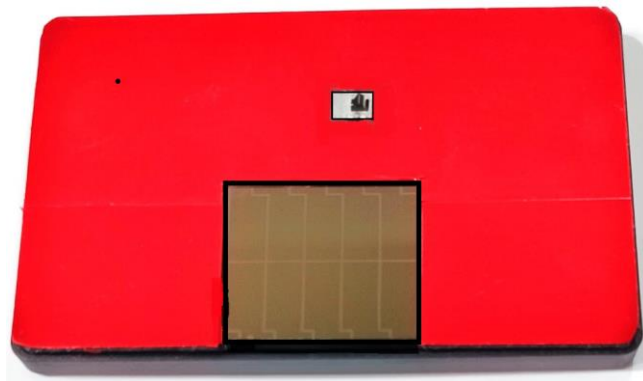


Ultra High Frequency(UHF) AES128 Encrypted Unit Multi-function RFID Semi-active tag



On Board Unit (Model: IVF-TU06-OBU)

Pick-to-Light Unit (Model: IVF-TU06-PLU)

Temperature Logger Unit (Model: IVF-TU06-TLU)

GENERAL DESCRIPTION

RD240078A/IVF-TU06 is an all-in-one multiple function UHF high performance long reading range RFID tag, designed as embedded rechargeable battery, semi-active working method, Ultra ECO-friendly low consumption, photovoltaic solar panel auto-powered, tamper evidence, LED reminding, temperature logging and so on.

The tag is compatible with existing EPC Class 1 Gen 2 V1 (ISO 18000-6C) communication protocol and existing RFID integration systems, without additional customizing hardware or investing new development.

Based on the industry-leading ultra-high frequency Gen2V2 technology, combined with the patented technology, working support in both of passive and active, it has an ultra-high RF reading sensitivity of up to -26dBm while enough RF energy is powered.

Which tag is adapted and configurable to meet three different applications.

- **Vehicle Application:** widely used in electronic license plate/E-plate/Vehicle license, parking station, gas station, driver license and so on, using bank card financial grade AES128 security chip and special tamper proof design, providing sufficient transaction security guarantee for large amount of capital transactions.
- **Smart Warehousing:** warehouse, air-cargo/sea-cargo transportation, courier company, archive/file/document asset and property finding and tracking management and so on, user friendly navigation service by a pick-to-light solution, instruction basing on different color of LED light or buzzer, provide look-to-find easy target locating.
- **Supply Chain Application:** provide user trusted service evidence basing on a stable temperature record, especially used in cold chain and fresh chain, such as healthcare medicine management, food management, farm produce management, medication transportation and so on, offline temperature sensor logger performs temperature measurement and record temperature log at a set of frequency during process, providing more reliable mutual trusts between parties and parties.

FEATURES

1. Ultra High RF Communication Performance

- ✧ Excellent communication capability of -26dBm, which is boosting well reading range from the existing passive design. Based on the standard EPC Class 1 Gen 2 V2(ISO 18000-6C) protocol, it can accurately and quickly identify vehicle information from a long distance.
- ✧ The RD240078A/IVF-TU06 have average reading detection range more than 20meters or more (subject to RFID reader power, reader antenna gain and installation location). A special designed reader antenna will effectively improve also the communication range.

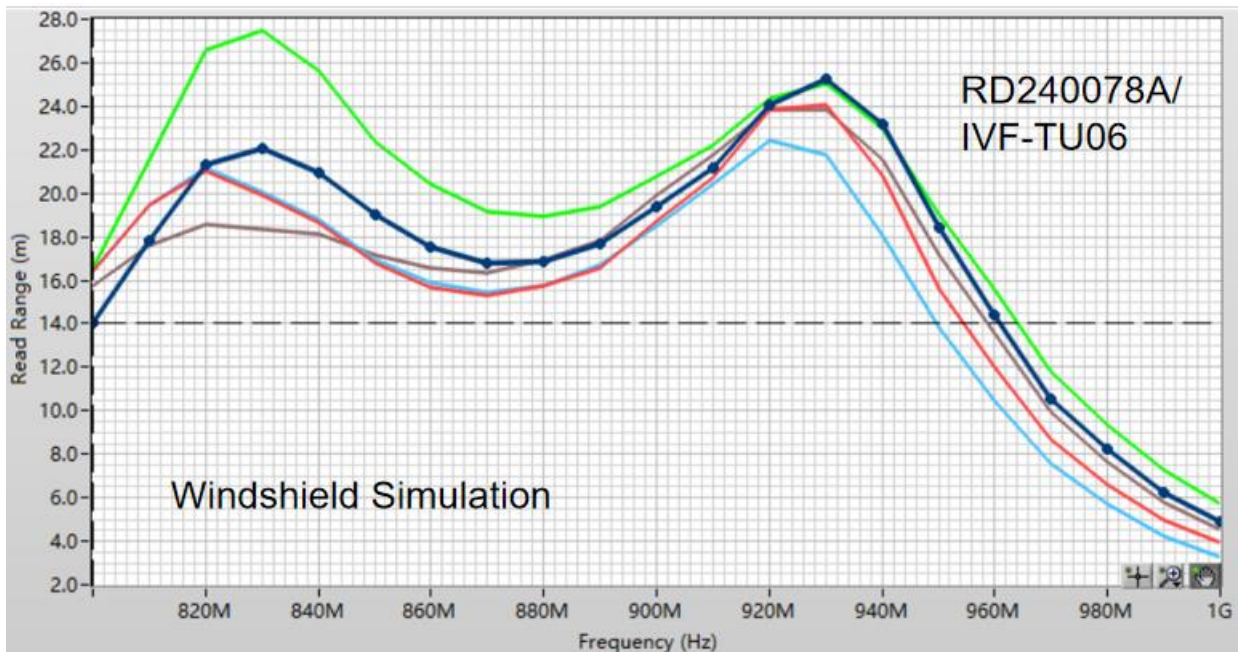


Fig1. Tag on windshield Simulation

2. Three Working Method

- ✧ Adopting standard "Semi-active working method, and allow to switching automatically between passive and semi-active, solar-powered energy enable full day RFID function.
- ✧ Ultra eco-friendly low power consumption, long life, environmental protection and energy saving.

3. Unique Anti-Disassembly Design

- ✧ Patented anti-disassembly technology effectively preventing the cost loss caused by any attempt or private disassembly.
- ✧ One-time disposable use and reusable design are both available.
 - When the tag is disassembled, TAMPERED will be detected and couldn't be restored for cycle use without new permission.

- Reactivation mechanism to scope with special situations, the product can only be reused by encrypted initialization after customer new approval.
- Before new approval, the tag status remained “TAMPERED” when the tag is re-installed for new detection.

4. Confidence, Safe and Reliable

- ✧ Use AES-128 and special key to encrypt user data. Not logically map secret keys to ensure reading or writing secret keys by means of Gen2 RF commands not possible.
- ✧ Untraceable is also an option to secure data such as EPC, TID and user data which can be partially or totally hidden or locked.

5. Perfectly Compatible

- ✧ Compatible with existing EPC Class 1 Gen 2 V1 (ISO 18000-6C) communication protocol and existing RFID integration systems, providing fast driving experience for car owners and realizing efficient management for property.
- ✧ No need to change current Implementation of RFID Reader and Reader Antennas, nothing special command or firmware is required except AES128 Gen2V2 new protocol.

6. LED and buzzer

- ✧ In addition to location navigation mode, location tracking notice with LED display, buzzer, or both LED and buzzer, can be defined by a standard RFID reader to trigger output such display RED color or make beep sound as a notice as customer need as possible, to enable user to instantly find owner’s property, positioning distance is up to 25meters.
- ✧ In standard semi-active mode, when customer press “Button” will activate LED display to measure and show low level or high level of battery by RED or Green led light.

7. Device condition checking Button

- ✧ Let user press “Button” on the side to perform battery measurement and display LED light for battery indication.

8. Temperature Sensor

- ✧ Temperature measurement function can be activated to log temperature measurement at a set frequency and record temperature data automatically for future use if the setting parameter is available, default setting is for online measurement.
- ✧ Recording intervals can be set as 1min, 2min, 5min, 10min, 20min, 30min, 1hr, 2hr, 3hr, 6hr, 12hr, 1d, 2d, 3d, 4d and 5d.
- ✧ Log records can be set as more as client requires.

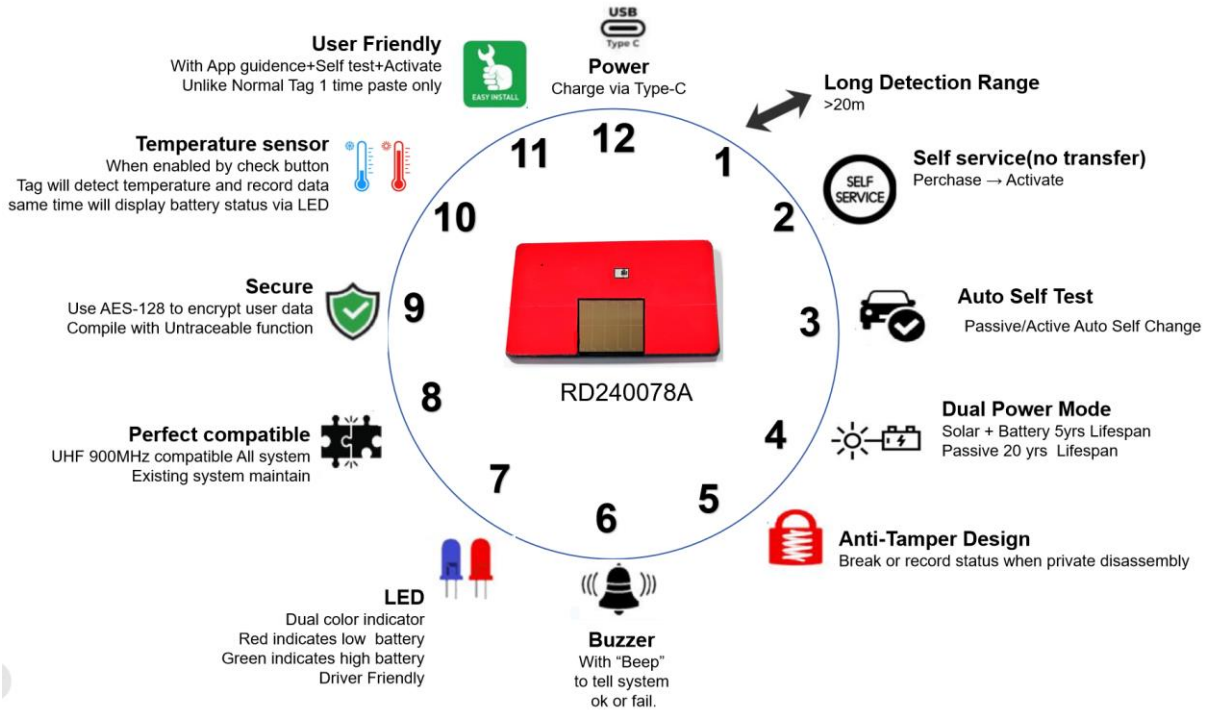


Fig2. Tag Features

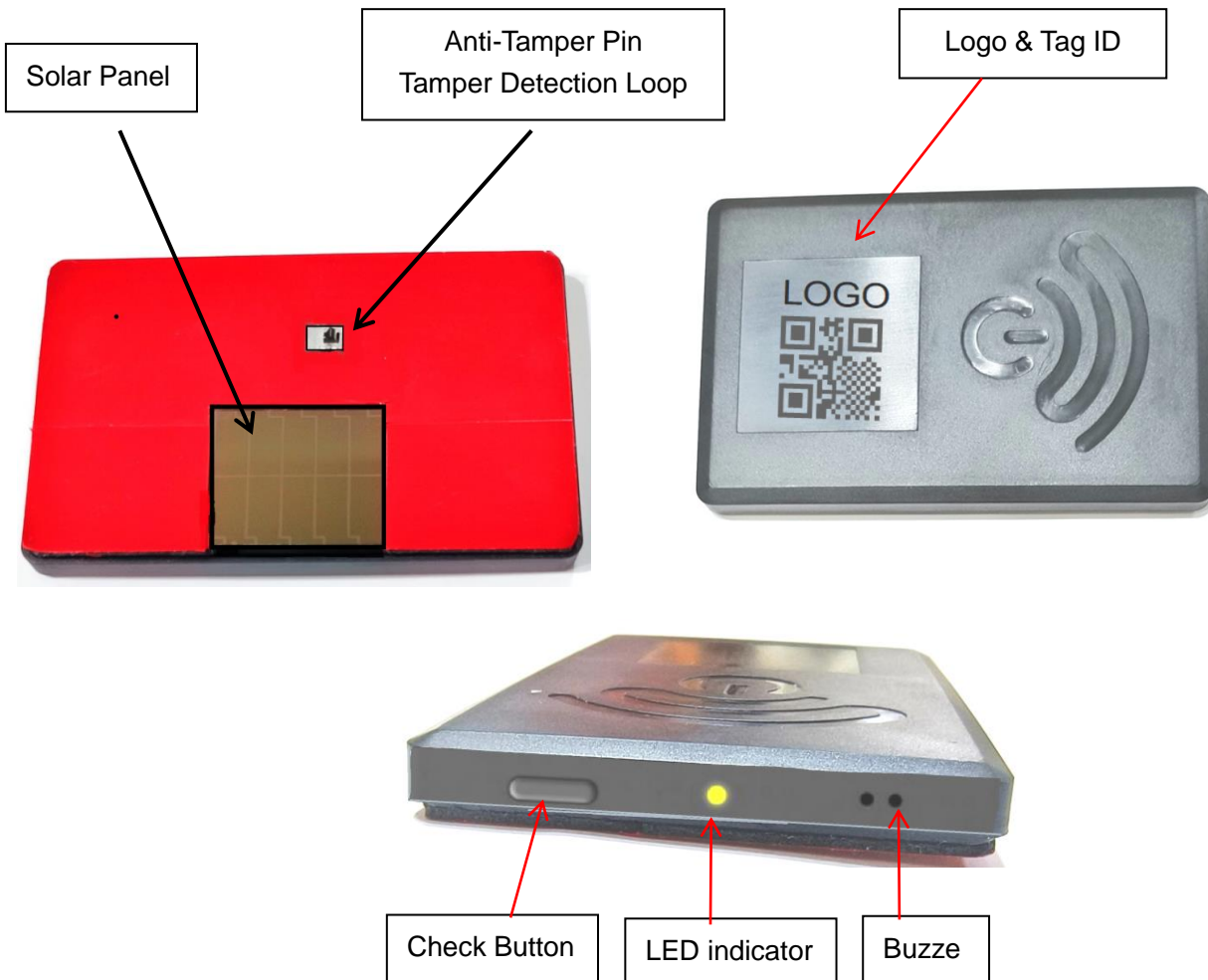


Fig3. Tag Configuration

Technical Specification

Parameters	Specification
Mechanical	
Dimension	86mm x 54mm x 7mm
Weight	< 100g
Material	ABS
Color	Black (White is optional)
Installation Location	Inside Windshield
RF Characteristics	
Protocol	EPC Class 1 Gen 2 V2 (compatible with ISO18000-6C)
Frequency	902-928MHz
Read Sensitivity	-18dBm in passive method / -26dBm in semi-active method
Write Sensitivity	-14dBm
Data Capacity	EPC Class1 Gen2 V2 512 Bits user NVM AES128 secured 512 Bits user data
Reading Distance	0-25m+ (Subject on RFID reader performance and environment)
Write Label Distance	0-10m+ (Subject on RFID reader performance and environment)
Electrical Characteristics	
Operating Voltage	3.7V DC
Working Current	Static current $\leq 5\mu\text{A}$ Working current < 10 μA
Power Supply	Rechargeable battery 10mAh Solar charging scheme
Service Life	Battery >3 Years Data write retention life > 100,000cycles
Environmental Characteristics	
Operating temperature	-30 °C ~ + 85 °C
Storage temperature	-40 °C ~ + 30 °C
Relative operating humidity	$\leq 95\%$ (non-condensing)
Anti-Static	4KV

Remark:

- Specifications are subject to change, please pay attention to our latest version.
- Xiamen Innov Information Science & Technology Co. LTD reserves the right to the final interpretation of the above terms.