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No. 1 / 1**77120B**

Date of handing in: 30.01.2007

Tested by:



Kari Kallio, Test Engineer

Reviewed by:



Timo Leismala, Test Manager



SORT OF EQUIPMENT:

Hand Terminal (13.56MHz RFID, BT, WLAN)

MARKETING NAME:

NORDICID PL3000

TYPE:

HTA00039

MANUFACTURER:

Nordic ID

CLIENT:

Nordic ID

ADDRESS:

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TEST LABORATORY:

Nemko Oy

FCC REG. NO.

91087 August 24, 2004

IC FILE NO.

IC 4627-1 October 10, 2006**SUMMARY:**

In regard to the performed tests the equipment under test fulfils the requirements defined in the test specifications, see page 2 for details.

The test results are valid for the tested unit only. Without a written permission of Nemko Oy it is allowed to copy this report as a whole, but not partially.

Summary of performed tests and test results

<i>FCC Part 15, Subpart C</i>	<i>Rss-210, Issue 6</i>	<i>Test</i>	<i>Result</i>
15.225, a	A2.6	Field strength in the 13.553-13.567 MHz band	PASS
15.225, d	A2.6	Field strength of any emissions appearing outside of the 13.110 – 14.010 MHz band	PASS

Explanations:

PASS The EUT passed that particular test.

FAIL The EUT failed that particular test.

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1. EUT and Accessory Information

1.1 EUT description

The EUT is a hand terminal with 13.56 MHz RFID, BT and WLAN modules.

1.2 EUT and accessories

Equipment under test (EUT):

Unit	Type	S/N
Hand terminal	HTA00039	-
Rechargeable battery	BAR00001 Li-Ion 7.4V 2200 mAh	-

Operating voltage of the EUT:

- Hand terminal 7.4 VDC, rechargeable battery

2. Standards and measurement methods

The tests were performed in guidance of the CFR 47 Part 15, Subpart B, Class B, ICES-003, ANSI C63.4 and EN 55022.

3. Test results

3.1 Radiated emissions

3.1.1 0.009 – 30 MHz

The test was performed as a compliance test. The test parameters concerned were as follows:

<i>Site name</i>	Nemko / Perkkaa
<i>Date of testing</i>	30.01.2007
<i>Test equipment</i>	350, 338, 98, 184
<i>Test conditions</i>	23 °C, 30 % RH
<i>Test result</i>	PASS

3.1.2 Test method and limit

The test was performed in a semi-anechoic shielded room. The EUT was placed on a non-conductive 0.8 m high table standing on the turntable (photograph 1). During the test in the frequency range 0.15 - 30 MHz the distance from the EUT to the measuring loop antenna was 3 m. The EUT was measured on three orthogonal axes. In order to find the maximum levels of the disturbance radiation the angle of the turntable was varied during the test. The highest levels of the radiated interference field strength measured by using the quasi-peak detector were recorded.

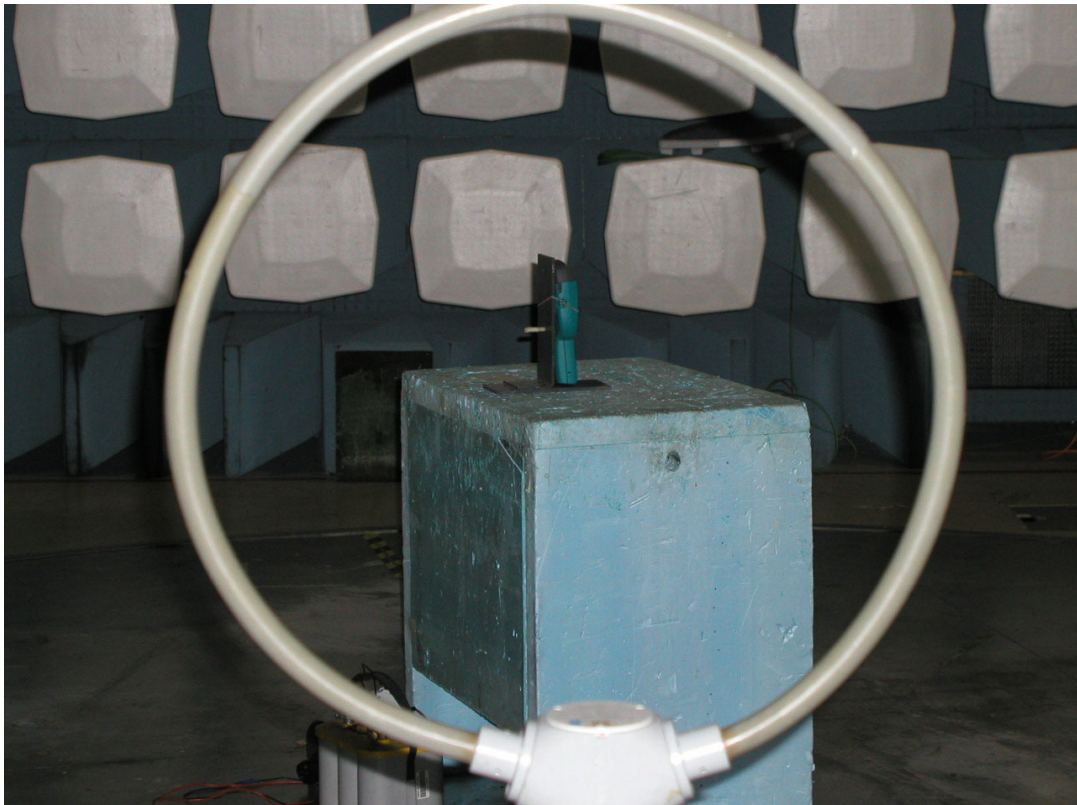
The frequency range 0.15 – 30 MHz was measured by using the peak detector. During the peak detector scan the turntable was rotated from 0° to 360° with 30° steps. The highest levels of the radiated interference field strength measured by using the quasi-peak detector were recorded.

<i>Frequency band MHz</i>	<i>Limit@30m (300m) μV/m</i>	<i>Limit@30m (300m) dBμV/m</i>	<i>Limit@3m dBμV/m</i>
0.009 – 0.490	267 – 4.9 (300m)	48.5 – 13.8 (300m)	88.5 – 53.8
0.490 – 1.705	49.0 – 14.1	33.8 – 23.0	73.8 – 63.0
1.705 – 13.110	30	29.5	69.5
13.110 – 13.410	106	40.5	80.5
13.410 – 13.553	334	50.5	90.5
13.553 – 13.567	15848	84.0	124.0
13.567 – 13.710	334	50.5	90.5
13.710 – 14.010	106	40.5	80.5
14.010 – 30	30	29.5	69.5

3.1.3 EUT operation mode

<i>EUT operation mode</i>	ID transmitter on, WLAN off, BT off
<i>EUT operation voltage</i>	7.4V DC

3.1.4 EUT test setup



Photograph 1. Radiated emissions test setup

3.1.5 Test data

Highest emissions (QP):

<i>Frequency MHz</i>	<i>Measured level@3m dBμV/m</i>	<i>Level@30m dBμV/m</i>	<i>Limit@30m dBμV/m</i>	<i>Margin dB</i>
13.5625	60.8	20.8	84.0	63.2

3.1.6 30 – 1000 MHz

<i>Site name</i>	Nemko / Perkkaa
<i>Date of testing</i>	06.02.2006
<i>Test equipment</i>	350, 338, 566, 564, 544, 319, 525, 184
<i>Test conditions</i>	20 °C. 30 % RH
<i>Test result</i>	PASS

3.1.7 Test method and limit

The test was performed in a semi-anechoic shielded room. The EUT was placed on a non-conductive 0.8 m high table standing on the turntable (photograph 2). During the test in the frequency range 30-1000 MHz the distance from the EUT to the measuring antenna was 3 m. In order to find the maximum levels of the disturbance radiation the angle of the turntable the height of the measuring antenna were varied during the tests. The test was performed with the measuring antenna being both in horizontal and vertical polarizations.

Vertical and horizontal polarizations in the frequency range 30 – 1000 MHz was measured by using the peak detector. During the peak detector scan the turntable was rotated from 0° to 360° with 30° steps with the antenna heights 1.0 m and 3.0 m. The highest levels of the radiated interference field strength measured by using the quasi-peak detector were recorded.

<i>Frequency band MHz</i>	<i>Limit@3m μV/m</i>	<i>Limit@3m dB(μV/m)</i>
30 – 88	100	40.0
88 – 216	150	43.5
216 – 960	200	46.0
960 – 1000	500	54.0

3.1.8 EUT operation mode

<i>EUT operation mode</i>	ID transmitter on, WLAN off, BT off
<i>EUT operation voltage</i>	7.4V DC

3.1.9 EUT test setup



Photograph 2. Radiated emissions test setup.

3.1.10 Test data

The measurement results were obtained as described below.

$$E [\mu\text{V}/\text{m}] = U_{RX} + A_{CABLE} + AF - G_{PREAMP}$$

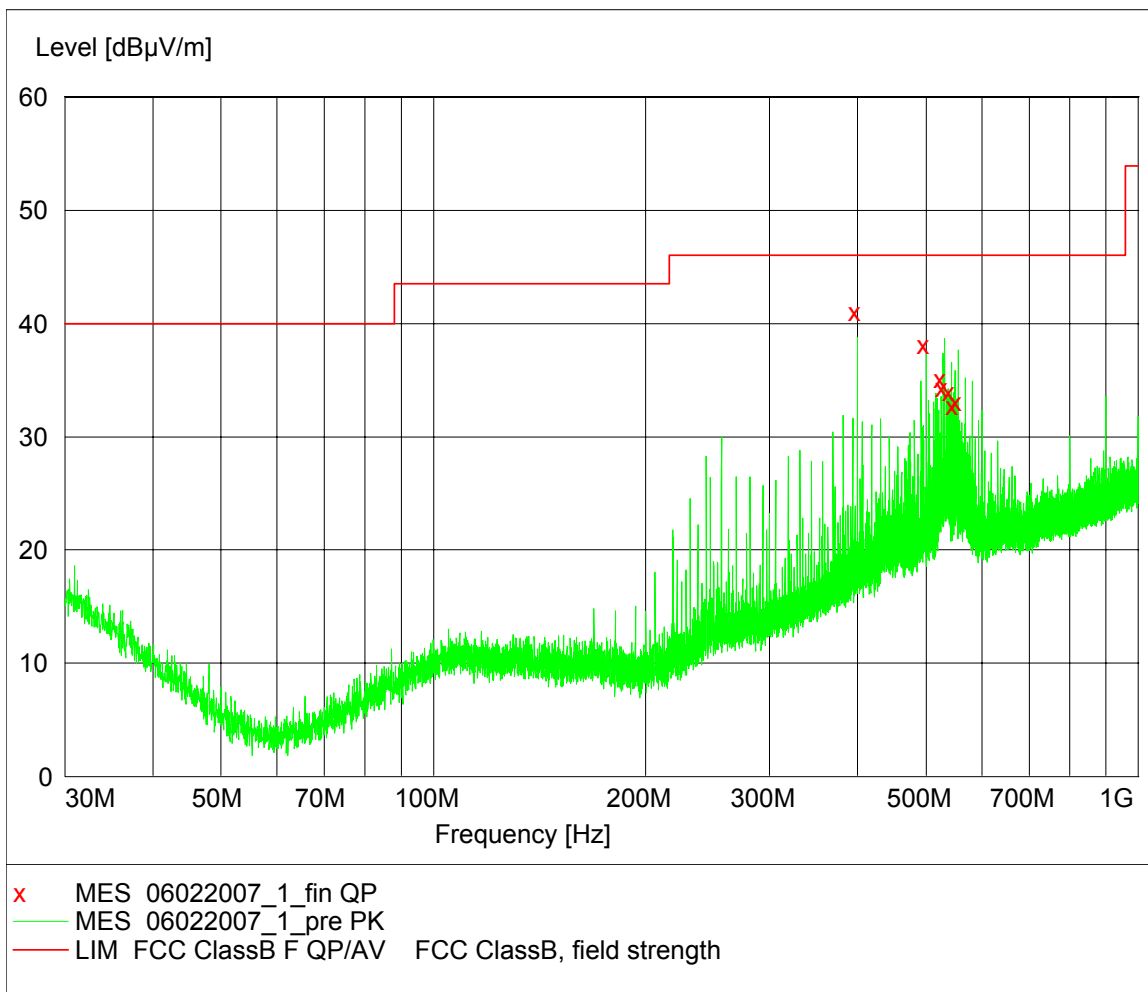
Where

U_{RX} receiver reading

A_{CABLE} attenuation of the cable

AF antenna factor

G_{PREAMP} gain of the preamplifier



Highest emissions (QP):

Frequency MHz	Level dBµV/m	Limit dBµV/m	Margin dB	Height cm	Azimuth deg	Polarization
400.00	41.0	46.0	5.0	140	33	VERTICAL
500.00	38.1	46.0	7.9	112	336	VERTICAL
528.00	35.1	46.0	10.9	103	318	VERTICAL
531.20	34.3	46.0	11.7	101	1	VERTICAL
543.80	34.0	46.0	12.0	99	1	VERTICAL
550.00	32.7	46.0	13.3	100	32	VERTICAL
556.20	33.1	46.0	12.9	102	338	VERTICAL

4. List of test equipment

Each active test equipment is calibrated once a year, antennas every 18 months and other passive equipments every 24 months.

Nr.	Equipment	Type	Manufacturer	Serial number
5	Test receiver	ESH-3	Rohde & Schwarz	894718/015
338	Test receiver	ESS	Rohde & Schwarz	847151/009
566	Spectrum analyzer	E4448A	Agilent	US42510236
564	RF-amplifier	CA018-4010	CIAO Wireless	101
544	RF-amplifier	ZFL-2000VH2	Mini-Circuits	D01080
168	Artificial Mains	NSLK 8127	Schwartzbeck	8127162
343	Artificial Mains	NSLK8128	Schwartzbeck	-
98	Antenna	HFH2	Rohde & Schwarz	871336/45
319	Antenna	CBL6112	Chase	2018
525	Double-Ridged Horn	3115	Emco	6691
184	Temp. & humidity meter	H MI 32	Vaisala	63837
348	Shielded room	RFSD-100	Euroshield Oy	1320
350	Semianechoic shielded room	RFD-F-100	Euroshield Oy	1327