Device Modeling Report

COMPONENTS: Light-Emitting Diode (LED) Professional
PART NUMBER: OSWT5161A
MANUFACTURER: OPTO SUPPLY
REMARK: TA=25 degree C

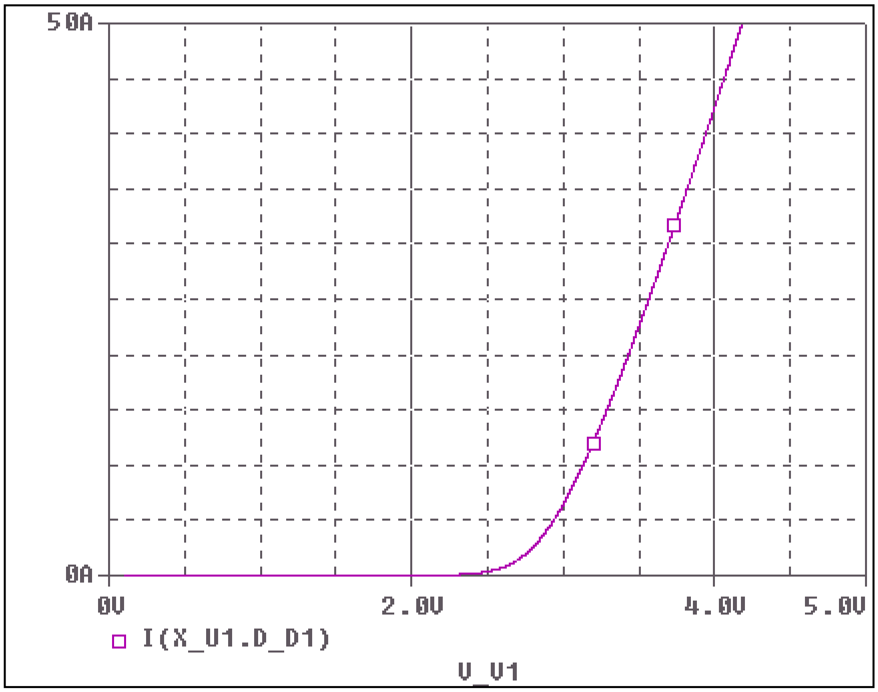
Bee Technologies

Bee Technologies Inc.

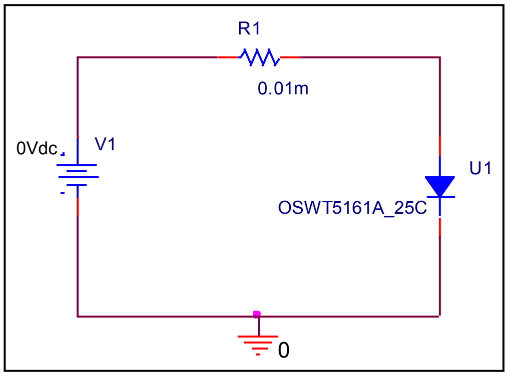
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

Circuit Simulation Result

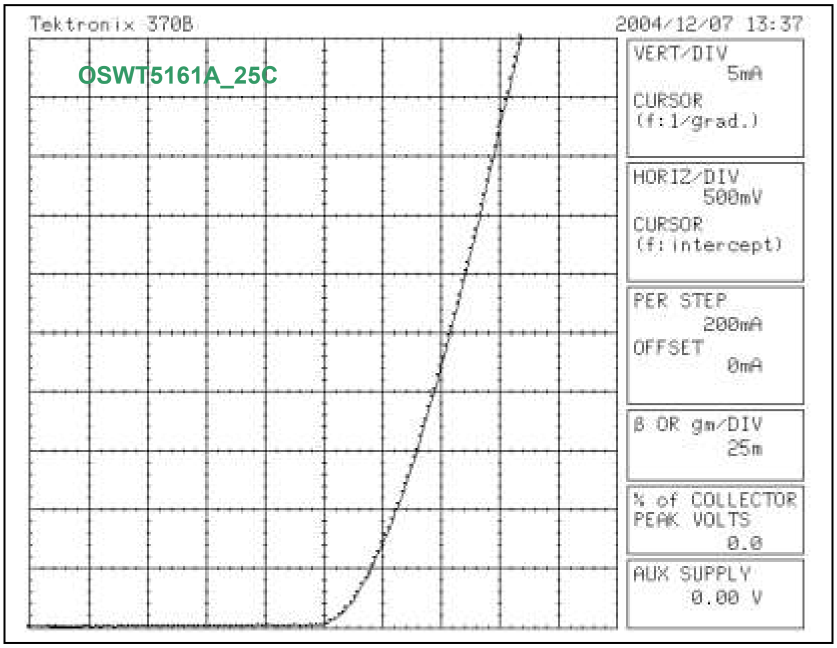


Evaluation Circuit



Forward Current Characteristic

Reference



Tektronix 370B
2004/12/07 13:37

VERT/DIV 5mA
CURSOR (f:1/grad.)

HORIZ/DIV 500mV
CURSOR (f: intercept)

PER STEP 200mA
OFFSET 0mA

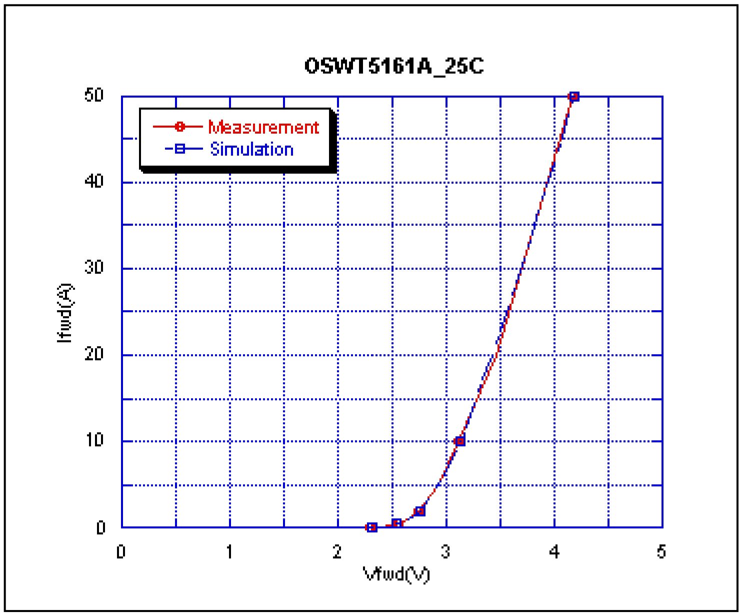
β OR gm/DIV 25m

% of COLLECTOR PEAK VOLTS 0.0

AUX SUPPLY 0.00 V

Comparison Graph

Circuit Simulation Result

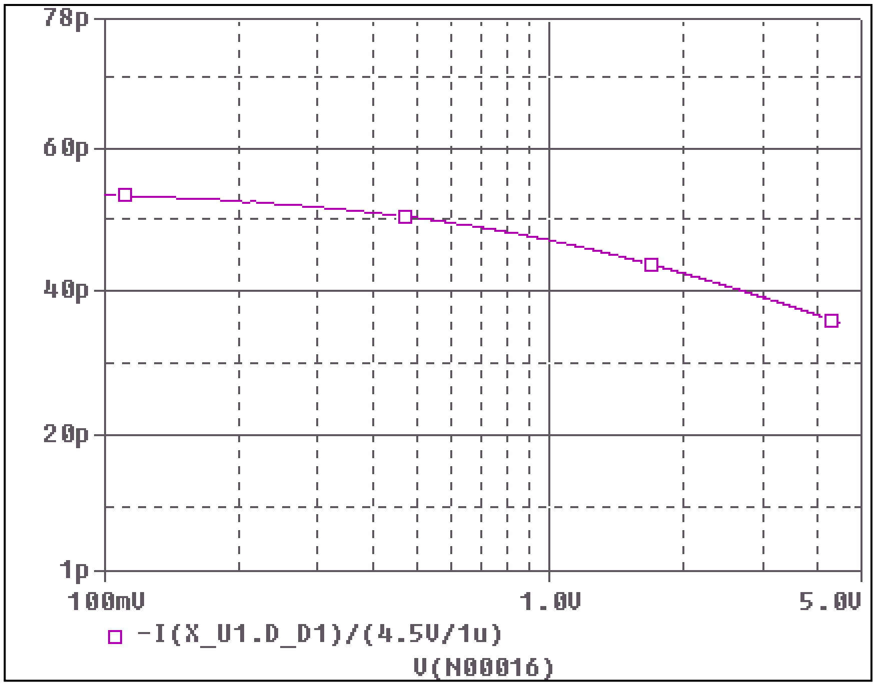


Simulation Result

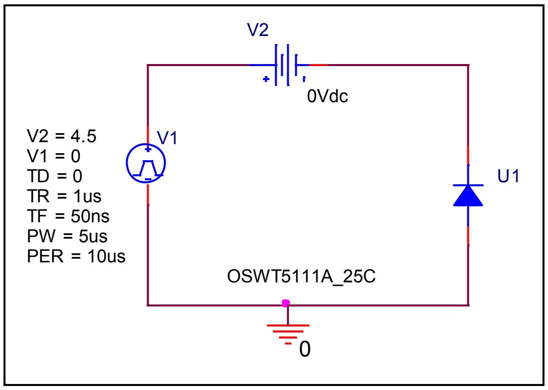
Ifwd(A)	Vfwd(V) Measurement	Vfwd(V) Simulation	%Error
0.1	2.3	2.32	0.8695
0.2	2.45	2.42	1.2244
0.5	2.565	2.54	0.9746
1	2.645	2.644	0.0378
2	2.74	2.754	0.5109
5	2.925	2.935	0.3418
10	3.115	3.136	0.6741
20	3.455	3.43	0.7235
50	4.175	4.18	0.1197

Capacitance Characteristic

Circuit Simulation Result

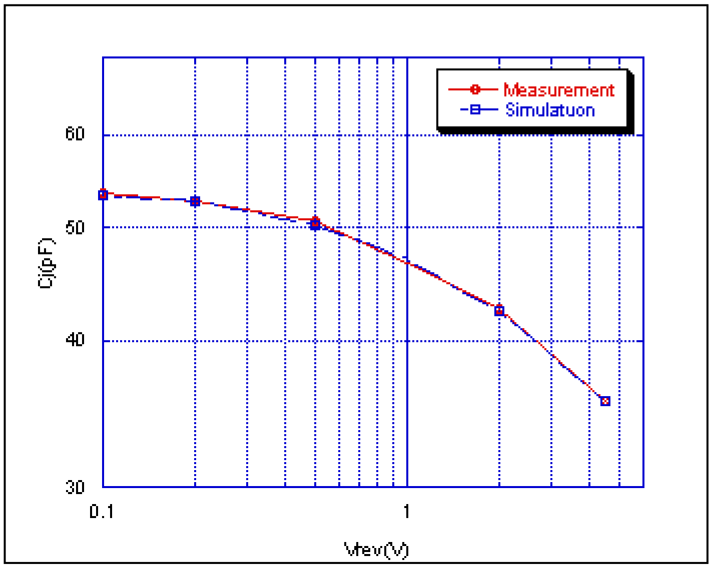


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

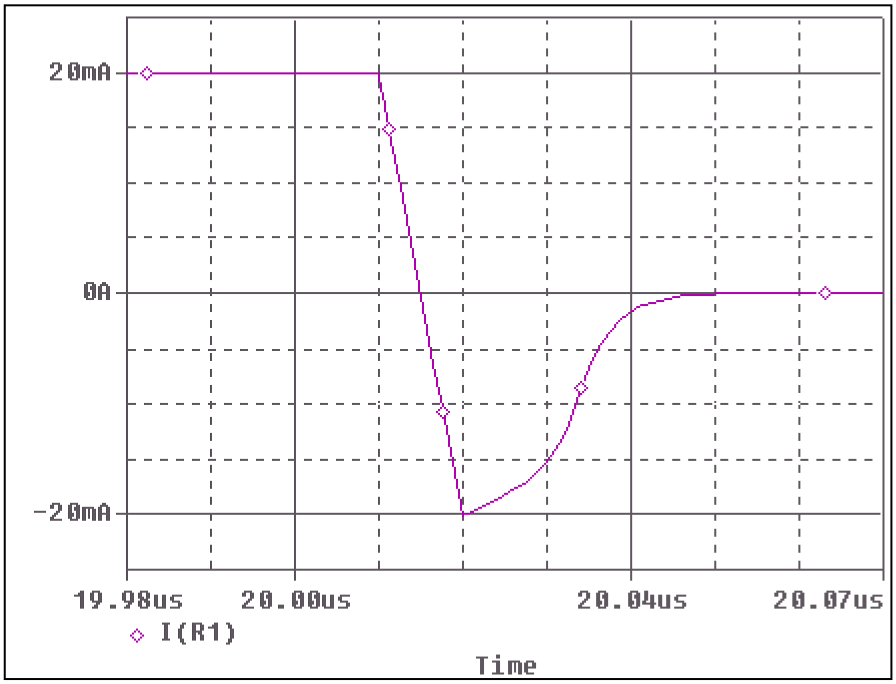


Simulation Result

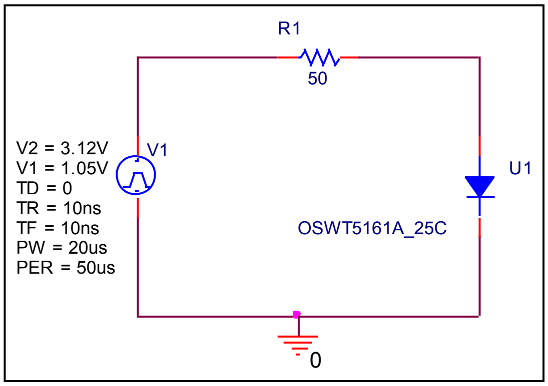
Vrev(V)	Cj(pF) Measurement	Cj(pF) Simulation	%Error
0	54.07	54.07	0
0.1	53.44	53.37	0.13098
0.2	52.78	52.577	0.38461
0.5	50.55	50.245	0.60336
1	46.68	47.006	0.69837
2	42.54	42.481	0.13869
4.5	35.59	35.583	0.01966

Reverse Recovery Characteristic

Circuit Simulation Result



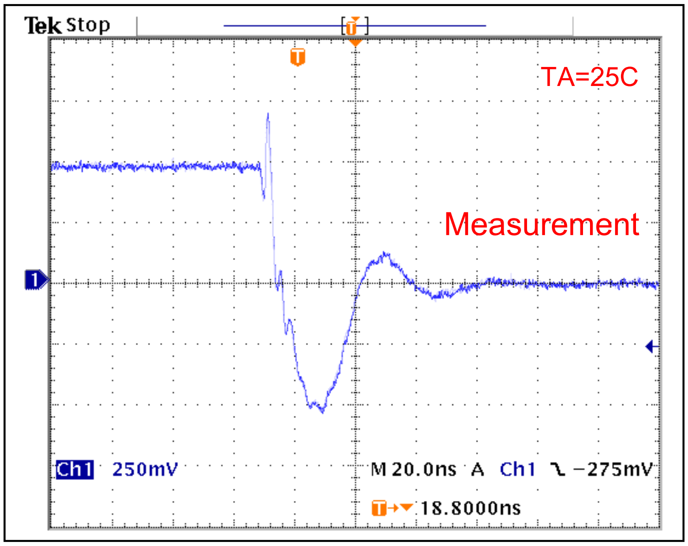
Evaluation Circuit



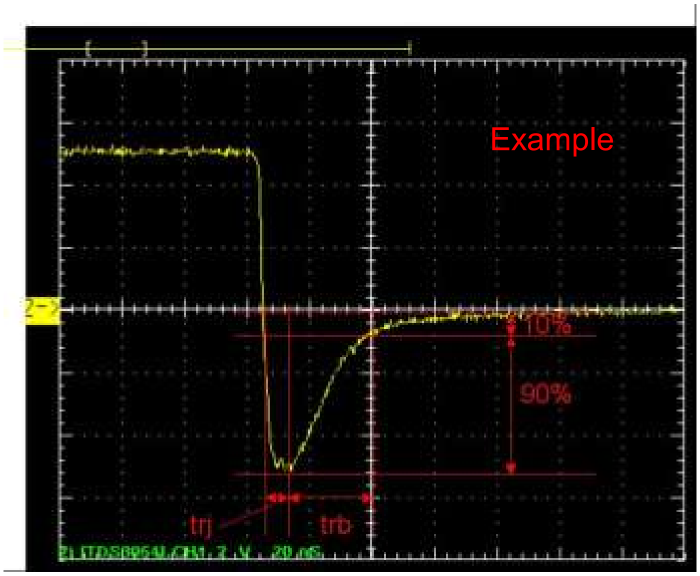
Compare Measurement vs. Simulation

Symbol	Measurement	Unit	Simulation	Unit	%Error
trj	12.4	ns	12.45	ns	0.05
trb	11.6	ns	11.58	ns	- 0.02

Reverse Recovery Characteristic Reference



Trj =12.4ns)
Trb=11.6(ns)
Conditions: Ifwd=Irev=0.02(A), Rl=50



Relation between trj and trb