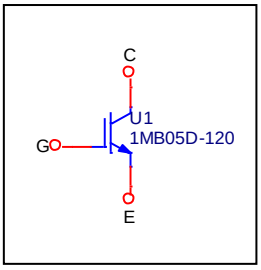
Device Modeling Report

COMPONENTS: Insulated Gate Bipolar Transistor (IGBT)
PART NUMBER: 1MB05D-120
MANUFACTURER: Fuji Electric
* REMARK: Free-Wheeling Diode Special Model

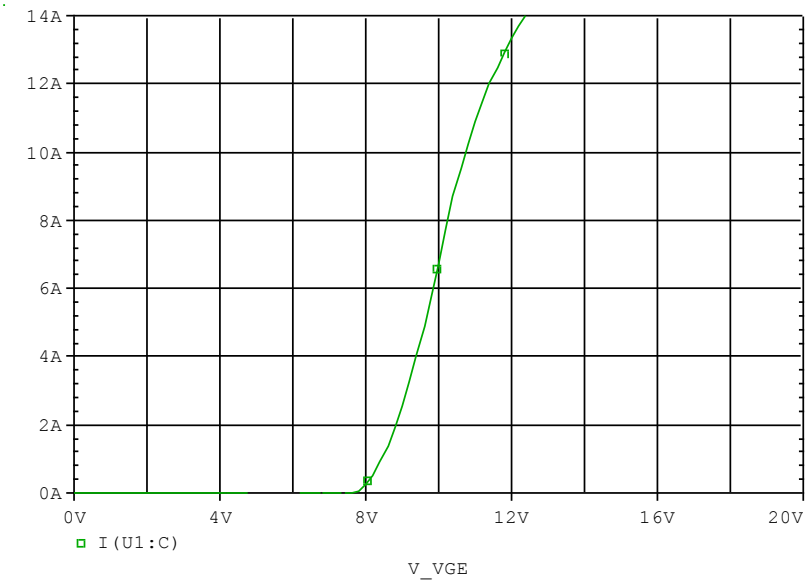
Bee Technologies Inc.

Circuit Configuration

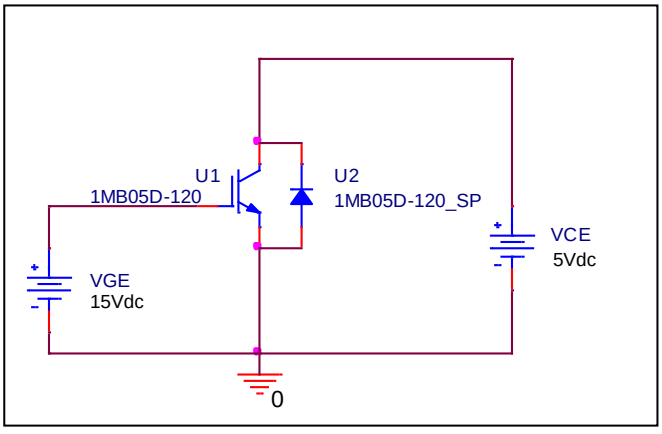


Transfer Characteristics

Circuit Simulation result

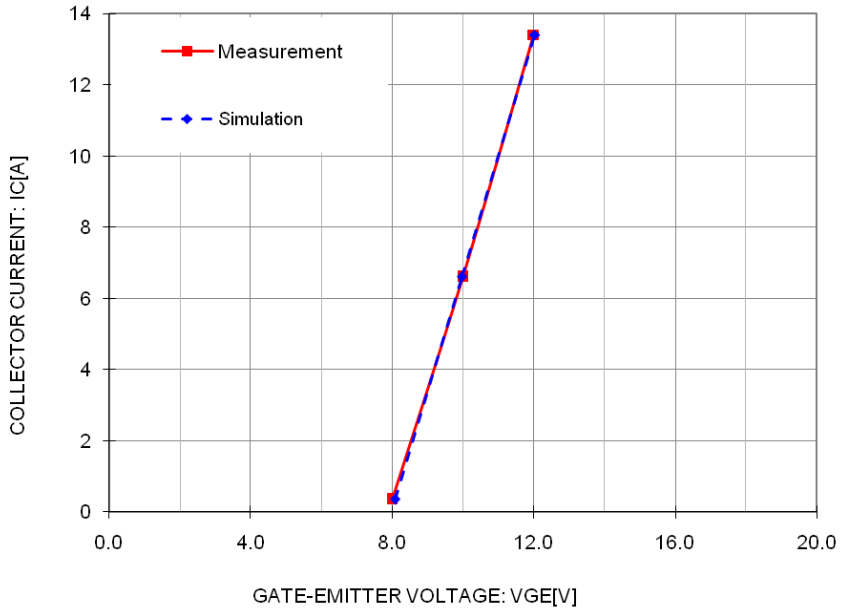


Evaluation circuit



Comparison Graph

Simulation result



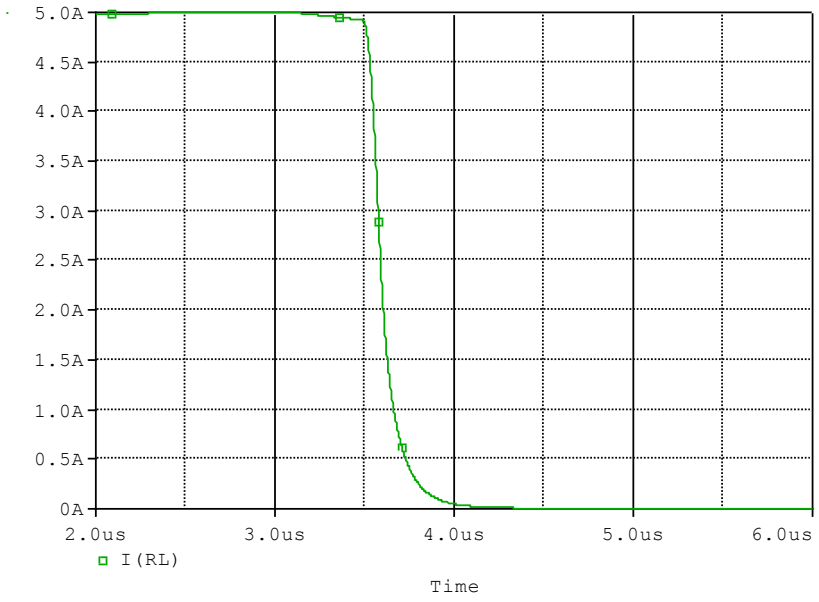
Comparison table

Test condition: V_{CE} =5 (V)

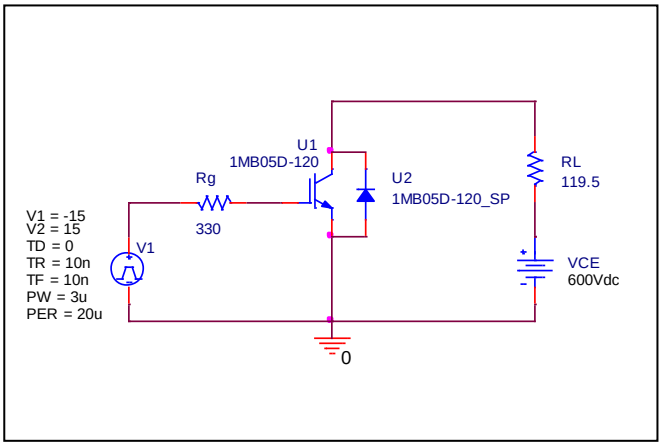
IC (A)	VGE (V)		%Error
	Measurement	Simulation	
0.350	8.000	8.082	1.02
6.600	10.000	9.970	-0.30
13.400	12.000	12.037	0.31

Fall Time Characteristics

Circuit Simulation result



Evaluation circuit

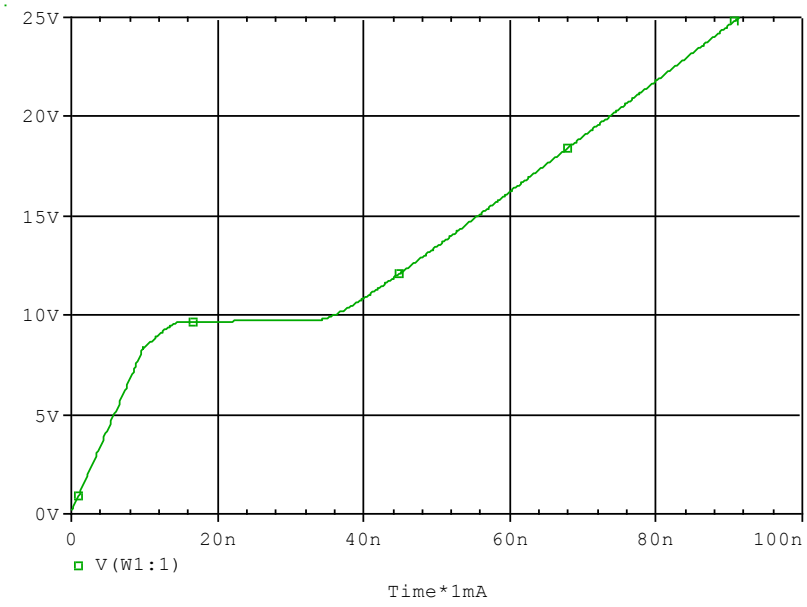


Test condition: I_C=5 (A), V_{CC}=600 (V)

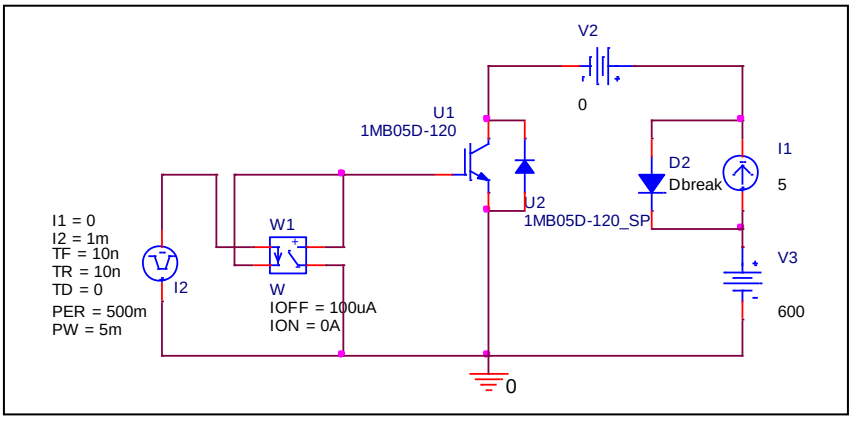
Parameter	Unit	Measurement	Simulation	%Error
tf	us	0.200	0.201	0.365

Gate Charge Characteristics

Circuit Simulation result



Evaluation circuit

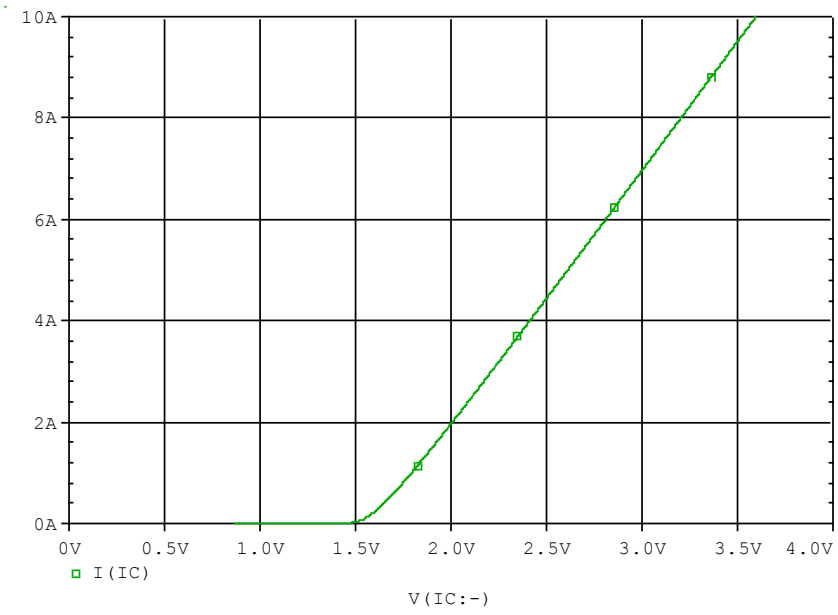


Test condition: V_{CC}=600 (V), I_C=5 (A), V_{GE}=15 (V)

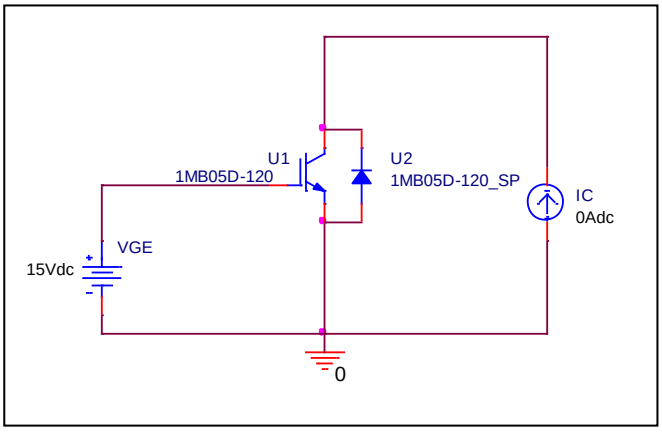
Parameter	Unit	Measurement	Simulation	%Error
Qge	nc	12.000	12.000	0.000
Qgc	nc	26.000	25.565	-1.673
Qg	nc	55.000	55.625	1.136

Saturation Characteristics

Circuit Simulation result

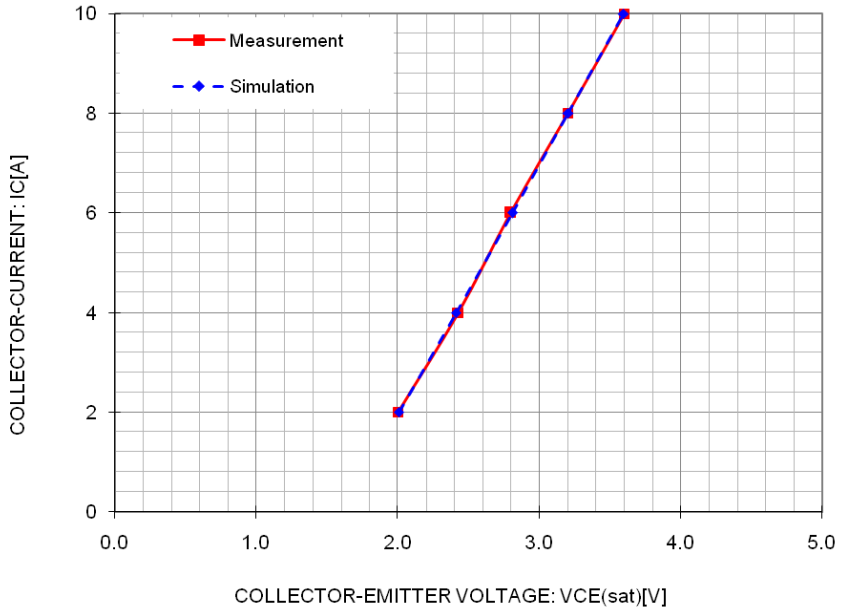


Evaluation circuit



Comparison Graph

Simulation result



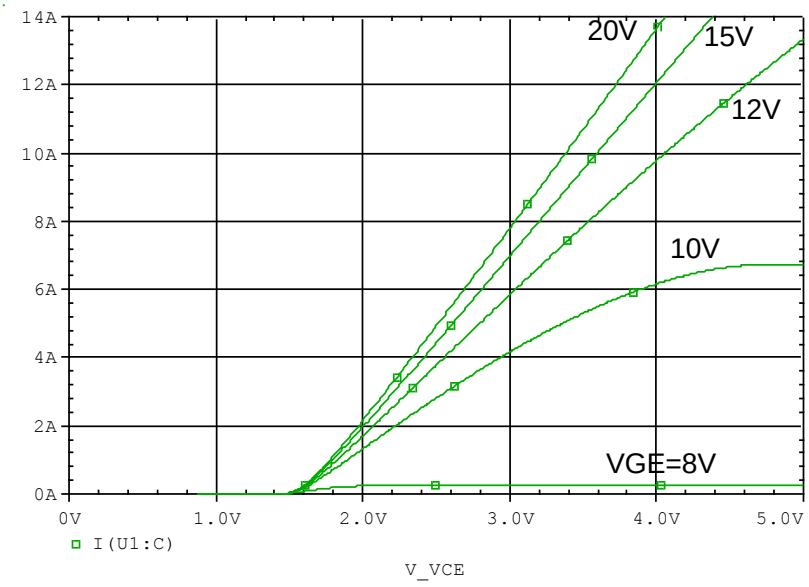
Comparison table

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

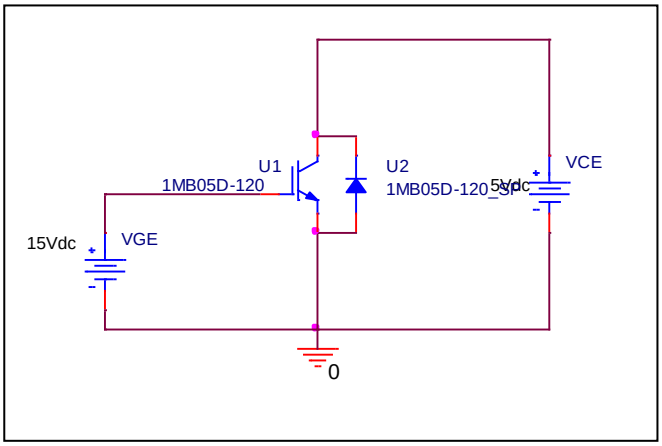
IC (A)	VCE (V)		%Error
	Measurement	Simulation	
2.0	2.000	2.007	0.35
4.0	2.430	2.413	-0.71
6.0	2.800	2.810	0.35
8.0	3.200	3.204	0.12
10.0	3.600	3.597	-0.09

Output Characteristics

Circuit Simulation result

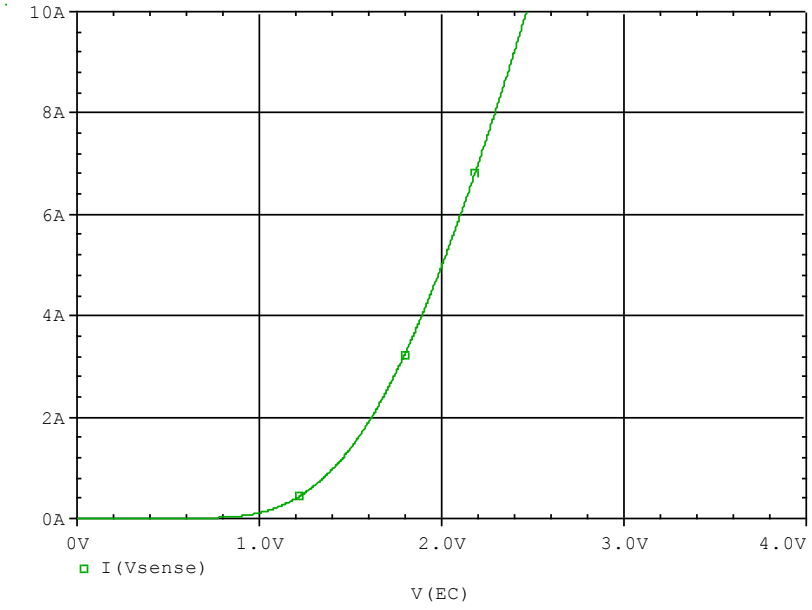


Evaluation circuit

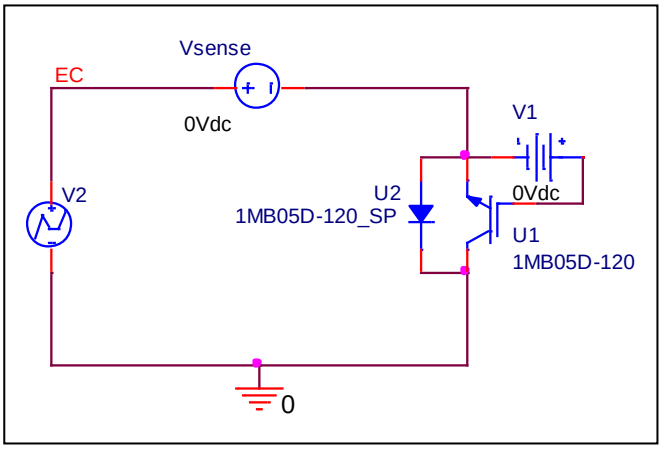


FWD Forward Current Characteristics

Circuit Simulation result

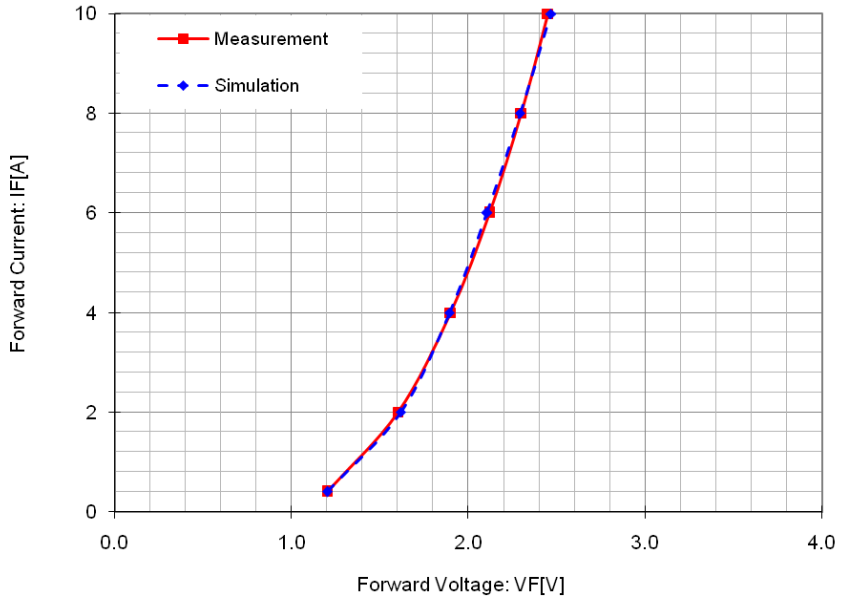


Evaluation circuit



Comparison Graph

Simulation result

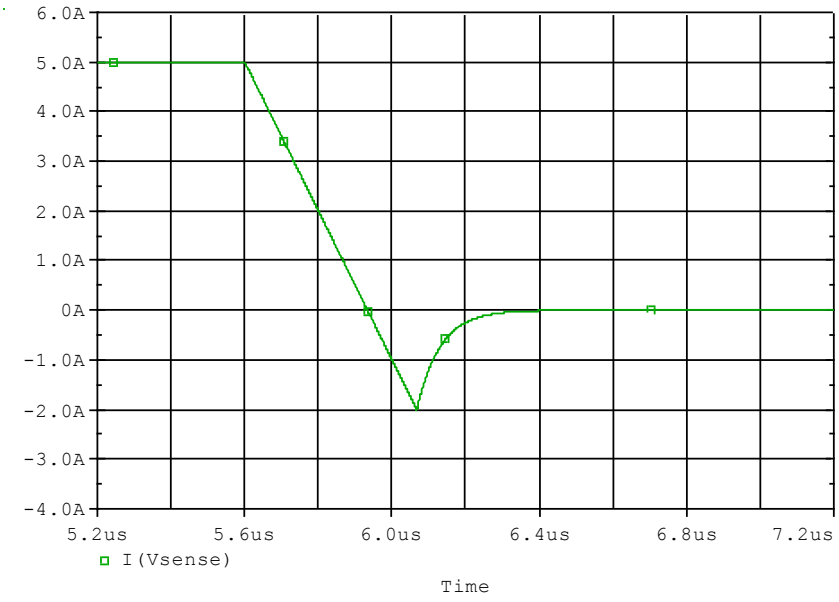


Comparison table

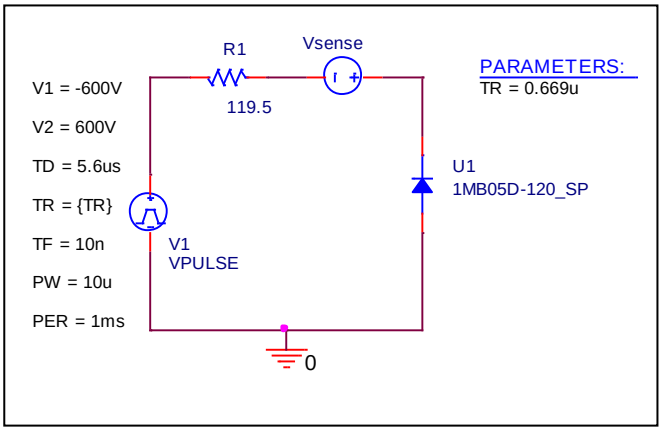
IF(A)	VF (V)		%Error
	Measurement	Simulation	
0.4	1.200	1.202	0.20
2	1.600	1.616	1.01
4	1.900	1.891	-0.49
6	2.120	2.104	-0.75
8	2.300	2.292	-0.34
10	2.450	2.466	0.66

Reverse Recovery Characteristics

Circuit Simulation result



Evaluation circuit



Test condition: VCC=600 (V), IC=5 (A), -di/dt=15 (A/us)

Parameter	Unit	Measurement	Simulation	%Error
trr	nsec	280.000	279.827	-0.06
Irr	A	2.000	1.997	-0.14