

INSITE GSM1900 BTS

ANTENNA

REQUIREMENT SPECIFICATION

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GLOSSARY

BW	Bandwidth
dB	Decibel
dBi	A ratio of decibels to an isotropic antenna
RX	Receiver
TX	Transmitter

1. INTRODUCTION

This document describes the electrical and general requirements for InSite GSM1900 Antenna.

This document is intended as a design requirement for manufacturers and Nokia RAS R&D department.

2. ELECTRICAL SPECIFICATION

The electrical specification is presented in the Table 2.1.

Table 2.1. Electrical specification

Item	Rx	Tx
Frequency of operation	1850...1910 MHz	1930 ... 1990 MHz
Return loss at BW		
Free space values (*)	- 14.0dB	- 14.0 dB
3 dB beamwidth	60°/80° H/E	
6 dB beamwidth	90°/160° H/E	
Gain (*)	+ 4.0 dBi	+ 4.0 dBi
Terminating impedance	50 ohms	
Permissible input power	2.0 W for 10 min.period	
Operating temperature range	+ 5 ... + 40 °C	
Transport temperature range	-25 ... + 70 °C	
Storage temperature range	- 5 ... + 45 °C	

(*) must be measured in the actual chasses

3. MECHANICAL SPECIFICATION

3.1. Mechanical outline

The maximum dimension for antenna are 170*52*30 mm.

3.2. Connection interface

Connection interface for antenna is SMA RF-connector (male).

4. ENVIRONMENTAL SPECIFICATION

4.1. Temperature change

The temperature change test conditions are according the Table 4.1.

(Exceeds ETS 300 019-2-3 class 3.3 test requirements)

Table 4.1. Temperature change test conditions

Item	Specification
Lower temperature	- 25 °C
Upper temperature	+ 70 °C
Rate of temperature change	1.0 ± 0.1 °C/min
Duration	2 h
Test time per cycle	8 h
Number of cycles	5

After this test, the antenna shall satisfy the electrical demands, according to paragraph 2 and the mechanical demands according to paragraph 3.
Functionality of the antenna shall be same than before the test.

4.2. Damp heat

The damp heat test conditions are according the Table 4.2.

(Exceeds ETS 300 019-2-3 class 3.3 test requirements)

Table 4.2. Damp heat test conditions

Item	Specification
Upper air temperature	$40 \pm 2 \text{ }^{\circ}\text{C}$
Humidity	$93 \pm 3 \%$
Duration	4 day

After this test, the antenna shall satisfy the electrical demands, according to paragraph 2 and the mechanical demands according to paragraph 3.
Functionality of the antenna shall be same than before the test.

4.3. Moist heat

The moist heat test conditions are according the Table 4.3.

(Exceeds ETS 300 019-2-3 class 3.3 test requirements)

Table 4.3. Moist heat test conditions

Item	Specification
Upper air temperature	$25...55 \pm 2 \text{ }^{\circ}\text{C}$
Time sequence	Variant 1
Humadity	90 - 100 %
Duration	12 + 12 h
Number of cycles	4

After this test, the antenna shall satisfy the electrical demands, according to paragraph 2 and the mechanical demands according to paragraph 3.
Functionality of the antenna shall be same than before the test.

4.4. Heat with sunshine

The heat with sunshine test conditions are according the Table 4.4.

(Exceeds ETS 300 019-2-3 class 3.1 test requirements)

Table 4.4. Heat with sunshine test conditions

Item	Specification
Ambient temperature	55 °C
Radiation	1120 W/m ²
Duration	8 h

After this test, functionality of the antenna shall be same than before the test. There shall not be found ageing effects on antenna materials.

4.5. Ageing (dry heat, constant)

The ageing test conditions are according the Table 4.5.

(Exceeds ETS 300 019-2-2 class 2.2 test requirements)

Table 4.5. Ageing test conditions

Item	Specification
Upper air temperature	70 ± 2 °C
Duration	96 h

After this test, functionality of the antenna shall be same than before the test. There shall not be found ageing effects on antenna materials.

4.6. Vibration

The vibration test conditions are according the Table 4.6.

(Exceeds ETS 300 019-2-3 class 3.3 test requirements)

Table 4.6. Vibration test conditions

Item	Specification
Frequency	10 ... 200 Hz 3.5 mm amplitude or 10 m/s ² acceleration
Duration	2 h each axis
Direction	all 3 axis

After this test, the antenna shall satisfy the electrical demands, according to paragraph 2 and the mechanical demands according to paragraph 3.
Functionality of the antenna shall be same than before the test.

4.7. Shock

The shock test conditions are according the Table 4.7.

(Exceeds ETS 300 019-2-3 class 3.3 test requirements)

Table 4.7. Shock test conditions

Item	Specification
Type	Semi-sinusoidal
Acceleration	500 m/s ²
Duration	1 ms
Number	3 shock in each direction
Direction	all 3 axis ($\pm x, y, z$) (total 18 shocks)

After this test, the antenna shall satisfy the electrical demands, according to paragraph 2 and the mechanical demands according to paragraph 3.
Functionality of the antenna shall be same than before the test.

4.8. Free fall

The free fall test conditions are according the Table 4.8.

Table 4.8. Free fall conditions

Item	Specification
Height	0.25 m
Number	2 times

After this test, functionality of the antenna shall be same than before the test .

4.9. Tensile strength of the cable

The tensile strength of the cable test conditions are according the Table 4.9.

Table 3.9. tensile strength of the cable test conditions

Item	Specification
Max. acceleration during the test	0.02 m/s ²
Force	25 N
Duration	1 s
Number	3 shocks
Pulling direction	Directly downwards from the antenna