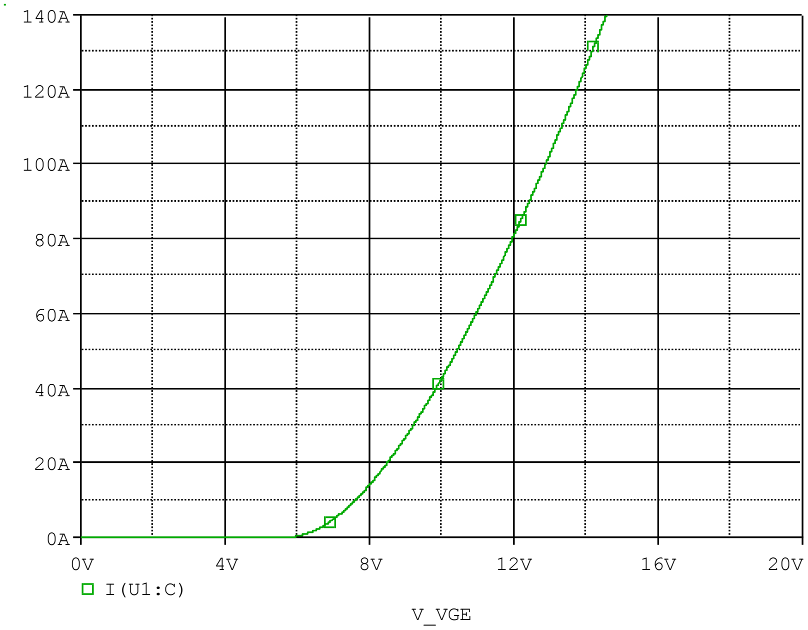
Device Modeling Report

COMPONENTS: Insulated Gate Bipolar Transistor (IGBT)
PART NUMBER: KGH15N120NDA
MANUFACTURER: KEC
* REMARK: Free-Wheeling Diode Special Model

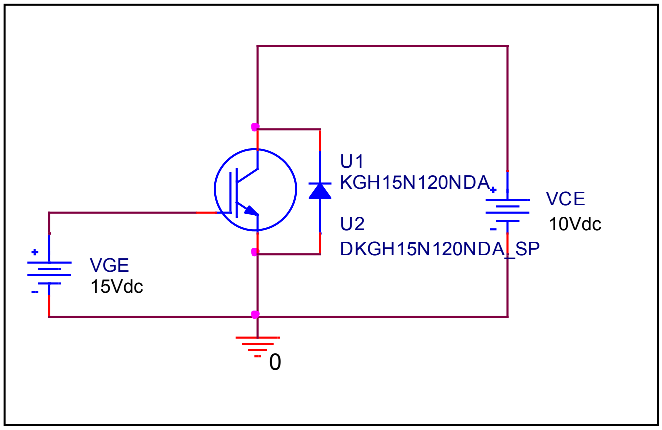
Bee Technologies Inc.

Transfer Characteristics

Circuit Simulation result

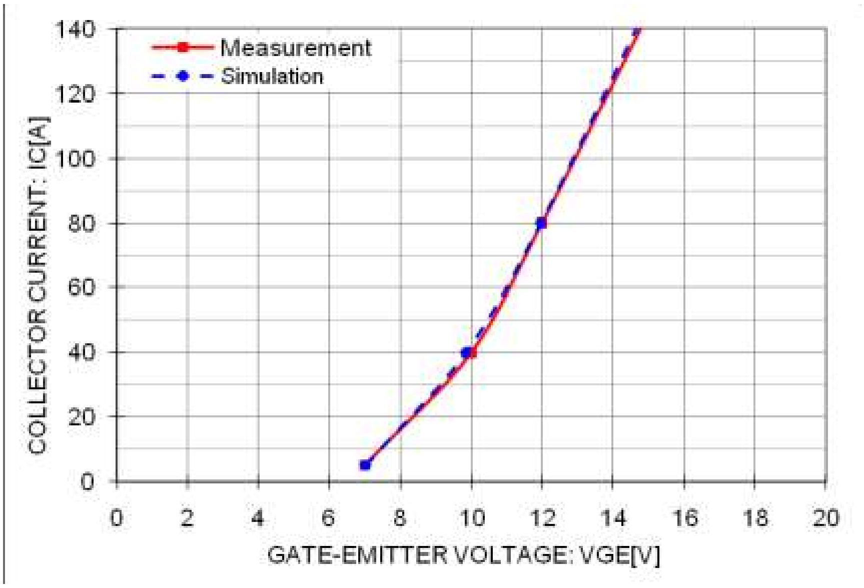


Evaluation circuit



Comparison Graph

Simulation result



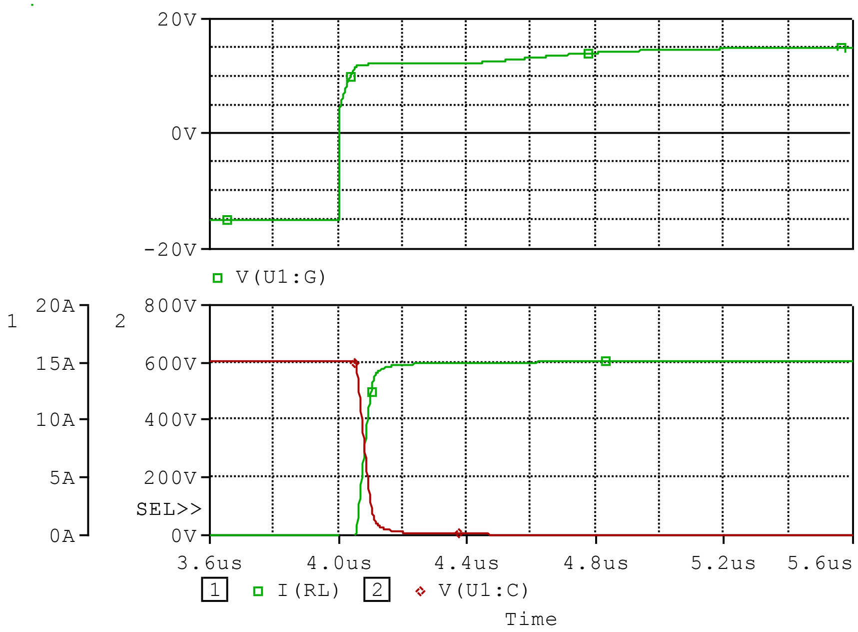
Comparison table

Test condition: V_{CE} =10 (V)

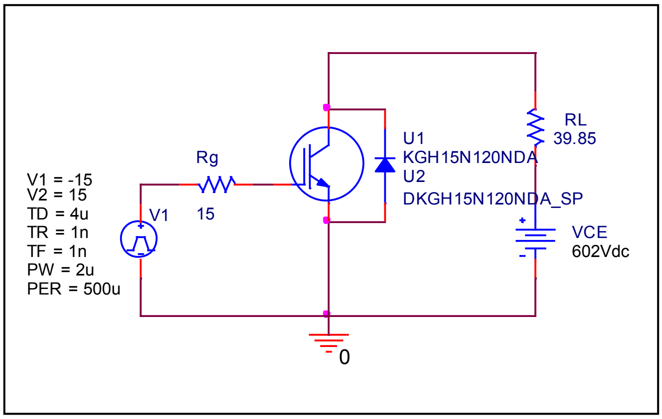
IC (A)	VGE (V)		%Error
	Measurement	Simulation	
5	7.000	7.020	0.28
40	10.000	9.846	-1.54
80	12.000	11.961	-0.32
140	15.000	14.866	-0.89

Rise Time Characteristics

Circuit Simulation result



Evaluation circuit

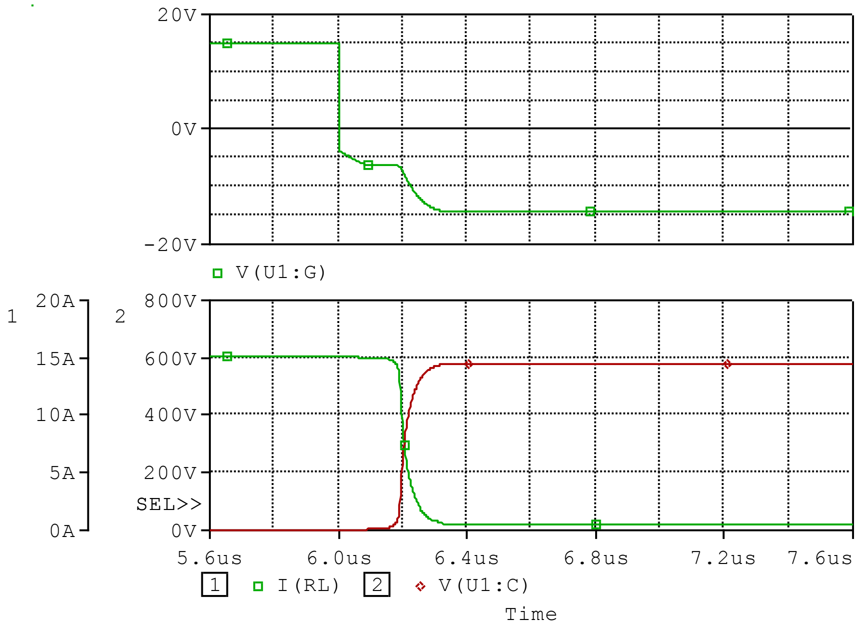


Test condition: I_C=15 (A), V_{CC}=600 (V), V_{GE}= ±15 (V), R_G=15 (Ω)

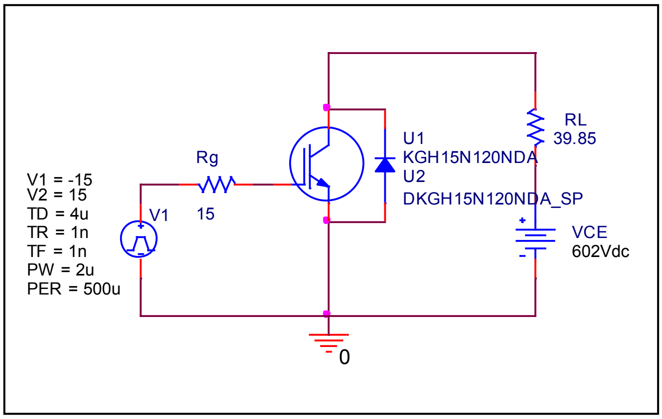
Parameter	Unit	Measurement	Simulation	%Error
tr	ns	50.000	49.582	-0.84
td(on)	ns	60.000	59.100	-1.50

Fall Time Characteristics

Circuit Simulation result



Evaluation circuit

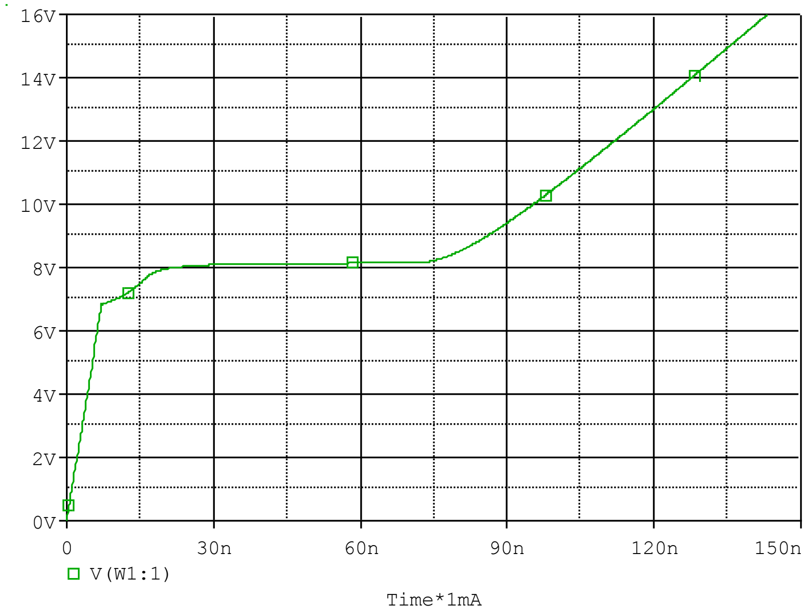


Test condition: I_C=15 (A), V_{CC}=600 (V), V_{GE}= ±15 (V), R_G=15 (Ω)

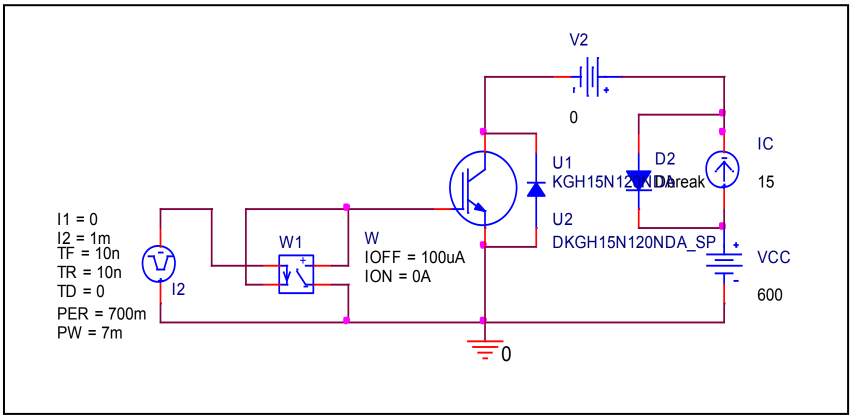
Parameter	Unit	Measurement	Simulation	%Error
tf	ns	70.000	73.077	4.40
td(off)	ns	180.000	186.600	3.67

Gate Charge Characteristics

Circuit Simulation result



Evaluation circuit

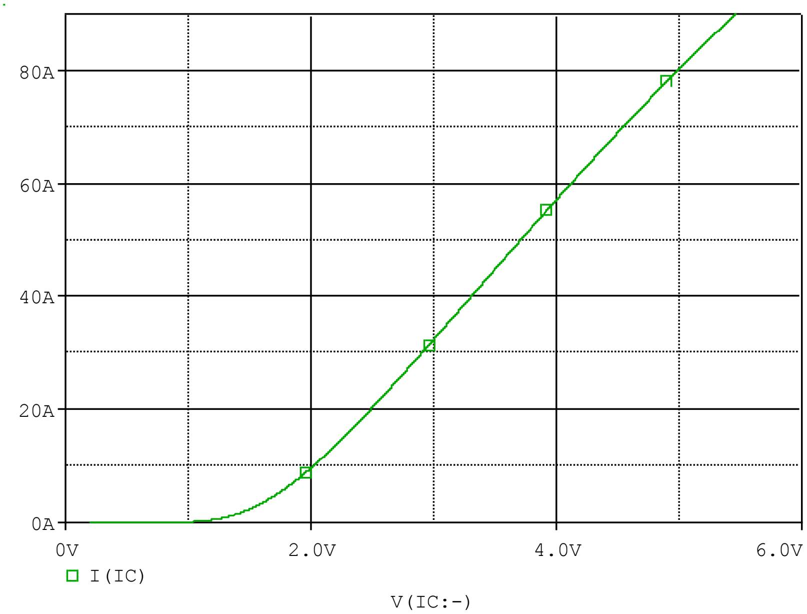


Test condition: VCC=600 (V), IC=15 (A), VGE=15 (V)

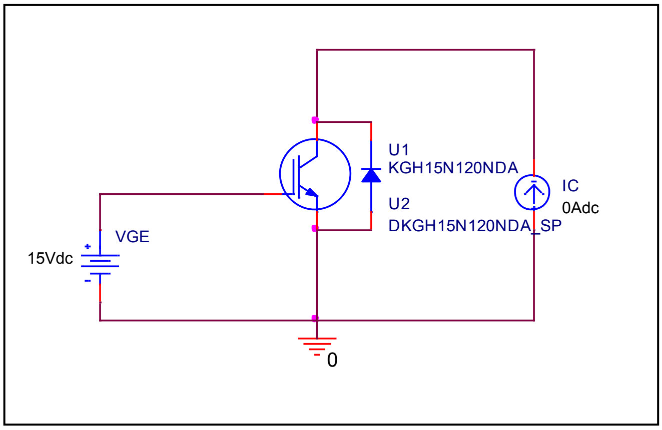
Parameter	Unit	Measurement	Simulation	%Error
Qge	nc	12.000	11.719	-2.34
Qgc	nc	65.000	63.412	-2.44
Qg	nc	140.000	135.472	-3.23

Saturation Characteristics

Circuit Simulation result

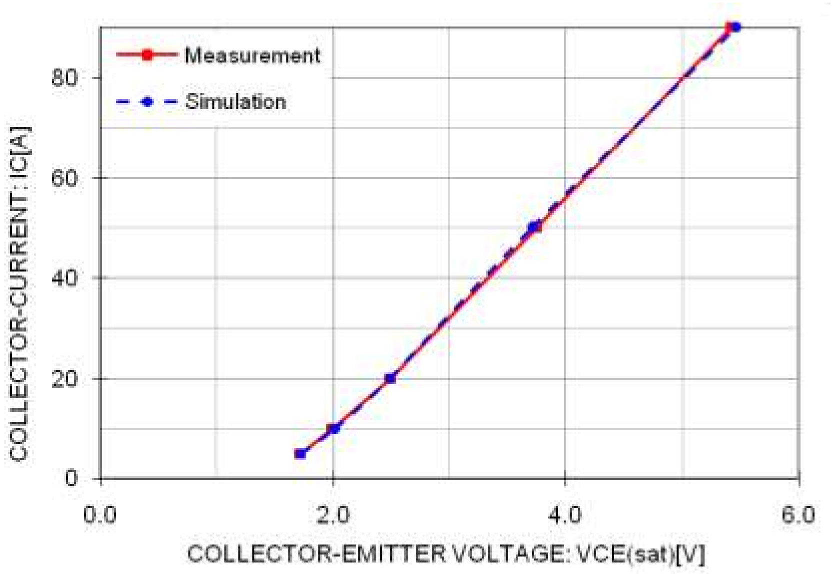


Evaluation circuit



Comparison Graph

Simulation result



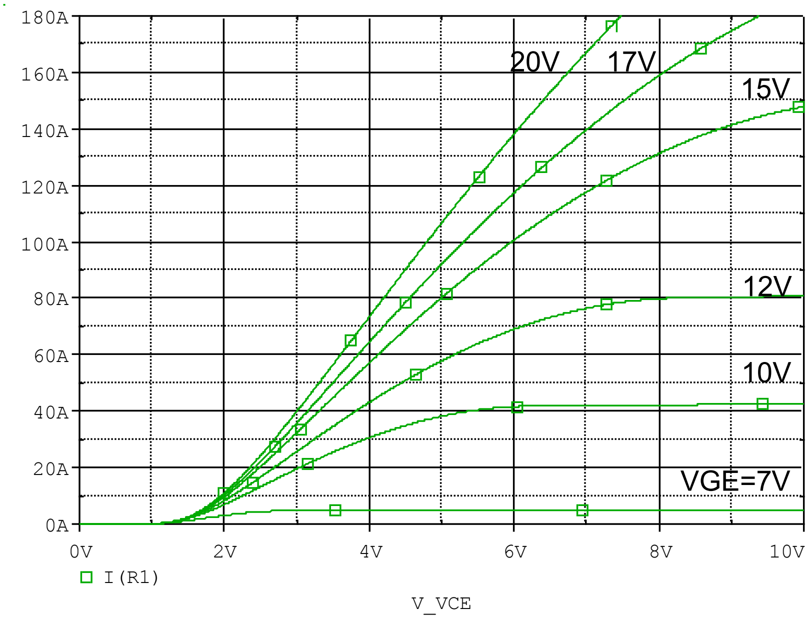
Comparison table

Test condition: V_{GE} =15 (V)

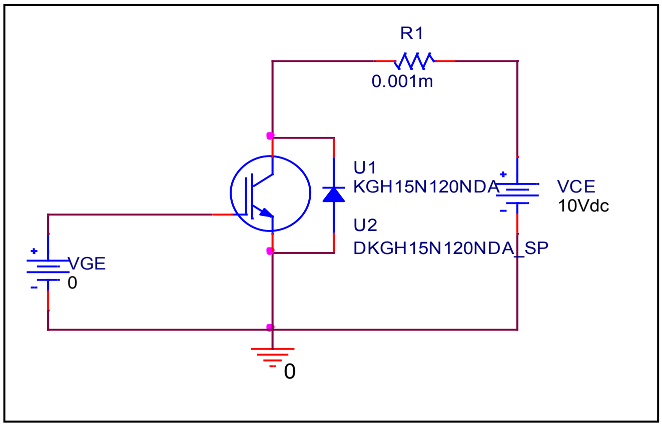
Ic(A)	VCE (V)		%Error
	Measurement	Simulation	
5	1.725	1.722	-0.17
10	2.000	2.019	0.95
20	2.500	2.487	-0.54
50	3.750	3.710	-1.07
90	5.425	5.462	0.68

Output Characteristics

Circuit Simulation result

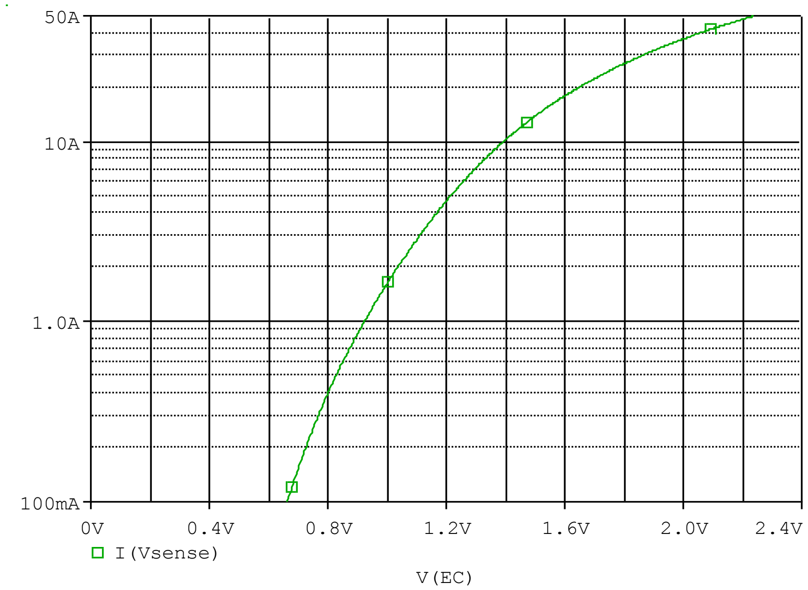


Evaluation circuit

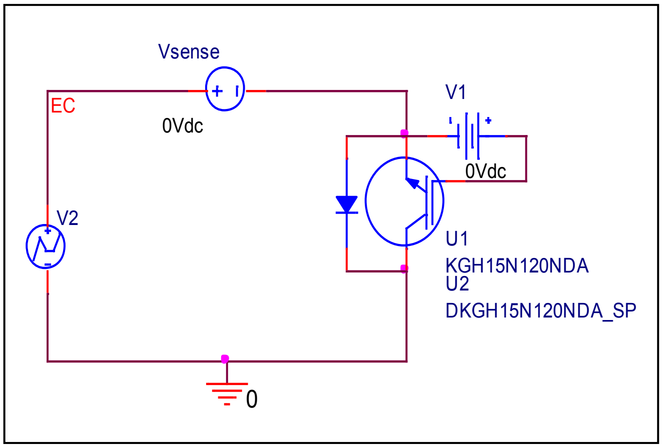


FWD Forward Current Characteristics

Circuit Simulation result

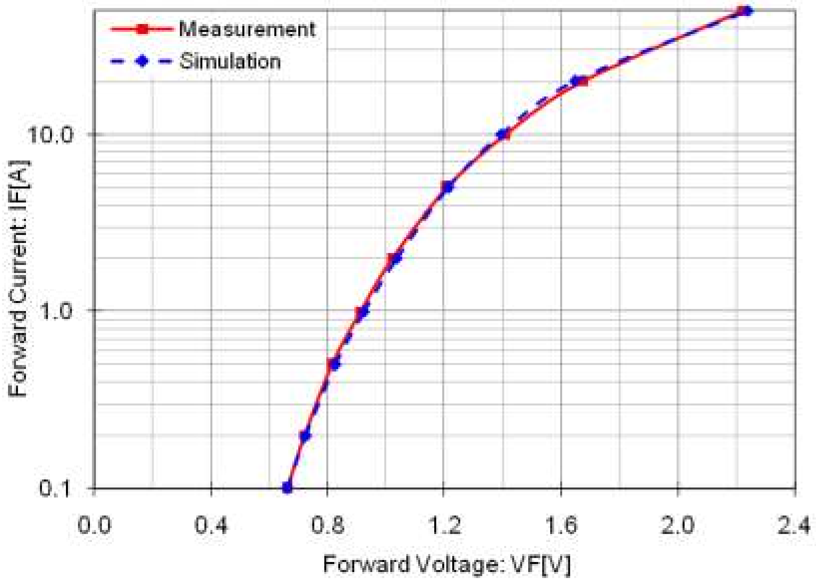


Evaluation circuit



Comparison Graph

Simulation result

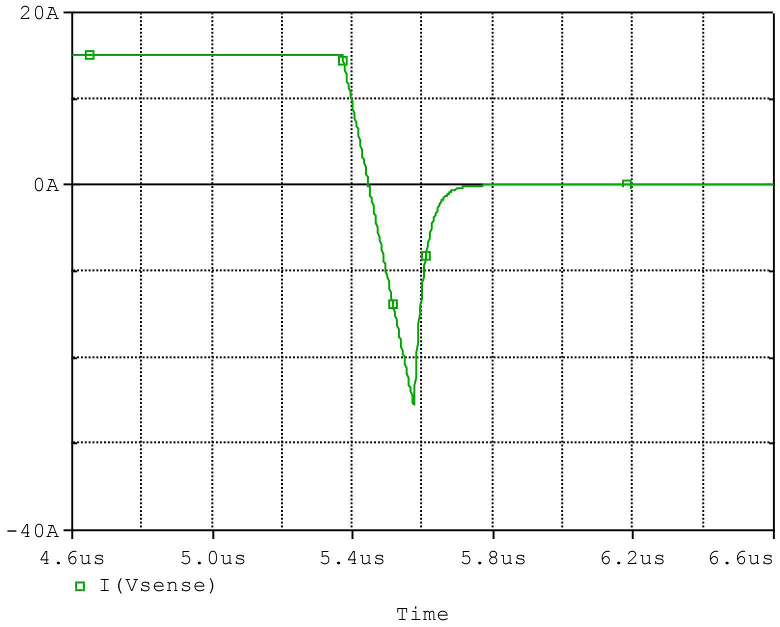


Comparison table

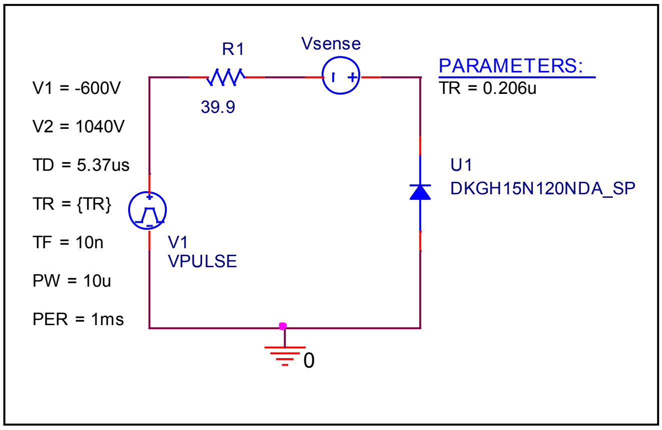
IF(A)	VF (V)		%Error
	Measurement	Simulation	
0.1	0.660	0.662	0.30
0.2	0.718	0.725	0.97
0.5	0.814	0.827	1.60
1	0.910	0.923	1.43
2	1.020	1.035	1.47
5	1.210	1.215	0.40
10	1.410	1.393	-1.21
20	1.675	1.647	-1.65
50	2.220	2.239	0.86

Reverse Recovery Characteristics

Circuit Simulation result



Evaluation circuit



Test condition: Vcc=1040,-600 (V), Ic=15 (A), -di/dt=200 (A/us)

Parameter	Unit	Measurement	Simulation	%Error
trr	nsec	200.000	198.486	-0.76
Irr	A	26.000	25.510	-1.88