


Electromagnetic Emission FCC MEASUREMENT REPORT

CERTIFICATE OF FCC PART15 Subpart B COMPLIANCE

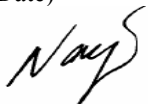
PRODUCT : VOICEYE MATE
MODEL/TYPE NO : VMP-200
FCC ID : TOLVMP-200
TRADE NAME : 
APPLICANT : AD Information & Communications Co., Ltd.
#608, Ace Techno Tower 8th, 191-7, Guro-dong, Guro-gu,
Seoul, Korea
FCC CLASSIFICATION : JBP: Part 15 Class B Computing Device Peripheral
FCC RULE PART(S) : FCC Part 15 Subpart B Class B
FCC PROCEDURE : Certificate
DATES OF TEST : April 28, 2008
DATES OF ISSUE : May 02, 2008
TEST REPORT No. : BWS-08-EF-0023
TEST LAB. : BWS Tech., Inc. (Registration No. : 553281)

This VOICEYE MATE has been tested in accordance with the measurement procedures specified in ANSI C63.4-2003 at the BWS TECH/EMC Test Laboratory and has been shown to be complied with the electromagnetic emission limits specified in FCC Rule Part15 Subpart B Section15.107 and 15.109

I attest to the accuracy of data. All measurement herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them. The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

May 02, 2008

(Date)



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Chief Engineer
Laboratory Division

BWS TECH Inc.

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FCC TEST REPORT

Scope – Measurement and determination of electromagnetic emission(EME) of radio frequency devices including intentional radiators and/or unintentional radiators for compliance with the technical rules and regulations of the U.S Federal Communications Commission(FCC)

1. General Information

Applicant Information

Company Name : AD Information & Communications Co., Ltd.
Company Address : #608, Ace Techno Tower 8th, 191-7, Guro-dong, Guro-gu, Seoul, Korea
Phone/Fax : Tel No. : +82-02-2028-2300 Fax No. : +82-02-2028-2309

Manufacturer Information

Company Name : AD Information & Communications Co., Ltd.
Company Address : #608, Ace Techno Tower 8th, 191-7, Guro-dong, Guro-gu, Seoul, Korea
Phone/Fax : Tel No. : +82-02-2028-2300 Fax No. : +82-02-2028-2309

- **EUT Type** : VOICEYE MATE
- **Model Number** : VMP-200
- **FCC Identifier** : TOLVMP-200
- **S/N** : Prototype
- **FCC Rule Part(s)** : CFR Title 47 Part 15 Subpart B Class B
- **Test Procedure** : ANSI C63.4-2003
- **Dates of Tests** : April 28, 2008
- **Place of Tests :**
 - : BWS TECH Inc.
 - EMC Testing Lab (FCC Registration Number : 553281)
 - 611-1, Maesan-ri, Mohyeon-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do
 - 449-853, Korea
 - TEL: +82 31 333 5997 FAX: +82 31 333 0017
- **Test Report No.** : BWS-08-EF-0023

2. Description of Test Facility

The measurement for radiated emission test were practiced at the open area test site of BWS TECH Inc. Measurement for conducted emission test were practiced at the semi EMC Anechoic Chamber test site of BWS TECH Inc. facility located at *611-1, Maesan-ri, Mohyeon-myeon, Yongin-si, Gyeonggi-do 449-853, Korea*. The site is constructed in conformance with the requirements of the ANSI C63.4-2003 and CISPR Publication 16. The BWS TECH measurement facility has been filed to the Commission with the FCC for 3 and 10 meter site configurations. Detailed description of test facility was found to be in compliance with the requirements of Section 2.948 FCC Rules according to the ANSI C63.4-2003 and registered to the Federal Communications Commission(Registration Number : 553281).

The measurement procedure described in American National Standard for Method of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz (ANSI C63.4-2003) was used in determining radiated and conducted emissions from the AD Information & Communications Co., Ltd. VOICEYE MATE Model : VMP-200

3. Product Information

3.1 Equipment Description

※ VOICEYE Player

Audio	The number of channels	Stereo (left and right side)
	Output frequency range	20Hz~20KHz
	Ear phone output	(L)15mW + (R)15mW, 16Ω
	Speaker output	(L)250mW + (R)250mW, 8Ω
FM tuner	FM frequency range	87.5MHz ~ 108MHz
File	File type	Text (*.txt)
Power supply	Adapter	USB or power adapter (5V/0.5A)
	Battery	Lithium ion
	Charging time	2 hours
General	Dimension	102 x 65 x 23 mm
	Weight	125g (including battery)
	LCD size	1.89"
	LCD resolution	160 x 128 STN/4096 color
	Operating temperature	0 ~ 40℃
	Memory	512MB internal memory (TTS DB 200MB)
	USB	USB 2.0
	Maximum operation time	3 hour playing in speech
	Recording	Sampling frequency 16KHz, 16 bit mono

※ VOICEYE scanner

Dimension	43 x 48 x 67 mm
Weight	80g
Image sensor	1/2 inch CMOS Color SXGA sensor
Color	24 bit RGB Color
Pixel array size	1280 x 1024 Pixel
Exposure	Automatic & manual control
Signal to noise ratio	54 dB
Maximum image transfer rate	15 FPS (Frame Per Sec)
Interface	24 pin port
Cable length	45cm

3.2 Variations covered by this report :

-Model Difference: N/A

3.3 Additional Information Related to Testing :

Test results apply only to the particular sample tested and functionality described in this test report. This report may be reproduced in full. Partial reproduction may only be made with the written permission of the BWS Tech Inc.

4. Description of Tests

4.1 Conducted Emission Measurement

Conducted emissions measurements were made in accordance with section 11, "Measurement of Information Technology Equipment" of ANSI C63.4-2003. The measurements were performed over the frequency range of 0.15MHz to 30MHz using a 50Ω/50uH LISN as the input transducer to a Spectrum Analyzer or a Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within a bandwidth of 10KHz or for "quasi-peak" within a bandwidth of 9KHz.

The line-conducted emission test is conducted inside a shielded anechoic chamber room with 1m x 1.5m x 0.8m wooden table which is placed 40cm away from the vertical wall and 1.5m away from the side wall of the chamber room. Two LISNs are bonded to bottom plane of the shielded room. The EUT is powered from the FCC. Power to the LISNs is filtered by a noise cut power line filters. All electrical cables are shielded by braided tinned steel tubing with inner ϕ 1.2cm. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and these supply lines will be connected to the Com-power LISN. All interconnecting cables more than 1m were shortened by non-inductive bundling (serpentine fashion) to a 1m length. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the ESPI Test Receiver to determine the frequency producing the max. Emission was from the EUT. The frequency was producing the max. Level was reexamined using the detector function set to the CISPR Quasi-Peak mode by manual, after scanned by automatic Peak mode from 0.15 to 30MHz. The bandwidth of the Spectrum Analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was maximized by switching power lines, varying the mode of operation or resolution, clock or data exchange speed, if applicable, whichever determined the worst-case emission. Each emission reported was calibrated using self-calibrating mode.

Photographs of the worst-case emission can be seen in photographs of conducted emission test setup.

4.2 Radiated Emission Measurement

Preliminary measurements were made at indoors 3 meter semi EMC Anechoic Chamber using broadband antennas, broadband amplifier, and spectrum analyzer to determine the emission frequencies producing the maximum EME.

Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth with respect to the antenna was noted for each frequency found. The spectrum was scanned from 30 to 1000MHz using bilog antenna and above 1000MHz, linearly polarized double ridge horn antennas were used. Above 1GHz, linearly polarized double ridge horn antennas were used. The measurements were performed with three frequencies which were selected as bottom, middle and top frequency in the operating band. Emission level from the EUT with various configurations was examined on the spectrum analyzer connected with the RF amplifier and plotted graphically.

Final measurements were made outdoors open site at 3-meter test range using bilog antenna. The output from the antenna was connected, via a pre-selector or a preamplifier, to the input of the EMI Measuring Receiver and Spectrum analyzer(for above 1GHz). The detector function was set to the quasi-peak or peak mode as appropriate. The measurement bandwidth on the Field strength receiver was set to at least 120kHz (1MHz for measurement above 1GHz), with all post-detector filtering no less than 10 times the measurement bandwidth. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition.

Each frequency found during preliminary measurement was examined and investigated as the same set up and configuration which produced the maximum emission. The EUT, support equipment and interconnecting cables were configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8-meter high non-metallic 1m x 1.5 meter table. The turntable containing the system was rotated and the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission.

Each emission was maximized by varying the mode of operating frequencies of the EUT. The system was tested in all the three orthogonal planes and changing the polarity of the antenna. The worst case emissions are recorded in the data tables. If necessary, the radiated emission measurement could be performed at a closer distance to ensure higher accuracy and the results were extrapolated to the specified distance using an inverse linear distance extrapolation factor(20dB/decade) as per section 15.31(f).

Photographs of the worst-case emission test setup can be seen in Appendix 1.

5. Test Condition

5.1 Test Configuration

The device was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the EUT and the supported equipments were installed to meet FCC requirement and operated in a manner which tends to maximize its emission level in a typical application.

Radiated Emission Test

Preliminary radiated emission tests were conducted using the procedure in ANSI C63.4/2003 Clause 8.3.1.1 to determine the worst operating condition. Final radiated emission tests were conducted at 10 meter open field test site.

5.2 EUT operation

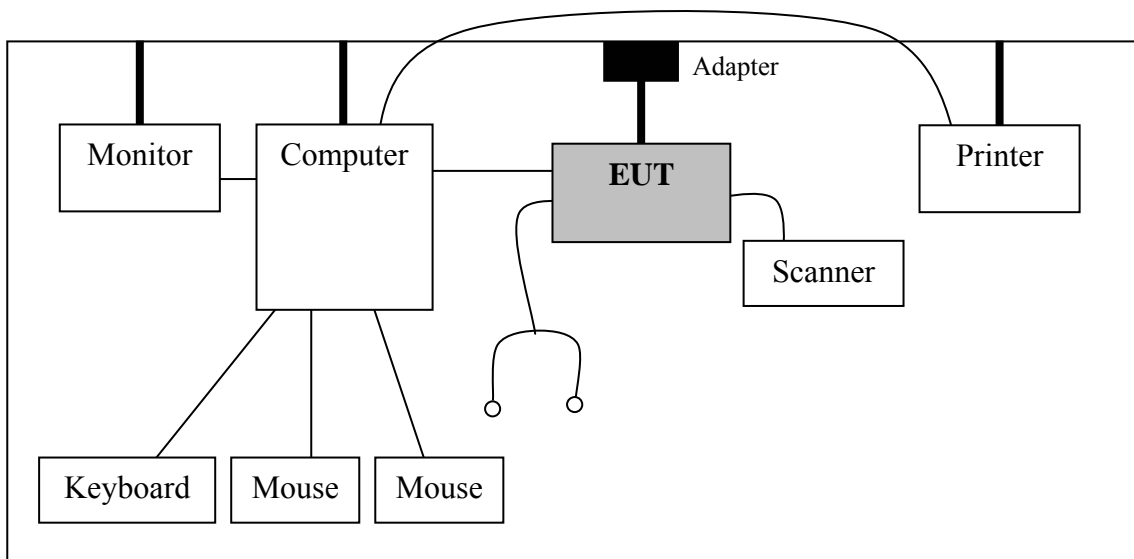
EUT was tested according to the following operation modes provided by the specifications given by the manufacturer, and reported the worst emissions.

Operation Modes	Worst Case
Data Downloading Mode	0

5.3 Test System layout on EUT and peripherals

Test System layout on EUT and peripherals (EMI)

— Interface cable — Power cable



5.4 Peripherals / Support Equipment Used

Following peripheral devices and interface cables were connected during the measurement:

Type of Peripheral Equipment Used:

Description	Model Name	Serial No.	Manufacturer	FCC ID
EUT	VMP-200	N/A	AD Information & Communications Co., Ltd.	TOLVMP-200
Adapter	KSAFB0500100W1KO	0206	Kuantech (Shenzhen) Co., Ltd.	N/A
Computer	DX7300	CNG704070X	HP	N/A
LCD Monitor	FP737s	99L8372RSK5130 0385TABRSK	BenQ	N/A
Printer	Epson Stylus C60	DR5K004835	EPSON	N/A
Keyboard	RT2300	7668200800658	Microsoft	N/A
Mouse	SMOP5000WX	06090040391	SAMSUNG	N/A
Mouse	SMOP5000WX	06090060248	SAMSUNG	N/A

Type of Cables Used:

Device from	Device to	Type of Cable	Length(m)	Type of shield
EUT	Adapter	USB	1.9	Unshielded
EUT	Scanner	24Pin BVLK	0.45	Shielded
EUT	Earphones	LINE OUT	0.8	Unshielded
Computer	LCD Monitor	VIDEO	1.8	Shielded
Computer	Keyboard	PS/2	2.1	Unshielded
Computer	Mouse	PS/2	1.8	Unshielded
Computer	Mouse	SERIAL	1.5	Unshielded
Computer	Printer	PARALLEL	1.9	Shielded
Computer	Power socket	Inlet	1.5	Unshielded

6. TEST RESULTS

6.1 Summary of Test Results

The measurement results were obtained with the EUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum emission of the EUT are reported.

FCC Rule Parts	Measurement Required	Result
5.107(a)	Conducted Emission	Passed by – 9.15 dB
15.109(g)	Radiated Emissions	Passed by – 12.85 dB

The data collected shows that the AD Information & Communications Co., Ltd. VOICEYE MATE Model : VMP-200 complies with technical requirements of the Part 15.107 and 15.109 of the FCC Rules.

6.2 Conducted Emissions

EUT : VOICEYE MATE Model: VMP-200 (SN: Prototype)
 Limit apply to : FCC Part15 Subpart B Section 15.107(a)
 Test Date : April 28, 2008
 Operating Condition : Data Downloading Mode
 Environment Condition : Temperature : 23 °C, Humidity Level : 42 %
 Result : Passed by -9.15 dB

The following table shows the highest levels of conducted emissions on both phases of Hot and Neutral line.

Tabulated Conducted Emission Test Data

Detector Mode; CISPR Quasi Peak mode (6dB Bandwidth: 9 kHz).

Freq [MHz]	Correcton		Phase [H/N]	Quasi-Peak Mode				Average Mode			
	AMN	C.L		Limit [dBuV]	Reading [dBuV]	Emission Level [dBuV]	Margin [dBuV]	Limit [dBuV]	Reading [dBuV]	Emission Level [dBuV]	Margin [dBuV]
0.500	0.07	0.30	H	56.00	36.98	37.35	-18.65	46.00			
0.182	0.06	0.03	N	65.10	53.44	53.53	-11.57	55.10			
0.246	0.07	0.10	H	63.30	45.38	45.55	-17.75	53.30			
0.306	0.08	0.22	N	61.60	43.23	43.53	-18.07	51.60			
0.390	0.08	0.24	H	59.10	37.38	37.70	-21.40	49.10			
0.490	0.07	0.28	N	56.30	36.37	36.72	-19.58	46.30			
0.550	0.07	0.30	N	56.00	36.55	36.92	-19.08	46.00			
0.914	0.05	0.35	N		35.62	36.02	-19.98				
1.214	0.04	0.43	N		38.04	38.51	-17.49				
1.894	0.03	0.53	H		32.60	33.16	-22.84				
3.542	0.03	0.68	H		31.26	31.97	-24.03				
4.642	0.04	0.83	H		33.28	34.15	-21.85				
5.682	0.06	0.89	H	60.00	36.55	37.50	-22.50	50.00			
8.062	0.06	1.00	N		49.79	50.85	-9.15				
11.910	0.04	1.14	N		38.41	39.59	-20.41				
15.086	0.06	1.22	H		32.96	34.24	-25.76				
21.202	0.07	1.43	H		28.81	30.31	-29.69				
27.238	0.20	1.56	H		27.12	28.88	-31.12				

NOTE:

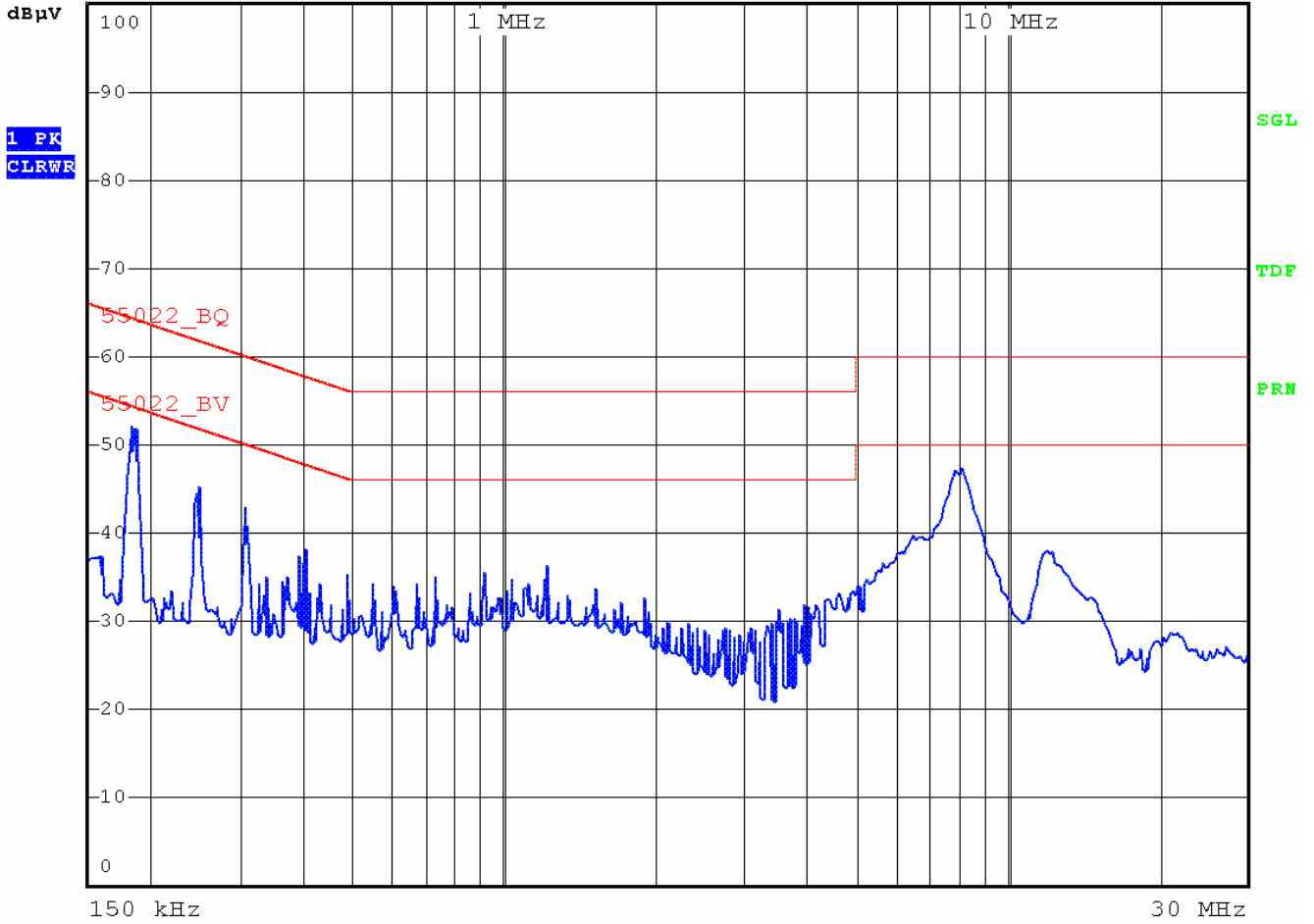
1. H : Hot Line , N :Neutral Line
2. Emission Level = Reading + Correction Factor
3. Margin = Limit - Emission Level
4. Measurements were performed at the AC Power Inlet of the host PC with the EUT plugged in the frequency band of 150 kHz ~30MHz
5. Measurement uncertainty estimated at ±1.38 dB.
 The measurement uncertainty is given with a confidence of 95.45 % with the coverage factor, k=2.

Plots of Conducted Emission Test



RBW 9 kHz
 MT 20 ms

Att 10 dB AUTO PREAMP OFF



Test Model: VMP-200

Test Mode: HOT

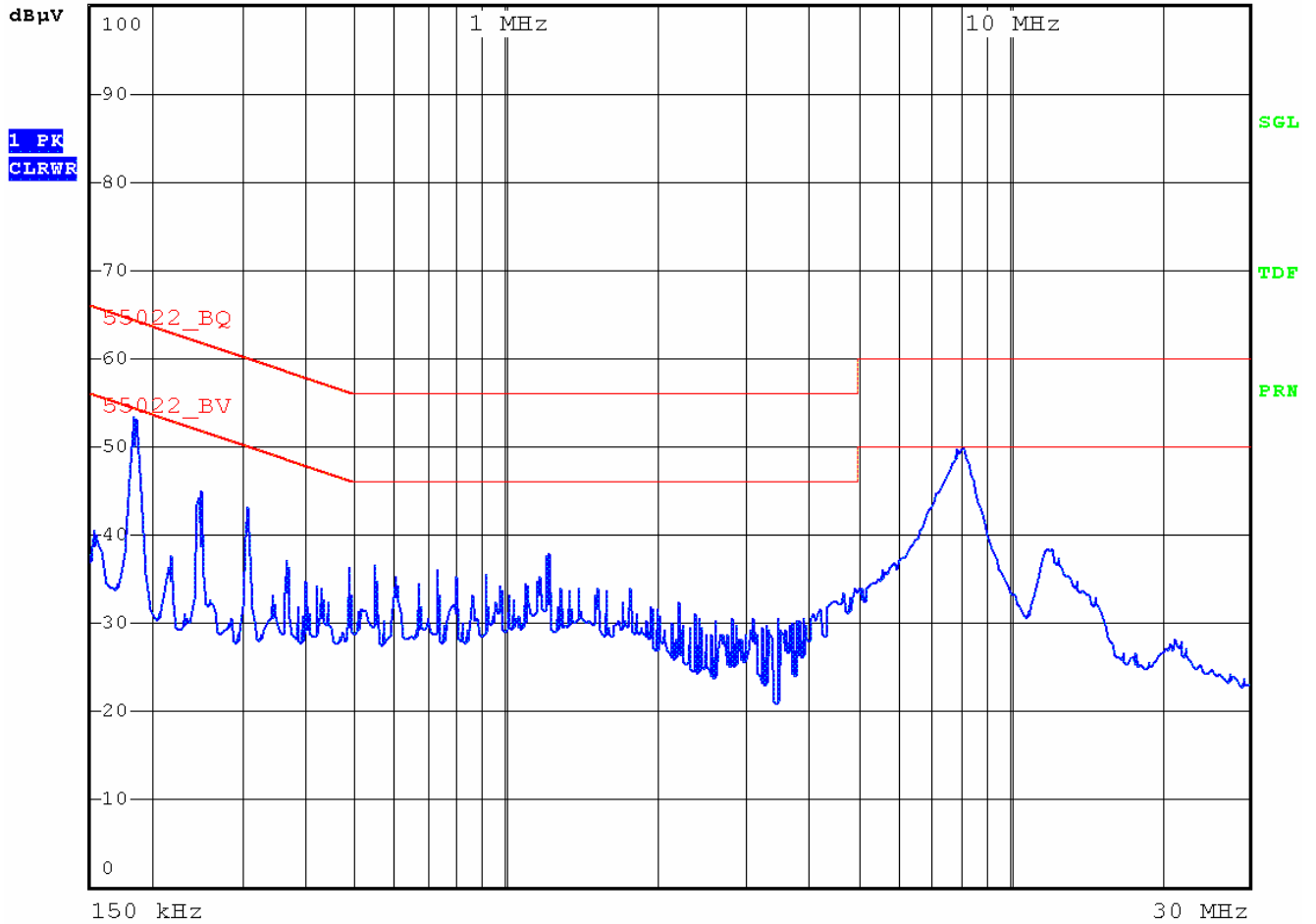
Classification: FCC Part15 Subpart B Section 15.107(g) Class B

Plots of Conducted Emission Test



RBW 9 kHz
 MT 20 ms

Att 10 dB AUTO PREAMP OFF



Test Model: VMP-200

Test Mode: NEUTRAL

Classification: FCC Part15 Subpart B Section 15.107(g) Class B

6.3 Radiated Emissions

EUT : VOICEYE MATE Model: VMP-200 (SN: Prototype)
 Limit apply to : FCC Part15 Subpart B Section 15.109(g)
 Test Date : April 28, 2008
 Operating Condition : Data Downloading Mode
 Environment Condition : Temperature : 5 °C, Humidity Level : 52 %
 Result : Passed by -12.85 dB

Radiated Emission Test Data

The following table shows the highest levels of radiated emissions on both polarization of horizontal and vertical.

Detector mode : CISPR Quasi-Peak mode (6dB Bandwidth : 120 kHz)

Measurement Distance : 3 meters

Frequency [MHz]	Reading [dB μ V]	Polarization [*H/**V]	Ant.Factor [dB]	Cable Loss [dB]	Limit [dB μ V/m]	Emission Level [dB μ V/m]	Margin [dB]
30.61	9.91	V	11.86	1.24	40.00	23.01	-16.99
83.17	13.58	V	8.53	2.00	40.00	24.11	-15.89
178.17	9.26	V	12.16	2.96	43.50	24.39	-19.11
209.65	10.01	V	10.24	3.22	43.50	23.47	-20.03
210.74	10.10	V	10.25	3.23	43.50	23.58	-19.92
222.42	10.78	V	10.39	3.31	46.00	24.48	-21.52
253.54	13.06	H	11.94	3.54	46.00	28.54	-17.46
336.06	11.13	H	14.27	4.07	46.00	29.47	-16.53
365.99	12.88	H	14.98	4.28	46.00	32.14	-13.86
377.99	13.51	H	15.27	4.37	46.00	33.15	-12.85
408.02	12.02	H	15.97	4.59	46.00	32.58	-13.42
594.10	6.33	H	19.74	5.55	46.00	31.62	-14.38

NOTE:

- * H : Horizontal polarization , ** V : Vertical polarization
- Emission Level = Reading + Antenna factor + Cable loss
 Margin = Limit - Emission Level
- All other emissions not reported were more than 25dB below the permitted limit.
- Measurement uncertainty estimated at ± 4.08 dB.
 The measurement uncertainty is given with a confidence of 95.45 % with the coverage factor, k=2.



Tested by Ki,

No-Kyu

7. Sample Calculation and Other Information

7.1 Sample Calculations

$$\text{dB}\mu\text{V} = 20 \log_{10} (\mu\text{V}/\text{m})$$

$$\mu\text{V} = 10^{(\text{dB}\mu\text{V}/20)}$$

EX. 1.

@8.062 MHz Class A limit = 60.00 dB μ V

Reading = 49.79 dB μ V (calibrated level)

AMN factor + Cable Loss = 1.06 dB

Total = 50.85 dB μ V/m

$10^{(49.82/20)} = \mu\text{V}$

Margin = 50.85 – 60.00 = -9.15

9.15 dB ; below limit

EX. 2.

@377.99 MHz Class A limit = 46.00 dB μ V/m

Reading = 13.51 dB μ V (calibrated level)

Antenna factor + Cable Loss = 19.64 dB

Total = 33.15 dB μ V/m

Margin = 33.15 – 46.00 = -12.85 dB

12.85 dB ; below limit

8. TEST EQUIPMENTS LIST

The listing below denotes the test equipments utilized for the test(s).

Equipment Type	Model	Manufacture	Serial No	Cal Due Date	Use
TEST RECEIVER	ESPI	ROHDE&SCHWARZ	100063	11. 19. 2008	<input checked="" type="checkbox"/>
Conducted Cable	N/A	N/A	N/A	N/A	<input checked="" type="checkbox"/>
LISN	NSLK 8127	SCHWARZBECK MESS-ELEKTRONIK	8127-414	01. 03. 2009	<input checked="" type="checkbox"/>
LISN multiline	L1-115	Com-Power	241018	11. 19. 2008	<input checked="" type="checkbox"/>
Bilog Antenna	VULB 9160	SCHWARZBECK	9160-3122	01. 24. 2010	<input checked="" type="checkbox"/>
Open Site Cable	OSC-30	N/A	BWS-01	N/A	<input checked="" type="checkbox"/>
Antenna Mast	JAC-3	DAIL EMC	N/A	N/A	<input checked="" type="checkbox"/>
Antenna Turntable Controller	JAC-2	JAEMC	N/A	N/A	<input checked="" type="checkbox"/>
EMI Receiver	ESVN30	ROHDE&SCHWARZ	832854/010	07. 13. 2008	<input checked="" type="checkbox"/>