

Device Modeling Report

COMPONENTS:

DIODE/GENERALPURPOSE RECTIFIER/ PROFESSIONAL

PART NUMBER: D3SB80

MANUFACTURER: SHINDENGEN

REMARK: TC=25C

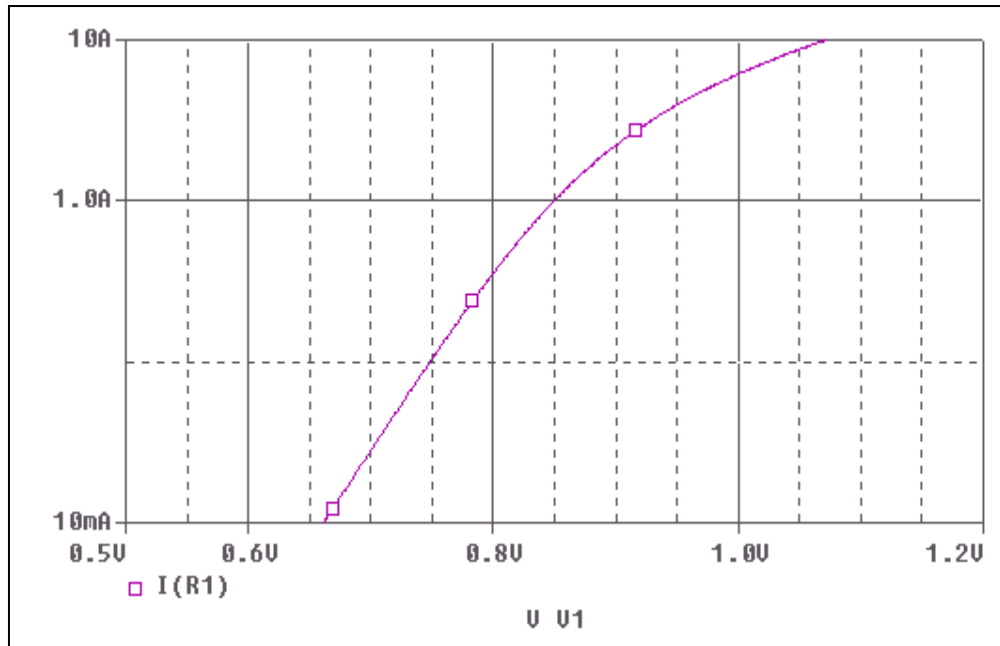


Bee Technologies Inc.

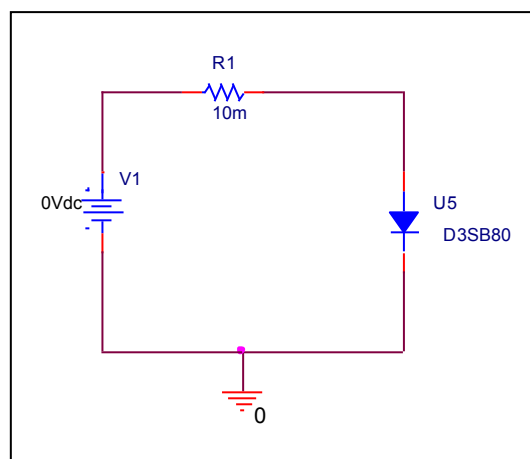
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

Circuit Simulation Result

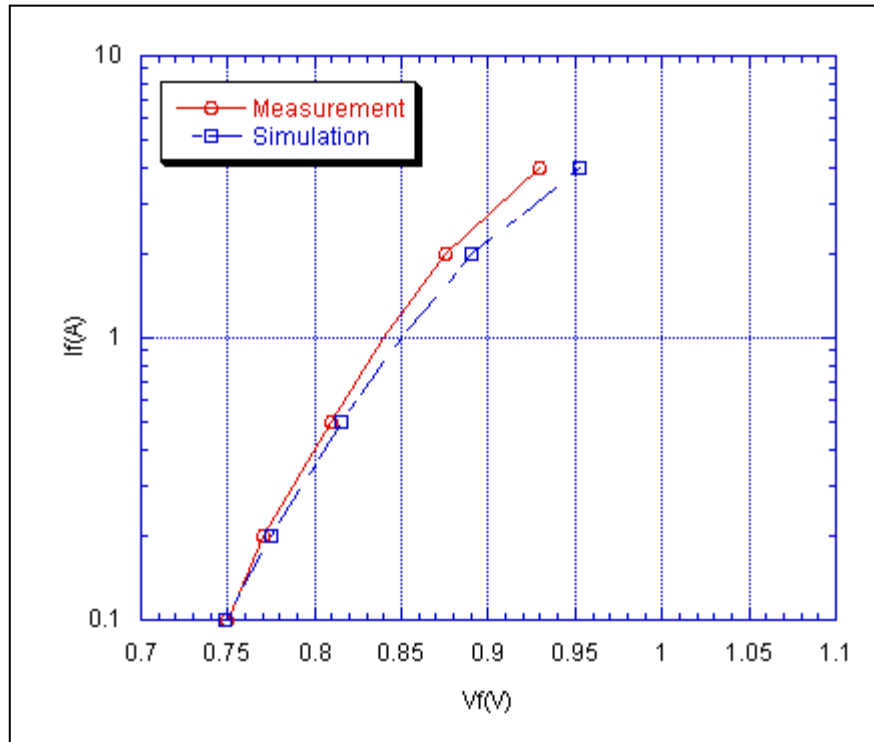


Evaluation circuit



Comparison graph

Circuit Simulation Result

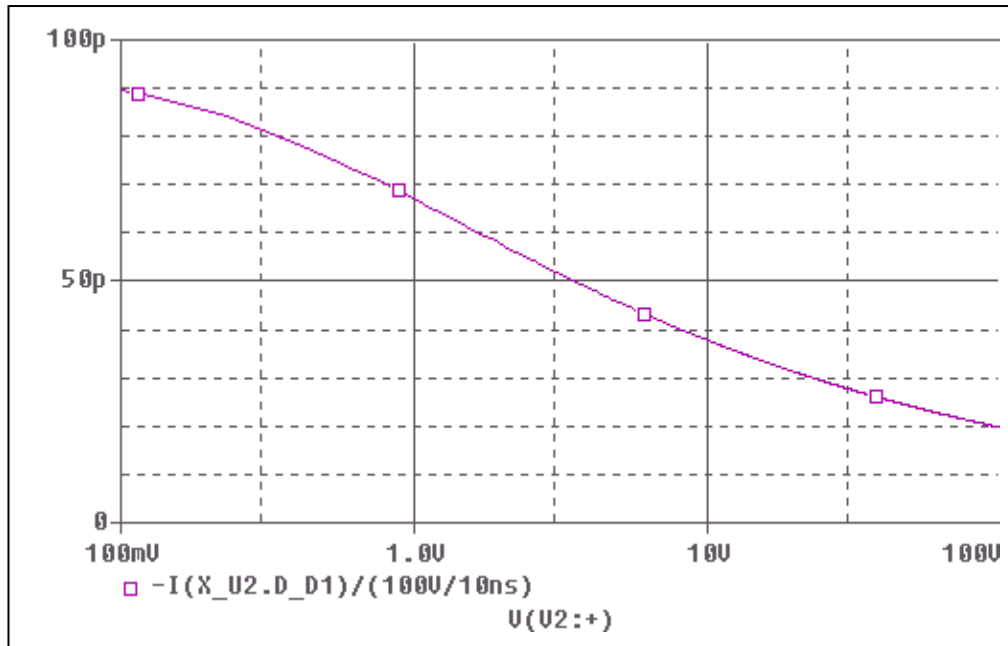


Simulation Result

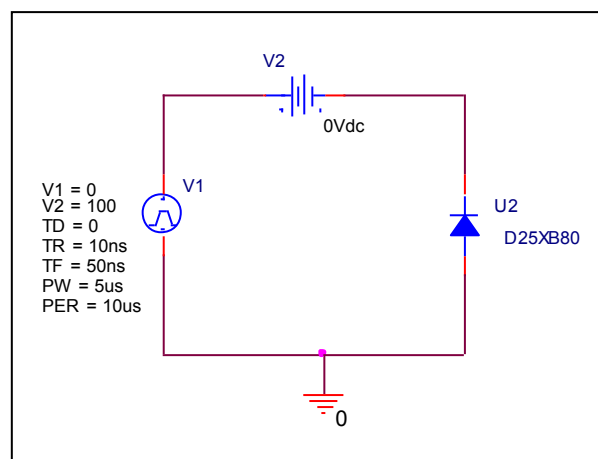
Ifwd (A)	Vfwd(V) Measurement	Vfwd(V) Simulation	%Error
0.1	0.750	0.748	0.27
0.2	0.770	0.775	-0.65
0.5	0.810	0.815	-0.62
1	0.840	0.850	-1.19
2	0.875	0.890	-1.71
4	0.930	0.952	-2.37

Junction Capacitance Characteristic

Circuit Simulation Result

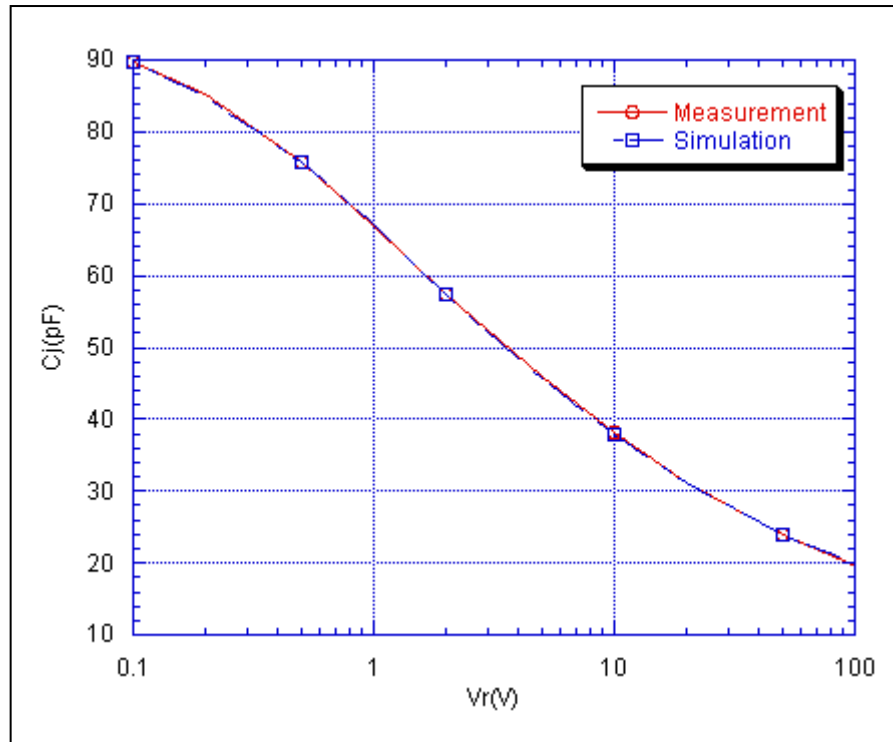


Evaluation circuit



Comparison graph

Circuit Simulation Result

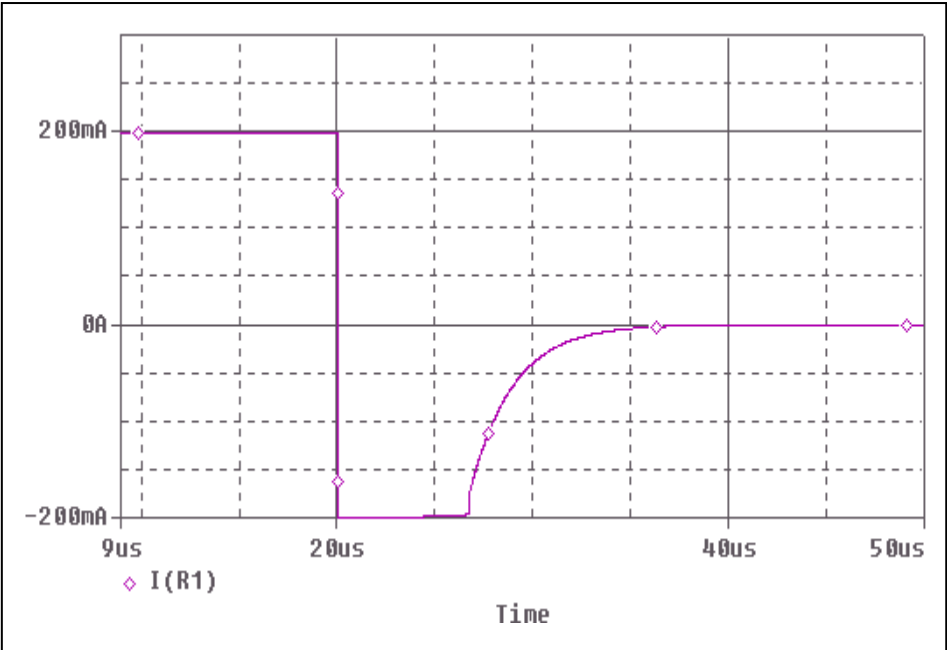


Simulation Result

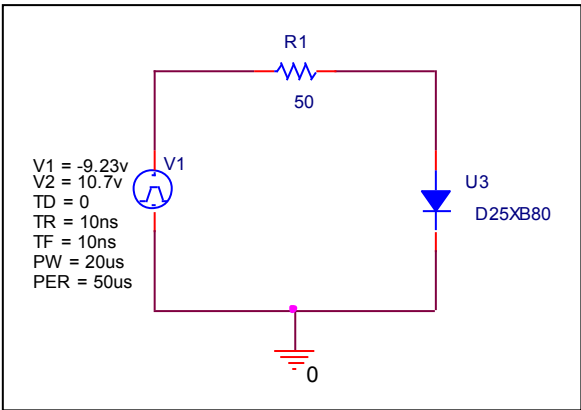
Vrev (V)	Cj(pF) Measurement	Cj(pF) Simulation	%Error
0.1	89.748	89.676	0.08
0.2	85.335	85.011	0.38
0.5	75.662	75.880	-0.29
1	66.916	67.050	-0.20
2	57.441	57.399	0.07
5	45.863	45.563	0.65
10	38.075	37.792	0.74
20	31.252	31.177	0.24
50	23.868	24.000	-0.55
100	19.424	19.733	-1.59

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation circuit

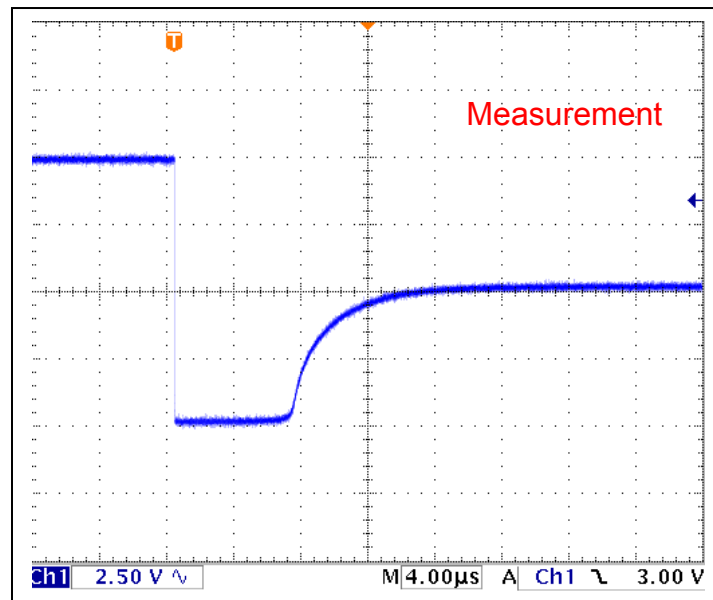


Compare Measurement vs. Simulation

	Measurement		Simulation		Error (%)
trj	6.56	us	6.57	us	0.152
trb	4.96	us	4.93	us	0.504

Reverse Recovery Characteristic

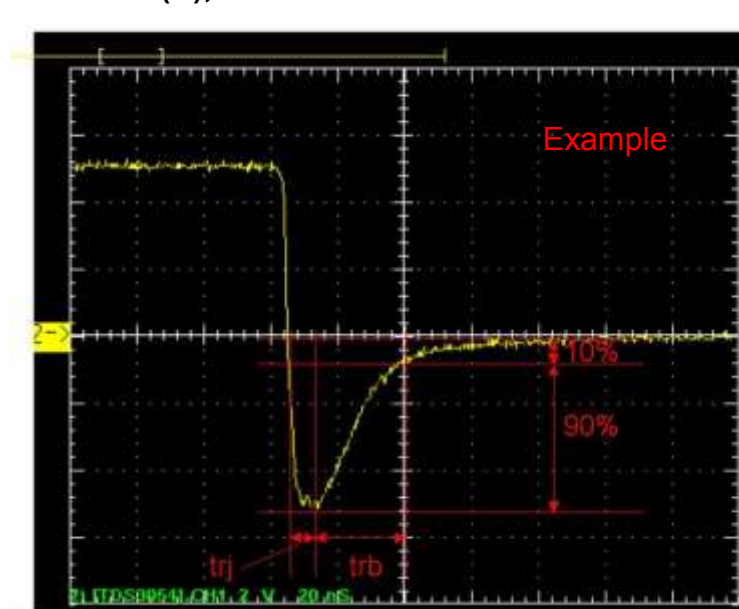
Reference



$tr_j = 6.56(\mu s)$

$tr_b = 4.96(\mu s)$

Conditions: $I_{fwd} = I_{rev} = 0.2(A)$, $R_I = 50$



Relation between tr_j and tr_b