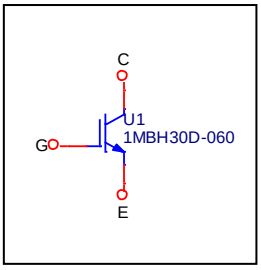
Device Modeling Report

COMPONENTS: Insulated Gate Bipolar Transistor (IGBT)
PART NUMBER: 1MBH30D-060
MANUFACTURER: Fuji Electric
* REMARK: Free-Wheeling Diode Special Model

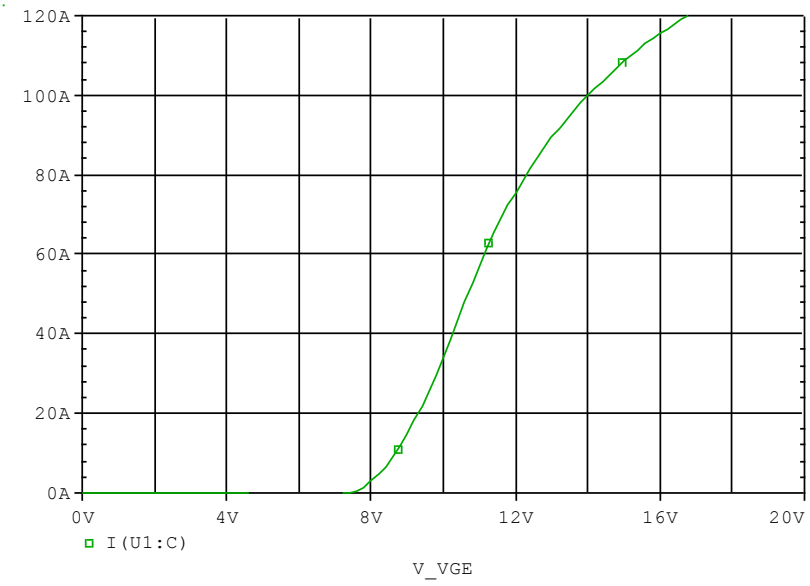
Bee Technologies Inc.

Circuit Configuration

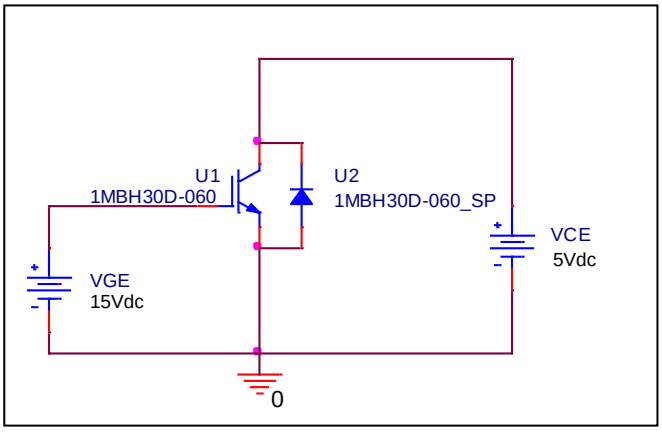


Transfer Characteristics

Circuit Simulation result

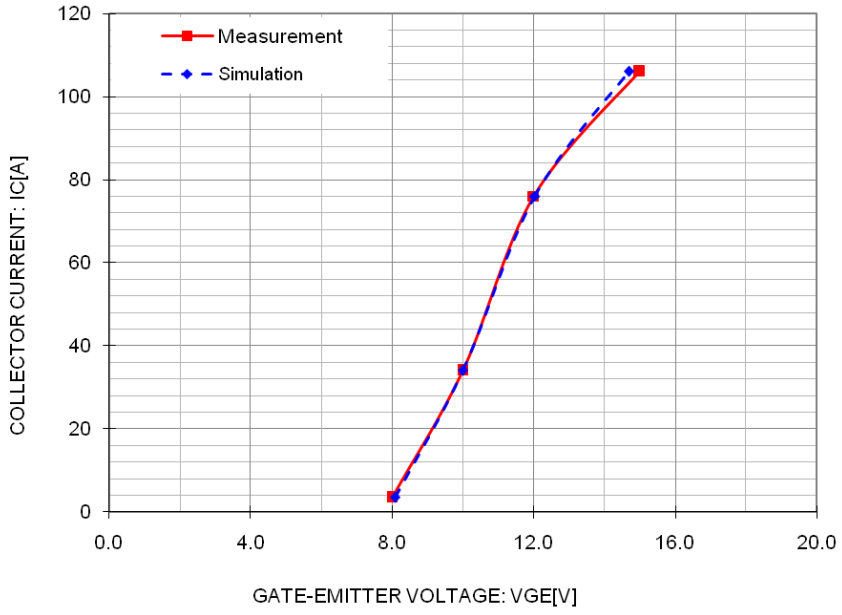


Evaluation circuit



Comparison Graph

Simulation result



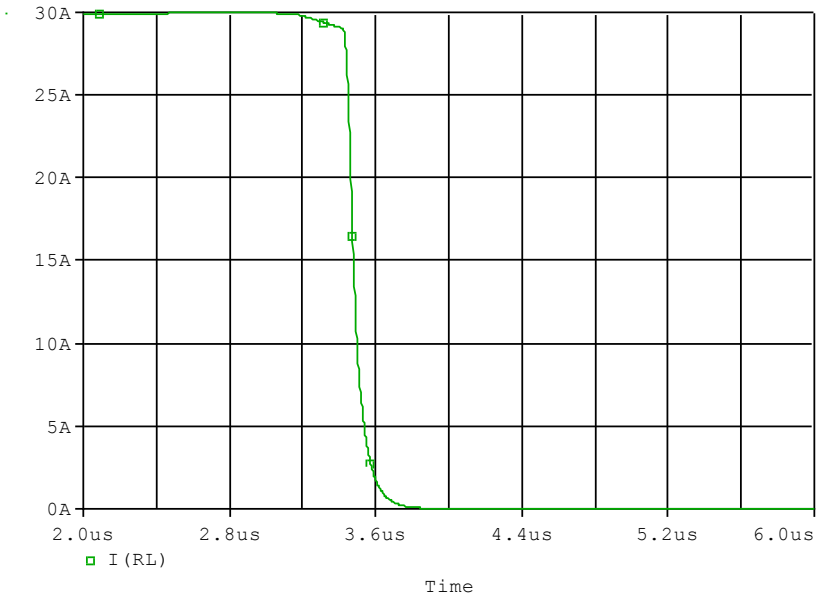
Comparison table

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

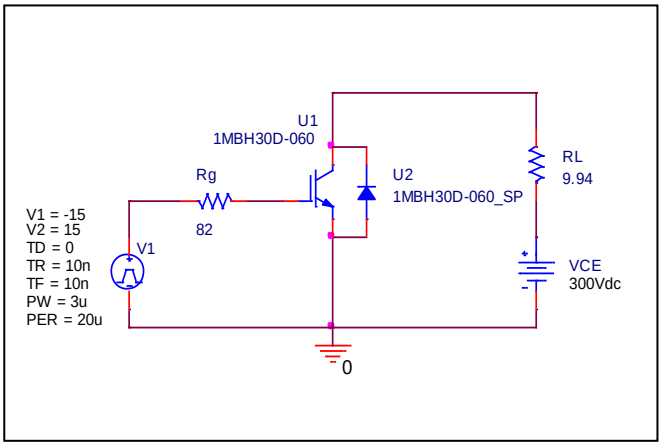
IC (A)	VGE (V)		%Error
	Measurement	Simulation	
3.500	8.000	8.075	0.93
34.000	10.000	9.995	-0.05
76.000	12.000	12.027	0.22
106.000	15.000	14.693	-2.05

Fall Time Characteristics

Circuit Simulation result



Evaluation circuit

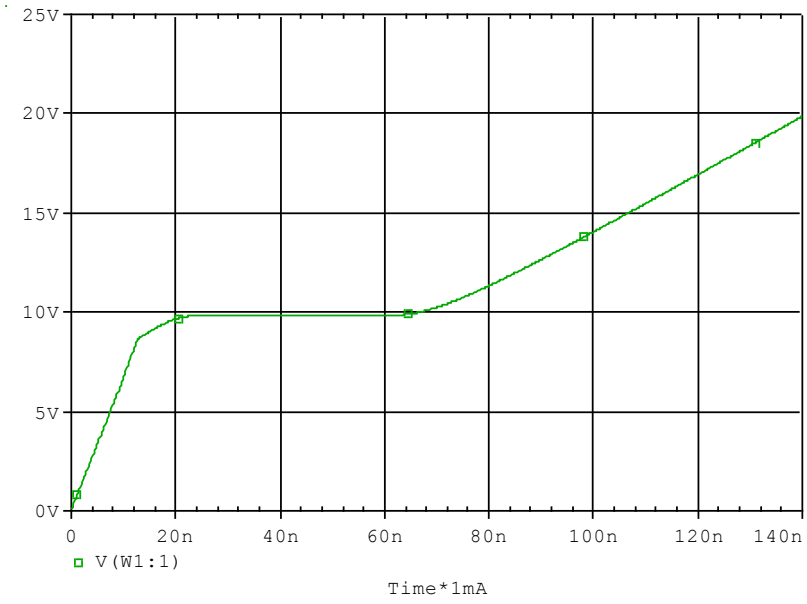


Test condition: IC=30 (A), VCC=300 (V)

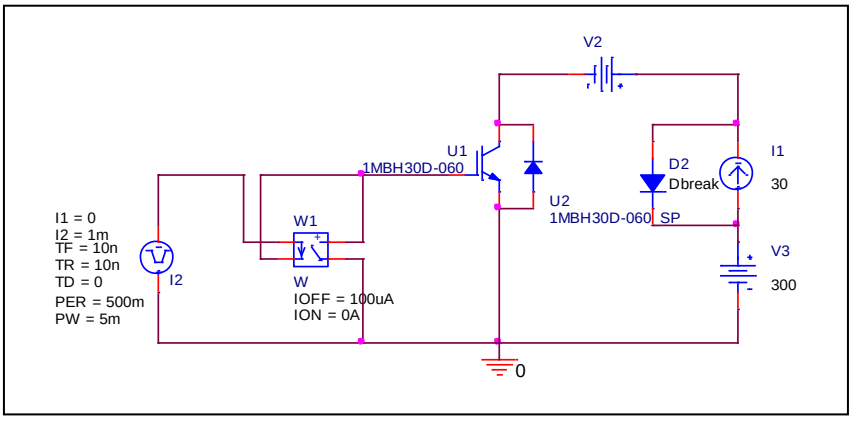
Parameter	Unit	Measurement	Simulation	%Error
tf	us	0.125	0.126	0.445

Gate Charge Characteristics

Circuit Simulation result



Evaluation circuit

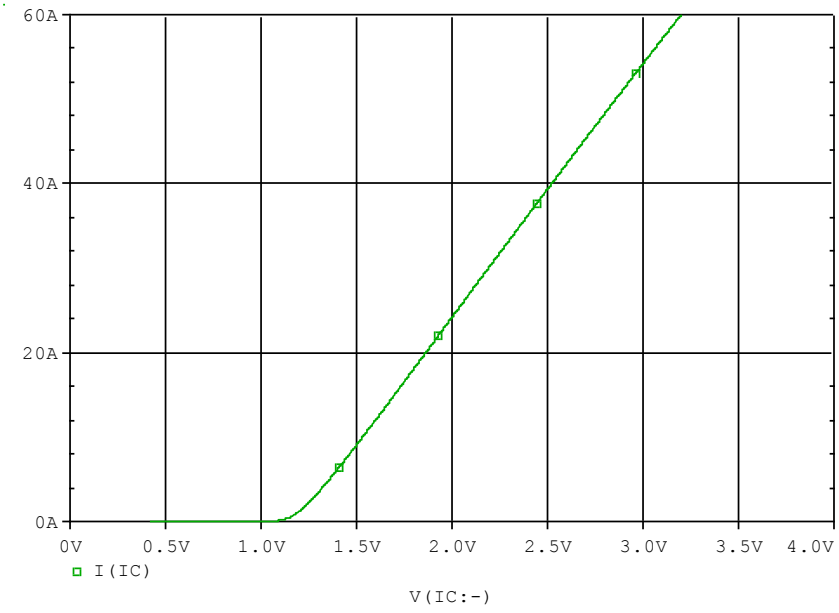


Test condition: V_{CC}=300 (V), I_C=30 (A), V_{GE}=15 (V)

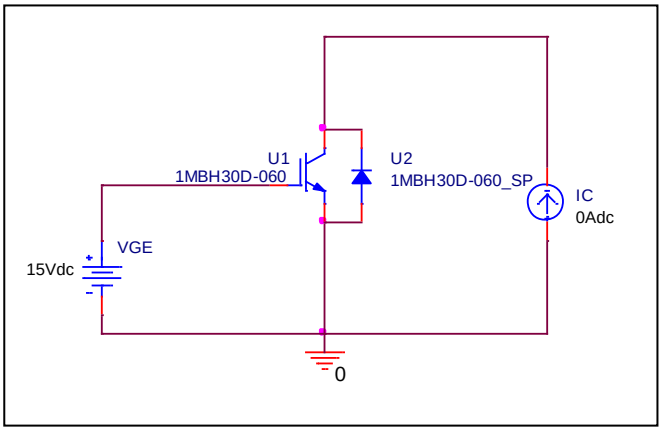
Parameter	Unit	Measurement	Simulation	%Error
Qge	nc	16.000	15.976	-0.150
Qgc	nc	52.000	51.707	-0.563
Qg	nc	106.000	106.672	0.634

Saturation Characteristics

Circuit Simulation result

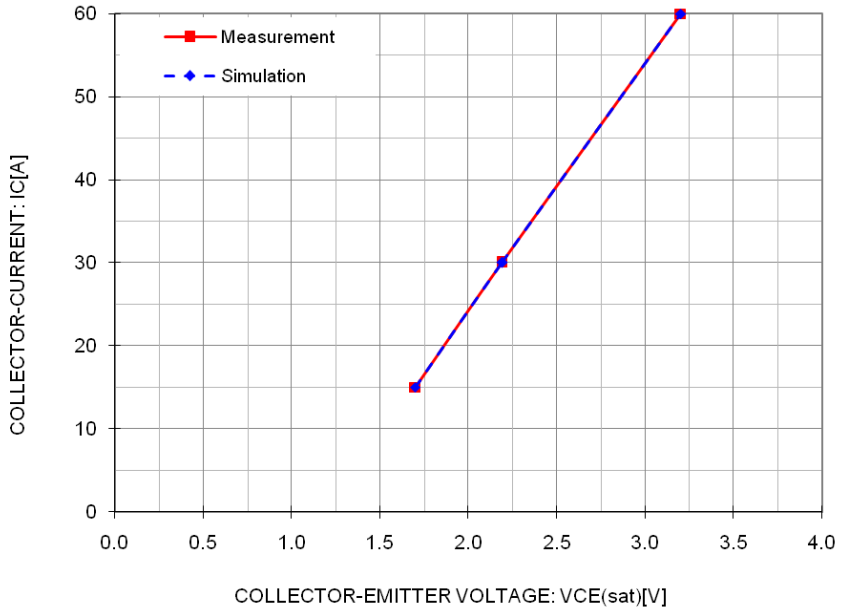


Evaluation circuit



Comparison Graph

Simulation result



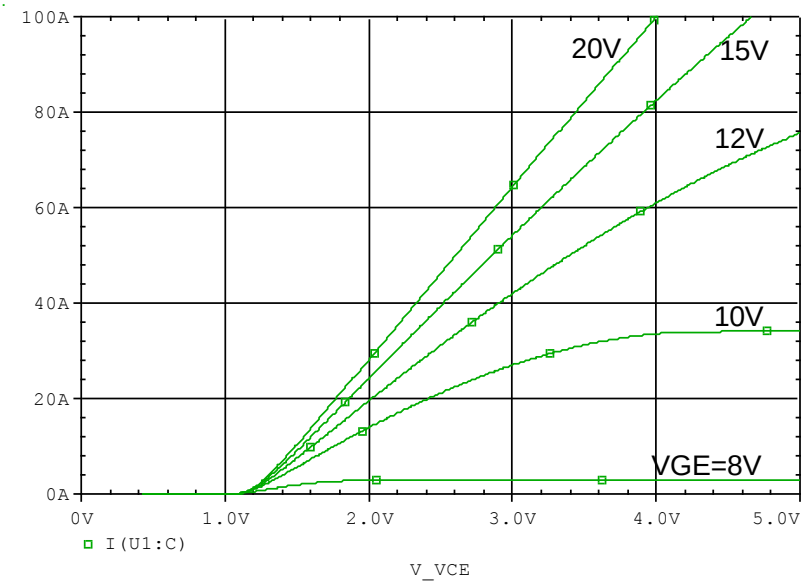
Comparison table

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

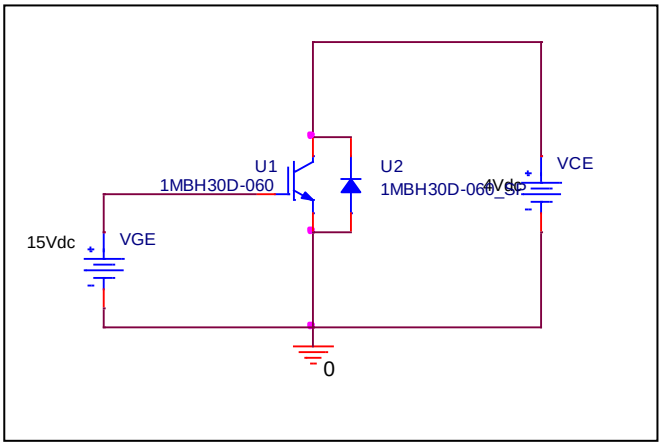
IC (A)	VCE (V)		%Error
	Measurement	Simulation	
15.0	1.700	1.699	-0.06
30.0	2.190	2.191	0.05
60.0	3.200	3.200	0.00

Output Characteristics

Circuit Simulation result

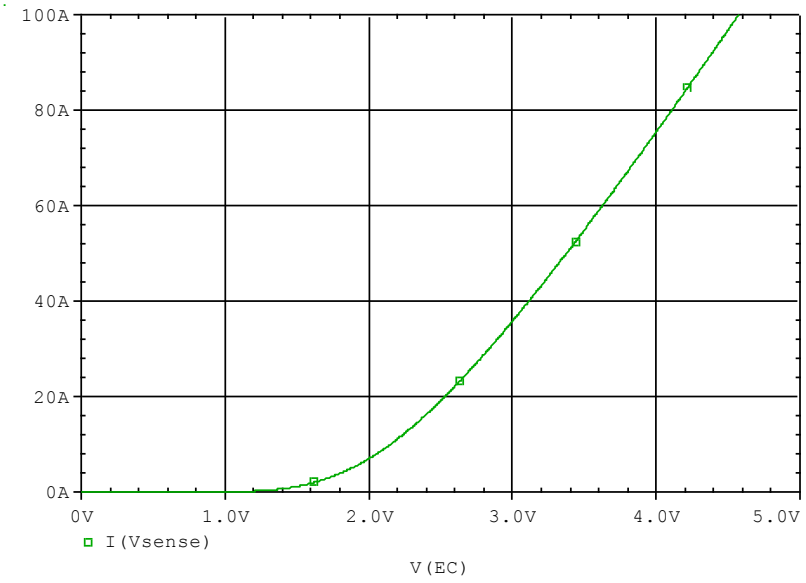


Evaluation circuit

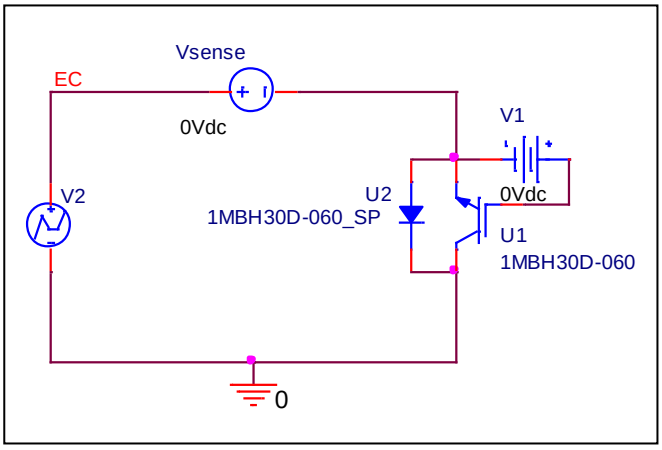


FWD Forward Current Characteristics

Circuit Simulation result

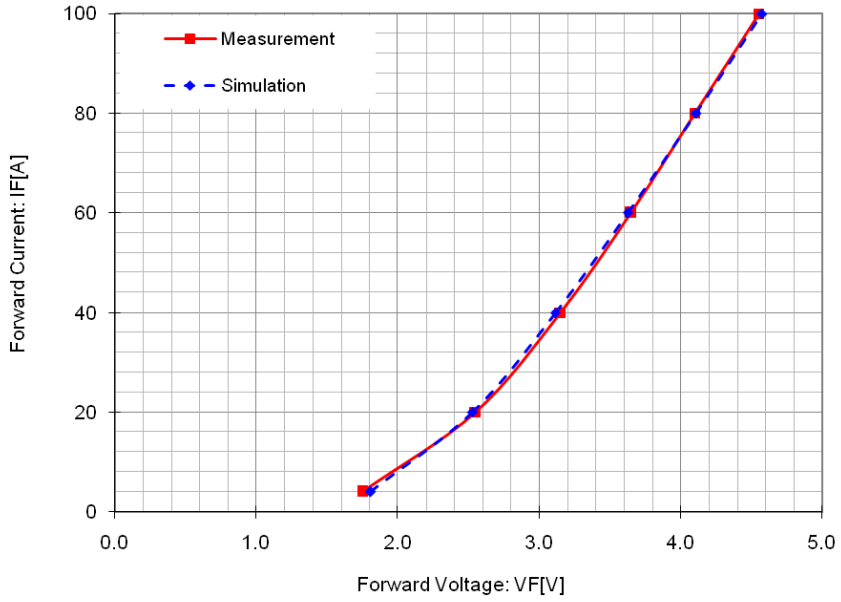


Evaluation circuit



Comparison Graph

Simulation result

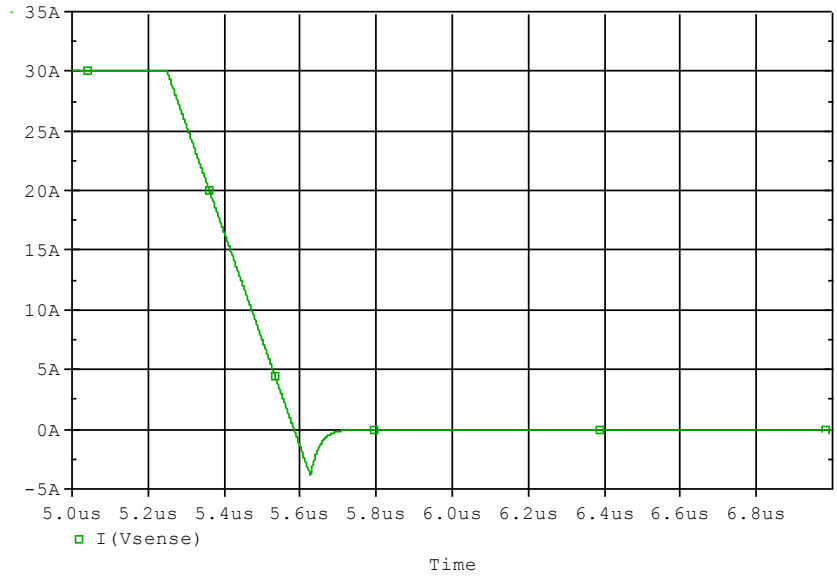


Comparison table

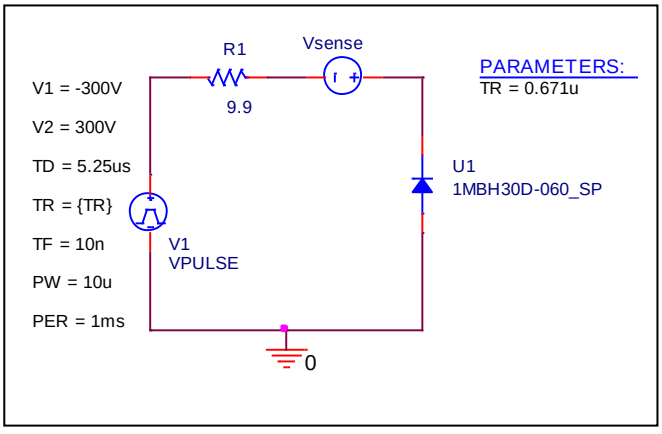
IF(A)	VF (V)		%Error
	Measurement	Simulation	
4	1.750	1.808	3.34
20	2.550	2.530	-0.78
40	3.150	3.115	-1.13
60	3.650	3.626	-0.65
80	4.100	4.108	0.20
100	4.550	4.574	0.52

Reverse Recovery Characteristics

Circuit Simulation result



Evaluation circuit



Test condition: V_{CC}=300 (V), I_C=30 (A), -di/dt=90 (A/us)

Parameter	Unit	Measurement	Simulation	%Error
trr	nsec	98.000	98.059	0.06
Irr	A	3.800	3.801	0.04