Estimation of capacitance performance of a given capacitor

How is capacitance estimated?

The capacitance is estimated by the zero-crossing point voltage and current. There are various research results on methods of estimating ESR,too. There is a technique for estimating the ESR by calculating the intermediate frequency band value extracted using the bandpass filter .

How do you calculate a capacitor's capacitance?

One involves using data from the system related to the capacitor, and the other involves using the direct data of the capacitor. First, when using capacitor-related system data, the capacitance is estimated using the root mean square of input and output data and capacitor voltage of one phase of a three-phase back-to-back converter [8, 9].

Is capacitor capacitance estimation a problem in railway applications?

Currently,there is a big challengefor capacitor capacitance estimation in railway applications. The noise fluctuation of the voltage sensor may be nearly equal to that of ripple voltage,leading to the considerable errors of the existing capacitor condition monitoring methods.

What is deep learning in capacitor estimation?

Deep learning is a process in which an algorithm learns the characteristics of data and its answers by itself through a large amount of data. In this study,the process of analyzing the characteristics of complex relationship data and finding a solutionwas applied to the field of capacitor estimation.

Can a deep neural network estimate the state of a capacitor?

This study proposes an algorithm to estimate the state of an input capacitor based on a deep neural network (DNN). This algorithm runs in a DC/AC single-phase converter. According to the analysis result of the data from the capacitor, the component with twice the fundamental and switching frequencies demonstrated dominant characteristics.

How to estimate the state of a capacitor using a DNN?

To estimate the state of a capacitor using a DNN,data that have a high correlation with the estimated value should be used as an input to the DNN. Therefore,data having a high correlation with capacitance and ESR were analyzed based on the frequency characteristics of capacitors.

This study proposes an algorithm to estimate the state of an input capacitor based on a deep neural network (DNN). This algorithm runs in a DC/AC single-phase ...

Therefore, a capacitance estimation method based on precharging model and noise evaluation is proposed in this article. The capacitance is estimated by improved recursive extended least square. The influence of the

noise can be effectively reduced and both the calculation accuracy and convergence speed can be well guaranteed through ...

This paper proposes a correction method of capacitance estimation considering the temperature effect for the DC-link capacitor banks in three-phase AC/DC/AC PWM converters. At first, operating ...

In the present study, for the first time, the experimental data from more than 300 published papers have been extracted and then analyzed through an optimized support vector ...

Index Terms--Capacitance estimation, capacitance measure- ment, capacitor health status, condition monitoring, electrolytic capacitors (E-Caps), film capacitors, reliability.

In this paper, we estimate the internal state variables of DC/AC 3-phase converter input capacitors according to the input data characteristics of algorithms and ...

Artificial Neural Networks (ANN) and Random Forest (RF) models have been employed to predict the various in-operando performance metrics of carbon-based supercapacitors based on three input features such as mesopore surface area, micropore surface area and scan rate.

In this work, the capacitance of carbon-based EDCLs is accurately predicted as a function of specific surface area, calculated pore size, ID / IG ratio (ratio of the D-band (at 1360 cm -1, which reflects the amorphous carbon and the defects) ...

Download scientific diagram | Degradation of capacitor performance, capacitance loss as a function of aging time. from publication: A physics-based degradation modeling framework for diagnostic ...

In the present study, for the first time, the experimental data from more than 300 published papers have been extracted and then analyzed through an optimized support vector machine (SVM) ...

Also, the cyclic voltammetric response of a capacitor would give a constant value of capacitance over the whole potential range which is not true for the cyclic voltammograms obtained from pseudocapacitive materials (Forghani and Donne 2018a). The terminology, pseudocapacitance, therefore should be limited to materials having, at most, ...

Abstract: Accurate capacitance estimation for aluminum electrolytic capacitor is vital for parametric fault diagnosis and fault prognosis of switching power converters. This paper ...

Here, it is discussed how one can extract consistent capacitance values from measurements obtained with the three techniques, to be interpreted within a single dynamic ...

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Lifetime estimation of high-temperature high-voltage polymer film capacitor based on capacitance loss . ... that the capacitance increase for capacitors using polar polymers is due to an easier orientation of their dipole at a given frequency. The contribution of electrical, thermal and combined electrothermal stresses may also have a negative effect on the behavior of MPF ...

In this paper, we estimate the internal state variables of DC/AC 3-phase converter input capacitors according to the input data characteristics of algorithms and compare their performance.

Equivalent circuit model of a high-voltage switching transformer with multi-layers secondary including leakage inductances (Llki), magnetising inductances (Li), winding-to-winding ...

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