TEXAS INSTRUMENTS

RI-TRP-DR2B 32-mm glass transponder

1 Device Overview

1.1 Features

- Best-in-class performance through patented half-duplex (HDX) technology
- Patented transponder tuning provides stable and high read and write performance
- MPT 1360-bit type
- ISO 11784 and ISO 11785 compliant
- Insensitive to almost all nonmetallic materials

1.2 Applications

- Access control
- Vehicle identification
- Container tracking
- Asset management
- Waste management

1.3 Description

TI 32-mm glass transponders provide superior performance and operate at a resonance frequency of 134.2 kHz. Specific products are compliant to ISO 11784 and ISO 11785 global open standards. TI LF transponders are manufactured with TI's patented tuning process to provide consistent read and write performance. Before delivery, the transponders undergo complete functional and parametric testing to provide the high quality that customers have come to expect from TI. The transponder is well suited for use in a broad range of applications including, but not limited to, access control, vehicle identification, container tracking, asset management, and waste management applications.

Device Information[1]

PART NUMBER	PACKAGE (PIN)	BODY SIZE[2]
RI-TRP-DR2B-40	TRP (0)	3.85 mm × 32.2 mm

(1) For the most current device, package, and ordering information, see the *Package Option Addendum* in Section 5, or see the TI website at www.ti.com.
(2) The sizes shown here are approximations. For the package dimensions with tolerances, see the *Mechanical Data* in Section 5.

Figure 1-1. RI-TRP-DR2B Transponder

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2 Revision History

Changes from October 20, 2016 to February 28, 2019   **Page**

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Product Folder Links: *RI-TRP-DR2B*

3 Specifications

3.1 Absolute Maximum Ratings

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

		MIN	MAX	UNIT
T_A	Operating temperature	−25	85	°C
	Write (program) temperature	0	70	°C
T_{STG}	Storage temperature	−40	125[1]	°C

(1) For a total of 1000 hours

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
Tr	Recommended operating temperature	0	70	°C

3.4 Electrical Characteristics

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

PARAMETER	RI-TRP-DR2B	UNIT
Functionality	MPT	
Memory	1360	bits
	17 R/W	pages
Operating Frequency	134.2	kHz
Modulation	FSK (frequency shift keying), 134.2 kHz and 123.2 kHz	
Transmission Principle	HDX (half duplex)	
Power Source	Powered from the reader signal (batteryless)	
Typical Read Range	≤100[1]	cm
Typical Programming Range	30% of specified reading range	
Typical Read Time	86	ms
Typical Programming Time	293	ms
Typical Programming Cycles	100000	

(1) Depends on RF regulation in country of use, the reader antenna configuration used, and the environmental conditions.

3.5 Physical Characteristics

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

PARAMETER	RI-TRP-DR2B	UNIT
Case Material	Glass	
Protection Class	Hermetically sealed	
EMC	Programmed code is not affected by normal electromagnetic interference or x-rays	
Signal Penetration	Transponder can be read through almost all nonmetallic material	
Dimensions	∅3.85 ±0.05 × 32.2 ±0.6	mm
Weight	0.85	g

4 Device and Documentation Support

4.1 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. For more information, see Overview for NFC / RFID.

4.2 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, XRI-TRP-DR2B).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:

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

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

null – 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.

4.3 Documentation Support

The following documents describe the RI-TRP-DR2B device. Copies of these documents are available on the Internet at www.ti.com.

Receiving Notice of Document Updates

To receive notification of documentation updates—including silicon errata—go to the product folder for your device on ti.com (for example, RI-TRP-DR2B). In the upper right corner, click the "Alert me" button. This registers you to receive a weekly digest of product information that has changed (if any). For change details, check the revision history of any revised document.

User's Guides

32-mm glass-encapsulated multipage transponders reference guide
Describes the use of the 32-mm glass transponders.

32-mm glass encapsulated multipage transponders
The TI 32-mm glass transponder is a key product in low-frequency RFID systems that can be used for a variety of applications, and is especially useful for those applications requiring a robust and waterproof transponder.

Multipage, selective-addressable, selective-addressable (secured) transponders
The TIRIS transponder is a key product in low frequency RFID systems that can be used for a variety of applications. Electromagnetic signals are used to power the passive (batteryless) device, to transmit the identification number to a reader unit, or to program the device with new data. The transponder comprises an antenna, a charge capacitor, a resonance capacitor, and the integrated circuit. The antenna inductance and a capacitor form a high-quality resonant circuit.

Selection and Solution Guides

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.

4.4 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

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.

4.5 Trademarks

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4.6 Electrostatic Discharge Caution

This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

4.7 Export Control Notice

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4.8 Glossary

TI Glossary This glossary lists and explains terms, acronyms, and definitions.

5   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.

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)
RI-TRP-DR2B-40	Active	Production	XCEPT (TRP) | 0	2000 | LARGE T&R	Yes	Call TI	Call TI	-25 to 85	
RI-TRP-DR2B-40.B	Active	Production	XCEPT (TRP) | 0	2000 | LARGE T&R	-	Call TI	Call TI	-25 to 85	

(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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