TEST REPORT

OF

FCC Part 15 Subpart C

FCC ID : UFSINK06A

Equipment Under Test	:	Cross Wireless AP to USB Router
Model Name	:	IN-ROUTER-UW
Serial No.	:	N/A
Applicant	:	INEW DIGITAL COMPANY
Manufacturer	:	INEW DIGITAL COMPANY
Date of Test(s)	:	2006-08-25 ~ 2006-09-11
Date of Issue	:	2006-09-11

In the configuration tested, the EUT complied with the standards specified above.

Remarks:

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.
This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS Testing Korea Co., Ltd. or testing done by SGS Testing Korea Co., Ltd. in connection with distribution or use of the product described in this report must be approved by SGS Testing Korea Co., Ltd. in writing.

VERIFICATION OF COMPLIANCE

Applicant :	INEW DIGITAL COMPANY
Kind of Product :	Cross Wireless AP to USB Router
Brand Name :	N/A
Model Name :	IN-ROUTER-UW
Report File No. :	STROR-06-070
Date of test :	2006-08-25 ~ 2006-09-11

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
Part 15, Subpart B and Subpart C §15.247	Complied

The above equipment was tested by SGS Testing Korea Co., Ltd. for compliance with the requirements set forth in the FCC RULES Part 15, Subpart B and Subpart C §15.247. The results of testing in this report apply to the product system that was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:  **Date** **2006-09-11**

Feel Jeong

Approved By  **Date** **2006-09-11**

Albert Lim

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1. General Information

1-1. Testing Laboratory

SGS Testing Korea Co., Ltd.
Wireless Div. 2FL, 18-34, Sanbon-dong, Gunpo-Si, Gyeonggi-do, Korea 435-040
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Telephone : +82 +31 428 5700
FAX : +82 +31 427 2371

1-2. Details of Applicant

Applicant	: INEW DIGITAL COMPANY
Address	: Supply Bureau 3th floor KT&G #203-1, Pyong chon-dong, Daedeog-gu, Daejeon, Korea
Contact Person	: Young-Jin Jin
Phone No.	: 82-42-933-7328
Fax No.	: 82-42-934-4829

1-3. Description of EUT

Kind of Product	Cross Wireless to USB Router
Model Name	IN-ROUTER-UW
Serial Number	N/A
Power Supply	AC 100 ~ 250 V (50 Hz ~ 60 Hz)
Frequency Range	2412~2462 MHz
Transmit Power	802.11b mode: 13.20 dBm 802.11g mode: 13.18 dBm
Modulation Technique	802.11b: DSSS (CCK; DQPSK; DBPSK) 802.11g: OFDM
Number of Channels	11 CH.(DSSS 11b, OFDM 11g)
Transmit Data Rate	802.11b: 11Mbps(CCK) with fall back rates of 5.5, 2, and 1Mbps 802.11g : 54Mbps with fall back rates of 48/36/24/18/12/9/6 Mbps (OFDM)
Operating Conditions	-20 ℃ ~ + 55 ℃
Antenna Type	Monopole Antenna(left-handed SMA Type)
Antenna Gain	4.33 dBi

Note : This Product is used FCC Certified RF module (FCC ID : TE7WN56XG).

1-4. Details of modification

-N/A

1.5. Test Equipment List

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	Agilent	E4440A	May 2007
Signal Generator	Agilent	E4438C	May 2007
AC Power Supply	Daekang	5978	Dec.2006
Two-Line V-Network	Rohde & Schwarz	ENV216	Dec.2006
Two-Line V-Network	NNB 41	Schaffner	Sep. 2006
Test Receiver	Rohde & Schwarz	ESHS 10	Sep. 2006
Test Receiver	Rohde & Schwarz	ESIB 26	Mar. 2007
Preamplifier	Agilent	8449B	May 2007
Log-periodic	Rohde & Schwarz	UHALP9107	Jan. 2007
Biconical Antenna	Schwarzbeck	VHA9103	Mar. 2007
Horn Antenna	Schwarzbeck	BBHA9120A	Jul. 2007
Anechoic Chamber	SY Corporation	L x W x H 9.6 x 6.4 x 6.4	Aug. 2007

1.6. Summary of Test Results

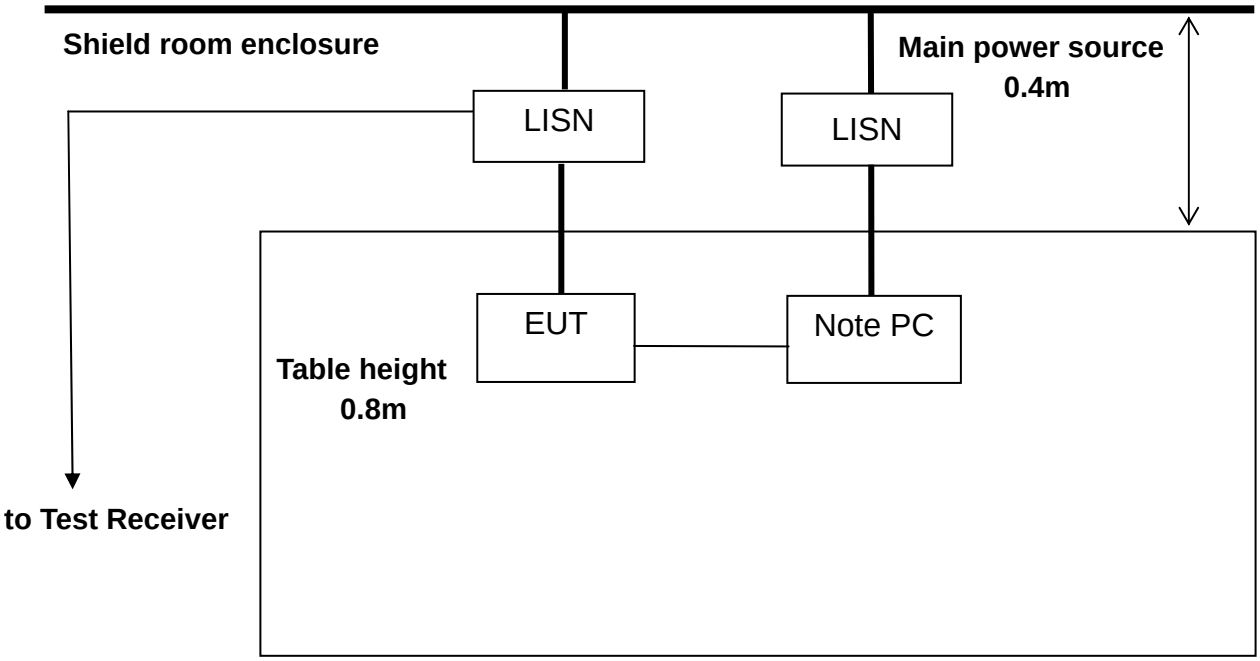
The EUT has been tested according to the following specifications:

APPLIED STANDARD:FCC 47 C.F.R. Part15, Subpart B and Subpart C		
Standard Section	**Test Item**	**Result**
15.107(a)	AC Power Conducted Emission	PASS
15.247(a)(2)	6 dB Bandwidth	*Not applied
15.247(b)	Maximum Peak Output Power	*Not applied
15.205(a) 15.209(a) 15.247(d)	Spurious Emission, Band Edge, and Restricted Bands	PASS
15.247(d)	Power Spectral Density	*Not applied
15.247(i) 1.1307(b)(1)	RF Exposure	PASS

*** Note :** This Product is used FCC Certified RF module (FCC ID : TE7WN56XG).

2. Conducted Power Line Test

2.1. Test Setup



2.2. Limit

According to §15.107(a) for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 uH/50 ohm line impedance stabilization network(LISN).
Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted limit (dBμV)	
	Qausi-peak	Average
0.15 – 0.50	66-56*	56-46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

* Decreases with the logarithm of the frequency.

2.3. Test Procedure

The test procedure is performed in a 12 ft ×12 ft ×8 ft (L×W×H) shielded room. The EUT along with its peripherals were placed on a 1.0m(W)× 1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

2.4. Test Result

The following table shows the highest levels of conducted emissions on both phase of Hot and Neutral line.

Frequency range : 0.15 MHz – 30 MHz
Measured Bandwidth : 9 kHz

Test mode : 802.11b

FREQ.	LEVEL(dB μV)		LINE	LIMIT(dB μV)		MARGIN(dB)	
(MHz)	Q-Peak	Average		Q-Peak	Average	Q-Peak	Average
0.159	37.7	24.0	H	65.5	55.5	27.82	31.52
0.295	39.3	26.8	H	60.4	50.4	21.08	23.58
0.400	39.6	37.5	H	57.9	47.9	18.25	10.31
0.595	36.8	34.8	H	56.0	46.0	19.20	11.20
2.645	29.0	23.1	H	56.0	46.0	27.00	22.90
6.240	34.6	31.3	H	60.0	50.0	25.40	18.70
0.210	44.7	32.8	N	63.2	53.2	18.51	20.41
0.475	38.2	28.8	N	56.4	46.4	18.23	17.63
2.385	40.5	29.7	N	56.0	46.0	15.50	16.30
2.585	42.0	30.9	N	56.0	46.0	14.00	15.10
3.250	37.5	30.8	N	56.0	46.0	18.50	15.20
6.300	33.4	30.1	N	60.0	50.0	26.60	19.90

REMARKS :

1. Note : • Line (H) : Hot
   • Line (N) : Neutral

Frequency range : 0.15 MHz – 30 MHz
Measured Bandwidth : 9 kHz

Test mode : 802.11g

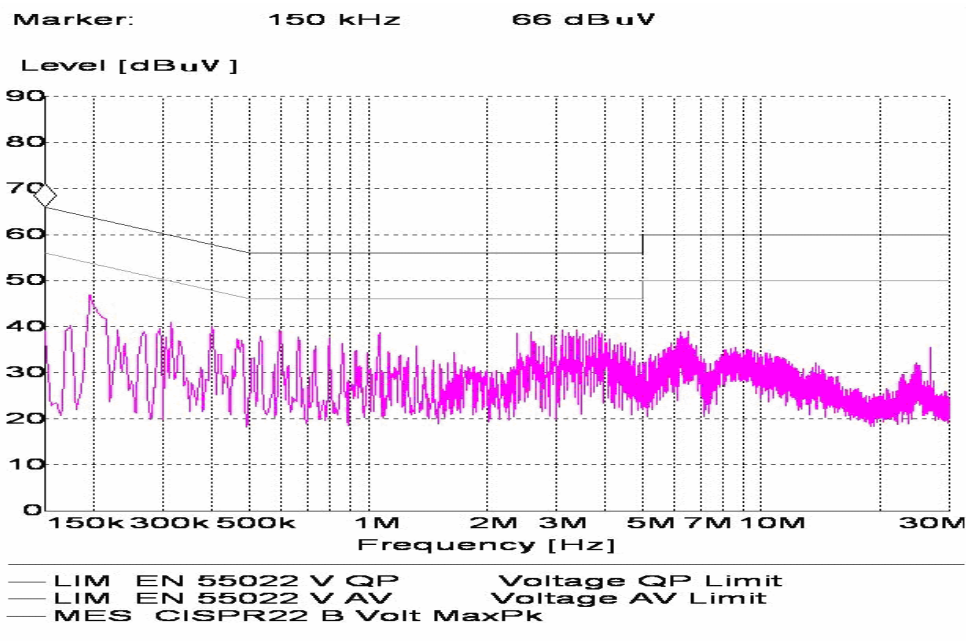
FREQ.	LEVEL(dB μV)		LINE	LIMIT(dB μV)		MARGIN(dB)	
(MHz)	Q-Peak	Average		Q-Peak	Average	Q-Peak	Average
0.200	47.3	43.5	H	63.6	53.6	16.31	10.11
0.265	42.5	39.4	H	61.3	51.3	18.77	11.87
0.395	41.1	38.3	H	58.0	48.0	16.86	9.66
3.645	34.4	28.8	H	56.0	46.0	21.60	17.20
4.035	40.3	37.4	H	56.0	46.0	15.70	8.60
6.165	34.5	32.3	H	60.0	50.0	25.50	17.70
0.190	45.3	34.3	N	64.0	54.0	18.74	19.74
0.310	38.1	28.6	N	60.0	50.0	21.87	21.37
0.470	38.0	28.7	N	56.0	46.0	18.00	17.30
2.585	39.3	29.0	N	56.0	46.0	16.70	17.00
2.850	35.3	29.5	N	56.0	46.0	20.70	16.50
6.355	32.3	31.0	N	60.0	50.0	27.70	19.00

REMARKS :

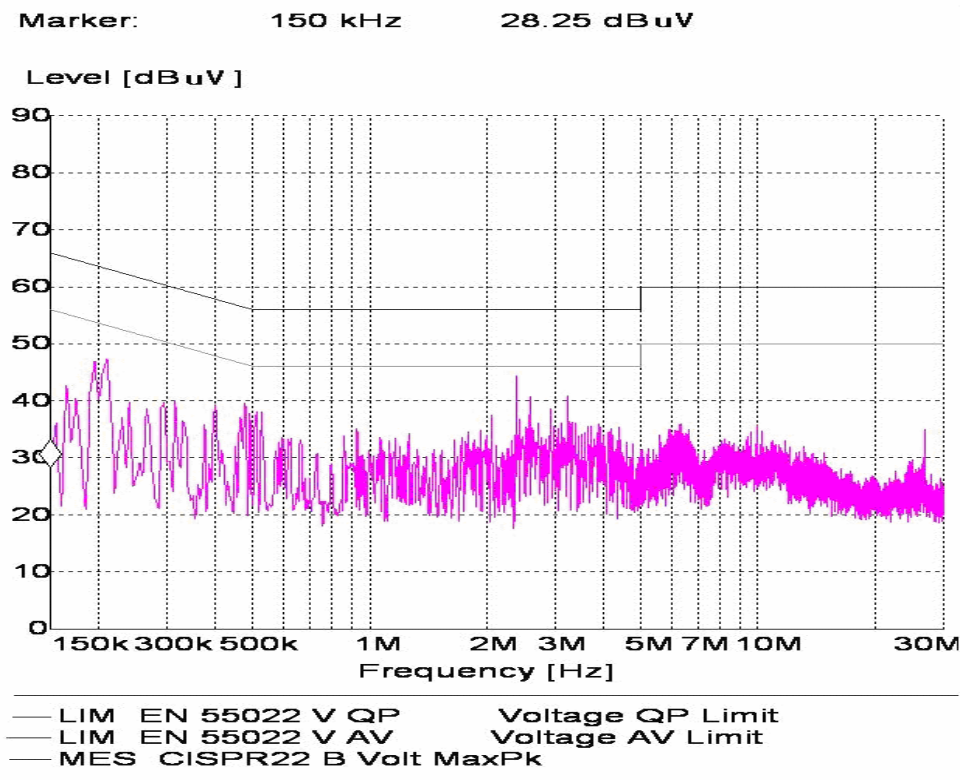
2. Note : • Line (H) : Hot
• Line (N) : Neutral

Plot of Conducted Power line

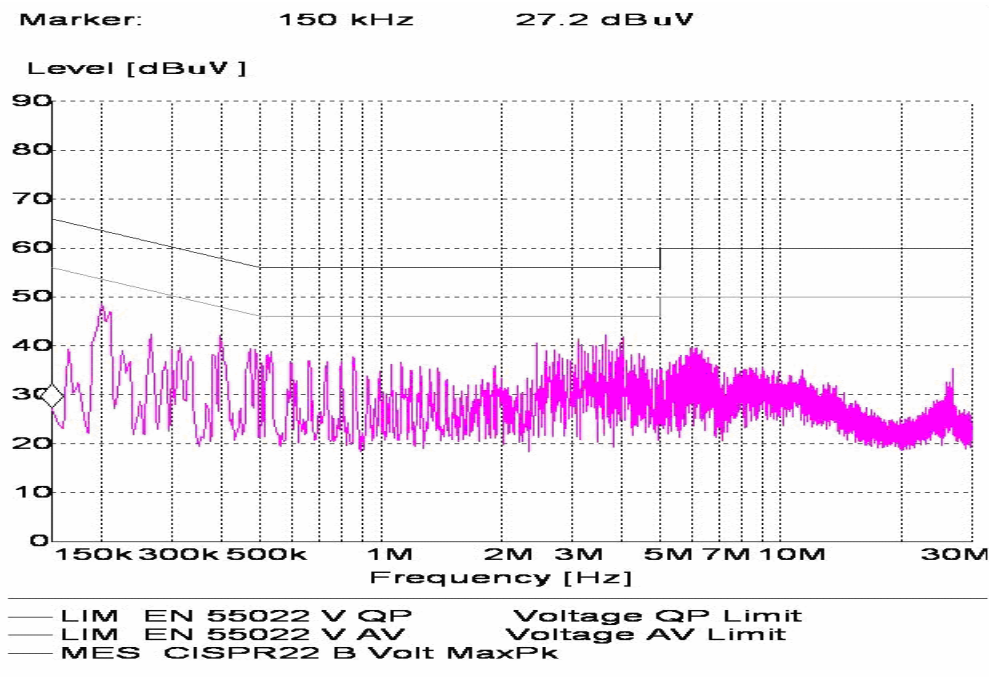
Test mode: 802.11b (Hot)



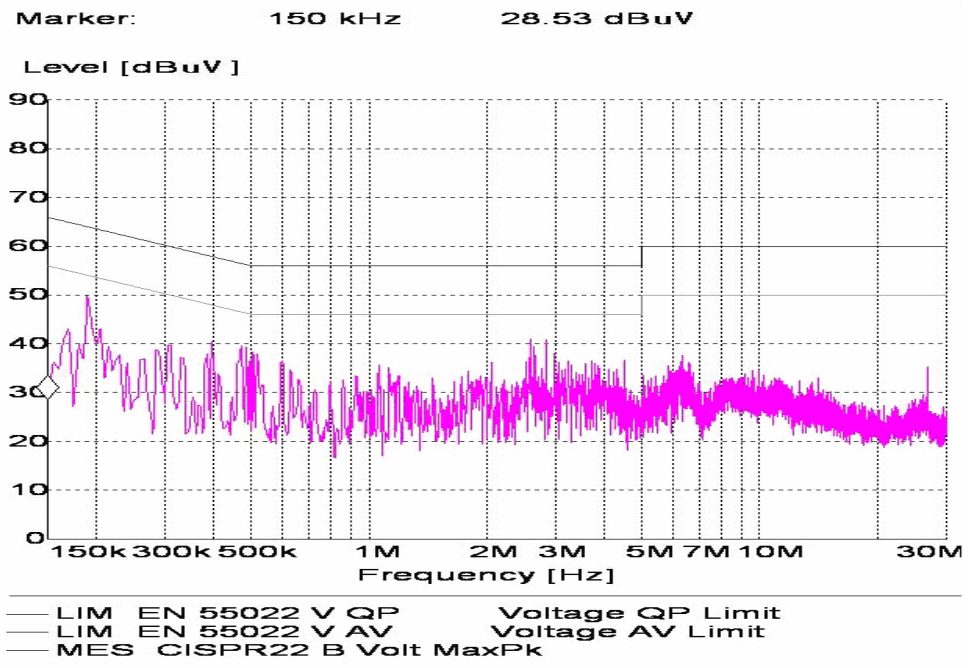
Test mode: 802.11b (Neutral)



Test mode: 802.11g (Hot)



Test mode: 802.11g (Neutral)



3. Spurious Emission, Band Edge, and Restricted Band Test

3.1. Test Setup

3-1-1. Spurious Radiated Emission

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 40 GHz Emissions.

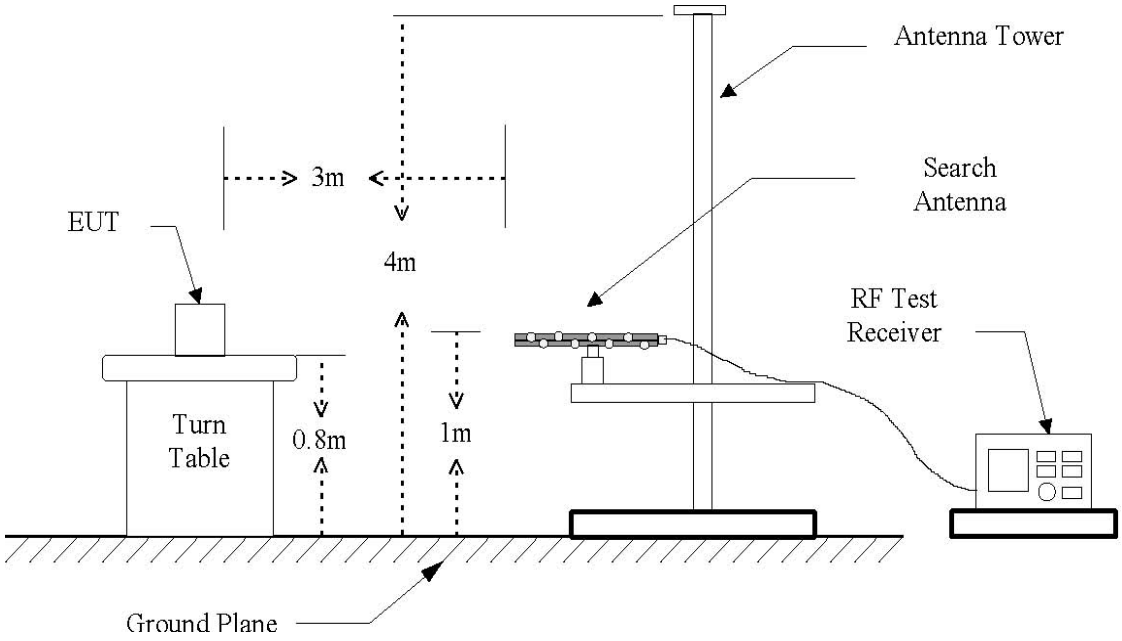


Figure 1 : Frequencies measured below 1 GHz configuration

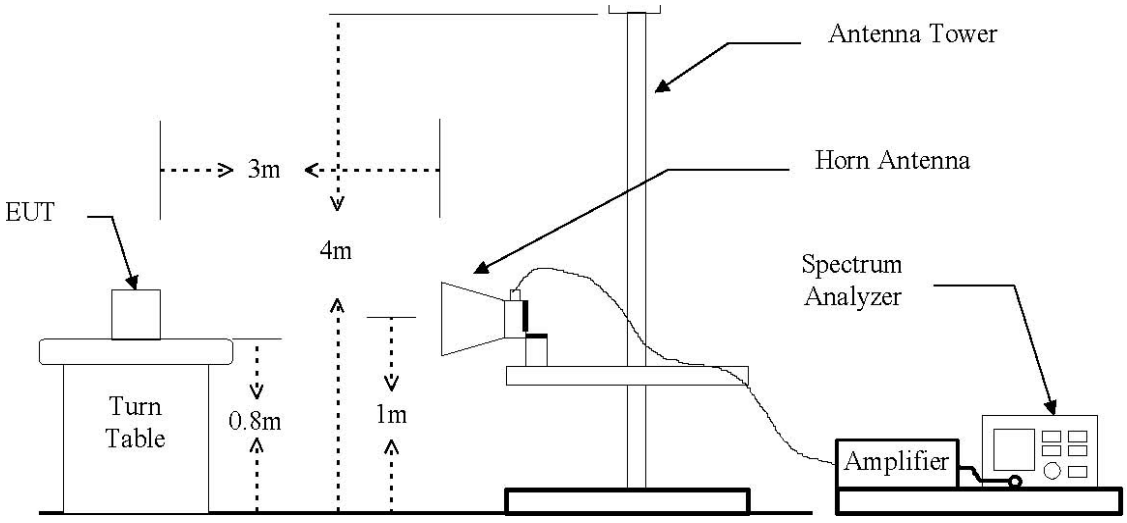
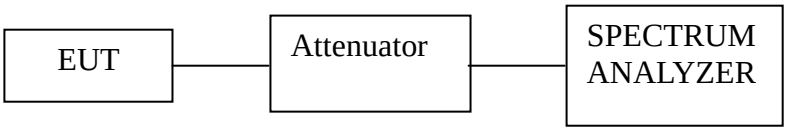


Figure 2 : Frequencies measured above 1 GHz configuration

3-1-2. Spurious RF Conducted Emissions (Not applied)

- **Note :** This Product is used FCC Certified RF module (FCC ID : TE7WN56XG).



3.2. Limit

According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement , provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval , as permitted under paragraph(b)(3) of this section , the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in section §15.209(a) is not required. In addition, radiated emission which in the restricted band, as define in section §15.205(a), must also comply the radiated emission limits specified in section §15.209(a) (see section §15.205(c))
According to § 15.209(a), for an intentional radiator devices, the general required of field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values：

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
30 - 88	3	40.0	100
88 – 216	3	43.5	150
216 – 960	3	46.0	200
Above 960	3	54.0	500

According to §15.109(a), for an unintentional device, except for Class A digital devices, the field strength of radiated emission from unintentional radiators at a distance of 3 meters shall not exceed the above table.

3.3. Test Procedures

3-3-1. Spurious Radiated Emissions

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
b. During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 GHz, the EUT was set 1 meter away from the interference-receiving antenna.
c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarization 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 table was turned from 0 degrees to 360 degrees to find the maximum reading.
e.The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE：

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

3-3-2 Spurious RF Conducted Emissions (Not applied)

- **Note :** This Product is used FCC Certified RF module (FCC ID : TE7WN56XG).

The transmitter output was connected to the spectrum analyzer via a low loss cable.
Set both RBW and VBW of spectrum analyzer with suitable frequency span including 100 kHz bandwidth from band edge. The band edges was measured and recorded.

3.4. Test Result

Ambient temperature: 23 ℃ Relative humidity: 50 %

3-4-1. Spurious Radiated Emissions

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions are not reported much lower than the prescribed limits. All reading values are quasi-peak values.

Antenna : Radiated Spurious Emission 30 MHz ~1000 MHz Test Data (Worst-Case Configuration)

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (MHz)	Reading (dBuV)	Detect Mode	Pol.	Ant. (dB/m)	Cable (dB)	Actual (dBuV/m)	Limit (dBuV/m)	Margin (dB)
191.998	21.4	Q.P.	V	7.40	1.37	30.17	43.5	13.33
287.994	13.6	Q.P.	V	10.61	1.70	25.92	46.0	20.08
693.010	6.5	Q.P.	V	18.33	2.78	27.61	46.0	18.39
864.980	5.7	Q.P.	V	20.24	3.23	29.17	46.0	16.83
939.225	5.3	Q.P.	V	20.76	3.30	29.35	46.0	16.65

REMARKS :
1. All spurious emission at channels are almost the same below 1 GHz, so that the channel was chosen at representative in final test
2.“*” means the restricted band.
3..Actual = Reading + AF + CL.

The frequency spectrum above 1000 MHz was investigated. All emissions are not reported much lower than the prescribed limits. Reading values are both peak and average values.

Antenna : Radiated Emission Test Data (Above 1 GHz)

802.11b Low Channel (2412 MHz)

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (MHz)	Reading (dBuV)	Detect Mode	Pol.	AF/CL (dB/m)/(dB)	Amp Gain (dB)	Actual (dBuV/m)	Limit (dBuV/m)	Margin (dB)
*2390.00	45.54	Peak	P	28.06/5.56	36.54	42.62	74.00	31.38
*2390.00	33.66	Average	P	28.06/5.56	36.54	30.74	54.00	23.26
4824.00	45.14	Peak	P	32.23/8.27	36.33	49.21	74.00	24.79
4824.00	33.21	Average	P	32.23/8.27	36.33	37.28	54.00	16.72
7236.00	48.27	Peak	P	35.74/11.22	36.43	58.80	74.00	15.20
7236.00	35.92	Average	P	35.74/11.22	36.43	46.45	54.00	7.55

802.11b Middle Channel (2437 MHz)

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (MHz)	Reading (dBuV)	Detect Mode	Pol.	AF/CL (dB/m)/(dB)	Amp Gain (dB)	Actual (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.00	45.21	Peak	P	32.93/8.27	36.33	50.08	74.00	23.92
4874.00	32.00	Average	P	32.93/8.27	36.33	36.87	54.00	17.13
7311.00	49.11	Peak	P	35.84/11.03	36.43	60.15	74.00	13.85
7311.00	35.70	Average	P	35.84/11.03	36.43	46.74	54.00	7.26

802.11b High Channel (2462 MHz)

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (MHz)	Reading (dBuV)	Detect Mode	Pol.	AF/CL (dB/m)/(dB)	Amp Gain (dB)	Actual (dBuV/m)	Limit (dBuV/m)	Margin (dB)
*2483.50	45.11	Peak	P	28.34/5.30	36.54	42.21	74.00	31.79
*2483.50	34.62	Average	P	28.34/5.30	36.54	31.72	54.00	22.28
4924.00	45.41	Peak	P	32.95/8.32	36.33	50.35	74.00	23.65
4924.00	32.74	Average	P	32.95/8.32	36.33	37.68	54.00	16.65
7311.00	47.00	Peak	P	35.94/12.55	36.43	59.06	74.00	14.94
7311.00	36.12	Average	P	35.94/12.55	36.43	48.18	54.00	5.82

802.11g Low Channel (2412 MHz)

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (MHz)	Reading (dBuV)	Detect Mode	Pol.	AF/CL (dB/m)/(dB)	Amp Gain (dB)	Actual (dBuV/m)	Limit (dBuV/m)	Margin (dB)
*2390.00	46.11	Peak	P	28.06/5.56	36.54	43.19	74.00	30.81
*2390.00	34.61	Average	P	28.06/5.56	36.54	31.09	54.00	22.91
4824.00	49.00	Peak	P	32.23/8.27	36.33	53.07	74.00	20.93
4824.00	34.11	Average	P	32.23/8.27	36.33	38.18	54.00	15.82
7236.00	44.00	Peak	P	35.74/11.22	36.43	54.53	74.00	19.47
7236.00	32.10	Average	P	35.74/11.22	36.43	42.63	54.00	11.37

802.11g Middle Channel (2437 MHz)

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (MHz)	Reading (dBuV)	Detect Mode	Pol.	AF/CL (dB/m)/(dB)	Amp Gain (dB)	Actual (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.00	43.00	Peak	P	32.93/8.27	36.33	47.87	74.00	26.13
4874.00	31.11	Average	P	32.93/8.27	36.33	35.98	54.00	18.02
7311.00	48.00	Peak	P	35.84/11.03	36.43	59.04	74.00	14.96
7311.00	34.29	Average	P	35.84/11.03	36.43	45.33	54.00	8.67

802.11g High Channel (2462 MHz)

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (MHz)	Reading (dBuV)	Detect Mode	Pol.	AF/CL (dB/m)/(dB)	Amp Gain (dB)	Actual (dBuV/m)	Limit (dBuV/m)	Margin (dB)
*2483.50	45.72	Peak	P	28.34/5.30	36.54	37.52	74.00	36.48
*2483.50	34.91	Average	P	28.34/5.30	36.54	26.71	54.00	27.29
4924.00	44.00	Peak	P	32.95/8.32	36.33	48.94	74.00	25.06
4924.00	33.61	Average	P	32.95/8.32	36.33	38.55	54.00	15.45
7311.00	48.11	Peak	P	35.94/12.55	36.43	60.17	74.00	13.83
7311.00	36.91	Average	P	35.94/12.55	36.43	48.97	54.00	5.03

REMARKS :

1. "*" means the restricted band.
2. Actual = Reading + AF + CL – Amp Gain
3. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental Frequency
4. Measurements above only up to 6 maximum emission noted, or would be lesser if No specific emission from the EUT are recorded (ie: margin>20 dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Radiated emission measured in frequency above 1000 MHz were made with an Instrument using Peak detector mode and average detector mode of the emission Shown in Actual FS column.
6. Spectrum setting:
   a. Peak Setting 1 GHz to 10th harmonics of fundamental, RBW=1 MHz, VBW=1 MHz, Sweep time : Auto
   b. Average Setting 1 GHz to 10th harmonics of fundamental,
   RBW=1 MHz, VBW=10 Hz, Sweep time : Auto

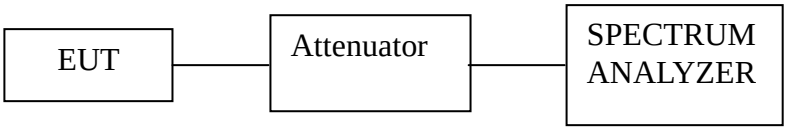
3-4-2. Spurious RF Conducted Emissions : (Not applied)

- **Note :** This Product is used FCC Certified RF module (FCC ID : TE7WN56XG).

4. 6 dB Bandwidth Measurement (Not applied)

- **Note :** This Product is used FCC Certified RF module (FCC ID : TE7WN56XG).

4.1. Test Setup



4.2. Limits

According to §15.247(a)(2), systems using digital modulation techniques may operate in the 902 ~928 MHz , 2400 ~ 2483.5 MHz, and 5725 ~ 5825 MHz bands. The minimum of 6dB Bandwidth shall be at least 500 kHz

4.3. Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW=100 kHz and VBW=100 kHz. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

5. Maximum Peak Output Power Measurement (Not applied)

- Note : This Product is used FCC Certified RF module (FCC ID : TE7WN56XG).

5.1. Test Setup

5.2. Limit

According to §15.247(b)(3), for systems using digital modulation in the 902 ~ 928 MHz, 2400 ~2483.5 MHz, and 5725 ~ 5850 MHz band: 1 Watt. As an alternative to a peak power measurement.
Compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antenna elements. The average must not include any intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.
According to §15.247(b)(4), the conducted output power limit specified in paragraph(b) of this section is based on the use of antenna with directional gains that do not exceed 6 dBi. Except as shown in paragraph(c) of this section, if transmitting antenna of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraph(b)(1), (b)(2), and (b)(3) of this section , as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi

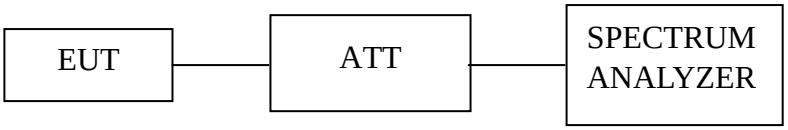
5.3. Test Procedure

The RF power output was measured with a Power meter connected to the Antenna connector (conducted measurement)while EUT was operating in transmit mode at the appropriate center frequency.

6. Power Spectral Density Measurement (Not applied)

- Note : This Product is used FCC Certified RF module (FCC ID : TE7WN56XG).

6.1. Test Setup



6.2. Limit

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

6.3. Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using RBW=3 kHz and VBW>=3 kHz, set sweep time=span / 3 kHz.
The power spectral density was measured and recorded.
The sweep time is allowed to be longer than span / 3 kHz for a full response of the mixer in the spectrum analyzer.

7. Antenna Requirement

7.1. Standard Applicable

For intentional device, according to FCC 47 CFR Section §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section § 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the gain of the antenna exceeds 6 dBi.

7.2. Antenna Connected Construction

Antenna used in this product is connected left-handed SMA Type with Monopole antenna gain of 4.33 dBi

8. RF Exposure Evaluation

According to FCC 1.1310 : The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in §1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength(V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time
(A) Limits for Occupational /Control Exposures				
300 – 1500	--	--	F/300	6
1500 - 100000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300 – 1500	--	--	F/1500	6
1500 - 100000	--	--	1	30

8.1. Friis transmission formula (Pd)

$$Pd = (Pout*G)/(4*pi*R^2)$$

Where, Pd = power density in mW/cm^2
Pout = output power to antenna in mW
G = gain of antenna in linear scale
Pi = 3.1416
R = distance between observation point and center of the radiator in cm

Pd the limit of MPE, 1 mW/cm^2. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

8.2. EUT Operating Condition

A software provided by client enabled the EUT to transmit and receive data at low, middle and high channel individually.

8.3. Test Result of RF Exposure Evaluation

Test Item : RF Exposure Evaluation Data
Test Mode : Normal Operation

8.3.1. Output Power into Antenna & RF Exposure Evaluation Distance

Antenna gain : 4.33 dBi

801.11b (11 Mbps)

Channel	Channel Frequency (MHz)	Output Peak Power to Antenna (dBm)	Antenna Gain (dBi)	Power Density at 20cm (mW/cm^2)	LIMITS (mW/cm^2)
Low	2412	13.20	4.33	0.01127	1
Middle	2437	13.14	4.33	0.01112	1
High	2462	11.60	4.33	0.01117	1

801.11g (54 Mbps)

Channel	Channel Frequency (MHz)	Output Peak Power to Antenna (dBm)	Antenna Gain (dBi)	Power Density at 20cm (mW/cm^2)	LIMITS (mW/cm^2)
Low	2412	13.18	4.33	0.01122	1
Middle	2437	13.12	4.33	0.01106	1
High	2462	11.60	4.33	0.00780	1

NOTE :

The power density Pd (4th column) at a distance of 20cm calculated from the friis transmission formula is far below the limit of 1 mW/ cm^2.