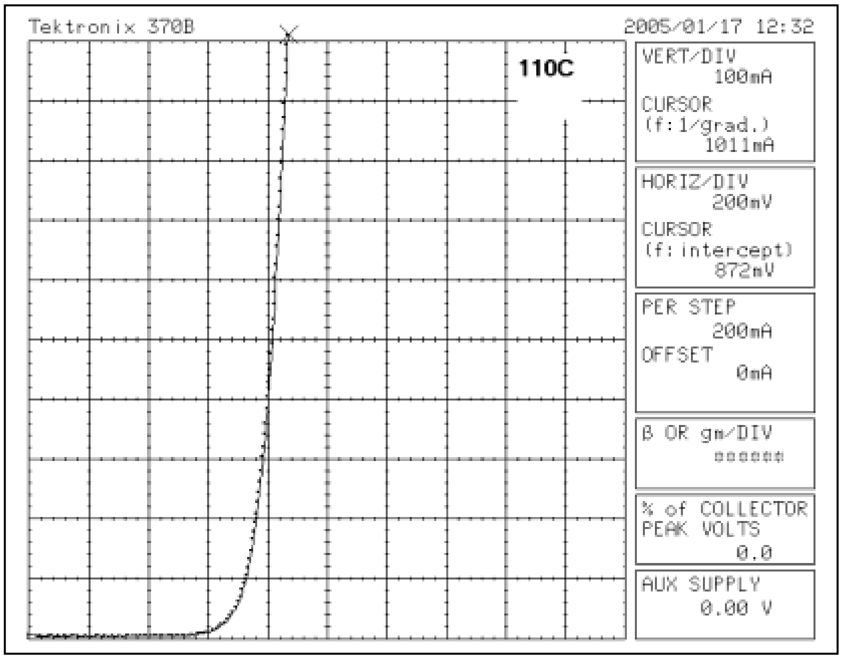
Device Modeling Report

COMPONENTS:
DIODE/ GENERAL PURPOSE RECTIFIER / PROFESSIONAL
PART NUMBER: 1SR139-600
MANUFACTURER: ROHM
REMARK: TC=110C

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



Tektronix 370B

2005/01/17 12:32

VERT/DIV
100mA
CURSOR
(f:1/grad.)
1011mA

HORIZ/DIV
200mV
CURSOR
(f: intercept)
872mV

PER STEP
200mA
OFFSET
0mA

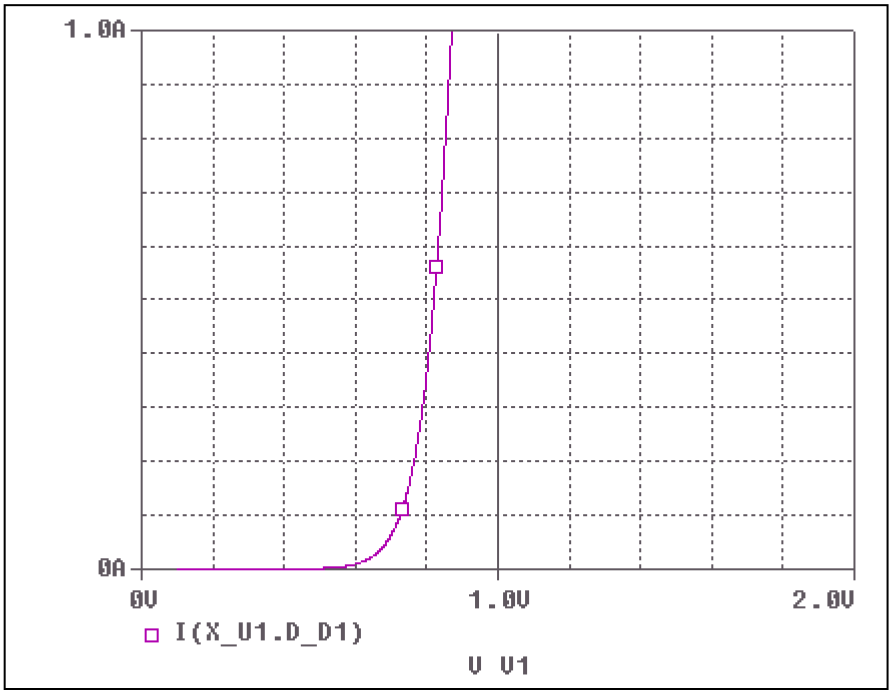
β OR gm/DIV
######

% of COLLECTOR
PEAK VOLTS
0.0

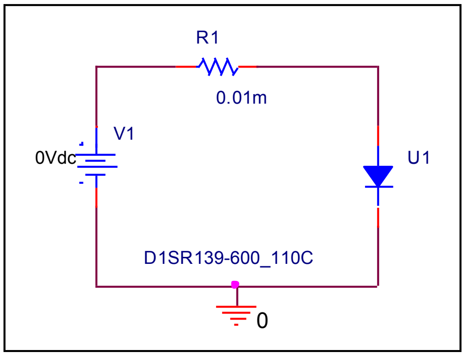
AUX SUPPLY
0.00 V

Forward Current Characteristic

Circuit Simulation Result

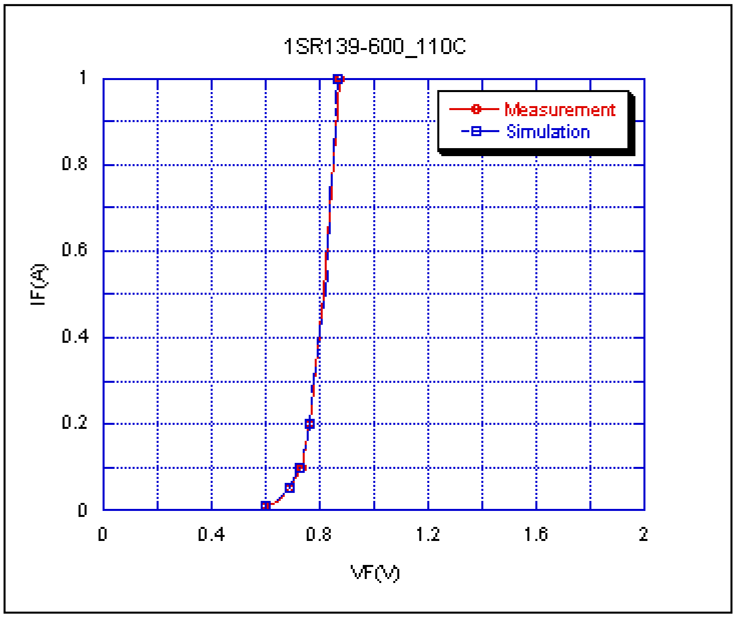


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

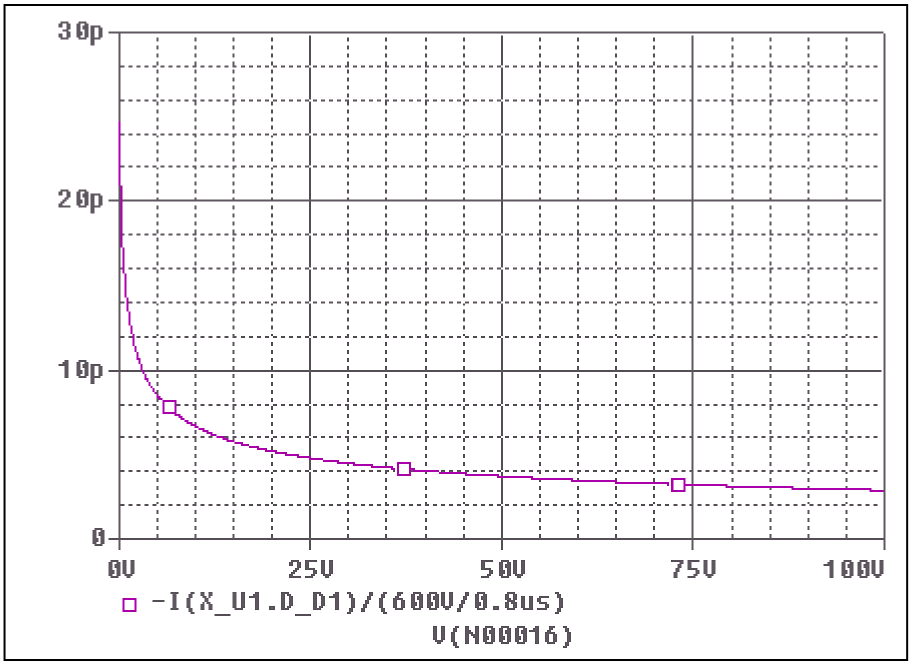


Simulation Result

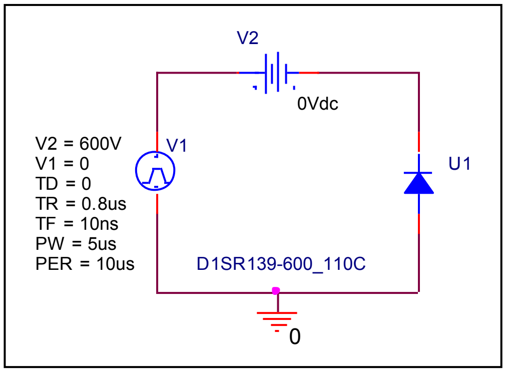
Ifwd(A)	Vfwd(V) Measurement	Vfwd(V) Simulation	%Error
0.01	0.598	0.602	-0.67
0.02	0.642	0.638	0.62
0.05	0.688	0.687	0.15
0.1	0.730	0.725	0.68
0.2	0.762	0.764	-0.26
0.5	0.816	0.820	-0.49
1	0.872	0.870	0.23

Capacitance Characteristic

Circuit Simulation Result

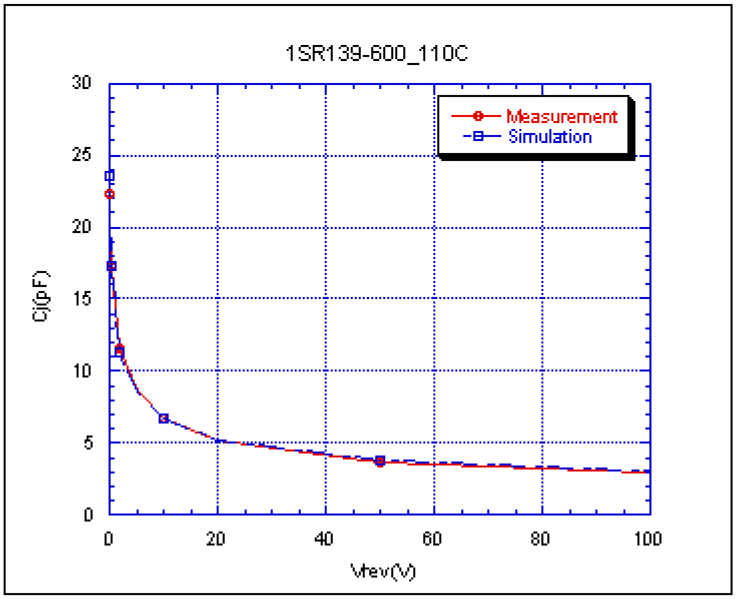


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

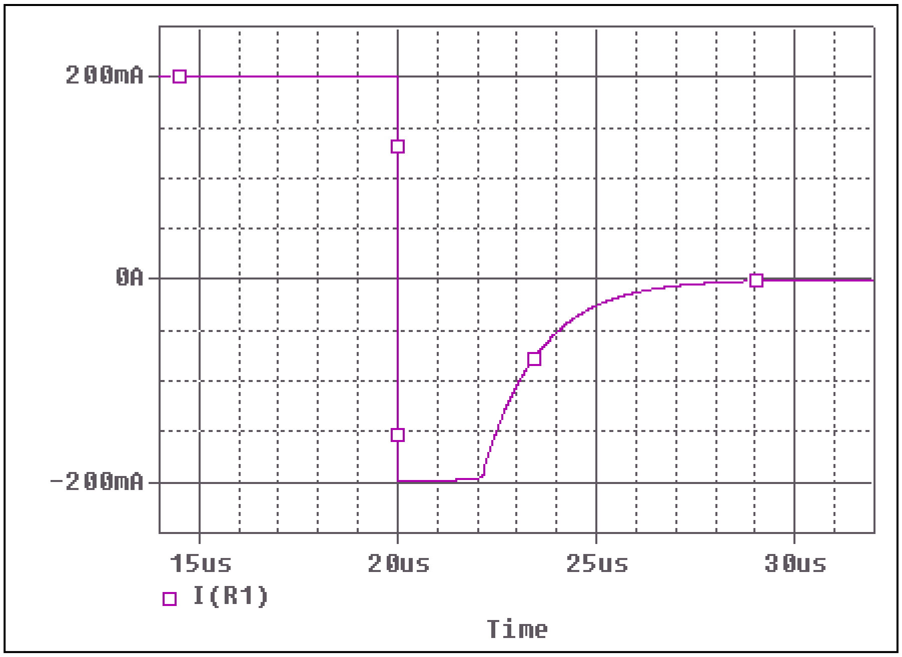


Simulation Result

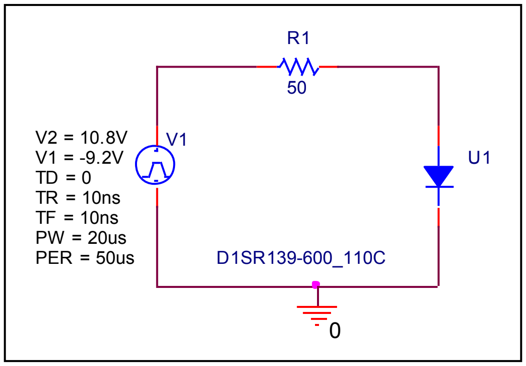
Vrev(V)	Cj(pF) Measurement	Cj(pF) Simulation	%Error
0	25.052	25.052	0.00
0.1	22.307	23.500	-5.35
0.2	20.545	20.940	-1.92
0.5	17.305	17.240	0.38
1	14.307	14.440	-0.93
2	11.644	11.367	2.38
5	8.654	8.542	1.29
10	6.749	6.676	1.08
20	5.200	5.203	-0.06
50	3.644	3.721	-2.11
100	2.782	2.880	-3.52

Reverse Recovery Characteristic

Circuit Simulation Result



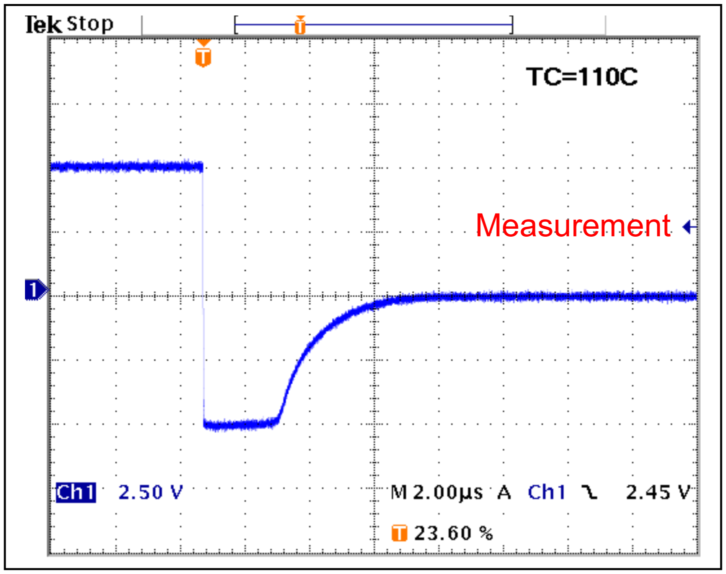
Evaluation Circuit



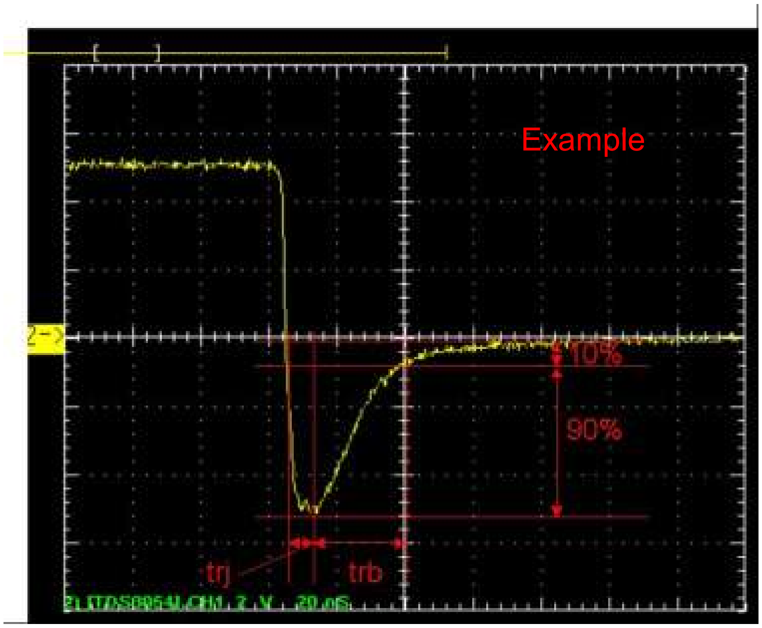
Compare Measurement vs. Simulation

	Measurement		Simulation		%Error
trj	**2.12**	**us**	**2.13**	**us**	**0.47**
trb	**3.20**	**us**	**3.21**	**us**	**0.31**

Reverse Recovery Characteristic Reference



Trj =2.12(us)
Trb=3.20(us)
Conditions: Ifwd=Irev=0.2(A), Rl=50



Relation between trj and trb