13.56-MHz ENCAPSULATED PLUS TRANSPONDER

FEATURES

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

APPLICATIONS

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

DESCRIPTION

Texas Instruments' 13.56-MHz encapsulated plus transponder is compliant with the ISO/IEC 15693 and ISO/IEC 18000-3 global open standards. This product offers a user accessible memory of 2048 bits, organized in 64 blocks and an extensive 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 plus transponders are well suited for a variety of applications including but not limited to: laundry garment tracking, process automation, product authentication, and asset management.

ABSOLUTE MAXIMUM RATINGS

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

	RF-HDT-DVBB	UNIT
Operating Temperature	−25 to 90	°C
Storage Temperature	−40 to 120 (130°C for total 50 hours, 220°C for total 30 seconds)	°C

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.

www.BDTIC.com/TI

RF-HDT-DVBB

OPERATING CHARACTERISTICS

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

PARAMETER	RF-HDT-DVBB[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)	2k bits organized in 64 × 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: 1000 N (10 s, static) Radial compression strength: 500 N (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 operation of readers at a modulation depth of 20% or higher.

SUPPORTED COMMAND SET

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

(1)   √: Implemented, – : Not applicable

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

MEMORY ORGANIZATION
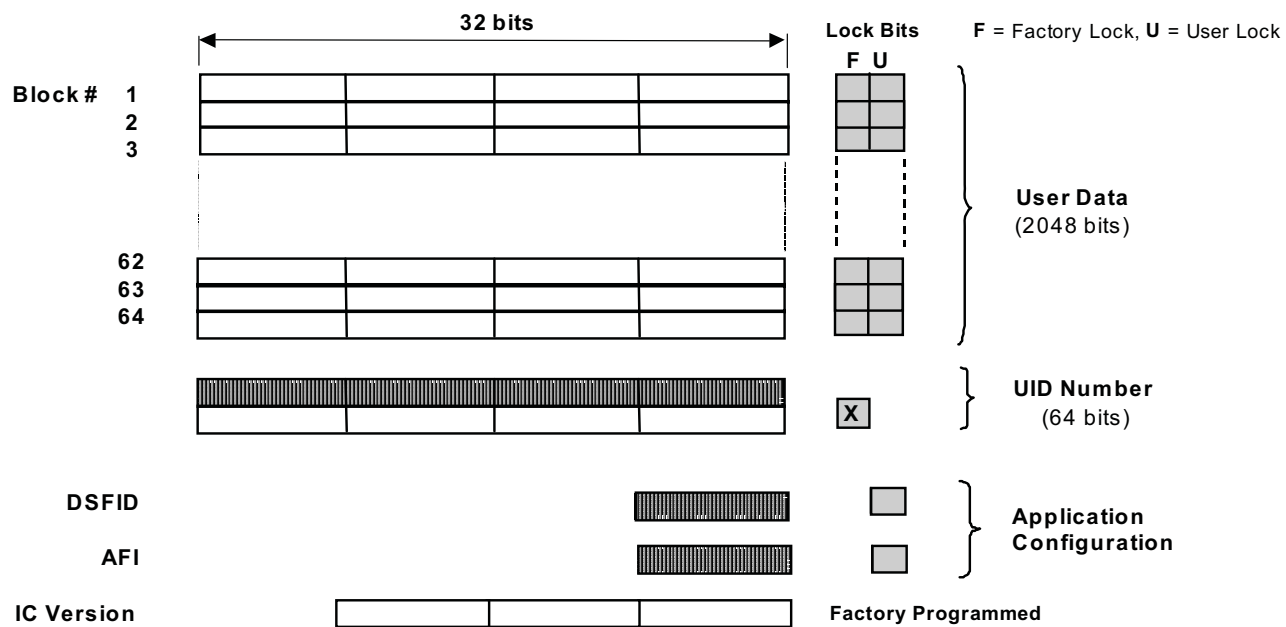
PACKAGING INFORMATION

Orderable Device	Status [1]	Package Type	Package Drawing	Pins	Package Qty	Eco Plan [2]	Lead/Ball Finish	MSL Peak Temp [3]	Samples (Requires Login)
RF-HDT-DVBB-N1	OBSOLETE	RFIDP	TEC	0		TBD	Call TI	Call TI	
RF-HDT-DVBB-N2	ACTIVE	RFIDP	TEC	0	1000	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.

Important Information and Disclaimer: The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

www.BDTIC.com/TI

IMPORTANT NOTICE