

DIGITAL SIGNATURE TRANSPONDER WITH INTEGRATED DST80 AUTHENTICATION, EEPROM, AND LF IMMOBILIZER

Check for Samples: [TMS37145](#)

FEATURES

- **Low-Frequency (LF) Immobilizer Interface**
 - 75-Byte EEPROM
 - 80-Bit DST80 Security Authentication Coprocessor
 - Integrated Batteryless Immobilizer Interface
 - Half Duplex (HDX) Immobilizer Communication Achieves up to 4-in (10-cm) Read Range
 - Special Selective Addressing Mode Allows Reliable Learn-In Sequence
 - 80-Bit Authentication Key Length
 - Up to 8-kbit/s Uplink Data Rate
 - 5-/3-Byte Challenge/Response Algorithm
 - Fast Authentication Within 42 ms
- **Fast Mutual Authentication Within 65 ms**
- 75-Byte EEPROM
- 48-Byte Available EEPROM User Memory
- 32-Bit Unique Serial Number
- High EEPROM Security and Flexibility
- Write-Only Authentication Keys
- Pages Are Irreversibly Lockable and Protectable
- Protected Pages Programmable Only Through Mutual Authentication
- Each User Page is Lockable
- Resonant Frequency: 134.2 kHz

DESCRIPTION

This new generation of security RFID transponder provides the highest level of security with its integrated 80-bit encryption algorithm. The 5-byte challenge and 3-byte response algorithm is backward compatible with existing TI products and provides, together with the burst length coding, short encryption telegram times.

The DST80 offers 65 bytes of free programmable user data stored in nine pages, each of them lockable for programming. Each of the two 80-bit encryption keys with can be programmed with a single telegram.

The DST80 comes in two versions, preprogrammed with either PWM or PPM communication formats, eliminating the need for the user to change this field.

Ordering Information⁽¹⁾

T _A	PACKAGE ⁽²⁾	COMMUNICATION FORMAT	ORDERABLE PART NUMBER
-40°C to 85°C	Wedge	PWM	TMS37145TEAIE
		PPM	TMS37145TEAIEG

(1) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI web site at www.ti.com.

(2) Package drawings, thermal data, and symbolization are available at www.ti.com/packaging.

WEDGE PACKAGE

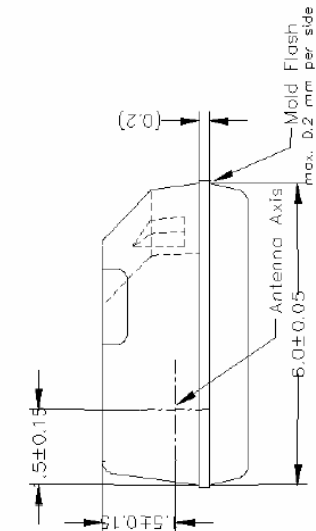


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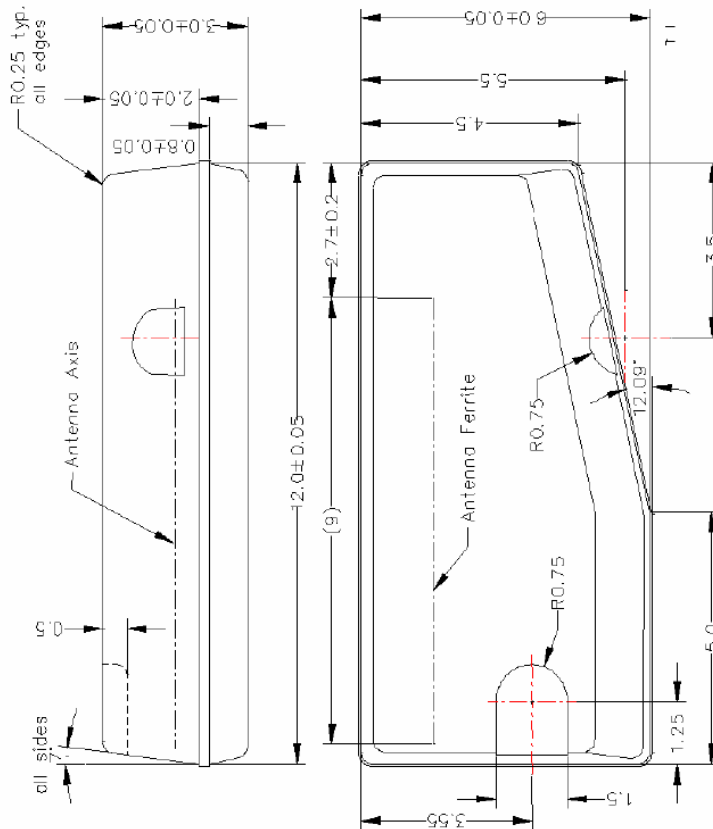
Operating Characteristics

Part Number	TMS37145TEAIE, TMS37145TEAIEG	
Features	Immobilizer plus microcontroller with integrated power management	
DST80 authentication logic	80-bit key length, 4-byte or 5-byte challenge, 3-byte signature	
DST80 encryption time	Mutual authentication: 65 ms Fast authentication: 42 ms	
Transponder		
Transmission principle	HDX (half duplex telegram protocol)	
Operating frequency	134.2 kHz Integrated resonant frequency trimming capability via LF or test interface	
Security	Challenge/response, mutual authentication	
Downlink	100% AM, PPM bit coding with 2 kbit/s (typ)	
Uplink	FSK modulation with 7.9 kbit/s (typ)	
Read time for an encryption	PPM: 60 ms (typ) (including 20-ms charge time)	
Read time for mutual authentication	PPM: 85 ms (typ) (including 20-ms charge time)	
Protocol transmission security	16-bit block check character	
Activation field strength	141.5 dBμA/m	
Minimum required operation Q-factor	30	
EEPROM memory	75 bytes	48-byte free available EEPROM user memory
		32-bit unique serial number
		Two 80-bit security keys
EEPROM endurance	200 000 (min) write-erase cycles ($T_A = 25^\circ\text{C}$)	
Key learn-in	Special selective addressing to provide secure learn-in procedure	
Storage temperature	-40°C to 100°C (175°C for 5 minutes)	
Operating temperature	-40°C to 85°C	
Case material	Plastic	
Protection class	IP 68	
EMC	Programmed code is not affected by natural electromagnetic interference or X-rays	
Mechanical shock	IEC 68-2-27, Test Ea; 200 g, half sine, 3 ms, 6 shocks per axis	
Vibration	IEC 68-2-6, Test Fc; 10 to 500 Hz, 1.65 mm peak to peak, 10 g, 4 hours per axis	
Dimensions	12.0 mm ± 0.2 mm x 6.0 mm ± 0.2 mm x 3.0 mm ± 0.05 mm	
Weight	0.4 g	
Packaging	Bulk (2000 units per box)	

MECHANICAL DATA



Application Note:
 The mold flash can occur at both sides of the package. The flash does not extend 0.2 mm max on both package sides at the same time. The typical overall dimension does not exceed 6.25 mm for width and 12.25 mm for length. The flash area should be excluded from use for guides or other type of mechanical fixturing.



If not otherwise noted tolerance according DIN 2768:
 Nominal dimension below $3 \text{ mm} \pm 0.1 \text{ mm}$
 Nominal dimension above $3 \text{ mm} \pm 0.2 \text{ mm}$
 Nominal angle: $\pm 1^\circ$

PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/ Ball Finish	MSL Peak Temp ⁽³⁾	Samples (Requires Login)
TMS37145TEAIE	ACTIVE	RFIDP	TEA	0		Pb-Free (RoHS)	Call TI	N / A for Pkg Type	

⁽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.

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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.

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