

Device Modeling Report

COMPONENTS: CAPACITOR/ CERAMIC
PART NUMBER: DE1E3KX222MA5B
MANUFACTURER: MURATA
REMARK: TA=60C



Bee Technologies Inc.

Theory: Auto Balancing Bridge Method

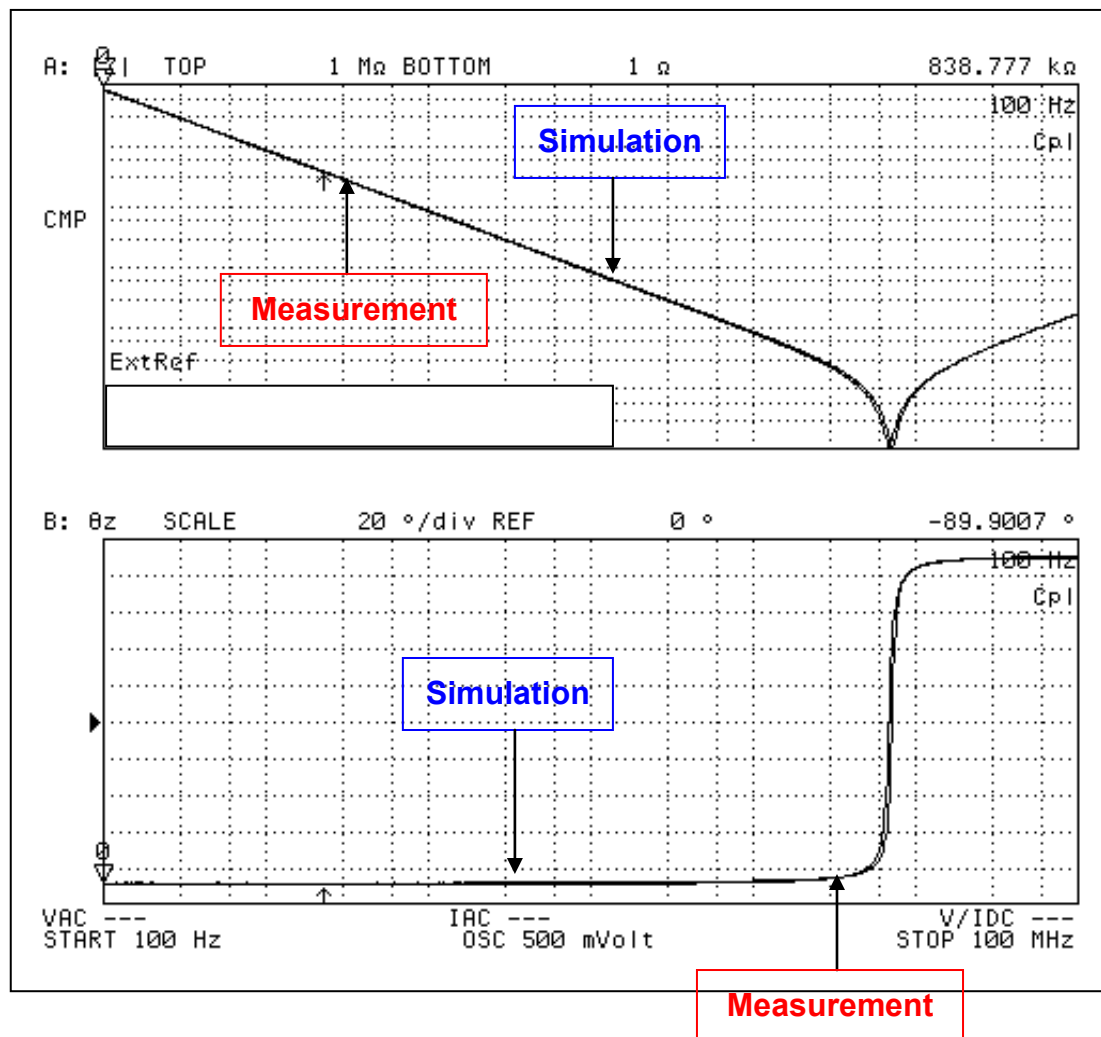
Optimization of Simulation

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

Frequency vs. $|Z|$ and Frequency vs. θ_z Characteristic

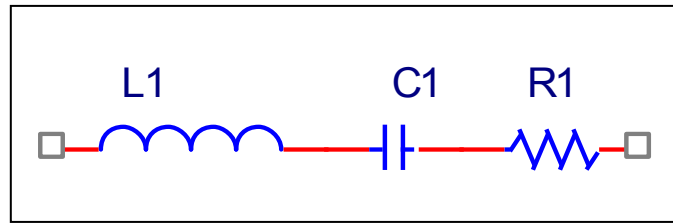
Attention)

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



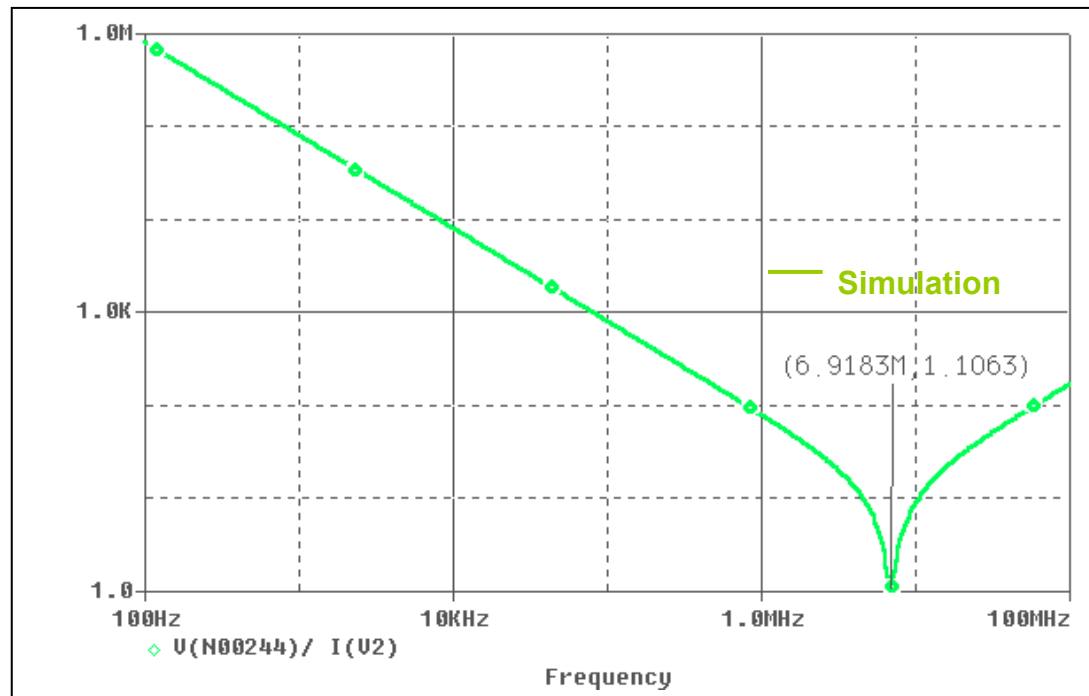
| | |
|----|--|
| L1 | |
| C1 | |
| R1 | |

Equivalent circuit

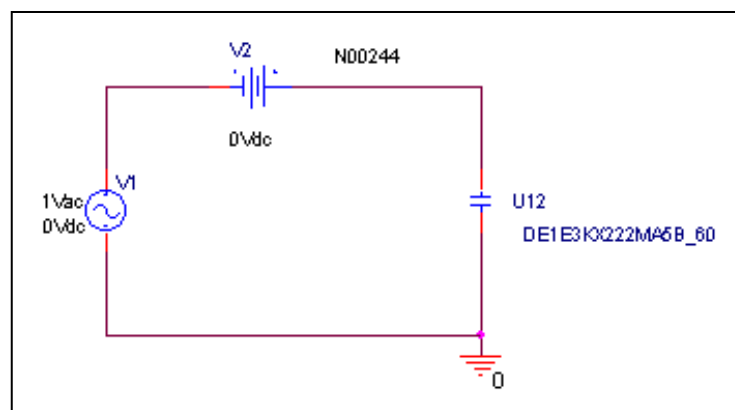


Frequency vs. |Z| Characteristic

Circuit Simulation result



Evaluation Circuit



Simulation result

| Frequency (Hz) | IZI (ohm) :Measurement | IZI (ohm) :Simulation | % Error |
|---------------------------|-----------------------------------|----------------------------------|----------------|
| 100 | 838.777K | 815.138K | 2.8183 |
| 1K | 84.5672K | 81.514K | 3.6104 |
| 10K | 8.62336K | 8.1514K | 5.4730 |
| 100K | 870.373 | 814.970 | 6.3654 |
| 1M | 86.8896 | 79.831 | 8.1236 |
| 10M | 7.93031 | 8.8276 | 11.3147 |
| 100M | 160.579 | 168.286 | 4.7995 |

| | Measurement | Simulation | %Error |
|------------------|--------------------|-------------------|---------------|
| FSRF(Hz) | 7.120M | 6.9183M | 2.8329 |
| IZI (ohm) | 1.0992 | 1.1063 | 0.6459 |