



CMOS028FDSOI Technology

MIM CAPACITOR models

DK1.2_RF_mmW

Comparison with DK1.1_RF_mmW model(s)

Spice Models Benchmark

Please use the bookmark to navigate

Sep 21, 2018

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

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General information on models

- Maximum supply voltage is - V.
- Validity domain is defined as follows:

Output parameters definitions

- Model(s): cmim16acc_acc
 - ✓ C_j : Junction capacitance at $V_j = 0.1V$, $f = 100e3Hz$.
 - ✓ I_j : Junction leakage current at $V_j = 0.1V$.

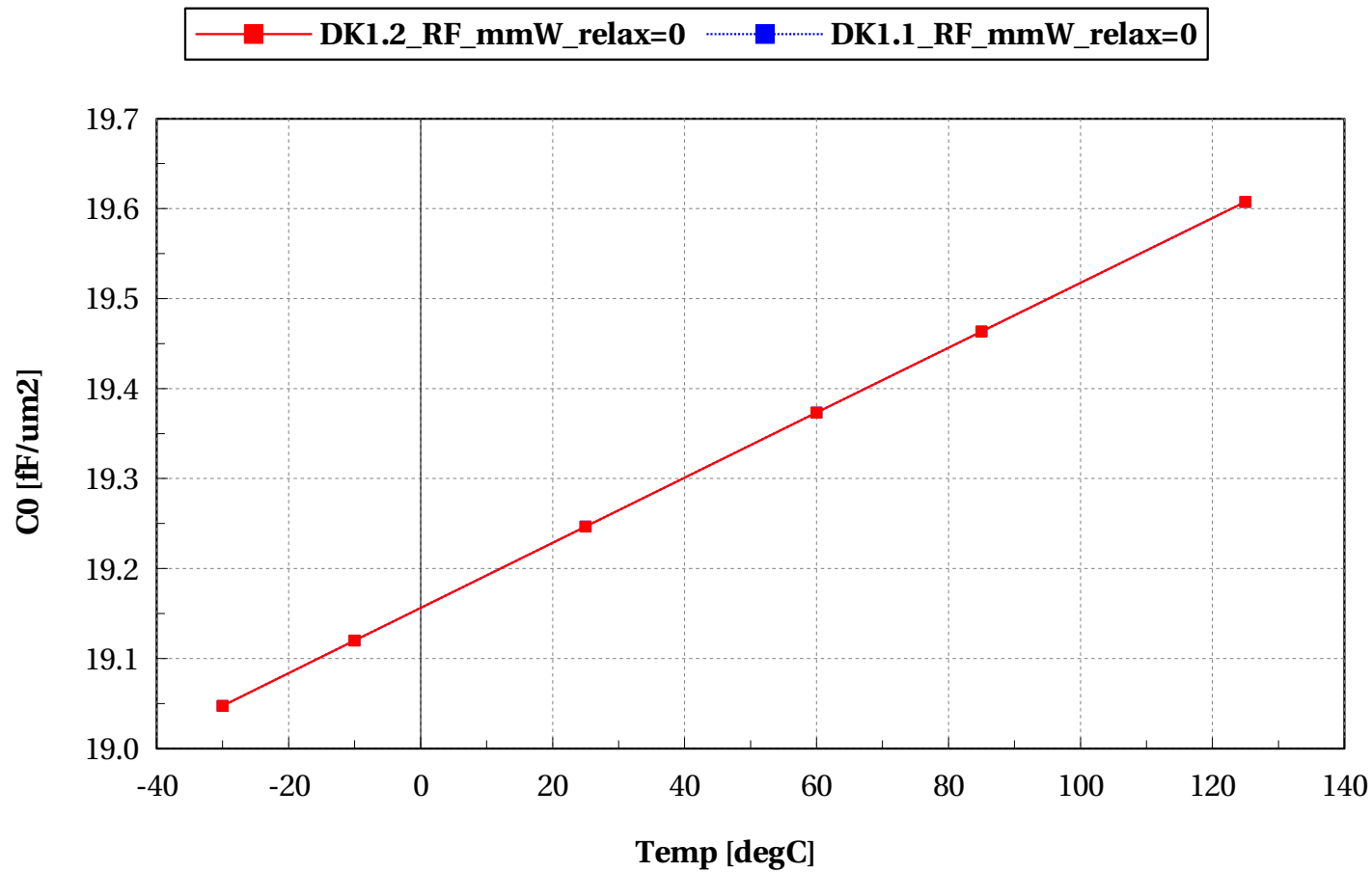
cmiml6acc_acc

Electrical characteristics scaling

Cj vs Temp @ f=100kHz

cmim16acc_acc, C0 [fF/um2] vs Temp [degC]

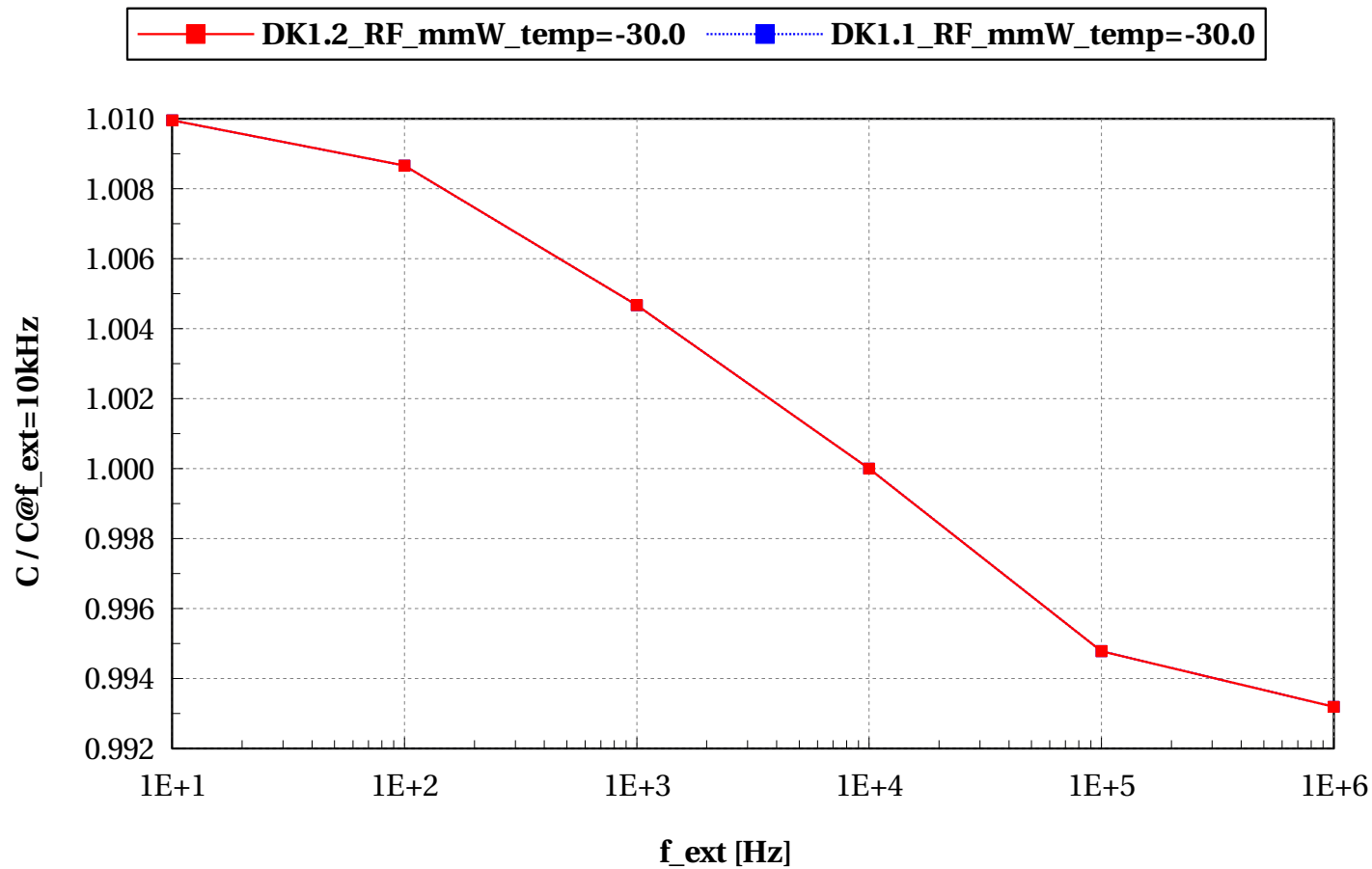
$f_{\text{ext}}=100\text{e}3$ and $W=141\text{e}-6$ and $\text{relax}=0$ and $V_j=0.1$



Cj vs f_ext @ Temp=-30

cmim16acc_acc, C / C@f_ext=10kHz vs f_ext [Hz]

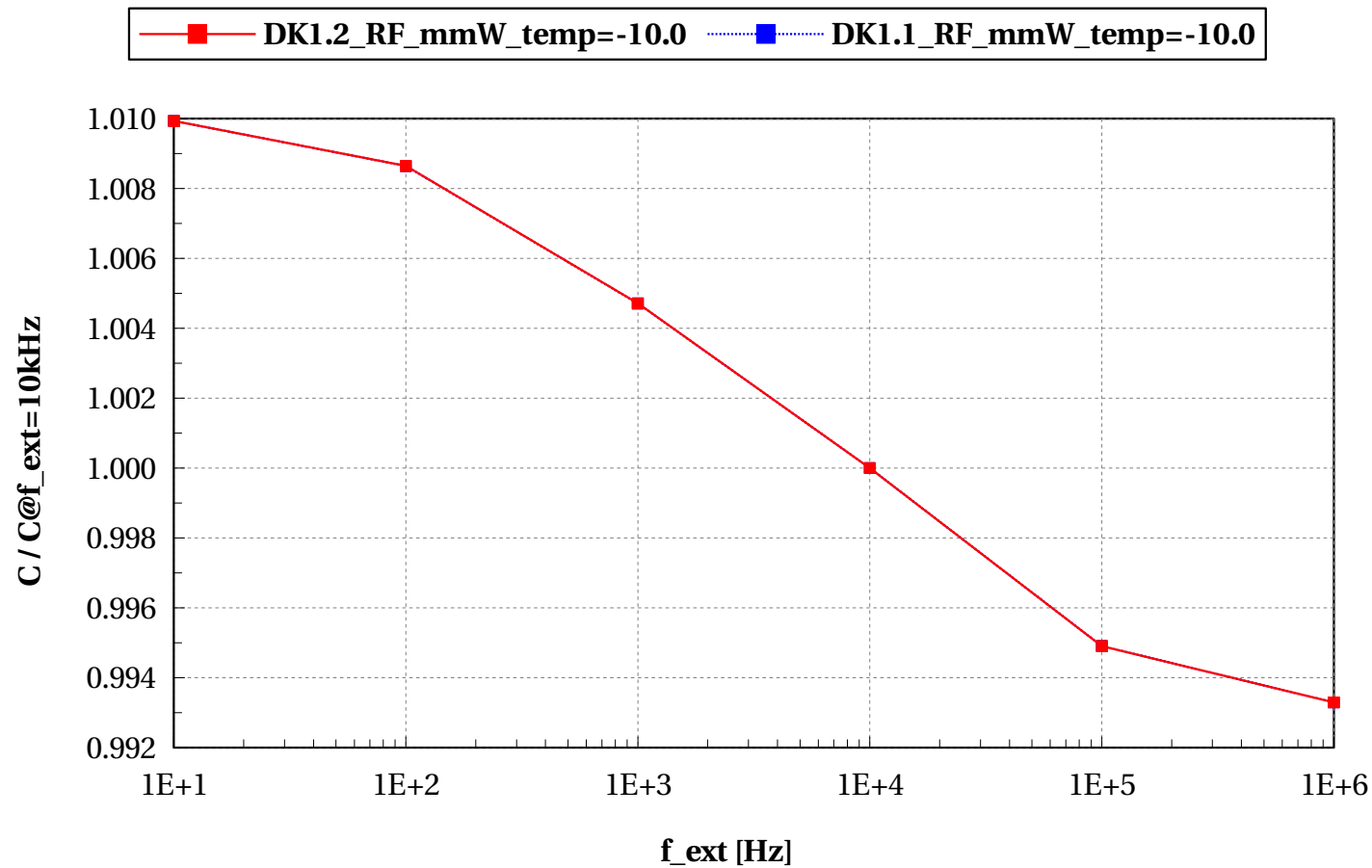
W==141e-6 and relax==1 and Vj==0.1 and Temp== -30



Cj vs f_ext @ Temp=-10

cmim16acc_acc, C / C@f_ext=10kHz vs f_ext [Hz]

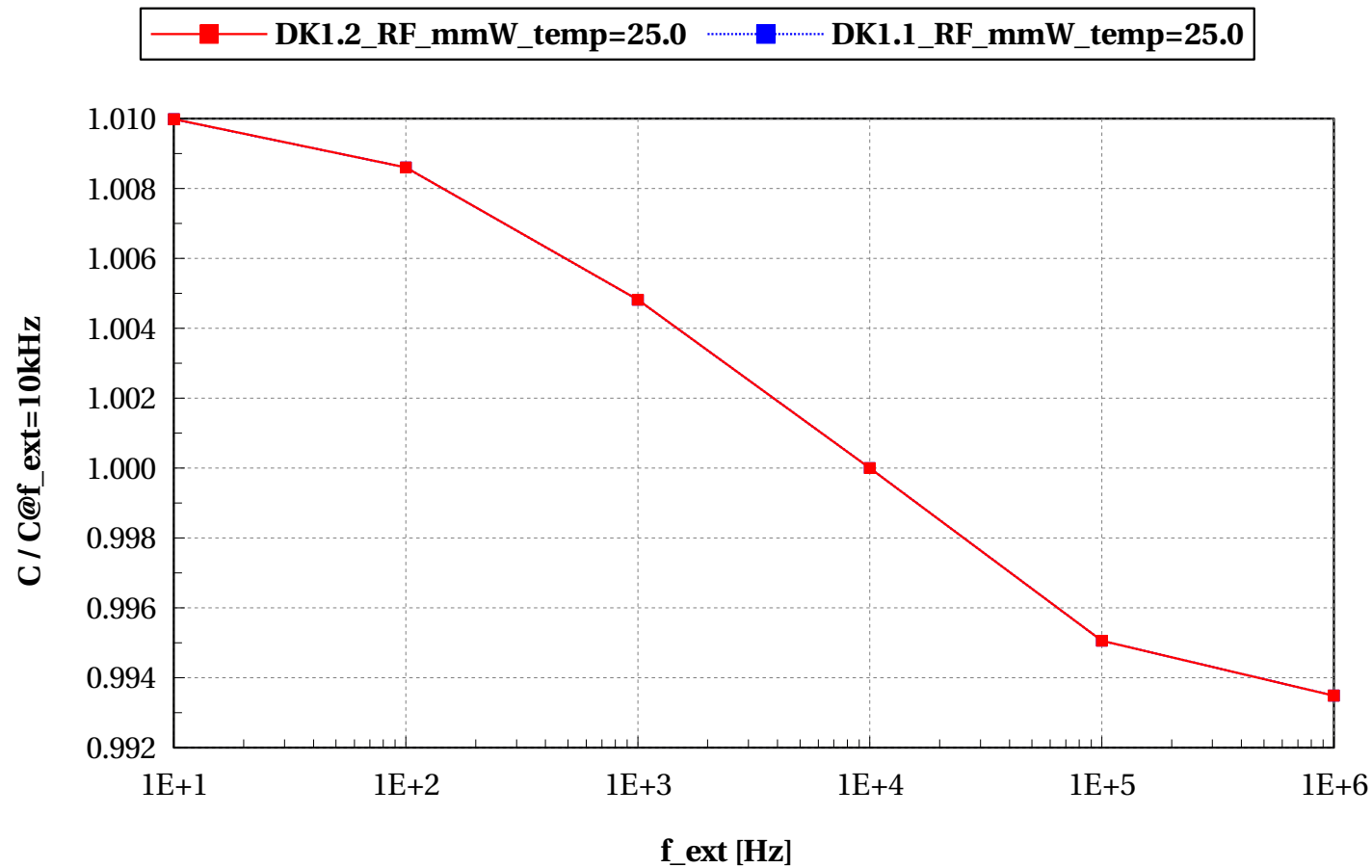
W==141e-6 and relax==1 and Vj==0.1 and Temp== -10



Cj vs f_ext @ Temp=25

cmim16acc_acc, C / C@f_ext=10kHz vs f_ext [Hz]

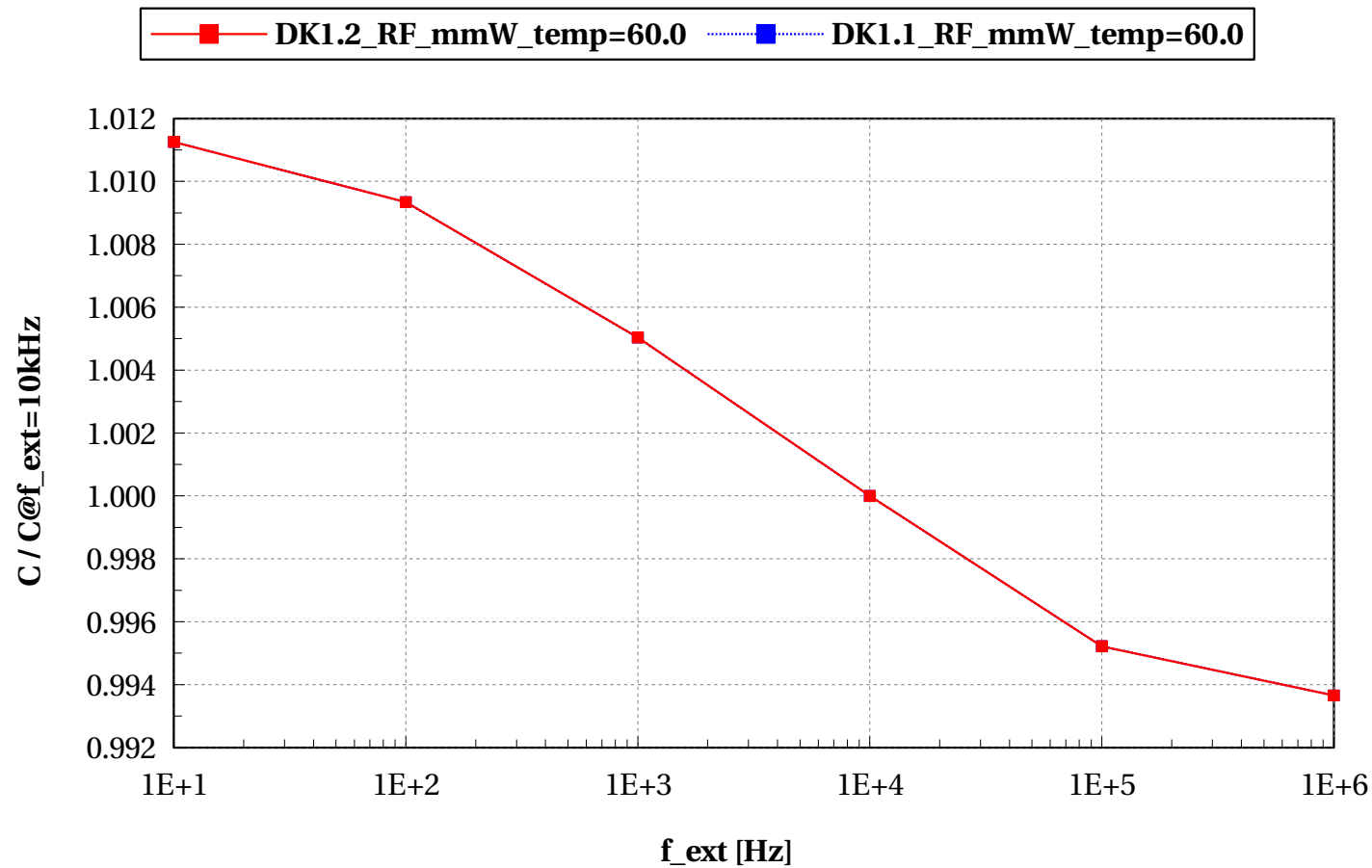
W==141e-6 and relax==1 and Vj==0.1 and Temp==25



Cj vs f_ext @ Temp=60

cmim16acc_acc, C / C@f_ext=10kHz vs f_ext [Hz]

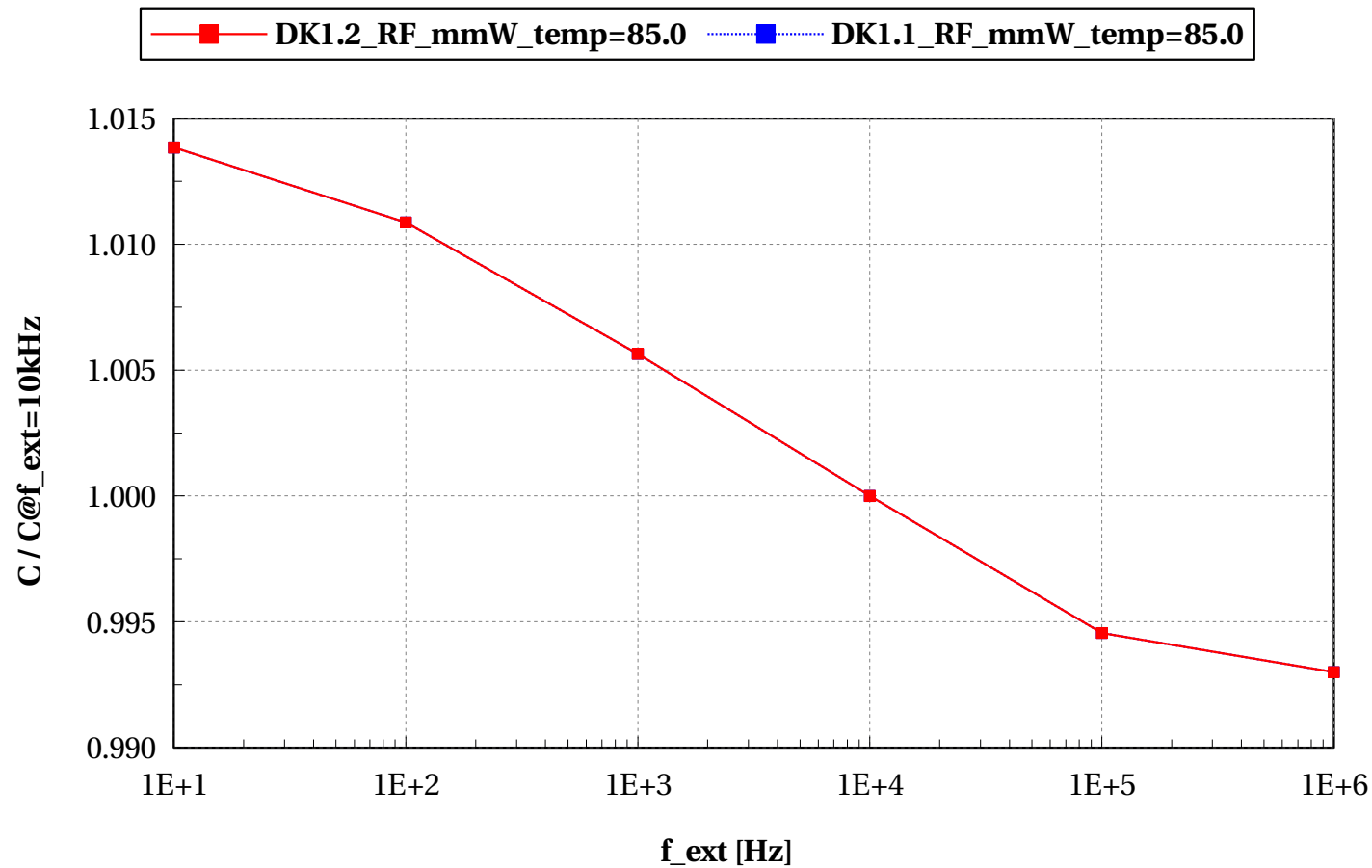
W==141e-6 and relax==1 and Vj==0.1 and Temp==60



Cj vs f_ext @ Temp=85

cmim16acc_acc, C / C@f_ext=10kHz vs f_ext [Hz]

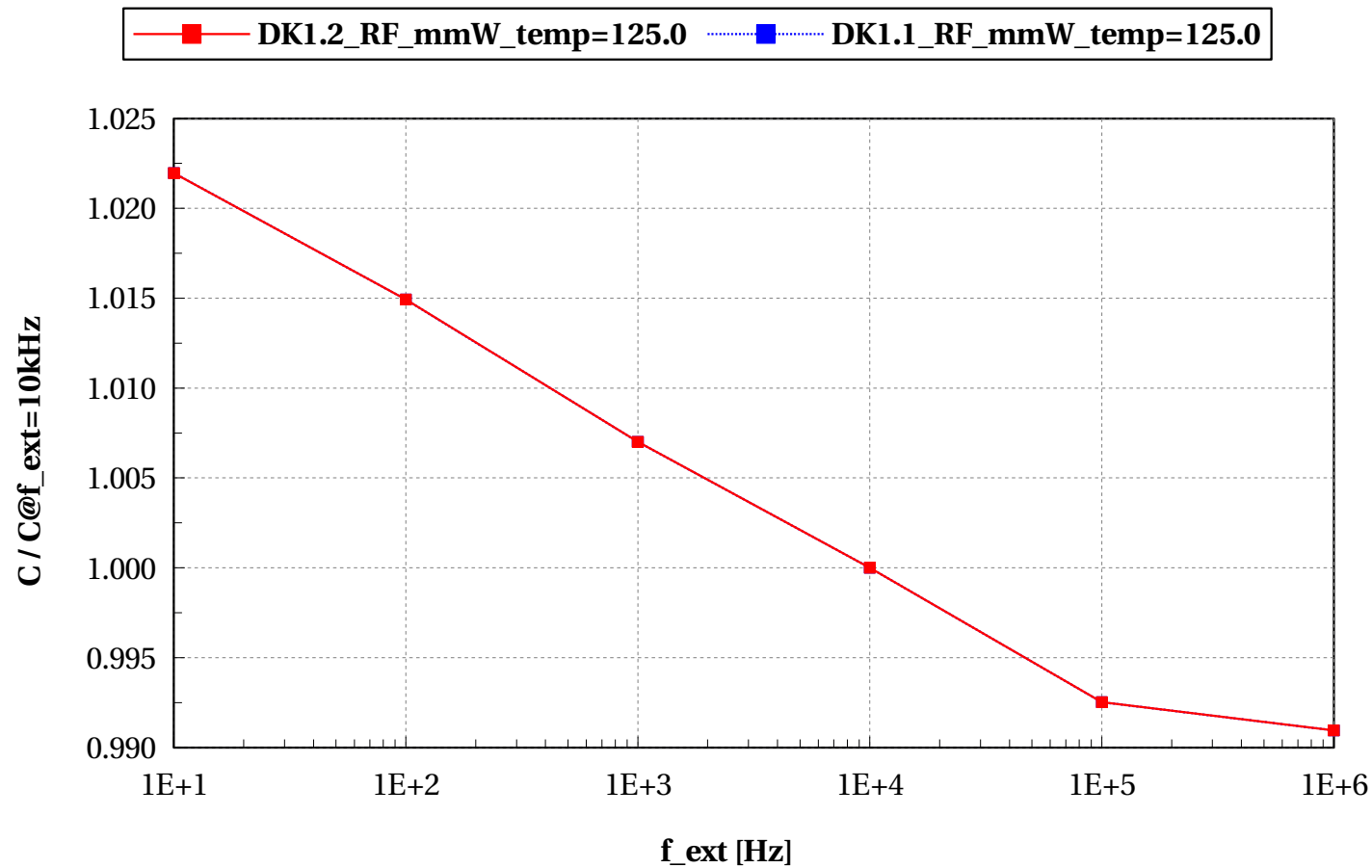
W==141e-6 and relax==1 and Vj==0.1 and Temp==85



Cj vs f_ext @ Temp=125

cmim16acc_acc, C / C@f_ext=10kHz vs f_ext [Hz]

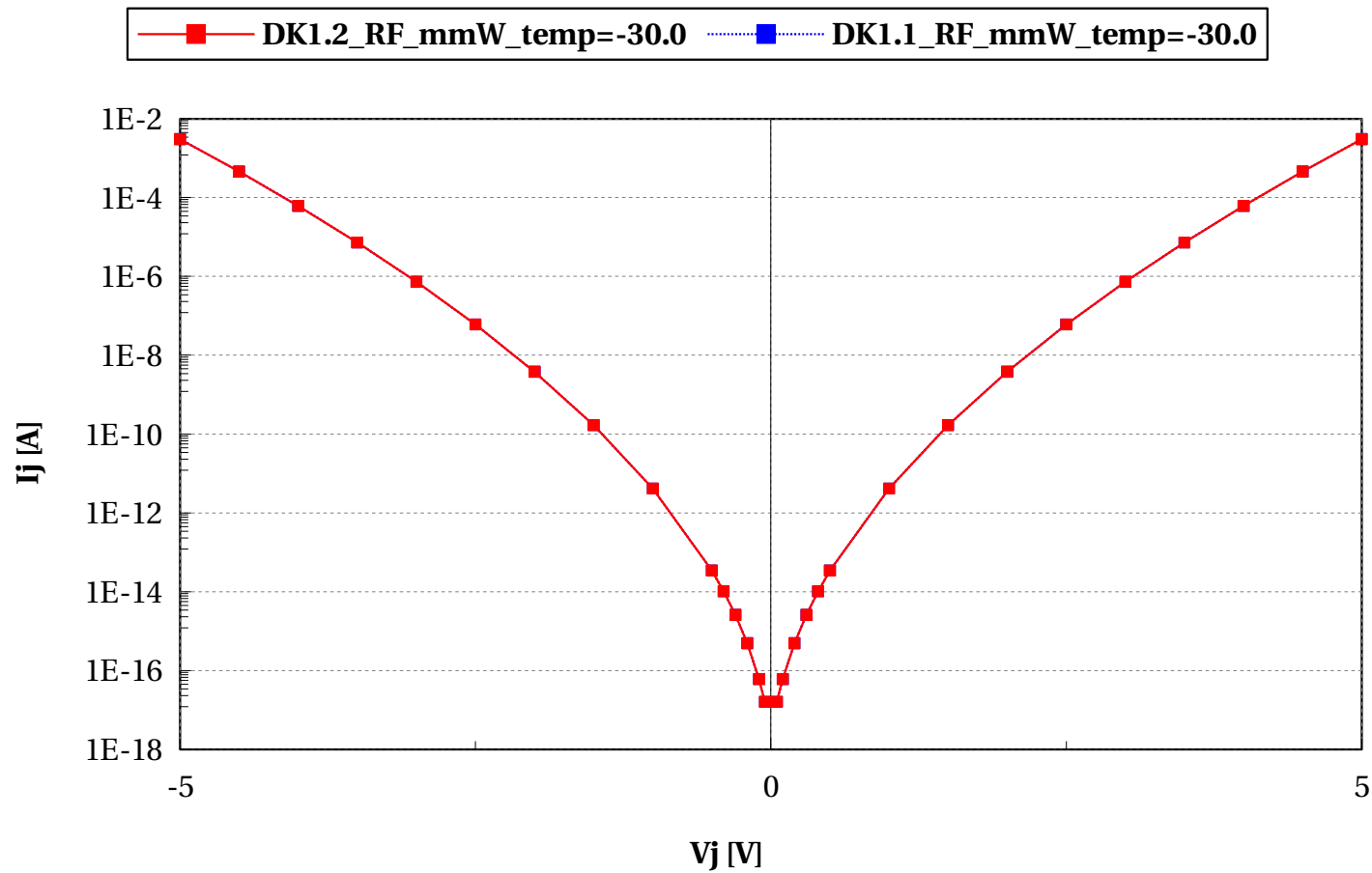
W==141e-6 and relax==1 and Vj==0.1 and Temp==125



I_j vs V_j @ Temp=-30

cmim16acc_acc, Ij [A] vs Vj [V]

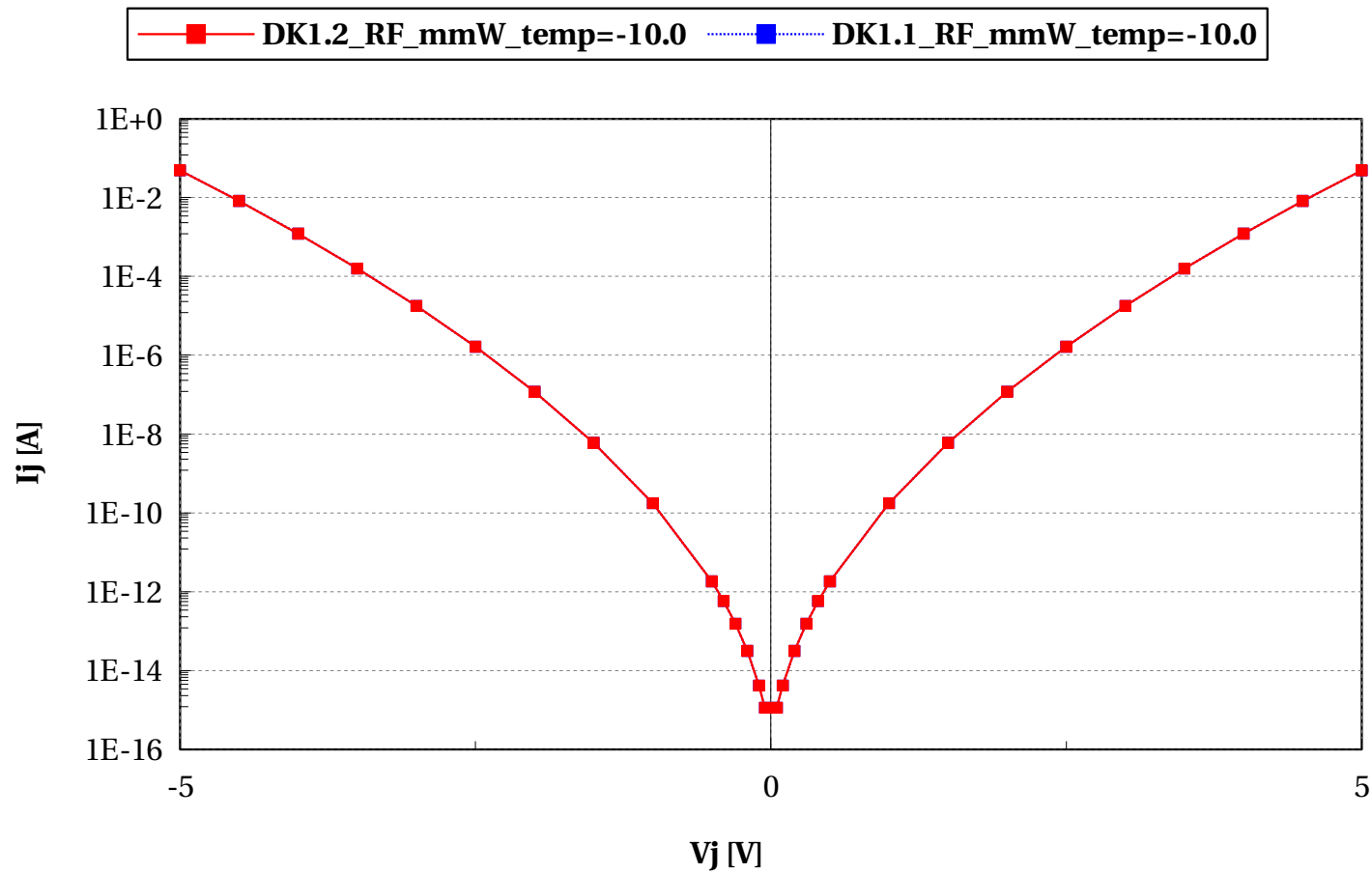
W==141e-6 and relax==0 and Temp== -30



I_j vs V_j @ Temp=-10

cmim16acc_acc, I_j [A] vs V_j [V]

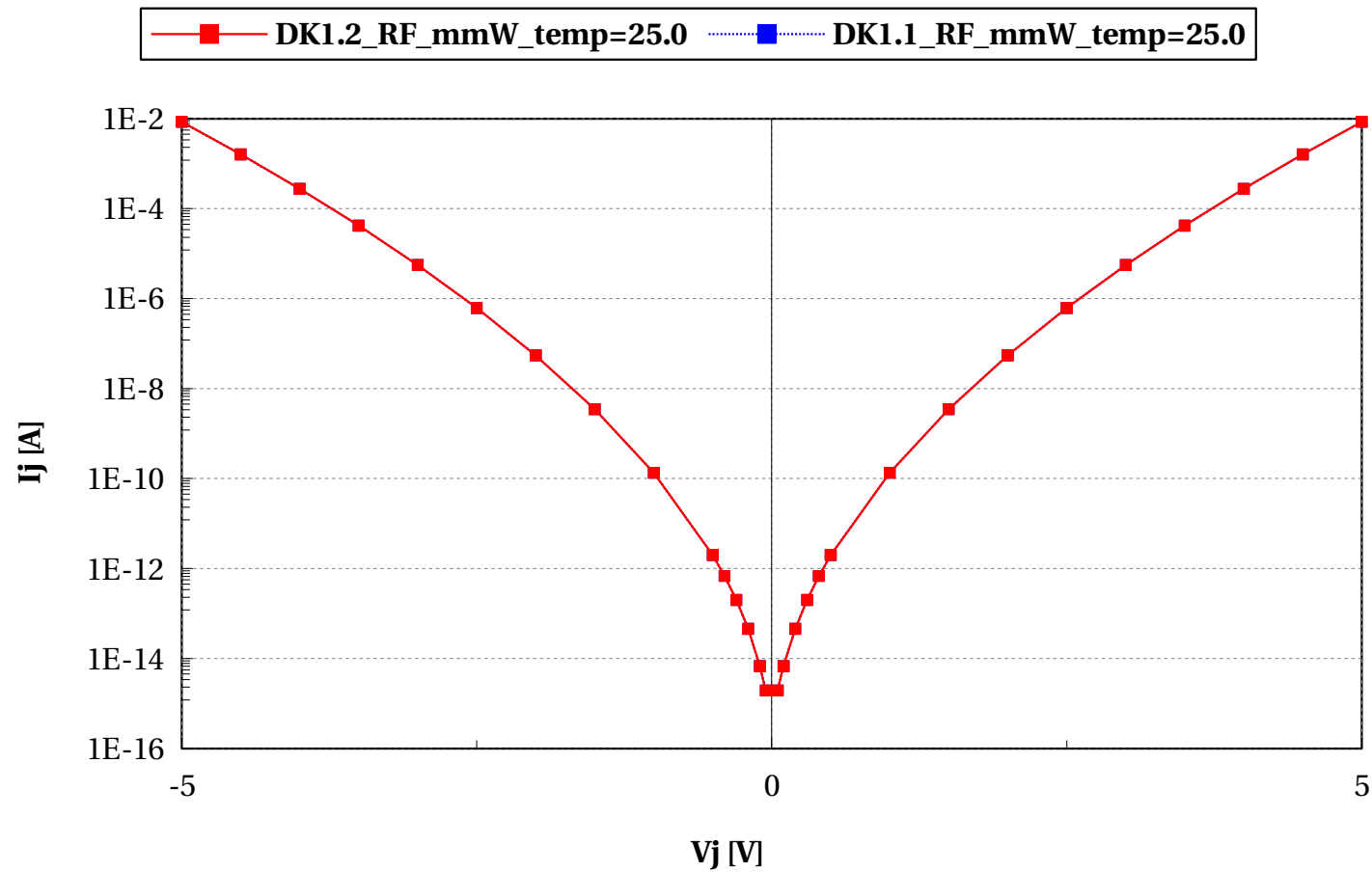
$W=141e-6$ and $relax=0$ and $Temp=-10$



Ij vs Vj @ Temp=25

cmim16acc_acc, Ij [A] vs Vj [V]

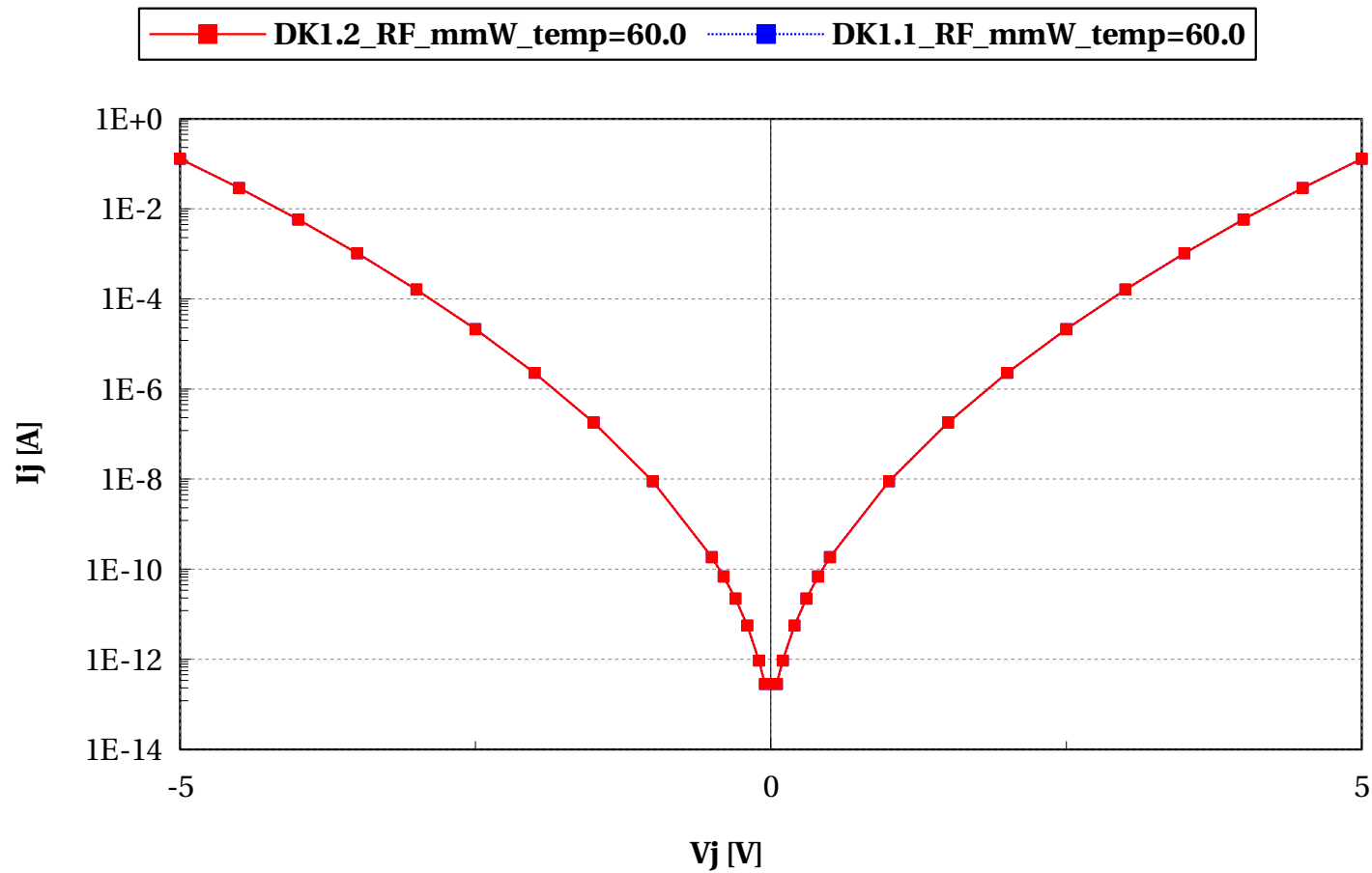
W==141e-6 and relax==0 and Temp==25



Ij vs Vj @ Temp=60

cmim16acc_acc, Ij [A] vs Vj [V]

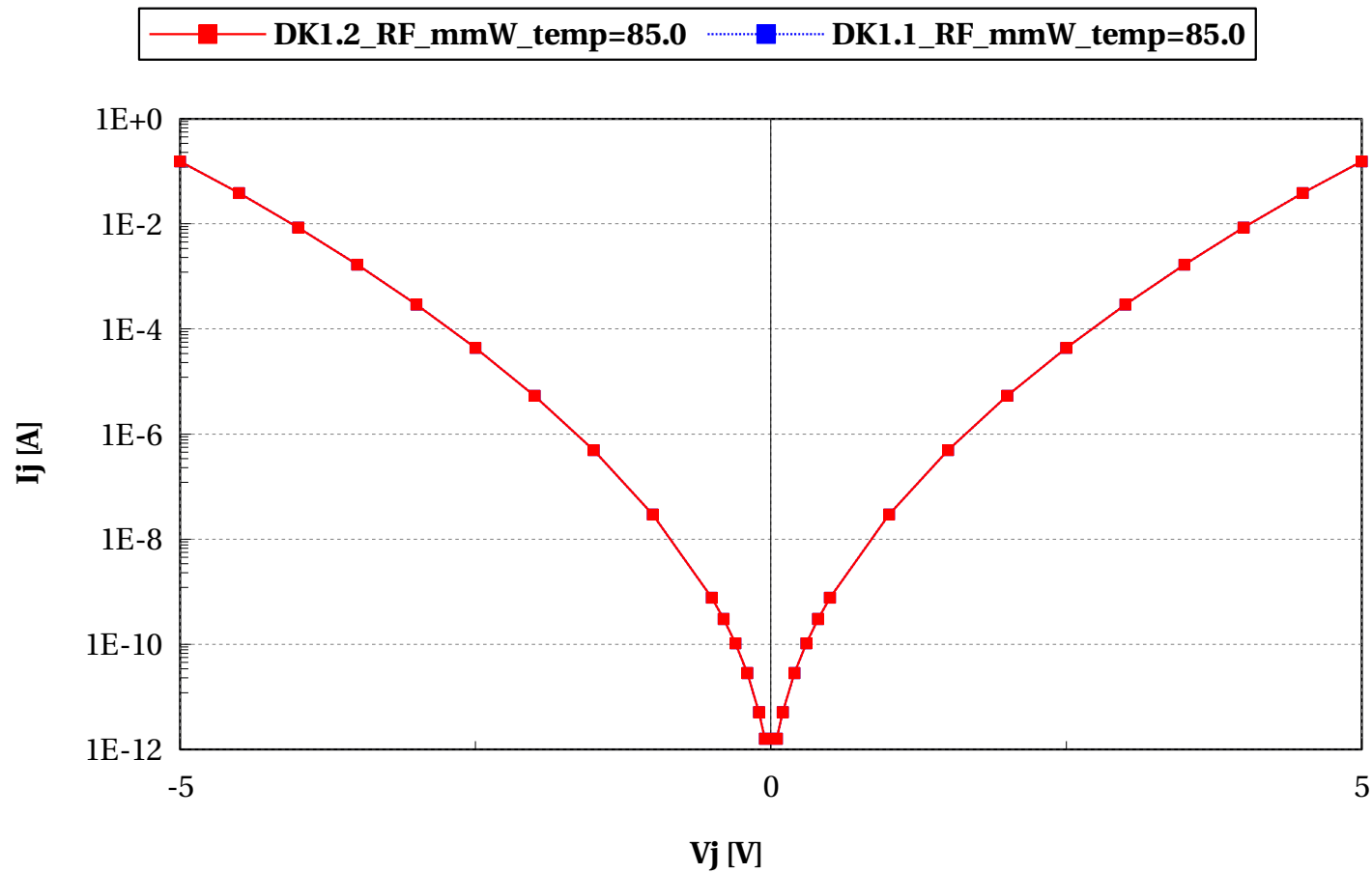
W==141e-6 and relax==0 and Temp==60



Ij vs Vj @ Temp=85

cmim16acc_acc, Ij [A] vs Vj [V]

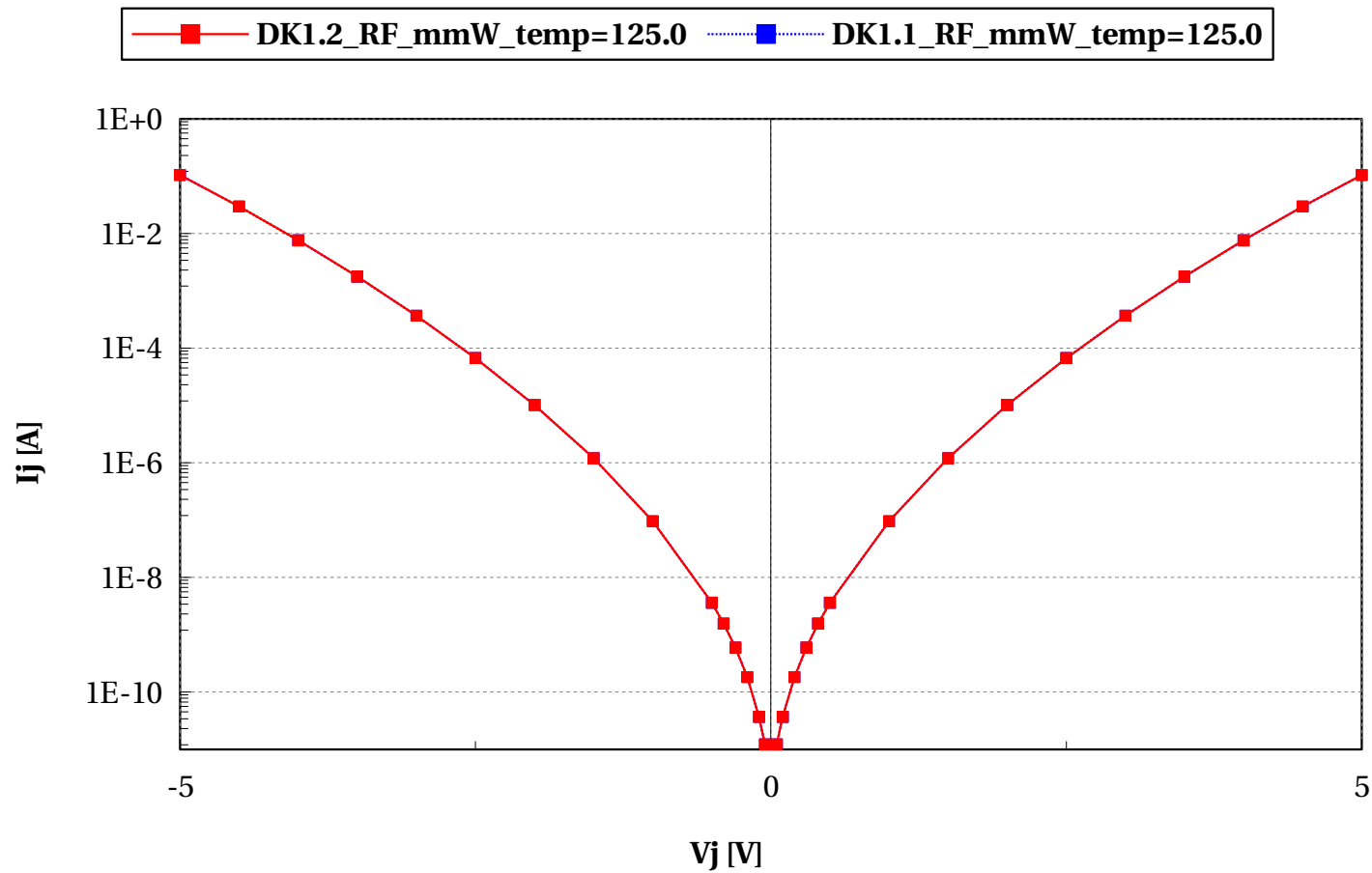
W==141e-6 and relax==0 and Temp==85



I_j vs V_j @ Temp=125

cmim16acc_acc, I_j [A] vs V_j [V]

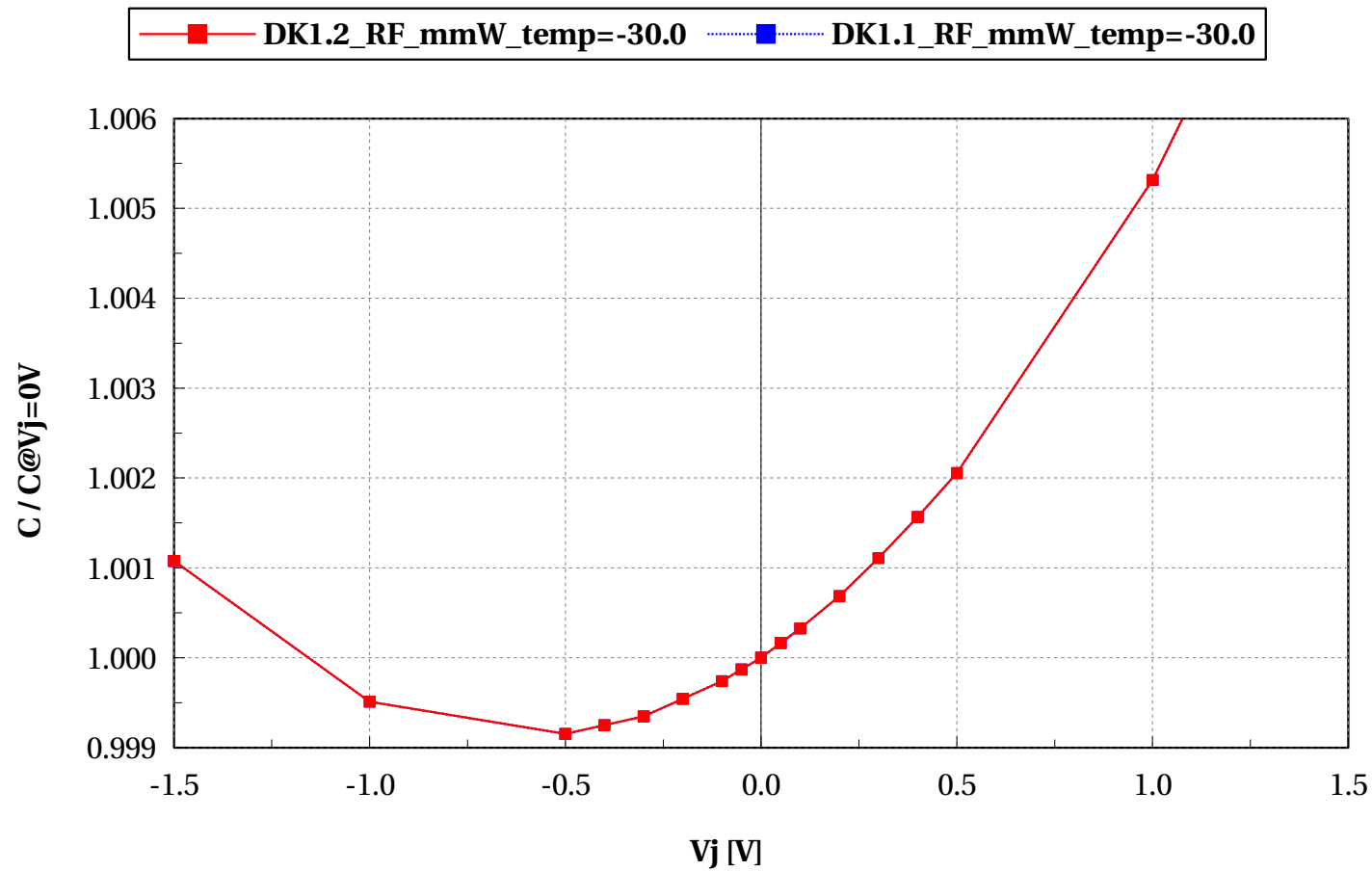
$W=141e-6$ and $relax=0$ and $Temp=125$



Cj vs Vj @ Temp=-30

cmim16acc_acc, C / C@Vj=0V vs Vj [V]

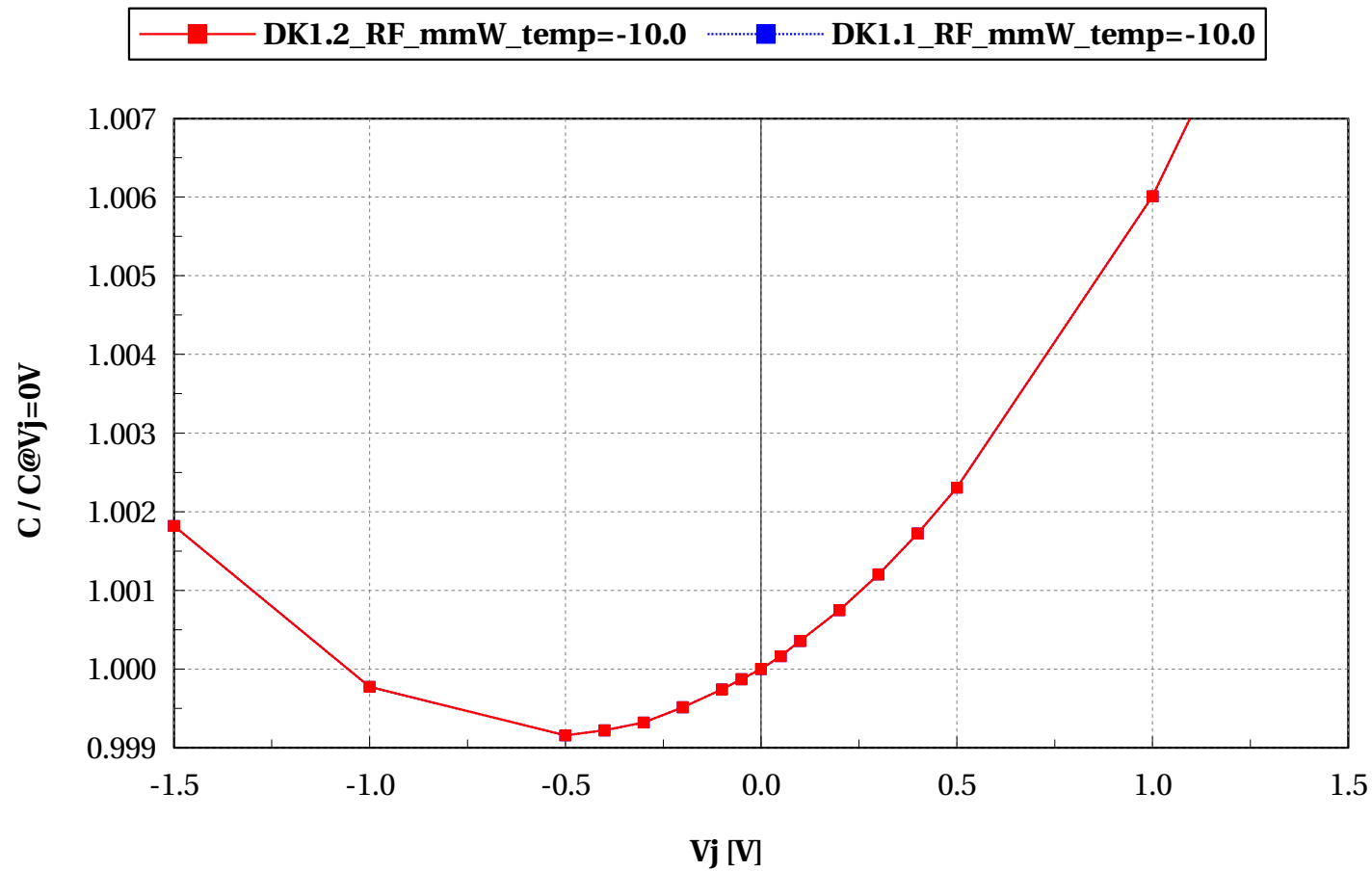
f_ext==100e3 and relax==0 and Temp== -30



Cj vs Vj @ Temp=-10

cmim16acc_acc, C / C@Vj=0V vs Vj [V]

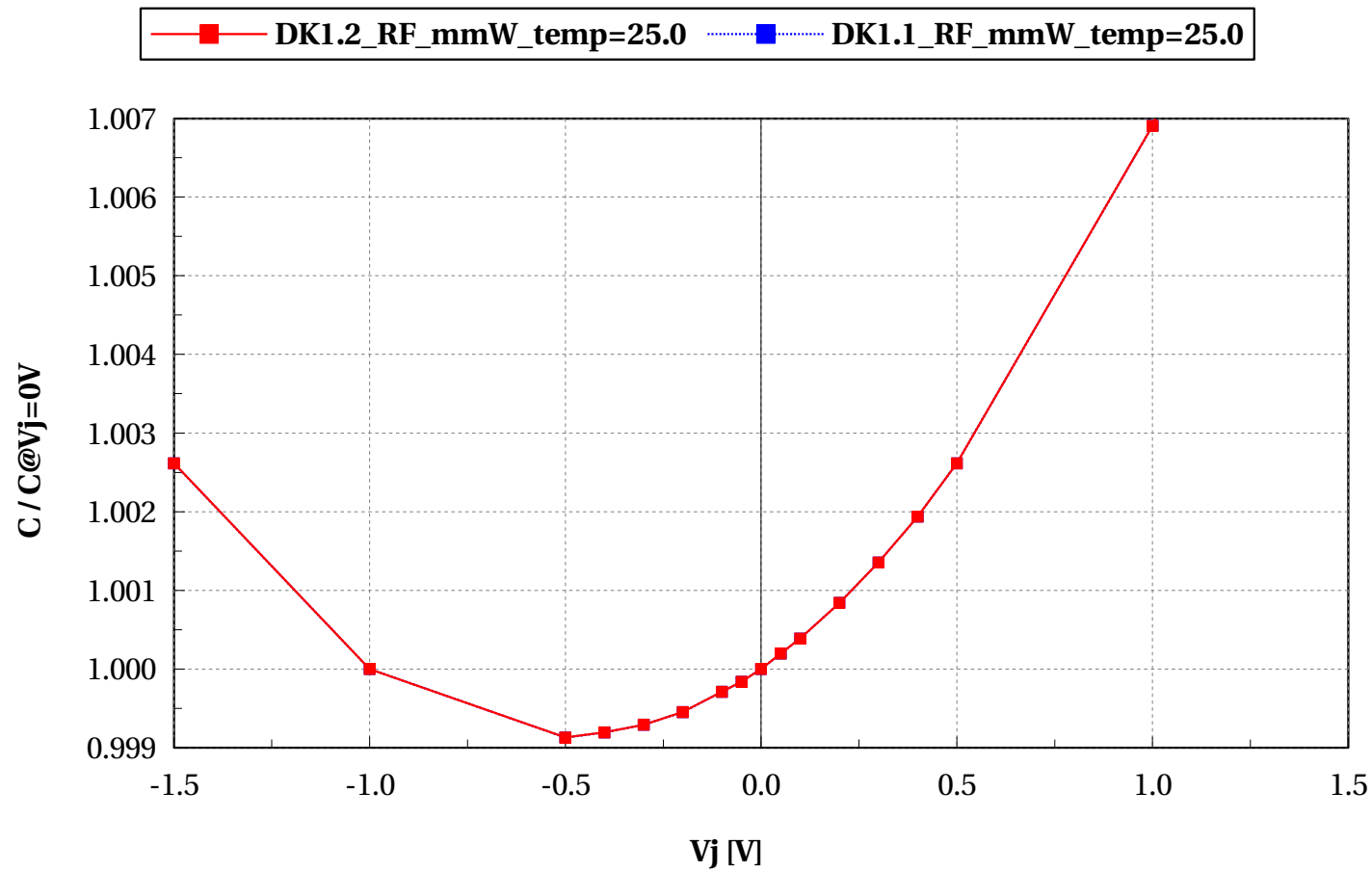
f_ext==100e3 and relax==0 and Temp== -10



Cj vs Vj @ Temp=25

cmim16acc_acc, $C / C@V_j=0V$ vs V_j [V]

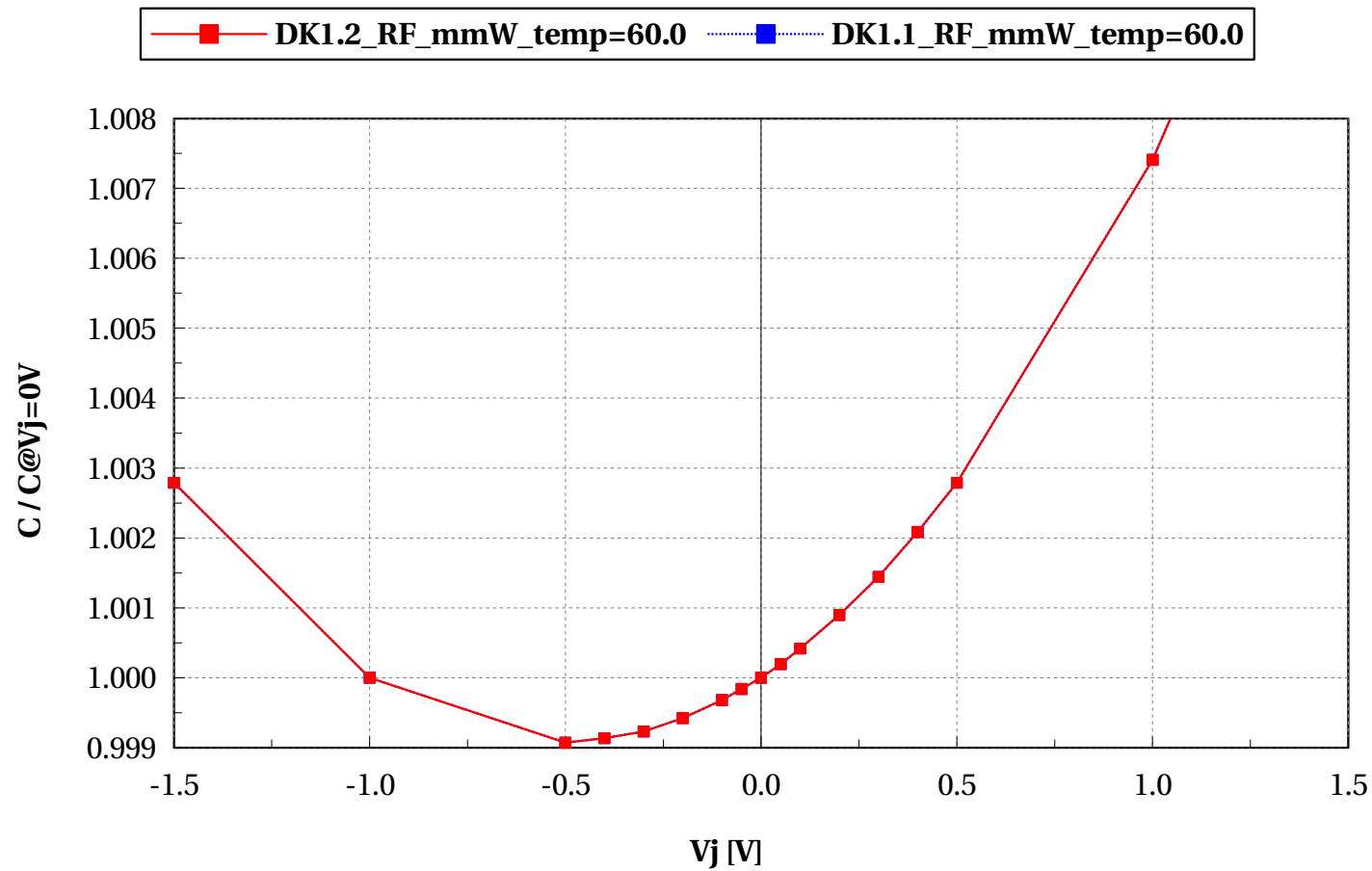
$f_{ext}=100e3$ and $relax=0$ and $Temp=25$



Cj vs Vj @ Temp=60

cmim16acc_acc, C / C@Vj=0V vs Vj [V]

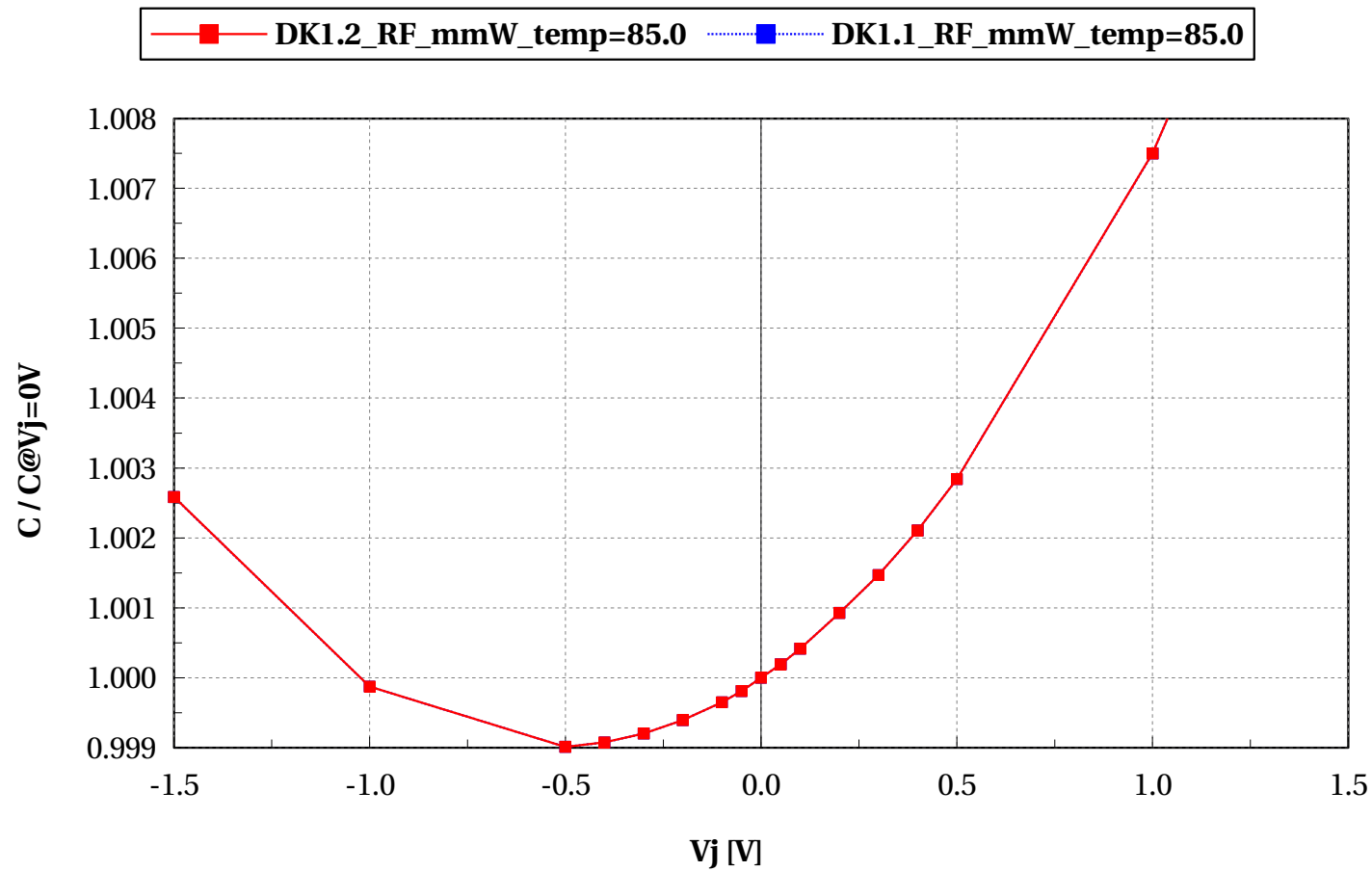
f_ext==100e3 and relax==0 and Temp==60



Cj vs Vj @ Temp=85

cmim16acc_acc, $C / C@V_j=0V$ vs V_j [V]

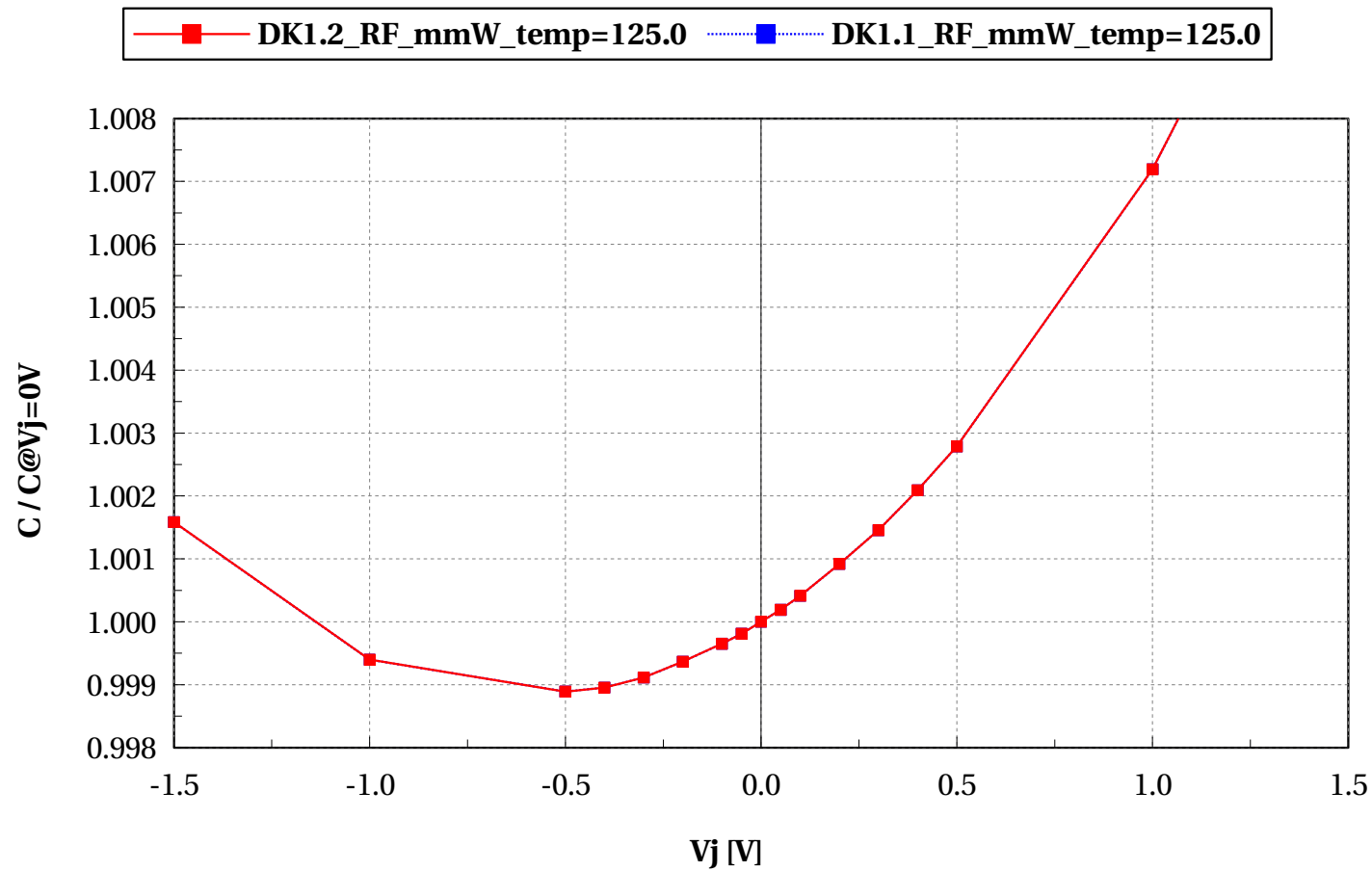
$f_{ext}=100e3$ and $relax=0$ and $Temp=85$



Cj vs Vj @ Temp=125

cmim16acc_acc, C / C@Vj=0V vs Vj [V]

f_ext==100e3 and relax==0 and Temp==125



Annex

Conditions of simulations

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

- Model cmim16acc_acc (DK1.2_RF_mmW)

- ✓ Input Parameters

- ✗ mc_runs = 1000

- ✗ vsub1 = 0

- ✗ temp = 25 °C

- ✗ mc_sens = 0

- ✗ vj = 0.1 V

- ✗ f_ext = 100e3 Hz

- ✗ sbenchlsf_release = Alpha

- ✗ ams_release = 2018.3

- ✗ model_version = 1.0

- ✗ mc_nsigma = 3

- ✓ Sweep Parameters

- ✗ vj = -5.0, -4.5, -4.0, -3.5, -3.0, -2.5, -2.0, -1.5, -1.0, -0.5, -0.4, -0.3, -0.2, -0.1, -0.05, 0.0, 0.05, 0.1, 0.2, 0.3, 0.4, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0

- ✗ f_ext = 10.0, 100.0, 1000.0, 10000.0, 100000.0, 1000000.0

- ✗ temp = -30.0, -10.0, 25.0, 60.0, 85.0, 125.0

- ✓ Extra parameters
 - ✗ cmim16acc_dev = 0
- Model cmim16acc_acc (DK1.1_RF_mmW)
 - ✓ Input Parameters
 - ✗ mc_runs = 1000
 - ✗ vsub1 = 0
 - ✗ temp = 25 °C
 - ✗ mc_sens = 0
 - ✗ vj = 0.1 V
 - ✗ f_ext = 100e3 Hz
 - ✗ sbenchlsf_release = Alpha
 - ✗ ams_release = 2018.3
 - ✗ model_version = 1.0
 - ✗ mc_nsigma = 3
 - ✓ Sweep Parameters
 - ✗ vj = -5.0, -4.5, -4.0, -3.5, -3.0, -2.5, -2.0, -1.5, -1.0, -0.5, -0.4, -0.3, -0.2, -0.1, -0.05, 0.0, 0.05, 0.1, 0.2, 0.3, 0.4, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0
 - ✗ f_ext = 10.0, 100.0, 1000.0, 10000.0, 100000.0, 1000000.0
 - ✗ temp = -30.0, -10.0, 25.0, 60.0, 85.0, 125.0
 - ✓ Extra parameters
 - ✗ cmim16acc_dev = 0