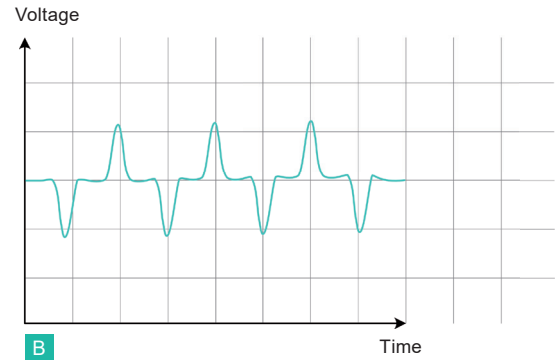
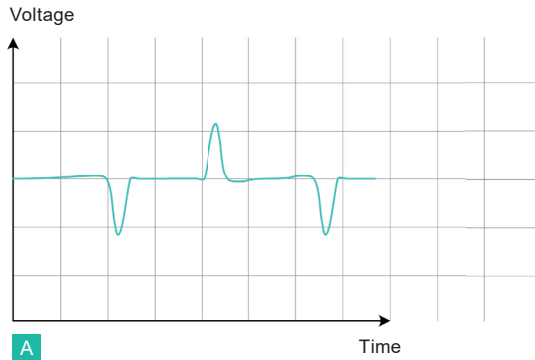


EXPLORATION NOTE

Wiegand Pulses

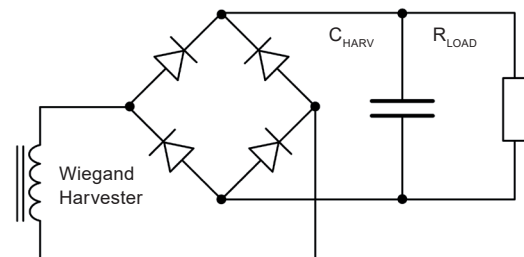
Wiegand sensors (WS) generate a pulse voltage when exposed to alternating magnetic fields. The voltage polarity is linked to the external magnetic field gradient, resulting in pulses of alternating polarity as the field alternates. The minimum pulse voltage and energy is independent of the speed that the external field changes.



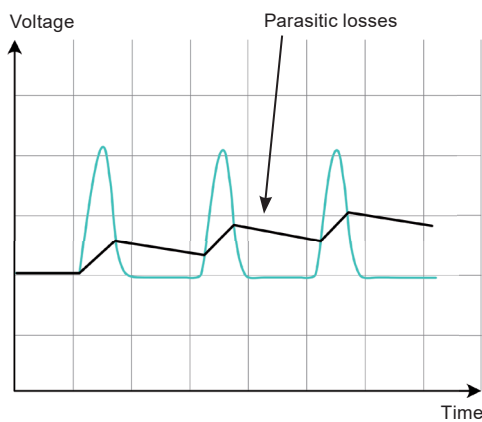
A) Pulse pattern at low excitation frequency. B) Pulse pattern at high excitation frequency. *Pulse shape for reference only

Use Case Considerations

Such pulses can serve as signals and as an energy source to power electronics. Rectified pulses are desirable in most cases, as are low energy losses. Either passive or active rectifier circuits can be chosen, the latter providing superior detection of thresholds and polarity detection, and the former providing lower energy losses.



Example passive rectification circuit



Capacitor charge (black) over several Wiegand pulses (green)

WS pulses are typically short (few $10\mu s$), so when designing a WS-powered system, target circuitry needs to cold start and process information quickly.

For systems dependent on the accumulated energy of multiple pulses, care must be taken to control parasitic losses. If accumulated energy is needed for targeted tasks with higher energy demands, like wireless transmission, such energy losses need to be outpaced by the incoming pulse frequency.

Have a question?
Contact us at ubito.com

