

HCT CO., LTD.

CERTIFICATE OF COMPLIANCE

FCC Certification

Applicant Name: SAMSUNG Electronics Co., Ltd.	Date of Issue: February 10, 2014
Address: 129, Samsung-ro, Yeongtong-gu Suwon-si, Gyeonggi-do, 443-742 Rep. of Korea	Test Site/Location: HCT CO., LTD., 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea.
	Report No.: HCTR1402F010
	HCT FRN: 0005866421

FCC ID : A3LSMN7506V

APPLICANT : SAMSUNG Electronics Co., Ltd.

FCC Model(s):	SM-N7506V
EUT Type:	Mobile Phone
Max. RF Output Power:	Wi-Fi 802.11b (22.47 dBm) / Wi-Fi 802.11g (21.64 dBm) / Wi-Fi 802.11n (2.4 GHz) (20.86 dBm) / Wi-Fi 802.11a (5.8 GHz) (16.17 dBm) / Wi-Fi 802.11n_20 MHz BW (5.8 GHz) (15.27 dBm) / Wi-Fi 802.11n_40 MHz BW (5.8 GHz) (14.49 dBm)
Frequency Range:	2412 MHz - 2462 MHz (2.4 GHz Band) 5745 MHz - 5825 MHz (5.8 GHz Band)_20 MHz BW, 5755 MHz - 5795 MHz (5.8 GHz Band)_40 MHz BW
Modulation type	CCK/DSSS/OFDM
FCC Classification:	Digital Transmission System(DTS)
FCC Rule Part(s):	Part 15.247

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
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Test engineer of RF Team



Approved by
: Kyoung Houn Seo
Manager of RF Team

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FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCTR1402F010	February 12, 2014	- First Approval Report

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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 02, 2014 ~ February 12, 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

EUT Type	Mobile Phone	
FCC Model Name	SM-N7506V	
Power Supply	DC 3.8 V	
Battery type	Li-ion Battery(Standard)	
Frequency Range	TX	: 2412 MHz~2462 MHz, 5745 MHz~5825 MHz_20 MHz, 5755 MHz~5795 MHz_40 MHz
	RX	: 2412 MHz~2462 MHz, 5745 MHz~5825 MHz_20 MHz, 5755 MHz~5795 MHz_40 MHz
Max. RF Output Power	Peak	Wi-Fi 802.11b (22.47 dBm) / Wi-Fi 802.11g (21.64 dBm)/ Wi-Fi 802.11n (2.4 GHz) (20.86 dBm) / Wi-Fi 802.11a (5.8 GHz) (16.17 dBm)/ Wi-Fi 802.11n_20 MHz BW (5.8 GHz) (15.27 dBm) / Wi-Fi 802.11n_40 MHz BW (5.8 GHz) (14.49 dBm)
	Average	Wi-Fi 802.11b (16.65 dBm) / Wi-Fi 802.11g (13.37 dBm)/ Wi-Fi 802.11n (2.4 GHz) (12.66 dBm) / Wi-Fi 802.11a (5.8 GHz) (8.76 dBm)/ Wi-Fi 802.11n_20 MHz BW (5.8 GHz) (7.77 dBm) / Wi-Fi 802.11n_40 MHz BW (5.8 GHz) (7.32 dBm)
Modulation Type	DSSS/CCK(802.11b), OFDM(802.11a, 802.11g, 802.11n)	
Antenna Specification	Manufacturer: PULSE ELECTRONICS KOREA Antenna type: LDS Antenna Peak Gain : -1.51 dBi (2.4 GHz Band), -0.72 dBi (5.8 GHz Band)	

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3. TEST METHODOLOGY

FCC KDB 558074 D01 DTS Meas Guidance v03r01 dated April 09, 2013 entitled “Guidance for Performing Compliance Measurements on Digital Transmission Systems(DTS) and the measurement procedure described in the American National Standard for Testing Unlicensed Wireless Devices(ANSI C63.4-2003) Operating Under §15.247” 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 15.207, 15.209 and 15.247 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)

Conducted Antenna Terminal

See Section from 9.1 to 9.2.(KDB 558074)

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.

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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 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

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7. SUMMARY TEST OF RESULTS

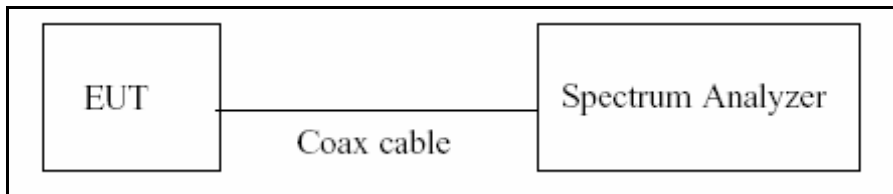
Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
6 dB Bandwidth	§15.247(a)(2)	> 500 kHz	CONDUCTED	PASS
Conducted Maximum Peak Output Power	§15.247(b)(3)	< 1 Watt		PASS
Power Spectral Density	§15.247(e)	< 8 dBm / 3 kHz Band		PASS
Band Edge(Out of Band Emissions)	§15.247(d)	Conducted > 20 dBc		PASS
AC Power line Conducted Emissions	§15.207	cf. Section 8.6		PASS
Radiated Spurious Emissions	§15.205, 15.209	cf. Section 8.5.1	RADIATED	PASS
Radiated Restricted Band Edge	§15.247(d), 15.205, 15.209	cf. Section 8.5.2		PASS

8. TEST RESULT

8.1 DUTY CYCLE(802.11a/b/g/n)

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW $\geq$ OBW if possible; otherwise, set RBW to the largest available value. Set VBW $\geq$ RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are $> 50/T$ and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if $T \leq 16.7$ microseconds.)

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer. We tested according to the zero-span measurement method, 6.0)b) in KDB 558074(issued 04/09/2013)

The largest available value of RBW is 8 MHz and VBW is 50 MHz. The zero-span method of measuring duty cycle shall not be used if $T \leq 6.25$ microseconds. ($50/6.25 = 8$)

The zero-span method was used because all measured T data are > 6.25 microseconds and both RBW and VBW are $> 50/T$.

1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz ($\geq$ RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep > 100
6. Trace mode = Clear write
7. Measure T_{total} and T_{on}
8. Calculate Duty Cycle = T_{on} / T_{total} and Duty Cycle Factor = $10 \cdot \log(1/\text{Duty Cycle})$

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Duty Cycle Factor

Mode	Data Rate	T _{on} (ms)	T _{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
2.4 GHz Band 802.11b	1	8.380	8.500	0.98588235	0.062
	2	4.190	4.300	0.97441860	0.113
	5.5	1.587	1.692	0.93794326	0.278
	11	0.840	0.942	0.89171975	0.498
2.4 GHz Band 802.11g and 5.8 GHz Band 802.11a	6	1.392	1.497	0.92985972	0.316
	9	0.939	1.041	0.90201729	0.448
	12	0.706	0.808	0.87376238	0.586
	18	0.478	0.578	0.82698962	0.825
	24	0.364	0.464	0.78448276	1.054
	36	0.251	0.351	0.71509972	1.456
	48	0.191	0.291	0.65635739	1.829
	54	0.175	0.275	0.63636364	1.963
2.4 GHz Band 802.11n_20 MHz BW and 5.8 GHz Band 802.11n_20 MHz BW	6.5	1.293	1.395	0.92688172	0.330
	13	0.657	0.756	0.86904762	0.610
	19.5	0.446	0.546	0.81684982	0.879
	26	0.342	0.442	0.77375566	1.114
	39	0.234	0.334	0.70059880	1.545
	52	0.183	0.282	0.64893617	1.878
	58.5	0.167	0.266	0.62781955	2.022
	65	0.152	0.250	0.60800000	2.161
5.8 GHz Band 802.11n_40 MHz BW	13.5	0.634	0.734	0.86376022	0.636
	27	0.330	0.432	0.76388889	1.170
	40.5	0.227	0.328	0.69207317	1.598
	54	0.179	0.279	0.64157706	1.928
	81	0.127	0.228	0.55701754	2.541
	108	0.103	0.203	0.50738916	2.947
	121.5	0.092	0.192	0.47916667	3.195
	135	0.088	0.188	0.46808511	3.297

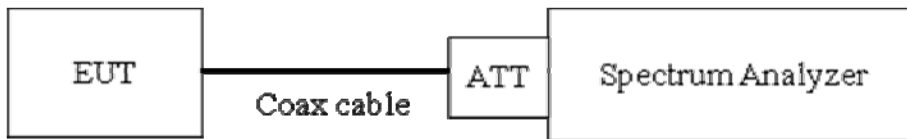
8.2 6dB BANDWIDTH (802.11a/b/g/n)

Test Requirements and limit, §15.247(a)(2)

The bandwidth at 6dB 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.

The minimum permissible 6dB bandwidth is 500 kHz.

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to (Page 5 in KDB 558074, issued 04/09/2013)

RBW = 100 kHz

VBW $\geq 3 \times$ RBW

Detector = Peak

Trace mode = max hold

Sweep = auto couple

Allow the trace to stabilize

Note : We tested 6 dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer. X dB is set 6 dB.

TEST RESULTS

2.4 GHz Band

Conducted 6dB Bandwidth Measurements for 802.11b

802.11b Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
2412	1	8.12	0.500	Pass
2437	6	8.13	0.500	Pass
2462	11	9.05	0.500	Pass

Conducted 6dB Bandwidth Measurements for 802.11g

802.11g Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
2412	1	16.38	0.500	Pass
2437	6	16.41	0.500	Pass
2462	11	16.39	0.500	Pass

Conducted 6dB Bandwidth Measurements for 802.11n_20 MHz BW

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
2412	1	17.58	0.500	Pass
2437	6	17.62	0.500	Pass
2462	11	17.63	0.500	Pass

5.8 GHz Band

Conducted 6 dB Bandwidth Measurements for 802.11a

802.11a Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	16.40	0.500	Pass
5785	157	16.43	0.500	Pass
5825	165	16.43	0.500	Pass

Conducted 6 dB Bandwidth Measurements for 802.11n_20 MHz BW

802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.63	0.500	Pass
5785	157	17.60	0.500	Pass
5825	165	17.67	0.500	Pass

Conducted 6 dB Bandwidth Measurements for 802.11n_40 MHz BW

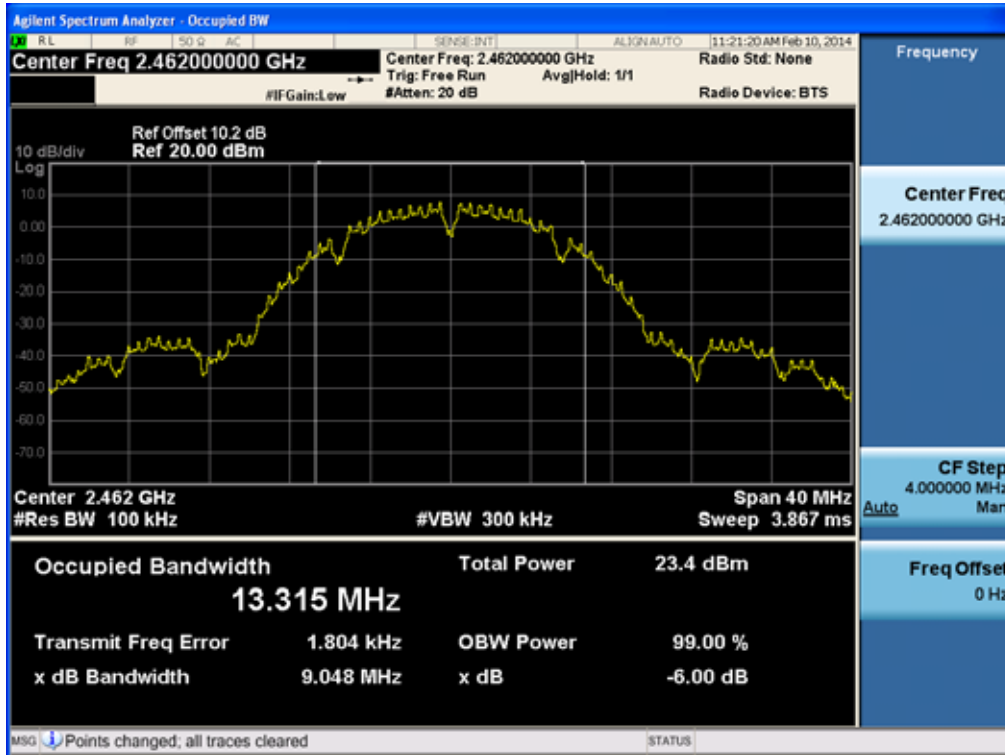
802.11n Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.26	0.500	Pass
5795	159	35.38	0.500	Pass

Note : In order to simplify the report, attached plots were only the most wide 6 dB BW channel.

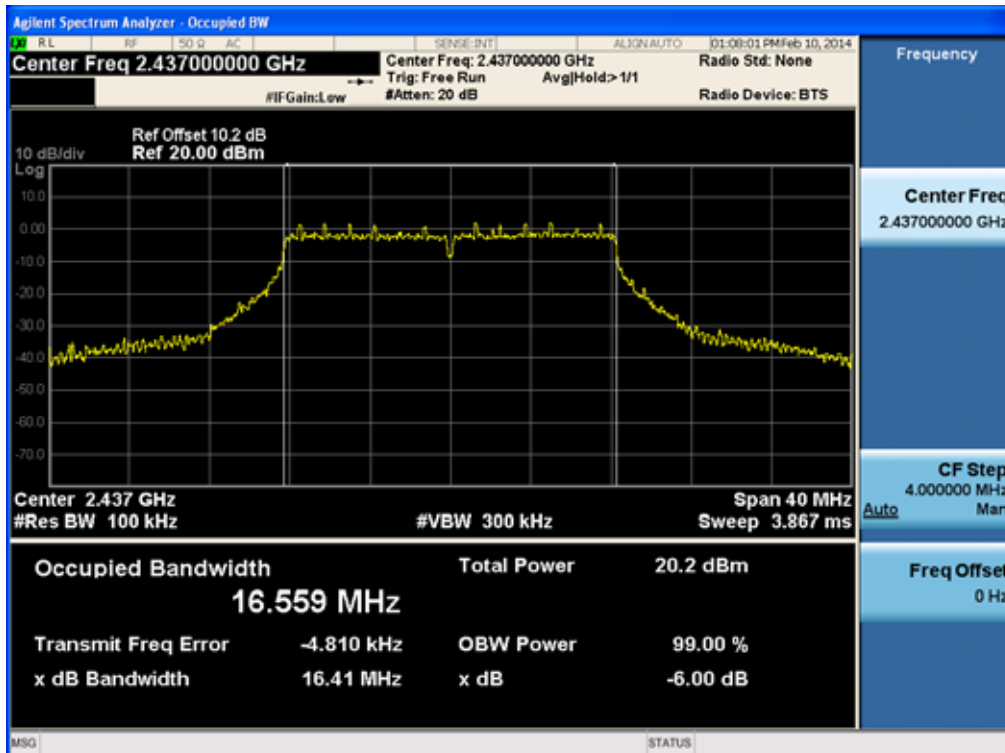
RESULT PLOTS

2.4 GHz Band

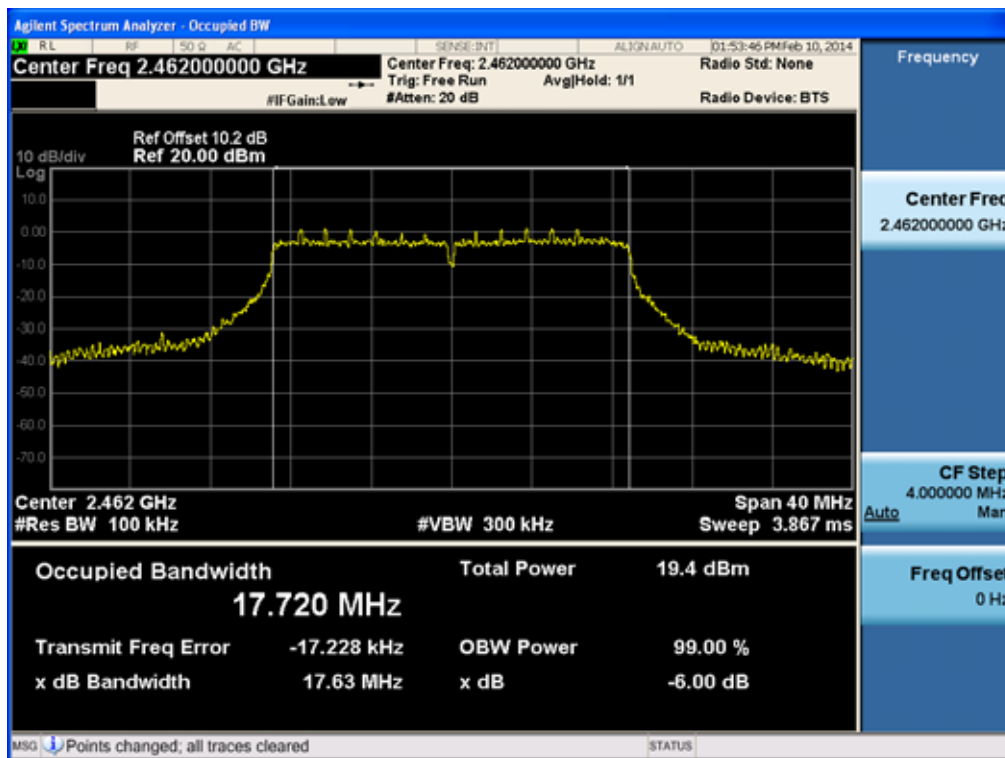
6dB Bandwidth plot (802.11b-CH 11)



6dB Bandwidth plot (802.11g-CH 6)



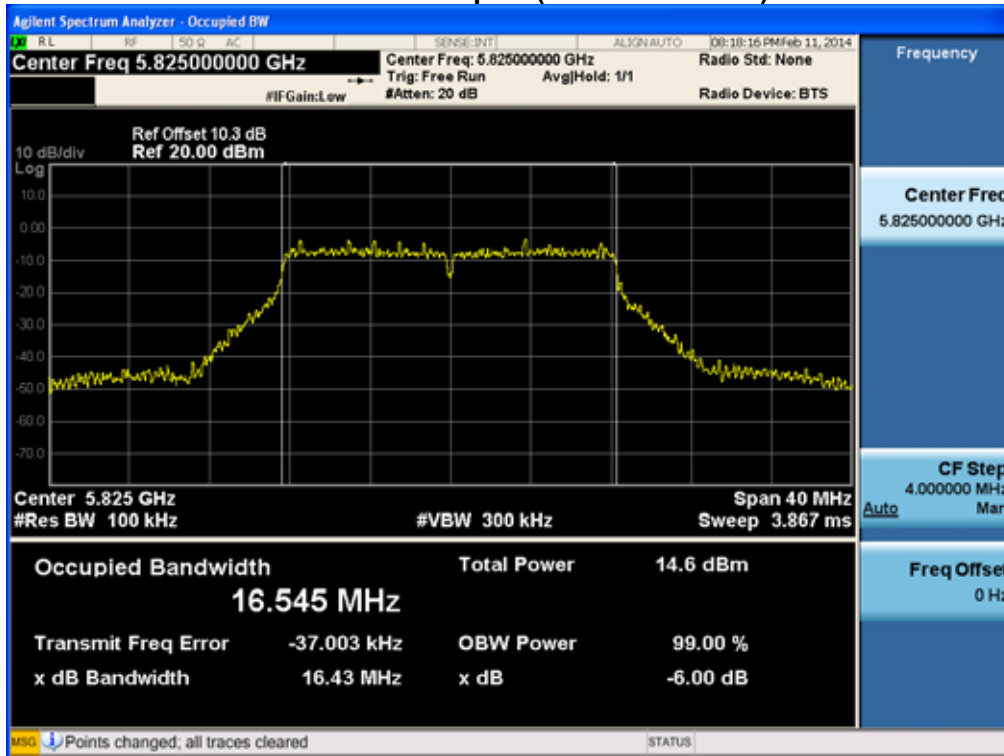
6dB Bandwidth plot (802.11n-CH 11)



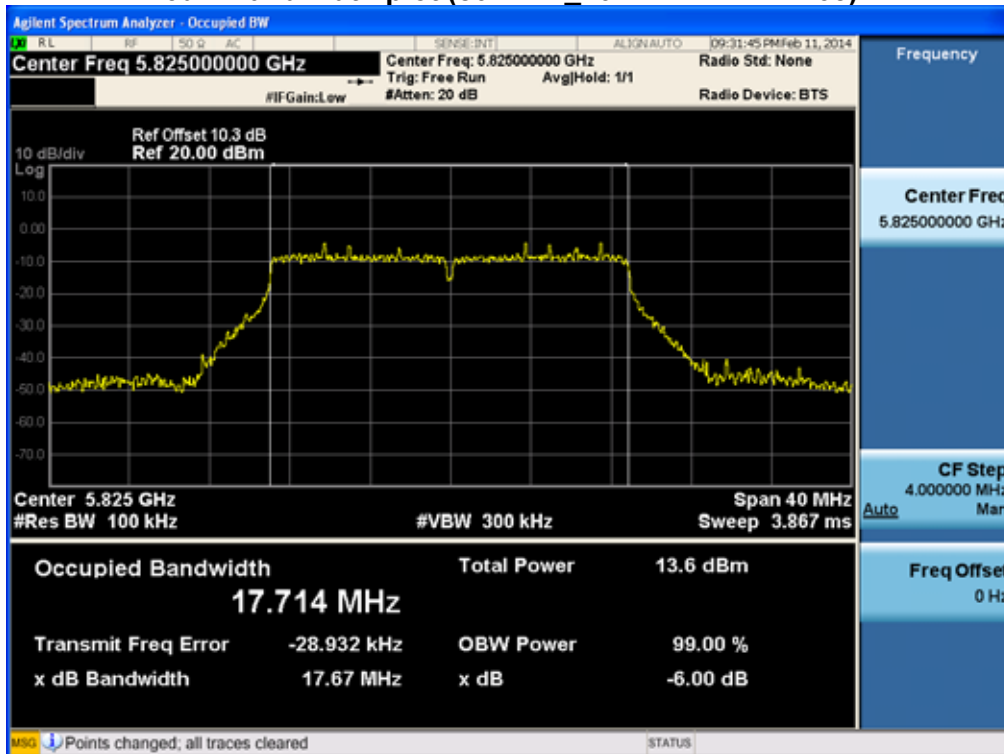
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5.8 GHz Band

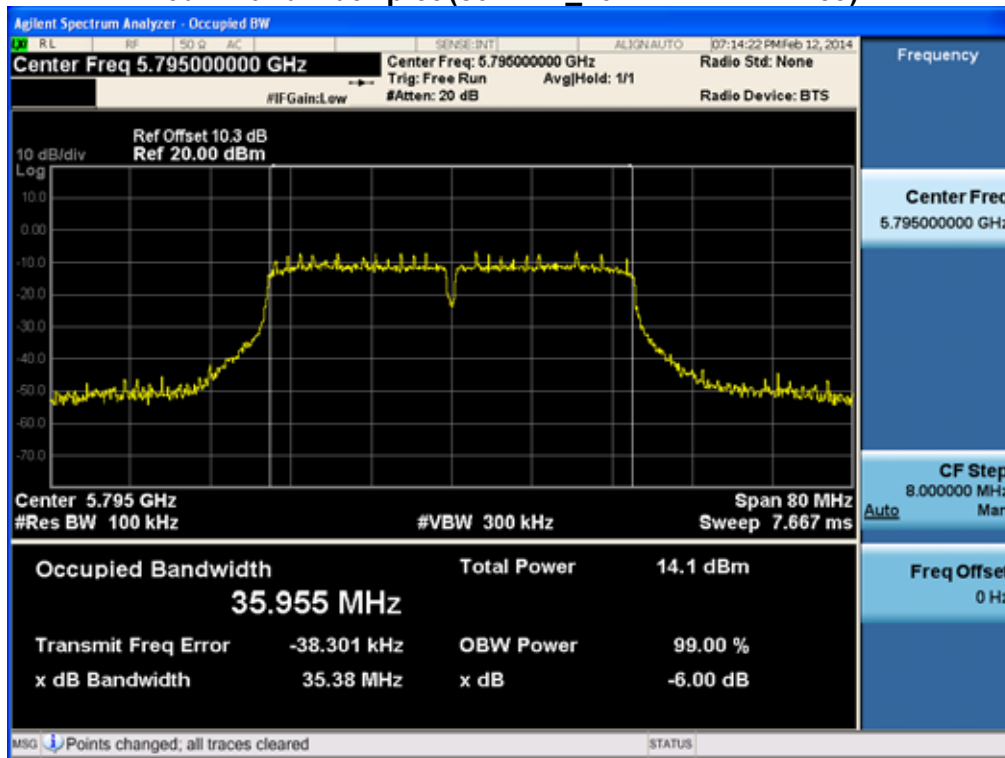
6dB Bandwidth plot (802.11a-CH 165)



6dB Bandwidth plot (802.11n_20 MHz BW-CH 165)



6dB Bandwidth plot (802.11n_40 MHz BW-CH 159)



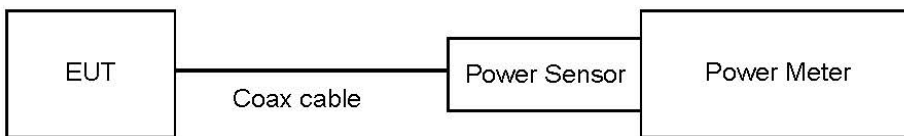
8.3 OUTPUT POWER (802.11a/b/g/n)

Test Requirements and limit, §15.247(b)(3)

The transmitter output is connected to the input of an RF power sensor. Measurement is made using a broadband power meter capable of making peak and average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

The maximum permissible conducted output power is 1 Watt.

TEST CONFIGURATION(20 MHz BW)



TEST PROCEDURE(20 MHz BW)

- Peak Power (Procedure 9.1.3 in KDB 558074, issued 04/09/2013)
 1. Measure the peak power of the transmitter.
- Average Power (Procedure 9.2.3.1 in KDB 558074, issued 04/09/2013)
 1. Measure the duty cycle.
 2. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
 3. Add $10 \log (1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

Note :

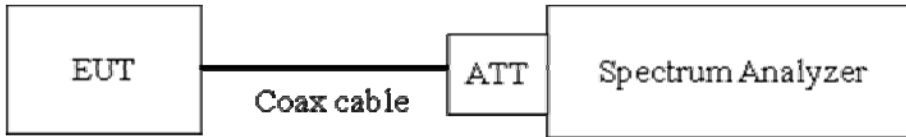
1. We apply to the offset in the 2.4 GHz and 5.8 GHz range that was rounded off to the closest tenth dB. So, 20.2 dB is offset for 2.4 GHz Band and 20.3 dB is offset for 5.8 GHz Band.

Actual value of loss for the attenuator and cable combination is below table.

Band	Frequency(MHz)	Loss(dB)
2.4 GHz	2412	20.21
	2437	20.24
	2462	20.24
5.8 GHz	5745	20.31
	5755	20.30
	5785	20.29
	5795	20.26
	5825	20.28

(Actual value of loss for the attenuator and cable combination)

TEST CONFIGURATION(40 MHz BW)



TEST PROCEDURE(40 MHz BW)

The transmitter output is connected to the Spectrum Analyzer. We use the spectrum analyzer's integrated band power measurement function.

The Spectrum Analyzer is set to

- Peak Power (Procedure 9.1.2 in KDB 558074, issued 04/09/2013)

RBW = 1 MHz

VBW $\geq 3 \times$ RBW

SPAN $\geq 1.5 \times$ DTS bandwidth

Detector Mode = Peak

Sweep = auto couple

Trace Mode = max hold

Allow trace to fully stabilize.

Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some instruments, this may require a manual override to select peak detector).

- Average Power (Procedure 9.2.2.4 in KDB 558074, issued 04/09/2013)

Measure the duty cycle

Set span to at least 1.5 times the OBW

RBW = 1-5 % of the OBW, not to exceed 1 MHz.

VBW $\geq 3 \times$ RBW.

Number of points in sweep $\geq 2 \times$ span / RBW. (This gives bin-to-bin spacing $\leq$ RBW/2, so that narrowband signals are not lost between frequency bins.)

Sweep time = auto.

Detector = RMS(i.e., power averaging)

Do not use sweep triggering. Allow the sweep to "free run".

Trace average at least 100 traces in power averaging(RMS) mode.

Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges.

Add $10 \log (1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.

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Sample Calculation

Output Power = Reading Value + ATT loss + Cable loss(1 ea) + Duty Cycle Factor

Output Power = 10 dBm + 20 dB + 0.8 dB + 0.2 dB = 31.0 dBm

Note :

1. Spectrum reading values are not plot data. The power results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 2.4 GHz and 5.8 GHz range that was rounded off to the closest tenth dB. So, 10.2 dB is offset for 2.4 GHz Band and 10.3 dB is offset for 5.8 GHz Band.
Actual value of loss for the attenuator and cable combination is below table.

Band	Frequency(MHz)	Loss(dB)
2.4 GHz	2412	20.21
	2437	20.24
	2462	20.24
5.8 GHz	5745	20.31
	5755	20.30
	5785	20.29
	5795	20.26
	5825	20.28

(Actual value of loss for the attenuator and cable combination)

TEST RESULTS-Peak

2.4 GHz Band

Conducted Output Power Measurements (802.11b Mode)

802.11b Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
2412	1	1 Mbps	18.03	30
		2 Mbps	18.36	30
		5.5 Mbps	20.02	30
		11 Mbps	21.71	30
2437	6	1 Mbps	18.84	30
		2 Mbps	19.11	30
		5.5 Mbps	20.76	30
		11 Mbps	22.47	30
2462	11	1 Mbps	18.52	30
		2 Mbps	18.80	30
		5.5 Mbps	20.41	30
		11 Mbps	22.18	30

Conducted Output Power Measurements (802.11g Mode)

802.11g Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
2412	1	6 Mbps	20.59	30
		9 Mbps	20.83	30
		12 Mbps	20.74	30
		18 Mbps	20.70	30
		24 Mbps	21.25	30
		36 Mbps	21.23	30
		48 Mbps	21.12	30
		54 Mbps	21.35	30
2437	6	6 Mbps	20.88	30
		9 Mbps	21.13	30
		12 Mbps	21.03	30
		18 Mbps	21.02	30
		24 Mbps	21.57	30
		36 Mbps	21.51	30
		48 Mbps	21.64	30
		54 Mbps	21.59	30
2462	11	6 Mbps	21.01	30
		9 Mbps	21.00	30
		12 Mbps	20.93	30
		18 Mbps	20.90	30
		24 Mbps	21.41	30
		36 Mbps	21.45	30
		48 Mbps	21.50	30
		54 Mbps	21.53	30

Conducted Output Power Measurements (802.11n Mode)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
2412	1	6.5 Mbps	19.75	30
		13 Mbps	19.63	30
		19.5 Mbps	19.68	30
		26 Mbps	20.37	30
		39 Mbps	20.11	30
		52 Mbps	20.24	30
		58.5 Mbps	20.52	30
		65 Mbps	20.10	30
2437	6	6.5 Mbps	20.10	30
		13 Mbps	19.98	30
		19.5 Mbps	20.21	30
		26 Mbps	20.40	30
		39 Mbps	20.50	30
		52 Mbps	20.80	30
		58.5 Mbps	20.85	30
		65 Mbps	20.54	30
2462	11	6.5 Mbps	20.10	30
		13 Mbps	20.26	30
		19.5 Mbps	20.19	30
		26 Mbps	20.78	30
		39 Mbps	20.75	30
		52 Mbps	20.81	30
		58.5 Mbps	20.86	30
		65 Mbps	20.55	30

5.8 GHz Band

Conducted Output Power Measurements (802.11a Mode: 5745~5825)

802.11a Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
5745	149	6 Mbps	15.02	30
		9 Mbps	15.03	30
		12 Mbps	14.75	30
		18 Mbps	14.76	30
		24 Mbps	15.25	30
		36 Mbps	15.18	30
		48 Mbps	15.15	30
		54 Mbps	15.20	30
5785	157	6 Mbps	15.91	30
		9 Mbps	15.95	30
		12 Mbps	15.67	30
		18 Mbps	15.59	30
		24 Mbps	16.06	30
		36 Mbps	16.07	30
		48 Mbps	16.13	30
		54 Mbps	16.17	30
5825	165	6 Mbps	15.36	30
		9 Mbps	15.41	30
		12 Mbps	15.07	30
		18 Mbps	15.01	30
		24 Mbps	15.47	30
		36 Mbps	15.45	30
		48 Mbps	15.51	30
		54 Mbps	15.52	30

Conducted Output Power Measurements (802.11n_20 MHz BW Mode: 5745~5825)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
5745	149	6.5 Mbps	14.24	30
		13 Mbps	13.91	30
		19.5 Mbps	13.88	30
		26 Mbps	14.32	30
		39 Mbps	14.23	30
		52 Mbps	14.34	30
		58.5 Mbps	14.33	30
		65 Mbps	14.33	30
5785	157	6.5 Mbps	15.08	30
		13 Mbps	14.77	30
		19.5 Mbps	14.72	30
		26 Mbps	15.17	30
		39 Mbps	15.16	30
		52 Mbps	15.10	30
		58.5 Mbps	15.27	30
		65 Mbps	15.09	30
5825	165	6.5 Mbps	14.47	30
		13 Mbps	14.13	30
		19.5 Mbps	14.18	30
		26 Mbps	14.62	30
		39 Mbps	14.52	30
		52 Mbps	14.61	30
		58.5 Mbps	14.66	30
		65 Mbps	14.60	30

Conducted Output Power Measurements (802.11n_40 MHz BW Mode: 5755~5795)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
5755	151	13.5 Mbps	14.03	30
		27 Mbps	13.77	30
		40.5 Mbps	13.75	30
		54 Mbps	14.08	30
		81 Mbps	13.97	30
		108 Mbps	14.04	30
		121.5 Mbps	13.97	30
		135 Mbps	13.93	30
5795	159	13.5 Mbps	14.46	30
		27 Mbps	14.21	30
		40.5 Mbps	14.18	30
		54 Mbps	14.45	30
		81 Mbps	14.48	30
		108 Mbps	14.49	30
		121.5 Mbps	14.38	30
		135 Mbps	14.37	30

TEST RESULTS-Average

2.4 GHz Band

Conducted Output Power Measurements (802.11b Mode)

802.11b Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
2412	1	1 Mbps	15.60	0.062	15.67	30
		2 Mbps	15.61	0.113	15.72	30
		5.5 Mbps	15.60	0.278	15.88	30
		11 Mbps	15.33	0.498	15.82	30
2437	6	1 Mbps	16.43	0.062	16.49	30
		2 Mbps	16.38	0.113	16.49	30
		5.5 Mbps	16.37	0.278	16.65	30
		11 Mbps	16.13	0.498	16.63	30
2462	11	1 Mbps	15.85	0.062	15.91	30
		2 Mbps	15.87	0.113	15.98	30
		5.5 Mbps	15.85	0.278	16.13	30
		11 Mbps	15.64	0.498	16.14	30

Conducted Output Power Measurements (802.11g Mode)

802.11g Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
2412	1	6 Mbps	12.47	0.316	12.78	30
		9 Mbps	12.43	0.448	12.87	30
		12 Mbps	12.50	0.586	13.08	30
		18 Mbps	12.22	0.825	13.04	30
		24 Mbps	12.02	1.054	13.07	30
		36 Mbps	11.69	1.456	13.14	30
		48 Mbps	11.14	1.829	12.97	30
		54 Mbps	11.25	1.963	13.21	30
2437	6	6 Mbps	12.74	0.316	13.06	30
		9 Mbps	12.86	0.448	13.31	30
		12 Mbps	12.74	0.586	13.33	30
		18 Mbps	12.47	0.825	13.30	30
		24 Mbps	12.23	1.054	13.28	30
		36 Mbps	11.82	1.456	13.27	30
		48 Mbps	11.52	1.829	13.35	30
		54 Mbps	11.41	1.963	13.37	30
2462	11	6 Mbps	12.88	0.316	13.20	30
		9 Mbps	12.72	0.448	13.16	30
		12 Mbps	12.62	0.586	13.20	30
		18 Mbps	12.38	0.825	13.21	30
		24 Mbps	12.17	1.054	13.22	30
		36 Mbps	11.81	1.456	13.26	30
		48 Mbps	11.50	1.829	13.33	30
		54 Mbps	11.27	1.963	13.24	30

Conducted Output Power Measurements (802.11n Mode)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
2412	1	6.5 Mbps	11.59	0.330	11.92	30
		13 Mbps	11.34	0.610	11.95	30
		19.5 Mbps	11.06	0.879	11.94	30
		26 Mbps	11.11	1.114	12.22	30
		39 Mbps	10.40	1.545	11.95	30
		52 Mbps	10.21	1.878	12.09	30
		58.5 Mbps	10.25	2.022	12.27	30
		65 Mbps	10.10	2.161	12.26	30
2437	6	6.5 Mbps	11.99	0.330	12.32	30
		13 Mbps	11.66	0.610	12.27	30
		19.5 Mbps	11.66	0.879	12.54	30
		26 Mbps	11.02	1.114	12.14	30
		39 Mbps	10.84	1.545	12.38	30
		52 Mbps	10.68	1.878	12.56	30
		58.5 Mbps	10.64	2.022	12.66	30
		65 Mbps	10.48	2.161	12.64	30
2462	11	6.5 Mbps	11.83	0.330	12.16	30
		13 Mbps	11.89	0.610	12.50	30
		19.5 Mbps	11.61	0.879	12.49	30
		26 Mbps	11.44	1.114	12.56	30
		39 Mbps	11.06	1.545	12.61	30
		52 Mbps	10.75	1.878	12.63	30
		58.5 Mbps	10.62	2.022	12.64	30
		65 Mbps	10.44	2.161	12.60	30

5.8 GHz Band

Conducted Output Power Measurements (802.11a Mode: 5745~5825)

802.11a Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5745	149	6 Mbps	7.39	0.316	7.70	30
		9 Mbps	7.25	0.448	7.70	30
		12 Mbps	7.05	0.586	7.64	30
		18 Mbps	6.89	0.825	7.72	30
		24 Mbps	6.68	1.054	7.74	30
		36 Mbps	6.33	1.456	7.79	30
		48 Mbps	5.92	1.829	7.75	30
		54 Mbps	5.82	1.963	7.78	30
5785	157	6 Mbps	8.21	0.316	8.52	30
		9 Mbps	8.20	0.448	8.64	30
		12 Mbps	8.03	0.586	8.62	30
		18 Mbps	7.76	0.825	8.58	30
		24 Mbps	7.55	1.054	8.61	30
		36 Mbps	7.20	1.456	8.66	30
		48 Mbps	6.86	1.829	8.69	30
		54 Mbps	6.80	1.963	8.76	30
5825	165	6 Mbps	7.66	0.316	7.97	30
		9 Mbps	7.51	0.448	7.96	30
		12 Mbps	7.40	0.586	7.99	30
		18 Mbps	7.18	0.825	8.01	30
		24 Mbps	6.96	1.054	8.01	30
		36 Mbps	6.57	1.456	8.03	30
		48 Mbps	6.27	1.829	8.10	30
		54 Mbps	6.19	1.963	8.15	30

Conducted Output Power Measurements (802.11n_20 MHz BW Mode: 5745~5825)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5745	149	6.5 Mbps	6.52	0.330	6.85	30
		13 Mbps	6.28	0.610	6.89	30
		19.5 Mbps	5.99	0.879	6.87	30
		26 Mbps	5.70	1.114	6.81	30
		39 Mbps	5.28	1.545	6.82	30
		52 Mbps	5.03	1.878	6.90	30
		58.5 Mbps	4.91	2.022	6.93	30
		65 Mbps	4.73	2.161	6.89	30
5785	157	6.5 Mbps	7.37	0.330	7.70	30
		13 Mbps	7.12	0.610	7.73	30
		19.5 Mbps	6.83	0.879	7.70	30
		26 Mbps	6.61	1.114	7.72	30
		39 Mbps	6.23	1.545	7.77	30
		52 Mbps	5.88	1.878	7.76	30
		58.5 Mbps	5.73	2.022	7.75	30
		65 Mbps	5.56	2.161	7.72	30
5825	165	6.5 Mbps	6.74	0.330	7.07	30
		13 Mbps	6.46	0.610	7.07	30
		19.5 Mbps	6.24	0.879	7.12	30
		26 Mbps	5.96	1.114	7.07	30
		39 Mbps	5.57	1.545	7.12	30
		52 Mbps	5.24	1.878	7.12	30
		58.5 Mbps	5.14	2.022	7.16	30
		65 Mbps	4.97	2.161	7.13	30

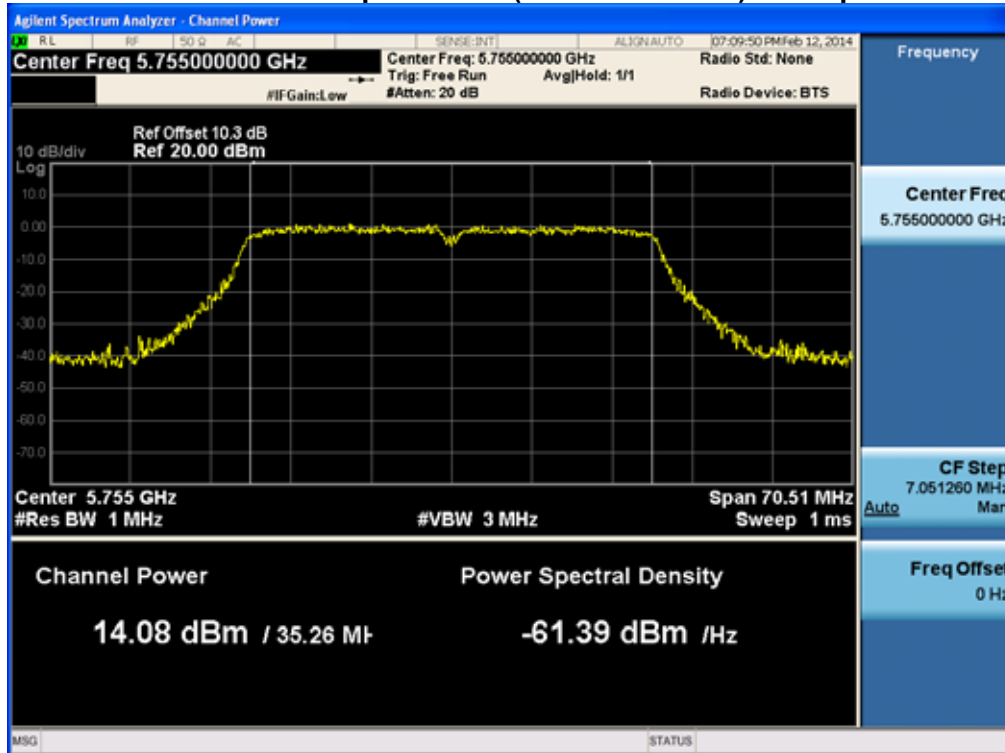
Conducted Output Power Measurements (802.11n_40 MHz BW Mode: 5755~5795)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5755	151	13.5 Mbps	6.08	0.636	6.72	30
		27 Mbps	5.60	1.170	6.77	30
		40.5 Mbps	5.21	1.598	6.81	30
		54 Mbps	4.78	1.928	6.71	30
		81 Mbps	4.26	2.541	6.80	30
		108 Mbps	3.82	2.947	6.77	30
		121.5 Mbps	3.66	3.195	6.86	30
		135 Mbps	3.56	3.297	6.85	30
5795	159	13.5 Mbps	6.46	0.636	7.10	30
		27 Mbps	5.99	1.170	7.16	30
		40.5 Mbps	5.72	1.598	7.32	30
		54 Mbps	5.29	1.928	7.22	30
		81 Mbps	4.65	2.541	7.19	30
		108 Mbps	4.22	2.947	7.17	30
		121.5 Mbps	4.04	3.195	7.23	30
		135 Mbps	3.90	3.297	7.20	30

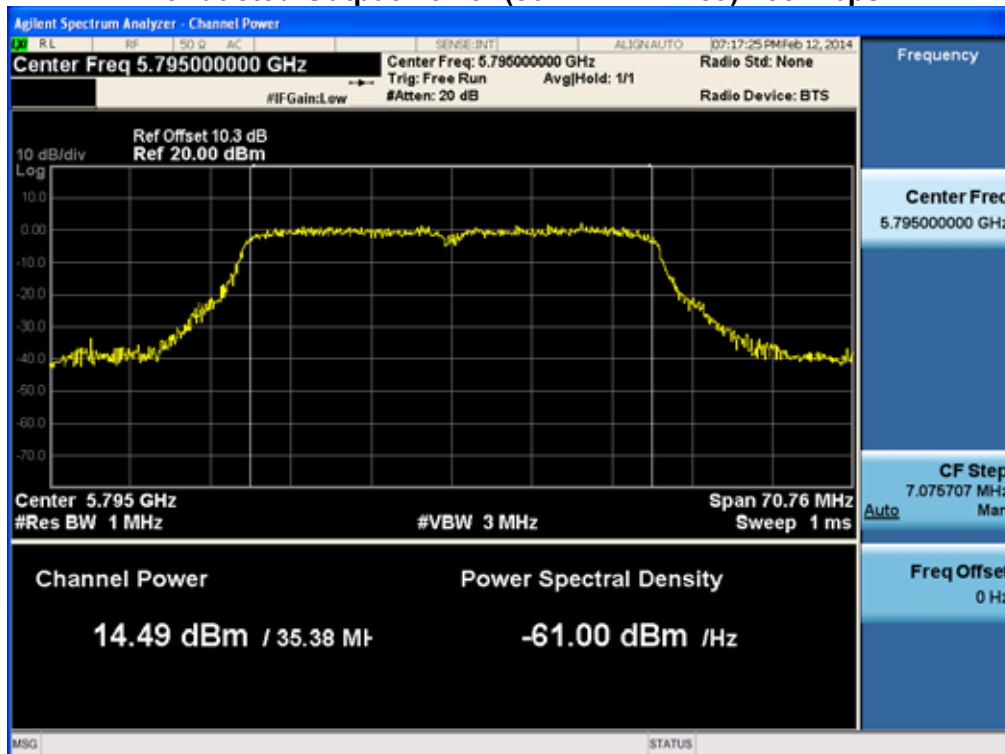
Note : In order to simplify the report, attached plots were only the highest conducted power channel and data rate.

RESULT PLOTS-Peak
40 MHz BW
(5755 MHz ~5795 MHz)

Conducted Output Power (802.11n-CH 151) 54 Mbps



Conducted Output Power (802.11n-CH 159) 108 Mbps



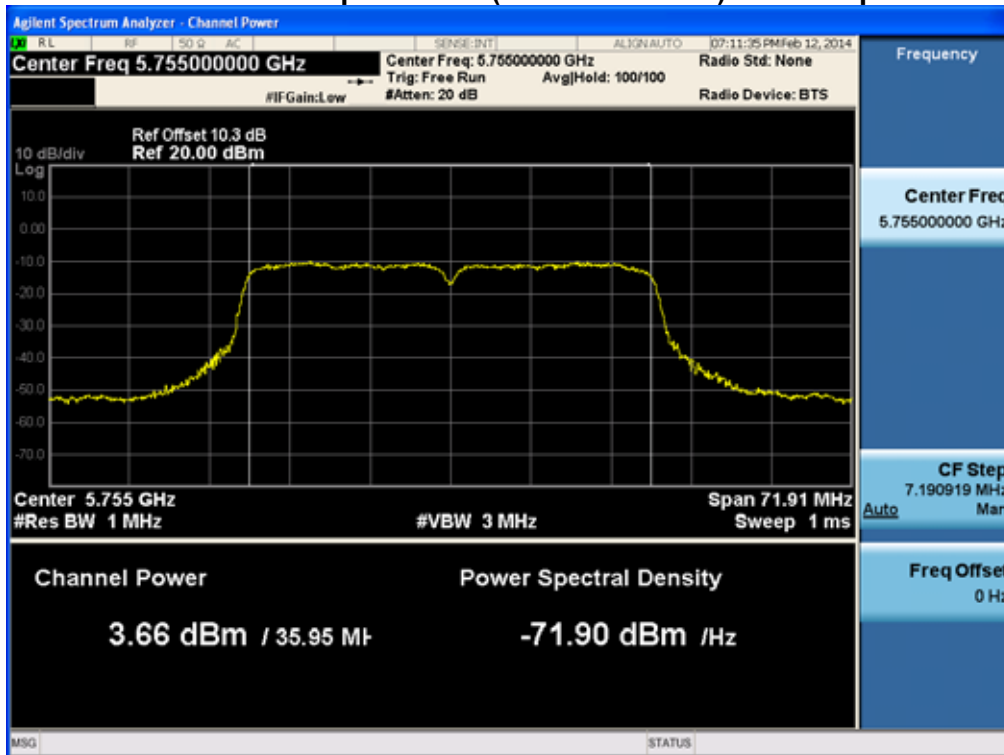


RESULT PLOTS-Average

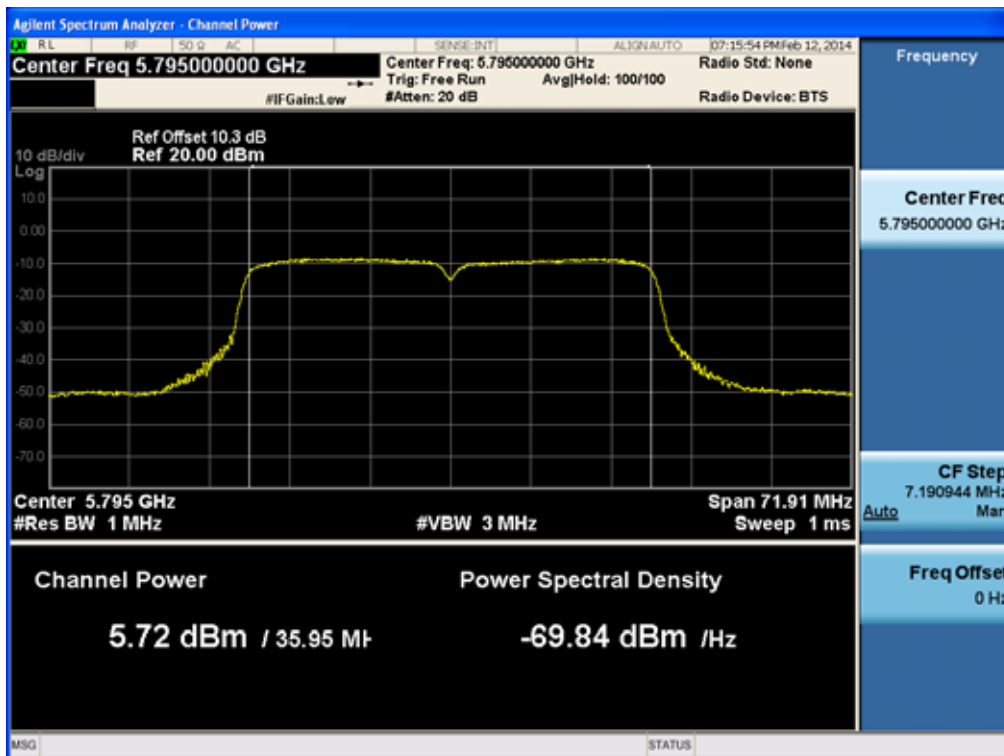
40 MHz BW

(5755 MHz ~5795 MHz)

Conducted Output Power (802.11n-CH 151) 121.5 Mbps



Conducted Output Power (802.11n-CH 159) 40.5 Mbps



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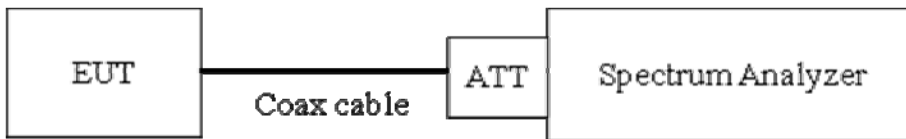
8.4 POWER SPECTRAL DENSITY (802.11a/b/g/n)

Test Requirements and limit, §15.247(e)

The peak power spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

Minimum Standard – the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST CONFIGURATION



TEST PROCEDURE

We tested according to Procedure 10.2 in KDB 558074, issued 04/09/2013

The spectrum analyzer is set to :

Set analyzer center frequency to DTS channel center frequency.

Span = 1.5 times the DTS channel bandwidth.

RBW = 3 kHz ≤ RBW ≤ 100 kHz.

VBW ≥ 3 x RBW.

Sweep = auto couple

Detector = peak

Trace Mode = max hold

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Sample Calculation

$$\begin{aligned} \text{PSD} &= \text{Reading Value} + \text{ATT loss} + \text{Cable loss}(1 \text{ ea}) \\ &= -5 \text{ dBm} + 10 \text{ dB} + 0.8 \text{ dB} = 5.8 \text{ dBm} \end{aligned}$$

Note :

1. Spectrum reading values are not plot data. The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 2.4 GHz and 5.8 GHz range that was rounded off to the closest tenth dB. So, 20.2 dB is offset for 2.4 GHz Band and 20.3 dB is offset for 5.8 GHz Band.
Actual value of loss for the attenuator and cable combination is below table.

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Band	Frequency(MHz)	Loss(dB)
2.4 GHz	2412	20.21
	2437	20.24
	2462	20.24
5.8 GHz	5745	20.31
	5755	20.30
	5785	20.29
	5795	20.26
	5825	20.28

(Actual value of loss for the attenuator and cable combination)

TEST RESULTS

Conducted Power Density Measurements

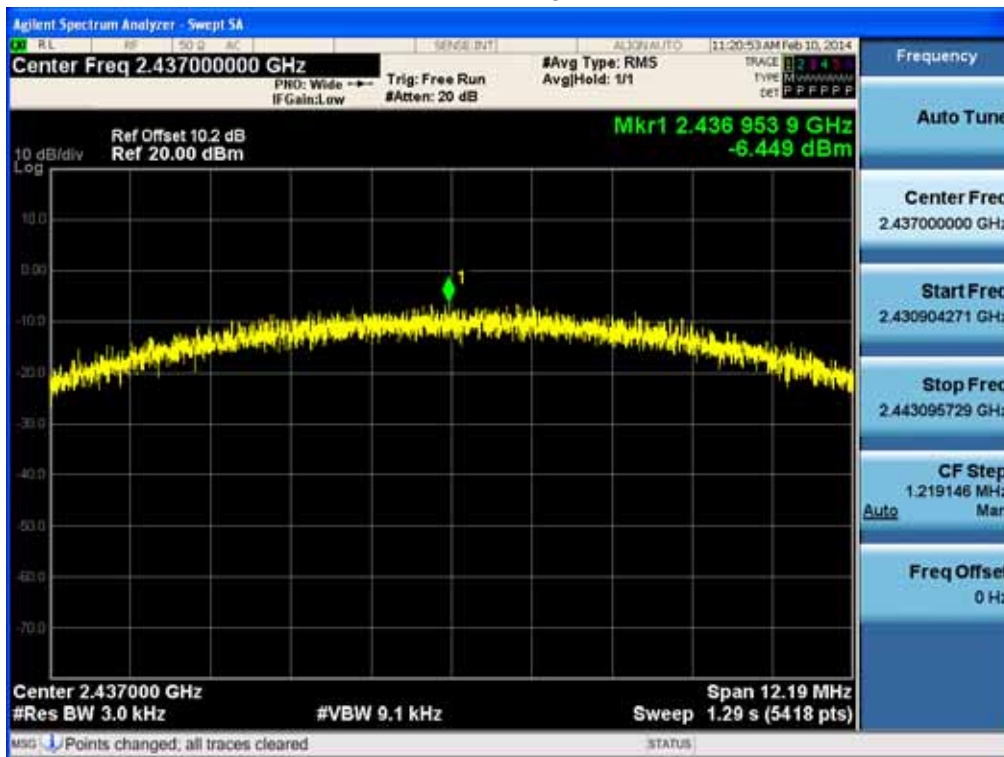
Frequency (MHz)	Channel No.	Mode	Test Result		
			PSD (dBm)	Limit (dBm)	Pass/Fail
2412	1	802.11b	-7.117	8	Pass
2437	6		-6.449		Pass
2462	11		-6.853		Pass
2412	1	802.11g	-13.400		Pass
2437	6		-12.447		Pass
2462	11		-12.133		Pass
2412	1	802.11n 2.4 GHz Band	-14.530		Pass
2437	6		-13.281		Pass
2462	11		-13.417		Pass
5745	149	802.11a	-17.674		Pass
5785	157		-16.593		Pass
5825	165		-17.347		Pass
5745	149	802.11n_20 MHz BW 5.8 GHz Band	-20.028		Pass
5785	157		-17.965		Pass
5825	165		-19.768		Pass
5755	151	802.11n_40 MHz BW 5.8 GHz Band	-21.770		Pass
5795	159		-23.467		Pass

Note : In order to simplify the report, attached plots were only the highest PSD channels.

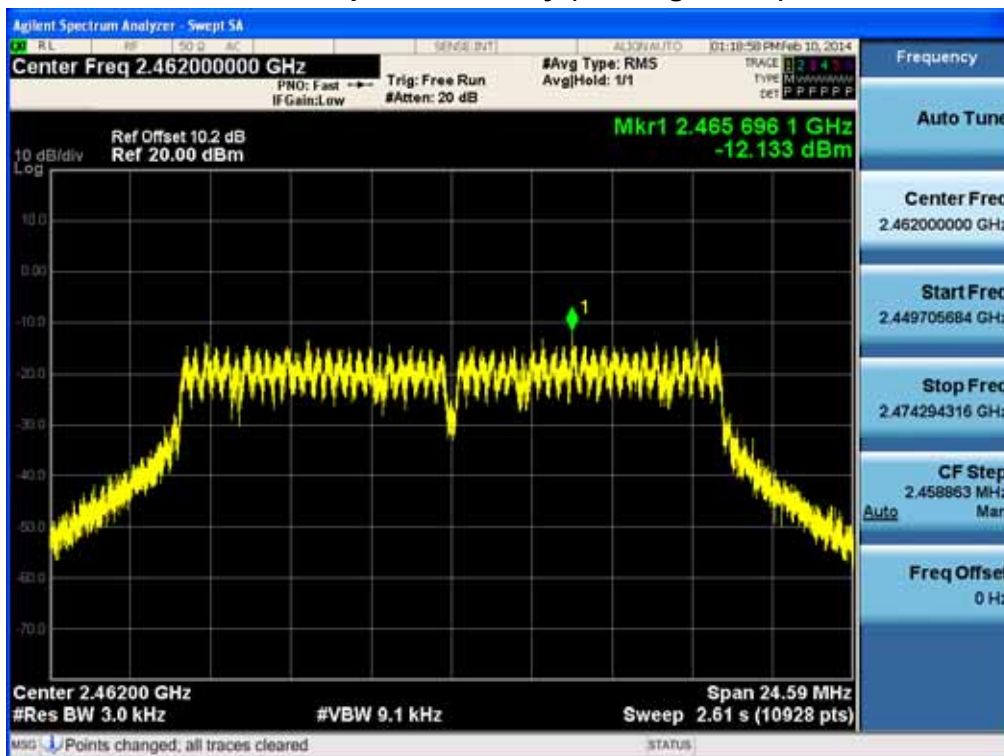
RESULT PLOTS

2.4 GHz Band

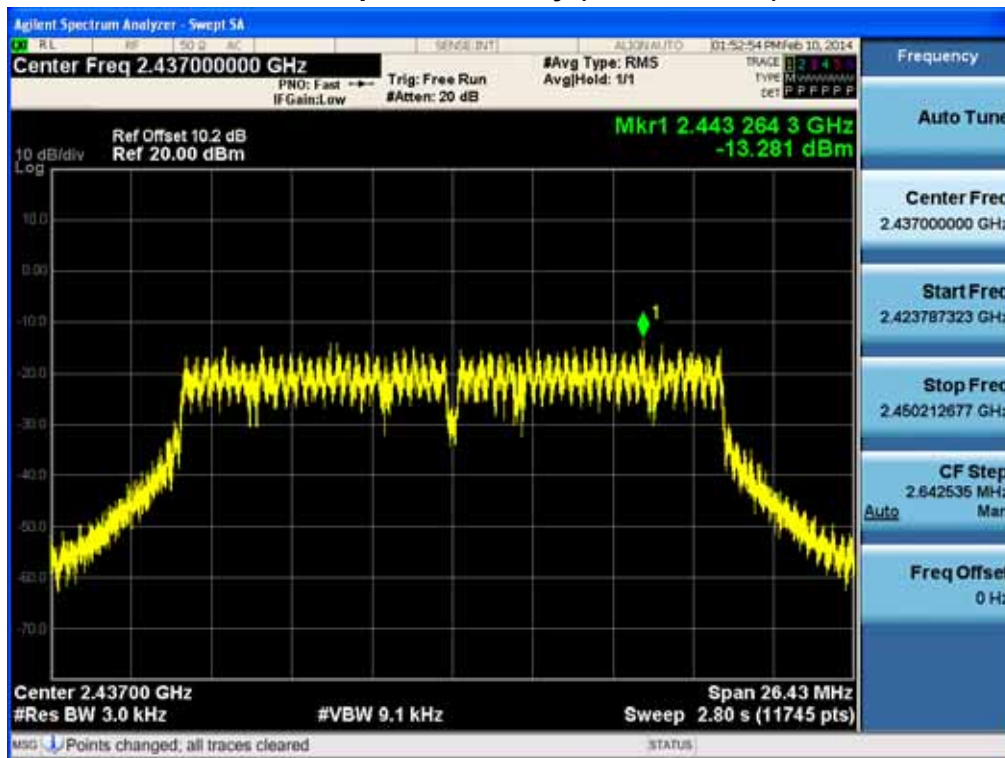
Power Spectral Density (802.11b-CH 6)



Power Spectral Density (802.11g-CH 11)



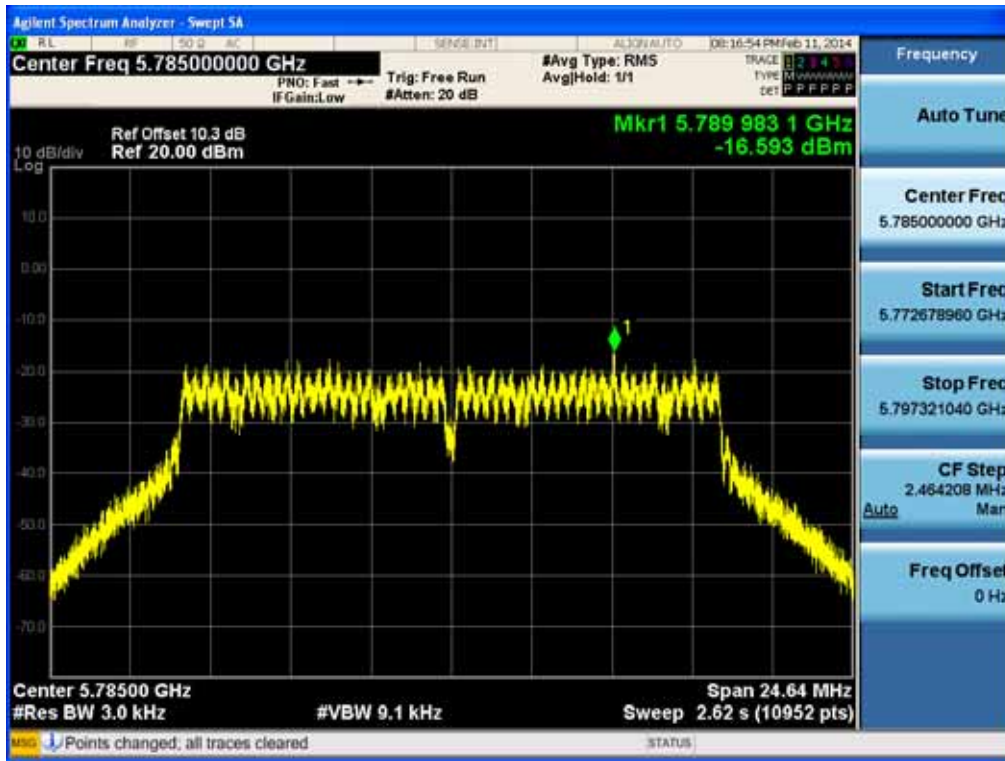
Power Spectral Density (802.11n-CH 6)



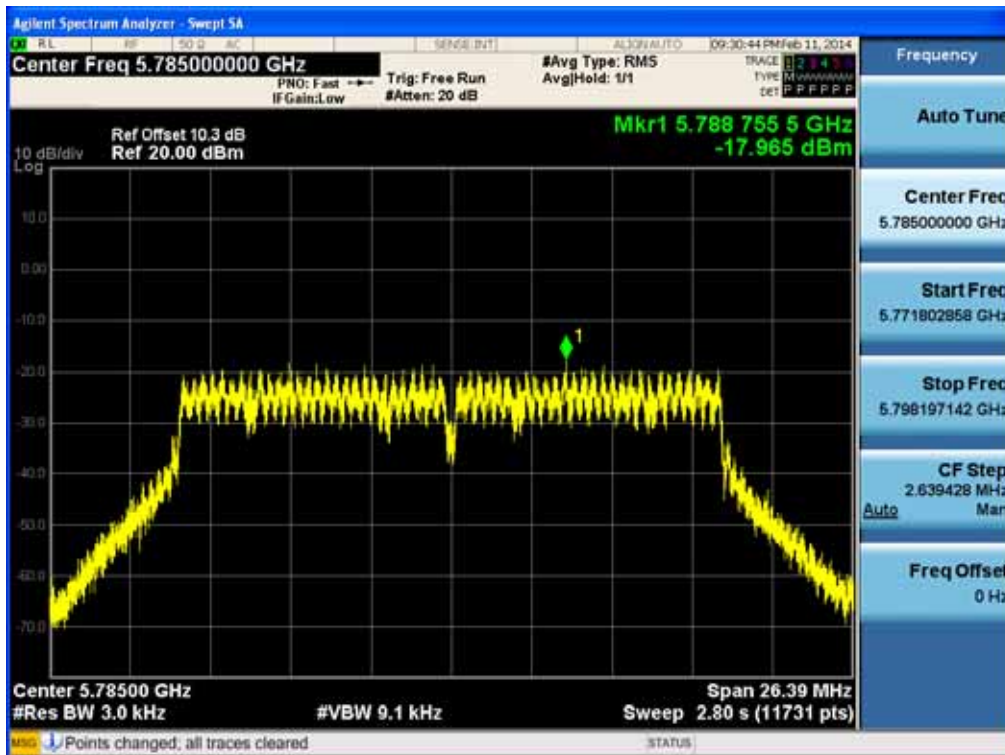
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
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5.8 GHz Band 20 MHz BW

Power Spectral Density (802.11a-CH 157)

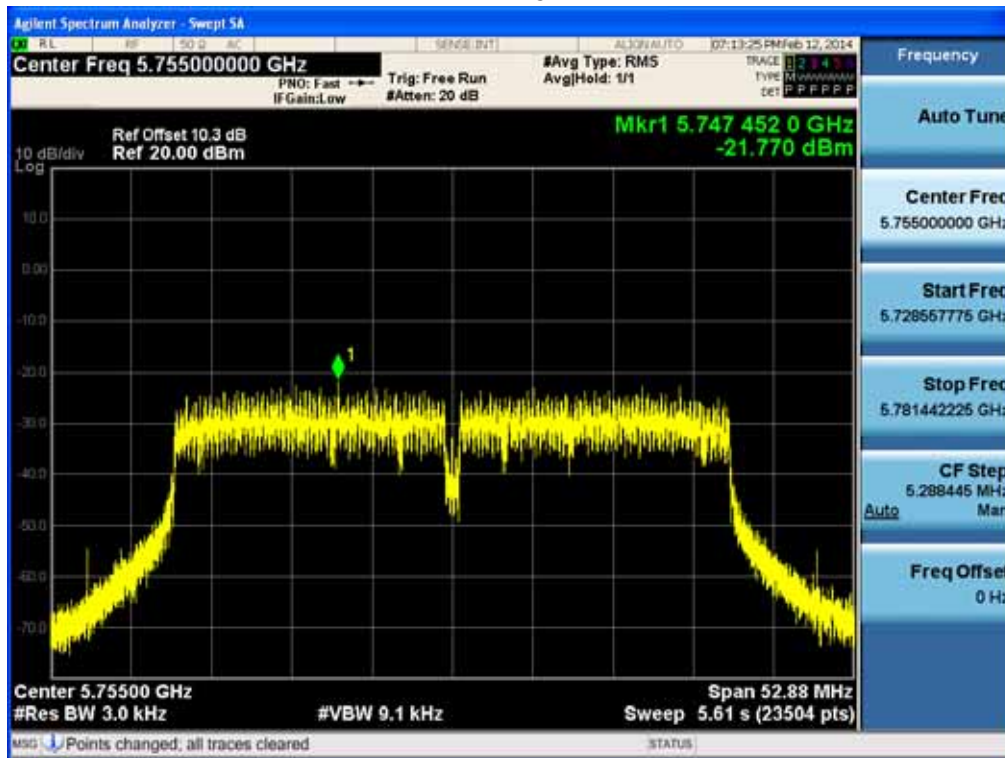


Power Spectral Density (802.11n-CH 157)



40 MHz BW

Power Spectral Density (802.11n-CH 151)



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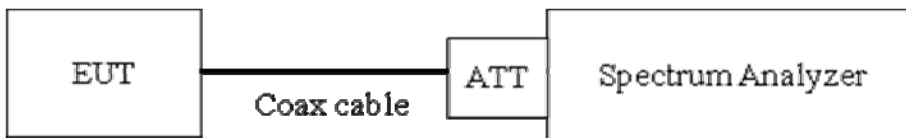
8.5 OUT OF BAND EMISSIONS AT THE BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS

Test Requirements and limit, §15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

Limit : 20 dBc

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. (Procedure 11.0 in KDB 558074, issued 04/09/2013)

RBW = 100 kHz

VBW $\geq 3 \times$ RBW

Set span to encompass the spectrum to be examined

Detector = Peak

Trace Mode = max hold

Sweep time = auto couple

Ensure that the number of measurement points $\geq$ Span/RBW

Allow trace to fully stabilize.

Use peak marker function to determine the maximum amplitude level.

Measurements are made over the 30 MHz to 10th harmonic range with the transmitter set to the lowest, middle, and highest channels.

Note :

1. The band edge results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss

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3. We apply to the offset in the 2.4 GHz and 5.8 GHz range that was rounded off to the closest tenth dB. So, 20.2 dB is offset for 2.4 GHz Band and 20.3 dB is offset for 5.8 GHz Band.

Actual value of loss for the attenuator and cable combination is below table.

Band	Frequency(MHz)	Loss(dB)
2.4 GHz	2412	20.21
	2437	20.24
	2462	20.24
5.8 GHz	5745	20.31
	5755	20.30
	5785	20.29
	5795	20.26
	5825	20.28

(Actual value of loss for the attenuator and cable combination)

4. In case of conducted spurious emissions test, please check factors blow table.
5. In order to simplify the report, attached plots were only the worst case channel and data rate.

FACTORS FOR FREQUENCY

Freq(MHz)	Factor(dB)
30	19.95
100	20.01
200	20.03
300	20.04
400	20.05
500	20.04
600	20.03
700	20.09
800	20.10
900	20.08
1000	20.11
2000	20.25
2400*	20.19
2500*	20.26
3000	20.27
4000	20.22
5000	20.48
5700*	20.42
5800*	20.48

6000	20.48
7000	20.57
8000	20.45
9000	20.50
10000	20.64
11000	20.69
12000	20.75
13000	20.92
14000	21.90
15000	21.00
16000	21.03
17000	20.93
18000	20.96
19000	20.85
20000	22.11
21000	21.17
22000	20.99
23000	21.12
24000	21.10
25000	21.42
26000	21.28
27000	20.83
28000	21.03
29000	20.99
30000	22.08
31000	20.99
32000	21.32
33000	21.33
34000	22.62
35000	24.85
36000	24.78
37000	25.73
38000	25.81
39000	23.47
40000	24.89

Note : 1. '*' is fundamental frequency range.

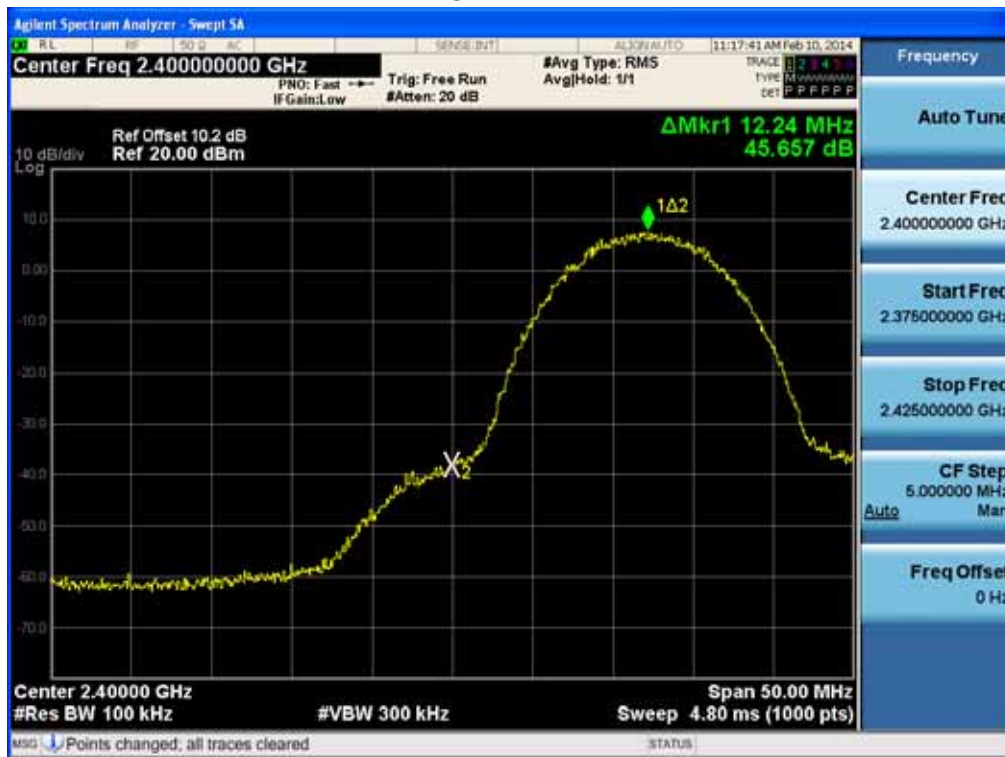
2. Factor = Cable loss + Attenuator loss

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

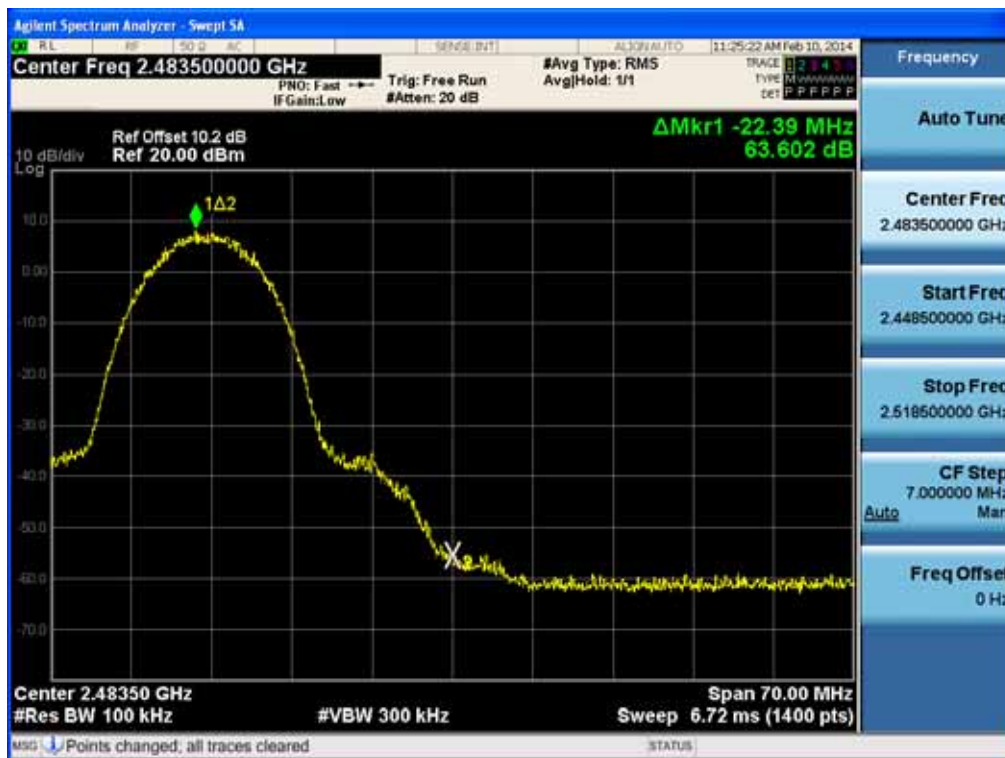
RESULT PLOTS

2.4 GHz Band

BandEdge (802.11b-CH1)

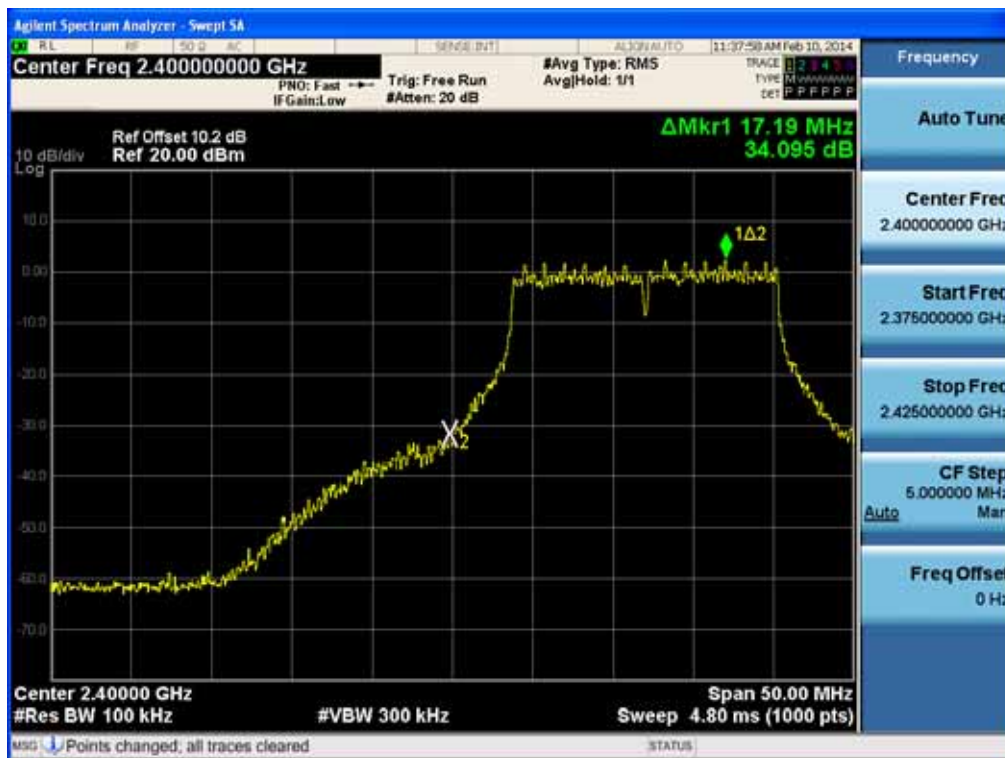


BandEdge (802.11b-CH11)

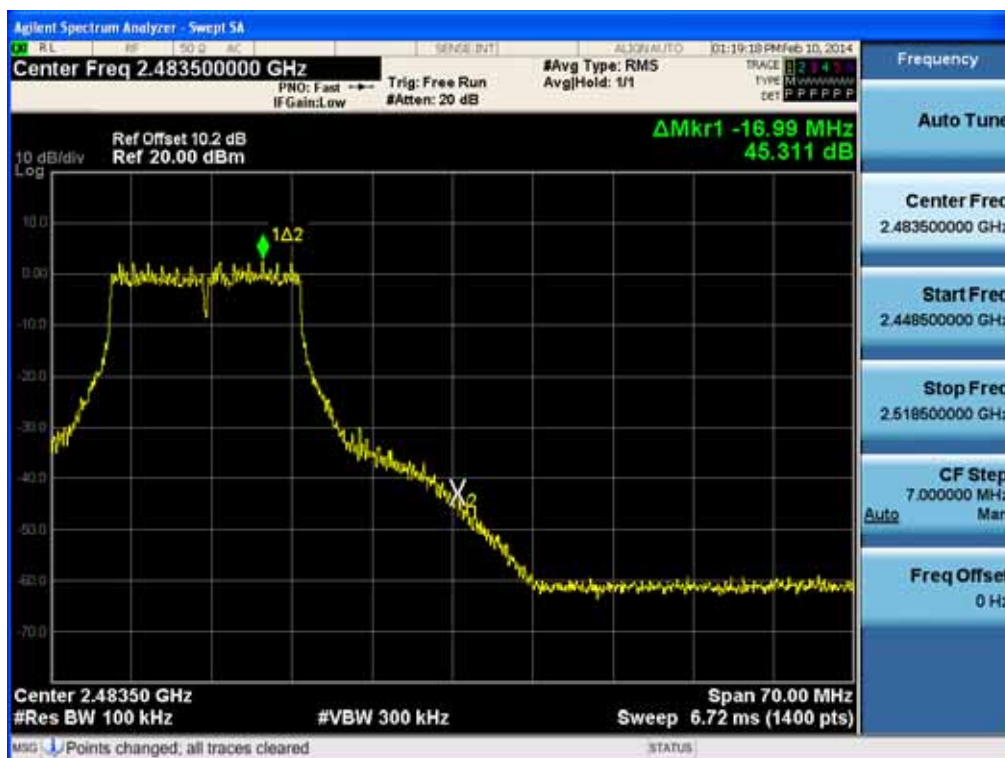


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

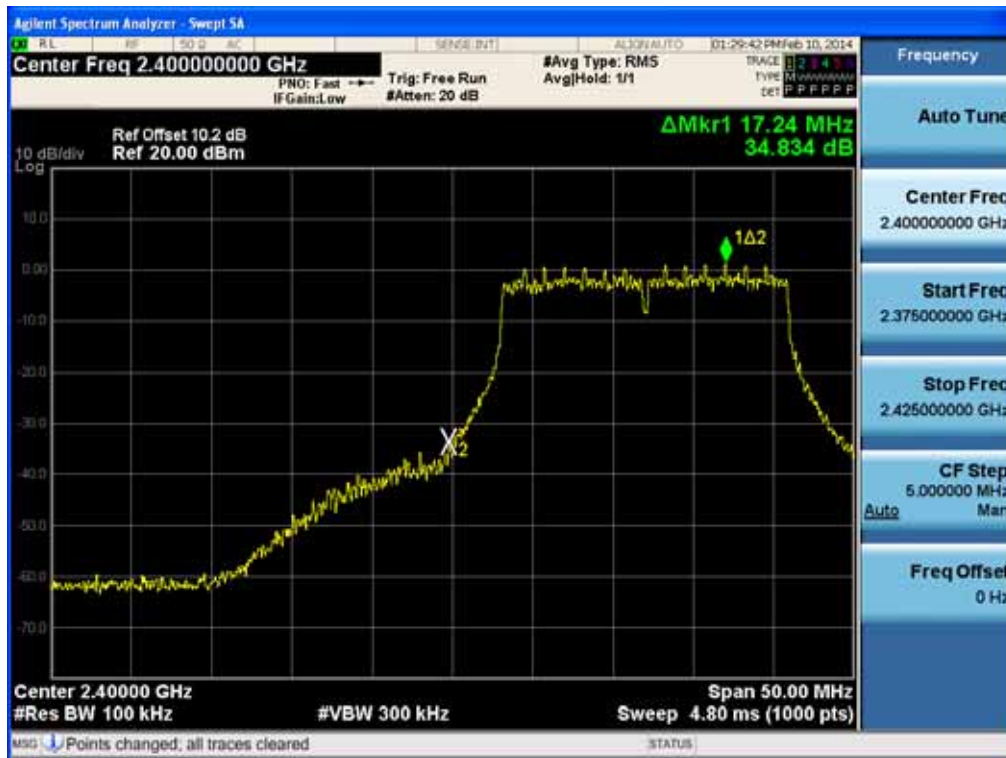
BandEdge (802.11g-CH1)



BandEdge (802.11g-CH11)



BandEdge (802.11n-CH1)



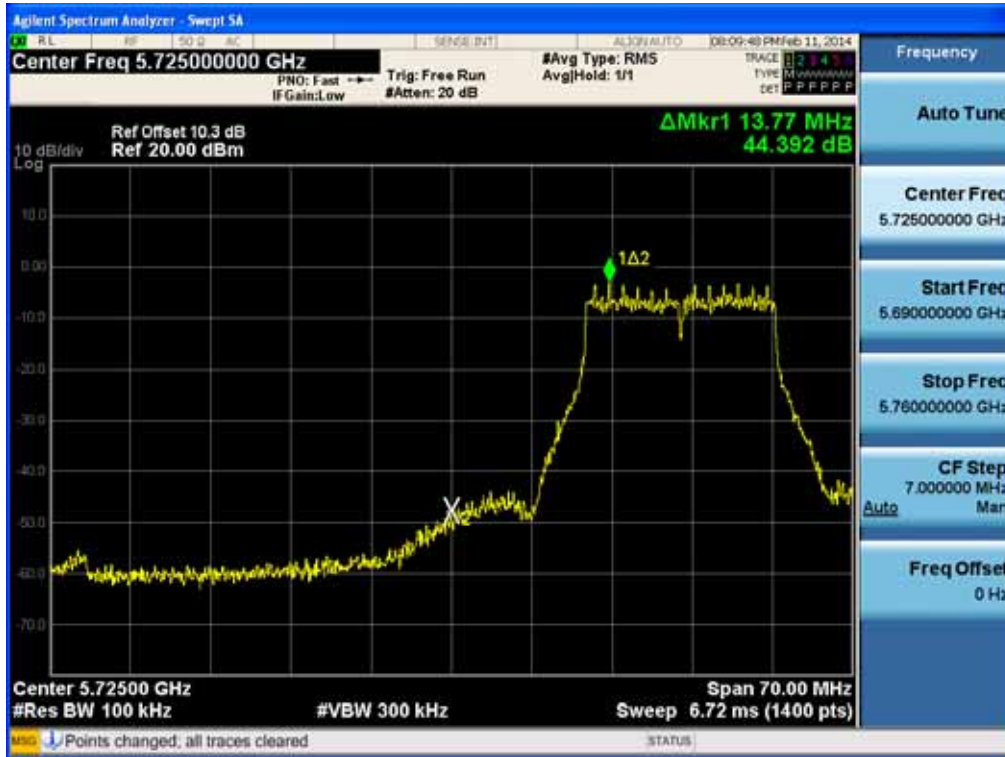
BandEdge (802.11n-CH11)



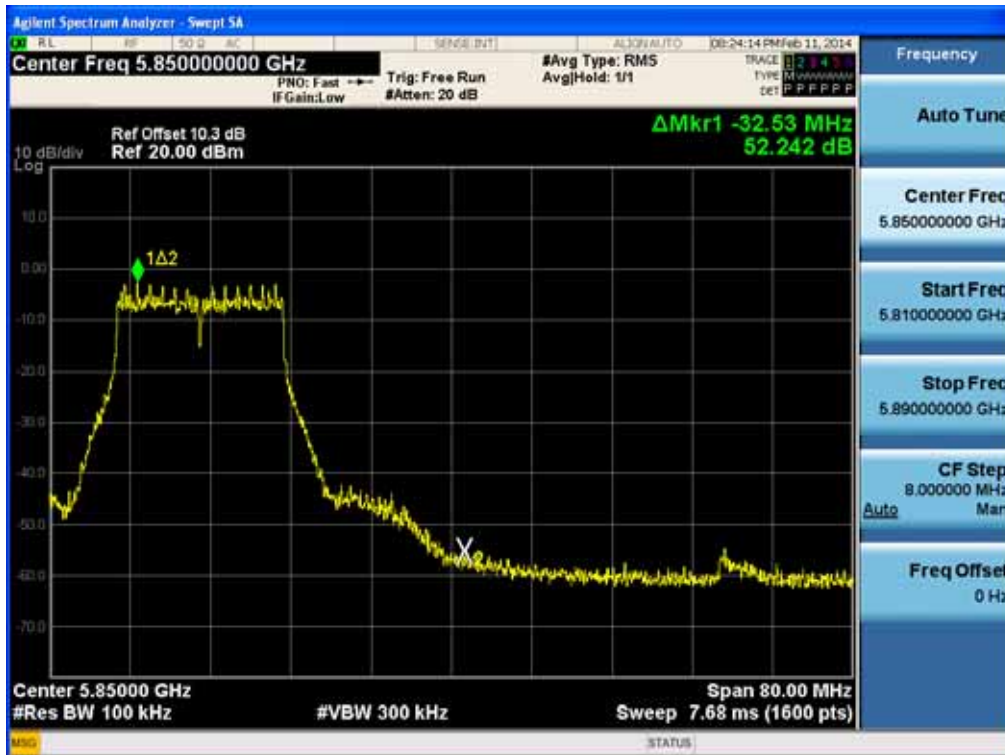
5.8 GHz Band

20 MHz BW

BandEdge (802.11a-CH 149)

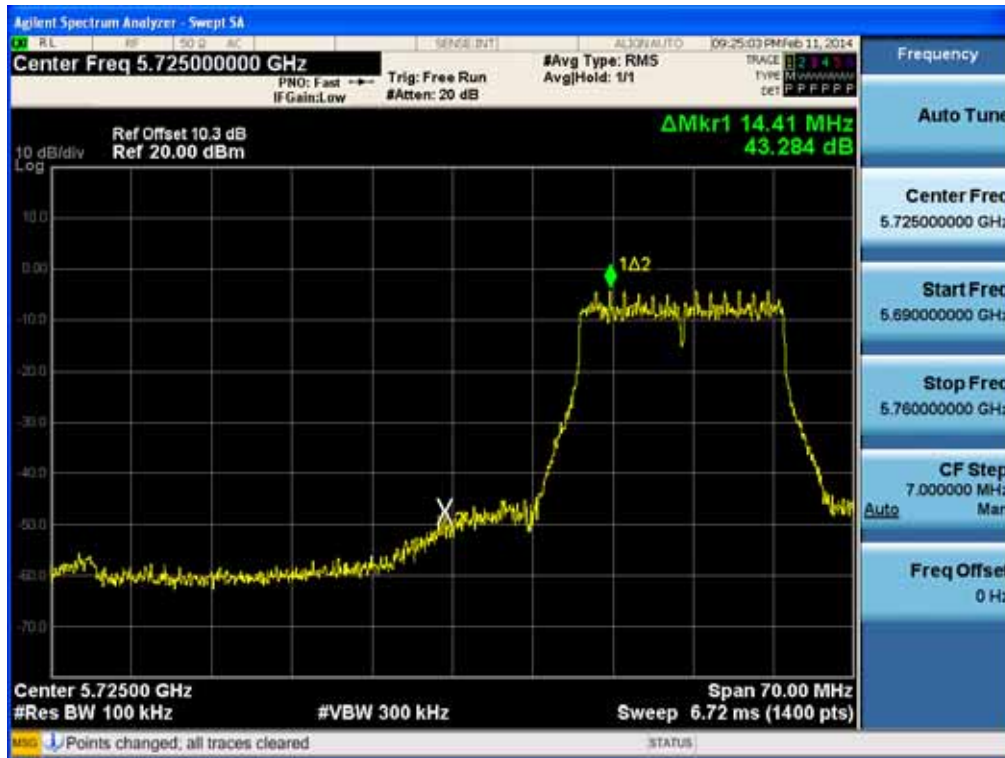


BandEdge (802.11a-CH 165)

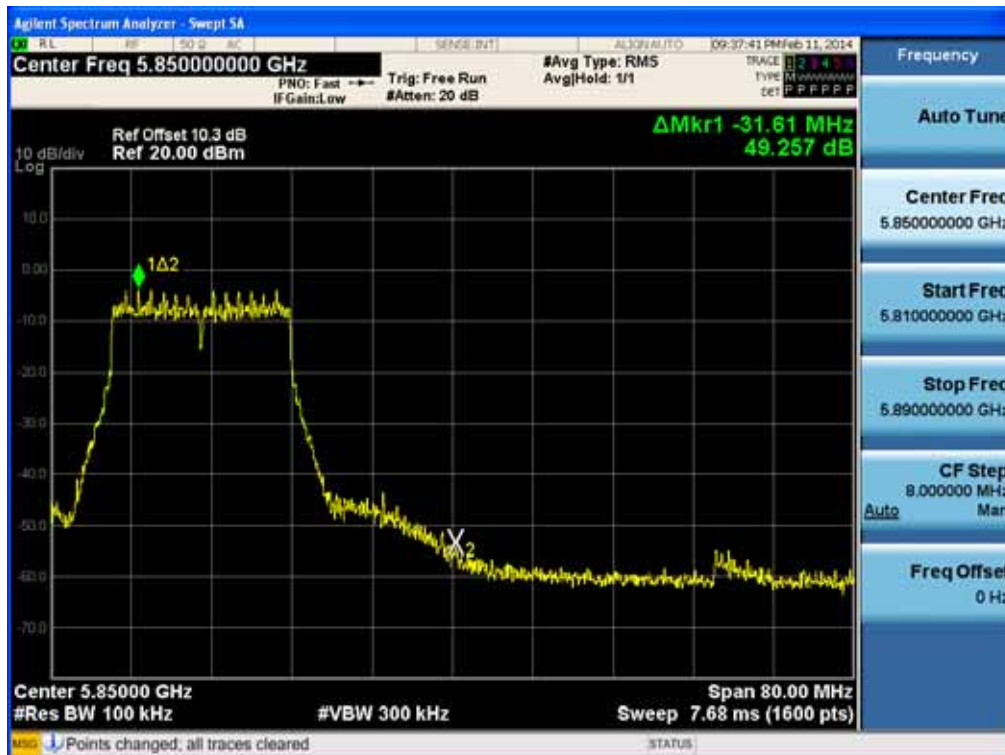


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

BandEdge (802.11n-CH 149)



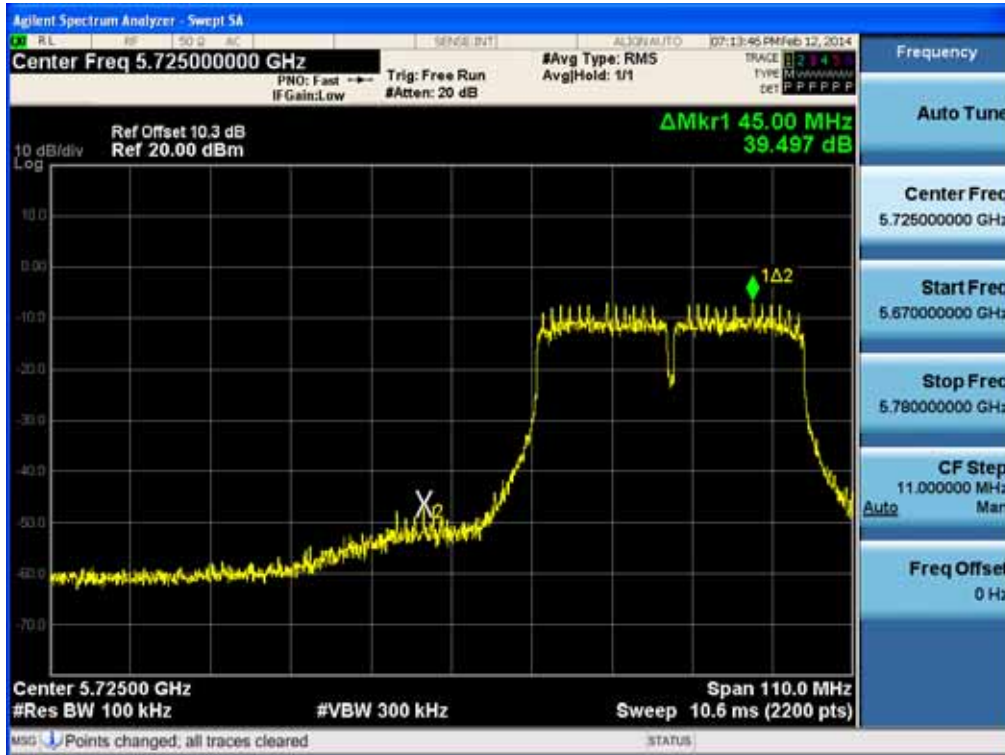
BandEdge (802.11n-CH 165)



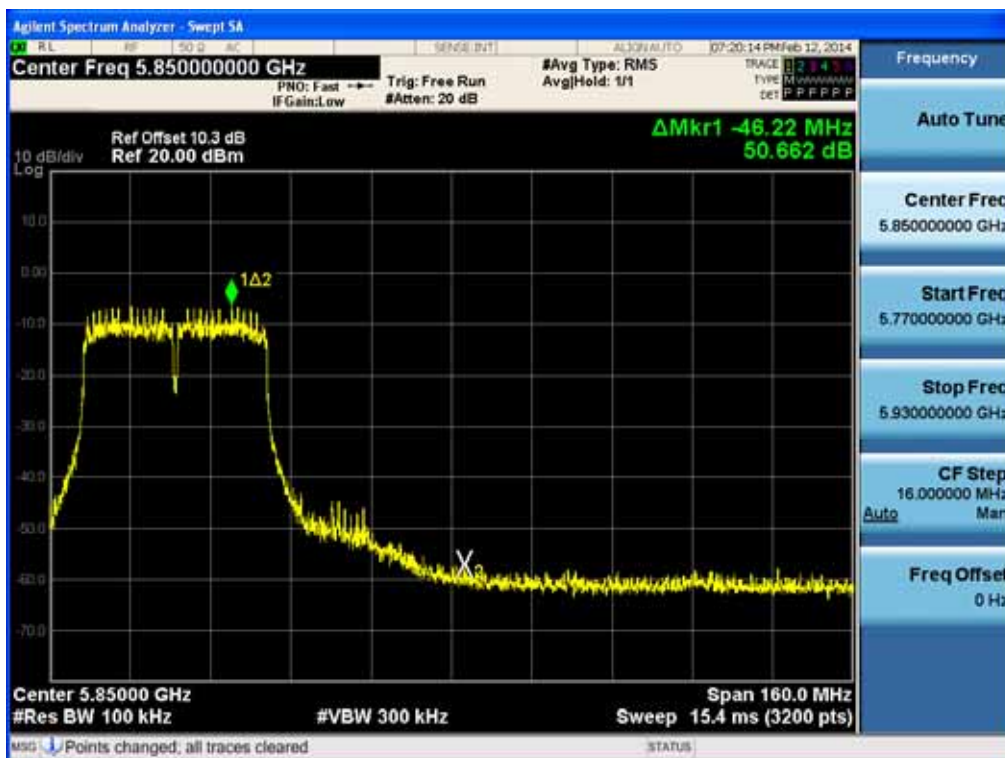
FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

40 MHz BW

BandEdge (802.11n-CH 151)



BandEdge (802.11n-CH 159)

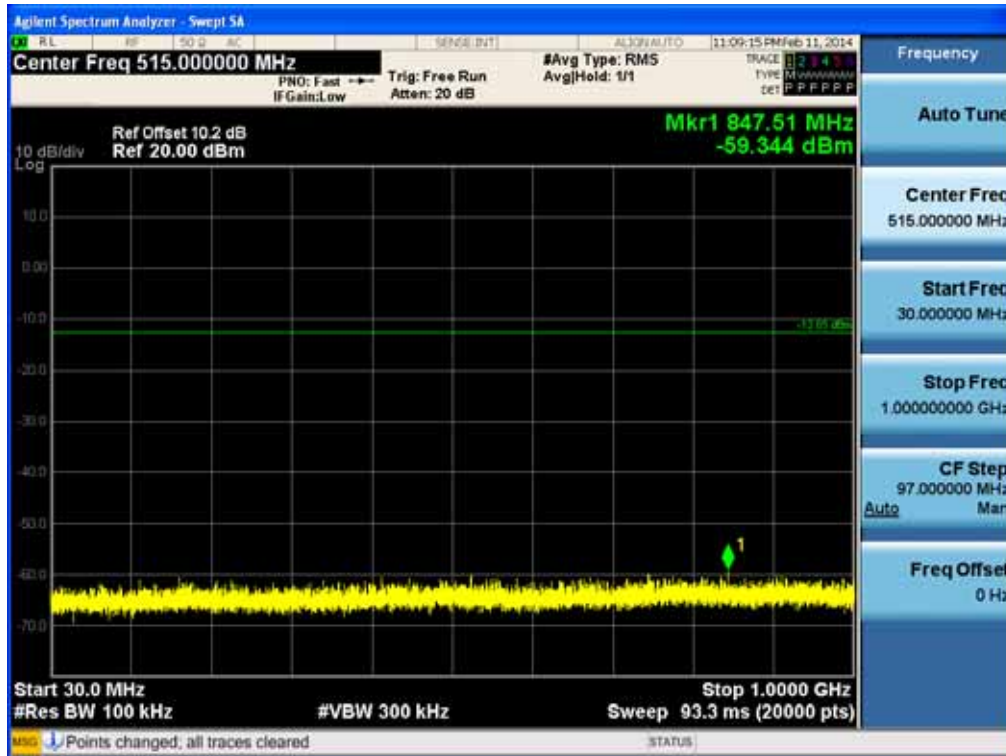


FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

2.4 GHz Band

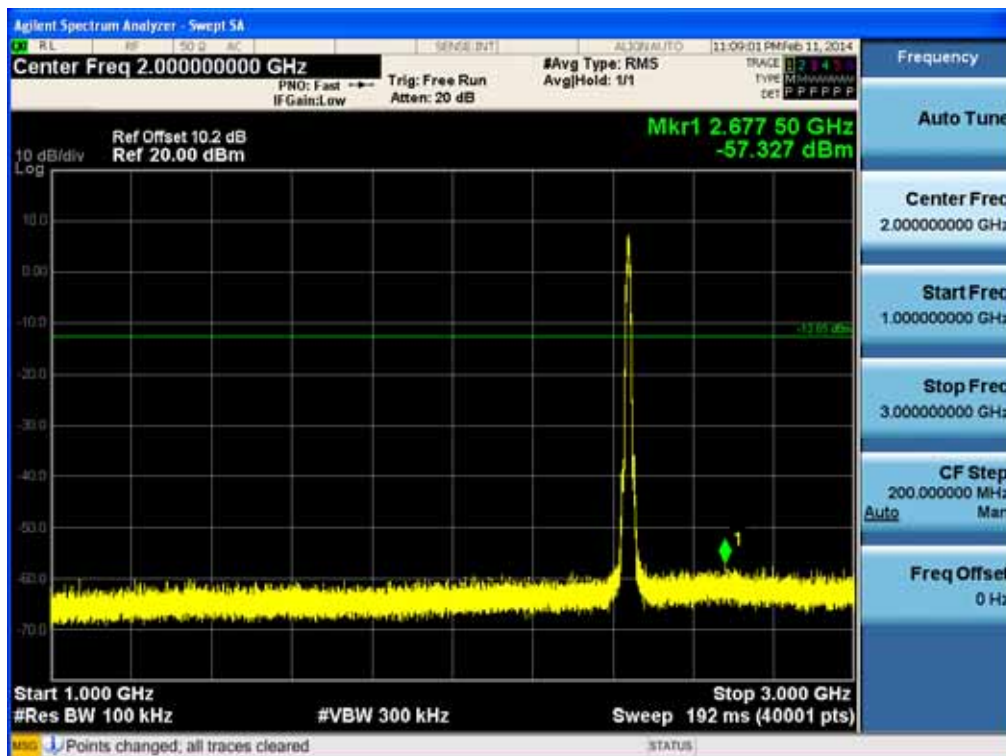
30 MHz ~ 1 GHz

Conducted Spurious Emission (802.11b-CH6)



1 GHz ~ 3 GHz

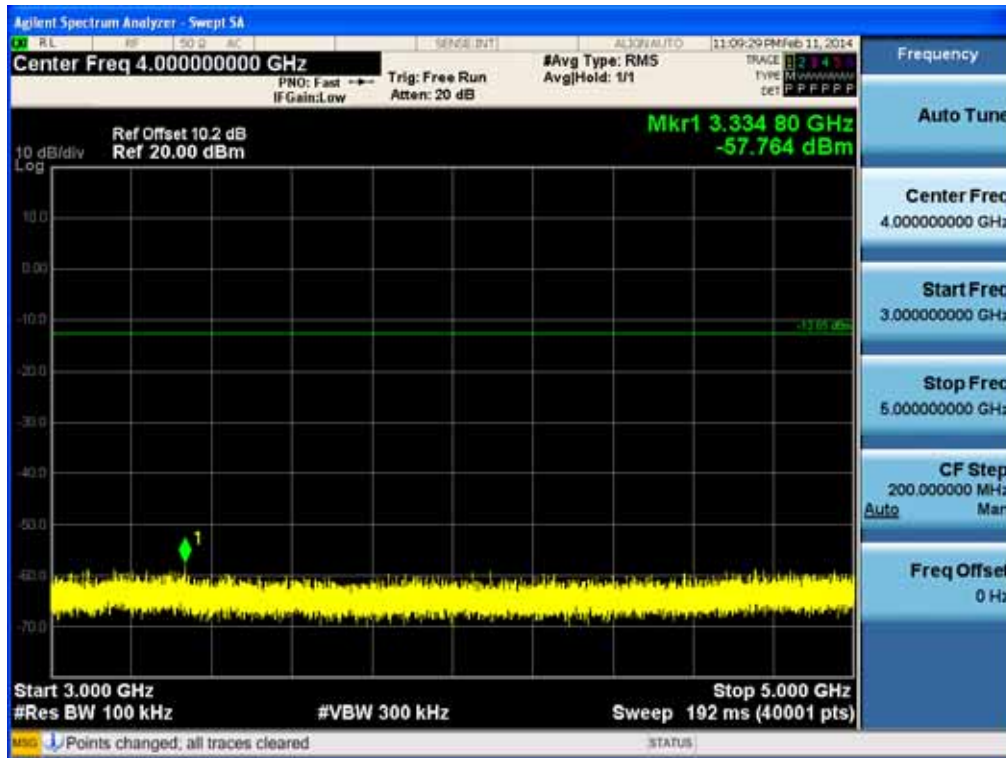
Conducted Spurious Emission (802.11b-CH6)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

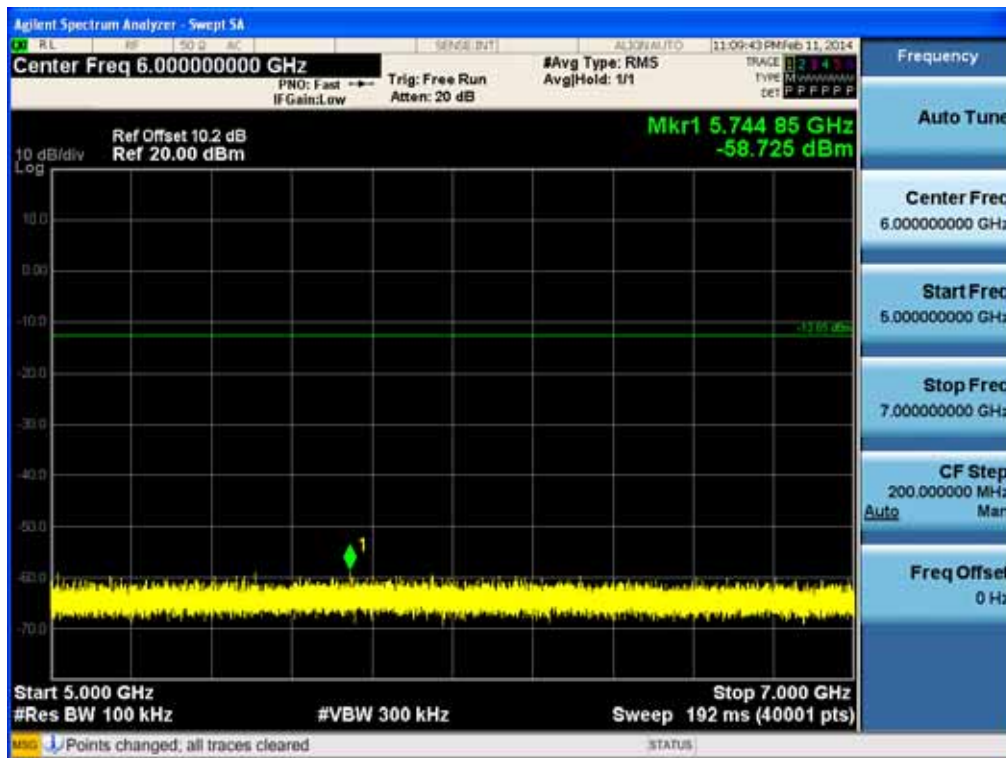
3 GHz ~ 5 GHz

Conducted Spurious Emission (802.11b-CH6)



5 GHz ~ 7 GHz

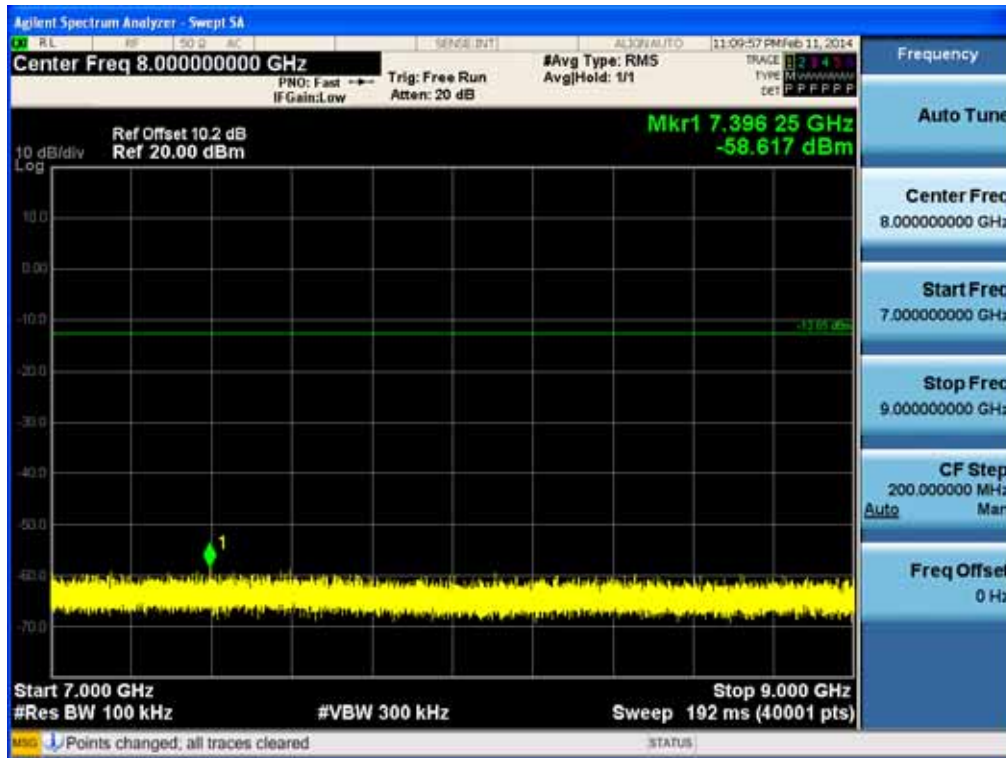
Conducted Spurious Emission (802.11b-CH6)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

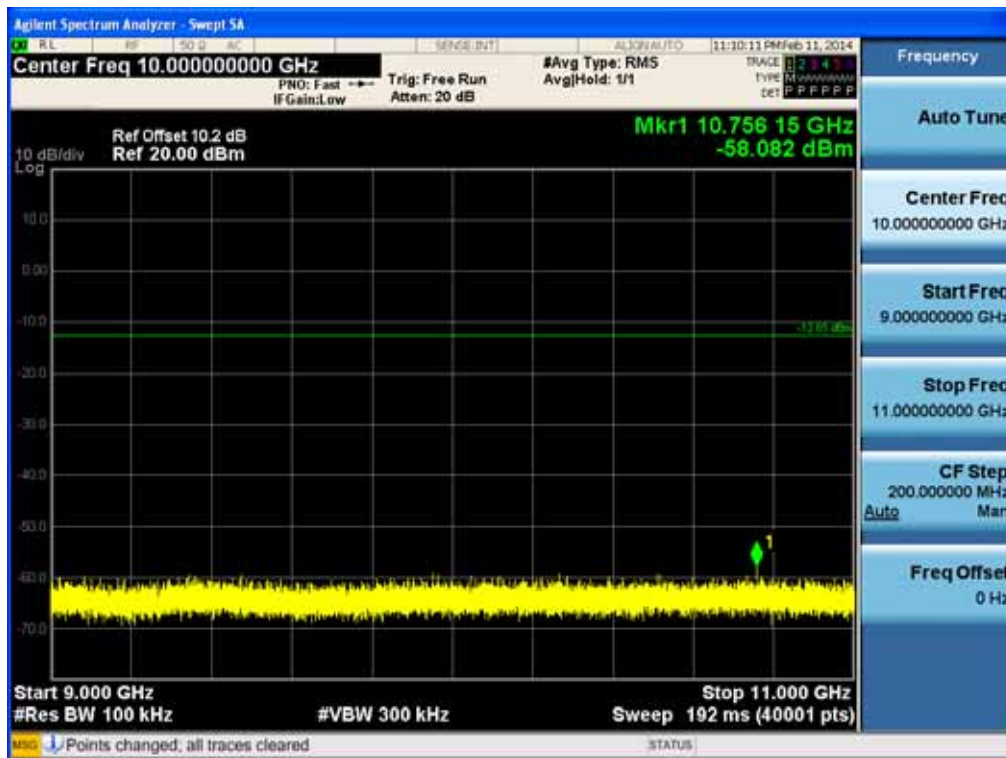
7 GHz ~ 9 GHz

Conducted Spurious Emission (802.11b-CH6)



9 GHz ~ 11 GHz

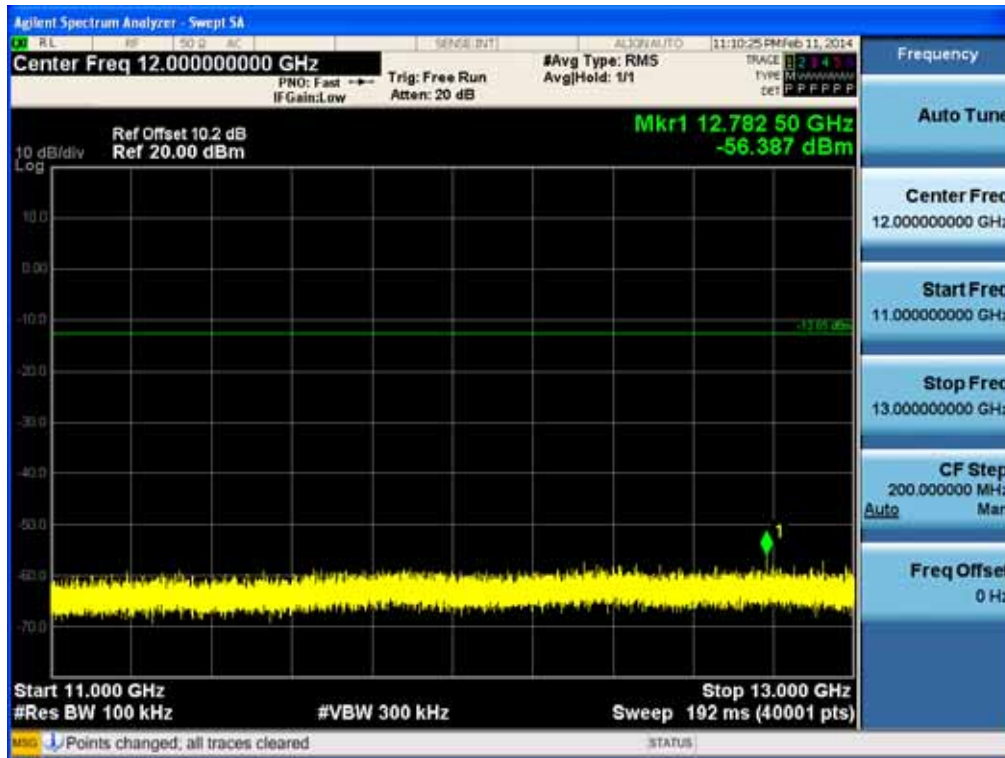
Conducted Spurious Emission (802.11b-CH6)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

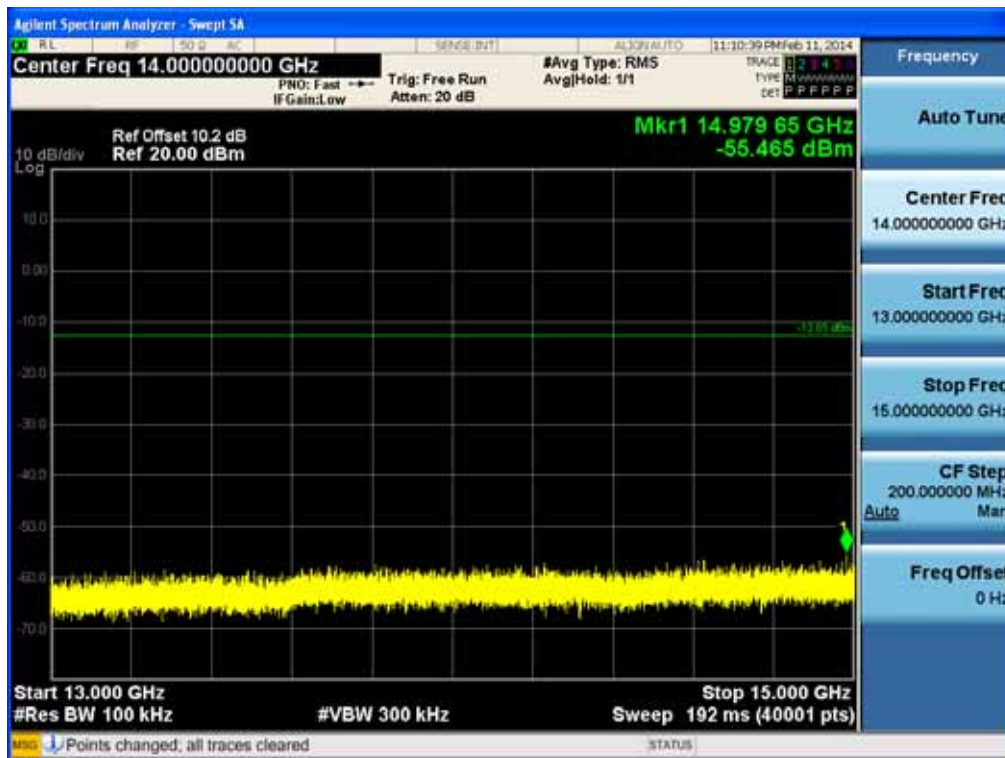
11 GHz ~ 13 GHz

Conducted Spurious Emission (802.11b-CH6)



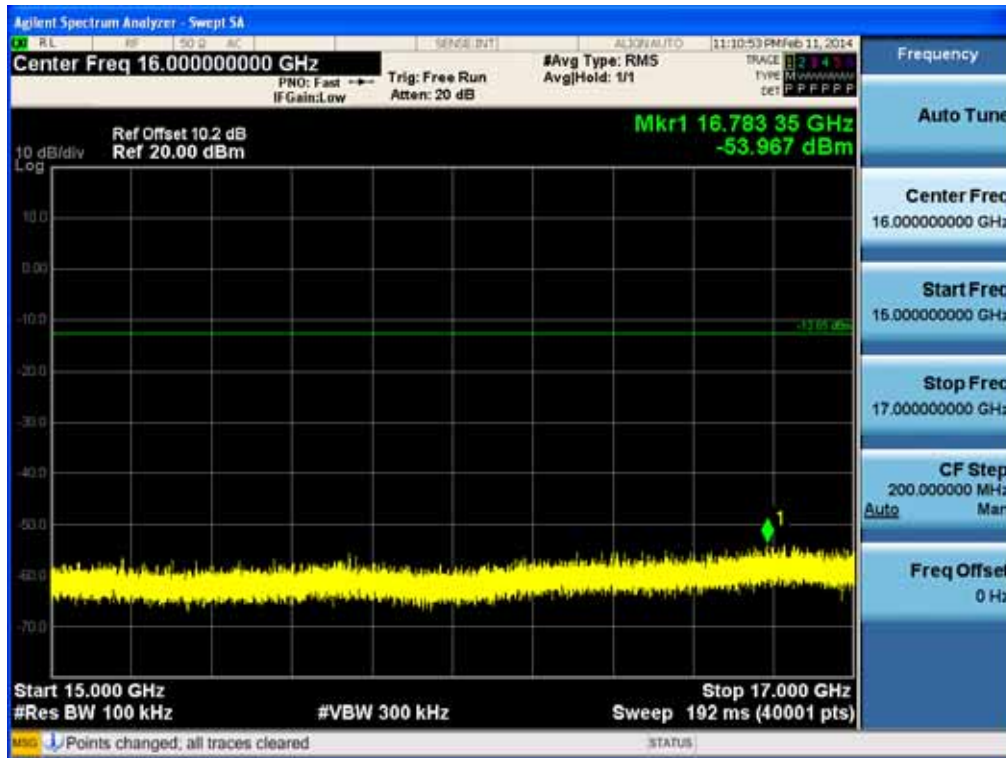
13 GHz ~ 15 GHz

Conducted Spurious Emission (802.11b-CH6)



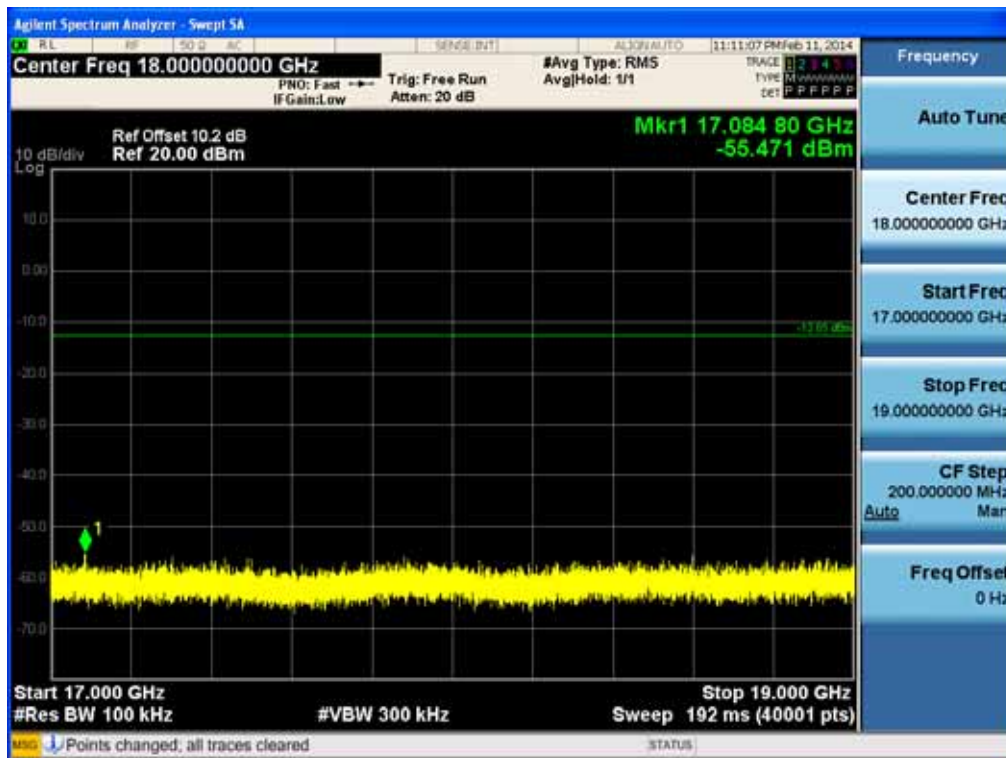
15 GHz ~ 17 GHz

Conducted Spurious Emission (802.11b-CH6)



17 GHz ~ 19 GHz

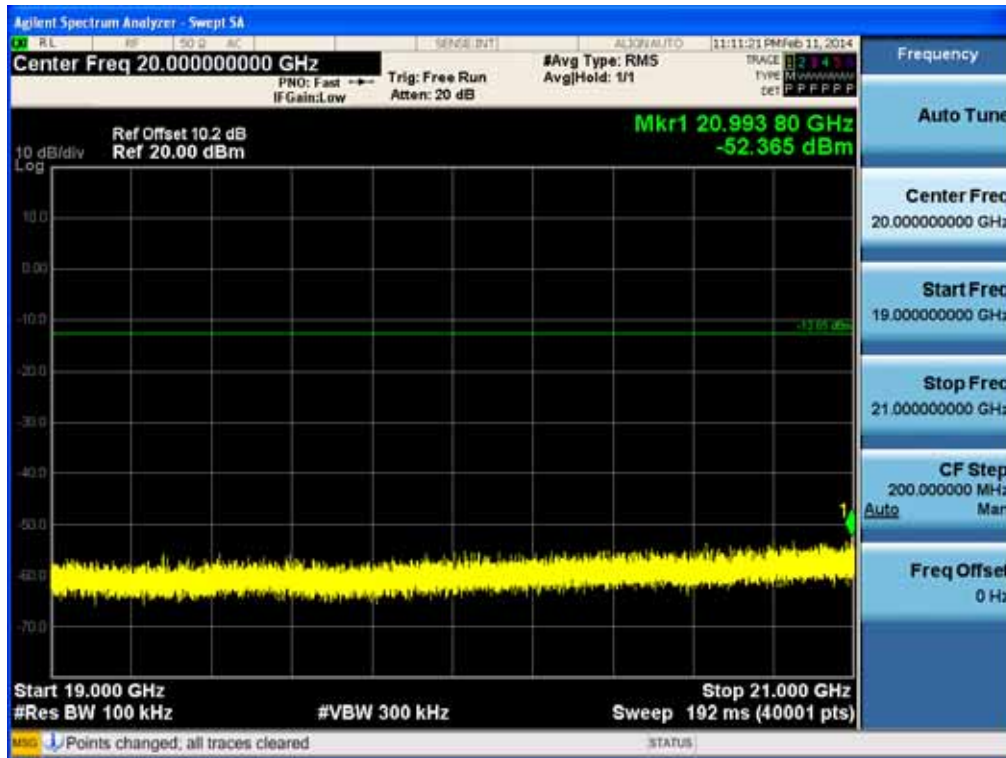
Conducted Spurious Emission (802.11b-CH6)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

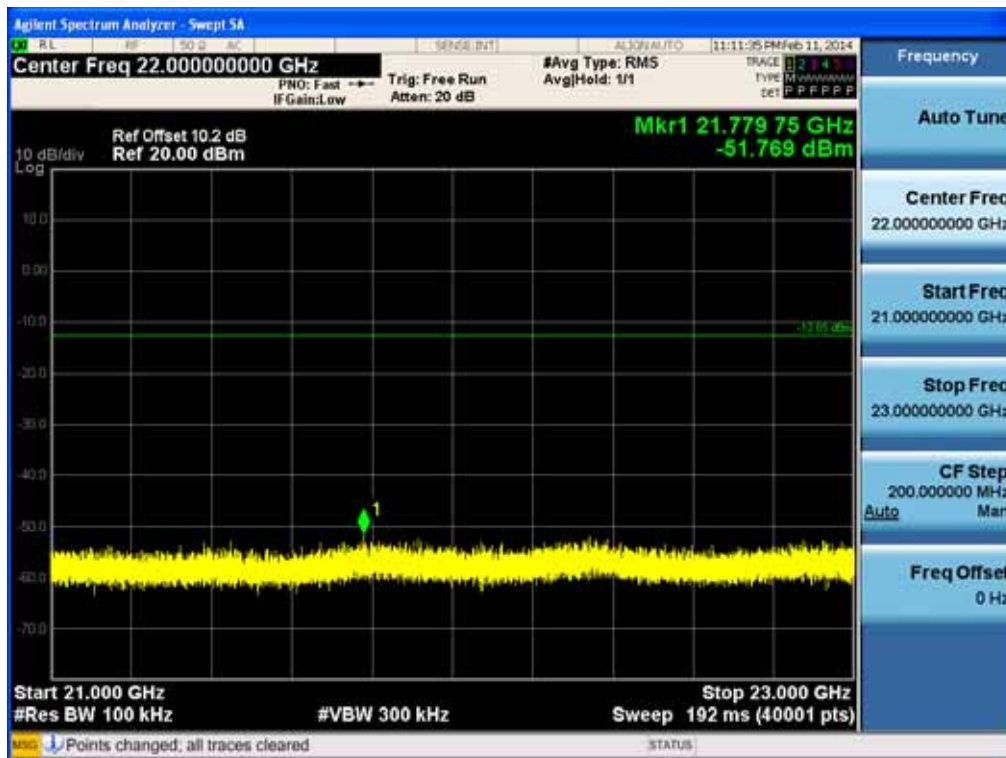
19 GHz ~ 21 GHz

Conducted Spurious Emission (802.11b-CH6)



21 GHz ~ 23 GHz

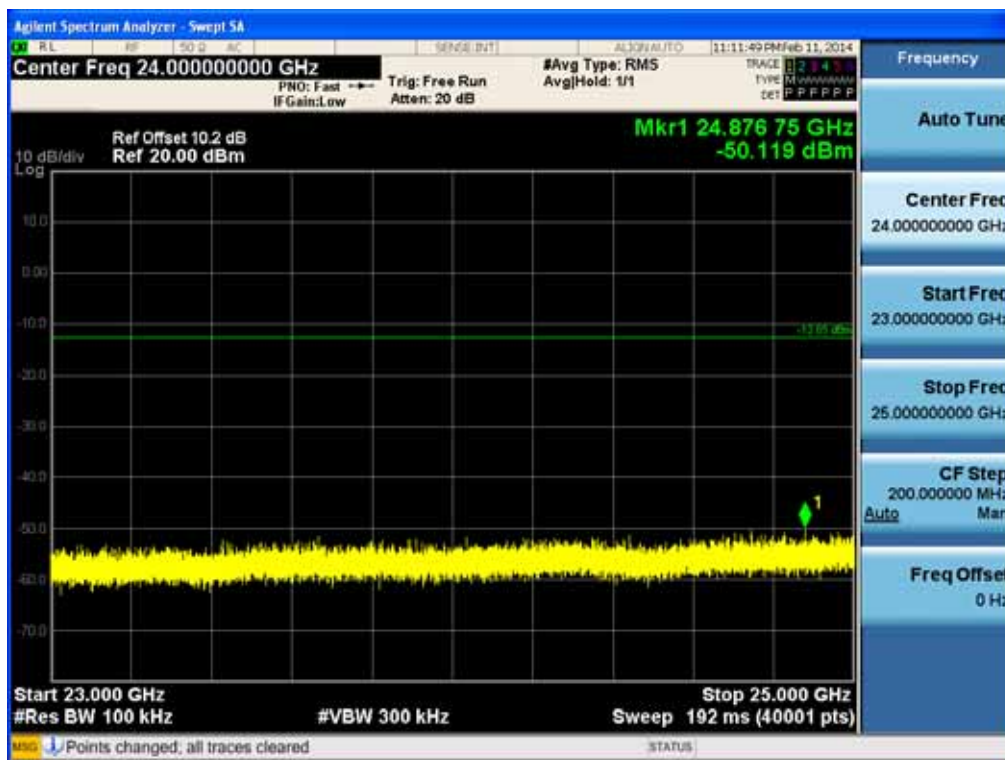
Conducted Spurious Emission (802.11b-CH6)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

23 GHz ~ 25 GHz

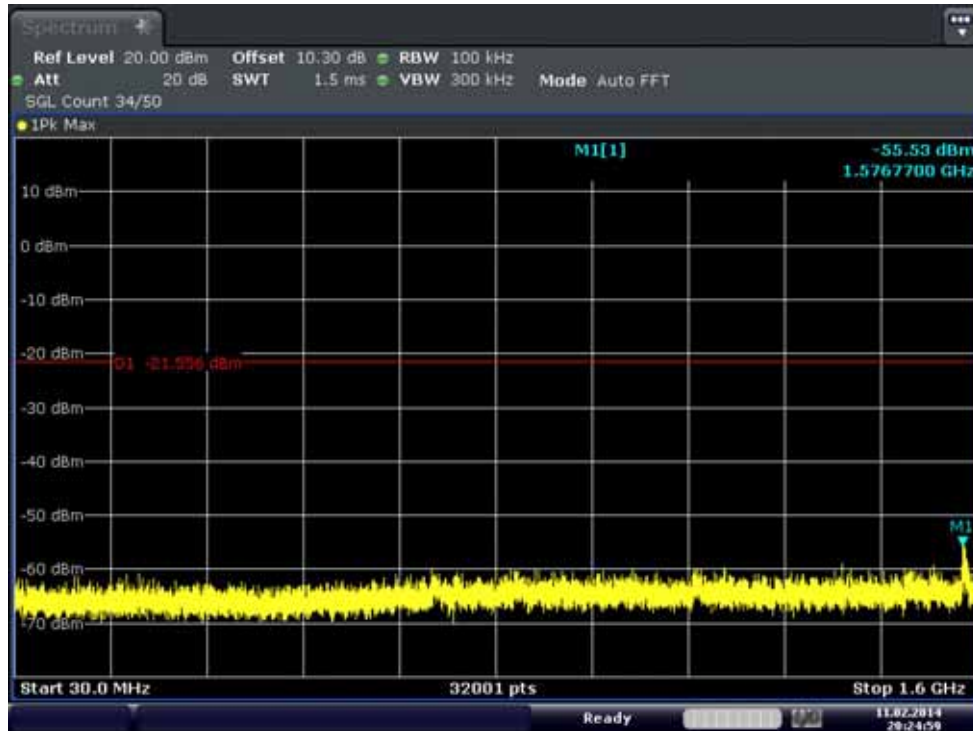
Conducted Spurious Emission (802.11b-CH6)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

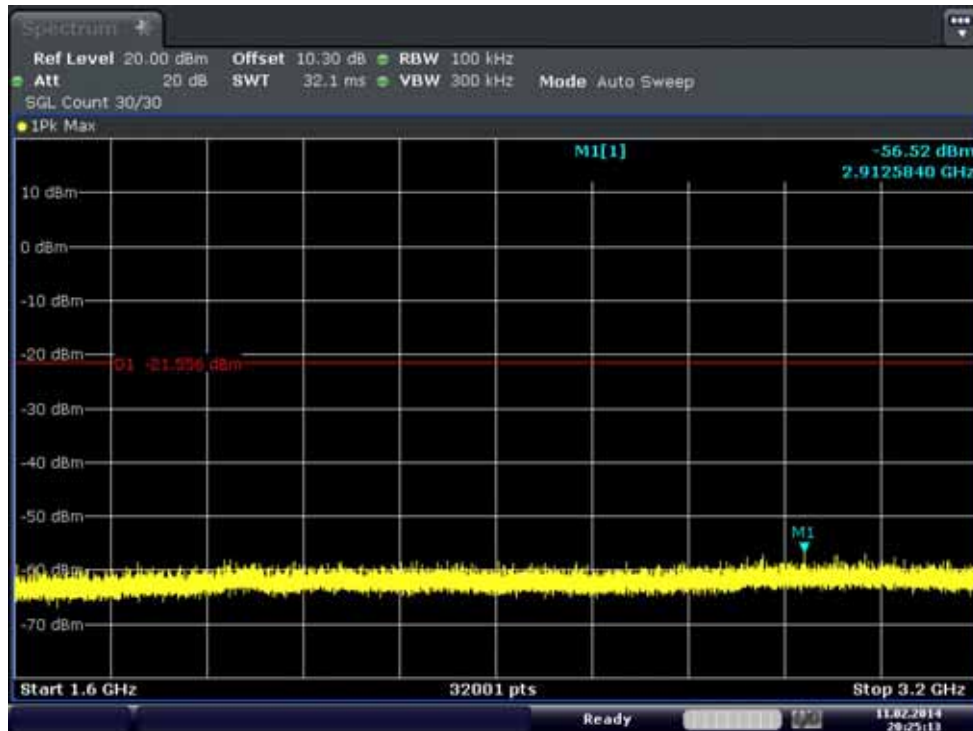
5 GHz Band 30 MHz ~ 1.6 GHz

Conducted Spurious Emission (802.11a-CH157)



1.6 GHz ~ 3.2 GHz

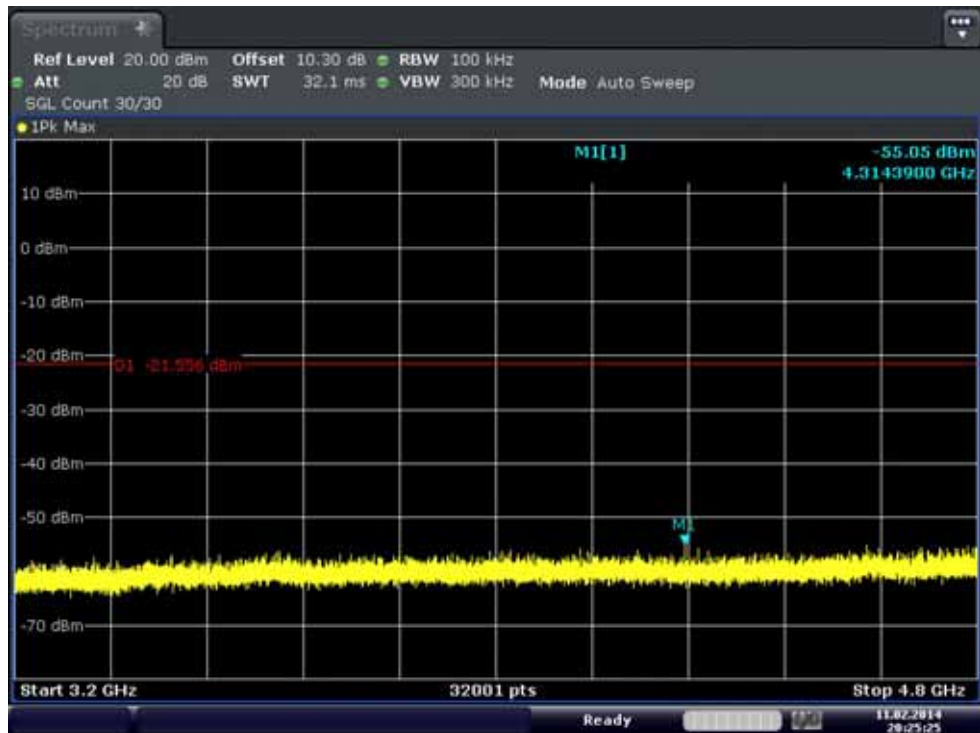
Conducted Spurious Emission (802.11a-CH157)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

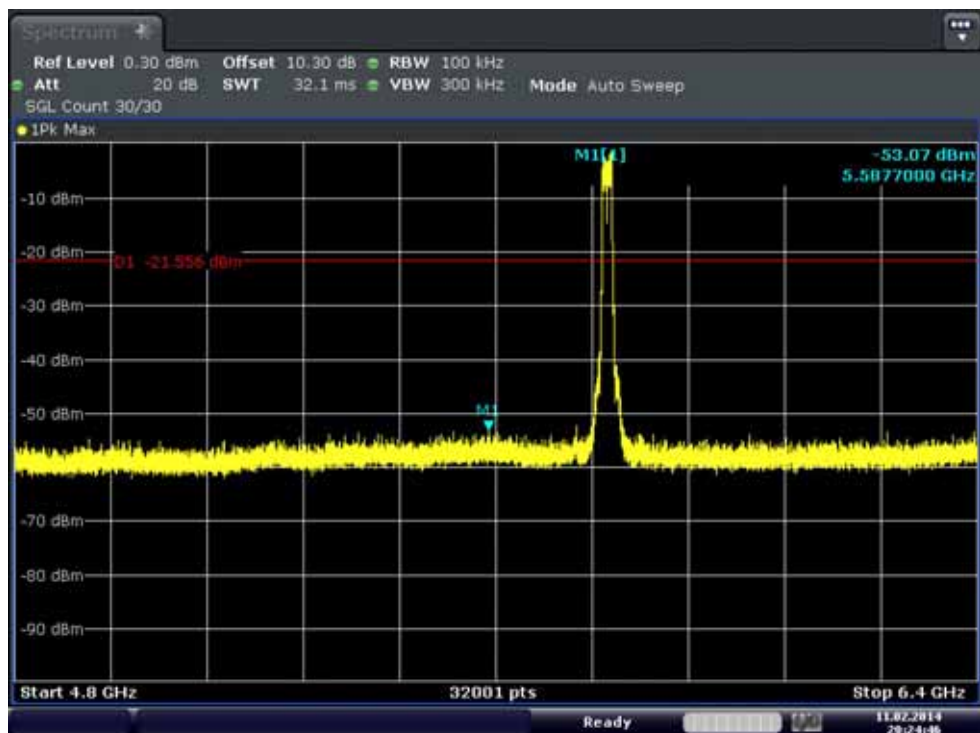
3.2 GHz ~ 4.8 GHz

Conducted Spurious Emission (802.11a-CH157)



4.8 GHz ~ 6.4 GHz

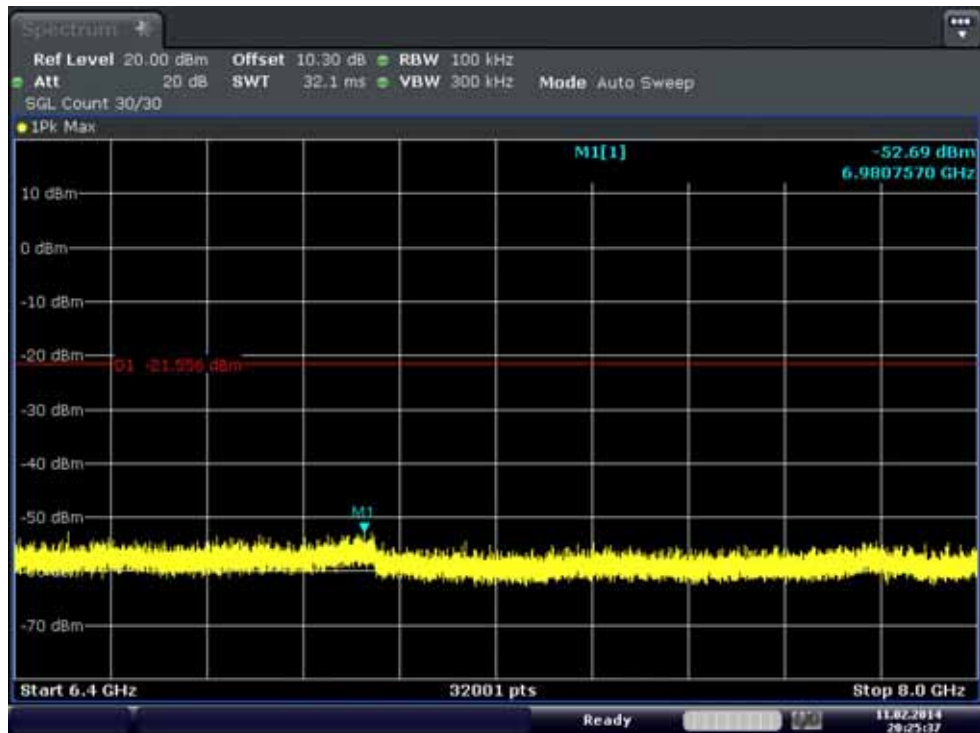
Conducted Spurious Emission (802.11a-CH157)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

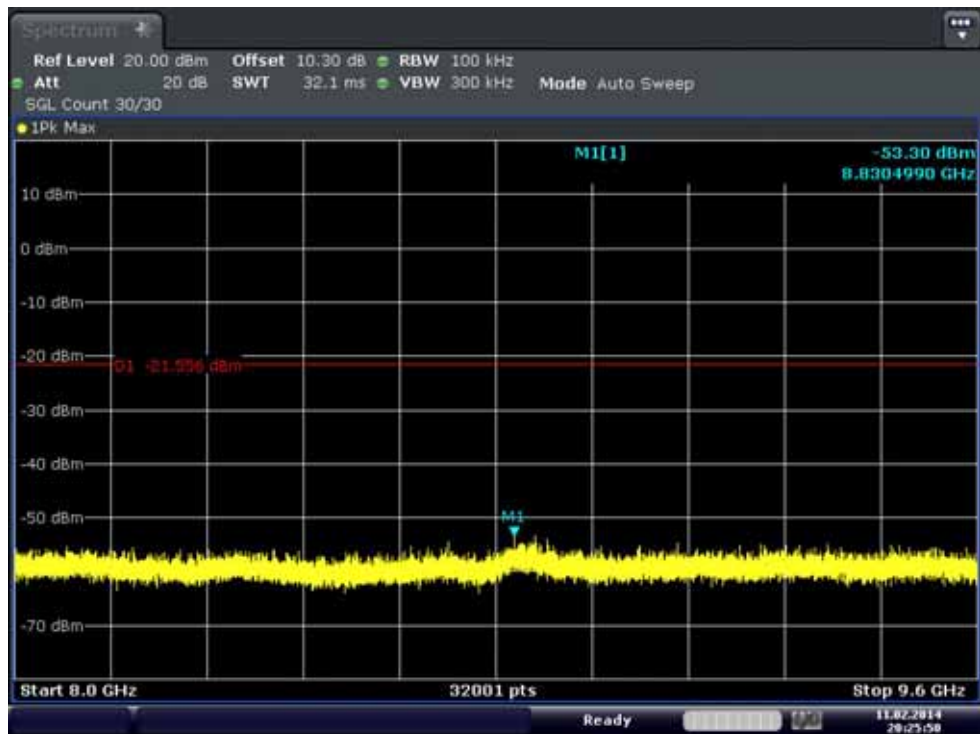
6.4 GHz ~ 8 GHz

Conducted Spurious Emission (802.11a-CH157)



8 GHz ~ 9.6 GHz

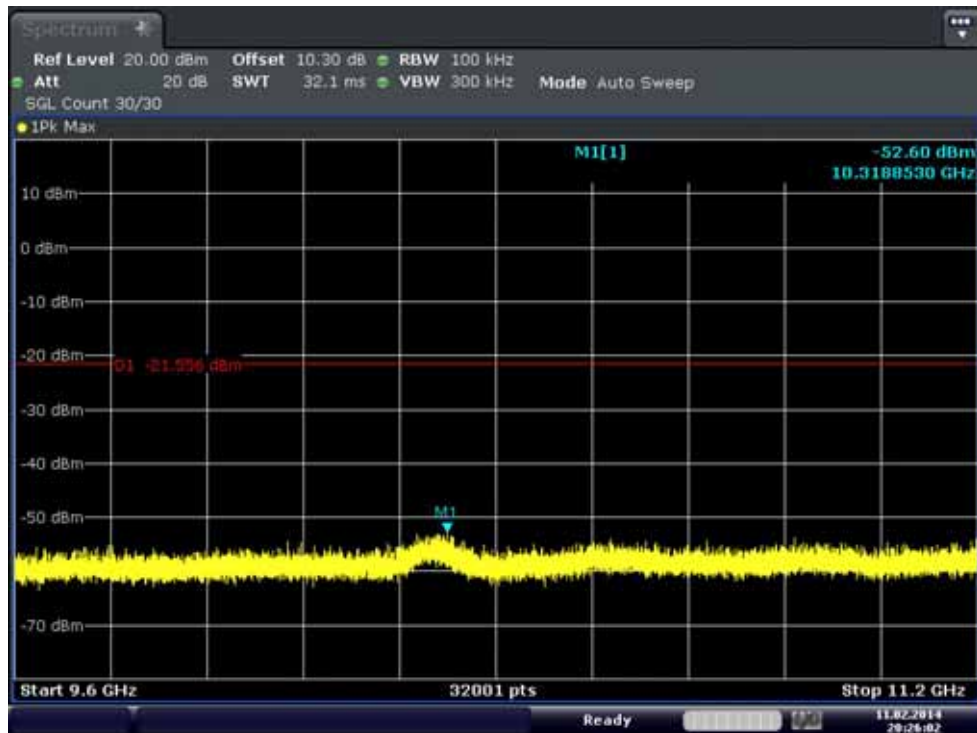
Conducted Spurious Emission(802.11a-CH157)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

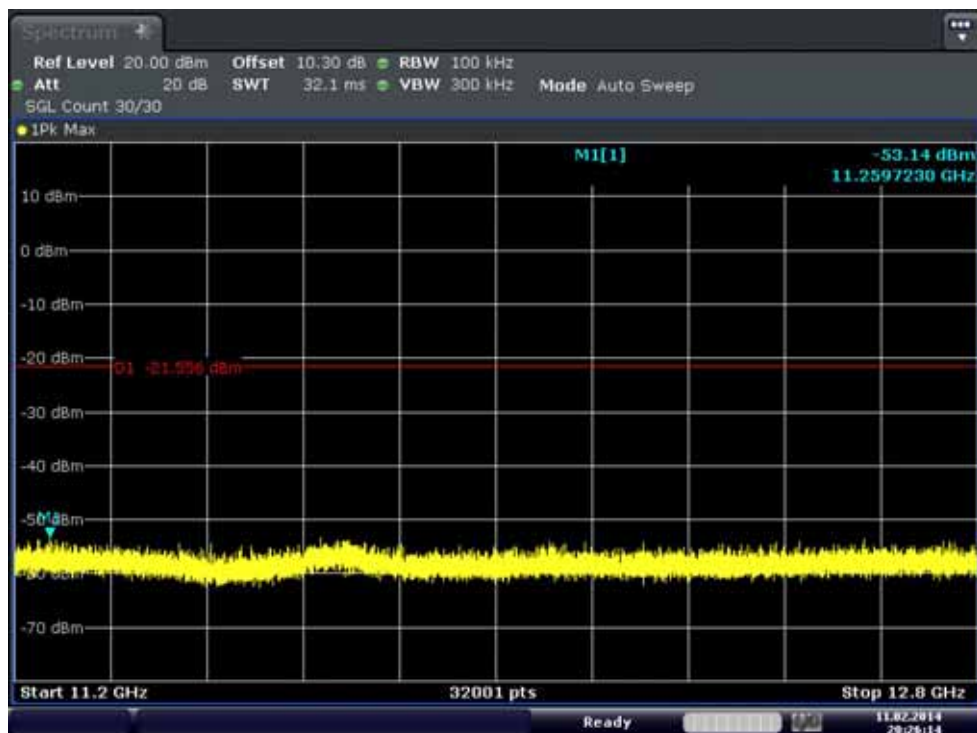
9.6 GHz ~ 11.2 GHz

Conducted Spurious Emission(802.11a-CH157)



11.2 GHz ~ 12.8 GHz

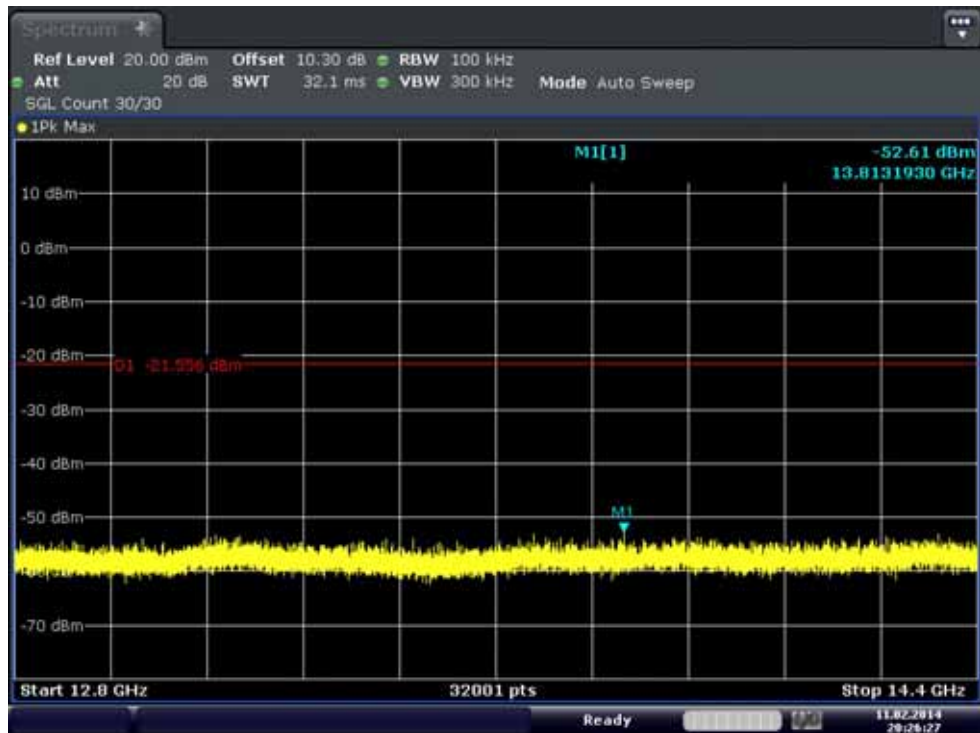
Conducted Spurious Emission (802.11a-CH157)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

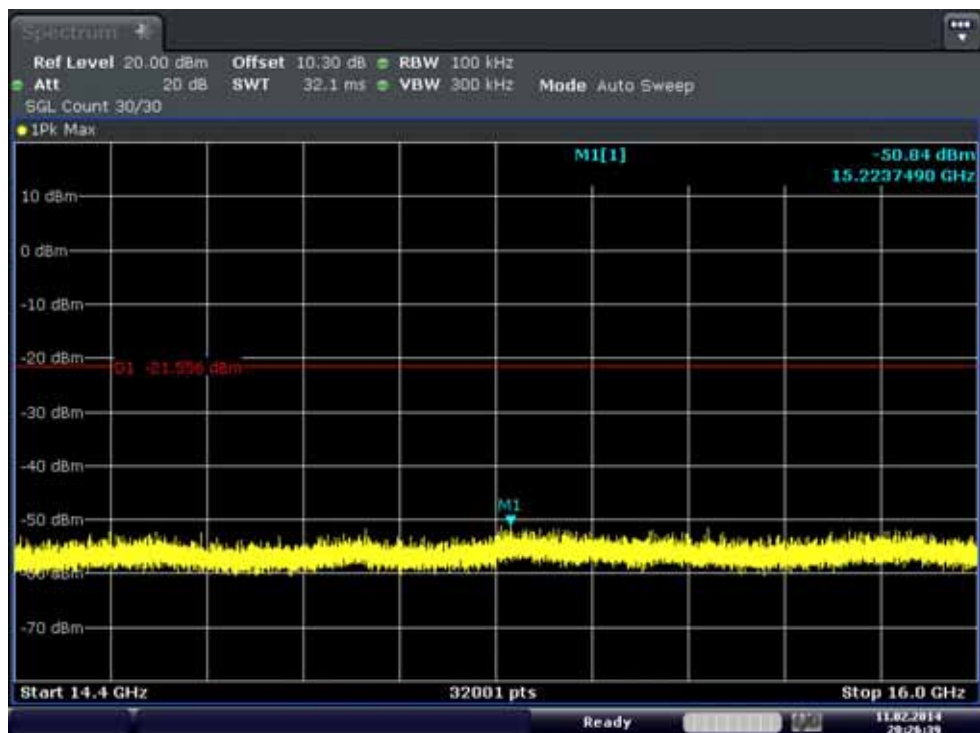
12.8 GHz ~ 14.4 GHz

Conducted Spurious Emission (802.11a-CH157)



14.4 GHz ~ 16 GHz

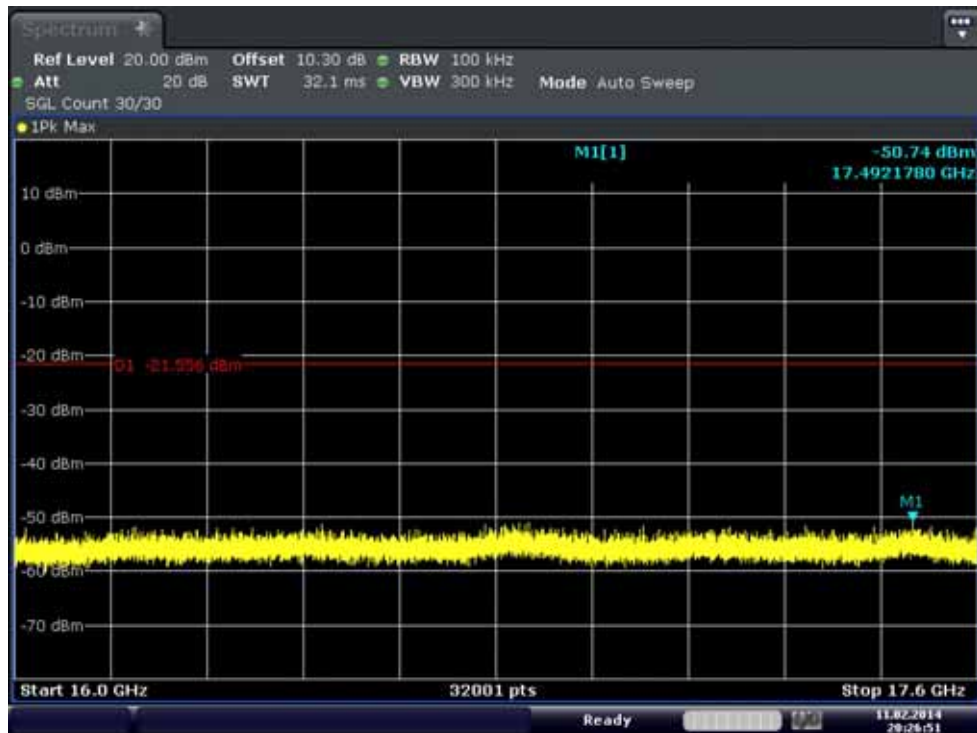
Conducted Spurious Emission (802.11a-CH157)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

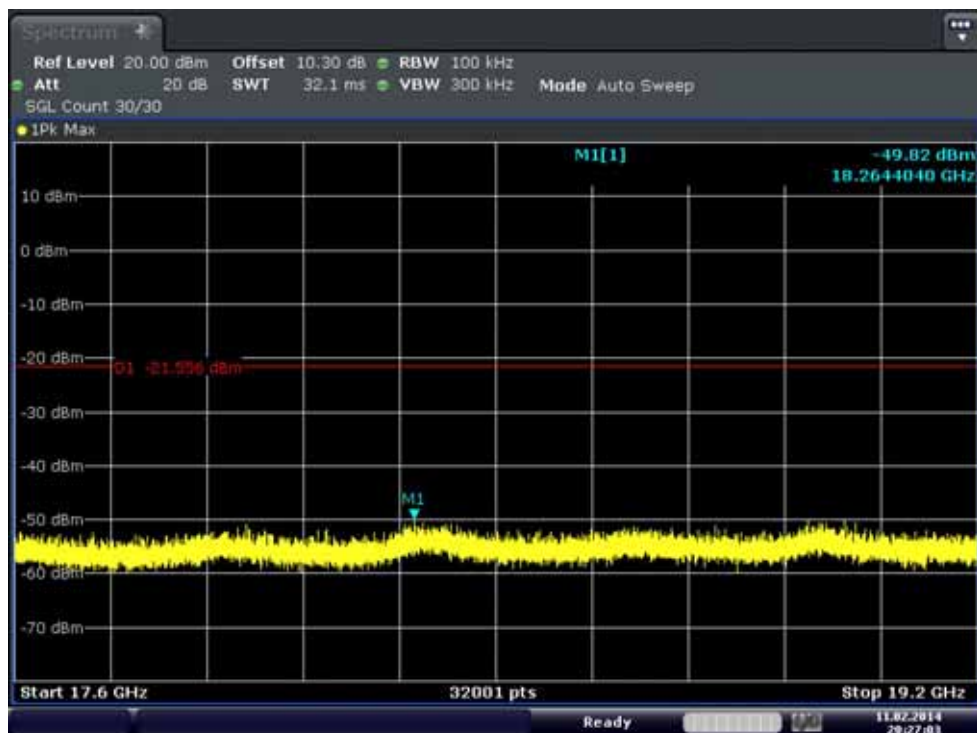
16 GHz ~ 17.6 GHz

Conducted Spurious Emission (802.11a-CH157)



17.6 GHz ~ 19.2 GHz

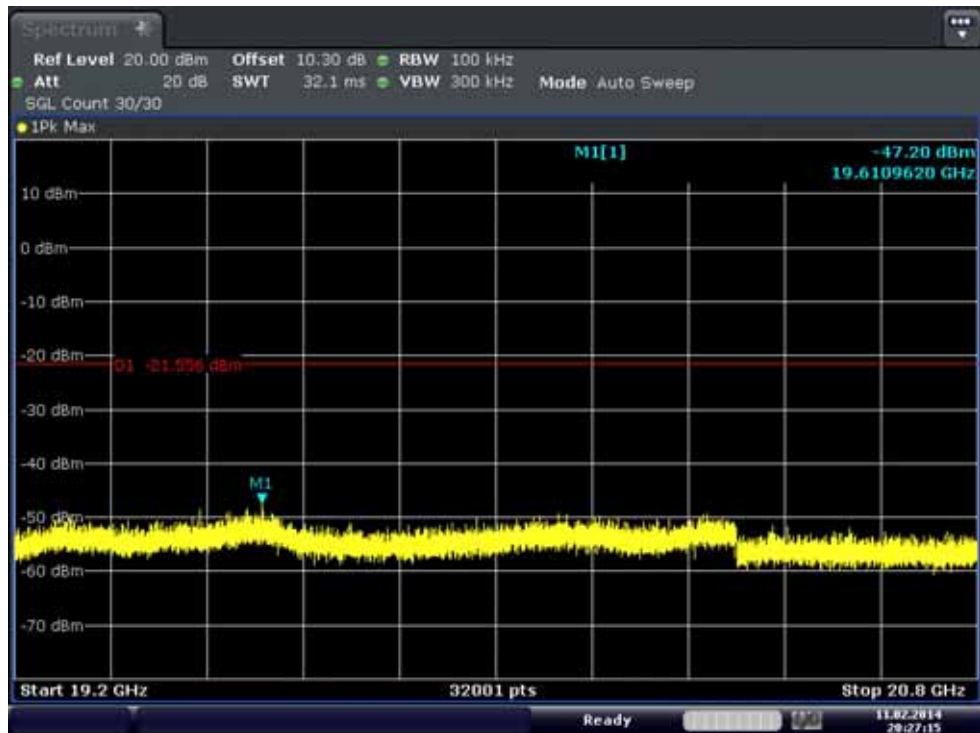
Conducted Spurious Emission (802.11a-CH157)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

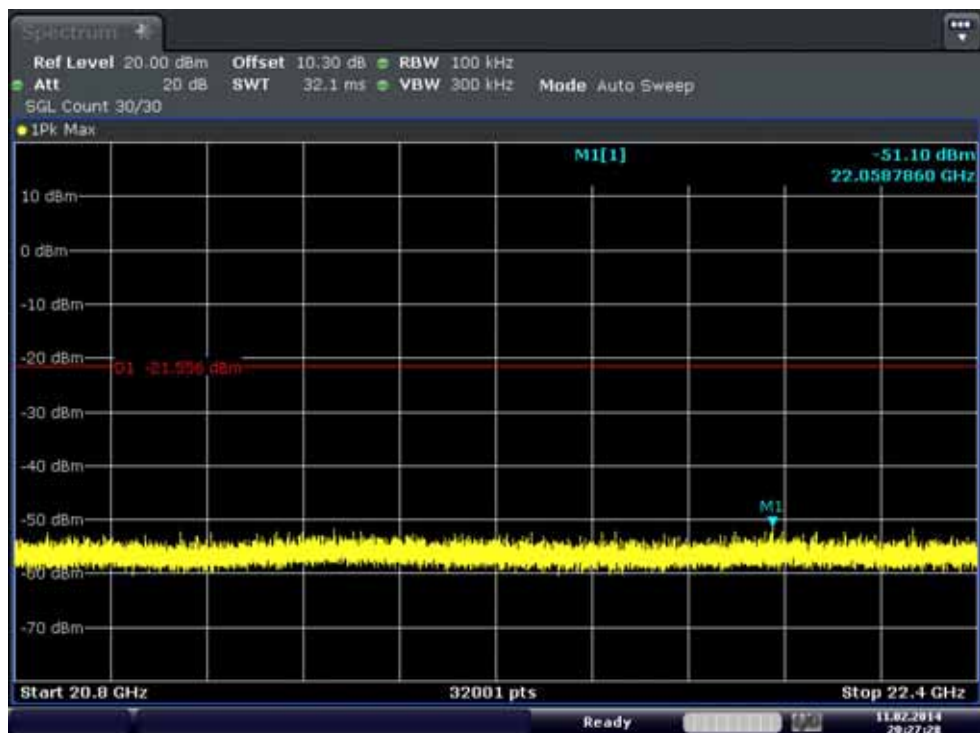
19.2 GHz ~ 20.8 GHz

Conducted Spurious Emission (802.11a-CH157)



20.8 GHz ~ 22.4 GHz

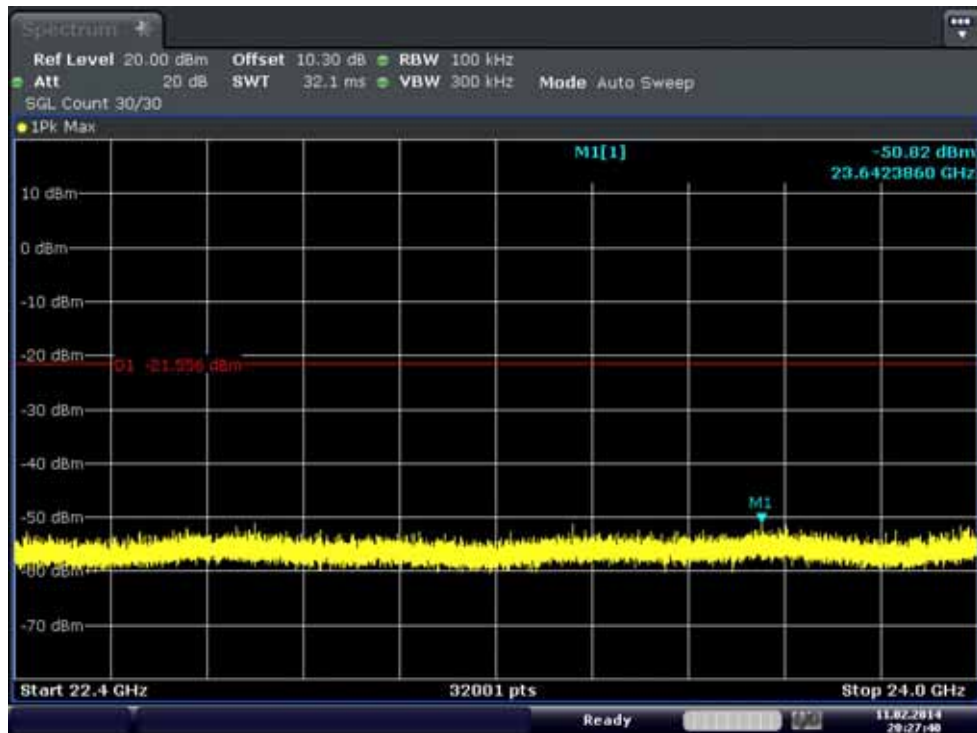
Conducted Spurious Emission (802.11a-CH157)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

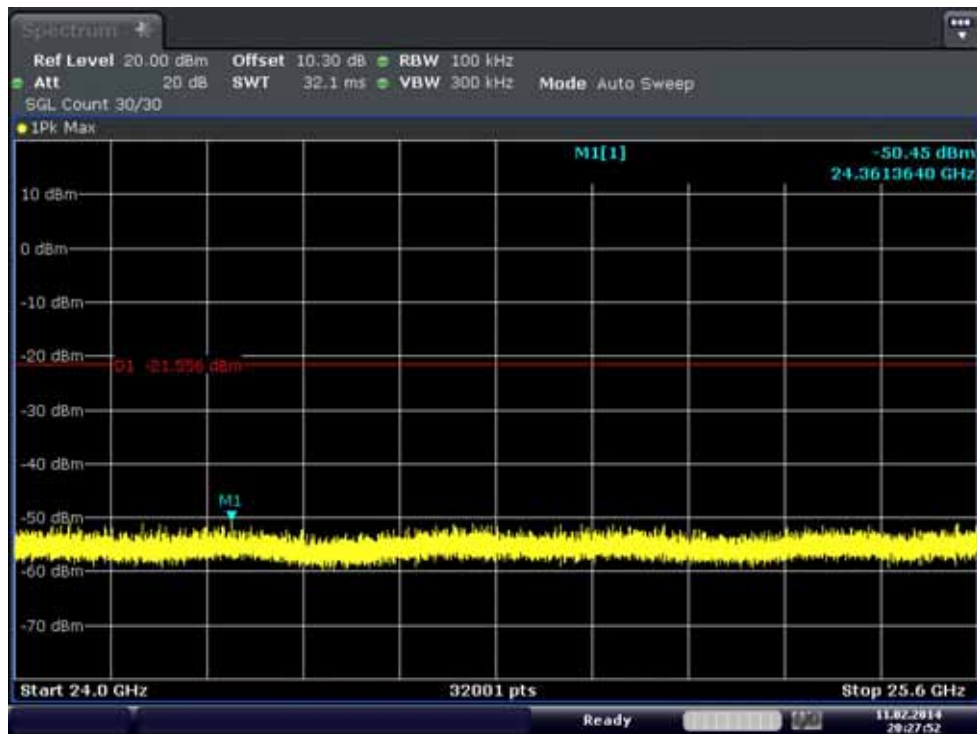
22.4 GHz ~ 24 GHz

Conducted Spurious Emission (802.11a-CH157)



24 GHz ~ 25.6 GHz

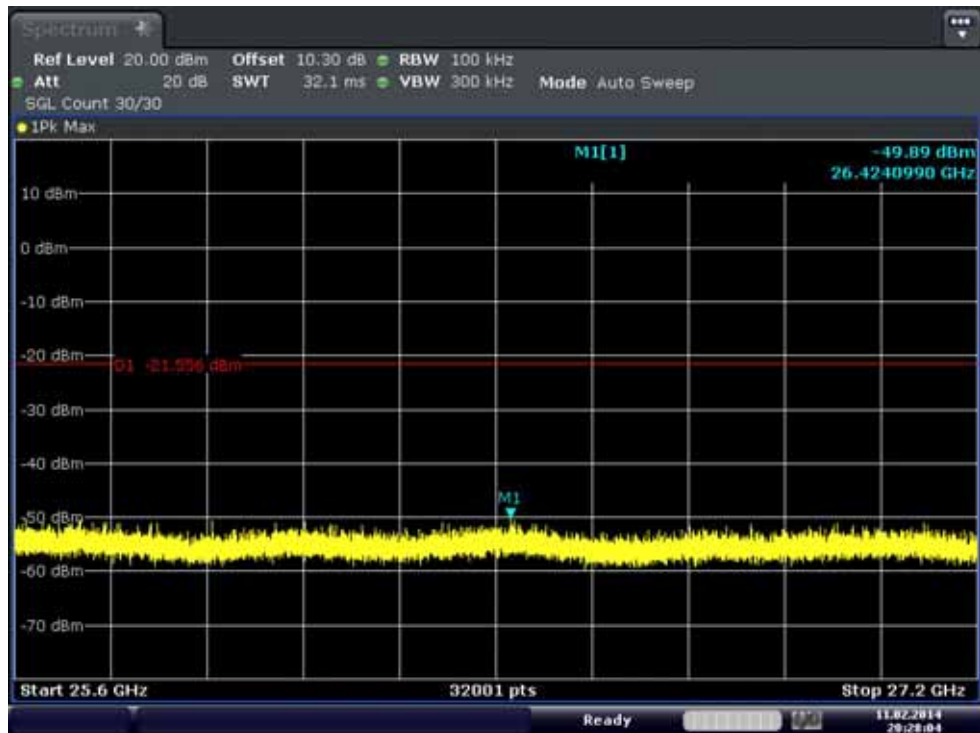
Conducted Spurious Emission (802.11a-CH157)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

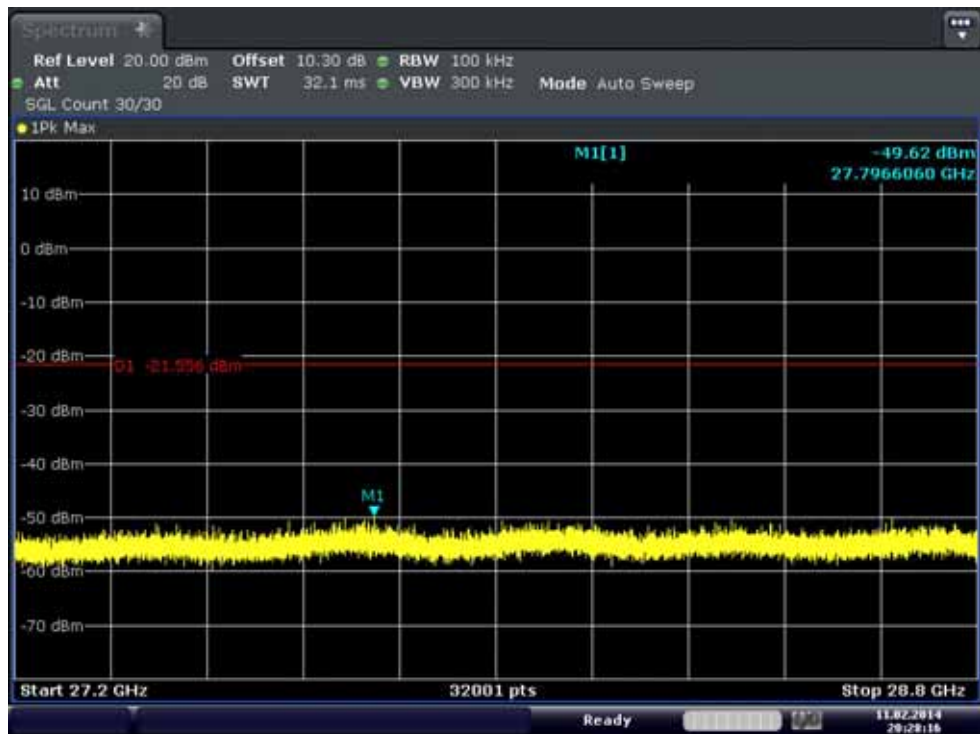
25.6 GHz ~ 27.2 GHz

Conducted Spurious Emission (802.11a-CH157)



27.2 GHz ~ 28.8 GHz

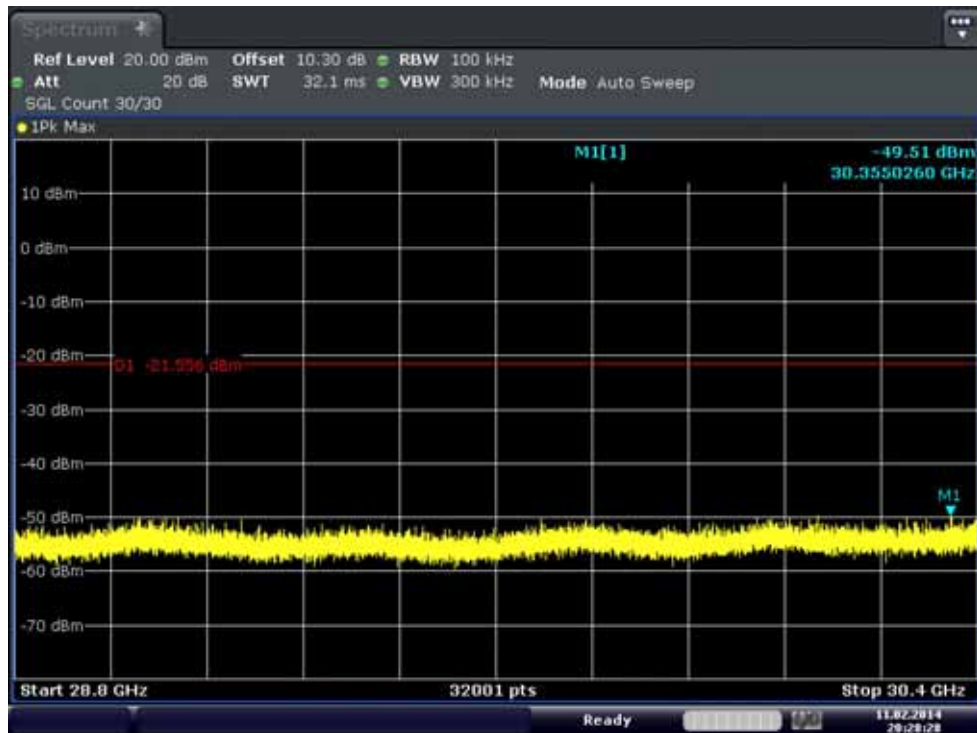
Conducted Spurious Emission (802.11a-CH157)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

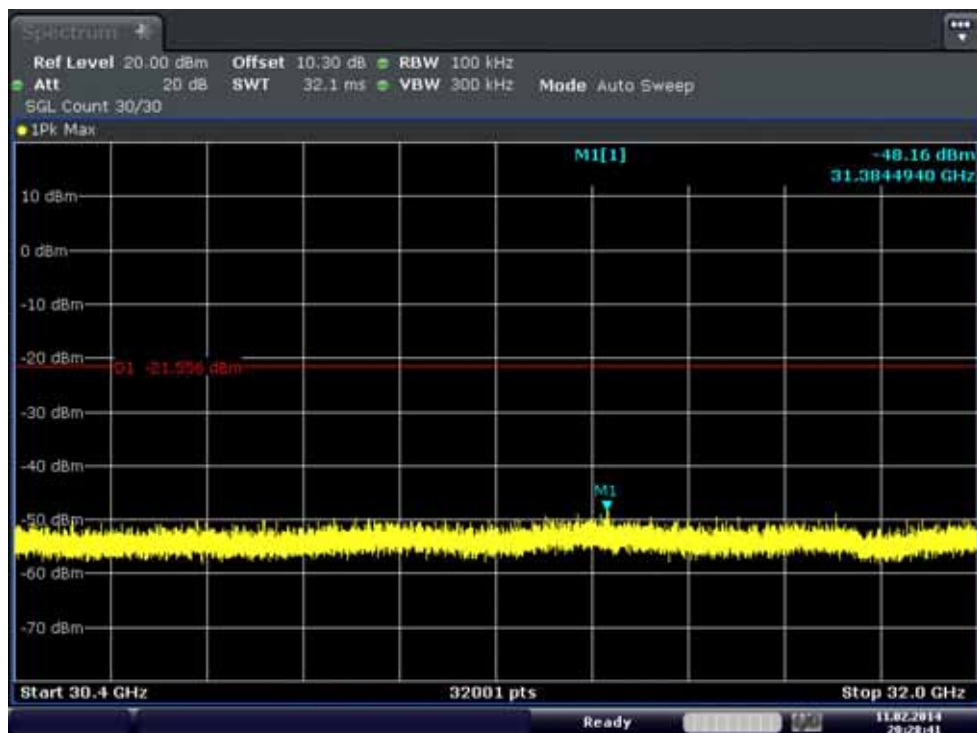
28.8 GHz ~ 30.4 GHz

Conducted Spurious Emission (802.11a-CH157)



30.4 GHz ~ 32 GHz

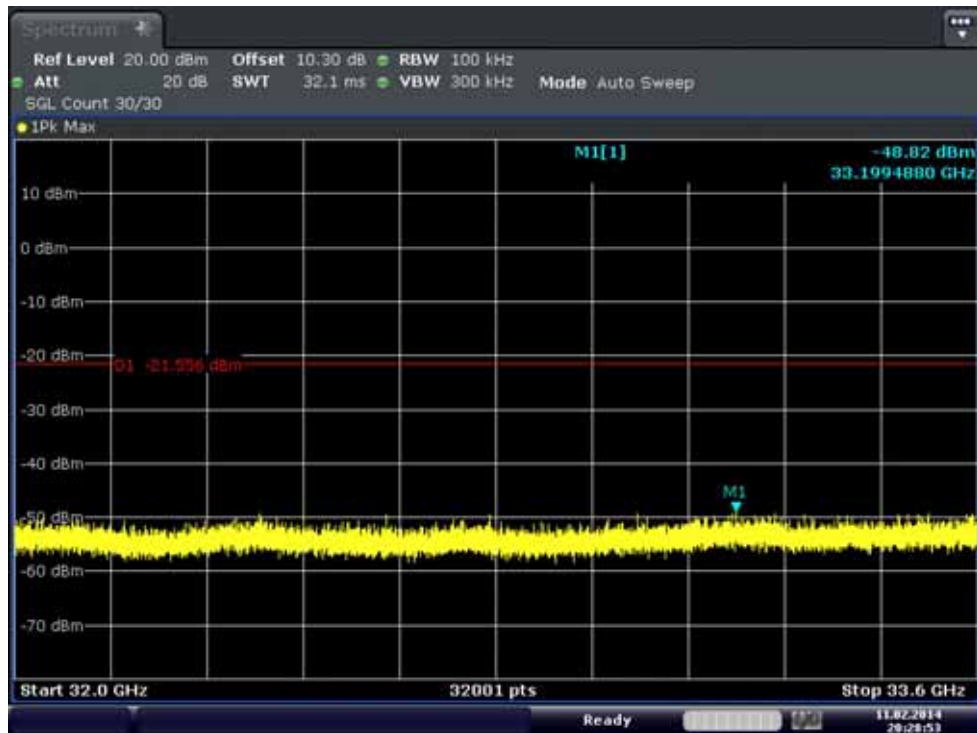
Conducted Spurious Emission (802.11a-CH157)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

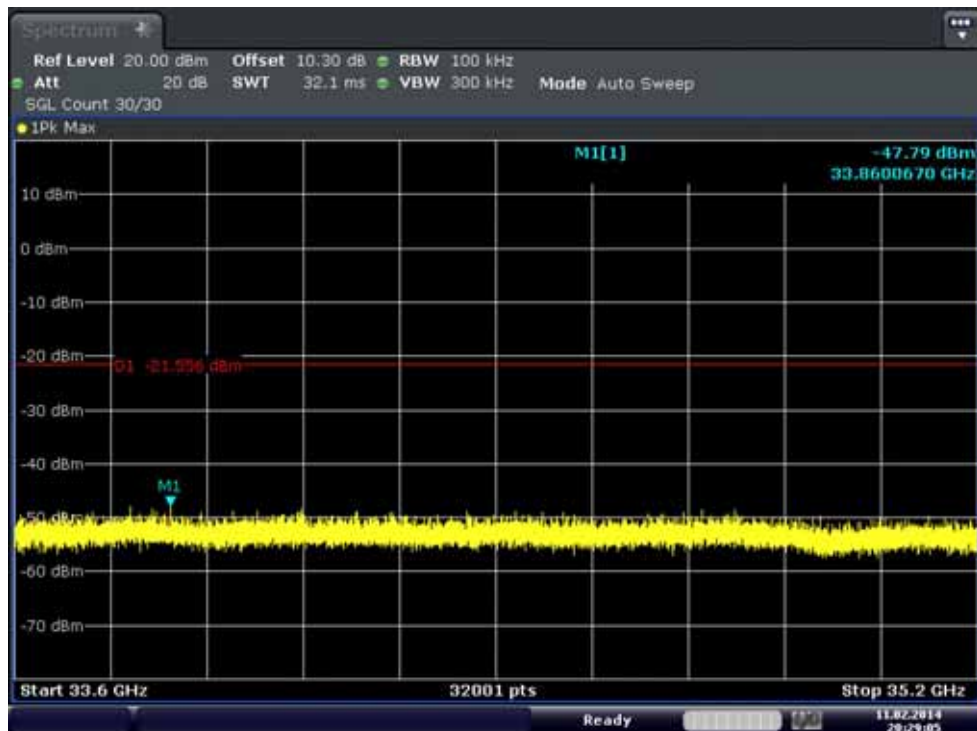
32 GHz ~ 33.6 GHz

Conducted Spurious Emission (802.11a-CH157)



33.6 GHz ~ 35.2 GHz

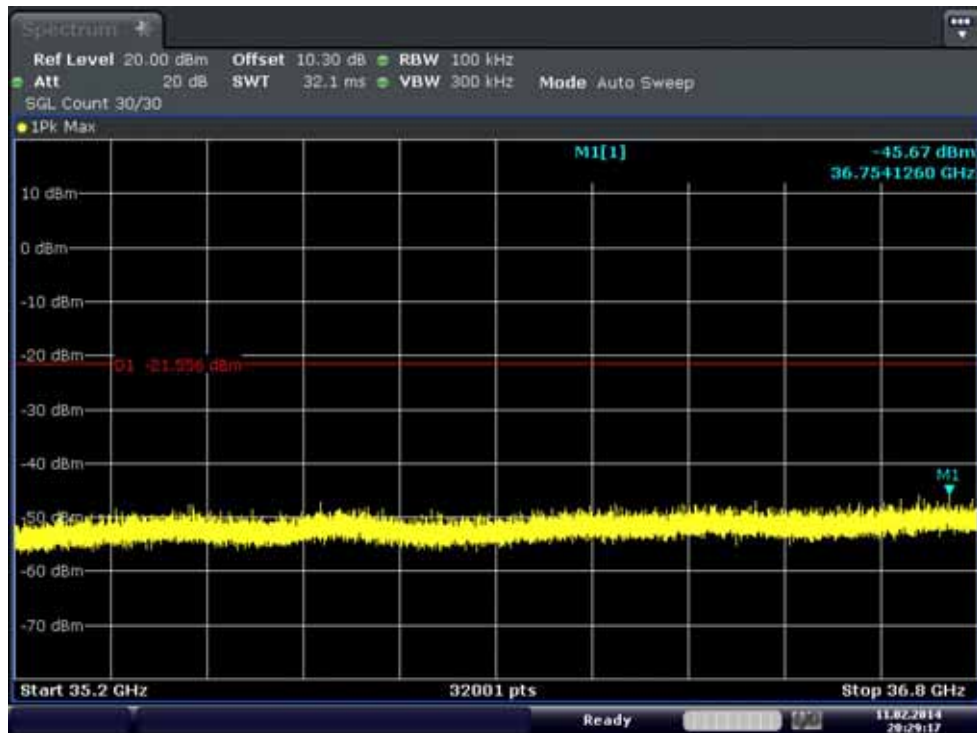
Conducted Spurious Emission (802.11a-CH157)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

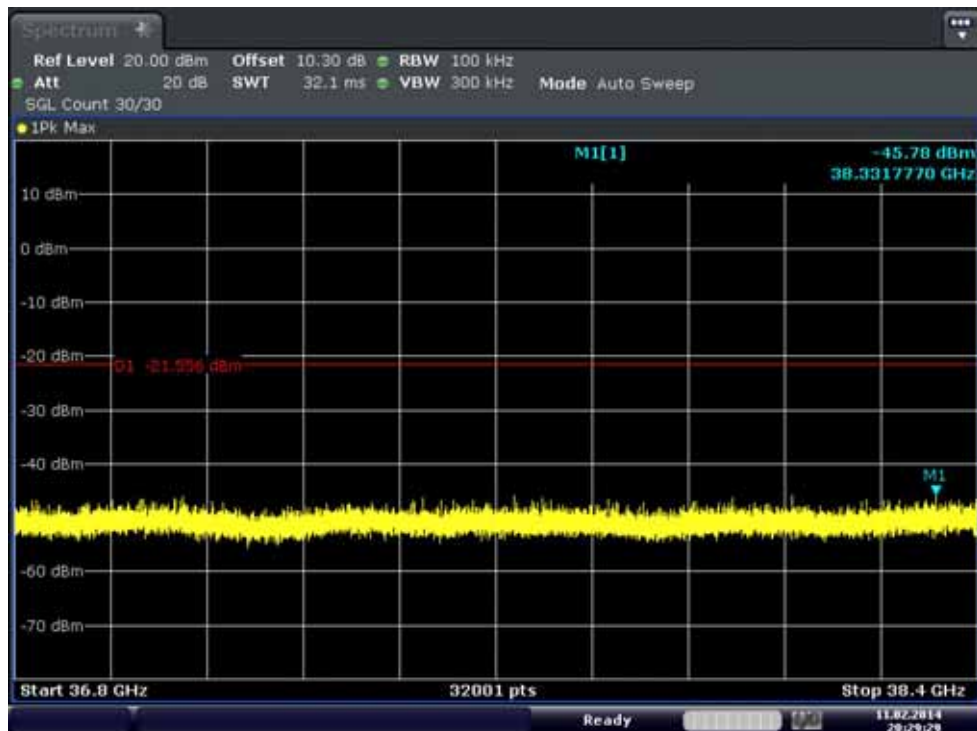
35.2 GHz ~ 36.8 GHz

Conducted Spurious Emission (802.11a-CH157)



36.8 GHz ~ 38.4 GHz

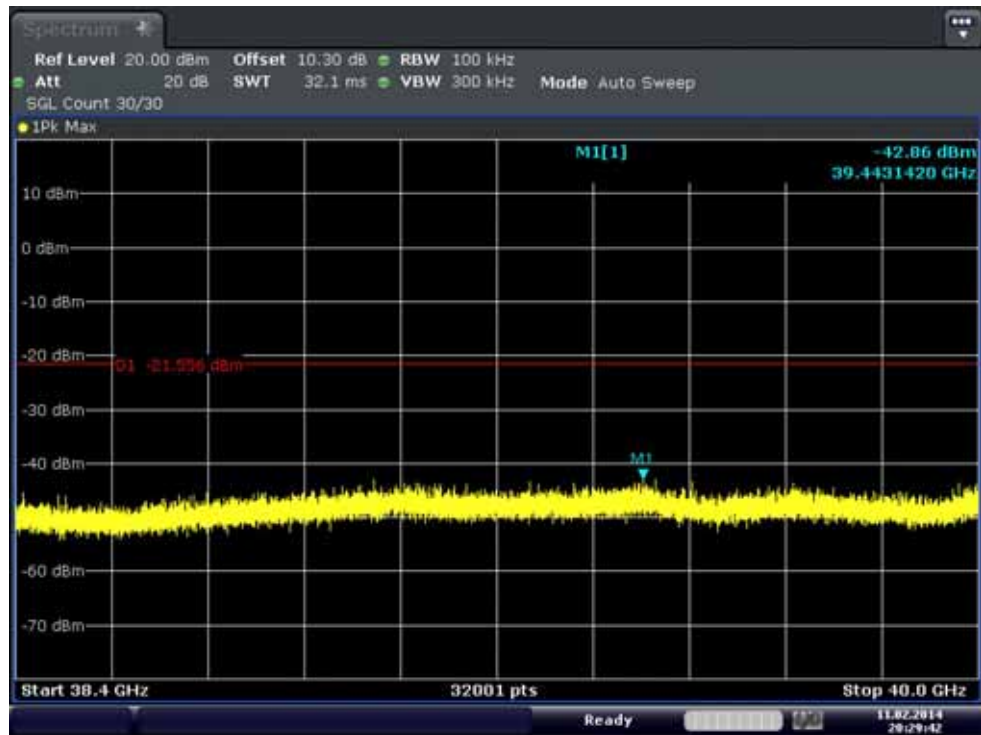
Conducted Spurious Emission (802.11a-CH157)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

38.4 GHz ~ 40 GHz

Conducted Spurious Emission (802.11a-CH157)



FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

8.6 RADIATED MEASUREMENT.

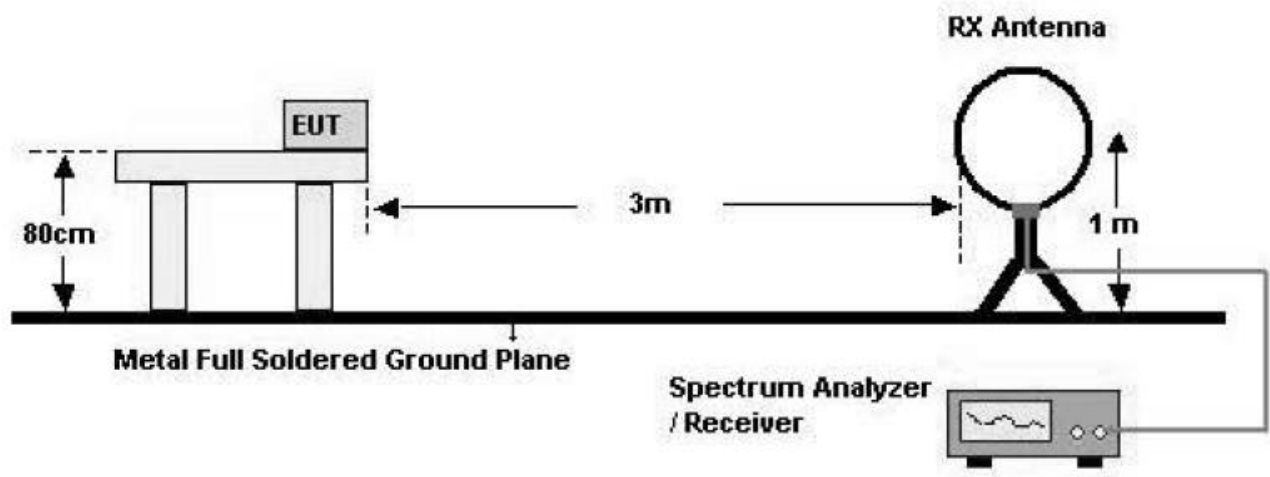
8.6.1 RADIATED SPURIOUS EMISSIONS.

Test Requirements and limit, §15.205, §15.209

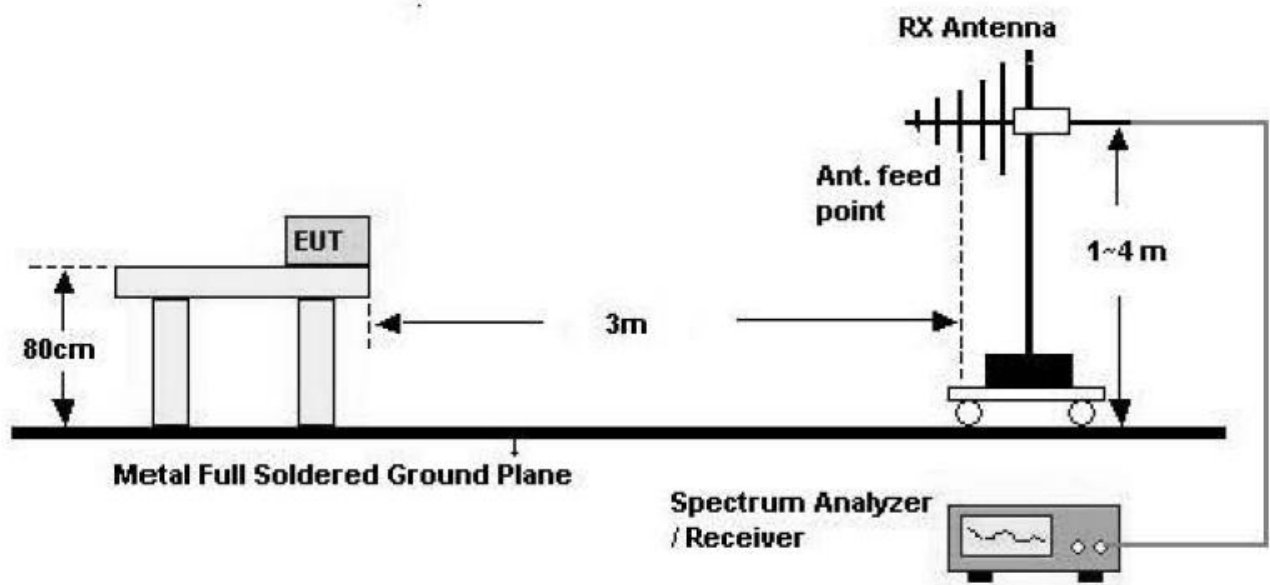
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

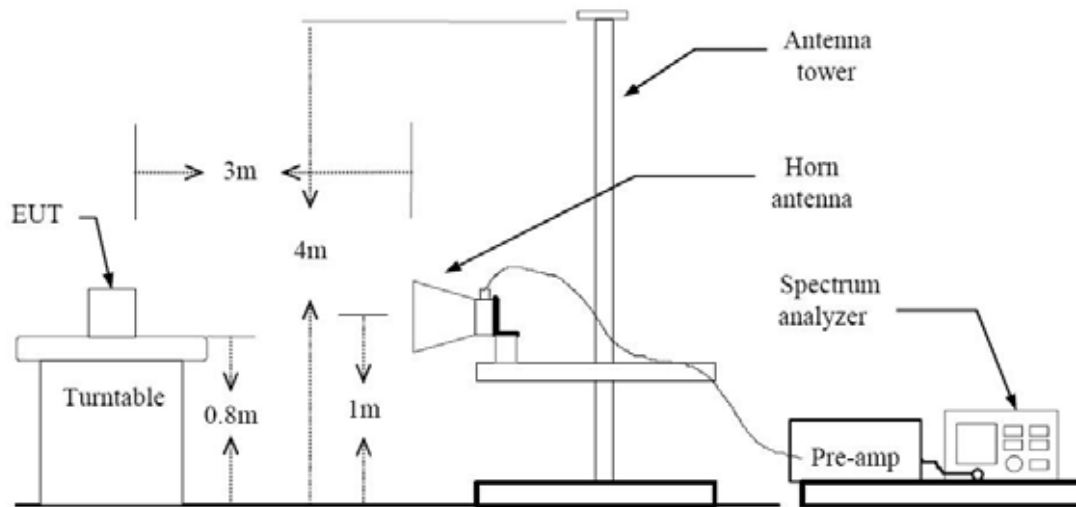
Below 30 MHz



30 MHz - 1 GHz



Above 1 GHz



TEST PROCEDURE USED

ANSI C63.4(2003)

Method 12.2.4 in KDB 558074, issued 04/09/2013 (Peak)

Method 12.2.5.1 in KDB 558074, issued 04/09/2013(Average Case 1)

Method 12.2.5.3 in KDB 558074, issued 04/09/2013(Average Case 2)

Spectrum Setting

- Peak

Peak emission levels are measured by setting the instrument as follows:

RBW = cf. Table 1.

VBW $\geq 3 \times$ RBW.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow sweeps to continue until the trace stabilizes.

(Note that the required measurement time may be longer for low duty cycle applications).

Table 1 —RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

- Average

Case 1

If the EUT can be configured or modified to transmit continuously (duty cycle ≥ 98 percent) then the average emission levels shall be measured using the following method (with EUT transmitting continuously).

RBW = 1 MHz (unless otherwise specified).

VBW $\geq 3 \times$ RBW.

Detector = RMS, if span/(# of points in sweep) $\leq$ (RBW/2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.

Averaging type = power (i.e., RMS).

- 1) As an alternative, the detector and averaging type may be set for linear voltage averaging.
- 2) Some instruments require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.

Sweep time = auto.

Perform a trace average of at least 100 traces.

Case 2

If continuous transmission of the EUT (i.e., duty cycle ≥ 98 percent) cannot be achieved and the duty cycle is not constant (i.e., duty cycle variations exceed ± 2 percent), then the following procedure shall be used:

Set RBW = 1 MHz.

Set VBW $\geq 1/T$.

Video bandwidth mode or display mode

- 1) The instrument shall be set to ensure that video filtering is applied in the power domain. Typically, this requires setting the detector mode to RMS and setting the Average-VBW Type to Power (RMS).
- 2) As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Allow max hold to run for at least 50 times (1/duty cycle) traces.

Note :

1. We used the case 1 for 802.11b mode and the case 2 for 802.11a/g/n_20/n_40 to perform the average filed strength measurements for RSE and radiated band edge test.
2. The actual setting value of VBW for 802.11a/g/n_20/n_40.

FCC PT.15.247 TEST REPORT	FCC CERTIFICATION REPORT		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

Mode	Worst Data rate (Mbps)	T _{on} (ms)	T _{total} (ms)	Duty Cycle (%)	VBW(1/T) (Hz)	The actual setting value of VBW (Hz)
a	6	1.392	1.497	92.99	718	1000
g	6	1.392	1.497	93.01	718	1000
n_20	6.5	1.293	1.395	92.69	773	1000
n_40	13.5	0.634	0.734	86.38	1577	3000

TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dB μ V/m	dBm /m	dBm	(H/V)	dB μ V/m	dB μ 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 (dB μ V) + Distance extrapolation factor
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

TEST RESULTS

Below 1 GHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dB μ V/m	dBm /m	dBm	(H/V)	dB μ V/m	dB μ 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. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Above 1 GHz

Band :	2.4 GHz
Operation Mode:	802.11 b
Transfer Rate:	1 Mbps
Operating Frequency	2412
Channel No.	01 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	55.79	-4.25	V	51.54	73.98	22.44	PK
4824	48.24	-4.25	V	43.99	53.98	9.99	AV
7236	53.24	5.21	V	58.45	73.98	15.53	PK
7236	40.84	5.21	V	46.05	53.98	7.93	AV
4824	55.08	-4.25	H	50.83	73.98	23.15	PK
4824	46.96	-4.25	H	42.71	53.98	11.27	AV
7236	52.75	5.21	H	57.96	73.98	16.02	PK
7236	40.77	5.21	H	45.98	53.98	8.00	AV

Band :	2.4 GHz
Operation Mode:	802.11 b
Transfer Rate:	1 Mbps
Operating Frequency	2437
Channel No.	06 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	55.83	-3.93	V	51.90	73.98	22.08	PK
4874	48.99	-3.93	V	45.06	53.98	8.92	AV
7311	52.93	4.97	V	57.90	73.98	16.08	PK
7311	37.76	4.97	V	42.73	53.98	11.25	AV
4874	55.37	-3.93	H	51.44	73.98	22.54	PK
4874	47.02	-3.93	H	43.09	53.98	10.89	AV
7311	53.30	4.97	H	58.27	73.98	15.71	PK
7311	37.80	4.97	H	42.77	53.98	11.21	AV

Band :	2.4 GHz
Operation Mode:	802.11 b
Transfer Rate:	1 Mbps
Operating Frequency	2462
Channel No.	11 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	56.15	-3.75	V	52.40	73.98	21.58	PK
4924	49.34	-3.75	V	45.59	53.98	8.39	AV
7386	53.23	5.60	V	58.83	73.98	15.15	PK
7386	40.75	5.60	V	46.35	53.98	7.63	AV
4924	54.98	-3.75	H	51.23	73.98	22.75	PK
4924	47.13	-3.75	H	43.38	53.98	10.60	AV
7386	53.37	5.60	H	58.97	73.98	15.01	PK
7386	40.83	5.60	H	46.43	53.98	7.55	AV

Notes:

11. 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 - Amp Gain
5. We have done 802.11b mode and all data rate. Worst data rate is the lowest data of each mode.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band : 2.4 GHz

Operation Mode: 802.11 g

Transfer Rate: 6 Mbps

Operating Frequency 2412

Channel No. 01 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	54.07	-4.25	V	49.82	73.98	24.16	PK
4824	39.97	-4.25	V	35.72	53.98	18.26	AV
7236	53.25	5.21	V	58.46	73.98	15.52	PK
7236	39.16	5.21	V	44.37	53.98	9.61	AV
4824	53.54	-4.25	H	49.29	73.98	24.69	PK
4824	39.76	-4.25	H	35.51	53.98	18.47	AV
7236	52.94	5.21	H	58.15	73.98	15.83	PK
7236	39.22	5.21	H	44.43	53.98	9.55	AV

Band : 2.4 GHz

Operation Mode: 802.11 g

Transfer Rate: 6 Mbps

Operating Frequency 2437

Channel No. 06 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	53.84	-3.93	V	49.91	73.98	24.07	PK
4874	39.43	-3.93	V	35.50	53.98	18.48	AV
7311	53.06	4.97	V	58.03	73.98	15.95	PK
7311	39.07	4.97	V	44.04	53.98	9.94	AV
4874	52.98	-3.93	H	49.05	73.98	24.93	PK
4874	39.01	-3.93	H	35.08	53.98	18.90	AV
7311	53.11	4.97	H	58.08	73.98	15.90	PK
7311	39.04	4.97	H	44.01	53.98	9.97	AV

Band :	2.4 GHz
Operation Mode:	802.11 g
Transfer Rate:	6 Mbps
Operating Frequency	2462
Channel No.	11 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	53.40	-3.75	V	49.65	73.98	24.33	PK
4924	39.06	-3.75	V	35.31	53.98	18.67	AV
7386	53.17	5.60	V	58.77	73.98	15.21	PK
7386	39.20	5.60	V	44.80	53.98	9.18	AV
4924	52.93	-3.75	H	49.18	73.98	24.80	PK
4924	38.67	-3.75	H	34.92	53.98	19.06	AV
7386	52.60	5.60	H	58.20	73.98	15.78	PK
7386	39.12	5.60	H	44.72	53.98	9.26	AV

Notes:

11. 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 - Amp Gain
5. We have done 802.11g mode and all data rate. Worst data rate is the lowest data of each mode.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band : 2.4 GHz

Operation Mode: 802.11 n

Transfer Rate: 6.5 Mbps

Operating Frequency 2412

Channel No. 01 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	54.15	-4.25	V	49.90	73.98	24.08	PK
4824	39.82	-4.25	V	35.57	53.98	18.41	AV
7236	52.95	5.21	V	58.16	73.98	15.82	PK
7236	39.26	5.21	V	44.47	53.98	9.51	AV
4824	53.68	-4.25	H	49.43	73.98	24.55	PK
4824	39.54	-4.25	H	35.29	53.98	18.69	AV
7236	52.61	5.21	H	57.82	73.98	16.16	PK
7236	39.28	5.21	H	44.49	53.98	9.49	AV

Band : 2.4 GHz

Operation Mode: 802.11 n

Transfer Rate: 6.5 Mbps

Operating Frequency 2437

Channel No. 06 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	53.07	-3.93	V	49.14	73.98	24.84	PK
4874	39.24	-3.93	V	35.31	53.98	18.67	AV
7311	53.36	4.97	V	58.33	73.98	15.65	PK
7311	39.02	4.97	V	43.99	53.98	9.99	AV
4874	53.00	-3.93	H	49.07	73.98	24.91	PK
4874	38.88	-3.93	H	34.95	53.98	19.03	AV
7311	53.13	4.97	H	58.10	73.98	15.88	PK
7311	39.13	4.97	H	44.10	53.98	9.88	AV

Band :	2.4 GHz
Operation Mode:	802.11 n
Transfer Rate:	6.5 Mbps
Operating Frequency	2462
Channel No.	11 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	52.79	-3.75	V	49.04	73.98	24.94	PK
4924	38.90	-3.75	V	35.15	53.98	18.83	AV
7386	53.66	5.60	V	59.26	73.98	14.72	PK
7386	39.03	5.60	V	44.63	53.98	9.35	AV
4924	52.57	-3.75	H	48.82	73.98	25.16	PK
4924	38.52	-3.75	H	34.77	53.98	19.21	AV
7386	53.99	5.60	H	59.59	73.98	14.39	PK
7386	39.17	5.60	H	44.77	53.98	9.21	AV

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 - Amp Gain
5. We have done 802.11n mode and all data rate. Worst data rate is the lowest data of each mode.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band : 5.8 GHz

Operation Mode: 802.11 a

Transfer Rate: 6 Mbps

Operating Frequency 5745 MHz

Channel No. 149 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11490	42.42	11.22	V	53.64	73.98	20.34	PK
11490	34.67	11.22	V	45.89	53.98	8.09	AV
11490	42.02	11.22	H	53.24	73.98	20.74	PK
11490	33.77	11.22	H	44.99	53.98	8.99	AV

Band : 5.8 GHz

Operation Mode: 802.11 a

Transfer Rate: 6 Mbps

Operating Frequency 5785 MHz

Channel No. 157 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11570	42.75	11.71	V	54.46	73.98	19.52	PK
11570	36.44	11.71	V	48.15	53.98	5.83	AV
11570	42.21	11.71	H	53.92	73.98	20.06	PK
11570	35.59	11.71	H	47.30	53.98	6.68	AV

Band :	5.8 GHz
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5825 MHz
Channel No.	165 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11650	41.78	11.34	V	53.12	73.98	20.86	PK
11650	35.08	11.34	V	46.42	53.98	7.56	AV
11650	41.42	11.34	H	52.76	73.98	21.22	PK
11650	34.11	11.34	H	45.45	53.98	8.53	AV

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 - Amp Gain
5. We have done 802.11a mode and all data rate. Worst data rate is the lowest data of each mode
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band : 5.8 GHz

Operation Mode: 802.11 n_20 MHz BW

Transfer Rate: 6.5 Mbps

Operating Frequency 5745 MHz

Channel No. 149 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11490	41.77	11.22	V	52.99	73.98	20.99	PK
11490	34.81	11.22	V	46.03	53.98	7.95	AV
11490	41.31	11.22	H	52.53	73.98	21.45	PK
11490	33.99	11.22	H	45.21	53.98	8.77	AV

Band : 5.8 GHz

Operation Mode: 802.11 n_20 MHz BW

Transfer Rate: 6.5 Mbps

Operating Frequency 5785 MHz

Channel No. 157 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11570	42.54	11.71	V	54.25	73.98	19.73	PK
11570	36.25	11.71	V	47.96	53.98	6.02	AV
11570	42.52	11.71	H	54.23	73.98	19.75	PK
11570	36.23	11.71	H	47.94	53.98	6.04	AV

Band :	5.8 GHz
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5825 MHz
Channel No.	165 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11650	41.89	11.34	V	53.23	73.98	20.75	PK
11650	35.25	11.34	V	46.59	53.98	7.39	AV
11650	41.88	11.34	H	53.22	73.98	20.76	PK
11650	35.24	11.34	H	46.58	53.98	7.40	AV

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 - Amp Gain
5. We have done 802.11n_20 MHz BW mode and all data rate. Worst data rate is the lowest data of each mode
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna

Band : 5.8 GHz

Operation Mode: 802.11 n_40 MHz BW

Transfer Rate: 13.5 Mbps

Operating Frequency 5755 MHz

Channel No. 151 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11510	42.28	11.53	V	53.81	73.98	20.17	PK
11510	35.81	11.53	V	47.34	53.98	6.64	AV
11510	41.85	11.53	H	53.38	73.98	20.60	PK
11510	34.97	11.53	H	46.50	53.98	7.48	AV

Band : 5.8 GHz

Operation Mode: 802.11 n_40 MHz BW

Transfer Rate: 13.5 Mbps

Operating Frequency 5795 MHz

Channel No. 159 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11590	41.86	11.64	V	53.50	73.98	20.48	PK
11590	34.71	11.64	V	46.35	53.98	7.63	AV
11590	41.29	11.64	H	52.93	73.98	21.05	PK
11590	33.88	11.64	H	45.52	53.98	8.46	AV

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 - Amp Gain
5. We have done 802.11n_40 MHz BW mode and all data rate. Worst data rate is the lowest data of each mode
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

8.6.2 RADIATED RESTRICTED BAND EDGES

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

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)).

Band :	2.4 GHz
Operation Mode:	802.11g
Transfer Rate:	6 Mbps
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	27.46	33.90	H	61.36	73.98	12.62	PK
2390.0	12.78	33.90	H	46.68	53.98	7.30	AV
2390.0	26.20	33.90	V	60.10	73.98	13.88	PK
2390.0	12.30	33.90	V	46.20	53.98	7.78	AV
2483.5	33.08	33.99	H	67.07	73.98	6.91	PK
2483.5	15.00	33.99	H	48.99	53.98	4.99	AV
2483.5	31.67	33.99	V	65.66	73.98	8.32	PK
2483.5	14.57	33.99	V	48.56	53.98	5.42	AV

Band : 2.4 GHz

Operation Mode: 802.11b

Transfer Rate: 1 Mbps

Operating Frequency 2412 MHz, 2462 MHz

Channel No. 01 Ch, 11 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	25.47	33.90	H	59.37	73.98	14.61	PK
2390.0	13.77	33.90	H	47.67	53.98	6.31	AV
2390.0	25.29	33.90	V	59.19	73.98	14.79	PK
2390.0	13.75	33.90	V	47.65	53.98	6.33	AV
2483.5	24.86	33.99	H	58.85	73.98	15.13	PK
2483.5	13.50	33.99	H	47.49	53.98	6.49	AV
2483.5	24.67	33.99	V	58.66	73.98	15.32	PK
2483.5	13.48	33.99	V	47.47	53.98	6.51	AV

Band : 2.4 GHz

Operation Mode: 802.11n

Transfer Rate: 6.5 Mbps

Operating Frequency 2412 MHz, 2462 MHz

Channel No. 01 Ch, 11 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	25.60	33.90	H	59.50	73.98	14.48	PK
2390.0	12.37	33.90	H	46.27	53.98	7.71	AV
2390.0	25.14	33.90	V	59.04	73.98	14.94	PK
2390.0	12.25	33.90	V	46.15	53.98	7.83	AV
2483.5	34.05	33.99	H	68.04	73.98	5.94	PK
2483.5	15.93	33.99	H	49.92	53.98	4.06	AV
2483.5	33.37	33.99	V	67.36	73.98	6.62	PK
2483.5	15.51	33.99	V	49.50	53.98	4.48	AV

Notes:

1. Total = Reading Value + Antenna Factor + Cable Loss
2. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
3. 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		www.hct.co.kr
Test Report No. HCTR1402F010	Date of Issue: February 12, 2014	EUT Type: Mobile Phone	FCC ID: A3LSMN7506V

8.7 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 11 Mbps, Ch.6 and 802.11b.
Because 802.11b mode is worst case.

RESULT PLOTS

Conducted Emissions (Line 1)

EMI Auto Test(1)

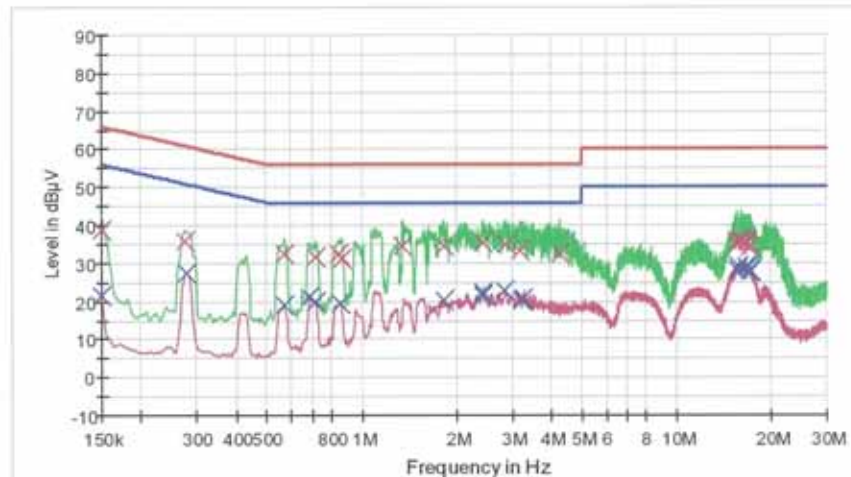
1 / 2

HCT TEST Report

Common Information

EUT: SM-N7506V
 Manufacturer: SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions: WLAN MODE(DTS)
 Operator Name: JC SHIN

FCC CLASS B



— FCC CLASS B_LQP — FCC CLASS B_L_AV — Preview Result 1-PK
 — Preview Result 2-AVG — Final Result 1-OPK — Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	38.9	9.000	Off	L1	9.7	27.1	66.0
0.276000	35.6	9.000	Off	L1	9.7	25.3	60.9
0.572000	32.6	9.000	Off	L1	9.8	23.4	56.0
0.711500	31.5	9.000	Off	L1	9.8	24.5	56.0
0.851000	32.4	9.000	Off	L1	9.8	23.8	56.0
0.869000	31.1	9.000	Off	L1	9.8	24.9	56.0
1.355000	34.6	9.000	Off	L1	9.8	21.4	56.0
1.832000	34.7	9.000	Off	L1	9.9	21.3	56.0
2.435000	35.4	9.000	Off	L1	9.9	20.6	56.0
2.885000	34.8	9.000	Off	L1	10.0	21.2	56.0
3.177500	33.3	9.000	Off	L1	10.0	22.7	56.0
4.298000	32.4	9.000	Off	L1	10.1	23.6	56.0
15.579500	34.8	9.000	Off	L1	10.7	25.2	60.0
15.795500	35.6	9.000	Off	L1	10.7	24.4	60.0
16.173500	35.9	9.000	Off	L1	10.8	24.1	60.0
16.560500	35.7	9.000	Off	L1	10.8	24.3	60.0

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EMI Auto Test(1)

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Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
16.880000	35.5	9.000	Off	L1	10.8	24.5	60.0
17.096000	34.3	9.000	Off	L1	10.8	25.7	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	21.4	9.000	Off	L1	9.7	34.6	56.0
0.280500	27.5	9.000	Off	L1	9.7	23.3	50.8
0.567500	18.8	9.000	Off	L1	9.8	27.2	46.0
0.684500	21.2	9.000	Off	L1	9.8	24.8	46.0
0.711500	20.0	9.000	Off	L1	9.8	26.0	46.0
0.855500	19.4	9.000	Off	L1	9.8	26.6	46.0
1.832000	20.1	9.000	Off	L1	9.9	25.9	46.0
2.417000	21.5	9.000	Off	L1	9.9	24.5	46.0
2.435000	22.5	9.000	Off	L1	9.9	23.5	46.0
2.858000	22.6	9.000	Off	L1	10.0	23.4	46.0
3.213500	20.1	9.000	Off	L1	10.0	25.9	46.0
3.276500	20.8	9.000	Off	L1	10.0	25.2	46.0
15.579500	28.4	9.000	Off	L1	10.7	21.6	50.0
15.795500	28.9	9.000	Off	L1	10.7	21.1	50.0
16.560500	28.9	9.000	Off	L1	10.8	21.1	50.0
16.880000	28.5	9.000	Off	L1	10.8	21.5	50.0
17.096000	27.7	9.000	Off	L1	10.8	22.3	50.0
17.132000	27.8	9.000	Off	L1	10.8	22.2	50.0

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Conducted Emissions (Line 2)

EMI Auto Test(1)

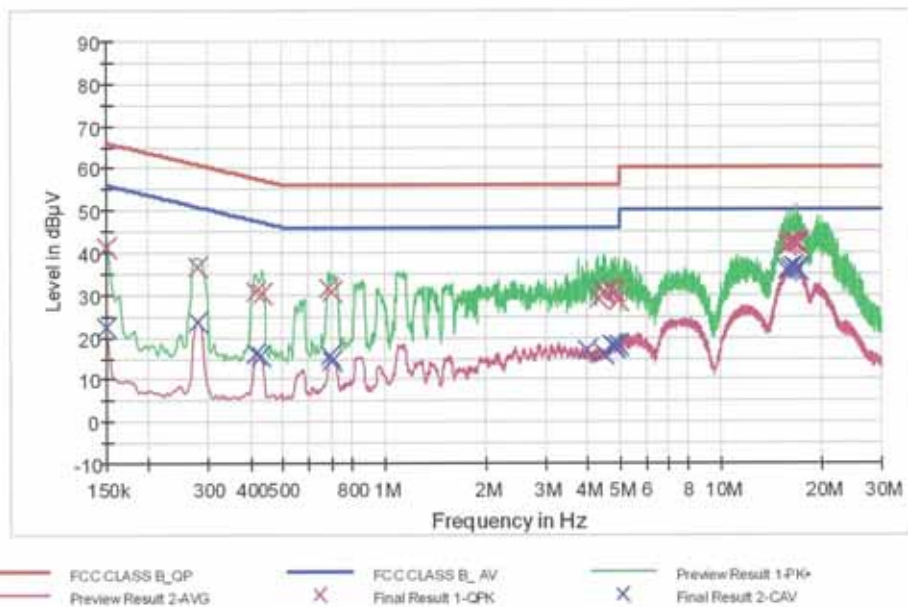
1 / 2

HCT TEST Report

Common Information

EUT: SM-N7506V
 Manufacturer: SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions: WLAN MODE(DTS)
 Operator Name: JC SHIN

FCC CLASS B



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	41.3	9.000	Off	N	9.7	24.7	66.0
0.280500	36.6	9.000	Off	N	9.7	24.2	60.8
0.415500	30.8	9.000	Off	N	9.8	26.7	57.5
0.433500	30.3	9.000	Off	N	9.8	26.9	57.2
0.684500	31.4	9.000	Off	N	9.8	24.6	56.0
0.698000	30.8	9.000	Off	N	9.8	25.2	56.0
4.343000	29.0	9.000	Off	N	10.1	27.0	56.0
4.482500	30.4	9.000	Off	N	10.1	25.6	56.0
4.554500	30.7	9.000	Off	N	10.1	25.3	56.0
4.748000	31.2	9.000	Off	N	10.1	24.8	56.0
4.838000	30.7	9.000	Off	N	10.1	25.3	56.0
4.986500	28.6	9.000	Off	N	10.1	27.4	56.0
15.822500	41.8	9.000	Off	N	10.7	18.2	60.0
16.101500	42.3	9.000	Off	N	10.7	17.7	60.0
16.542500	42.5	9.000	Off	N	10.7	17.5	60.0
16.799000	42.4	9.000	Off	N	10.7	17.6	60.0

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EMI Auto Test(1)

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Frequency (MHz)	QuasiPeak (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
16.817000	42.2	9.000	Off	N	10.7	17.8	60.0
16.979000	41.9	9.000	Off	N	10.7	18.1	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	22.3	9.000	Off	N	9.7	33.7	56.0
0.280500	23.4	9.000	Off	N	9.7	27.4	50.8
0.415500	15.9	9.000	Off	N	9.8	31.6	47.5
0.429000	15.5	9.000	Off	N	9.8	31.8	47.3
0.689000	15.8	9.000	Off	N	9.8	30.2	46.0
0.702500	14.6	9.000	Off	N	9.8	31.4	46.0
3.987500	16.9	9.000	Off	N	10.1	29.1	46.0
4.482500	16.1	9.000	Off	N	10.1	29.9	46.0
4.748000	18.0	9.000	Off	N	10.1	28.0	46.0
4.788500	17.6	9.000	Off	N	10.1	28.4	46.0
4.838000	17.8	9.000	Off	N	10.1	28.2	46.0
4.986500	18.0	9.000	Off	N	10.1	28.0	46.0
15.822500	35.8	9.000	Off	N	10.7	14.2	50.0
16.101500	36.3	9.000	Off	N	10.7	13.7	50.0
16.542500	36.4	9.000	Off	N	10.7	13.6	50.0
16.799000	36.3	9.000	Off	N	10.7	13.7	50.0
16.817000	36.1	9.000	Off	N	10.7	13.9	50.0
16.979000	35.9	9.000	Off	N	10.7	14.1	50.0

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9. 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
EMCO	6502.LOOP ANTENNA	Biennial	01/11/2014	9009-2536
Agilent	8493C / Attenuator(10 dB)	Annual	07/24/2014	76649
WEINSCHL	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