

Device Modeling Report

COMPONENTS: Silicon Carbide Schottky Diode
PART NUMBER: SCS110AG_125C
MANUFACTURER: ROHM
REMARK: Professional Model

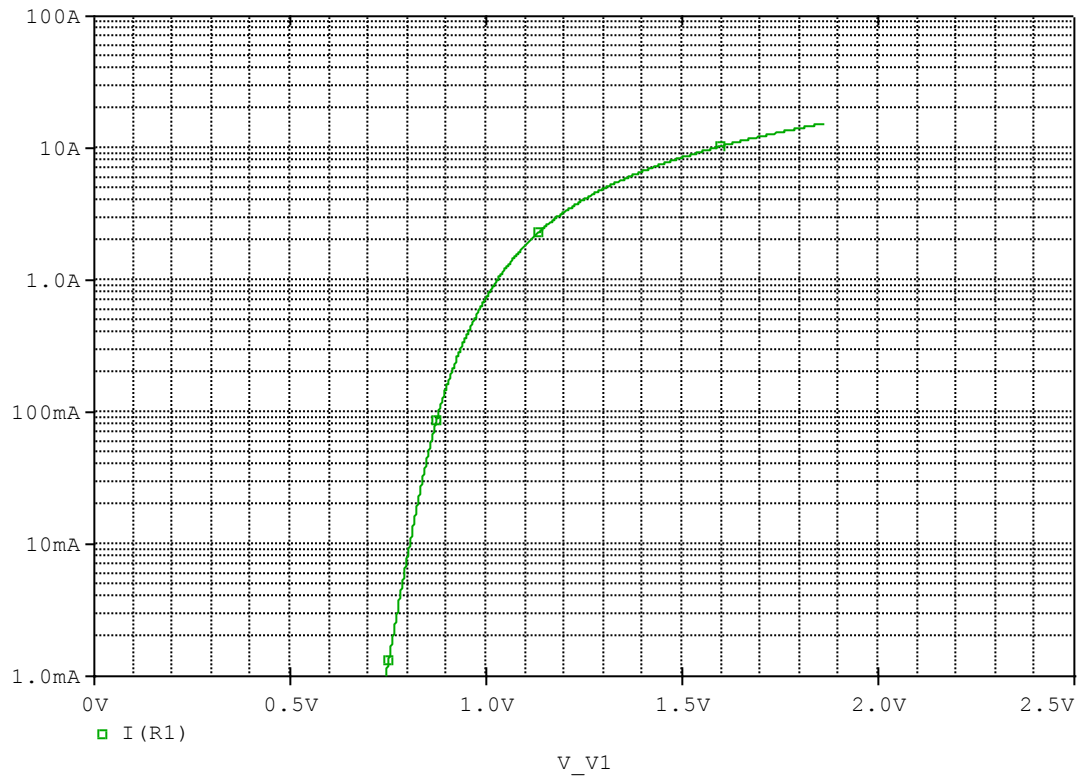


Bee Technologies Inc.

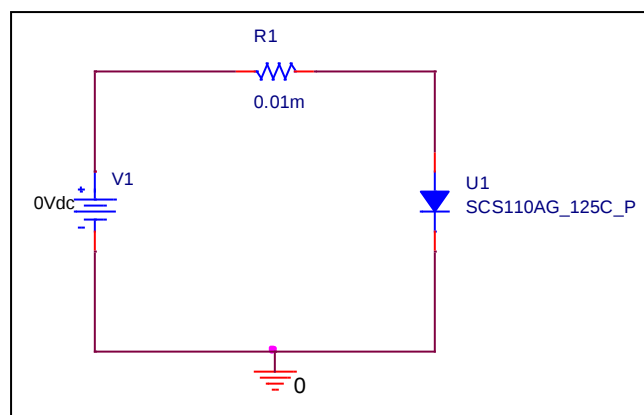
PSpice model parameter	Model description
IS	Saturation Current
N	Emission Coefficient
RS	Series Resistance
IKF	High-injection Knee Current
CJO	Zero-bias Junction Capacitance
M	Junction Grading Coefficient
VJ	Junction Potential
ISR	Recombination Current Saturation Value
BV	Reverse Breakdown Voltage(a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

Forward Current Characteristic

Circuit Simulation Result

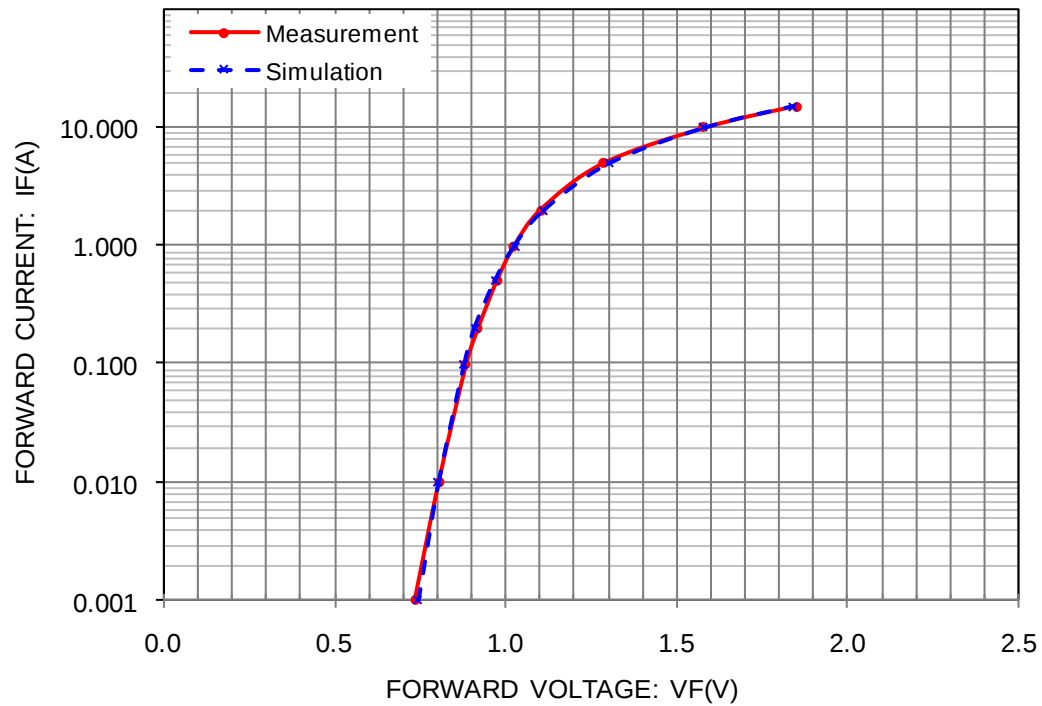


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

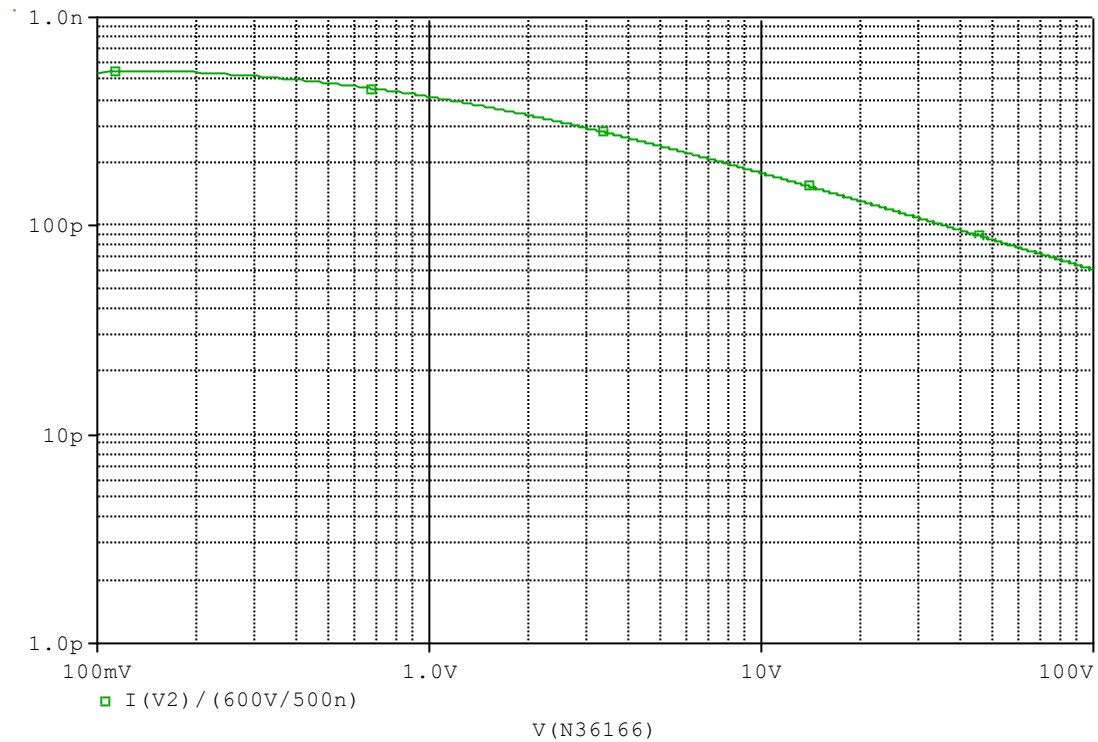


Simulation Result

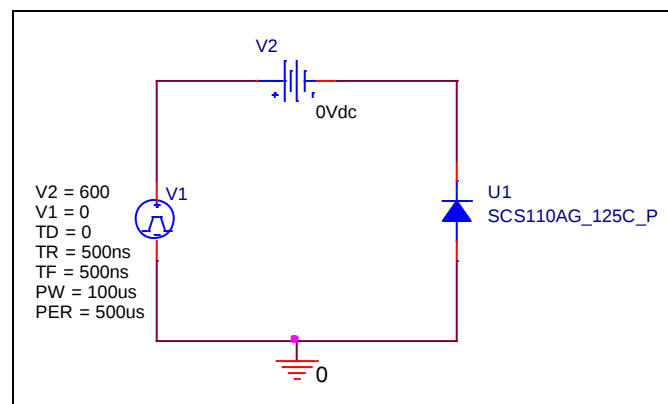
I_F (A)	V_F (V)		Error (%)
	Measurement	Simulation	
0.001	0.7350	0.7436	1.18
0.01	0.8050	0.8047	-0.04
0.1	0.8850	0.8788	-0.70
0.2	0.9200	0.9112	-0.96
0.5	0.9750	0.9686	-0.66
1	1.0250	1.0276	0.25
2	1.1050	1.1114	0.58
5	1.2850	1.3032	1.42
10	1.5800	1.5798	-0.01
15	1.8500	1.8416	-0.45

Junction Capacitance Characteristic

Circuit Simulation Result

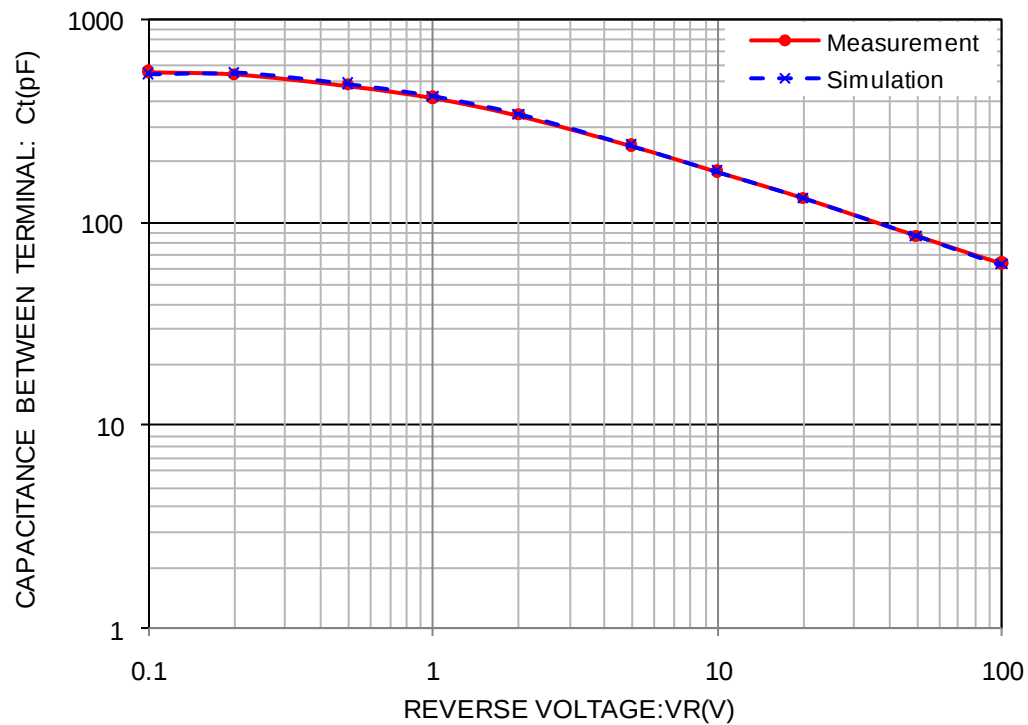


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

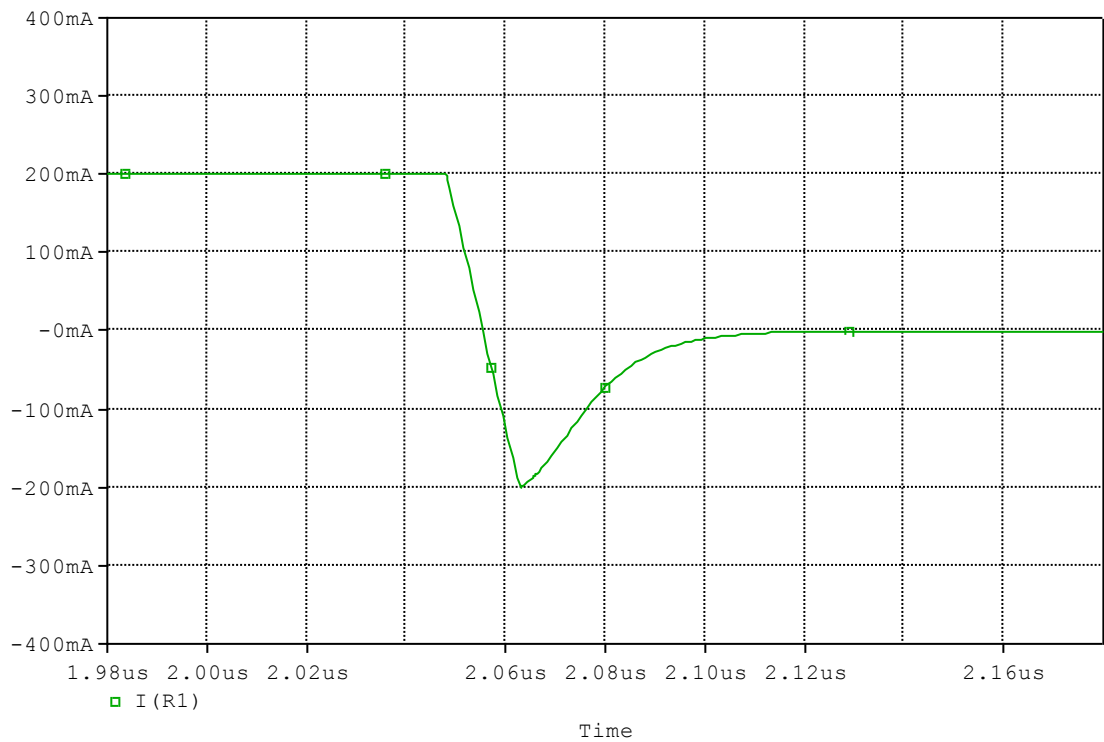


Simulation Result

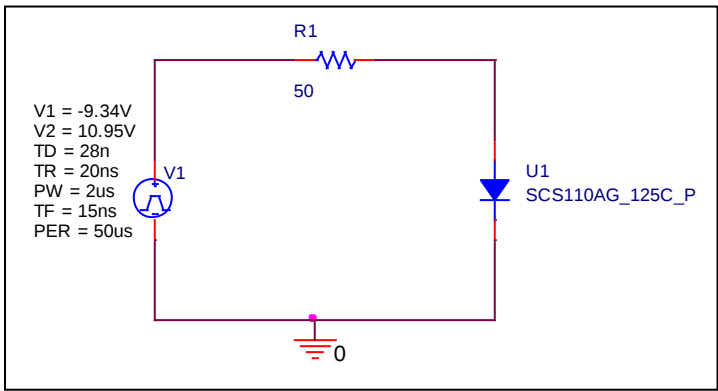
V _R (V)	C (pF)		Error (%)
	Measurement	Simulation	
0.1	551.372	542.429	-1.62
0.2	535.162	544.659	1.77
0.5	475.224	483.584	1.76
1	411.432	416.135	1.14
2	337.924	339.050	0.33
5	239.767	240.841	0.45
10	178.669	179.458	0.44
20	131.457	131.401	-0.04
50	85.266	85.651	0.45
100	62.800	61.684	-1.78

Reverse Recovery Characteristic

Circuit Simulation Result



Evaluation Circuit

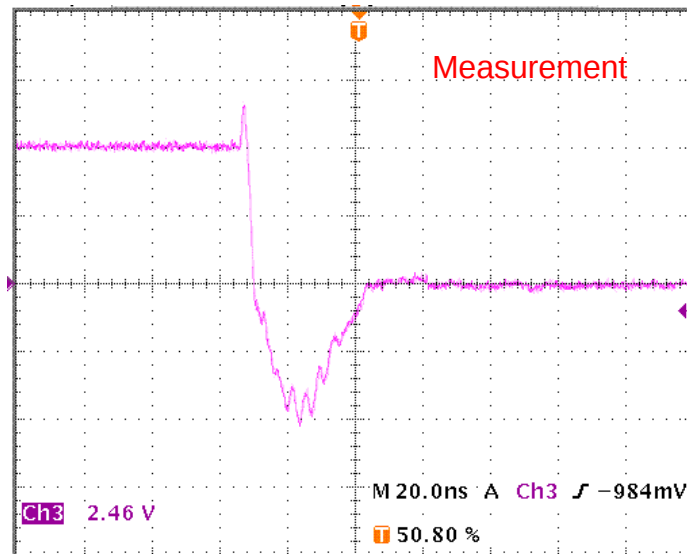


Compare Measurement vs. Simulation

		Measurement	Simulation	Error (%)
trj	ns	7.500	7.534	0.45

Reverse Recovery Characteristic

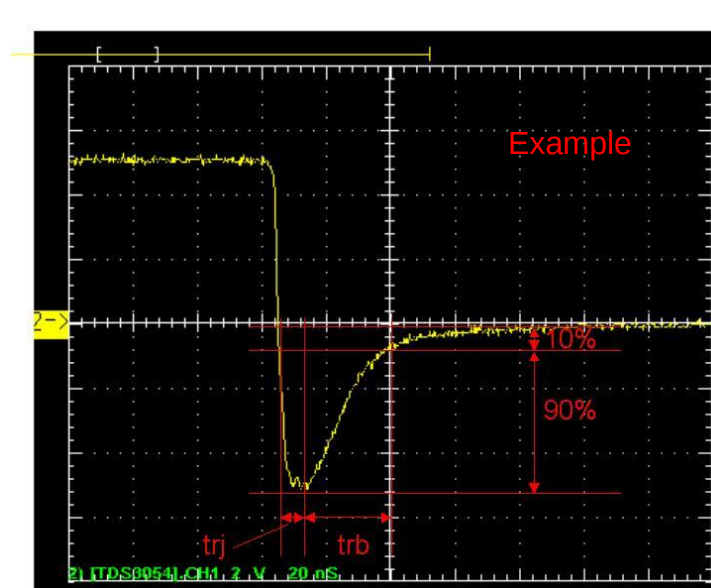
Reference



$T_{rj} = 7.5(\text{ns})$

$T_{rb} = 16.00(\text{ns})$

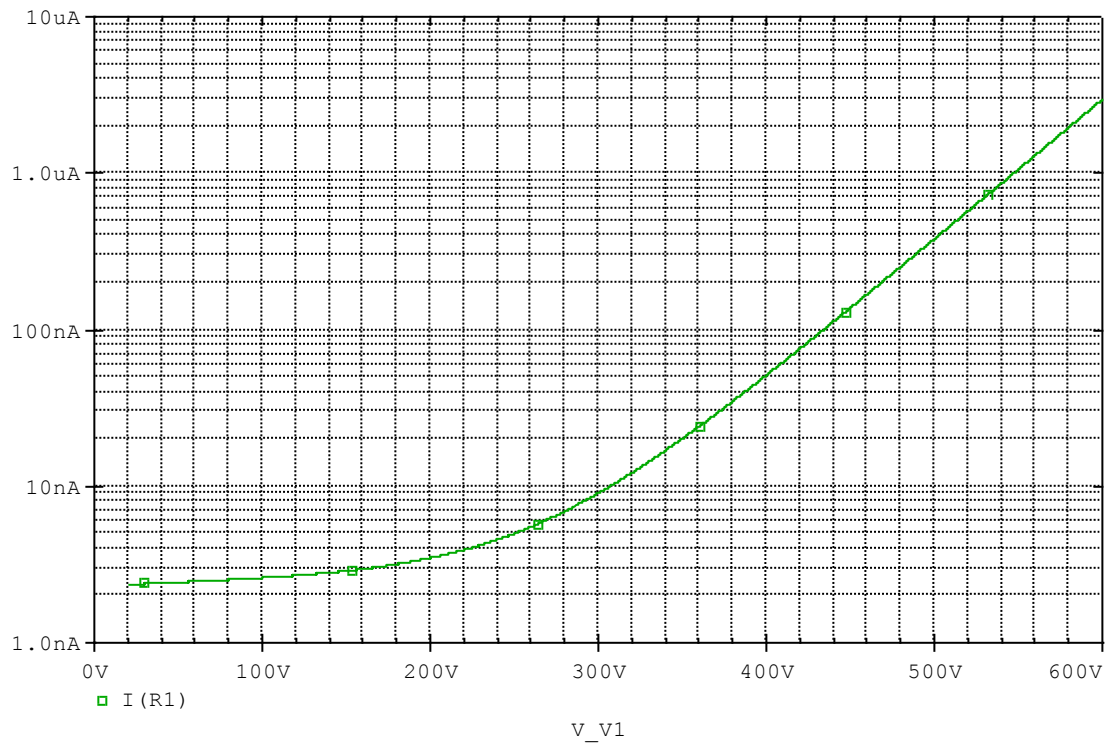
Conditions: $I_{fwd} = 0.2\text{A}$, $I_{rev} = 0.2\text{A}$, $R_l = 50\Omega$



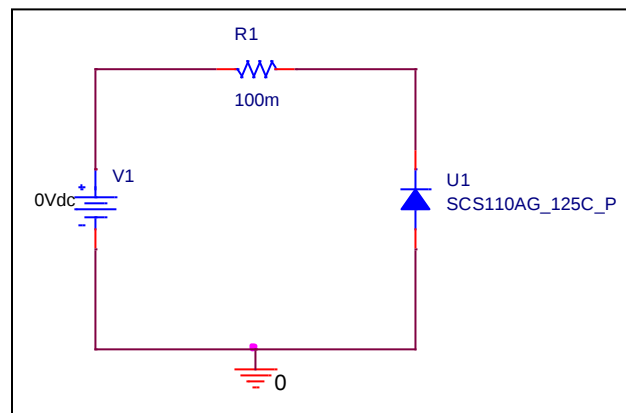
Relation between t_{rr} and τ_{rr}

Reverse Characteristic

Circuit Simulation Result

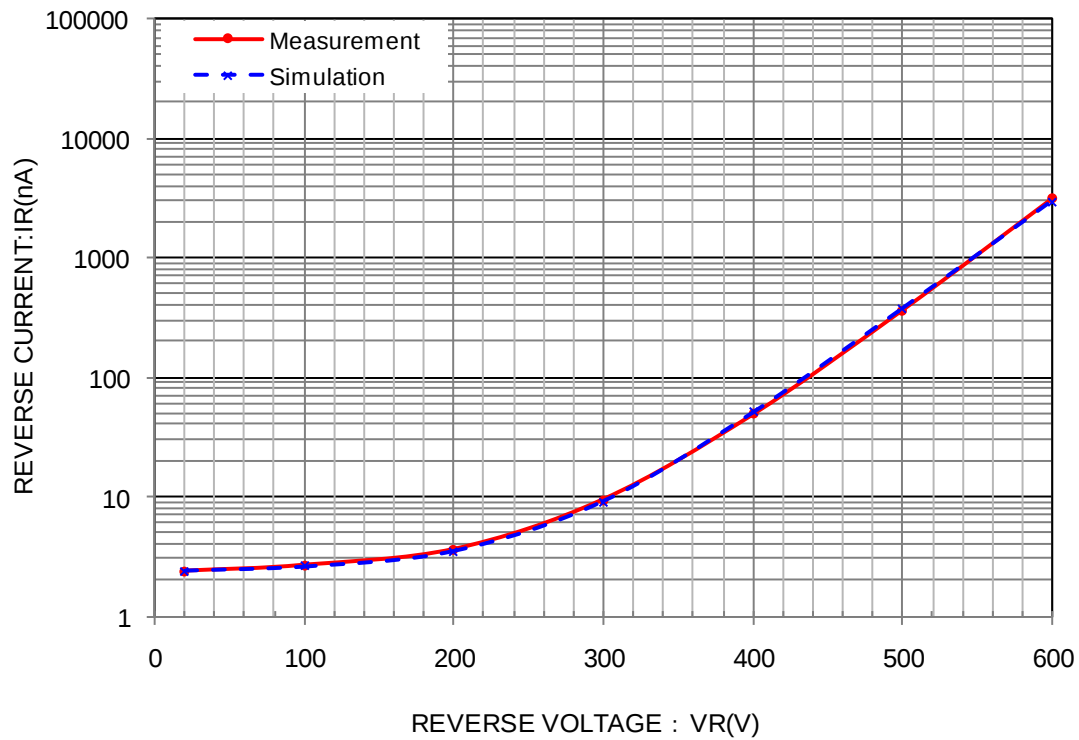


Evaluation Circuit



Comparison Graph

Circuit Simulation Result



Simulation Result

V_R (V)	I_R (nA)		Error (%)
	Measurement	Simulation	
20	2.4000	2.3593	-1.70
100	2.6500	2.6002	-1.88
200	3.6300	3.4842	-4.02
300	9.4000	9.0421	-3.81
400	49.0000	51.2140	4.52
500	365.0000	380.2370	4.17
600	3100.0000	2956.5000	-4.63