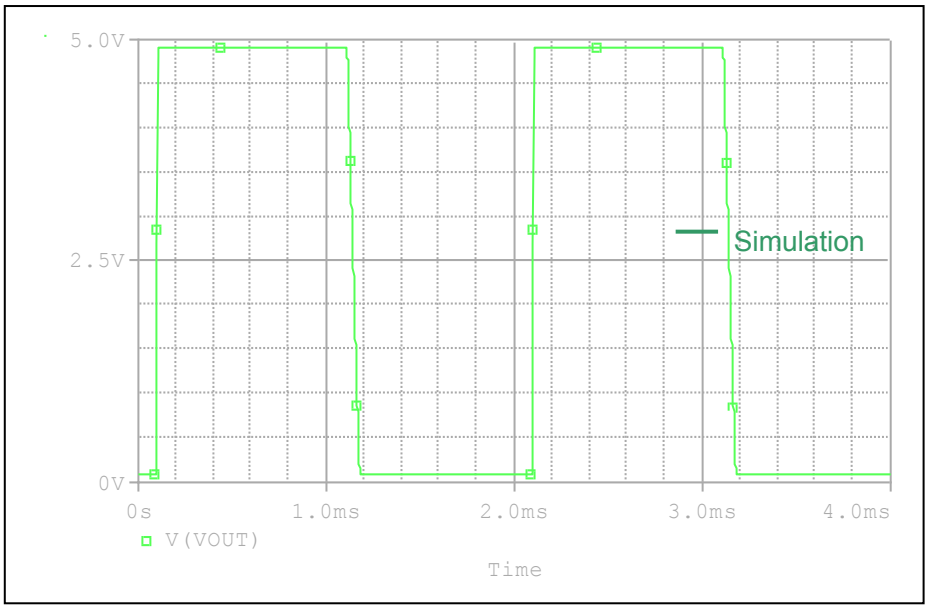
# Device Modeling Report

COMPONENTS : OPERATIONAL AMPLIFIER
PART NUMBER : NJM2746
MANUFACTURER: NEW JAPAN RADIO

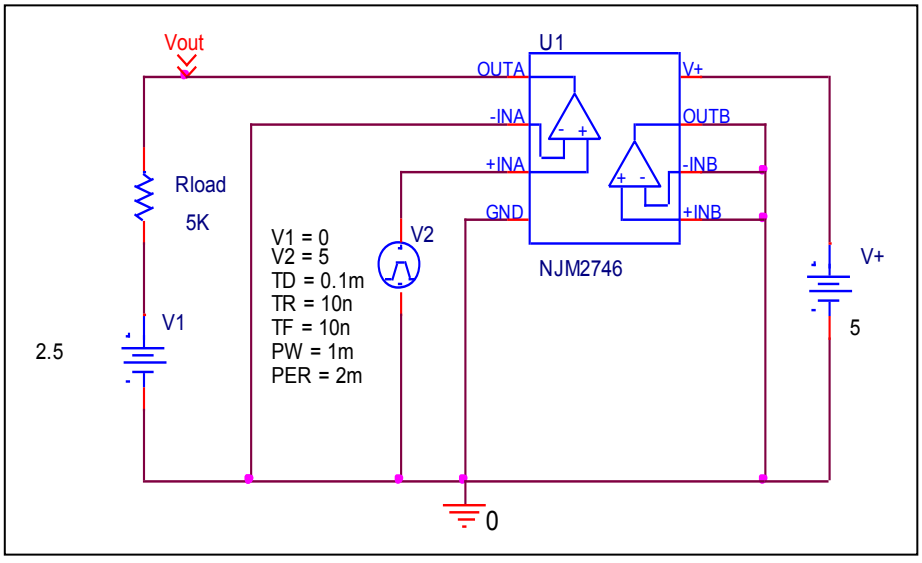

**Bee Technologies Inc.**

## Output Voltage Swing

Simulation result




Evaluation circuit

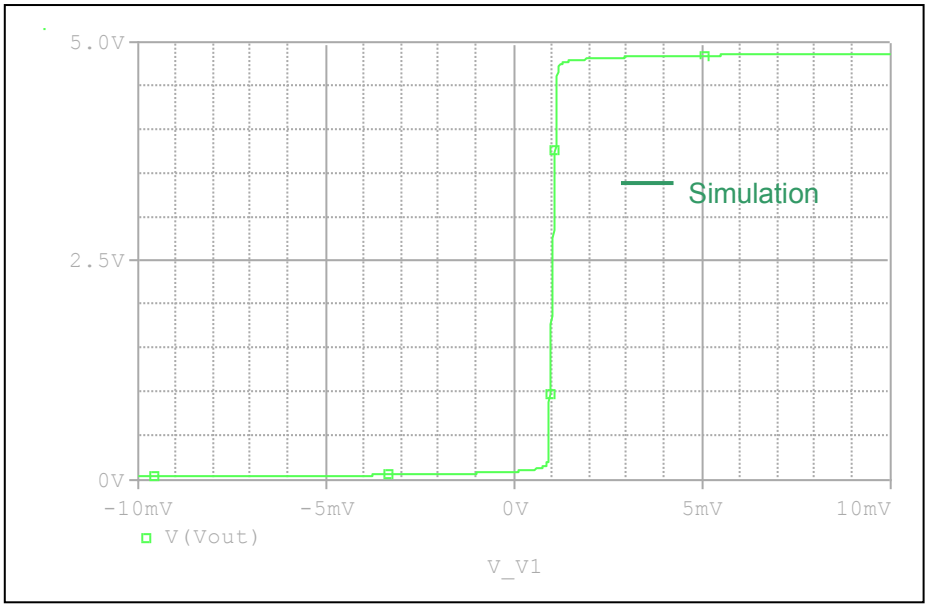



Comparison Table

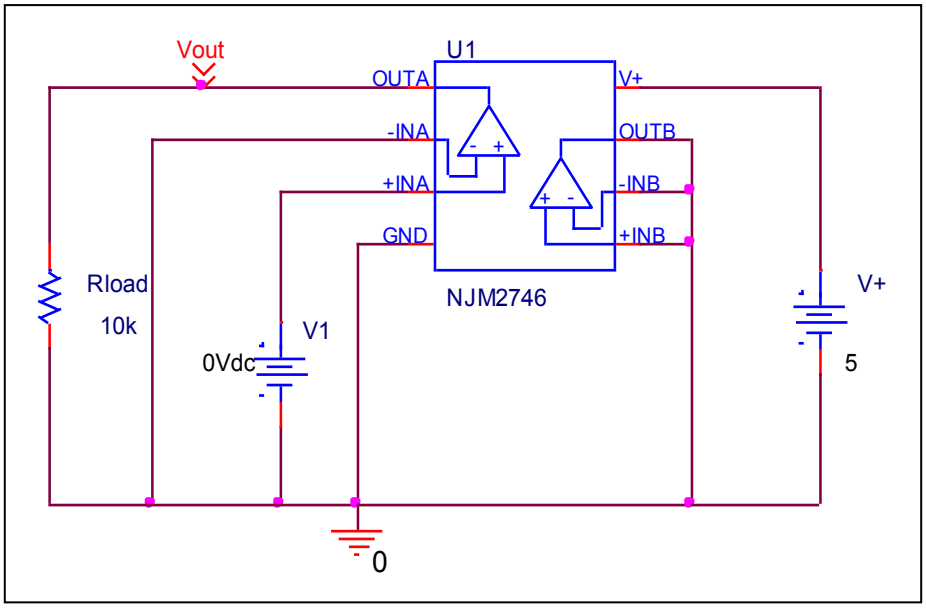
| $R_L$ = 5 kΩ to 2.5 V | Measurement | Simulation | %Error |
|---|---|---|---|
| $V_{OH}$ (V) | 4.9 | 4.9002 | 0.004 |
| $V_{OL}$ (V) | 0.1 | 0.099967 | -0.033 |

## Input Offset Voltage

Simulation result




Evaluation Circuit

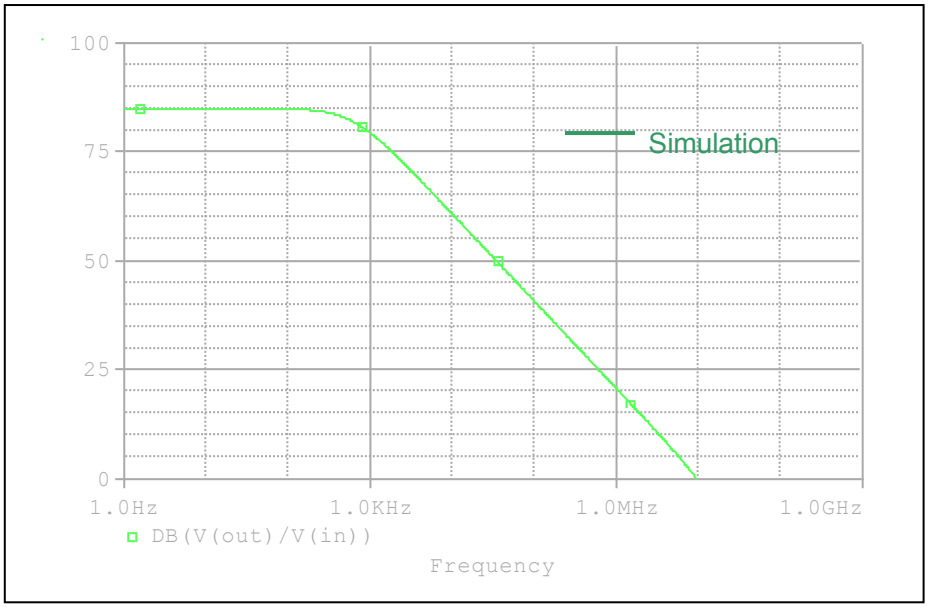



Comparison Table

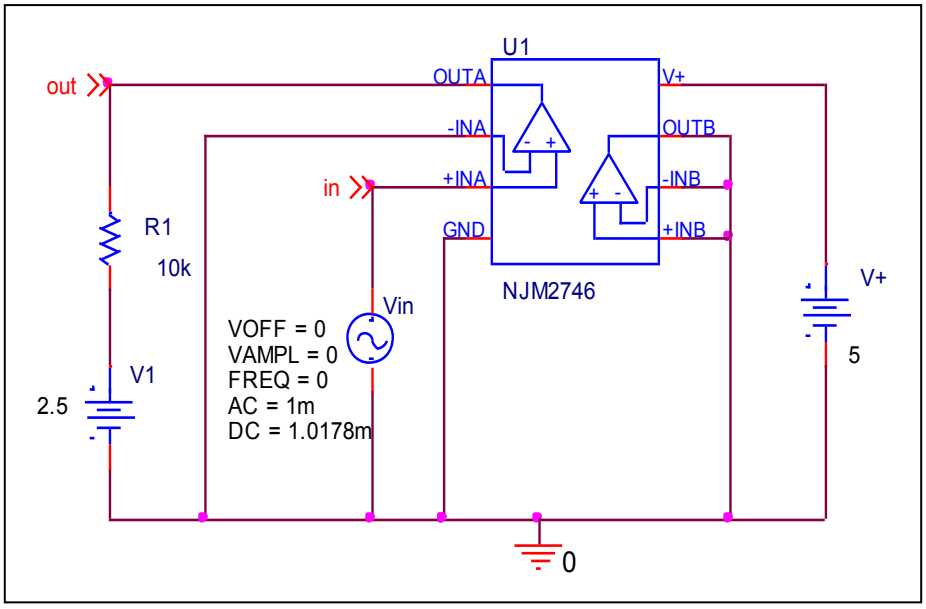
| Input offset Voltage | Measurement | Simulation | %Error |
|---|---|---|---|
| **$V_{OS}$ (mV)** | 1 | 1.0178 | 1.780 |

## Open loop Voltage Gain

Simulation result




Evaluation Circuit

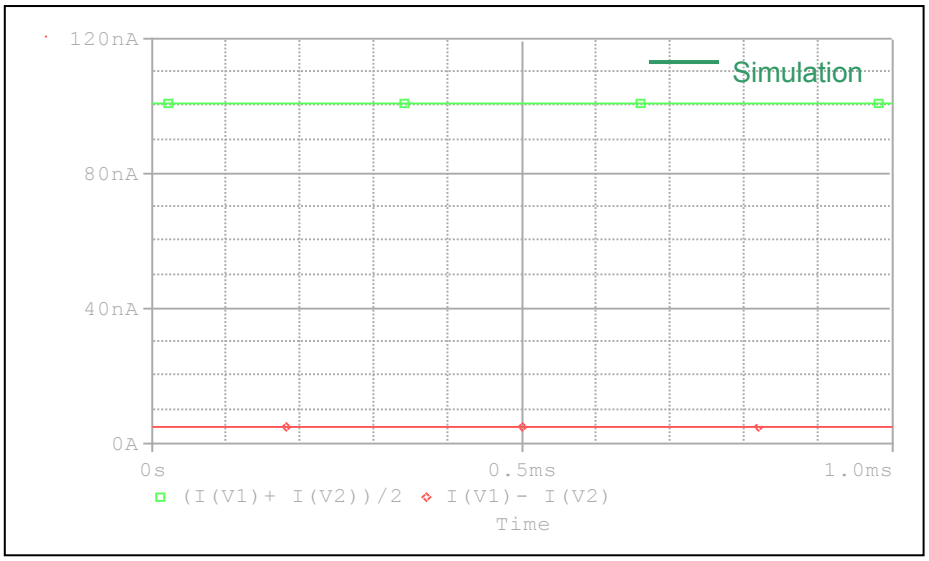



Comparison Table

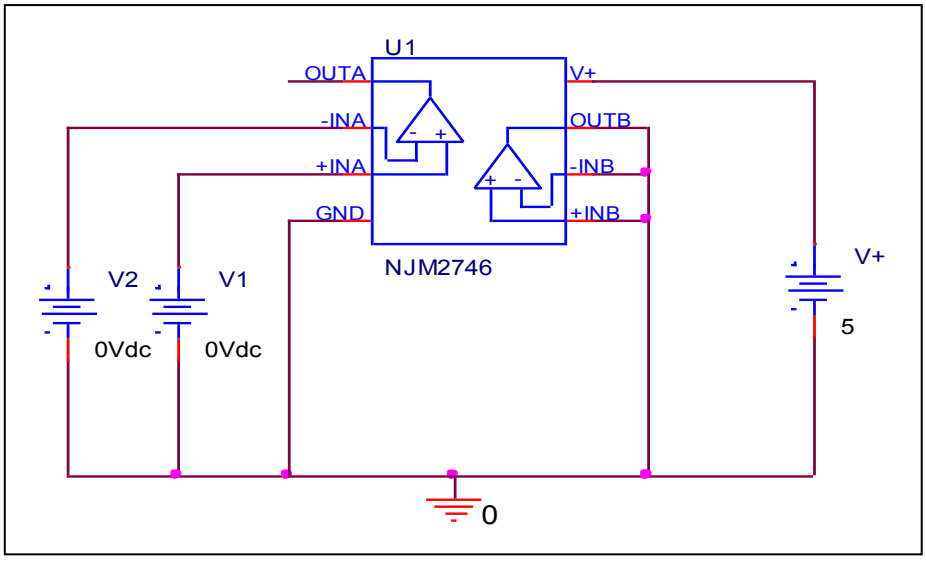
| | Measurement | Simulation | % Error |
|---|---|---|---|
| **Av (dB)** | 85 | 85.005 | 0.006 |

## Input Current

Simulation result




Evaluation Circuit

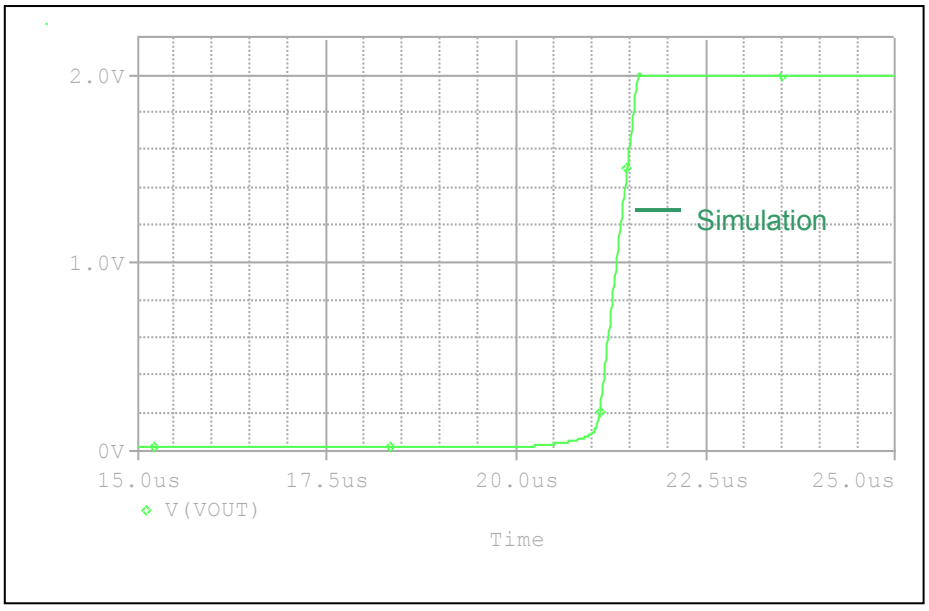



Comparison Table

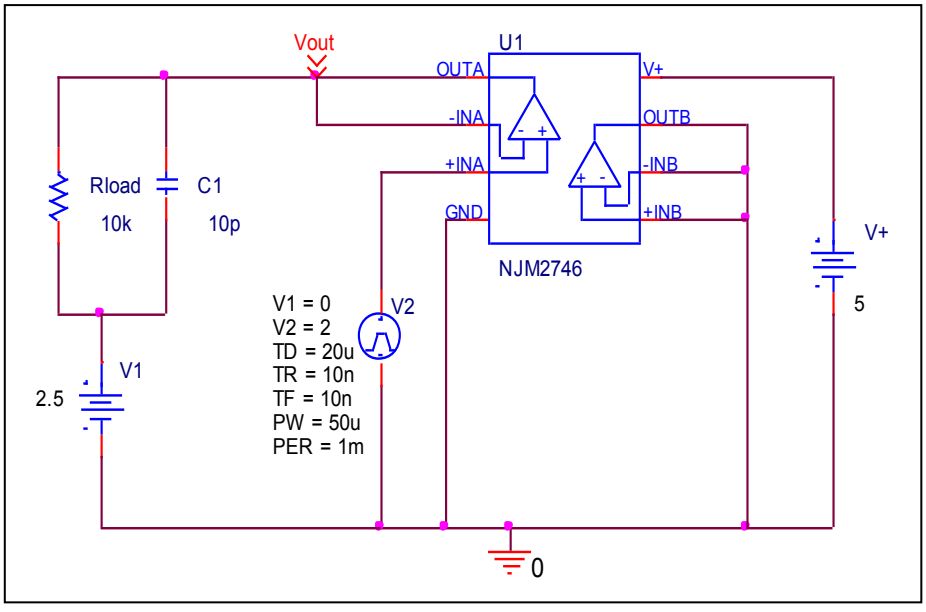
| Input Current | Measurement | Simulation | % Error |
|---|---|---|---|
| **$I_b$ (nA)** | 100 | 100.928 | 0.928 |
| **$I_{bos}$ (nA)** | 5 | 5.0595 | 1.190 |

## Slew Rate

Simulation result




Evaluation Circuit

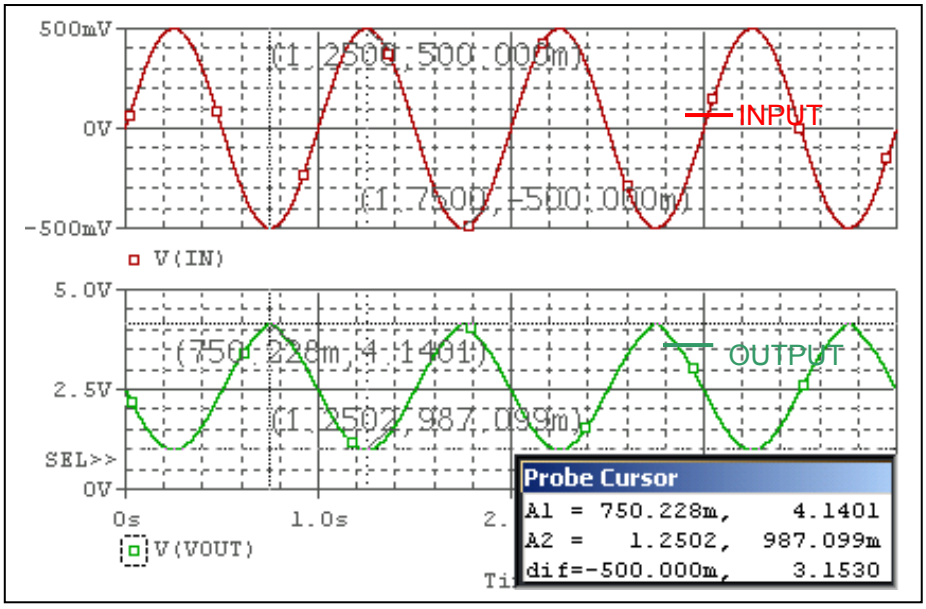



Comparison Table

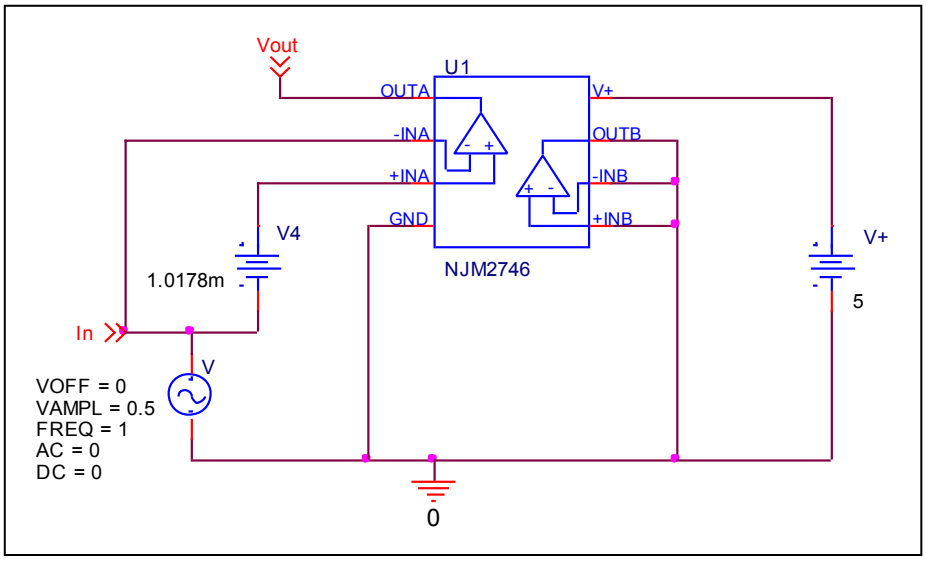
| Slew Rate | Measurement | Simulation | %Error |
|---|---|---|---|
| SR (V/us) | 3.5 | 3.575 | 2.143 |

## Common-Mode Rejection Ratio

Simulation result




Evaluation Circuit




**CMRR = AV/ACM**
**= 17793/(3.153/1)**

Comparison Table

| | Measurement | Simulation | % Error |
|---|---|---|---|
| **CMRR (dB)** | 75 | 75.031 | 0.041 |