

# Device Modeling Report

COMPONENTS: RESISTOR  
PART NUMBER: ERF10AJ181  
THERMAL:TA= 80(degree)  
MANUFACTURER: MATSUSHITA



**Bee Technologies Inc.**

## Theory: Auto Balancing Bridge Method

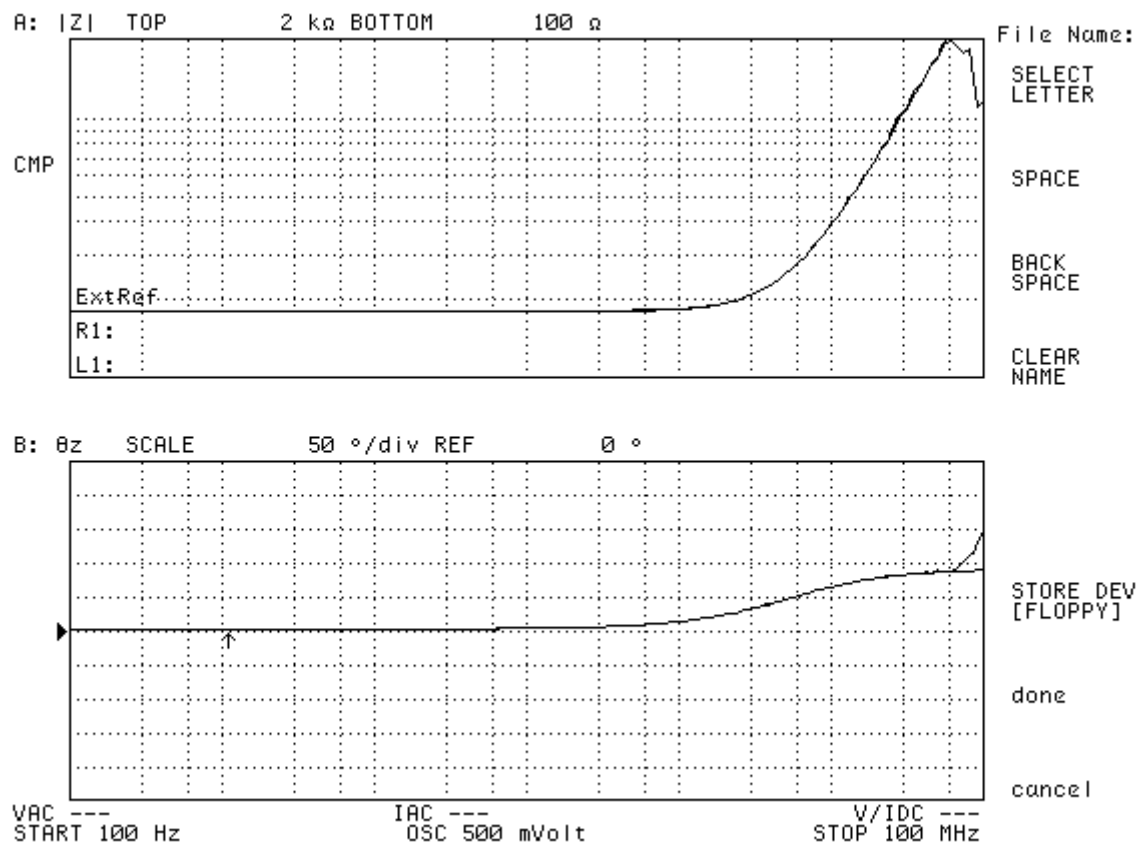
### Optimization of Simulation

Range of adjustment Frequency: 100 to 100M(Hz)

Frequency vs.  $|Z|$  and Frequency vs.  $\theta_z$  Characteristic

Attention

*Please use SPICE MODEL within the range from 100 to 100M(Hz)*



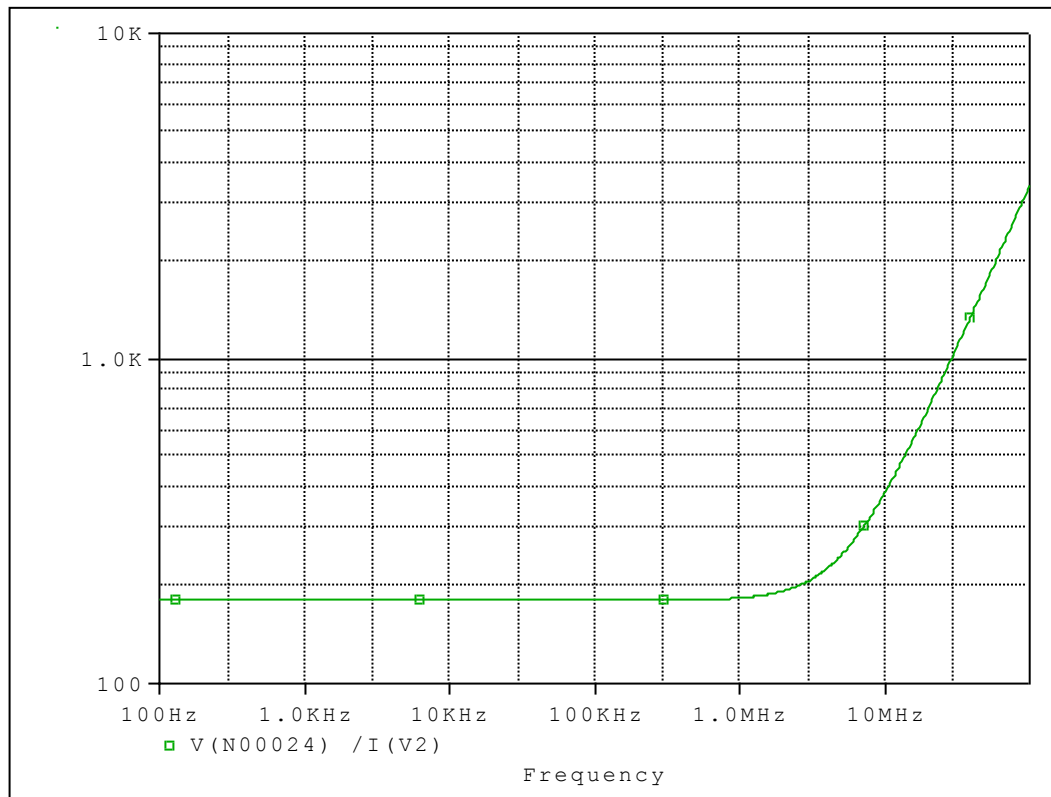
| Measurement |  |  |
|-------------|--|--|
| R1          |  |  |
| L1          |  |  |
| C1          |  |  |

Equivalent circuit

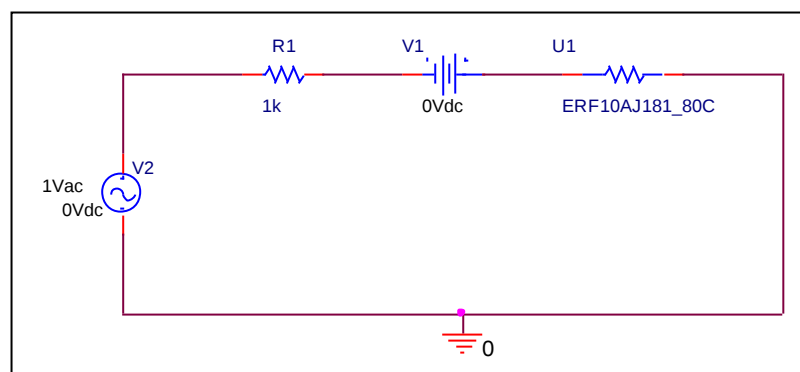


## Frequency vs. |Z| Characteristic

Circuit simulation result



Evaluation Circuit



## Simulation Result

| Frequency(HZ) | Z (ohm)<br>Measurement | Z (ohm)<br>Circuit Simulation | %Error |
|---------------|------------------------|-------------------------------|--------|
| 100           | 179.132                | 180.267                       | 0.634  |
| 1K            | 179.209                | 180.265                       | 0.589  |
| 10K           | 178.954                | 180.265                       | 0.733  |
| 100K          | 179.210                | 180.297                       | 0.606  |
| 1M            | 182.904                | 183.438                       | 0.292  |
| 10M           | 389.915                | 384.569                       | 1.371  |