The micropower current amplifier in an RFID tag can be powered by LiTE*STAR™, a thin-film rechargeable lithium battery. The effective read range of the tag can be significantly increased by amplifying the current induced by the external RF field transmitted from the reader. The RF field tag develops a modulated signal in the tag coil and the battery powered current amplifier will enhance the level of modulation. This will have the effect of increasing the depth of modulation in the encoded waveform, increasing the distance that the reader can detect the data.

Recharging the Tag: Additional circuitry can be added to recharge the lithium battery to further enhance the functionality of the RFID tag. Recharging of the tag can be accomplished either by direct charging means where the application allows, or in a real-time, continuous mode using the RF Signal that is activating the tag.
Product Design Optimization:

The LiTE*STAR™ battery is most effective when the system applications and product designs are developed to take full advantage of the long life cycle performance of the battery. With LiTE*STAR™, battery power is now available in packages that have previously been too constrained for traditional primary and secondary batteries. The LiTE*STAR™ recharging features enable a micro-battery to deliver the overall system performance of larger primary batteries.

Typical smart card or RF tag applications require nano-amp or micro-amp currents during milli-second pulses to transmit the desired data. An extremely small amount of power is needed to support an individual pulse, but many pulses over time have traditionally driven the requirement for a large button cell type of primary battery. LiTE*STAR™ is able to deliver the power in smaller doses by receiving an RF energy re-charge in real-time, and deliver the required power again, and again, and again....

As a result a rechargeable LiTE*STAR™ Battery can deliver greater lifetime performance with capacities 100s of times less than conventional batteries.

The LiTE*STAR™ requirements are principally driven by the interval periods between exposure to the induced RF energy fields that are used to modulate the tag. The same energy field can also be used to re-charge the battery. For many applications, a 0.2mAhr capacity or about 1cm², is all that is required, and the thin format enables miniature conformal packages. Further optimization can be achieved by switching off the circuit to the battery during times when the RF signal is not present.

Recharging Diagram not available in PDF Format