Device Modeling Report

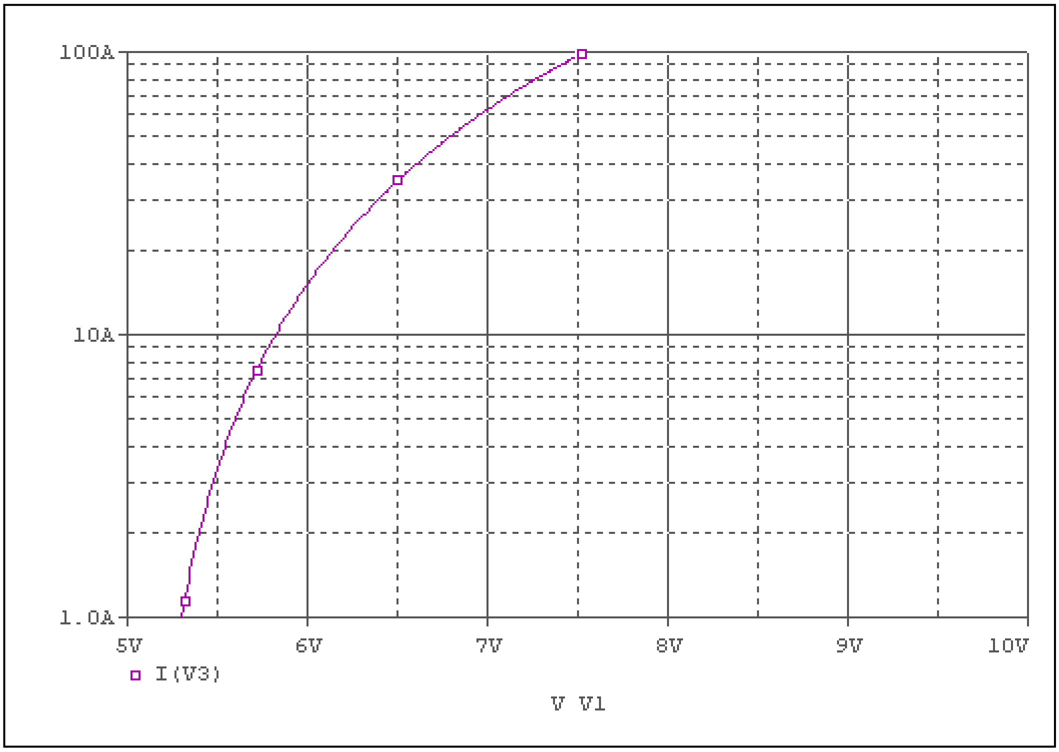
COMPONENTS: Insulated Gate Bipolar Transistor (IGBT)
PART NUMBER: IRG4PF50W
MANUFACTURER: International Rectifier

Bee Technologies Inc.

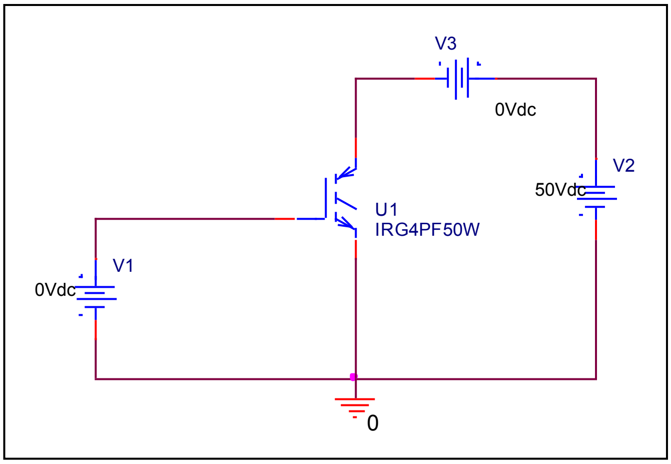
Pspice model parameter	Model description
TAU	Ambipolar Recombination Lifetime
KP	MOS Transconductance
AREA	Area of the Device
AGD	Gate-Drain Overlap Area
WB	Metallurgical Base Width
VT	Threshold Voltage
KF	Triode Region Factor
CGS	Gate-Source Capacitance per Unit Area
COXD	Gate-Drain Oxide Capacitance per Unit Area
VTD	Gate-Drain Overlap Depletion Threshold

Transfer Characteristics

Circuit Simulation result

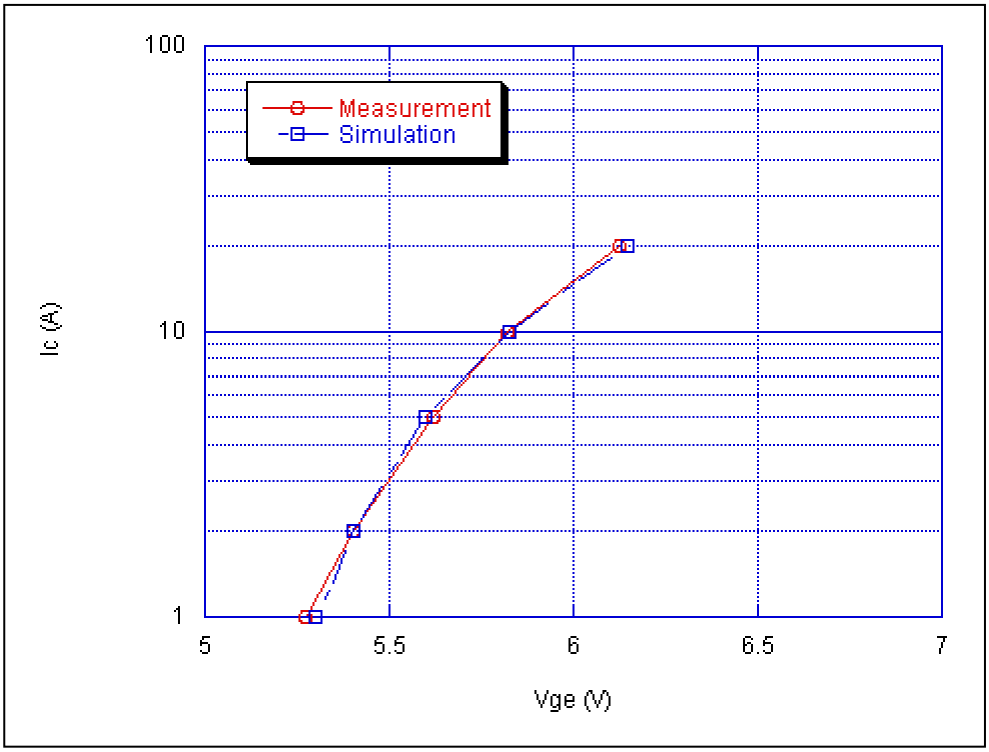


Evaluation circuit



Comparison Graph

Circuit Simulation Result



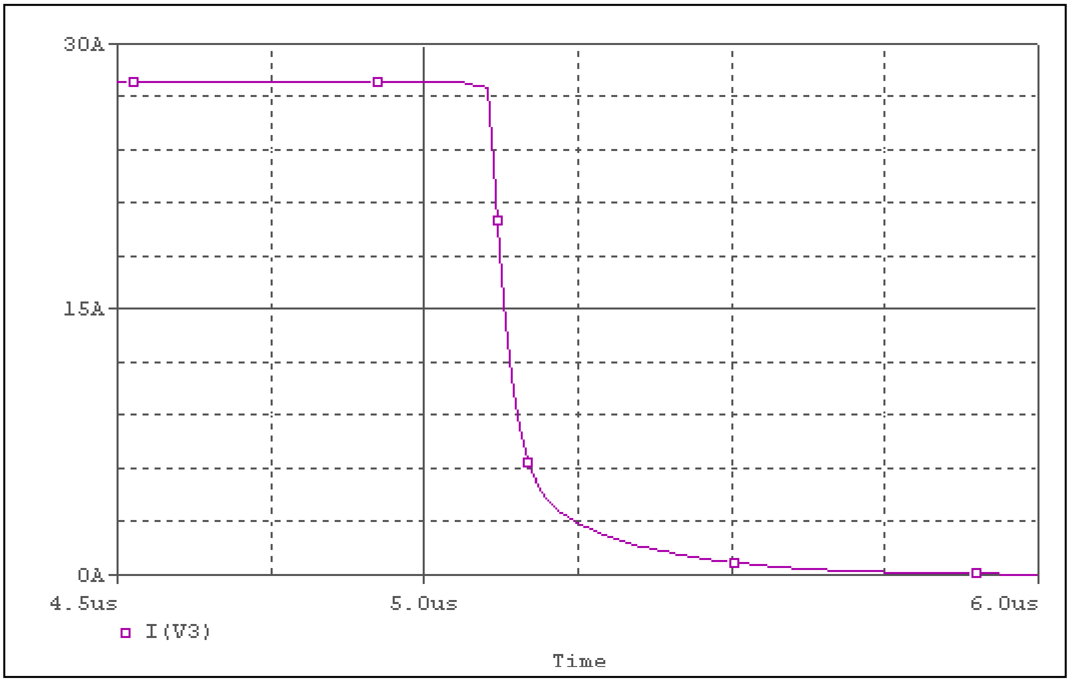
Simulation Result

Test condition : Vce = 50 V

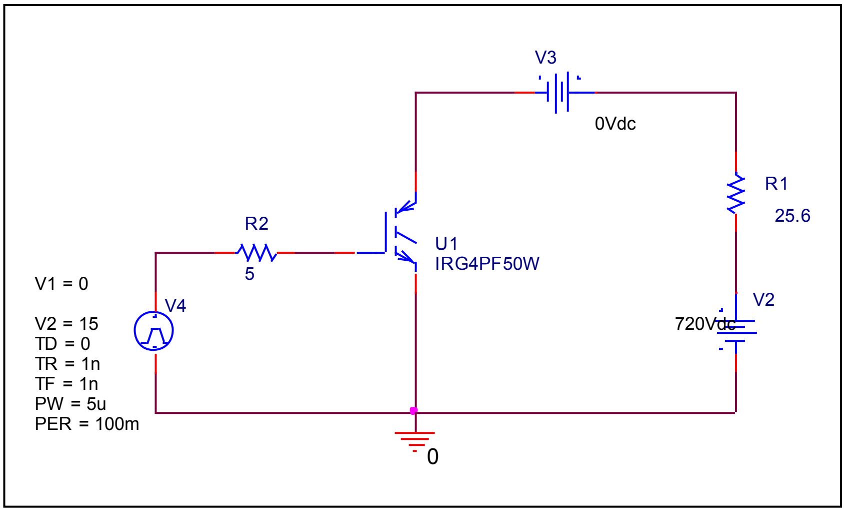
Ic(A)	Vge(V)		Error (%)
	Measurement	Simulation	
1	5.27	5.3026	0.61860
2	5.4	5.4048	0.08889
5	5.62	5.6047	-0.27224
10	5.82	5.8352	0.26117
20	6.123	6.1591	0.58958

Fall Time Characteristics

Circuit Simulation result



Evaluation circuit

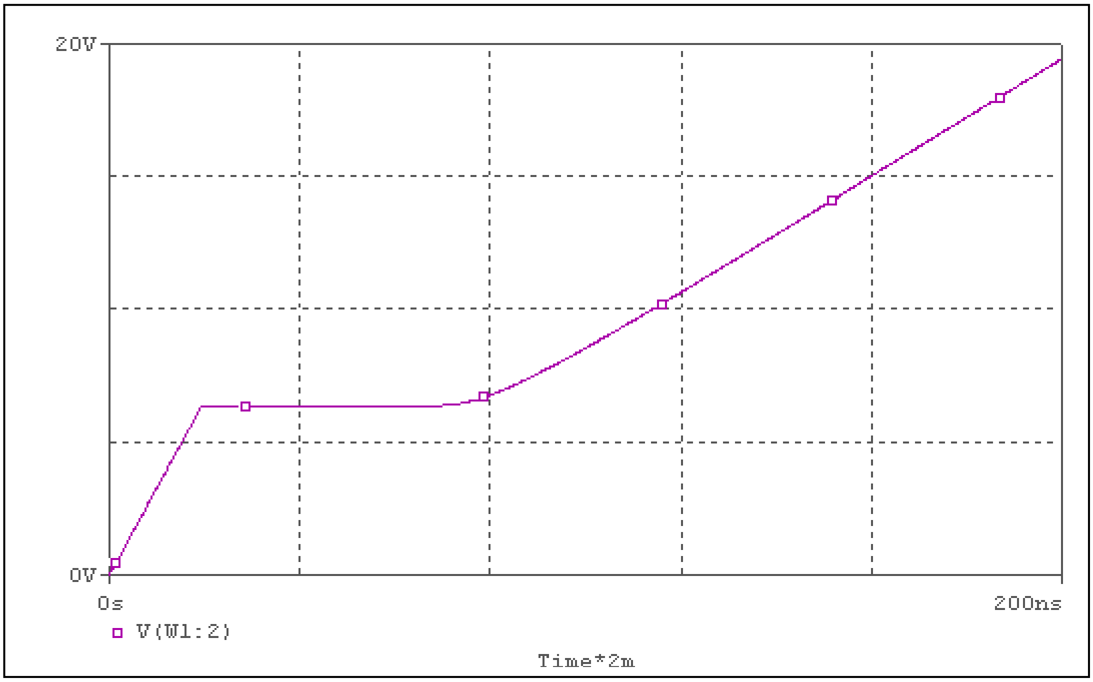


Test condition Ic=28(A) ,Vcc=720(V)

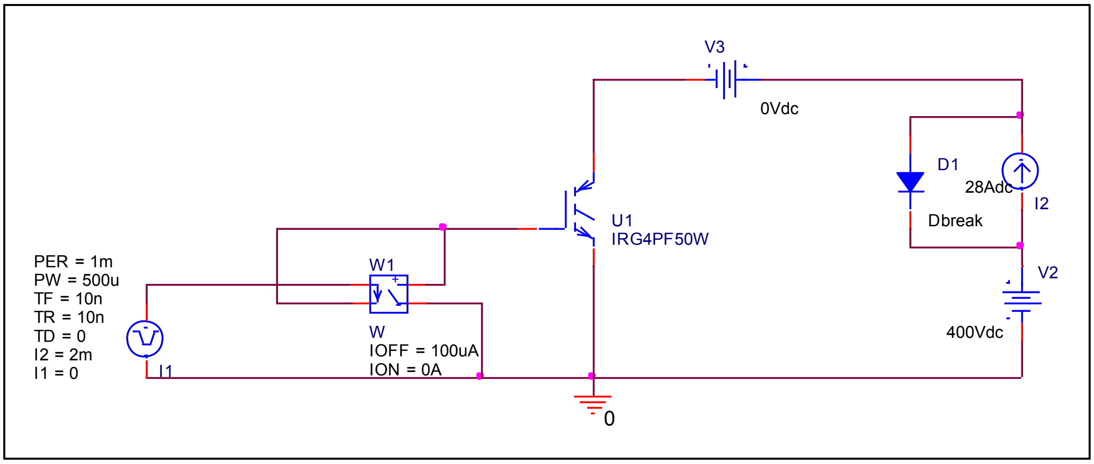
tf	Measurement		Simulation		Error
	150	ns	149.503	ns	-0.33133

Gate Charge Characteristics

Circuit Simulation result



Evaluation circuit

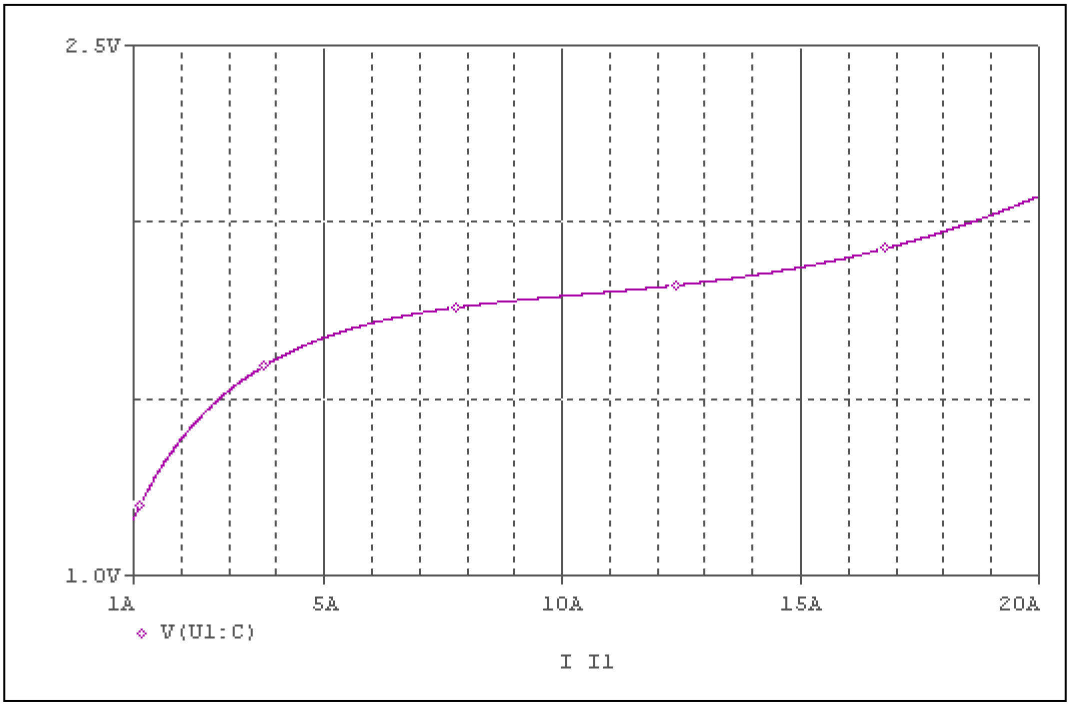


Test condition : Vcc=400(V) ,Ic=28(A) ,Vge=15(V)

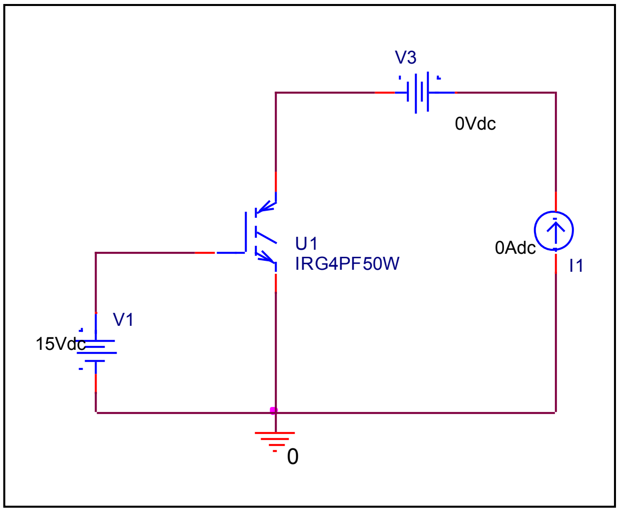
	Measurement		**Simulation**		**Error(%)**
Qge	**19**	**nc**	**19.560**	**nc**	**2.94737**
Qgc	**53**	**nc**	**52.967**	**nc**	**-0.06226**
Qg	**160**	**nc**	**159.780**	**nc**	**-0.13750**

Saturation Characteristics

Circuit Simulation result

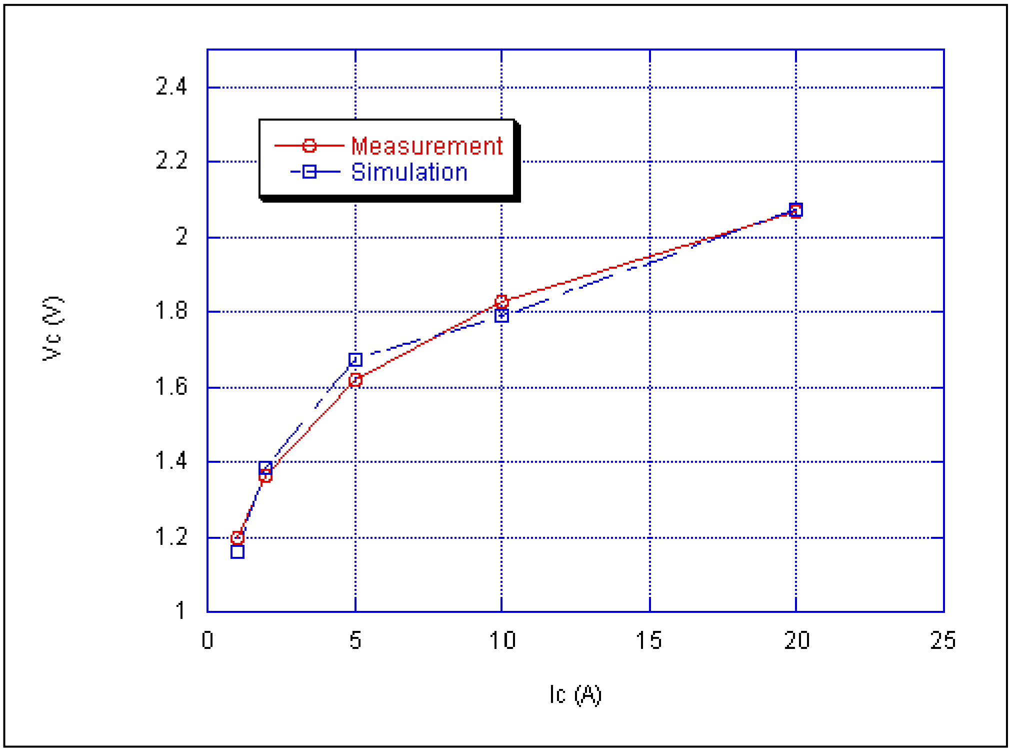


Evaluation circuit



Comparison Graph

Circuit Simulation Result



Simulation Result

Ic(A)	Vce(sat)(V)		Error (%)
	Measurement	Simulation	
1	1.2	1.1583	-3.47500
2	1.3636	1.3856	1.61338
5	1.62	1.6729	3.26543
10	1.83	1.7903	-2.16940
20	2.07	2.0738	0.18357