

## 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<sup>(1)</sup>

PART NUMBER	PACKAGE (PIN)	BODY SIZE <sup>(2)</sup>
RI-TRP-DR2B-40	TRP (0)	3.85 mm x 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](http://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



## Table of Contents

<p><b>1 Device Overview</b> ..... <a href="#">1</a></p> <p>1.1 Features ..... <a href="#">1</a></p> <p>1.2 Applications ..... <a href="#">1</a></p> <p>1.3 Description ..... <a href="#">1</a></p> <p><b>2 Revision History</b> ..... <a href="#">2</a></p> <p><b>3 Specifications</b> ..... <a href="#">3</a></p> <p>3.1 Absolute Maximum Ratings ..... <a href="#">3</a></p> <p>3.2 ESD Ratings ..... <a href="#">3</a></p> <p>3.3 Recommended Operating Conditions ..... <a href="#">3</a></p> <p>3.4 Electrical Characteristics ..... <a href="#">3</a></p> <p>3.5 Physical Characteristics ..... <a href="#">3</a></p>	<p><b>4 Device and Documentation Support</b> ..... <a href="#">4</a></p> <p>4.1 Getting Started and Next Steps ..... <a href="#">4</a></p> <p>4.2 Device Nomenclature ..... <a href="#">4</a></p> <p>4.3 Documentation Support ..... <a href="#">4</a></p> <p>4.4 Community Resources ..... <a href="#">5</a></p> <p>4.5 Trademarks ..... <a href="#">5</a></p> <p>4.6 Electrostatic Discharge Caution ..... <a href="#">5</a></p> <p>4.7 Export Control Notice ..... <a href="#">5</a></p> <p>4.8 Glossary ..... <a href="#">5</a></p> <p><b>5 Mechanical, Packaging, and Orderable Information</b> ..... <a href="#">6</a></p>
---	--

---

## 2 Revision History

---

Changes from October 20, 2016 to February 28, 2019	Page
<ul style="list-style-type: none"> <li>• Changed package designator from TGB to TRP ..... <a href="#">1</a></li> </ul>	<a href="#">1</a>

---

### 3 Specifications

#### 3.1 Absolute Maximum Ratings

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

		MIN	MAX	UNIT
T <sub>A</sub>	Operating temperature	-25	85	°C
	Write (program) temperature	0	70	°C
T <sub>STG</sub>	Storage temperature	-40	125 <sup>(1)</sup>	°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 <sup>(1)</sup>	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](http://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](http://e2e.ti.com), you can ask questions, share knowledge, explore ideas, and help solve problems with fellow engineers.

## 4.5 Trademarks

TI-RFid, E2E are trademarks of Texas Instruments.  
All other trademarks are the property of their respective owners.

## 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

Recipient agrees to not knowingly export or re-export, directly or indirectly, any product or technical data (as defined by the U.S., EU, and other Export Administration Regulations) including software, or any controlled product restricted by other applicable national regulations, received from disclosing party under nondisclosure obligations (if any), or any direct product of such technology, to any destination to which such export or re-export is restricted or prohibited by U.S. or other applicable laws, without obtaining prior authorization from U.S. Department of Commerce and other competent Government authorities to the extent required by those laws.

## 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 Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
RI-TRP-DR2B-40	ACTIVE	XCEPT	TRP	0	2000	TBD	Call TI	Call TI	-25 to 85		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.

**OBSELETE:** TI has discontinued the production of the device.

(2) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

**RoHS Exempt:** TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

**Green:** TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

(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 finish/Ball material - Orderable Devices 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.

**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.

## IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATA SHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to [TI's Terms of Sale](#) or other applicable terms available either on [ti.com](https://www.ti.com) or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.

TI objects to and rejects any additional or different terms you may have proposed.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265  
Copyright © 2023, Texas Instruments Incorporated