TEST REPORT

of

FCC Part 15 Subpart E §15.407

FCC ID: O6ZGFHD100

Equipment Under Test	: IP-set top BOX
Model Name	: GFHD100
Serial No.	: N/A
Applicant	: HUMAX CO., Ltd.
Manufacturer	: HUMAX CO., Ltd.
Date of Test(s)	: 2012. 04. 20 ~ 2012. 05. 22
Date of Issue	: 2012. 06. 05

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

Tested By:	Alvin Kim	**Date**	2012. 06. 05
Approved By:	Feel Jeong	**Date**	2012. 06. 05

Table of contents

1. General information

1.1. Testing laboratory

SGS Korea Co., Ltd.(Gunpo Laboratory)
- 705, Dongchun-Dong Sooji-Gu, Yongin-Shi, Kyungki-Do, South Korea.
- Wireless Div. 2FL, 18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea 435-040

www.ee.sgs.com/korea

Phone No. : +82 31 428 5700
Fax No. : +82 31 427 2371

1.2 Details of applicant

Applicant : HUMAX CO., Ltd.
Address : HUMAX Village, 11-4, Sunae-dong, Bundang-gu, Seongnam-si, Gyeonggi-do, 463-875, Korea
Contact Person : Im, Byung-Suk
Phone No. : +82 31 776 6341

1.3 Description of EUT

Kind of Product		IP-set top BOX	
Model Name		GFHD100	
Serial Number		N/A	
Power Supply		AC 110 V	
Frequency Range		2 402 ㎒ ~ 2 480 ㎒ (BT, BT LE), 2 412 ㎒ ~ 2 462 ㎒ (11b/g/n_HT20), 2 422 ㎒ ~ 2 452 ㎒ (11n_HT40), 5 745 ㎒ ~ 5 825 ㎒ (11a/n_HT20), 5 755 ㎒ ~ 5 795 ㎒ (11n_HT40), 5 180 ㎒ ~ 5 240 ㎒ (11a/n_ HT20 – Non DFS), 5 190 ㎒ ~ 5 230 ㎒ (11n_ HT40 – Non DFS)	
Modulation Technique		DSSS, OFDM	
Number of Channels		79 channel(BT), 40 channel(BT LE), 11 channel(11b/g/n_HT20), 7 channel(11n_HT40), 5 channel(11a/n_HT20), 2 channel(11n_HT40), 4 channel(11a/n_HT20 – Non DFS), 2 channel(11n_HT40 – Non DFS)	
Antenna Type		Fixed type (2 Tx / 2 Rx)	
Antenna Gain	**WLAN**	**ANT0** 2 412 ㎒ ~ 2 462 ㎒: 3.42 dB i, 5 745 ㎒ ~ 5 825 ㎒: 4.94 dB i, 5 180 ㎒ ~ 5 240 ㎒: 4.71 dB i	**ANT1** 2 412 ㎒ ~ 2 462 ㎒: 4.40 dB i, 5 745 ㎒ ~ 5 825 ㎒: 5.20 dB i, 5 180 ㎒ ~ 5 240 ㎒: 4.13 dB i
	Bluetooth	2 402 ㎒ ~ 2 480 ㎒: 4.40 dB i (Same to ANT1 of WLAN)	

1.4. Declaration by the manufacturer

- EUT is a Master unused DFS channel and EUT does not support 11b of ANT1 port.
- Duty Cycle ≥ 98 percent.

1.5. Test equipment list

Equipment	Manufacturer	Model	S/N	Cal Date	Cal Interval	Cal Due.
Signal Generator	R&S	SMR40	100272	Jul. 15, 2011	Annual	Jul. 15, 2012
Spectrum Analyzer	Agilent	N9030A	US51350132	Oct. 28, 2011	Annual	Oct. 28, 2012
Spectrum Analyzer	Agilent	E4440A	MY43362142	Mar. 29, 2012	Annual	Mar. 29, 2013
Attenuator	Mini-Circuits	BW-N20W5+	0950-1	Mar. 30, 2012	Annual	Mar. 30, 2013
Low Pass Filter	Mini-Circuits	NLP-1200+	V8979400903-1	Jul. 11, 2011	Annual	Jul. 11, 2012
High Pass Filter	Wainwright	WHK3.0/18G-10SS	344	Jul. 07, 2011	Annual	Jul. 07, 2012
High Pass Filter	Wainwright	WHK6.0/18G-10SS	11	Jul. 07, 2011	Annual	Jul. 07, 2012
DC Power Supply	Agilent	U8002A	MY50020026	Mar. 29, 2012	Annual	Mar. 29, 2013
Preamplifier	H.P.	8447F	2944A03909	Jul. 04, 2011	Annual	Jul. 04, 2012
Preamplifier	R&S	SCU18	10117	Jan. 12, 2012	Annual	Jan. 12, 2013
Preamplifier	MITEQ Inc.	JS44-18004000-35-8P	1546891	Jul. 04, 2011	Annual	Jul. 04, 2012
Test Receiver	R&S	ESU26	100109	Feb. 21, 2012	Annual	Feb. 21, 2013
Bilog Antenna	SCHWARZBECK MESSELEKTRONIK	VULB9163	396	May. 12, 2011	Biennial	May. 12, 2013
Horn Antenna	R&S	HF906	100326	Nov. 23, 2010	Biennial	Nov. 23, 2012
Horn Antenna	SCHWARZBECK MESSELEKTRONIK	BBHA9170	BBHA9170223	Jun. 30, 2010	Biennial	Jun. 30, 2012
Antenna Master	INNCO	MM4000	N/A	N.C.R.	N/A	N.C.R.
Turn Table	INNCO	DS 1200S	N/A	N.C.R.	N/A	N.C.R.
Anechoic Chamber	SY Corporation	L × W × H (6.5 m × 3.5 m × 3.5 m)	N/A	N.C.R.	N/A	N.C.R.
EMI Test Receiver	R&S	ESHSI0	863365/018	Jul. 07, 2011	Annual	Jul. 07, 2012
Two-Line V-Network	R&S	ENV216	100190	Jan. 09, 2011	Biennial	Jan. 09, 2013
Anechoic Chamber	SY Corporation	L × W × H (9.6 m × 6.4 m × 6.4 m)	N/A	N.C.R.	N/A	N.C.R.

▶ Support equipment

Description	Manufacturer	Model	Serial Number
N/A	-	-	-

1.6. Summary of test result

The EUT has been tested according to the following specifications:

APPLIED STANDARD:FCC Part15		
Section in FCC 15	**Test Item**	**Result**
15.205(a) 15.209(a) 15.407(b)(1) 15.407(b)(2) 15.407(b)(3)	Transmitter radiated spurious emissions and Conducted spurious emission	Complied
15.407(a)(1) 15.407(a)(2)	Output power	Complied
15.407(a)(1) 15.407(a)(2)	Peak power spectral density	Complied
15.407(a)(6)	Peak excursion	Complied
15.407(h)	DFS -Channel closing transmission time -Channel move time -Non occupied period	N/A[1)]
15.207	Transmitter AC Power Line Conducted Emission	Complied

1) The EUT do not support DFS channel.

1.7. Test Procedure(s)

The measurement procedures described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9 ㎑ to 40 ㎓ (ANSI C63.4-2003) and the guidance provided in KDB 789033 were used in the measurement of the DUT.

SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**
Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

1.8. Sample calculation

Where relevant, the following sample calculation is provided:

1.8.1. Conducted test

offset value (dB) = Attenuator (dB) + Cable loss (dB)

1.8.2. Radiation test

Field strength level (dBμV/m) = Measured level (dBμV) + Antenna factor (dB) + Cable loss (dB) - amplifier (dB)

1.9. Test report revision

Revision	Report number	Description
0	F690501/RF-RTL005568	Initial
1	F690501/RF-RTL005568-1	Modify power limit
2	F690501/RF-RTL005568-2	modify FCC ID

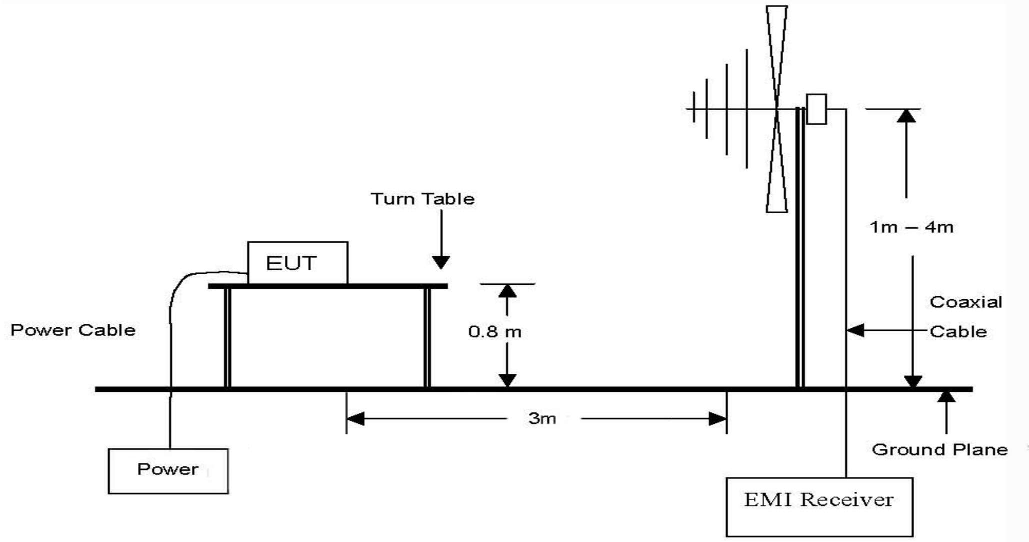
SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**
Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

2. Transmitter radiated spurious emissions and conducted spurious emission

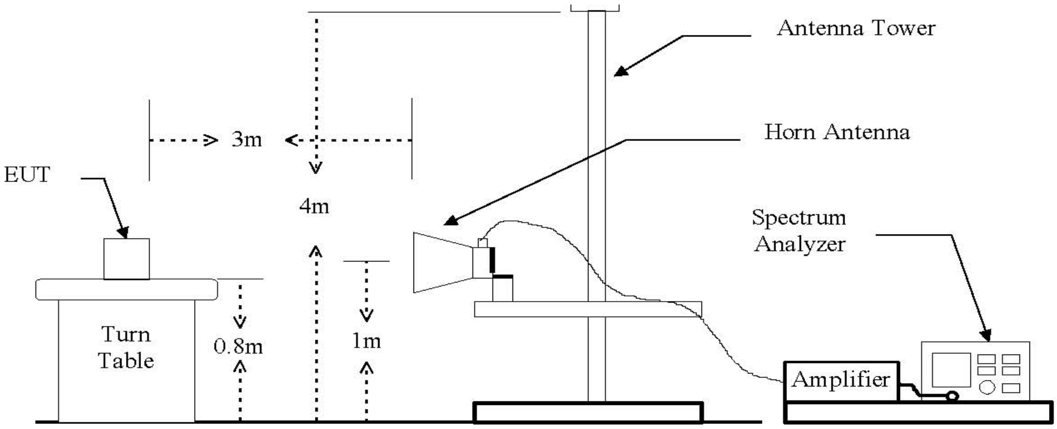
2.1. Test setup

2.1.1. Transmitter radiated spurious emissions

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 ㎒ to 1 ㎓ Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission .The spurious emissions were investigated form 1 ㎓ to the 10th harmonic of the highest fundamental frequency or 40 ㎓, whichever is lower.



2.1.2. Conducted spurious emissions

EUT	Attenuator	Spectrum Analyzer

2.2. Limit

For transmitters operating in the 5.15 ~ 5.25 ㎓ band : all emissions outside of the 5.15 ~ 5.35 ㎓ band shall not exceed an EIRP of -27 ㏈m

According to § 15.209(a), Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Frequency (㎒)	Distance (Meters)	Field Strength (㏈㎶/m)	Field Strength (㎶/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

2.3. Test procedures

Conducted and Radiated emissions from the EUT were measured according to the dictates in section G of KDB 789033.

All data rates and modes were investigated for conducted spurious emissions. The emissions of the configuration that produced the worst case emissions are reported in this section.

2.3.1. Test procedures for radiated spurious emissions

1. 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.
2. 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 3 meter away from the interference-receiving antenna.
3. 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 polarizations of the antenna are set to make the measurement.
4. 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.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. 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 measurements for below 1 GHz
   Compliance shall be demonstrated using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.
2. The measurements for above 1 GHz
   1) Peak emission levels are measured by setting the analyzer as follows:
   Set to RBW = 1 MHz, VBW ≥ 3 MHz, Detector = Peak, Sweep time = auto, Trace mode= Max hold.
   2) Average emission levels are measured by setting the analyzer as follows:
   Set to RBW = 1 MHz, Detector = Peak, Sweep time = auto, Trace mode= Max hold.
   - If duty cycle ≥ 98 percent: VBW < RBW/100 (i.e., 10 kHz) but not less than 10 Hz.
   - If duty cycle < 98 percent: VBW ≥ 1/T.
3. To get a maximum emission level from the EUT, the EUT is manipulated through three orthogonal planes.

2.3.2 Test procedures for conducted spurious emissions

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Peak emission levels are measured by setting the analyzer as follows: RBW = 1 MHz, VBW ≥ 3 MHz, Detector = Peak, Sweep time = auto, Trace hold = max hold.

SGS Korea Co., Ltd. (Gunpo Laboratory) 18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040
Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

2.4. Test result

Ambient temperature : (24 ± 2) ℃
Relative humidity : 49 % R.H.

2.4.1. Spurious radiated emission (Worst case configuration_11n_HT20 mode – MCS0)

The frequency spectrum from 30 ㎒ to 1 000 ㎒ was investigated. Emission levels are not reported much lower than the limits by over 30 ㏈. All reading values are peak values.

Radiated emissions			Ant	Correction factors		Total	Limit	
Frequency (㎒)	Reading (㏈㎶)	Detect Mode	Pol.	AF (㏈/m)	Amp gain+CL (㏈)	Actual (㏈ uV/m)	Limit (㏈ uV/m)	Margin (㏈)
285.03	50.20	Peak	H	12.60	-24.70	38.10	46.00	7.90
286.48	51.47	Peak	H	12.60	-24.70	39.37	46.00	6.63
288.18	54.40	Peak	H	12.60	-24.70	42.30	46.00	3.70
289.68	53.00	Peak	H	12.60	-24.70	40.90	46.00	5.10
291.25	53.00	Peak	H	12.60	-24.70	40.90	46.00	5.10
291.90	51.60	Peak	H	12.60	-24.70	39.50	46.00	6.50
293.52	50.00	Peak	H	12.60	-24.70	37.90	46.00	8.10
800.02	48.00	Peak	H	20.90	-24.90	44.00	46.00	2.00
Above 900.00	Not detected	-	-	-	-	-	-	-

▣ *Remark:*

1. All spurious emission at channels are almost the same below 1 ㎓, So that the Middle channel was chose at representative in final test.
2. Actual = Reading + AF + AMP + CL

SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**

Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

2.4.2. Spurious radiated emission for above 1 ㎓

ANT0

802.11a – 6 Mbps

A. Low Channel (5 180 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 150.00	18.63	Peak	H	33.43	7.69	59.75	74.00	14.25
*5 150.00	6.95	Average	H	33.43	7.69	48.07	54.00	5.93
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 360.91	37.29	Peak	H	37.58	-31.53	43.34	68.23	24.89
Above 10 400.00	Not detected	-	-	-	-	-	-	-

B. Middle Channel (5 220 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 439.62	36.19	Peak	H	37.67	-31.61	42.25	68.23	25.99
Above 10 500.00	Not detected	-	-	-	-	-	-	-

C. High Channel (5 240 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 480.00	36.13	Peak	H	37.61	-31.58	42.16	68.23	26.07
Above 10 500.00	Not detected	-	-	-	-	-	-	-

ANT1

802. 11a – 6 Mbps

A. Low Channel (5 180 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	**Reading (dB uV)**	**Detect Mode**	**Pol.**	**AF (dB/m)**	**CL (dB)**	**Actual (dB uV/m)**	**Limit (dB uV/m)**	**Margin (dB)**
*5 150.00	21.44	Peak	H	33.43	7.69	62.56	74.00	11.44
*5 150.00	8.57	Average	H	33.43	7.69	49.69	54.00	4.31
Frequency (㎒)	**Reading (dB uV)**	**Detect Mode**	**Pol.**	**AF (dB/m)**	**Amp Gain+CL (dB)**	**Actual (dB uV/m)**	**Limit (dB uV/m)**	**Margin (dB)**
10 359.26	36.31	Peak	H	37.58	-31.53	42.36	68.23	25.87
Above 10 400.00	Not detected	-	-	-	-	-	-	-

B. Middle Channel (5 220 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	**Reading (dB uV)**	**Detect Mode**	**Pol.**	**AF (dB/m)**	**Amp Gain+CL (dB)**	**Actual (dB uV/m)**	**Limit (dB uV/m)**	**Margin (dB)**
10 440.16	36.05	Peak	H	37.67	-31.61	42.11	68.23	26.12
Above 10 500.00	Not detected	-	-	-	-	-	-	-

C. High Channel (5 240 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	**Reading (dB uV)**	**Detect Mode**	**Pol.**	**AF (dB/m)**	**Amp Gain+CL (dB)**	**Actual (dB uV/m)**	**Limit (dB uV/m)**	**Margin (dB)**
10 480.78	36.81	Peak	H	37.61	-31.58	42.84	68.23	25.39
Above 10 500.00	Not detected	-	-	-	-	-	-	-

ANT0 + ANT1

802.11n_HT20 – MCS0

A. Low Channel (5 180 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 150.00	20.29	Peak	H	33.43	7.69	61.41	74.00	12.59
*5 150.00	8.58	Average	H	33.43	7.69	49.70	54.00	4.30
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 359.84	36.52	Peak	H	37.58	-31.53	42.57	68.23	25.66
Above 10 400.00	Not detected	-	-	-	-	-	-	-

B. Middle Channel (5 220 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 439.28	36.20	Peak	H	37.67	-31.60	42.27	68.23	25.96
Above 10 500.00	Not detected	-	-	-	-	-	-	-

C. High Channel (5 240 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 479.95	36.09	Peak	H	37.61	-31.58	42.12	68.23	26.11
Above 10 500.00	Not detected	-	-	-	-	-	-	-

802.11n_HT40 – MCS0

A. Low Channel (5 190 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
*5 150.00	24.51	Peak	H	33.43	7.69	65.63	74.00	8.37
*5 150.00	8.48	Average	H	33.43	7.69	49.60	54.00	4.40
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 379.75	36.31	Peak	H	37.54	-31.52	42.33	68.23	25.90
Above 10 400.00	Not detected	-	-	-	-	-	-	-

B. High Channel (5 230 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	Limit	
Frequency (㎒)	Reading (dB uV)	Detect Mode	Pol.	AF (dB/m)	Amp Gain+CL (dB)	Actual (dB uV/m)	Limit (dB uV/m)	Margin (dB)
10 460.43	36.74	Peak	H	37.62	-31.61	42.75	68.23	25.48
Above 10 500.00	Not detected	-	-	-	-	-	-	-

◙ Remarks

1. "*" means the restricted band.
2. Radiated emissions measured in frequency above 1 000 ㎒ were made with an instrument using Peak / average detector mode if frequency was in restricted band. Otherwise the frequency was in outside of restricted band, only peak detector should be used.
3. Average test would be performed if the peak result was greater than the average limit and frequency was in the restricted band.
4 If frequency was outside of restricted band, the calculation method for peak limit is same as below:
68.23 dB㎶/m = EIRP – 20 log(d) + 104.77 = -27 – 20 log (3) + 104.77
*distance: 3 m, *EIRP: -27 dB m/㎒

2.4.3. Spurious RF Conducted Emissions: Plot of Spurious RF Conducted Emission

ANT0

For 5.15 ~ 5.25 ㎓, the combination antenna gain is 4.71 ㏈i, so the EIRP limit is -31.71 ㏈m/㎒.

802.11a – 6 Mbps

5 180 ㎒

5 220 ㎒

5 240 ㎒


Agilent Spectrum Analyzer - Swept SA
Marker 1 38.441170000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
02:25:03 PM Apr 25, 2012
Ref Offset 23.86 dB
10 dB/div Ref 23.86 dBm
Log
Mkr1 38.44 GHz
-35.56 dBm
13.9
3.86
-6.14
-16.1
-26.1
-36.1
-46.1
-56.1
-66.1
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 40.00 GHz
Sweep 66.7 ms (1001 pts)
Marker
Select Marker
1
Normal
Delta
Fixed
Off
Properties
More
1 of 2
MSG
STATUS

802.11n-HT20 – MCS0

5 180 ㎒

5 220 ㎒

SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**
Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

5 240 ㎒


Agilent Spectrum Analyzer - Swept SA
Marker 1 34.883840000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
02:26:31 PM Apr 25, 2012
Marker
Select Marker
1
Ref Offset 23.86 dB
10 dB/div
Ref 23.86 dBm
Log
Mkr1 34.88 GHz
-35.38 dBm
Normal
Delta
Fixed
Off
Properties
More
1 of 2
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 40.00 GHz
Sweep 66.7 ms (1001 pts)

802.11n-HT40 – MCS0

5 190 ㎒

5 230 ㎒

ANT1

5.15 ~ 5.25 ㎓, the combination antenna gain is 4.13 ㏈i, so the EIRP limit is -31.13 ㏈m/㎒.

802.11a – 6 Mbps

5 180 ㎒

5 220 ㎒

5 240 ㎒


Agilent Spectrum Analyzer - Swept SA
Marker 1 36.842370000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
02:29:40 PM Apr 25, 2012
Marker
Select Marker 1
Ref Offset 23.86 dB
10 dB/div Ref 23.86 dBm
Log
Mkr1 36.84 GHz
-35.54 dBm
Normal
Delta
Fixed
Off
Properties
More 1 of 2
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 40.00 GHz
Sweep 66.7 ms (1001 pts)

802.11n-HT20 – MCS0

5 180 ㎒

5 220 ㎒

5 240 ㎒


Agilent Spectrum Analyzer - Swept SA
Marker 1 37.441920000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: Log-Pwr
02:30:43 PM Apr 25, 2012
Marker
Select Marker
1
Ref Offset 23.86 dB
10 dB/div
Ref 23.86 dBm
Log
Mkr1 37.44 GHz
-35.75 dBm
Normal
Delta
Fixed
Off
Properties
More
1 of 2
Start 30 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 40.00 GHz
Sweep 66.7 ms (1001 pts)

802.11n-HT40 – MCS0

5 190 ㎒

5 230 ㎒

SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**

Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

3. 26 dB bandwidth measurement

3.1. Test setup

EUT	Attenuator	Spectrum Analyzer

3.2. Limit

None; for reporting purpose only

3.3. Test procedure

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.

1. This measurement settings are specified in section D of KDB 789033.
2. Set RBW: approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %

Note: The automatic bandwidth measurement capability of a spectrum analyzer may be employed if it implements the functionality described above.

SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**
Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

3.4. Test result

Ambient temperature : (24 ± 2) ℃
Relative humidity : 49 % R.H.

ANT0

Operating mode	Data Rate (Mbps)	Frequency (㎒)	26 ㏈ bandwidth (㎒)
11a	6	5 180	19.29
	6	5 220	18.73
	6	5 240	18.76
11n_HT20	MCS0	5 180	19.30
	MCS0	5 220	19.12
	MCS0	5 240	19.12
11n_HT40	MCS0	5 190	38.90
	MCS0	5 230	38.30

ANT 1

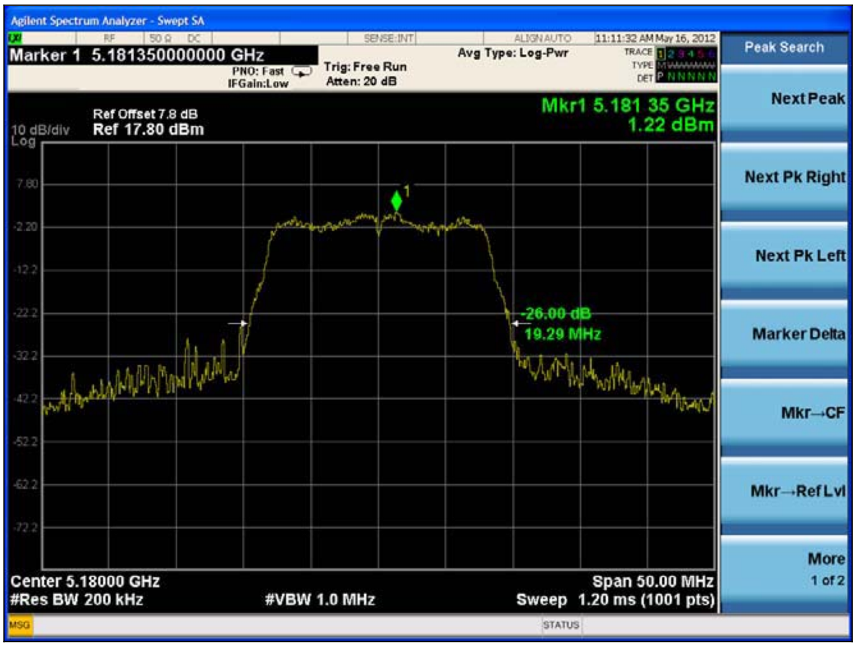
Operating mode	Data Rate (Mbps)	Frequency (㎒)	26 ㏈ bandwidth (㎒)
11a	6	5 180	18.76
	6	5 220	18.82
	6	5 240	18.64
11n_HT20	MCS0	5 180	19.22
	MCS0	5 220	19.13
	MCS0	5 240	19.29
11n_HT40	MCS0	5 190	38.80
	MCS0	5 230	38.70

26 dB Bandwidth

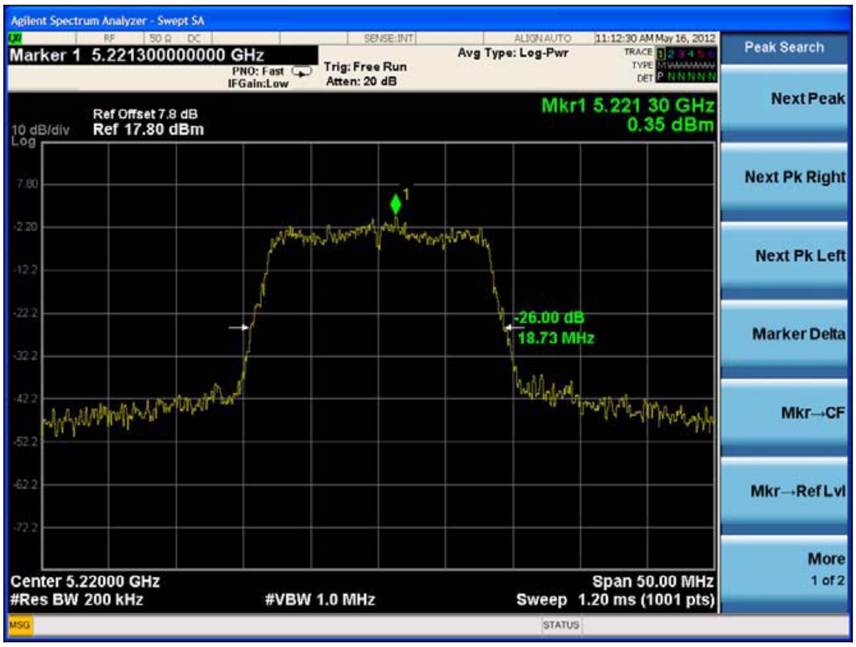
ANT0

802.11a

Low Channel (5 180 ㎒)



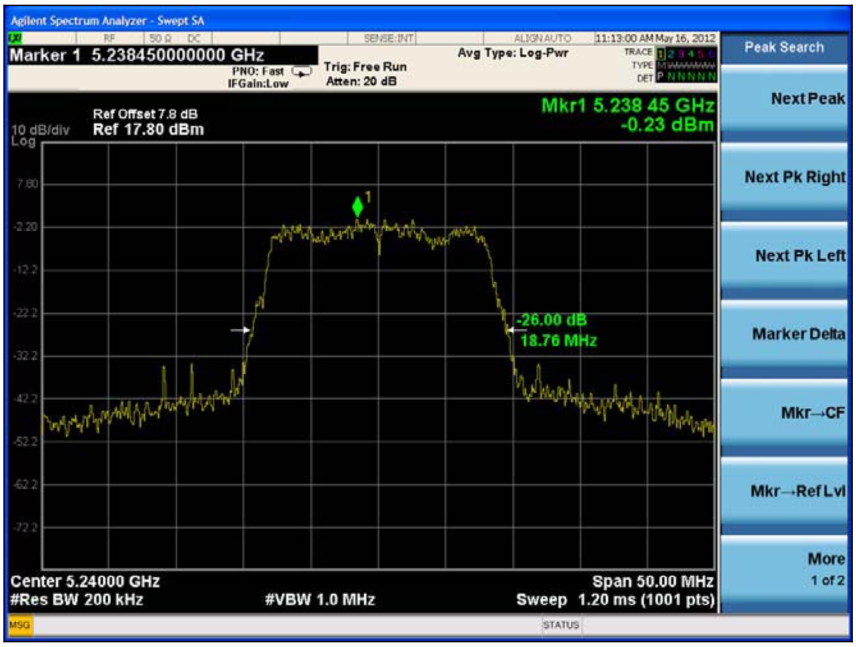
Middle Channel (5 220 ㎒)



SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**

Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

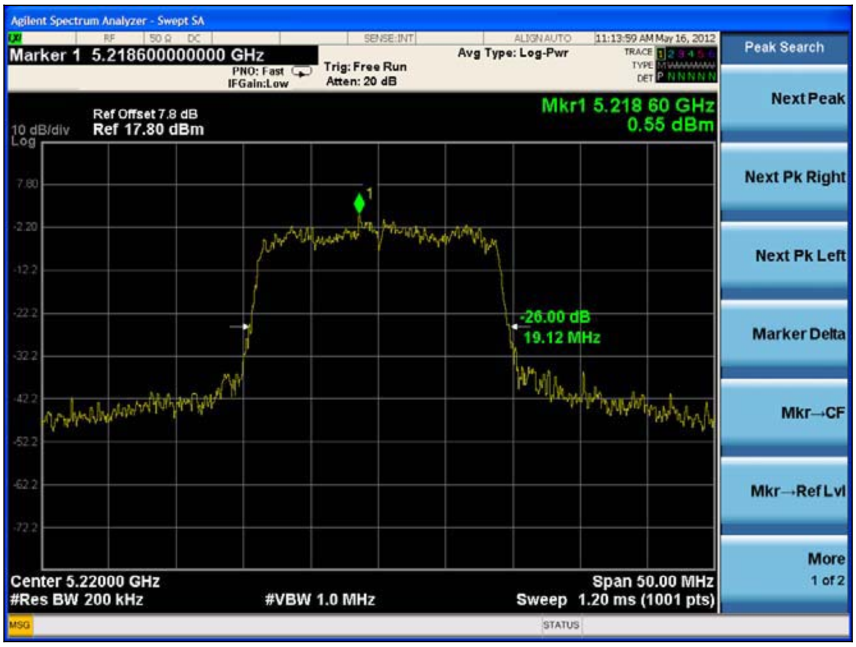
High Channel (5 240 ㎒)



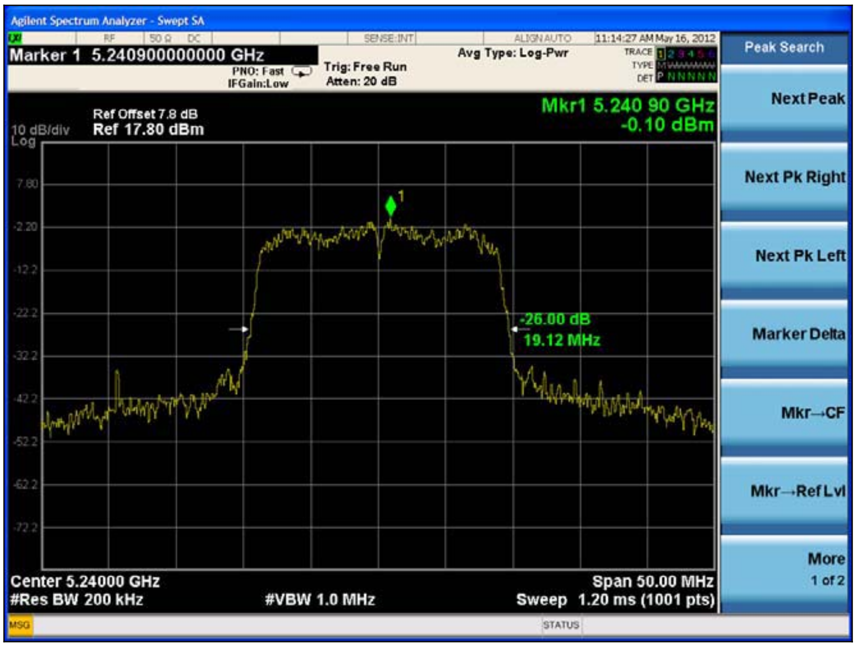
802.11n-HT20

Low Channel (5 180 ㎒)

Middle Channel (5 220 ㎒)



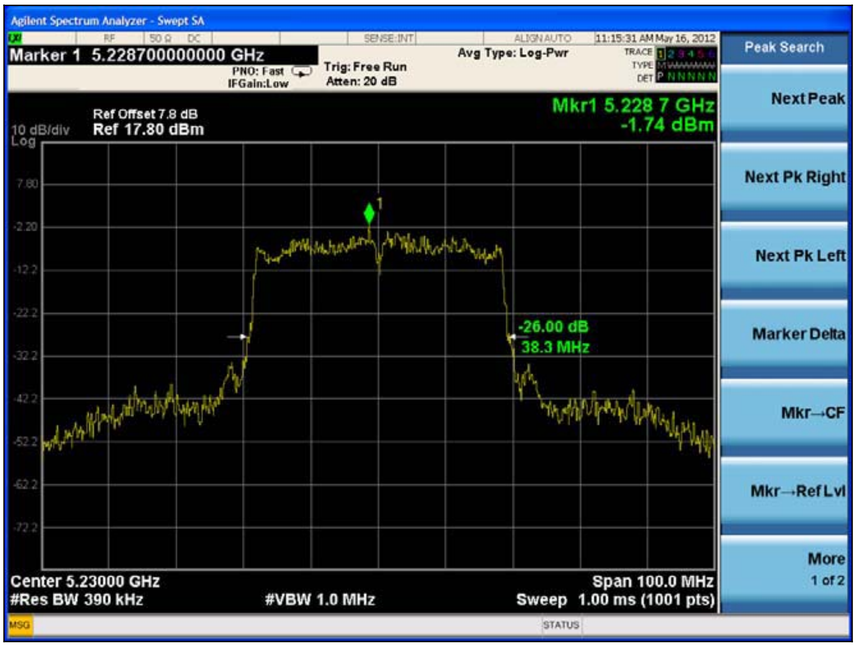
High Channel (5 240 ㎒)



802.11n-HT40

Low Channel (5 190 ㎒)

High Channel (5 230 ㎒)

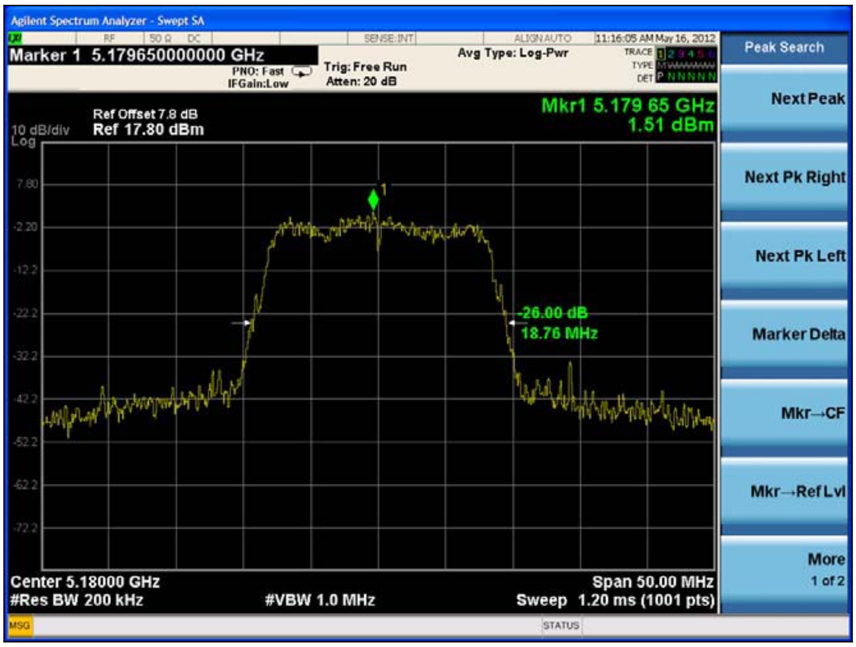


SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**
Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

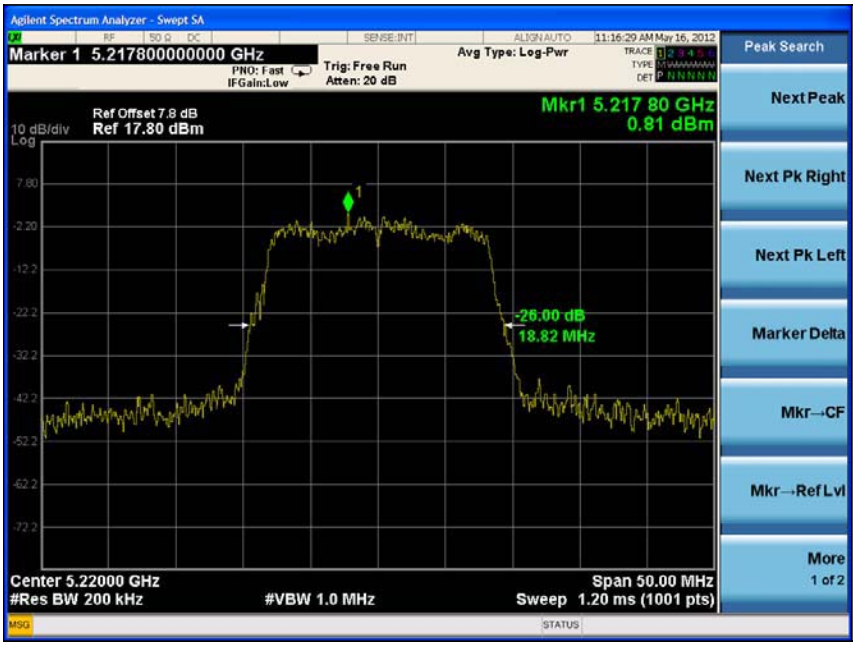
ANT1

802.11a

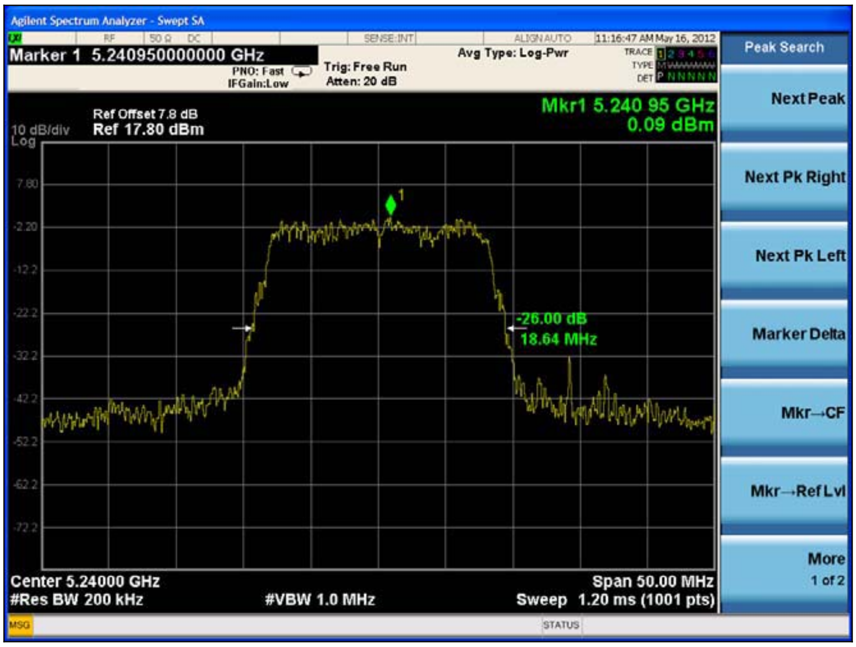
Low Channel (5 180 ㎒)



Middle Channel (5 220 ㎒)

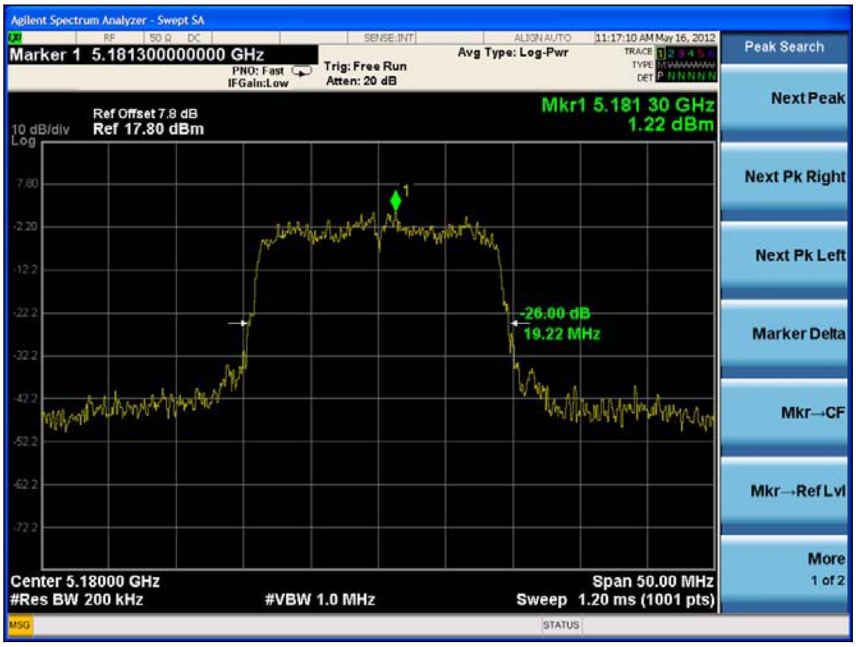


High Channel (5 240 ㎒)

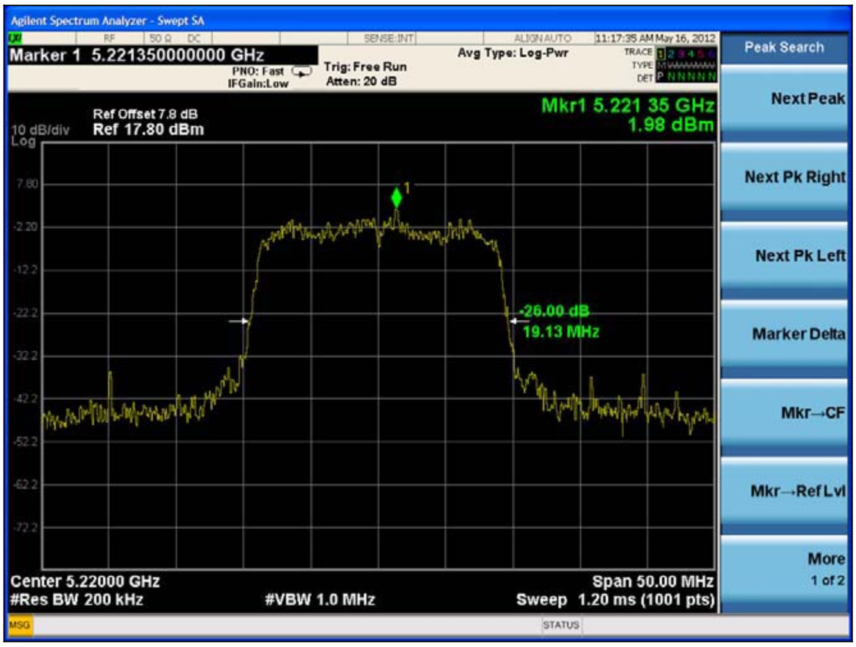


802.11n-HT20

Low Channel (5 180 ㎒)



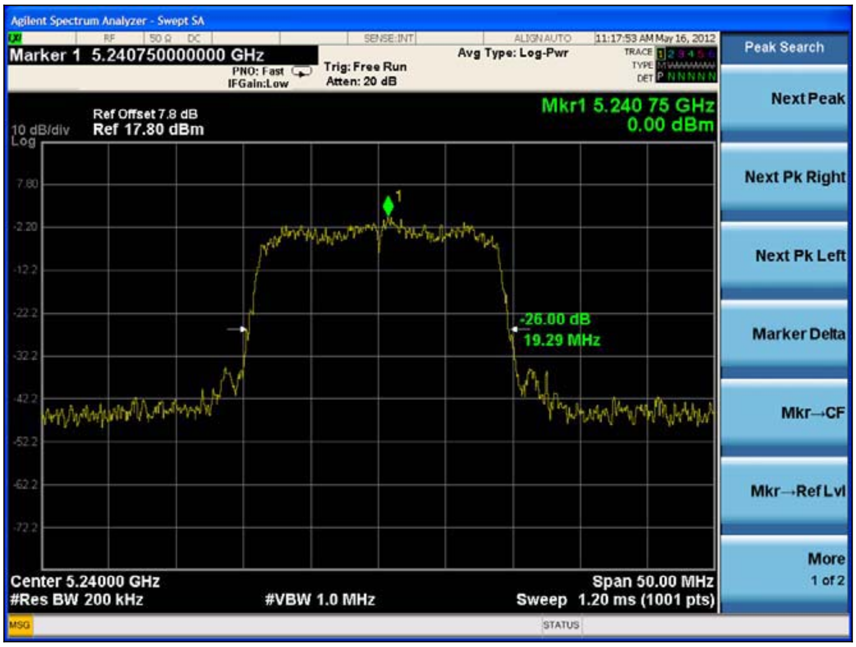
Middle Channel (5 220 ㎒)



SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**

Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

High Channel (5 240 ㎒)



802.11n-HT40

Low Channel (5 190 ㎒)

High Channel (5 230 ㎒)

4. Output power

4.1. Test setup

EUT	Attenuator	Spectrum Analyzer

4.2. Limit

FCC 15.407 (a)(1)

For the 5.15 - 5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.3. Test procedure

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.

1. This measurement settings are specified in clause b) of section C of KDB 789033.
2. Set span to encompass the entire emission bandwidth (EBW) of the signal.
3. Set RBW = 1 MHz
4. Set VBW ≥ 3 MHz
5. Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
6. Sweep time = auto.
7. Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
8. if transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run”.
9. Trace average at least 100 traces in power averaging (i.e., RMS) mode.
10. Compute power by integrating the spectrum across the 26 dB EBW of the signal using the spectrum analyzer’s band power measurement function with band limits set equal to the EBW band edges. If the spectrum analyzer does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the 26 dB EBW of the spectrum.

SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**
Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

4.4. Test result

Ambient temperature : (24 ± 2) ℃
Relative humidity : 49 % R.H.

Limit

ANT0

Mode	Data Rate (Mbps)	Frequency (㎒)	Fixed Limit (dB m)	26 dB BW (㎒)	4+10LogB (dB m)	Antenna gain (dB i)	Limit (dB)
11a	6	5 180	17	19.29	16.85	4.71	16.85
	6	5 220	17	18.73	16.73	4.71	16.73
	6	5 240	17	18.76	16.73	4.71	16.73
11n_HT20	MCS0	5 180	17	19.30	16.86	4.71	16.86
	MCS0	5 220	17	19.12	16.81	4.71	16.81
	MCS0	5 240	17	19.12	16.81	4.71	16.81
11n_HT40	MCS0	5 190	17	38.90	19.90	4.71	17.00
	MCS0	5 230	17	38.30	19.83	4.71	17.00

ANT1

Mode	Data Rate (Mbps)	Frequency (㎒)	Fixed Limit (dB m)	26 dB BW (㎒)	4+10LogB (dB m)	Antenna gain (dB i)	Limit (dB)
11a	6	5 180	17	18.76	16.73	4.13	16.73
	6	5 220	17	18.82	16.75	4.13	16.75
	6	5 240	17	18.64	16.70	4.13	16.70
11n_HT20	MCS0	5 180	17	19.22	16.84	4.13	16.84
	MCS0	5 220	17	19.13	16.82	4.13	16.82
	MCS0	5 240	17	19.29	16.85	4.13	16.85
11n_HT40	MCS0	5 190	17	38.80	19.89	4.13	17.00
	MCS0	5 230	17	38.70	19.88	4.13	17.00

SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**
Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

Result

Operation Mode	Antenna	Channel	Data Rate (Mbps)	Channel Frequency (㎒)	FCC Result (dB m)	FCC Limit (dB m)	Final Limit (dB m)
Non DFS 11a	ANT0	Low	6	5 180	10.13	16.85	-
		Middle	6	5 220	9.91	16.73	-
		High	6	5 240	9.82	16.73	-
	ANT1	Low	6	5 180	11.14	16.73	-
		Middle	6	5 220	11.10	16.75	-
		High	6	5 240	11.00	16.70	-
Non DFS 11n_HT20	ANT0	Low	MCS0	5 180	10.17	16.86	-
		Middle	MCS0	5 220	9.91	16.81	-
		High	MCS0	5 240	9.92	16.81	-
	ANT1	Low	MCS0	5 180	10.86	16.84	-
		Middle	MCS0	5 220	10.87	16.82	-
		High	MCS0	5 240	10.68	16.85	-
	ANT0+ANT1 (Calculated)	Low	MCS0	5 180	13.54	16.84	15.13
		Middle	MCS0	5 220	13.43	16.81	15.10
		High	MCS0	5 240	13.33	16.81	15.10
Non DFS 11n_HT40	ANT0	Low	MCS0	5 190	7.50	17.00	-
		High	MCS0	5 230	7.25	17.00	-
	ANT1	Low	MCS0	5 190	8.15	17.00	-
		High	MCS0	5 230	8.23	17.00	-
	ANT0+ANT1 (Calculated)	Low	MCS0	5 190	10.85	17.00	15.29
		High	MCS0	5 230	10.78	17.00	15.29

Remark

According to KDB662911, average power of each port (ANT0 and ANT1) was combined by using below calculation.

ANT0+ANT1 (Calculated)
Power: 10log{10^(ANT0_Average Power/10)+10^(ANT1_Average Power/10)}

In case of 5 ㎓ 11n_HT20 and HT40, worst antenna gain: 4.71 dB i.
4.71 – 3 = 1.71 dB.
Final limit = FCC Limit – 1.71

ANT0

802.11a

Low Channel (5 180 ㎒)

Middle Channel (5 220 ㎒)

SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**

Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

High Channel (5 240 ㎒)

802.11n-HT20

Low Channel (5 180 ㎒)

Middle Channel (5 220 ㎒)

High Channel (5 240 ㎒)

802.11n-HT40

Low Channel (5 190 ㎒)

High Channel (5 230 ㎒)

SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**

Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

ANT1

802.11a

Low Channel (5 180 ㎒)

Middle Channel (5 220 ㎒)

High Channel (5 240 ㎒)

802.11n-HT20

Low Channel (5 180 ㎒)

Middle Channel (5 220 ㎒)

High Channel (5 240 ㎒)

802.11n-HT40

Low Channel (5 190 ㎒)

High Channel (5 230 ㎒)

5. Peak power spectral density

5.1. Test setup

5.2. Limit

FCC 15.407 (a)(1)
For the band 5.15 ~ 5.25 ㎓ band, the peak power spectral density shall not exceed 4 ㏈m in any 1 ㎒ band.
If transmitting antennas of directional gain greater than 6 ㏈i are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i.

6.3. Test procedure

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.

1. This measurement settings are specified in clause b) of section C of KDB 789033.
2. Set span to encompass the entire emission bandwidth (EBW) of the signal.
3. Set RBW = 1 ㎒
4. Set VBW ≥ 3 ㎒
5. Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
6. Sweep time = auto.
7. Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
8. if transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run”.
9. Trace average at least 100 traces in power averaging (i.e., RMS) mode.
10. Use the peak search function on the spectrum analyzer to find the peak of the spectrum.
11. The result is the PPSD.

SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**
Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

5.4. Test result

Ambient temperature : (24 ± 2) ℃
Relative humidity : 49 % R.H.

5.4.1. Non-DFS Band

<table>
<tr><th rowspan="2">Operation Mode</th><th rowspan="2">Antenna</th><th rowspan="2">Channel</th><th rowspan="2">Data Rate (Mbps)</th><th rowspan="2">Channel Frequency (㎒)</th><th colspan="2">Peak power spectral density</th></tr>
<tr><th>FCC Result (dB m)</th><th>FCC Limit (dB m)</th></tr>
<tr><td rowspan="6">11a</td><td rowspan="3">ANT0</td><td>Low</td><td>6</td><td>5 180</td><td>0.02</td><td rowspan="22">4</td></tr>
<tr><td>Middle</td><td>6</td><td>5 220</td><td>-0.97</td></tr>
<tr><td>High</td><td>6</td><td>5 240</td><td>-0.15</td></tr>
<tr><td rowspan="3">ANT1</td><td>Low</td><td>6</td><td>5 180</td><td>0.60</td></tr>
<tr><td>Middle</td><td>6</td><td>5 220</td><td>-0.15</td></tr>
<tr><td>High</td><td>6</td><td>5 240</td><td>0.10</td></tr>
<tr><td rowspan="9">11n-HT20</td><td rowspan="3">ANT0</td><td>Low</td><td>MCS0</td><td>5 180</td><td>-0.08</td></tr>
<tr><td>Middle</td><td>MCS0</td><td>5 220</td><td>-1.03</td></tr>
<tr><td>High</td><td>MCS0</td><td>5 240</td><td>-1.09</td></tr>
<tr><td rowspan="3">ANT1</td><td>Low</td><td>MCS0</td><td>5 180</td><td>0.11</td></tr>
<tr><td>Middle</td><td>MCS0</td><td>5 220</td><td>-0.20</td></tr>
<tr><td>High</td><td>MCS0</td><td>5 240</td><td>0.54</td></tr>
<tr><td rowspan="3">ANT0+ANT1 (Calculated)</td><td>Low</td><td>MCS0</td><td>5 180</td><td>3.03</td></tr>
<tr><td>Middle</td><td>MCS0</td><td>5 220</td><td>2.64</td></tr>
<tr><td>High</td><td>MCS0</td><td>5 240</td><td>2.81</td></tr>
<tr><td rowspan="6">11n-HT40</td><td rowspan="2">ANT0</td><td>Low</td><td>MCS0</td><td>5 190</td><td>-7.05</td></tr>
<tr><td>High</td><td>MCS0</td><td>5 230</td><td>-7.88</td></tr>
<tr><td rowspan="2">ANT1</td><td>Low</td><td>MCS0</td><td>5 190</td><td>-6.80</td></tr>
<tr><td>High</td><td>MCS0</td><td>5 230</td><td>-7.17</td></tr>
<tr><td rowspan="2">ANT0+ANT1 (Calculated)</td><td>Low</td><td>MCS0</td><td>5 190</td><td>-3.91</td></tr>
<tr><td>High</td><td>MCS0</td><td>5 230</td><td>-4.50</td></tr>
</table>

SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**
Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

ANT0

802.11a

Low Channel (5 180 ㎒)

Middle Channel (5 220 ㎒)

SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**

Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

High Channel (5 240 ㎒)

SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**

Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

802.11n-HT20

Low Channel (5 180 ㎒)

Middle Channel (5 220 ㎒)

High Channel (5 240 ㎒)

802.11n-HT40

Low Channel (5 190 ㎒)

High Channel (5 230 ㎒)

ANT1

802.11a

Low Channel (5 180 ㎒)

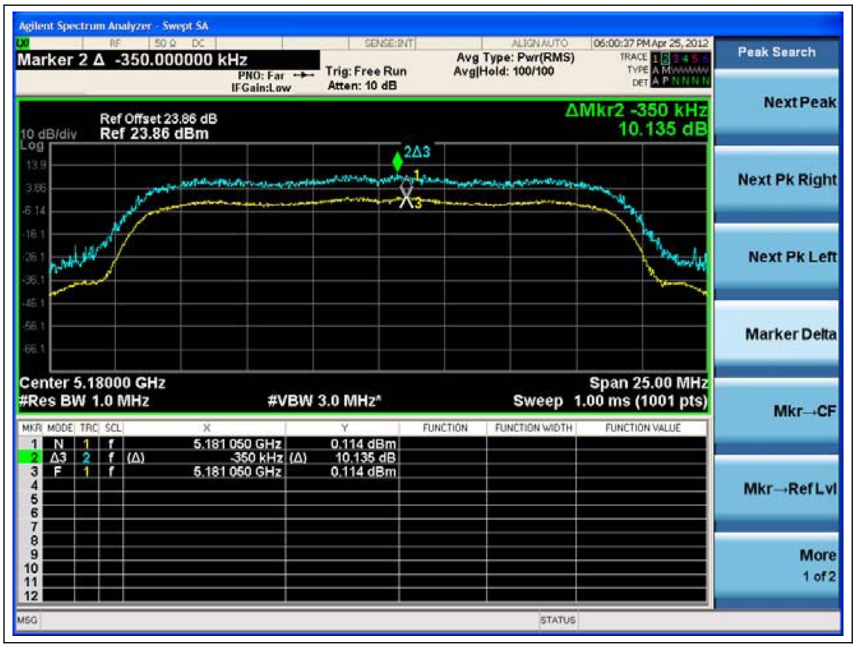
Middle Channel (5 220 ㎒)

SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**
Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

High Channel (5 240 ㎒)

802.11n-HT20

Low Channel (5 180 ㎒)



Middle Channel (5 220 ㎒)

High Channel (5 240 ㎒)

802.11n-HT40

Low Channel (5 190 ㎒)

High Channel (5 230 ㎒)

SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**

Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

6. Peak excursion

6.1. Test setup

EUT		Attenuator		Spectrum Analyzer

6.2. Limit

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 ㏈ across any 1 ㎒ bandwidth or the emission bandwidth whichever is less.

6.3. Test procedure

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.

1. This measurement settings are specified in section F of KDB 789033.
2. Set the spectrum analyzer span to view the entire emission bandwidth.
3. Find the maximum of the peak-max-hold spectrum.
4. Set RBW = 1 ㎒.
5. Set VBW ≥ 3 ㎒.
6. Detector = Peak.
7. Trace mode = max-hold.
8. Allow the sweeps to continue until the trace stabilizes.
9. Use the peak search function to find the peak of the spectrum.
10. Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.

SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**
Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

6.4. Test result

Ambient temperature : (24 ± 2) ℃
Relative humidity : 49 % R.H.

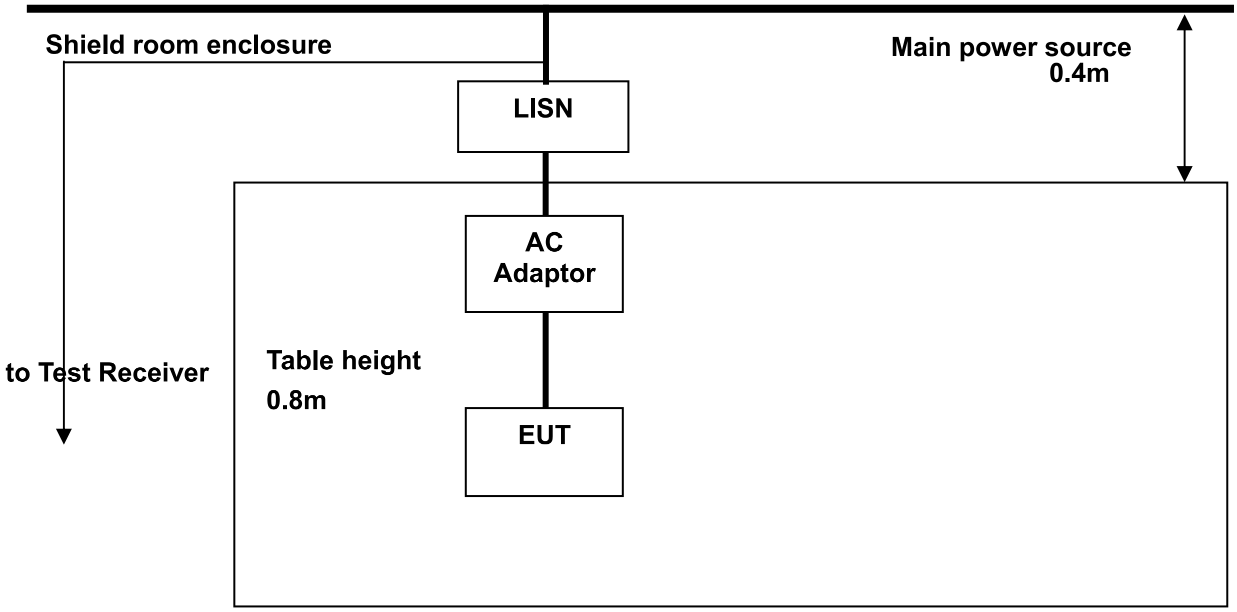
6.4.1. Non-DFS Band

Operation Mode	Antenna	Channel	Data Rate (Mbps)	Channel Frequency (㎒)	Peak excursion (dB)	Limit (dB)
11a	ANT0	Low	6	5 180	9.58	13
		Middle	6	5 220	10.85	
		High	6	5 240	9.57	
	ANT1	Low	6	5 180	9.95	
		Middle	6	5 220	11.11	
		High	6	5 240	10.22	
11n-HT20	ANT0	Low	MCS0	5 180	9.64	
		Middle	MCS0	5 220	10.31	
		High	MCS0	5 240	10.06	
	ANT1	Low	MCS0	5 180	10.14	
		Middle	MCS0	5 220	10.41	
		High	MCS0	5 240	8.93	
11n-HT40	ANT0	Low	MCS0	5 190	10.71	
		High	MCS0	5 230	11.48	
	ANT1	Low	MCS0	5 190	12.06	
		High	MCS0	5 230	12.06	

Captured images
Please refer to the PPSD captured image as above.

7. Transmitter AC Power Line Conducted Emission

7.1. Test Setup



7.2. Limit

According to §15.207(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 ㎑ to 30 ㎒, 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 (㎒)	Conducted limit (dB㎶)	
	Quasi-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.

7.3. Test Procedures

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.4:2003

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.

1. The test procedure is performed in a 6.5m × 3.6m× 3.6m (L × W × H) shielded room. The EUT along with its peripherals were placed on a 1.0 m(W)× 1.5 m(L) and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
2. 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.
3. The excess power cable between the EUT and the LISN was bundled. All connecting cables of EUT were moved to find the maximum emission.

SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**

Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

7.4. Test Results (Worst case configuration_11a mode – 6 Mbps)

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

Ambient temperature : (24 ± 2) ℃
Relative humidity : 47 % R.H.

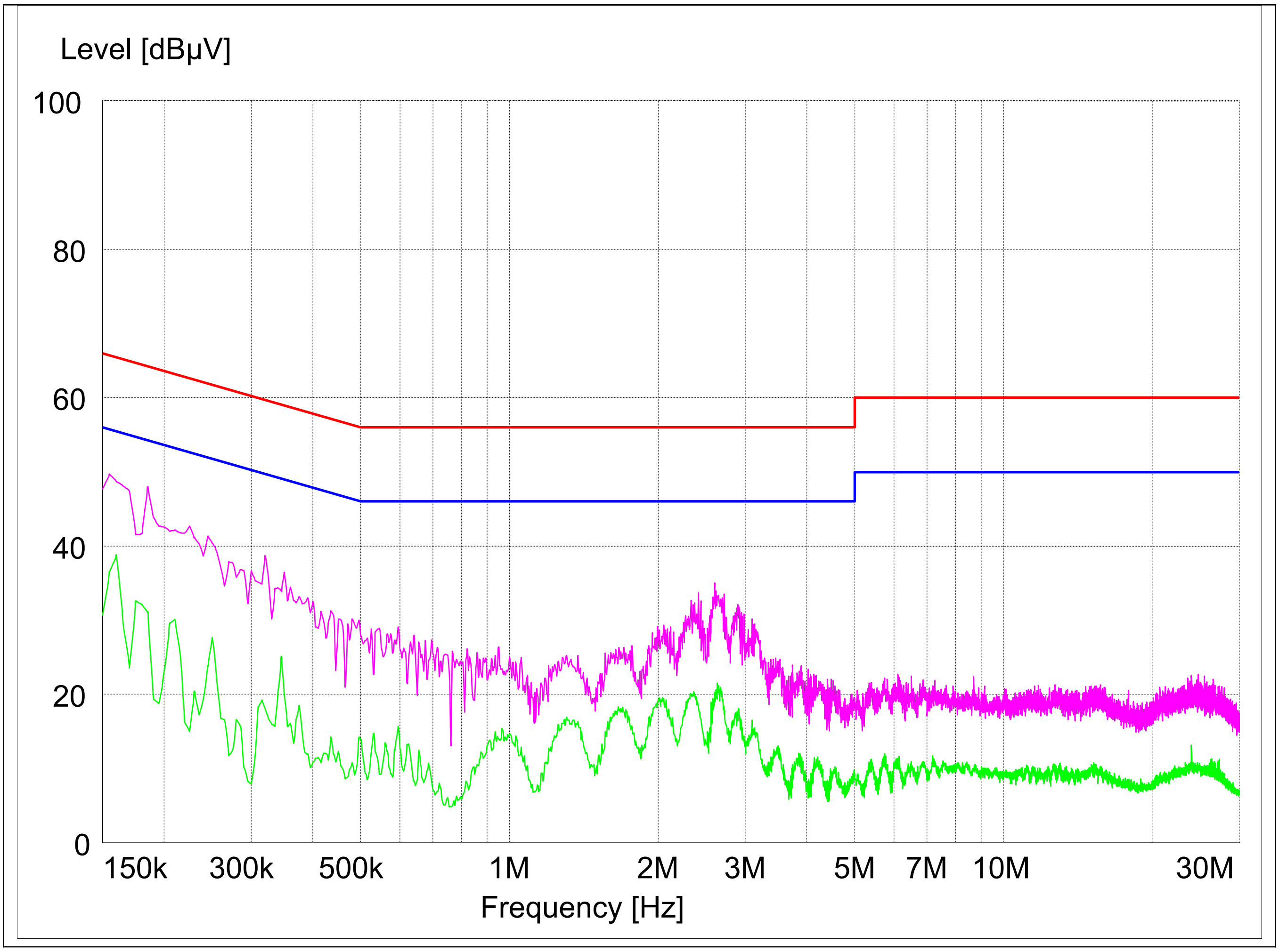
Frequency range : 0.15 ㎒ – 30 ㎒
Measured Bandwidth : 9 ㎑

FREQ.	LEVEL(dB㎶)		LINE	LIMIT(dB㎶)		MARGIN(dB)	
(㎒)	Q-Peak	Average		Q-Peak	Average	Q-Peak	Average
0.16	34.50	28.40	N	65.73	55.73	21.26	17.36
0.19	29.10	22.50	N	64.26	54.26	25.14	21.74
0.35	16.00	9.70	N	59.08	49.08	32.84	29.14
2.60	22.20	12.70	N	56.00	46.00	24.04	23.54
2.69	23.60	12.40	N	56.00	46.00	22.64	23.84
15.73	8.70	4.40	N	60.00	50.00	41.26	35.56
0.16	34.90	29.70	H	65.46	55.46	20.67	15.87
0.19	32.20	24.70	H	64.26	54.26	22.12	19.62
0.25	25.50	18.50	H	61.92	51.92	26.40	23.40
2.42	16.50	10.70	H	56.00	46.00	29.82	25.62
2.60	19.00	11.50	H	56.00	46.00	27.32	24.82
8.71	4.80	0.70	H	60.00	50.00	45.32	39.42

Note ;
Line (H) : Hot
Line (N) : Neutral

Plot of Conducted Power line

Test mode : (Hot)



SGS Korea Co., Ltd. (Gunpo Laboratory) **18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea, 435-040**

Tel. +82 31 428 5700 / Fax. +82 31 427 2371 www.ee.sgs.com/korea

Test mode : (Neutral)