TRPGP40ATGC 12-mm Low-Frequency Glass-Encapsulated Transponder, CCT

1 Device Overview

1.1 Features

- Best-in-Class Performance Through Patented HDX Technology
- Patented Transponder Tuning Provides Stable and High Read Performance
- 80-Bit Customer-Configurable Transponder (CCT) Type
- Insensitive to Almost All Nonmetallic Materials

1.2 Applications

- Animal ID

1.3 Description

Texas Instruments' 12-mm low-frequency (LF) glass transponders provide superior performance and operate at a resonance frequency of 134.2 kHz. The products are compliant to ISO/IEC 11784 and ISO/IEC 11785 global open standards. Texas Instruments LF glass transponders are manufactured with TI's patented tuning process to provide consistent read performance. Before delivery, the transponders undergo complete functional and parametric testing to provide the high quality customers have come to expect from TI.

Device Information[1]

PART NUMBER	PACKAGE	BODY SIZE (NOM)[2]
TRPGP40ATGC	TGC (0)	2.12 mm x 12.0 mm

(1) For the most current device, package, and ordering information, see the Package Option Addendum in Section 5, or see the TI web site 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 shows the transponder.

Figure 1-1. TRPGP40ATGC Transponder

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2   Revision History

DATE	REVISION	NOTES
August 2014	*	Initial Release

3 Specifications

3.1 Absolute Maximum Ratings

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

		MIN	MAX	UNIT
T_A	Operating temperature range	-25	70	°C

3.2 Handling Ratings

		MIN	MAX	UNIT
T_{STG}	Storage temperature range	-40	85	°C

3.3 Electrical Characteristics

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

PARAMETER	TRPGP40ATGC
Functionality	Not programmed
Memory (bits)	80
Memory (pages)	1
Resonance frequency	134.6 kHz
Modulation	FSK (frequency shift keying) 134.2 kHz and 124.2 kHz
Transmission principle	HDX (half duplex)
Power source	Powered from the reader signal (battery-less)
Typical reading range	≤60 cm[1]
Typical reading time	70 ms
Case material	Glass
Protection glass	Hermetically sealed
EMC	Programmed code is not affected by natural electromagnetic interference or x-rays
Signal penetration	Transponder can be read through almost all nonmetallic material
Mechanical shock	IEC 60068-2-32 free-fall drop test, 20 times from 1.5-m height
Dimensions	Ø 2.12 ± 0.05 mm x 12.0 ± 0.5 mm
Weight	0.10 g

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

4 Device and Documentation Support

4.1 Documentation Support

The following documents describe the TRPGR30ATGC device. Copies of these documents are available on the Internet at www.ti.com.

SPAT178 *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.

SPAT184 *12mm Glass Encapsulated HDX Transponders.* Product bulletin that provides an overview of the features of the glass encapsulated transponders from TI.

4.2 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, you can ask questions, share knowledge, explore ideas and help solve problems with fellow engineers.

4.3 Trademarks

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

4.4 Electrostatic Discharge Caution

These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

4.5 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 this Agreement, 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.

4.6 Glossary

SLYZ022 — *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.

PACKAGE OPTION ADDENDUM

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)
TRPGP40ATGC	Active	Production	RFIDT (TGC) | 0	2000 | LARGE T&R	Yes	Call TI	N/A for Pkg Type	-25 to 70	
TRPGP40ATGC.B	Active	Production	RFIDT (TGC) | 0	2000 | LARGE T&R	Yes	Call TI	N/A for Pkg Type	-25 to 70	

(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.
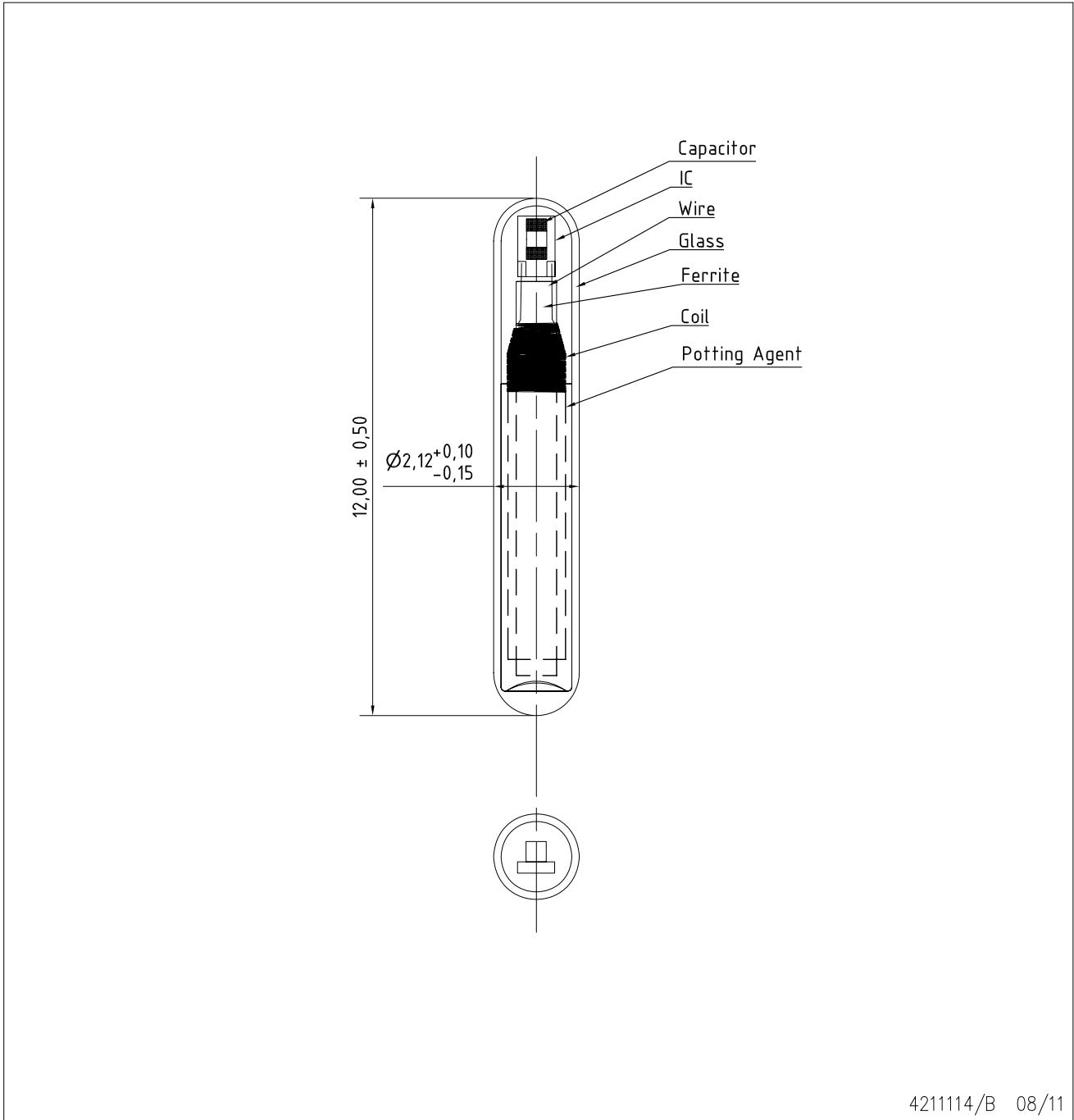
(5) MSL rating/Peak reflow: The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be 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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TGC (R−RFID−NO)   RFIDT

Capacitor
IC
Wire
Glass
Ferrite
Coil
Potting Agent

12,00 ± 0,50

$\emptyset 2,12^{+0,10}_{-0,15}$

4211114/B   08/11

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+ 12mm glass TRP MCU−RF with capacitor on Die

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