

# Device Modeling Report

COMPONENTS: CAPACITOR/CERAMIC  
PART NUMBER: ECKATS471MB  
MANUFACTURER: PANASONIC  
REMARK: TA=80C



**Bee Technologies Inc.**

## Theory: Auto Balancing Bridge Method

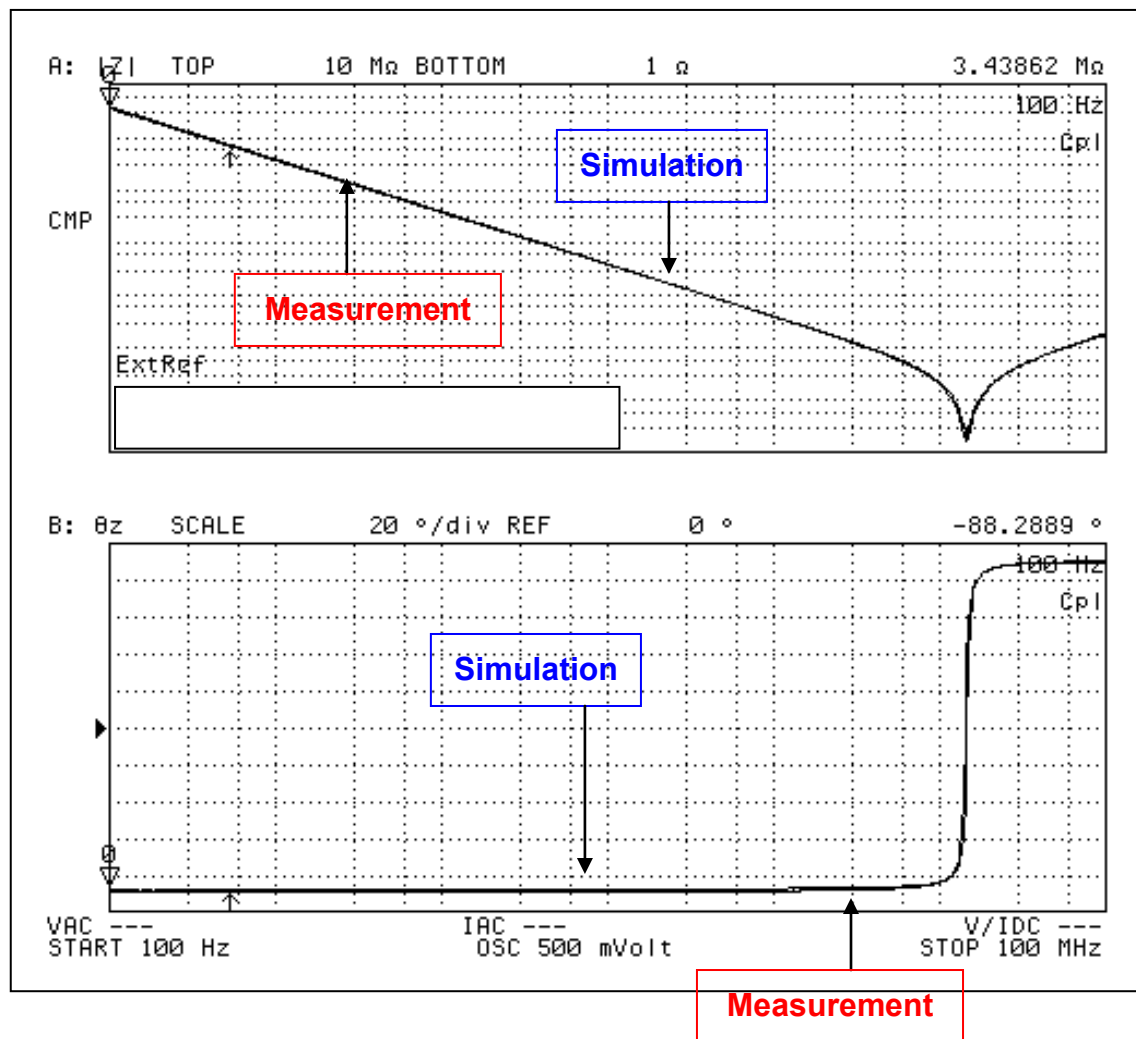
### Optimization of Simulation

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

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

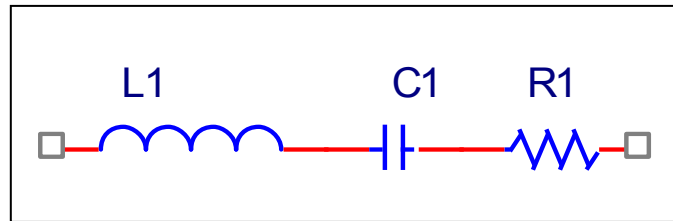
Attention)

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



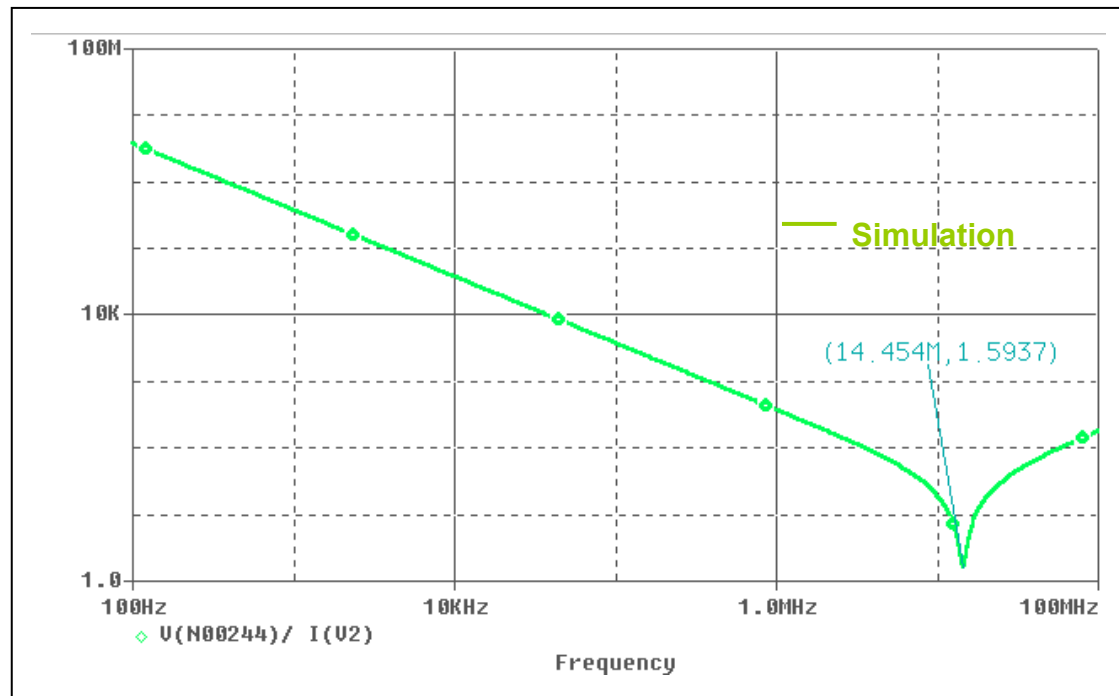
L1	
C1	
R1	

Equivalent circuit

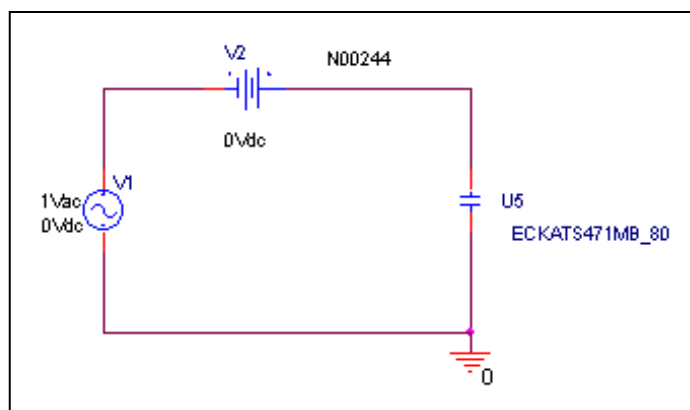


## Frequency vs. |Z| Characteristic

### Circuit Simulation result



### Evaluation Circuit



**Simulation result**

<b>Frequency (Hz)</b>	<b>IZI (ohm) :Measurement</b>	<b>IZI (ohm) :Simulation</b>	<b>% Error</b>
100	3.49688M	3.7970M	8.5825
1K	358.293K	375.147K	4.7040
10K	36.4059K	37.970K	4.2963
100K	3.72975K	3.7513K	0.5778
1M	382.783	377.888	1.2788
10M	21.7133	19.268	11.2618
100	3.49688	3.7970	8.5825

	<b>Measurement</b>	<b>Simulation</b>	<b>%Error</b>
<b>FSRF(Hz)</b>	14.791M	14.454M	2.2784
<b>IZI (ohm)</b>	1.57627	1.5937	1.1058