13.56-MHz ENCAPSULATED STANDARD TRANSPONDER

Check for Samples: RF-HDT-DVBE

FEATURES

- **ISO/IEC 15693-2,-3; ISO/IEC 18000-3 Compliant**
- **13.56-MHz Operating Frequency**
- **256-Bit User Memory in 8 × 32-Bit Blocks**
- **User and Factory Lock Per Block**
- **Application Family Identifier (AFI)**
- **Fast Simultaneous Identification (Anti-Collision)**

APPLICATIONS

- **Laundry**
- **Process Automation**
- **Product Authentication**
- **Asset Management**

DESCRIPTION

Texas Instruments' 13.56-MHz encapsulated standard 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.

Designed for harsh environments, such as garment tracking in laundries, each transponder has a 64-bit factory programmed Read Only Number, which is also laser engraved on the transponder housing. Prior to delivery, transponders undergo complete functional and parametric testing to provide the high quality that customers have come to expect from TI.

The 13.56-MHz encapsulated standard transponders are well suited for a variety of applications including, but not limited to, laundry garment tracking, process automation, product authentication, and asset management.

Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

Absolute Maximum Ratings

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

		UNIT
Operating temperature	–25 to 90	°C
Storage temperature	–40 to 120 (130°C for total 50 hours, 220°C for total 30 s)	°C

Operating Characteristics

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

PARAMETER	RF-HDT-DVBE[1]	UNIT
Supported standard	ISO/IEC 15693-2,-3; ISO/IEC 18000-3	
Resonance frequency (at 25°C)	13.56 MHz ± 300 kHz	
Typ. required activation field strength to read (at 25°C)	112	dBµA/m
Typ. required activation field strength to write (at 25°C)	115	dBµA/m
Factory programmed read only number	64	bits
Memory (user programmable)	256 bits organized in 8 × 32-bit blocks	
Typical programming cycles (at 25°C)	100,000	
Data retention time (at 25°C)	> 10 years	
Simultaneous identification of tags	Up to 50 tags per second (reader/antenna dependent)	
Dimensions	ø 22 ± 0.2 mm × 3 ± 0.2 mm	
Weight	2.1 ± 0.2	grams
Case material	PPS, black	
Protection class	IP 68	
Vibration	ISO/IEC 68.2.6 (10 g, 10 to 2000 Hz, 3 axis, 2.5 h)	
Mechanical shock	ISO/IEC 68.2.27 (100 g, 6 ms, 6 axis, 20 times per axis)	
Mechanical stability	Axial compression strength: 1000N (10 s, static) Radial compression strength: 500N (10 s, static) Isostatic water pressure: 45 bar (10 h)	
Chemical resistance	Typical chemicals used in laundry and dry-cleaning processes	
Delivery	1000 units in bulk	

(1)   For highest possible read-out coverage, TI recommends operating readers at a modulation depth of 20% or higher.
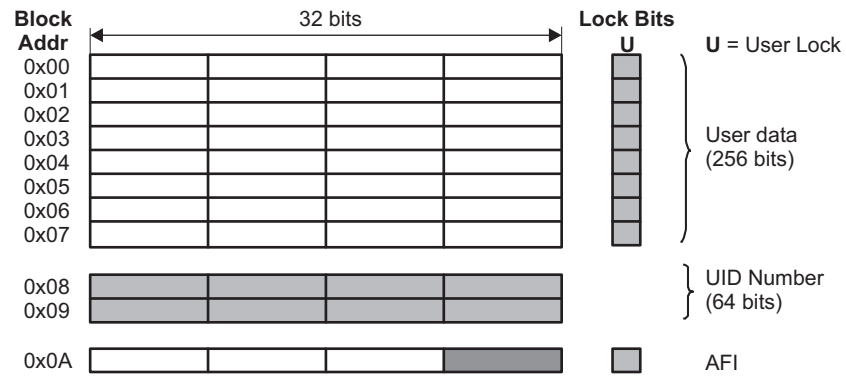
Supported Command Set

REQUEST	REQUEST MODE[1] [2]					
	REQUEST CODE	INVENTORY	ADDRESSED	NON-ADDRESSED	AFI	OPTIONAL 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

(1)   ✓: Implemented
(2)   -: Not applicable

Product Folder Link(s): *RF-HDT-DVBE*

Memory Organization

Block Addr	32 bits				Lock Bits U	
0x00						**U** = User Lock
0x01						
0x02						
0x03						User data
0x04						(256 bits)
0x05						
0x06						
0x07						
0x08						UID Number
0x09						(64 bits)
0x0A						AFI

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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
RF-HDT-DVBE-N0	OBSOLETE	RFIDP	TEC	0		TBD	Call TI	Call TI	-25 to 90		
RF-HDT-DVBE-N2	ACTIVE	RFIDP	TEC	0	1000	Pb-Free (RoHS)	Call TI	N / A for Pkg Type	-25 to 90		Samples

(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.
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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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