

Device Modeling Report

COMPONENTS: Light-Emitting Diode (LED) Professional
PART NUMBER: OSWT5161A
MANUFACTURER: OPTO SUPPLY
REMARK:TA= - 40 degree C

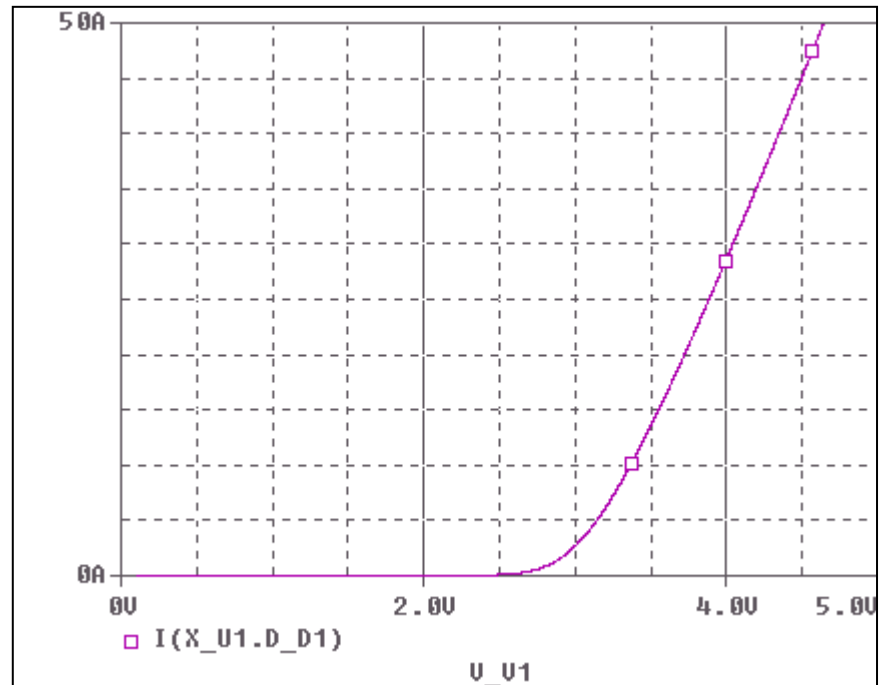


Bee Technologies Inc.

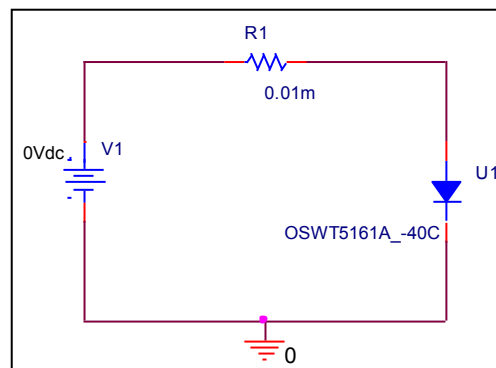
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

Circuit Simulation Result

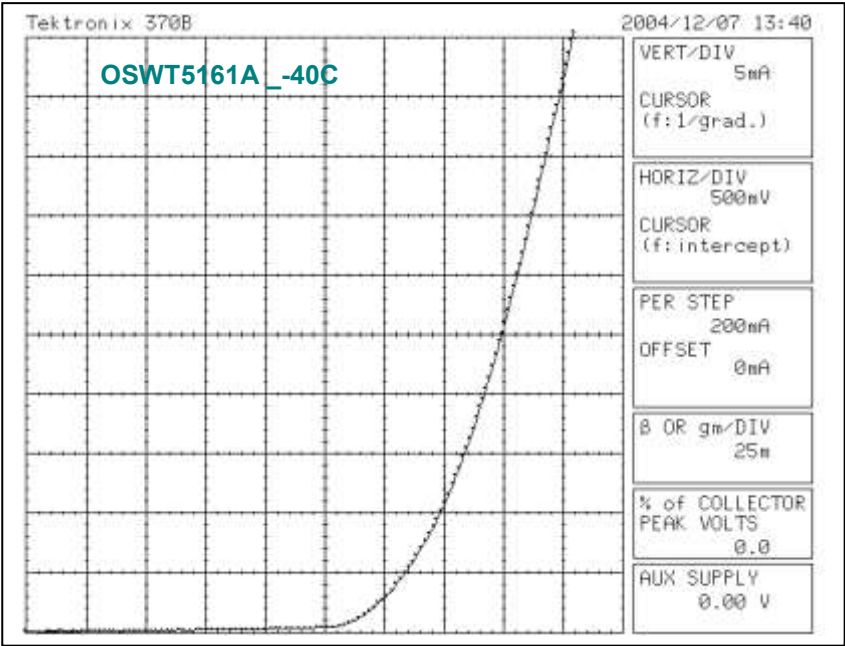


Evaluation Circuit



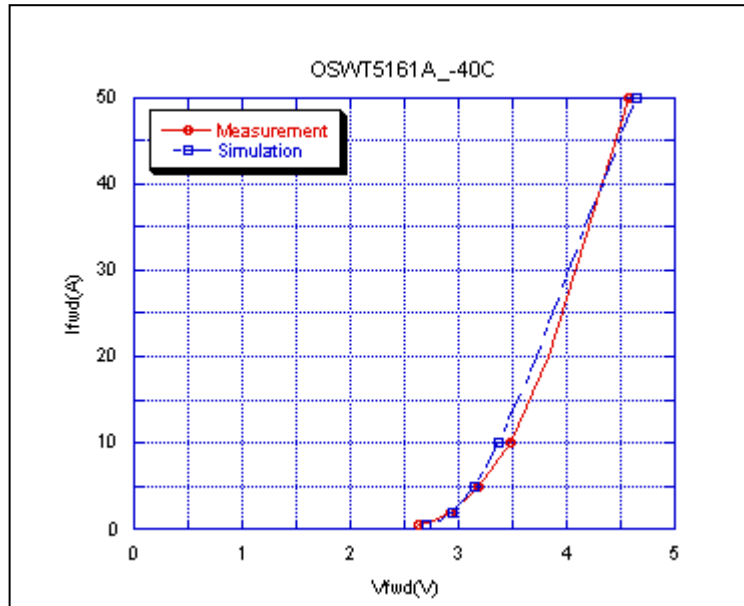
Forward Current Characteristic

Reference



Comparison Graph

Circuit Simulation Result

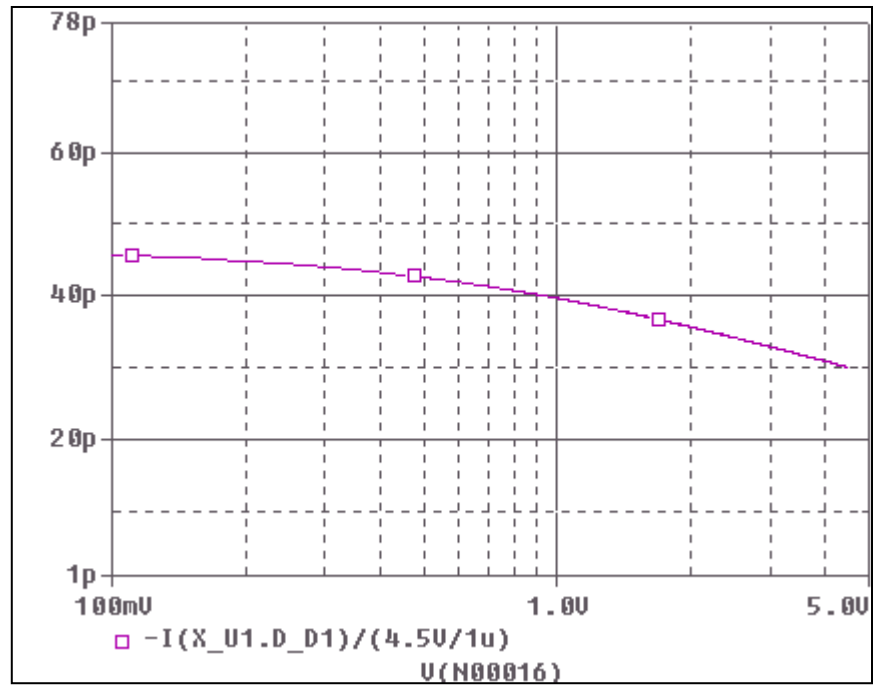


Simulation Result

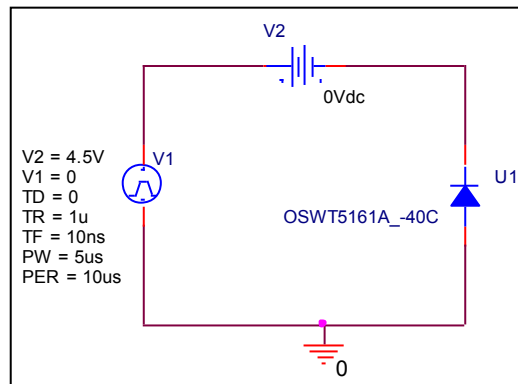
Ifwd(A)	Vfwd(V) Measurement	Vfwd(V) Simulation	%Error
0.5	2.63	2.7	2.6615
1	2.75	2.827	2.8
2	2.92	2.943	0.7876
5	3.18	3.142	1.1949
10	3.48	3.38	2.8735
20	3.83	3.722	2.8198
50	4.575	4.641	1.4426

Capacitance Characteristic

Circuit Simulation Result

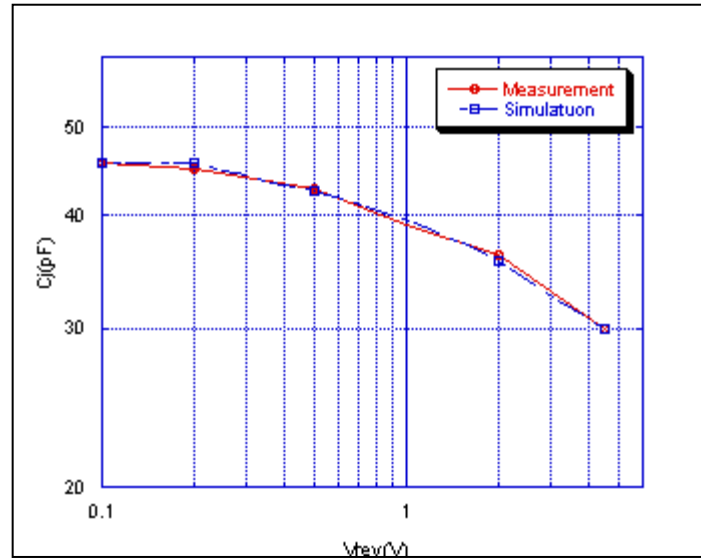


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

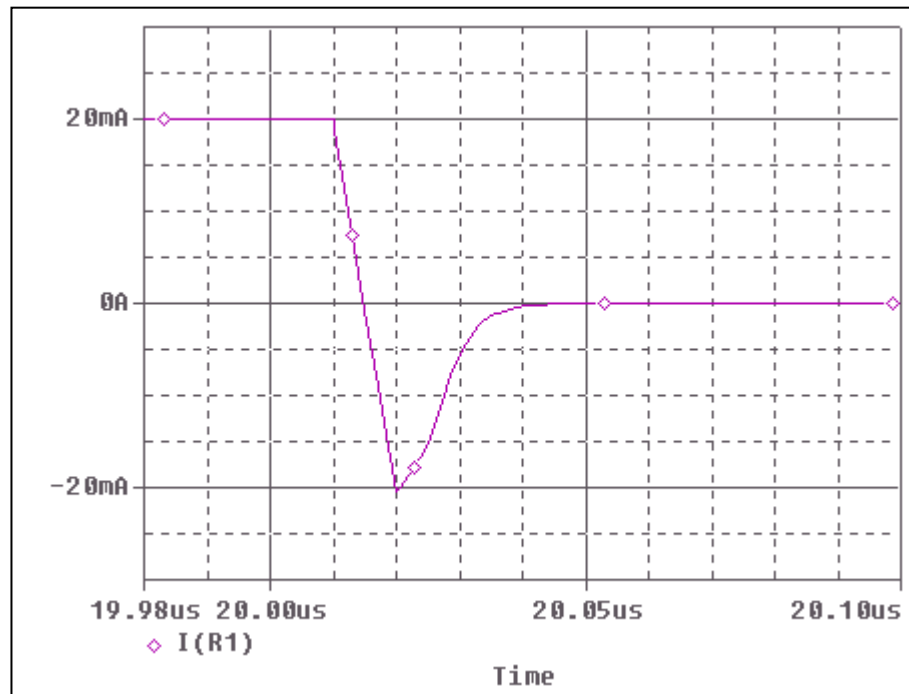


Simulation Result

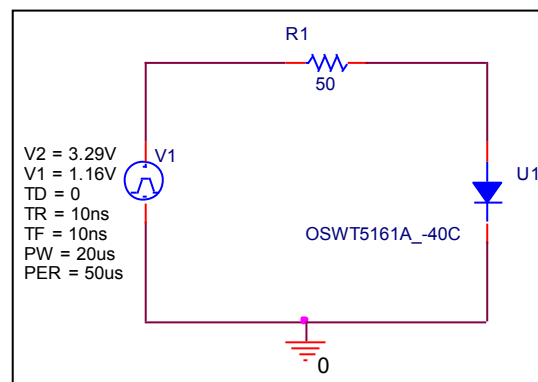
$V_{rev}(V)$	$C_j(pF)$ Measurement	$C_j(pF)$ Simulation	%Error
0	46.4	46.4	0
0.1	45.8	45.66	0.3056
0.2	45.1	45.71	1.3525
0.5	42.69	42.58	0.2576
1	39.02	39.64	1.5889
2	36.08	35.65	1.1917
4.5	29.93	30.01	0.2672

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

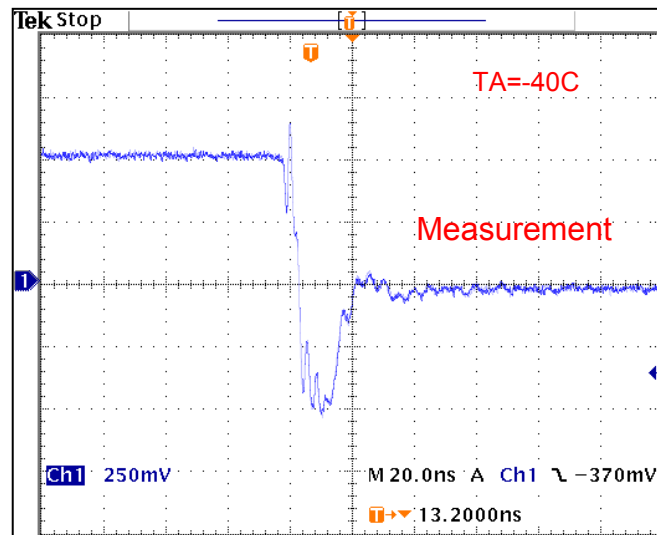


Compare Measurement vs. Simulation

Symbol	Measurement	Unit	Simulation	Unit	%Error
trj	6.8	ns	6.74	ns	- 0.8823
trb	10.4	ns	11	ns	7.6923

Reverse Recovery Characteristic

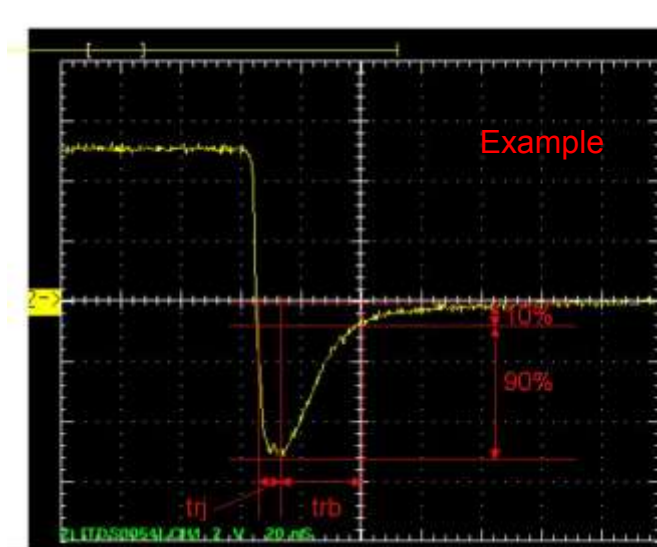
Reference



$Trj = 6.8(ns)$

$Trb = 10.4(ns)$

Conditions: $I_{fwd} = I_{rev} = 0.02(A)$, $R_I = 50$



Relation between trj and trb