

Device Modeling Report

COMPONENTS:

Operational Amplifier NPN BJT Input

PART NUMBER: uPC741G2

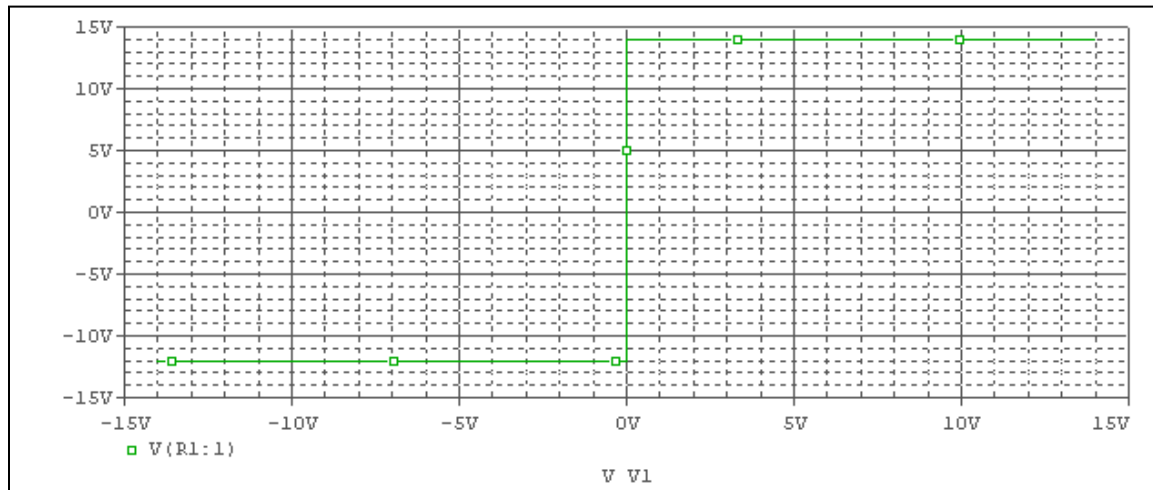
MANUFACTURER: NEC ELECTRONICS



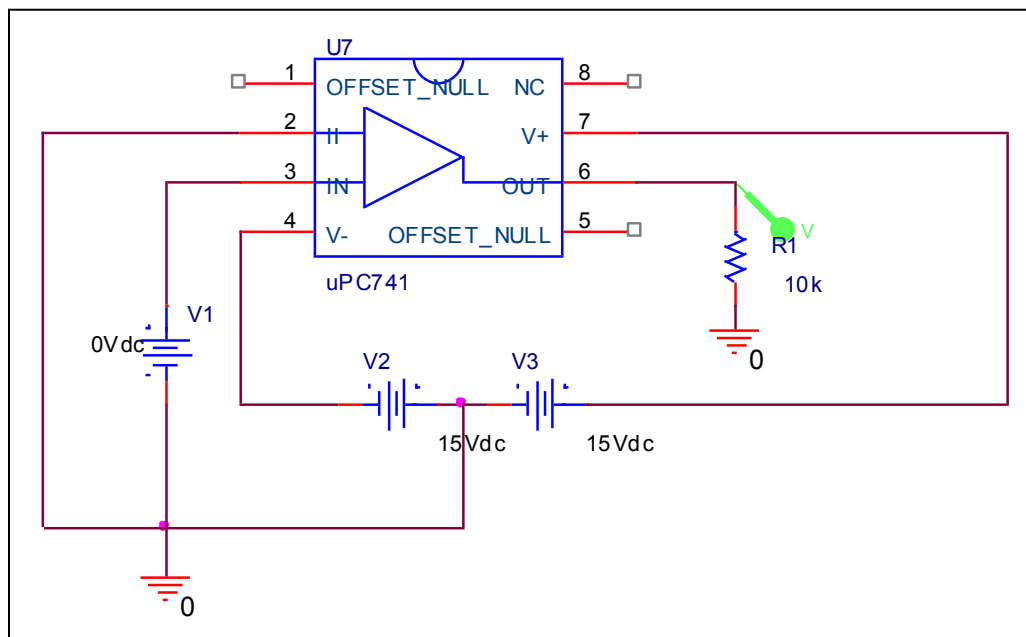
Bee Technologies Inc.

Output Voltage Swing ($V_{\pm} = \pm 15$)

Circuit Simulation Result



Evaluation circuit

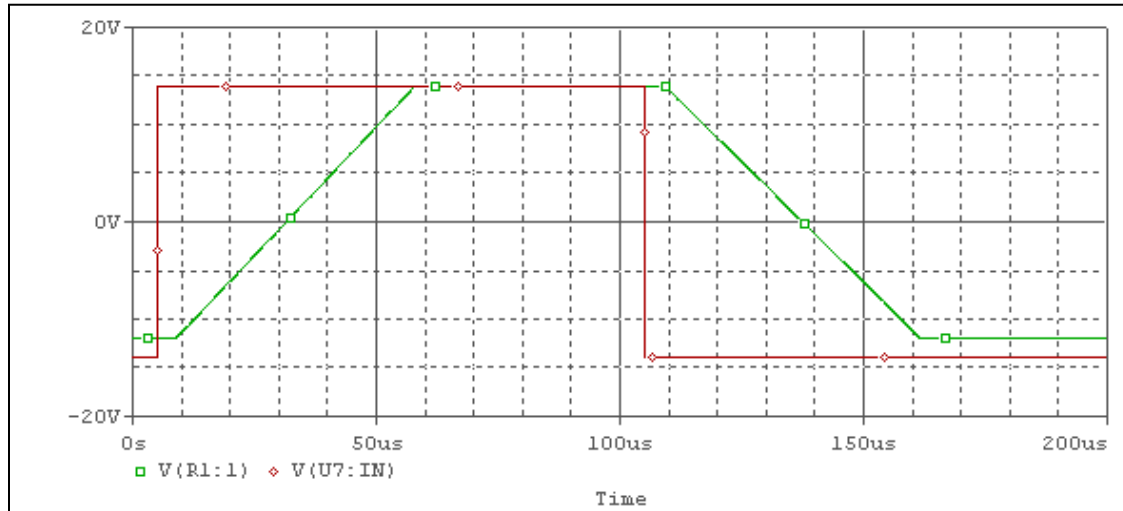


Compare Measurement vs. Simulation

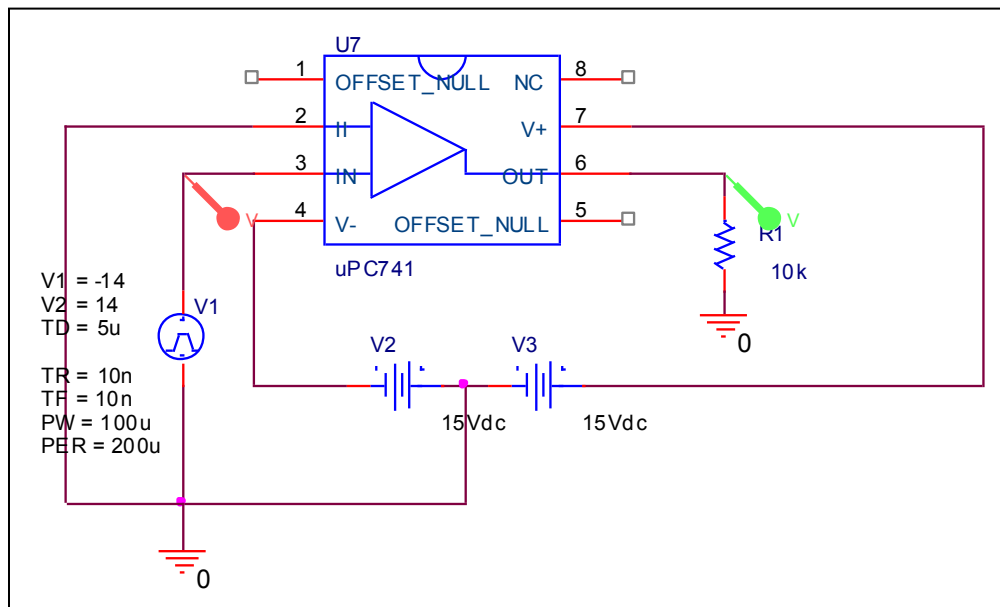
	Measurement		Simulation		Error	
+Vout	14	V	13.999	V	0.007	%
-Vout	-12	V	-11.999	V	0.007	%

Slew Rate

Circuit Simulation Result



Evaluation circuit

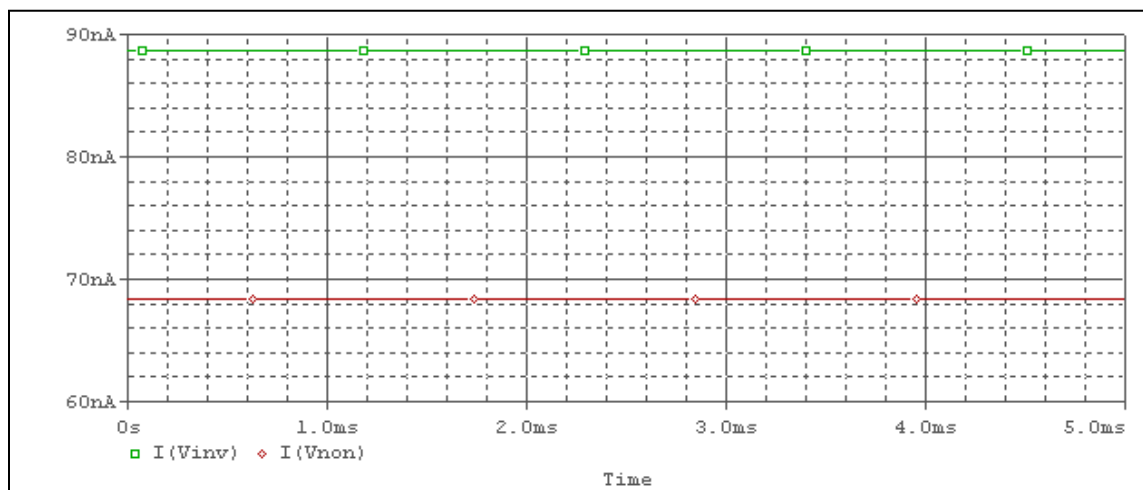


Compare Measurement vs. Simulation

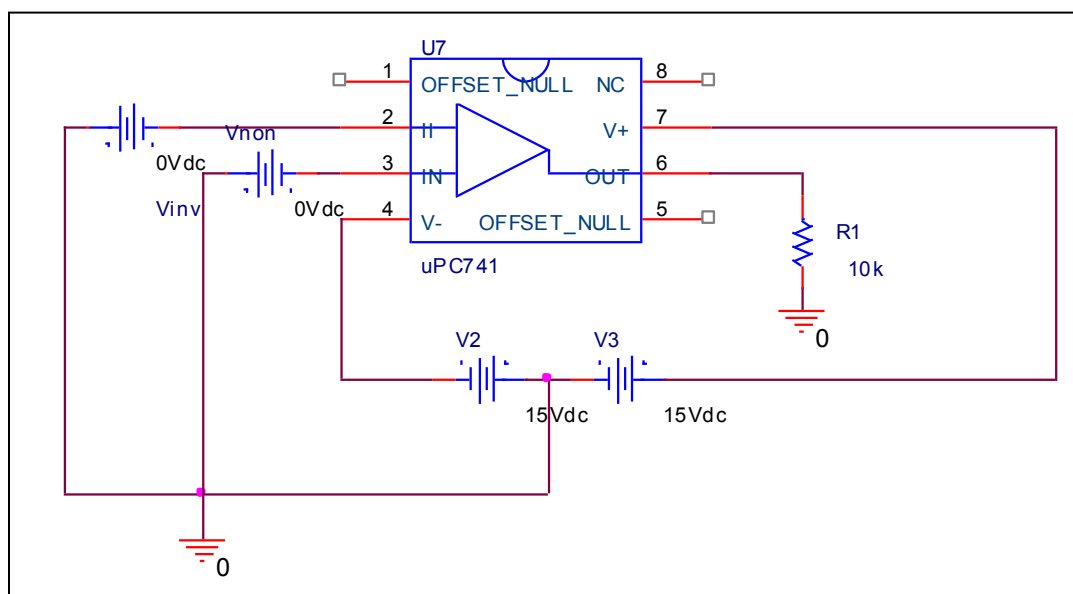
	Measurement		Simulation		Error	
+SR	+0.5	V/us	+0.53013	V/us	6.026	%
-SR	-0.5	V/us	-0.48985	V/us	2.03	%

Input Bias Current

Circuit Simulation Result



Evaluation circuit

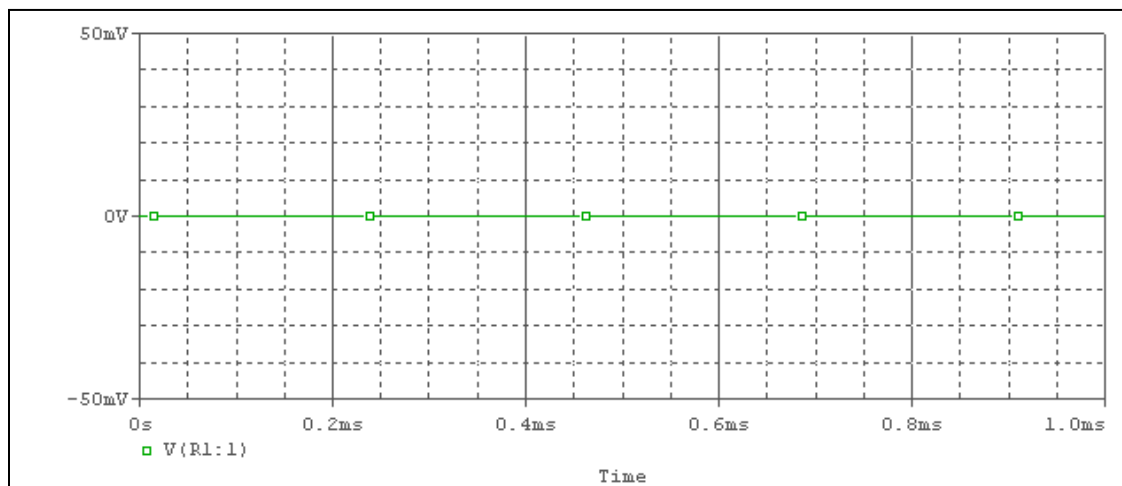


Compare Measurement vs. Simulation

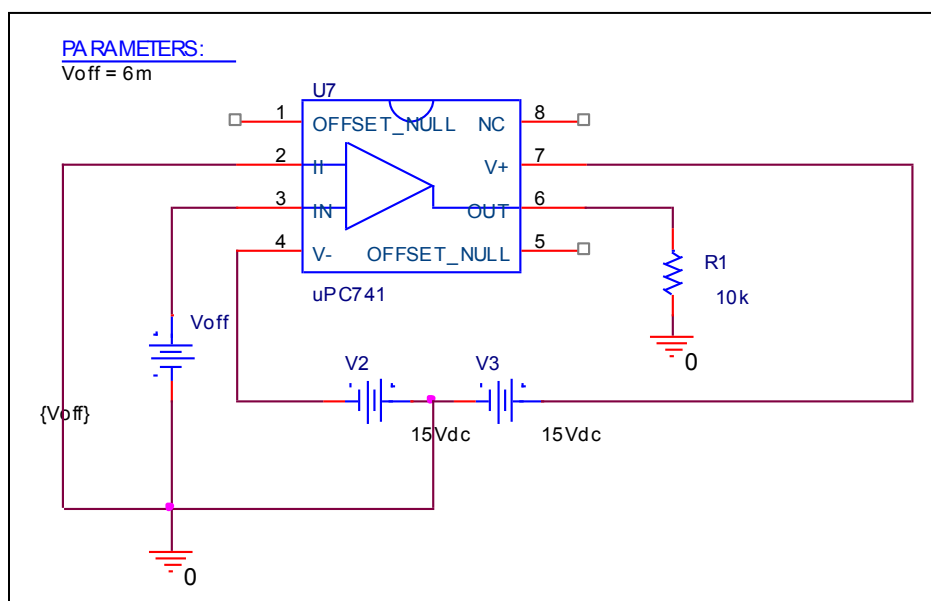
	Measurement		Simulation		Error	
lb	80	nA	78.522	nA	1.8475	%
lbos	20	nA	20.265	nA	1.325	%

Input Offset Voltage

Circuit Simulation Result



Evaluation circuit

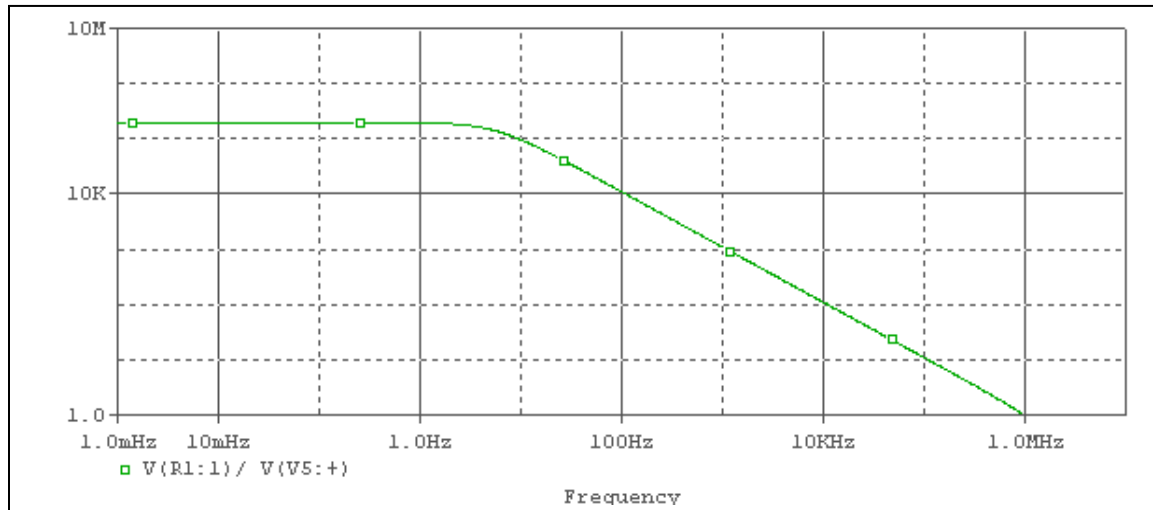


Compare Measurement vs. Simulation

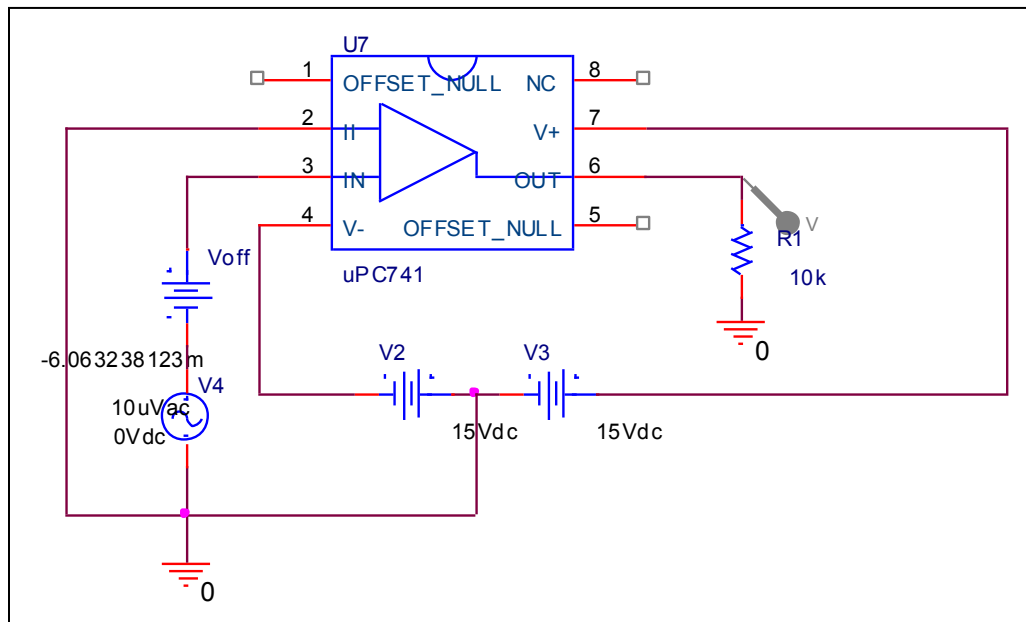
	Measurement		Simulation		Error	
Vos	6	mV	6.063238123	mV	1.05396871	%

Open Loop Gain (DC) and Unity Gain Frequency

Circuit Simulation Result



Evaluation circuit

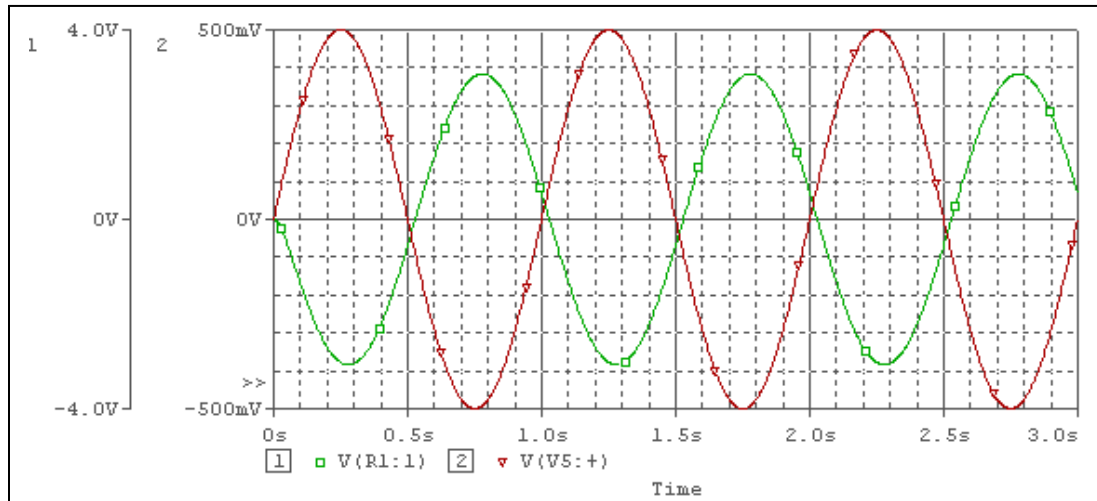


Compare Measurement vs. Simulation

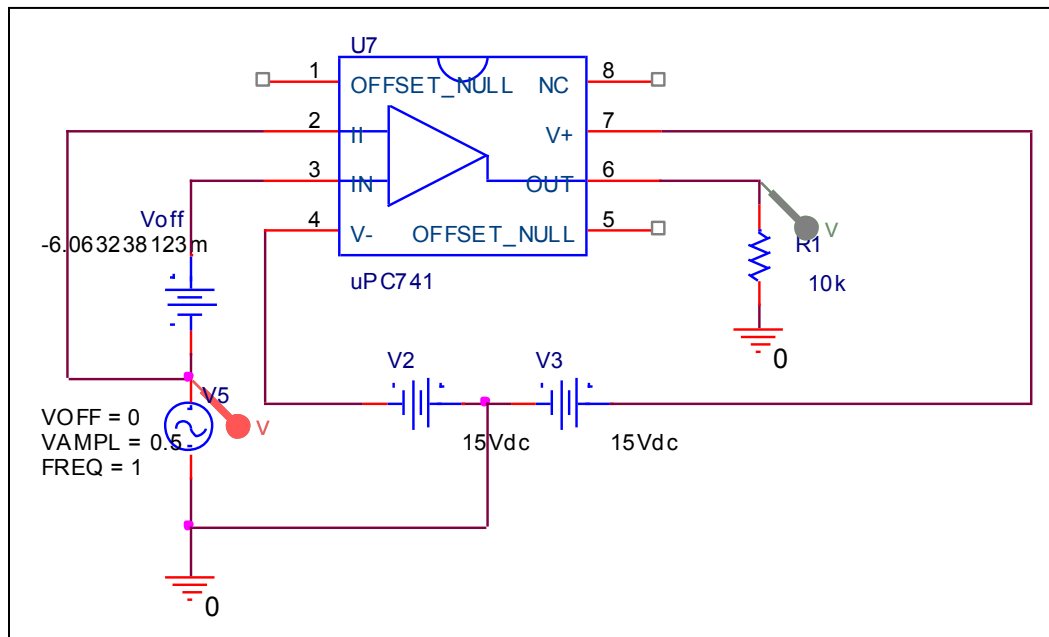
	Measurement		Simulation		Error	
Av-dc	200	V/mV	198.022	V/mV	0.989	%
f-0db	1	MHz	972.623	kHz	2.7377	%

Common - Mode Rejection Ratio – CMRR

Circuit Simulation Result



Evaluation circuit



Common-model gain = 6.1556 V/V

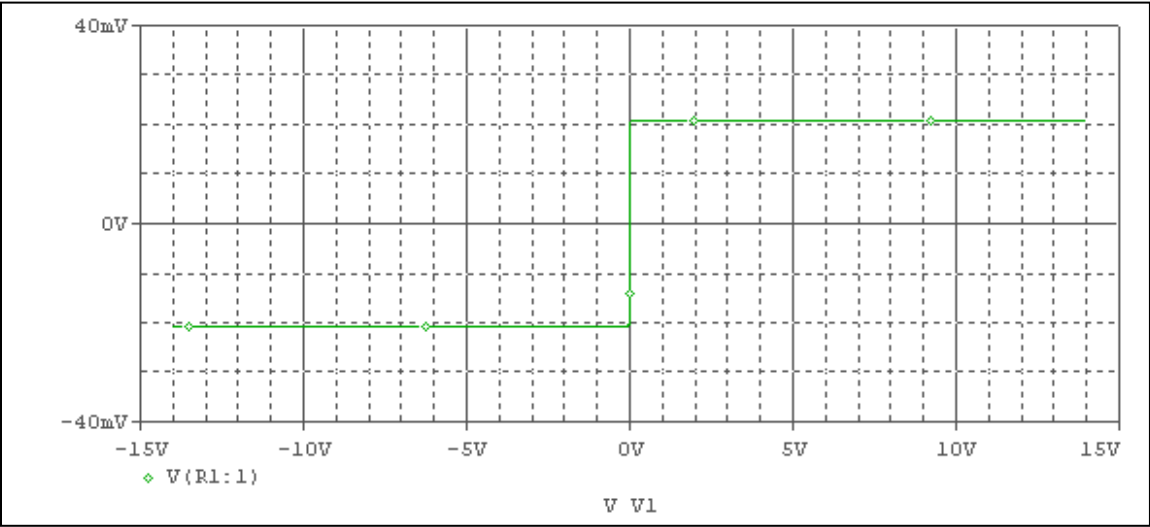
$$\text{CMRR} = 198022 / 6.1556 = 32169, 20\log_{10}(32169) = 90.15\text{dB}$$

Compare Measurement vs. Simulation

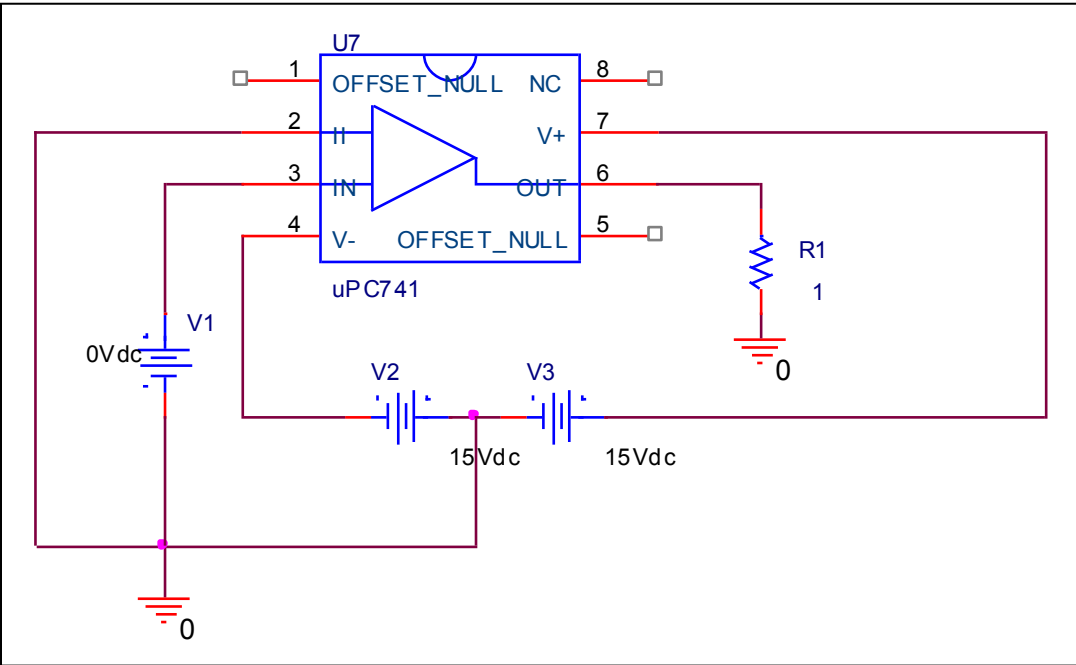
	Measurement		Simulation		Error	
CMRR	90	dB	90.15	dB	0.167	%

Output Short Circuit Current

Circuit Simulation Result



Evaluation circuit



Compare Measurement vs. Simulation

	Measurement		Simulation		Error	
Ios	20	mA	20.613	mA	3.065	%