Device Modeling Report

COMPONENTS : PHOTOCOUPLER
PART NUMBER : PC3Q67Q
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)

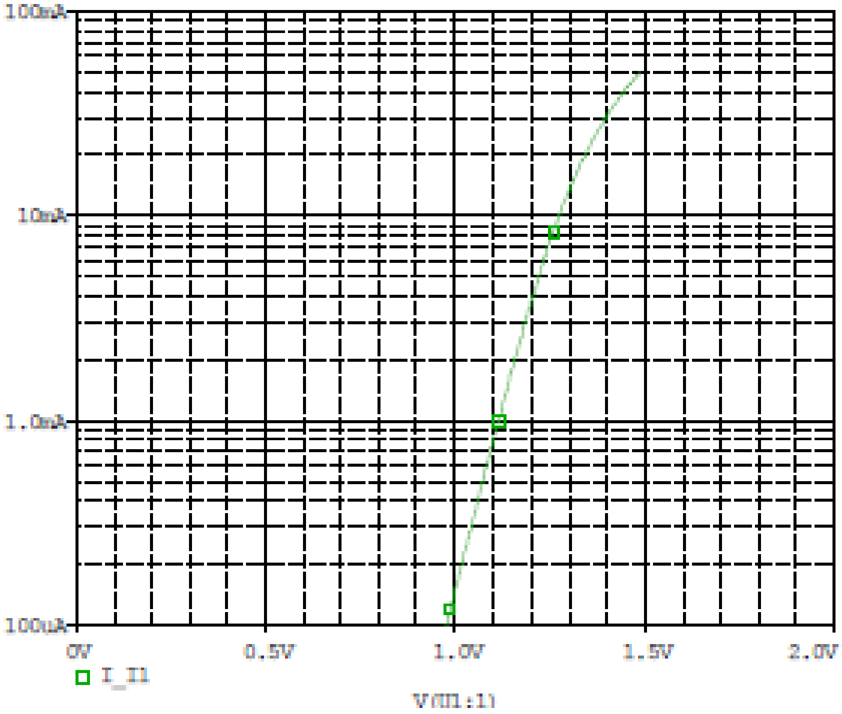
E<Name><(+)Node><(－)Node>VALUE={Expression}

CURRENT CONTROLLED MODEL(W)

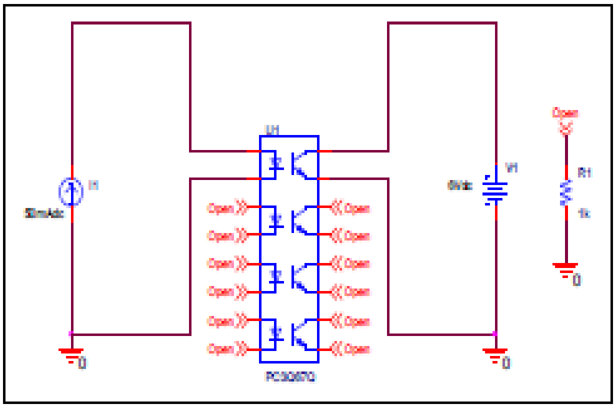
Pspice model parameter	Model description
IOFF	Controlling current to Off state
ION	Controlling current to On state
ROFF	Off Resistance
RON	On Resistance

LED IV Curve Characteristics

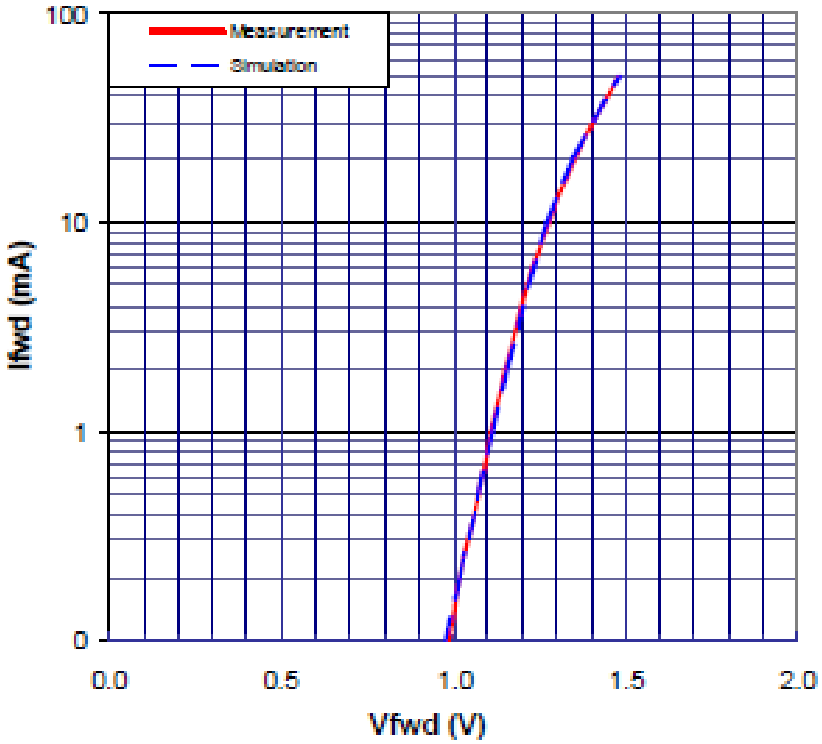
Simulation result



Evaluation Circuit



Comparison Graph

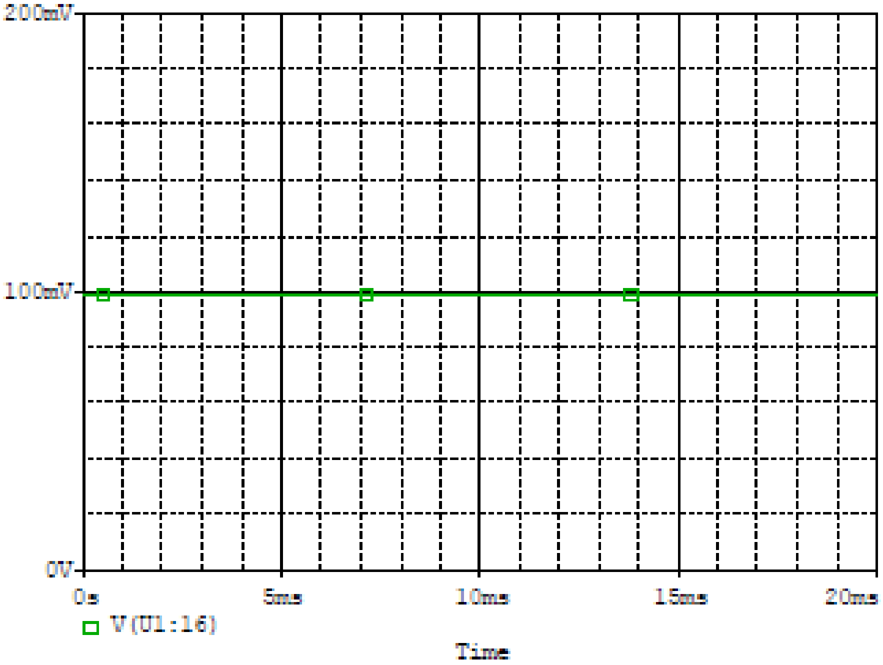


Comparison Table

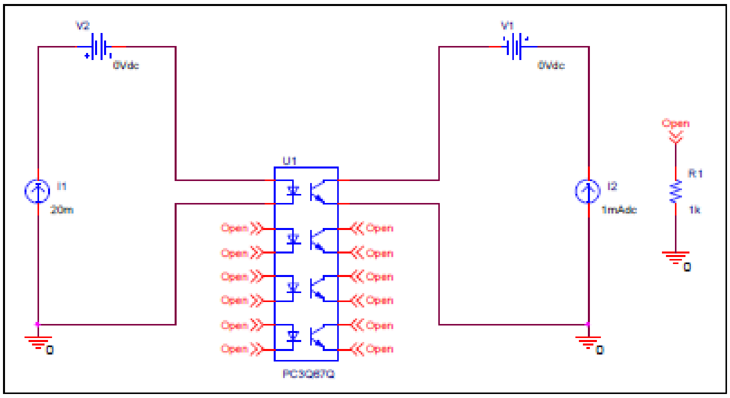
Ifwd (mA)	Vfwd(V)		% Error
	Measurement	Simulation	
0.100	0.985	0.978	-0.711
0.200	1.020	1.019	-0.098
0.500	1.070	1.072	0.187
1.000	1.108	1.113	0.451
2.000	1.150	1.157	0.609
5.000	1.215	1.220	0.412
10.000	1.280	1.275	-0.391
20.000	1.355	1.345	-0.738
50.000	1.480	1.483	0.203

Transistor Saturation Characteristics

Simulation result



Evaluation Circuit

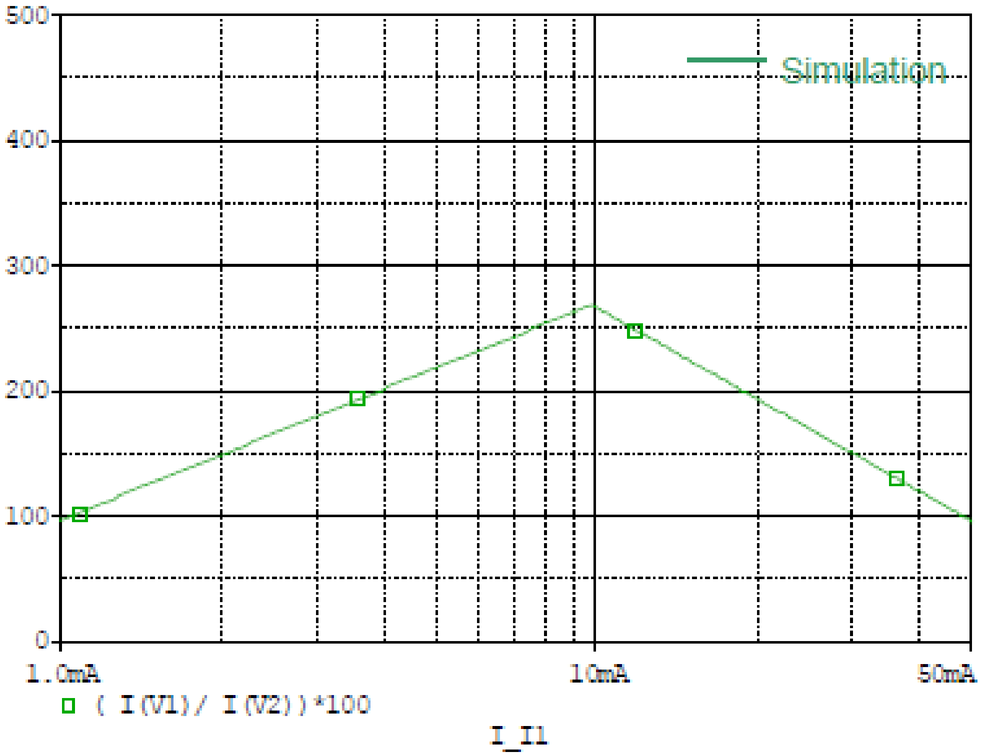


Comparison Table

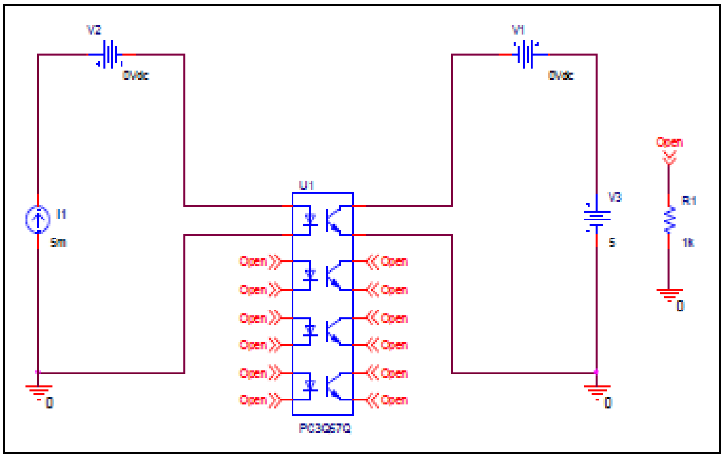
VCE(sat) (V)	Measurement	Simulation	% Error
	0.100	0.099	-1.00

CTR(Current Transfer Ratio) Characteristics

Simulation result



Evaluation Circuit



Rise Curve Table

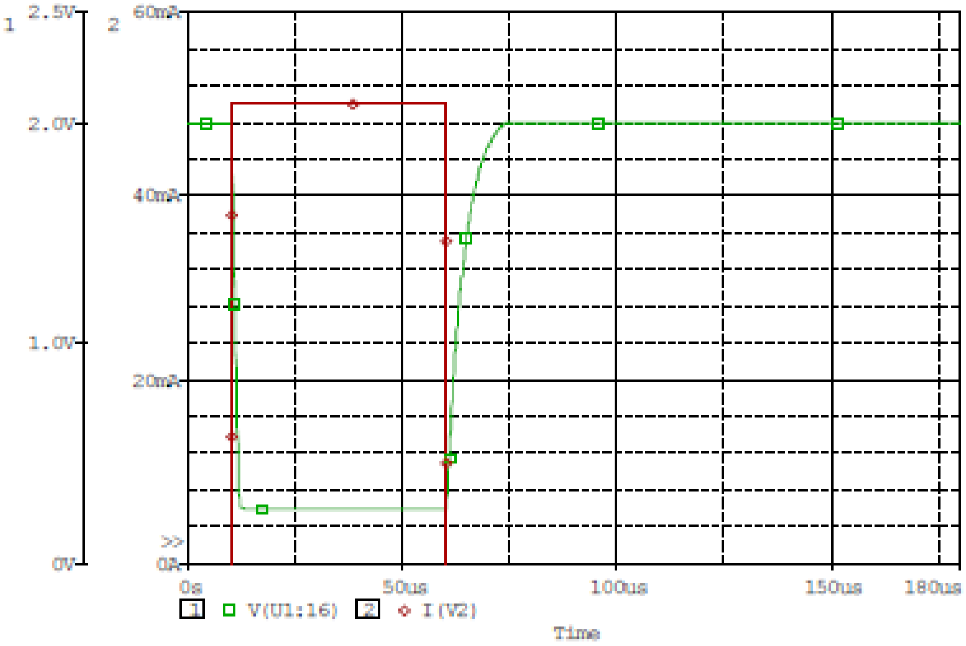
If (mA)	IO/IF		% Error
	Measurement	Simulation	
1.000	95.000	96.706	1.796
2.000	150.000	149.152	-0.565
5.000	225.000	217.828	-3.188
10.000	265.000	266.055	0.398

Fall Curve Table

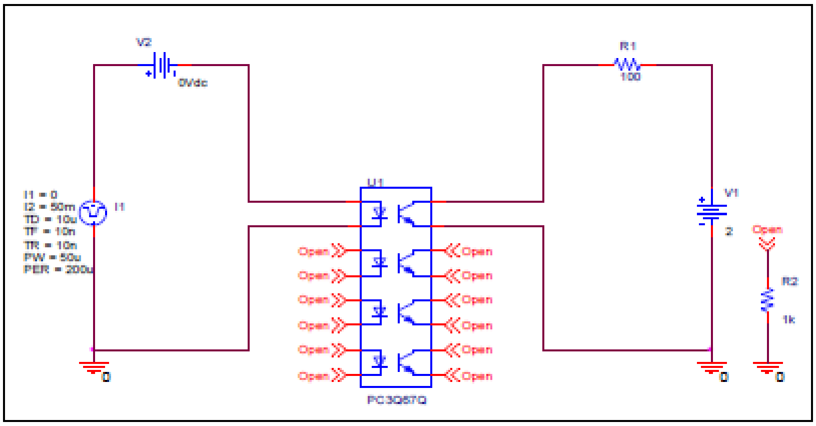
If (mA)	IO/IF		% Error
	Measurement	Simulation	
10.000	265.000	266.055	0.398
20.000	195.000	192.536	-1.264
50.000	95.000	95.908	0.956

Switching Time Characteristics

Simulation result



Evaluation Circuit



Comparison Table

IF=50mA, RL=100Ω	Measurement	Simulation	% Error
tS (us)	0.80	0.79	-1.13
tOFF (us)	8.50	8.57	0.85