

Two of your colleagues get involved in a discussion. One claimed that photoresistors are fast while the other said they are slow.

A: switch "ON" they are slow but when switch "OFF" they are fast

### Quiz 5

Discuss construction, operation, and applications of the Gunn diode.

A: also known as a transferred electron device (TED) is a form of diode, a two-terminal passive semiconductor electronic component, with negative resistance, used in high-frequency electronics, microwaves, radar guns, electronic oscillators, microwave relay.

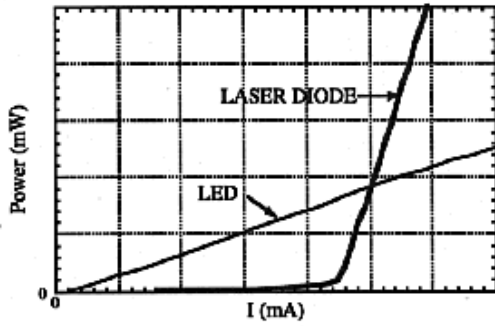
Discuss construction of a semiconductor Peltier effect heat pump.

A: The semiconductors are placed thermally in parallel to each other and electrically in series and then joined with a thermally conducting plate on each side. The amount of heat that can be absorbed is proportional to the current and time

Why reducing crystallite size down to nm range improves performance of Peltier coolers/and thermoelectric generators.

A: its more efficient

Write equation of current vs voltage dependence for an ideal diode



Describe structure of the VCSEL

A:

Vertical cavity surface emitting laser



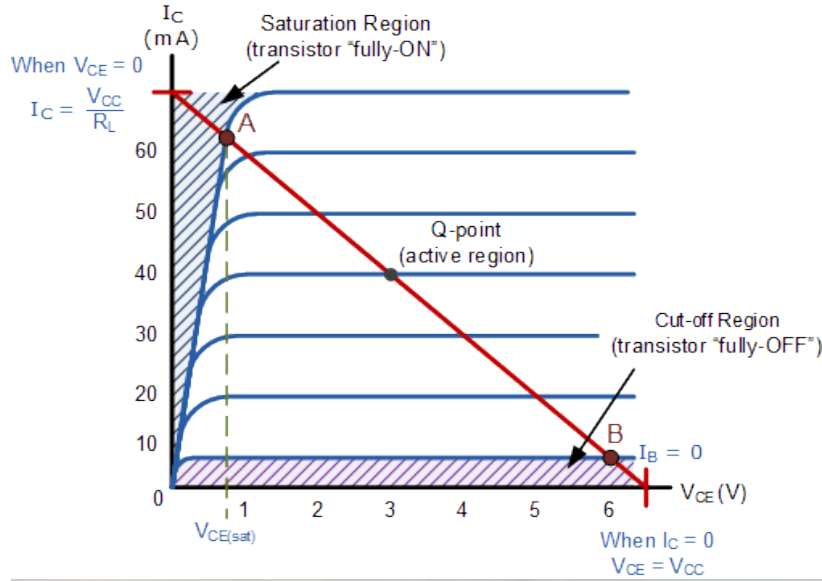
laser beam emission perpendicular from top surface

7) Describe construction of Schottky diode

*n doped one end*  
*METAL the other*

*work - fast*  
*behaves*  
*like capacitor*

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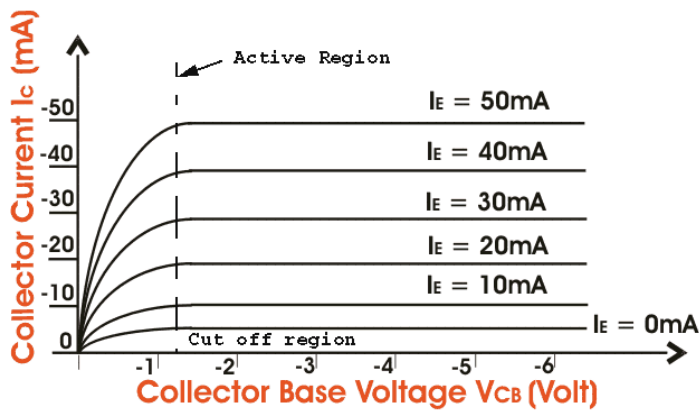


6) Explain the meaning of the statement "this transistor is in cut off".  
 What is  $V_{ce}$  voltage on this transistor in respect to the battery voltage?

*Handwritten notes:*  
 $V_{ce} = V_{cc}$   
 output is battery voltage

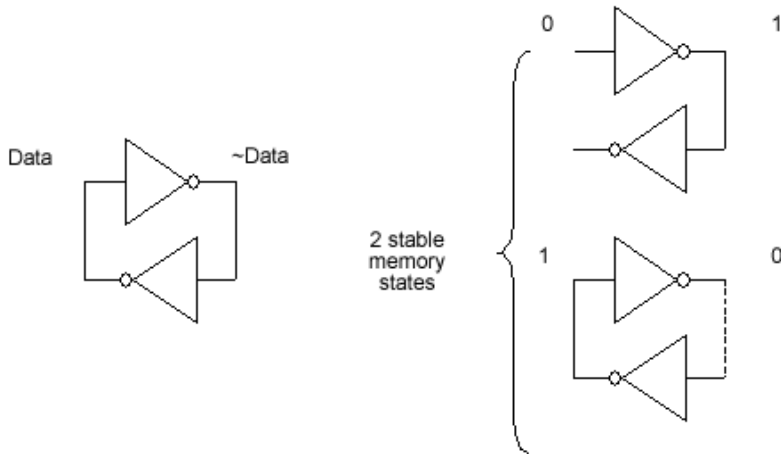
**Quiz 1**

Describe breakdown of a transistor operating in CB. Plot current/voltage dependence.



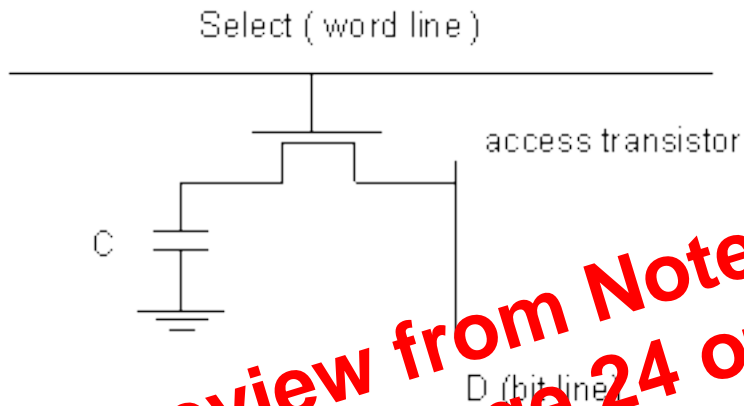
Describe breakdown of a transistor operating in CE. Plot current/voltage dependence.

A:



Describe construction of dynamic memory cell

**A:**



Refreshment of memory is needed for...

**A: dynamic memory**

Plot an equivalent transistor model of IGBT including parasitic transistor

**A: insulated gate bipolar transistor**

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