

FCC Test Report

Report No.: RF130702E05B R1

FCC ID: Q87-E2500V3

Test Model: E2500

Received Date: Feb. 22, 2016

Test Date: Mar. 17 to 24, 2016

Issued Date: Apr. 21, 2016

Applicant: Linksys LLC

Address: 121 Theory Drive Irvine California 92617 United States

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Hsin Chu Laboratory

Lab Address: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
Taiwan R.O.C.

Test Location (1): E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
Taiwan R.O.C.

Test Location (2): No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin
Chu Hsien 307, Taiwan R.O.C.



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty	6
2.2 Modification Record	6
3 General Information	7
3.1 General Description of EUT	7
3.2 Description of Test Modes	9
3.2.1 Test Mode Applicability and Tested Channel Detail	10
3.3 Duty Cycle of Test Signal	12
3.4 Description of Support Units	13
3.4.1 Configuration of System under Test	14
3.5 General Description of Applied Standard	15
4 Test Types and Results	16
4.1 Radiated Emission and Bandedge Measurement	16
4.1.1 Limits of Radiated Emission and Bandedge Measurement	16
4.1.2 Test Instruments	17
4.1.3 Test Procedure	18
4.1.4 Deviation from Test Standard	18
4.1.5 Test Setup	19
4.1.6 EUT Operating Condition	19
4.1.7 Test Results	20
4.2 Transmit Power Measurement	37
4.2.1 Limits of Transmit Power Measurement	37
4.2.2 Test Setup	38
4.2.3 Test Instruments	38
4.2.4 Test Procedure	38
4.2.5 Deviation from Test Standard	38
4.2.6 EUT Operating Condition	38
4.2.7 Test Result	39
4.3 Peak Power Spectral Density Measurement	40
4.3.1 Limits of Peak Power Spectral Density Measurement	40
4.3.2 Test Setup	40
4.3.3 Test Instruments	40
4.3.4 Test Procedure	41
4.3.5 Deviation from Test Standard	41
4.3.6 EUT Operating Condition	41
4.3.7 Test Results	42
4.4 Frequency Stability Measurement	46
4.4.1 Limits of Frequency Stability Measurement	46
4.4.2 Test Setup	46
4.4.3 Test Instruments	46
4.4.4 Test Procedure	46
4.4.5 Deviation from Test Standard	46
4.4.6 EUT Operating Condition	46
4.4.7 Test Results	47
4.5 6dB Bandwidth Measurement	48
4.5.1 Limits of 6dB Bandwidth Measurement	48
4.5.2 Test Setup	48
4.5.3 Test Instruments	48
4.5.4 Test Procedure	48
4.5.5 Deviation from Test Standard	48
4.5.6 EUT Operating Condition	48



4.5.7 Test Results	49
5 Pictures of Test Arrangements.....	51
Appendix – Information on the Testing Laboratories	52



A D T

Report Issue History Record

Issue No.	Reason for Change	Date Issued
RF130702E05 RF130702E05-1	Original	Aug. 09, 2013
RF130702E05B R1	Upgraded the standard to section 15.407 under new rule for U-NII-1 and U-NII-3 band.	Apr. 21, 2016

Release Control Record

Issue No.	Description	Date Issued
RF130702E05B	Original release.	Apr. 07, 2016
RF130702E05B R1	Modified the applicant's address.	Apr. 21, 2016



A D T

1 Certificate of Conformity

Product: Linksys E2500 Dual-Band Wireless-N Router
Brand: Linksys
Test Model: E2500
Sample Status: ENGINEERING SAMPLE
Applicant: Linksys LLC
Test Date: Mar. 17 to 24, 2016
Standard: 47 CFR FCC Part 15, Subpart E (Section 15.407)
ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Wendy Wu, **Date:** Apr. 21, 2016
Wendy Wu / Specialist

Approved by : May Chen, **Date:** Apr. 21, 2016
May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (SECTION 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b) (1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5150.00MHz, 5860.00MHz and 10400.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(e)	6dB bandwidth	PASS	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used.

NOTE: 1. This report is prepared for FCC Class II change. (Upgraded the standard to section 15.407 under new rule for U-NII-1 and U-NII-3 band)

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) ($\pm$)
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.19 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.43 dB
	6GHz ~ 18GHz	3.49 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Linksys E2500 Dual-Band Wireless-N Router
Brand	Linksys
Test Model	E2500
Status of EUT	ENGINEERING SAMPLE
Driver version	3.0.01
Power Supply Rating	DC 12V from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11g/a: up to 54Mbps 802.11n: up to 270Mbps
Operating Frequency	For 15.407: 5.18GHz ~ 5.24GHz, 5.745GHz ~ 5.825GHz
	For 15.247: 2.412 ~ 2.462GHz
Number of Channel	For 15.407: 802.11a, 802.11n (HT20): 9 802.11n (HT40): 4
	For 15.247: 802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7
Output Power	For 15.407: 194.939mW
	For 15.247: 570.997mW
Antenna Type	Refer to Note
Antenna Connector	NA
Accessory Device	Adapter x 1
Data Cable Supplied	RJ-45 cable (unshielded, 1.8m)

Note:

1. This is a supplementary report of RF130702E05 and RF130702E05-1. The differences between them are as below information:

◆ Upgraded the standard to section 15.407 under new rule for U-NII-1 and U-NII-3 band.

2. According to above conditions, all test items of U-NII-1 and U-NII-3 band need to be performed, except for AC power conducted emission test item. And all data was verified to meet the requirements.

3. There are 2.4GHz and 5GHz WLAN technology used for the EUT.

4. The EUT must be supplied with a power adapter as following table:

Brand	Model No.	Plug	Spec.
HK	HK-AO-120A100-US	US	Input: 100-240V, 0.5A, 50/60Hz Output: 12V, 1A DC power cable: 1.5m, unshielded

5. The antennas provided to the EUT, please refer to the following table:

2.4GHz			
Transmitter Circuit	Antenna Type	Antenna Gain (dBi)	Connector
Chain (0)	PIFA	2.5	NA
Chain (1)	PIFA	4	NA
5GHz			
Transmitter Circuit	Antenna Type	Antenna Gain (dBi)	Connector
Chain (0)	PIFA	4	NA
Chain (1)	PIFA	5	NA

6. The EUT incorporates a MIMO function.

MODULATION MODE	TX/RX FUNCTION
802.11a	1TX/2RX(diversity)
802.11b	1TX/2RX(diversity)
802.11g	1TX/2RX(diversity)
802.11n (HT20)	2TX/2RX
802.11n (HT40)	2TX/2RX

7. Spurious emission of the simultaneous operation (2.4GHz & 5GHz) has been evaluated and no non-compliance was found.
8. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 15.
9. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

4 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n (HT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

2 channels are provided for 802.11n (HT40):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	-	√	-

Where **RE≥1G**: Radiated Emission above 1GHz **RE<1G**: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **APCM**: Antenna Port Conducted Measurement

NOTE:

1. "-" means no effect.

Radiated Emission Test (Above 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	13.5

Radiated Emission Test (Below 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11n (HT20)	5180-5240	36 to 48	40	OFDM	BPSK	6.5

Antenna Port Conducted Measurement:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	13.5

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY	TEST LOCATION
RE $\geq$ 1G	19deg. C, 62%RH	120Vac, 60Hz	Andy Ho	1
RE<1G	25deg. C, 70%RH	120Vac, 60Hz	Robert Cheng	1
APCM	19deg. C, 68%RH	120Vac, 60Hz	Anderson Chen	1

3.3 Duty Cycle of Test Signal

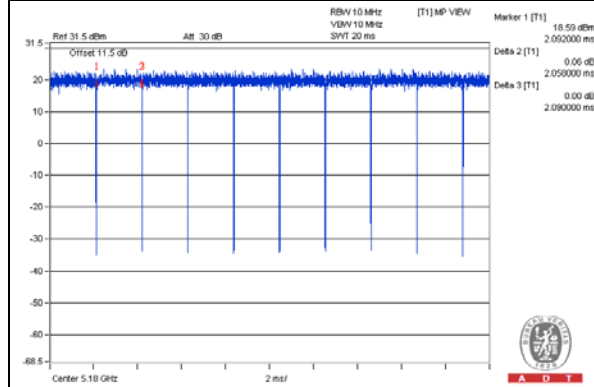
Duty cycle of test signal is $\geq 98\%$, duty factor is not required.

802.11a: Duty cycle = $2.058 \text{ ms} / 2.09 \text{ ms} = 0.985$

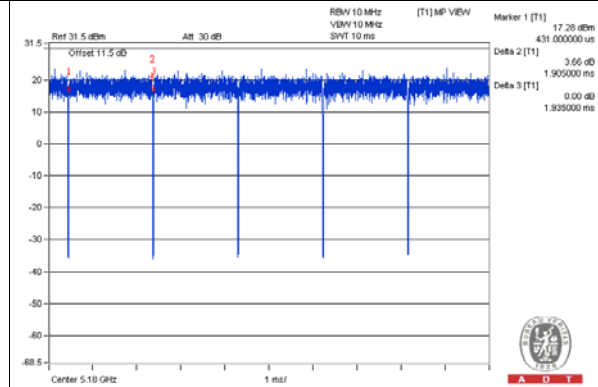
802.11n (HT20): Duty cycle = $1.905 \text{ ms} / 1.935 \text{ ms} = 0.984$

802.11n (HT40): Duty cycle = $0.941 \text{ ms} / 0.96 \text{ ms} = 0.98$

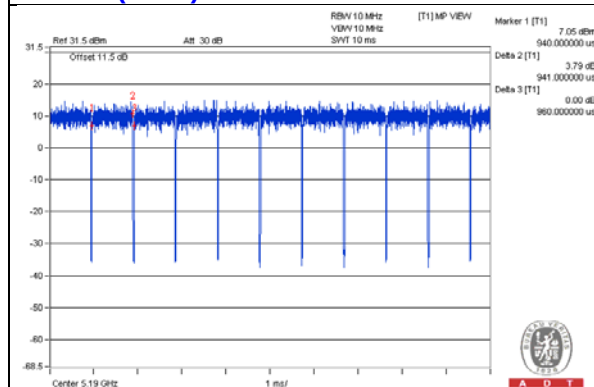
802.11a



802.11n (HT20)



802.11n (HT40)



3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

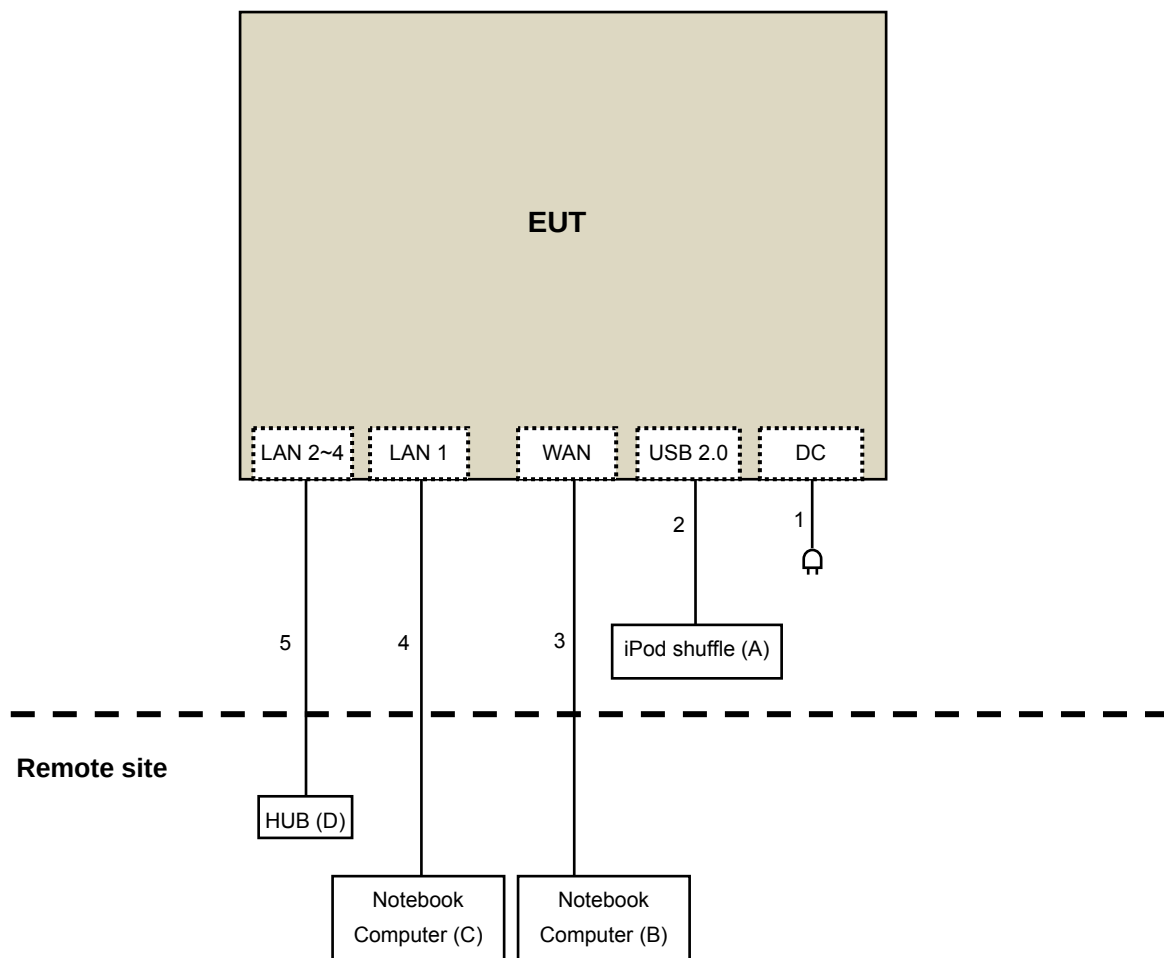
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	iPod shuffle	Apple	MD778TA/A	CC4JG680F4T1	NA	Provided by Lab
B.	Notebook Computer	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab
C.	Notebook Computer	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
D.	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab

Note:

1. All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC	1	1.5	No	0	Supplied by Client
2.	USB	1	0.1	Yes	0	Provided by Lab
3.	RJ45	1	10	No	0	Provided by Lab
4.	RJ45	1	10	No	0	Provided by Lab
5.	RJ45	3	10	No	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standard

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart E (15.407)

KDB 789033 D02 General UNII Test Procedure New Rules v01r01

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = 20 log Emission level (uV/m).
- For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
789033 D02 General UNII Test Procedure New Rules v01r01	FIELD STRENGTH AT 3m	
	PK:74 (dBuV/m)	AV:54 (dBuV/m)
APPLICABLE TO	EIRP LIMIT	EQUIVALENT FIELD STRENGTH AT 3m
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBuV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)	PK:-27 (dBm/MHz) ^{*1} PK:-17 (dBm/MHz) ^{*2}	PK: 68.2(dBuV/m) ^{*1} PK:78.2 (dBuV/m) ^{*2}

NOTE: ^{*1} beyond 10MHz of the band edge ^{*2} within 10 MHz of band edge

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts).}$$



A D T

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY54450088	July 24, 2015	July 23, 2016
Pre-Amplifier ^(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna ^(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2016	Jan. 17, 2017
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 11, 2015	Nov. 10, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Jan. 04, 2016	Jan. 03, 2017
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 03, 2015	Apr. 02, 2016
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Jan. 19, 2016	Jan. 18, 2017
Pre-Amplifier Agilent	8449B	3008A01922	Sep. 19, 2015	Sep. 18, 2016
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150318 150323 150324	Mar. 31, 2015	Mar. 30, 2016
Pre-Amplifier EMCI	EMC184045	980143	Jan. 15, 2016	Jan. 14, 2017
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Jan. 08, 2016	Jan. 07, 2017
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 16, 2016	Jan. 15, 2017
Software	ADT_Radiated_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
Boresight Antenna Fixture	NA	NA	NA	NA
SPECTRUM ANALYZER R&S	FSP 40	100060	May 08, 2015	May 07, 2016
Power meter Anritsu	ML2495A	1014008	Apr. 28, 2015	Apr. 27, 2016
Power sensor Anritsu	MA2411B	0917122	Apr. 28, 2015	Apr. 27, 2016
Temperature & Humidity Chamber GIANTFORCE	GTH-150-40-SP-AR	MAA0812-008	Jan. 15, 2016	Jan. 14, 2017

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Loop antenna was used for all emissions below 30 MHz.
4. The test was performed in 966 Chamber No. 4.
5. The FCC Site Registration No. is 292998
6. The CANADA Site Registration No. is 20331-2
7. Tested Date: Mar. 17 to 24, 2016

4.1.3 Test Procedure

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

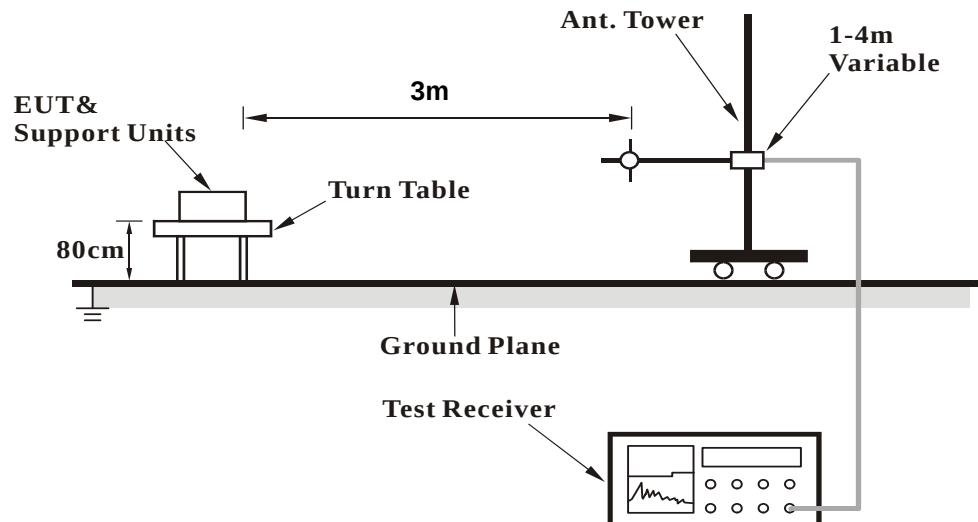
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

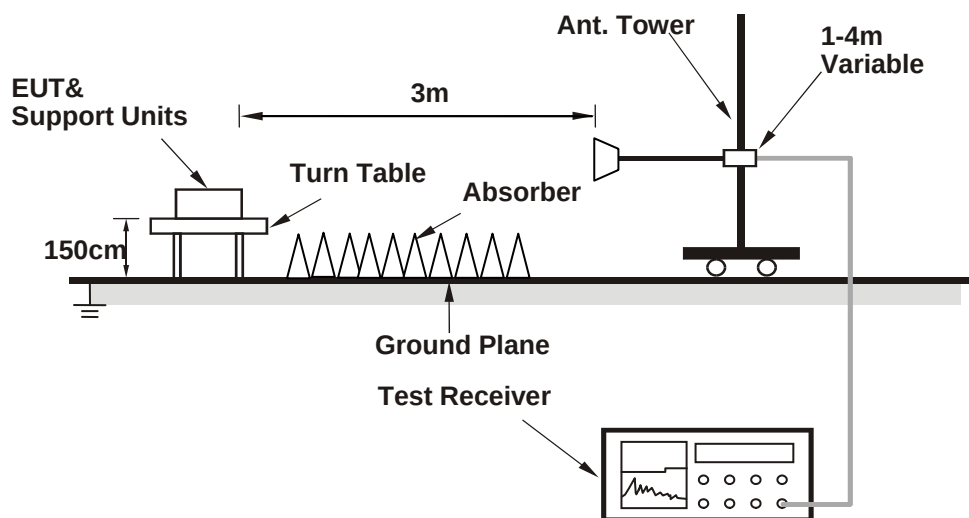
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Condition

1. Connect the EUT with the support unit B & C (Notebook computer) which are placed in remote site.
2. The communication partner run test program "Mtool Ver.2.0.1.0" to enable EUT under transmission/receiving condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz Data:

802.11a

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	72.1 PK	74.0	-1.9	1.38 H	133	71.30	0.80
2	5150.00	53.4 AV	54.0	-0.6	1.38 H	133	52.60	0.80
3	*5180.00	109.4 PK			1.38 H	133	108.51	0.89
4	*5180.00	98.4 AV			1.38 H	133	97.51	0.89
5	#10360.00	54.5 PK	74.0	-19.5	1.18 H	314	43.52	10.98
6	#10360.00	42.3 AV	54.0	-11.7	1.18 H	314	31.32	10.98
7	15540.00	56.3 PK	74.0	-17.7	1.38 H	360	43.57	12.73
8	15540.00	42.0 AV	54.0	-12.0	1.38 H	360	29.27	12.73
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	70.0 PK	74.0	-4.0	3.64 V	356	69.20	0.80
2	5150.00	49.9 AV	54.0	-4.1	3.64 V	356	49.10	0.80
3	*5180.00	109.5 PK			3.64 V	356	108.61	0.89
4	*5180.00	99.1 AV			3.64 V	356	98.21	0.89
5	#10360.00	60.1 PK	74.0	-13.9	1.00 V	360	49.12	10.98
6	#10360.00	47.4 AV	54.0	-6.6	1.00 V	360	36.42	10.98
7	15540.00	56.6 PK	74.0	-17.4	1.69 V	136	43.87	12.73
8	15540.00	43.9 AV	54.0	-10.1	1.69 V	136	31.17	12.73

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	70.0 PK	74.0	-4.0	1.25 H	132	69.20	0.80
2	5150.00	50.3 AV	54.0	-3.7	1.25 H	132	49.50	0.80
3	*5200.00	111.6 PK			1.25 H	132	110.66	0.94
4	*5200.00	101.2 AV			1.25 H	132	100.26	0.94
5	#10400.00	55.7 PK	74.0	-18.3	1.14 H	308	44.37	11.33
6	#10400.00	42.7 AV	54.0	-11.3	1.14 H	308	31.37	11.33
7	15600.00	56.2 PK	74.0	-17.8	1.36 H	360	43.33	12.87
8	15600.00	42.1 AV	54.0	-11.9	1.36 H	360	29.23	12.87
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	66.3 PK	74.0	-7.7	3.63 V	355	65.50	0.80
2	5150.00	47.4 AV	54.0	-6.6	3.63 V	355	46.60	0.80
3	*5200.00	113.0 PK			3.63 V	355	112.06	0.94
4	*5200.00	102.9 AV			3.63 V	355	101.96	0.94
5	#10400.00	62.0 PK	74.0	-12.0	1.03 V	358	50.67	11.33
6	#10400.00	49.3 AV	54.0	-4.7	1.03 V	358	37.97	11.33
7	15600.00	57.3 PK	74.0	-16.7	1.66 V	150	44.43	12.87
8	15600.00	44.3 AV	54.0	-9.7	1.66 V	150	31.43	12.87

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	110.7 PK			1.22 H	130	109.64	1.06
2	*5240.00	100.7 AV			1.22 H	130	99.64	1.06
3	5350.00	53.8 PK	74.0	-20.2	1.22 H	130	52.50	1.30
4	5350.00	40.7 AV	54.0	-13.3	1.22 H	130	39.40	1.30
5	#10480.00	56.1 PK	74.0	-17.9	1.17 H	317	44.91	11.19
6	#10480.00	43.1 AV	54.0	-10.9	1.17 H	317	31.91	11.19
7	15720.00	56.4 PK	74.0	-17.6	1.38 H	360	44.09	12.31
8	15720.00	42.3 AV	54.0	-11.7	1.38 H	360	29.99	12.31
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	111.8 PK			4.00 V	356	110.74	1.06
2	*5240.00	101.6 AV			4.00 V	356	100.54	1.06
3	5350.00	54.1 PK	74.0	-19.9	4.00 V	356	52.80	1.30
4	5350.00	40.9 AV	54.0	-13.1	4.00 V	356	39.60	1.30
5	#10480.00	62.0 PK	74.0	-12.0	1.02 V	360	50.81	11.19
6	#10480.00	49.2 AV	54.0	-4.8	1.02 V	360	38.01	11.19
7	15720.00	57.3 PK	74.0	-16.7	1.64 V	135	44.99	12.31
8	15720.00	44.3 AV	54.0	-9.7	1.64 V	135	31.99	12.31

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	70.9 PK	74.0	-3.1	2.38 H	117	68.98	1.92
2	#5715.00	51.0 AV	54.0	-3.0	2.38 H	117	49.08	1.92
3	#5725.00	77.4 PK	78.2	-0.8	2.38 H	117	75.47	1.93
4	*5745.00	108.0 PK			2.38 H	117	106.02	1.98
5	*5745.00	97.0 AV			2.38 H	117	95.02	1.98
6	11490.00	54.4 PK	74.0	-19.6	1.17 H	321	41.53	12.87
7	11490.00	42.1 AV	54.0	-11.9	1.17 H	321	29.23	12.87
8	#17235.00	55.9 PK	74.0	-18.1	1.37 H	360	38.34	17.56
9	#17235.00	41.7 AV	54.0	-12.3	1.37 H	360	24.14	17.56
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	69.3 PK	74.0	-4.7	2.91 V	74	67.38	1.92
2	#5715.00	51.4 AV	54.0	-2.6	2.91 V	74	49.48	1.92
3	#5725.00	78.0 PK	78.2	-0.2	2.91 V	74	76.07	1.93
4	*5745.00	108.3 PK			2.91 V	74	106.32	1.98
5	*5745.00	98.1 AV			2.91 V	74	96.12	1.98
6	11490.00	60.2 PK	74.0	-13.8	1.00 V	360	47.33	12.87
7	11490.00	47.5 AV	54.0	-6.5	1.00 V	360	34.63	12.87
8	#17235.00	57.9 PK	74.0	-16.1	1.64 V	139	40.34	17.56
9	#17235.00	44.8 AV	54.0	-9.2	1.64 V	139	27.24	17.56

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	61.2 PK	78.2	-17.0	1.32 H	117	59.27	1.93
2	*5785.00	110.5 PK			1.32 H	117	108.44	2.06
3	*5785.00	100.1 AV			1.32 H	117	98.04	2.06
4	#5850.00	62.7 PK	78.2	-15.5	1.32 H	117	60.57	2.13
5	11570.00	55.3 PK	74.0	-18.7	1.14 H	314	42.68	12.62
6	11570.00	42.5 AV	54.0	-11.5	1.14 H	314	29.88	12.62
7	#17355.00	57.0 PK	74.0	-17.0	1.37 H	360	38.82	18.18
8	#17355.00	42.7 AV	54.0	-11.3	1.37 H	360	24.52	18.18
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	56.9 PK	78.2	-21.3	2.87 V	75	54.97	1.93
2	*5785.00	111.1 PK			2.87 V	75	109.04	2.06
3	*5785.00	101.1 AV			2.87 V	75	99.04	2.06
4	#5850.00	60.9 PK	78.2	-17.3	2.87 V	75	58.77	2.13
5	11570.00	62.3 PK	74.0	-11.7	1.04 V	360	49.68	12.62
6	11570.00	49.6 AV	54.0	-4.4	1.04 V	360	36.98	12.62
7	#17355.00	57.5 PK	74.0	-16.5	1.62 V	142	39.32	18.18
8	#17355.00	44.4 AV	54.0	-9.6	1.62 V	142	26.22	18.18

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	109.4 PK			1.21 H	118	107.28	2.12
2	*5825.00	99.0 AV			1.21 H	118	96.88	2.12
3	#5850.00	75.4 PK	78.2	-2.8	1.21 H	118	73.27	2.13
4	#5860.00	67.2 PK	74.0	-6.8	1.21 H	118	65.07	2.13
5	#5860.00	53.2 AV	54.0	-0.8	1.21 H	118	51.07	2.13
6	11650.00	55.0 PK	74.0	-19.0	1.14 H	323	42.55	12.45
7	11650.00	42.3 AV	54.0	-11.7	1.14 H	323	29.85	12.45
8	#17475.00	56.8 PK	74.0	-17.2	1.41 H	360	38.05	18.75
9	#17475.00	42.4 AV	54.0	-11.6	1.41 H	360	23.65	18.75
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	108.8 PK			2.74 V	63	106.68	2.12
2	*5825.00	98.3 AV			2.74 V	63	96.18	2.12
3	#5850.00	72.9 PK	78.2	-5.3	2.74 V	63	70.77	2.13
4	#5860.00	65.1 PK	74.0	-8.9	2.74 V	63	62.97	2.13
5	#5860.00	51.1 AV	54.0	-2.9	2.74 V	63	48.97	2.13
6	11650.00	61.7 PK	74.0	-12.3	1.06 V	360	49.25	12.45
7	11650.00	49.0 AV	54.0	-5.0	1.06 V	360	36.55	12.45
8	#17475.00	57.0 PK	74.0	-17.0	1.70 V	135	38.25	18.75
9	#17475.00	44.2 AV	54.0	-9.8	1.70 V	135	25.45	18.75

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11n (20MHz)

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	73.2 PK	74.0	-0.8	1.35 H	124	72.40	0.80
2	5150.00	52.2 AV	54.0	-1.8	1.35 H	124	51.40	0.80
3	*5180.00	109.1 PK			1.35 H	124	108.21	0.89
4	*5180.00	99.8 AV			1.35 H	124	98.91	0.89
5	#10360.00	54.6 PK	74.0	-19.4	1.19 H	311	43.62	10.98
6	#10360.00	42.3 AV	54.0	-11.7	1.19 H	311	31.32	10.98
7	15540.00	56.8 PK	74.0	-17.2	1.31 H	360	44.07	12.73
8	15540.00	42.5 AV	54.0	-11.5	1.31 H	360	29.77	12.73
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	73.9 PK	74.0	-0.1	2.46 V	360	73.10	0.80
2	5150.00	52.6 AV	54.0	-1.4	2.46 V	360	51.80	0.80
3	*5180.00	110.0 PK			2.46 V	360	109.11	0.89
4	*5180.00	99.9 AV			2.46 V	360	99.01	0.89
5	#10360.00	62.0 PK	74.0	-12.0	1.02 V	360	51.02	10.98
6	#10360.00	49.5 AV	54.0	-4.5	1.02 V	360	38.52	10.98
7	15540.00	60.2 PK	74.0	-13.8	1.68 V	160	47.47	12.73
8	15540.00	47.4 AV	54.0	-6.6	1.68 V	160	34.67	12.73

REMARKS:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- " * ": Fundamental frequency.
- " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.7 PK	74.0	-8.3	1.41 H	128	64.90	0.80
2	5150.00	51.2 AV	54.0	-2.8	1.41 H	128	50.40	0.80
3	*5200.00	112.2 PK			1.41 H	128	111.26	0.94
4	*5200.00	102.8 AV			1.41 H	128	101.86	0.94
5	#10400.00	60.9 PK	74.0	-13.1	1.18 H	253	49.57	11.33
6	#10400.00	46.7 AV	54.0	-7.3	1.18 H	253	35.37	11.33
7	15600.00	59.2 PK	74.0	-14.8	1.22 H	309	46.33	12.87
8	15600.00	46.2 AV	54.0	-7.8	1.22 H	309	33.33	12.87
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	68.4 PK	74.0	-5.6	2.60 V	8	67.60	0.80
2	5150.00	52.1 AV	54.0	-1.9	2.60 V	8	51.30	0.80
3	*5200.00	113.7 PK			2.60 V	8	112.76	0.94
4	*5200.00	104.5 AV			2.60 V	8	103.56	0.94
5	#10400.00	67.4 PK	74.0	-6.6	1.26 V	12	56.07	11.33
6	#10400.00	53.9 AV	54.0	-0.1	1.26 V	12	42.57	11.33
7	15600.00	65.8 PK	74.0	-8.2	3.23 V	147	52.93	12.87
8	15600.00	51.5 AV	54.0	-2.5	3.23 V	147	38.63	12.87

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	112.3 PK			1.41 H	128	111.24	1.06
2	*5240.00	103.0 AV			1.41 H	128	101.94	1.06
3	5350.00	55.1 PK	74.0	-18.9	1.41 H	128	53.80	1.30
4	5350.00	41.9 AV	54.0	-12.1	1.41 H	128	40.60	1.30
5	#10480.00	59.9 PK	74.0	-14.1	1.11 H	302	48.71	11.19
6	#10480.00	45.7 AV	54.0	-8.3	1.11 H	302	34.51	11.19
7	15720.00	57.4 PK	74.0	-16.6	1.42 H	360	45.09	12.31
8	15720.00	45.2 AV	54.0	-8.8	1.42 H	360	32.89	12.31
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	113.4 PK			2.65 V	360	112.34	1.06
2	*5240.00	104.3 AV			2.65 V	360	103.24	1.06
3	5350.00	53.8 PK	74.0	-20.2	2.65 V	360	52.50	1.30
4	5350.00	41.7 AV	54.0	-12.3	2.65 V	360	40.40	1.30
5	#10480.00	65.2 PK	74.0	-8.8	1.30 V	25	54.01	11.19
6	#10480.00	52.7 AV	54.0	-1.3	1.30 V	25	41.51	11.19
7	15720.00	63.2 PK	74.0	-10.8	3.28 V	163	50.89	12.31
8	15720.00	50.1 AV	54.0	-3.9	3.28 V	163	37.79	12.31

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	71.2 PK	74.0	-2.8	2.42 H	114	69.28	1.92
2	#5715.00	50.7 AV	54.0	-3.3	2.42 H	114	48.78	1.92
3	#5725.00	78.0 PK	78.2	-0.2	2.42 H	114	76.07	1.93
4	*5745.00	108.9 PK			2.42 H	114	106.92	1.98
5	*5745.00	98.8 AV			2.42 H	114	96.82	1.98
6	11490.00	54.4 PK	74.0	-19.6	1.19 H	332	41.53	12.87
7	11490.00	42.2 AV	54.0	-11.8	1.19 H	332	29.33	12.87
8	#17235.00	56.2 PK	74.0	-17.8	1.32 H	360	38.64	17.56
9	#17235.00	41.9 AV	54.0	-12.1	1.32 H	360	24.34	17.56

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	69.0 PK	74.0	-5.0	1.80 V	30	67.08	1.92
2	#5715.00	49.8 AV	54.0	-4.2	1.80 V	30	47.88	1.92
3	#5725.00	77.4 PK	78.2	-0.8	1.80 V	30	75.47	1.93
4	*5745.00	107.8 PK			1.80 V	30	105.82	1.98
5	*5745.00	97.8 AV			1.80 V	30	95.82	1.98
6	11490.00	56.2 PK	74.0	-17.8	1.00 V	360	43.33	12.87
7	11490.00	45.7 AV	54.0	-8.3	1.00 V	360	32.83	12.87
8	#17235.00	59.8 PK	74.0	-14.2	1.63 V	166	42.24	17.56
9	#17235.00	47.2 AV	54.0	-6.8	1.63 V	166	29.64	17.56

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	61.3 PK	78.2	-16.9	2.42 H	112	59.37	1.93
2	*5785.00	112.0 PK			2.42 H	112	109.94	2.06
3	*5785.00	101.6 AV			2.42 H	112	99.54	2.06
4	#5850.00	59.0 PK	78.2	-19.2	2.42 H	112	56.87	2.13
5	11570.00	57.9 PK	74.0	-16.1	1.24 H	136	45.28	12.62
6	11570.00	45.6 AV	54.0	-8.4	1.24 H	136	32.98	12.62
7	#17355.00	57.3 PK	74.0	-16.7	1.52 H	184	39.12	18.18
8	#17355.00	45.0 AV	54.0	-9.0	1.52 H	184	26.82	18.18
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5725.00	60.0 PK	78.2	-18.2	1.80 V	33	58.07	1.93
2	*5785.00	111.9 PK			1.80 V	33	109.84	2.06
3	*5785.00	100.8 AV			1.80 V	33	98.74	2.06
4	#5850.00	57.3 PK	78.2	-20.9	1.80 V	33	55.17	2.13
5	11570.00	60.1 PK	74.0	-13.9	2.49 V	322	47.48	12.62
6	11570.00	48.1 AV	54.0	-5.9	2.49 V	322	35.48	12.62
7	#17355.00	65.2 PK	74.0	-8.8	3.99 V	216	47.02	18.18
8	#17355.00	51.5 AV	54.0	-2.5	3.99 V	216	33.32	18.18

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	111.6 PK			1.22 H	119	109.48	2.12
2	*5825.00	100.0 AV			1.22 H	119	97.88	2.12
3	#5850.00	74.1 PK	78.2	-4.1	1.22 H	119	71.97	2.13
4	#5860.00	69.8 PK	74.0	-4.2	1.22 H	119	67.67	2.13
5	#5860.00	53.9 AV	54.0	-0.1	1.22 H	119	51.77	2.13
6	11650.00	57.1 PK	74.0	-16.9	1.15 H	316	44.65	12.45
7	11650.00	44.8 AV	54.0	-9.2	1.15 H	316	32.35	12.45
8	#17475.00	56.4 PK	74.0	-17.6	1.42 H	360	37.65	18.75
9	#17475.00	44.1 AV	54.0	-9.9	1.42 H	360	25.35	18.75

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	110.1 PK			1.72 V	30	107.98	2.12
2	*5825.00	100.2 AV			1.72 V	30	98.08	2.12
3	#5850.00	74.0 PK	78.2	-4.2	1.72 V	30	71.87	2.13
4	#5860.00	70.4 PK	74.0	-3.6	1.72 V	30	68.27	2.13
5	#5860.00	53.8 AV	54.0	-0.2	1.72 V	30	51.67	2.13
6	11650.00	59.1 PK	74.0	-14.9	1.07 V	360	46.65	12.45
7	11650.00	47.1 AV	54.0	-6.9	1.07 V	360	34.65	12.45
8	#17475.00	63.8 PK	74.0	-10.2	1.64 V	161	45.05	18.75
9	#17475.00	50.2 AV	54.0	-3.8	1.64 V	161	31.45	18.75

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11n (40MHz)

CHANNEL	TX Channel 38	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	69.5 PK	74.0	-4.5	1.22 H	131	68.70	0.80
2	5150.00	53.9 AV	54.0	-0.1	1.22 H	131	53.10	0.80
3	*5190.00	101.7 PK			1.22 H	131	100.79	0.91
4	*5190.00	91.1 AV			1.22 H	131	90.19	0.91
5	#10380.00	54.5 PK	74.0	-19.5	1.15 H	331	43.34	11.16
6	#10380.00	42.3 AV	54.0	-11.7	1.15 H	331	31.14	11.16
7	15570.00	55.6 PK	74.0	-18.4	1.38 H	360	42.80	12.80
8	15570.00	41.4 AV	54.0	-12.6	1.38 H	360	28.60	12.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	69.0 PK	74.0	-5.0	2.62 V	11	68.20	0.80
2	5150.00	53.6 AV	54.0	-0.4	2.62 V	11	52.80	0.80
3	*5190.00	102.5 PK			2.62 V	11	101.59	0.91
4	*5190.00	91.5 AV			2.62 V	11	90.59	0.91
5	#10380.00	54.2 PK	74.0	-19.8	2.50 V	318	43.04	11.16
6	#10380.00	42.0 AV	54.0	-12.0	2.50 V	318	30.84	11.16
7	15570.00	55.6 PK	74.0	-18.4	3.99 V	208	42.80	12.80
8	15570.00	41.1 AV	54.0	-12.9	3.99 V	208	28.30	12.80

REMARKS:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- " * ": Fundamental frequency.
- " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 46	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	69.0 PK	74.0	-5.0	1.46 H	131	68.20	0.80
2	5150.00	52.1 AV	54.0	-1.9	1.46 H	131	51.30	0.80
3	*5230.00	108.6 PK			1.46 H	131	107.56	1.04
4	*5230.00	97.6 AV			1.46 H	131	96.56	1.04
5	5350.00	64.7 PK	74.0	-9.3	1.46 H	131	63.40	1.30
6	5350.00	48.7 AV	54.0	-5.3	1.46 H	131	47.40	1.30
7	#10460.00	53.7 PK	74.0	-20.3	1.13 H	311	42.48	11.22
8	#10460.00	41.7 AV	54.0	-12.3	1.13 H	311	30.48	11.22
9	15690.00	56.0 PK	74.0	-18.0	1.42 H	360	43.62	12.38
10	15690.00	41.7 AV	54.0	-12.3	1.42 H	360	29.32	12.38

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	68.8 PK	74.0	-5.2	2.70 V	360	68.00	0.80
2	5150.00	53.6 AV	54.0	-0.4	2.70 V	360	52.80	0.80
3	*5230.00	109.7 PK			2.70 V	360	108.66	1.04
4	*5230.00	98.7 AV			2.70 V	360	97.66	1.04
5	5350.00	65.1 PK	74.0	-8.9	2.70 V	360	63.80	1.30
6	5350.00	50.1 AV	54.0	-3.9	2.70 V	360	48.80	1.30
7	#10460.00	54.9 PK	74.0	-19.1	2.45 V	336	43.68	11.22
8	#10460.00	42.5 AV	54.0	-11.5	2.45 V	336	31.28	11.22
9	15690.00	55.9 PK	74.0	-18.1	4.00 V	233	43.52	12.38
10	15690.00	41.5 AV	54.0	-12.5	4.00 V	233	29.12	12.38

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 151	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	69.4 PK	74.0	-4.6	1.37 H	130	67.48	1.92
2	#5715.00	53.2 AV	54.0	-0.8	1.37 H	130	51.28	1.92
3	#5725.00	73.3 PK	78.2	-4.9	1.37 H	130	71.37	1.93
4	*5755.00	101.9 PK			1.37 H	130	99.90	2.00
5	*5755.00	90.5 AV			1.37 H	130	88.50	2.00
6	11510.00	54.2 PK	74.0	-19.8	1.19 H	325	41.37	12.83
7	11510.00	41.7 AV	54.0	-12.3	1.19 H	325	28.87	12.83
8	#17265.00	55.2 PK	74.0	-18.8	1.33 H	360	37.55	17.65
9	#17265.00	41.3 AV	54.0	-12.7	1.33 H	360	23.65	17.65

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	71.3 PK	74.0	-2.7	1.07 V	73	69.38	1.92
2	#5715.00	53.8 AV	54.0	-0.2	1.07 V	73	51.88	1.92
3	#5725.00	74.5 PK	78.2	-3.7	1.07 V	73	72.57	1.93
4	*5755.00	102.1 PK			1.07 V	73	100.10	2.00
5	*5755.00	90.7 AV			1.07 V	73	88.70	2.00
6	11510.00	54.7 PK	74.0	-19.3	2.48 V	320	41.87	12.83
7	11510.00	42.6 AV	54.0	-11.4	2.48 V	320	29.77	12.83
8	#17265.00	55.4 PK	74.0	-18.6	4.00 V	226	37.75	17.65
9	#17265.00	41.4 AV	54.0	-12.6	4.00 V	226	23.75	17.65

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 159	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	63.2 PK	74.0	-10.8	1.15 H	116	61.28	1.92
2	#5715.00	46.0 AV	54.0	-8.0	1.15 H	116	44.08	1.92
3	#5725.00	69.2 PK	78.2	-9.0	1.15 H	116	67.27	1.93
4	*5795.00	108.3 PK			1.15 H	116	106.21	2.09
5	*5795.00	95.9 AV			1.15 H	116	93.81	2.09
6	#5850.00	72.6 PK	78.2	-5.6	1.15 H	116	70.47	2.13
7	#5860.00	72.0 PK	74.0	-2.0	1.15 H	116	69.87	2.13
8	#5860.00	53.7 AV	54.0	-0.3	1.15 H	116	51.57	2.13
9	11590.00	54.2 PK	74.0	-19.8	1.12 H	324	41.65	12.55
10	11590.00	42.1 AV	54.0	-11.9	1.12 H	324	29.55	12.55
11	#17385.00	56.2 PK	74.0	-17.8	1.36 H	360	37.81	18.39
12	#17385.00	42.0 AV	54.0	-12.0	1.36 H	360	23.61	18.39

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	65.7 PK	74.0	-8.3	1.58 V	6	63.78	1.92
2	#5715.00	46.8 AV	54.0	-7.2	1.58 V	6	44.88	1.92
3	#5725.00	70.1 PK	78.2	-8.1	1.58 V	6	68.17	1.93
4	*5795.00	107.6 PK			1.58 V	6	105.51	2.09
5	*5795.00	95.2 AV			1.58 V	6	93.11	2.09
6	#5850.00	71.1 PK	78.2	-7.1	1.58 V	6	68.97	2.13
7	#5860.00	70.6 PK	74.0	-3.4	1.58 V	6	68.47	2.13
8	#5860.00	53.1 AV	54.0	-0.9	1.58 V	6	50.97	2.13
9	11590.00	54.5 PK	74.0	-19.5	2.45 V	329	41.95	12.55
10	11590.00	42.3 AV	54.0	-11.7	2.45 V	329	29.75	12.55
11	#17385.00	55.5 PK	74.0	-18.5	4.00 V	218	37.11	18.39
12	#17385.00	41.3 AV	54.0	-12.7	4.00 V	218	22.91	18.39

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Below 1GHz Data:

802.11n (HT20)

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	36.18	28.1 QP	40.0	-11.9	2.00 H	314	37.78	-9.71
2	73.17	30.8 QP	40.0	-9.2	2.00 H	85	42.57	-11.73
3	81.19	33.1 QP	40.0	-6.9	2.00 H	51	46.93	-13.86
4	148.15	29.2 QP	43.5	-14.4	2.00 H	274	37.66	-8.51
5	250.02	29.8 QP	46.0	-16.2	1.50 H	0	39.68	-9.84
6	600.00	39.0 QP	46.0	-7.0	1.50 H	332	39.55	-0.58
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	73.89	31.9 QP	40.0	-8.1	2.00 V	106	43.67	-11.81
2	110.83	32.8 QP	43.5	-10.8	1.50 V	86	44.16	-11.41
3	141.21	31.3 QP	43.5	-12.2	2.00 V	293	40.21	-8.91
4	250.02	29.6 QP	46.0	-16.4	1.00 V	0	39.41	-9.84
5	625.00	34.9 QP	46.0	-11.1	1.50 V	25	35.03	-0.11
6	750.01	37.5 QP	46.0	-8.5	1.00 V	6	35.59	1.88

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.2 Transmit Power Measurement

4.2.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p $\leq$ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
	√	Indoor Access Point	1 Watt (30 dBm)
		Mobile and Portable client device	250mW (24 dBm)
U-NII-2A			250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C			250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	√		1 Watt (30 dBm)

*B is the 26 dB emission bandwidth in megahertz

Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

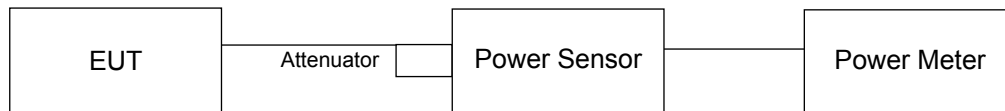
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

4.2.2 Test Setup

FOR POWER OUTPUT MEASUREMENT



4.2.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.2.4 Test Procedure

FOR POWER OUTPUT MEASUREMENT

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.2.5 Deviation from Test Standard

No deviation.

4.2.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.2.7 Test Result

POWER OUTPUT:

802.11a

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
36	5180	49.545	16.95	30	Pass
40	5200	95.719	19.81	30	Pass
48	5240	57.943	17.63	30	Pass
149	5745	50.234	17.01	30	Pass
157	5785	86.896	19.39	30	Pass
165	5825	62.373	17.95	30	Pass

802.11n (HT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	17.06	16.14	91.931	19.63	30	Pass
40	5200	20.22	19.53	194.939	22.90	30	Pass
48	5240	19.45	18.81	164.138	22.15	30	Pass
149	5745	14.74	15.23	63.128	18.00	30	Pass
157	5785	18.23	19.41	153.824	21.87	30	Pass
165	5825	16.89	17.57	106.013	20.25	30	Pass

802.11n (HT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	11.89	10.96	27.927	14.46	30	Pass
46	5230	17.67	17.07	109.412	20.39	30	Pass
151	5755	11.89	12.67	33.946	15.31	30	Pass
159	5795	16.11	16.81	88.805	19.48	30	Pass

4.3 Peak Power Spectral Density Measurement

4.3.1 Limits of Peak Power Spectral Density Measurement

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	17dBm/ MHz
		Fixed point-to-point Access Point	
	√	Indoor Access Point	
		Mobile and Portable client device	11dBm/ MHz
U-NII-2A			11dBm/ MHz
U-NII-2C			11dBm/ MHz
U-NII-3	√		30dBm/ 500kHz

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

For U-NII-1:

Using method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW $\geq$ 3 MHz, Detector = RMS
3. Sweep time = auto, trigger set to "free run".
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value

For U-NII-3:

Using method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW $\geq$ 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500 \text{ kHz}/300\text{kHz})$
5. Sweep time = auto, trigger set to "free run".
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

Same as Item 4.3.6.

4.3.7 Test Results

For U-NII-1:

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
36	5180	4.78	17	Pass
40	5200	7.75	17	Pass
48	5240	6.86	17	Pass

802.11n (HT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	3.49	3.60	6.56	15.48	Pass
40	5200	7.46	7.63	10.56	15.48	Pass
48	5240	6.54	6.53	9.55	15.48	Pass

- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.52\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17 - (7.52 - 6) = 15.48\text{dBm}$.

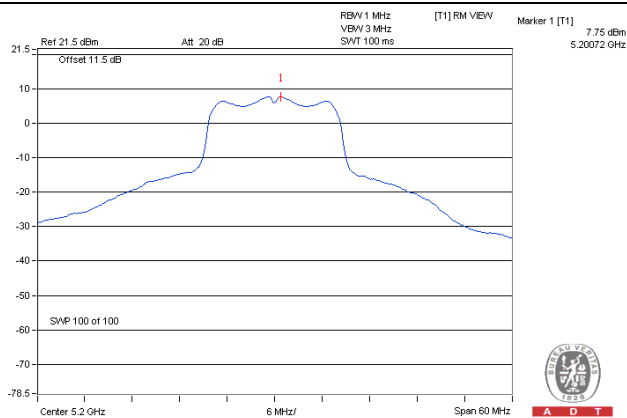
802.11n (HT40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
38	5190	-5.11	-4.86	-1.97	15.48	Pass
46	5230	1.29	1.59	4.45	15.48	Pass

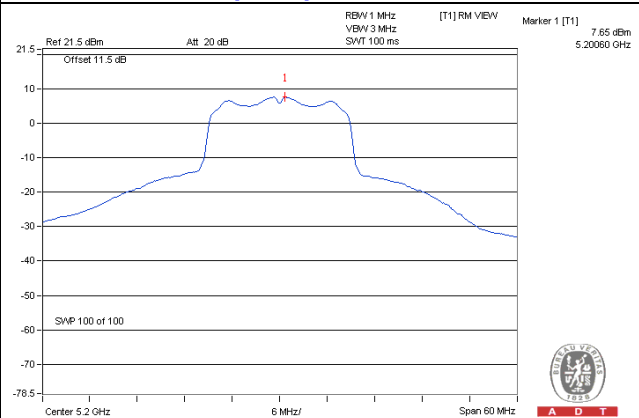
- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.52\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17 - (7.52 - 6) = 15.48\text{dBm}$.

Spectrum Plot of Worst Value

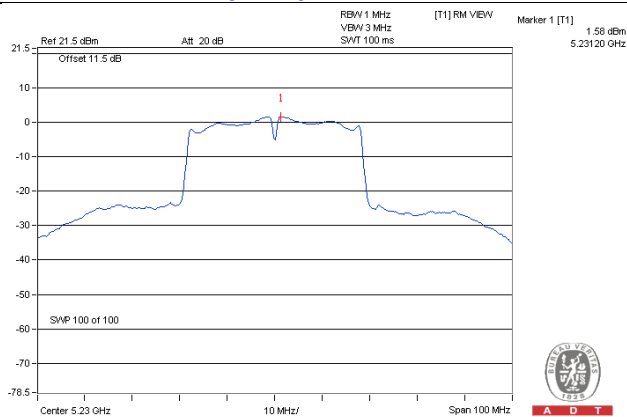
802.11a_Chain 1 / CH40



802.11n (HT20)_Chain 1 / CH40



802.11n (HT40)_Chain 1 / CH46



For U-NII-3:

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
149	5745	-2.33	-0.11	30	Pass
157	5785	-0.19	2.03	30	Pass
165	5825	-2.34	-0.12	30	Pass

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	-3.88	-1.66	3.01	1.35	28.48	Pass
	157	5785	0.26	2.48	3.01	5.49	28.48	Pass
	165	5825	-2.18	0.04	3.01	3.05	28.48	Pass
1	149	5745	-3.70	-1.48	3.01	1.53	28.48	Pass
	157	5785	0.32	2.54	3.01	5.55	28.48	Pass
	165	5825	-2.36	-0.14	3.01	2.87	28.48	Pass

- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.52\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (7.52 - 6) = 28.48\text{dBm}$.

802.11n (HT40)

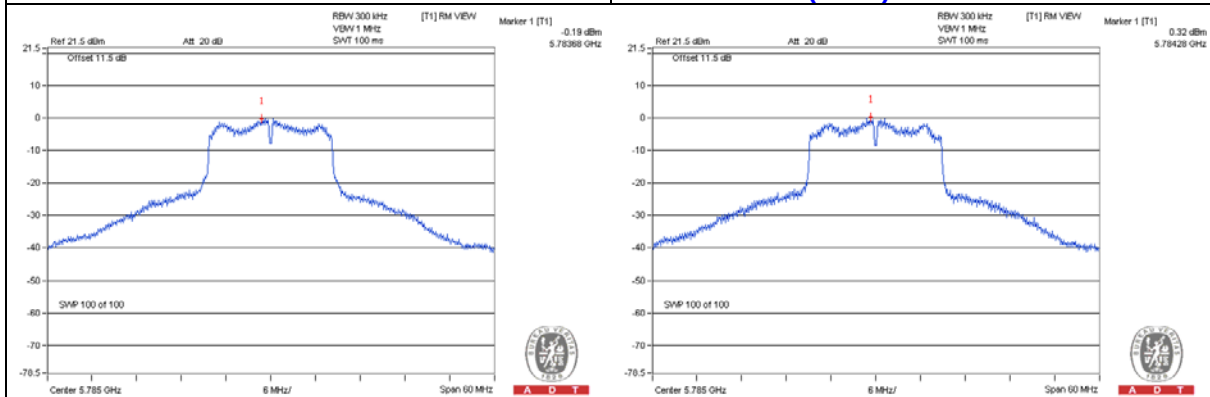
TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	151	5755	-10.85	-8.63	3.01	-5.62	28.48	Pass
	159	5795	-6.60	-4.38	3.01	-1.37	28.48	Pass
1	151	5755	-10.74	-8.52	3.01	-5.51	28.48	Pass
	159	5795	-6.50	-4.28	3.01	-1.27	28.48	Pass

- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.52\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (7.52 - 6) = 28.48\text{dBm}$.

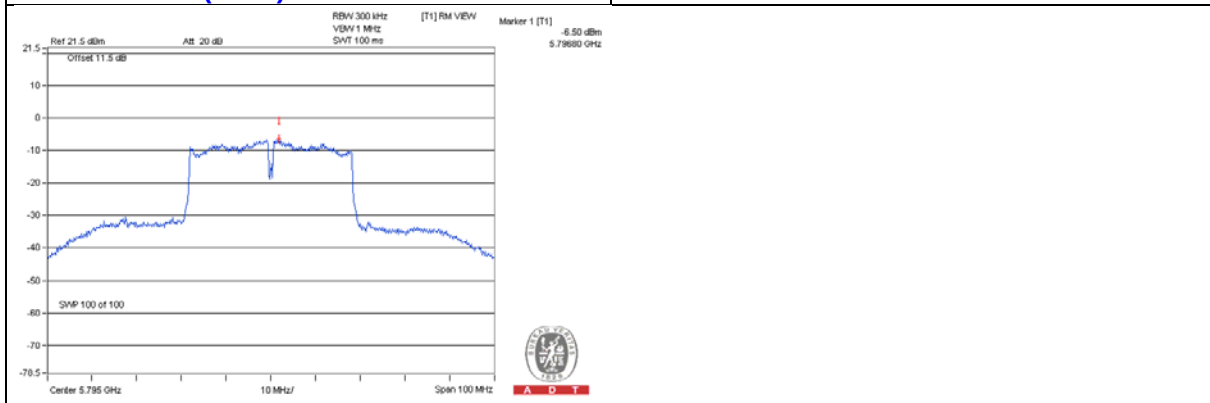
Spectrum Plot of Worst Value

802.11a – Chain 1: CH 157

802.11n (HT20) – Chain 1: CH 157



802.11n (HT40) – Chain 1: CH 159

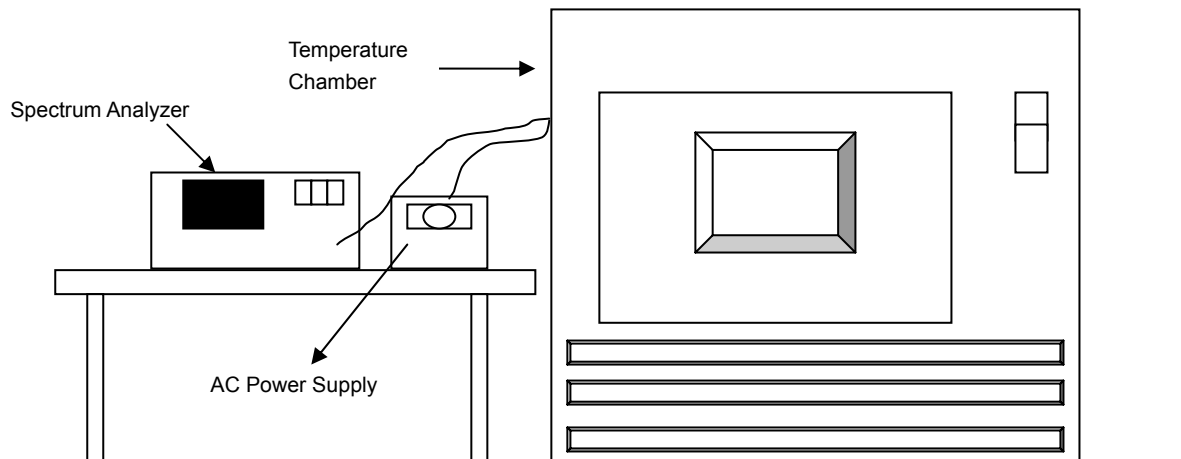


4.4 Frequency Stability Measurement

4.4.1 Limits of Frequency Stability Measurement

The frequency of the carrier signal shall be maintained within band of operation

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedure

- The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Condition

Set the EUT transmit at un-modulation mode to test frequency stability.

4.4.7 Test Results

FREQUENCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5180MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5180.0253	0.00049	5180.0263	0.00051	5180.025	0.00048	5180.0271	0.00052
40	120	5180.0122	0.00024	5180.0103	0.00020	5180.0097	0.00019	5180.0143	0.00028
30	120	5180.013	0.00025	5180.0148	0.00029	5180.0133	0.00026	5180.0172	0.00033
20	120	5179.9973	-0.00005	5179.9966	-0.00007	5179.9931	-0.00013	5179.9963	-0.00007
10	120	5180.0177	0.00034	5180.0156	0.00030	5180.016	0.00031	5180.0147	0.00028
0	120	5180.0204	0.00039	5180.0206	0.00040	5180.0209	0.00040	5180.0219	0.00042
-10	120	5180.0204	0.00039	5180.0225	0.00043	5180.0225	0.00043	5180.0206	0.00040
-20	120	5179.9829	-0.00033	5179.9851	-0.00029	5179.9869	-0.00025	5179.9843	-0.00030
-30	120	5180.0198	0.00038	5180.0187	0.00036	5180.0214	0.00041	5180.019	0.00037

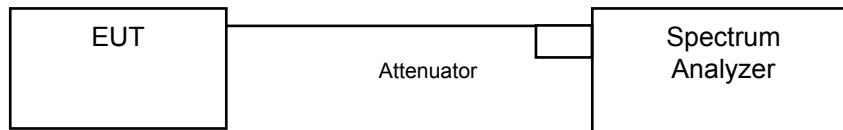
FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5180MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency(MHz)	Frequency Drift (%)	Measured Frequency(MHz)	Frequency Drift (%)	Measured Frequency(MHz)	Frequency Drift (%)	Measured Frequency(MHz)	Frequency Drift (%)
20	138	5179.9973	-0.00005	5179.996	-0.00008	5179.9934	-0.00013	5179.9963	-0.00007
	120	5179.9973	-0.00005	5179.9966	-0.00007	5179.9931	-0.00013	5179.9963	-0.00007
	102	5179.9968	-0.00006	5179.9963	-0.00007	5179.9939	-0.00012	5179.9961	-0.00008

4.5 6dB Bandwidth Measurement

4.5.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

MEASUREMENT PROCEDURE REF

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.5.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	15.46	0.5	Pass
157	5785	15.16	0.5	Pass
165	5825	15.18	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	15.96	15.39	0.5	Pass
157	5785	15.15	15.16	0.5	Pass
165	5825	15.72	15.15	0.5	Pass

802.11n (HT40)

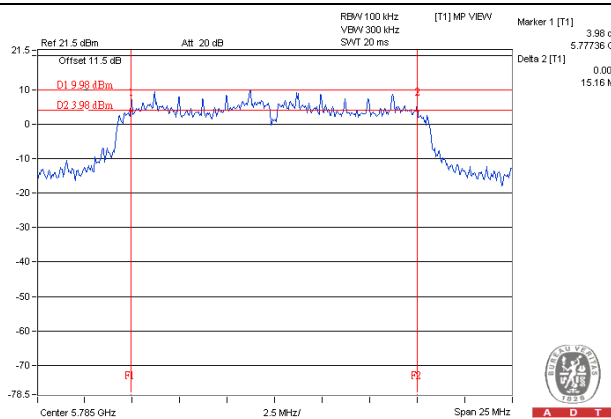
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.36	35.78	0.5	Pass
159	5795	35.80	35.80	0.5	Pass



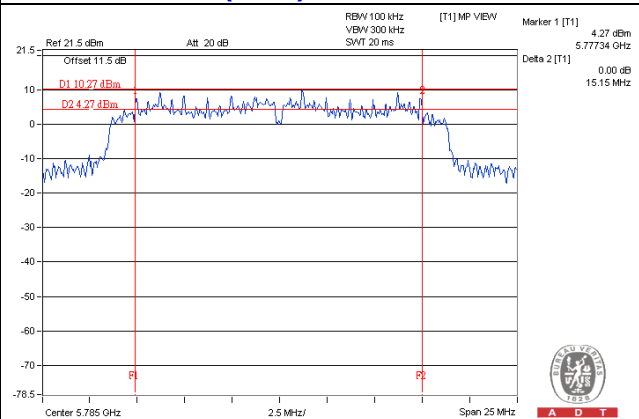
A D T

Spectrum Plot of Worst Value

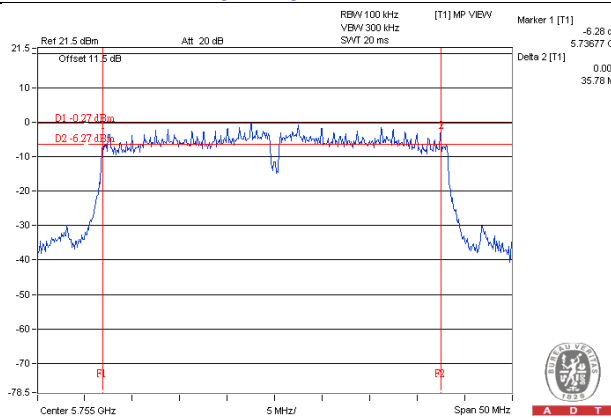
802.11a_Chain 1 / CH157



802.11n (HT20)_Chain 0 / CH157



802.11n (HT40)_Chain 1 / CH151



5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

--- END ---