



TDK RFID Label Technology Application

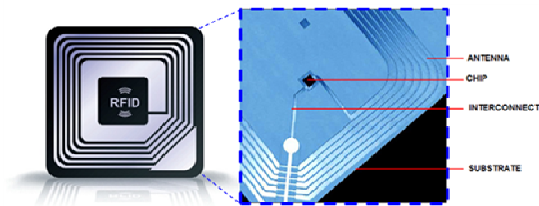
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Abstract

Until recently, RFID technology was cost prohibitive and limited to specialized applications. With the decreasing cost and miniaturization of RFID components such as tags and readers, more companies are adopting this technology as a basis for improving asset tracking and management. The purpose of this FAQ is to explain the basics of Ultra High Frequency RFID technology and TDK's application of the RFID reel tag.

Q1: What is RFID?

A1: RFID (Radio Frequency IDentification) is a technology that uses radio waves to transfer data to and from an electronic tag (RFID tag). A RFID reader / writer is used for the purposes of identifying, tracking, reading and writing information to RFID tags. Today's RFID technology is superior to barcode based systems and offers tags and readers that allow bulk reading of tags at read distances of several meters away.

**Q2: How does RFID work?**

A2: A passive RFID system has three major components: reader antenna, reader, and RFID tag. The reader antenna emits radio frequency signals to provide a means of communicating and to provide energy to the RFID tag. When a tag passes through the field of the antenna, the tag is energized and detected by the reader. The RFID tag "wakes up" and transmits the information stored on its microchip to be picked up by the reader antenna. RFID tag information collected by the antenna is processed by the RFID reader, which interfaces with the network or legacy systems.

Q3: What are some current applications of RFID technology?

A3: RFID is commonly used today in applications such as: smart cards, asset tracking, race timing, livestock tagging inventory management, electronic toll collection, etc...

Q4: What is necessary to read RFID tags?

A4: A UHF (Ultra High Frequency) ISO 18000-6C compliant RFID reader is required to read TDK's tag. UHF RFID readers can be in the form of a hand held device or a fixed mount reader. Software (middleware) to communicate between the UHF reader and user's system (ex.: network, legacy system) may also be required.

Q5: What are the advantages of using RFID vs. barcode technology?

A5: RFID offers several advantages beyond the capability of barcode based systems.

- RFID operates with radio waves and does not require line of sight to read data from the tag.
- RFID tags can be scanned through materials such as cardboard, plastic, wood, liquids, etc...
- Does not require proper orientation to read the tag.
- Unlike barcodes, the tag information is not degraded by poor print quality.
- RFID tags can be read from several meters away.
- RFID readers have the ability to simultaneously read data from multiple tags (bulk reading).
- RFID tags are reusable and have read / write capability.
- RFID tags offer higher information storage capacity.
- RFID can operate in harsh environments with higher read accuracy.
- RFID tags have a unique serial ID number embedded in the tag data.



Q6: What standard information is stored on TDK's RFID reel tag?

A6: TDK's RFID reel tags are commissioned with lot specific information such as: lot number, customer part number, and quantity. RFID reel tag data can be customized to meet individual customer RFID requirements, as up to 64 bits of data can be stored on TDK's RFID reel tag. Please contact your TDK sales representative for more information regarding customized information for RFID reel tags. Below is an example of TDK standard RFID reel tag data (red font indicates data identifiers).

PCGJ2B1C104K, 1PCGJ2B1C104KT0Y0N, Q10000
(customer part no.) (TDK item description) (reel quantity)

Q7: What kind of RFID tag does TDK use?

A7: TDK is currently using a UHF (Ultra High Frequency) Generation 2, passive RFID tag. The UHF Gen 2 tag is capable of operating at standard domestic and international RFID frequencies.



Q8: Is TDK's RFID tag compliant to any industry standards?

A8: TDK's RFID tag is compliant to ISO / IEC 18000 – 6 :2010 requirements and can be read within the standard operating frequency range for the United States (902-928Mhz) and international regulated frequencies within the Ultra High Frequency (UHF) bandwidth for Europe (865 – 868 Mhz) and Japan (952 -957 Mhz).

Q9: Does TDK offer RFID tags on all product lines?

A9: No. At the moment, UHF RFID tags are available only for CGJ (extended life) capacitor series products. Please contact your TDK sales representative for more information regarding customized application of RFID reel tags.

Q10: Does TDK's RFID reel tag contain any hazardous or restricted substances?

A10: No. The UHF RFID tags used by TDK are in compliance with RoHS 2002/95/EC and REACH 1907/2006/EC directives.

Q11: Where can I find more information about RFID technology?

A11: There are numerous resources available on the internet that discusses RFID technology. Some examples are: www.rfid.org and www.rfidjournal.com

End of Report



Contact our office to find a local TDK Sales Representative near you for further information or visit our website at <http://www.tdk.com>

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