ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

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

OF

Product Name:	**PCIE 802.11a/b/g/n 2.4GHz/5GHz +USB BT 4.0card**
Brand Name:	**Qualcomm Atheros**
Model No.:	**QCNFA222**
Model Difference:	**N/A**
FCC ID:	**PPD-QCNFA222**
IC:	**4104A-QCNFA222**
Report No.:	**E2/2014/90020**
Issue Date:	**Dec. 09, 2014**
FCC Rule Part:	**§15.407**
IC Rule Part:	**RSS-210 issue 8:2010, Annex 9**
Prepared for:	**Qualcomm Atheros, Inc. 1700 Technology Drive, San Jose, CA 95110**
Prepared by:	**SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Township, Taoyuan County, Taiwan 333**

Testing Laboratory
0513

VERIFICATION OF COMPLIANCE

Applicant:	Qualcomm Atheros, Inc. 1700 Technology Drive, San Jose, CA 95110
Product Name:	PCIE 802.11a/b/g/n 2.4GHz/5GHz +USB BT 4.0card
Brand Name:	Qualcomm Atheros
Model No.:	QCNFA222
Model Difference:	N/A
FCC ID:	PPD-QCNFA222
IC:	4104A-QCNFA222
File Number:	E2/2014/90020
Date of test:	Sep. 15, 2014 ~ Dec. 09, 2014
Date of EUT Received:	Dec. 09, 2014

We hereby certify that:

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

Test By:	Jazz Huang	***Date:***	Dec. 09, 2014
	Jazz Huang / Sr. Engineer		
Prepared By:	Tiffany Kao	***Date:***	Dec. 09, 2014
	Tiffany Kao / Clerk		
Approved By:	Jim Chang	***Date:***	Dec. 09, 2014
	Jim Chang / Supervisor		

Version

Version No.	Date	Description
00	Dec. 09, 2014	Initial creation of document

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1. GENERAL INFORMATION

1.1. Product Description

Product Name:	Notebook	
Brand Name:	acer	
Model No.:	MS2398	
Model Difference:	N/A	
Hardware Version:	ENG phase	
Software Version:	N/A	
Model No. for BT/WLAN Module:	QCNFA222	
Module FCC ID:	PPD-QCNFA222	
Module IC:	4104A-QCNFA222	
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:	PCIE 802.11a/b/g/n 2.4GHz/5GHz +USB BT 4.0card (QCNFA222) INSTALLED IN AN Tablet Computer	
Power Supply:	11.4Vdc Rechargeable Li-polymer battery pack or 19Vdc from AC/DC adapter	
	Battery:	Model No.: AC14C8I, Supplier: acer
	Adapter:	Model No.: A13-045N2A, Supplier: CHICONY

WLAN 5GHz:

Wi-Fi	Frequency Range	Channels	Rated Power (Avg.) / Average Rated Power(EIRP)	Modulation Technology	Type of Emission
11a	5150~5250	4	Avg. Power: (MIMO Chain 0): 12.87dBm (MIMO Chain 1): 12.97dBm (MIMO Chain 0+1): 15.93dBm EIRP: (MIMO Chain 0+1): 18.87dBm	OFDM	17M6D1D
	5250~5350	4	Avg. Power: (MIMO Chain 0): 14.03dBm (MIMO Chain 1): 14.52dBm (MIMO Chain 0+1): 17.13dBm EIRP: (MIMO Chain 0+1): 20.27dBm		17M7D1D
	5470~5600	5	Avg. Power: (MIMO Chain 0): 14.44dBm (MIMO Chain 1): 14.38dBm (MIMO Chain 0+1): 17.42dBm EIRP: (MIMO Chain 0+1): 21.85dBm		17M8D1D
	5650~5725	3	Avg. Power: (MIMO Chain 0): 11.85dBm (MIMO Chain 1): 11.29dBm (MIMO Chain 0+1): 14.59dBm EIRP: (MIMO Chain 0+1): 19.02dBm		17M7D1D
11n	HT20 5150~5250	4	Avg. Power: (MIMO Chain 0): 12.02dBm (MIMO Chain 1): 12.56dBm (MIMO Chain 0+1): 15.23dBm EIRP: (MIMO Chain 0+1): 18.17dBm	OFDM	18M4D1D
	HT20 5250~5350	4	Avg. Power: HT 20: 13.70dBm (MIMO Chain 0): 11.59dBm (MIMO Chain 1): 12.72dBm (MIMO Chain 0+1): 15.20dBm EIRP: (MIMO Chain 0+1): 18.34dBm		18M4D1D

11n	HT20 5470~5600	5	Avg. Power: (MIMO Chain 0): 12.04dBm (MIMO Chain 1): 12.20dBm (MIMO Chain 0+1): 15.13dBm EIRP (MIMO Chain 0+1): 19.56dBm	OFDM	18M4D1D
	HT20 5650~5725	3	Avg. Power: (MIMO Chain 0): 10.16dBm (MIMO Chain 1): 9.59dBm (MIMO Chain 0+1): 12.89dBm HT20: 13.10dBm (MIMO Chain 0+1): 17.32dBm		18M2D1D
	HT40 5150-5250	2	Avg. Power: (MIMO Chain 0): 12.33dBm (MIMO Chain 1): 12.37dBm (MIMO Chain 0+1): 15.36dBm EIRP (MIMO Chain 0+1): 18.30dBm	OFDM	36M6D1D
	HT40 5250-5350	2	Avg. Power: (MIMO Chain 0): 12.05dBm (MIMO Chain 1): 12.37dBm (MIMO Chain 0+1): 15.22dBm EIRP (MIMO Chain 0+1): 18.36dBm		36M6D1D
	HT40 5470-5600	2	Avg. Power: (MIMO Chain 0):12.38dBm (MIMO Chain 1): 12.36dBm (MIMO Chain 0+1): 15.38dBm EIRP (MIMO Chain 0+1): 19.81dBm		36M8D1D
	HT40 5650-5725	1	Avg. Power: (MIMO Chain 0):10.78dBm (MIMO Chain 1): 10.27dBm (MIMO Chain 0+1): 15.34dBm EIRP (MIMO Chain 0+1): 17.97dBm		36M6D1D

Antenna Designation	PIFA Antenna 1. Main: 5GHz Gain: -0.07dBi (5150MHz-5250MHz) 5GHz Gain: -0.42dBi (5250MHz-5350MHz) 5GHz Gain: -0.04dBi (5470MHz-5725MHz) 2. Aux: 5GHz Gain: -0.20dBi (5150MHz-5250MHz) 5GHz Gain: 0.13dBi (5250MHz-5350MHz) 5GHz Gain: 1.42dBi (5470MHz-5725MHz)
Modulation type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Transition Rate:	802.11 a: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 144Mbps 802.11 n_40MHz: 13.5 – 300Mbps

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

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: PPD-QCNFA222** filing to comply with Section 15.407 of the FCC Part 15, Subpart C Rules. And **IC: 4104A-QCNFA222** filing to comply with Industry Canada RSS-210 issue 8: 2010 Annex 9. The composite system (digital device) is compliance with Subpart B is authorized under a DoC procedure.

1.3. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4:2009 & KDB 789033 D01published on 04, 08, 2013. Radiated testing was performed at an antenna to EUT distance 3 meters.

Tested in accordance with FCC KDB789033 D01 General UNII Test Procedures v01r03 for compliance to FCC 47CFR 15.407 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 & 6.2.2, is followed to carry out the test. The CISPR Quasi-Peak and Average detector mode is employed according to §15.107

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna according to the requirements in Section 8 and 13 and of ANSI C63.4:2009,.

2.4. Configuration of Tested System

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

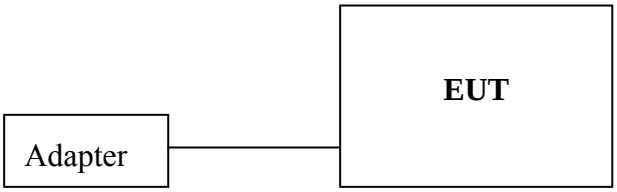


Table 2-1 Equipment Used in Tested System

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 RESULT

FCC/IC Rules	Description Of Test	Result
§15.407(a) (1) (2) RSS 210 A9.2(1)(2)(3)	The Maximum Output Power Measurement	Compliant
§15.407(b) (1) (2) (3)(6) (7) RSS 210 A9.2 (1) (2)(3) RSS-Gen 7.2.5	Undesirable Emission – Radiated Measurement	Compliant
§15.203 RSS-Gen 7.1.2	Antenna Requirement	Compliant

4. DESCRIPTION OF TEST MODES

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

a mode:
5150MHz-5250MHz: Channel lowest(5180MHz)、Mid(5220MHz) and Highest(5240MHz).
5250MHz-5350MHz: Channel lowest(5260MHz)、Mid(5300MHz) and Highest(5320MHz).
5470MHz-5725MHz: Channel lowest(5500MHz)、Mid(5580MHz) and Highest(5700MHz) and with 6Mbps data rate are chosen for full testing.

n HT 20 mode:
5150MHz-5250MHz: Channel lowest(5180MHz)、Mid(5220MHz) and Highest(5240MHz).
5250MHz-5350MHz: Channel lowest(5260MHz)、Mid(5300MHz) and Highest(5320MHz).
5470MHz-5725MHz: Channel lowest(5500MHz)、Mid(5580MHz) and Highest(5700MHz)with 6.5Mbps data rate are chosen for full testing

n HT 40 mode:
5150MHz-5250MHz: Channel lowest (5190MHz) and Highest (5230MHz).
5250MHz-5350MHz: Channel lowest (5270MHz) and Highest (5310MHz).
5470MHz-5725MHz: Channel lowest(5510MHz)、Mid(5550MHz) and Highest(5670MHz)with 13.5Mbps data rate are chosen for full testing

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 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/n WLAN Transmitter for channel Low, Mid and High, the worst case E2 position was reported for 802.11a (5220MHz, 5260MHz, 5500MHz).

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

For radiation spurious emission test relevant n_HT20&HT40, MIMO mode that generates the higher emission is chosen to be tested in comparison with transmission at SISO mode.

5. MEASUREMENT UNCERTAINTY

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

Radiated Spurious Emission:

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

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

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

6. The MAXIMUM OUTPUT POWER MEASUREMENT

6.1 Standard Applicable:

According to §15.407(a)

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

According to RSS-210 A9.2

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

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

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

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

3. For the band 5725-5825 MHz, the maximum conducted output power shall not exceed 1.0 W or 17 + 10 log10 B, dBm, whichever power is less. The power spectral density shall not exceed 17 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 4.0 W or 23 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

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

   where B is the 26dB emission bandwidth in MHz.

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

Effective Legacy Gain = -0.07+3.01=2.94dBi (5150MHz-5250MHz)

Effective Legacy Gain = 0.13+3.01=3.14dBi (5250MHz-5350MHz)

Effective Legacy Gain = 1.42+3.01=4.43dBi (5470MHz-5725MHz)

6.2 Measurement Procedure

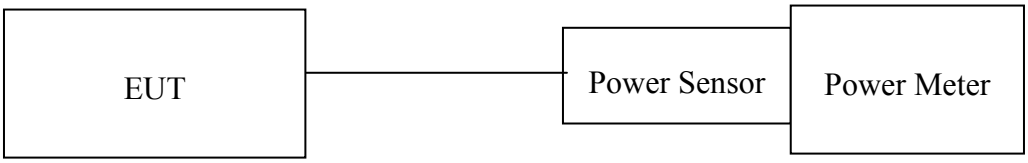
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
3. Set the offset 10*log(1/x), n_HT20=0.10, n_HT40=0.12
4. Record the max. reading.
5. Repeat above procedures until all frequency (low, middle, and high channel) measured were complete.
6. Employing step 1 to4 obtaining per-chain basis in MIMO operation, and sum the power in linear to result the output of MIMO operation at frequency of interest (, where MIMO is applicable).

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

6.3 Measurement Equipment Used:

SGS Conducted Room					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Spectrum Analyzer	Agilent	N9010A	MY53400256	2014/10/15	2015/10/14
Power Meter	Anritsu	ML2496A	1326001	2014/06/20	2015/06/19
Power Sensor	Anritsu	MA2411B	1315048	2014/06/20	2015/06/19
Power Sensor	Anritsu	MA2411B	1315049	2014/06/20	2015/06/19
Coaxial Cable 30cm	WOKEN	00100A1F1A195C	2	2014/01/06	2015/01/05
DC Block	Mini-Circuits	BLK-18-S+	4	2014/01/06	2015/01/05
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-019	2014/01/06	2015/01/05
Attenuator	WOKEN	218FS-10	7	2014/01/06	2015/01/05
Bluetooth Test Set	Anritsu	8852B	1329002	2014/07/16	2015/07/15

6.4 Test Set-up:



6.5 Measurement Result

802.11a MIMO operation CH0

Cable loss = 0		The Maximum Output Power	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
36	5180	11.10	**16.99dBm or 4+10log(B) = 18.36dBm**
44	5220	**12.87**	**16.99dBm or 4+10log(B) = 18.53dBm**
48	5240	12.36	**16.99dBm or 4+10log(B) = 18.64dBm**
52	5260	13.67	**23.98dBm or 11+10log(B) = 25.91dBm**
60	5300	**14.03**	**23.98dBm or 11+10log(B) = 25.71dBm**
64	5320	12.08	**23.98dBm or 11+10log(B) = 25.76dBm**
100	5500	**14.44**	**23.98dBm or 11+10log(B) = 25.58dBm**
116	5580	13.89	**23.98dBm or 11+10log(B) = 25.58dBm**
140	5700	**11.85**	**23.98dBm or 11+10log(B) = 25.67dBm**

Note: Limit is re-adjusted in terms of dBm

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

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

Note: Cable loss is 11.5dB is set as the offset on the spectrum to compensate the loss causing by cable

.

802.11a MIMO operation CH1

Cable loss = 0		The Maximum Output Power	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
36	5180	12.00	16.99dBm or 4+10log(B) = 18.36dBm
44	5220	**12.97**	16.99dBm or 4+10log(B) = 18.53dBm
48	5240	12.88	16.99dBm or 4+10log(B) = 18.64dBm
52	5260	**14.52**	23.98dBm or 11+10log(B) = 25.91dBm
60	5300	14.21	23.98dBm or 11+10log(B) = 25.71dBm
64	5320	13.24	23.98dBm or 11+10log(B) = 25.76dBm
100	5500	**14.38**	23.98dBm or 11+10log(B) = 25.58dBm
116	5580	13.91	23.98dBm or 11+10log(B) = 25.58dBm
140	5700	**11.29**	23.98dBm or 11+10log(B) = 25.67dBm

Note: Offset 11.5dB

802.11a MIMO operation CH0+CH1

Cable loss = 0		The Maximum Output Power	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
36	5180	14.58	16.99dBm or 4+10log(B) = 18.36dBm
44	5220	**15.93**	16.99dBm or 4+10log(B) = 18.53dBm
48	5240	15.64	16.99dBm or 4+10log(B) = 18.64dBm
52	5260	17.13	23.98dBm or 11+10log(B) = 25.91dBm
60	5300	**17.13**	23.98dBm or 11+10log(B) = 25.71dBm
64	5320	15.71	23.98dBm or 11+10log(B) = 25.76dBm
100	5500	**17.42**	23.98dBm or 11+10log(B) = 25.58dBm
116	5580	16.91	23.98dBm or 11+10log(B) = 25.58dBm
140	5700	**14.59**	23.98dBm or 11+10log(B) = 25.67dBm

Note: Offset 11.5dB

802.11n HT20 MIMO operation CH0

Cable loss = 0		The Maximum Output Power CH 0	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS8	
36	5180	10.80	16.99dBm or 4+10log(B) = 18.27dBm
44	5220	**12.02**	16.99dBm or 4+10log(B) = 18.17dBm
48	5240	11.72	16.99dBm or 4+10log(B) = 18.18dBm
52	5260	**11.59**	23.98dBm or 11+10log(B) = 25.24dBm
60	5300	11.35	23.98dBm or 11+10log(B) = 25.13dBm
64	5320	10.67	23.98dBm or 11+10log(B) = 25.23dBm
100	5500	**12.04**	23.98dBm or 11+10log(B) = 25.21dBm
116	5580	11.78	23.98dBm or 11+10log(B) = 25.28dBm
140	5700	**10.16**	23.98dBm or 11+10log(B) = 25.17dBm

Note: Offset 11.5dB

802.11n HT20 MIMO operation CH 1

Cable loss = 0		The Maximum Output Power CH 1	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS8	
36	5180	11.88	16.99dBm or 4+10log(B) = 18.27dBm
44	5220	12.41	16.99dBm or 4+10log(B) = 18.17dBm
48	5240	**12.56**	16.99dBm or 4+10log(B) = 18.18dBm
52	5260	**12.72**	23.98dBm or 11+10log(B) = 25.24dBm
60	5300	12.46	23.98dBm or 11+10log(B) = 25.13dBm
64	5320	11.62	23.98dBm or 11+10log(B) = 25.23dBm
100	5500	**12.20**	23.98dBm or 11+10log(B) = 25.21dBm
116	5580	12.15	23.98dBm or 11+10log(B) = 25.28dBm
140	5700	**9.59**	23.98dBm or 11+10log(B) = 25.17dBm

Note: Offset 11.5dB

802.11n HT20 MIMO operation CH 0 + CH 1

Cable loss = 0		The Maximum Output Power CH 0 +CH 1	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS8	
36	5180	14.38	16.99dBm or 4+10log(B) = 18.27dBm
44	5220	**15.23**	16.99dBm or 4+10log(B) = 18.17dBm
48	5240	15.17	16.99dBm or 4+10log(B) = 18.18dBm
52	5260	**15.20**	23.98dBm or 11+10log(B) = 25.24dBm
60	5300	14.95	23.98dBm or 11+10log(B) = 25.13dBm
64	5320	14.18	23.98dBm or 11+10log(B) = 25.23dBm
100	5500	**15.13**	23.98dBm or 11+10log(B) = 25.21dBm
116	5580	14.98	23.98dBm or 11+10log(B) = 25.28dBm
140	5700	**12.89**	23.98dBm or 11+10log(B) = 25.17dBm

Note: Offset 11.5dB

802.11n HT40 MIMO operation CH 0

Cable loss = 0		The Maximum Output Power CH 0	
CH	**Frequency (MHz)**	**Data Rate**	**Required Limit**
		MCS8	
38	5190	9.91	**16.99dBm or 4+10log(B) = 20.53dBm**
46	5230	**12.33**	**16.99dBm or 4+10log(B) = 20.55dBm**
54	5270	**12.05**	**23.98dBm or 11+10log(B) = 27.66dBm**
62	5310	8.24	**23.98dBm or 11+10log(B) = 27.56dBm**
102	5510	8.85	**23.98dBm or 11+10log(B) = 27.48dBm**
110	5550	**12.38**	**23.98dBm or 11+10log(B) = 27.52dBm**
134	5670	**10.78**	**23.98dBm or 11+10log(B) = 27.71dBm**

Note: Offset 11.5dB

802.11n HT40 MIMO operation CH 1

Cable loss = 0		The Maximum Output Power CH 1	
CH	**Frequency (MHz)**	**Data Rate**	**Required Limit**
		MCS8	
38	5190	11.00	**16.99dBm or 4+10log(B) = 20.53dBm**
46	5230	**12.37**	**16.99dBm or 4+10log(B) = 20.55dBm**
54	5270	**12.37**	**23.98dBm or 11+10log(B) = 27.66dBm**
62	5310	9.34	**23.98dBm or 11+10log(B) = 27.56dBm**
102	5510	8.96	**23.98dBm or 11+10log(B) = 27.48dBm**
110	5550	**12.36**	**23.98dBm or 11+10log(B) = 27.52dBm**
134	5670	**10.27**	**23.98dBm or 11+10log(B) = 27.71dBm**

Note: Offset 11.5dB

802.11n HT40 MIMO operation CH 0 + CH 1

Cable loss = 0		The Maximum Output Power CH 0 +CH1	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS8	
38	5190	13.50	16.99dBm or 4+10log(B) = 20.53dBm
46	5230	**15.36**	16.99dBm or 4+10log(B) = 20.55dBm
54	5270	**15.22**	23.98dBm or 11+10log(B) = 27.66dBm
62	5310	11.84	23.98dBm or 11+10log(B) = 27.56dBm
102	5510	11.92	23.98dBm or 11+10log(B) = 27.48dBm
110	5550	**15.38**	23.98dBm or 11+10log(B) = 27.52dBm
134	5670	**13.54**	23.98dBm or 11+10log(B) = 27.71dBm

Note: Offset 11.5dB

ERP/EIRP Measurement:

802.11a MIMO operation CH 0

Cable loss = 0		EIRP	
CH	**Frequency (MHz)**	**Data Rate**	**Required Limit**
		6	
36	5180	14.04	**23.01dBm or 10+10log(B) = 16.38dBm**
44	5220	**15.81**	**23.01dBm or 10+10log(B) = 16.35dBm**
48	5240	15.30	**23.01dBm or 10+10log(B) = 16.35dBm**
52	5260	16.81	**30.00dBm or 17+10log(B) = 23.35dBm**
60	5300	**17.17**	**30.00dBm or 17+10log(B) = 23.38dBm**
64	5320	15.22	**30.00dBm or 17+10log(B) = 23.35dBm**
100	5500	**18.87**	**30.00dBm or 17+10log(B) = 23.41dBm**
116	5580	18.32	**30.00dBm or 17+10log(B) = 23.35dBm**
140	5700	**16.28**	**30.00dBm or 17+10log(B) = 23.35dBm**

Note: Limit is re-adjusted in terms of dBm

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

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

Note: Cable loss is 11.5dB is set as the offset on the spectrum to compensate the loss causing by cable

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802.11a MIMO operation CH 1

Cable loss = 0		EIRP	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
36	5180	14.94	23.01dBm or 10+10log(B) = 16.38dBm
44	5220	**15.91**	23.01dBm or 10+10log(B) = 16.35dBm
48	5240	15.82	23.01dBm or 10+10log(B) = 16.35dBm
52	5260	**17.66**	30.00dBm or 17+10log(B) = 23.35dBm
60	5300	17.35	30.00dBm or 17+10log(B) = 23.38dBm
64	5320	16.38	30.00dBm or 17+10log(B) = 23.35dBm
100	5500	**18.81**	30.00dBm or 17+10log(B) = 23.41dBm
116	5580	18.34	30.00dBm or 17+10log(B) = 23.35dBm
140	5700	**15.72**	30.00dBm or 17+10log(B) = 23.35dBm

Note: Offset 11.5dB

802.11a MIMO operation CH0 + CH1

Cable loss = 0		EIRP	
CH	Frequency (MHz)	Data Rate	Required Limit
		6	
36	5180	17.52	23.01dBm or 10+10log(B) = 16.38dBm
44	5220	**18.87**	23.01dBm or 10+10log(B) = 16.35dBm
48	5240	18.58	23.01dBm or 10+10log(B) = 16.35dBm
52	5260	**20.27**	30.00dBm or 17+10log(B) = 23.35dBm
60	5300	20.27	30.00dBm or 17+10log(B) = 23.38dBm
64	5320	18.85	30.00dBm or 17+10log(B) = 23.35dBm
100	5500	**21.85**	30.00dBm or 17+10log(B) = 23.41dBm
116	5580	21.34	30.00dBm or 17+10log(B) = 23.35dBm
140	5700	**19.02**	30.00dBm or 17+10log(B) = 23.35dBm

Note: Offset 11.5dB

802.11n HT20 MIMO operation CH0

Cable loss = 0		EIRP CH 0	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS8	
36	5180	13.74	**23.01dBm or 10+10log(B) = 16.58dBm**
44	5220	**14.96**	**23.01dBm or 10+10log(B) = 16.55dBm**
48	5240	14.66	**23.01dBm or 10+10log(B) = 16.58dBm**
52	5260	**14.73**	**30.00dBm or 17+10log(B) = 23.58dBm**
60	5300	14.49	**30.00dBm or 17+10log(B) = 23.61dBm**
64	5320	13.81	**30.00dBm or 17+10log(B) = 23.58dBm**
100	5500	**16.47**	**30.00dBm or 17+10log(B) = 23.58dBm**
116	5580	16.21	**30.00dBm or 17+10log(B) = 23.58dBm**
140	5700	**14.59**	**30.00dBm or 17+10log(B) = 23.55dBm**

Note: Offset 11.5dB

802.11n HT20 MIMO operation CH 1

Cable loss = 0		EIRP CH 1	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS8	
36	5180	14.82	**23.01dBm or 10+10log(B) = 16.58dBm**
44	5220	15.35	**23.01dBm or 10+10log(B) = 16.55dBm**
48	5240	**15.50**	**23.01dBm or 10+10log(B) = 16.58dBm**
52	5260	**15.86**	**30.00dBm or 17+10log(B) = 23.58dBm**
60	5300	15.60	**30.00dBm or 17+10log(B) = 23.61dBm**
64	5320	14.76	**30.00dBm or 17+10log(B) = 23.58dBm**
100	5500	**16.63**	**30.00dBm or 17+10log(B) = 23.58dBm**
116	5580	16.58	**30.00dBm or 17+10log(B) = 23.58dBm**
140	5700	**14.02**	**30.00dBm or 17+10log(B) = 23.55dBm**

Note: Offset 11.5dB

802.11n HT20 MIMO operation CH 0 + CH 1

Cable loss = 0		EIRP CH 0 +CH 1	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS8	
36	5180	17.32	23.01dBm or 10+10log(B) = 16.58dBm
44	5220	**18.17**	23.01dBm or 10+10log(B) = 16.55dBm
48	5240	18.11	23.01dBm or 10+10log(B) = 16.58dBm
52	5260	**18.34**	30.00dBm or 17+10log(B) = 23.58dBm
60	5300	18.09	30.00dBm or 17+10log(B) = 23.61dBm
64	5320	17.32	30.00dBm or 17+10log(B) = 23.58dBm
100	5500	**19.56**	30.00dBm or 17+10log(B) = 23.58dBm
116	5580	19.41	30.00dBm or 17+10log(B) = 23.58dBm
140	5700	**17.32**	30.00dBm or 17+10log(B) = 23.55dBm

Note: Offset 11.5dB

802.11n HT40 MIMO operation CH 0

Cable loss = 0		EIRP CH 0	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS8	
38	5190	12.85	23.01dBm or 10+10log(B) = 19.61dBm
46	5230	**15.27**	23.01dBm or 10+10log(B) = 19.63dBm
54	5270	**15.19**	30.00dBm or 17+10log(B) = 26.63dBm
62	5310	11.38	30.00dBm or 17+10log(B) = 26.59dBm
102	5510	13.28	30.00dBm or 17+10log(B) = 26.61dBm
110	5550	**16.81**	30.00dBm or 17+10log(B) = 26.63dBm
134	5670	**15.21**	30.00dBm or 17+10log(B) = 26.61dBm

Note: Offset 11.5dB

802.11n HT40 MIMO operation CH 1

Cable loss = 0		EIRP CH 1	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS8	
38	5190	13.94	**23.01dBm or 10+10log(B) = 19.61dBm**
46	5230	**15.31**	**23.01dBm or 10+10log(B) = 19.63dBm**
54	5270	**15.51**	**30.00dBm or 17+10log(B) = 26.63dBm**
62	5310	12.48	**30.00dBm or 17+10log(B) = 26.59dBm**
102	5510	13.39	**30.00dBm or 17+10log(B) = 26.61dBm**
110	5550	**16.79**	**30.00dBm or 17+10log(B) = 26.63dBm**
134	5670	**14.70**	**30.00dBm or 17+10log(B) = 26.61dBm**

Note: Offset 11.5dB

802.11n HT40 MIMO operation CH 0 + CH 1

Cable loss = 0		EIRPCH 0 +CH1	
CH	Frequency (MHz)	Data Rate	Required Limit
		MCS8	
38	5190	16.44	**23.01dBm or 10+10log(B) = 19.61dBm**
46	5230	**18.30**	**23.01dBm or 10+10log(B) = 19.63dBm**
54	5270	**18.36**	**30.00dBm or 17+10log(B) = 26.63dBm**
62	5310	14.98	**30.00dBm or 17+10log(B) = 26.59dBm**
102	5510	16.35	**30.00dBm or 17+10log(B) = 26.61dBm**
110	5550	**19.81**	**30.00dBm or 17+10log(B) = 26.63dBm**
134	5670	**17.97**	**30.00dBm or 17+10log(B) = 26.61dBm**

Note: Offset 11.5dB

* Note: EIRP = Average Power + Gain, where the nominal gain of the antenna: 2.94dBi for 5150-5250MHz (MIMO), 3.14dBi for 5250-5350MHz(MIMO) and 4.43dBi for 5470-5725MHz (MIMO) where MIMO gain = directive gain + nominal gain.

7. UNDESIRABLE EMISSION - RADIATED MEASUREMENT

7.1 Standard Applicable

According to §15.407(b) (6) (7),

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

(1) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in Section 15.207.

(2) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

(3) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

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

§15.205- RESTRICTED BANDS OF OPERATIONS

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

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

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

[2] Above 38.6

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

§15.209- RADIATED EMISSION LIMITS: GENERAL REQUIREMENTS

FCC PART 15.209

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

According to RSS-Gen section 4.9 Transmitter Unwanted Emissions

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

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

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

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

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

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

When limits are expressed in absolute terms, compliance with the emission limits shall be demonstrated using a CISPR quasi-peak detector and the related measurement bandwidth for emissions below1000MHz. As an alternative to CISPR quasi-peak measurement, compliance with the emission limits can be demonstrated using measuring equipment employing a peak detector function properly adjusted for factors such as pulse desensitization as required, with an equal or greater measurement bandwidth relative to the applicable CISPR quasi-peak bandwidth.

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

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

Restricted bands, identified in Table 1, are designated primarily for safety-of-life services (distress calling and certain aeronautical bands), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following restrictions apply:

(a) Fundamental components of modulation of licence-exempt radio apparatus shall not fall within the restricted bands of Table 1;

(b) Unwanted emissions falling into restricted bands of Table 1 shall comply with the limits specified in RSS-Gen;

(c) Unwanted emissions not falling within restricted frequency bands shall either comply with the limits specified in the applicable RSS, or with those specified in RSS-Gen.

Table 3: Restricted Frequency Bands (Note)

MHz
0.090-0.110
2.1735-2.1905
3.020-3.026
4.125-4.128
4.17725-4.17775
4.20725-4.20775
5.677-5.683
6.215-6.218
6.26775-6.26825
6.31175-6.31225
8.291-8.294
8.362-8.366
8.37625-8.38675
8.41425-8.41475
12.29-12.293
12.51975-12.52025
12.57675-12.57725
13.36-13.41
16.42-16.423
16.69475-16.69525
16.80425-16.80475
25.5-25.67
37.5-38.25
73-74.6
74.8-75.2
108-138
156.52475-156.52525
156.7-156.9

MHz
240-285
322-335.4
399.9-410
608-614
960-1427
1435-1626.5
1645.5-1646.5
1660-1710
1718.8-1722.2
2200-2300
2310-2390
2655-2900
3260-3267
3332-3339
3345.8-3358
3500-4400
4500-5150
5350-5460
7250-7750
8025-8500

GHz
9.0-9.2
9.3-9.5
10.6-12.7
13.25-13.4
14.47-14.5
15.35-16.2
17.7-21.4
22.01-23.12
23.6-24.0
31.2-31.8
36.43-36.5
Above 38.6

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

7.1.1 Transmitter Spurious Emission Limits

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

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

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

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

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

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

Limit derivation in terms of Field Strength:

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

E = 1000000* (30*EIRP)^(1/2) / 3 uV/m
= 68.3dBuV/m

7.2 EUT Setup

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

7.3 Measurement Procedure

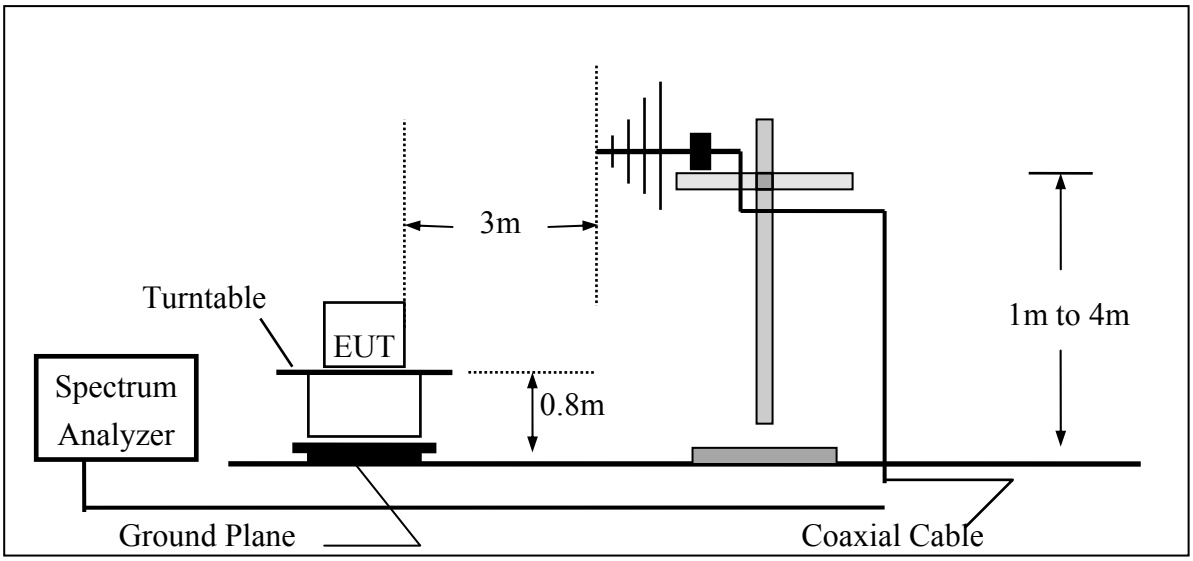
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was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

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

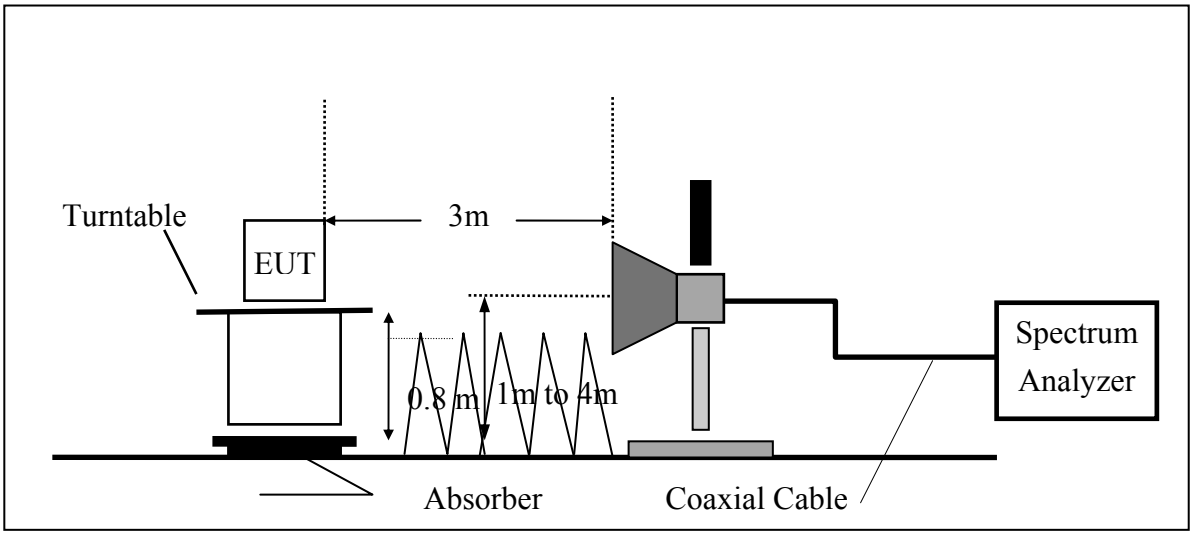
For Measurement above 1GHz, for peak unwanted emission measurements follow the KDB 789033 D01 requirements in section H)5) b), for average unwanted emission measurements follow the KDB 789033 D01 requirements in section H)6) c) or d).

7.4 Test SET-UP (Block Diagram of Configuration)

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



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



7.5 Measurement Equipment Used:

SGS SAC Chamber No.C					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
EMI Test Receiver	R&S	ESU 40	100363	2014/04/12	2015/04/11
Loop Antenna	ETS-Lindgren	6502	00143303	2014/01/16	2015/01/15
Broadband Antenna	TESEQ	CBL 6112D	35240	2014/01/17	2015/01/16
Horn Antenna	ETS-Lindgren	3117	00143272	2014/01/27	2015/01/26
Horn Antenna	ETS-Lindgren	3160-09	00117911	2014/01/22	2015/01/21
Horn Antenna	ETS-Lindgren	3160-10	00117783	2014/01/22	2015/01/21
Pre Amplifier	R&S	SCU-18	10204	2014/03/26	2015/03/25
Pre Amplifier	R&S	SCU-26	100780	2014/03/26	2015/03/25
Pre Amplifier	R&S	SCU-40	100356	2014/03/26	2015/03/25
Pre Amplifier	EMC Instruments	EMC330	980096	2014/03/26	2015/03/25
Coaxial Cable	Huber+Suhner	RG 214/U	W21.03	2014/03/26	2015/03/25
Coaxial Cable	Huber+Suhner	RG 214/U	W22.03	2014/03/26	2015/03/25
Coaxial Cable	Huber+Suhner	SUCCOFLEX 104	MY17413/4	2014/03/26	2015/03/25
Coaxial Cable	Huber+Suhner	SUCCOFLEX 104	MY17404/4	2014/03/26	2015/03/25
Coaxial Cable	Huber+Suhner	SUCCOFLEX 104	MY17394/4	2014/03/26	2015/03/25
Coaxial Cable	Huber+Suhner	SUCCOFLEX 104	MY17386/4	2014/03/26	2015/03/25
Coaxial Cable	Huber+Suhner	SUCCOFLEX 104	MY17388/4	2014/03/26	2015/03/25
Attenuator	WOKEN	218FS-10	HY-151	2014/01/06	2015/01/05
Controller	MF	MF-7802	N/A	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Turn Table	MF	N/A	N/A	N.C.R.	N.C.R.
Site NSA	SGS	966 Chamber C	SAC-C	2014/03/05	2015/03/04
Site VSWR	SGS	966 Chamber C	SAC-C	2014/04/10	2015/04/09
Test Software	World-Pallas	Dr. E	V 3.0 Lite	N.C.R.	N.C.R.

7.6 Field Strength Calculation

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

FS = RA + AF + CL - AG

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

7.7 Measurement Result

Refer to attach tabular data sheets.

NOTE:

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

Radiated Spurious Emission Measurement Result 802.11a, 5150~5250 MHz (Worst Case)

Operation Band	:802.11 a	Test Date	:2014-11-26
Fundamental Frequency	:5220 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:TX LOW	Engineer	:Tai
EUT Pol.	:E2 Plan	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.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
10440.00	Peak	H	37.17	15.68	52.85	74.00	-21.15
10440.00	Average	H	24.15	15.68	39.83	54.00	-14.17
15660.00	Peak	H	---				
20880.00	Peak	H	---				
26100.00	Peak	H	---				
31320.00	Peak	H	---				
36540.00	Peak	H	---				

Operation Band	:802.11 a	Test Date	:2014-11-26
Fundamental Frequency	:5220 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:TX MID	Engineer	:Tai
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
10440.00	Peak	H	36.77	15.68	52.45	74.00	-21.55
10440.00	Average	H	23.92	15.68	39.60	54.00	-14.40
15660.00	Peak	H	---				
20880.00	Peak	H	---				
26100.00	Peak	H	---				
31320.00	Peak	H	---				
36540.00	Peak	H	---				

Operation Band	:802.11 a	Test Date	:2014-11-26
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge LOW	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5148.88	Peak	S	60.91	6.11	67.02	74.00	-6.98
5148.88	Average	S	34.36	6.11	40.47	54.00	-13.53
5150.00	Peak	E	59.44	6.12	65.55	74.00	-8.45
5150.00	Average	E	35.31	6.12	41.43	54.00	-12.58

Operation Band	:802.11 a	Test Date	:2014-11-26
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge LOW	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5147.80	Peak	S	60.69	6.11	66.80	74.00	-7.20
5147.80	Average	S	34.93	6.11	41.04	54.00	-12.96
5150.00	Peak	E	60.64	6.12	66.76	74.00	-7.24
5150.00	Average	E	35.92	6.12	42.04	54.00	-11.97

Radiated Emission Measurement Result 802.11n HT20, 5150~5250 MHz (MIMO)

Operation Band	:802.11 n20M	Test Date	:2014-11-26
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge LOW	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5145.88	Peak	S	59.85	6.10	65.95	74.00	-8.05
5145.88	Average	S	33.51	6.10	39.61	54.00	-14.39
5150.00	Peak	E	59.90	6.12	66.01	74.00	-7.99
5150.00	Average	E	35.72	6.12	41.84	54.00	-12.17

Operation Band	:802.11 n20M	Test Date	:2014-11-26
Fundamental Frequency	:5180 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge LOW	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5145.88	Peak	S	65.41	6.10	71.51	74.00	-2.49
5145.88	Average	S	36.50	6.10	42.60	54.00	-11.40
5150.00	Peak	E	65.21	6.12	71.33	74.00	-2.67
5150.00	Average	E	39.52	6.12	45.64	54.00	-8.36

Radiated Emission Measurement Result 802.11n HT40, 5150~5250 MHz (MIMO)

Operation Band	:802.11 n40M	Test Date	:2014-11-26
Fundamental Frequency	:5190 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge LOW	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5150.00	Peak	E	59.57	6.12	65.69	74.00	-8.31
5150.00	Average	E	39.95	6.12	46.07	54.00	-7.93

Operation Band	:802.11 n40M	Test Date	:2014-11-26
Fundamental Frequency	:5190 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge LOW	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5147.44	Peak	S	63.11	6.11	69.22	74.00	-4.78
5147.44	Average	S	41.86	6.11	47.97	54.00	-6.03
5150.00	Peak	E	65.22	6.12	71.33	74.00	-2.67
5150.00	Average	E	44.07	6.12	50.19	54.00	-3.82

Radiated Spurious Emission Measurement Result 802.11a, 5250MHz-5350MHz (Worst Case)

Operation Band	:802.11 a	Test Date	:2014-11-26
Fundamental Frequency	:5260 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:TX LOW	Engineer	:Jerry
EUT Pol.	:E2 Plan	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.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
10520.00	Peak	H	48.29	16.27	64.56	74.00	-9.44
10520.00	Average	H	33.22	16.27	49.49	54.00	-4.51
15780.00	Peak	H	---				
21040.00	Peak	H	---				
26300.00	Peak	H	---				
31560.00	Peak	H	---				
36820.00	Peak	H	---				

Operation Band	:802.11 a	Test Date	:2014-11-26
Fundamental Frequency	:5260 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:TX LOW	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
10520.00	Peak	H	46.54	16.48	63.02	74.00	-10.98
10520.00	Average	H	33.76	16.48	50.24	54.00	-3.76
15780.00	Peak	H	---				
21040.00	Peak	H	---				
26300.00	Peak	H	---				
31560.00	Peak	H	---				
36820.00	Peak	H	---				

Operation Band	:802.11 a	Test Date	:2014-11-26
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge HIGH	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5350.00	Peak	E	56.57	6.66	63.23	74.00	-10.77
5350.00	Average	E	33.05	6.66	39.71	54.00	-14.30
5353.20	Peak	S	52.40	6.65	59.06	74.00	-14.94
5353.20	Average	S	32.12	6.65	38.77	54.00	-15.23

Operation Band	:802.11 a	Test Date	:2014-11-26
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge HIGH	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5350.00	Peak	E	61.81	6.66	68.46	74.00	-5.54
5350.00	Average	E	33.99	6.66	40.65	54.00	-13.36

Radiated Emission Measurement Result 802.11n HT20, 5250~5350 MHz (MIMO)

Operation Band	:802.11 n20M	Test Date	:2014-11-26
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge HIGH	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5350.00	Peak	E	60.14	6.66	66.79	74.00	-7.21
5350.00	Average	E	35.92	6.66	42.58	54.00	-11.43
5354.52	Peak	S	57.95	6.65	64.60	74.00	-9.40
5354.52	Average	S	33.53	6.65	40.18	54.00	-13.82

Operation Band	:802.11 n20M	Test Date	:2014-11-26
Fundamental Frequency	:5320 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge HIGH	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5350.00	Peak	E	60.51	6.66	67.16	74.00	-6.84
5350.00	Average	E	36.99	6.66	43.65	54.00	-10.36
5355.48	Peak	S	59.01	6.65	65.66	74.00	-8.34
5355.48	Average	S	34.17	6.65	40.82	54.00	-13.18

Radiated Emission Measurement Result 802.11n HT40, 5250~5350 MHz (MIMO)

Operation Band	:802.11 n40M	Test Date	:2014-11-26
Fundamental Frequency	:5310 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge HIGH	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5350.00	Peak	E	59.81	6.66	66.47	74.00	-7.53
5350.00	Average	E	40.86	6.66	47.52	54.00	-6.48

Operation Band	:802.11 n40M	Test Date	:2014-11-26
Fundamental Frequency	:5310 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge HIGH	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5350.00	Peak	E	63.33	6.66	69.99	74.00	-4.01
5350.00	Average	E	43.65	6.66	50.31	54.00	-3.69
5352.68	Peak	S	62.51	6.65	69.16	74.00	-4.84
5352.68	Average	S	41.83	6.65	48.48	54.00	-5.52

Radiated Spurious Emission Measurement Result 802.11a, 5470~5725 MHz (Worst Case)

Operation Band	:802.11 a	Test Date	:2014-11-26
Fundamental Frequency	:5500 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:TX LOW	Engineer	:Jerry
EUT Pol.	:E2 Plan	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.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
11000.00	Peak	H	44.64	16.23	60.87	74.00	-13.13
11000.00	Average	H	28.53	16.23	44.76	54.00	-9.24
16500.00	Peak	H	---				
22000.00	Peak	H	---				
27500.00	Peak	H	---				
33000.00	Peak	H	---				
38500.00	Peak	H	---				

Operation Band	:802.11 a	Test Date	:2014-11-26
Fundamental Frequency	:5500 MHz	Temp./Humi.	:24 deg_C / 61 RH
Operation Mode	:TX LOW	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
11000.00	Peak	H	43.30	16.38	59.68	74.00	-14.32
11000.00	Average	H	28.32	16.38	44.70	54.00	-9.30
16500.00	Peak	H	---				
22000.00	Peak	H	---				
27500.00	Peak	H	---				
33000.00	Peak	H	---				
38500.00	Peak	H	---				

Operation Band	:802.11 a	Test Date	:2014-11-26
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge LOW	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5458.40	Peak	S	52.91	6.43	59.34	74.00	-14.66
5458.40	Average	S	32.47	6.43	38.90	54.00	-15.10
5460.00	Peak	E	51.49	6.43	57.92	74.00	-16.08
5460.00	Average	E	32.48	6.43	38.91	54.00	-15.09
5468.72	Peak	S	62.14	6.41	68.56	74.00	-5.44
5468.72	Average	S	35.69	6.41	42.10	54.00	-11.90
5470.00	Peak	E	60.63	6.41	67.04	74.00	-6.96
5470.00	Average	E	36.07	6.41	42.48	54.00	-11.52

Operation Band	:802.11 a	Test Date	:2014-11-26
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge LOW	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5459.36	Peak	S	56.24	6.43	62.67	74.00	-11.33
5459.36	Average	S	33.23	6.43	39.66	54.00	-14.34
5460.00	Peak	E	54.63	6.43	61.06	74.00	-12.94
5460.00	Average	E	33.31	6.43	39.74	54.00	-14.26
5468.36	Peak	S	65.48	6.41	71.89	74.00	-2.11
5468.36	Average	S	37.45	6.41	43.86	54.00	-10.14
5470.00	Peak	E	64.54	6.41	70.95	74.00	-3.05
5470.00	Average	E	38.43	6.41	44.84	54.00	-9.16

Operation Band	:802.11 a	Test Date	:2014-11-26
Fundamental Frequency	:5700 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge HIGH	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5725.00	Peak	E	63.68	7.15	70.84	74.00	-3.16
5725.00	Average	E	38.38	7.15	45.53	54.00	-8.47
5729.96	Peak	S	61.72	7.21	68.92	74.00	-5.08
5729.96	Average	S	34.26	7.21	41.47	54.00	-12.53

Operation Band	:802.11 a	Test Date	:2014-11-26
Fundamental Frequency	:5700 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge HIGH	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5725.00	Peak	E	63.16	7.15	70.31	74.00	-3.69
5725.00	Average	E	38.39	7.15	45.54	54.00	-8.46
5726.60	Peak	S	64.14	7.17	71.31	74.00	-2.69
5726.60	Average	S	38.28	7.17	45.45	54.00	-8.55

Radiated Emission Measurement Result 802.11n HT20, 5470~5725 MHz (MIMO)

Operation Band	:802.11 n20M	Test Date	:2014-11-26
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge LOW	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5452.16	Peak	S	51.33	6.45	57.78	74.00	-16.22
5452.16	Average	S	32.11	6.45	38.56	54.00	-15.44
5460.00	Peak	E	54.39	6.43	60.82	74.00	-13.18
5460.00	Average	E	32.58	6.43	39.01	54.00	-14.99
5465.60	Peak	S	61.27	6.42	67.68	74.00	-6.32
5465.60	Average	S	33.85	6.42	40.27	54.00	-13.73
5470.00	Peak	E	59.79	6.41	66.20	74.00	-7.80
5470.00	Average	E	35.96	6.41	42.37	54.00	-11.63

Operation Band	:802.11 n20M	Test Date	:2014-11-26
Fundamental Frequency	:5500 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge LOW	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5452.16	Peak	S	55.49	6.45	61.94	74.00	-12.06
5452.16	Average	S	32.05	6.45	38.50	54.00	-15.50
5460.00	Peak	E	56.85	6.43	63.28	74.00	-10.72
5460.00	Average	E	32.75	6.43	39.18	54.00	-14.82
5466.68	Peak	S	65.86	6.42	72.28	74.00	-1.72
5466.68	Average	S	36.06	6.42	42.48	54.00	-11.52
5470.00	Peak	E	64.85	6.41	71.26	74.00	-2.74
5470.00	Average	E	38.55	6.41	44.96	54.00	-9.04

Operation Band	:802.11 n20M	Test Date	:2014-11-26
Fundamental Frequency	:5700 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge HIGH	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5725.00	Peak	E	57.11	7.15	64.27	74.00	-9.73
5725.00	Average	E	34.45	7.15	41.60	54.00	-12.40
5729.72	Peak	S	50.72	7.20	57.93	74.00	-16.07
5729.72	Average	S	31.34	7.20	38.54	54.00	-15.46

Operation Band	:802.11 n20M	Test Date	:2014-11-26
Fundamental Frequency	:5700 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge HIGH	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5725.00	Peak	E	62.56	7.15	69.71	74.00	-4.29
5725.00	Average	E	38.85	7.15	46.00	54.00	-8.00
5729.12	Peak	S	58.63	7.20	65.82	74.00	-8.18
5729.12	Average	S	33.85	7.20	41.05	54.00	-12.95

Radiated Emission Measurement Result 802.11n HT40, 5470~5725 MHz (MIMO)

Operation Band	:802.11 n40M	Test Date	:2014-11-26
Fundamental Frequency	:5510 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge LOW	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5455.32	Peak	S	51.21	6.44	57.65	74.00	-16.35
5455.32	Average	S	32.10	6.44	38.54	54.00	-15.46
5460.00	Peak	E	53.28	6.43	59.71	74.00	-14.29
5460.00	Average	E	33.55	6.43	39.98	54.00	-14.02
5467.44	Peak	S	58.29	6.42	64.71	74.00	-9.29
5467.44	Average	S	38.36	6.42	44.78	54.00	-9.22
5470.00	Peak	E	58.64	6.41	65.05	74.00	-8.95
5470.00	Average	E	40.15	6.41	46.56	54.00	-7.44

Operation Band	:802.11 n40M	Test Date	:2014-11-26
Fundamental Frequency	:5510 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge LOW	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5455.56	Peak	S	54.09	6.44	60.53	74.00	-13.47
5455.56	Average	S	32.45	6.44	38.89	54.00	-15.11
5460.00	Peak	E	56.74	6.43	63.17	74.00	-10.83
5460.00	Average	E	35.05	6.43	41.48	54.00	-12.52
5467.56	Peak	S	62.80	6.41	69.21	74.00	-4.79
5467.56	Average	S	41.95	6.41	48.36	54.00	-5.64
5470.00	Peak	E	64.20	6.41	70.61	74.00	-3.39
5470.00	Average	E	43.60	6.41	50.01	54.00	-3.99

Operation Band	:802.11 n40M	Test Date	:2014-11-26
Fundamental Frequency	:5510 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge LOW	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:VERTICAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5725.00	Peak	E	45.74	7.15	52.89	74.00	-21.11
5725.00	Average	E	31.02	7.15	38.17	54.00	-15.83

Operation Band	:802.11 n40M	Test Date	:2014-11-26
Fundamental Frequency	:5510 MHz	Temp./Humi.	:25.4 deg_C / 57 RH
Operation Mode	:Bandedge LOW	Engineer	:Jerry
EUT Pol.	:E2 Plan	Measurement Antenna Pol.	:HORIZONTAL

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

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

Note : "F" : denotes Fundamental Frequency. ; "H" : denotes Harmonic Frequency.

"E" : denotes Band Edge Frequency. ; "S" : denotes Spurious Frequency.

"---" : denotes Noise Floor.

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

Freq.	Detector Mode	Note	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	PK/QP/AV	F/H/E/S	dBμV	dB	dBμV / m	dBμV / m	dB
5725.00	Peak	E	52.44	7.15	59.59	74.00	-14.41
5725.00	Average	E	32.58	7.15	39.73	54.00	-14.27
5734.16	Peak	S	49.77	7.25	57.02	74.00	-16.98
5734.16	Average	S	31.52	7.25	38.77	54.00	-15.23

8. ANTENNA REQUIREMENT

8.1 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.

8.2 Antenna Connected Construction

The directional gains of antenna used for transmitting is 1.42dBi for frequency band of 5150~5725MHz, 2.94dBi for 802.11 a/n20, 2.94dBi for 802.11 n40 (5150~5250MHz_MIMO gain); 3.14dBi for 802.11 a/n20, 3.14dBi for 802.11 n40 (5250~5350MHz_MIMO gain), and 4.43dBi for 802.11 a/n20, 4.43dBi for 802.11 n40 (5470~5725MHz_MIMO Gain). and the antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec.for details.