

**TEST REPORT CONCERNING THE COMPLIANCE OF A
DEACTIVATOR OF DISPOSABLE TAGS
(PART 15 ANTI-PILFERAGE DEVICE),
MANUFACTURER Gigatek Inc. Taiwan
BRAND NEDAP, MODEL SMARTDEACT,
OPERATING ON 7.8 to 8.5 MHz.**

**WITH 47 CFR PART 15 (10-1-13) AND THE
REQUIREMENTS OF INDUSTRY CANADA:
RSS-GEN (ISSUE 3, DECEMBER 2010) AND
RSS-210 (ISSUE 8, DECEMBER 2010)**

**14031106.fcc01_Rev02
April 08, 2014**

FCC listed : 90828
Industry Canada : 2932G-2
R&TTE, LVD, EMC Notified Body : 1856

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MEASUREMENT/TECHNICAL REPORT

Manufacturer: Gigatek Inc. Taiwan
Brand: Nedap
Model: SMARTDEACT

FCC ID: CGDSMARTDEACT
IC: 1444A-SMARTDEACT

This report concerns:	Original grant/certification	Class 2 Permissive Change	Verification
Equipment type:	Part 15 Anti-Pilferage Device		
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The data taken for this test and report herein was done in accordance with 47 CFR Part 15 (10-1-13 edition) RSS-GEN (ISSUE 3, DECEMBER 2010), RSS-210 (ISSUE 8, DECEMBER 2010) and the measurement procedures of ANSI C63.4-2009. TÜV Rheinland Nederland at Leek, The Netherlands, certifies that the data is accurate and contains a true representation of the emission profile of the Equipment Under Test (EUT) on the date of the test as noted in the test report. I have reviewed the test report and find it to be an accurate description of the test(s) performed and the EUT so tested.

Date: April 08, 2014

Signature:



O. Hoekstra
Senior Engineer Telecom TÜV Rheinland Nederland B.V.

Summary

The device under test does:

- fulfill the general approval requirements as identified in this test report
- not fulfill the general approval requirements as identified in this test report

Description of test item

Test item (EUT) : Deactivator of disposable tags-Anti-Pilferage Device
Manufacturer : Gigatek Inc. Taiwan
Brand : Nedap
Model(s) : SMARTDEACT
Serial number(s) : --
Receipt date : March 21, 2014

Applicant information

Applicant's representative : Mr. J. Hulshof
Company : N.V. Nederlandsche Apparatenfabriek "Nedap"
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Postal code : 7141 DC
City : Groenlo
Country : The Netherlands
Telephone number : +31 544 471 162
Telefax number : +31 544 463 475

Test(s) performed

Location : Leek
Test(s) started : March 21, 2014
Test(s) completed : March 24, 2014
Purpose of test(s) : Equipment Authorization (Original grant/certification)

Test specification(s) : 47 CFR Part 15 (10-1-13 edition) and
RSS-GEN (ISSUE 3, DECEMBER 2010) AND
RSS-210 (ISSUE 8, DECEMBER 2010)

Test engineer(s) : R. van der Meer 

Report written by : R. van der Meer 

Report date : April 04, 2014

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The test results relate only to the item(s) tested.

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1 General information.

1.1 Product description.

1.1.1 Introduction.

The brand Nedap model SMARTDEACT, hereafter referred to as EUT is an Anti-Pilferage Device. The SMARTDEACT is meant for deactivation of disposable tags according to the Pulse Listen method. It detects a tag in the field and shall try to deactivate it until it is not functioning anymore. The EUT is a transmitter that uses 8 discrete frequencies, the lowest of which is 7.8 MHz and the highest of which is 8.5 MHz. The 8 frequencies will be considered as one fundamental frequency centered around 8.1 MHz.

The content of this report and measurement results have not been changed other than the way of presenting the data.

1.2 Related submittal(s) and/or Grant(s).

1.2.1 General.

This test report supports the original certification in equipment authorization files under registration number.
FCC ID: CGDSMARTDEACT and IC: 1444A-SMARTDEACT.

1.3 Tested system details.

Details and an overview of the system and all of its components, as it has been tested, may be found below.

EUT	:	Deactivator of disposable tags-Anti-Pilferage Device
Manufacturer	:	Gigatek Inc. Taiwan
Brand	:	Nedap
Model	:	SMARTDEACT
Serial number	:	--
Voltage input rating	:	12Vdc
Voltage output rating	:	n.a.
Current input rating	:	--
Antenna	:	External, tested in combination with antenna model SDA-265x265
Operating frequency	:	7.8 -8.5 MHz (Hopping)
Modulation	:	AM (Pulsed)
Remarks	:	n.a.
AUX1	:	Laptop PC including power supply adapter
Manufacturer	:	HP
Brand	:	HP
Model	:	Elite 8530p
Serial number	:	2CE943F14R
Voltage input rating	:	--
Voltage output rating	:	--
Current input rating	:	--
Remarks	:	Required to program the EUT not part of the testsetup, property applicant



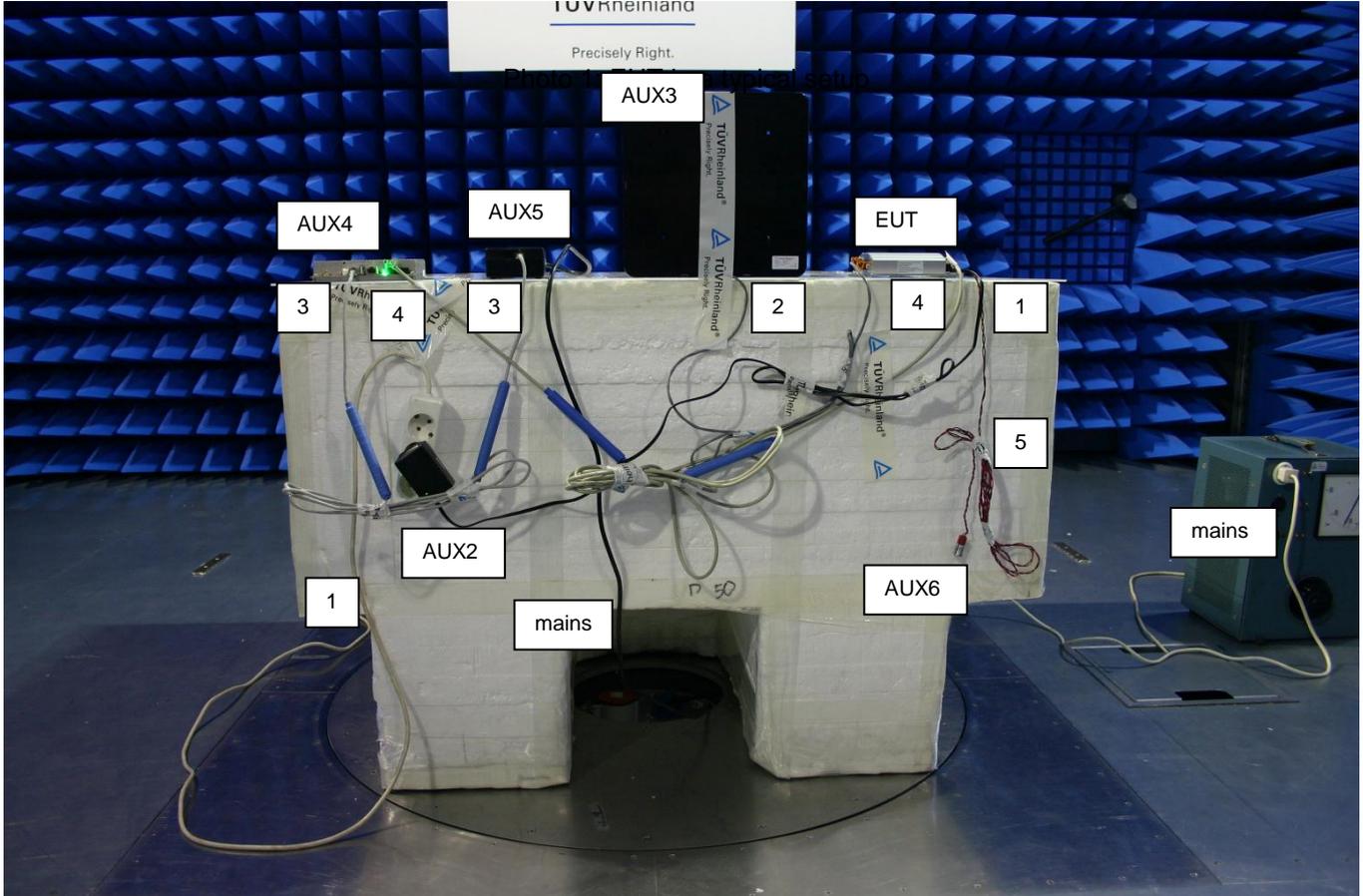
AUX2 : Power supply
Brand : Power-win Technology Corp.
Model : PW-024A-1Y120K
Serial number : --
Voltage input rating : 100 – 240V 50-60Hz
Voltage output rating : 12Vdc
Current input rating : 2A
Remarks : Connects to EUT

AUX3 : Antenna
Brand : Nedap
Model : SDA-265x265
Serial number : E319 A 001
Voltage input rating : --
Voltage output rating : n.a.
Current input rating : n.a.
Remarks : Connects to EUT

AUX4 : Communication unit
Brand : Nedap
Model : RENOS-PL
Serial number : DO07B045
Voltage input rating : --
Voltage output rating : n.a.
Current input rating : n.a.
Remarks : Connects to RS 485 port EUT

AUX5 : Power supply
Brand : Power-win Technology Corp.
Model : PW-085C-1Y560HPOE
Serial number : --
Voltage input rating : 100 – 240V 50-60Hz
Voltage output rating : 56Vdc
Current output rating : 1.5A
Remarks : Connets to AUX4

AUX6 : LED lamp
Brand : Nedap
Model : --
Serial number : --
Voltage input rating : --
Voltage output rating : n.a.
Current input rating : n.a.
Remarks : --



1.3.1 Description of input and output ports.

Number	Ports	From	To	Shielding	Remarks
1	Power supply	AUX2	EUT	yes / no	None
2	Antenna connection	EUT	AUX3	yes / no	None
3	Power supply	AUX5	AUX4	yes / no	None
4	Communication	EUT	AUX4	yes / no	None
5	LED indication	EUT	AUX6	yes / no	None

Operation mode 1: System “Passive”, not detecting a tag.
 Operation mode 2: System “Active”, detecting a tag.

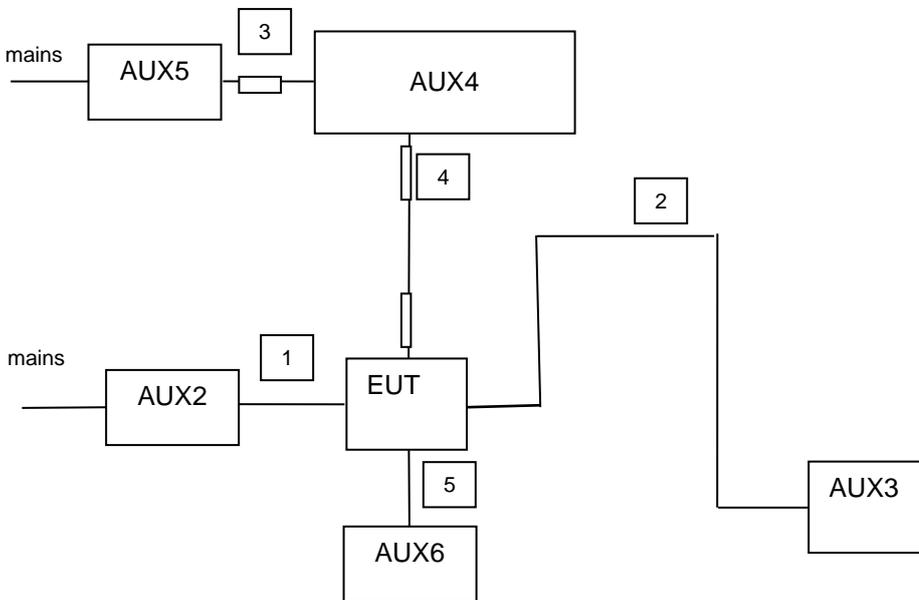


Figure 1: Basic testsetup and connections

1.4 Test summary

The EUT was tested in accordance with the specifications given in the table below.

Test Standard		Description	Page	Pass / Fail / Not Applicable
47 CFR Part 15 (10-1-13 Edition)	RSS-Gen issue 3 and RSS-210 Issue 8, December 2010			
15.207(a)	RSS-Gen(7.2.4)	Conducted emissions	17 – 18	Pass
15.209, 15.223	RSS-Gen(7.2.5) RSS-210(A2.3)	Radiated emissions	12 - 16	Pass
15.223(a)	RSS-Gen (4.6.2) RSS-210(A2.3)	Bandwidth of the emission	19 - 20	Pass

Table 1: Test specifications

Testmethods: ANSI C63.4:2009 and RSS-Gen.

1.5 Test methodology.

The test methodology used is based on the requirements of 47 CFR Part 15 (10-1-13)), sections 15.31, 15.35, 15.205, 15.209, 15.223 and RSS-GEN (ISSUE 3, DECEMBER 2010), RSS-210 (ISSUE 8, DECEMBER 2010).

The test methods, which have been used, are based on ANSI C63.4: 2009.

Radiated emission tests above 30 MHz were performed at a measurement distance of 3 meters.

Radiated emission tests below 30 MHz were performed at a measurement distance of 3 meters.

To calculate the field strength level from these results to the appropriate distance at which the limit is specified, the appropriate extrapolation factor is used.

The receivers are switching automatically to the right bandwidth in accordance with CISPR 16. This is implemented in the receiver.

1.6 Test facility.

The Federal Communications Commission and Industry Canada has reviewed the technical characteristics of the test facilities at TÜV Rheinland Nederland, located in Leek, 9351VT Eiberkamp 10, The Netherlands, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948.

The description of the test facilities has been filed at the Office of the Federal Communications Commission under registration number 90828. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

The description of the test facilities has been filed to Industry Canada under registration number 2932G-2. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

1.7 Test conditions.

Normal test conditions:

Temperature (*)	: +15°C to +35°C
Relative humidity(*)	: 20 % to 75 %
Supply voltage	: 120VAC/60Hz to the AC/DC Power Supply – the DC output was varied across the voltage range specified by the manufacturer
Air pressure	: 950 – 1050 hPa

When it was impracticable to carry out the tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests are stated separately.

1.8 Measurement Uncertainty

Compliance of the product is based on the measured value. However, the measurement uncertainty is included for informational purposes.

The expanded uncertainty ($k = 2$) for radiated emissions below 1000 MHz has been determined to be: ± 5.0 dB at 3m.

The expanded uncertainty ($k = 2$) for radiated emissions above 1000 MHz has been determined to be: ± 5.0 dB at 3m

The expanded uncertainty ($k = 2$) for mains conducted emissions from 150 kHz to 30 MHz has been determined to be: ± 3.5 dB.

2 System test configuration.

2.1 Justification.

The system was configured for testing in a typical situation as a customer would normally use it.

The justification and manipulation of cables and equipment in order to simulate a worst-case behavior of the test setup has been carried out as prescribed in ANSI C63.4- 2009.

2.2 EUT mode of operation.

The EUT has been tested in passive(stand-by)- and deactivate mode, i.e. the EUT is ready to detect a tag and deactivate it. To assess the behavior of the EUT while reading the tag, the EUT is tested with a tag presented such that it continuously reads the tag. The tests have been performed with a complete functioning EUT and interconnections.

Besides the normal hopping mode, the system was also tested on modulated carriers at 7.8 MHz (Freq0), 8.1 MHz (Freq3) and 8.5 MHz (Freq7).

The EUTs 8 frequencies of operation are: 7.8 , 7.9 , 8.0 , 8.1 , 8.2 , 8.3 , 8.4 and 8.5 MHz.

2.3 Special accessories.

No special accessories are used and/or needed to achieve compliance.

2.4 Equipment modifications.

No special accessories are used and/or needed to achieve compliance.

2.5 Product Labeling

The product labeling information is available in the technical documentation package.

2.6 Block diagram of the EUT.

The block diagram is available in the technical documentation package.

2.7 Schematics of the EUT.

The schematics are available in the technical documentation package.

2.8 Part list of the EUT.

The part list is available in the technical documentation package.

3 Radiated emission data.

RESULT: PASS

Date of testing: 2014-03-21

Frequency range: 30MHz - 1GHz

Requirements:

FCC 15.205, FCC 15.209, FCC 15.223 and IC RSS-Gen(4.9, 7.2.2 and 7.2.5) and RSS-210(2.3)

Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a), must comply with the radiated emission limits specified in FCC 15.209(a). FCC 15.223 and RSS-210 (A2.5).

Radiated emissions which fall outside the operation frequency band and outside restricted bands shall either meet the limit specified in FCC 15.209(a)/ RSS-Gen (7.2.5) or be attenuated at least 20dB below the power level in the 100kHz bandwidth within the band that contains the highest level of the desired power (the less severe limit applies).

Frequency (MHz)	Field strength (microvolts/meter)	Field strength (dBmicrovolts/meter)	Measurement distance (meters)
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Table of applicable limits

Test procedure:

ANSI C63.4-2009, RSS-Gen.

The EUT was placed on a nonconductive turntable 0.8m above the ground plane. Before final measurements of radiated emissions were performed, the EUT was scanned to determine its emission spectrum profile. The physical arrangement of the test system, the associated cabling and the EUT orientation (X, Y, Z) were varied in order to ensure that maximum emission amplitudes were attained.

The spectrum was examined from 30MHz to 1 GHz. Final radiated emission measurements were made at 3m distance.

At each frequency where a spurious emission was found, the EUT was rotated 360° and the antenna was raised and lowered from 1 to 4m in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations.

The highest emission amplitudes relative to the appropriate limit were recorded in this report. Field strength values of radiated emissions at frequencies not listed in the tables are more than 20 dB below the applicable limit.

3.1 Radiated field strength measurements (30 MHz – 1 GHz, E-field)

Frequency (MHz)	Measurement results @3m Vertical (dBµV)	Antenna polarisation	Correction factor (dB)	Results after correction (dBµV/m)	Limits @3m (dBµV/m)	Pass/Fail
39.50	23.2	Vertical	13.9	37.1	40	Pass
40.15	15.5	Vertical	13.4	28.9	40	Pass
46.65	18.4	Vertical	9.7	28.1	40	Pass
56.35	22.0	Vertical	6.0	28.0	40	Pass
493.45	12.2	Vertical	20.7	32.9	46	Pass
503.80	13.2	Vertical	21.1	34.3	46	Pass

Table 2 Radiated emissions of the EUT

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15 section 15.205, 15.209 15.223, RSS-210 and RSS-Gen, section 2.2 and 2.6 are depicted in Table 2.

Notes:

- Field strength values of radiated emissions at frequencies not listed in the table above are more than 20 dB below the applicable limit.
- Measurement uncertainty is ± 5.0 dB.
- The EUT was varied in three positions, the loop antenna was varied in horizontal and vertical orientations and also around it's axis. The reported value is the worst case found at the reported frequency
- The EUT was tested in both normal mode (i.e. without a tag in its proximity) and in activated mode (i.e. with a tag in its proximity). Worst case (which was for activated mode) values noted.
- Tested with Fre0, Freq3, Freq7 and Hopping mode, worst case values noted.
- The six highest values-relative to the applicable limits- were noted.
- A Quasi-peak detector was used with a bandwidth of 120 kHz.

Used test equipment and ancillaries:

99847/99580	99858	99877	15667	99861	99609	99755		

3.2 Radiated field strength measurements (frequency range of 0.009-30 MHz, H-field).

RESULT: Pass.

Date of testing: 2014-03-21

Requirements:

The field strength of any emission within the band 1.705–10.0 MHz shall not exceed 100 microvolts/meter at a distance of 30 meters. However, if the bandwidth of the emission is less than 10% of the center frequency, the field strength shall not exceed 15 microvolts / meter or (the bandwidth of the device in kHz) divided by (the center frequency of the device in MHz) microvolts/meter at a distance of 30 meters, whichever is the higher level. For the purposes of this section, bandwidth is determined at the points 6 dB down from the modulated carrier. The emission limits in this paragraph are based on measurement instrumentation employing an average detector. The provisions in FCC part 15.35(b) for limiting peak emissions apply.

The measured 6 dB bandwidth is 0.876 MHz (see section 5) which is more than 0.81 MHz (10% of the 8.1 MHz of center frequency), hence the limit for the field strength is 100 microvolts/meter (40 dB μ V/m) at a distance of 30 meters.

Radiated and FCC emissions tests were performed using the procedures of ANSI C63.4 including methods for signal maximizations and EUT configuration. The test setup photos report shows the EUT in its maximized configuration. Radiated emission testing was performed at a distance of 3 meters in a 5 meter semi-anechoic chamber. The measured values were corrected to the 30m distance using the extrapolation factor of 40dB/decade as per FCC Part 15.31(f)(2).

Average values are obtained from application of the calculated duty cycle correction factor (See section 6) to the fundamental field strength amplitude measured with a peak detector.

Table 3a EUT operating at Lowest Frequency of 7.8 MHz

EUT Frequency	Measured Frequency	Measurement results	Detector	Antenna factor	Cable loss	Extrapolation factor	Measurement results (calculated)	Limits	Pass/Fail
MHz	MHz	dB μ V @3m		dB	dB	dB	dB μ V/m@30m	dB μ V/m@30m	
7.8	7.875	73.0	Pk	19.6	1	40	53.6	60	Pass

EUT Frequency	Measured Frequency	Measurement results Peak	Duty Cycle correction factor	Measurement results Av (=Peak – DCcf) (calculated)	Limits Av	Pass/Fail
MHz	MHz	dB μ V @30m	dB	dB μ V/m@30m	dB μ V/m@30m	
7.8	7.875	53.6	62.5	-8.9	40	Pass

*For Duty Cycle Correction factor see section 6

Table 3b EUT operating at middle frequency of 8.1 MHz

EUT Frequency	Measured Frequency	Measurement results	Detector	Antenna factor	Cable loss	Extrapolation factor	Measurement results (calculated)	Limits	Pass/Fail
MHz	MHz	dB μ V @3m		dB	dB	dB	dB μ V/m@30m	dB μ V/m@30m	
8.1	8.09	77.3	Pk	19.6	1	40	57.9	60	Pass

EUT Frequency	Measured Frequency	Measurement results Peak	Duty Cycle correction factor	Measurement results Av (=Peak – DCcf) (calculated)	Limits Av	Pass/Fail
MHz	MHz	dB μ V @30m	dB	dB μ V/m@30m	dB μ V/m@30m	
8.1	8.09	57.9	62.5	-4.6	40	Pass

*For Duty Cycle Correction factor see section 6

Table 3c EUT operating at highest frequency of 8.5 MHz

EUT Frequency	Measured Frequency	Measurement results	Detector	Antenna factor	Cable loss	Extrapolation factor	Measurement results (calculated)	Limits	Pass/Fail
MHz	MHz	dB μ V @3m		dB	dB	dB	dB μ V/m@30m	dB μ V/m@30m	
8.5	8.510	74.3	Pk	19.6	1	40	54.9	60	Pass

EUT Frequency	Measured Frequency	Measurement results Peak	Duty Cycle correction factor	Measurement results Av (=Peak – DCcf) (calculated)	Limits Av	Pass/Fail
MHz	MHz	dB μ V @30m	dB	dB μ V/m@30m	dB μ V/m@30m	
8.5	8.510	54.9	62.5	-7.6	40	Pass

*For Duty Cycle Correction factor see section 6

Emissions Outside the band - FCC Part 15.233(b)and RSS210 A2.3.

The field strength of emissions outside of the band 1.705–10.0 MHz shall not exceed the general radiated emission limits in § 15.209 and RSS-Gen section 7.2.5 table 5.

Test procedure: ANSI C63.4-2009.

EUT Frequency	Measured Frequency	Measurement results	Detector	Antenna factor	Cable loss	Extrapolation factor	Measurement results (calculated)	Limits	Pass/Fail
MHz	MHz	dBµV @3m		dB	dB	dB	dBµV/m@30m	dBµV/m@30m	
7.8	15.700 ^h	14.0	Qp	19.7	1	40	-5.3	29.5	Pass
Hopping	16.985 ^h	7.7	Qp	19.7	1	40	-11.6	29.5	Pass
8.1	24.300 ^h	14.5	Qp	19.7	1	40	-4.8	29.5	Pass
8.5	25.460 ^h	22.5	Qp	19.7	1	40	3.2	29.5	Pass
Hopping	25.285 ^h	11.3	Qp	19.7	1	40	-8.0	29.5	Pass
Hopping	28.440	8.2	Qp	19.7	1	40	-11.1	29.5	Pass

Table 3d Radiated emissions of the EUT, outside of the band 1.705–10.0 MHz.

Restricted band operation:

The EUT is a Carrier hopped system and its hopping frequencies are: 7.8 , 7.9 , 8.0 , 8.1 , 8.2 , 8.3 , 8.4 and 8.5 MHz.

These hopping frequencies are outside of the restricted band frequencies.

Notes:

1. Calculated measurement results are obtained by using the 40dB/decade factor (antenna factor and cable loss is included). i.e at 8.5 MHz: 22.5 dBµv + 19.7 dB + 1dB - 40dB= 3.2 dBµV/m.
2. A resolution bandwidth of 9kHz was used during testing
3. The six highest values-relative to the applicable limits- were noted.
4. The loop antenna was varied in horizontal and vertical orientations and also around it's axis. The reported value is the worst case found at the reported frequency.
5. Measurement uncertainty is ±5.0dB
6. Tested with Freq0, Freq3, Freq7 and Hopping mode, worst case values noted.
7. The EUT was tested in both normal mode (i.e. without a tag in its proximity) and in activated mode (i.e. with a tag in its proximity-this proved to be the worst case). Worst case values noted.
8. Restricted bands especially between 7 MHz and 9 MHz were investigated and were found to be below the levels as reported in Tables 3a, 3b, 3c and 3d.

3.2.1 Test equipment used (for reference see test equipment listing).

15667	99857	99861	99755	99847/ 99580	15453	99858
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4 Conducted emission data.

4.1 AC Power Line Conducted Emission data of the EUT.

RESULT: Pass.

Date of testing: 2014-03-24

Requirements: Except when the requirements applicable to a given device state otherwise, for any license-exempt radio communication device equipped to operate from the public utility AC power supply, either directly or indirectly, the radio frequency voltage that is conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the following table. The tighter limit applies at the frequency range boundaries.

Frequency of Emission (MHz)	Conducted Limit (dB μ V) Quasi-Peak	Conducted Limit (dB μ V) Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 - 30	46	50

*Decreases with the logarithm of the frequency.

Test procedure:

ANSI C63.4-2009.

Each phase and neutral of the AC power line were measured with respect to ground. Measurements were performed using a 50 μ H / 50 Ω LISN. The frequency range from 150kHz to 30MHz was searched. The six highest EUT emissions relative to the limit were noted for three supply voltages. In the case of tabletop equipment, the EUT is placed on a 1.0m x 1.5m non-conductive table 80cm above the ground plane and 40cm from a vertical ground reference plane. The rear of the EUT was positioned flush with the backside of the table and directly over the LISNs. The power and I/O cables were routed over the edge of the table and bundled approximately 40cm from the ground plane.

Frequency (MHz)	Measurement results Line 1 dB μ V		Measurement results Line 2/Neutral dB μ V		Limits dB μ V		Pass/Fail
	QP	AV	QP	AV	QP	AV	
0.15486	60.7	40.5	60.7	41.6	65.7	55.7	PASS
0.20467	54.3	34.6	56.1	35.0	63.6	53.6	PASS
0.29528	52.3	29.2	52.0	26.6	60.3	50.3	PASS
0.34907	50.2	13.0	51.0	26.2	59.0	49.0	PASS
0.49171	50.6	29.2	49.8	24.6	56.2	46.2	PASS
8.25540	51.0	18.9	49.3	28.1	60.0	50.0	PASS

Table 4 Conducted emission measurements

The results of the conducted emission tests, carried out in accordance with 47 CFR Part 15 section 15.207 & RSS-Gen, section 7.2.4, at the 120 Volts AC mains connection terminals of the AC/DC power supply which was connected to the EUT, are depicted in Table 4.

Notes:

1. The test data shown above is of the worst case EUT. Maximum values recorded.
2. The values of conducted emissions at frequencies not listed in the table above are more than 20 dB below the applicable limit.
3. Measurement uncertainty is ± 3.5 dB
4. The six highest values-relative to the applicable limits- were noted
5. The EUT was tested while continuously transmitting.
6. The EUT was tested in both normal mode (i.e. without a tag in its proximity) and in activated mode (i.e. with a tag in its proximity-this proved to be the worst case). Worst case values (which was activated mode) noted.

4.1.1 Test equipment used (for reference see test equipment listing).

15667	12512	99161	99548	13313		
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5 6 dB Bandwidth

5.1 6 dB Bandwidth of the emission

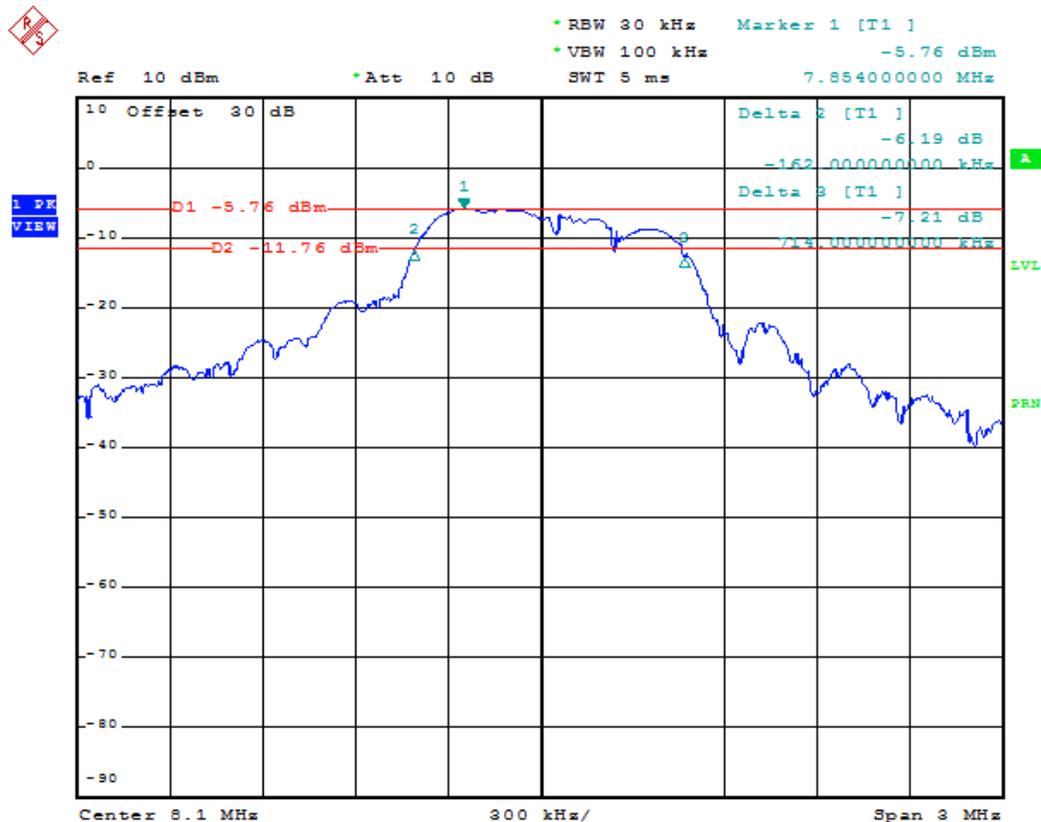
RESULT: PASS

Date of testing: 2014-03-27

Requirements:

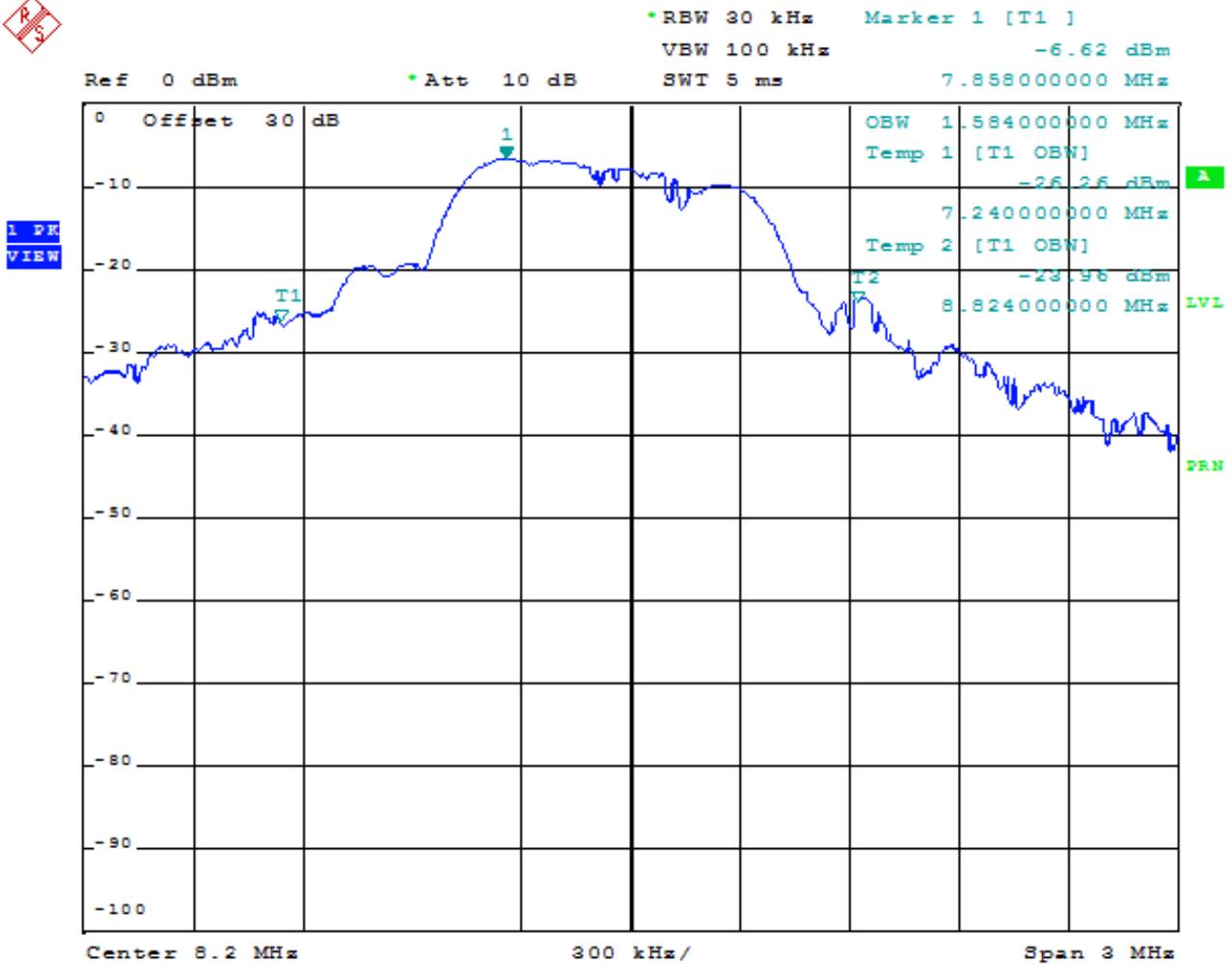
The 6 dB bandwidth of the fundamental emission shall be measured in order to find out the exact allowed limit of the field strength of any emission within the band 1.705-10.0 MHz.

Testprocedure: ANSI C63.4:2009



Date: 27.MAR.2014 12:23:39

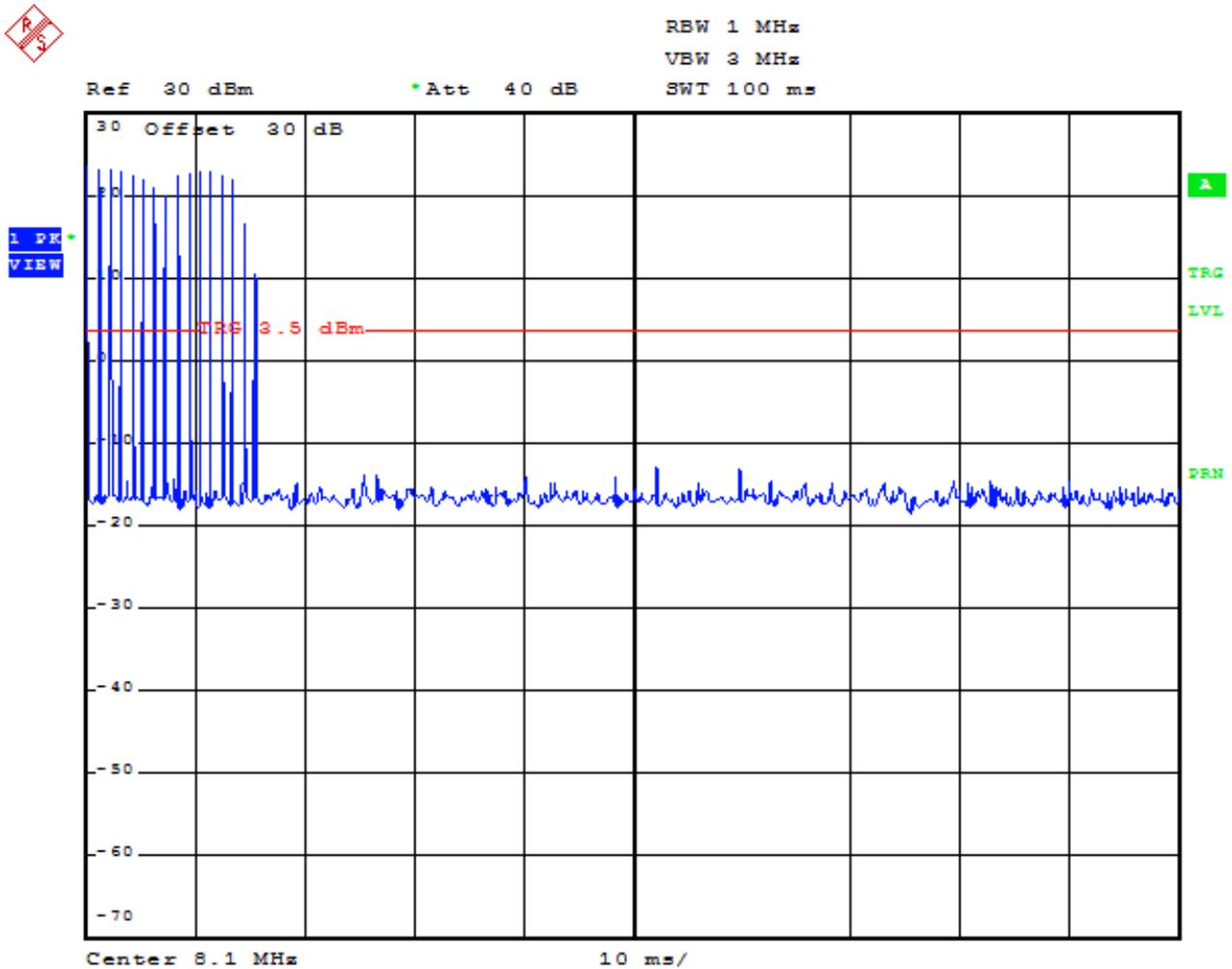
Plot1a: plot of the emission. Measured value is 876 kHz as measured on a spectrum analyzer.



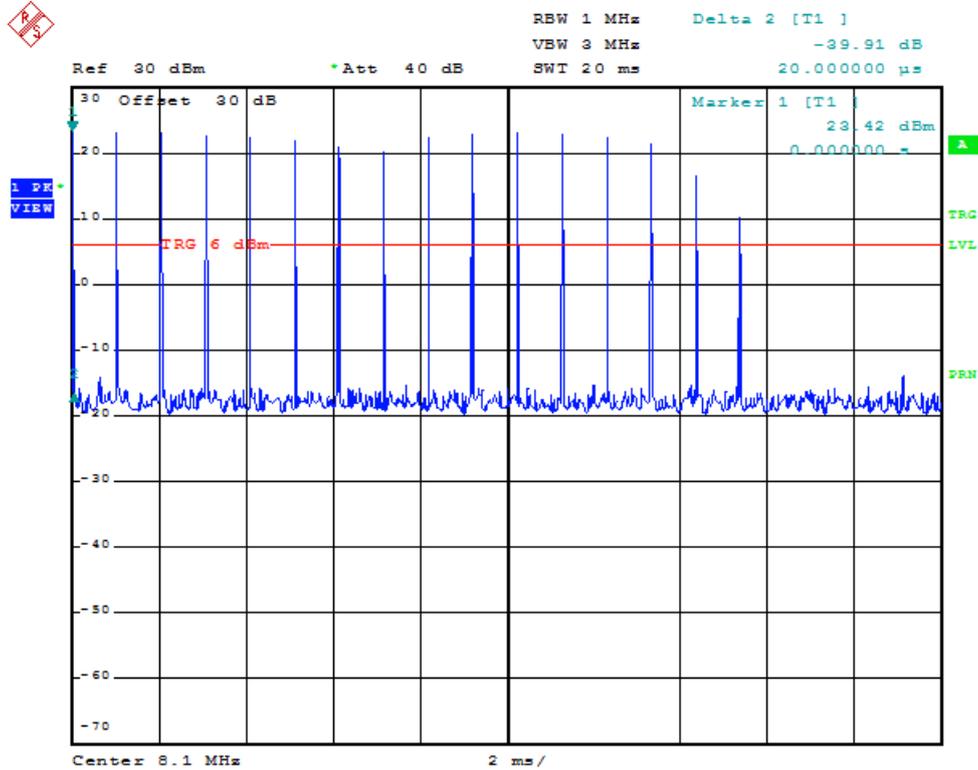
Plot1b: plot of the 99% emission bandwidth. Measured value is 1584 kHz as measured on a spectrum analyzer.

6 Duty Cycle

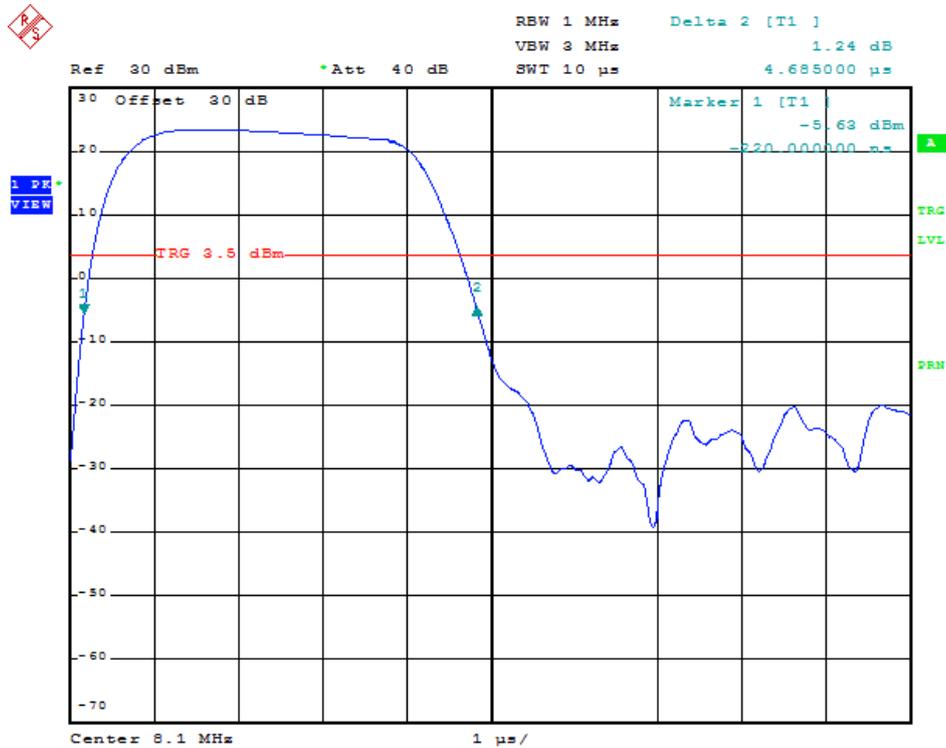
Notes: 16 peaks were observed in a 100 ms interval. Each peak was measured to have a duration of 4.685 μ s. This yields a total on-time of 0.07496 ms in a 100 ms interval. Using the formula Average factor (dB) = $20 \cdot \text{LOG}(0.07496\text{ms} / 100\text{ms})$, the duty cycle average factor is therefore -62.5 dB.



Plot 2a: number of peaks in 100ms.



Plot 2b: number of peaks



Plot 2c: peak duration

7 List of utilized test equipment.

Inventory number	Description	Brand	Model	Last cal.	Next cal.
12512	LISN	EMCO	3625/2	01/2014	01/2015
13313	Pulse Limiter	R&S	ESH3-Z2	01/2014	01/2015
15453	Active loopant. 60 cm	Chase	HLA6120	05/2013	05/2014
15667	Measuring receiver	R&S	ESCS30	09/2013	09/2014
99877	Biconilog Testantenna	Teseq	CBL 6111D	06/2013	06/2014
99755	Variac 250V 6A	Tektronix	-	NA	NA
99161	Variac 120Vac	RFT	LTS001	NA	NA
99861	Turntable controller	Maturo	SCU/088/8090811	NA	NA
99852/ 99857/ 99858	Temperature-Humiditymeter	EXtech	SD500	02/2014	02/2015
99580/ 99847	Test facility	Comtest	FCC listed: 90828 IC listed: 2932G-2	12/2011	12/2014
99608	Controller	EMCS	DOC202	NA	NA
99609	Antenna mast	EMCS	AP-4702C	NA	NA
99651	Variac	NA	Vast Activa: 08-9510	NA	NA
99683	Loop antenna, 6cm	--	7405-901	09/2013	09/2014
99858	RF Cable S-AR	Gigalink	APG0500	01/2014	01/2015

NA= Not Applicable