

Device Modeling Report

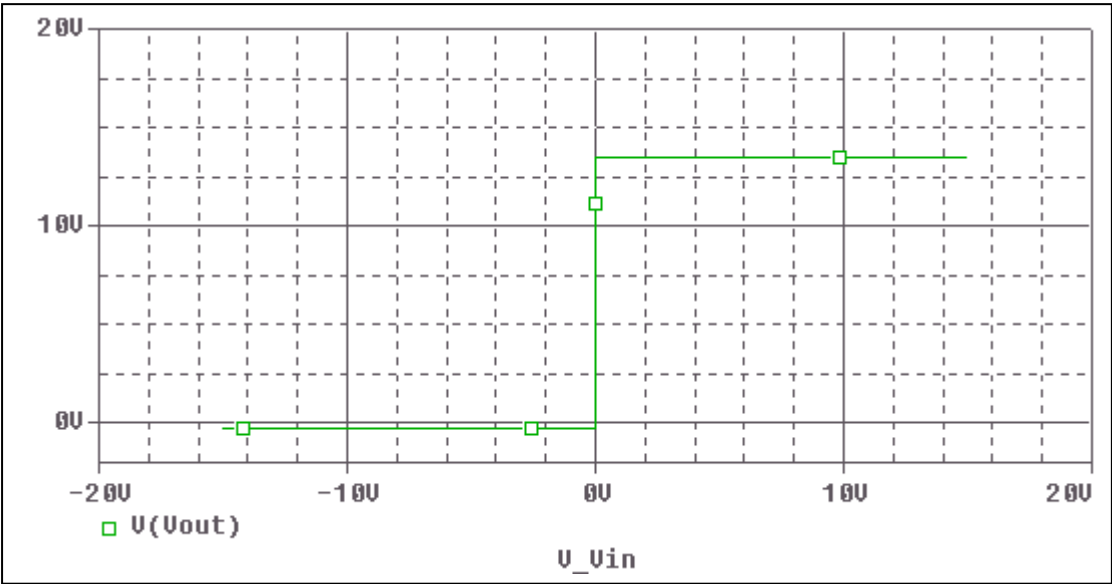
COMPONENTS:MOSFET: OPERATIONAL AMPLIFIER
PART NUMBER:HA17358A
MANUFACTURER:RENESAS



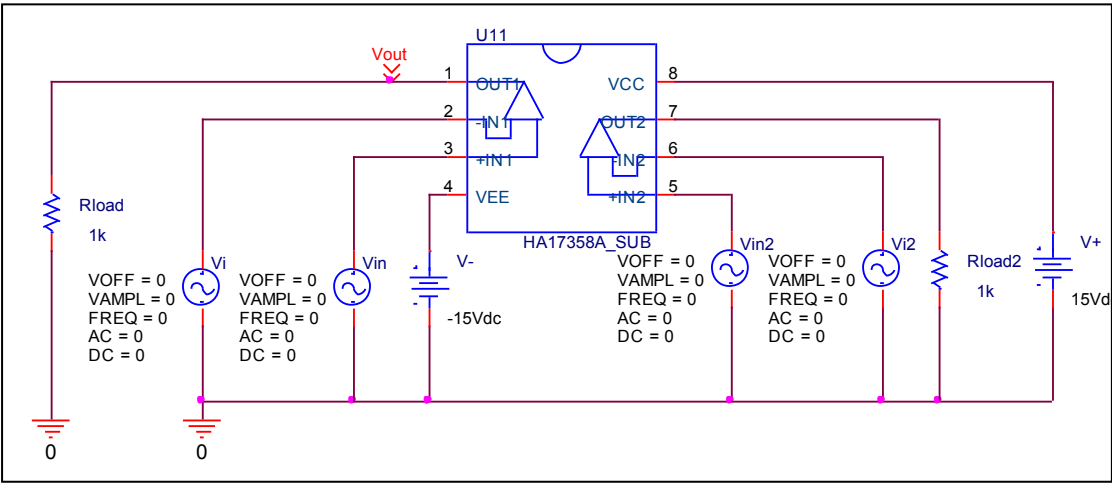
Bee Technologies Inc.

Output Voltage Swing, +Vout and -Vout

Simulation result



Evaluation circuit

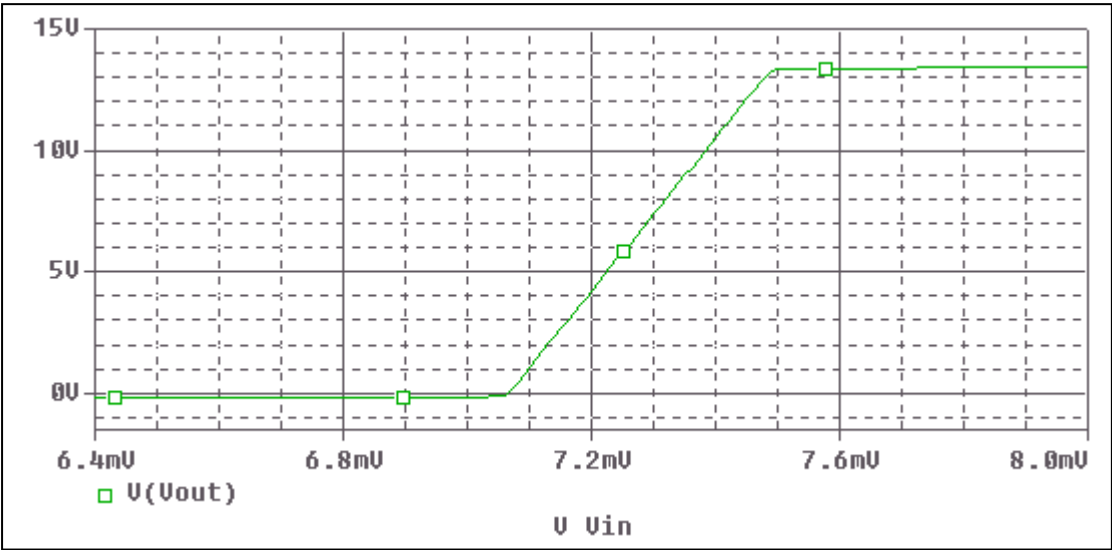


These simulation results are compared with $\pm V_{out}$

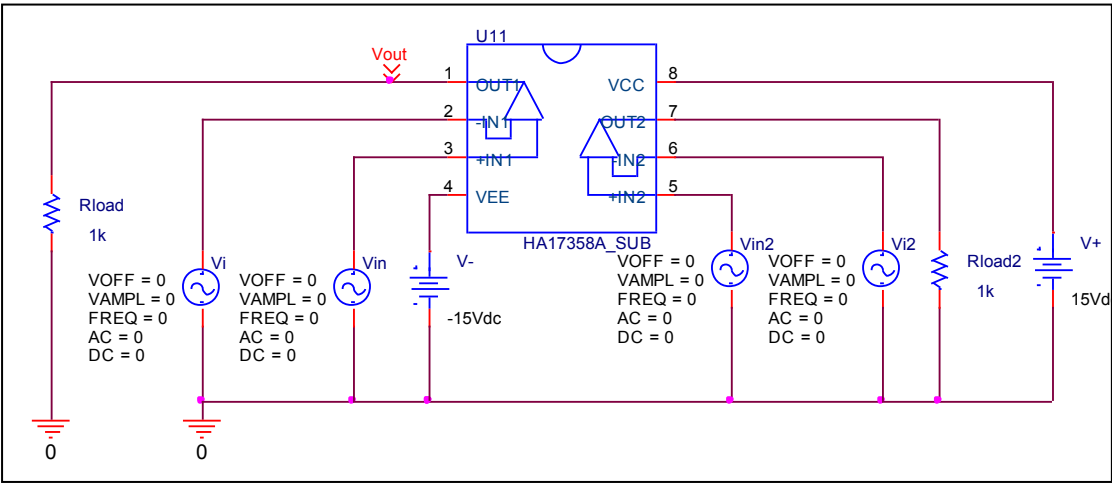
Output Voltage Swing	Data sheet	Simulation	%Error
+Vout(V)	13.5	13.508	0.059
-Vout(V)	0.3	0.314	4.6

Input Offset Voltage

Simulation result



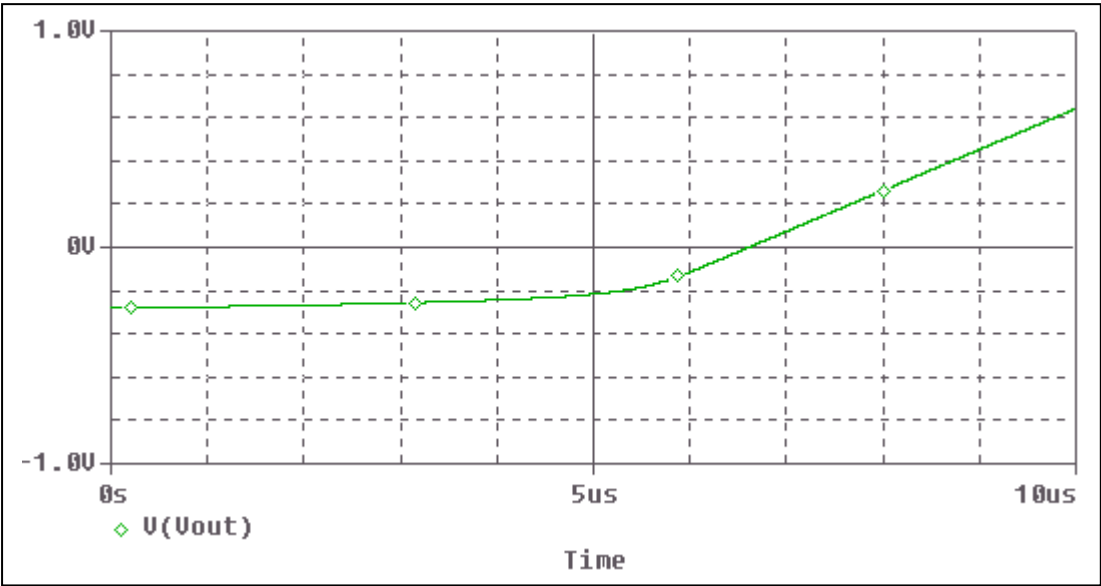
Evaluation circuit



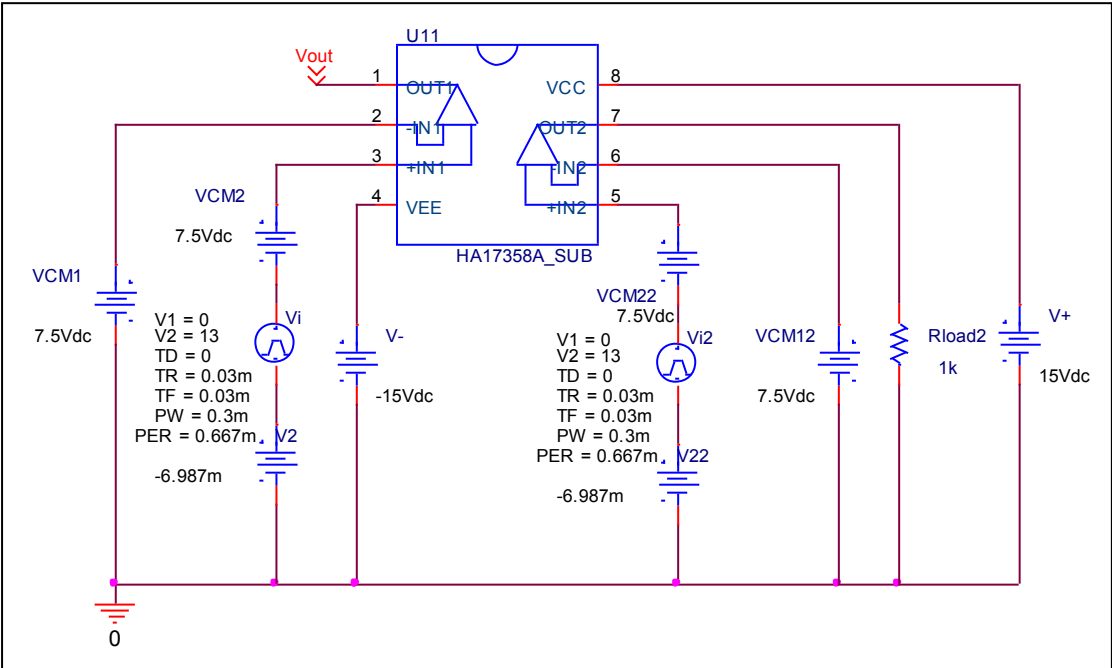
	Measurement		Simulation		Error	
V_{os}	7	mV	6.987	mV	0.185	%

Slew Rate, +SR, -SR

Simulation result



Evaluation circuit

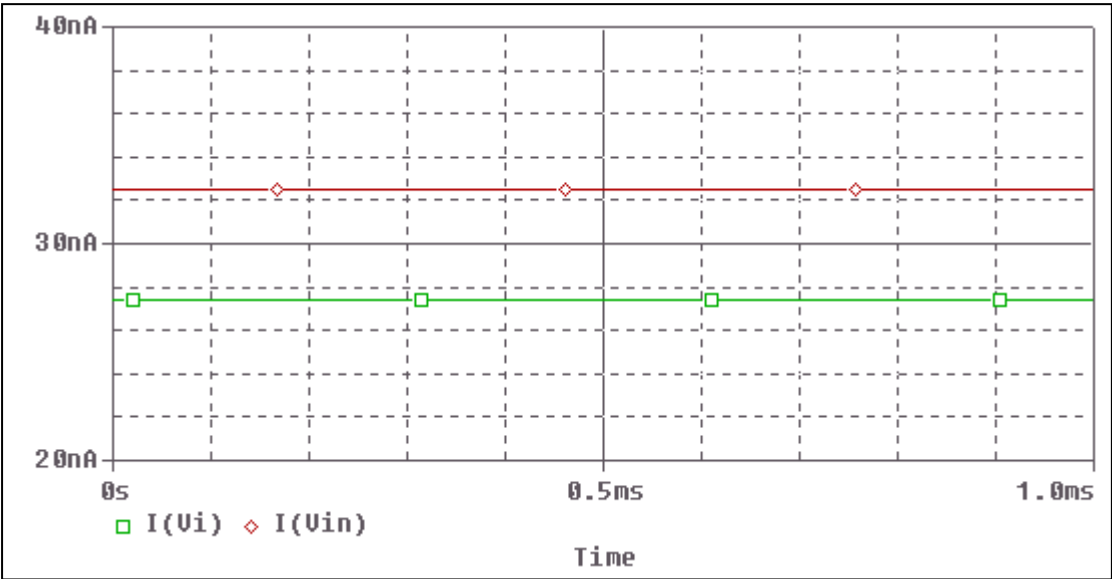


Output voltage change 0.2V in 1 μs (If no good can change **C2** of Spice Model Editor)

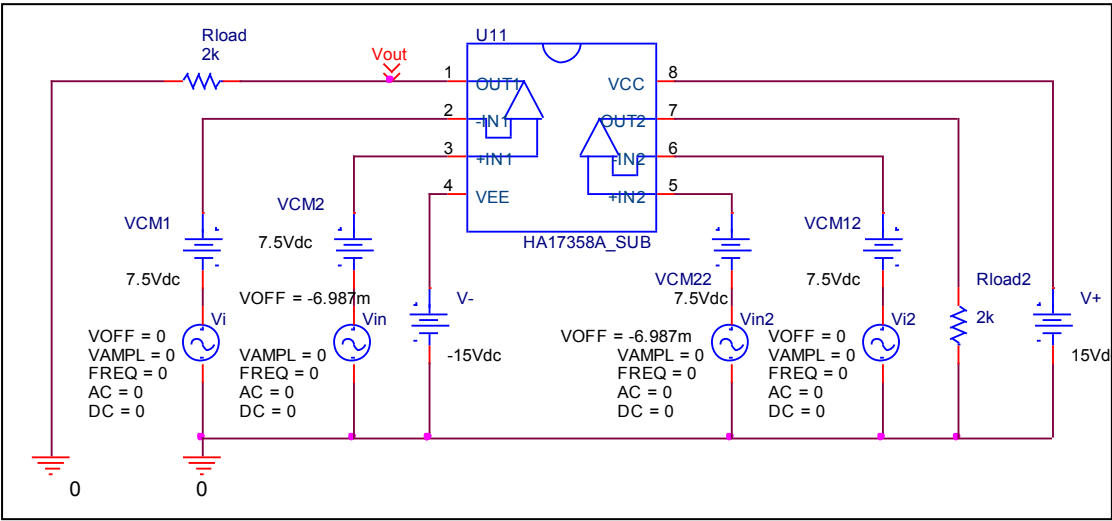
Slew Rate(v/us)	Data sheet	Simulation	%Error
	0.2	0.188	6

Input current Ib, Ibos

Simulation result



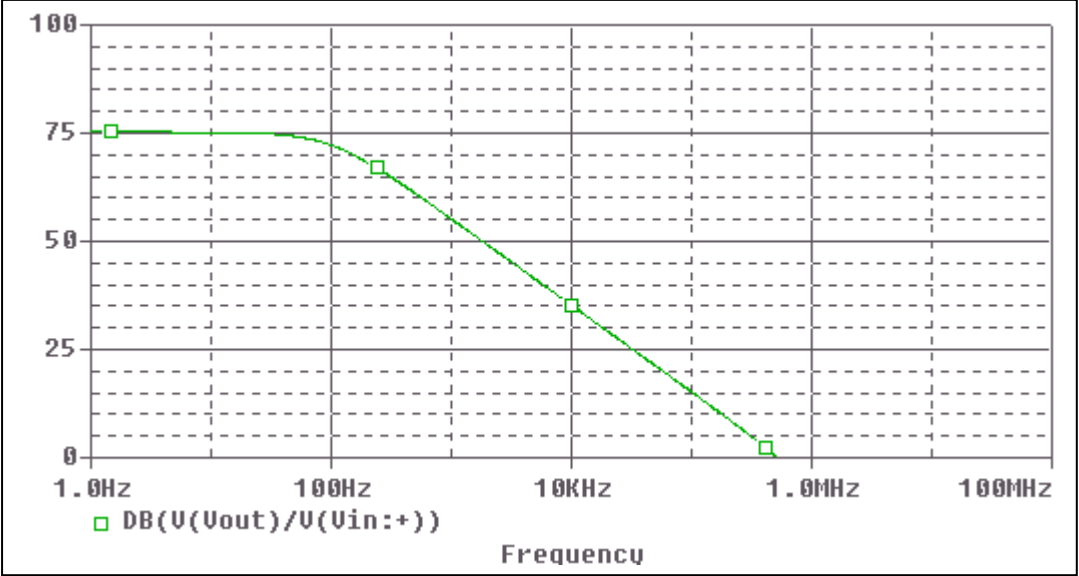
Evaluation circuit



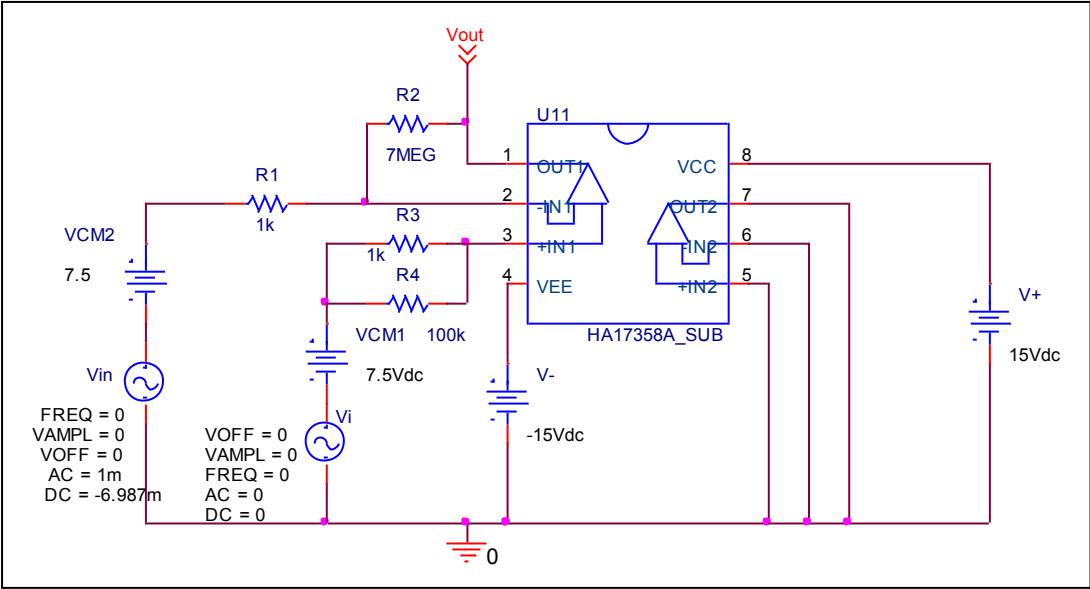
	Data sheet	Simulation	%Error
Ib(nA)	30	29.95	0.166
Ibos(nA)	5	5.09	1.8

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

Simulation result



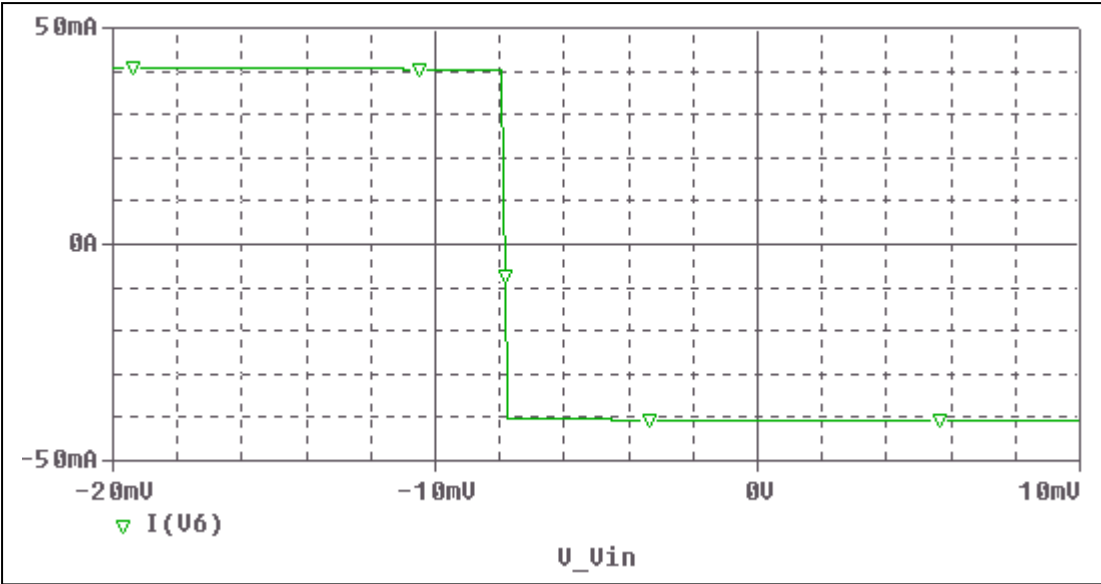
Evaluation circuit



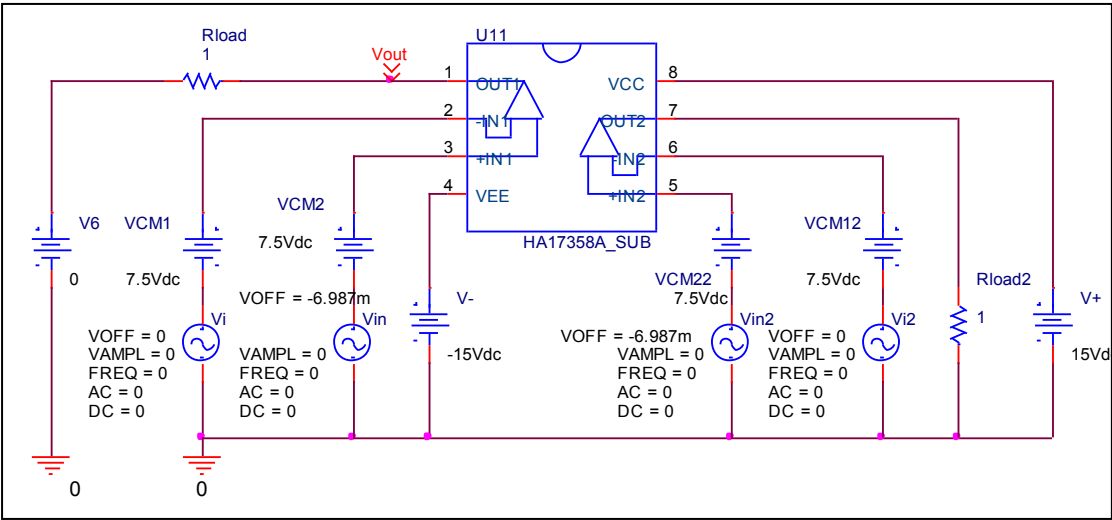
	Data sheet	Simulation	%Error
f-0dB(MHz)	0.5	0.513	2.6
Av-dc	75dB(Min)	75.24dB	0.32

Output Short Circuit Current - Ios

Simulation result



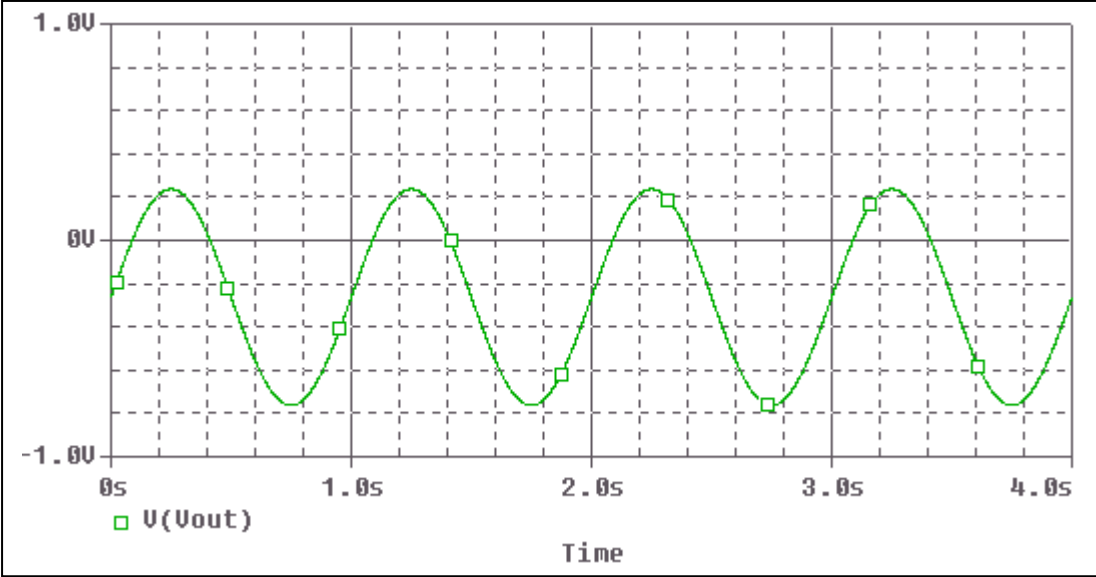
Evaluation circuit



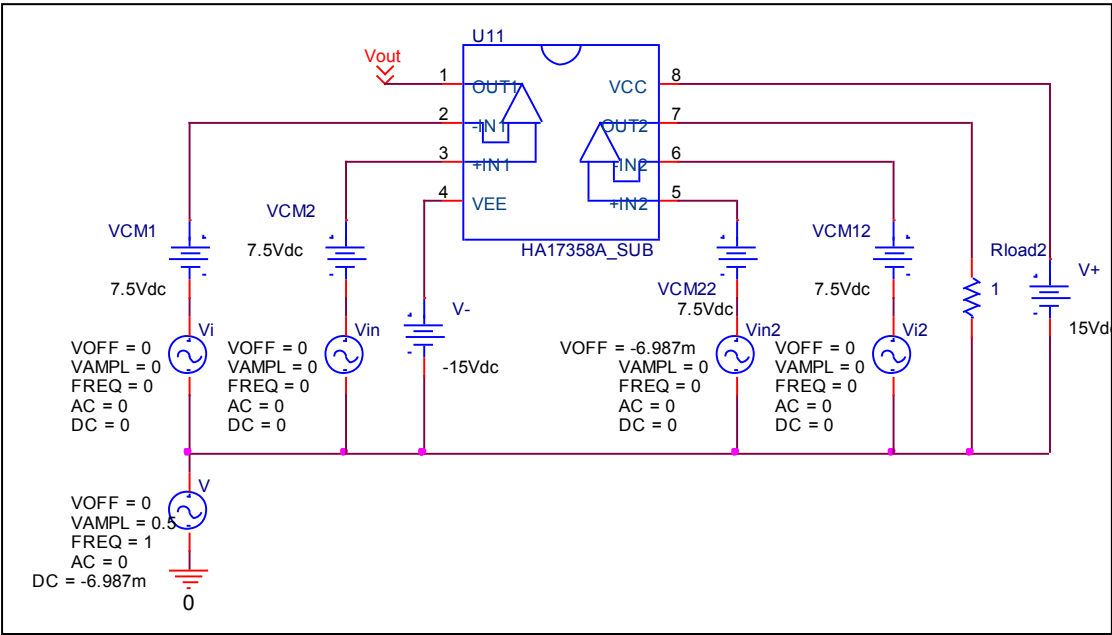
Short Circuit Current	Data sheet	Simulation	%Error
	40mA	40.5mA	1.25

Common-Mode Rejection Voltage gain

Simulation result



Evaluation circuit



Common mode gain=1/0.31623
Common Mode Reject Ratio=/3.162=

CMRR	Data sheet	Simulation	%Error
	10000	10000	0