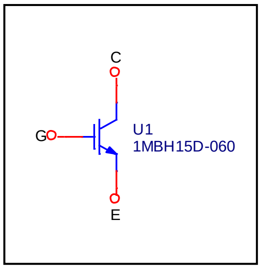
Device Modeling Report

COMPONENTS: Insulated Gate Bipolar Transistor (IGBT)
PART NUMBER: 1MBH15D-060
MANUFACTURER: FUJI ELECTRIC
* REMARK: Free-Wheeling Diode Special Model

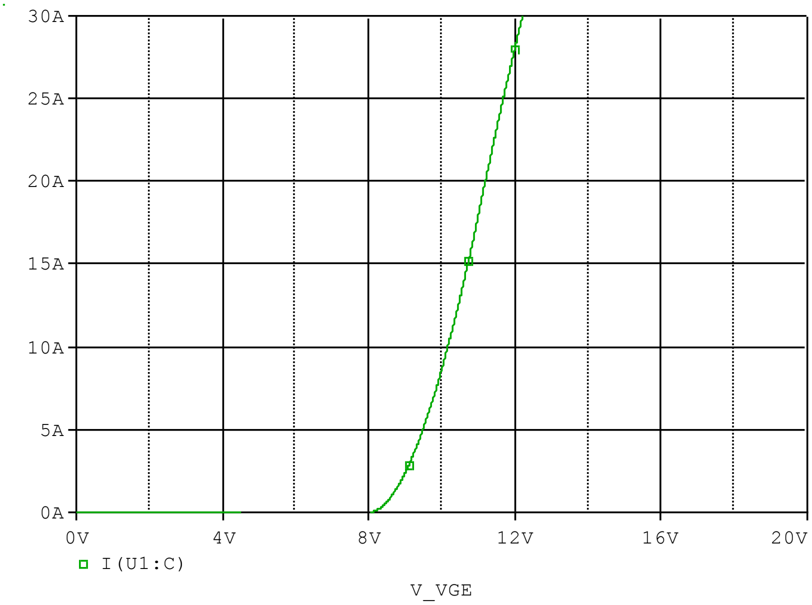
Bee Technologies Inc.

Circuit Configuration

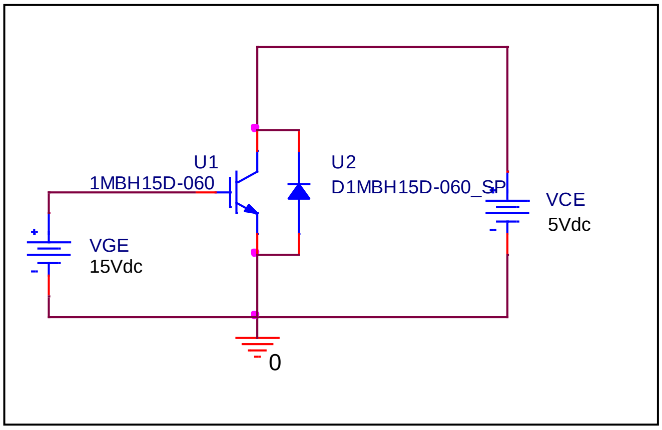


Transfer Characteristics

Circuit Simulation result

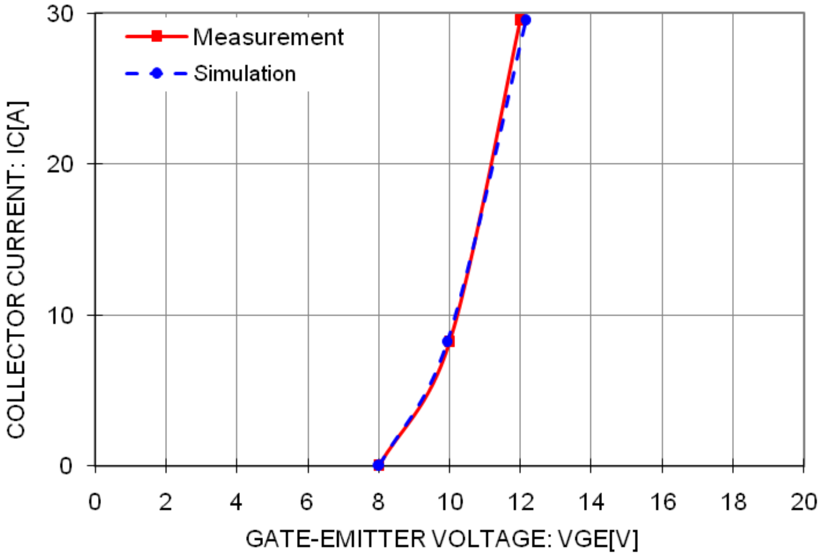


Evaluation circuit



Comparison Graph

Simulation result



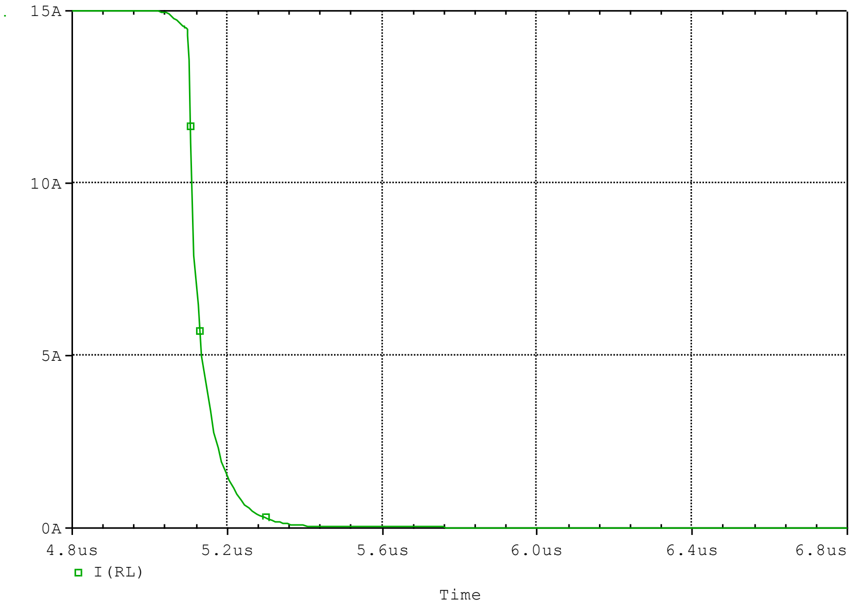
Comparison table

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

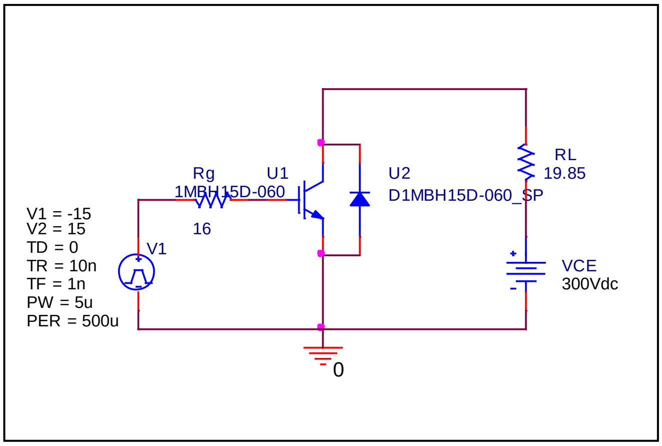
IC (A)	VGE (V)		%Error
	Measurement	Simulation	
0.000	8.000	8.020	0.25
8.200	10.000	9.941	-0.59
29.500	12.000	12.157	1.31

Fall Time Characteristics

Circuit Simulation result



Evaluation circuit

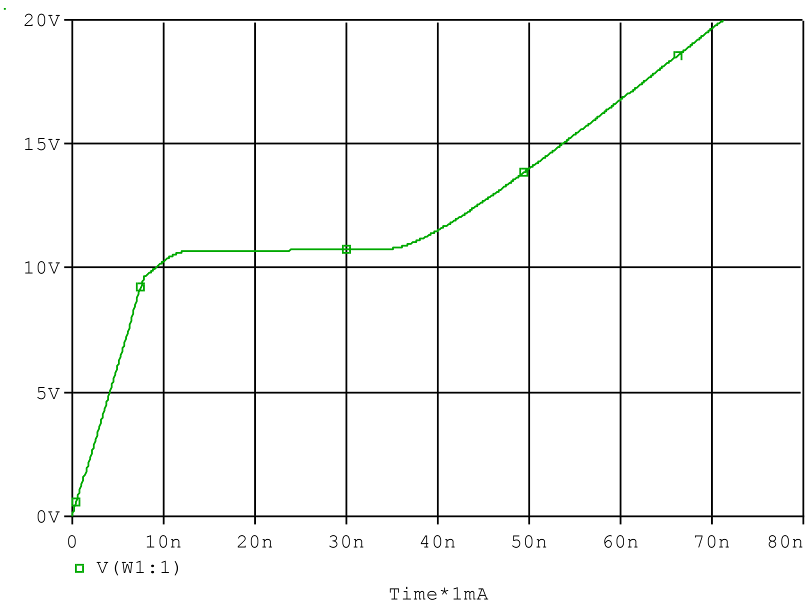


Test condition: IC=15 (A), VCC=300 (V)

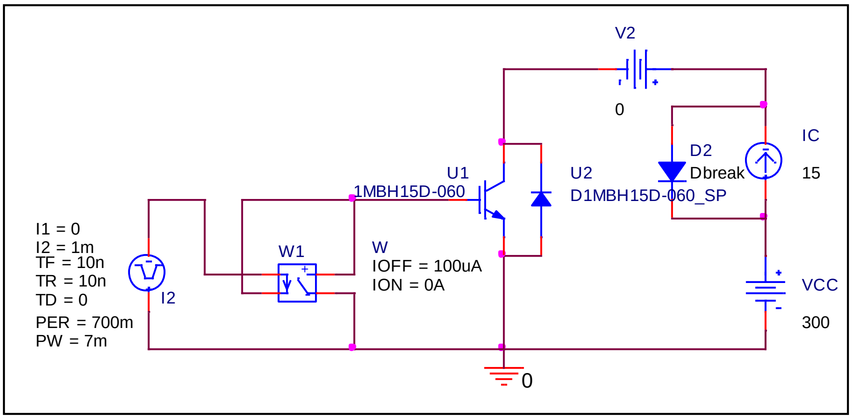
Parameter	Unit	Measurement	Simulation	%Error
tf	us	0.100	0.102	1.91

Gate Charge Characteristics

Circuit Simulation result



Evaluation circuit

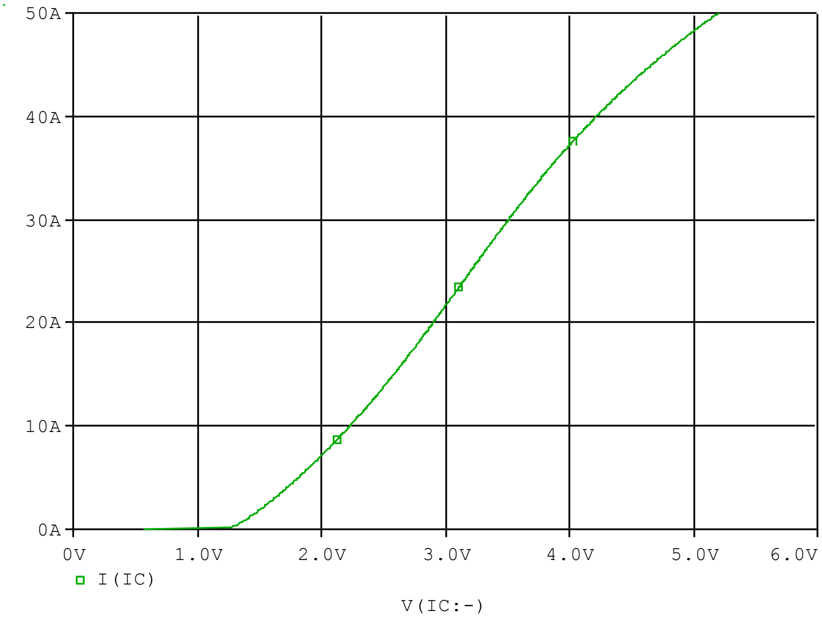


Test condition: V_{CC}=300 (V), I_C=15 (A), V_{GE}=15 (V)

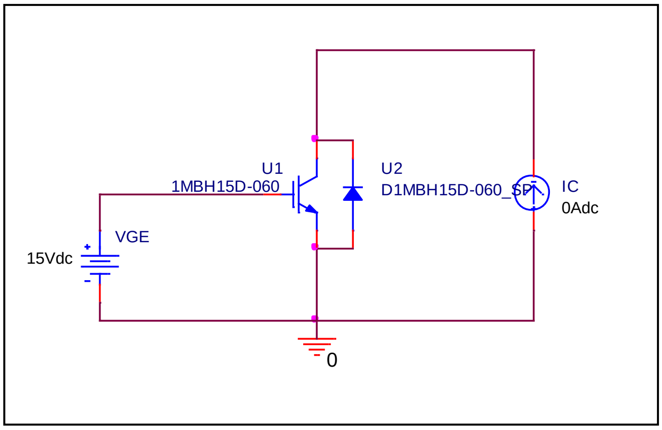
Parameter	Unit	Measurement	Simulation	%Error
Qge	nc	9.000	9.097	1.08
Qgc	nc	26.000	25.972	-0.11
Qg	nc	53.000	53.646	1.22

Saturation Characteristics

Circuit Simulation result

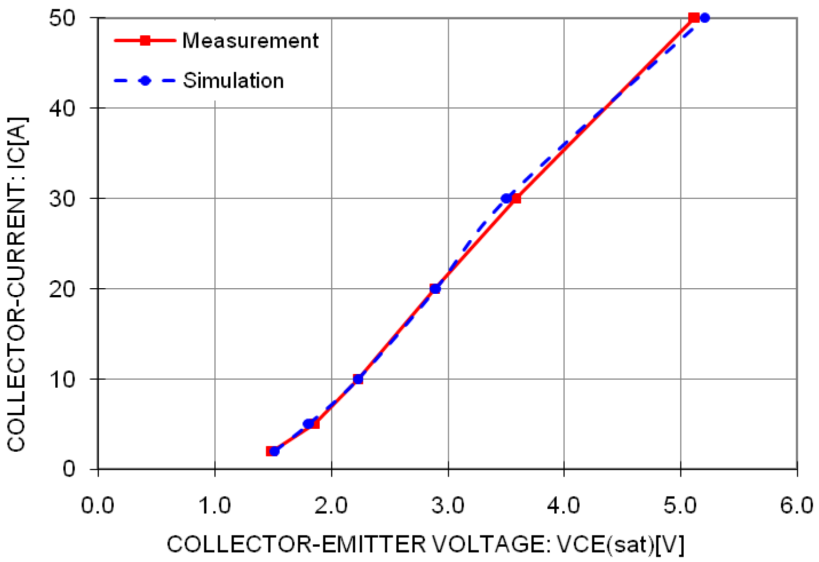


Evaluation circuit



Comparison Graph

Simulation result



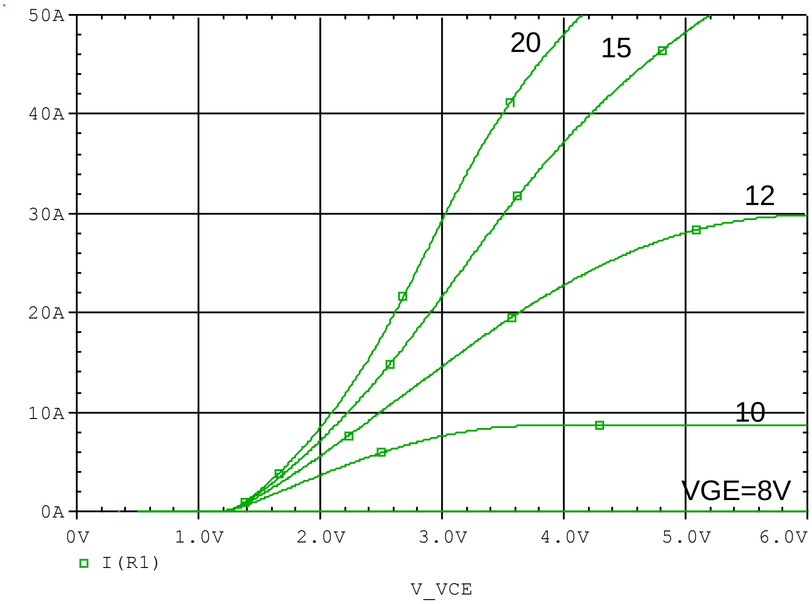
Comparison table

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

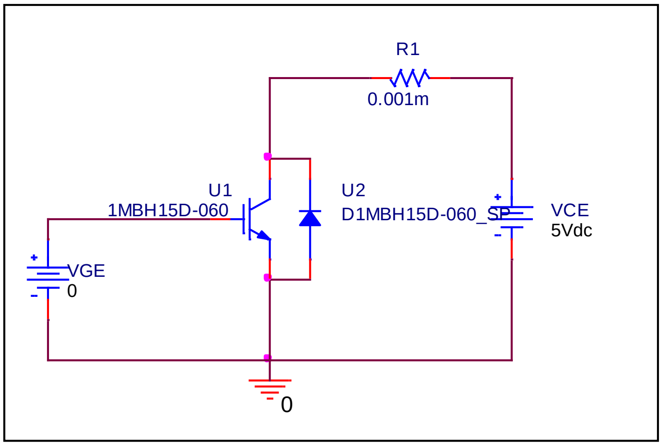
Ic(A)	VCE (V)		%Error
	Measurement	Simulation	
2	1.500	1.517	1.15
5	1.860	1.815	-2.44
10	2.230	2.230	0.00
20	2.887	2.902	0.52
30	3.590	3.511	-2.21
50	5.120	5.201	1.59

Output Characteristics

Circuit Simulation result

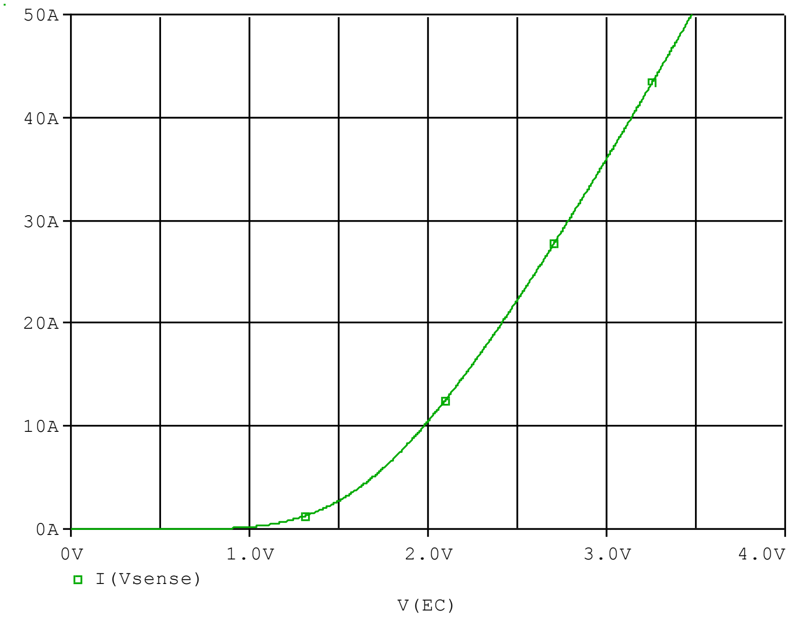


Evaluation circuit

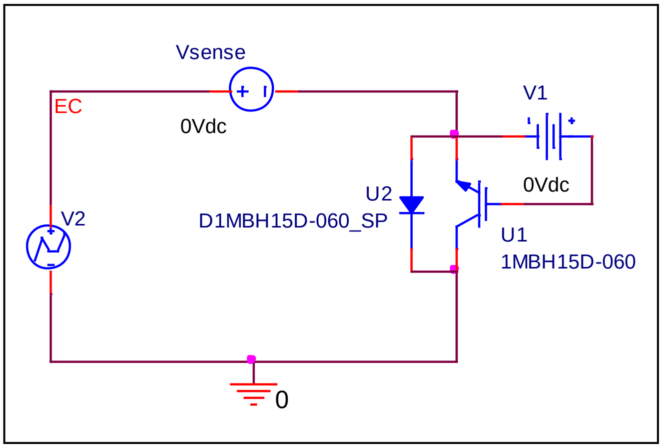


FWD Forward Current Characteristics

Circuit Simulation result

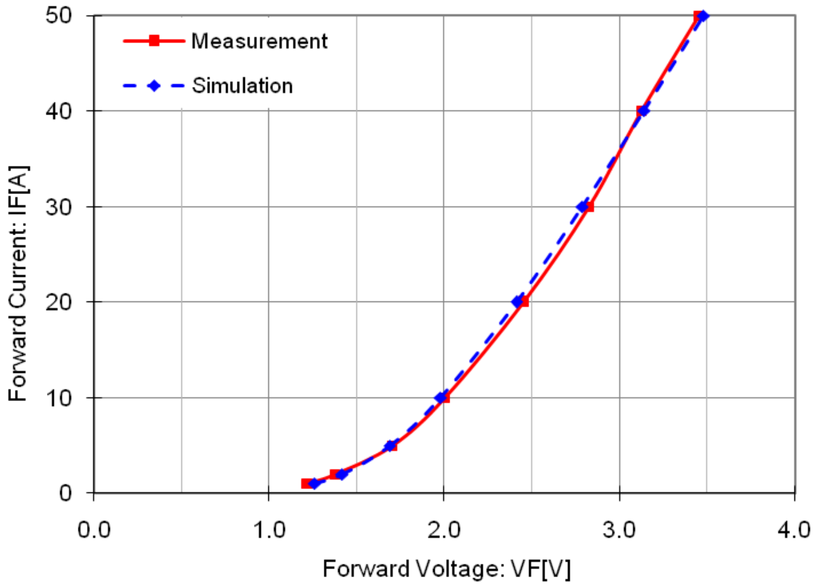


Evaluation circuit



Comparison Graph

Simulation result

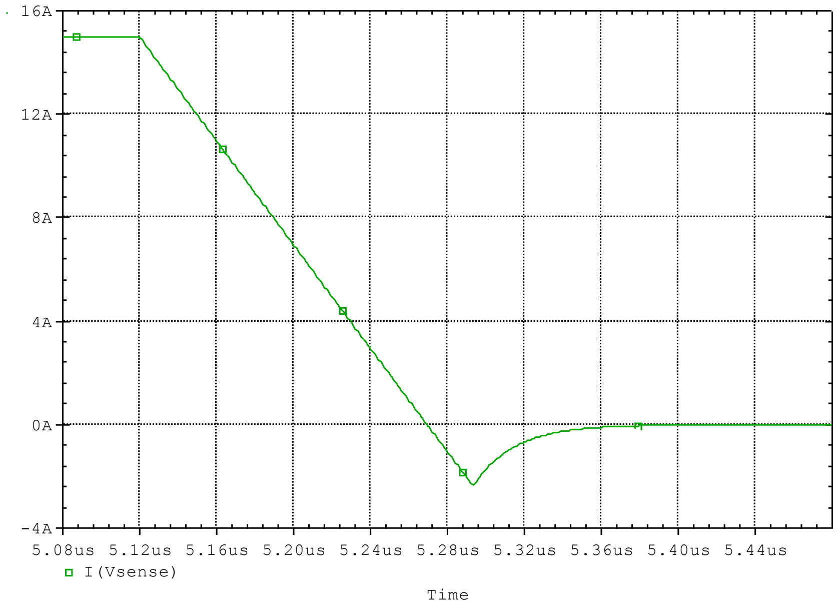


Comparison table

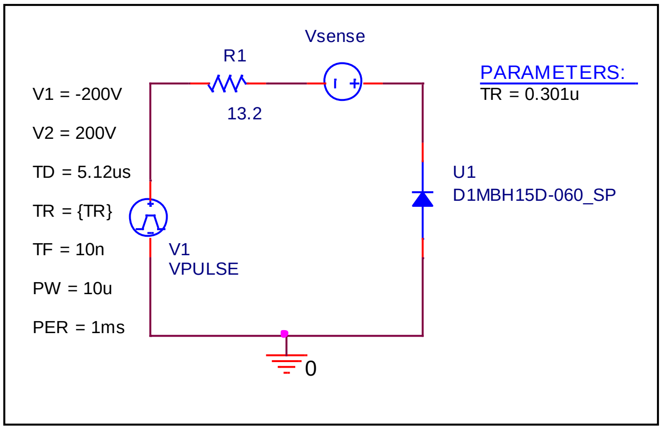
IF(A)	VF (V)		%Error
	Measurement	Simulation	
1	1.220	1.261	3.34
2	1.375	1.418	3.10
5	1.700	1.689	-0.66
10	2.000	1.977	-1.14
20	2.450	2.412	-1.53
30	2.825	2.788	-1.30
40	3.125	3.140	0.48
50	3.450	3.478	0.82

Reverse Recovery Characteristics

Circuit Simulation result



Evaluation circuit



Test condition: VCC=200 (V), IC=15 (A), -di/dt=100 (A/us)

Parameter	Unit	Measurement	Simulation	%Error
trr	nsec	73.000	73.063	0.09
Irr	A	2.350	2.353	0.12