Difference between LED and Photo diode

	LED (LIGHT EMITTING DIODE)	**PHOTODIODE**
Definition	Two terminal device which converts electrical energy into light energy.	Two Terminal Device which converts light energy into electrical energy.
Working Principle	Works on the principle of Electro-luminance.	Works on the principle of Photoconduction.
Semiconductor used	Gallium Arsenide Phosphide (GaAsP) or Gallium Phosphide (GaP)	Germanium and Silicon
Biasing Mode	Forward Biased Only	Reversed Biased Only

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Problem of Leakage Current	No leakage current	Reverese saturation current is significant. Dark current flows when no light rays are incident on it.
Applications	Indicator in AC circuit, Alphanumeric and Numeric display etc.	Switching, high speed counting, ac coupled signalling etc.

Link:https://electronicscoach.com/difference-between-led-and-photodiode.html

Key Differences Between LED and Photodiode

1. **Function:** The function of the LED and Photodiode is contrasting. LED emits photons due to electron-hole recombination, while Photodiode provides energy to electron and holes by exposing itself towards light radiation.
2. **Operating Principle:** As we have discussed above the operating principle of LED and Photodiode is also different. The principle on which LED works is called Electro-luminance, i.e. Lumination using Electric charges. While the photodiode works on the principle of Photoconduction which means conduction using photons.
3. **Biasing:** LED always operate in forward biased mode, it cannot be operated in a reversed mode as it will destroy it. A photodiode is a device which operated in reversed mode only.

4. **Conversion form of Energy:** LED converts electrical energy into light energy and photodiode converts Light energy into electrical energy.
5. **Material Used:** LED is made up of GaAsP or GaP. Germanium and silicon semiconductor are not used in the manufacturing of LED. Photodiodes are made up of Germanium and silicon semiconductor.

Conclusion

LED and **Photodiode,** both are **two terminal devices,** but they differ in their working mechanism. They are completely different devices. One generates electricity and other generates current. The intensity of light produced by LED is directly proportional to the applied voltage. The higher the voltage, the higher will be the light intensity.

Similarly, the intensity of electric current generated by the photodiode is directly dependant on the intensity of light rays falls on it. But a term is associated with photodiodes, i.e. dark current, this is the current that flows in the reversed biased photodiode when no light is incident on it.