FCC Test Report

Report No.:	RF151202C39
FCC ID:	JVPWDP02T
Test Model:	WDP02T
Received Date:	Dec. 02, 2015
Test Date:	Dec. 09 ~ Dec. 22, 2015
Issued Date:	Dec. 29, 2015
Applicant:	BenQ Corporation
Address:	16 Jihu Road, Neihu, Taipei 114, Taiwan
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

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Release Control Record

Issue No.	Description	Date Issued
RF151202C39	Original release.	Dec. 29, 2015

1 Certificate of Conformity

Product: Wireless FHD Kit

Brand: BenQ

Test Model: WDP02T

Sample Status: Engineering sample

Applicant: BenQ Corporation

Test Date: Dec. 09 ~ Dec. 22, 2015

Standards: 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 : _____ , **Date:** Dec. 29, 2015
Suntee Liu / Specialist

Approved by : _____ , **Date:** Dec. 29, 2015
Ken Liu / Senior 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)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -7.00dB at 0.34108MHz.
15.407(b) (1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.5dB at 5470.00MHz.
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.

3 General Information

3.1 General Description of EUT

Product	Wireless FHD Kit
Brand	BenQ
Test Model	WDP02T
Sample Status	Engineering sample
Power Supply Rating	5Vdc (adapter)
Modulation Technology	OFDM
Transfer Rate	63Mbps
Operating Frequency	5190~5230MHz, 5270~5310MHz, 5510~5670MHz, 5755-5795MHz
Number of Channel	5190~5230MHz: 2 5270~5310MHz: 2 5510~5670MHz: 3 5755~5795MHz: 2
Output Power	5190~5230MHz: 106.608mW 5270~5310MHz: 104.913mW 5510~5670MHz: 105.895mW 5755~5795MHz: 103.848mW
Antenna Type	PCB antenna with 3.01dBi gain
Antenna Connector	NA
Accessory Device	Adapter, Remote control (Brand: BenQ, Model: JX-9051)
Data Cable Supplied	1m shielded USB cable with 1 core (used to connect with adapter) 1.5m non-shielded IR Blaster cable without core

Note:

1. The EUT incorporates a MIMO function. Physically, the EUT provides provides 4 completed transmitters and 1 receiver.

Modulation Mode	TX Function	Support
WHDI (40MHz)	4TX	Nss=4

2. The EUT uses following adapter.

Brand	Asian Power Devices Inc.
Model	WB-10E05R
Input Power	100-240Vac, 50-60Hz, 0.4A Max.
Output Power	5Vdc, 2A

3.2 Description of Test Modes

5190~5230MHz:

2 channels are provided for WHDI (40MHz).

Channel	Frequency	Channel	Frequency
38	5190MHz	46	5230MHz

5270~5310MHz:

2 channels are provided for WHDI (40MHz).

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

5510~5670MHz:

3 channels are provided for WHDI (40MHz).

Channel	Frequency	Channel	Frequency
102	5510 MHz	134	5670 MHz
110	5550 MHz		

5755~5795MHz:

2 channels are provided for WHDI (40MHz).

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 & Bandedge Measurement RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission APCM: Antenna Port Conducted Measurement

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.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	WHDI (40MHz)	5190-5230	38 to 46	38, 46	OFDM	63
-		5270-5310	54 to 62	54, 62	OFDM	63
-		5510-5670	102 to 134	102, 110, 134	OFDM	63
-		5755-5795	151 to 159	151, 159	OFDM	63

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.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	WHDI (40MHz)	5190-5230	38 to 46	38	OFDM	63

Power Line Conducted Emission Test:

☒ 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.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	WHDI (40MHz)	5190-5230	38 to 46	38	OFDM	63

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.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	WHDI (40MHz)	5190-5230	38 to 46	38, 46	OFDM	63
-		5270-5310	54 to 62	54, 62	OFDM	63
-		5510-5670	102 to 134	102, 110, 134	OFDM	63
-		5755-5795	151 to 159	151, 159	OFDM	63

Test Condition:

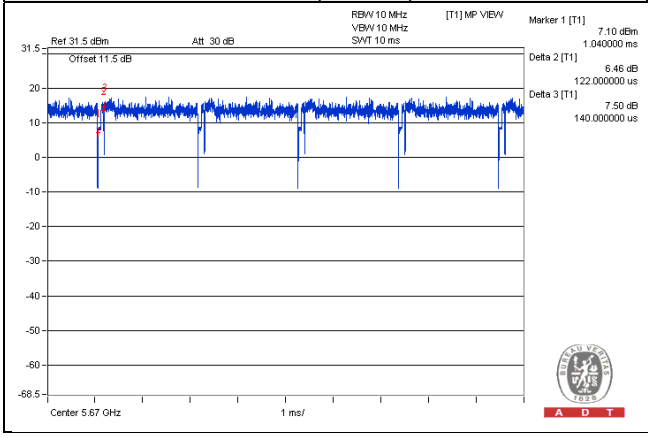
Applicable to	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 60% RH	120Vac, 60Hz	Tank Wu
RE<1G	25 deg. C, 65% RH	120Vac, 60Hz	Tank Wu
PLC	20 deg. C, 70% RH	120Vac, 60Hz	Jones Chang
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Leo Tsai

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is < 98%, duty factor shall be considered.

WHDI (40MHz): Duty cycle = 1.22/1.4 = 0.871, Duty factor = 10 * log(1/0.871) = 0.60

WHDI (40MHz)



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.

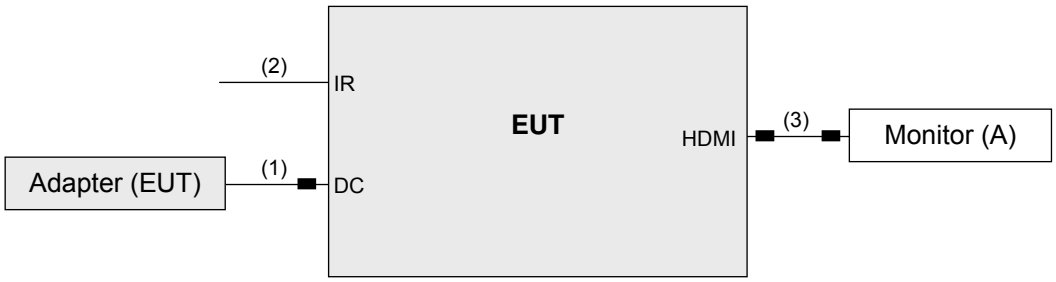
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Monitor	sony	KDL-32EX650	4365185	FCC DoC Approved	-

Note: 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.	USB	1	1	Y	1	Accessory of EUT
2.	IR Blaster	1	1.5	N	0	Accessory of EUT
3.	HDMI	1	1.5	Y	2	-

Note: The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

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)
789033 D02 General UNII Test Procedures New Rules v01r02
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. Other emissions shall be at least 20dB below the highest level of the desired power:

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:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. 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 Procedures New Rules v01r02	FIELD STRENGTH AT 3m	
	PK:74 (dBμV/m)	AV:54 (dBμV/m)
APPLICABLE TO	EIRP LIMIT	EQUIVALENT FIELD STRENGTH AT 3m
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBμV/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(dBμV/m) [*1] PK:78.2 (dBμV/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:

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 12, 2015	Oct. 11, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Mar. 30, 2015	Mar. 29, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-148	Feb. 02, 2015	Feb. 01, 2016
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Feb. 09, 2015	Feb. 08, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 09, 2015	Feb. 08, 2016
Preamplifier Agilent	8449B	3008A01911	Aug. 09, 2015	Aug. 08, 2016
Preamplifier Agilent	8447D	2944A10638	Aug. 09, 2015	Aug. 08, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-02 (309222 +248780)	Aug. 09, 2015	Aug. 08, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-03 (274092)	Aug. 09, 2015	Aug. 08, 2016
RF signal cable Woken	8D-FB	Cable-CH9-01	Aug. 11, 2015	Aug. 10, 2016
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2015	Oct. 17, 2016
High Speed Peak Power Meter	ML2495A	0824011	Jul. 09, 2015	Jul. 08, 2016
Power Sensor	MA2411B	0738171	Jul. 09, 2015	Jul. 08, 2016
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 08, 2015	Jun. 07, 2016

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 test was performed in HwaYa Chamber 9.
3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 215374.
5. The IC Site Registration No. is IC 7450F-9.

4.1.3 Test Procedures

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:

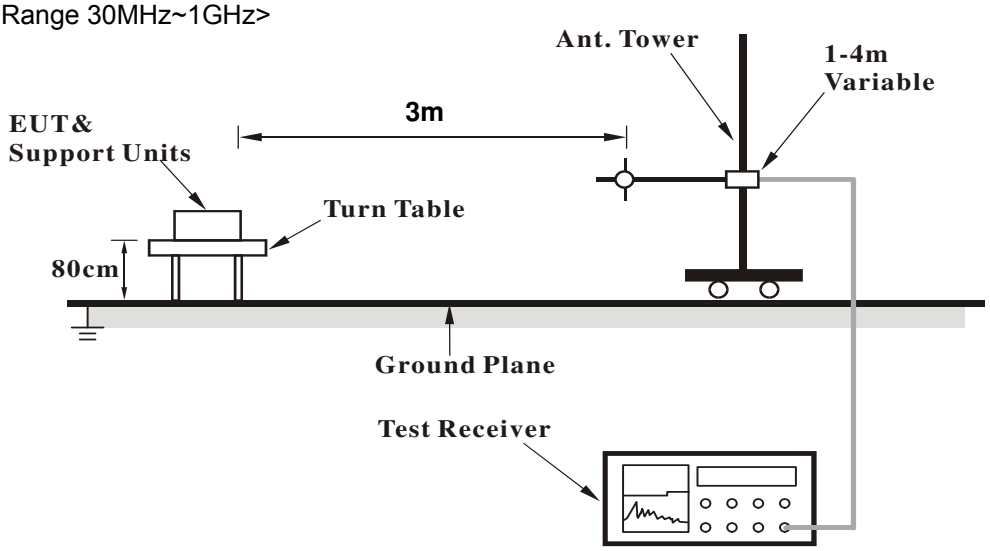
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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/duty cycle)).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle ≥ 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

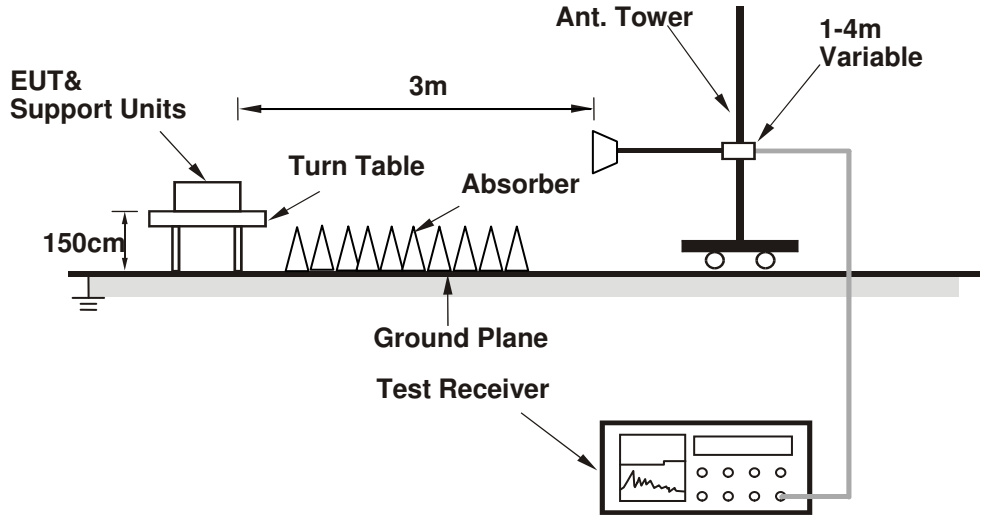
No deviation.

4.1.5 Test Set Up

<Frequency Range 30MHz~1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Conditions

a. The EUT was connected with the monitor via HDMI cable.
b. The EUT was under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz data:

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

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	68.0 PK	74.0	-6.0	1.00 H	299	64.10	3.90
2	5150.00	50.7 AV	54.0	-3.3	1.00 H	299	46.80	3.90
3	*5190.00	107.3 PK			1.35 H	262	65.80	41.50
4	*5190.00	94.1 AV			1.35 H	262	52.60	41.50
5	#10380.00	60.4 PK	74.0	-13.6	1.15 H	159	45.00	15.40
6	#10380.00	47.3 AV	54.0	-6.7	1.15 H	159	31.90	15.40
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	61.6 PK	74.0	-12.4	1.85 V	52	57.70	3.90
2	5150.00	47.5 AV	54.0	-6.5	1.85 V	52	43.60	3.90
3	*5190.00	101.2 PK			1.09 V	256	59.70	41.50
4	*5190.00	88.3 AV			1.09 V	256	46.80	41.50
5	#10380.00	60.6 PK	74.0	-13.4	1.07 V	247	45.20	15.40
6	#10380.00	49.4 AV	54.0	-4.6	1.07 V	247	34.00	15.40

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

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	*5230.00	107.0 PK			1.00 H	261	65.40	41.60
2	*5230.00	93.9 AV			1.00 H	261	52.30	41.60
3	5350.00	59.1 PK	74.0	-14.9	1.07 H	232	55.10	4.00
4	5350.00	46.4 AV	54.0	-7.6	1.07 H	232	42.40	4.00
5	#10460.00	60.8 PK	74.0	-13.2	1.07 H	224	45.30	15.50
6	#10460.00	47.4 AV	54.0	-6.6	1.07 H	224	31.90	15.50
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	*5230.00	102.2 PK			1.00 V	263	60.60	41.60
2	*5230.00	89.8 AV			1.00 V	263	48.20	41.60
3	5350.00	59.8 PK	74.0	-14.2	1.80 V	117	55.80	4.00
4	5350.00	45.8 AV	54.0	-8.2	1.80 V	117	41.80	4.00
5	#10460.00	61.4 PK	74.0	-12.6	1.00 V	89	45.90	15.50
6	#10460.00	49.5 AV	54.0	-4.5	1.00 V	89	34.00	15.50

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)
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 54	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	59.0 PK	74.0	-15.0	1.10 H	329	55.10	3.90
2	5150.00	46.7 AV	54.0	-7.3	1.10 H	329	42.80	3.90
3	*5270.00	107.9 PK			1.10 H	264	66.20	41.70
4	*5270.00	95.0 AV			1.10 H	264	53.30	41.70
5	#10540.00	61.1 PK	74.0	-12.9	1.08 H	120	45.30	15.80
6	#10540.00	47.9 AV	54.0	-6.1	1.08 H	120	32.10	15.80
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	58.7 PK	74.0	-15.3	1.19 V	198	54.80	3.90
2	5150.00	45.5 AV	54.0	-8.5	1.19 V	198	41.60	3.90
3	*5270.00	102.6 PK			1.05 V	260	60.90	41.70
4	*5270.00	89.9 AV			1.05 V	260	48.20	41.70
5	#10540.00	61.5 PK	74.0	-12.5	1.05 V	95	45.70	15.80
6	#10540.00	48.9 AV	54.0	-5.1	1.05 V	95	33.10	15.80

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)
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 62	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*5310.00	108.2 PK			1.10 H	259	66.50	41.70
2	*5310.00	94.9 AV			1.10 H	259	53.20	41.70
3	5350.00	66.7 PK	74.0	-7.3	1.32 H	264	62.70	4.00
4	5350.00	50.9 AV	54.0	-3.1	1.32 H	264	46.90	4.00
5	10620.00	60.5 PK	74.0	-13.5	1.00 H	210	44.60	15.90
6	10620.00	47.4 AV	54.0	-6.6	1.00 H	210	31.50	15.90
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	*5310.00	101.5 PK			1.00 V	212	59.80	41.70
2	*5310.00	89.8 AV			1.00 V	212	48.10	41.70
3	5350.00	61.3 PK	74.0	-12.7	1.12 V	228	57.30	4.00
4	5350.00	47.8 AV	54.0	-6.2	1.12 V	228	43.80	4.00
5	10620.00	61.0 PK	74.0	-13.0	1.06 V	100	45.10	15.90
6	10620.00	48.0 AV	54.0	-6.0	1.06 V	100	32.10	15.90

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 102	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5460.00	62.6 PK	74.0	-11.4	1.06 H	259	58.70	3.90
2	5460.00	49.1 AV	54.0	-4.9	1.06 H	259	45.20	3.90
3	#5470.00	71.3 PK	74.0	-2.7	1.06 H	257	67.40	3.90
4	**#5470.00**	**52.5 AV**	**54.0**	**-1.5**	**1.06 H**	**257**	**48.60**	**3.90**
5	*5510.00	109.0 PK			1.06 H	260	67.40	41.60
6	*5510.00	95.6 AV			1.06 H	260	54.00	41.60
7	11020.00	61.7 PK	74.0	-12.3	1.13 H	172	44.80	16.90
8	11020.00	48.2 AV	54.0	-5.8	1.13 H	172	31.30	16.90
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	5460.00	58.7 PK	74.0	-15.3	1.23 V	257	54.80	3.90
2	5460.00	46.2 AV	54.0	-7.8	1.23 V	257	42.30	3.90
3	#5470.00	67.0 PK	74.0	-7.0	1.22 V	276	63.10	3.90
4	#5470.00	49.0 AV	54.0	-5.0	1.22 V	276	45.10	3.90
5	*5510.00	104.0 PK			1.17 V	221	62.40	41.60
6	*5510.00	90.2 AV			1.17 V	221	48.60	41.60
7	11020.00	62.0 PK	74.0	-12.0	1.12 V	125	45.10	16.90
8	11020.00	49.4 AV	54.0	-4.6	1.12 V	125	32.50	16.90

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)
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 110	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*5550.00	109.8 PK			1.03 H	262	68.10	41.70
2	*5550.00	96.4 AV			1.03 H	262	54.70	41.70
3	11100.00	60.0 PK	74.0	-14.0	1.03 H	138	44.20	15.80
4	11100.00	47.7 AV	54.0	-6.3	1.03 H	138	31.90	15.80
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	*5550.00	102.1 PK			1.02 V	260	60.40	41.70
2	*5550.00	89.3 AV			1.02 V	260	47.60	41.70
3	11100.00	61.0 PK	74.0	-13.0	1.07 V	121	45.20	15.80
4	11100.00	48.7 AV	54.0	-5.3	1.07 V	121	32.90	15.80

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 134	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*5670.00	106.2 PK			1.06 H	260	64.20	42.00
2	*5670.00	93.9 AV			1.06 H	260	51.90	42.00
3	#5725.00	59.8 PK	74.0	-14.2	1.23 H	258	55.40	4.40
4	#5725.00	46.9 AV	54.0	-7.1	1.23 H	258	42.50	4.40
5	11340.00	61.1 PK	74.0	-12.9	1.21 H	174	44.30	16.80
6	11340.00	48.2 AV	54.0	-5.8	1.21 H	174	31.40	16.80
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	*5670.00	103.3 PK			1.00 V	281	61.30	42.00
2	*5670.00	90.0 AV			1.00 V	281	48.00	42.00
3	#5725.00	59.0 PK	74.0	-15.0	1.13 V	288	54.60	4.40
4	#5725.00	46.3 AV	54.0	-7.7	1.13 V	288	41.90	4.40
5	11340.00	61.8 PK	74.0	-12.2	1.00 V	102	45.00	16.80
6	11340.00	48.1 AV	54.0	-5.9	1.00 V	102	31.30	16.80

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)
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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	#5714.90	70.0 PK	74.0	-4.0	1.48 H	255	65.60	4.40
2	#5714.90	51.3 AV	54.0	-2.7	1.48 H	255	46.90	4.40
3	#5722.90	73.5 PK	78.2	-4.7	1.47 H	258	69.10	4.40
4	#5725.00	61.5 PK	78.2	-16.7	1.50 H	259	57.10	4.40
5	*5755.00	108.3 PK			1.20 H	256	66.10	42.20
6	*5755.00	95.2 AV			1.20 H	256	53.00	42.20
7	11510.00	60.3 PK	74.0	-13.7	1.16 H	211	45.10	15.20
8	11510.00	47.3 AV	54.0	-6.7	1.16 H	211	32.10	15.20
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	#5714.90	66.4 PK	74.0	-7.6	2.99 V	286	62.00	4.40
2	#5714.90	49.5 AV	54.0	-4.5	2.99 V	286	45.10	4.40
3	#5722.90	71.4 PK	78.2	-6.8	2.96 V	280	67.00	4.40
4	#5725.00	61.1 PK	78.2	-17.1	2.98 V	286	56.70	4.40
5	*5755.00	104.5 PK			2.93 V	277	62.30	42.20
6	*5755.00	91.4 AV			2.93 V	277	49.20	42.20
7	11510.00	60.5 PK	74.0	-13.5	1.13 V	246	45.30	15.20
8	11510.00	47.6 AV	54.0	-6.4	1.13 V	246	32.40	15.20

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)
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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*5795.00	107.9 PK			1.18 H	255	65.60	42.30
2	*5795.00	94.9 AV			1.18 H	255	52.60	42.30
3	#5850.00	47.1 PK	78.2	-31.1	1.26 H	255	42.40	4.70
4	#5852.10	60.5 PK	78.2	-17.7	1.26 H	266	55.80	4.70
5	#5860.10	60.6 PK	74.0	-13.4	1.25 H	257	55.90	4.70
6	#5860.10	45.9 AV	54.0	-8.1	1.25 H	257	41.20	4.70
7	11590.00	60.7 PK	74.0	-13.3	1.20 H	196	45.60	15.10
8	11590.00	47.5 AV	54.0	-6.5	1.20 H	196	32.40	15.10
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	*5795.00	104.4 PK			2.91 V	279	62.10	42.30
2	*5795.00	91.0 AV			2.91 V	279	48.70	42.30
3	#5850.00	45.2 PK	78.2	-33.0	1.65 V	144	40.50	4.70
4	#5852.10	59.4 PK	78.2	-18.8	1.60 V	143	54.70	4.70
5	#5860.10	58.4 PK	74.0	-15.6	1.67 V	142	53.70	4.70
6	#5860.10	45.5 AV	54.0	-8.5	1.67 V	142	40.80	4.70
7	11590.00	61.1 PK	74.0	-12.9	1.23 V	221	46.00	15.10
8	11590.00	48.0 AV	54.0	-6.0	1.23 V	221	32.90	15.10

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)
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 worst-case data:

CHANNEL	TX Channel 38	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 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	30.00	30.0 QP	40.0	-10.0	1.50 H	2	45.60	-15.60
2	59.10	27.4 QP	40.0	-12.6	1.00 H	95	42.00	-14.60
3	76.56	20.2 QP	40.0	-19.8	1.99 H	214	38.00	-17.80
4	144.46	23.5 QP	43.5	-20.0	1.99 H	278	37.40	-13.90
5	256.98	21.9 QP	46.0	-24.1	1.24 H	231	36.00	-14.10
6	480.08	31.0 QP	46.0	-15.0	1.99 H	49	39.70	-8.70
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	35.08	30.2 QP	40.0	-9.8	1.24 V	134	45.80	-15.60
2	59.10	23.4 QP	40.0	-16.6	1.99 V	8	38.00	-14.60
3	76.56	21.9 QP	40.0	-18.1	1.24 V	255	39.70	-17.80
4	154.16	19.4 QP	43.5	-24.1	1.00 V	11	33.10	-13.70
5	480.08	28.8 QP	46.0	-17.2	1.00 V	297	37.50	-8.70
6	747.80	32.5 QP	46.0	-13.5	1.24 V	354	36.10	-3.60

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1.

4.2.3 Test Procedures

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup

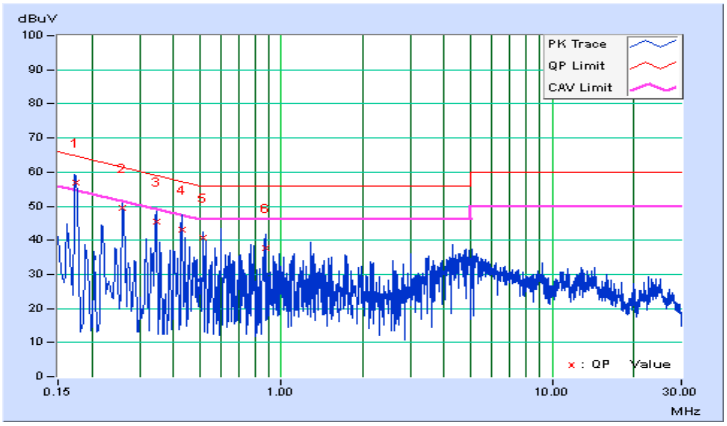
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17374	9.83	47.00	25.26	56.83	35.09	64.78	54.78	-7.95	-19.69
2	0.25948	9.85	39.53	25.89	49.38	35.74	61.45	51.45	-12.07	-15.71
3	0.34550	9.87	35.46	14.01	45.33	23.88	59.07	49.07	-13.74	-25.19
4	0.43152	9.88	33.21	20.46	43.09	30.34	57.22	47.22	-14.13	-16.88
5	0.51363	9.89	31.01	8.77	40.90	18.66	56.00	46.00	-15.10	-27.34
6	0.88117	9.92	27.69	8.29	37.61	18.21	56.00	46.00	-18.39	-27.79

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

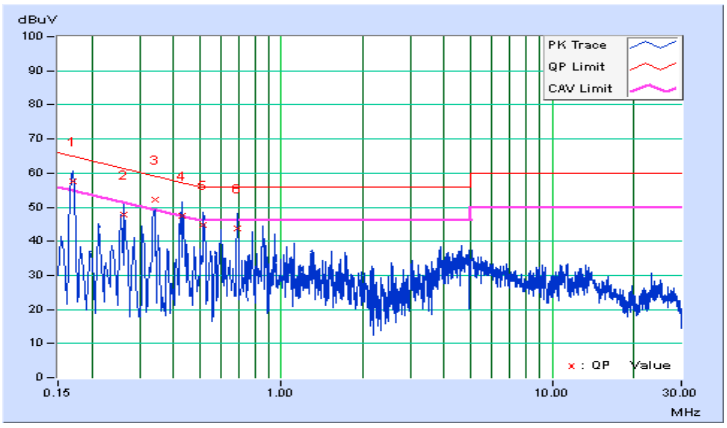


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16955	9.82	47.66	27.18	57.48	37.00	64.98	54.98	-7.50	-17.98
2	0.26339	9.85	37.85	21.32	47.70	31.17	61.32	51.32	-13.63	-20.16
3	**0.34108**	**9.87**	**42.31**	**19.67**	**52.18**	**29.54**	**59.18**	**49.18**	**-7.00**	**-19.64**
4	0.43152	9.88	37.47	22.39	47.35	32.27	57.22	47.22	-9.87	-14.95
5	0.51754	9.89	35.04	13.50	44.93	23.39	56.00	46.00	-11.07	-22.61
6	0.68564	9.90	33.94	11.80	43.84	21.70	56.00	46.00	-12.16	-24.30

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category	LIMIT
U-NII-1	Outdoor Access Point	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.

4.3.2 Test Setup

For Power Output

For 26dB and Occupied Bandwidth

4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

For Power Output

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.

For Occupied Bandwidth

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 300 kHz RBW and 1MHz VBW. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

4.3.5 Deviation fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

Power Output:

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	14.20	14.07	14.46	14.29	**106.608**	20.28	30	Pass
46	5230	14.34	14.05	14.16	14.22	105.060	20.21	30	Pass
54	5270	14.29	14.23	14.30	13.92	**104.913**	20.21	24	Pass
62	5310	14.26	14.21	14.12	14.10	104.559	20.19	24	Pass
102	5510	14.12	14.40	14.37	14.01	**105.895**	20.25	24	Pass
110	5550	14.10	13.89	14.37	14.36	104.838	20.21	24	Pass
134	5670	14.04	13.51	14.21	14.48	102.207	20.09	24	Pass
151	5755	14.27	13.47	14.26	13.48	97.916	19.91	30	Pass
159	5795	14.14	14.02	14.26	14.15	**103.848**	20.16	30	Pass

Note:
For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log (51.71) = 28.14 > 24dBm
2. 11dBm + 10log (52.73) = 28.22 > 24dBm
3. 11dBm + 10log (53.30) = 28.27 > 24dBm
4. 11dBm + 10log (57.08) = 28.56 > 24dBm
5. 11dBm + 10log (52.21) = 28.18 > 24dBm

Chain 1
1. 11dBm + 10log (40.61) = 27.09 > 24dBm
2. 11dBm + 10log (40.84) = 27.11 > 24dBm
3. 11dBm + 10log (40.84) = 27.11 > 24dBm
4. 11dBm + 10log (40.74) = 27.10 > 24dBm
5. 11dBm + 10log (40.80) = 27.11 > 24dBm

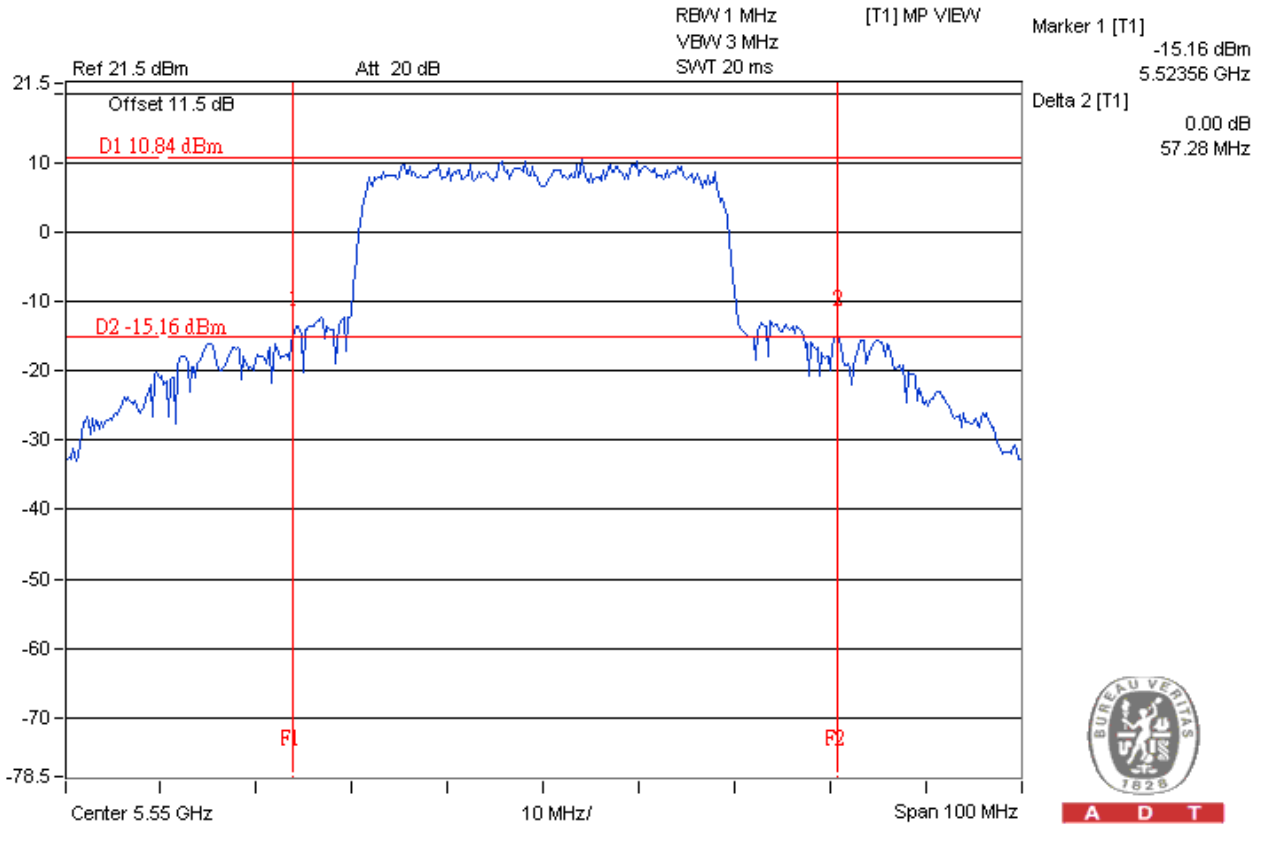
Chain 2
1. 11dBm + 10log (40.67) = 27.09 > 24dBm
2. 11dBm + 10log (53.47) = 28.28 > 24dBm
3. 11dBm + 10log (52.98) = 28.24 > 24dBm
4. 11dBm + 10log (57.28) = 28.58 > 24dBm
5. 11dBm + 10log (52.68) = 28.22 > 24dBm

Chain 3
1. 11dBm + 10log (40.77) = 27.10 > 24dBm
2. 11dBm + 10log (40.71) = 27.10 > 24dBm
3. 11dBm + 10log (46.03) = 27.63 > 24dBm
4. 11dBm + 10log (45.98) = 27.63 > 24dBm
5. 11dBm + 10log (45.81) = 27.61 > 24dBm

26dB Bandwidth:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)				Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3	
38	5190	40.64	40.70	40.78	40.86	Pass
46	5230	41.47	40.59	40.67	40.80	Pass
54	5270	51.71	40.61	40.67	40.77	Pass
62	5310	52.73	40.84	53.47	40.71	Pass
102	5510	53.30	40.84	52.98	46.03	Pass
110	5550	57.08	40.74	57.28	45.98	Pass
134	5670	52.21	40.80	52.68	45.81	Pass

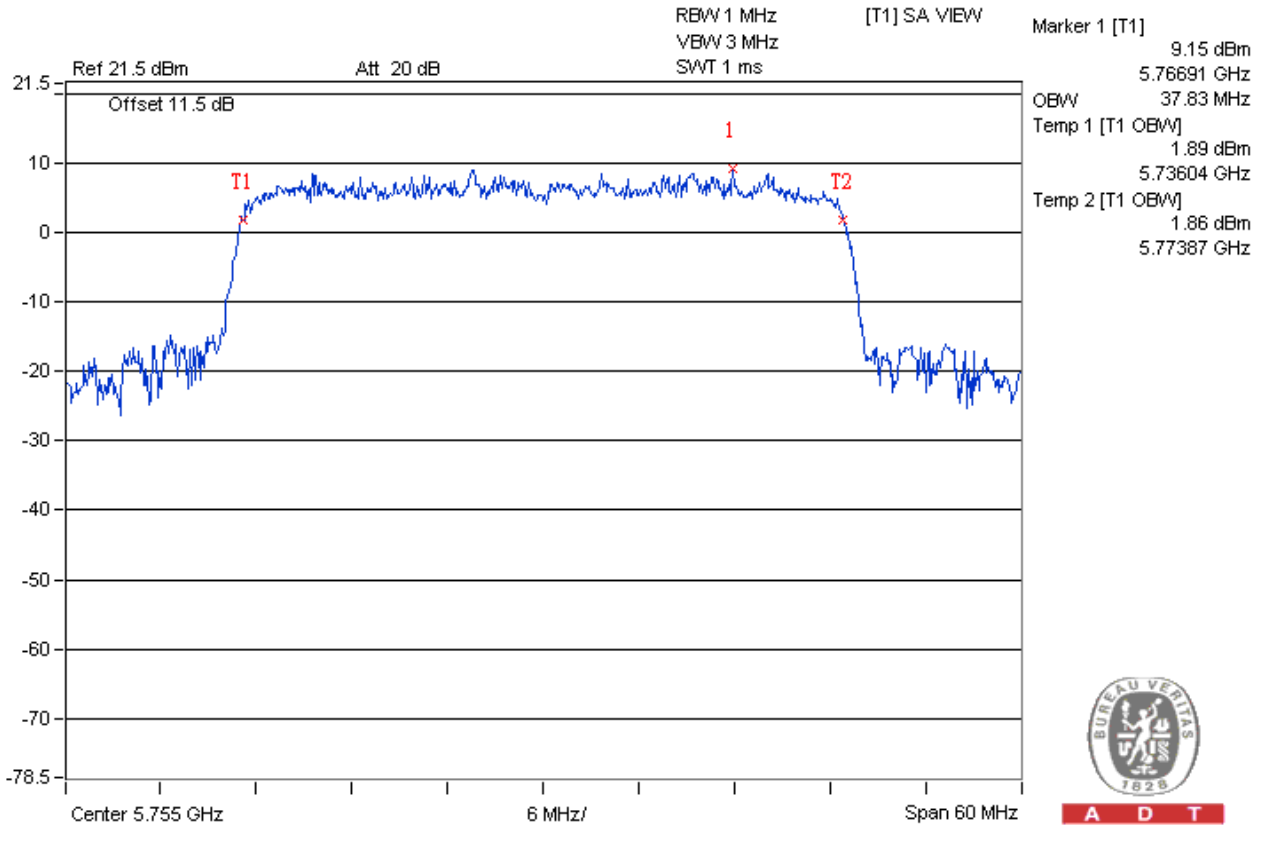
Spectrum Plot of Worst Value



Occupied Bandwidth:

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
38	5190	37.68	37.68	37.68	37.68
46	5230	37.80	37.68	37.68	37.68
54	5270	37.80	59.52	37.68	37.68
62	5310	37.80	37.68	37.80	37.68
102	5510	37.80	37.80	37.80	37.68
110	5550	37.80	37.80	37.80	37.80
134	5670	37.80	37.68	37.80	37.68
151	5755	37.83	37.74	37.65	37.74
159	5795	37.80	37.68	37.68	37.80

Spectrum Plot of Worst Value



EUT MAXIMUM CONDUCTED POWER

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	104.913	20.21
5470~5725	105.895	20.25

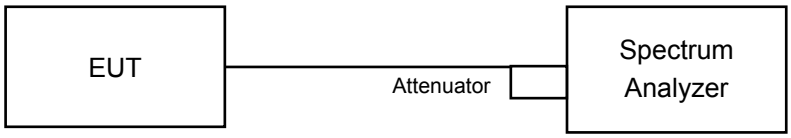
Note: Manufacturer provides Transmit Power Control description to meet this requirement.

4.4 Peak Power Spectral Density Measurement

4.4.1 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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

For U-NII-1, U-NII-2A, U-NII-2C band:
Using method SA-2
1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
2) Set RBW = 30 kHz, Set VBW ≥ 1 MHz, Detector = RMS.
3) Set Channel power measure = 1MHz.
4) Sweep time = auto, trigger set to “free run”.
5) Trace average at least 100 traces in power averaging mode.
6) Record the max value and add 10 log (1/duty cycle).

For U-NII-3 band:
1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
2) Set RBW = 500 kHz, Set VBW ≥ 3 RBW, 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 and add 10 log (1/duty cycle).
6) 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 = 10log(500 kHz/300kHz).

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as item 4.3.6.

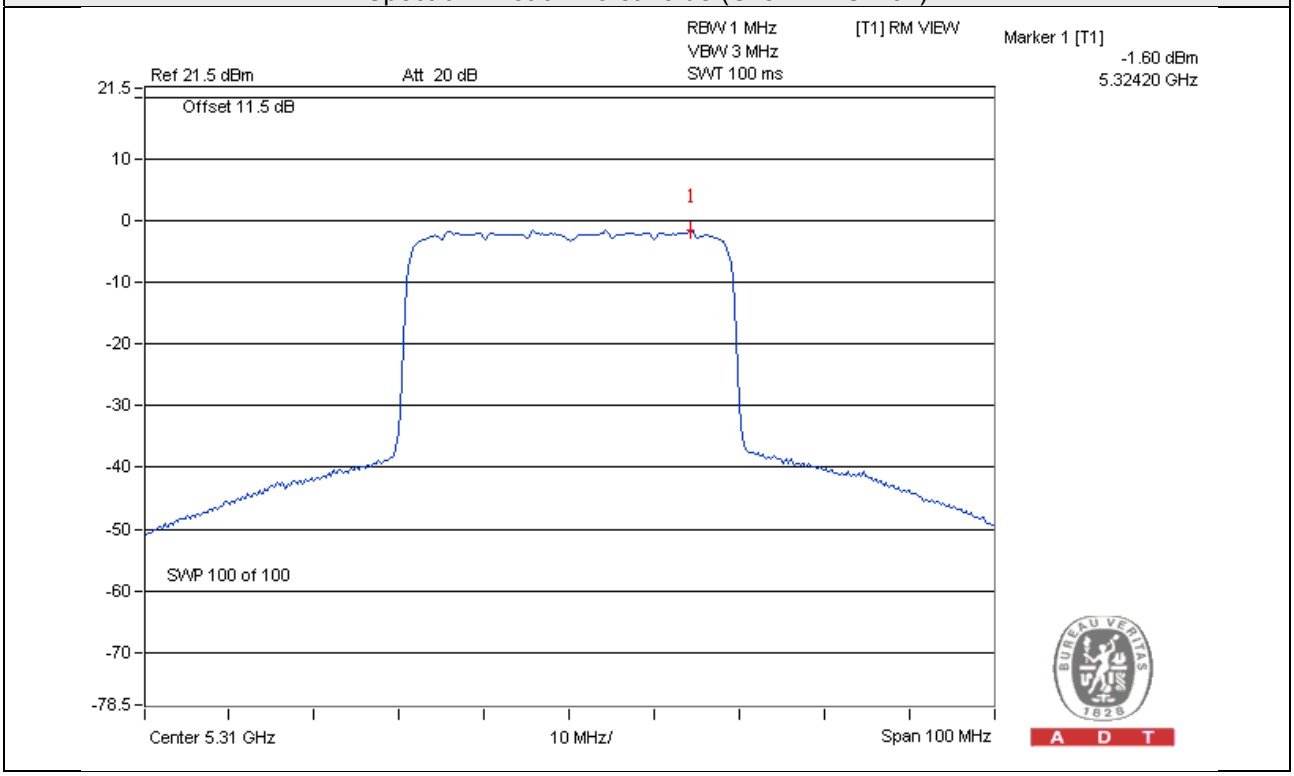
4.4.7 Test Results

For U-NII-1, U-NII-2A, U-NII-2C Band:

Chan.	Freq. (MHz)	PSD (dBm)				Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3					
38	5190	-2.85	-2.86	-2.57	-2.75	3.26	0.60	3.86	17	Pass
46	5230	-2.69	-3.28	-3.26	-3.11	2.94	0.60	3.54	17	Pass
54	5270	-2.79	-2.91	-3.42	-2.92	3.02	0.60	3.62	11	Pass
62	5310	-2.97	-1.72	-2.06	-2.74	3.68	0.60	4.28	11	Pass
102	5510	-3.11	-2.66	-2.85	-2.14	3.35	0.60	3.95	11	Pass
110	5550	-2.24	-2.41	-2.11	-2.22	3.78	0.60	4.38	11	Pass
134	5670	-2.90	-2.66	-2.90	-2.21	3.36	0.60	3.96	11	Pass

Note:
1. Method 1 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. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value (Chain 1 / CH 62)

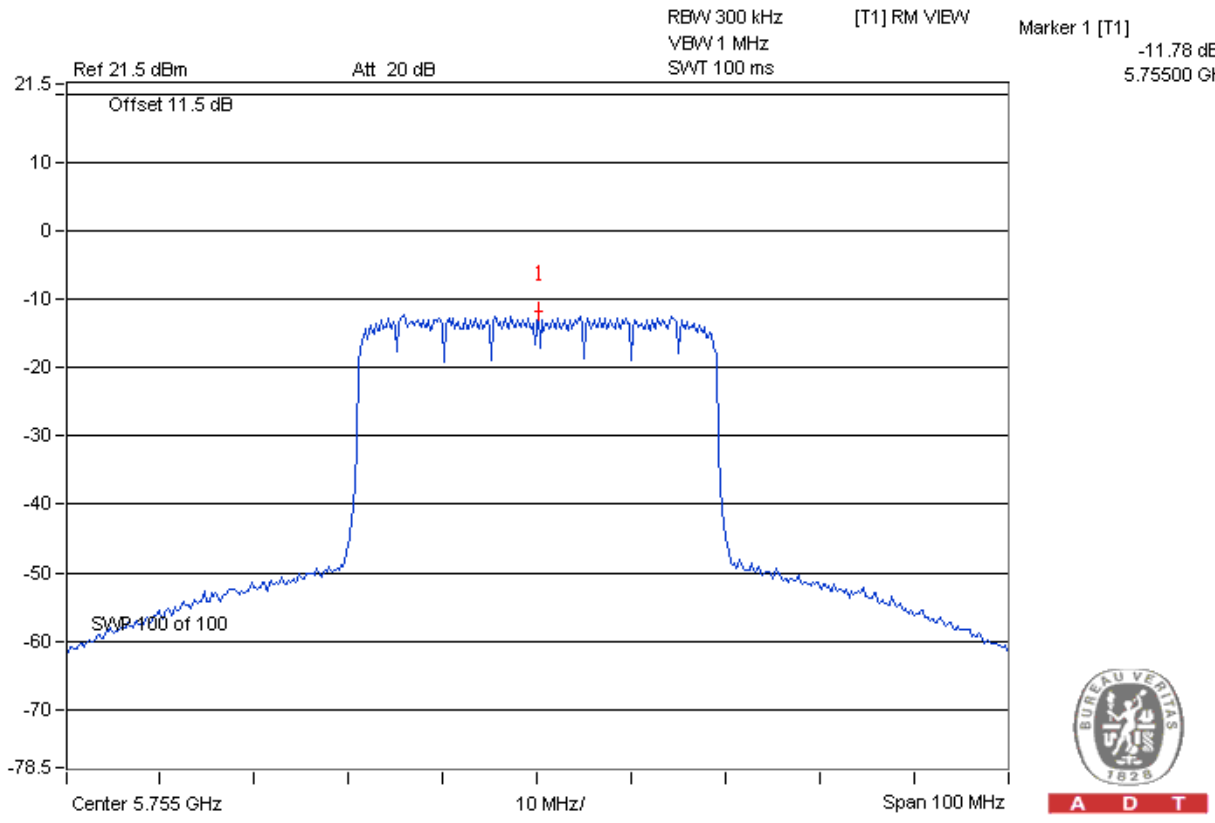


For U-NII-3 Band:

TX chain	Chan.	Freq. (MHz)	PSD (dBm /300kHz)	PSD (dBm /500kHz)	10 log (N=4) dB	Total PSD without Duty Factor (dBm/500kHz)	Duty Factor	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm /500kHz)	Pass /Fail
0	151	5755	-11.78	-9.56	6.02	-3.54	0.60	-2.94	30	Pass
	159	5795	-11.90	-9.68	6.02	-3.66	0.60	-3.06	30	Pass
1	151	5755	-15.73	-13.51	6.02	-7.49	0.60	-6.89	30	Pass
	159	5795	-15.75	-13.53	6.02	-7.51	0.60	-6.91	30	Pass
2	151	5755	-16.25	-14.03	6.02	-8.01	0.60	-7.41	30	Pass
	159	5795	-15.30	-13.08	6.02	-7.06	0.60	-6.46	30	Pass
3	151	5755	-12.59	-10.37	6.02	-4.35	0.60	-3.75	30	Pass
	159	5795	-12.49	-10.27	6.02	-4.25	0.60	-3.65	30	Pass

Note: 1. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

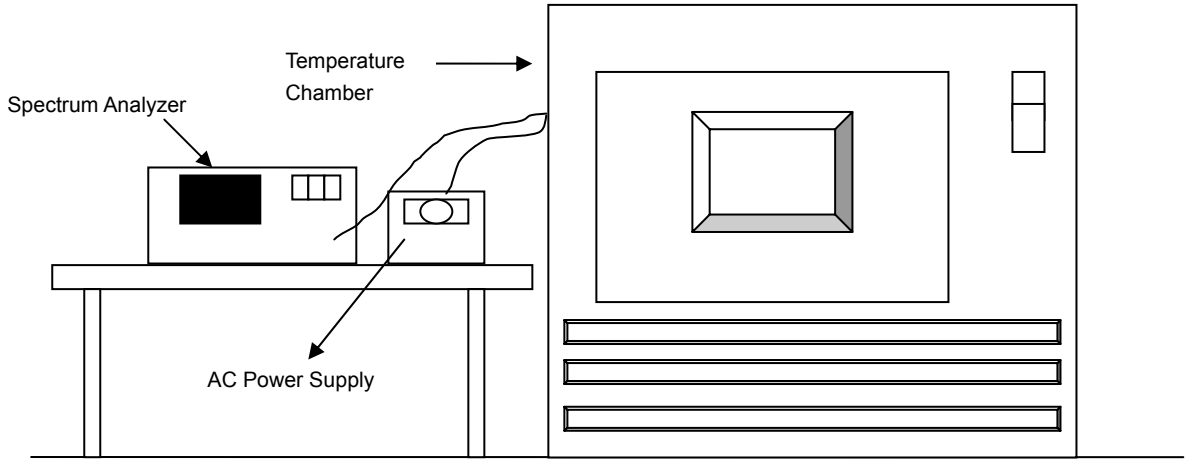


4.5 Frequency Stability

4.5.1 Limits of Frequency Stability Measurement

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

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

a. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
b. Turn the EUT on and couple its output to a spectrum analyzer.
c. Turn the EUT off and set the chamber to the highest temperature specified.
d. 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.
e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
f. 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.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

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

4.5.7 Test Results

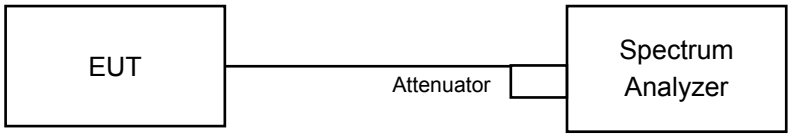
Frequency Stability Versus Temp.	
Operating Frequency: 5190MHz	
Temp. (	

4.6 6dB Bandwidth Measurement

4.6.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

Measurement Procedure REF

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. 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

4.6.5 Deviation from Test Standard

No deviation.

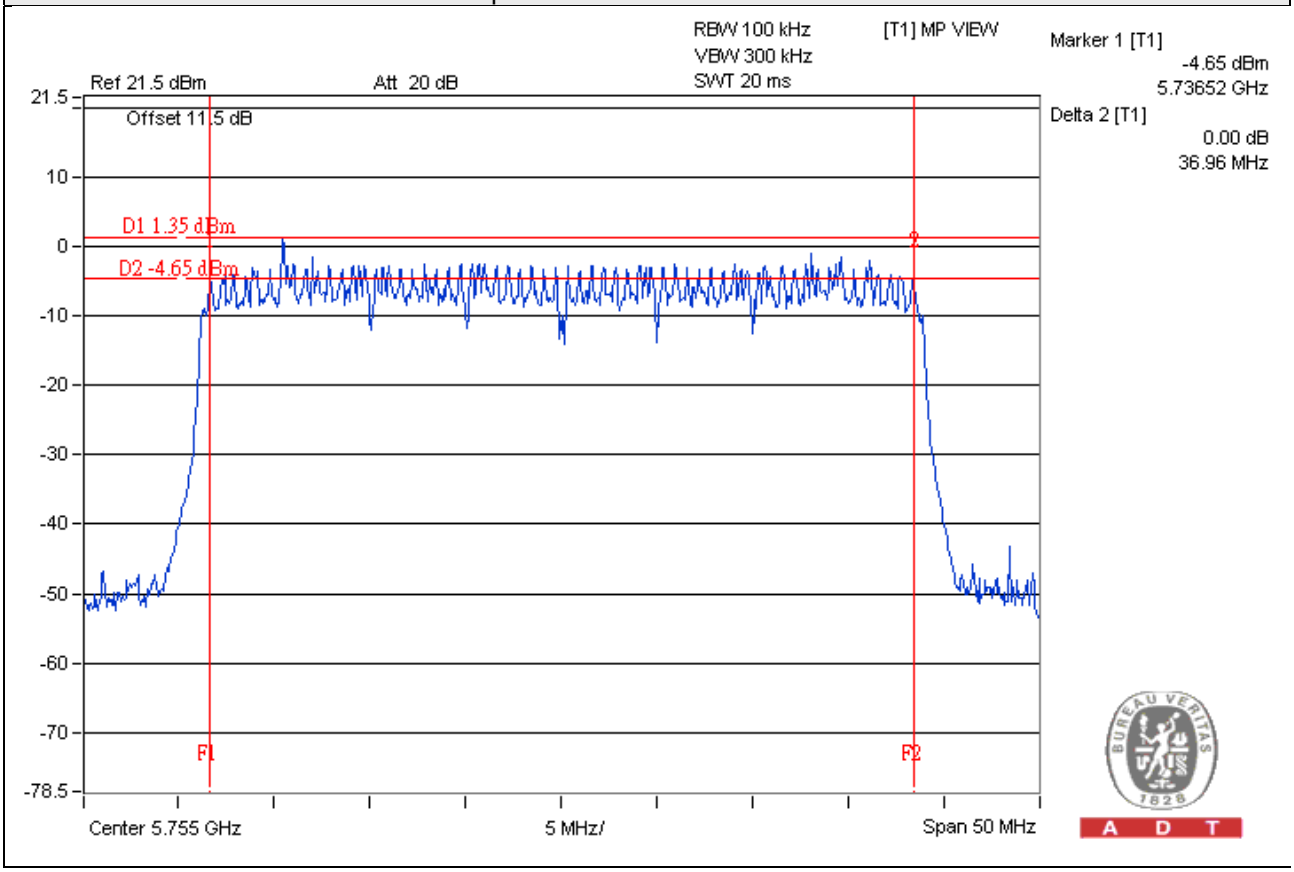
4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	36.98	36.96	37.00	37.01	0.5	Pass
159	5795	37.02	37.05	37.01	37.04	0.5	Pass

Spectrum Plot of Worst Value



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:

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

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