

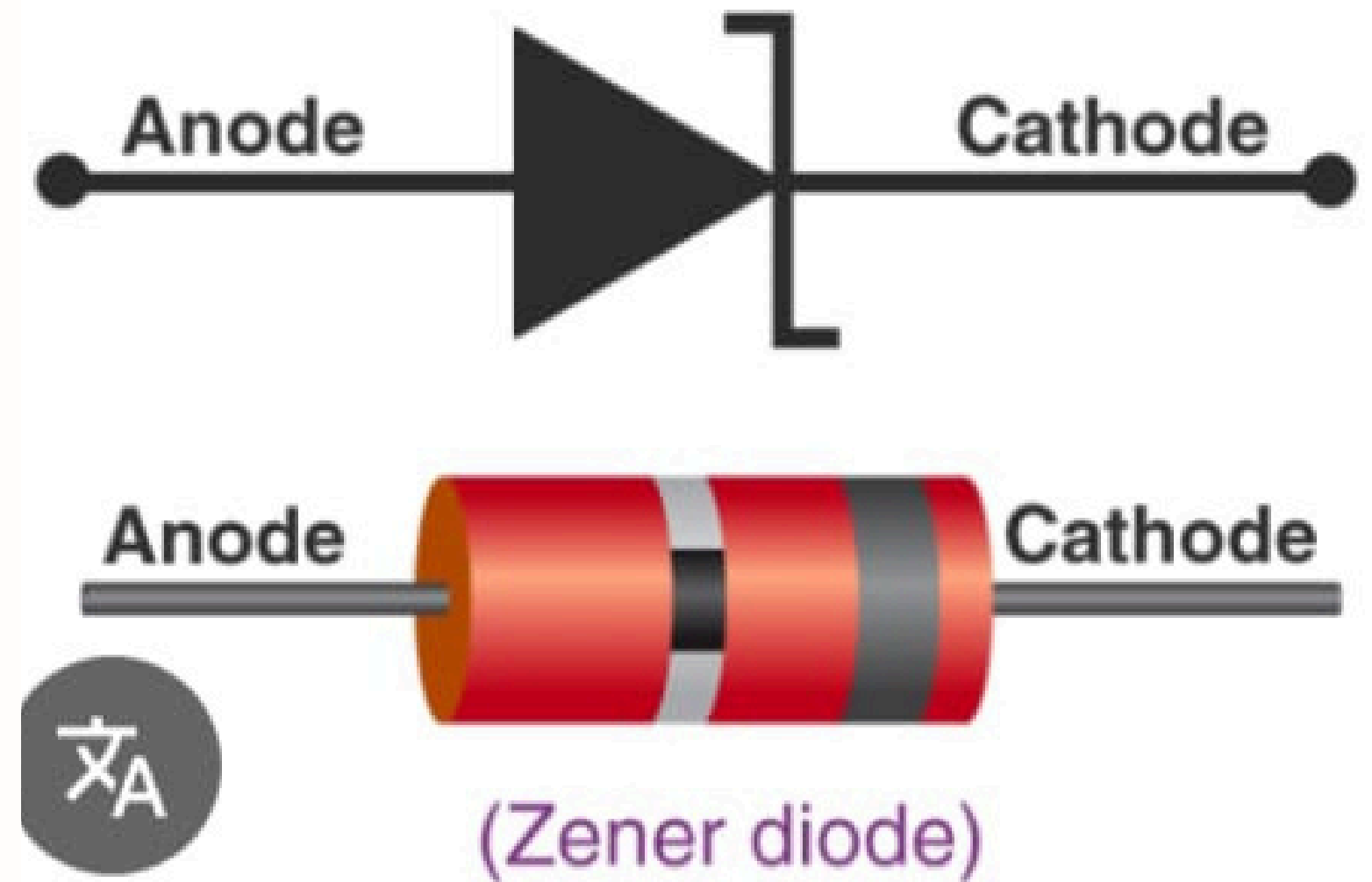


ZENER DIODE

DEFINITION

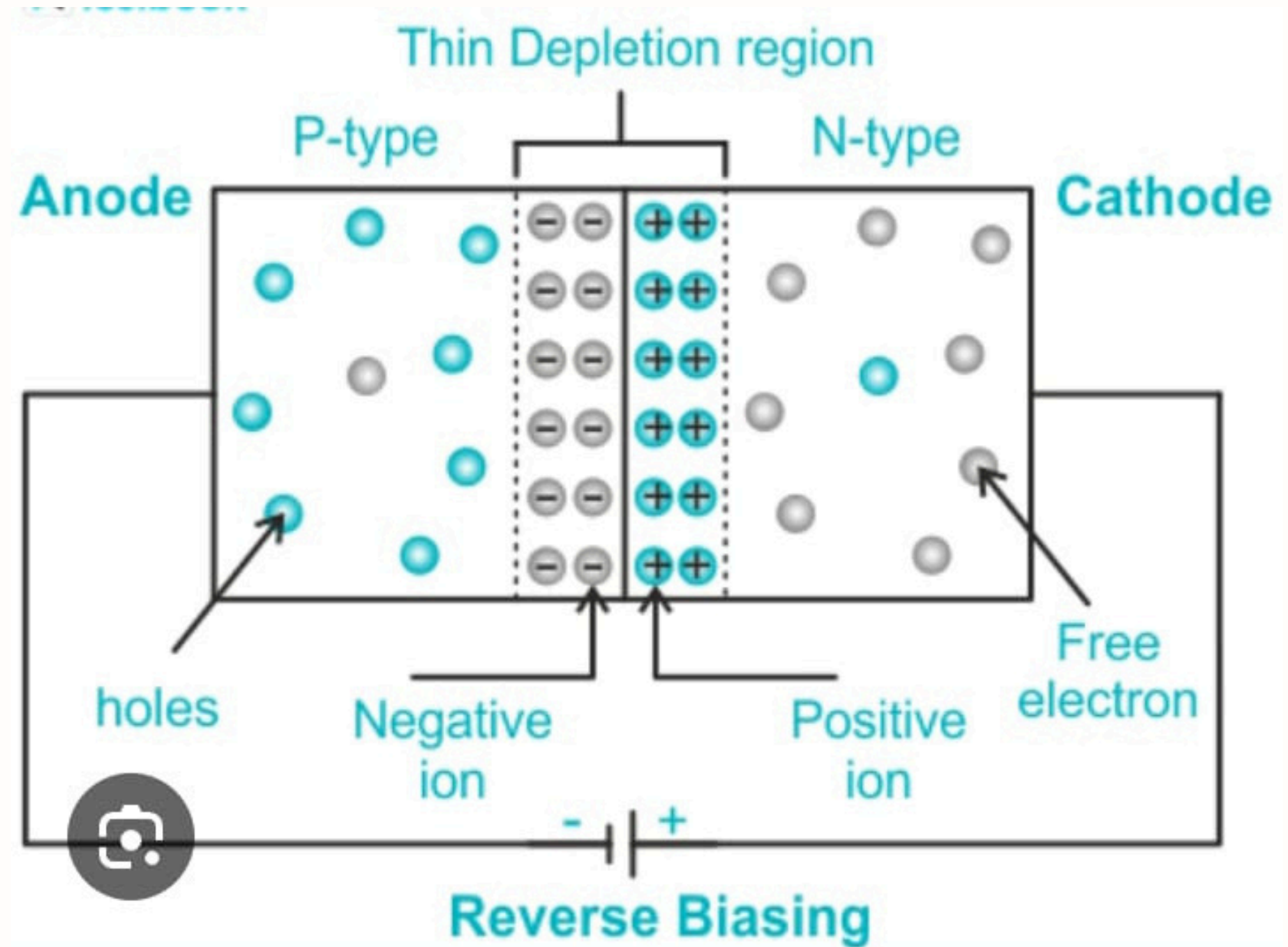
Zener diode is a special type of p-n junction diode that works in reverse bias.

It maintains a constant voltage (called Zener voltage) after breakdown



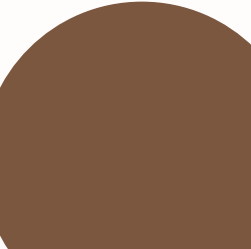
WORKING PRINCIPLE

- Forward Bias: Works like a normal diode.
- Reverse Bias: When voltage reaches Zener voltage (V_z), it conducts and keeps voltage constant.
- Used for voltage regulation and circuit protection





KEY FEATURES

- Fixed reverse breakdown voltage.
 - Provides stable voltage output.
 - Used as voltage regulator and protection device.
 - Needs a series resistor to limit current
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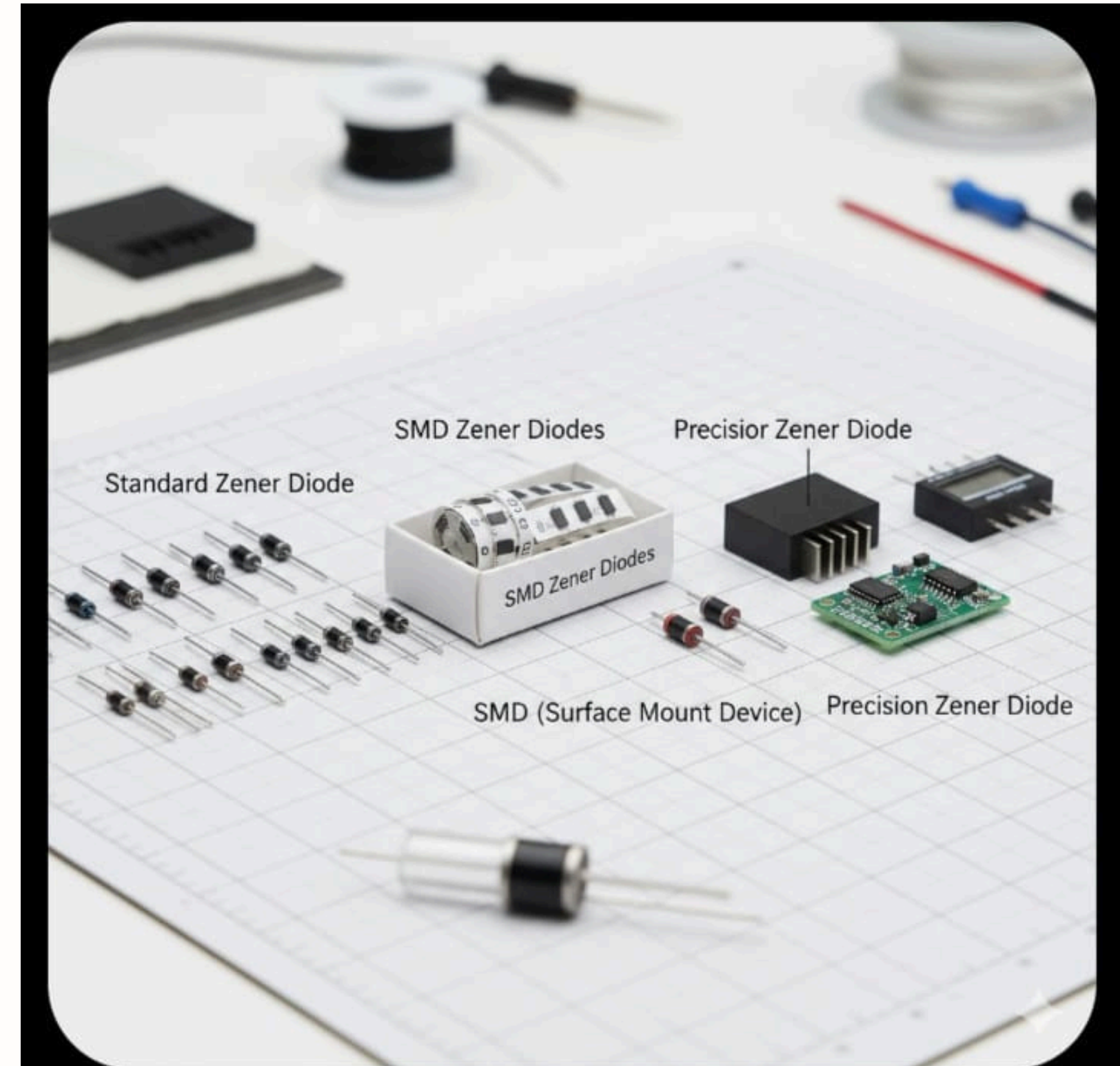
TYPES OF ZENER DIODE

Types of Zener

1. Standard Zener Diode – (Common in circuits)
2. SMD (Surface Mount) – Small and compact.
3. Precision Zener – Temperature stable.
4. Breakdown types: Zener (below 5.6V) & Avalanche (above 5.6V).

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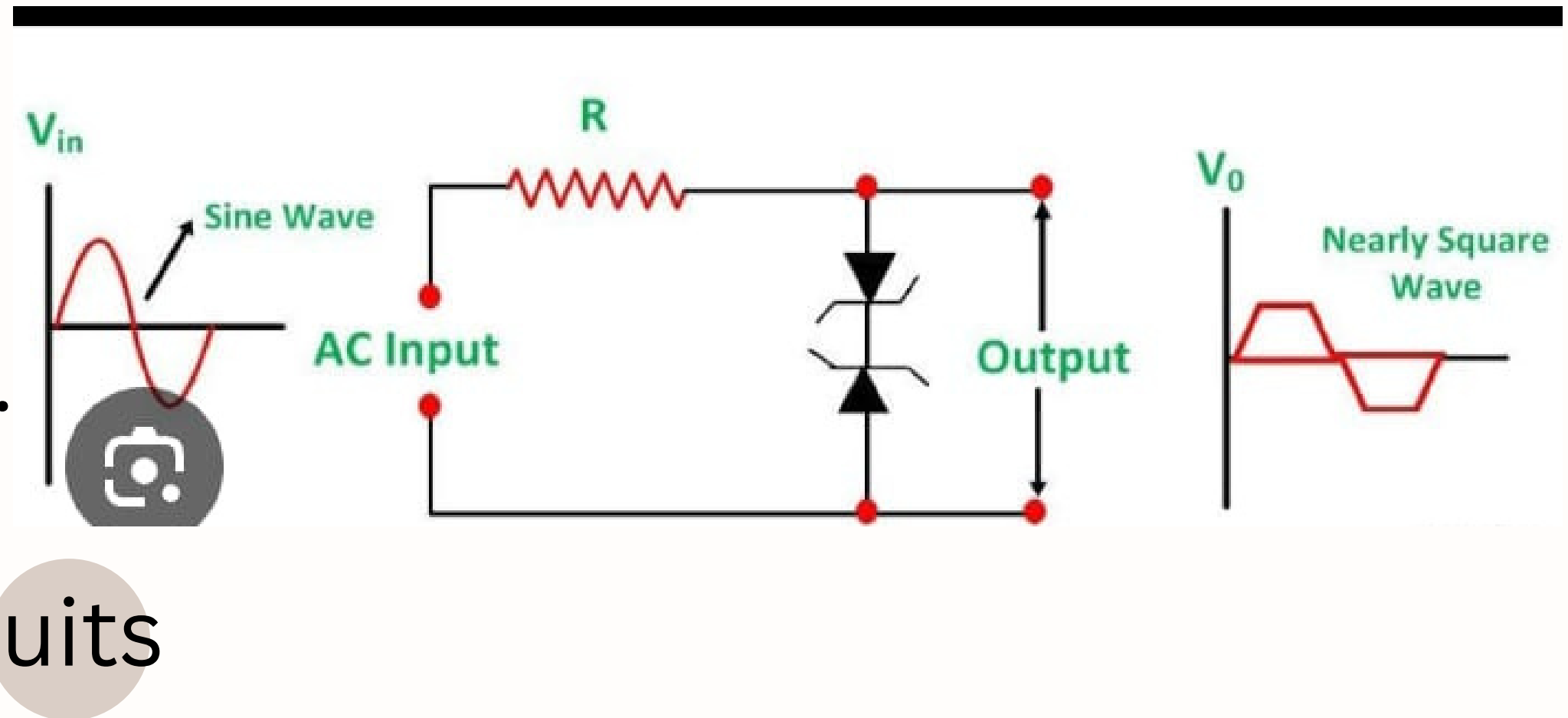
Types of Zener



APPLICATIONS

Timmerman Industries

- Voltage regulators.
- Reference voltage sources.
- Over-voltage protection.
- Clipping and clamping circuits



IMPORTANT POINTS

- Choose correct voltage & power rating ($P = V_z \times I_z$).
- Avoid excess current.
- Temperature affects breakdown voltage

SUMMARY

ZENER DIODE

Zener diode is simple yet powerful.

It keeps voltage stable and protects circuits.

Widely used in voltage regulators and electronics



THANK YOU

