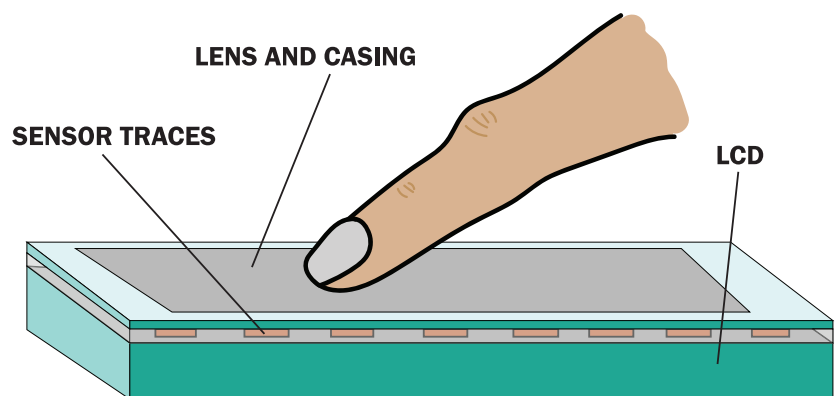


CONCEPT Coulomb's Law is a fundamental law of electromagnetism that describes the interaction between electric charges. The law states the force between two charges is proportional to the product of the charges and inversely proportional to the square of the distance between them. This law helps explain the behavior of electric fields and is used to calculate the strength of the force between two charges.

Capacitance is the ability of a system of conductors and dielectrics to store electrical energy. It is a measure of the amount of charge that can be stored in a capacitor for a given voltage. Capacitance depends on the physical characteristics of the system, such as the distance between the conductors and the dielectric constant of the material between them. Capacitance is used in various electronic applications, such as energy storage, filtering and coupling circuits.

BACKGROUND

Capacitance is a property of a capacitor, which is a device used to store electrical energy. The concept of capacitance was first introduced by Michael Faraday in the early 19th century, but it was not until the development of the Leyden jar, an early type of capacitor, that capacitance was fully understood. The capacitance of a capacitor is directly proportional to the area of its plates and inversely proportional to the distance between them. Today, Coulomb's Law and capacitance are fundamental concepts in the study of electricity and are used in a wide range of applications, including electronics, telecommunications and power generation.



CAPACITIVE TOUCHSCREEN

Make sure it measures up

EXAMPLES

CAPACITOR: Capacitance is a property of a capacitor, which is a device used to store electrical energy. A capacitor consists of two conductive plates separated by a dielectric material.

CHARGE: The amount of charge a capacitor can store is directly proportional to its capacitance. As the capacitance of a capacitor increases, it can store more charge.

VOLTAGE: The voltage across a capacitor is another important component of capacitance. The capacitance of a capacitor is directly proportional to the voltage across it.

APPLICATION

In a touchscreen, the capacitance of the device is used to detect when and where a user's finger is touching the screen. When a user touches the screen, the capacitance between the user's finger and the screen changes, and this change can be measured to determine the location of the touch.

Capacitive touchscreens work by placing a layer of conductive material, usually indium tin oxide (ITO), on top of the screen. When a user touches the screen, their finger acts as a conductor and changes the capacitance of the screen. The change in capacitance is detected by a controller, which sends the corresponding signal to the device's processor to execute the desired action.



REAL WORLD CONNECTIONS

Worldwide, most electrical power is generated at power plants and transmitted over long distances to substations, where it is distributed to homes and businesses. During this transmission and distribution, electrical energy can be lost due to various factors, including resistance in the power lines.

Capacitors are used to mitigate this loss by storing electrical energy and releasing it when needed. By placing capacitors at strategic points along the power grid, the voltage can be regulated and the efficiency of the transmission and distribution of electrical power can be improved. This helps reduce energy consumption, lower costs, and minimize the environmental impact of power generation.



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