

RF37S114 Tag-it™ HF-I Type 5 NFC, ISO/IEC 15693 Transponder, 4 mm × 4 mm

1 Device Overview

1.1 Features

- ISO/IEC 15693-2, ISO/IEC 15693-3, ISO/IEC 18000-3, NFC Tag Type 5
- Integrated Antenna
- 13.56-MHz Operating Frequency
- 256-Bit User Memory in Eight 32-Bit Blocks
- Application Family Identifier (AFI)
- Fast Simultaneous Identification (Anticollision)

1.2 Applications

- Product Authentication
- Supply Chain Management
- Asset Management
- Medical

1.3 Description

The TI Tag-it™ HF-I Type 5 NFC transponder is compliant with the ISO/IEC 15693 and ISO/IEC 18000-3 global open standards. This product offers a user-accessible memory of 256 bits, organized in 8 blocks, and an optimized command set. This transponder product comes with an integrated antenna and, therefore, is ready for application without the need for an external antenna.

Device Information ⁽¹⁾

PART NUMBER	PACKAGE	BODY SIZE
RF37S114HTFJB	RFIDP (0)	4 mm × 4 mm x 0.66 mm

(1) For the most current device, package, and ordering information, see the *Package Option Addendum* in [Section 6](#).

[Figure 1-1](#) shows the transponder.

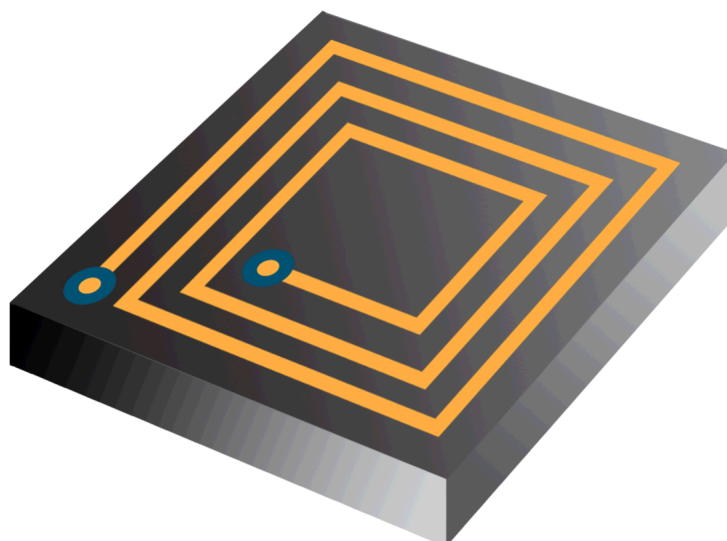


Figure 1-1. RF37S114HTFJB Transponder



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2 Revision History

DATE	REVISION	NOTES
November 2015	*	Initial Release

3 Specifications

3.1 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted)

	MIN	MAX	UNIT
T _A Operating temperature	–25	70	°C
T _{STG} Storage temperature	–40	85	°C

3.2 ESD Ratings

Device is fully encapsulated and protected. No ESD classification applies.

3.3 Recommended Operating Conditions

over operating free-air temperature range (unless otherwise noted)

	MIN	MAX	UNIT
T _A Operating temperature	–25	70	°C

3.4 Electrical Characteristics

over operating free-air temperature range (unless otherwise noted)

PARAMETER	RF37S114HTFJB
Supported standard	ISO/IEC 15693-2, ISO/IEC 15693-3, ISO/IEC 18000-3
Recommended operating frequency	13.56 MHz
Typical read activation field strength (at 25°C)	136.0 dBμA/m
Typical write activation field strength (at 25°C)	136.0 dBμA/m
Factory programmed read-only number	64 bits
Memory (user programmable)	256 bits organized in eight 32-bit blocks
Typical programming cycles (at 25°C)	100000
Data retention time (at 55°C)	>10 years
Simultaneous identification of tags	Up to 50 tags per second (reader and antenna dependent)

3.5 Physical Characteristics

over operating free-air temperature range (unless otherwise noted)

PARAMETER	RF37S114HTFJB
Dimensions	4 mm × 4 mm × 0.66 mm ±0.1 mm

4 Detailed Description

4.1 Supported Command Set

Table 4-1 summarizes the ISO/IEC 15693 mandatory and optional commands that are supported by this transponder.

Table 4-1. Supported Command Set (ISO/IEC 15693 Mandatory and Optional Commands)

REQUEST	REQUEST MODE ⁽¹⁾					
	REQUEST CODE	INVENTORY	ADDRESSED	NONADDRESSED	AFI	OPTIONAL FLAG
Inventory	0x01	✓	✗	✗	✓	0/–
Stay Quiet	0x02	✗	✓	✗	✗	0/–
Read_Single_Block	0x20	✗	✓	✓	✗	–/1
Write_Single_Block	0x21	✗	✓	✓	✗	–/1
Lock_Block	0x22	✗	✓	✓	✗	–/1

(1) ✓ = Implemented, ✗ = Not applicable

4.2 Memory Organization

Figure 4-1 shows the organization of the user-accessible memory on this transponder.

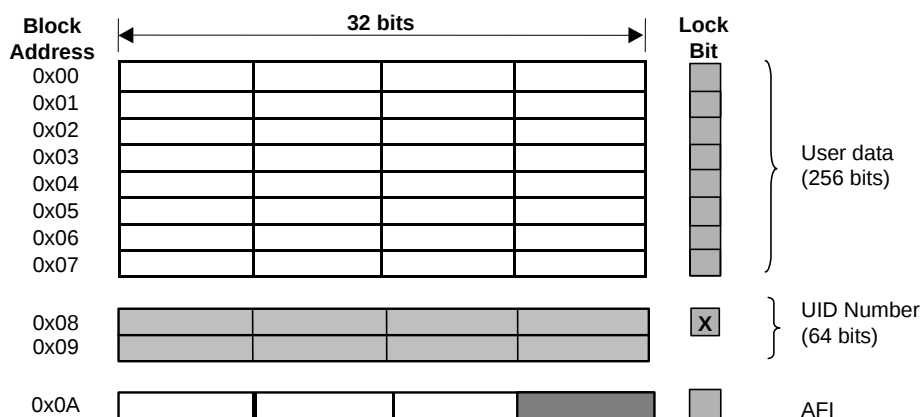


Figure 4-1. Memory Organization

5 Device and Documentation Support

5.1 Device Support

5.1.1 Development Support

5.1.1.1 Getting Started and Next Steps

RFID products from TI provide the ultimate solution for a wide range of applications. With its patented HDX technology, TI RFID offers unmatched performance in read range, read rate, and robustness. TI offers one-stop-shopping of transponders, inlays, reader modules, and reader ICs. For more information, see the [Overview for NFC / RFID](#) page.

5.1.2 Device Nomenclature

To designate the stages in the product development cycle, TI assigns prefixes to the part numbers of devices. Each commercial family member has one of three prefixes: x, p, or no prefix (for example, xRF37S114HTFJB). These prefixes represent evolutionary stages of product development from engineering prototypes (with prefix x) through fully qualified production devices (with no prefix).

Device development evolutionary flow:

xRF... – Experimental device that is not necessarily representative of the electrical specifications of the final device

pRF... – Final device that conforms to the electrical specifications of the final product but has not completed quality and reliability verification

RF... – Fully qualified production device

Devices with a prefix of **x** or **p** are shipped against the following disclaimer:

"Developmental product is intended for internal evaluation purposes."

Production devices have been characterized fully, and the quality and reliability of the device have been demonstrated fully. TI's standard warranty applies.

Predictions show that prototype devices have a greater failure rate than the standard production devices. TI recommends that these devices not be used in any production system because their expected end-use failure rate still is undefined. Only qualified production devices are to be used.

TI device nomenclature also includes a suffix with the device family name. This suffix indicates the package type (for example, TEL) and, optionally, the temperature range (for example, T). [Figure 5-1](#) provides a legend for reading the complete device name for any family member.

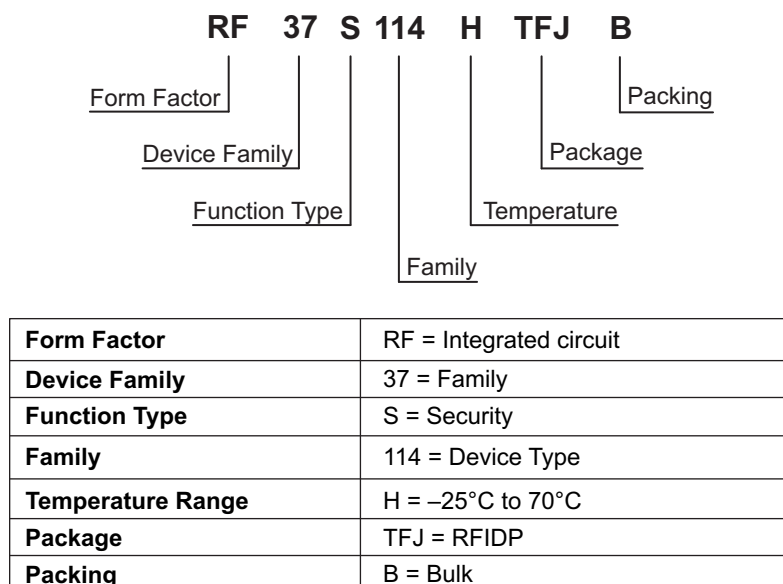


Figure 5-1. Device Nomenclature

5.2 Documentation Support

The following documents describe the RF37S114HTFJB device. Copies of these documents are available on the Internet at www.ti.com.

SPAT178 ***RFID Systems Product Specifications.*** Texas Instruments Radio Frequency Identification Systems is an industry leader in RFID technology, and the world's largest integrated manufacturer of TI-RFid™ tags, TI-RFid smart labels, and TI-RFid reader systems. With more than 1 billion RFID tags manufactured, TI-RFid technology is used in a broad range of RFID applications worldwide. TI is an active member of many standards bodies, including ISO, ISO/IEC, ECMA International, ETSI, and several national standardization bodies working to drive the adoption of global standards for RFID technology.

5.3 Community Resources

The following links connect to TI community resources. Linked contents are provided "AS IS" by the respective contributors. They do not constitute TI specifications and do not necessarily reflect TI's views; see TI's Terms of Use.

TI E2E™ Online Community ***TI's Engineer-to-Engineer (E2E) Community.*** Created to foster collaboration among engineers. At e2e.ti.com, you can ask questions, share knowledge, explore ideas and help solve problems with fellow engineers.

5.4 Trademarks

Tag-it, TI-RFid, E2E are trademarks of Texas Instruments.

5.5 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.

5.6 Export Control Notice

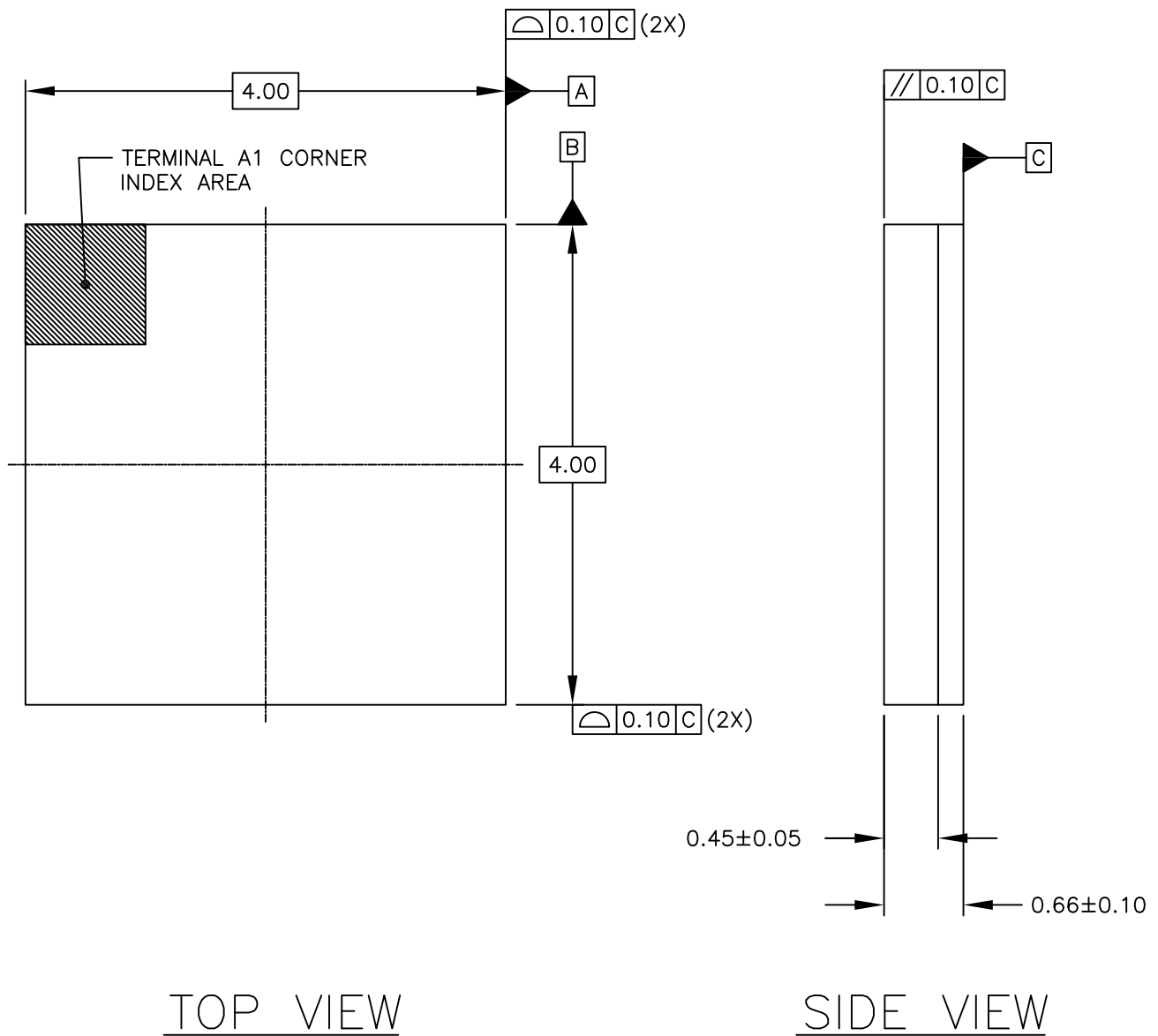
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5.7 Glossary

[TI Glossary](#) This glossary lists and explains terms, acronyms, and definitions.

6 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.

Mechanical Data

PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package Pins	Package qty Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
RF37S114HTFJB	Active	Production	RFIDN (TFJ) 0	5000 BULK	Yes	Call TI	Level-1-260C-UNLIM	-25 to 70	
RF37S114HTFJB.B	Active	Production	RFIDN (TFJ) 0	5000 BULK	Yes	Call TI	Level-1-260C-UNLIM	-25 to 70	

⁽¹⁾ **Status:** For more details on status, see our [product life cycle](#).

⁽²⁾ **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

⁽³⁾ **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

⁽⁴⁾ **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

⁽⁵⁾ **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

⁽⁶⁾ **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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