## I. light. there are also many new

**Design** 



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Types of Diode: Backward Diode- This type ofdiodae is also called the back diode, and it is not widely used. The backwarddiode is a PN-junction diode that is similar to the tunnel diode in itsprocess. It finds a few special applications where its specific properties canbe used. BARITT Diode- The shortterm of this diode Barrier Injection Transit Time diode is BARITT diode.

It isapplicable in microwave applications and allows many comparisons to the morewidely used IMPATT diode. Please refer the below link for BARRITT Diode Gunn Diode- Gunn diodeis a PN junction diode, this sort of diode is a semiconductor device that hastwo terminals. Generally, it is used for producing microwave signals. Laser Diode- The laserdiode is not the similar as the ordinary LED (light emitting diode) because itgenerates coherent light. These diodes are extensively used in manyapplications like DVDs, CD drives and laser light pointers for PPTs. Althoughthese diodes are inexpensive than other types of laser generator, they are muchmore expensive than LEDs. Light Emitting Diode- The term LEDstands for light emitting diode, is one of the most standard types of thediode. When the diode is connected in forwarding bias, then the current flowsthrough the junction and generates the light.

There are also many new LEDdevelopments are changing they are LEDs and OLEDs. Photodiode- Thephotodiode is used to detect light. It is found that when light strikes aPN-junction it can create electrons and holes. simply noticed. These diodes canalso be used to produce electricity. . PIN Diode-This type ofdiode is characterized by its construction. It has the standard P-

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type &N-type regions, but the area between the two regions namely intrinsicsemiconductor has no doping.

The region of the intrinsic semiconductor has the effect of increasing the area of the depletion region which can be beneficial for switching applications. . PN Junction Diode- The standardPN junction may be thought of as the normal or standard type of diode in usetoday. These diodes can come as small signal types for use in RF (radiofrequency), or other low current applications which may be called as signal diodes.

Other types may be planned for high voltage and high currentapplications and are normally named rectifier diodes. Schottky Diode- The Schottkydiode has a lower forward voltage drop than ordinary Si PN-junction diodes. Atlow currents, the voltage drop may be between 0. 15 & 0. 4 volts as opposed to 0. 6 volts for a Si diode.

To attain this performance they are designed in adifferent way to compare with normal diodes having a metal to semiconductorcontact. These diodes are extensively used in rectifier application, clampingdiodes, and also in RF applications. Step Recovery Diode- A steprecovery diode is a type of microwave diode used to generate pulses at very HF(high frequencies).

These diodes depend on the diode which has a very fastturn-off characteristic for their operation. Tunnel Diode- The tunneldiode is used for microwave applications where its performance surpassed thatof other devices of the day. Varactor Diode or Varicap Diode- Varactor diode is one sort of semiconductormicrowave solid-state device and it is used in where the variable capacitanceis chosen which can be accomplished by https://assignbuster.com/i-light-there-are-also-many-new/

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controlling voltage. These diodes arealso called as variceal diodes. Even though the o/p of the variable capacitancecan be exhibited by the normal PN-junction diodes. But, this diode is chosen forgiving the preferred capacitance changes as they are different types of diodes. These diodes are precisely designed and enhanced such that they allow a high rangeof changes in capacitance.

Zener Diode- The Zenerdiode is used to provide a stable reference voltage. As a result, it is used invast amounts. It works under reverse bias condition and found that when aparticular voltage is reached it breaks down. If the flow of current is limitedby a resistor, it activates a stable voltage to be generated. This type ofdiode is widely used to offer a reference voltage in power supplies. II. Rectifier Circuit: Half Wave Rectifier circuit- A rectifieris a circuit which converts the Alternating Current (AC) input power into aDirect Current (DC) output power.

The input power supply may be either asingle-phase or a multi-phase supply with the simplest of all the rectifiercircuits being that of the Half Wave Rectifier. Average voltage, Vaverage = Vm/? | Average Current, laverage = Im/? Rms Voltage, Vrms = Vm/2 | RmsCurrent, Irms = Im/2 Full Wave Rectifier circuits- A full wave rectifier is a type of rectifier which converts both halfcycles of the AC signal into pulsating DC signal. Average voltage, Vaverage = 2Vm/? | Average Current, laverage = 2Im/? RMS Voltage, Vrms = Vm/? 2 | RMS Current, Irms = Im/? 2The full waverectifier is further classified into two types: center tapped full waverectifier and full wave bridge rectifier. Center tapped full wave rectifiermploys atransformer with the secondary winding AB tapped at the center point C. Itconverts the AC input voltage into DC voltage the two diode D1, and D2 areconnected in the circuit as shown in the circuit diagram below. Full Wave Bridge Rectifier: Bridge rectifier circuita circuit arrangement whichmakes use of both half cycles of input alternating current (AC) and convertsthem to direct current (DC). In our tutorial on Half wave rectifiers, we haveseen that a half wave rectifier makes use of only one-half cycle of the inputalternating current. Thus a full wave rectifier is much more efficient(double+) than a half wave rectifier. This process of converting both halfcycles of the input supply (alternating current) to direct current (DC) is termedfull wave rectification.

III. Block Diagram of Power Supply. A transformer is a static electricaldevice that transfers energy by inductive coupling between its windingcircuits.

A varying current in the primary winding creates a varying magneticflux in the transformer's core and thus a varying magnetic flux through thesecondary winding. This varying magnetic flux induces a varying electromotiveforce (EMF) or voltage in the secondary winding. Transformers range in sizefrom thumbnail-sized used in microphones to units weighing hundreds of tonsinterconnecting the power grid. A wide range of transformer designs are used inelectronic and electric power applications. Transformers are essential for thetransmission, distribution, and utilization of electrical energy. A rectifier is an electrical device thatconverts alternating current (AC), which periodically reverses direction, todirect current (DC), which flows in only one direction. The process is known asrectification. Physically, https://assignbuster.com/i-light-there-are-also-many-new/ rectifiers take a number of forms, including vacuumtube diodes, mercury-arc valves, copper and selenium oxide rectifiers, solid-state diodes, siliconcontrolled rectifiers and other silicon-basedsemiconductor switches.

Historically, even synchronous electromechanicalswitches and motors have been used. Early radio receivers, called crystal radios, used a " cat's whisker" of fine wire pressing on a crystal of galena(lead sulfide) to serve as a point-contact rectifier or " crystaldetector". The simple process of rectification produces a type of DCcharacterized by pulsating voltages and currents (although stillunidirectional). Depending upon the type of end-use, this type of DC currentmay then be further modified into the type of relatively constant voltage DCcharacteristically produced by such sources as batteries and solar cells. Filter capacitorsare capacitors used for filtering of undesirable frequencies. They are commonin electrical and electronic equipment, and cover a number of applications. Thesimple capacitor filter is the most basic type of power supply filter. Theapplication of the simple capacitor filter is very limited.

It is sometimesused on extremely high-voltage, low-current power supplies for cathode-ray and similar electron tubes, which require very little load current from the supply. The capacitor filter is also used where the powersupply ripple frequency isnot critical; this frequency can be relatively high. A voltage regulator is designed toautomatically maintain a constant voltage level. A voltage regulator may be asimple "feed-forward" design or may include negative feedback controlloops.

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It may use an electromechanical mechanism, or electronic components. Depending on the design, it may be used to regulate one or more AC or DCvoltages. IV. Application of Diode1. Reverse Current Protection Ever stick a battery in the wrongway? Or switch up the red and black power wires? If so, a diode might be tothank for your circuit still being alive.

A diode placed in series with thepositive side of the power supply is called a reverse protection diode. Itensures that current can only flow in the positive direction, and the powersupply only applies a positive voltage to your circuit. This diodeapplication is useful when a power supply connector isn't polarized, making iteasy to mess up and accidentally connect the negative supply to the positive of the input circuit. The drawbackof a reverse protection diode is that it'll induce some voltage loss because of the forward voltage drop. This makes Schottky diodes an excellent choice forreverse protection diodes.

2. Demodulation of SignalsThe most common use for diodes is to remove the negative component of anAC signal so it can be worked with easier with electronics. Since the negativeportion of an AC waveform is usually identical to the positive half, very littleinformation is effectively lost in this process. Signal demodulation is commonly used in radios as part of the filtering system to help extract theradio signal from the carrier wave.
3. Over-VoltageProtectionsDiodes also function well as protection devices for sensitive electroniccomponents.

When used as voltage protection devices, the diodes arenon-conducting under normal operating conditions but immediately short any highvoltage spike to ground where it cannot harm an integrated circuit. Specializeddiodes called transient voltage suppressors are designed specifically forover-voltage protection and can handle very large power spikes for short timeperiods, typical characteristics of a voltage spike or electric shock, which wouldnormally damage components and shorten the life of an electronic product. 4. Current SteeringThe basic application of diodes is to steer current and make sure itonly flows in the proper direction. One area where the current steeringcapability of diodes is used to good effect is in switching from power from apower supply to running from a battery.

When a device is plugged in andcharging, for example, a cell phone or uninterruptible power supply, the deviceshould be drawing power only from the external power supply and not the batteryand while the device is plugged in the battery should be drawing power andrecharging. As soon as the power source is removed, the battery should powerthe device so no interruption in noticed by the user.