

TEST REPORT

Regulation : **FCC Part15B – Scanning Receiver**
Industry Canada RSS-215 Issue 1

: **FCC Part15B Class B**
CANADA ICES-003 Class B

Applicant	Testing Laboratory
Vertex Standard Co., Ltd. 4-8-8 Nakameguro Meguro-ku, Tokyo 153-8644 Japan Tel : +81 3 5725 6111 Fax : +81 3 5725 6225	ETL SEMKO Japan K.K. Kashima Site 3-2 Sunayama, Kamisu, Ibaraki 314-0255 Japan Tel.: +81 479 40 1097 Fax.: +81 479 46 1788 URL: http://www.japan.intertek-etlsemko.com

Equipment Type	HF Transceiver
Category	Scanning Receiver & Peripherals
Trademark	YAESU
Model (s)	FT-450
Serial No.	7C000001
FCC ID	K6620241X50
IC	511B-20241X50
Test Result	Complied
Report Number	ESJ-107009
Report Issue Date	February 13, 2007

This equipment has been shown to be capable of compliance with the applicable standard(s) as indicated in the test report. I attest to the accuracy of data. All measurements reported 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.

This test report shall not be reproduced partially, or in full, without the prior written approval of ETL SEMKO Japan K.K. The results and statements contained in this report pertain only to the equipment evaluated.

Approved by

Tested by




Kazuo Gokita
 [Assistant Manager]

Kazuo Masuda

TABLE OF CONTENTS

	Page
SECTION 1. GENERAL INFORMATION	3
SECTION 2. SUMMARY OF TEST RESULTS	4
SECTION 3. INFORMATION ABOUT EUT	5
SECTION 4. SUPPORT EQUIPMENT(S).....	7
SECTION 5. USED CABLE (S).....	8
SECTION 6. CONSTRUCTION OF EQUIPMENT	9
SECTION 7. OPERATING CONDITION.....	11
SECTION 8. TEST PROCEDURE(S).....	12
SECTION 9. EVALUATION OF TEST RESULTS.....	17
SECTION 10. LIST OF MEASURING INSTRUMENTS	36
SECTION 11. MEASUREMENT UNCERTAINTY	37
SECTION 12. DESCRIPTION OF TEST LABORATORY	38

SECTION 1. GENERAL INFORMATION

TEST PERFORMED

Location	Kashima No.1 Test Site (FCC Reg. : 934283) (IC File No. : IC 2065-1)
EUT Received	January 18, 2007
Test Started	January 18, 2007
Test Completed	January 23, 2007
Standard Applied	FCC Part15B – Scanning Receiver Industry Canada RSS-215 Issue 1 FCC Part15B Class B - Peripherals and Canada ICES-003 Class B
Test Setup	ANSI C63.4-2003
Deviation from Standard (s)	No deviation

TEST TRACEABILITY

Traceability to national standards of test result is achieved by means of calibration traceability to national or international standards.

LIMITATIONS ON RESULTS

The test result of this report is effective for equipment under test itself and under the test configuration described on the report.

This test report does not assure that whether the test result taken in other testing laboratory is compatible or reproducible to the test result on this report or not.

ABBREVIATIONS

- | | |
|--|---|
| AE = Associated Equipment | DIP = Dipole Antenna |
| AMN = Artificial Mains Network | DoC = Device for Declaration of Conformity |
| AMP = Amplifier, ATT = Attenuator | EUT = Equipment Under Test |
| ANT = Antenna, BBA = Broadband Antenna | ISN = Impedance Stabilization Network |
| AVG = Average | LISN = Line Impedance Stabilization Network |
| Cal = Calibration | PK = Peak |
| CDN = Coupling Decoupling Network | Q-P = Quasi-peak |
| LCD = Liquid-Crystal Display | RX = Receive |
| SPKR = Speaker | |

SECTION 2. SUMMARY OF TEST RESULTS

This test report clearly shows that the EUT is in compliance with the **FCC Part15B** (- Scanning Receiver with Industry Canada RSS-215) and **FCC Part15B Class B** (- Peripheral with Canada ICES-003 Class B) specification.

The minimum margins to the limits are as follows:

Conducted Voltages on Mains Port	RX 56MHz mode	26.2 dB	at	0.1500 MHz
Radiated Electric Field	RX 56MHz mode	9.1 dB	at	110.59 MHz
Conducted Power on Antenna Port	RX 56MHz mode	23.2 dB	at	1105.93 MHz
38dB Rejection Test (15.121(b))	No frequency of response was detected. - Passed -			

Note : See Section 9 for details.

SECTION 3. INFORMATION ABOUT EUT

The equipment under test (EUT) consisted of the following equipment.

3.1 List of System Configuration

Symbol	Item	Model No.	Serial No.	Manufacturer	Notes	FCC ID
A1	HF Transceiver	FT-450	7C000001	Vertex Standard	EUT	K6620241X50
A2	Microphone	MH-67A8J	None	Vertex Standard	EUT	N.A.
A3	Headphone	YH-77STA	None	Vertex Standard	Option	N.A.
A4	Antenna Tuner	ATU-450	None	Vertex Standard	Option	N.A.
A5	External Speaker	SP-2000	None	Vertex Standard	Option	N.A.
A6	Power Supply Unit	FP-1030A	None	Vertex Standard	Option	N.A.
Power Ratings of EUT : DC 13.8V, 22A (FT-450) AC 120V, 50/60Hz, 8A (FP-1030A)						
Power Supply : AC 120V, 60 Hz						
Condition of Equipment		Prototype				
Type		Tabletop				
Suppression Devices		No Modifications by the laboratory were made to the device				

3.2 Overview of EUT :

Frequency Ranges	0.030 – 56.000 MHz
Receiver Type	Double Conversion Super-heterodyne
Mode of Operation	A1A, A3E, F3E, J3E

3.3 Intermediate Frequencies :

1st	67.899 MHz (Upper)
2nd	24 kHz (Upper)

3.4 Oscillator(s) / Crystal (s) :

Oscillator	Operating Frequency	Board Name	Notes
19.82 MHz	19.82 MHz	CNTL Unit	Microprocessor
19.82 MHz	19.82 MHz	PANEL Unit	Microprocessor
36.864 MHz	36.864 MHz	DSP Unit	Microprocessor
67.869 – 123.899 MHz	67.869 – 123.899 MHz	RF-IF Unit	LOCAL Oscillator
135.75 MHz	135.75 MHz	LOCAL Unit	LOCAL Oscillator (Highest)
22.625 MHz	22.625 MHz	RF-IF Unit	Reference OSC

3.5 Port(s)/Connector(s) :

Port Name	Connector Type	Connector Pin	Notes
MIC	RJ-45	8pin	
PHONE	3.5φ Stereo	1pin	
KEY	3.5φ Stereo	1pin	
ANT	MR-S (Coaxial)	1pin	
DATA	DIN	6pin	
TUNER	DIN	8pin	
LINER	DIN	10pin	
CAT	D-sub	9pin	
+13.8V	HL	4pin	
EXT SPKR	3.5φ Mono	1pin	

3.6 Frequency Range of Measurements

	Measured Frequency Range
Conducted Voltages on Mains Port	0.15 – 30 MHz
Radiated Electric Field	30 – 2000 MHz
Conducted Power on Antenna Port	30 – 2000 MHz
38dB Rejection	0.030 – 56 MHz

SECTION 4. SUPPORT EQUIPMENT(S)

The EUT was supported by the following equipment during the test.

Symbol	Item	Model No.	Serial No.	Manufacturer	FCC ID / DoC	Note
B	Computer	Dimension2100 MCM	3V5W41S	Dell Computer	DoC	
C	LCD Monitor	E152FPc	CN-0N1546- 64180-443-12QH	Dell Computer	DoC	
D	Keyboard	SK-8110	CN-0C6227- 71616-46O-05B7	Dell Computer	DoC	
E	Mouse	M-S34	LNA12785508	Dell Computer	DZL211029	
F	Printer	C6490B	MY35G1R1KT	Hewlett Packard	DoC	
G	AC Adapter	ADP-32BBA	PLT031803	Hewlett Packard	N.A.	
H	ANT Terminator	MP752A	M66325	Anritsu	N.A.	
Power Supply :						
B, C, G	AC120V, 60Hz					

SECTION 5. USED CABLE (S)

The following cable(s) was used for the test.

No.	Name	Length (m)	Shield	Connector Type	Ferrite Core
1	Microphone cable	0.6 m	Yes	Plastic	
2	Headphone cable	1.5 m	Yes	Metal	
3	KEY cable	1.5 m	Yes	Metal	
4	DATA cable	1.0 m	Yes	Metal	
5	TUNER cable	1.9 m	Yes	Metal	
6	LINER cable	1.9 m	Yes	Metal	
7	EXT SPKR cable	1.0 m	Yes	Metal	
8	CAT cable	1.5 m	Yes	Metal	
9	Centronics cable	1.7 m	Yes	Metal	
10	LCD Monitor cable	1.8 m	Yes	Metal	Fixed ×1
11	Keyboard cable	2.0 m	Yes	Metal	
12	Mouse cable	1.8 m	Yes	Metal	
13	Power cable (DC) for EUT	3.0 m	No	-	
14	Power cable (AC) for EUT (PSU)	1.6 m	No	-	
15	Power cable for Computer	1.9 m	No	-	
16	Power cable for LCD Monitor	1.8 m	No	-	
17	Power cable for Printer (DC)	1.7 m	No	-	Fixed ×1
18	Power cable for Printer (AC)	2.0 m	No	-	

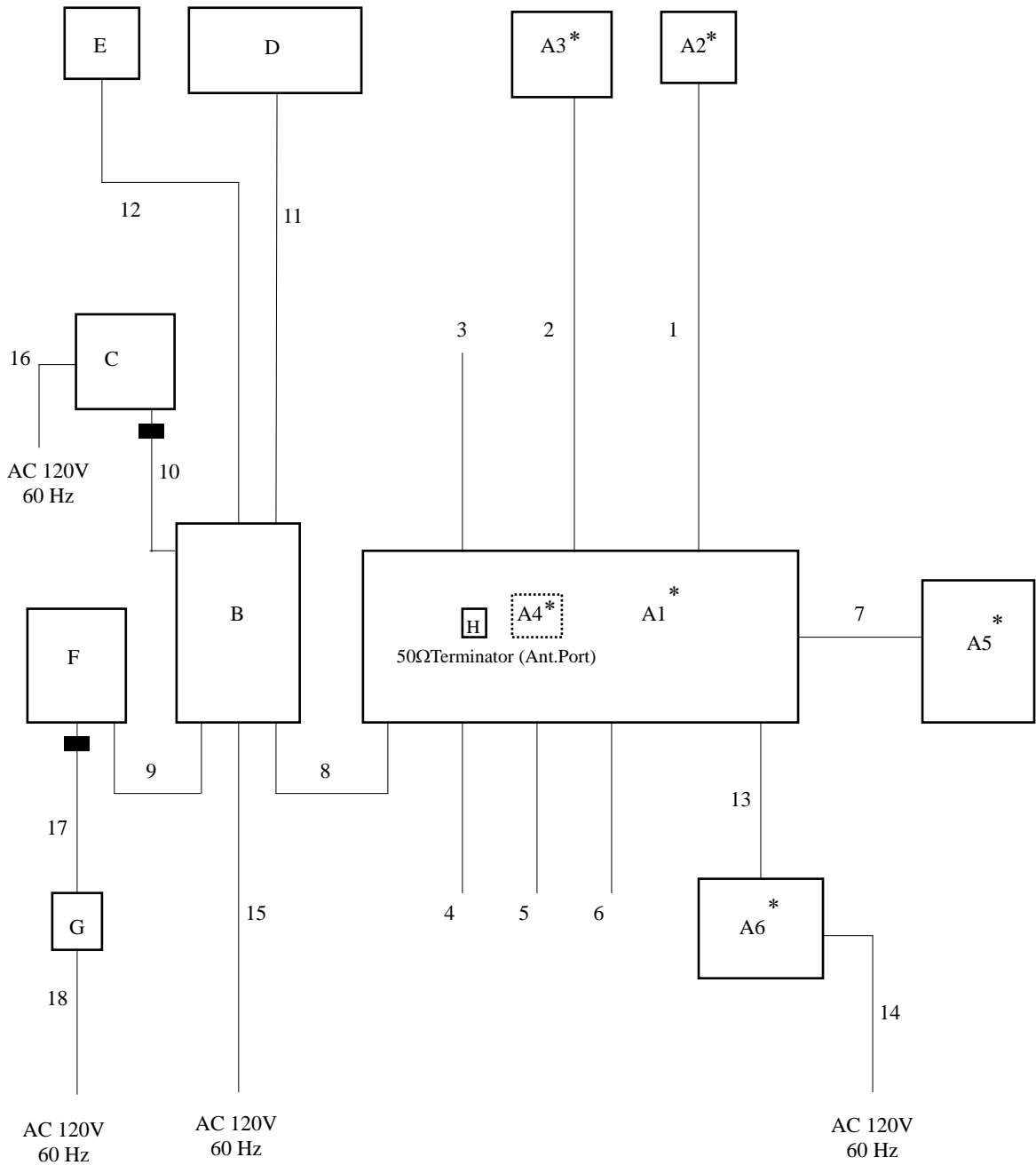
Note :

SECTION 6. CONSTRUCTION OF EQUIPMENT

6.1 Conducted Voltages on Mains Port Radiated Electric Field

System configuration

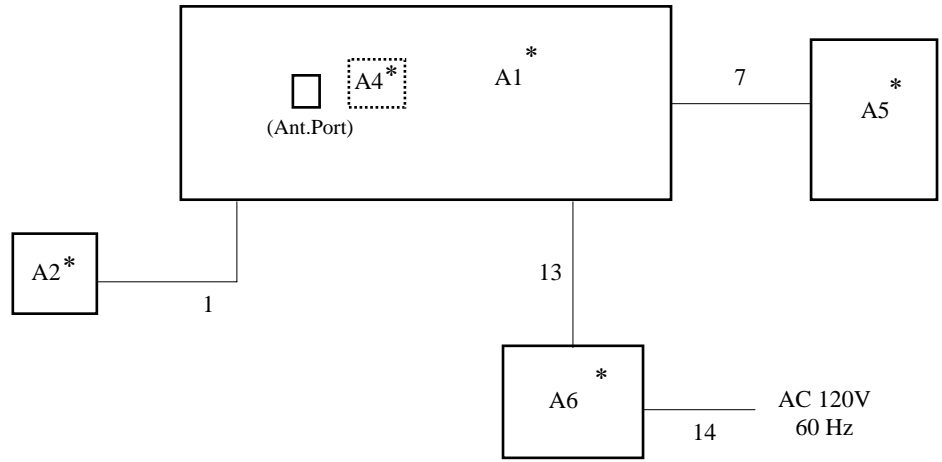
* : EUT
 ■ : Ferrite core



The symbols and numbers assigned to the equipments and cables on this diagram correspond to the ones in Sections 3 to 5.

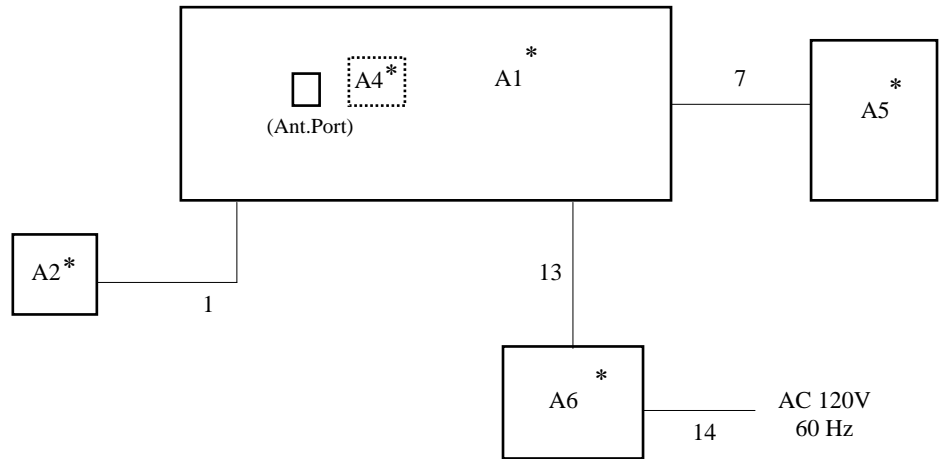
6.2 Conducted Power on Antenna Port

* : EUT



6.3 38dB Rejection

* : EUT



The symbols and numbers assigned to the equipments and cables on this diagram correspond to the ones in Sections 3 to 5.

SECTION 7. OPERATING CONDITION

The EUT was operated under the following conditions during the test.

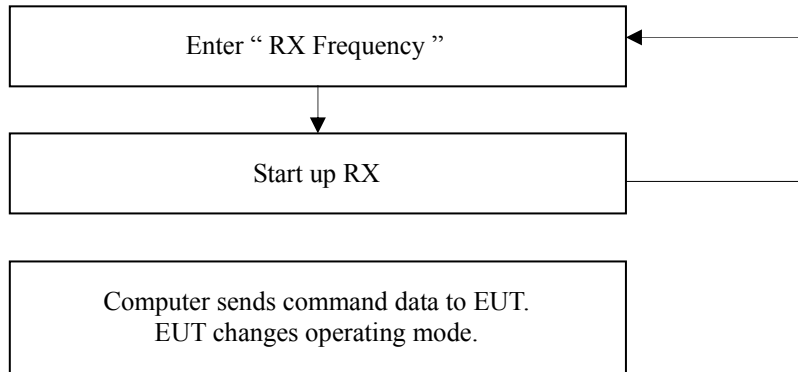
7.1 Operating Condition

The test was carried out under RX mode and VFO Scan mode.
EUT was examined in the operating conditions that had maximum emissions.

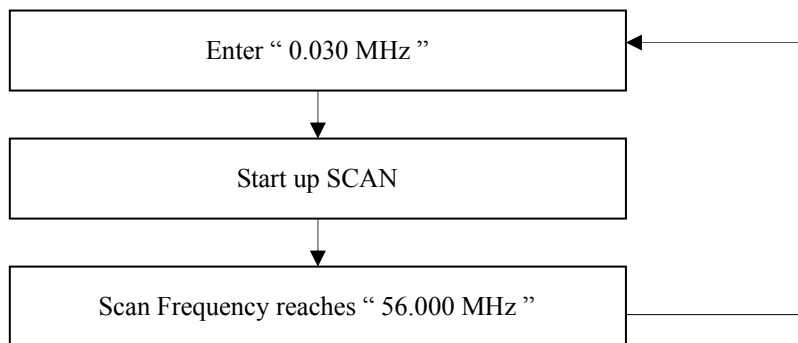
7.2 Operating Flow [RX mode and VFO Scan mode]

Following operations were performed continuously.

7.2.1 RX mode



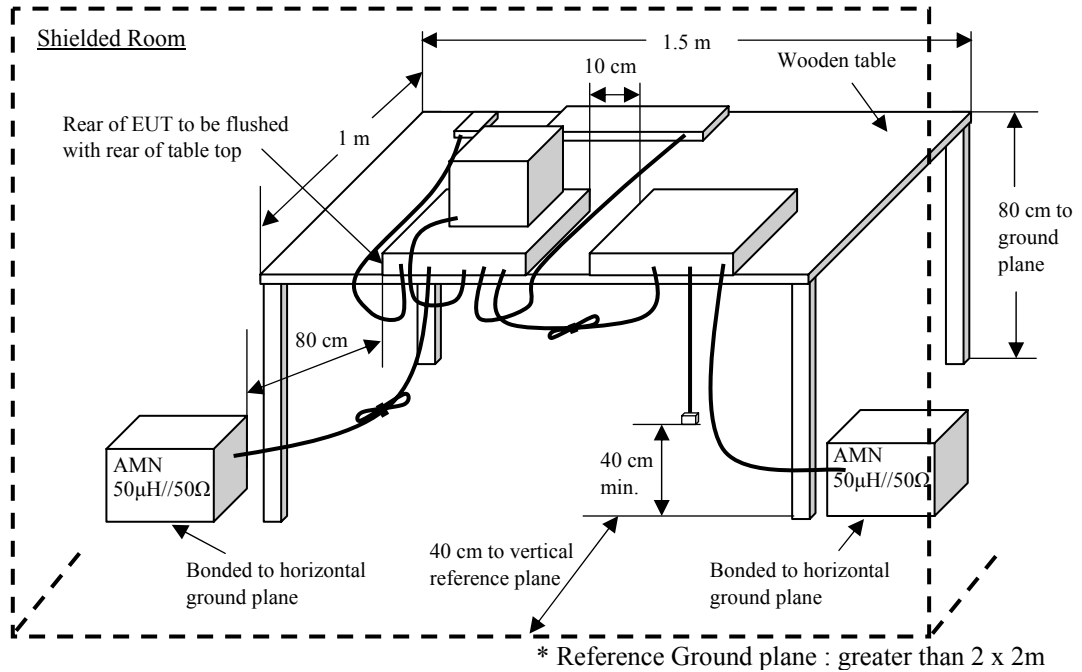
7.2.2 VFO Scan mode



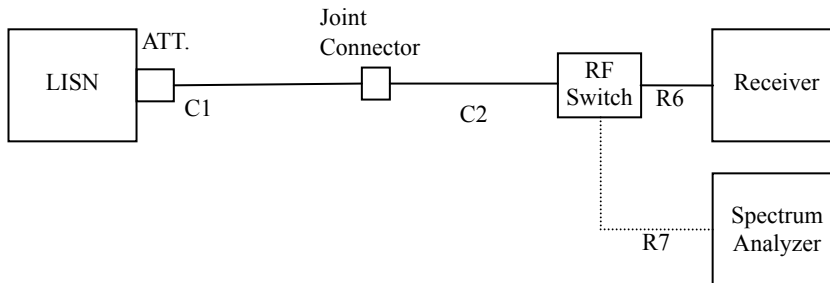
SECTION 8. TEST PROCEDURE(S)

Test was carried out under the following conditions.

Conducted Voltages on Mains Port



Schema for the conducted voltages on mains port measurement



[Instrument Setup]

Frequency [MHz]	Instrument	Detector Function	Resolution Bandwidth	Video Bandwidth
0.15 – 30	Receiver	Quasi Peak	10 kHz	N.A.
		Average	10 kHz	N.A.

[Preliminary Measurement]

EUT is tested on all operating conditions.

The spectrum analyzer is controlled by the computer program to sweep the frequency range to be measured, then spectrum chart are plotted out to find the worst emission conditions in operating mode and/or configuration decision for the final test.

All leads other than safety ground are tested.

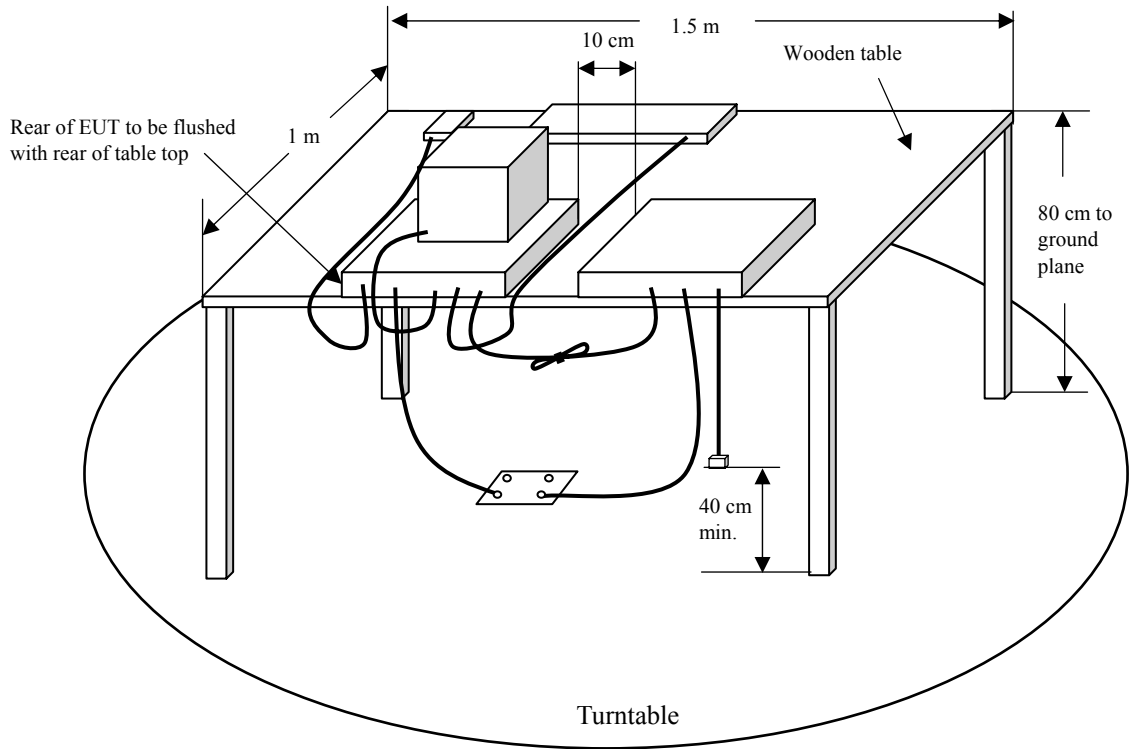
[Final Measurement]

The EUT is operated in the worst emission condition found by the preliminary test.

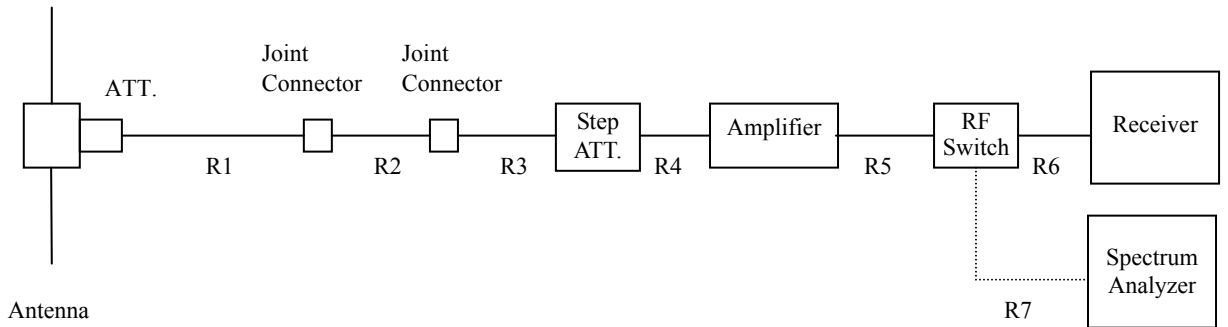
The equipment and cables are arranged or manipulated within the range of the test standard in the above condition.

At least six highest spectrum are measured in quasi-peak and average (if necessary) using the test receiver.

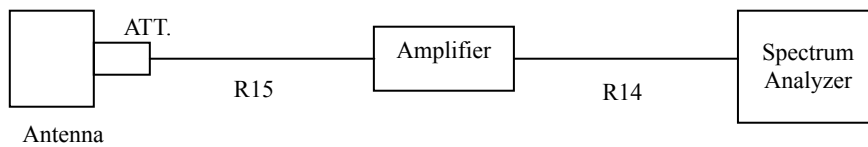
Radiated Electric Field



Schema for the radiated electric field measurement (30-1000MHz)



Above 1GHz



[Instrument Setup]

Frequency [MHz]	Instrument	Detector Function	Resolution Bandwidth	Video Bandwidth
30 to 1000	Receiver	Quasi Peak	120 kHz	N.A.
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz
		Average	1 MHz	10 Hz

[Preliminary Measurement]

EUT is tested on all operating conditions.

The spectrum analyzer is set max-hold mode and swept during turntable was rotated 0 to 360 degree. Then spectrum chart are plotted out to find the worst emission conditions in configuration, operating mode, or ambient noise notation.

[Final Measurement]

The EUT operated in the worst emission condition found by the preliminary test.

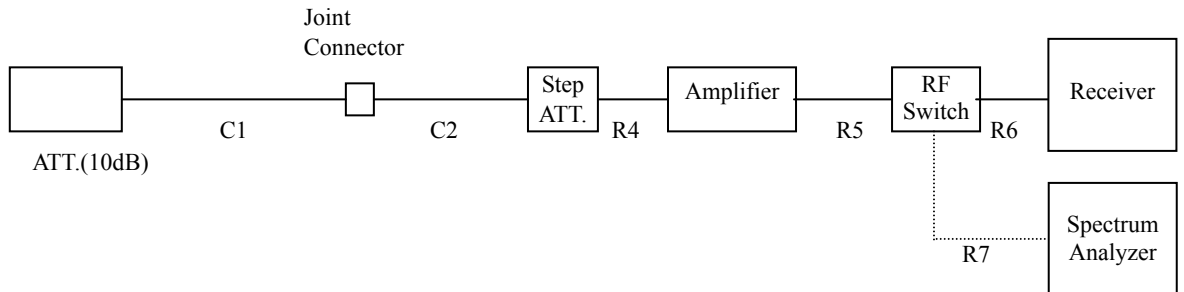
The turntable azimuth (EUT direction) and antenna height (1 to 4 meters) are adjusted the position so that maximum field strength is obtained for each frequency spectrum to be measured.

The equipment and cables are arranged or manipulated within the range of the test standard in the above condition.

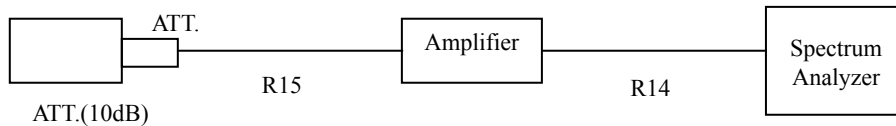
At least six highest spectrum are measured by the test receiver (quasi-peak) and spectrum analyzer (peak and average). When the uncertain result was obtained, the measurement is retried by using the half wave dipole antenna instead of the broadband antenna.

Conducted Power on Antenna port

Schema for the conducted power on antenna port measurement



Above 1GHz



[Instrument Setup]

Frequency [MHz]	Instrument	Detector Function	Resolution Bandwidth	Video Bandwidth
30 to 1000	Receiver	Quasi Peak	120 kHz	N.A.
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz
		Average	1 MHz	10 Hz

[Preliminary Measurement]

EUT is tested on all operating conditions.

The spectrum analyzer is controlled by the computer program to sweep the frequency range to be measured, then spectrum chart are plotted out to find the worst emission conditions in operating mode and/or configuration decision for the final test.

[Final Measurement]

The EUT is operated in the worst emission condition found by the preliminary test.

The equipment and cables are arranged or manipulated within the range of the test standard in the above condition.

At least six highest spectrum are measured in quasi-peak using the test receiver.

38dB Rejection

Schema for the 38dB rejection measurement



[Preliminary Measurement]

The Signal Generator conditions :

Output level = 66 dBuV.

Modulation = Frequency modulated to 1 kHz tone at 3 kHz peak deviation.

Frequency Points = 824.040 MHz, 836.505 MHz, 848.970 MHz
869.040 MHz, 881.505 MHz, 893.970 MHz

(The Cellular Radiotelephone Service mobile and base frequency bands)

The EUT condition :

Scanning Frequency = 0.030 MHz – 60.000 MHz (5 kHz Step).

Scan stopped point, was the detected frequency.

[Final Measurement]

Injected 12dB SINAD Reading (SG RF Output)

The EUT condition :

Frequency = Scan stopped point

The Signal Generator condition :

Frequency = Cellular point

Detected 12dB SINAD Reading (SG RF Output)

The EUT condition :

Frequency = Scan stopped point

The Signal Generator condition :

Frequency = Scan stopped point

Under the requirements of Section 15.121(b) of the Rule.

Injected 12dB SINAD Reading – Detected 12dB SINAD Reading = 38 dB or more.

SECTION 9. EVALUATION OF TEST RESULTS

9.1 Conducted Voltages on Mains Port

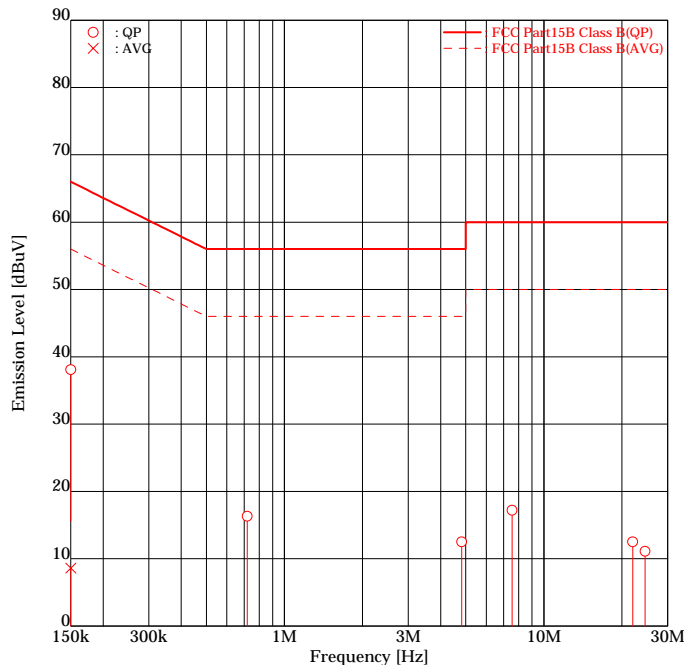
9.1.1 RX 0.030MHz mode

ETL SEMKO Japan K.K.

Kashima No.1 Test Site

Conducted Voltages on Mains Port

APPLICANT : Vertex Standard Co., Ltd.
 EUT NAME : HF Transceiver
 MODEL NO. : FT-450
 SERIAL NO. : 7C000001
 TEST MODE : RX 0.030MHz
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jan 18 2007
 FILE NO. : ESJ-107009
 REGULATION : FCC Part15B Class B
 TEST METHOD : ANSI C63.4-2003
 TEMPERATURE : 22.0 [degC]
 HUMIDITY : 35.0 [%]
 NOTE :



ENGINEER : Kazuo Masuda

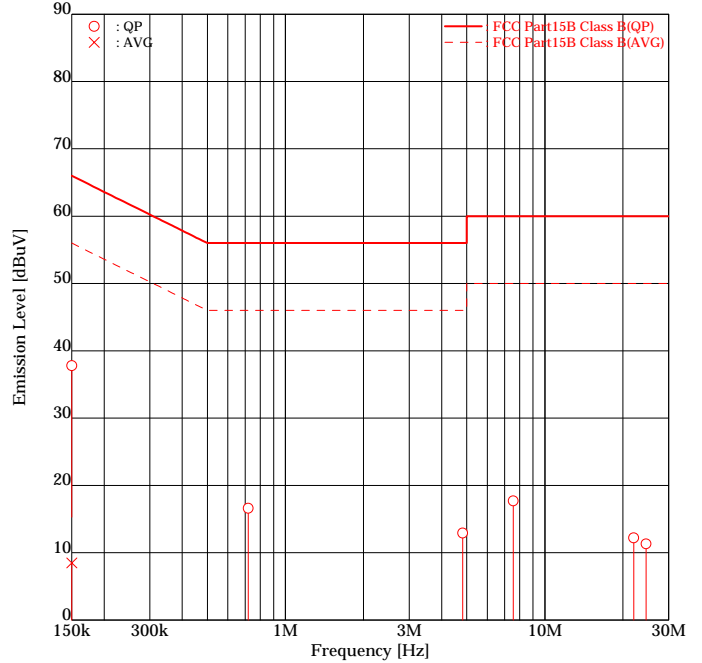
FREQUENCY [No]	MODE [MHz]	READING [dBuV]		FACTOR [dB]		EMISSION [dBuV]		LIMIT [dBuV]	MARGIN [dB]		
		Line1	Line2	Line1	Line2	Line1	Line2		Line1	Line2	
1	0.1500	QP	31.8	<u>32.0</u>	6.1	6.1	37.9	<u>38.1</u>	66.0	28.1	27.9
2	0.1500	AVG	<u>2.5</u>	2.2	6.1	6.1	<u>8.6</u>	8.3	56.0	<u>47.4</u>	47.7
3	0.7188	QP	7.9	<u>10.1</u>	6.3	6.2	14.2	<u>16.3</u>	56.0	41.8	<u>39.7</u>
4	4.8203	QP	<u>6.1</u>	5.8	6.4	6.4	<u>12.5</u>	12.2	56.0	<u>43.5</u>	43.8
5	7.5499	QP	8.6	<u>10.7</u>	6.5	6.5	15.1	<u>17.2</u>	60.0	44.9	<u>42.8</u>
6	21.9983	QP	<u>5.6</u>	4.8	6.9	7.1	<u>12.5</u>	11.9	60.0	<u>47.5</u>	48.1
7	24.5750	QP	2.8	4.0	6.8	7.1	9.6	11.1	60.0	50.4	48.9

Higher six points are underlined.
 Other frequencies : Below the FCC Part15B Class B limit
 Emission Level = Read + Factor(LISN,Pad,Cable)

9.1.2 RX 30MHz mode

ETL SEMKO Japan K.K.
Kashima No.1 Test Site
 Conducted Voltages on Mains Port

APPLICANT : Vertex Standard Co., Ltd.
 EUT NAME : HF Transceiver
 MODEL NO. : FT-450
 SERIAL NO. : 7C000001
 TEST MODE : RX 30MHz
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jan 18 2007
 FILE NO. : ESJ-107009
 REGULATION : FCC Part15B Class B
 TEST METHOD : ANSI C63.4-2003
 TEMPERATURE : 22.0 [degC]
 HUMIDITY : 35.0 [%]
 NOTE :



ENGINEER : Kazuo Masuda

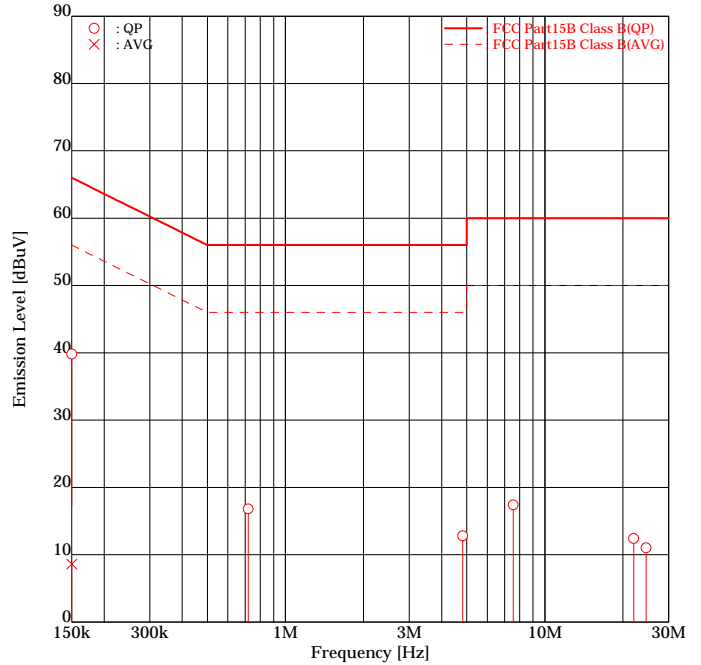
FREQUENCY [No]	MODE [MHz]		READING [dBuV]		FACTOR [dB]		EMISSION [dBuV]		LIMIT [dBuV]	MARGIN [dB]	
			Line1	Line2	Line1	Line2	Line1	Line2		Line1	Line2
1	0.1500	QP	<u>31.7</u>	31.6	6.1	6.1	<u>37.8</u>	37.7	66.0	<u>28.2</u>	28.3
2	0.1500	AVG	2.3	<u>2.4</u>	6.1	6.1	8.4	8.5	56.0	47.6	<u>47.5</u>
3	0.7185	QP	8.9	<u>10.4</u>	6.3	6.2	15.2	<u>16.6</u>	56.0	40.8	<u>39.4</u>
4	4.8207	QP	<u>6.5</u>	6.3	6.4	6.4	<u>12.9</u>	12.7	56.0	<u>43.1</u>	43.3
5	7.5540	QP	8.7	<u>11.2</u>	6.5	6.5	15.2	<u>17.7</u>	60.0	44.8	<u>42.3</u>
6	21.9989	QP	<u>5.3</u>	5.0	6.9	7.1	<u>12.2</u>	12.1	60.0	<u>47.8</u>	47.9
7	24.5752	QP	3.0	4.2	6.8	7.1	9.8	11.3	60.0	50.2	48.7

Higher six points are underlined.
 Other frequencies : Below the FCC Part15B Class B limit
 Emission Level = Read + Factor(LISN,Pad,Cable)

9.1.3 RX 56MHz mode

ETL SEMKO Japan K.K.
Kashima No.1 Test Site
 Conducted Voltages on Mains Port

APPLICANT : Vertex Standard Co., Ltd.
 EUT NAME : HF Transceiver
 MODEL NO. : FT-450
 SERIAL NO. : 7C000001
 TEST MODE : RX 56MHz
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jan 18 2007
 FILE NO. : ESJ-107009
 REGULATION : FCC Part15B Class B
 TEST METHOD : ANSI C63.4-2003
 TEMPERATURE : 22.0 [degC]
 HUMIDITY : 35.0 [%]
 NOTE :



ENGINEER : Kazuo Masuda

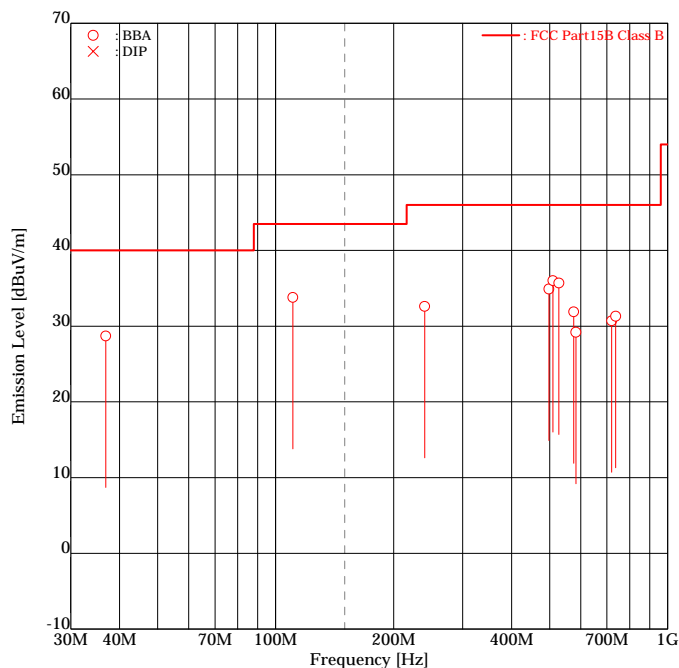
FREQUENCY [No]	MODE [MHz]	READING [dBuV]		FACTOR [dB]		EMISSION [dBuV]		LIMIT [dBuV]	MARGIN [dB]		
		Line1	Line2	Line1	Line2	Line1	Line2		Line1	Line2	
1	0.1500	QP	32.5	<u>33.7</u>	6.1	6.1	38.6	<u>39.8</u>	66.0	27.4	<u>26.2</u>
2	0.1500	AVG	2.0	<u>2.5</u>	6.1	6.1	8.1	<u>8.6</u>	56.0	47.9	<u>47.4</u>
3	0.7186	QP	7.8	<u>10.6</u>	6.3	6.2	14.1	<u>16.8</u>	56.0	41.9	<u>39.2</u>
4	4.8200	QP	<u>6.4</u>	5.1	6.4	6.4	<u>12.8</u>	11.5	56.0	<u>43.2</u>	44.5
5	7.5536	QP	8.3	<u>10.9</u>	6.5	6.5	14.8	<u>17.4</u>	60.0	45.2	<u>42.6</u>
6	21.9976	QP	<u>5.5</u>	4.1	6.9	7.1	<u>12.4</u>	11.2	60.0	<u>47.6</u>	48.8
7	24.5757	QP	2.7	3.9	6.8	7.1	9.5	11.0	60.0	50.5	49.0

Higher six points are underlined.
 Other frequencies : Below the FCC Part15B Class B limit
 Emission Level = Read + Factor(LISN,Pad,Cable)

9.2 Radiated Electric Field
 9.2.1 RX 0.030MHz mode (30 – 1000MHz)

ETL SEMKO Japan K.K.
 Kashima No.1 Test Site
 Radiated Electric Field

APPLICANT : Vertex Standard Co., Ltd.
 EUT NAME : HF Transceiver
 MODEL NO. : FT-450
 SERIAL NO. : 7C000001
 TEST MODE : RX 0.030MHz
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jan 18 2007
 FILE NO. : ESJ-107009
 REGULATION : FCC Part15B Class B
 TEST METHOD : ANSI C63.4-2003
 DISTANCE : 3.00 [m]
 TEMPERATURE : 22.0 [degC]
 HUMIDITY : 35.0 [%]
 NOTE :



ENGINEER : Kazuo Masuda

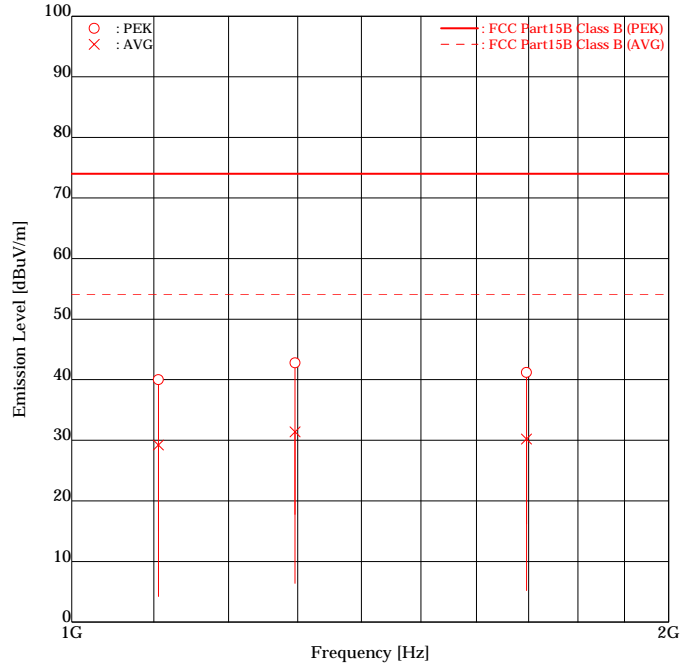
FREQUENCY [No]	ANT. [MHz]	READING [dBuV]		FACTOR [dB/m]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]		
		Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert	
1	36.86	BBA	-	<u>33.4</u>	-4.7	-4.7	-	<u>28.7</u>	40.0	-	<u>11.3</u>
2	110.59	BBA	<u>39.4</u>	38.9	-5.6	-5.6	<u>33.8</u>	<u>33.3</u>	43.5	9.7	10.2
3	240.02	BBA	<u>36.0</u>	-	-3.4	-3.4	<u>32.6</u>	-	46.0	<u>13.4</u>	-
4	497.66	BBA	-	<u>30.1</u>	4.8	4.8	-	<u>34.9</u>	46.0	-	<u>11.1</u>
5	509.94	BBA	27.5	<u>30.9</u>	5.1	5.1	32.6	<u>36.0</u>	46.0	13.4	<u>10.0</u>
6	528.04	BBA	<u>30.1</u>	28.4	5.6	5.6	<u>35.7</u>	34.0	46.0	<u>10.3</u>	12.0
7	576.05	BBA	-	24.9	7.0	7.0	-	31.9	46.0	-	14.1
8	583.67	BBA	-	22.0	7.2	7.2	-	29.2	46.0	-	16.8
9	720.06	BBA	-	21.5	9.2	9.2	-	30.7	46.0	-	15.3
10	737.27	BBA	21.7	-	9.6	9.6	31.3	-	46.0	14.7	-

Higher six points are underlined.
 Other frequencies : Below the FCC Part15B Class B limit
 Emission Level = Read + Factor(Antenna,Pad,Cable,Preamp)
 ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

9.2.2 RX 0.030MHz mode (1000 – 2000MHz)

ETL SEMKO Japan K.K.
Kashima No.1 Test Site
Radiated Electric Field

APPLICANT : Vertex Standard Co., Ltd.
 EUT NAME : HF Transceiver
 MODEL NO. : FT-450
 SERIAL NO. : 7C000001
 TEST MODE : RX 0.030MHz
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jan 19 2007
 FILE NO. : ESJ-107009
 REGULATION : FCC Part15B Class B
 TEST METHOD : ANSI C63.4-2003
 DISTANCE : 3.00 [m]
 TEMPERATURE : 22.0 [degC]
 HUMIDITY : 31.0 [%]
 NOTE :



ENGINEER : Kazuo Masuda

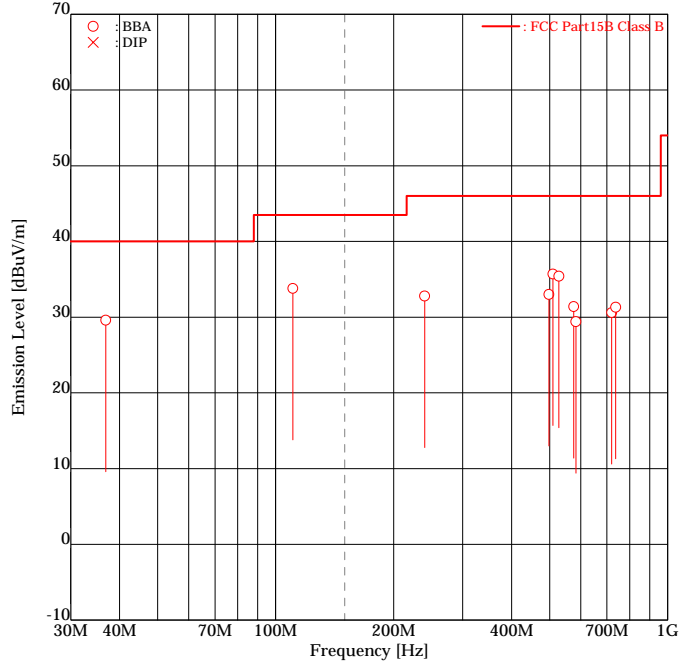
FREQUENCY [No]	MODE [MHz]		READING [dBuV]		FACTOR [dB/m]		EMISSION [dBuV/m]		LIMIT [dBuV/m]		MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert	Hori	Vert	Hori	Vert
1	1105.88	PEK	<u>41.0</u>	40.5	-1.0	-1.0	<u>40.0</u>	39.5	74.0	<u>34.0</u>	34.5	
2	1105.88	AVG	<u>30.2</u>	29.7	-1.0	-1.0	<u>29.2</u>	28.7	54.0	<u>24.8</u>	25.3	
3	1296.15	PEK	42.1	<u>43.5</u>	-0.7	-0.7	41.4	<u>42.8</u>	74.0	32.6	<u>31.2</u>	
4	1296.15	AVG	<u>32.1</u>	31.5	-0.7	-0.7	<u>31.4</u>	30.8	54.0	22.6	23.2	
5	1695.80	PEK	39.5	<u>40.2</u>	1.0	1.0	40.5	<u>41.2</u>	74.0	33.5	<u>32.8</u>	
6	1695.80	AVG	29.0	<u>29.2</u>	1.0	1.0	30.0	<u>30.2</u>	54.0	24.0	<u>23.8</u>	

Higher six points are underlined.
 Other frequencies : Below the FCC Part15B Class B limit
 Emission Level = Read + Factor(Antenna, Antenna Pad, Cable, Preamp)
 ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

9.2.3 RX 30MHz mode (30 – 1000MHz)

ETL SEMKO Japan K.K.
Kashima No.1 Test Site
Radiated Electric Field

APPLICANT : Vertex Standard Co., Ltd.
 EUT NAME : HF Transceiver
 MODEL NO. : FT-450
 SERIAL NO. : 7C000001
 TEST MODE : RX 30MHz
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jan 18 2007
 FILE NO. : ESJ-107009
 REGULATION : FCC Part15B Class B
 TEST METHOD : ANSI C63.4-2003
 DISTANCE : 3.00 [m]
 TEMPERATURE : 22.0 [degC]
 HUMIDITY : 35.0 [%]
 NOTE :



ENGINEER : Kazuo Masuda

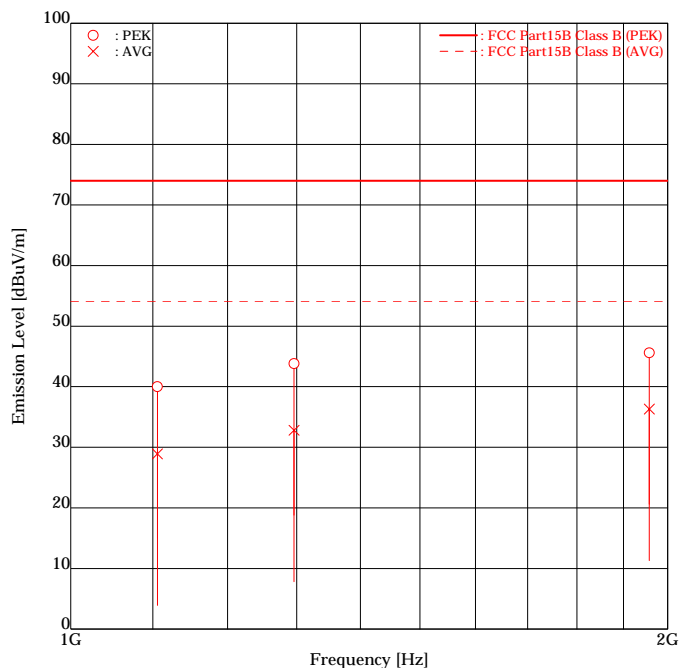
FREQUENCY [No]	ANT. [MHz]	ANT.	READING [dBuV]		FACTOR [dB/m]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	36.86	BBA	-	<u>34.3</u>	-4.7	-4.7	-	<u>29.6</u>	40.0	-	<u>10.4</u>
2	110.59	BBA	<u>39.4</u>	38.6	-5.6	-5.6	<u>33.8</u>	33.0	43.5	9.7	10.5
3	240.02	BBA	<u>36.2</u>	-	-3.4	-3.4	<u>32.8</u>	-	46.0	<u>13.2</u>	-
4	497.66	BBA	-	<u>28.2</u>	4.8	4.8	-	<u>33.0</u>	46.0	-	<u>13.0</u>
5	509.95	BBA	27.7	<u>30.6</u>	5.1	5.1	32.8	<u>35.7</u>	46.0	13.2	<u>10.3</u>
6	528.04	BBA	<u>29.8</u>	28.4	5.6	5.6	<u>35.4</u>	34.0	46.0	<u>10.6</u>	12.0
7	576.05	BBA	-	24.4	7.0	7.0	-	31.4	46.0	-	14.6
8	583.67	BBA	-	22.2	7.2	7.2	-	29.4	46.0	-	16.6
9	720.06	BBA	-	21.4	9.2	9.2	-	30.6	46.0	-	15.4
10	737.27	BBA	21.7	-	9.6	9.6	31.3	-	46.0	14.7	-

Higher six points are underlined.
 Other frequencies : Below the FCC Part15B Class B limit
 Emission Level = Read + Factor(Antenna,Pad,Cable,Preamp)
 ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

9.2.4 RX 30MHz mode (1000 – 2000MHz)

ETL SEMKO Japan K.K.
Kashima No.1 Test Site
Radiated Electric Field

APPLICANT : Vertex Standard Co., Ltd.
 EUT NAME : HF Transceiver
 MODEL NO. : FT-450
 SERIAL NO. : 7C000001
 TEST MODE : RX 30MHz
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jan 19 2007
 FILE NO. : ESJ-107009
 REGULATION : FCC Part15B Class B
 TEST METHOD : ANSI C63.4-2003
 DISTANCE : 3.00 [m]
 TEMPERATURE : 22.0 [degC]
 HUMIDITY : 31.0 [%]
 NOTE :



ENGINEER : Kazuo Masuda

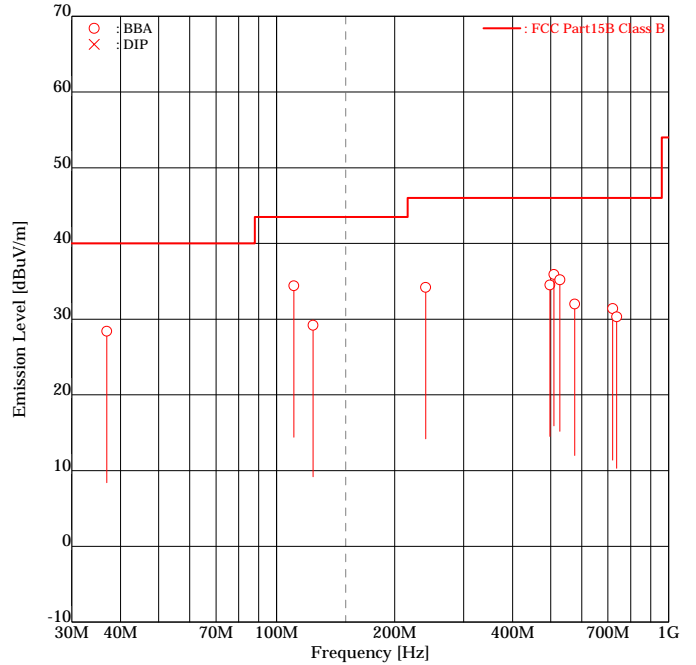
FREQUENCY [No]	MODE [MHz]		READING [dBuV]		FACTOR [dB/m]		EMISSION [dBuV/m]		LIMIT [dBuV/m]		MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert	Hori	Vert		
1	1105.88	PEK	39.5	<u>41.0</u>	-1.0	-1.0	38.5	<u>40.0</u>	74.0	35.5	<u>34.0</u>	
2	1105.88	AVG	28.6	<u>29.9</u>	-1.0	-1.0	27.6	<u>28.9</u>	54.0	26.4	<u>25.1</u>	
3	1296.15	PEK	43.4	<u>44.5</u>	-0.7	-0.7	42.7	<u>43.8</u>	74.0	31.3	<u>30.2</u>	
4	1296.15	AVG	32.5	<u>33.5</u>	-0.7	-0.7	31.8	<u>32.8</u>	54.0	22.2	<u>21.2</u>	
5	1958.00	PEK	40.0	<u>42.6</u>	3.0	3.0	43.0	<u>45.6</u>	74.0	31.0	<u>28.4</u>	
6	1958.00	AVG	30.0	<u>33.3</u>	3.0	3.0	33.0	<u>36.3</u>	54.0	21.0	<u>17.7</u>	

Higher six points are underlined.
 Other frequencies : Below the FCC Part15B Class B limit
 Emission Level = Read + Factor(Antenna, Antenna Pad, Cable, Preamp)
 ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

9.2.5 RX 56MHz mode (30 – 1000MHz)

ETL SEMKO Japan K.K.
Kashima No.1 Test Site
Radiated Electric Field

APPLICANT : Vertex Standard Co., Ltd.
 EUT NAME : HF Transceiver
 MODEL NO. : FT-450
 SERIAL NO. : 7C000001
 TEST MODE : RX 56MHz
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jan 18 2007
 FILE NO. : ESJ-107009
 REGULATION : FCC Part15B Class B
 TEST METHOD : ANSI C63.4-2003
 DISTANCE : 3.00 [m]
 TEMPERATURE : 22.0 [degC]
 HUMIDITY : 35.0 [%]
 NOTE :



ENGINEER : Kazuo Masuda

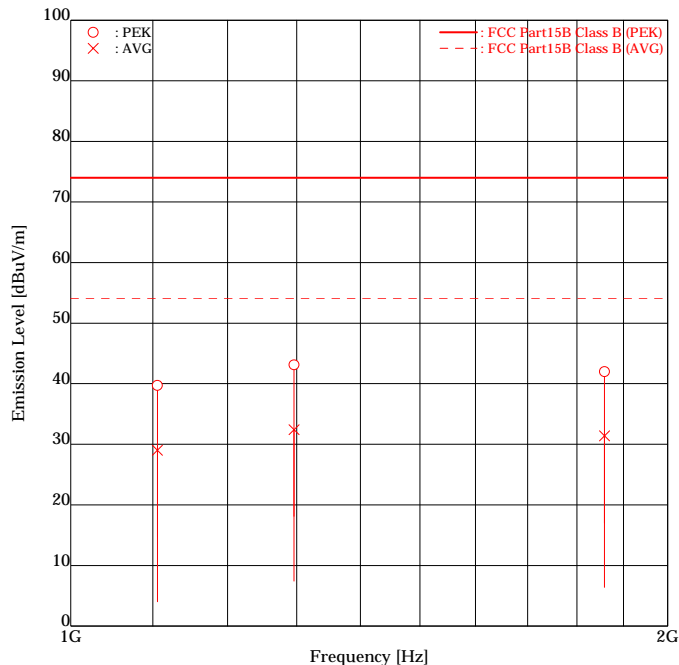
FREQUENCY [No]	ANT. [MHz]	ANT.	READING [dBuV]		FACTOR [dB/m]		EMISSION [dBuV/m]		LIMIT [dBuV/m]	MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert		Hori	Vert
1	36.86	BBA	-	<u>33.1</u>	-4.7	-4.7	-	<u>28.4</u>	40.0	-	<u>11.6</u>
2	110.59	BBA	<u>40.0</u>	<u>38.1</u>	-5.6	-5.6	<u>34.4</u>	<u>32.5</u>	43.5	9.1	11.0
3	123.89	BBA	-	33.0	-3.8	-3.8	-	29.2	43.5	-	14.3
4	240.02	BBA	<u>37.6</u>	-	-3.4	-3.4	<u>34.2</u>	-	46.0	<u>11.8</u>	-
5	497.66	BBA	-	<u>29.7</u>	4.8	4.8	-	<u>34.5</u>	46.0	-	<u>11.5</u>
6	509.94	BBA	27.8	<u>30.8</u>	5.1	5.1	32.9	<u>35.9</u>	46.0	13.1	<u>10.1</u>
7	528.04	BBA	28.7	<u>29.6</u>	5.6	5.6	34.3	<u>35.2</u>	46.0	11.7	<u>10.8</u>
8	576.05	BBA	-	25.0	7.0	7.0	-	32.0	46.0	-	14.0
9	720.06	BBA	-	22.2	9.2	9.2	-	31.4	46.0	-	14.6
10	737.27	BBA	20.7	-	9.6	9.6	30.3	-	46.0	15.7	-

Higher six points are underlined.
 Other frequencies : Below the FCC Part15B Class B limit
 Emission Level = Read + Factor(Antenna,Pad,Cable,Preamp)
 ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

9.2.6 RX 56MHz mode (1000 – 2000MHz)

ETL SEMKO Japan K.K.
Kashima No.1 Test Site
Radiated Electric Field

APPLICANT : Vertex Standard Co., Ltd.
 EUT NAME : HF Transceiver
 MODEL NO. : FT-450
 SERIAL NO. : 7C000001
 TEST MODE : RX 56MHz
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jan 19 2007
 FILE NO. : ESJ-107009
 REGULATION : FCC Part15B Class B
 TEST METHOD : ANSI C63.4-2003
 DISTANCE : 3.00 [m]
 TEMPERATURE : 22.0 [degC]
 HUMIDITY : 31.0 [%]
 NOTE :



ENGINEER : Kazuo Masuda

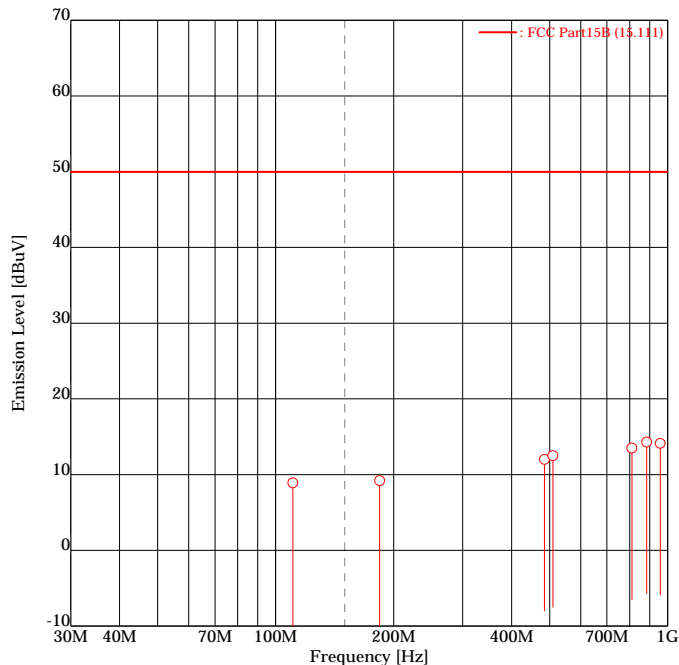
FREQUENCY [No]	MODE [MHz]		READING [dBuV]		FACTOR [dB/m]		EMISSION [dBuV/m]		LIMIT [dBuV/m]		MARGIN [dB]	
			Hori	Vert	Hori	Vert	Hori	Vert	Hori	Vert		
1	1105.88	PEK	39.8	<u>40.7</u>	-1.0	-1.0	38.8	<u>39.7</u>	74.0	35.2	<u>34.3</u>	
2	1105.88	AVG	29.1	<u>30.0</u>	-1.0	-1.0	28.1	<u>29.0</u>	54.0	25.9	<u>25.0</u>	
3	1296.15	PEK	42.2	<u>43.8</u>	-0.7	-0.7	41.5	<u>43.1</u>	74.0	32.5	<u>30.9</u>	
4	1296.15	AVG	32.2	<u>33.1</u>	-0.7	-0.7	31.5	<u>32.4</u>	54.0	22.5	<u>21.6</u>	
5	1858.49	PEK	39.6	<u>39.7</u>	2.3	2.3	41.9	<u>42.0</u>	74.0	32.1	<u>32.0</u>	
6	1858.49	AVG	29.0	<u>29.1</u>	2.3	2.3	31.3	<u>31.4</u>	54.0	22.7	<u>22.6</u>	

Higher six points are underlined.
 Other frequencies : Below the FCC Part15B Class B limit
 Emission Level = Read + Factor(Antenna, Antenna Pad, Cable, Preamp)
 ANT. : Used antenna(BBA = Broadband antenna, DIP = Dipole antenna)

9.3 Conducted Power on Antenna Port
 9.3.1 RX 0.030MHz mode (30 – 1000MHz)

ETL SEMKO Japan K.K.
 Kashima No.1 Test Site
 Conducted Power on Antenna Port

APPLICANT : Vertex Standard Co., Ltd.
 EUT NAME : HF Transceiver
 MODEL NO. : FT-450
 SERIAL NO. : 7C000001
 TEST MODE : RX 0.030MHz
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jan 19 2007
 FILE NO. : ESJ-107009
 REGULATION : FCC Part15B (15.111)
 TEST METHOD : ANSI C63.4-2003
 TEMPERATURE : 22.0 [degC]
 HUMIDITY : 35.0 [%]
 NOTE :



ENGINEER : Kazuo Masuda

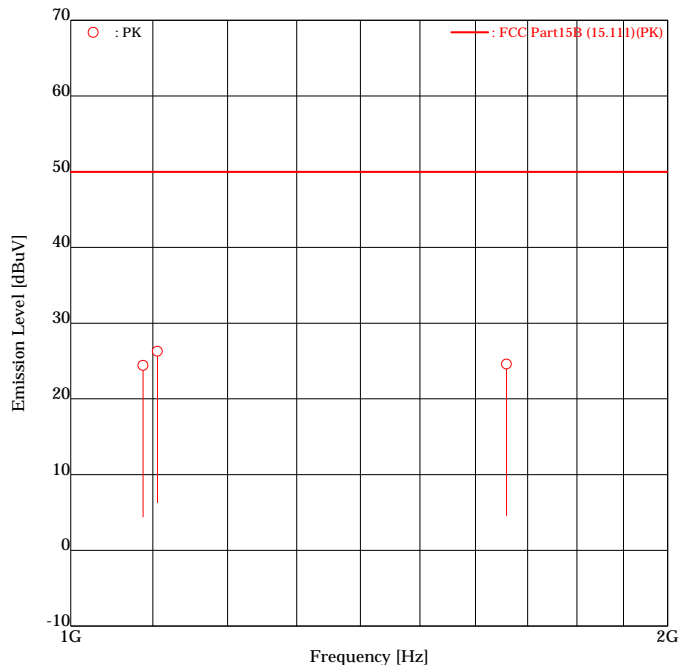
FREQUENCY [No]	FREQUENCY [MHz]	READING [dBuV]	FACTOR [dB]	EMISSION [dBuV]	LIMIT [dBuV]	MARGIN [dB]
1	110.5900	20.9	-12.0	8.9	50.0	41.1
2	184.3100	<u>20.6</u>	-11.4	<u>9.2</u>	50.0	<u>40.8</u>
3	485.3700	<u>21.5</u>	-9.5	<u>12.0</u>	50.0	<u>38.0</u>
4	509.9400	<u>21.9</u>	-9.4	<u>12.5</u>	50.0	<u>37.5</u>
5	810.9900	<u>21.3</u>	-7.8	<u>13.5</u>	50.0	<u>36.5</u>
6	884.7200	<u>21.5</u>	-7.2	<u>14.3</u>	50.0	<u>35.7</u>
7	958.4500	<u>20.9</u>	-6.8	<u>14.1</u>	50.0	<u>35.9</u>

Higher six points are underlined.
 Other frequencies : Below the FCC Part15B (15.111) limit
 Emission Level = Read + Factor(Pad,Cable,Preamplifier)

9.3.2 RX 0.030MHz mode (1000 – 2000MHz)

ETL SEMKO Japan K.K.
Kashima No.1 Test Site
 Conducted Power on Antenna Port

APPLICANT : Vertex Standard Co., Ltd.
 EUT NAME : HF Transceiver
 MODEL NO. : FT-450
 SERIAL NO. : 7C000001
 TEST MODE : RX 0.030MHz
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jan 22 2007
 FILE NO. : ESJ-107009
 REGULATION : FCC Part15B (15.111)
 TEST METHOD : ANSI C63.4-2003
 TEMPERATURE : 23.0 [degC]
 HUMIDITY : 31.0 [%]
 NOTE :



ENGINEER : Kazuo Masuda

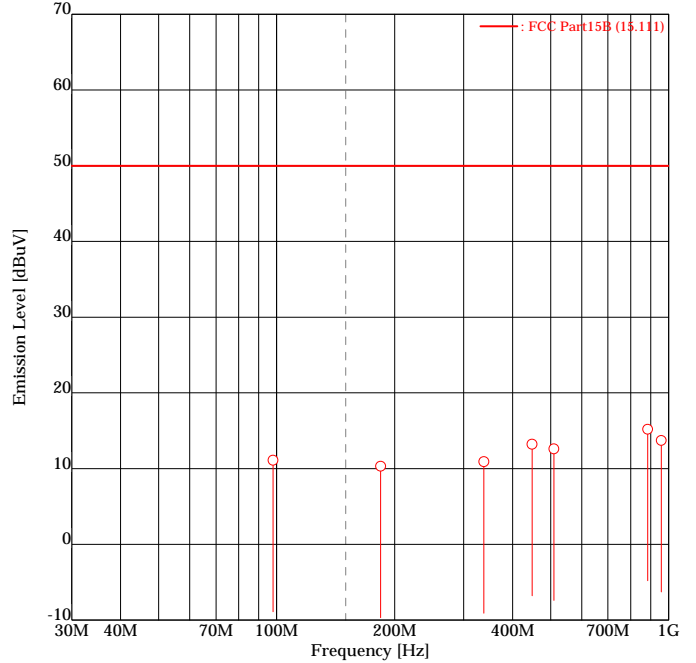
FREQUENCY [No]	FREQUENCY [MHz]	READING [dBuV]	FACTOR [dB]	EMISSION [dBuV]	LIMIT [dBuV]	MARGIN [dB]
1	1087.5000	<u>39.6</u>	-15.2	<u>24.4</u>	50.0	<u>25.6</u>
2	1105.9300	<u>41.6</u>	-15.3	<u>26.3</u>	50.0	<u>23.7</u>
3	1658.8800	<u>39.7</u>	-15.1	<u>24.6</u>	50.0	<u>25.4</u>

Higher six points are underlined.
 Other frequencies : Below the FCC Part15B (15.111) limit
 Emission Level = Read + Factor(Pad,Cable,Preamp)

9.3.3 RX 30MHz mode (30 – 1000MHz)

ETL SEMKO Japan K.K.
Kashima No.1 Test Site
Conducted Power on Antenna Port

APPLICANT : Vertex Standard Co., Ltd.
 EUT NAME : HF Transceiver
 MODEL NO. : FT-450
 SERIAL NO. : 7C000001
 TEST MODE : RX 30MHz
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jan 19 2007
 FILE NO. : ESJ-107009
 REGULATION : FCC Part15B (15.111)
 TEST METHOD : ANSI C63.4-2003
 TEMPERATURE : 22.0 [degC]
 HUMIDITY : 35.0 [%]
 NOTE :



ENGINEER : Kazuo Masuda

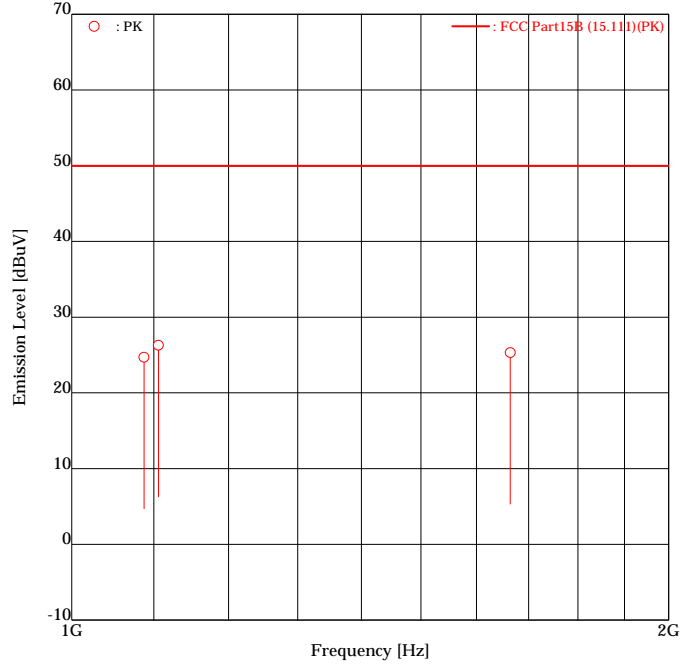
FREQUENCY [No]	FREQUENCY [MHz]	READING [dBuV]	FACTOR [dB]	EMISSION [dBuV]	LIMIT [dBuV]	MARGIN [dB]
1	97.8900	<u>23.1</u>	-12.0	<u>11.1</u>	50.0	<u>38.9</u>
2	184.3100	21.7	-11.4	10.3	50.0	39.7
3	337.9100	<u>21.3</u>	-10.4	<u>10.9</u>	50.0	<u>39.1</u>
4	448.5000	<u>22.9</u>	-9.7	<u>13.2</u>	50.0	<u>36.8</u>
5	509.9400	<u>22.0</u>	-9.4	<u>12.6</u>	50.0	<u>37.4</u>
6	884.7200	<u>22.4</u>	-7.2	<u>15.2</u>	50.0	<u>34.8</u>
7	958.4500	<u>20.5</u>	-6.8	<u>13.7</u>	50.0	<u>36.3</u>

Higher six points are underlined.
 Other frequencies : Below the FCC Part15B (15.111) limit
 Emission Level = Read + Factor(Pad,Cable,Preamplifier)

9.3.4 RX 30MHz mode (1000 – 2000MHz)

ETL SEMKO Japan K.K.
Kashima No.1 Test Site
 Conducted Power on Antenna Port

APPLICANT : Vertex Standard Co., Ltd.
 EUT NAME : HF Transceiver
 MODEL NO. : FT-450
 SERIAL NO. : 7C000001
 TEST MODE : RX 30MHz
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jan 22 2007
 FILE NO. : ESJ-107009
 REGULATION : FCC Part15B (15.111)
 TEST METHOD : ANSI C63.4-2003
 TEMPERATURE : 23.0 [degC]
 HUMIDITY : 31.0 [%]
 NOTE :



ENGINEER : Kazuo Masuda

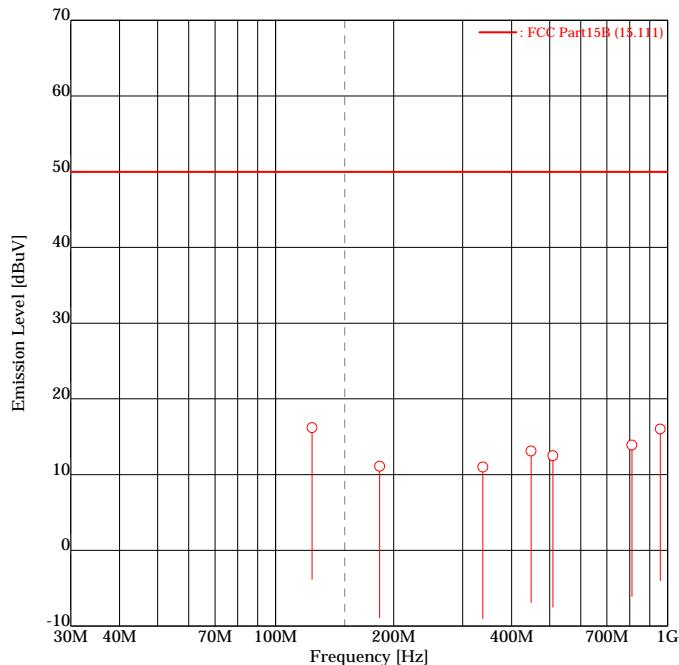
FREQUENCY [No]	FREQUENCY [MHz]	READING [dBuV]	FACTOR [dB]	EMISSION [dBuV]	LIMIT [dBuV]	MARGIN [dB]
1	1087.5000	<u>39.9</u>	-15.2	<u>24.7</u>	50.0	<u>25.3</u>
2	1105.9300	<u>41.6</u>	-15.3	<u>26.3</u>	50.0	<u>23.7</u>
3	1664.3000	<u>40.4</u>	-15.1	<u>25.3</u>	50.0	<u>24.7</u>

Higher six points are underlined.
 Other frequencies : Below the FCC Part15B (15.111) limit
 Emission Level = Read + Factor(Pad,Cable,Preamp)

9.3.5 RX 56MHz mode (30 – 1000MHz)

ETL SEMKO Japan K.K.
Kashima No.1 Test Site
Conducted Power on Antenna Port

APPLICANT : Vertex Standard Co., Ltd.
 EUT NAME : HF Transceiver
 MODEL NO. : FT-450
 SERIAL NO. : 7C000001
 TEST MODE : RX 56MHz
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jan 19 2007
 FILE NO. : ESJ-107009
 REGULATION : FCC Part15B (15.111)
 TEST METHOD : ANSI C63.4-2003
 TEMPERATURE : 22.0 [degC]
 HUMIDITY : 35.0 [%]
 NOTE :



ENGINEER : Kazuo Masuda

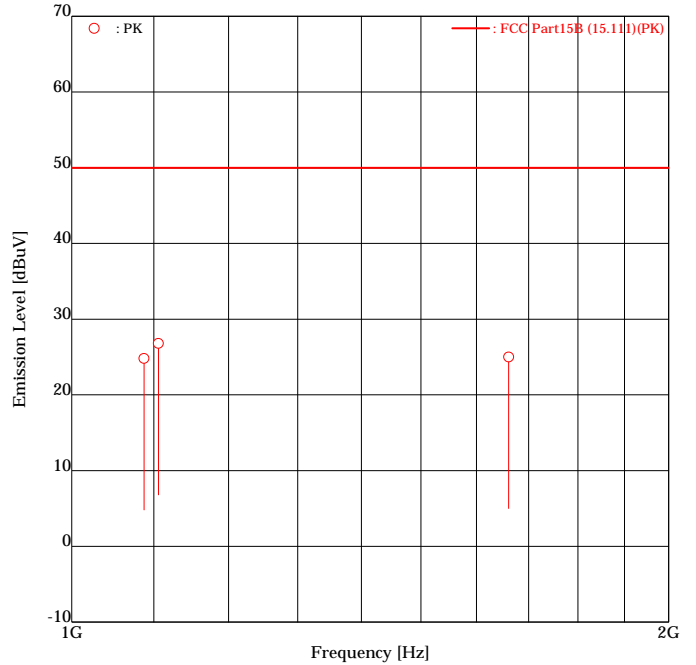
FREQUENCY [No]	FREQUENCY [MHz]	READING [dBuV]	FACTOR [dB]	EMISSION [dBuV]	LIMIT [dBuV]	MARGIN [dB]
1	123.9000	<u>28.1</u>	-11.9	<u>16.2</u>	50.0	<u>33.8</u>
2	184.3100	<u>22.5</u>	-11.4	<u>11.1</u>	50.0	<u>38.9</u>
3	337.9100	21.4	-10.4	11.0	50.0	39.0
4	448.5000	<u>22.8</u>	-9.7	<u>13.1</u>	50.0	<u>36.9</u>
5	509.9400	<u>21.9</u>	-9.4	<u>12.5</u>	50.0	<u>37.5</u>
6	811.0000	<u>21.7</u>	-7.8	<u>13.9</u>	50.0	<u>36.1</u>
7	958.4500	<u>22.8</u>	-6.8	<u>16.0</u>	50.0	<u>34.0</u>

Higher six points are underlined.
 Other frequencies : Below the FCC Part15B (15.111) limit
 Emission Level = Read + Factor(Pad,Cable,Preamplifier)

9.3.6 RX 56MHz mode (1000 – 2000MHz)

ETL SEMKO Japan K.K.
Kashima No.1 Test Site
Conducted Power on Antenna Port

APPLICANT : Vertex Standard Co., Ltd.
 EUT NAME : HF Transceiver
 MODEL NO. : FT-450
 SERIAL NO. : 7C000001
 TEST MODE : RX 56MHz
 POWER SOURCE : AC120V/60Hz
 DATE TESTED : Jan 22 2007
 FILE NO. : ESJ-107009
 REGULATION : FCC Part15B (15.111)
 TEST METHOD : ANSI C63.4-2003
 TEMPERATURE : 23.0 [degC]
 HUMIDITY : 31.0 [%]
 NOTE :



ENGINEER : Kazuo Masuda

FREQUENCY [No]	FREQUENCY [MHz]	READING [dBuV]	FACTOR [dB]	EMISSION [dBuV]	LIMIT [dBuV]	MARGIN [dB]
1	1087.5000	<u>40.0</u>	-15.2	<u>24.8</u>	50.0	<u>25.2</u>
2	1105.9300	<u>42.1</u>	-15.3	<u>26.8</u>	50.0	<u>23.2</u>
3	1661.2000	<u>40.1</u>	-15.1	<u>25.0</u>	50.0	<u>25.0</u>

Higher six points are underlined.
 Other frequencies : Below the FCC Part15B (15.111) limit
 Emission Level = Read + Factor(Pad,Cable,Preamp)

9.3.7 VFO Scan mode

< Graph number #1 >

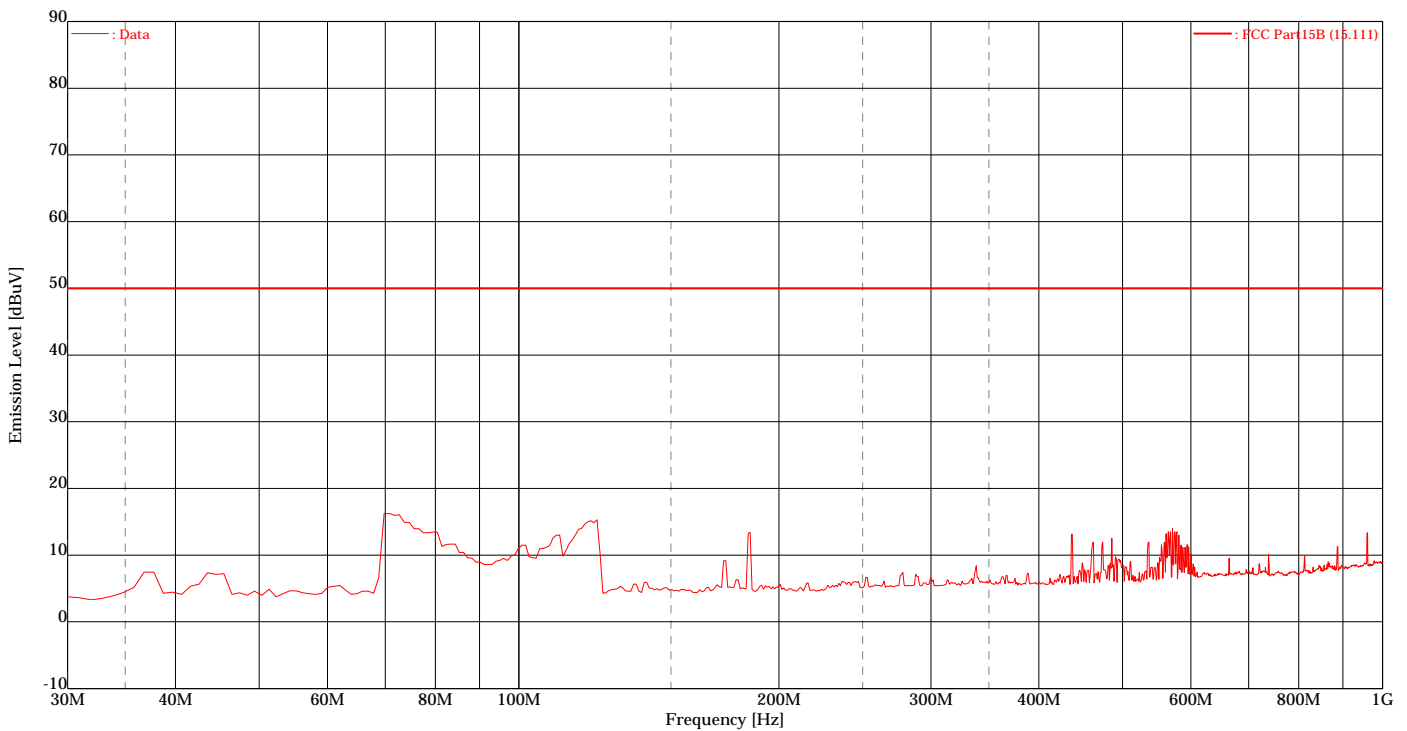
SPECTRUM ANALYSIS

Kashima No.1 Test Site

23.0degC/31.0%

Date tested : Jan 22 2007
Company : Vertex Standard Co., Ltd.
EUT Name : HF Transceiver
Model number : FT-450
Serial number : 7C000001

Test mode : VFO Scan
Power source : AC120V/60Hz
File number : ESJ-107009
Engineer : Kazuo Masuda
Note : Band : 0.030 - 56.000MHz



9.4 38dB Rejection Test

9.4.1 VFO Scan mode

Location : Kashima No.1 Test Site
 Date Tested : January. 23, 2007
 Temperature : 23 [degC]
 Humidity : 30 [%]
 Engineer : Kazuo Masuda

Injected Frequency [MHz]	Detected Frequency [MHz]	12dB SINAD Reading Injected Frequency [dBm]	12dB SINAD Reading Detected Frequency [dBm]	Rejection Level [dB]	Margin [dB]
824.040	No Point Detected	N / A	N / A	N / A	N / A
836.505	No Point Detected	N / A	N / A	N / A	N / A
848.970	No Point Detected	N / A	N / A	N / A	N / A
869.040	No Point Detected	N / A	N / A	N / A	N / A
881.505	No Point Detected	N / A	N / A	N / A	N / A
893.970	No Point Detected	N / A	N / A	N / A	N / A

The Audio Analyzer condition :
 12dB SINAD measurement level = 750mV.

9.5 Sample Calculations

9.5.1 Conducted Voltages on Mains Port

Example @ 0.1500MHz

Emission Level	=	Meter Reading		33.7	dBuV
	+	Factor	+	6.1	dB
				=	39.8
				dBuV	
Margin	=	Limit		66.0	dBuV
	-	Emission Level	-	39.8	dBuV
				=	26.2
				dB	

Factor = LISN Factor + Cable Loss + Pad Loss

9.5.2 Radiated Electric Field

Example @ 110.59MHz

Emission Level	=	Meter Reading		40.0	dBuV
	+	Factor	+	-5.6	dB/m
				=	34.4
				dBuV/m	
Margin	=	Limit		43.5	dBuV/m
	-	Emission Level	-	34.4	dBuV/m
				=	9.1
				dB	

Factor = Antenna Factor + Cable Loss + Amplifier Gain + Pad Loss

9.5.3 Conducted Power on Antenna Port

Example @ 1105.93MHz

Output Power Level	=	Meter Reading		42.1	dBuV
	+	Factor	+	-15.3	dB
			=	26.8	dBuV
 Margin	 =	 Limit (:2.0nW)		 50.0	 dBuV
	-	Output Power Level	-	26.8	dBuV
			=	23.2	dB

Factor = Cable Loss + Amplifier Gain + Pad Loss

9.5.4 38dB Rejection

Example @ N/A MHz

Rejection Level	=	12dB SINAD Reading at Injected Frequency		N/A	dBm
	-	12dB SINAD Reading at Detected Frequency	-	N/A	dBm
			=	N/A	dB
 Margin	 =	 Rejection Level		 N/A	 dB
	-	Limit	-	38.0	dB
			=	N/A	dB

SECTION 10. LIST OF MEASURING INSTRUMENTS

Instrument	Model No.	Serial No.	Manufacturer	Cal. Date	Calibration Expired
LISN (EUT)	ESH2-Z5	882395/022	Rohde & Schwarz	Sep. 29, 06	Sep. 30, 07
6dB Attenuator	CFA-01	None	TME	Nov. 13, 06	Nov. 30, 07
LISN (Peripheral)	KNW-242	8-851-21	Kyoritsu	Feb. 06, 06	Feb. 28, 07
50Ω Termination	CT-01	A010CON50	TME	Sep. 29, 06	Sep. 30, 07
Coaxial cable	5D-2W (7.0 m)	C1	ETL SEMKO	Nov. 13, 06	Nov. 30, 07
Coaxial cable	5D-2W (2.0 m)	C2	ETL SEMKO	Nov. 13, 06	Nov. 30, 07
Coaxial cable	5D-2W (1.0 m)	R6	ETL SEMKO	Nov. 13, 06	Nov. 30, 07
Coaxial cable	5D-2W (1.0 m)	R7	ETL SEMKO	Nov. 13, 06	Nov. 30, 07
Tri-Log antenna	VULB9168	106	Schwarzbeck	Aug. 29, 06	Aug. 31, 07
6dB Attenuator	MP721B	M57593	Anritsu	Jan. 15, 07	Jan. 31, 08
Step Attenuator	8494B	2726A14513	Hewlett Packard	Jan. 15, 07	Jan. 31, 08
Amplifier	ZX60-3018G	001	ETL SEMKO	Jan. 15, 07	Jan. 31, 08
Double Ridged Antenna	3115	5044	EMCO	Jun. 08, 06	Jun. 30, 07
3dB Attenuator	4768-3	79	narda	Sep. 27, 06	Sep. 30, 07
Amplifier	83051A	3332A00329	Hewlett Packard	Sep. 27, 06	Sep. 30, 07
Coaxial cable	5D-2W (9.0 m)	R1	ETL SEMKO	Jan. 15, 07	Jan. 31, 08
Coaxial cable	10D-2W (5.5 m)	R2	ETL SEMKO	Jan. 15, 07	Jan. 31, 08
Coaxial cable	5D-2W (2.0 m)	R3	ETL SEMKO	Jan. 15, 07	Jan. 31, 08
Coaxial cable	5D-2W (0.2 m)	R4	ETL SEMKO	Jan. 15, 07	Jan. 31, 08
Coaxial cable	5D-2W (1.0 m)	R5	ETL SEMKO	Jan. 15, 07	Jan. 31, 08
Coaxial cable	5D-2W (1.0 m)	R6	ETL SEMKO	Jan. 15, 07	Jan. 31, 08
Coaxial cable	5D-2W (1.0 m)	R7	ETL SEMKO	Jan. 15, 07	Jan. 31, 08
Coaxial cable	SUCOFLEX102(1.0m)	R14 712/2	SUHNER	Sep. 27, 06	Sep. 30, 07
Coaxial cable	KPS-1501-2362-KPS(6.0m)	R15 03292004	Insulated Wire	Sep. 27, 06	Sep. 30, 07
Spectrum Analyzer	8564E	3643A00665	Hewlett Packard	Aug. 17, 06	Aug. 31, 07
Site Attenuation				Jun. 14, 06	Jun. 30, 07
Test receiver	ESS (Firmware Version 1.07)	844861/004	Rohde & Schwarz	Mar. 10, 06	Mar. 31, 07
RF Switch	ACX-150-1	None	ETL SEMKO	Nov. 13, 06	Nov. 30, 07
Testing Software : emiT (Version 2.0.2.0)					
Attenuator (10dB)	CFA-05NPJ-10	262843	TME	Aug. 01, 06	Aug. 31, 07
RF Signal Generator	SMG	860289/011	Rohde & Schwarz	Apr. 14, 06	Apr. 30, 07
Audio Analyzer	8903B	2948A07326	Hewlett Packard	Apr. 18, 06	Apr. 30, 07

Note : Test instruments are calibrated according to Quality Manual and Calibration Rules of ETL SEMKO Japan.

SECTION 11. MEASUREMENT UNCERTAINTY

The uncertainty of the measurements performed for this report lies:

Radiated Electric Field at 3m		
30 MHz – 1000 MHz	± 3.7 dB	
Above 1 GHz	± 4.1 dB	
Radiated Electric Field at 10m		
30 MHz – 1000 MHz	± 3.8 dB	
Above 1 GHz	± 4.1 dB	
Radiated Electric Field at 30m		
Under consideration		
Radiated Effective Power		
11.7 GHz – 12.7 GHz	± 3.8 dB	
Conducted Voltages on Mains Port		
9 kHz – 30 MHz	± 3.0 dB	
Conducted Voltages on Telecommunication Port		
9 kHz – 30 MHz	± 3.4 dB	
Conducted Current on Telecommunication Port		
9 kHz – 30 MHz	± 1.3 dB	
Conducted Voltages on Terminals		
150 kHz – 30 MHz	± 1.0 dB	
Radiated Power		
30 MHz – 300 MHz	± 3.3 dB	

Note on Radiated Electric Field measurement uncertainty

The following items are not included in the calculations in spite of their own uncertainty components because it is impracticable to find the value.

It is our problem awaiting solution in future.

(1) Repeatability of measurement

It is not possible to calculate repeatability since the measurement was carried out only one time.

(2) Antenna factor variation

The definition of measured (radiated electric field strength) is not completed on the referred standard(s).




(3) Loss of EUT radiation propagation




It is certainly one of the uncertainty components, however is not able to calculate.

Please note that these uncertainties are not reflected to the compliance judgment of the test results in this report.

SECTION 12. DESCRIPTION OF TEST LABORATORY

ETL SEMKO is a division of Intertek plc (LSE: ITRK), a global leader in testing, inspection and certification services, operating in 273 laboratories and 521 offices in 100 countries throughout the world. The ETL SEMKO division of Intertek provides access to global markets through its local services, which include product safety testing and certification, EMC testing and performance testing for customers in such industries as wireless technology, security, appliances, HVAC, cables and wiring accessories, industrial machinery, medical devices, telecommunications, lighting, automotive, semiconductor, building products and electronics.

ACCREDITATION	SCOPE	LAB. CODE
 NVLAP USA <small>LAB CODE 100290-0</small>	EMC Testing	100290-0
 VLAC JAPAN	EMC Testing	VLAC-008-1
 BSMI TAIWAN	EMC Testing	SL2-IN-E-6008

FILING	SCOPE	LAB. CODE
 VCCI JAPAN	EMC Testing	-
 FCC USA	EMC Testing	Registration Number 934283
 IC CANADA	EMC Testing Telecom Testing	IC 2065
	EMC Testing	-