

## SERIES 2000 READER S251B

### FEATURES

- Best in Class Performance Through Patented HDX Technology
- Automatic Antenna Tuning
- High Power Output
- Proven in Harsh Industrial Environments
- Easy to Install and Use

### APPLICATIONS

- Access Control
- Vehicle Identification
- Container Tracking
- Asset Management
- Waste Management



### DESCRIPTION

The Texas Instruments' low-frequency (LF) reader provides all the functionality required to communicate with Texas Instruments 134.2 kHz LF transponders which are available in a variety of form factors. The RI-STU-251B Reader/Writer is capable driving a variety of antennas with inductance ranges from 26.0 $\mu$ H to 27.9 $\mu$ H including TI standard antennas RI-ANT-G01E, RI-ANT-G02E, RI-ANT-G04E gate antennas as well as RI-ANT-S01C and RI-ANT-S02C stick antennas. The RI-STU-251B includes an automatic antenna resonance tuning feature which further reduces the need for maintenance and simplifies installation. It also supports both RS232 and RS422/485 interface standards.

The RI-STU-251B is well suited for usage in a broad range of applications including, but not limited to, access control, vehicle identification, container tracking, asset management and waste management applications.

The Series 2000 Reader S251B provides all RF and Control Functions to communicate with 134.2 kHz HDX/FSK transponders. It sends an energizing signal to the transponder, modulates the RF signal to send data to the transponder, decodes and checks the received transponder data and transmits it via a standard serial interface (RS232, RS422/485). The reader includes a Dynamic Auto Tuning (DAT) function that automatically tunes a standard antenna to resonance and keeps it tuned during operation.

### ABSOLUTE MAXIMUM RATINGS<sup>(1)</sup>

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

	RI-STU-251B	UNIT
Operating Temperature	-20 to +70 (depending on power consumption)	°C
Storage Temperature	-40 to +85	°C

(1) Stresses beyond those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Conditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.



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.

TIRIS is a trademark of Texas Instruments.

**RECOMMENDED OPERATING CONDITIONS**

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

	<b>RI-STU-251B</b>
Power Supply	10 to 24 Vdc, regulated

**OPERATING CHARACTERISTICS**

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

PARAMETER	PART NUMBER	UNIT
	RI-STU-251B	
Relative Humidity	<97% non-condensing, IEC 68-2-30 Test Db, 21 cycles	
RF Transmit Frequency	134.2	kHz
Memory	64 kByte EPROM for Firmware 1kBit EEPROM for Configuration 32 kByte RAM for Data	
Data Storage	909 ID Codes (each 64bit)	
Communications Interface	RS232, RS422/485	
System Architecture	Point-to-point and point-to-multipoint	
Communications Parameters	600 - 57600 baud, 7/8 data bits, even/odd parity	
Communications Protocol	ASCII with Xon/Xoff handshake, TIRIS™ Bus Protocol	
Inputs/Outputs	8 configurable digital I/Os, 2 open collector outputs	
Antenna Tuning Range	26 to 27.9 μH (Dynamic Auto Tuning)	
Antenna Resonance Voltage	Max. 380 Vpeak	
Transponder Types	134.2 kHz HDX/FSK	
Dimensions (L × W × H)	(200 mm × 120mm × 120 mm) ± 1.5 mm	
Weight	900	g
Mounting	DIN rail TS35	

**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
TRPGR30ATGA	ACTIVE	RFIDT	TGA	0	2000	RoHS & Green	Call TI	N / A for Pkg Type	-25 to 70		<a href="#">Samples</a>
TRPGR30ATGB	ACTIVE	RFIDT	TGB	0	2000	RoHS & Green	Call TI	N / A for Pkg Type	-25 to 70		<a href="#">Samples</a>
TRPGR30ENATGA	ACTIVE	RFIDT	TGA	0	2000	RoHS & Green	Call TI	N / A for Pkg Type	-25 to 70		<a href="#">Samples</a>
TRPGR30ENATGB	ACTIVE	RFIDT	TGB	0	2000	RoHS & Green	Call TI	N / A for Pkg Type	-25 to 70		<a href="#">Samples</a>

(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.

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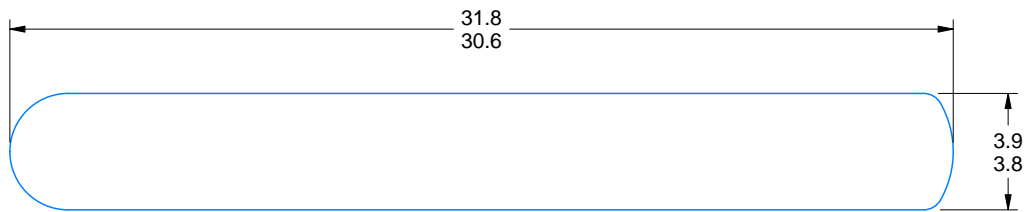
In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

# PACKAGE OUTLINE

**TGB0000A**

**RFIDT - 3.9 mm max height**

RADIO FREQUENCY IDENTIFICATION



4224849/A 03/2019

**NOTES:**

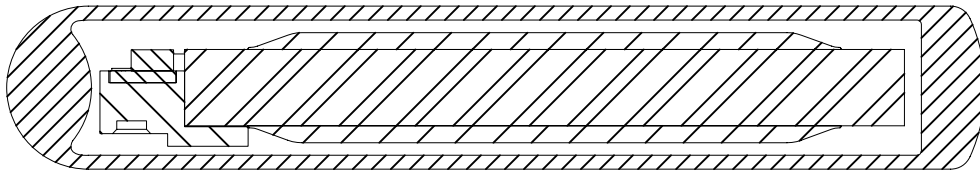
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. HDX+ 32mm glass transponder with capacitor on die technology.

TGA (R-RFID-N0)

RFIDT



A-A



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- NOTES:
- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5-1994.
  - B. This drawing is subject to change without notice.
  - C. HDX+ 23mm Glass TRP Cap on Die.

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