# Device Modeling Report

COMPONENTS: Insulated Gate Bipolar Transistor (IGBT)
PART NUMBER: 1MB03D-120
MANUFACTURER: Fuji Electric
*REMARK: Free-Wheeling Diode Professional Model
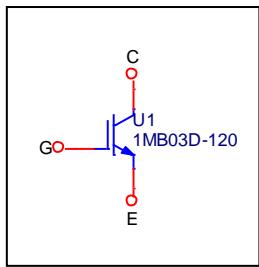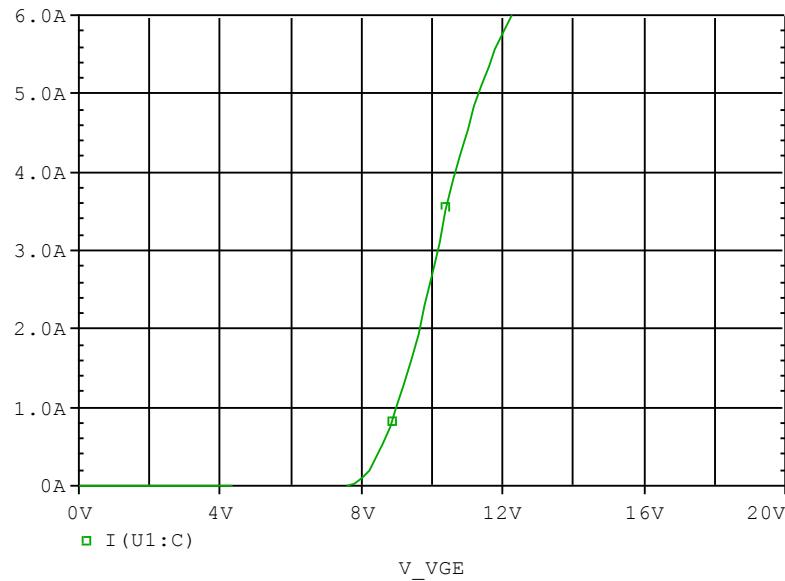
**Bee Technologies Inc.**

Circuit Configuration

C
○
U1
1MB03D-120
G○
○
E
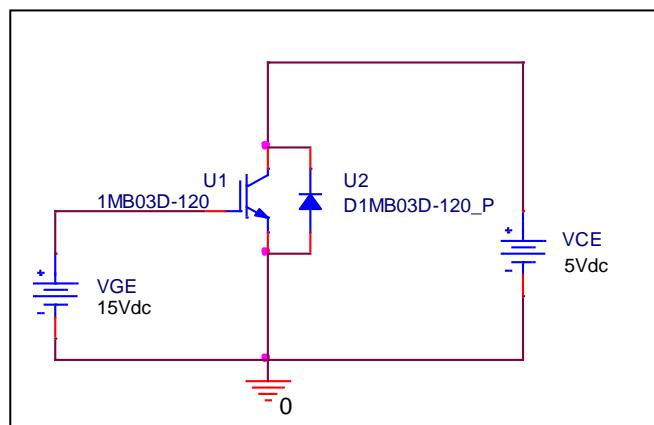
Transfer Characteristics
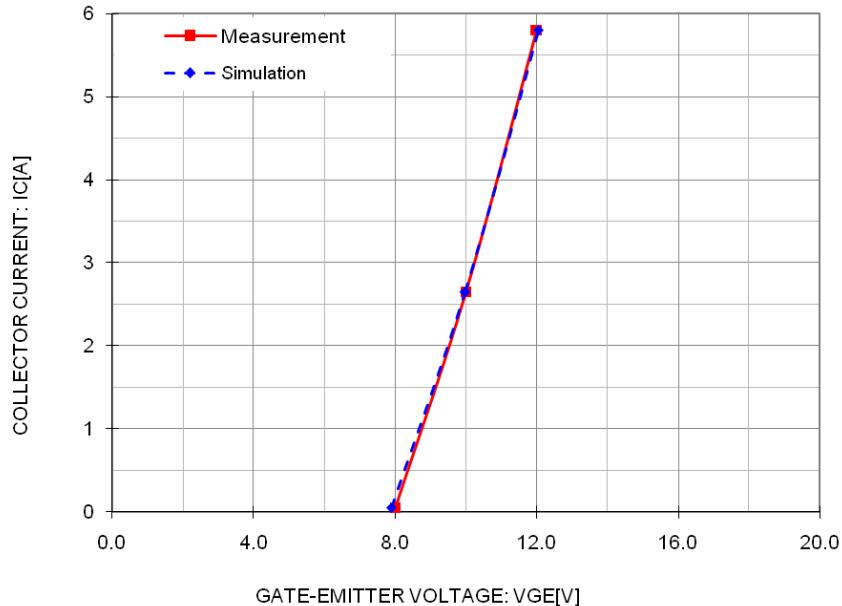
Comparison Graph

GATE-EMITTER VOLTAGE: VGE[V]
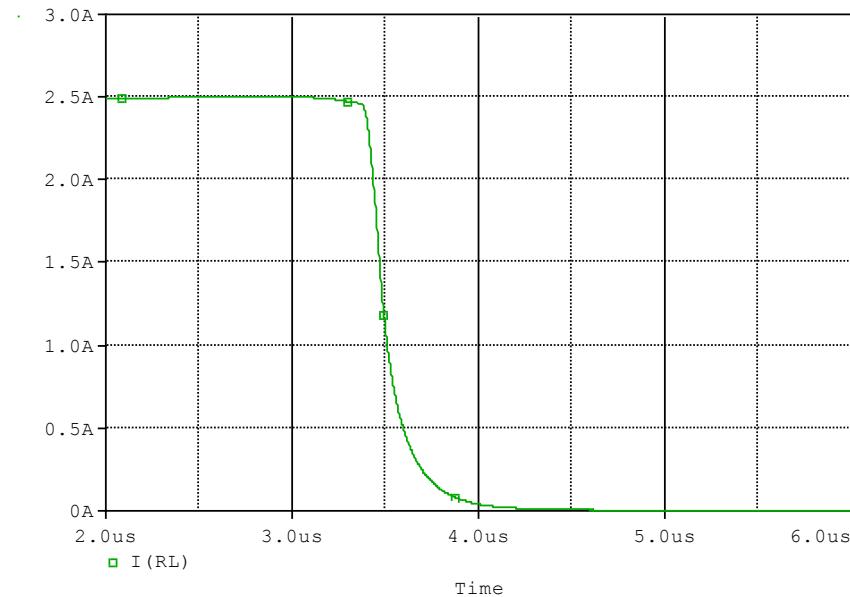
Comparison table

Test condition: VCE =5 (V)
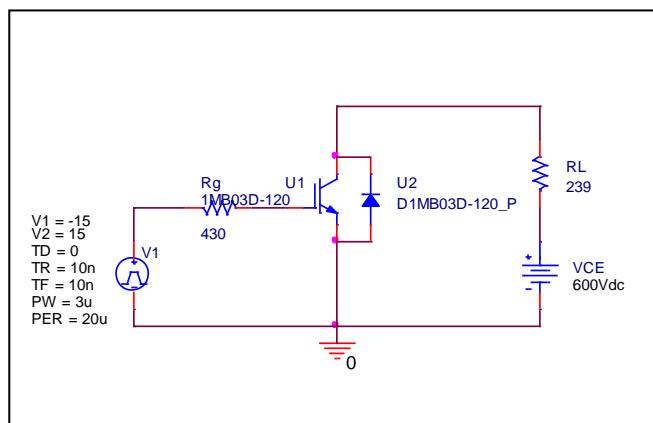
IC (A)	VGE (V)		%Error
	Measurement	Simulation	
0.050	8.000	7.883	-1.46
2.650	10.000	9.981	-0.19
5.800	12.000	12.039	0.32

Fall Time Characteristics
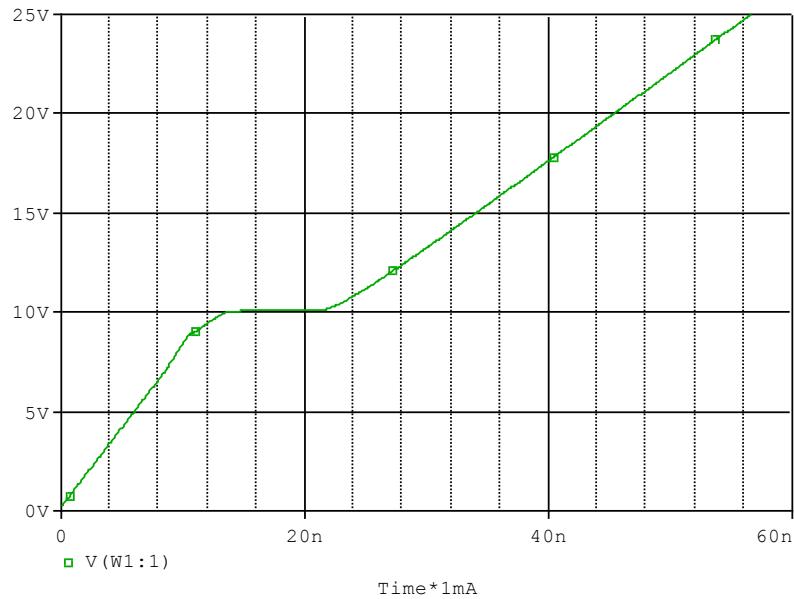
Test condition: IC=2.5 (A), VCC=600 (V)
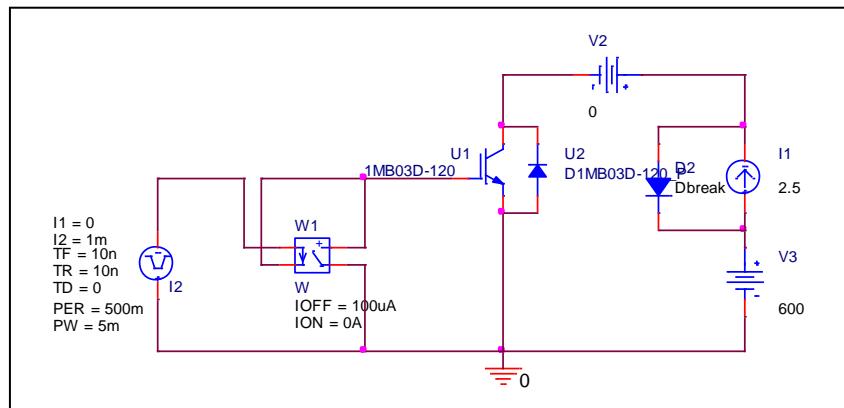
Parameter	Unit	Measurement	Simulation	%Error
tf	us	0.280	0.282	0.583

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Gate Charge Characteristics
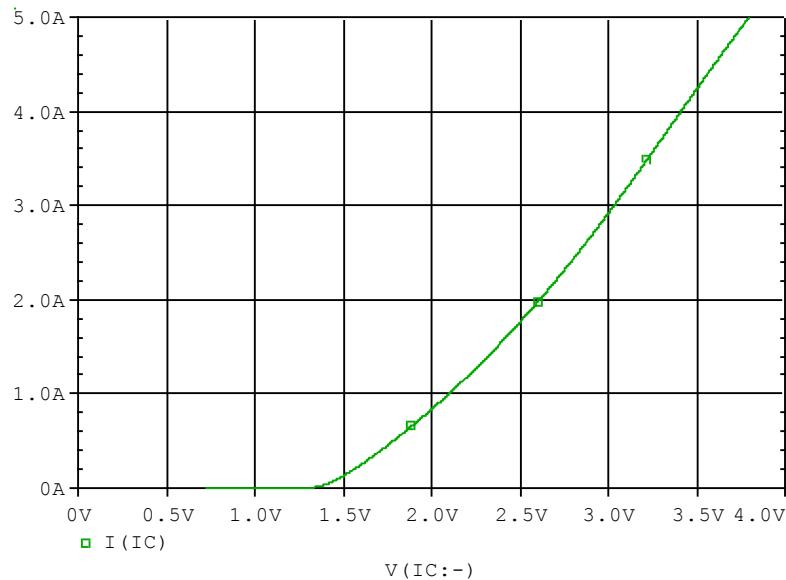
Test condition: VCC=600 (V), IC=2.5 (A), VGE=15 (V)
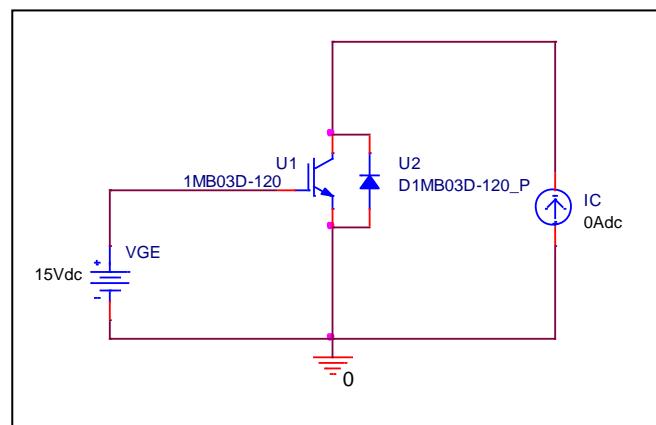
Parameter	Unit	Measurement	Simulation	%Error
Qge	nc	12.000	11.927	-0.608
Qgc	nc	11.000	10.833	-1.518
Qg	nc	33.500	34.034	1.594

Saturation Characteristics
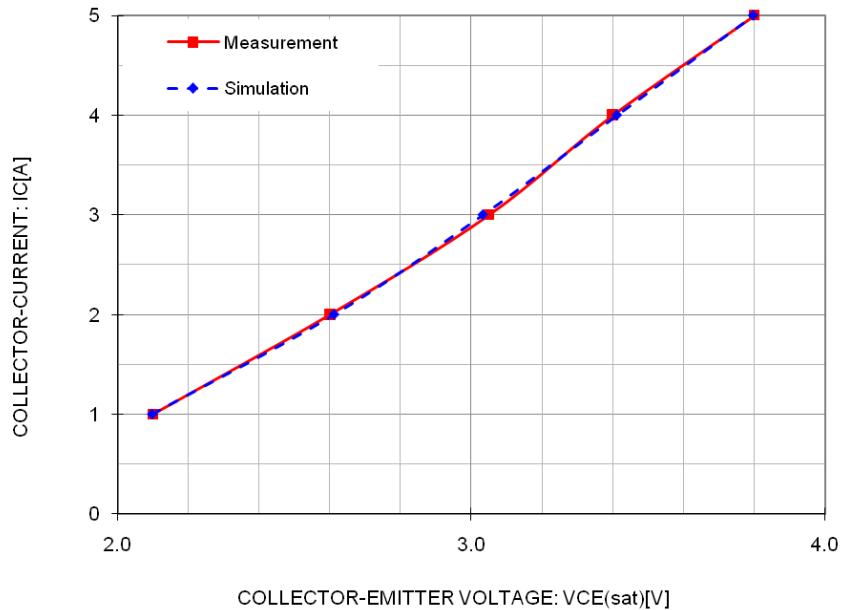
I(IC)

V(IC:-)

Evaluation circuit

Comparison Graph

COLLECTOR-EMITTER VOLTAGE: VCE(sat)[V]
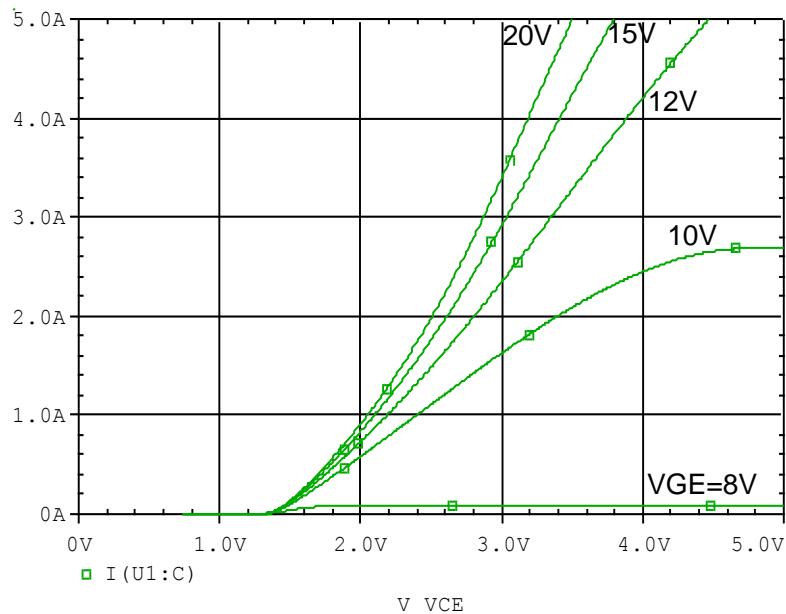
Comparison table

Test condition: V_{GE} =15 (V)
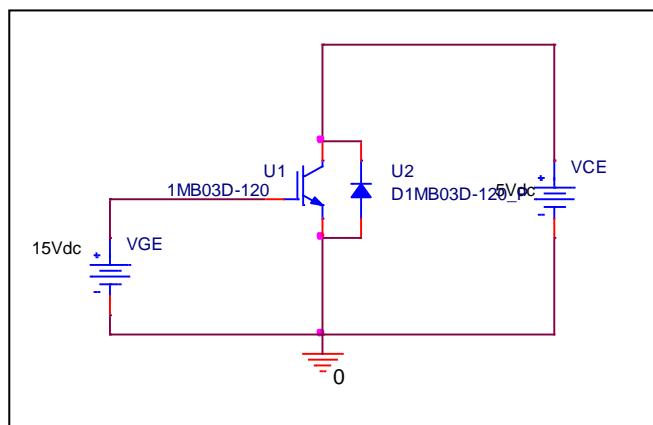
Ic(A)	VCE (V)		%Error
	Measurement	Simulation	
1.00	2.100	2.098	-0.11
2.00	2.600	2.612	0.46
3.00	3.050	3.033	-0.57
4.00	3.400	3.412	0.34
5.00	3.800	3.797	-0.07

Output Characteristics

Circuit Simulation result
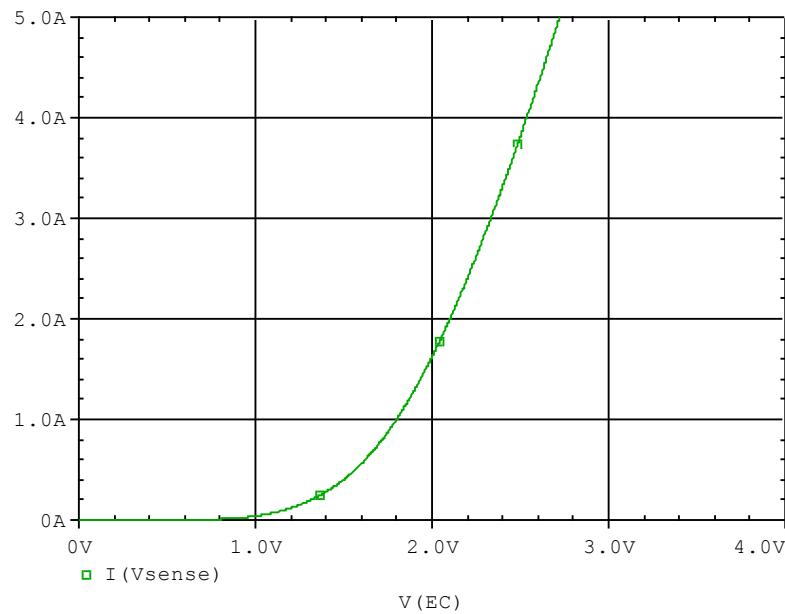
Evaluation circuit
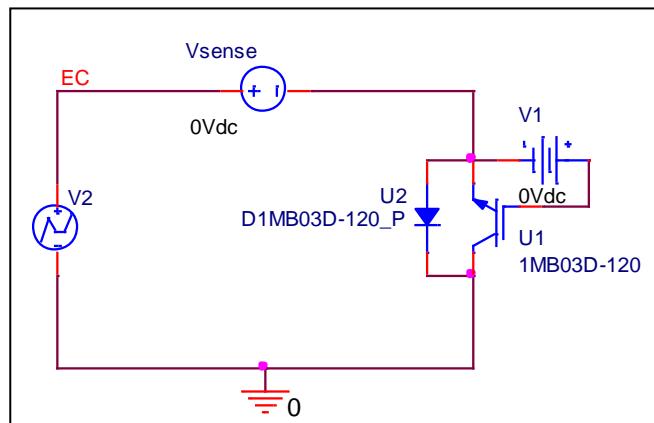
FWD Forward Current Characteristics
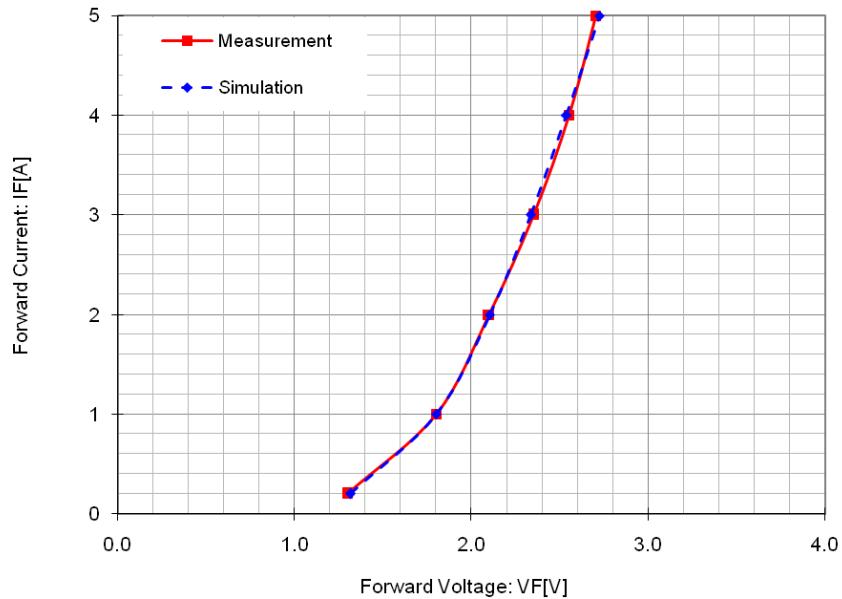
Circuit Simulation result


Evaluation circuit

Comparison Graph
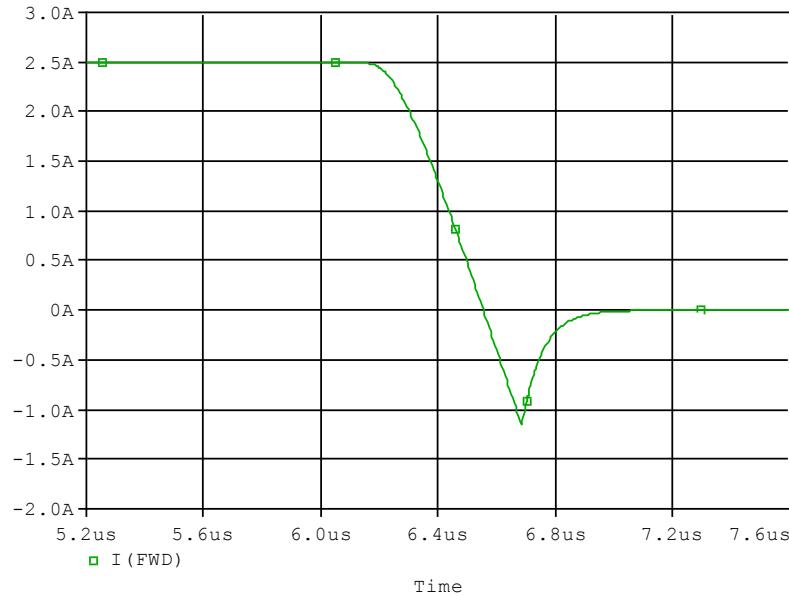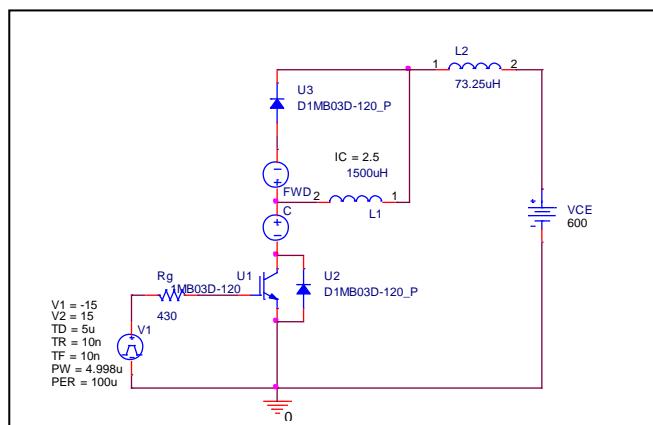
IF(A)	VF (V)		%Error
	Measurement	Simulation	
0.2	1.300	1.316	1.20
1	1.800	1.799	-0.06
2	2.100	2.101	0.06
3	2.350	2.333	-0.72
4	2.550	2.536	-0.55
5	2.700	2.723	0.84

Reverse Recovery Characteristics

Circuit Simulation result

Evaluation circuit

Test condition: VCC=600 (V), IC=2.5 (A)

Parameter	Unit	Measurement	Simulation	%Error
trr	nsec	290.000	289.712	-0.10
Irr	A	1.150	1.158	0.65