

# Device Modeling Report

COMPONENTS: RESISTOR  
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**Bee Technologies Inc.**

## Theory: Auto Balancing Bridge Method

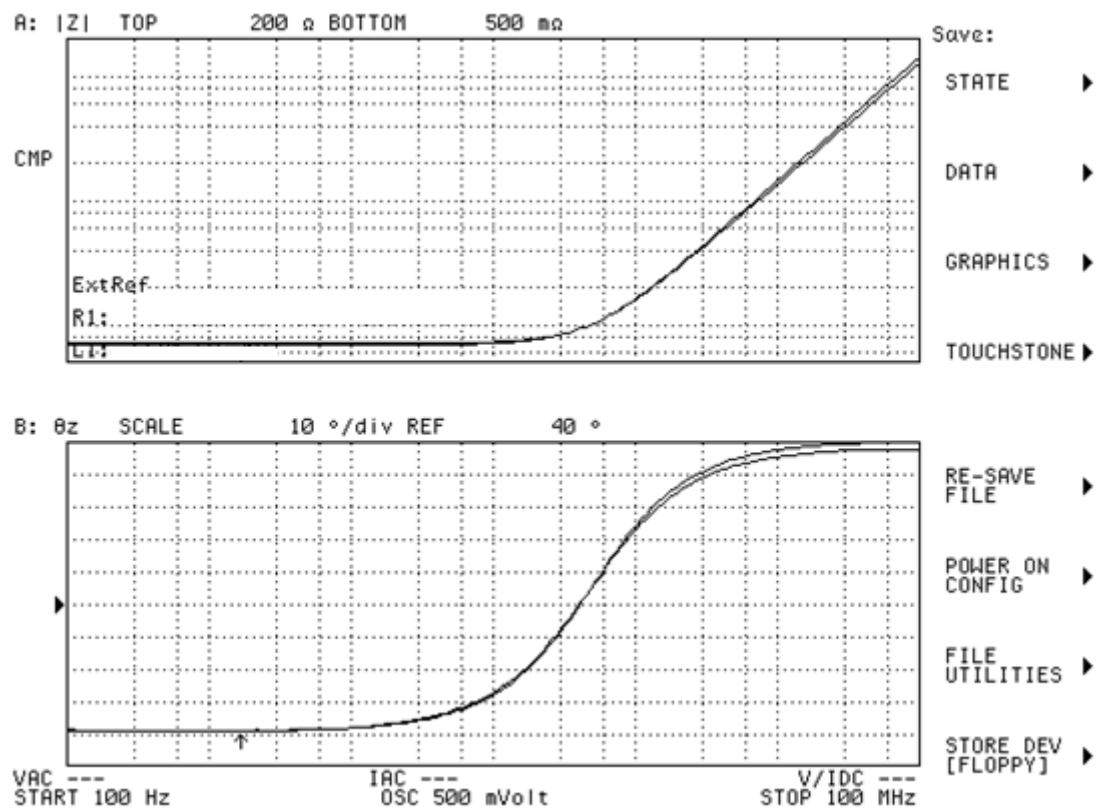
### Optimization of Simulation

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)*



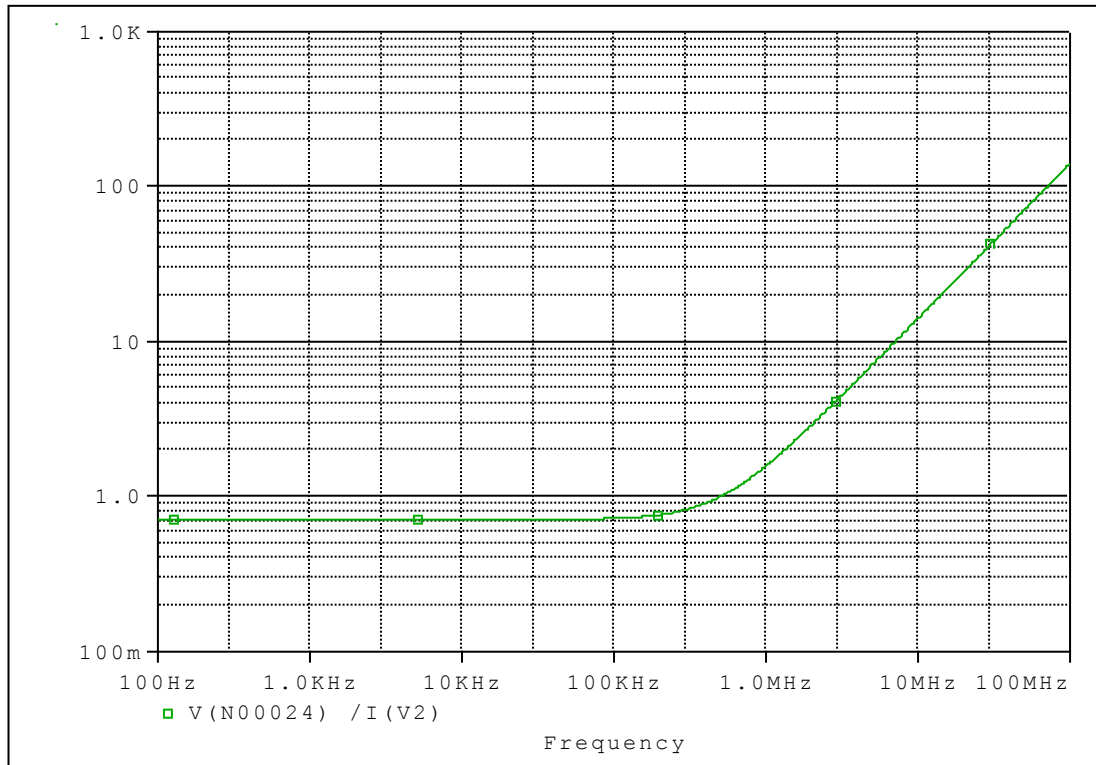
| Measurement |  |  |
|-------------|--|--|
| R1          |  |  |
| L1          |  |  |
| C1          |  |  |

Equivalent circuit

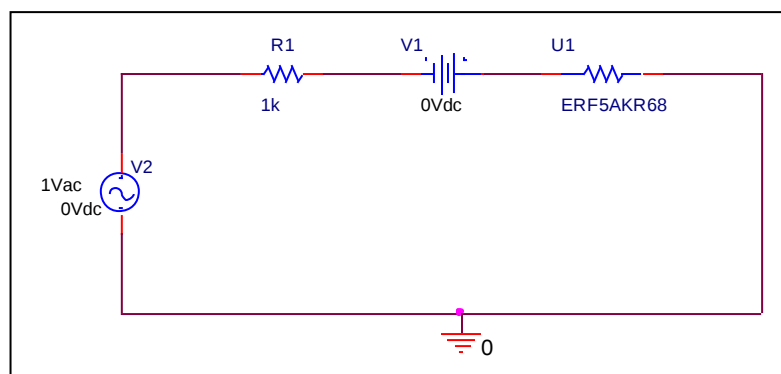


## Frequency vs. $|Z|$ Characteristic

Circuit simulation result



Evaluation Circuit



# Simulation Result

| Frequency(HZ) | Z (ohm)<br>Measurement | Z (ohm)<br>Circuit Simulation | %Error |
|---------------|------------------------|-------------------------------|--------|
| 100           | 688.619                | 711.068                       | 3.260  |
| 1K            | 686.355                | 711.032                       | 3.595  |
| 10K           | 687.559                | 711.171                       | 3.434  |
| 100K          | 706.196                | 724.914                       | 2.651  |
| 1M            | 1.572                  | 1.581                         | 0.541  |
| 10M           | 13.242                 | 14.137                        | 6.756  |