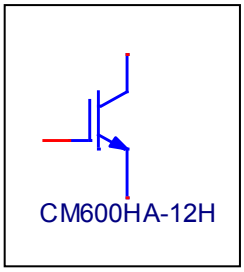
Device Modeling Report

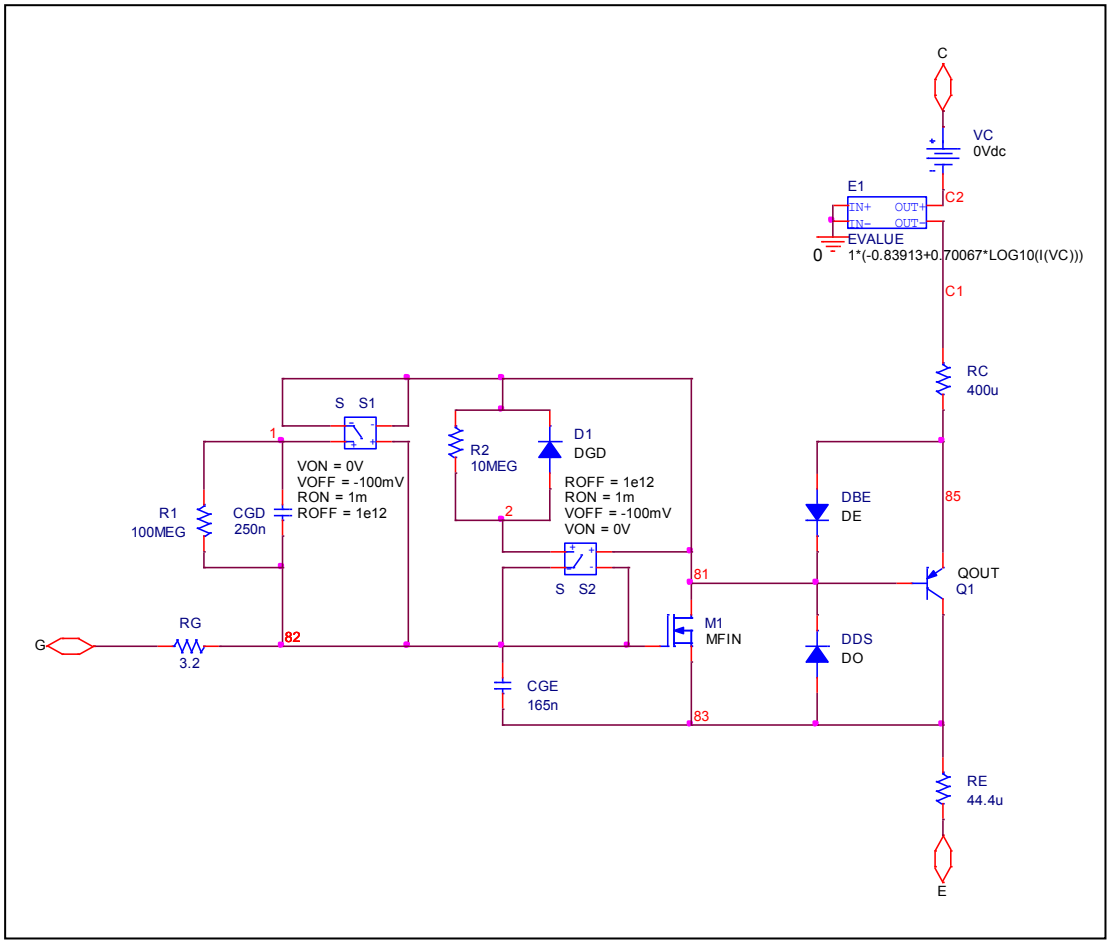
COMPONENTS: Insulated Gate Bipolar Transistor (IGBT)
PART NUMBER: CM600HA-12H
MANUFACTURER: MITSUBISHI
*REMARK: Free-Wheeling Diode Professional Model

Bee Technologies Inc.

Circuit Configuration

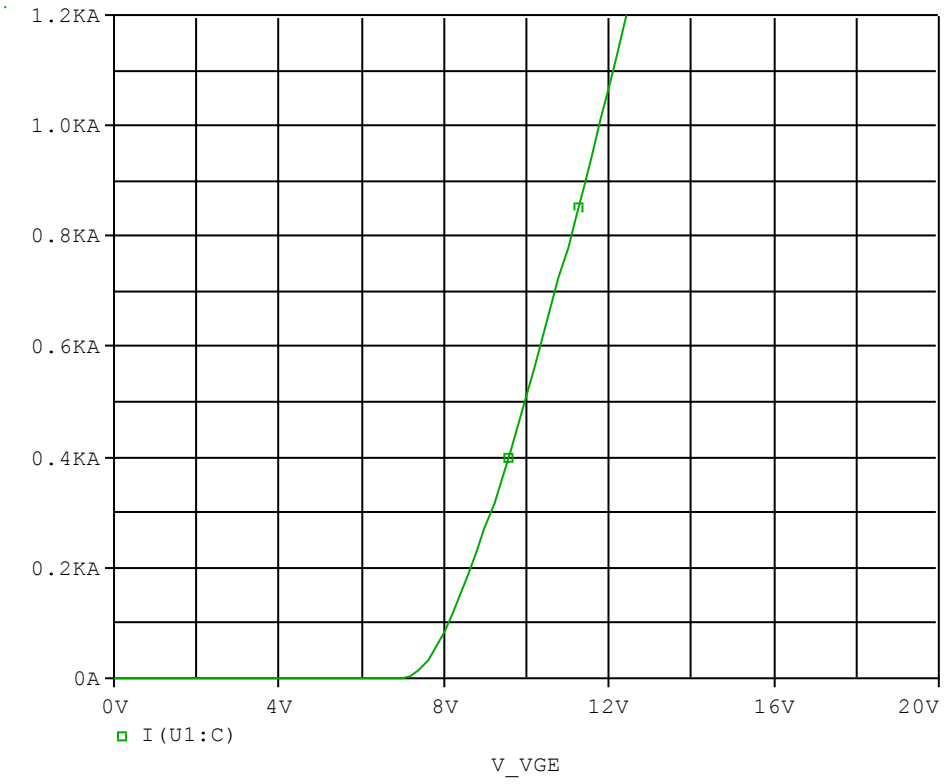


IGBT Subcircuit

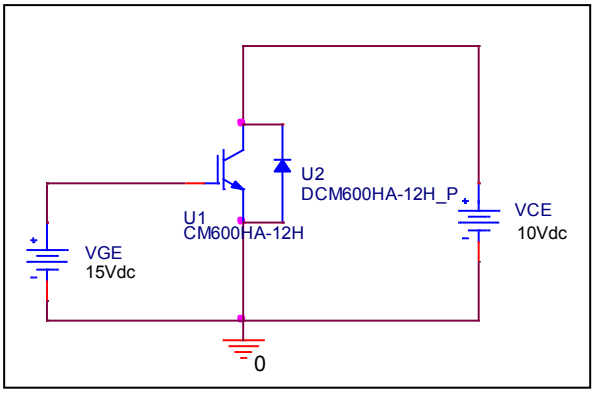


Transfer Characteristics

Circuit Simulation result

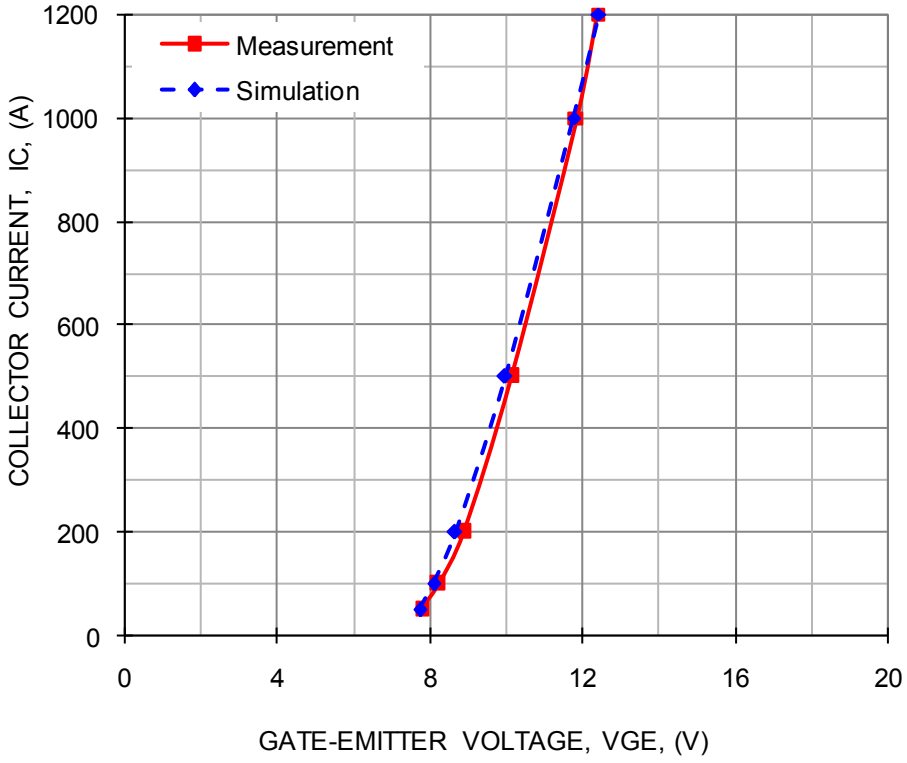


Evaluation circuit



Comparison Graph

Circuit Simulation Result



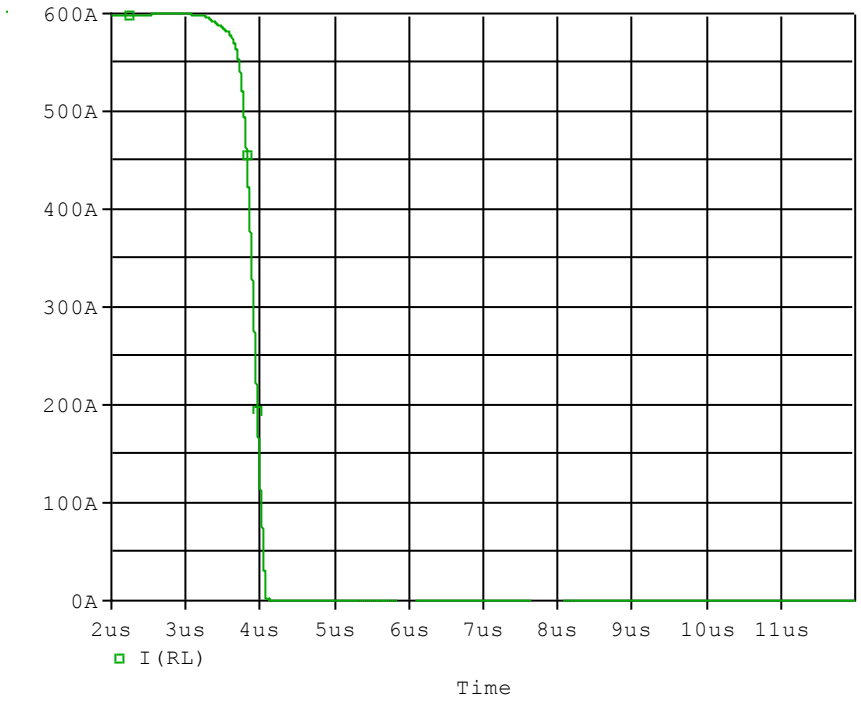
Simulation Result

Test condition: V_{CE} = 10 V

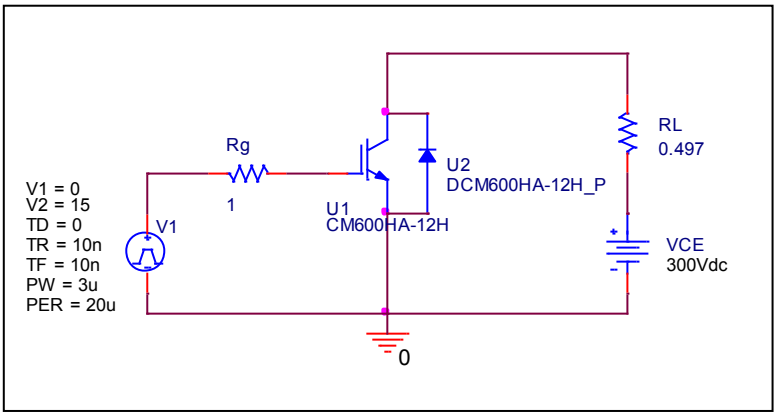
IC (A)	VGE (V)		Error (%)
	Measurement	Simulation	
50	7.800	7.743	-0.73
100	8.250	8.100	-1.81
200	8.900	8.658	-2.72
500	10.150	9.958	-1.89
1000	11.850	11.764	-0.73
1200	12.400	12.444	0.35

Fall Time Characteristics

Circuit Simulation result



Evaluation circuit

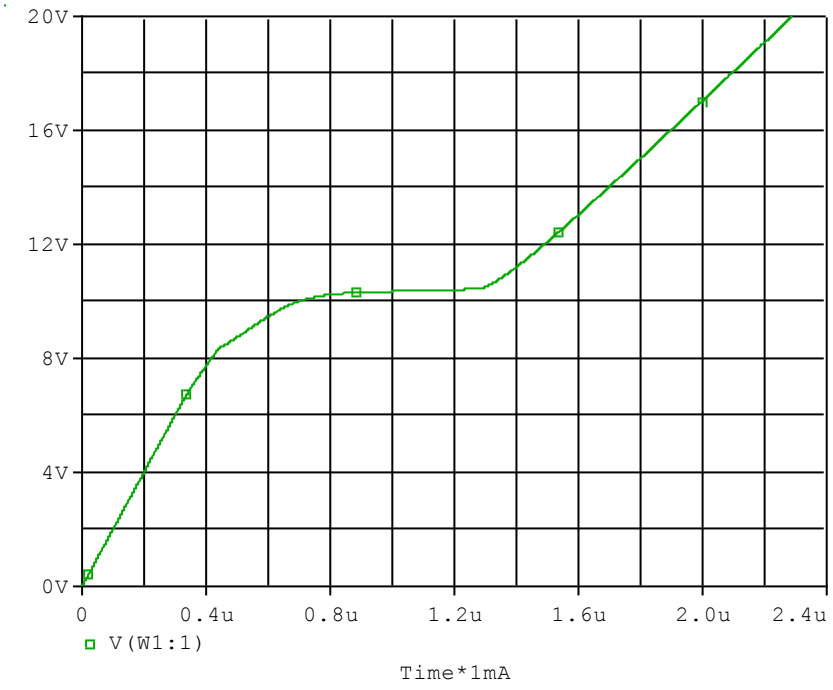


Test condition IC=600 (A), VCC=300(V)

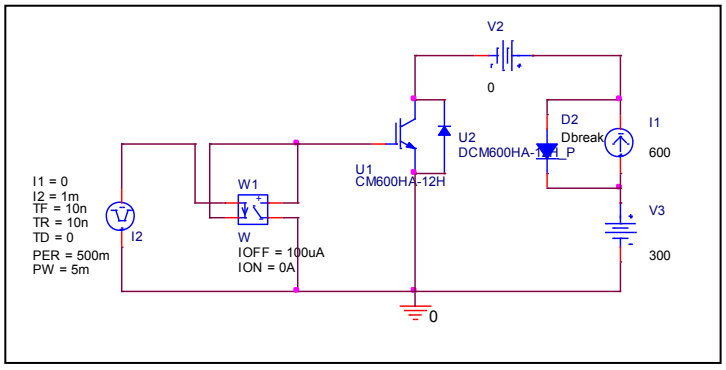
Parameter	Unit	Measurement	Simulation	Error
tf	**ns**	**300.000**	**303.381**	**1.127**

Gate Charge Characteristics

Circuit Simulation result



Evaluation circuit

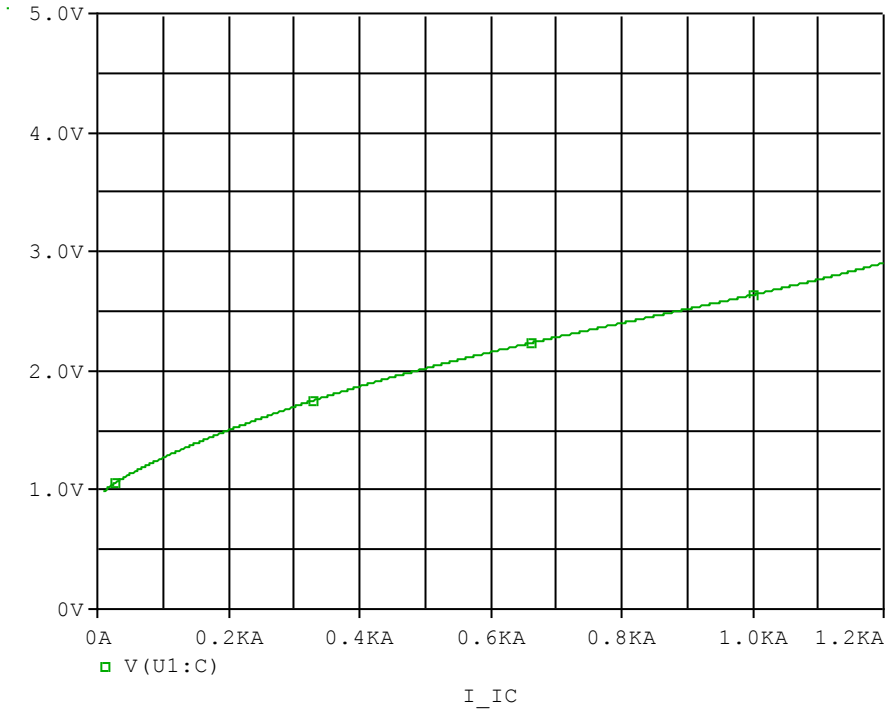


Test condition: V_{CC}=300 (V), I_C=600(A) ,V_{GE}=15(V)

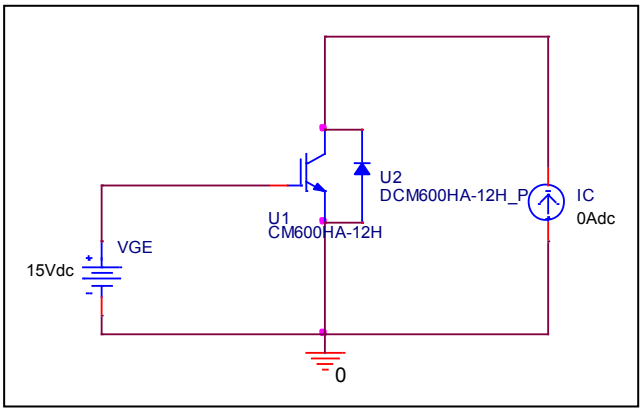
Parameter	Unit	Measurement	Simulation	Error(%)
Qge	nc	400.000	400.216	0.054
Qgc	nc	950.000	918.653	-3.300
Qg	nc	1800.000	1799.300	-0.039

Saturation Characteristics

Circuit Simulation result

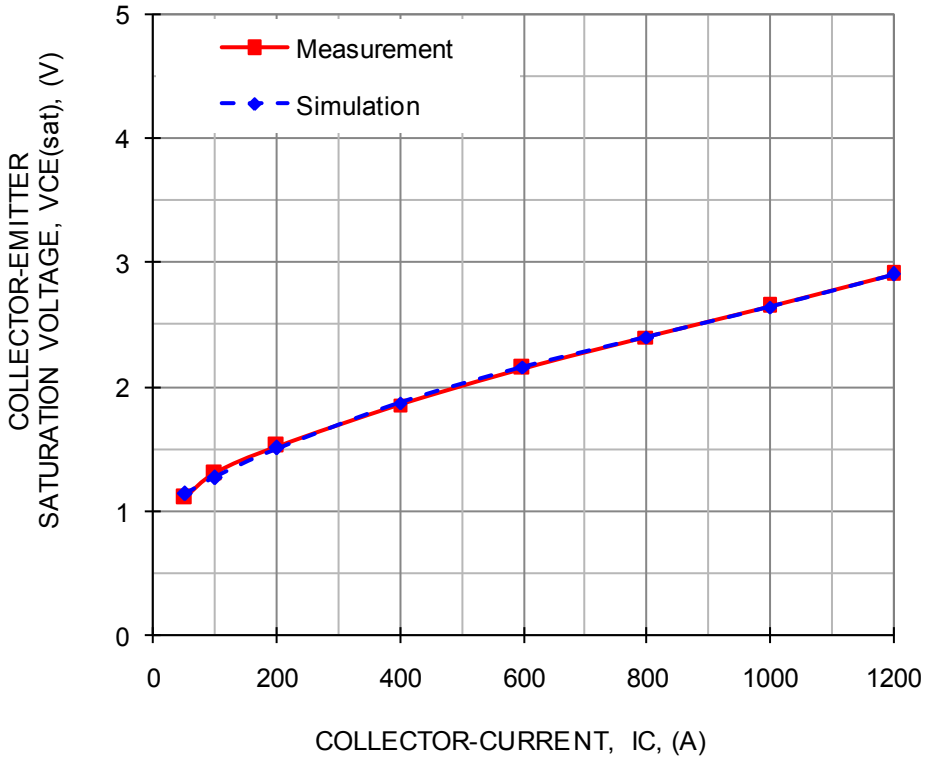


Evaluation circuit



Comparison Graph

Circuit Simulation Result



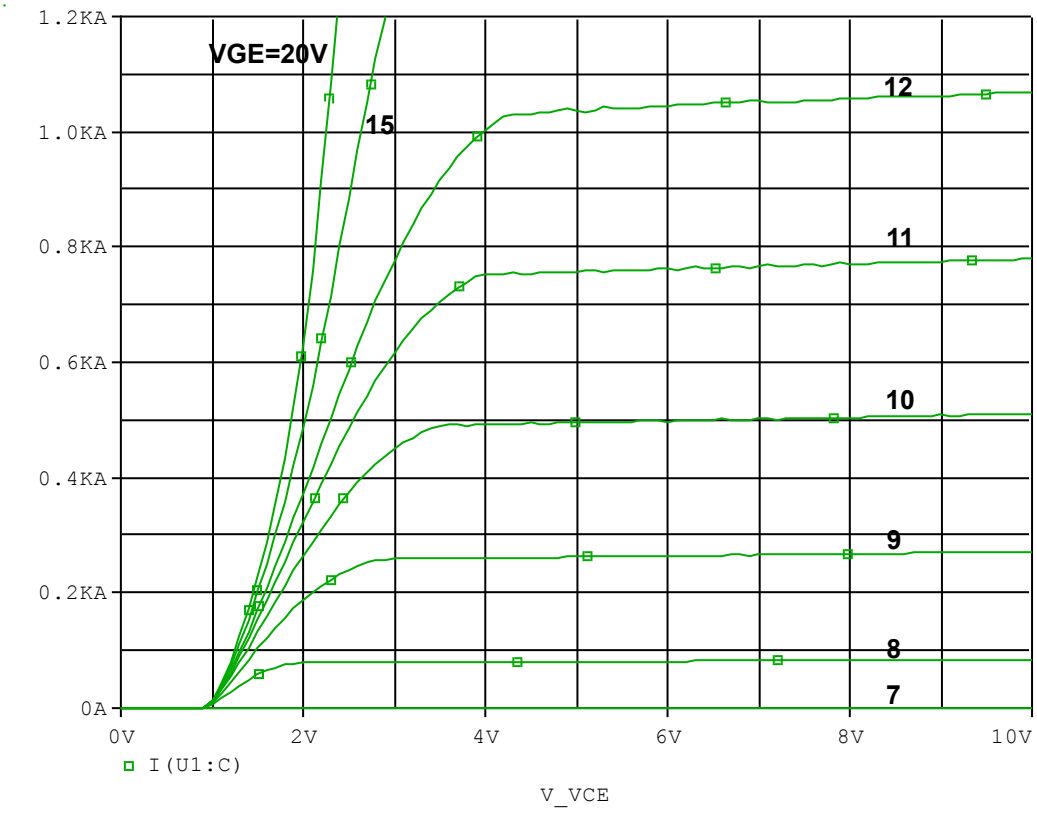
Simulation Result

Test condition: V_{GE} = 15 V

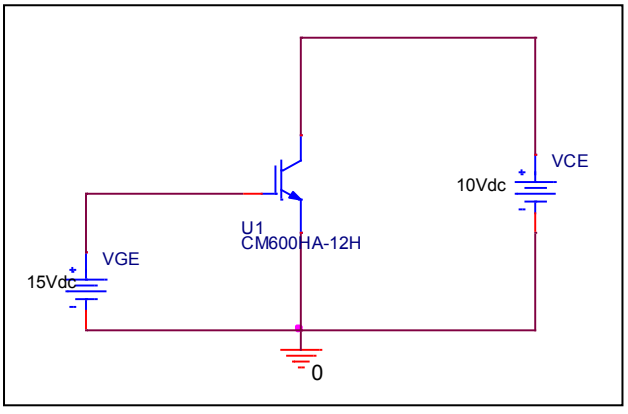
Ic(A)	VCE (V)		Error (%)
	Measurement	Simulation	
50	1.100	1.132	2.95
100	1.300	1.270	-2.35
200	1.520	1.501	-1.27
400	1.850	1.869	1.00
600	2.150	2.156	0.27
800	2.400	2.400	0.01
1000	2.650	2.637	-0.48

Output Characteristics

Circuit Simulation result

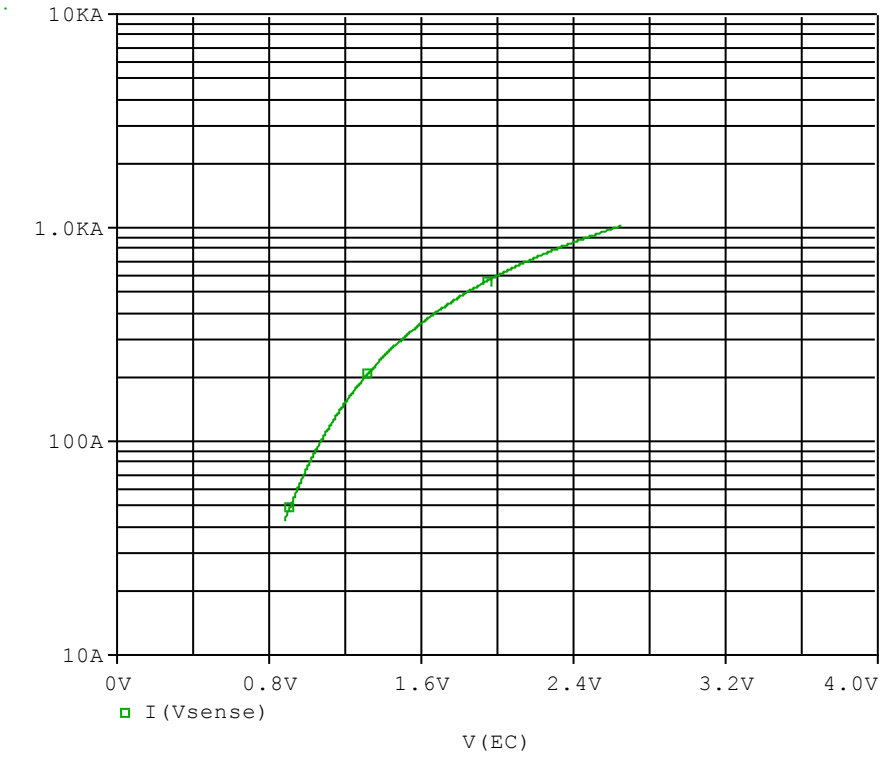


Evaluation circuit

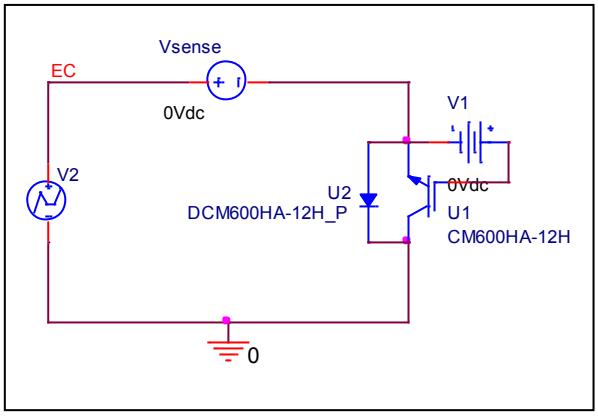


Forward Current Characteristic

Circuit Simulation Result

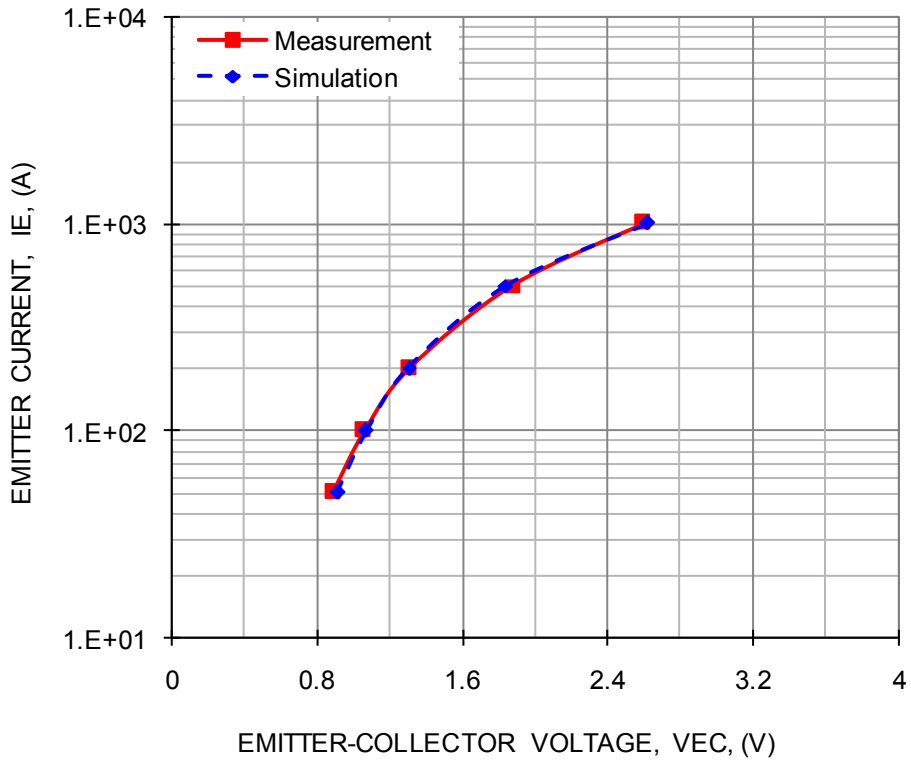


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

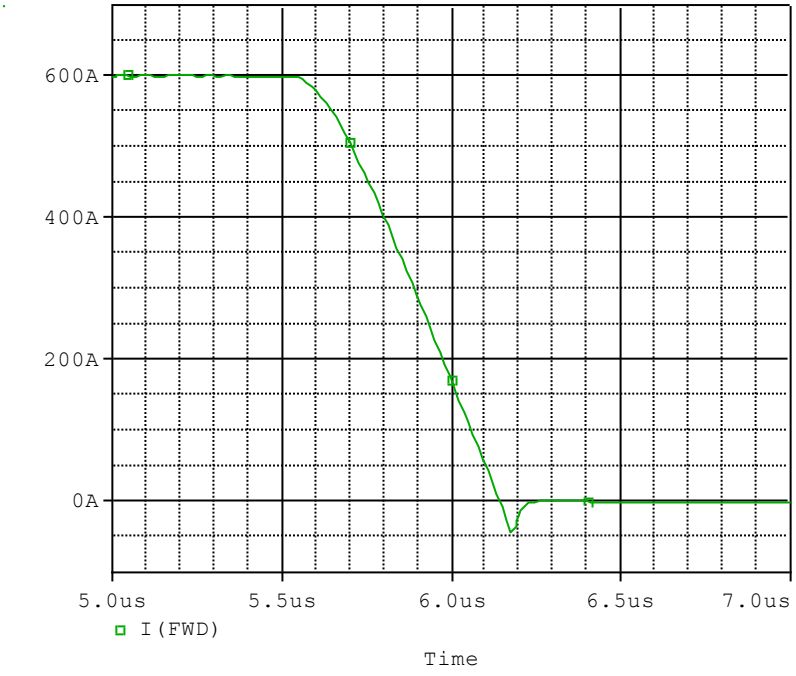


Simulation Result

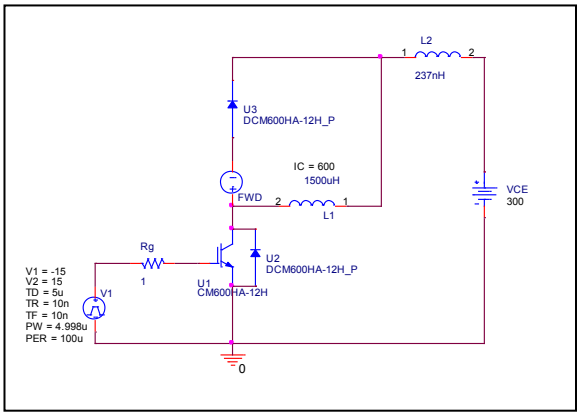
IE(A)	VEC(V)		%Error
	Measurement	Simulation	
50	0.890	0.912	2.53
100	1.060	1.072	1.13
200	1.310	1.305	-0.40
500	1.880	1.843	-1.99
1000	2.600	2.621	0.80

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	41.000	42.379	3.36
Irr	A	80.000	80.800	1.00