

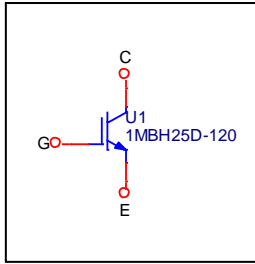
# Device Modeling Report

COMPONENTS: Insulated Gate Bipolar Transistor (IGBT)  
PART NUMBER: 1MBH25D-120  
MANUFACTURER: Fuji Electric  
\* REMARK: Free-Wheeling Diode Special Model



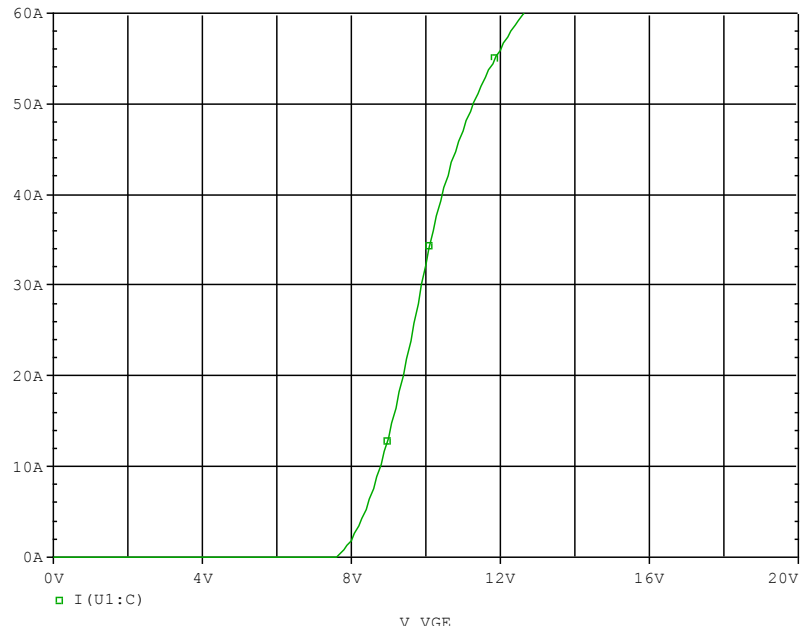
**Bee Technologies Inc.**

## Circuit Configuration

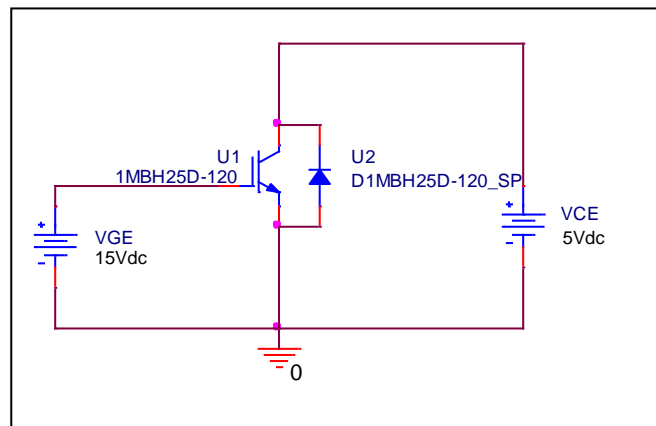


# Transfer Characteristics

## Circuit Simulation result

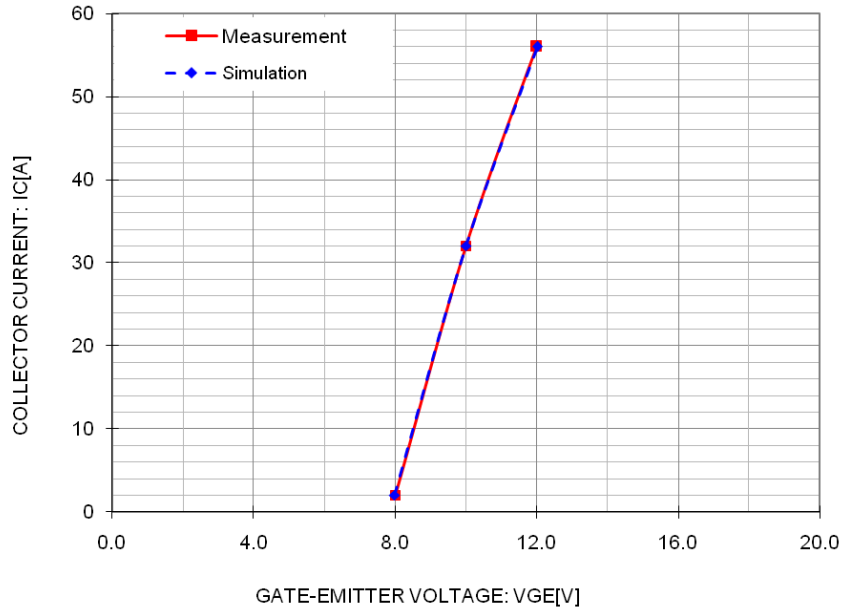


## Evaluation circuit



# Comparison Graph

## Simulation result



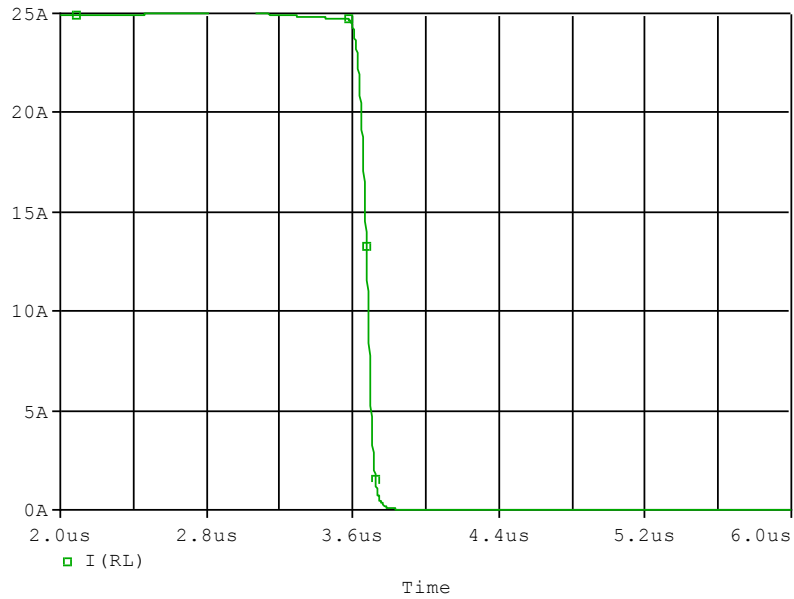
## Comparison table

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

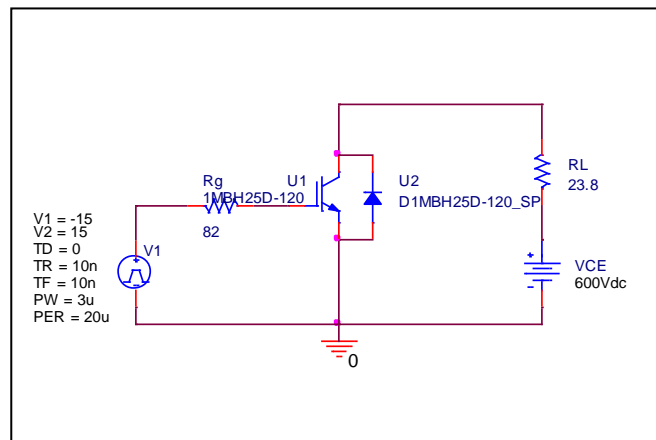
IC (A)	VGE (V)		%Error
	Measurement	Simulation	
2.000	8.000	8.018	0.23
32.000	10.000	9.994	-0.06
56.000	12.000	12.004	0.03

# Fall Time Characteristics

## Circuit Simulation result



## Evaluation circuit

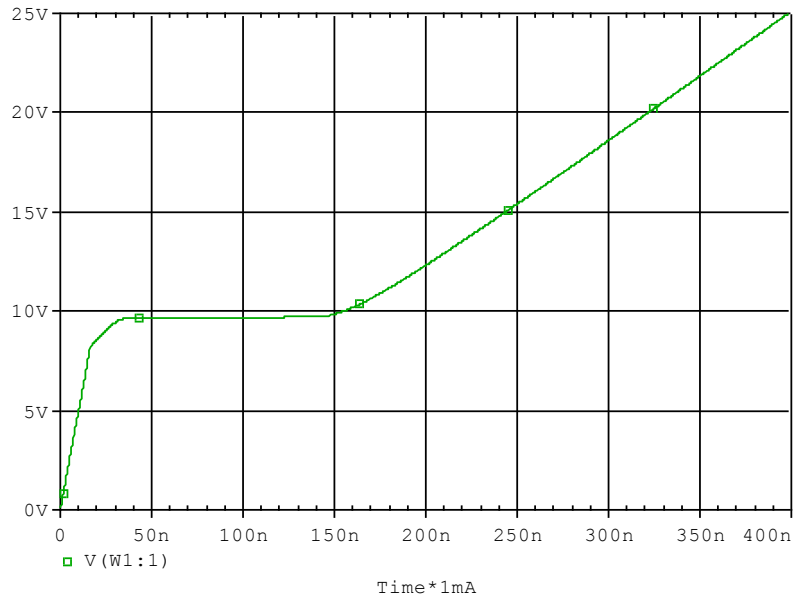


Test condition:  $I_C=25$  (A),  $V_{CC}=600$  (V)

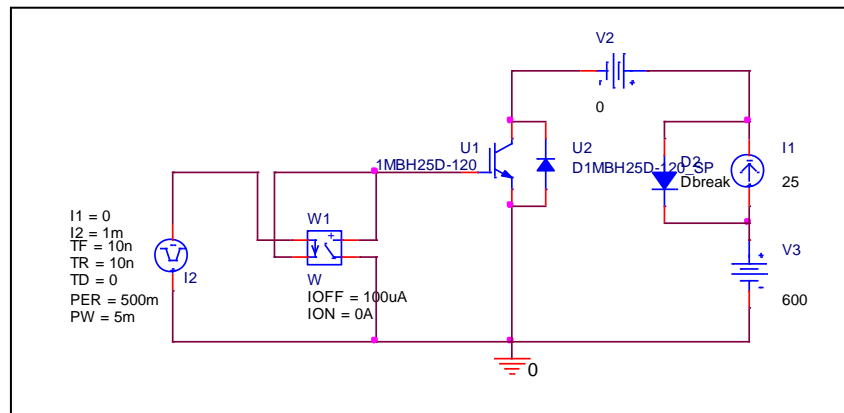
Parameter	Unit	Measurement	Simulation	%Error
tf	us	0.086	0.087	1.500

# Gate Charge Characteristics

## Circuit Simulation result



## Evaluation circuit

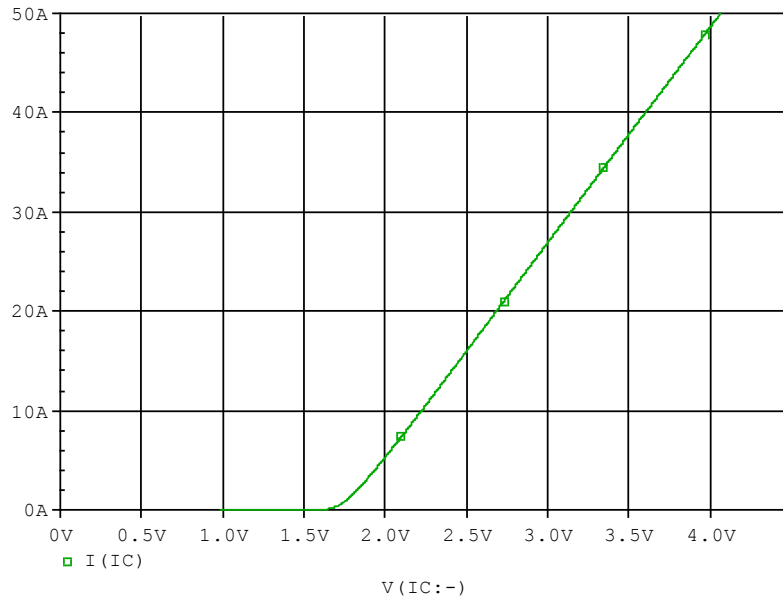


Test condition:  $V_{CC}=600$  (V),  $I_C=25$  (A),  $V_{GE}=15$  (V)

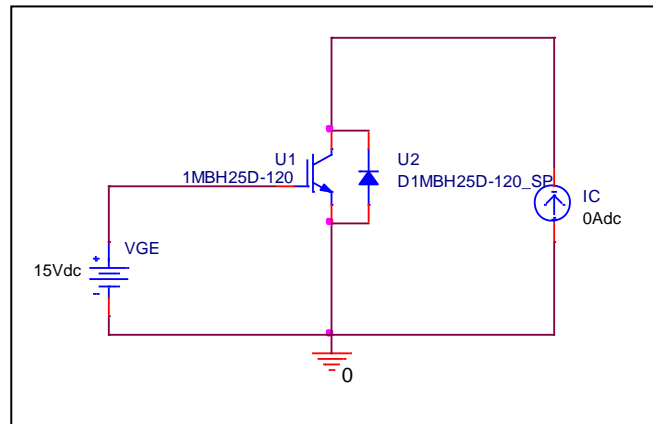
Parameter	Unit	Measurement	Simulation	%Error
<b>Q<sub>ge</sub></b>	<b>nc</b>	<b>25.000</b>	<b>25.044</b>	<b>0.176</b>
<b>Q<sub>gc</sub></b>	<b>nc</b>	<b>135.000</b>	<b>132.870</b>	<b>-1.578</b>
<b>Q<sub>g</sub></b>	<b>nc</b>	<b>240.000</b>	<b>243.659</b>	<b>1.525</b>

# Saturation Characteristics

## Circuit Simulation result

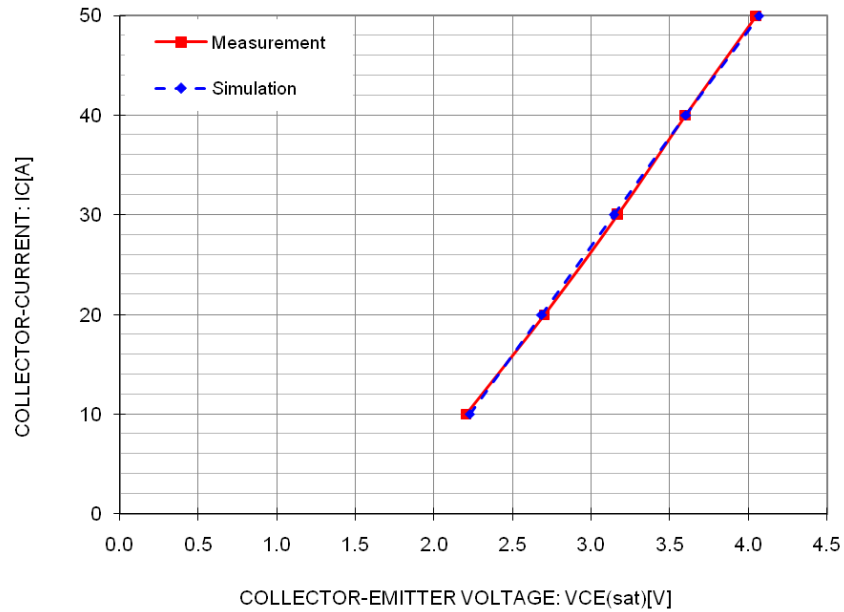


## Evaluation circuit



## Comparison Graph

### Simulation result



### Comparison table

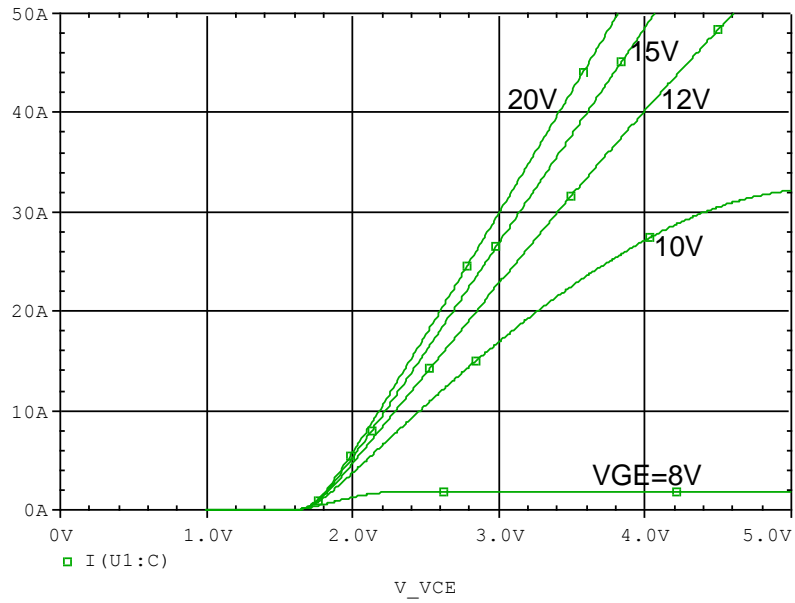
Test condition:  $V_{GE} = 15$  (V)

Ic(A)	VCE (V)		%Error
	Measurement	Simulation	
10.0	2.200	2.225	1.12
20.0	2.700	2.685	-0.55
30.0	3.170	3.142	-0.87
40.0	3.600	3.602	0.05
50.0	4.050	4.066	0.40

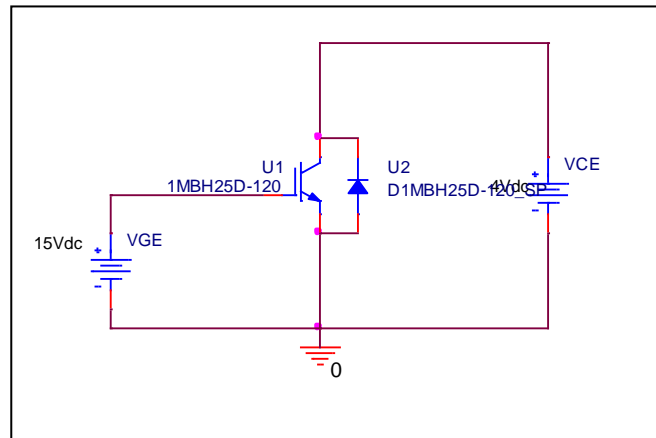


# Output Characteristics

## Circuit Simulation result

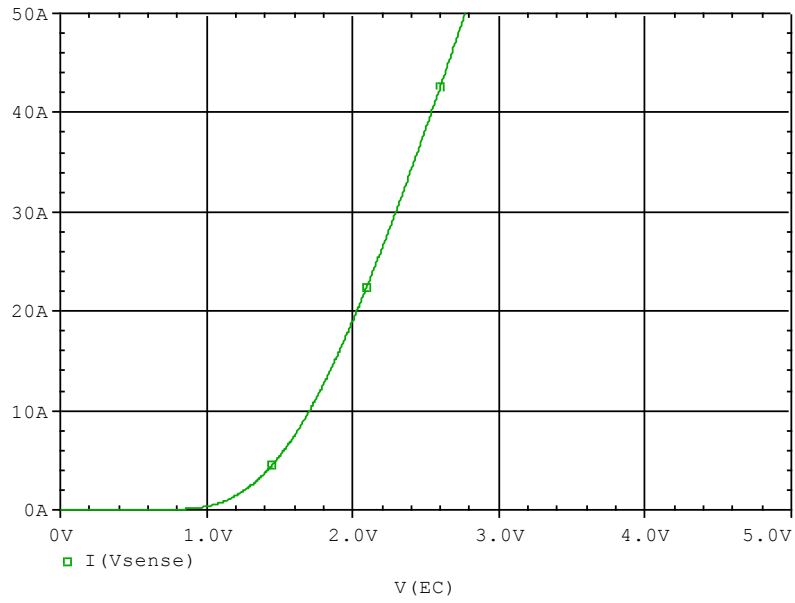


## Evaluation circuit

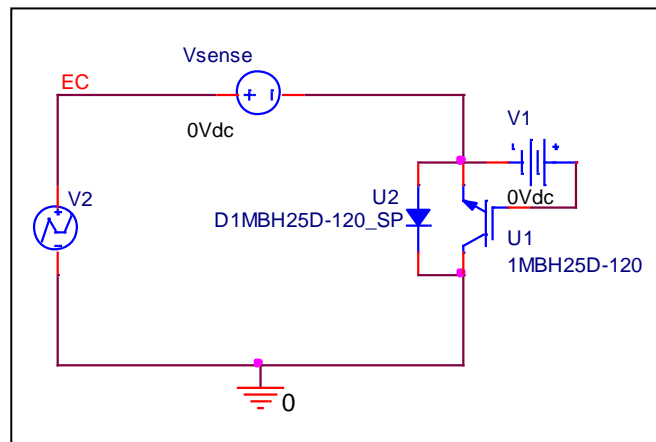


# FWD Forward Current Characteristics

## Circuit Simulation result

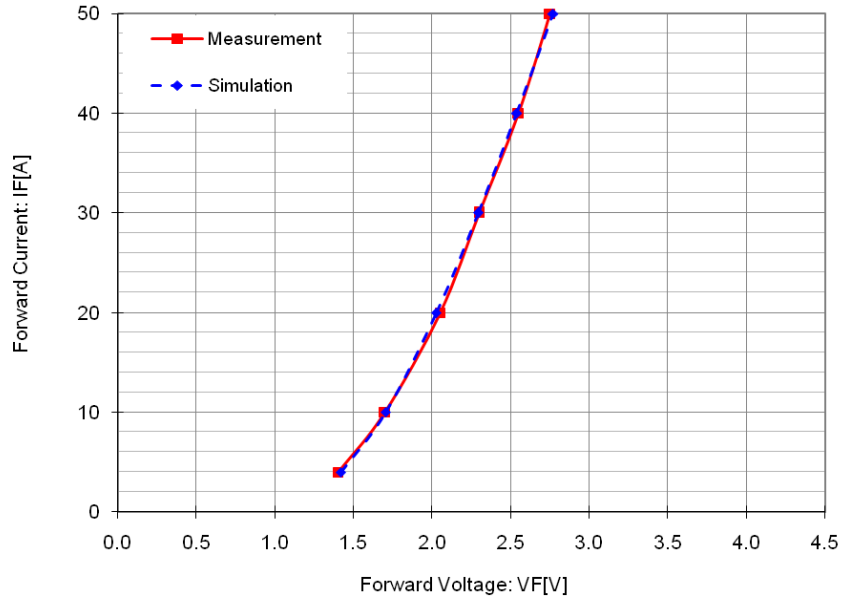


## Evaluation circuit



# Comparison Graph

## Simulation result

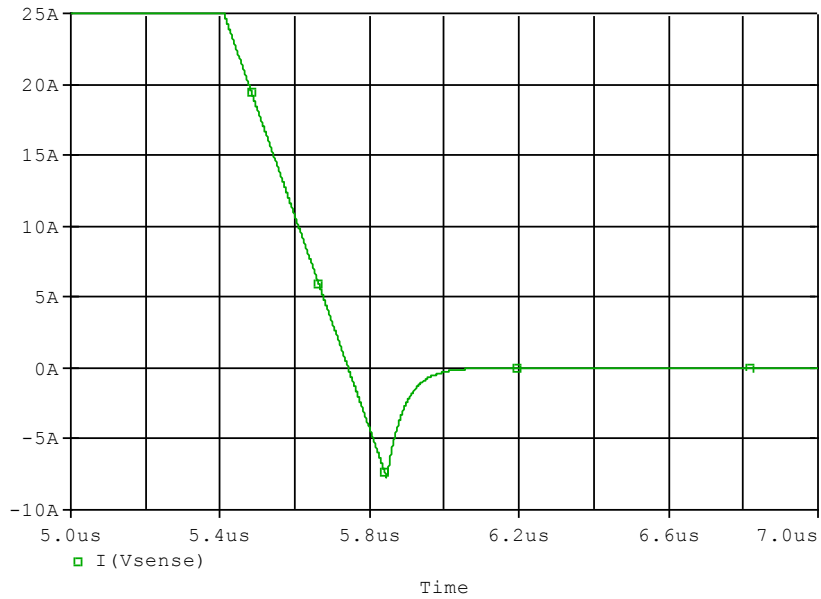


## Comparison table

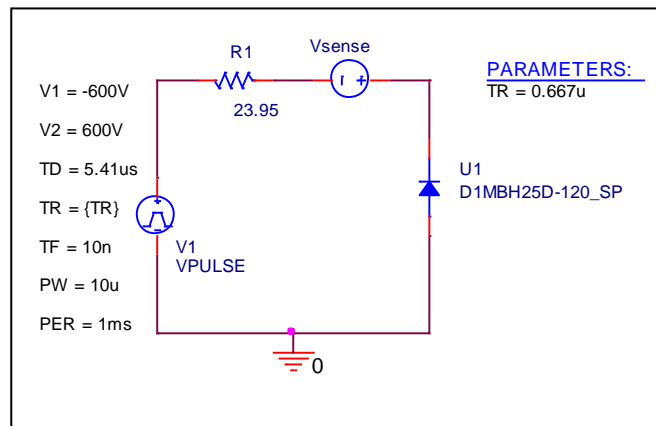
IF(A)	VF (V)		%Error
	Measurement	Simulation	
4	1.400	1.420	1.40
10	1.700	1.705	0.26
20	2.050	2.027	-1.12
30	2.300	2.294	-0.26
40	2.550	2.538	-0.46
50	2.750	2.770	0.72

# Reverse Recovery Characteristics

## Circuit Simulation result



## Evaluation circuit



Test condition:  $V_{CC}=600$  (V),  $I_C=25$  (A),  $-di/dt=75$  A/usec

Parameter	Unit	Measurement	Simulation	%Error
<b>trr</b>	<b>nsec</b>	<b>210.000</b>	<b>209.933</b>	<b>-0.03</b>
<b>Irr</b>	<b>A</b>	<b>7.700</b>	<b>7.697</b>	<b>-0.04</b>