SIEMENS

# SIMATIC Ident
# RFID systems
# SIMATIC RF683T (6GT2810-3HG00)
## Compact Operating Instructions

## Legal information
## Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

| ⚠ DANGER |
| --- |
| indicates that death or severe personal injury **will** result if proper precautions are not taken. |

| ⚠ WARNING |
| --- |
| indicates that death or severe personal injury **may** result if proper precautions are not taken. |

| ⚠ CAUTION |
| --- |
| indicates that minor personal injury can result if proper precautions are not taken. |

| NOTICE |
| --- |
| indicates that property damage can result if proper precautions are not taken. |

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

### Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

### Proper use of Siemens products

Note the following:

| ⚠ WARNING |
| --- |
| Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed. |


C79000-G8976-C667-01, 07/2022

# 1 Characteristics

The heat-proof SIMATIC RF683T is a passive and maintenance-free data carrier. The RF683T operates based on the UHF Class 1 Gen 2 technology and is used to store the "Electronic Product Code" (EPC ID) of 28 bytes/224 bits. The transponder also has a 384-byte/3072-bit user memory.

These transponders with a limited service life are ideally suited to high-temperature applications (e.g. the painting of vehicle bodies) as well as applications in production logistics. The RF683T is rugged and suitable for industrial applications with IP68/IPX9K degree of protection. It is highly resistant to oil, grease and cleaning agents.

The SIMATIC RF683T is only intended for mounting directly on metal.

Note that this transponder cannot be disabled using a kill password.

| SIMATIC RF683T | Characteristics | |
|---|---|---|
|  | Area of application | Applications with high temperatures (up to +220 °C).<br>Typical areas of application:<br>• Paint shops and their preparatory treatments, incl. drying ovens<br>• Electrophoretic deposition area<br>• Primer coat incl. drying oven<br>• Top coat area incl. drying oven<br>• Washing areas at temperatures > 85 °C |
| | Air interface | According to ISO 18000-63 |
| | Memory | • EPC memory: 32 bytes / 256 bits<br>• EPC ID: 28 bytes / 224 bits [1)]<br>• User memory: 384 bytes / 3072 bits |
| | Read range | Max. 8.0 m [1)] |
| | Mounting | Only intended for mounting directly on metal. |

1) The first 12 bytes/96 bits are preset in the delivery state.

2) Depending on the environment, the reader/the antennas and the set power.

# 2 Ordering data

Table 2-1 Ordering data

| | Article number |
|---|---|
| SIMATIC RF683T | 6GT2810-3HG80 |
| Mounting set for SIMATIC RF68xT<br>(2x bracket) | 6GT2890-2AA00 |

### Delivery format

The SIMATIC RF683T is supplied in the following form:

- 10 transponders per packaging unit
  Minimum order quantity: 1 packaging unit

The mounting set for SIMATIC RF683T is supplied in the following form:

- 10 mounting sets per packaging unit
  Minimum order quantity: 1 packaging unit

# 3 Presetting of the EPC memory

The first 12 bytes of the EPC memory ("0x00 - 0x0B") are preset. The EPC memory can be written as of byte 13 ("0x0C").

Table 3-1 Presetting of the EPC memory

| Address UID | Address with FB (UID) | Value |
|---|---|---|
| 0x00 | 0xFF00 | 0x00 |
| ... | ... | ... |
| 0x04 | 0xFF04 | 0x00 |
| 0x05 | 0xFF05 | Transponder type [1] |
| 0x06 | 0xFF06 | Year produced [1] |
| 0x07 | 0xFF07 | Month produced [1] |
| 0x08 | 0xFF08 | Day produced [1] |
| 0x09 | 0xFF09 | Consecutive number [1] |
| 0x0A | 0xFF0A | |
| 0x0B | 0xFF0B | |

[1] In the following table, these values are described in greater detail.

Table 3-2 Explanation of the values

| Transponder type | Year produced | Month produced | Day produced | Consecutive number [1] | | |
|---|---|---|---|---|---|---|
| RF680T = 0x44 | 2018 = 0x12 | Jan. = 0x01 | 01 = 0x01 | 0x00 | 0x00 | 0x01 |
| RF682T = 0x64 | 2019 = 0x13 | Feb. = 0x02 | 02 = 0x02 | 0x00 | 0x00 | 0x02 |
| RF683T = 0x74 | ... | ... | ... | ... | ... | ... |
| | ... | Dec. = 0x0C | 31 = 0x1F | 0xFF | 0xFF | 0xFF |

[1] The consecutive number is counted absolutely as of the respective production date and is therefore unique.

# 4 Planning operation

## 4.1 Optimum antenna/transponder positioning with plane mounting of the transponder on metal

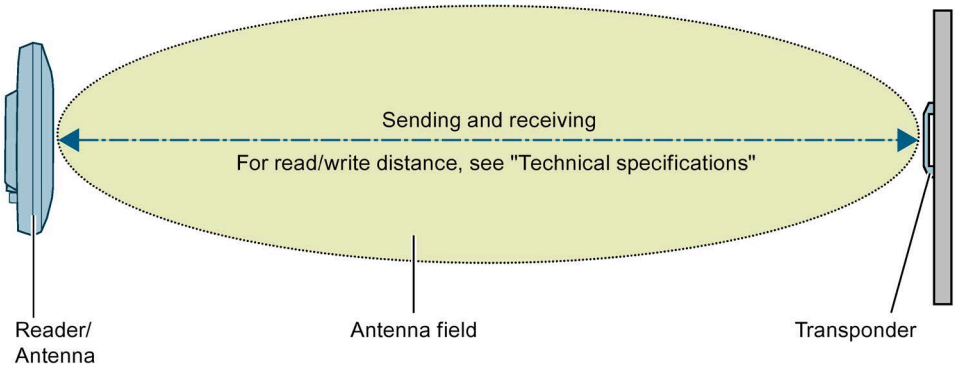


Figure 4-1 Example of optimum antenna/transponder positioning

## 4.2 Note on installation

| NOTICE |
| --- |
| **Reduction of the write/read range**<br>When mounting on metal or conductive material, ensure that the space below the transponder remains empty. |

| NOTICE |
| --- |
| **Mounting at a high temperature**<br>To relieve mechanical strain or tension on the transponder, when using the transponder at temperatures > +80 °C the transponder should be mechanically separated from the supporting surface by using the mounting brackets (due to the differing expansion coefficients of all materials). |

## 4.3 Range when mounted on flat metallic carrier plates

The transponder generally has linear polarization. The polarization axis runs as shown in the diagram below. The polarization axis of the transponder should always run parallel to the polarization axis of the antenna to achieve optimum distances and results.

If the transponder is centrally mounted on a plane metal plate, which may either be almost square or circular, it can be aligned in any direction if the transmitting and receiving antennas operate with circular polarization (such as the RF650A).

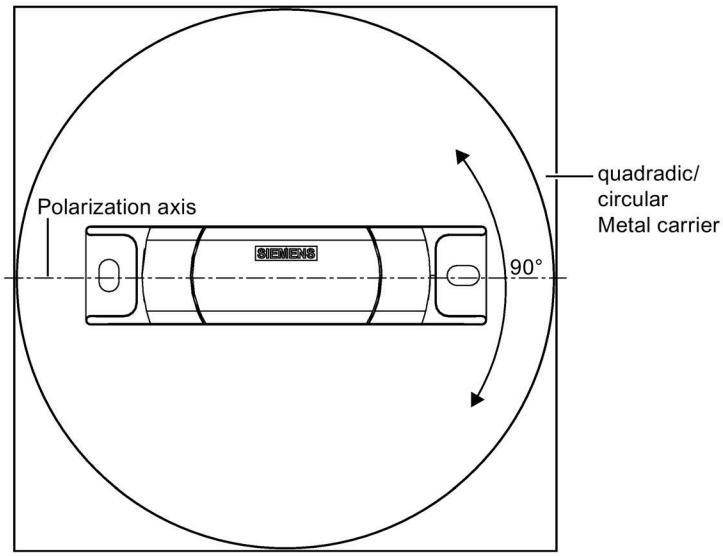


Figure 4-2 Optimum positioning of the transponder on a (square or circular) metal plate

To achieve the listed maximum read/write ranges, the transponder must be mounted on a metallic mounting surface with a minimum diameter of 150 mm. Smaller surfaces can cause a reduction of the read/write distances.

On rectangular carrier plates, the range depends on the mounting orientation of the transponder.

## 4.4 Maximum read/write ranges

Table 4-1 Read ranges of the transponder (all ranges in meters [m])

| | | **SIMATIC RF683T** [1] |
|---|---|---|
| **SIMATIC RF610R**<br>**SIMATIC RF615R**<br>with internal antenna | | 2.0 |
| **SIMATIC RF615R**<br>with internal antenna | | 2.0 |
| | With RF615A [2] | 0.5 |
| | With RF620A/RF622A | 0.5 |
| | with RF642A | 5.0 |
| | with RF650A | 2.5 |
| | with RF660A | 5.0 |
| | With RF680A (circular) | 2.5 |
| **SIMATIC RF650R**<br>with RF615A [2] | | 0.6 [3] |
| | With RF620A/RF622A | 0.6 [3] |
| | with RF642A | 8.0 |
| | with RF650A | 3.0 |
| | with RF660A | 7.0 |
| | With RF680A (circular) | 4.0 |
| **SIMATIC RF685R**<br>with internal antenna | | 4.5 |
| **SIMATIC RF680R**<br>**SIMATIC RF685R**<br>with RF615A [2] | | 0.6 [3] |
| | With RF620A/RF622A | 0.6 [3] |
| | with RF642A | 8.0 |
| | with RF650A | 4.5 |
| | with RF660A | 7.0 |
| | With RF680A (circular) | 4.0 |

[1] Mounting on metal. Mounting surface with a minimum diameter of 150 mm.

[2] Mounting on metal. Mounting surface with a minimum diameter of 75 mm.

[3] The maximum read/write range with a radiant power of approx. 15 dBm is achieved with these antennas.

**Maximum write ranges**

The reader antenna requires more power for writing than for reading data. When writing, the maximum range is reduced by approximately 60% compared with the read range.

# 5 Technical specifications

Table 5-1 Technical specifications of SIMATIC RF683T

| | 6GT2810-3HG00 |
|---|---|
| Product designation | SIMATIC RF683T |
| **Radio frequency** | |
| Operating frequency | |
| • ETSI | • 865 to 868 MHz |
| **Memory** | |
| Chip (manufacturer/type) | NXP UCode DNA |
| Memory type | EEPROM |
| Memory configuration | |
| • EPC ID | • 28 bytes / 224 bits |
| • User memory | • 384 bytes / 3072 bits |
| • TID | • 12 bytes / 96 bits |
| Number of write cycles (< 40 °C) | > $10^5$ |
| Number of read cycles (< 40 °C) | unlimited |
| Data retention time (< 40 °C) | 20 years |
| **Electrical data** | |
| Range | |
| • Writing | • ≤ 3.5 m [1)] |
| • Reading | • ≤ 8.0 m [1)] |
| Protocol | EPCglobal Class 1 Gen 2 / ISO 18000-63 |
| Transmission speed | ≤ 400 kbps |
| Polarization | Linear |
| **Mechanical specifications** | |
| Material | Plastic (PPS) |
| Silicone-free | Yes |
| Color | Black |
| Imprint | No |

| | 6GT2810-3HG00 |
|---|---|
| **Permitted ambient conditions** | |
| Ambient temperature | |
| • In operation, during write/read access | • -25 to +100 °C permanently<br>Special features:<br>As of +140 °C, no processing possible |
| • In operation, outside write/read access | • -40 to +200 °C<br>Special features:<br>Up to 200 °C: Tested up to 3 000 hours or 3 000 cycles<br>• -40 to +220 °C<br>Special features:<br>Up to 220 °C: Tested up to 1 000 hours or 1 500 cycles |
| • During transportation and storage | • -40 ... +100 °C |
| Distance from metal | 0 mm<br>Only intended for mounting directly on metal. |
| Degree of protection | IP68 / IPx9K |
| Shock-resistant according to DIN EN 60721-3-7, Class 7 M3 | 100 g [2] |
| Vibrations according to EN 60068-2-6 | 20 g [2] |
| Resistance to mechanical stress | Torsion and bending stress are not permitted |
| **Design, dimensions and weight** | |
| Dimensions (L x W x H) | 130 × 32.6 × 16.5 mm |
| Weight | 50 g |
| Type of mounting | 2 x M6 screws<br>≤ 1 Nm |
| **Standards, specifications, approvals** | |
| MTBF | 1940 years |

[1] Depending on the environment, the reader / the antennas and the set power

[2] The values for shock and vibration are maximum values and must not be applied continuously.

# 6 Dimension drawing

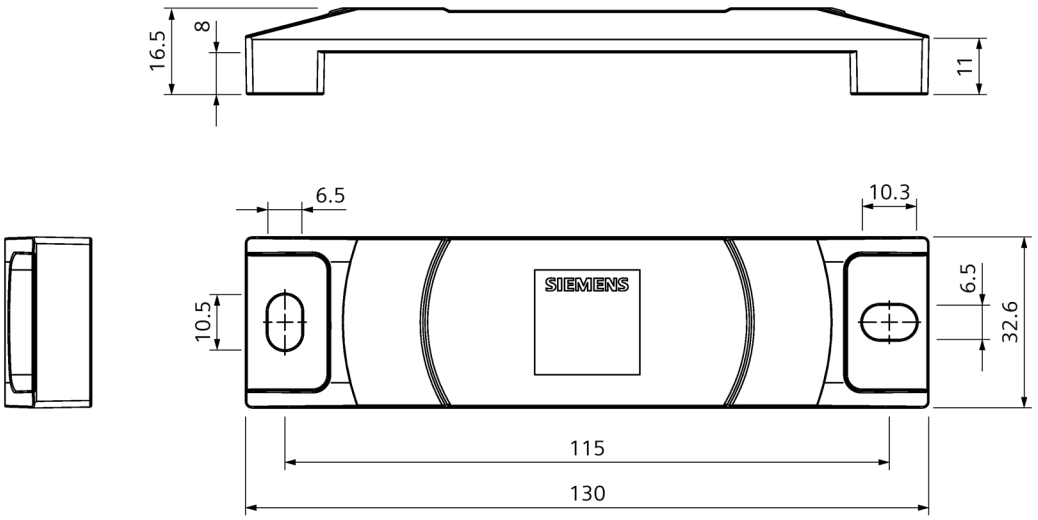


Figure 6-1 Dimension drawing of SIMATIC RF683T

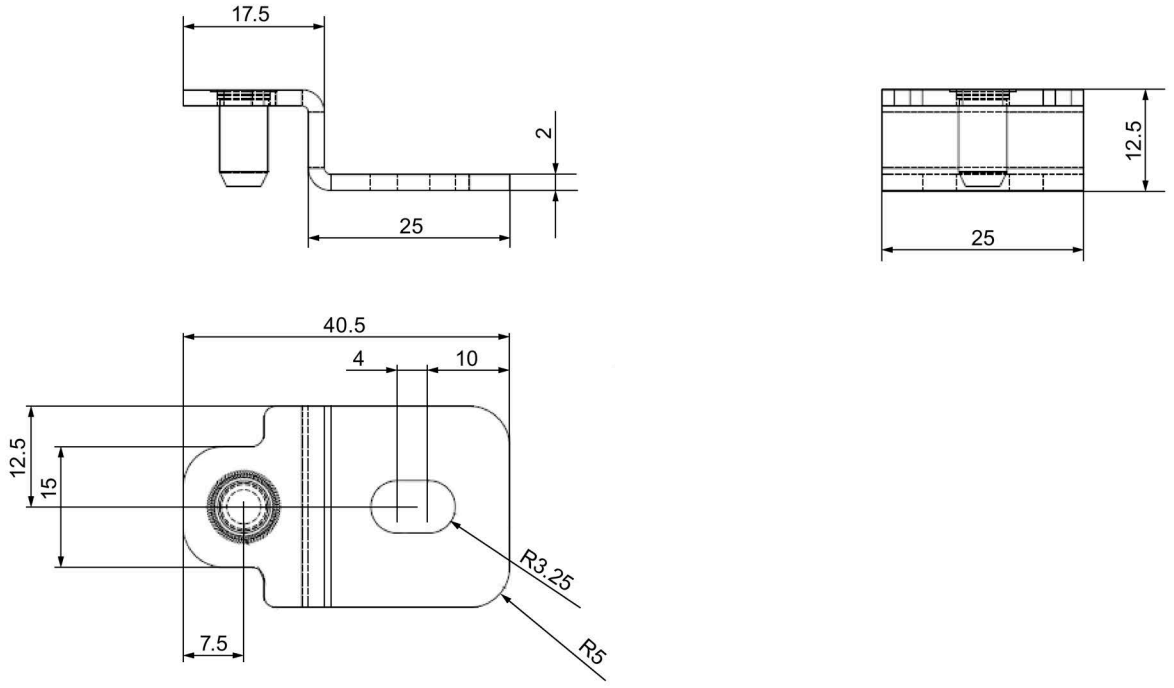


Figure 6-2 Dimension drawing mounting for SIMATIC RF68xT

All dimensions in mm

Tolerances unless indicated otherwise ±0.5 mm.

# 7 Certificates and approvals

Table 7-1 Certificates and approvals

| Labeling | Description |
|---|---|
| CE | Conformity with the RED directive 2014/53/EU<br>Conformity with the RoHS directive 2011/65/EU |



Siemens AG
Digital Industries
Postfach 48 48
90026 NÜRNBERG
GERMANY

SIMATIC RF683T (6GT2810-3HG00)
C79000-G8976-C667-01, 07/2022