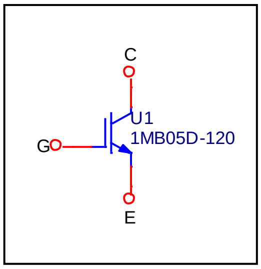
Device Modeling Report

COMPONENTS: Insulated Gate Bipolar Transistor (IGBT)
PART NUMBER: 1MB05D-120
MANUFACTURER: Fuji Electric

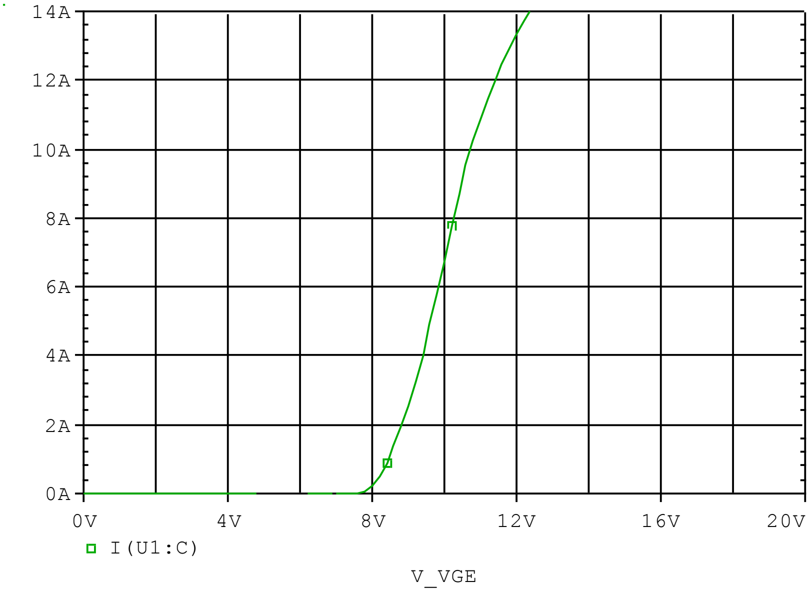
Bee Technologies Inc.

Circuit Configuration

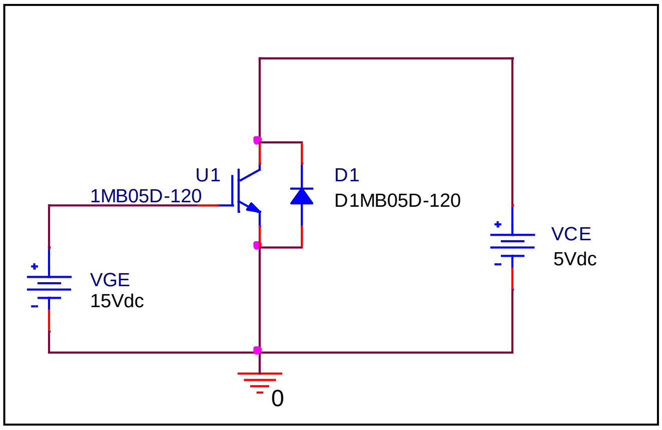


Transfer Characteristics

Circuit Simulation result

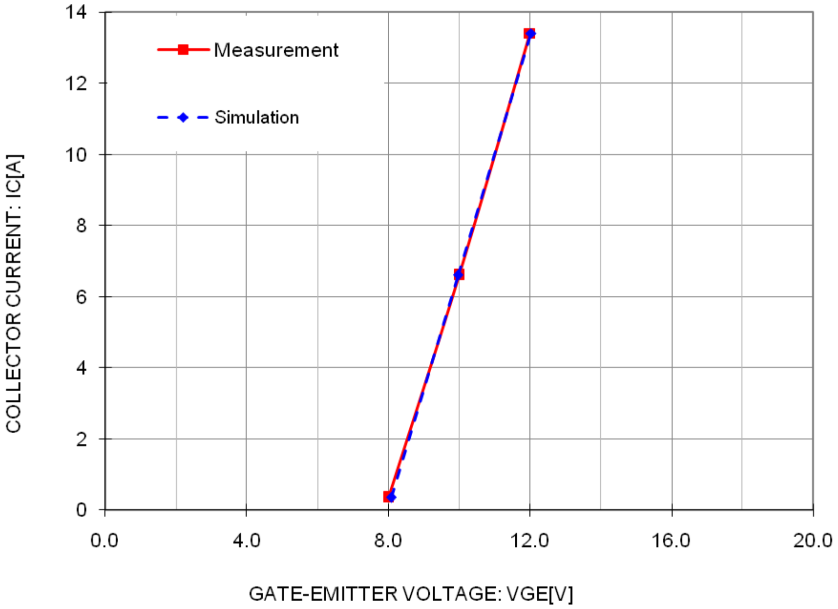


Evaluation circuit



Comparison Graph

Simulation result



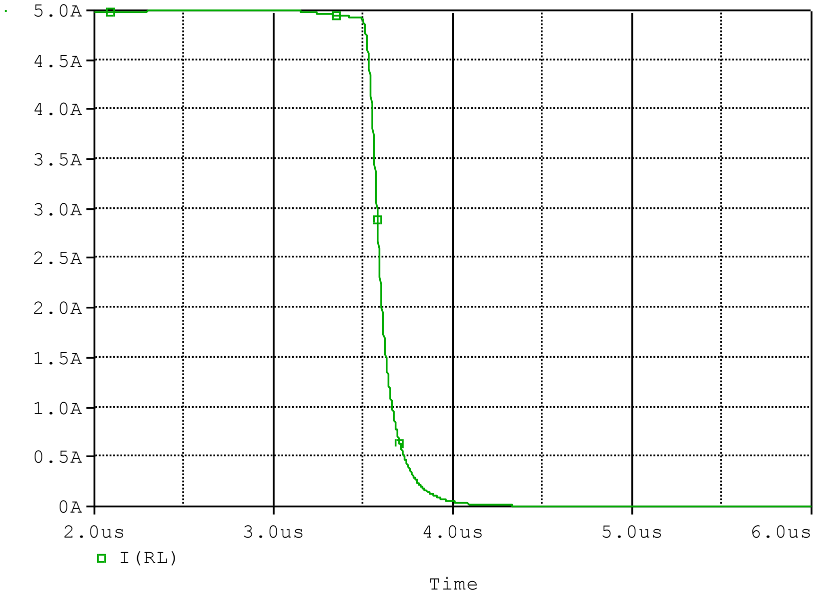
Comparison table

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

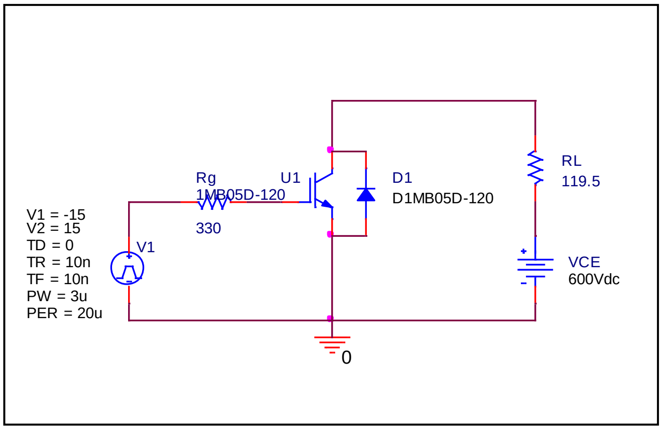
IC (A)	VGE (V)		%Error
	Measurement	Simulation	
0.350	8.000	8.082	1.02
6.600	10.000	9.970	-0.30
13.400	12.000	12.037	0.31

Fall Time Characteristics

Circuit Simulation result



Evaluation circuit

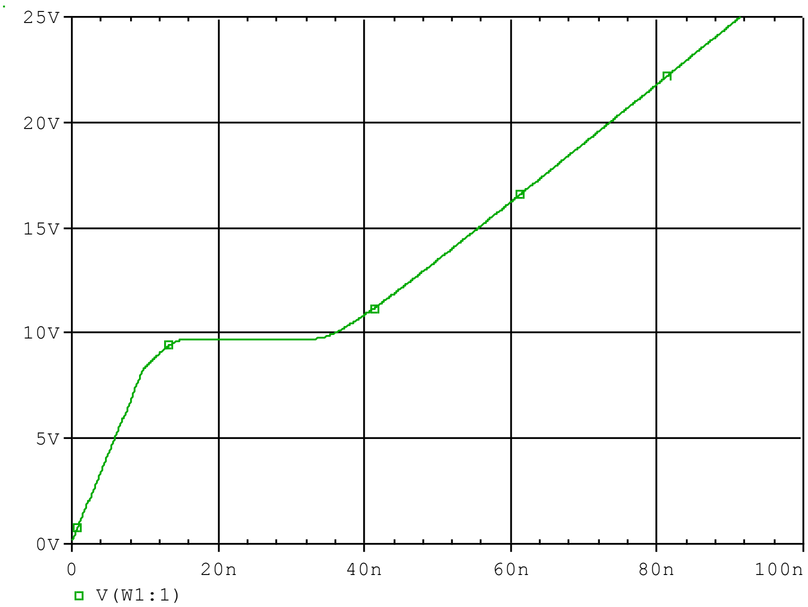


Test condition: IC=5 (A), VCC=600 (V)

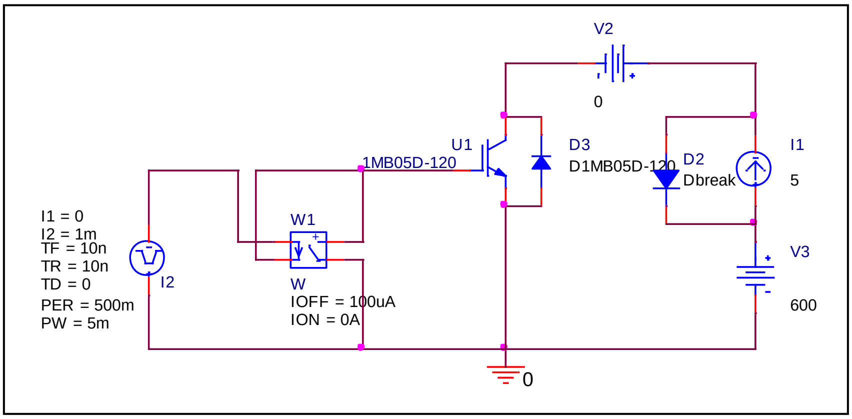
Parameter	Unit	Measurement	Simulation	%Error
tf	us	0.200	0.200	0.022

Gate Charge Characteristics

Circuit Simulation result



Evaluation circuit

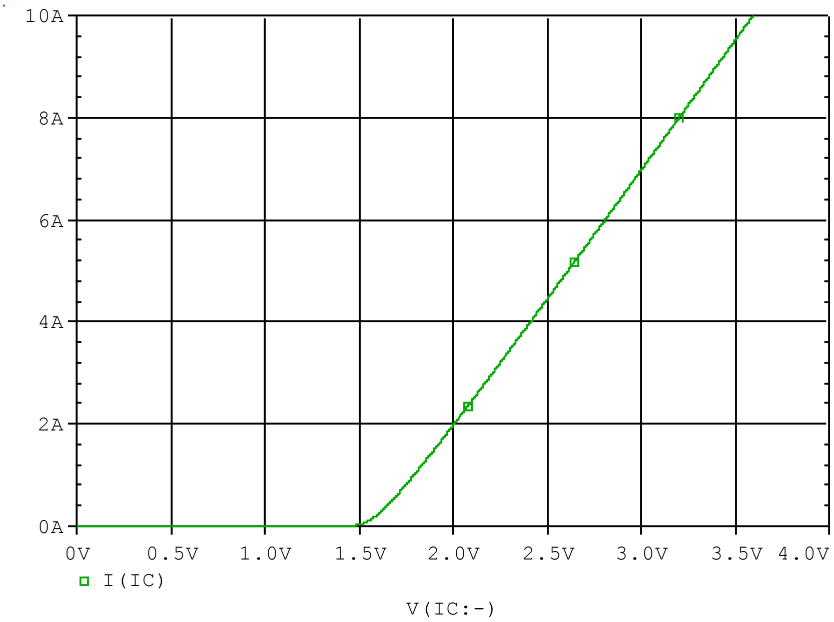


Test condition: VCC=600 (V), IC=5 (A), VGE=15 (V)

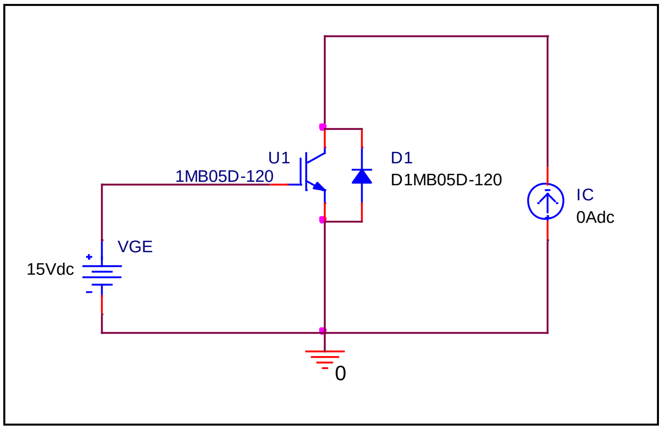
Parameter	Unit	Measurement	Simulation	%Error
Qge	nc	12.000	12.000	0.000
Qgc	nc	26.000	25.565	-1.673
Qg	nc	55.000	55.622	1.131

Saturation Characteristics

Circuit Simulation result

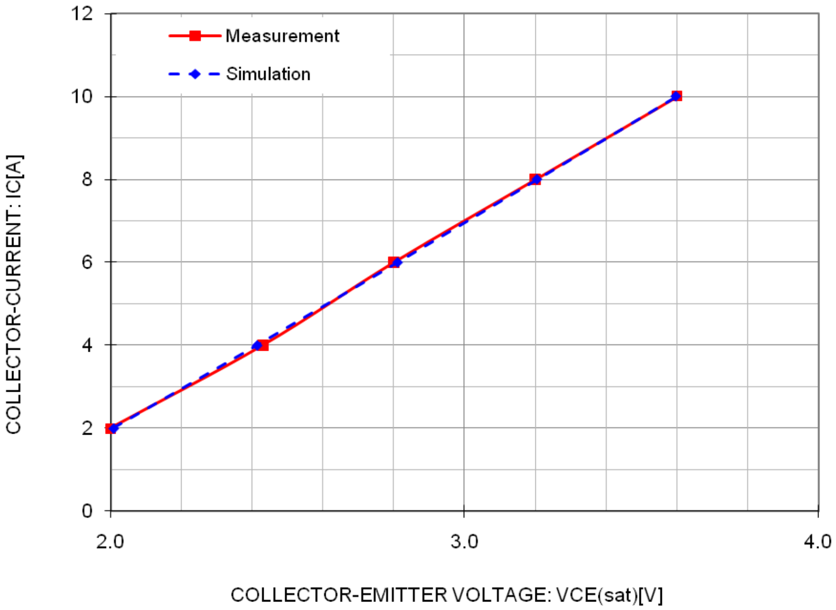


Evaluation circuit



Comparison Graph

Simulation result



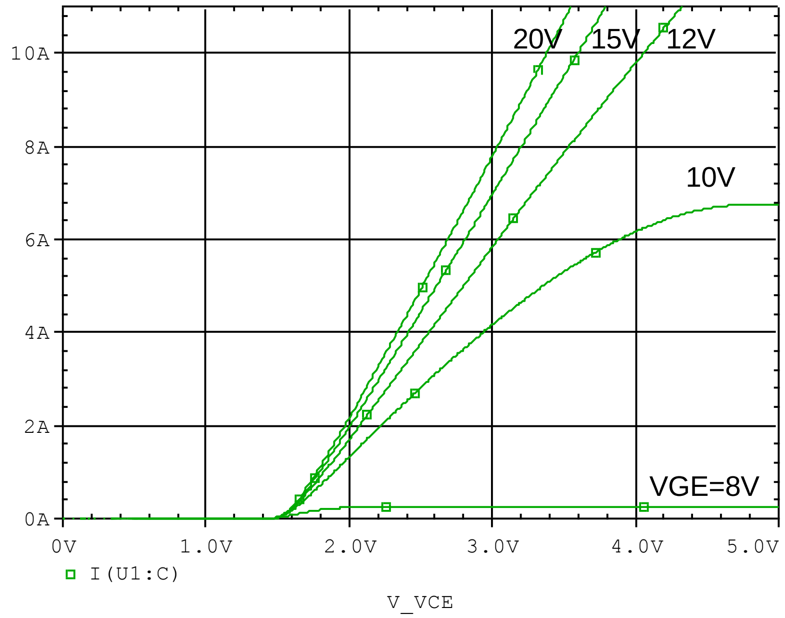
Comparison table

Test condition: VGE =15 (V)

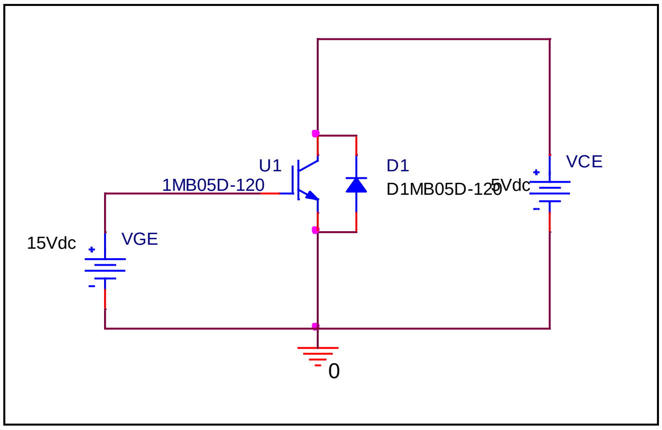
Ic(A)	VCE (V)		%Error
	Measurement	Simulation	
2.0	2.00	2.01	0.35
4.0	2.43	2.41	-0.71
6.0	2.80	2.81	0.35
8.0	3.20	3.20	0.12
10.0	3.60	3.60	-0.09

Output Characteristics

Circuit Simulation result

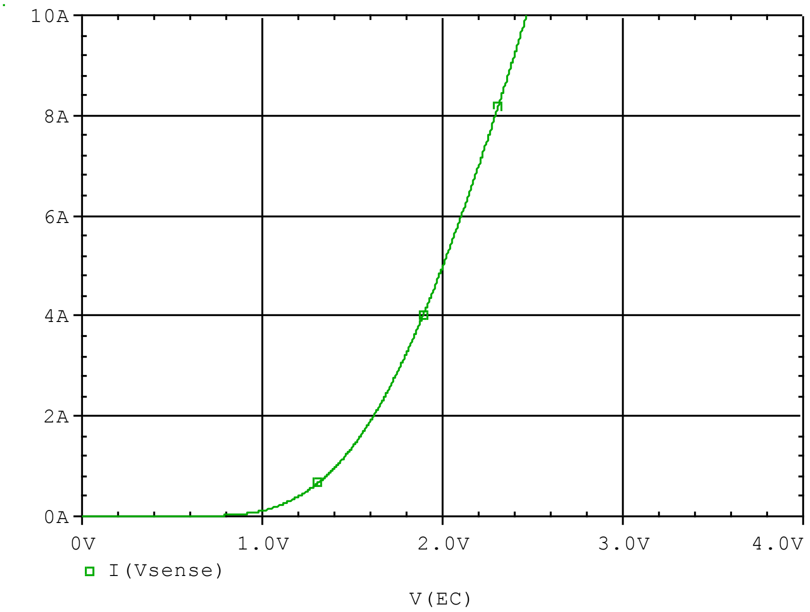


Evaluation circuit

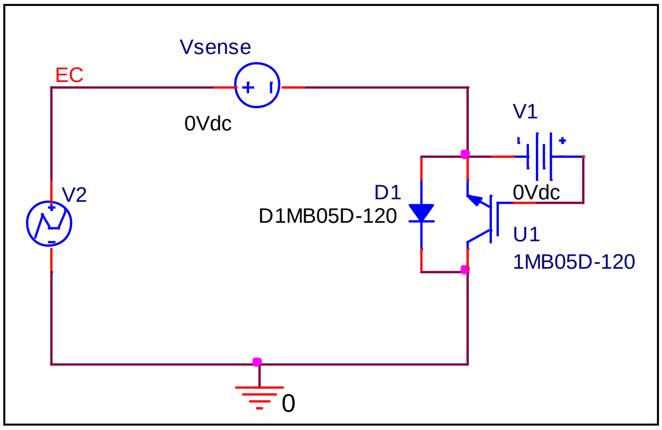


FWD Forward Current Characteristics

Circuit Simulation result

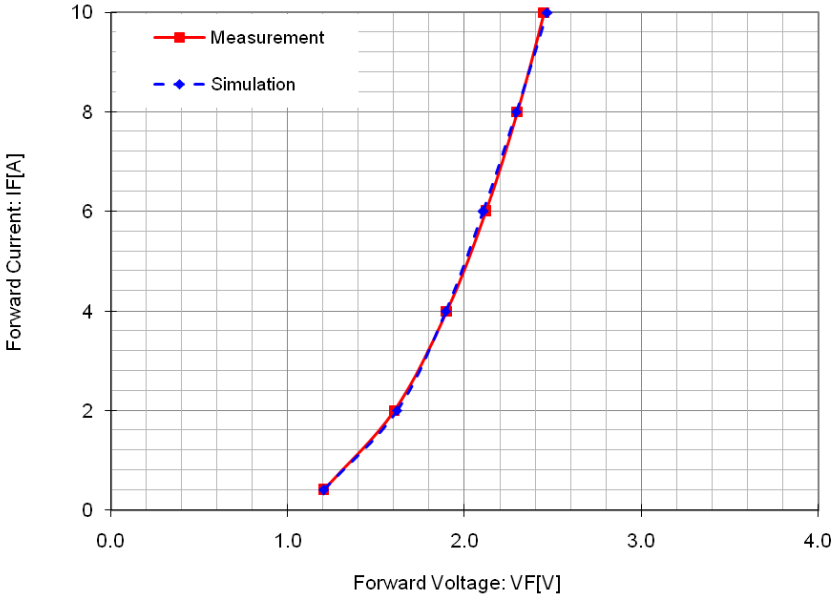


Evaluation circuit



Comparison Graph

Simulation result

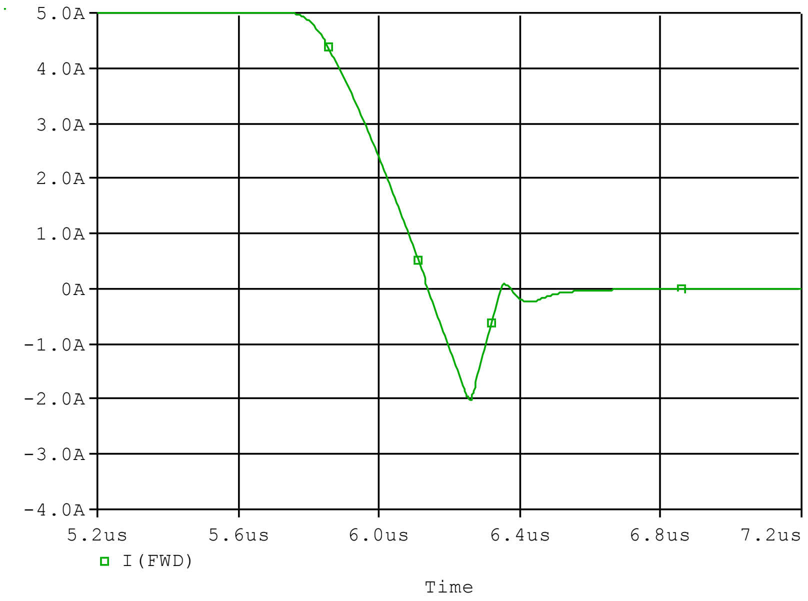


Comparison table

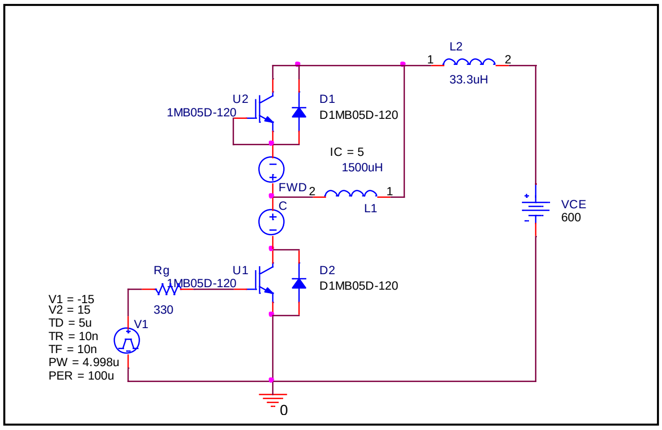
IF(A)	VF (V)		%Error
	Measurement	Simulation	
0.4	1.200	1.202	0.20
2	1.600	1.616	1.01
4	1.900	1.891	-0.49
6	2.120	2.104	-0.75
8	2.300	2.292	-0.34
10	2.450	2.466	0.66

Reverse Recovery Characteristics

Circuit Simulation result



Evaluation circuit



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

Parameter	Unit	Measurement	Simulation	%Error
trr	nsec	280.000	198.247	-29.20
Irr	A	2.000	2.034	1.70