Device Modeling Report

COMPONENTS:PHOTOCOUPLER
PART NUMBER:PC357NT
MANUFACTURER: SHARP

Bee Technologies Inc.

DIODE MODEL

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

BIPOLAR JUNCTION TRANSISTOR MODEL

Pspice model parameter	Model description
NR	Reverse Emission Coefficient
RB	Base Resistance
RC	Series Collector Resistance
CJE	Zero-bias Emitter-Base Junction Capacitance
CJC	Zero-bias Collector-Base Junction Capacitance
TF	Forward Transit Time
TR	Reverse Transit Time

VOLTAGE CONTROLLED VOLTAGE SOURCE MODEL(VCVS)

E<Name><(+)Node><(－)Node>VALUE={Expression}

E<Name><(+)Node><(－)Node>TABLE={Expression}

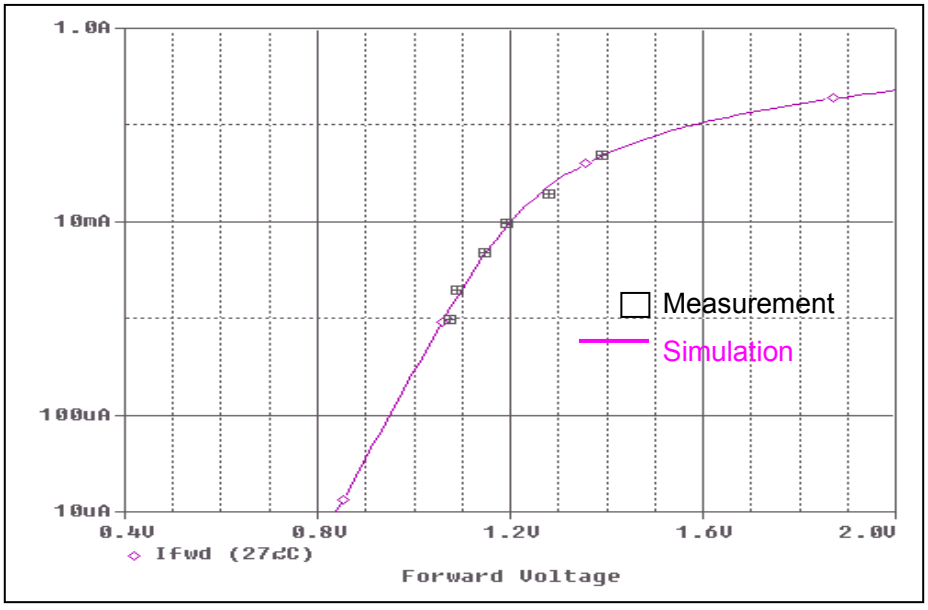
VOLTAGE CONTROLLED CURRENT SOURCE MODEL(VCCS)

E<Name><(+)Node><(－)Node>VALUE={Expression}

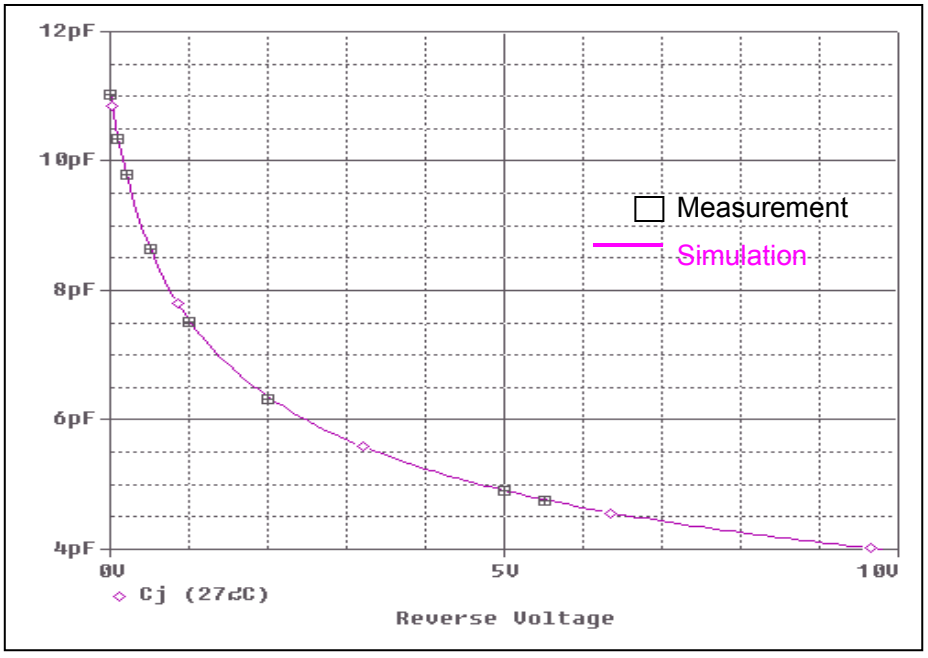
CURRENT CONTROLLED MODEL(W)

Pspice model parameter	Model description
IOFF	Controlling current to Off state
ION	Controlling current to On state
ROFF	Off Resistance
RON	On Resistance

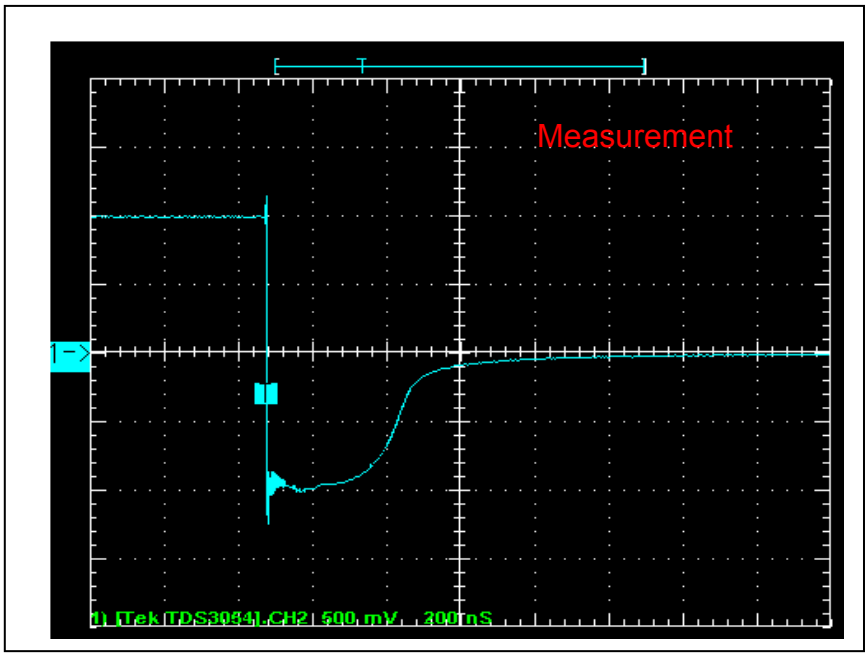
Input Device Forward Current Characteristics



Input Device Junction Capacitance Characteristics



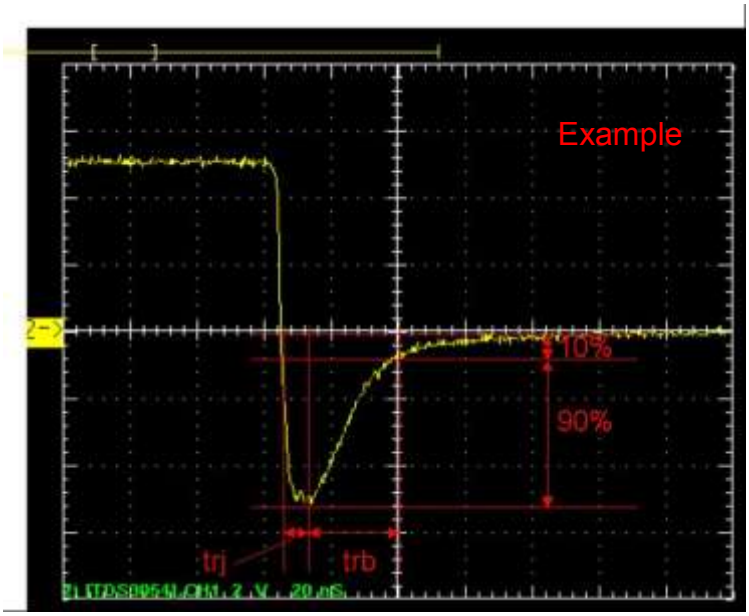
Input Device Reverse Recovery Characteristics



trj=228n(s)

trb=300n(s)

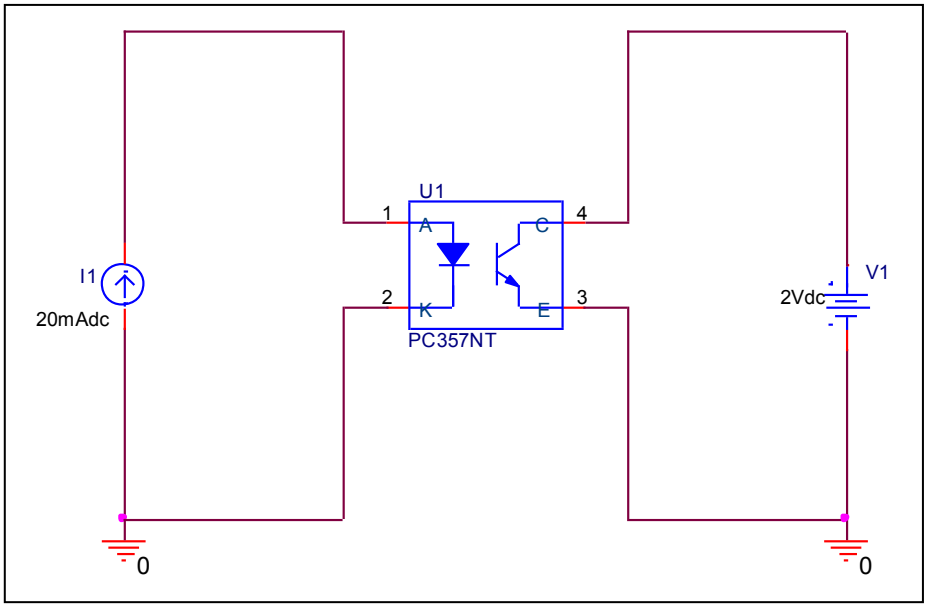
Conditions:Ifwd=Irev=0.04(A),Rl=50



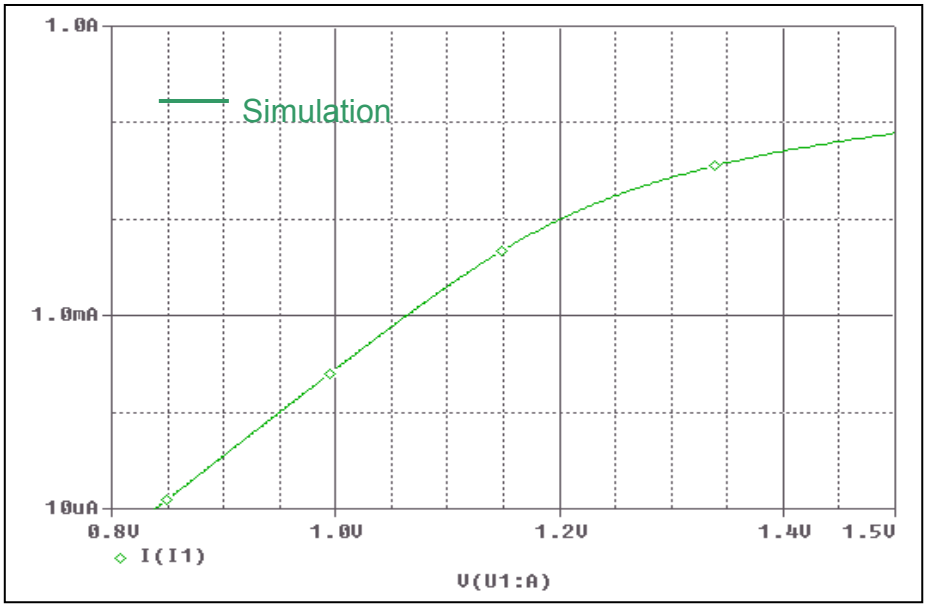
Relation between trj and trb

LED IV Curve Characteristics

Evaluation Circuit



Simulation result

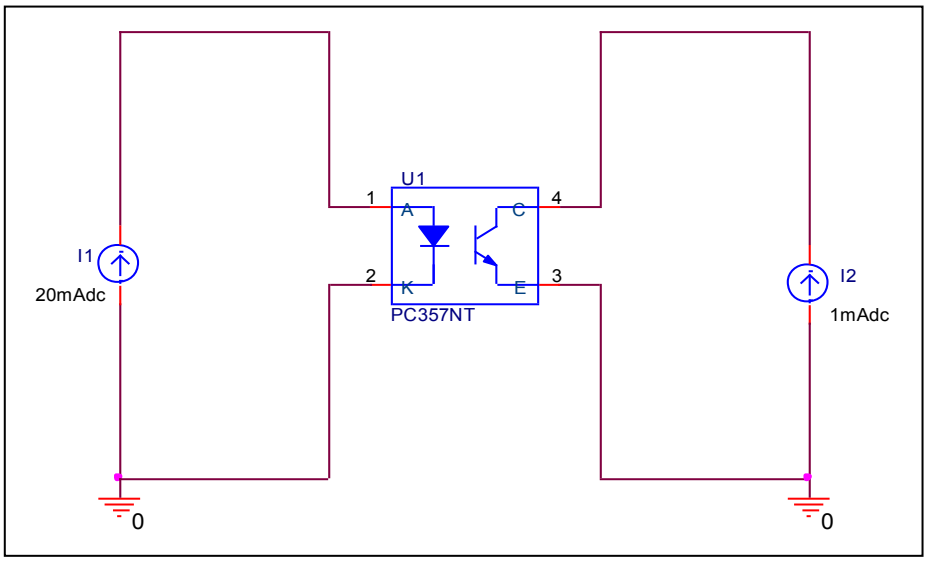


Comparison Table

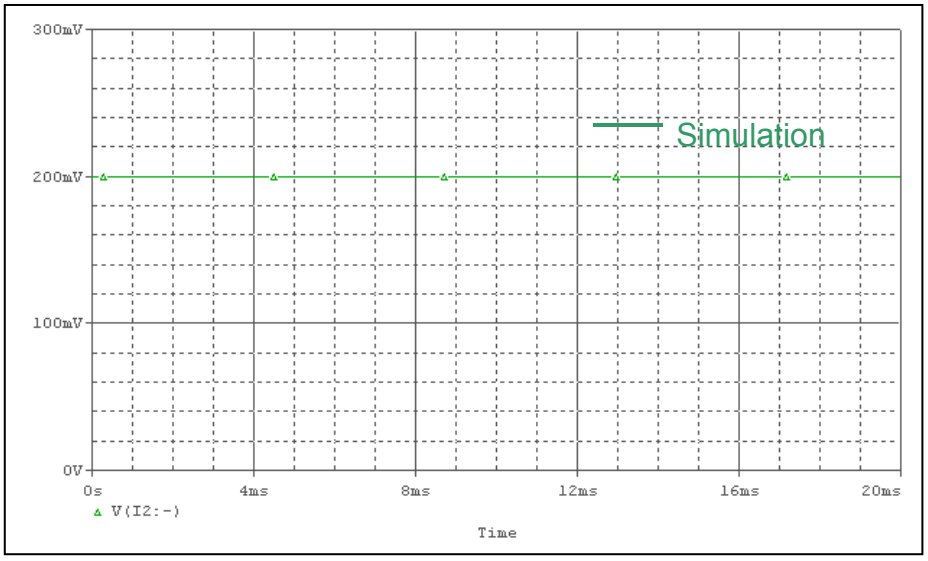
Ifwd(A)	Vfwd(V)		% Error
	Measurement	Simulation	
0.001	1.074	1.0632	-1.006
0.002	1.089	1.0995	0.964
0.005	1.148	1.1524	0.383
0.01	1.192	1.2006	0.721
0.02	1.281	1.2635	-1.366
0.05	1.392	1.3966	0.330

Transistor Saturation Characteristics

Evaluation Circuit



Simulation result

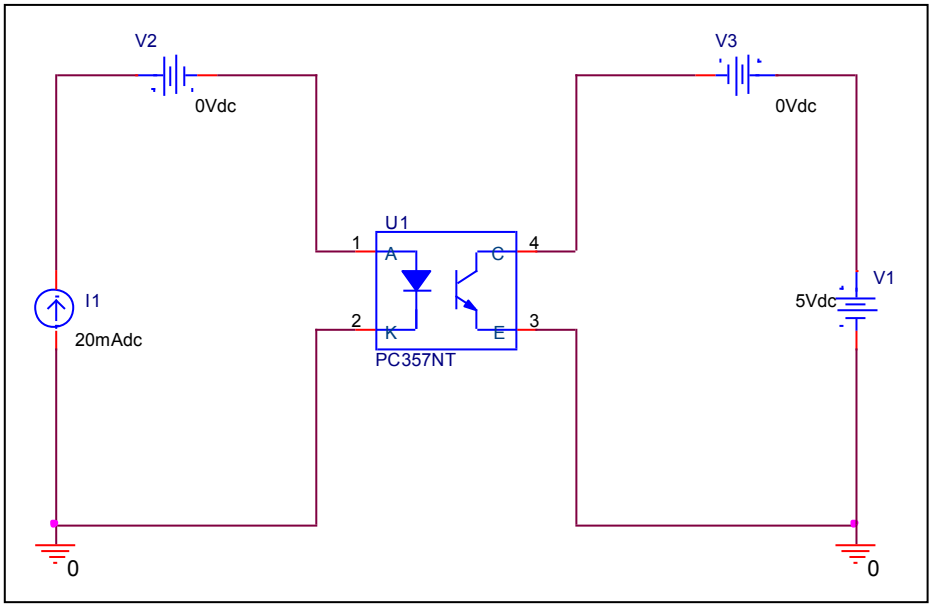


Comparison Table

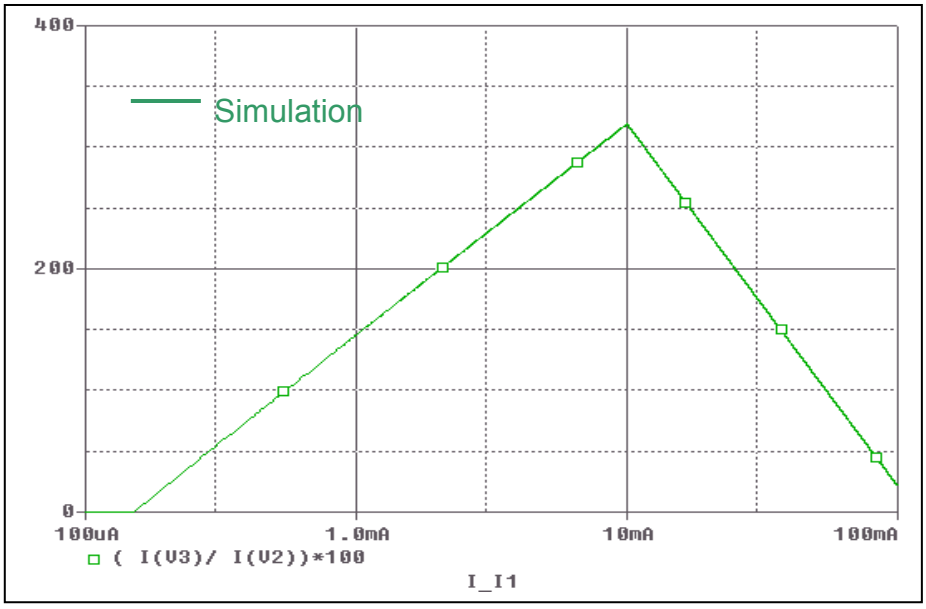
	Measurement	Simulation	% Error
Vce(sat) (V)	0.2	0.199	-0.5

CTR(Current Transfer Ratio) Characteristics

Evaluation Circuit



Simulation result



Rise Curve Table

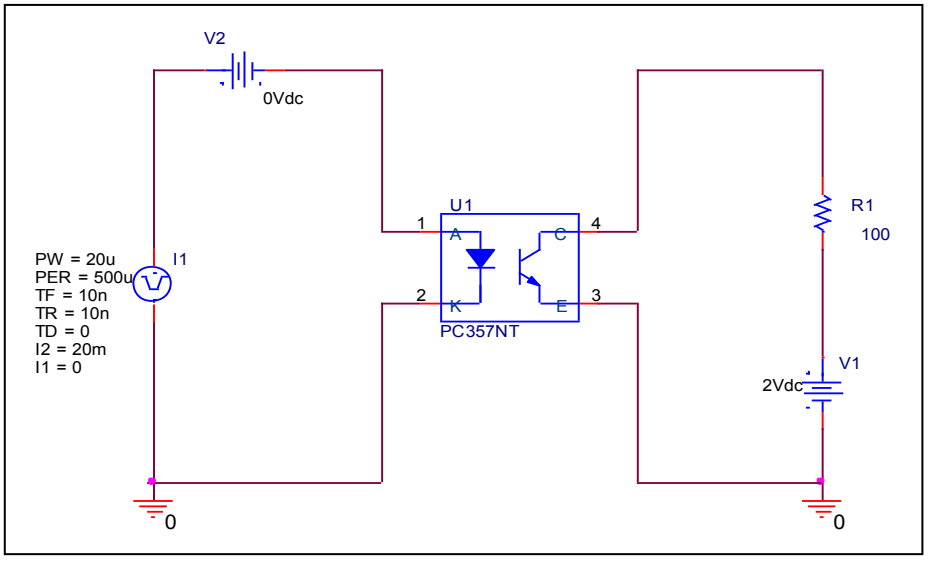
If(mA)	CTR(%)		% Error
	Measurement	Simulation	
1	145	149.626	3.190
2	210	200.635	-4.460
4	260	251.413	-3.303
6	290	281.021	-3.096
9	311	310.547	-0.146
10	318.7	318.13	-0.179

Fall Curve Table

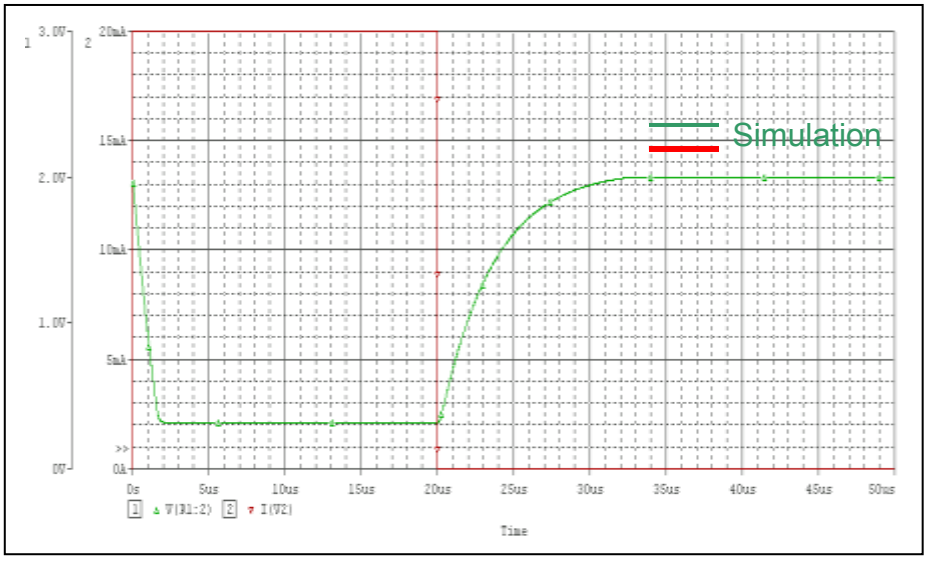
If(mA)	CTR(%)		% Error
	Measurement	Simulation	
10	318.70	318.13	-0.179
20	240.00	228.263	-4.890
30	175.00	176.612	0.921
40	140.00	139.994	-0.004
50	115.00	111.607	-2.950

Switching Time Characteristics

Evaluation Circuit



Simulation result



Comparison Table

Vcc=2V,IC=2mA,RL=100Ω	Measurement	Simulation	% Error
Ts (us)	0.48	0.487353	1.532
Tf (us)	6.9	6.8875	-0.181