

Self Powered Wireless Thermal Sensor

A technological innovation for temperature measurement application



ERDA developed technology

Conventional Methods of Temperature Measurement

- Thermocouples
- Infrared sensors

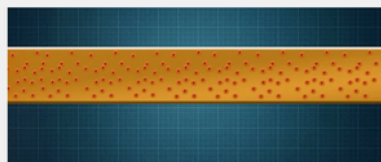
Demerits of Existing Method

- Accessibility restriction in case of panels – form factor
- Limitations of taking readings using IR sensor
- Live electric panel busbar using wired method
- Invasive method
- Prone to create fault - ageing

Aim of Project

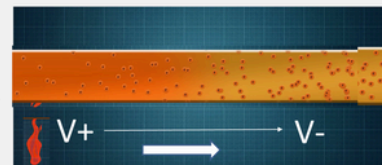
- Eliminate wires from thermal sensor
 - No source of power
 - Sensor has to generate its own power

Principle of Operation



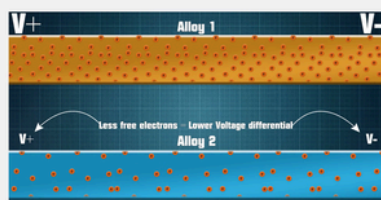
Uniform distribution of electrons at same temperature

Hot side deficit of e-

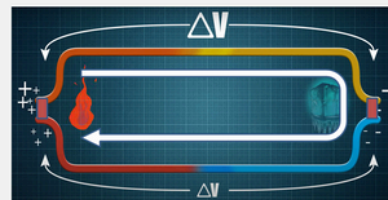


Cold side surplus of e-

Heat source Voltage differential creation because of difference in concentration of electrons on both the sides



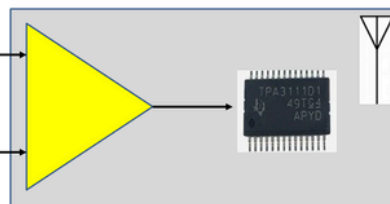
Different alloys having different concentration of free electrons



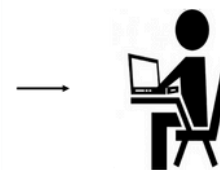
Potential difference creation in a loop



Wireless thermal sensor



Signal conditioning and Power management circuit



Receipt of live temperature data wirelessly at receiving location

Features of developed technology

- Self powered
- Provides live temperature data wirelessly once in every 2 minutes
- No external wired input power required to operate
- Plug and play type device
- Increased safety

Advantages of developed technology

- Indigenous development / technology
- Self-powered
- Wireless
- Backup power
- Continuous temperature monitoring
- Increased safety

Application: Electrical panel Busbar temperature measurement