HCT CO., LTD.

CERTIFICATE OF COMPLIANCE

FCC Certification

Applicant Name:
LG Electronics MobileComm U.S.A., Inc.

Address:
1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Date of Issue:
June 02, 2014

Test Site/Location:
HCT CO., LTD., 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea

Report No.: HCT-R-1406-F006

HCT FRN: 0005866421

FCC ID : ZNFLGL24

APPLICANT : LG Electronics MobileComm U.S.A., Inc.

FCC Model(s):	LGL24
EUT Type:	Cellular/PCS GSM, Cellular WCDMA, LTE Phone with Bluetooth/WLAN/NFC
Max. RF Output Power:	Wi-Fi 802.11b (22.33 dBm) / Wi-Fi 802.11g (20.69 dBm)/ Wi-Fi 802.11n (2.4 GHz) (19.79 dBm) / Wi-Fi 802.11a (5.8 GHz) (18.77 dBm)/ Wi-Fi 802.11n_20 MHz BW (5.8 GHz) (17.88 dBm) / Wi-Fi 802.11n_40 MHz BW (5.8 GHz) (16.80 dBm) / Wi-Fi 802.11ac_20 MHz BW (5.8 GHz) (17.72 dBm) / Wi-Fi 802.11ac_40 MHz BW (5.8 GHz) (16.30 dBm) / Wi-Fi 802.11ac_80 MHz BW (5.8 GHz) (16.15 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 5775 MHz (5.8 GHz Band)_80 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
: Kyoung Houn Seo
Test engineer of RF Team

Approved by
: Chang Seok Choi
Manager of RF Team

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-R-1406-F006	June 02, 2014	- First Approval Report

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1. GENERAL INFORMATION

Applicant:	LG Electronics MobileComm U.S.A., Inc.
Address:	1000 Sylvan Avenue, Englewood Cliffs NJ 07632
FCC ID:	ZNFLGL24
EUT Type:	Cellular/PCS GSM, Cellular WCDMA, LTE Phone with Bluetooth/WLAN/NFC
Model name(s):	LGL24
Date(s) of Tests:	May 02, 2014 ~ May 29, 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	Cellular/PCS GSM, Cellular WCDMA, LTE Phone with Bluetooth/WLAN/NFC	
FCC Model Name	LGL24	
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 5775 MHz_80 MHz
	RX	: 2412 MHz~2462 MHz, 5745 MHz~5825 MHz_20 MHz, 5755 MHz~5795 MHz_40 MHz 5775 MHz_80 MHz
Max. RF Output Power	Peak	Wi-Fi 802.11b (22.33 dBm) / Wi-Fi 802.11g (20.69 dBm)/ Wi-Fi 802.11n (2.4 GHz) (19.79 dBm) / Wi-Fi 802.11a (5.8 GHz) (18.77 dBm)/ Wi-Fi 802.11n_20 MHz BW (5.8 GHz) (17.88 dBm) / Wi-Fi 802.11n_40 MHz BW (5.8 GHz) (16.80 dBm) / Wi-Fi 802.11ac_20 MHz BW (5.8 GHz) (17.72 dBm) / Wi-Fi 802.11ac_40 MHz BW (5.8 GHz) (16.30 dBm) / Wi-Fi 802.11ac_80 MHz BW (5.8 GHz) (16.15 dBm)
	Average	Wi-Fi 802.11b (16.25 dBm) / Wi-Fi 802.11g (12.25 dBm)/ Wi-Fi 802.11n (2.4 GHz) (11.24 dBm) / Wi-Fi 802.11a (5.8 GHz) (11.14 dBm)/ Wi-Fi 802.11n_20 MHz BW (5.8 GHz) (10.32 dBm) / Wi-Fi 802.11n_40 MHz BW (5.8 GHz) (9.28 dBm) / Wi-Fi 802.11ac_20 MHz BW (5.8 GHz) (10.33 dBm) / Wi-Fi 802.11ac_40 MHz BW (5.8 GHz) (9.19 dBm) / Wi-Fi 802.11ac_80 MHz BW (5.8 GHz) (9.05 dBm)
Modulation Type	DSSS/CCK(802.11b), OFDM(802.11a, 802.11g, 802.11n, 802.11ac)	
Antenna Specification	Manufacturer: Ace Technology Antenna type: BUILT-IN Antenna Peak Gain : -0.81 dBi (2.4 GHz Band), -8.10 dBi (5GHz Band)	

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. For 802.11ac, KDB644545 D01 v01r01 dated April 08, 2013.

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.

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 February 28, 2014 (Registration Number: 90661)

5.2 EQUIPMENT

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

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

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

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

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

7. 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 8.7		PASS
Radiated Spurious Emissions	§15.205, 15.209	cf. Section 8.6.1	RADIATED	PASS
Radiated Restricted Band Edge	§15.247(d), 15.205, 15.209	cf. Section 8.6.2		PASS

8. TEST RESULT

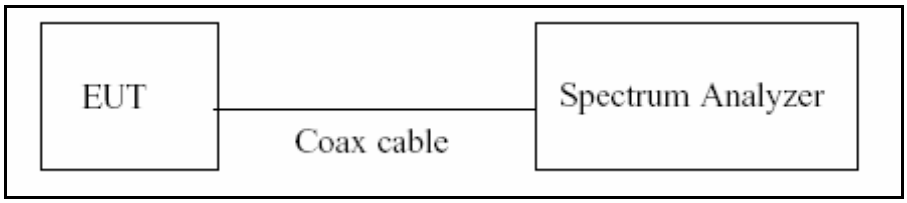
8.1 DUTY CYCLE (802.11a/b/g/n/ac)

▣ TEST PROCEDURE

According to KDB558074)6)b), issued 04/09/2013)

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 ≥ OBW if possible; otherwise, set RBW to the largest available value. Set VBW ≥ 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 ≤ 16.7 microseconds.)

▣ TEST CONFIGURATION



▣ TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer. We tested accroding 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 ≤ 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 (≥ 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*log(1/Duty Cycle)

▣ 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	12.200	12.320	0.99025974	0.043
	2	6.180	6.300	0.98095238	0.084
	5.5	2.360	2.480	0.95161290	0.215
	11	1.280	1.380	0.92753623	0.327
2.4 GHz Band 802.11g and 5.8 GHz Band 802.11a	6	2.030	2.130	0.95305164	0.209
	9	1.360	1.460	0.93150685	0.308
	12	1.026	1.125	0.91200000	0.400
	18	0.687	0.789	0.87072243	0.601
	24	0.522	0.622	0.83922830	0.761
	36	0.354	0.454	0.77973568	1.081
	48	0.271	0.371	0.73045822	1.364
	54	0.243	0.343	0.70845481	1.497
2.4 GHz Band 802.11n_20 MHz BW and 5.8 GHz Band 802.11n_20 MHz BW	6.5	1.880	1.980	0.94949495	0.225
	13	0.950	1.050	0.90476190	0.435
	19.5	0.640	0.740	0.86486486	0.631
	26	0.488	0.586	0.83276451	0.795
	39	0.336	0.436	0.77064220	1.131
	52	0.254	0.354	0.71751412	1.442
	58.5	0.231	0.330	0.70000000	1.549
	65	0.211	0.310	0.68064516	1.671
2.4 GHz & 5.8 GHz Band 802.11n_40 MHz BW	13.5	0.920	1.020	0.90196078	0.448
	27	0.472	0.572	0.82517483	0.835
	40.5	0.322	0.423	0.76122931	1.185
	54	0.247	0.348	0.70977011	1.489
	81	0.175	0.275	0.63636364	1.963
	108	0.135	0.235	0.57446809	2.407
	121.5	0.123	0.223	0.55156951	2.584
	135	0.115	0.215	0.53488372	2.717
5.8 GHz Band 802.11ac_20 MHz BW	6.5	0.975	1.074	0.90782123	0.420
	13	0.508	0.606	0.83828383	0.766
	19.5	0.350	0.450	0.77777778	1.091
	26	0.276	0.374	0.73796791	1.320
	39	0.195	0.294	0.66326531	1.783
	52	0.159	0.258	0.61627907	2.102
	58.5	0.143	0.241	0.59336100	2.267
	65	0.136	0.234	0.58119658	2.357
	78	0.120	0.218	0.55045872	2.593

Mode	Data Rate	T_{on} (ms)	T_{total} (ms)	Duty Cycle	Duty Cycle Factor (dB)
5.8 GHz Band 802.11ac_40 MHz BW	13.5	0.491	0.590	0.83220339	0.798
	27	0.267	0.366	0.72950820	1.370
	40.5	0.191	0.291	0.65635739	1.829
	54	0.155	0.255	0.60784314	2.162
	81	0.115	0.215	0.53488372	2.717
	108	0.099	0.199	0.49748744	3.032
	121.5	0.091	0.191	0.47643979	3.220
	135	0.087	0.187	0.46524064	3.323
	162	0.080	0.180	0.44444444	3.522
	180	0.076	0.175	0.43428571	3.622
5.8 GHz Band 802.11ac_80 MHz BW	29.3	0.247	0.347	0.71181556	1.476
	58.5	0.144	0.244	0.59016393	2.290
	87.8	0.111	0.212	0.52358491	2.810
	117	0.092	0.192	0.47916667	3.195
	175.5	0.076	0.176	0.43181818	3.647
	234	0.067	0.168	0.39880952	3.992
	263.3	0.064	0.164	0.39024390	4.087
	292.5	0.063	0.164	0.38414634	4.155
	351	0.059	0.159	0.37106918	4.305
	390	0.055	0.156	0.35256410	4.528

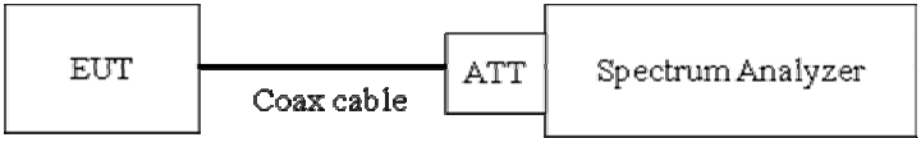
8.2 6dB BANDWIDTH (802.11a/b/g/n/ac)

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 ≥ 3 x 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	9.059	0.500	Pass
2437	6	9.036	0.500	Pass
2462	11	8.568	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	16.41	0.500	Pass
2437	6	16.45	0.500	Pass
2462	11	16.40	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	17.61	0.500	Pass
2437	6	17.65	0.500	Pass
2462	11	17.61	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	16.47	0.500	Pass
5785	157	16.42	0.500	Pass
5825	165	16.41	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	17.62	0.500	Pass
5785	157	17.64	0.500	Pass
5825	165	17.62	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	35.24	0.500	Pass
5795	159	35.25	0.500	Pass

Conducted 6 dB Bandwidth Measurements for 802.11ac_20 MHz BW

802.11ac Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5745	149	17.63	0.500	Pass
5785	157	17.62	0.500	Pass
5825	165	17.64	0.500	Pass

Conducted 6 dB Bandwidth Measurements for 802.11ac_40 MHz BW

802.11ac Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5755	151	35.22	0.500	Pass
5795	159	35.21	0.500	Pass

Conducted 6 dB Bandwidth Measurements for 802.11ac_80 MHz BW

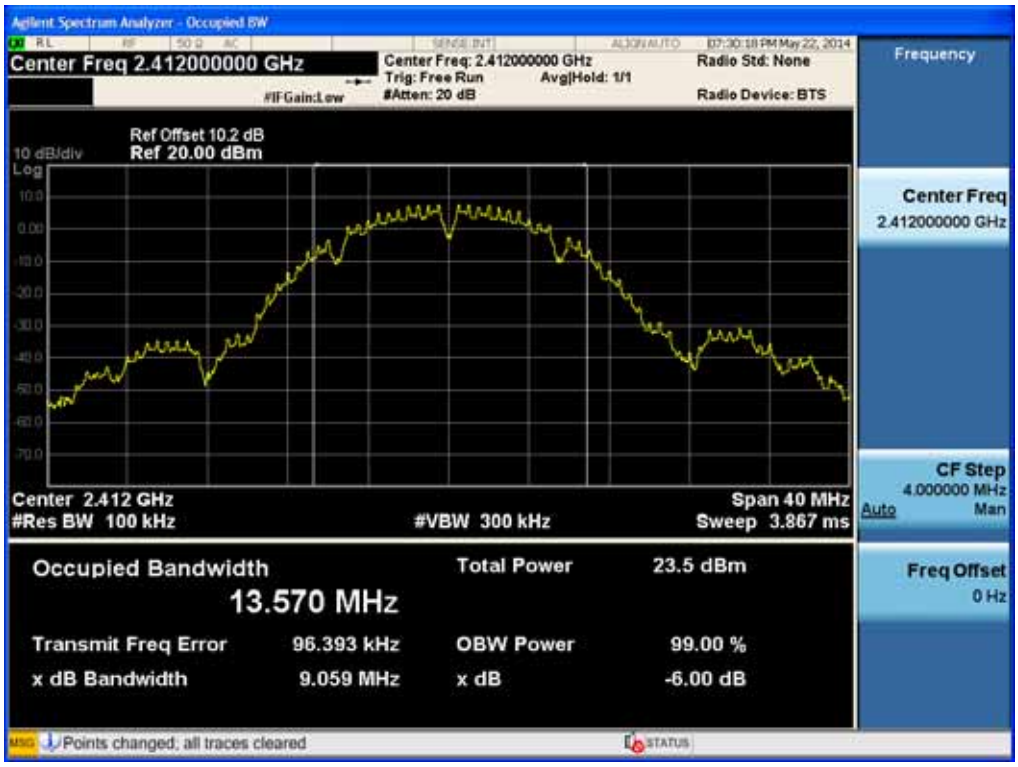
802.11ac Mode		Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
Frequency [MHz]	Channel No.			
5775	155	75.15	0.500	Pass

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

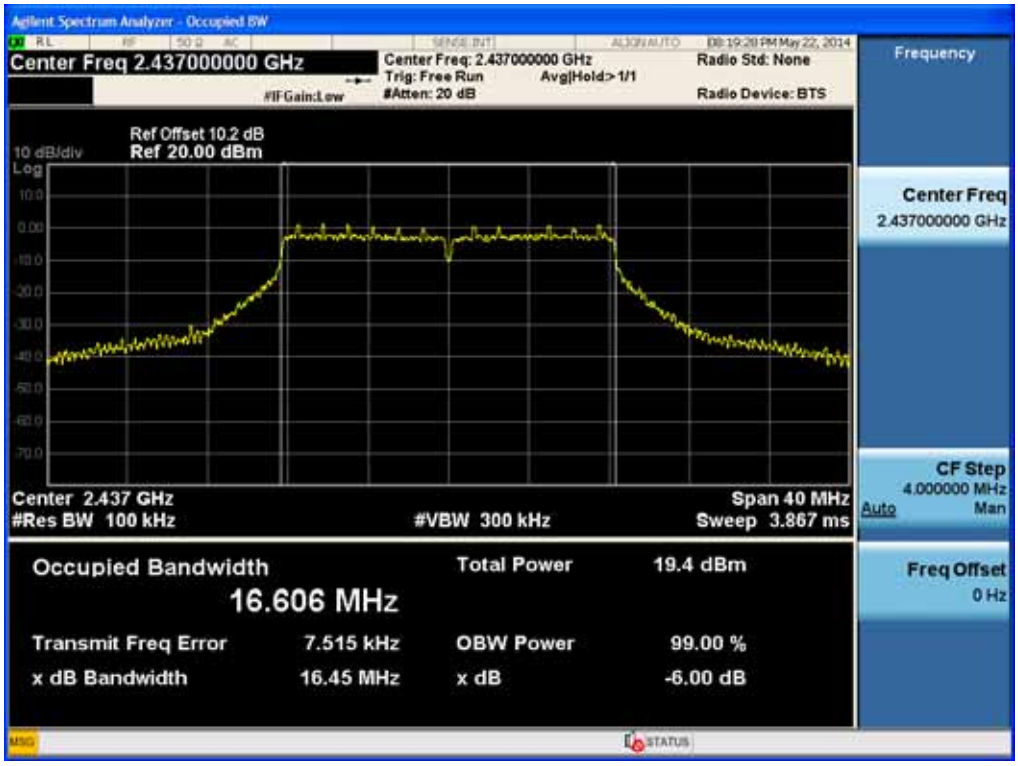
▣ RESULT PLOTS

2.4 GHz Band

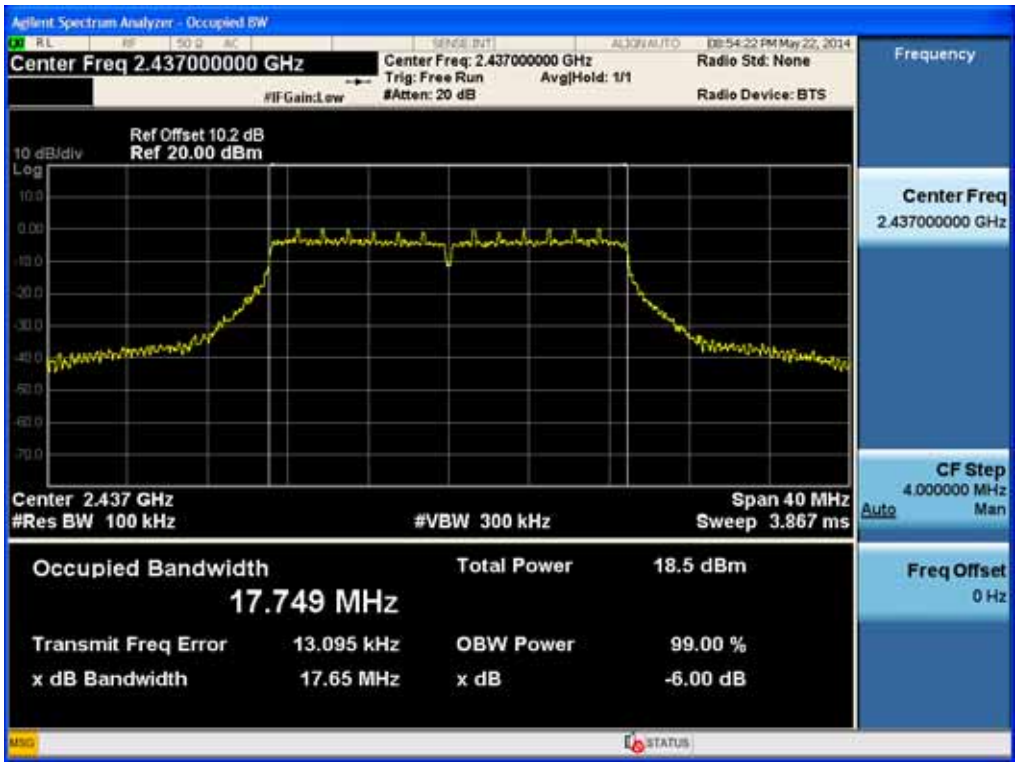
6dB Bandwidth plot (802.11b-CH 1)



6dB Bandwidth plot (802.11g-CH 6)



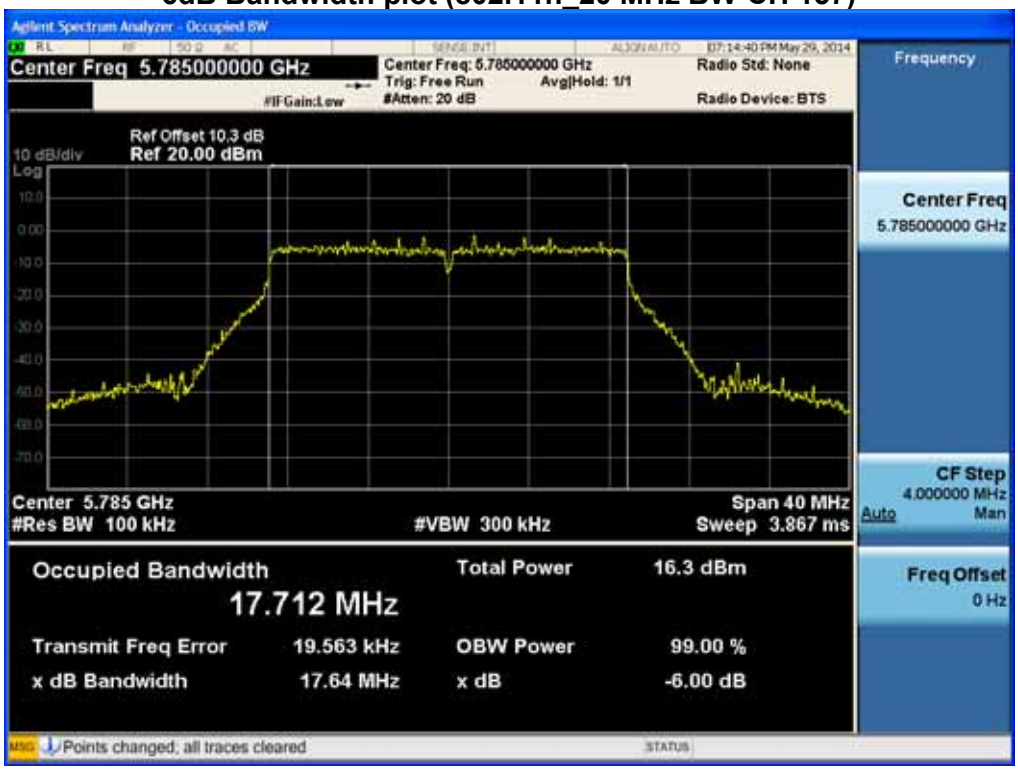
6dB Bandwidth plot (802.11n-CH 6)



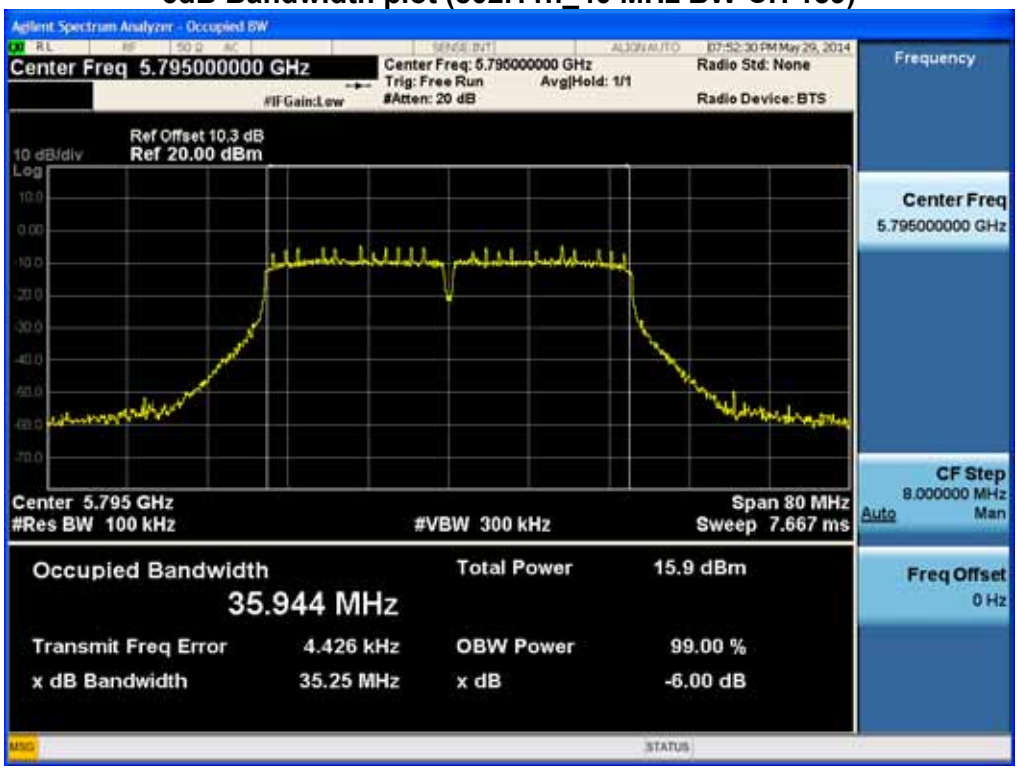
5.8 GHz Band

6dB Bandwidth plot (802.11a-CH 149)

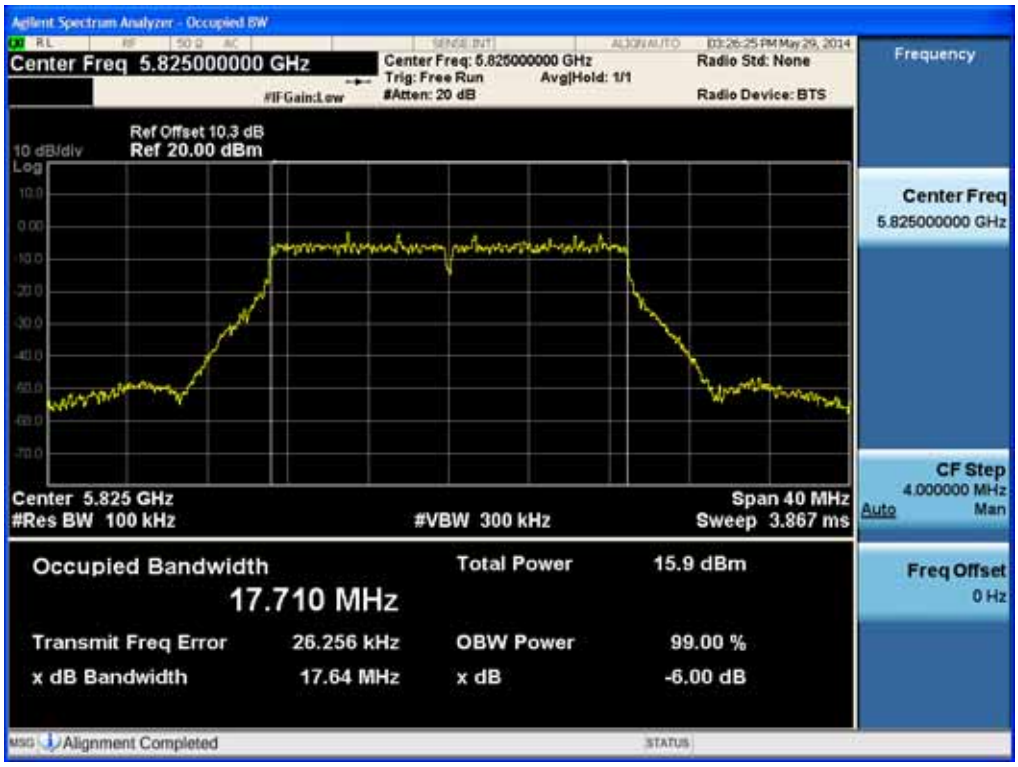
6dB Bandwidth plot (802.11n_20 MHz BW-CH 157)



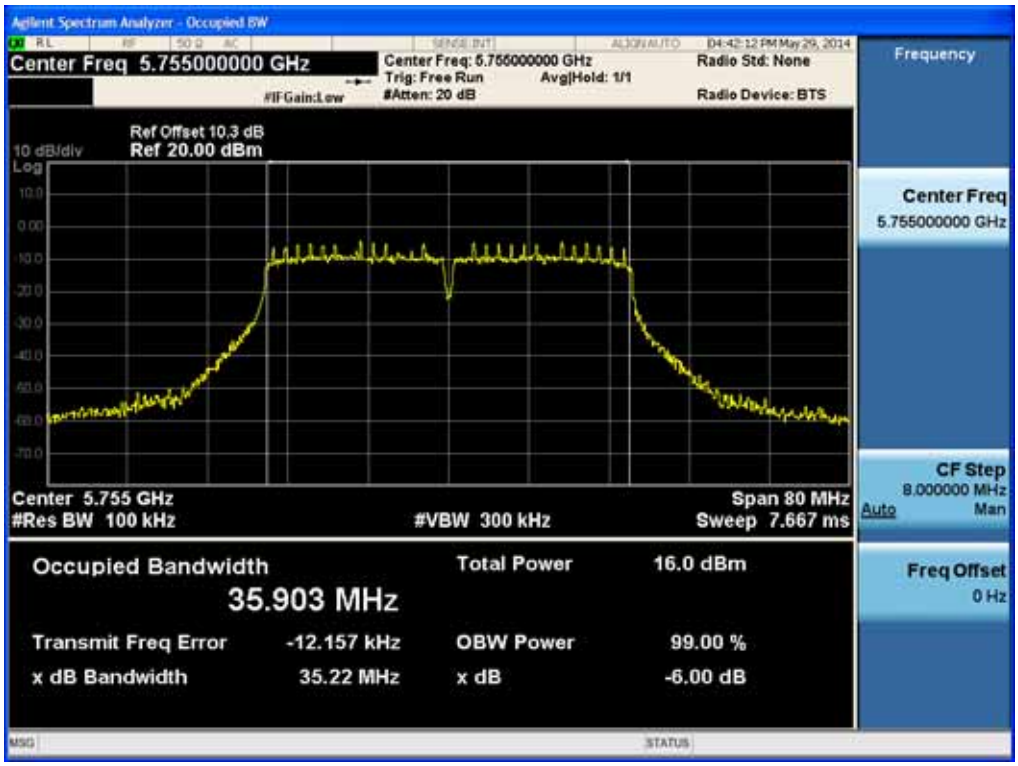
6dB Bandwidth plot (802.11n_40 MHz BW-CH 159)



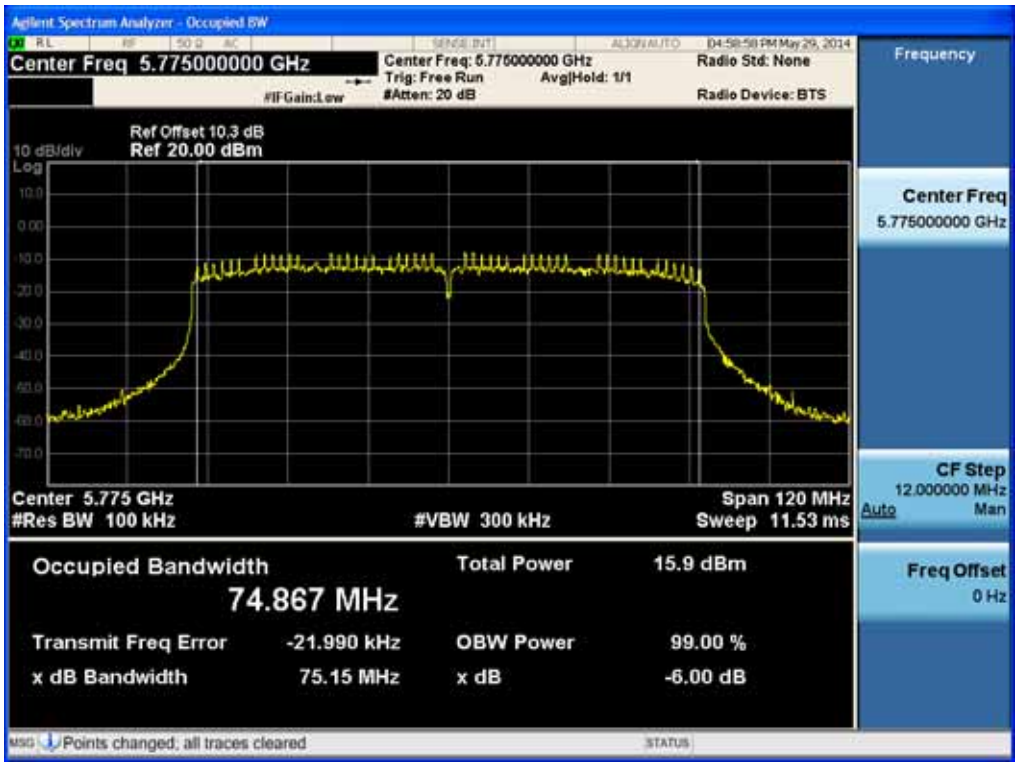
6dB Bandwidth plot (802.11ac_20 MHz BW-CH 165)



6dB Bandwidth plot (802.11ac_40 MHz BW-CH 151)



6dB Bandwidth plot (802.11ac_80 MHz BW-CH 155)



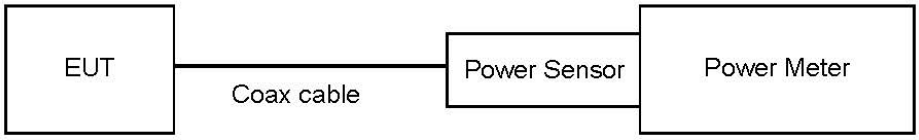
8.3 OUTPUT POWER (802.11a/b/g/n/ac)

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.

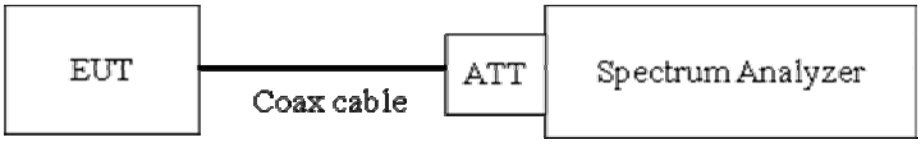
Note :

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 & 80 MHz BW)



▣ TEST PROCEDURE(40 MHz & 80 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 ≥ 3 x RBW

SPAN ≥ 1.5 x 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 ≥ 3 x RBW.

Number of points in sweep ≥ 2 x span / RBW. (This gives bin-to-bin spacing ≤ 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.

▣ 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	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
2412	1	1 Mbps	18.50	30
		2 Mbps	18.82	30
		5.5 Mbps	20.50	30
		11 Mbps	22.23	30
2437	6	1 Mbps	18.59	30
		2 Mbps	18.87	30
		5.5 Mbps	20.53	30
		11 Mbps	22.33	30
2462	11	1 Mbps	18.52	30
		2 Mbps	18.79	30
		5.5 Mbps	20.51	30
		11 Mbps	22.13	30

Conducted Output Power Measurements (802.11g Mode)

802.11g Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
2412	1	6 Mbps	20.02	30
		9 Mbps	20.06	30
		12 Mbps	20.23	30
		18 Mbps	20.23	30
		24 Mbps	20.56	30
		36 Mbps	20.55	30
		48 Mbps	20.69	30
		54 Mbps	20.49	30
2437	6	6 Mbps	20.10	30
		9 Mbps	20.09	30
		12 Mbps	20.17	30
		18 Mbps	20.10	30
		24 Mbps	20.51	30
		36 Mbps	20.65	30
		48 Mbps	20.66	30
		54 Mbps	20.61	30
2462	11	6 Mbps	20.14	30
		9 Mbps	20.13	30
		12 Mbps	20.30	30
		18 Mbps	20.16	30
		24 Mbps	20.58	30
		36 Mbps	20.56	30
		48 Mbps	20.52	30
		54 Mbps	20.66	30

Conducted Output Power Measurements (802.11n Mode)

802.11n Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
2412	1	6.5 Mbps	19.22	30
		13 Mbps	19.28	30
		19.5 Mbps	19.30	30
		26 Mbps	19.68	30
		39 Mbps	19.63	30
		52 Mbps	19.79	30
		58.5 Mbps	19.62	30
		65 Mbps	19.61	30
2437	6	6.5 Mbps	19.14	30
		13 Mbps	19.25	30
		19.5 Mbps	19.26	30
		26 Mbps	19.62	30
		39 Mbps	19.60	30
		52 Mbps	19.70	30
		58.5 Mbps	19.64	30
		65 Mbps	19.63	30
2462	11	6.5 Mbps	19.10	30
		13 Mbps	19.21	30
		19.5 Mbps	19.10	30
		26 Mbps	19.55	30
		39 Mbps	19.61	30
		52 Mbps	19.67	30
		58.5 Mbps	19.61	30
		65 Mbps	19.65	30

5.8 GHz Band

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

802.11a Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
5745	149	6 Mbps	18.17	30
		9 Mbps	18.56	30
		12 Mbps	18.27	30
		18 Mbps	18.27	30
		24 Mbps	18.77	30
		36 Mbps	18.39	30
		48 Mbps	18.53	30
		54 Mbps	18.57	30
5785	157	6 Mbps	17.94	30
		9 Mbps	17.94	30
		12 Mbps	17.63	30
		18 Mbps	17.68	30
		24 Mbps	18.09	30
		36 Mbps	18.11	30
		48 Mbps	18.20	30
		54 Mbps	18.02	30
5825	165	6 Mbps	17.85	30
		9 Mbps	17.60	30
		12 Mbps	17.30	30
		18 Mbps	17.36	30
		24 Mbps	17.86	30
		36 Mbps	17.81	30
		48 Mbps	17.75	30
		54 Mbps	17.88	30

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

802.11n Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
5745	149	6.5 Mbps	17.79	30
		13 Mbps	17.49	30
		19.5 Mbps	17.47	30
		26 Mbps	17.86	30
		39 Mbps	17.88	30
		52 Mbps	17.81	30
		58.5 Mbps	17.80	30
		65 Mbps	17.71	30
5785	157	6.5 Mbps	17.33	30
		13 Mbps	16.95	30
		19.5 Mbps	16.95	30
		26 Mbps	17.48	30
		39 Mbps	17.45	30
		52 Mbps	17.55	30
		58.5 Mbps	17.36	30
		65 Mbps	17.25	30
5825	165	6.5 Mbps	17.03	30
		13 Mbps	16.73	30
		19.5 Mbps	16.75	30
		26 Mbps	17.21	30
		39 Mbps	17.20	30
		52 Mbps	17.31	30
		58.5 Mbps	17.25	30
		65 Mbps	17.22	30

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

802.11n Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
5755	151	13.5 Mbps	16.78	30
		27 Mbps	16.49	30
		40.5 Mbps	16.40	30
		54 Mbps	16.80	30
		81 Mbps	16.70	30
		108 Mbps	16.65	30
		121.5 Mbps	16.76	30
		135 Mbps	16.75	30
5795	159	13.5 Mbps	16.42	30
		27 Mbps	16.03	30
		40.5 Mbps	16.14	30
		54 Mbps	16.44	30
		81 Mbps	16.40	30
		108 Mbps	16.31	30
		121.5 Mbps	16.42	30
		135 Mbps	16.33	30

Conducted Output Power Measurements (802.11ac_20 MHz BW Mode: 5745~5825)

802.11ac Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
5745	149	6.5	17.72	30
		13	17.32	30
		19.5	17.27	30
		26	17.69	30
		39	17.57	30
		52	17.46	30
		58.5	17.40	30
		65	17.22	30
		78	17.25	30
5785	157	6.5	17.34	30
		13	16.91	30
		19.5	16.80	30
		26	17.04	30
		39	17.08	30
		52	16.97	30
		58.5	17.16	30
		65	16.77	30
		78	16.76	30
5825	165	6.5	17.18	30
		13	16.79	30
		19.5	16.65	30
		26	17.03	30
		39	16.93	30
		52	16.77	30
		58.5	17.00	30
		65	16.61	30
		78	16.75	30

Conducted Output Power Measurements (802.11ac_40 MHz BW Mode: 5755~5795)

802.11ac Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
5755	151	13.5	16.30	30
		27	16.19	30
		40.5	16.01	30
		54	16.23	30
		81	16.29	30
		108	15.88	30
		121.5	15.94	30
		135	15.75	30
		162	15.95	30
		180	16.28	30
5795	159	13.5	15.97	30
		27	15.83	30
		40.5	15.53	30
		54	15.85	30
		81	15.74	30
		108	15.50	30
		121.5	15.46	30
		135	15.21	30
		162	15.49	30
		180	15.59	30

Conducted Output Power Measurements (802.11ac_80 MHz BW Mode: 5775)

802.11ac Mode		Rate	Measured	Limit
Frequency[MHz]	Channel No.	(Mbps)	Power(dBm)	(dBm)
5775	155	29.3	16.15	30
		58.5	15.57	30
		87.8	15.66	30
		117	16.00	30
		175.5	15.92	30
		234	15.97	30
		263.3	15.58	30
		292.5	15.66	30
		351	16.05	30
		390	15.75	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	15.92	0.043	15.97	30
		2 Mbps	15.89	0.084	15.98	30
		5.5 Mbps	15.99	0.215	16.20	30
		11 Mbps	15.70	0.327	16.03	30
2437	6	1 Mbps	16.03	0.043	16.07	30
		2 Mbps	15.99	0.084	16.07	30
		5.5 Mbps	16.03	0.215	16.25	30
		11 Mbps	15.83	0.327	16.16	30
2462	11	1 Mbps	16.02	0.043	16.06	30
		2 Mbps	16.01	0.084	16.10	30
		5.5 Mbps	15.98	0.215	16.20	30
		11 Mbps	15.78	0.327	16.11	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	11.84	0.209	12.05	30
		9 Mbps	11.78	0.308	12.09	30
		12 Mbps	11.85	0.400	12.25	30
		18 Mbps	11.60	0.601	12.20	30
		24 Mbps	11.32	0.761	12.08	30
		36 Mbps	11.06	1.081	12.14	30
		48 Mbps	10.76	1.364	12.12	30
		54 Mbps	10.75	1.497	12.24	30
2437	6	6 Mbps	11.93	0.209	12.14	30
		9 Mbps	11.86	0.308	12.17	30
		12 Mbps	11.74	0.400	12.14	30
		18 Mbps	11.51	0.601	12.11	30
		24 Mbps	11.27	0.761	12.03	30
		36 Mbps	11.10	1.081	12.18	30
		48 Mbps	10.81	1.364	12.17	30
		54 Mbps	10.61	1.497	12.10	30
2462	11	6 Mbps	11.98	0.209	12.19	30
		9 Mbps	11.87	0.308	12.18	30
		12 Mbps	11.84	0.400	12.24	30
		18 Mbps	11.55	0.601	12.15	30
		24 Mbps	11.31	0.761	12.07	30
		36 Mbps	11.06	1.081	12.14	30
		48 Mbps	10.72	1.364	12.08	30
		54 Mbps	10.61	1.497	12.11	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	11.01	0.225	11.24	30
		13 Mbps	10.78	0.435	11.22	30
		19.5 Mbps	10.56	0.631	11.19	30
		26 Mbps	10.39	0.795	11.19	30
		39 Mbps	10.07	1.131	11.20	30
		52 Mbps	9.76	1.442	11.20	30
		58.5 Mbps	9.60	1.549	11.15	30
		65 Mbps	9.41	1.671	11.08	30
2437	6	6.5 Mbps	10.97	0.225	11.19	30
		13 Mbps	10.71	0.435	11.15	30
		19.5 Mbps	10.55	0.631	11.18	30
		26 Mbps	10.26	0.795	11.05	30
		39 Mbps	9.99	1.131	11.12	30
		52 Mbps	9.71	1.442	11.15	30
		58.5 Mbps	9.62	1.549	11.17	30
		65 Mbps	9.51	1.671	11.18	30
2462	11	6.5 Mbps	10.91	0.225	11.14	30
		13 Mbps	10.68	0.435	11.12	30
		19.5 Mbps	10.37	0.631	11.00	30
		26 Mbps	10.21	0.795	11.00	30
		39 Mbps	10.00	1.131	11.14	30
		52 Mbps	9.67	1.442	11.11	30
		58.5 Mbps	9.54	1.549	11.09	30
		65 Mbps	9.55	1.671	11.22	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	10.84	0.209	11.05	30
		9 Mbps	10.68	0.308	10.99	30
		12 Mbps	10.64	0.400	11.04	30
		18 Mbps	10.54	0.601	11.14	30
		24 Mbps	10.31	0.761	11.07	30
		36 Mbps	9.76	1.081	10.84	30
		48 Mbps	9.52	1.364	10.89	30
		54 Mbps	9.48	1.497	10.98	30
5785	157	6 Mbps	10.28	0.209	10.49	30
		9 Mbps	10.24	0.308	10.55	30
		12 Mbps	10.06	0.400	10.46	30
		18 Mbps	9.91	0.601	10.51	30
		24 Mbps	9.70	0.761	10.46	30
		36 Mbps	9.44	1.081	10.52	30
		48 Mbps	9.14	1.364	10.51	30
		54 Mbps	8.85	1.497	10.35	30
5825	165	6 Mbps	10.11	0.209	10.32	30
		9 Mbps	9.79	0.308	10.09	30
		12 Mbps	9.75	0.400	10.15	30
		18 Mbps	9.58	0.601	10.18	30
		24 Mbps	9.36	0.761	10.12	30
		36 Mbps	9.12	1.081	10.20	30
		48 Mbps	9.05	1.364	10.41	30
		54 Mbps	8.75	1.497	10.25	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	10.04	0.225	10.27	30
		13 Mbps	9.87	0.435	10.30	30
		19.5 Mbps	9.69	0.631	10.32	30
		26 Mbps	9.44	0.795	10.23	30
		39 Mbps	9.13	1.131	10.26	30
		52 Mbps	8.74	1.442	10.18	30
		58.5 Mbps	8.63	1.549	10.18	30
		65 Mbps	8.52	1.671	10.19	30
5785	157	6.5 Mbps	9.51	0.225	9.74	30
		13 Mbps	9.33	0.435	9.76	30
		19.5 Mbps	9.21	0.631	9.84	30
		26 Mbps	9.04	0.795	9.84	30
		39 Mbps	8.73	1.131	9.86	30
		52 Mbps	8.45	1.442	9.89	30
		58.5 Mbps	8.16	1.549	9.71	30
		65 Mbps	7.98	1.671	9.65	30
5825	165	6.5 Mbps	9.34	0.225	9.57	30
		13 Mbps	9.05	0.435	9.49	30
		19.5 Mbps	8.94	0.631	9.57	30
		26 Mbps	8.73	0.795	9.53	30
		39 Mbps	8.52	1.131	9.66	30
		52 Mbps	8.18	1.442	9.62	30
		58.5 Mbps	8.05	1.549	9.60	30
		65 Mbps	7.84	1.671	9.51	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	8.66	0.448	9.11	30
		27 Mbps	8.40	0.835	9.23	30
		40.5 Mbps	8.06	1.185	9.25	30
		54 Mbps	7.75	1.489	9.24	30
		81 Mbps	7.22	1.963	9.18	30
		108 Mbps	6.85	2.407	9.26	30
		121.5 Mbps	6.69	2.584	9.28	30
		135 Mbps	6.55	2.717	9.27	30
5795	159	13.5 Mbps	8.40	0.448	8.85	30
		27 Mbps	8.06	0.835	8.89	30
		40.5 Mbps	7.80	1.185	8.99	30
		54 Mbps	7.37	1.489	8.86	30
		81 Mbps	7.00	1.963	8.96	30
		108 Mbps	6.48	2.407	8.89	30
		121.5 Mbps	6.35	2.584	8.93	30
		135 Mbps	6.17	2.717	8.89	30

Conducted Output Power Measurements (802.11ac_20 MHz BW Mode: 5745~5825)

802.11ac 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	9.86	0.420	10.28	30
		13	9.47	0.766	10.24	30
		19.5	9.20	1.091	10.29	30
		26	8.99	1.320	10.31	30
		39	8.34	1.783	10.13	30
		52	8.23	2.102	10.33	30
		58.5	7.94	2.267	10.21	30
		65	7.83	2.357	10.19	30
		78	7.63	2.593	10.22	30
5785	157	6.5	9.46	0.420	9.88	30
		13	9.01	0.766	9.78	30
		19.5	8.72	1.091	9.81	30
		26	8.47	1.320	9.79	30
		39	8.05	1.783	9.83	30
		52	7.86	2.102	9.96	30
		58.5	7.65	2.267	9.92	30
		65	7.43	2.357	9.79	30
		78	7.13	2.593	9.73	30
5825	165	6.5	9.33	0.420	9.75	30
		13	8.88	0.766	9.65	30
		19.5	8.57	1.091	9.66	30
		26	8.20	1.320	9.52	30
		39	7.99	1.783	9.78	30
		52	7.75	2.102	9.86	30
		58.5	7.54	2.267	9.81	30
		65	7.31	2.357	9.66	30
		78	7.01	2.593	9.60	30

Conducted Output Power Measurements (802.11ac_40 MHz BW Mode: 5755~5795)

802.11ac 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	8.10	0.798	8.89	30
		27	7.67	1.370	9.04	30
		40.5	7.26	1.829	9.09	30
		54	6.78	2.162	8.94	30
		81	6.35	2.717	9.07	30
		108	6.03	3.032	9.06	30
		121.5	5.92	3.220	9.14	30
		135	5.78	3.323	9.10	30
		162	5.60	3.522	9.12	30
		180	5.57	3.622	9.19	30
5795	159	13.5	7.81	0.798	8.61	30
		27	7.30	1.370	8.67	30
		40.5	6.71	1.829	8.54	30
		54	6.27	2.162	8.43	30
		81	5.79	2.717	8.51	30
		108	5.58	3.032	8.61	30
		121.5	5.44	3.220	8.66	30
		135	5.16	3.323	8.48	30
		162	5.13	3.522	8.65	30
		180	4.99	3.622	8.62	30

Conducted Output Power Measurements (802.11ac_80 MHz BW Mode: 5775)

802.11ac Mode		Rate (Mbps)	Measured Power(dBm)	Duty Cycle Factor	Measured Power(dBm) + Duty Cycle Factor	Limit (dBm)
Frequency [MHz]	Channel No.					
5775	155	29.3	7.42	1.476	8.90	30
		58.5	6.36	2.290	8.65	30
		87.8	5.97	2.810	8.78	30
		117	5.50	3.195	8.70	30
		175.5	5.17	3.647	8.82	30
		234	5.02	3.992	9.01	30
		263.3	4.60	4.087	8.68	30
		292.5	4.65	4.155	8.80	30
		351	4.74	4.305	9.05	30
		390	4.33	4.528	8.86	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 (802.11ac-CH 151) 13.5 Mbps

80 MHz BW

(5775 MHz)

Conducted Output Power (802.11ac-CH 155) 29.3 Mbps

▣ RESULT PLOTS-Average

40 MHz BW

(5755 MHz ~5795 MHz)

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

Conducted Output Power (802.11ac-CH 151) 180 Mbps

80 MHz BW

(5775 MHz)

Conducted Output Power (802.11ac-CH 155) 351 Mbps

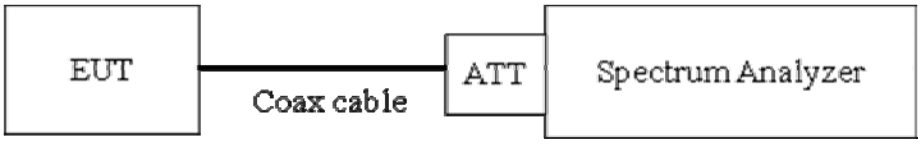
8.4 POWER SPECTRAL DENSITY (802.11a/b/g/n/ac)

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

PSD = Reading Value + ATT loss + Cable loss(1 ea)

Output Power = -5 dBm + 10 dB + 0.8 dB = 5.8 dBm

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.

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

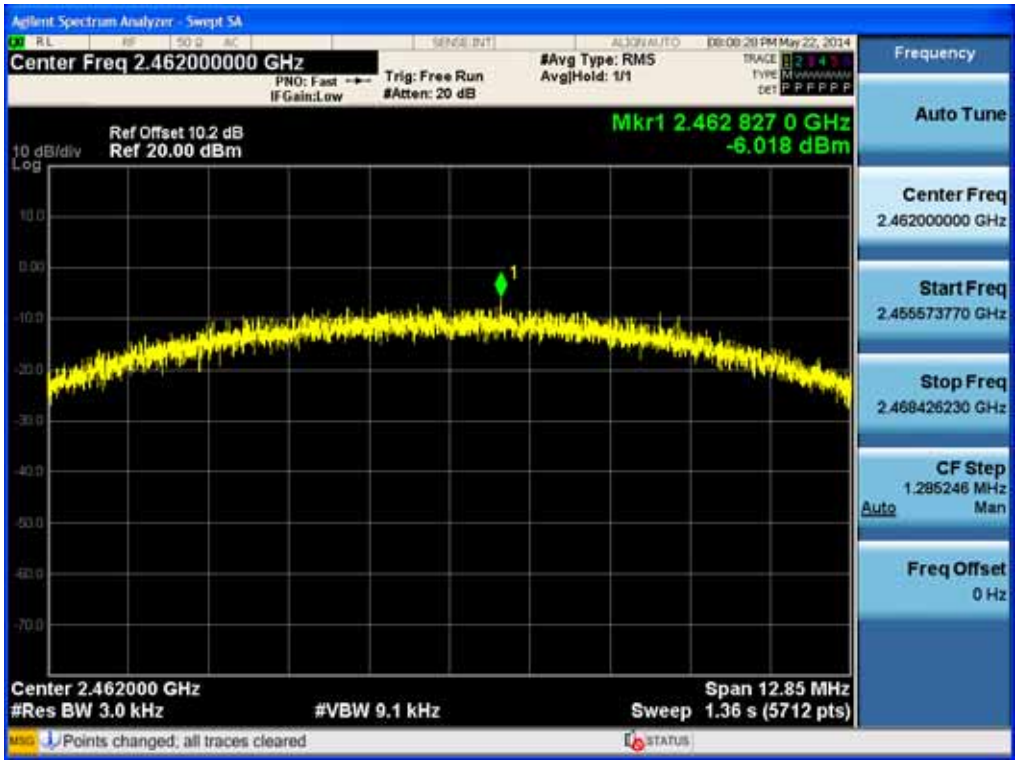
Frequency (MHz)	Channel No.	Mode	Test Result		
			PSD (dBm)	Limit (dBm)	Pass/Fail
2412	1	802.11b	-6.458	8	Pass
2437	6		-6.955		Pass
2462	11		-6.018		Pass
2412	1	802.11g	-12.592		Pass
2437	6		-13.160		Pass
2462	11		-13.518		Pass
2412	1	802.11n 2.4 GHz Band	-13.884		Pass
2437	6		-14.599		Pass
2462	11		-14.703		Pass
5745	149	802.11a	-14.685		Pass
5785	157		-14.965		Pass
5825	165		-15.411		Pass
5745	149	802.11n_20 MHz BW 5.8 GHz Band	-14.895		Pass
5785	157		-15.990		Pass
5825	165		-15.327		Pass
5755	151	802.11n_40 MHz BW 5.8 GHz Band	-20.766		Pass
5795	159		-20.030		Pass
5745	149	802.11ac_20 MHz BW 5.8 GHz Band	-16.690		Pass
5785	157		-17.094		Pass
5825	165		-15.080		Pass
5755	151	802.11ac_40 MHz BW 5.8 GHz Band	-20.119		Pass
5795	159		-20.620		Pass
5775	155	802.11ac_80 MHz BW 5.8 GHz Band	-23.028		Pass

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

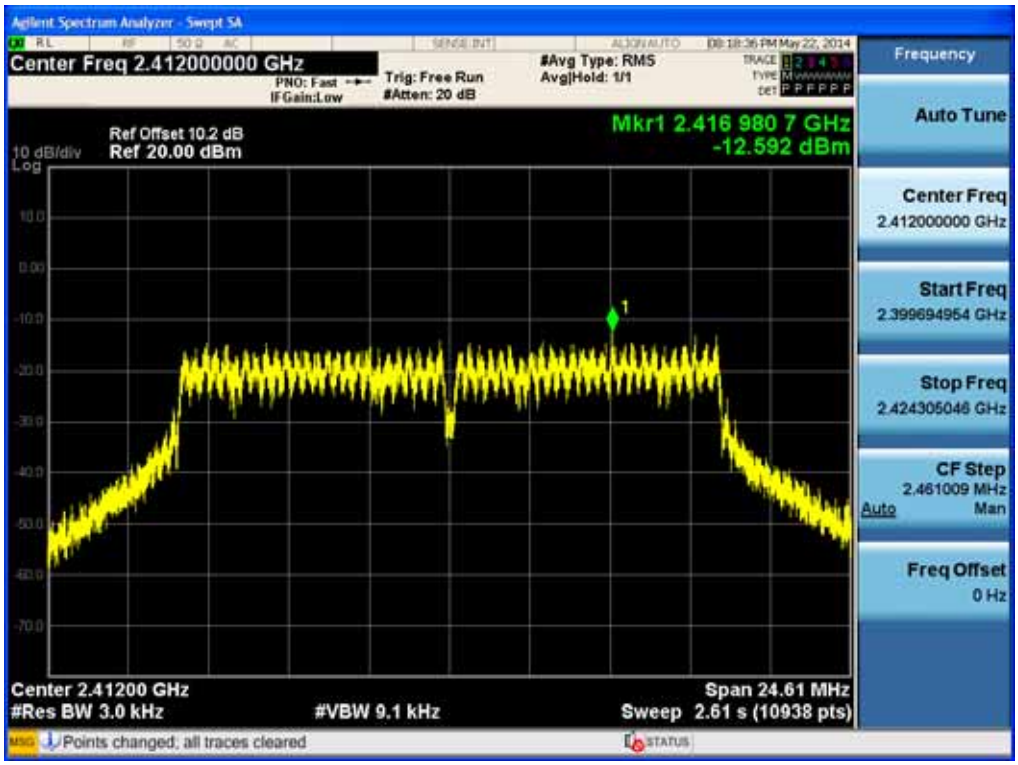
▣ RESULT PLOTS

2.4 GHz Band

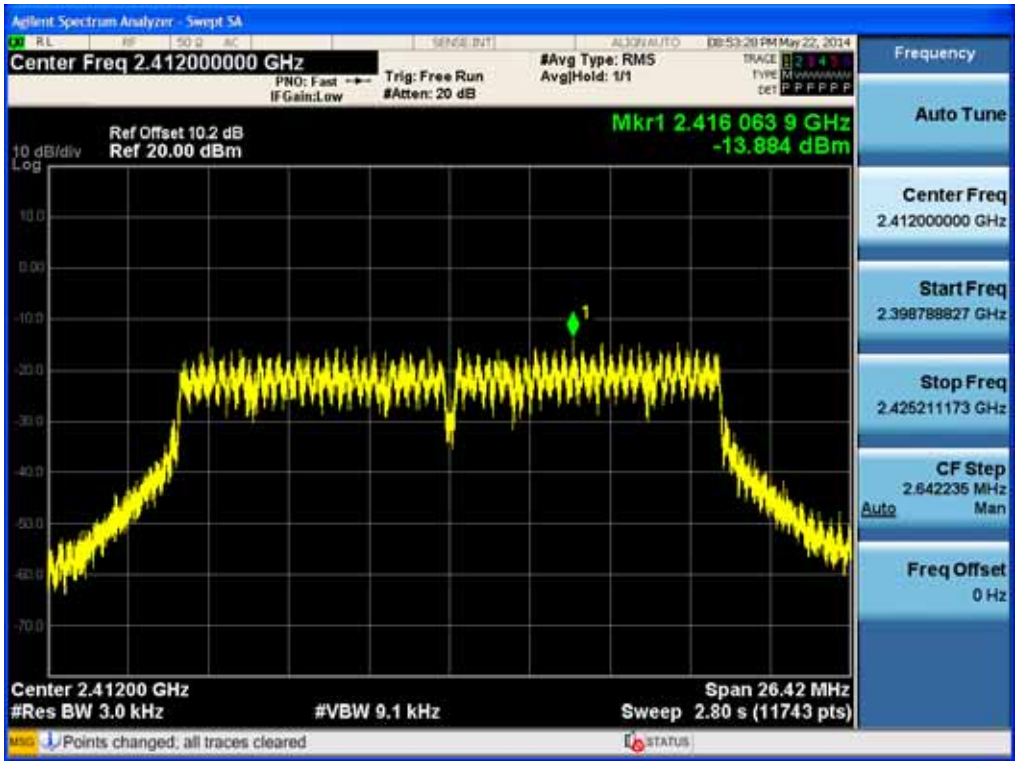
Power Spectral Density (802.11b-CH 11)



Power Spectral Density (802.11g-CH 1)

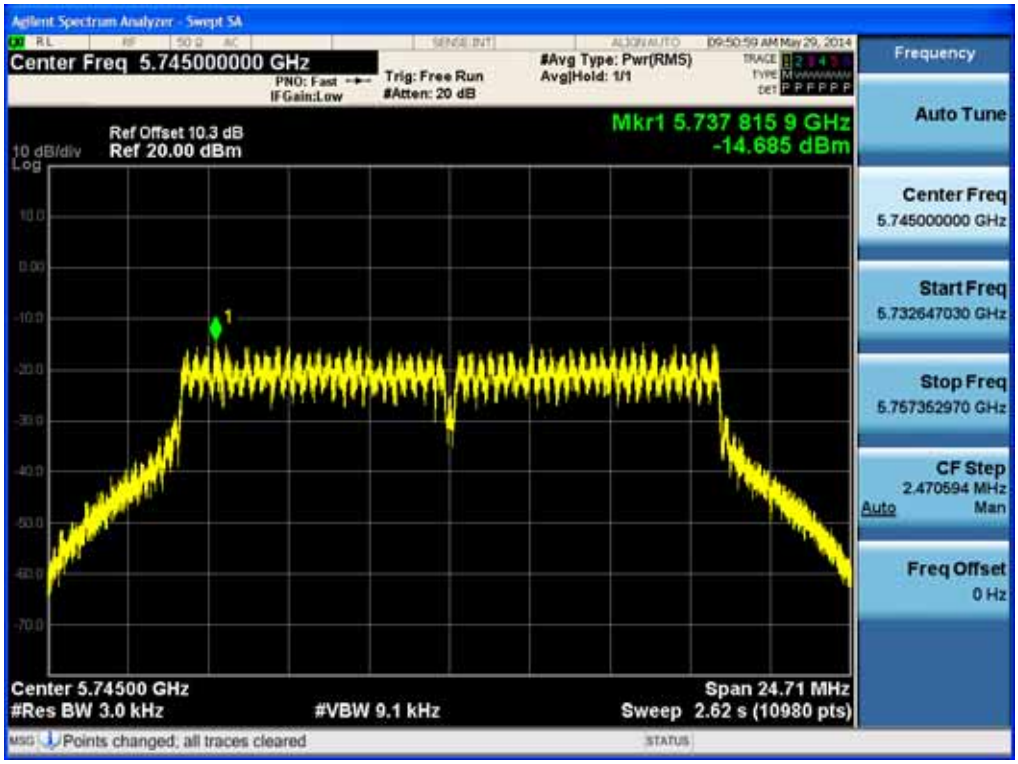


Power Spectral Density (802.11n-CH 1)

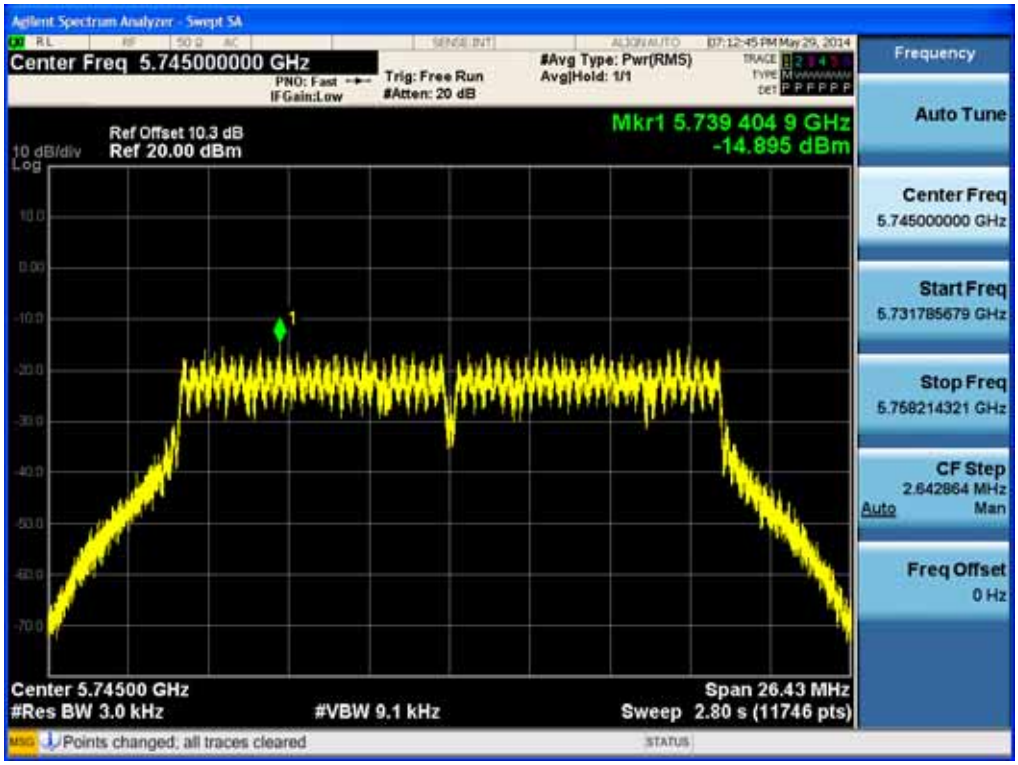


5.8 GHz Band

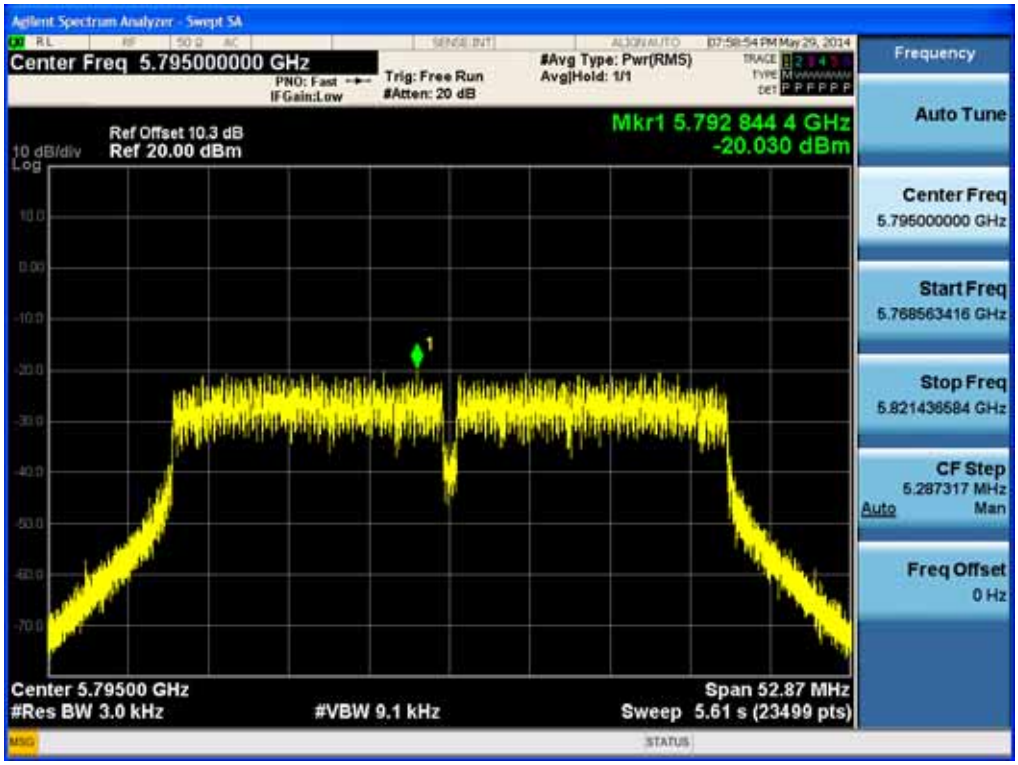
Power Spectral Density (802.11a-CH 149)



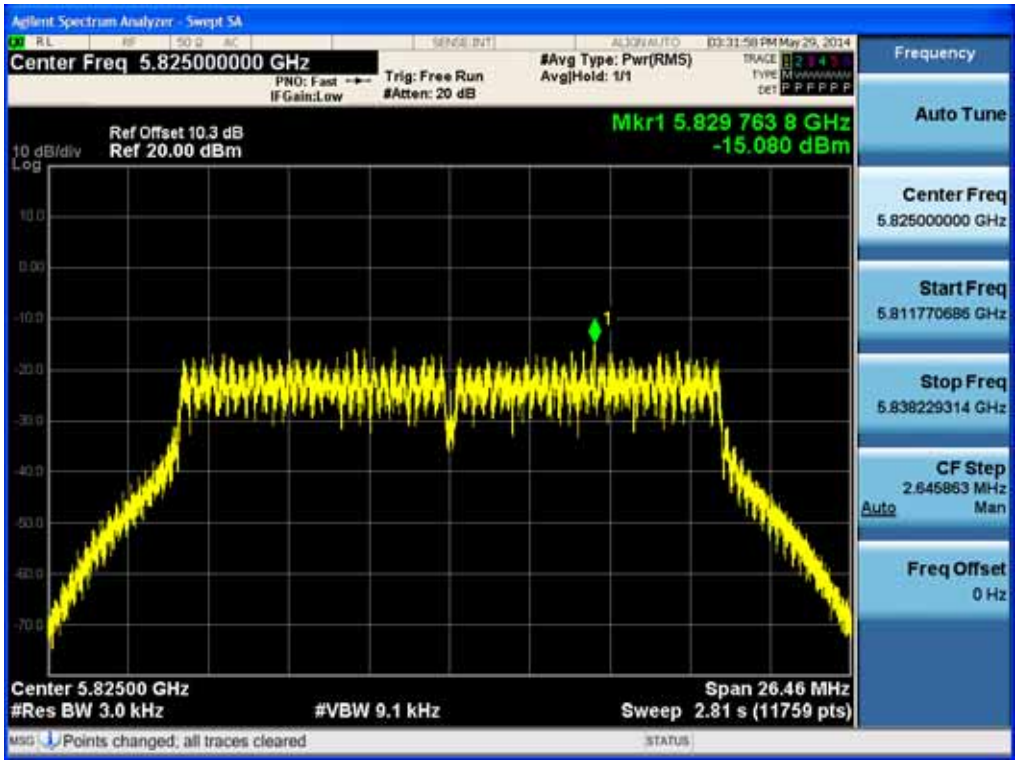
Power Spectral Density (802.11n_20 MHz BW -CH 149)



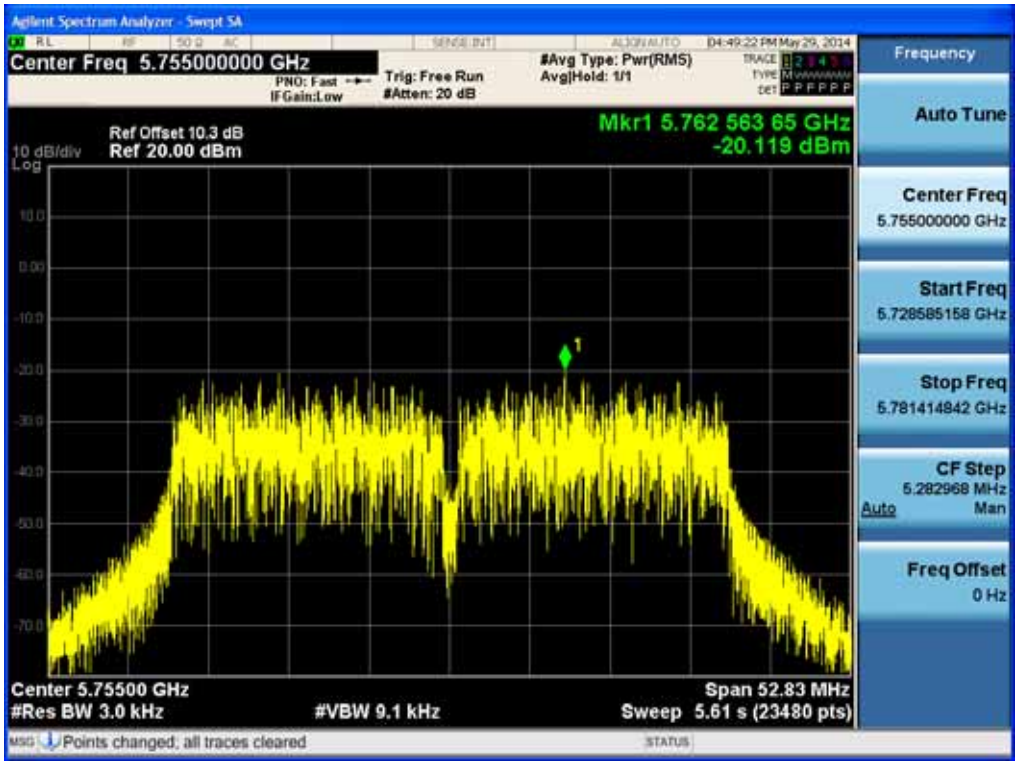
Power Spectral Density (802.11n_40 MHz BW -CH 159)



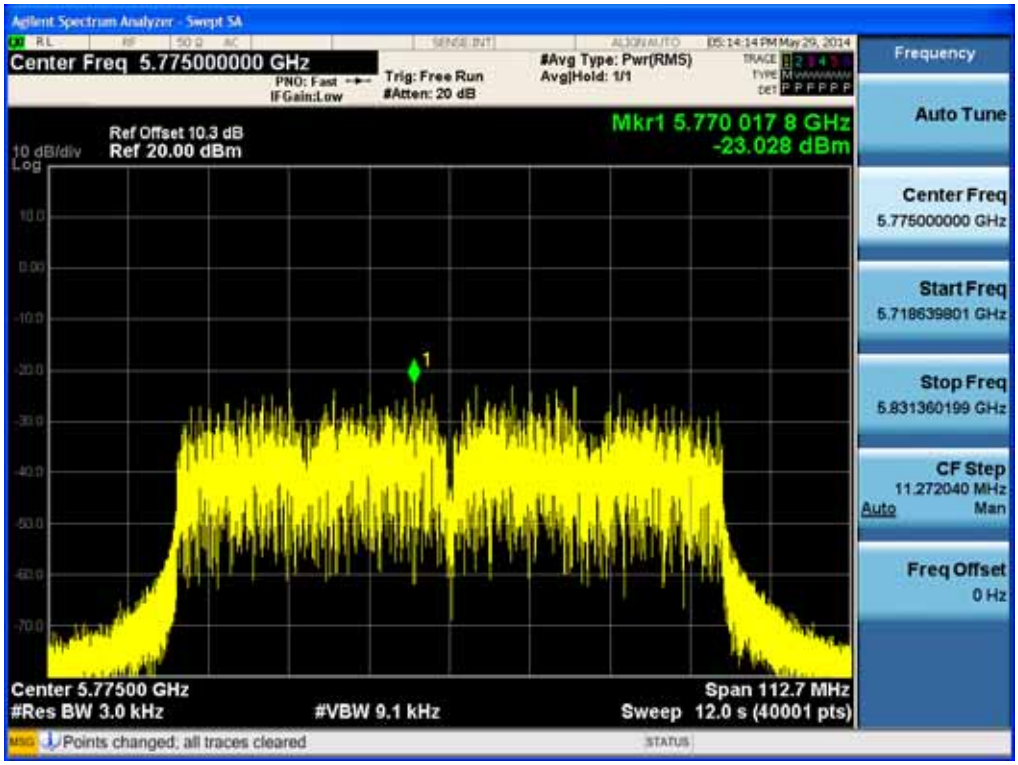
Power Spectral Density (802.11ac_20 MHz BW _CH 165)



Power Spectral Density (802.11ac_40 MHz BW _CH 151)



Power Spectral Density (802.11ac_80 MHz BW _CH 155)



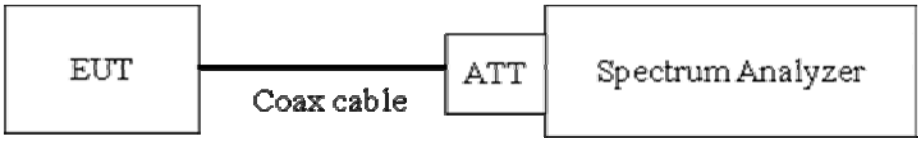
8.5 OUT OF BAND EMISSIONS AT THE BAND EDGE/ CONDUCTED SPURIOUS EMISSIONS

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 ≥ 3 x 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 ≥ 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
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.

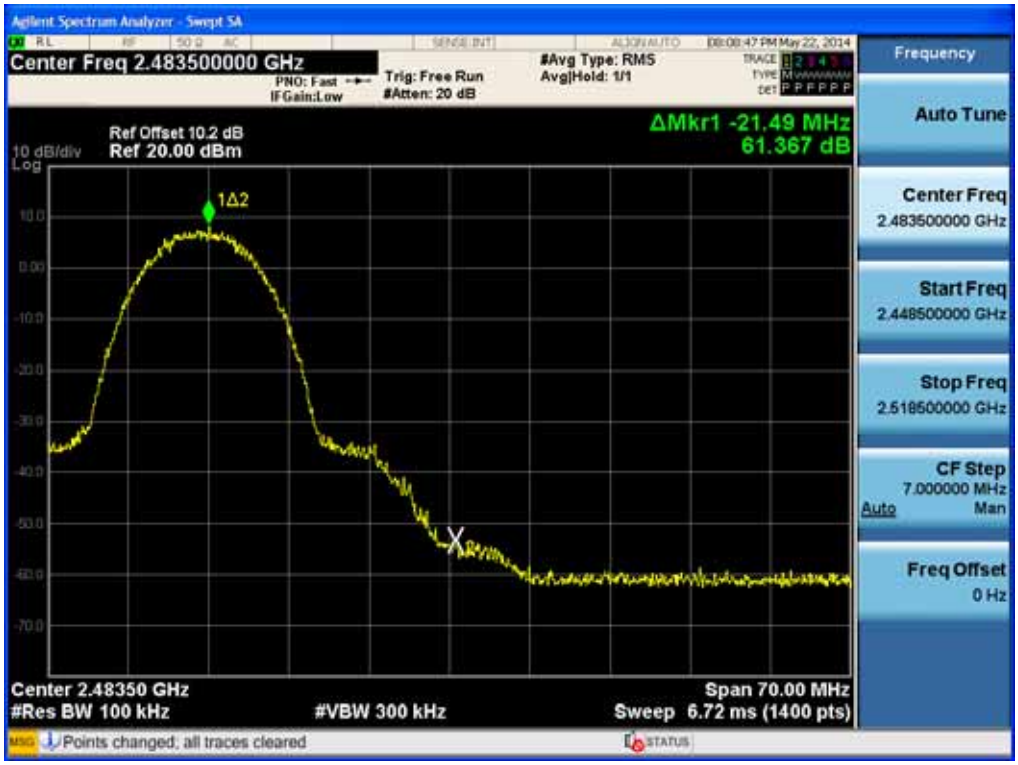
2. Factor = Cable loss + Attenuator loss

▣ RESULT PLOTS

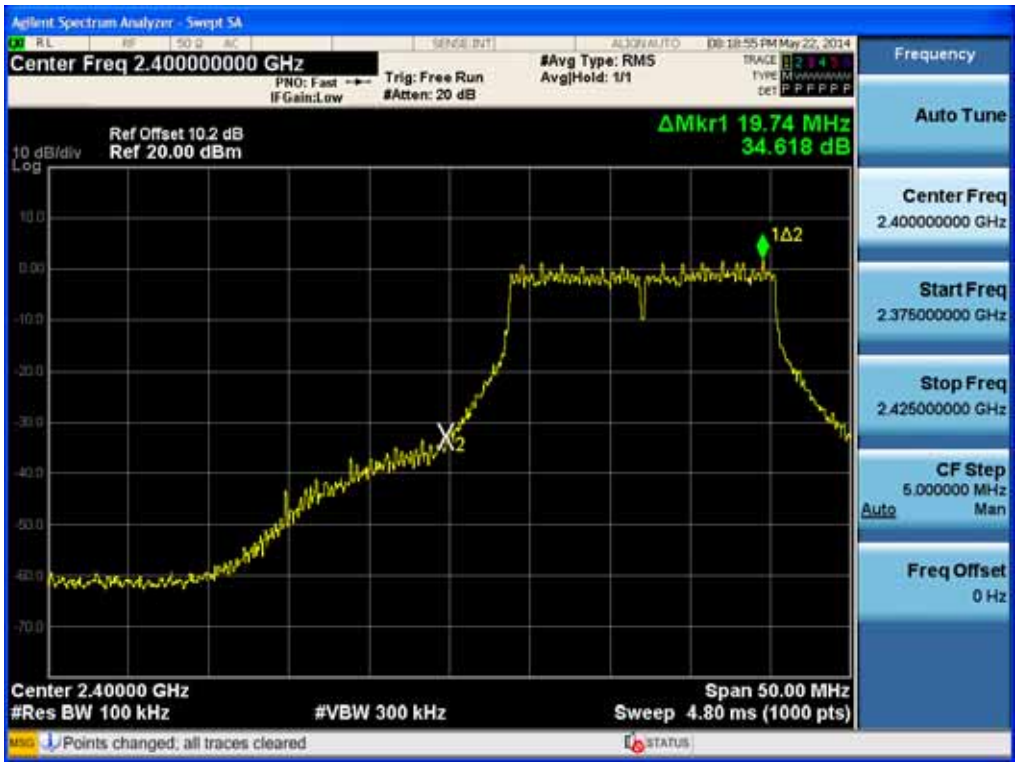
2.4 GHz Band

BandEdge (802.11b-CH1)

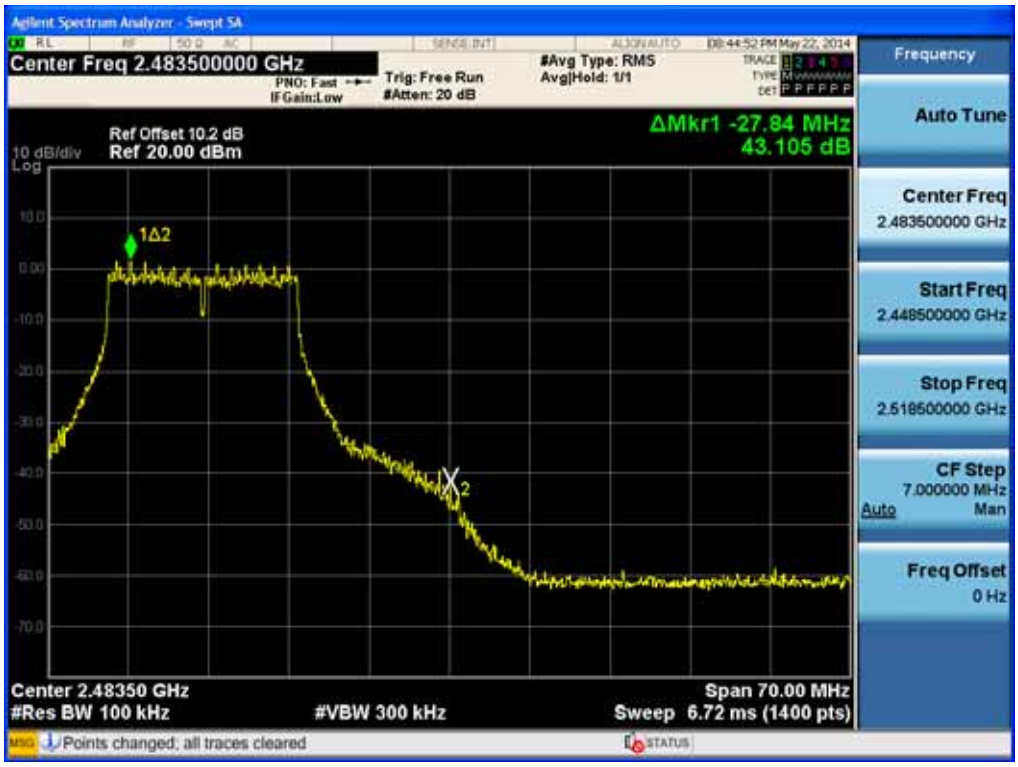
BandEdge (802.11b-CH11)



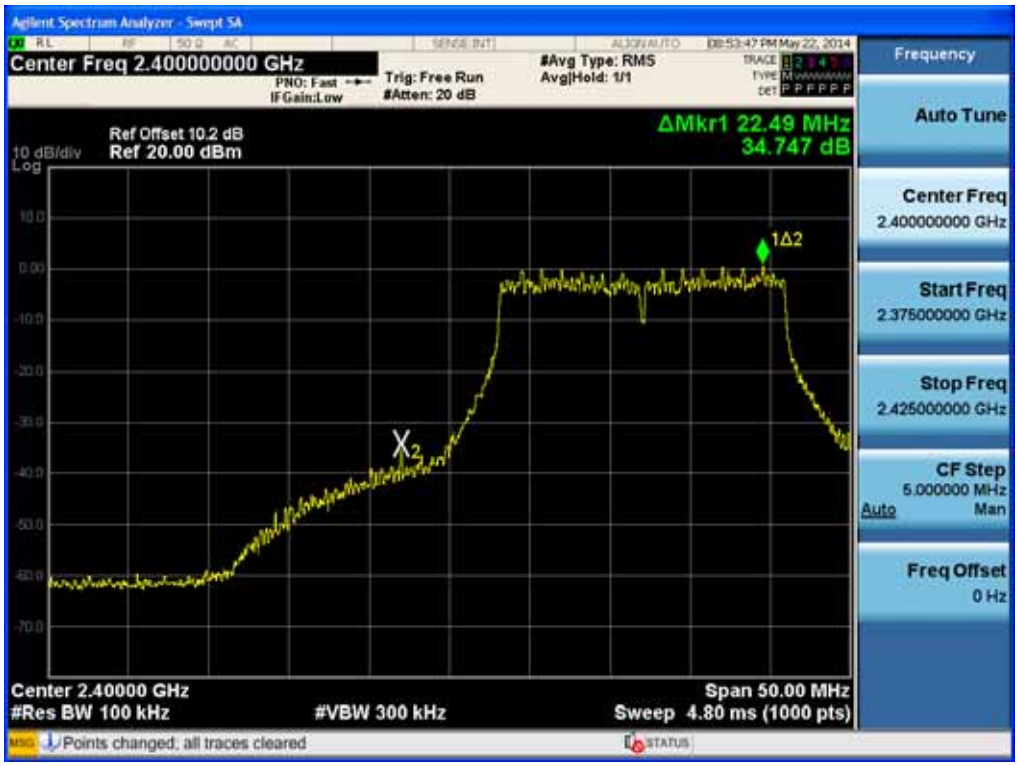
BandEdge (802.11g-CH1)



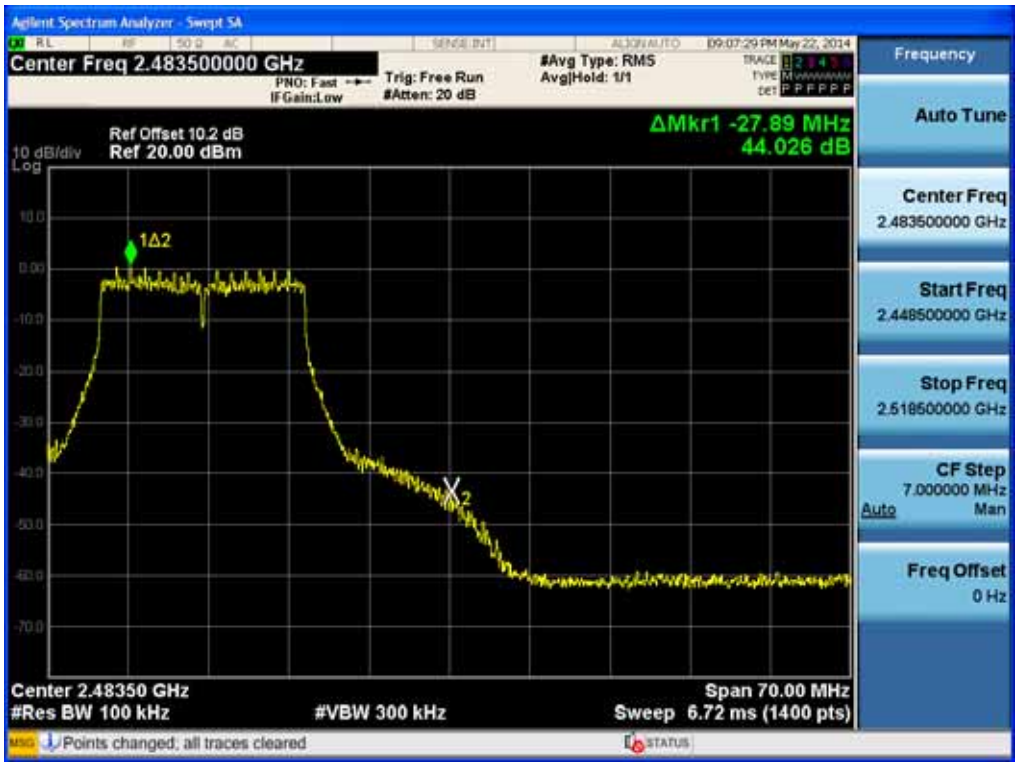
BandEdge (802.11g-CH11)



BandEdge (802.11n-CH1)



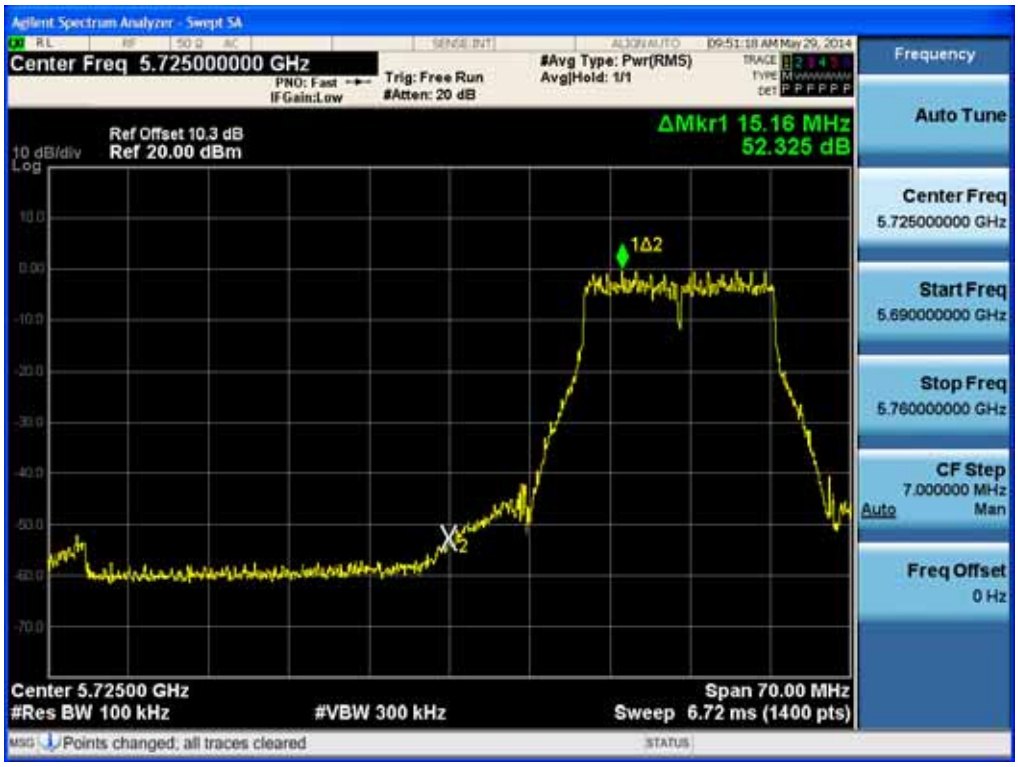
BandEdge (802.11n-CH11)



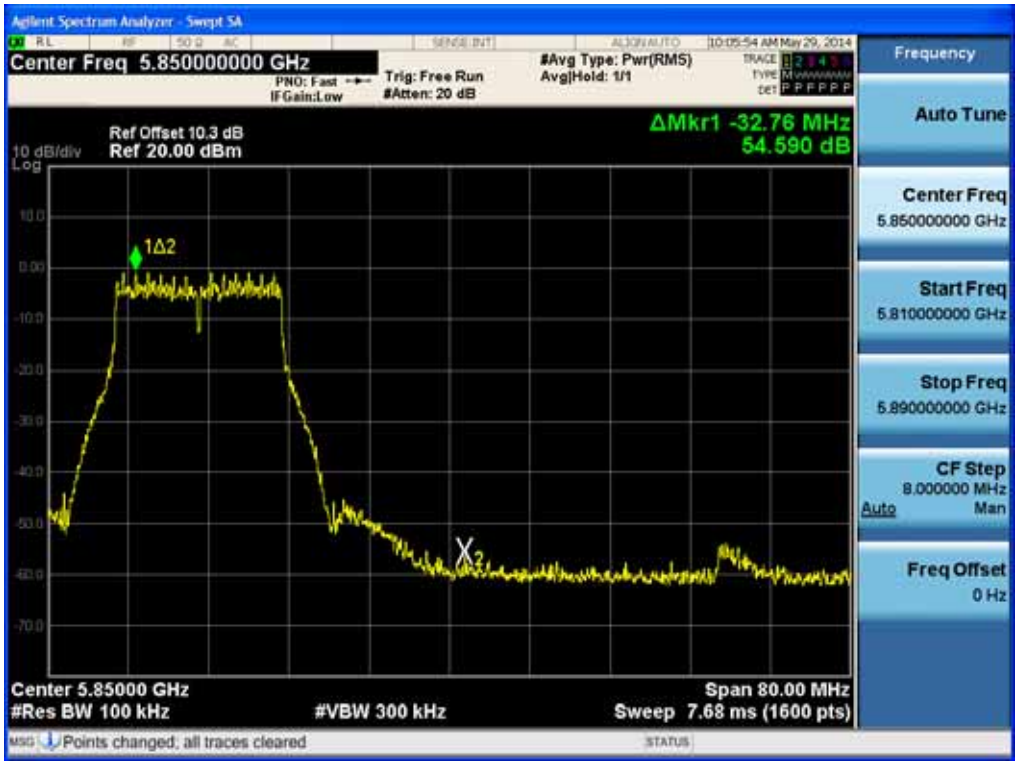
5.8 GHz Band

20 MHz BW

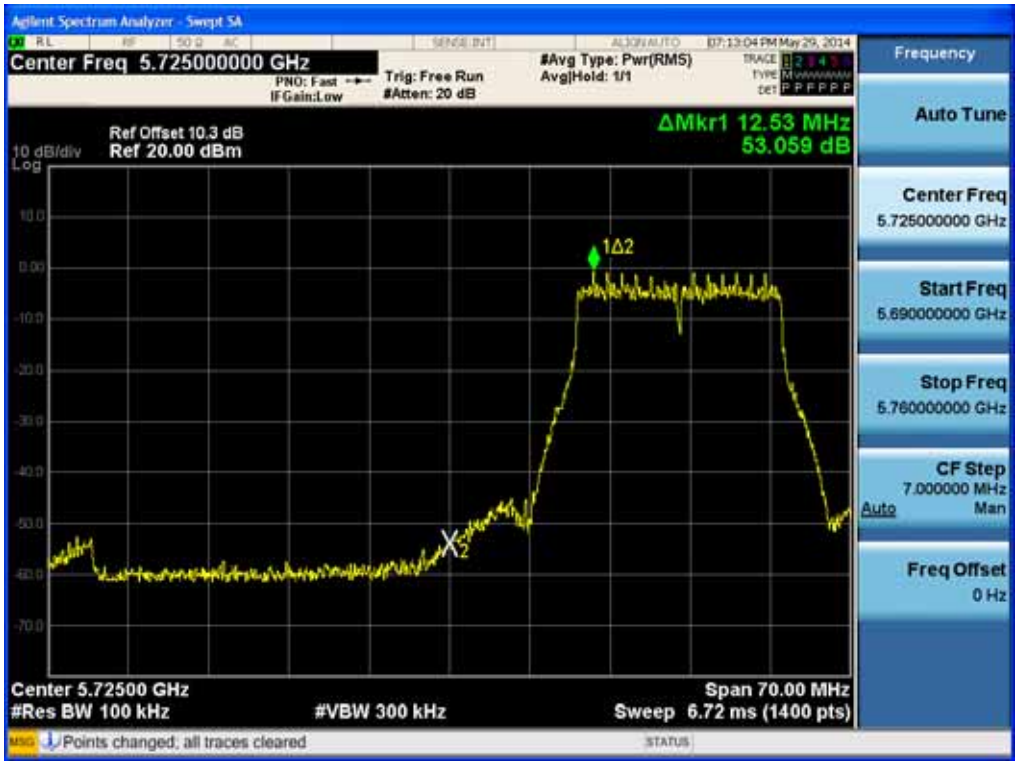
BandEdge (802.11a-CH 149)



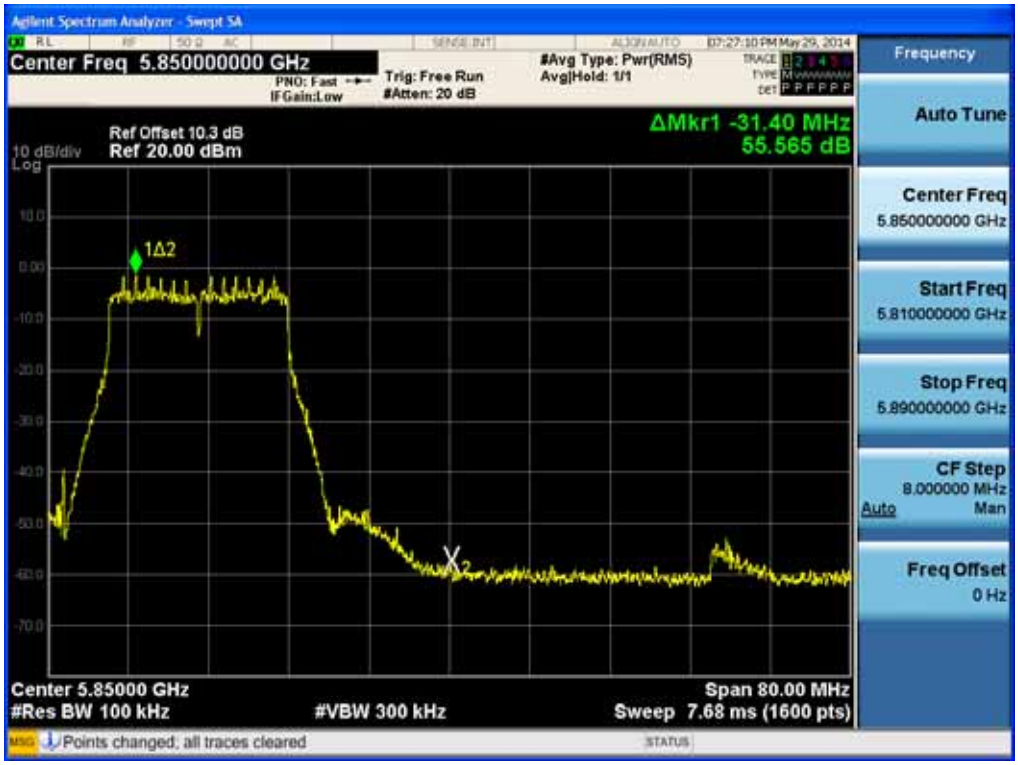
BandEdge (802.11a-CH 165)



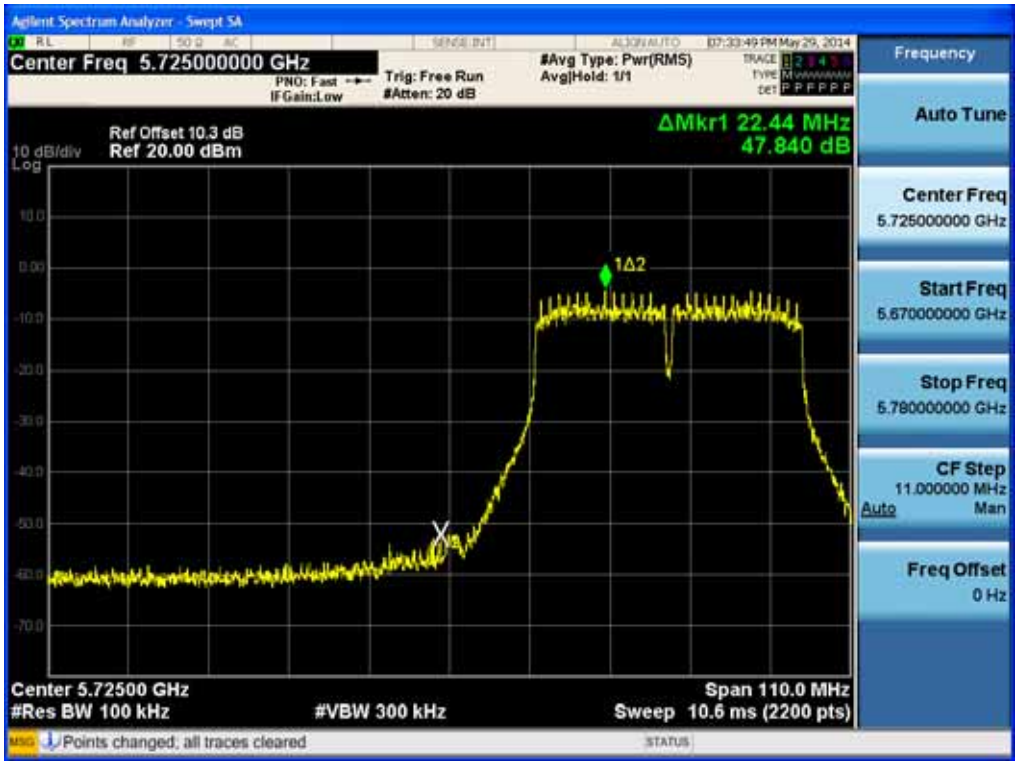
BandEdge (802.11n_20 MHz BW -CH 149)



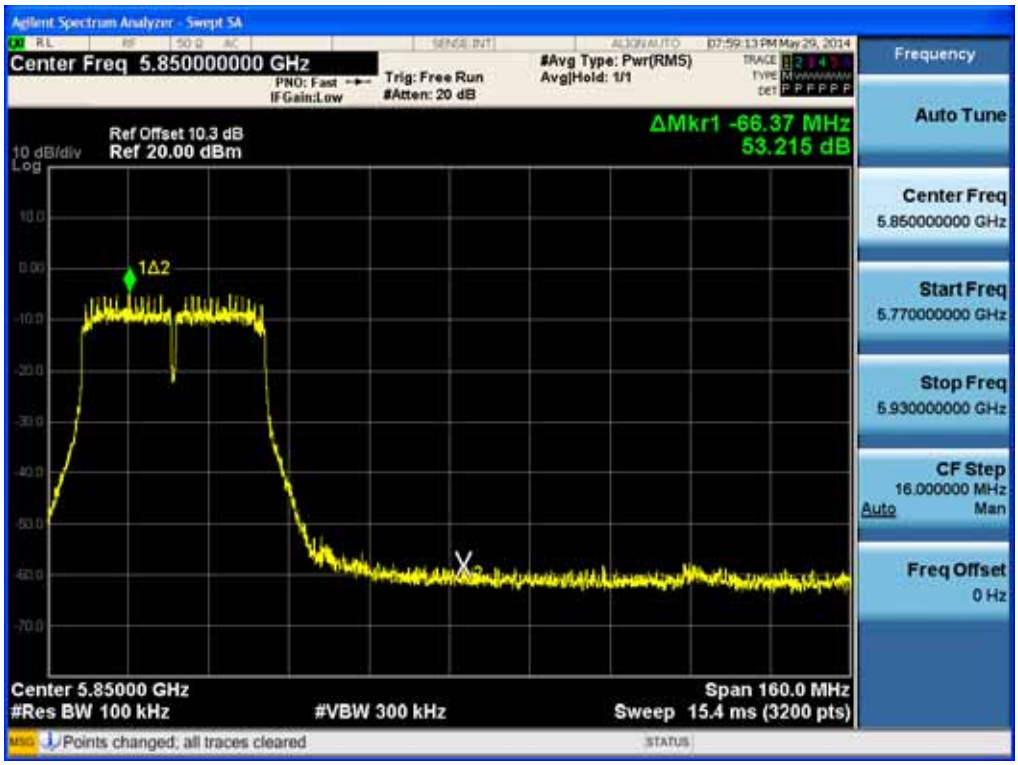
BandEdge (802.11n_20 MHz BW -CH 165)



BandEdge (802.11n_40 MHz BW -CH 151)

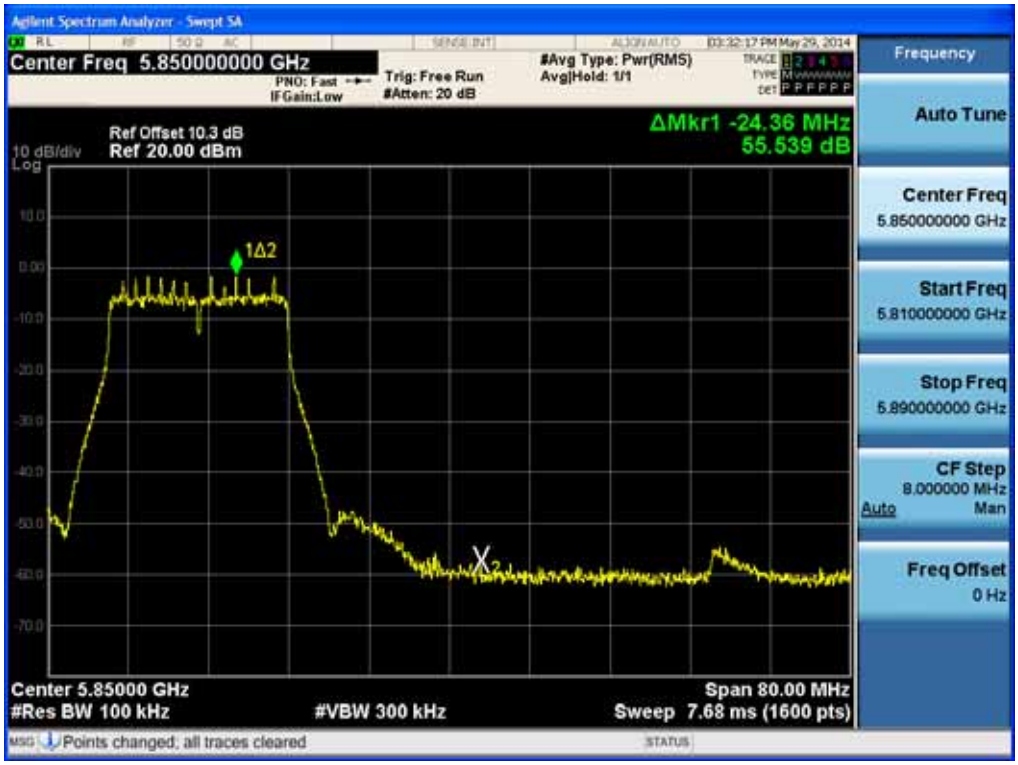


BandEdge (802.11n_40 MHz BW -CH 159)

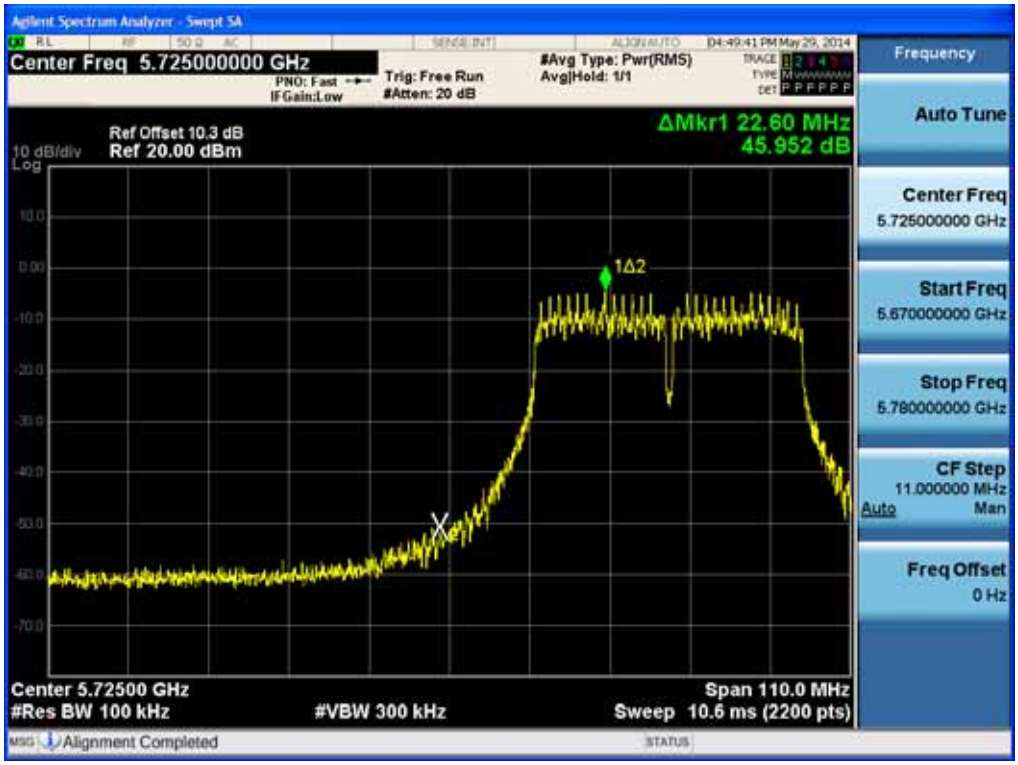


BandEdge (802.11ac_20 MHz BW -CH 149)

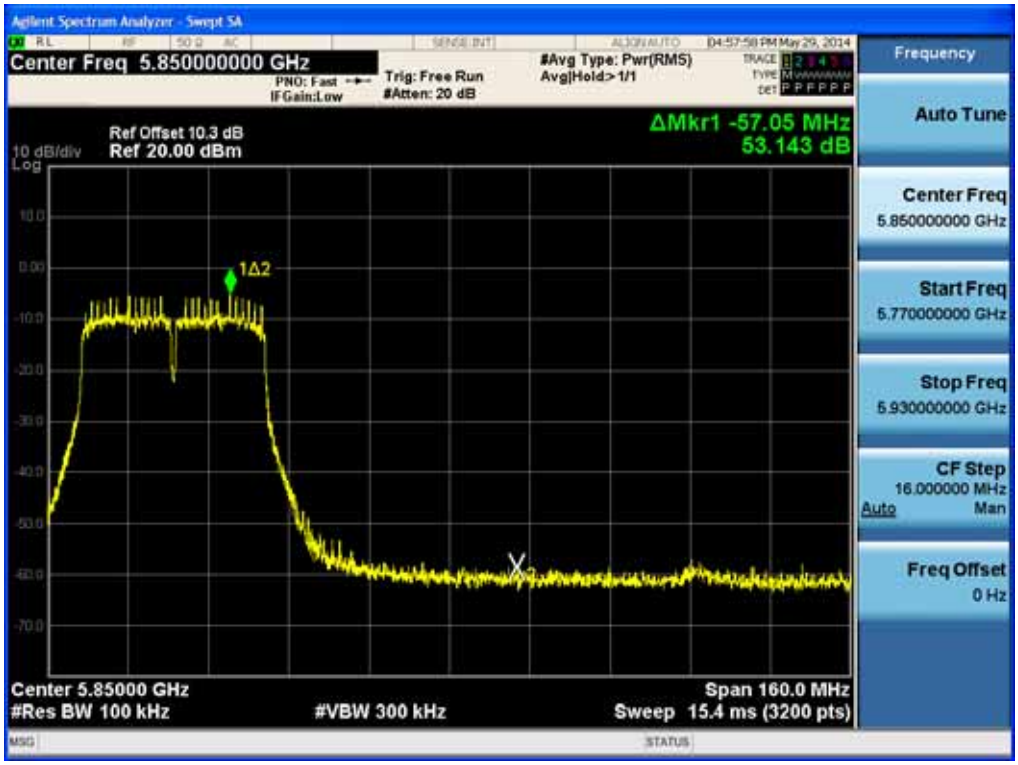
BandEdge (802.11ac_20 MHz BW -CH 165)



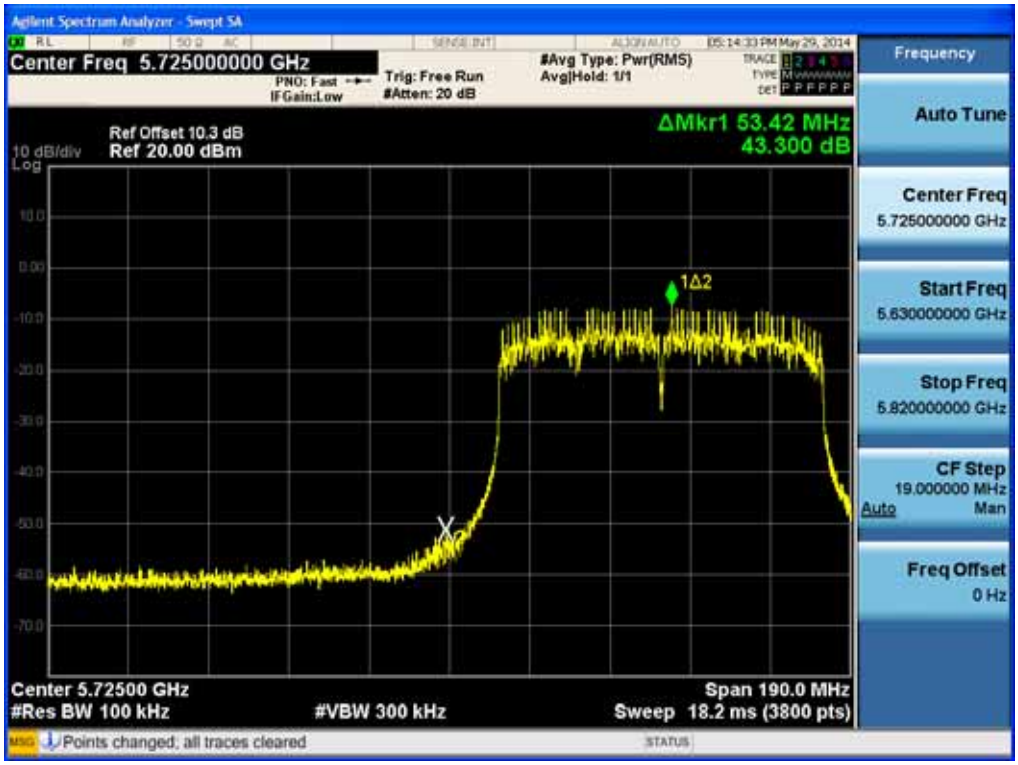
BandEdge (802.11ac_40 MHz BW -CH 151)



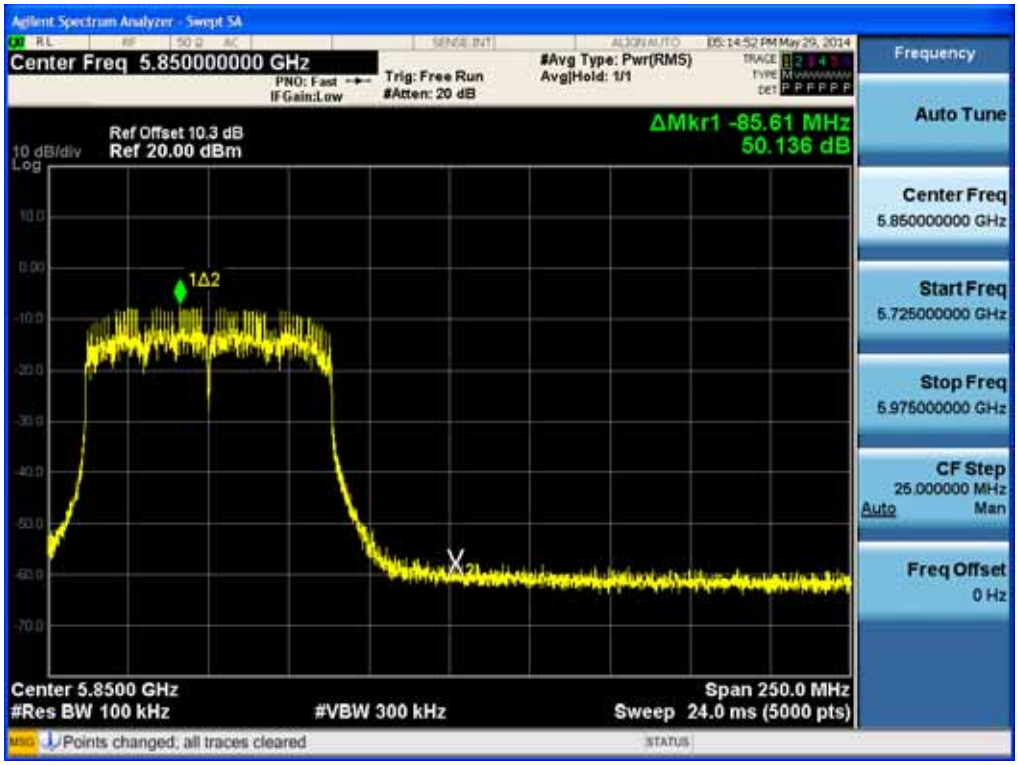
BandEdge (802.11ac_40 MHz BW -CH 159)



BandEdge (802.11ac_80 MHz BW -CH 155)



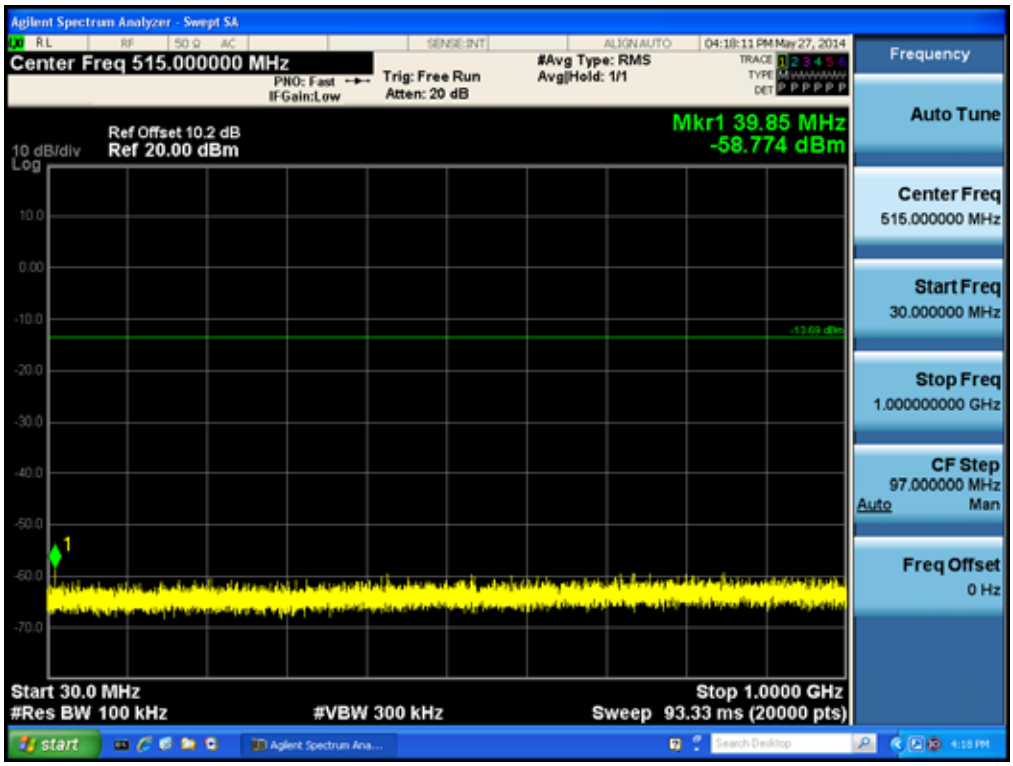
BandEdge (802.11ac_80 MHz BW -CH 155)



2.4 GHz Band

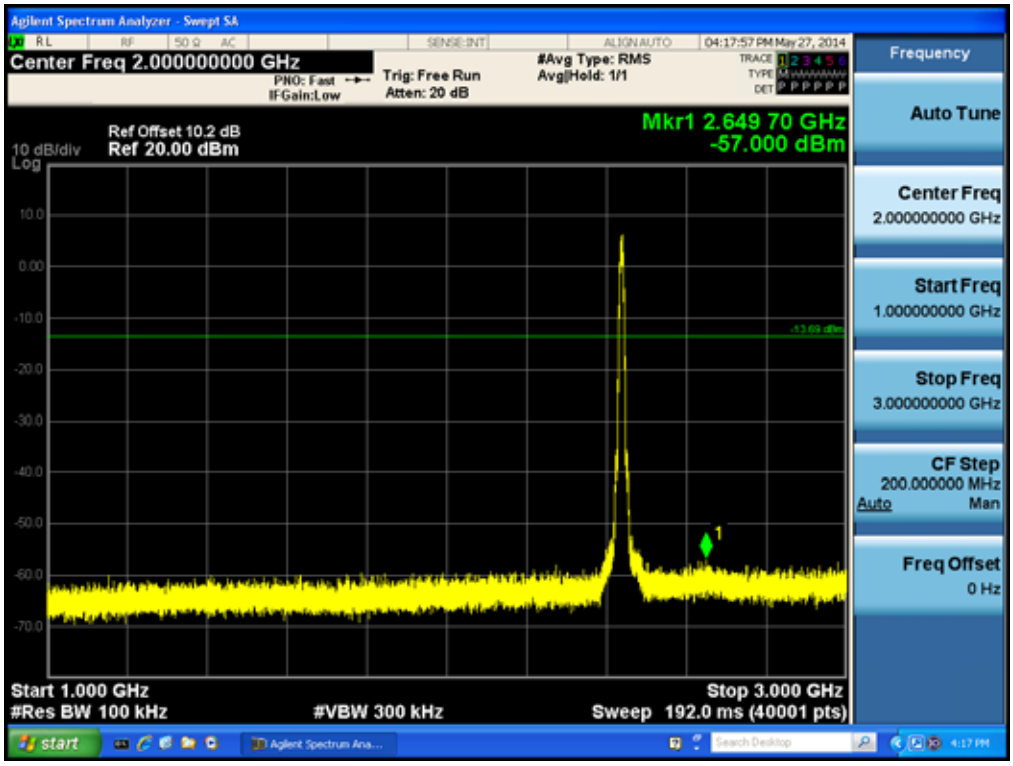
30 MHz ~ 1 GHz

Conducted Spurious Emission (802.11b-CH6)



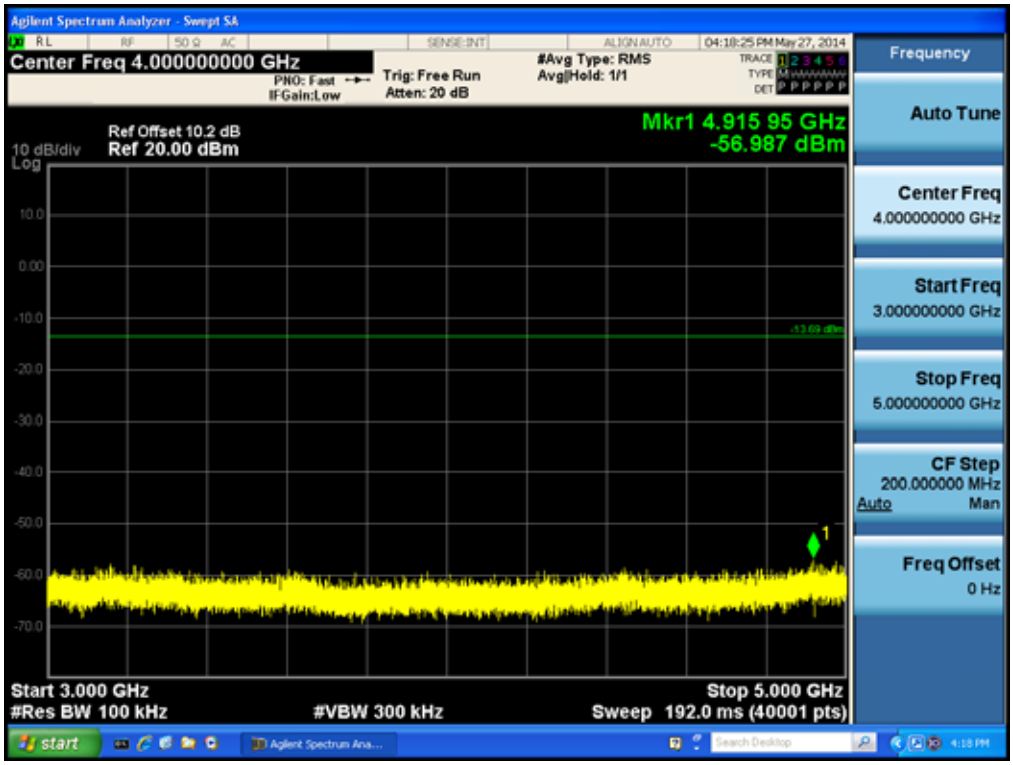
1 GHz ~ 3 GHz

Conducted Spurious Emission (802.11b-CH6)



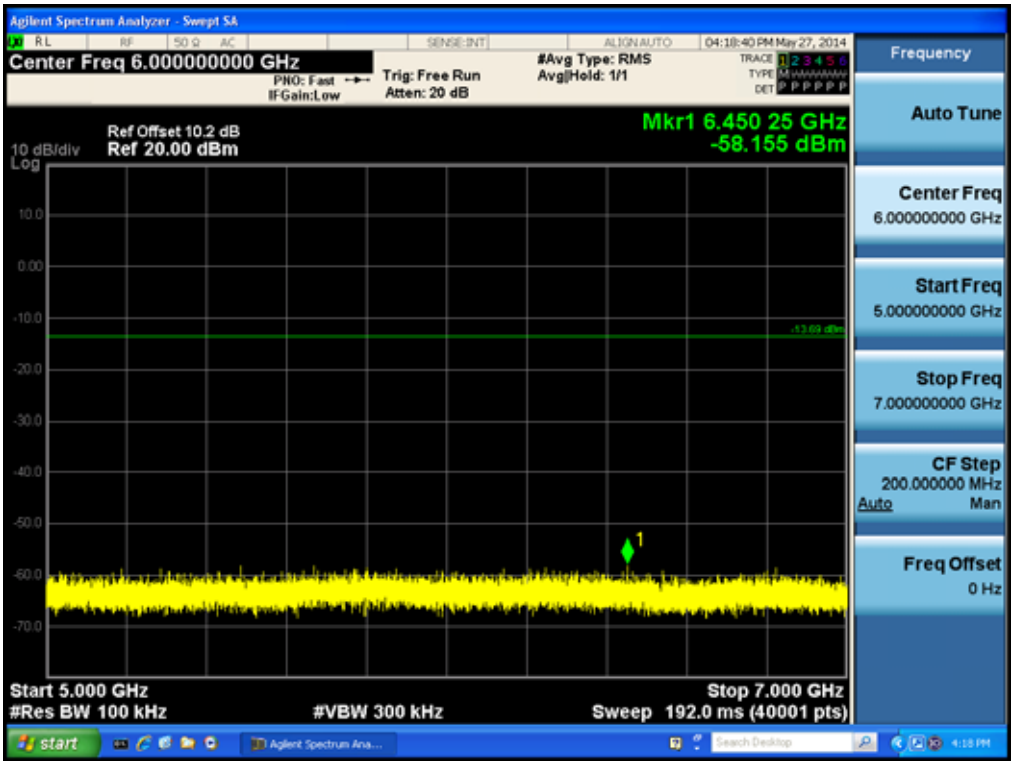
3 GHz ~ 5 GHz

Conducted Spurious Emission (802.11b-CH6)



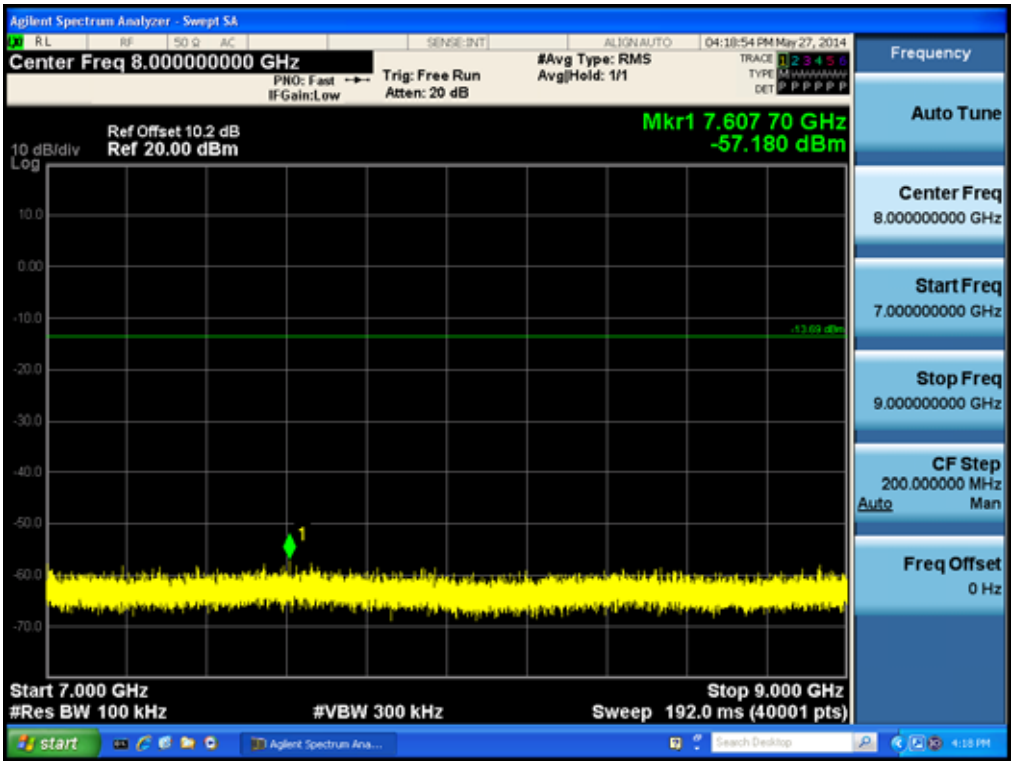
5 GHz ~ 7 GHz

Conducted Spurious Emission (802.11b-CH6)



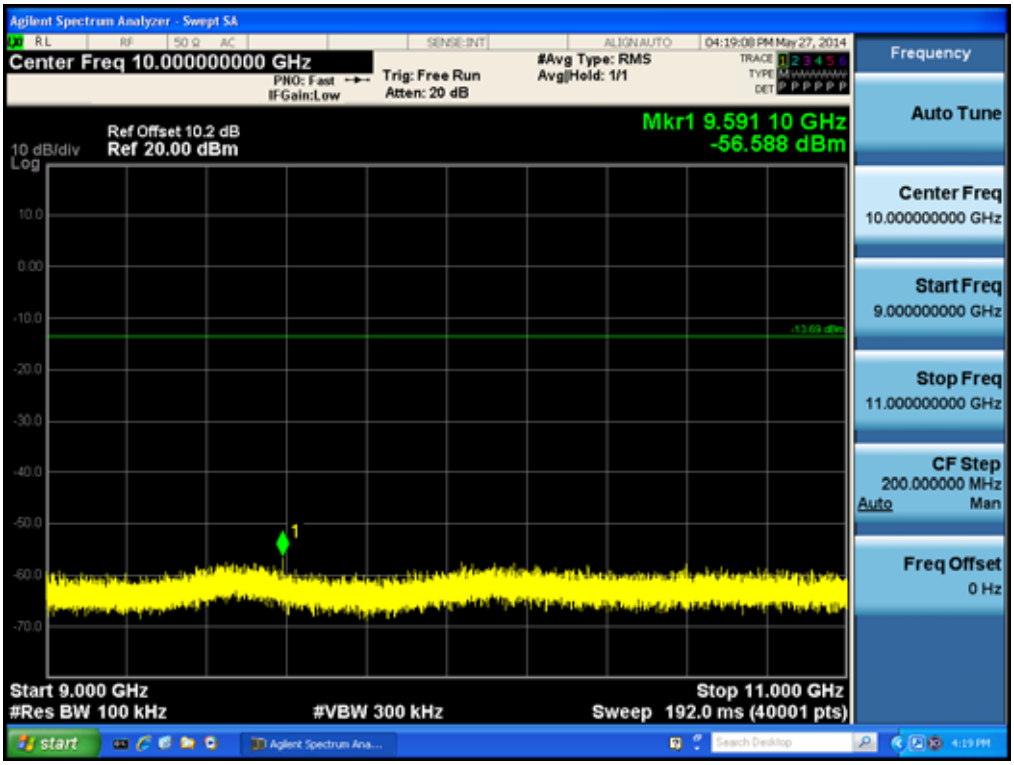
7 GHz ~ 9 GHz

Conducted Spurious Emission (802.11b-CH6)



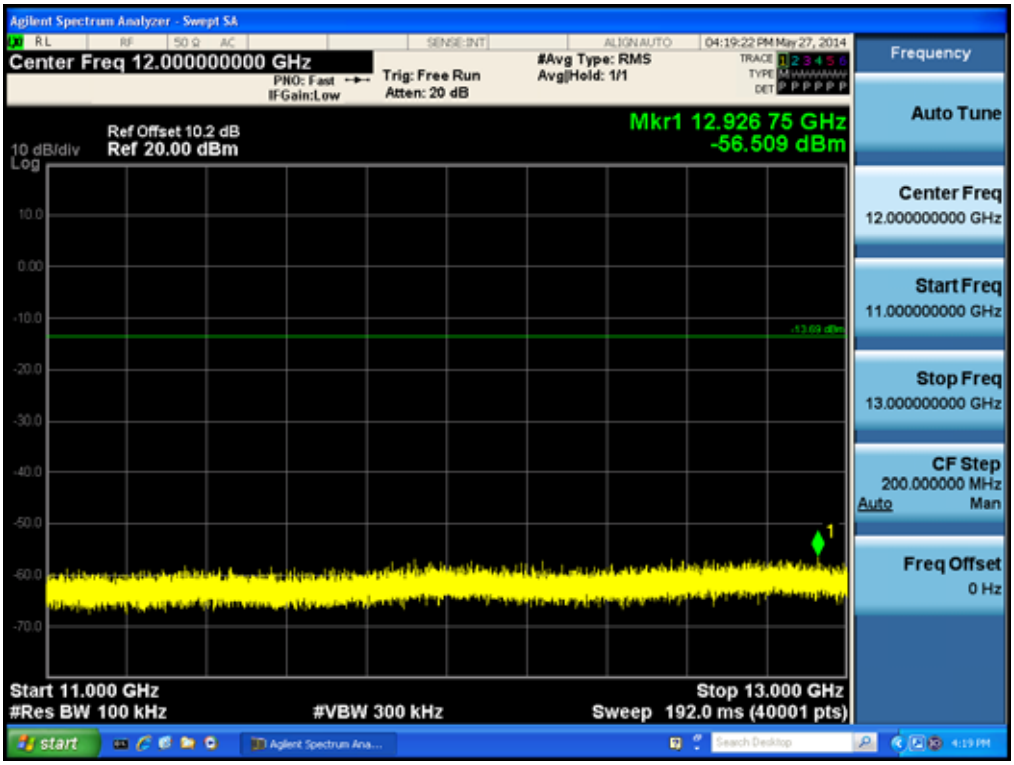
9 GHz ~ 11 GHz

Conducted Spurious Emission (802.11b-CH6)



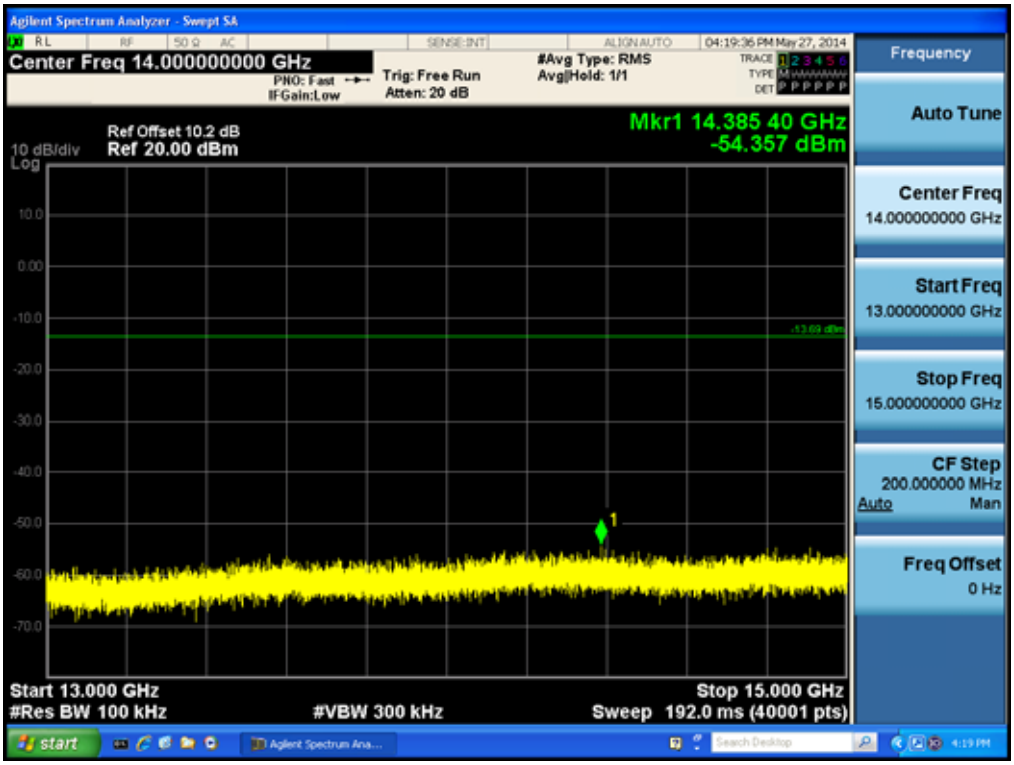
11 GHz ~ 13 GHz

Conducted Spurious Emission (802.11b-CH6)



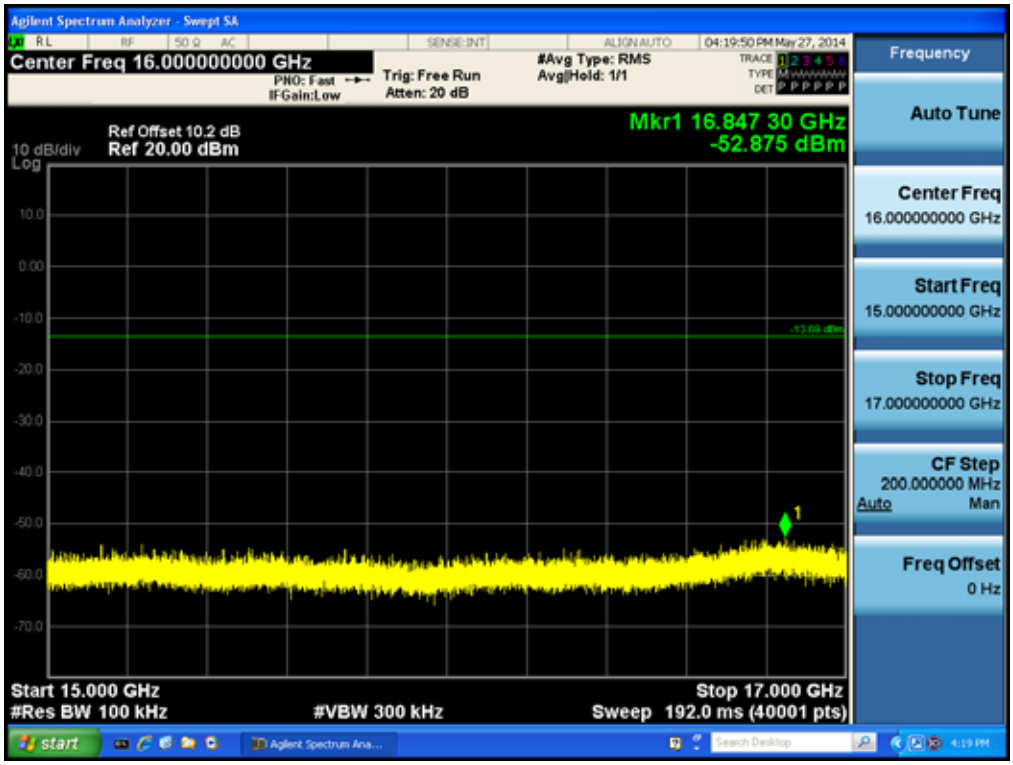
13 GHz ~ 15 GHz

Conducted Spurious Emission (802.11b-CH6)



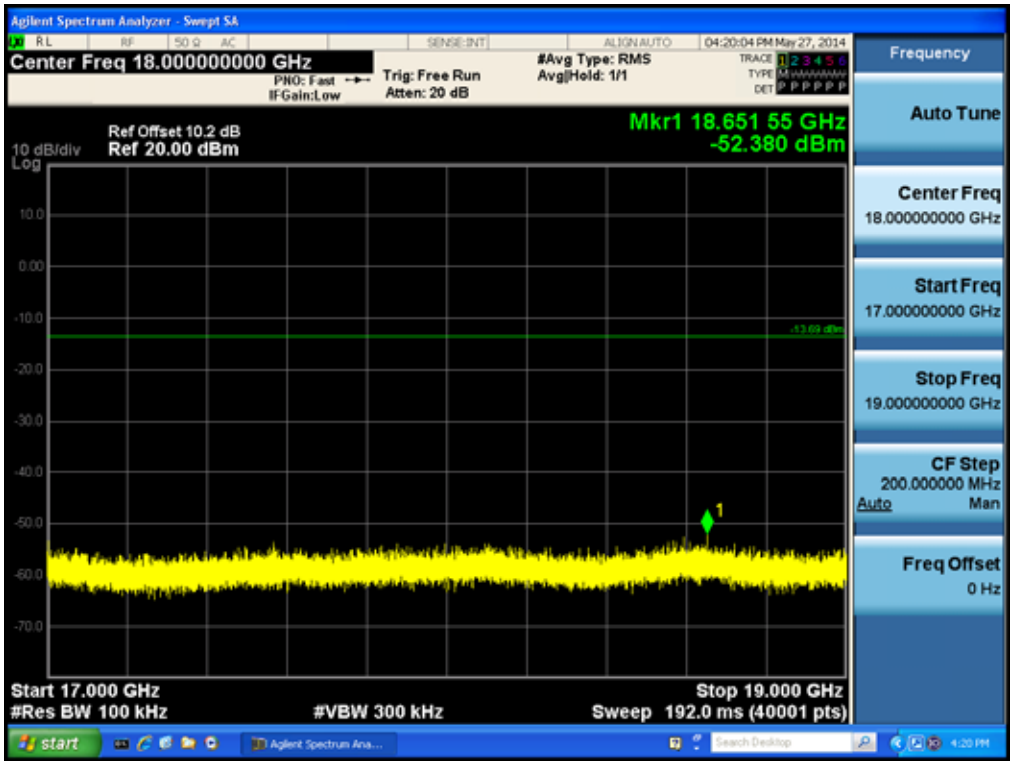
15 GHz ~ 17 GHz

Conducted Spurious Emission (802.11b-CH6)



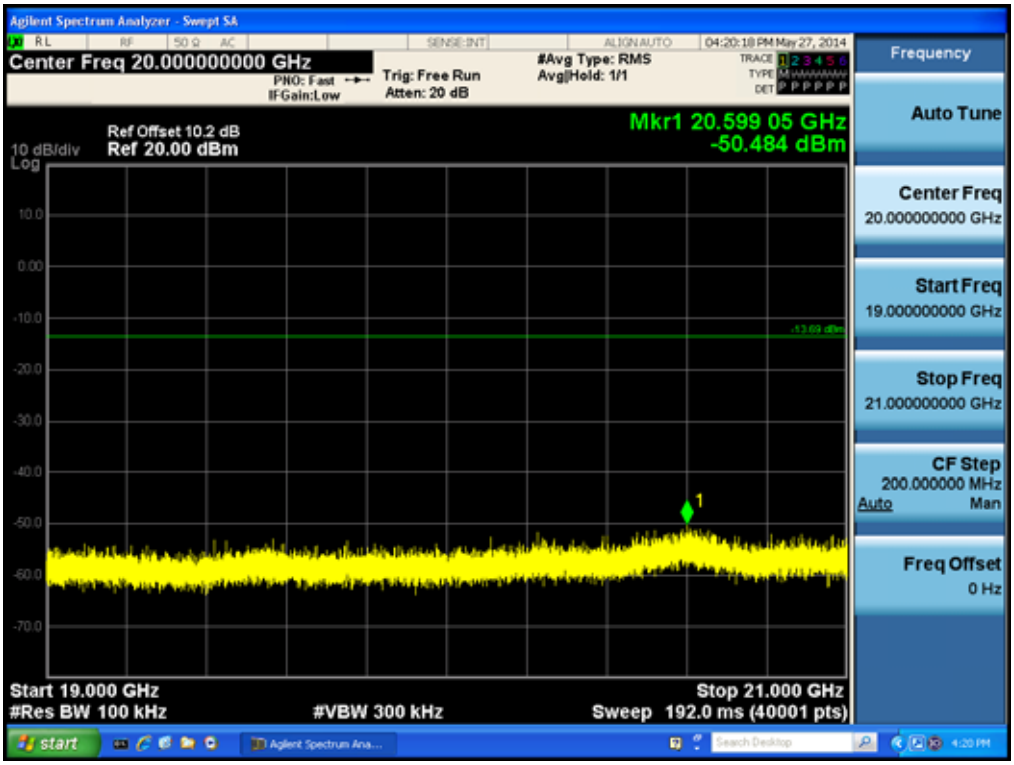
17 GHz ~ 19 GHz

Conducted Spurious Emission (802.11b-CH6)



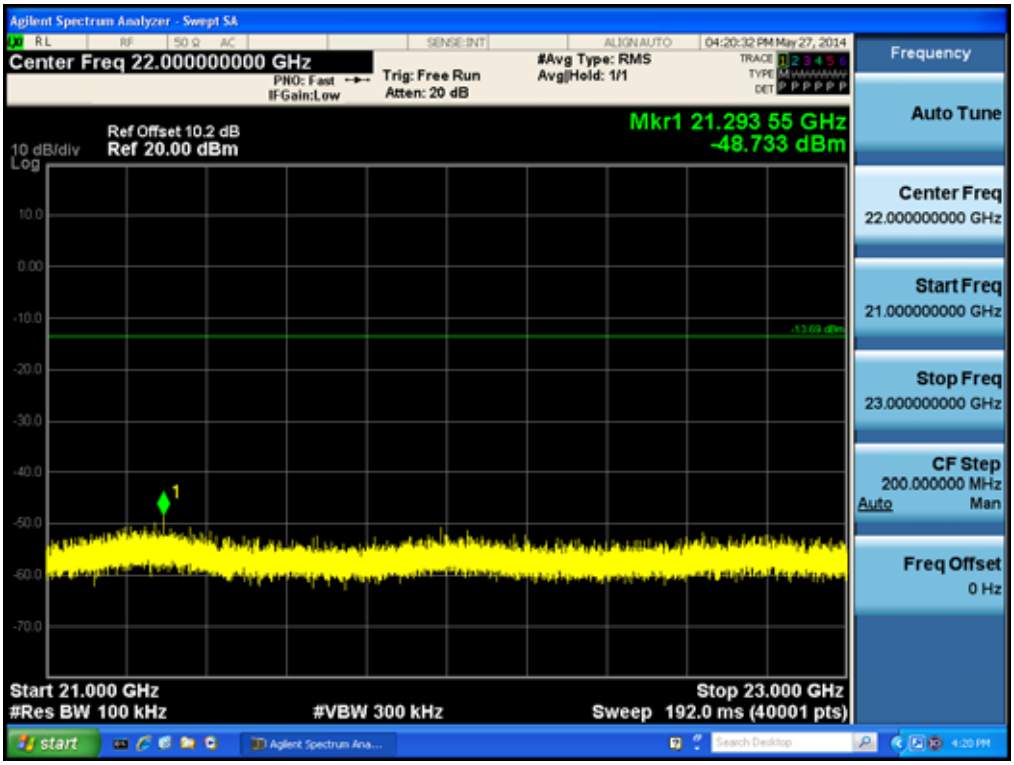
19 GHz ~ 21 GHz

Conducted Spurious Emission (802.11b-CH6)



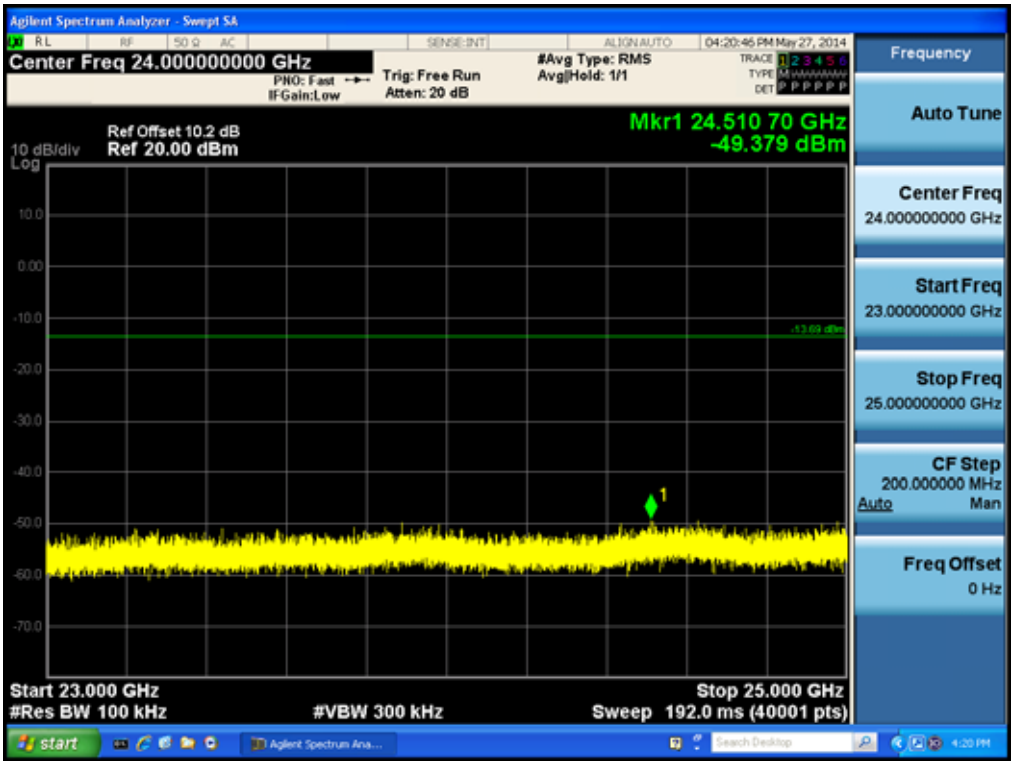
21 GHz ~ 23 GHz

Conducted Spurious Emission (802.11b-CH6)



23 GHz ~ 25 GHz

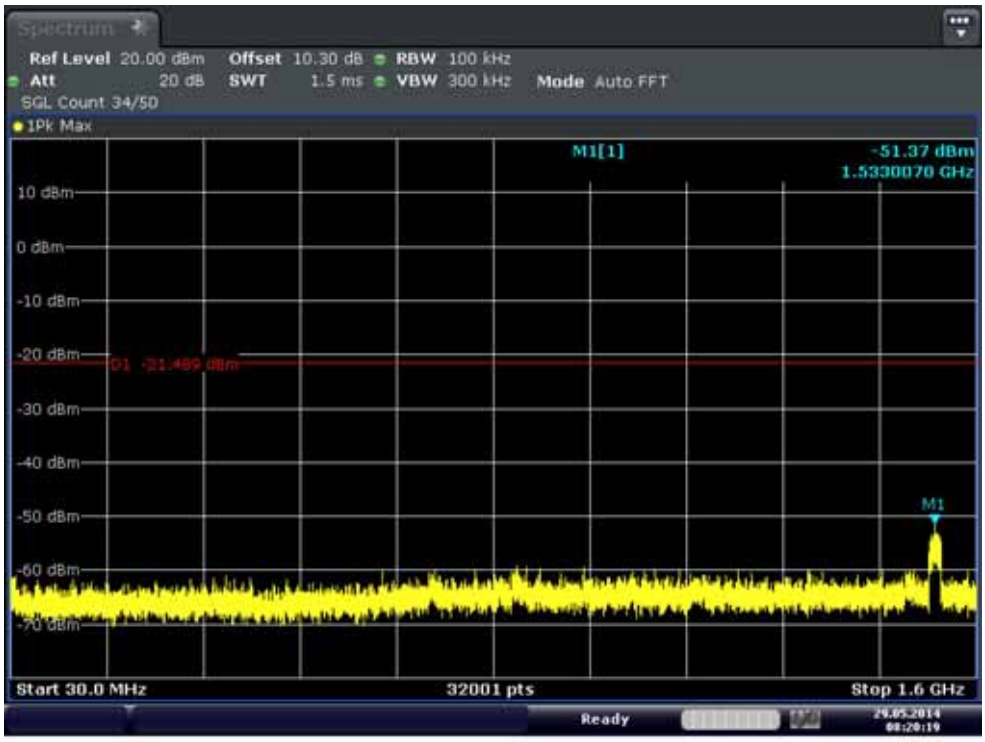
Conducted Spurious Emission (802.11b-CH6)



5 GHz Band

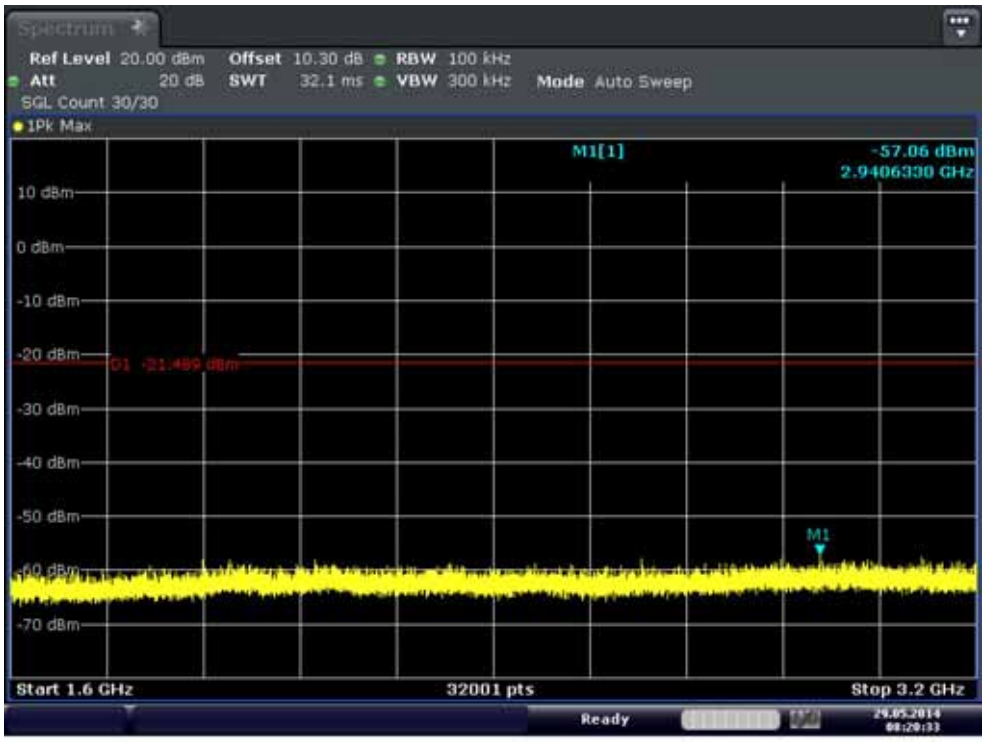
30 MHz ~ 1.6 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



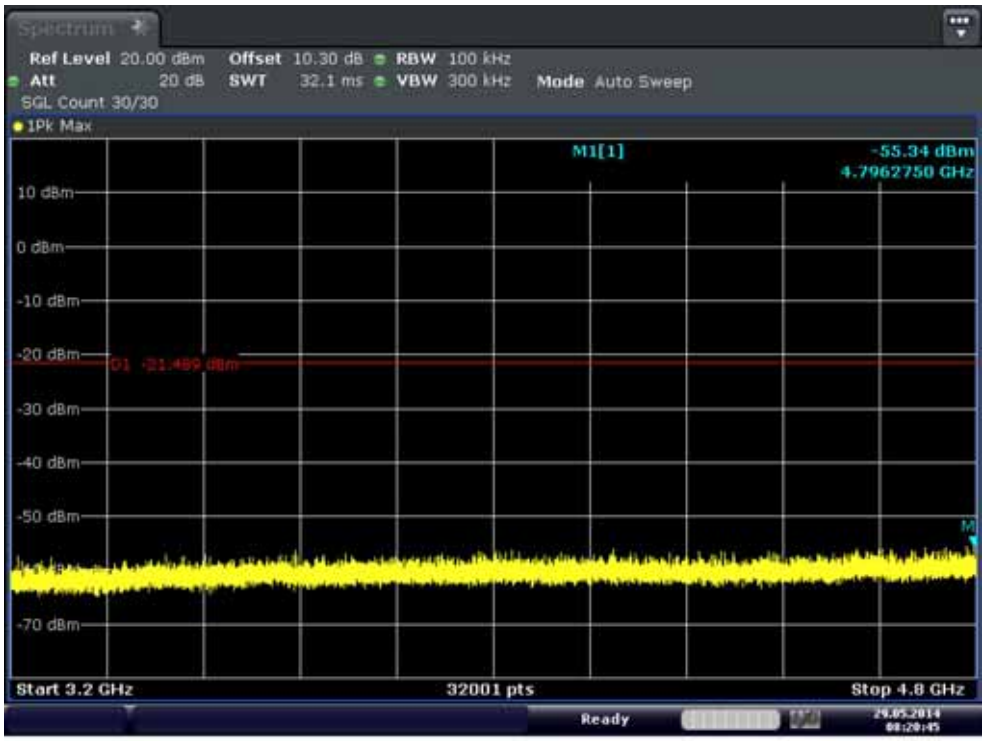
1.6 GHz ~ 3.2 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



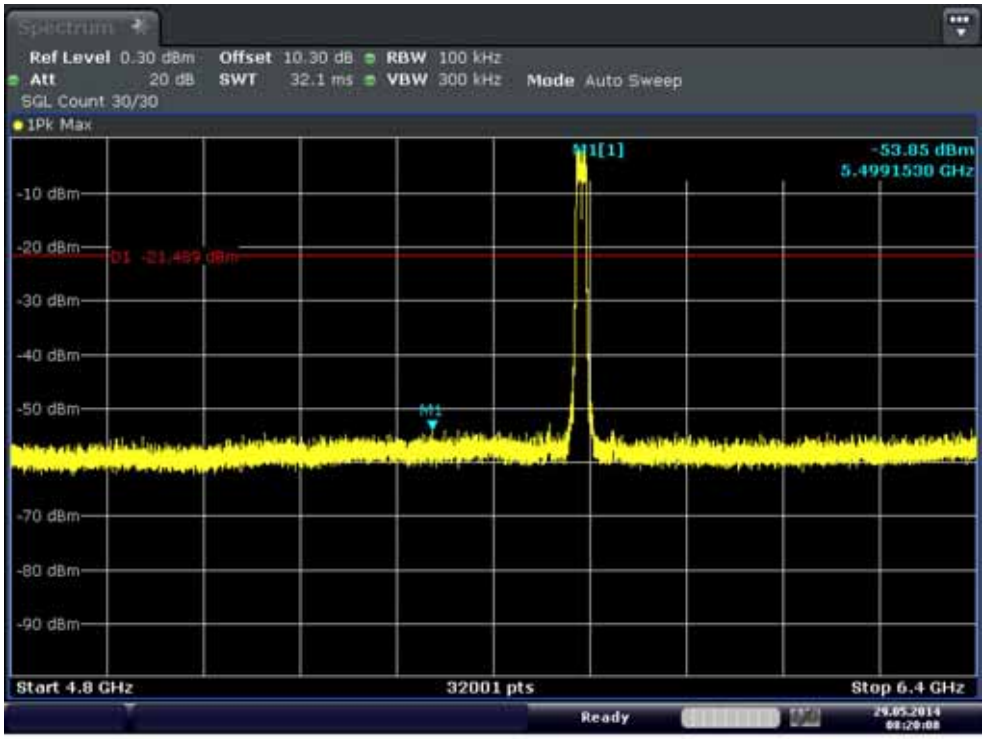
3.2 GHz ~ 4.8 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



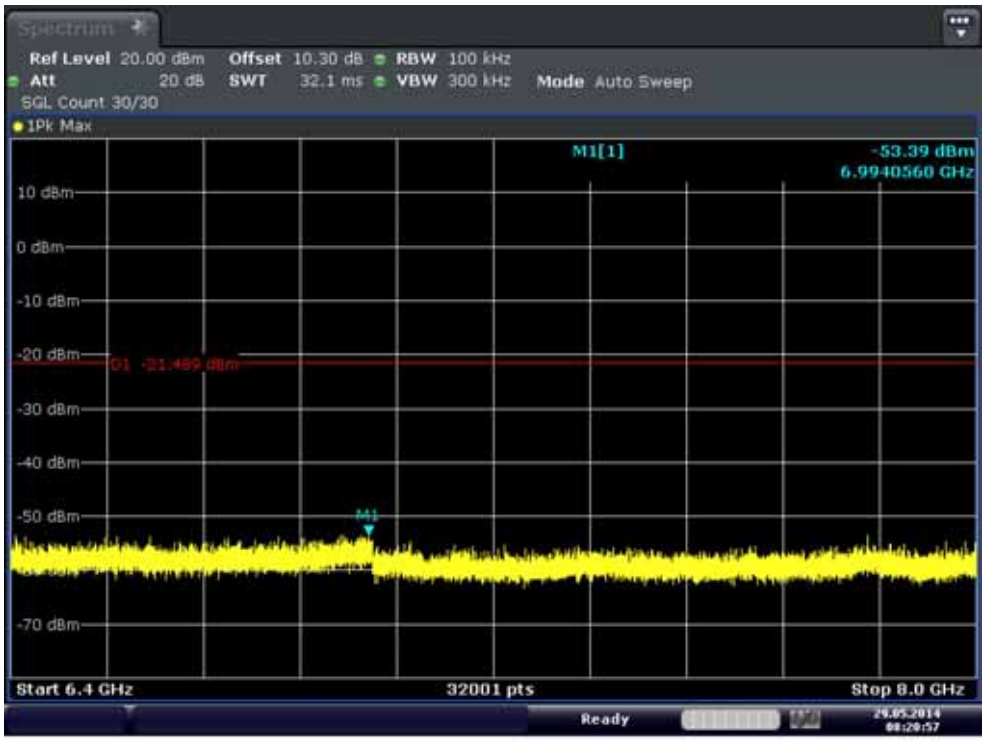
4.8 GHz ~ 6.4 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



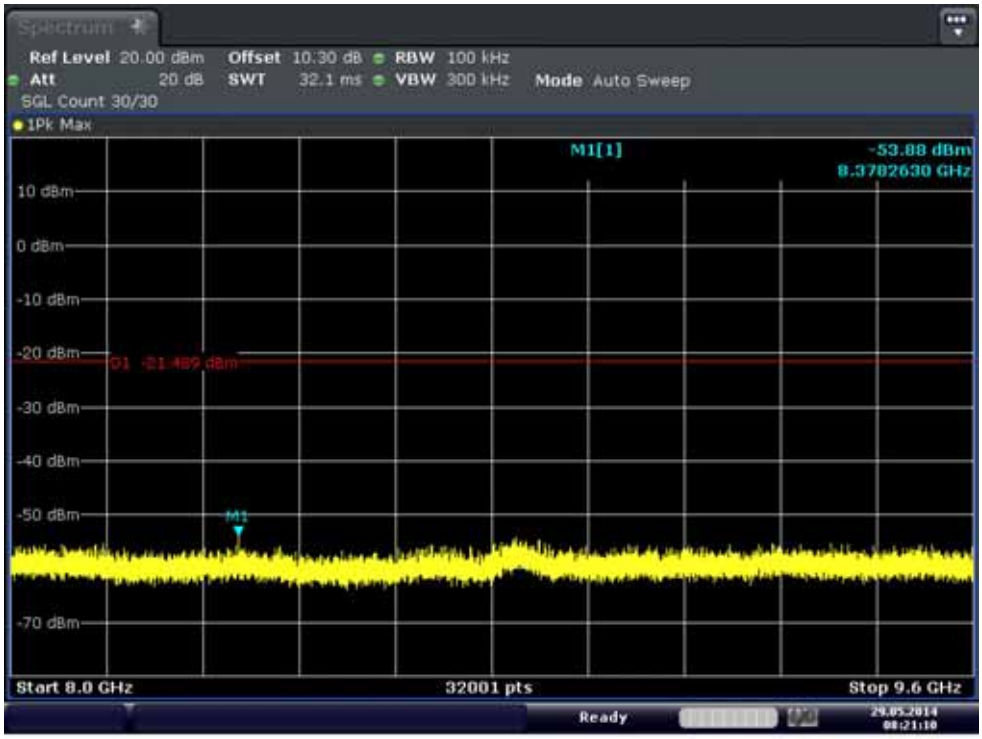
6.4 GHz ~ 8 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



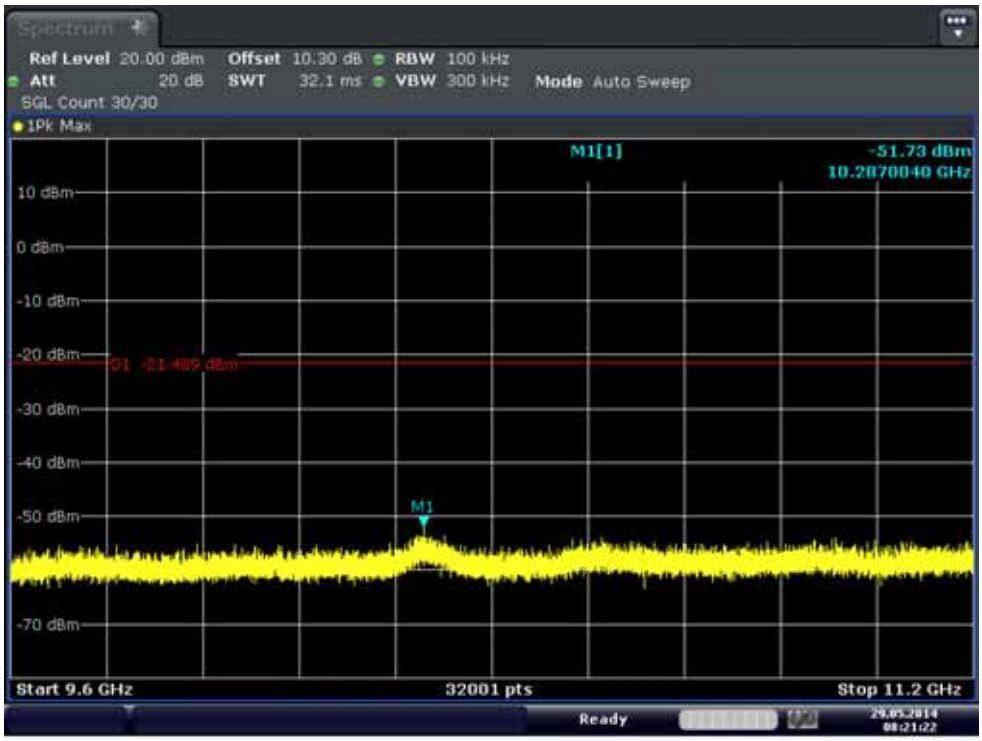
8 GHz ~ 9.6 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



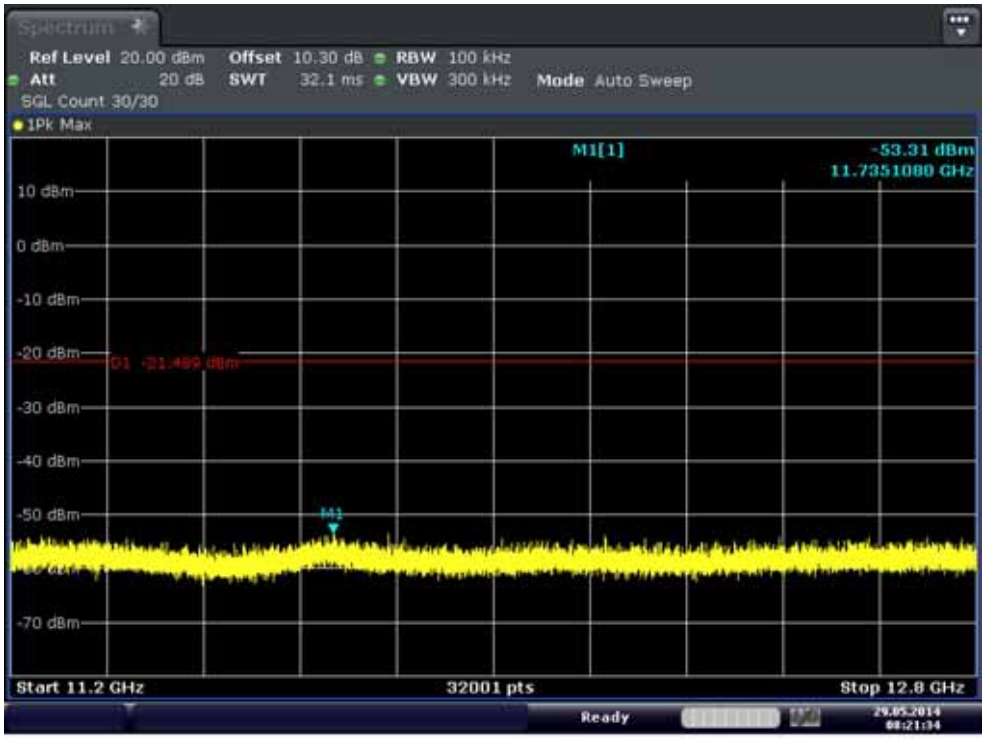
9.6 GHz ~ 11.2 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



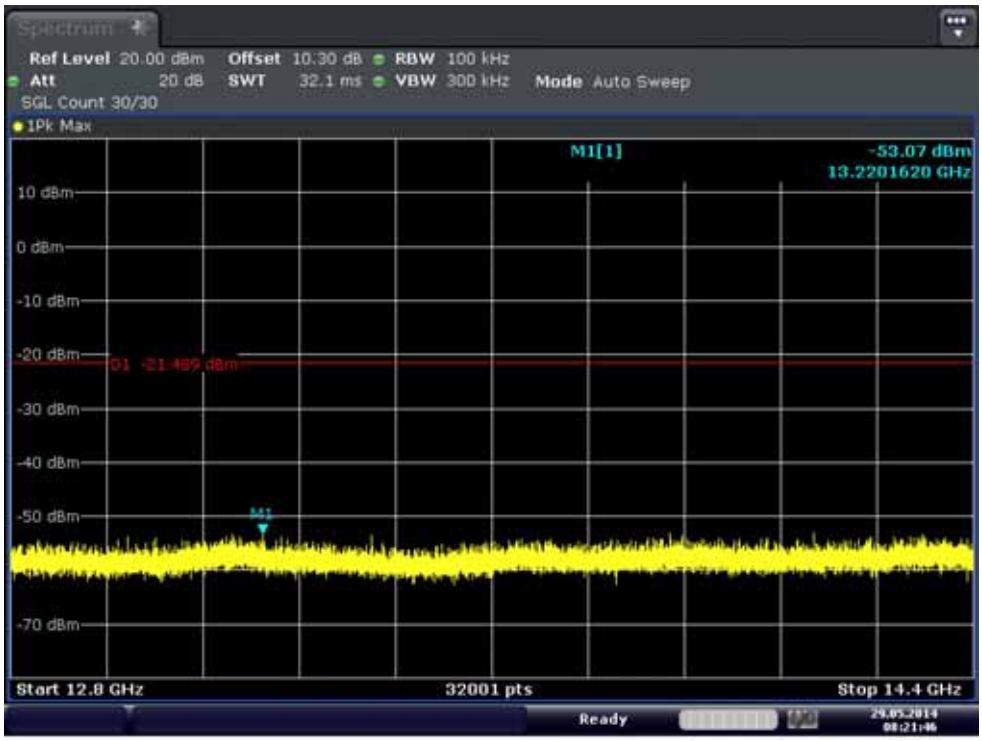
11.2 GHz ~ 12.8 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



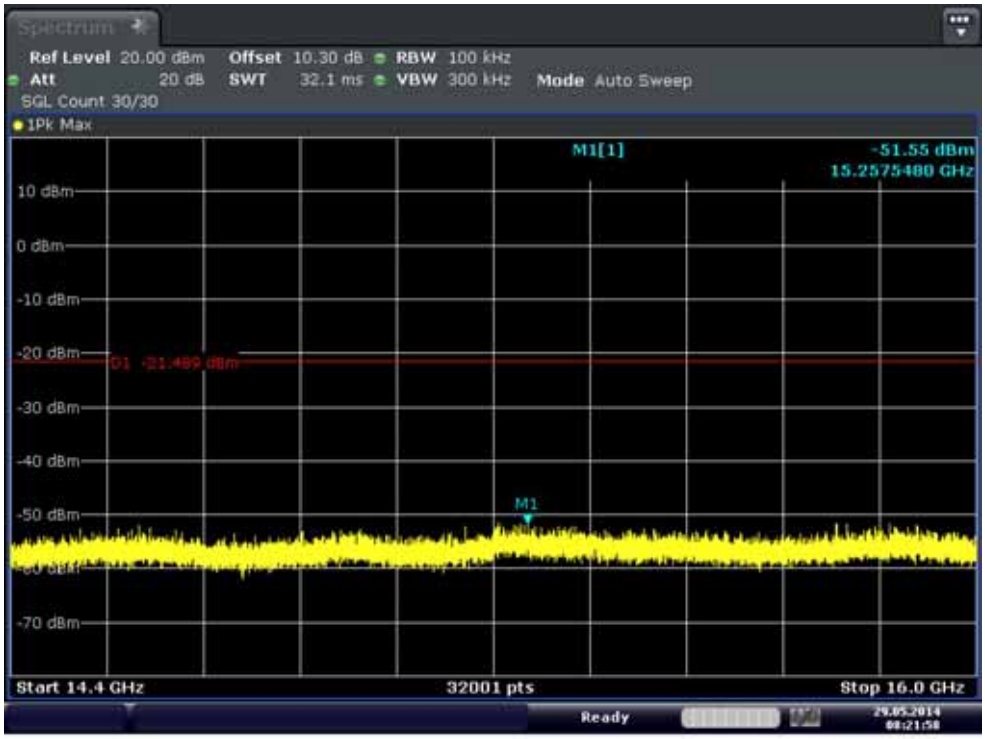
12.8 GHz ~ 14.4 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



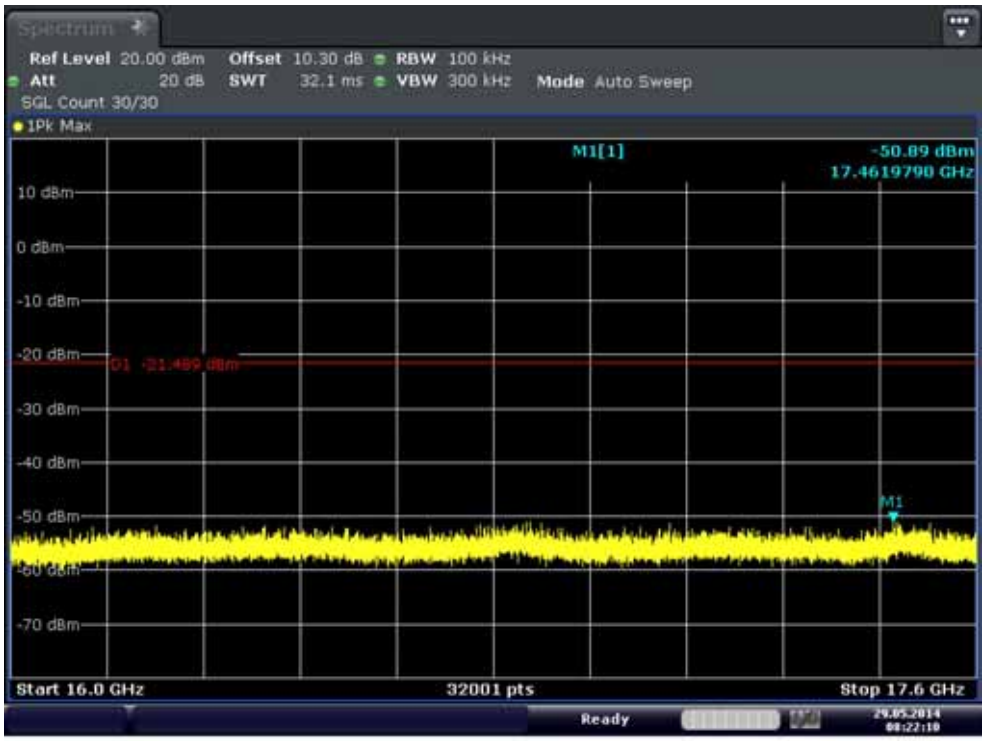
14.4 GHz ~ 16 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



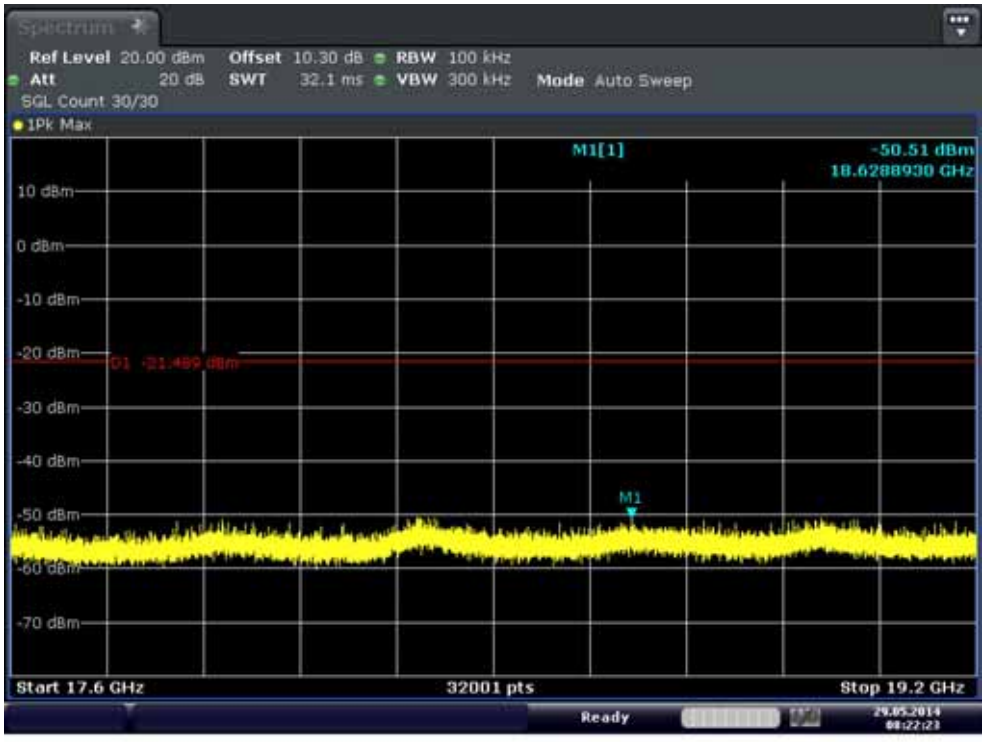
16 GHz ~ 17.6 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



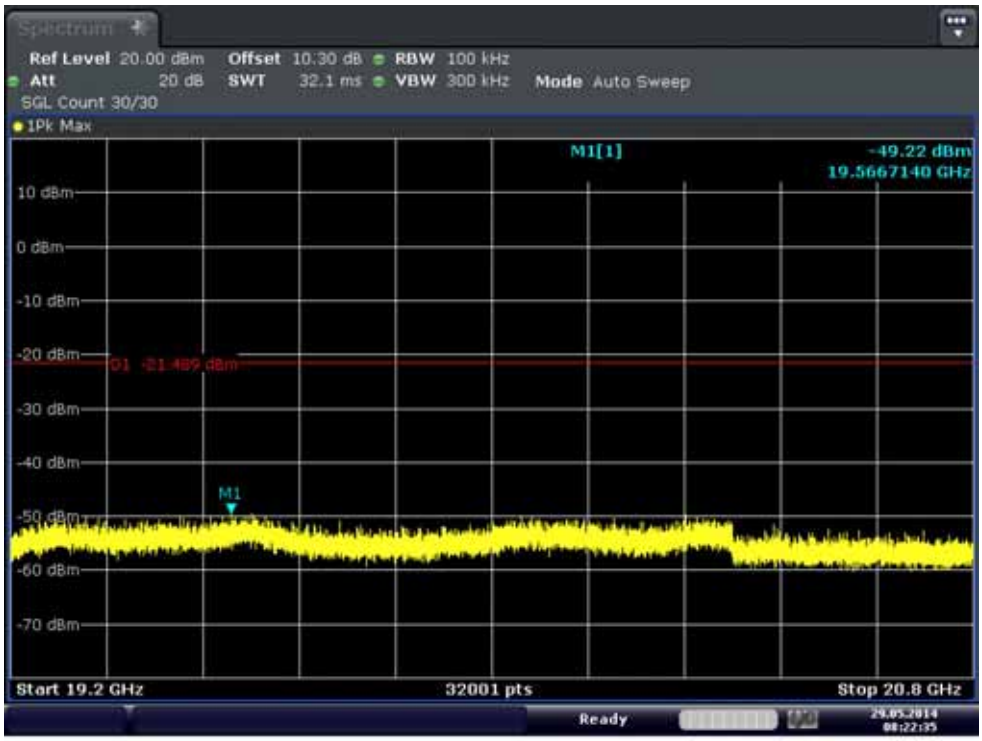
17.6 GHz ~ 19.2 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



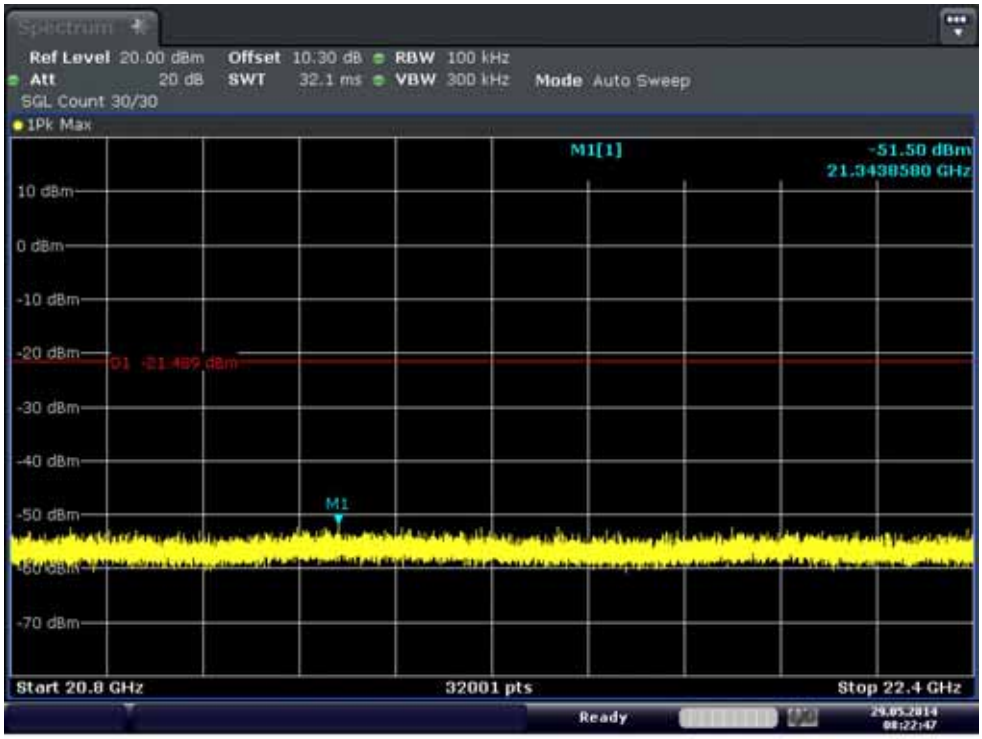
19.2 GHz ~ 20.8 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



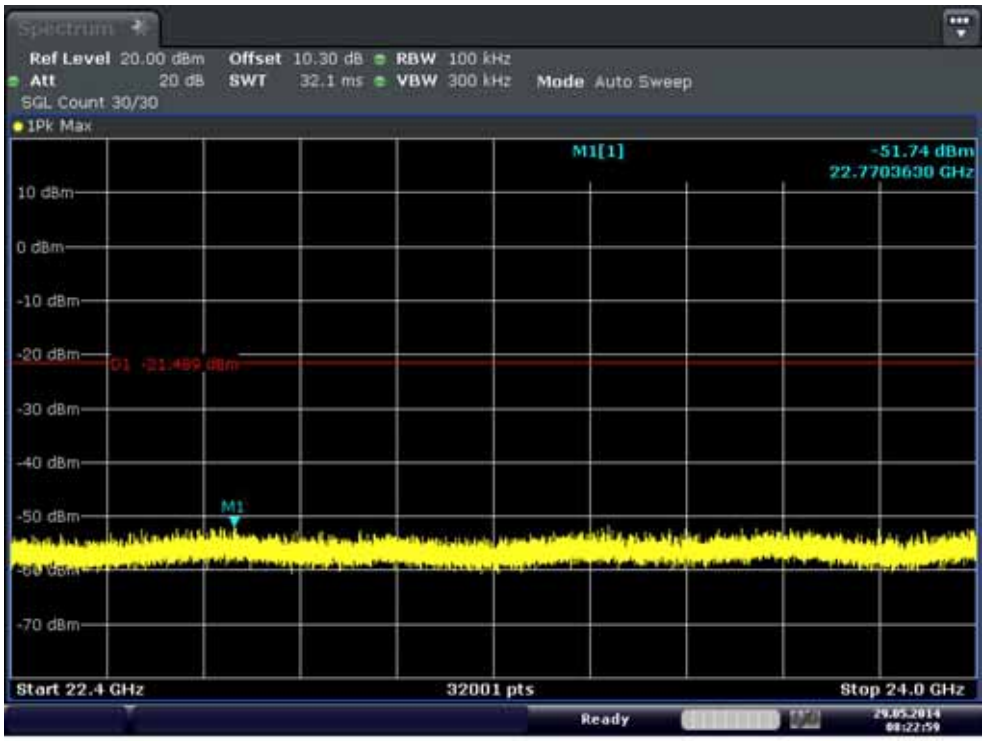
20.8 GHz ~ 22.4 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



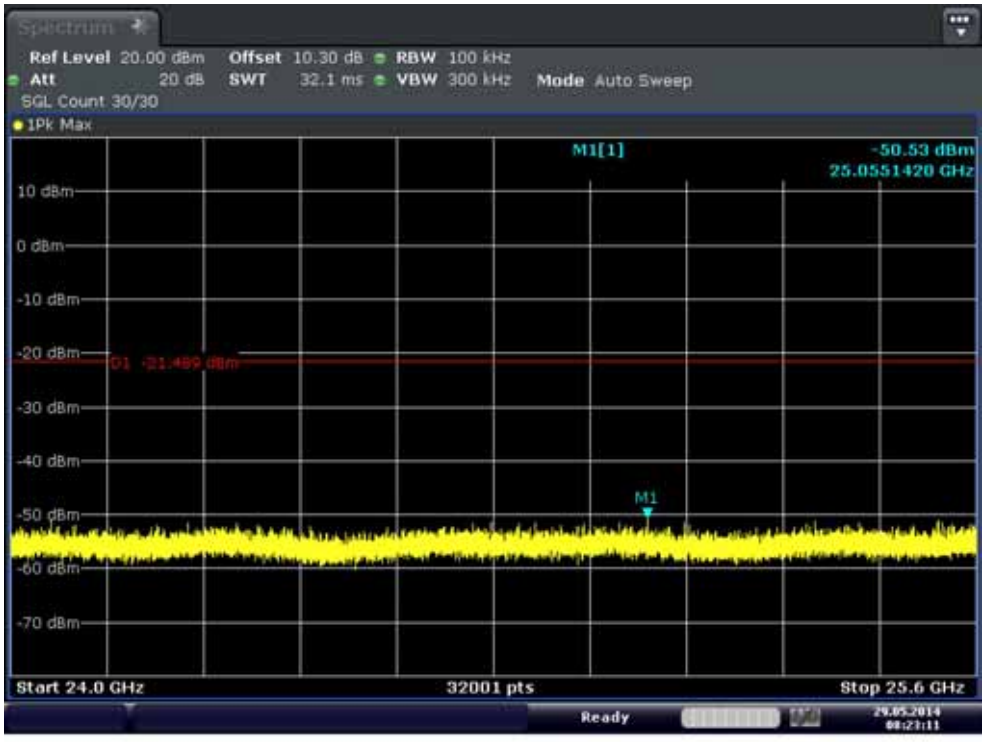
22.4 GHz ~ 24 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



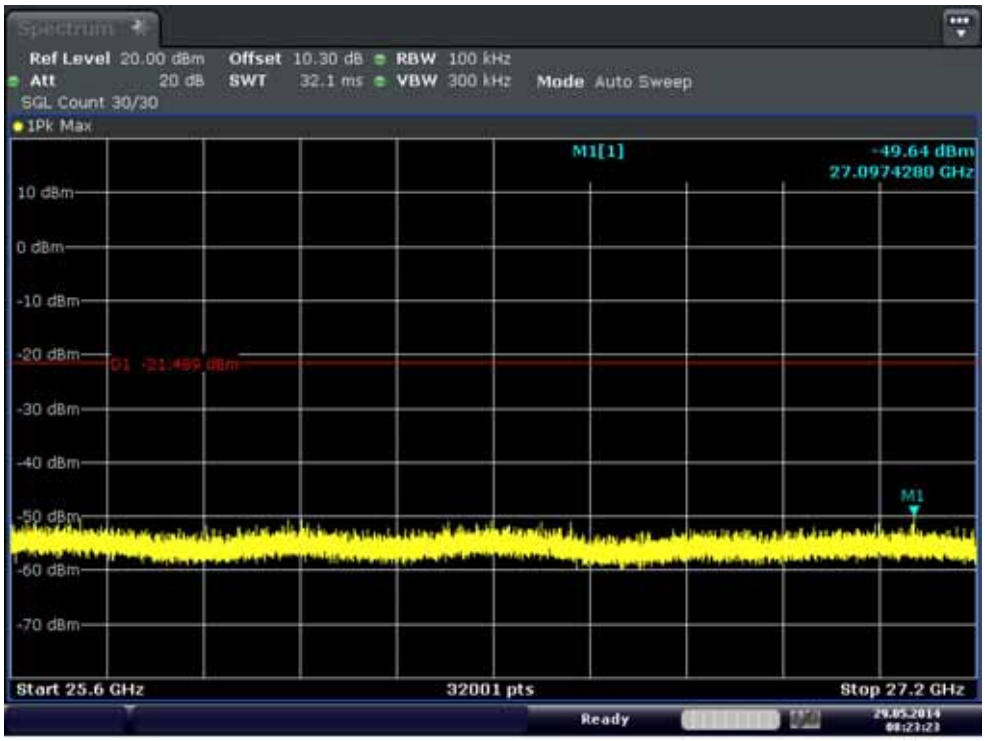
24 GHz ~ 25.6 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



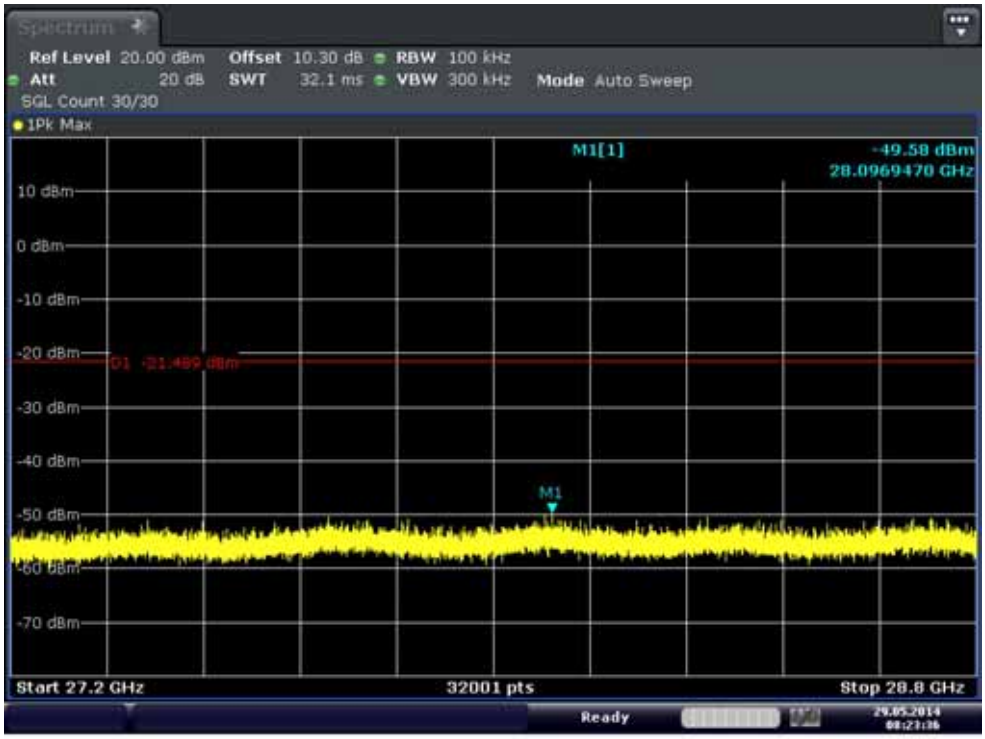
25.6 GHz ~ 27.2 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



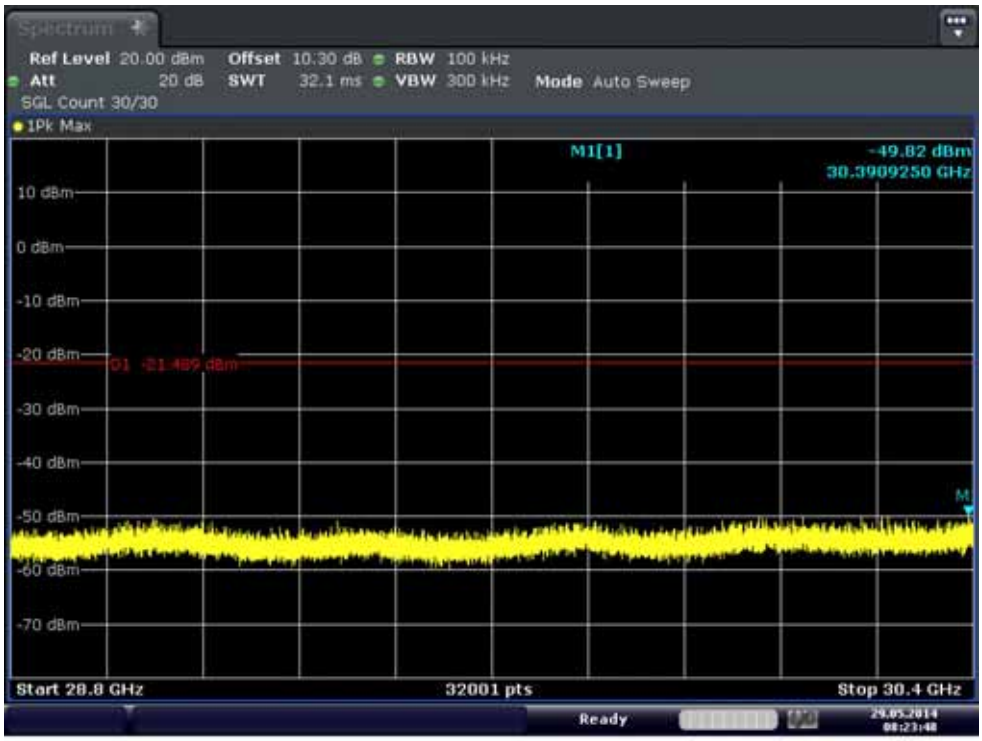
27.2 GHz ~ 28.8 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



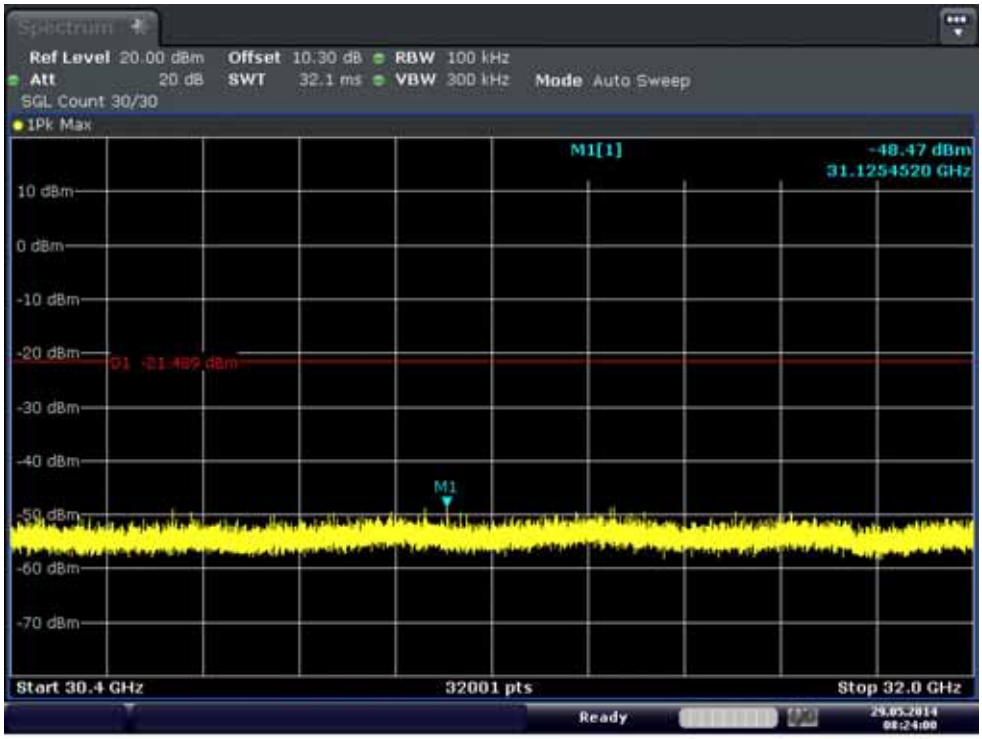
28.8 GHz ~ 30.4 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



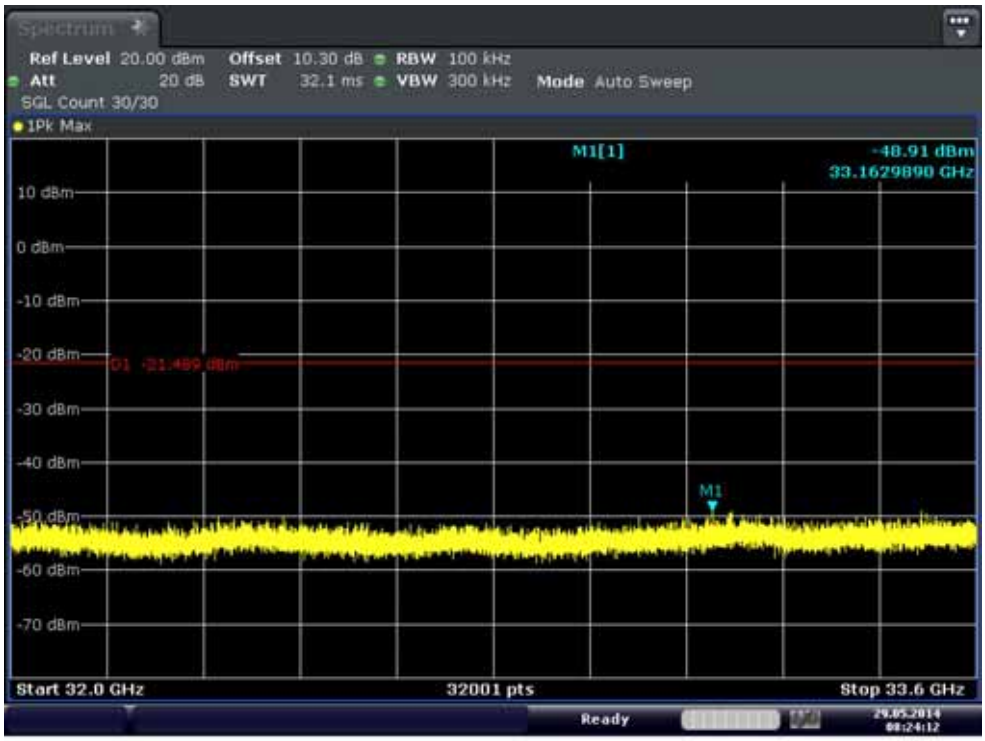
30.4 GHz ~ 32 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



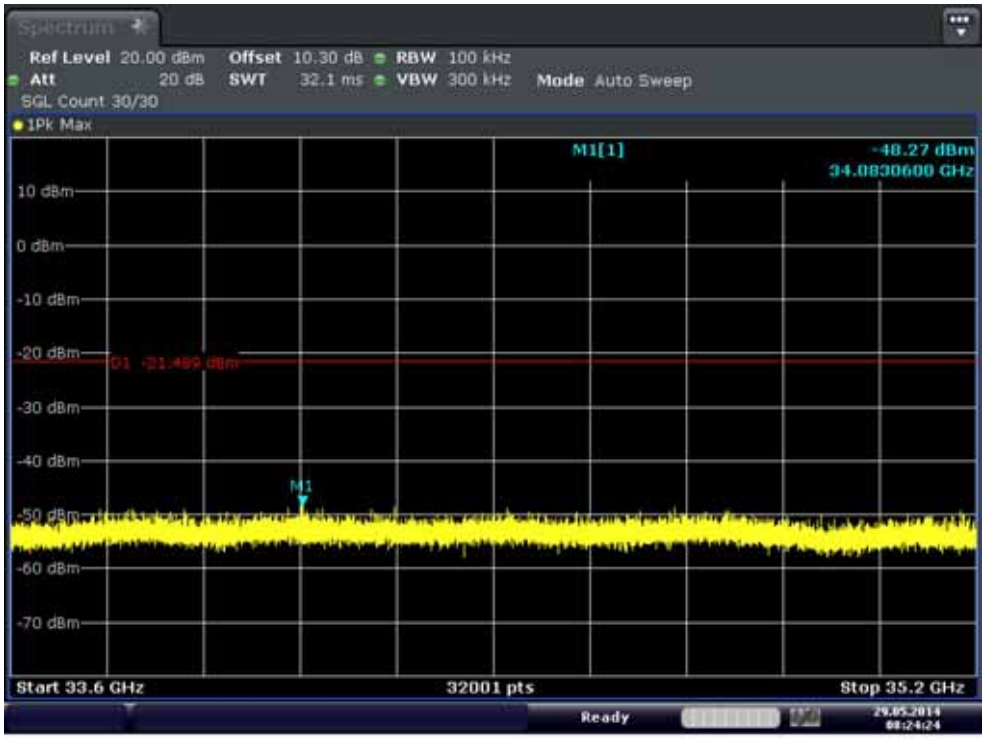
32 GHz ~ 33.6 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



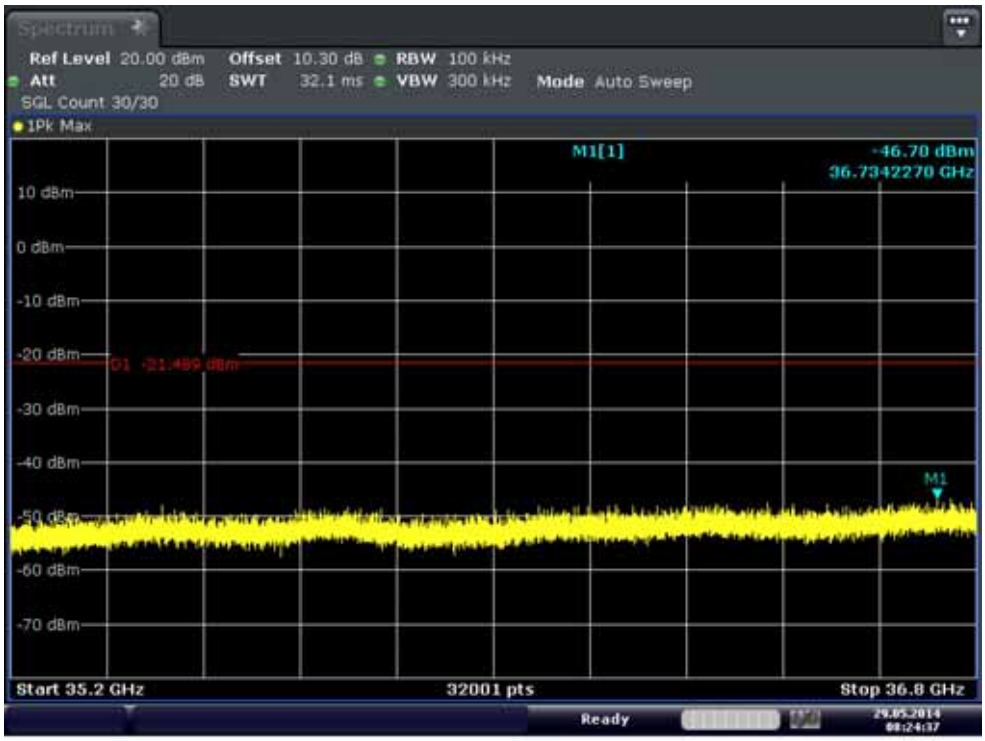
33.6 GHz ~ 35.2 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



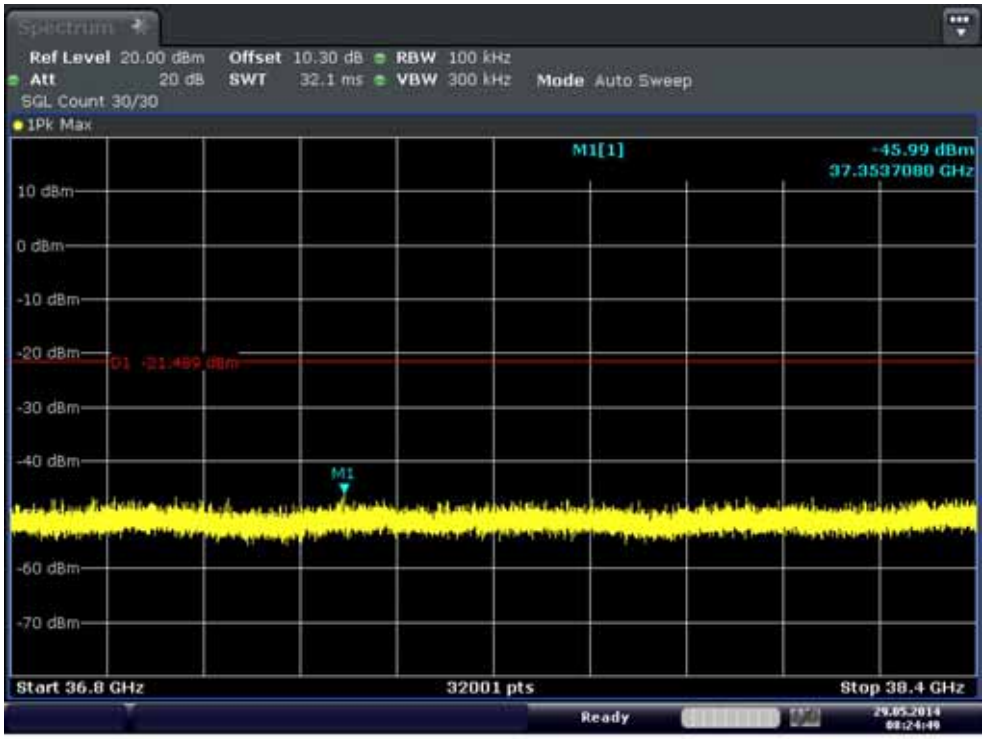
35.2 GHz ~ 36.8 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



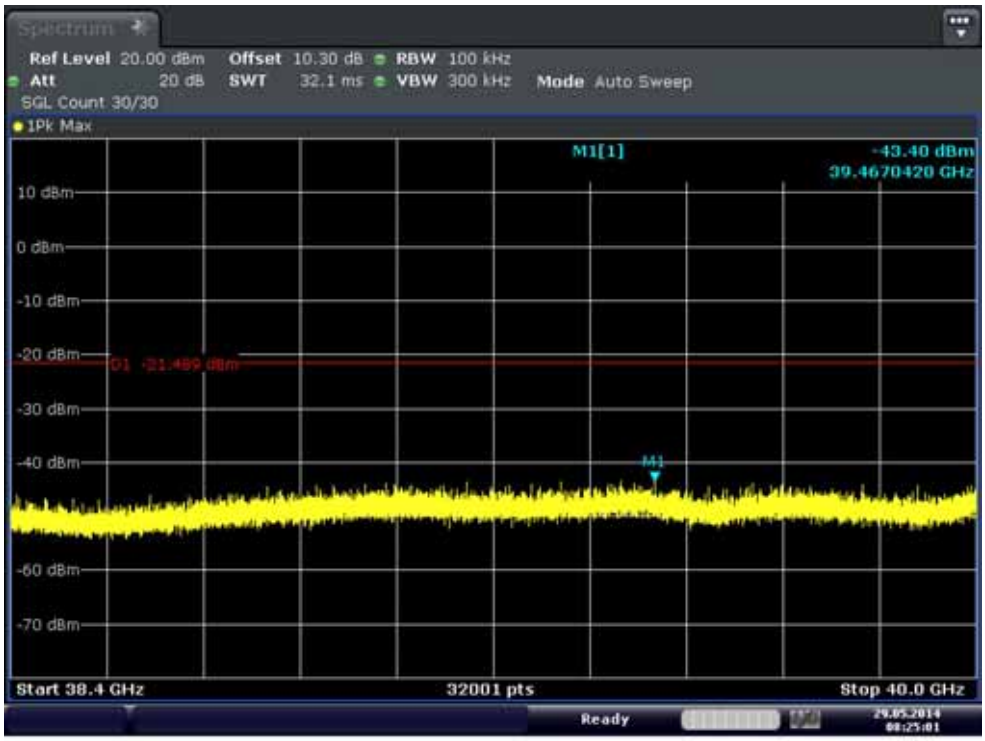
36.8 GHz ~ 38.4 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



38.4 GHz ~ 40 GHz

Conducted Spurious Emission (802.11a-CH149) _20 MHz BW



8.6 RADIATED MEASUREMENT.

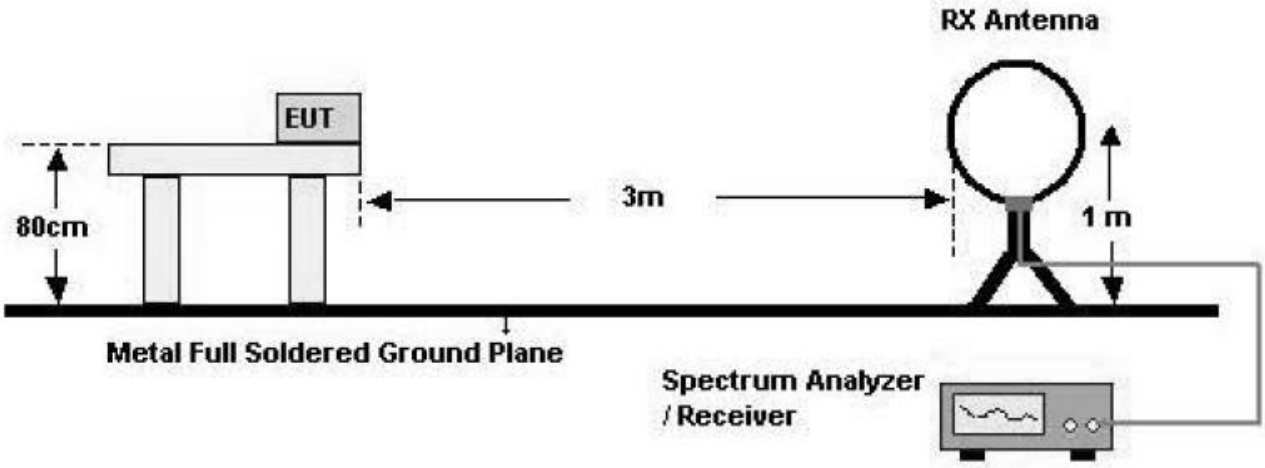
8.6.1 RADIATED SPURIOUS EMISSIONS.

Test Requirements and limit, §15.205, §15.209

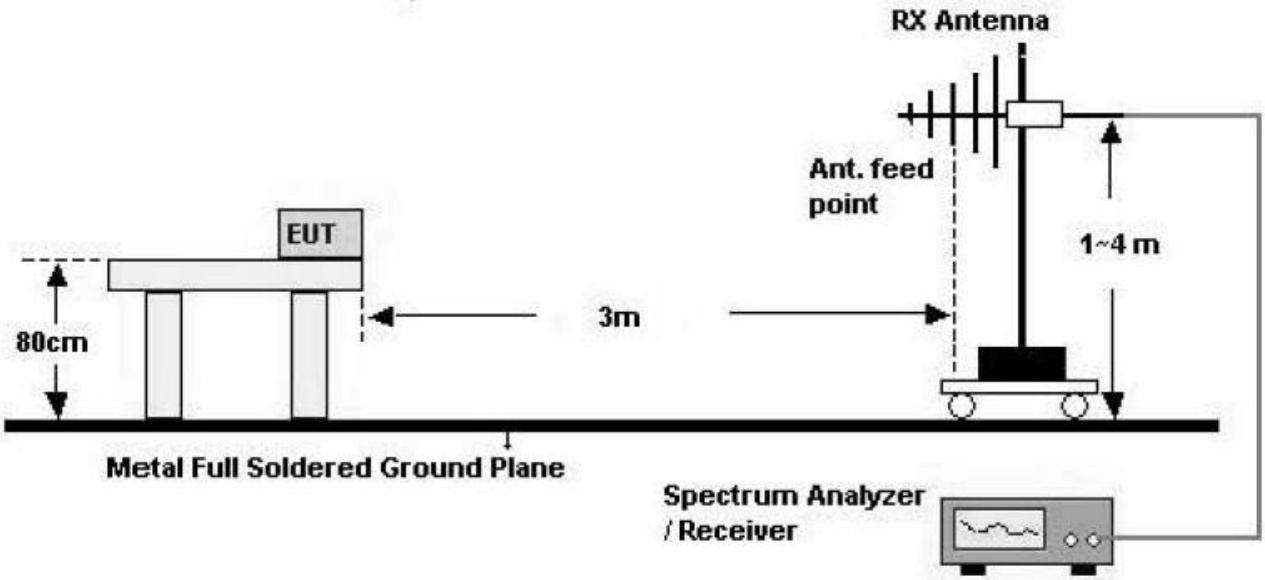
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

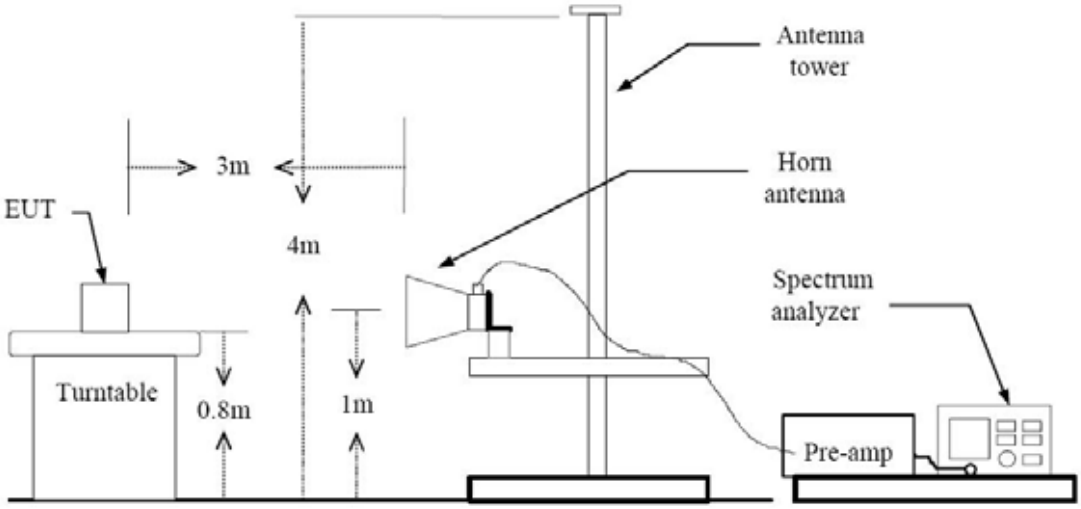
Below 30 MHz



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

Spectrum Setting

- Peak

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

RBW = cf. Table 1.

VBW ≥ 3 x 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

Set RBW = 1 MHz

Set VBW ≥ 1/T.(at least 100 times less than the resolution bandwidth, but no less than 10 Hz.)

Select spectrum analyzer linear display mode.

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

Note :

1. We used the case 1 for 802.11b mode and the case 2 for802.11a/g/n_20/n_40/ac_20/ac_40/ac_80 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/ac_20/ac_40/ac_80.

Mode	Worst Data rate (Mbps)	T_{on} (ms)	T_{total} (ms)	Duty Cycle (%)	VBW(1/T) (Hz)	The actual setting value of VBW (Hz)
b	**1**	**12.200**	**12.320**	**99.03**	**82**	**1000**
a	**6**	**2.030**	**2.130**	**95.31**	**493**	**1000**
g	**6**	**2.030**	**2.130**	**95.31**	**493**	**1000**
n_20	**6.5**	**1.880**	**1.980**	**94.95**	**532**	**1000**
n_40	**13.5**	**0.920**	**1.020**	**90.20**	**1087**	**3000**
5.8 GHz band ac_20	**6.5**	**0.975**	**1.074**	**90.78**	**1026**	**1000**
ac_40	**13.5**	**0.491**	**0.590**	**83.22**	**2037**	**3000**
ac_80	**29.3**	**0.247**	**0.347**	**71.18**	**4049**	**3000**

TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
㎒	dBμV/m	dBm /m	dBm	(H/V)	dBμV/m	dBμV/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. 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
㎒	dBμV/m	dBm /m	dBm	(H/V)	dBμV/m	dBμV/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]	Measurement Type
4824	53.23	-4.25	V	48.98	73.98	25.00	PK
4824	42.02	-4.25	V	37.77	53.98	16.21	AV
7236	51.76	5.21	V	56.97	73.98	17.01	PK
7236	38.06	5.21	V	43.27	53.98	10.71	AV
4824	53.24	-4.25	H	48.99	73.98	24.99	PK
4824	42.04	-4.25	H	37.79	53.98	16.19	AV
7236	52.23	5.21	H	57.44	73.98	16.54	PK
7236	37.99	5.21	H	43.20	53.98	10.78	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]	Measurement Type
4874	51.90	-3.93	V	47.97	73.98	26.01	PK
4874	40.57	-3.93	V	36.64	53.98	17.34	AV
7311	51.43	4.97	V	56.40	73.98	17.58	PK
7311	37.89	4.97	V	42.86	53.98	11.12	AV
4874	51.87	-3.93	H	47.94	73.98	26.04	PK
4874	41.02	-3.93	H	37.09	53.98	16.89	AV
7311	51.82	4.97	H	56.79	73.98	17.19	PK
7311	37.87	4.97	H	42.84	53.98	11.14	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]	Measurement Type
4924	51.56	-3.75	V	47.81	73.98	26.17	PK
4924	39.53	-3.75	V	35.78	53.98	18.20	AV
7386	51.20	5.60	V	56.80	73.98	17.18	PK
7386	37.99	5.60	V	43.59	53.98	10.39	AV
4924	51.21	-3.75	H	47.46	73.98	26.52	PK
4924	39.03	-3.75	H	35.28	53.98	18.70	AV
7386	52.52	5.60	H	58.12	73.98	15.86	PK
7386	38.11	5.60	H	43.71	53.98	10.27	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]	Measurement Type
4824	51.90	-4.25	V	47.65	73.98	26.33	PK
4824	38.17	-4.25	V	33.92	53.98	20.06	AV
7236	52.35	5.21	V	57.56	73.98	16.42	PK
7236	37.86	5.21	V	43.07	53.98	10.91	AV
4824	52.02	-4.25	H	47.77	73.98	26.21	PK
4824	38.15	-4.25	H	33.90	53.98	20.08	AV
7236	52.24	5.21	H	57.45	73.98	16.53	PK
7236	37.84	5.21	H	43.05	53.98	10.93	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]	Measurement Type
4874	51.52	-3.93	V	47.59	73.98	26.39	PK
4874	37.84	-3.93	V	33.91	53.98	20.07	AV
7311	51.87	4.97	V	56.84	73.98	17.14	PK
7311	37.54	4.97	V	42.51	53.98	11.47	AV
4874	51.67	-3.93	H	47.74	73.98	26.24	PK
4874	37.67	-3.93	H	33.74	53.98	20.24	AV
7311	51.75	4.97	H	56.72	73.98	17.26	PK
7311	37.46	4.97	H	42.43	53.98	11.55	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]	Measurement Type
4924	51.21	-3.75	V	47.46	73.98	26.52	PK
4924	37.63	-3.75	V	33.88	53.98	20.10	AV
7386	51.32	5.60	V	56.92	73.98	17.06	PK
7386	37.45	5.60	V	43.05	53.98	10.93	AV
4924	51.23	-3.75	H	47.48	73.98	26.50	PK
4924	37.59	-3.75	H	33.84	53.98	20.14	AV
7386	51.28	5.60	H	56.88	73.98	17.10	PK
7386	37.42	5.60	H	43.02	53.98	10.96	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]	Measurement Type
4824	52.21	-4.25	V	47.96	73.98	26.02	PK
4824	38.16	-4.25	V	33.91	53.98	20.07	AV
7236	51.94	5.21	V	57.15	73.98	16.83	PK
7236	37.90	5.21	V	43.11	53.98	10.87	AV
4824	52.25	-4.25	H	48.00	73.98	25.98	PK
4824	38.14	-4.25	H	33.89	53.98	20.09	AV
7236	51.84	5.21	H	57.05	73.98	16.93	PK
7236	37.88	5.21	H	43.09	53.98	10.89	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]	Measurement Type
4874	51.89	-3.93	V	47.96	73.98	26.02	PK
4874	37.96	-3.93	V	34.03	53.98	19.95	AV
7311	51.68	4.97	V	56.65	73.98	17.33	PK
7311	37.85	4.97	V	42.82	53.98	11.16	AV
4874	51.87	-3.93	H	47.94	73.98	26.04	PK
4874	37.91	-3.93	H	33.98	53.98	20.00	AV
7311	51.71	4.97	H	56.68	73.98	17.30	PK
7311	37.82	4.97	H	42.79	53.98	11.19	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]	Measurement Type
4924	51.33	-3.75	V	47.58	73.98	26.40	PK
4924	37.58	-3.75	V	33.83	53.98	20.15	AV
7386	51.29	5.60	V	56.89	73.98	17.09	PK
7386	37.47	5.60	V	43.07	53.98	10.91	AV
4924	51.36	-3.75	H	47.61	73.98	26.37	PK
4924	37.54	-3.75	H	33.79	53.98	20.19	AV
7386	51.48	5.60	H	57.08	73.98	16.90	PK
7386	37.42	5.60	H	43.02	53.98	10.96	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]	Measurement Type
11490	44.02	11.22	V	55.24	73.98	18.74	PK
11490	36.11	11.22	V	47.33	53.98	6.65	AV
11490	44.35	11.22	H	55.57	73.98	18.41	PK
11490	36.57	11.22	H	47.79	53.98	6.19	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]	Measurement Type
11570	43.59	11.71	V	55.30	73.98	18.68	PK
11570	35.96	11.71	V	47.67	53.98	6.31	AV
11570	43.97	11.71	H	55.68	73.98	18.30	PK
11570	35.44	11.71	H	47.15	53.98	6.83	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]	Measurement Type
11650	43.87	11.34	V	55.21	73.98	18.77	PK
11650	34.78	11.34	V	46.12	53.98	7.86	AV
11650	44.14	11.34	H	55.48	73.98	18.50	PK
11650	35.20	11.34	H	46.54	53.98	7.44	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]	Measurement Type
11490	44.12	11.22	V	55.34	73.98	18.64	PK
11490	36.08	11.22	V	47.30	53.98	6.68	AV
11490	44.47	11.22	H	55.69	73.98	18.29	PK
11490	36.39	11.22	H	47.61	53.98	6.37	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]	Measurement Type
11570	43.49	11.71	V	55.20	73.98	18.78	PK
11570	35.13	11.71	V	46.84	53.98	7.14	AV
11570	43.85	11.71	H	55.56	73.98	18.42	PK
11570	35.56	11.71	H	47.27	53.98	6.71	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]	Measurement Type
11650	43.61	11.34	V	54.95	73.98	19.03	PK
11650	34.28	11.34	V	45.62	53.98	8.36	AV
11650	44.08	11.34	H	55.42	73.98	18.56	PK
11650	34.69	11.34	H	46.03	53.98	7.95	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	43.12	11.53	V	54.65	73.98	19.33	PK
11510	35.85	11.53	V	47.38	53.98	6.60	AV
11510	43.46	11.53	H	54.99	73.98	18.99	PK
11510	36.42	11.53	H	47.95	53.98	6.03	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	42.68	11.64	V	54.32	73.98	19.66	PK
11590	35.37	11.64	V	47.01	53.98	6.97	AV
11590	42.84	11.64	H	54.48	73.98	19.50	PK
11590	35.72	11.64	H	47.36	53.98	6.62	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.

Band :	5.8 GHz
Operation Mode:	802.11 ac_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]	Measurement Type
11490	43.37	11.22	V	54.59	73.98	19.39	PK
11490	36.27	11.22	V	47.49	53.98	6.49	AV
11490	43.99	11.22	H	55.21	73.98	18.77	PK
11490	36.61	11.22	H	47.83	53.98	6.15	AV

Band :	5.8 GHz
Operation Mode:	802.11 ac_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]	Measurement Type
11570	43.11	11.71	V	54.82	73.98	19.16	PK
11570	35.57	11.71	V	47.28	53.98	6.70	AV
11570	43.59	11.71	H	55.30	73.98	18.68	PK
11570	35.93	11.71	H	47.64	53.98	6.34	AV

Band :	5.8 GHz
Operation Mode:	802.11 ac_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]	Measurement Type
11650	43.47	11.34	V	54.81	73.98	19.17	PK
11650	34.39	11.34	V	45.73	53.98	8.25	AV
11650	43.88	11.34	H	55.22	73.98	18.76	PK
11650	34.74	11.34	H	46.08	53.98	7.90	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 802.11ac 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
7. In case of 802.11ac, we applied the limit of spurious emissions according to KDB 644545 D01 Alternative Guidance for 802.11ac v01.

Band :	5.8 GHz
Operation Mode:	802.11 ac_40 MHz BW
Transfer Rate:	MCS0
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]	Measurement Type
11510	42.89	11.53	V	54.42	73.98	19.56	PK
11510	35.86	11.53	V	47.39	53.98	6.59	AV
11510	43.16	11.53	H	54.69	73.98	19.29	PK
11510	36.46	11.53	H	47.99	53.98	5.99	AV

Band :	5.8 GHz
Operation Mode:	802.11 ac_40 MHz BW
Transfer Rate:	MCS0
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]	Measurement Type
11590	42.61	11.64	V	54.25	73.98	19.73	PK
11590	35.47	11.64	V	47.11	53.98	6.87	AV
11590	42.75	11.64	H	54.39	73.98	19.59	PK
11590	35.89	11.64	H	47.53	53.98	6.45	AV

Band :	UNII 4
Operation Mode:	802.11 ac _80 MHz BW
Transfer Rate:	MCS0
Operating Frequency	5775 MHz
Channel No.	155 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
11550	41.09	11.50	V	52.59	73.98	21.39	PK
11550	34.58	11.50	V	46.08	53.98	7.90	AV
11550	41.36	11.50	H	52.86	73.98	21.12	PK
11550	35.04	11.50	H	46.54	53.98	7.44	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 802.11ac 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
7. In case of 802.11ac, we applied the limit of spurious emissions according to KDB 644545 D01 Alternative Guidance for 802.11ac v01.

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]	Measurement Type
2390.0	29.01	33.90	H	62.91	73.98	11.07	PK
2390.0	12.39	33.90	H	46.29	53.98	7.69	AV
2390.0	26.26	33.90	V	60.16	73.98	13.82	PK
2390.0	12.12	33.90	V	46.02	53.98	7.96	AV
2483.5	34.56	33.99	H	68.55	73.98	5.43	PK
2483.5	14.51	33.99	H	48.50	53.98	5.48	AV
2483.5	31.96	33.99	V	65.95	73.98	8.03	PK
2483.5	14.02	33.99	V	48.01	53.98	5.97	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]	Measurement Type
2390.0	24.96	33.90	H	58.86	73.98	15.12	PK
2390.0	11.27	33.90	H	45.17	53.98	8.81	AV
2390.0	24.55	33.90	V	58.45	73.98	15.53	PK
2390.0	11.22	33.90	V	45.12	53.98	8.86	AV
2483.5	25.20	33.99	H	59.19	73.98	14.79	PK
2483.5	11.83	33.99	H	45.82	53.98	8.16	AV
2483.5	24.57	33.99	V	58.56	73.98	15.42	PK
2483.5	11.67	33.99	V	45.66	53.98	8.32	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]	Measurement Type
2390.0	28.61	33.90	H	62.51	73.98	11.47	PK
2390.0	12.35	33.90	H	46.25	53.98	7.73	AV
2390.0	25.67	33.90	V	59.57	73.98	14.41	PK
2390.0	12.15	33.90	V	46.05	53.98	7.93	AV
2483.5	33.83	33.99	H	67.82	73.98	6.16	PK
2483.5	14.34	33.99	H	48.33	53.98	5.65	AV
2483.5	30.29	33.99	V	64.28	73.98	9.70	PK
2483.5	13.95	33.99	V	47.94	53.98	6.04	AV

Band:	5.8 GHz
Operation Mode:	802.11ac_20 MHz
Transfer Rate:	6.5 Mbps
Operating Frequency	5825 MHz
Channel No.	165 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp Gain [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
*5850	68.40	0.94	H	69.34	73.98	4.64	PK
*5850	67.98	0.94	V	68.92	73.98	5.06	PK

Band:	5.8 GHz
Operation Mode:	802.11ac_40 MHz
Transfer Rate:	13.5 Mbps
Operating Frequency	5795 MHz
Channel No.	159 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp Gain [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
*5850	58.77	0.94	H	59.71	73.98	14.27	PK
*5850	58.39	0.94	V	59.33	73.98	14.65	PK

Band:	5.8 GHz
Operation Mode:	802.11ac_80 MHz
Transfer Rate:	29.3 Mbps
Operating Frequency	5775 MHz
Channel No.	155 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp Gain [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Measurement Type
*5850	69.43	0.94	H	70.37	73.98	3.61	PK
*5850	69.11	0.94	V	70.05	73.98	3.93	PK

Notes:

1. Total = Reading Value + Antenna Factor + Cable Loss
2. We have done 802.11b/g/n/ac 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.

4. In case of 5.8 GHz band 802.11ac, we applied the limit of spurious emissions according to KDB 644545 D01 Alternative Guidance for 802.11ac v01.
5. '*' is radiated band edge test frequency(not restricted band emissions).

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

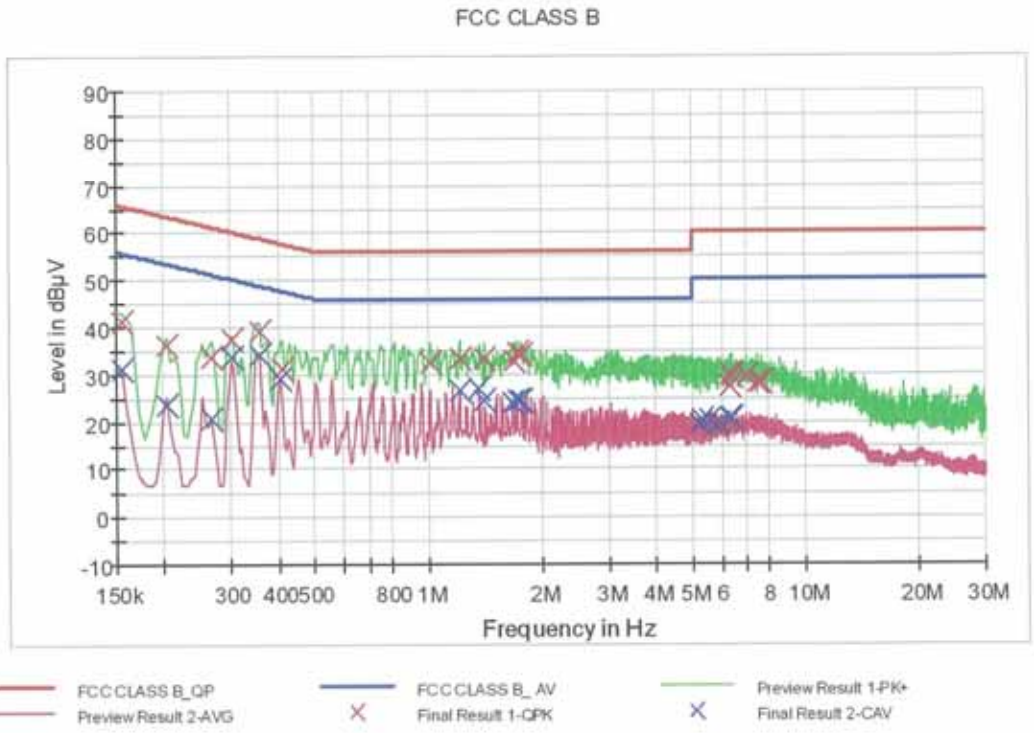
Conducted Emissions (Line 1)

EMI Auto Test(2) 1 / 2

HCT TEST Report

Common Information

EUT:	LGL24
Manufacturer:	LG
Test Site:	SHIELD ROOM
Operating Conditions:	WLAN(2.4G)
Operator Name:	KH-SEO



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	41.3	9.000	Off	L1	9.7	24.5	65.8
0.204000	36.3	9.000	Off	L1	9.7	27.1	63.4
0.267000	33.9	9.000	Off	L1	9.7	27.3	61.2
0.303000	37.3	9.000	Off	L1	9.7	22.9	60.2
0.357000	39.1	9.000	Off	L1	9.7	19.7	58.8
0.411000	31.4	9.000	Off	L1	9.7	26.2	57.6
1.022000	32.3	9.000	Off	L1	9.7	23.7	56.0
1.215500	33.2	9.000	Off	L1	9.8	22.8	56.0
1.418000	33.2	9.000	Off	L1	9.8	22.8	56.0
1.683500	32.9	9.000	Off	L1	9.8	23.1	56.0
1.733000	34.7	9.000	Off	L1	9.8	21.3	56.0
1.773500	34.1	9.000	Off	L1	9.8	21.9	56.0
6.278000	29.7	9.000	Off	L1	10.2	30.3	60.0
6.287000	27.5	9.000	Off	L1	10.2	32.5	60.0
6.327500	29.5	9.000	Off	L1	10.2	30.5	60.0
6.930500	29.5	9.000	Off	L1	10.3	30.5	60.0

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Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
7.439000	28.4	9.000	Off	L1	10.3	31.6	60.0
7.641500	28.4	9.000	Off	L1	10.3	31.6	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	31.3	9.000	Off	L1	9.7	24.5	55.8
0.204000	23.7	9.000	Off	L1	9.7	29.7	53.4
0.267000	20.5	9.000	Off	L1	9.7	30.7	51.2
0.303000	33.6	9.000	Off	L1	9.7	16.6	50.2
0.357000	34.3	9.000	Off	L1	9.7	14.5	48.8
0.406500	29.1	9.000	Off	L1	9.7	18.6	47.7
1.215500	26.6	9.000	Off	L1	9.8	19.4	46.0
1.368500	26.9	9.000	Off	L1	9.8	19.1	46.0
1.418000	24.4	9.000	Off	L1	9.8	21.6	46.0
1.674500	23.9	9.000	Off	L1	9.8	22.1	46.0
1.724000	24.6	9.000	Off	L1	9.8	21.4	46.0
1.778000	24.5	9.000	Off	L1	9.8	21.5	46.0
5.220500	19.5	9.000	Off	L1	10.1	30.5	50.0
5.315000	20.1	9.000	Off	L1	10.1	29.9	50.0
5.567000	20.3	9.000	Off	L1	10.1	29.7	50.0
5.882000	19.5	9.000	Off	L1	10.2	30.5	50.0
6.273500	20.6	9.000	Off	L1	10.2	29.4	50.0
6.327500	20.5	9.000	Off	L1	10.2	29.5	50.0

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Conducted Emissions (Line 2)

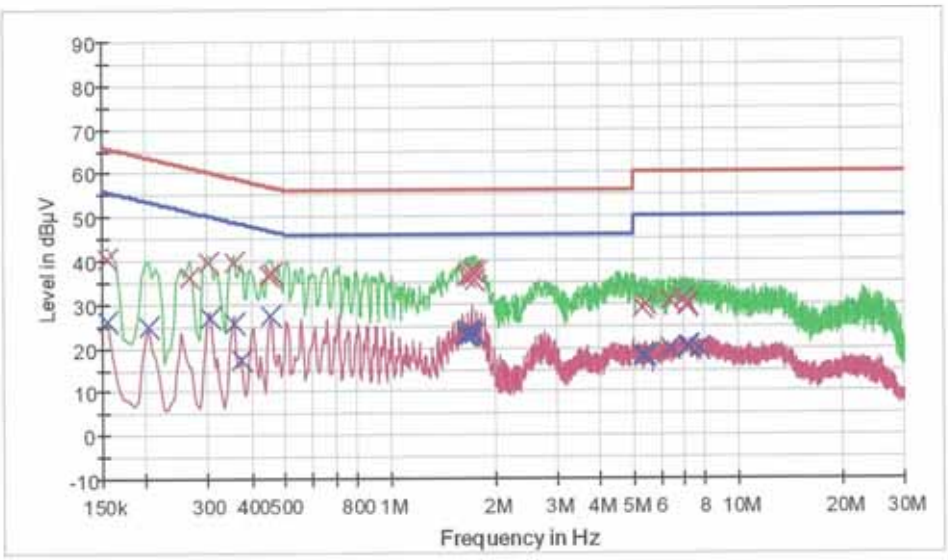
EMI Auto Test(2) 1 / 2

HCT TEST Report

Common Information

EUT:	LGL24
Manufacturer:	LG
Test Site:	SHIELD ROOM
Operating Conditions:	WLAN(2.4G)
Operator Name:	KH-SEO

FCC CLASS B



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	40.6	9.000	Off	N	9.7	25.2	65.8
0.267000	36.3	9.000	Off	N	9.7	24.9	61.2
0.303000	39.6	9.000	Off	N	9.7	20.6	60.2
0.357000	39.6	9.000	Off	N	9.7	19.2	58.8
0.451500	36.8	9.000	Off	N	9.7	20.0	56.8
0.460500	37.0	9.000	Off	N	9.7	19.7	56.7
1.652000	36.3	9.000	Off	N	9.8	19.7	56.0
1.688000	36.7	9.000	Off	N	9.8	19.3	56.0
1.706000	36.4	9.000	Off	N	9.8	19.6	56.0
1.733000	37.6	9.000	Off	N	9.8	18.4	56.0
1.742000	35.5	9.000	Off	N	9.8	20.5	56.0
1.760000	36.9	9.000	Off	N	9.8	19.1	56.0
5.301500	29.2	9.000	Off	N	10.1	30.8	60.0
5.400500	30.0	9.000	Off	N	10.1	30.0	60.0
6.332000	30.7	9.000	Off	N	10.2	29.3	60.0
6.998000	31.1	9.000	Off	N	10.3	28.9	60.0

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Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
7.128500	30.0	9.000	Off	N	10.3	30.0	60.0
7.137500	29.4	9.000	Off	N	10.3	30.6	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	26.3	9.000	Off	N	9.7	29.5	55.8
0.204000	24.7	9.000	Off	N	9.7	28.7	53.4
0.307500	26.8	9.000	Off	N	9.7	23.2	50.0
0.357000	25.6	9.000	Off	N	9.7	23.2	48.8
0.375000	17.2	9.000	Off	N	9.7	31.2	48.4
0.456000	27.6	9.000	Off	N	9.7	19.2	46.8
1.652000	23.2	9.000	Off	N	9.8	22.8	46.0
1.661000	23.0	9.000	Off	N	9.8	23.0	46.0
1.688000	23.7	9.000	Off	N	9.8	22.3	46.0
1.697000	22.8	9.000	Off	N	9.8	23.2	46.0
1.706000	23.2	9.000	Off	N	9.8	22.8	46.0
1.742000	23.3	9.000	Off	N	9.8	22.7	46.0
5.292500	18.1	9.000	Off	N	10.1	31.9	50.0
5.400500	18.2	9.000	Off	N	10.1	31.8	50.0
6.341000	19.9	9.000	Off	N	10.2	30.1	50.0
7.128500	20.3	9.000	Off	N	10.3	29.7	50.0
7.218500	20.2	9.000	Off	N	10.3	29.8	50.0
7.668500	20.0	9.000	Off	N	10.3	30.0	50.0

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9. LIST OF TEST EQUIPMENT

9.1 LIST OF TEST EQUIPMENT(Conducted Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Calibration Due	Serial No.
Rohde & Schwarz	ENV216/ LISN	01/29/2014	Annual	01/29/2015	100073
Agilent	E4440A/ Spectrum Analyzer	04/09/2014	Annual	04/09/2015	US45303008
Agilent	N9020A/ SIGNAL ANALYZER	05/23/2014	Annual	05/23/2015	MY51110063
Agilent	N1911A/Power Meter	01/24/2014	Annual	01/24/2015	MY45100523
Agilent	N1921A /POWER SENSOR	07/11/2013	Annual	07/11/2014	MY45241059
Hewlett Packard	11636B/Power Divider	10/22/2013	Annual	10/22/2014	11377
Agilent	87300B/Directional Coupler	12/18/2013	Annual	12/18/2014	3116A03621
Hewlett Packard	11667B / Power Splitter	01/27/2014	Annual	01/27/2015	10545
DIGITAL	EP-3010 /DC POWER SUPPLY	10/29/2013	Annual	10/29/2014	3110117
ITECH	IT6720 / DC POWER SUPPLY	11/05/2013	Annual	11/05/2014	0100021562870011 99
TESCOM	TC-3000C / BLUETOOTH TESTER	04/24/2014	Annual	04/24/2015	3000C000276
Rohde & Schwarz	CBT / BLUETOOTH TESTER	05/07/2014	Annual	05/07/2015	100422
Agilent	8493C / Attenuator(10 dB)	07/24/2013	Annual	07/24/2014	76649
WEINSCHEL	2-3 / Attenuator(3 dB)	10/28/2013	Annual	10/28/2014	BR0617

Note: This equipment (N9020A/ SIGNAL ANALYZER) is used after 05/23/2014 and actual calibration date is 05/23/2014

This equipment (CBT / BLUETOOTH TESTER) is used after 05/07/2014 and actual calibration date is 05/07/2014

9.2 LIST OF TEST EQUIPMENT(Radiated Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Calibration Due	Serial No.
Schwarzbeck	VULB 9160/ TRILOG Antenna	12/17/2012	Biennial	12/17/2014	3150
Rohde & Schwarz	ESCI / EMI TEST RECEIVER	01/24/2014	Annual	01/24/2015	100584
HD	MA240/ Antenna Position Tower	N/A	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	N/A	13
HD GmbH	KMS 560/ SlideBar	N/A	N/A	N/A	12
Rohde & Schwarz	SCU-18/ Signal Conditioning Unit	09/10/2013	Annual	09/10/2014	10094
CERNEX	CBL18265035 / POWER AMP	07/24/2013	Annual	07/24/2014	22966
CERNEX	CBL26405040 / POWER AMP	04/04/2014	Annual	04/04/2015	19660
Schwarzbeck	BBHA 9120D/ Horn Antenna	07/05/2013	Biennial	07/05/2015	1151
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	10/30/2012	Biennial	10/30/2014	BBHA9170124
Rohde & Schwarz	FSP / Spectrum Analyzer	01/24/2014	Annual	01/24/2015	839117/011
Wainwright Instrument	WHF3.0/18G-10EF / High Pass Filter	02/03/2014	Annual	02/03/2015	F6
Wainwright Instrument	WHNX6.0/26.5G-6SS / High Pass Filter	04/09/2014	Annual	04/09/2015	1
Wainwright Instrument	WHNX7.0/18G-8SS / High Pass Filter	04/04/2014	Annual	04/04/2015	29
Wainwright Instrument	WRCJ2400/2483.5-2370/2520-60/14SS / Band Reject Filter	06/24/2013	Annual	06/24/2014	1
TESCOM	TC-3000C / BLUETOOTH TESTER	04/24/2014	Annual	04/24/2015	3000C000276
Rohde & Schwarz	CBT / BLUETOOTH TESTER	05/07/2014	Annual	05/07/2015	100422
Rohde & Schwarz	LOOP ANTENNA	08/14/2012	Biennial	08/14/2014	100179
CERNEX	CBL06185030 / POWER AMP	07/24/2013	Annual	07/24/2014	22965
CERNEX	CBLU1183540 / POWER AMP	07/24/2013	Annual	07/24/2014	22964
Note: This equipment (CBT / BLUETOOTH TESTER) is used after 05/07/2014 and actual calibration date is 05/07/2014					