



# HCT CO., LTD.

## CERTIFICATE OF COMPLIANCE FCC Certification

**Applicant Name:**  
SAMSUNG Electronics Co., Ltd.

**Address:**  
129, Samsung-ro, Yeongtong-gu Suwon-si, Gyeonggi-do, 443-742 Rep. of Korea

**Date of Issue:**

February 21, 2014

**Test Site/Location:**

HCT CO., LTD., 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea.

**Report No.:** HCT-R-1402-F023

**HCT FRN:** 0005866421

**FCC ID : A3LSMN7506V**

**APPLICANT : SAMSUNG Electronics Co., Ltd.**

**FCC Model(s):** SM-N7506V

**EUT Type:** Mobile Phone

**Frequency Range:** 2402 MHz -2480 MHz

**Modulation type** GFSK

**FCC Classification:** Low Power Transceiver, Rx Verified (DXT)

**FCC Rule Part(s):** Part 15.249

**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)

**Report prepared by**  
**: Jae Chul Shin**  
**Test engineer of RF Team**

**Approved by**  
**: Chang Seok Choi**  
**Manager of RF Team**

This report only responds to the tested sample and may not be reproduced, except in full, without written approval of the HCT Co., Ltd.

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone		FCC ID: A3LSMN7506V



# Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1402-F023	February 21, 2014	- First Approval Report

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

# Table of Contents

- 1. GENERAL INFORMATION ..... 4
- 2. EUT DESCRIPTION ..... 4
- 3. TEST METHODOLOGY ..... 5
  - 3.1 EUT CONFIGURATION ..... 5
  - 3.2 EUT EXERCISE ..... 5
  - 3.3 GENERAL TEST PROCEDURES ..... 5
  - 3.4 DESCRIPTION OF TEST MODES ..... 5
- 4. INSTRUMENT CALIBRATION..... 5
- 5. FACILITIES AND ACCREDITATIONS ..... 6
  - 5.1 FACILITIES ..... 6
  - 5.2 EQUIPMENT ..... 6
- 6. ANTENNA REQUIREMENTS ..... 6
- 7. SUMMARY TEST OF RESULTS ..... 7
- 8. TEST RESULT ..... 8
  - 8.1 DUTY CYCLE..... 8
  - 8.2 OCCUPIED BANDWIDTH MEASUREMENT ..... 1 0
  - 8.3 RADIATED MEASUREMENT..... 1 3
    - 8.3.1 FUNDAMENTAL FIELD STRENGTH LEVEL MEASUREMENT ..... 1 3
    - 8.3.2 RADIATED SPURIOUS EMISSIONS..... 1 5
    - 8.3.3 RADIATED RESTRICTED BAND EDGES MEASUREMENTS..... 2 3
  - 8.4 POWERLINE CONDUCTED EMISSIONS ..... 2 5
  - 8.5 LIST OF TEST EQUIPMENT ..... 3 0

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone		FCC ID: A3LSMN7506V



## 1. GENERAL INFORMATION

**Applicant:** SAMSUNG Electronics Co., Ltd.  
**Address:** 129, Samsung-ro, Yeongtong-gu Suwon-si, Gyeonggi-do, 443-742 Rep. of Korea  
**FCC ID:** A3LSMN7506V  
**EUT Type:** Mobile Phone  
**Model name(s):** SM-N7506V  
**Date(s) of Tests:** February 20, 2014 ~ February 21, 2014  
**Place of Tests:** HCT Co., Ltd.  
 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea.  
 (IC Recognition No. : 5944A-3)

## 2. EUT DESCRIPTION

<b>EUT Type</b>	Mobile Phone	
<b>FCC Model Name</b>	SM-N7506V	
<b>Power Supply</b>	DC 3.8 V	
<b>Battery type</b>	Li-ion Battery(Standard)	
<b>Frequency Range</b>	TX: 2402 MHz ~ 2480 MHz RX: 2402 MHz ~ 2480 MHz	
<b>Fundamental Field Strength Level</b>	Peak	95.31 dBuV/m
	Average	45.58 dBuV/m
<b>BT Operating Mode</b>	ANT+	
<b>Modulation Type</b>	GFSK	
<b>Number of Channels</b>	79 Channels	
<b>Antenna Specification</b>	Manufacturer: PULSE ELECTRONICS KOREA Antenna type: LDS Antenna Peak Gain : -1.51 dBi	

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V



### 3. TEST METHODOLOGY

The measurement procedure described in the American National Standard for Testing Unlicensed Wireless Devices(ANSI C63.4-2003) Operating Under §15.249” were used in the measurement.

#### 3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

#### 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 15.249 under the FCC Rules Part 15 Subpart C.

#### 3.3 GENERAL TEST PROCEDURES

##### Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version :2003) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

##### Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. 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. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version: 2003)

#### 3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel low, mid and high with highest data rate (worst case) is chosen for full testing.

### 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.

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone		FCC ID: A3LSMN7506V



## 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 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 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 21, 2011 (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

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

## 7. SUMMARY TEST OF RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
Occupied Bandwidth	§2.1049	N/A	CONDUCTED	PASS
Duty Cycle	§15.35(c)	N/A	RADIATED	N/A
Fundamental Field Strength Level	§15.249(a)(e)	< 50 mV/m		PASS
Harmonic Field Strength Level	§15.249(a)(e)	< 500 mV/m		PASS
General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	§15.205, 15.209, 15.249(d)(e)	< 15.209 limits or 50dB below the level of the fundamental		PASS
AC Power line Conducted Emissions	§15.207	cf. Section 8.6		PASS

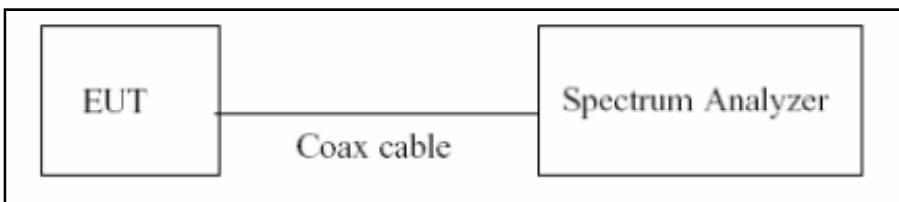
## 8. TEST RESULT

### 8.1 DUTY CYCLE

#### Test Requirements §15.35(c)

(c) Unless otherwise specified, e.g. § 15.255(b), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification

#### TEST CONFIGURATION



#### TEST RESULTS

$$\begin{aligned}
 \text{DCCF} &= 20\log_{10}(\text{number of hits} * (\text{worst case } 100\text{ms operation} / 100\text{ms})) \\
 &= 20\log_{10}(2*(0.163\text{ms}/100\text{ms})) = -49.74 \text{ dB}
 \end{aligned}$$

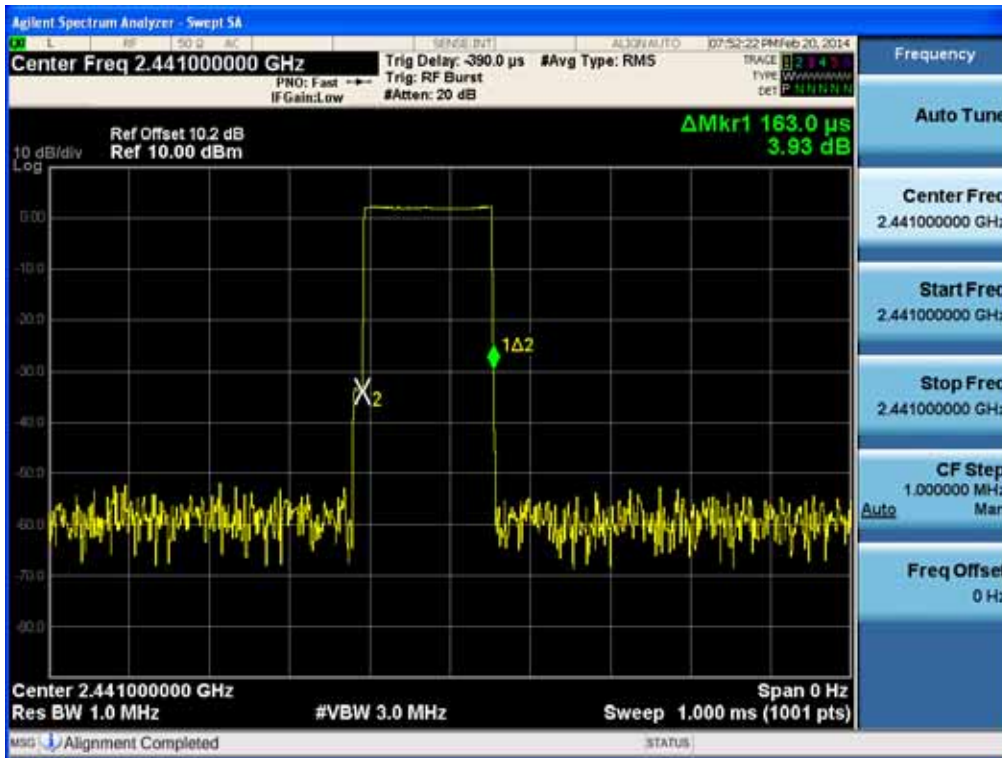
<b>DCCF</b>
<b>-49.62 dB</b>

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

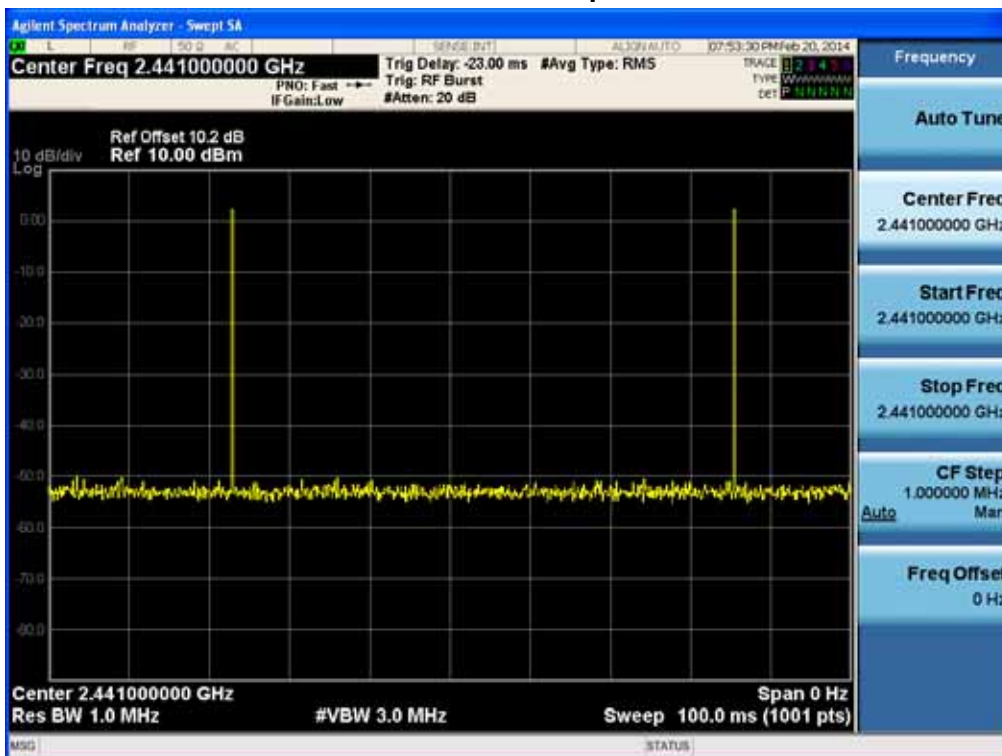


## TEST RESULTS PLOTS

### Pulse Width plot



### Number of hits plot

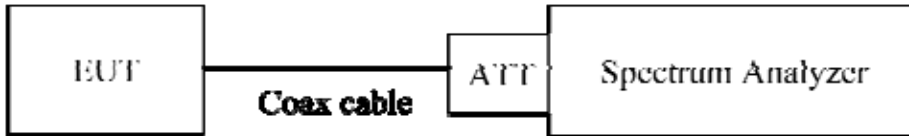


## 8.2 OCCUPIED BANDWIDTH MEASUREMENT

### Test Requirements and limit, §2.1049

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured.

#### TEST CONFIGURATION



#### TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer.

RBW = 1% to 3% of the 99% bandwidth.

VBW = 3 x RBW

Detector = Peak

Trace mode = max hold

Sweep = auto couple

Allow the trace to stabilize

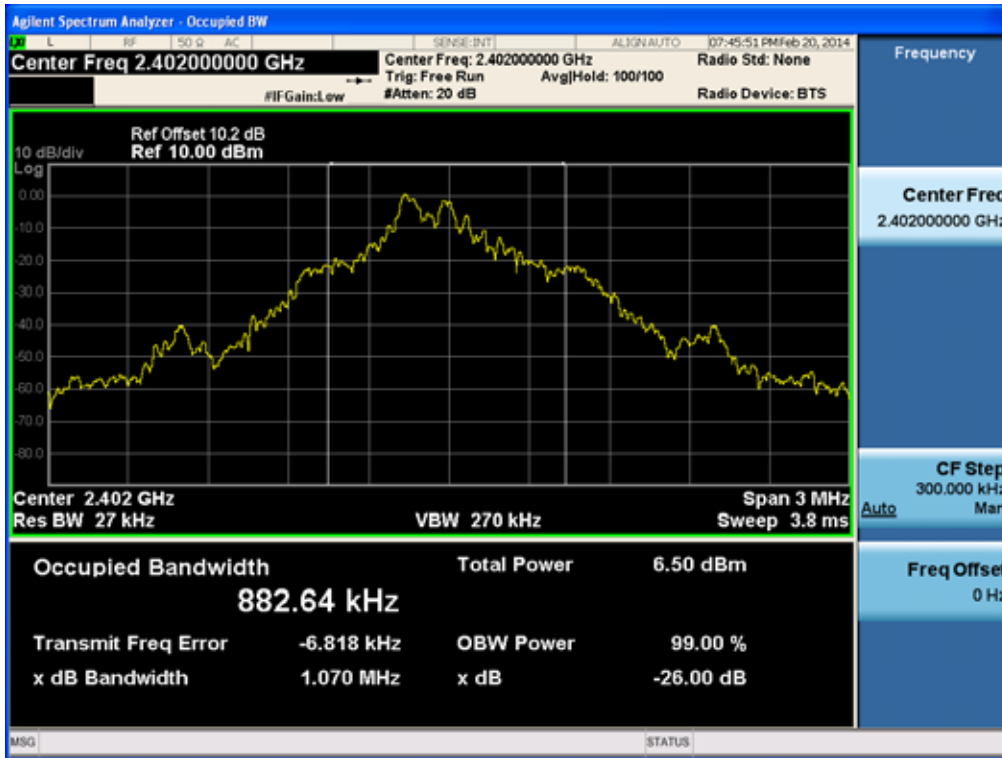
Note : We tested Occupied Bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer.

#### TEST RESULTS

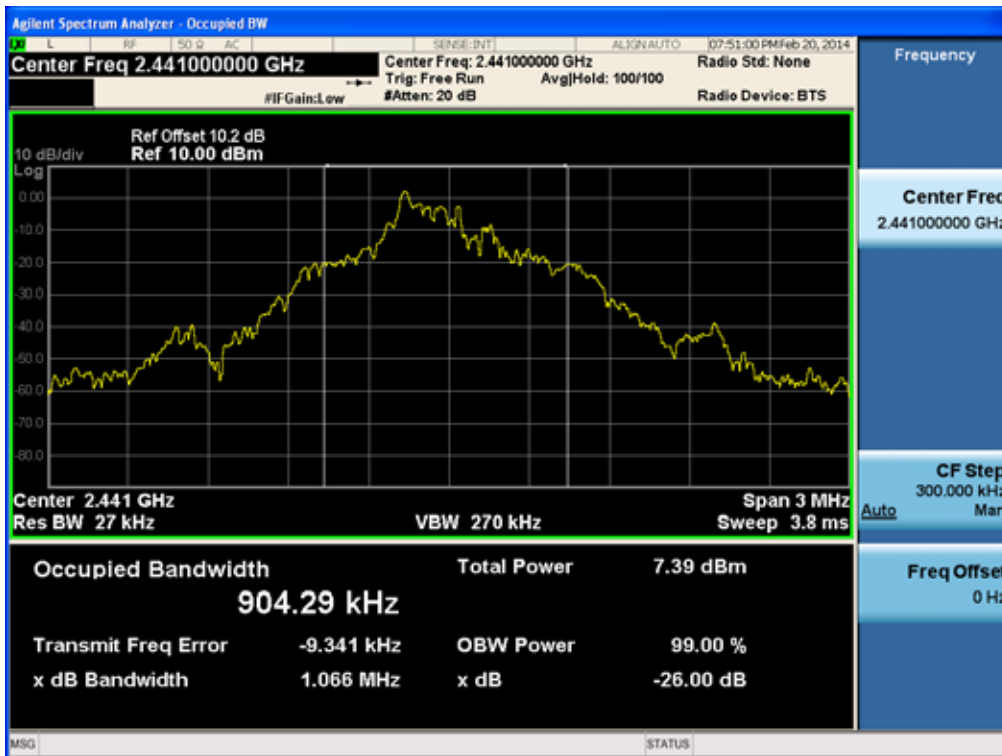
ANT+ Mode		99% Bandwidth (MHz)
Frequency[MHz]	Channel No.	
2402	0	0.88264
2440	39	0.90429
2480	78	0.86749

RESULT PLOTS

Occupied Bandwidth plot (Low-CH 0)

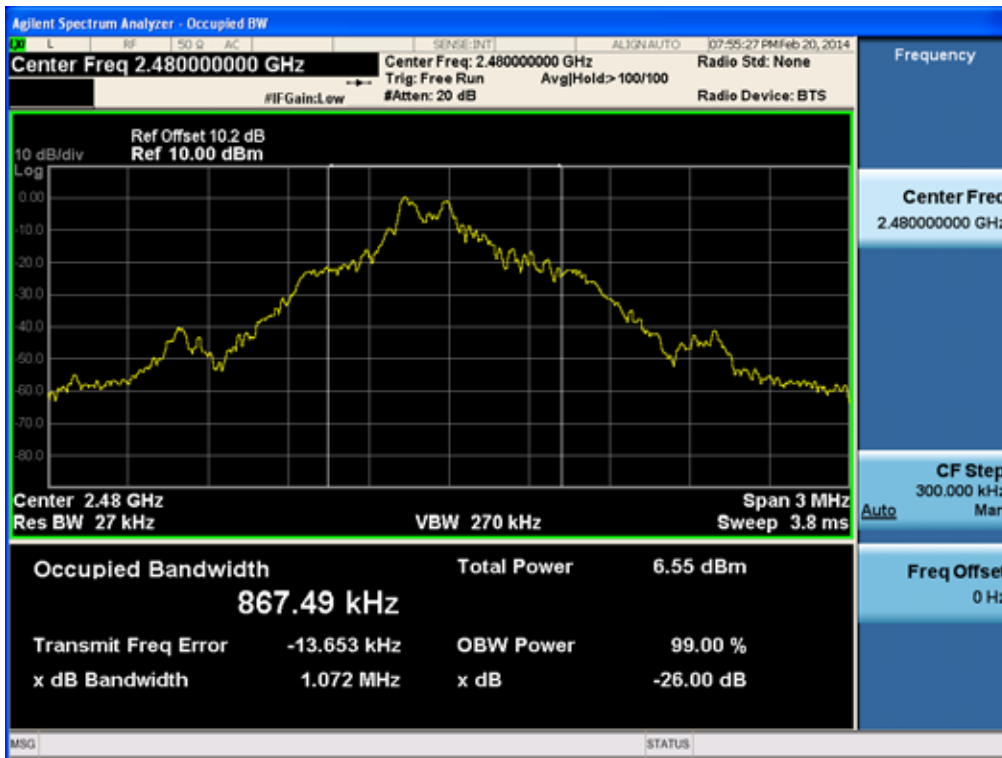


Occupied Bandwidth plot (Mid-CH 39)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

### Occupied Bandwidth plot (High-CH 78)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V



### 8.3 RADIATED MEASUREMENT.

#### 8.3.1 FUNDAMENTAL FIELD STRENGTH LEVEL MEASUREMENT

##### Test Requirements and limit, §15.249(a)(e)

Operation within the bands 902–928 MHz, 2400–2483.5 MHz, 5725–5875 MHz, and 24.0–24.25 GHz.

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts meter)	Field strength of harmonics (millivolts meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

(e) As shown in § 15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

**The maximum permissible average field strength level is 50 mV/m (93.98 dBuV/m).**

**The maximum permissible peak field strength level is 500 mV/m (113.98 dBuV/m).**

#### 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. Spectrum Setting  
1 GHz – 26 GHz, RBW = 3 MHz, VBW ≥ RBW

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

## TEST RESULTS

Frequency [MHz]	Reading [dBuV/m]	A.F.+CL [dB]	Ant. Pol. [H/V]	Duty Cycle Correction [dB]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2402	59.14	33.87	V	0.00	93.01	113.98	20.97	PK
2402	59.14	33.87	V	-49.74	43.27	93.98	50.71	AV
2402	59.26	33.87	H	0.00	93.13	113.98	20.85	PK
2402	59.26	33.87	H	-49.74	43.39	93.98	50.59	AV
2441	61.31	33.94	V	0.00	95.25	113.98	18.73	PK
2441	61.31	33.94	V	-49.74	45.52	93.98	48.46	AV
2441	61.37	33.94	H	0.00	95.31	113.98	18.67	PK
2441	61.37	33.94	H	-49.74	45.58	93.98	48.40	AV
2480	57.50	34.02	V	0.00	91.52	113.98	22.46	PK
2480	57.50	34.02	V	-49.74	41.78	93.98	52.20	AV
2480	58.45	34.02	H	0.00	92.47	113.98	21.51	PK
2480	58.45	34.02	H	-49.74	42.73	93.98	51.25	AV

1. Average field strength data is determined by applying the duty cycle correction factor(DCCF) found in Section 8.1 to the measured peak field strength values.
2. Peak: Total = Reading Value + Antenna Factor + Cable Loss  
Average: Total = Reading Value + Antenna Factor + Cable Loss + Duty Cycle Correction
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



### 8.3.2 RADIATED SPURIOUS EMISSIONS.

#### Test Requirements and limit, §15.205, §15.209, §15.249(d)(e)

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

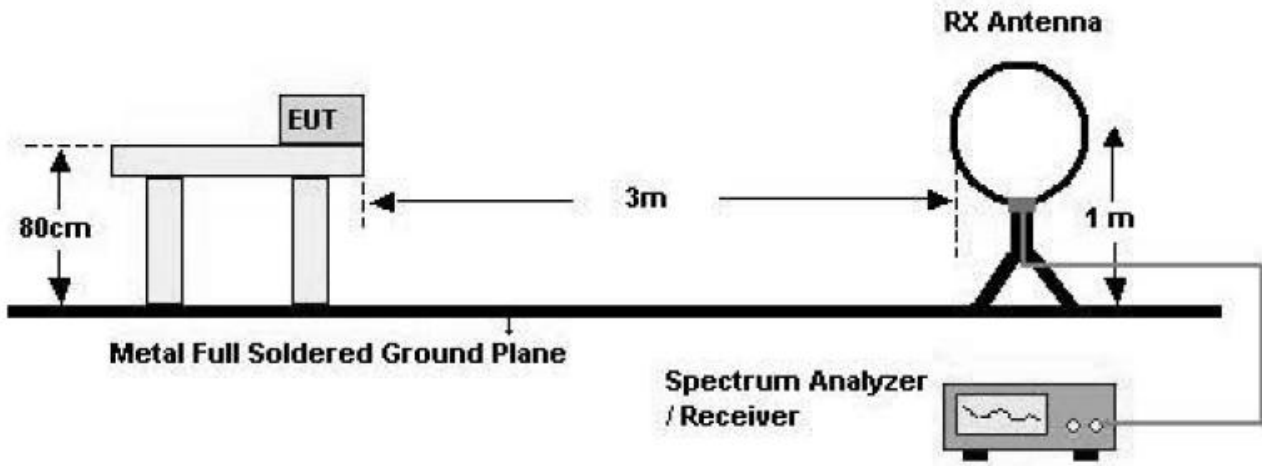
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

(e) As shown in § 15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

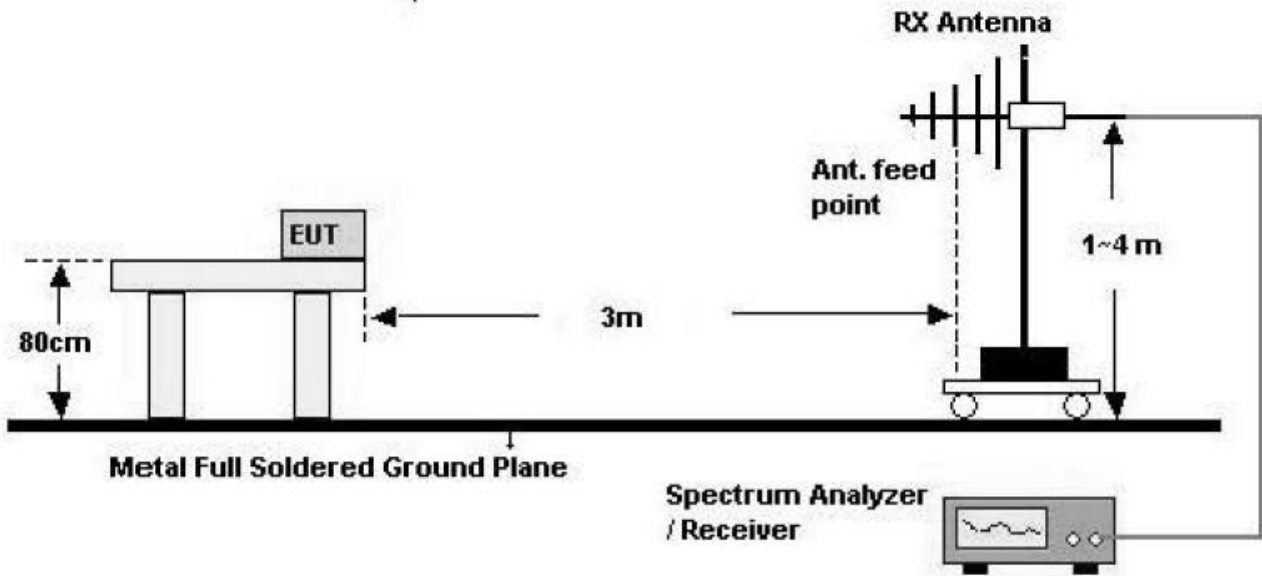
FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone		FCC ID: A3LSMN7506V

### Test Configuration

#### Below 30 MHz

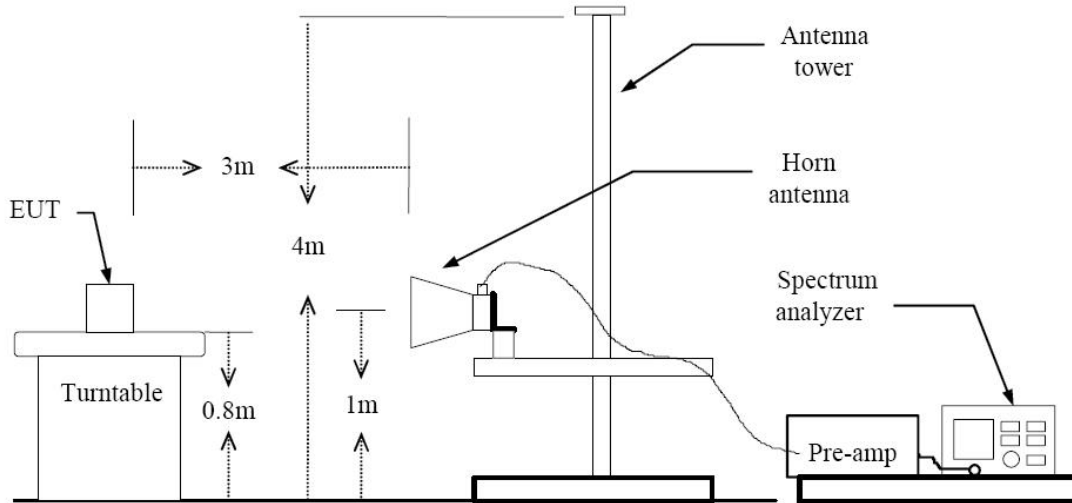


#### 30 MHz - 1 GHz





### Above 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. Spectrum Setting
  - a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
  - b. AV Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 kHz  $\geq 1/\tau$  Hz, where  $\tau$  = pulse width in seconds.

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone		FCC ID: A3LSMN7506V



## TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dB $\mu$ V/m	dBm /m	dBm	(H/V)	dB $\mu$ V/m	dB $\mu$ V/m	dB
No Critical peaks found							

### Notes:

1. Measuring frequencies from 9 kHz to the 30MHz.
2. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
3. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
4. Limit line = specific Limits (dBuV) + Distance extrapolation factor
5. This test is performed with hopping off.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V



## TEST RESULTS

### Below 1 GHz

**Operation Mode:** Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dB $\mu$ V/m	dBm /m	dBm	(H/V)	dB $\mu$ V/m	dB $\mu$ V/m	dB
No Critical peaks found							

### Notes:

1. Measuring frequencies from 30 MHz to the 1 GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.
3. This test is performed with hopping off.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V



**Above 1 GHz**

**Operation Mode:** CH Low (2402 MHz)

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4804	52.82	-4.32	V	48.50	73.98	25.48	PK
4804	40.98	-4.32	V	36.66	53.98	17.32	AV
7206	52.65	5.18	V	57.83	73.98	16.15	PK
7206	40.74	5.18	V	45.92	53.98	8.06	AV
4804	53.63	-4.32	H	49.31	73.98	24.67	PK
4804	41.21	-4.32	H	36.89	53.98	17.09	AV
7206	52.80	5.18	H	57.98	73.98	16.00	PK
7206	40.88	5.18	H	46.06	53.98	7.92	AV

A·F: ANTENNA FACTOR  
 C·L: CABLE LOSS  
 AMP G: AMPLIFIER GAIN

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss
5. Spectrum setting:
  - a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
  - b. AV Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 kHz  $\geq 1/\tau$  Hz, where  $\tau$  = pulse width in seconds.  
 We performed using a reduced video BW method was done with the analyzer in linear mode.
6. We have done Normal Mode and EDR Mode test.
7. This test is performed with hopping off.
8. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone		FCC ID: A3LSMN7506V



**Operation Mode: CH Mid (2441 MHz)**

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4882	51.22	-3.95	V	47.27	73.98	26.71	PK
4882	39.91	-3.95	V	35.96	53.98	18.02	AV
7323	52.63	5.46	V	58.09	73.98	15.90	PK
7323	40.37	5.46	V	45.83	53.98	8.16	AV
4882	50.79	-3.95	H	46.84	73.98	27.14	PK
4882	39.95	-3.95	H	36.00	53.98	17.98	AV
7323	52.51	5.46	H	57.97	73.98	16.02	PK
7323	40.42	5.46	H	45.88	53.98	8.11	AV

A:F: ANTENNA FACTOR  
 C:L: CABLE LOSS  
 AMP G: AMPLIFIER GAIN

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss
5. Spectrum setting:
  - a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
  - b. AV Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 kHz  $\geq 1/\tau$  Hz, where  $\tau$  = pulse width in seconds.  
 We performed using a reduced video BW method was done with the analyzer in linear mode.
6. We have done Normal Mode and EDR Mode test.
7. This test is performed with hopping off.
8. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone		FCC ID: A3LSMN7506V



**Operation Mode: CH High (2480 MHz)**

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4960	50.84	-3.49	V	47.35	73.98	26.63	PK
4960	39.58	-3.49	V	36.09	53.98	17.89	AV
7440	52.49	5.10	V	57.59	73.98	16.39	PK
7440	40.23	5.10	V	45.33	53.98	8.65	AV
4960	51.00	-3.49	H	47.51	73.98	26.47	PK
4960	39.64	-3.49	H	36.15	53.98	17.83	AV
7440	51.87	5.10	H	56.97	73.98	17.01	PK
7440	40.20	5.10	H	45.30	53.98	8.68	AV

A·F: ANTENNA FACTOR  
 C·L: CABLE LOSS  
 AMP G: AMPLIFIER GAIN

**Notes:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss
5. Spectrum setting:
  - a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
  - b. AV Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 kHz  $\geq 1/\tau$  Hz, where  $\tau$  = pulse width in seconds.  
 We performed using a reduced video BW method was done with the analyzer in linear mode.
6. We have done Normal Mode and EDR Mode test.
7. This test is performed with hopping off.
8. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.247 TEST REPORT		FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone		FCC ID: A3LSMN7506V



### 8.3.3 RADIATED RESTRICTED BAND EDGES MEASUREMENTS

#### Test Requirements and limit, §15.205, §15.209, §15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a) (See section 15.205(c)).

Operation Mode	ANT+
Operating Frequency	2402 MHz
Channel No	0 Ch

Frequency [MHz]	Reading [dBuV/m]	A.F.+CL [dB]	Ant. Pol. [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	24.48	33.90	H	58.38	73.98	15.60	PK
2390.0	12.75	33.90	H	46.65	53.98	7.33	AV
2390.0	24.41	33.90	V	58.31	73.98	15.67	PK
2390.0	12.71	33.90	V	46.61	53.98	7.37	AV

A:F: ANTENNA FACTOR

C:L: CABLE LOSS

#### Notes:

- 1.. Frequency range of measurement = 2310 MHz ~ 2390 MHz
2. Total = Fundamental Reading Value + Antenna Factor + Cable Loss
3. Spectrum setting:
  - a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
  - b. AV Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 kHz  $\geq 1/\tau$  Hz, where  $\tau$  = pulse width in seconds.  
We performed using a reduced video BW method was done with the analyzer in linear mode.
4. This test is performed with hopping off.
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

Operation Mode	ANT+
Operating Frequency	2480 MHz
Channel No	78 Ch

Frequency [MHz]	Reading [dBuV/m]	A.F.+CL [dB]	Ant. Pol. [H/V]	Duty Cycle Correction [dB]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2483.5	24.71	33.99	H	0	58.70	73.98	15.28	PK
2483.5	17.40	33.99	H	-49.74	1.65	53.98	52.33	AV
2483.5	24.66	33.99	V	0	58.65	73.98	15.33	PK
2483.5	16.64	33.99	V	-49.74	0.89	53.98	53.09	AV

A:F: ANTENNA FACTOR

C:L: CABLE LOSS

**Notes:**

1. Frequency range of measurement = 2483.5 MHz ~ 2500 MHz
2. Total = Fundamental Reading Value + Antenna Factor + Cable Loss – Delta Value + Duty Cycle Correction Factor
3. Spectrum setting:
  - a. Peak Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 MHz.
  - b. AV Setting 1 GHz – 26 GHz, RBW = 1 MHz, VBW = 1 kHz  $\geq 1/\tau$  Hz, where  $\tau$  = pulse width in seconds.

We performed using a reduced video BW method was done with the analyzer in linear mode.
4. Duty Cycle Correction Factor = -49.74dB (section 8.2 Duty Cycle)
5. This test is performed with hopping off.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.



## 8.4 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 ground plane.
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.
5. We are performed the AC Power Line Conducted Emission test for Ch.39 on ANT+ mode.  
Because Ch.39 on ANT+ mode is worst case.



**RESULT PLOTS**

**Conducted Emissions (Line 1)**

EMI Auto Test(1)

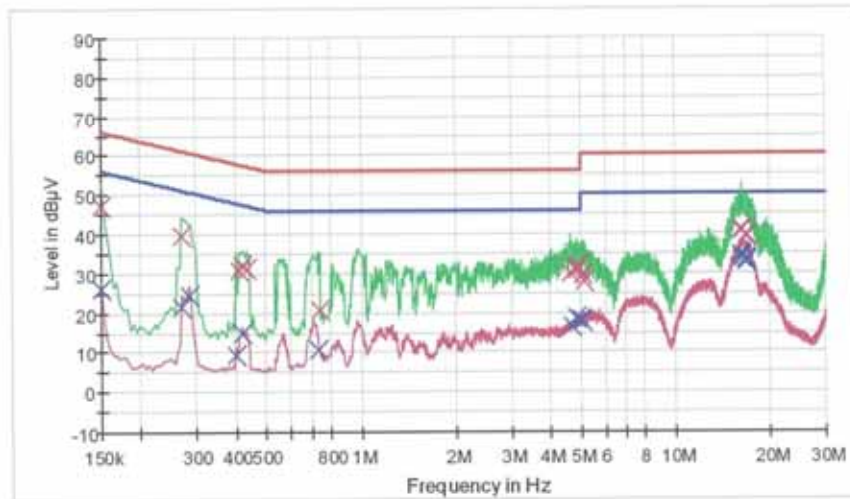
1 / 2

**HCT TEST Report**

**Common Information**

EUT: SM-N7506V  
 Manufacturer: SAMSUNG  
 Test Site: SHIELD ROOM  
 Operating Conditions: ANTPLUS MODE  
 Operator Name: JC SHIN

FCC CLASS B



— FCCCLASS\_B\_LP      — FCCCLASS\_B\_AV      — Preview Result 1-PK  
 — Preview Result 2-AVG      X Final Result 1-QPK      X Final Result 2-CAV

**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	47.0	9.000	Off	N	9.7	19.0	66.0
0.271500	39.8	9.000	Off	N	9.7	21.3	61.1
0.411000	30.8	9.000	Off	N	9.8	26.8	57.6
0.420000	32.1	9.000	Off	N	9.8	25.3	57.4
0.433500	31.3	9.000	Off	N	9.8	25.9	57.2
0.738500	20.6	9.000	Off	N	9.8	35.4	56.0
4.631000	30.0	9.000	Off	N	10.1	26.0	56.0
4.838000	31.7	9.000	Off	N	10.1	24.3	56.0
4.860500	30.9	9.000	Off	N	10.1	25.1	56.0
4.919000	31.8	9.000	Off	N	10.1	24.2	56.0
5.072000	29.4	9.000	Off	N	10.1	30.6	60.0
5.126000	28.0	9.000	Off	N	10.1	32.0	60.0
16.110500	40.8	9.000	Off	N	10.7	19.2	60.0
16.187000	40.9	9.000	Off	N	10.7	19.1	60.0
16.331000	40.7	9.000	Off	N	10.7	19.3	60.0
16.340000	41.0	9.000	Off	N	10.7	19.0	60.0

2/21/2014

2:46:15

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

EMI Auto Test(1)

2 / 2

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
16.799000	39.7	9.000	Off	N	10.7	20.3	60.0
16.911500	39.0	9.000	Off	N	10.7	21.0	60.0

### Final Result 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	26.2	9.000	Off	N	9.7	29.8	56.0
0.271500	21.4	9.000	Off	N	9.7	29.7	51.1
0.285000	24.5	9.000	Off	N	9.7	26.2	50.7
0.402000	9.3	9.000	Off	N	9.8	38.5	47.8
0.420000	15.0	9.000	Off	N	9.8	32.4	47.4
0.729500	10.5	9.000	Off	N	9.8	35.5	46.0
4.680500	16.5	9.000	Off	N	10.1	29.5	46.0
4.838000	18.4	9.000	Off	N	10.1	27.6	46.0
4.847000	18.5	9.000	Off	N	10.1	27.5	46.0
4.860500	18.4	9.000	Off	N	10.1	27.6	46.0
4.991000	18.1	9.000	Off	N	10.1	27.9	46.0
5.072000	17.5	9.000	Off	N	10.1	32.5	50.0
16.110500	34.4	9.000	Off	N	10.7	15.6	50.0
16.331000	33.9	9.000	Off	N	10.7	16.1	50.0
16.340000	33.9	9.000	Off	N	10.7	16.1	50.0
16.578500	33.2	9.000	Off	N	10.7	16.8	50.0
16.794500	32.9	9.000	Off	N	10.7	17.1	50.0
16.911500	33.7	9.000	Off	N	10.7	16.3	50.0

2/21/2014

2:46:15

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

# Conducted Emissions (Line 2)

EMI Auto Test(1)

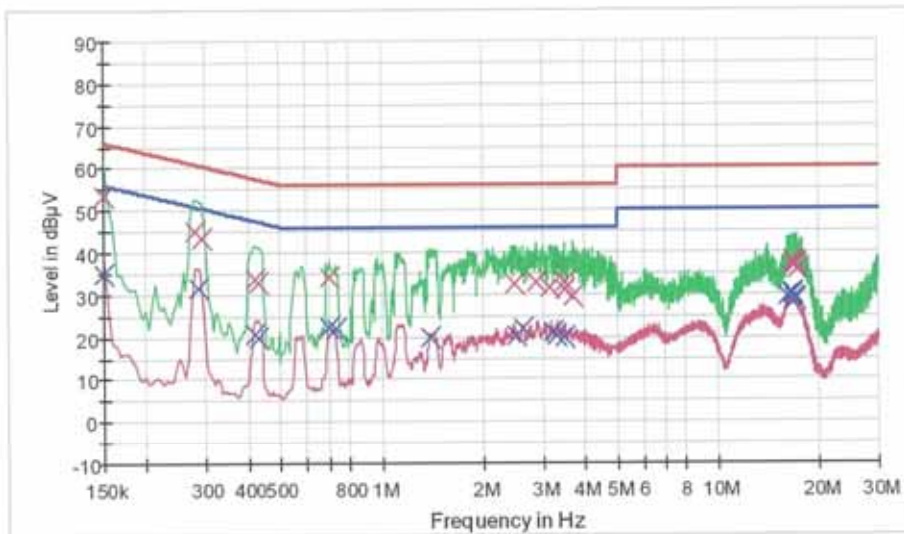
1 / 2

## HCT TEST Report

### Common Information

EUT: SM-N7506V  
 Manufacturer: SAMSUNG  
 Test Site: SHIELD ROOM  
 Operating Conditions: ANTPLUS MODE  
 Operator Name: JC SHIN

FCC CLASS B



— FCCCLASS B\_OP      — FCCCLASS B\_AV      — Preview Result 1-PK\*  
— Preview Result 2-AVG      X Final Result 1-CFK      X Final Result 2-CAV

### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	53.5	9.000	Off	L1	9.7	12.5	66.0
0.280500	45.2	9.000	Off	L1	9.7	15.6	60.8
0.294000	43.2	9.000	Off	L1	9.7	17.2	60.4
0.420000	33.7	9.000	Off	L1	9.7	23.7	57.4
0.429000	32.9	9.000	Off	L1	9.7	24.4	57.3
0.702500	34.3	9.000	Off	L1	9.8	21.7	56.0
2.480000	32.3	9.000	Off	L1	9.9	23.7	56.0
2.894000	32.7	9.000	Off	L1	10.0	23.3	56.0
3.164000	31.7	9.000	Off	L1	10.0	24.3	56.0
3.483500	33.0	9.000	Off	L1	10.0	23.0	56.0
3.501500	31.0	9.000	Off	L1	10.0	25.0	56.0
3.713000	29.5	9.000	Off	L1	10.0	26.5	56.0
16.695500	38.1	9.000	Off	L1	10.8	21.9	60.0
16.709000	38.0	9.000	Off	L1	10.8	22.0	60.0
16.754000	37.5	9.000	Off	L1	10.8	22.5	60.0
16.911500	37.1	9.000	Off	L1	10.8	22.9	60.0

2/21/2014

2:40:00

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		<a href="http://www.hct.co.kr">www.hct.co.kr</a>
Test Report No. HCT-R-1402-F023	Date of Issue: February 21, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
16.956500	37.2	9.000	Off	L1	10.8	22.8	60.0
17.267000	35.8	9.000	Off	L1	10.8	24.2	60.0

**Final Result 2**

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	34.8	9.000	Off	L1	9.7	21.2	56.0
0.285000	31.5	9.000	Off	L1	9.7	19.2	50.7
0.420000	26.5	9.000	Off	L1	9.7	26.9	47.4
0.429000	20.0	9.000	Off	L1	9.7	27.3	47.3
0.702500	22.4	9.000	Off	L1	9.8	23.6	46.0
0.729500	21.9	9.000	Off	L1	9.8	24.1	46.0
1.391000	19.8	9.000	Off	L1	9.8	26.2	46.0
2.502500	20.1	9.000	Off	L1	9.9	25.9	46.0
2.633000	21.7	9.000	Off	L1	9.9	24.3	46.0
3.222500	21.1	9.000	Off	L1	10.0	24.9	46.0
3.281000	20.3	9.000	Off	L1	10.0	25.7	46.0
3.501500	20.0	9.000	Off	L1	10.0	26.0	46.0
16.061000	29.3	9.000	Off	L1	10.7	20.7	50.0
16.578500	30.0	9.000	Off	L1	10.8	20.0	50.0
16.650500	29.7	9.000	Off	L1	10.8	20.3	50.0
16.695500	30.2	9.000	Off	L1	10.8	19.8	50.0
16.911500	28.9	9.000	Off	L1	10.8	21.1	50.0
16.961000	28.5	9.000	Off	L1	10.8	21.5	50.0

## 8.5 LIST OF TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Interval	Calibration Due	Serial No.
Rohde & Schwarz	ENV216/ LISN	Annual	01/29/2015	100073
Schwarzbeck	VULB 9160/ TRILOG Antenna	Biennial	12/17/2014	3150
Rohde & Schwarz	ESI 40 / EMI TEST RECEIVER	Annual	04/16/2014	831564103
Agilent	E4440A/ Spectrum Analyzer	Annual	04/25/2014	US45303008
Agilent	N9020A/ SIGNAL ANALYZER	Annual	05/14/2014	MY51110063
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	SCU-18/ Signal Conditioning Unit	Annual	09/10/2014	10094
CERNEX	CBL18265035 / POWER AMP	Annual	07/24/2014	22966
CERNEX	CBL26405040 / POWER AMP	Annual	04/16/2014	19660
Schwarzbeck	BBHA 9120D/ Horn Antenna	Biennial	07/05/2015	1151
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	Biennial	10/30/2014	BBHA9170124
Rohde & Schwarz	FSP / Spectrum Analyzer	Annual	01/24/2015	839117/011
Agilent	N1911A/Power Meter	Annual	01/24/2015	MY45100523
Agilent	N1921A /POWER SENSOR	Annual	07/11/2014	MY45241059
Wainwright Instrument	WHF3.0/18G-10EF / High Pass Filter	Annual	02/03/2015	F6
Wainwright Instrument	WHNX6.0/26.5G-6SS / High Pass Filter	Annual	04/16/2014	1
Wainwright Instrument	WHNX7.0/18G-8SS / High Pass Filter	Annual	04/16/2014	29
Wainwright Instrument	WRCJ2400/2483.5-2370/2520-60/14SS / Band Reject Filter	Annual	03/19/2014	1
Hewlett Packard	11636B/Power Divider	Annual	10/22/2014	11377
Agilent	87300B/Directional Coupler	Annual	12/18/2014	3116A03621
Hewlett Packard	11667B / Power Splitter	Annual	05/29/2014	05001
DIGITAL	EP-3010 /DC POWER SUPPLY	Annual	10/29/2014	3110117
ITECH	IT6720 / DC POWER SUPPLY	Annual	11/05/2014	010002156287001199
TESCOM	TC-3000C / BLUETOOTH TESTER	Annual	04/24/2014	3000C000276
Rohde & Schwarz	CBT / BLUETOOTH TESTER	Annual	04/25/2014	100422
Rohde & Schwarz	LOOP ANTENNA	Biennial	08/14/2014	100179
Agilent	8493C / Attenuator(10 dB)	Annual	07/24/2014	76649
WEINSCHTEL	2-3 / Attenuator(3 dB)	Annual	10/28/2014	BR0617
CERNEX	CBL06185030 / POWER AMP	Annual	07/24/2014	22965
CERNEX	CBLU1183540 / POWER AMP	Annual	07/24/2014	22964