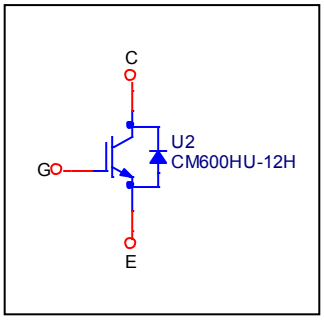
Device Modeling Report

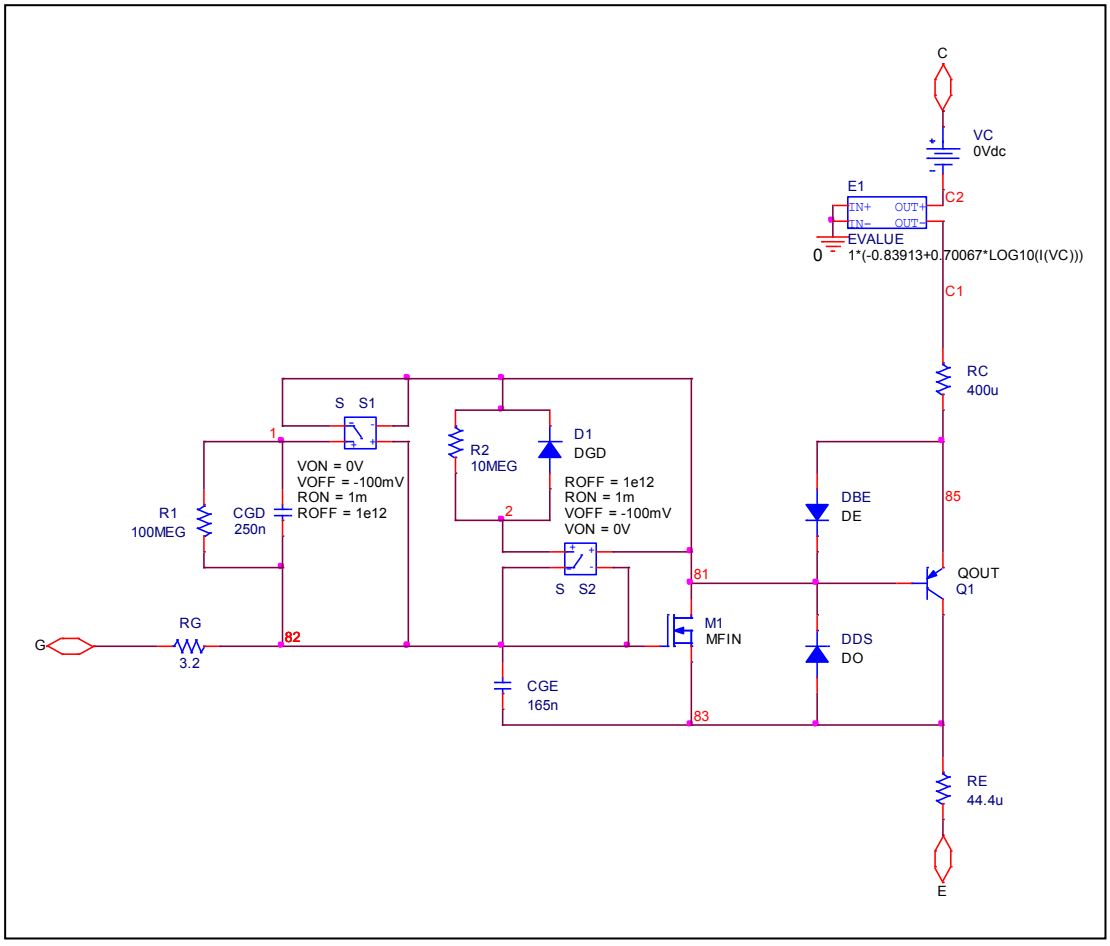
COMPONENTS: Insulated Gate Bipolar Transistor (IGBT)
PART NUMBER: CM600HU-12H
MANUFACTURER: MITSUBISHI
*REMARK: Free-Wheeling Diode Standard Model

Bee Technologies Inc.

Circuit Configuration

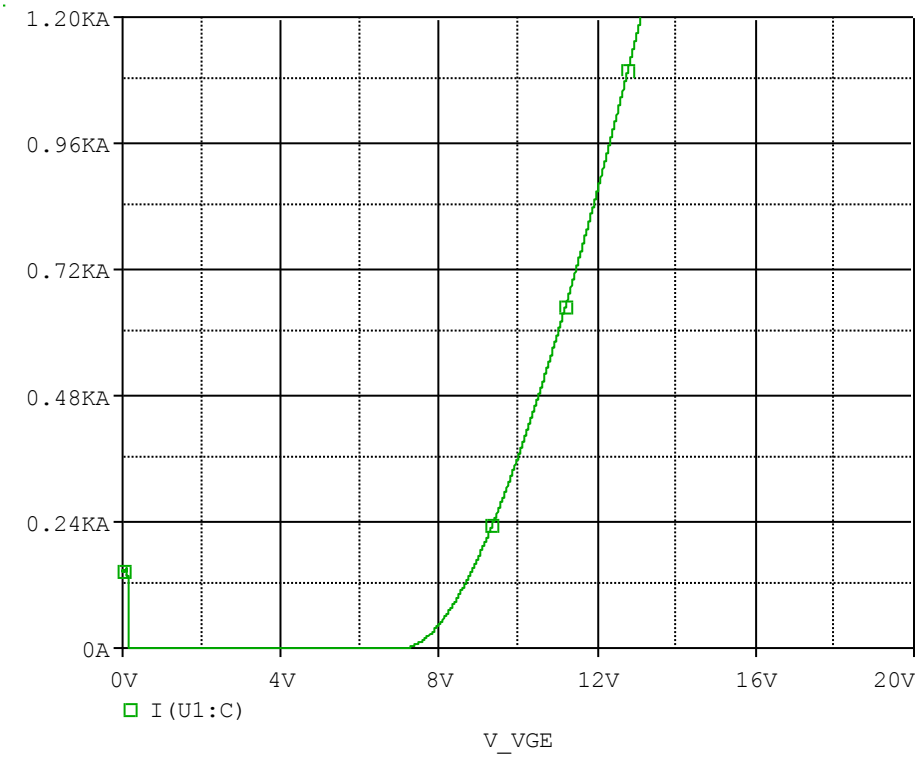


IGBT Subcircuit

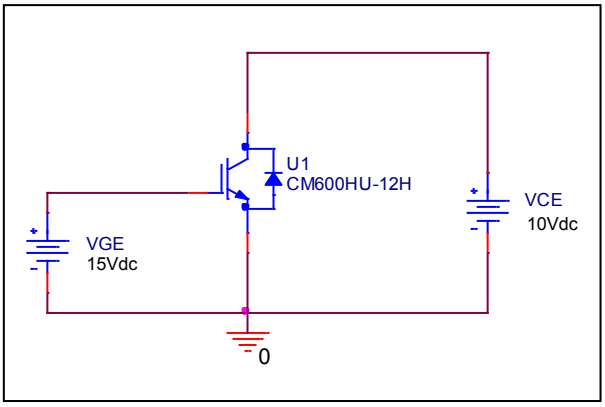


Transfer Characteristics

Circuit Simulation result

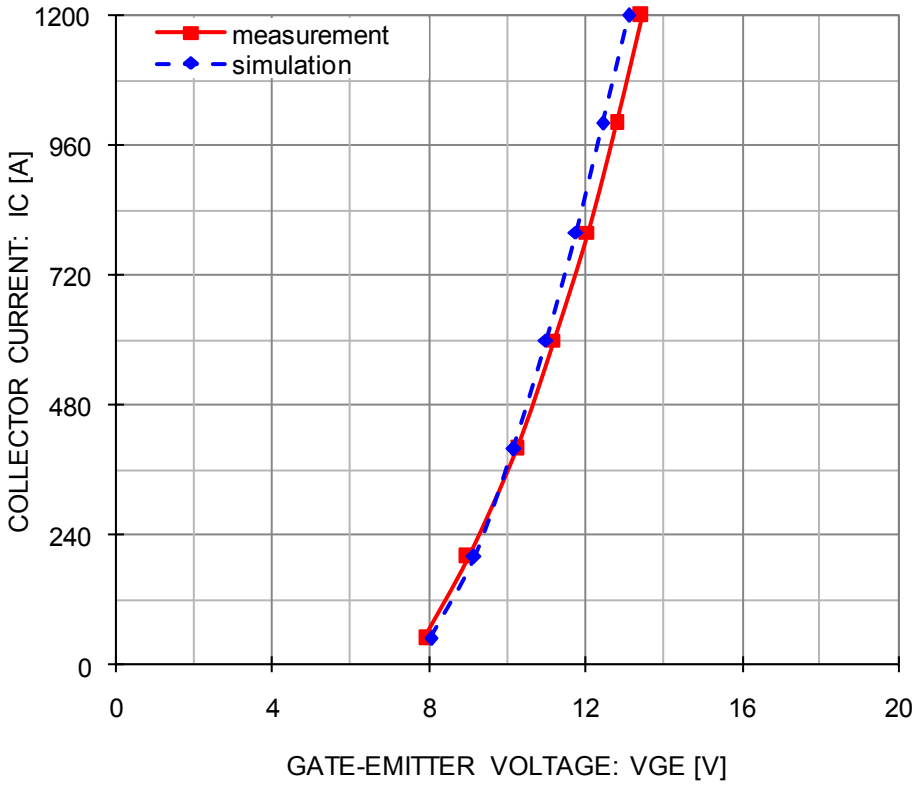


Evaluation circuit



Comparison Graph

Circuit Simulation Result



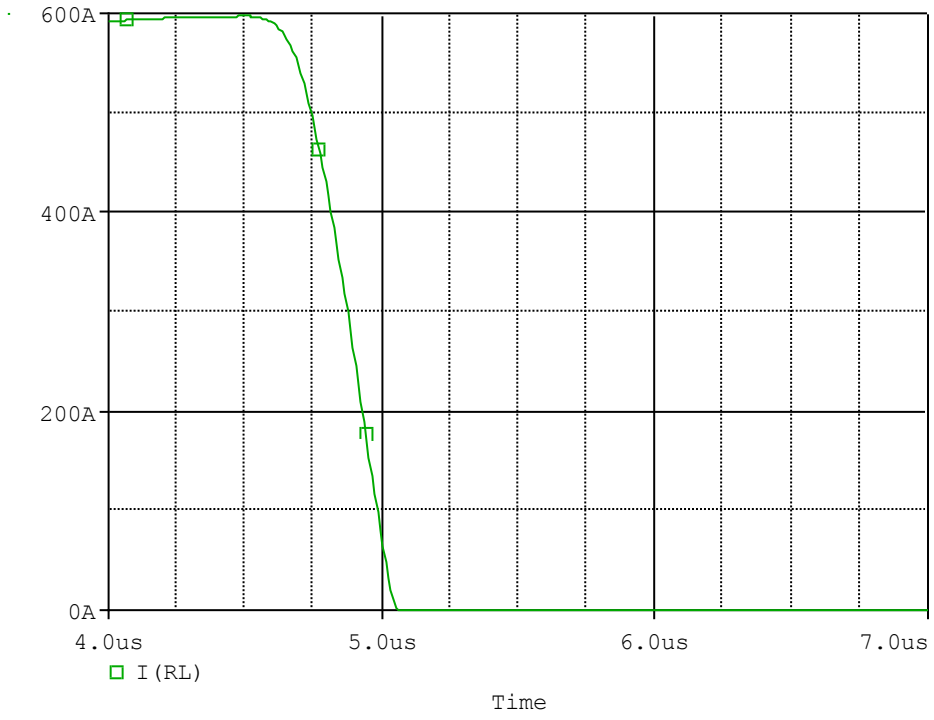
Simulation Result

Test condition: V_{CE} = 10 V

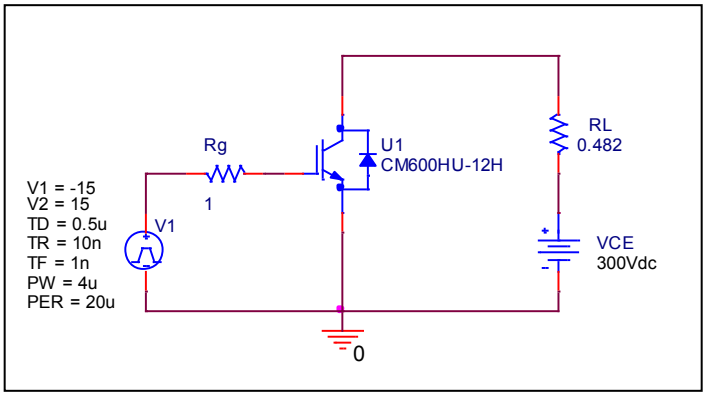
IC (A)	VGE (V)		Error (%)
	Measurement	Simulation	
50	7.900	8.054	1.95
200	9.000	9.153	1.70
400	10.250	10.163	-0.85
600	11.200	11.001	-1.78
800	12.075	11.751	-2.68
1000	12.800	12.447	-2.76
1200	13.45	13.103	2.37

Fall Time Characteristics

Circuit Simulation result



Evaluation circuit

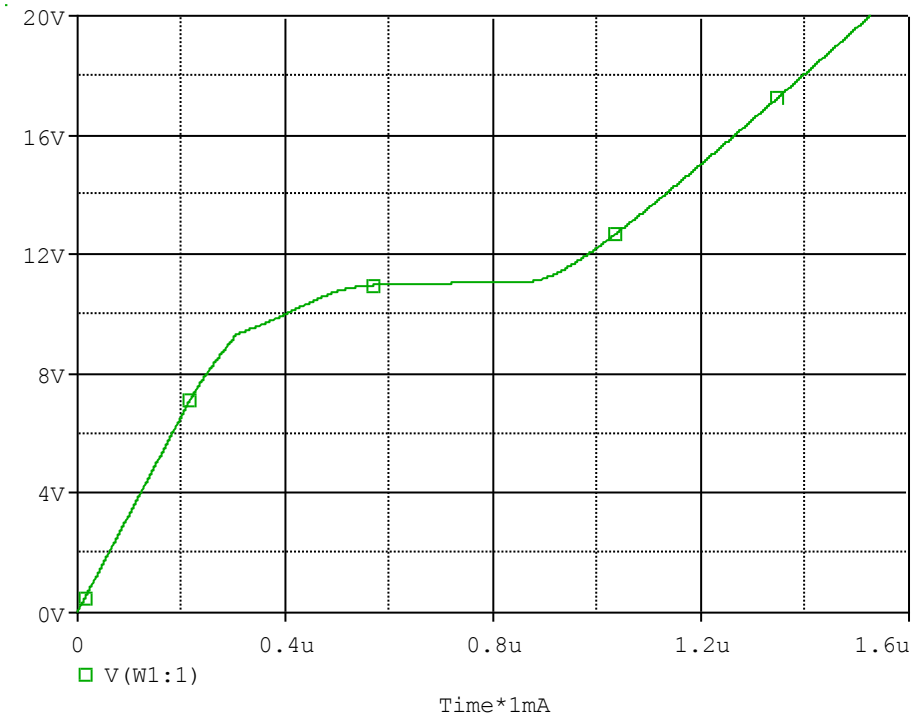


Test condition IC=600 (A), VCC=300(V)

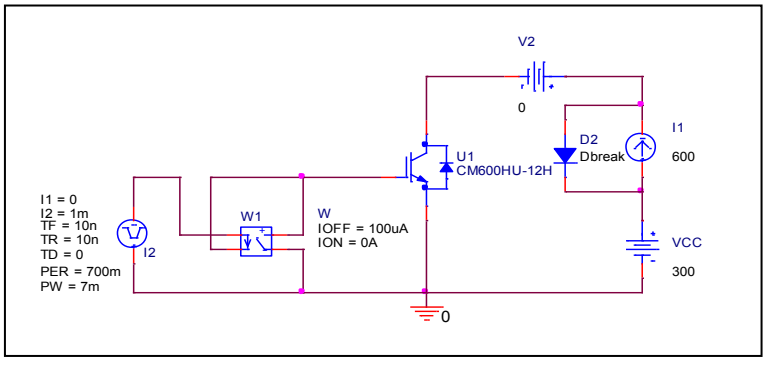
Parameter	Unit	Measurement	Simulation	Error
tf	ns	300.000	303.154	1.051

Gate Charge Characteristics

Circuit Simulation result



Evaluation circuit

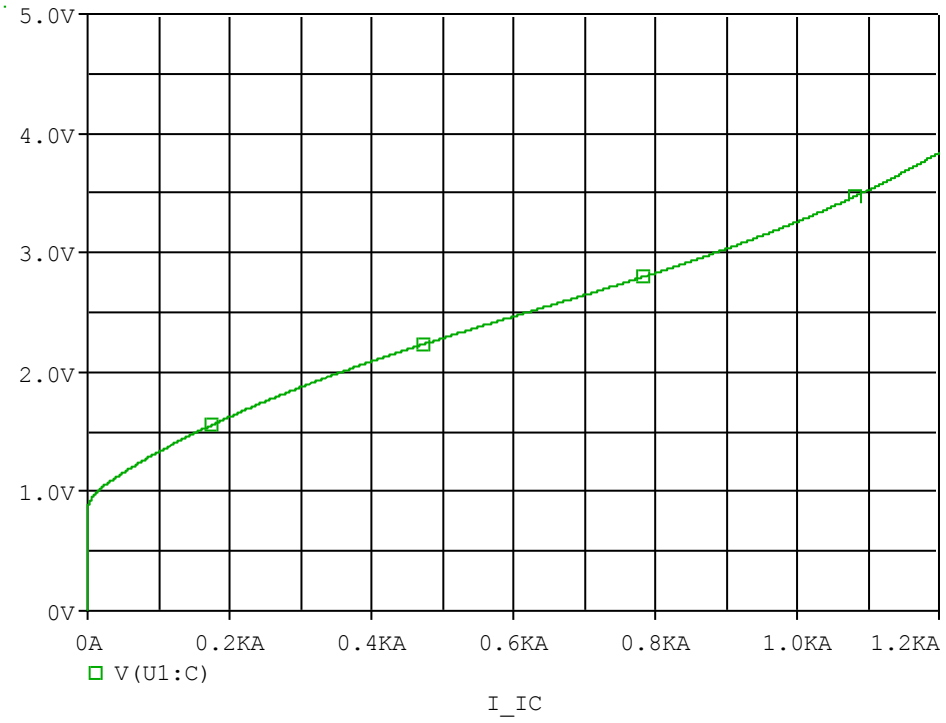


Test condition: V_{CC}=300 (V), I_C=600(A) ,V_{GE}=15(V)

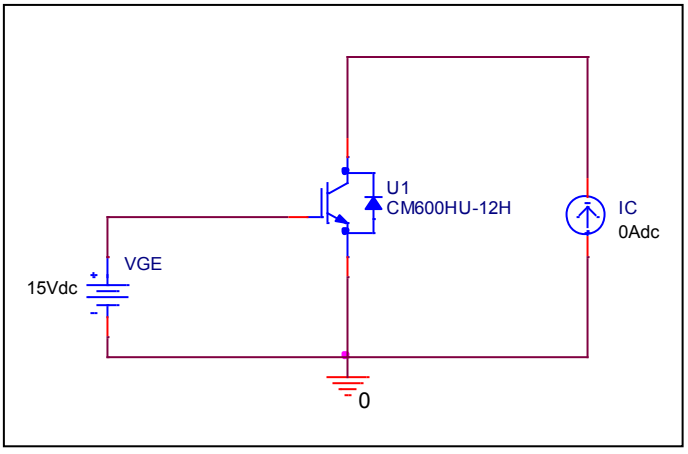
Parameter	Unit	Measurement	Simulation	Error(%)
Qge	nc	280.000	279.308	-0.25
Qgc	nc	600.000	606.007	1.00
Qg	nc	1200.000	1198.000	-0.17

Saturation Characteristics

Circuit Simulation result

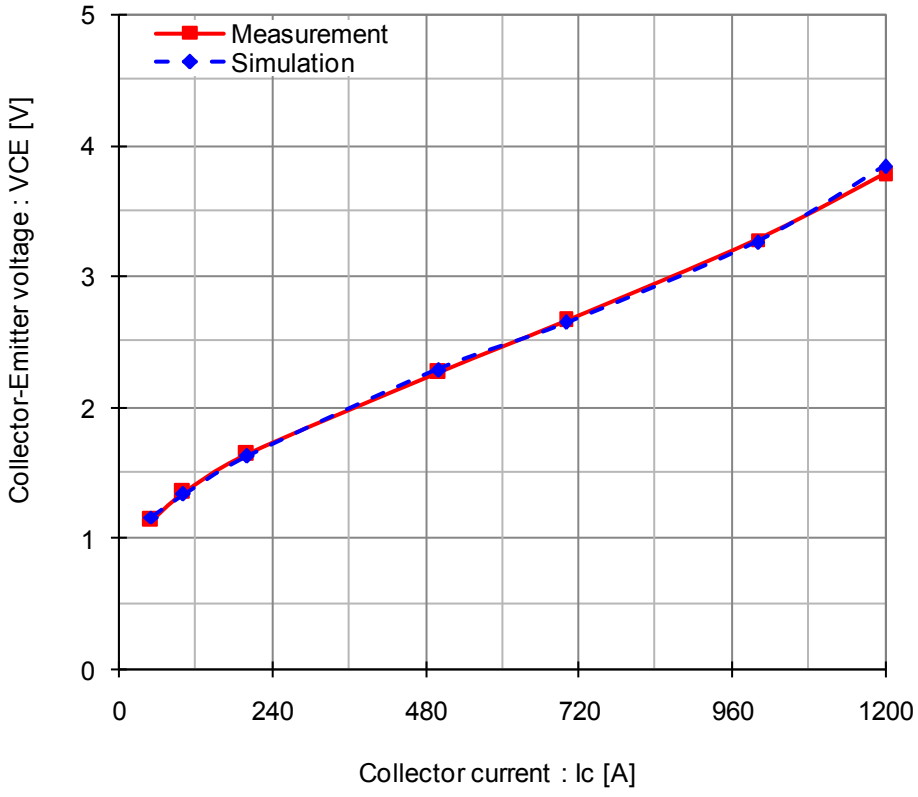


Evaluation circuit



Comparison Graph

Circuit Simulation Result



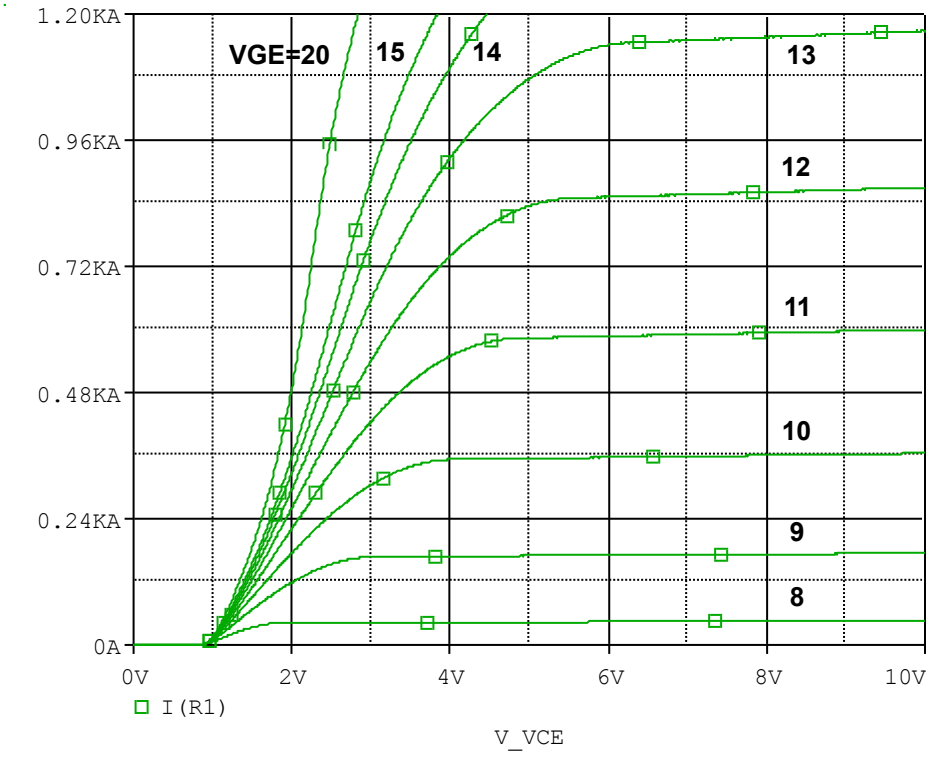
Simulation Result

Test condition: V_{GE} = 15 V

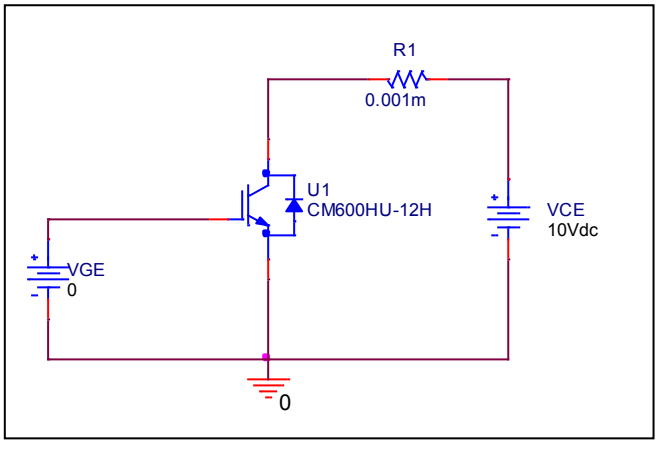
Ic(A)	VCE (V)		Error (%)
	Measurement	Simulation	
50	1.135	1.157	1.91
100	1.345	1.331	-1.08
200	1.640	1.624	-0.98
500	2.265	2.283	0.79
700	2.660	2.644	-0.60
1000	3.275	3.258	-0.51
1200	3.775	3.837	1.64

Output Characteristics

Circuit Simulation result

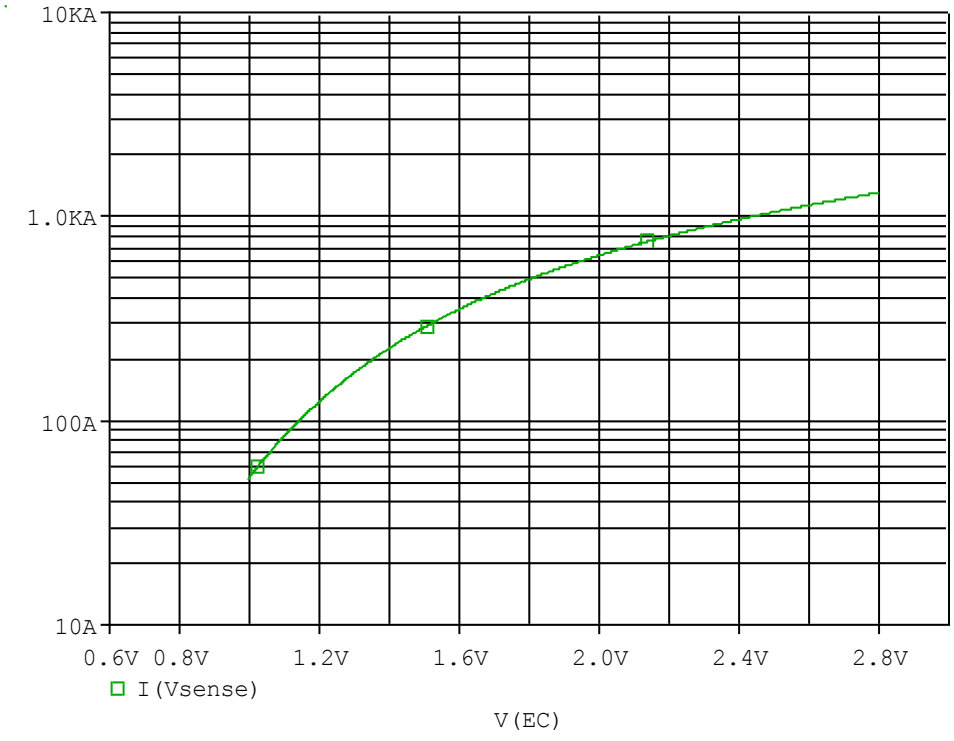


Evaluation circuit

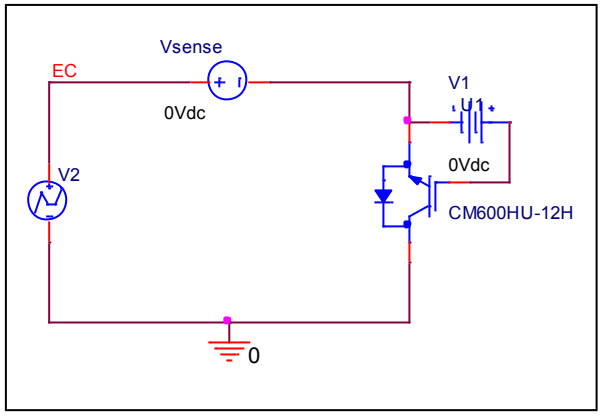


Forward Current Characteristic

Circuit Simulation Result

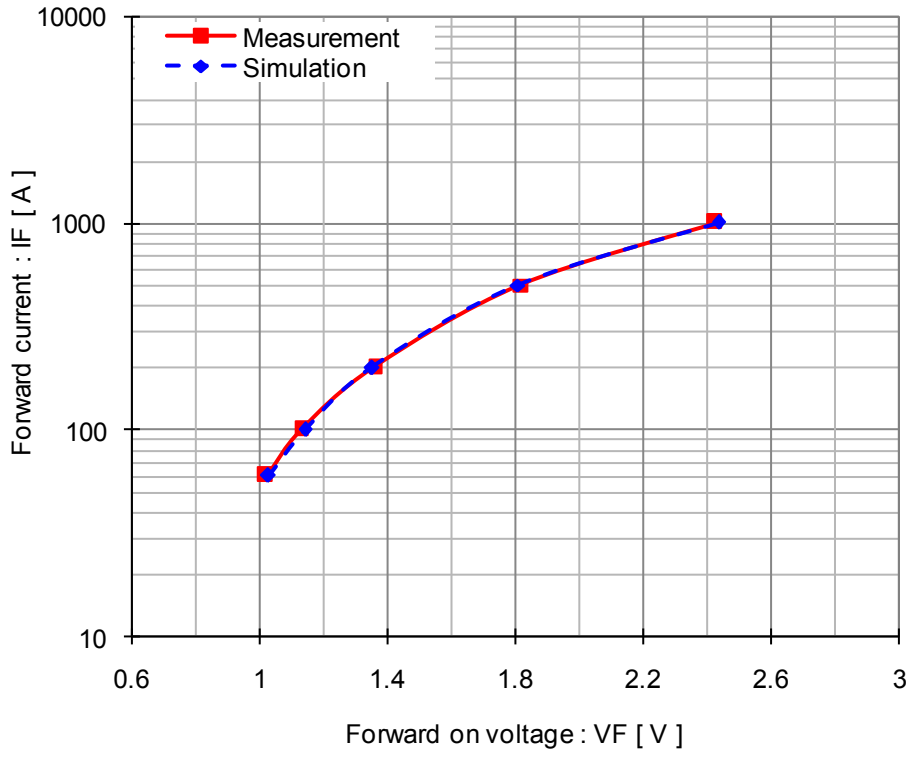


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

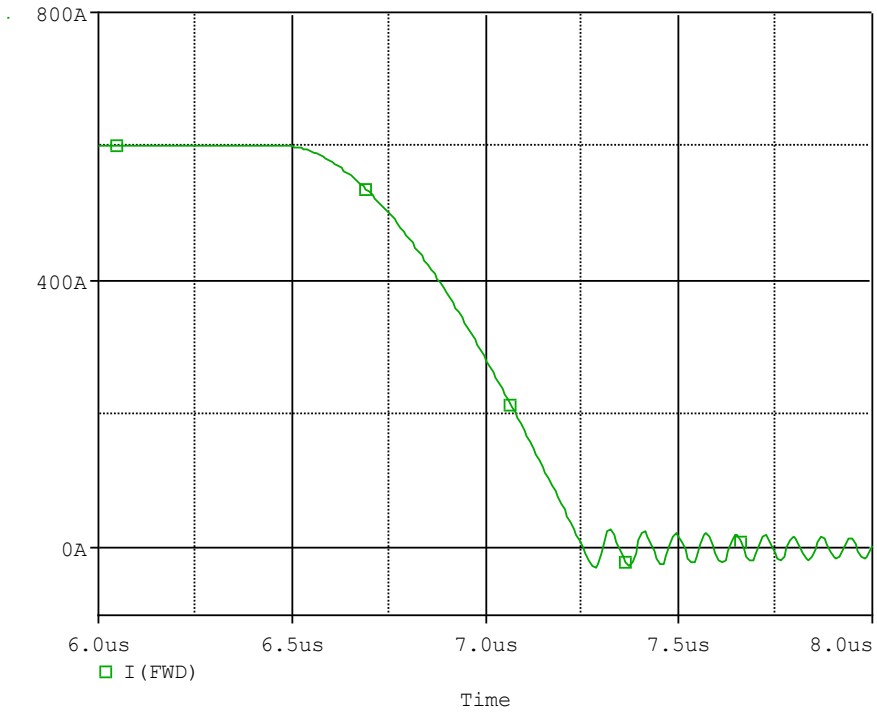


Simulation Result

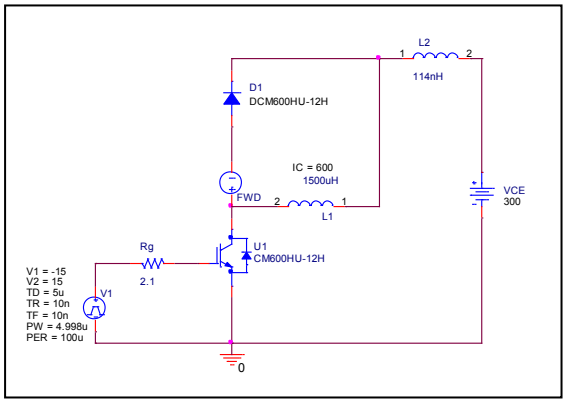
IE(A)	VEC(V)		%Error
	Measurement	Simulation	
60	1.020	1.025	0.52
100	1.130	1.142	1.05
200	1.360	1.353	-0.51
500	1.820	1.809	-0.60
1000	2.430	2.437	0.29

Reverse Recovery Characteristics

Circuit Simulation result



Evaluation circuit



Test condition: V_{CC}=300 (V), I_C=600(A) ,V_{GE}=±15(V)

Parameter	Unit	Measurement	Simulation	Error(%)
trr	nsec	100	48.241	-51.76
Irr	A	30	30.17	0.57