

Device Modeling Report

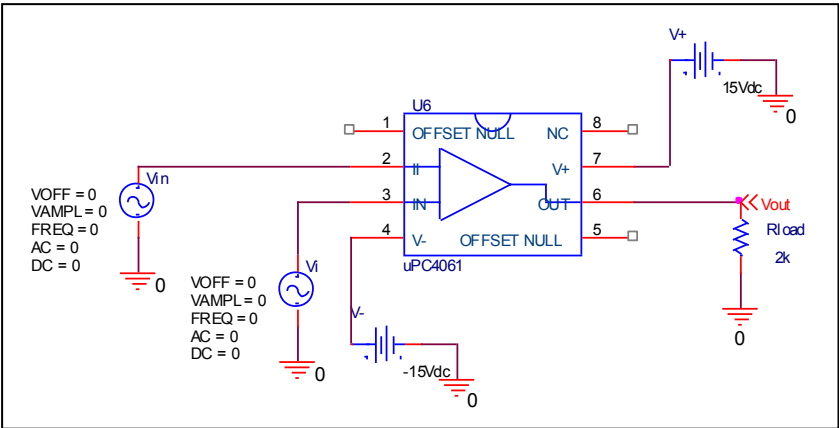
COMPONENTS:MOSFET: OPERATIONAL AMPLIFIER
PART NUMBER:uPC4061G2
MANUFACTURER: NEC ELECTRONICS



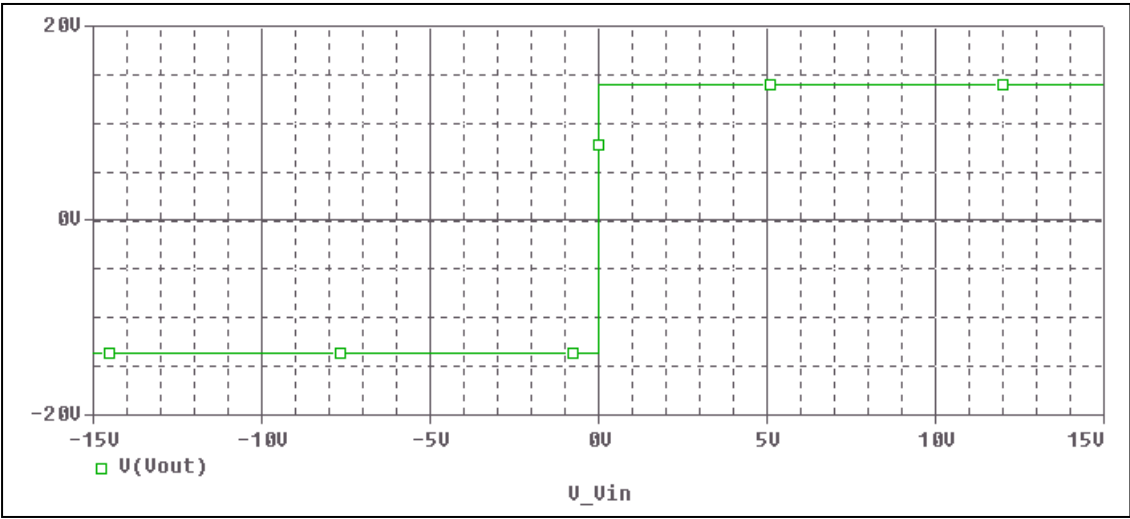
Bee Technologies Inc.

Output Voltage Swing, +Vout and -Vout

Evaluation circuit



Simulation result

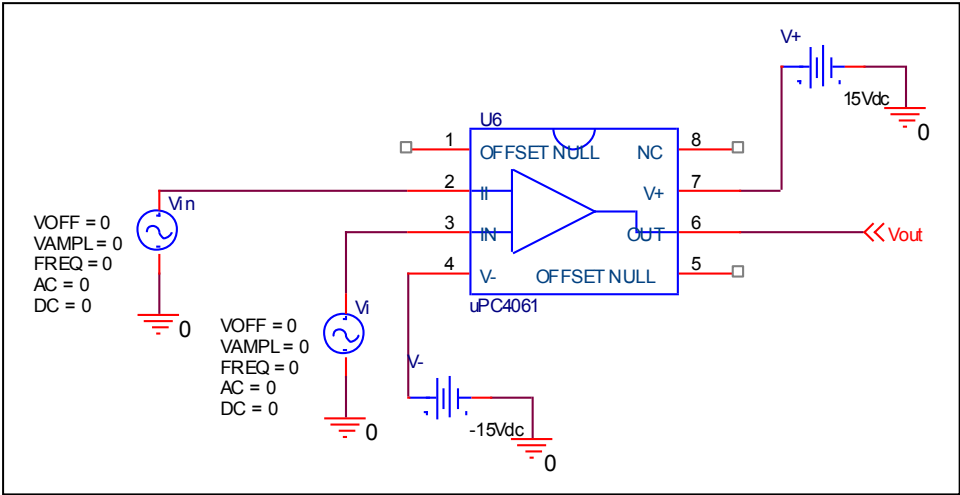


These simulation results are compared with $\pm V_{out}$

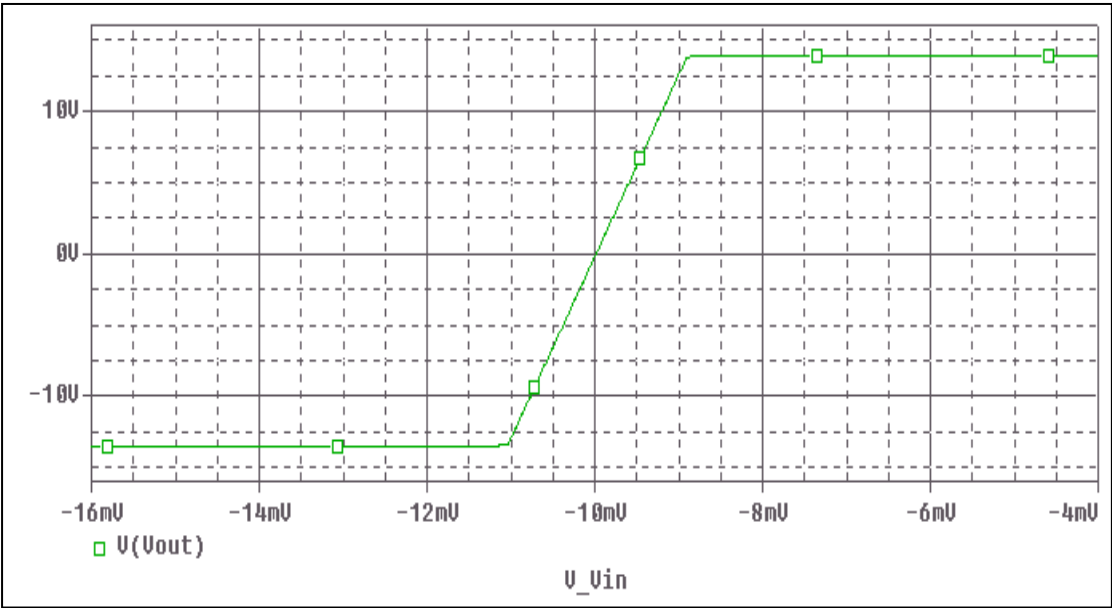
Output Voltage Swing	Data sheet	Simulation	%Error
+Vout(V)	+14	+13.972	0.2
-Vout(V)	-13.6	-13.572	0.205882353

Input Offset Voltage

Evaluation circuit



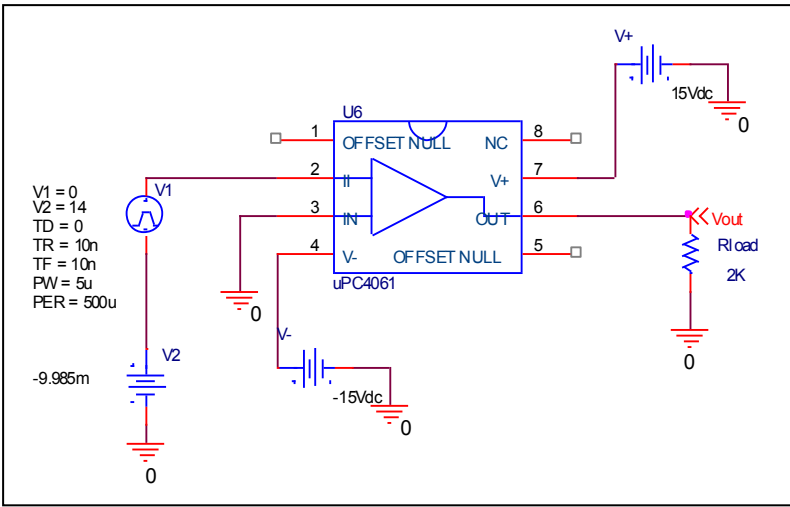
Simulation result



Vos	Measurement		Simulation		Error	
	10	mV	9.985	mV	0.15	%

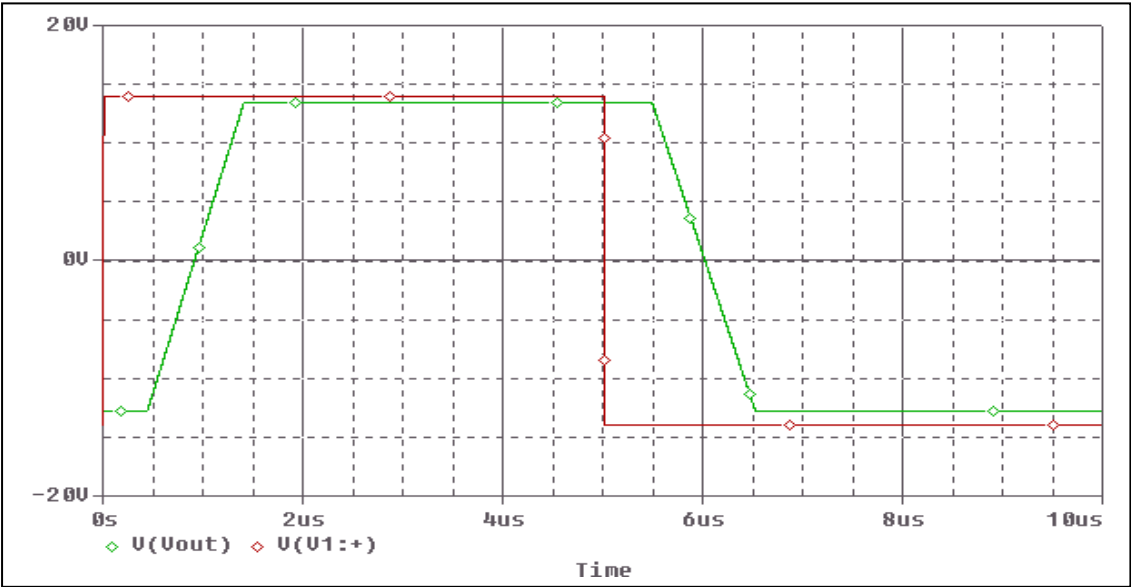
Slew Rate, +SR, -SR

Evaluation circuit



The output voltage change versus time (slope) of op-amp when input electric step voltage.

Simulation result

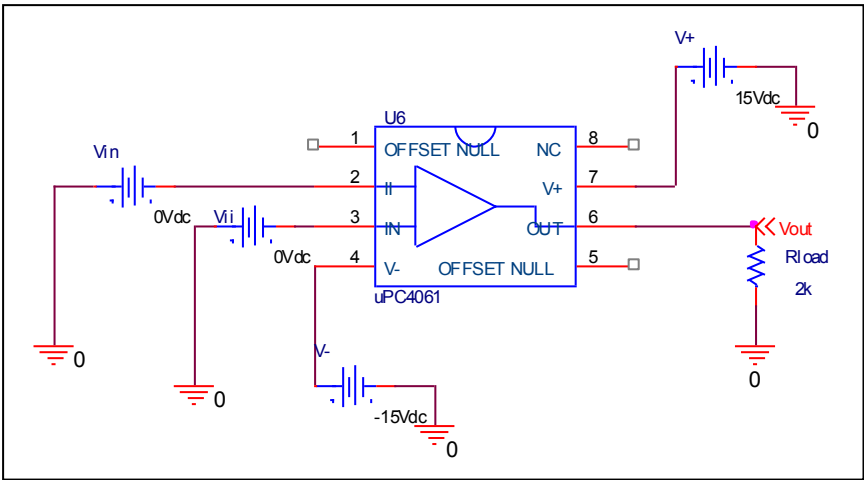


Output voltage change 15V in 1 us (If no good can change **C2** of Spice Model Editor)

Slew Rate(v/us)	Data sheet	Simulation	%Error
	15	15.072	0.48

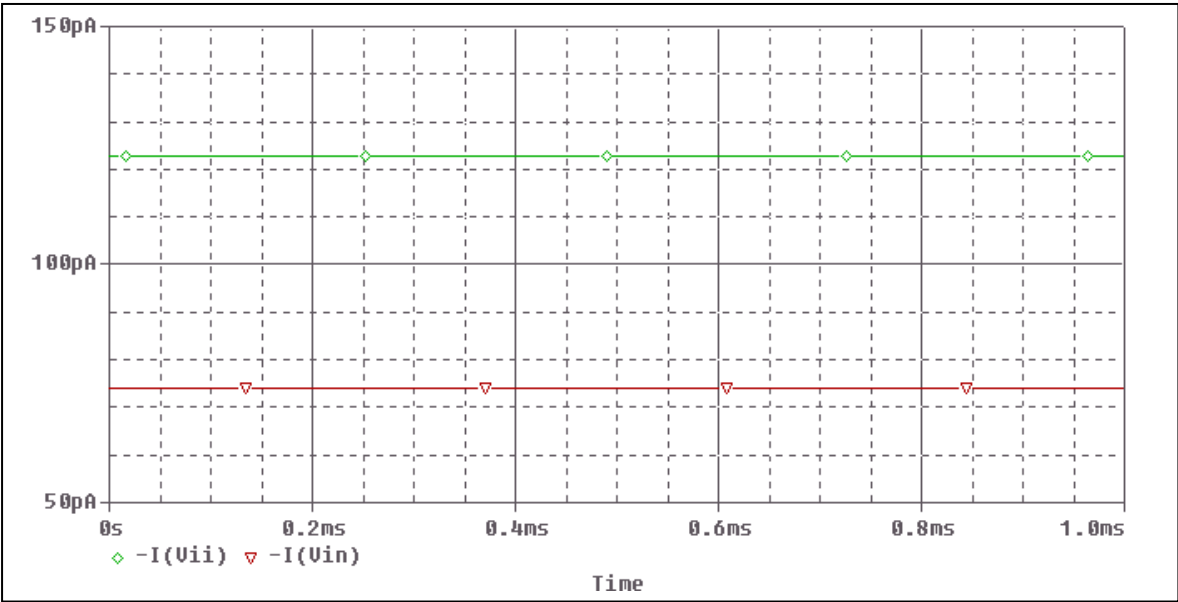
Input current Ib, Ibos

Evaluation circuit



The input offset current when supply voltage to op-amp

Simulation result

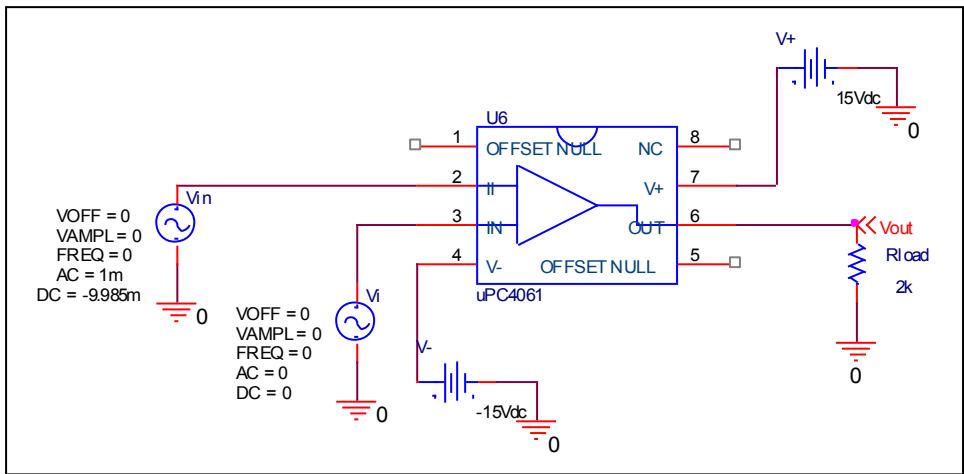


$I(Vin) = 73.91\text{pA}$, $I(Vi) = 122.92\text{pA}$: $Ib = (I(Vin) + I(Vi))/2$, $Ibos = 49.01\text{p}$

	Data sheet	Simulation	%Error
Ib(pA)	100	98.415	1.585
Ibos(pA)	50	49.01	1.98

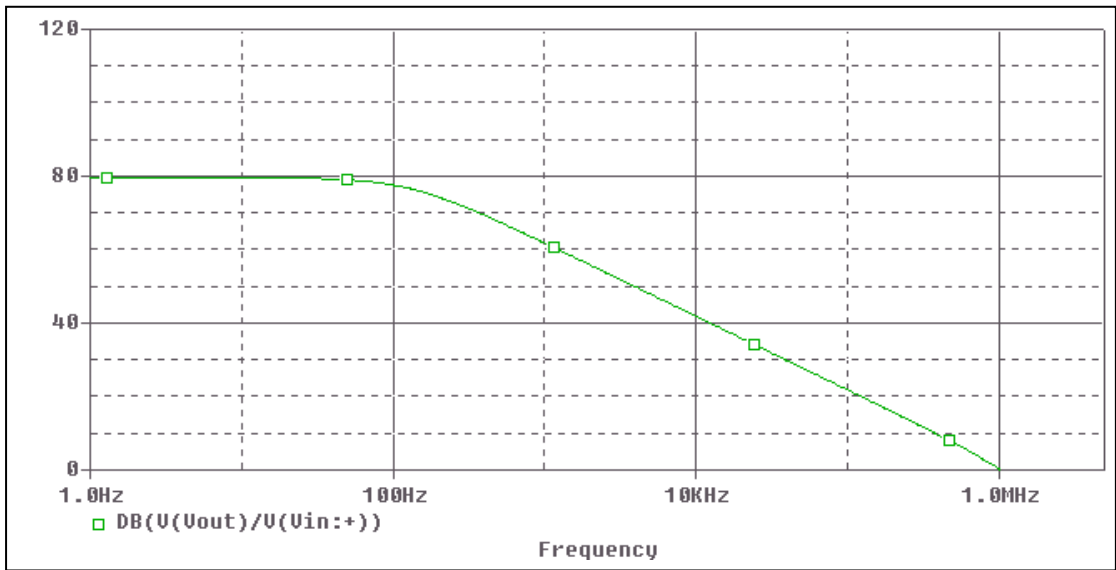
Open Loop Voltage Gain vs. Frequency , Av-dc, f-0dB

Evaluation circuit



The open loop voltage gain of op-amp when supply AC input voltage 1MHz frequency

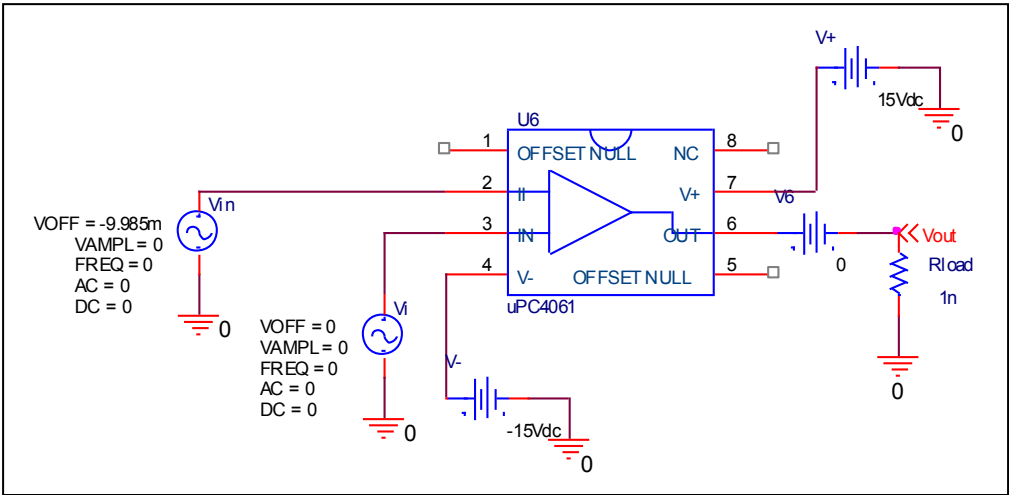
Simulation result



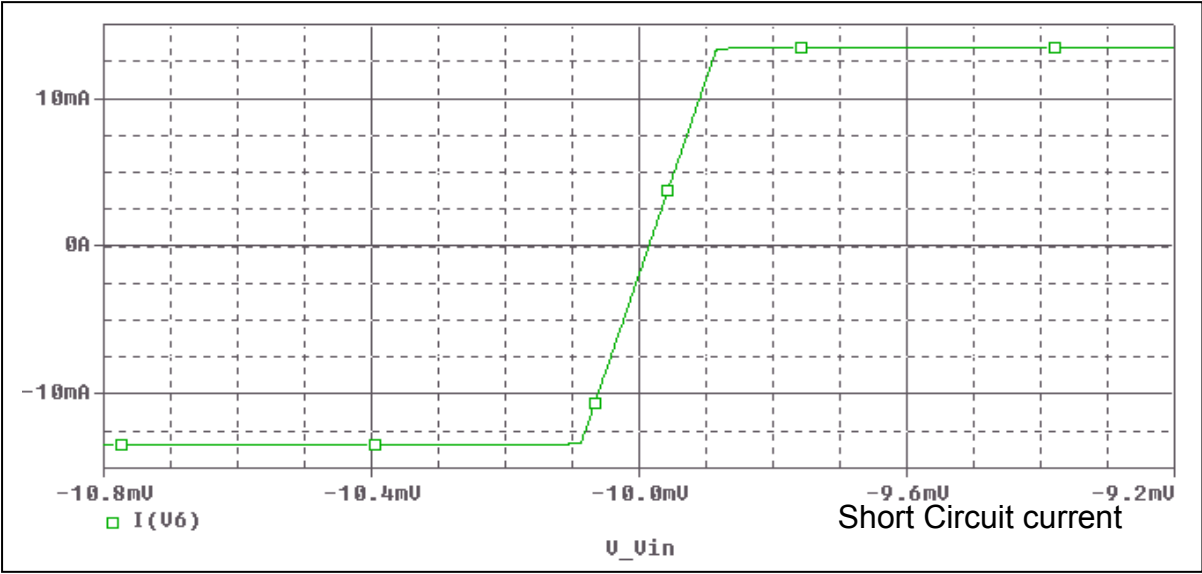
	Data sheet	Simulation	%Error
f-0dB(MHz)	1	1.035	3.5
Av-dc	9000	9555	6.166666667

Output Short Circuit Current - Ios

Evaluation circuit



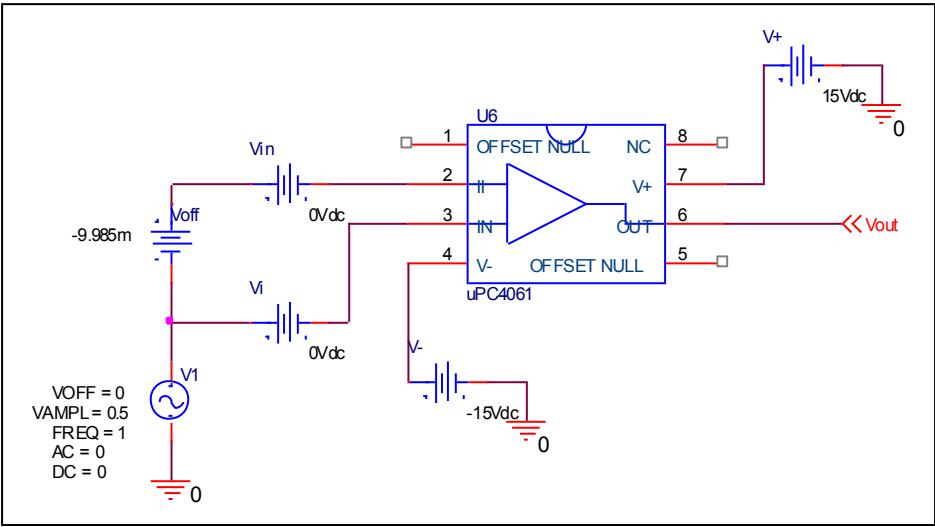
Simulation result



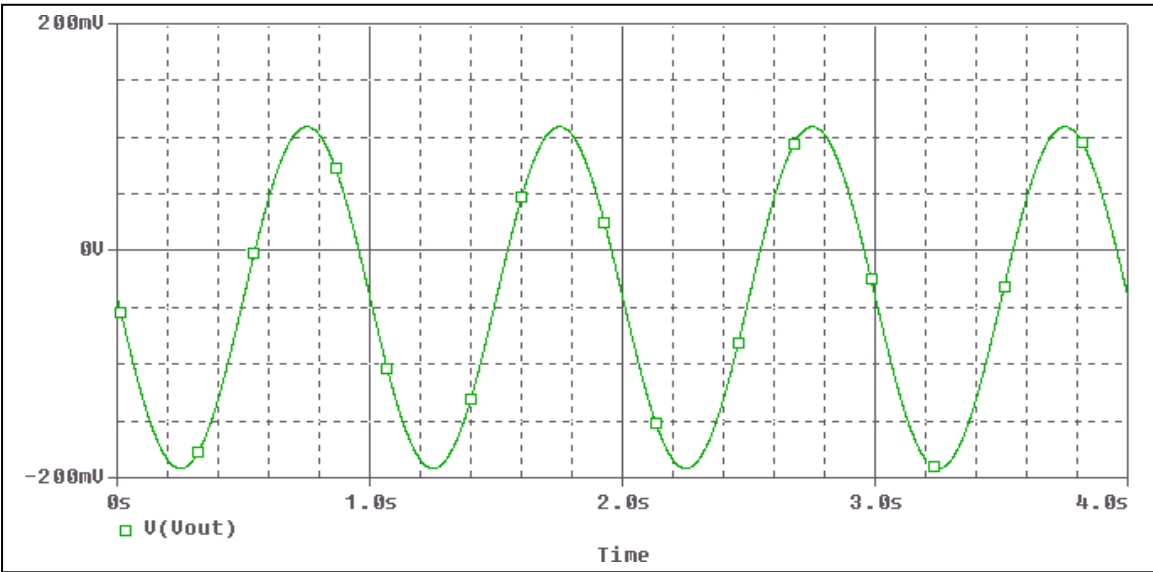
Short Circuit Current	Data sheet	Simulation	%Error
	13mA	13.467mA	3.592

Common-Mode Rejection Voltage gain

Evaluation circuit



Simulation result



Common mode gain=0.301/1
Common Mode Reject Ratio=9555/0.301=31744

CMRR	Data sheet	Simulation	%Error
	31623	31744	0.382632894