

# Device Modeling Report

COMPONENTS: CAPACITOR/ CERAMIC  
PART NUMBER: DE1E3KX472MA5B  
MANUFACTURER: MURATA  
REMARK: TA=80C



**Bee Technologies Inc.**

## Theory: Auto Balancing Bridge Method

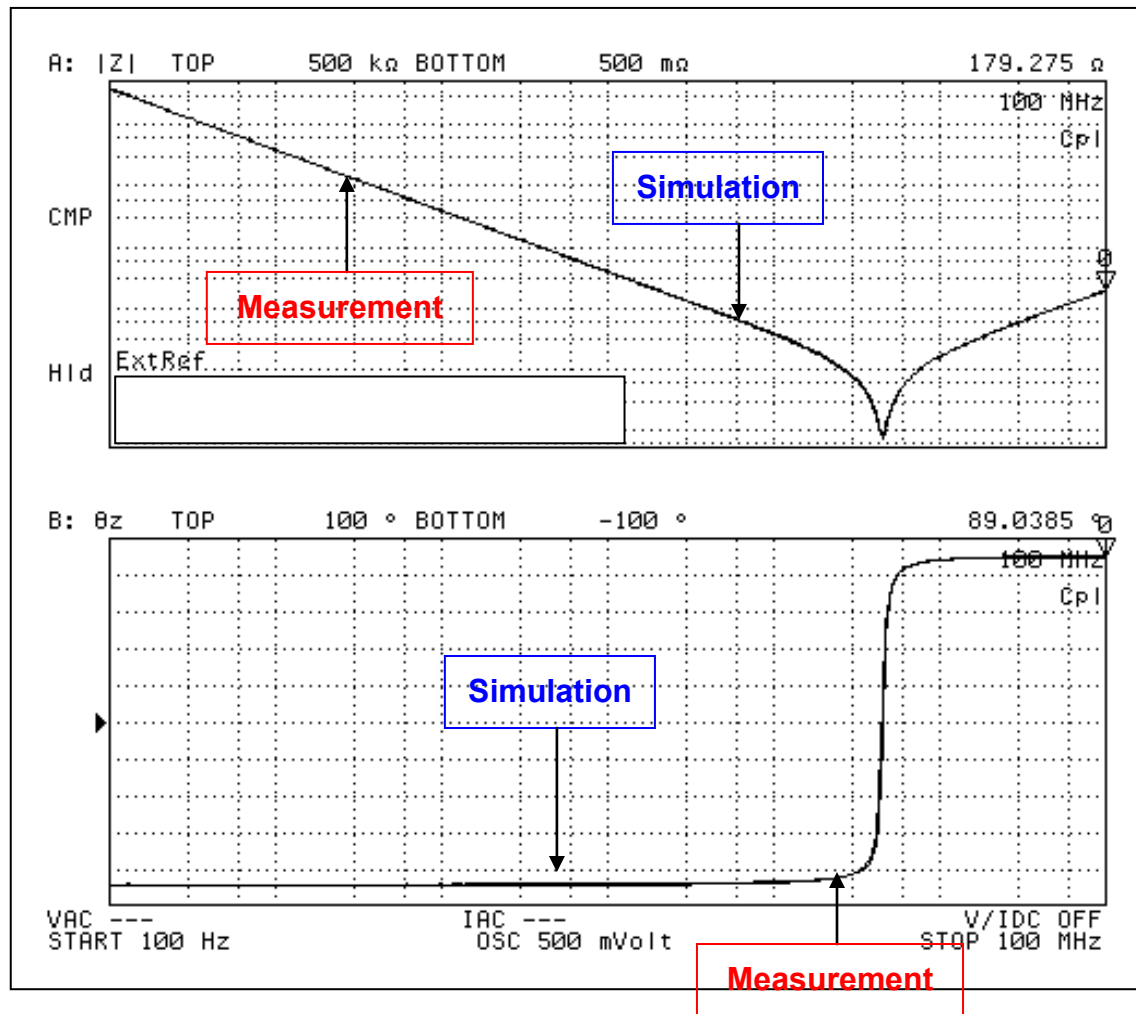
### Optimization of Simulation

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

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

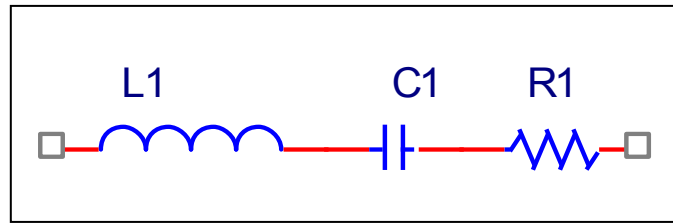
Attention)

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



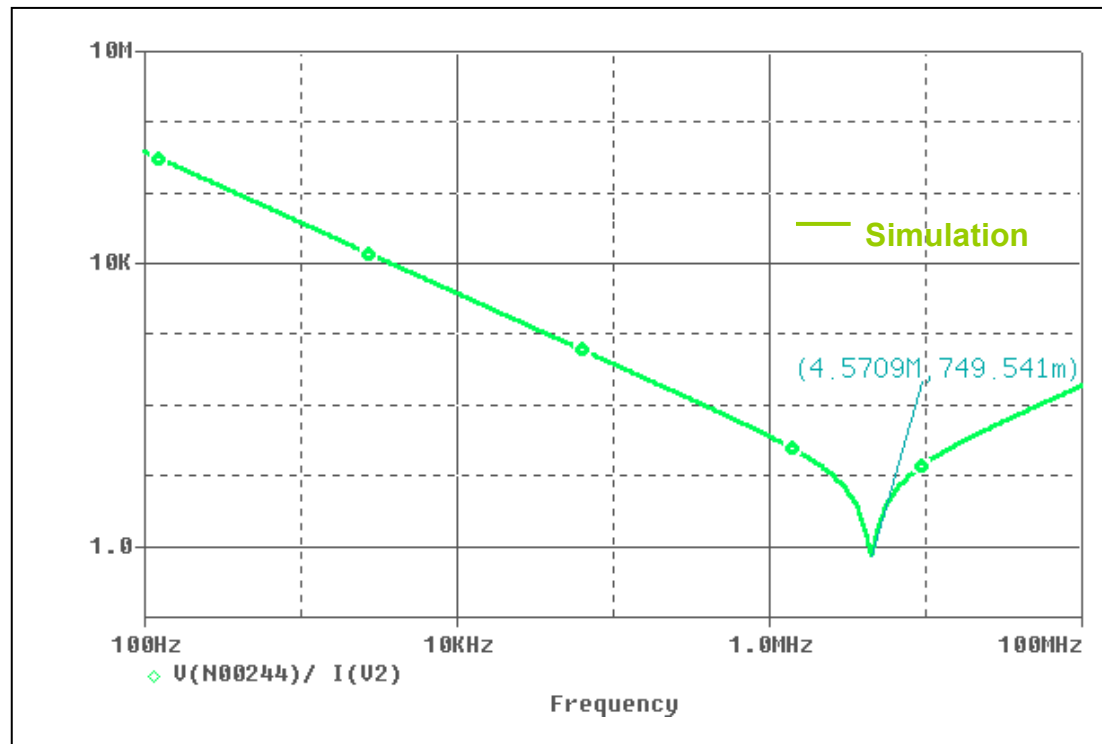
L1	
C1	
R1	

Equivalent circuit

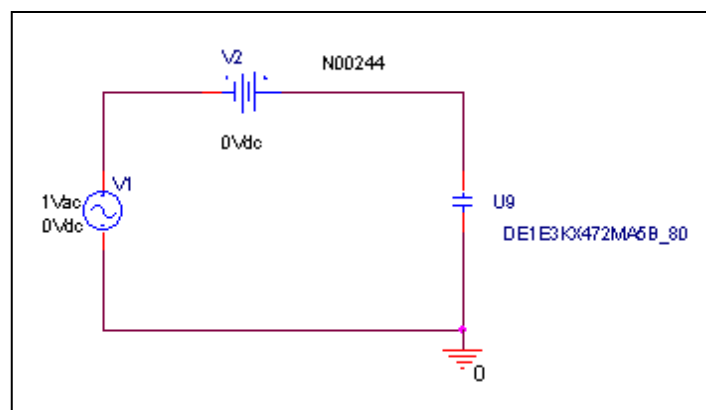


## Frequency vs. |Z| Characteristic

### 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	386.207K	379.099K	1.8405
1K	38.3423K	37.910K	1.1275
10K	3.87011K	3.7910K	2.0441
100K	391.684	378.915	3.2600
1M	38.1212	36.065	5.3938
10M	15.0994	14.748	2.3272
100M	179.275	184.831	3.0991

	<b>Measurement</b>	<b>Simulation</b>	<b>%Error</b>
<b>FSRF(Hz)</b>	4.571M	4.5709M	0.0004
<b>IZI (ohm)</b>	704.571m	749.541m	6.3826