

# Device Modeling Report

COMPONENTS: RESISTOR  
PART NUMBER: ERF5AJ221  
THERMAL:TA=80(degree)  
MANUFACTURER: MATSUSHITA



**Bee Technologies Inc.**

## Theory: Auto Balancing Bridge Method

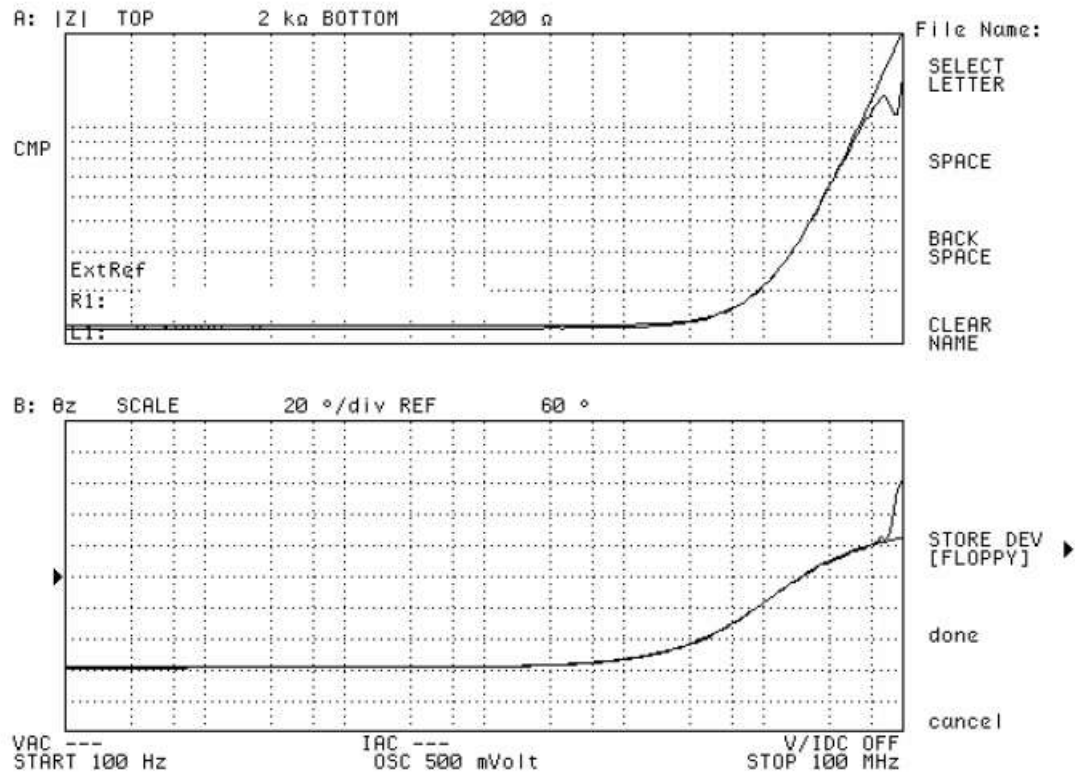
### Optimization of Simulation

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

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

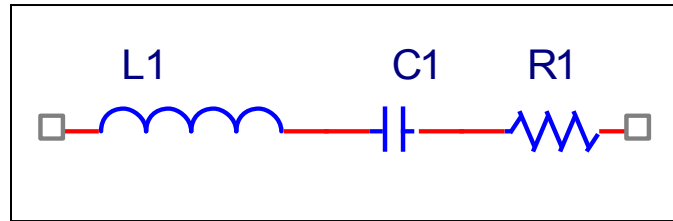
Attention

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



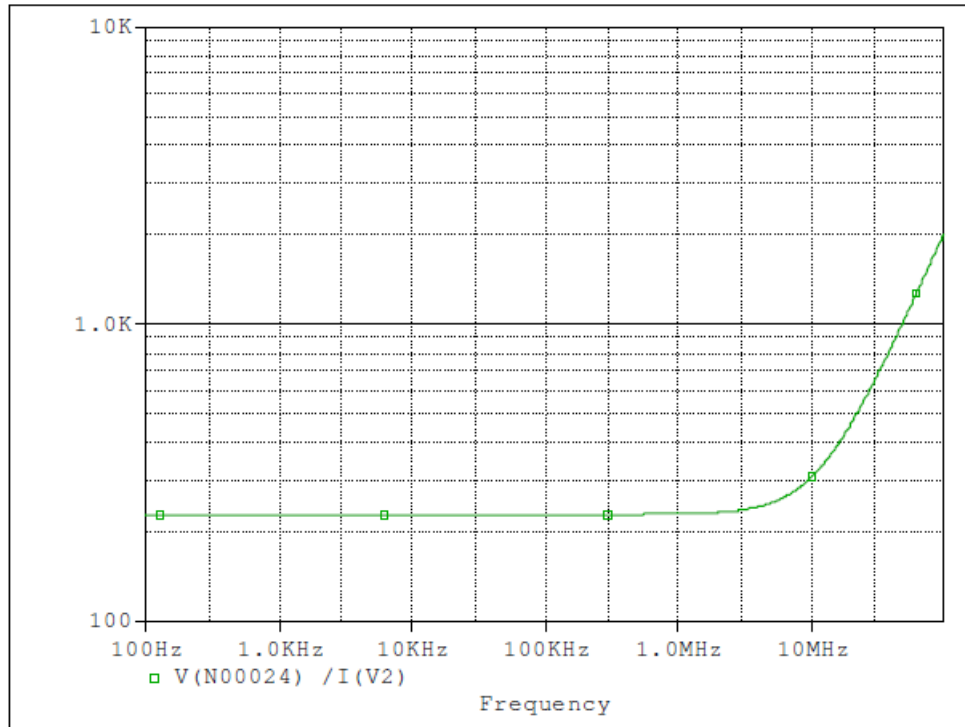
| Measurement |  |  |
|-------------|--|--|
| R1          |  |  |
| L1          |  |  |
| C1          |  |  |

Equivalent circuit

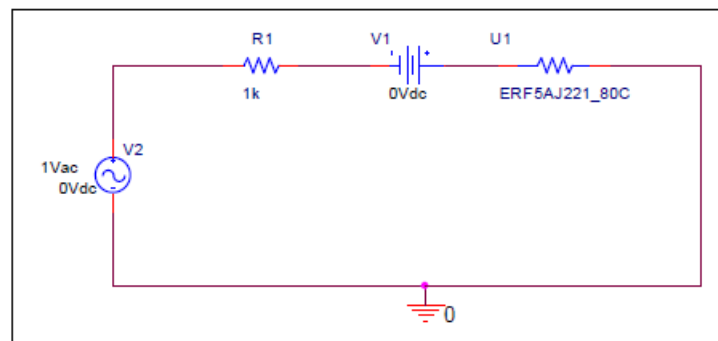


## Frequency vs. $|Z|$ Characteristic

Circuit simulation result



Evaluation Circuit



## Simulation Result

| Frequency(HZ) | Z (ohm)<br>Measurement | Z (ohm)<br>Circuit Simulation | %Error |
|---------------|------------------------|-------------------------------|--------|
| 100           | 224.311                | 229.407                       | 2.272  |
| 1K            | 224.367                | 229.399                       | 2.243  |
| 10K           | 224.169                | 229.399                       | 2.333  |
| 100K          | 224.343                | 229.408                       | 2.258  |
| 1M            | 226.088                | 230.273                       | 1.851  |
| 10M           | 308.130                | 304.622                       | 1.138  |