

Device Modeling Report

COMPONENTS: Light-Emitting Diode (LED) STANDARD
PART NUMBER: EFR5365S
MANUFACTURER: STANLEY
REMARK: 25 degree C

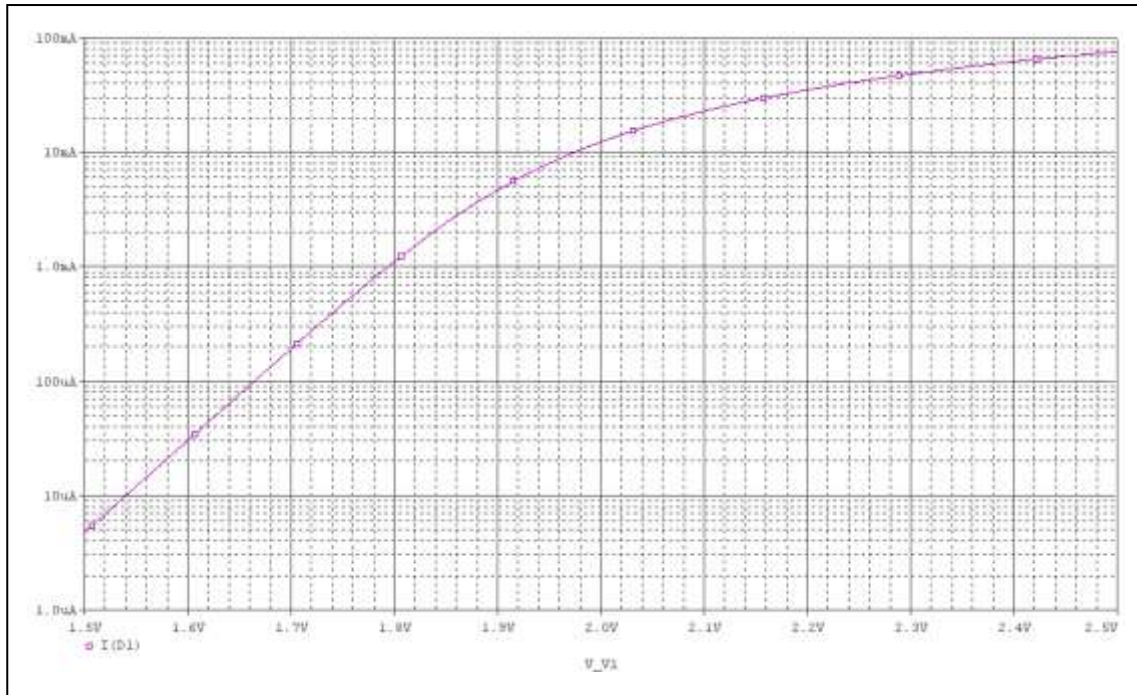


Bee Technologies Inc.

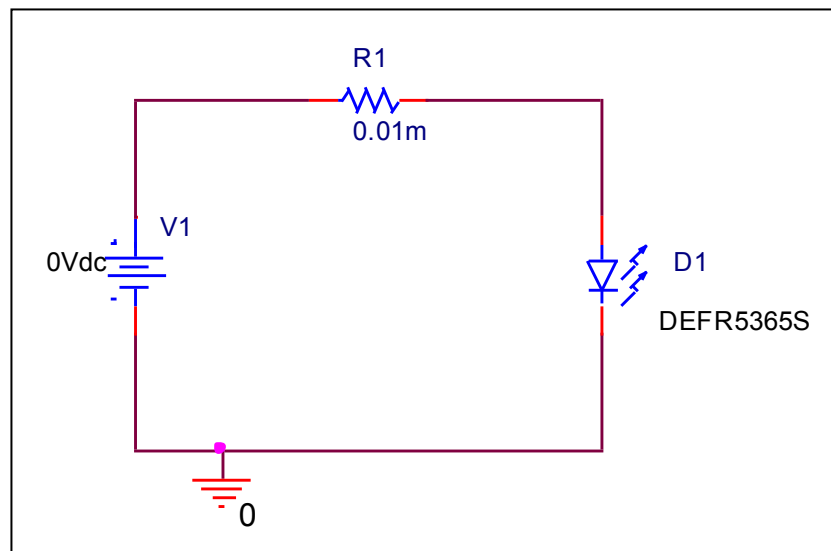
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

Circuit simulation result

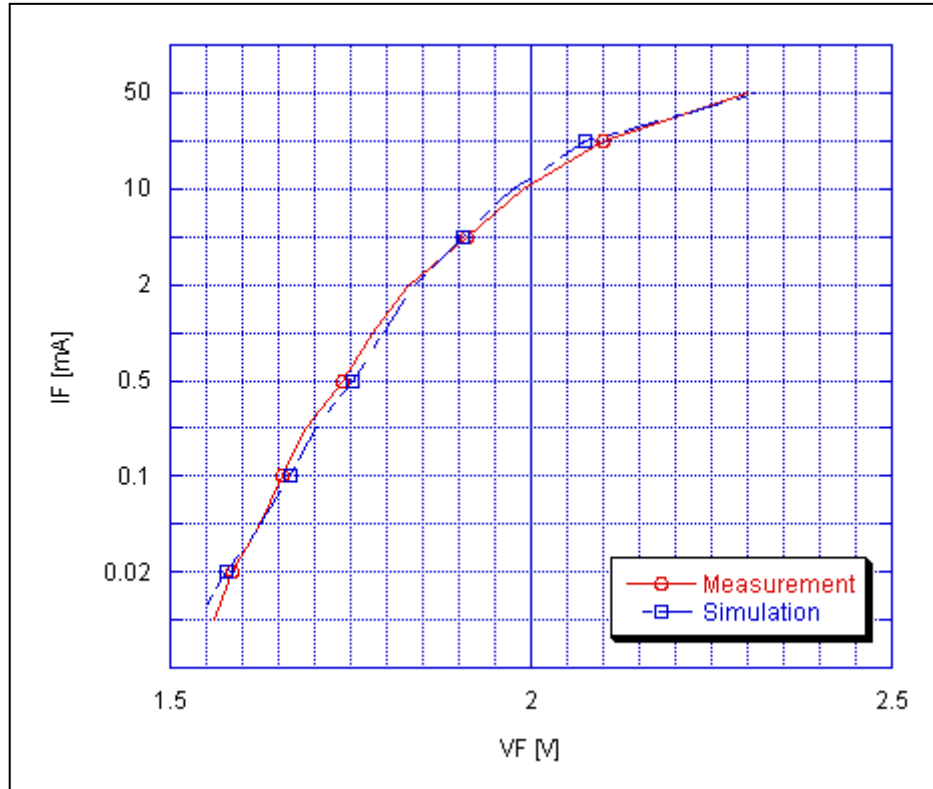


Evaluation circuit



Comparison graph

Circuit simulation result

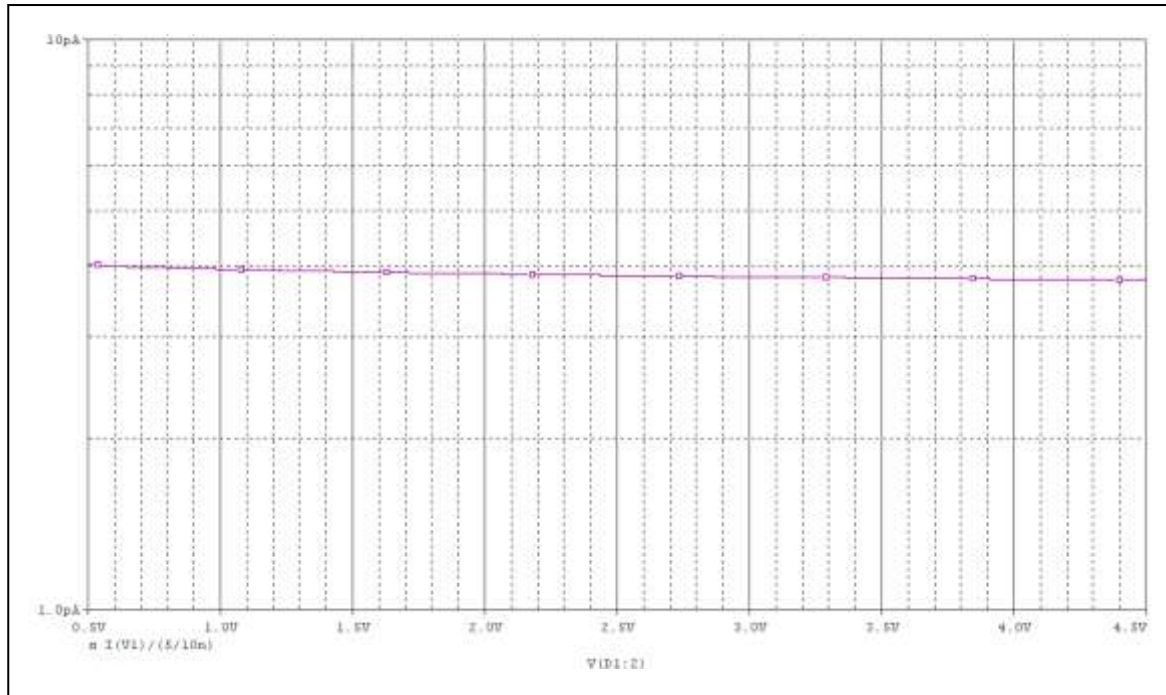


Simulation Result

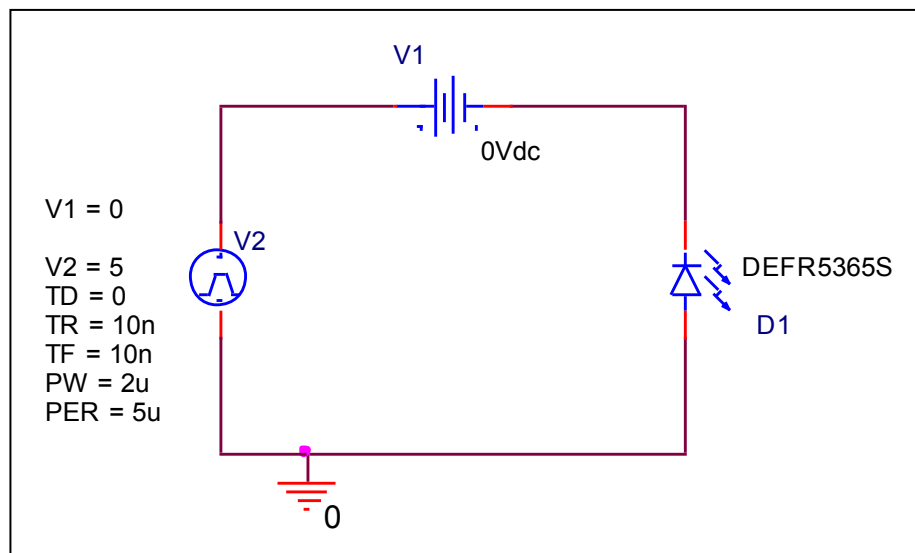
IF(A)	VF(V)		
	Measurement	Simulation	Error (%)
10u	1.56	1.5402	1.269231
20u	1.585	1.5782	0.429022
50u	1.625	1.6264	0.086154
100u	1.655	1.6655	0.634441
200u	1.69	1.7023	0.727811
500u	1.74	1.7529	0.741379
1m	1.78	1.7943	0.803371
2m	1.83	1.8379	0.431694
5m	1.91	1.9058	0.219895
10m	1.99	1.9747	0.768844
20m	2.1	2.0759	1.147619
50m	2.3	2.3126	0.547826

Junction Capacitance Characteristic

Circuit simulation result

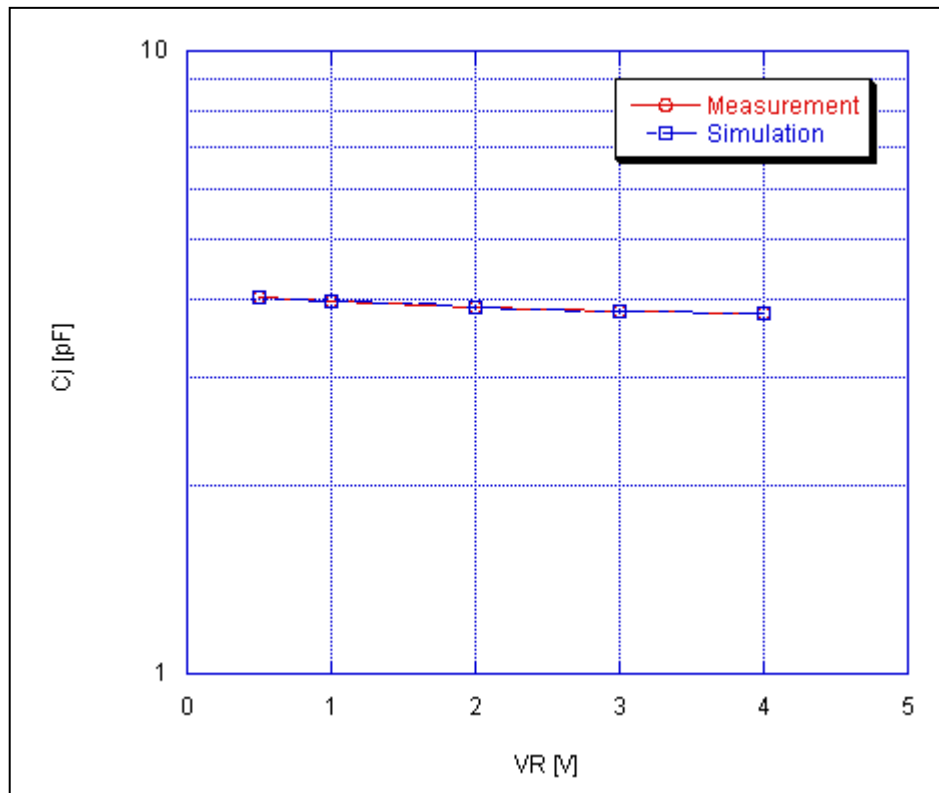


Evaluation circuit



Comparison graph

Circuit simulation result

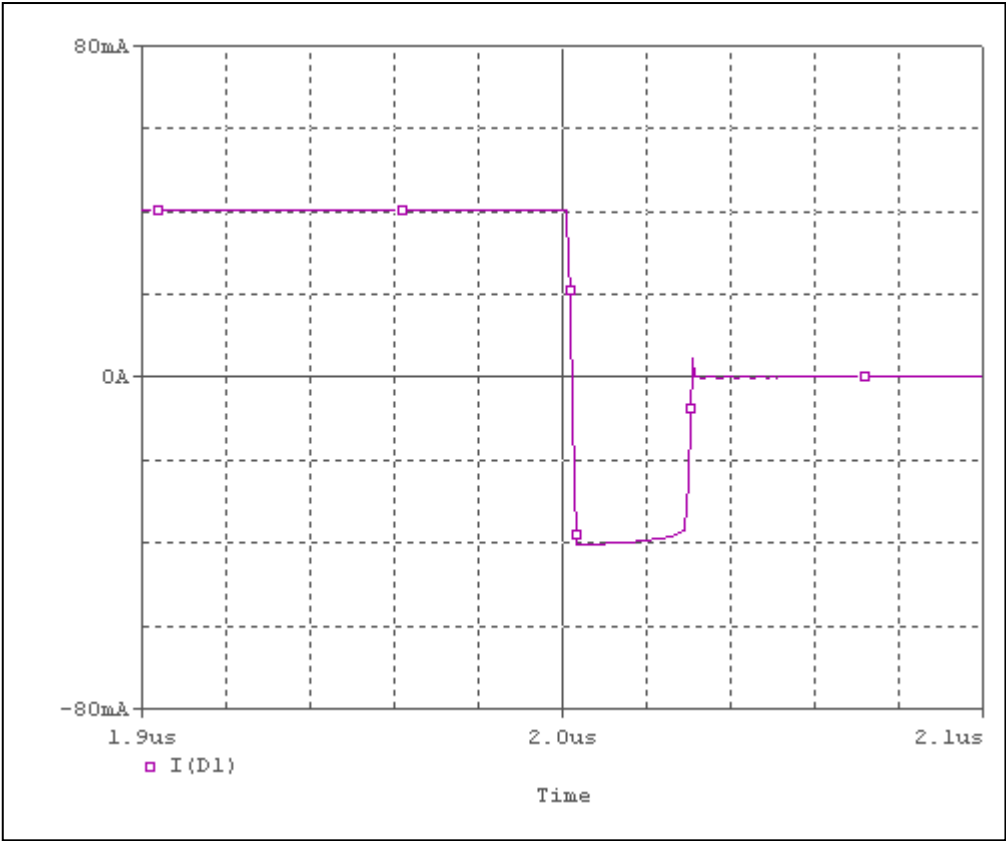


Simulation Result

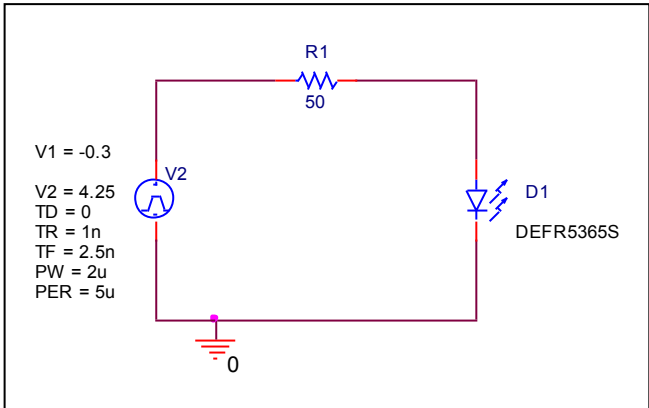
Vrev(V)	Cj(pF)		
	Measurement	Simulation	Error (%)
0.5	4.023	4.0274	0.109371
1	3.962	3.9538	0.206966
2	3.884	3.8823	0.043769
3	3.834	3.8344	0.010433
4	3.798	3.799	0.02633

Reverse Recovery Characteristic

Circuit simulation result



Simulation Result

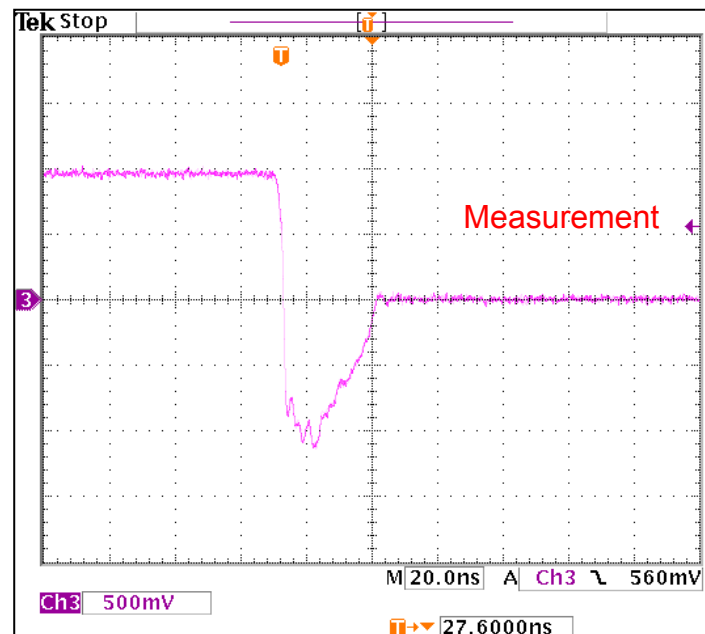


Compare Measurement VS. Simulation

Trj+Trb (Measurement)	Trr(s) Simulation	Error (%)
27.6(ns)	28.144(ns)	1.971

Reverse Recovery Characteristic

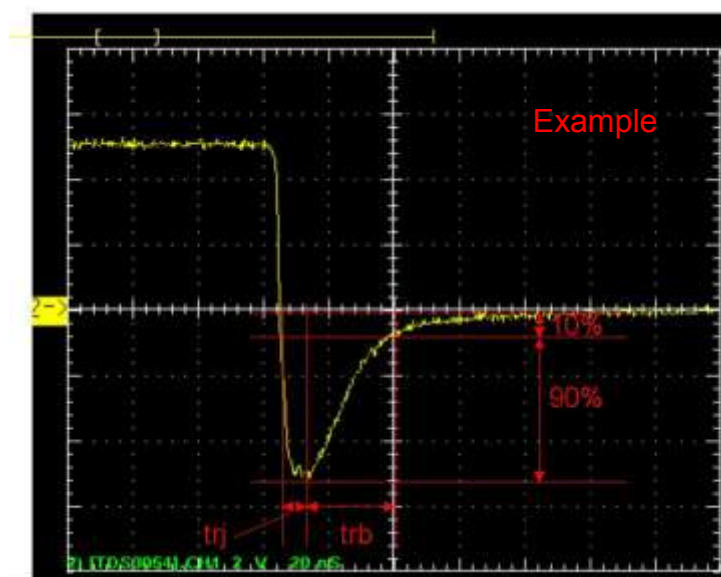
Reference



$tr_j = 8.4(\text{ns})$

$tr_b = 19.2(\text{ns})$

Conditions: $I_{fwd} = I_{rev} = 0.04(\text{A})$, $R_I = 50$



Relation between tr_j and tr_b