

HCT CO., LTD.

CERTIFICATE OF COMPLIANCE FCC Class II Permissive Change

Applicant Name: LG Electronics MobileComm U.S.A., Inc.	Date of Issue: August 09, 2013
Address: 1000 Sylvan Avenue, Englewood Cliffs NJ 07632	Test Site/Location: HCT CO., LTD., 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, Korea
	Report No.: HCTR1308FR09-1
	HCT FRN: 0005866421

FCC ID : ZNFVS980

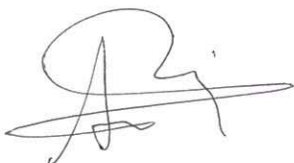
APPLICANT : LG Electronics MobileComm U.S.A., Inc.

FCC Model(s):	LG-VS980
EUT Type:	GSM/WCDMA/CDMA/LTE Phone Bluetooth, WLAN and NFC
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
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Approved by
: Chang Seok Choi
Manager of RF Team

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FCC PT.15.247 TEST REPORT	FCC Class II Permissive Change REPORT		www.hct.co.kr
Test Report No. HCTR1308FR09-1	Date of Issue: August 09, 2013	EUT Type: GSM/WCDMA/CDMA/LTE Phone Bluetooth, WLAN and NFC	FCC ID: ZNFVS980

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCTR1308FR09	August 01, 2013	- First Approval Report
HCTR1308FR09-1	August 09, 2013	- Retest and Revised the Limit for 802.11ac according to KDB 644545

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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: ZNFVS980
EUT Type: GSM/WCDMA/CDMA/LTE Phone Bluetooth, WLAN and NFC
Model name(s): LG-VS980
Date(s) of Tests: July 11, 2013 ~ August 09, 2013
Place of Tests: HCT Co., Ltd.
 105-1, Jangam-ri , Majang-Myeon, Icheon-si, Kyunggi-Do, 467-811, KOREA.
 (IC Recognition No. : 5944A-3)

2. EUT DESCRIPTION

EUT Type	GSM/WCDMA/CDMA/LTE Phone Bluetooth, WLAN and NFC	
FCC Model Name	LG-VS980	
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
Modulation Type	DSSS/CCK(802.11b), OFDM(802.11a, 802.11g, 802.11n, 802.11ac)	
Antenna Specification	Antenna type: FPCB Antenna Peak Gain : -1.00 dBi	

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3. TEST METHODOLOGY

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

3.1 EUT CONFIGURATION

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

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

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

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version: 2003)

Conducted Antenna Terminal

See Section from 9.1 to 9.2.(KDB 558074)

3.4 DESCRIPTION OF TEST MODES

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

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

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4. INSTRUMENT CALIBRATION

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

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, 467-811, Korea. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2003) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated June 21, 2011 (Registration Number: 90661)

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

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

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

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

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7. SUMMARY TEST OF RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
Radiated Spurious Emissions	§15.205, 15.209	cf. Section 8.5.1	RADIATED	PASS
Radiated Restricted Band Edge	§15.247(d), 15.205, 15.209	cf. Section 8.5.2		PASS

8. TEST RESULT

8.1 RADIATED MEASUREMENT.

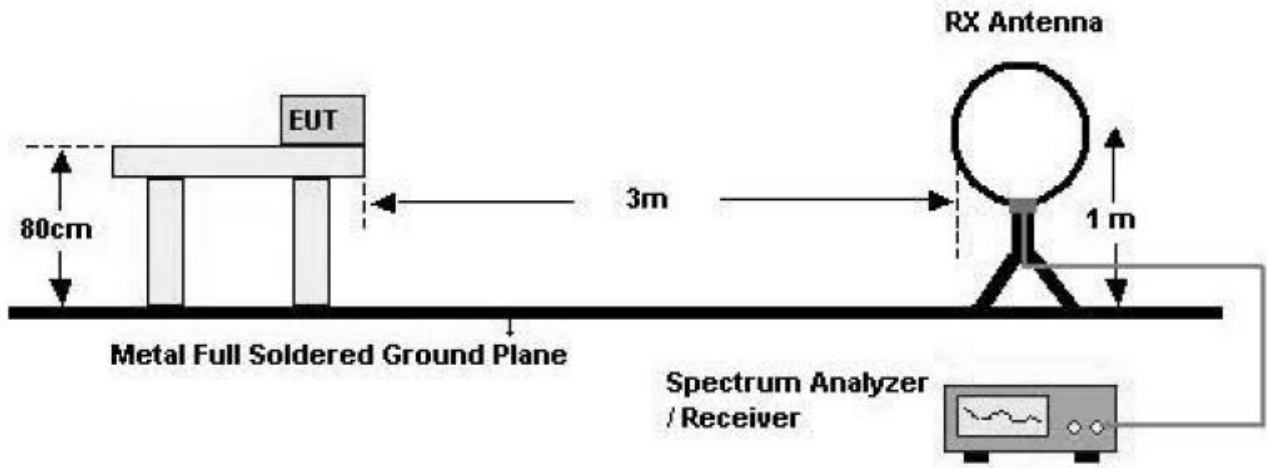
8.1.1 RADIATED SPURIOUS EMISSIONS.

Test Requirements and limit, §15.205, §15.209

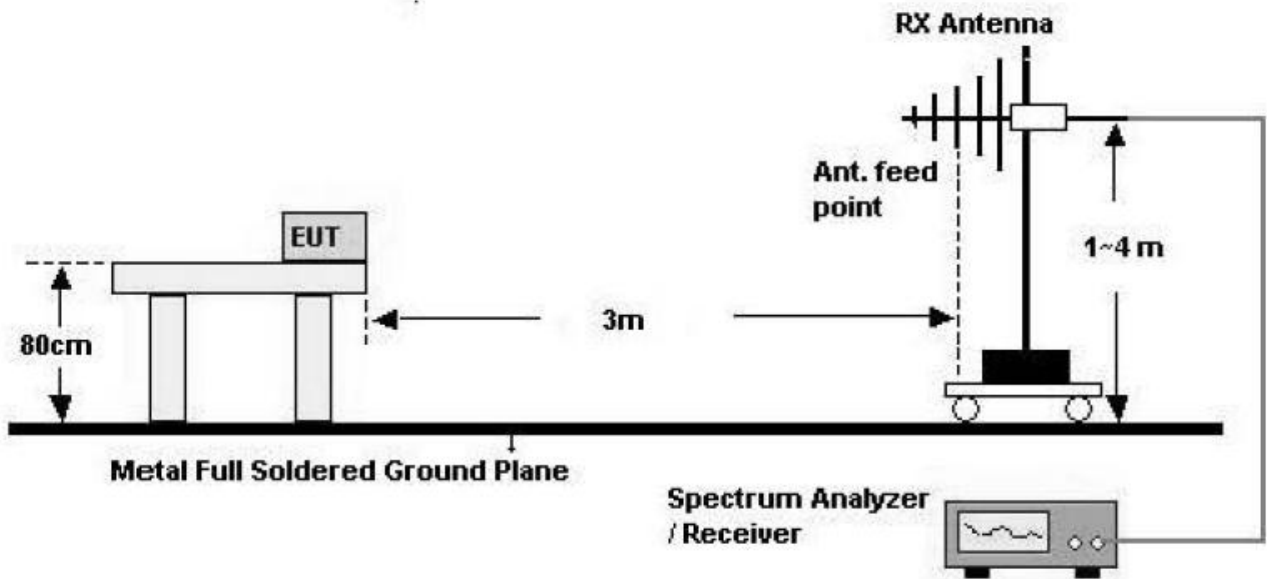
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Configuration

Below 30 MHz

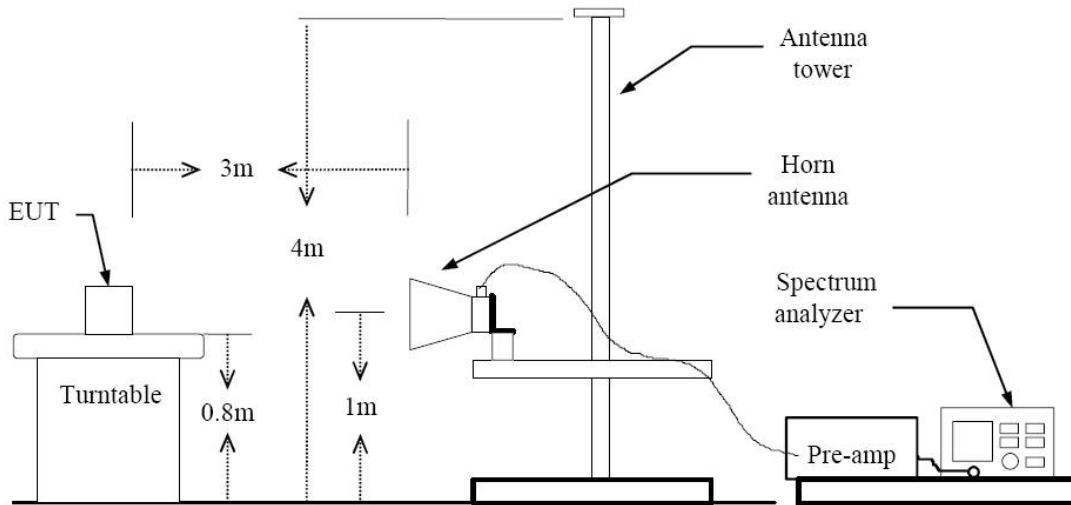


30 MHz - 1 GHz



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Above 1 GHz



TEST PROCEDURE USED

ANSI C63.10(2009)

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

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

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

Spectrum Setting

- Peak

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

RBW = cf. Table 1.

VBW ≥ 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

Case 1

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

RBW = 1 MHz (unless otherwise specified).

VBW ≥ 3 x RBW.

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

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

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

Sweep time = auto.

Perform a trace average of at least 100 traces.

Case 2

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

Set RBW = 1 MHz.

Set VBW ≥ 1/T.

Video bandwidth mode or display mode

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

Detector = Peak.

Sweep time = auto.

Trace mode = max hold.

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

Note :

- 1. We used the case 1 for 802.11b mode and the case 2 for 802.11a/g/n_20/n_40/ac_20/ac_40/ac_80 to perform the average filed strength measurements.
- 2. The actual setting value of VBW for 802.11a/g/n_20/n_40/ac_20/ac_40/ac_80

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Mode	Worst Data rate (Mbps)	T _{on} (ms)	T _{total} (ms)	Duty Cycle (%)	VBW(1/T) (Hz)	The actual setting value of VBW (Hz)
a	6	2.065	2.165	95.38	484.3	1000
g	6	2.065	2.165	95.38	484.3	1000
n_20	6.5	1.923	2.025	94.96	520.0	1000
n_40	13.5	0.942	1.044	90.23	1061.6	3000
2.4 GHz band ac_20	6.5	1.930	2.030	95.07	518.1	1000
5.8 GHz band ac_20	6.5	1.930	2.030	95.07	518.1	1000
ac_40	13.5	0.953	1.051	90.68	1049.3	3000
ac_80	29.3	0.463	0.561	82.53	2159.8	3000

TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Mode

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

Notes:

1. Measuring frequencies from 9 kHz to the 30MHz.
2. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
3. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
4. Limit line = specific Limits (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
MHz	dB μ V/m	dBm /m	dBm	(H/V)	dB μ V/m	dB μ V/m	dB
No Critical peaks found							

Notes:

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



Above 1 GHz

Stand alone

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

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	51.69	-0.79	V	50.90	74	23.10	PK
4824	40.27	-0.79	V	39.48	54	14.52	AV
7236	49.22	9.08	V	58.3	74	15.70	PK
7236	37.49	9.08	V	46.57	54	7.43	AV
4824	52.17	-0.79	H	51.38	74	22.62	PK
4824	42.88	-0.79	H	42.09	54	11.91	AV
7236	48.79	9.08	H	57.87	74	16.13	PK
7236	37.54	9.08	H	46.62	54	7.38	AV

Operation Mode: 802.11 g
 Transfer Rate: 6 Mbps
 Operating Frequency: 2412
 Channel No. 01 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	50.01	-0.79	V	49.22	74	24.78	PK
4824	36.46	-0.79	V	35.67	54	18.33	AV
7236	49.45	9.08	V	58.53	74	15.47	PK
7236	35.96	9.08	V	45.04	54	8.96	AV
4824	51.07	-0.79	H	50.28	74	23.72	PK
4824	36.80	-0.79	H	36.01	54	17.99	AV
7236	48.68	9.08	H	57.76	74	16.24	PK
7236	35.83	9.08	H	44.91	54	9.09	AV



Operation Mode: 802.11 n
 Transfer Rate: 6.5 Mbps
 Operating Frequency: 2412
 Channel No. 01 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	48.84	-0.79	V	48.05	74	25.95	PK
4824	36.55	-0.79	V	35.76	54	18.24	AV
7236	48.78	9.08	V	57.86	74	16.14	PK
7236	35.82	9.08	V	44.9	54	9.10	AV
4824	50.07	-0.79	H	49.28	74	24.72	PK
4824	36.60	-0.79	H	35.81	54	18.19	AV
7236	48.75	9.08	H	57.83	74	16.17	PK
7236	35.71	9.08	H	44.79	54	9.21	AV

Operation Mode: 802.11ac
 Transfer Rate: 6.5 Mbps
 Operating Frequency: 2412
 Channel No. 01 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	48.99	-0.79	V	48.20	74	25.80	PK
4824	36.43	-0.79	V	35.64	54	18.36	AV
7236	48.86	9.08	V	57.94	74	16.06	PK
7236	35.88	9.08	V	44.96	54	9.04	AV
4824	49.54	-0.79	H	48.75	74	25.25	PK
4824	36.48	-0.79	H	35.69	54	18.31	AV
7236	48.69	9.08	H	57.77	74	16.23	PK
7236	35.85	9.08	H	44.93	54	9.07	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

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- 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/g/n 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.

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

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	50.59	-0.37	V	50.22	74	23.78	PK
4874	39.67	-0.37	V	39.30	54	14.70	AV
7311	49.14	8.64	V	57.78	74	16.22	PK
7311	37.13	8.64	V	45.77	54	8.23	AV
4874	51.61	-0.37	H	51.24	74	22.76	PK
4874	41.68	-0.37	H	41.31	54	12.69	AV
7311	49.31	8.64	H	57.95	74	16.05	PK
7311	37.17	8.64	H	45.81	54	8.19	AV

Operation Mode: 802.11 g
 Transfer Rate: 6 Mbps
 Operating Frequency: 2437
 Channel No.: 06 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	49.87	-0.37	V	49.50	74	24.50	PK
4874	36.60	-0.37	V	36.23	54	17.77	AV
7311	48.46	8.64	V	57.10	74	16.90	PK
7311	35.43	8.64	V	44.07	54	9.93	AV
4874	50.35	-0.37	H	49.98	74	24.02	PK
4874	36.83	-0.37	H	36.46	54	17.54	AV
7311	48.95	8.64	H	57.59	74	16.41	PK
7311	35.54	8.64	H	44.18	54	9.82	AV



Operation Mode: 802.11 n
 Transfer Rate: 6.5 Mbps
 Operating Frequency: 2437
 Channel No. 06 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	50.36	-0.37	V	49.99	74	24.01	PK
4874	36.40	-0.37	V	36.03	54	17.97	AV
7311	48.60	8.64	V	57.24	74	16.76	PK
7311	35.42	8.64	V	44.06	54	9.94	AV
4874	49.92	-0.37	H	49.55	74	24.45	PK
4874	36.56	-0.37	H	36.19	54	17.81	AV
7311	48.82	8.64	H	57.46	74	16.54	PK
7311	35.53	8.64	H	44.17	54	9.83	AV

Operation Mode: 802.11ac
 Transfer Rate: 6.5 Mbps
 Operating Frequency: 2437
 Channel No. 06 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	50.07	-0.37	V	49.70	74	24.30	PK
4874	36.53	-0.37	V	36.16	54	17.84	AV
7311	48.81	8.64	V	57.45	74	16.55	PK
7311	35.46	8.64	V	44.10	54	9.90	AV
4874	50.15	-0.37	H	49.78	74	24.22	PK
4874	36.59	-0.37	H	36.22	54	17.78	AV
7311	48.92	8.64	H	57.56	74	16.44	PK
7311	35.58	8.64	H	44.22	54	9.78	AV

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 5. We have done 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode.
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Operation Mode: 802.11 b
 Transfer Rate: 1 Mbps
 Operating Frequency: 2462
 Channel No. 11 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	50.50	-0.15	V	50.35	74	23.65	PK
4924	39.55	-0.15	V	39.40	54	14.60	AV
7386	50.18	9.06	V	59.24	74	14.76	PK
7386	37.54	9.06	V	46.6	54	7.4	AV
4924	51.40	-0.15	H	51.25	74	22.75	PK
4924	41.45	-0.15	H	41.3	54	12.7	AV
7386	48.80	9.06	H	57.86	74	16.14	PK
7386	37.55	9.06	H	46.61	54	7.39	AV

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

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	49.34	-0.15	V	49.19	74	24.81	PK
4924	36.37	-0.15	V	36.22	54	17.78	AV
7386	49.61	9.06	V	58.67	74	15.33	PK
7386	35.95	9.06	V	45.01	54	8.99	AV
4924	49.19	-0.15	H	49.04	74	24.96	PK
4924	36.25	-0.15	H	36.1	54	17.9	AV
7386	49.17	9.06	H	58.23	74	15.77	PK
7386	35.93	9.06	H	44.99	54	9.01	AV



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

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	49.80	-0.15	V	49.65	74	24.35	PK
4924	36.36	-0.15	V	36.21	54	17.79	AV
7386	49.54	9.06	V	58.6	74	15.40	PK
7386	35.94	9.06	V	45	54	9.00	AV
4924	49.28	-0.15	H	49.13	74	24.87	PK
4924	36.28	-0.15	H	36.13	54	17.87	AV
7386	49.33	9.06	H	58.39	74	15.61	PK
7386	35.92	9.06	H	44.98	54	9.02	AV

Operation Mode: 802.11ac
 Transfer Rate: 6.5 Mbps
 Operating Frequency: 2462
 Channel No. 11 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	49.88	-0.15	V	49.73	74	24.27	PK
4924	36.30	-0.15	V	36.15	54	17.85	AV
7386	49.39	9.06	V	58.45	74	15.55	PK
7386	35.96	9.06	V	45.02	54	8.98	AV
4924	49.68	-0.15	H	49.53	74	24.47	PK
4924	36.35	-0.15	H	36.2	54	17.8	AV
7386	49.28	9.06	H	58.34	74	15.66	PK
7386	35.93	9.06	H	44.99	54	9.01	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

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- 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/g/n 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.

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Band :	5.8 GHz
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5745 MHz
Channel No.	149 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11490	49.85	11.22	V	61.07	74	12.91	PK
11490	37.12	11.22	V	48.34	54	5.64	AV
11490	48.01	11.22	H	59.23	74	14.75	PK
11490	34.89	11.22	H	46.11	54	7.87	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 802.11b/g/n 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.

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Band :	5.8 GHz
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5785 MHz
Channel No.	157 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11570	49.94	11.71	V	61.65	74	12.33	PK
11570	37.01	11.71	V	48.72	54	5.26	AV
11570	48.76	11.71	H	60.47	74	13.51	PK
11570	35.38	11.71	H	47.09	54	6.89	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 802.11b/g/n 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	5825 MHz
Channel No.	165 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11650	51.67	11.34	V	63.01	74	10.97	PK
11650	37.02	11.34	V	48.36	54	5.62	AV
11650	50.37	11.34	H	61.71	74	12.27	PK
11650	35.49	11.34	H	46.83	54	7.15	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 802.11b/g/n mode and all data rate. Worst data rate is the lowest data of each mode
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band :	5.8 GHz
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5745 MHz
Channel No.	149 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11490	50.78	11.22	V	62.00	74	11.98	PK
11490	36.31	11.22	V	47.53	54	6.45	AV
11490	47.58	11.22	H	58.80	74	15.18	PK
11490	33.74	11.22	H	44.96	54	9.02	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 802.11b/g/n 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	5785 MHz
Channel No.	157 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11570	48.99	11.71	V	60.70	74	13.28	PK
11570	36.09	11.71	V	47.80	54	6.18	AV
11570	47.88	11.71	H	59.59	74	14.39	PK
11570	34.17	11.71	H	45.88	54	8.10	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 802.11b/g/n 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

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

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11650	50.47	11.34	V	61.81	74	12.17	PK
11650	36.01	11.34	V	47.35	54	6.63	AV
11650	49.72	11.34	H	61.06	74	12.92	PK
11650	34.47	11.34	H	45.81	54	8.17	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 802.11b/g/n 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

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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	39.31	11.53	V	50.84	74	23.14	PK
11510	25.96	11.53	V	37.49	54	16.49	AV
11510	39.30	11.53	H	50.83	74	23.15	PK
11510	25.84	11.53	H	37.37	54	16.61	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 802.11b/g/n 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	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	39.55	11.64	V	51.19	74	22.79	PK
11590	25.18	11.64	V	36.82	54	17.16	AV
11590	39.34	11.64	H	50.98	74	23.00	PK
11590	25.25	11.64	H	36.89	54	17.09	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 802.11b/g/n 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]	Detect
11490	50.49	11.22	V	61.71	74	12.27	PK
11490	36.17	11.22	V	47.39	54	6.59	AV
17235	45.12	18.82	V	63.94	68.2	4.26	PK
11490	47.18	11.22	H	58.4	74	15.58	PK
11490	33.69	11.22	H	44.91	54	9.07	AV
17235	45.45	18.82	H	64.27	68.2	3.93	PK

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]	Detect
11570	48.52	11.71	V	60.23	74	13.75	PK
11570	35.56	11.71	V	47.27	54	6.71	AV
17355	44.59	18.94	V	63.53	68.2	4.67	PK
11570	47.29	11.71	H	59.00	74	14.98	PK
11570	33.97	11.71	H	45.68	54	8.30	AV
17355	45.39	18.94	H	64.33	68.2	3.87	PK

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]	Detect
11650	50.19	11.34	V	61.53	74	12.45	PK
11650	35.66	11.34	V	47.00	54	6.98	AV
17475	45.54	19.52	V	65.06	68.2	3.14	PK
11650	48.58	11.34	H	59.92	74	14.06	PK
11650	34.21	11.34	H	45.55	54	8.43	AV
17475	45.36	19.52	H	64.88	68.2	3.32	PK

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 D02 Alternative Guidance for 802.11ac v01.

Band : 5.8 GHz
 Operation Mode: 802.11 ac_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	39.44	11.53	V	50.97	74	23.01	PK
11510	25.77	11.53	V	37.30	54	16.68	AV
17265	45.39	18.46	V	63.85	68.2	4.35	PK
11510	39.42	11.53	H	50.95	74	23.03	PK
11510	25.87	11.53	H	37.40	54	16.58	AV
17265	44.57	18.46	H	63.03	68.2	5.17	PK

Band : 5.8 GHz
 Operation Mode: 802.11 ac_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	39.84	11.64	V	51.48	74	22.50	PK
11590	25.34	11.64	V	36.98	54	17.00	AV
17385	44.76	18.91	V	63.67	68.2	4.53	PK
11590	39.75	11.64	H	51.39	74	22.59	PK
11590	25.42	11.64	H	37.06	54	16.92	AV
17385	44.62	18.91	H	63.53	68.2	4.67	PK

Band :	UNII 4
Operation Mode:	802.11 ac _80 MHz BW
Transfer Rate:	29.3 Mbps
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]	Detect
11550	39.65	11.50	V	51.15	74	22.83	PK
11550	25.40	11.50	V	36.90	54	17.08	AV
17325	44.98	18.90	V	63.88	68.2	4.32	PK
11550	39.47	11.50	H	50.97	74	23.01	PK
11550	25.37	11.50	H	36.87	54	17.11	AV
17325	44.67	18.90	H	63.57	68.2	4.63	PK

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 D02 Alternative Guidance for 802.11ac v01.

With Wireless Charger

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

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	50.84	-0.79	V	50.05	74	23.95	PK
4824	40.01	-0.79	V	39.22	54	14.78	AV
7236	49.12	9.08	V	58.2	74	15.80	PK
7236	37.48	9.08	V	46.56	54	7.44	AV
4824	50.38	-0.79	H	49.59	74	24.41	PK
4824	38.45	-0.79	H	37.66	54	16.34	AV
7236	48.92	9.08	H	58.00	74	16.00	PK
7236	37.59	9.08	H	46.67	54	7.33	AV

Operation Mode: 802.11 g
 Transfer Rate: 6 Mbps
 Operating Frequency: 2412
 Channel No. 01 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	50.12	-0.79	V	49.33	74	24.67	PK
4824	36.48	-0.79	V	35.69	54	18.31	AV
7236	49.23	9.08	V	58.31	74	15.69	PK
7236	35.89	9.08	V	44.97	54	9.03	AV
4824	50.96	-0.79	H	50.17	74	23.83	PK
4824	36.81	-0.79	H	36.02	54	17.98	AV
7236	48.77	9.08	H	57.85	74	16.15	PK
7236	35.85	9.08	H	44.93	54	9.07	AV



Operation Mode: 802.11 n
 Transfer Rate: 6.5 Mbps
 Operating Frequency: 2412
 Channel No. 01 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	48.48	-0.79	V	47.69	74	26.31	PK
4824	36.59	-0.79	V	35.8	54	18.20	AV
7236	48.87	9.08	V	57.95	74	16.05	PK
7236	35.88	9.08	V	44.96	54	9.04	AV
4824	50.22	-0.79	H	49.43	74	24.57	PK
4824	36.66	-0.79	H	35.87	54	18.13	AV
7236	48.77	9.08	H	57.85	74	16.15	PK
7236	35.81	9.08	H	44.89	54	9.11	AV

Operation Mode: 802.11ac
 Transfer Rate: 6.5 Mbps
 Operating Frequency: 2412
 Channel No. 01 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	48.88	-0.79	V	48.09	74	25.91	PK
4824	36.49	-0.79	V	35.70	54	18.30	AV
7236	49.15	9.08	V	58.23	74	15.77	PK
7236	35.89	9.08	V	44.97	54	9.03	AV
4824	49.59	-0.79	H	48.80	74	25.20	PK
4824	36.50	-0.79	H	35.71	54	18.29	AV
7236	48.74	9.08	H	57.82	74	16.18	PK
7236	35.86	9.08	H	44.94	54	9.06	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

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- 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/g/n 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.

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

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	50.11	-0.37	V	49.74	74	24.26	PK
4874	39.07	-0.37	V	38.70	54	15.30	AV
7311	49.24	8.64	V	57.88	74	16.12	PK
7311	37.15	8.64	V	45.79	54	8.21	AV
4874	50.54	-0.37	H	50.17	74	23.83	PK
4874	36.88	-0.37	H	36.51	54	17.49	AV
7311	48.94	8.64	H	57.58	74	16.42	PK
7311	37.16	8.64	H	45.80	54	8.20	AV

Operation Mode: 802.11 g
 Transfer Rate: 6 Mbps
 Operating Frequency: 2437
 Channel No. 06 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	49.93	-0.37	V	49.56	74	24.44	PK
4874	36.59	-0.37	V	36.22	54	17.78	AV
7311	48.62	8.64	V	57.26	74	16.74	PK
7311	35.47	8.64	V	44.11	54	9.89	AV
4874	50.18	-0.37	H	49.81	74	24.19	PK
4874	36.82	-0.37	H	36.45	54	17.55	AV
7311	49.17	8.64	H	57.81	74	16.19	PK
7311	35.59	8.64	H	44.23	54	9.77	AV



Operation Mode: 802.11 n
 Transfer Rate: 6.5 Mbps
 Operating Frequency: 2437
 Channel No.: 06 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	50.71	-0.37	V	50.34	74	23.66	PK
4874	36.46	-0.37	V	36.09	54	17.91	AV
7311	48.70	8.64	V	57.34	74	16.66	PK
7311	35.46	8.64	V	44.10	54	9.90	AV
4874	49.87	-0.37	H	49.50	74	24.50	PK
4874	36.57	-0.37	H	36.20	54	17.80	AV
7311	48.92	8.64	H	57.56	74	16.44	PK
7311	35.56	8.64	H	44.20	54	9.80	AV

Operation Mode: 802.11ac
 Transfer Rate: 6.5 Mbps
 Operating Frequency: 2437
 Channel No.: 06 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	50.22	-0.37	V	49.85	74	24.15	PK
4874	36.49	-0.37	V	36.12	54	17.88	AV
7311	48.96	8.64	V	57.60	74	16.40	PK
7311	35.50	8.64	V	44.14	54	9.86	AV
4874	50.11	-0.37	H	49.74	74	24.26	PK
4874	36.57	-0.37	H	36.20	54	17.80	AV
7311	48.98	8.64	H	57.62	74	16.38	PK
7311	35.64	8.64	H	44.28	54	9.72	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

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- 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/g/n 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.

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

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	49.99	-0.15	V	49.84	74	24.16	PK
4924	39.02	-0.15	V	38.87	54	15.13	AV
7386	50.12	9.06	V	59.18	74	14.82	PK
7386	37.53	9.06	V	46.59	54	7.41	AV
4924	49.29	-0.15	H	49.14	74	24.86	PK
4924	36.31	-0.15	H	36.16	54	17.84	AV
7386	48.88	9.06	H	57.94	74	16.06	PK
7386	37.56	9.06	H	46.62	54	7.38	AV

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

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	49.43	-0.15	V	49.28	74	24.72	PK
4924	36.40	-0.15	V	36.25	54	17.75	AV
7386	49.16	9.06	V	58.22	74	15.78	PK
7386	35.58	9.06	V	44.64	54	9.36	AV
4924	49.31	-0.15	H	49.16	74	24.84	PK
4924	36.27	-0.15	H	36.12	54	17.88	AV
7386	49.72	9.06	H	58.78	74	15.22	PK
7386	35.39	9.06	H	44.45	54	9.55	AV



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

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	49.86	-0.15	V	49.71	74	24.29	PK
4924	36.30	-0.15	V	36.15	54	17.85	AV
7386	49.74	9.06	V	58.80	74	15.20	PK
7386	35.97	9.06	V	45.03	54	8.97	AV
4924	49.53	-0.15	H	49.38	74	24.62	PK
4924	36.24	-0.15	H	36.09	54	17.91	AV
7386	49.40	9.06	H	58.46	74	15.54	PK
7386	35.90	9.06	H	44.96	54	9.04	AV

Operation Mode: 802.11ac
 Transfer Rate: 6.5 Mbps
 Operating Frequency: 2462
 Channel No. 11 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	49.55	-0.15	V	49.40	74	24.60	PK
4924	36.33	-0.15	V	36.18	54	17.82	AV
7386	49.95	9.06	V	59.01	74	14.99	PK
7386	35.99	9.06	V	45.05	54	8.95	AV
4924	49.76	-0.15	H	49.61	74	24.39	PK
4924	36.69	-0.15	H	36.54	54	17.46	AV
7386	49.35	9.06	H	58.41	74	15.59	PK
7386	35.99	9.06	H	45.05	54	8.95	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

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- 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/g/n 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.

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Band :	5.8 GHz
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5745 MHz
Channel No.	149 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11490	48.09	11.22	V	59.31	73.98	14.67	PK
11490	32.84	11.22	V	44.06	53.98	9.92	AV
11490	47.91	11.22	H	59.13	73.98	14.85	PK
11490	34.72	11.22	H	45.94	53.98	8.04	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 802.11b/g/n 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	5785 MHz
Channel No.	157 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11570	48.20	11.71	V	59.91	73.98	14.07	PK
11570	32.90	11.71	V	44.61	53.98	9.37	AV
11570	47.87	11.71	H	59.58	73.98	14.40	PK
11570	34.61	11.71	H	46.32	53.98	7.66	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 802.11b/g/n 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	5825 MHz
Channel No.	165 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11650	47.23	11.34	V	58.57	73.98	15.41	PK
11650	32.81	11.34	V	44.15	53.98	9.83	AV
11650	47.66	11.34	H	59.00	73.98	14.98	PK
11650	34.40	11.34	H	45.74	53.98	8.24	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 802.11b/g/n 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.

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Band :	5.8 GHz
Operation Mode:	802.11 n_20 MHz BW
Transfer Rate:	6.5 Mbps
Operating Frequency	5745 MHz
Channel No.	149 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11490	50.88	11.22	V	62.10	73.98	11.88	PK
11490	33.86	11.22	V	45.08	53.98	8.90	AV
11490	47.85	11.22	H	59.07	73.98	14.91	PK
11490	33.47	11.22	H	44.69	53.98	9.29	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 802.11b/g/n 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	5785 MHz
Channel No.	157 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11570	47.21	11.71	V	58.92	73.98	15.06	PK
11570	32.48	11.71	V	44.19	53.98	9.79	AV
11570	46.77	11.71	H	58.48	73.98	15.50	PK
11570	33.78	11.71	H	45.49	53.98	8.49	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 802.11b/g/n 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	5825 MHz
Channel No.	165 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL-AMP G [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11650	46.89	11.34	V	58.23	73.98	15.75	PK
11650	32.09	11.34	V	43.43	53.98	10.55	AV
11650	48.39	11.34	H	59.73	73.98	14.25	PK
11650	33.84	11.34	H	45.18	53.98	8.80	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 802.11b/g/n 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

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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	39.55	11.53	V	51.08	73.98	22.90	PK
11510	25.84	11.53	V	37.37	53.98	16.61	AV
11510	39.41	11.53	H	50.94	73.98	23.04	PK
11510	25.88	11.53	H	37.41	53.98	16.57	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 802.11b/g/n 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

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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	39.47	11.64	V	51.11	73.98	22.87	PK
11590	25.20	11.64	V	36.84	53.98	17.14	AV
11590	39.44	11.64	H	51.08	73.98	22.90	PK
11590	25.53	11.64	H	37.17	53.98	16.81	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 802.11b/g/n 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

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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]	Detect
11490	49.88	11.22	V	61.10	73.98	12.88	PK
11490	34.89	11.22	V	46.11	53.98	7.87	AV
17235	45.33	18.82	V	64.15	68.2	4.05	PK
11490	48.21	11.22	H	59.43	73.98	14.55	PK
11490	33.48	11.22	H	44.70	53.98	9.28	AV
17235	45.70	18.82	H	64.52	68.2	3.68	PK

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]	Detect
11570	48.25	11.71	V	59.96	73.98	14.02	PK
11570	34.76	11.71	V	46.47	53.98	7.51	AV
17355	44.88	18.94	V	63.82	68.2	4.38	PK
11570	47.17	11.71	H	58.88	73.98	15.10	PK
11570	33.10	11.71	H	44.81	53.98	9.17	AV
17355	45.10	18.94	H	64.04	68.2	4.16	PK



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]	Detect
11650	49.77	11.34	V	61.11	73.98	12.87	PK
11650	34.49	11.34	V	45.83	53.98	8.15	AV
17475	45.00	19.52	V	64.52	68.2	3.68	PK
11650	48.07	11.34	H	59.41	73.98	14.57	PK
11650	33.51	11.34	H	44.85	53.98	9.13	AV
17475	45.03	19.52	H	64.55	68.2	3.65	PK

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 D02 Alternative Guidance for 802.11ac v01.

FCC PT.15.247 TEST REPORT		FCC Class II Permissive Change REPORT		www.hct.co.kr
Test Report No. HCTR1308FR09-1	Date of Issue: August 09, 2013	EUT Type: GSM/WCDMA/CDMA/LTE Phone Bluetooth, WLAN and NFC		FCC ID: ZNFVS980



Band : 5.8 GHz
 Operation Mode: 802.11 ac_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	39.57	11.53	V	51.10	73.98	22.88	PK
11510	25.81	11.53	V	37.34	53.98	16.64	AV
17265	44.96	18.46	V	63.42	68.2	4.78	PK
11510	39.28	11.53	H	50.81	73.98	23.17	PK
11510	25.79	11.53	H	37.32	53.98	16.66	AV
17265	44.30	18.46	H	62.76	68.2	5.44	PK

Band : 5.8 GHz
 Operation Mode: 802.11 ac_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	39.47	11.64	V	51.11	73.98	22.87	PK
11590	25.47	11.64	V	37.11	53.98	16.87	AV
17385	44.21	18.91	V	63.12	68.2	5.08	PK
11590	39.58	11.64	H	51.22	73.98	22.76	PK
11590	25.45	11.64	H	37.09	53.98	16.89	AV
17385	44.03	18.91	H	62.94	68.2	5.26	PK



Band :	UNII 4
Operation Mode:	802.11 ac _80 MHz BW
Transfer Rate:	29.3 Mbps
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]	Detect
11550	39.42	11.50	V	50.92	73.98	23.06	PK
11550	25.68	11.50	V	37.18	53.98	16.80	AV
17325	44.91	18.90	V	63.81	68.2	4.39	PK
11550	39.18	11.50	H	50.68	73.98	23.30	PK
11550	25.71	11.50	H	37.21	53.98	16.77	AV
17325	44.65	18.90	H	63.55	68.2	4.65	PK

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 D02 Alternative Guidance for 802.11ac v01.

FCC PT.15.247 TEST REPORT	FCC Class II Permissive Change REPORT		www.hct.co.kr
Test Report No. HCTR1308FR09-1	Date of Issue: August 09, 2013	EUT Type: GSM/WCDMA/CDMA/LTE Phone Bluetooth, WLAN and NFC	FCC ID: ZNFVS980

8.1.2 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)).

Stand alone

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

Frequency [MHz]	Reading [dBuV/m]	AN.+CL [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	35.29	33.90	H	69.19	74	4.81	PK
2390.0	12.53	33.90	H	46.43	54	7.57	AV
2390.0	32.07	33.90	V	65.97	74	8.03	PK
2390.0	12.12	33.90	V	46.02	54	7.98	AV
2483.5	32.77	33.99	H	66.76	74	7.24	PK
2483.5	12.88	33.99	H	46.87	54	7.13	AV
2483.5	31.70	33.99	V	65.69	74	8.31	PK
2483.5	12.30	33.99	V	46.29	54	7.71	AV

Operation Mode: 802.11b
 Transfer Rate: 1 Mbps
 Operating Frequency: 2412 MHz, 2462 MHz
 Channel No.: 01 Ch, 11 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	24.14	33.90	H	58.04	74	15.96	PK
2390.0	13.08	33.90	H	46.98	54	7.02	AV
2390.0	24.96	33.90	V	58.86	74	15.14	PK
2390.0	13.52	33.90	V	47.42	54	6.58	AV
2483.5	24.81	33.99	H	58.80	74	15.20	PK
2483.5	13.28	33.99	H	47.27	54	6.73	AV
2483.5	25.28	33.99	V	59.27	74	14.73	PK
2483.5	13.40	33.99	V	47.39	54	6.61	AV

Operation Mode: 802.11n
 Transfer Rate: 6.5 Mbps
 Operating Frequency: 2412 MHz, 2462 MHz
 Channel No.: 01 Ch, 11 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	24.61	33.90	H	58.51	74	15.49	PK
2390.0	11.54	33.90	H	45.44	54	8.56	AV
2390.0	32.59	33.90	V	66.49	74	7.51	PK
2390.0	12.27	33.90	V	46.17	54	7.83	AV
2483.5	24.87	33.99	H	58.86	74	15.14	PK
2483.5	11.46	33.99	H	45.45	54	8.55	AV
2483.5	32.99	33.99	V	66.98	74	7.02	PK
2483.5	12.55	33.99	V	46.54	54	7.46	AV



Operation Mode: 802.11ac
 Transfer Rate: 6.5 Mbps
 Operating Frequency: 2412 MHz, 2462 MHz
 Channel No. 01 Ch, 11 Ch

Frequency [MHz]	Reading dBuV	AN.+CL [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	24.76	33.90	H	58.66	74	15.34	PK
2390.0	11.63	33.90	H	45.53	54	8.47	AV
2390.0	33.63	33.90	V	67.53	74	6.47	PK
2390.0	12.24	33.90	V	46.14	54	7.86	AV
2483.5	36.15	33.99	H	70.14	74	3.86	PK
2483.5	13.62	33.99	H	47.61	54	6.39	AV
2483.5	32.34	33.99	V	66.33	74	7.67	PK
2483.5	12.45	33.99	V	46.44	54	7.56	AV

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.

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]	Detect
5850	61.65	0.94	H	62.59	68.2	5.61	PK
5850	60.54	0.94	V	61.48	68.2	6.72	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 802.11ac, we applied the limit of spurious emissions according to KDB 644545 D02 Alternative Guidance for 802.11ac v01.

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]	Detect
5850	53.52	0.94	H	54.46	68.2	13.74	PK
5850	53.01	0.94	V	53.95	68.2	14.25	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 802.11ac, we applied the limit of spurious emissions according to KDB 644545 D02 Alternative Guidance for 802.11ac v01.

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]	Detect
5850	57.9	0.94	H	58.84	68.2	9.36	PK
5850	55.96	0.94	V	56.9	68.2	11.3	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 802.11ac, we applied the limit of spurious emissions according to KDB 644545 D02 Alternative Guidance for 802.11ac v01.



With Wireless Charger

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

Frequency [MHz]	Reading [dBuV/m]	AN.+CL [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	34.98	33.90	H	68.88	74	5.12	PK
2390.0	12.28	33.90	H	46.18	54	7.82	AV
2390.0	25.63	33.90	V	59.53	74	14.47	PK
2390.0	11.58	33.90	V	45.48	54	8.52	AV
2483.5	32.36	33.99	H	66.35	74	7.65	PK
2483.5	12.51	33.99	H	46.50	54	7.50	AV
2483.5	25.20	33.99	V	59.19	74	14.81	PK
2483.5	11.61	33.99	V	45.60	54	8.40	AV

Operation Mode: 802.11b
 Transfer Rate: 1 Mbps
 Operating Frequency: 2412 MHz, 2462 MHz
 Channel No. 01 Ch, 11 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	23.59	33.90	H	57.49	74	16.51	PK
2390.0	12.76	33.90	H	46.66	54	7.34	AV
2390.0	23.18	33.90	V	57.08	74	16.92	PK
2390.0	12.49	33.90	V	46.39	54	7.61	AV
2483.5	24.54	33.99	H	58.53	74	15.47	PK
2483.5	12.84	33.99	H	46.83	54	7.17	AV
2483.5	24.21	33.99	V	58.20	74	15.80	PK
2483.5	12.50	33.99	V	46.49	54	7.51	AV

Operation Mode: 802.11n
 Transfer Rate: 6.5 Mbps
 Operating Frequency: 2412 MHz, 2462 MHz
 Channel No. 01 Ch, 11 Ch

Frequency [MHz]	Reading [dBuV/m]	AN.+CL [dBm]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	24.32	33.90	H	58.22	74	15.78	PK
2390.0	11.38	33.90	H	45.28	54	8.72	AV
2390.0	23.95	33.90	V	57.85	74	16.15	PK
2390.0	11.21	33.90	V	45.11	54	8.89	AV
2483.5	24.46	33.99	H	58.45	74	15.55	PK
2483.5	11.25	33.99	H	45.24	54	8.76	AV
2483.5	24.28	33.99	V	58.27	74	15.73	PK
2483.5	11.23	33.99	V	45.22	54	8.78	AV

Operation Mode: 802.11ac
 Transfer Rate: 6.5 Mbps
 Operating Frequency: 2412 MHz, 2462 MHz
 Channel No. 01 Ch, 11 Ch

Frequency [MHz]	Reading dBuV	AN.+CL [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	24.51	33.90	H	58.41	74	15.59	PK
2390.0	11.40	33.90	H	45.30	54	8.70	AV
2390.0	24.15	33.90	V	58.05	74	15.95	PK
2390.0	11.23	33.90	V	45.13	54	8.87	AV
2483.5	35.48	33.99	H	69.47	74	4.53	PK
2483.5	13.25	33.99	H	47.24	54	6.76	AV
2483.5	35.21	33.99	V	69.20	74	4.80	PK
2483.5	12.86	33.99	V	46.85	54	7.15	AV

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.



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]	Detect
5850	60.28	0.94	H	61.22	68.2	6.98	PK
5850	58.69	0.94	V	59.63	68.2	8.57	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 802.11ac, we applied the limit of spurious emissions according to KDB 644545 D02 Alternative Guidance for 802.11ac v01.

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Test Report No. HCTR1308FR09-1	Date of Issue: August 09, 2013	EUT Type: GSM/WCDMA/CDMA/LTE Phone Bluetooth, WLAN and NFC		FCC ID: ZNFVS980

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]	Detect
5850	52.16	0.94	H	53.1	68.2	15.1	PK
5850	51.64	0.94	V	52.58	68.2	15.62	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 802.11ac, we applied the limit of spurious emissions according to KDB 644545 D02 Alternative Guidance for 802.11ac v01.



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]	Detect
5850	56.87	0.94	H	57.81	68.2	10.39	PK
5850	55.61	0.94	V	56.55	68.2	11.65	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 802.11ac, we applied the limit of spurious emissions according to KDB 644545 D02 Alternative Guidance for 802.11ac v01.

FCC PT.15.247 TEST REPORT	FCC Class II Permissive Change REPORT		www.hct.co.kr
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9. LIST OF TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Interval	Calibration Due	Serial No.
Rohde & Schwarz	ENV216/ LISN	Annual	02/06/2014	100073
Schwarzbeck	VULB 9160/ TRILOG Antenna	Biennial	12/17/2014	3150
Rohde & Schwarz	ESI 40 / EMI TEST RECEIVER	Annual	04/16/2014	831564103
Agilent	E4440A/ Spectrum Analyzer	Annual	04/25/2014	US45303008
Agilent	N9020A/ SIGNAL ANALYZER	Annual	05/14/2014	MY51110063
HD	MA240/ Antenna Position Tower	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	13
HD GmbH	KMS 560/ SlideBar	N/A	N/A	12
Rohde & Schwarz	SCU-18/ Signal Conditioning Unit	Annual	09/11/2013	10094
MITEQ	AMF-6B-180265-35-10P / POWER AMP	Annual	04/16/2014	667624
CERNEX	CBL26405040 / POWER AMP	Annual	04/16/2014	19660
Schwarzbeck	BBHA 9120D/ Horn Antenna	Biennial	10/17/2013	937
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	Biennial	10/30/2014	BBHA9170124
Rohde & Schwarz	FSP / Spectrum Analyzer	Annual	02/08/2014	839117/011
Agilent	E4416A /Power Meter	Annual	11/07/2013	GB41291412
Agilent	E9327A /POWER SENSOR	Annual	04/16/2014	MY4442009
Wainwright Instrument	WHF3.0/18G-10EF / High Pass Filter	Annual	02/08/2014	F6
Wainwright Instrument	WHNX6.0/26.5G-6SS / High Pass Filter	Annual	04/16/2014	1
Wainwright Instrument	WHNX7.0/18G-8SS / High Pass Filter	Annual	04/16/2014	29
Wainwright Instrument	WRCJ2400/2483.5-2370/2520-60/14SS / Band Reject Filter	Annual	03/19/2014	1
Hewlett Packard	11636B/Power Divider	Annual	11/07/2013	11377
Agilent	87300B/Directional Coupler	Annual	12/24/2013	3116A03621
Hewlett Packard	11667B / Power Splitter	Annual	05/29/2014	05001
DIGITAL	EP-3010 /DC POWER SUPPLY	Annual	11/07/2013	3110117
ITECH	IT6720 / DC POWER SUPPLY	Annual	11/07/2013	010002156287001199
TESCOM	TC-3000C / BLUETOOTH TESTER	Annual	04/24/2014	3000C000276
Rohde & Schwarz	CBT / BLUETOOTH TESTER	Annual	04/25/2014	100422
EMCO	6502.LOOP ANTENNA	Biennial	01/11/2014	9009-2536
CERNEX	CBLU1183540 / POWER AMP	Annual	07/24/2014	21691
Agilent	8493C / Attenuator(10 dB)	Annual	07/24/2014	76649
WEINSCHL	2-3 / Attenuator(3 dB)	Annual	11/07/2013	BR0617

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