

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART E REQUIREMENT AND INDUSTRY CANADA RSS 210 CLASS II PC REPORT

OF

Product Name: 802.11ac/a/b/g/n + BT Wireless Module
Brand Name: UG
Model No.: NFA-BAC-MR-02
Model Difference: N/A
FCC ID: COFNFABACMR02
IC: 10293A- NFABACMR02
Report No.: ER/2014/40012
Issue Date: May. 06, 2014
FCC Rule Part: §15.407
IC Rule Part: RSS-210 issue 8:2010, Annex 9
Prepared for: UNIVERSAL GLOBAL SCIENTIFIC INDUSTRIAL CO., LTD.
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VERIFICATION OF COMPLIANCE

Applicant: UNIVERSAL GLOBAL SCIENTIFIC INDUSTRIAL CO., LTD.
141, Lane 351, Sec. 1, Taiping Road, Tsaotuen, Nantou 54261, Taiwan

Product Name: 802.11ac/a/b/g/n + BT Wireless Module

Brand Name: UG

Model No.: NFA-BAC-MR-02

Model Difference: N/A

FCC ID: COFNFABACMR02

IC: 10293A- NFABACMR02

File Number: ER/2014/40012

Date of test: Apr. 03, 2014 ~ Apr. 25, 2014

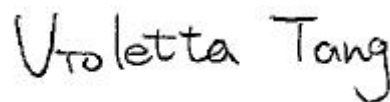
Date of EUT Received: Apr. 03, 2014

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4:2009 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.407 and RSS-210 issue 8: 2010 Annex 9. The test results of this report relate only to the tested sample identified in this report.

Test By:  **Date:** May. 06, 2014

Marcus Tseng / Engineer

Prepared By:  **Date:** May. 06, 2014

Violetta Tang / Clerk

Approved By:  **Date:** May. 06, 2014

Jim Chang / Supervisor

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Version

Version No.	Date	Description
00	May. 06, 2014	Initial creation of document

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1. GENERAL INFORMATION

1.1. Product Description

1.2. General Information of Notebook:

Product Name:	Notebook Computer	
Brand Name:	Lenovo	
Model No.:	Lenovo N20 Chrome, 80G1, 20419, Lenovo N20p Chrome, 80G2, 20425	
Model Difference:	Market Segmentation	
Hardware Version:	N/A	
Software Version:	N/A	
Model No. for BT Module:	NFA-BAC-MR-02	
Module FCC ID:	COFNFABACMR02	
Module IC:	10293A- NFABACMR02	
Scope:	The test report covers the radiated emissions requirements of the standards referenced in the report to allow system level approval of the module in this specific host.	
Class II Permissive change:	802.11ac/a/b/g/n + BT Wireless Module (NFA-BAC-MR-02) card Installed in an Notebook Computer	
Power Supply:	11.1Vdc Rechargeable Li-polymer battery pack or 20Vdc from AC/DC adapter	
	Battery:	1. Model No.: L13M6P61, Supplier: Simplo
		2. Model No.: L13L3P61, Supplier: LG
	Adapter:	1. Model No.: ADLX45NCC3A, Supplier: Chicony
		2. Model No.: ADLX45NDC3A , Supplier: Delta
3. Model No.: ADLX45NLC3A, Supplier: Liteon		

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WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Rated Power (Avg.) / Average Rated Power(EIRP)	Modulation Technology	Type of Emission Listed in Test Report/Original Grant:
11a	5150~5250	4	15.93dBm (Avg.) 16.61dBm (EIRP)	OFDM	17M8D1D
	5250~5350	4	14.96dBm (Avg.) 16.52dBm (EIRP)		18M0D1D
	5470~5600	5	15.99dBm (Avg.) 18.76dBm (EIRP)		18M0D1D
	5650~5725	3	15.19dBm (Avg.) 17.96dBm (EIRP)		18M0D1D
11ac	(20M) 5150~5250	4	Avg. Power: ac 20M: 14.27dBm (MIMO Chain 0): 14.53dBm (MIMO Chain 1): 13.19dBm (MIMO Chain 0+1): 16.81dBm EIRP: ac 20M: 15.01dBm (MIMO Chain 0+1): 18.22dBm	OFDM	17M8D1D
	(20M) 5250~5350	4	Avg. Power: ac 20M: 14.98dBm (MIMO Chain 0): 15.69dBm (MIMO Chain 1): 14.73dBm (MIMO Chain 0+1): 18.25dBm EIRP: ac 20M: 16.55dBm (MIMO Chain 0+1): 20.93dBm		18M0D1D
	(20M) 5470~5600	5	Avg. Power: ac 20M:15.71dBm (MIMO Chain 0): 15.24dBm (MIMO Chain 1): 15.41dBm (MIMO Chain 0+1): 18.34dBm EIRP ac 20M:18.48dBm (MIMO Chain 0+1): 23.88dBm		18M0D1D
	(20M) 5650~5725	3	Avg. Power: ac 20M: 11.68dBm (MIMO Chain 0): 10.91dBm (MIMO Chain 1): 12.02dBm (MIMO Chain 0+1): 14.51dBm EIRP ac 20M: 14.45dBm (MIMO Chain 0+1): 20.05dBm		18M0D1D

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11ac	(40M) 5150-5250	2	Avg. Power: ac 40M: 13.82dBm (MIMO Chain 0): 13.34dBm (MIMO Chain 1): 13.62dBm (MIMO Chain 0+1): 16.49dBm EIRP ac 40M: 14.56dBm (MIMO Chain 0+1): 17.94dBm	OFDM	36M6D1D
	(40M) 5250-5350	2	Avg. Power: ac 40M: 14.56dBm (MIMO Chain 0): 14.78dBm (MIMO Chain 1): 13.81dBm (MIMO Chain 0+1): 17.33dBm EIRP ac 40M: 16.13dBm (MIMO Chain 0+1): 20.00dBm		36M8D1D
	(40M) 5470-5600	2	Avg. Power: ac 40M: 13.88dBm (MIMO Chain 0):14.55dBm (MIMO Chain 1): 14.20dBm (MIMO Chain 0+1): 17.39dBm EIRP ac 40M: 17.18dBm (MIMO Chain 0+1): 22.93dBm		36M6D1D
	(40M) 5650-5725	1	Avg. Power: HT40:13.09dBm (MIMO Chain 0):12.82dBm (MIMO Chain 1): 13.25dBm (MIMO Chain 0+1): 16.05dBm EIRP ac 40M: 15.86dBm (MIMO Chain 0+1): 21.59dBm		36M6D1D

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11ac	(80M) 5150-5250	1	Avg. Power: ac 80M: 9.07dBm (MIMO Chain 0): 9.77dBm (MIMO Chain 1): 6.44dBm (MIMO Chain 0+1): 11.43dBm EIRP ac 80M: 9.81dBm (MIMO Chain 0+1): 12.72dBm	OFDM	76M3D1D
	(80M) 5250-5350	1	Avg. Power: ac 80M: 8.65dBm (MIMO Chain 0): 9.25dBm (MIMO Chain 1): 7.01dBm (MIMO Chain 0+1): 11.28dBm EIRP ac 80M: 10.22dBm (MIMO Chain 0+1): 13.86dBm		76M3D1D
	(80M) 5470-5600	1	Avg. Power: ac 80M: 8.48dBm (MIMO Chain 0):8.05dBm (MIMO Chain 1): 8.36dBm (MIMO Chain 0+1): 11.22dBm EIRP ac 80M: 11.25dBm (MIMO Chain 0+1): 16.75dBm		76M3D1D
Antenna Designation			PIFA Antenna, Supplier: High-Tek Electronics Co., Ltd TX1 Antenna: 5GHz Gain: 0.68dBi (5150MHz-5250MHz) 5GHz Gain: 0.68dBi (5250MHz-5350MHz) 5GHz Gain: 2.77dBi (5470MHz-5725MHz) TX2 Antenna: 5GHz Gain: 0.74dBi (5150MHz-5250MHz) 5GHz Gain: 1.57dBi (5250MHz-5350MHz) 5GHz Gain: 2.77dBi (5470MHz-5725MHz)		
Modulation type			CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM		
Transition Rate:			802.11 a: 6/9/12/18/24/36/48/54Mbps 802.11 ac (20M): 6.5 – 144Mbps; 802.11 ac (40M): 13.5 – 300Mbps; 802.11 ac (80M): 29.3 - 866.7Mbps		

This report applies for frequency bands 5150MHz-5250MHz, 5250MHz-5350MHz and 5470MHz-5725MHz.

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IEEE 802.11n Spec:

MCS Index	Nss	Modulation	R	NBPS	NCBPS		NDBPS		Datarate(Mbps)			
					20MHz	40MHz	20MHz	40MHz	80nsGI		400nsGI	
									20MHz	40MHz	20MHz	40MHz
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5	7.200	15
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0	14.400	30
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5	21.700	45
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0	28.900	60
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0	43.300	90
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0	57.800	120
6	1	64-QAM	3/4	6	312	648	234	486	58.5	121.5	65.000	135
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0	72.200	150

Symbol	Explanation
NSS	Number of spatial streams
R	Code rate
NBPS	Number of coded bite per single carrier
NCBPS	Number of coded bite per symbol
NDBPS	Number of data bite per symbol
GI	Guard interval

802.11n_HT20 MCS8 -15

MCS Index	Modulation	R	N _{BPS} (i _{SS})	N _{SD}	N _{SP}	N _{CBPS}	N _{DBPS}	Data rate (Mb/s)	
								800 ns GI	400 ns GI (see NOTE)
8	BPSK	1/2	1	52	4	104	52	13.0	14.4
9	QPSK	1/2	2	52	4	208	104	26.0	28.9
10	QPSK	3/4	2	52	4	208	156	39.0	43.3
11	16-QAM	1/2	4	52	4	416	208	52.0	57.8
12	16-QAM	3/4	4	52	4	416	312	78.0	86.7
13	64-QAM	2/3	6	52	4	624	416	104.0	115.6
14	64-QAM	3/4	6	52	4	624	468	117.0	130.0
15	64-QAM	5/6	6	52	4	624	520	130.0	144.4

NOTE—The 400 ns GI rate values are rounded to 1 decimal place.

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802.11n_HT40 MCS8 -15

MCS Index	Modulation	R	$N_{BPSCS(i_{SS})}$	N_{SD}	N_{SP}	N_{CBPS}	N_{DBPS}	Data rate (Mb/s)	
								800 ns GI	400 ns GI
8	BPSK	1/2	1	108	6	216	108	27.0	30.0
9	QPSK	1/2	2	108	6	432	216	54.0	60.0
10	QPSK	3/4	2	108	6	432	324	81.0	90.0
11	16-QAM	1/2	4	108	6	864	432	108.0	120.0
12	16-QAM	3/4	4	108	6	864	648	162.0	180.0
13	64-QAM	2/3	6	108	6	1296	864	216.0	240.0
14	64-QAM	3/4	6	108	6	1296	972	243.0	270.0
15	64-QAM	5/6	6	108	6	1296	1080	270.0	300.0

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1.1. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: COFNFABACMR02** filing to comply with Section 15.407 of the FCC Part 15, Subpart C Rules. And **IC: 10293A-NFABACMR02** filing to comply with Industry Canada RSS-210 issue 8: 2010 Annex 9. The composite system (digital device) is compliance with Subpart B is authorized under a DoC procedure.

1.2. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4:2009 & KDB 789033 D01 published on 04, 08, 2013. Radiated testing was performed at an antenna to EUT distance 3 meters.

Tested in accordance with FCC KDB789033 D01 for compliance to FCC 47CFR 15.407 requirements.

1.3. Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Township, Taoyuan County, Taiwan 333 which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2009. FCC Registration Number is: 990257. Canada Registration Number: 4620A-4.

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 94644.

1.4. Special Accessories

There are no special accessories used while test was conducted.

1.5. Equipment Modifications

There was no modification incorporated into the EUT.

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2. SYSTEM TEST CONFIGURATION

2.1. EUT Configuration

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

2.2. EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

2.3. Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the general criterion in Section 7.1 of ANSI C63.4:2009. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz, and the measurement procedure 7.3 in ANSI 63.4:2009 & 6.2.2, is followed to carry out the test. The CISPR Quasi-Peak and Average detector mode is employed according to §15.107

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m 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 and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna according to the requirements in Section 8 and 13 and of ANSI C63.4:2009,.

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2.4. Configuration of Tested System

Fig. 2-1 Radiated Emission & Conducted (Antenna Port) Configuration

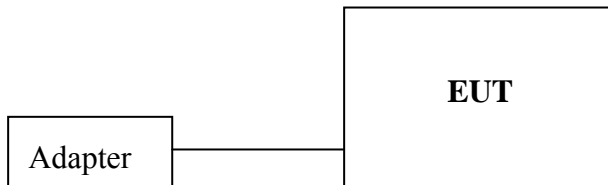


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WLAN Test Software	N/A	N/A	N/A	N/A	N/A

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3. SUMMARY OF TEST RESULT

FCC/IC Rules	Description Of Test	Result
§15.207 RSS-Gen §7.2.4	AC Power Line Conducted Emission	N/A
§15.407(a) (1) (2) RSS 210 A9.2 RSS-Gen §4.6.1	26 dB and 99% Emission Bandwidth	N/A
§15.407(a) (1) (2) RSS 210 A9.2(1)(2)(3)	The Maximum Output Power Measurement	Compliant
§15.407(a) (5) RSS 210 A9.2(1)(2)(3)	Peak Power Spectral Density Measurement	N/A
15.407(a)(6)	Peak Excursion Measurement	N/A
§15.407(b) (1) (2) (3) RSS 210 A9.2(1)(2)(3)	Undesirable Emission – Conducted Measurement	N/A
§15.407(b) (1) (2) (3)(6) (7) RSS 210 A9.2 (1) (2)(3) RSS-Gen 7.2.5	Undesirable Emission – Radiated Measurement	Compliant
§15.407(c) RSS 210 A9.4(4)	Transmission in case of Absence of Information	N/A
§15.407(g)	Frequency Stability	N/A
§15.203 RSS-Gen 7.1.2	Antenna Requirement	Compliant
§15.407(h) RSS 210 A9.3	TPC and DFS Measurement	N/A

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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 mode is programmed.

a mode:

5150MHz-5250MHz: Channel lowest(5180MHz)、 Mid(5220MHz) and Highest(5240MHz).

5250MHz-5350MHz: Channel lowest(5260MHz)、 Mid(5300MHz) and Highest(5320MHz).

5470MHz-5725MHz: Channel lowest(5500MHz)、 Mid(5580MHz) and Highest(5700MHz) and with 6Mbps data rate are chosen for full testing.

ac 20M mode:

5150MHz-5250MHz: Channel lowest(5180MHz)、 Mid(5220MHz) and Highest(5240MHz).

5250MHz-5350MHz: Channel lowest(5260MHz)、 Mid(5300MHz) and Highest(5320MHz).

5470MHz-5725MHz: Channel lowest(5500MHz)、 Mid(5580MHz) and Highest(5700MHz)with 6.5Mbps data rate are chosen for full testing

ac 40M mode:

5150MHz-5250MHz: Channel lowest (5190MHz) and Highest (5230MHz).

5250MHz-5350MHz: Channel lowest (5270MHz) and Highest (5310MHz).

5470MHz-5725MHz: Channel lowest(5510MHz)、 Mid(5550MHz) and Highest(5670MHz)with 13.5Mbps data rate are chosen for full testing

ac 80M mode:

5150MHz-5250MHz: Channel 5210MHz.

5250MHz-5350MHz: Channel 5530MHz.

29.3Mbps data rate are chosen for full testing

The worst case is determined by the output power that generates the highest emission. As examined in the section of output power measurement, the section 7.5, the lowest data rate at a/ac (20M)/ac (40M)/ac (80M) resulted the highest level of fundamental emission, and therefore, the lowest data rate is chosen as the worst-case to conduct the remaining of other mandatory test cases.

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for 802.11a/ac WLAN Transmitter for channel Low, Mid and High, the worst case E2 position was reported.

Pre-scanned was done on TX1 Antenna and TX2 Antenna, and TX2 Antenna results higher emission at 5GHz. Therefore, the completed set of measurement was done on Antenna Aux to be presented on this test report.

For radiation spurious emission test relevant ac (20M)/ac (40M)/ac (80M), MIMO mode that generates the higher emission is chosen to be tested in comparison with transmission at SISO mode.

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Directional gain (MIMO)

The Tx transmission to construct MIMO operation is cyclic delay diversity, and the following deduction to obtain the array gain of MIMO operation is based on the approach given by KDB 662911 D01.

Array gain = 3.01dBi (peak spectral density, conducted spurious emission)

Gain that is combined with different magnitude of two antennas:

- (ii) If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream:
- Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain; or,

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

N_{SS} = the number of independent spatial streams of data;

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k/20}$ if the k th antenna is being fed by spatial stream j , or zero if it is not;
 G_k is the gain in dBi of the k th antenna.

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Directive Gain = 0.67dBi for 802.11 ac 20M, 0.71dBi for 802.11 ac 40M (5150~5250MHz)
, 0.55dBi for 802.11 ac 80M (5150~5250MHz)

Directive Gain = 1.12dBi for 802.11 ac 20M, 1.10dBi for 802.11 ac 40M (5250~5350MHz)
, 1.01dBi for 802.11 ac 80M (5250~5350MHz)

Directive Gain = 2.77dBi for 802.11 ac 20M, 2.77dBi for 802.11 ac 40M (5470~5725MHz)
, 2.77dBi for 802.11 ac 80M (5470~5725MHz)

MIMO Gain = 1.41dBi for 802.11 ac 20M, 1.45dBi for 802.11 ac 40M (5150~5250MHz)
, 1.29dBi for 802.11 ac 80M (5150~5250MHz)

MIMO Gain = 2.69dBi for 802.11 ac 20M, 2.67dBi for 802.11 ac 40M (5250~5350MHz)
, 2.58dBi for 802.11 ac 80M (5250~5350MHz)

MIMO Gain = 5.54dBi for 802.11 ac 20M, 5.54dBi for 802.11 ac 40M (5470~5725MHz)
, 5.54dBi for 802.11 ac 80M (5470~5725MHz)

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Duty Cycle Analysis:

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode (a/ac (20M)/ac (40M)/ac (80M)) shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle. All duty cycle is pre-scanned, resulted as obtained below, and showed only the most representative ones

Tabular results as indicates below entails the results of duty factor for all supported modes.

Formula:

$$\text{Duty Cycle} = \text{Ton} / (\text{Ton} + \text{Toff})$$

Test Procedure:

Set span = 0, RBW = 8MHz, the largest as possible, VBW = 8MHz, Detector = Peak, and RBW, and VBW = the highest RBW the spectrum is capable of, where zero-span is permissible, that > 50/T, where T is ~ 4.3ms

Duty Cycle:

5150-5725MHz	Antenna	Duty Cycle	Duty Factor (dBm)
802.11a	Single	0.99	0.04
802.11 ac (20M)	SISO	0.99	0.04
	MIMO	0.99	0.04
802.11 ac (40M)	SISO	0.99	0.04
	MIMO	0.99	0.04
802.11 ac (80M)	SISO	0.99	0.04
	MIMO	0.99	0.04

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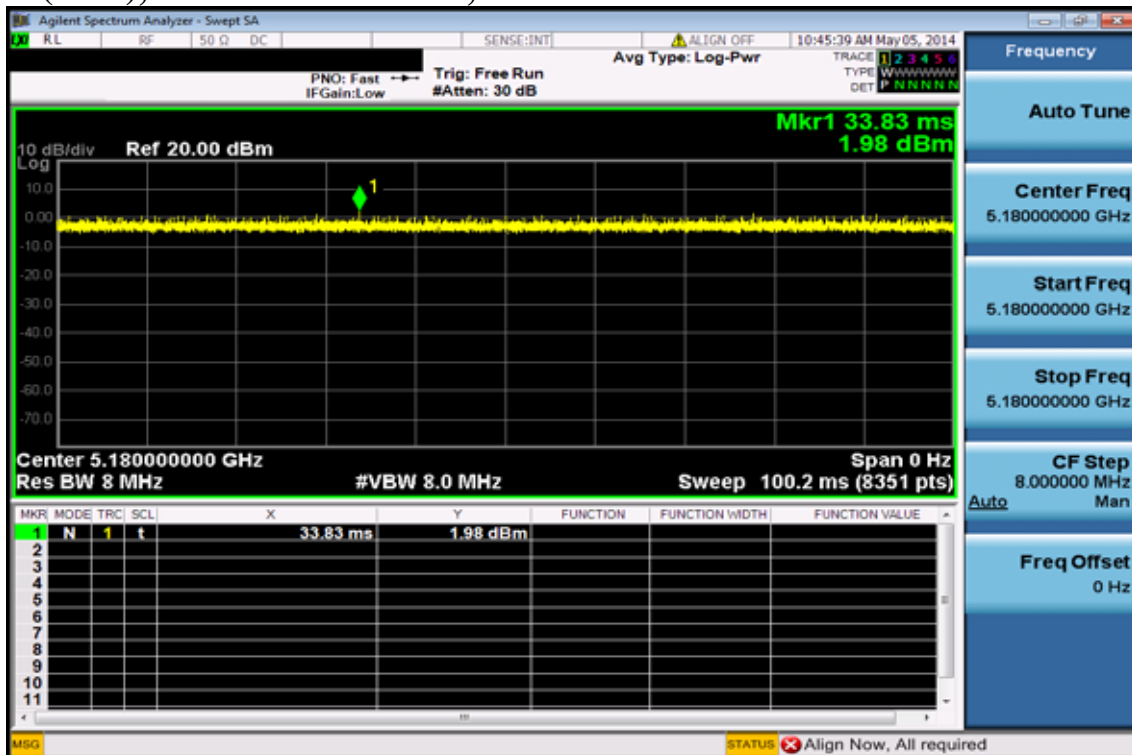
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DUTY CYCLE OF TEST SIGNAL 802.11a, CH Low 5180 MHz



802.11ac (20M), CH Low 5180 MHz, SISO



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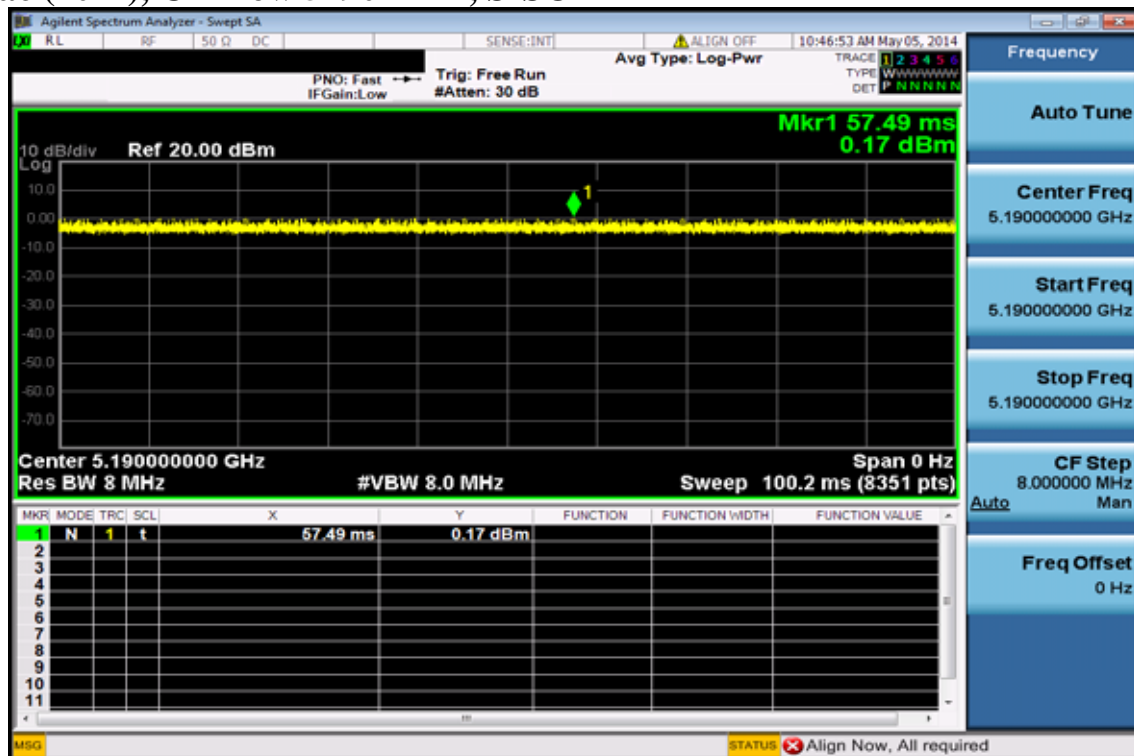
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802.11 ac (20M), CH Low 5180 MHz, MIMO



802.11ac (40M), CH Low 5190 MHz, SISO

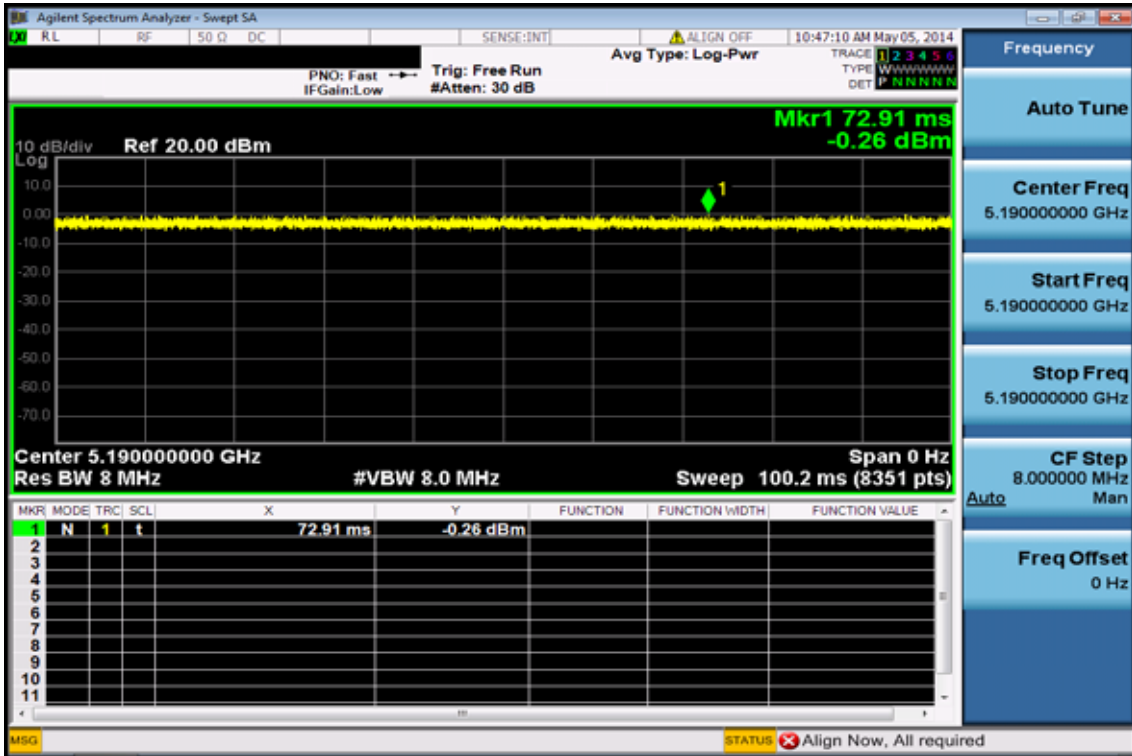


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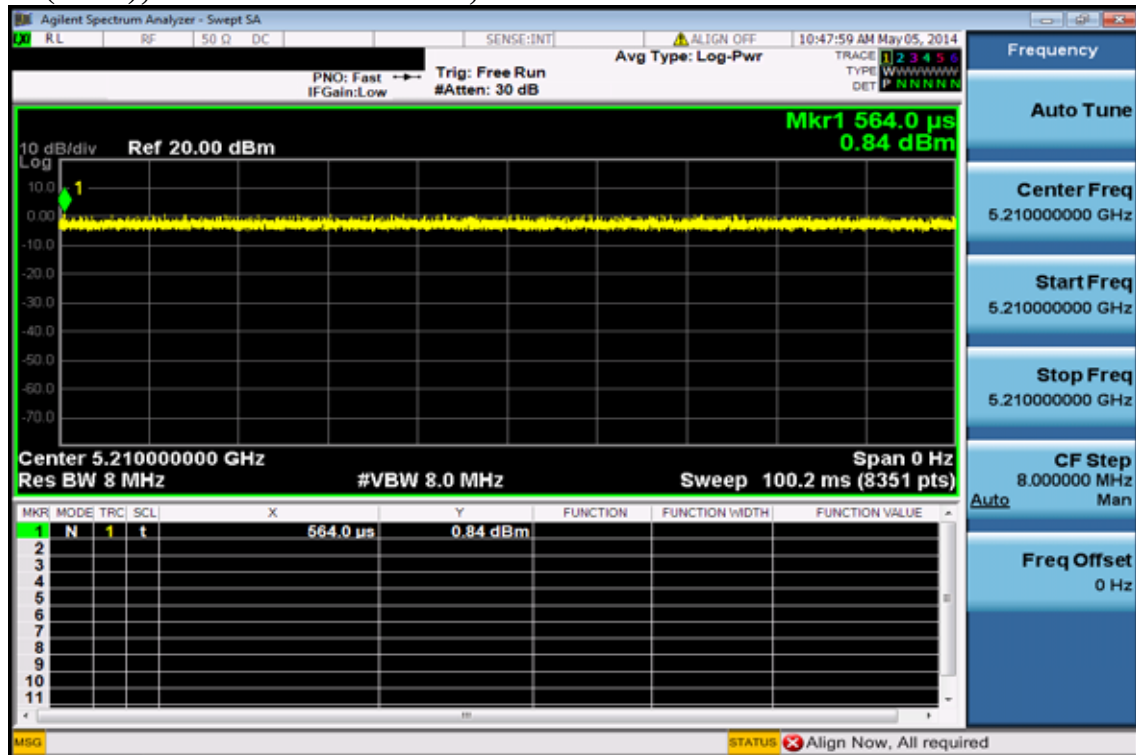
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802.11 ac (40M), CH Low 5190 MHz, MIMO



802.11ac (80M), CH Low 5210 MHz, SISO

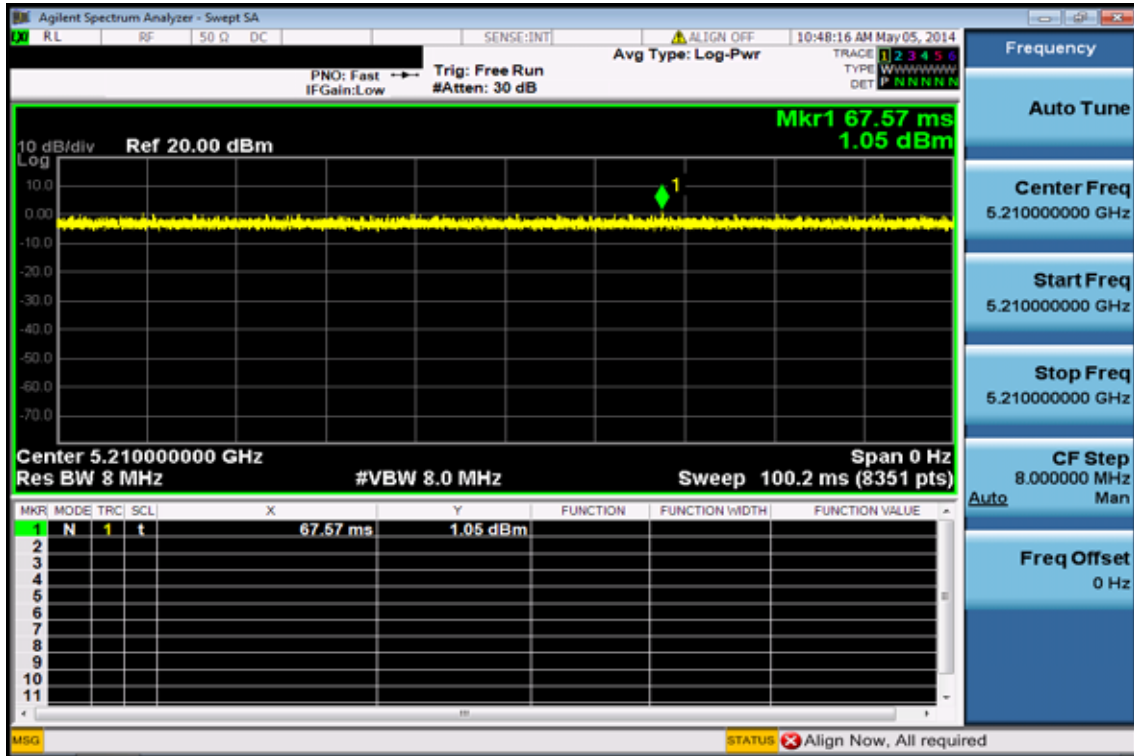


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802.11 ac (80M), CH Low 5210 MHz, MIMO



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5. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
26 dB and 99% Emission Bandwidth	+/- 123.36 Hz
The Maximum Output Power Measurement	+/- 1.42 dB
Peak Power Spectral Density Measurement	+/- 1.55 dB
Peak Excursion Measurement	+/- 1.55 dB
Undesirable Emission – Conducted Measurement	+/- 1.55 dB
Transmission in case of Absence of Information	+/- 1.55 dB
Frequency Stability	+/- 123.36 Hz
TPC and DFS Measurement	+/- 123.36 Hz
Temperature	+/- 0.8 °C
Humidity	+/- 4.7 %
DC / AC Power Source	DC= +/- 1%, AC= +/- 0.2%

Radiated Spurious Emission:

Measurement uncertainty (Polarization : Vertical)	30MHz - 180MHz: +/- 3.37dB
	180MHz -417MHz: +/- 3.19dB
	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

Measurement uncertainty (Polarization : Horizontal)	30MHz - 167MHz: +/- 4.22dB
	167MHz -500MHz: +/- 3.44dB
	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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6. CONDUCTED EMISSION TEST

6.1. Standard Applicable

According to §15.207 and RSS-Gen §7.2.4, frequency range within 150 KHz to 30 MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits dB(uV)	
	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

Note

- The lower limit shall apply at the transition frequencies
- The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

6.2. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESCI7	100760	05/27/2013	05/26/2014
LISN	Rolf-Heine	NNB-2/16Z	99012	03/26/2014	03/25/2015
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	03/19/2014	03/18/2015
Coaxial Cables	N/A	WK CE Cable	N/A	11/26/2013	11/25/2014

6.3. EUT Setup

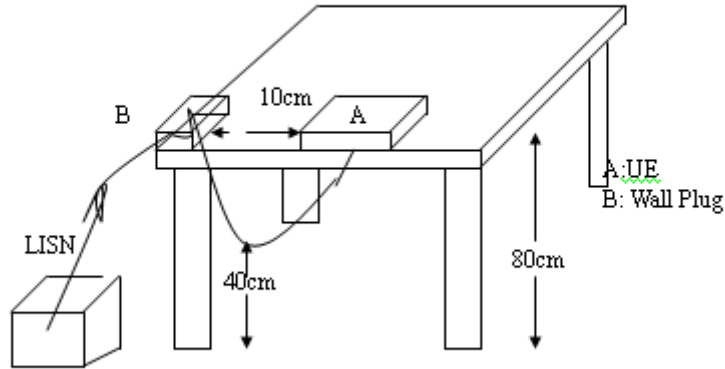
- The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4:2009.
- The AC/DC Power adaptor of EUT was plug-in LISN. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
- The LISN was connected with 120Vac/60Hz power source.

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6.4. Test SET-UP (Block Diagram of Configuration)



6.5. Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all phases of power being supplied by given UE are completed

6.6. Measurement Result

Please refer to FCC Part15B Test Report for the plots.

Report No.: T140306L10-D, Test Lab: Compliance Certification Services Inc. Linkuo Laboratory

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7. 26dB and 99%EMISSION BANDWIDTH MEASUREMENT

7.1 Standard Applicable

According to §15.407(a). No Limit required.

According to RSS 210 A9.2 (1), No Limit required

RSS-Gen §4.6, the transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual.

The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded.

7.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the Antenna port to the spectrum analyzer.
3.
 - a. 26dB Band width Measurement: Set the spectrum analyzer as 1% of emission BW Sweep=auto, Detector = Peak, Trace Mode = Max Hold, Manually readjust RBW until the RBW/EBW ratio is 1% based on EBW as observed on the result of pre-sequence measurement.
 - b. A) 99% Bandwidth Measurement: set resolution BW as close to 1% of the selected span without it is being lower than 1%, & VBW = 3 XRBW. Detector = Peak or Sample, where sample must be selected whenever it is appropriate, Trace Mode = Max Hold
B) Mark the peak frequency and -26dB (upper and lower) frequency.
4. Repeat the procedures as list above until all test default channels (low, middle, and high) are completed.

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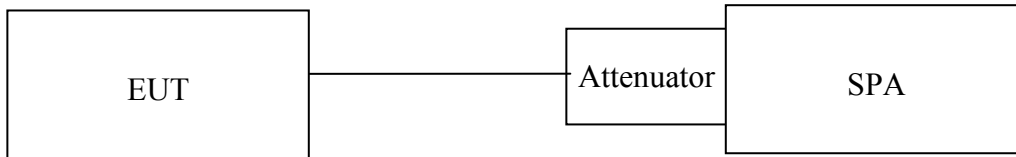
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7.3 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power Meter	Anritsu	ML2495A	1005007	01/13/2014	01/12/2015
Power Sensor	Anritsu	MA2411B	917032	01/13/2014	01/12/2015
Spectrum Analyzer	Agilent	E4446A	MY51100003	05/30/2013	05/29/2014
Spectrum Analyzer	Agilent	E4440A	MY45304525	03/08/2014	03/07/2015
DC Block	Mini-Circuits	BLK-18-S+	1	02/27/2014	02/26/2015
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA	N/A	01/03/2014	01/02/2015
Attenuator	Mini-Circuit	BW-S10W2+	002	02/27/2014	02/26/2015
Splitter	Agilent	11636B	N/A	02/27/2014	02/26/2015

7.4 Test Set-up:



7.5 Measurement Result: N/A

7.6 Measurement Result: N/A

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8. The MAXIMUM OUTPUT POWER MEASUREMENT

8.1 Standard Applicable

According to §15.407(a)

1. For the band 5.15-5.25 GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B.
2. For the band 5.25-5.35 GHz and 5.47-5.725GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm + 10log B.
3. For the band 5.725-5.825 GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 1W (30dBm) or 17 dBm + 10log B.

According to RSS-210 A9.2

1. For the band 5150-5250 MHz, the maximum equivalent isotropically radiated power (e.i.r.p.) shall not exceed 200 mW or 10 + 10 log₁₀ B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.
2. For the bands 5250-5350 MHz and 5470-5725 MHz, the maximum conducted output power shall not exceed 250 mW or 11 + 10 log₁₀ B, dBm, whichever power is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log₁₀ B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

In addition, devices with maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

In addition to the above requirements, devices operating in the band 5250-5350 MHz with maximum e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. elevation mask where θ is the angle above the local horizontal plane (of the earth) as shown below:

- (i) -13 dB(W/MHz) for $0^\circ \leq \theta < 8^\circ$
- (ii) -13 - 0.716 (θ -8) dB(W/MHz) for $8^\circ \leq \theta < 40^\circ$
- (iii) -35.9 - 1.22 (θ -40) dB(W/MHz) for $40^\circ \leq \theta \leq 45^\circ$
- (iv) -42 dB(W/MHz) for $\theta > 45^\circ$

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- For the band 5725-5825 MHz, the maximum conducted output power shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever power is less. The power spectral density shall not exceed 17 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 4.0 W or $23 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

Fixed point-to-point systems for this band are permitted to have an e.i.r.p. greater than 4 W, provided that the higher e.i.r.p. is achieved by employing higher gain antennas, but not higher transmitter output powers. Point-to-multipoint systems, omni-directional applications and multiple co-located transmitters transmitting the same information are prohibited from exceeding 4 W e.i.r.p. However, remote stations of point-to-multipoint systems shall be permitted to operate at greater than 4 W e.i.r.p., under the same conditions as for point-to-point systems.

where B is the 26dB emission bandwidth in MHz.

8.2 Measurement Procedure

- Place the EUT on the table and set it in transmitting mode.
- Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
- Set the offset $10 * \log(1/x)$, $n_{HT20}=0.10$, $n_{HT40}=0.12$
- Record the max. reading.
- Repeat above procedures until all frequency (low, middle, and high channel) measured were complete.
- Employing step 1 to 4 obtaining per-chain basis in MIMO operation, and sum the power in linear to result the output of MIMO operation at frequency of interest (, where MIMO is applicable).

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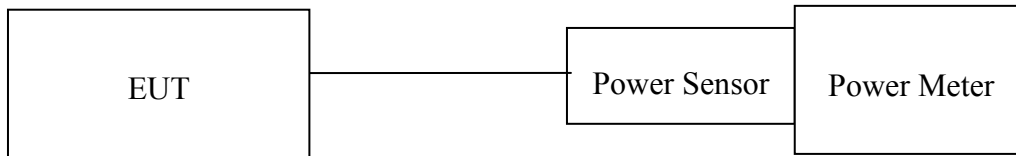
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Note: For EIRP/ERP measurement complying with RSS-210 9.2, the formula as deduced in 1.3.2 of KDB 412172 D01 is used to calculate. $ERP/EIRP = P_t + G_t - L_c$, where P_t = transmitter output power measured directly at antenna port, expressing in dBm, and G_t = gain of the transmitting antenna in dBi that can be referred in antenna spec provided by the manufacturer in section 1.1, L_c = signal attenuation in the cable between the transmitting port and antenna.

8.3 Measurement Equipment Used:

Refer to section 7.3 for details.

8.4 Test Set-up:



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8.5 Measurement Result

802.11a (Antenna Main)

Cable loss = 0		The Maximum Output Power	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
36	5180	14.92	16.99dBm or 4+10log(B) = 18.03dBm
44	5220	14.97	16.99dBm or 4+10log(B) = 17.26dBm
48	5240	15.93	16.99dBm or 4+10log(B) = 17.25dBm
52	5260	14.96	23.98dBm or 11+10log(B) = 24.01dBm
60	5300	14.74	23.98dBm or 11+10log(B) = 24.02dBm
64	5320	14.60	23.98dBm or 11+10log(B) = 24.05dBm
100	5500	15.27	23.98dBm or 11+10log(B) = 24.02dBm
116	5580	15.99	23.98dBm or 11+10log(B) = 24.03dBm
140	5700	15.19	23.98dBm or 11+10log(B) = 24.00dBm

Note: Limit is re-adjusted in terms of dBm

$10*\log(50mW) = 16.99dBm$ for the limit on the band of 5150~5250MHz

$10*\log(250mW)=23.98dBm$ for the limit on the band of 5260~5320Mz, &5470~5725MHz

Note: Cable loss is 11.10dB is set as the offset on the spectrum to compensate the loss causing by cable

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802.11ac (20M) – SISO (Antenna Main)

Cable loss = 0		The Maximum Output Power	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
36	5180	12.67	16.99dBm or 4+10log(B) = 17.08dBm
44	5220	13.19	16.99dBm or 4+10log(B) = 17.45dBm
48	5240	12.73	16.99dBm or 4+10log(B) = 17.11dBm
52	5260	14.98	23.98dBm or 11+10log(B) = 25.55dBm
60	5300	14.50	23.98dBm or 11+10log(B) = 24.89dBm
64	5320	11.84	23.98dBm or 11+10log(B) = 24.04dBm
100	5500	13.27	23.98dBm or 11+10log(B) = 25.18dBm
116	5580	15.18	23.98dBm or 11+10log(B) = 25.66dBm
140	5700	11.01	23.98dBm or 11+10log(B) = 24.16dBm

Note: Offset 11.10dB

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802.11ac (40M) – SISO (Antenna Main)

Cable loss = 0		The Maximum Output Power	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
38	5190	8.34	16.99dBm or 4+10log(B) = 20.19dBm
46	5230	13.09	16.99dBm or 4+10log(B) = 20.09dBm
54	5270	14.27	23.98dBm or 11+10log(B) = 28.46dBm
62	5310	10.49	23.98dBm or 11+10log(B) = 27.21dBm
102	5510	7.98	23.98dBm or 11+10log(B) = 27.21dBm
110	5550	13.88	23.98dBm or 11+10log(B) = 27.85dBm
134	5670	12.81	23.98dBm or 11+10log(B) = 27.62dBm

Note: Offset 11.10dB

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802.11ac (80M) – SISO (Antenna Main)

Cable loss = 0		The Maximum Output Power	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
42	5210	7.66	16.99dBm or 4+10log(B) = 23.15dBm
58	5290	7.96	23.98dBm or 11+10log(B) = 30.14dBm
106	5530	7.81	23.98dBm or 11+10log(B) = 31.60dBm

Note: Offset 11.10dB

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802.11a (Antenna Aux)

Cable loss = 0		The Maximum Output Power	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
36	5180	14.98	16.99dBm or 4+10log(B) = 18.03dBm
44	5220	14.94	16.99dBm or 4+10log(B) = 17.26dBm
48	5240	15.58	16.99dBm or 4+10log(B) = 17.25dBm
52	5260	14.93	23.98dBm or 11+10log(B) = 24.01dBm
60	5300	14.95	23.98dBm or 11+10log(B) = 24.02dBm
64	5320	14.94	23.98dBm or 11+10log(B) = 24.05dBm
100	5500	15.11	23.98dBm or 11+10log(B) = 24.02dBm
116	5580	15.60	23.98dBm or 11+10log(B) = 24.03dBm
140	5700	15.12	23.98dBm or 11+10log(B) = 24.00dBm

Note: Limit is re-adjusted in terms of dBm

$10 \cdot \log(50mW) = 16.99dBm$ for the limit on the band of 5150~5250MHz

$10 \cdot \log(250mW) = 23.98dBm$ for the limit on the band of 5260~5320MHz, & 5470~5725MHz

Note: Cable loss is 11.10dB is set as the offset on the spectrum to compensate the loss causing by cable

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802.11ac (20M) – SISO (Antenna Aux)

Cable loss = 0		The Maximum Output Power	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
36	5180	14.09	16.99dBm or 4+10log(B) = 17.08dBm
44	5220	14.21	16.99dBm or 4+10log(B) = 17.45dBm
48	5240	14.27	16.99dBm or 4+10log(B) = 17.11dBm
52	5260	14.98	23.98dBm or 11+10log(B) = 25.55dBm
60	5300	14.66	23.98dBm or 11+10log(B) = 24.89dBm
64	5320	11.93	23.98dBm or 11+10log(B) = 24.04dBm
100	5500	13.29	23.98dBm or 11+10log(B) = 25.18dBm
116	5580	15.71	23.98dBm or 11+10log(B) = 25.66dBm
140	5700	11.68	23.98dBm or 11+10log(B) = 24.16dBm

Note: Offset 11.10dB

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802.11ac (40M) – SISO (Antenna Aux)

Cable loss = 0		The Maximum Output Power	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
38	5190	9.83	16.99dBm or 4+10log(B) = 20.19dBm
46	5230	13.82	16.99dBm or 4+10log(B) = 20.09dBm
54	5270	14.56	23.98dBm or 11+10log(B) = 28.46dBm
62	5310	10.62	23.98dBm or 11+10log(B) = 27.21dBm
102	5510	7.73	23.98dBm or 11+10log(B) = 27.21dBm
110	5550	14.41	23.98dBm or 11+10log(B) = 27.85dBm
134	5670	13.09	23.98dBm or 11+10log(B) = 27.62dBm

Note: Offset 11.10dB

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802.11ac (80M) – SISO (Antenna Aux)

Cable loss = 0		The Maximum Output Power	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
42	5210	9.07	16.99dBm or $4+10\log(B) = 23.15\text{dBm}$
58	5290	8.65	23.98dBm or $11+10\log(B) = 30.14\text{dBm}$
106	5530	8.48	23.98dBm or $11+10\log(B) = 31.60\text{dBm}$

Note: Offset 11.10dB

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802.11ac (20M) MIMO operation CH0

Cable loss = 0		The Maximum Output Power CH 0	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS8	
36	5180	14.53	16.99dBm or 4+10log(B) = 17.08dBm
44	5220	14.41	16.99dBm or 4+10log(B) = 17.45dBm
48	5240	14.31	16.99dBm or 4+10log(B) = 17.11dBm
52	5260	15.69	23.98dBm or 11+10log(B) = 25.55dBm
60	5300	15.29	23.98dBm or 11+10log(B) = 24.89dBm
64	5320	12.15	23.98dBm or 11+10log(B) = 24.04dBm
100	5500	12.99	23.98dBm or 11+10log(B) = 25.18dBm
116	5580	15.24	23.98dBm or 11+10log(B) = 25.66dBm
140	5700	10.91	23.98dBm or 11+10log(B) = 24.16dBm

Note: Offset 11.10dB

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802.11ac (20M) MIMO operation CH1

Cable loss = 0		The Maximum Output Power CH 1	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS8	
36	5180	12.21	16.99dBm or 4+10log(B) = 17.08dBm
44	5220	13.08	16.99dBm or 4+10log(B) = 17.45dBm
48	5240	13.19	16.99dBm or 4+10log(B) = 17.11dBm
52	5260	14.73	23.98dBm or 11+10log(B) = 25.55dBm
60	5300	14.72	23.98dBm or 11+10log(B) = 24.89dBm
64	5320	14.05	23.98dBm or 11+10log(B) = 24.04dBm
100	5500	11.99	23.98dBm or 11+10log(B) = 25.18dBm
116	5580	15.41	23.98dBm or 11+10log(B) = 25.66dBm
140	5700	12.02	23.98dBm or 11+10log(B) = 24.16dBm

Note: Offset 11.10dB

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802.11ac (20M) MIMO operation CH 0 + CH 1

Cable loss = 0		The Maximum Output Power CH 0 +CH 1	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS8	
36	5180	16.53	16.99dBm or 4+10log(B) = 17.08dBm
44	5220	16.81	16.99dBm or 4+10log(B) = 17.45dBm
48	5240	16.80	16.99dBm or 4+10log(B) = 17.11dBm
52	5260	18.25	23.98dBm or 11+10log(B) = 25.55dBm
60	5300	18.02	23.98dBm or 11+10log(B) = 24.89dBm
64	5320	15.08	23.98dBm or 11+10log(B) = 24.04dBm
100	5500	16.26	23.98dBm or 11+10log(B) = 25.18dBm
116	5580	18.34	23.98dBm or 11+10log(B) = 25.66dBm
140	5700	14.51	23.98dBm or 11+10log(B) = 24.16dBm

Note: Offset 11.10dB

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802.11 ac (40M) MIMO operation CH 0

Cable loss = 0		The Maximum Output Power CH 0	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS8	
38	5190	10.29	16.99dBm or 4+10log(B) = 20.19dBm
46	5230	13.34	16.99dBm or 4+10log(B) = 20.09dBm
54	5270	14.78	23.98dBm or 11+10log(B) = 28.46dBm
62	5310	10.84	23.98dBm or 11+10log(B) = 27.21dBm
102	5510	7.61	23.98dBm or 11+10log(B) = 27.21dBm
110	5550	14.55	23.98dBm or 11+10log(B) = 27.85dBm
134	5670	12.82	23.98dBm or 11+10log(B) = 27.62dBm

Note: Offset 11.10dB

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802.11 ac (40M) MIMO operation CH 1

Cable loss = 0		The Maximum Output Power CH 1	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS8	
38	5190	8.22	16.99dBm or 4+10log(B) = 20.19dBm
46	5230	13.62	16.99dBm or 4+10log(B) = 20.09dBm
54	5270	13.81	23.98dBm or 11+10log(B) = 28.46dBm
62	5310	10.72	23.98dBm or 11+10log(B) = 27.21dBm
102	5510	8.48	23.98dBm or 11+10log(B) = 27.21dBm
110	5550	14.20	23.98dBm or 11+10log(B) = 27.85dBm
134	5670	13.25	23.98dBm or 11+10log(B) = 27.62dBm

Note: Offset 11.10dB

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802.11 ac (40M) MIMO operation CH 0 + CH 1

Cable loss = 0		The Maximum Output Power CH 0 +CH1	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS8	
38	5190	12.39	16.99dBm or 4+10log(B) = 20.19dBm
46	5230	16.49	16.99dBm or 4+10log(B) = 20.09dBm
54	5270	17.33	23.98dBm or 11+10log(B) = 28.46dBm
62	5310	13.79	23.98dBm or 11+10log(B) = 27.21dBm
102	5510	11.08	23.98dBm or 11+10log(B) = 27.21dBm
110	5550	17.39	23.98dBm or 11+10log(B) = 27.85dBm
134	5670	16.05	23.98dBm or 11+10log(B) = 27.62dBm

Note: Offset 11.10dB

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802.11ac (80M) MIMO operation CH 0

Cable loss = 0		The Maximum Output Power CH 0	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
42	5210	9.77	16.99dBm or 4+10log(B) = 23.15dBm
58	5290	9.25	23.98dBm or 11+10log(B) = 30.14dBm
106	5530	8.05	23.98dBm or 11+10log(B) = 31.60dBm

802.11ac (80M) MIMO operation CH 1

Cable loss = 0		The Maximum Output Power CH 1	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
42	5210	6.44	16.99dBm or 4+10log(B) = 23.15dBm
58	5290	7.01	23.98dBm or 11+10log(B) = 30.14dBm
106	5530	8.36	23.98dBm or 11+10log(B) = 31.60dBm

Note: Offset 11.10dB

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802.11ac (80M) MIMO operation CH 0 + CH 1

Cable loss = 0		The Maximum Output Power CH 0+ CH 1	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
42	5210	11.43	16.99dBm or $4+10\log(B) = 23.15\text{dBm}$
58	5290	11.28	23.98dBm or $11+10\log(B) = 30.14\text{dBm}$
106	5530	11.22	23.98dBm or $11+10\log(B) = 31.60\text{dBm}$

Note: Offset 11.10dB

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ERP/EIRP Measurement:

802.11a (Antenna Main)

Cable loss = 0		EIRP	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
36	5180	15.60	23.01dBm or 10+10log(B) = 22.22dBm
44	5220	15.65	23.01dBm or 10+10log(B) = 22.22dBm
48	5240	16.61	23.01dBm or 10+10log(B) = 22.22dBm
52	5260	15.64	30.00dBm or 17+10log(B) = 29.22dBm
60	5300	15.42	30.00dBm or 17+10log(B) = 29.22dBm
64	5320	15.28	30.00dBm or 17+10log(B) = 29.19dBm
100	5500	18.04	30.00dBm or 17+10log(B) = 29.25dBm
116	5580	18.76	30.00dBm or 17+10log(B) = 29.28dBm
140	5700	17.96	30.00dBm or 17+10log(B) = 29.22dBm

Note: Limit is re-adjusted in terms of dBm

$10*\log(50mW) = 16.99dBm$ for the limit on the band of 5150~5250MHz

$10*\log(250mW)=23.98dBm$ for the limit on the band of 5260~5320Mz, &5470~5725MHz

Note: Cable loss is 11.10dB is set as the offset on the spectrum to compensate the loss causing by cable

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802.11ac (20M) – SISO (Antenna Main)

Cable loss = 0		EIRP	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
36	5180	13.35	23.01dBm or 10+10log(B) = 22.52dBm
44	5220	13.87	23.01dBm or 10+10log(B) = 22.49dBm
48	5240	13.41	23.01dBm or 10+10log(B) = 22.49dBm
52	5260	15.66	30.00dBm or 17+10log(B) = 29.55dBm
60	5300	15.18	30.00dBm or 17+10log(B) = 29.49dBm
64	5320	12.52	30.00dBm or 17+10log(B) = 29.52dBm
100	5500	16.04	30.00dBm or 17+10log(B) = 29.49dBm
116	5580	17.95	30.00dBm or 17+10log(B) = 29.55dBm
140	5700	13.78	30.00dBm or 17+10log(B) = 29.49dBm

Note: Offset 11.10dB

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802.11ac (40M) – SISO (Antenna Main)

Cable loss = 0		EIRP	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
38	5190	9.02	23.01dBm or 10+10log(B) = 25.63dBm
46	5230	13.77	23.01dBm or 10+10log(B) = 25.63dBm
54	5270	14.95	30.00dBm or 17+10log(B) = 32.63dBm
62	5310	11.17	30.00dBm or 17+10log(B) = 32.61dBm
102	5510	10.75	30.00dBm or 17+10log(B) = 32.61dBm
110	5550	16.65	30.00dBm or 17+10log(B) = 32.63dBm
134	5670	15.58	30.00dBm or 17+10log(B) = 32.63dBm

Note: Offset 11.10dB

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802.11ac (80M) – SISO (Antenna Main)

Cable loss = 0		EIRP	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
42	5210	8.34	23.01dBm or 10+10log(B) = 28.83dBm
58	5290	8.64	30.00dBm or 17+10log(B) = 35.81dBm
106	5530	10.58	30.00dBm or 17+10log(B) = 35.83dBm

Note: Offset 11.10dB

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802.11a (Antenna Aux)

Cable loss = 0		EIRP	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
36	5180	15.72	23.01dBm or 10+10log(B) = 22.22dBm
44	5220	15.68	23.01dBm or 10+10log(B) = 22.22dBm
48	5240	16.32	23.01dBm or 10+10log(B) = 22.22dBm
52	5260	16.50	30.00dBm or 17+10log(B) = 29.22dBm
60	5300	16.52	30.00dBm or 17+10log(B) = 29.22dBm
64	5320	16.51	30.00dBm or 17+10log(B) = 29.19dBm
100	5500	17.88	30.00dBm or 17+10log(B) = 29.25dBm
116	5580	18.37	30.00dBm or 17+10log(B) = 29.28dBm
140	5700	17.89	30.00dBm or 17+10log(B) = 29.22dBm

Note: Limit is re-adjusted in terms of dBm

$10 \cdot \log(50mW) = 16.99dBm$ for the limit on the band of 5150~5250MHz

$10 \cdot \log(250mW) = 23.98dBm$ for the limit on the band of 5260~5320MHz, & 5470~5725MHz

Note: Cable loss is 11.10dB is set as the offset on the spectrum to compensate the loss causing by cable

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802.11ac (20M) – SISO (Antenna Aux)

Cable loss = 0		EIRP	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
36	5180	14.83	23.01dBm or 10+10log(B) = 22.46dBm
44	5220	14.95	23.01dBm or 10+10log(B) = 22.49dBm
48	5240	15.01	23.01dBm or 10+10log(B) = 22.52dBm
52	5260	16.55	30.00dBm or 17+10log(B) = 29.49dBm
60	5300	16.23	30.00dBm or 17+10log(B) = 29.49dBm
64	5320	13.50	30.00dBm or 17+10log(B) = 29.46dBm
100	5500	16.06	30.00dBm or 17+10log(B) = 29.52dBm
116	5580	18.48	30.00dBm or 17+10log(B) = 29.55dBm
140	5700	14.45	30.00dBm or 17+10log(B) = 29.52dBm

Note: Offset 11.10dB

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802.11ac (40M) – SISO (Antenna Aux)

Cable loss = 0		EIRP	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
38	5190	10.57	23.01dBm or 10+10log(B) = 25.59dBm
46	5230	14.56	23.01dBm or 10+10log(B) = 25.63dBm
54	5270	16.13	30.00dBm or 17+10log(B) = 32.63dBm
62	5310	12.19	30.00dBm or 17+10log(B) = 32.66dBm
102	5510	10.50	30.00dBm or 17+10log(B) = 32.63dBm
110	5550	17.18	30.00dBm or 17+10log(B) = 32.63dBm
134	5670	15.86	30.00dBm or 17+10log(B) = 32.63dBm

Note: Offset 11.10dB

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802.11ac (80M) – SISO (Antenna Aux)

Cable loss = 0		EIRP	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
42	5210	9.81	23.01dBm or 10+10log(B) = 28.83dBm
58	5290	10.22	30.00dBm or 17+10log(B) = 35.83dBm
106	5530	11.25	30.00dBm or 17+10log(B) = 35.83dBm

Note: Offset 11.10dB

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802.11ac (20M) MIMO operation CH0 + CH 1

Cable loss = 0		EIRP CH 0 +CH 1	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS8	
36	5180	17.95	23.01dBm or 10+10log(B) = 22.52dBm
44	5220	18.22	23.01dBm or 10+10log(B) = 22.49dBm
48	5240	18.21	23.01dBm or 10+10log(B) = 22.52dBm
52	5260	20.93	30.00dBm or 17+10log(B) = 29.55dBm
60	5300	19.11	30.00dBm or 17+10log(B) = 29.49dBm
64	5320	20.71	30.00dBm or 17+10log(B) = 29.52dBm
100	5500	21.80	30.00dBm or 17+10log(B) = 29.52dBm
116	5580	23.88	30.00dBm or 17+10log(B) = 29.55dBm
140	5700	20.05	30.00dBm or 17+10log(B) = 29.52dBm

Note: Offset 11.10dB

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802.11 ac (40M) MIMO operation CH 0 + CH 1

Cable loss = 0		EIRP CH 0 + CH1	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS8	
38	5190	13.84	23.01dBm or 10+10log(B) = 25.63dBm
46	5230	17.94	23.01dBm or 10+10log(B) = 25.63dBm
54	5270	20.00	30.00dBm or 17+10log(B) = 32.63dBm
62	5310	16.46	30.00dBm or 17+10log(B) = 32.66dBm
102	5510	16.62	30.00dBm or 17+10log(B) = 32.63dBm
110	5550	22.93	30.00dBm or 17+10log(B) = 32.63dBm
134	5670	21.59	30.00dBm or 17+10log(B) = 32.63dBm

Note: Offset 11.10dB

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802.11ac (80M) MIMO operation CH 0 +CH 1

Cable loss = 0		EIRP CH 0 + CH 1	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
42	5210	12.72	23.01dBm or 10+10log(B) = 28.83dBm
58	5290	13.86	30.00dBm or 17+10log(B) = 35.83dBm
106	5530	16.75	30.00dBm or 17+10log(B) = 35.83dBm

Note: Offset 11.10dB

* Note: EIRP = Average Power + Gain, where the nominal gain of the antenna:

0.68dBi for 5150-5250MHz for Antenna Main, 0.74dBi for 5150-5250MHz for Antenna Aux,
0.68dBi for 5250-5350MHz for Antenna Main, 1.57dBi for 5250-5350MHz for Antenna Aux,
2.77dBi for 5470-5725MHz for Antenna Main, 2.77dBi for 5740-5725MHz for Antenna Aux

MIMO Gain: 1.41dBi for 802.11ac 20M, 1.45dBi for 802.11ac 40M, 1.29dBi for 802.11ac 80M (5150-5250MHz), 2.69dBi for 802.11ac 20M, 2.67dBi for 802.11ac 40M, 2.58dBi for 802.11ac 80M (5250-5350MHz), and 5.54dBi for 802.11ac 20M, 802.11ac 40M and 802.11ac 80M (5470-5725MHz) where MIMO gain = directive gain + nominal gain.

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9. PEAK POWER SPECTRAL DENSITY

9.1 Standard Applicable

According to §15.407(a)

1. For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band.
2. For the band 5.25-5.35 GHz and 5.47-5.725GHz, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band.

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to RSS-210 A9.2

1. For the band 5150-5250 MHz, the maximum equivalent isotropically radiated power (e.i.r.p.) shall not exceed 200 mW or $10 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.
2. For the bands 5250-5350 MHz and 5470-5725 MHz, the maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$, dBm, whichever power is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

In addition, devices with maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

In addition to the above requirements, devices operating in the band 5250-5350 MHz with maximum e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. elevation mask where θ is the angle above the local horizontal plane (of the earth) as shown below:

- (i) -13 dB (W/MHz) for $0^\circ \leq \theta < 8^\circ$
- (ii) $-13 - 0.716(\theta - 8)$ dB (W/MHz) for $8^\circ \leq \theta < 40^\circ$
- (iii) $-35.9 - 1.22(\theta - 40)$ dB (W/MHz) for $40^\circ \leq \theta \leq 45^\circ$
- (iv) -42 dB (W/MHz) for $\theta > 45^\circ$

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9.2 Measurement Procedure (following procedure F, & E) d) method SA-2 in KDB789033 D01)

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
3. Set RBW=1MHz, VBW=3MHz, Span=50MHz/80MHz (Base Mode), where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
4. Use the cursor on spectrum to peak search the highest level of trace
5. Add offset, duty factor $n_{HT20}=0.10$, $n_{HT40}=0.12$
6. Record the max. reading.
7. Repeat above procedures until all default test channel (low, middle, and high) was complete.
8. For MIMO mode, add the appropriate offset.

9.3 Measurement Equipment Used:

Refer to section 7.3 for details.

9.4 Test Set-up:

Refer to section 7.4 for details.

Remark: as per KDB 662291, MIMO mode is accomplished by the addition of $10 \log(N)$, where $N = 2$ as the simultaneous emission of PSD

9.5 Measurement Result: N/A

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10. PEAK EXCURSION MEASUREMENT

10.1 Standard Applicable

15.407(a)(6) The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

10.2 Measurement Procedure (following procedure G in KDB789033)

1. Pre-evaluation in selection for test mode based on KDB789033
2. Tests mode selection is based on the variations in signal structure,
 - (i) All signal types - OFDM;
 - (ii) All modulation types (BPSK, QPSK, 16-QAM, 64-QAM);
 - (iii) All bandwidth modes (20MHz, and 40MHz for 802.11n);
 - (iv) All variations in signal parameters (inapplicable);
 - (v) Error-correction coding rate (not required);
3. Place the EUT on the table and set it in transmitting mode.
4. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to spectrum.
5. Set RBW=1MHz, VBW = 3MHz, span =enough to capture the signal of the interest, Max. Hold, Detector = peak
6. use the procedure specified in KDB 789033 F) to determine the PPSD
7. compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD by the subtraction
8. Repeat above procedures until all default test mode of default frequency band of the test is completed.

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802.11a

Table 18-4—Modulation-dependent parameters

Modulation	Coding rate (R)	Coded bits per subcarrier (N_{BPSC})	Coded bits per OFDM symbol (N_{CBPS})	Data bits per OFDM symbol (N_{DBPS})	Data rate (Mb/s) (20 MHz channel spacing)	Data rate (Mb/s) (10 MHz channel spacing)	Data rate (Mb/s) (5 MHz channel spacing)
BPSK	1/2	1	48	24	6	3	1.5
BPSK	3/4	1	48	36	9	4.5	2.25
QPSK	1/2	2	96	48	12	6	3
QPSK	3/4	2	96	72	18	9	4.5
16-QAM	1/2	4	192	96	24	12	6
16-QAM	3/4	4	192	144	36	18	9
64-QAM	2/3	6	288	192	48	24	12
64-QAM	3/4	6	288	216	54	27	13.5

802.11n_20

Table 20-30—MCS parameters for mandatory 20 MHz, $N_{SS} = 1$, $N_{ES} = 1$

MCS Index	Modulation	R	$N_{BPSCS}(f_{SS})$	N_{SD}	N_{SP}	N_{CBPS}	N_{DBPS}	Data rate (Mb/s)	
								800 ns GI	400 ns GI (see NOTE)
0	BPSK	1/2	1	52	4	52	26	6.5	7.2
1	QPSK	1/2	2	52	4	104	52	13.0	14.4
2	QPSK	3/4	2	52	4	104	78	19.5	21.7
3	16-QAM	1/2	4	52	4	208	104	26.0	28.9
4	16-QAM	3/4	4	52	4	208	156	39.0	43.3
5	64-QAM	2/3	6	52	4	312	208	52.0	57.8
6	64-QAM	3/4	6	52	4	312	234	58.5	65.0
7	64-QAM	5/6	6	52	4	312	260	65.0	72.2

NOTE—Support of 400 ns GI is optional on transmit and receive.

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802.11n_40

Table 20-34—MCS parameters for optional 40 MHz, $N_{SS} = 1$, $N_{ES} = 1$

MCS Index	Modulation	R	$N_{BPSCS}(i_{SS})$	N_{SD}	N_{SP}	N_{CBPS}	N_{DBPS}	Data rate (Mb/s)	
								800 ns GI	400 ns GI
0	BPSK	1/2	1	108	6	108	54	13.5	15.0
1	QPSK	1/2	2	108	6	216	108	27.0	30.0
2	QPSK	3/4	2	108	6	216	162	40.5	45.0
3	16-QAM	1/2	4	108	6	432	216	54.0	60.0
4	16-QAM	3/4	4	108	6	432	324	81.0	90.0
5	64-QAM	2/3	6	108	6	648	432	108.0	120.0
6	64-QAM	3/4	6	108	6	648	486	121.5	135.0
7	64-QAM	5/6	6	108	6	648	540	135.0	150.0

802.11n_20_MIMO

MCS Index	Modulation	R	$N_{BPSCS}(i_{SS})$	N_{SD}	N_{SP}	N_{CBPS}	N_{DBPS}	Data rate (Mb/s)	
								800 ns GI	400 ns GI (see NOTE)
8	BPSK	1/2	1	52	4	104	52	13.0	14.4
9	QPSK	1/2	2	52	4	208	104	26.0	28.9
10	QPSK	3/4	2	52	4	208	156	39.0	43.3
11	16-QAM	1/2	4	52	4	416	208	52.0	57.8
12	16-QAM	3/4	4	52	4	416	312	78.0	86.7
13	64-QAM	2/3	6	52	4	624	416	104.0	115.6
14	64-QAM	3/4	6	52	4	624	468	117.0	130.0
15	64-QAM	5/6	6	52	4	624	520	130.0	144.4

NOTE—The 400 ns GI rate values are rounded to 1 decimal place.

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802.11n_40_MIMO

MCS Index	Modulation	R	$N_{BPSCS(i_{SS})}$	N_{SD}	N_{SP}	N_{CBPS}	N_{DBPS}	Data rate (Mb/s)	
								800 ns GI	400 ns GI
8	BPSK	1/2	1	108	6	216	108	27.0	30.0
9	QPSK	1/2	2	108	6	432	216	54.0	60.0
10	QPSK	3/4	2	108	6	432	324	81.0	90.0
11	16-QAM	1/2	4	108	6	864	432	108.0	120.0
12	16-QAM	3/4	4	108	6	864	648	162.0	180.0
13	64-QAM	2/3	6	108	6	1296	864	216.0	240.0
14	64-QAM	3/4	6	108	6	1296	972	243.0	270.0
15	64-QAM	5/6	6	108	6	1296	1080	270.0	300.0

Note: The test mode to be performed is circle in red as presents above

10.3 Measurement Equipment Used:

Refer to section 7.3 for details.

Remark: as per KDB 662291, MIMO mode is accomplished by the addition of $10 \log(N)$, where $N = 2$ as the simultaneous emission of Peak Excursion.

10.4 Test Set-up:

Refer to section 7.4 for details.

10.5 Test Results: N/A

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11. UNDESIRABLE EMISSION - CONDUCTED MEASUREMENT

11.1 Standard Applicable

According to §15.407(b),

(b) Undesirable Emission Limits: Except as shown in Paragraph (b)(6) of this section, the peak emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.
- (3) For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.
- (4) The above emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

According to RSS-210 A9.2

1. For transmitters operating in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.
2. Emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.
3. For transmitters operating in the band 5470-5725 MHz, all emissions outside that band shall not exceed -27 dBm/MHz e.i.r.p.

Procedure H2) a) b) c) are adopted, KDB 789033 D01, where the conducted measurement is being used to comply with out of emission requirement as per FCC 15.407 b) 1) 2) 3), and RSS-210 A9.2 1), 2), and 3)

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11.2 Measurement Procedure

Conducted Emission:

1. To connect Antenna Port of EUT to Spectrum.
2. Set RBW = 100 kHz, VBW = 300 kHz while frequency of the measurement is swept below 1GHz, RBW = 1MHz & VBW = 3MHz while frequency of the measurement is swept above 1GHz on Spectrum. Detector = Peak, set DL as the limit line to -27dBm, add the offset = 4.7dB for frequency below 1GHz, and 2dB for frequency above 1GHz.
3. Sweep the frequency to determine spurious emission as seen on spectrum from span of 30 to 1G, 1G to 3G, 3G to 6G, 6G to 13G, 13G to 18G, 18G to 26.5G and 26.5G to 40GHz
4. Via Software, combine 6 spans of frequency range into one plot

Conducted RF measurements of the transmitter output were made at the band edges and the adjacent restricted bands.

Also, conducted RF measurements of the transmitter output over the 30 MHz to 40 GHz band were made in order to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

Note: the spike on the spectrum is the fundamental emission that does not account for the test outside the frequency band as required by associative regulatory provision.

11.3 Measurement Equipment Used:

Refer to section 7.3 for details.

11.4 Test Set-up:

Refer to section 7.4 for details.

11.5 Measurement Result: N/A.

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12. UNDESIRABLE EMISSION - RADIATED MEASUREMENT

12.1 Standard Applicable

According to §15.407(b) (6) (7),

(b) Undesirable Emission Limits: Except as shown in Paragraph (b)(6) of this section, the peak emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in Section 15.207.
- (2) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.
- (3) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

Procedure H1) a) b) c) are adopted, KDB 789033 D01, where the conducted measurement is being used to comply with out of emission requirement as per FCC 15.407 b) 6) 7), and RSS-Gen 7.2.2.

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§15.205- RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(²)
13.36 - 13.41	322 - 335.4		

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

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§15.209- RADIATED EMISSION LIMITS: GENERAL REQUIREMENTS

FCC PART 15.209

MEASURING DISTANCE OF 3 METER		
FREQUENCY RANGE (MHz)	FIELD STRENGTH (Microvolts/m)	FIELD STRENGTH (dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

According to RSS-Gen section 4.9 Transmitter Unwanted Emissions

The measurement method shall be described in the test report. When the applicable unwanted emissions limits are defined in relative terms, the same parameter, peak power or average power, used for the transmitter output power measurement, shall be used for unwanted emission measurements.

In measuring unwanted emissions, the spectrum shall be investigated from 30 MHz or the lowest radio frequency signal generated in the equipment, whichever is lower, without going below 9 kHz, up to at least the frequency given in (a) and (b):

- (a) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
- (b) If the equipment operates at or above 10 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

Particular attention should be paid to harmonics and sub-harmonics of the carrier frequency, as well as to those frequencies removed from the carrier by multiples of the oscillator frequency. Radiation at the frequencies of multiplier stages should also be checked.

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value need not be reported.

When limits are expressed in absolute terms, compliance with the emission limits shall be demonstrated using a CISPR quasi-peak detector and the related measurement bandwidth for emissions below 1000 MHz. As an alternative to CISPR quasi-peak measurement, compliance with the emission limits can be demonstrated using measuring equipment employing a peak detector function properly adjusted for factors such as pulse desensitization as required, with an equal or greater measurement bandwidth relative to the applicable CISPR quasi-peak bandwidth.

Above 1000 MHz, compliance with the emission limits shall be demonstrated using an average detector with a minimum resolution bandwidth of 1 MHz.

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According to RSS-Gen section 7.2.2 Emissions Falling Within Restricted Frequency Bands

Restricted bands, identified in Table 1, are designated primarily for safety-of-life services (distress calling and certain aeronautical bands), certain satellite downlinks, radio astronomy and some government uses.

Except where otherwise indicated, the following restrictions apply:

- (a) Fundamental components of modulation of licence-exempt radio apparatus shall not fall within the restricted bands of Table 1;
- (b) Unwanted emissions falling into restricted bands of Table 1 shall comply with the limits specified in RSS-Gen;
- (c) Unwanted emissions not falling within restricted frequency bands shall either comply with the limits specified in the applicable RSS, or with those specified in RSS-Gen.

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Table 3: Restricted Frequency Bands ^(Note)

MHz	MHz	GHz
0.090-0.110	240-285	9.0-9.2
2.1735-2.1905	322-335.4	9.3-9.5
3.020-3.026	399.9-410	10.6-12.7
4.125-4.128	608-614	13.25-13.4
4.17725-4.17775	960-1427	14.47-14.5
4.20725-4.20775	1435-1626.5	15.35-16.2
5.677-5.683	1645.5-1646.5	17.7-21.4
6.215-6.218	1660-1710	22.01-23.12
6.26775-6.26825	1718.8-1722.2	23.6-24.0
6.31175-6.31225	2200-2300	31.2-31.8
8.291-8.294	2310-2390	36.43-36.5
8.362-8.366	2655-2900	Above 38.6
8.37625-8.38675	3260-3267	
8.41425-8.41475	3332-3339	
12.29-12.293	3345.8-3358	
12.51975-12.52025	3500-4400	
12.57675-12.57725	4500-5150	
13.36-13.41	5350-5460	
16.42-16.423	7250-7750	
16.69475-16.69525	8025-8500	
16.80425-16.80475		
25.5-25.67		
37.5-38.25		
73-74.6		
74.8-75.2		
108-138		
156.52475-156.52525		
156.7-156.9		

Note: Certain frequency bands listed in Table 1 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in the 200- and 300- series RSSs, such as RSS-210 and RSS-310, which contain the requirements that apply to licence-exempt radio apparatus.

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12.1.1 Transmitter Spurious Emission Limits

Spurious emissions from licence-exempt transmitters shall comply with the field strength limits shown below. Additionally, the level of any transmitter spurious emission shall not exceed the level of the transmitter's fundamental emission.

Table 5: General Field Strength Limits for Transmitters at Frequencies Above 30 MHz

Frequency (MHz)	Field Strength (microvolt/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960	500

Note: Transmitting devices are not permitted in Table 1 bands or, unless stated otherwise, in TV bands (54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz and 614-806 MHz).

12.1.2 Unwanted Emission that complies with the undesirable emission ruling by 15.407 (b) (1) (2) (3), RSS-210 A9.2 (1) (2) (3)

Frequencies (MHz)	EIRP Limit (dBm)	Equivalent Field Strength at 3m (dBuV/m)
5150 – 5250	-27	68.3
5250 – 5350	-27	68.3
5470 - 5725	-27	68.3

Limit derivation in terms of Field Strength:

$EIRP = (E \cdot d)^2 / 30$, where E is the field in V/m, d is the measurement distance (3m), EIRP is the equivalent isotropically radiated power in Watts.

$$E = 1000000 \cdot (30 \cdot EIRP)^{(1/2)} / 3 \text{ uV/m}$$

$$= 68.3 \text{ dBuV/m}$$

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12.2 EUT Setup

1. The radiated emission tests were performed in the 3 meter open-test site, using the setup in accordance with the ANSI C63.4:2009.
2. The EUT was put in the front of the test table. The host PC system was placed on the center of the back edge on the test table. The peripherals like modem, monitor printer, K/B, and mouse were placed on the side of the host PC system. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The keyboard was placed directly in the front of the monitor, flushed with the front tabletop. The mouse was placed next to the Keyboard, flushed with the back of keyboard.
4. The spacing between the peripherals was 10 centimeters.
5. External I/O cables were draped along the edge of the test table and bundle when necessary.
6. The host PC system was connected with 120Vac/60Hz power source.

12.3 Measurement Procedure

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

For measurements below 1GHz, follow the KDB 789033 D01 requirements in section H)3), "General Requirements for Unwanted Emissions Measurements" Compliance shall be demonstrated using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.

For Measurement above 1GHz, for peak unwanted emission measurements follow the KDB 789033 D01 requirements in section H)5) b), for average unwanted emission measurements follow the KDB 789033 D01 requirements in section H)6) c) or d).

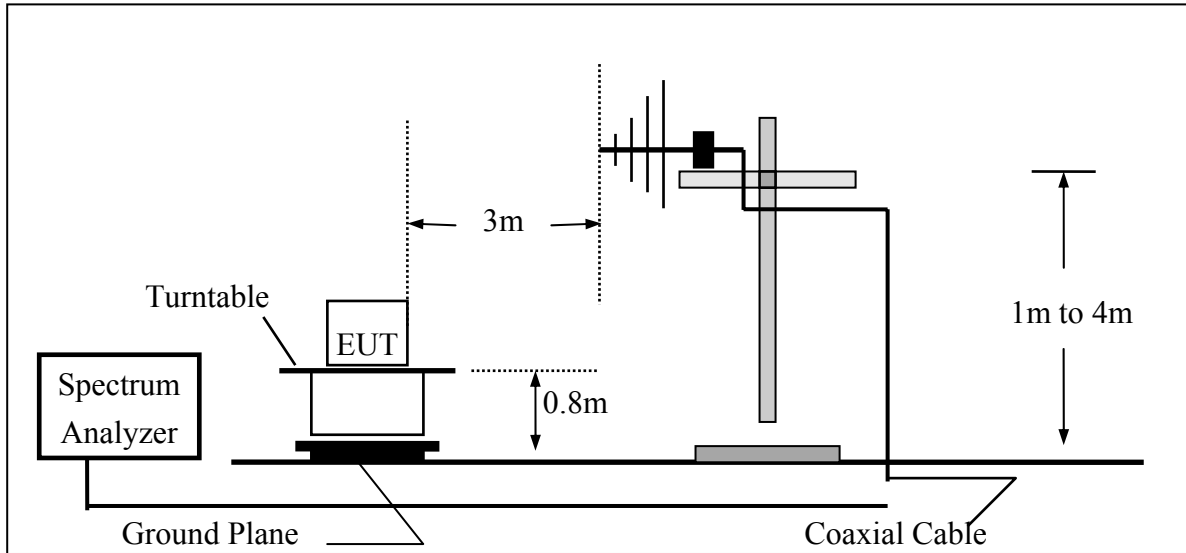
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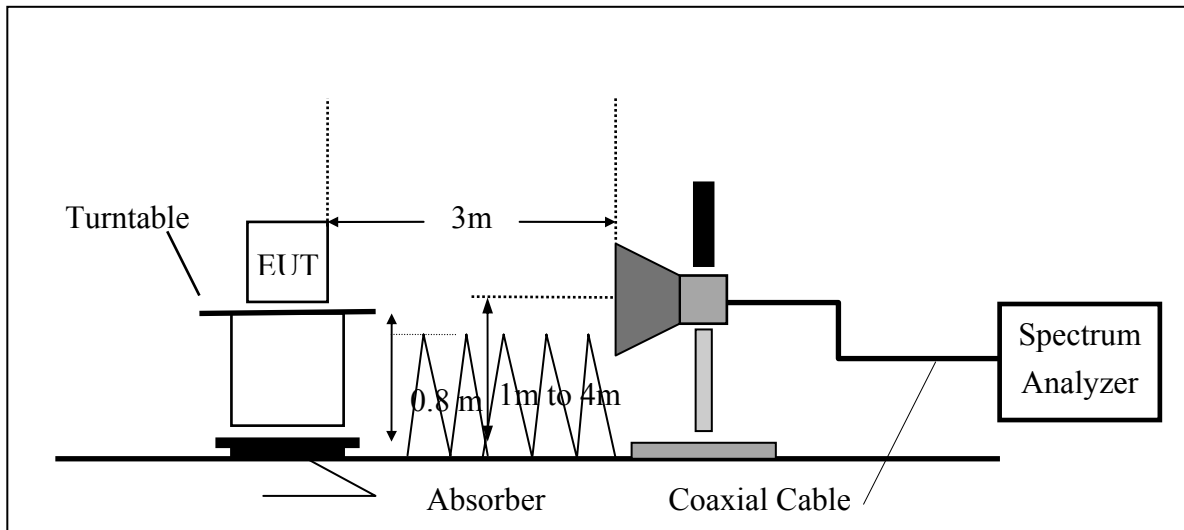
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12.4 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



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12.5 Measurement Equipment Used:

966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESC17	100760	05/27/2013	05/26/2014
Spectrum Analyzer	Agilent	E4446A	MY51100003	05/30/2013	05/29/2014
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	01/20/2014	01/19/2015
Spectrum Analyzer	R&S	FSV-30	101398	10/22/2013	10/21/2014
Loop Antenna	ETS.LINDGREN	6502	00148045	07/05/2013	07/04/2014
Bilog Antenna	SCHWAZBECK	VULB9168	378	01/02/2014	01/01/2015
Horn antenna	ETS.LINDGREN	3117	123995	05/31/2013	05/30/2014
Horn Antenna	Schwarzbeck	BBHA9170	184	01/23/2014	01/22/2015
Pre-Amplifier	EMC Instruments Corp.	EMC0126530	980038	01/03/2014	01/02/2015
Pre-Amplifier	Agilent	8447D	2944A07676	01/03/2014	01/02/2015
Pre-Amplifier	Agilent	8449B	3008A00578	01/03/2014	01/02/2015
Pre-Amplifier	EMC Instruments Corp.	EMC184045	980135	01/24/2014	01/23/2015
5150-5350 Band Reject Filter	Micro-Tronics	BRM50703	1	01/03/2014	01/02/2015
5470-5725 Band Reject Filter	Micro-Tronics	BRM50704	1	01/03/2014	01/02/2015
5725-5875 Band Reject Filter	Micro-Tronics	BRM50705	1	01/03/2014	01/02/2015
1GHz High Pass Filter	Micro-Tronics	HPM50108	32	02/27/2014	02/26/2015
2GHz High Pass Filter	Micro-Tronics	HPM50110	36	02/27/2014	02/26/2015
Attenuator	Mini-Circuit	BW-S10W2+	002	02/27/2014	02/26/2015
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	Huber Suhner	966_Rx	9	01/03/2014	01/02/2015
3m Site NSA	SGS	966 chamber	N/A	07/15/2013	07/14/2014

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12.6 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

12.7 Measurement Result

Refer to attach tabular data sheets.

NOTE:

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 100kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.

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Radiated Spurious Emission Measurement Result 802.11a, 5150~5250 MHz

Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5180 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10360.00	H	Peak	26.61	15.55	42.16	68.30	-26.14
15540.00	H	---					
20720.00	H	---					
25900.00	H	---					
31080.00	H	---					
36260.00	H	---					

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5180 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10360.00	H	Peak	26.14	15.55	41.69	68.30	-26.61
15540.00	H	---					
20720.00	H	---					
25900.00	H	---					
31080.00	H	---					
36260.00	H	---					

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5200 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10400.00	H	Peak	26.60	15.26	41.86	68.30	-26.44
15600.00	H	---					
20800.00	H	---					
26000.00	H	---					
31200.00	H	---					
36400.00	H	---					

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5200 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10400.00	H	Peak	25.92	15.26	41.18	68.30	-27.12
15600.00	H	---					
20800.00	H	---					
26000.00	H	---					
31200.00	H	---					
36400.00	H	---					

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5240 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10480.00	H	Peak	26.09	15.69	41.78	68.30	-26.52
15720.00	H	---					
20960.00	H	---					
26200.00	H	---					
31440.00	H	---					
36680.00	H	---					

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5240 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10480.00	H	Peak	25.68	15.69	41.37	68.30	-26.93
15720.00	H	---					
20960.00	H	---					
26200.00	H	---					
31440.00	H	---					
36680.00	H	---					

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Operation Band :802.11 a Test Date :2014-04-16
Fundamental Frequency :5180 MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge LOW Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5123.08	S	Average	32.65	7.45	40.10	54.00	-13.90
5123.08	S	Peak	51.75	7.45	59.20	74.00	-14.80
5150.00	E	Average	43.44	7.54	50.98	54.00	-3.02
5150.00	E	Peak	63.48	7.54	71.02	74.00	-2.98

Operation Band :802.11 a Test Date :2014-04-16
Fundamental Frequency :5180 MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge LOW Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5123.44	S	Average	30.12	7.45	37.57	54.00	-16.43
5123.44	S	Peak	49.56	7.45	57.01	74.00	-16.99
5150.00	E	Average	40.82	7.54	48.36	54.00	-5.64
5150.00	E	Peak	60.68	7.54	68.22	74.00	-5.78

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5240 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:Band Edge High	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	31.70	7.54	39.24	54.00	-14.76
5150.00	E	Peak	45.87	7.54	53.41	74.00	-20.59

Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5240 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:Band Edge High	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	31.21	7.54	38.75	54.00	-15.25
5150.00	E	Peak	43.87	7.54	51.41	74.00	-22.59

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Radiated Spurious Emission Measurement Result 802.11ac (20M), 5150~5250MHz (MIMO)

Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5180 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10360.00	H	Peak	25.50	15.55	41.05	68.30	-27.25
15540.00	H	---					
20720.00	H	---					
25900.00	H	---					
31080.00	H	---					
36260.00	H	---					

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Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5180 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10360.00	H	Peak	24.14	15.55	39.69	68.30	-28.61
15540.00	H	---					
20720.00	H	---					
25900.00	H	---					
31080.00	H	---					
36260.00	H	---					

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Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5200 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10400.00	H	Peak	26.47	15.26	41.73	68.30	-26.57
15600.00	H	---					
20800.00	H	---					
26000.00	H	---					
31200.00	H	---					
36400.00	H	---					

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Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5200 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	dB
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	
10400.00	H	Peak	26.03	15.26	41.29	68.30	-27.01
15600.00	H	---					
20800.00	H	---					
26000.00	H	---					
31200.00	H	---					
36400.00	H	---					

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Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5240 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10480.00	H	Peak	26.11	15.69	41.80	68.30	-26.50
15720.00	H	---					
20960.00	H	---					
26200.00	H	---					
31440.00	H	---					
36680.00	H	---					

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Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5240 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10480.00	H	Peak	25.89	15.69	41.58	68.30	-26.72
15720.00	H	---					
20960.00	H	---					
26200.00	H	---					
31440.00	H	---					
36680.00	H	---					

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Operation Band :802.11 AC20M Test Date :2014-04-16
Fundamental Frequency :5180 MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge LOW Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	E	Average	40.77	7.54	48.31	54.00	-5.69
5150.00	E	Peak	59.72	7.54	67.26	74.00	-6.74

Operation Band :802.11 AC20M Test Date :2014-04-16
Fundamental Frequency :5180 MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge LOW Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :HORIZONTAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	E	Average	36.55	7.54	44.09	54.00	-9.91
5150.00	E	Peak	56.56	7.54	64.10	74.00	-9.90

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Operation Band :802.11 AC20M Test Date :2014-04-16
Fundamental Frequency :5240 MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge HIGH Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	32.47	7.54	40.01	54.00	-13.99
5150.00	E	Peak	45.61	7.54	53.15	74.00	-20.85

Operation Band :802.11 AC20M Test Date :2014-04-16
Fundamental Frequency :5240 MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge HIGH Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5150.00	E	Average	29.89	7.54	37.43	54.00	-16.57
5150.00	E	Peak	41.51	7.54	49.05	74.00	-24.95

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Radiated Spurious Emission Measurement Result 802.11ac (40M), 5150~5250MHz (MIMO)

Operation Band	:802.11 AC40M	Test Date	:2014-04-16
Fundamental Frequency	:5190 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10380.00	H	Peak	18.73	15.40	34.13	68.30	-34.17
15570.00	H	---					
20760.00	H	---					
25950.00	H	---					
31140.00	H	---					
36330.00	H	---					

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Operation Band	:802.11 AC40M	Test Date	:2014-04-16
Fundamental Frequency	:5190 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10380.00	H	Peak	19.29	15.40	34.69	68.30	-33.61
15570.00	H	---					
20760.00	H	---					
25950.00	H	---					
31140.00	H	---					
36330.00	H	---					

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Operation Band	:802.11 AC40M	Test Date	:2014-04-16
Fundamental Frequency	:5230 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10460.00	H	Peak	18.33	15.46	33.79	68.30	-34.51
15690.00	H	---					
20920.00	H	---					
26150.00	H	---					
31380.00	H	---					
36610.00	H	---					

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Operation Band	:802.11 AC40M	Test Date	:2014-04-16
Fundamental Frequency	:5230 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10460.00	H	Peak	19.60	15.46	35.06	68.30	-33.24
15690.00	H	---					
20920.00	H	---					
26150.00	H	---					
31380.00	H	---					
36610.00	H	---					

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Operation Band :802.11 AC40M Test Date :2014-04-16
Fundamental Frequency :5190MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge LOW Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	E	Average	43.44	7.54	50.98	54.00	-3.02
5150.00	E	Peak	59.33	7.54	66.87	74.00	-7.13

Operation Band :802.11 AC40M Test Date :2014-04-16
Fundamental Frequency :5190MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge LOW Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :HORIZONTAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	E	Average	40.24	7.54	47.78	54.00	-6.22
5150.00	E	Peak	56.33	7.54	63.87	74.00	-10.13

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Operation Band :802.11 AC40M Test Date :2014-04-16
Fundamental Frequency :5230MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge HIGH Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	E	Average	32.02	7.54	39.56	54.00	-14.44
5150.00	E	Peak	49.26	7.54	56.80	74.00	-17.20

Operation Band :802.11 AC40M Test Date :2014-04-16
Fundamental Frequency :5230MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge HIGH Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :HORIZONTAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5150.00	E	Average	31.09	7.54	38.63	54.00	-15.37
5150.00	E	Peak	45.90	7.54	53.44	74.00	-20.56

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Radiated Spurious Emission Measurement Result 802.11ac (80M), 5150~5250MHz (MIMO)

Operation Band	:802.11 AC80M	Test Date	:2014-04-16
Fundamental Frequency	:5210 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10420.00	H	Peak	24.54	15.09	39.63	68.30	-28.67
15630.00	H	---					
20840.00	H	---					
26050.00	H	---					
31260.00	H	---					
36470.00	H	---					

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Operation Band	:802.11 AC80M	Test Date	:2014-04-16
Fundamental Frequency	:5210 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10420.00	H	Peak	23.94	15.09	39.03	68.30	-29.27
15630.00	H	---					
20840.00	H	---					
26050.00	H	---					
31260.00	H	---					
36470.00	H	---					

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Operation Band :802.11 AC80M Test Date :2014-04-16
Fundamental Frequency :5210 MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge LOW Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5140.08	S	Average	41.39	7.51	48.90	54.00	-5.10
5140.08	S	Peak	60.23	7.51	67.74	74.00	-6.26
5150.00	E	Average	38.34	7.54	45.88	54.00	-8.12
5150.00	E	Peak	56.99	7.54	64.53	74.00	-9.47

Operation Band :802.11 AC80M Test Date :2014-04-16
Fundamental Frequency :5210 MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge LOW Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5140.32	S	Average	37.44	7.51	44.95	54.00	-9.05
5140.32	S	Peak	57.62	7.51	65.13	74.00	-8.87
5150.00	E	Average	35.76	7.54	43.30	54.00	-10.70
5150.00	E	Peak	52.94	7.54	60.48	74.00	-13.52

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Radiated Spurious Emission Measurement Result 802.11a, 5250MHz-5350MHz

Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5260 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
10520.00	H	Peak	28.03	15.56	43.59	68.30	-24.71
15780.00	H	---					
21040.00	H	---					
26300.00	H	---					
31560.00	H	---					
36820.00	H	---					

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5260 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10520.00	H	Peak	25.67	15.56	41.23	68.30	-27.07
15780.00	H	---					
21040.00	H	---					
26300.00	H	---					
31560.00	H	---					
36820.00	H	---					

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5300 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10600.00	H	Average	25.61	15.83	41.44	54.00	-12.56
10600.00	H	Peak	29.06	15.83	44.89	74.00	-29.11
15900.00	H	---					
21200.00	H	---					
26500.00	H	---					
31800.00	H	---					
37100.00	H	---					

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5300 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10600.00	H	Average	23.71	15.83	39.54	54.00	-14.46
10600.00	H	Peak	26.49	15.83	42.32	74.00	-31.68
15900.00	H	---					
21200.00	H	---					
26500.00	H	---					
31800.00	H	---					
37100.00	H	---					

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5320 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10640.00	H	Average	28.88	15.84	44.72	54.00	-9.28
10640.00	H	Peak	31.09	15.84	46.93	74.00	-27.07
15960.00	H	---					
21280.00	H	---					
26600.00	H	---					
31920.00	H	---					
37240.00	H	---					

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5320 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10640.00	H	Average	23.72	15.84	39.56	54.00	-14.44
10640.00	H	Peak	25.29	15.84	41.13	74.00	-32.87
15960.00	H	---					
21280.00	H	---					
26600.00	H	---					
31920.00	H	---					
37240.00	H	---					

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5260 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	E	Average	30.25	7.79	38.04	54.00	-15.96
5350.00	E	Peak	42.98	7.79	50.77	74.00	-23.23

Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5260 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	E	Average	30.65	7.79	38.44	54.00	-15.56
5350.00	E	Peak	43.25	7.79	51.04	74.00	-22.96

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5320 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5350.00	E	Average	41.72	7.79	49.51	54.00	-4.49
5350.00	E	Peak	62.40	7.79	70.19	74.00	-3.81

Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5320 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5350.00	E	Average	41.01	7.79	48.80	54.00	-5.20
5350.00	E	Peak	59.44	7.79	67.23	74.00	-6.77

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Radiated Spurious Emission Measurement Result 802.11ac (20M), 5250~5350MHz (MIMO)

Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5260 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10520.00	H	Peak	28.22	15.56	43.78	68.30	-24.52
15780.00	H	---					
21040.00	H	---					
26300.00	H	---					
31560.00	H	---					
36820.00	H	---					

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Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5260 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10520.00	H	Peak	29.80	15.56	45.36	68.30	-22.94
15780.00	H	---					
21040.00	H	---					
26300.00	H	---					
31560.00	H	---					
36820.00	H	---					

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Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5300 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10600.00	H	Average	25.86	15.83	41.69	54.00	-12.31
10600.00	H	Peak	28.37	15.83	44.20	74.00	-29.80
15900.00	H	---					
21200.00	H	---					
26500.00	H	---					
31800.00	H	---					
37100.00	H	---					

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Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5300 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10600.00	H	Average	23.58	15.83	39.41	54.00	-14.59
10600.00	H	Peak	26.03	15.83	41.86	74.00	-32.14
15900.00	H	---					
21200.00	H	---					
26500.00	H	---					
31800.00	H	---					
37100.00	H	---					

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Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5320 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10640.00	H	Average	28.99	15.84	44.83	54.00	-9.17
10640.00	H	Peak	31.15	15.84	46.99	74.00	-27.01
15960.00	H	---					
21280.00	H	---					
26600.00	H	---					
31920.00	H	---					
37240.00	H	---					

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Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5320 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10640.00	H	Average	23.68	15.84	39.52	54.00	-14.48
10640.00	H	Peak	25.39	15.84	41.23	74.00	-32.77
15960.00	H	---					
21280.00	H	---					
26600.00	H	---					
31920.00	H	---					
37240.00	H	---					

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Operation Band :802.11 AC20M Test Date :2014-04-16
Fundamental Frequency :5260 MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge LOW Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	E	Average	31.11	7.79	38.90	54.00	-15.10
5350.00	E	Peak	47.38	7.79	55.17	74.00	-18.83

Operation Band :802.11 AC20M Test Date :2014-04-16
Fundamental Frequency :5260 MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge LOW Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :HORIZONTAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	E	Average	30.54	7.79	38.33	54.00	-15.67
5350.00	E	Peak	44.12	7.79	51.91	74.00	-22.09

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Operation Band :802.11 AC20M Test Date :2014-04-16
Fundamental Frequency :5320 MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge HIGH Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5350.00	S	Average	41.19	7.79	48.98	54.00	-5.02
5350.00	S	Peak	62.60	7.79	70.39	74.00	-3.61
5351.28	E	Average	41.68	7.78	49.46	54.00	-4.54
5351.28	E	Peak	65.22	7.78	73.00	74.00	-1.00

Operation Band :802.11 AC20M Test Date :2014-04-16
Fundamental Frequency :5320 MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge HIGH Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5350.00	S	Average	39.30	7.79	47.09	54.00	-6.91
5350.00	S	Peak	62.00	7.79	69.79	74.00	-4.21
5351.40	E	Average	40.71	7.78	48.49	54.00	-5.51
5351.40	E	Peak	63.04	7.78	70.82	74.00	-3.18

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Radiated Spurious Emission Measurement Result 802.11ac (40M), 5250~5350MHz (MIMO)

Operation Band	:802.11 AC40M	Test Date	:2014-04-16
Fundamental Frequency	:5270 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10540.00	H	Peak	31.61	15.47	47.08	68.30	-21.22
15810.00	H	---					
21080.00	H	---					
26350.00	H	---					
31620.00	H	---					
36890.00	H	---					

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Operation Band	:802.11 AC40M	Test Date	:2014-04-16
Fundamental Frequency	:5270 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10540.00	H	Peak	24.09	15.47	39.56	68.30	-28.74
15810.00	H	---					
21080.00	H	---					
26350.00	H	---					
31620.00	H	---					
36890.00	H	---					

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Operation Band	:802.11 AC40M	Test Date	:2014-04-16
Fundamental Frequency	:5310 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10620.00	H	Average	27.65	15.84	43.49	54.00	-10.51
10620.00	H	Peak	31.40	15.84	47.24	74.00	-26.76
15930.00	H	---					
21240.00	H	---					
26550.00	H	---					
31860.00	H	---					
37170.00	H	---					

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Operation Band	:802.11 AC40M	Test Date	:2014-04-16
Fundamental Frequency	:5310 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

Freq.	Detector	Note	Spectrum	Factor	Actual	Limit	Margin
MHz	Mode	F/H/E/S	Reading Level	dB	FS	@3m	dB
	PK/QP/AV		dBμV		dBμV/m	dBμV/m	
10640.00	Peak	H	39.69	15.97	55.66	74.00	-18.34
10640.00	Average	H	25.05	15.97	41.02	54.00	-12.98
15930.00	H	---					
21240.00	H	---					
26550.00	H	---					
31860.00	H	---					
37170.00	H	---					

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Operation Band :802.11 AC40M Test Date :2014-04-16
Fundamental Frequency :5270MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge LOW Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	E	Average	34.75	7.79	42.54	54.00	-11.46
5350.00	E	Peak	57.46	7.79	65.25	74.00	-8.75

Operation Band :802.11 AC40M Test Date :2014-04-16
Fundamental Frequency :5270MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge HIGH Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :HORIZONTAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	E	Average	33.41	7.79	41.20	54.00	-12.80
5350.00	E	Peak	54.69	7.79	62.48	74.00	-11.52

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Operation Band :802.11 AC40M Test Date :2014-04-16
Fundamental Frequency :5310MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge HIGH Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	E	Average	41.37	7.79	49.16	54.00	-4.84
5350.00	E	Peak	57.07	7.79	64.86	74.00	-9.14

Operation Band :802.11 AC40M Test Date :2014-04-16
Fundamental Frequency :5310MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge HIGH Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :HORIZONTAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5350.00	E	Average	38.56	7.79	46.35	54.00	-7.65
5350.00	E	Peak	53.83	7.79	61.62	74.00	-12.38

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Radiated Spurious Emission Measurement Result 802.11ac (80M), 5250~5350MHz (MIMO)

Operation Band	:802.11 AC80M	Test Date	:2014-04-16
Fundamental Frequency	:5290 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10580.00	H	Peak	31.96	15.71	47.67	68.30	-20.63
15870.00	H	---					
21160.00	H	---					
26450.00	H	---					
31740.00	H	---					
37030.00	H	---					

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Operation Band	:802.11 AC80M	Test Date	:2014-04-16
Fundamental Frequency	:5290 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
10580.00	H	Peak	23.11	15.71	38.82	68.30	-29.48
15870.00	H	---					
21160.00	H	---					
26450.00	H	---					
31740.00	H	---					
37030.00	H	---					

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Operation Band :802.11 AC80M Test Date :2014-04-16
Fundamental Frequency :5290 MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge HIGH Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5350.00	S	Average	45.05	7.79	52.84	54.00	-1.16
5350.00	S	Peak	62.10	7.79	69.89	74.00	-4.11
5364.24	E	Average	44.73	7.75	52.48	54.00	-1.52
5364.24	E	Peak	64.47	7.75	72.22	74.00	-1.78

Operation Band :802.11 AC80M Test Date :2014-04-16
Fundamental Frequency :5290 MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge HIGH Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5350.00	S	Average	42.23	7.79	50.02	54.00	-3.98
5350.00	S	Peak	59.99	7.79	67.78	74.00	-6.22
5355.00	E	Average	43.02	7.77	50.79	54.00	-3.21
5355.00	E	Peak	60.96	7.77	68.73	74.00	-5.27

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Radiated Spurious Emission Measurement Result 802.11a, 5470~5725 MHz

Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5500 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11000.00	H	Average	26.11	16.70	42.81	54.00	-11.19
11000.00	H	Peak	28.78	16.70	45.48	74.00	-28.52
16500.00	H	---					
22000.00	H	---					
27500.00	H	---					
33000.00	H	---					
38500.00	H	---					

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5500 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11000.00	H	Average	23.17	16.70	39.87	54.00	-14.13
11000.00	H	Peak	25.62	16.70	42.32	74.00	-31.68
16500.00	H	---					
22000.00	H	---					
27500.00	H	---					
33000.00	H	---					
38500.00	H	---					

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5580 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11160.00	H	Average	27.21	16.97	44.18	54.00	-9.82
11160.00	H	Peak	30.16	16.97	47.13	74.00	-26.87
16740.00	H	---					
22320.00	H	---					
27900.00	H	---					
33480.00	H	---					
39060.00	H	---					

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5580 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11160.00	H	Average	23.24	16.97	40.21	54.00	-13.79
11160.00	H	Peak	25.59	16.97	42.56	74.00	-31.44
16740.00	H	---					
22320.00	H	---					
27900.00	H	---					
33480.00	H	---					
39060.00	H	---					

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5700 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11400.00	H	Average	25.84	17.51	43.35	54.00	-10.65
11400.00	H	Peak	28.43	17.51	45.94	74.00	-28.06
17100.00	H	---					
22800.00	H	---					
28500.00	H	---					
34200.00	H	---					
39900.00	H	---					

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5700 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11400.00	H	Average	23.73	17.51	41.24	54.00	-12.76
11400.00	H	Peak	25.99	17.51	43.50	74.00	-30.50
17100.00	H	---					
22800.00	H	---					
28500.00	H	---					
34200.00	H	---					
39900.00	H	---					

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5500 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5470.00	E	Average	42.87	7.89	50.76	54.00	-3.24
5470.00	E	Peak	61.24	7.89	69.13	74.00	-4.87

Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5500 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5470.00	E	Average	40.08	7.89	47.97	54.00	-6.03
5470.00	E	Peak	58.88	7.89	66.77	74.00	-7.23

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Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5700 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	E	Average	42.30	8.29	50.59	54.00	-3.41
5725.00	E	Peak	59.78	8.29	68.07	74.00	-5.93

Operation Band	:802.11 a	Test Date	:2014-04-16
Fundamental Frequency	:5700 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	E	Average	39.90	8.29	48.19	54.00	-5.81
5725.00	E	Peak	58.93	8.29	67.22	74.00	-6.78

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Radiated Spurious Emission Measurement Result 802.11ac (20M), 5470~5725MHz (MIMO)

Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5500 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11000.00	H	Average	26.08	16.70	42.78	54.00	-11.22
11000.00	H	Peak	28.88	16.70	45.58	74.00	-28.42
16500.00	H	---					
22000.00	H	---					
27500.00	H	---					
33000.00	H	---					
38500.00	H	---					

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Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5500 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11000.00	H	Average	23.28	16.70	39.98	54.00	-14.02
11000.00	H	Peak	25.79	16.70	42.49	74.00	-31.51
16500.00	H	---					
22000.00	H	---					
27500.00	H	---					
33000.00	H	---					
38500.00	H	---					

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Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5580 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11160.00	H	Average	27.31	16.97	44.28	54.00	-9.72
11160.00	H	Peak	30.22	16.97	47.19	74.00	-26.81
16740.00	H	---					
22320.00	H	---					
27900.00	H	---					
33480.00	H	---					
39060.00	H	---					

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Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5580 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11160.00	H	Average	23.33	16.97	40.30	54.00	-13.70
11160.00	H	Peak	25.68	16.97	42.65	74.00	-31.35
16740.00	H	---					
22320.00	H	---					
27900.00	H	---					
33480.00	H	---					
39060.00	H	---					

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Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5700 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11400.00	H	Average	25.75	17.51	43.26	54.00	-10.74
11400.00	H	Peak	28.57	17.51	46.08	74.00	-27.92
17100.00	H	---					
22800.00	H	---					
28500.00	H	---					
34200.00	H	---					
39900.00	H	---					

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Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5700 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11400.00	H	Average	23.82	17.51	41.33	54.00	-12.67
11400.00	H	Peak	26.02	17.51	43.53	74.00	-30.47
17100.00	H	---					
22800.00	H	---					
28500.00	H	---					
34200.00	H	---					
39900.00	H	---					

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Operation Band :802.11 AC20M Test Date :2014-04-16
Fundamental Frequency :5500 MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge LOW Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5470.00	E	Average	41.73	7.89	49.62	54.00	-4.38
5470.00	E	Peak	62.87	7.89	70.76	74.00	-3.24

Operation Band :802.11 AC20M Test Date :2014-04-16
Fundamental Frequency :5500 MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge LOW Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :HORIZONTAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5470.00	E	Average	37.92	7.89	45.81	54.00	-8.19
5470.00	E	Peak	59.08	7.89	66.97	74.00	-7.03

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Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5700 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5725.00	S	Average	42.57	8.29	50.86	54.00	-3.14
5725.00	S	Peak	64.57	8.29	72.86	74.00	-1.14
5727.20	E	Average	40.91	8.29	49.20	54.00	-4.80
5727.20	E	Peak	64.03	8.29	72.32	74.00	-1.68

Operation Band	:802.11 AC20M	Test Date	:2014-04-16
Fundamental Frequency	:5700 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5725.00	S	Average	41.53	8.29	49.82	54.00	-4.18
5725.00	S	Peak	59.08	8.29	67.37	74.00	-6.63
5727.20	E	Average	40.70	8.29	48.99	54.00	-5.01
5727.20	E	Peak	60.32	8.29	68.61	74.00	-5.39

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Radiated Spurious Emission Measurement Result 802.11ac (40M), 5470~5725MHz (MIMO)

Operation Band	:802.11 AC40M	Test Date	:2014-04-16
Fundamental Frequency	:5510 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11020.00	H	Average	30.43	16.71	47.14	54.00	-6.86
11020.00	H	Peak	33.49	16.71	50.20	74.00	-23.80
16530.00	H	---					
22040.00	H	---					
27550.00	H	---					
33060.00	H	---					
38570.00	H	---					

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Operation Band	:802.11 AC40M	Test Date	:2014-04-16
Fundamental Frequency	:5510 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11020.00	H	Average	21.56	16.71	38.27	54.00	-15.73
11020.00	H	Peak	24.41	16.71	41.12	74.00	-32.88
16530.00	H	---					
22040.00	H	---					
27550.00	H	---					
33060.00	H	---					
38570.00	H	---					

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Operation Band	:802.11 AC40M	Test Date	:2014-04-16
Fundamental Frequency	:5550 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11100.00	H	Average	29.85	16.80	46.65	54.00	-7.35
11100.00	H	Peak	31.42	16.80	48.22	74.00	-25.78
16650.00	H	---					
22200.00	H	---					
27750.00	H	---					
33300.00	H	---					
38850.00	H	---					

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Operation Band	:802.11 AC40M	Test Date	:2014-04-16
Fundamental Frequency	:5550 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX MID	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11100.00	H	Average	16.36	16.80	33.16	54.00	-20.84
11100.00	H	Peak	18.48	16.80	35.28	74.00	-38.72
16650.00	H	---					
22200.00	H	---					
27750.00	H	---					
33300.00	H	---					
38850.00	H	---					

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Operation Band	:802.11 AC40M	Test Date	:2014-04-16
Fundamental Frequency	:5670 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11340.00	H	Average	33.92	17.32	51.24	54.00	-2.76
11340.00	H	Peak	35.90	17.32	53.22	74.00	-20.78
17010.00	H	---					
22680.00	H	---					
28350.00	H	---					
34020.00	H	---					
39690.00	H	---					

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Operation Band	:802.11 AC40M	Test Date	:2014-04-16
Fundamental Frequency	:5670 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11340.00	H	Average	21.85	17.32	39.17	54.00	-14.83
11340.00	H	Peak	23.86	17.32	41.18	74.00	-32.82
17010.00	H	---					
22680.00	H	---					
28350.00	H	---					
34020.00	H	---					
39690.00	H	---					

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Operation Band :802.11 AC40M Test Date :2014-04-16
Fundamental Frequency :5510MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge LOW Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5470.00	E	Average	39.67	7.89	47.56	54.00	-6.44
5470.00	E	Peak	56.75	7.89	64.64	74.00	-9.36

Operation Band :802.11 AC40M Test Date :2014-04-16
Fundamental Frequency :5510MHz Temp./Humi. :24 deg_C / 61 RH
Operation Mode :Band Edge LOW Engineer :Curry
EUT Pol. :E2 Plane Measurement Antenna Pol. :HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5470.00	E	Average	38.35	7.89	46.24	54.00	-7.76
5470.00	E	Peak	54.95	7.89	62.84	74.00	-11.16

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Operation Band	:802.11 AC40M	Test Date	:2014-04-16
Fundamental Frequency	:5670 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	E	Average	38.05	8.29	46.34	54.00	-7.66
5725.00	E	Peak	52.01	8.29	60.30	74.00	-13.70

Operation Band	:802.11 AC40M	Test Date	:2014-04-16
Fundamental Frequency	:5670 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBµV/m) = SPA. Reading level(dBµV) + Factor(dB)

Factor(dB) = Antenna Factor(dBµV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBµV	dB	dBµV/m	dBµV/m	dB
5725.00	E	Average	36.77	8.29	45.06	54.00	-8.94
5725.00	E	Peak	48.43	8.29	56.72	74.00	-17.28

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Radiated Spurious Emission Measurement Result 802.11ac (80M), 5470~5725MHz (MIMO)

Operation Band	:802.11 AC80M	Test Date	:2014-04-16
Fundamental Frequency	:5530 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11060.00	H	Average	30.14	16.68	46.82	54.00	-7.18
11060.00	H	Peak	33.86	16.68	50.54	74.00	-23.46
16590.00	H	---					
22120.00	H	---					
27650.00	H	---					
33180.00	H	---					
38710.00	H	---					

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Operation Band	:802.11 AC80M	Test Date	:2014-04-16
Fundamental Frequency	:5530 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
11060.00	H	Average	21.46	16.68	38.14	54.00	-15.86
11060.00	H	Peak	23.19	16.68	39.87	74.00	-34.13
16590.00	H	---					
22120.00	H	---					
27650.00	H	---					
33180.00	H	---					
38710.00	H	---					

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Operation Band	:802.11 AC80M	Test Date	:2014-04-16
Fundamental Frequency	:5530 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5456.48	S	Average	45.02	7.87	52.89	54.00	-1.11
5456.48	S	Peak	64.65	7.87	72.52	74.00	-1.48
5470.00	E	Average	44.78	7.89	52.67	54.00	-1.33
5470.00	E	Peak	62.56	7.89	70.45	74.00	-3.55

Operation Band	:802.11 AC80M	Test Date	:2014-04-16
Fundamental Frequency	:5530 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:Band Edge LOW	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5461.16	S	Average	43.81	7.88	51.69	54.00	-2.31
5461.16	S	Peak	63.52	7.88	71.40	74.00	-2.60
5470.00	E	Average	40.82	7.89	48.71	54.00	-5.29
5470.00	E	Peak	58.62	7.89	66.51	74.00	-7.49

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Operation Band	:802.11 AC80M	Test Date	:2014-04-16
Fundamental Frequency	:5530 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5725.00	E	Average	30.90	8.29	39.19	54.00	-14.81
5725.00	E	Peak	43.88	8.29	52.17	74.00	-21.83

Operation Band	:802.11 AC80M	Test Date	:2014-04-16
Fundamental Frequency	:5530 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:Band Edge HIGH	Engineer	:Curry
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
5725.00	E	Average	30.77	8.29	39.06	54.00	-14.94
5725.00	E	Peak	43.72	8.29	52.01	74.00	-21.99

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13. TRANSMISSION IN THE ABSENCE OF DATA

13.1 Standard Applicable

According to §15.407(c)

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

According to RSS-210 A9.4(4)

The device shall automatically discontinue transmission in case of absence of information to transmit, or operational failure. A description on how this is done shall accompany the application for equipment certification. Note that this is not intended to prohibit transmission of control or signaling information or the use of repetitive codes where required by the technology.

13.2 Result:

No non-compliance noted:

Refer to the theory of operation.

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14. FREQUENCY STABILITY

14.1 Standard Applicable

According to §15.407 (g) Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

14.2 Result: N/A.

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15. ANTENNA REQUIREMENT

15.1 Standard Applicable

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

According to RSS-GEN 7.1.2, a transmitter can only be sold or operated with antennas with which it was certified. A transmitter may be certified with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns. Testing shall be performed using the highest-gain antenna of each combination of transmitter and antenna type for which certification is being sought, with the transmitter output power set at the maximum level. Any antenna of the same type and having equal or lesser gain as an antenna that had been successfully tested for certification with the transmitter, will also be considered certified with the transmitter, and may be used and marketed with the transmitter. The manufacturer shall include with the application for certification a list of acceptable antenna types to be used with the transmitter.

15.2 Antenna Connected Construction

The directional gains of antenna used for transmitting is 2.77dBi for frequency band of 5150~5725MHz, 1.41dBi for 802.11ac 20M, 1.45dBi for 802.11ac 40M, 1.29dBi for 802.11ac 80M (5150~5250MHz_MIMO gain); 2.69dBi for 802.11ac 20M, 2.67dBi for 802.11ac 40M, 2.58dBi for 802.11ac 80M (5250~5350MHz_MIMO gain), and 5.54dBi for 802.11ac 20M, 802.11ac 40M and 802.11ac 80M (5470~5725MHz_MIMO Gain). and the antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.

~ End of Report ~

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