



Use Case

TAIYO YUDEN
Power Inductors For Smart
Agriculture and Industrial
Sensors

The Internet of Things (IoT) is a rapidly growing ecosystem opening up tremendous possibilities in a wide range of electronic applications. Cutting across a number of industries, IoT provides a space for connectivity between sensors, processing units, software, and physical objects or machines. According to Fortune Business Insights, the global IoT market is projected to grow from \$381 billion in 2021 to over \$1.8 trillion by 2028. With benefits such as higher operational efficiency, increased productivity, faster business scaling, lower wastage, and cost savings, IoT will drive exponential growth in multiple industry verticals.

A key application of IoT is “Smart Agriculture,” which allows farmers and livestock owners to more accurately monitor agricultural processes on their facilities and make decisions remotely, significantly reducing costs on labor and resources and improving yields. Automated farming enables data collection using electronic sensors placed at strategic locations within agricultural facilities. These systems enable smart diagnostics for real-time monitoring, decision-making, and high-precision control. Similarly, industrial IoT allows for data collection from field equipment, warehousing the data on edge devices, performing data analytics, and hosting data on the Cloud.

Both Agricultural and industrial IoT applications utilize electronic components, including power inductors for power management and voltage regulation. Power inductors are commonly utilized in switched-mode

power supplies (SMPS) to step up or step down the input voltage to suitable levels in agricultural and industrial equipment and minimize core losses that occur during voltage regulation. With higher power requirements in IoT applications, engineers must choose components with high current handling and high voltage characteristics. Industrial applications, such as manufacturing plants and assemblies also require power inductors suited to high-temperature environments to ensure reliable operation. Moreover, these components need to be sufficiently small and lightweight to keep up with trends in product miniaturization as greater numbers of components become integrated into space-constrained PCBs (Printed Circuit Boards).

TAIYO YUDEN’s LBEN (ME) and LBCN (MC) series power inductors are suited to today’s IIoT applications. LBEN series is designed using a high-integrity metal resin composite for structural robustness as well as improved heat resistance in high-temperature IIoT applications. It features five-sided electrodes with low DCR, ideal for low-voltage and high current applications. LBCN series power inductors provide an optimal balance of small footprint and flexibility over case sizes with stable temperature performance and low magnetic flux. They comprise durable metal resin materials ensuring better temperature resistance compared to conventional ferrite inductors.

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