

Tag-it™ HF-I PLUS TRANSPONDER INLAYS

24.2-mm CIRCULAR

Check for Samples: [RI-I16-112A-03](#)

FEATURES

- ISO/IEC 15693-2, -3; ISO/IEC 18000-3 Compliant
- 13.56-MHz Operating Frequency
- 2048-Bit User Memory in 64-Bit x 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.



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PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of the Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

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Table 1. 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 dB μ A/m ⁽²⁾ |
| Typical required activation field strength to write (at 25°C) | 116 dB μ A/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 | ∅ 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: 0.34 mm ±0.02 Antenna area (Al both sides): 0.085 mm ±0.01 Antenna area (Al one side): 0.075 mm ±0.008 |
| Base material | Substrate: PET (polyethyleneterephthalate); 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 (warping 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.

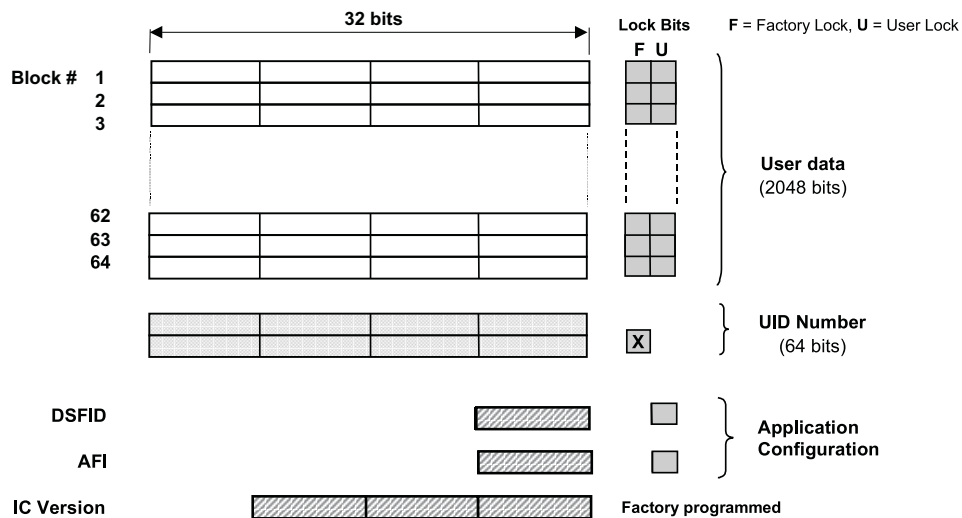
(2) After integration into paper

Table 2. SUPPORTED COMMAND SET

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

(1) ✓ = Implemented, – = Not applicable

MEMORY ORGANIZATION



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