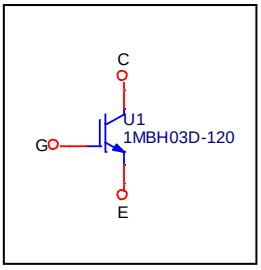
Device Modeling Report

COMPONENTS: Insulated Gate Bipolar Transistor (IGBT)
PART NUMBER: 1MBH03D-120
MANUFACTURER: Fuji Electric
*REMARK: Free-Wheeling Diode Professional Model

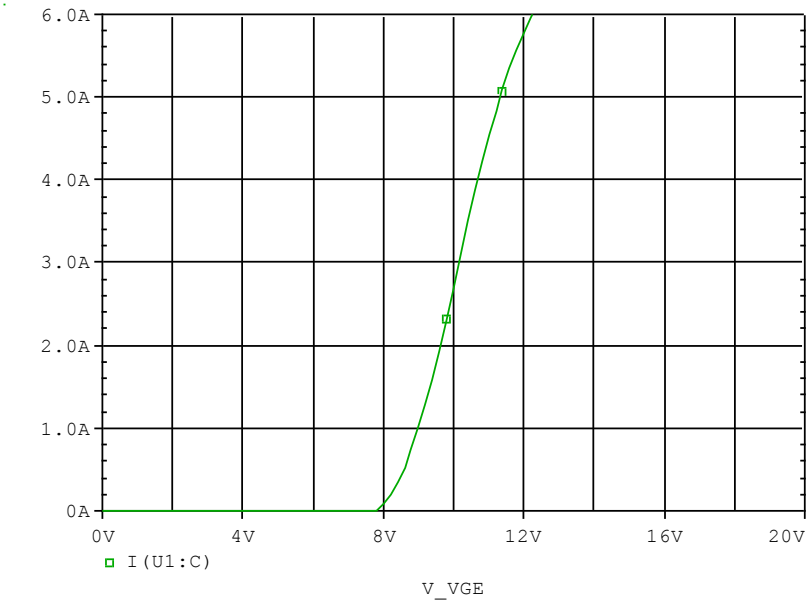
Bee Technologies Inc.

Circuit Configuration

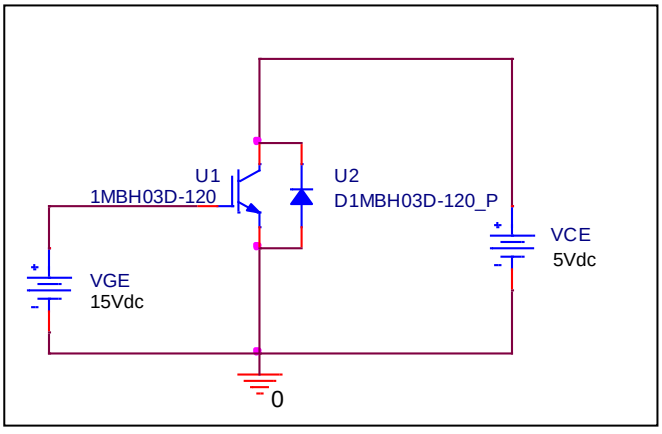


Transfer Characteristics

Circuit Simulation result

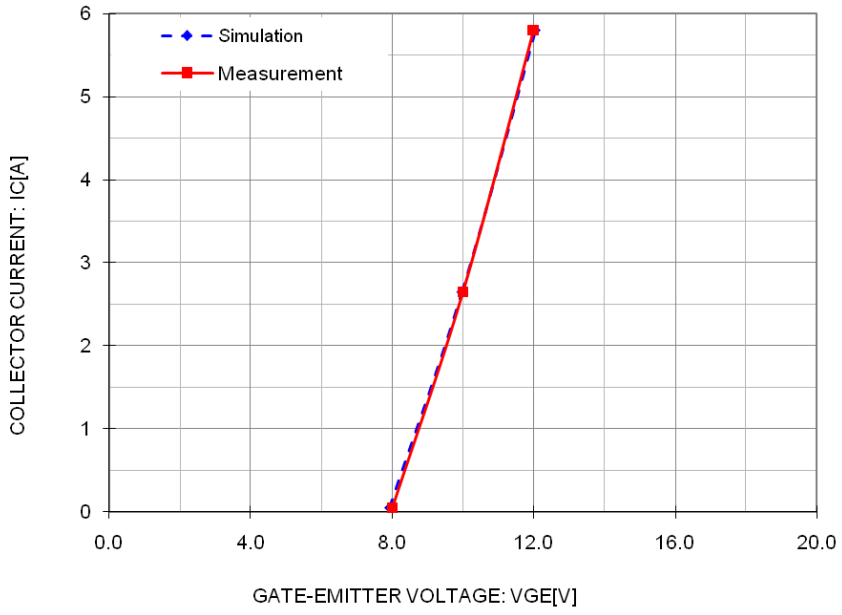


Evaluation circuit



Comparison Graph

Simulation result



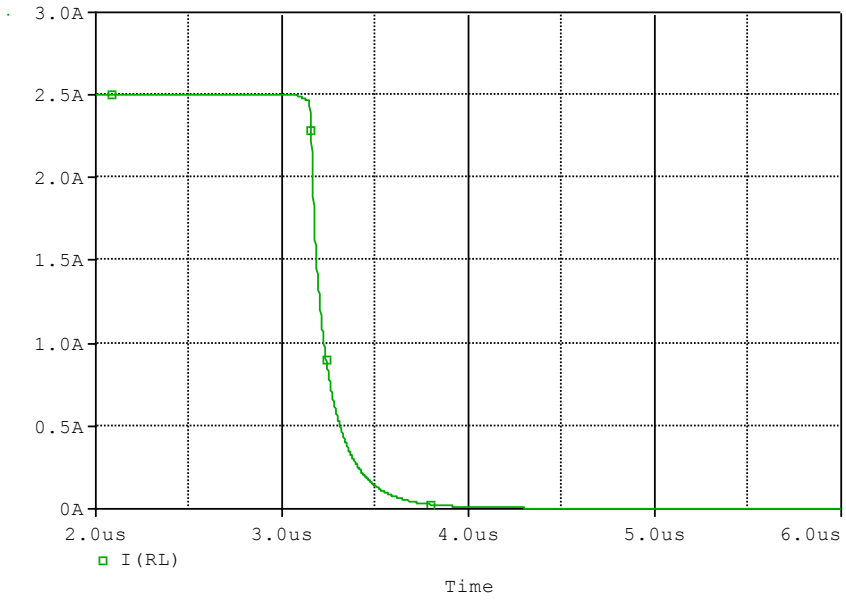
Comparison table

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

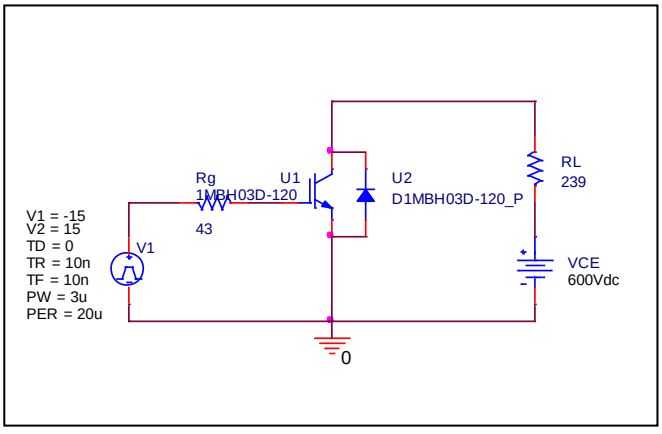
IC (A)	VGE (V)		%Error
	Measurement	Simulation	
0.050	8.000	7.913	-1.09
2.650	10.000	9.981	-0.19
5.800	12.000	12.039	0.32

Fall Time Characteristics

Circuit Simulation result



Evaluation circuit

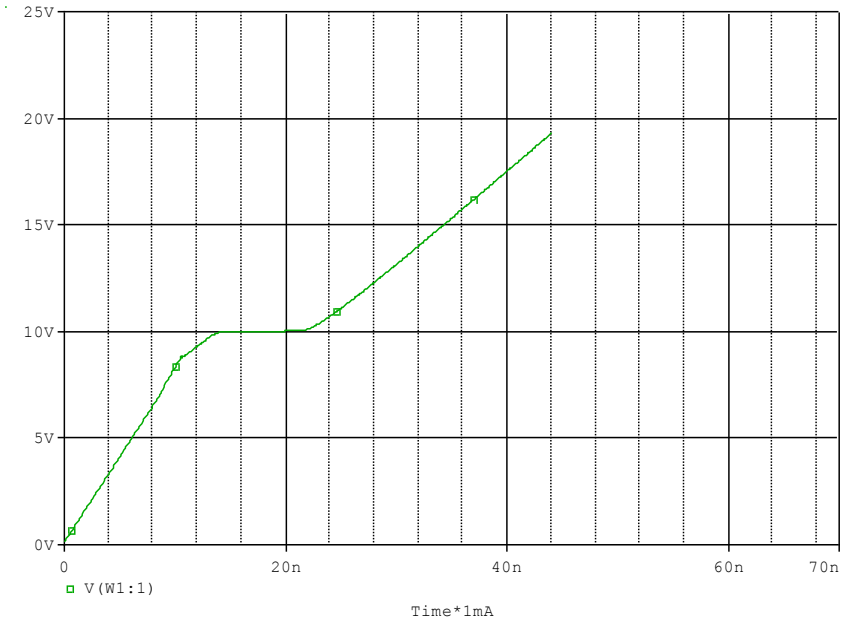


Test condition: I_C=2.5 (A), V_{CC}=600 (V)

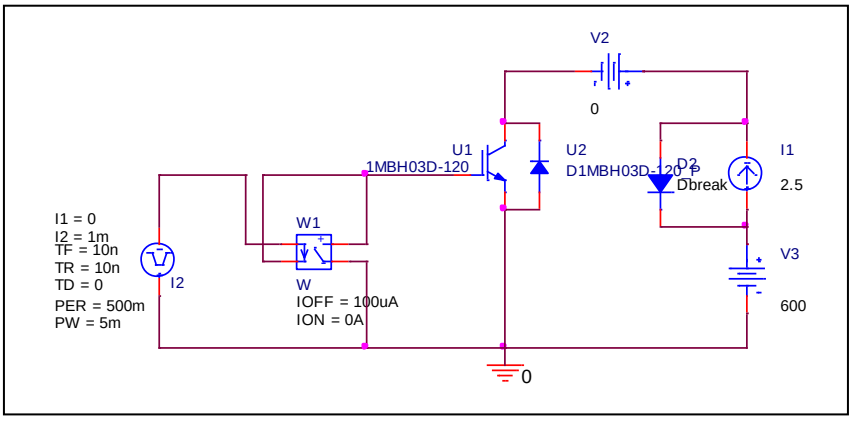
Parameter	Unit	Measurement	Simulation	%Error
tf	us	0.250	0.253	1.20

Gate Charge Characteristics

Circuit Simulation result



Evaluation circuit

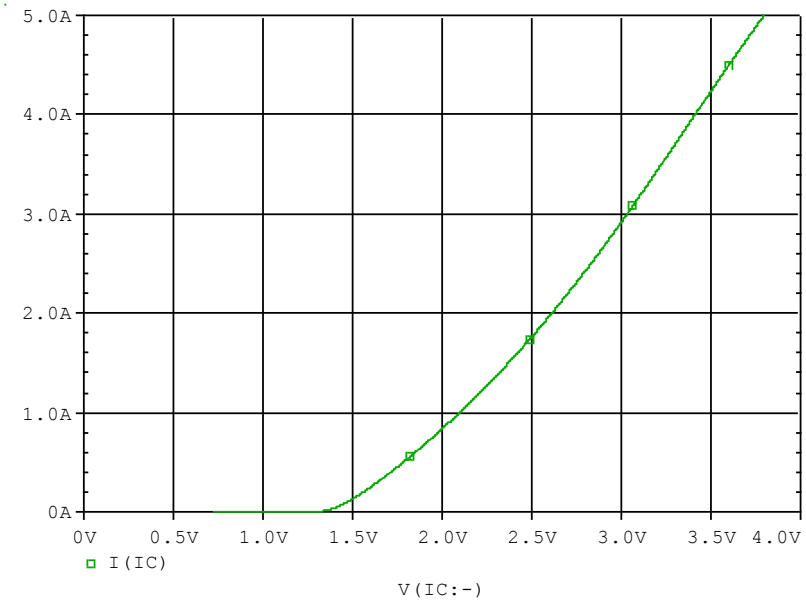


Test condition: V_{CC}=600 (V), I_C=2.5 (A), V_{GE}=15 (V)

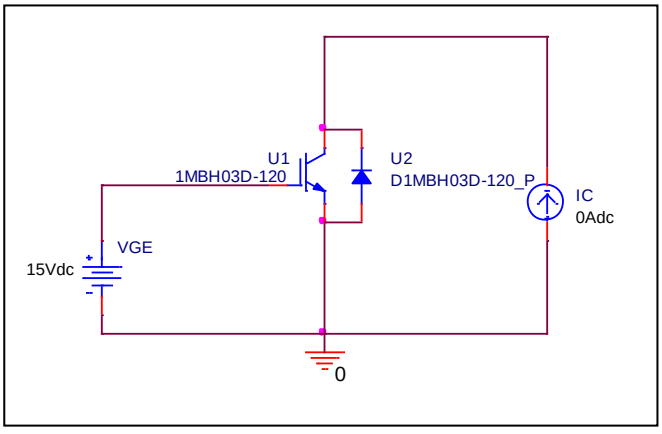
Parameter	Unit	Measurement	Simulation	%Error
Qge	nc	12.000	11.979	-0.18
Qgc	nc	11.000	10.833	-1.52
Qg	nc	33.500	34.220	2.15

Saturation Characteristics

Circuit Simulation result

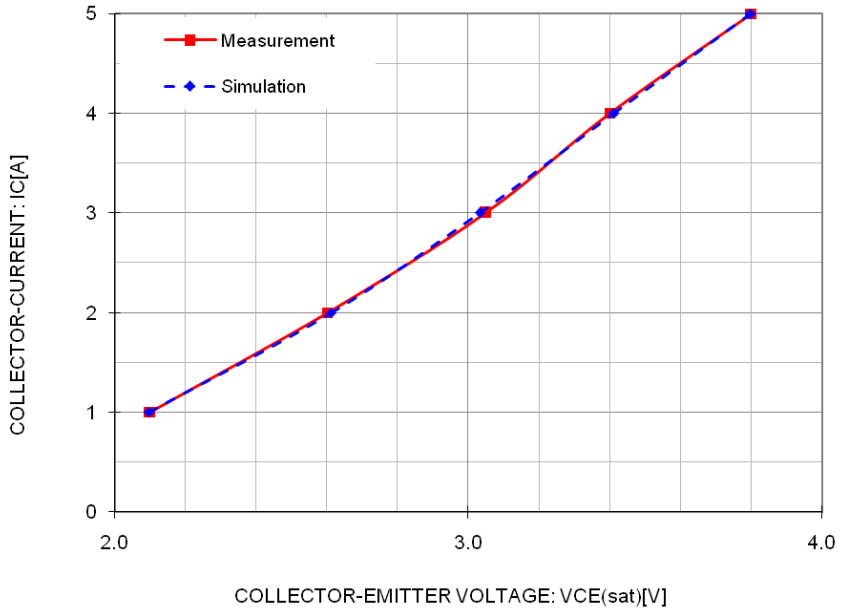


Evaluation circuit



Comparison Graph

Simulation result



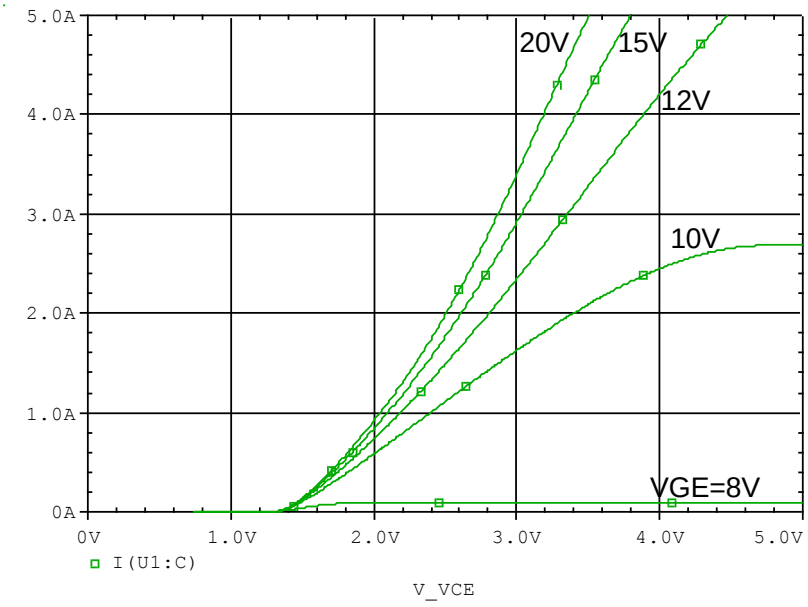
Comparison table

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

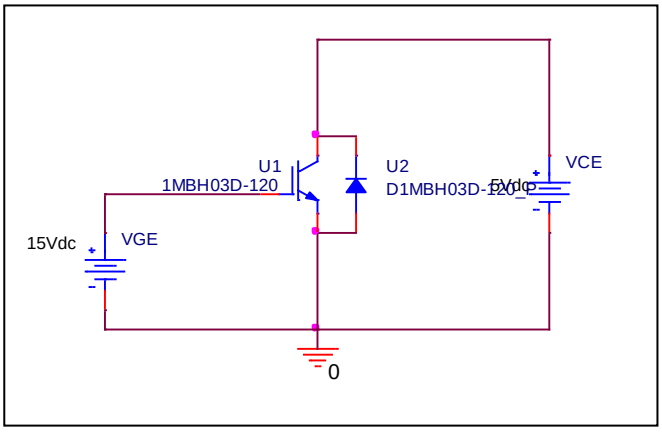
Ic(A)	VCE (V)		%Error
	Measurement	Simulation	
1.00	2.100	2.098	-0.11
2.00	2.600	2.612	0.46
3.00	3.050	3.033	-0.57
4.00	3.400	3.412	0.34
5.00	3.800	3.797	-0.07

Output Characteristics

Circuit Simulation result

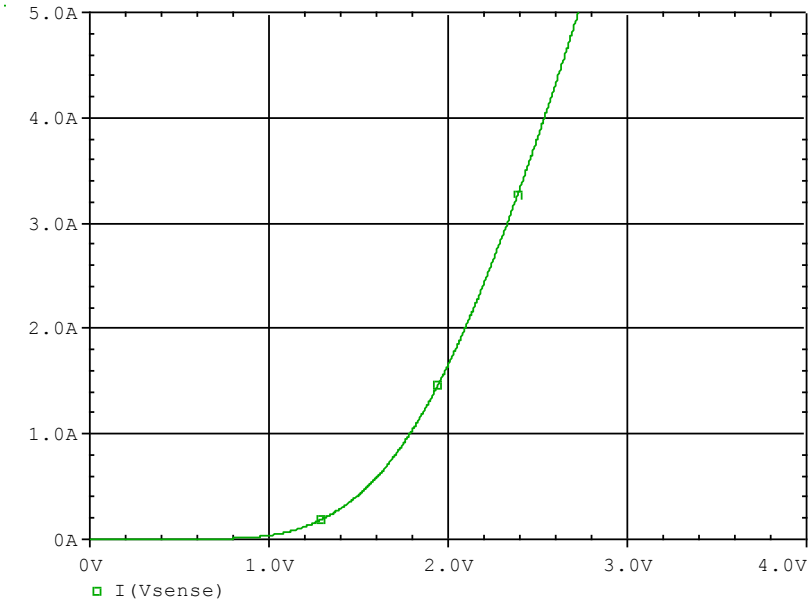


Evaluation circuit

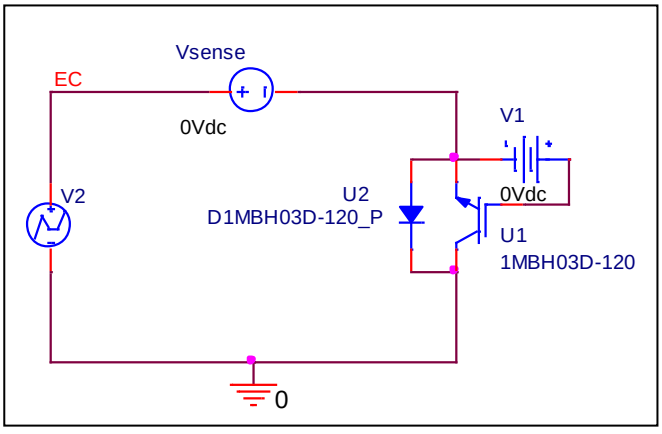


FWD Forward Current Characteristics

Circuit Simulation result

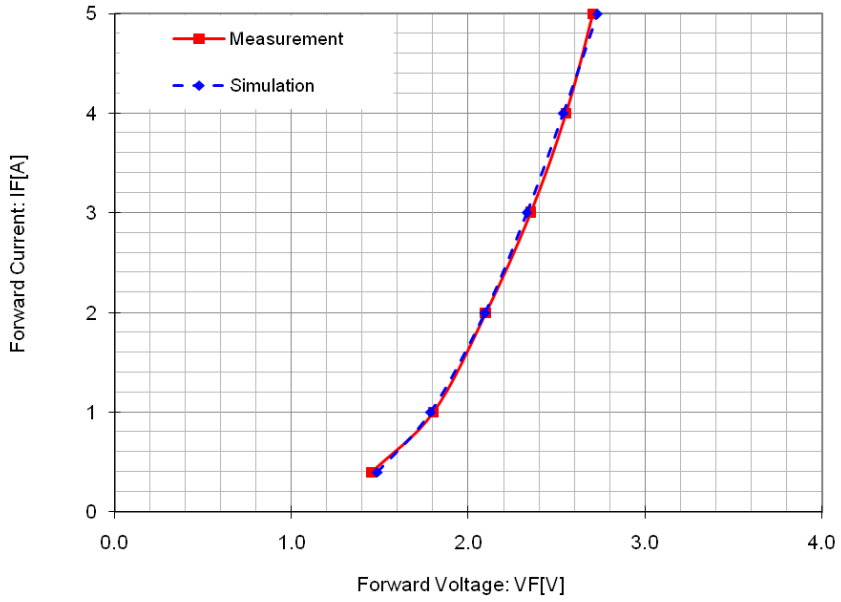


Evaluation circuit



Comparison Graph

Simulation result

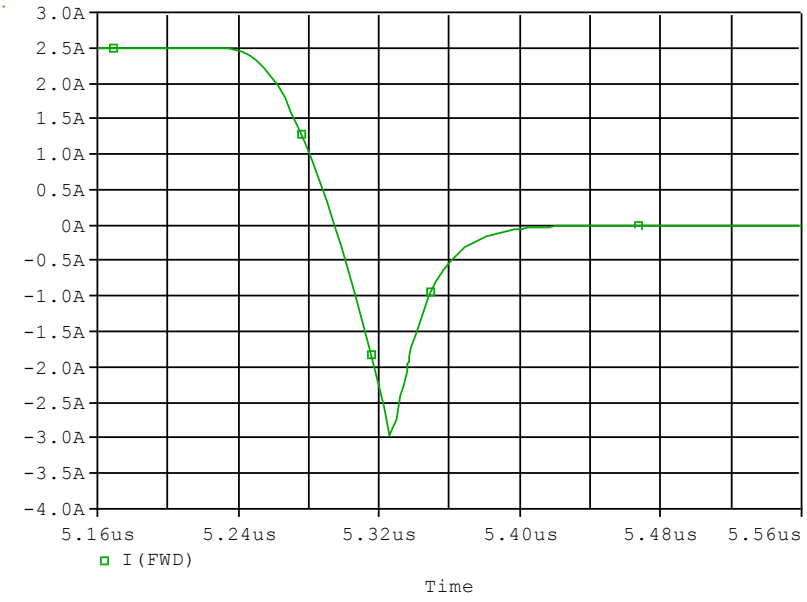


Comparison table

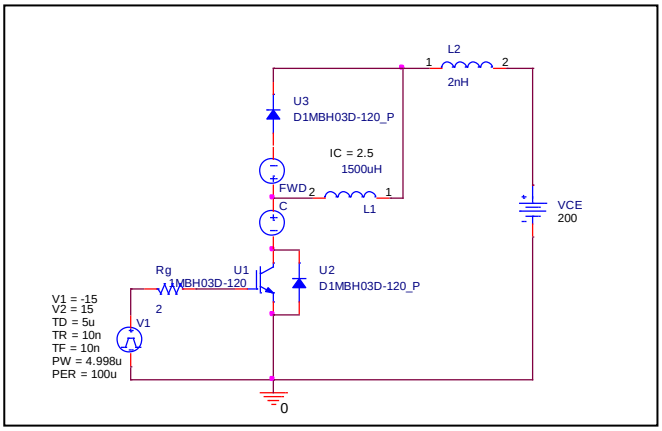
IF(A)	VF (V)		%Error
	Measurement	Simulation	
0.4	1.450	1.485	2.41
1	1.800	1.786	-0.77
2	2.100	2.094	-0.31
3	2.350	2.330	-0.86
4	2.550	2.537	-0.52
5	2.700	2.728	1.02

Reverse Recovery Characteristics

Circuit Simulation result



Evaluation circuit



Test condition: VCC=200 (V), IC=2.5 (A), di/dt=-100A/usec

Parameter	Unit	Measurement	Simulation	%Error
trr	nsec	75.000	74.886	-0.15
Irr	A	3.000	2.936	-2.13