Device Modeling Report

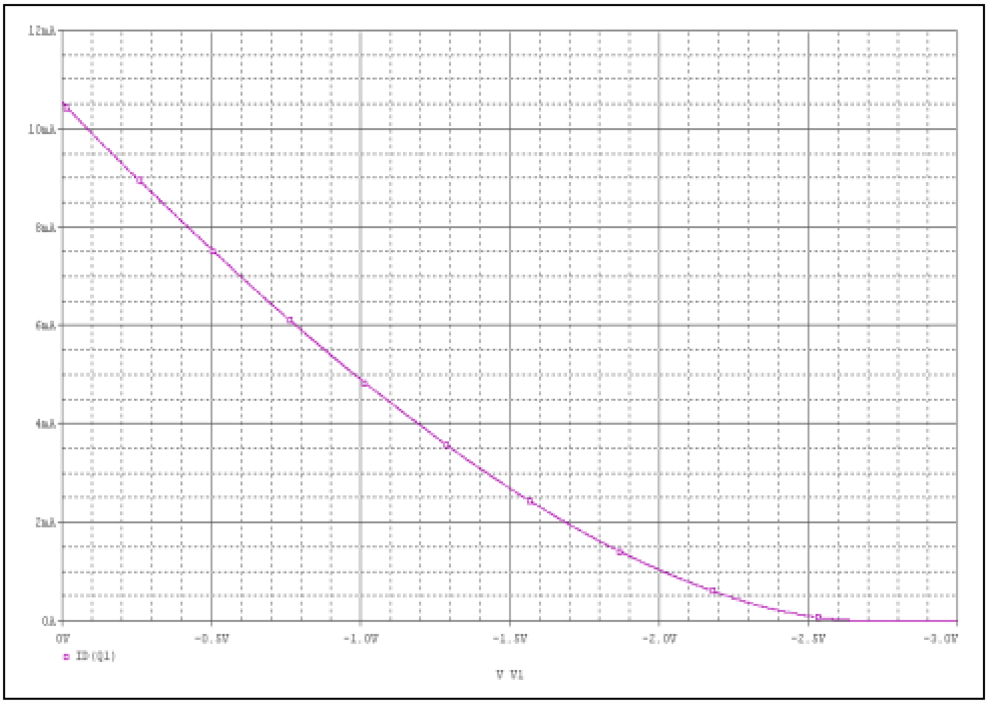
COMPONENTS: Junction Field Effect Transistor (JFET)
PART NUMBER: 2N3819
MANUFACTURER: Vishay Siliconix

Bee Technologies Inc.

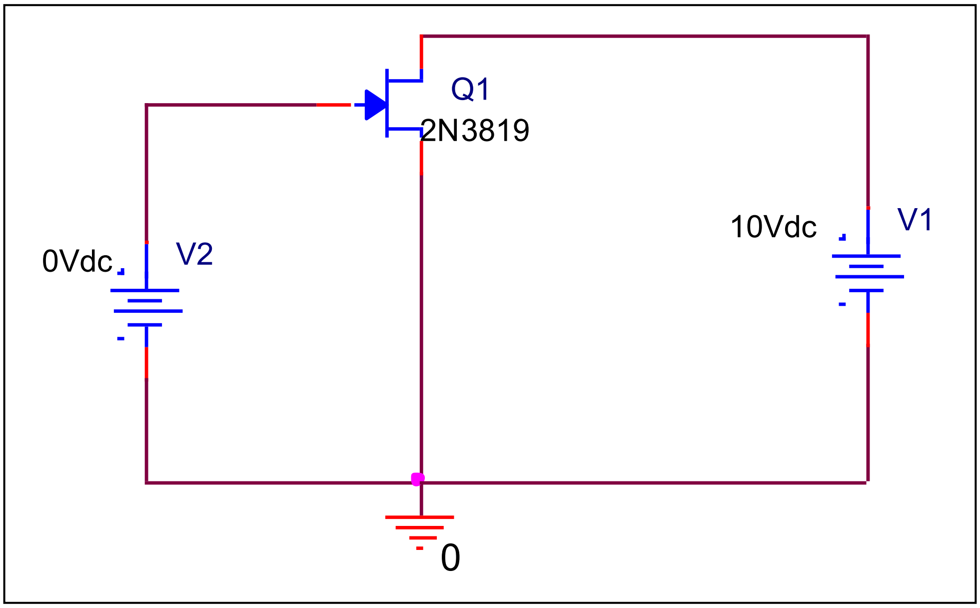
PSpice model parameter	Model description
BETA	Transconductance coefficient
RD	Drain resistance
RS	Source resistance
BETATCE	Temperature coefficient for BETA
LAMBDA	Channel-length modulation
VTO	Threshold voltage
VTOTC	Temperature coefficient for VTO
CGD	Zero-bias gate-drain capacitance
M	Junction grading factor
PB	Built-in potential
FC	Forward-bias coefficient
CGS	Zero-bias gate-source capacitance
ISR	Recombination current saturation value
NR	Recombination current emission coefficient
IS	Junction saturation current
N	Junction emission coefficient
XTI	IS temperature coefficient
ALPHA	Impact ionization coefficient
VK	Ionization “knee” voltage
KF	Flicker noise coefficient
AF	Flicker noise exponent

Transfer Curve Characteristic

Circuit Simulation Result

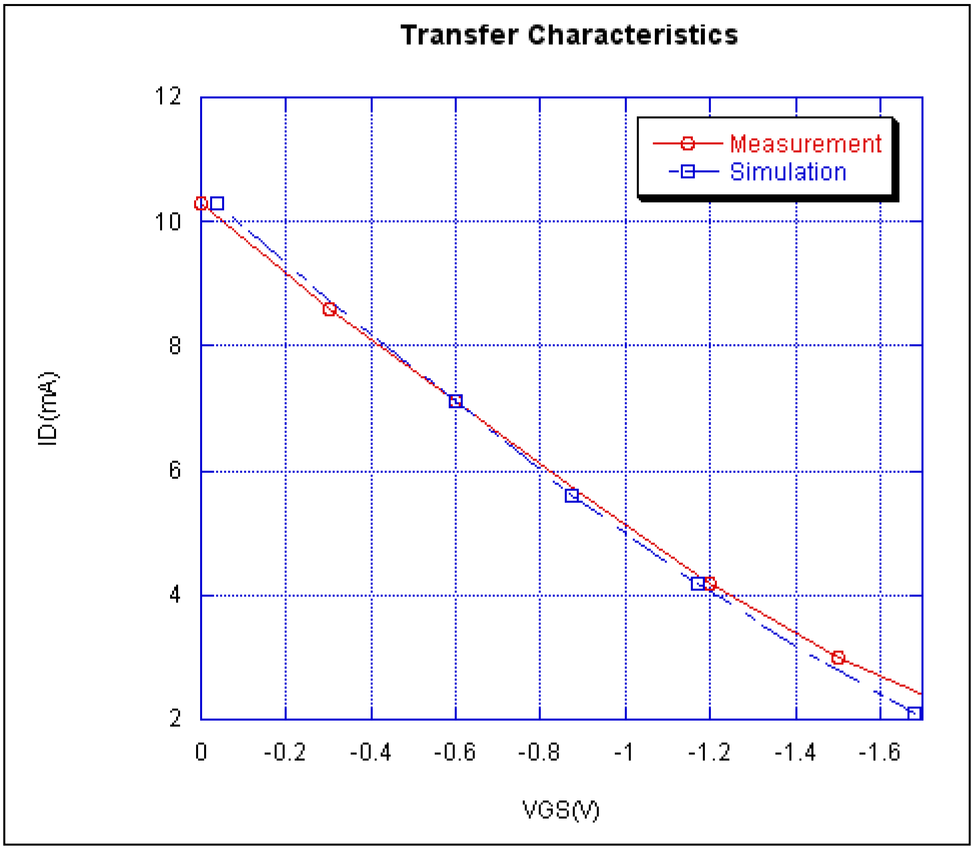


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

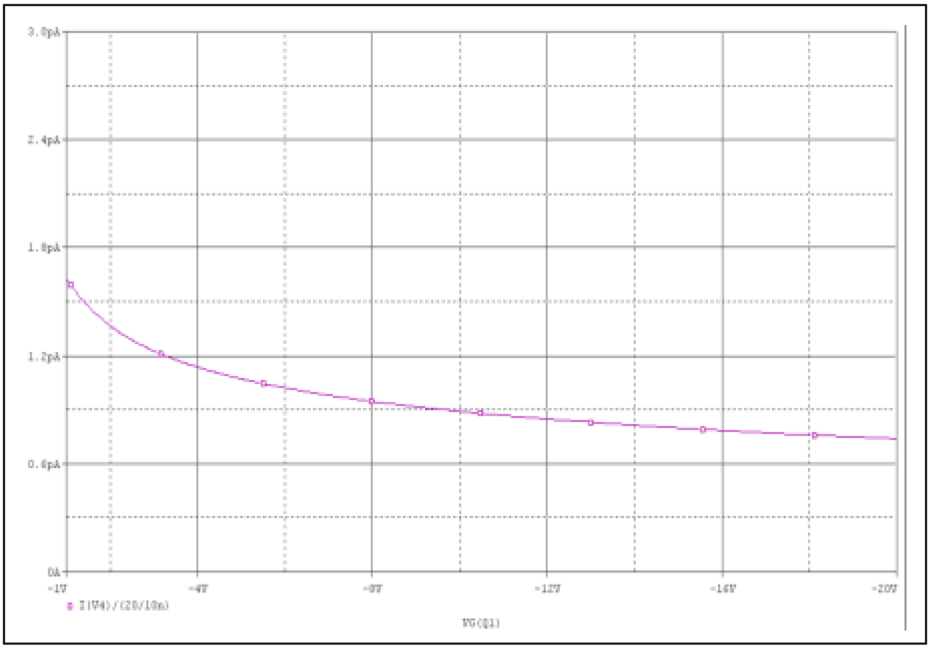


Simulation Result

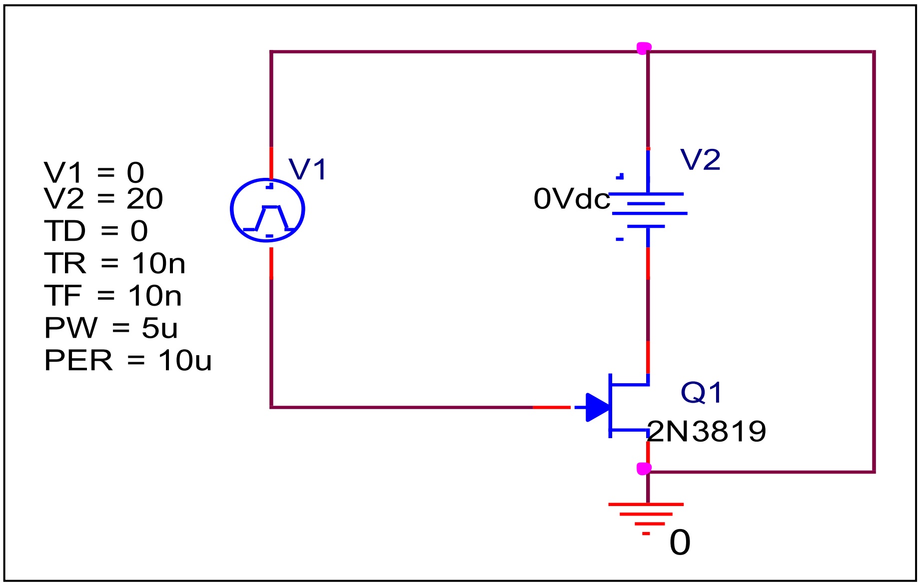
ID (mA)	VGS (V)		Error (%)
	Measurement	Simulation	
8.6	-0.3	-0.31	-3.333
7.1	-0.6	-0.60127	-0.211
5.6	-0.9	-0.873302	-2.966
4.2	-1.2	-1.169	-2.583
3	-1.5	-1.4467	-3.553
2.1	-1.75	-1.7	-2.857

Reverse Transfer Capacitance

Circuit Simulation Result



Evaluation Circuit



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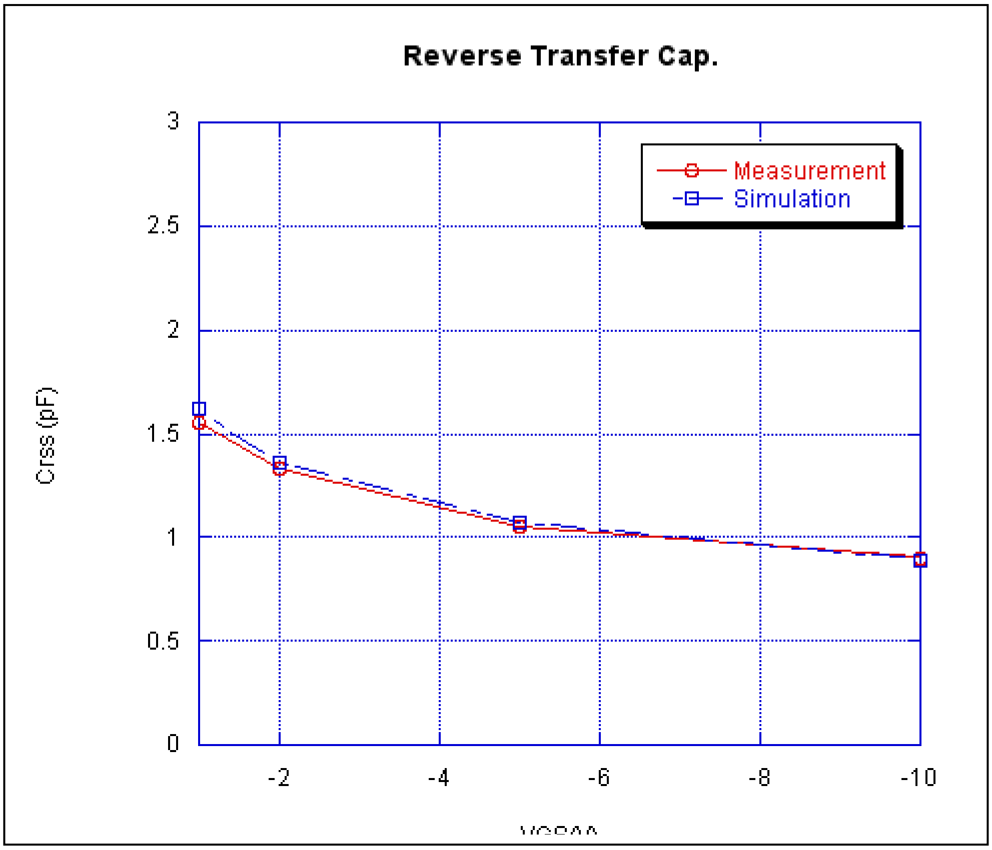
Comparison Graph

Circuit Simulation Result

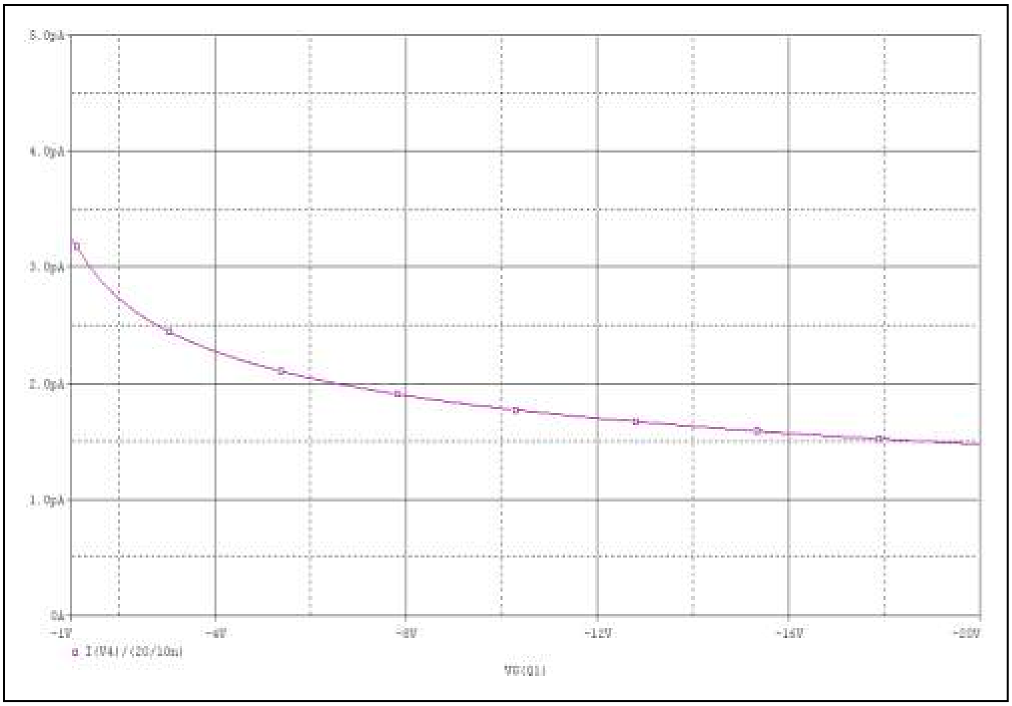


Simulation Result

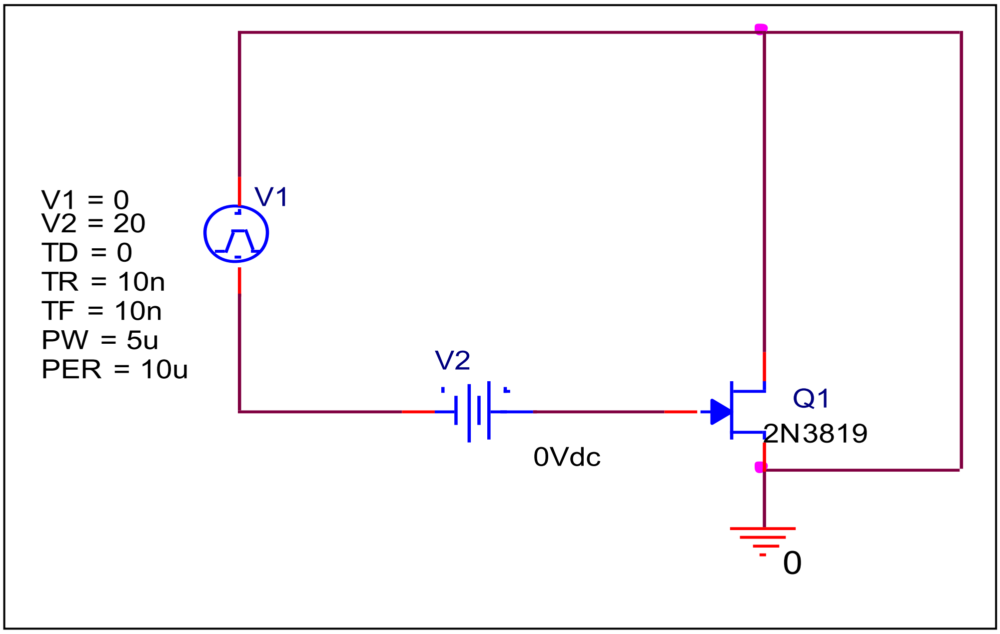
VGS (V)	Crss (pF)		Error(%)
	Measurement	Simulation	
-1	1.55	1.62	4.516
-2	1.33	1.36	2.255
-5	1.05	1.0715	2.047
-10	0.9	0.89	1.111

Input Capacitance

Circuit Simulation Result

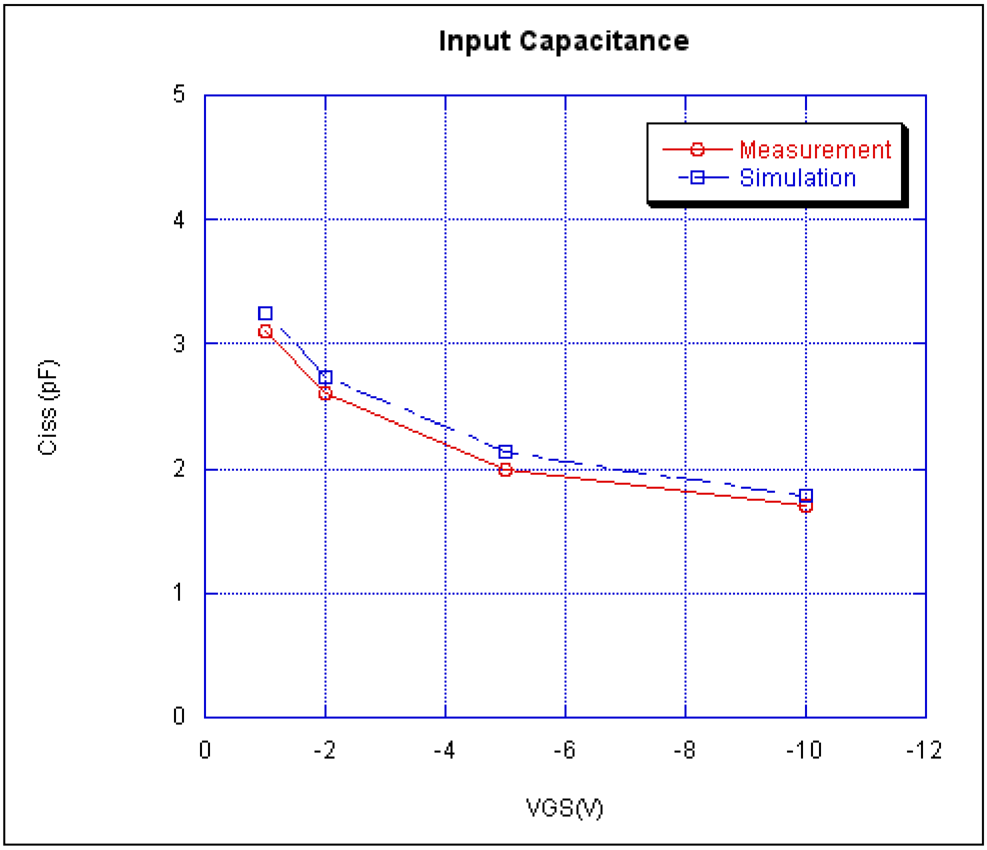


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

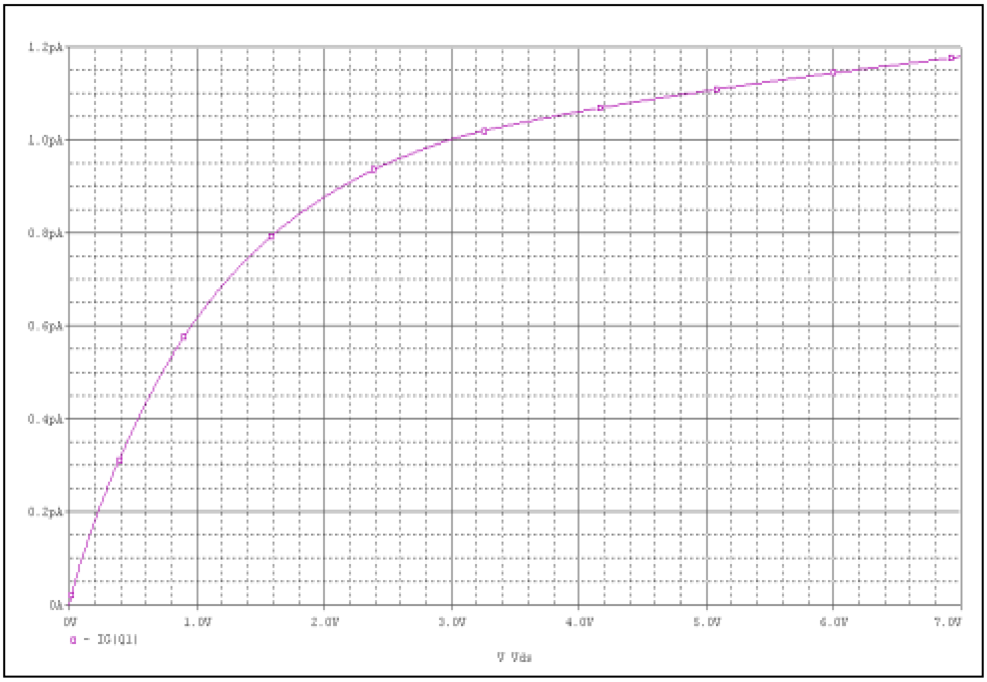


Simulation Result

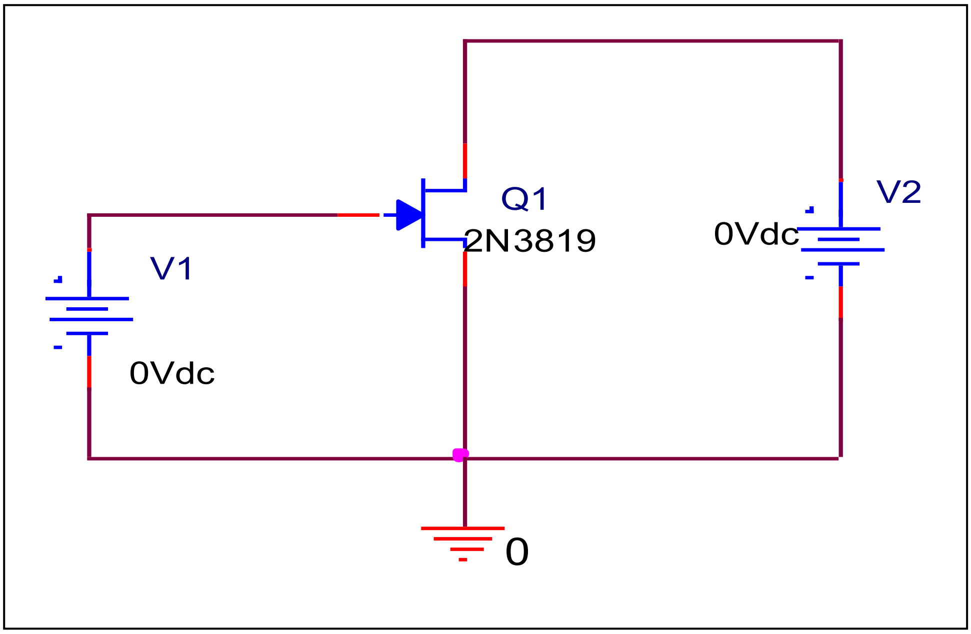
VGS (V)	Crss (pF)		Error(%)
	Measurement	Simulation	
-1	3.1	3.2433	4.622
-2	2.6	2.73	5
-5	2	2.1	5
-10	1.7	1.7819	4.817

Passive Gate Leakage

Circuit Simulation Result

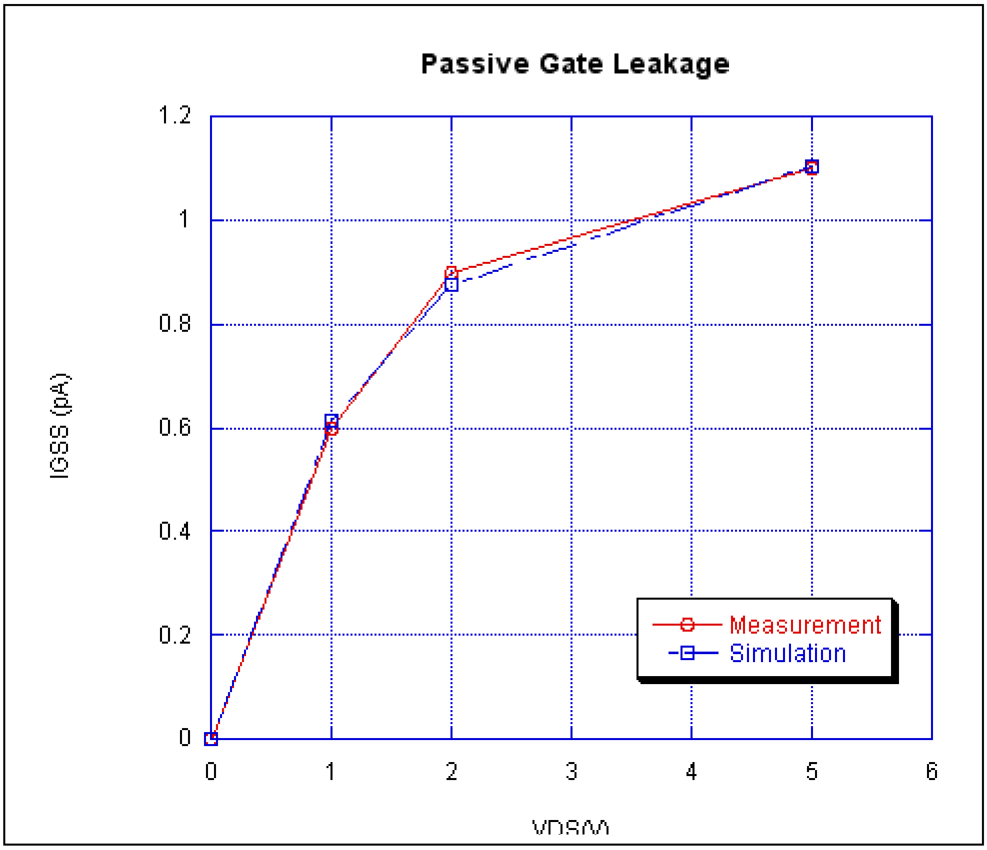


Evaluation Circuit



Comparison Graph

Circuit Simulation Result

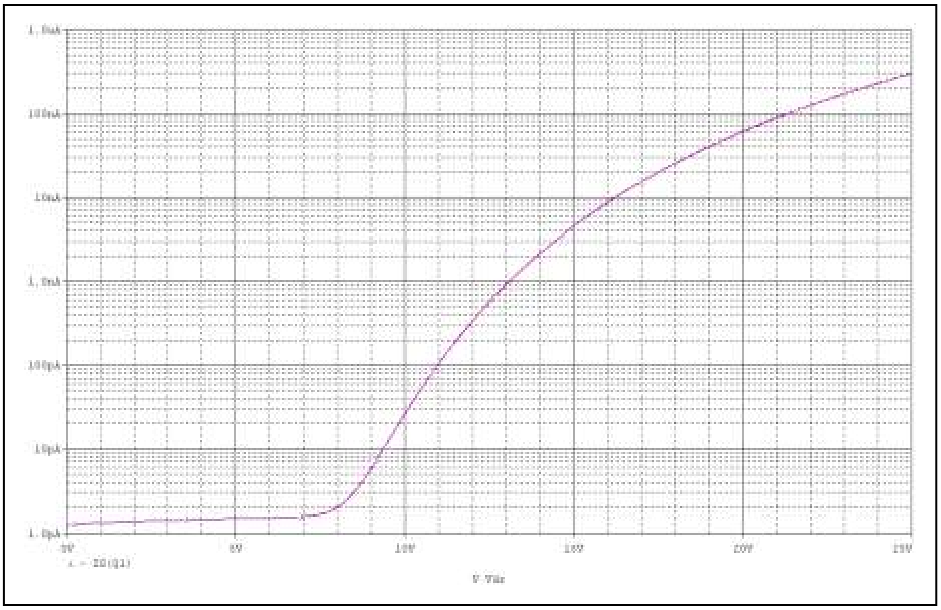


Simulation Result

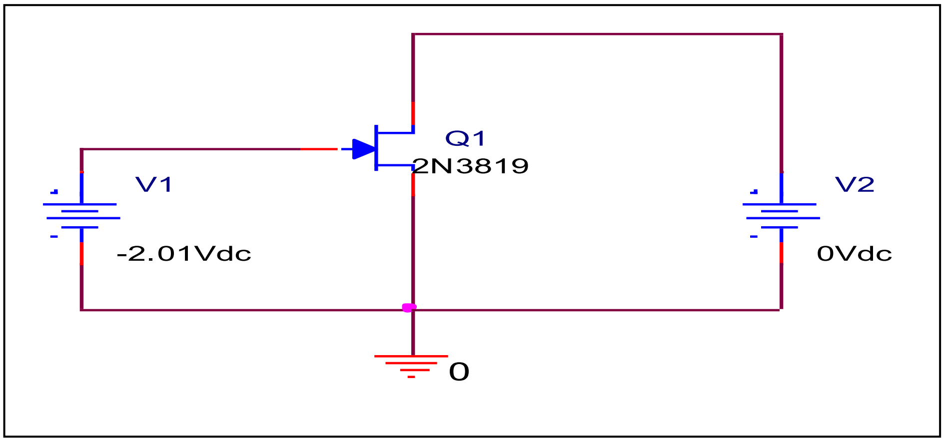
VDS (V)	Igss (pA)		Error(%)
	Measurement	**Simulation**	
1	0.6	0.615	2.5
2	0.9	0.877	2.555
5	1.1	1.1052	0.472

Active Gate Leakage

Circuit Simulation Result



Evaluation Circuit



VDG=10V,ID=1mA (Test Conditions)	IG (pA)		Error(%)
	Measurement	Simulation	
Gate Operating Current(IG)	-20	-20.5	2.5