CMOS028FDSOI Technology

1V8 OTP Drift MOSFET models

DK1.2_RF_mmW

Comparison with DK1.1_RF_mmW model(s)

Please use the bookmark to navigate

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

ST Confidential

General information on models

● Maximum supply voltage is - V.

● Validity domain is defined as follows:

    ✔ Drawn gate length varies from 0.167 nm to 0.2 um.

    ✔ Drawn transistor width varies from 1.0 um to 100 um.

    ✔ Device temperature varies from -40 °C to 125 °C.

Output parameters definitions

● Model(s): ndriftotp

   ✔ Isat : Drain current at Vgs = 1V, Vds = 4.4V.

   ✔ Ioff_d : Drain current at Vgs = 0V, Vds = 6.0V.

   ✔ Ilin : Drain current at Vgs = 1V, Vds = 0.1V.

   ✔ Vtgmmax : Threshold voltage at Vds = 0.1 derived from Gm max method.

ST Confidential
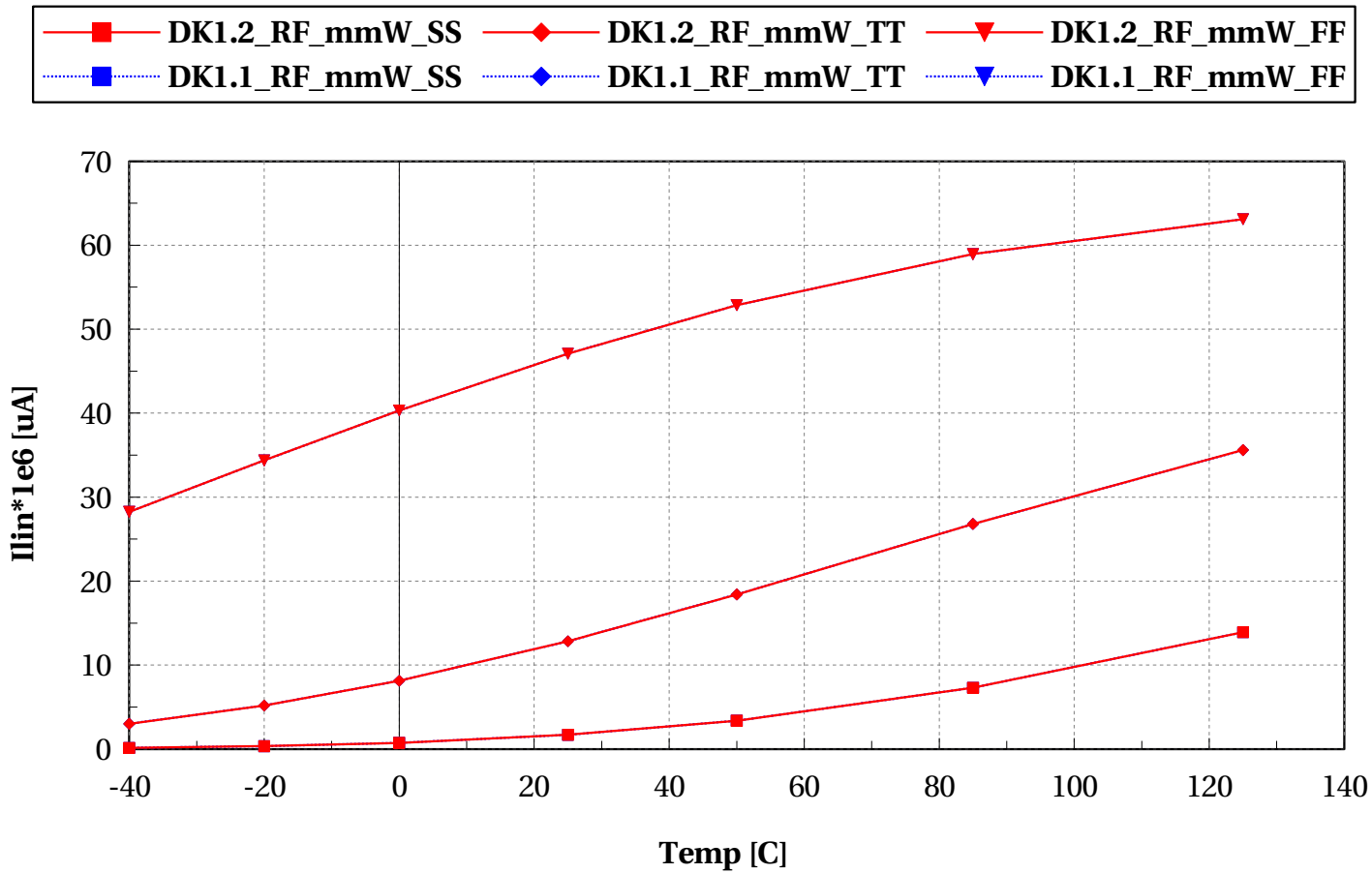
ndriftotp
Electrical characteristics scaling

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

Ilin scaling versus Temp (W=10um)

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

dormieub

ST Confidential

ndriftotp, Ilin*1e6 [uA] vs Temp [C]

L==0.167e-06 and W==10e-06 and sidenum==1

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

Isat scaling versus Temp (W=10um)

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

dormieub

ST Confidential

ndriftotp, Isat*1e3 [mA] vs Temp [C]

L==0.167e-06 and W==10e-06 and sidenum==1

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

dormieub
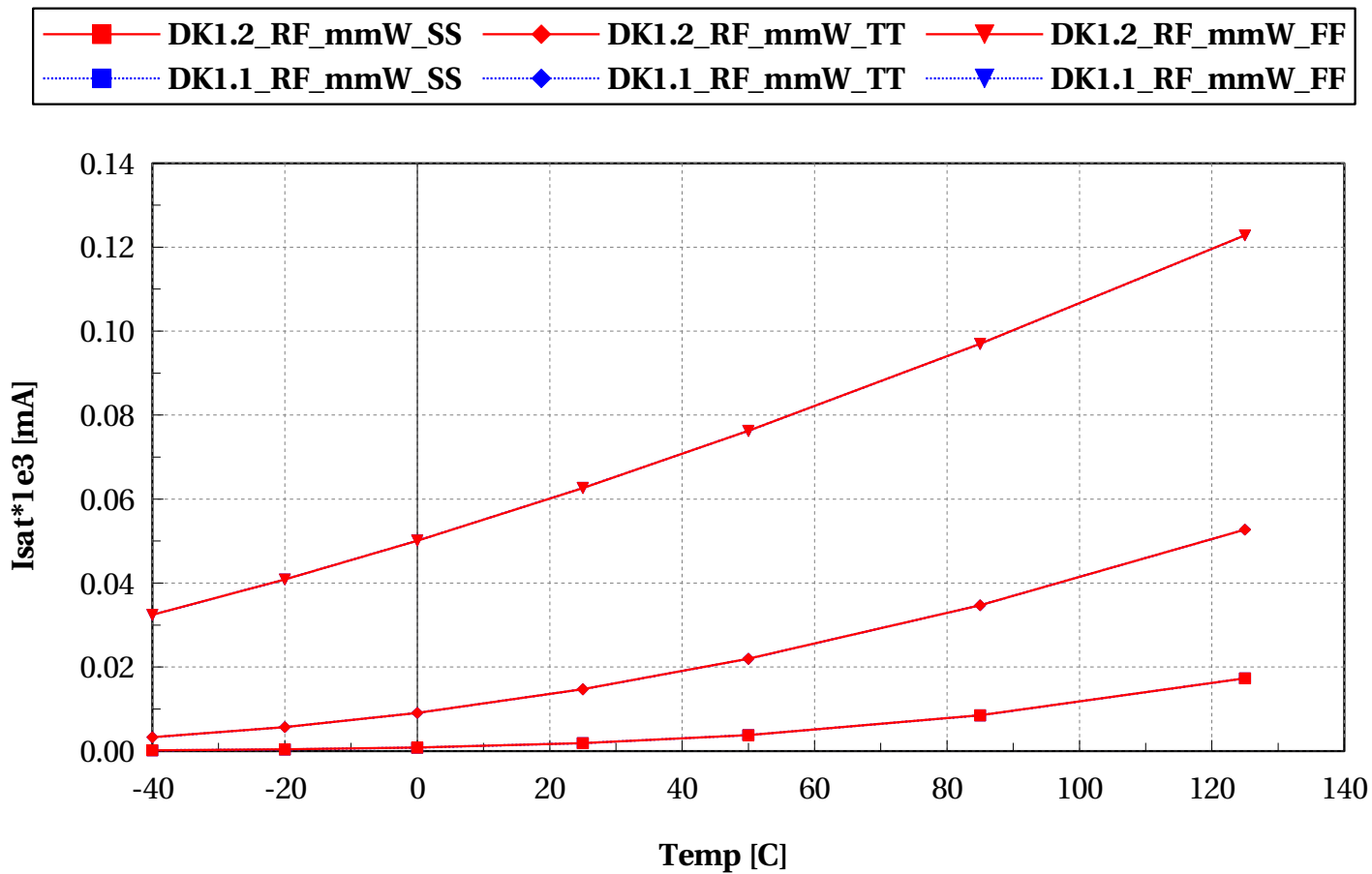
Vtgmmax scaling versus Temp (W=10um)

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

dormieub

ST Confidential

ndriftotp, Vtgmmax [mV] vs Temp [C]

L==0.167e-06 and W==10e-06 and sidenum==1

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

dormieub

ST Confidential

Ioff_d scaling versus Temp (W=10um)

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

dormieub

ST Confidential
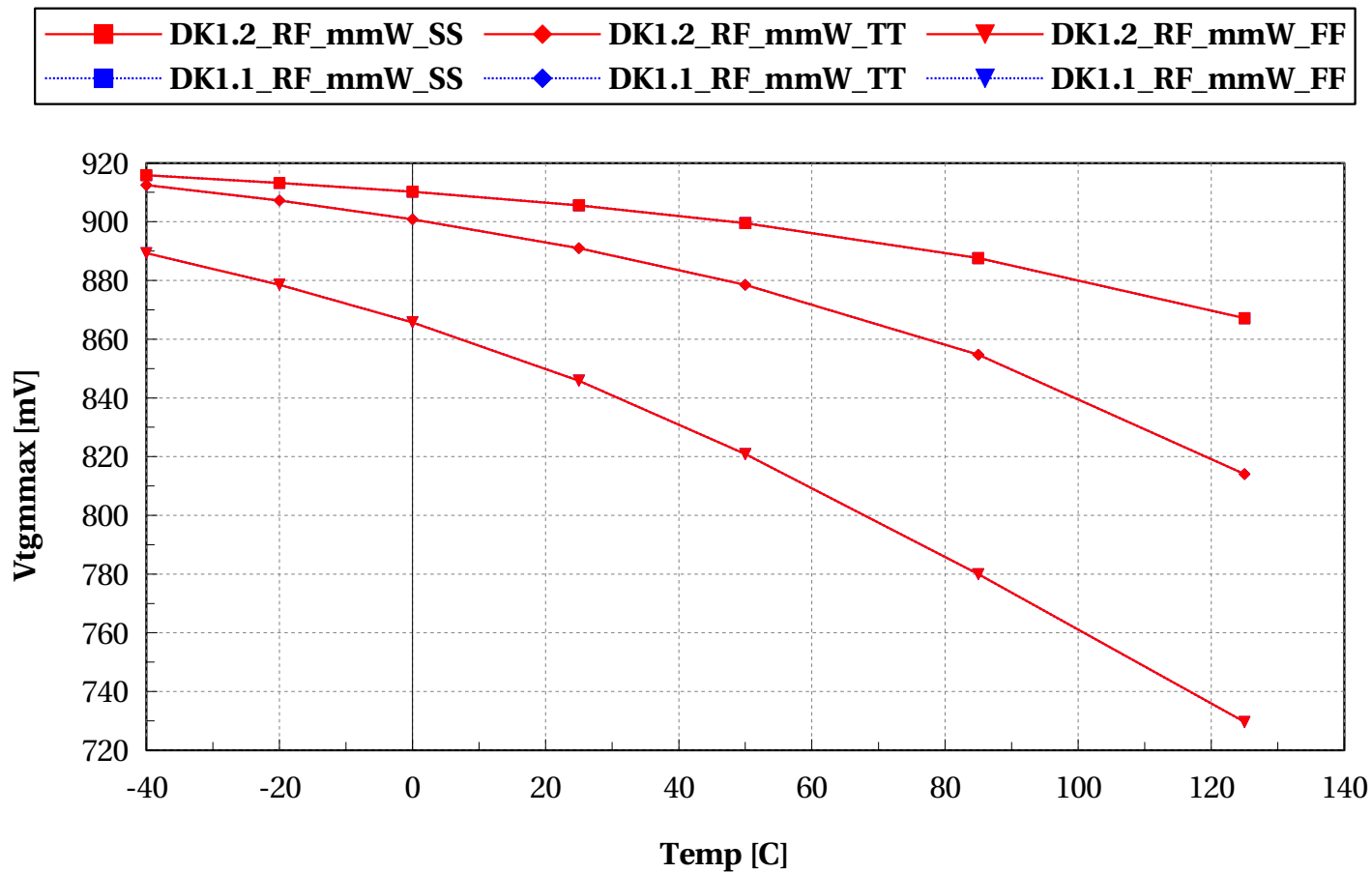
ndriftotp, Ioff_d [A] vs Temp [C]

L==0.167e-06 and W==10e-06 and sidenum==1

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

dormieub

Copyright STMicroelectronics

Unauthorized reproduction and communication strictly prohibited

ST Confidential

Annex

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

dormieub

Unauthorized reproduction and communication strictly prohibited

ST Confidential
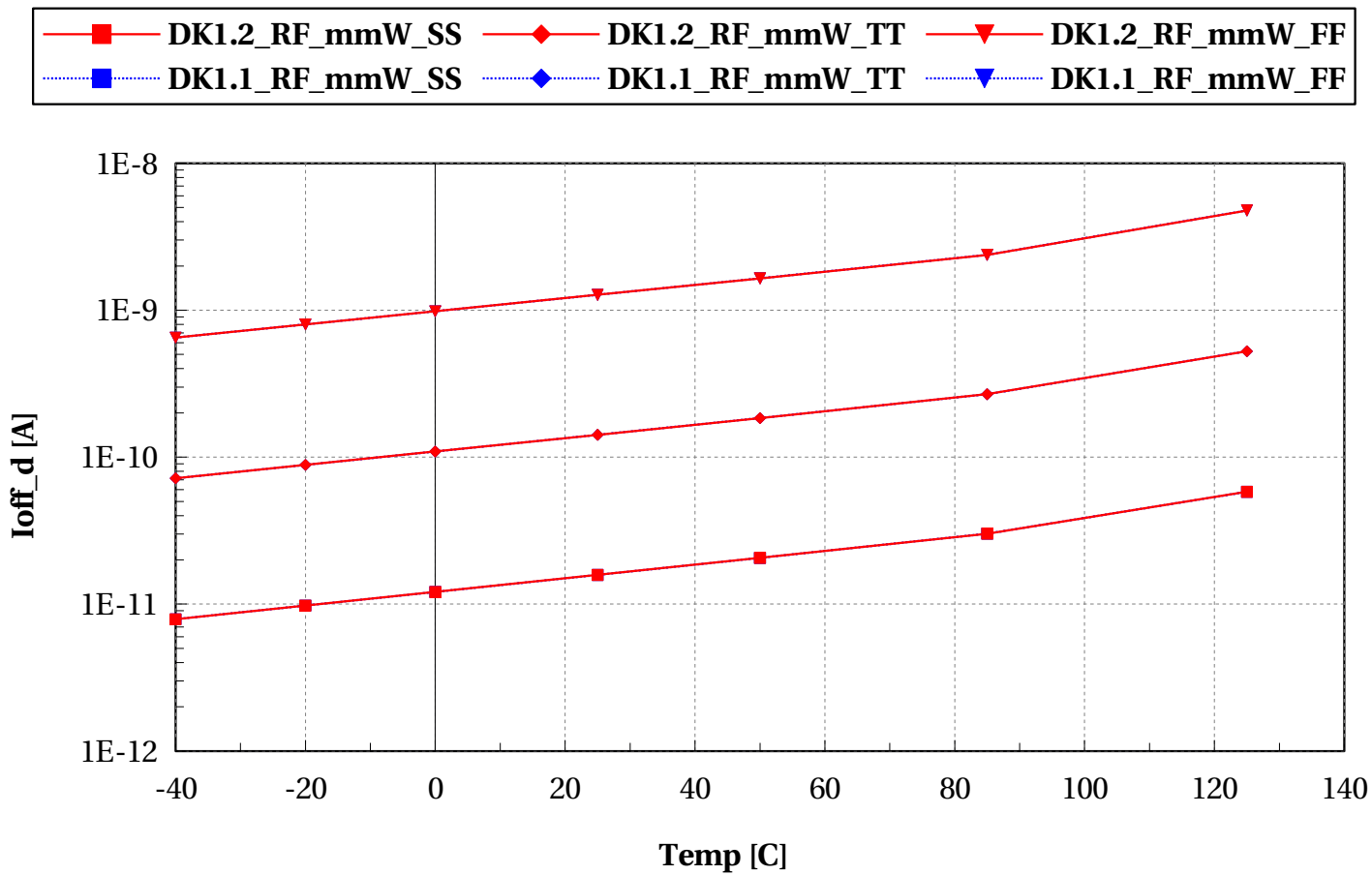
Conditions of simulations

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

● Model ndriftotp (DK1.2_RF_mmW)
  ✔ Input Parameters
    ✘ vds_off = 6.0 V
    ✘ vds_cgd = 0 V
    ✘ vds_cgg = 0 V
    ✘ mc_sens = 0
    ✘ vds_lin = 0.1 V
    ✘ ivt = 300e-9 A
    ✘ model_version = 1.2.b
    ✘ ams_release = 2018.3
    ✘ vgs_stop = vdd V
    ✘ dlshrink_ivt = 0
    ✘ sbenchlsf_release = Alpha
    ✘ vds_sat = 4.4 V
    ✘ mc_nsigma = 3
    ✘ shrink_ivt = 1

ST Confidential

- ✘ dlshrink_tinv = 0
- ✘ vgs_start = 0 V
- ✘ plashrink_ivt = 0
- ✘ ithslwi = 10e-9 A
- ✘ vds_cbd = 0 V
- ✘ vddmax = vdd
- ✘ voffset = 0.2 V
- ✘ mc_runs = 1000
- ✘ vstep_ivt = 0.01 V
- ✘ vgs_off = 0 V
- ✘ temp = 25 °C
- ✘ f_ext = 100k Hz
- ✘ vbs = 0 V
- ✘ vdd = 1 V
- ✘ shrink_tinv = 1
- ✘ vds_gmgd = 0.6 V
- ✔ Sweep Parameters
  - ✘ temp = -40.0, -20.0, 0.0, 25.0, 50.0, 85.0, 125.0
- ✔ Extra parameters
  - ✘ driftotp_dev = 0
  - ✘ cf_global = 1
- ● Model ndriftotp (DK1.1_RF_mmW)
  - ✔ Input Parameters
    - ✘ vds_off = 6.0 V
    - ✘ vds_cgd = 0 V

ST Confidential

- ✘ vds_cgg = 0 V
- ✘ mc_sens = 0
- ✘ vds_lin = 0.1 V
- ✘ ivt = 300e-9 A
- ✘ model_version = 1.2.b
- ✘ ams_release = 2018.3
- ✘ vgs_stop = vdd V
- ✘ dlshrink_ivt = 0
- ✘ sbenchlsf_release = Alpha
- ✘ vds_sat = 4.4 V
- ✘ mc_nsigma = 3
- ✘ shrink_ivt = 1
- ✘ dlshrink_tinv = 0
- ✘ vgs_start = 0 V
- ✘ plashrink_ivt = 0
- ✘ ithslwi = 10e-9 A
- ✘ vds_cbd = 0 V
- ✘ vddmax = vdd
- ✘ voffset = 0.2 V
- ✘ mc_runs = 1000
- ✘ vstep_ivt = 0.01 V
- ✘ vgs_off = 0 V
- ✘ temp = 25 °C
- ✘ f_ext = 100k Hz
- ✘ vbs = 0 V

- ✘ vdd = 1 V
- ✘ shrink_tinv = 1
- ✘ vds_gmgd = 0.6 V
- ✔ Sweep Parameters
  - ✘ temp = -40.0, -20.0, 0.0, 25.0, 50.0, 85.0, 125.0
- ✔ Extra parameters
  - ✘ driftotp_dev = 0
  - ✘ cf_global = 1

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

dormieub

Copyright STMicroelectronics

ST Confidential