

Device Modeling Report

COMPONENTS:

DIODE/GENERAL PURPOSE RECTIFIER/ PROFESSIONAL

PART NUMBER: UF5406

MANUFACTURER: VISHAY

REMARK: TC=25C

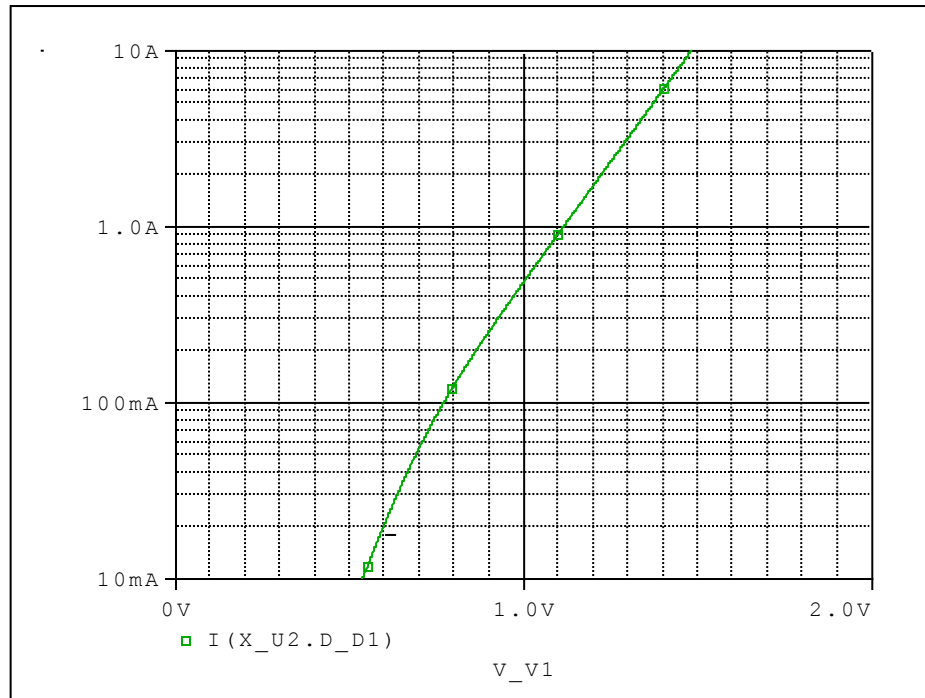


Bee Technologies Inc.

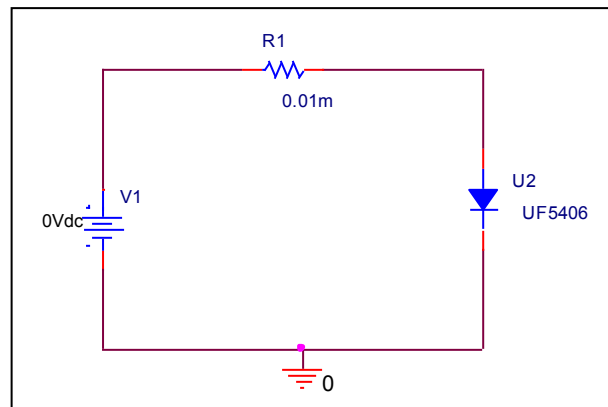
Pspice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a positive value)
IBV	Reverse Breakdown Current(a positive value)
TT	Transit Time

Forward Current Characteristic

Circuit simulation result

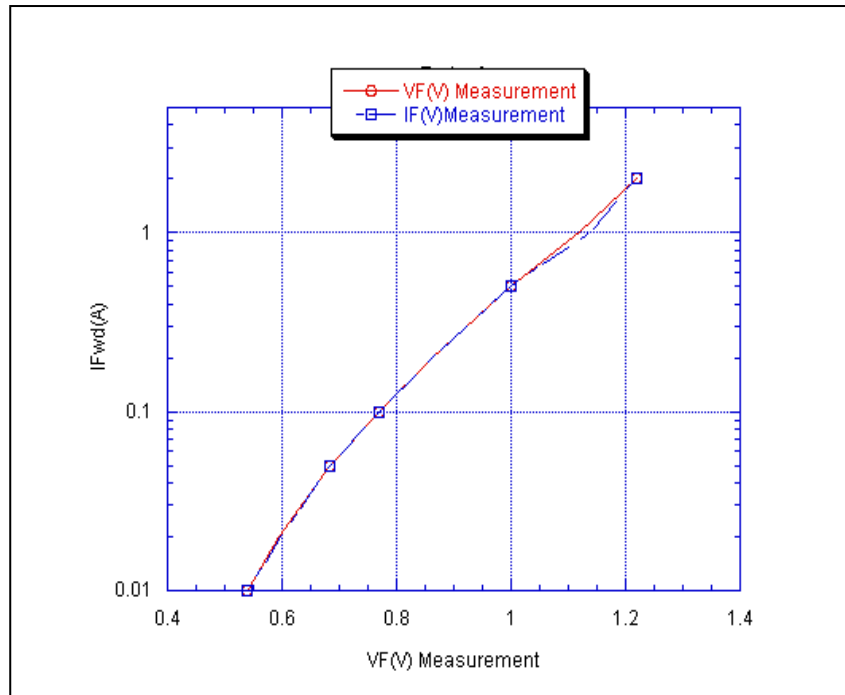


Evaluation circuit



Comparison graph

Circuit simulation result

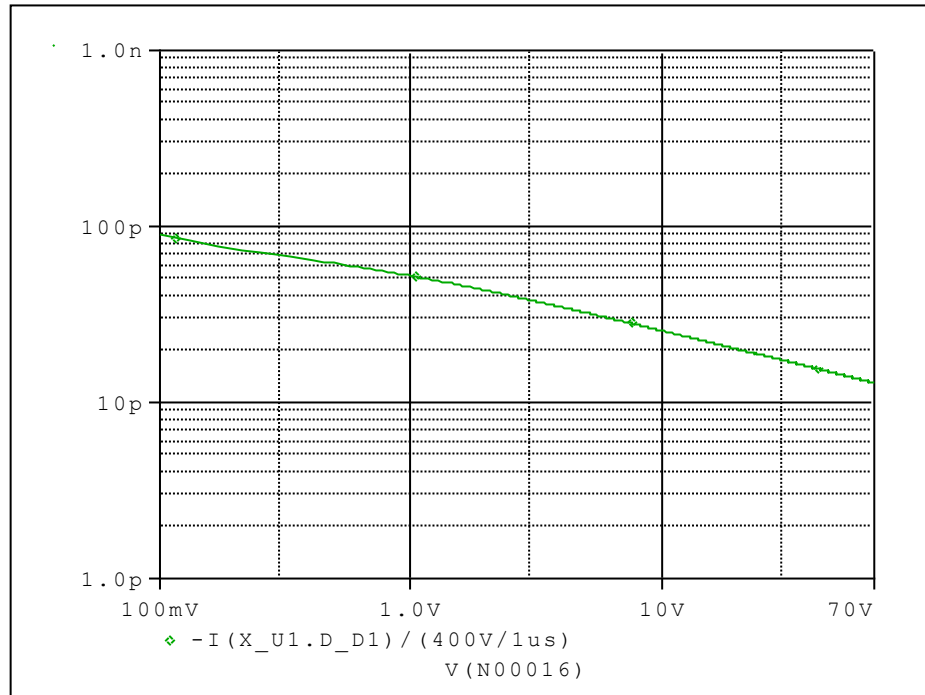


Simulation Result

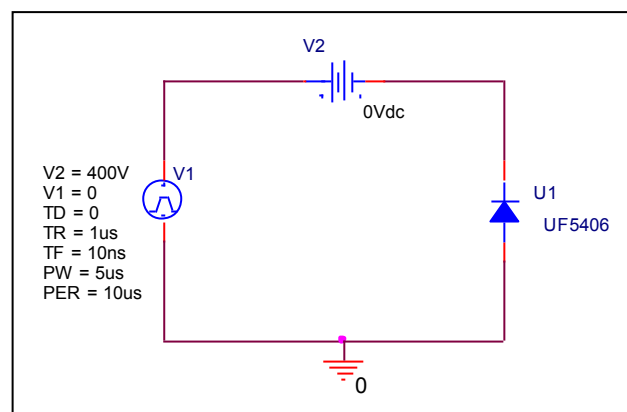
IF(A)	VF (V)		Error (%)
	Measurement	Simulation	
0.01	0.540	0.538	0.37
0.02	0.594	0.597	-0.51
0.05	0.684	0.683	0.15
0.1	0.770	0.771	-0.13
0.2	0.862	0.861	0.12
0.5	1.000	0.985	1.50
1	1.120	1.140	-1.79
2	1.220	1.210	0.82

Junction Capacitance Characteristic

Circuit simulation result

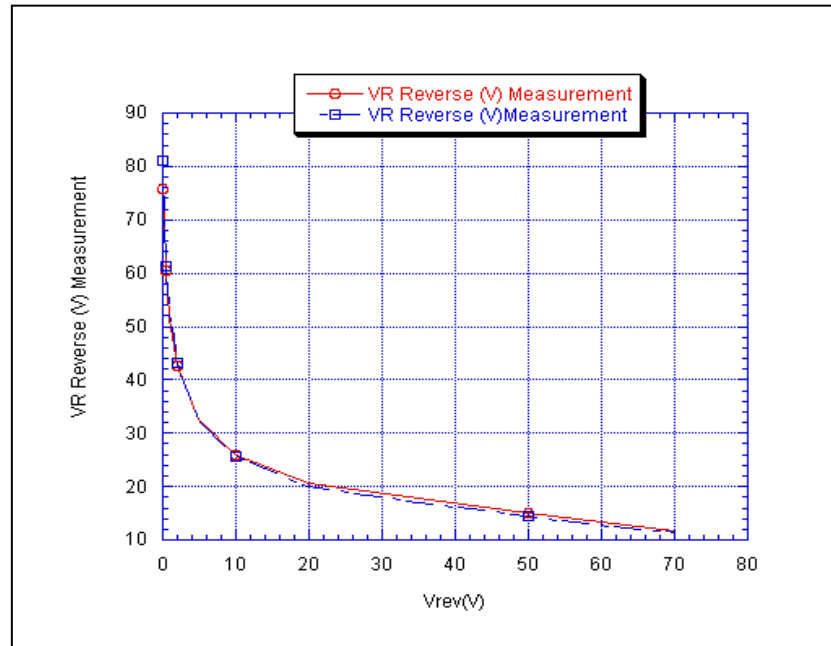


Evaluation circuit



Comparison graph

Circuit simulation result

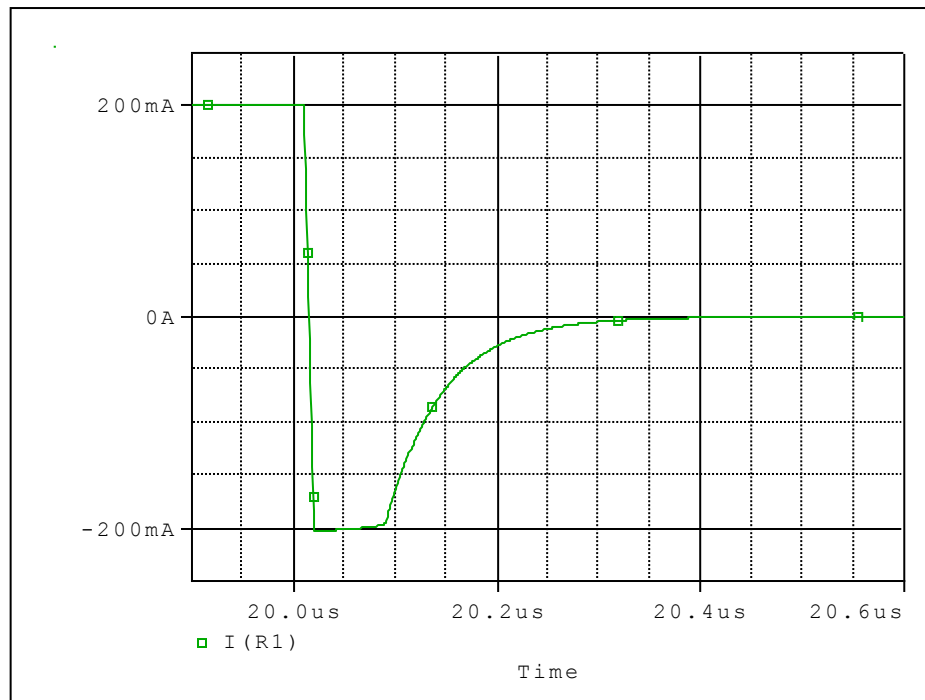


Simulation Result

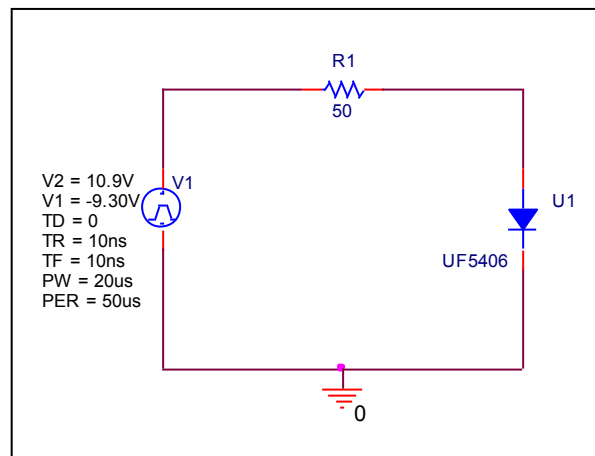
Vrev(V)	Cj(pF)		Error (%)
	Measurement	Simulation	
0.1	75.936	78.980	-4.01
0.2	70.857	72.745	-2.66
0.5	60.370	61.373	-1.66
1	51.610	52.353	-1.44
2	42.726	42.731	-0.01
5	32.477	32.149	1.01
10	25.998	25.505	1.90
20	20.613	20.196	2.02
50	14.976	14.277	4.67

Reverse Recovery Characteristic

Circuit simulation result



Simulation Result

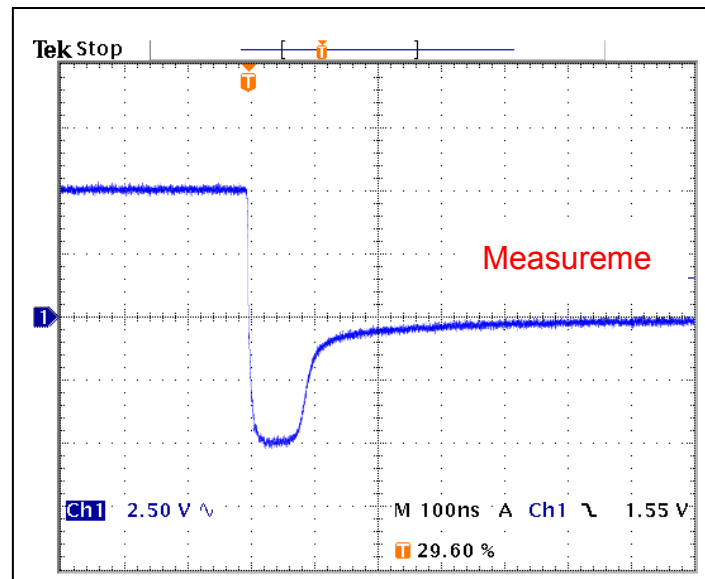


Compare Measurement VS. Simulation

	Measurement		Simulation		%Error
trj	74.00	ns	74.17	ns	0.229
trb	128.00	ns	127.97	ns	0.023

Reverse Recovery Characteristic

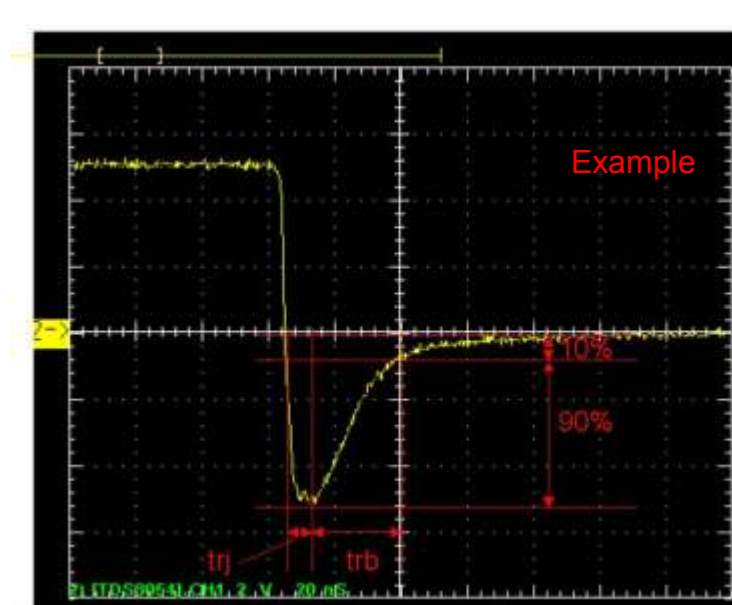
Reference



$tr_j = 74(\text{ns})$

$tr_b = 128(\text{ns})$

Conditions: $I_{fwd} = I_{rev} = 0.2(\text{A})$, $R_I = 50$



Relation between tr_j and tr_b