

## 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	TGB (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](#) shows the RI-TRP-DR2B transponder.



**Figure 1-1. RI-TRP-DR2B Transponder**



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## 2 Revision History

Changes from June 11, 2016 to October 19, 2016	Page
<ul style="list-style-type: none"> <li>Changed memory pages from "16 R/W, 1 R/O (UID)" to "17 R/W" in <a href="#">Section 3.4, Electrical Characteristics</a> .....</li> </ul>	<a href="#">3</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 TI's Engineer-to-Engineer (E2E) 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

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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 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
RI-TRP-DR2B-40	ACTIVE	RFIDT	TGB	0	2000	Pb-Free (RoHS)	Call TI	N / A for Pkg Type	-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.

**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.

(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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Only those TI components which TI has specifically designated as military grade or "enhanced plastic" are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components which have **not** been so designated is solely at the Buyer's risk, and that Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components as meeting ISO/TS16949 requirements, mainly for automotive use. In any case of use of non-designated products, TI will not be responsible for any failure to meet ISO/TS16949.

### Products

Audio	<a href="http://www.ti.com/audio">www.ti.com/audio</a>
Amplifiers	<a href="http://amplifier.ti.com">amplifier.ti.com</a>
Data Converters	<a href="http://dataconverter.ti.com">dataconverter.ti.com</a>
DLP® Products	<a href="http://www.dlp.com">www.dlp.com</a>
DSP	<a href="http://dsp.ti.com">dsp.ti.com</a>
Clocks and Timers	<a href="http://www.ti.com/clocks">www.ti.com/clocks</a>
Interface	<a href="http://interface.ti.com">interface.ti.com</a>
Logic	<a href="http://logic.ti.com">logic.ti.com</a>
Power Mgmt	<a href="http://power.ti.com">power.ti.com</a>
Microcontrollers	<a href="http://microcontroller.ti.com">microcontroller.ti.com</a>
RFID	<a href="http://www.ti-rfid.com">www.ti-rfid.com</a>
OMAP Applications Processors	<a href="http://www.ti.com/omap">www.ti.com/omap</a>
Wireless Connectivity	<a href="http://www.ti.com/wirelessconnectivity">www.ti.com/wirelessconnectivity</a>

### Applications

Automotive and Transportation	<a href="http://www.ti.com/automotive">www.ti.com/automotive</a>
Communications and Telecom	<a href="http://www.ti.com/communications">www.ti.com/communications</a>
Computers and Peripherals	<a href="http://www.ti.com/computers">www.ti.com/computers</a>
Consumer Electronics	<a href="http://www.ti.com/consumer-apps">www.ti.com/consumer-apps</a>
Energy and Lighting	<a href="http://www.ti.com/energy">www.ti.com/energy</a>
Industrial	<a href="http://www.ti.com/industrial">www.ti.com/industrial</a>
Medical	<a href="http://www.ti.com/medical">www.ti.com/medical</a>
Security	<a href="http://www.ti.com/security">www.ti.com/security</a>
Space, Avionics and Defense	<a href="http://www.ti.com/space-avionics-defense">www.ti.com/space-avionics-defense</a>
Video and Imaging	<a href="http://www.ti.com/video">www.ti.com/video</a>

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