<<工程电路分析>>

图书基本信息

书名：<<工程电路分析>>

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内容概要

本书首版于1962年，目前已是第八版。
作者从3个最基本的科学定律推导出电路分析中常用的分析方法及分析工具。
书中首先介绍电路基本参量及基本概念，然后结合基尔霍夫电压和电流定律，介绍节点和网孔分析法及叠加定理、电源变换等常用电路分析方法，并将运算放大器作为电路元件加以介绍；交流电路的分析开始于电容、电感的时域电路特性，然后分析RLC电路的正弦稳态响应，并介绍交流电路的功率分析方法，接着还对多相电路、磁耦合电路的性能分析进行了介绍；本书还介绍了复频率、拉普拉斯变换和s域分析、频率响应、傅里叶分析、二端口网络等内容。
作者注重将理论和实践相结合，无论例题、练习、章后习题还是正文中的应用实例，很多都来自于业界的典型应用，这也是本书的一大特色。

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书籍目录

章节摘录

Voltage We must now begin to refer to a circuit element, something best defined in general terms to begin with.Such electrical devices as fuses, light bulbs, re-sistors, batteries, capacitors, generators, and spark coils can be represented by combinations of simple circuit elements.We begin by showing a very general circuit element as a shapeless object possessing two terminals at which connections to other elements may be made （Fig.2.8）.There are two paths by which current may enter or leave the element.In subsequent discussions we will define particular circuit elements by describ-ing the electrical characteristics that may be observed at their terminals.In Fig.2.8, let us suppose that a dc current is sent into terminal A,through the general element, and back out of terminal B.Let us also assume that pushing charge through the element requires an expenditure of energy.We then say that an electrical voltage （or a potential difference） exists be-tween the two terminals, or that there is a voltage "across" the element.Thus, the voltage across a terminal pair is a measure of the work required to move charge through the element.The unit of voltage is the volt,2 and 1 volt is the same as 1 J/C.Voltage is represented by V or v.A voltage can exist between a pair of electrical terminals whether a current is flowing or not.An automobile battery, for example, has a voltage of 12 V across its terminals even if nothing whatsoever is connected to the terminals.According to the principle of conservation of energy, the energy that is expended in forcing charge through the element must appear somewhere else.When we later meet specific circuit elements, we will note whether that energy is stored in some form that is readily available as electric energy or whether it changes irreversibly into heat, acoustic energy, or some other nonelectrical form.We must now establish a convention by which we can distinguish be-tween energy supplied to an element and energy that is supplied by the element itself.We do this by our choice of sign for the voltage of terminalA with respect to terminal B.If a positive current is entering terminal A of the element and an external source must expend energy to establish this cur-rent, then terminal A is positive with respect to terminal B.（Alternatively,we may say that terminal B is negative with respect to terminal A.）

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