

Verification of Compliance

CFR 47 Part 15 Subpart C

Test Report File No. : 07-IST-0291

Date of Issue : July 20, 2007

Model(s) : SP5 ☒ Basic ☐ Alternate

Kind of Product : Digital Satellite Radio

Applicant : KIRYUNG ELECTRONICS Co., Ltd.

Address : 219-6, Gasan-Dong, Kumchun-Ku, Seoul, 153-023, Korea
Guro Dan Ji P.O. Box 37

Manufacturer : KIRYUNG ELECTRONICS Co., Ltd.

Address : 219-6, Gasan-Dong, Kumchun-Ku, Seoul, 153-023, Korea
Guro Dan Ji P.O. Box 37

Test Result ☒ Positive ☐ Negative

Reviewed By



S.J.Cho / EMC Group Manager

Approved By



B.S.Kim / Chief

Comment(s)

- Investigations requested : Measurement to the relevant clauses of FCC rules and regulations Part 15 Subpart C Section 15.239 - intentional Radiators.
- The test report with appendix consists of 16 pages.
- The test result only responds to the tested sample.
- It is not allowed to copy this report even partly without the allowance of IST EMC Laboratory.
- This equipment as for has been shown to be capable of continued compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4 2003.



INFORMATIONS OF TEST LABORATORY

EMC LABORATORY of IST Co., Ltd.
400-19, Singal-dong, Giheung-gu, Yongin-si, Gyeonggi-do,
446-599, Korea
TEL : +82 31 326 6700 FAX : +82 31 326 6797

ENVIRONMENTAL CONDITIONS

Temperature 22.5 °C
Humidity 68 %
Atmospheric pressure 1010 mbar

POWER SUPPLY SYSTEM USED

Power supply system Input : DC 12V, (Car Battery)
Output : DC 5.2V
(Refer to the product information)

PRODUCT INFORMATION

Satellite Frequencies	2322.293/2330.207 MHz
Terrestrial Frequencies	2326.250 MHz
Power Requirements	5.2Volts, Negative Ground, DC
Dimension-W x H x D	114.2(W) x 62.5(H) x 16.9(D) mm
Operating Temperature	-20 ~ 85°C
Tx Frequency Range	88.1 MHz ~107.9 MHz (range into 200 KHz Step)

- EMC suppression device is not used during the test.
- Please refer to user's manual.

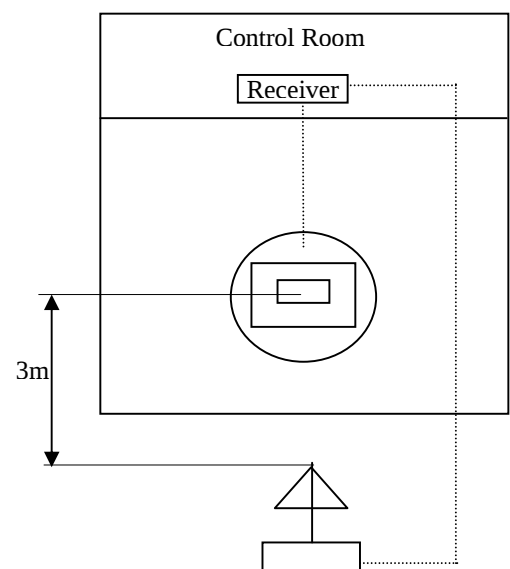
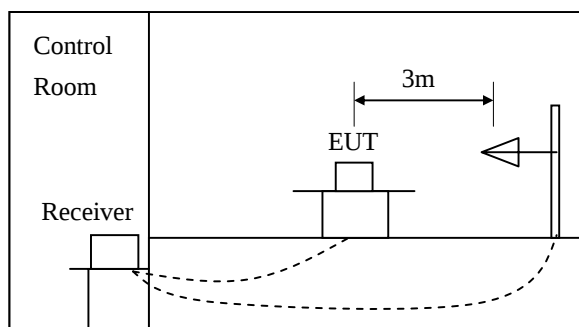
DESCRIPTION OF TEST

Radiated Emissions:

The measurement was performed over the frequency range of 30 MHz to 1GHz using antenna as the input transducer to a Spectrum analyzer or a Field Intensity Meter. The measurement was made with the detector set for "quasi-peak" within a bandwidth of 120 KHz.

-Procedure of Test

Preliminary measurements were made at 3 meter using bi-log antennas, and spectrum analyzer to determine the frequency producing the max. Emission in anechoic chamber. Appropriate precaution was taken to ensure that all emission from the EUT were maximized and investigated. The system configuration, mode of operation, turn-table azimuth and height with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 MHz to 1000 MHz using bi-log antenna. Above 1 GHz, linearly polarized double ridge horn antennas were used. Final measurements were made at open site with 3-meters test distance using bi-log antenna or horn antenna. The OATS have been verified in regular for its normalized site attenuation. The test equipment was placed on a wooden table. Sufficient time for the EUT, peripheral equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined by manual. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 120 kHz or 1MHz depending on the frequency of type of signal. The EUT, peripheral equipment and interconnecting cables were re-configured to the set-up producing the max. Emission for the frequency and were placed on top of a 0.8-meter high nonmetallic 1 x 1.5 meter table. The EUT, peripheral equipment, and interconnecting cables were re-arranged and manipulated to maximize each emission. The turntable containing the system was rotated; 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 operation to the EUT and/or peripheral equipment and changing the polarity of the antenna, whichever determined the worst-case emission.



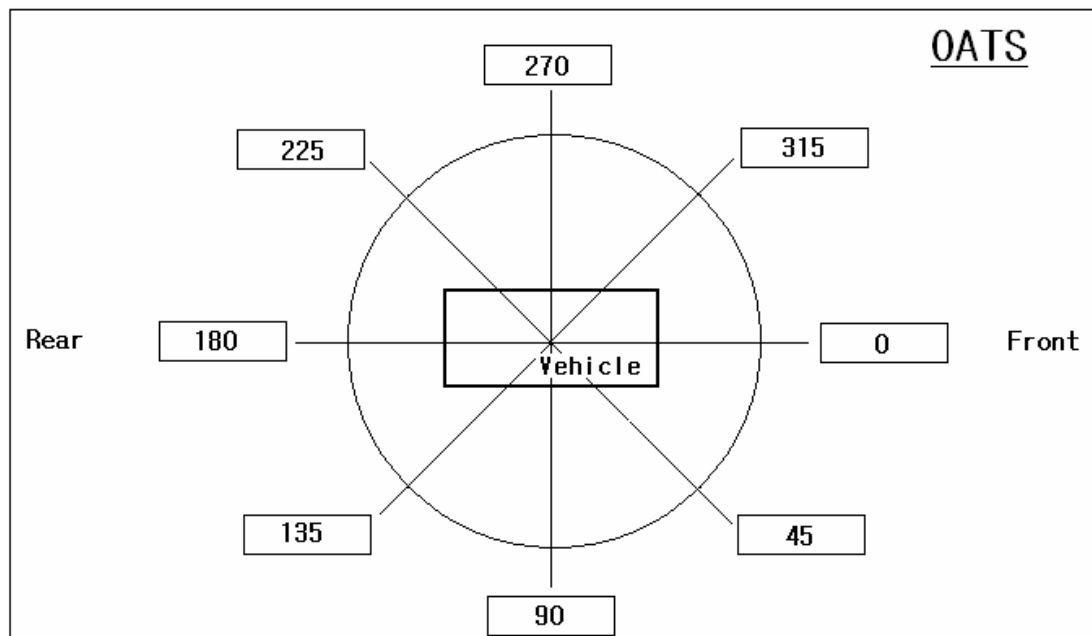
Equipment Under Test

Operation - mode of the E.U.T. :

The equipment under test was operated during the measurement under following conditions :

- ☐ Standby Mode
- ☒ Operational Condition : Transmit RF signal

Test set-up



Note :

SUMMARY

Emissions

■ Radiated Emission

The requirements are

● MET

○ Not MET

Minimum limit margin

7.49 dB at 97.9 MHz

Maximum limit exceeding

Remarks : Limits are kept with more 3dB margin.

- Large Vehicle

test Date

Begin of testing : July. 17, 2007

End of testing : July. 18, 2007

Note :

Prepared By



- ■ means the test is applicable,
- □ is not applicable.

S.C.JANG / EMC Project Manager

TEST CONDITIONS AND DATA

Radiated Emission

[Applicable]

◆ Test Equipment Used

Name	Type	Manufacturer	Calibration Date	Serial Number
ESCS 30	Test Receiver	Rohde & Schwarz	Aug. 17, 2006	100171
VULB 9160	Antenna	Schwarzbeck	Aug. 14, 2006	3047

◆ Test Accessories Used

Type	Manufacturer
Aneroid Barometer	Sato
Hygrometer	Sato

◆ Test Program See the operation in page 7.

◆ Test Date July. 17~18, 2007

◆ Test Area Open Area Test Site No.2

Note : The equipment used is calibrated in regular for every year.

Radiated Emissions

Radial Angle	88.1 MHz (dBuV)		97.9 MHz (dBuV)		107.9 MHz (dBuV)	
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
0°	22.51	31.11	17.6	17.6	28.27	33.27
45°	26.41	31.61	32.51	29.11	29.47	33.37
90°	27.61	34.61	33.01	32.21	37.87	33.87
135°	31.51	32.91	29.61	35.91	37.57	35.07
180°	31.21	38.91	31.21	38.91	26.47	34.07
225°	30.11	38.41	32.21	33.61	34.37	34.27
270°	27.71	26.71	32.71	30.11	31.27	34.87
315°	26.71	29.71	30.31	30.31	31.67	29.37
Minimum limit margin -9.90 dBuV at 88.10 MHz (38.91 dBuV)						

Note:

Small Vehicle

Radiated Emissions

Radial Angle	88.1 MHz (dBuV)		97.9 MHz (dBuV)		107.9 MHz (dBuV)	
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
0°	19.71	29.31	28.71	28.11	27.57	35.77
45°	28.71	30.51	26.41	28.41	30.67	33.77
90°	24.81	28.81	28.41	28.71	33.37	28.47
135°	25.31	32.71	26.91	29.81	31.27	32.07
180°	24.91	32.51	26.01	31.71	27.27	38.27
225°	24.21	32.51	33.61	31.31	33.87	32.27
270°	22.31	30.01	31.21	29.61	34.07	30.27
315°	29.71	31.01	28.81	29.01	31.27	31.07
Minimum limit margin			-9.73 dBuV at 107.90 MHz (38.27 dBuV)			

Note :

Medium Vehicle

Radiated Emissions

Radial Angle	88.1 MHz (dBuV)		97.9 MHz (dBuV)		107.9 MHz (dBuV)	
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
0°	30.01	27.31	35.01	34.41	27.27	31.67
45°	26.91	29.61	33.41	33.11	27.77	30.67
90°	26.11	28.51	33.01	34.81	31.07	31.87
135°	28.01	31.71	32.81	37.51	30.47	30.97
180°	32.71	31.31	37.81	38.11	30.77	34.77
225°	32.71	34.31	33.01	36.91	30.67	34.27
270°	34.41	34.01	35.51	40.51	31.87	31.47
315°	32.91	32.31	38.01	35.11	31.07	30.27
Minimum limit margin -7.49 dBuV at 97.90 MHz (40.51 dBuV)						

Note :

Large Vehicle

Appendix A. The Photos of Test Setup - Small Vehicle



Radiated Emissions(88.10 MHz- 107.90 MHz)-Front View



Radiated Emissions(88.10 MHz- 107.90 MHz)-Rear View

Appendix A. The Photos of Test Setup - Small Vehicle



Radiated Emissions(88.10 MHz- 107.90 MHz)- Install



Radiated Emissions(88.10 MHz- 107.90 MHz)- Rear glass

Appendix A. The Photos of Test Setup - Medium Vehicle



Radiated Emissions(88.10 MHz- 107.90 MHz)-Front View



Radiated Emissions(88.10 MHz- 107.90 MHz)-Rear View

Appendix A. The Photos of Test Setup - Medium Vehicle



Radiated Emissions(88.10 MHz- 107.90 MHz)- Install



Radiated Emissions(88.10 MHz- 107.90 MHz)- Rear glass

Appendix A. The Photos of Test Setup - Large Vehicle



Radiated Emissions(88.10 MHz- 107.90 MHz)-Front View

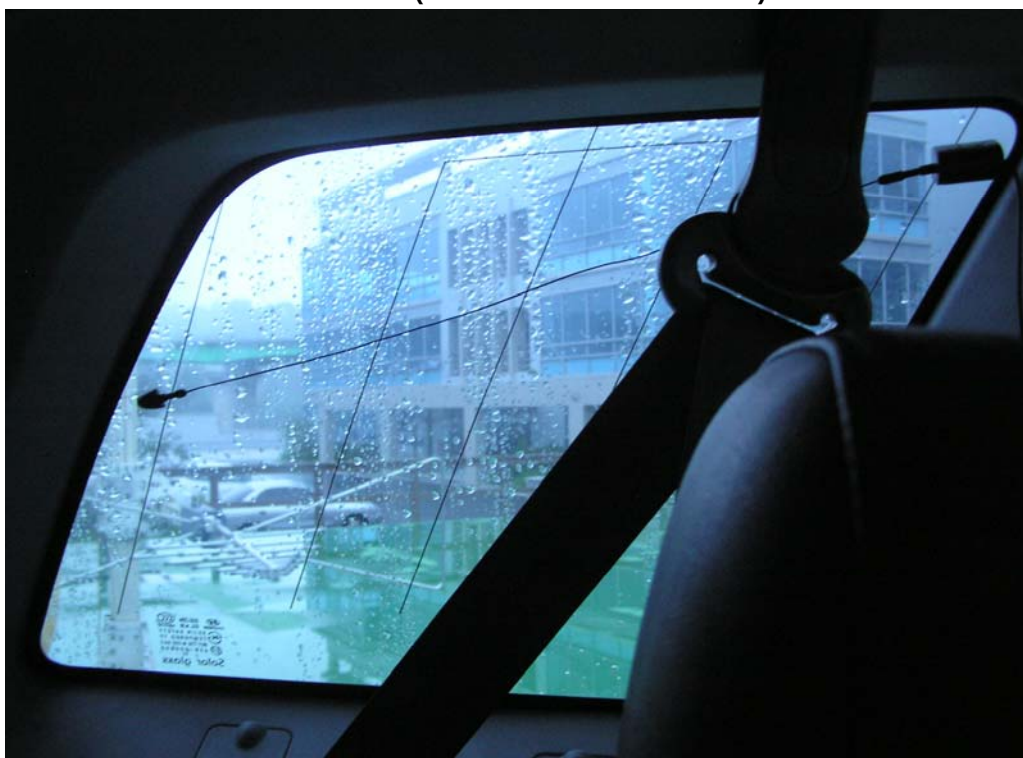


Radiated Emissions(88.10 MHz- 107.90 MHz)-Rear View

Appendix A. The Photos of Test Setup - Large Vehicle



Radiated Emissions(88.10 MHz- 107.90 MHz)- Install



Radiated Emissions(88.10 MHz- 107.90 MHz)- Side glass diversity