TECH OFFER

A Compact UHF RFID Tag for Metallic Objects

KEY INFORMATION

TECHNOLOGY CATEGORY:
Electronics - Sensors & Instrumentation
Electronics - Embedded Systems

TECHNOLOGY READINESS LEVEL (TRL): TRL4
COUNTRY: SINGAPORE
ID NUMBER: TO174754

OVERVIEW

This technology offer is a Ultrahigh Frequency (UHF) Radio-Frequency Identification (RFID) tag antenna for use on metal structures. 2 versions are available:

- A compact dual-band version with folded strip structure, with a total size of only 20 mm × 30 mm × 1.5 mm. This tag can be well used in different RFID systems, which work at different UHF bands, such as European and American frequencies. The reading patterns of this tag are with different directions in two bands.
- A single band version with a total size of only 10 mm × 30 mm × 1.5 mm. This tag can be well used in planar as well as conformal platforms, such as metallic cylinders and bearings.

Automated factories should be interested in these tags, and they can use the miniaturized tags with RFID technology to intelligently detect whether the machinery and equipment are running normally.

TECHNOLOGY FEATURES & SPECIFICATIONS

For the dual-band UHF RFID tag antenna, the main innovation is that its size is very compact. Compared to previous compact tags, this technology has the smallest dimensions of 0.06 λ × 0.09 λ × 0.0045 λ, where λ is the wavelength of free space at 915 MHz. In addition, very different from other products, the reading patterns of this tag are different in two bands. This design is able to provide a sufficiently far identification distance (> 7 meters in European RFID band, and > 5 meters in American RFID band) at such extremely small size, proving that this tag has very high radiation efficiency.

For the single band UHF RFID tag antenna, the main innovation is that its size is greatly reduce by three new strategies. Compared to previous compact tags, this technology has the smallest dimensions of 0.03 λ × 0.09 λ × 0.0045 λ, where λ is the wavelength of free space at 915 MHz. This design is able to provide a sufficiently far identification distance (> 5 meters) with such extremely small size, proving that this tag has very high radiation efficiency.

POTENTIAL APPLICATIONS

The primary application area of this technology is industrial intelligent RFID multifunctional detection system. The anti-metal tag of this system can use this technology because this single tag can cover two UHF RFID bands simultaneously. This technology also can be well used in intelligent driving RFID positioning system in different countries. Some products about logistics RFID management, luggage RFID management, containers RFID management, and shelves RFID management can be developed at different regions. The rapid development of the Internet of Things (IOTs) has spawned a variety of new technologies and product applications. The application trends of anti-metal tags are expected to be more extensive and more suitable for multi-scenario applications in RFID market.

UNIQUE VALUE PROPOSITION

The technology can offer some business opportunities in smart RFID logistics and smart agriculture. It has very broad prospects for the rich sensing applications of the IOTs in the near future. This design can save a lot of installation space for the rest of the industrial equipment, especially for the dual band tag which works at 2 different frequencies, with its multifunctional radiation beams. Due to its highly efficient radiation, it can reduce the input power of the transmit components of its RFID system. Other risk factors due to the continuous heating state of the system can be further reduced.

The technology owner is keen to license this technology to RFID application technology companies, including for logistics management, access control and equipment management, etc.