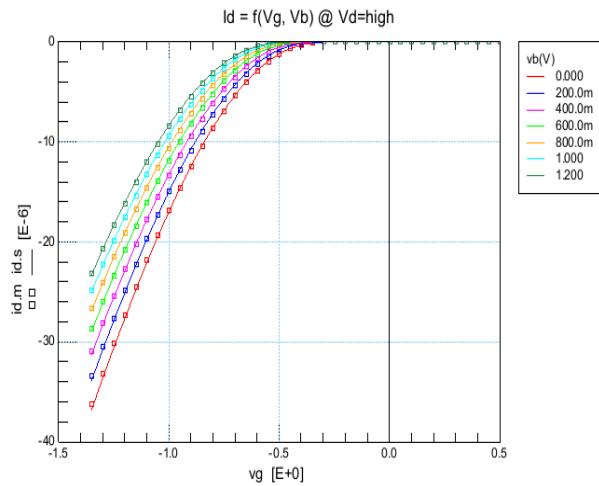
4.33 W05u0_L5u0_S550_2

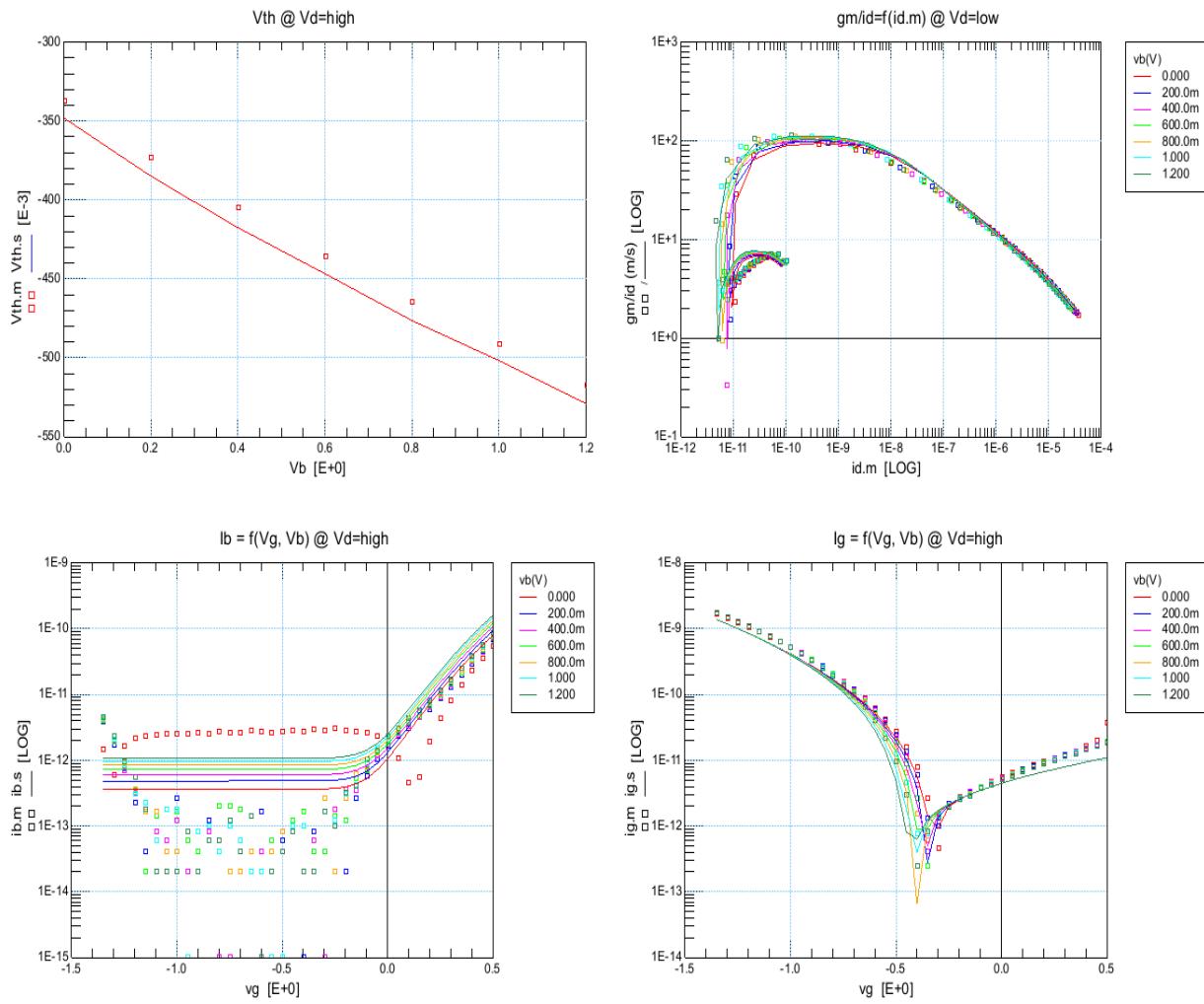
$idv_g, V_d = -0.05V, T = 27^\circ C$



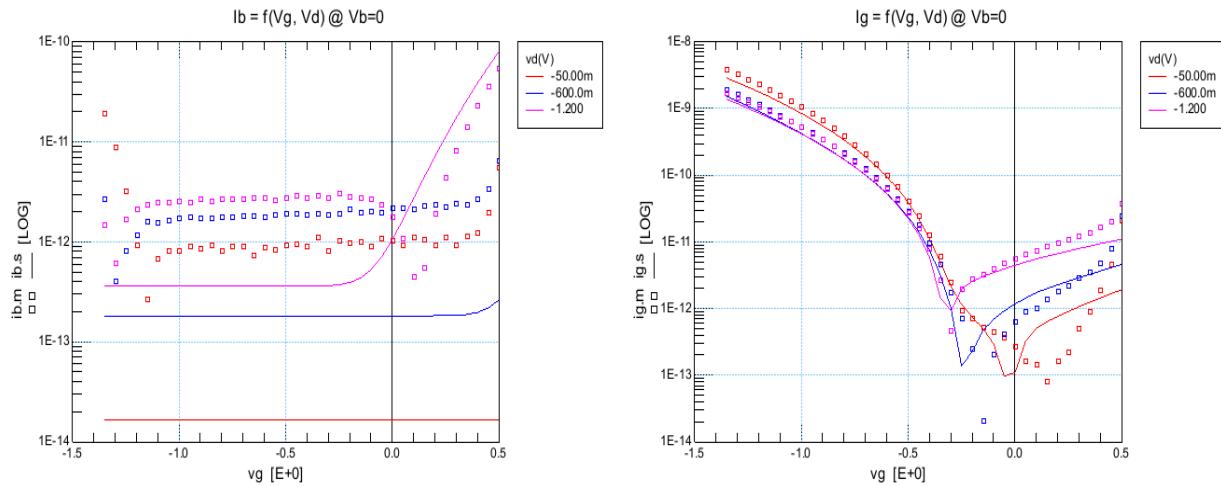


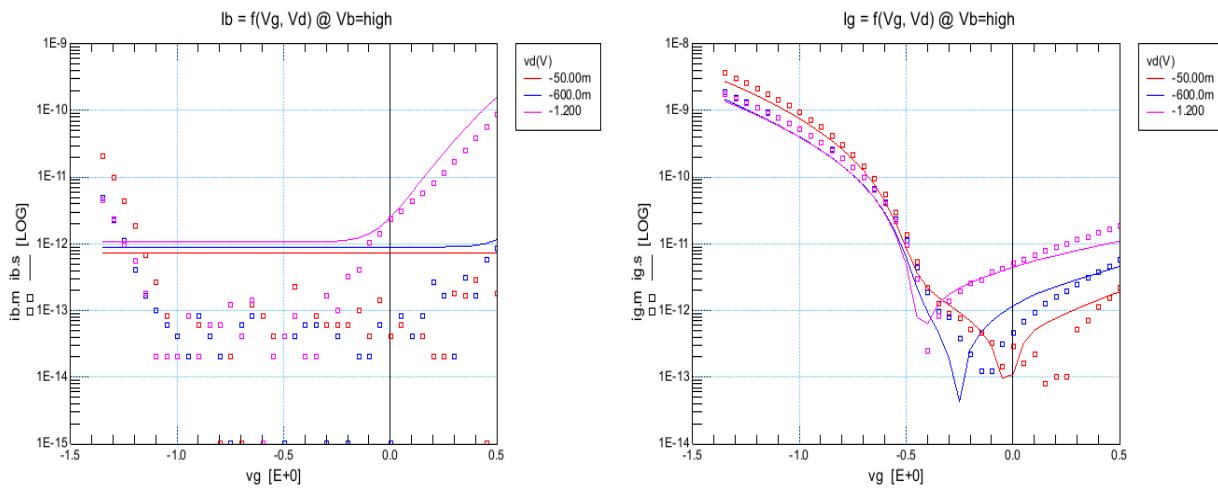
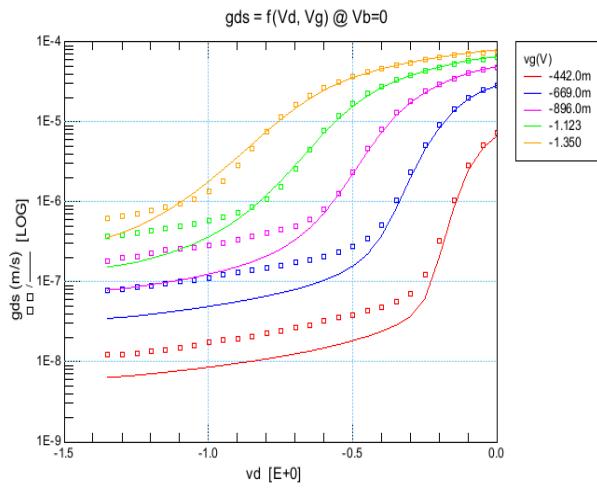
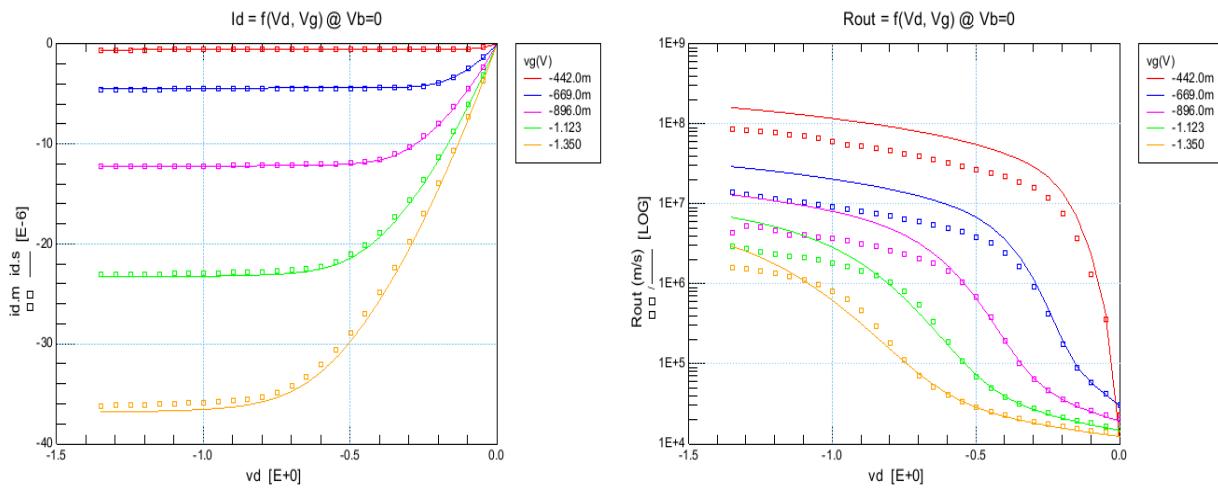
$i_{dvg}, V_d = -1.2V, T = 27^\circ C$

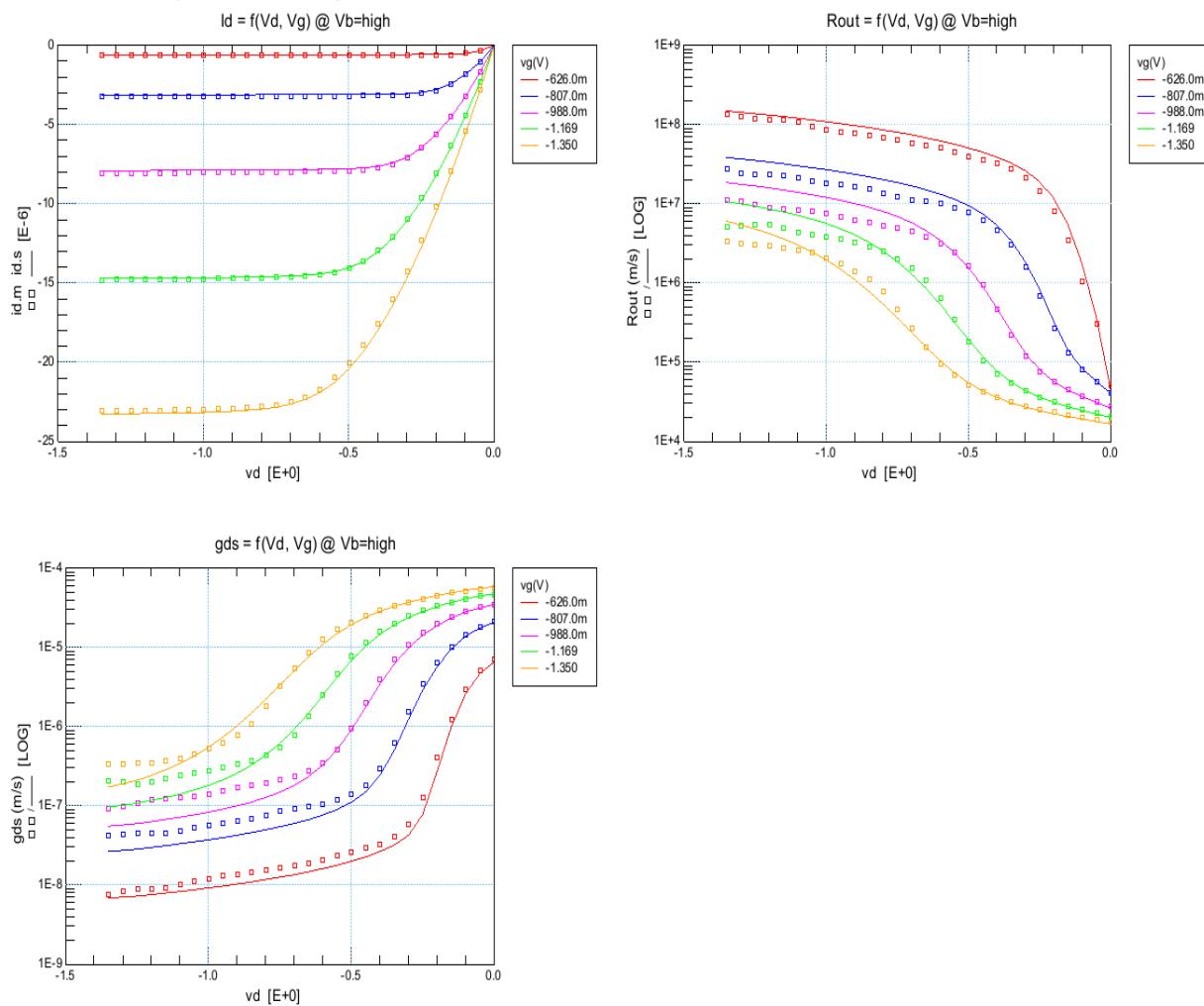
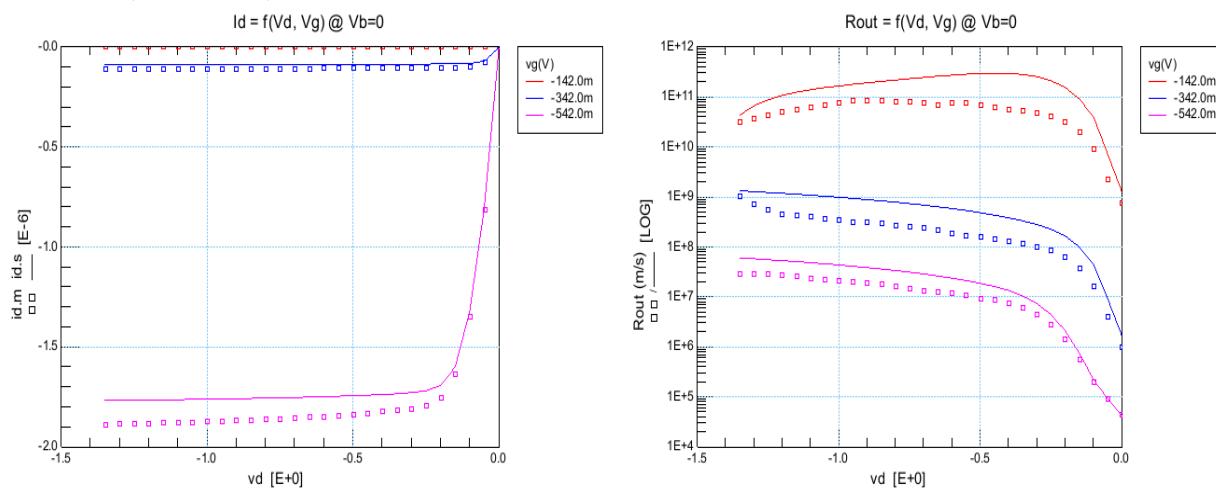


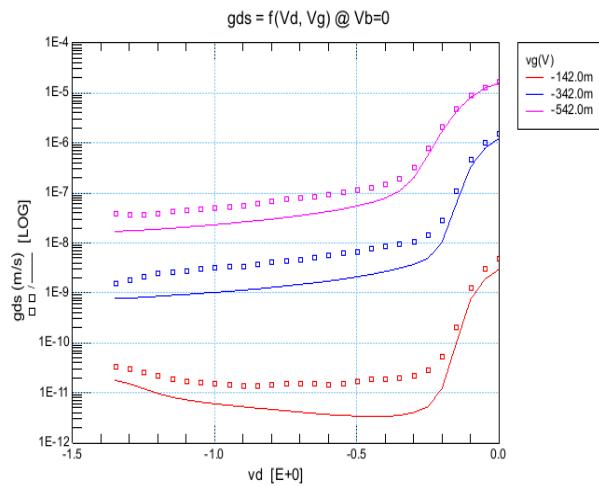


$I_dVg, I_b, I_g, V_b = 0V, T = 27^\circ C$

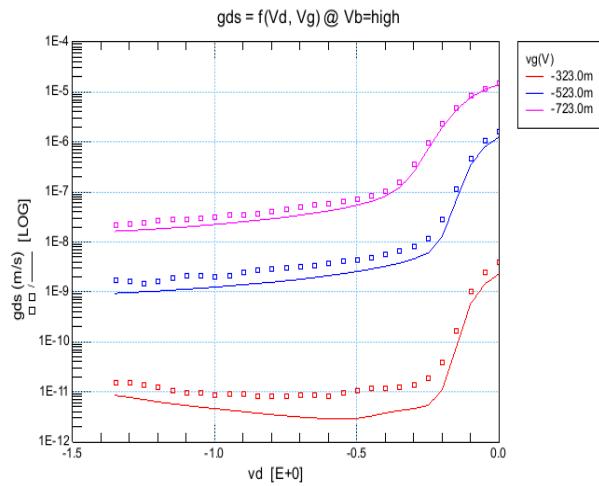
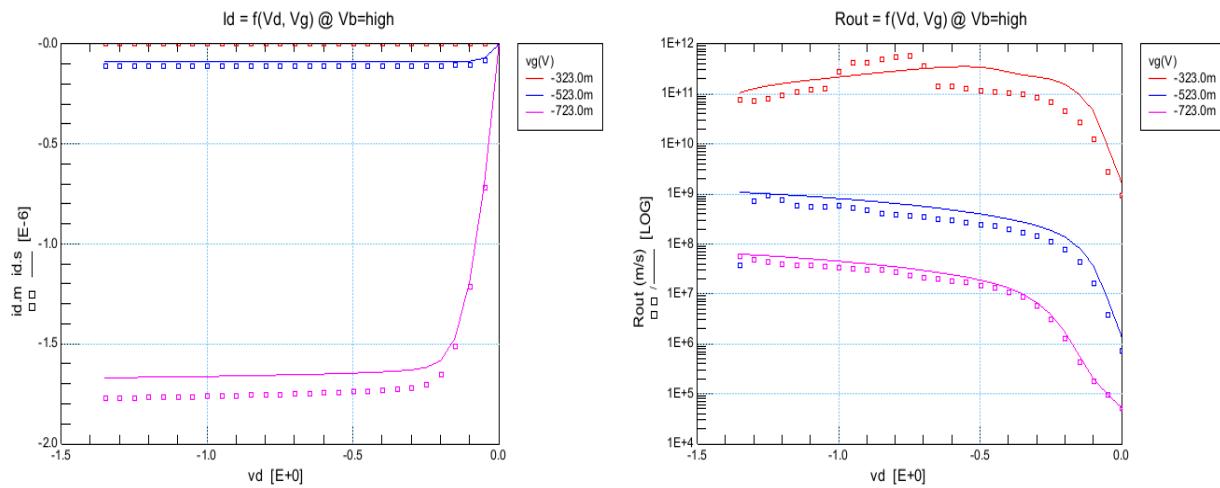


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C**idvd_vth, Vb = 0V, T = 27°C**

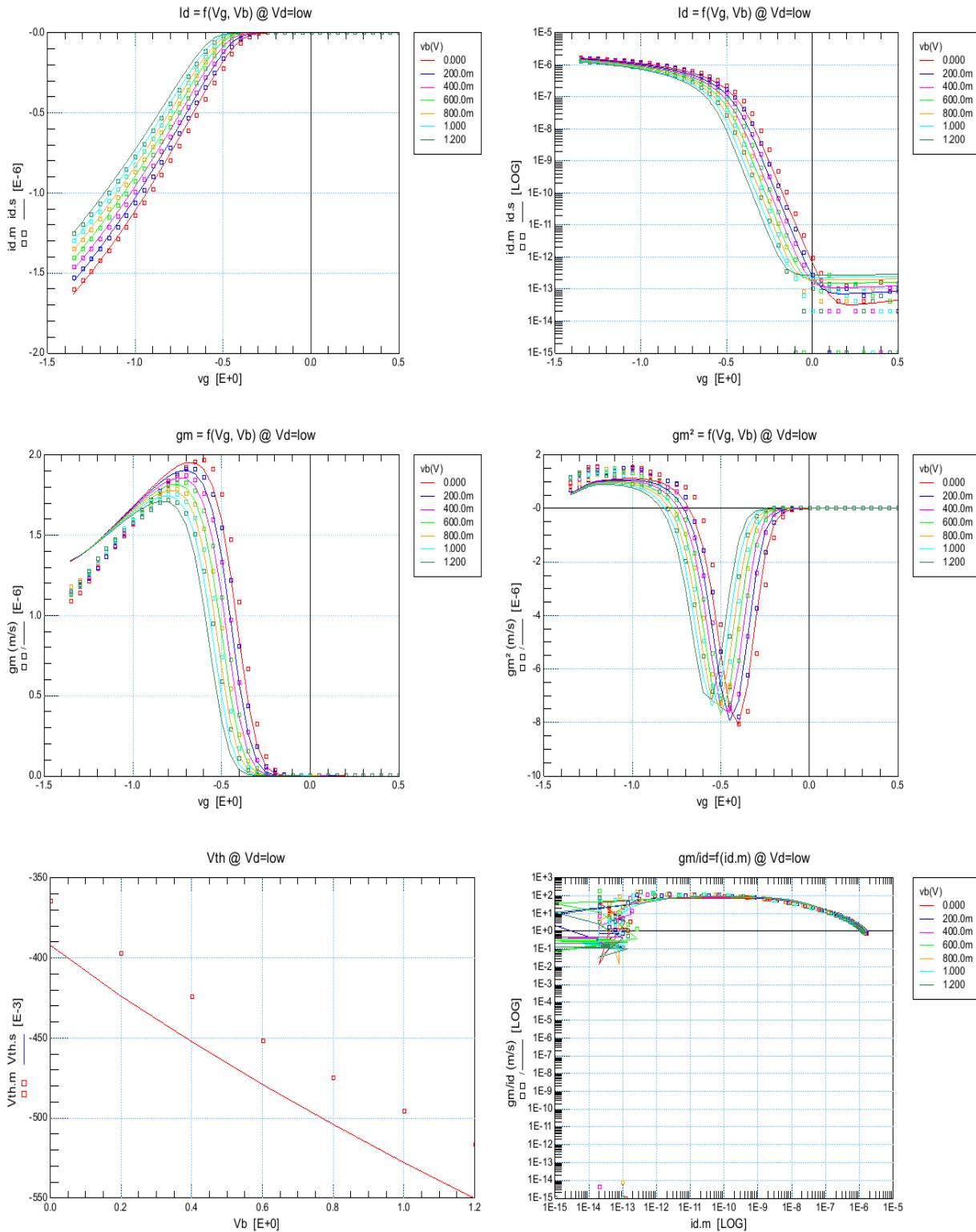


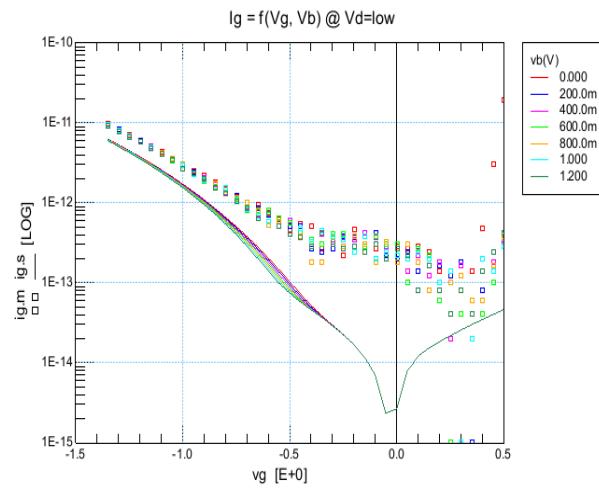
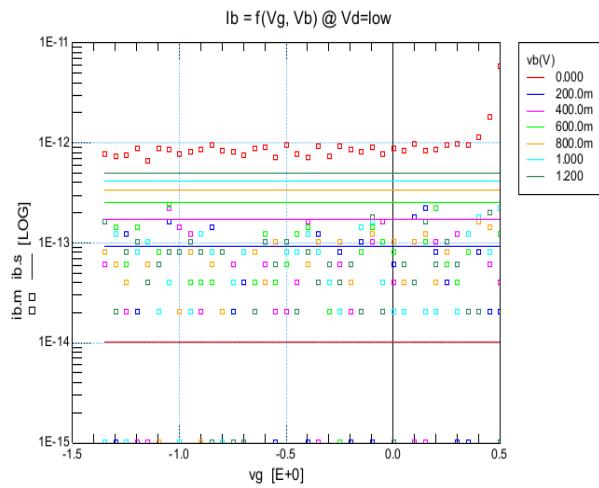
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



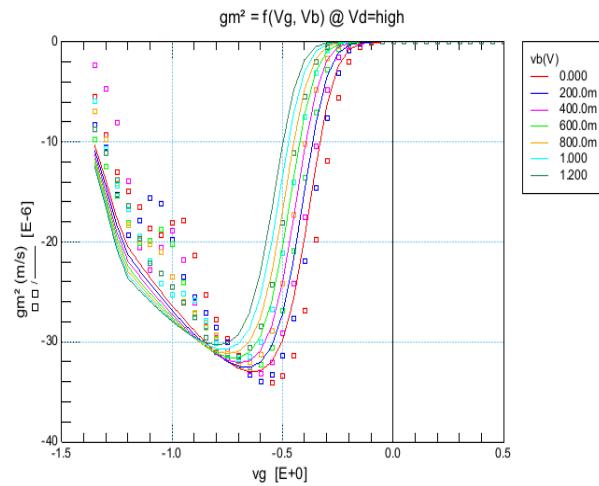
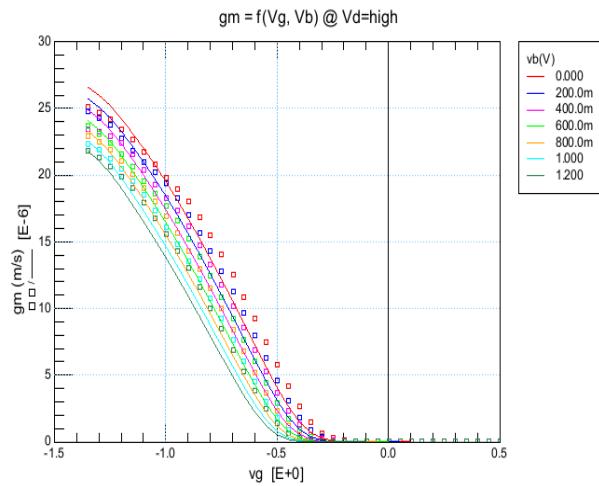
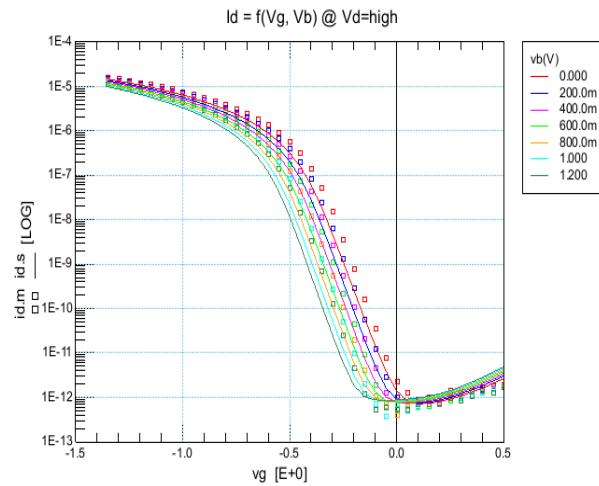
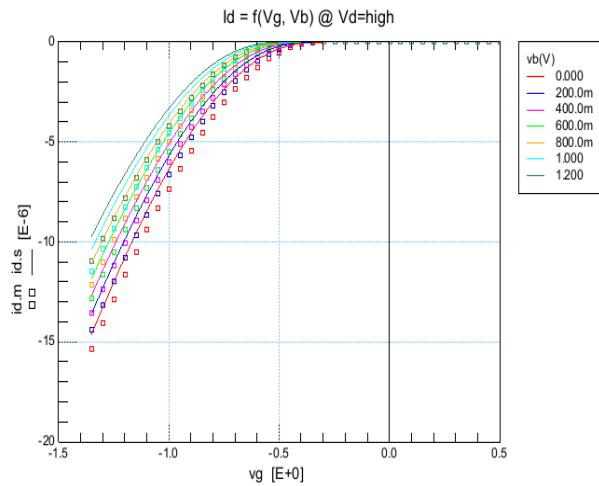
4.34 W0u15_L0u5_S555_2

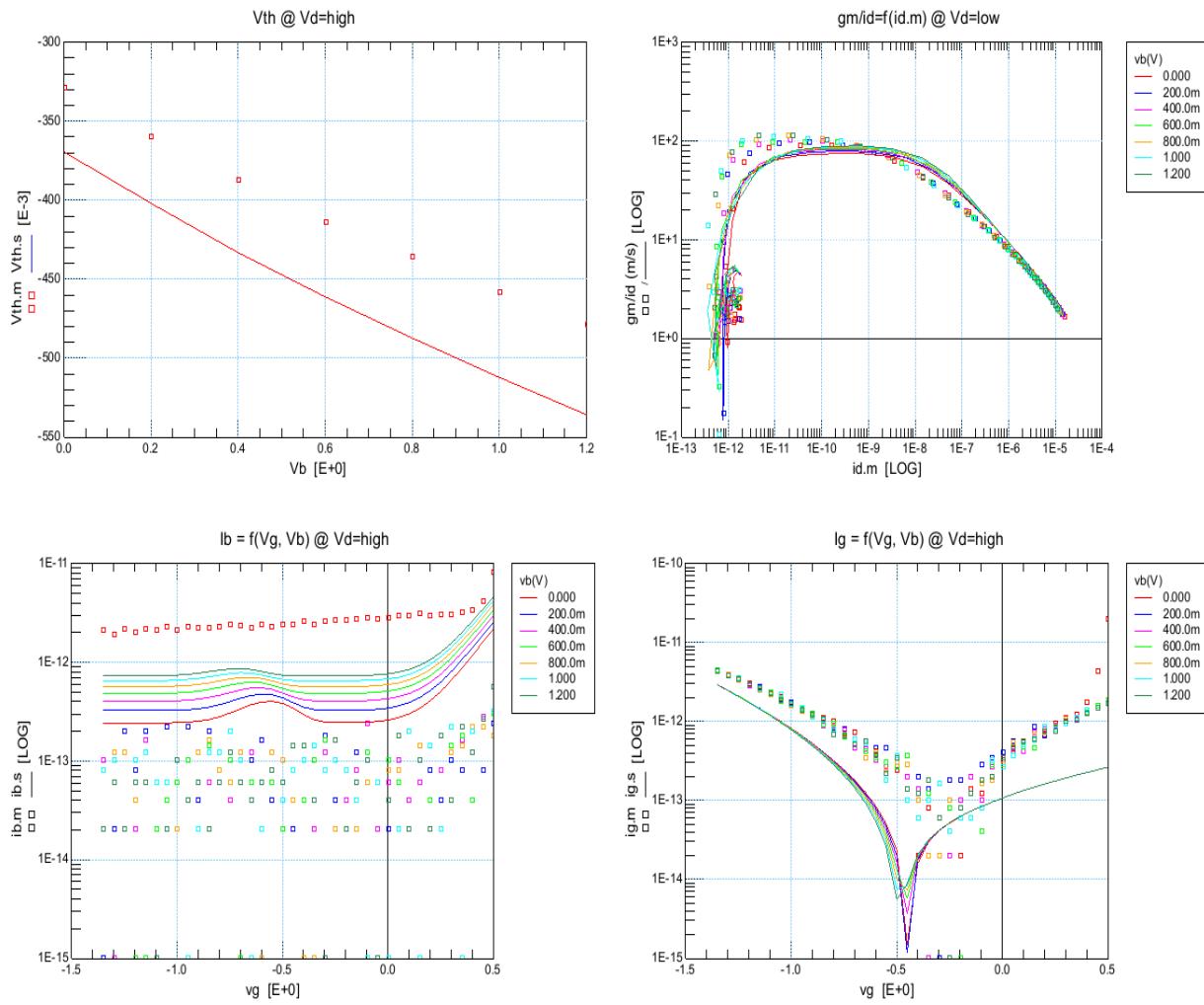
$idv_g, V_d = -0.05V, T = 27^\circ C$



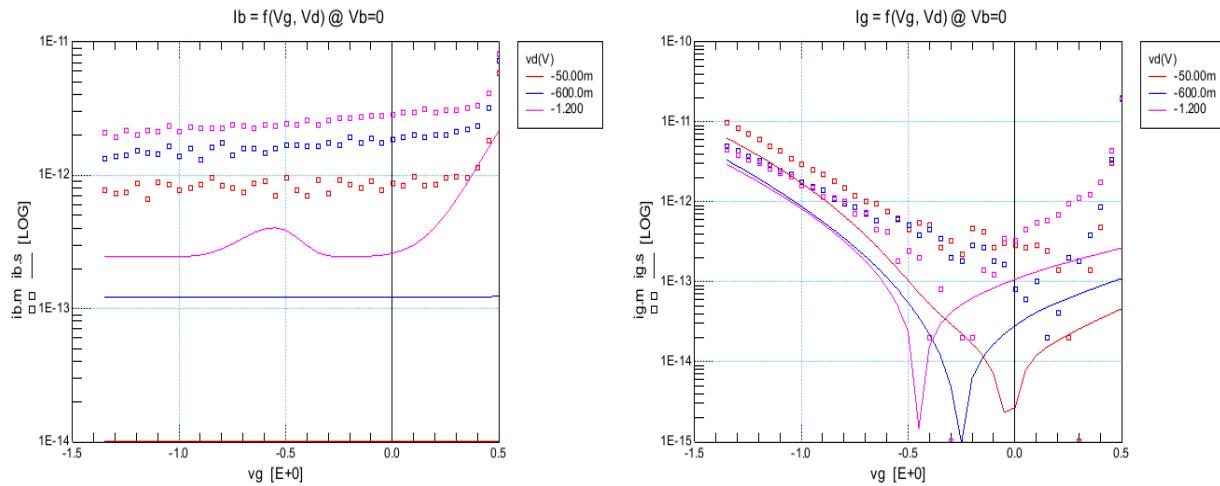


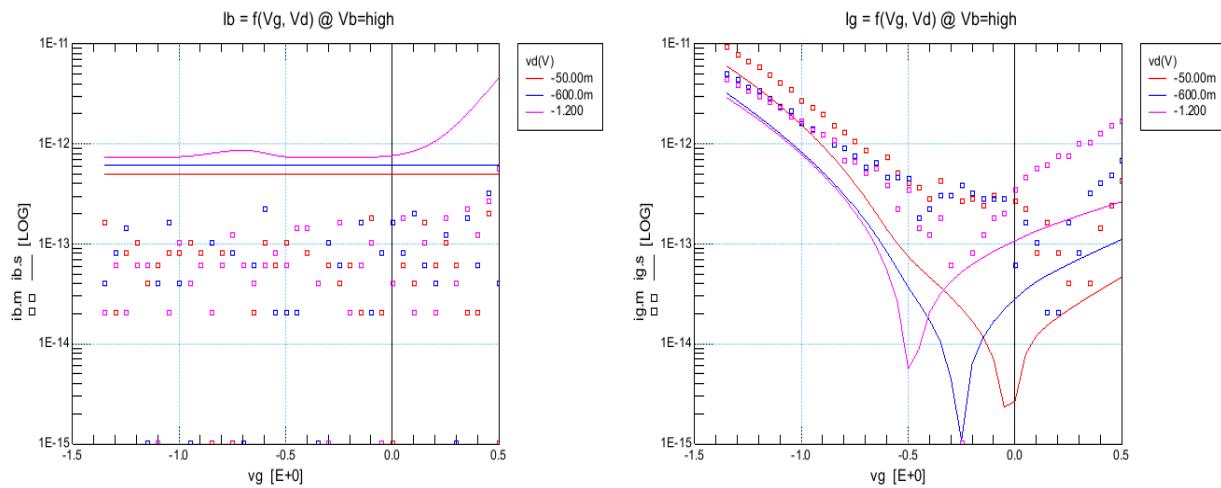
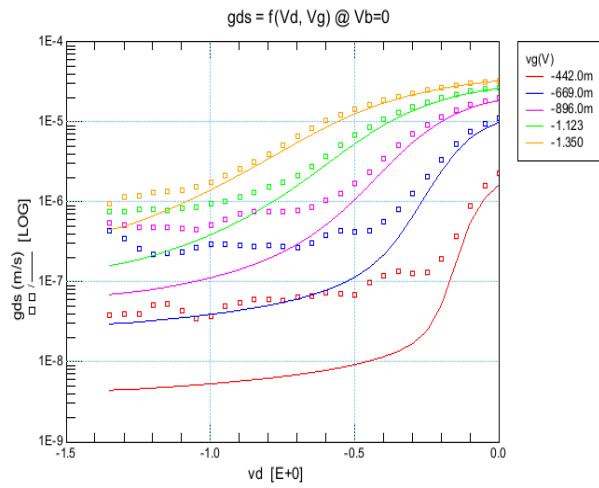
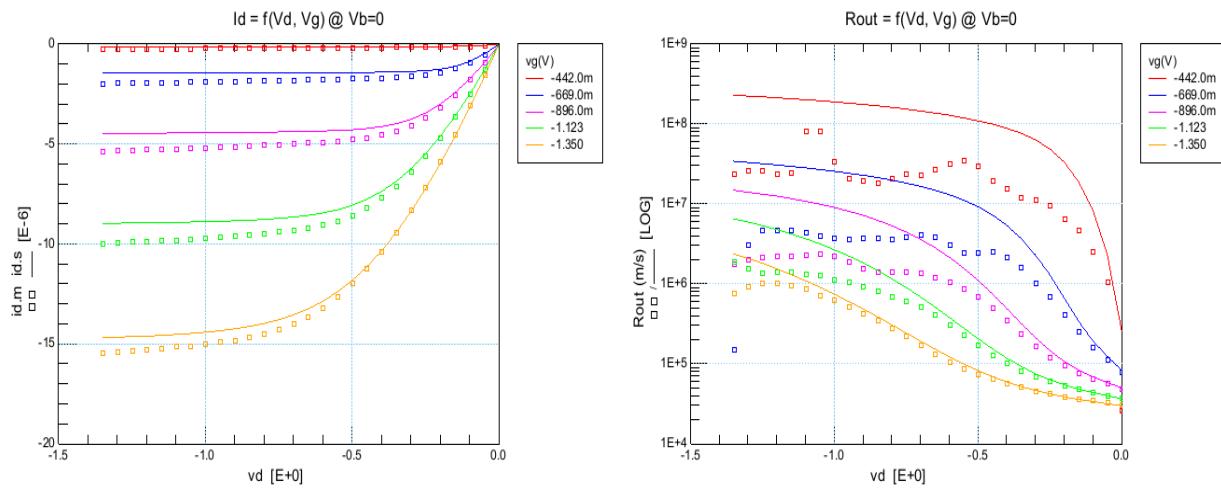
$i_{dvg}, V_d = -1.2V, T = 27^\circ C$

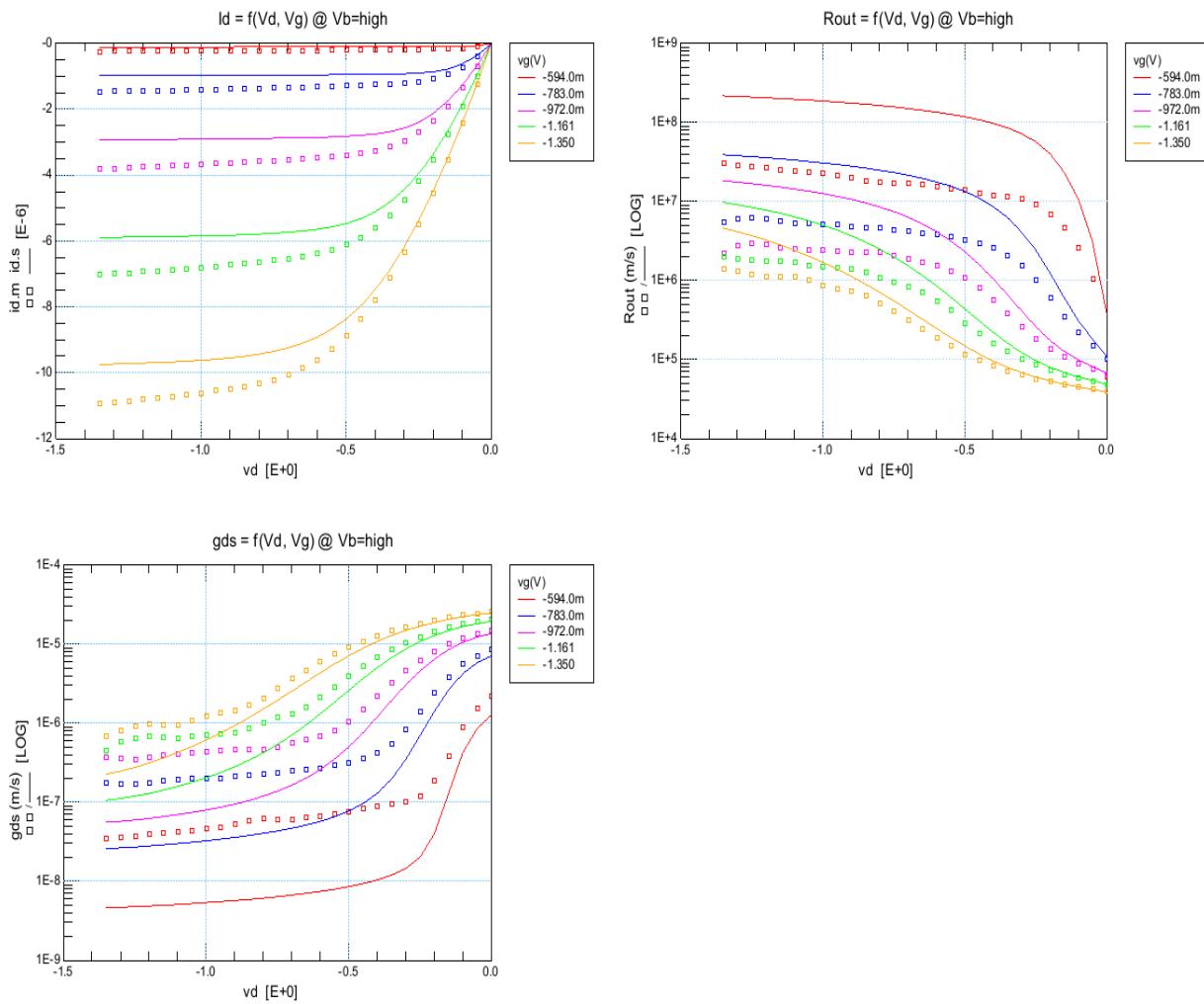
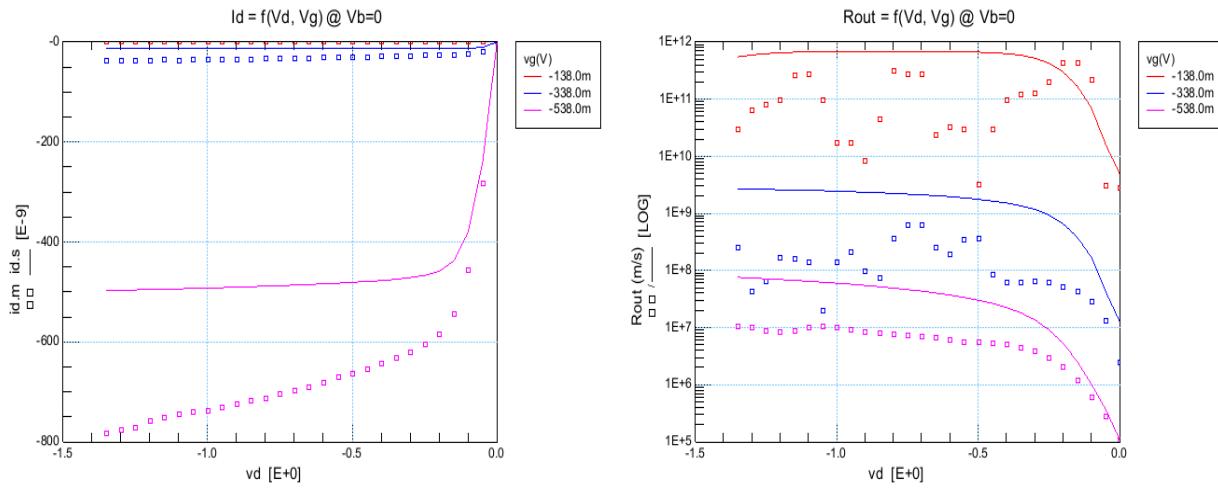


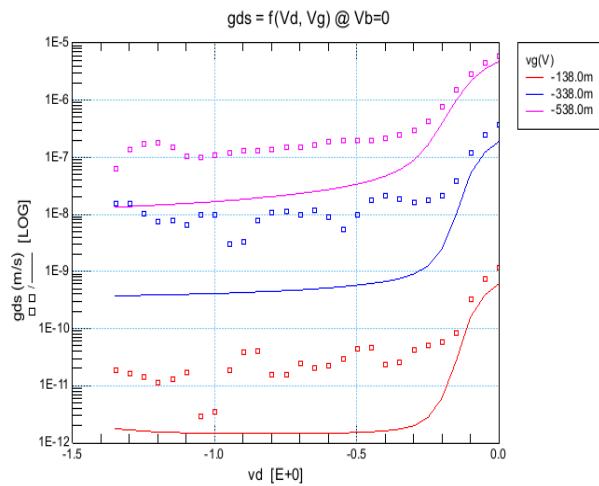


$I_d v g, I_b, I_g, V_b = 0V, T = 27^\circ C$

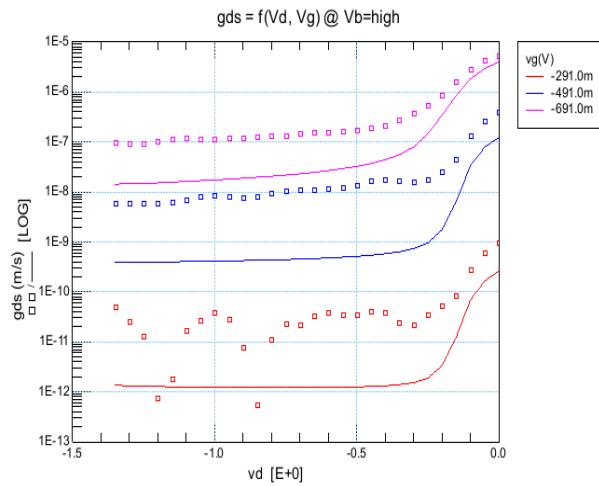
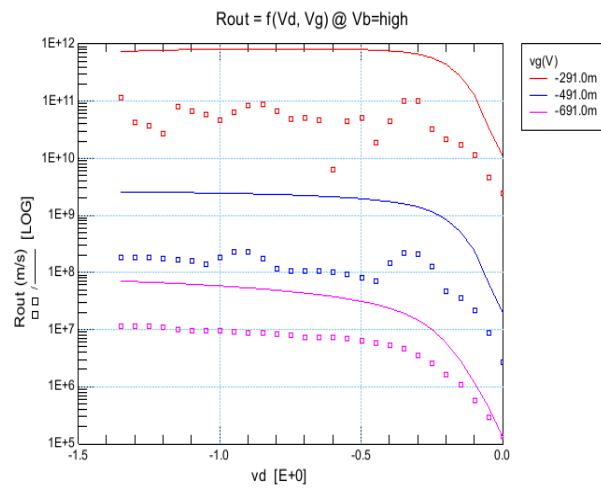
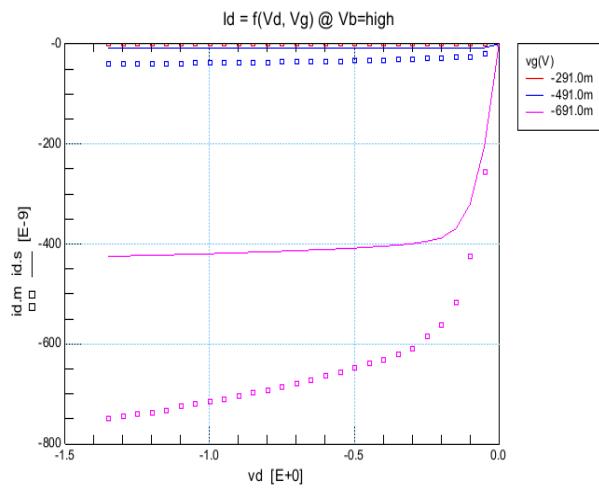


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C


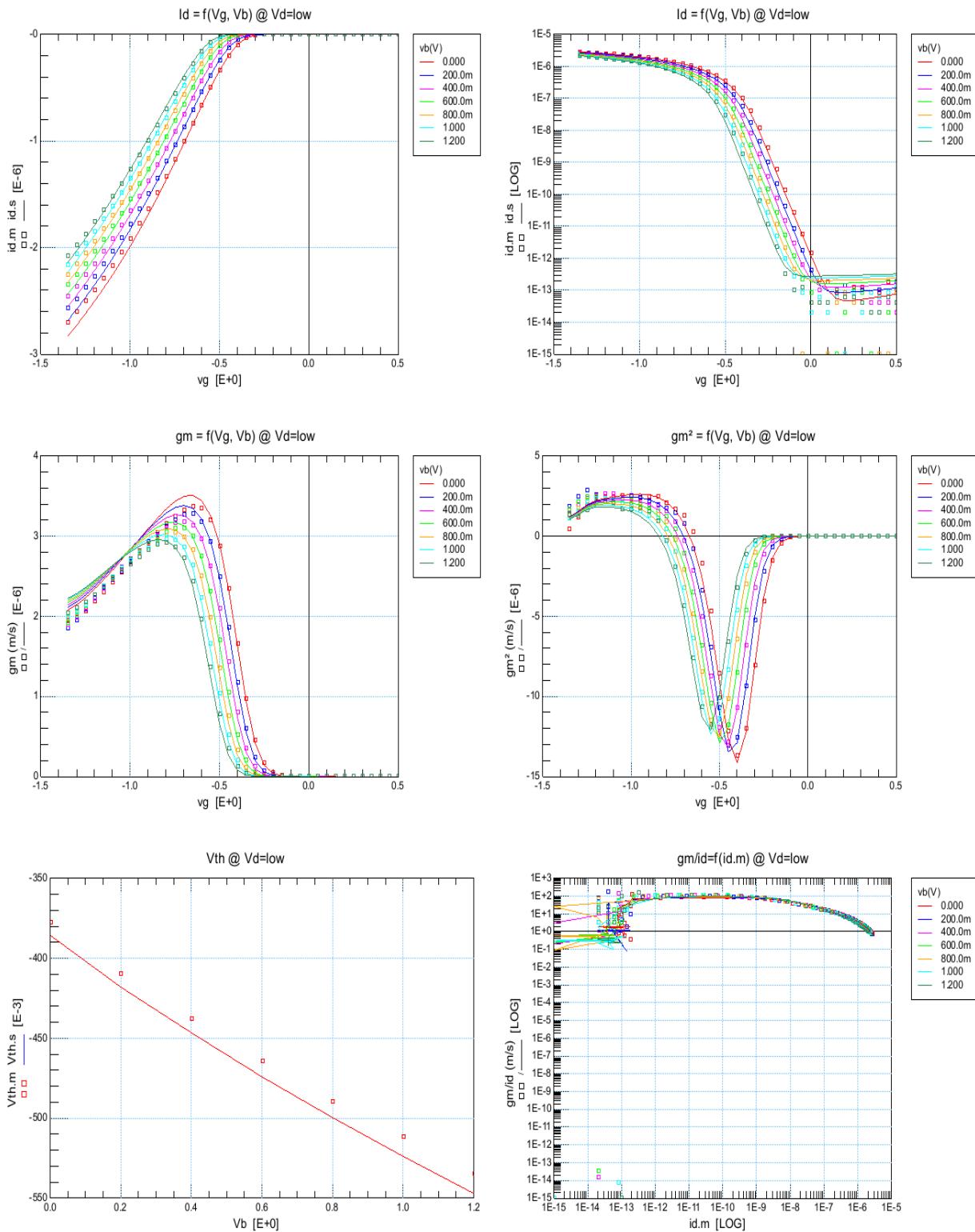


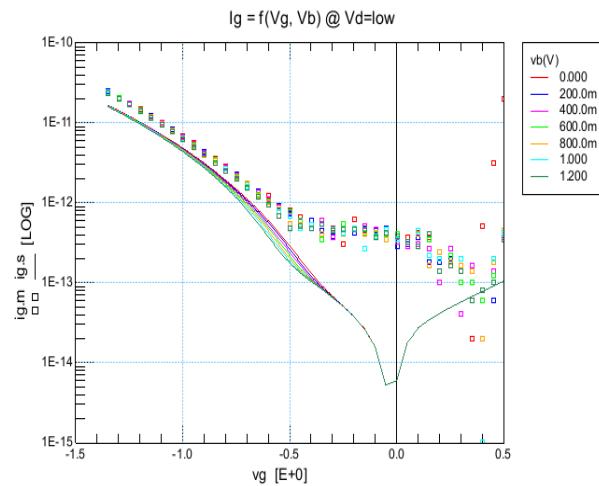
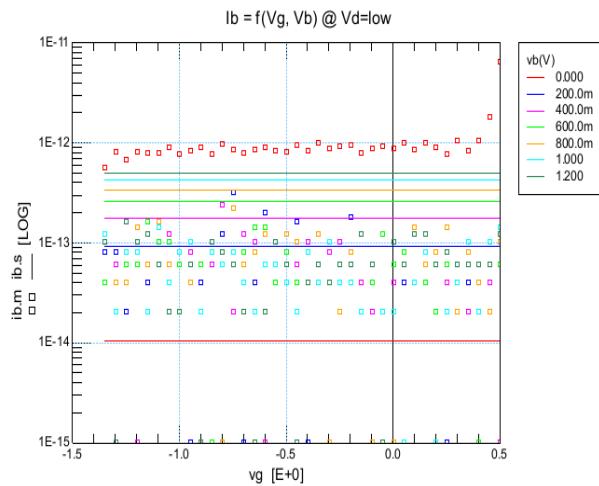
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



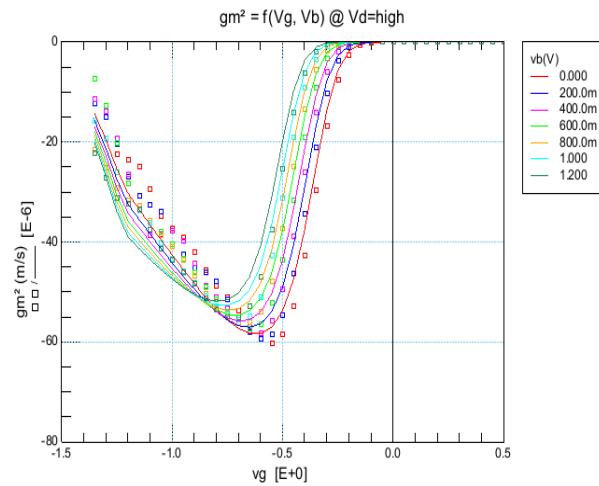
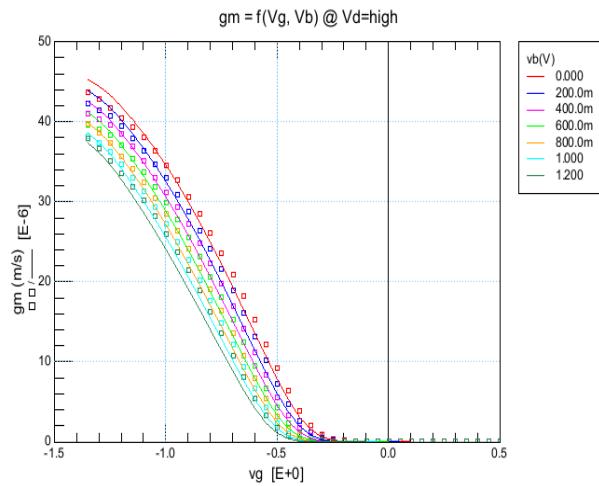
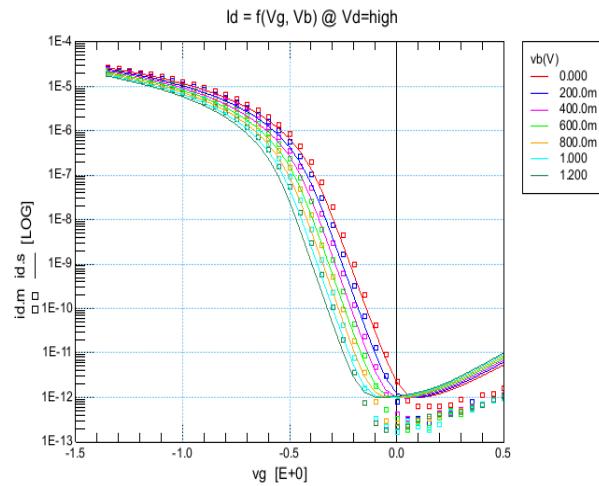
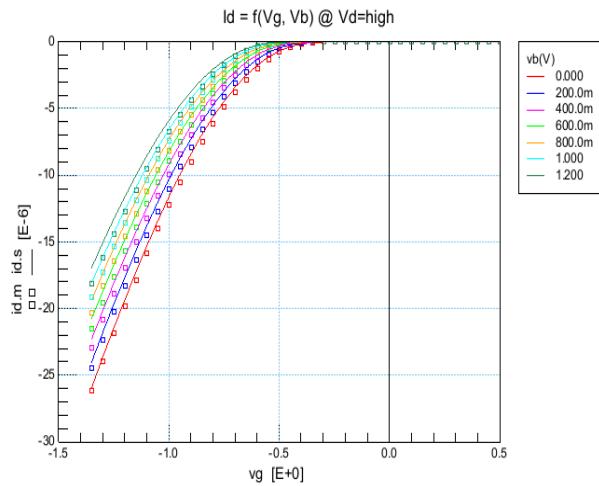
4.35 W0u3_L0u5_S553_1

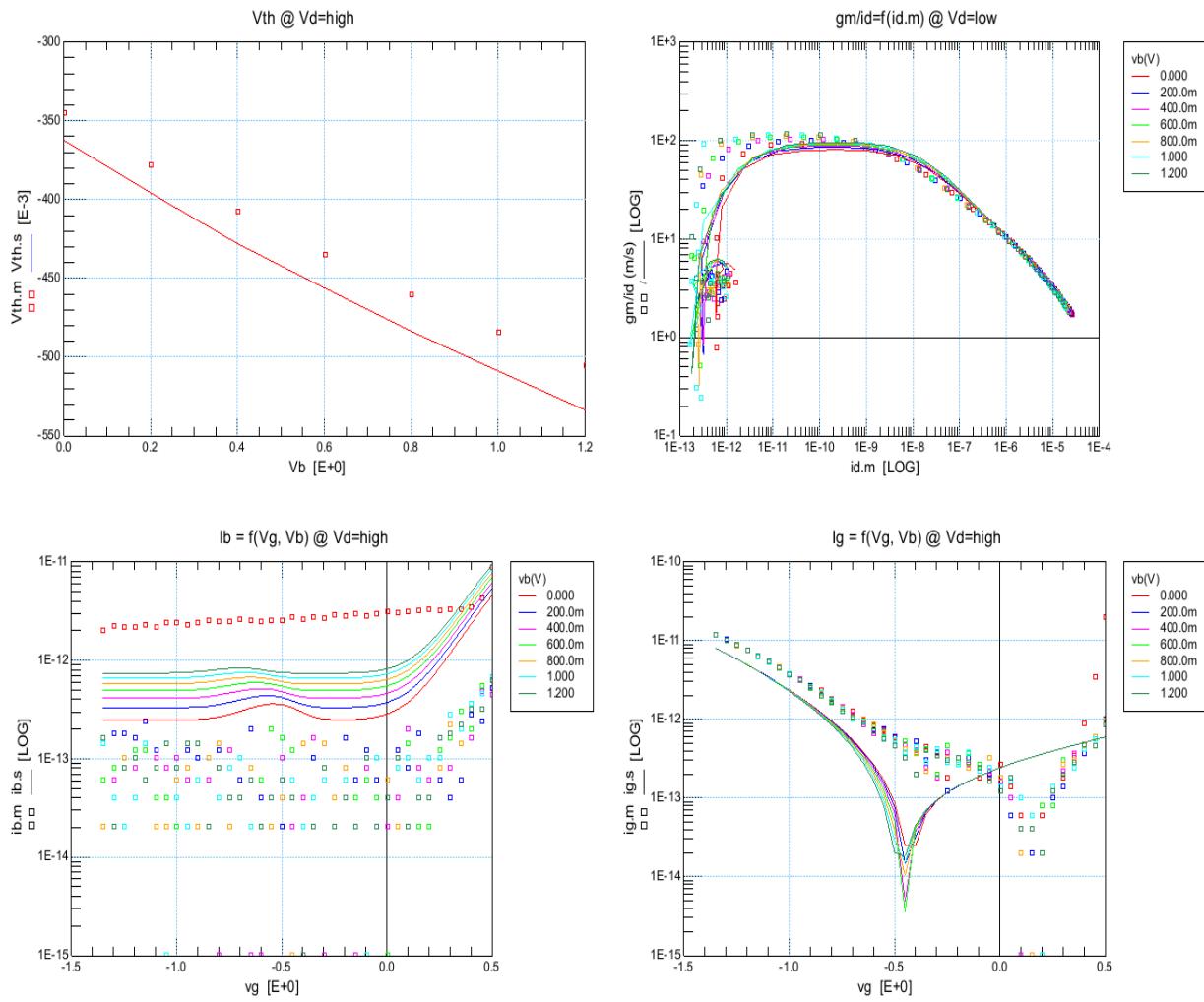
$idv_g, V_d = -0.05V, T = 27^\circ C$



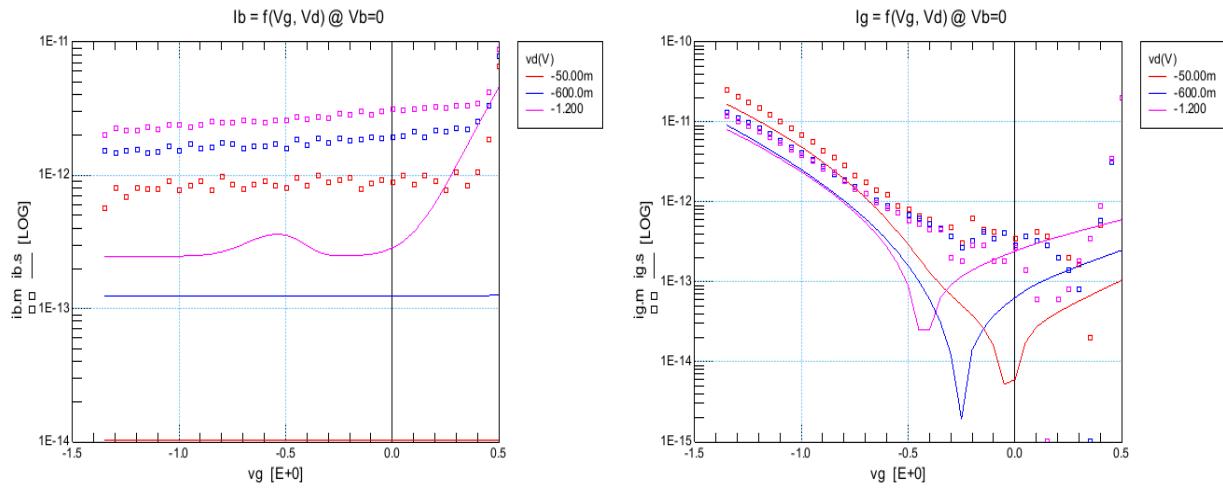


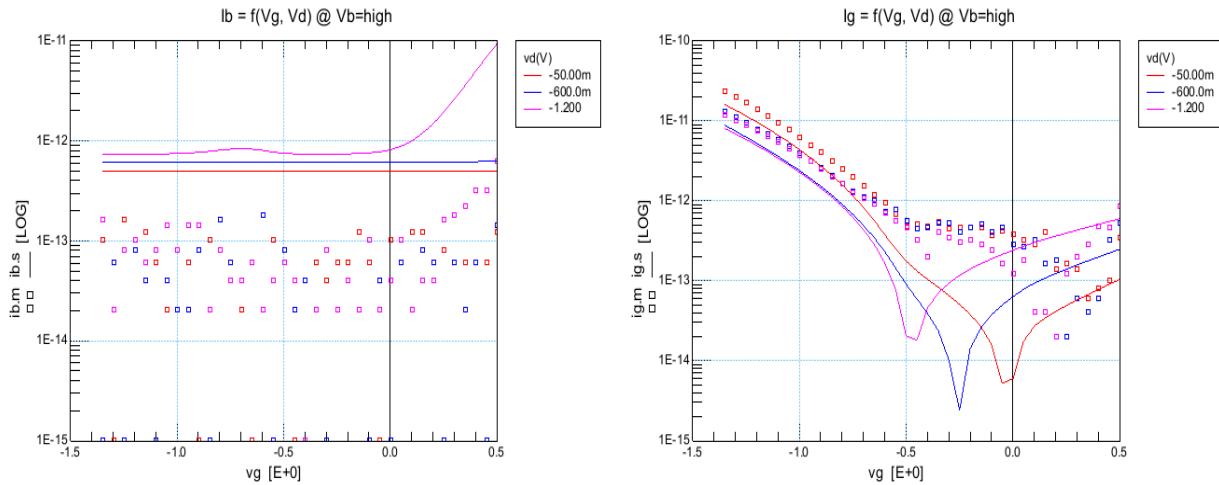
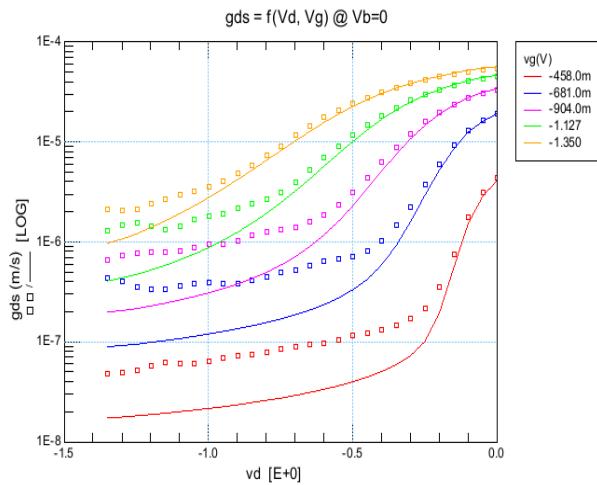
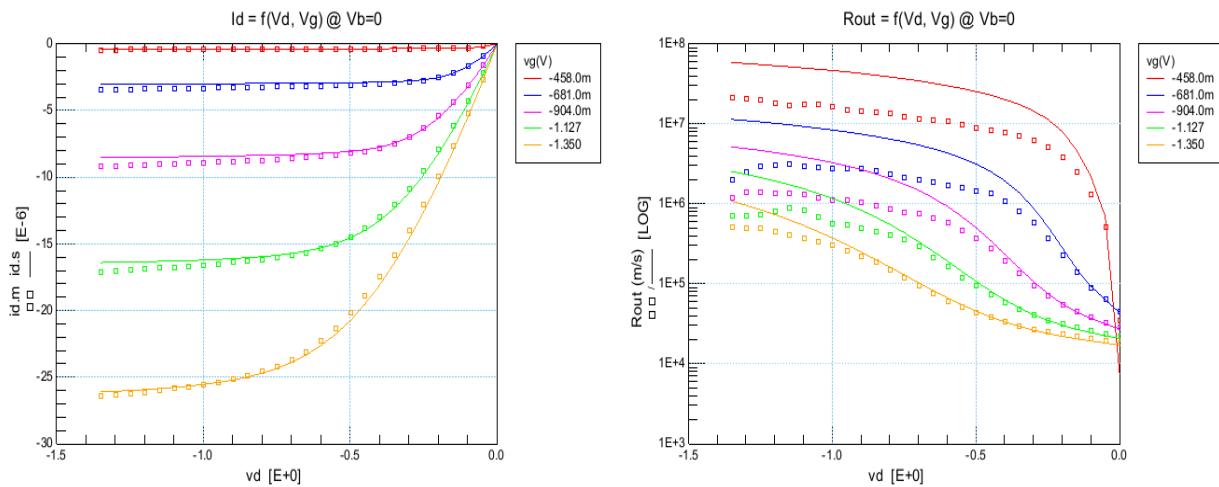
i_{dvg} , $V_d = -1.2V$, $T = 27^\circ C$

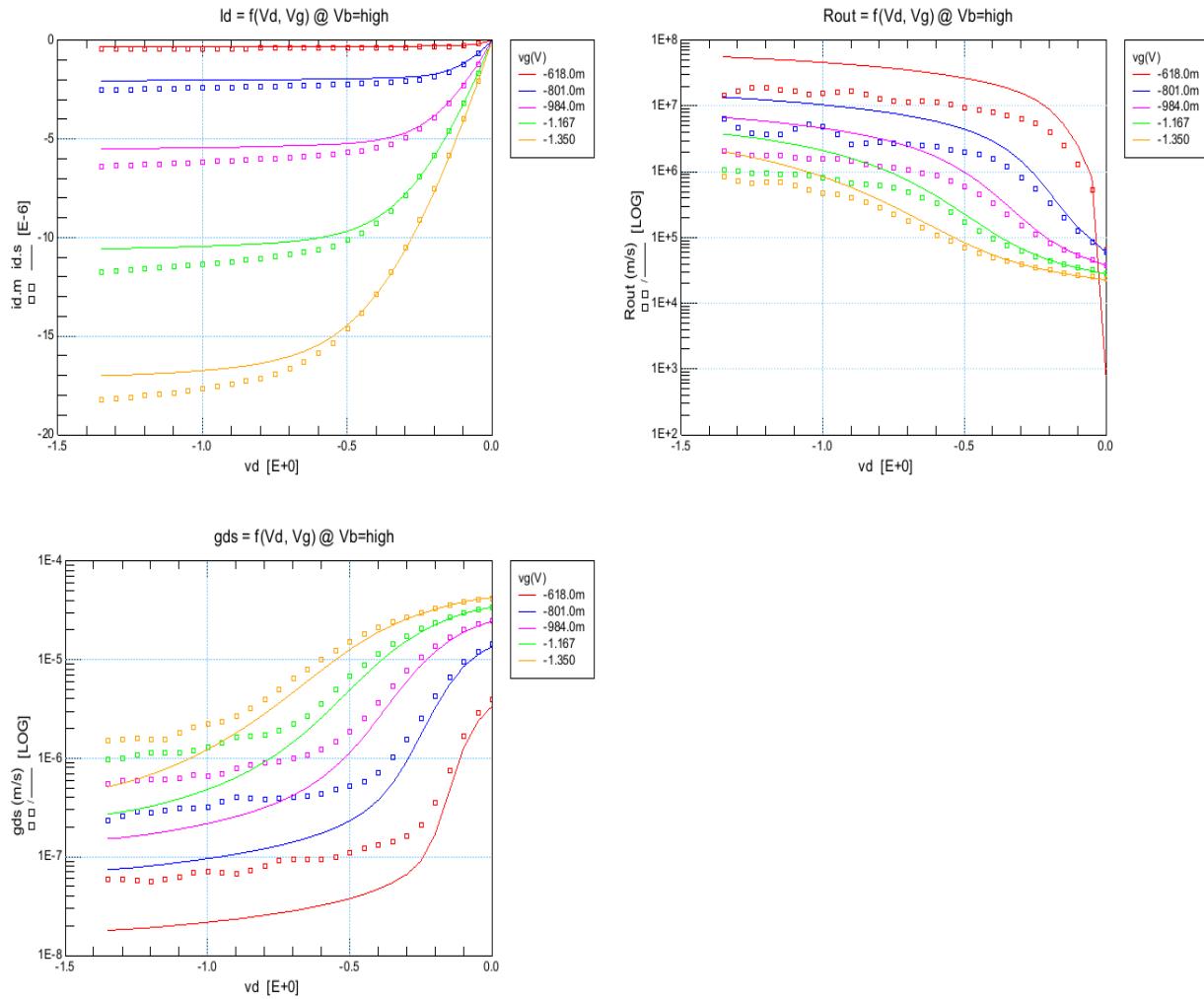
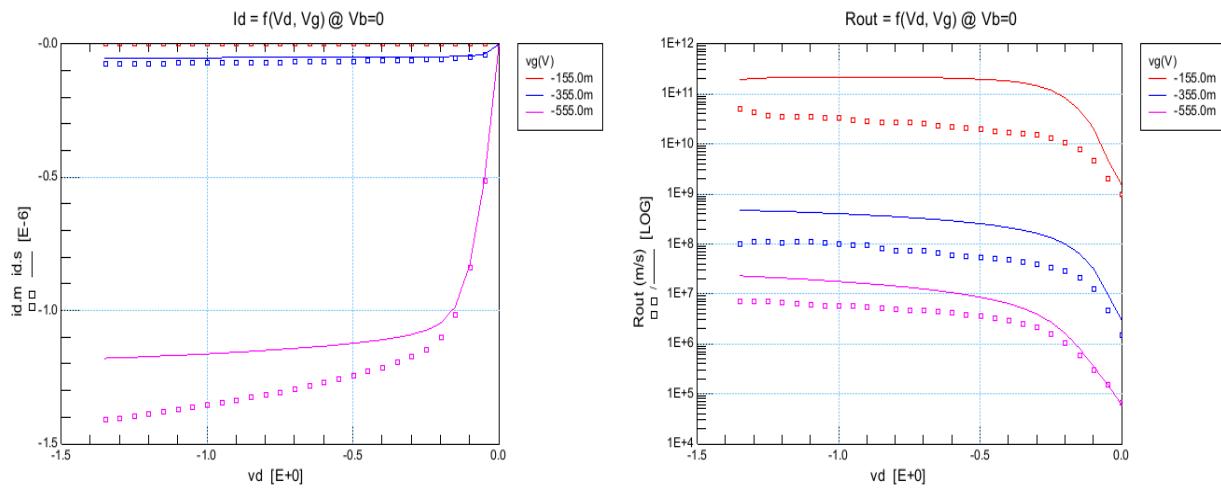


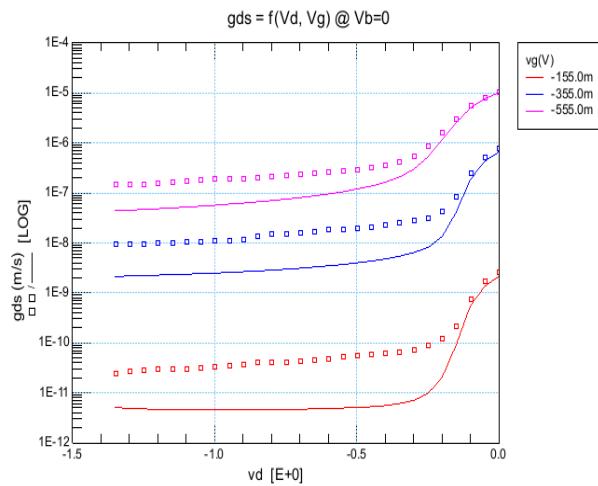


idvg, Ib,Ig, Vb = 0V, T = 27°C

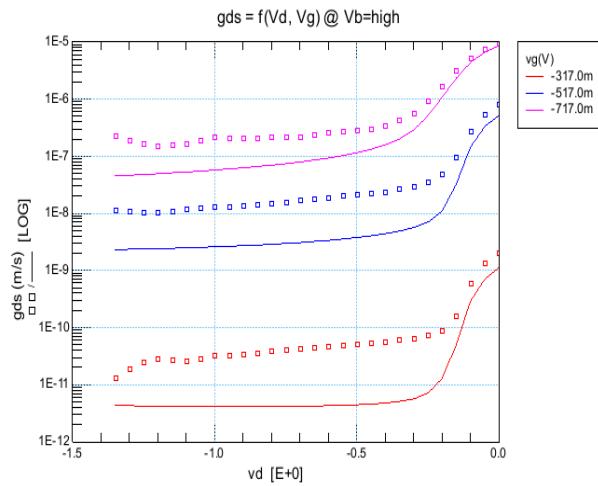
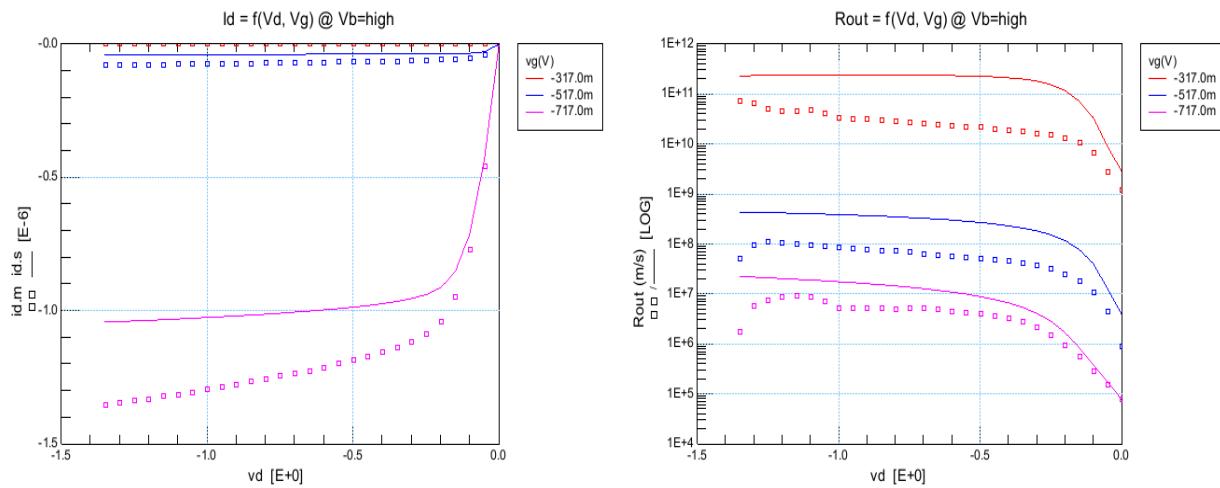


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C


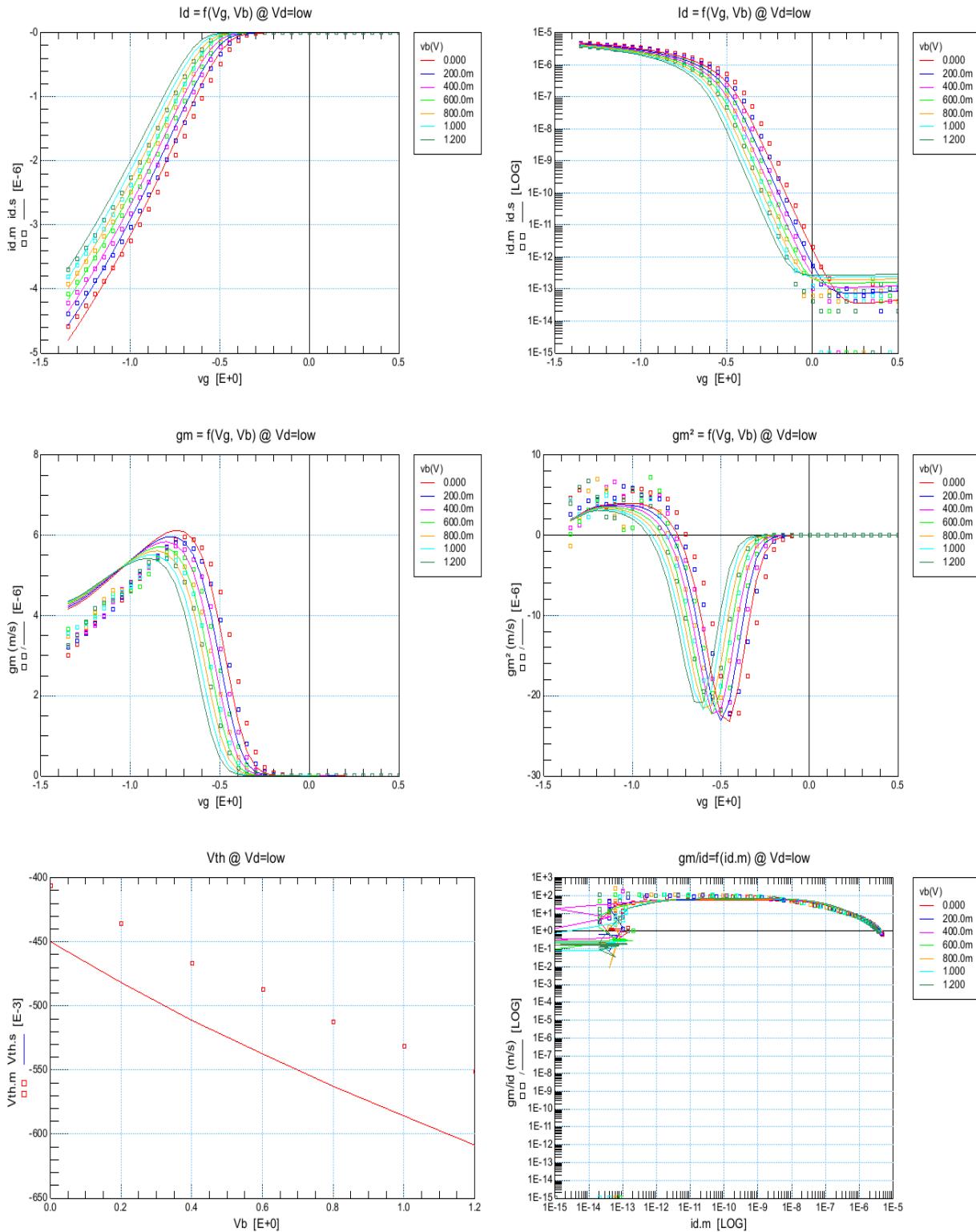


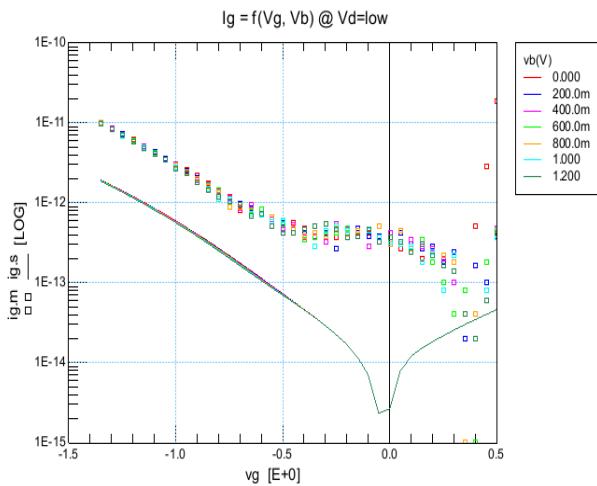
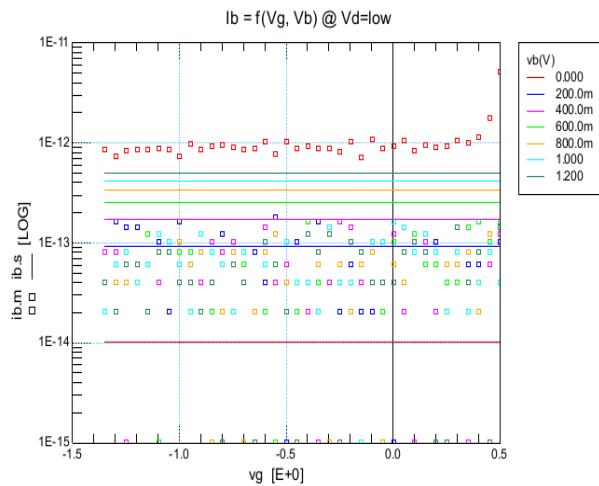
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



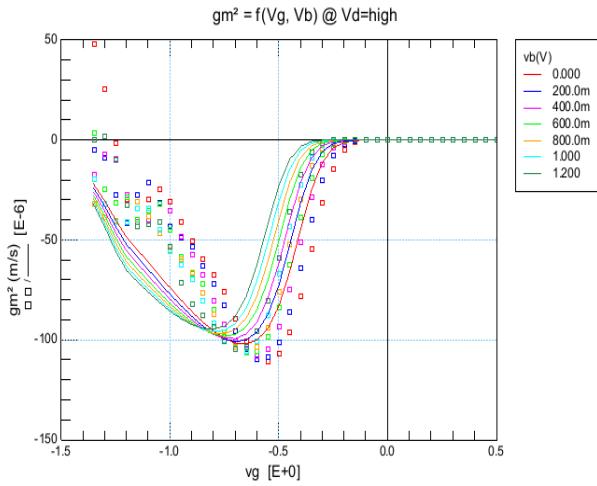
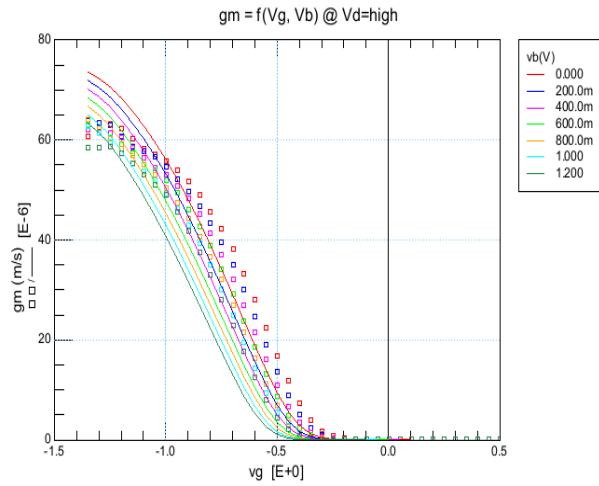
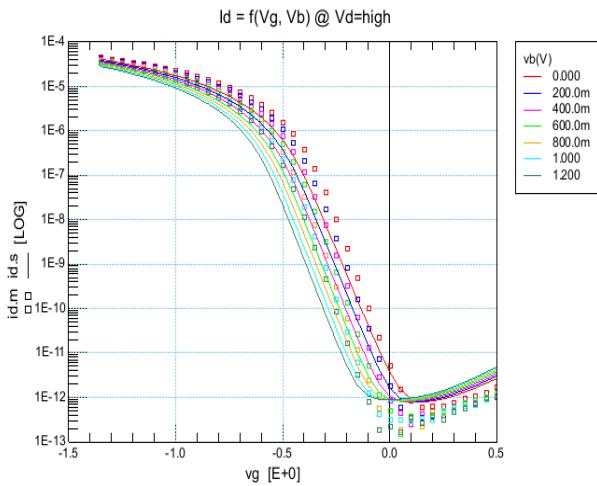
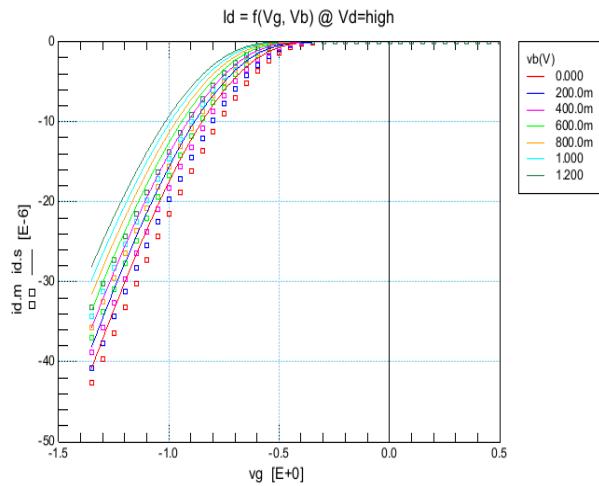
4.36 W0u15_L0u18_S555_1

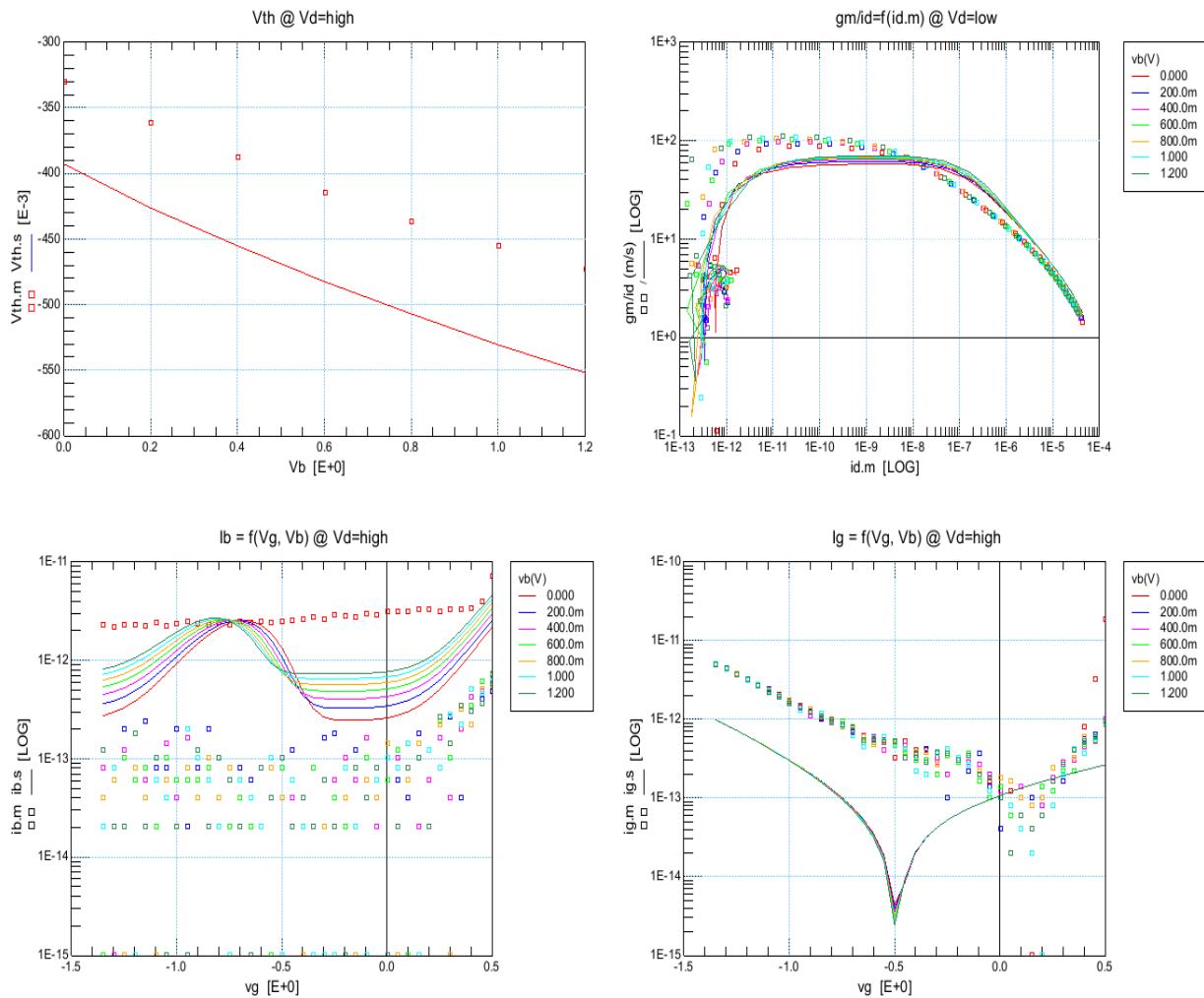
$idv_g, V_d = -0.05V, T = 27^\circ C$



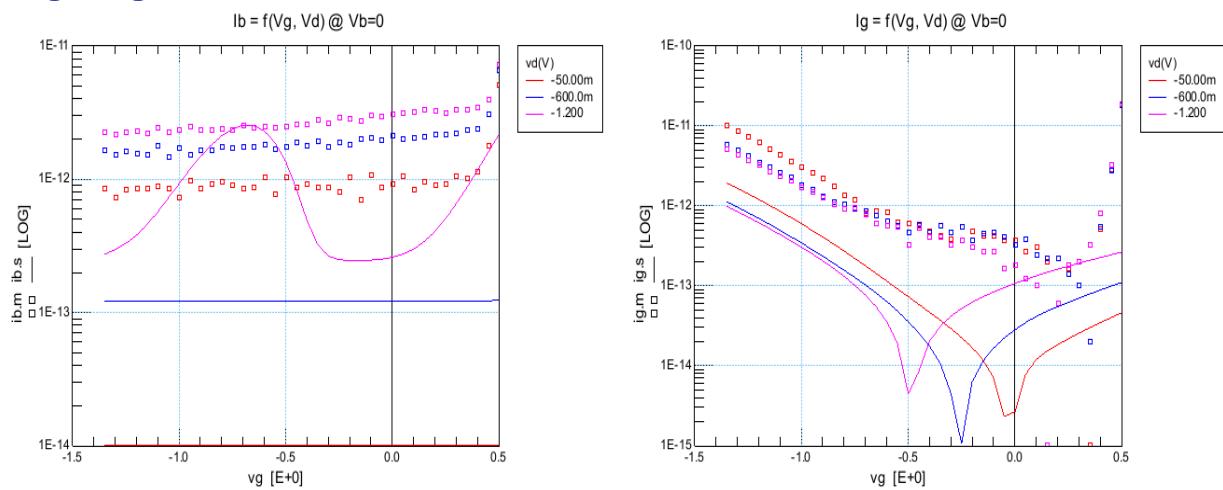


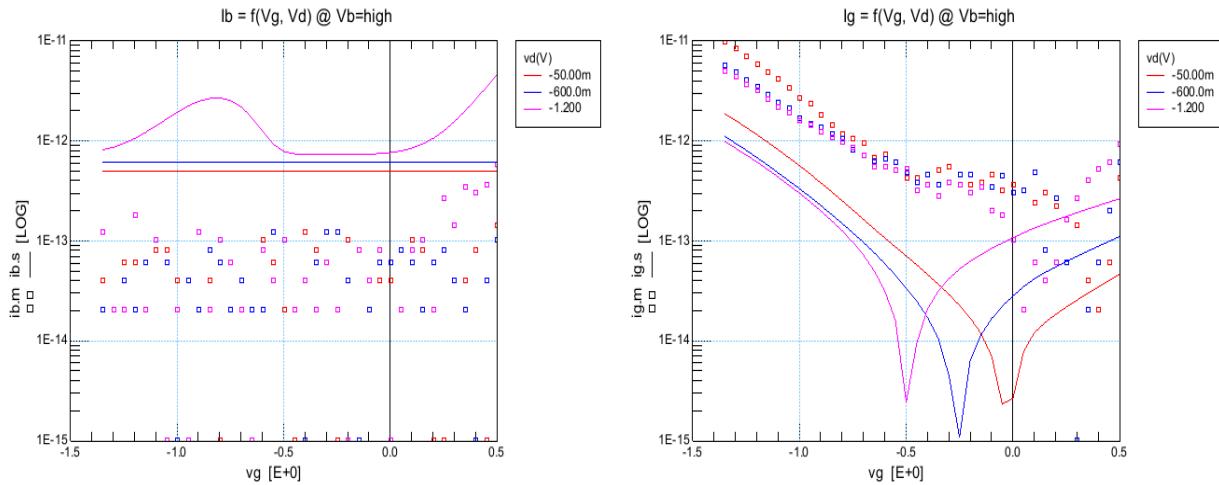
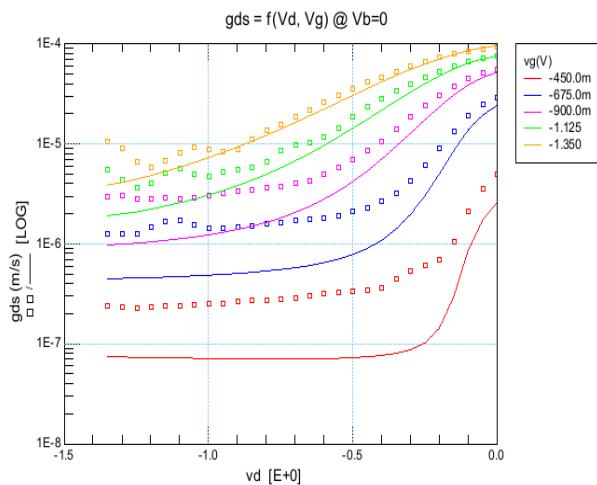
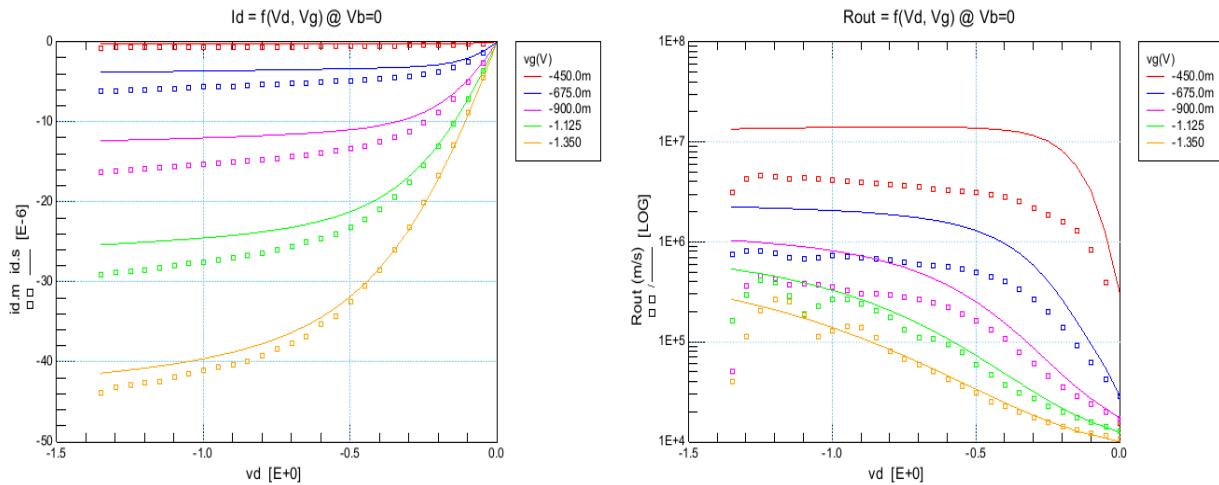
$i_{dvg}, V_d = -1.2V, T = 27^\circ\text{C}$

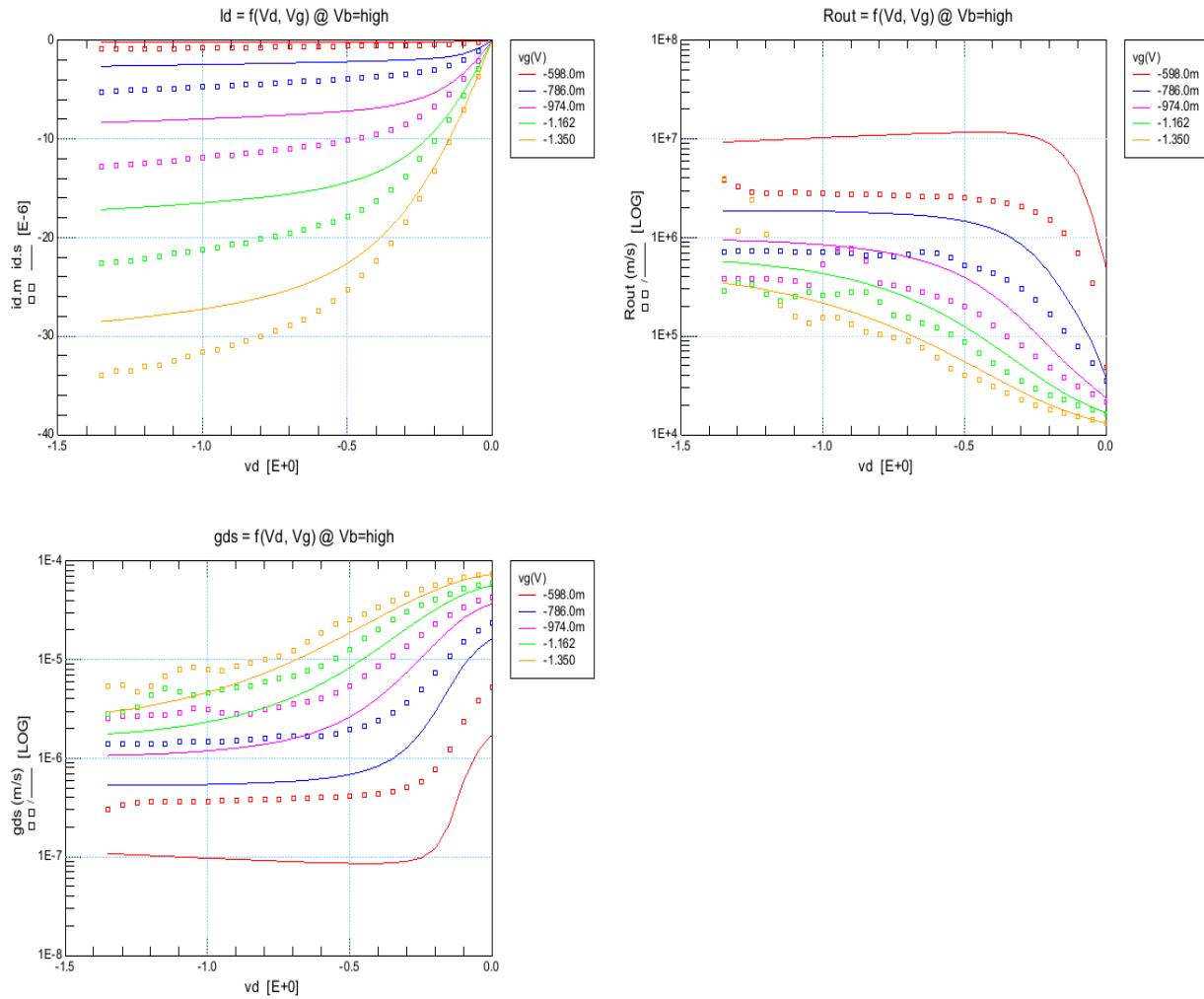
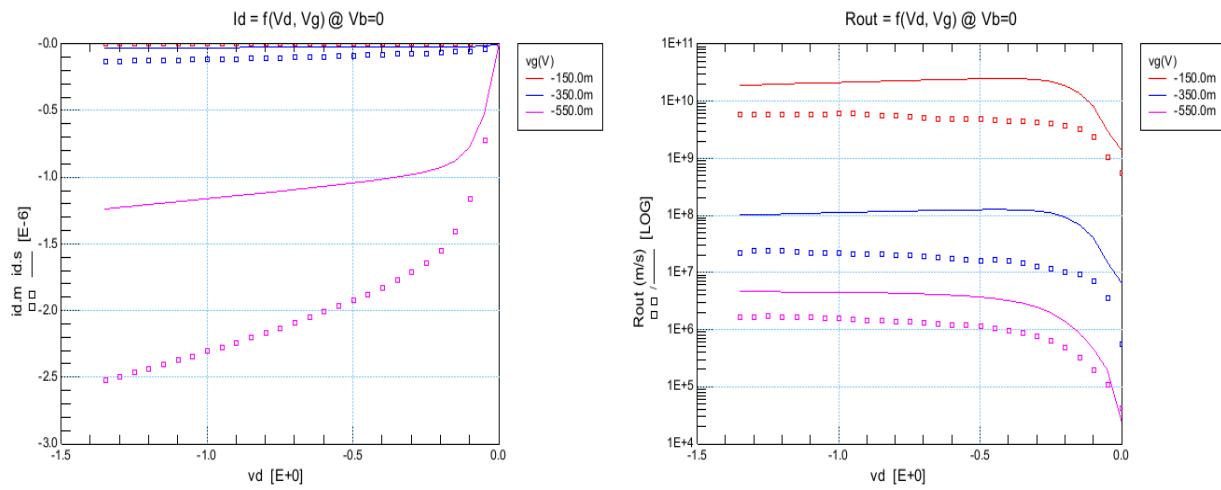


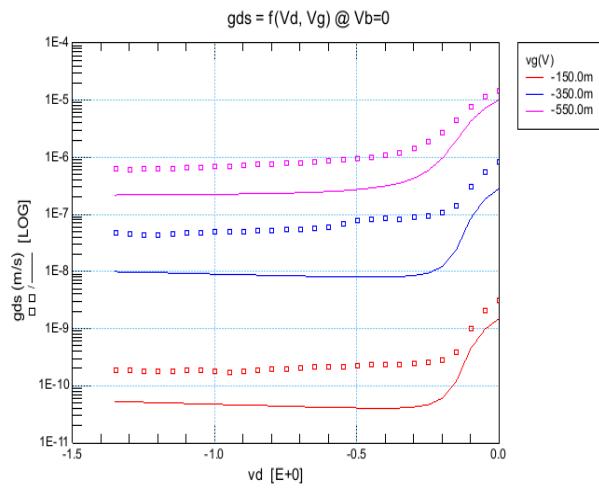


idvg, Ib,Ig, Vb = 0V, T = 27°C

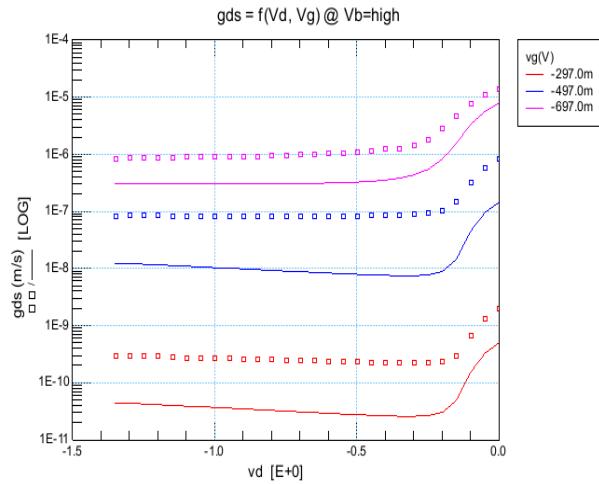
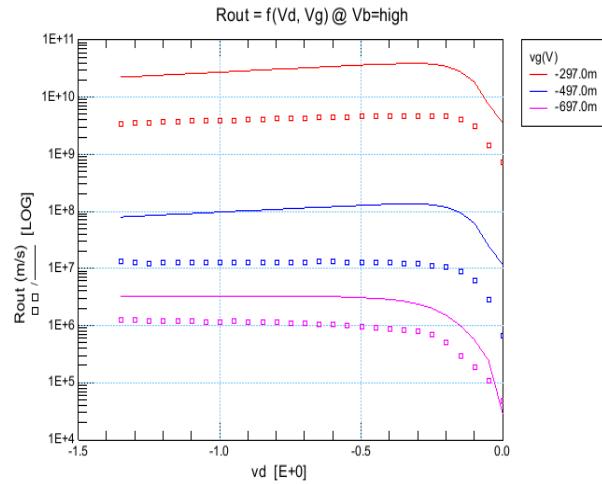
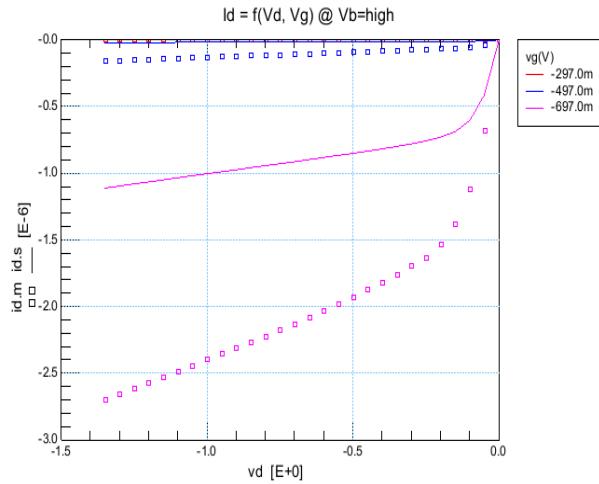


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


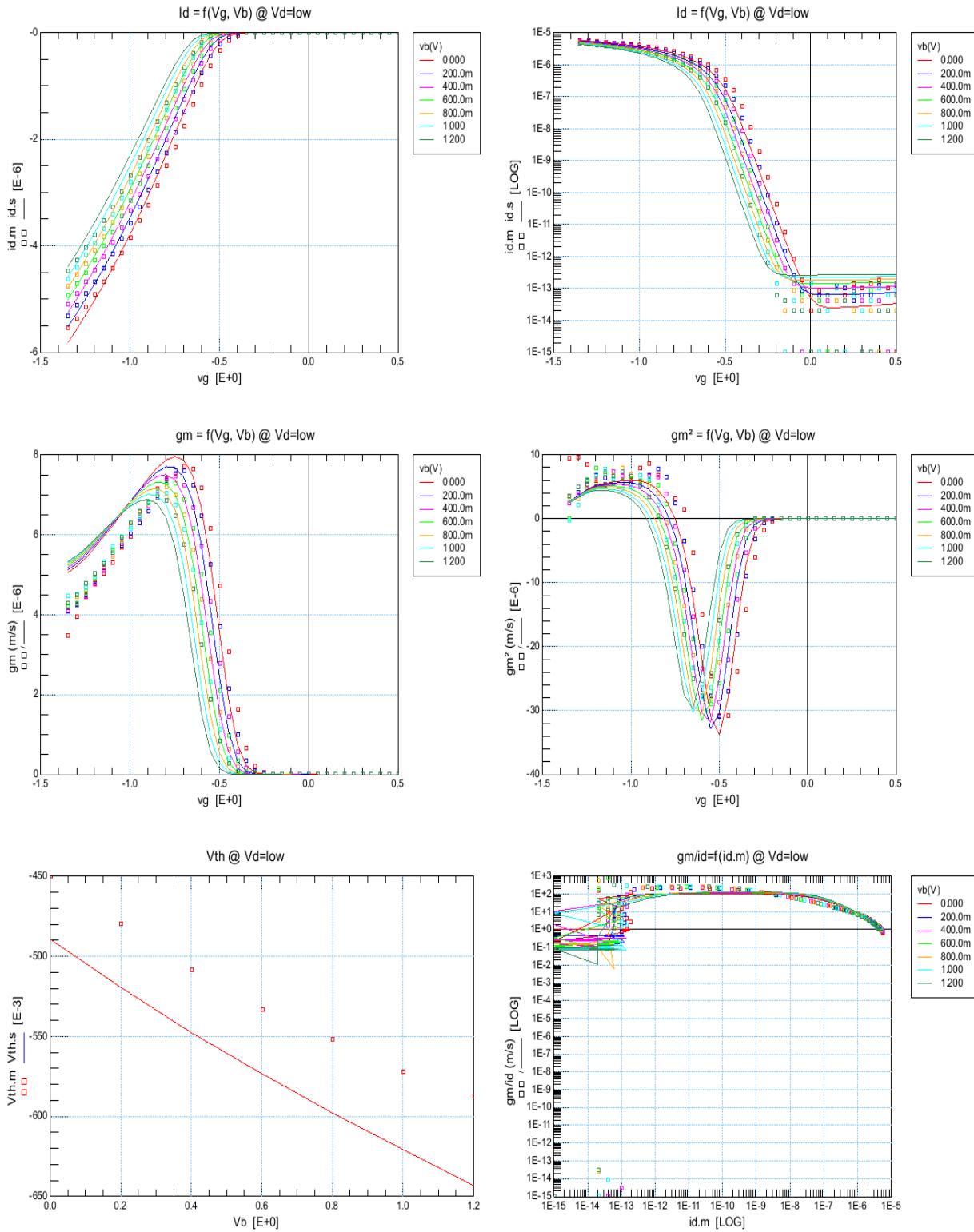
idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C


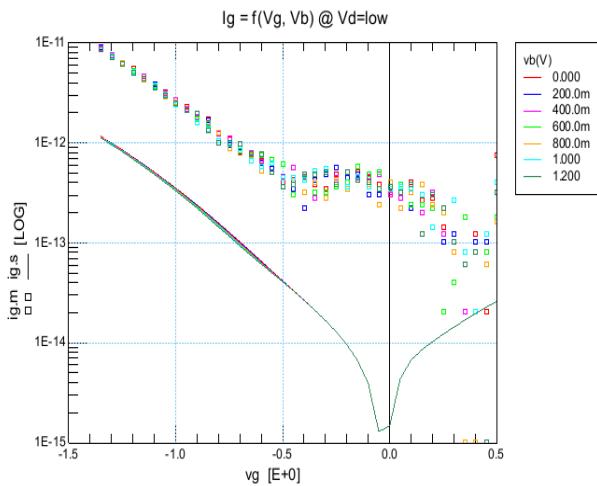
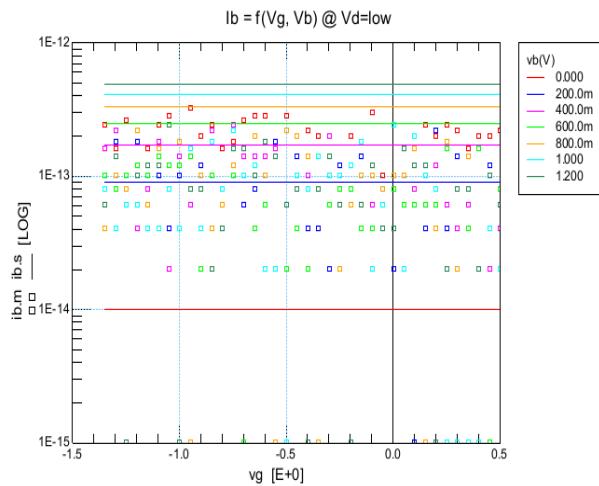


idvd_vth_vbmin, Vb = 1.2V, T = 27°C

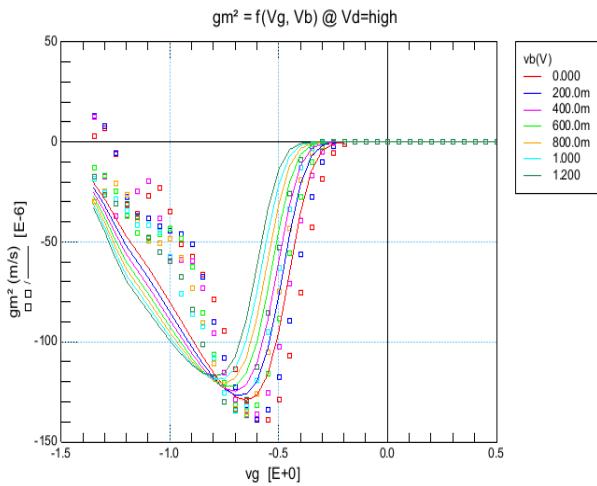
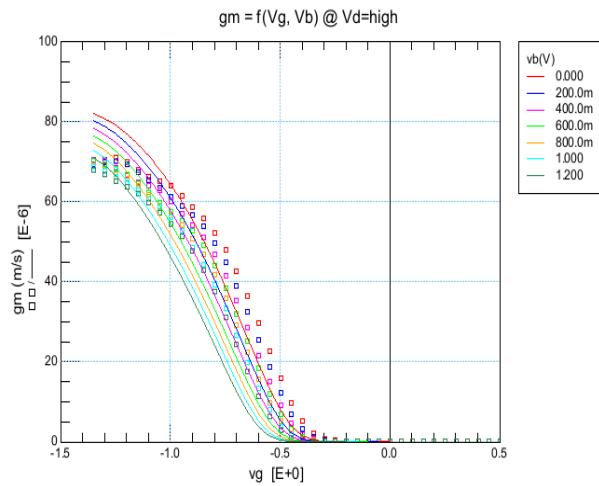
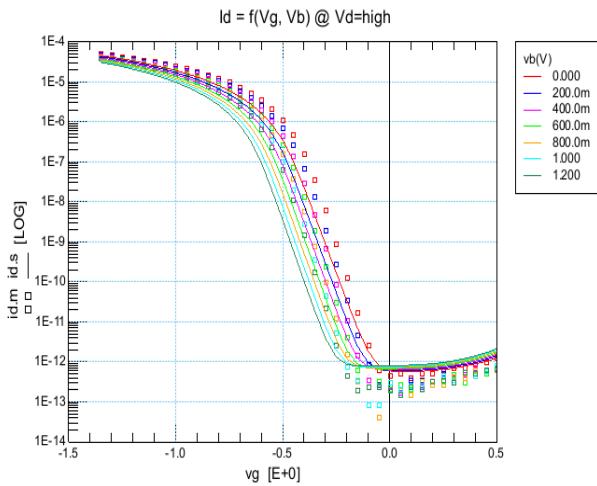
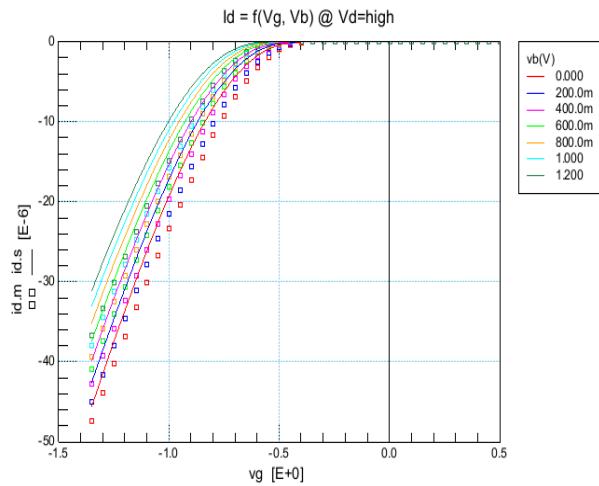


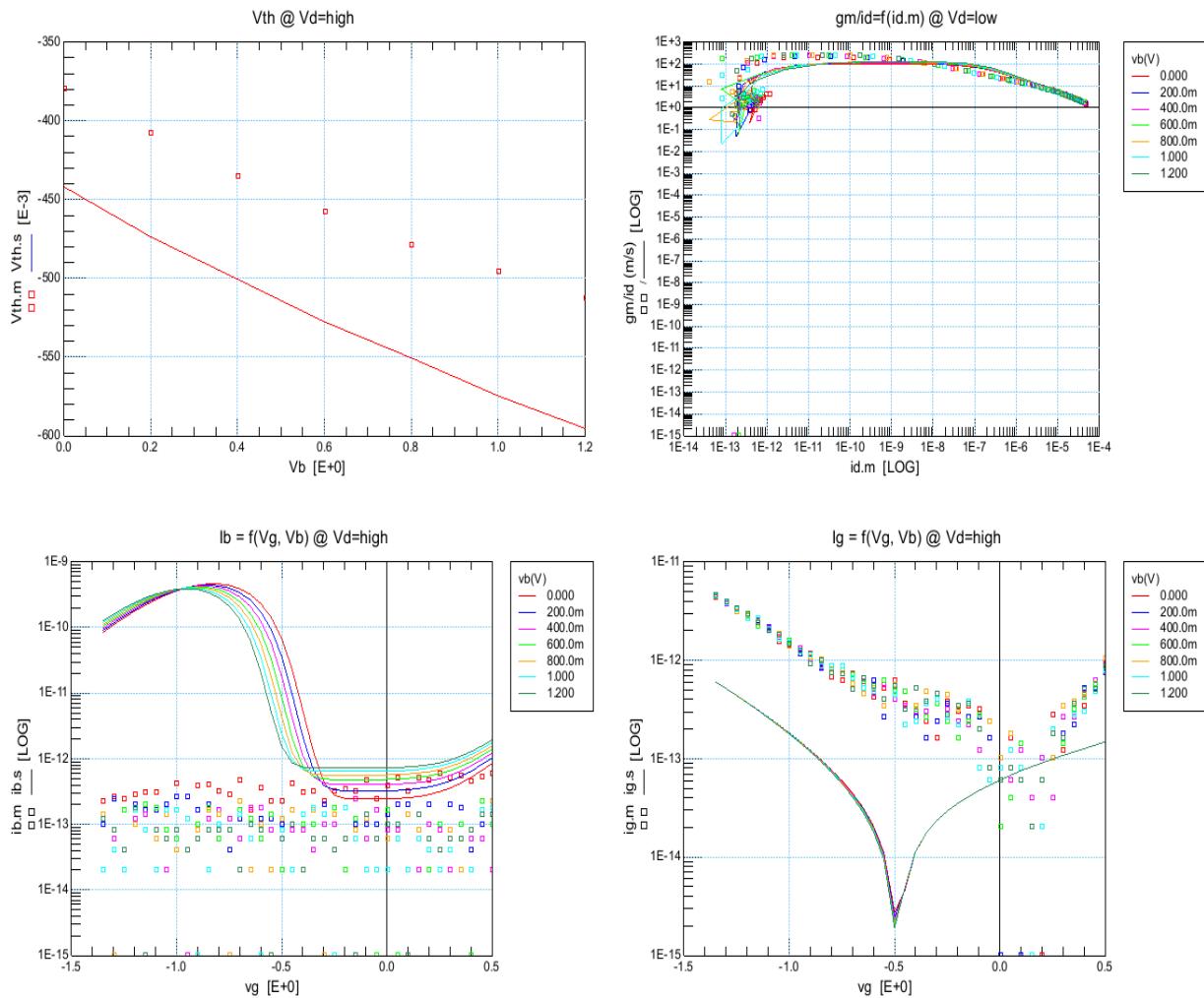
id_{vg} , $V_d = -0.05V$, $T = -40^{\circ}C$



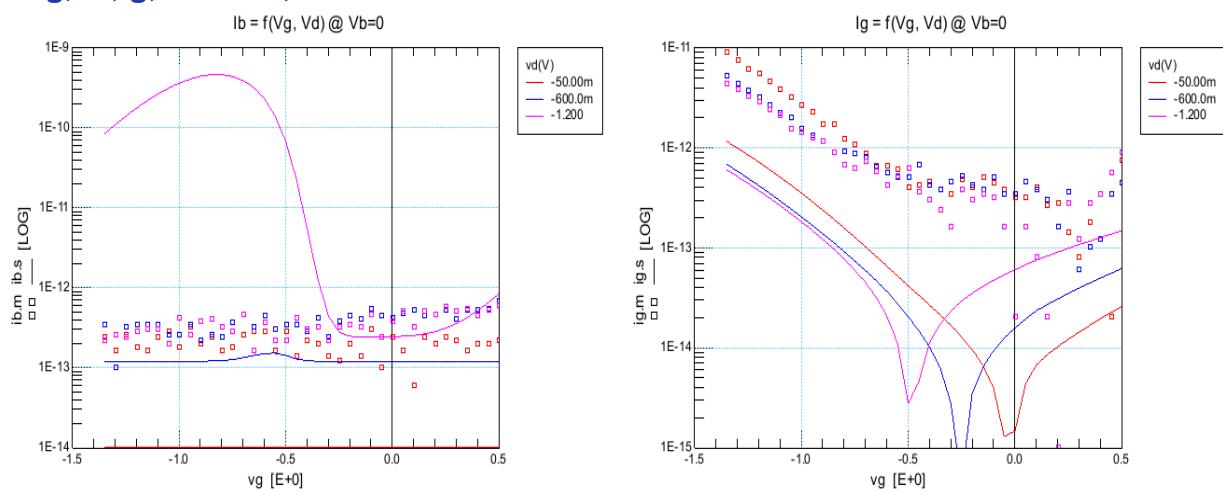


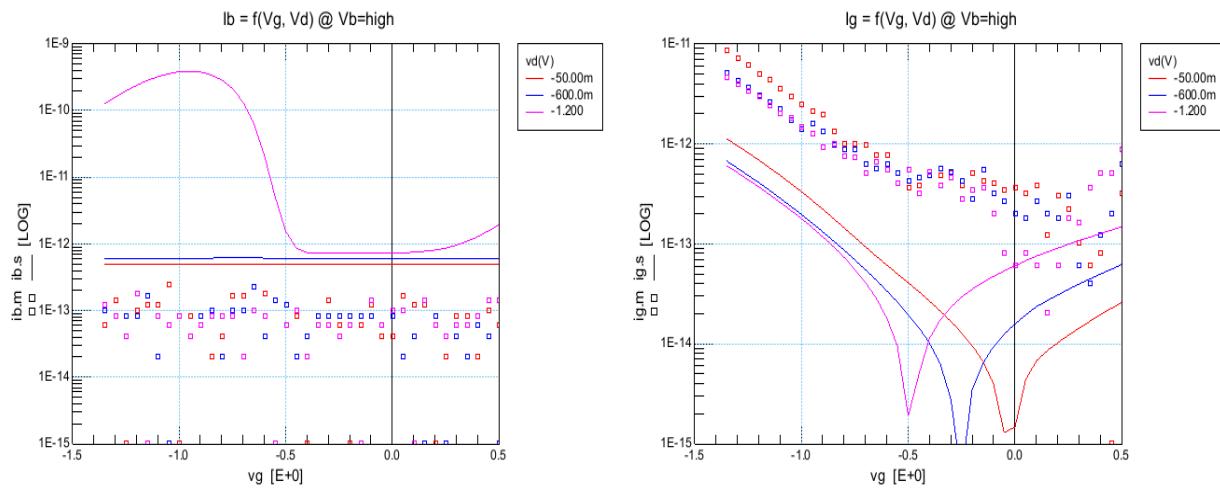
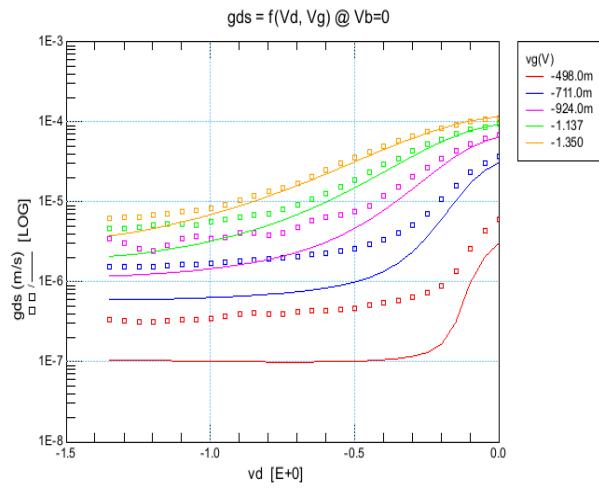
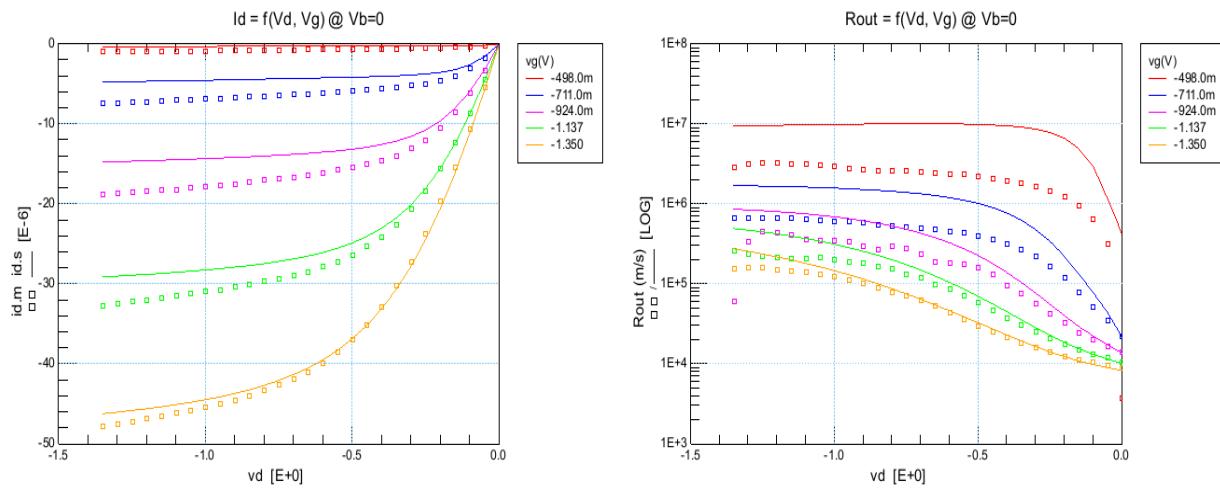
$idvg, Vd = -1.2V, T = -40^{\circ}C$

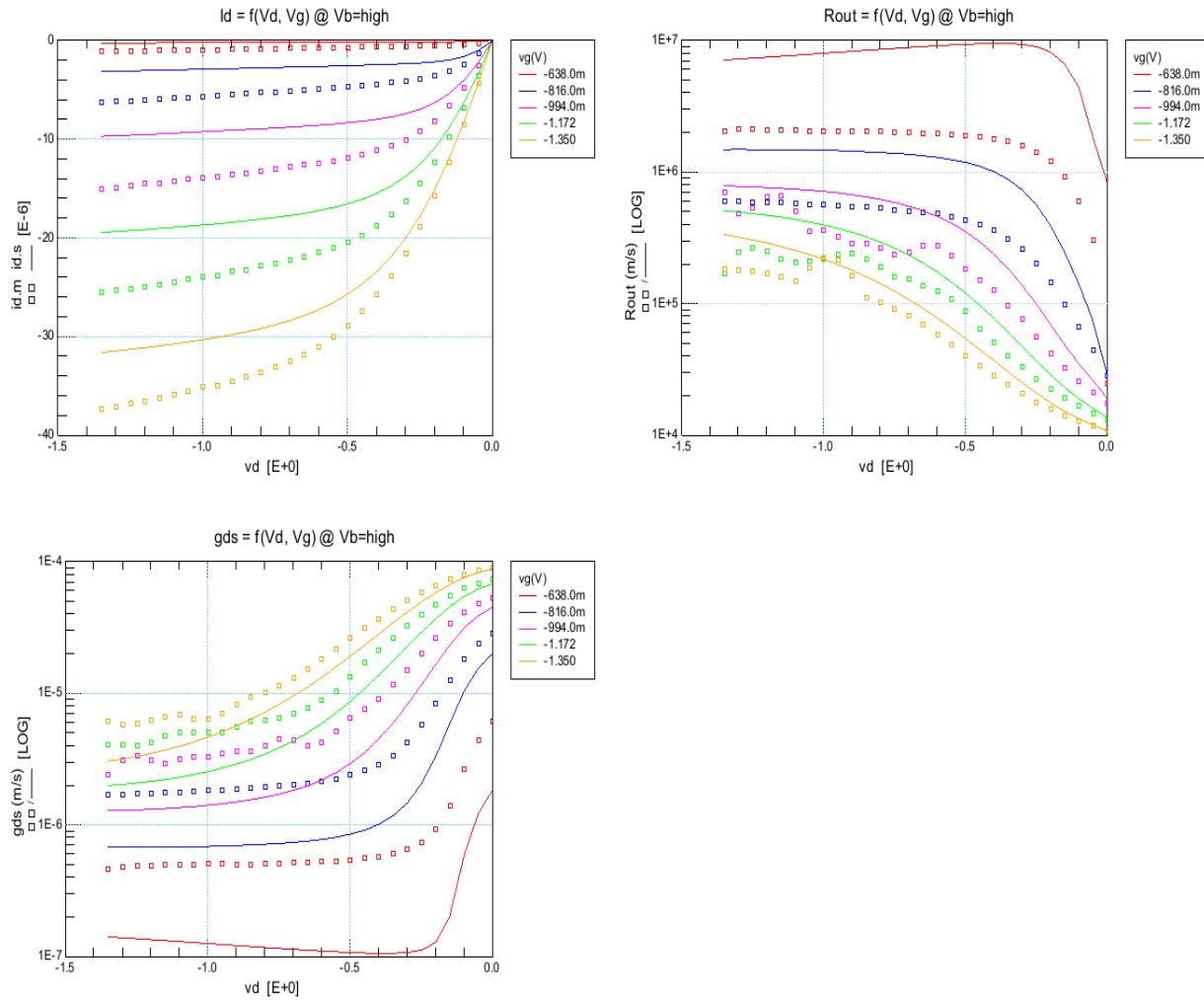
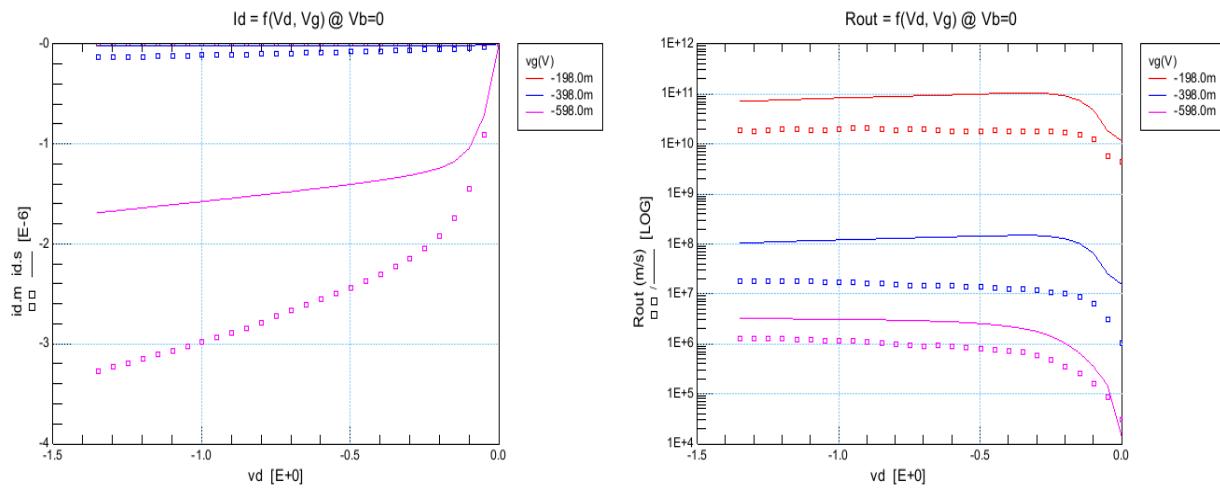


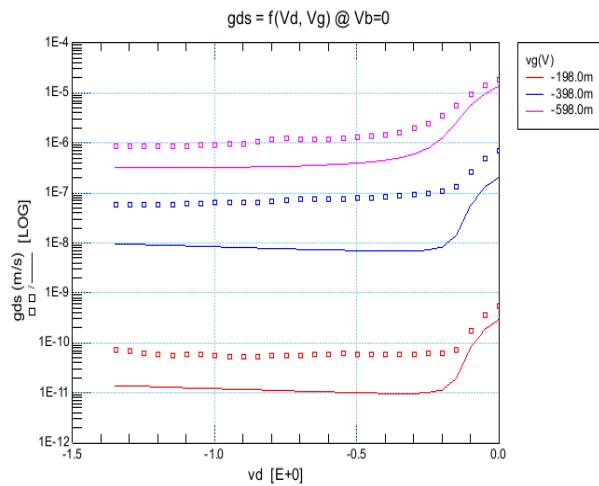


idvg, Ib, Ig, Vb = 0V, T = -40°C

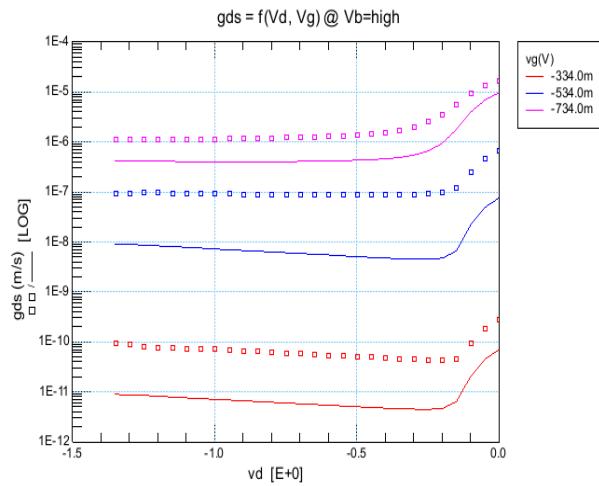
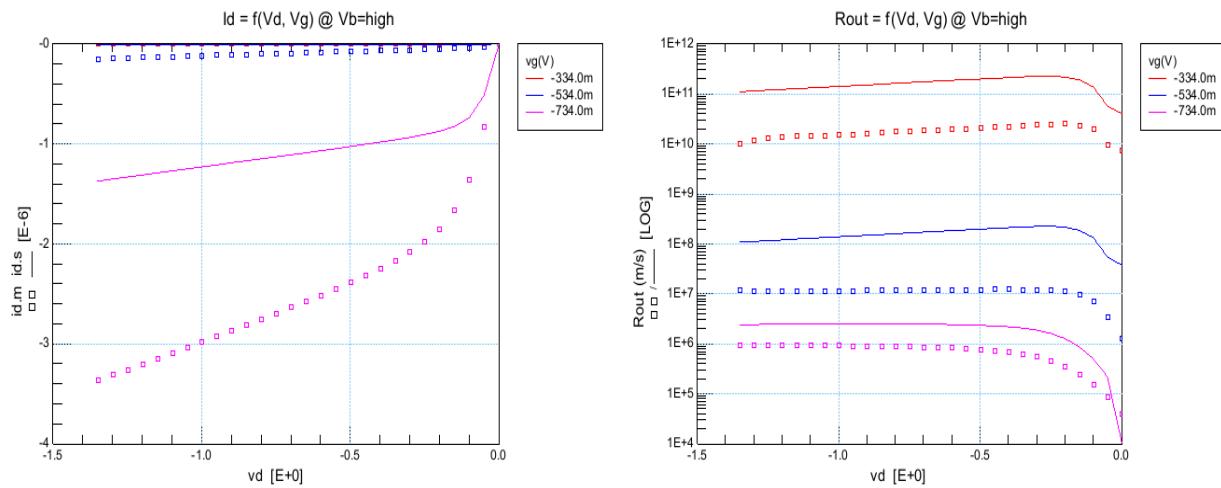


idvg, Ib,Ig, Vb = 1.2V, T = -40°C

idvd, Vb = 0V, T = -40°C


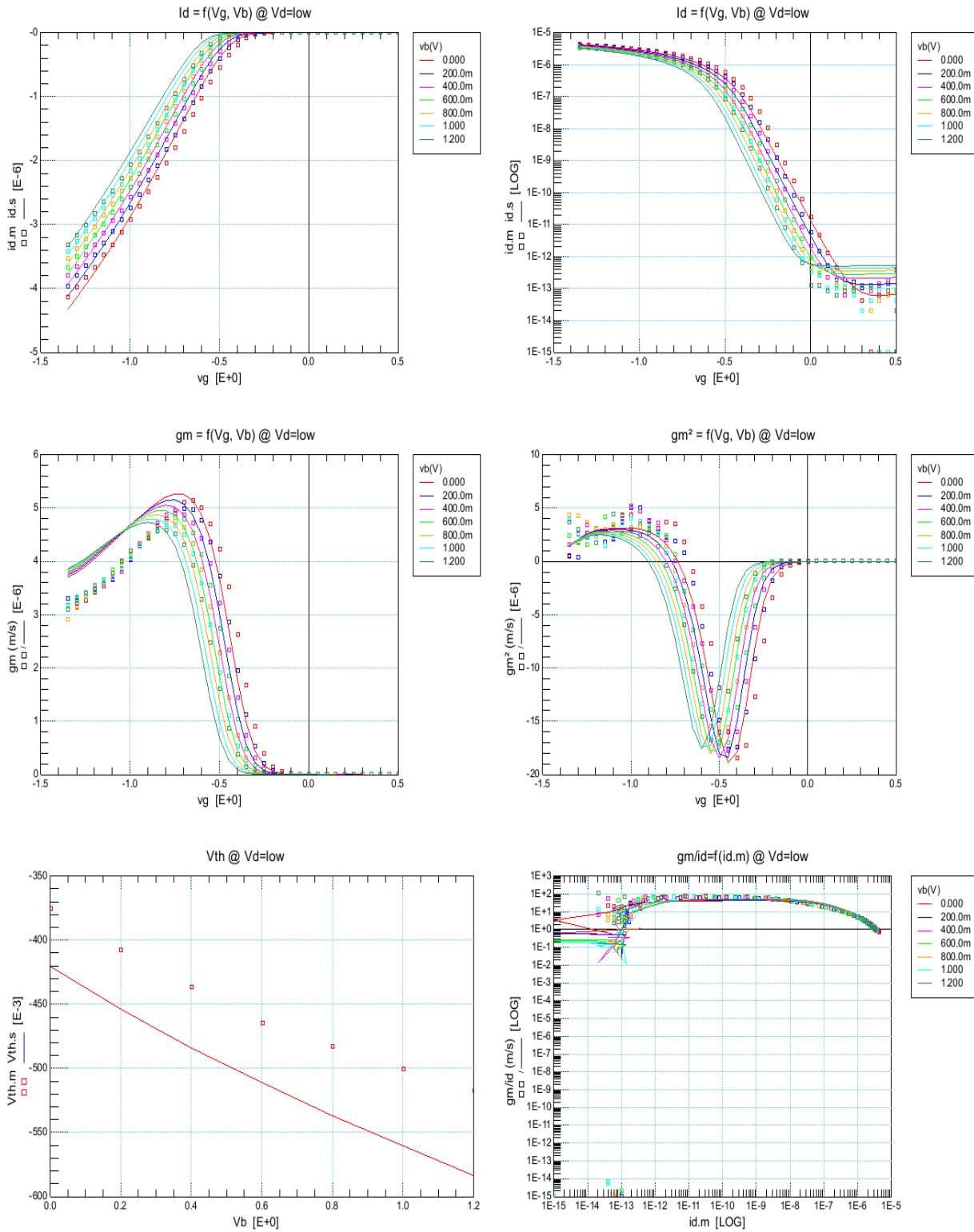
idvd_vbmin, Vb = 1.2V, T = -40°C

idvd_vth, Vb = 0V, T = -40°C


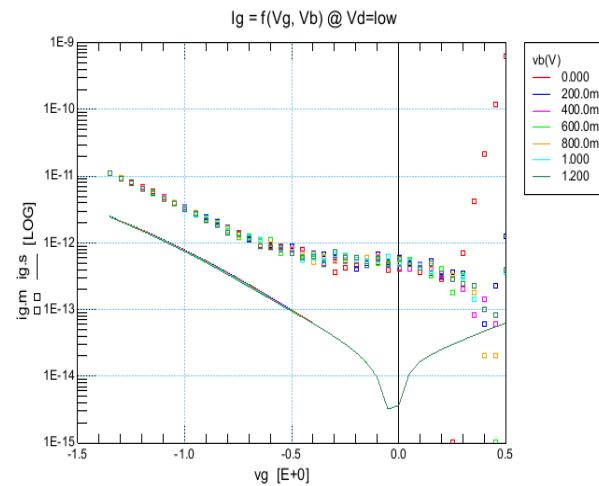
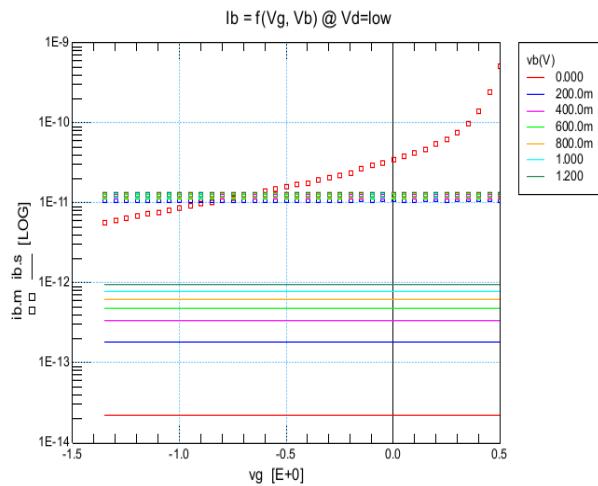


idvd_vth_vbmin, Vb = 1.2V, T = -40°C

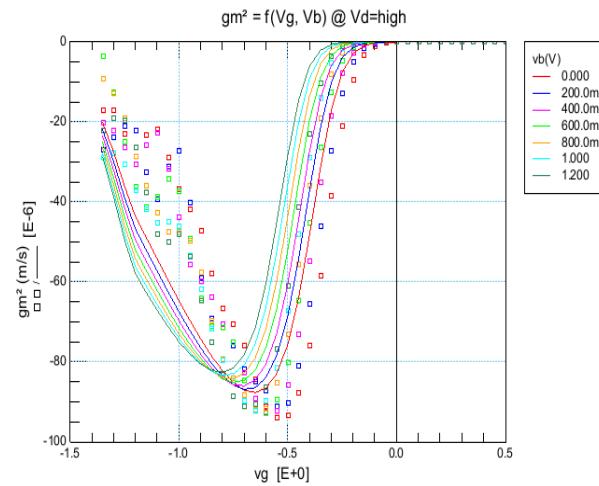
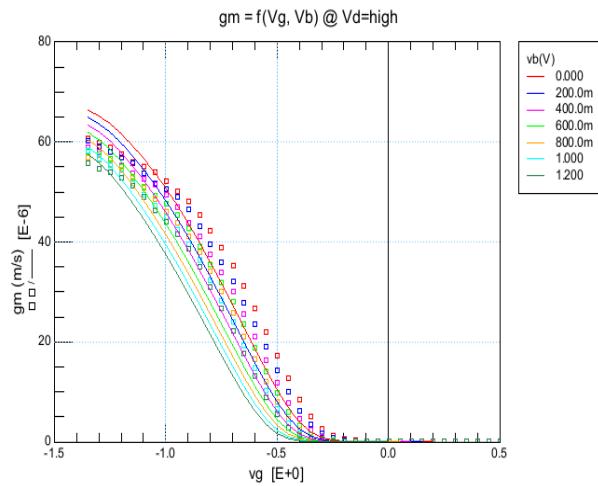
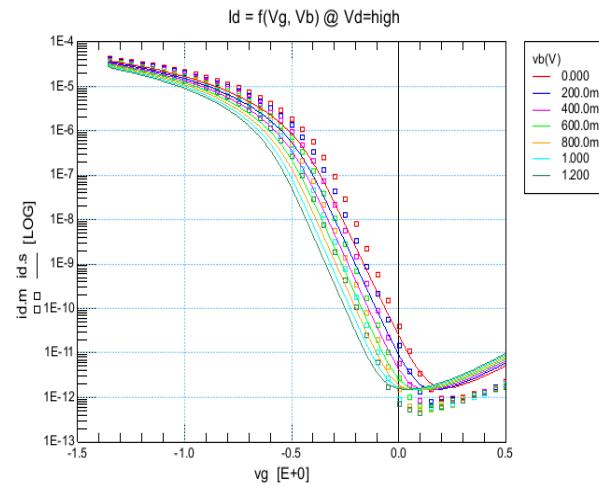
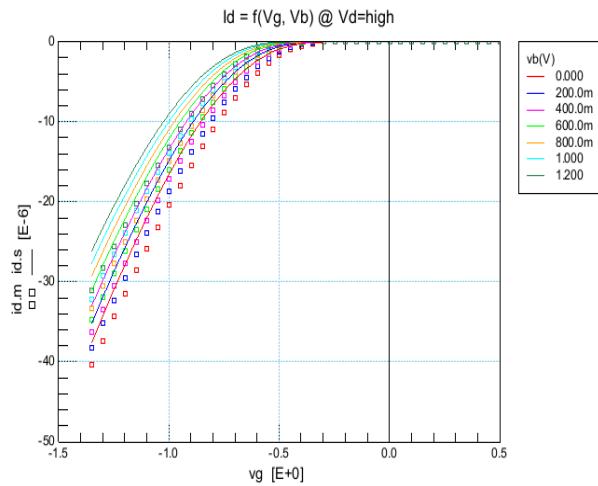


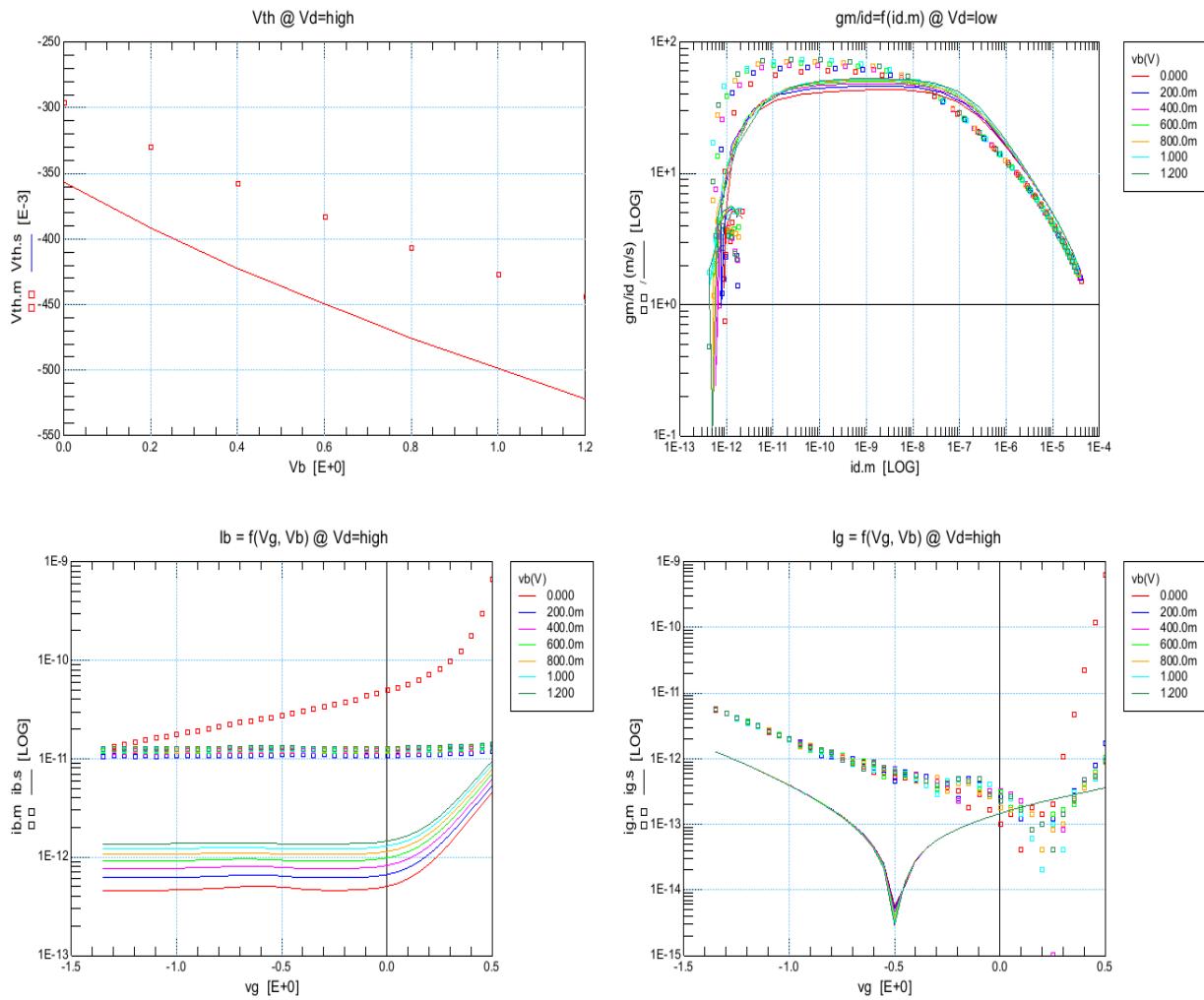
id_{vg} , $V_d = -0.05V$, $T = 70^\circ C$



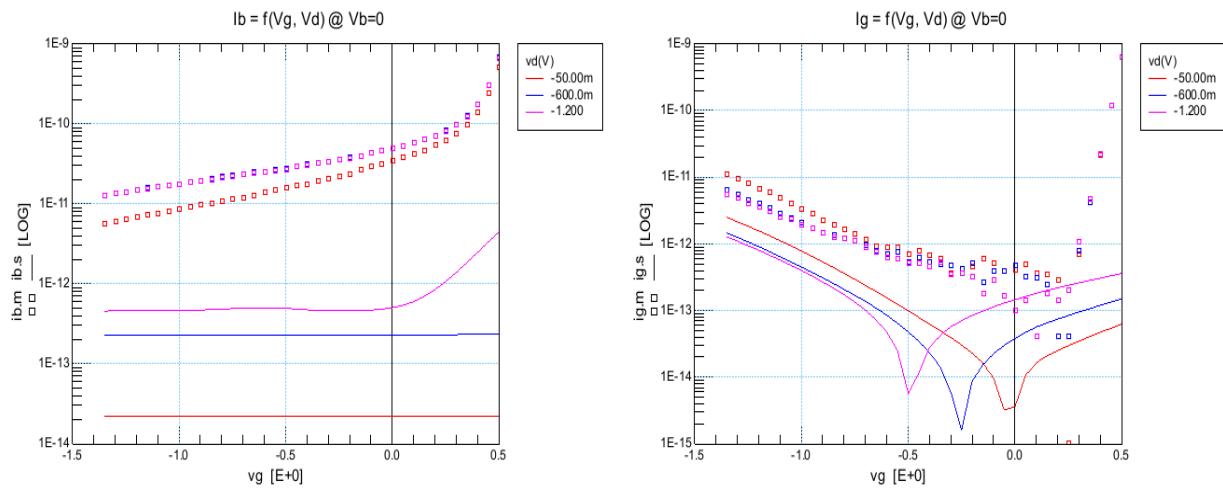


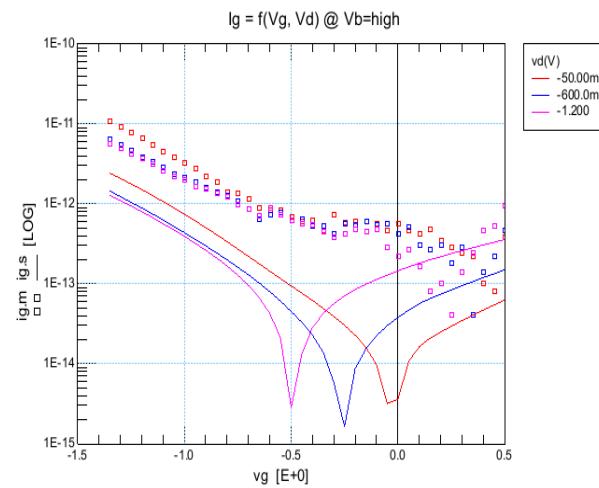
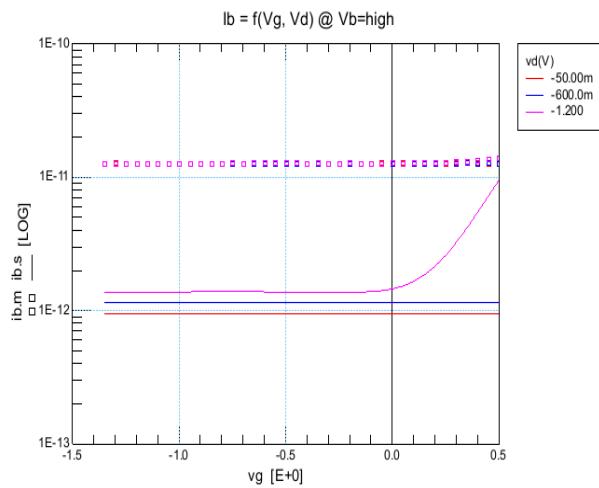
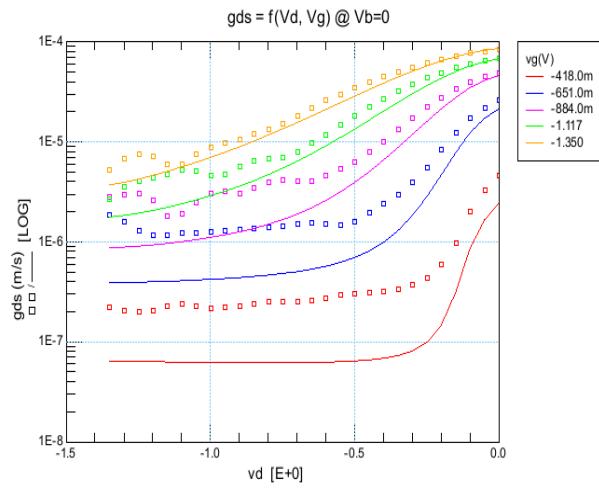
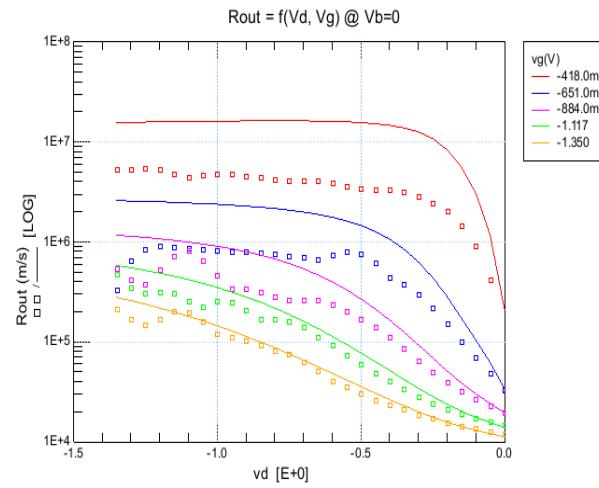
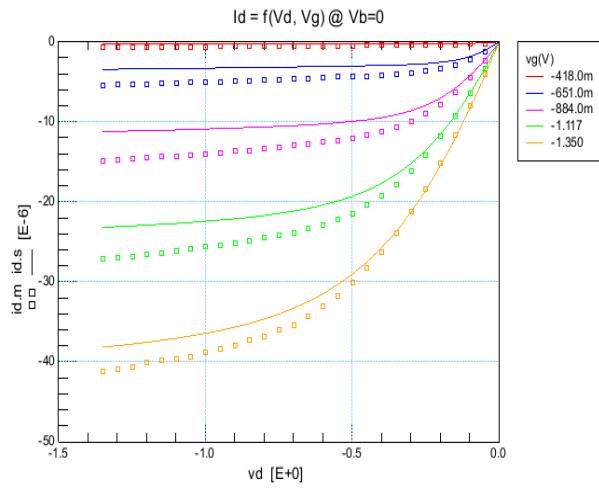
$i_{dvg}, V_d = -1.2V, T = 70^\circ\text{C}$

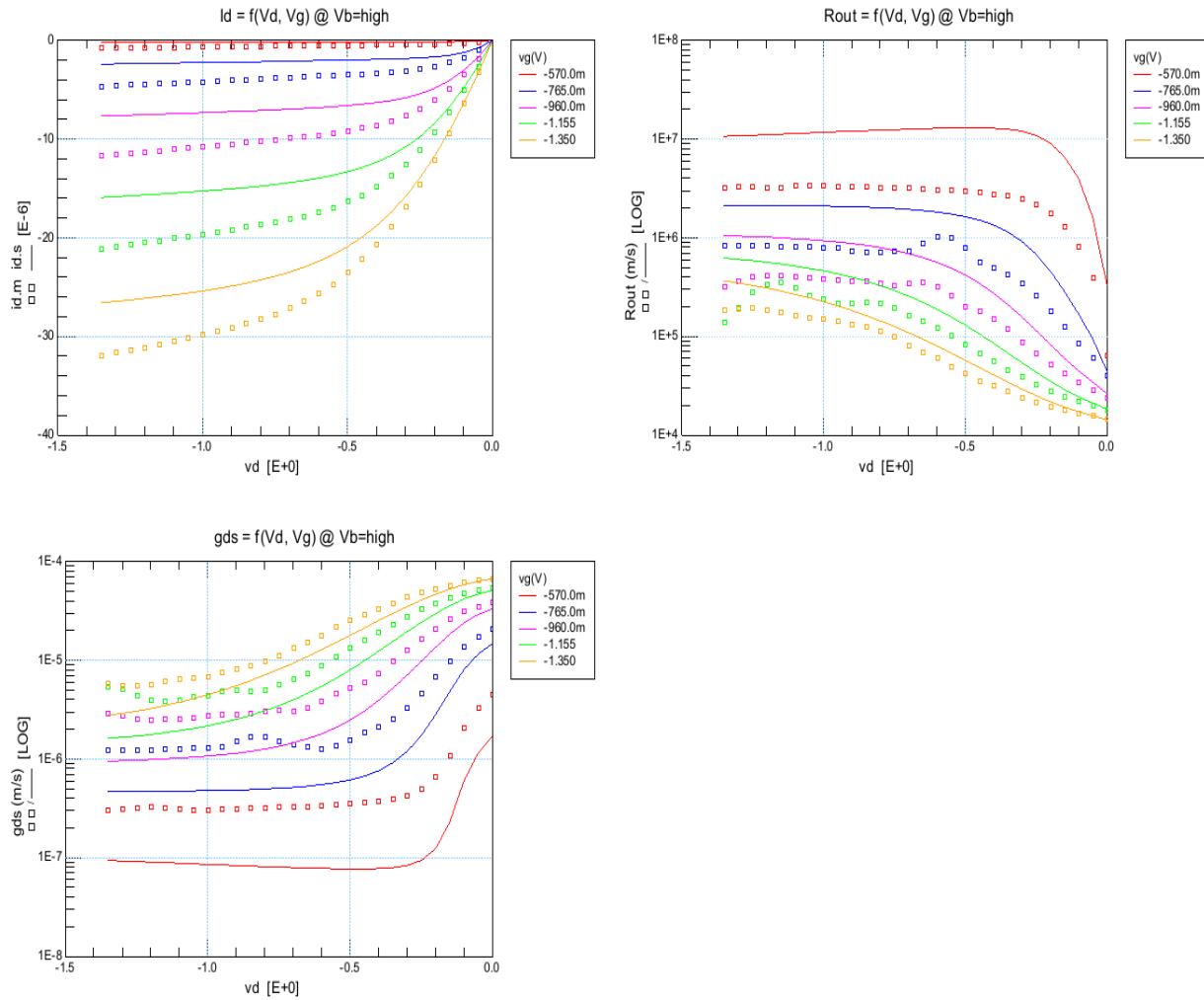
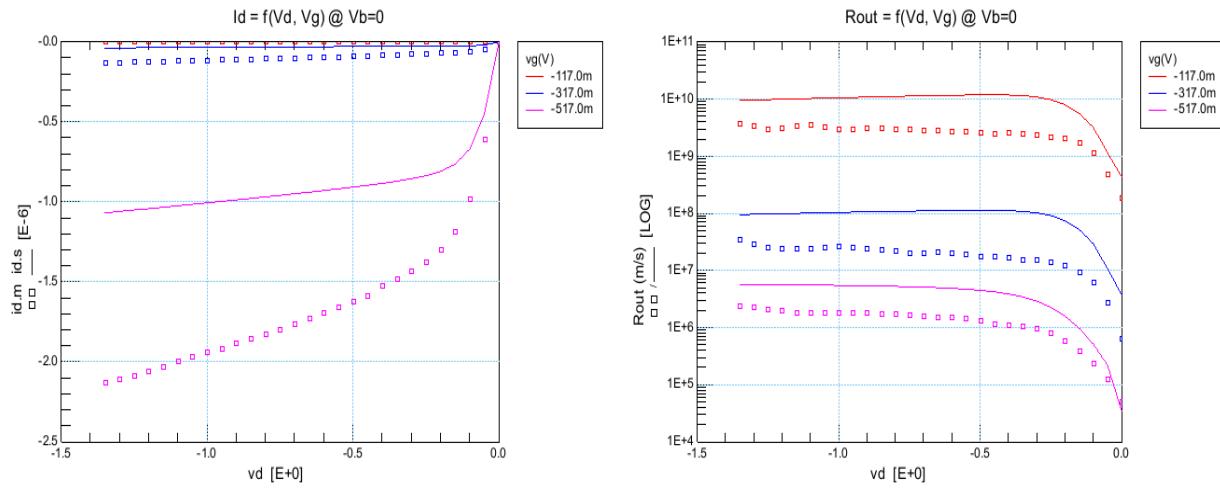


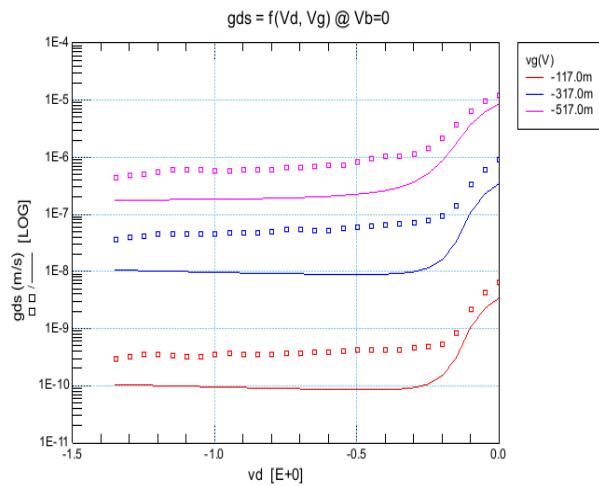


idvg, Ib,Ig, Vb = 0V, T = 70°C

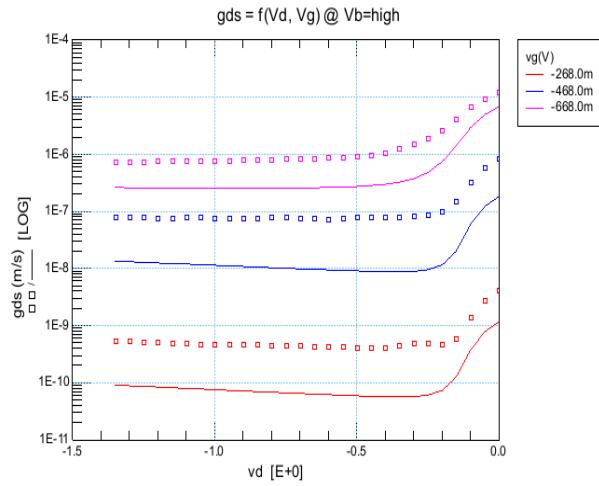
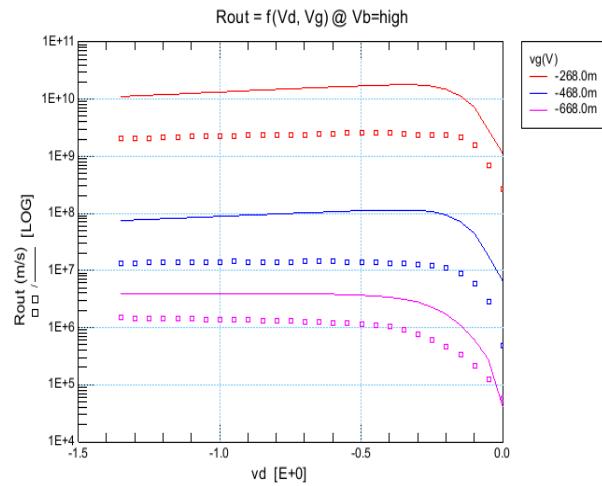
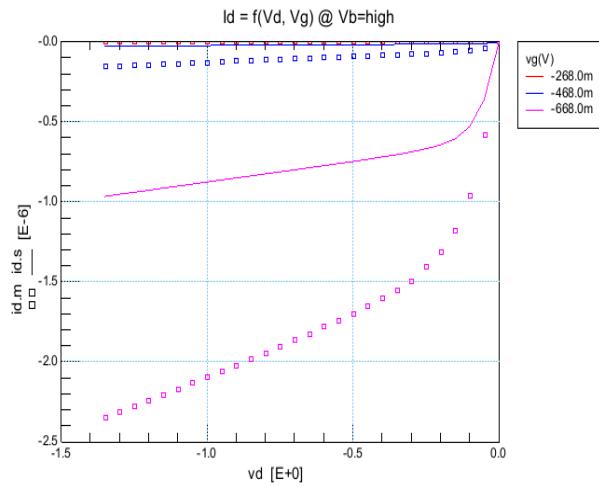


idvg, Ib,Ig, Vb = 1.2V, T = 70°C

idvd, Vb = 0V, T = 70°C


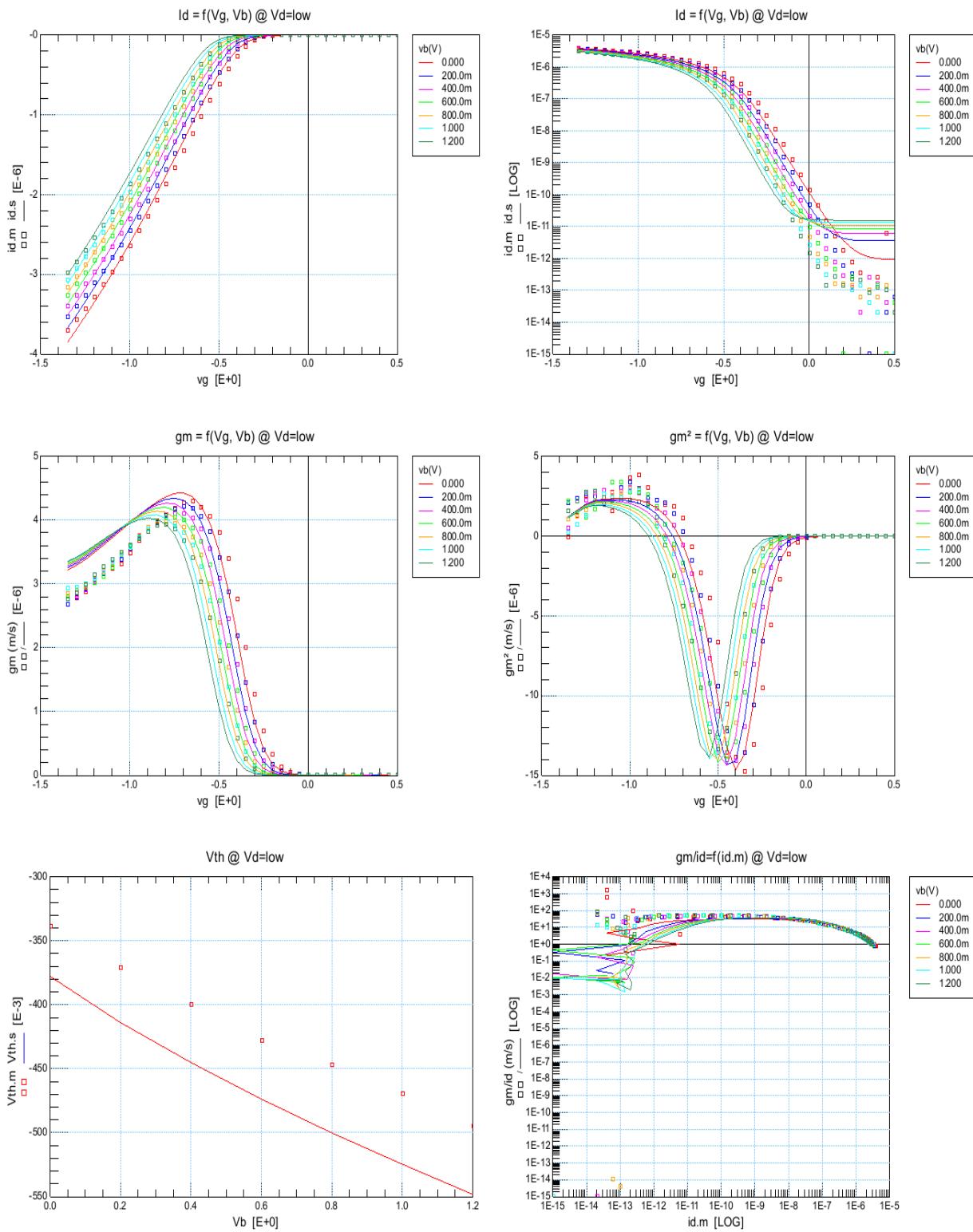
idvd_vbmin, Vb = 1.2V, T = 70°C

idvd_vth, Vb = 0V, T = 70°C


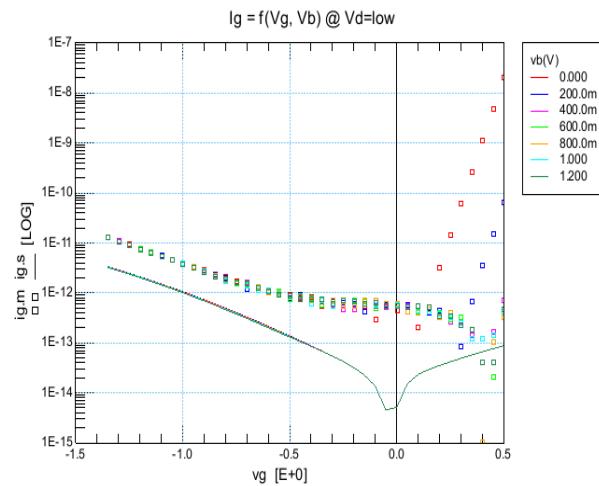
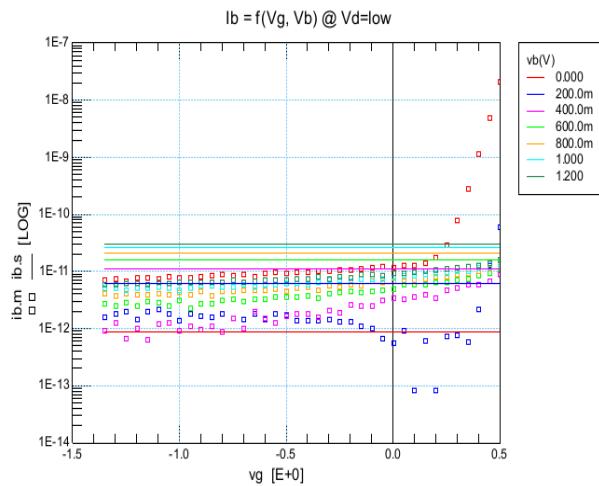


idvd_vth_vbmin, Vb = 1.2V, T = 70°C

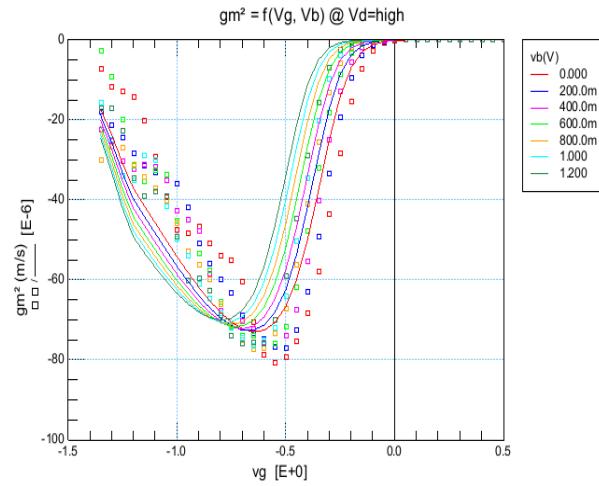
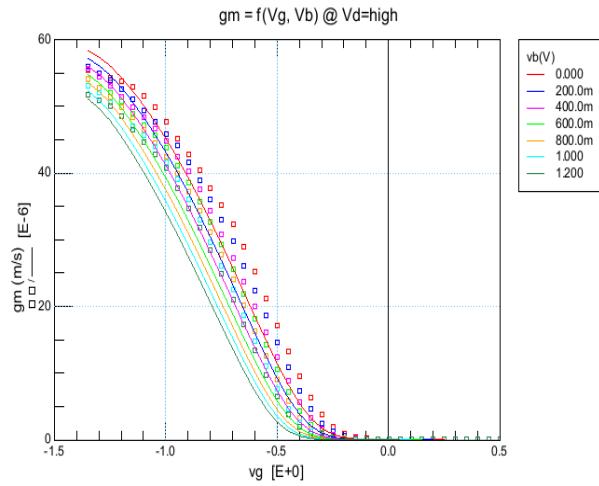
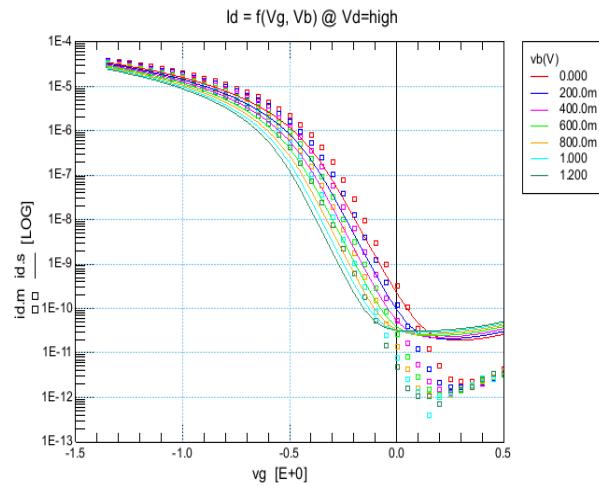
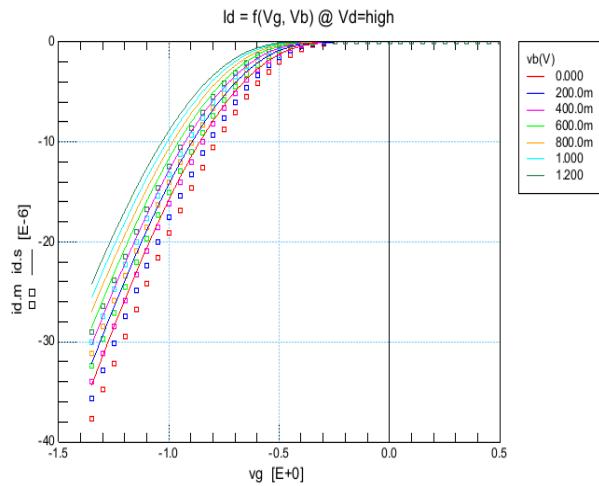


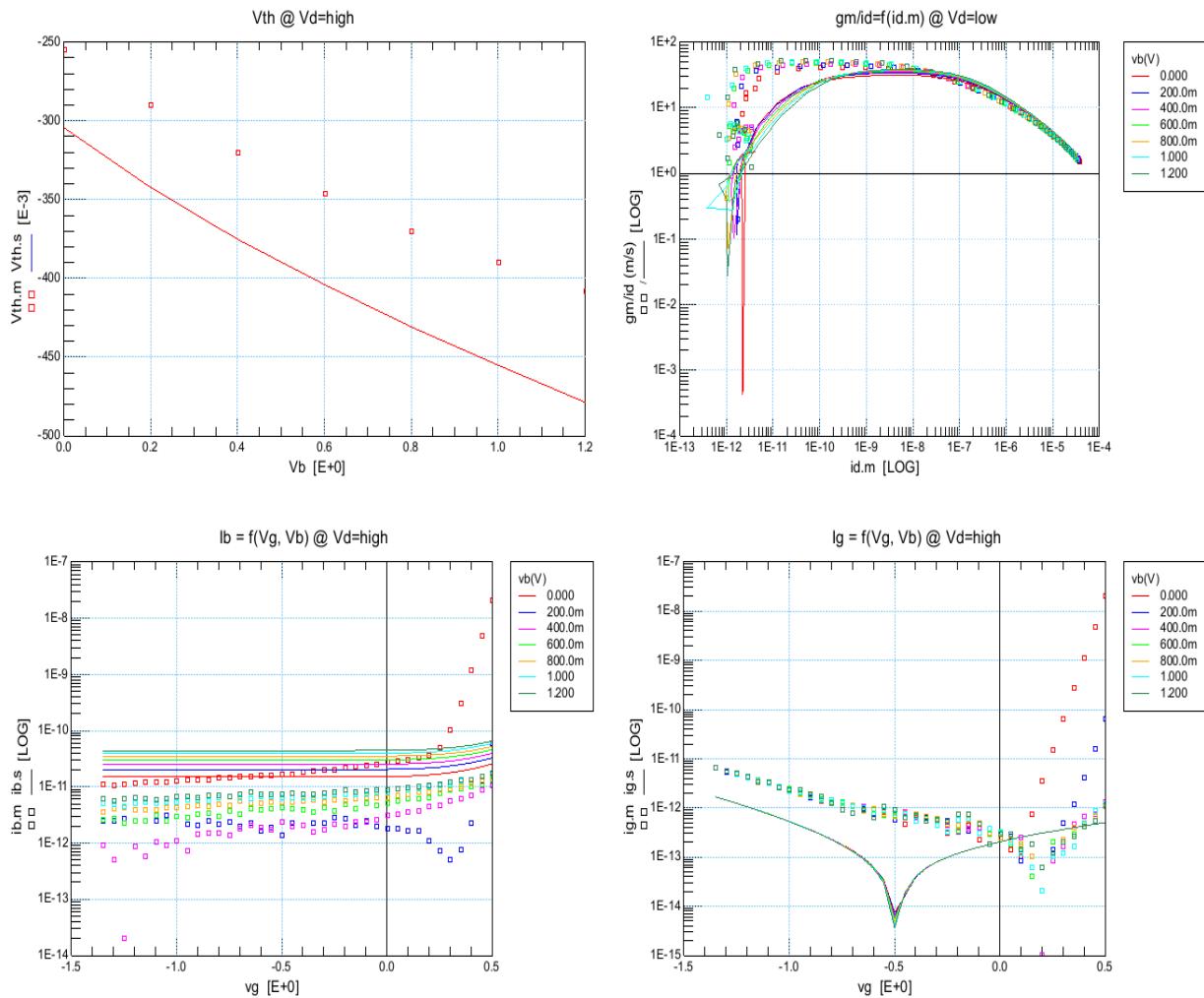
idvg, Vd = -0.05V, T = 125°C



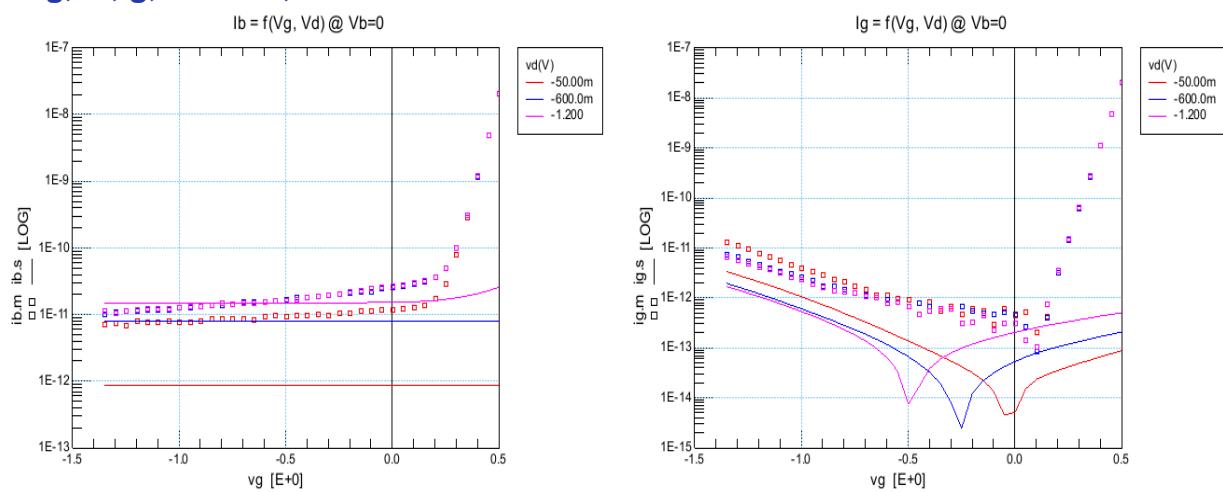


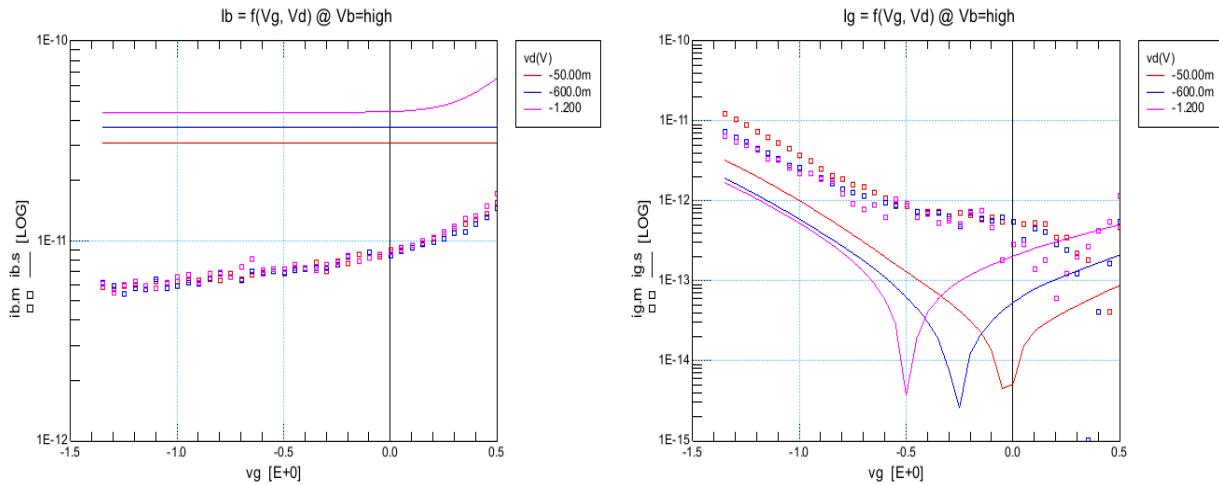
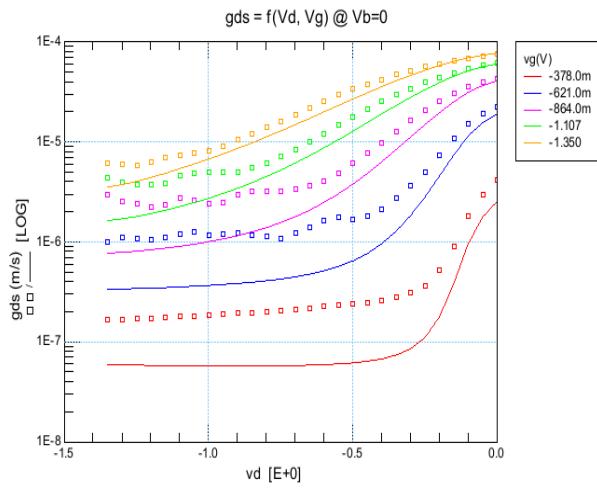
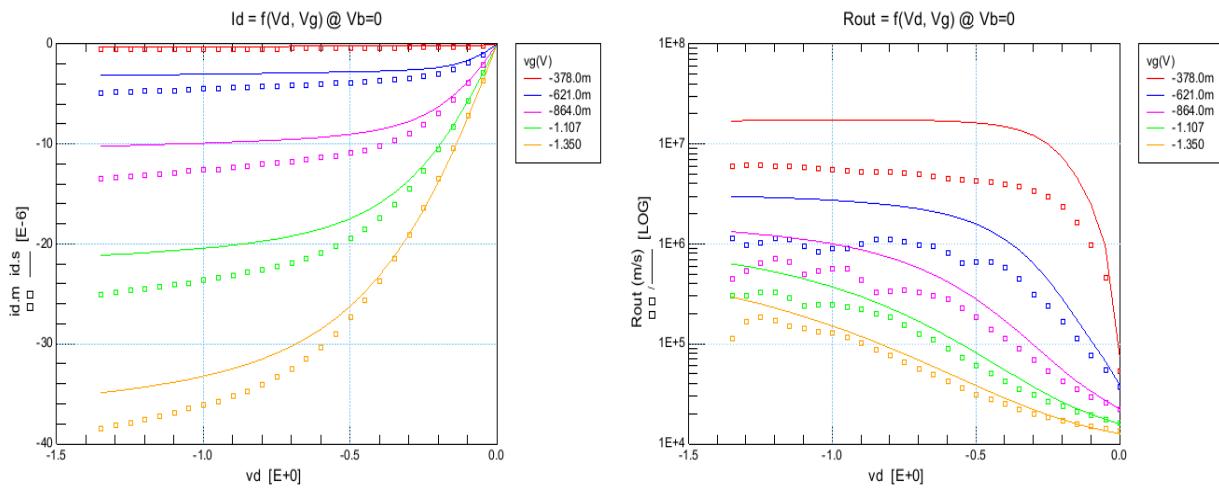
$i_{dvg}, V_d = -1.2V, T = 125^\circ C$

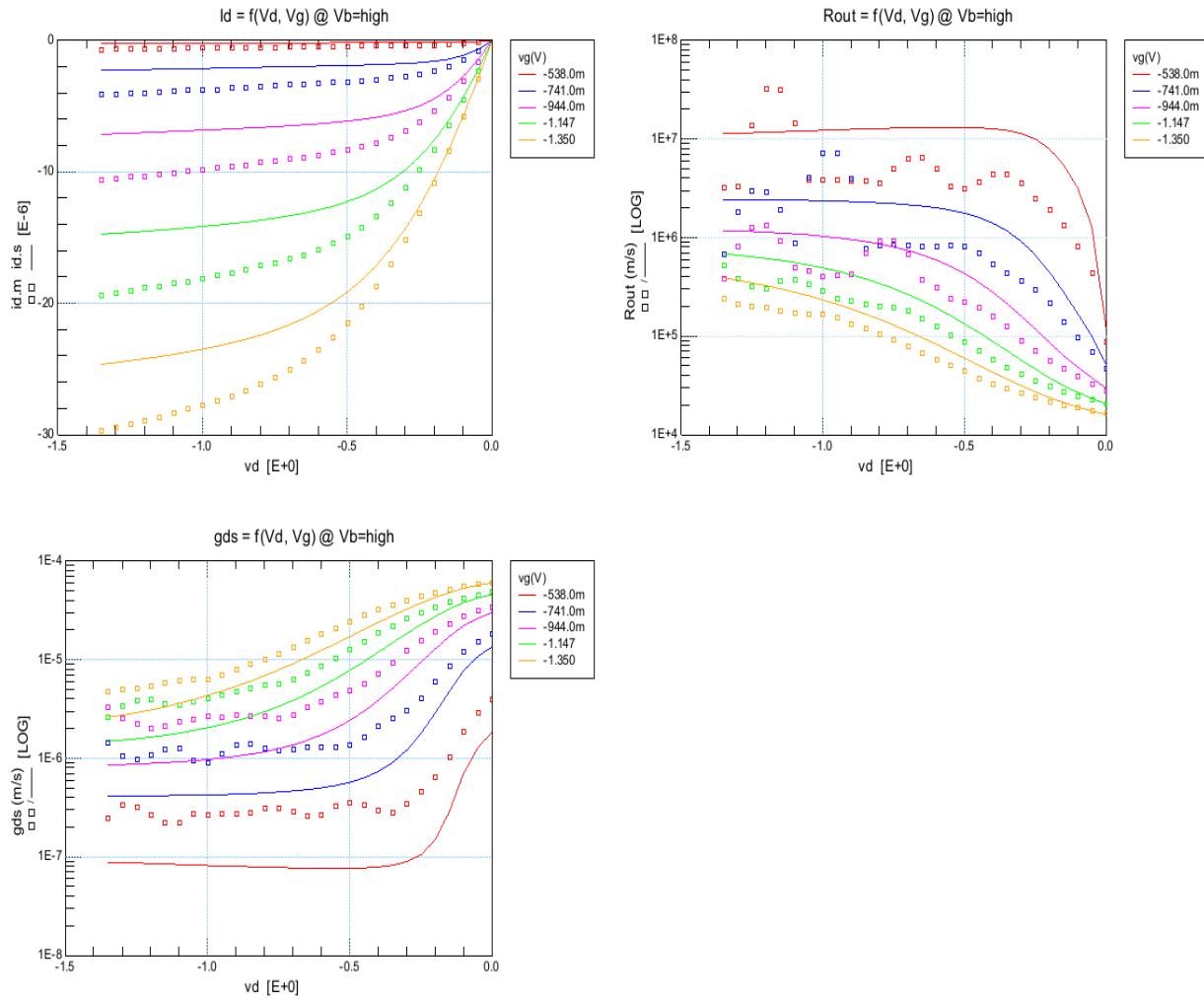
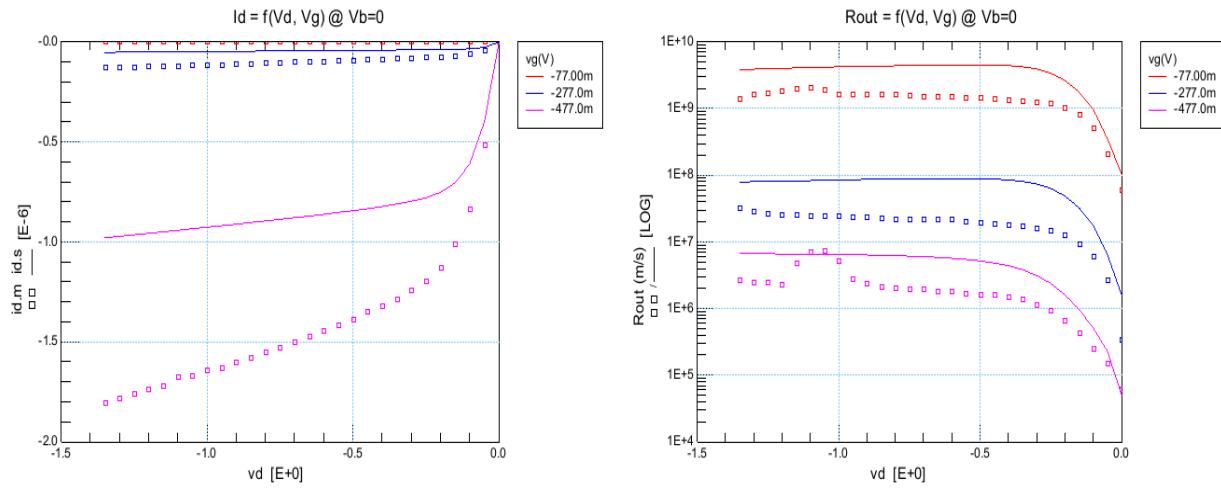


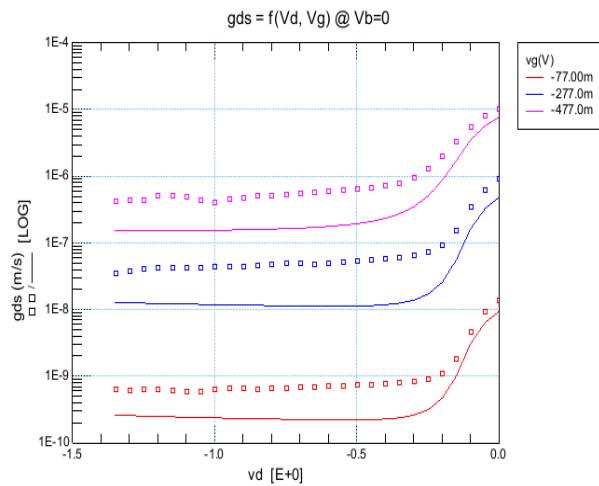


idvg, Ib,Ig, Vb = 0V, T = 125°C

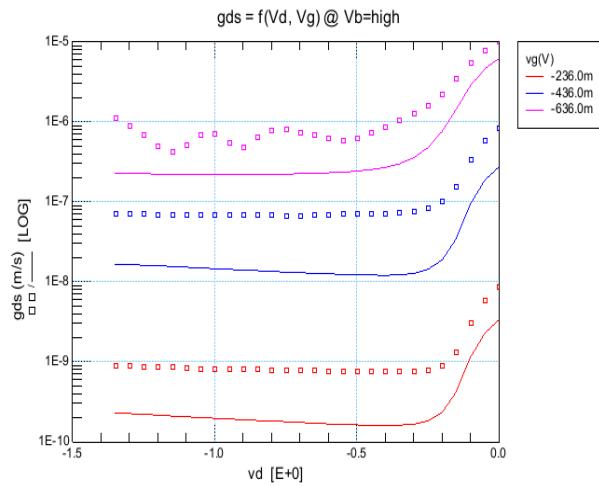
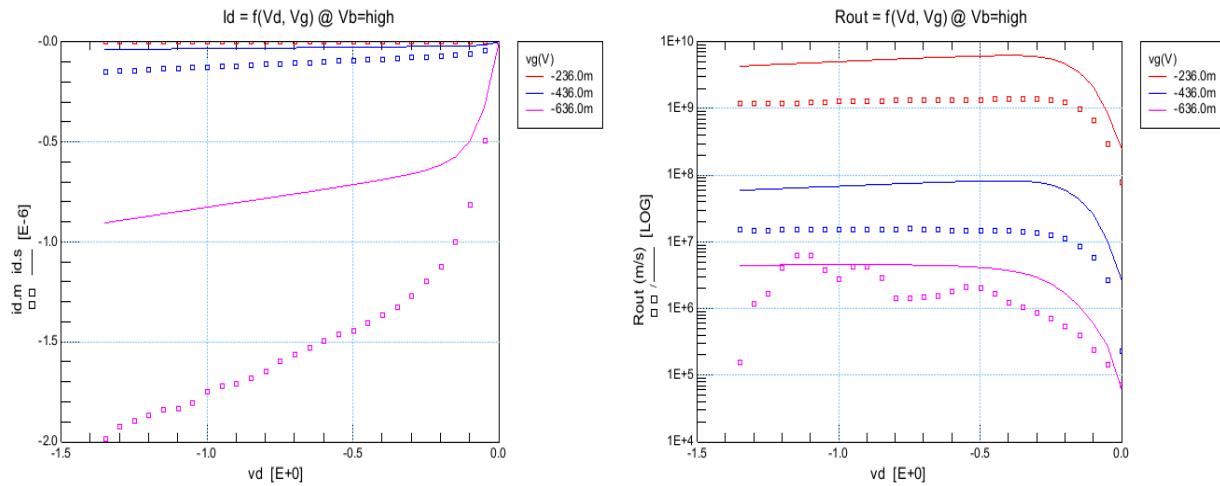


idvg, Ib,Ig, Vb = 1.2V, T = 125°C

idvd, Vb = 0V, T = 125°C


idvd_vbmin, Vb = 1.2V, T = 125°C

idvd_vth, Vb = 0V, T = 125°C


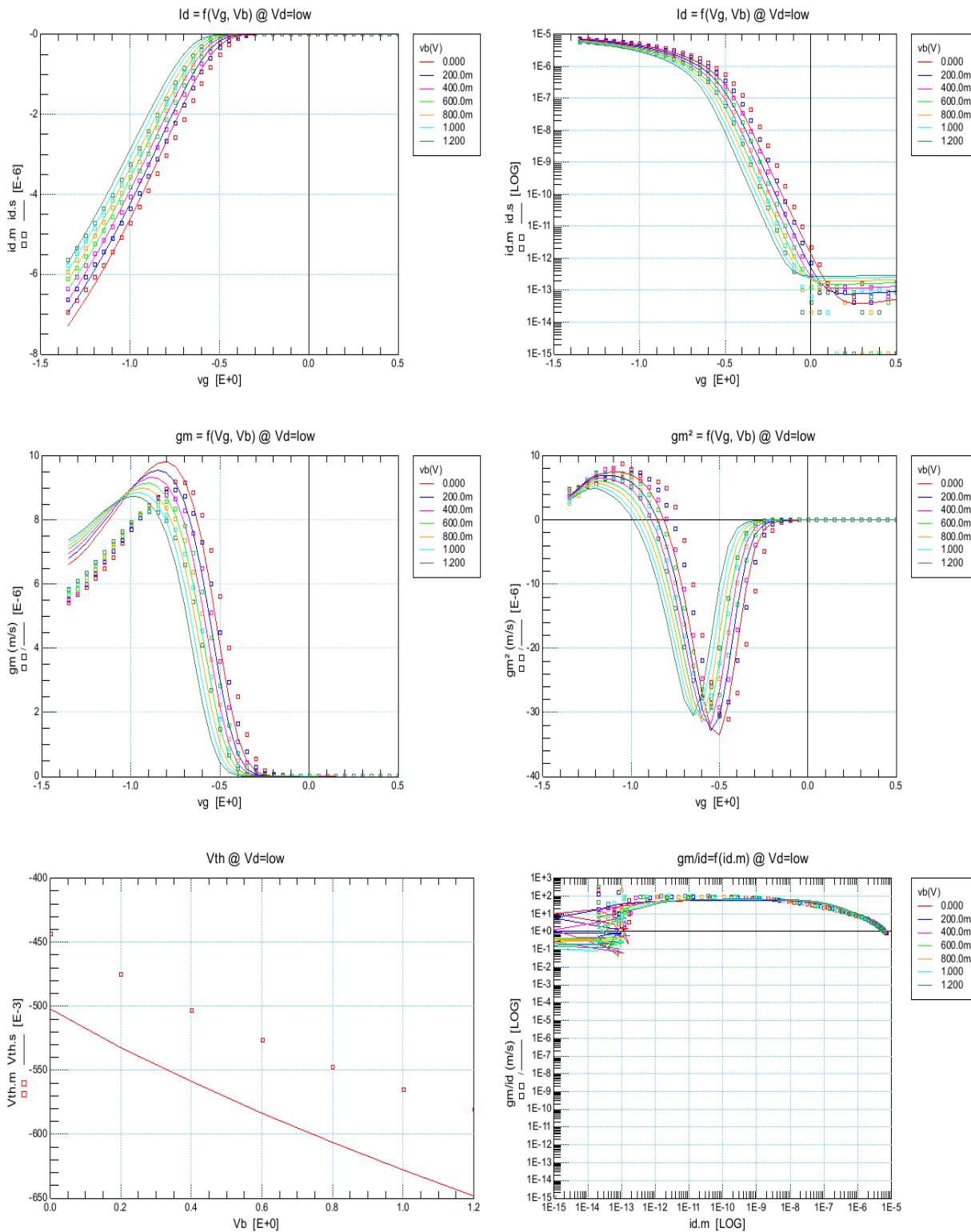


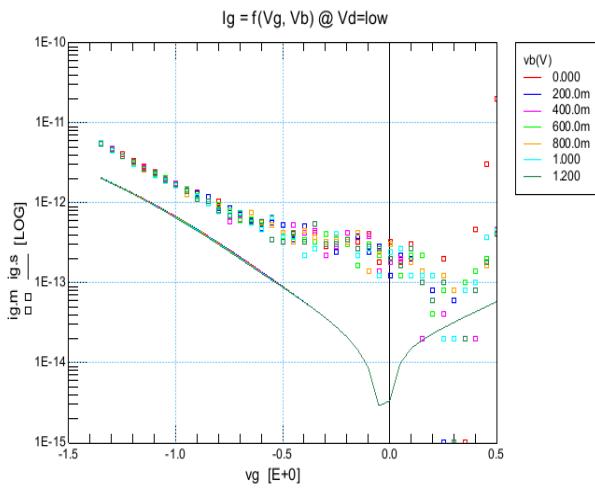
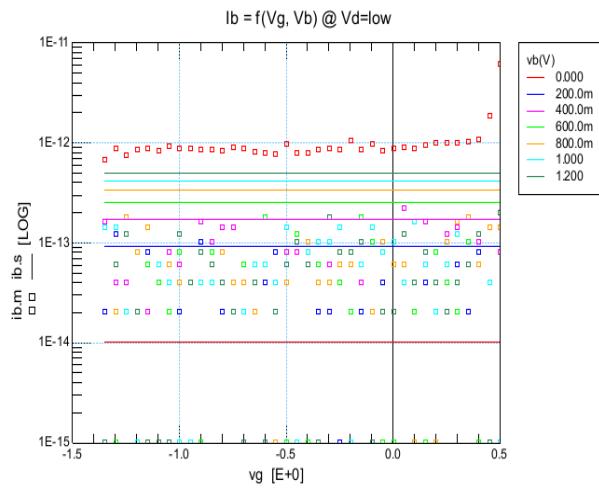
idvd_vth_vbmin, Vb = 1.2V, T = 125°C



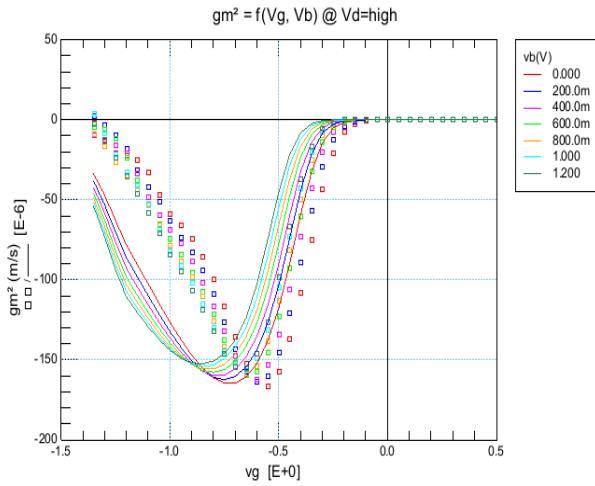
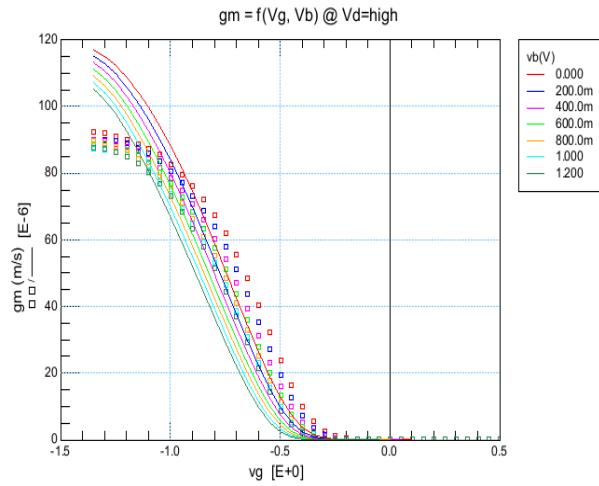
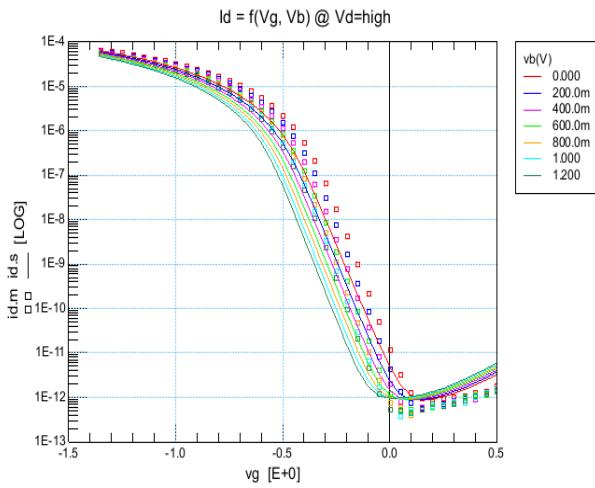
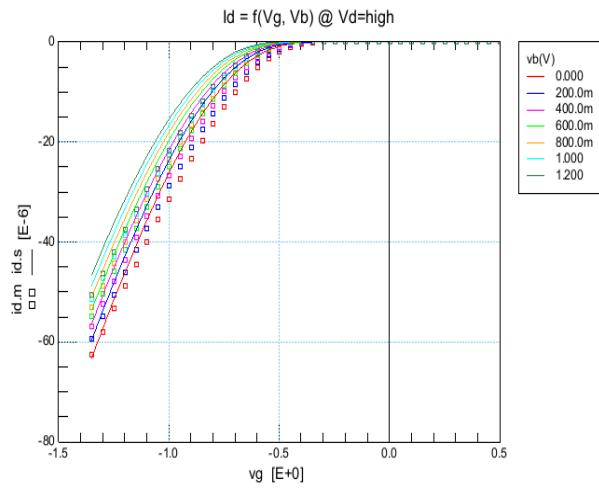
4.37W0u18_L0u13_S553_3

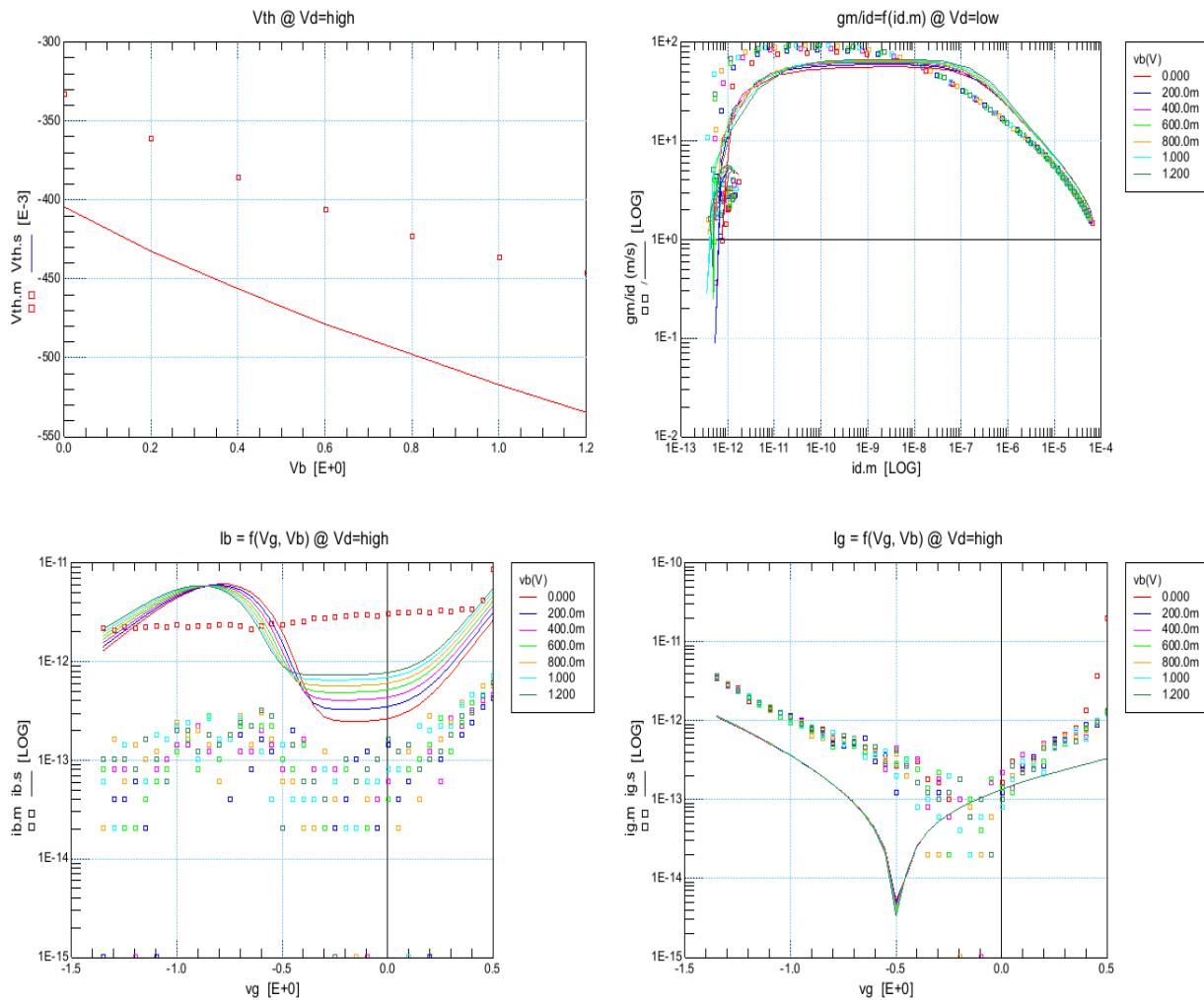
$idvg$, $Vd = -0.05V$, $T = 27^\circ C$



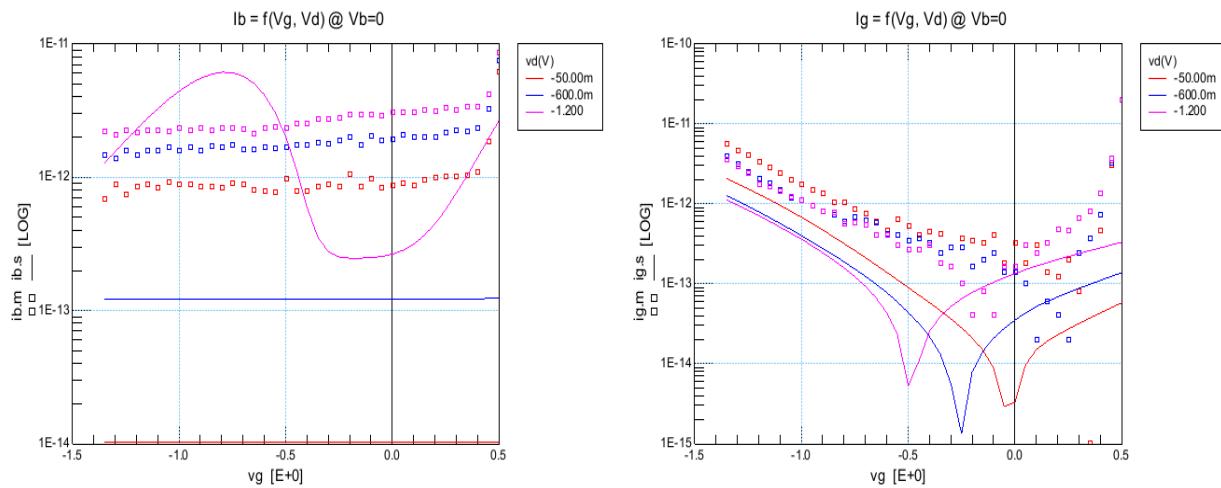


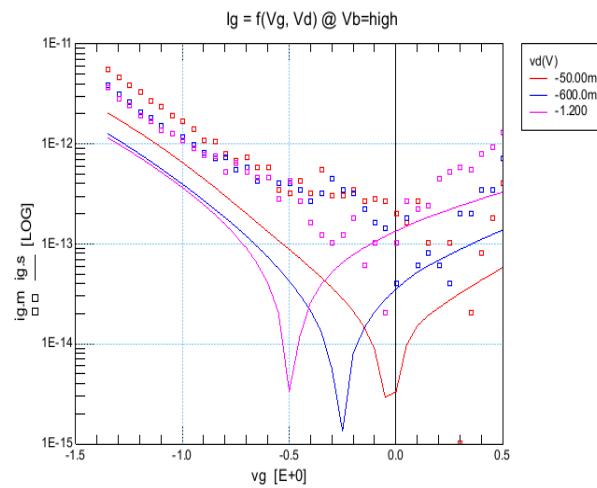
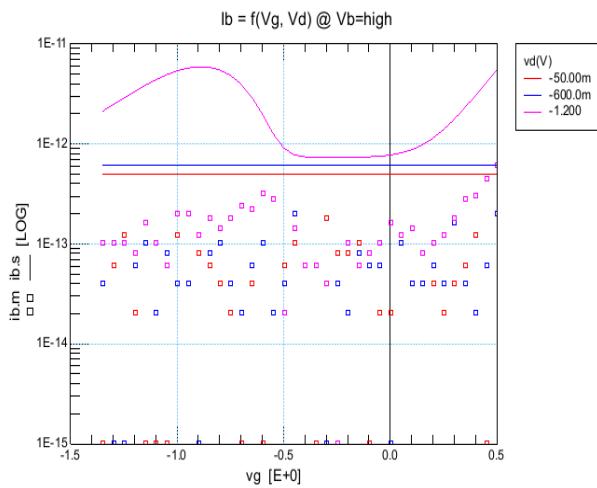
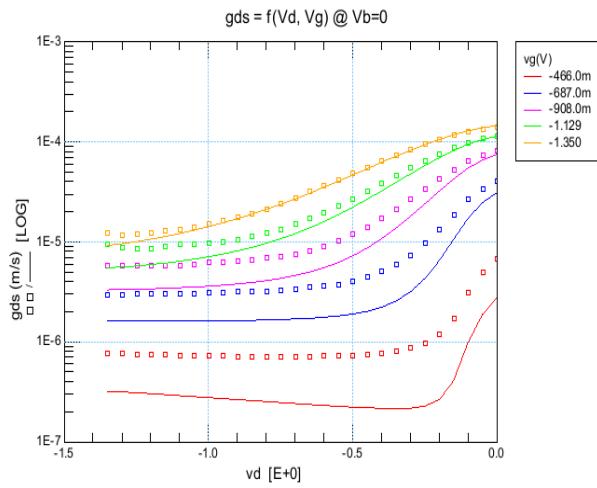
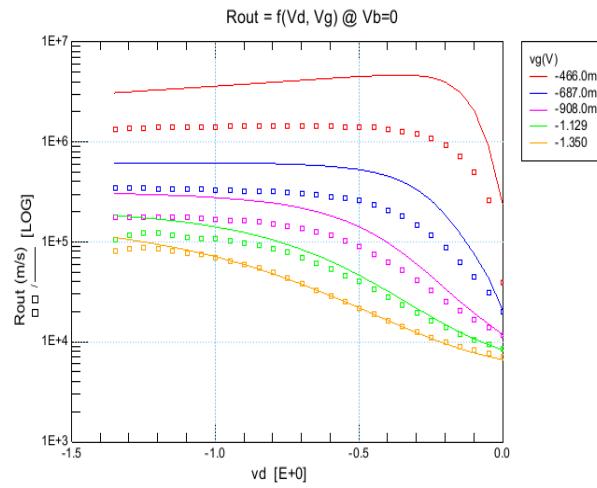
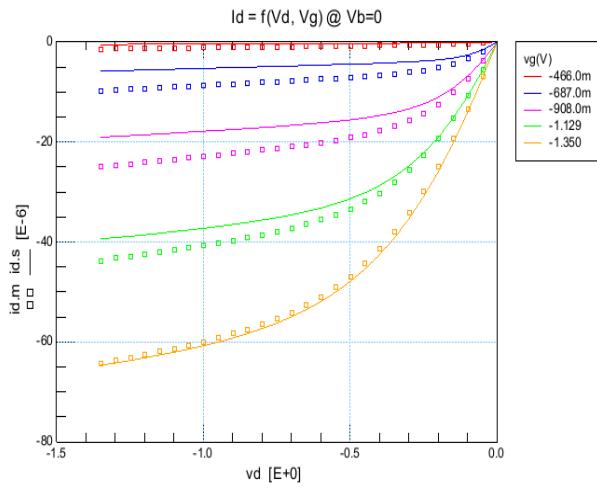
$i_{dvg}, V_d = -1.2V, T = 27^\circ C$

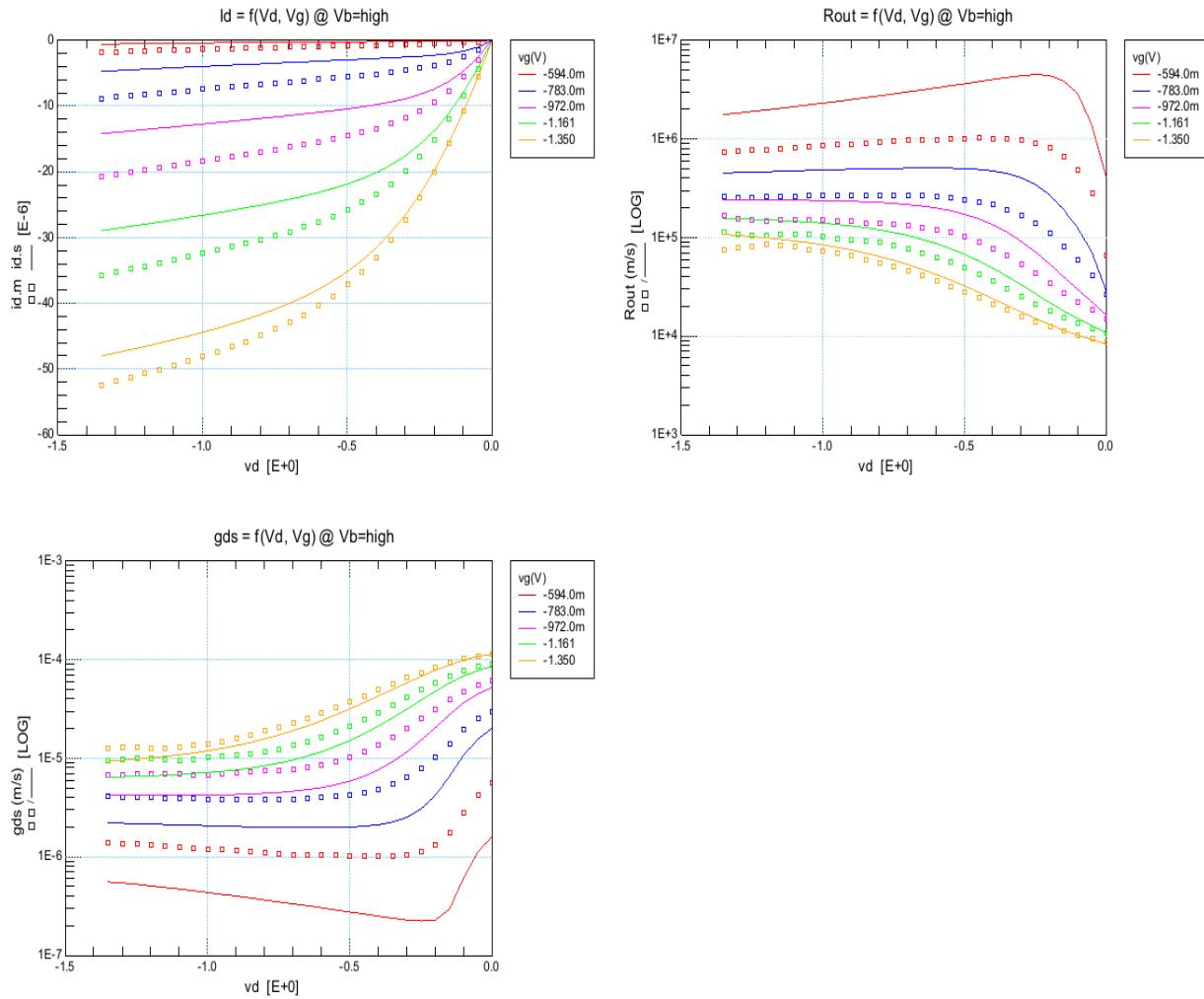
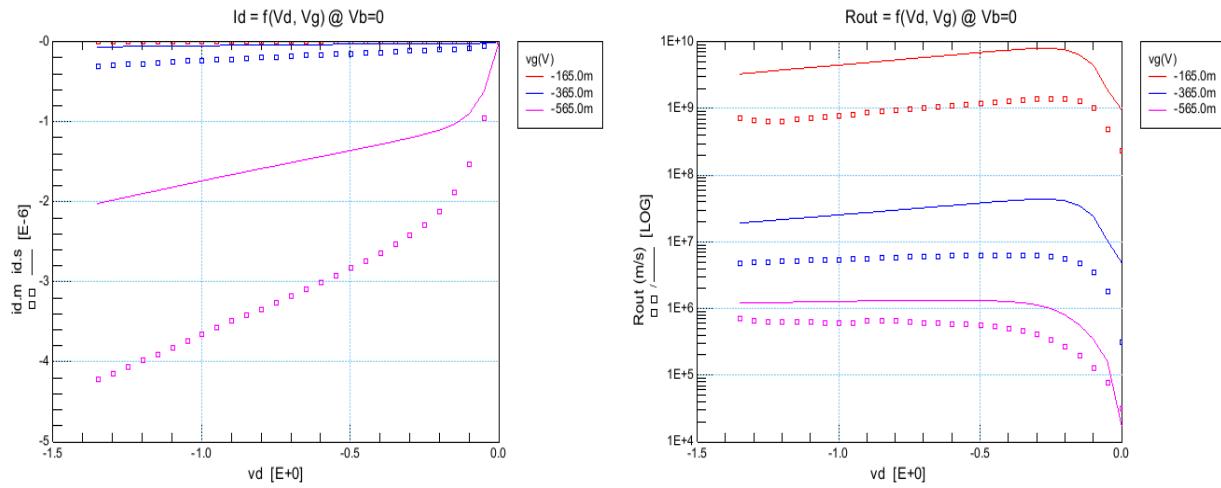


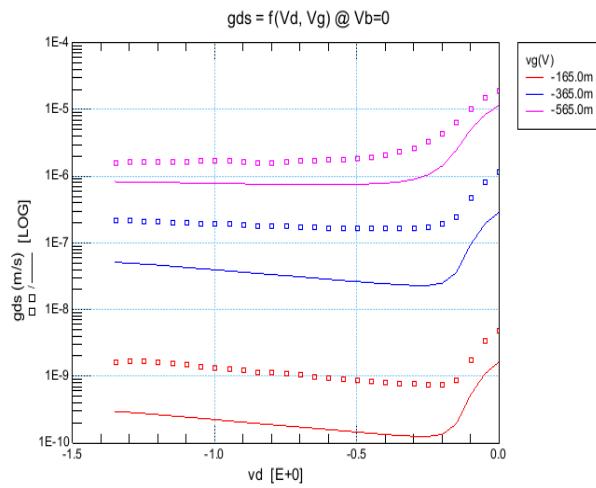


idvg, Ib, Ig, Vb = 0V, T = 27°C

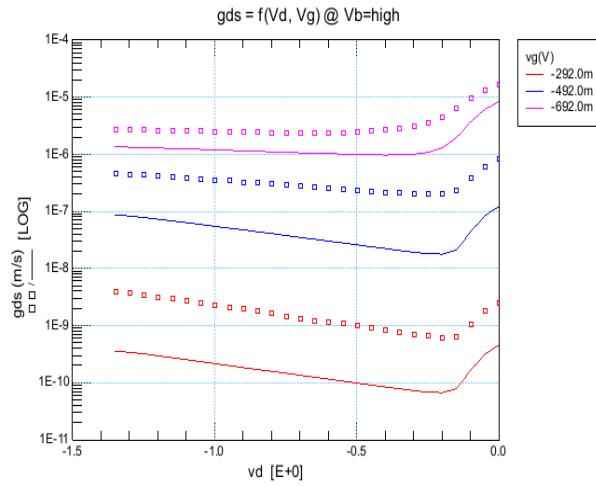
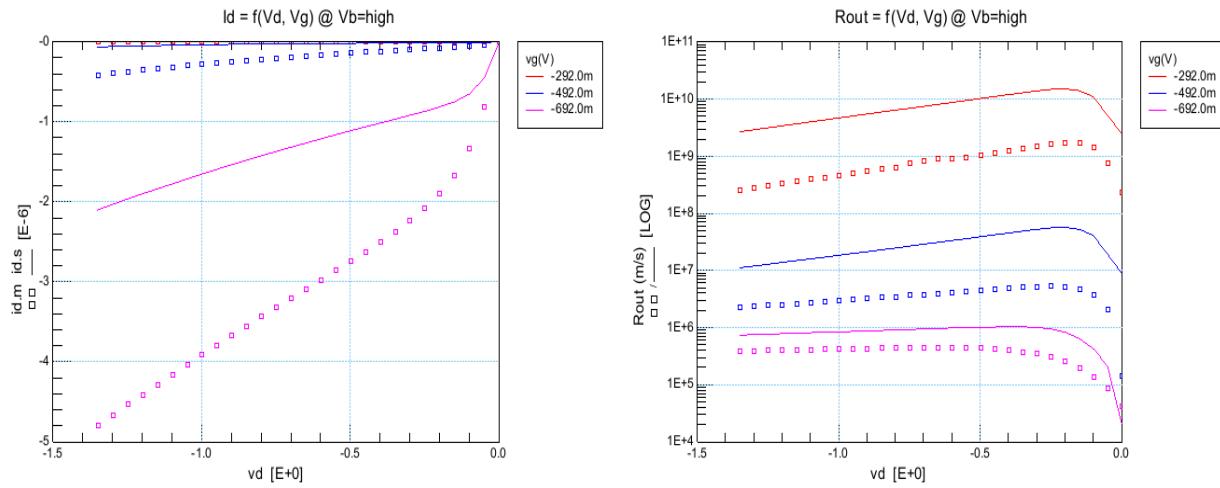


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C


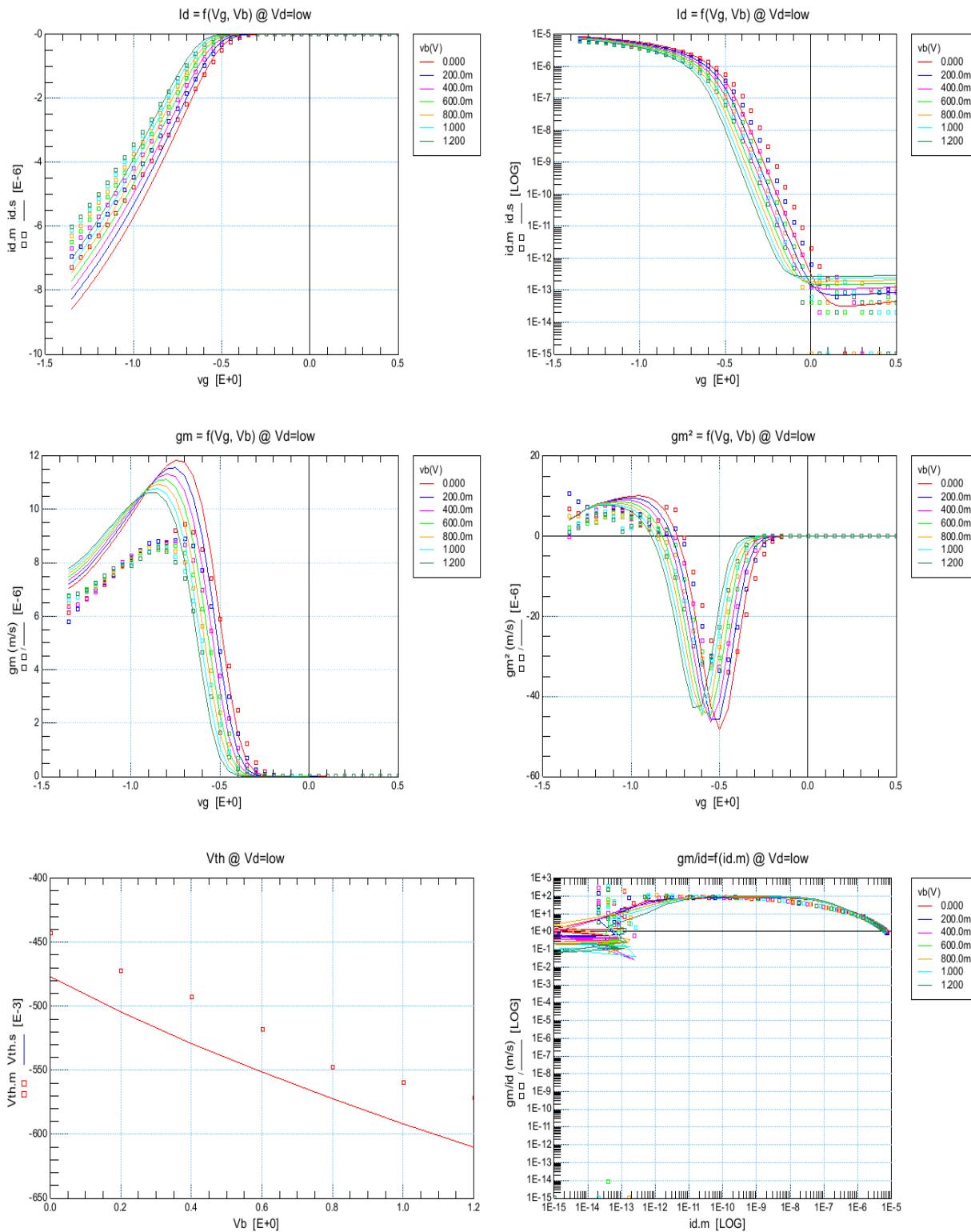


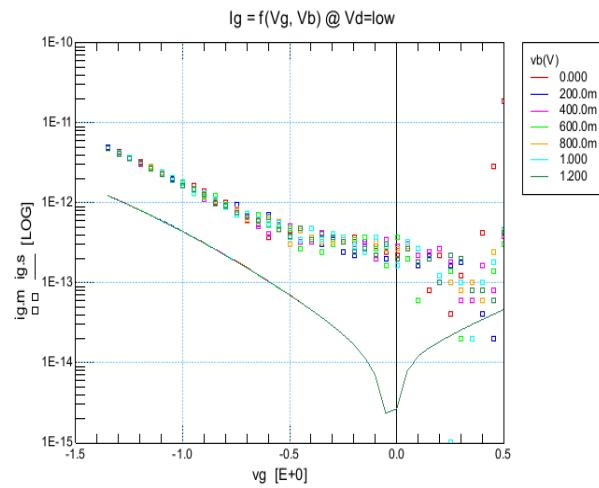
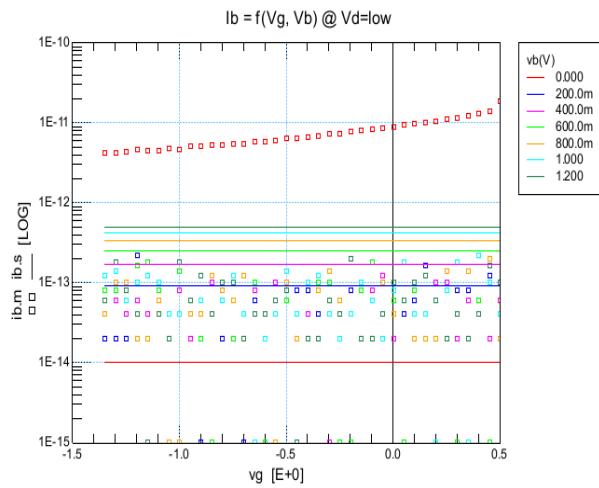
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



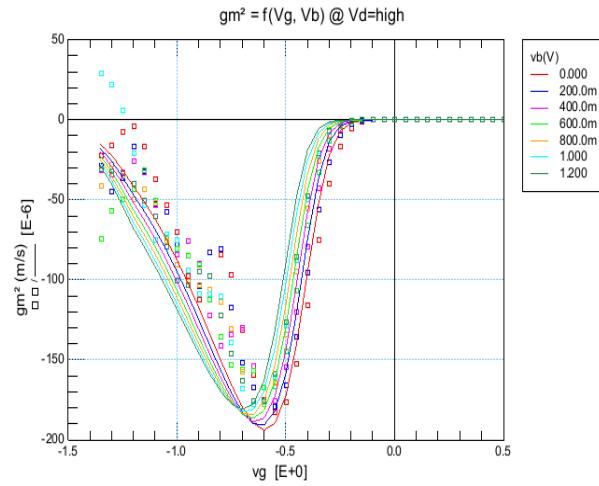
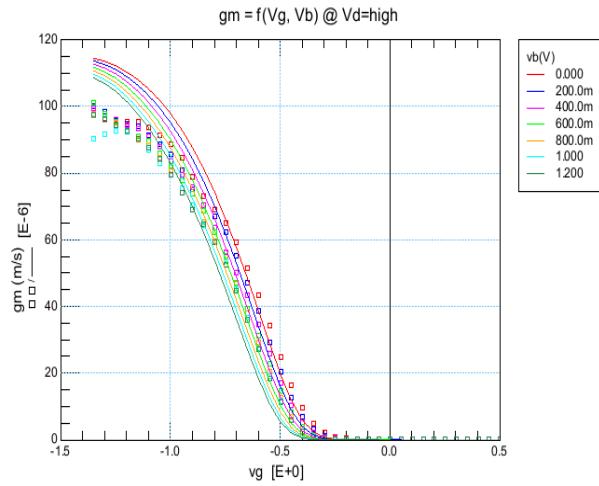
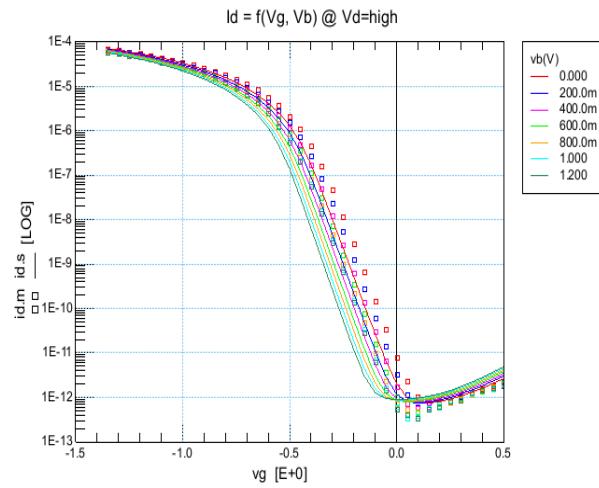
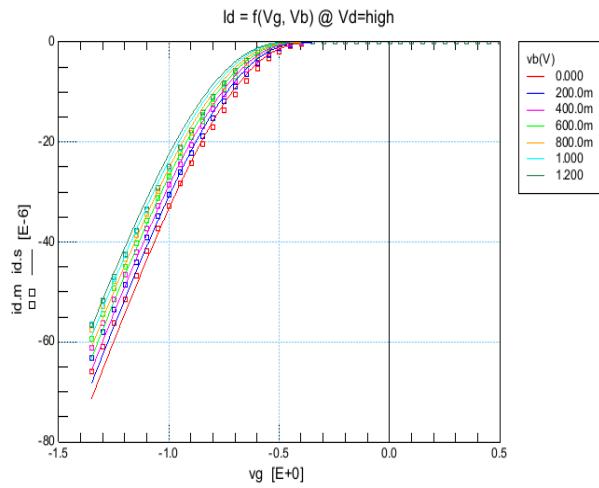
4.38 W0u15_L0u12_S554_2

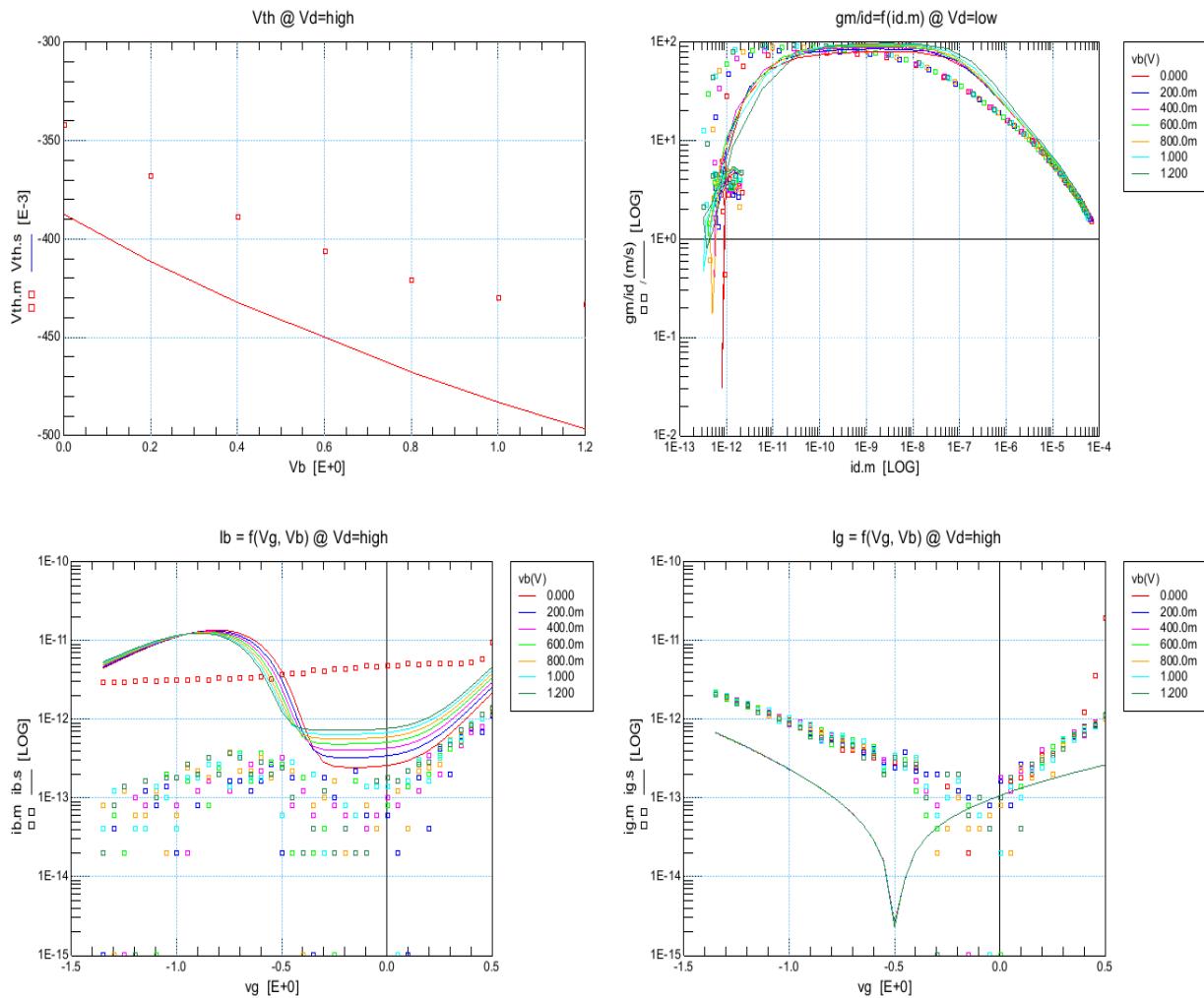
$idv_g, V_d = -0.05V, T = 27^\circ C$



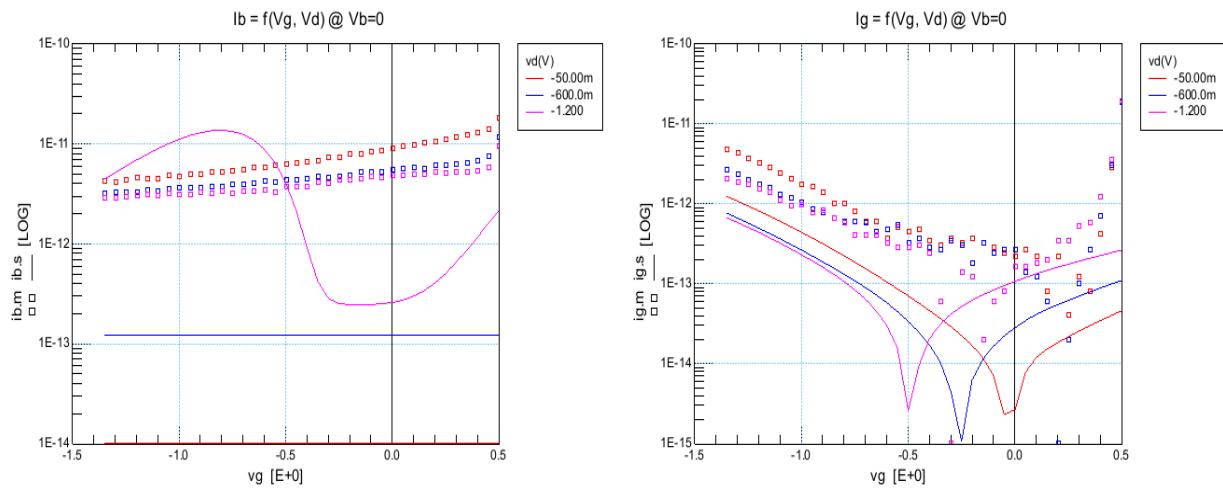


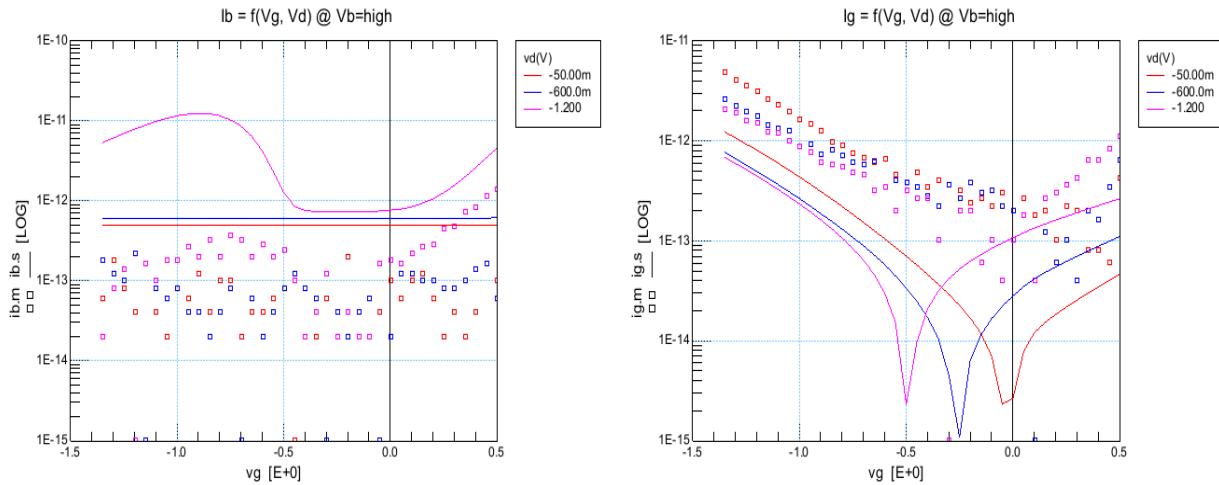
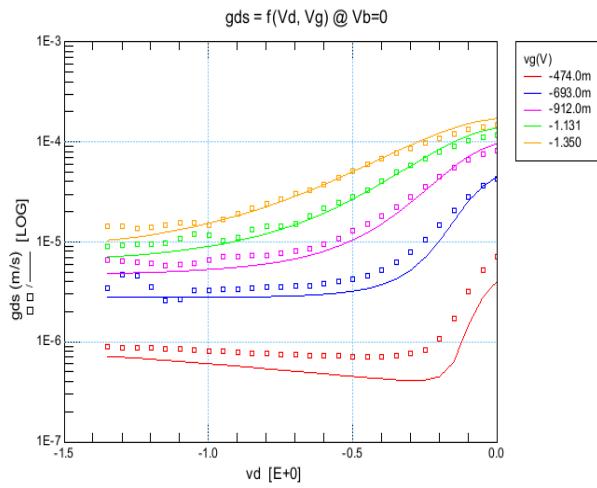
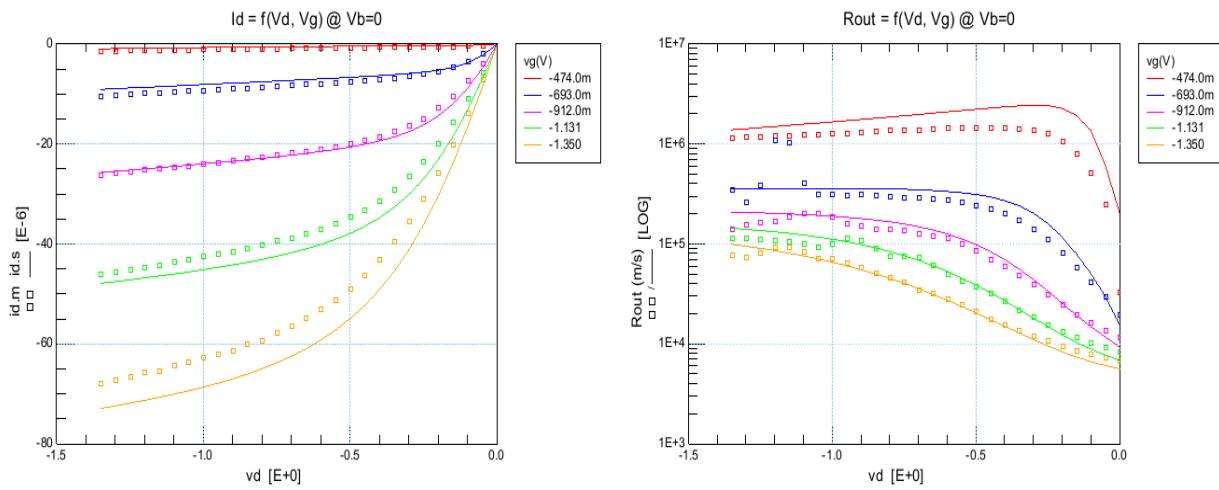
i_{dvg} , $V_d = -1.2V$, $T = 27^\circ C$

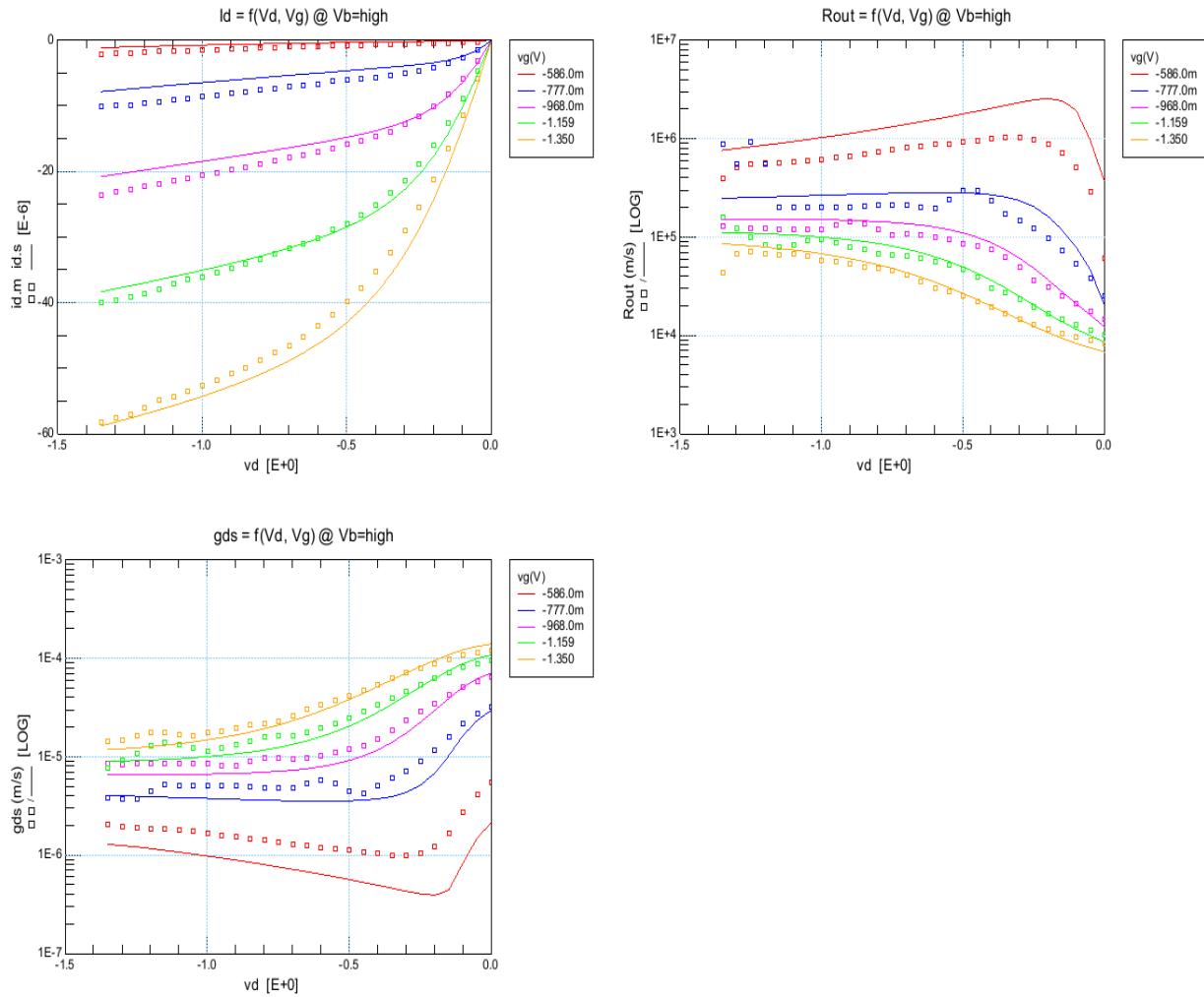
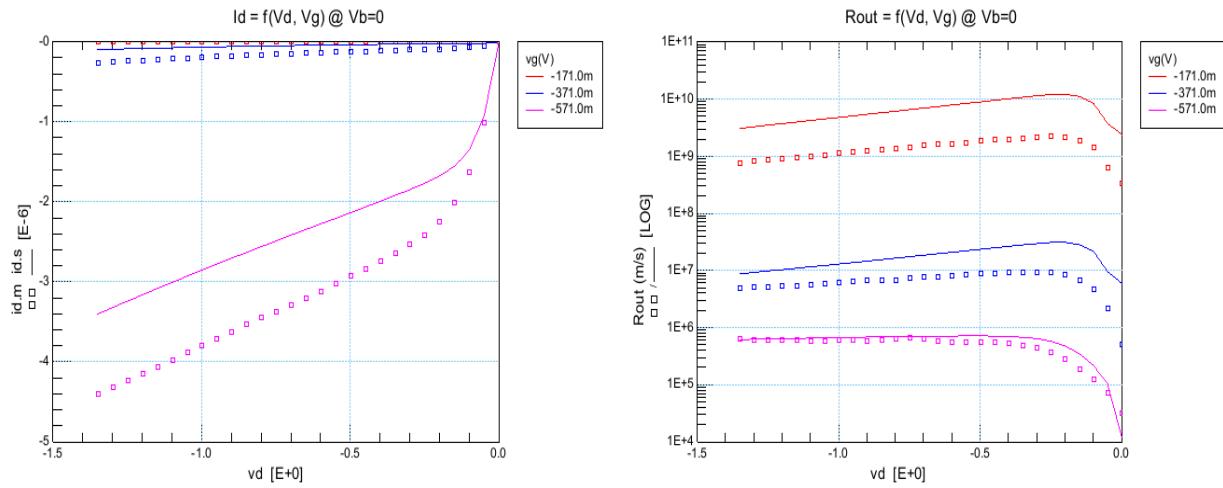


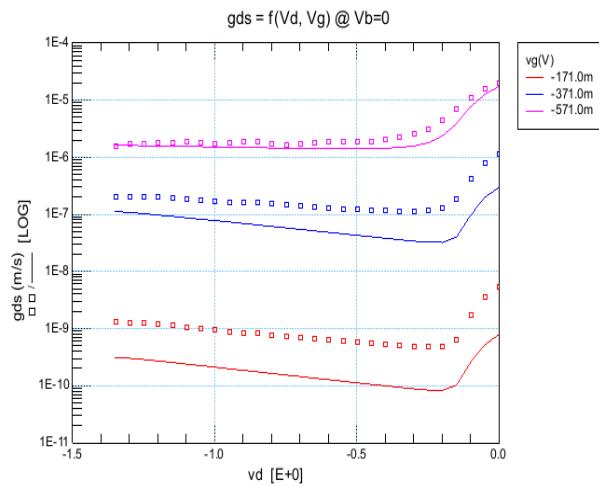


idvg, Ib, Ig, Vb = 0V, T = 27°C

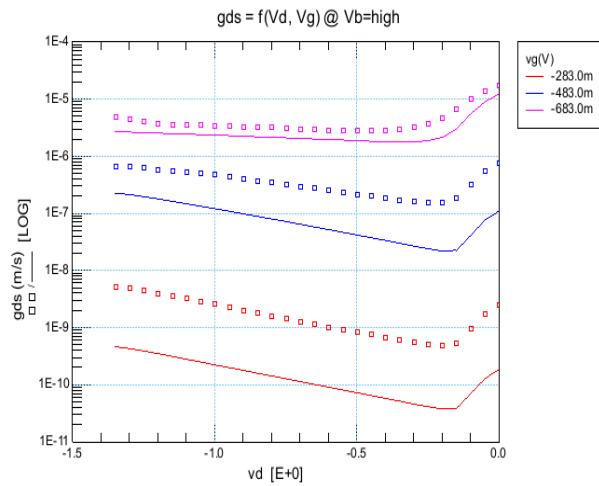
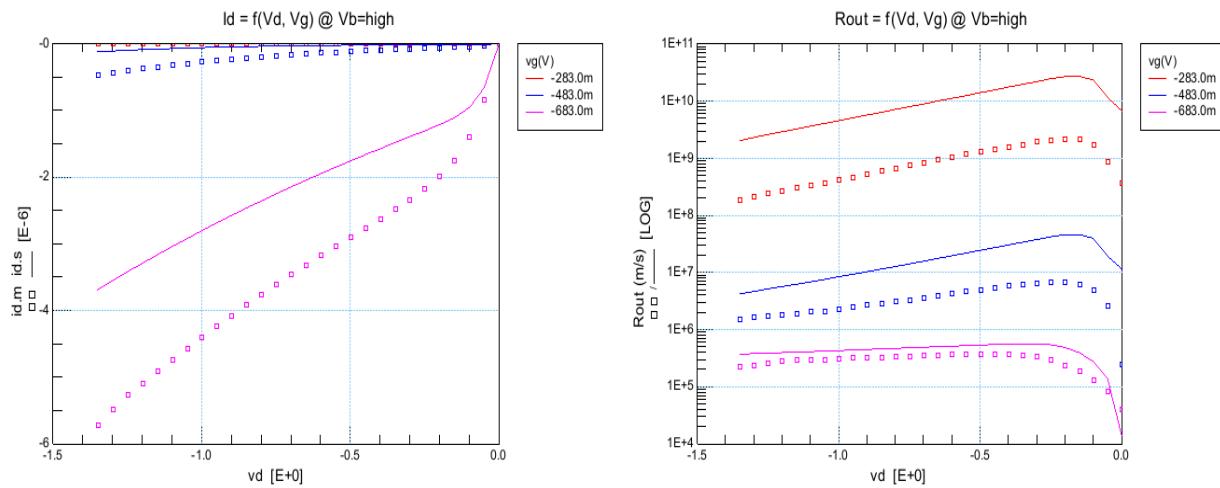


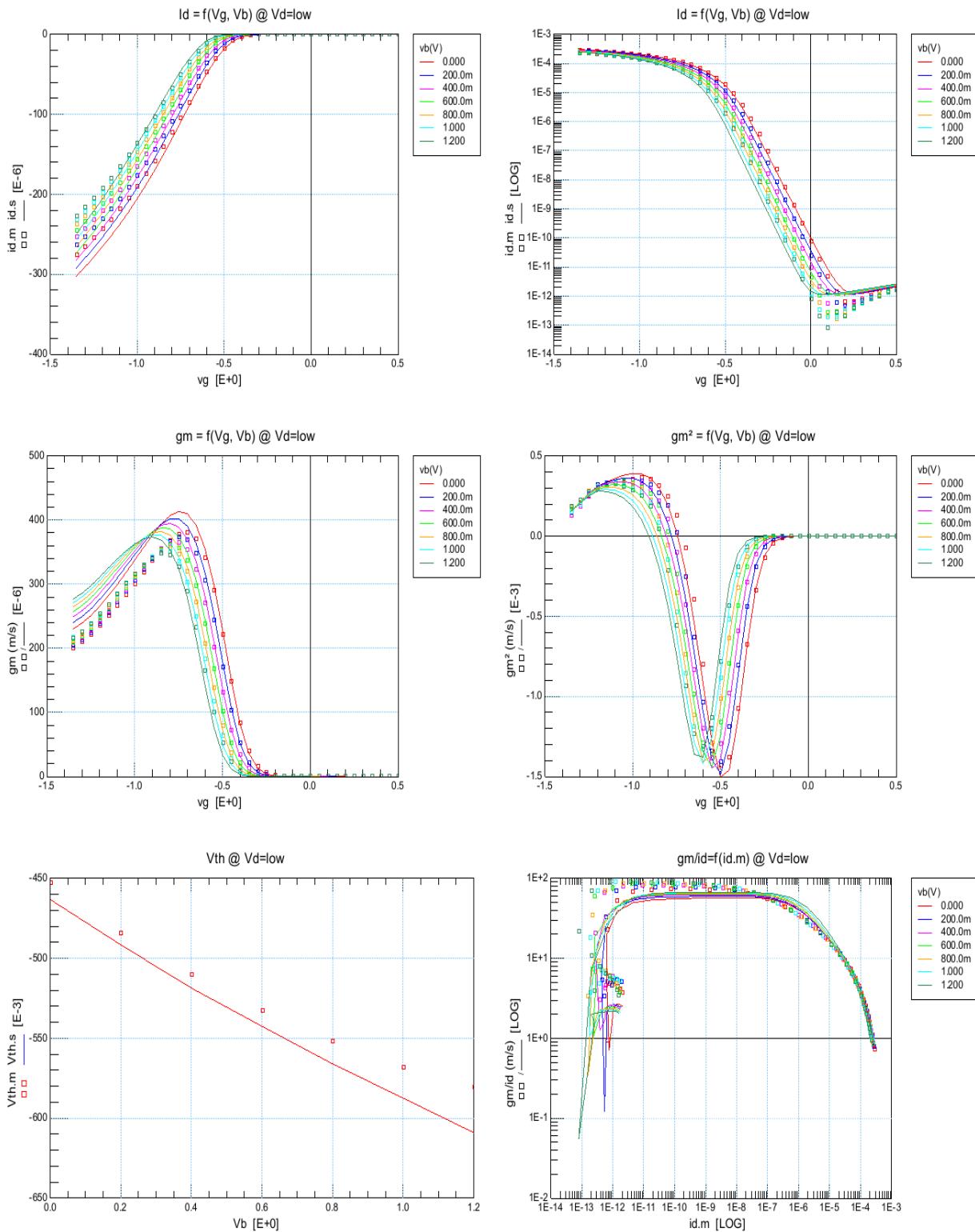
idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


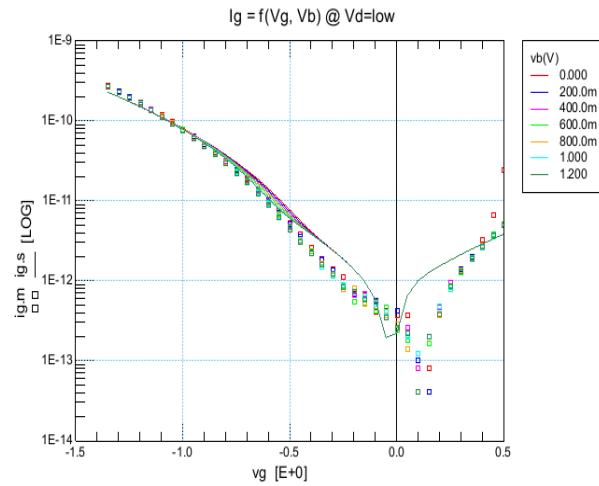
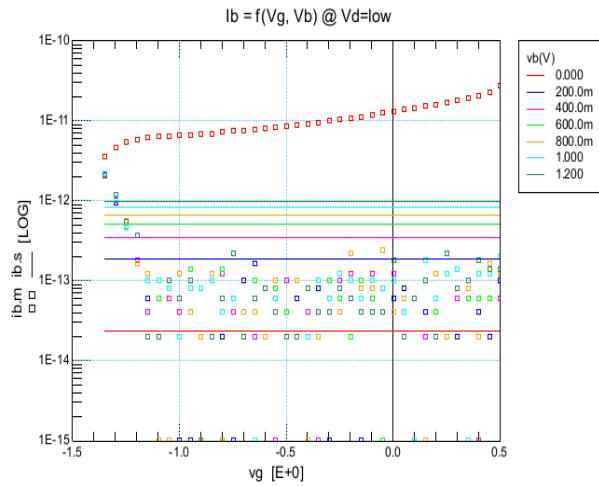
idvd_vbmin, Vb = 1.2V, T = 27°C

idvd_vth, Vb = 0V, T = 27°C




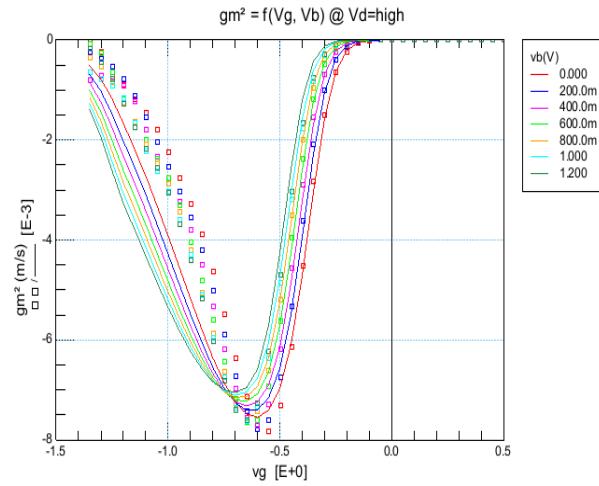
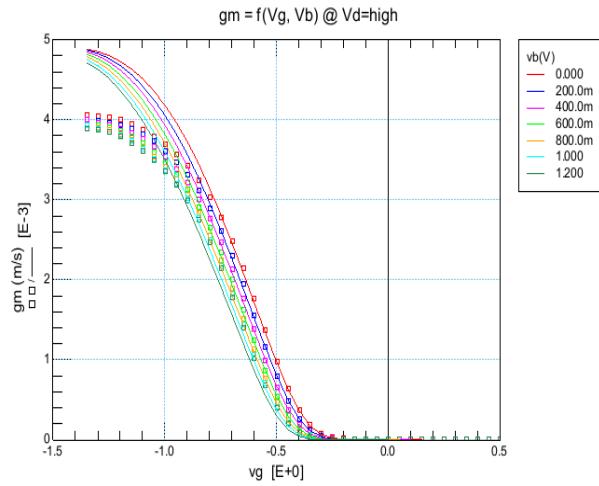
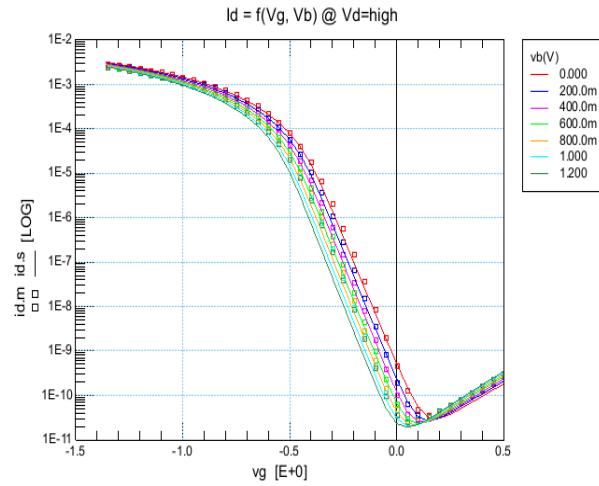
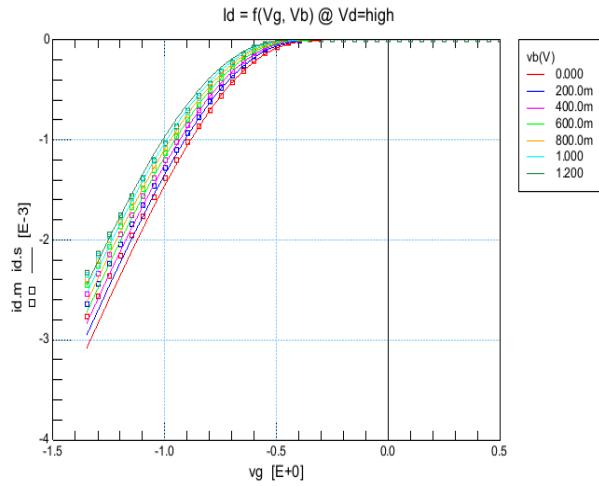
idvd_vth_vbmin, Vb = 1.2V, T = 27°C

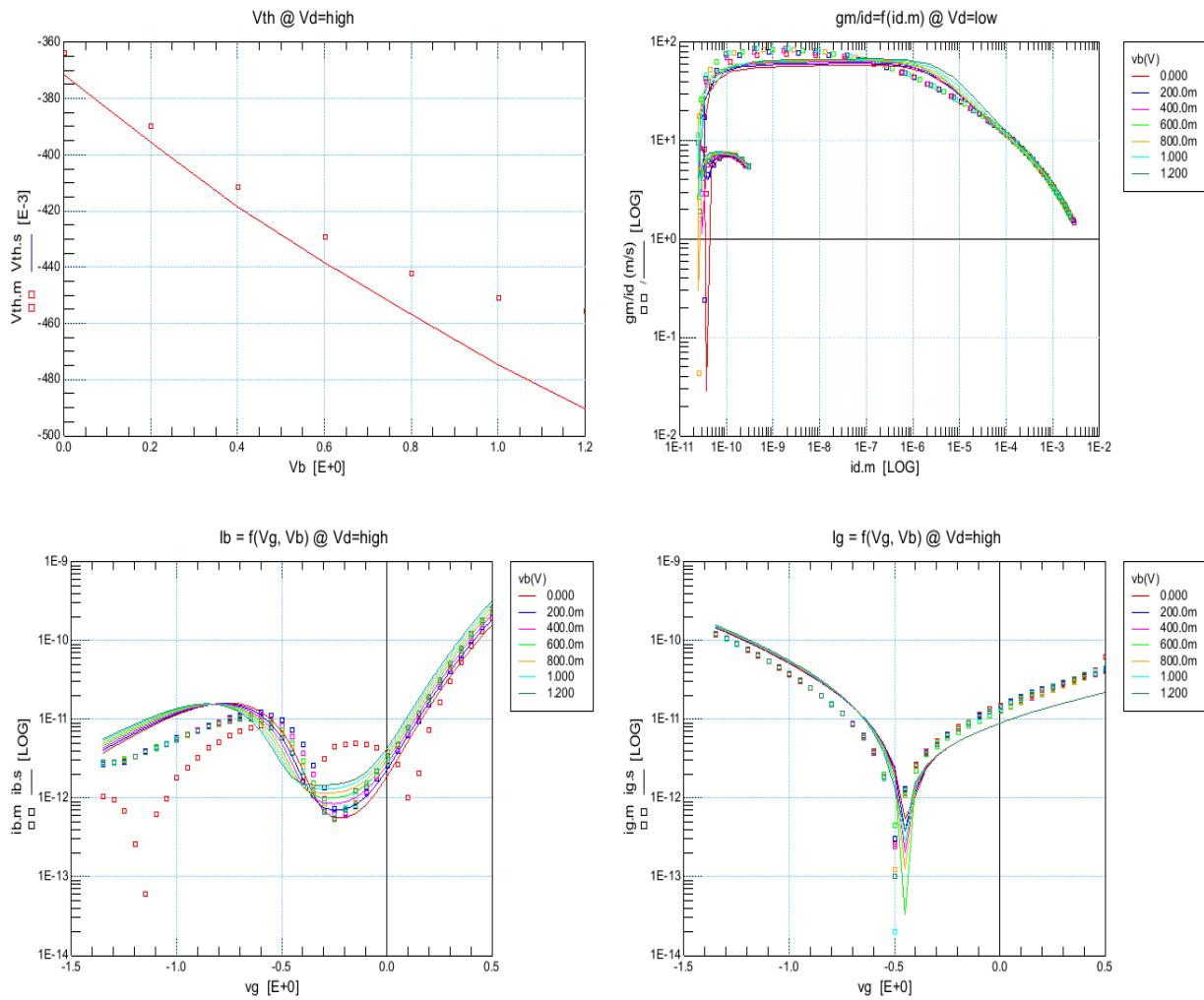


4.39 W10u0_L0u12_S548_1**idvg, Vd = -0.05V, T = 27°C**

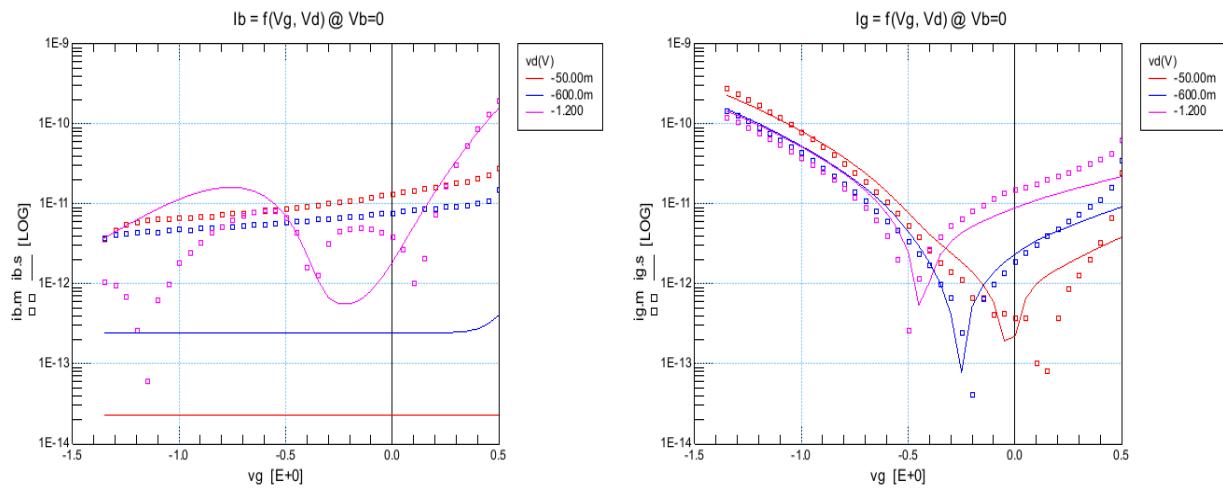


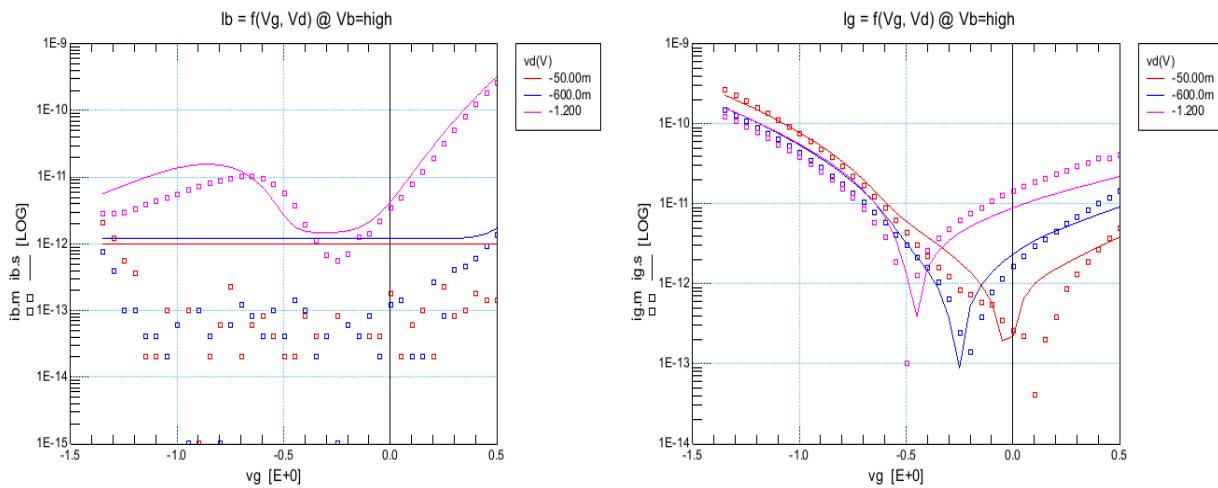
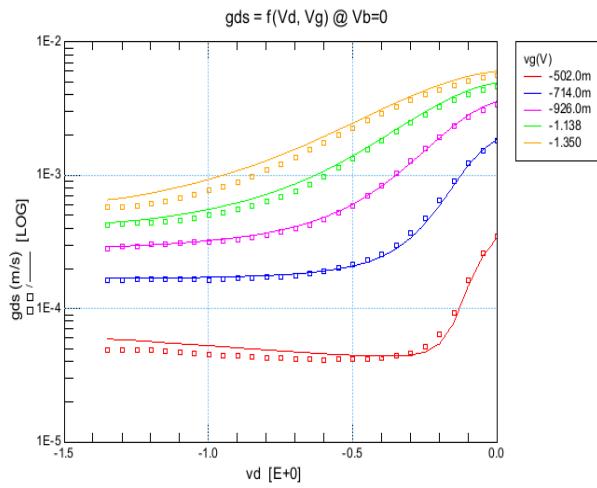
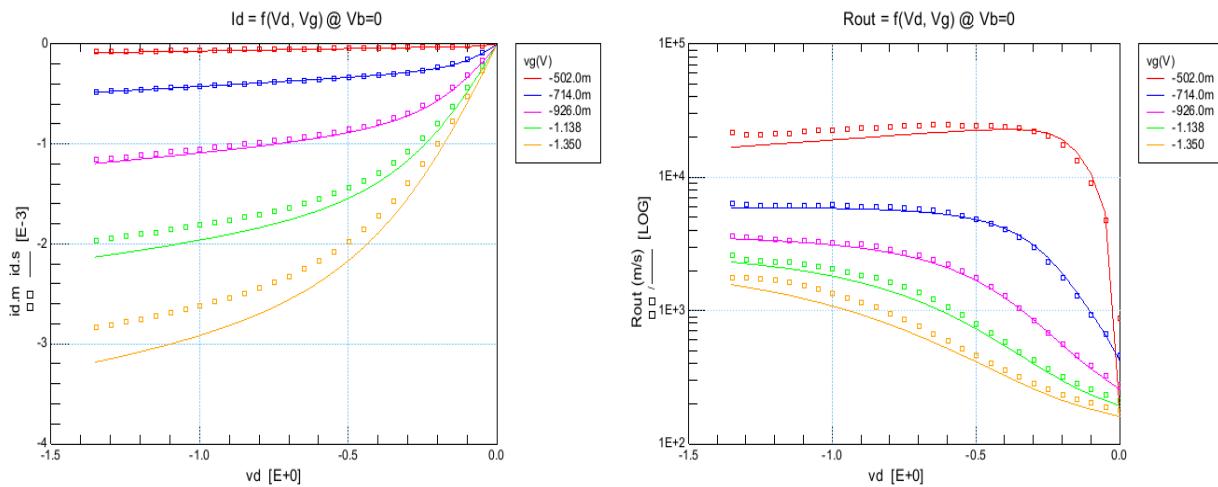
$i_{dvg}, V_d = -1.2V, T = 27^\circ C$

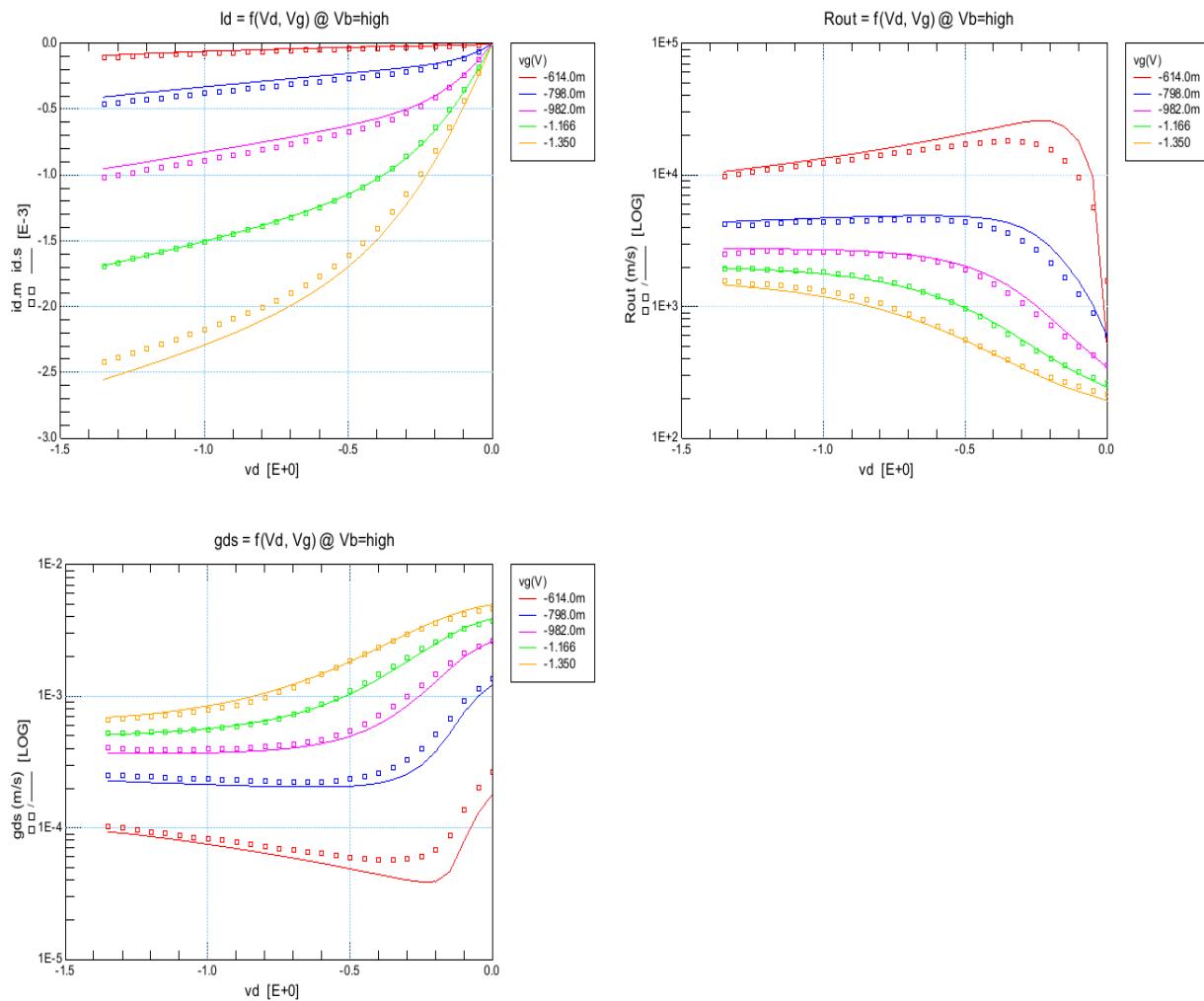
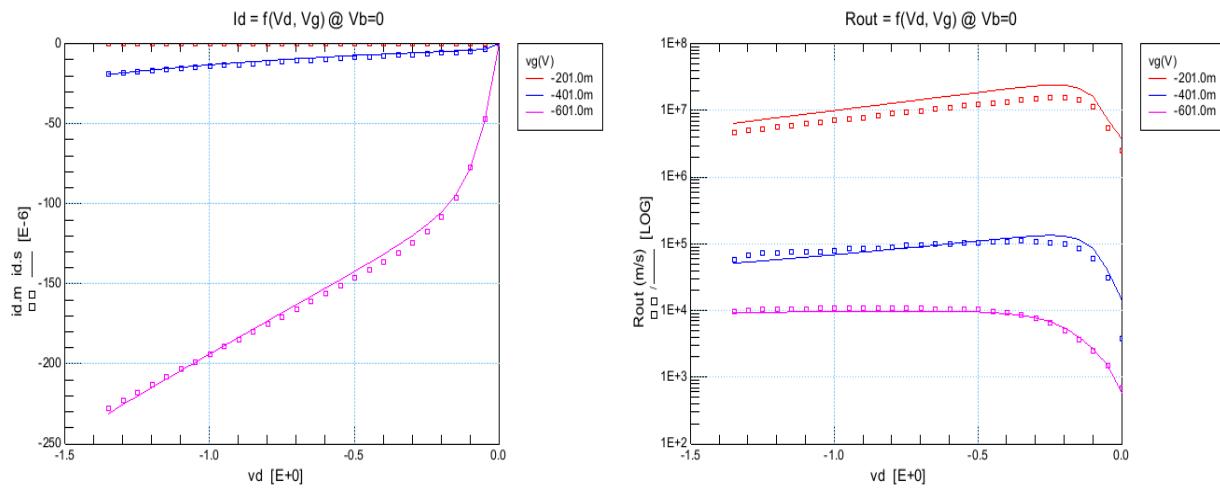


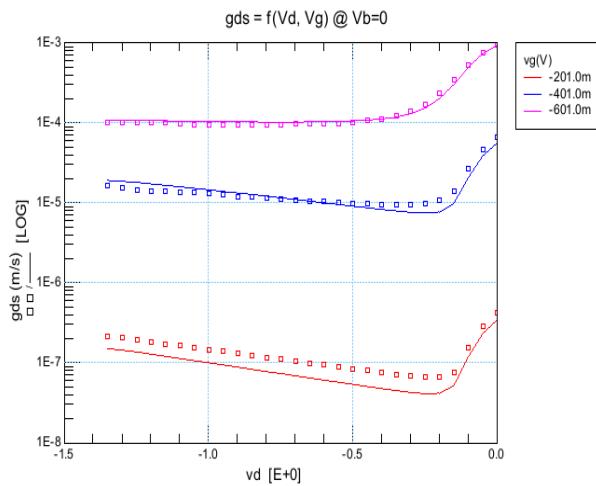


idvg, Ib,Ig, Vb = 0V, T = 27°C

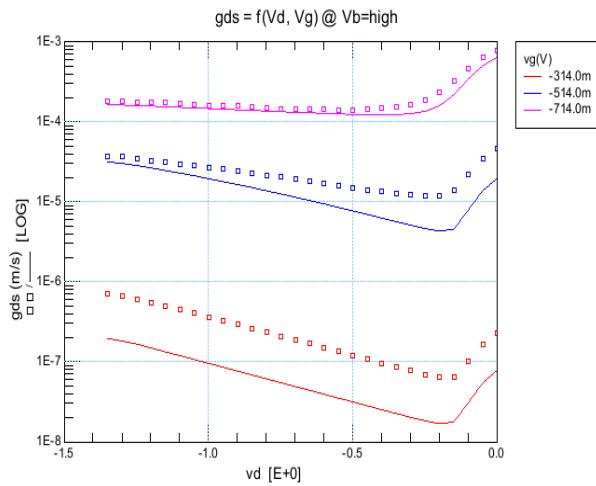
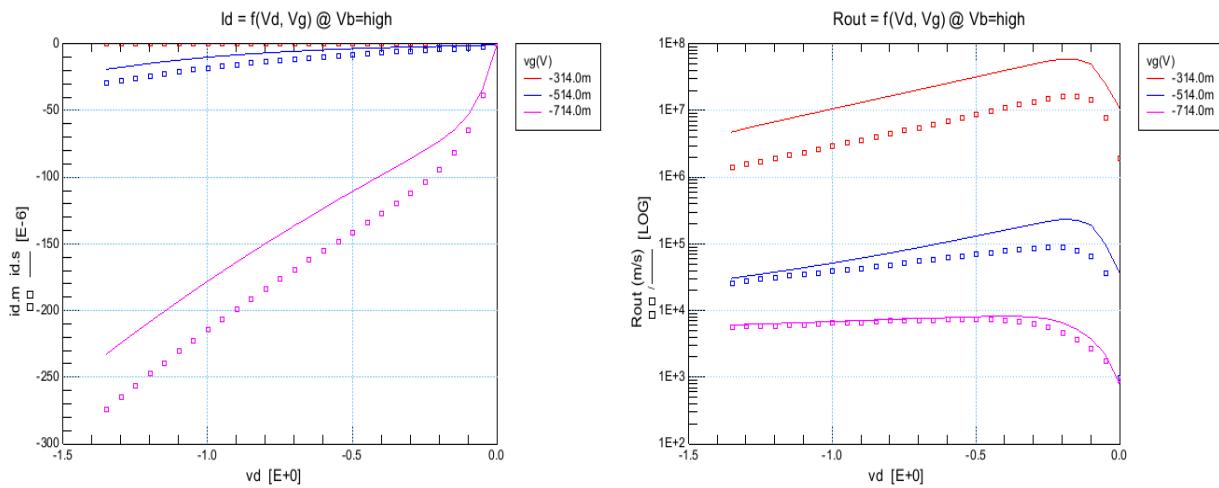


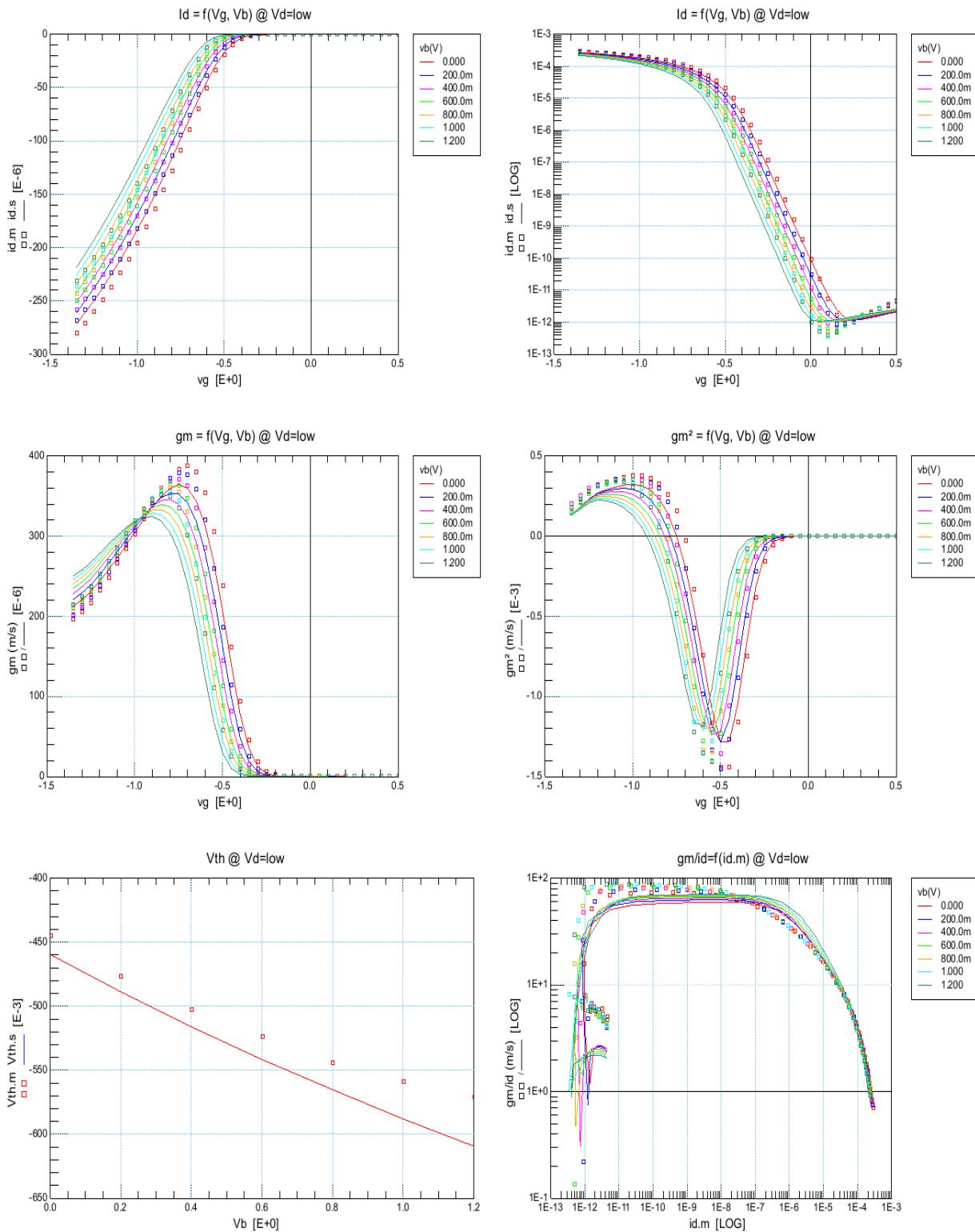
idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


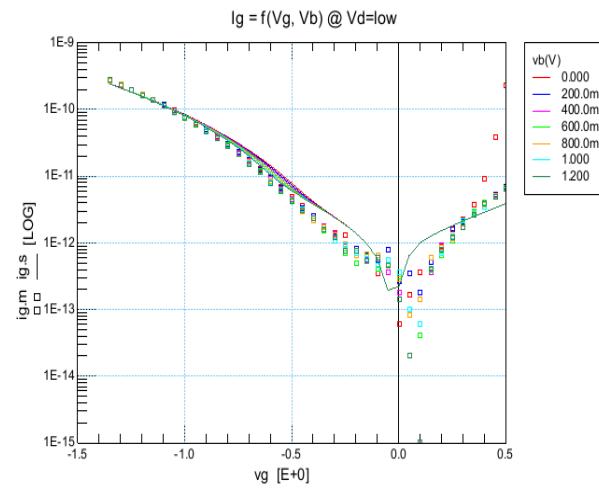
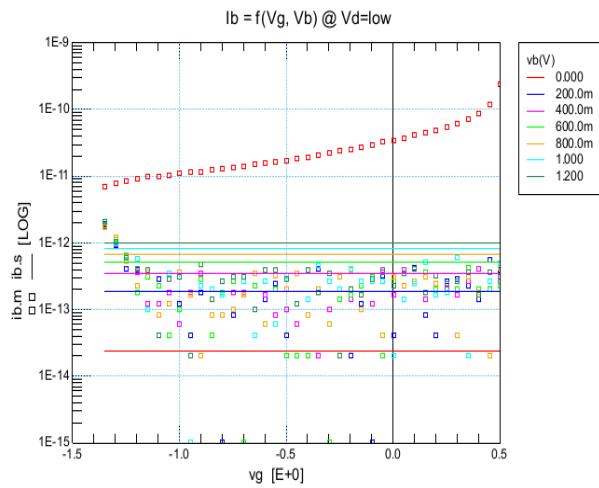
idvd_vbmin, Vb = 1.2V, T = 27°C**idvd_vth, Vb = 0V, T = 27°C**



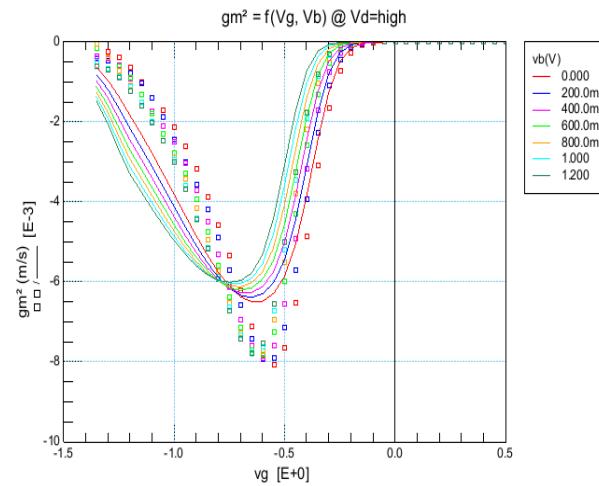
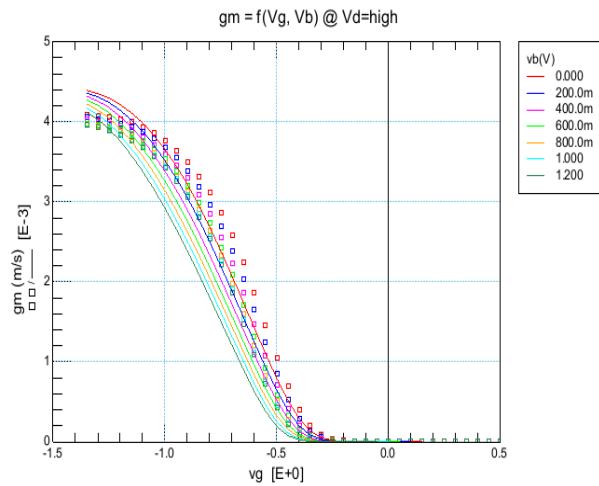
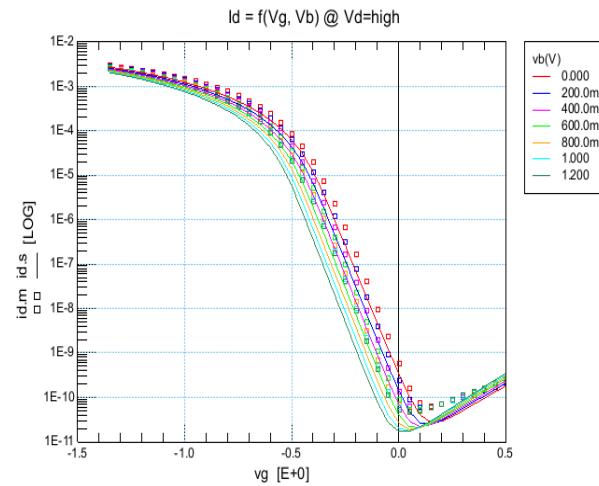
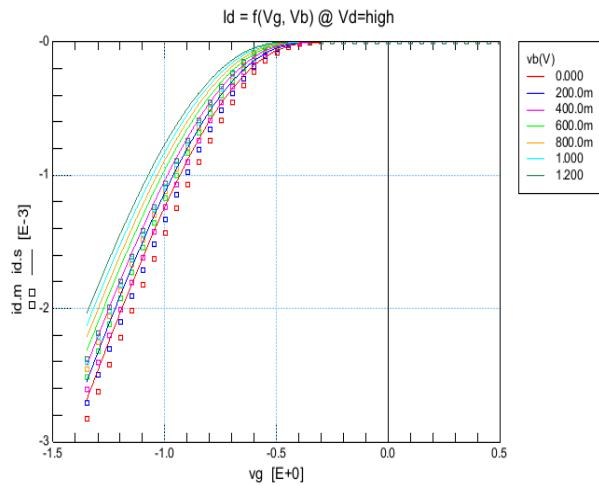
idvd_vth_vbmin, Vb = 1.2V, T = 27°C

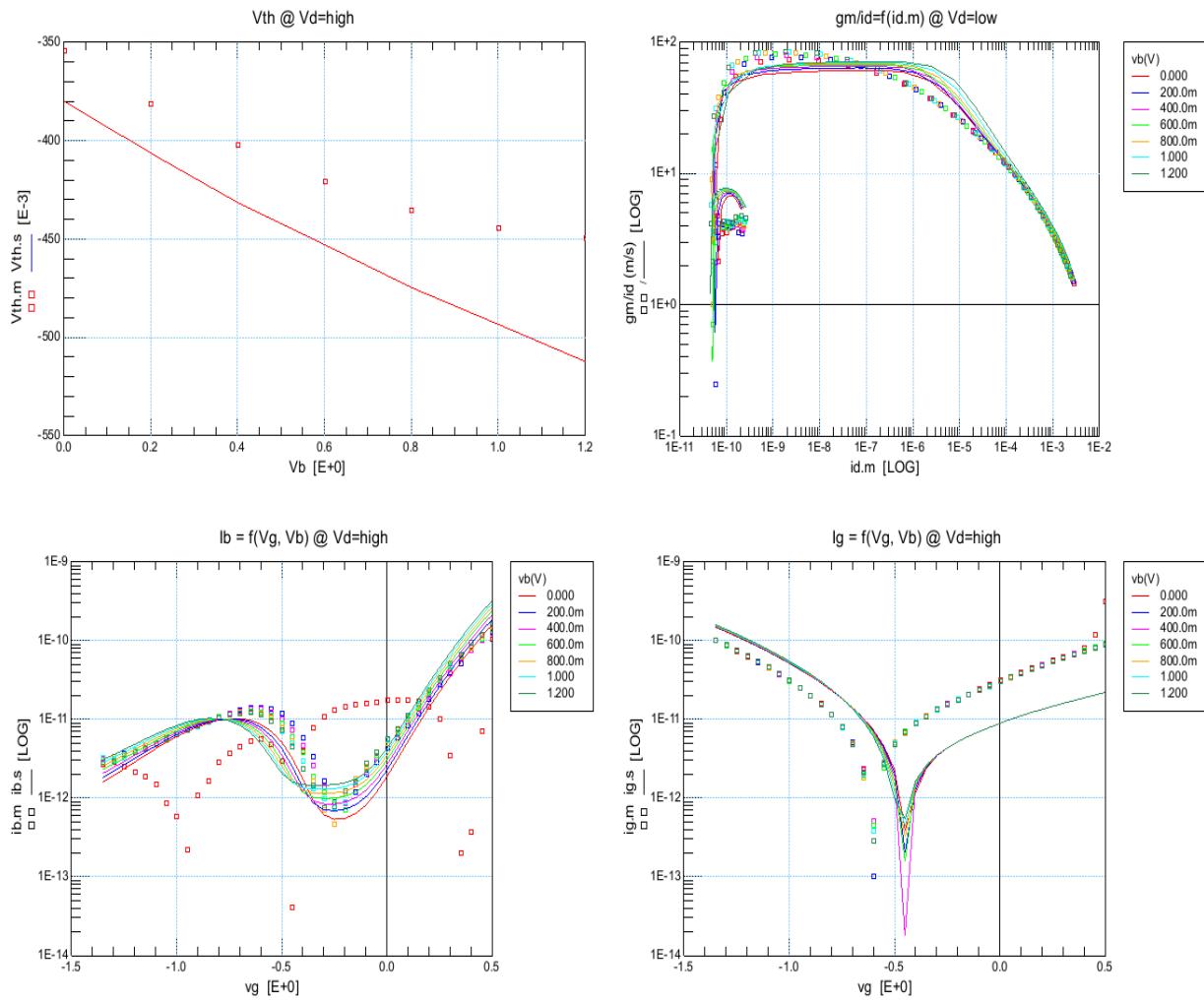


4.40W10u0_L0u13_S382_2**idvg, Vd = -0.05V, T = 27°C**

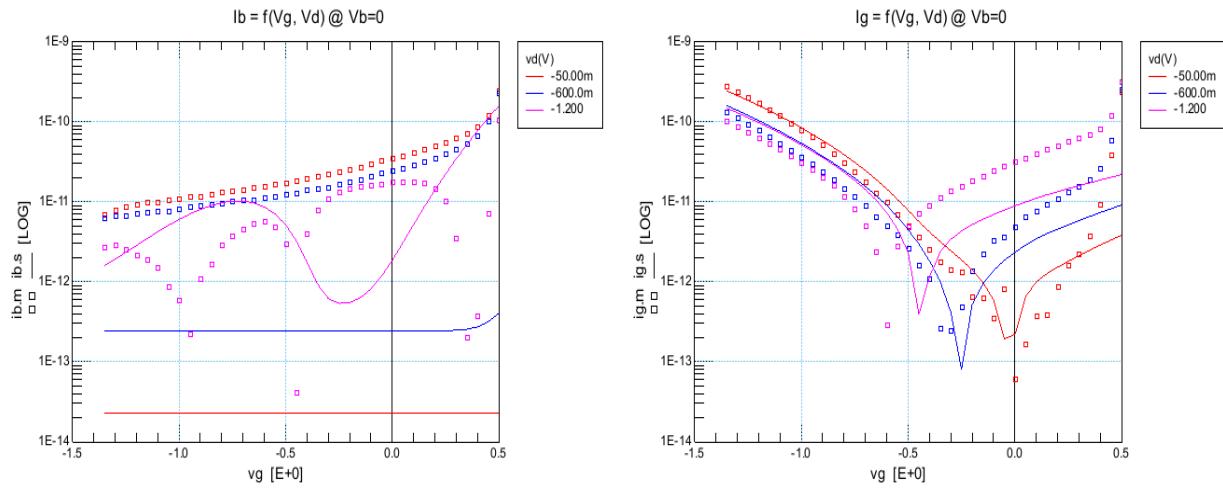


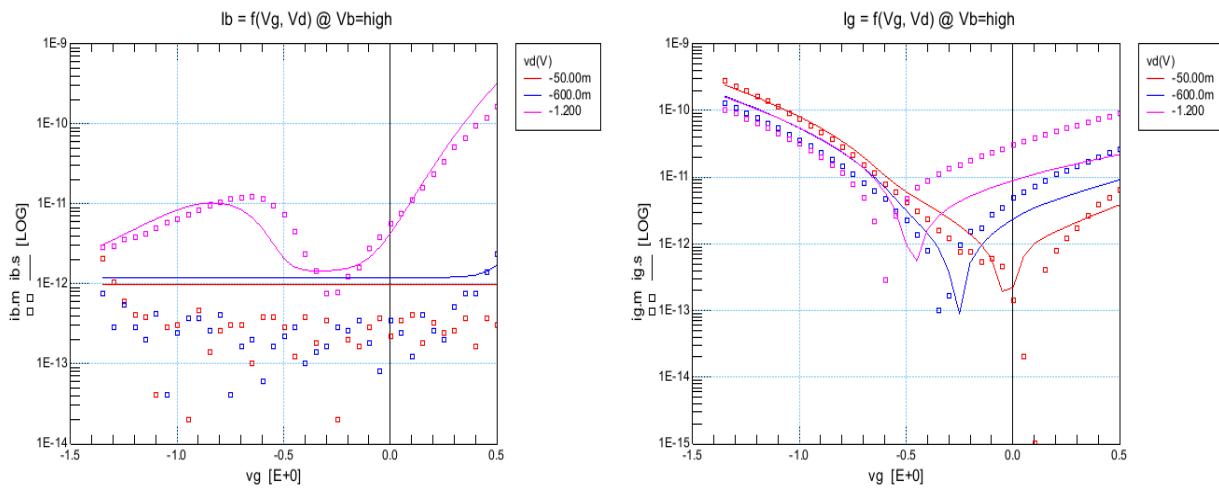
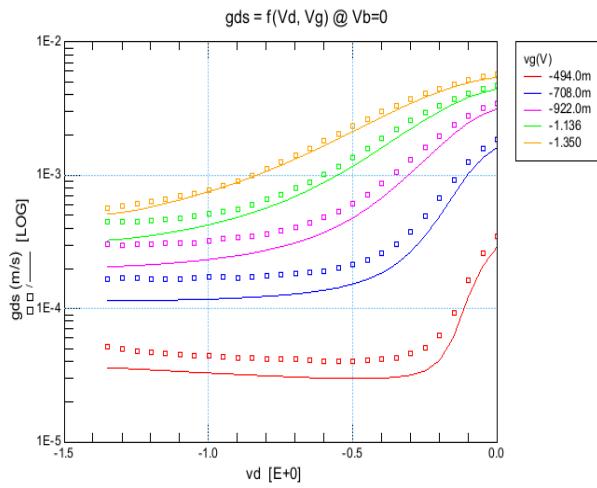
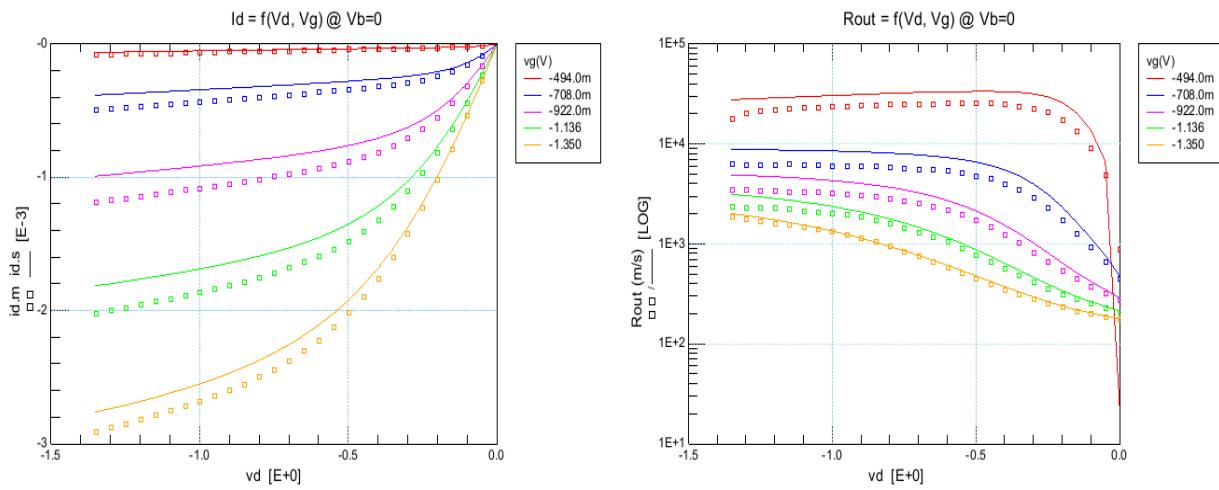
$i_{dvg}, V_d = -1.2V, T = 27^\circ C$

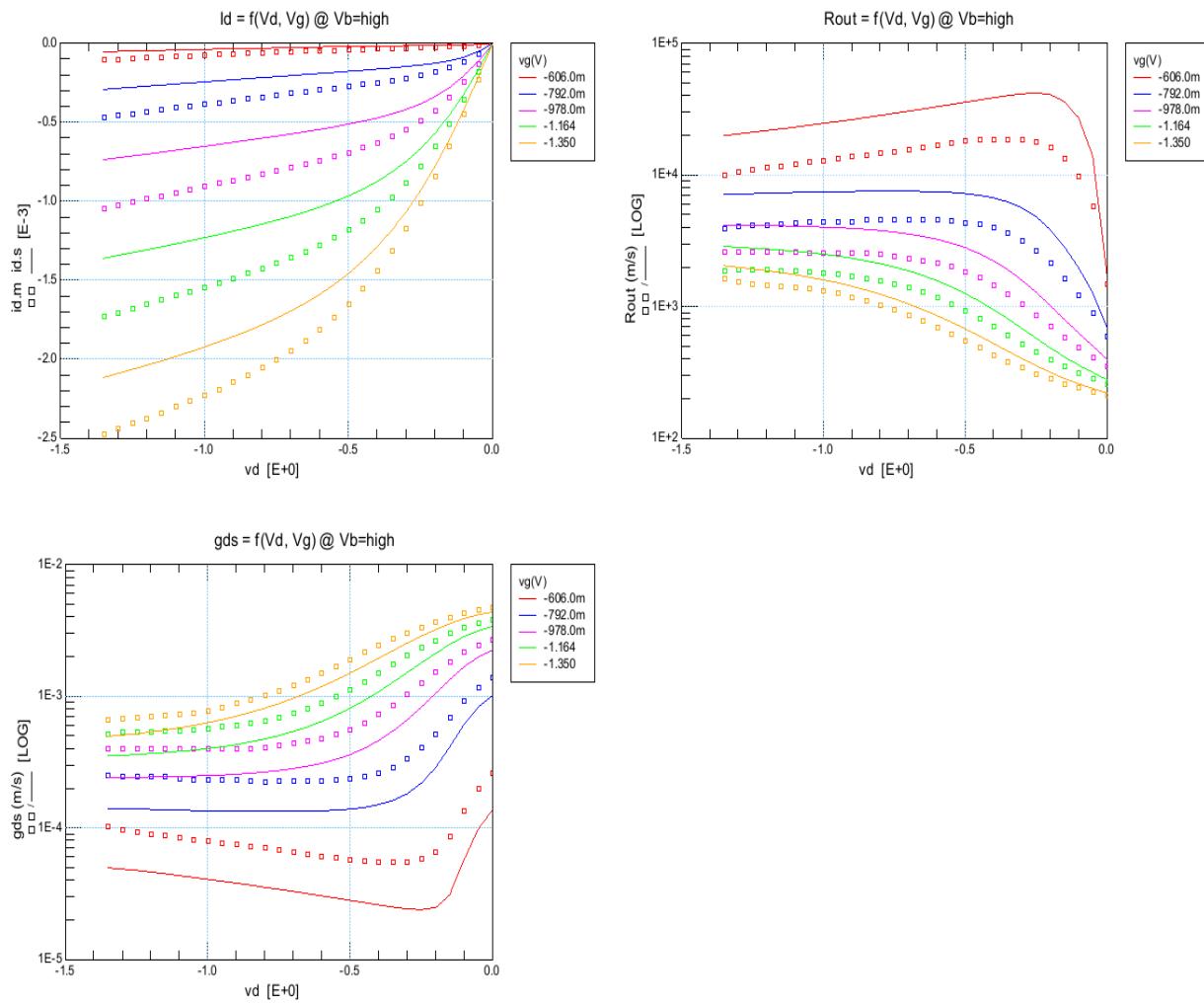
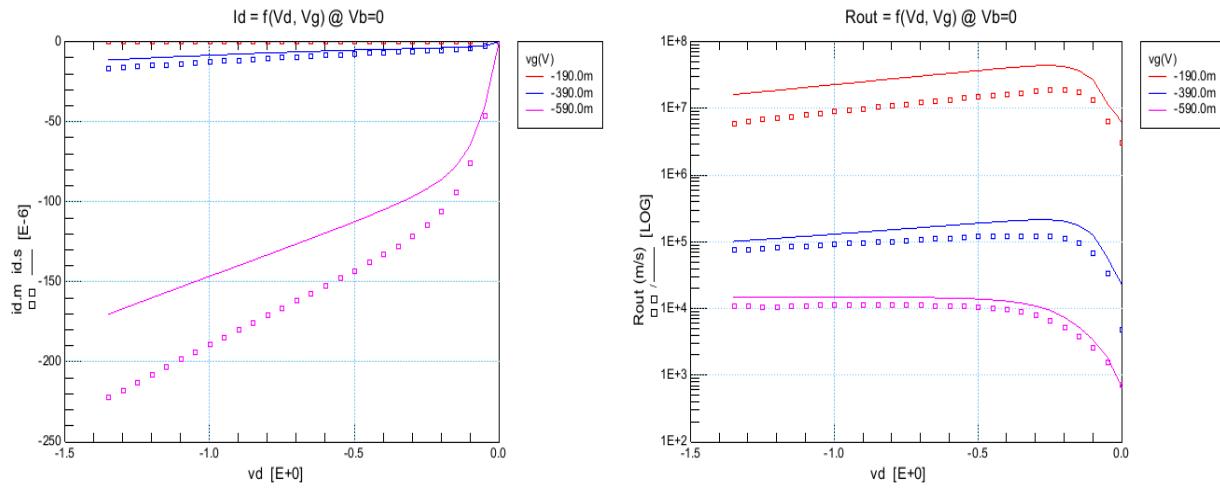


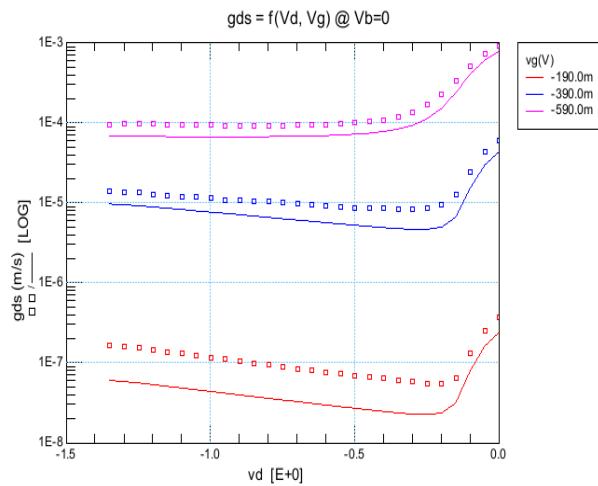


idvg, Ib,Ig, Vb = 0V, T = 27°C

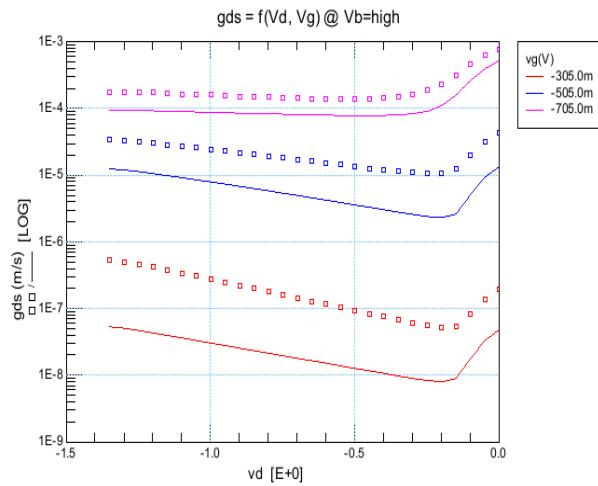
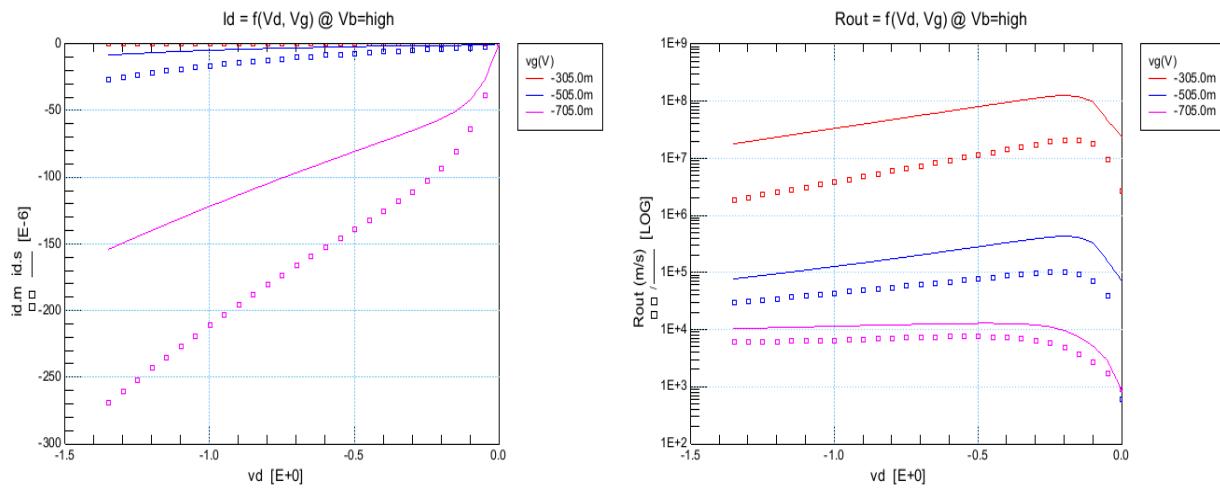


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C**idvd_vth, Vb = 0V, T = 27°C**

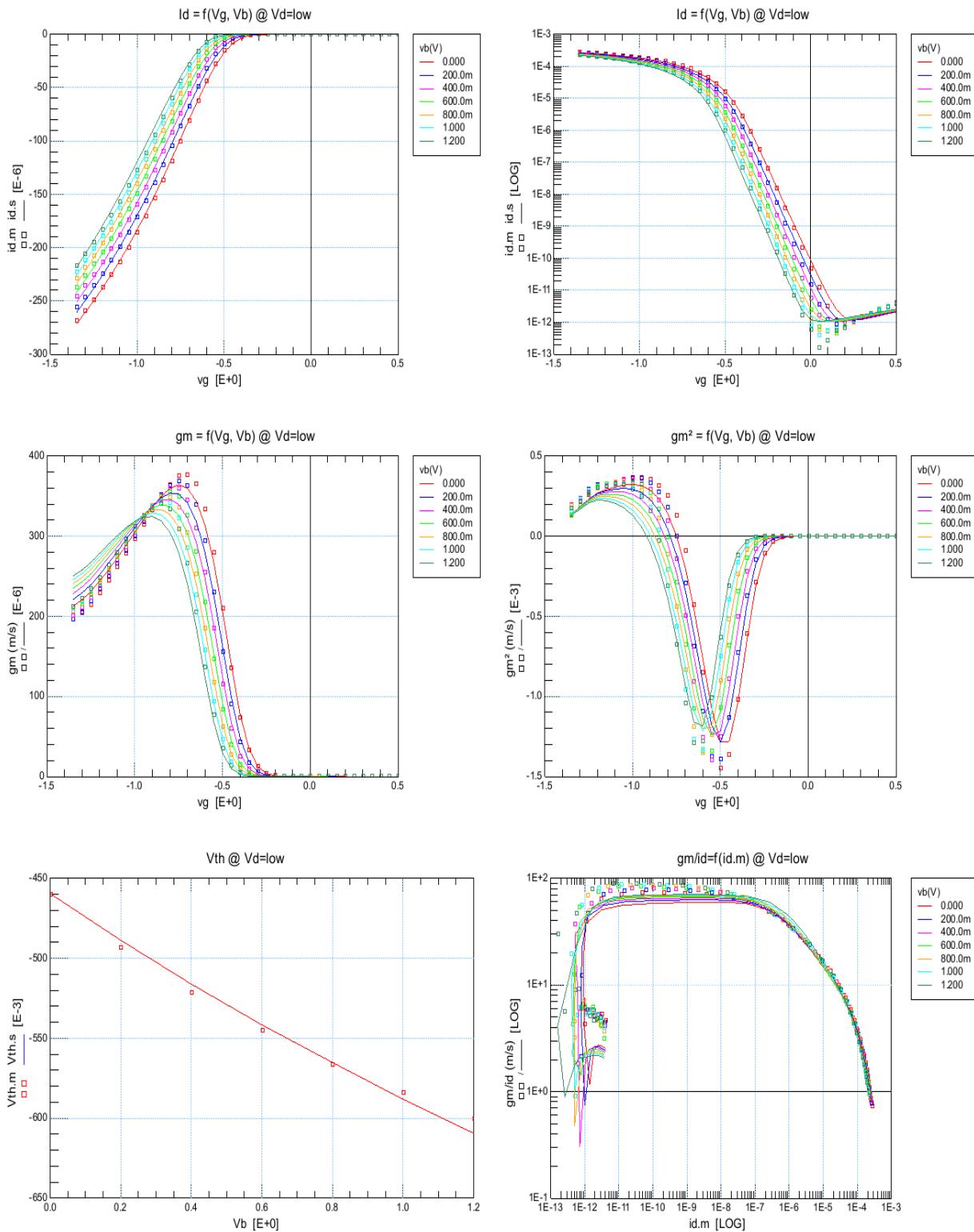


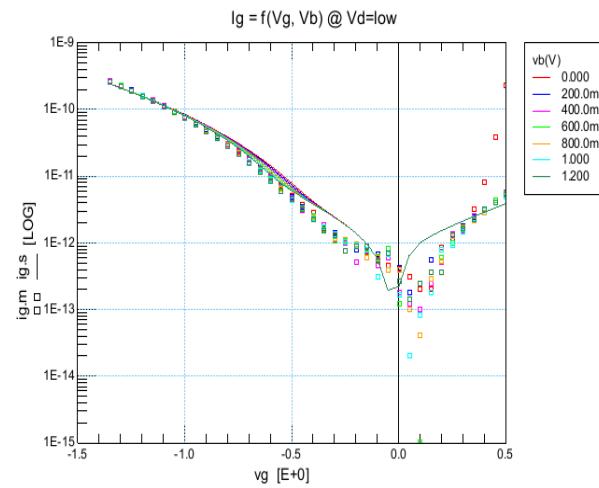
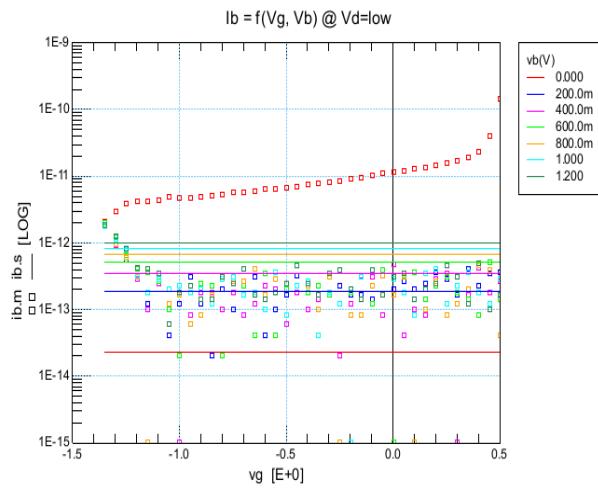
idvd_vth_vbmin, Vb = 1.2V, T = 27°C



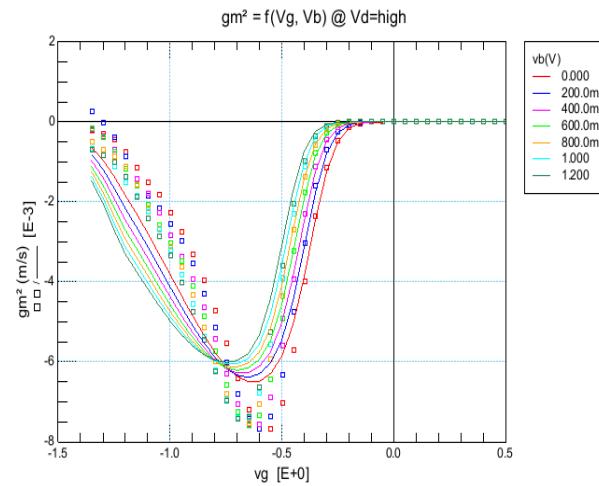
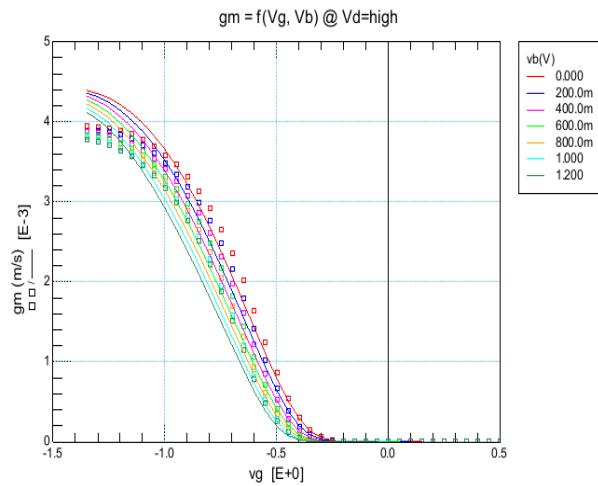
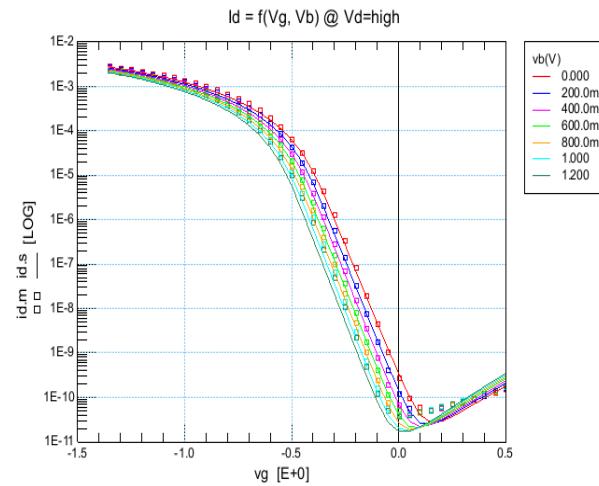
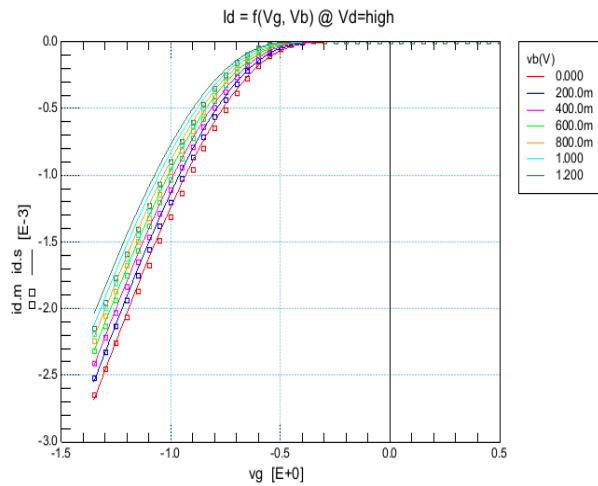
4.41 W10u0_L0u13_T356_S382_2

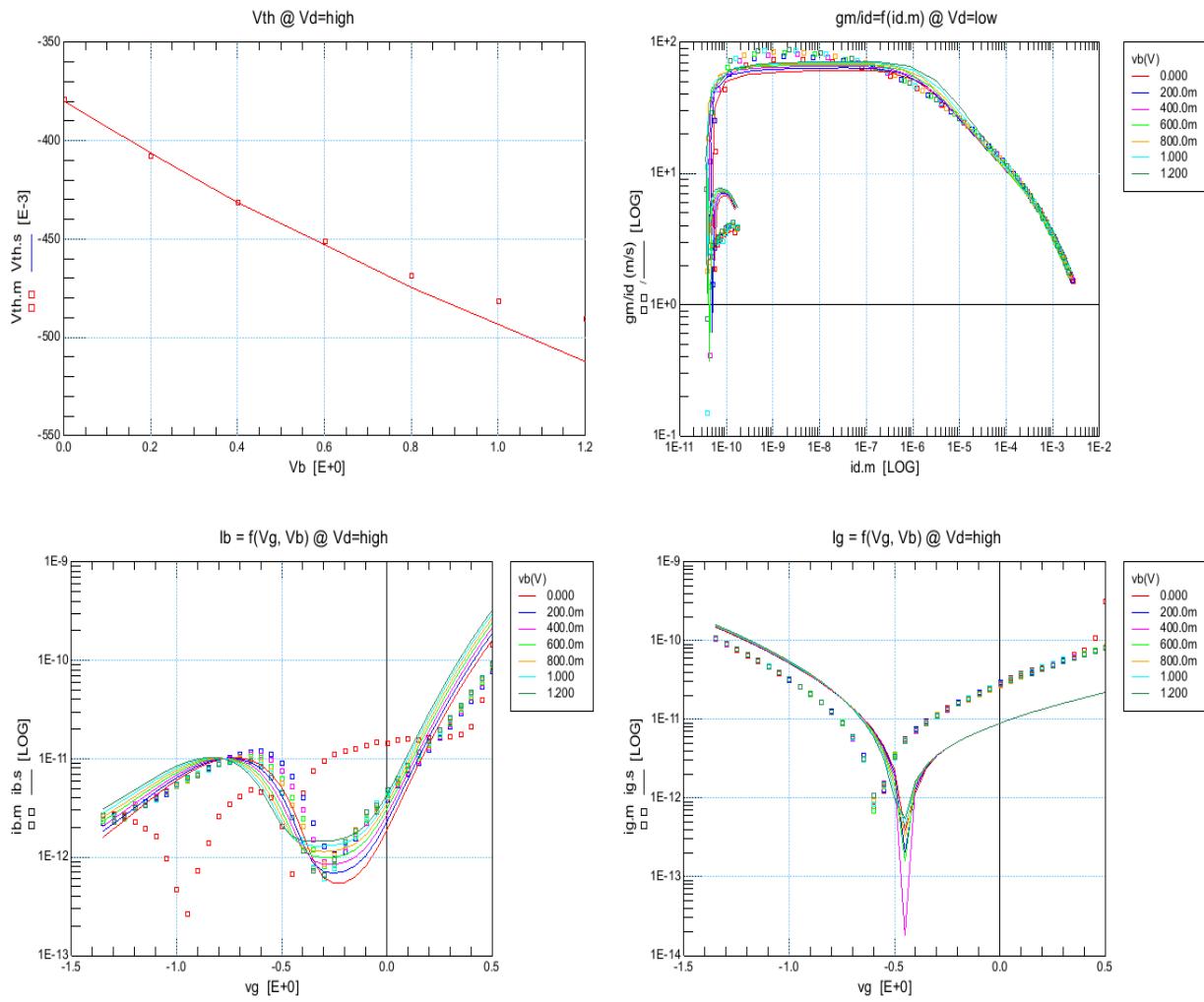
$idv_g, V_d = -0.05V, T = 27^\circ C$



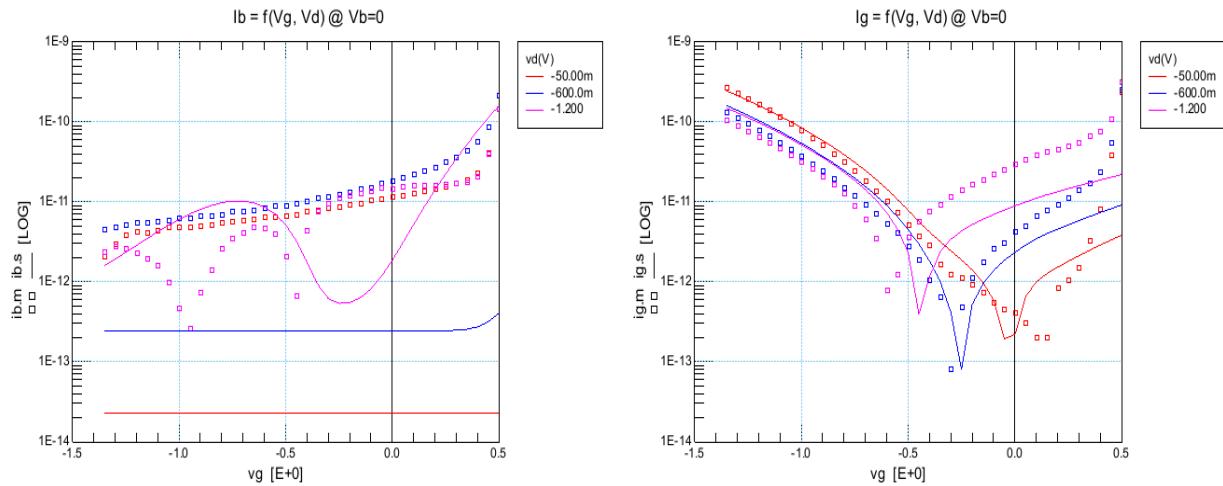


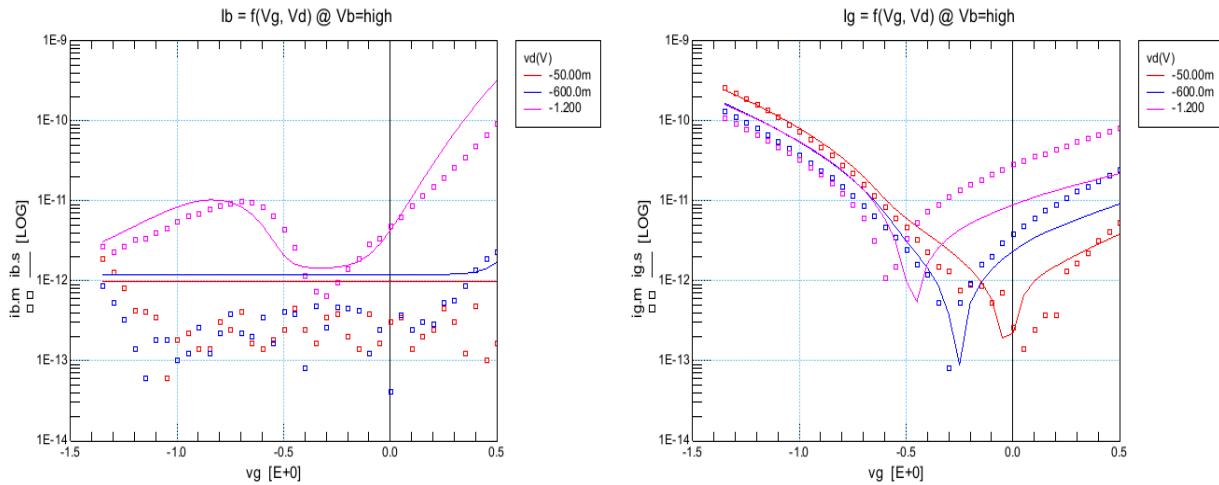
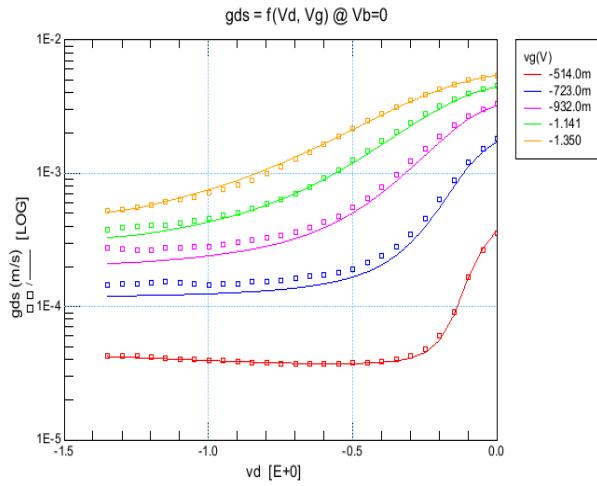
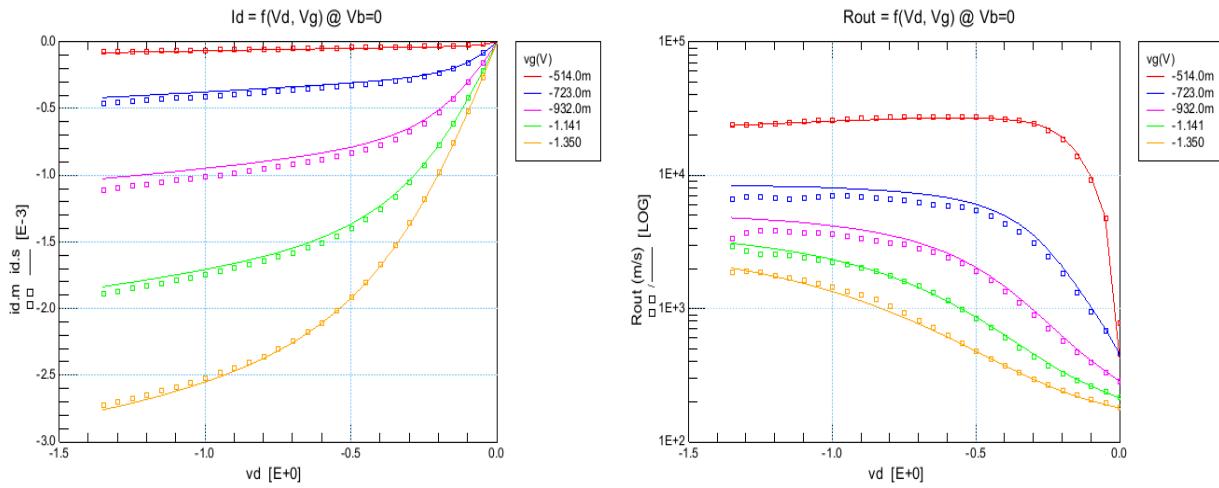
$i_{dvg}, V_d = -1.2V, T = 27^\circ\text{C}$

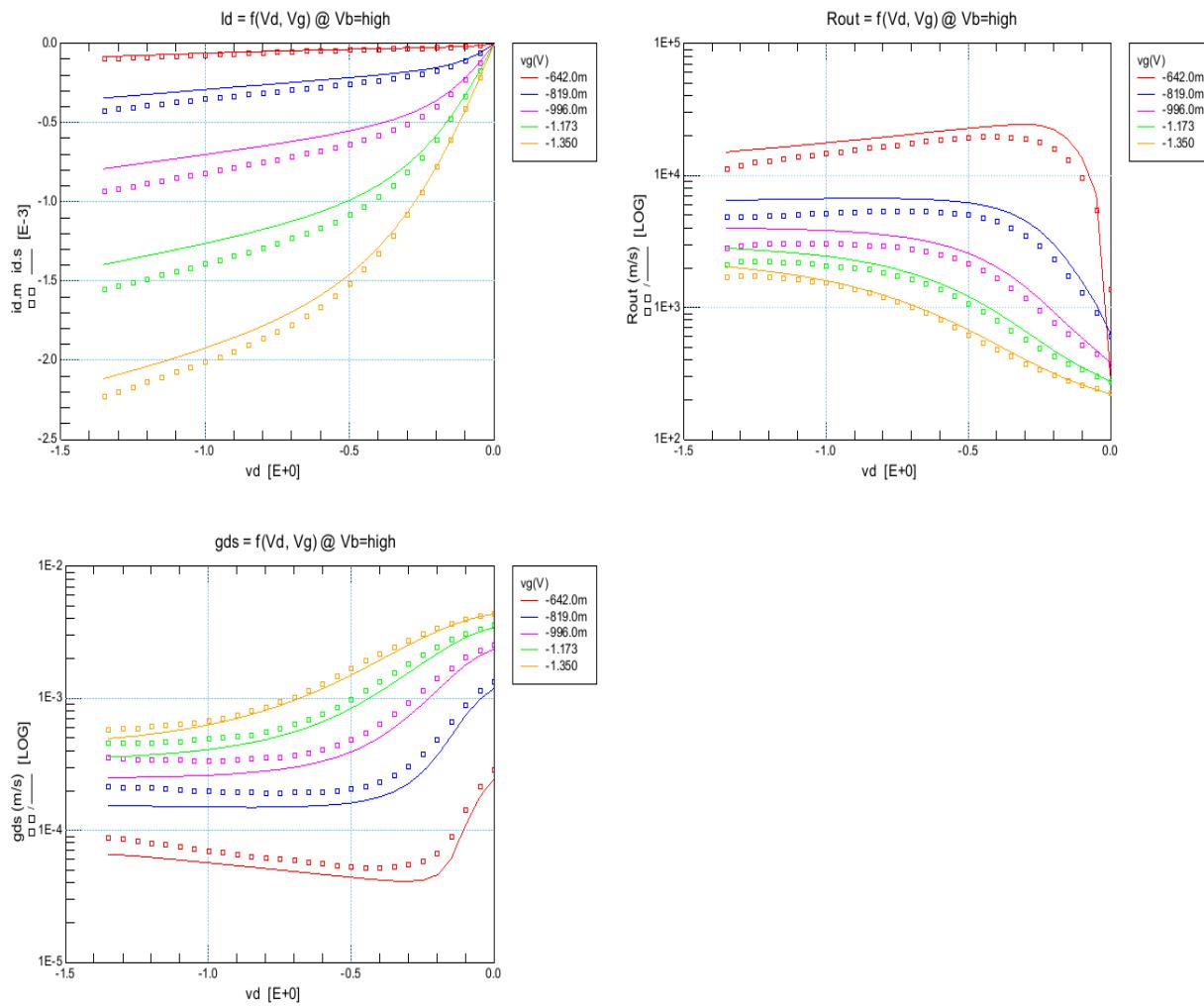
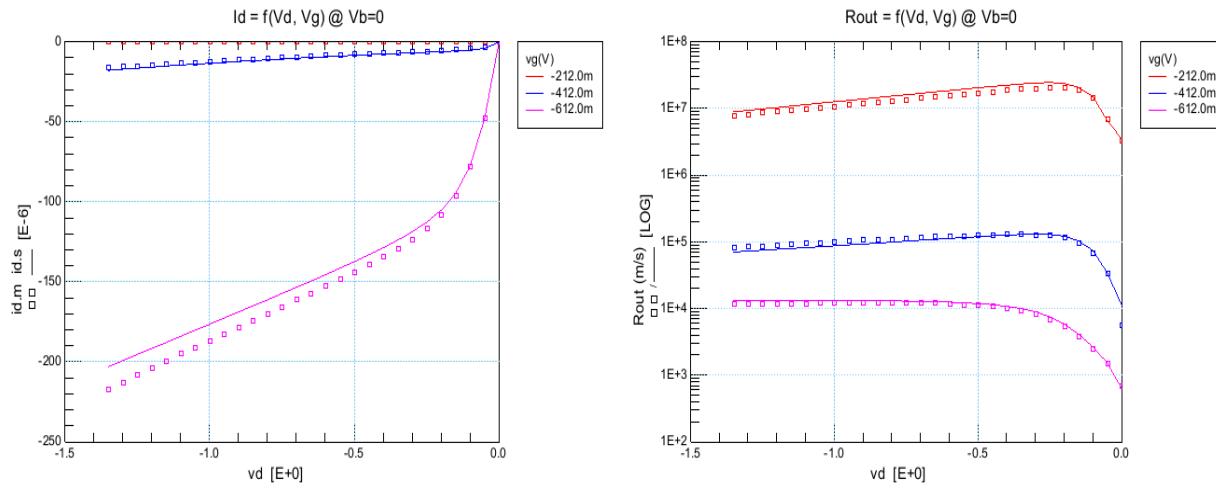


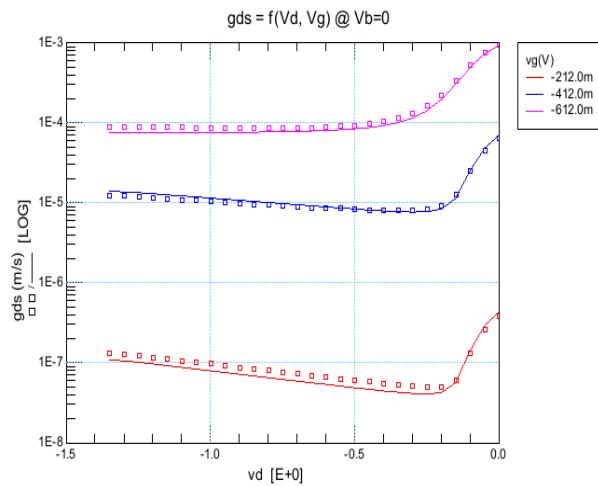


idvg, Id, Ig, Vb = 0V, T = 27°C

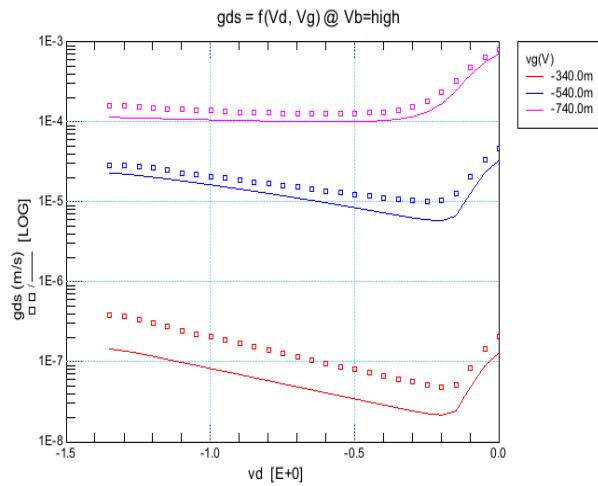
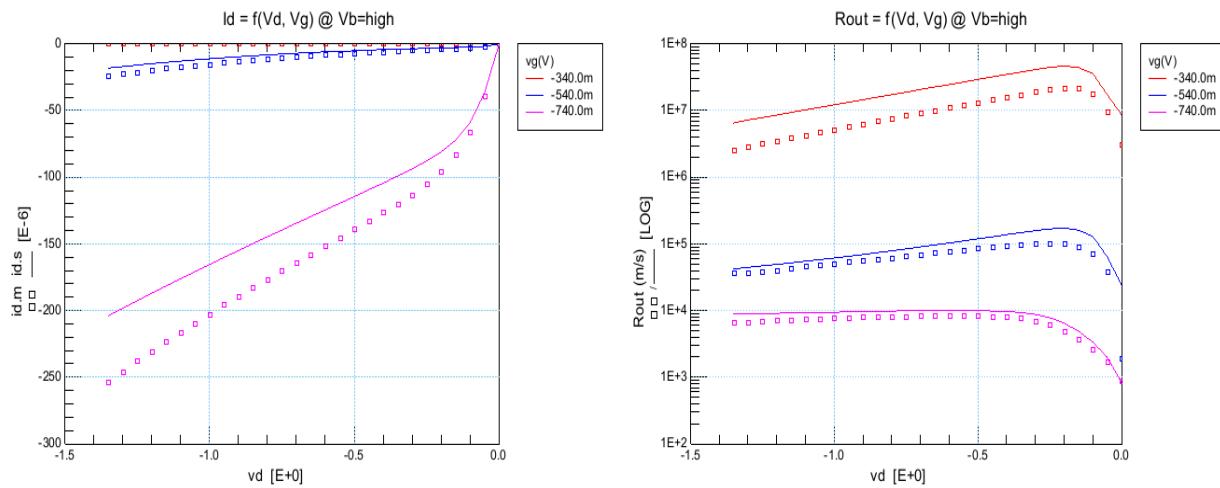


idvg, Ib,Ig, Vb = 1.2V, T = 27°C

idvd, Vb = 0V, T = 27°C


idvd_vbmin, Vb = 1.2V, T = 27°C**idvd_vth, Vb = 0V, T = 27°C**

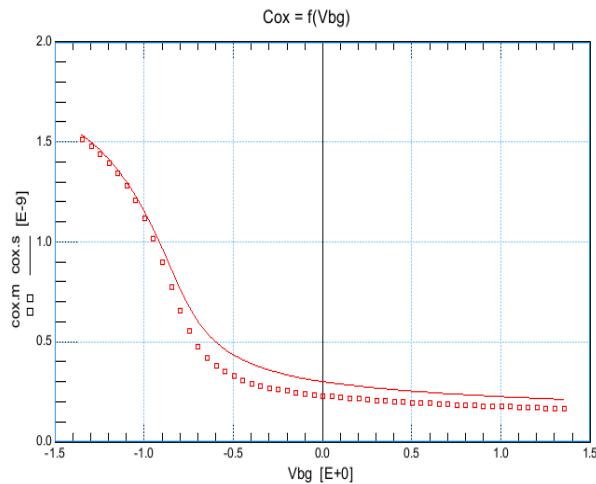


idvd_vth_vbmin, Vb = 1.2V, T = 27°C

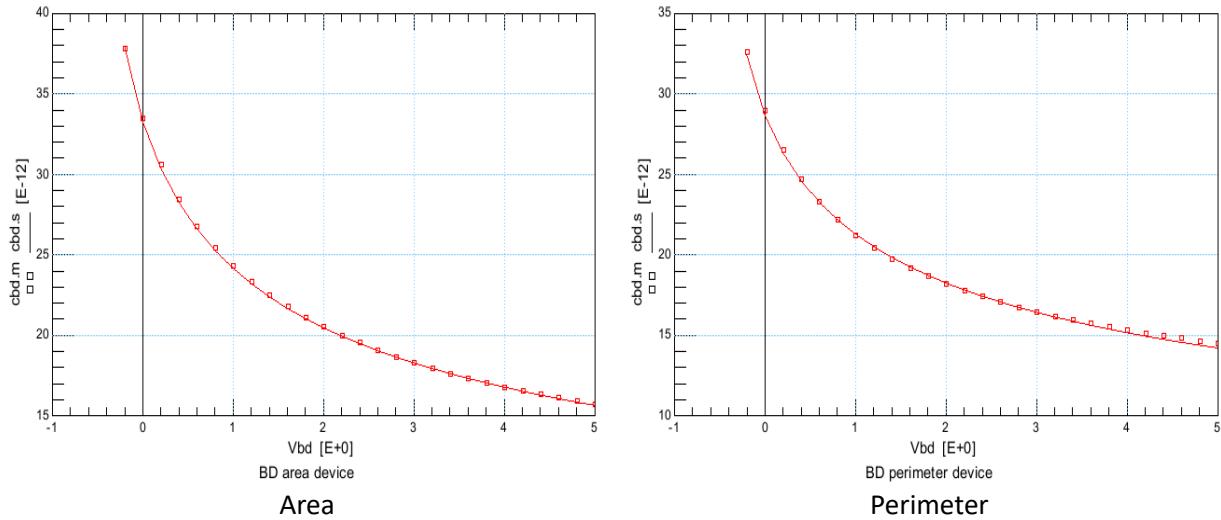


5 Capacitances

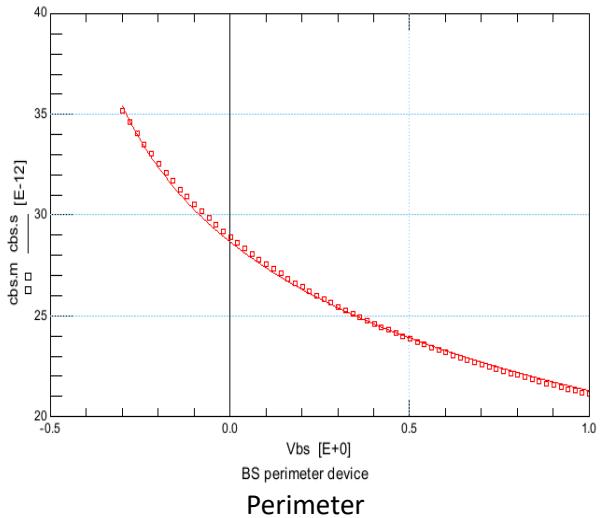
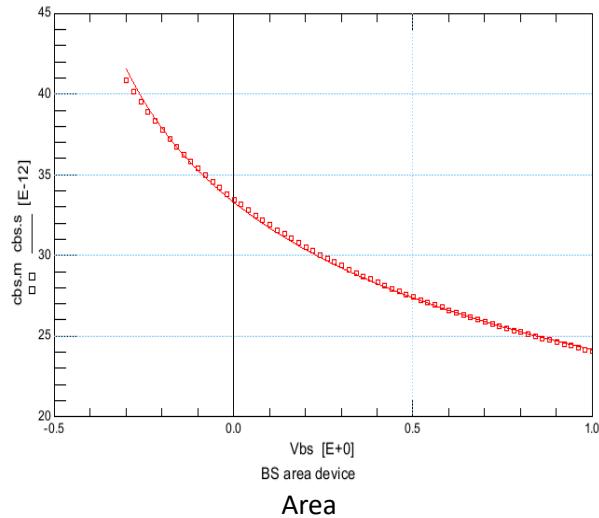
5.1 Gate Oxide Capacitance



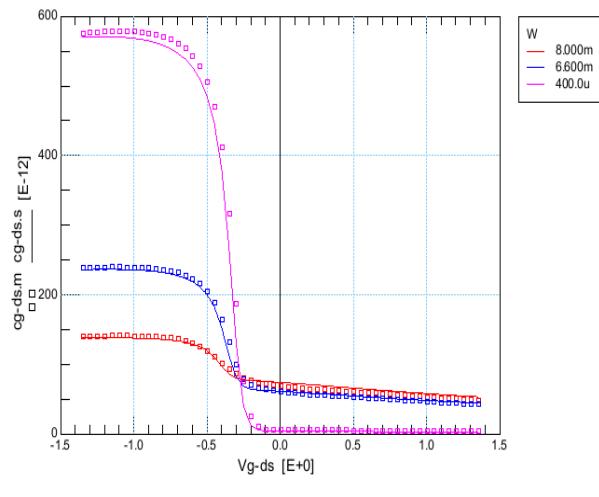
5.2 Junction Capacitance Bulk - Drain



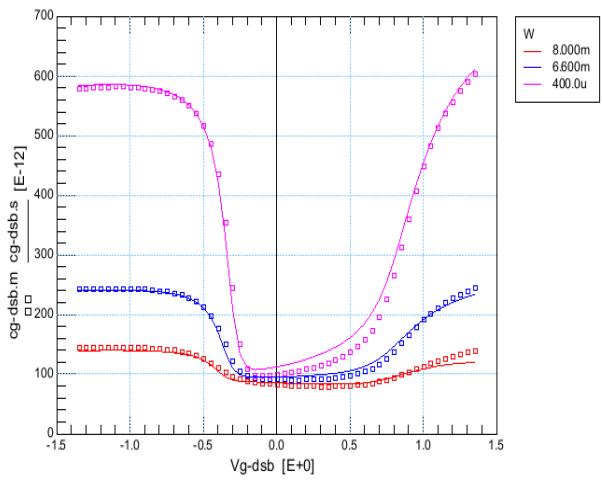
5.3 Junction Capacitance Bulk - Source



5.4 Overlap Capacitance



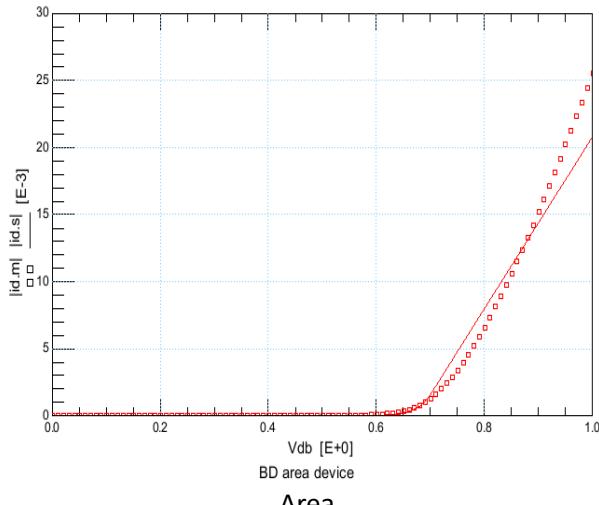
Gate - Drain,Source



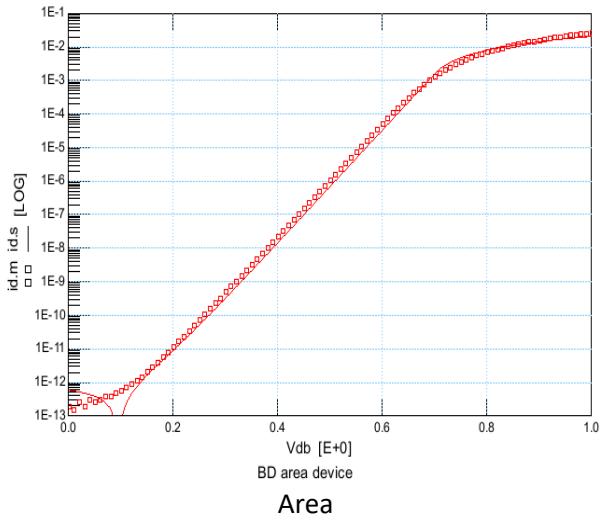
Gate - Drain,Source,Bulk

6 Diodes

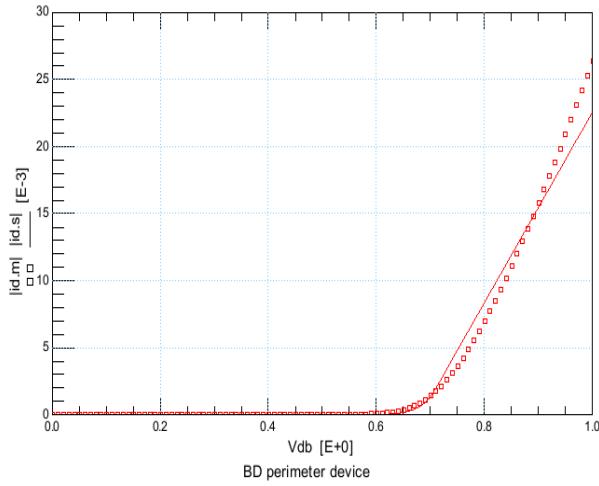
6.1 Diode Bulk - Drain



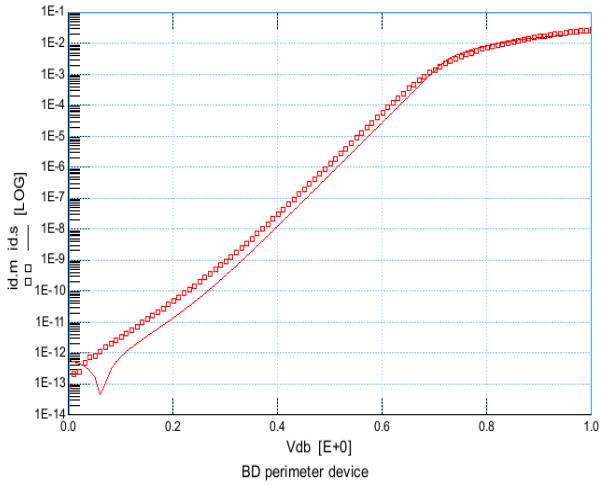
Area



Area

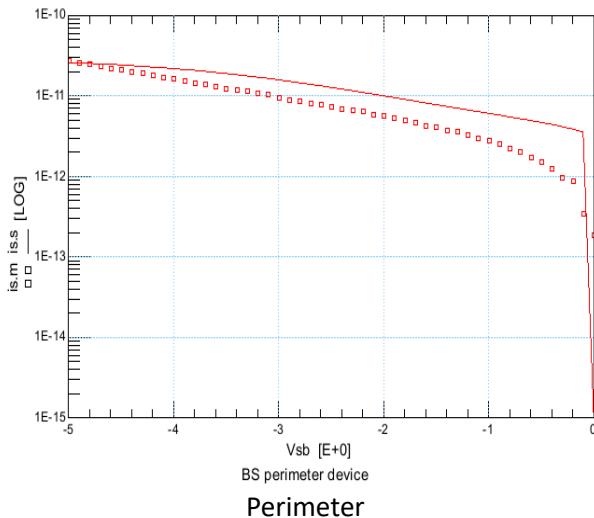
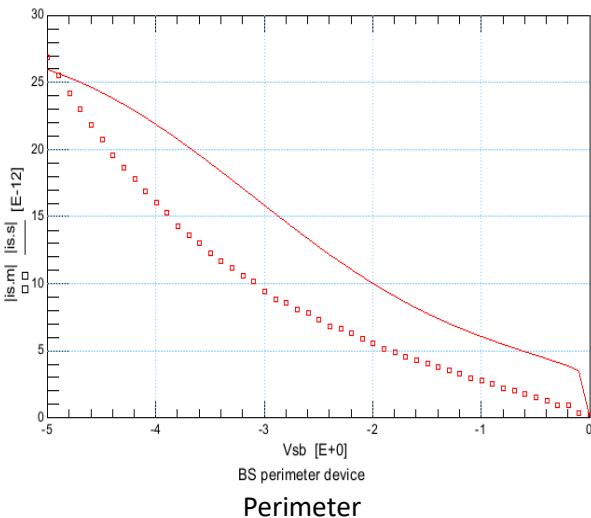
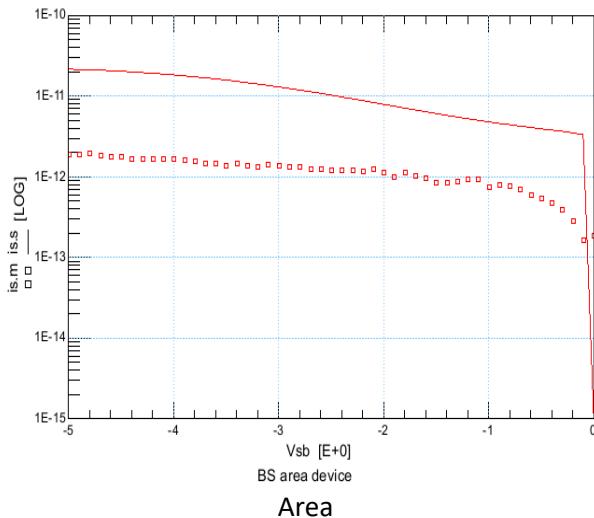
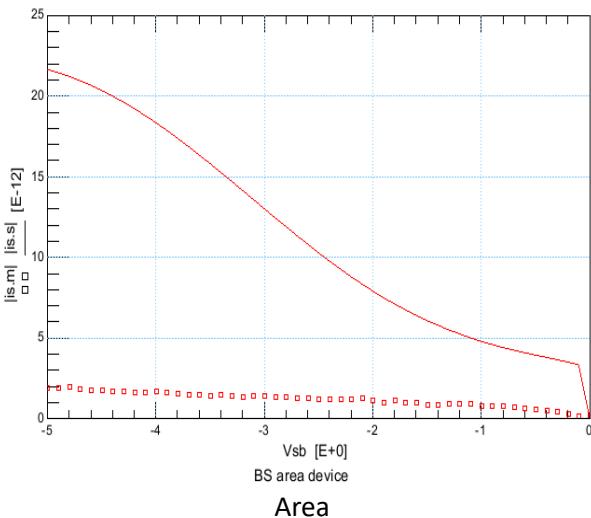


Perimeter



Perimeter

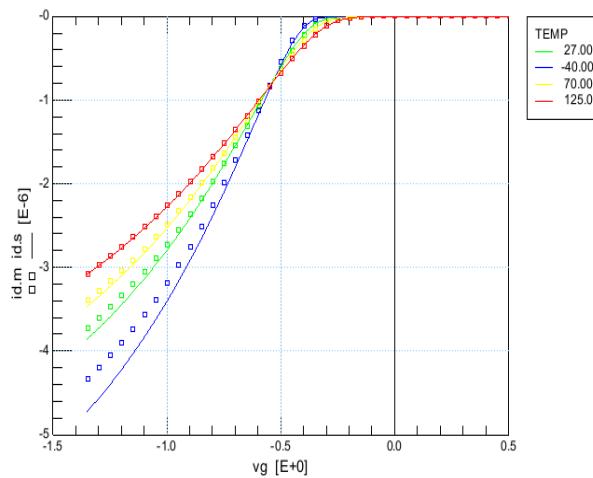
6.2 Diode Bulk - Source



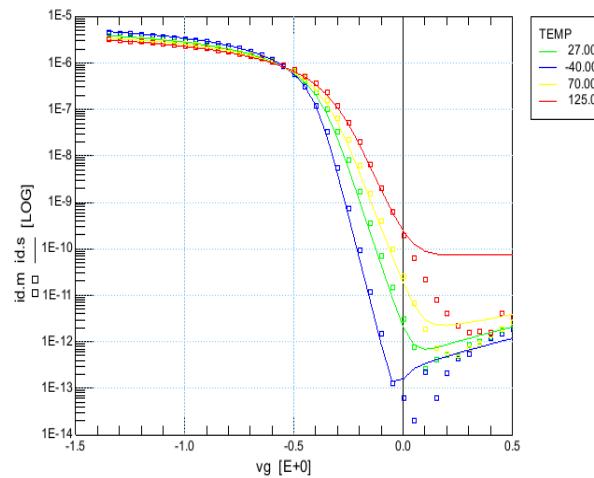
7 Temperature Measurement

7.1 Transistors

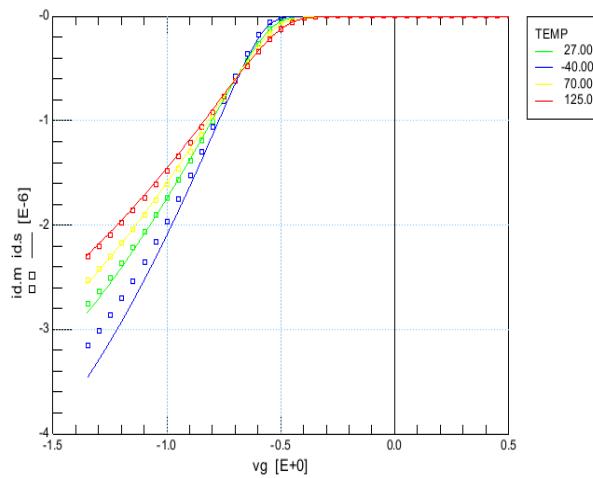
7.1.1 W10u0_L10u0_S549_5



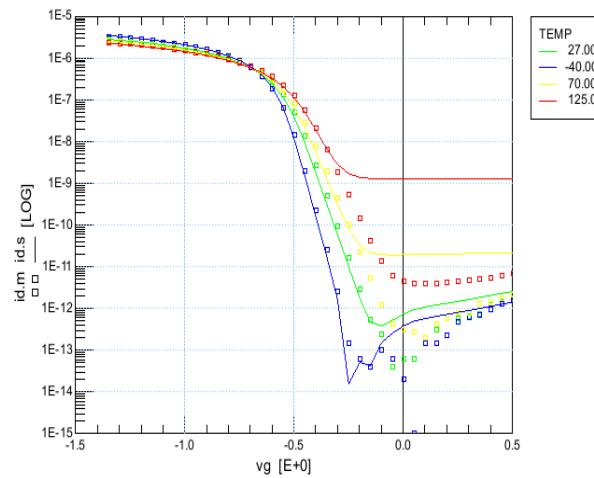
$Id = f(vg, T)$ @ low Vds , $Vbs = 0$



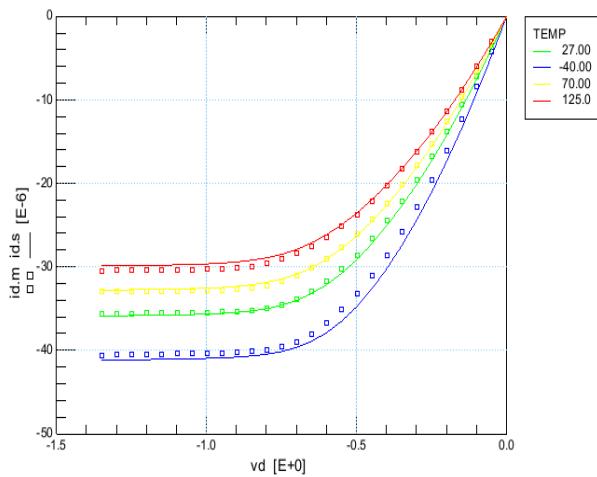
$\log(Id) = f(vg, T)$ @ low Vds , $Vbs = 0$



$Id = f(vg, T)$ @ low Vds , $Vbs = \text{max}$

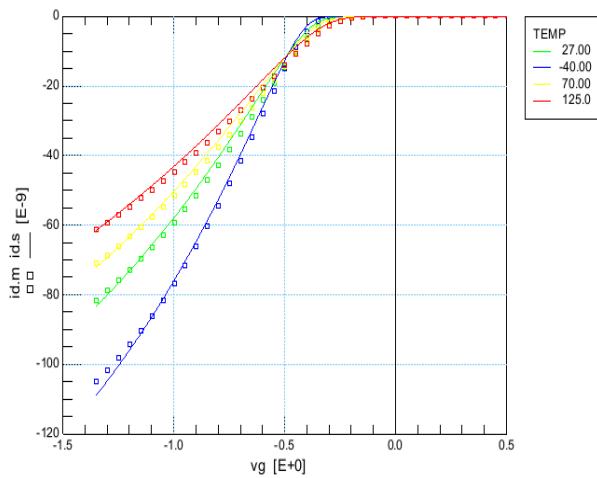


$\log(Id) = f(vg, T)$ @ low Vds , $Vbs = \text{max}$

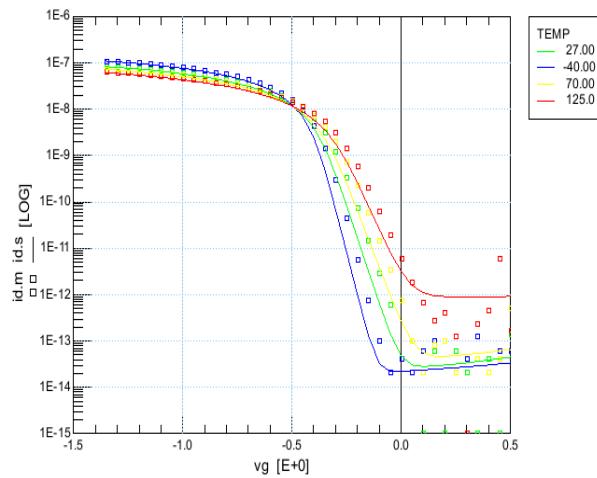


$$Id = f(Vd, Vg, T) @ Vbs = 0$$

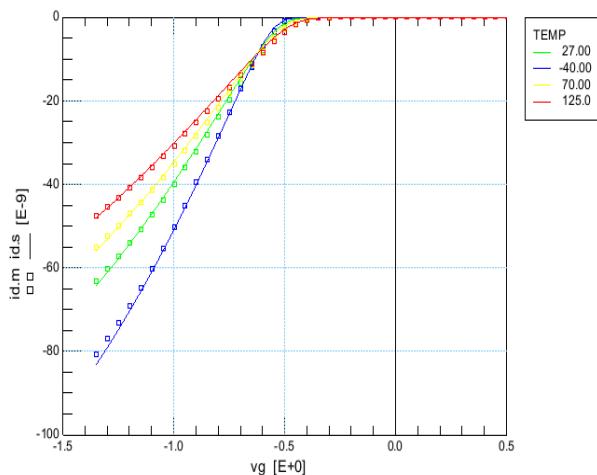
7.1.2 W0u15_L10u0_S555_3



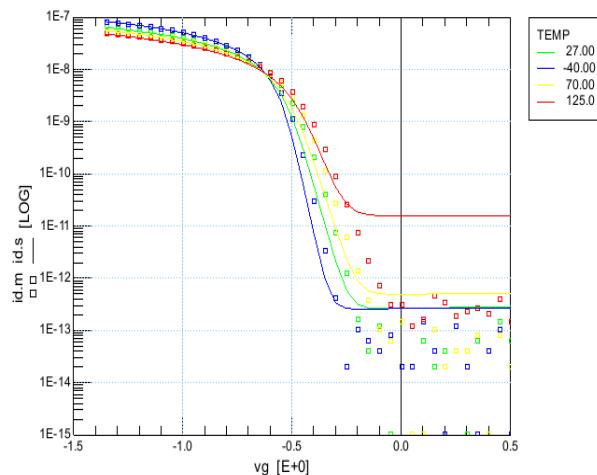
$$Id = f(vg, T) @ \text{low } Vds, Vbs = 0$$



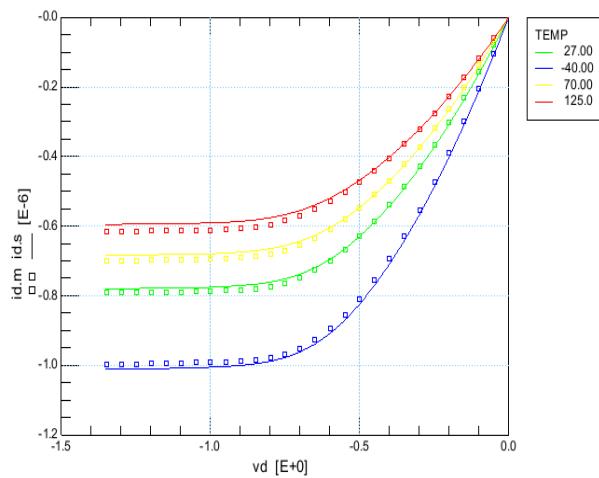
$$\log(Id) = f(vg, T) @ \text{low } Vds, Vbs = 0$$



$$Id = f(vg, T) @ \text{low } Vds, Vbs = \text{max}$$

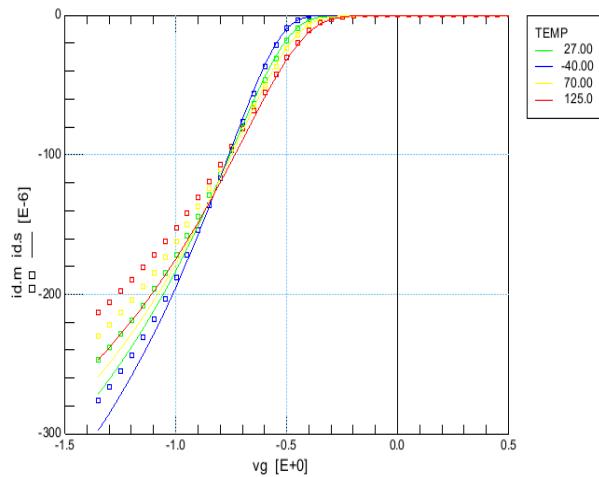


$$\log(Id) = f(vg, T) @ \text{low } Vds, Vbs = \text{max}$$

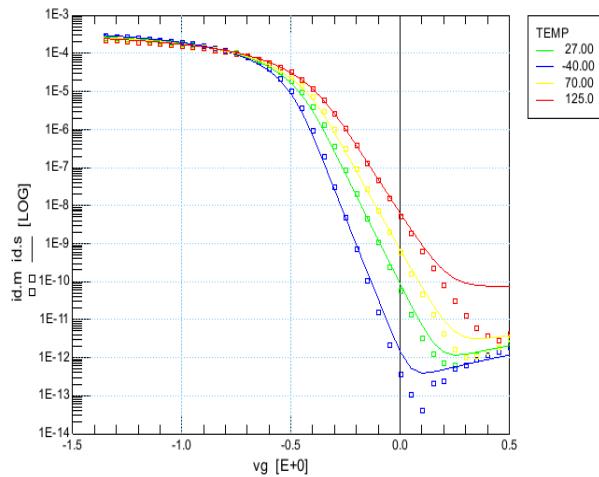


$Id = f(Vd, Vg, T) @ Vbs = 0$

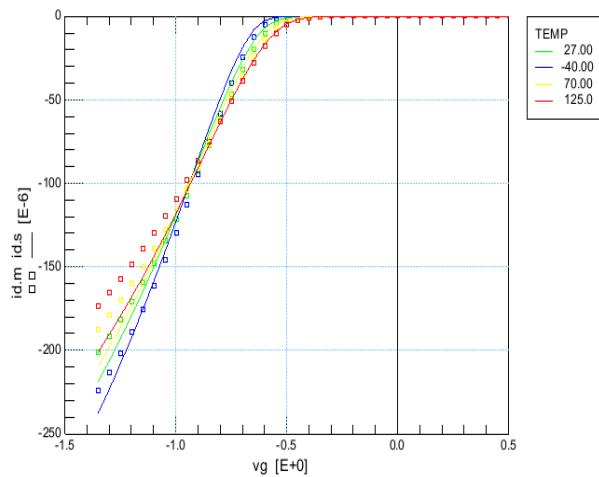
7.1.3 W10u0_L0u13_S548_2



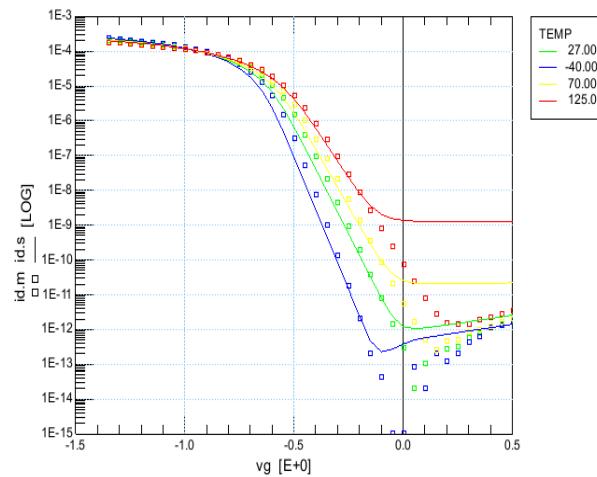
$Id = f(vg, T) @ \text{low } Vds, Vbs = 0$



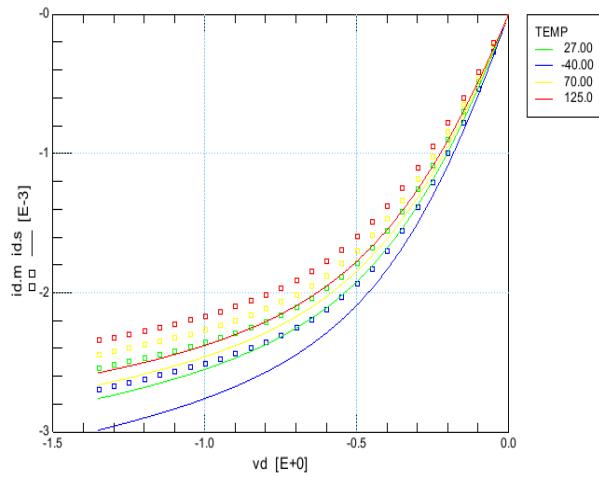
$\log(Id) = f(vg, T) @ \text{low } Vds, Vbs = 0$



$Id = f(vg, T)$ @ low Vds , $Vbs = \text{max}$

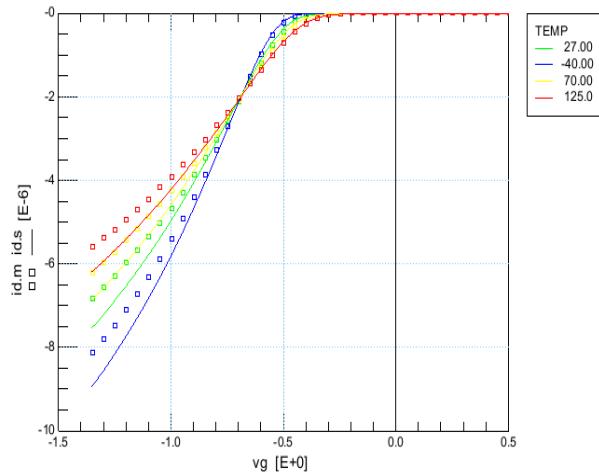


$\log(Id) = f(vg, T)$ @ low Vds , $Vbs = \text{max}$

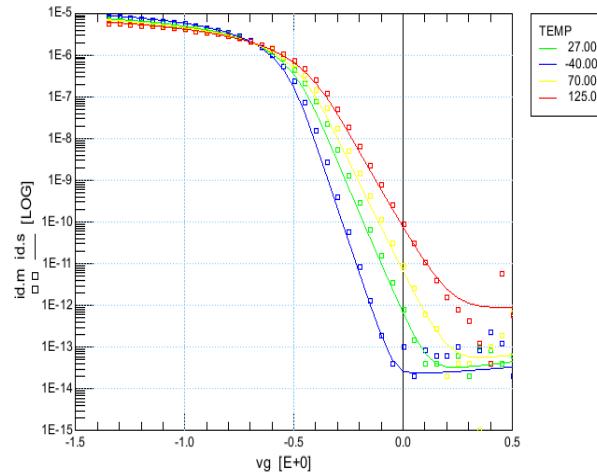


$Id = f(Vd, Vg, T)$ @ $Vbs = 0$

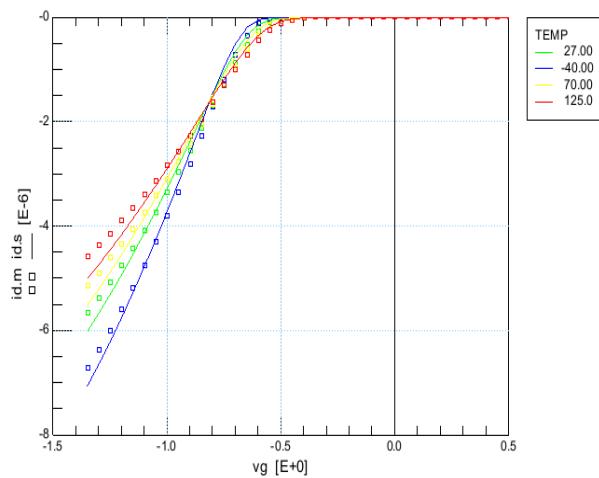
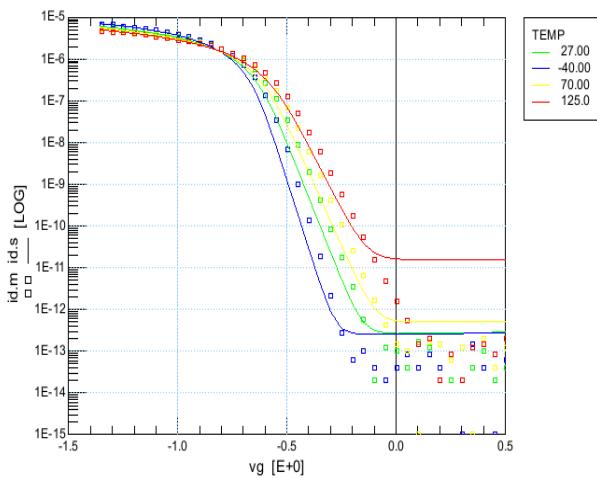
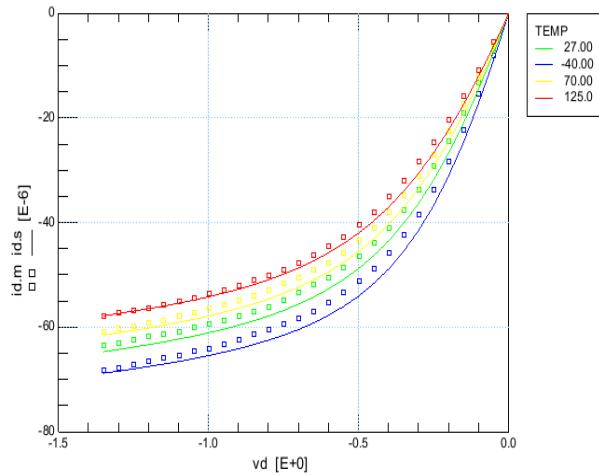
7.1.4 W0u15_L0u13_S554_3



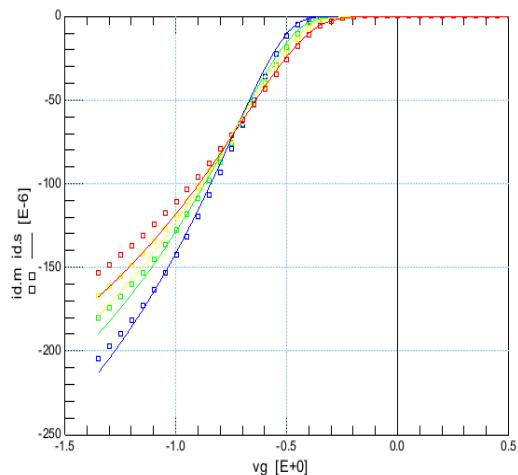
$Id = f(vg, T)$ @ low Vds , $Vbs = 0$



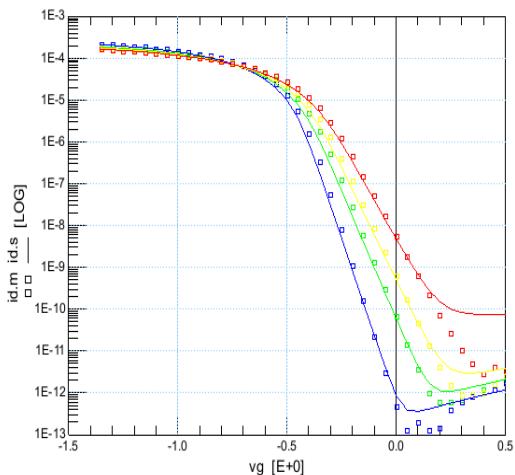
$\log(Id) = f(vg, T)$ @ low Vds , $Vbs = 0$

 $Id = f(V_g, T) @ \text{low } V_{ds}, V_{bs} = \text{max}$  $\log(Id) = f(V_g, T) @ \text{low } V_{ds}, V_{bs} = \text{max}$  $Id = f(V_d, V_g, T) @ V_{bs} = 0$

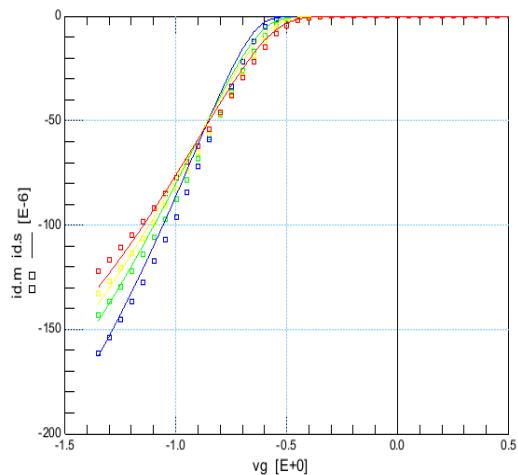
7.1.5 W10u0_L0u18_S548_5



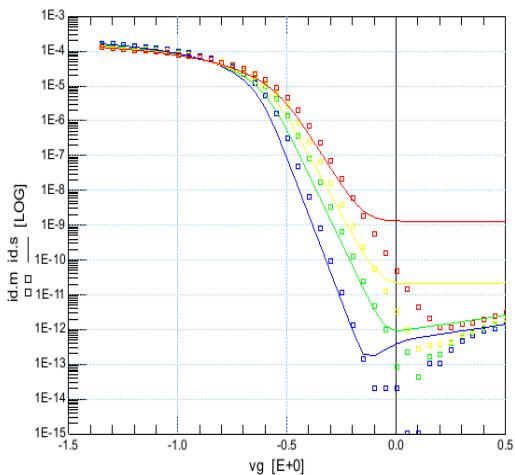
$Id = f(vg, T) @ \text{low } V_{ds}, V_{bs} = 0$



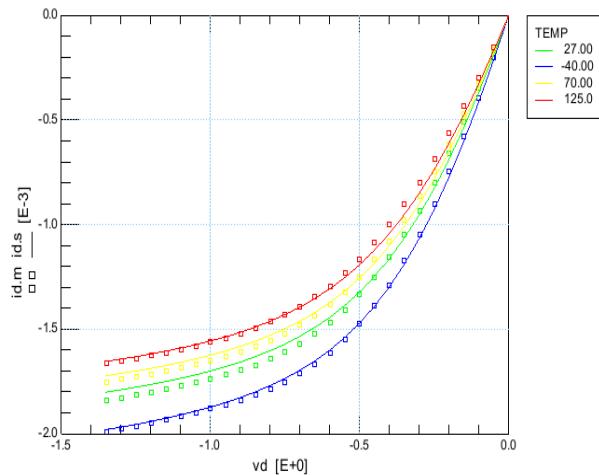
$\log(Id) = f(vg, T) @ \text{low } V_{ds}, V_{bs} = 0$



$Id = f(vg, T) @ \text{low } V_{ds}, V_{bs} = \text{max}$

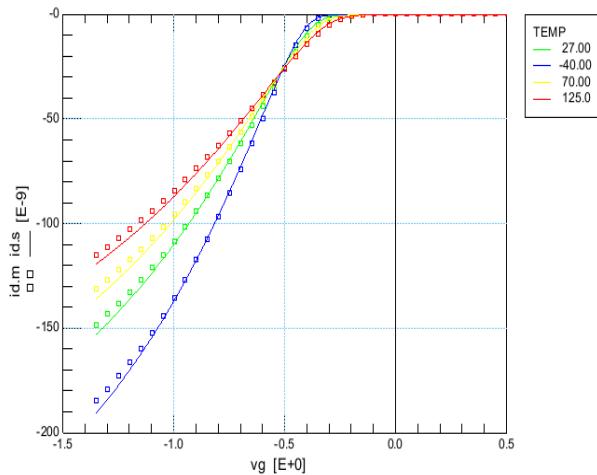


$\log(Id) = f(vg, T) @ \text{low } V_{ds}, V_{bs} = \text{max}$

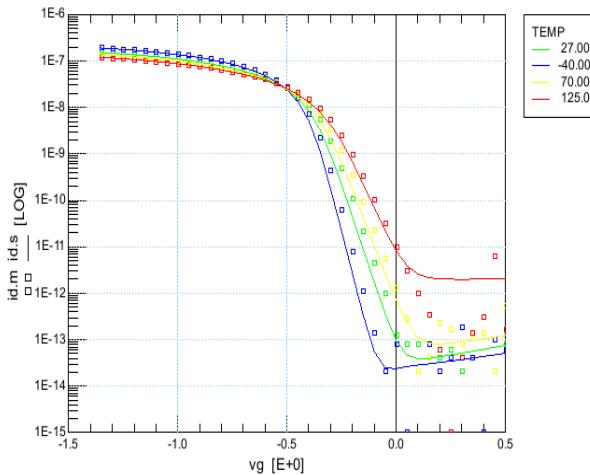


$Id = f(Vd, Vg, T) @ V_{bs} = 0$

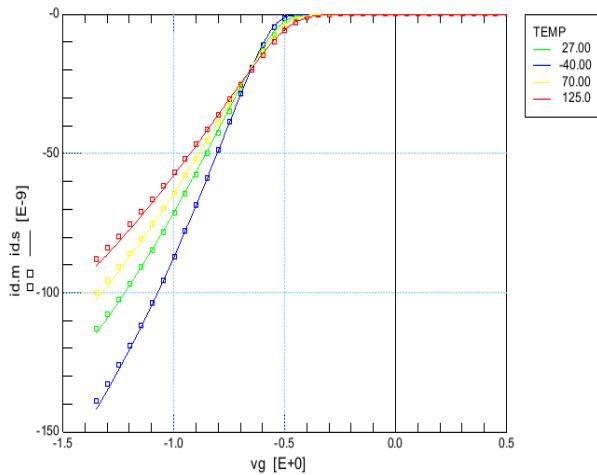
7.1.6 W0u3_L10u0_S553_2



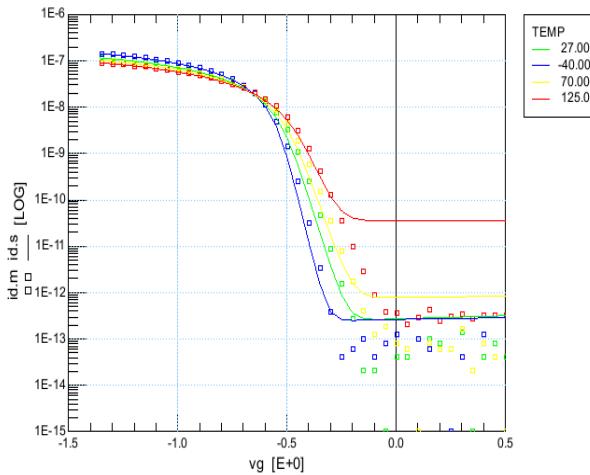
$Id = f(vg, T) @ \text{low } V_{ds}, V_{bs} = 0$



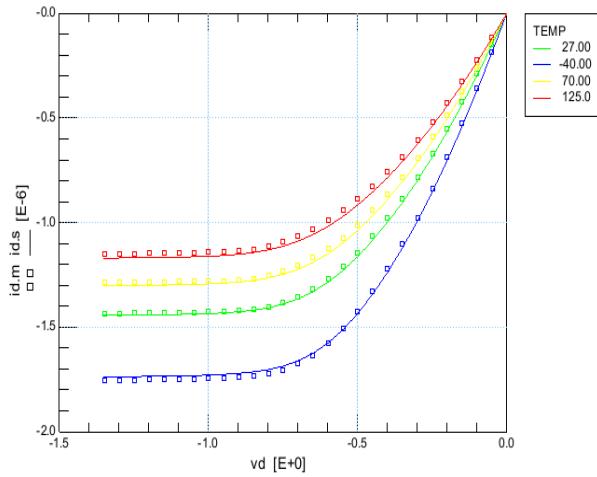
$\log(Id) = f(vg, T) @ \text{low } V_{ds}, V_{bs} = 0$



$Id = f(vg, T) @ \text{low } V_{ds}, V_{bs} = \text{max}$

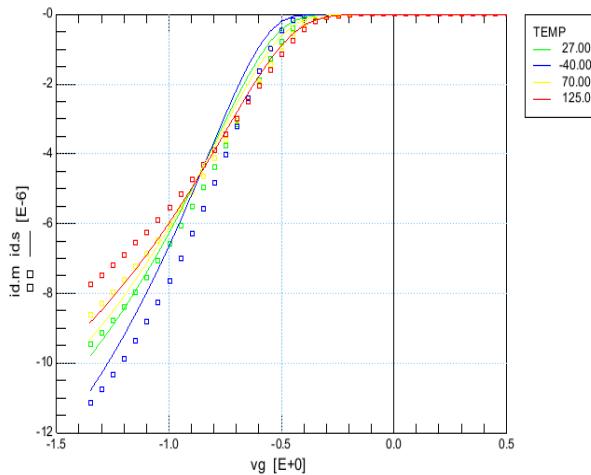
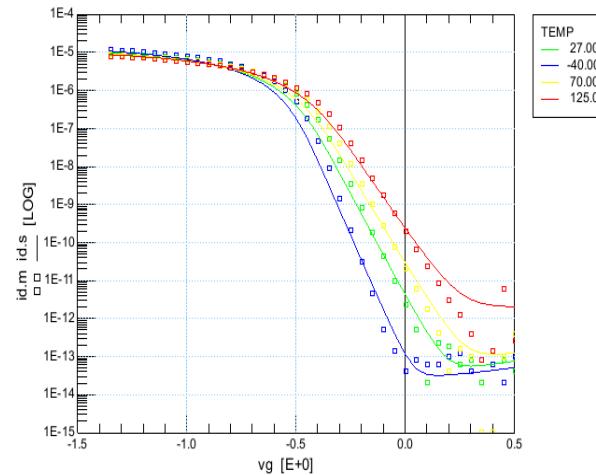
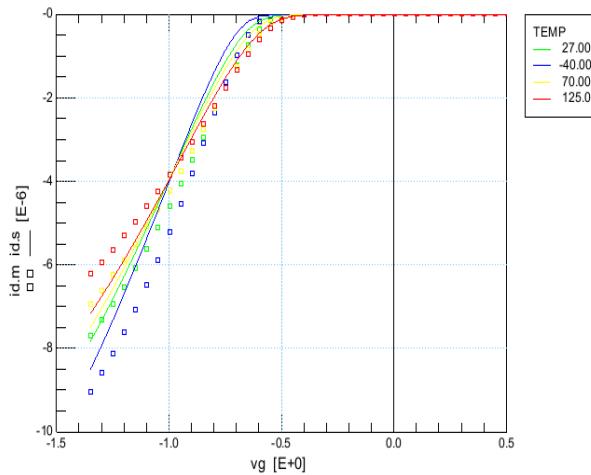
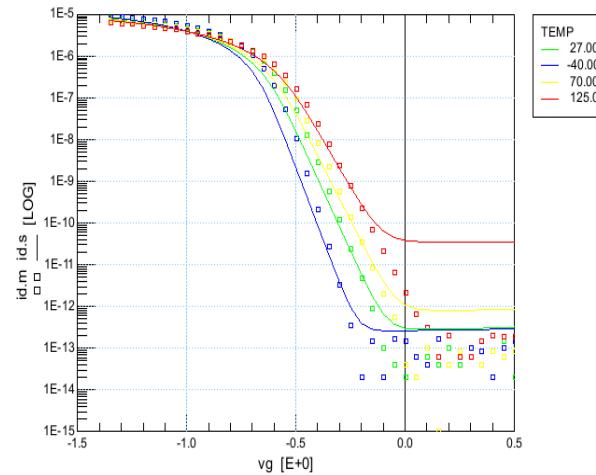
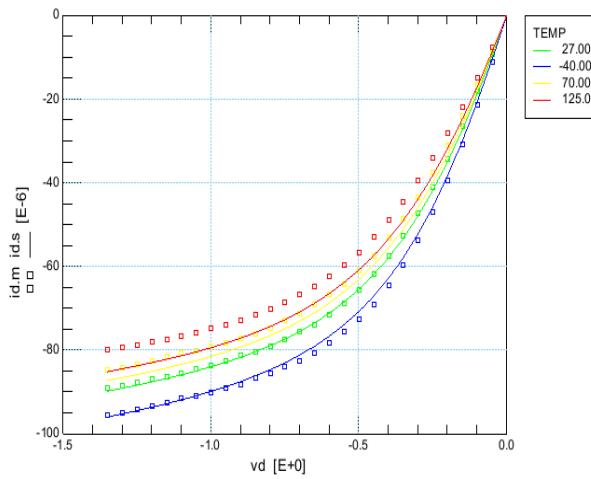


$\log(Id) = f(vg, T) @ \text{low } V_{ds}, V_{bs} = \text{max}$

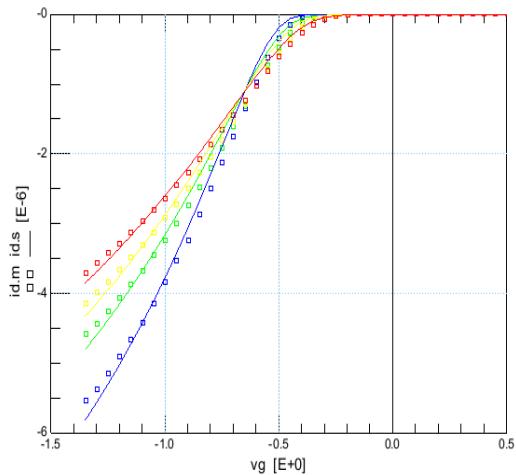


$Id = f(Vd, Vg, T) @ V_{bs} = 0$

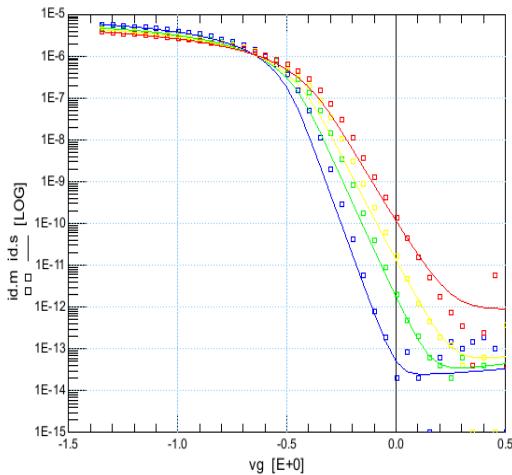
7.1.7 W0u3_L0u13_S552_2

 $Id = f(vg, T) @ \text{low } Vds, Vbs = 0$  $\log(Id) = f(vg, T) @ \text{low } Vds, Vbs = 0$  $Id = f(vg, T) @ \text{low } Vds, Vbs = \text{max}$  $\log(Id) = f(vg, T) @ \text{low } Vds, Vbs = \text{max}$  $Id = f(Vd, Vg, T) @ Vbs = 0$

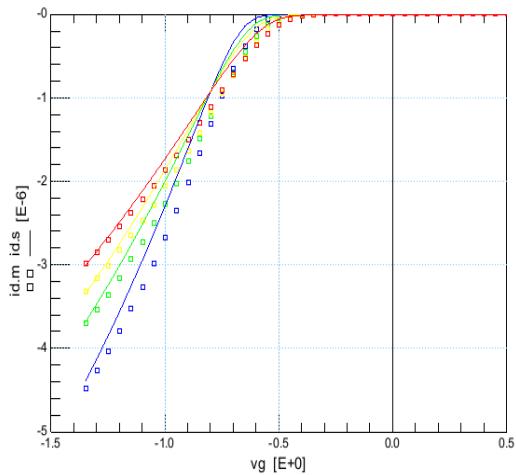
7.1.8 W0u15_L0u18_S555_1



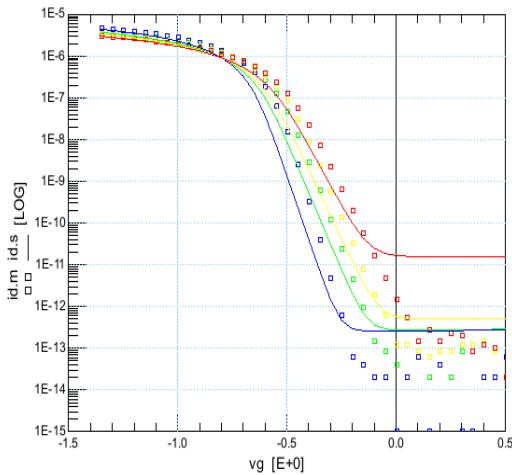
$Id = f(vg, T) @ \text{low } V_{ds}, V_{bs} = 0$



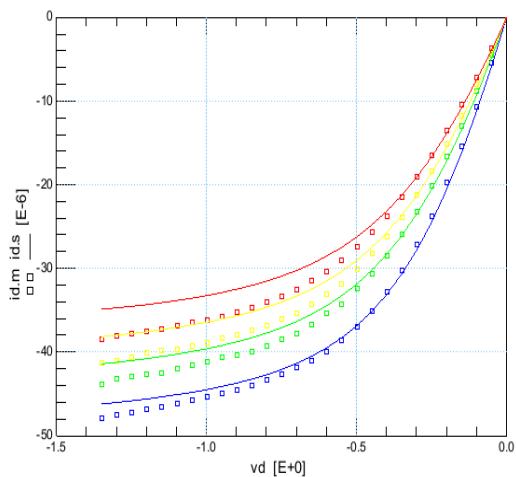
$\log(Id) = f(vg, T) @ \text{low } V_{ds}, V_{bs} = 0$



$Id = f(vg, T) @ \text{low } V_{ds}, V_{bs} = \text{max}$



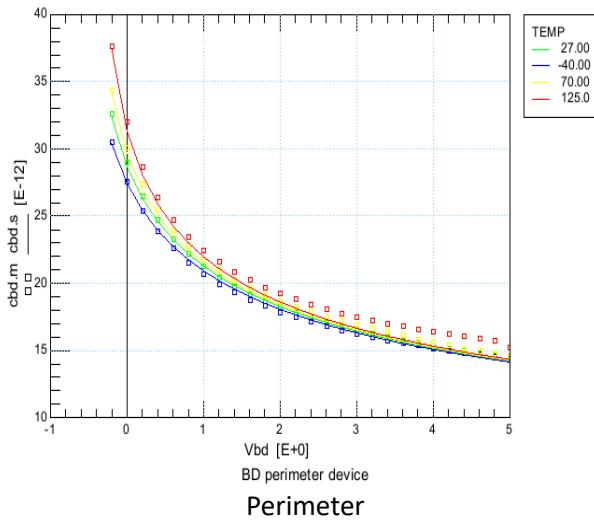
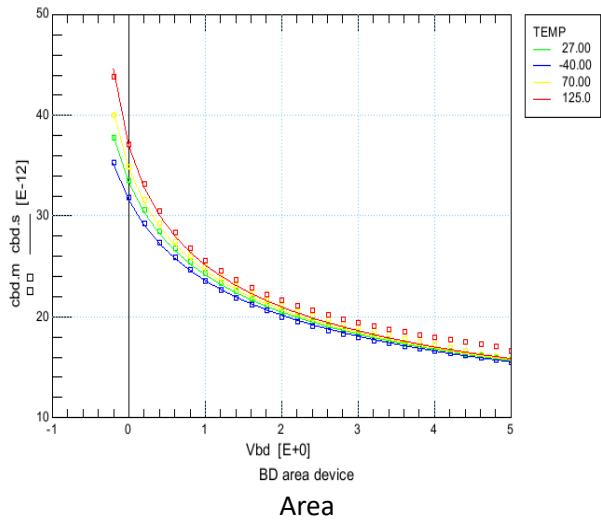
$\log(Id) = f(vg, T) @ \text{low } V_{ds}, V_{bs} = \text{max}$



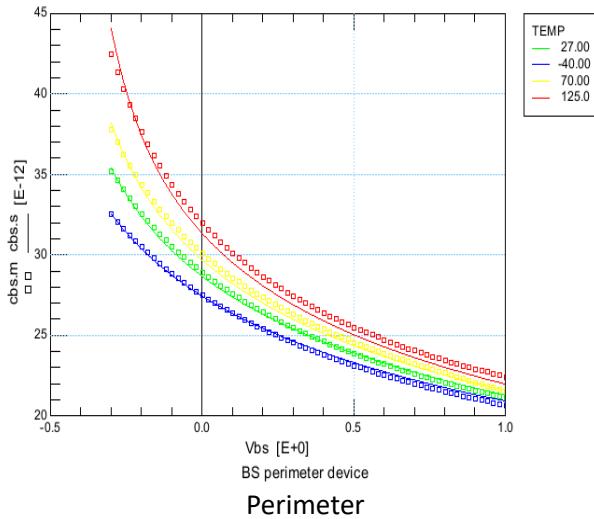
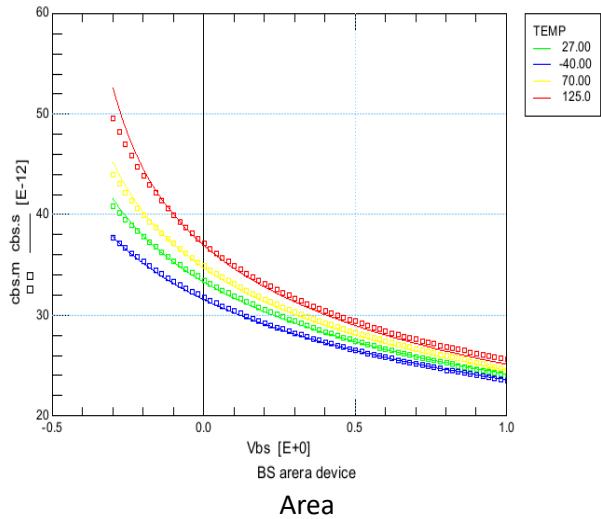
$Id = f(Vd, Vg, T) @ V_{bs} = 0$

7.2 Junction Capacitance

7.2.1 Bulk - Drain

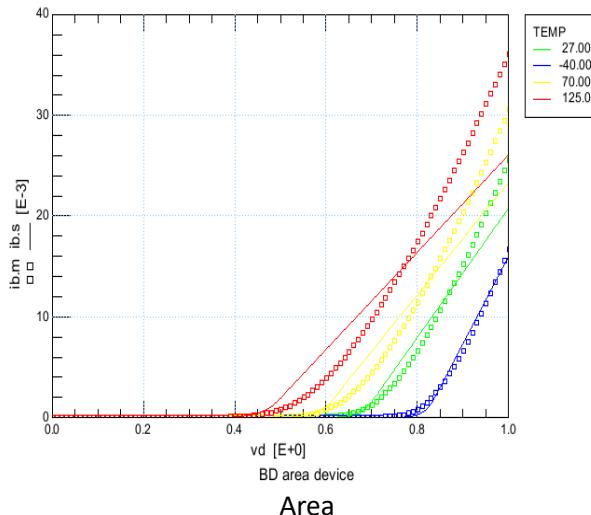


7.2.2 Bulk - Source

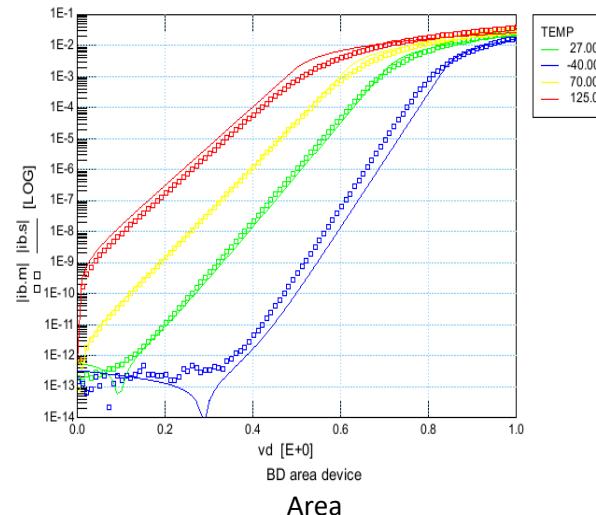


7.3 Parasitic Diodes

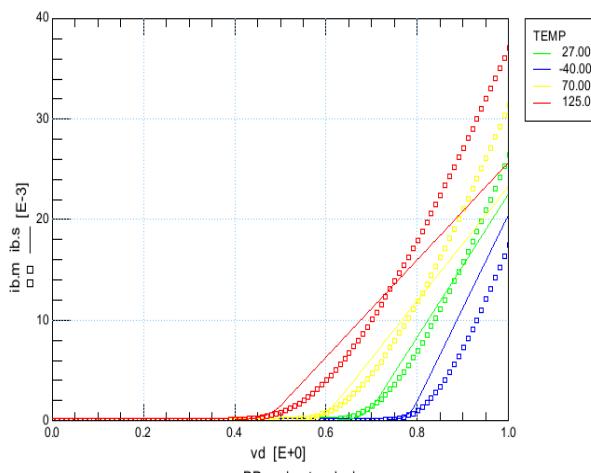
7.3.1 Bulk - Drain



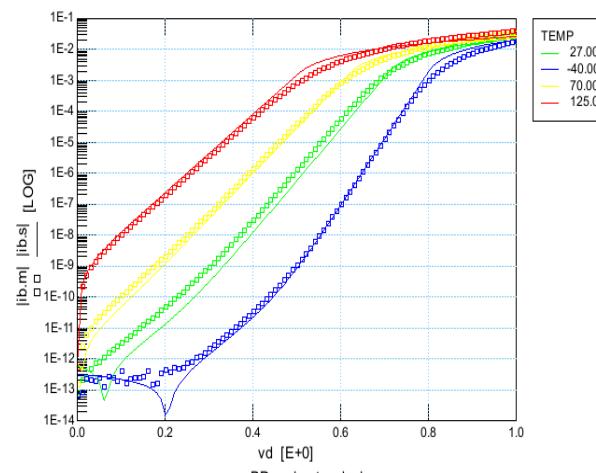
Area



Area

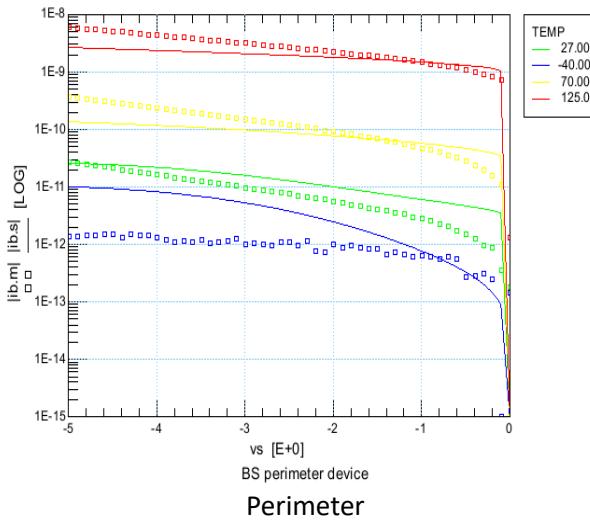
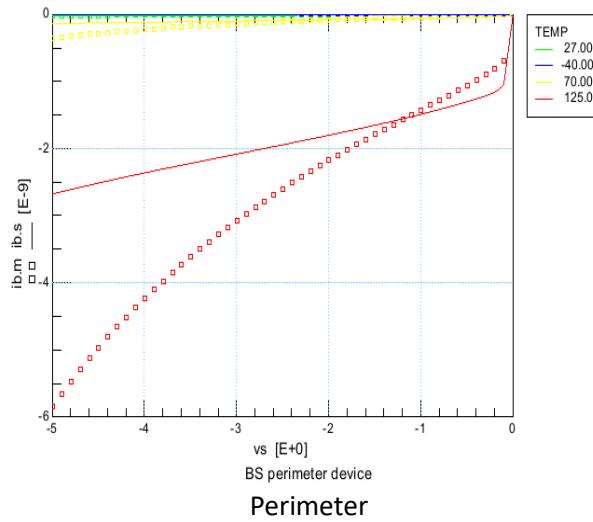
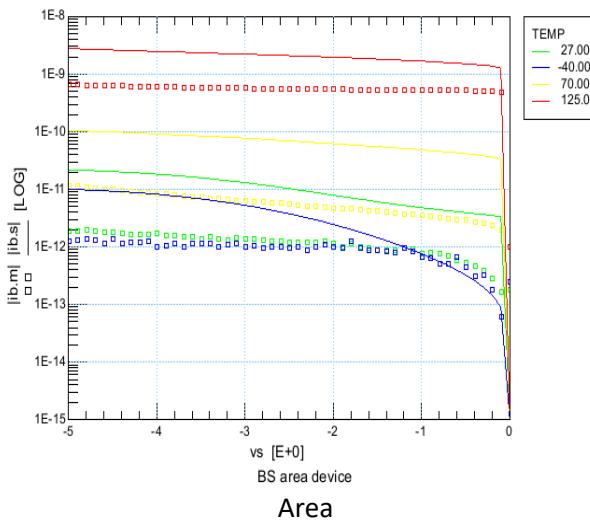
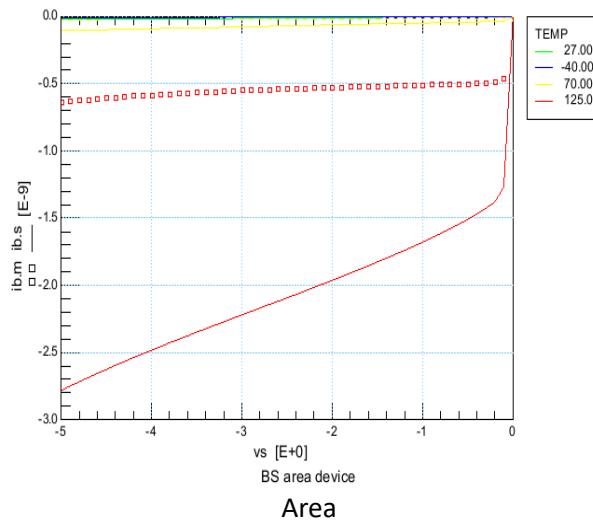


Perimeter



Perimeter

7.3.2 Bulk - Source



8 Flicker Noise

Flicker noise model parameters are taken from the SG13 simulation models.

8.1 Measurement Conditions

Not defined as no flicker noise measurements are yet done on SG13G2 devices.

8.2 Devices

Not defined as no flicker noise measurements are yet done on SG13G2 devices.

9 Change History

| Revision | Device | Changes |
|----------|--------------------|------------------------------------|
| 190606 | All | Initial version |
| 190730 | All | Adjust temperature and RF behavior |
| 190924 | Summarized Results | Legend added |