

Straubing, Mai 9, 2005

T E S T - R E P O R T

No. 55465-050219-1 (Edition 1)

for

Cardman 5125

Inductive TAG Reader

Applicant: OMNIKEY GmbH

Test Specifications: FCC Code of Federal Regulations,
CFR 47, Part 15,
Sections 15.205, 15.207 and 15.209

Industry Canada Radio Standards
Specification RSS-210 Issue 5,
Sections 6.2.1, 6.3 and 6.6
(Category I Equipment)

Note:

The test data of this report is related only to the individual item which has been tested. This report shall not be reproduced except in full extent without the written approval of the testing laboratory.

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1 Description of the Equipment Under Test (EUT)

General data of EUT	
Type designation ¹ :	Cardman 5125
Parts ² :	1
Serial number(s):	
Manufacturer:	OMNIKEY GmbH
Type of equipment:	Inductive TAG Reader
Version:	As delivered
FCC ID:	
Additional parts/accessories:	---

Technical data of EUT	
Application frequency range:	119 - 127 kHz
Frequency range:	119 - 127 kHz
Operating frequency:	125 kHz
Type of modulation:	ASK
Pulse train:	420 ms
Pulse width:	85 ms
Number of RF-channels:	1
Channel spacing:	Not Applicable
Designation of emissions ³ :	10K0A1D
Type of antenna:	Integrated
Size/length of antenna:	50 x 55 mm
Connection of antenna:	<input type="checkbox"/> detachable <input checked="" type="checkbox"/> not detachable
Type of power supply:	DC supply over USB-Port
Specifications for power supply:	nominal voltage: 5.00 V minimum voltage: 4.50 V maximum voltage: 5.50 V

¹ Type designation of the system if EUT consists of more than one part.

² Type designations of the parts of the system, if applicable.

³ Also known as "Class of Emission".

2 Administrative Data

Application details	
Applicant (full address):	OMNIKEY GmbH Ferihumerstraße 13 4040 Linz Austria
Contact person:	Mr. Stefan Kollingbaum
Contract identification:	---
Receipt of EUT:	4 th May 2005
Date(s) of test:	5 th May 2005 - 9 th May 2005
Note(s):	---

Report details	
Report number:	55465-050219-1
Edition:	1
Issue date:	Mai 9, 2005

3 Identification of the Test Laboratory

Details of the Test Laboratory	
Company name:	Senton GmbH EMI/EMC Test Center
Address:	Aeussere Fruehlingstrasse 45 D-94315 Straubing Germany
Laboratory accreditation:	DAR-Registration No. DAT-P-171/94-02
FCC test site registration number	90926
Industry Canada test site registration:	IC 3050
Contact person:	Mr. Johann Roidt
	Phone: (+49) (0)9421 5522-0 Fax: (+49) (0)9421 5522-99

4 Summary

Summary of test results

The tested sample complies with the requirements set forth in the
Code of Federal Regulations CFR 47, Part 15, Sections 15.205, 15.207 and 15.209
of the Federal Communication Commission (FCC) and the
Radio Standards Specification RSS-210 Issue 5, Sections 6.2.1, 6.3 and 6.6 (Category I Equipment)
of Industry Canada (IC).

Personnel involved in this report

Laboratory Manager:



Mr. Johann Roidt

Responsible for testing:



Mr. Martin Steindl

Responsible for test report:

Mr. Martin Steindl

5 Operation Mode and Configuration of EUT

Operation Mode(s)

- Transmitting continuously
- Reading TAG continuously

Configuration(s) of EUT

EUT was configured as stand-alone-device, connected to the USB-port of a Personal Computer.

List of ports and cables

Port	Description	Classification ⁴	Cable type	Cable length
1	USB-Port	dc power signal/control port	Shielded	

List of devices connected to EUT

Item	Description	Type Designation	Serial no. or ID	Manufacturer
	Not Applicable			

List of support devices

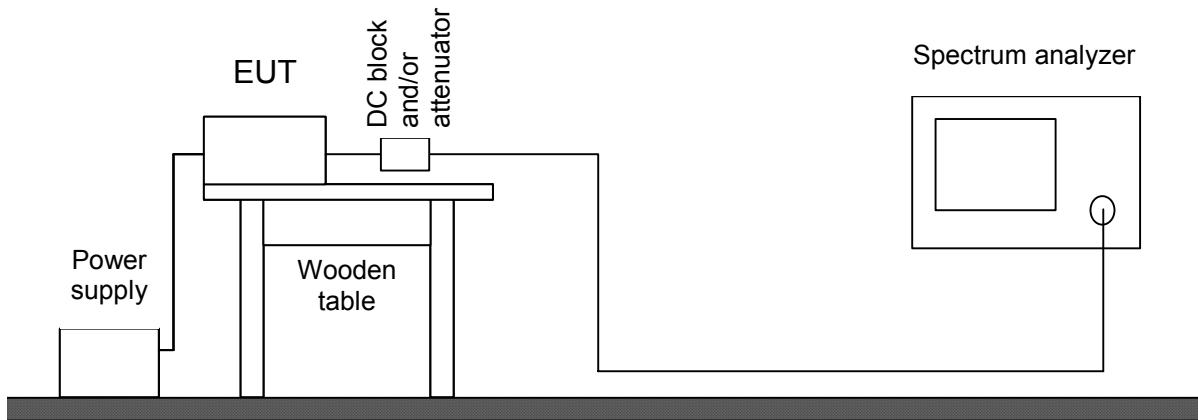
Item	Description	Type Designation	Serial no. or ID	Manufacturer
1	Optiplex GX280	Personal Computer		DELL

⁴ Ports shall be classified as ac power, dc power or signal/control port

6 Measurement Procedures

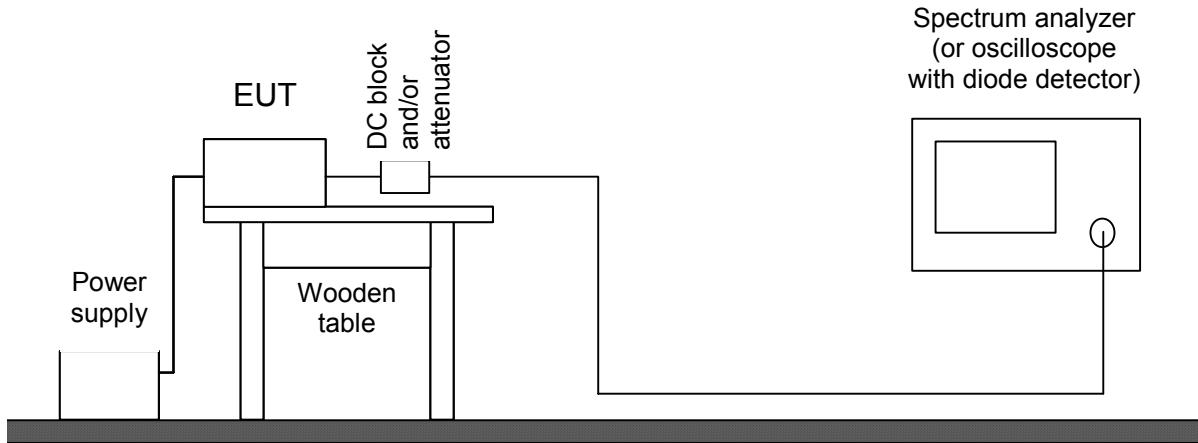
6.1 Bandwidth Measurements

Measurement Procedure:	
Rules and specifications:	CFR 47 Part 2, section 2.202(a) CFR 47 Part 15, section 15.215(c) IC RSS-210 Issue 5, section 5.9.1 IC RSS-210 Issue 5, section 6.1.1(c) ANSI C63.4, annex H.6
Guide:	ANSI C63.4 / IC RSS-210 Issue 5, section 5.9.1
Measurement setup:	<input type="checkbox"/> Conducted: See below <input checked="" type="checkbox"/> Radiated: Radiated Emission Measurement 9 kHz to 30 MHz (6.4)
<p>If antenna is detachable bandwidth measurements shall be performed at the antenna connector (conducted measurement) when the transmitter is adjusted in accordance with the tune-up procedure, if applicable. The RF output terminals are connected to a spectrum analyzer. If required, a resistive matching network equal to the impedance specified or employed for the antenna is used as well as dc block and appropriate attenuators (50 Ohms). The electrical characteristics of the radio frequency load attached to the output terminals shall be stated, if applicable.</p> <p>If radiated measurements are performed the same test setups and instruments are used as with radiated emission measurements for the appropriate frequency range.</p> <p>The analyzer settings are specified by the test description of the appropriate test record(s).</p>	



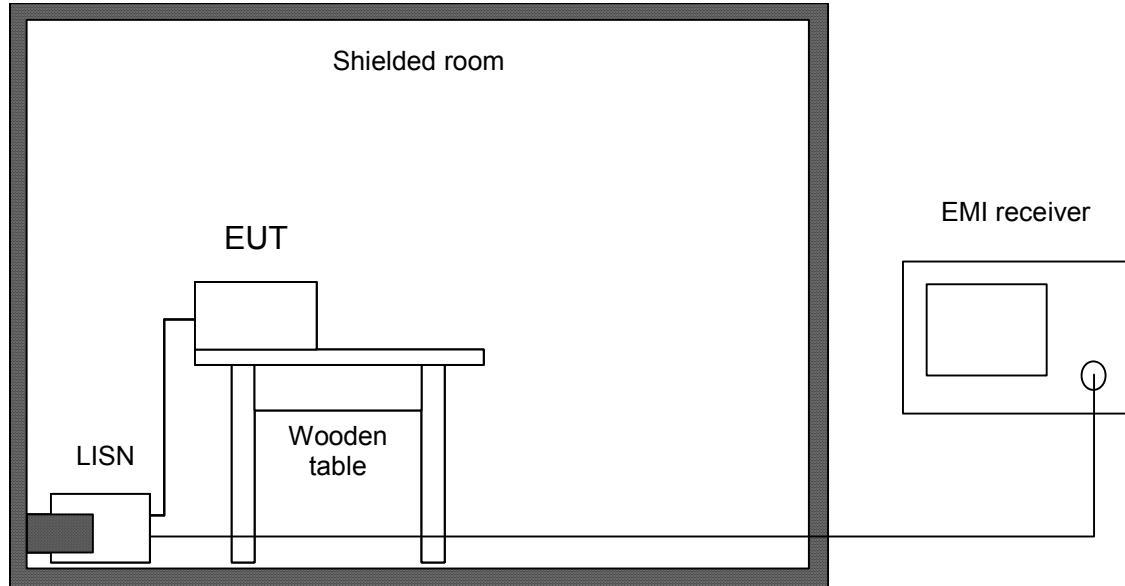
6.2 Pulse Train Measurement

Measurement Procedure:	
Rules and specifications:	CFR 47 Part 15, section 15.35(c) IC RSS-210 Issue 5, section 6.5
Guide:	ANSI C63.4
Measurement setup:	<input type="checkbox"/> Conducted: See below (direct connection or via test fixture) <input checked="" type="checkbox"/> Radiated: Radiated Emission Measurement 9 kHz to 30 MHz (6.4)
<p>If antenna is detachable pulse train measurements shall be performed at the antenna connector (conducted measurement). The RF output terminals are connected to a spectrum analyzer or to a diode detector in combination with an oscilloscope. If required, a resistive matching network equal to the impedance specified or employed for the antenna is used as well as dc block and appropriate attenuators (50 Ohms). The electrical characteristics of the radio frequency load attached to the output terminals shall be stated, if applicable.</p> <p>If antenna is not detachable a test fixture may be used instead of direct connection to RF output terminals.</p> <p>If radiated measurements are performed similar test setups and instruments are used as with radiated emission measurements for the appropriate frequency range. However, the spectrum analyzer may be replaced by a diode detector connected to an oscilloscope.</p>	



6.3 Conducted AC Powerline Emission

Measurement Procedure:	
Rules and specifications:	CFR 47 Part 15, section 15.207 IC RSS-210 Issue 5, section 6.6
Guide:	ANSI C63.4 / CISPR 22
Conducted emission tests in the frequency range 150 kHz to 30 MHz are performed using Line Impedance Stabilization Networks (LISNs). To simplify testing with quasi-peak and average detector the following procedure is used:	
First the whole spectrum of emission caused by the equipment under test (EUT) is recorded with detector set to peak using CISPR bandwidth of 10 kHz. After that all emission levels having less margin than 10 dB to or exceeding the average (CFR 47 Part 15) or quasi-peak (IC RSS-210) limit are retested with detector set to quasi-peak.	
If average limit is kept with quasi-peak levels no additional scan with average detector is necessary. In cases of emission levels between quasi-peak and average limit an additional scan with detector set to average is performed.	
According to ANSI C63.4, section 13.1.3.1, testing of intentional radiators with detachable antenna shall be performed using a suitable dummy load connected to the antenna output terminals. Otherwise, the tests shall be made with the antenna connected and, if adjustable, fully extended.	
Testing with dummy load may be necessary to distinguish (unintentional) conducted emissions on the supply lines from (intentional) emissions radiated by the antenna and coupling directly to supply lines and/or LISN. Usage of dummy load has to be stated in the appropriate test record(s) and notes should be added to clarify the test setup.	

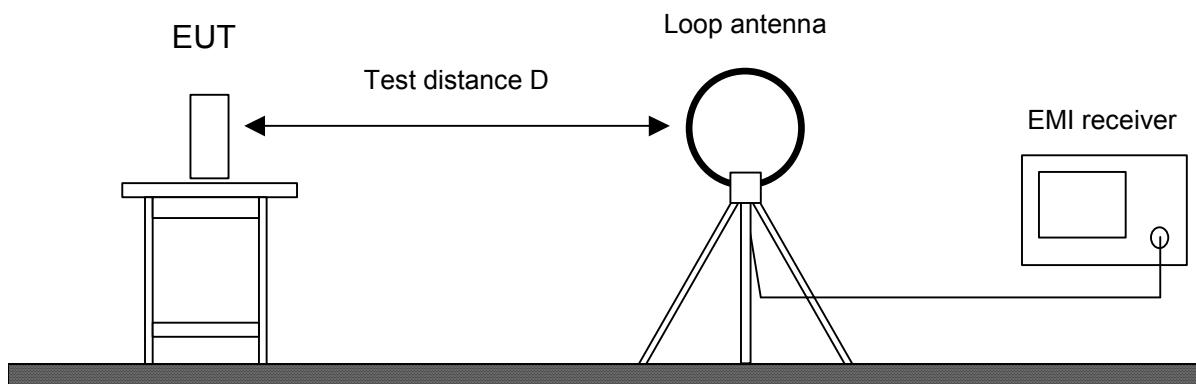


Test instruments used:

Used	Type	Model	Serial No. or ID	Manufacturer
<input checked="" type="checkbox"/>	EMI receiver	ESHS 10	860043/016	Rohde & Schwarz
<input checked="" type="checkbox"/>	LISN	ESH3-Z5	862770/021	Rohde & Schwarz
<input checked="" type="checkbox"/>	LISN	ESH3-Z5	830952/025	Rohde & Schwarz
<input type="checkbox"/>	Artificial mains network	ESH 2-Z5	842966/004	Rohde & Schwarz
<input type="checkbox"/>	Shielded room	No. 1	1451	Albatross Projects
<input checked="" type="checkbox"/>	Shielded room	No. 4	3FD-100 544	Euroshield

6.4 Radiated Emission Measurement 9 kHz to 30 MHz

Measurement Procedure:	
Rules and specifications:	CFR 47 Part 15, sections 15.205 and 15.209 IC RSS-210 Issue 5, sections 6.2.1 and 6.3
Guide:	ANSI C63.4
<p>Radiated emission in the frequency range 9 kHz to 30 MHz is measured using an active loop antenna. First the whole spectrum of emission caused by the equipment is recorded at a distance of 3 meters in a fully or semi anechoic room with the detector of the spectrum analyzer or EMI receiver set to peak. This configuration is also used for recording the spectrum of intentional radiators.</p> <p>Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing. EUT is rotated all around to find the maximum levels of emissions. Equipment and cables are placed and moved within the range of position likely to find their maximum emissions. Due to fixed polarization of the loop antenna, if possible, the EUT is put into a position that gives the maximum levels of emissions.</p> <p>Final measurement is performed at a test distance D of 30 meters using an open field test site. In case the regulation requires testing at other distances, the result is extrapolated by either making measurements at an additional distance D of 10 meters to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). In cases of very low emissions measurements are performed at shorter distances and results are extrapolated to the required distance. The provisions of CFR 47 Part 15 sections 15.31(d) and (f)(2) apply. According to CFR 47 Part 15 section 15.209(d) final measurement is performed with detector function set to quasi-peak except for the frequency bands 9 to 90 kHz and 110 to 490 kHz where, for non-pulsed operation, average detector is employed.</p> <p>If the radiated emission limits are expressed in terms of the average value of the emission there also is a peak limit corresponding to 20 dB above the maximum permitted average limit. Additionally, if pulsed operation is employed, the average field strength is determined by averaging over one complete pulse train, including blanking intervals, as specified in CFR 47 Part 15 section 15.35(c). If the pulse train exceeds 0.1 second that 0.1 second interval during which the value of the emission is at its maximum is selected for calculation. The pulse train correction is added to the peak value of the emission to get the average value.</p>	

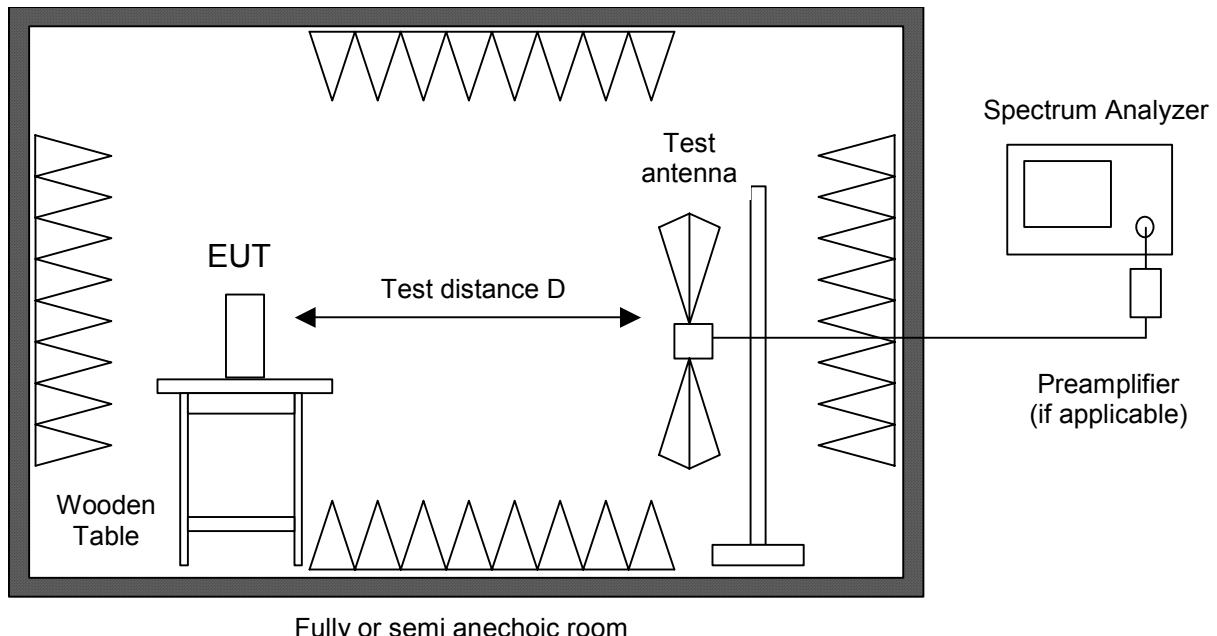


Test instruments used:

Used	Type	Model	Serial No. or ID	Manufacturer
<input checked="" type="checkbox"/>	Spectrum Analyzer	FSP 30	100063	Rohde & Schwarz
<input type="checkbox"/>	EMI test receiver	ESMI	839379/013 839587/006	Rohde & Schwarz
<input checked="" type="checkbox"/>	Test receiver	ESHS 10	860043/016	Rohde & Schwarz
<input type="checkbox"/>	Preamplifier	CPA9231A	3393	Schaffner
<input checked="" type="checkbox"/>	Loop antenna	HFH2-Z2	882964/1	Rohde & Schwarz
<input checked="" type="checkbox"/>	Fully anechoic room	No. 2	1452	Albatross Projects
<input type="checkbox"/>	Semi-anechoic room	No. 3	1453	Siemens
<input checked="" type="checkbox"/>	Open field test site	EG 1	1450	Senton

6.5 Radiated Emission in Fully or Semi Anechoic Room

Measurement Procedure:	
Rules and specifications:	CFR 47 Part 15, section 15.209 IC RSS-210 Issue 5, section 6.2.1
Guide:	ANSI C63.4
Radiated emission in fully or semi anechoic room is measured in the frequency range from 30 MHz to the maximum frequency as specified in CFR 47 Part 15 section 15.33.	
Measurements are made in both the horizontal and vertical planes of polarization in a fully anechoic room using a spectrum analyzer with the detector function set to peak and resolution as well as video bandwidth set to 100 kHz (below 1 GHz) or 1 MHz (above 1 GHz).	
Testing up to 1 GHz is performed with a linear polarized logarithmic periodic antenna combined with a 4:1 broadband dipole ("Trilog broadband antenna"). For testing above 1 GHz horn antennas are used.	
All tests below 18 GHz are performed at a test distance D of 3 meters. For higher frequencies the test distance is reduced (e.g. to 1 meter) due to the sensitivity of the measuring instrument(s) and the test results are calculated according to CFR 47 Part 15 section 15.31(f)(1) using an extrapolation factor of 20 dB/decade. If required, preamplifiers are used for the whole frequency range. Special care is taken to avoid overload, using appropriate attenuators and filters, if necessary.	
If the radiated emission limits are expressed in terms of the average value of the emission there also is a peak limit corresponding to 20 dB above the maximum permitted average limit. Additionally, if pulsed operation is employed, the average field strength is determined by averaging over one complete pulse train, including blanking intervals, as specified in CFR 47 Part 15 section 15.35(c). If the pulse train exceeds 0.1 second that 0.1 second interval during which the value of the emission is at its maximum is selected for calculation. The pulse train correction is added to the peak value of the emission to get the average value.	
Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing.	
During testing the EUT is rotated all around to find the maximum levels of emissions. Equipment and cables are placed and moved within the range of position likely to find their maximum emissions.	
For final testing below 1 GHz an open field test-site is used and the plots recorded in the fully or semi anechoic room are indicated as prescans.	

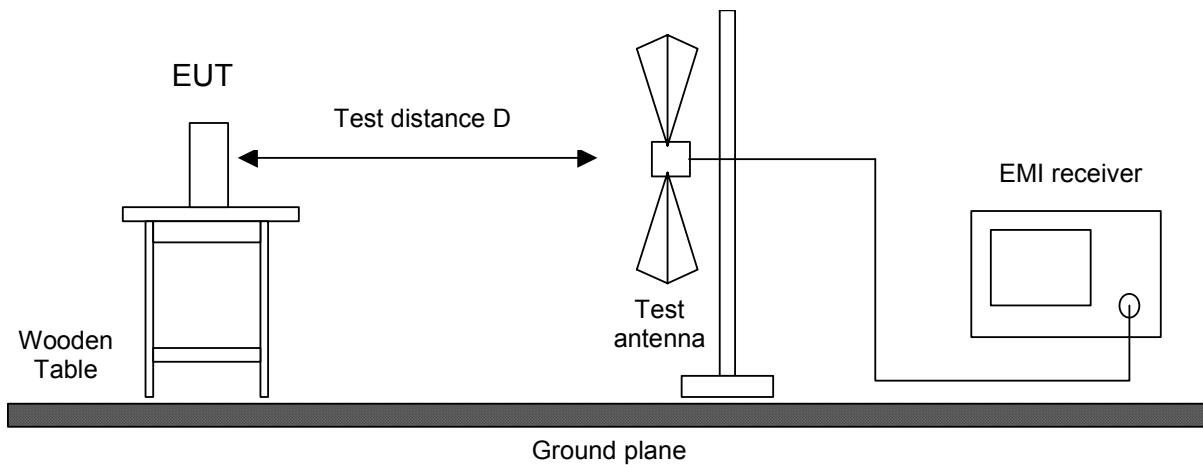


Test instruments used:

Used	Type	Model	Serial No. or ID	Manufacturer
<input checked="" type="checkbox"/>	Spectrum Analyzer	FSP 30	100063	Rohde & Schwarz
<input type="checkbox"/>	Spectrum analyzer	R 3271	05050023	Advantest
<input type="checkbox"/>	EMI test receiver	ESMI	839379/013 839587/006	Rohde & Schwarz
<input checked="" type="checkbox"/>	Preamplifier	CPA9231A	3393	Schaffner
<input type="checkbox"/>	Preamplifier	R14601		Advantest
<input type="checkbox"/>	Preamplifier 1-8 GHz	AFS3-00100800-32-LN	847743	Miteq
<input type="checkbox"/>	Preamplifier 0.5-8 GHz	AMF-4D-005080-25-13P	860149	Miteq
<input type="checkbox"/>	Preamplifier 8-18 GHz	ACO/180-3530	32641	CTT
<input type="checkbox"/>	External Mixer	WM782A	845881/005	Tektronix
<input type="checkbox"/>	Harmonic Mixer	FS-Z30	843389/007	Rohde & Schwarz
	Accessories			
<input checked="" type="checkbox"/>	Trilog broadband antenna	VULB 9163	9163-188	Schwarzbeck
<input type="checkbox"/>	Horn antenna	3115	9508-4553	EMCO
<input type="checkbox"/>	Horn antenna	3160-03	9112-1003	EMCO
<input type="checkbox"/>	Horn antenna	3160-04	9112-1001	EMCO
<input type="checkbox"/>	Horn antenna	3160-05	9112-1001	EMCO
<input type="checkbox"/>	Horn antenna	3160-06	9112-1001	EMCO
<input type="checkbox"/>	Horn antenna	3160-07	9112-1008	EMCO
<input type="checkbox"/>	Horn antenna	3160-08	9112-1002	EMCO
<input type="checkbox"/>	Horn antenna	3160-09	9403-1025	EMCO
<input type="checkbox"/>	Horn antenna	3160-10	399185	EMCO
<input checked="" type="checkbox"/>	Fully anechoic room	No. 2	1452	Albatross Projects
<input type="checkbox"/>	Semi-anechoic room	No. 3	1453	Siemens

6.6 Radiated Emission at Open Field Test Site

Measurement Procedure:	
Rules and specifications:	CFR 47 Part 15, section 15.209 IC RSS-210 Issue 5, section 6.2.1
Guide:	ANSI C63.4
Radiated emission at open field test site is measured in the frequency range 30 MHz to 1 GHz using a biconical antenna up to 300 MHz and a logarithmic periodic antenna above. The measurement bandwidth of the test receiver is set to 120 kHz with quasi-peak detector selected.	
If the radiated emission limits are expressed in terms of the average value of the emission there also is a peak limit corresponding to 20 dB above the maximum permitted average limit. Additionally, if pulsed operation is employed, the average field strength is determined by averaging over one complete pulse train, including blanking intervals, as specified in CFR 47 Part 15 section 15.35(c). If the pulse train exceeds 0.1 second that 0.1 second interval during which the value of the emission is at its maximum is selected for calculation. The pulse train correction is added to the peak value of the emission to get the average value.	
Hand-held or body-worn devices are tested in the position producing the highest emission relative to the limit as verified by prescans in the fully anechoic room. EUT is rotated all around and receiving antenna is raised and lowered within 1 meter to 4 meters to find the maximum levels of emission. Equipment and cables are placed and moved within the range of position likely to find their maximum emissions.	
For measuring emissions of intentional radiators and receivers a test distance D of 3 meters is selected. Testing of unintentional radiators is performed at a distance of 10 meters. If limits specified for 3 meters shall be used for measurements performed at 10 meters distance the limits are calculated according to CFR 47 Part 15 section 15.31(d) and (f)(1) using an inverse linear-distance extrapolation factor of 20 dB/decade.	

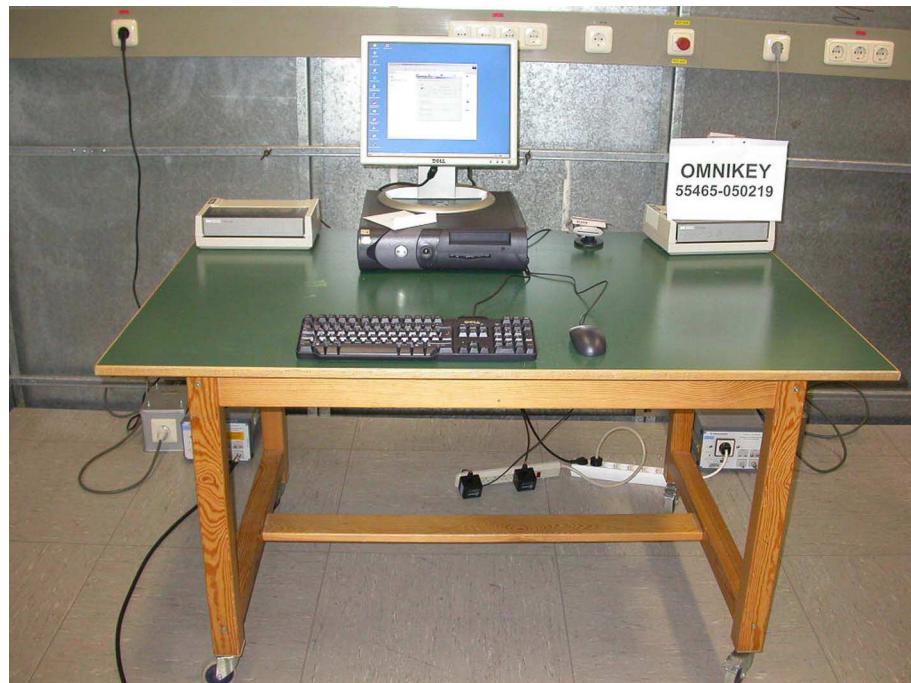


Test instruments used:

Used	Type	Model	Serial No. or ID	Manufacturer
<input checked="" type="checkbox"/>	EMI receiver	ESVP	881414/009	Rohde & Schwarz
<input checked="" type="checkbox"/>	Biconical antenna	EG 1	HK 116	Rohde & Schwarz
<input checked="" type="checkbox"/>	Log. per. antenna	EG 1	HL 223	Rohde & Schwarz
<input checked="" type="checkbox"/>	Open field test site	EG 1	1450	Senton

7 Photographs Taken During Testing

Test setup for conducted AC powerline emission measurement



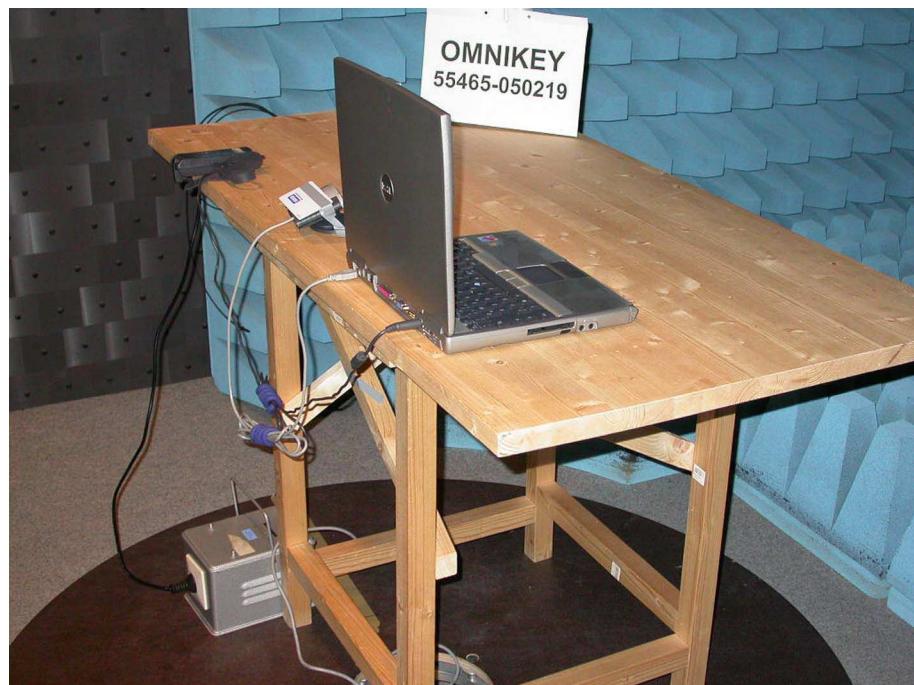
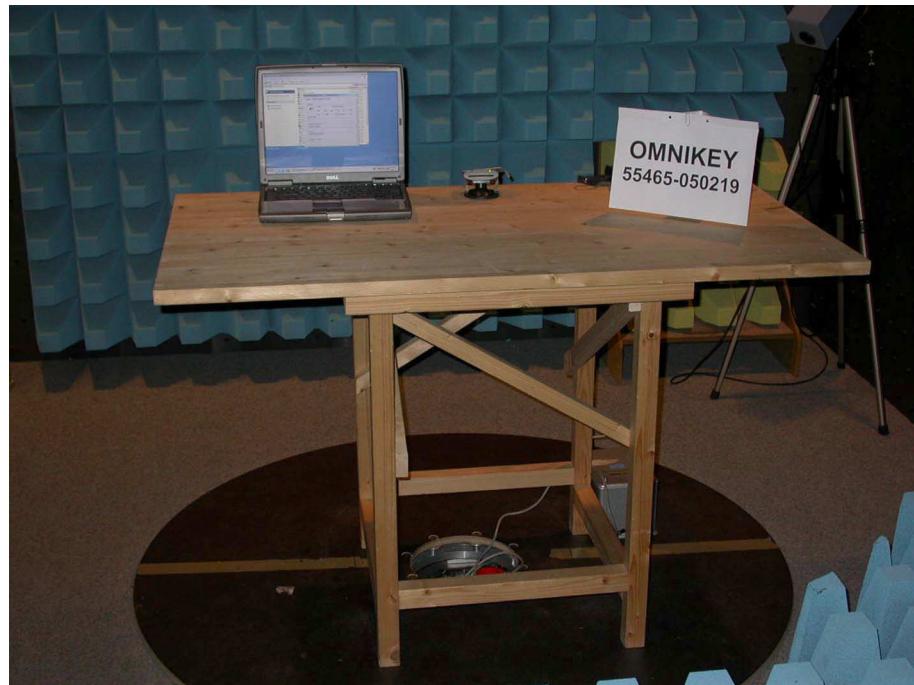
Test setup for conducted AC powerline emission measurement
- continued -



Test setup for radiated emission measurement 9 kHz – 30 MHz



**Test setup for radiated emission measurement
(fully anechoic room)**



**Test setup for radiated emission measurement
(open field test site)**



8 Test Results

FCC CFR 47 Parts 2 and 15			
Section(s)	Test	Page	Result
2.1046(a)	Conducted output power	---	Not applicable
2.202(a)	Occupied bandwidth	24	Recorded
2.201, 2.202	Class of emission	28	Calculated
15.35(c)	Pulse train measurement for pulsed operation	29	Recorded
15.205(a)	Restricted bands of operation	31	Test passed
15.207	Conducted AC powerline emission 150 kHz to 30 MHz	32	Test passed
15.205(b) 15.209	Radiated emission 9 kHz to 30 MHz	35	Test passed
15.205(b) 15.209	Radiated emission 30 MHz to 1 GHz	37	Test passed

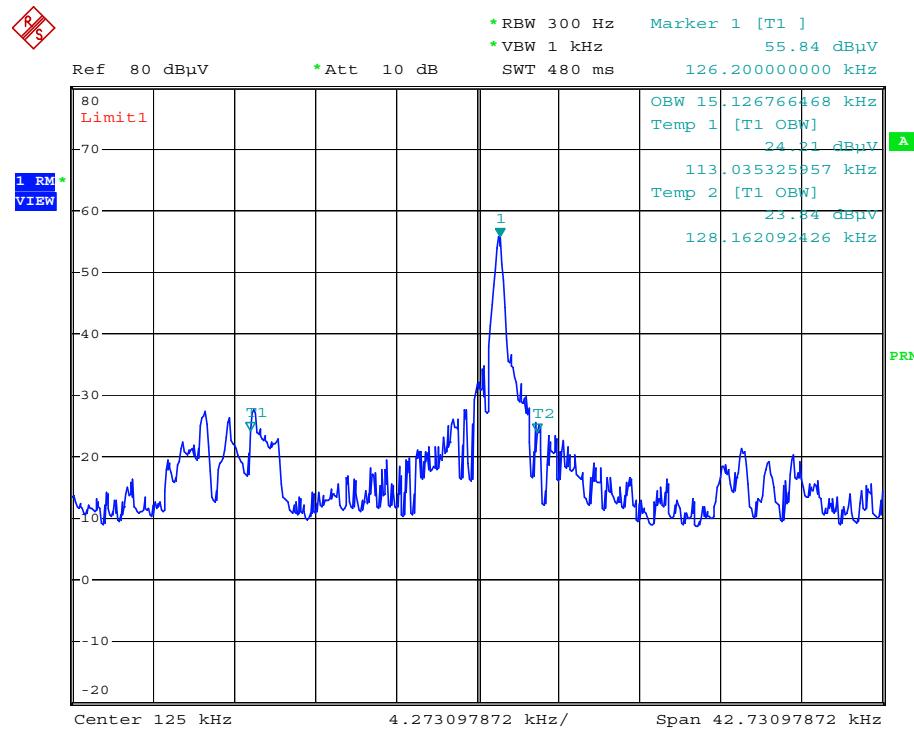
IC RSS-210 Issue 5			
Section(s)	Test	Page	Result
10	Antenna conducted output power	---	Not applicable
5.9.1	Emission bandwidth	27	Recorded
5.9.2	Designation of emissions	28	Calculated
6.5	Pulsed operation	29	Recorded
6.3(a)	Restricted bands and unwanted emission frequencies	31	Test passed
6.6	Transmitter AC wireline conducted emissions 450 kHz to 30 MHz	32	Test passed
6.2.1 6.3(b)-(d)	Field strength of emissions 9 kHz to 30 MHz	35	Test passed
6.2.1 6.3(b)-(d)	Field strength of emissions 30 MHz to 1 GHz	37	Test passed
14	Exposure of Humans to RF Fields	39	Recorded

8.1 Occupied Bandwidth

Rules and specifications:	CFR 47 Part 2, section 2.202(a) ANSI C63.4, annex H.6								
Guide:	ANSI C63.4								
Description:	<p>The occupied bandwidth according to CFR 47 Part 2, section 2.202(a), is measured as the 99% emission bandwidth, i.e. below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5% of the total mean power radiated by a given emission.</p> <p>The occupied bandwidth according to ANSI C63.4, annex H.6; is measured as the frequency range defined by the points that are 26 dB down relative to the maximum level of the modulated carrier.</p> <p>The resolution bandwidth of the spectrum analyzer shall be set to a value greater than 5.0% of the allowed bandwidth. If no bandwidth specifications are given, the following guidelines are used:</p> <table border="1"><thead><tr><th>Fundamental frequency</th><th>Minimum resolution bandwidth</th></tr></thead><tbody><tr><td>9 kHz to 30 MHz</td><td>1 kHz</td></tr><tr><td>30 MHz to 1000 MHz</td><td>10 kHz</td></tr><tr><td>1000 MHz to 40 GHz</td><td>100 kHz</td></tr></tbody></table> <p>The video bandwidth shall be at least three times greater than the resolution bandwidth.</p>	Fundamental frequency	Minimum resolution bandwidth	9 kHz to 30 MHz	1 kHz	30 MHz to 1000 MHz	10 kHz	1000 MHz to 40 GHz	100 kHz
Fundamental frequency	Minimum resolution bandwidth								
9 kHz to 30 MHz	1 kHz								
30 MHz to 1000 MHz	10 kHz								
1000 MHz to 40 GHz	100 kHz								
Measurement procedure:	Bandwidth Measurements (6.1)								

Comment:	
Date of test:	4th May 2005
Test site:	Fully anechoic room, cabin no. 2

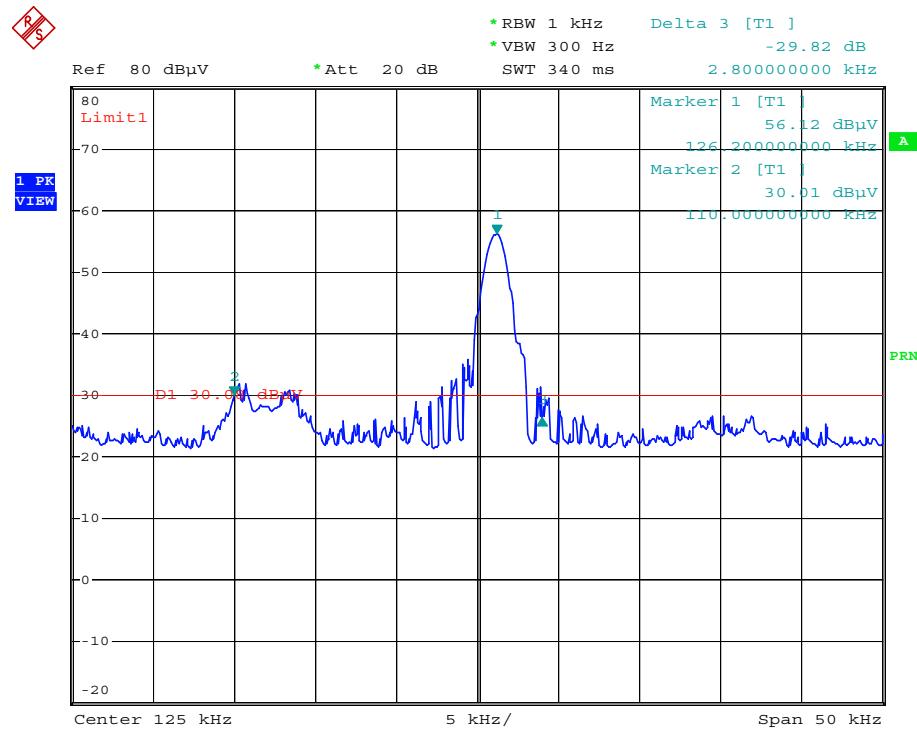
Occupied Bandwidth (99 %):



Comment: Omnikey 050219: Occupied Bandwidth
Date: 4.MAY.2005 18:52:50

Occupied Bandwidth (99 %): **15.12 kHz**

Occupied Bandwidth (-26 dB):

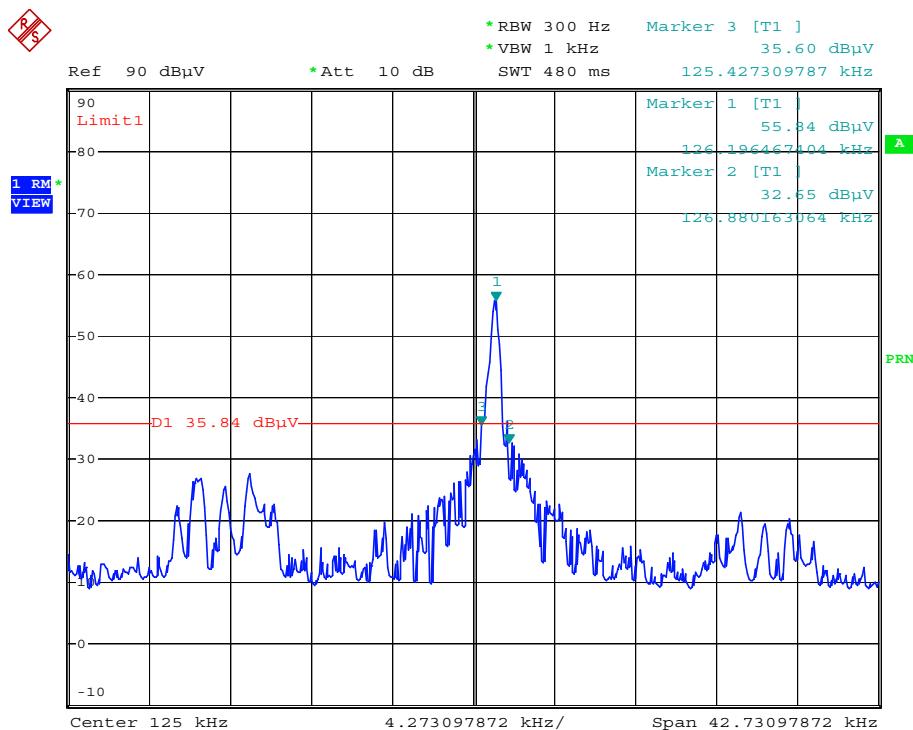


Occupied Bandwidth (-26 dB): **19.00 kHz**

8.2 Emission Bandwidth

Rules and specifications:	IC RSS-210 Issue 5, section 5.9.1
Guide:	IC RSS-210 Issue 5, section 5.9.1
Description:	The 20 dB bandwidth is measured at the points when the spectral density of the signal is 20 dB down from the inband spectral density of the modulated signal, with the transmitter modulated by a representative signal. Spectral density (power per unit bandwidth) is measured with a spectrum analyzer with resolution bandwidth set to 300 Hz or alternatively equal to approximately 1.0% of the emission bandwidth. The video bandwidth shall be at least three times greater than the resolution bandwidth.
Measurement procedure:	Bandwidth Measurements (6.1)

Comment:	
Date of test:	4th May 2005
Test site:	Fully anechoic room, cabin no. 2



Comment: Omnikey 050219: Emission Bandwidth
Date: 4.MAY.2005 18:58:00

Emission bandwidth (-20 dB):	0.77 kHz
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8.3 Designation of Emissions

Rules and specifications:	CFR 47 Part 2, sections 2.201 and 2.202 IC RSS-210 Issue 5, section 5.9.2
Guide:	ANSI C63.4 / TRC-43

Type of modulation:	Amplitude Modulation
---------------------	----------------------

B_n = Necessary Bandwidth	$B_n = 2BK$
B = Modulation rate	$B = 5 \text{ kHz}$
K = Overall numerical factor	$K = 1$
Calculation:	$B_n = 2 \cdot 5 \text{ kHz} \cdot 1 = 10 \text{ kHz}$

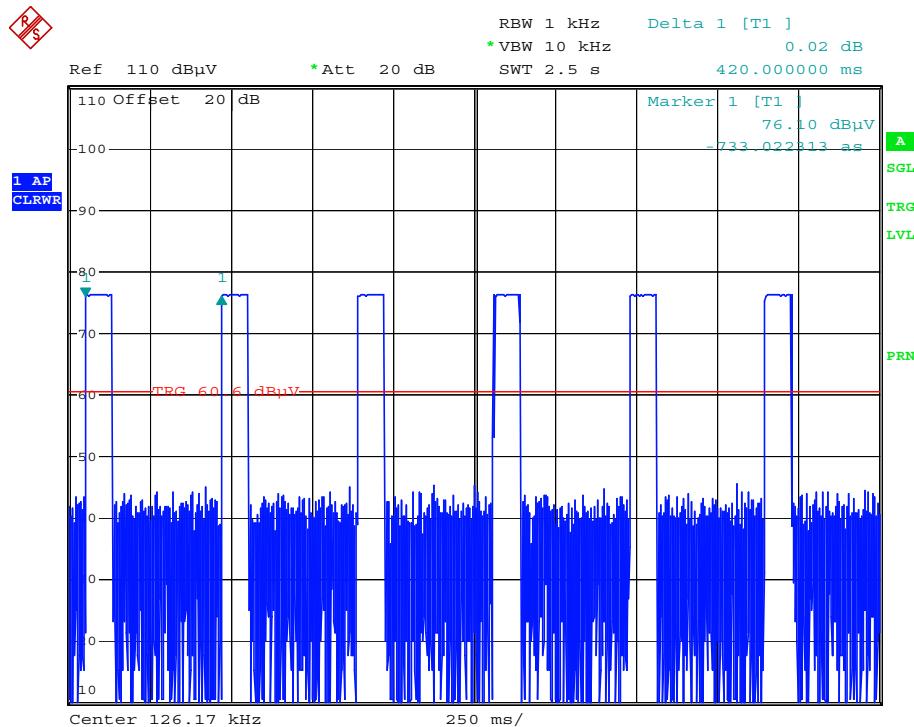
Designation of Emissions:	10K0A1D
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8.4 Pulse Train Measurement

Rules and specifications:	CFR 47 Part 15, section 15.35(c) IC RSS-210 Issue 5, section 6.5
Guide:	ANSI C63.4
Measurement procedure:	Pulse Train Measurement (6.2)

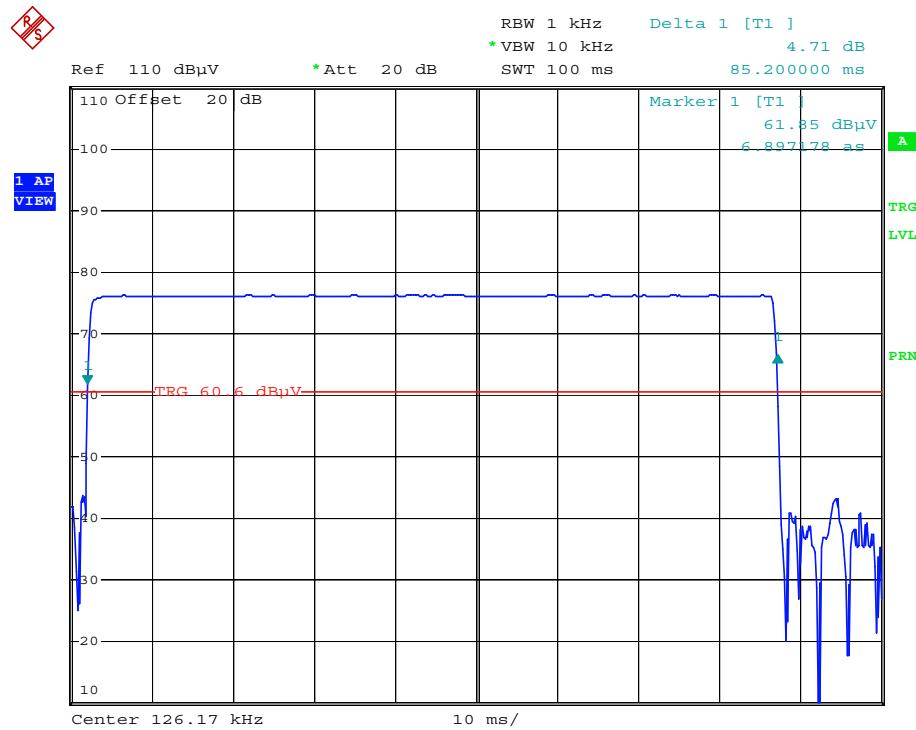
Comment:	
Date of test:	04 May 2005
Test site:	Fully anechoic room, cabin no. 2

Total Pulse Train:



Comment: Omnikey 050219: Puls Train Correction
Date: 4.MAY.2005 18:45:38

Worst case 0.1 second interval:



Comment: Omnikey 050219: Puls Train Correction
Date: 4.MAY.2005 18:43:51

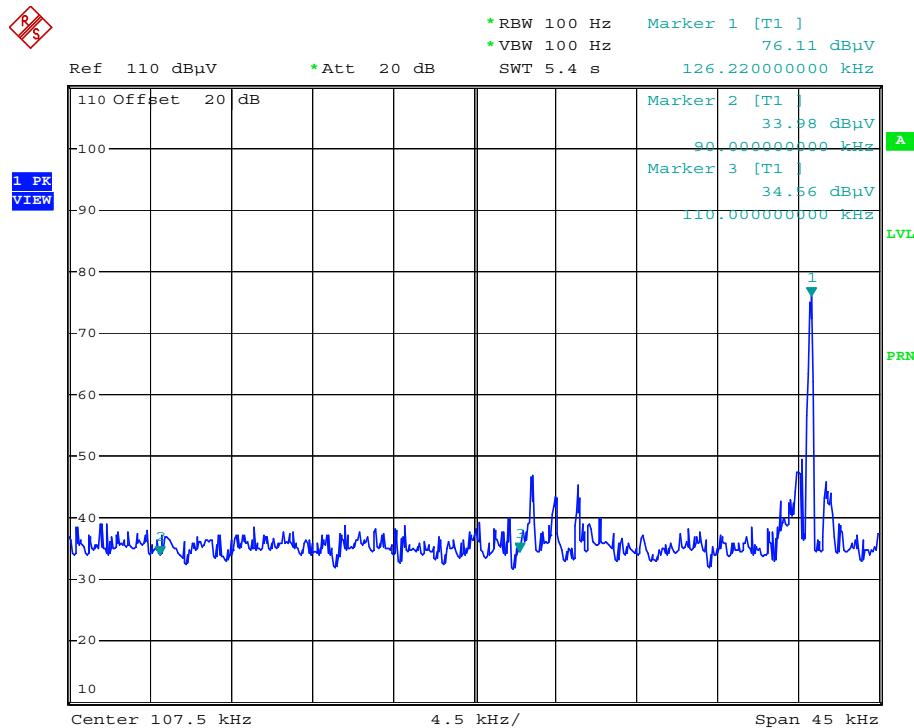
Calculation of pulse train correction:

TX-On-Time (worst case):	T_{on} = 85 ms
Pulse Train Time:	T_{pt} = 420 ms
Period Time:	T_{period} = 100 ms
Pulse Train Correction:	$C_{pt} = 20 \cdot \log(T_{on} / T_{period}) \text{ dB}$ $= -1.41 \text{ dB}$

8.5 Restricted Bands of Operation

Rules and specifications:	CFR 47 Part 15, section 15.205(a) IC RSS-210 Issue 5, section 6.3(a)
Guide:	ANSI C63.4
Limit:	Only spurious emissions are permitted in any of the frequency bands listed in CFR 47 Part 15, section 15.205(a) or IC RSS-210 Issue 5, section 6.3(a).
Measurement procedure:	Radiated Emission Measurement 9 kHz to 30 MHz (6.4)

Comment:	
Date of test:	4th May 2005
Test site:	Fully anechoic room, cabin no. 2
Test distance:	3 meters



Comment: Omnikey 050219: Restricted Bands of Operation
Date: 4.MAY.2005 18:40:55

Test Result:	Test passed
--------------	-------------

8.6 Conducted Powerline Emission Measurement 150 kHz to 30 MHz

Rules and specifications:	CFR 47 Part 15, section 15.207 IC RSS-210 Issue 5, section 6.6				
Guide:	ANSI C63.4 / CISPR 22				
Limit:	CFR 47 Part 15				IC RSS-210
	Frequency of Emission (MHz)	Conducted Limit (dB μ V)		Frequency of Emission (MHz)	Conducted Limit (dB μ V)
		Quasi-peak	Average		Quasi-peak
	0.15 - 0.5	66 to 56	56 to 46	0.45 - 30	48
	0.5 - 5	56	46		
	5 - 30	60	50		
Measurement procedure:	Conducted AC Powerline Emission (6.3)				

Comment:	Test performed on AC supply of PC.
Mode:	Transmitting continuously
Date of test:	9 th May, 2005
Test site:	Shielded room, cabin no. 4

Test Result:	Test passed
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Tested on:	L1
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Frequency (MHz)	Detector	Reading Value (dB μ V)	Correction Factor (dB)	Final Value (dB μ V)	CFR 47 Part 15 Limit (dB μ V)	Margin (dB)	RSS-210 Limit (dB μ V)	Margin (dB)
2.805	Quasi-Peak	33.8	0.0	33.8	56.0	22.2	48.0	14.2
2.955	Quasi-Peak	31.9	0.0	31.9	56.0	24.1	48.0	16.1
4.280	Quasi-Peak	36.5	0.0	36.5	56.0	19.5	48.0	11.5
4.725	Quasi-Peak	36.8	0.0	36.8	56.0	19.2	48.0	11.2
15.870	Quasi-Peak	43.5	0.0	43.5	60.0	16.5	48.0	4.5
18.525	Quasi-Peak	43.8	0.0	43.8	60.0	16.2	48.0	4.2
19.710	Quasi-Peak	42.0	0.0	42.0	60.0	18.0	48.0	6.0

Tested on:	N
------------	---

Frequency (MHz)	Detector	Reading Value (dB μ V)	Correction Factor (dB)	Final Value (dB μ V)	CFR 47 Part 15		RSS-210	
					Limit (dB μ V)	Margin (dB)	Limit (dB μ V)	Margin (dB)
0.370	Quasi-Peak	37.5	0.0	37.5	58.5	21.0		
0.590	Quasi-Peak	37.7	0.0	37.7	56.0	18.3	48.0	10.3
0.810	Quasi-Peak	37.4	0.0	37.4	56.0	18.6	48.0	10.6
0.885	Quasi-Peak	37.7	0.0	37.7	56.0	18.3	48.0	10.3
1.105	Quasi-Peak	36.4	0.0	36.4	56.0	19.6	48.0	11.6
1.330	Quasi-Peak	37.8	0.0	37.8	56.0	18.2	48.0	10.2
1.845	Quasi-Peak	37.6	0.0	37.6	56.0	18.4	48.0	10.4
2.065	Quasi-Peak	37.7	0.0	37.7	56.0	18.3	48.0	10.3
2.360	Quasi-Peak	36.3	0.0	36.3	56.0	19.7	48.0	11.7
3.100	Quasi-Peak	36.6	0.0	36.6	56.0	19.4	48.0	11.4
4.280	Quasi-Peak	35.5	0.0	35.5	56.0	20.5	48.0	12.5
4.795	Quasi-Peak	35.2	0.0	35.2	56.0	20.8	48.0	12.8
15.870	Quasi-Peak	43.0	0.0	43.0	60.0	17.0	48.0	5.0
18.150	Quasi-Peak	44.3	0.0	44.3	60.0	15.7	48.0	3.7
19.995	Quasi-Peak	38.6	0.0	38.6	60.0	21.4	48.0	9.4

Comment:	Test performed on AC supply of PC.		
Mode:	Reading TAG continuously		
Date of test:	9 th May, 2005		
Test site:	Shielded room, cabin no. 4		

Test Result:	Test passed		
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Tested on:	L1		
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Frequency (MHz)	Detector	Reading Value (dB μ V)	Correction Factor (dB)	Final Value (dB μ V)	CFR 47 Part 15 Limit (dB μ V)	Margin (dB)	RSS-210 Limit (dB μ V)	Margin (dB)
0.515	Quasi-Peak	35.7	0.0	35.7	56.0	20.3	48.0	12.3
3.545	Quasi-Peak	35.5	0.0	35.5	56.0	20.5	48.0	12.5
4.280	Quasi-Peak	35.5	0.0	35.5	56.0	20.5	48.0	12.5
4.725	Quasi-Peak	36.3	0.0	36.3	56.0	19.7	48.0	11.7
15.805	Quasi-Peak	40.5	0.0	40.5	60.0	19.5	48.0	7.5
18.305	Quasi-Peak	45.2	0.0	45.2	60.0	14.8	48.0	2.8
19.705	Quasi-Peak	44.8	0.0	44.8	60.0	15.2	48.0	3.2

Tested on:	N		
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Frequency (MHz)	Detector	Reading Value (dB μ V)	Correction Factor (dB)	Final Value (dB μ V)	CFR 47 Part 15 Limit (dB μ V)	Margin (dB)	RSS-210 Limit (dB μ V)	Margin (dB)
0.370	Quasi-Peak	37.6	0.0	37.6	58.5	20.9		
0.590	Quasi-Peak	37.8	0.0	37.8	56.0	18.2	48.0	10.2
0.810	Quasi-Peak	38.3	0.0	38.3	56.0	17.7	48.0	9.7
0.885	Quasi-Peak	37.9	0.0	37.9	56.0	18.1	48.0	10.1
1.035	Quasi-Peak	36.1	0.0	36.1	56.0	19.9	48.0	11.9
1.330	Quasi-Peak	38.0	0.0	38.0	56.0	18.0	48.0	10.0
1.845	Quasi-Peak	37.7	0.0	37.7	56.0	18.3	48.0	10.3
2.065	Quasi-Peak	37.8	0.0	37.8	56.0	18.2	48.0	10.2
2.805	Quasi-Peak	37.3	0.0	37.3	56.0	18.7	48.0	10.7
3.545	Quasi-Peak	36.6	0.0	36.6	56.0	19.4	48.0	11.4
3.840	Quasi-Peak	35.4	0.0	35.4	56.0	20.6	48.0	12.6
4.795	Quasi-Peak	33.2	0.0	33.2	56.0	22.8	48.0	14.8
15.870	Quasi-Peak	43.4	0.0	43.4	60.0	16.6	48.0	4.6
18.015	Quasi-Peak	45.2	0.0	45.2	60.0	14.8	48.0	2.8
19.710	Quasi-Peak	42.1	0.0	42.1	60.0	17.9	48.0	5.9

Sample calculation of final values:

$$\text{Final Value (dB}\mu\text{V)} = \text{Reading Value (dB}\mu\text{V)} + \text{Correction Factor (dB)}$$

8.7 Radiated Emission Measurement 9 kHz to 30 MHz

Rules and specifications:	CFR 47 Part 15, sections 15.205 and 15.209 IC RSS-210 Issue 5, sections 6.2.1 and 6.3			
Guide:	ANSI C63.4			
Limit:	Frequency of Emission (MHz)	Field Strength (μ V/m)	Field Strength ($dB\mu$ V/m)	Measurement Distance d (meters)
	0.009 - 0.490	2400/F(kHz)	67.6 - 20 · log(F(kHz))	300
	0.490 - 1.705	24000/F(kHz)	87.6 - 20 · log(F(kHz))	30
		1.705 - 30.000	30	29.5
Additionally, the level of any unwanted emissions shall not exceed the level of the fundamental emission.				
Measurement procedure:	Radiated Emission Measurement 9 kHz to 30 MHz (6.4)			

Comment:	EUT extended to maximum carrier output.	
Mode	Transmitting continuously	
Date of test:	9 th May, 2005	
Test site:	Open field test site	

Test Result:	Test passed	
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Frequency (MHz)	Detector	Distance d ₁ (m)	Distance d ₂ (m)	Reading Value d ₁ ($dB\mu$ V)	Reading Value d ₂ ($dB\mu$ V)	Correction Factor (dB/m)	Extrapolation Factor (dB/dec)	Pulse Train Correction (dB)	Final Value ($dB\mu$ V/m)	Limit ($dB\mu$ V/m)	Margin (dB)
0.126	QP	3	10	56.0	29.4	20.0	-50.9	-75.1	-25.7	25.6	51.3
0.379	QP		3		32.2	20.0	-40.0	-80.0	-27.8	16.0	43.8

Comment:	EUT extended to maximum carrier output.	
Mode:	Reading TAG continuously	
Date of test:	9 th May, 2005	
Test site:	Open field test site	

Test Result:	Test passed
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Frequency (MHz)	Detector	Distance d ₁ (m)	Distance d ₂ (m)	Reading Value d ₁ (dB μ V)	Reading Value d ₂ (dB μ V)	Correction Factor (dB/m)	Extrapolation Factor (dB/dec)	Pulse Train Correction (dB)	Final Value (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
0.126	QP	3	10	57.7	30.0	20.0	-53.0	-78.3	-28.3	25.6	53.8
0.379	QP		3		29.9	20.0	-40.0	-80.0	-30.1	16.0	46.1

Sample calculation of final values:

$$\text{Extrapolation Factor (dB/decade)} = \begin{cases} -40 \text{ (dB/decade)} & \text{if } d_1 = d_2 \\ \frac{\text{Reading Value } d_2 \text{ (dB}\mu\text{V)} - \text{Reading Value } d_1 \text{ (dB}\mu\text{V)}}{\text{Log}(d_2) - \text{Log}(d_1)} & \text{if } d_1 \neq d_2 \end{cases}$$

$$\text{Extrapolation Factor (dB)} = (\text{Log}(d) - \text{Log}(d_2)) \cdot \text{Extrapolation Factor (dB/decade)}$$

$$\text{Final Value (dB}\mu\text{V/m)} = \text{Reading Value } d_2 \text{ (dB}\mu\text{V)} + \text{Correction Factor (dB/m)} + \text{Extrapolation Factor (dB)} + \text{Pulse Train Correction (dB)}$$

8.8 Radiated Emission Measurement 30 MHz to 1 GHz

Rules and specifications:	CFR 47 Part 15, section 15.209 IC RSS-210 Issue 5, section 6.2.1		
Guide:	ANSI C63.4		
Limit:	Frequency of Emission (MHz)	Field Strength (μ V/m)	Field Strength (dB μ V/m)
	30 - 88	100	40.0
	88 - 216	150	43.5
	216 - 960	200	46.0
	Above 960	500	54.0
Additionally, the level of any unwanted emissions shall not exceed the level of the fundamental emission.			
Measurement procedures:	Radiated Emission in Fully or Semi Anechoic Room (6.5) Radiated Emission at Open Field Test Site (6.6)		

Comment:		
Date of test:	9 th May, 2005	
Mode:	Transmitting continuously	
Test site:	Frequencies \leq 1 GHz: Open field test site Frequencies $>$ 1 GHz: Fully anechoic room, cabin no. 2	
Test distance:	3 meters	

Test Result:	Test passed
--------------	-------------

Frequency (MHz)	Antenna Polarization	Detector	Receiver Reading (dB μ V)	Correction Factor (dB/m)	Pulse Train Correction (dB)	Final Value (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
47.800	vertical	Quasi-Peak	22.2	10.7		32.9	40.0	7.1
170.450	vertical	Quasi-Peak	14.2	14.5		28.7	43.5	14.8
171.970	vertical	Quasi-Peak	14.7	14.6		29.3	43.5	14.2
173.470	vertical	Quasi-Peak	14.7	14.7		29.4	43.5	14.1
177.030	horizontal	Quasi-Peak	17.8	15.2		33.0	43.5	10.5
179.300	vertical	Quasi-Peak	15.5	15.7		31.2	43.5	12.3
181.550	horizontal	Quasi-Peak	18.0	15.9		33.9	43.5	9.6
183.820	vertical	Quasi-Peak	16.7	16.0		32.7	43.5	10.8
187.370	horizontal	Quasi-Peak	17.7	16.2		33.9	43.5	9.6
188.070	vertical	Quasi-Peak	17.8	16.2		34.0	43.5	9.5
195.400	horizontal	Quasi-Peak	16.6	16.6		33.2	43.5	10.3
199.220	vertical	Quasi-Peak	12.2	16.8		29.0	43.5	14.5
385.430	horizontal	Quasi-Peak	14.8	18.0		32.8	46.0	13.2

Comment:	
Date of test:	9 th May 2005
Mode:	Reading TAG continuously
Test site:	Frequencies ≤ 1 GHz: Open field test site Frequencies > 1 GHz: Fully anechoic room, cabin no. 2
Test distance:	3 meters

Test Result:	Test passed
--------------	-------------

Frequency (MHz)	Antenna Polarization	Detector	Receiver Reading (dB μ V)	Correction Factor (dB/m)	Pulse Train Correction (dB)	Final Value (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
47.520	vertical	Quasi-Peak	22.9	10.7		33.6	40.0	6.4
124.260	vertical	Quasi-Peak	15.3	12.5		27.8	43.5	15.7
180.000	vertical	Quasi-Peak	17.9	15.8		33.7	43.5	9.8
185.060	vertical	Quasi-Peak	16.1	16.1		32.2	43.5	11.3
185.320	horizontal	Quasi-Peak	20.2	16.1		36.3	43.5	7.2
187.220	vertical	Quasi-Peak	17.2	16.2		33.4	43.5	10.1
190.360	horizontal	Quasi-Peak	23.7	16.3		40.0	43.5	3.5
193.140	vertical	Quasi-Peak	18.3	16.5		34.8	43.5	8.7
195.890	horizontal	Quasi-Peak	17.1	16.6		33.7	43.5	9.8
199.310	vertical	Quasi-Peak	12.1	16.8		28.9	43.5	14.6
385.500	horizontal	Quasi-Peak	16.0	18.0		34.0	46.0	12.0

Sample calculation of final values:

$$\text{Final Value (dB}\mu\text{V/m)} = \text{Reading Value (dB}\mu\text{V)} + \text{Correction Factor (dB/m)} + \text{Pulse Train Correction (dB)}$$

8.9 Exposure of Humans to RF Fields

Rules and specifications:	IC RSS-210 Issue 5, section 14
Guide:	IC RSS-102 Issue 1, section 4.1

Exposure of Humans to RF Fields		Applicable	Declared by applicant	Measured	Exemption
The transmitter is for					
<input checked="" type="checkbox"/> fixed use <input type="checkbox"/> mobile use <input type="checkbox"/> portable use			<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The antenna is					
<input type="checkbox"/> detachable The output power (TP in watts) is measured at the antenna connector: $TP = \dots \text{W}$					
Numerical gain of the antenna:		$G = \dots$ <input type="checkbox"/>			
<input checked="" type="checkbox"/> not detachable A field strength measurement is used to determine the output power (TP in watts) given by ⁵ : $TP = \frac{(FS \cdot D)^2}{30 \cdot G} \Rightarrow TP = 333 \text{ nW}$					
with: Field strength ⁶ in V/m: $FS = 316 \mu\text{V/m}$ Distance between the two antennas in m: $D = 10 \text{ m}$ Numerical gain of the antenna: $G = 1$					
SAR and RF evaluation					
$EIRP = G \cdot TP \Rightarrow EIRP = 333 \text{ nW}$					
<input type="checkbox"/> Transmitter is operating at frequencies below 1.0 GHz with an output power TP equal to or less than 200 milliwatts (mW). <input type="checkbox"/> Transmitter is operating at frequencies between 1.0 and 2.2 GHz with an output power TP equal to or less than 100 milliwatts (mW). <input type="checkbox"/> Transmitter is for mobile use and operating frequency is below 1.5 GHz with effective radiated power (ERP) of 1.5 watts or less (i.e. EIRP of 2.5 watts or less). <input type="checkbox"/> Transmitter is for mobile use and operating frequency is above 1.5 GHz with ERP of 3 watts or less (i.e. EIRP of 5 watts or less). <input type="checkbox"/> SAR and/or RF evaluation is documented in test report no.					<input checked="" type="checkbox"/>

⁵ The conversion formula is valid only for properly matched antennas. In other cases the transmitter output power may have to be measured by a terminated measurement when applying the exemption clauses.

⁶ If an open area test site is used for field strength measurement, the effect due to the metal ground reflecting plane should be subtracted from the maximum field strength value in order to reference it to free space, before calculating TP.

9 Referenced Regulations

All tests were performed with reference to the following regulations and standards:

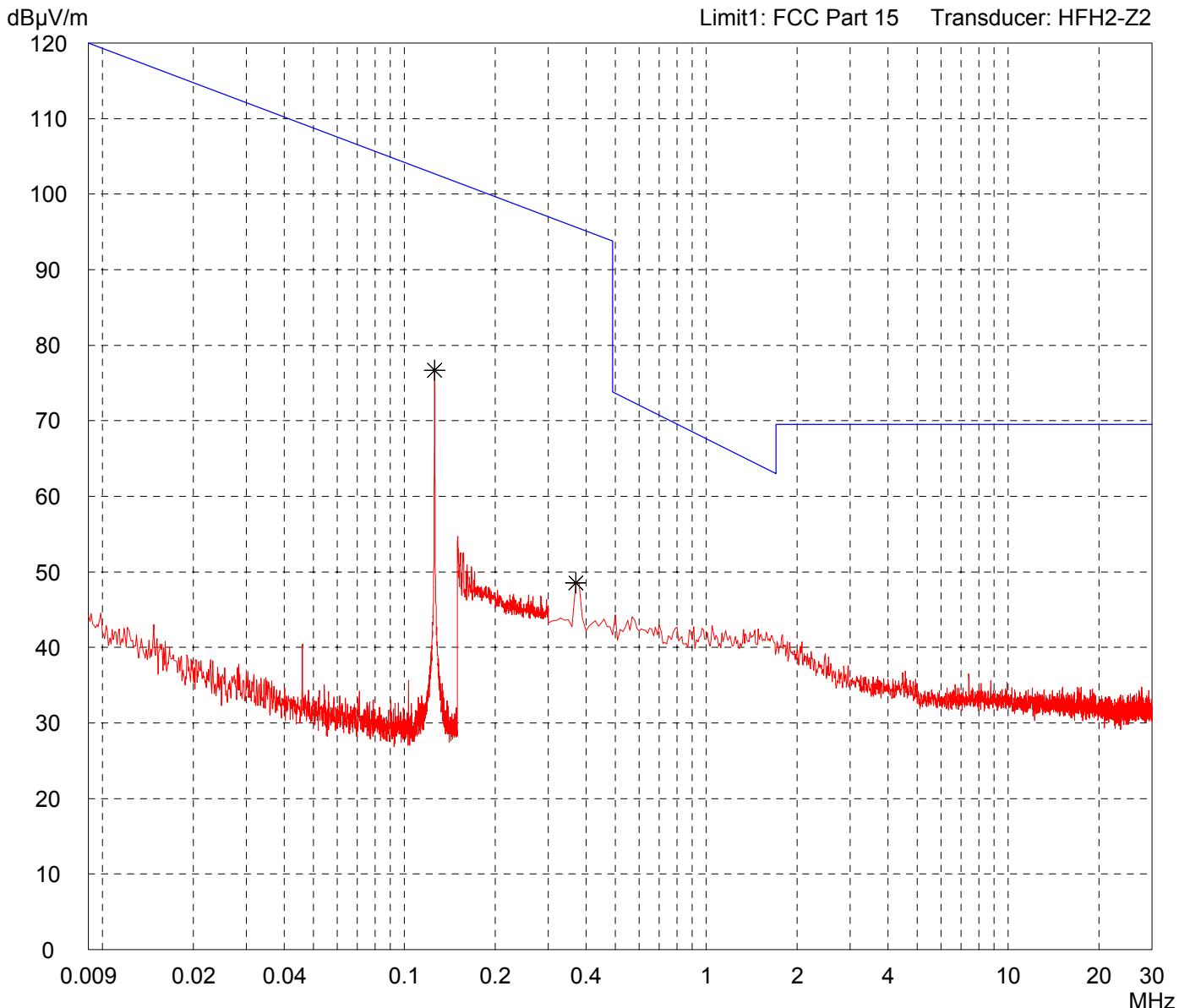
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<input checked="" type="checkbox"/>	CFR 47 Part 15	Code of Federal Regulations Part 15 (Radio Frequency Devices) of the Federal Communication Commission (FCC)	April 5, 2005
<input checked="" type="checkbox"/>	ANSI C63.4	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	December 11, 2003 (published on January 30, 2004)
<input checked="" type="checkbox"/>	RSS-210	Radio Standards Specification RSS-210 Issue 5 for Low Power Licence-Exempt Radiocommunication Devices (All Frequency Bands), published by Industry Canada	November 2001
<input checked="" type="checkbox"/>	RSS-102	Radio Standards Specification RSS-102 Issue 1: Evaluation Procedure for Mobile and Portable Radio Transmitters with respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields, published by Industry Canada	September 1999
<input type="checkbox"/>	ICES-003	Interference-Causing Equipment Standard ICES-003 Issue 4 for Digital Apparatus, published by Industry Canada	February 2004
<input checked="" type="checkbox"/>	CISPR 22	Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22, "Information Technology Equipment – Radio Disturbance Characteristics – Limits and Methods of Measurement"	1997
<input type="checkbox"/>	CAN/CSA-CEI/IEC CISPR 22	Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment	2002
<input checked="" type="checkbox"/>	TRC-43	Notes Regarding Designation of Emission (Including Necessary Bandwidth and Classification), Class of Station and Nature of Service, published by Industry Canada	October 9, 1982

10 Charts taken during testing

Radiated Emission Test 9 kHz - 30 MHz acc. to FCC Part 15 (Fully Anechoic Chamber)

Model: CardMan 5125	Comment: - With Laptop "DELL Latitude"
Serial no.: ---	- transmitting continuously
Applicant: Omnikey GmbH	
Test site: Fully anechoic room, cabin no. 2	
Tested on: Test distance 3 metres	
Date of test: 05/04/2005	Operator: M. Steindl
Test performed: by hand	File name: default.emi

Detector: Peak	List of values: Selected by hand
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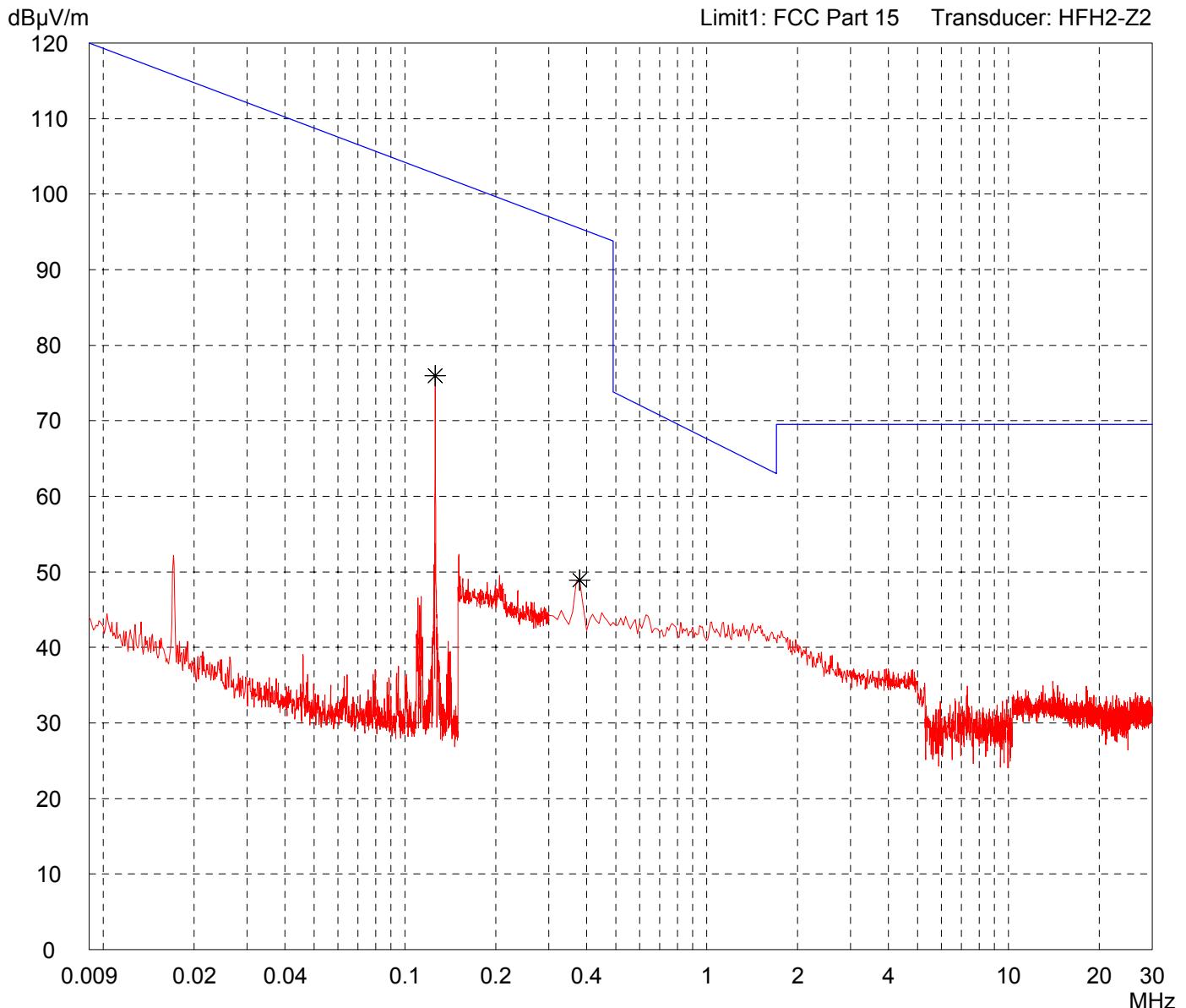
Result: Prescan

Project file: 55465-50219	Page of Pages
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Radiated Emission Test 9 kHz - 30 MHz acc. to FCC Part 15 (Fully Anechoic Chamber)

Model: CardMan 5125	Comment: - With Laptop "DELL Latitude"
Serial no.: ---	- transmitting continuously
Applicant: Omnikey GmbH	
Test site: Fully anechoic room, cabin no. 2	
Tested on: Test distance 3 metres	
Date of test: 05/04/2005	Operator: M. Steindl
Test performed: by hand	File name: default.emi

Detector: Peak	List of values: Selected by hand
-------------------	-------------------------------------



Result: Prescan

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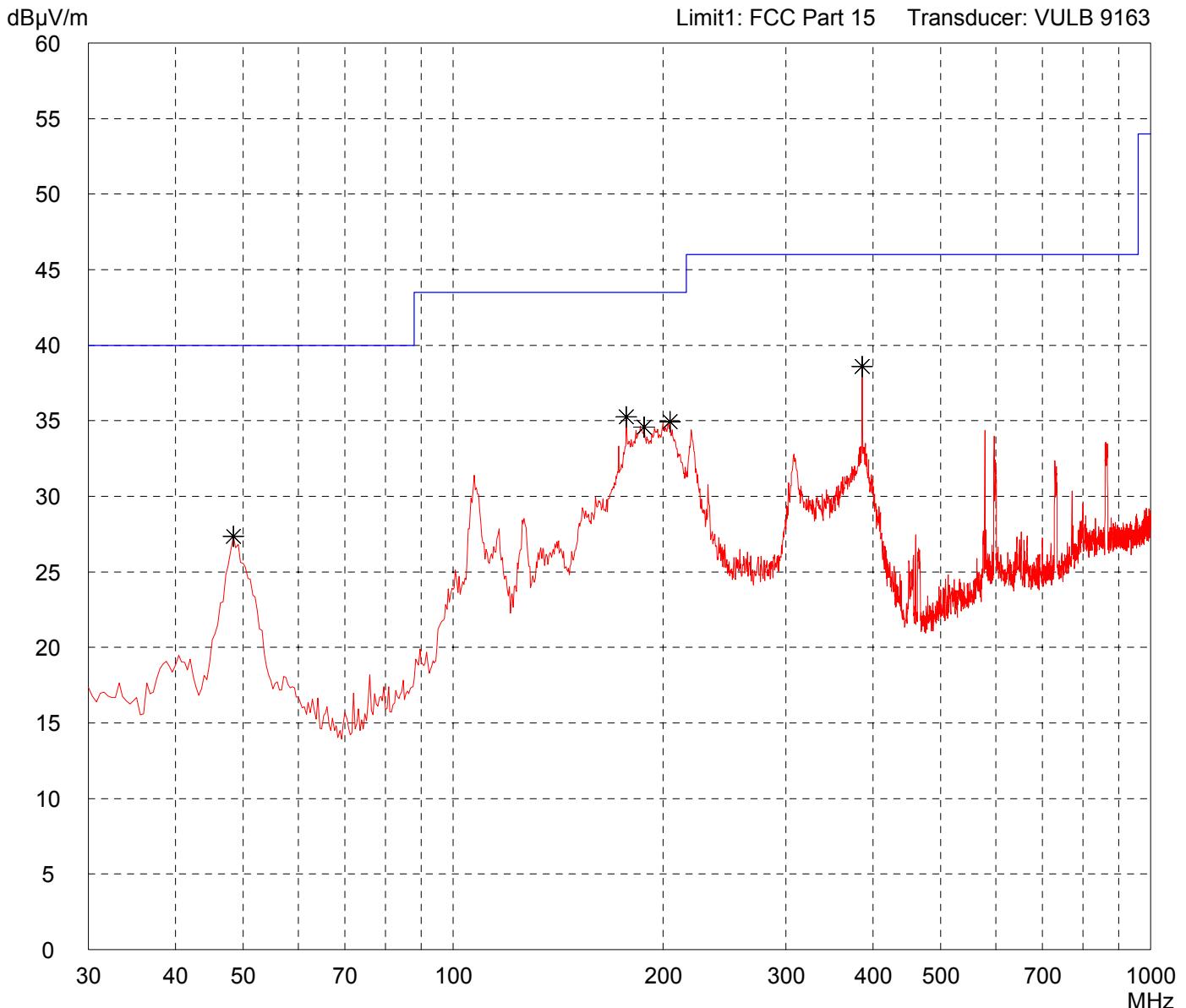
Radiated Emission Test 30 MHz - 1 GHz acc. to FCC Part 15 (Fully Anechoic Chamber)

Model: CardMan 5125	
Serial no.: ---	
Applicant: Omnikey GmbH	
Test site: Fully anechoic room, cabin no. 2	
Tested on: Test distance 3 metres Horizontal Polarization	
Date of test: 05/04/2005	Operator: M. Steindl
Test performed: automatically	File name: default.emi

Comment: - With Laptop "DELL Latitude" - transmitting continuously

Detector: Peak

List of values:
Selected by hand



Result: Prescan

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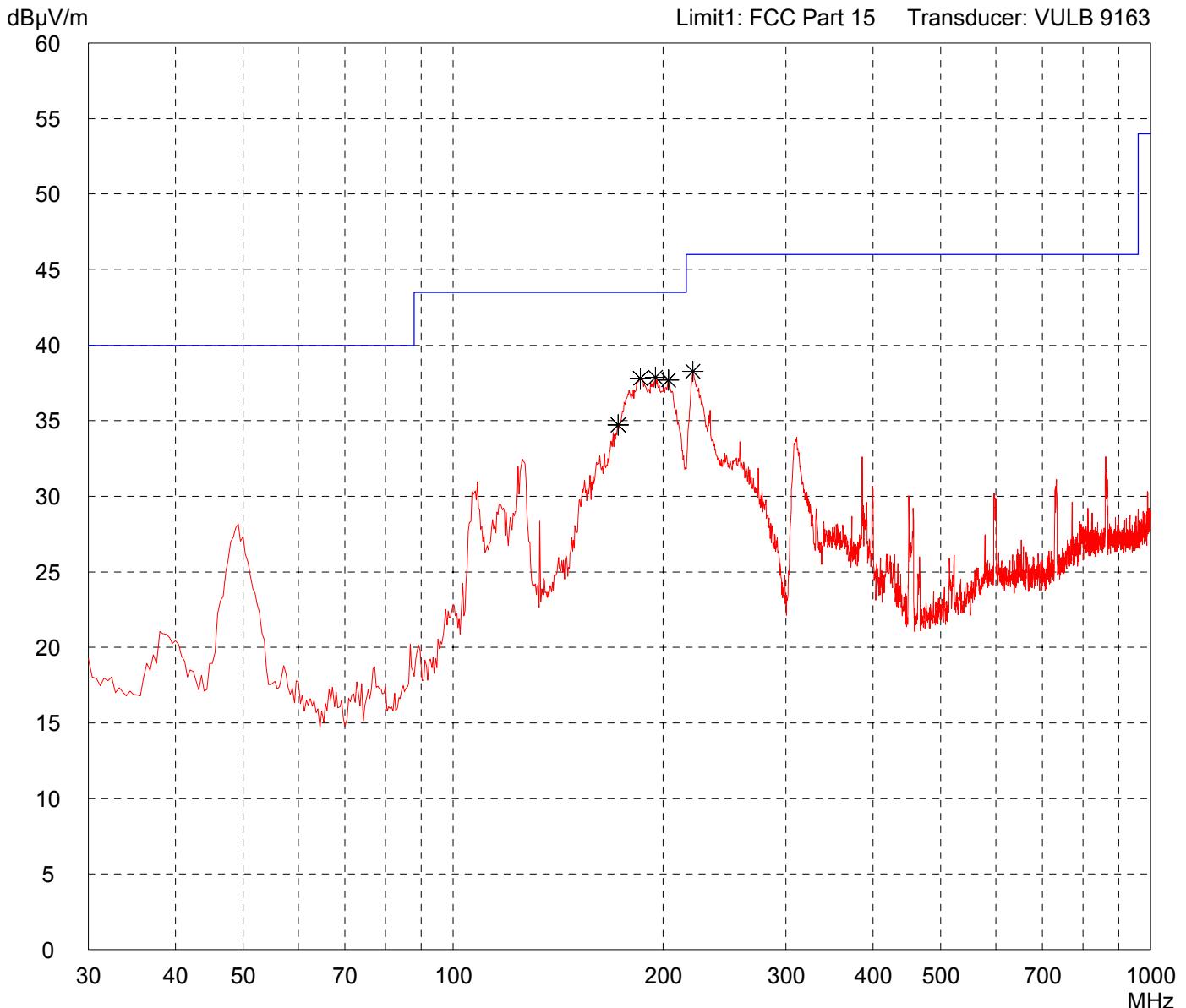
Radiated Emission Test 30 MHz - 1 GHz acc. to FCC Part 15 (Fully Anechoic Chamber)

Model: CardMan 5125	
Serial no.: ---	
Applicant: Omnikey GmbH	
Test site: Fully anechoic room, cabin no. 2	
Tested on: Test distance 3 metres Vertical Polarization	
Date of test: 05/04/2005	Operator: M. Steindl
Test performed: automatically	File name: default.emi

Comment: - With Laptop "DELL Latitude" - transmitting continuously

Detector: Peak

List of values: 10 dB Margin	50 Subranges
---------------------------------	--------------



Result: Prescan

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Radiated Emission Test 30 MHz - 1 GHz acc. to FCC Part 15 (Fully Anechoic Chamber)

Model: CardMan 5125	Comment: - With Laptop "DELL Latitude"
Serial no.: ---	- reading TAG continuously
Applicant: Omnikey GmbH	
Test site: Fully anechoic room, cabin no. 2	
Tested on: Test distance 3 metres Horizontal Polarization	
Date of test: 05/04/2005	Operator: M. Steindl
Test performed: automatically	File name: default.emi

Detector: Peak	List of values: 10 dB Margin	50 Subranges
-------------------	---------------------------------	--------------

dB μ V/m

Limit1: FCC Part 15 Transducer: VULB 9163



Result:

Prescan

Project file:

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Radiated Emission Test 30 MHz - 1 GHz

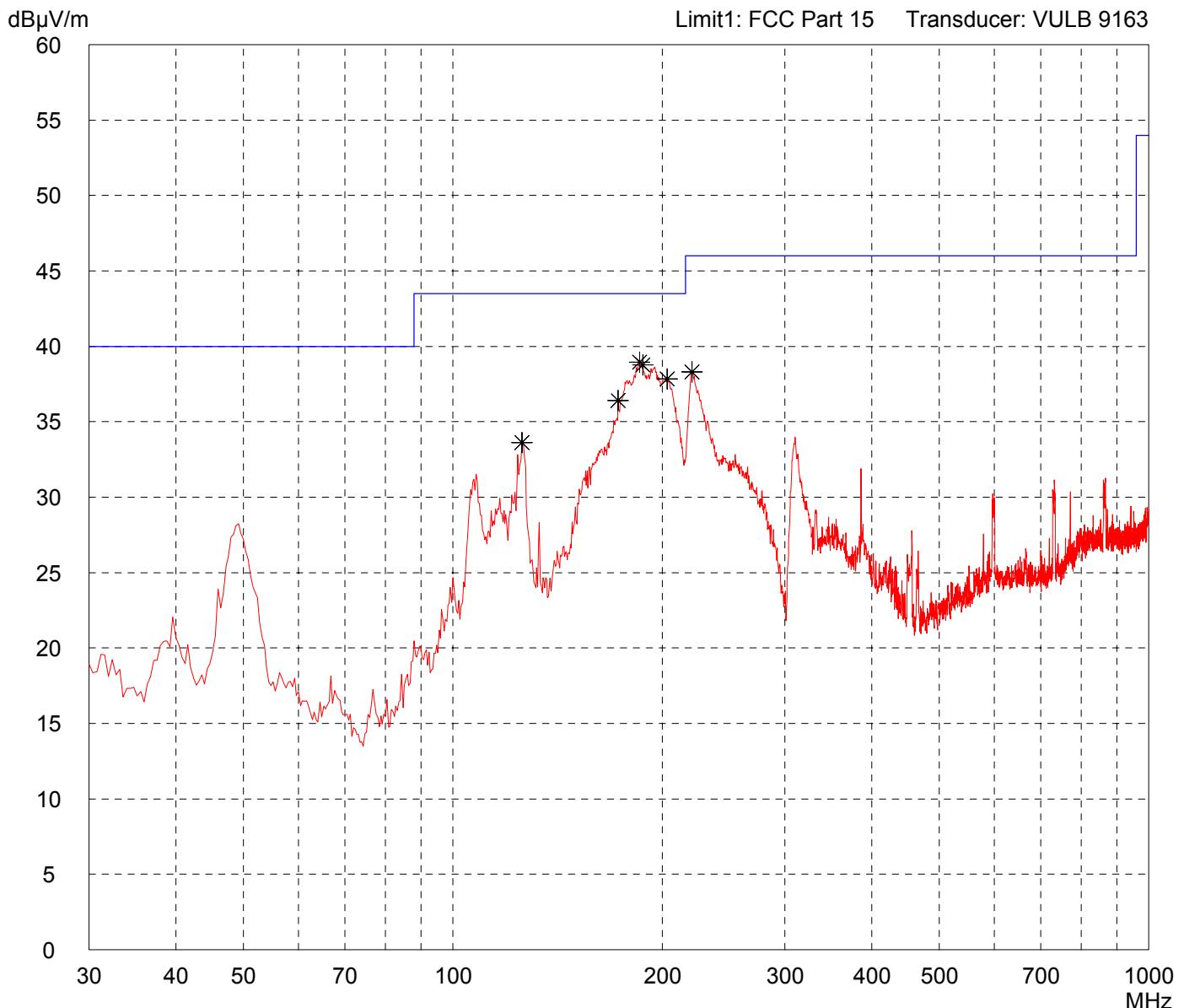
acc. to FCC Part 15 (Fully Anechoic Chamber)

Model: CardMan 5125	
Serial no.: ---	
Applicant: Omnikey GmbH	
Test site: Fully anechoic room, cabin no. 2	
Tested on: Test distance 3 metres Vertical Polarization	
Date of test: 05/04/2005	Operator: M. Steindl
Test performed: automatically	File name: default.emi

Comment: - With Laptop "DELL Latitude" - reading TAG continuously

Detector: Peak

List of values: 10 dB Margin	50 Subranges
---------------------------------	--------------



Result: Prescan

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Conducted Emission Test 150 kHz - 30 MHz according to FCC Part 15 Subpart C

Model:
CardMan 5125

Serial no.:

Applicant:
Omnikey GmbH

Test site:
Shielded room, cabin no. 1

Tested on:
Linecord
Phase L1

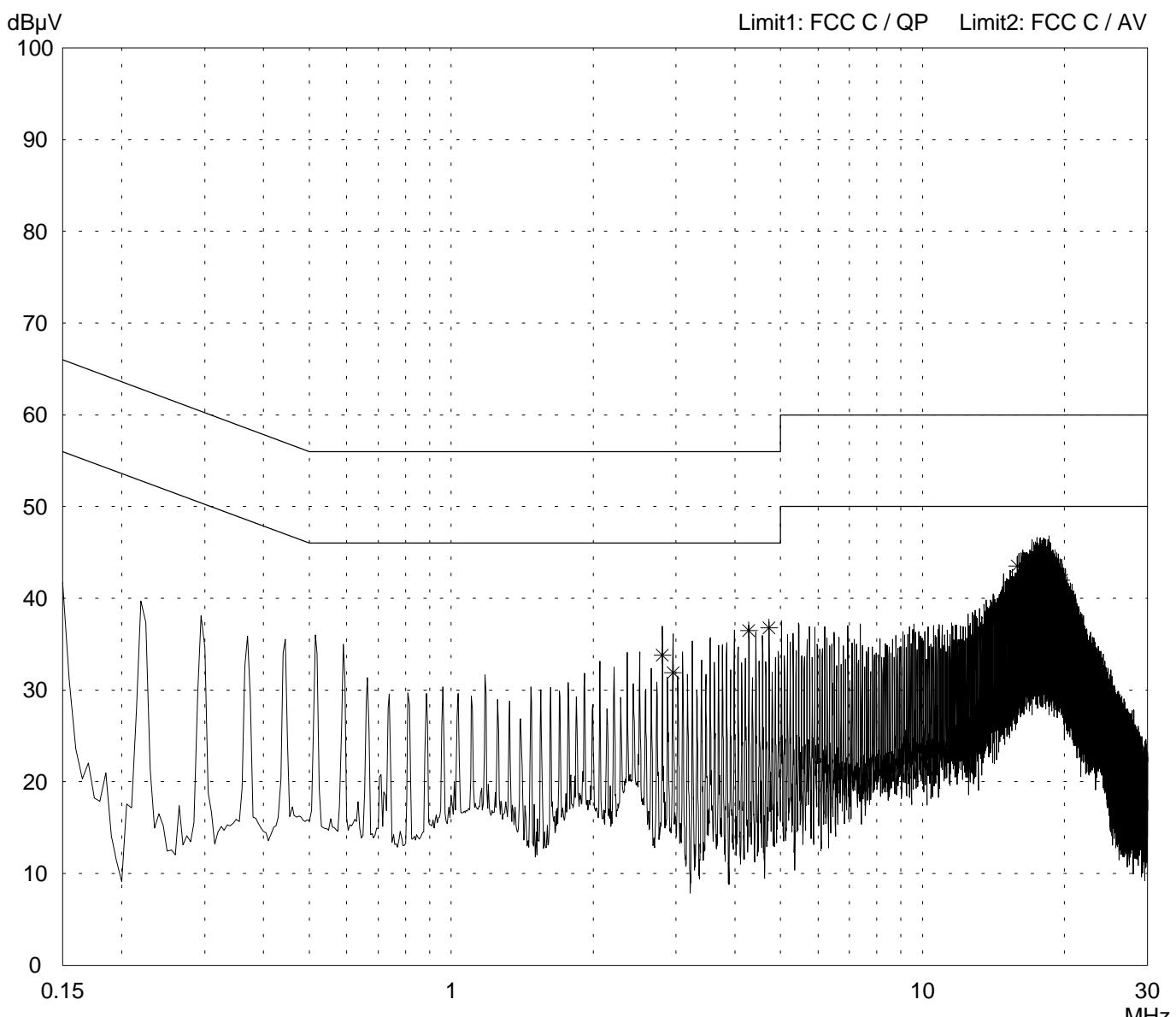
Date of test: 05/09/2005 Operator: M. Steindl

Test performed: semi automatically

Mode:
- With PC "DELL Optiplex GX280"
- FCC test setup
- AC 115 V power supply
- transmitting continuously

Detector:
Peak / Final Results: QP

Final results:
20 dB Margin 25 Subranges



Result:
Limit kept

Project file:
55465-50219

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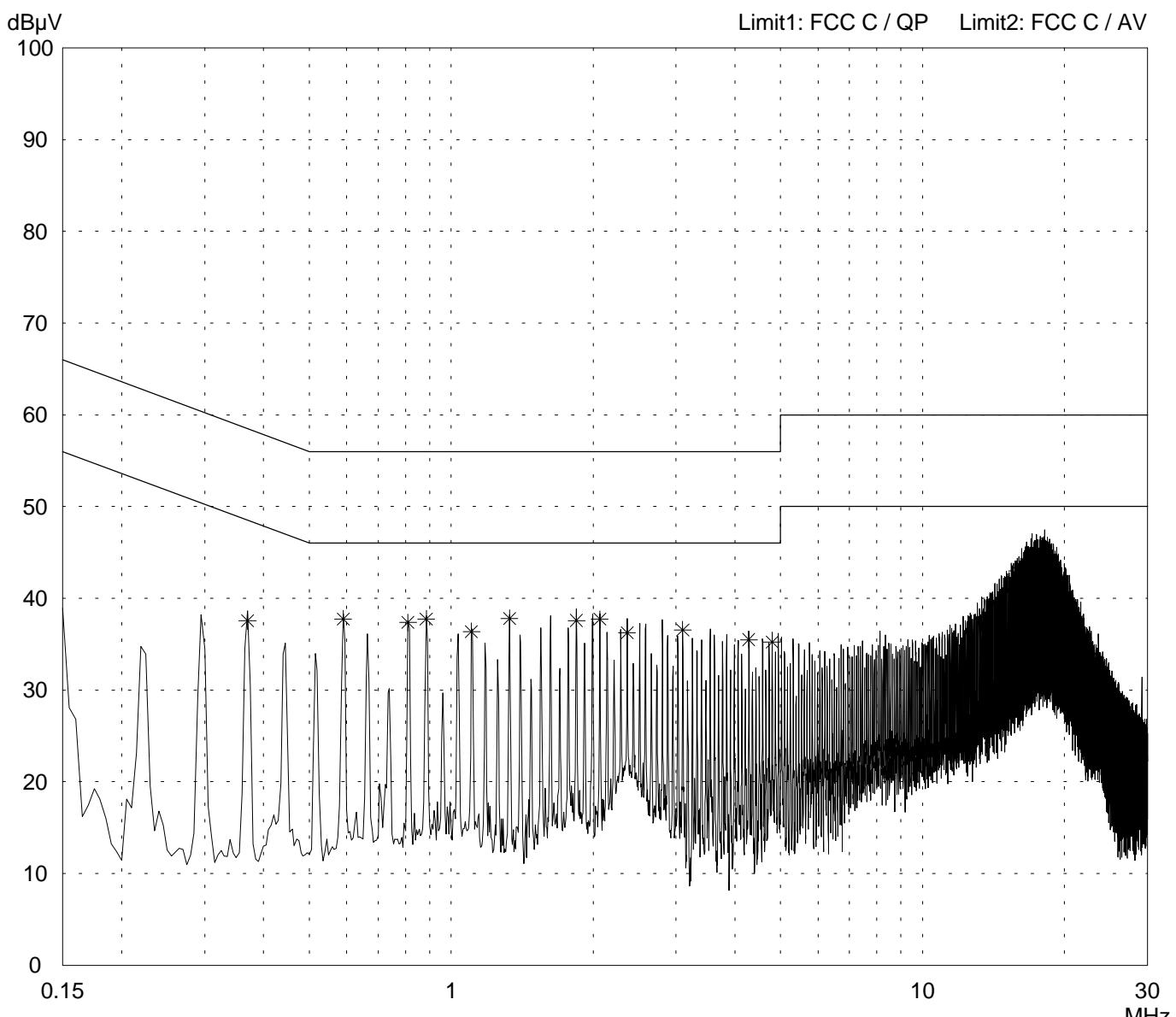
Conducted Emission Test 150 kHz - 30 MHz according to FCC Part 15 Subpart C

Model: CardMan 5125	
Serial no.: ---	
Applicant: Omnikey GmbH	
Test site: Shielded room, cabin no. 1	
Tested on: Linecord Phase N	
Date of test: 05/09/2005	Operator: M. Steindl
Test performed: semi automatically	File name:

Mode: - With PC "DELL Optiplex GX280" - FCC test setup - AC 115 V power supply - transmitting continuously

Detector: Peak / Final Results: QP

Final results: 20 dB Margin	25 Subranges
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Result: Limit kept

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Conducted Emission Test 150 kHz - 30 MHz according to FCC Part 15 Subpart C

Model:
CardMan 5125

Serial no.:

Applicant:
Omnikey GmbH

Test site:
Shielded room, cabin no. 1

Tested on:
Linecord
Phase L1

Date of test: 05/09/2005 Operator: M. Steindl

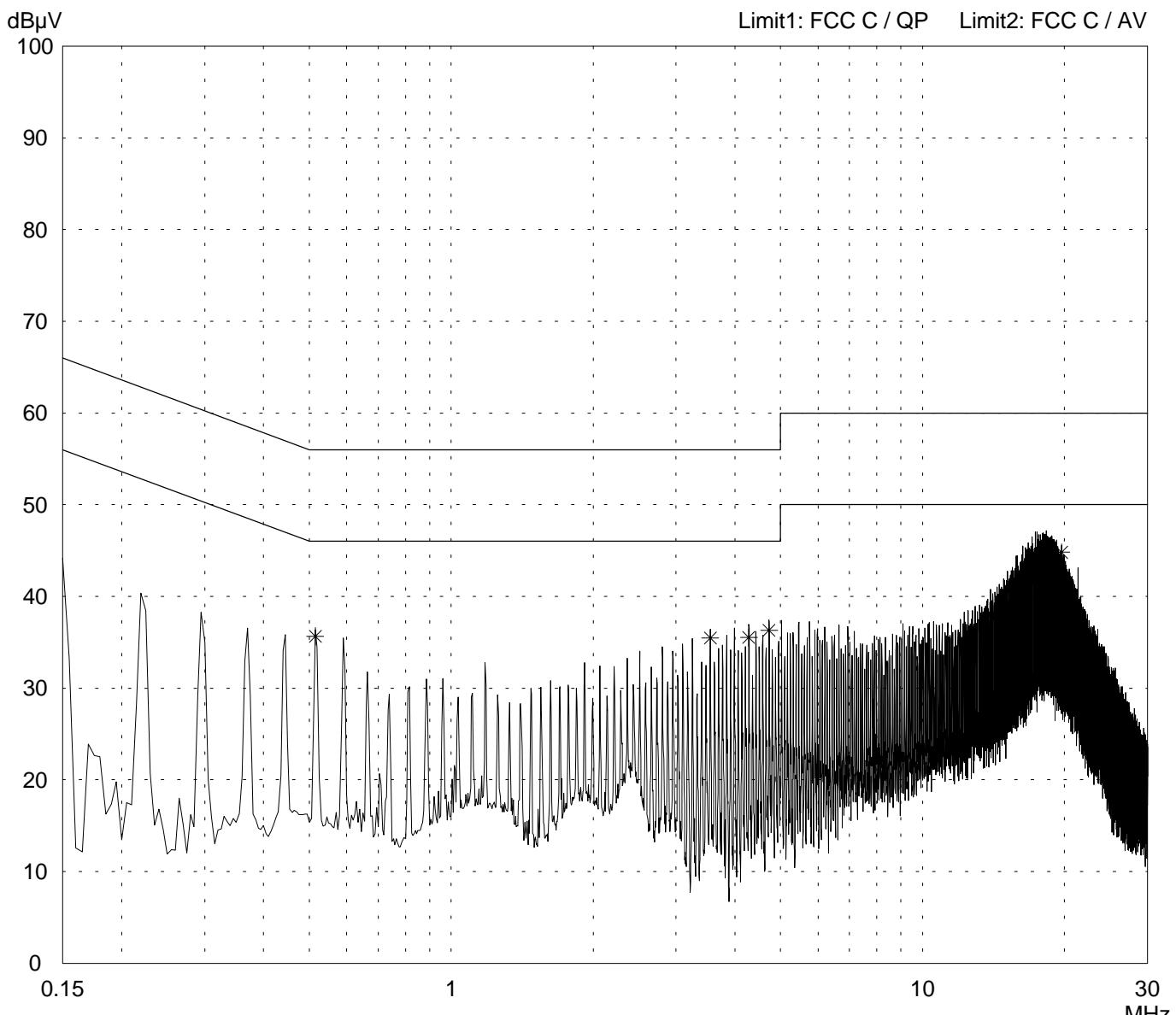
Test performed: semi automatically

Mode:
- With PC "DELL Optiplex GX280"
- FCC test setup
- AC 115 V power supply

- reading TAG continuously

Detector:
Peak / Final Results: QP

Final results:
20 dB Margin 25 Subranges



Result:
Limit kept

Project file:
55465-50219

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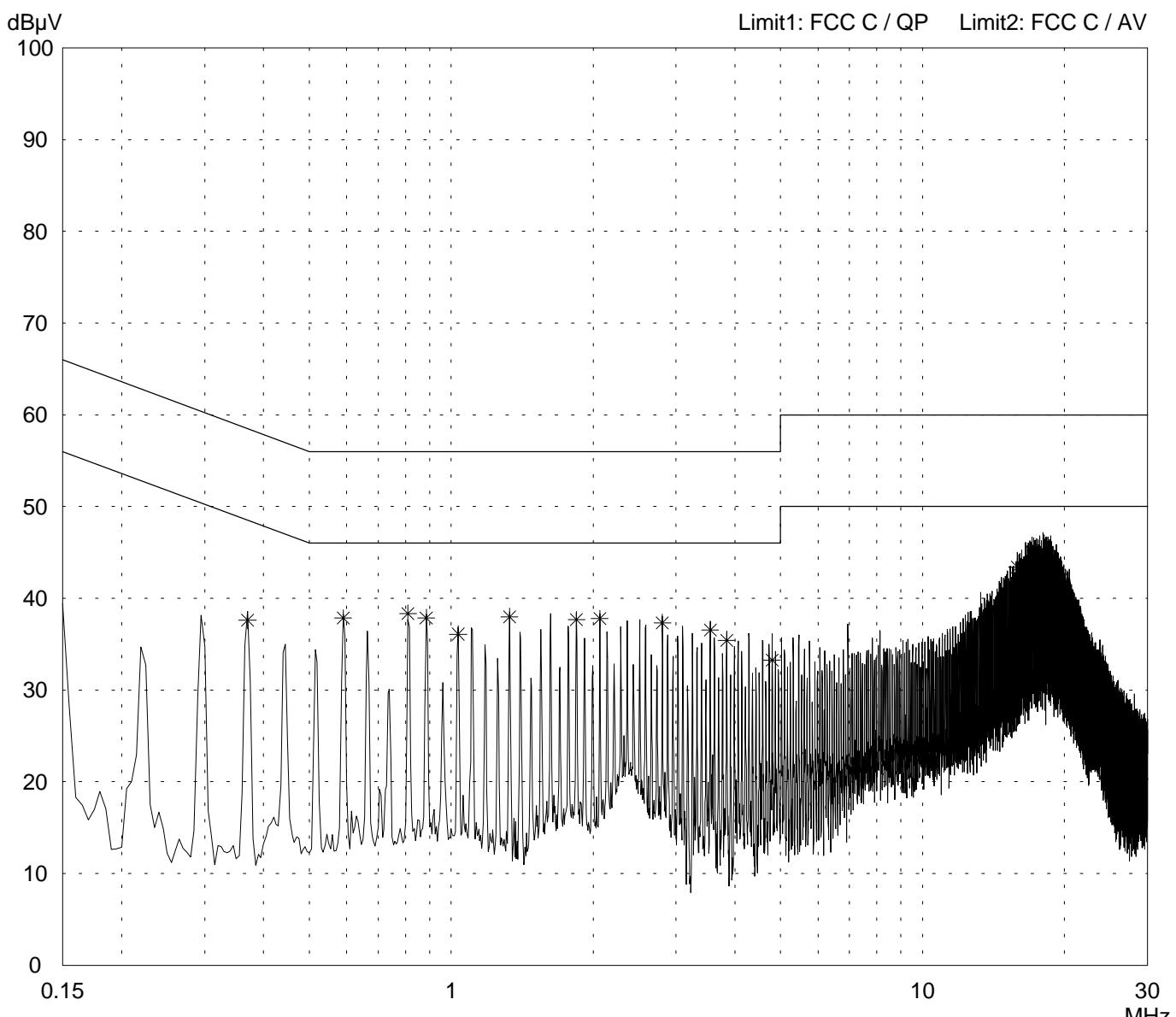
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Detector: Peak / Final Results: QP

Final results: 20 dB Margin	25 Subranges
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Result: Limit kept

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