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Tag-it™ HF-I PLUS TRANSPONDER INLAYS 24.2-mm CIRCULAR

FEATURES

- **ISO/IEC 15693-2, -3; ISO/IEC 18000-3 Compliant**
- **13.56-MHz Operating Frequency**
- **2048-Bit User Memory in 64-Bit × 32-Bit Blocks**
- **User and Factory Lock Per Block**
- **Application Family Identifier (AFI)**
- **Data Storage Format Identifier (DSFID)**
- **Combined Inventory Read Block**

APPLICATIONS

- **Product Authentication**
- **Library**
- **Supply-Chain Management**
- **Asset Management**
- **Ticketing/Stored Value**

DESCRIPTION

Texas Instruments Tag-it™ HF-I plus 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 2048 bits, organized in 64 blocks, and an extensive command set available in six different antenna shapes, with frequency offset for integration into paper, PVC, or other substrates.

The Tag-it HF-I plus 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 plus 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.

SPECIFICATIONS(1)

	PART NUMBER
	RI-I16-112A-03
Supported standard	ISO/IEC 15693-2, -3; ISO/IEC 18000-3
Recommended operating frequency	13.56 MHz
Passive resonance frequency (at 25°C)	13.70 MHz ± 400 kHz (includes frequency offset to compensate further integration into paper or PVC lamination)
Typical required activation field strength to read (at 25°C)	113 dBμA/m(2)
Typical required activation field strength to write (at 25°C)	116 dBμA/m(2)
Factory programmed read-only number	64 bits
Memory (user programmable)	2k bits organized in 64-bit × 32-bit blocks
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	ø 24.2 mm +0.1 mm/–0.2 mm (~1.95 in)
Foil width	48 mm ± 0.5 mm (1.89 in ± 0.02 in)
Foil pitch	50.8 mm +0.1 mm/–0.4 mm (2 in)
Thickness	Chip area: 0.355 mm (~0.014 in) Antenna area: 0.085 mm (~0.0033 in)
Base material	Substrate: PET (polyethylenetherephtalate); Antenna: aluminum
Smallest bending radius allowed	18 mm (~0.71 in)
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 (~2.36 in) Reel inner width: approximately 50 mm (~1.97 in) Hub diameter: 76.2 mm (3 in)
Typical quantity of good units per reel	5,000

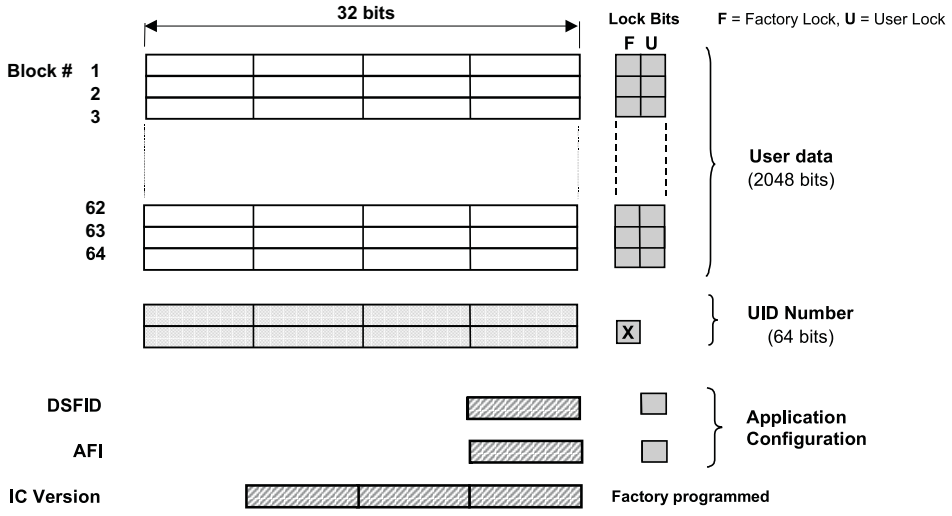
(1) For highest possible read-out coverage, operate readers at a modulation depth of 20% or higher.
(2) After integration into paper

SUPPORTED COMMAND SET

REQUEST	REQUEST MODE(1)					
	REQUEST CODE	INVENTORY	ADDRESSED	NON-ADDRESSED	SELECT	AFI
ISO 15693 Mandatory and Optional Commands						
Inventory	0x01	ü	–	–	–	ü
Stay Quiet	0x02	–	ü	–	–	–
Read_Single_Block	0x20	ü	ü	ü	ü	ü
Write_Single_Block	0x21	–	ü	ü	ü	–
Lock_Block	0x22	–	ü	ü	ü	–
Read_Multi_Blocks	0x23	ü	ü	ü	ü	ü
Write_Multi_Blocks	0x24	–	–	–	–	–
Select Tag	0x25	–	ü	–	–	–
Reset to Ready	0x26	–	ü	ü	ü	–
Write_AFI	0x27	–	ü	ü	ü	–
Lock_AFI	0x28	–	ü	ü	ü	–
Write DSFID	0x29	–	ü	ü	ü	–
Lock DSFID	0x2A	–	ü	ü	ü	–
Get_System_info	0x2B	ü	ü	ü	ü	ü
Get_M_BLK_Sec_St	0x2C	ü	ü	ü	ü	ü
TI Custom Commands						
Write_2_Blocks	0xA2	–	ü	ü	ü	–
Lock_2_Blocks	0xA3	–	ü	ü	ü	–

(1) ü = Implemented, – = Not applicable

MEMORY ORGANIZATION



PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)
RI-I16-112A-03	ACTIVE	RFIDN	TFC	0	5000	Pb-Free (RoHS)	Call TI	N / A for Pkg Type

(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.

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265