RI-I03-114A-S1 Tag-it™ HF-I Pro Transponder Inlays Miniature Rectangle

Not Recommended for New Designs

1 Features

- ISO/IEC 15693-2, -3; ISO/IEC 18000-3 Compliant
- 13.56-MHz Operating Frequency
- 256-Bit User Memory in 8 blocks × 32-Bit
- User and Factory Lock Per Block
- Application Family Identifier (AFI)
- Fast Simultaneous Identification (Anti-Collision)
- Password Protected Write Command
- Command to Disable IC Functionality

2 Applications

- Product Authentication
- Ticketing
- Stored Value

3 Description

Texas Instruments Tag-it™ HF-I pro transponder inlays consist of 13.56-MHz high-frequency (HF) transponders that are compliant with the ISO/IEC 15693 and ISO/IEC 18000-3 global open standards. These products offer a user-accessible memory of 256 bits, organized in eight blocks, and an extended command set including password protect write available in five different antenna shapes, with frequency offset for integration into paper, PVC, or other substrates.

The Tag-it HF-I pro transponder inlays are manufactured with TI's patented laser tuning process to provide consistent read performance. Prior to delivery, the transponders undergo complete functional and parametric testing, in order to provide the high quality that customers have come to expect from TI.

The Tag-it HF-I pro transponder inlays are well suited for a variety of applications including, but not limited to, product authentication, library, supply-chain management, asset management, and ticketing/stored value applications.

Device Information(1)

PART NUMBER	PACKAGE	BODY SIZE (NOM)
RI-I03-114A-S1	TFE	22.50 mm x 38.00 mm

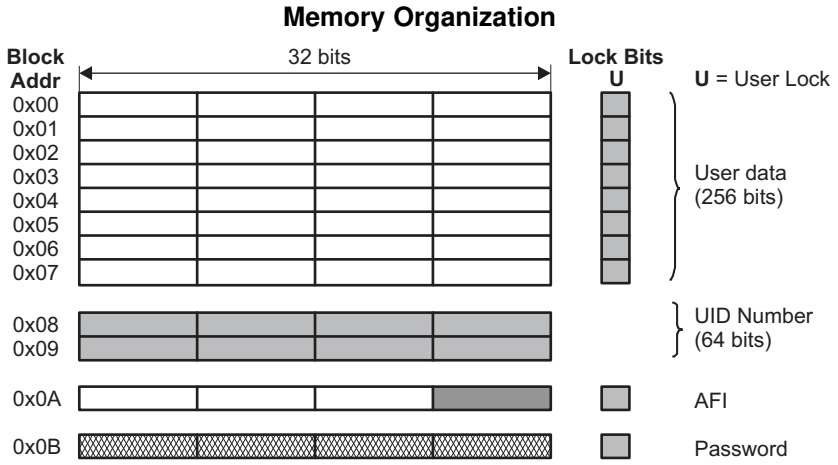
(1) For all available packages, see the orderable addendum at the end of the datasheet.

4 Revision History

Changes from Revision B (Sept 2011) to Revision C **Page**

- Changed feature from 8 bits x 32-bit blocks to 8 blocks x 32-Bit 1
- Changed spec from 8 bits x 32-bit blocks to 8 blocks x 32-Bit 3

5 Pin Configuration and Functions



6 Specifications

Table 1. Specifications (1)

	PART NUMBER
	RI-I03-114A-S1
Supported standard	ISO/IEC 15693-2, -3; ISO/IEC 18000-3
Recommended operating frequency	13.56 MHz
Passive resonance frequency (at 25°C)	13.86 MHz ±200 kHz (includes frequency offset to compensate further integration into paper or PVC lamination)
Typical required activation field strength to read (at 25°C)	107 dBµA/m (2)
Typical required activation field strength to write (at 25°C)	111 dBµA/m (2)
Factory programmed read-only number	64 bits
Memory (user programmable)	256 bits organized in 8 blocks × 32-Bit
Typical programming cycles (at 25°C)	100,000
Data retention time (at 55°C)	>10 years
Simultaneous identification of tags	Up to 50 tags per second (reader/antenna dependent)
Antenna size	22.5 mm × 38 mm (~0.89 in × ~1.5 in)
Foil width	48 mm ± 0.5 mm (1.89 in ± 0.02 in)
Foil pitch	48 mm +0.1 mm/–0.4 mm (~1.89 in)
Thickness	Chip area: 0.34 mm ± 0.02 mm Antenna area (Al both sides): 0.085 mm ±0.01 Antenna area (Al one side): 0.075 mm ±0.008
Base material	Substrate: PET (polyethylenetherephtalate); Antenna: aluminum
Operating temperature	–25°C to 70°C
Storage temperature (single inlay)	–40°C to 85°C (warpage may occur at upper temperature range)
Storage temperature (on reel)	–40°C to 40°C
Delivery	Single-row tape wound on cardboard reel with 500-mm diameter Reel outer width: approximately 60 mm (about 2.36 inches) Reel inner width: approximately 50 mm (about 1.97 inches) Hub diameter: 76.2 mm (3 in)
Typical quantity of good units per reel	5000

(1) For highest possible read-out coverage, operate readers at a modulation depth of 20% or higher.
(2) After integration into paper or PVC lamination.

Table 2. Supported Command Set

REQUEST	REQUEST MODE(1)					
	REQUEST CODE	INVENTORY	ADDRESSED	NON-ADDRESSED	AFI	OPT. FLAG
ISO 15693 Mandatory and Optional Commands						
Inventory	0x01	✓	–	–	✓	0
Stay Quiet	0x02	–	✓	–	–	0
Read_Single_Block	0x20	–	✓	✓	–	1
Write_Single_Block	0x21	–	✓	✓	–	1
Lock_Block	0x22	–	✓	✓	–	1
TI Custom Commands						
Kill	0xA4	–	✓	–	–	1
WriteSingleBlockPwd	0xA5	–	✓	–	–	1

(1) ✓ = Implemented, – = Not applicable

7 Device and Documentation Support

7.1 Trademarks

Tag-it is a trademark of Texas Instruments.

7.2 Electrostatic Discharge Caution

These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

7.3 Glossary

SLYZ022 — *TI Glossary*.

This glossary lists and explains terms, acronyms, and definitions.

8 Mechanical, Packaging, and Orderable Information

The following pages include mechanical packaging and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
RI-I03-114A-S1	NRND	RFIDN	TFE	0		Pb-Free (RoHS)	Call TI	N / A for Pkg Type	-25 to 70		

(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been defined.
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

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