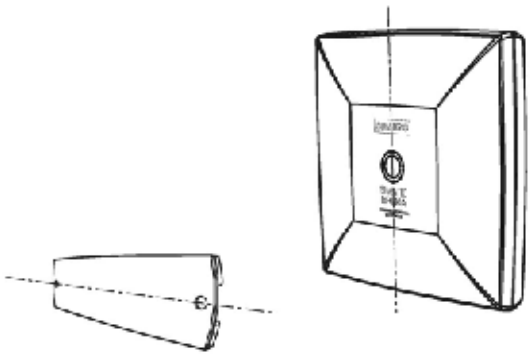


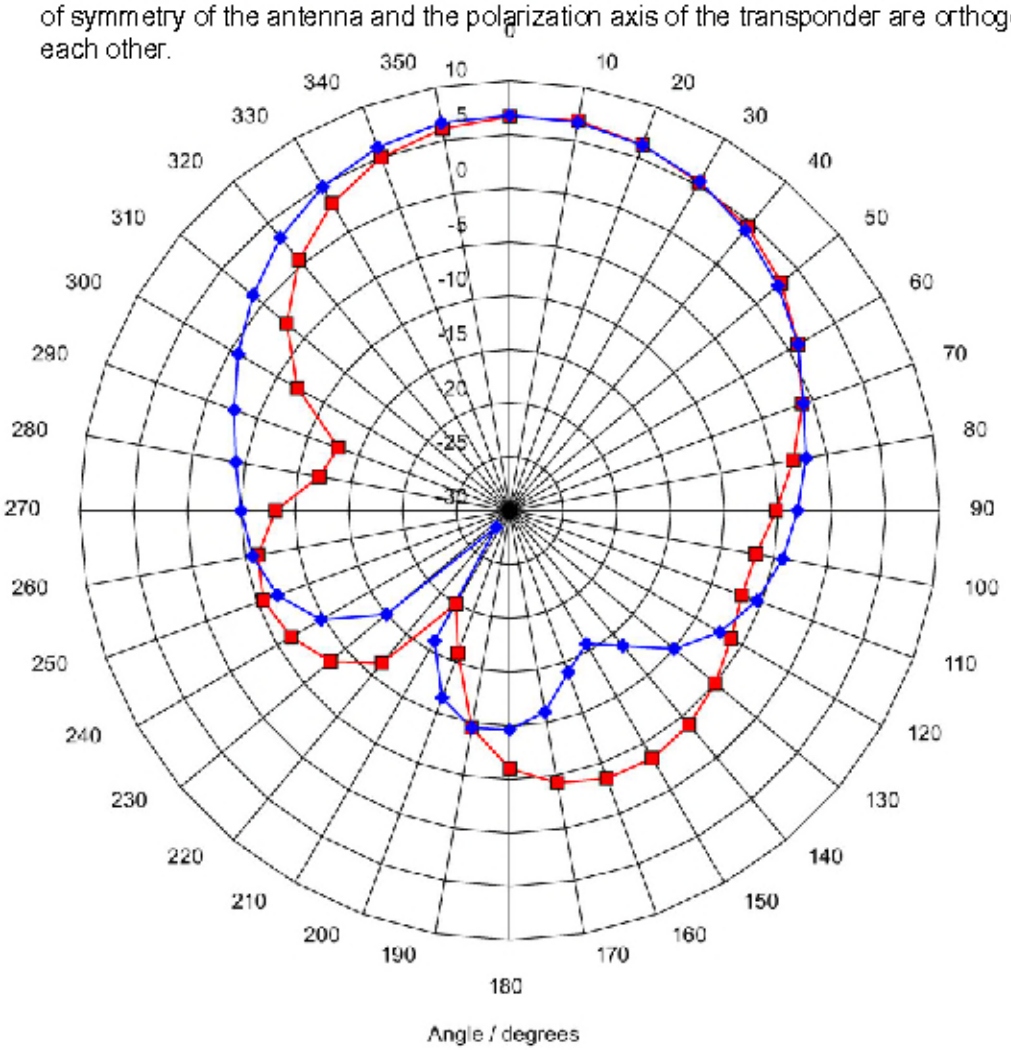
Pattern of the vertical plane of the antenna

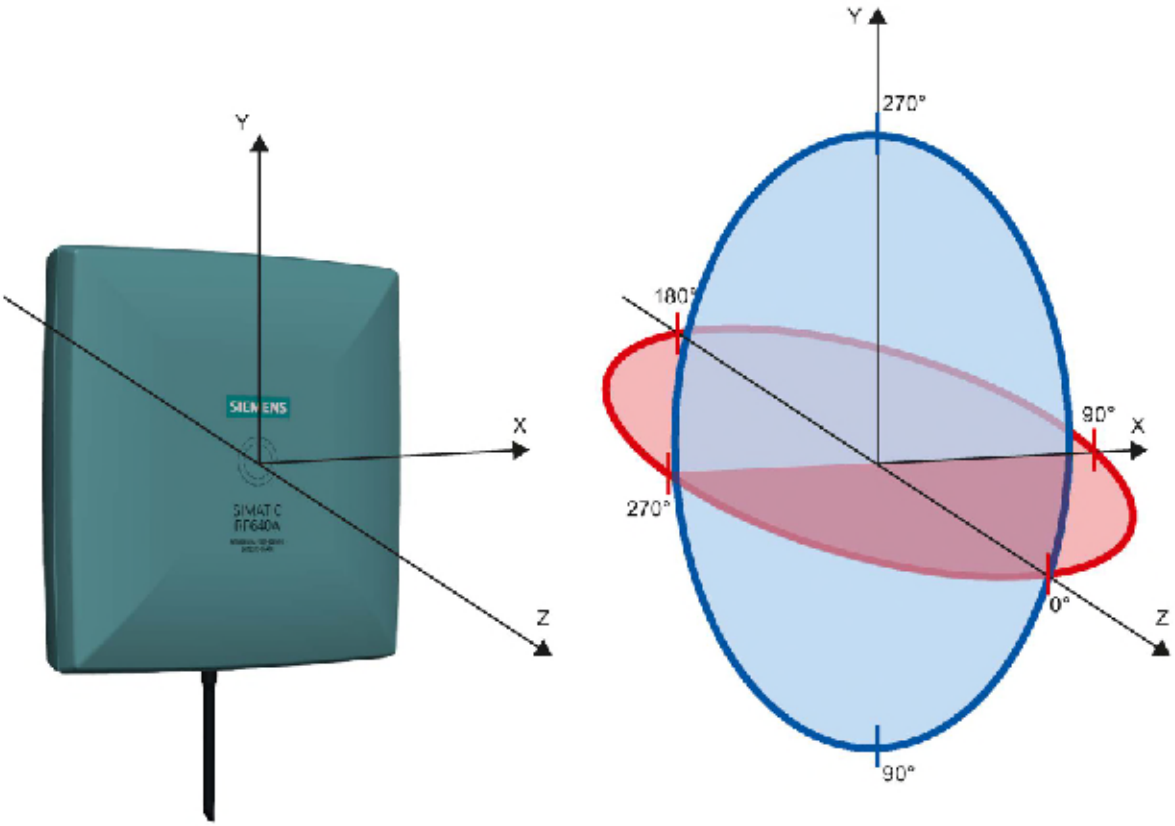
Pattern of the horizontal plane of the antenna

Figure 6-25 The RF640A directional radiation pattern in the ETSI frequency band, polarization axis of the transponder, and axis of symmetry of the antenna are parallel to each other.

Polarization axis and axis of symmetry are orthogonal to each other

In a configuration based on the following directional radiation pattern of the antenna, the axis of symmetry of the antenna and the polarization axis of the transponder are orthogonal to each other.





Pattern of the vertical plane of the antenna

Pattern of the horizontal plane of the antenna

Figure 6-26 The RF640A directional radiation pattern in the ETSI frequency band, axis of symmetry of the antenna, and polarization axis of the transponder are orthogonal to each other

6.4.6.2 Antenna radiation patterns in the FCC frequency band

Directional radiation pattern USA (FCC)

The directional radiation pattern is shown for nominal alignment and a center frequency of 915 MHz.

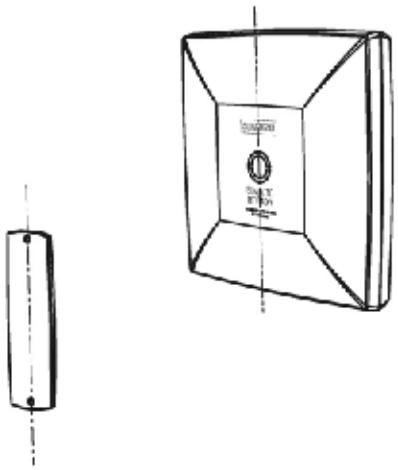


Figure 6-27 Reference system

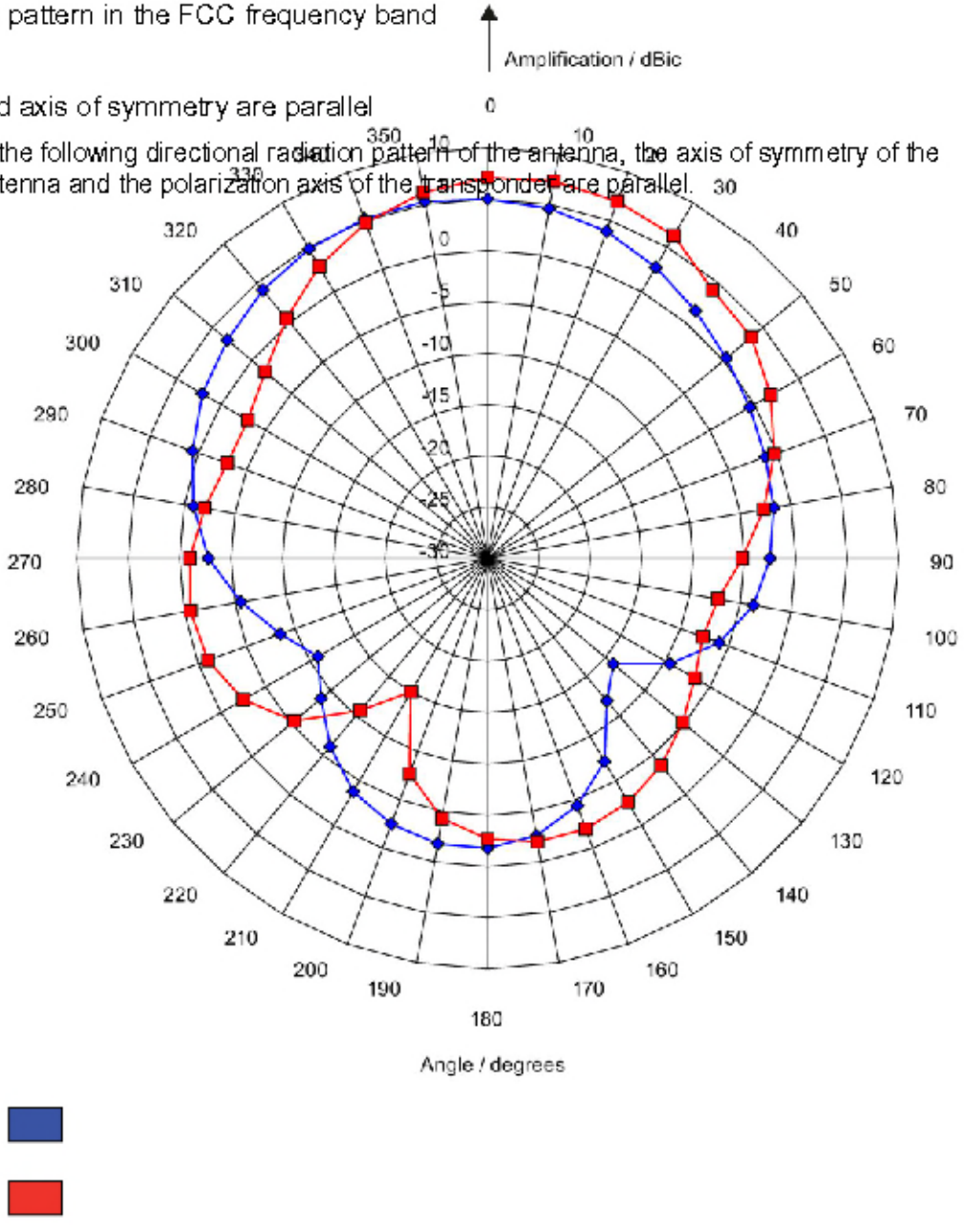
The half-power beam width of the antenna is defined by the angle between the two -3 dB points (corresponding to half the power referred to the maximum power). Which range (in %) corresponds to the dB values in the patterns can be obtained from this table (Page 288).

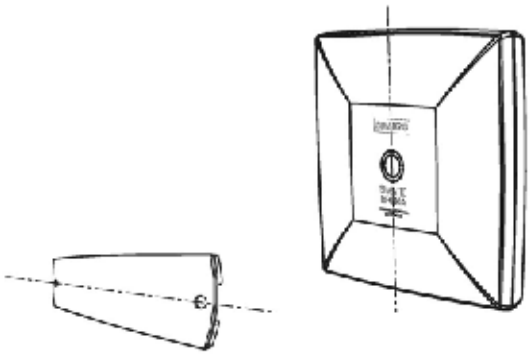
Note that the measurements presented graphically below were carried out in a low-reflection environment. Deviations can therefore occur in a normally reflecting environment.

Directional radiation pattern in the FCC frequency band

Polarization axis and axis of symmetry are parallel

In the following directional radiation pattern of the antenna, the axis of symmetry of the antenna and the polarization axis of the transponder are parallel.





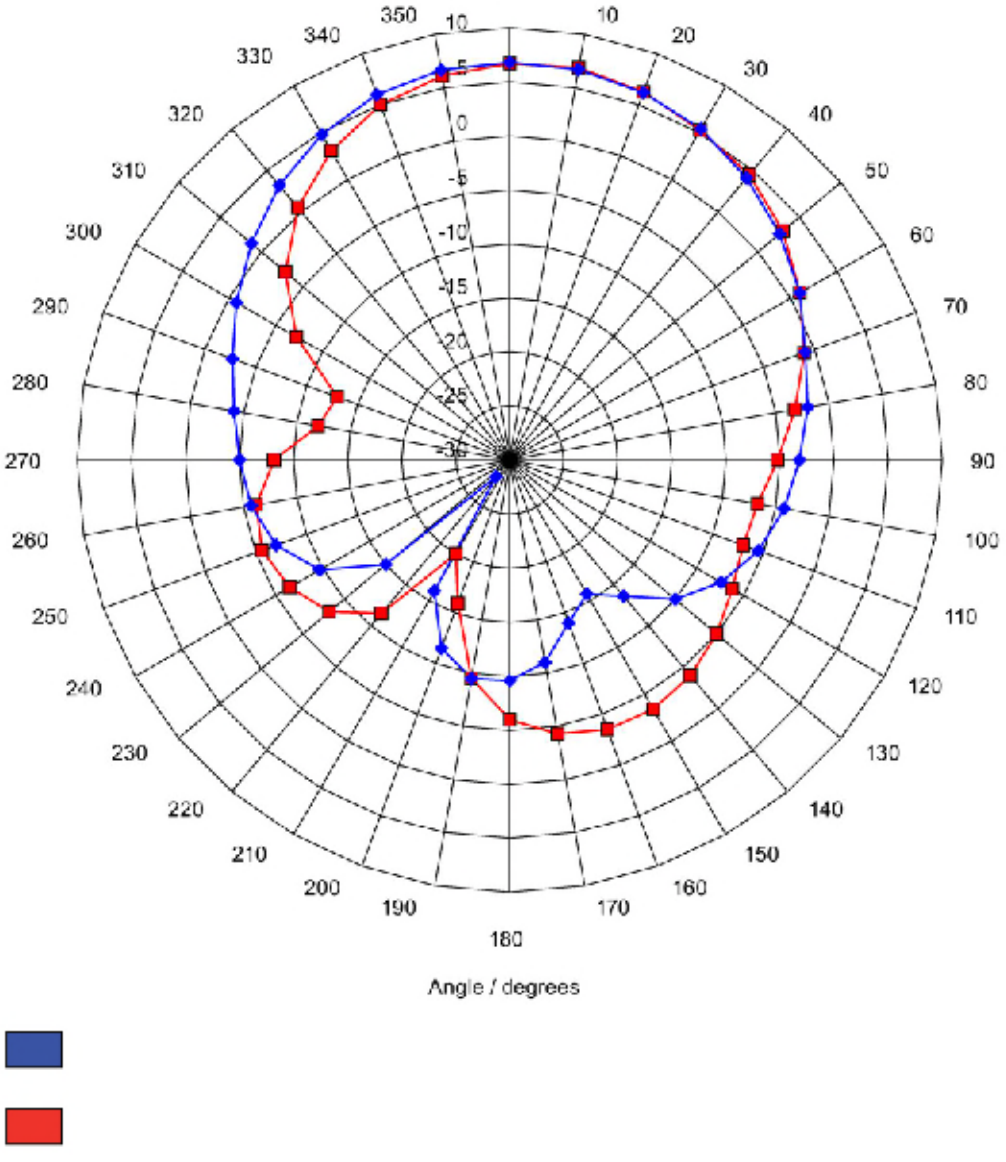
Pattern of the vertical plane of the antenna

Pattern of the horizontal plane of the antenna

Figure 6-28 The RF640A directional radiation pattern in the FCC frequency band, polarization axis of the transponder, and axis of symmetry of the antenna are parallel to each other

Polarization axis and axis of symmetry are orthogonal to each other

In the following directional radiation pattern of the antenna, the axis of symmetry of the antenna and the polarization axis of the transponder are orthogonal to each other.



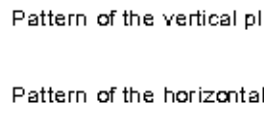


Figure 6-29 The RF640A directional radiation pattern in the FCC frequency band, axis of symmetry of the antenna, and polarization axis of the transponder are orthogonal to each other

6.4.6.3 Interpretation of directional radiation patterns

The following overview table will help you with the interpretation of directional radiation patterns.

The table shows which dBi values correspond to which read/write ranges (in %): You can read the radiated power depending on the reference angle from the directional radiation patterns, and thus obtain information on the read/write range with this reference angle with regard to a transponder.

The dBr values correspond to the difference between the maximum dBi/dBic value and a second dBi/dBic value.

Deviation from maximum antenna gain [dBr]	Read/write range [%]
0	100
-3	70
-6	50
-9	35
-12	25
-15	18
-18	13

Example

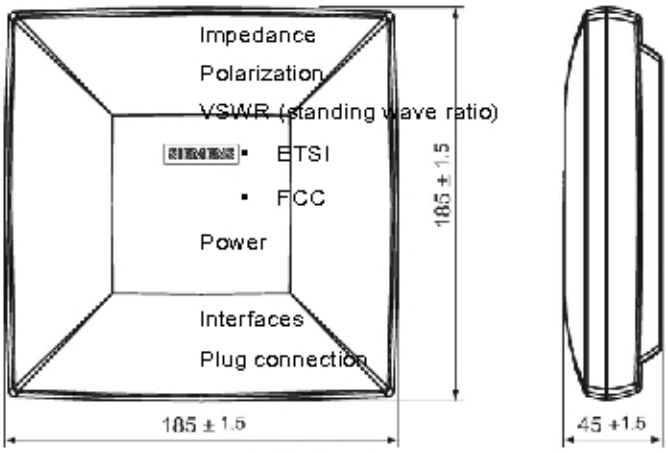
As can be seen in Directional radiation patterns in the ETSI frequency band (Page 279), the maximum antenna gain in the vertical plane is 3.45 dBi (6.45 dBic). In this plane, and with the polarization axis of the transponder parallel to the axis of symmetry of the antenna, the antenna gain drops to about 0.5 dBic at +50° or 310°. Therefore the dBr value is -6. The antenna range is only 50% of the maximum range at + 50° or 310° from the Z axis within the vertical plane (see values shown in blue in the directional radiation pattern: Characteristic of the vertical plane of the antenna (Page 279) and the associated representation of the reference system (Page 278)).

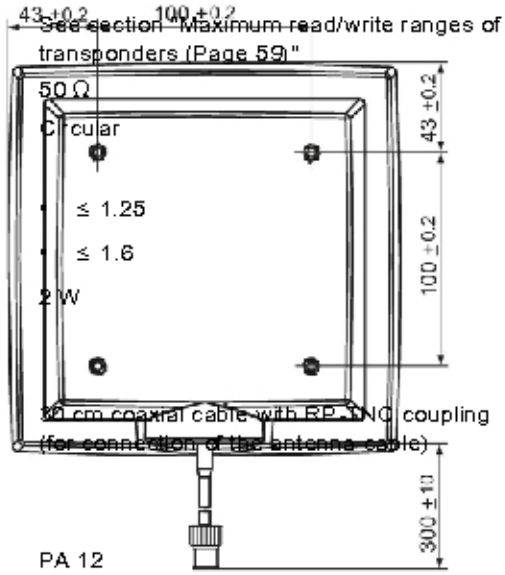
6.4.7 Technical data

Table 6- 19 Technical specifications for the RF640A antenna

	6GT2812-0GA08
Product type designation	SIMATIC RF640A
Radio frequencies	
Operating frequency	865 to 928 MHz
Maximum radiated power	
▪ ETSI	▪ RF650R: ≤ 1360 mW ERP RF680R/RF685R: ≤ 2000 mW ERP
▪ FCC	▪ RF650R: ≤ 2400 mW EIRP RF680R/RF685R: ≤ 4000 mW EIRP
▪ CMIIT	▪ RF650R: ≤ 1300 mW ERP RF680R/RF685R: ≤ 2000 mW ERP
▪ ARIB	▪ STD-T107: RF650R: ≤ 500 mW EIRP
	▪ STD-T106: RF680R/RF685R: ≤ 4000 mW EIRP
Antenna gain	
▪ ETSI	▪ 4 dBi (7 dBic)
▪ FCC	▪ 4.3 dBi (7.3 dBic)
Opening angle for sending/receiving when mounted on a metal surface of 15 cm x 15 cm [1]	
▪ ETSI	▪ Horizontal plane: 80° Vertical plane: 75° see section "Directional radiation patterns in the ETSI frequency band (Page 279)"
▪ FCC	▪ Horizontal plane: 75° Vertical plane: 85° see section "Directional radiation pattern in the FCC frequency band (Page 284)"
Front-to-back ratio	
▪ ETSI	▪ 14 dB ± 2.4 dB (depends on orientation of the transponder)
▪ FCC	▪ 9 dB ± 2.7 dB (depends on orientation of the transponder)

6GT2812-0GA08





Electrical data	
Range	See section "Maximum read/write ranges of transponders (Page 59)"
Impedance	50 Ω
Polarization	Circular
VSWR (standing wave ratio)	
▪ ETSI	≤ 1.25
▪ FCC	≤ 1.6
Power	2 W
Interfaces	
Plug connection	30 cm coaxial cable with RP-TNC coupling (for connection of the antenna cable)
Mechanical specifications	
Material	PA 12
Color	Pastel turquoise
Tightening torque (at room temperature)	≤ 2 Nm
Permitted ambient conditions	
Ambient temperature	
▪ During operation	-25 ... +75 °C
▪ During transportation and storage	-40 ... +85 °C
Degree of protection	IP65
Shock resistant to EN 60068-2-27	25 g [2]
Vibrations according to EN 60068-2-6	1g [2]
Design, dimensions and weight	
Dimensions (H x W x D)	185 x 185 x 45 mm
Weight	600 g
Standards, specifications, approvals	
Proof of suitability	CE (according to RED), FCC (Title 47, Part 15.247), cULus
MTBF	445 years

[1] The values differ for different dimensions/materials of the mounting surface.

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

6.4.8 Dimension drawing

Figure 6-30 Dimension drawing RF640A

All dimensions in mm

6.4.9 Approvals & certificates

Table 6- 20 6GT2812-0GA08

Labeling	Description
	Conformity with the RED directive 2014/53/EU Conformity with the RoHS directive 2011/65/EU

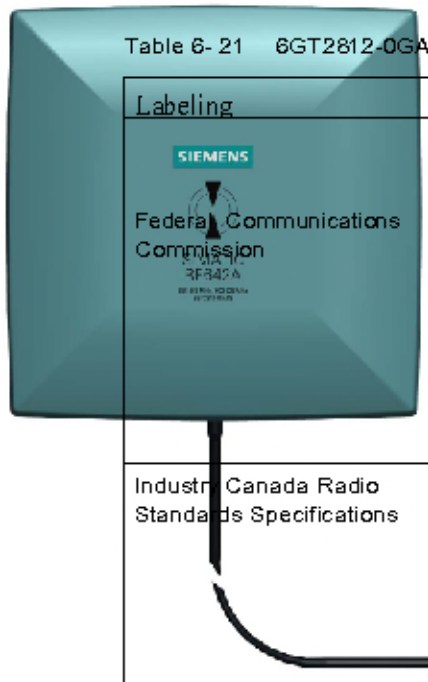


Table 6- 21 6GT2812-0GA08

Labeling	Description
	FCC CFR 47, Part 15 sections 15.247 Radio Frequency Interference Statement This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. The FCC approval is granted in association with the FCC approval of the following RF600 readers: ▪ FCC ID: NXW-RF600R2 (for RF650R: 6GT2811-6AB20-1AA0, RF680R: 6GT2811-6AA10-1AA0, RF685R: 6GT2811-6CA10-1AA0)
Industry Canada Radio Standards Specifications	RSS-210 Issue 7, June 2007, Sections 2.2, A8 The approval for Industry Canada is granted in association with the Industry Canada approval of the following RF600 readers: ▪ IC: 267X-RF600R2, Model RF650R (for 6GT2811-6AB20-1AA0) ▪ IC: 267X-RF600R2, Model RF680R (for 6GT2811-6AA10-1AA0) ▪ IC: 267X-RF600R2, Model RF685R (for 6GT2811-6CA10-1AA0)
	This product is UL-certified for the USA and Canada. It meets the following safety standard(s): ▪ UL 60950-1 - Information Technology Equipment Safety - Part 1: General Requirements ▪ CSA C22.2 No. 60950 -1 - Safety of Information Technology Equipment ▪ UL Report E 205089

6.5 SIMATIC RF642A

6.5.1 Characteristics

SIMATIC RF642A	Characteristics	
	Area of application	The SIMATIC RF642A is a universal UHF antenna in a medium size with high range for industrial applications in production and logistics.
	Frequency range	865 to 928 MHz
	Read range	Max. 8 m
	Polarization	Linear
	Degree of protection	IP65
	Mounting	4 x M4 (VESA 100 fixing system)
	Connector	30 cm connecting cable (connected permanently to the antenna) and RP-TNC coupling An antenna cable is required for connection to the reader (e.g. 6GT2815-0BH30).

Frequency ranges

The antenna is a broadband antenna and covers the frequency ranges from 865 to 928 MHz.

Function

The SIMATIC RF642A is used for transmitting and receiving data in the UHF range. The antennas are connected to the SIMATIC RF600 readers via antenna cables that are available in different lengths.

6.5.2 Ordering data

Table 6- 22 Ordering data RF642A

Product	Article number
SIMATIC RF642A	6GT2812-1GA08

Table 6- 23 Ordering data accessories

Product		Article number
Connecting cable between reader and antenna	1 m (cable loss 0.5 dB)	6GT2815-0BH10
	3 m (cable loss 1.0 dB)	6GT2815-0BH30
	5 m, suitable for drag chains (cable loss 1.5 dB)	6GT2815-2BH50
	10 m (cable loss 2.0 dB)	6GT2815-1BN10
	10 m (cable loss 4.0 dB)	6GT2815-0BN10
	15 m, suitable for drag chains (cable loss 4.0 dB)	6GT2815-2BN15
	20 m (cable loss 4.0 dB)	6GT2815-0BN20
	40 m (cable loss 5.0 dB)	6GT2815-0BN40
SIMATIC antenna holder for RF600 devices		6GT2890-2AB10
Antenna mounting kit		6GT2890-0AA00

6.5.3 Installation

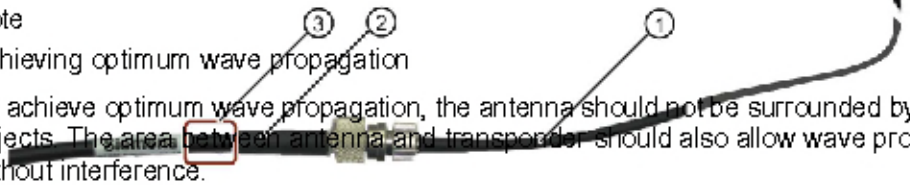
Mounting system

A standardized VESA 100 mounting system is provided to mount the antenna. The mounting system consists of four fixing holes for M4 screws at intervals of 100 mm. The antenna is suitable for mounting on metallic and non-metallic surfaces.

Note

Achieving optimum wave propagation

To achieve optimum wave propagation, the antenna should not be surrounded by conducting objects. The area between antenna and transponder should also allow wave propagation without interference.



Antenna holders

The Siemens antenna holders allow for fine adjustment of the antenna field by setting the solid angle.

6.5.4 Connecting the antenna

The SIMATIC RF642A antenna must be connected to the reader using an antenna cable.

Preassembled standard cables in lengths of 1 m, 3 m, 5 m, 10 m, 15 m, 20 m and 40 m are available to connect the antenna.

The range of the antenna is limited by the cable loss. The maximum range can be achieved with the cable 6GT2815-0BH10 (length 1 m), since this cable has the lowest cable loss.

Requirement

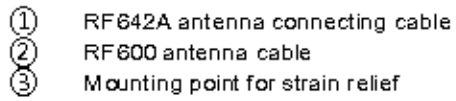
Note

Use of Siemens antenna cable

To ensure optimum functioning of the antenna, it is recommended that a Siemens antenna cable is used in accordance with the list of accessories.

Strain relief

To protect the antenna connecting cable from strain, you can attach strain relief, e.g. in the form of a strain relief clamp. The following graphic shows the optimum mounting point for attaching strain relief.



① RF642A antenna connecting cable
② RF600 antenna cable
③ Mounting point for strain relief

Figure 6-31 Strain relief

6.5.4.1 Bending radii and bending cycles of the cable

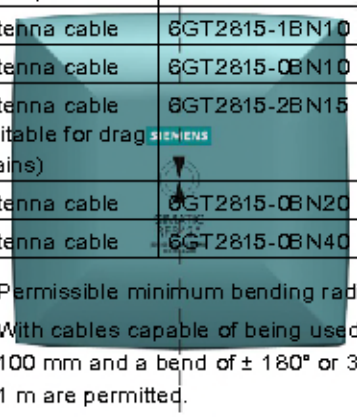
The following listed bending radii are minimum values, which may not be fallen below and are based on repeated bending.

Table 6- 24 Bending radii of the antenna cable

Cable designation	Article number	Length [m]	Cable loss [dB]	Bending radius [mm]
Antenna cable	6GT2815-0BH10	1	0.5	51
Antenna cable	6GT2815-0BH30	3	1	51
Antenna cable (suitable for drag chains)	6GT2815-2BH50	5	1.5	45 [1) 2)]
Antenna cable	6GT2815-1BN10	10	2	77
Antenna cable	6GT2815-0BN10	10	4	51
Antenna cable (suitable for drag chains)	6GT2815-2BN15	15	4	45 [1) 2)]
Antenna cable	6GT2815-0BN20	20	4	77
Antenna cable	6GT2815-0BN40	40	5	77

1) Permissible minimum bending radius with one-time bending. 28 mm

2) With cables capable of being used in drag chains, 100,000 bending cycles at a bending radius of 100 mm and a bend of ± 180° or 3 million torsion cycles with a bend of ± 180° on a cable length of 1 m are permitted.



6.5.5 Antenna parameter assignment

6.5.5.1 Alignment of transponders to the antenna

Polarization axis

Since the RF642A antenna has linear polarization, it is necessary to consider the alignment of the transponders with regard to the polarization axis of the antenna.

The polarization axes of antenna and transponder must always be parallel. The symbol on the antenna indicates the polarization axis.

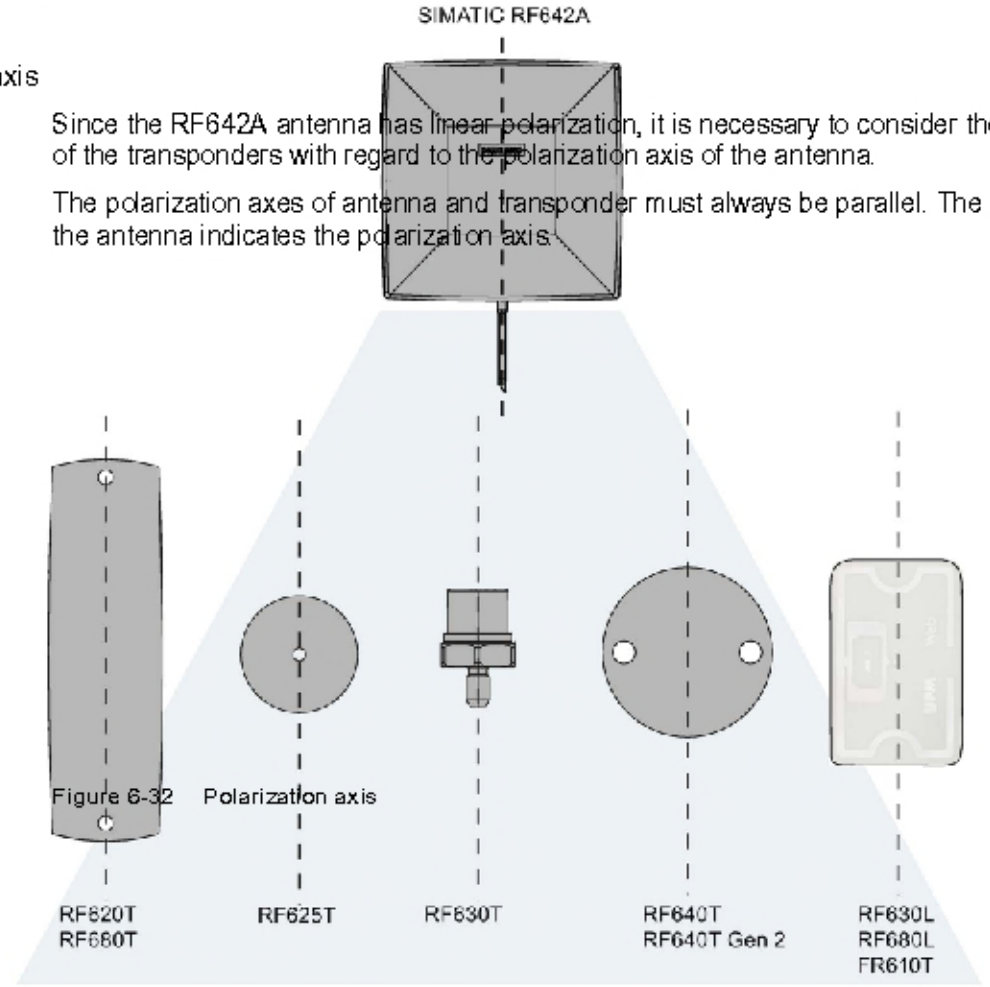


Figure 6-32 Polarization axis

Alignment

The following diagram shows the optimum alignment of the RF600 transponders to the RF642A antenna.

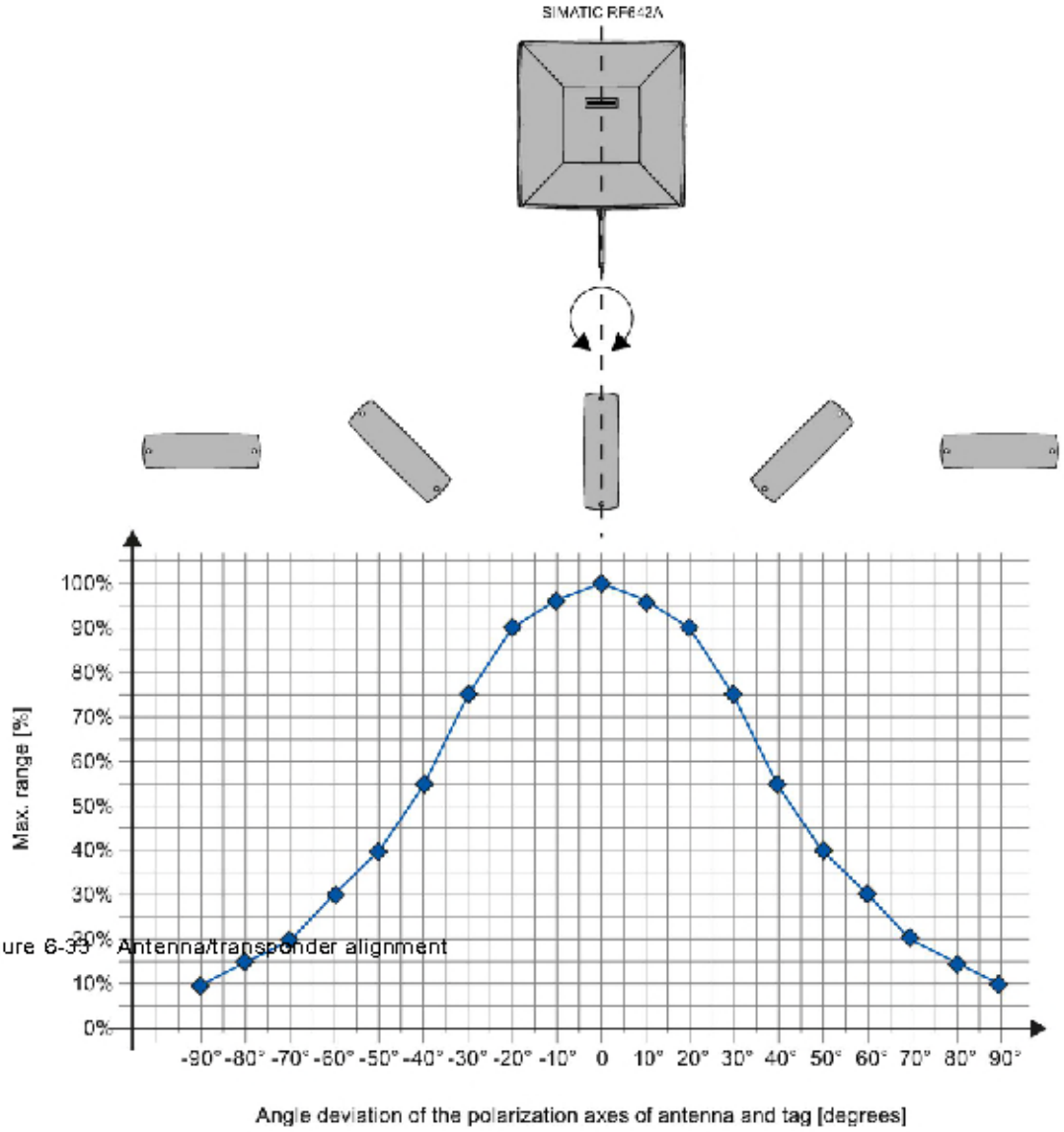


Figure 6-39 Antenna/transponder alignment

Angle deviation diagram for alignment

The following diagram shows the dependence of the following factors.

- Alignment angle of transponder to antenna
- Maximum range of antenna

Figure 6-34 Angle deviation diagram for alignment

6.5.5.2 RF642A parameter assignment

Depending on the country or region in which the antenna is being operated, it is subject to regional limitations with respect to the radiated power.

Limitations in the EU, EFTA, or Turkey

Note

Limitation of the radiated power according to EN 302 208 V1.4.1 (ETSI)

RF600 systems that are put into operation in the EU, EFTA or Turkey must not exceed the following radiated power with an RF642A antenna:

- 2000 mW ERP (or 33 dBm ERP)
  Converted into EIRP: 3250 mW EIRP (or 35 dBm EIRP)

Make the following settings to ensure that the maximum permitted radiated power of the antenna is not exceeded:

- Antenna gain: 6 dBi
- Radiated power: ≤ 2000 mW ERP (or 33 dBm ERP)
  Converted into EIRP: ≤ 3250 mW EIRP (or 35 dBm EIRP)
- Use of cable loss associated with the antenna cable.

Limitations in the USA and Canada

Note

Limitation of the radiated power (FCC)

RF600 systems that are put into operation in the USA and Canada must not exceed the following radiated power with an RF642A antenna:

- 4000 mW EIRP (or 36 dBm EIRP)

Make the following settings to ensure that the maximum permitted radiated power of the antenna is not exceeded:

- Conducted power P (dBm) of the RF600 reader: < 30 dBm
- Antenna gain G_i (dBi) in the FCC frequency band: ≤ 7 dBi
- Cable loss a_k (dB): ≥ 1 dB

$P\ (dBm) \leq 30\ dBm - (G_i - 6\ dBi) + a_k$

Limitations in China

Note

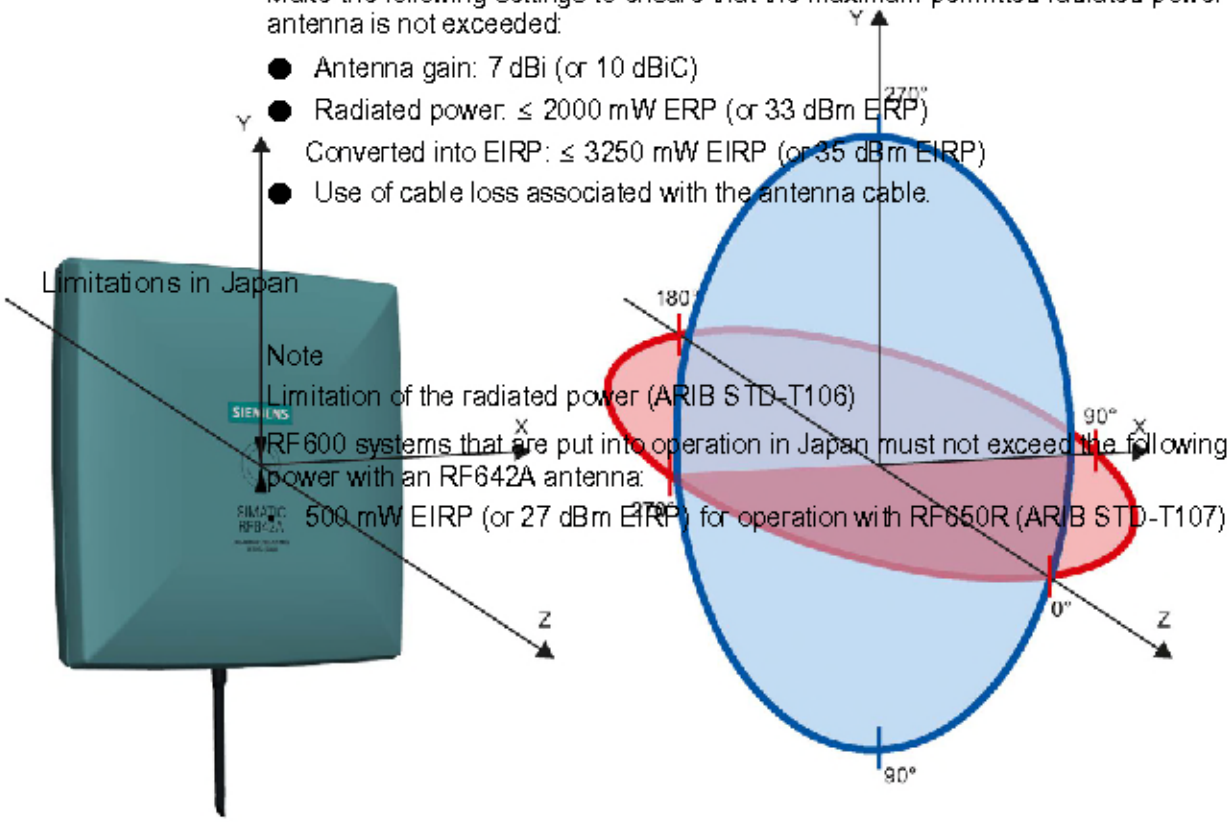
Limitation of the radiated power (CMIIT)

RF600 systems that are put into operation in China must not exceed the following radiated power with an RF642A antenna:

- 2000 mW ERP (or 33 dBm ERP)
  Converted into EIRP: 3250 mW EIRP (or 35 dBm EIRP)

Make the following settings to ensure that the maximum permitted radiated power of the antenna is not exceeded:

- Antenna gain: 7 dBi (or 10 dBiC)
- Radiated power: ≤ 2000 mW ERP (or 33 dBm ERP)
  Converted into EIRP: ≤ 3250 mW EIRP (or 35 dBm EIRP)
- Use of cable loss associated with the antenna cable.



Limitations in Japan

Note

Limitation of the radiated power (ARIB STD-T106)

RF600 systems that are put into operation in Japan must not exceed the following radiated power with an RF642A antenna:

- 500 mW EIRP (or 27 dBm EIRP) for operation with RF650R (ARIB STD-T107)

6.5.6 Antenna patterns

6.5.6.1 Antenna radiation patterns in the ETSI frequency band

Directional radiation pattern ETSI

The directional radiation pattern is shown for nominal alignment and a center frequency of 866.3 MHz. The nominal antenna alignment is given when the antenna elevation is provided as shown in the following figure.

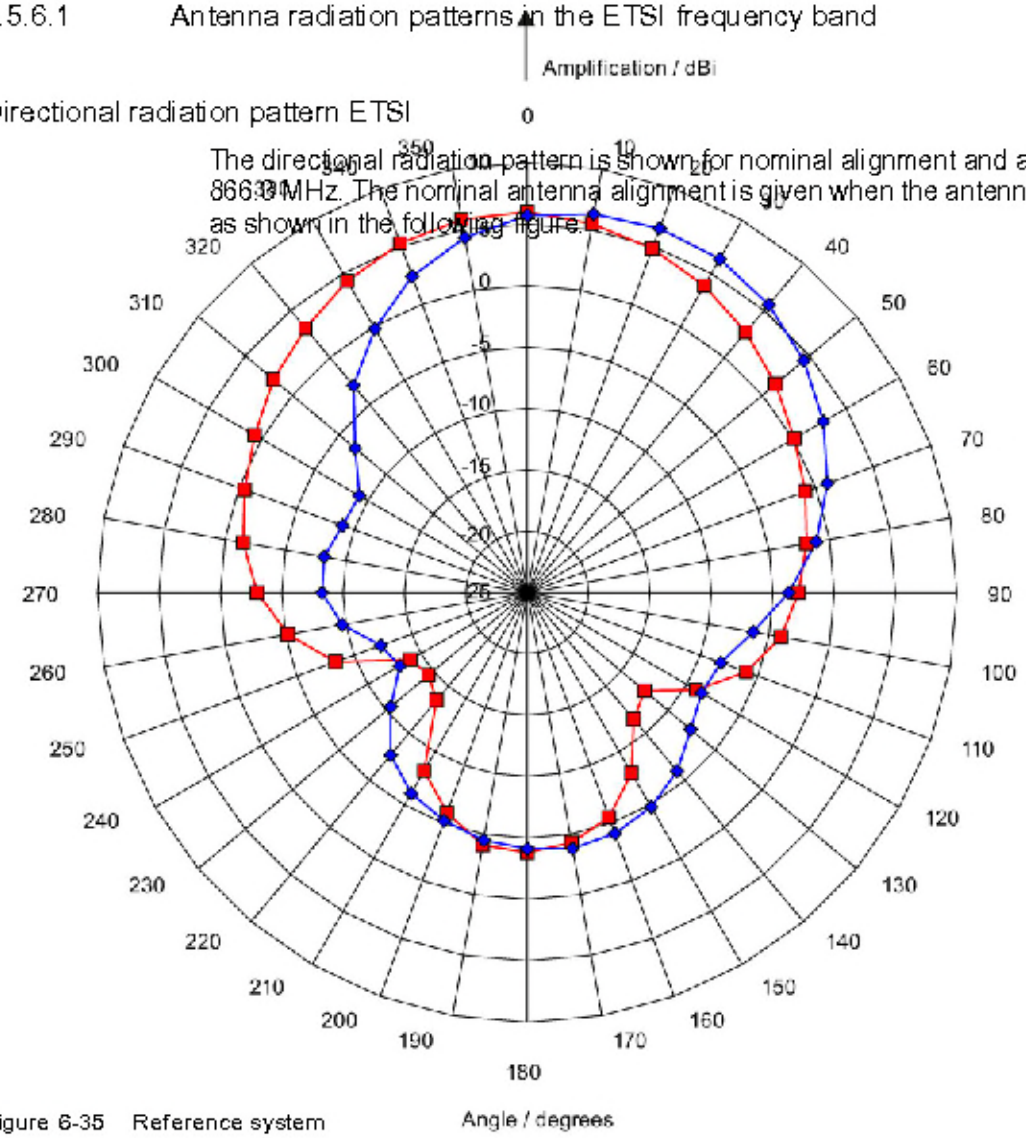
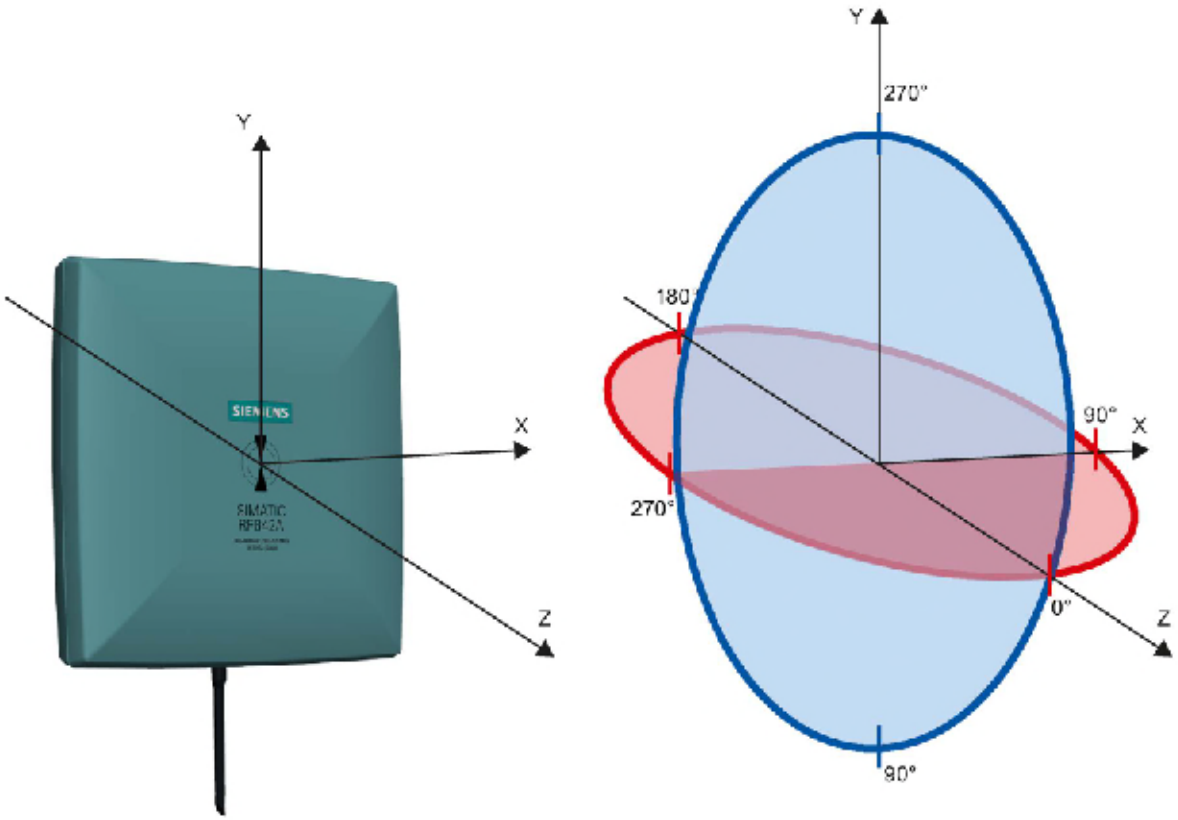


Figure 6-35 Reference system

The half-power beam width of the antenna is defined by the angle between the two -3 dB points. The range (in %) corresponding to the dB values in the patterns can be obtained from this table (Page 306).

Note that the measurements presented graphically below were carried out in a low-reflection environment. Deviations can therefore occur in a normally reflecting environment.

Directional radiation pattern in the ETSI frequency band



Pattern of the vertical plane of the antenna

Pattern of the horizontal plane of the antenna

Figure 6-36 Directional radiation pattern of RF642A in the ETSI frequency band

6.5.6.2 Antenna radiation patterns in the FCC frequency band

Directional radiation pattern USA (FCC)

The directional radiation pattern is shown for nominal alignment and a center frequency of 915 MHz.

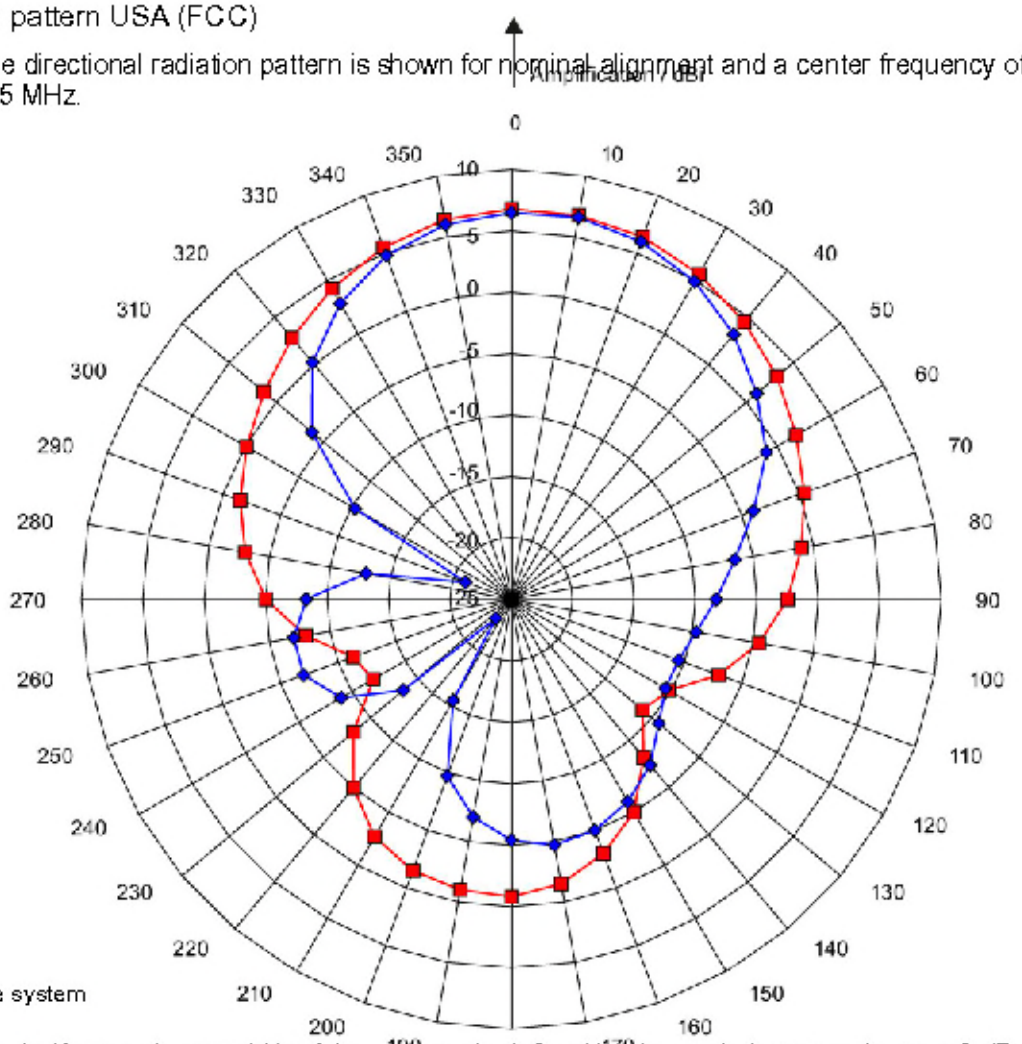


Figure 6-37 Reference system

The half-power beam width of the antenna is defined by the angle between the two -3 dB points (corresponding to half the power referred to the maximum power). Which range (in %) corresponds to the dB values in the patterns can be obtained from this table .

Note that the measurements presented graphically below were carried out in a low-reflection environment. Deviations can therefore occur in a normally reflecting environment.

Directional radiation pattern of the RF642A in the FCC frequency band

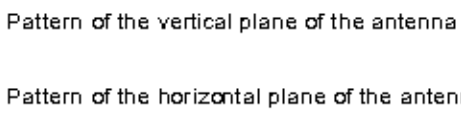


Figure 6-38 Directional radiation pattern of the RF642A in the FCC frequency band

6.5.6.3 Interpretation of directional radiation patterns

The following overview table will help you with the interpretation of directional radiation patterns.

The table shows which dBi values correspond to which read/write ranges (in %): You can read the radiated power depending on the reference angle from the directional radiation patterns, and thus obtain information on the read/write range with this reference angle with regard to a transponder.

The dBr values correspond to the difference between the maximum dBi value and a second dBi value.

Deviation from maximum antenna gain [dBr]	Read/write range [%]
0	100
-3	70
-6	50
-9	35
-12	25
-15	18
-18	13

Example

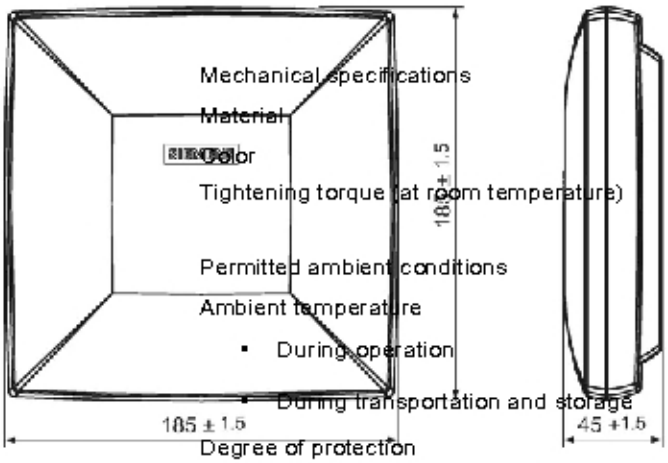
As can be seen in Directional radiation pattern in the ETSI frequency band (Page 303), the maximum antenna gain in the horizontal plane is 6 dBi. In this plane and with the parallel polarization axis at +70° or 300°, the antenna gain dropped to about 0 dBi. Therefore the dBr value is 6. The antenna range is only 70° of the maximum range at + 50° or +300° from the Z axis within the horizontal plane (see values shown in red in the directional radiation pattern: Characteristic of the vertical plane of the antenna (Page 302) and the associated representation of the reference system (Page 302)).

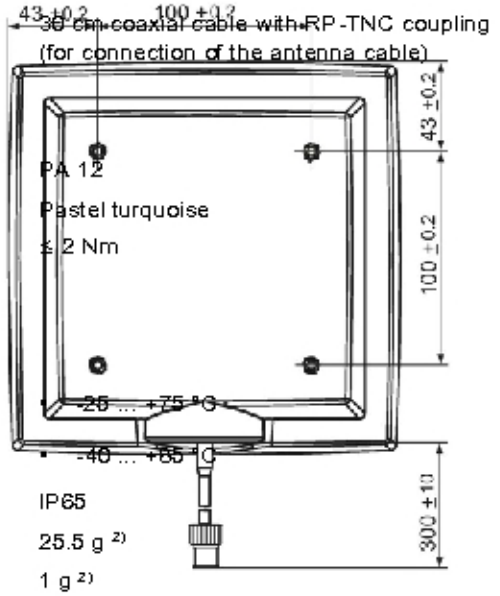
6.5.7 Technical data

Table 6- 25 Technical specifications for the RF642A antenna

	6GT2812-1GA08
Product type designation	SIMATIC RF642A
Radio frequencies	
Operating frequency	865 to 928 MHz
Maximum radiated power	
▪ ETSI	▪ RF650R: ≤ 2000 mW ERP RF680R/RF685R: ≤ 2000 mW ERP
▪ FCC	▪ RF650R: ≤ 4000 mW EIRP RF680R/RF685R: ≤ 4000 mW EIRP
▪ CMIIT	▪ RF650R: ≤ 1900 mW ERP RF680R/RF685R: ≤ 2000 mW ERP
▪ ARIB	▪ STD-T107: RF650R: ≤ 500 mW EIRP
Antenna gain	
▪ ETSI	▪ 6 dBi
▪ FCC	▪ 7 dBi
Opening angle for sending/receiving when mounted on a metal surface of 15 cm x 15 cm [1]	
▪ ETSI	▪ Horizontal plane: 75° Vertical plane: 70° see section "Directional radiation pattern in the ETSI frequency band (Page 303)"
▪ FCC	▪ Horizontal plane: 80° Vertical plane: 70° see section "Directional radiation pattern of the RF642A in the FCC frequency band (Page 305)"
Front-to-back ratio	
▪ ETSI	▪ 10 dB
▪ FCC	▪ 9.8 dB ± 2.2 dB
Electrical data	
Range	See section "Maximum read/write ranges of transponders (Page 59)"
Impedance	50 Ω
Polarization	Linear
VSWR (standing wave ratio)	≤ 1.5
Power	2 W

6GT2812-1GA08





Interfaces	
Plug connection	30 cm coaxial cable with RP-TNC coupling (for connection of the antenna cable)
Mechanical specifications	
Material	PA 12
Color	Pastel turquoise
Tightening torque (at room temperature)	≤ 2 Nm
Permitted ambient conditions	
Ambient temperature	
▪ During operation	-25 ... +75 °C
▪ During transportation and storage	-40 ... +85 °C
Degree of protection	IP65
Shock resistant to EN 60068-2-27	25 g [2]
Vibrations according to EN 60068-2-6	1 g [2]
Design, dimensions and weight	
Dimensions (H x W x D)	185 x 185 x 45 mm
Weight	600 g
Standards, specifications, approvals	
Proof of suitability	CE (according to RED), FCC (Title 47, Part 15.247), cULus
MTBF	16880 years

[1] The values differ for different dimensions/materials of the mounting surface.

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

6.5.8 Dimension drawing

Figure 6-39 Dimensional drawing of RF642A

All dimensions in mm

6.5.9 Approvals & certificates

Table 6- 26 6GT2812-1GA08

Labeling	Description
	Conformity with the RED directive 2014/53/EU Conformity with the RoHS directive 2011/65/EU

Table 6- 27 6GT2812-1GA08

Labeling	Description
Federal Communications Commission	FCC CFR 47, Part 15 sections 15.247 Radio Frequency Interference Statement This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. The FCC approval is granted in association with the FCC approval of the following RF600 readers: ▪ FCC ID: NXW-RF600R2 (for RF650R: 6GT2811-6AB20-1AA0, RF680R: 6GT2811-6AA10-1AA0, RF685R: 6GT2811-6CA10-1AA0)
Industry Canada Radio Standards Specifications	RSS-210 Issue 7, June 2007, Sections 2.2, A8 The approval for Industry Canada is granted in association with the Industry Canada approval of the following RF600 readers: ▪ IC: 267X-RF600R2, Model RF650R (for 6GT2811-6AB20-1AA0) ▪ IC: 267X-RF600R2, Model RF680R (for 6GT2811-6AA10-1AA0) ▪ IC: 267X-RF600R2, Model RF685R (for 6GT2811-6CA10-1AA0)
	This product is UL-certified for the USA and Canada. It meets the following safety standard(s): ▪ UL 60950-1 - Information Technology Equipment Safety - Part 1: General Requirements ▪ CSA C22.2 No. 60950 -1 - Safety of Information Technology Equipment ▪ UL Report E 205089

6.6 SIMATIC RF650A

6.6.1 Characteristics

SIMATIC RF650A	Characteristics	
	Area of application	The SIMATIC RF650A is a universal UHF antenna in a medium size with medium range for industrial applications in production and logistics
	Frequency range	865 to 928 MHz
	Read range	Max. 6 m
	Polarization	Circular
	Degree of protection	IP65
	Mounting	4 x M4 (VESA 100 fixing system)
	Connector	The antenna is connected directly to the housing with an RP-TNC coupling ①.

Frequency ranges

The antenna is a broadband antenna and covers the frequency ranges from 865 to 928 MHz.

Function

The SIMATIC RF650A is used for transmitting and receiving data in the UHF range. The antennas are connected to the SIMATIC RF600 readers via antenna cables that are available in different lengths.

6.6.2 Ordering data

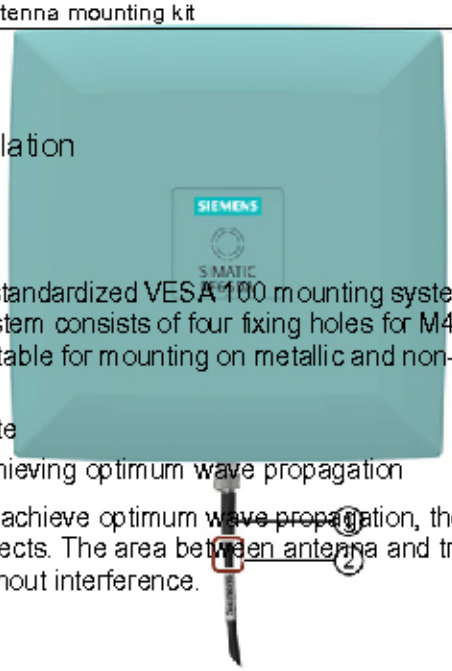
Table 6- 28 Ordering data RF650A

Product	Article number
SIMATIC RF650A	6GT2812-0GB08

Table 6- 29 Ordering data accessories

Product		Article number
Connecting cable between reader and antenna	1 m (cable loss 0.5 dB)	6GT2815-0BH10
	3 m (cable loss 1.0 dB)	6GT2815-0BH30
	5 m, suitable for drag chains (cable loss 1.5 dB)	6GT2815-2BH50
	10 m (cable loss 2.0 dB)	6GT2815-1BN10
	10 m (cable loss 4.0 dB)	6GT2815-0BN10
	15 m, suitable for drag chains (cable loss 4.0 dB)	6GT2815-2BN15
	20 m (cable loss 4.0 dB)	6GT2815-0BN20
	40 m (cable loss 5.0 dB)	6GT2815-0BN40
SIMATIC antenna holder for RF600 devices		6GT2890-2AB10
Antenna mounting kit		6GT2890-0AA00

6.6.3 Installation



Mounting system

A standardized VESA 100 mounting system is provided to mount the antenna. The mounting system consists of four fixing holes for M4 screws at intervals of 100 mm. The antenna is suitable for mounting on metallic and non-metallic surfaces.

Note

Achieving optimum wave propagation

To achieve optimum wave propagation, the antenna should not be surrounded by conducting objects. The area between antenna and transponder should also allow wave propagation without interference.

Antenna holders

The Siemens antenna holders allow for fine adjustment of the antenna field by setting the solid angle.

6.6.4 Connecting the antenna

The SIMATIC RF650A antenna must be connected to the reader using an antenna cable.

Preassembled standard cables in lengths of 1 m, 3 m, 5 m, 10 m, 15 m, 20 m and 40 m are available to connect the antenna.

The range of the antenna is limited by the cable loss. The maximum range can be achieved with the cable 6GT2815-0BH10 (length 1 m), since this cable has the lowest cable loss.

Requirement

Note

Use of Siemens antenna cables

To ensure optimum functioning of the antenna, it is recommended that a Siemens antenna cable be used in accordance with the list of accessories.

Strain relief

To protect the antenna from strain, you can attach strain relief, e.g. in the form of a strain relief clamp. The following graphic shows the optimum mounting point for attaching strain relief.

① RF600 antenna cable
② Mounting point for strain relief

Figure 6-40 RF 650A strain relief

6.6.4.1 Bending radii and bending cycles of the cable

The following listed bending radii are minimum values, which may not be fallen below and are based on repeated bending.

Table 6- 30 Bending radii of the antenna cable

Cable designation	Article number	Length [m]	Cable loss [dB]	Bending radius [mm]
Antenna cable	6GT2815-0BH10	1	0.5	51
Antenna cable	6GT2815-0BH30	3	1	51
Antenna cable (suitable for drag chains)	6GT2815-2BH50	5	1.5	45 [1) 2)]
Antenna cable	6GT2815-1BN10	10	2	77
Antenna cable	6GT2815-0BN10	10	4	51
Antenna cable (suitable for drag chains)	6GT2815-2BN15	15	4	45 [1) 2)]
Antenna cable	6GT2815-0BN20	20	4	77
Antenna cable	6GT2815-0BN40	40	5	77

1) Permissible minimum bending radius with one-time bending. 28 mm

2) With cables capable of being used in drag chains, 100,000 bending cycles at a bending radius of 100 mm and a bend of ± 180° or 3 million torsion cycles with a bend of ± 180° on a cable length of 1 m are permitted.

6.6.5 Antenna parameter assignment

Depending on the country or region in which the antenna is being operated, it is subject to regional limitations with respect to the radiated power.

Limitations in the EU, EFTA, or Turkey

Note

Limitation of the radiated power according to EN 302 208 V1.4.1 (ETSI)

RF600 systems that are put into operation in the EU, EFTA or Turkey must not exceed the following radiated power with an RF650A antenna:

- 2000 mW ERP (or 33 dBm ERP)
  Converted into EIRP: 3250 mW EIRP (or 35 dBm EIRP)

Make the following settings to ensure that the maximum permitted radiated power of the antenna is not exceeded:

- Antenna gain: 4 dBi (7 dBic)
- Radiated power: ≤ 1300 mW ERP (or 31.15 dBm ERP)
  Converted into EIRP: ≤ 2140 mW EIRP (or 33.3 dBm EIRP)
- Use of cable loss associated with the antenna cable.

Limitations in the USA and Canada

Note

Limitation of the radiated power (FCC)

RF600 systems that are put into operation in the USA and Canada must not exceed the following radiated power with an RF650A antenna:

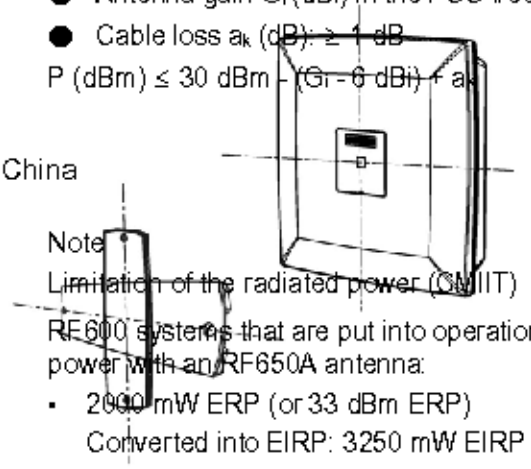
- 4000 mW EIRP (or 36 dBm EIRP)

Make the following settings to ensure that the maximum permitted radiated power of the antenna is not exceeded:

- Conducted power P (dBm) of the RF600 reader: < 30 dBm
- Antenna gain G_i (dBi) in the FCC frequency band: ≤ 3.5 dBi
- Cable loss a_k (dB): ≥ 1 dB

P (dBm) ≤ 30 dBm - (Gi - 6 dBi) + a_k

Limitations in China



Note

Limitation of the radiated power (SMIIT)

RF600 systems that are put into operation in China must not exceed the following radiated power with an RF650A antenna:

- 2000 mW ERP (or 33 dBm ERP)
  Converted into EIRP: 3250 mW EIRP (or 35 dBm EIRP)

Make the following settings to ensure that the maximum permitted radiated power of the antenna is not exceeded:

- Antenna gain: 3.5 dBi (6.5 dBic)
- Radiated power: ≤ 2000 mW ERP (or 33 dBm ERP)
  Converted into EIRP: ≤ 3250 mW EIRP (or 35 dBm EIRP)
- Use of cable loss associated with the antenna cable.

Limitations in Japan

Note

Limitation of the radiated power (ARIB)

RF600 systems that are put into operation in Japan must not exceed the following radiated power with an RF650A antenna:

- 500 mW EIRP (or 27 dBm EIRP) for operation with RF650R (ARIB STD-T107)
- 4000 mW EIRP (or 36 dBm EIRP) for operation with RF680R/RF685R (ARIB STD-T106)

6.6.6 Antenna patterns

Transponder alignment

The RF650A antenna has a circular antenna. With a circular antenna the alignment of the antenna axis of symmetry changes between horizontal and vertical each time it transmits. For this reason the alignment of the transponder polarization axis (horizontal/vertical) is unimportant. Make sure, however, that the transponder is aligned with the antenna.

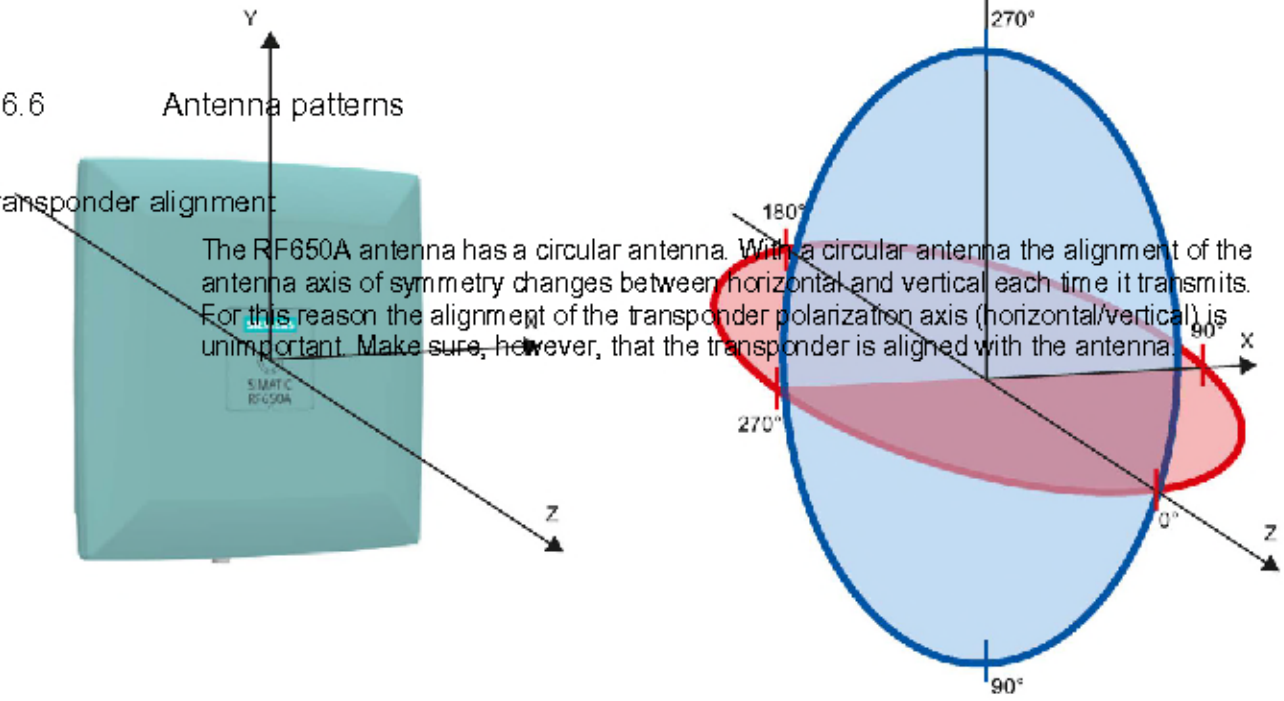


Figure 6-41 Alignment of the transponder polarization axis with a circular antenna axis of symmetry

6.6.6.1 Antenna patterns in the ETSI frequency band

Directional radiation pattern ETSI

The directional radiation pattern is shown for nominal alignment and a center frequency of 866.3 MHz. The nominal antenna alignment is given when the antenna elevation is provided as shown in the following figure.

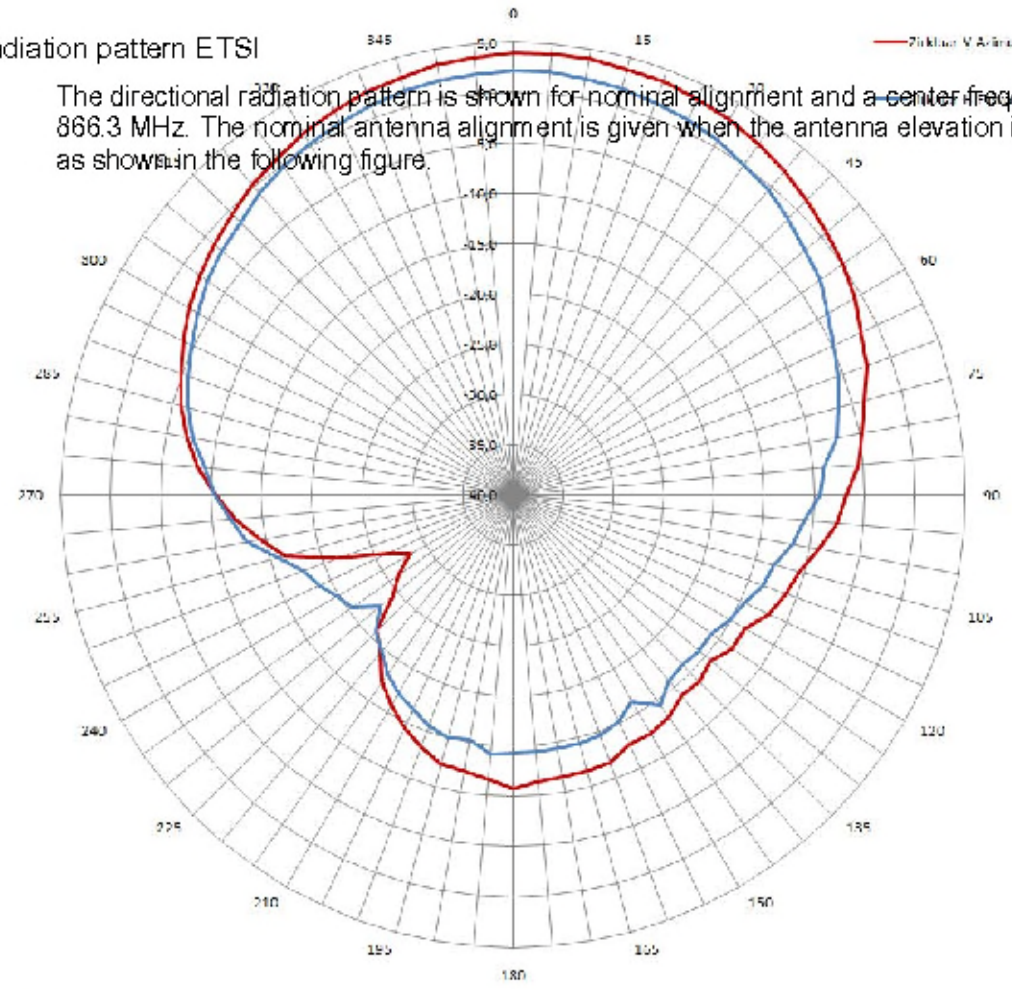
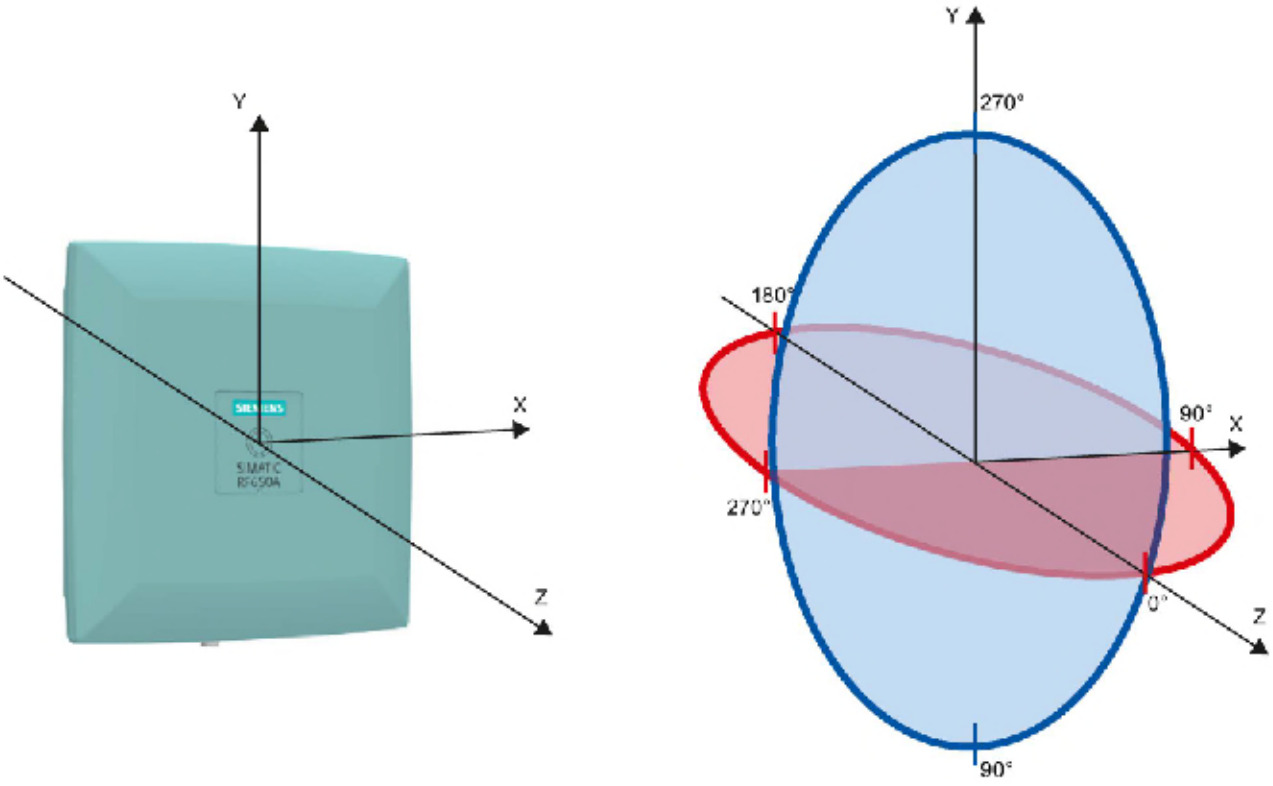


Figure 6-42 Reference system

The half-power beam width of the antenna is defined by the angle between the two -3 dB points. The range (in %) corresponding to the dB values in the patterns can be obtained from this table (Page 321).

Note that the measurements presented graphically below were carried out in a low-reflection environment. Deviations can therefore occur in a normally reflecting environment.

Radiation diagram (circular) in the ETSI frequency band



Pattern of the vertical plane of the antenna

Pattern of the horizontal plane of the antenna

Figure 6-43 Directional radiation pattern of RF650A in the ETSI frequency band

6.6.6.2 Antenna patterns in the FCC frequency band

Directional radiation pattern FCC

The directional radiation pattern is shown for nominal alignment and a center frequency of 915 MHz.

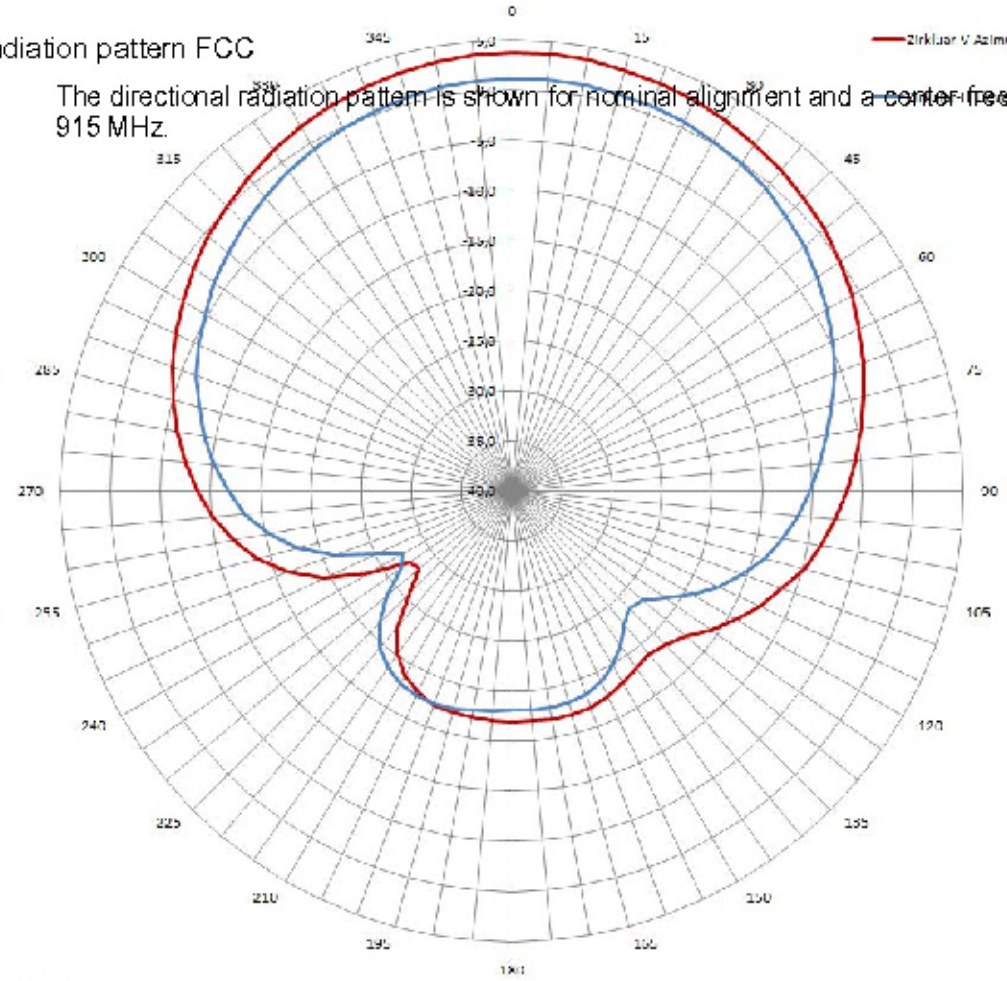


Figure 6-44 Reference system

The half-power beam width of the antenna is defined by the angle between the two -3 dB points (corresponding to half the power in relation to the maximum power). Which range (in %) corresponds to the dB values in the patterns can be obtained from this table (Page 321).

Note that the measurements presented graphically below were carried out in a low-reflection environment. Deviations can therefore occur in a normally reflecting environment.

Radiation diagram (circular) in the FCC frequency band

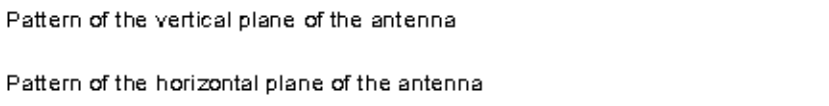


Figure 6-45 Directional radiation pattern of the RF650A in the FCC frequency band

6.6.6.3 Interpretation of directional radiation patterns

The following overview table will help you with the interpretation of directional radiation patterns.

The table shows which dBi values correspond to which read/write ranges (in %). You can read the radiated power depending on the reference angle from the directional radiation patterns, and thus obtain information on the read/write range with this reference angle with regard to a transponder.

The dBr values correspond to the difference between the maximum dBi/dBic value and a second dBi/dBic value.

Table 6- 31 Interpretation of directional radiation patterns

Deviation from maximum antenna gain [dBr]	Read/write range [%]
0	100
-3	70
-6	50
-9	35
-12	25
-15	18
-18	13

Example

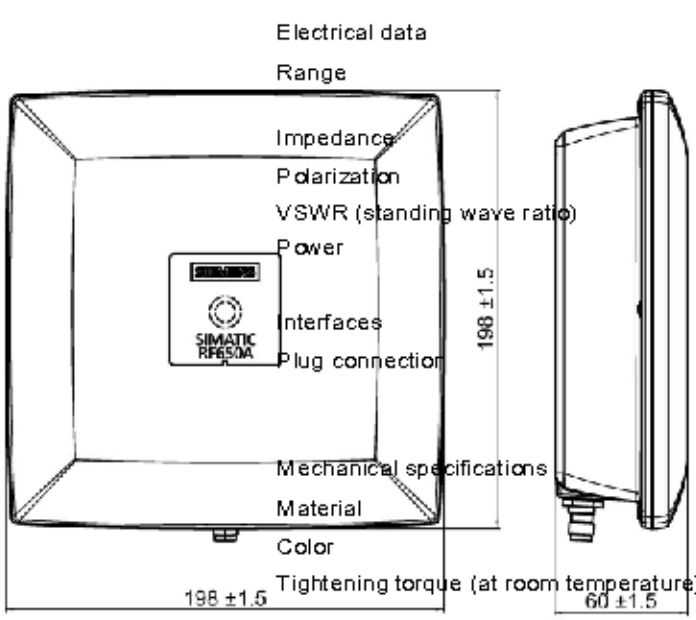
As can be seen in "Antenna patterns in the ETSI frequency band (Page 317)" the maximum antenna gain in the vertical plane is 3.45 dBi (6.45 dBic). In this plane, and with the polarization axis of the transponder parallel to the axis of symmetry of the antenna, the antenna gain drops to about 0.5 dBic at +50° or 310°. This means that the dBr value is -6. The antenna range is only +50% of the maximum range at + 50° or 310° from the Z axis within the vertical plane (see values shown in blue in the directional radiation pattern: Characteristic of the vertical plane of the antenna (Page 317)and the associated representation of the reference system (Page 317)).

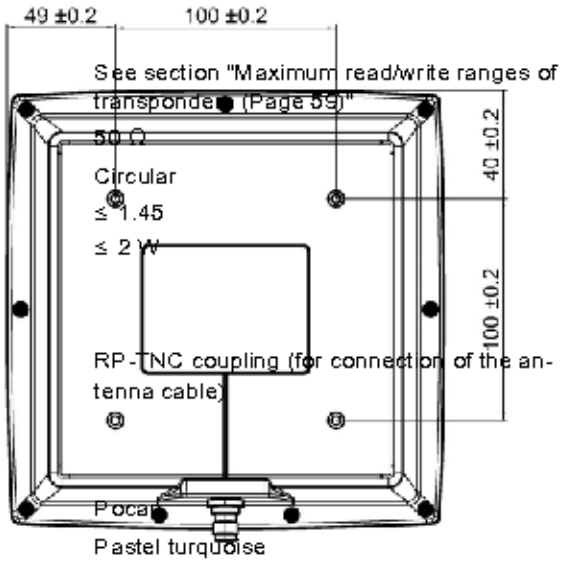
6.6.7 Technical data

Table 6- 32 Technical specifications for the RF650A antenna

	6GT2812-0GB08
Product type designation	SIMATIC RF650A
Radio frequencies	
Operating frequency	865 to 928 MHz
Maximum radiated power	
▪ ETSI	▪ RF650R: ≤ 1365 mW ERP RF680R/RF685R: ≤ 2000 mW ERP
▪ FCC	▪ RF650R: ≤ 2240 mW EIRP RF680R/RF685R: ≤ 4000 mW EIRP
▪ CMIIT	▪ RF650R: ≤ 1365 mW ERP RF680R/RF685R: ≤ 2000 mW ERP
▪ ARIB	▪ STD-T107: RF650R: ≤ 500 mW EIRP ▪ STD-T106: RF680R/RF685R: < 4000 mW EIRP
Antenna gain	
▪ ETSI	▪ 4 dBi (7 dBic)
▪ FCC	▪ 3.5 dBi (6.5 dBic)
Opening angle for sending/receiving when mounted on a metal surface of 15 cm x 15 cm [1]	
▪ ETSI	▪ Horizontal plane: 83° Vertical plane: 70° see section "Antenna patterns in the ETSI frequency band (Page 317)"
▪ FCC	▪ Horizontal plane: 90° Vertical plane: 76° see section "Antenna patterns in the FCC frequency band (Page 319)"
Front-to-back ratio	
▪ ETSI	▪ 15 dB ± 2 dB (depends on orientation of the transponder)
▪ FCC	▪ 17.5 dB ± 2.5 dB (depends on orientation of the transponder)

6GT2812-0GB08





Electrical data	
Range	See section "Maximum read/write ranges of transponders (Page 59)"
Impedance	50 Ω
Polarization	Circular
VSWR (standing wave ratio)	≤ 1.45
Power	≤ 2 W
Interfaces	
Plug connection	RP-TNC coupling (for connection of the antenna cable)
Mechanical specifications	
Material	Poca
Color	Pastel turquoise
Tightening torque (at room temperature)	≤ 2 Nm

Permitted ambient conditions	
Ambient temperature	
▪ During operation	▪ -25 ... +75 °C
▪ During transportation and storage	▪ -40 ... +85 °C
Degree of protection	IP65
Shock resistant to EN 60068-2-27	30 g [2]
Vibrations according to EN 60068-2-6	10 g [2]
Design, dimensions and weight	
Dimensions (H x W x D)	198 x 198 x 60 mm
Weight	680 g
Standards, specifications, approvals	
Proof of suitability	CE (according to RED), FCC (Title 47, Part 15.247), cULus
MTBF	946 years

[1] The values differ for different dimensions/materials of the mounting surface.

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

6.6.8 Dimension drawing

Figure 6-46 Dimension drawing RF650A

All dimensions in mm

6.6.9 Approvals & certificates

Table 6- 33 6GT2812-0GB08

Labeling	Description
	Conformity with the RED directive 2014/53/EU Conformity with the RoHS directive 2011/65/EU

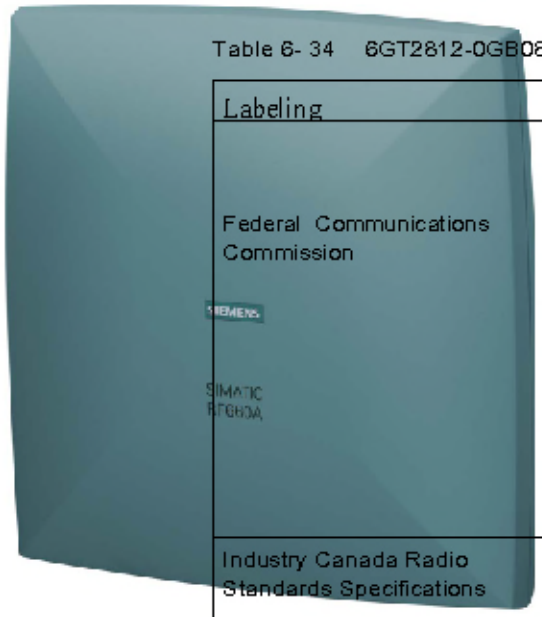


Table 6- 34 6GT2812-0GB08

Labeling	Description
Federal Communications Commission	FCC CFR 47, Part 15 sections 15.247 Radio Frequency Interference Statement This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. The FCC approval is granted in association with the FCC approval of the following RF600 readers: ▪ FCC ID: NXW-RF615R (for RF615R: 6GT2811-6CC10-1AA0) ▪ FCC ID: NXW-RF600R2 (for RF650R: 6GT2811-6AB20-1AA0, RF680R: 6GT2811-6AA10-1AA0, RF685R: 6GT2811-6CA10-1AA0)
Industry Canada Radio Standards Specifications	RSS-247 Issue 2 The approval for Industry Canada is granted in association with the Industry Canada approval of the following RF600 readers: ▪ IC: 267X-RF615R, Model RF615R (for 6GT2811-6CC10-1AA0) RSS-210 Issue 7, June 2007, Sections 2.2, A8 The approval for Industry Canada is granted in association with the Industry Canada approval of the following RF600 readers: ▪ IC: 267X-RF600R2, Model RF650R (for 6GT2811-6AB20-1AA0) ▪ IC: 267X-RF600R2, Model RF680R (for 6GT2811-6AA10-1AA0) ▪ IC: 267X-RF600R2, Model RF685R (for 6GT2811-6CA10-1AA0)
	This product is UL-certified for the USA and Canada. It meets the following safety standard(s): ▪ UL 60950-1 - Information Technology Equipment Safety - Part 1: General Requirements ▪ CSA C22.2 No. 60950 -1 - Safety of Information Technology Equipment ▪ UL Report E 115352

6.7 SIMATIC RF660A

6.7.1 Characteristics

SIMATIC RF660A	Characteristics	
	Area of application	The SIMATIC RF660A is a universal UHF antenna with high range for industrial applications in production and logistics.
	Frequency ranges	▪ 865 to 868 MHz (RF660A FCC) ▪ 902 to 928 MHz (RF660A FCC)
	Read range	Max. 8 m
	Polarization	Circular
	Degree of protection	IP67
	Mounting	4 x M4 (VESA 100 fixing system)
	Connector	The antenna is connected directly to the housing with an RP-TNC coupling.

Frequency ranges

The antenna is a narrowband antenna and is available in the following two frequency range variants.

- RF660A ETSI: 865 to 868 MHz
- RF660A FCC: 902 to 928 MHz

Function

The SIMATIC RF660A is used for transmitting and receiving data in the UHF range. The antennas are connected to the SIMATIC RF600 readers via antenna cables that are available in different lengths.

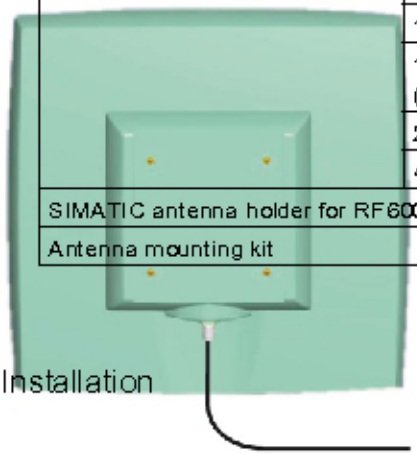
6.7.2 Ordering data

Table 6- 35 Ordering data RF660A

Product	Article number
SIMATIC RF660A (ETSI)	6GT2812-0AA00
SIMATIC RF660A (FCC)	6GT2812-0AA01

Table 6- 36 Ordering data accessories

Product		Article number
Connecting cable between reader and antenna	1 m (cable loss 0.5 dB)	6GT2815-0BH10
	3 m (cable loss 1.0 dB)	6GT2815-0BH30
	5 m, suitable for drag chains (cable loss 1.5 dB)	6GT2815-2BH50
	10 m (cable loss 2.0 dB)	6GT2815-1BN10
	10 m (cable loss 4.0 dB)	6GT2815-0BN10
	15 m, suitable for drag chains (cable loss 4.0 dB)	6GT2815-2BN15
	20 m (cable loss 4.0 dB)	6GT2815-0BN20
	40 m (cable loss 5.0 dB)	6GT2815-0BN40
SIMATIC antenna holder for RF600 devices		6GT2890-2AB10
Antenna mounting kit		6GT2890-0AA00



6.7.3 Installation

Mounting system

A standardized VESA 100 mounting system is provided to mount the antenna. The mounting system consists of four fixing holes for M4 screws at intervals of 100 mm. The antenna is suitable for mounting on metallic and non-metallic surfaces.

Note

Achieving optimum wave propagation

To achieve optimum wave propagation, the antenna should not be surrounded by conducting objects. The area between antenna and transponder should also allow wave propagation without interference.

Antenna holders

The Siemens antenna holders allow for fine adjustment of the antenna field by setting the solid angle.

6.7.4 Connecting the antenna

The SIMATIC RF660A antenna must be connected to the reader using an antenna cable.

Preassembled standard cables in lengths of 1 m, 3 m, 5 m, 10 m, 15 m, 20 m and 40 m are available to connect the antenna.

The range of the antenna is limited by the cable loss. The maximum range can be achieved with the cable 6GT2815-0BH10 (length 1m), since this cable has the lowest cable loss.

Requirement

Note

Use of Siemens antenna cable

To ensure optimum functioning of the antenna, it is recommended that a Siemens antenna cable is used in accordance with the list of accessories.

Figure 6-47 Rear of antenna with RTNC connection

6.7.4.1 Bending radii and bending cycles of the cable

The following listed bending radii are minimum values, which may not be fallen below and are based on repeated bending.

Table 6- 37 Bending radii of the antenna cable

Cable designation	Article number	Length [m]	Cable loss [dB]	Bending radius [mm]
Antenna cable	6GT2815-0BH10	1	0.5	51
Antenna cable	6GT2815-0BH30	3	1	51
Antenna cable (suitable for drag chains)	6GT2815-2BH50	5	1.5	45 [1)2)]
Antenna cable	6GT2815-1BN10	10	2	77

Cable designation	Article number	Length [m]	Cable loss [dB]	Bending radius [mm]
Antenna cable	6GT2815-0BN10	10	4	51
Antenna cable (suitable for drag chains)	6GT2815-2BN15	15	4	45 [1) 2)]
Antenna cable	6GT2815-0BN20	20	4	77
Antenna cable	6GT2815-0BN40	40	5	77

1) Permissible minimum bending radius with one-time bending. 28 mm

2) With cables capable of being used in drag chains, 100,000 bending cycles at a bending radius of 100 mm and a bend of ± 180° or 3 million torsion cycles with a bend of ± 180° on a cable length of 1 m are permitted.

6.7.5 Antenna parameter assignment

Depending on the country or region in which the antenna is being operated, it is subject to regional limitations with respect to the radiated power.

Limitations in the EU, EFTA, or Turkey

Note

Limitation of the radiated power according to EN 302 208 V1.4.1 (ETSI)

RF600 systems that are put into operation in the EU, EFTA or Turkey must not exceed the following radiated power with an RF660A antenna:

- 2000 mW ERP (or 33 dBm ERP)
  Converted into EIRP: 3250 mW EIRP (or 35 dBm EIRP)

Make the following settings to ensure that the maximum permitted radiated power of the antenna is not exceeded:

- Antenna gain: 7 dBi (10 dBic)
- Radiated power: ≤ 2000 mW ERP (or 33 dBm ERP)
  Converted into EIRP: ≤ 3250 mW EIRP (or 35 dBm EIRP)
- Use of cable loss associated with the antenna cable.

Limitations in the USA and Canada

Note

Limitation of the radiated power (FCC)

RF600 systems that are put into operation in the USA and Canada must not exceed the following radiated power with an RF660A antenna:

- 4000 mW EIRP (or 36 dBm EIRP)

Make the following settings to ensure that the maximum permitted radiated power of the antenna is not exceeded:

- Conducted power P (dBm) of the RF600 reader: < 30 dBm
- Antenna gain G_i (dBi) in the FCC frequency band: ≤ 6 dBi
- Cable loss a_k (dB): ≥ 1 dB

$P\ (dBm) \leq 30\ dBm - (G_i - 6\ dBi) + a_k$

Limitations in China

Note

Limitation of the radiated power (CMIIT)

RF600 systems that are put into operation in China must not exceed the following radiated power with an RF660A antenna:

- 2000 mW ERP (or 33 dBm ERP)
  Converted into EIRP: 3250 mW EIRP (or 35 dBm EIRP)

Make the following settings to ensure that the maximum permitted radiated power of the antenna is not exceeded:

- Antenna gain: 6 dBi (9 dBic)
- Radiated power: ≤ 2000 mW ERP (or 33 dBm ERP)
  Converted into EIRP: ≤ 3250 mW EIRP (or 35 dBm EIRP)
- Use of cable loss associated with the antenna cable.

Limitations in Japan

Note

Limitation of the radiated power (ARIB STD-T106)

RF600 systems that are put into operation in Japan must not exceed the following radiated power with an RF660A antenna:

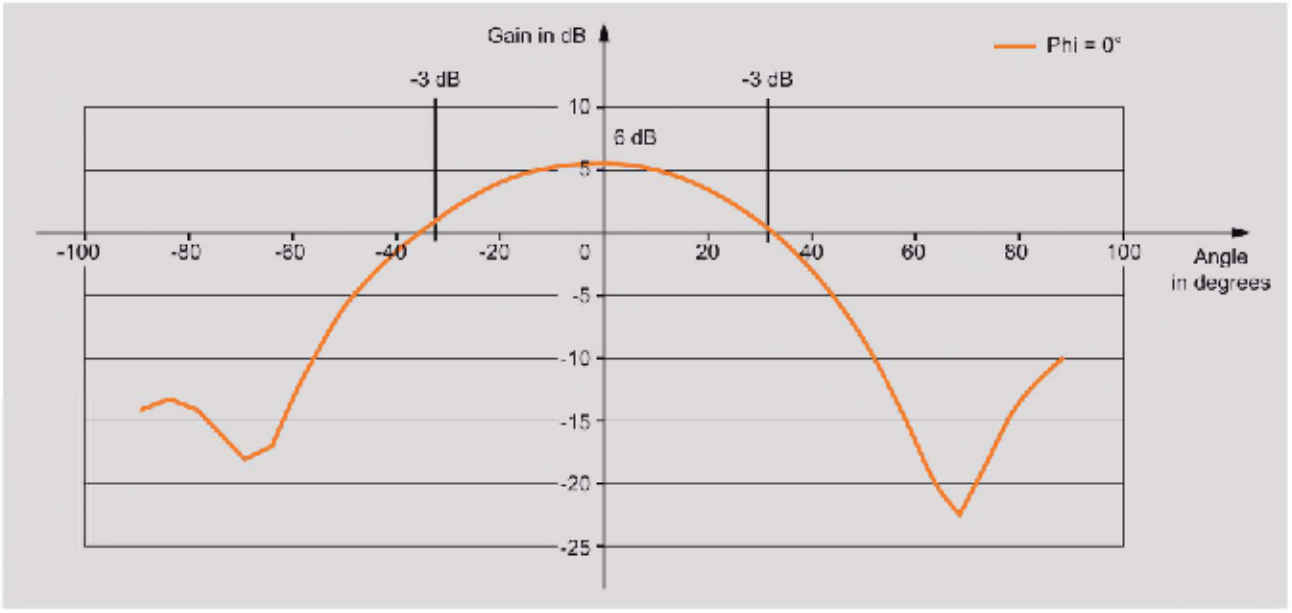
- 500 mW EIRP (or 27 dBm EIRP) for operation with RF650R (ARIB STD-T107)
- 4000 mW EIRP (or 36 dBm EIRP) for operation with RF680R/RF685R (ARIB STD-T106)

6.7.6 Antenna patterns

Spatial directional radiation pattern

The following schematic diagram shows the main and auxiliary fields of the RF660A antenna in free space in the absence of reflecting/absorbing materials. Please note that the diagram is not to scale.

The recommended working range lies within the main field that is shown in green.



Main field (processing field)

Secondary fields

Figure 6-48 Main and auxiliary fields of the RF660A antenna

Radiation diagram (horizontal)

Europe (ETSI)

The radiation diagram is shown for horizontal alignment and for a center frequency of 865 MHz. Horizontal antenna alignment is provided when the TNC connection on the antenna points vertically up or down.

The radiating/receiving angle of the antenna is defined by the angle between the two -3 dB points (corresponding to half the power referred to the maximum performance at a 0° angle).

The optimum radiating/receiving angle is therefore approximately ±30 degrees.

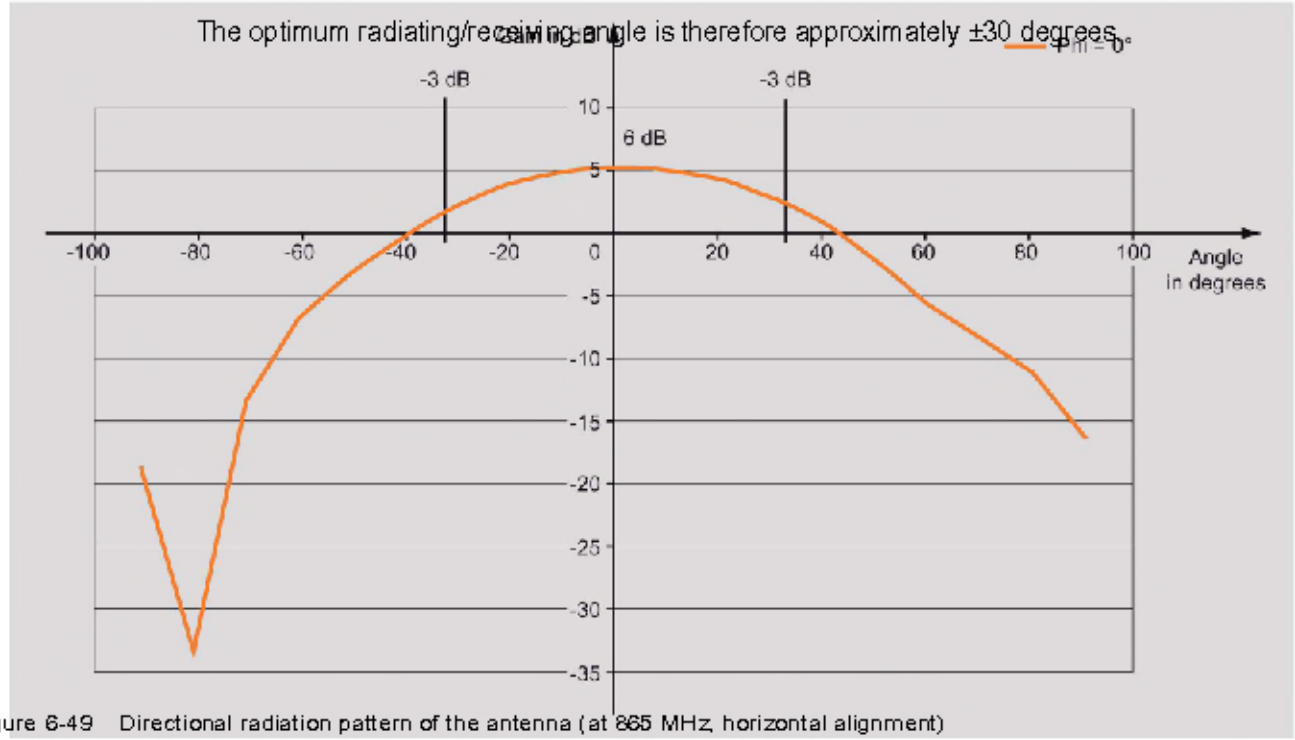


Figure 6-49 Directional radiation pattern of the antenna (at 865 MHz, horizontal alignment)

USA (FCC)

The radiation diagram is shown for horizontal alignment and for a center frequency of 915 MHz.

The radiating/receiving angle of the antenna is defined by the angle between the two -3 dB points (corresponding to half the power referred to the maximum performance at a 0° angle).

The optimum radiating/receiving angle is therefore approximately ±35 degrees.

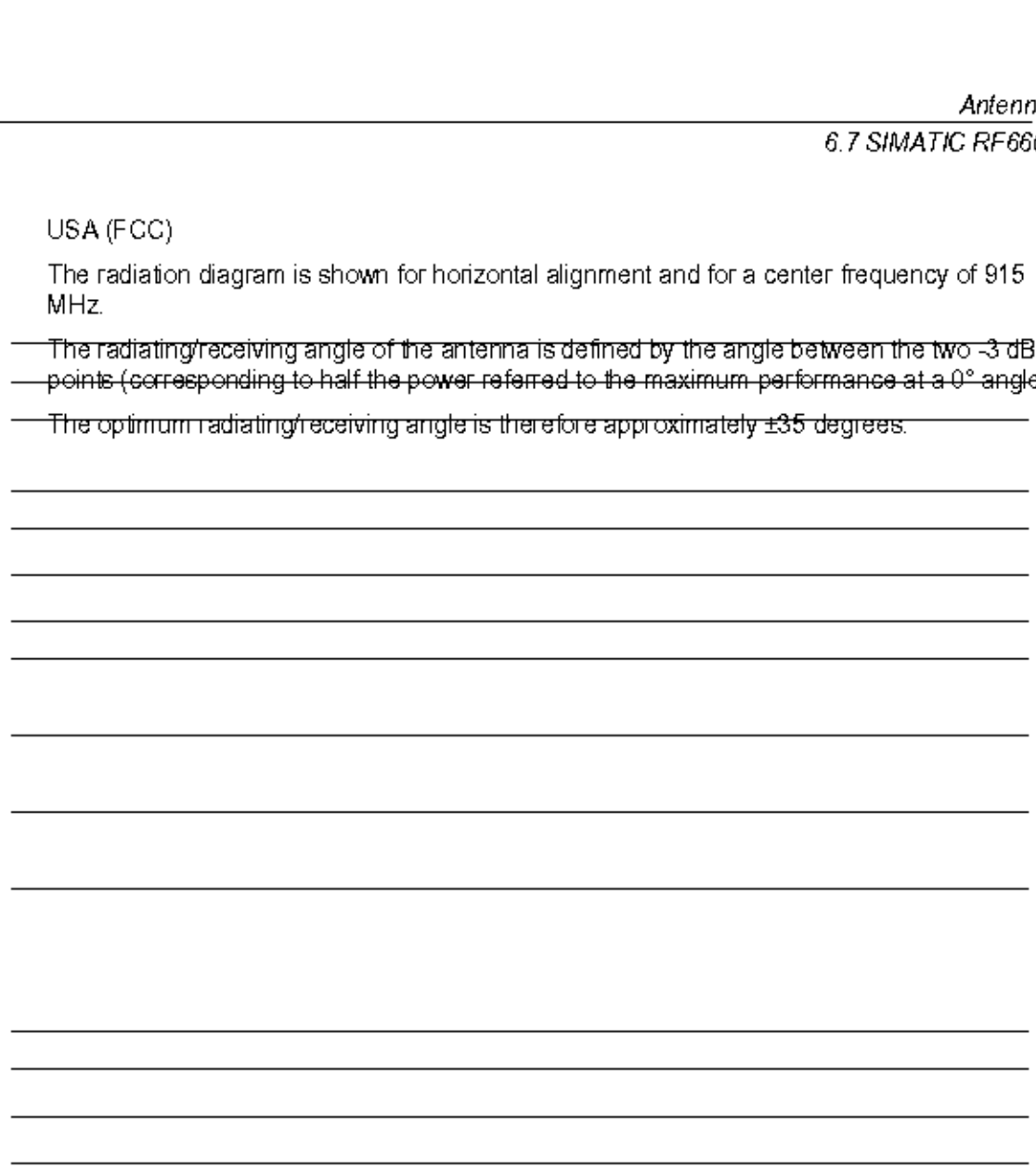


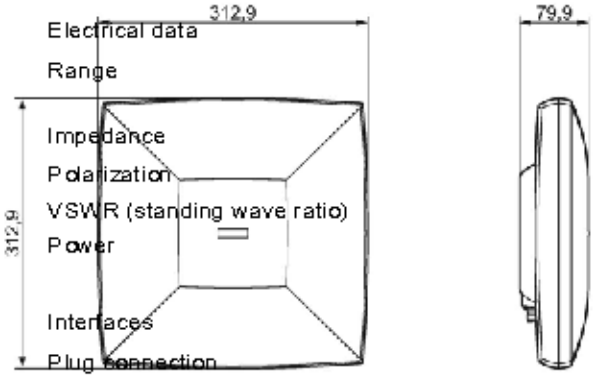
Figure 6-50 Directional radiation pattern of the antenna (at 915 MHz, horizontal alignment)

6.7.7 Technical data

Table 6- 38 Technical specifications for the RF660A antenna

	6GT2812-0AA0x
Product type designation	SIMATIC RF660A
Radio frequencies	
Operating frequency	
• ETSI	• 865 to 868 MHz
• FCC	• 902 to 928 MHz
Maximum radiated power	
• ETSI	• RF650R: ≤ 2000 mW ERP RF680R/RF685R: ≤ 2000 mW ERP
• FCC	• RF650R: ≤ 4000 mW EIRP RF680R/RF685R: ≤ 4000 mW EIRP
• CMIIT	• RF650R: ≤ 2000 mW ERP RF680R/RF685R: ≤ 2000 mW ERP
• ARIB	• STD-T107: RF650R: ≤ 500 mW EIRP
	• STD-T106: RF680R/RF685R: < 4000 mW EIRP
Antenna gain	
• ETSI	• 5 ... 7 dBi (8 ... 10 dBic)
• FCC	• 6 dBi (9 dBic)
Opening angle for sending/receiving when mounted on a metal surface of 15 cm x 15 cm [1]	
• ETSI	• Horizontal plane: 55° Vertical plane: 80° see section "Antenna patterns (Page 331)"
• FCC	• Horizontal plane: 60° Vertical plane: 75° see section "Antenna patterns (Page 331)"
Front-to-back ratio	
• ETSI	• 10 dB ± 2 dB
• FCC	• 15 dB ± 2 dB

6GT2812-0AA0x



Electrical data	
Range	See section "Maximum read/write ranges of transponders (Page 59)"
Impedance	50 Ω
Polarization	Circular
VSWR (standing wave ratio)	≤ 2
Power	≤ 2 W
Interfaces	
Plug connection	RP-TNC coupling (for connection of the antenna cable)

Mechanical specifications	
Material	PA 12
Color	Pastel turquoise
Tightening torque (at room temperature)	≤ 2 Nm
Permitted ambient conditions	
Ambient temperature	
▪ During operation	▪ -25 ... +75 °C
▪ During transportation and storage	▪ -40 ... +85 °C
Degree of protection	IP67
Shock resistant to EN 60068-2-27	25.5 g [2]
Vibrations according to EN 60068-2-6	1 g [2]
Design, dimensions and weight	
Dimensions (H x W x D)	313 x 313 x 80 mm
Weight	1.6 kg
Standards, specifications, approvals	
Proof of suitability	CE (ETSI EN 302208), FCC (Title 47, Part 15.247), cULus
MTBF	228310 years

[1] The values differ for different dimensions/materials of the mounting surface.

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

6.7.8 Dimension drawing

Figure 6-51 Dimension drawing RF660A

All dimensions in mm (± 0.5 mm tolerance)

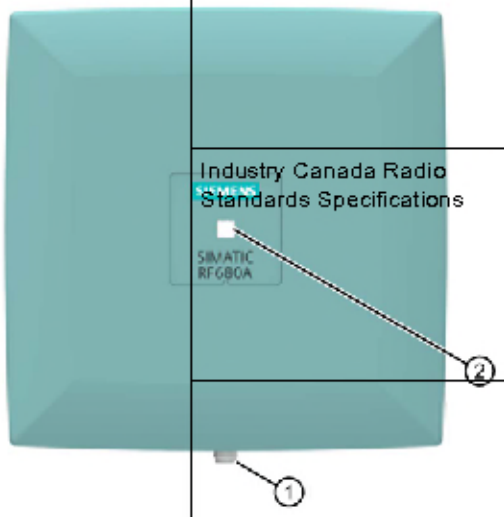
6.7.9 Approvals & certificates

Table 6- 39 6GT2812-0AA00

Labeling	Description
	Conformity with the RED directive 2014/53/EU Conformity with the RoHS directive 2011/65/EU

Table 6- 40 6GT2812-0AA01

Labeling	Description
Federal Communications Commission	FCC CFR 47, Part 15 sections 15.247 Radio Frequency Interference Statement This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. The FCC approval is granted in association with the FCC approval of the following RF600 readers: • FCC ID: NXW-RF600R2 (for RF650R: 6GT2811-6AB20-1AA0, RF680R: 6GT2811-6AA10-1AA0, RF685R: 6GT2811-6CA10-1AA0)
Industry Canada Radio Standards Specifications	RSS-210 Issue 7, June 2007, Sections 2.2, A8 The approval for Industry Canada is granted in association with the Industry Canada approval of the following RF600 readers: • IC: 267X-RF600R2, Model RF650R (for 6GT2811-6AB20-1AA0) • IC: 267X-RF600R2, Model RF680R (for 6GT2811-6AA10-1AA0) • IC: 267X-RF600R2, Model RF685R (for 6GT2811-6CA10-1AA0)
	This product is UL-certified for the USA and Canada. It meets the following safety standard(s): • UL 60950-1 - Information Technology Equipment Safety - Part 1: General Requirements • CSA C22.2 No. 60950 -1 - Safety of Information Technology Equipment • UL Report E 205089



6.8 SIMATIC RF680A

NOTICE
Note on release The use of the adaptive antenna SIMATIC RF680A with the readers RF650R, RF680R and RF685R as of version V2.2.0 (supplied as of 03/2016) is possible. You will find the version on the type plate of the device.

6.8.1 Characteristics

SIMATIC RF680A	Characteristics	
	Area of application	The SIMATIC RF680A is an adaptive UHF antenna in a medium size with high range for industrial applications in production and logistics.
	Frequency range	865 to 928 MHz
	Read range	Max. 8 m
	Polarization	Selectable (circular, linear horizontal, linear vertical)
	Degree of protection	IP65
	Mounting	4 x M4 (VESA 100 fixing system)
	Connector	The antenna is connected directly to the housing with an RP-TNC coupling ①.
	Status display	1 LED ②

Frequency ranges

The antenna is a broadband antenna and covers the frequency ranges from 865 to 928 MHz.

Function

The SIMATIC RF680A is used for transmitting and receiving data in the UHF range. The antennas are connected to the SIMATIC RF600 readers via antenna cables that are available in different lengths.

LED status display

The operating statuses of the antenna are displayed by an LED status display. The LED can adopt the colors green, red or yellow and the statuses off , on , flashing :

Table 6- 41 Display of operating statuses of the antenna

LED	Meaning
	LED static for 1 second when the reader starts up: The device is ready for operation and the connection to the reader is established; operational staus.
	The device is ready for operation but currently inactive.
	The device is active but there is no transponder in the antenna field.
	The device is active and there is at least one transponder in the antenna field.
	Identification of the antenna by the reader function "buzz test".
	There is an error or antenna firmware update is being made.

Indication of the quality of the antenna alignment (RSSI)

When aligning the antenna using the WBM, the three-color LED status display indicates the RSSI value with which the transponder was detected:

- Red: Low RSSI value
- Yellow: Medium RSSI value
- Green: High RSSI value