

# Device Modeling Report

COMPONENTS: RESISTOR  
PART NUMBER: ERF5AJ151  
THERMAL:TA=150(degree)  
MANUFACTURER: MATSUSHITA



**Bee Technologies Inc.**

## Theory: Auto Balancing Bridge Method

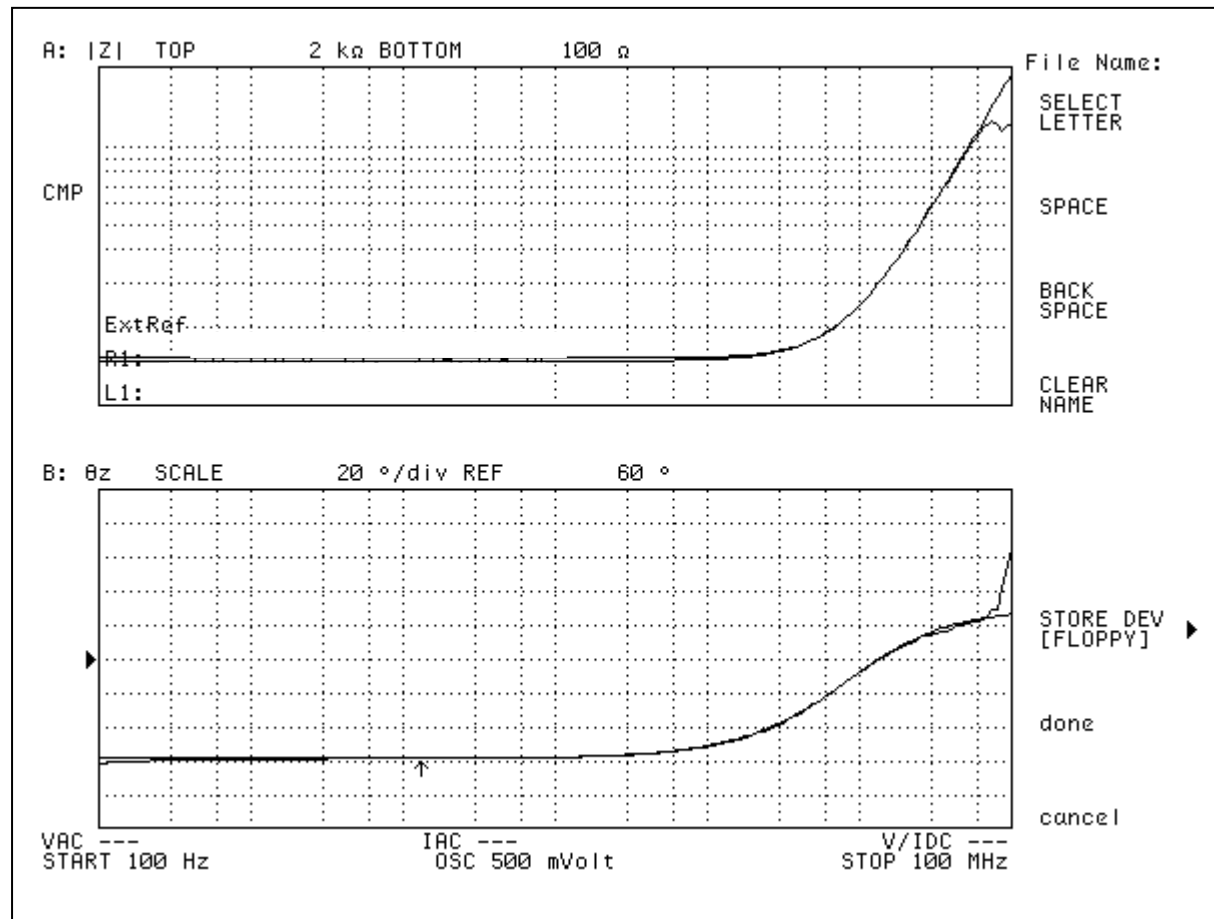
### Optimization of Simulation

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

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

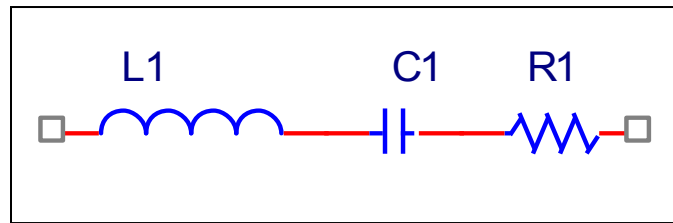
Attention

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



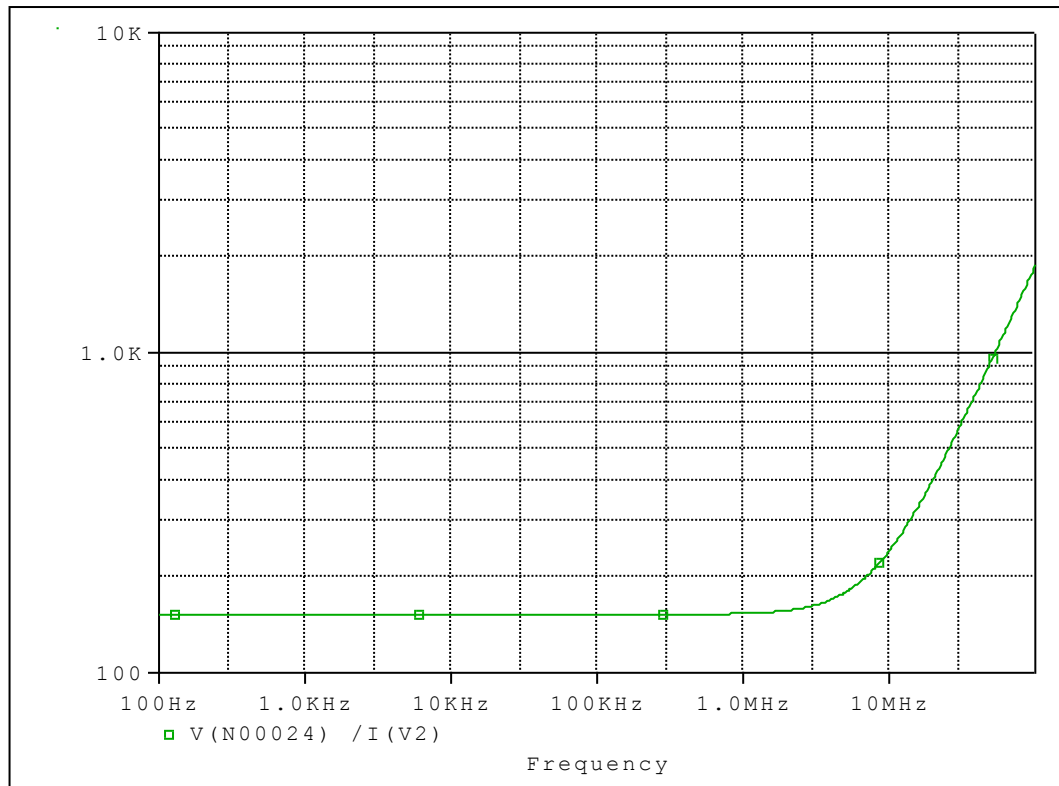
| Measurement |  |  |
|-------------|--|--|
| R1          |  |  |
| L1          |  |  |
| C1          |  |  |

Equivalent circuit

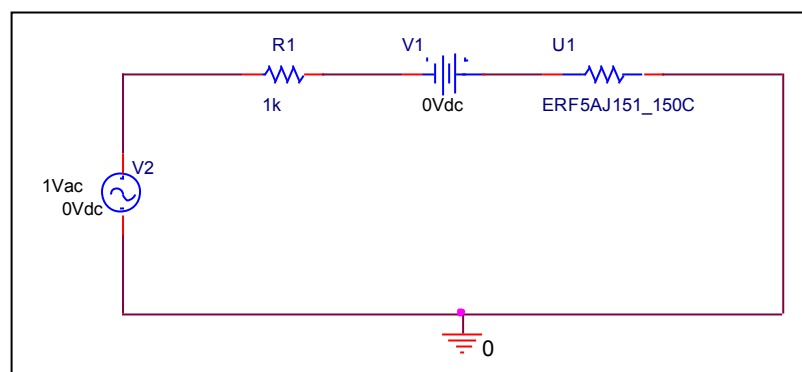


## Frequency vs. $|Z|$ Characteristic

Circuit simulation result



Evaluation Circuit



## Simulation Result

| <b>Frequency(HZ)</b> | <b> Z (ohm)<br/>Measurement</b> | <b> Z (ohm)<br/>Circuit Simulation</b> | <b>%Error</b> |
|----------------------|---------------------------------|----------------------------------------|---------------|
| <b>100</b>           | <b>148.356</b>                  | <b>152.291</b>                         | <b>2.652</b>  |
| <b>1K</b>            | <b>148.407</b>                  | <b>152.112</b>                         | <b>2.497</b>  |
| <b>10K</b>           | <b>148.352</b>                  | <b>152.110</b>                         | <b>2.533</b>  |
| <b>100K</b>          | <b>148.380</b>                  | <b>152.121</b>                         | <b>2.521</b>  |
| <b>1M</b>            | <b>150.351</b>                  | <b>153.249</b>                         | <b>1.927</b>  |
| <b>10M</b>           | <b>244.982</b>                  | <b>240.675</b>                         | <b>1.758</b>  |