

Definitions and Reference

pp. 5-4 thru 5-8, p. 5-14

Point-Contact Diodes - constructed from a metal whisker and an N-type wafer

Junction Diode - constructed from a wafer of P-type and a wafer of N-type

Hot-carrier Diode - constructed from whisker and a metal dot deposited on the silicon wafer

Schottky Barrier Diodes - the point-contact and hot-carrier diodes are both examples Schottky barriers, named after their inventor.

Zener Diodes - a special class of junction diode used as voltage reference and voltage regulators.

Tunnel Diodes - When properly biased it exhibits a negative resistance characteristic.

Varactor Diodes - Reverse bias can change the capacitance making this diode useful in tuning circuits.

PIN Diode - A three layer device with a slice of intrinsic semiconductor between a P-type layer and an N-type layer.

PIV - Peak Inverse Voltage, the maximum voltage that can be applied in the reverse bias condition without causing breakdown.

Questions

E6B01 – What is the principal characteristic of a Zener diode?

A constant voltage under conditions of varying current

NB – This constant voltage is called the “zener voltage” or the reverse breakdown voltage. The place on the current voltage curve where this happens is referred to as the “knee”.

E6B02 – What is the principal characteristic of a tunnel diode?

A negative resistance region

E6B03 – What is an important characteristic of a Schottky Barrier diode as compared to an ordinary silicon diode when used as a power supply rectifier?

Less forward voltage drop

E6B04 – What special type of diode is capable of both amplification and oscillation?

Tunnel

E6B05 – What type of semiconductor device varies its internal capacitance as the voltage applied to its terminals varies?

Varactor diode

E6B06 – In Figure E6–3, what is the schematic symbol for a varactor diode?

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varactor diode

E6B07 – What is a common use of a hot-carrier diode?

As a VHF/UHF mixer or detector

E6B08 – What limits the maximum forward current rating in a junction diode?

Junction temperature

E6B09 – Which of the following describes a type of semiconductor diode?

Metal–semiconductor junction

NB – this is the description of a Schottky Barrier diode, point–contact diode, and a hot–carrier diode.

E6B10 – what is a common use for point contact diodes?

As an RF detector

E6B11 – In figure E6–3, what is the schematic symbol for a light–emitting diode?

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light-emitting diode

E6B12 – How are junction diodes rated?

Maximum forward current and PIV

E6B13 – What is one common use for PIN diodes?

As an RF switch

E6B14 – What type of bias is required for an LED to produce luminescence?

Forward bias