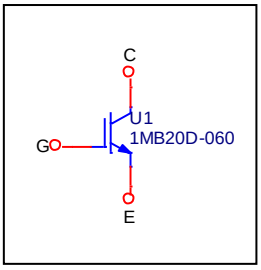
Device Modeling Report

COMPONENTS: Insulated Gate Bipolar Transistor (IGBT)
PART NUMBER: 1MB20D-060
MANUFACTURER: Fuji Electric
*REMARK: Free-Wheeling Diode Professional Model

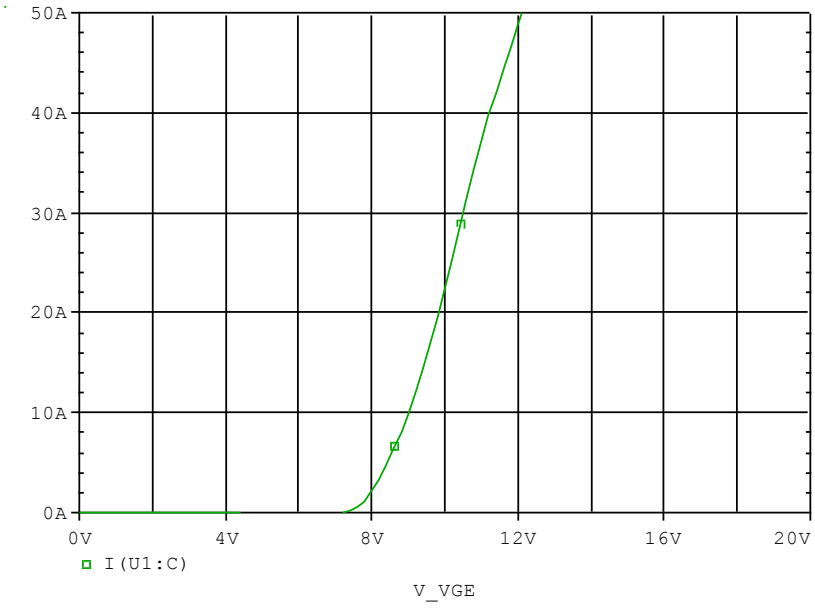
Bee Technologies Inc.

Circuit Configuration

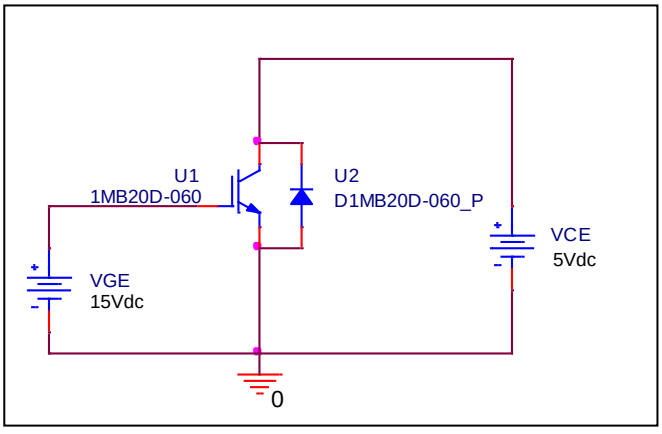


Transfer Characteristics

Circuit Simulation result

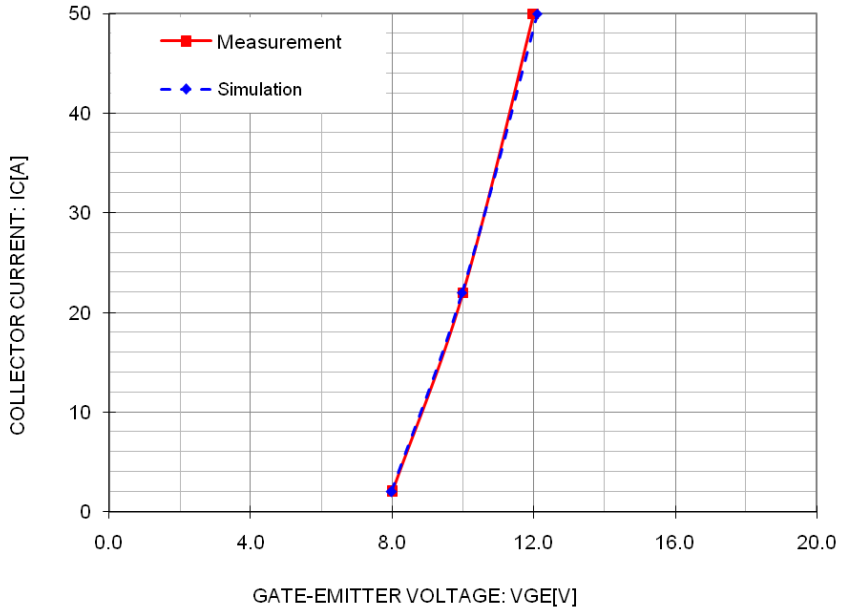


Evaluation circuit



Comparison Graph

Simulation result



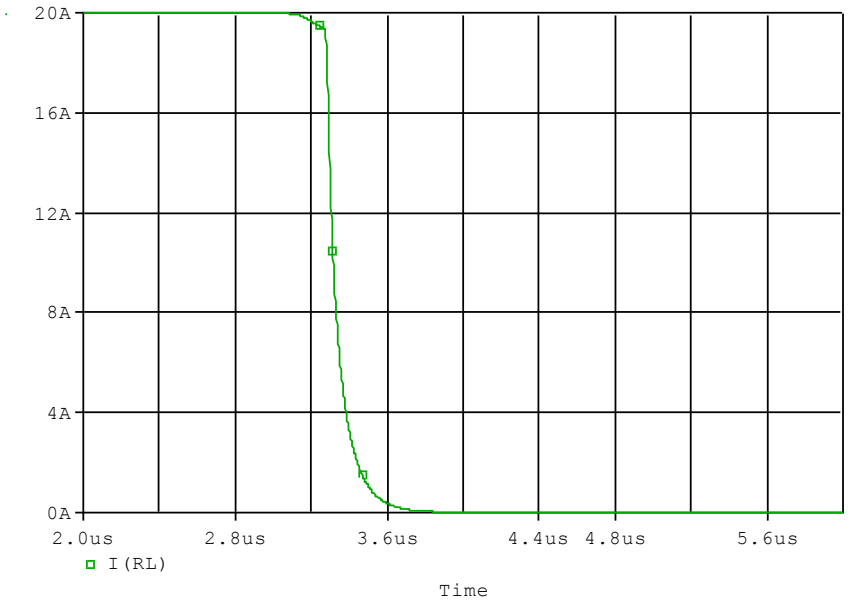
Comparison table

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

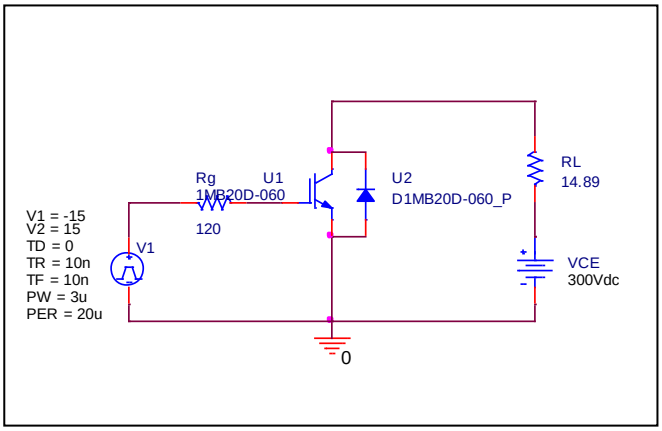
IC (A)	VGE (V)		%Error
	Measurement	Simulation	
2.000	8.000	7.986	-0.17
22.000	10.000	9.972	-0.28
50.000	12.000	12.107	0.89

Fall Time Characteristics

Circuit Simulation result



Evaluation circuit

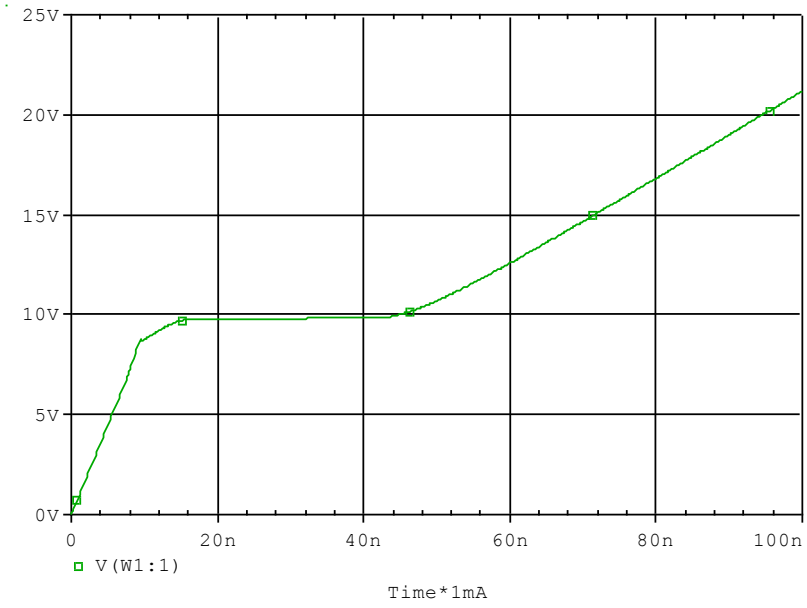


Test condition: IC=20 (A), VCC=300 (V)

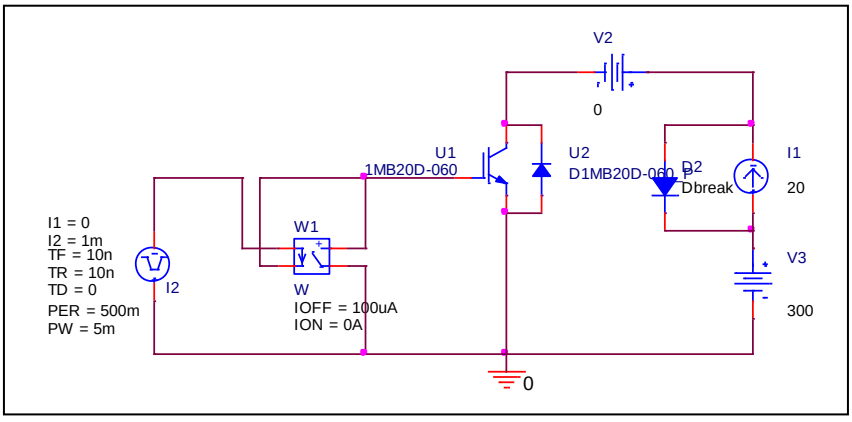
Parameter	Unit	Measurement	Simulation	%Error
tf	us	0.160	0.160	0.062

Gate Charge Characteristics

Circuit Simulation result



Evaluation circuit

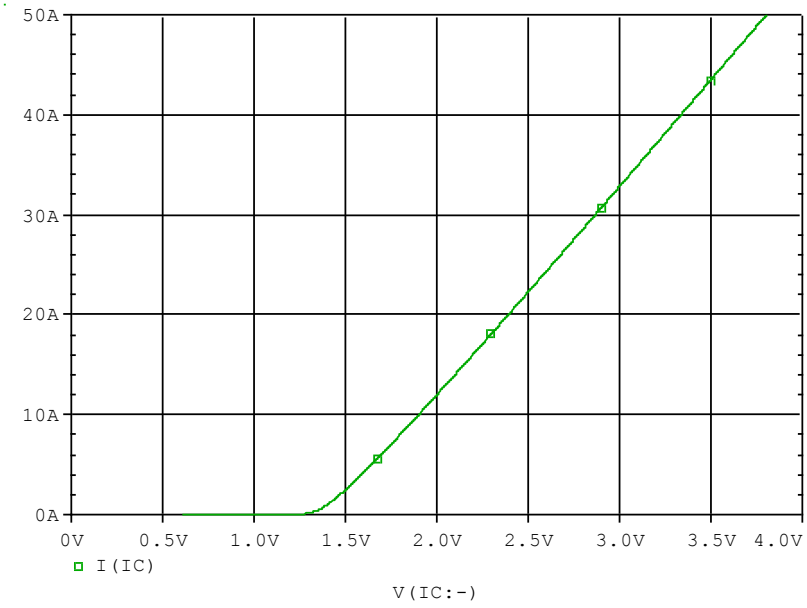


Test condition: V_{CC}=300 (V), I_C=20 (A), V_{GE}=15 (V)

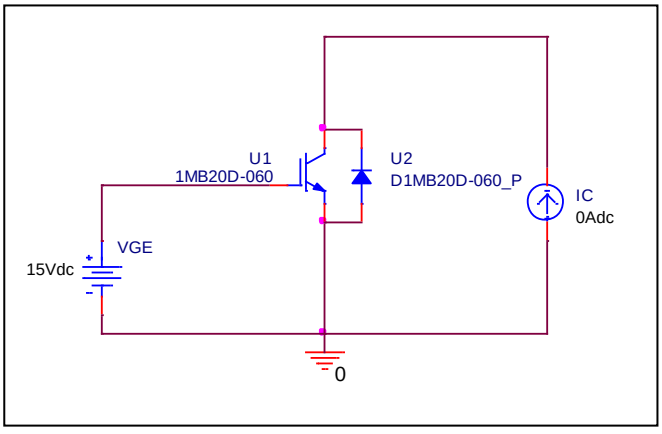
Parameter	Unit	Measurement	Simulation	%Error
Qge	nc	12.000	12.000	0.000
Qgc	nc	34.000	33.913	-0.256
Qg	nc	70.000	71.589	2.270

Saturation Characteristics

Circuit Simulation result

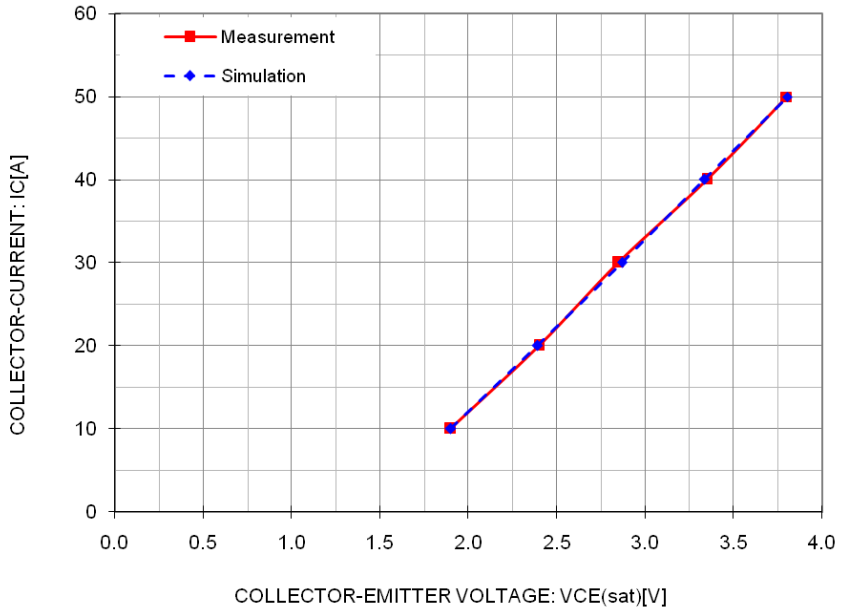


Evaluation circuit



Comparison Graph

Simulation result



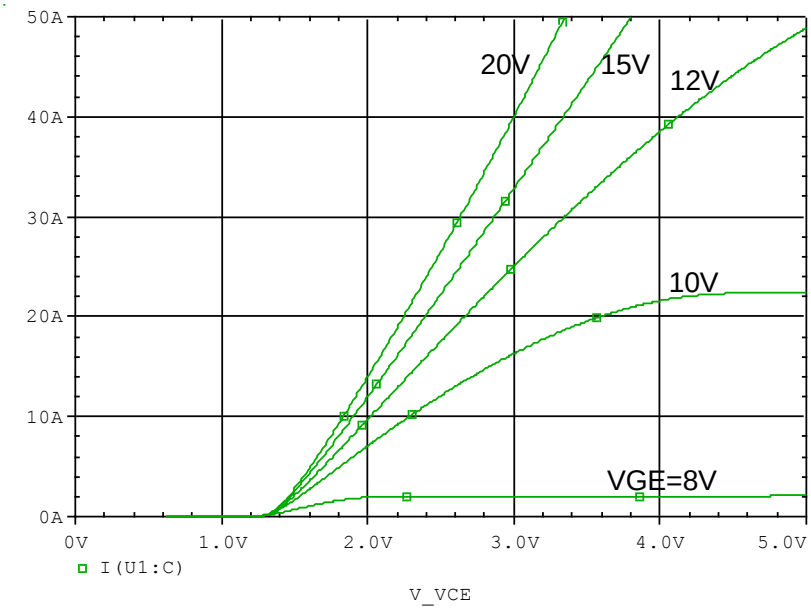
Comparison table

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

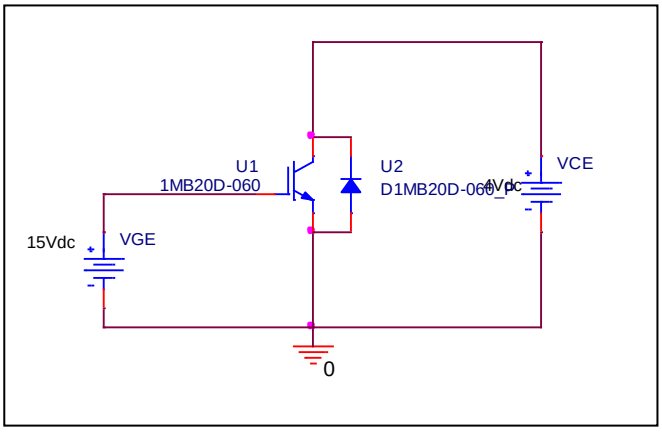
Ic(A)	VCE (V)		%Error
	Measurement	Simulation	
10.0	1.900	1.901	0.06
20.0	2.400	2.392	-0.35
30.0	2.850	2.868	0.61
40.0	3.350	3.337	-0.40
50.0	3.800	3.804	0.10

Output Characteristics

Circuit Simulation result

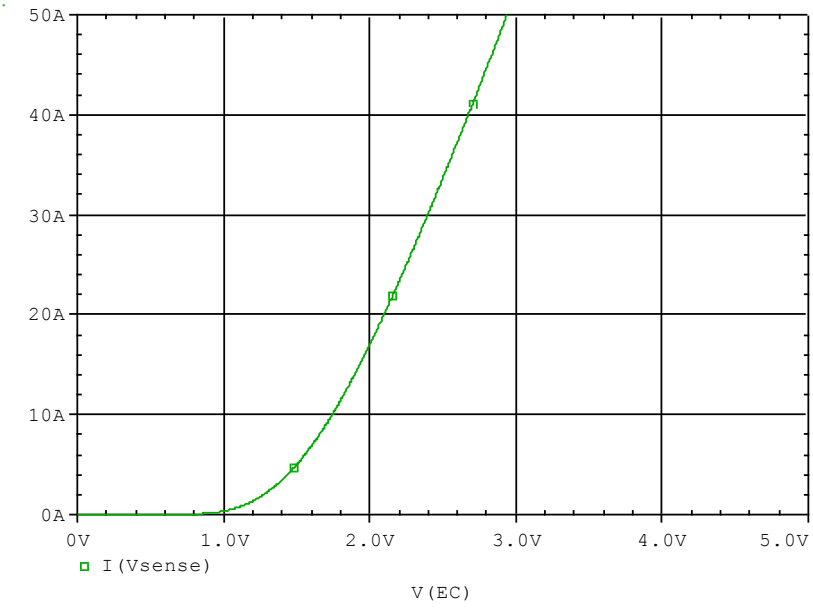


Evaluation circuit

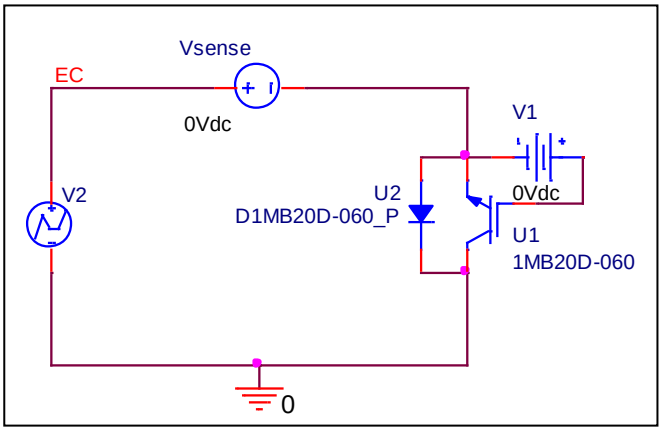


FWD Forward Current Characteristics

Circuit Simulation result

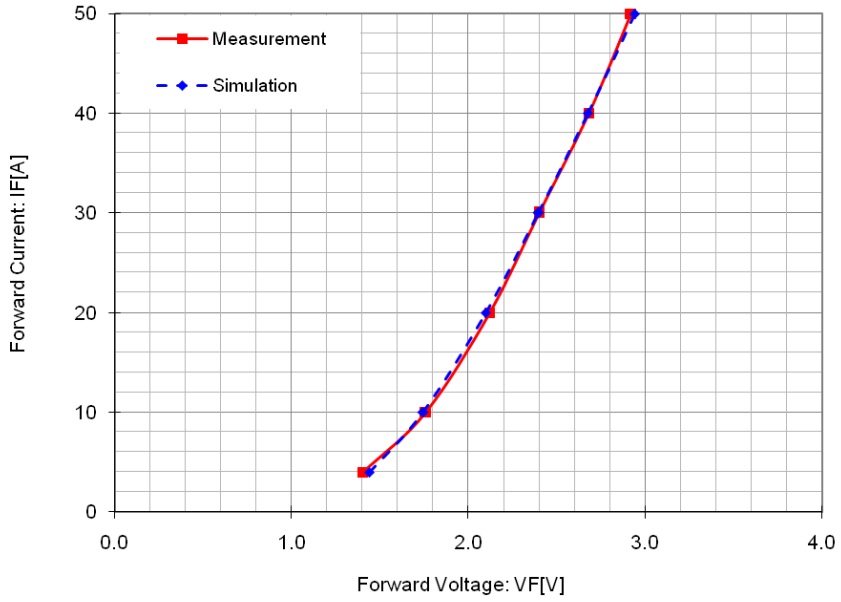


Evaluation circuit



Comparison Graph

Simulation result

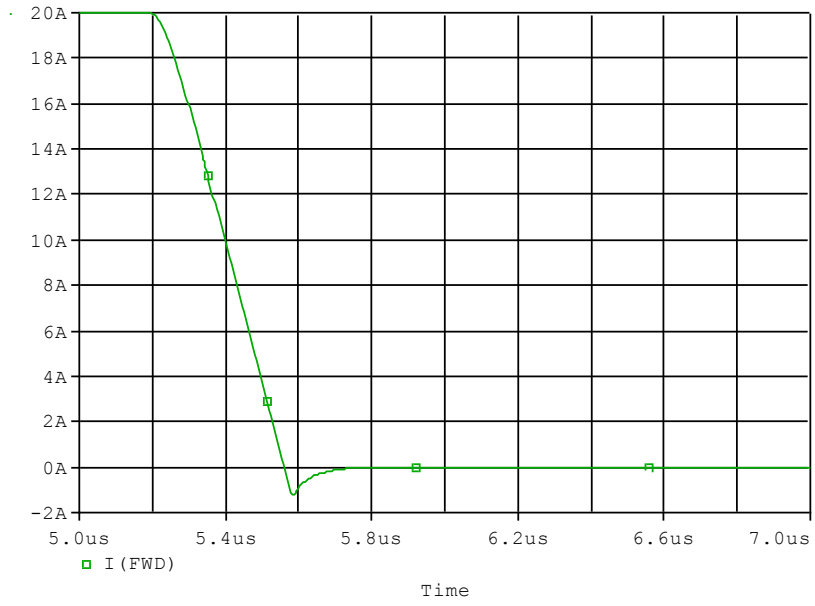


Comparison table

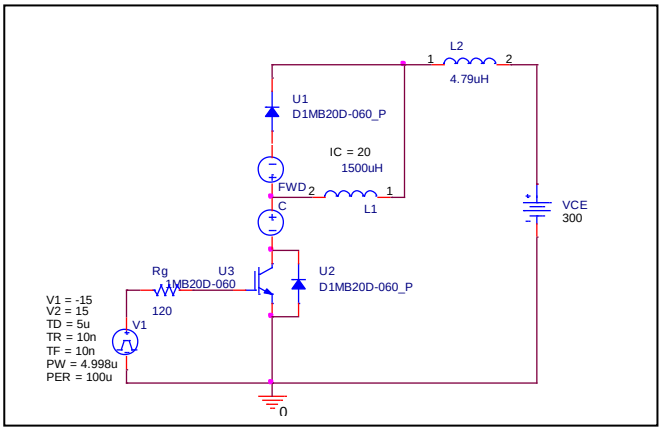
IF(A)	VF (V)		%Error
	Measurement	Simulation	
4	1.400	1.438	2.70
10	1.760	1.743	-0.96
20	2.120	2.098	-1.03
30	2.400	2.398	-0.10
40	2.680	2.674	-0.22
50	2.920	2.938	0.62

Reverse Recovery Characteristics

Circuit Simulation result



Evaluation circuit



Test condition: VCC=300 (V), IC=20 (A) –di/dt=60 A/usec

Parameter	Unit	Measurement	Simulation	%Error
trr	nsec	140.000	137.823	-1.55
Irr	A	1.200	1.195	-0.42