

Device Modeling Report

COMPONENTS:

DIODE/ ENHANCED POWER LED / Professional

PART NUMBER: EP204K-35G1R1B1-CA

MANUFACTURER: PARA Light

EMARK: 25 degree C

COLER: Green

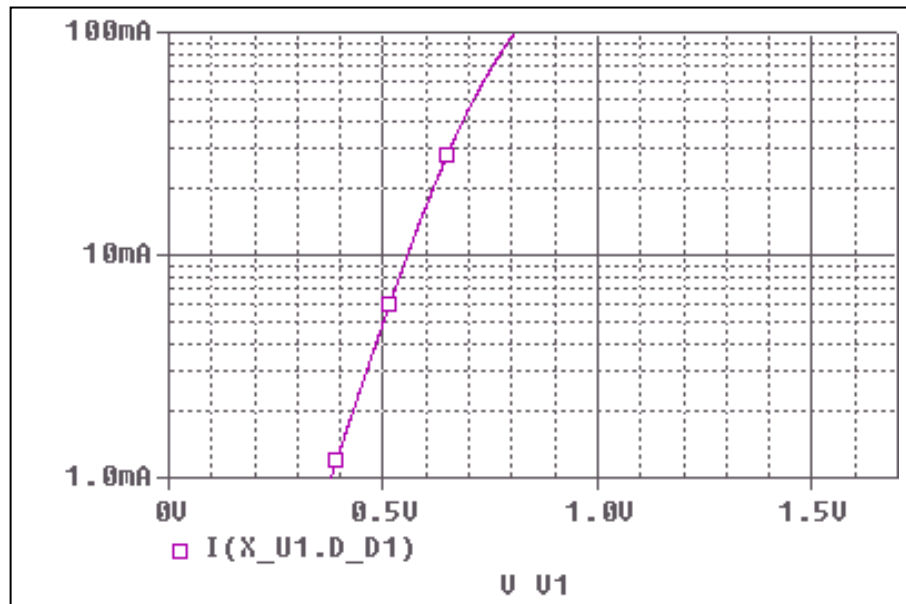


Bee Technologies Inc.

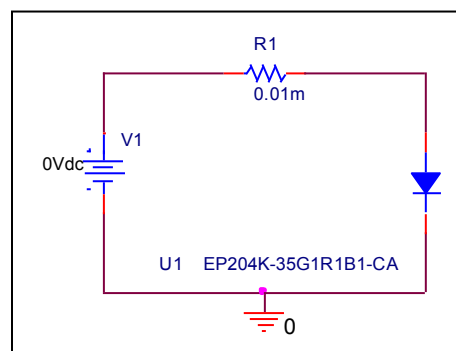
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

Circuit Simulation Result

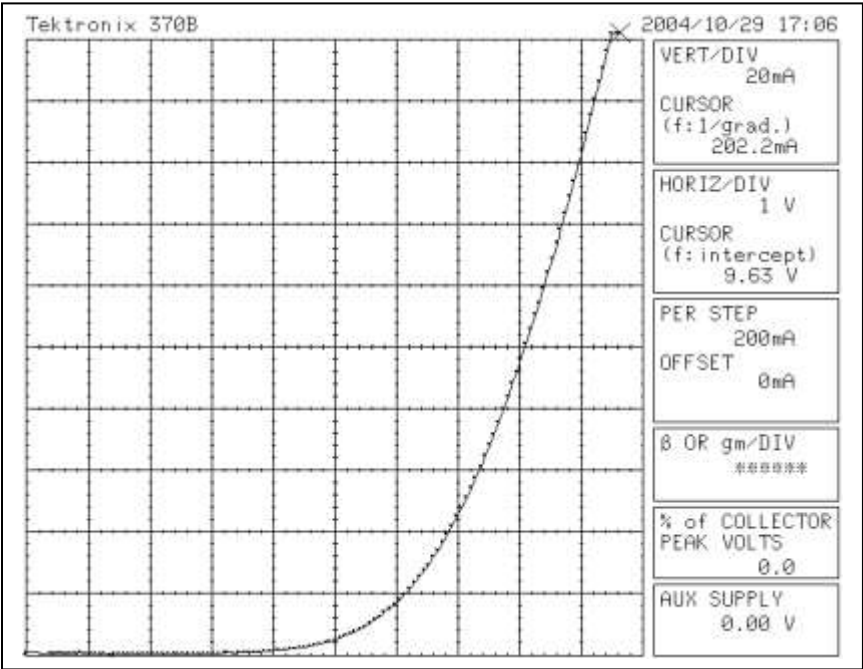


Evaluation Circuit



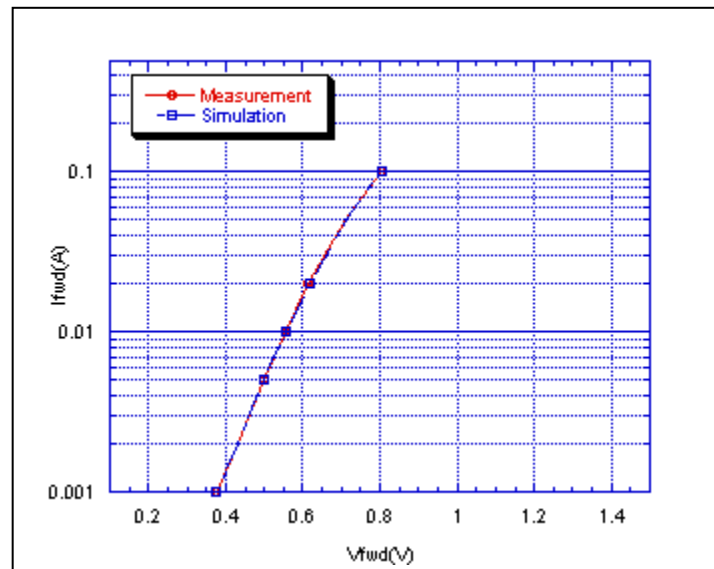
Forward Current Characteristic

Reference



Comparison Graph

Circuit Simulation Result

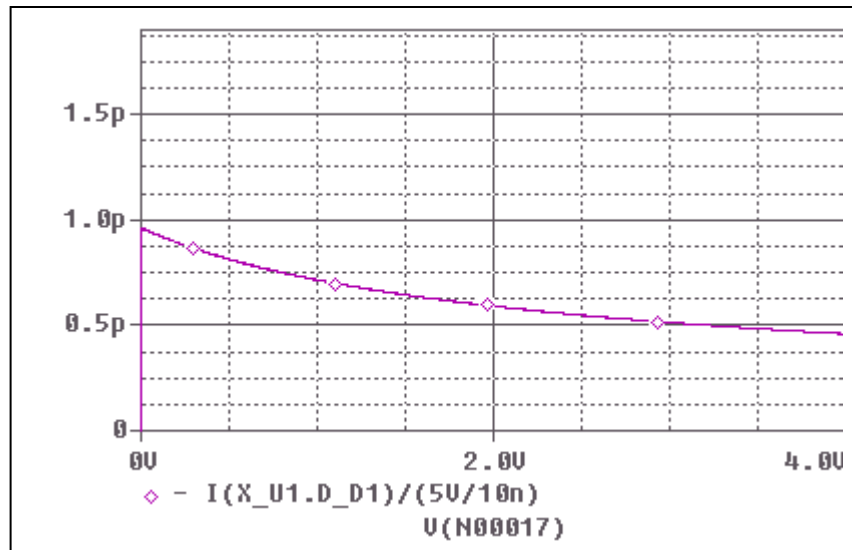


Simulation Result

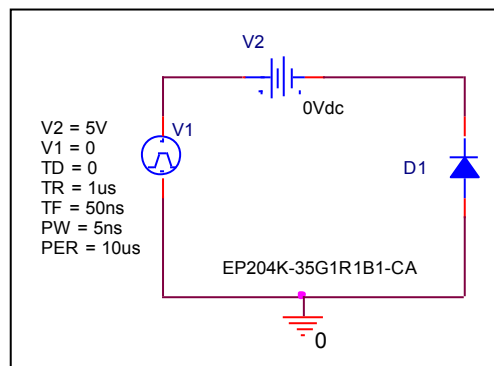
$I_{fwd}(A)$	$V_{fwd}(V)$ Measurement	$V_{fwd}(V)$ Simulation	%Error
0.001	0.375	0.377	0.533
0.002	0.434	0.4341	0.023
0.005	0.5	0.5	0
0.01	0.556	0.5564	0.071
0.02	0.616	0.6167	0.113
0.05	0.712	0.7114	0.084
0.1	0.807	0.8072	0.024

Capacitance Characteristic

Circuit Simulation Result

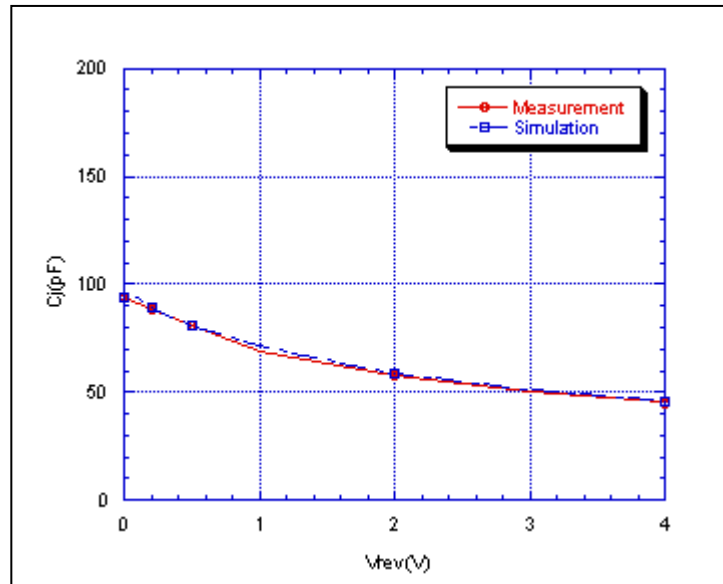


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

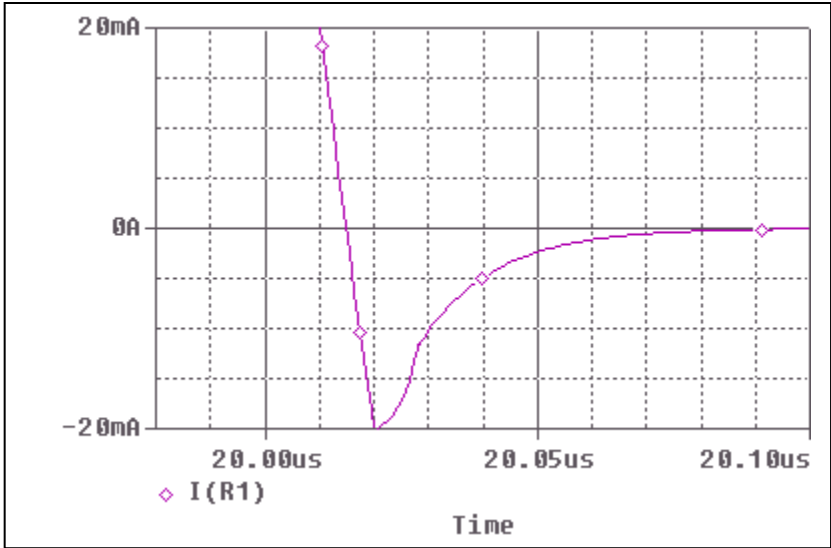


Simulation Result

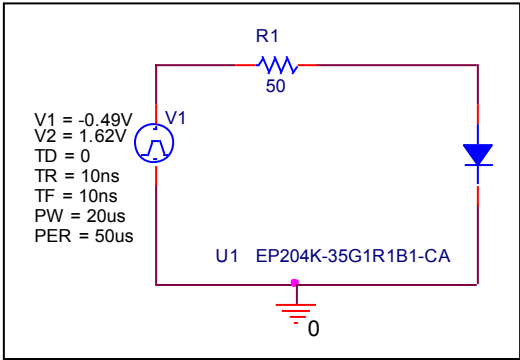
V_{rev} (V)	C_j (pF) Measurement	C_j (pF) Simulation	%Error
0	94	94	0
0.1	91.54	93.473	2.111
0.2	88.71	89.473	0.860
0.5	81.37	81.286	0.103
1	68.6	71.507	4.237
2	57.7	59.046	2.332
3	50	51.336	2.672
4	45	45.849	1.886

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

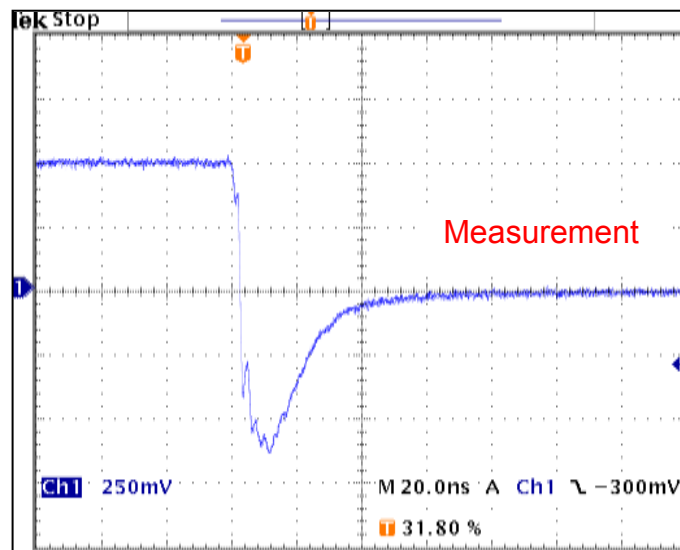


Compare Measurement vs. Simulation

Symbol	Measurement	Unit	Simulation	Unit	%Error
trj	9.20	ns	9.25	ns	0.0554
trb	28.0	ns	27.7	ns	1.0714

Reverse Recovery Characteristic

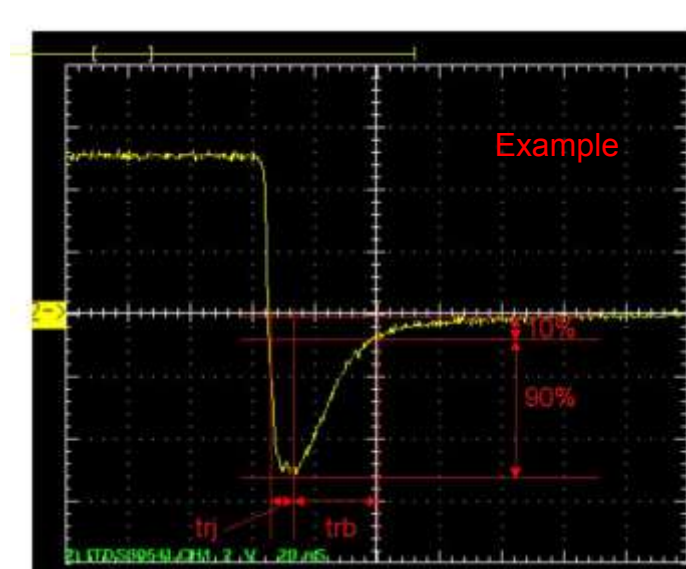
Reference



$T_{rj} = 9.20(\text{ns})$

$T_{rb} = 28.0(\text{ns})$

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



Relation between t_{rj} and t_{rb}