

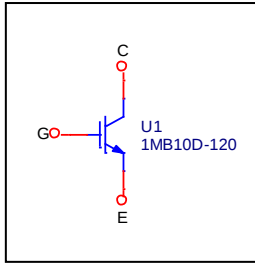
Device Modeling Report

COMPONENTS: Insulated Gate Bipolar Transistor (IGBT)
PART NUMBER: 1MB10D-120
MANUFACTURER: FUJI ELECTRIC
*REMARK: Free-Wheeling Diode Professional Model



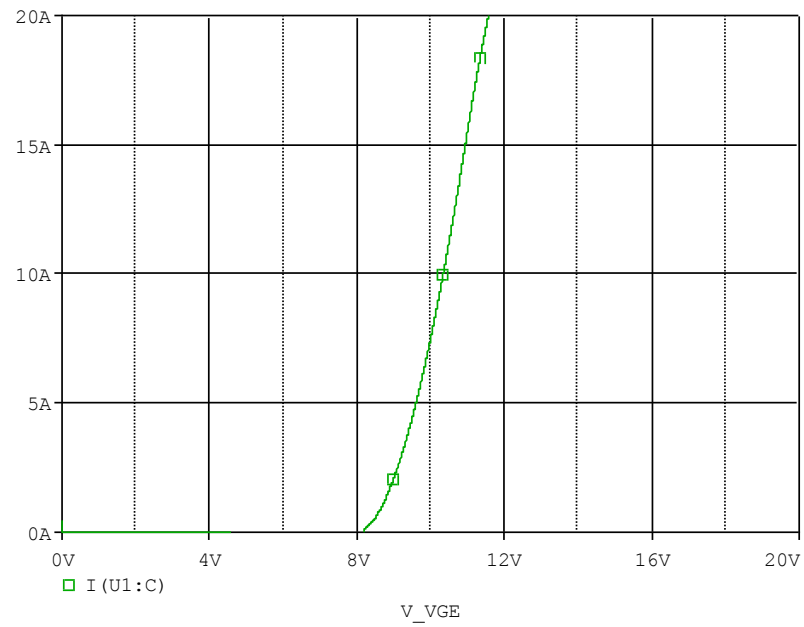
Bee Technologies Inc.

Circuit Configuration

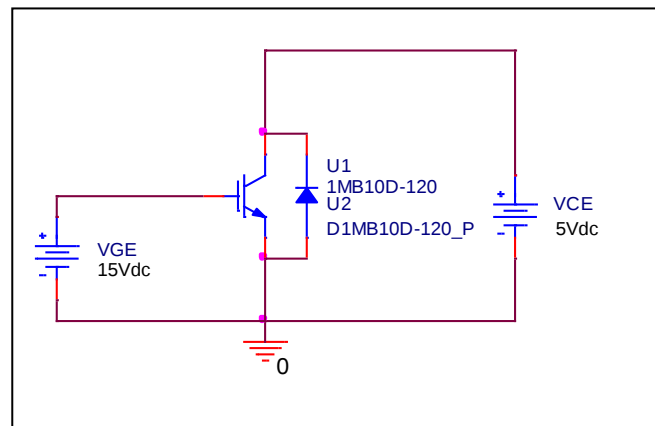


Transfer Characteristics

Circuit Simulation result

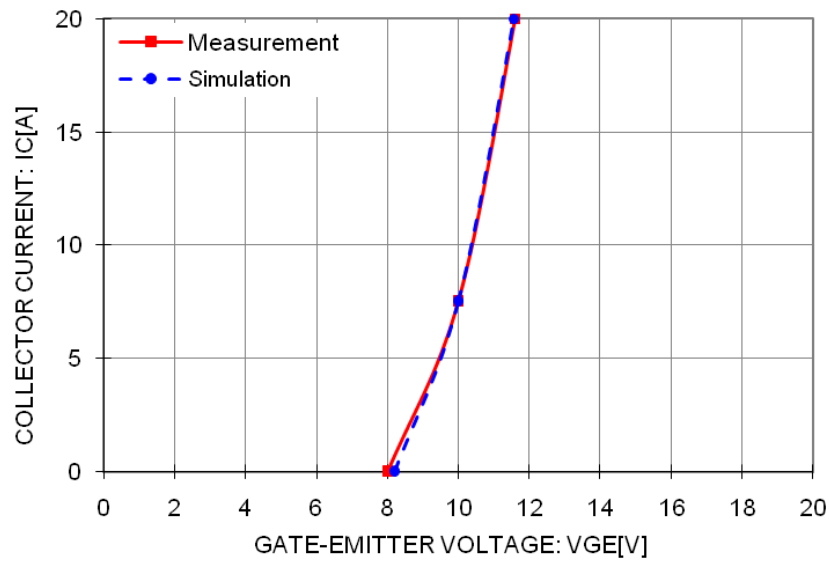


Evaluation circuit



Comparison Graph

Simulation result



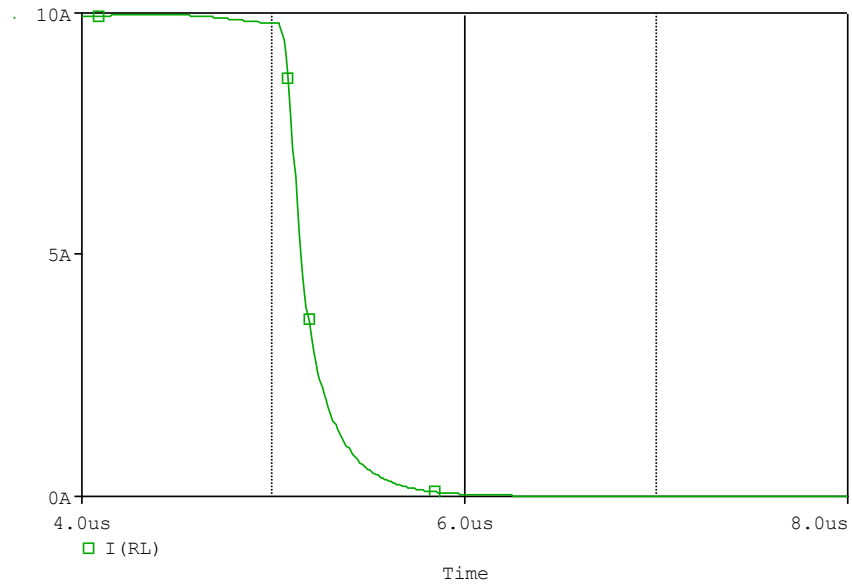
Comparison table

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

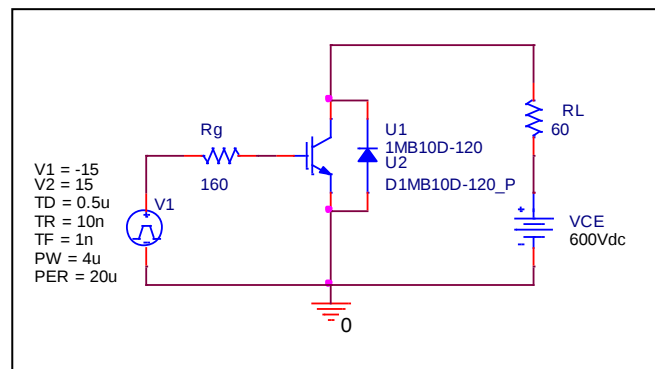
IC (A)	VGE (V)		%Error
	Measurement	Simulation	
0.000	8.000	8.194	2.43
7.500	10.000	10.000	0.00
20.000	11.600	11.567	-0.28

Fall Time Characteristics

Circuit Simulation result



Evaluation circuit

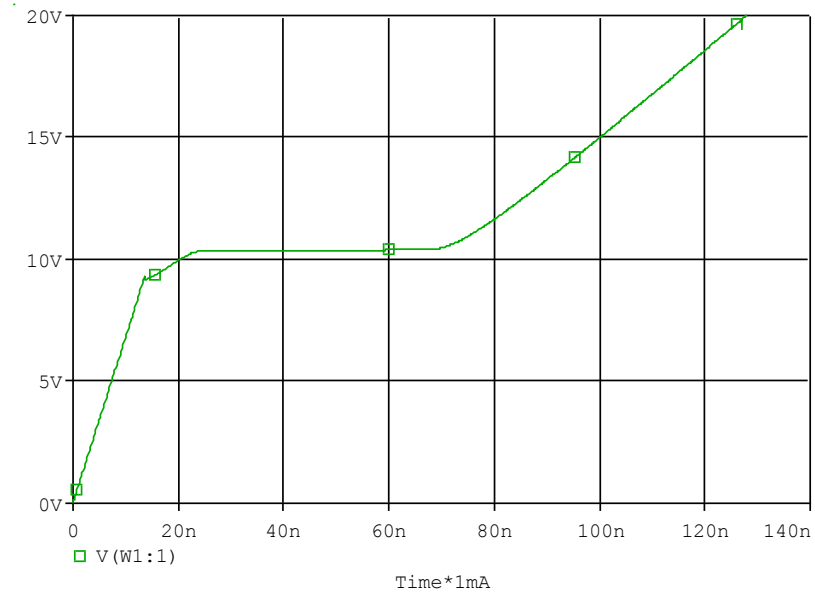


Test condition: $I_C=10$ (A), $V_{CC}=600$ (V)

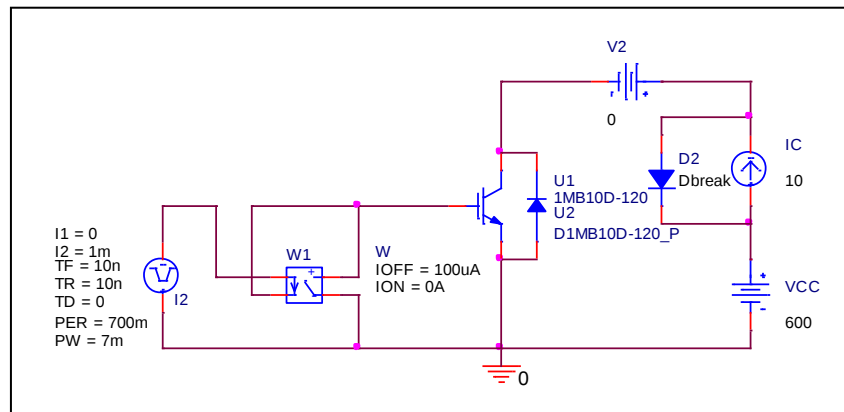
Parameter	Unit	Measurement	Simulation	%Error
t_f	us	0.320	0.323	0.94

Gate Charge Characteristics

Circuit Simulation result



Evaluation circuit

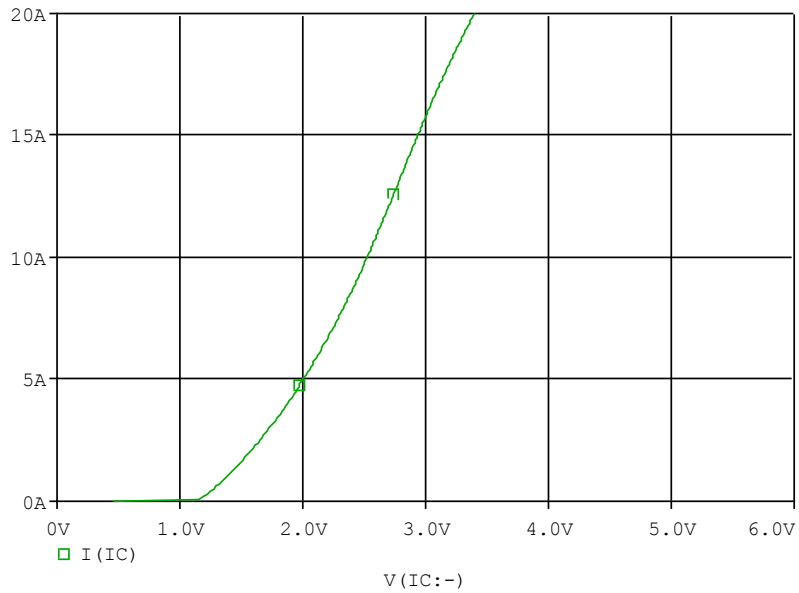


Test condition: $V_{CC}=600$ (V), $I_C=10$ (A), $V_{GE}=15$ (V)

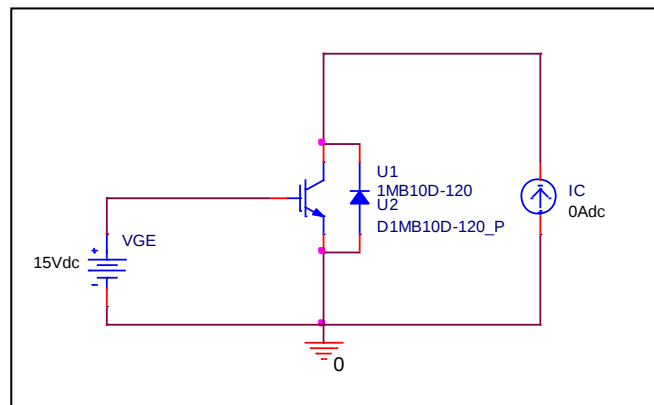
Parameter	Unit	Measurement	Simulation	%Error
Qge	nc	18.000	18.293	1.63
Qgc	nc	53.000	51.707	-2.44
Qg	nc	100.000	100.006	0.01

Saturation Characteristics

Circuit Simulation result

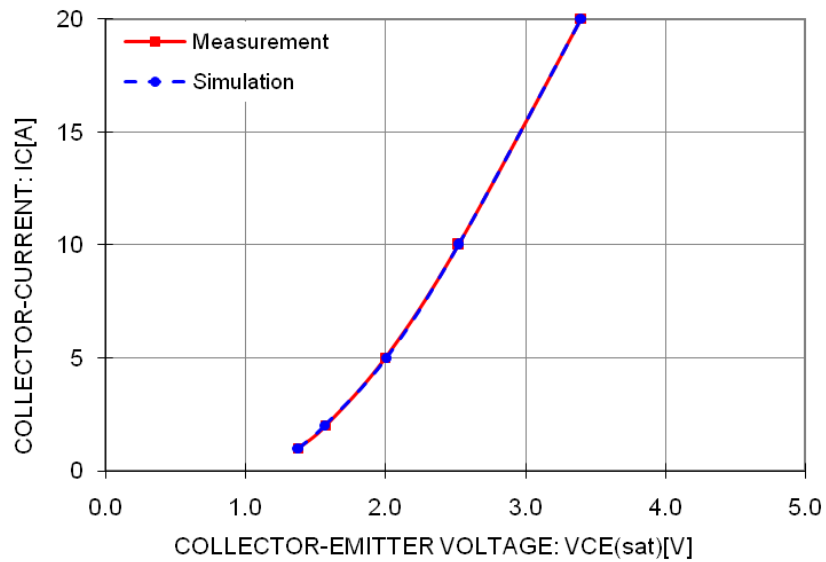


Evaluation circuit



Comparison Graph

Simulation result



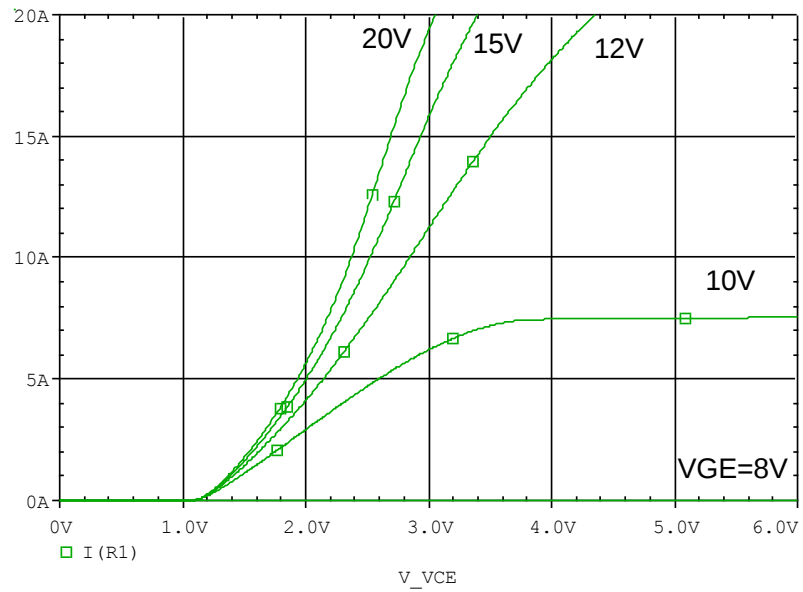
Comparison table

Test condition: VGE =15 (V)

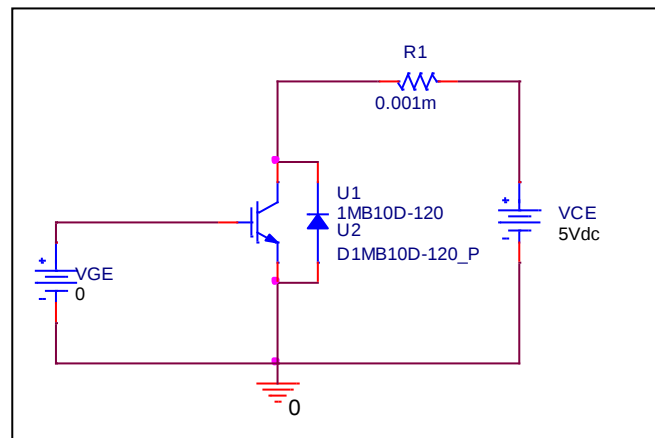
Ic(A)	VCE (V)		%Error
	Measurement	Simulation	
1	1.375	1.381	0.44
2	1.575	1.566	-0.60
5	2.000	2.005	0.23
10	2.525	2.524	-0.04
20	3.400	3.400	0.00

Output Characteristics

Circuit Simulation result

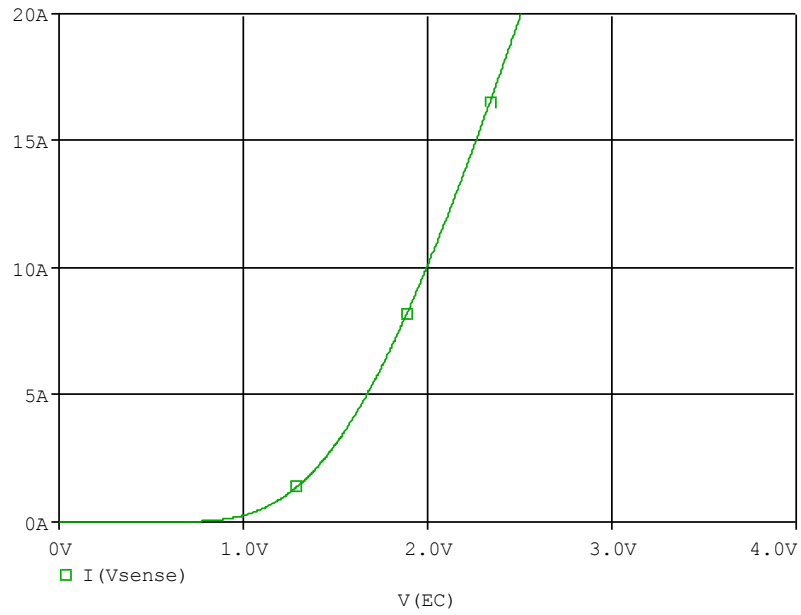


Evaluation circuit

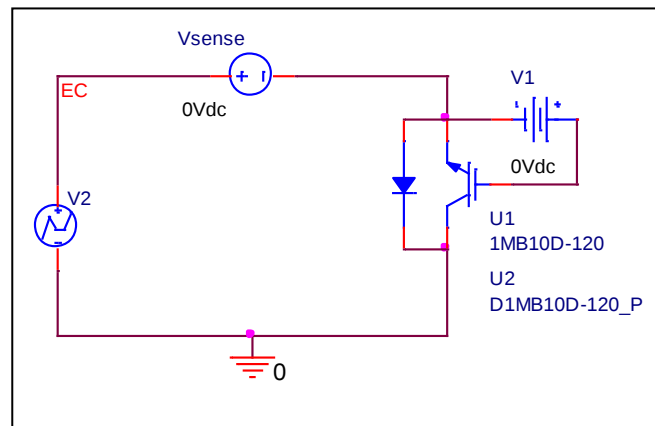


FWD Forward Current Characteristics

Circuit Simulation result

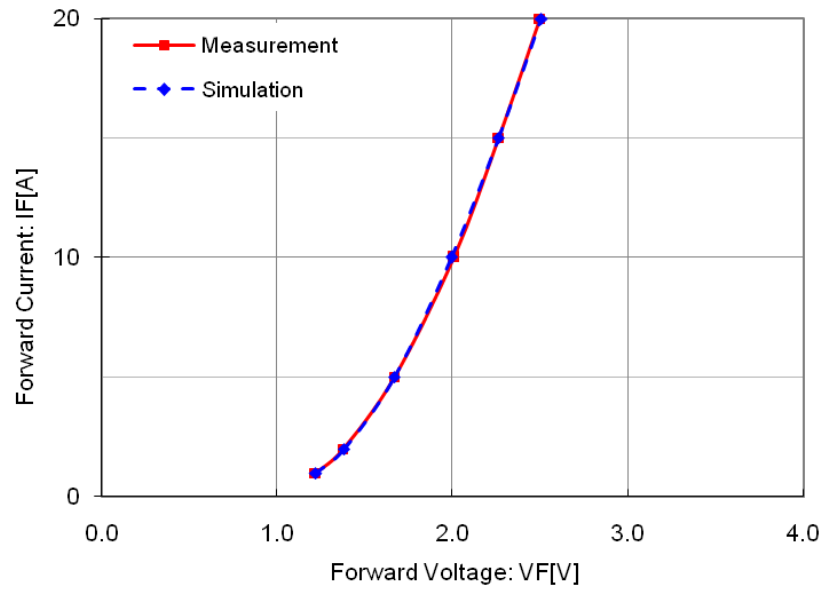


Evaluation circuit



Comparison Graph

Simulation result

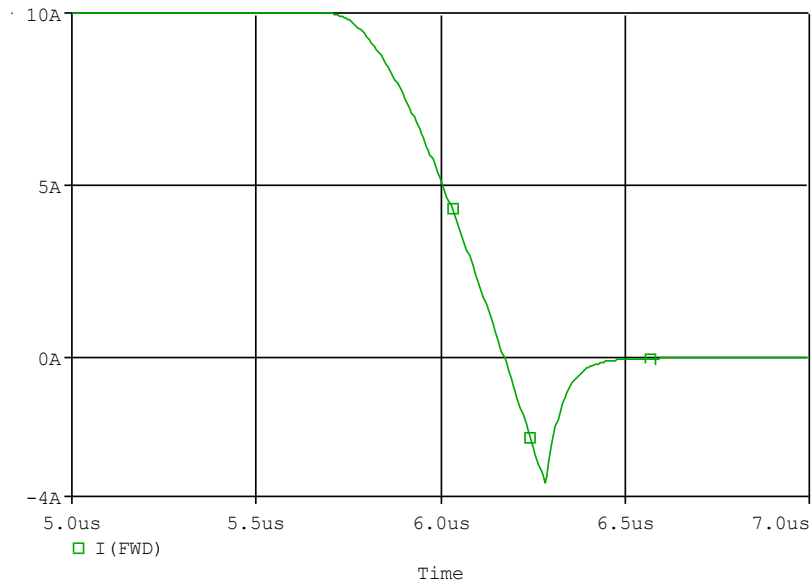


Comparison table

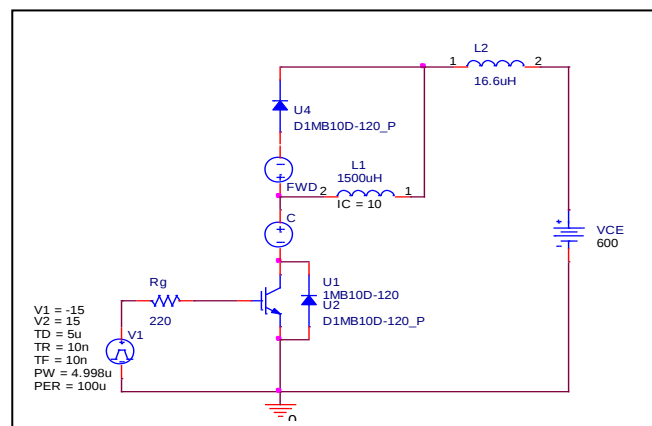
IF(A)	VF (V)		%Error
	Measurement	Simulation	
1	1.220	1.221	0.07
2	1.375	1.381	0.41
5	1.670	1.669	-0.05
10	2.010	1.993	-0.83
15	2.265	2.262	-0.13
20	2.500	2.507	0.27

Reverse Recovery Characteristics

Circuit Simulation result



Evaluation circuit



Test condition: $V_{CC}=600$ (V), $I_C=10$ (A), $-di/dt=30$ (A/ μs)

Parameter	Unit	Measurement	Simulation	%Error
trr	nsec	210.000	215.354	2.55
Irr	A	3.500	3.605	3.00