ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C 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/2014/40011**
Issue Date:	**May. 06, 2014**
FCC Rule Part:	**§15.247, Cat: DTS**
IC Rule Part:	**RSS-210 issue 8 :2010, Annex 8**
Prepared for:	**UNIVERSAL GLOBAL SCIENTIFIC INDUSTRIAL CO., LTD. 141, Lane 351, Sec. 1, Taiping Road, Tsaotuen, Nantou 54261, Taiwan**
Prepared by:	**SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803**

Testing Laboratory
0513

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
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FCC ID:	COFNFABACMR02
IC:	10293A- NFABACMR02
File Number:	ER/2014/40011
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 RSS-Gen. issue 3 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 15.247 and IC RSS 210 issue 8: 2010 Annex 8.
The test results of this report relate only to the tested sample identified in this report.

Test By:	Marcus Tseng	***Date***	May. 06, 2014
	Marcus Tseng / Engineer		
Prepared By:	Violetta Tang	***Date***	May. 06, 2014
	Violetta Tang / Clerk		
Approved By:	Jim Chang	***Date***	May. 06, 2014
	Jim Chang / Supervisor		

Version

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

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1 GENERAL INFORMATION

1.1 Product description

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

WLAN 2.4GHz+5.7GHz:

Wi-Fi	Frequency Range	Channels	Rated Power (Peak)	Modulation Technology	Type of Emission Listed in Test Report/Original Grant:
11b/g	2412-2462	11	b: 19.76dBm g: 25.28dBm	DSSS OFDM	b: 17M7D1D g: 17M7D1D
11n (2.4GHz)	HT20 2412-2462	11	n: 25.08dBm n: 24.70dBm (MIMO Chain0) n: 26.22dBm (MIMO Chain 1) n: 28.54dBm (MIMO Chain 0+1)	OFDM	17M7D1D
11n (2.4GHz)	HT40 2422-2452	7	n: 24.98dBm n: 24.44dBm (MIMO Chain0) n: 24.01dBm (MIMO Chain 1) n: 27.24dBm (MIMO Chain 0+1)	OFDM	36M6D1D
11a	5725-5850	5	a: 22.81dBm	OFDM	28M3D1D
11n (5GHz)	HT20 5725-5850	5	n: 22.64dBm n: 21.38dBm (MIMO Chain0) n: 21.93dBm (MIMO Chain 1) n: 24.60dBm (MIMO Chain 0+1)		28M3D1D
11n (5GHz)	HT40 5725-5850	2	n: 23.44dBm n: 20.70dBm (MIMO Chain0) n: 21.28dBm (MIMO Chain 1) n: 24.10dBm (MIMO Chain 0+1)		51M6D1D
11ac (20M)	5725-5850	5	ac 20M: 23.15dBm ac 20M: 21.90dBm (MIMO Chain0) ac 20M: 21.98dBm (MIMO Chain 1) ac 20M: 24.74dBm (MIMO Chain 0+1)	OFDM	28M3D1D
11ac (40M)	5725-5850	2	ac 40M: 23.41dBm ac 40M: 20.75dBm (MIMO Chain0) ac 40M: 21.60dBm (MIMO Chain 1) ac 40M: 24.14dBm (MIMO Chain 0+1)		51M6D1D
11ac (80M)	5725-5850	1	ac 80M: 14.82dBm ac 80M: 13.46dBm (MIMO Chain0) ac 80M: 14.76dBm (MIMO Chain 1) ac 80M: 17.17dBm (MIMO Chain 0+1)		76M4D1D

Antenna Designation:	PIFA Antenna, Supplier: High-Tek Electronics Co., Ltd 2.4G: TX1 Antenna (P/N: 0ACCN013045N, Peak gain: 1.5dBi) TX2 Antenna (P/N: 0ACCN013046N, Peak gain: -1.55dBi) 5.7G: TX1 Antenna (P/N: 0ACCN013045N, Peak gain: 2.72dBi) TX2 Antenna (P/N: 0ACCN013046N, Peak gain: 1.70dBi)
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 b: 1/2/5.5/11 Mbps; 802.11 g: 6/9/12/18/24/36/48/54Mbps; 802.11 n_20MHz: 6.5 – 144Mbps; 802.11 n_40MHz: 13.5 – 300Mbps; 802.11 ac (20M): 6.5 – 144Mbps; 802.11 ac (40M): 13.5 – 300Mbps; 802.11 ac (80M): 29.3 - 866.7Mbps

The 2.4G max antenna gain is 1.5dBi which was choosing for Radiated Spurious Emission test.
The 5.7G max antenna gain is 2.72dBi which was choosing for Radiated Spurious Emission test.
The EUT is in compliance with FCC §15.247 at which the frequency band of 2400~2483.5, and 5725~5850MHz has been tested.

IEEE 802.11n Spec:

MCS Index	Nss	Modulation	R	NBPSC	NCBPS		NDBPS		Datarate(Mbps)			
									800nsGI		400nsGI	
					20MHz	40MHz	20MHz	40MHz	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
NBPSC	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*	$N_{BPSCS(iSS)}$	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.									

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

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: COFNFABACMR02** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules. And **IC: 10293A- NFABACMR02** filing to comply with Industry Canada RSS-210 issue 8: 2010 Annex 8. The composite system (digital device) is compliance with Subpart B under the DoC procedure.

1.3 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4:2009 and RSS-Gen: 2010. Radiated testing was performed at an antenna to EUT distance 3 meters.

Tested in accordance with Apr 2013 KDB558074 D01 V03 for compliance to FCC 47CFR 15.247 requirements.

1.4 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.

1.5 Special Accessories

There are no special accessories used while test was conducted.

1.6 Equipment Modifications

There was no modification incorporated into the EUT.

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 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,

2.4 Configuration of Tested System

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

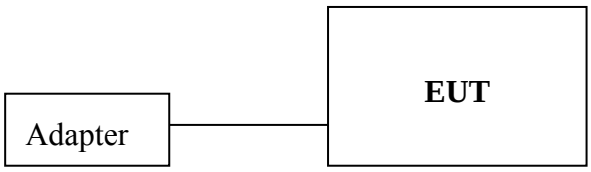


Table 2-1 Equipment Used in Tested System

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

3 SUMMARY OF TEST RESULTS

FCC / IC Rules	Description Of Test	Result
§15.207(a) RSS-Gen §7.2.4	AC Power Line Conducted Emission	N/A
§15.247(b) (3) RSS-210 §A8.4(4)	Peak Output Power	Compliant
§15.247(a)(2) RSS-210 §A8.2 (a)	6dB Bandwidth	N/A
§15.247(d) RSS-210 §A8.5	100 KHz Bandwidth Of Frequency Band Edges	N/A
§15.247(d) RSS-210 §A8.5	Spurious Emission	Compliant
§15.247(e) RSS-210 §A8.2(b)	Peak Power Density	N/A
§15.203 RSS-GEN §7.1.2,	Antenna Requirement	Compliant
RSS-Gen §4.6.1	99% Power Bandwidth	N/A

4 DESCRIPTION OF TEST MODES

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

802.11 b mode: Channel low (2412MHz)、mid (2437MHz) and high (2462MHz) with 1Mbps lowest data rate are chosen for full testing.

802.11 g mode: Channel low (2412MHz)、mid (2437MHz) and high (2462MHz) with 6Mbps lowest data rate are chosen for full testing.

802.11 n_20MHz mode: Channel low (2412MHz)、mid (2437MHz) and high (2462MHz) with 6.5Mbps lowest data rate are chosen for full testing.

802.11 n_40MHz mode: Channel low (2422MHz)、mid (2437MHz) and high (2452MHz) with 13.5Mbps lowest data rate are chosen for full testing.

802.11 a mode: Channel low (5745MHz)、mid (5785MHz) and high (5825MHz) with 6Mbps lowest data rate are chosen for full testing.

802.11 n (5GHz) _20MHz: Lowest (5745MHz), Mid (5785MHz) and high (5825MHz) with 6.5Mbps lowest data rate are chosen for full testing.

802.11 n (5GHz) _40MHz: Lowest (5755MHz) and high (5795MHz) with 13.5Mbps lowest data rate are chosen for full testing.

802.11 ac (20M) mode: Channel low (5745MHz)、mid (5785MHz) and high (5825MHz) with 6.5Mbps lowest data rate are chosen for full testing.

802.11 ac (40M): Lowest (5755MHz) and high (5795MHz) with 13.5Mbps lowest data rate are chosen for full testing.

802.11 ac (80M): 5775MHz with 29.3Mbps lowest 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/b/g/n_HT20/n_HT40/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/b/g/n/ac WLAN Transmitter for channel Low, Mid and High, the worst case E2 position was tested as resulted in pre-scanned measurement with respect to 2.4GHz 802.11b/g/n and 5.7GHz 802.11a/n_HT20/n_HT40/ac (20M)/ac (40M)/ac (80M).

Pre-scanned was done on TX1 Antenna and TX2 Antenna, and TX1 Antenna results higher emission at 2.4GHz and 5.7GHz. Therefore, the completed set of measurement was done on TX1 Antenna to be pre-sented on this test report.

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.

Gain with 5.7G is combined with the identical gain:

(i) If all antennas have the same gain, G_{ANT}, Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

- For power spectral density (PSD) measurements on all devices,
  Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

- For power measurements on IEEE 802.11 devices, [1,2]
  Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
  Array Gain = 0 dB (i.e., no array gain) for channel widths $\geq$ 40 MHz for any N_{ANT};
  Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

Array gain = 0dBi (ERP/EIRP related measurement)
Array gain = 3.01dBi (peak spectral density)

MIMO gain = gain (nominal gain) + array gain = (2.04 + 0)dBi = 2.04dBi

Gain with 2.4G 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 kth antenna is being fed by spatial stream j, or zero if it is not;
G_k is the gain in dBi of the kth antenna.

Directive Gain = -0.06dBi (Wifi 2.4G),
2.22dBi (802.11ac 20M 5.8G), 2.20dBi (802.11ac 40M 5.8G), 2.09dBi (802.11ac 80M 5.8G)
MIMO Gain = 1.17dBi (Wifi 2.4G),
4.94dBi (802.11n_HT 20/ ac 20M 5.8G), 4.92dBi (802.11n_HT 40/ ac 40M 5.8G), 4.81dBi (802.11ac 80M 5.8G)

5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
Peak Output Power	+/- 1.55dB (for Spectrum) +/- 1.42 dB (for Power Meter)
6dB Bandwidth	+/- 123.36 Hz
100 KHz Bandwidth Of Frequency Band Edges	+/- 1.55 dB
Peak Power Density	+/- 1.55 dB
99% Power Bandwidth	+/- 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.

6 CONDUCTED EMISSION TEST

6.1 Standard Applicable:

According to §15.207 and RSS-Gen §7.2.4, frequency range within 150KHz to 30MHz 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 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

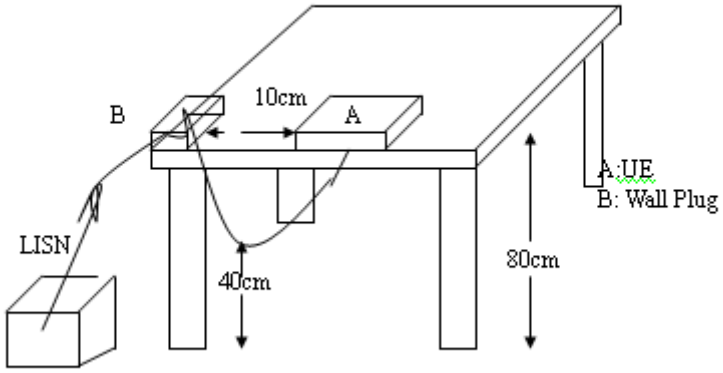
6.2 Measurement Equipment Used:

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:

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

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

7 PEAK OUTPUT POWER MEASUREMENT

7.1 Standard Applicable:

According to §15.247 (b)

(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to RSS-210 issue 8,§A8.4(4), for systems employing digital modulation techniques operating in the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz, the maximum peak conducted output power shall not exceed 1 W. Except as provided in Section A8.4 (5), the e.i.r.p. shall not exceed 4 W.

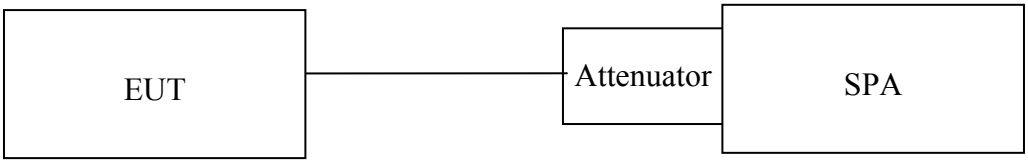
As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power. The maximum conducted output power is the total transmitted power delivered to all antennas and antenna elements, averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or transmitting at a reduced power level. If multiple modes of operation are implemented, the maximum conducted output power is the highest total transmit power occurring in any mode.

7.2 Measurement Equipment Used:

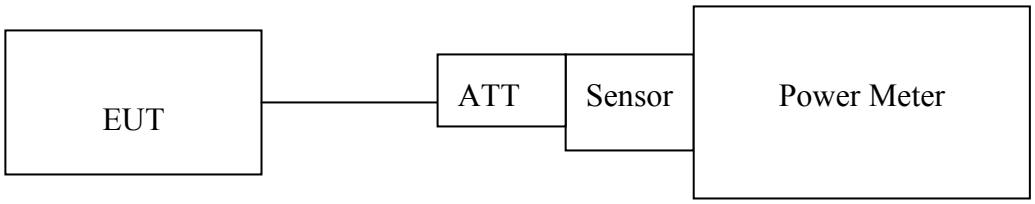
Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power Meter	Anritsu	ML2495A	1005007	01/13/2014	01/12/2015
Power Sensor	Anritsu	MA2411B	917032	01/13/2014	01/12/2015
Spectrum Analyzer	Agilent	E4446A	MY51100003	05/30/2013	05/29/2014
Spectrum Analyzer	Agilent	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

7.3 Test Set-up:

Spectrum:



Power Meter:



7.4 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 power meter or spectrum. (**Peak power setting on Spectrum:** Channel power function, RBW = 1MHz, VBW = 3MHz, Span: 30/60MHz, Detector =peak, Sweep = Auto. Setting on spectrum is adjusted based on the mandatory procedure in 9.1.2 of the KDB558074). Power Meter is used as the auxiliary test equipment to conduct the output power measurement. 9.1.3 in KDB558074 is followed.
   (**Avg. power setting on Spectrum:** Channel power function, RBW = 1MHz, VBW = 3MHz, Span: 30/60MHz, Detector =Avg., Trace avg =100, Sweep = Auto, Setting on spectrum is adjusted based on the mandatory procedure in 9.2.2.4 of the KDB558074). Power Meter is used as the auxiliary test equipment to conduct the output power measurement. 9.2.3, option 3 in KDB558074 is followed.
3. Record the max. Reading as observed from Spectrum or Power Meter.
4. Repeat above procedures until all frequency of interest measured was complete.
5. For MIMO operation, measurement is done per chain basis, and then sum the simultaneous transmitting output in linear.

Pre-anaysis Check: While conducting average power measurement, duty cycle of each mode (a/n_ht20/n_ht40) 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:

Duty Cycle = Ton / (Ton+Toff)

Test Procedure:

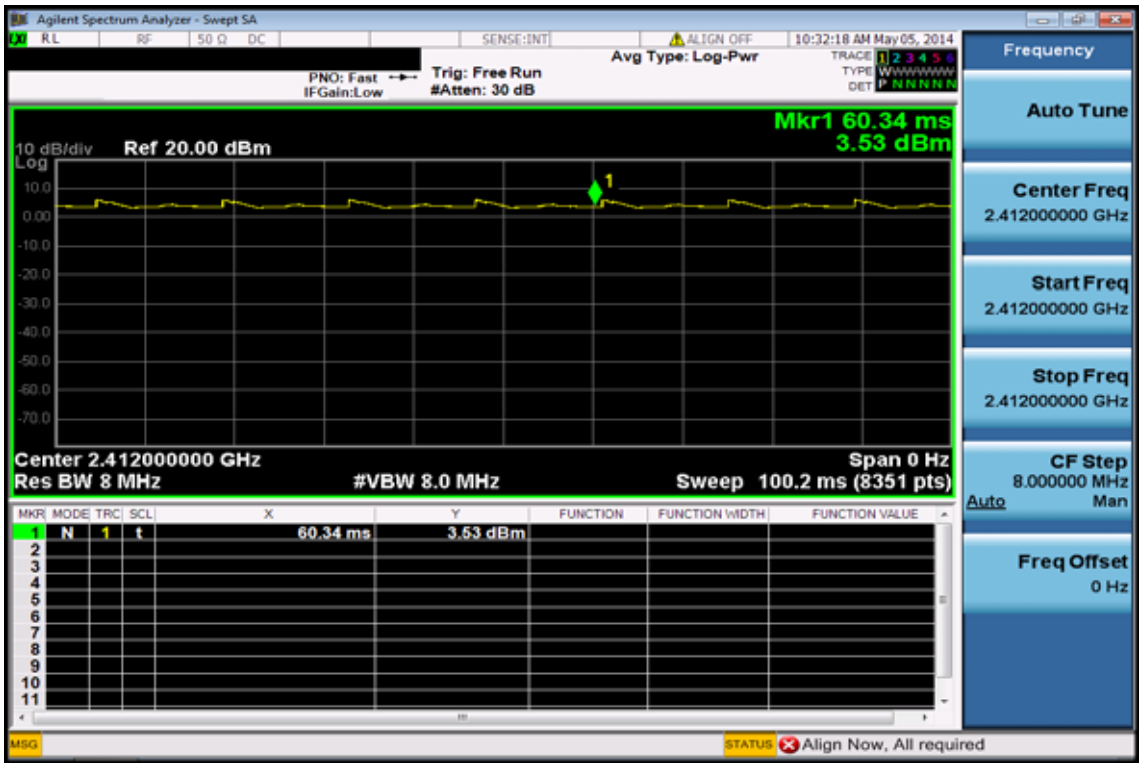
Set span = 0, RBW = 8MHz, VBW = 8MHz, Detector = Peak

Duty Cycle:

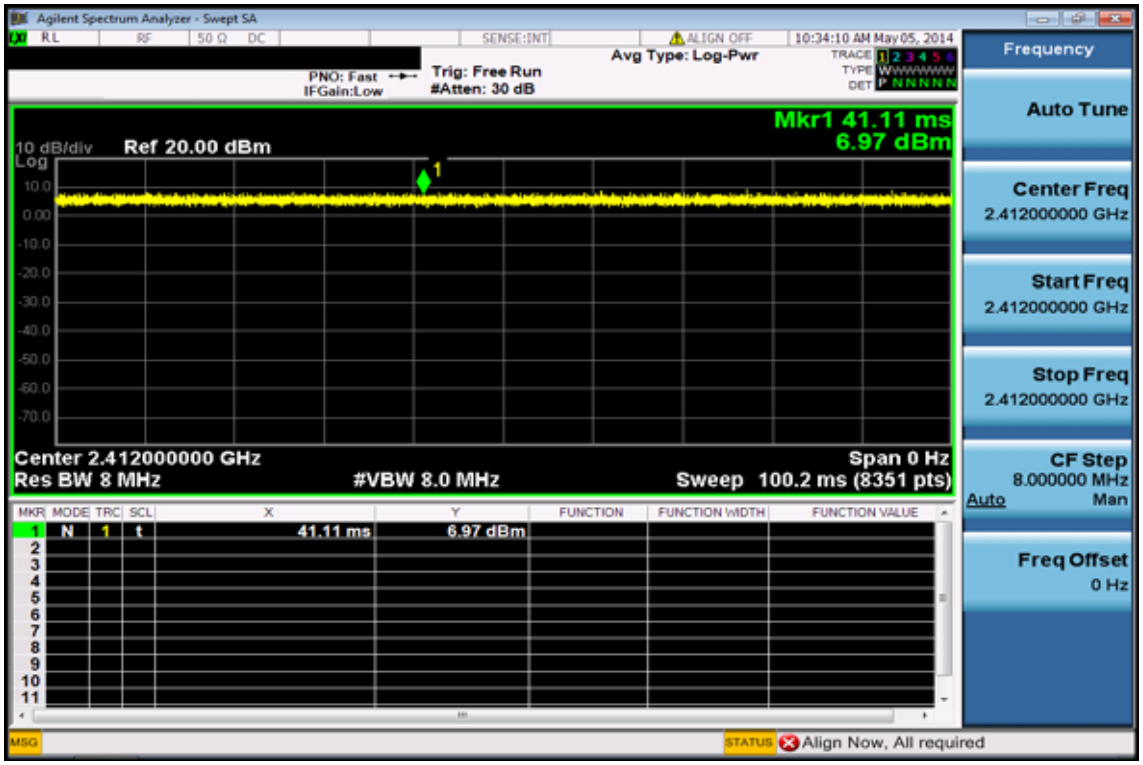
	Antenna	Duty Cycle	Duty Factor (dBm)
802.11b	Single	0.99	0.04
802.11g	Single	0.99	0.04
802.11n_20 (2.4G)	SISO	0.99	0.04
	MIMO	0.99	0.04
802.11n_40 (2.4G)	SISO	0.99	0.04
	MIMO	0.99	0.04
802.11a	Single	0.99	0.04
802.11n_20 (5G)	SISO	0.99	0.04
	MIMO	0.99	0.04
802.11n_40 (5G)	SISO	0.99	0.04
	MIMO	0.99	0.04
802.11ac (20M)	Single	0.99	0.04
802.11ac (40M)	SISO	0.99	0.04
	MIMO	0.99	0.04
802.11ac (80MG)	SISO	0.99	0.04
	MIMO	0.99	0.04

Duty Factor:

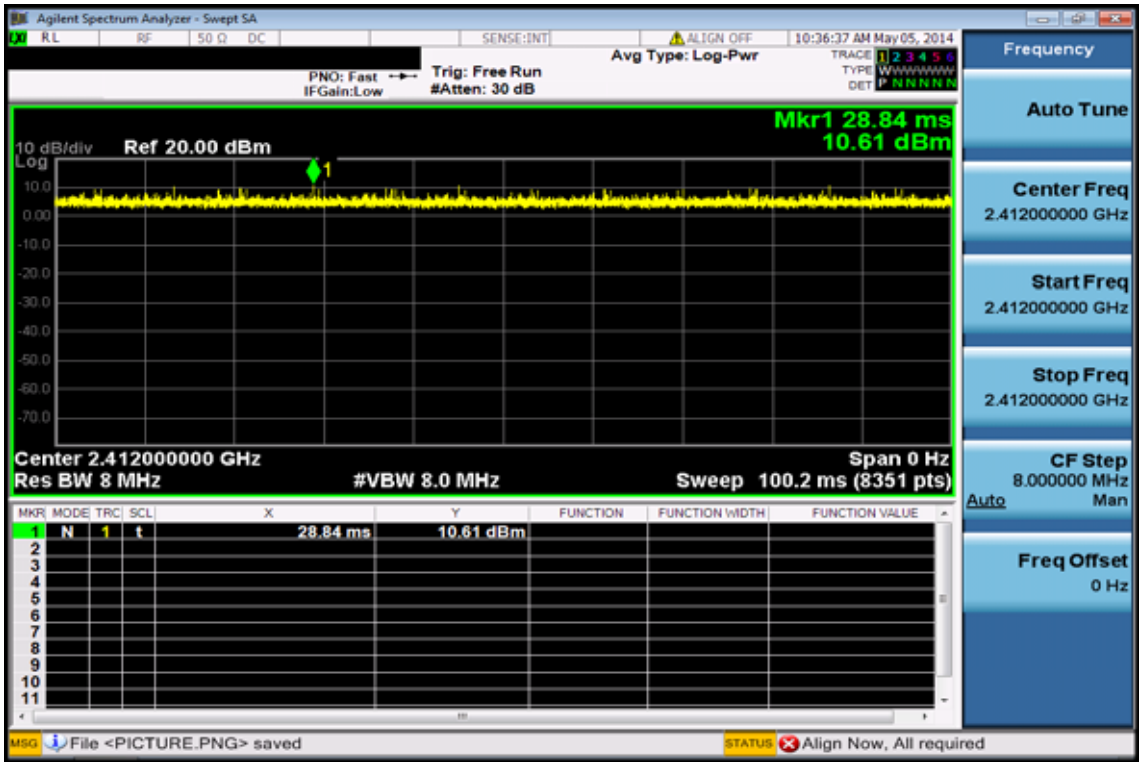
802.11 b



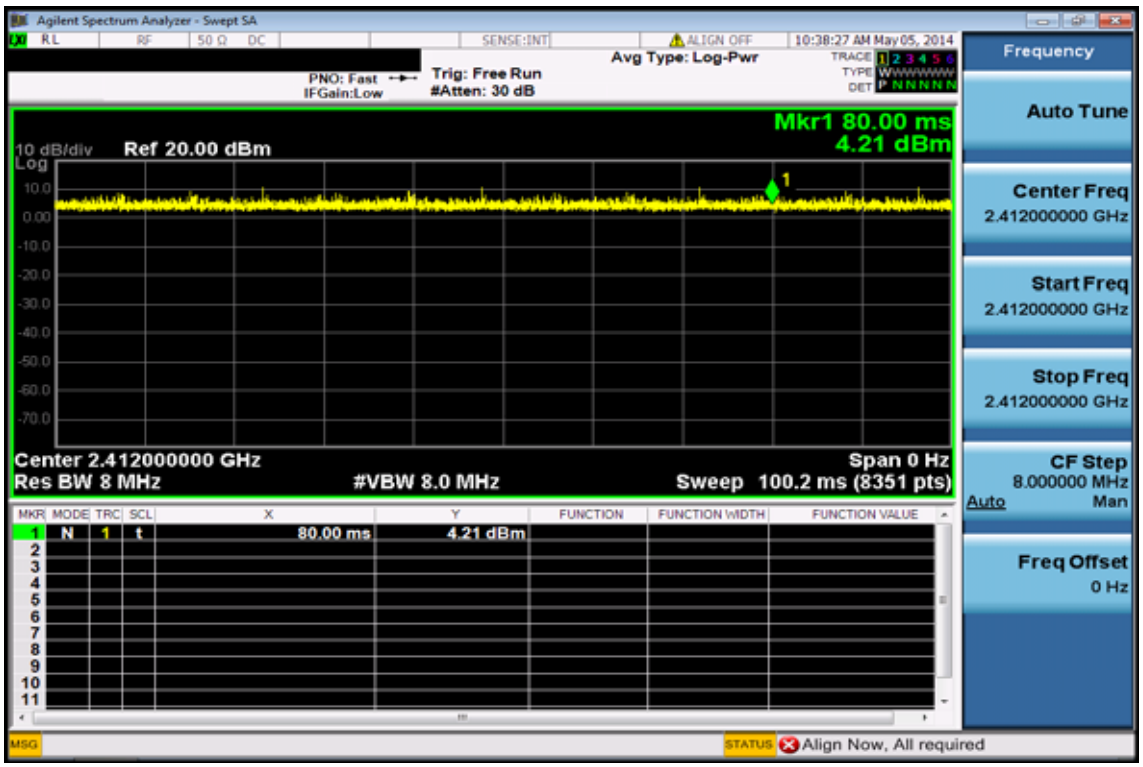
802.11 g



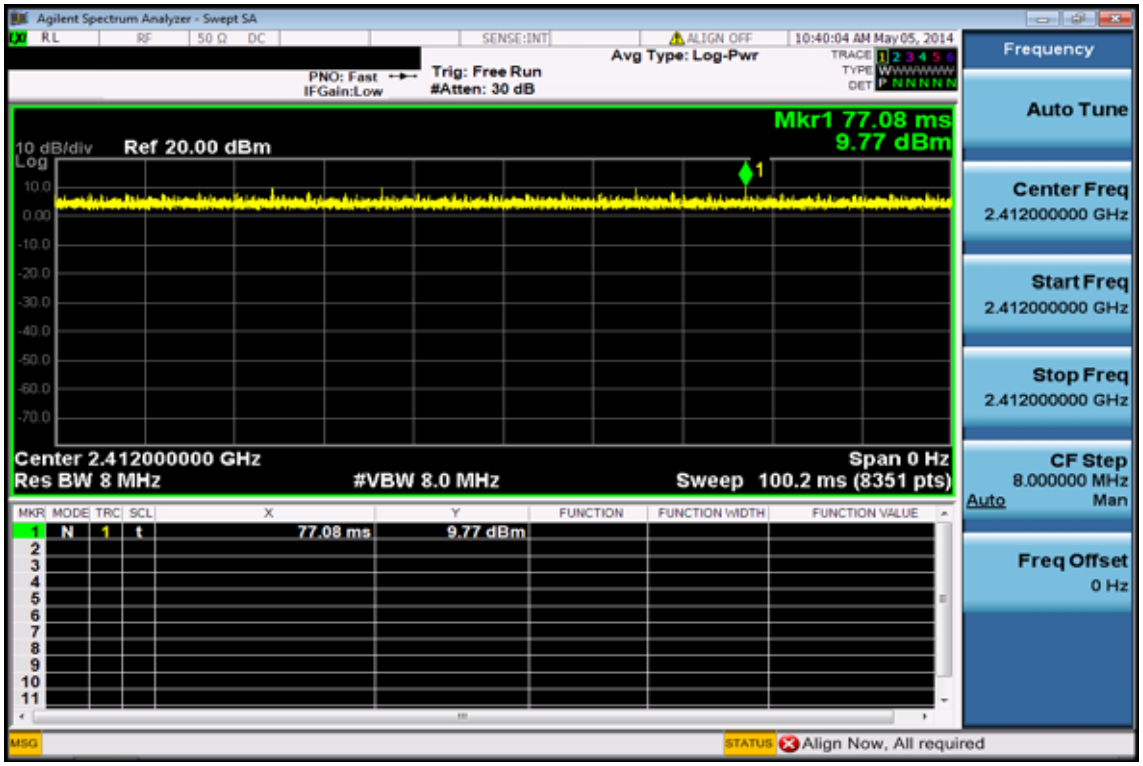
802.11 n_20 MHz – SISO



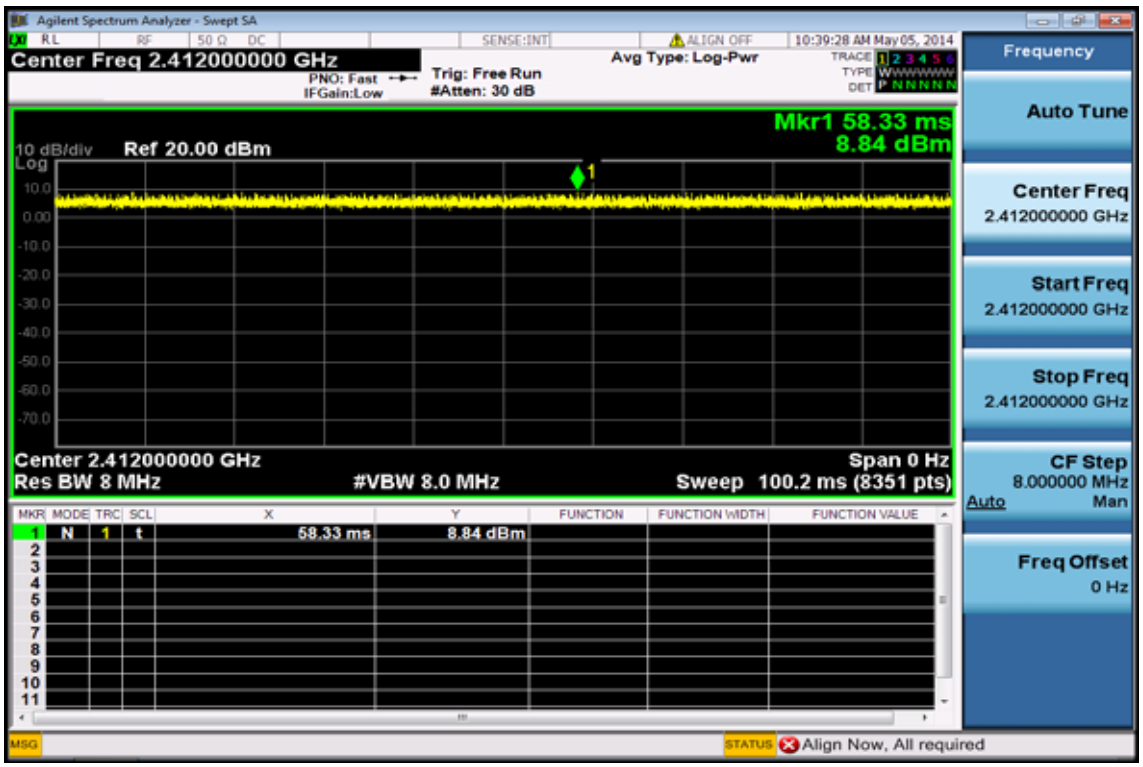
802.11 n_20 MHz – MIMO



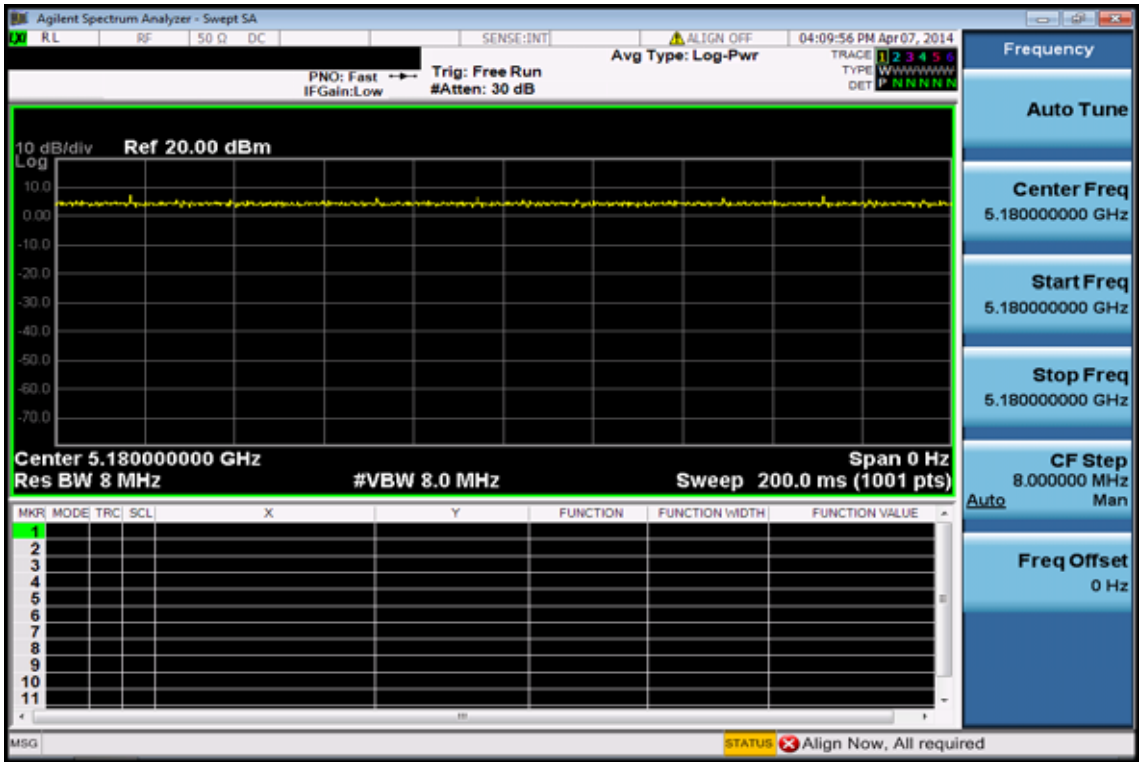
802.11 n_40 MHz – SISO



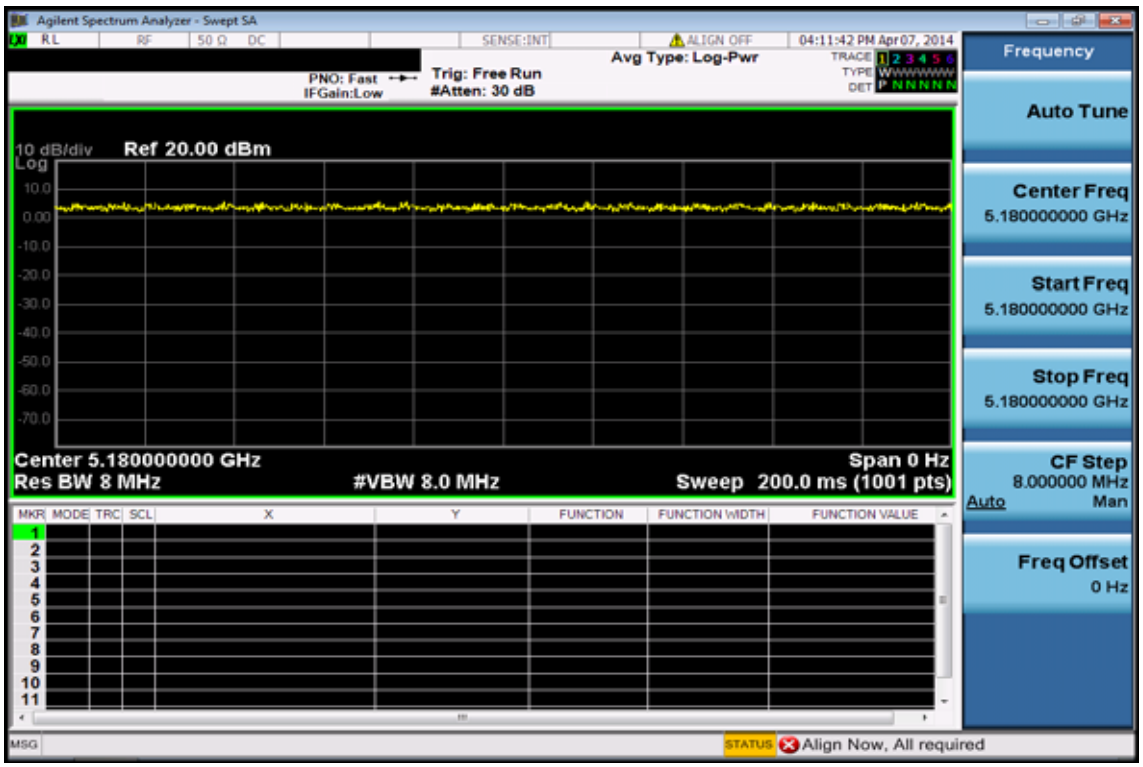
802.11 n_40 MHz – MIMO



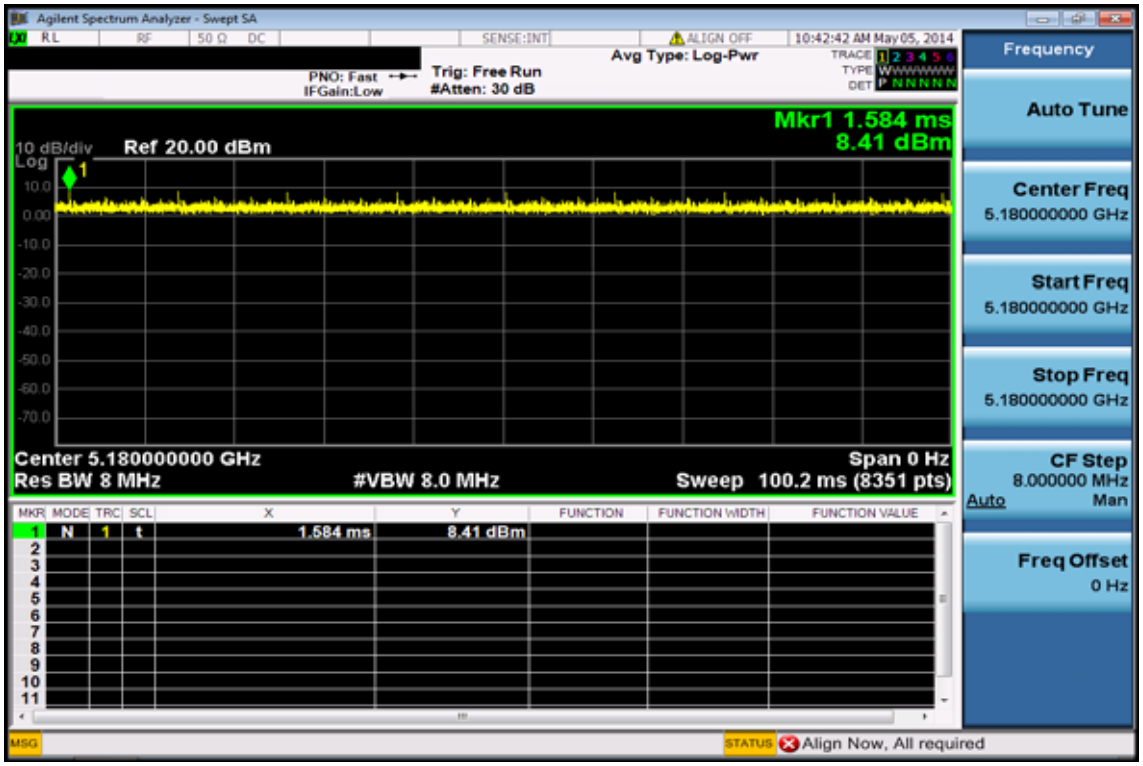
802.11a



802.11 n (5GHz)_20M – SISO

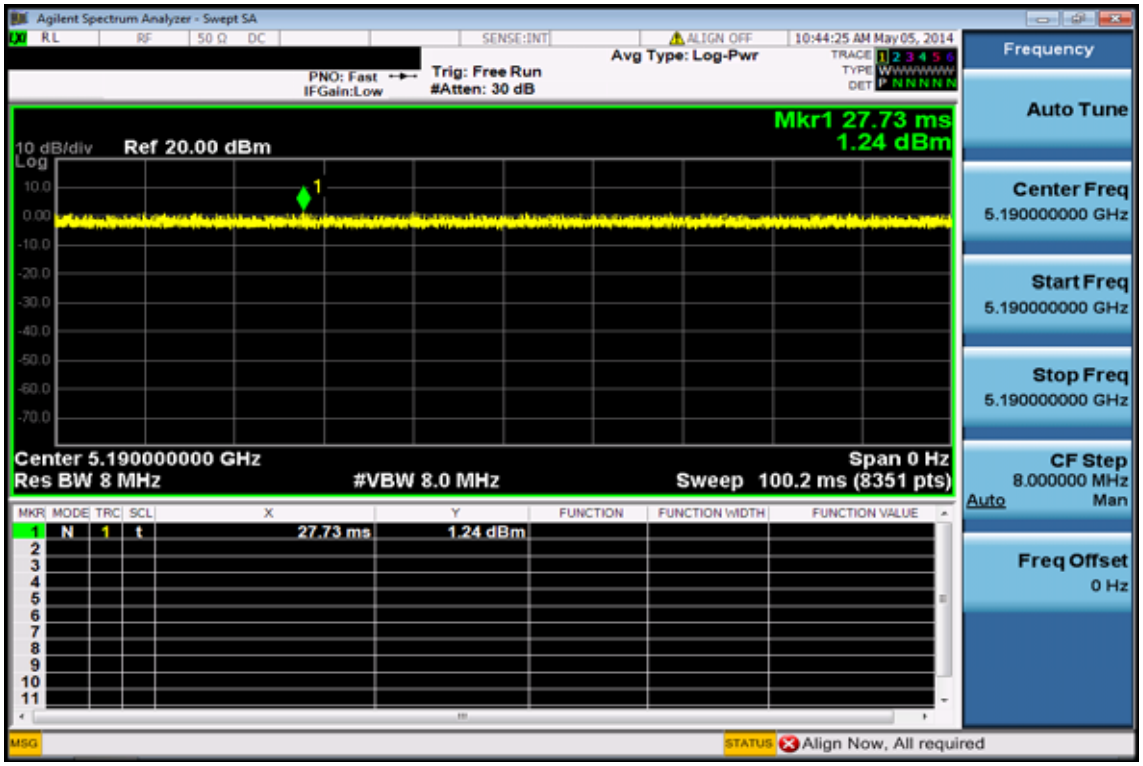


802.11 n (5GHz)_20M – MIMO

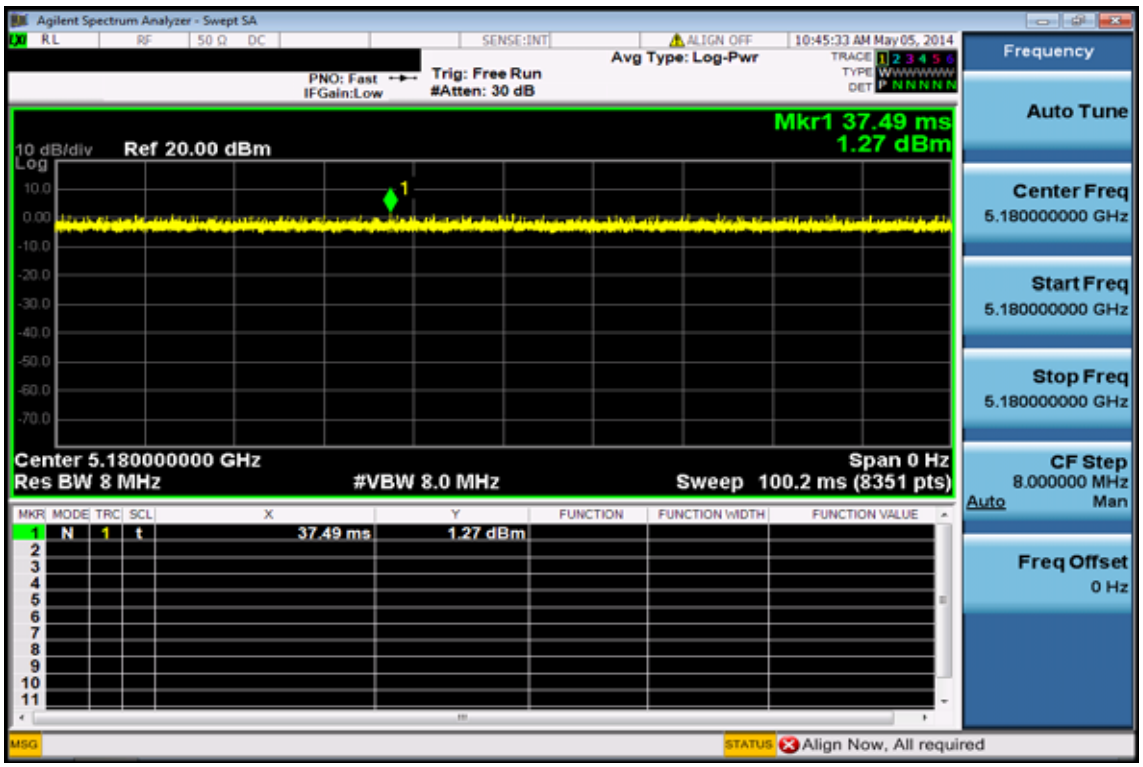


802.11 n (5GHz)_40M – SISO

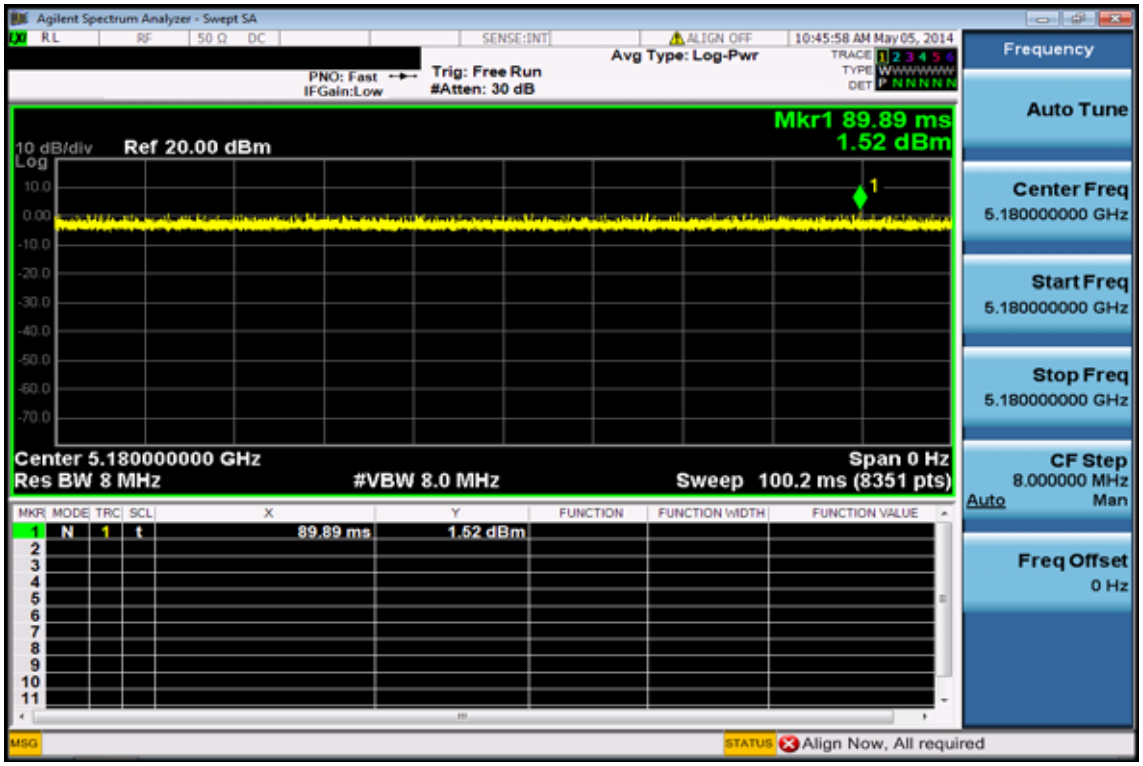
802.11 n (5GHz)_40M – MIMO



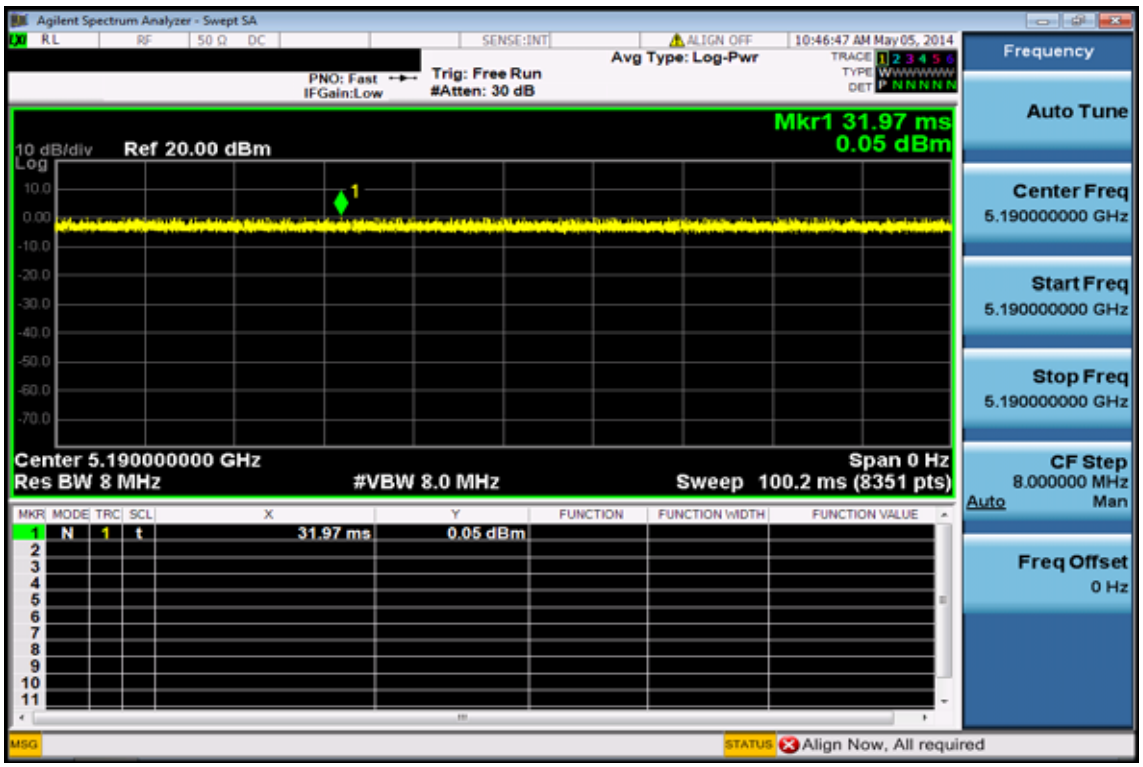
802.11 ac (20M) – SISO



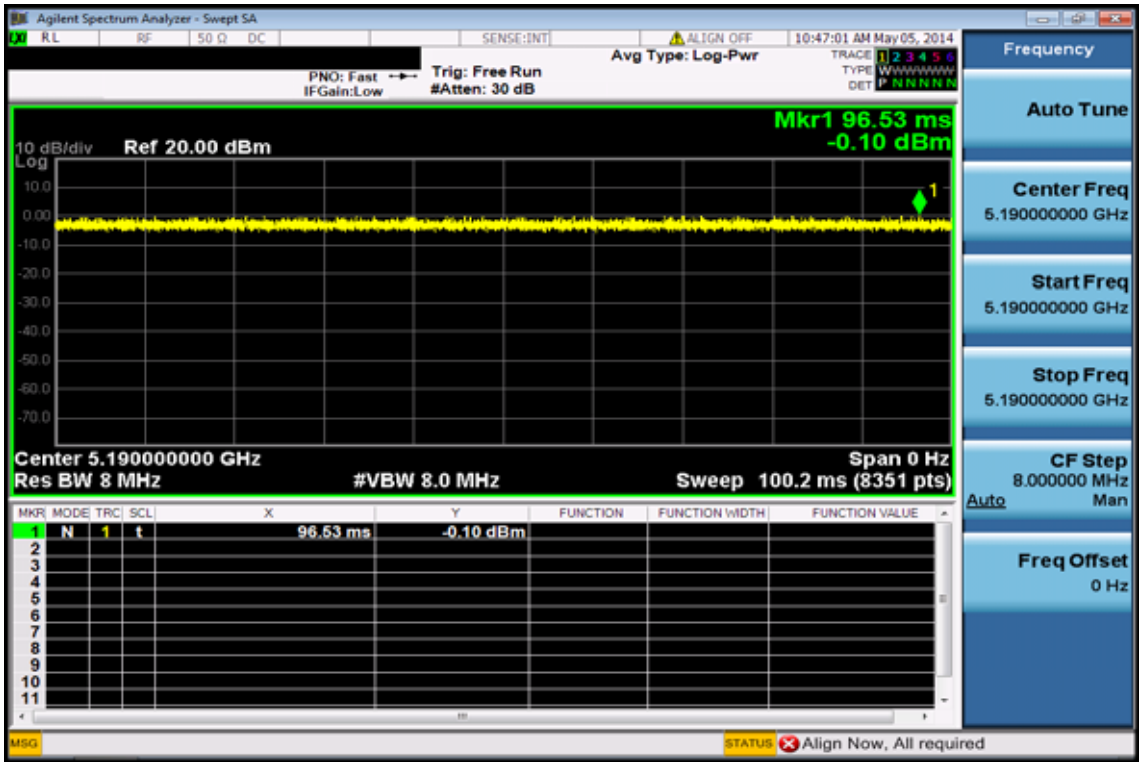
802.11 ac (20M) – MIMO



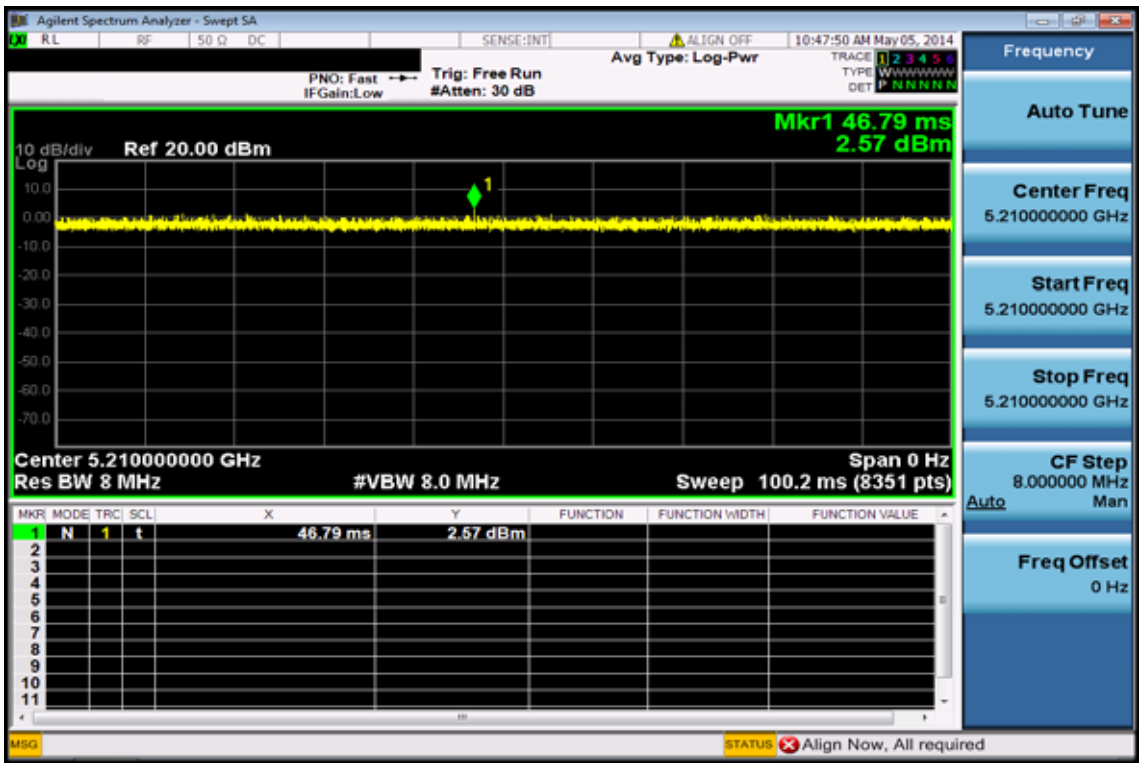
802.11 ac (40M) – SISO



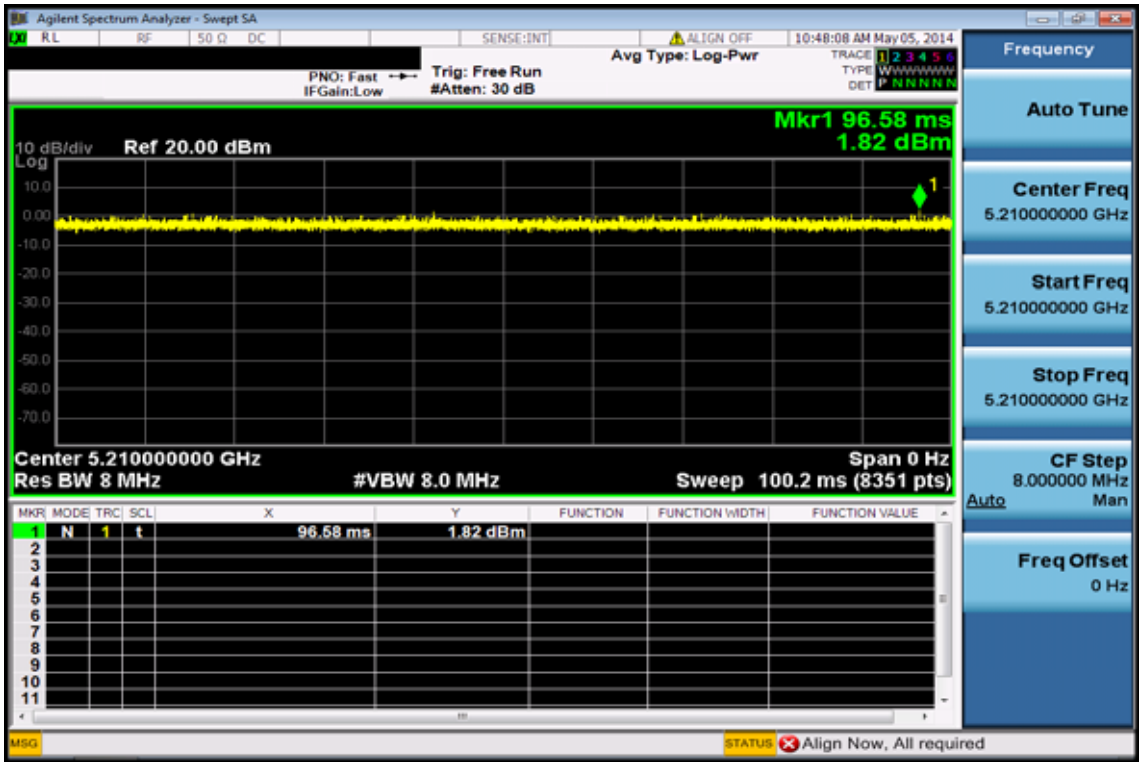
802.11 ac (40M) – MIMO



802.11 ac (80M) – SISO



802.11 ac (80M) – MIMO



7.5 Measurement Result (Worst Case Data Rate):

802.11b (Antenna Main)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		1	
1	2412	19.72	1 Watt = 30 dBm
6	2437	**19.74**	1 Watt = 30 dBm
11	2462	19.74	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		1	
1	2412	**16.88**	1 Watt = 30 dBm
6	2437	16.77	1 Watt = 30 dBm
11	2462	16.86	1 Watt = 30 dBm

802.11g (Antenna Main)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
1	2412	23.28	1 Watt = 30 dBm
6	2437	**25.16**	1 Watt = 30 dBm
11	2462	23.74	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
1	2412	14.35	1 Watt = 30 dBm
6	2437	**15.29**	1 Watt = 30 dBm
11	2462	13.30	1 Watt = 30 dBm

802.11n_20M (Antenna Main)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
1	2412	23.22	1 Watt = 30 dBm
6	2437	**24.89**	1 Watt = 30 dBm
11	2462	22.94	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
1	2412	12.69	1 Watt = 30 dBm
6	2437	**15.32**	1 Watt = 30 dBm
11	2462	13.50	1 Watt = 30 dBm

802.11n_40M (Antenna Main)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS1	
3	2422	21.70	1 Watt = 30 dBm
6	2437	**24.19**	1 Watt = 30 dBm
9	2452	22.70	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS1	
3	2422	12.08	1 Watt = 30 dBm
6	2437	**14.51**	1 Watt = 30 dBm
9	2452	12.96	1 Watt = 30 dBm

802.11b (Antenna Aux)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		1	
1	2412	19.55	1 Watt = 30 dBm
6	2437	19.66	1 Watt = 30 dBm
11	2462	**19.76**	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		1	
1	2412	**16.89**	1 Watt = 30 dBm
6	2437	16.78	1 Watt = 30 dBm
11	2462	16.87	1 Watt = 30 dBm

802.11g (Antenna Aux)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
1	2412	23.39	1 Watt = 30 dBm
6	2437	**25.28**	1 Watt = 30 dBm
11	2462	23.82	1 Watt = 30 dBm

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
1	2412	14.36	1 Watt = 30 dBm
6	2437	**16.08**	1 Watt = 30 dBm
11	2462	13.76	1 Watt = 30 dBm

802.11n_20M (Antenna Aux)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
1	2412	22.56	1 Watt = 30 dBm
6	2437	**25.08**	1 Watt = 30 dBm
11	2462	23.95	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
1	2412	12.74	1 Watt = 30 dBm
6	2437	**15.63**	1 Watt = 30 dBm
11	2462	14.20	1 Watt = 30 dBm

802.11n_40M (Antenna Aux)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
3	2422	22.26	1 Watt = 30 dBm
6	2437	**24.98**	1 Watt = 30 dBm
9	2452	23.22	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
3	2422	12.09	1 Watt = 30 dBm
6	2437	**15.37**	1 Watt = 30 dBm
9	2452	13.27	1 Watt = 30 dBm

802.11n_20M (2.4G) MIMO Chain 0

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
1	2412	23.85	1 Watt = 30 dBm
6	2437	**24.70**	1 Watt = 30 dBm
11	2462	23.69	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
1	2412	13.01	1 Watt = 30 dBm
6	2437	**14.97**	1 Watt = 30 dBm
11	2462	13.61	1 Watt = 30 dBm

802.11n_20M (2.4G) MIMO Chain 1

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
1	2412	23.61	1 Watt = 30 dBm
6	2437	**26.22**	1 Watt = 30 dBm
11	2462	23.58	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
1	2412	13.23	1 Watt = 30 dBm
6	2437	**15.10**	1 Watt = 30 dBm
11	2462	14.26	1 Watt = 30 dBm

802.11n_20M (2.4G) MIMO Chain 0+Chain 1

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
1	2412	26.74	1 Watt = 30 dBm
6	2437	**28.54**	1 Watt = 30 dBm
11	2462	26.65	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
1	2412	16.13	1 Watt = 30 dBm
6	2437	**18.05**	1 Watt = 30 dBm
11	2462	16.96	1 Watt = 30 dBm

802.11n_40M (2.4G) MIMO Chain 0

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
3	2422	21.60	1 Watt = 30 dBm
6	2437	**24.44**	1 Watt = 30 dBm
9	2452	23.09	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
3	2422	12.24	1 Watt = 30 dBm
6	2437	**14.41**	1 Watt = 30 dBm
9	2452	13.02	1 Watt = 30 dBm

802.11n_40M (2.4G) MIMO Chain 1

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
3	2422	22.20	1 Watt = 30 dBm
6	2437	**24.01**	1 Watt = 30 dBm
9	2452	22.94	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
3	2422	12.36	1 Watt = 30 dBm
6	2437	**14.62**	1 Watt = 30 dBm
9	2452	13.56	1 Watt = 30 dBm

802.11n_40M (2.4G) MIMO Chain 0+Chain 1

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
3	2422	24.92	1 Watt = 30 dBm
6	2437	**27.24**	1 Watt = 30 dBm
9	2452	26.03	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
3	2422	15.31	1 Watt = 30 dBm
6	2437	**17.53**	1 Watt = 30 dBm
9	2452	16.31	1 Watt = 30 dBm

802.11a (Antenna Main)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
149	5745	**22.81**	1 Watt = 30 dBm
157	5785	22.65	1 Watt = 30 dBm
165	5825	22.64	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
149	5745	**15.32**	1 Watt = 30 dBm
157	5785	14.72	1 Watt = 30 dBm
165	5825	15.13	1 Watt = 30 dBm

802.11n (5GHz)_20M (Antenna Main)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	**22.64**	1 Watt = 30 dBm
157	5785	22.61	1 Watt = 30 dBm
165	5825	22.48	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	15.73	1 Watt = 30 dBm
157	5785	**16.54**	1 Watt = 30 dBm
165	5825	16.05	1 Watt = 30 dBm

802.11n (5GHz)_40M (Antenna Main)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	**23.44**	1 Watt = 30 dBm
159	5795	23.32	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	15.70	1 Watt = 30 dBm
159	5795	**15.99**	1 Watt = 30 dBm

802.11ac (20M) (Antenna Main)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	23.02	1 Watt = 30 dBm
157	5785	**23.15**	1 Watt = 30 dBm
165	5825	22.73	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	16.19	1 Watt = 30 dBm
157	5785	**16.64**	1 Watt = 30 dBm
165	5825	16.22	1 Watt = 30 dBm

802.11ac (40M) (Antenna Main)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	23.41	1 Watt = 30 dBm
159	5795	23.33	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	15.84	1 Watt = 30 dBm
159	5795	16.02	1 Watt = 30 dBm

802.11ac (80M) (Antenna Main)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
155	5775	14.82	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
155	5775	8.84	1 Watt = 30 dBm

802.11a (Antenna Aux)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
149	5745	**22.38**	1 Watt = 30 dBm
157	5785	22.31	1 Watt = 30 dBm
165	5825	22.09	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
149	5745	**15.68**	1 Watt = 30 dBm
157	5785	14.99	1 Watt = 30 dBm
165	5825	15.05	1 Watt = 30 dBm

802.11n (5GHz)_20M (Antenna Aux)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	**22.31**	1 Watt = 30 dBm
157	5785	22.08	1 Watt = 30 dBm
165	5825	22.03	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	15.07	1 Watt = 30 dBm
157	5785	15.06	1 Watt = 30 dBm
165	5825	**15.08**	1 Watt = 30 dBm

802.11n (5GHz)_40M (Antenna Aux)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	**22.63**	1 Watt = 30 dBm
159	5795	22.52	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	**14.19**	1 Watt = 30 dBm
159	5795	14.16	1 Watt = 30 dBm

802.11ac (20M) (Antenna Aux)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	**22.62**	1 Watt = 30 dBm
157	5785	22.57	1 Watt = 30 dBm
165	5825	22.12	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	14.72	1 Watt = 30 dBm
157	5785	**14.93**	1 Watt = 30 dBm
165	5825	14.72	1 Watt = 30 dBm

802.11ac (40M) (Antenna Aux)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	22.54	1 Watt = 30 dBm
159	5795	22.62	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	14.02	1 Watt = 30 dBm
159	5795	13.90	1 Watt = 30 dBm

802.11ac (80M) (Antenna Aux)

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
155	5775	13.82	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
155	5775	8.03	1 Watt = 30 dBm

802.11n (5GHz)_20M MIMO Chain 0

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	**21.38**	1 Watt = 30 dBm
157	5785	21.22	1 Watt = 30 dBm
165	5825	21.30	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	**15.00**	1 Watt = 30 dBm
157	5785	15.00	1 Watt = 30 dBm
165	5825	14.62	1 Watt = 30 dBm

802.11n (5GHz)_20M MIMO Chain 1

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	21.78	1 Watt = 30 dBm
157	5785	**21.93**	1 Watt = 30 dBm
165	5825	21.83	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	**15.54**	1 Watt = 30 dBm
157	5785	15.01	1 Watt = 30 dBm
165	5825	15.40	1 Watt = 30 dBm

802.11n (5GHz)_20M MIMO Chain 0+ Chain1

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	24.59	1 Watt = 30 dBm
157	5785	**24.60**	1 Watt = 30 dBm
165	5825	24.58	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	**18.29**	1 Watt = 30 dBm
157	5785	18.06	1 Watt = 30 dBm
165	5825	18.04	1 Watt = 30 dBm

802.11n (5GHz)_40M MIMO Chain 0

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	**5755**	**20.70**	**1 Watt = 30 dBm**
159	**5795**	20.53	**1 Watt = 30 dBm**

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	**5755**	14.70	**1 Watt = 30 dBm**
159	**5795**	**14.83**	**1 Watt = 30 dBm**

802.11n (5GHz)_40M MIMO Chain 1

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	**5755**	**21.28**	**1 Watt = 30 dBm**
159	**5795**	21.59	**1 Watt = 30 dBm**

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	**5755**	**15.32**	**1 Watt = 30 dBm**
159	**5795**	15.23	**1 Watt = 30 dBm**

802.11n (5GHz)_40M MIMO Chain 0+Chain 1

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	24.01	1 Watt = 30 dBm
159	5795	**24.10**	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	18.03	1 Watt = 30 dBm
159	5795	**18.04**	1 Watt = 30 dBm

802.11ac (20M) MIMO Chain 0

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	**21.90**	1 Watt = 30 dBm
157	5785	21.23	1 Watt = 30 dBm
165	5825	21.31	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	15.65	1 Watt = 30 dBm
157	5785	**15.65**	1 Watt = 30 dBm
165	5825	14.82	1 Watt = 30 dBm

802.11ac (20M) MIMO Chain 1

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	21.55	1 Watt = 30 dBm
157	5785	**21.98**	1 Watt = 30 dBm
165	5825	21.82	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	**15.84**	1 Watt = 30 dBm
157	5785	15.74	1 Watt = 30 dBm
165	5825	15.62	1 Watt = 30 dBm

802.11ac (20M) MIMO Chain 0+ Chain 1

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	**24.74**	1 Watt = 30 dBm
157	5785	24.63	1 Watt = 30 dBm
165	5825	24.58	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	**18.76**	1 Watt = 30 dBm
157	5785	18.71	1 Watt = 30 dBm
165	5825	18.65	1 Watt = 30 dBm

802.11ac (40M) MIMO Chain 0

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	20.75	1 Watt = 30 dBm
159	5795	20.61	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	14.95	1 Watt = 30 dBm
159	5795	14.93	1 Watt = 30 dBm

802.11ac (40M) MIMO Chain 1

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	21.32	1 Watt = 30 dBm
159	5795	21.60	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	15.51	1 Watt = 30 dBm
159	5795	15.55	1 Watt = 30 dBm

802.11ac (40M) MIMO Chain 0+ Chain 1

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	24.05	1 Watt = 30 dBm
159	5795	24.14	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	18.25	1 Watt = 30 dBm
159	5795	18.26	1 Watt = 30 dBm

802.11ac (80M) MIMO Chain 0

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate MCS0	Required Limit
155	5775	13.46	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate MCS0	Required Limit
155	5775	7.49	1 Watt = 30 dBm

802.11ac (80M) MIMO Chain 1

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate MCS0	Required Limit
155	5775	14.76	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate MCS0	Required Limit
155	5775	9.76	1 Watt = 30 dBm

802.11ac (80M) MIMO Chain 0+ Chain 1

		Peak Power Output (dBm)	
CH	Frequency (MHz)	Data Rate MCS0	Required Limit
155	5775	17.17	1 Watt = 30 dBm

		Average Power Output (dBm)	
CH	Frequency (MHz)	Data Rate MCS0	Required Limit
155	5775	11.78	1 Watt = 30 dBm

**** Note: The duty cycle factor is compensated back to obtain the maximum value of the measurement in average.***

802.11b (Antenna Main)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		1	
1	2412	**18.38**	1 Watt = 30 dBm
6	2437	18.27	1 Watt = 30 dBm
11	2462	18.36	1 Watt = 30 dBm

802.11g (Antenna Main)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
1	2412	15.85	1 Watt = 30 dBm
6	2437	**16.79**	1 Watt = 30 dBm
11	2462	14.80	1 Watt = 30 dBm

802.11n_20M (Antenna Main)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
1	2412	14.19	1 Watt = 30 dBm
6	2437	**16.82**	1 Watt = 30 dBm
11	2462	15.00	1 Watt = 30 dBm

802.11n_40M (Antenna Main)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS1	
3	2422	13.58	1 Watt = 30 dBm
6	2437	**16.01**	1 Watt = 30 dBm
9	2452	14.46	1 Watt = 30 dBm

802.11b (Antenna Aux)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		1	
1	2412	**15.34**	1 Watt = 30 dBm
6	2437	15.23	1 Watt = 30 dBm
11	2462	15.32	1 Watt = 30 dBm

802.11g (Antenna Aux)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
1	2412	12.81	1 Watt = 30 dBm
6	2437	**14.53**	1 Watt = 30 dBm
11	2462	12.21	1 Watt = 30 dBm

802.11n_20M (Antenna Aux)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
1	2412	11.19	1 Watt = 30 dBm
6	2437	**14.08**	1 Watt = 30 dBm
11	2462	12.65	1 Watt = 30 dBm

802.11n_40M (Antenna Aux)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
3	2422	10.54	1 Watt = 30 dBm
6	2437	**13.82**	1 Watt = 30 dBm
9	2452	11.72	1 Watt = 30 dBm

802.11n_20M (2.4G) MIMO Chain 0+Chain 1

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
1	2412	17.30	1 Watt = 30 dBm
6	2437	**19.22**	1 Watt = 30 dBm
11	2462	18.13	1 Watt = 30 dBm

802.11n_40M (2.4G) MIMO Chain 0+Chain 1

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
3	2422	16.48	1 Watt = 30 dBm
6	2437	**18.70**	1 Watt = 30 dBm
9	2452	17.48	1 Watt = 30 dBm

802.11a (Antenna Main)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
149	5745	**18.04**	1 Watt = 30 dBm
157	5785	17.44	1 Watt = 30 dBm
165	5825	17.85	1 Watt = 30 dBm

802.11n (5GHz)_20M (Antenna Main)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	18.45	1 Watt = 30 dBm
157	5785	**19.26**	1 Watt = 30 dBm
165	5825	18.77	1 Watt = 30 dBm

802.11n (5GHz)_40M (Antenna Main)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	18.42	1 Watt = 30 dBm
159	5795	**18.71**	1 Watt = 30 dBm

802.11a (Antenna Aux)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
149	5745	**17.38**	1 Watt = 30 dBm
157	5785	16.69	1 Watt = 30 dBm
165	5825	16.75	1 Watt = 30 dBm

802.11n (5GHz)_20M (Antenna Aux)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	16.77	1 Watt = 30 dBm
157	5785	16.76	1 Watt = 30 dBm
165	5825	**16.78**	1 Watt = 30 dBm

802.11n (5GHz)_40M (Antenna Aux)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	**15.89**	1 Watt = 30 dBm
159	5795	15.86	1 Watt = 30 dBm

802.11n (5GHz)_20M MIMO Chain 0+ Chain1

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	23.22	1 Watt = 30 dBm
157	5785	23.00	1 Watt = 30 dBm
165	5825	22.97	1 Watt = 30 dBm

802.11n (5GHz)_40M MIMO Chain 0+Chain 1

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	22.95	1 Watt = 30 dBm
159	5795	18.04	1 Watt = 30 dBm

802.11ac (20M) (Antenna Main)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	18.91	1 Watt = 30 dBm
157	5785	**19.36**	1 Watt = 30 dBm
165	5825	18.94	1 Watt = 30 dBm

802.11ac (40M) (Antenna Main)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	18.56	1 Watt = 30 dBm
159	5795	**18.74**	1 Watt = 30 dBm

802.11ac (80M) (Antenna Main)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
155	5775	**11.56**	1 Watt = 30 dBm

802.11ac (20M) (Antenna Aux)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	16.42	1 Watt = 30 dBm
157	5785	**16.63**	1 Watt = 30 dBm
165	5825	16.42	1 Watt = 30 dBm

802.11ac (40M) (Antenna Aux)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	**15.72**	1 Watt = 30 dBm
159	5795	15.60	1 Watt = 30 dBm

802.11ac (80M) (Antenna Aux)

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
155	5775	**9.73**	1 Watt = 30 dBm

802.11ac (20M) MIMO Chain 0+ Chain 1

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
149	5745	**23.69**	1 Watt = 30 dBm
157	5785	23.64	1 Watt = 30 dBm
165	5825	23.18	1 Watt = 30 dBm

802.11ac (40M) MIMO Chain 0+ Chain 1

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
151	5755	23.17	1 Watt = 30 dBm
159	5795	**23.18**	1 Watt = 30 dBm

802.11ac (80M) MIMO Chain 0+ Chain 1

		EIRP (dBm)	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS0	
155	5775	**16.59**	1 Watt = 30 dBm

* Note: EIRP = Average Power + Gain, where the nominal gain of the antenna (1.5dBi for 2.4GHz Antenna Main, -1.55dBi for 2.4GHz Antenna Aux, and 2.72dBi for 5GHz Antenna Main, 1.70dBi for 5GHz Antenna Aux, 1.17dBi for 2.4GHz (MIMO) and 4.94dBi (802.11n_HT 20/ ac 20M 5.8G), 4.92dBi (802.11n_HT 40/ ac 40M 5.8G), 4.81dBi (802.11ac 80M 5.8G) (MIMO)), where MIMO gain = directive gain + nominal gain.

8 6dB BANDWIDTH

8.1 Standard Applicable:

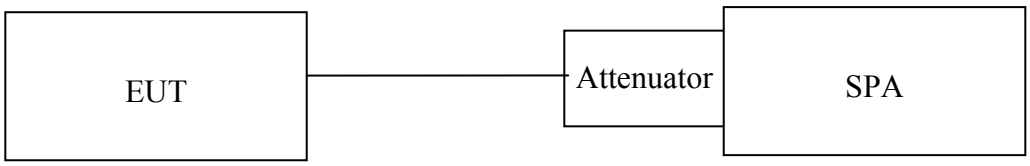
According to §15.247(a)(2), Systems using digital modulation techniques may operate in the 902 - 928 MHz,2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500kHz.

According to RSS 210 issue 8: 2010Annex 8.2. Systems employing digital modulation techniques (which includes direct sequence) can now be certified under RSS-210 provided they comply with the following requirements: The minimum 6 dB bandwidth shall be at least 500 kHz.

8.2 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

8.3 Test Set-up:



8.4 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. Set the spectrum analyzer as RBW = 100 kHz, VBW = 3*RBW, Span = 30M/50MHz, Detector=Peak, Sweep=auto, the setting on spectrum is adjusted based on the procedure as guide in 8.1 option 1 of KDB558074.
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat above procedures until all frequency of interest measured was complete.

8.5 Measurement Result: N/A

9 BAND EDGES MEASUREMENT

9.1 Standard Applicable:

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in15.209(a).

According to RSS-Gen §7.2.5 and RSS-210 issue 8,§A8.5, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 5 and 6 is not required. In addition, radiated emissions which fall in the restricted bands of Table 3 must also comply with the radiated emission limits specified in Tables 5 and 6.

9.2 Measurement Equipment Used:

9.2.1 Conducted Emission at antenna port:

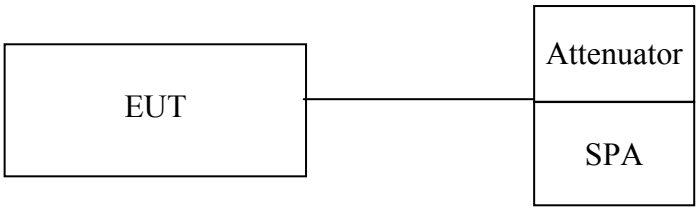
Refer to section 7.2 for details.

9.2.2 Radiated emission:

966 Chamber					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
EMI Test Receiver	R&S	ESCI7	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	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
Filter 2400-2483.5 MHz	EWT	EWT-14-0166	M2	02/27/2014	02/26/2015
Attenuator	Mini-Circuit	BW-S10W2+	004	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

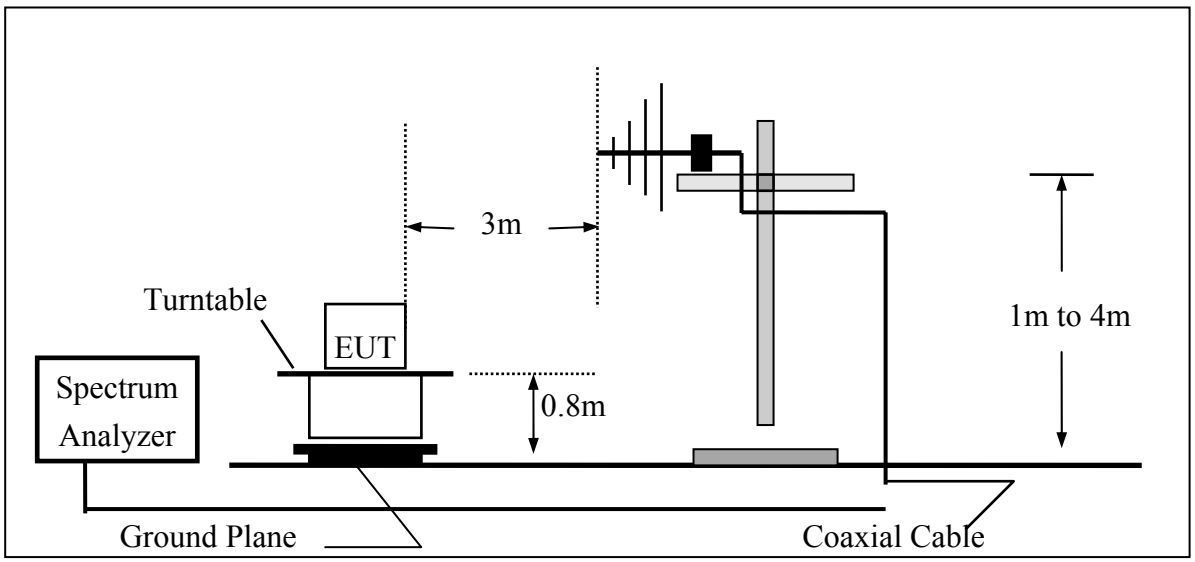
9.3 Test SET-UP:

9.3.1 Conducted Emission at antenna port:

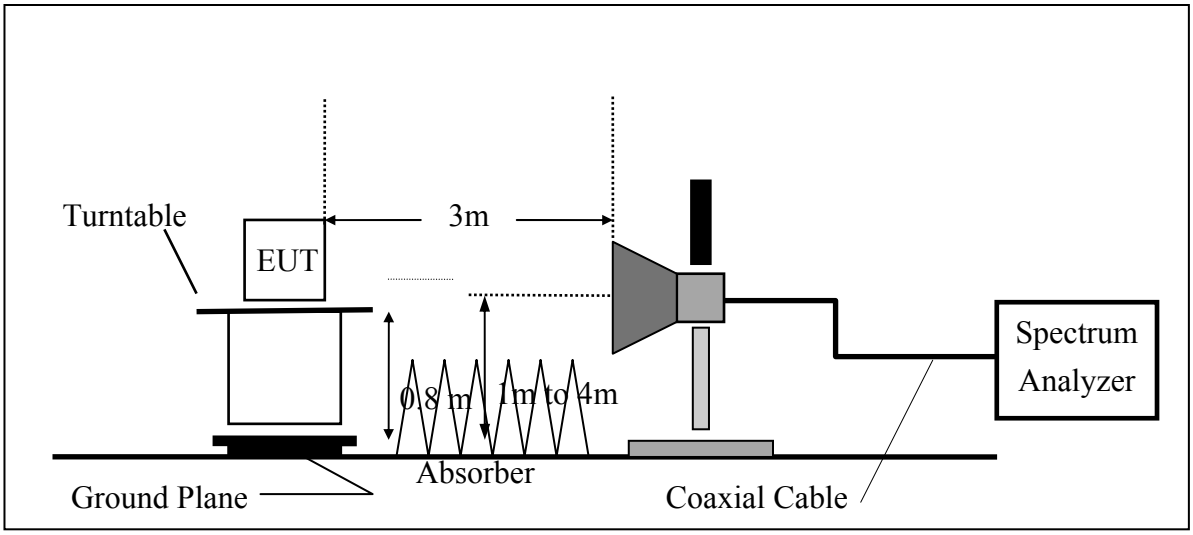


9.3.2 Radiated emission:

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



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



9.4 Measurement Procedure:

Unwanted Emissions into Non-Restricted Frequency Bands, Measurement Procedure followed by 11.1 of KDB558074 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 the spectrum analyzer.
3. Set start to edge frequency, and stop frequency of spectrum analyzer so as to encompass the spectrum to be examined.
4. Set the spectrum analyzer as RBW, VBW=300KHz, Detector = Peak, Sweep = auto
5. Mark the highest reading of the emission as the reference level measurement.
6. Set DL as the limit = reading on marker 1 – 20dBm
7. Marker on frequency, 2.3999GHz and 2.4836GHz, and examine shall 100 KHz immediately outside the authorized (2400~2483.5) be attenuated by 20dB at least relative to the maximum emission of power.
8. Repeat above procedures until all default test channel (low, middle, and high) was complete.

Unwanted Emission falling into Restricted Frequency Bands, Measurement Procedure followed by 12.1 of KDB558074 D01

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. When 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.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. On spectrum, following 8.1.2, and RBW = 1MHz, VBW = 3MHz, & Marker 2390MHz, and 2483.5MHz (Peak Measurement). Average Measurement: following 8.2 with the modification span to 1MHz, &RBW = 1MHz, VBW = 3MHz and peak marker function to obtain the highest reading on 2390, and 2483.5MHz.
8. Repeat above procedures until all default test channel (low, middle, and high) was complete

Note: For MIMO operation, directional gain is not subjected to offset back as prescribe in KDB 662911 D01 for relative out-of-band measurement, including conducted bandedge falling into non-restricted frequency band.

9.5 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	

9.6 Measurement Result:

Note: Refer to next page tabular data sheets.

Radiated Emission:

(Unwanted Emissions into Restricted Frequency Bands): 802.11 b mode

Operation Band	:802.11 b	Test Date	:2014-04-23
Fundamental Frequency	:2412 MHz	Temp./Humi.	:21 deg_C /59 RH
Operation Mode	:Band Edge LOW	Engineer	:Tin
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.

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
2386.08	S	Average	49.02	2.40	51.42	54.00	-2.58
2386.08	S	Peak	55.61	2.40	58.01	74.00	-15.99
2390.00	E	Average	44.47	2.42	46.89	54.00	-7.11
2390.00	E	Peak	52.59	2.42	55.01	74.00	-18.99

Operation Band	:802.11 b	Test Date	:2014-04-23
Fundamental Frequency	:2412 MHz	Temp./Humi.	:21 deg_C /59 RH
Operation Mode	:Band Edge LOW	Engineer	:Tin
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.

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
2386.20	S	Average	45.11	2.40	47.51	54.00	-6.49
2386.20	S	Peak	53.17	2.40	55.57	74.00	-18.43
2390.00	E	Average	42.01	2.42	44.43	54.00	-9.57
2390.00	E	Peak	51.36	2.42	53.78	74.00	-20.22

Operation Band	:802.11 b	Test Date	:2014-04-23
Fundamental Frequency	:2462 MHz	Temp./Humi.	:21 deg_C /59 RH
Operation Mode	:Band Edge HIGH	Engineer	:Tin
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.

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
2483.50	E	Average	45.41	2.74	48.15	54.00	-5.85
2483.50	E	Peak	51.88	2.74	54.62	74.00	-19.38

Operation Band	:802.11 b	Test Date	:2014-04-23
Fundamental Frequency	:2462 MHz	Temp./Humi.	:21 deg_C /59 RH
Operation Mode	:Band Edge HIGH	Engineer	:Tin
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.

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
2483.50	E	Average	43.16	2.74	45.90	54.00	-8.10
2483.50	E	Peak	49.96	2.74	52.70	74.00	-21.30

Radiated Emission:

(Unwanted Emissions into Restricted Frequency Bands): 802.11 g mode

Operation Band	:802.11 g	Test Date	:2014-04-23
Fundamental Frequency	:2412 MHz	Temp./Humi.	:21 deg_C /59 RH
Operation Mode	:Band Edge LOW	Engineer	:Tin
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.

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
2390.00	E	Average	49.96	2.42	52.38	54.00	-1.62
2390.00	E	Peak	69.66	2.42	72.08	74.00	-1.92

Operation Band	:802.11 g	Test Date	:2014-04-23
Fundamental Frequency	:2412 MHz	Temp./Humi.	:21 deg_C /59 RH
Operation Mode	:Band Edge LOW	Engineer	:Tin
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.

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
2390.00	E	Average	46.26	2.42	48.68	54.00	-5.32
2390.00	E	Peak	65.76	2.42	68.18	74.00	-5.82

Operation Band	:802.11 g	Test Date	:2014-04-23
Fundamental Frequency	:2462 MHz	Temp./Humi.	:21 deg_C /59 RH
Operation Mode	:Band Edge HIGH	Engineer	:Tin
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.

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
2483.50	E	Average	43.12	2.74	45.86	54.00	-8.14
2483.50	E	Peak	63.84	2.74	66.58	74.00	-7.42
2496.50	S	Average	34.13	2.78	36.91	54.00	-17.09
2496.50	S	Peak	56.54	2.78	59.32	74.00	-14.68

Operation Band	:802.11 g	Test Date	:2014-04-23
Fundamental Frequency	:2462 MHz	Temp./Humi.	:21 deg_C /59 RH
Operation Mode	:Band Edge HIGH	Engineer	:Tin
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.

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
2483.50	E	Average	41.61	2.74	44.35	54.00	-9.65
2483.50	E	Peak	61.71	2.74	64.45	74.00	-9.55
2496.00	S	Average	32.34	2.78	35.12	54.00	-18.88
2496.00	S	Peak	53.80	2.78	56.58	74.00	-17.42

Radiated Emission:

(Unwanted Emissions into Restricted Frequency Bands): 802.11 n_20M mode

Operation Band	:802.11 n20M	Test Date	:2014-04-23
Fundamental Frequency	:2412 MHz	Temp./Humi.	:20.3deg_C /58 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.

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
2390.00	E	Average	49.53	2.42	51.95	54.00	-2.05
2390.00	E	Peak	69.69	2.42	72.11	74.00	-1.89

Operation Band	:802.11 n20M	Test Date	:2014-04-23
Fundamental Frequency	:2412 MHz	Temp./Humi.	:20.3deg_C /58 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.

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
2390.00	E	Average	48.75	2.42	51.17	54.00	-2.83
2390.00	E	Peak	68.50	2.42	70.92	74.00	-3.08

Operation Band	:802.11 n20M	Test Date	:2014-04-23
Fundamental Frequency	:2462 MHz	Temp./Humi.	:20.3deg_C /58 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.

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
2483.50	E	Average	44.70	2.74	47.44	54.00	-6.56
2483.50	E	Peak	69.92	2.74	72.66	74.00	-1.34

Operation Band	:802.11 n20M	Test Date	:2014-04-23
Fundamental Frequency	:2462 MHz	Temp./Humi.	:20.3deg_C /58 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.

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
2483.50	E	Average	44.62	2.74	47.36	54.00	-6.64
2483.50	E	Peak	70.04	2.74	72.78	74.00	-1.22

Radiated Emission:

(Unwanted Emissions into Restricted Frequency Bands): 802.11 n_40M mode

Operation Band	:802.11 n40M	Test Date	:2014-04-23
Fundamental Frequency	:2422 MHz	Temp./Humi.	:20.3deg_C /58 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.

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
2388.48	S	Average	50.22	2.41	52.63	54.00	-1.37
2388.48	S	Peak	67.51	2.41	69.92	74.00	-4.08
2390.00	E	Average	50.91	2.42	53.33	54.00	-0.67
2390.00	E	Peak	64.87	2.42	67.29	74.00	-6.71

Operation Band	:802.11 n40M	Test Date	:2014-04-23
Fundamental Frequency	:2422 MHz	Temp./Humi.	:20.3deg_C /58 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.

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
2388.00	S	Average	49.57	2.40	51.97	54.00	-2.03
2388.00	S	Peak	65.42	2.40	67.82	74.00	-6.18
2390.00	E	Average	49.21	2.42	51.63	54.00	-2.37
2390.00	E	Peak	62.88	2.42	65.30	74.00	-8.70

Operation Band	:802.11 n40M	Test Date	:2014-04-23
Fundamental Frequency	:2452 MHz	Temp./Humi.	:20.3deg_C /58 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.

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
2483.50	E	Average	46.06	2.74	48.80	54.00	-5.20
2483.50	E	Peak	67.27	2.74	70.01	74.00	-3.99

Operation Band	:802.11 n40M	Test Date	:2014-04-23
Fundamental Frequency	:2452 MHz	Temp./Humi.	:20.3deg_C /58 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.

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
2483.50	E	Average	46.48	2.74	49.22	54.00	-4.78
2483.50	E	Peak	68.31	2.74	71.05	74.00	-2.95

10 SPURIOUS EMISSION TEST

10.1 Standard Applicable

According to §15.247(d),

Emission at antenna port:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Radiated Spurious Emission

Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

And according to §15.33(a) (1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

According to RSS-Gen §7.2.5 and RSS-210 issue 8,§A8.5, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 5 and 6 is not required. In addition, radiated emissions which fall in the restricted bands of Table 3 must also comply with the radiated emission limits specified in Tables 5 and 6 of RSS-GEN.

10.2 Measurement Equipment Used:

10.2.1 Conducted Emission at antenna port:

Refer to section 7.2 for details.

10.2.2 Radiated emission:

Refer to section 9.2.2 for details.

10.3 Test SET-UP:

10.3.1 Conducted Emission at antenna port:

Refer to section 7.3 for details.

10.3.2 Radiated emission:

Refer to section 9.3.2 for details.

10.4 Measurement Procedure:

Radiated Emission:

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. When 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.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. On spectrum, change spectrum mode in linear display mode, and reduce VBW = 10Hz if average reading is measured.
7. Repeat above procedures until all default test channel measured were complete.

Conducted Emission:

1. To connect Antenna Port of EUT to Spectrum.
2. Set RBW = 100K & VBW = 300K on Spectrum.
3. Sweep the frequency to determine spurious emission as seen on spectrum from span of 30 to 3G, 3G to 8G, 8G to 13G, 13G to 18G and 18G to 26.5GHz, 18G to 40GHz (applicable if operation mode is 5GHz)
4. Via Software, combine 5 spans of frequency range into one plot
5. Repeat above procedures until all default test channel measured were complete.

Note: For MIMO operation, directional gain is not subjected to offset back as prescribe in KDB 662911 D01 for relative out-of-band measurement, including conducted bandedge falling into non-restricted frequency band.

10.5 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	

10.6 Measurement Result:

Note: Refer to next page for tabular data sheets.

Radiated Spurious Emission Measurement Result (802.11b)

Operation Band	:802.11 b	Test Date	:2014-04-23
Fundamental Frequency	:2412 MHz	Temp./Humi.	:20.3deg_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
4824.00	H	Average	42.93	6.89	49.82	54.00	-4.18
4824.00	H	Peak	46.01	6.89	52.90	74.00	-21.10
7236.00	H	---					
9648.00	H	---					
12060.00	H	---					
14472.00	H	---					
16884.00	H	---					
19296.00	H	---					
21708.00	H	---					
24120.00	H	---					

Operation Band	:802.11 b	Test Date	:2014-04-23
Fundamental Frequency	:2412 MHz	Temp./Humi.	:20.3deg_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
4824.00	H	Average	39.97	6.89	46.86	54.00	-7.14
4824.00	H	Peak	43.84	6.89	50.73	74.00	-23.27
7236.00	H	---					
9648.00	H	---					
12060.00	H	---					
14472.00	H	---					
16884.00	H	---					
19296.00	H	---					
21708.00	H	---					
24120.00	H	---					

Operation Band	:802.11 b	Test Date	:2014-04-23
Fundamental Frequency	:2437 MHz	Temp./Humi.	:20.3deg_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
4874.00	H	Average	45.30	6.96	52.26	54.00	-1.74
4874.00	H	Peak	47.28	6.96	54.24	74.00	-19.76
7311.00	H	---					
9748.00	H	---					
12185.00	H	---					
14622.00	H	---					
17059.00	H	---					
19496.00	H	---					
21933.00	H	---					
24370.00	H	---					

Operation Band	:802.11 b	Test Date	:2014-04-23
Fundamental Frequency	:2437 MHz	Temp./Humi.	:20.3deg_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
4874.00	H	Average	40.81	6.96	47.77	54.00	-6.23
4874.00	H	Peak	43.79	6.96	50.75	74.00	-23.25
7311.00	H	---					
9748.00	H	---					
12185.00	H	---					
14622.00	H	---					
17059.00	H	---					
19496.00	H	---					
21933.00	H	---					
24370.00	H	---					

Operation Band	:802.11 b	Test Date	:2014-04-23
Fundamental Frequency	:2462 MHz	Temp./Humi.	:20.3deg_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
4924.00	H	Average	43.14	7.01	50.15	54.00	-3.85
4924.00	H	Peak	46.24	7.01	53.25	74.00	-20.75
7386.00	H	---					
9848.00	H	---					
12310.00	H	---					
14772.00	H	---					
17234.00	H	---					
19696.00	H	---					
22158.00	H	---					
24620.00	H	---					

Operation Band	:802.11 b	Test Date	:2014-04-23
Fundamental Frequency	:2462 MHz	Temp./Humi.	:20.3deg_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
4924.00	H	Average	38.98	7.01	45.99	54.00	-8.01
4924.00	H	Peak	42.88	7.01	49.89	74.00	-24.11
7386.00	H	---					
9848.00	H	---					
12310.00	H	---					
14772.00	H	---					
17234.00	H	---					
19696.00	H	---					
22158.00	H	---					
24620.00	H	---					

Radiated Spurious Emission Measurement Result (802.11g)

Operation Band	:802.11 g	Test Date	:2014-04-23
Fundamental Frequency	:2412 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Tin
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
4824.00	H	Average	26.78	6.89	33.67	54.00	-20.33
4824.00	H	Peak	38.17	6.89	45.06	74.00	-28.94
7236.00	H	---					
9648.00	H	---					
12060.00	H	---					
14472.00	H	---					
16884.00	H	---					
19296.00	H	---					
21708.00	H	---					
24120.00	H	---					

Operation Band	:802.11 g	Test Date	:2014-04-23
Fundamental Frequency	:2412 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Tin
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
4824.00	H	Average	26.98	6.89	33.87	54.00	-20.13
4824.00	H	Peak	38.93	6.89	45.82	74.00	-28.18
7236.00	H	---					
9648.00	H	---					
12060.00	H	---					
14472.00	H	---					
16884.00	H	---					
19296.00	H	---					
21708.00	H	---					
24120.00	H	---					

Operation Band	:802.11 g	Test Date	:2014-04-23
Fundamental Frequency	:2437 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX MID	Engineer	:Tin
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
4874.00	H	Average	26.87	6.96	33.83	54.00	-20.17
4874.00	H	Peak	38.27	6.96	45.23	74.00	-28.77
7311.00	H	---					
9748.00	H	---					
12185.00	H	---					
14622.00	H	---					
17059.00	H	---					
19496.00	H	---					
21933.00	H	---					
24370.00	H	---					

Operation Band	:802.11 g	Test Date	:2014-04-23
Fundamental Frequency	:2437 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX MID	Engineer	:Tin
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
4874.00	H	Average	24.88	6.96	31.84	54.00	-22.16
4874.00	H	Peak	36.73	6.96	43.69	74.00	-30.31
7311.00	H	---					
9748.00	H	---					
12185.00	H	---					
14622.00	H	---					
17059.00	H	---					
19496.00	H	---					
21933.00	H	---					
24370.00	H	---					

Operation Band	:802.11 g	Test Date	:2014-04-23
Fundamental Frequency	:2462 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Tin
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
4924.00	H	Average	26.30	7.01	33.31	54.00	-20.69
4924.00	H	Peak	37.41	7.01	44.42	74.00	-29.58
7386.00	H	---					
9848.00	H	---					
12310.00	H	---					
14772.00	H	---					
17234.00	H	---					
19696.00	H	---					
22158.00	H	---					
24620.00	H	---					

Operation Band	:802.11 g	Test Date	:2014-04-23
Fundamental Frequency	:2462 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Tin
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
4924.00	H	Average	26.57	7.01	33.58	54.00	-20.42
4924.00	H	Peak	37.55	7.01	44.56	74.00	-29.44
7386.00	H	---					
9848.00	H	---					
12310.00	H	---					
14772.00	H	---					
17234.00	H	---					
19696.00	H	---					
22158.00	H	---					
24620.00	H	---					

Radiated Spurious Emission Measurement Result (802.11n_20M)

Operation Band	:802.11 n20M	Test Date	:2014-04-23
Fundamental Frequency	:2412 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Tin
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
4824.00	H	Average	27.14	6.89	34.03	54.00	-19.97
4824.00	H	Peak	40.47	6.89	47.36	74.00	-26.64
7236.00	H	---					
9648.00	H	---					
12060.00	H	---					
14472.00	H	---					
16884.00	H	---					
19296.00	H	---					
21708.00	H	---					
24120.00	H	---					

Operation Band	:802.11 n20M	Test Date	:2014-04-23
Fundamental Frequency	:2412 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Tin
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
4824.00	H	Average	26.57	6.89	33.46	54.00	-20.54
4824.00	H	Peak	37.95	6.89	44.84	74.00	-29.16
7236.00	H	---					
9648.00	H	---					
12060.00	H	---					
14472.00	H	---					
16884.00	H	---					
19296.00	H	---					
21708.00	H	---					
24120.00	H	---					

Operation Band	:802.11 n20M	Test Date	:2014-04-23
Fundamental Frequency	:2437 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX MID	Engineer	:Tin
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
30.97	S	Peak	39.45	-14.03	25.42	40.00	-14.58
324.88	S	Peak	36.23	-10.92	25.31	46.00	-20.69
402.48	S	Peak	37.88	-9.10	28.78	46.00	-17.22
600.36	S	Peak	42.07	-5.51	36.56	46.00	-9.44
800.18	S	Peak	31.03	-2.29	28.74	46.00	-17.26
916.58	S	Peak	29.99	-0.36	29.63	46.00	-16.37
4874.00	H	Average	29.02	6.96	35.98	54.00	-18.02
4874.00	H	Peak	41.65	6.96	48.61	74.00	-25.39
7311.00	H	---					
9748.00	H	---					
12185.00	H	---					
14622.00	H	---					
17059.00	H	---					
19496.00	H	---					
21933.00	H	---					
24370.00	H	---					

Operation Band	:802.11 n20M	Test Date	:2014-04-23
Fundamental Frequency	:2437 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX MID	Engineer	:Tin
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
224.97	S	Peak	43.68	-14.42	29.26	46.00	-16.74
333.61	S	Peak	38.96	-10.74	28.22	46.00	-17.78
417.03	S	Peak	39.73	-8.92	30.81	46.00	-15.19
500.45	S	Peak	35.97	-7.52	28.45	46.00	-17.55
800.18	S	Peak	32.67	-2.29	30.38	46.00	-15.62
916.58	S	Peak	32.26	-0.36	31.90	46.00	-14.10
4874.00	H	Average	26.95	6.96	33.91	54.00	-20.09
4874.00	H	Peak	38.35	6.96	45.31	74.00	-28.69
7311.00	H	---					
9748.00	H	---					
12185.00	H	---					
14622.00	H	---					
17059.00	H	---					
19496.00	H	---					
21933.00	H	---					
24370.00	H	---					

Operation Band	:802.11 n20M	Test Date	:2014-04-23
Fundamental Frequency	:2462 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Tin
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
4924.00	H	Average	25.76	7.01	32.77	54.00	-21.23
4924.00	H	Peak	38.08	7.01	45.09	74.00	-28.91
7386.00	H	---					
9848.00	H	---					
12310.00	H	---					
14772.00	H	---					
17234.00	H	---					
19696.00	H	---					
22158.00	H	---					
24620.00	H	---					

Operation Band	:802.11 n20M	Test Date	:2014-04-23
Fundamental Frequency	:2462 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Tin
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
4924.00	H	Average	24.91	7.01	31.92	54.00	-22.08
4924.00	H	Peak	37.46	7.01	44.47	74.00	-29.53
7386.00	H	---					
9848.00	H	---					
12310.00	H	---					
14772.00	H	---					
17234.00	H	---					
19696.00	H	---					
22158.00	H	---					
24620.00	H	---					

Radiated Spurious Emission Measurement Result (802.11n_40M)

Operation Band	:802.11 n40M	Test Date	:2014-04-23
Fundamental Frequency	:2422 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Tin
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
4844.00	H	Average	25.27	6.95	32.22	54.00	-21.78
4844.00	H	Peak	36.98	6.95	43.93	74.00	-30.07
7266.00	H	---					
9688.00	H	---					
12110.00	H	---					
14532.00	H	---					
16954.00	H	---					
19376.00	H	---					
21798.00	H	---					
24220.00	H	---					

Operation Band	:802.11 n40M	Test Date	:2014-04-23
Fundamental Frequency	:2422 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Tin
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
4844.00	H	Average	25.33	6.95	32.28	54.00	-21.72
4844.00	H	Peak	38.23	6.95	45.18	74.00	-28.82
7266.00	H	---					
9688.00	H	---					
12110.00	H	---					
14532.00	H	---					
16954.00	H	---					
19376.00	H	---					
21798.00	H	---					
24220.00	H	---					

Operation Band	:802.11 n40M	Test Date	:2014-04-23
Fundamental Frequency	:2437 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX MID	Engineer	:Tin
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
4874.00	H	Average	25.69	6.96	32.65	54.00	-21.35
4874.00	H	Peak	37.13	6.96	44.09	74.00	-29.91
7311.00	H	---					
9748.00	H	---					
12185.00	H	---					
14622.00	H	---					
17059.00	H	---					
19496.00	H	---					
21933.00	H	---					
24370.00	H	---					

Operation Band	:802.11 n40M	Test Date	:2014-04-23
Fundamental Frequency	:2437 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX MID	Engineer	:Tin
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
4874.00	H	Average	25.66	6.96	32.62	54.00	-21.38
4874.00	H	Peak	36.98	6.96	43.94	74.00	-30.06
7311.00	H	---					
9748.00	H	---					
12185.00	H	---					
14622.00	H	---					
17059.00	H	---					
19496.00	H	---					
21933.00	H	---					
24370.00	H	---					

Operation Band	:802.11 n40M	Test Date	:2014-04-23
Fundamental Frequency	:2452 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Tin
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
4904.00	H	Average	24.91	6.96	31.87	54.00	-22.13
4904.00	H	Peak	38.36	6.96	45.32	74.00	-28.68
7356.00	H	---					
9808.00	H	---					
12260.00	H	---					
14712.00	H	---					
17164.00	H	---					
19616.00	H	---					
22068.00	H	---					
24520.00	H	---					

Operation Band	:802.11 n40M	Test Date	:2014-04-23
Fundamental Frequency	:2452 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Tin
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
4904.00	H	Average	24.94	6.96	31.90	54.00	-22.10
4904.00	H	Peak	37.55	6.96	44.51	74.00	-29.49
7356.00	H	---					
9808.00	H	---					
12260.00	H	---					
14712.00	H	---					
17164.00	H	---					
19616.00	H	---					
22068.00	H	---					
24520.00	H	---					

Radiated Spurious Emission Measurement Result (802.11a)

Operation Band	:802.11 a	Test Date	:2014-04-23
Fundamental Frequency	:5745 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Tin
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
11490.00	H	Average	32.56	17.78	50.34	54.00	-3.66
11490.00	H	Peak	38.89	17.78	56.67	74.00	-17.33
17235.00	H	---					
22980.00	H	---					
28725.00	H	---					
34470.00	H	---					

Operation Band	:802.11 a	Test Date	:2014-04-23
Fundamental Frequency	:5745 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Tin
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
11490.00	H	Average	30.38	17.78	48.16	54.00	-5.84
11490.00	H	Peak	37.49	17.78	55.27	74.00	-18.73
17235.00	H	---					
22980.00	H	---					
28725.00	H	---					
34470.00	H	---					

Operation Band	:802.11 a	Test Date	:2014-04-23
Fundamental Frequency	:5785 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX MID	Engineer	:Tin
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
11570.00	H	Average	22.91	17.66	40.57	54.00	-13.43
11570.00	H	Peak	26.59	17.66	44.25	74.00	-29.75
17355.00	H	---					
23140.00	H	---					
28925.00	H	---					
34710.00	H	---					

Operation Band	:802.11 a	Test Date	:2014-04-23
Fundamental Frequency	:5785 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX MID	Engineer	:Tin
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
11570.00	H	Average	21.92	17.66	39.58	54.00	-14.42
11570.00	H	Peak	25.08	17.66	42.74	74.00	-31.26
17355.00	H	---					
23140.00	H	---					
28925.00	H	---					
34710.00	H	---					

Operation Band	:802.11 a	Test Date	:2014-04-23
Fundamental Frequency	:5825 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Tin
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
11650.00	H	Average	31.72	17.87	49.59	54.00	-4.41
11650.00	H	Peak	34.94	17.87	52.81	74.00	-21.19
17475.00	H	---					
23300.00	H	---					
29125.00	H	---					
34950.00	H	---					

Operation Band	:802.11 a	Test Date	:2014-04-23
Fundamental Frequency	:5825 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Tin
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
11650.00	H	Average	25.63	17.87	43.50	54.00	-10.50
11650.00	H	Peak	28.57	17.87	46.44	74.00	-27.56
17475.00	H	---					
23300.00	H	---					
29125.00	H	---					
34950.00	H	---					

Radiated Spurious Emission Measurement Result (802.11ac 20M)

Operation Band	:802.11 AC20M	Test Date	:2014-04-23
Fundamental Frequency	:5745 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX LOW	Engineer	:Tin
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
30.97	S	Peak	39.14	-14.03	25.11	40.00	-14.89
74.62	S	Peak	37.85	-16.21	21.64	40.00	-18.36
417.03	S	Peak	38.64	-8.92	29.72	46.00	-16.28
600.36	S	Peak	33.43	-5.51	27.92	46.00	-18.08
800.18	S	Peak	29.90	-2.29	27.61	46.00	-18.39
916.58	S	Peak	30.16	-0.36	29.80	46.00	-16.20
11490.00	H	Average	32.45	17.78	50.23	54.00	-3.77
11490.00	H	Peak	35.58	17.78	53.36	74.00	-20.64
17235.00	H	---					
22980.00	H	---					
28725.00	H	---					
34470.00	H	---					

Operation Band	:802.11 AC20M	Test Date	:2014-04-23
Fundamental Frequency	:5745 MHz	Temp./Humi.	:22 deg_C /62 RH
Operation Mode	:TX LOW	Engineer	:Tin
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
224.97	S	Peak	43.35	-14.42	28.93	46.00	-17.07
417.03	S	Peak	36.96	-8.92	28.04	46.00	-17.96
499.48	S	Peak	35.52	-7.54	27.98	46.00	-18.02
656.62	S	Peak	34.21	-4.41	29.80	46.00	-16.20
697.36	S	Peak	35.03	-3.98	31.05	46.00	-14.95
916.58	S	Peak	31.47	-0.36	31.11	46.00	-14.89
11490.00	H	Average	25.55	17.78	43.33	54.00	-10.67
11490.00	H	Peak	28.18	17.78	45.96	74.00	-28.04
17235.00	H	---					
22980.00	H	---					
28725.00	H	---					
34470.00	H	---					

Operation Band	:802.11 AC20M	Test Date	:2014-04-23
Fundamental Frequency	:5785 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX MID	Engineer	:Tin
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
11570.00	H	Average	25.66	17.66	43.32	54.00	-10.68
11570.00	H	Peak	28.28	17.66	45.94	74.00	-28.06
17355.00	H	---					
23140.00	H	---					
28925.00	H	---					
34710.00	H	---					

Operation Band	:802.11 AC20M	Test Date	:2014-04-23
Fundamental Frequency	:5785 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX MID	Engineer	:Tin
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
11570.00	H	Average	25.78	17.66	43.44	54.00	-10.56
11570.00	H	Peak	28.88	17.66	46.54	74.00	-27.46
17355.00	H	---					
23140.00	H	---					
28925.00	H	---					
34710.00	H	---					

Operation Band	:802.11 AC20M	Test Date	:2014-04-23
Fundamental Frequency	:5825 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Tin
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
11650.00	H	Average	31.38	17.87	49.25	54.00	-4.75
11650.00	H	Peak	34.25	17.87	52.12	74.00	-21.88
17475.00	H	---					
23300.00	H	---					
29125.00	H	---					
34950.00	H	---					

Operation Band	:802.11 AC20M	Test Date	:2014-04-23
Fundamental Frequency	:5825 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Tin
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
11650.00	H	Average	25.13	17.87	43.00	54.00	-11.00
11650.00	H	Peak	28.15	17.87	46.02	74.00	-27.98
17475.00	H	---					
23300.00	H	---					
29125.00	H	---					
34950.00	H	---					

Radiated Spurious Emission Measurement Result (802.11ac 40M)

Operation Band	:802.11 AC40M	Test Date	:2014-04-23
Fundamental Frequency	:5755 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Tin
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
11510.00	H	Average	31.87	17.78	49.65	54.00	-4.35
11510.00	H	Peak	33.67	17.78	51.45	74.00	-22.55
17265.00	H	---					
23020.00	H	---					
28775.00	H	---					
34530.00	H	---					

Operation Band	:802.11 AC40M	Test Date	:2014-04-23
Fundamental Frequency	:5755 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX LOW	Engineer	:Tin
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
11510.00	H	Average	25.45	17.78	43.23	54.00	-10.77
11510.00	H	Peak	28.53	17.78	46.31	74.00	-27.69
17265.00	H	---					
23020.00	H	---					
28775.00	H	---					
34530.00	H	---					

Operation Band	:802.11 AC40M	Test Date	:2014-04-23
Fundamental Frequency	:5795 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Tin
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
11590.00	H	Average	30.82	17.74	48.56	54.00	-5.44
11590.00	H	Peak	33.89	17.74	51.63	74.00	-22.37
17385.00	H	---					
23180.00	H	---					
28975.00	H	---					
34770.00	H	---					

Operation Band	:802.11 AC40M	Test Date	:2014-04-23
Fundamental Frequency	:5795 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX HIGH	Engineer	:Tin
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
11590.00	H	Average	25.30	17.74	43.04	54.00	-10.96
11590.00	H	Peak	28.36	17.74	46.10	74.00	-27.90
17385.00	H	---					
23180.00	H	---					
28975.00	H	---					
34770.00	H	---					

Radiated Spurious Emission Measurement Result (802.11ac 80M)

Operation Band	:802.11 AC80M	Test Date	:2014-04-23
Fundamental Frequency	:5775 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX	Engineer	:Tin
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
11550.00	H	Average	24.11	17.63	41.74	54.00	-12.26
11550.00	H	Peak	27.77	17.63	45.40	74.00	-28.60
17325.00	H	---					
23100.00	H	---					
28875.00	H	---					
34650.00	H	---					

Operation Band	:802.11 AC80M	Test Date	:2014-04-23
Fundamental Frequency	:5775 MHz	Temp./Humi.	:20.3 deg_C /58 RH
Operation Mode	:TX	Engineer	:Tin
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
11550.00	H	Average	24.21	17.63	41.84	54.00	-12.16
11550.00	H	Peak	27.98	17.63	45.61	74.00	-28.39
17325.00	H	---					
23100.00	H	---					
28875.00	H	---					
34650.00	H	---					

11 PEAK POWER SPECTRAL DENSITY

11.1 Standard Applicable:

According to §15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

According to RSS-210 issue 8, §A8.2(b) The transmitter power spectral density (into the antenna) shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

11.2 Measurement Equipment Used:

Refer to section 7.2 for details.

11.3 Test Set-up:

Refer to section 7.3 for details. (Spectrum Option)

11.4 Measurement Procedure (following the measurement procedure 10.2 of KDB558074):

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW ≥ 3 kHz.
4. Set the VBW ≥ 3 x RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
11. 802.11n MIMO mode: offset is set following "measure and add 10 Log (N)" on spectrum to measure the PSD for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna. N=2 for this given application.

Note: For the test of PSD at MIMO mode, the highest emission of worst case employing Measure and add 10 log (N) technical is reported on this report after the comparison between Main Antenna at single transmitting mode and Aux that yields the higher value. . The single transmitting mode is only reported measurement that produces higher value of outcome.

11.5 Measurement Result: N/A

12 ANTENNA REQUIREMENT

12.1 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.

When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer. Any antenna gain in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power before using the power limits specified in RSS-210 or RSS-310 for devices of RF output powers of 10 milliwatts or less. For devices of output powers greater than 10 milliwatts, except devices subject to RSS-210 Annex 8 (Frequency Hopping and Digital Modulation Systems Operating in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz Bands) or RSS-210 Annex 9 (Local Area Network Devices), the total antenna gain shall be added to the measured RF output power before using the specified power limits. For devices subject to RSS-210 Annex 8 or Annex 9, the antenna gain shall not be added.

12.2 Antenna Connected Construction:

The directional gains of antenna used for transmitting is 1.5dBi for 2.4GHz, 2.72dBi for 5725-5850 MHz, and 1.17dBi for 2.4GHz MIMO, and 4.94dBi (802.11n_HT 20/ ac 20M 5.8G), 4.92dBi (802.11n_HT 40/ ac 40M 5.8G), 4.81dBi (802.11ac 80M 5.8G) MIMO. In addition, the antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.

13 99% BANDWIDTH MEASUREMENT

13.1 Standard Applicable:

RSS-Gen §4.6.1, 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.

The span between the two recorded frequencies is the occupied bandwidth.

13.2 Measurement Equipment Used:

Refer to section 7.2 for details.

13.3 Test Set-up:

Refer to section 7.3 for details. (Spectrum analyzer)

13.4 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. Set the spectrum analyzer as RBW=1% of the Span, VBW = 3 times RBW, Span= 30 MHz /50MHz.
4. Turn on the 99% bandwidth function, max reading..
5. Repeat above procedures until all frequency measured were complete.

13.5 Measurement Result: N/A

~ End of Report ~