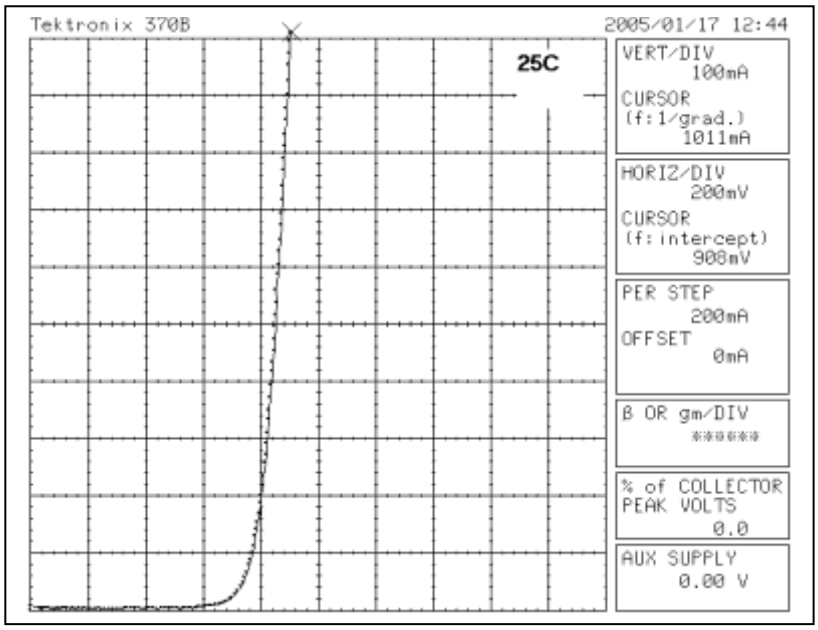
Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER / STANDARD
PART NUMBER: 1SR139-600
MANUFACTURER: ROHM
REMARK: TC=25C

Bee Technologies Inc.

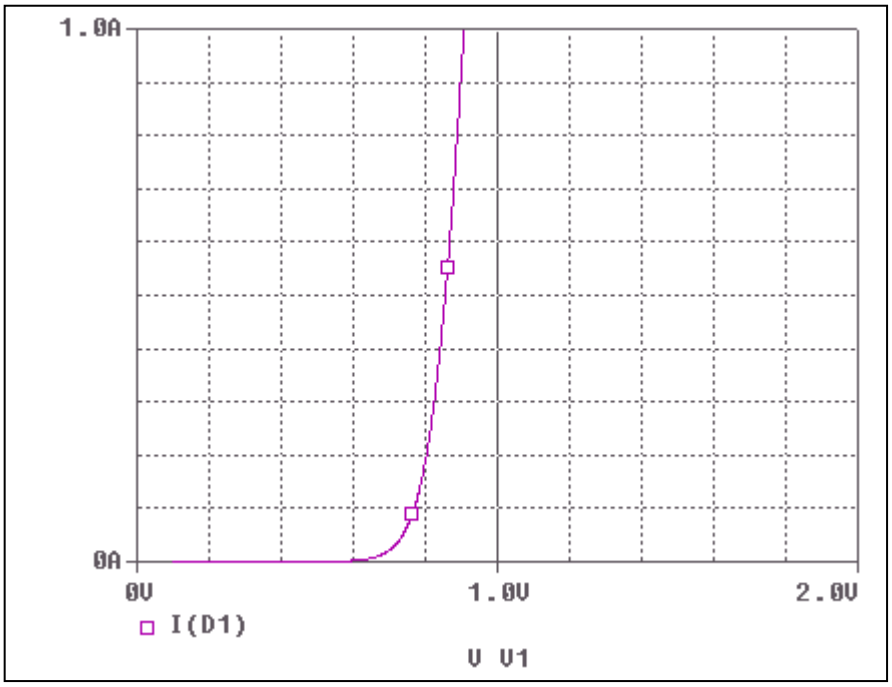
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic Reference

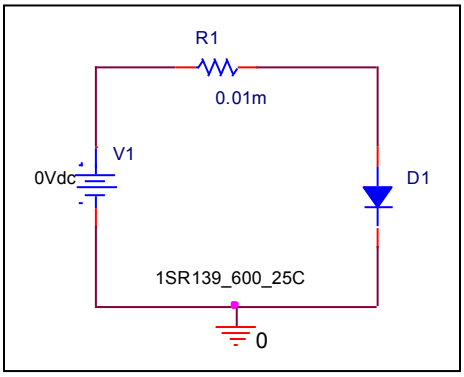


Forward Current Characteristic

Circuit Simulation Result

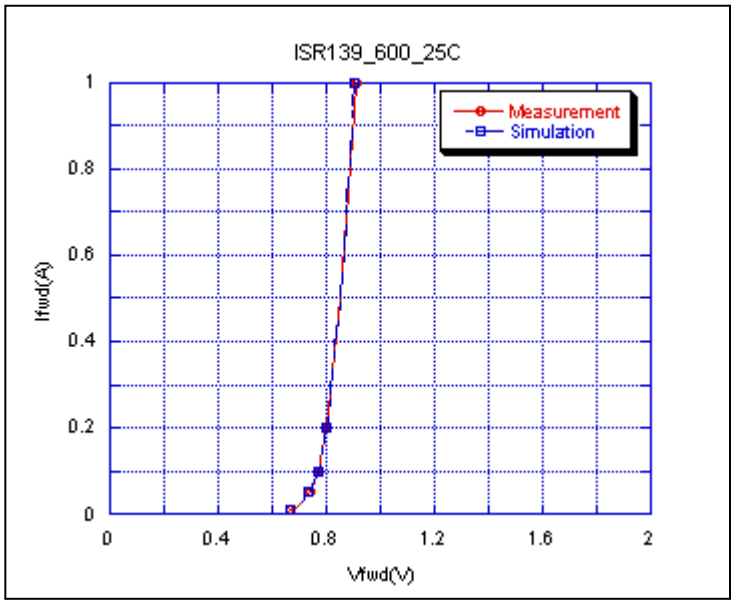


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

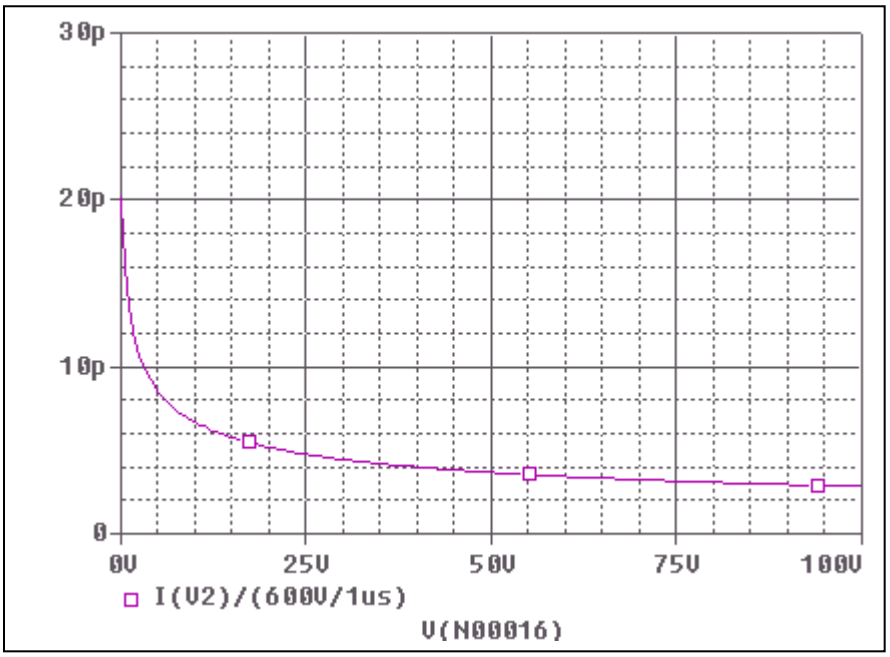


Simulation Result

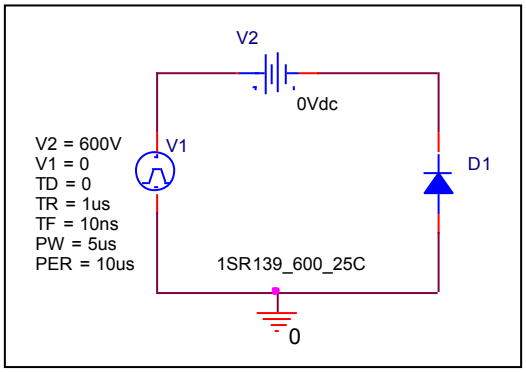
Ifwd(A)	Vfwd(V) Measurement	Vfwd(V) Simulation	%Error
0.01	0.665	0.666	-0.15
0.02	0.696	0.696	0.00
0.05	0.740	0.736	0.54
0.1	0.770	0.768	0.26
0.2	0.802	0.802	0.00
0.5	0.852	0.855	-0.35
1	0.908	0.906	0.22

Capacitance Characteristic

Circuit Simulation Result

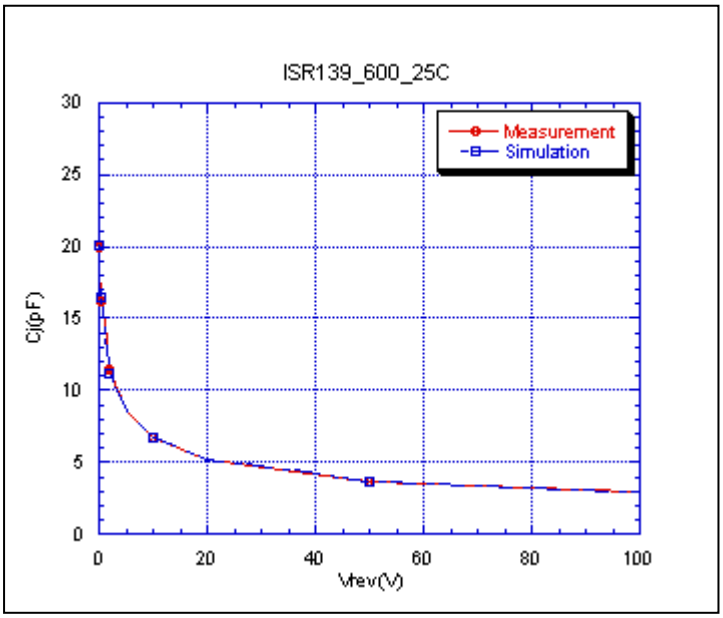


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

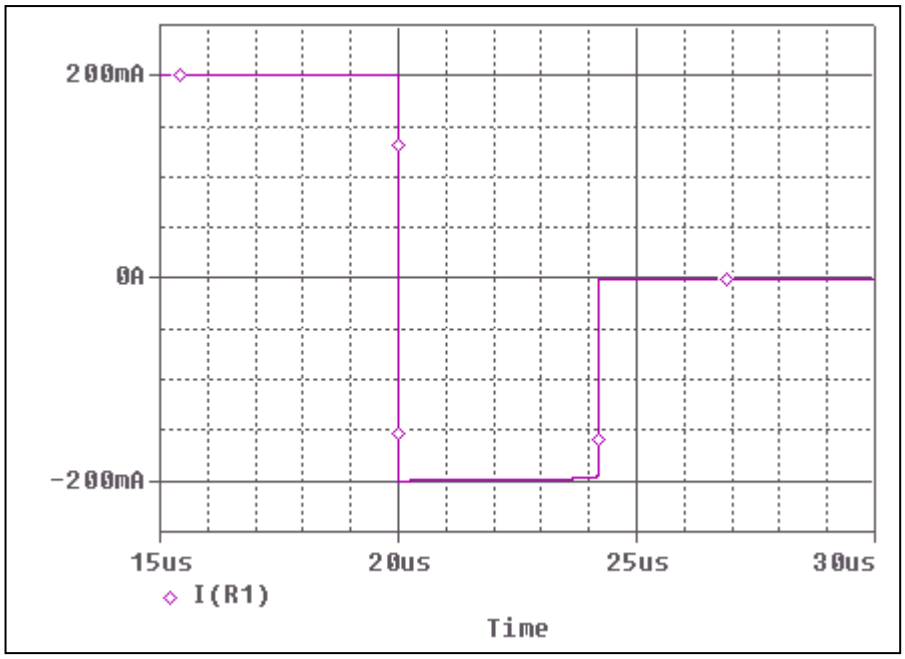


Simulation Result

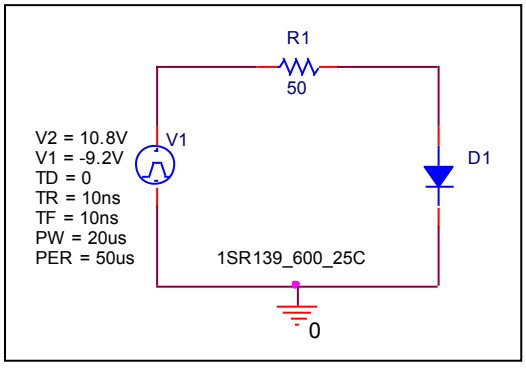
Vrev(V)	Cj(pF) Measurement	Cj(pF) Simulation	%Error
0	21.847	21.847	0.00
0.1	19.950	20.131	-0.91
0.2	18.746	18.974	-1.22
0.5	16.163	16.478	-1.95
1	14.830	14.532	2.01
2	11.433	11.230	1.78
5	8.559	8.577	-0.21
10	6.710	6.709	0.01
20	5.186	5.190	-0.08
50	3.642	3.678	-0.99
100	2.786	2.829	-1.54

Reverse Recovery Characteristic

Circuit Simulation Result



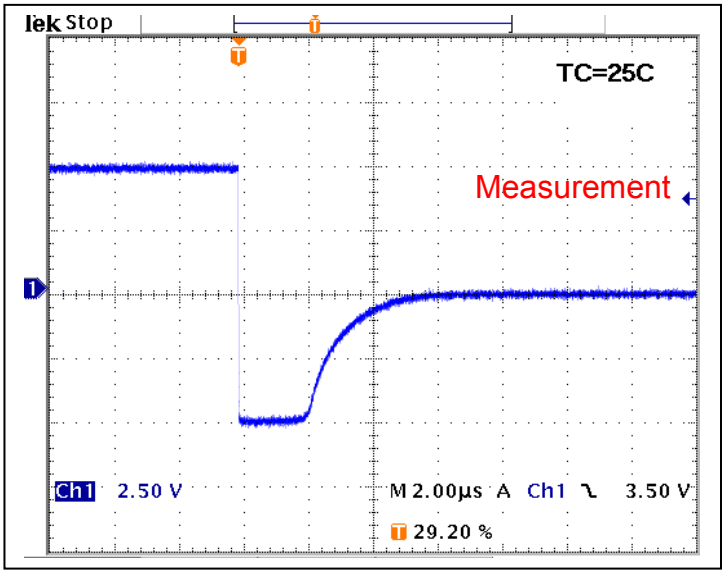
Evaluation Circuit



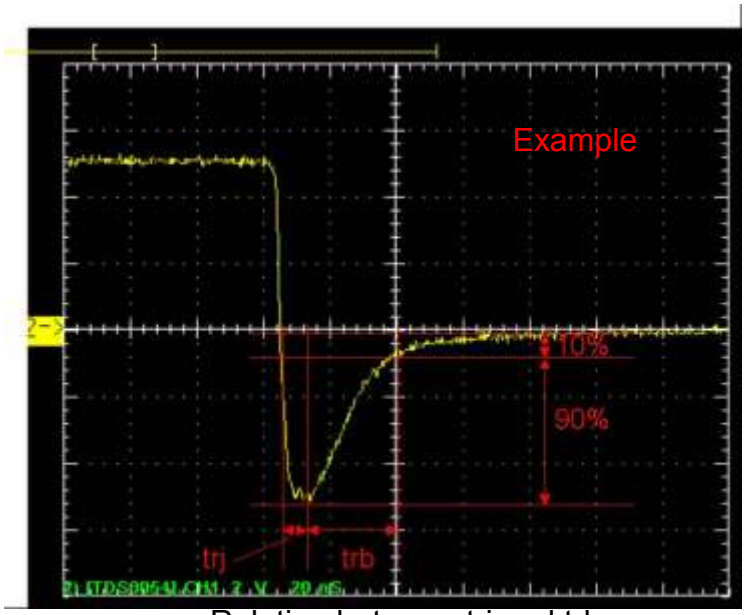
Compare Measurement vs. Simulation

	Measurement		Simulation		%Error
trr	**4.16**	**us**	**4.18**	**us**	**0.48**

Reverse Recovery Characteristic Reference



Trj =1.96(us)
Trb=2.20(us)
Conditions: Ifwd=Irev=0.2(A), Rl=50



Relation between trj and trb