

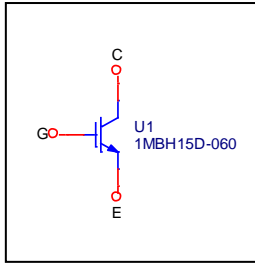
# Device Modeling Report

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



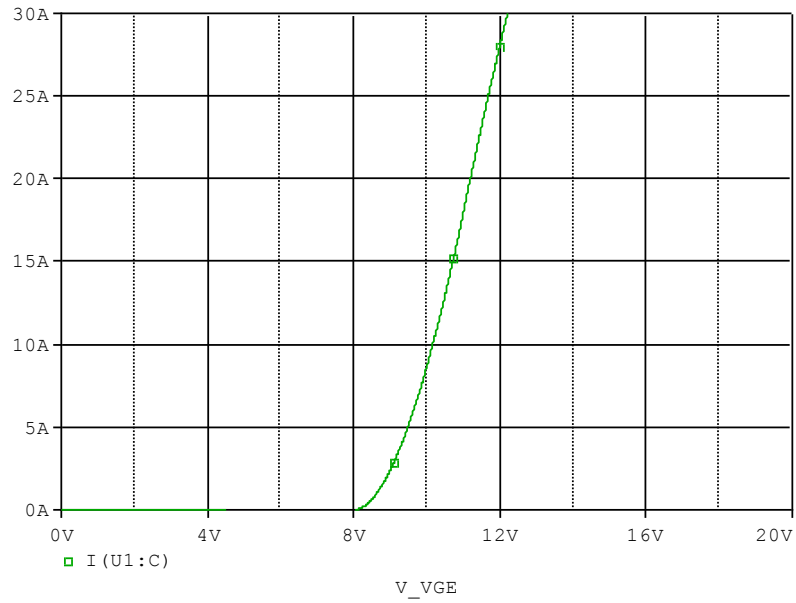
**Bee Technologies Inc.**

## Circuit Configuration

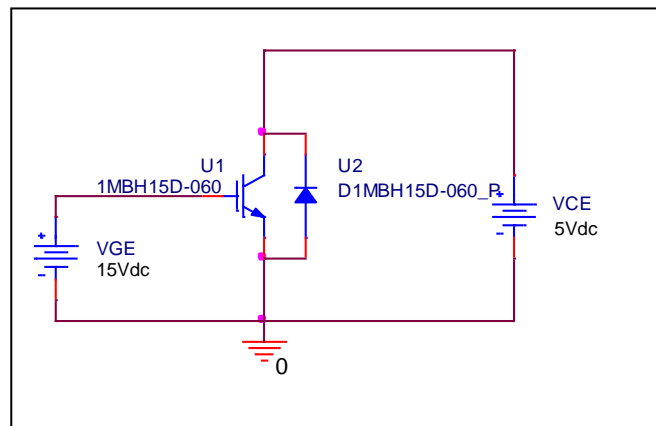


# Transfer Characteristics

## Circuit Simulation result

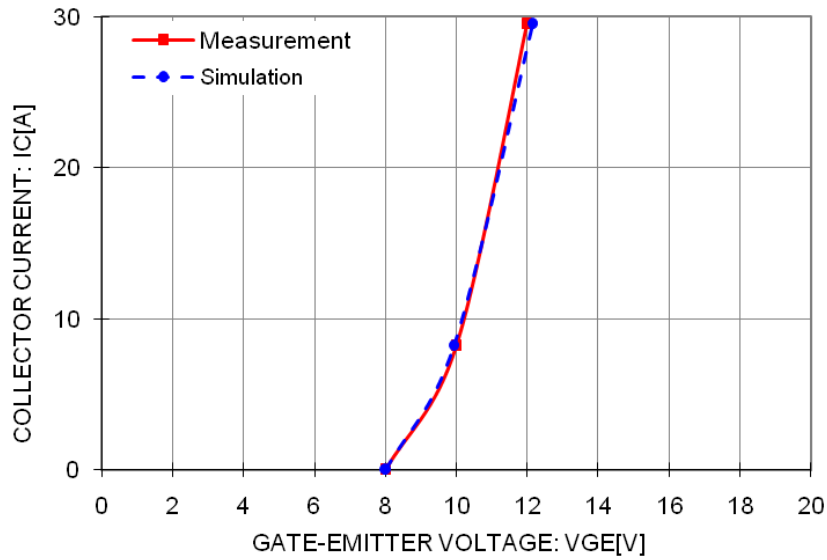


## Evaluation circuit



## Comparison Graph

Simulation result



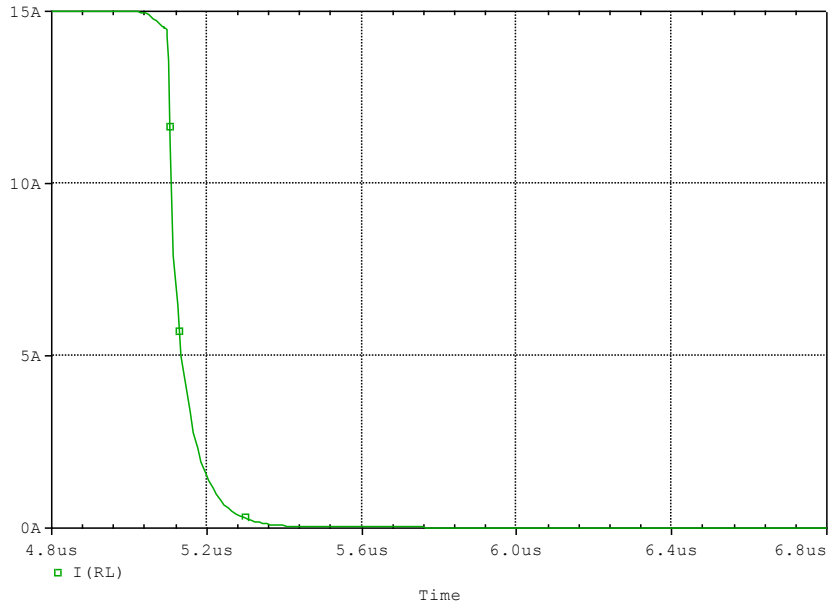
Comparison table

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

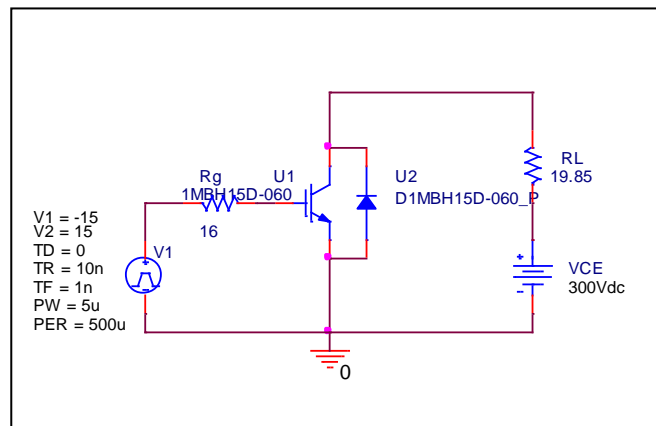
IC (A)	VGE (V)		%Error
	Measurement	Simulation	
0.000	8.000	8.020	0.25
8.200	10.000	9.941	-0.59
29.500	12.000	12.157	1.31

# Fall Time Characteristics

## Circuit Simulation result



## Evaluation circuit

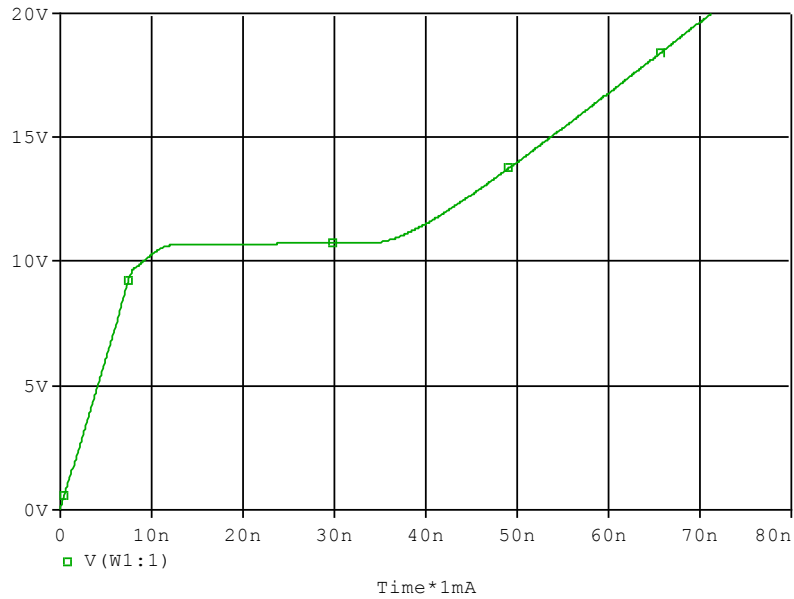


Test condition:  $I_C=15$  (A),  $V_{CC}=300$  (V)

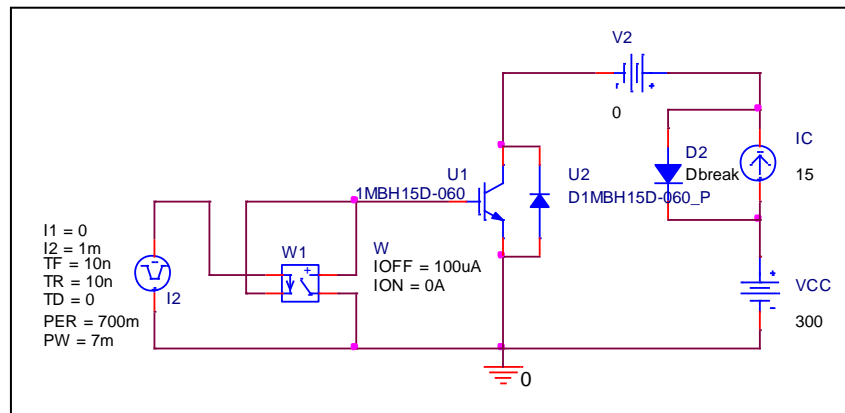
Parameter	Unit	Measurement	Simulation	%Error
tf	us	0.100	0.101	1.07

# Gate Charge Characteristics

## Circuit Simulation result



## Evaluation circuit

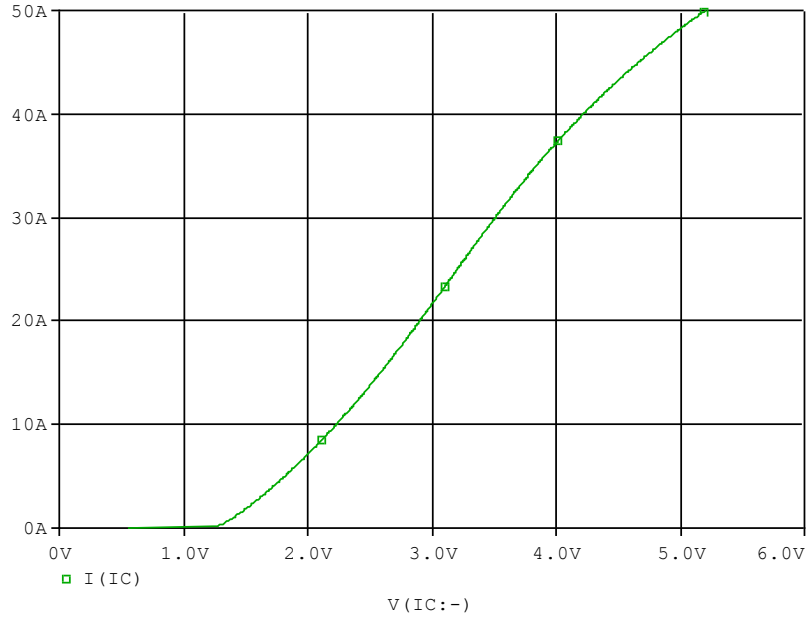


Test condition:  $V_{CC}=300$  (V),  $I_C=15$  (A),  $V_{GE}=15$  (V)

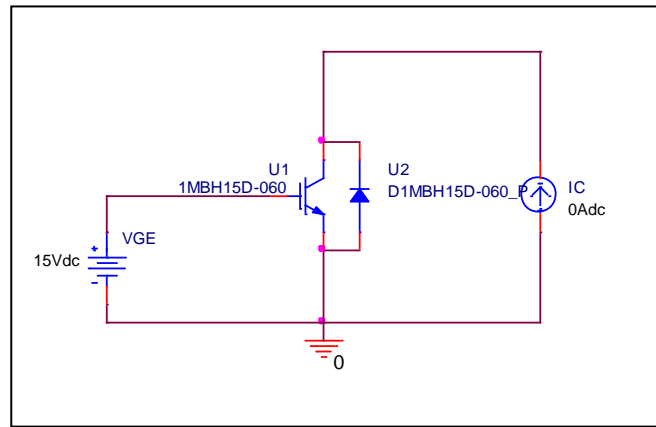
Parameter	Unit	Measurement	Simulation	%Error
<b>Qge</b>	<b>nc</b>	<b>9.000</b>	<b>9.097</b>	<b>1.08</b>
<b>Qgc</b>	<b>nc</b>	<b>26.000</b>	<b>25.972</b>	<b>-0.11</b>
<b>Qg</b>	<b>nc</b>	<b>53.000</b>	<b>53.640</b>	<b>1.21</b>

# Saturation Characteristics

## Circuit Simulation result

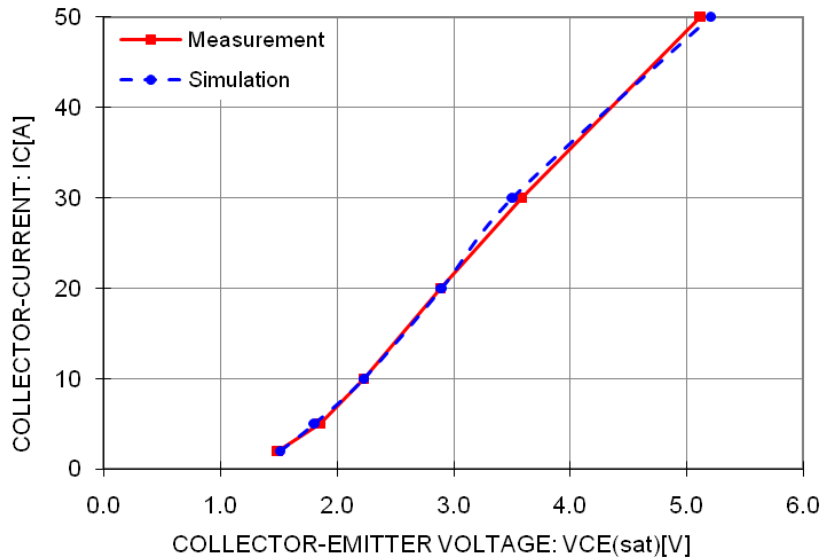


## Evaluation circuit



## Comparison Graph

Simulation result



Comparison table

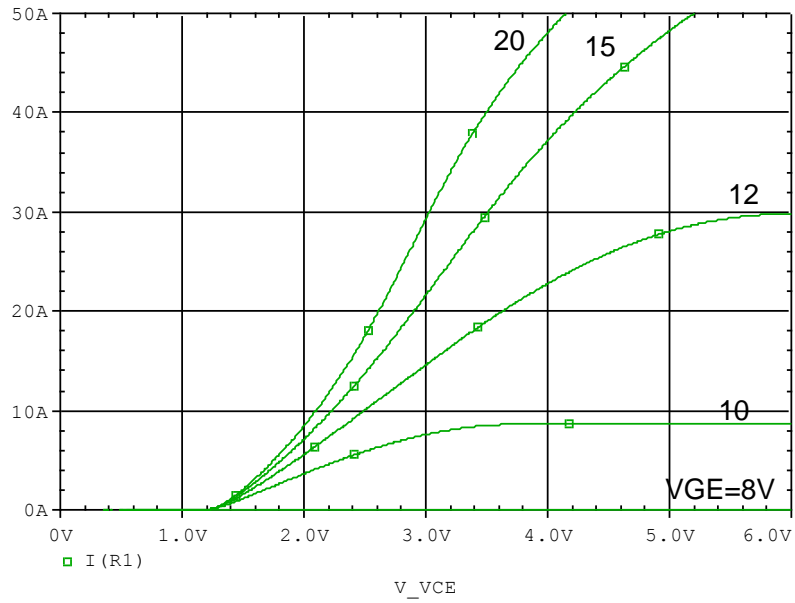
Test condition:  $V_{GE} = 15$  (V)

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

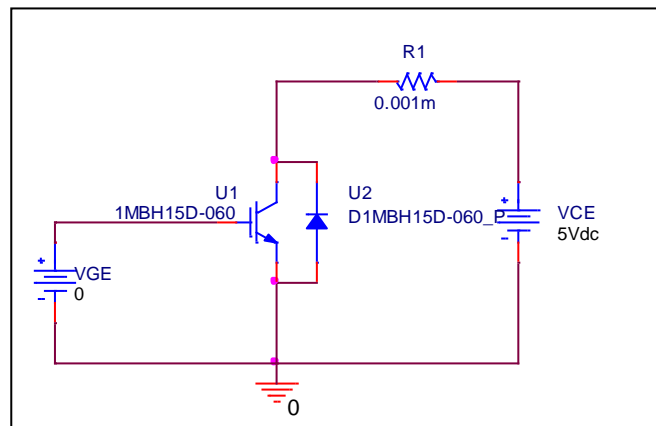


# Output Characteristics

## Circuit Simulation result

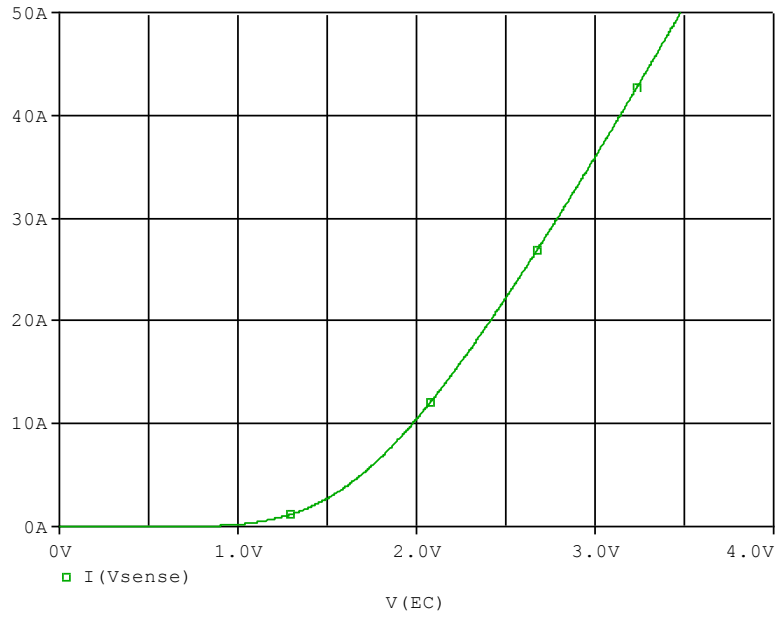


## Evaluation circuit

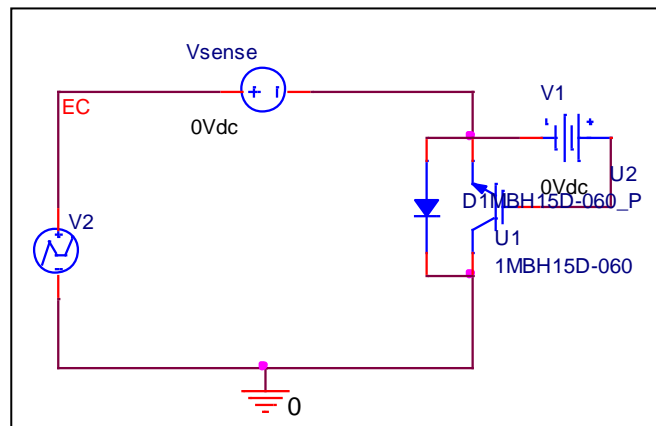


# FWD Forward Current Characteristics

## Circuit Simulation result

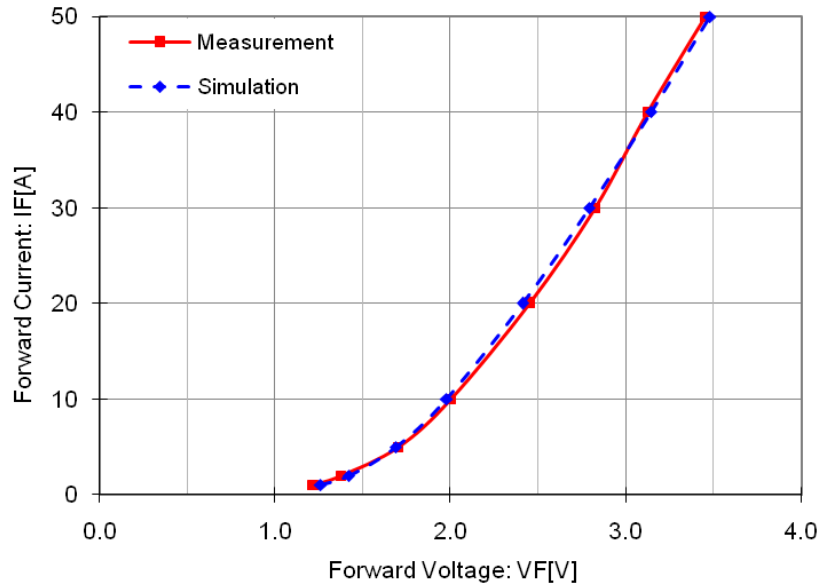


## Evaluation circuit



## Comparison Graph

### Simulation result

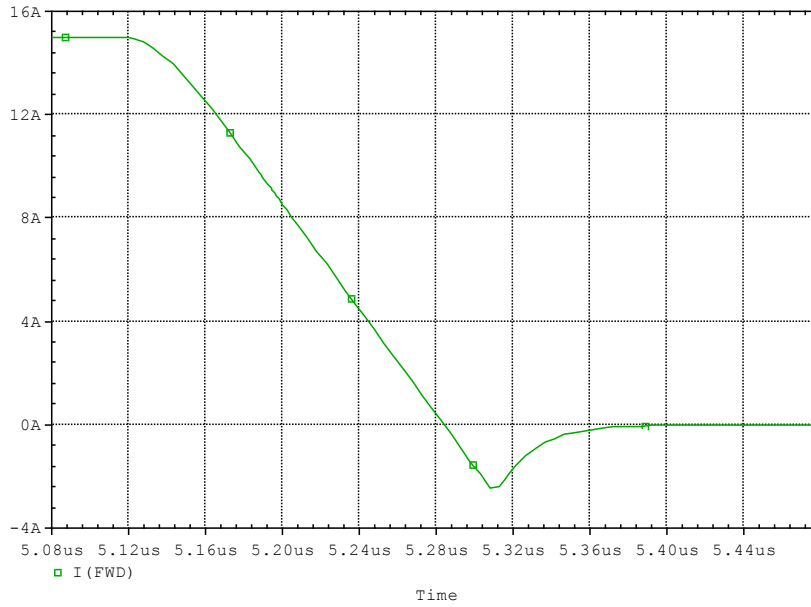


### Comparison table

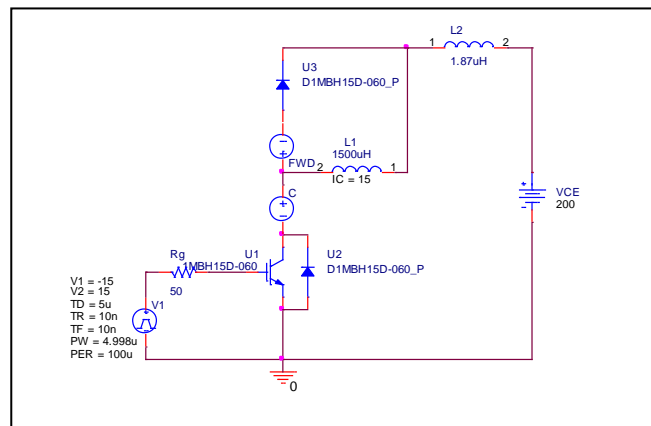
IF(A)	VF (V)		%Error
	Measurement	Simulation	
1	1.220	1.261	3.36
2	1.375	1.418	3.12
5	1.700	1.689	-0.64
10	2.000	1.978	-1.12
20	2.450	2.413	-1.50
30	2.825	2.789	-1.26
40	3.125	3.141	0.52
50	3.450	3.480	0.87

# Reverse Recovery Characteristics

## Circuit Simulation result



## Evaluation circuit



Test condition:  $V_{CC}=200$  (V),  $I_C=15$  (A),  $-di/dt= 100$  (A/us)

Parameter	Unit	Measurement	Simulation	%Error
trr	nsec	73.000	72.252	-1.02
Irr	A	2.350	2.430	3.40