

Device Modeling Report

COMPONENTS: Photo diode
PART NUMBER: SFH 205FA
MANUFACTURER: SIEMENS

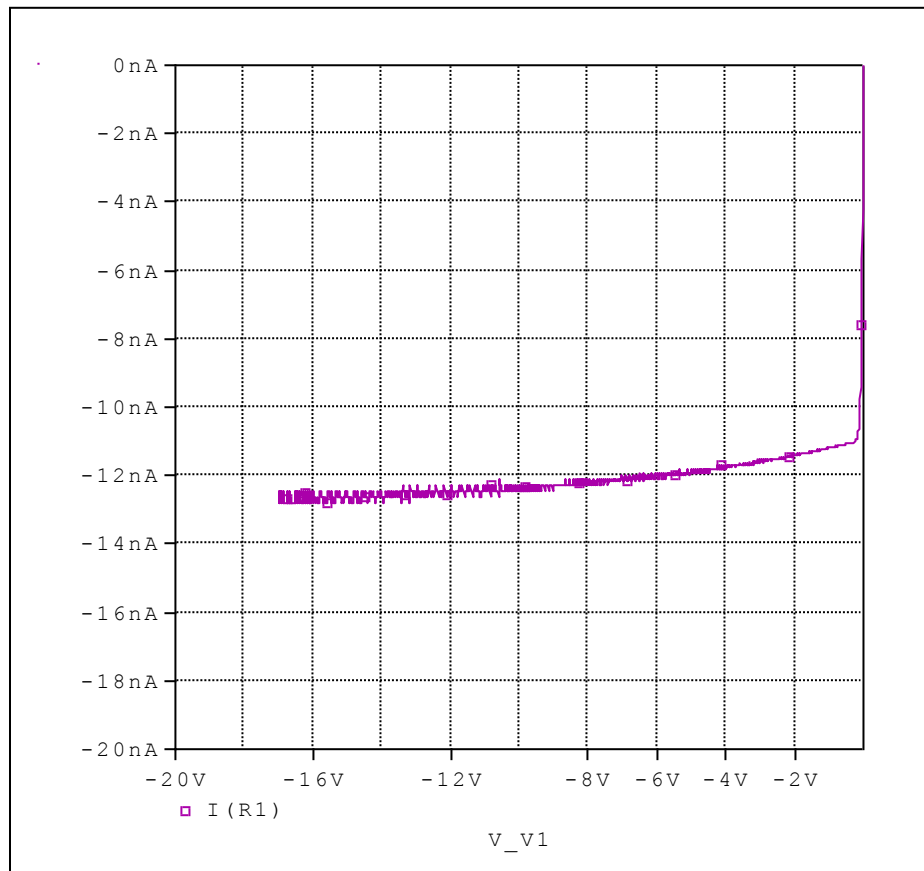


Bee Technologies Inc.

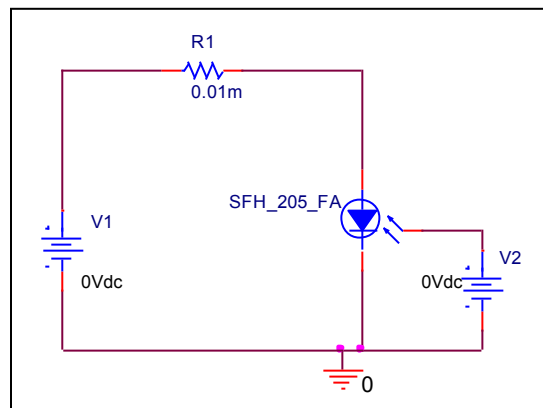
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a positive value)
IBV	Reverse Breakdown Current(a positive value)
TT	Transit Time

Dark Current Characteristic

Circuit simulation result

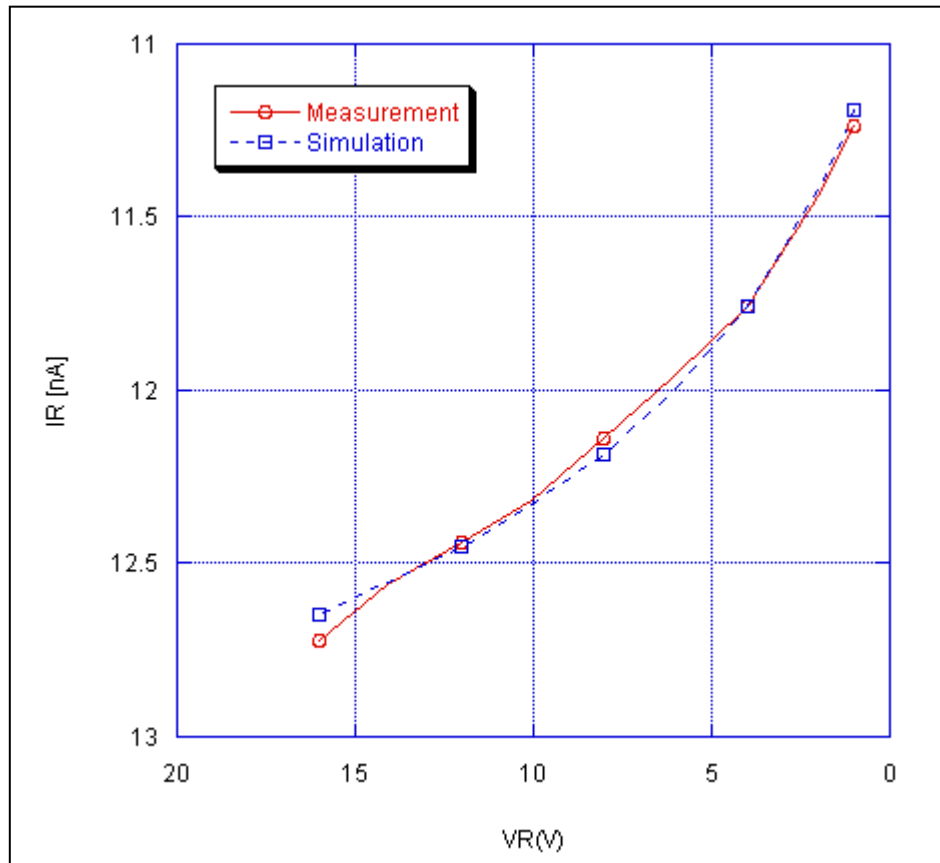


Evaluation circuit



Circuit simulation result

Comparison graph

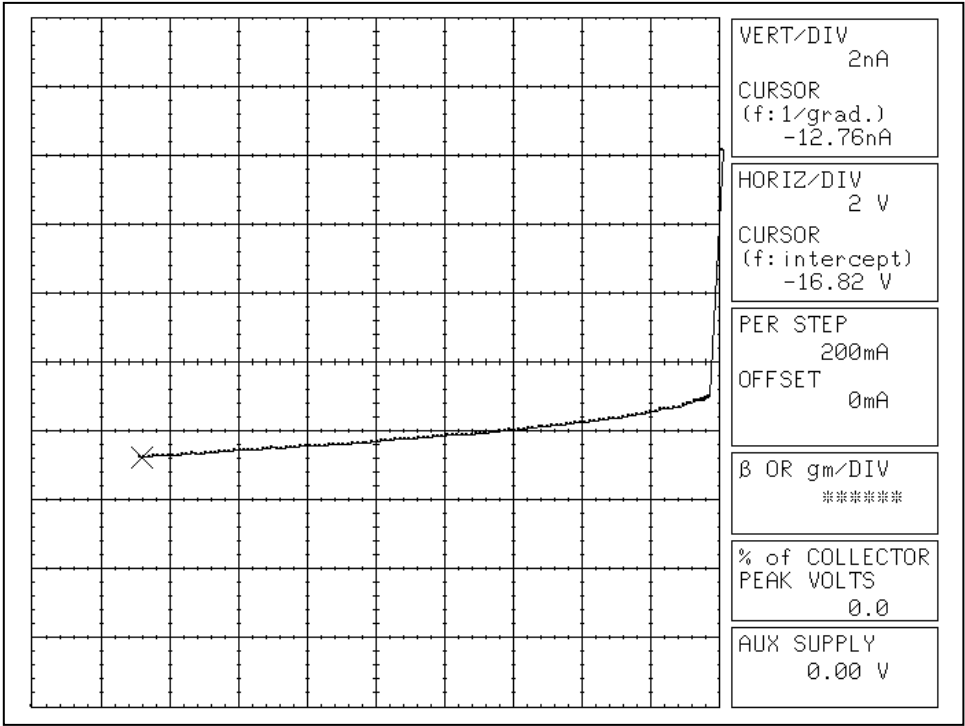


Simulation Result

V_R (V)	I_R (nA)		Error (%)
	Measurement	Simulation	
1.000	11.240	11.190	-0.445
1.940	11.420	11.404	-0.140
3.980	11.760	11.756	-0.034
6.060	11.960	12.002	0.351
8.020	12.140	12.186	0.379
10.080	12.320	12.329	0.073
12.000	12.440	12.449	0.072
14.080	12.560	12.555	-0.040
16.000	12.720	12.650	-0.550

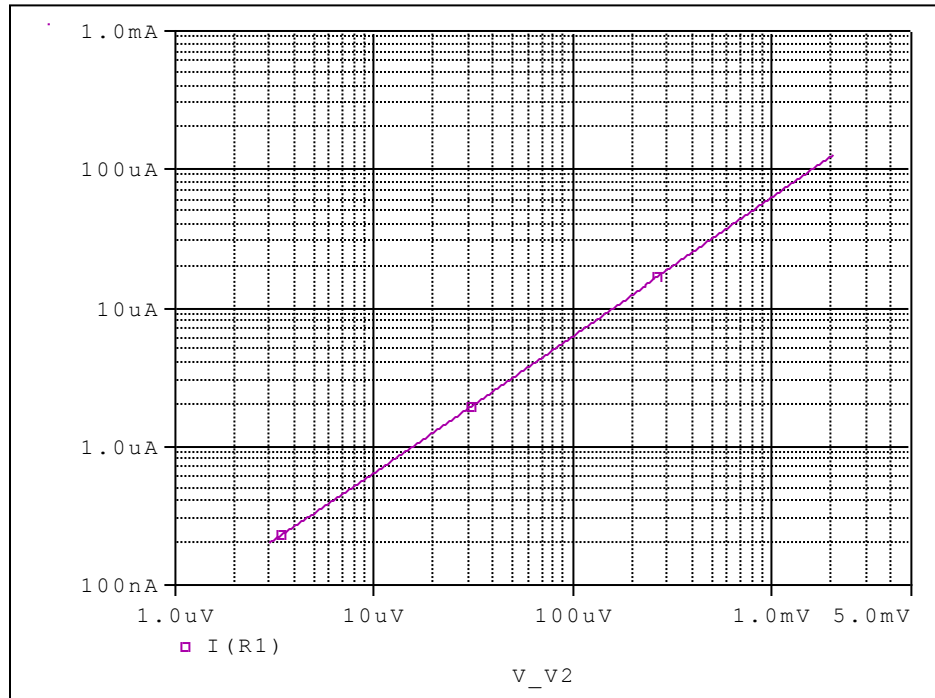
Dark Current Characteristic

Reference

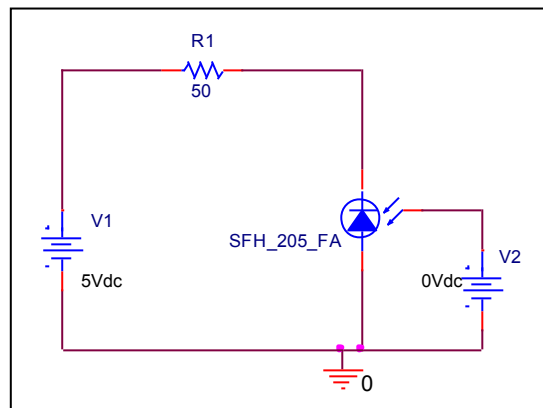


Radiant Energy (E_e) vs. Photocurrent (I_p)

Circuit simulation result

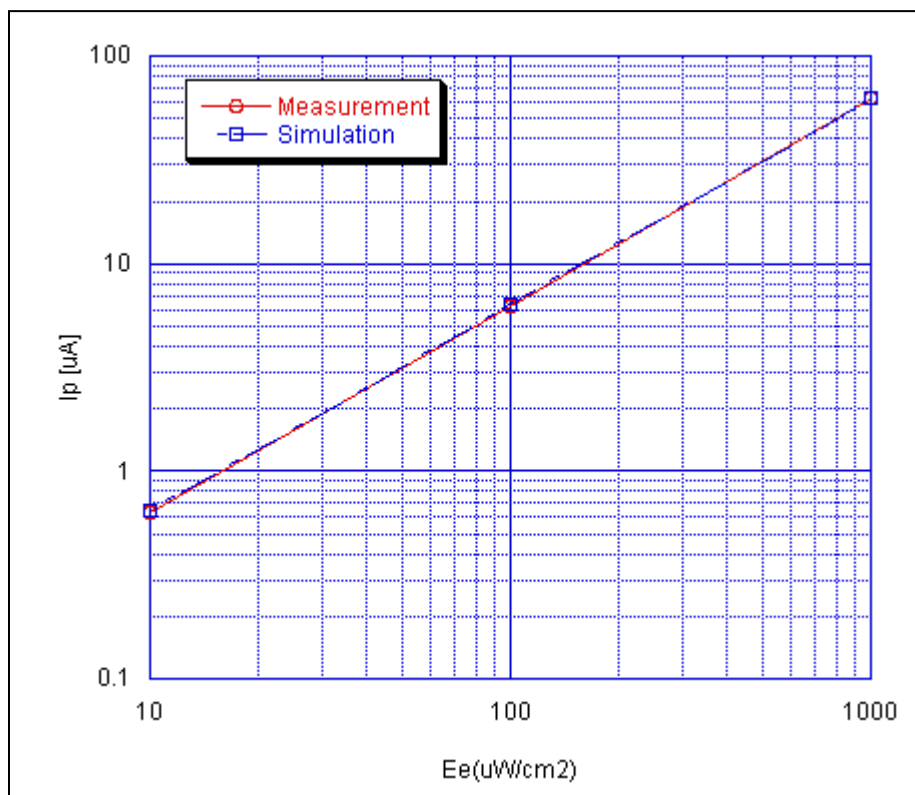


Evaluation circuit



Circuit simulation result

Comparison graph

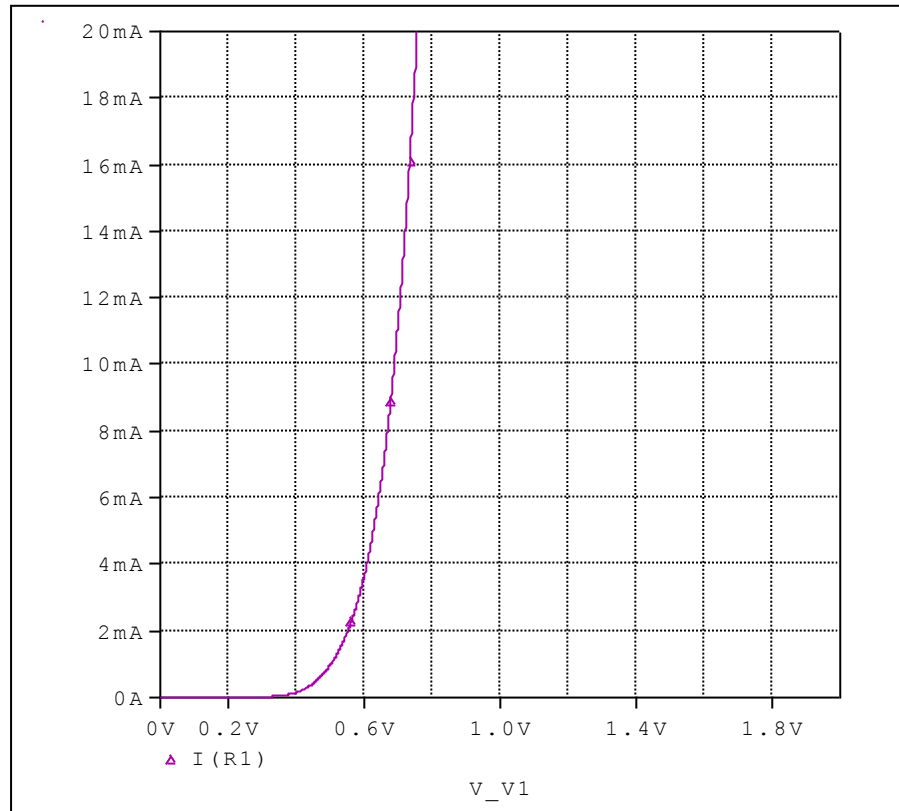


Simulation Result

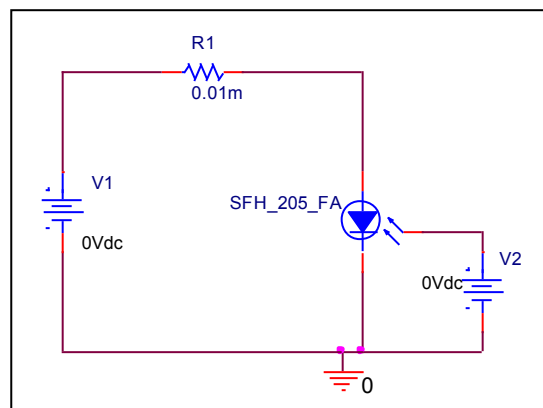
E_e (uW/cm ²)	I_p (uF)		
	Measurement	Simulation	Error (%)
10.000	0.630	0.642	1.888
100.000	6.300	6.312	0.189
1000.000	63.000	63.012	0.019

Forward Current Characteristic

Circuit simulation result

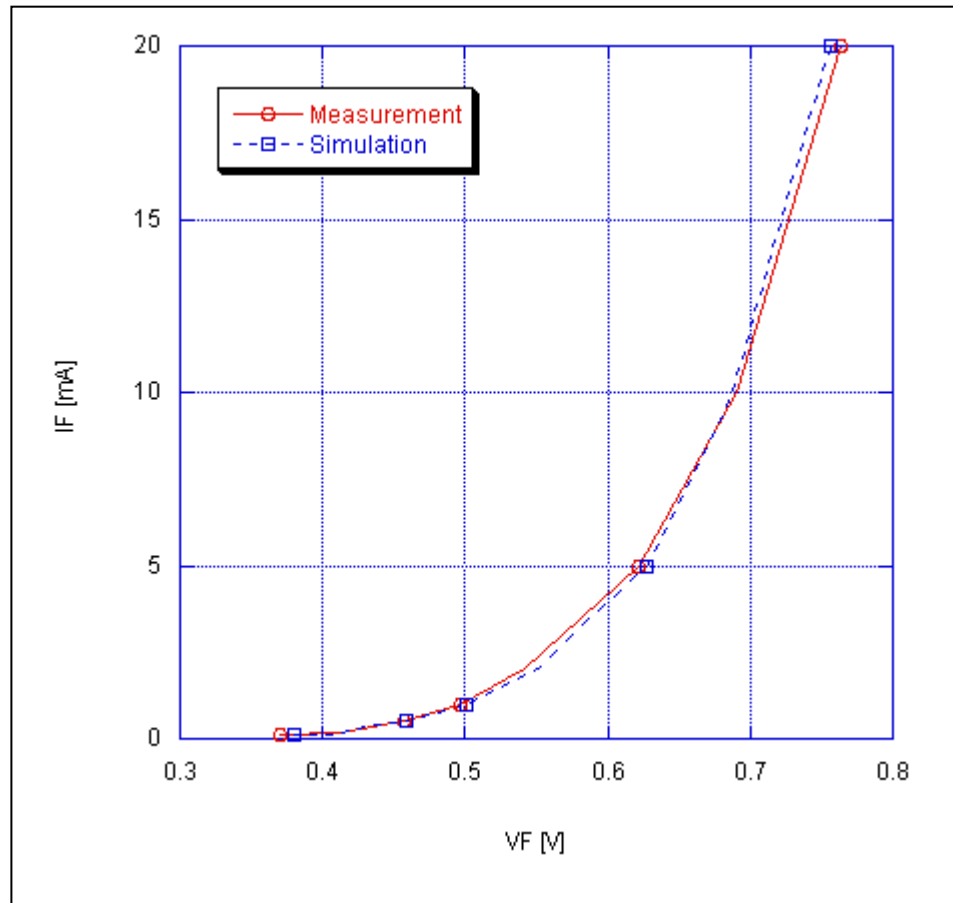


Evaluation circuit



Circuit simulation result

Comparison graph

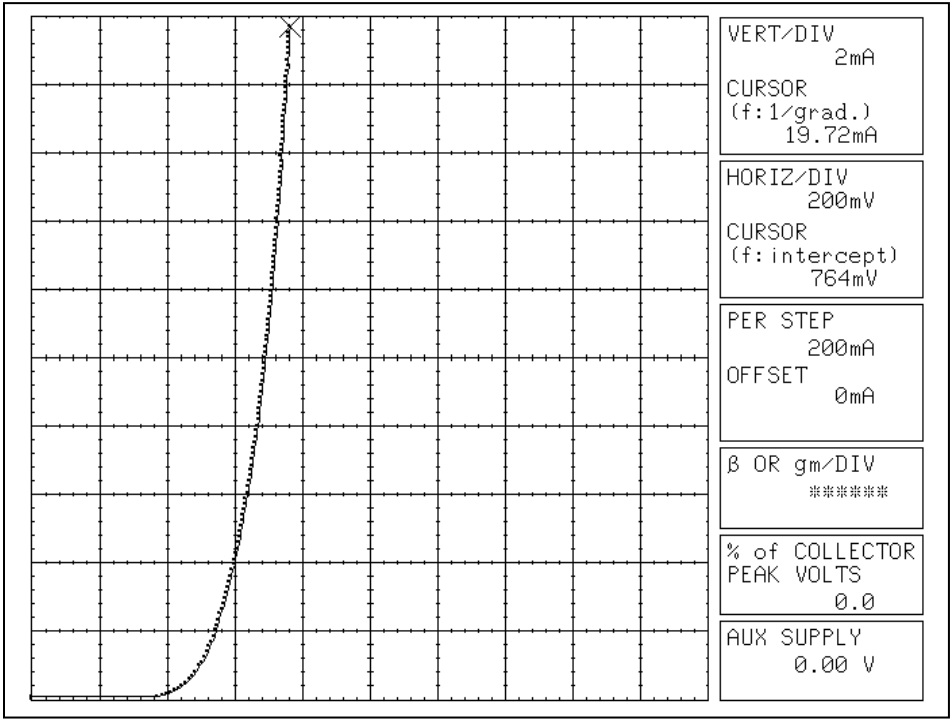


Simulation Result

I_F (mA)	V_F (V)		Error (%)
	Measurement	Simulation	
0.100	0.370	0.380	2.737
0.200	0.412	0.412	-0.027
0.500	0.458	0.459	0.180
1.000	0.496	0.501	1.047
2.000	0.542	0.551	1.720
5.000	0.622	0.627	0.754
10.000	0.690	0.688	-0.223
20.000	0.764	0.756	-1.092

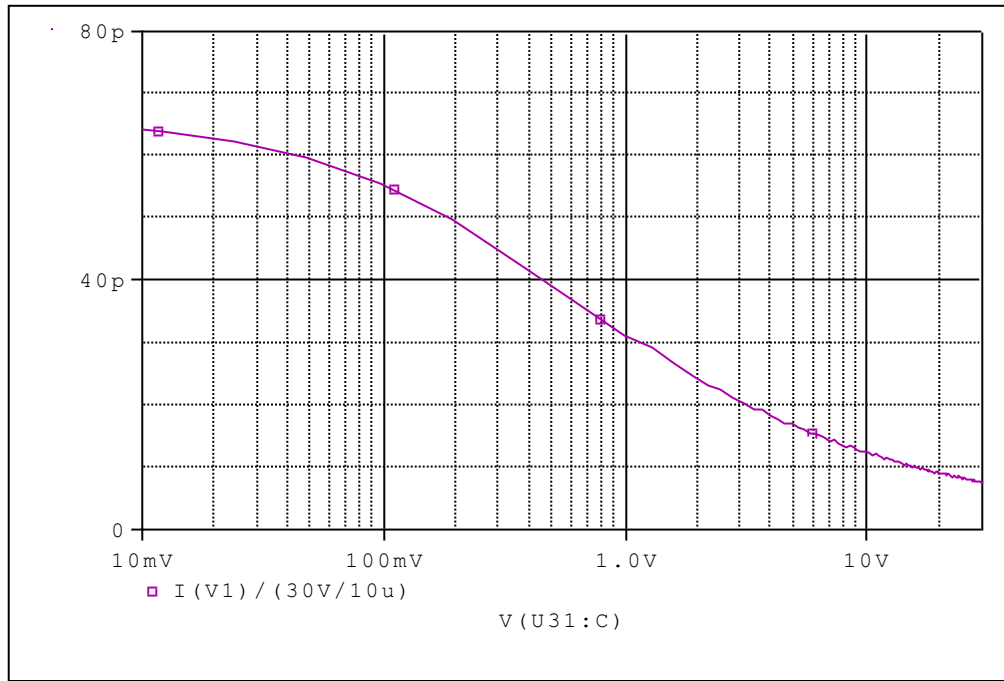
Forward Current Characteristic

Reference

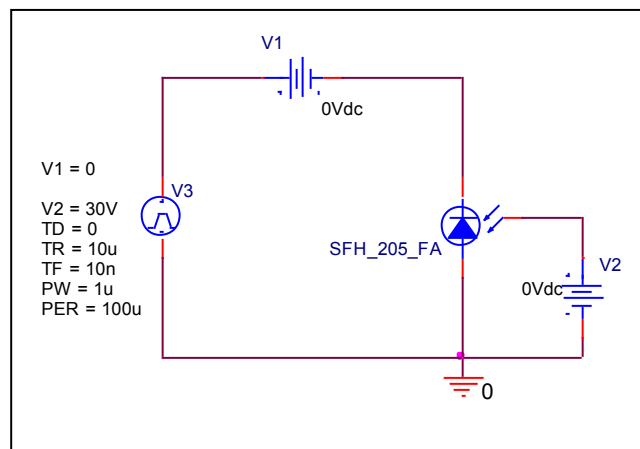


Junction Capacitance Characteristic

Circuit simulation result

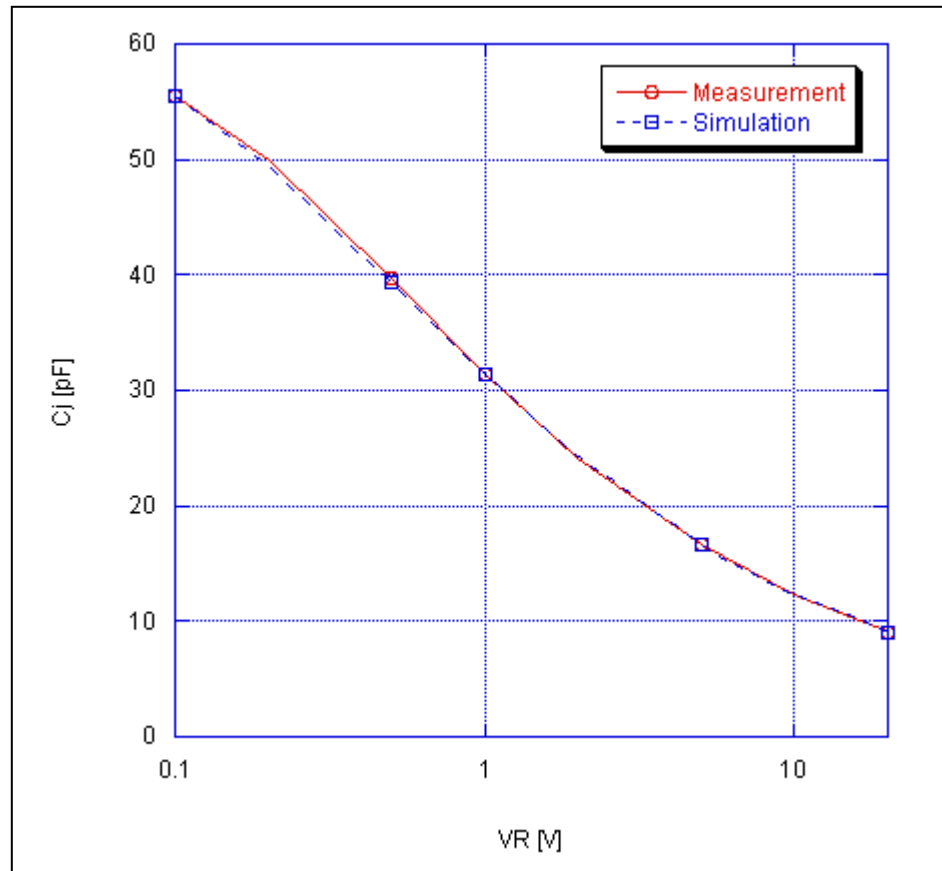


Evaluation circuit



Circuit simulation result

Comparison graph



Simulation Result

V_R (V)	C_j (pF)		Error (%)
	Measurement	Simulation	
0.100	55.500	55.465	-0.063
0.200	50.000	49.452	-1.096
0.500	39.700	39.363	-0.849
1.000	31.450	31.456	0.019
2.000	24.180	24.294	0.471
5.000	16.600	16.643	0.259
10.000	12.320	12.323	0.024
20.000	9.000	9.078	0.862