HCT CO., LTD.

CERTIFICATE OF COMPLIANCE

FCC PART 15.239 Certification

Applicant Name:
SysOnChip, Inc.

Address:
4F., Singwan Bldg., KT Buk-Daejeon Branch, 138 Gajeong-dong, Yuseong-gu, Daejeon., 302-828 South Korea

Date of Issue:
January 10, 2011

Test Site/Location:
HCT CO., LTD., 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, Korea(Lab)

Test Report No.: HCTR1101FR08

HCT FRN: 0005866421

IC Recognition No.: 5944A-2

FCC ID:	**P47SOCT5B**
APPLICANT:	**SysOnChip, Inc.**

Model(s):	SOCT570B
Additional Model(s):	SOCT530B
EUT Type:	SOCT570B Portable GPS Navigation device
Max. RF Output Power:	44.5 dBuv/m
Frequency Range:	88.1 ~ 107.9 MHz
Modulation Type:	Frequency Modulation
FCC Classification:	FCC Part 15 Low Power Communication Device TX (DXX)
FCC Rule Part(s)	Part 15 Subpart C (15.239)

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

Jong Seok Lee

Report prepared by
: Jong Seok Lee
Test engineer of RF Team

Approved by
: Sang Jun Lee
Manager of RF Team

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCTR1101FR08	January 10, 2011	First Approval Report

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1. GENERAL INFORMATION

Applicant Name:	SysOnChip, Inc.
Address:	4F., Singwan Bldg., KT Buk-Daejeon Branch, 138 Gajeong-dong, Yuseong-gu, Daejeon., 302-828 South Korea
FCC ID:	P47SOCT5B
Application Type:	Certification
EUT:	Portable GPS Navigation device
Model:	SOCT570B
Additional Model:	SOCT530B
Date of Test:	November 23, 2010 ~ December 29, 2010
Contact person:	Name: In Chul Ha Phone #: +82-42-864-4665 Fax #: +82-42-864-4664

2. EUT DESCRIPTION

Product	Portable GPS Navigation device
Model Name	SOCT570B
Additional Model Name	SOCT530B
Power Supply	DC 12 V
Frequency Range	88.1 ~ 107.9 MHz
Max. Transmit Power	44.5 dBuv/m
Modulation Type	Frequency Modulation
Antenna Specification	Antenna type: WIRE ANTENNA

3. TEST METHODOLOGY

The measurement procedure described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz(ANSI C63.4-2003)

3.1 EUT CONFIGURATION

In situ testing was performed for three vehicles based on the following vehicle sizes; small, medium and large. The selected vehicles were: YUNDAI AVANTE, KIA SORENTO, KIA GRAND CARNICAL. The EUT was connected to cigar jack in the above three types of vehicle.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.205, 15.207, 15.209 and 15.239 under the FCC Rules Part 15 Subpart C.

3.3 TEST PROCEDURES

EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. The data was taken on 8 radials with 3 different vehicles at a distance of 3 meters from the closet point of the vehicle.

3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Three frequency in the FM band were measured: The frequencies tested are low (88.1MHz), middle (98.3MHz) and high (107.9MHz) of the allocated band.

4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, 467-811, Korea. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2003) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated June 10, 2009 (Registration Number: 90661)

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.
All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

* The antennas of this E.U.T are permanently attached.

*The E.U.T Complies with the requirement of §15.203

7. TEST RESULT

Summary

The intentional radiator has been bench tested to demonstrate compliance with the relevant FCC performance and procedural standards. The volume was set to maximum with the cell phone software playing the MP3 file and the FM transmitter was transmitting at full power on the selected frequency. The frequencies tested are high (107.9MHz), middle(98.3MHz) and low (88.1MHz) of the allocated band. Final system data was gathered in a mode that tended to maximize emissions by varying the orientation of the EUT, orientation of antenna and I/O cabling, antenna search height, and antenna polarization. The unit was tested at the lowest, highest and mid frequency of operation in three orthogonal positions with the worst case reported.

Method/System: **FM Transmitter**

Number of Channels : **199**

Summary of Test Results

FCC Part Section(s)	RSS Section	Test Description	Test Limit	Test Condition	Test Result
TRANSMITTER MODE (TX)					
15.239(a)	RSS-210 [A.2.8]	20 dB Bandwidth	< 200 kHz	Radiated	PASS
15.239(b)	RSS-210 [A.2.8]	Field Strength	< 250 uV/m @ 3 meters		PASS
15.239(a)	RSS-210 [A.2.8]	Number of Channels	200 Channels		PASS
15.205 15.209	RSS-210 [A.2.8]	General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	<FCC 15.209 limits or <RSS-210 table 3limits Emissions in restricted bands must meet the radiated limits detailed in 15.209		PASS
15.207	RSS-GEN [7.2.2]	AC Conducted Emissions 150kHz ~ 30MHz	<FCC 15.207 limits or <RSS-Gen table 2 limits	Line Conducted	* N/A

7.1 20 dB BANDWIDTH MEASUREMENT

Test Requirements and limit, §15.239(a)

The bandwidth at 20 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the receive antenna while the EUT is operating in transmission mode at the appropriate frequencies. For maximum power and bandwidth the volume was set to maximum with the cell phone software playing the MP3 file.

The maximum permissible 20 dB bandwidth is 200 kHz.

▣ TEST PROCEDURE

The spectrum analyzer is set to :

1. Span = 200 kHz
2. RBW = 30 kHz
3. VBW = 100 kHz

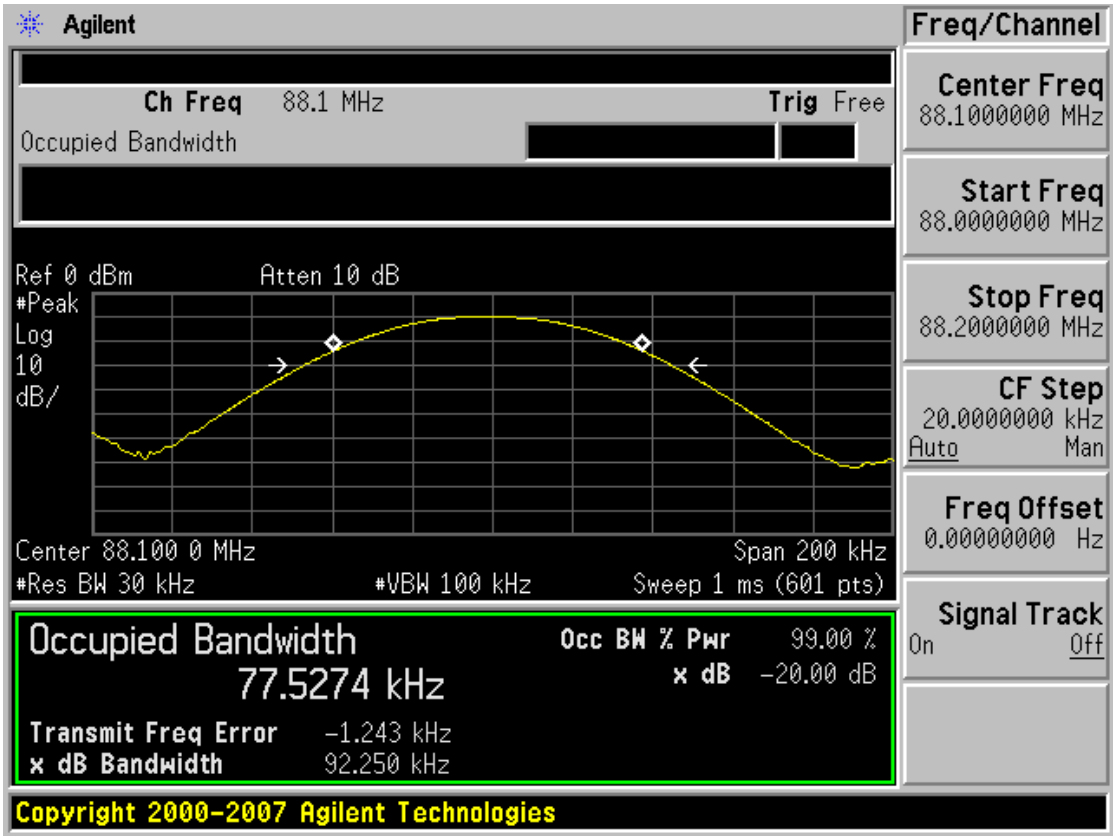
▣ TEST RESULTS

20 dB Bandwidth Measurements

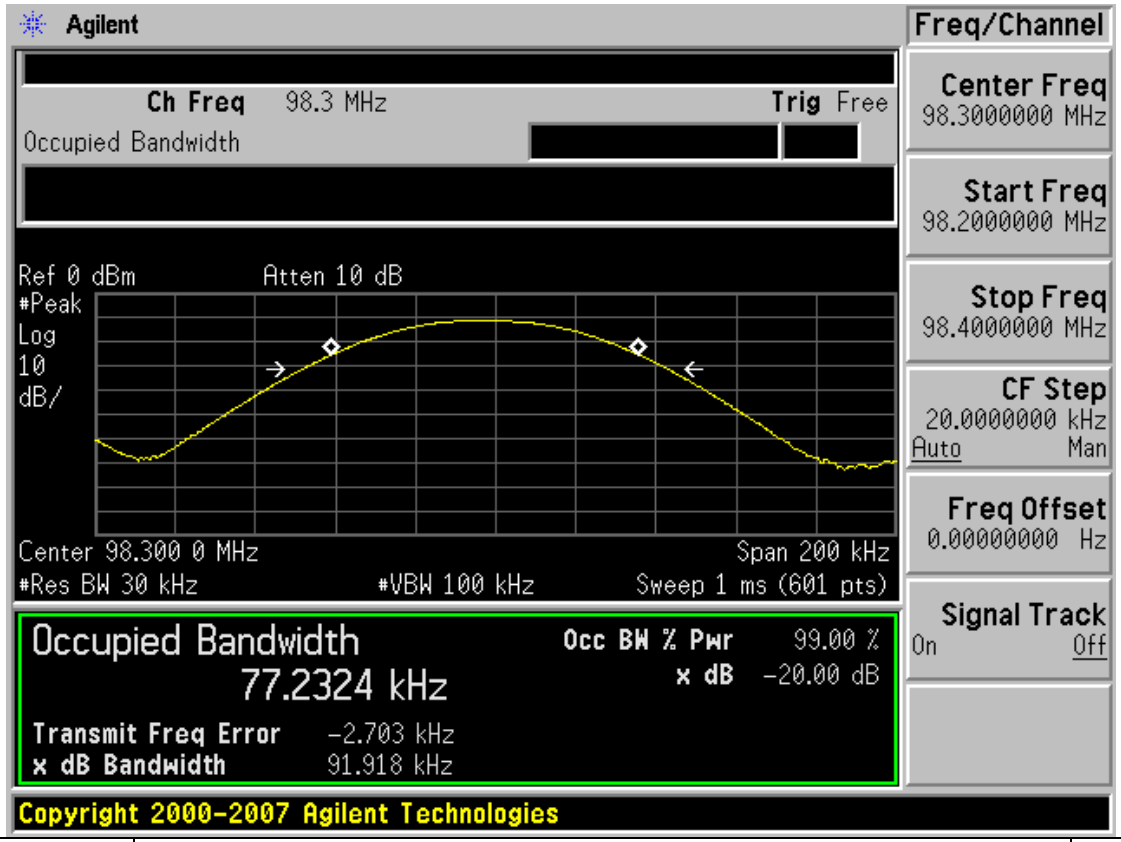
FREQUENCY (kHz)	20 dB BW (kHz)	Limit (kHz)	Results
88.1	92.250	200	Pass
98.3	91.918	200	Pass
107.9	91.520	200	Pass

▣ RESULT PLOTS

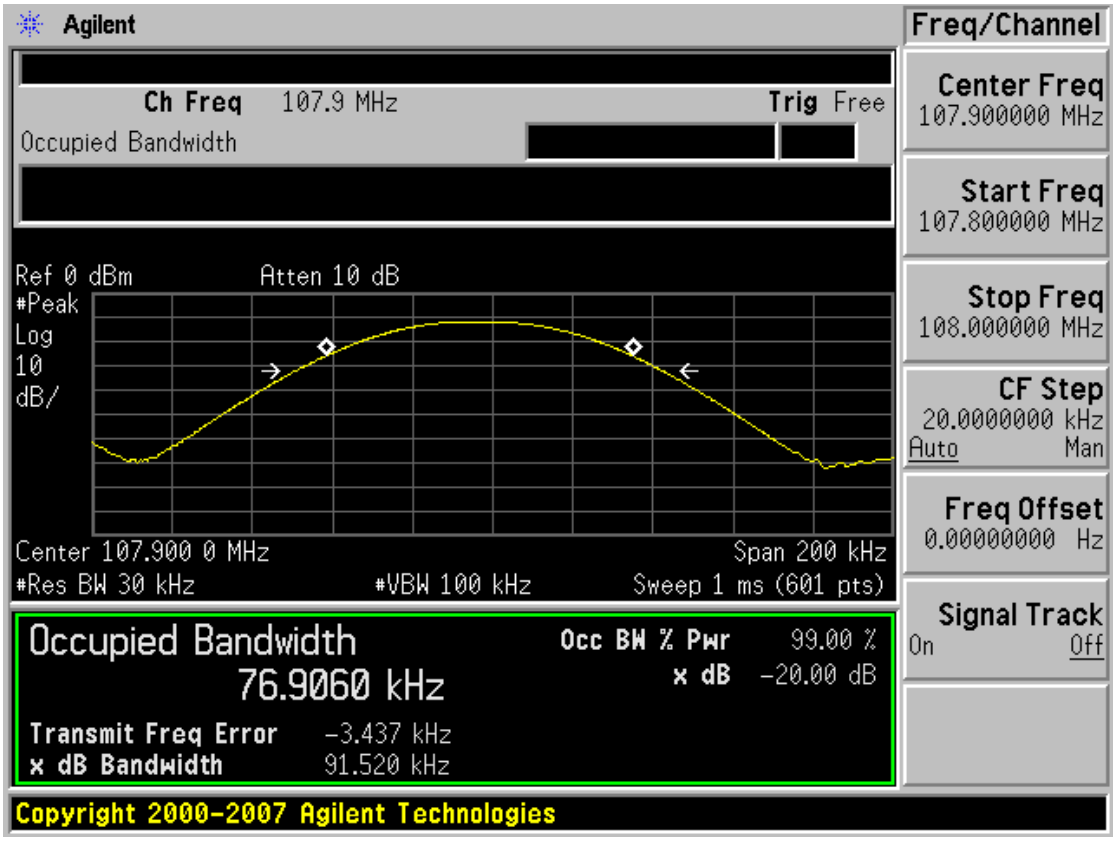
20 dB Bandwidth plot (Low Channel : 88.1MHz)



20 dB Bandwidth plot (Mid Channel : 98.3MHz)

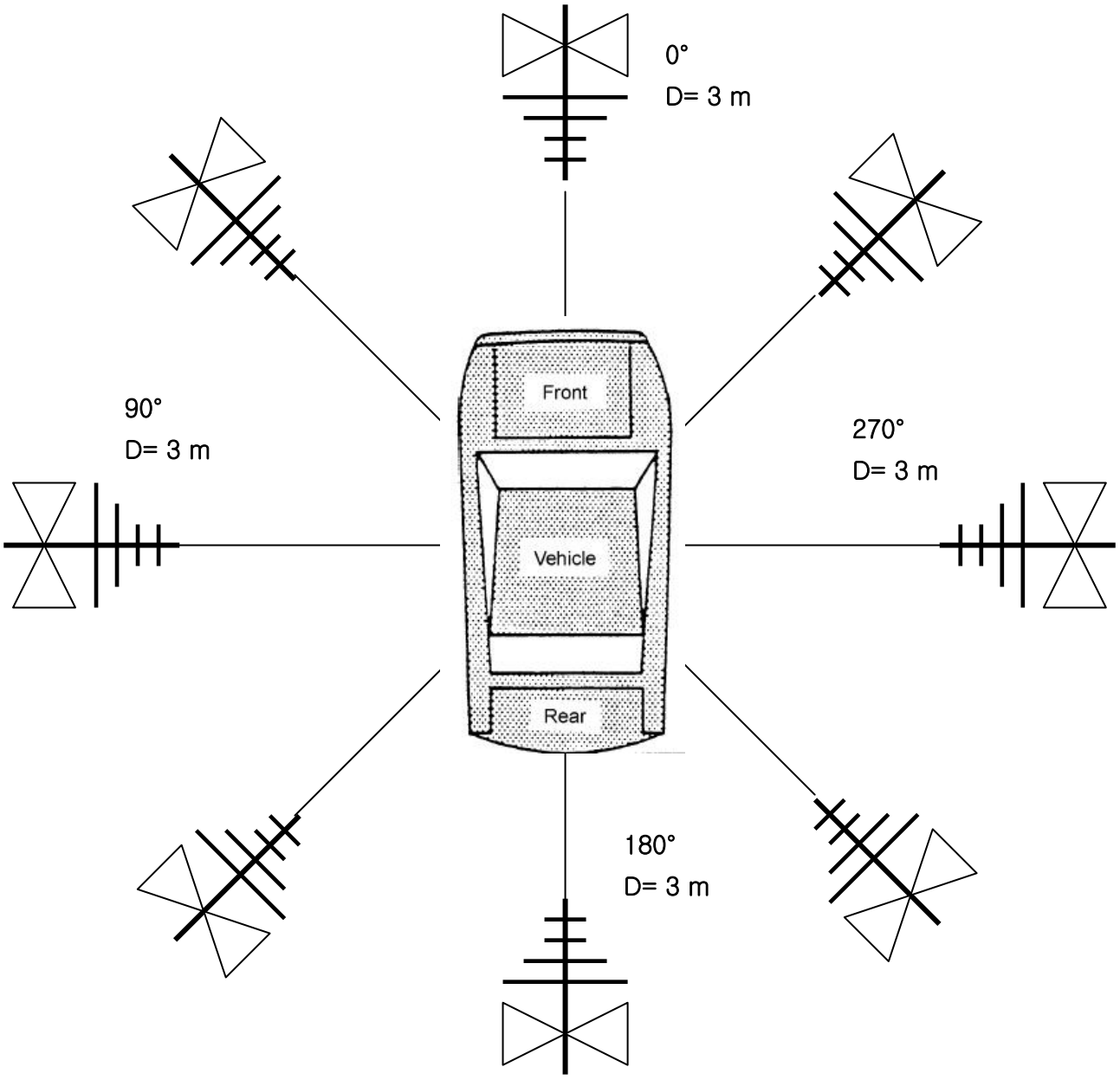


20 dB Bandwidth plot (High Channel : 107.9 MHz)



7.2 FIELD STRENGTH MEASUREMENT

7.2.1 DESCRIPTION OF TEST SETUP



7.2.2 LIMITS & TEST RESULT

7.2.2.1 LIMITS

Section 15.239 Operation in the band 88 - 108 MHz.

(a) Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz.

(b) The field strength of any emissions within the permitted 200 kHz band shall not exceed 250 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

(c) The field strength of any emissions radiated on any frequency outside of the specified 200 kHz band shall not exceed the general radiated emission limits in Section 15.209.

Section 15.209 Radiated emission limits, general requirements.

(a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

(b) In the emission table above, the tighter limit applies at the band edges.

7.2.2.2 TEST RESULT

No non-compliance noted.

Note :

The unit was tested with the lowest, highest and mid channels. Three orthogonal positions were tested with the worst case levels reported.

▣ TEST DATA

VEHECLE SMALL: HYUNDAI AVANTE

EUT at 0 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	30.1	8.652	0.71	39.5	67.96	28.498	Peak	V	1.2	0 °
88.1	19.0	8.652	0.71	28.4	67.96	39.598	Peak	H	4.0	
98.3	23.0	8.828	0.76	32.6	67.96	35.372	Peak	V	1.0	
98.3	25.1	8.828	0.76	34.7	67.96	33.272	Peak	H	2.7	
107.9	28.7	9.550	0.80	39.1	67.96	28.91	Peak	V	4.0	
107.9	23.1	9.550	0.80	33.5	67.96	34.51	Peak	H	3.0	

EUT at 45 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	29.2	8.652	0.71	38.6	67.96	29.398	Peak	V	2.0	45 °
88.1	23.9	8.652	0.71	33.3	67.96	34.698	Peak	H	4.0	
98.3	24.7	8.828	0.76	34.3	67.96	33.672	Peak	V	4.0	
98.3	23.3	8.828	0.76	32.9	67.96	35.072	Peak	H	3.5	
107.9	28.7	9.550	0.80	39.1	67.96	28.91	Peak	V	1.2	
107.9	25.4	9.550	0.80	35.8	67.96	32.21	Peak	H	4.0	

EUT at 90 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	24.6	8.652	0.71	34.0	67.96	33.998	Peak	V	4.0	90 °
88.1	20.0	8.652	0.71	29.4	67.96	38.598	Peak	H	1.0	
98.3	23.7	8.828	0.76	33.3	67.96	34.672	Peak	V	4.0	
98.3	30.4	8.828	0.76	40.0	67.96	27.972	Peak	H	3.0	
107.9	25.8	9.550	0.80	36.2	67.96	31.81	Peak	V	4.0	
107.9	27.2	9.550	0.80	37.6	67.96	30.41	Peak	H	1.5	

NOTES :

1. **Levels recorded in the above table are peak measurements.**
2. **According to ANSI C63.4, If the peak(or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement. So peak value is 44.5 dBuV and complies with average limit(47.96 dBuV).**

EUT at 135 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	22.7	8.652	0.71	32.1	67.96	35.898	Peak	V	1.8	135 °
88.1	20.9	8.652	0.71	30.3	67.96	37.698	Peak	H	3.8	
98.3	24.3	8.828	0.76	33.9	67.96	34.072	Peak	V	1.5	
98.3	30.6	8.828	0.76	40.2	67.96	27.772	Peak	H	2.2	
107.9	23.7	9.550	0.80	34.1	67.96	33.91	Peak	V	1.4	
107.9	25.8	9.550	0.80	36.2	67.96	31.81	Peak	H	3.1	

EUT at 180 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	21.0	8.652	0.71	30.4	67.96	37.598	Peak	V	4.0	180 °
88.1	19.0	8.652	0.71	28.4	67.96	39.598	Peak	H	3.0	
98.3	29.1	8.828	0.76	38.7	67.96	29.272	Peak	V	1.9	
98.3	21.4	8.828	0.76	31.0	67.96	36.972	Peak	H	3.5	
107.9	30.9	9.550	0.80	41.3	67.96	26.71	Peak	V	1.0	
107.9	24.4	9.550	0.80	34.8	67.96	33.21	Peak	H	3.0	

EUT at 225 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	18.8	8.652	0.71	28.2	67.96	39.798	Peak	V	1.5	225 °
88.1	18.2	8.652	0.71	27.6	67.96	40.398	Peak	H	4.0	
98.3	24.0	8.828	0.76	33.6	67.96	34.372	Peak	V	4.0	
98.3	27.5	8.828	0.76	37.1	67.96	30.872	Peak	H	1.0	
107.9	22.0	9.550	0.80	32.4	67.96	35.61	Peak	V	1.8	
107.9	25.8	9.550	0.80	36.2	67.96	31.81	Peak	H	3.5	

NOTES :

1. **Levels recorded in the above table are peak measurements.**
2. **According to ANSI C63.4, If the peak(or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement. So peak value is 44.5 dBuV and complies with average limit(47.96 dBuV).**

EUT at 270 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	22.1	8.652	0.71	31.5	67.96	36.498	Peak	V	1.0	270 °
88.1	17.4	8.652	0.71	26.8	67.96	41.198	Peak	H	4.0	
98.3	18.1	8.828	0.76	27.7	67.96	40.272	Peak	V	3.0	
98.3	30.4	8.828	0.76	40.0	67.96	27.972	Peak	H	4.0	
107.9	22.5	9.550	0.80	32.9	67.96	35.11	Peak	V	1.8	
107.9	19.1	9.550	0.80	29.5	67.96	38.51	Peak	H	2.5	

EUT at 315 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	28.8	8.652	0.71	38.2	67.96	29.798	Peak	V	1.8	315 °
88.1	20.1	8.652	0.71	29.5	67.96	38.498	Peak	H	4.0	
98.3	24.0	8.828	0.76	33.6	67.96	34.372	Peak	V	1.5	
98.3	29.8	8.828	0.76	39.4	67.96	28.572	Peak	H	4.0	
107.9	30.4	9.550	0.80	40.8	67.96	27.21	Peak	V	1.0	
107.9	25.7	9.550	0.80	36.1	67.96	31.91	Peak	H	3.0	

NOTES :

1. **Levels recorded in the above table are peak measurements.**
2. **According to ANSI C63.4, If the peak(or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement. So peak value is 44.5 dBuV and complies with average limit(47.96 dBuV).**

VEHECLE MEDIUM: KIA SORENTO

EUT at 0 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	28.8	8.652	0.71	38.2	67.96	29.798	Peak	V	1.8	0 °
88.1	15.2	8.652	0.71	24.6	67.96	43.398	Peak	H	4.0	
98.3	31.7	8.828	0.76	41.3	67.96	26.672	Peak	V	1.0	
98.3	19.7	8.828	0.76	29.3	67.96	38.672	Peak	H	4.0	
107.9	34.1	9.550	0.80	44.5	67.96	23.51	Peak	V	1.4	
107.9	22.5	9.550	0.80	32.9	67.96	35.11	Peak	H	1.8	

EUT at 45 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	27.9	8.652	0.71	37.3	67.96	30.698	Peak	V	1.9	45 °
88.1	20.7	8.652	0.71	30.1	67.96	37.898	Peak	H	4.0	
98.3	25.9	8.828	0.76	35.5	67.96	32.472	Peak	V	1.4	
98.3	29.0	8.828	0.76	38.6	67.96	29.372	Peak	H	3.6	
107.9	30.5	9.550	0.80	40.9	67.96	27.11	Peak	V	1.0	
107.9	23.6	9.550	0.80	34.0	67.96	34.01	Peak	H	4.0	

EUT at 90 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	20.9	8.652	0.71	30.3	67.96	37.698	Peak	V	4.0	90 °
88.1	18.5	8.652	0.71	27.9	67.96	40.098	Peak	H	2.4	
98.3	20.4	8.828	0.76	30.0	67.96	37.972	Peak	V	3.8	
98.3	29.1	8.828	0.76	38.7	67.96	29.272	Peak	H	3.1	
107.9	26.4	9.550	0.80	36.8	67.96	31.21	Peak	V	3.8	
107.9	24.7	9.550	0.80	35.1	67.96	32.91	Peak	H	4.0	

NOTES :

1. **Levels recorded in the above table are peak measurements.**
2. **According to ANSI C63.4, If the peak(or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement. So peak value is 44.5 dBuV and complies with average limit(47.96 dBuV).**

EUT at 135 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	23.4	8.652	0.71	32.8	67.96	35.198	Peak	V	2.2	135 °
88.1	19.8	8.652	0.71	29.2	67.96	38.798	Peak	H	4.0	
98.3	21.4	8.828	0.76	31.0	67.96	36.972	Peak	V	1.2	
98.3	28.3	8.828	0.76	37.9	67.96	30.072	Peak	H	2.0	
107.9	22.5	9.550	0.80	32.9	67.96	35.11	Peak	V	1.4	
107.9	26.7	9.550	0.80	37.1	67.96	30.91	Peak	H	2.2	

EUT at 180 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	20.1	8.652	0.71	29.5	67.96	38.498	Peak	V	4.0	180 °
88.1	18.2	8.652	0.71	27.6	67.96	40.398	Peak	H	3.2	
98.3	28.7	8.828	0.76	38.3	67.96	29.672	Peak	V	1.8	
98.3	19.9	8.828	0.76	29.5	67.96	38.472	Peak	H	2.2	
107.9	29.8	9.550	0.80	40.2	67.96	27.81	Peak	V	1.0	
107.9	22.6	9.550	0.80	33.0	67.96	35.01	Peak	H	3.0	

EUT at 225 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	17.4	8.652	0.71	26.8	67.96	41.198	Peak	V	1.0	225 °
88.1	17.1	8.652	0.71	26.5	67.96	41.498	Peak	H	4.0	
98.3	23.1	8.828	0.76	32.7	67.96	35.272	Peak	V	4.0	
98.3	26.0	8.828	0.76	35.6	67.96	32.372	Peak	H	1.6	
107.9	21.6	9.550	0.80	32.0	67.96	36.01	Peak	V	1.4	
107.9	24.9	9.550	0.80	35.3	67.96	32.71	Peak	H	3.2	

NOTES :

1. **Levels recorded in the above table are peak measurements.**
2. **According to ANSI C63.4, If the peak(or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement. So peak value is 44.5 dBuV and complies with average limit(47.96 dBuV).**

EUT at 270 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	21.0	8.652	0.71	30.4	67.96	37.598	Peak	V	1.0	270 °
88.1	16.8	8.652	0.71	26.2	67.96	41.798	Peak	H	4.0	
98.3	18.8	8.828	0.76	28.4	67.96	39.572	Peak	V	3.4	
98.3	29.1	8.828	0.76	38.7	67.96	29.272	Peak	H	3.6	
107.9	20.4	9.550	0.80	30.8	67.96	37.21	Peak	V	4.0	
107.9	15.4	9.550	0.80	25.8	67.96	42.21	Peak	H	2.2	

EUT at 315 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	27.5	8.652	0.71	36.9	67.96	31.098	Peak	V	1.2	315 °
88.1	22.0	8.652	0.71	31.4	67.96	36.598	Peak	H	3.8	
98.3	23.1	8.828	0.76	32.7	67.96	35.272	Peak	V	1.8	
98.3	28.8	8.828	0.76	38.4	67.96	29.572	Peak	H	4.0	
107.9	29.5	9.550	0.80	39.9	67.96	28.11	Peak	V	1.0	
107.9	26.0	9.550	0.80	36.4	67.96	31.61	Peak	H	2.9	

NOTES :

1. **Levels recorded in the above table are peak measurements.**
2. **According to ANSI C63.4, If the peak(or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement. So peak value is 44.5 dBuV and complies with average limit(47.96 dBuV).**

VEHECLE LARGE: KIA GRAND CARNIVAL

EUT at 0 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	31.0	8.652	0.71	40.4	67.96	27.598	Peak	V	1.7	0 °
88.1	19.2	8.652	0.71	28.6	67.96	39.398	Peak	H	3.8	
98.3	29.1	8.828	0.76	38.7	67.96	29.272	Peak	V	1.4	
98.3	24.4	8.828	0.76	34.0	67.96	33.972	Peak	H	4.0	
107.9	26.2	9.550	0.80	36.6	67.96	31.41	Peak	V	1.2	
107.9	24.2	9.550	0.80	34.6	67.96	33.41	Peak	H	4.0	

EUT at 45 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	26.4	8.652	0.71	35.8	67.96	32.198	Peak	V	2.2	45 °
88.1	21.5	8.652	0.71	30.9	67.96	37.098	Peak	H	4.0	
98.3	25.6	8.828	0.76	35.2	67.96	32.772	Peak	V	1.0	
98.3	25.0	8.828	0.76	34.6	67.96	33.372	Peak	H	4.0	
107.9	25.8	9.550	0.80	36.2	67.96	31.81	Peak	V	3.8	
107.9	26.2	9.550	0.80	36.6	67.96	31.41	Peak	H	3.2	

EUT at 90 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	21.8	8.652	0.71	31.2	67.96	36.798	Peak	V	4.0	90 °
88.1	19.8	8.652	0.71	29.2	67.96	38.798	Peak	H	1.9	
98.3	22.8	8.828	0.76	32.4	67.96	35.572	Peak	V	4.0	
98.3	31.0	8.828	0.76	40.6	67.96	27.372	Peak	H	2.8	
107.9	27.8	9.550	0.80	38.2	67.96	29.81	Peak	V	2.8	
107.9	25.1	9.550	0.80	35.5	67.96	32.51	Peak	H	4.0	

NOTES :

1. **Levels recorded in the above table are peak measurements.**
2. **According to ANSI C63.4, If the peak(or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement. So peak value is 44.5 dBuV and complies with average limit(47.96 dBuV).**

EUT at 135 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	25.5	8.652	0.71	34.9	67.96	33.098	Peak	V	1.5	135 °
88.1	16.4	8.652	0.71	25.8	67.96	42.198	Peak	H	4.0	
98.3	23.7	8.828	0.76	33.3	67.96	34.672	Peak	V	2.0	
98.3	31.3	8.828	0.76	40.9	67.96	27.072	Peak	H	1.4	
107.9	22.4	9.550	0.80	32.8	67.96	35.21	Peak	V	1.2	
107.9	27.5	9.550	0.80	37.9	67.96	30.11	Peak	H	3.4	

EUT at 180 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	22.6	8.652	0.71	32.0	67.96	35.998	Peak	V	4.0	180 °
88.1	20.7	8.652	0.71	30.1	67.96	37.898	Peak	H	3.2	
98.3	28.8	8.828	0.76	38.4	67.96	29.572	Peak	V	1.6	
98.3	22.5	8.828	0.76	32.1	67.96	35.872	Peak	H	3.8	
107.9	30.8	9.550	0.80	41.2	67.96	26.81	Peak	V	1.2	
107.9	25.0	9.550	0.80	35.4	67.96	32.61	Peak	H	3.2	

EUT at 225 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	19.1	8.652	0.71	28.5	67.96	39.498	Peak	V	2.0	225 °
88.1	19.8	8.652	0.71	29.2	67.96	38.798	Peak	H	3.7	
98.3	25.0	8.828	0.76	34.6	67.96	33.372	Peak	V	3.6	
98.3	26.6	8.828	0.76	36.2	67.96	31.772	Peak	H	1.1	
107.9	21.4	9.550	0.80	31.8	67.96	36.21	Peak	V	1.9	
107.9	24.9	9.550	0.80	35.3	67.96	32.71	Peak	H	4.0	

NOTES :

1. **Levels recorded in the above table are peak measurements.**
2. **According to ANSI C63.4, If the peak(or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement. So peak value is 44.5 dBuV and complies with average limit(47.96 dBuV).**

EUT at 270 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	22.9	8.652	0.71	32.3	67.96	35.698	Peak	V	1.2	270 °
88.1	18.8	8.652	0.71	28.2	67.96	39.798	Peak	H	3.9	
98.3	20.2	8.828	0.76	29.8	67.96	38.172	Peak	V	3.2	
98.3	29.8	8.828	0.76	39.4	67.96	28.572	Peak	H	4.0	
107.9	21.9	9.550	0.80	32.3	67.96	35.71	Peak	V	1.6	
107.9	20.6	9.550	0.80	31.0	67.96	37.01	Peak	H	2.7	

EUT at 315 °

Frequency	Reading	AF	C/L	LEVEL	LIMIT	Margin	Detector	POL	Height	Azimuth
88.1	29.1	8.652	0.71	38.5	67.96	29.498	Peak	V	1.5	315 °
88.1	24.0	8.652	0.71	33.4	67.96	34.598	Peak	H	3.8	
98.3	22.8	8.828	0.76	32.4	67.96	35.572	Peak	V	1.1	
98.3	30.6	8.828	0.76	40.2	67.96	27.772	Peak	H	3.6	
107.9	30.7	9.550	0.80	41.1	67.96	26.91	Peak	V	1.0	
107.9	26.1	9.550	0.80	36.5	67.96	31.51	Peak	H	3.5	

NOTES :

1. **Levels recorded in the above table are peak measurements.**
2. **According to ANSI C63.4, If the peak(or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement. So peak value is 44.5 dBuV and complies with average limit(47.96 dBuV).**

7.3 NUMBER OF CHANNELS (TUNING RANGE)

Test Requirements and limit, §15.239

Measurement is made while EUT is operating in transmitting mode.

Frequency / Channel Operations

Ch.	Frequency(MHz)
00	88.1
01	88.2
…	…
102	98.2
103	98.3
104	98.4
…	…
198	107.8
199	107.9

7.4 RADIATED SPURIOUS EMISSIONS

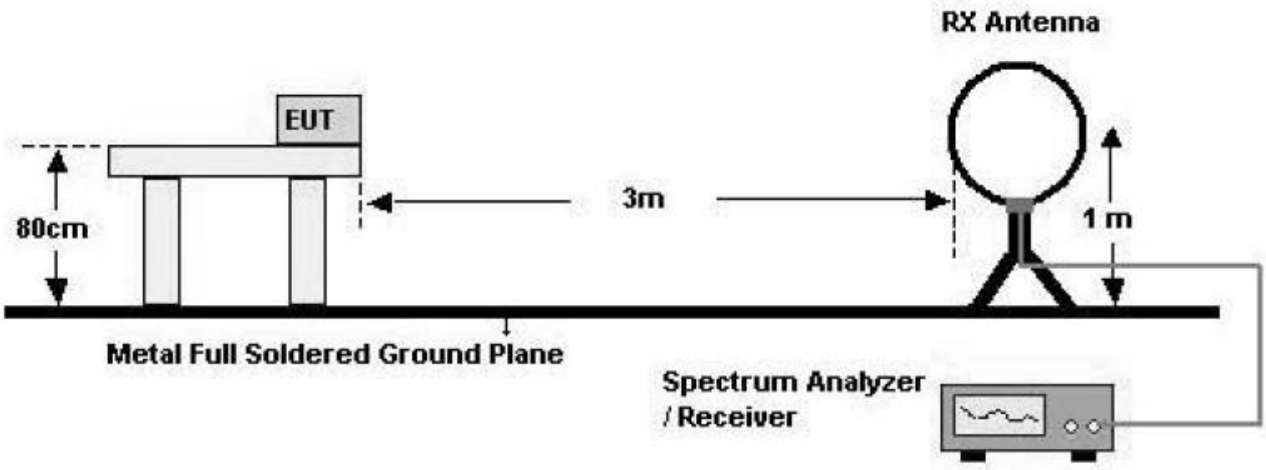
LIMIT

1. 20 dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed

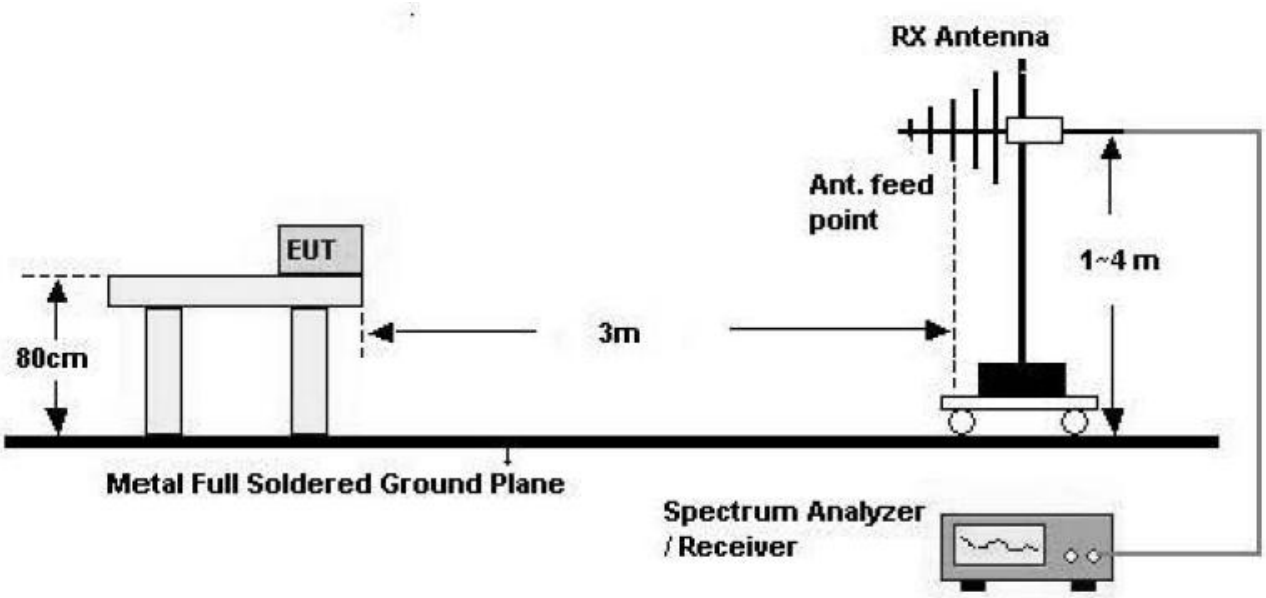
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30 (29.5 dBuV/m)	30
30-88	100 (40 dBuV/m)	3
88-216	150 (43.5 dBuV/m)	3
216-960	200 (46 dBuV/m)	3
Above 960	500 (54 dBuV/m)	3

Test Configuration

Below 30 MHz



30 MHz - 1 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8 m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

7.4.1 Radiated Spurious Measurements

Test Requirements and limit, §15.239

Mode : TX

Measurement Distance : 3 Meters

Operating Frequency : 88.1 MHz

Radiated Spurious Measurements at 3 – meters

Frequency [MHz]	Reading dBuV	Ant. Factor dB/m	Cable Loss dB	Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dBuV/m]	Limit dBuV/m	Margin [dB]
176.2	13.4	12.0	1.7	V	1.397	183.3	27.08	43.5	16.42
176.2	10.8	12.0	1.7	H	1.000	280.0	24.54	43.5	18.96
264.3	10.2	12.0	2.1	H	1.000	0.0	24.31	46.0	21.69
264.3	10.6	12.0	2.1	V	1.110	38.0	24.70	46.0	21.30

NOTES :

1.The antenna is manipulated through typical positions, polarity and length during the testing

2. The EUT is supplied with the nominal DC voltage or/and a new/fully re-charged battery.

3. The spectrum is measured from 9kHz up to the 10th harmonic and the worst-case emissions are reported.

4. There is detected level above reference noise floor spectrum analyzer. Except above frequency

Test Requirements and limit, §15.239

Mode : TX

Measurement Distance : 3 Meters

Operating Frequency : 98.3 MHz

Radiated Spurious Measurements at 3 – meters

Frequency [MHz]	Reading dBuV	Ant. Factor dB/m	Cable Loss dB	Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dBuV/m]	Limit dBuV/m	Margin [dB]
196.6	12.1	10.1	1.6	H	1.00	320.0	23.83	43.5	19.67
196.6	15.8	10.1	1.6	V	1.00	0.0	27.45	43.5	16.05
294.9	13.5	13.1	2.3	V	1.18	220.0	28.89	46.0	17.11
294.9	12.7	13.1	2.3	H	1.14	100.0	28.08	46.0	17.92

NOTES :

1.The antenna is manipulated through typical positions, polarity and length during the testing

2. The EUT is supplied with the nominal DC voltage or/and a new/fully re-charged battery.

3. The spectrum is measured from 9kHz up to the 10th harmonic and the worst-case emissions are reported.

4. There is detected level above reference noise floor spectrum analyzer. Except above frequency

Test Requirements and limit, §15.239

Mode : TX

Measurement Distance : 3 Meters

Operating Frequency : 107.9 MHz

Radiated Spurious Measurements at 3 – meters

Frequency [MHz]	Reading dBuv	Ant. Factor dB/m	Cable Loss dB	ANT Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dBuV/m]	Limit dBuV/m	Margin [dB]
215.8	12.3	10.2	1.8	H	1.08	160.0	24.27	43.5	19.23
215.8	17.6	10.2	1.8	V	1.09	218.8	29.63	43.5	13.87
323.7	11.5	13.6	2.3	V	1.00	270.0	27.43	46.0	18.57
323.7	11.1	13.6	2.3	H	1.19	311.0	26.95	46.0	19.05

NOTES :

1.The antenna is manipulated through typical positions, polarity and length during the testing

2. The EUT is supplied with the nominal DC voltage or/and a new/fully re-charged battery.

3. The spectrum is measured from 9kHz up to the 10th harmonic and the worst-case emissions are reported.

4. There is detected level above reference noise floor spectrum analyzer. Except above frequency

7.5 POWERLINE CONDUCTED EMISSIONS

Test Requirements and limit, §15.207

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT is placed on a wooden table 80 cm above the reference groundplane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.

▣ RESULT PLOTS

HCT

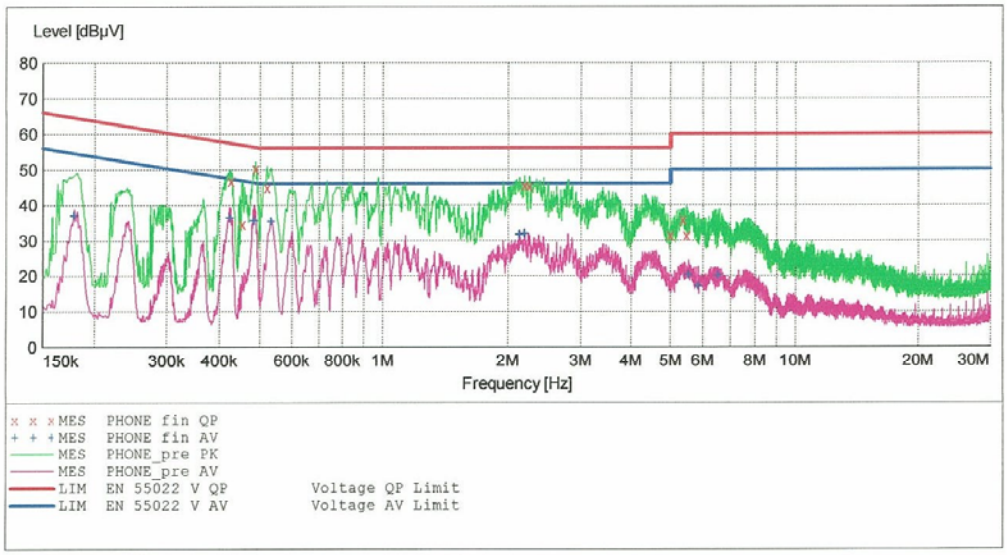
EMC

```
EUT:                    SOCT570B
Manufacturer:           SYSONCHIP
Operating Condition:    FMT MODE
Test Site:              SHIELD ROOM
Operator:               JS LEE
Test Specification:     CISPR22 CLASS B
Comment:                H
```

SCAN TABLE: "CISPR22 CLASS B"

Short Description: CISPR 22 CLASS B

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None



MEASUREMENT RESULT: "PHONE_fin QP"

12/21/2010 1:54PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.425001	46.70	10.1	57	10.6	---	---
0.454001	34.60	10.1	57	22.2	---	---
0.487001	50.20	10.1	56	6.0	---	---
0.520000	44.80	10.1	56	11.2	---	---
2.192000	45.60	10.3	56	10.4	---	---
2.252000	45.30	10.3	56	10.7	---	---
5.000000	31.50	10.5	56	24.5	---	---
5.364000	35.80	10.5	60	24.2	---	---
5.484000	31.40	10.5	60	28.6	---	---

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MEASUREMENT RESULT: "PHONE_fin AV"

12/21/2010 1:54PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.179001	36.90	10.1	55	17.6	---	---
0.422001	36.40	10.1	47	11.0	---	---
0.484001	35.50	10.1	46	10.7	---	---
0.532000	35.40	10.1	46	10.6	---	---
2.132000	31.60	10.3	46	14.4	---	---
2.192000	31.90	10.3	46	14.1	---	---
5.540000	20.20	10.5	50	29.8	---	---
5.848000	17.00	10.5	50	33.0	---	---
6.528000	20.10	10.6	50	29.9	---	---

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HCT

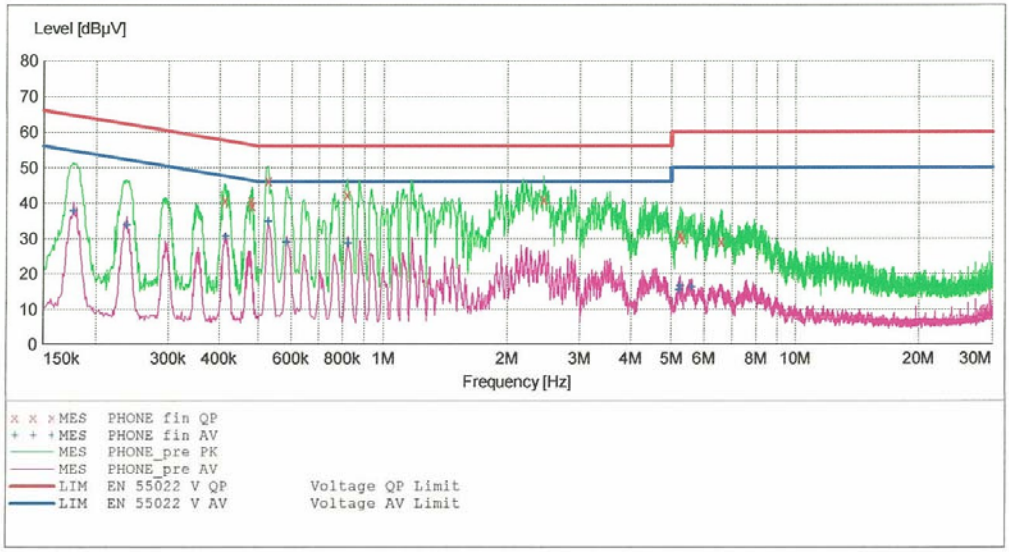
EMC

```
EUT:                    SOCT570B
Manufacturer:           SYSONCHIP
Operating Condition:    FMT MODE
Test Site:              SHIELD ROOM
Operator:               JS LEE
Test Specification:     CISPR22 CLASS B
Comment:                N
```

SCAN TABLE: "CISPR22 CLASS B"

Short Description: CISPR 22 CLASS B

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None



MEASUREMENT RESULT: "PHONE_fin QP"

12/21/2010 1:50PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.412001	40.80	10.1	58	16.8	---	---
0.480001	40.60	10.1	56	15.7	---	---
0.482001	39.30	10.1	56	17.0	---	---
0.528000	46.30	10.1	56	9.7	---	---
0.820000	42.30	10.1	56	13.7	---	---
2.452000	41.00	10.3	56	15.0	---	---
5.260000	31.10	10.5	60	28.9	---	---
5.300000	30.00	10.5	60	30.0	---	---
6.588000	29.10	10.6	60	30.9	---	---

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MEASUREMENT RESULT: "PHONE_fin AV"

12/21/2010 1:50PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.177001	37.80	10.1	55	16.8	---	---
0.237001	33.80	10.1	52	18.4	---	---
0.414001	30.60	10.1	48	17.0	---	---
0.528000	34.70	10.1	46	11.3	---	---
0.584000	28.90	10.1	46	17.1	---	---
0.824000	28.70	10.2	46	17.3	---	---
5.224000	15.40	10.5	50	34.6	---	---
5.260000	16.60	10.5	50	33.4	---	---
5.604000	16.30	10.5	50	33.7	---	---

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8. CONCLUSION

The data collected relate only the item(s) tested and show that the SysOnChip, Inc. Portable Navigation FCC ID : P47SOCT5B is in compliance with Part 15 Subpart C 15.239) of the FCC Rules.

9. SETUP PHOTOS

VEHECLE SMALL: HYUNDAI AVANTE

VEHECLE MEDIUM: KIA SORENTO

VEHECLE LARGE: KIA GRAND CARNIVAL

10. LIST OF TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Interval	Calibration Due	Serial No.
Rohde & Schwarz	ESH2-Z5/ LISN	Annual	03/24/2011	861741/013
Rohde & Schwarz	ESH3-Z6/ LISN	Annual	03/05/2011	100329
Schwarzbeck	VULB 9160/ TRILOG Antenna	Biennial	07/15/2012	9160-3150
HD	MA240/ Antenna Position Tower	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	13
HD GmbH	KMS 560/ SlideBar	N/A	N/A	12
Rohde & Schwarz	ESH3-Z2/ PULSE LIMITER	Annual	10/25/2011	375.8810.352
MITEQ	AMF-6D-001180-35-20P/AMP	Annual	05/20/2011	990893
MITEQ	AFS44-00101800-35-20P-44-PS/AMP	Annual	04/05/2011	1119544
Schwarzbeck	BBHA 9120D/ Horn Antenna	Biennial	09/23/2011	296
Rohde & Schwarz	FSP30 / Spectrum Analyzer	Annual	03/25/2011	839117/011
Agilent	E4440A / Spectrum Analyzer	Annual	06/09/2011	US45303008
Agilent	E4416A /Power Meter	Annual	01/04/2012	GB41291412
Agilent	E9327A /POWER SENSOR	Annual	07/23/2011	MY4442009
Wainwright Instrument	WHF3.3/18G-10EF / High Pass Filter	Annual	06/25/2011	1
Wainwright Instrument	WRCJ2400/2483.5-2370/2520-60/14SS / Band Reject Filter	Annual	07/23/2011	1
Hewlett Packard	11636B/Power Divider	Annual	12/29/2011	11377
Hewlett Packard	11667B / Power Spliter	Annual	11/08/2011	10126
DIGITAL	EP-3010 /DC POWER SUPPLY	Annual	01/04/2012	3110117
ITECH	IT6720 / DC POWER SUPPLY	Annual	12/01/2011	010002156287001199
TESCOM	TC-3000A / BLUETOOTH TESTER	Annual	01/11/2011	3000A490112
Rohde & Schwarz	CBT / BLUETOOTH TESTER	Annual	06/24/2011	100422
EMCO	6502.LOOP ANTENNA	Biennial	01/13/2012	9009-2536