

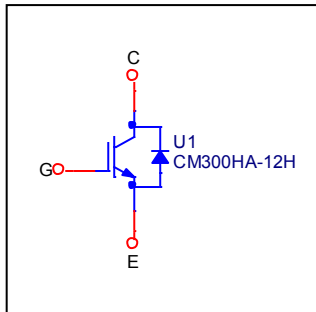
Device Modeling Report

COMPONENTS: Insulated Gate Bipolar Transistor (IGBT)
PART NUMBER: CM300HA-12H
MANUFACTURER: MITSUBISHI
*REMARK: Free-Wheeling Diode Standard Model

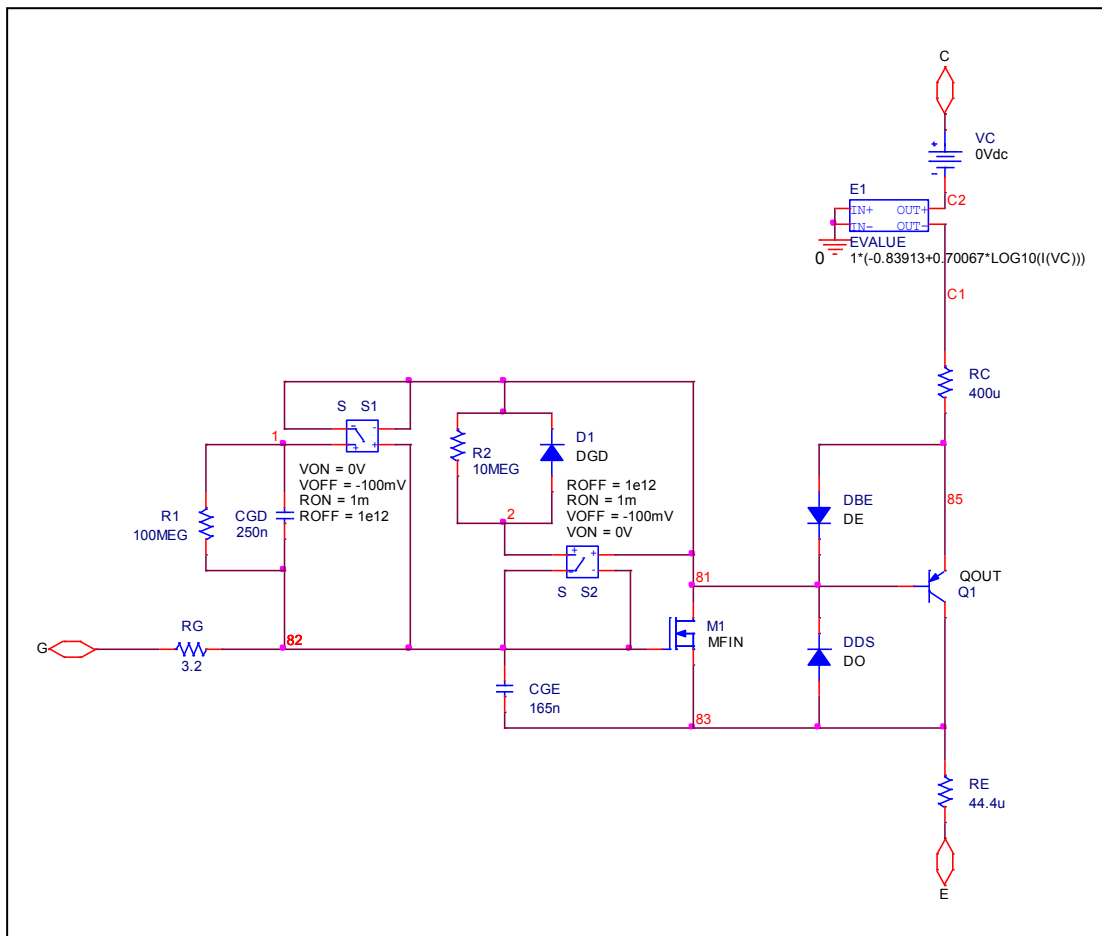


Bee Technologies Inc.

Circuit Configuration

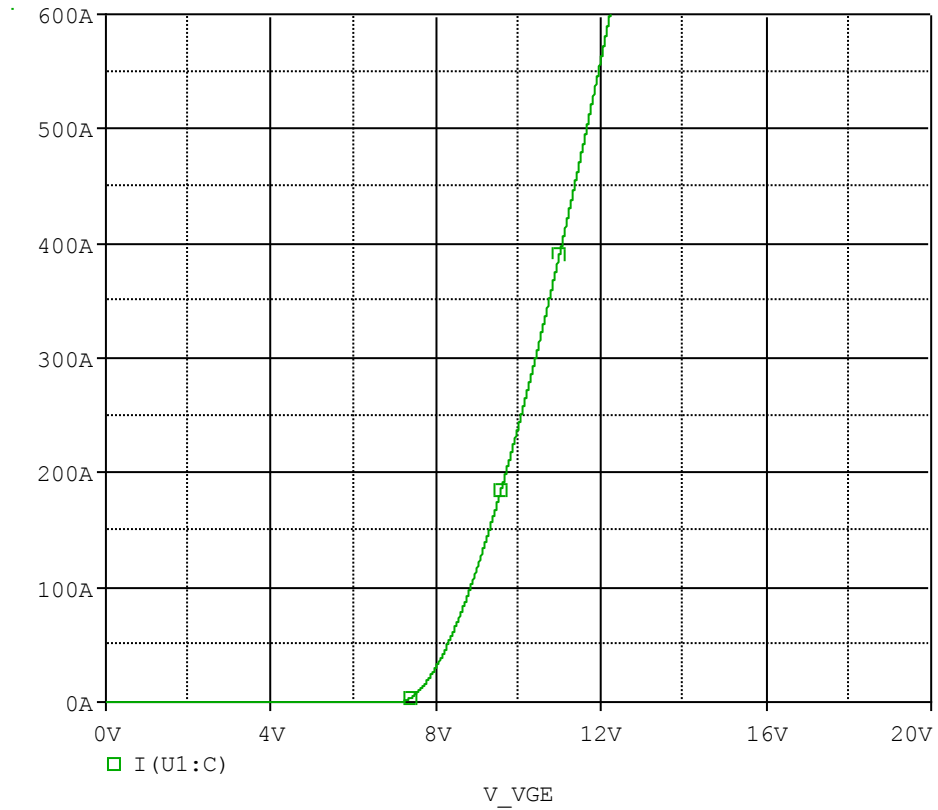


IGBT Subcircuit

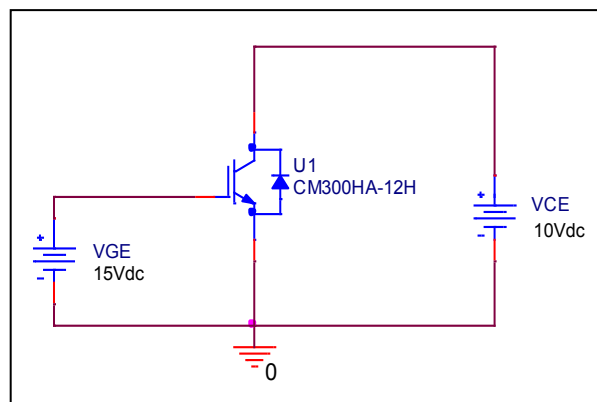


Transfer Characteristics

Circuit Simulation result

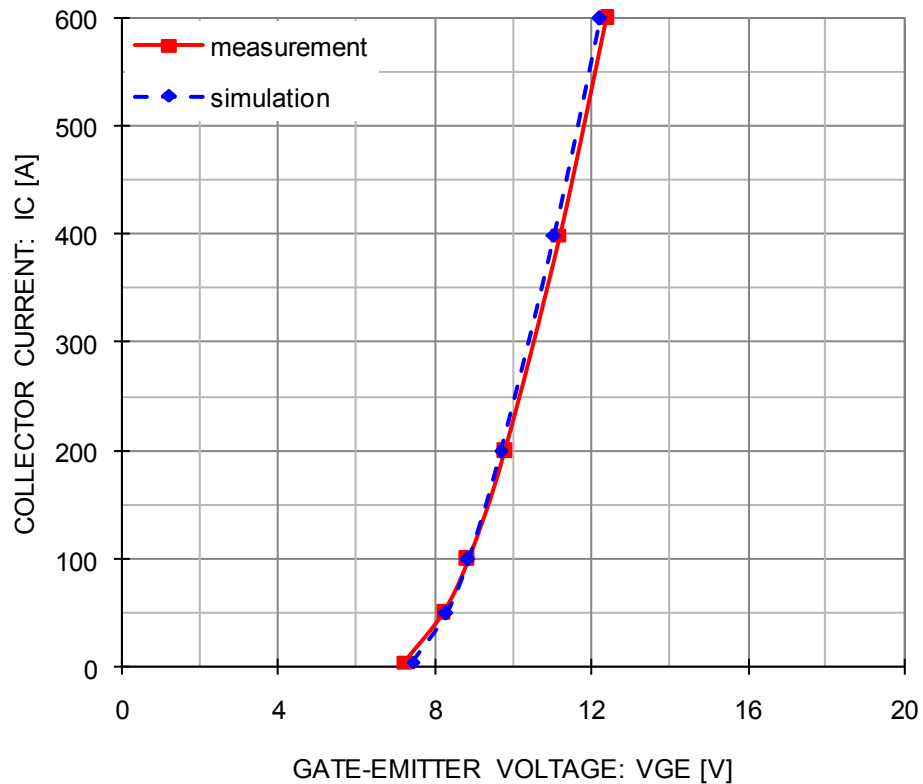


Evaluation circuit



Comparison Graph

Circuit Simulation Result



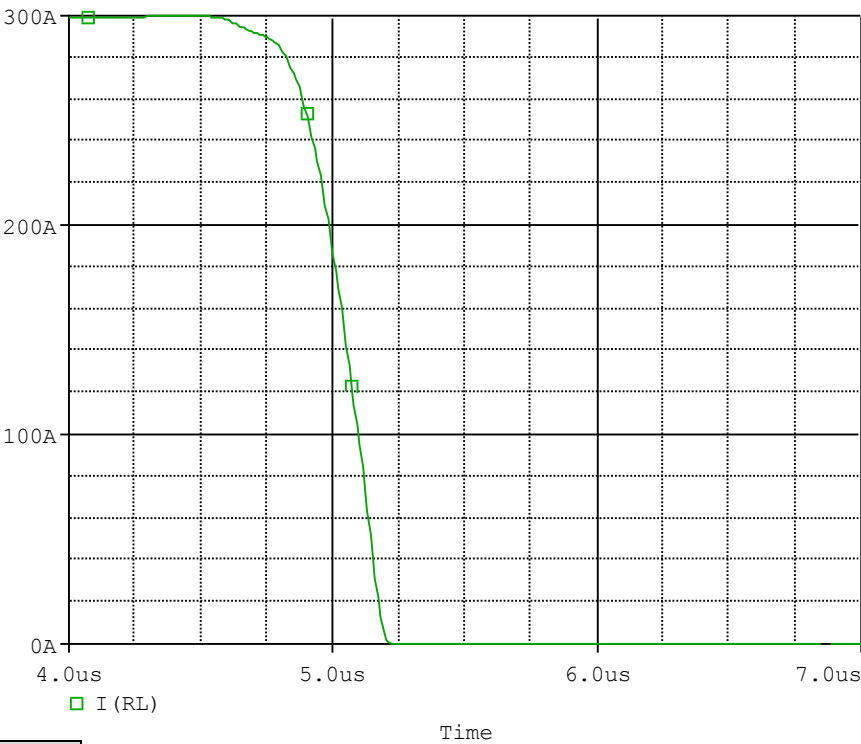
Simulation Result

Test condition: $V_{CE} = 10\text{ V}$

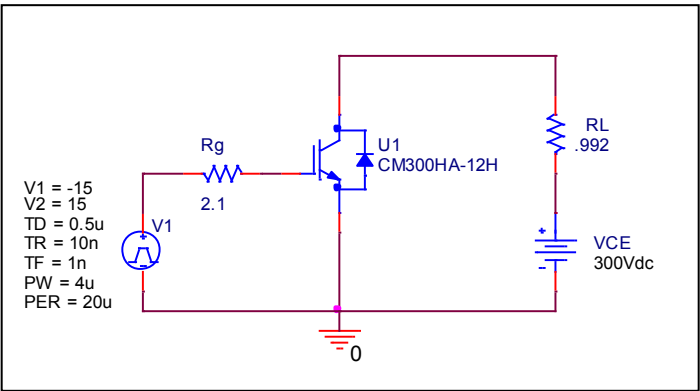
IC (A)	VGE (V)		Error (%)
	Measurement	Simulation	
5	7.250	7.446	2.70
50	8.200	8.279	0.96
100	8.850	8.836	-0.16
200	9.800	9.694	-1.08
400	11.200	11.053	-1.31
600	12.400	12.218	-1.47

Fall Time Characteristics

Circuit Simulation result



Evaluation circuit

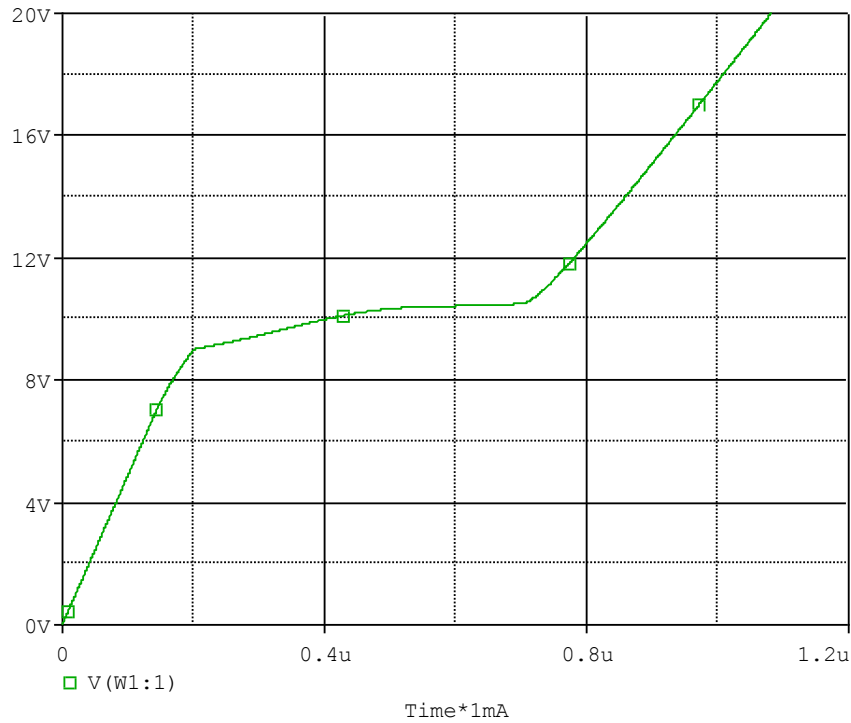


Test condition $I_c=300\text{ (A)}$, $V_{cc}=300\text{(V)}$

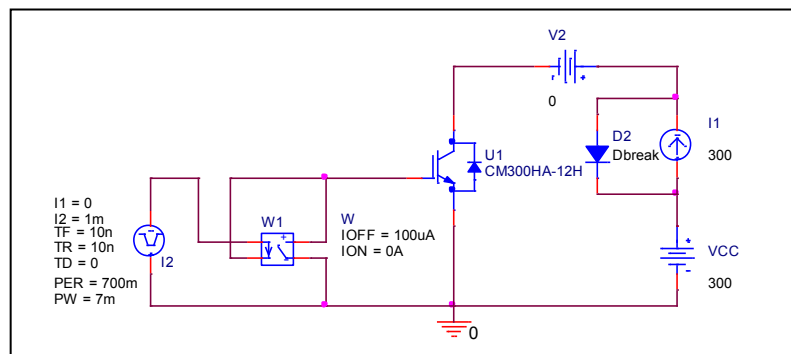
Parameter	Unit	Measurement	Simulation	Error
tf	ns	300.000	300.994	0.331

Gate Charge Characteristics

Circuit Simulation result



Evaluation circuit

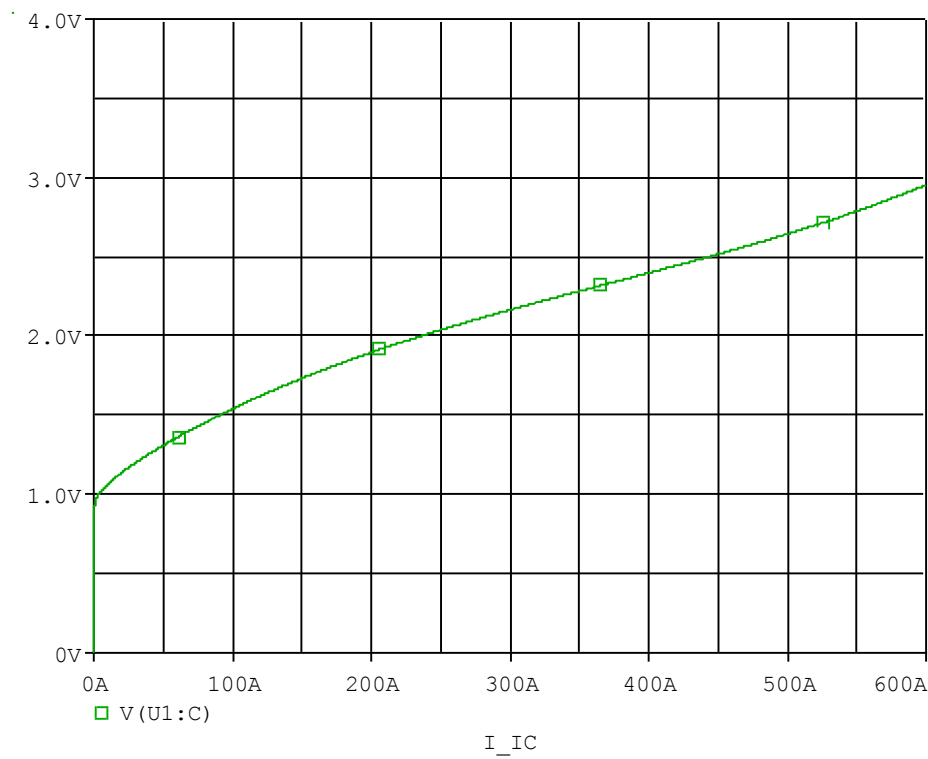


Test condition: $V_{CC}=300$ (V), $I_C=300$ (A) , $V_{GE}=15$ (V)

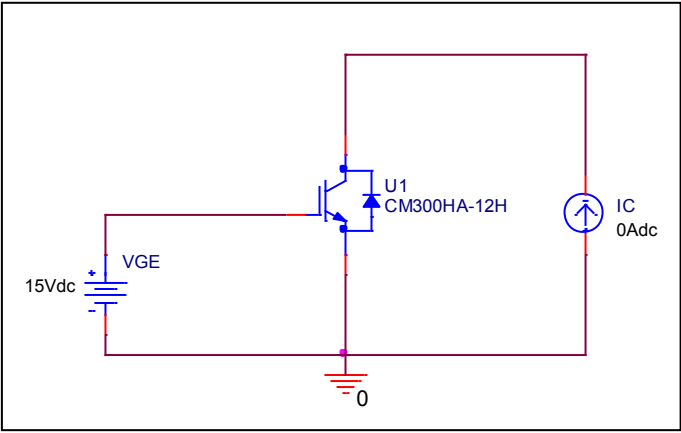
Parameter	Unit	Measurement	Simulation	Error(%)
Qge	nc	200.000	202.730	1.365
Qgc	nc	500.000	504.508	0.902
Qg	nc	900.000	897.238	-0.307

Saturation Characteristics

Circuit Simulation result

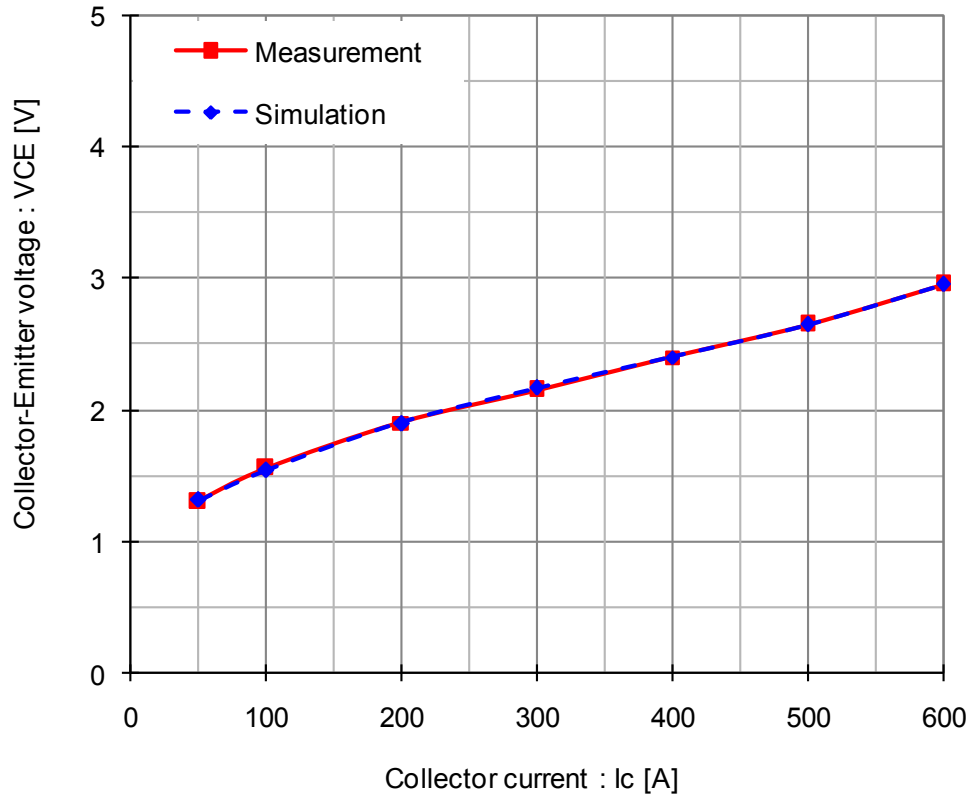


Evaluation circuit



Comparison Graph

Circuit Simulation Result



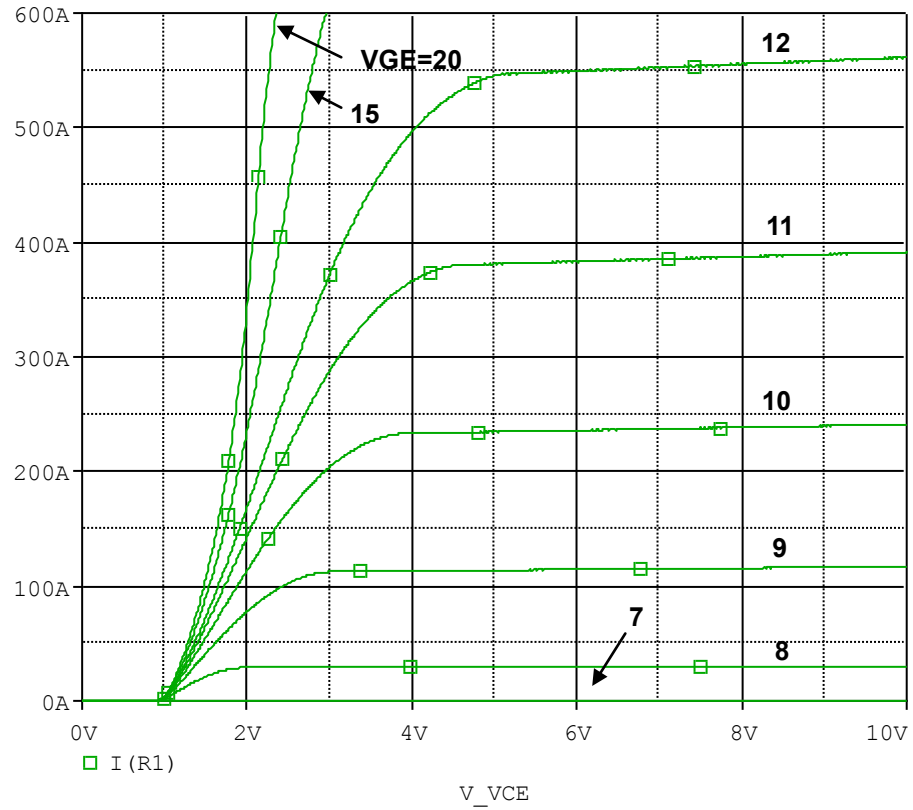
Simulation Result

Test condition: $V_{GE} = 15\text{ V}$

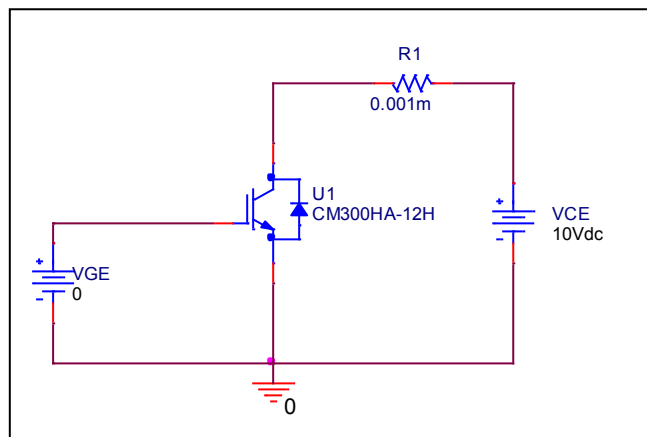
I_c (A)	V_{CE} (V)		Error (%)
	Measurement	Simulation	
50	1.300	1.308	0.62
100	1.550	1.540	-0.65
200	1.900	1.896	-0.24
300	2.150	2.164	0.66
400	2.400	2.397	-0.12
500	2.650	2.643	-0.25
600	2.950	2.953	0.09

Output Characteristics

Circuit Simulation result

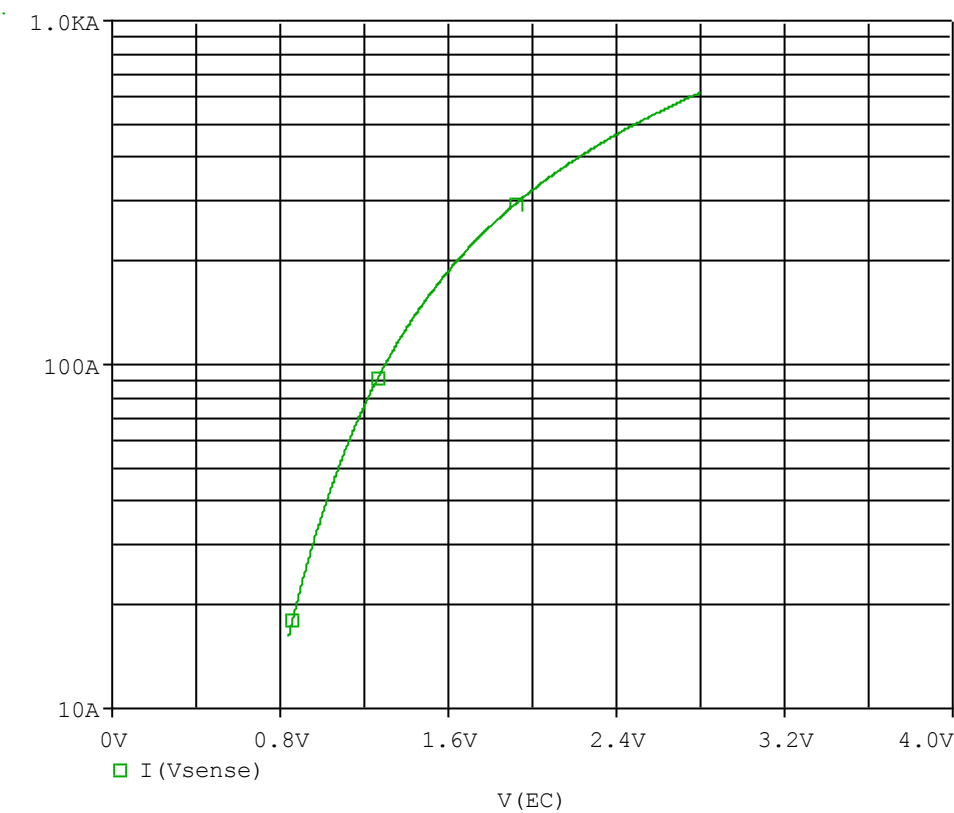


Evaluation circuit

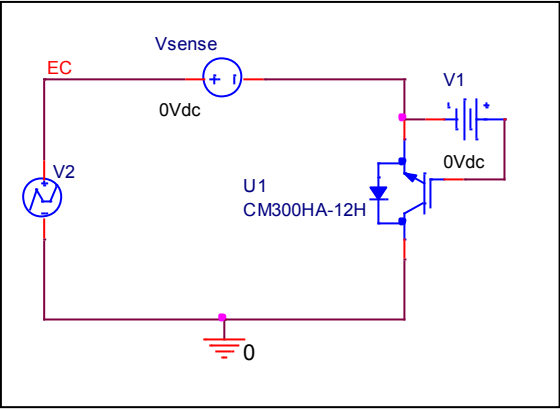


Forward Current Characteristic

Circuit Simulation Result

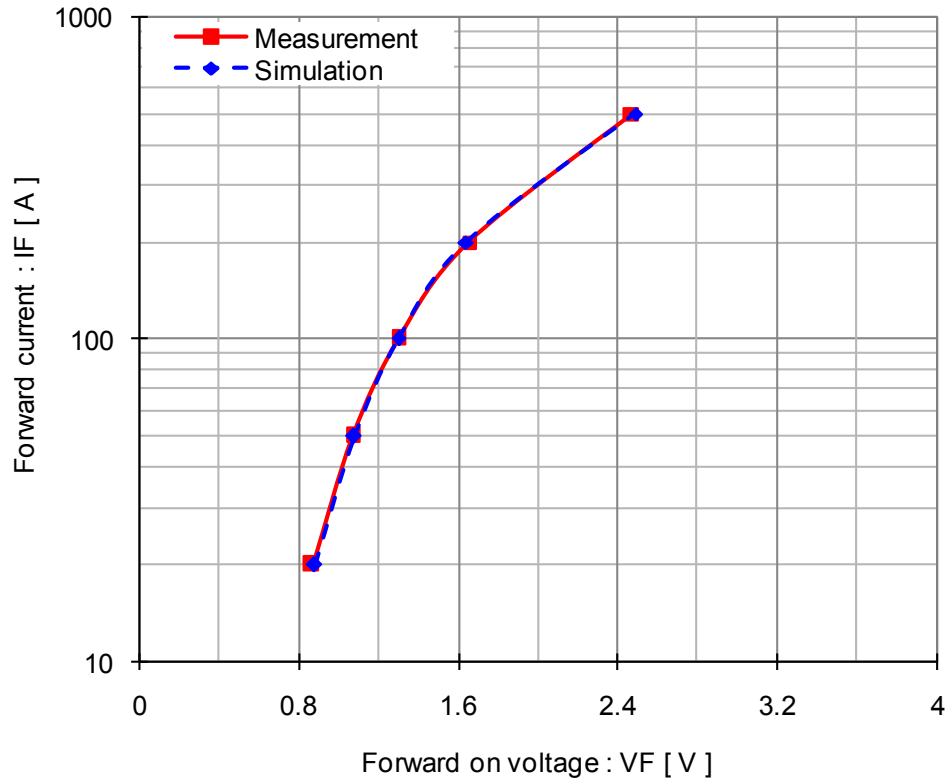


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

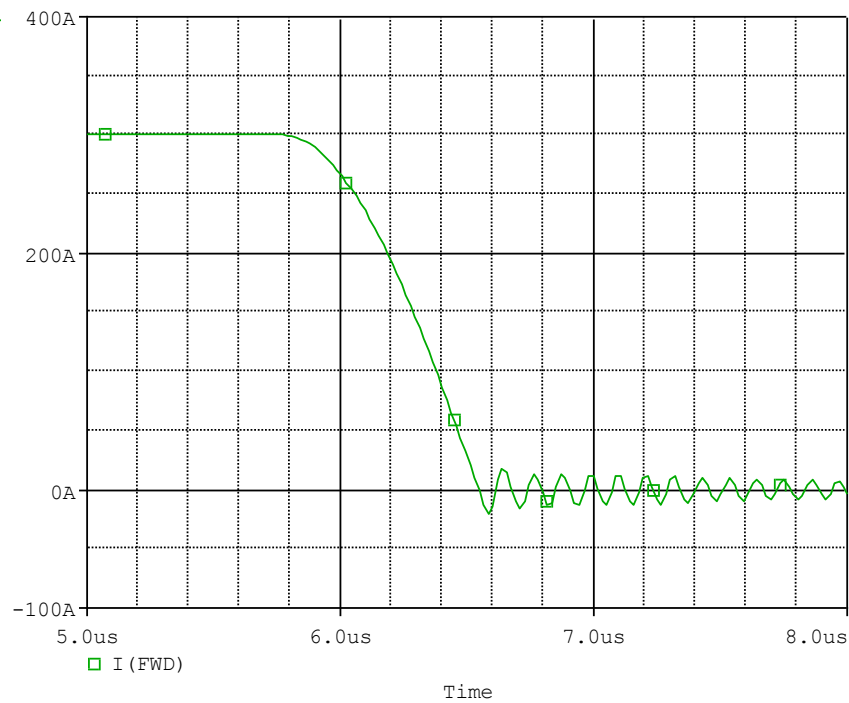


Simulation Result

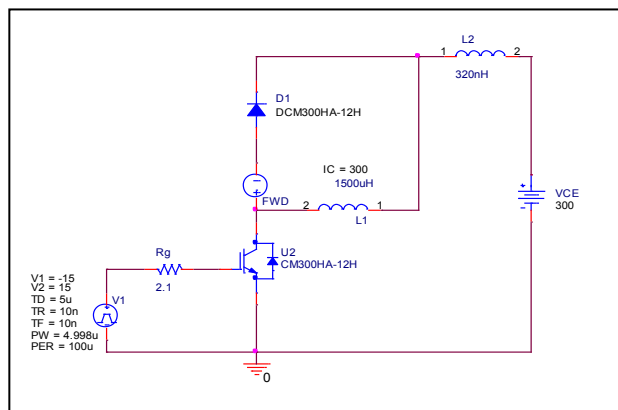
IE(A)	VEC(V)		%Error
	Measurement	Simulation	
20	0.865	0.876	1.27
50	1.070	1.076	0.56
100	1.300	1.299	-0.08
200	1.655	1.640	-0.91
500	2.475	2.489	0.57

Reverse Recovery Characteristics

Circuit Simulation result



Evaluation circuit



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

Parameter	Unit	Measurement	Simulation	Error(%)
trr	nsec	80	65.737	-17.83
Irr	A	20	20.427	2.14