

# TEST REPORT

of

FCC Part 15 Subpart E §15.407

FCC ID: TQ8-ADBB0A9AN

Equipment Under Test : DISPLAY CAR SYSTEM  
Model Name : ADBB0A9AN  
Variant Model Name : ADBB1A9AN  
Applicant : Hyundai MOBIS Co., Ltd.  
Manufacturer : Hyundai MOBIS Co., Ltd.  
Date of Test(s) : 2016.03.31 ~ 2016.04.18  
Date of Issue : 2016.04.20

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

Tested By:



Date:

2016.04.20

Jinhyoung Cho

Approved By:



Date:

2016.04.20

Hyunchae You

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## 1. General information

### 1.1. Testing laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- Wireless Div. 2FL, 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>.

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### 1.2. Details of applicant

Applicant : Hyundai MOBIS Co., Ltd.

Address : 203, Teheran-ro, Gangnam-gu, Seoul, 06141, Korea

Contact Person : Kwon, Heung-Chul

Phone No. : +82 31 260 2714

### 1.3. Description of EUT

Kind of Product	DISPLAY CAR SYSTEM
Model Name	ADBB0A9AN
Variant Model Name	ADBB1A9AN
Power Supply	DC 14.4 V
Frequency Range	2 402 MHz ~ 2 480 MHz (Bluetooth), 2 412 MHz ~ 2 462 MHz (11b/g/n_HT20), 5 745 MHz ~ 5 825 MHz (Band 3: 11a/n_HT20, 11ac_VHT20), 5 755 MHz ~ 5 795 MHz (Band 3: 11n_HT40, 11ac_VHT40), 5 775 MHz (Band 3: 11ac_VHT80), 5 180 MHz ~ 5 240 MHz (Band 1: 11a/n_HT20, 11ac_VHT20), 5 190 MHz ~ 5 230 MHz (Band 1: 11n_HT40, 11ac_VHT40), 5 210 MHz (Band 1: 11ac_VHT80), 5 260 MHz ~ 5 320 MHz (Band 2A: 11a/n_HT20, 11ac_VHT20), 5 270 MHz ~ 5 310 MHz (Band 2A: 11n_HT40, 11ac_VHT40), 5 290 MHz (Band 2A: 11ac_VHT80), 5 500 MHz ~ 5 720 MHz (Band 2C: 11a/n_HT20, 11ac_VHT20), 5 510 MHz ~ 5 710 MHz (Band 2C: 11n_HT40, 11ac_VHT40), 5 530 MHz ~ 5 690 MHz (Band 2C: 11ac_VHT80)
Modulation Technique	DSSS, OFDM, GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channels	79 channel (Bluetooth), 11 channel (11b/g/n_HT20), 5 channel (Band 3: 11a/n_HT20, 11ac_VHT20), 2 channel (Band 3: 11n_HT40, 11ac_VHT40), 1 channel (Band 3: 11ac_VHT80), 4 channel (Band 1: 11a/n_HT20, 11ac_VHT20), 2 channel (Band 1: 11n_HT40, 11ac_VHT40), 1 channel (Band 1: 11ac_VHT80), 4 channel (Band 2A: 11a/n_HT20, 11ac_VHT20), 2 channel (Band 2A: 11n_HT40, 11ac_VHT40), 1 channel (Band 2A: 11ac_VHT80), 9 channel (Band 2C: 11a/n_HT20, 11ac_VHT20), 4 channel (Band 2C: 11n_HT40, 11ac_VHT40), 2 channel (Band 2C: 11ac_VHT80)
Antenna Type	Chip Antenna (Bluetooth), Pcb Antenna (WLAN)
Antenna Gain	2 402 MHz ~ 2 480 MHz: 2.29 dB i, 2 412 MHz ~ 2 462 MHz: -0.50 dB i, 5 180 MHz ~ 5 320 MHz: 2.89 dB i, 5 500 MHz ~ 5 720 MHz: 2.51 dB i, 5 745 MHz ~ 5 825 MHz: 5.78 dB i

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#### 1.4. Declaration by the manufacturer

- The EUT is a slave without radar detection and TPC.
- EUT is not supported TDWR(5.6-5.65 GHz) band.

#### 1.5. Test equipment list

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval	Cal. Due
Signal Generator	Agilent	E8257D	MY51501169	Jul. 13, 2015	Annual	Jul. 13, 2016
Spectrum Analyzer	Agilent	N9020A	MY53421758	Sep. 24, 2015	Annual	Sep. 24, 2016
Spectrum Analyzer	R&S	FSV30	103100	Jun. 22, 2015	Annual	Jun. 22, 2016
Attenuator	MCLI	FAS-12-10	3	Jun. 09, 2015	Annual	Jun. 09, 2016
High Pass Filter	Wainwright Instrument GmbH	WHK6.0/18G-10SS	11	Jun. 08, 2015	Annual	Jun. 08, 2016
High Pass Filter	Wainwright Instrument GmbH	WHNX7.5/26.5G-6SS	15	Jun. 23, 2015	Annual	Jun. 23, 2016
Low Pass Filter	Mini-Circuits	NLP-1200+	V 8979400903-2	Feb. 29, 2016	Annual	Feb. 29, 2017
Power Sensor	Anritsu	MA2411B	1207272	Jun. 08, 2015	Annual	Jun. 08, 2016
Power Meter	Anritsu	ML2495A	1223004	Jun. 08, 2015	Annual	Jun. 08, 2016
DC Power Supply	Agilent	U8002A	MY53150029	Jun. 22, 2015	Annual	Jun. 22, 2016
Preamplifier	H.P.	8447F	2944A03909	Aug. 27, 2015	Annual	Aug. 27, 2016
Preamplifier	R&S	SCU-18	10117	Apr. 07, 2016	Annual	Apr. 07, 2017
Preamplifier	MITEQ Inc.	JS44-18004000-35-8P	1546891	May 07, 2015	Annual	May 07, 2016
Loop Antenna	R&S	HFH2-Z2	100118	Jun. 04, 2015	Biennial	Jun. 04, 2017
Trilog Broadband Antenna	Schwarzbeck Mess-Elektronik	VULB9163	396	Jun. 18, 2015	Biennial	Jun. 18, 2017
Horn Antenna	R&S	HF906	100326	Feb. 01, 2016	Biennial	Feb. 01, 2018
Horn Antenna	Schwarzbeck Mess-Elektronik	BBHA9170	BBHA9170431	May 15, 2014	Biennial	May 15, 2016
Antenna Master	INN-CO	MM4000	N/A	N.C.R.	N/A	N.C.R.
Turn Table	INN-CO	DS 1200 S	N/A	N.C.R.	N/A	N.C.R.
Test Receiver	R&S	ESU26	100109	Mar. 07, 2016	Annual	Mar. 07, 2017
Anechoic Chamber	SY Corporation	L × W × H (9.6 m × 6.4 m × 6.6 m)	N/A	N.C.R.	N/A	N.C.R.

#### ► Support equipment

Description	Manufacturer	Model	Serial Number / FCC ID
N/A	-	-	-

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## 1.6. Summary of test result

The EUT has been tested according to the following specifications:

APPLIED STANDARD : FCC Part 15 Subpart E		
Standard section	Test Item	Result
15.205(a) 15.209(a) 15.407(b)(1) 15.407(b)(2) 15.407(b)(3) 15.407(b)(4)	Transmitter radiated spurious emissions	Complied
15.407(a)	26 dB Bandwidth & 99 % Occupied Bandwidth	Complied
15.407(e)	6 dB Bandwidth	Complied
15.407(a)(1) 15.407(a)(2) 15.407(a)(3)	Maximum Conducted Output Power	Complied
15.407(a)(1) 15.407(a)(2) 15.407(a)(3)	Peak power spectral density	Complied

## 1.7. Test Procedure(s)

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2009), the guidance provided in KDB 789033\_D02 v01r02 and KDB 644545\_D03 v01 were used in the measurement of the DUT.

## 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 (dB $\mu$ V/m) = Measured level (dB $\mu$ V) + Antenna factor (dB) + Cable loss (dB) - amplifier (dB)

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## 1.9. Test report revision

Revision	Report number	Date of Issue	Description
0	F690501/RF-RTL009719	2016.04.20	Initial

## 1.10. Information of Variant Model

Model Name	Bluetooth	WIFI	TMU
ADBB0A9AN (Basic)	O	O	O
ADBB1A9AN (Variant)	O	O	X

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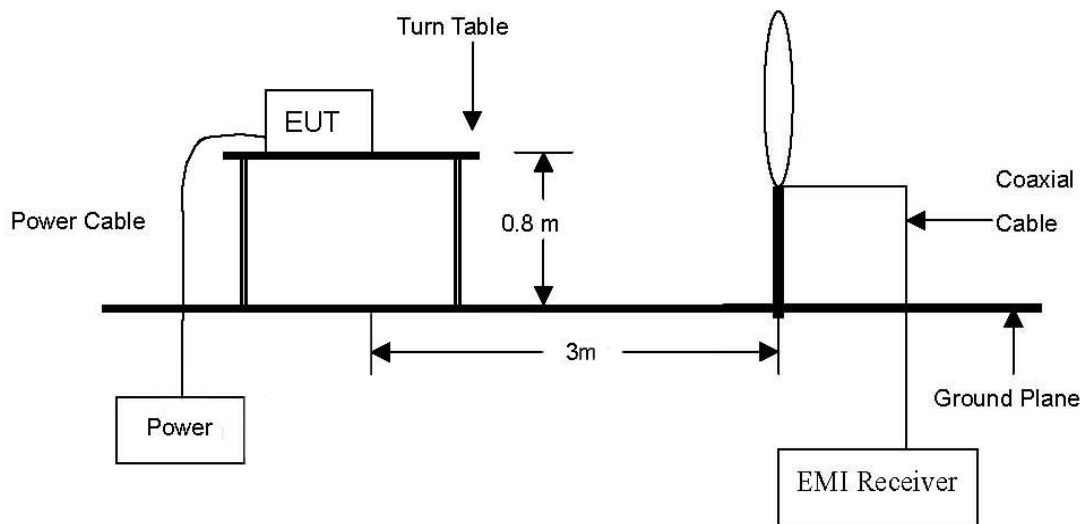
**SGS Korea Co., Ltd. (Gunpo Laboratory)** 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

## 2. Transmitter radiated spurious emissions

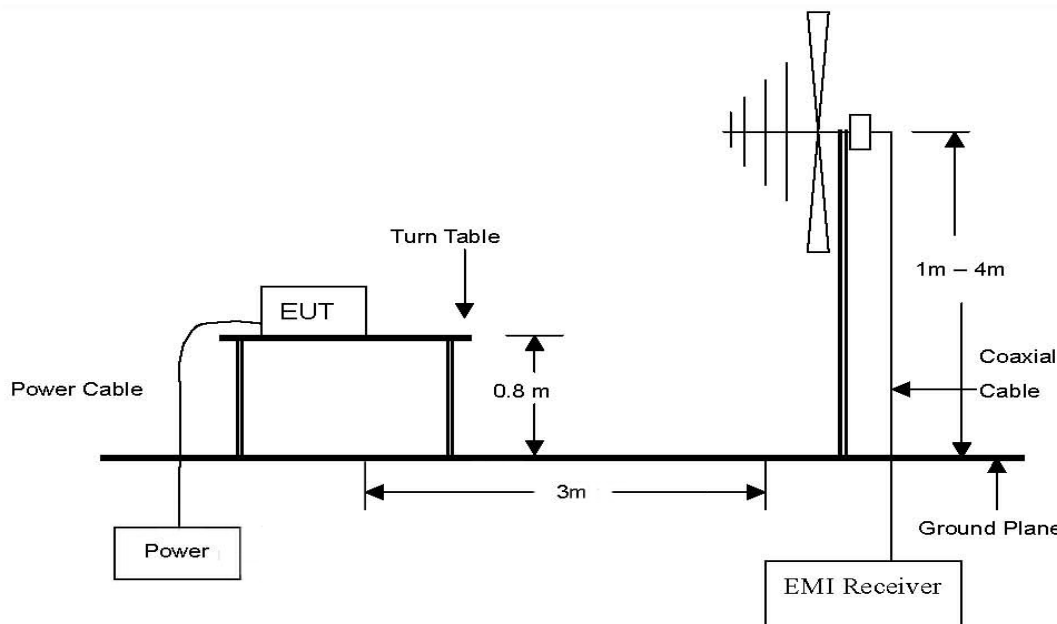
### 2.1. Test setup

#### 2.1.1. Transmitter Radiated Spurious Emissions

The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30 MHz Emissions.



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



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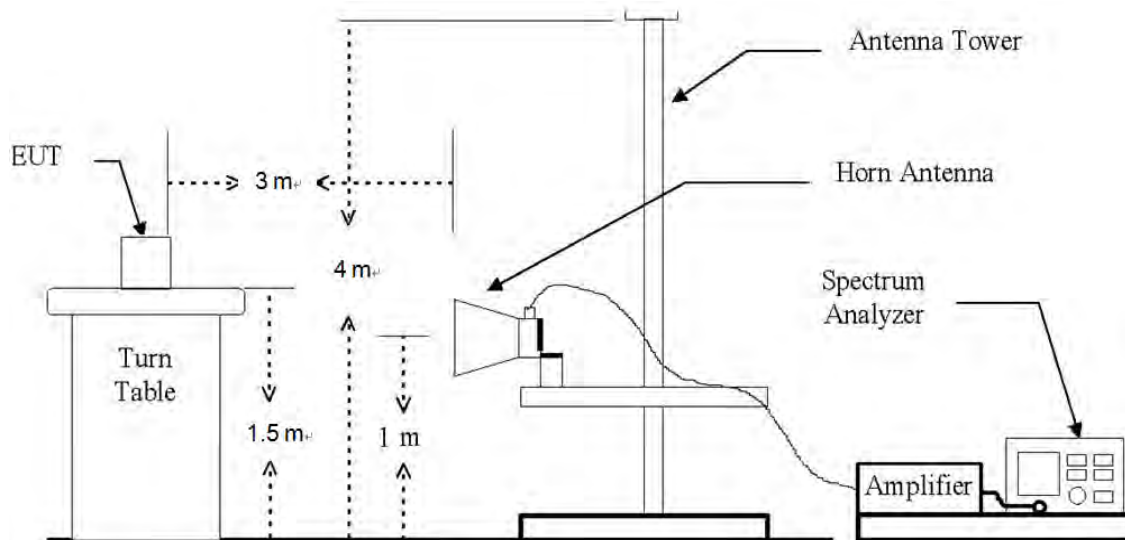
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The diagram below shows the test setup that is utilized to make the measurements for emission. The spurious emissions were investigated from 1 GHz to the 10th harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.



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## 2.2. Limit

For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dB m/MHz.

For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dB m/MHz.

For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dB m/MHz.

For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dB m/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dB m/MHz.

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 (MHz)	Distance (Meters)	Field Strength (dBμV/m)	Field Strength (μV/m)
0.009 - 0.490	300	20 log (2 400/F(kHz))	2 400/F(kHz)
0.490 - 1.705	30	20 log (24 000/F(kHz))	24 000/F(kHz)
1.705 - 30.0	30	29.54	30
30 - 88	3	40.0	100**
88 - 216	3	43.5	150**
216 - 960	3	46.0	200**
Above 960	3	54.0	500

\*\*Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz.

However, operation within these frequency bands is permitted under other sections of this part, e.g., §15.231 and §15.241.

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## 2.3. Test procedures

Radiated spurious emissions from the EUT were measured according to the dictates in section G of KDB 789033\_D02 v01r02 and ANSI C63.10-2009.

### Remark:

Testing for radiated emissions above 1 GHz was performed with the EUT elevated at 1.5m instead of 0.8m. 1.5m is the required height in ANSI C63.10:2013 as referenced by RSS GEN issue 4. This test height has been permitted by FCC as discussed in FCC-TCB conference call in December 2014.

### 2.3.1. Test Procedures for emission below 30 MHz

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. Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement.
3. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading.
4. The test-receiver system was set to average or quasi peak detect function and Specified Bandwidth with Maximum Hold Mode.

### 2.3.2. Test Procedures for emission from above 30 MHz

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 below 1 GHz and 1.5 meters above the ground at a 3 meter anechoic chamber test site above 1 GHz. 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 bi-log antenna, a horn 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.

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#### NOTE;

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

- The measurements for below 1 GHz refer to section II.G.4.  
Compliance shall be demonstrated using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.
  - The measurements for above 1 GHz refer to section II.G.5.  
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
  - The measurements for above 1 GHz refer to section II.G.6.  
Average emission levels are measured by setting the analyzer as follows:  
Set to RBW = 1 MHz, VBW ≥ 3 MHz, Detector = power averaging (rms), Averaging type = power averaging (rms), Sweep time = auto, Perform a trace average of at least 100 traces If the transmission is continuous. If the transmission is not continuous, the number of traces shall be increased by a factor of 1/x, where x is the duty cycle. For example, with 50% duty cycle, at least 200 traces shall be averaged.
- If tests are performed with the EUT transmitting at a duty cycle less than 98%, a correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:
- If power averaging (rms) mode was used in step (iv) above, the correction factor is  $10 \log (1/x)$ , where x is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB must be added to the measured emission levels.
- Definition of DUT Axis.  
Definition of the test orthogonal plan for EUT was described in the test setup photo.  
The test orthogonal plan of EUT is X-axis during radiation test.

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## 2.4. Test result

Ambient temperature : (23 ± 1) °C

Relative humidity : 47 % R.H.

### 2.4.1. Radiated Spurious Emission below 1 000 MHz

The frequency spectrum from 9 MHz to 1 000 MHz was investigated. All reading values are peak values.

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP + CL (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
339.55	39.70	Peak	V	16.15	-25.24	30.61	46.00	15.39
359.96	37.70	Peak	H	15.74	-25.44	28.00	46.00	18.00
515.16	41.80	Peak	H	18.56	-25.86	34.50	46.00	11.50
542.16	46.10	Peak	V	18.58	-25.95	38.73	46.00	7.27
633.18	38.50	Peak	H	20.12	-25.74	32.88	46.00	13.12
981.93	35.80	Peak	V	24.19	-23.95	36.04	54.00	17.96
Above 1 000.00	Not detected	-	-	-	-	-	-	-

Remark:

1. Spurious emissions for all channels and modes were investigated and almost the same below 1 GHz.
2. Reported spurious emissions are in **11n HT20 (Band 2A) / MCS 0 / Low channel** as worst case among other modes.
3. Radiated spurious emission measurement as below.  
(Actual = Reading + AF + AMP + CL)
4. According to §15.31(o), emission levels are not report much lower than the limits by over 20 dB.

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## 2.4.2. Radiated Spurious Emission above 1 000 MHz

### 802.11a (Band 1)\_6 Mbps

#### A. Low Channel (5 180 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*4 500.00	15.77	Peak	V	31.84	7.42	-	55.03	74.00	18.97
*4 500.00	8.20	Average	V	31.84	7.42	0.32	47.78	54.00	6.22
*5 121.16	19.75	Peak	V	33.34	7.46	-	60.55	74.00	13.45
*5 141.60	8.96	Average	V	33.37	7.48	0.32	50.13	54.00	3.87
*5 150.00	17.69	Peak	V	33.38	7.49	-	58.56	74.00	15.44
*5 150.00	8.97	Average	V	33.38	7.49	0.32	50.16	54.00	3.84

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
10 361.55	36.30	Peak	V	37.67	-25.21	-	48.76	68.23	19.47
Above 10 400.00	Not detected	-	-	-	-	-	-	-	-

#### B. Middle Channel (5 200 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
10 399.38	38.24	Peak	V	37.69	-25.30	-	50.63	68.23	17.60
Above 10 400.00	Not detected	-	-	-	-	-	-	-	-

#### C. High Channel (5 240 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
10 480.55	37.61	Peak	V	37.73	-25.60	-	49.74	68.23	18.49
Above 10 500.00	Not detected	-	-	-	-	-	-	-	-

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## 802.11a (Band 2A)\_6 Mbps

### A. Low Channel (5 260 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
10 517.84	36.37	Peak	V	37.75	-25.71	-	48.41	68.23	19.82
Above 10 600.00	Not detected	-	-	-	-	-	-	-	-

### B. Middle Channel (5 280 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
10 562.37	36.88	Peak	V	37.78	-25.79	-	48.87	68.23	19.36
Above 10 600.00	Not detected	-	-	-	-	-	-	-	-

### C. High Channel (5 320 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*5 350.00	17.41	Peak	V	33.66	7.34	-	58.41	74.00	15.59
*5 350.00	8.01	Average	V	33.66	7.34	0.32	49.33	54.00	4.67
*5 408.52	19.28	Peak	V	33.74	7.89	-	60.91	74.00	13.09
*5 352.90	8.58	Average	V	33.66	7.37	0.32	49.93	54.00	4.07
*5 460.00	17.14	Peak	V	33.81	7.74	-	58.69	74.00	15.31
*5 460.00	7.63	Average	V	33.81	7.74	0.32	49.50	54.00	4.50

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*10 637.97	37.06	Peak	V	37.83	-25.96	-	48.93	74.00	25.07
*10 640.88	25.65	Average	V	37.84	-25.97	0.32	37.84	54.00	16.16
Above 10 700.00	Not detected	-	-	-	-	-	-	-	-

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RTT5041-20(2015.10.01)(3)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

## 802.11a (Band 2C)\_6 Mbps

### A. Low Channel (5 500 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*5 350.00	17.67	Peak	V	33.66	7.34	-	58.67	74.00	15.33
*5 350.00	7.52	Average	V	33.66	7.34	0.32	48.84	54.00	5.16
*5 449.20	18.82	Peak	V	33.79	7.70	-	60.31	74.00	13.69
*5 365.68	8.27	Average	V	33.68	7.53	0.32	49.80	54.00	4.20
*5 460.00	16.63	Peak	V	33.81	7.74	-	58.18	74.00	15.82
*5 460.00	7.83	Average	V	33.81	7.74	0.32	49.70	54.00	4.30

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*10 998.73	36.17	Peak	V	38.08	-26.89	-	47.36	74.00	26.64
*11 000.22	25.54	Average	V	38.08	-26.89	0.32	37.05	54.00	16.95
Above 11 100.00	Not detected	-	-	-	-	-	-	-	-

### B. Middle Channel (5 580 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 160.29	35.90	Peak	V	38.20	-26.60	-	47.50	74.00	26.50
*11 159.52	25.05	Average	V	38.20	-26.60	0.32	36.97	54.00	17.03
Above 11 200.00	Not detected	-	-	-	-	-	-	-	-

### C. High Channel (5 720 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 439.27	35.74	Peak	V	38.41	-26.02	-	48.13	74.00	25.87
*11 438.61	24.80	Average	V	38.40	-26.02	0.32	37.50	54.00	16.50
Above 11 500.00	Not detected	-	-	-	-	-	-	-	-

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## 802.11a (Band 3)\_6 Mbps

### A. Low Channel (5 745 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
5 712.22	12.91	Peak	V	34.21	7.88	-	55.00	68.23	13.23
5 718.04	13.41	Peak	V	34.22	7.92	-	55.55	78.23	22.68

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*11 488.22	36.73	Peak	V	38.44	-26.06	-	49.11	74.00	24.89
*11 489.11	25.95	Average	V	38.44	-26.06	0.32	38.65	54.00	15.35
Above 11 500.00	Not detected	-	-	-	-	-	-	-	-

### B. Middle Channel (5 785 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*11 568.77	36.17	Peak	V	38.43	-26.16	-	48.44	74.00	25.56
*11 570.50	25.15	Average	V	38.43	-26.16	0.32	37.74	54.00	16.26
Above 11 600.00	Not detected	-	-	-	-	-	-	-	-

### C. High Channel (5 825 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
5 859.78	13.16	Peak	V	34.45	8.23	-	55.84	78.23	22.39
5 864.14	12.33	Peak	V	34.46	8.24	-	55.03	68.23	13.20

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*11 652.13	36.31	Peak	V	38.40	-26.04	-	48.67	74.00	25.33
*11 651.58	24.96	Average	V	38.40	-26.04	0.32	37.64	54.00	16.36
Above 11 700.00	Not detected	-	-	-	-	-	-	-	-

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## 802.11n\_HT20 (Band 1)\_MCS0

### A. Low Channel (5 180 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*4 500.00	16.98	Peak	V	31.84	7.42	-	56.24	74.00	17.76
*4 500.00	7.88	Average	V	31.84	7.42	0.32	47.46	54.00	6.54
*5 141.60	20.99	Peak	V	33.37	7.48	-	61.84	74.00	12.16
*5 148.90	9.26	Average	V	33.38	7.49	0.32	50.45	54.00	3.55
*5 150.00	18.92	Peak	V	33.38	7.49	-	59.79	74.00	14.21
*5 150.00	9.96	Average	V	33.38	7.49	0.32	51.15	54.00	2.85

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
10 359.62	36.11	Peak	V	37.67	-25.20	-	48.58	68.23	19.65
Above 10 400.00	Not detected	-	-	-	-	-	-	-	-

### B. Middle Channel (5 200 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
10 400.15	37.49	Peak	V	37.69	-25.30	-	49.88	68.23	18.35
Above 10 500.00	Not detected	-	-	-	-	-	-	-	-

### C. High Channel (5 240 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
10 481.26	36.32	Peak	V	37.73	-25.60	-	48.45	68.23	19.78
Above 10 500.00	Not detected	-	-	-	-	-	-	-	-

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RTT5041-20(2015.10.01)(3)

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A4(210 mm x 297 mm)

## 802.11n\_HT20 (Band 2A)\_MCS0

### A. Low Channel (5 260 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
10 519.01	37.34	Peak	V	37.75	-25.70	-	49.39	68.23	18.84
Above 10 600.00	Not detected	-	-	-	-	-	-	-	-

### B. Middle Channel (5 280 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
10 559.72	37.05	Peak	V	37.78	-25.78	-	49.05	68.23	19.18
Above 10 600.00	Not detected	-	-	-	-	-	-	-	-

### C. High Channel (5 320 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*5 350.00	17.01	Peak	V	33.66	7.34	-	58.01	74.00	15.99
*5 350.00	8.30	Average	V	33.66	7.34	0.32	49.62	54.00	4.38
*5 401.50	19.06	Peak	V	33.73	7.92	-	60.71	74.00	13.29
*5 352.36	8.41	Average	V	33.66	7.37	0.32	49.76	54.00	4.24
*5 460.00	16.76	Peak	V	33.81	7.74	-	58.31	74.00	15.69
*5 460.00	7.97	Average	V	33.81	7.74	0.32	49.84	54.00	4.16

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*10 642.30	37.27	Peak	V	37.84	-25.97	-	49.14	74.00	24.86
*10 638.02	25.58	Average	V	37.83	-25.96	0.32	37.77	54.00	16.23
Above 10 700.00	Not detected	-	-	-	-	-	-	-	-

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RTT5041-20(2015.10.01)(3)

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A4(210 mm x 297 mm)

## 802.11n\_HT20 (Band 2C)\_MCS0

### A. Low Channel (5 500 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*5 350.00	16.99	Peak	V	33.66	7.34	-	57.99	74.00	16.01
*5 350.00	7.50	Average	V	33.66	7.34	0.32	48.82	54.00	5.18
*5 371.44	18.96	Peak	V	33.69	7.59	-	60.24	74.00	13.76
*5 372.16	8.19	Average	V	33.69	7.60	0.32	49.80	54.00	4.20
*5 460.00	16.02	Peak	V	33.81	7.74	-	57.57	74.00	16.43
*5 460.00	7.31	Average	V	33.81	7.74	0.32	49.18	54.00	4.82

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 000.28	36.76	Peak	V	38.08	-26.89	-	47.95	74.00	26.05
*10 999.24	25.25	Average	V	38.08	-26.89	0.32	36.76	54.00	17.24
Above 11 100.00	Not detected	-	-	-	-	-	-	-	-

### B. Middle Channel (5 580 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 158.82	36.14	Peak	V	38.20	-26.60	-	47.74	74.00	26.26
*11 159.20	25.20	Average	V	38.20	-26.60	0.32	37.12	54.00	16.88
Above 11 200.00	Not detected	-	-	-	-	-	-	-	-

### C. High Channel (5 720 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 440.90	35.96	Peak	V	38.41	-26.02	-	48.35	74.00	25.65
*11 438.22	24.86	Average	V	38.40	-26.02	0.32	37.56	54.00	16.44
Above 11 500.00	Not detected	-	-	-	-	-	-	-	-

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## 802.11n\_HT20 (Band 3)\_MCS0

### A. Low Channel (5 745 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
5 706.79	12.90	Peak	V	34.20	7.85	-	54.95	68.23	13.28
5 724.50	13.82	Peak	V	34.23	7.97	-	56.02	78.23	22.21

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*11 492.36	36.43	Peak	V	38.44	-26.05	-	48.82	74.00	25.18
*11 488.87	25.59	Average	V	38.44	-26.06	0.32	38.29	54.00	15.71
Above 11 500.00	Not detected	-	-	-	-	-	-	-	-

### B. Middle Channel (5 785 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*11 568.70	36.07	Peak	V	38.43	-26.16	-	48.34	74.00	25.66
*11 568.12	25.13	Average	V	38.43	-26.16	0.32	37.72	54.00	16.28
Above 11 600.00	Not detected	-	-	-	-	-	-	-	-

### C. High Channel (5 825 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
5 851.09	12.73	Peak	V	34.44	8.22	-	55.39	78.23	22.84
5 865.96	13.16	Peak	V	34.46	8.24	-	55.86	68.23	12.37

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*11 649.11	36.72	Peak	V	38.41	-26.04	-	49.09	74.00	24.91
*11 650.50	25.27	Average	V	38.40	-26.04	0.32	37.95	54.00	16.05
Above 11 700.00	Not detected	-	-	-	-	-	-	-	-

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## 802.11n\_HT40 (Band 1)\_MCS0

### A. Low Channel (5 190 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*4 500.00	17.21	Peak	V	31.84	7.42	-	56.47	74.00	17.53
*4 500.00	8.27	Average	V	31.84	7.42	0.60	48.13	54.00	5.87
*4 663.45	19.62	Peak	V	32.28	7.48	-	59.38	74.00	14.62
*4 653.23	8.68	Average	V	32.25	7.56	0.60	49.09	54.00	4.91
*5 150.00	16.99	Peak	V	33.38	7.49	-	57.86	74.00	16.14
*5 150.00	8.69	Average	V	33.38	7.49	0.60	50.16	54.00	3.84

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
10 379.02	37.23	Peak	V	37.68	-25.25	-	49.66	68.23	18.57
Above 10 400.00	Not detected	-	-	-	-	-	-	-	-

### B. High Channel (5 230 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
10 459.30	36.49	Peak	V	37.72	-25.52	-	48.69	68.23	19.54
Above 10 500.00	Not detected	-	-	-	-	-	-	-	-

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A4(210 mm x 297 mm)

## 802. 11n\_HT40 (Band 2A)\_MCS0

### A. Low Channel (5 270 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
10 541.56	36.86	Peak	V	37.77	-25.75	-	48.88	68.23	19.35
Above 10 600.00	Not detected	-	-	-	-	-	-	-	-

### B. High Channel (5 310 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*5 350.00	18.32	Peak	V	33.66	7.34	-	59.32	74.00	14.68
*5 350.00	8.55	Average	V	33.66	7.34	0.60	50.15	54.00	3.85
*5 407.26	19.05	Peak	V	33.73	7.90	-	60.68	74.00	13.32
*5 352.18	8.56	Average	V	33.66	7.37	0.60	50.19	54.00	3.81
*5 460.00	16.54	Peak	V	33.81	7.74	-	58.09	74.00	15.91
*5 460.00	7.03	Average	V	33.81	7.74	0.60	49.18	54.00	4.82

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*10 621.41	36.98	Peak	V	37.82	-25.92	-	48.88	74.00	25.12
*10 617.91	25.97	Average	V	37.82	-25.91	0.60	38.48	54.00	15.52
Above 10 700.00	Not detected	-	-	-	-	-	-	-	-

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## 802. 11n\_HT40 (Band 2C)\_MCS0

### A. Low Channel (5 510 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*5 350.00	15.76	Peak	V	33.66	7.34	-	56.76	74.00	17.24
*5 350.00	7.03	Average	V	33.66	7.34	0.60	48.63	54.00	5.37
*5 420.10	18.92	Peak	V	33.75	7.84	-	60.51	74.00	13.49
*5 428.74	8.41	Average	V	33.76	7.80	0.60	50.57	54.00	3.43
*5 460.00	16.42	Peak	V	33.81	7.74	-	57.97	74.00	16.03
*5 460.00	7.23	Average	V	33.81	7.74	0.60	49.38	54.00	4.62

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*11 020.65	36.19	Peak	V	38.10	-26.85	-	47.44	74.00	26.56
*11 020.27	25.18	Average	V	38.09	-26.85	0.60	37.02	54.00	16.98
Above 11 100.00	Not detected	-	-	-	-	-	-	-	-

### B. Middle Channel (5 550 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*11 101.08	37.36	Peak	V	38.15	-26.69	-	48.82	74.00	25.18
*11 100.37	26.23	Average	V	38.15	-26.69	0.60	38.29	54.00	15.71
Above 11 200.00	Not detected	-	-	-	-	-	-	-	-

### C. High Channel (5 710 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*11 417.80	36.65	Peak	V	38.39	-26.01	-	49.03	74.00	24.97
*11 418.72	25.27	Average	V	38.39	-26.00	0.60	38.26	54.00	15.74
Above 11 500.00	Not detected	-	-	-	-	-	-	-	-

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## 802.11n\_HT40 (Band 3)\_MCS0

### A. Low Channel (5 755 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
5 705.36	13.65	Peak	V	34.20	7.84	-	55.69	68.23	12.54
5 718.06	13.31	Peak	V	34.22	7.92	-	55.45	78.23	22.78

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*11 508.05	36.75	Peak	V	38.45	-26.07	-	49.13	74.00	24.87
*11 508.20	25.52	Average	V	38.45	-26.07	0.60	38.50	54.00	15.50
Above 11 600.00	Not detected	-	-	-	-	-	-	-	-

### B. High Channel (5 795 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
5 858.31	12.73	Peak	V	34.45	8.23	-	55.41	78.23	22.82
5 863.66	13.07	Peak	V	34.46	8.24	-	55.77	68.23	12.46

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*11 588.50	36.70	Peak	V	38.42	-26.20	-	48.92	74.00	25.08
*11 591.37	25.69	Average	V	38.42	-26.19	0.60	38.52	54.00	15.48
Above 11 600.00	Not detected	-	-	-	-	-	-	-	-

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A4(210 mm x 297 mm)



## 802.11ac\_VHT80 (Band 1)\_MCS0

A. Middle Channel (5 210 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*4 500.00	16.84	Peak	V	31.84	7.42	-	56.10	74.00	17.90
*4 500.00	7.86	Average	V	31.84	7.42	1.14	48.26	54.00	5.74
*4 661.26	19.14	Peak	V	32.27	7.50	-	58.91	74.00	15.09
*4 651.04	9.01	Average	V	32.24	7.58	1.14	49.97	54.00	4.03
*5 150.00	17.62	Peak	V	33.38	7.49	-	58.49	74.00	15.51
*5 150.00	8.19	Average	V	33.38	7.49	1.14	50.20	54.00	3.80

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 421.10	36.63	Peak	V	37.70	-25.38	-	48.95	68.23	19.28
Above 10 500.00	Not detected	-	-	-	-	-	-	-	-

## 802. 11ac\_VHT80 (Band 2A)\_MCS0

A. Middle Channel (5 290 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*5 350.00	17.26	Peak	V	33.66	7.34	-	58.26	74.00	15.74
*5 350.00	7.69	Average	V	33.66	7.34	1.14	49.83	54.00	4.17
*5 404.20	17.79	Peak	V	33.73	7.91	-	59.43	74.00	14.57
*5 386.38	8.38	Average	V	33.71	7.77	1.14	51.00	54.00	3.00
*5 460.00	16.87	Peak	V	33.81	7.74	-	58.42	74.00	15.58
*5 460.00	7.48	Average	V	33.81	7.74	1.14	50.17	54.00	3.83

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10 581.57	37.33	Peak	V	37.80	-25.82	-	49.31	68.23	18.92
Above 10 600.00	Not detected	-	-	-	-	-	-	-	-

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## 802. 11ac\_VHT80 (Band 2C)\_MCS0

### A. Low Channel (5 530 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*5 350.00	17.82	Peak	V	33.66	7.34	-	58.82	74.00	15.18
*5 350.00	7.31	Average	V	33.66	7.34	1.14	49.45	54.00	4.55
*5 459.16	19.21	Peak	V	33.80	7.74	-	60.75	74.00	13.25
*5 419.38	8.52	Average	V	33.75	7.84	1.14	51.25	54.00	2.75
*5 460.00	18.19	Peak	V	33.81	7.74	-	59.74	74.00	14.26
*5 460.00	7.61	Average	V	33.81	7.74	1.14	50.30	54.00	3.70

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*11 060.84	36.52	Peak	V	38.13	-26.76	-	47.89	74.00	26.11
*11 057.93	25.53	Average	V	38.12	-26.78	1.14	38.01	54.00	15.99
Above 11 100.00	Not detected	-	-	-	-	-	-	-	-

### B. High Channel (5 690 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB $\mu$ V)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
*11 377.88	36.52	Peak	V	38.36	-26.06	-	48.82	74.00	25.18
*11 380.32	25.77	Average	V	38.36	-26.05	1.14	39.22	54.00	14.78
Above 11 400.00	Not detected	-	-	-	-	-	-	-	-

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A4(210 mm x 297 mm)

## 802.11ac\_VHT80 (Band 3)\_MCS0

### A. Middle Channel (5 775 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 707.61	13.51	Peak	V	34.20	7.85	-	55.56	68.23	12.67
5 715.30	13.35	Peak	V	34.21	7.90	-	55.46	78.23	22.77
5 856.75	12.55	Peak	V	34.45	8.23	-	55.23	78.23	23.00
5 863.33	14.07	Peak	V	34.46	8.24	-	56.77	68.23	11.46

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+ CL (dB)	Duty (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*11 547.73	36.22	Peak	V	38.44	-26.13	-	48.53	74.00	25.47
*11 548.88	25.21	Average	V	38.44	-26.13	1.14	38.66	54.00	15.34
Above 11 600.00	Not detected	-	-	-	-	-	-	-	-

Remark:

1. "\*" means the restricted band.
2. Radiated emissions measured in frequency above 1 000 MHz were made with an instrument using Peak / average detector mode if frequency was in restricted band. Otherwise the frequency was out of restricted band, only peak detector should be used.
3. Band edge measurement.  
(Actual = Reading + AF + CL + Duty cycle)
4. Radiated spurious emission measurement.  
(Actual = Reading + AF + AMP + CL + Duty cycle)
5. If frequency was out of restricted band, the calculation method for peak limit is same as below.  

$$68.23 \text{ dB}\mu\text{V/m} = \text{EIRP} - 20 \log(d) + 104.77 = -27 - 20 \log(3) + 104.77$$
6. In case of the frequency between 5 715 MHz ~ 5 725 MHz and 5 850 MHz ~ 5 860 MHz the limit is determined as 78.23 dBμV/m.  

$$78.23 \text{ dB}\mu\text{V/m} = \text{EIRP} - 20 \log(d) + 104.77 = -17 - 20 \log(3) + 104.77$$
7. According to § 15.31(o), Emission levels are not reported much lower than the limits by over 20 dB.

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A4(210 mm x 297 mm)

### 3. 26 dB Bandwidth & 99 % Occupied Bandwidth

#### 3.1. Test setup



#### 3.2. 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.

##### 3.2.1. 26 dB Bandwidth

1. This measurement settings are specified in section C.1 of KDB 789033\_D02 v01r02.
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 Maximum 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 %.
7. In case of band crossing channels 138, 142 and 144, the measurement is complied with section D of KDB 644545\_D03 v01.

##### 3.2.2. 99 % Bandwidth

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW.
4. Set VBW  $\geq 3 \cdot$  RBW.
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99 % occupied bandwidth is the difference between these two frequencies.

In the result,

- DFS requirements are not applicable in the 5 150 MHz - 5 250 MHz.

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### 3.4. Test result

Ambient temperature : (23 ± 1) °C

Relative humidity : 47 % R.H.

Band	Mode	Frequency (MHz)	Ch.	Data Rate	26 dB Bandwidth (MHz)	99 % Bandwidth (MHz)
U-NII 1	11a	5 180	36	6 Mbps	21.31	-
		5 200	40	6 Mbps	21.50	-
		5 240	48	6 Mbps	21.54	17.30
	11n_HT20	5 180	36	MCS0	21.58	-
		5 200	40	MCS0	21.82	-
		5 240	48	MCS0	21.96	18.30
	11n_HT40	5 190	38	MCS0	40.55	-
		5 230	46	MCS0	40.59	36.92
	11ac_VHT80	5 210	42	MCS0	82.48	75.76
U-NII 2A	11a	5 260	52	6 Mbps	21.46	-
		5 280	56	6 Mbps	21.50	-
		5 320	64	6 Mbps	21.50	-
	11n_HT20	5 260	52	MCS0	21.86	-
		5 280	56	MCS0	21.86	-
		5 320	64	MCS0	21.90	-
	11n_HT40	5 270	54	MCS0	40.39	-
		5 310	62	MCS0	40.36	-
	11ac_VHT80	5 290	58	MCS0	82.64	-
U-NII 2C	11a	5 500	100	6 Mbps	21.46	-
		5 580	116	6 Mbps	21.50	-
		5 720	144	6 Mbps	21.62	-
	11n_HT20	5 500	100	MCS0	21.82	-
		5 580	116	MCS0	21.94	-
		5 720	144	MCS0	21.82	-
	11n_HT40	5 510	102	MCS0	40.60	-
		5 550	110	MCS0	40.36	-
		5 710	142	MCS0	40.44	-
11ac_VHT80	5 530	106	MCS0	83.28	-	
	5 690	138	MCS0	82.48	-	
U-NII 3	11a	5 745	149	6 Mbps	21.54	-
		5 785	157	6 Mbps	21.66	-
		5 825	165	6 Mbps	21.62	-
	11n_HT20	5 745	149	MCS0	21.78	-
		5 785	157	MCS0	22.02	-
		5 825	165	MCS0	21.94	-
	11n_HT40	5 755	151	MCS0	40.60	-
		5 795	159	MCS0	40.68	-
	11ac_VHT80	5 775	155	MCS0	82.98	-

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Band	Mode	Frequency (MHz)	Ch.	Data Rate	26 dB Bandwidth (MHz)
U-NII 2C (Band-crossing channel)	11a	5 720	144	6 Mbps	15.71
	11n_HT20	5 720	144	MCS0	15.83
	11n_HT40	5 710	142	MCS0	35.69
	11ac_VHT80	5 690	138	MCS0	76.53

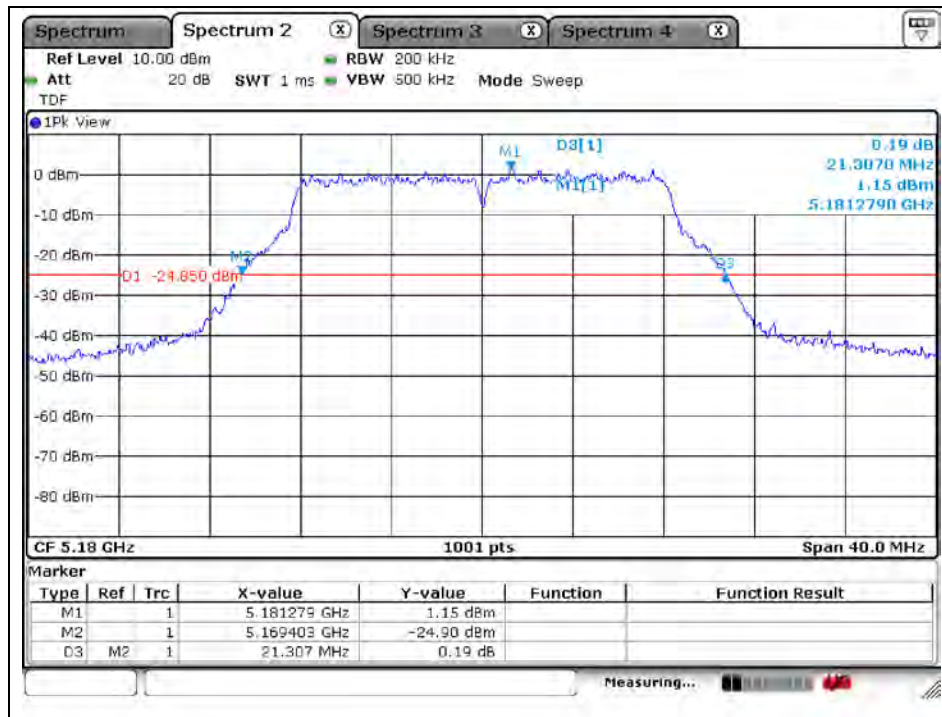
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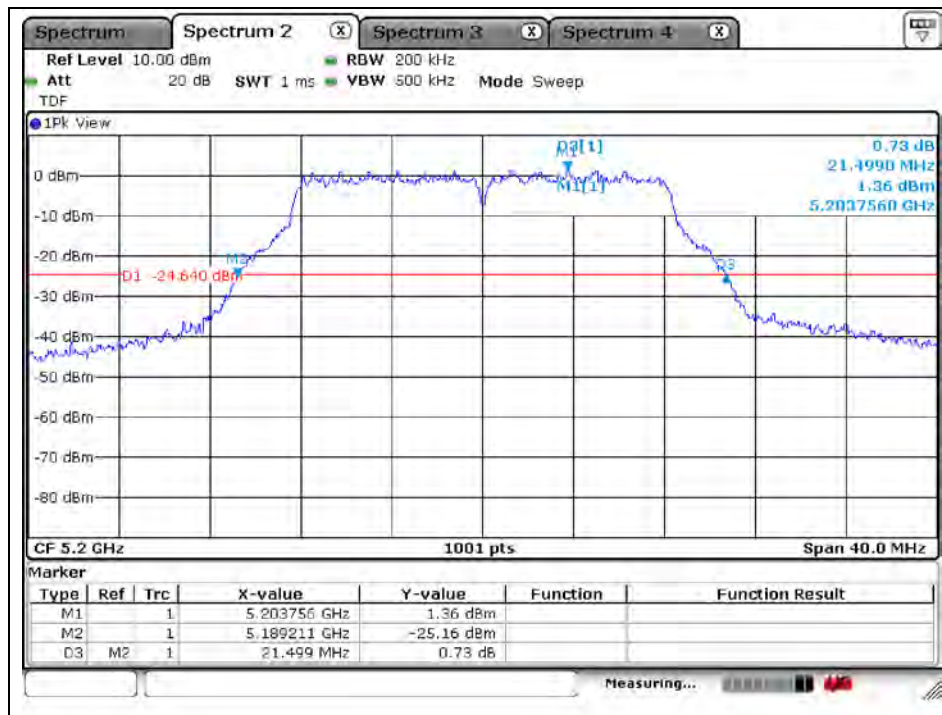
## 26 dB Bandwidth

### 802.11a (Band 1)

Low Channel (5 180 MHz)



Middle Channel (5 200 MHz)



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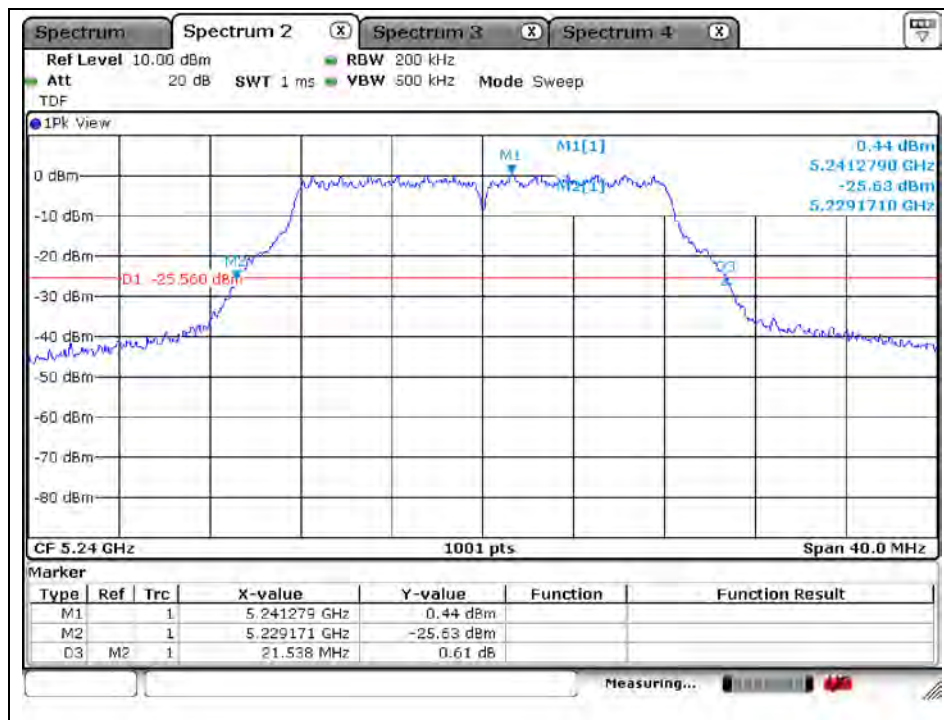
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A4(210 mm x 297 mm)

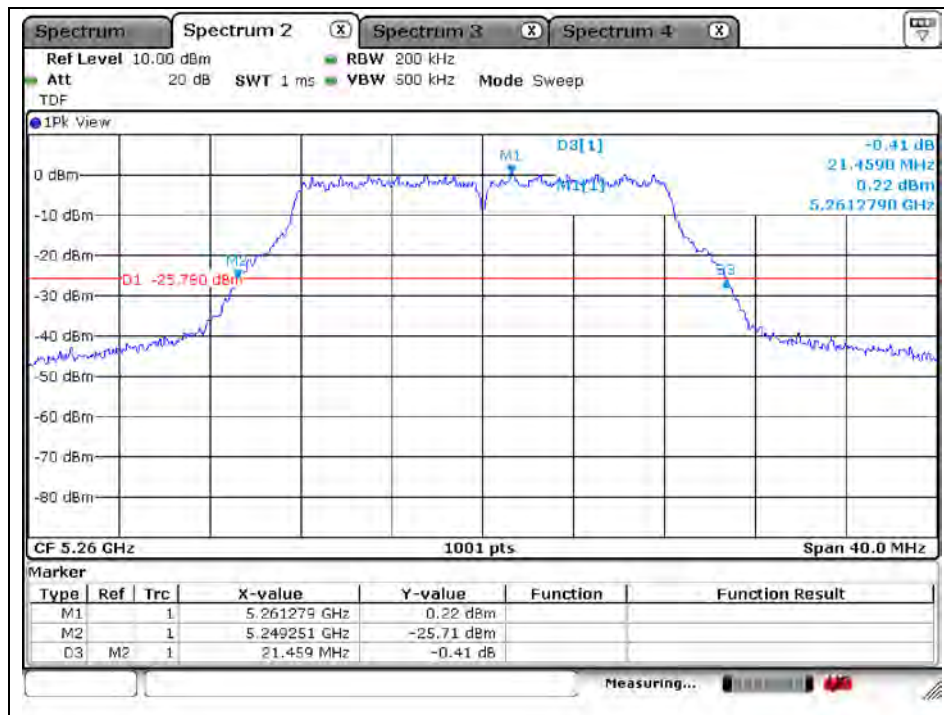


## High Channel (5 240 MHz)



## 802.11a (Band 2A)

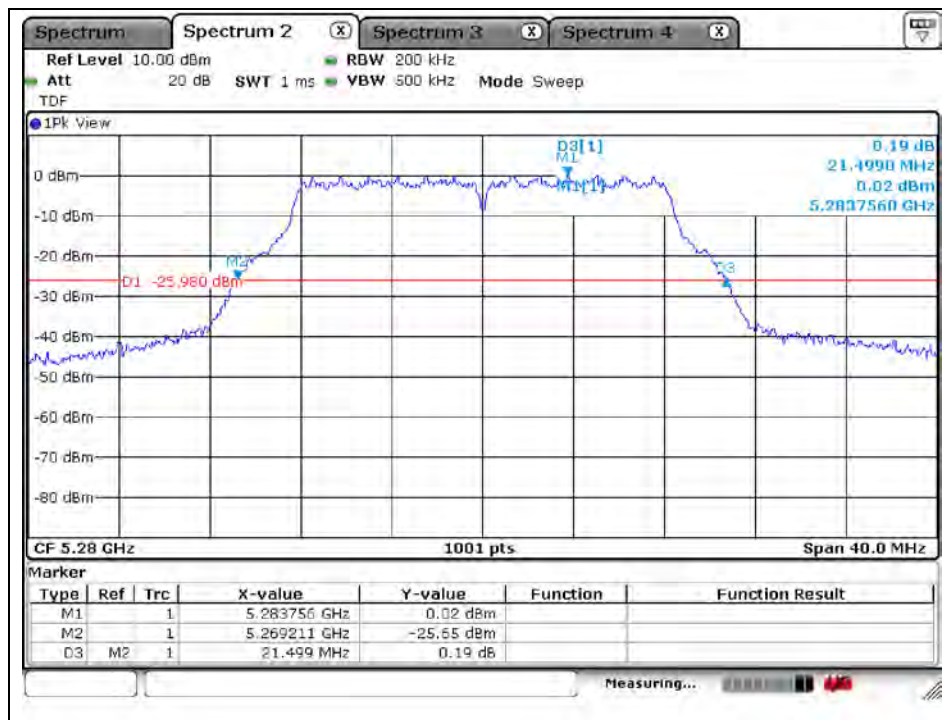
### Low Channel (5 260 MHz)



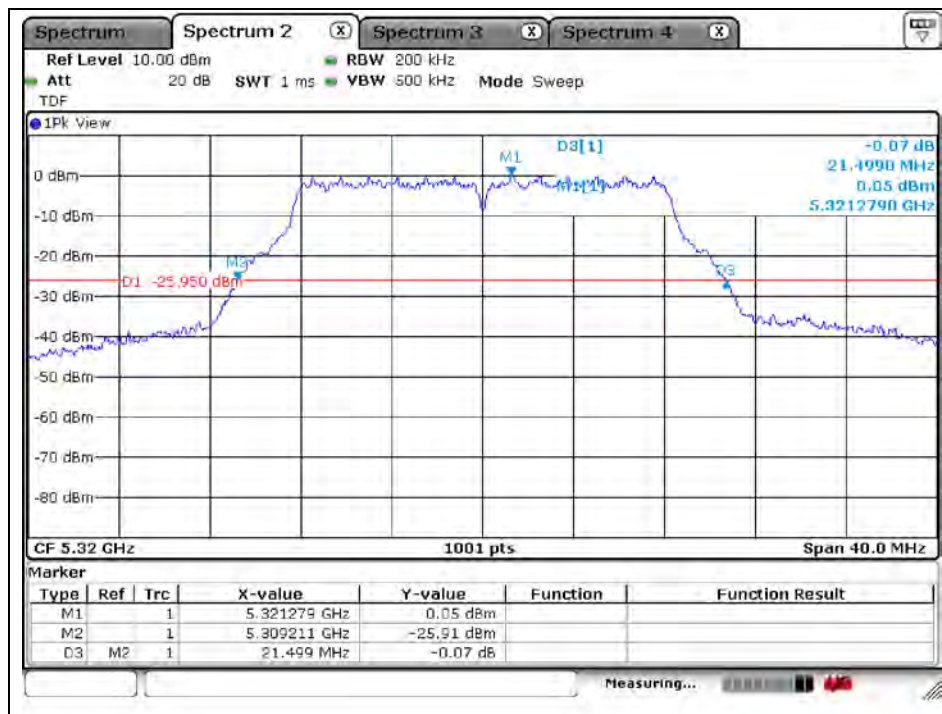
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### Middle Channel (5 280 MHz)



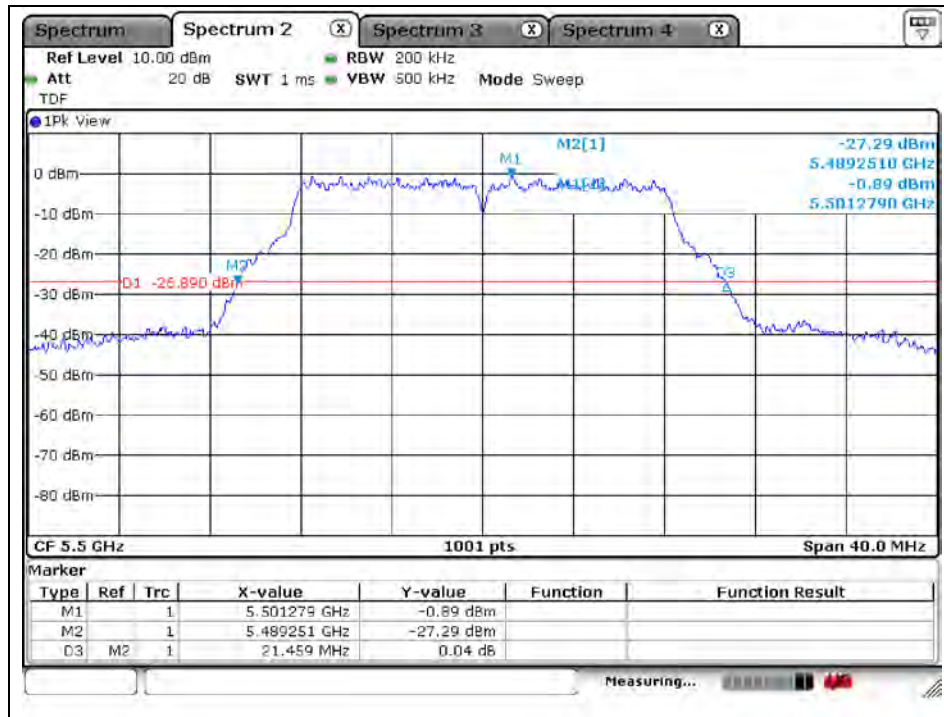
## High Channel (5 320 MHz)



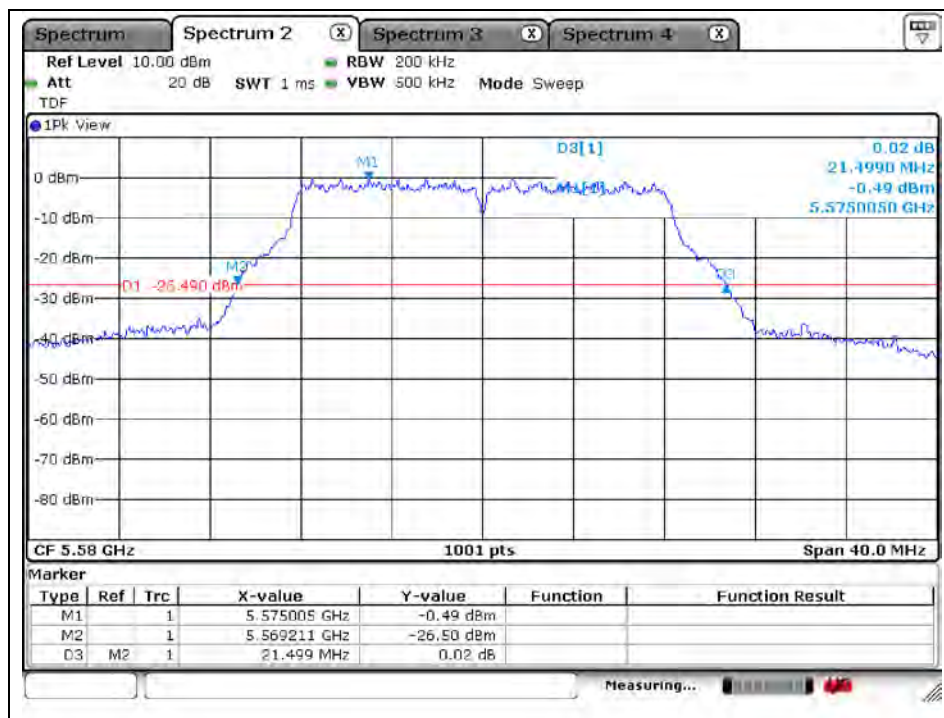
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## 802.11a (Band 2C)

Low Channel (5 500 MHz)



Middle Channel (5 580 MHz)



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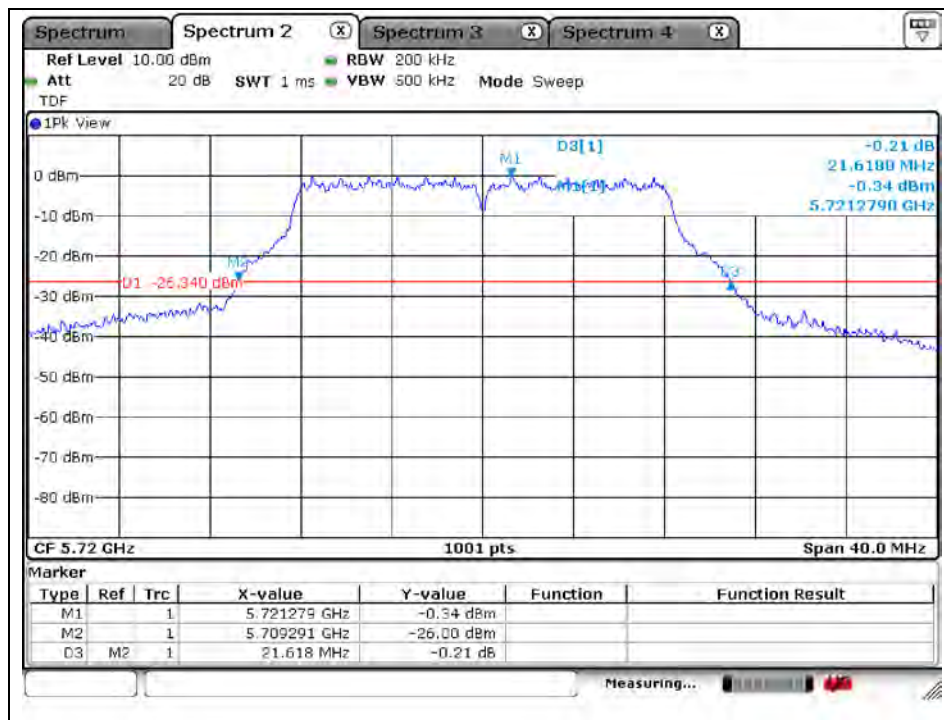
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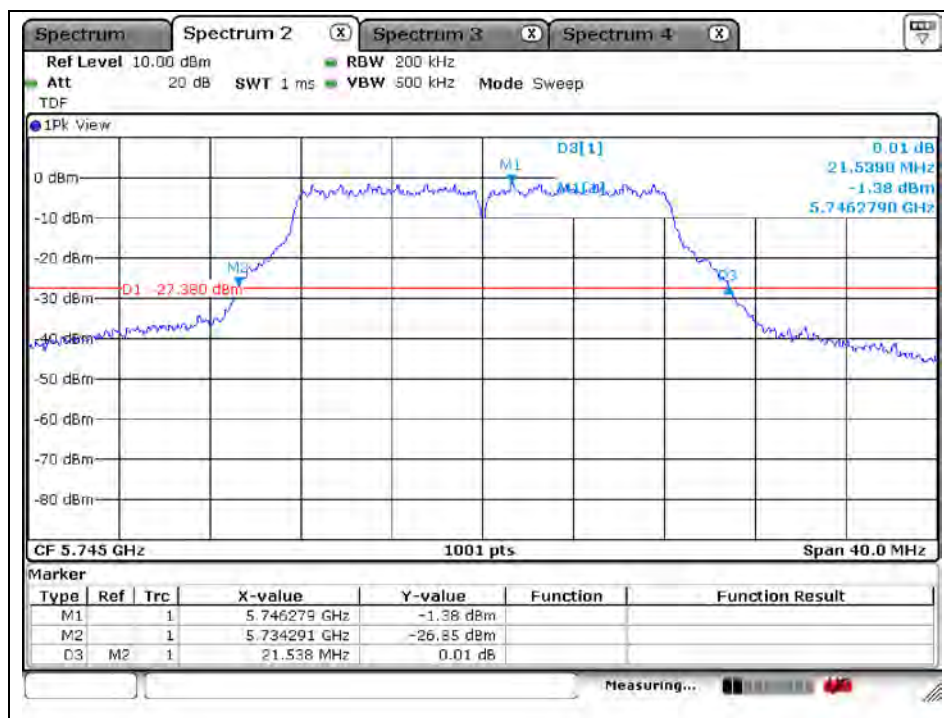
A4(210 mm x 297 mm)

## High Channel (5 720 MHz)



## 802.11a (Band 3)

### Low Channel (5 745 MHz)



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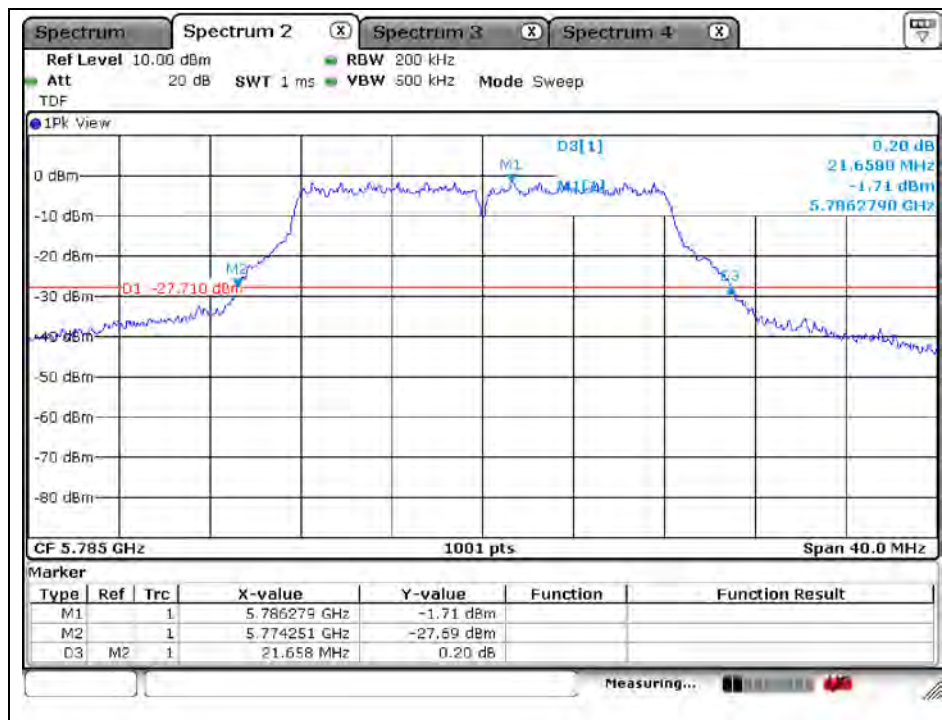
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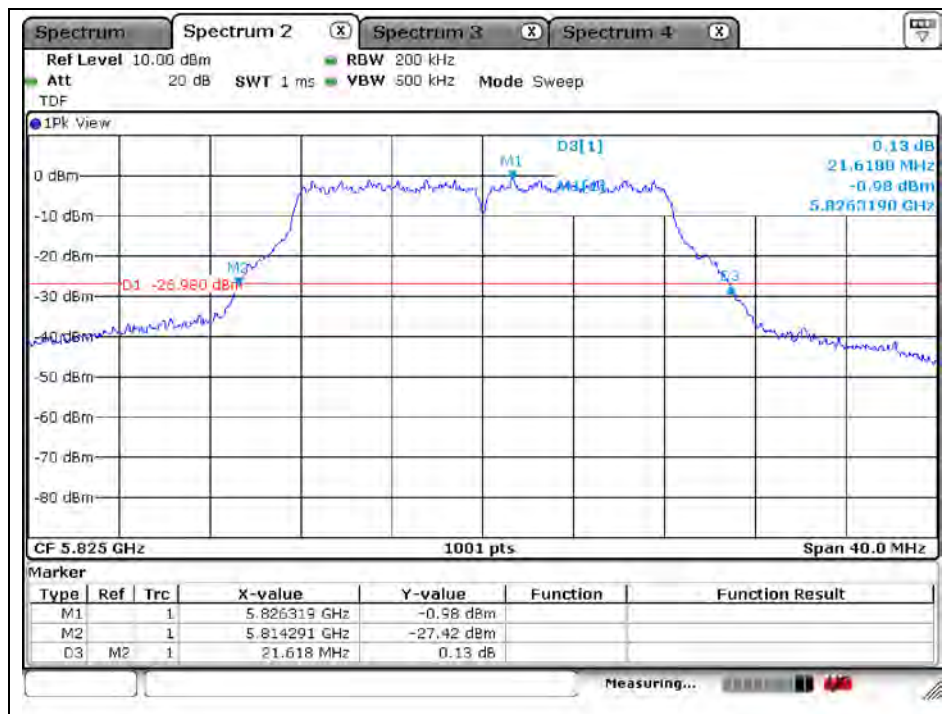
A4(210 mm x 297 mm)



## Middle Channel (5 785 MHz)



## High Channel (5 825 MHz)



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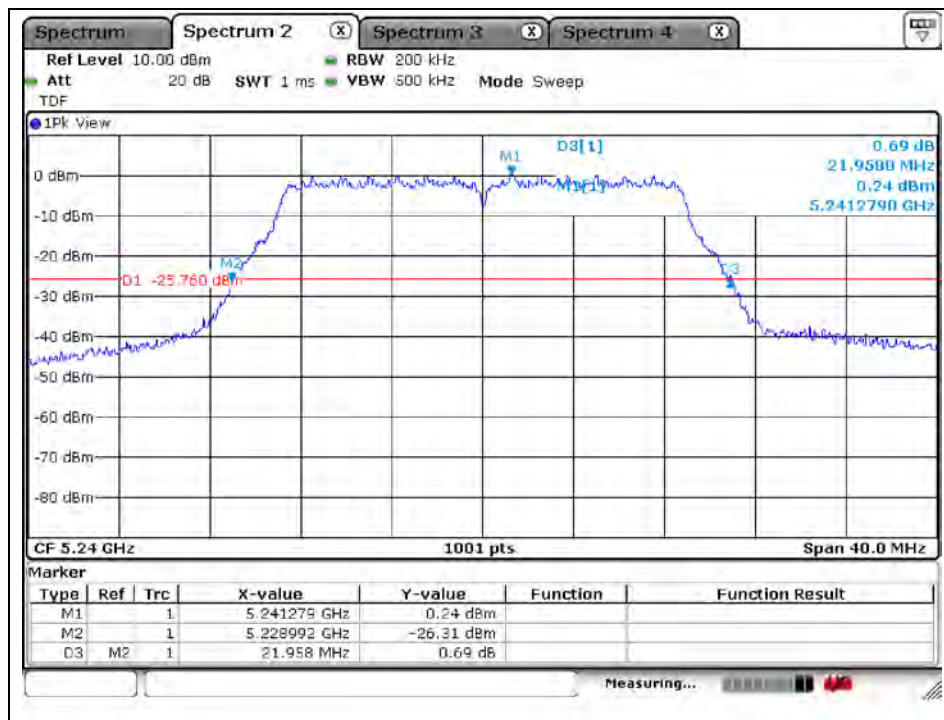
RTT5041-20(2015.10.01)(3)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

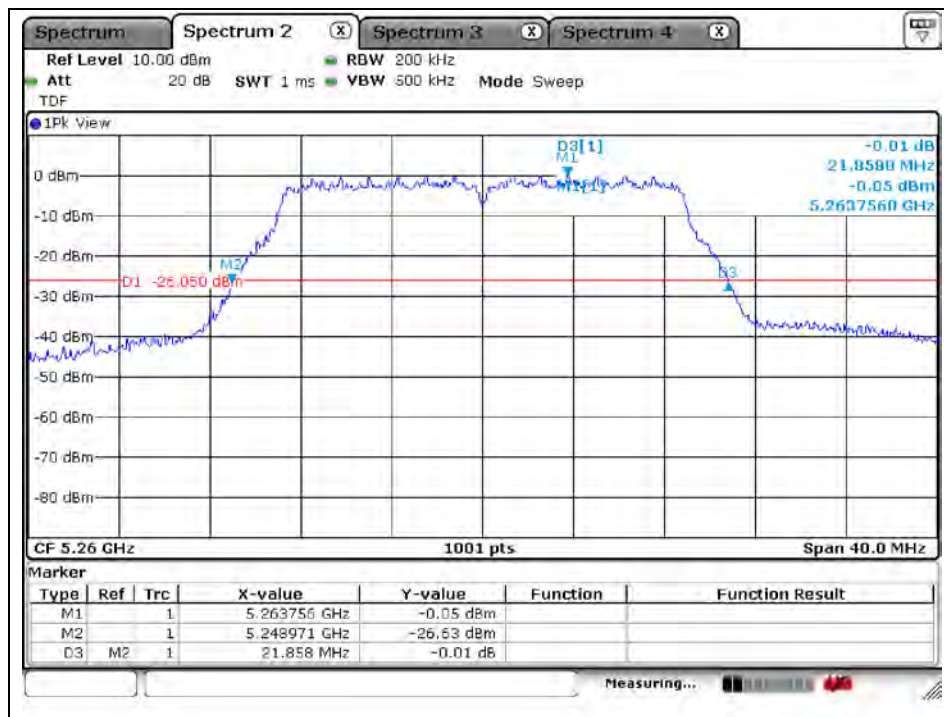


## High Channel (5 240 MHz)



## 802.11n\_HT20 (Band 2A)

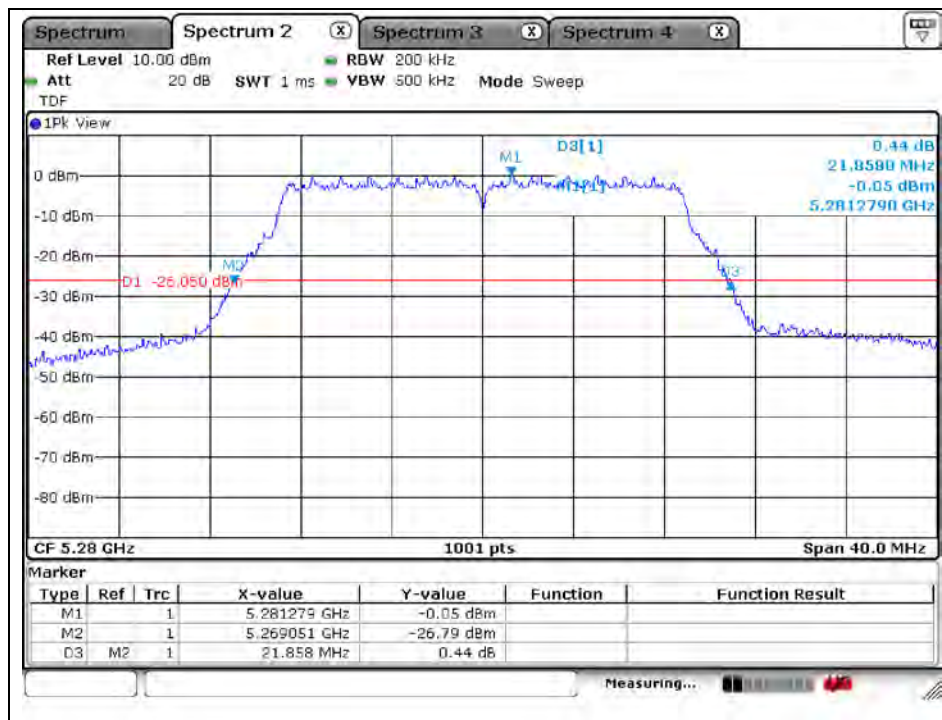
### Low Channel (5 260 MHz)



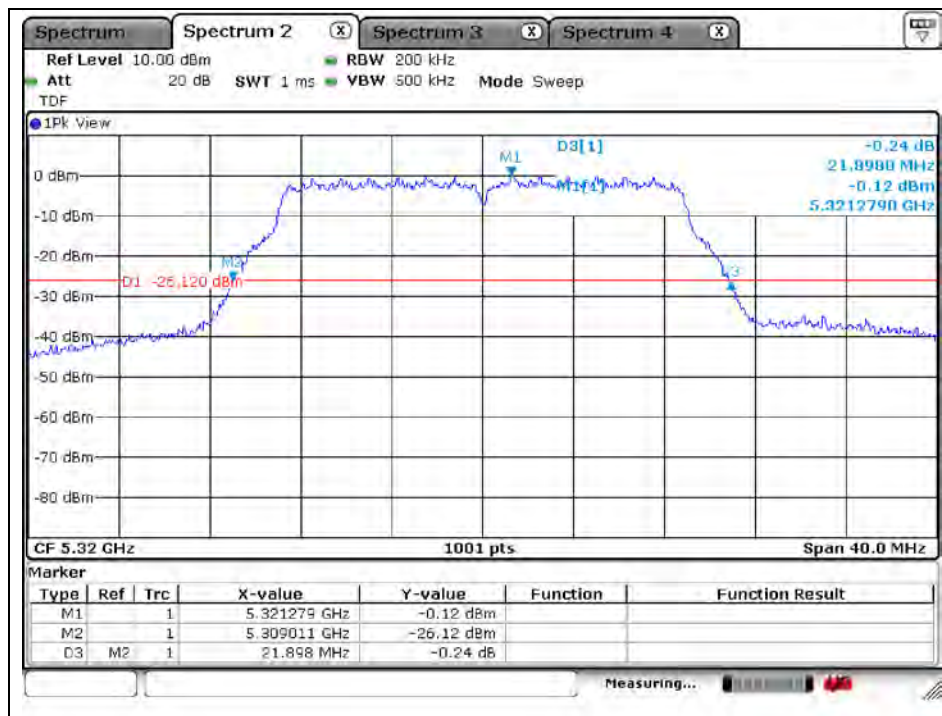
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## Middle Channel (5 280 MHz)



## High Channel (5 320 MHz)



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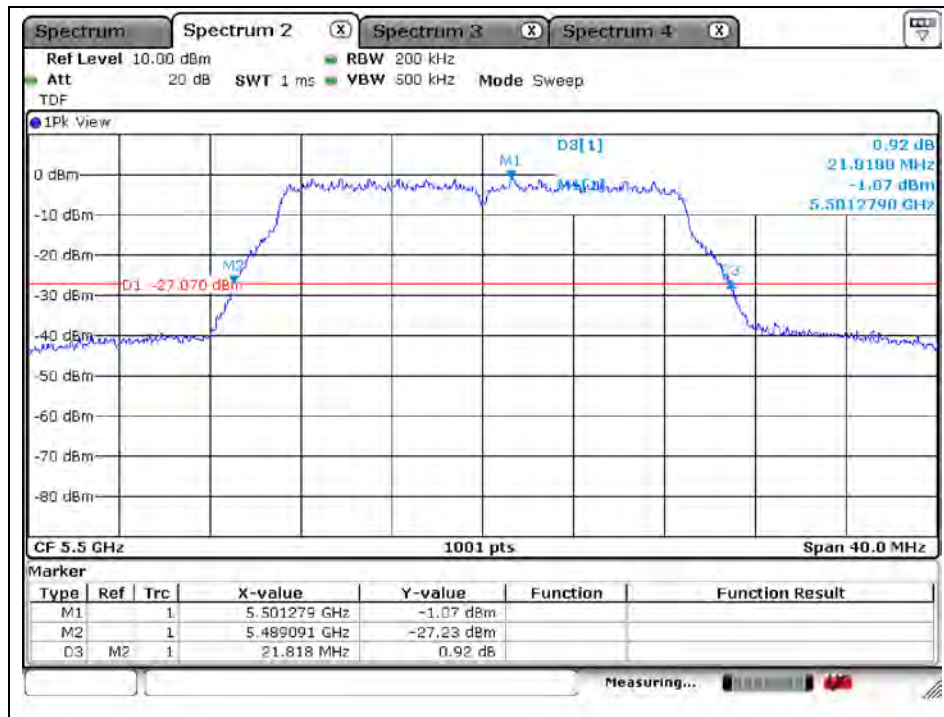
RTT5041-20(2015.10.01)(3)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

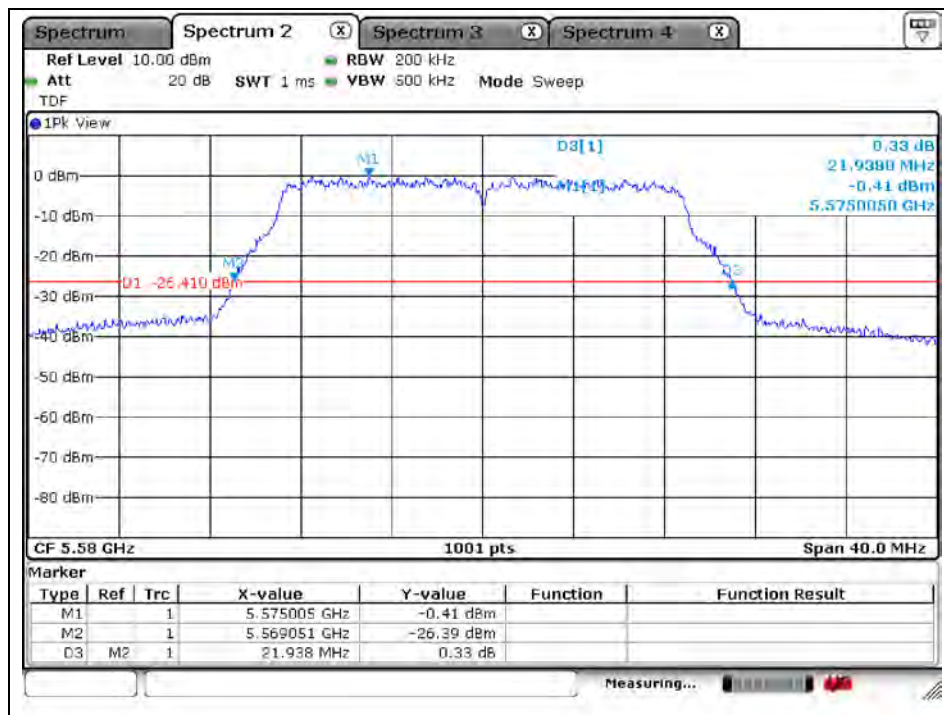
A4(210 mm x 297 mm)

## 802.11n\_HT20 (Band 2C)

Low Channel (5 500 MHz)



Middle Channel (5 580 MHz)



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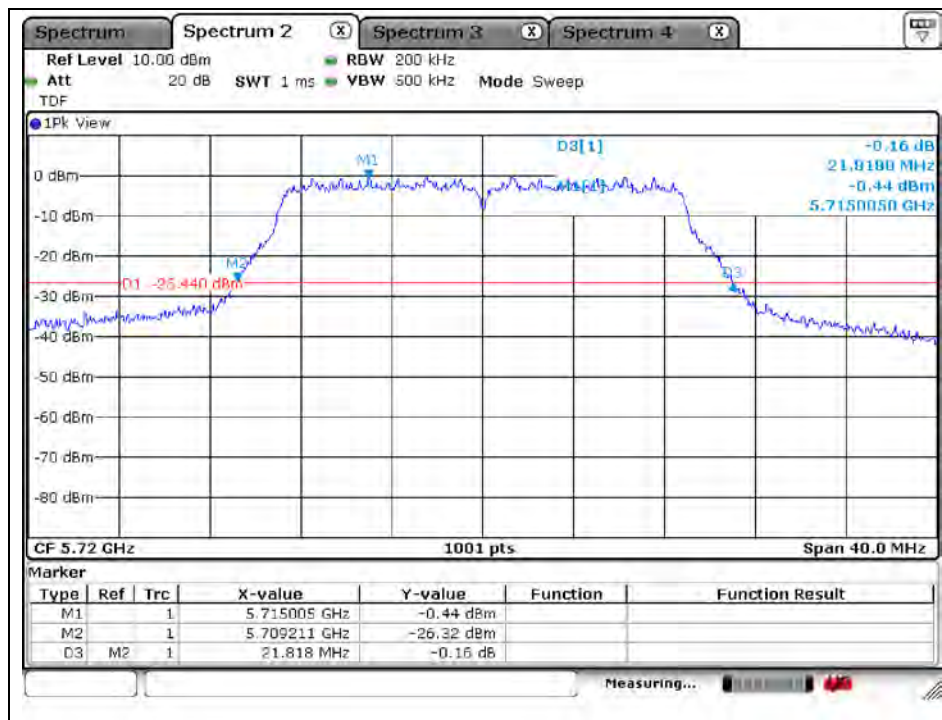
RTT5041-20(2015.10.01)(3)

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A4(210 mm x 297 mm)

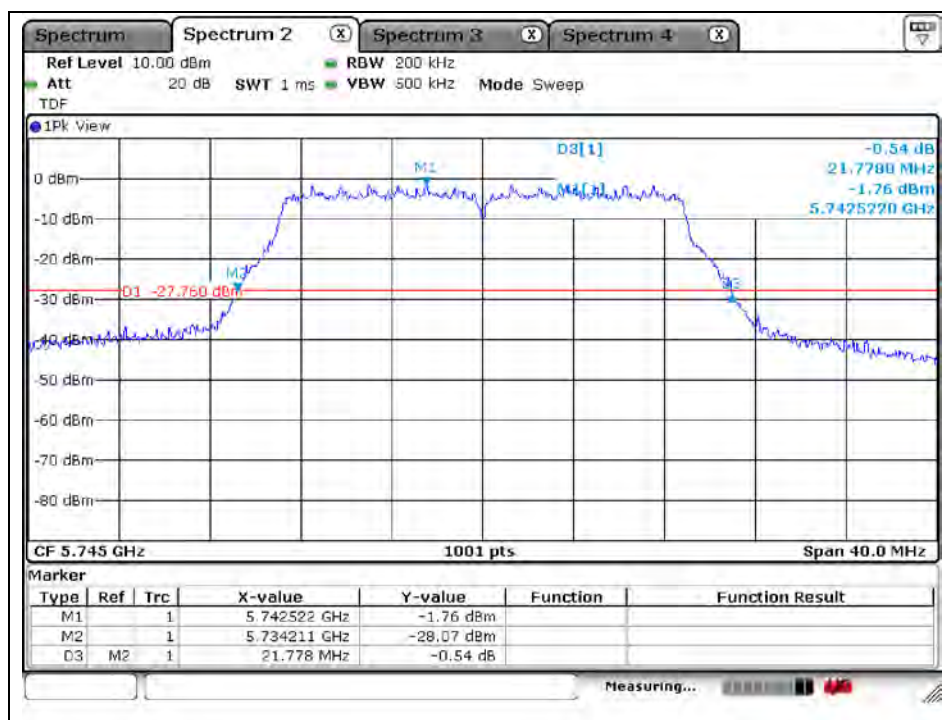


## High Channel (5 720 MHz)



## 802.11n\_HT20 (Band 3)

### Low Channel (5 745 MHz)



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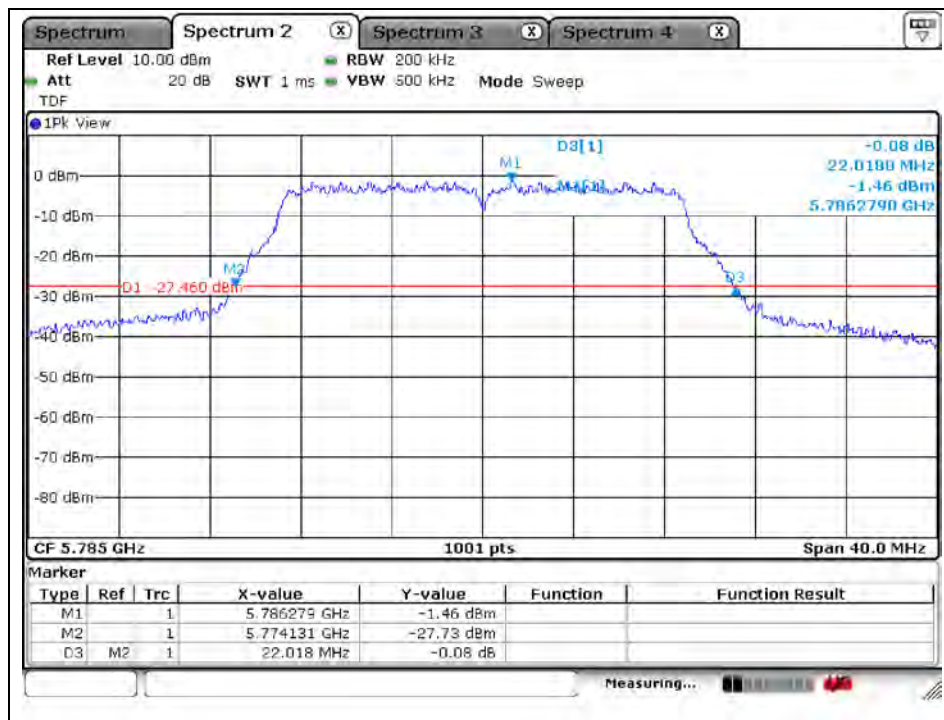
SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

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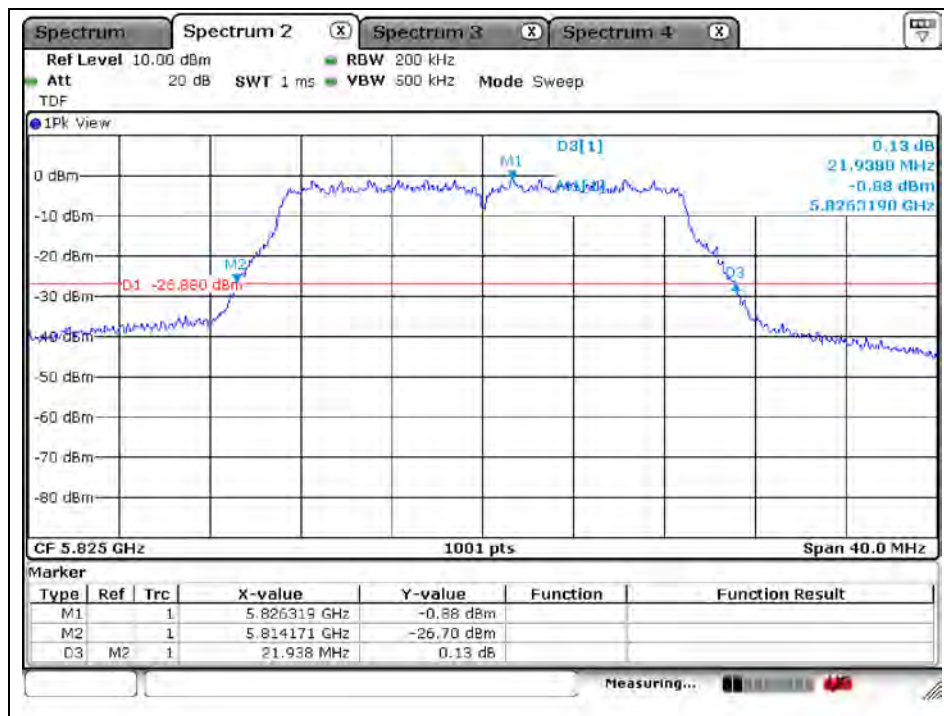
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A4(210 mm x 297 mm)

## Middle Channel (5 785 MHz)



## High Channel (5 825 MHz)



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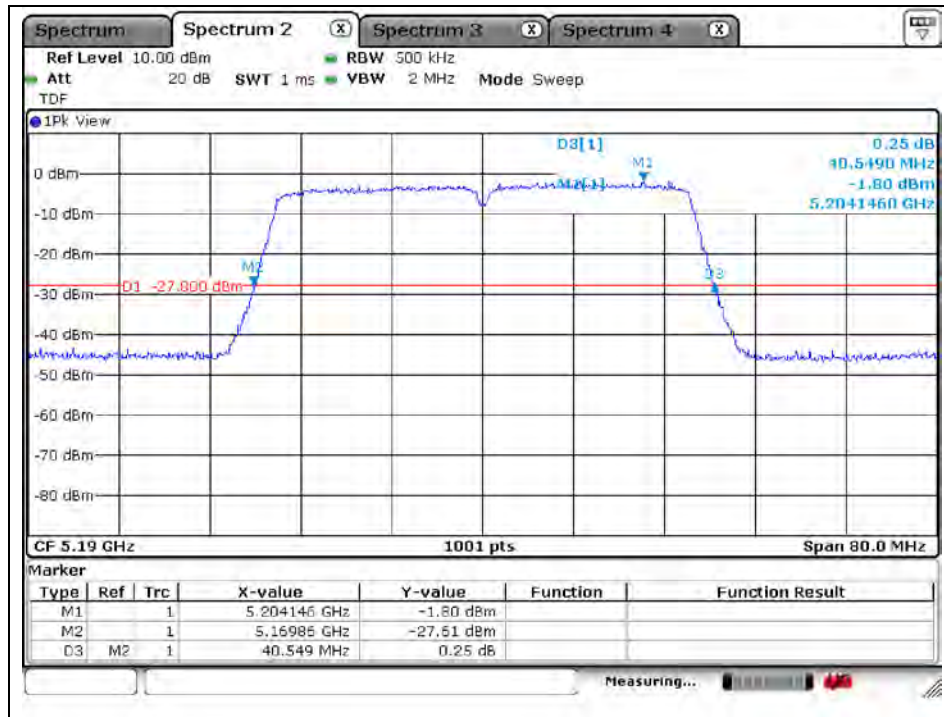
RTT5041-20(2015.10.01)(3)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

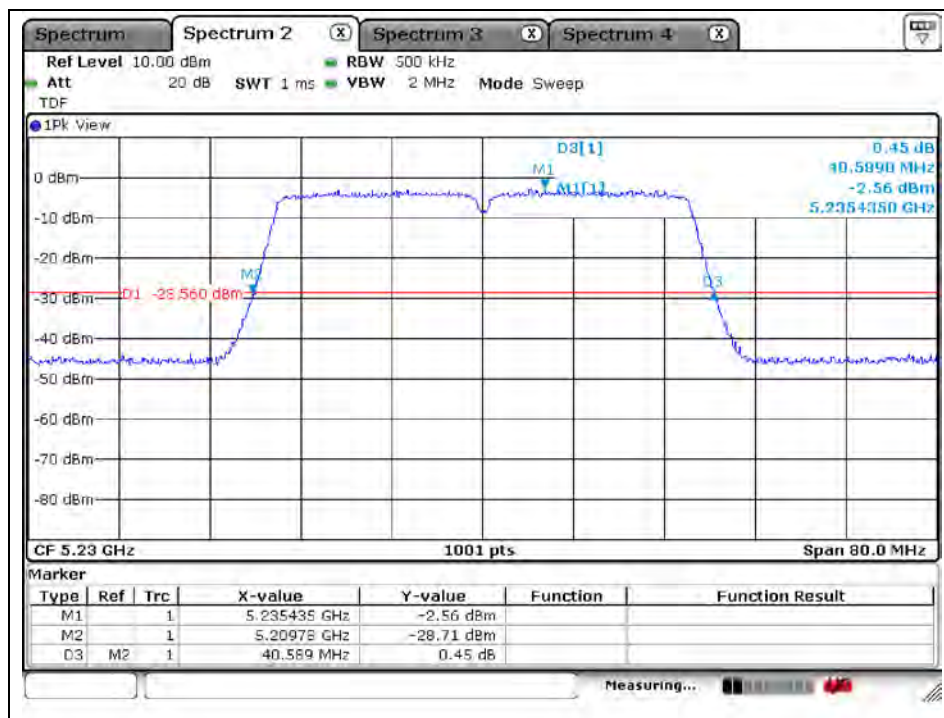
A4(210 mm x 297 mm)

## 802.11n\_HT40 (Band 1)

Low Channel (5 190 MHz)



High Channel (5 230 MHz)



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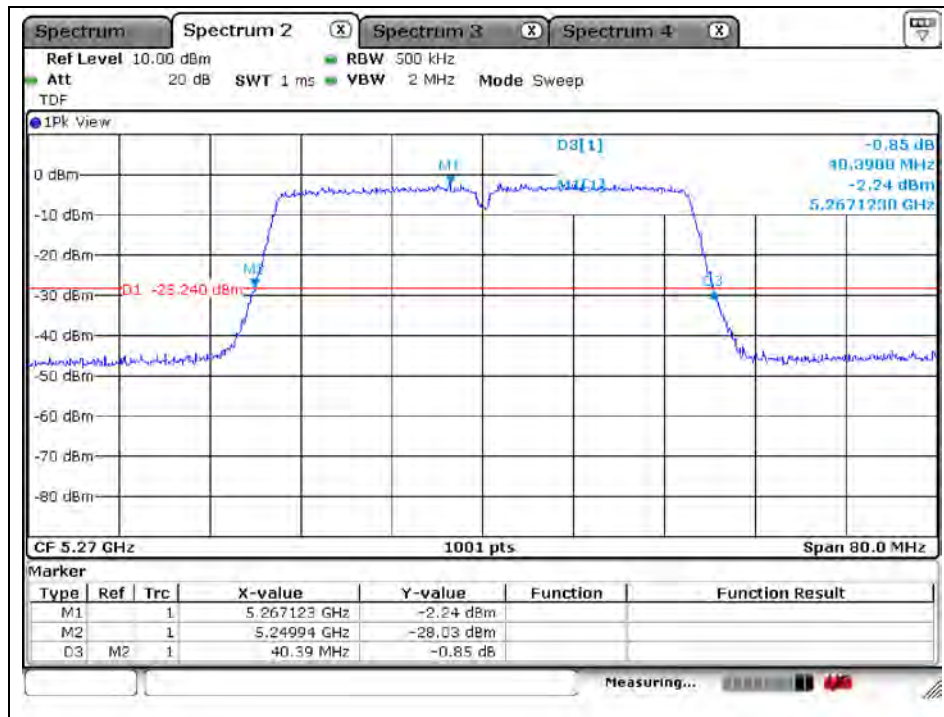
Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

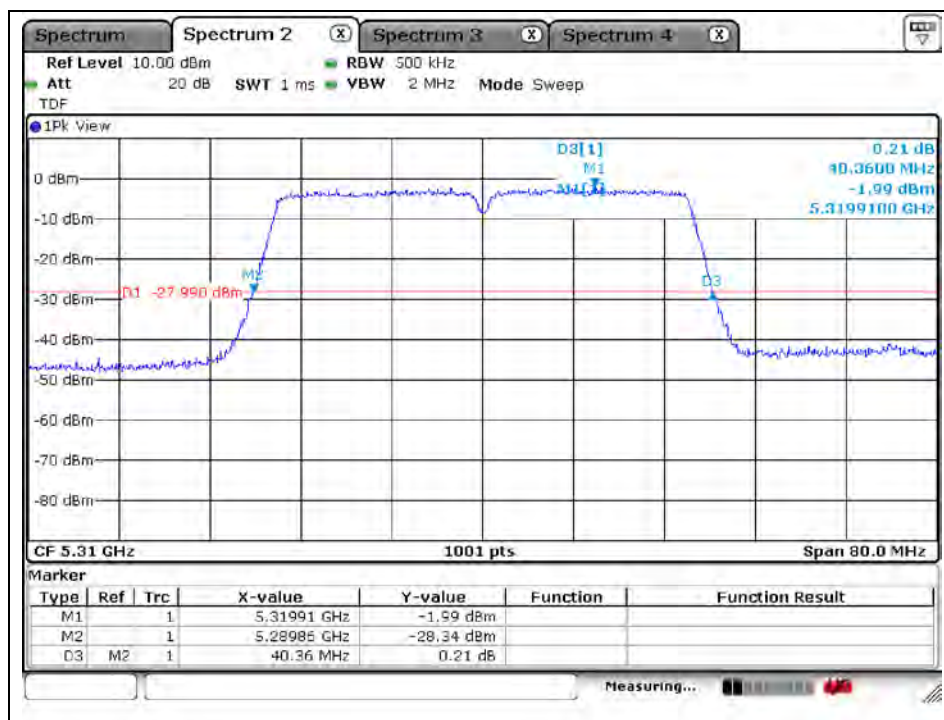


## 802.11n\_HT40 (Band 2A)

Low Channel (5 270 MHz)



High Channel (5 310 MHz)



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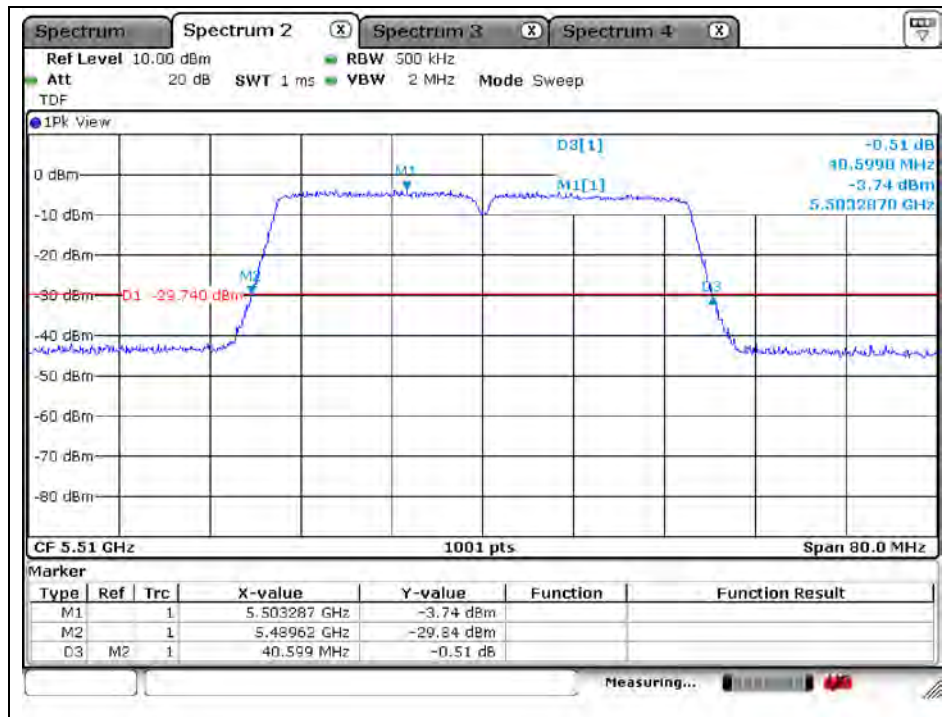
RTT5041-20(2015.10.01)(3)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

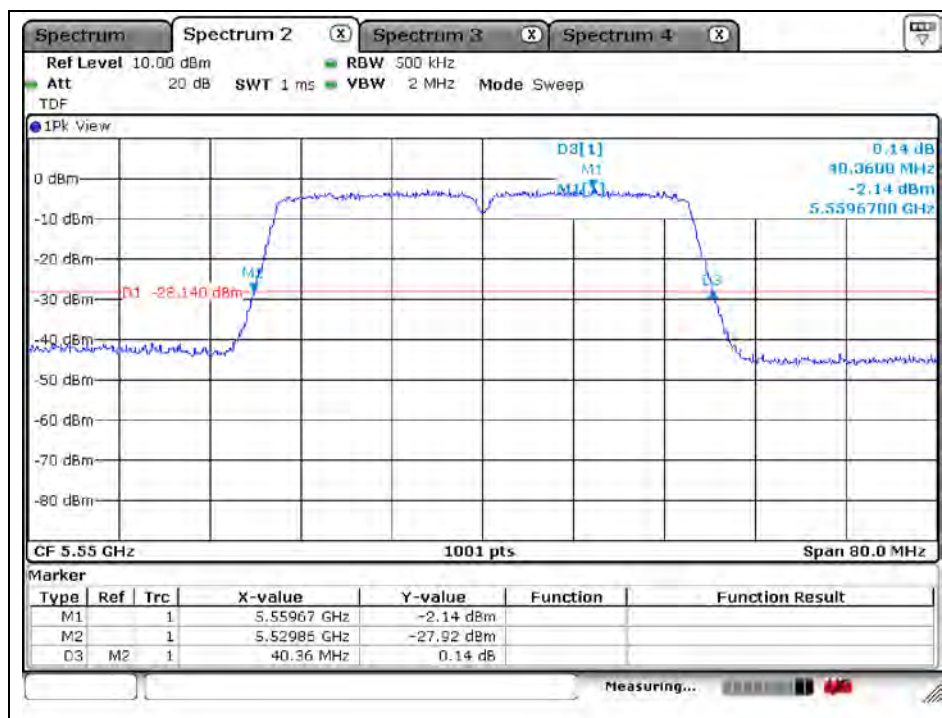
A4(210 mm x 297 mm)

## 802.11n\_HT40 (Band 2C)

Low Channel (5 510 MHz)



Middle Channel (5 550 MHz)



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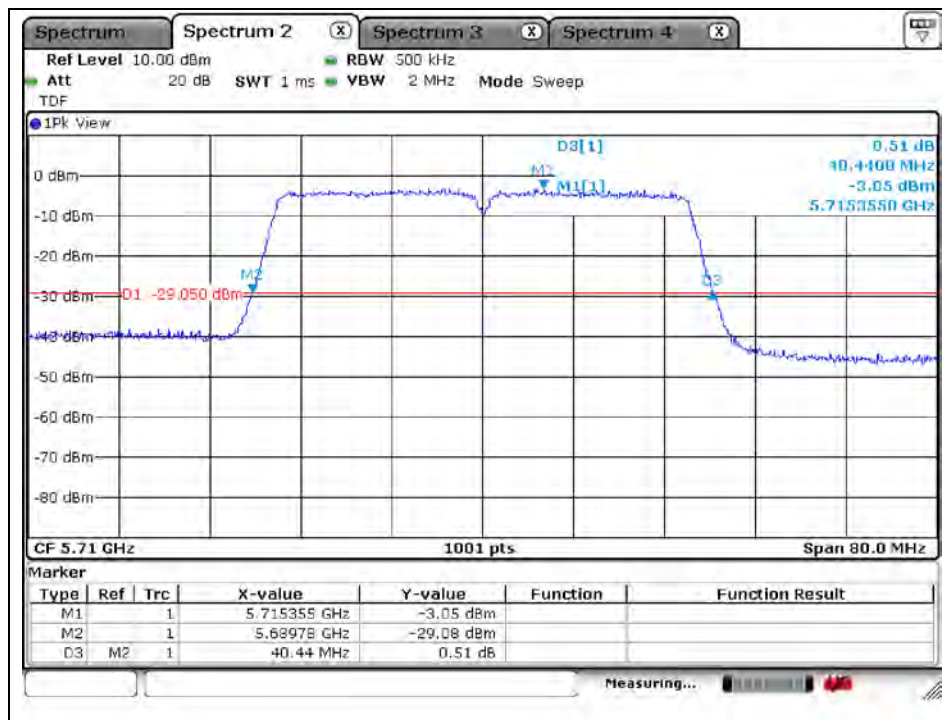
SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-20(2015.10.01)(3)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

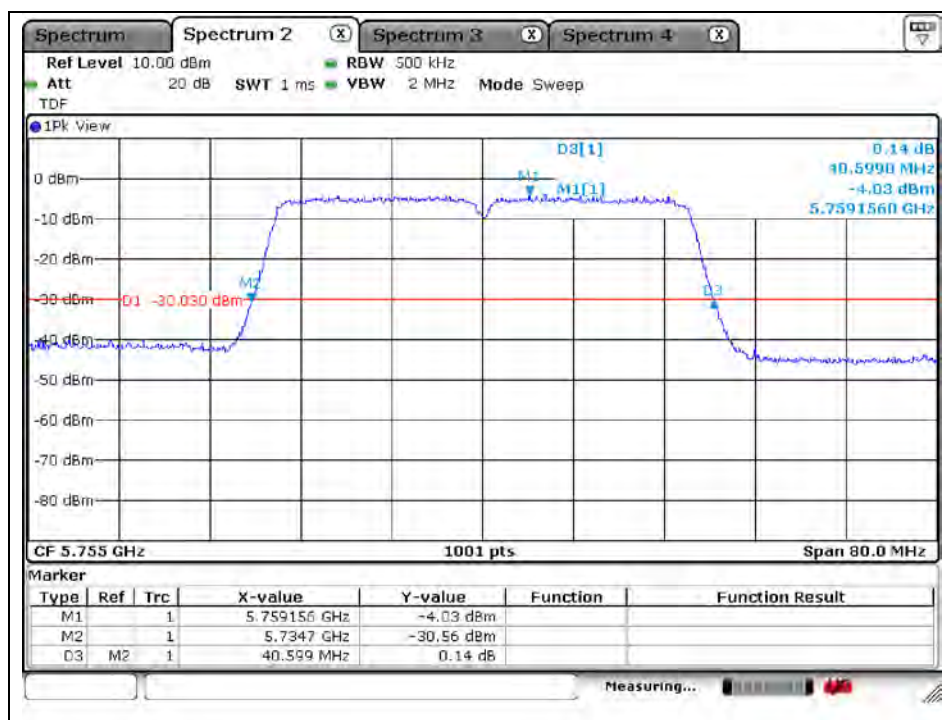
A4(210 mm x 297 mm)

## High Channel (5 710 MHz)



## 802.11n\_HT40 (Band 3)

### Low Channel (5 755 MHz)



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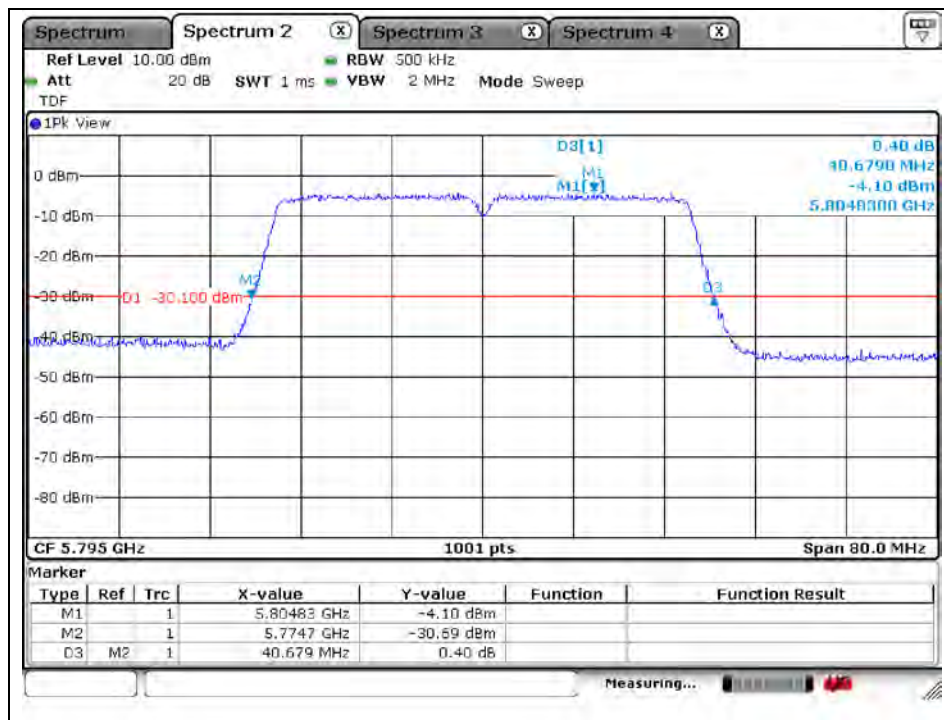
RTT5041-20(2015.10.01)(3)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

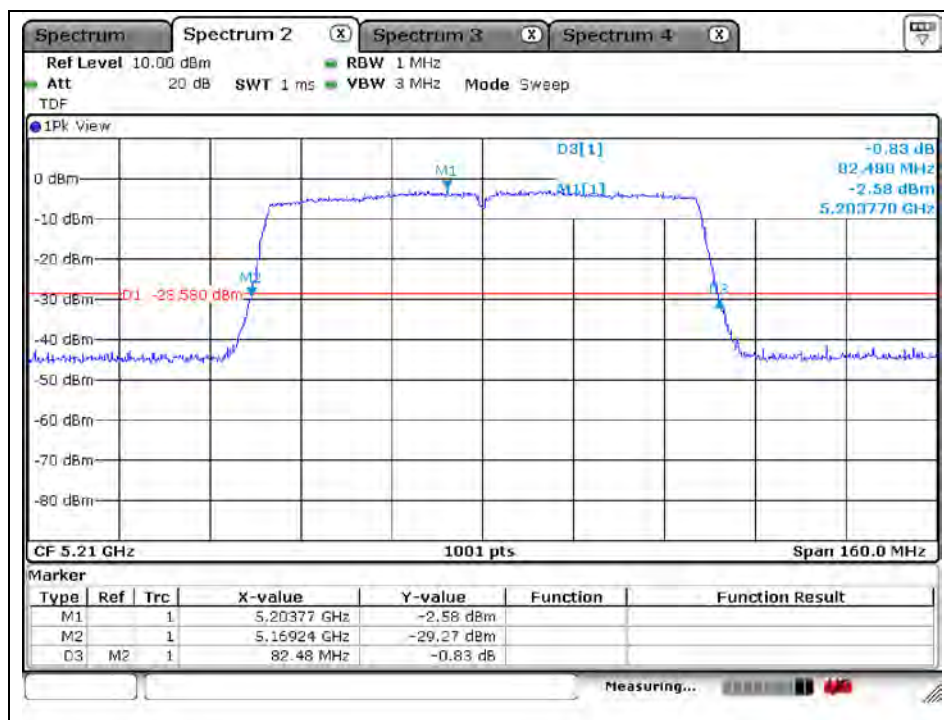


## High Channel (5 795 MHz)



## 802.11ac\_VHT80 (Band 1)

### Middle Channel (5 210 MHz)



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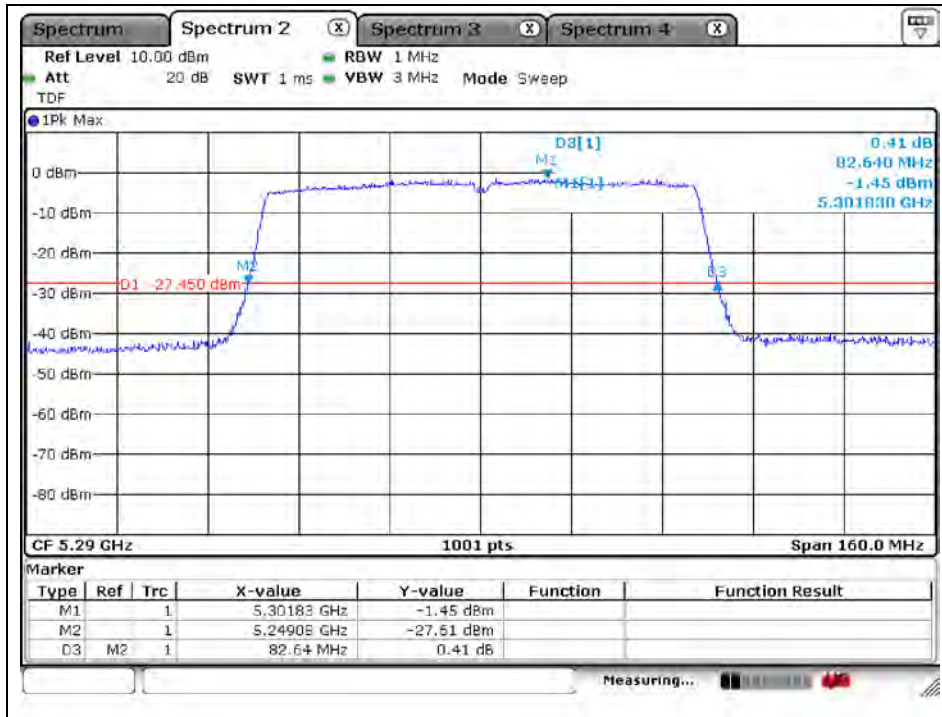
RTT5041-20(2015.10.01)(3)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

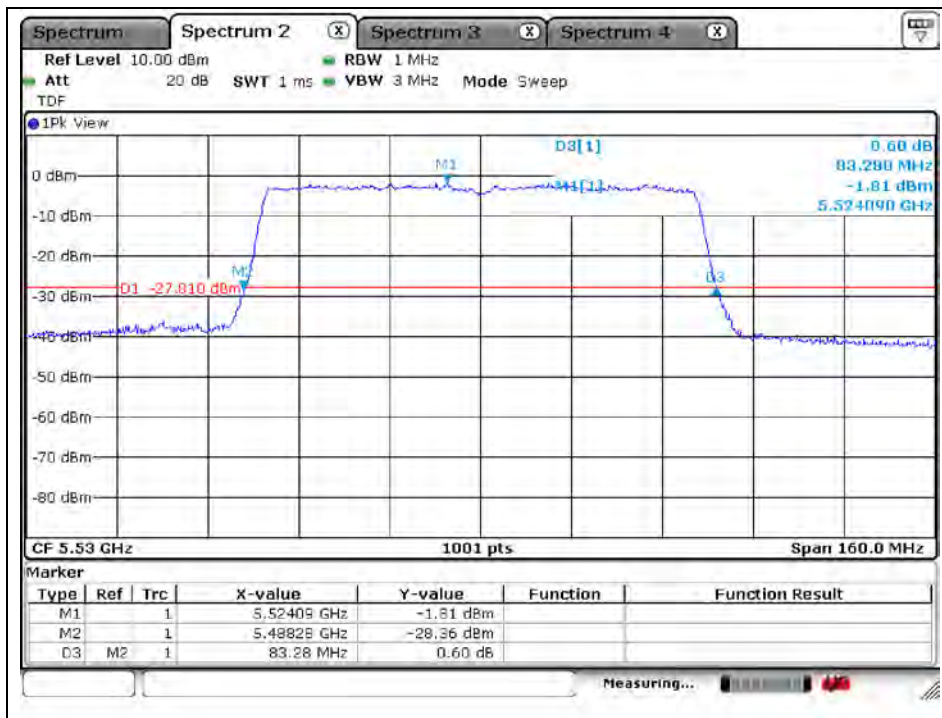
## 802. 11ac\_VHT80 (Band 2A)

Middle Channel (5 290 MHz)



## 802. 11ac\_VHT80 (Band 2C)

Low Channel (5 530 MHz)



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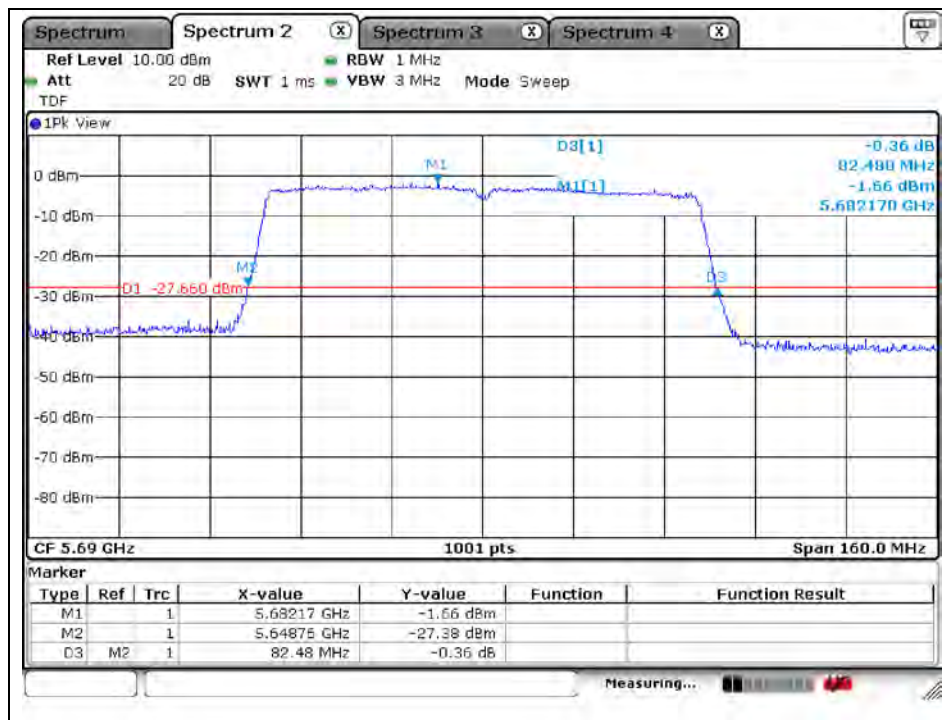
SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

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Tel. +82 31 428 5700 / Fax. +82 31 427 2370

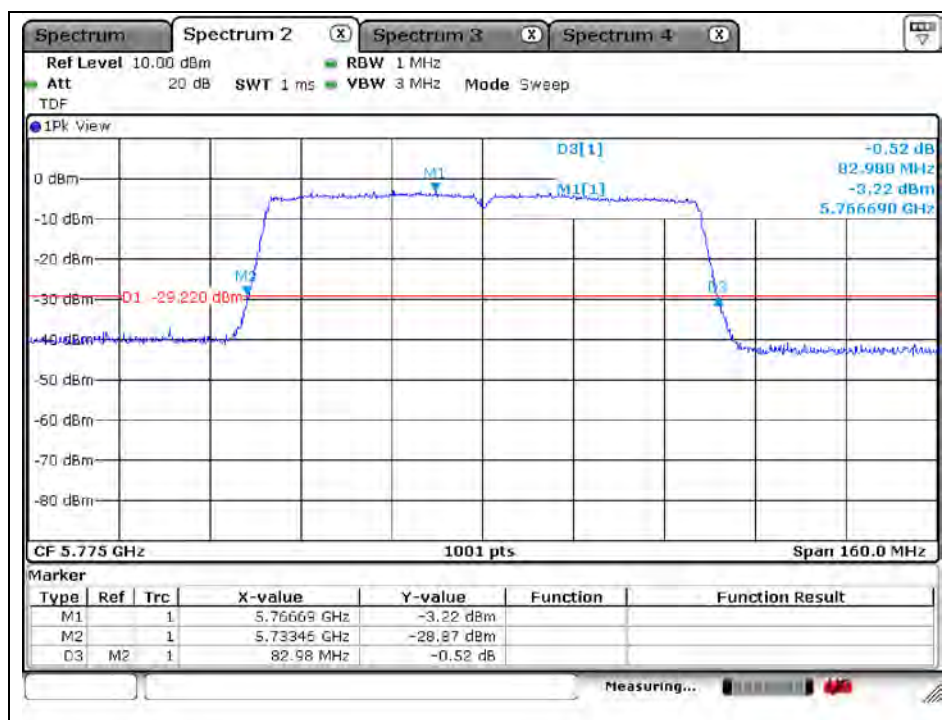
A4(210 mm x 297 mm)

## High Channel (5 690 MHz)



## 802.11ac\_VHT80 (Band 3)

### Middle Channel (5 775 MHz)



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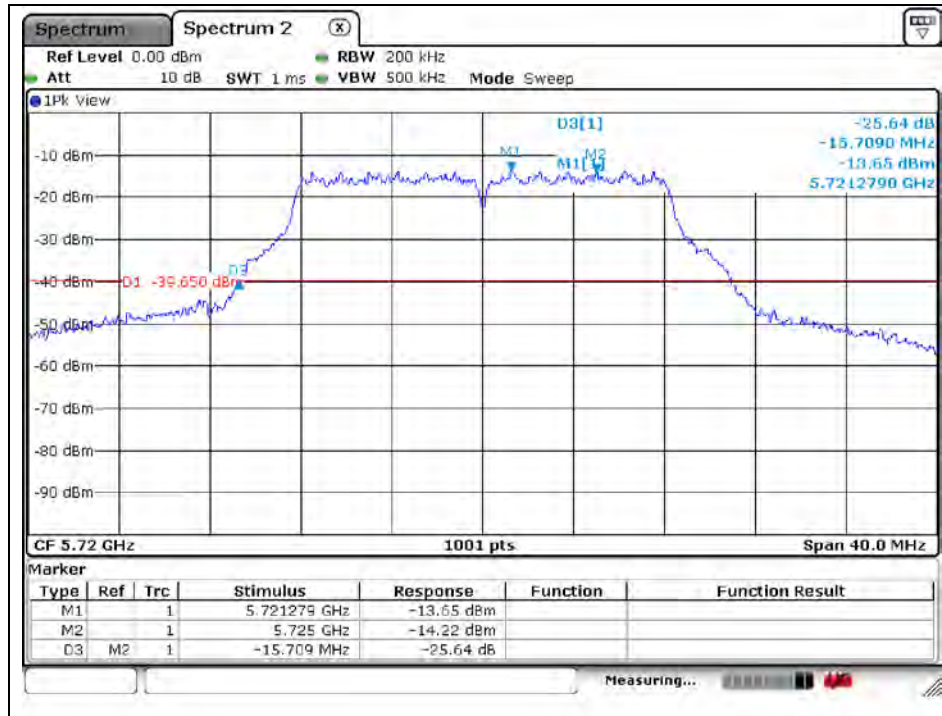
Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

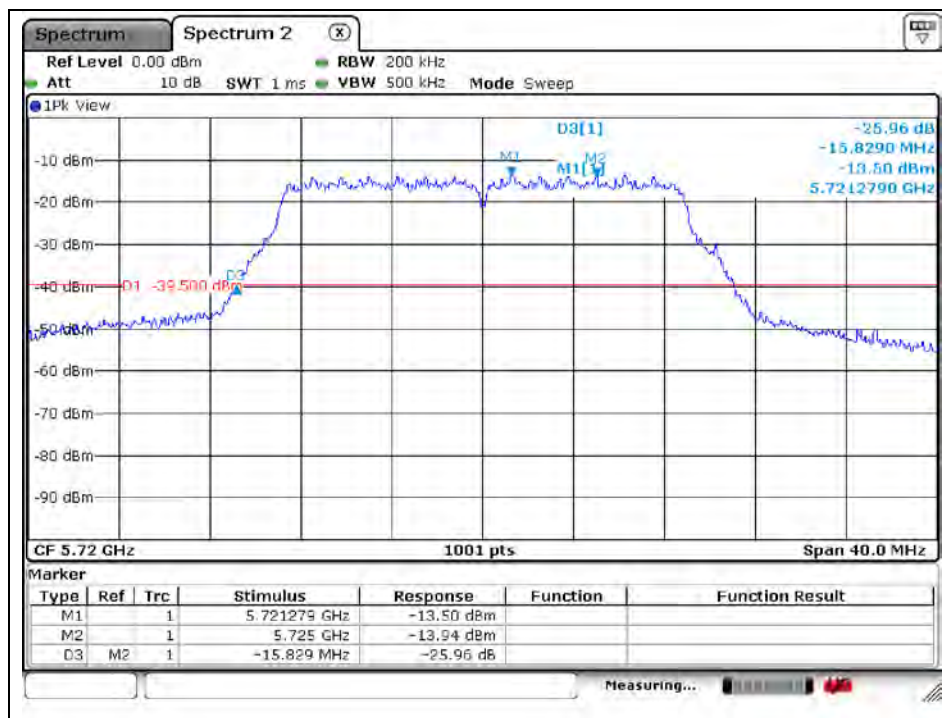


## Band-crossing channels

## 802.11a (5 720 MHz)



802.11n\_HT20 (5 720 MHz)



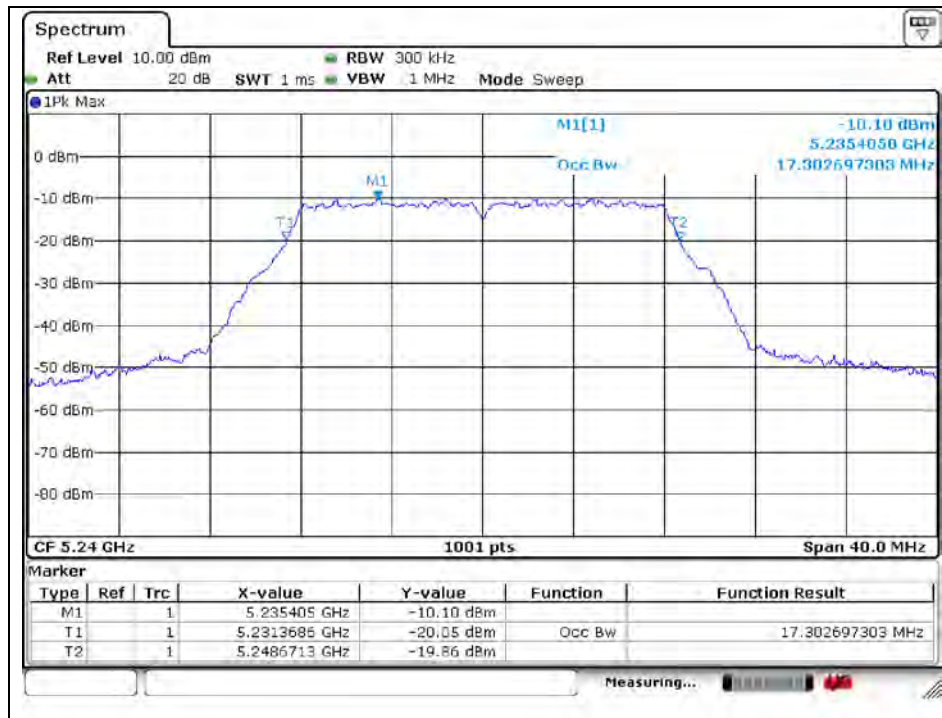
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## 99 % Bandwidth

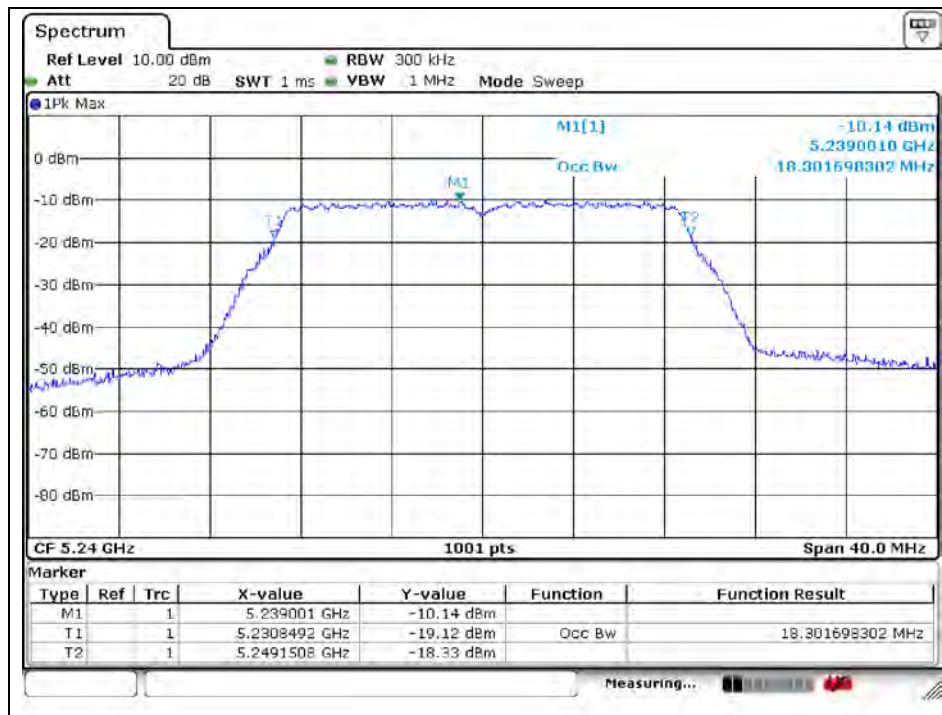
### 802.11a (Band 1)

High Channel (5 240 MHz)



### 802.11n\_HT20 (Band 1)

High Channel (5 240 MHz)



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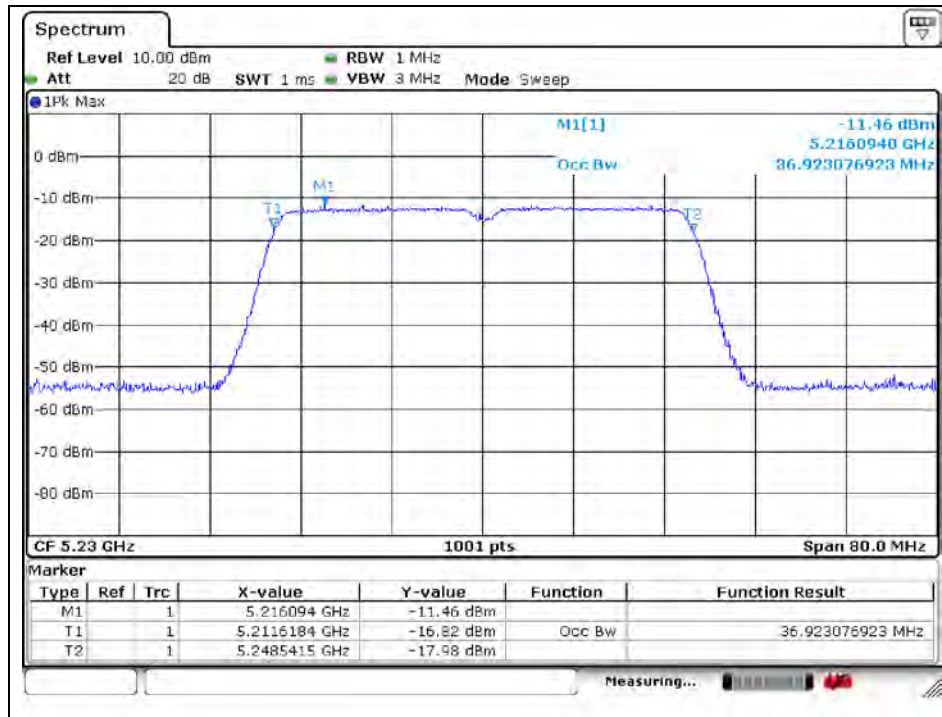
Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)



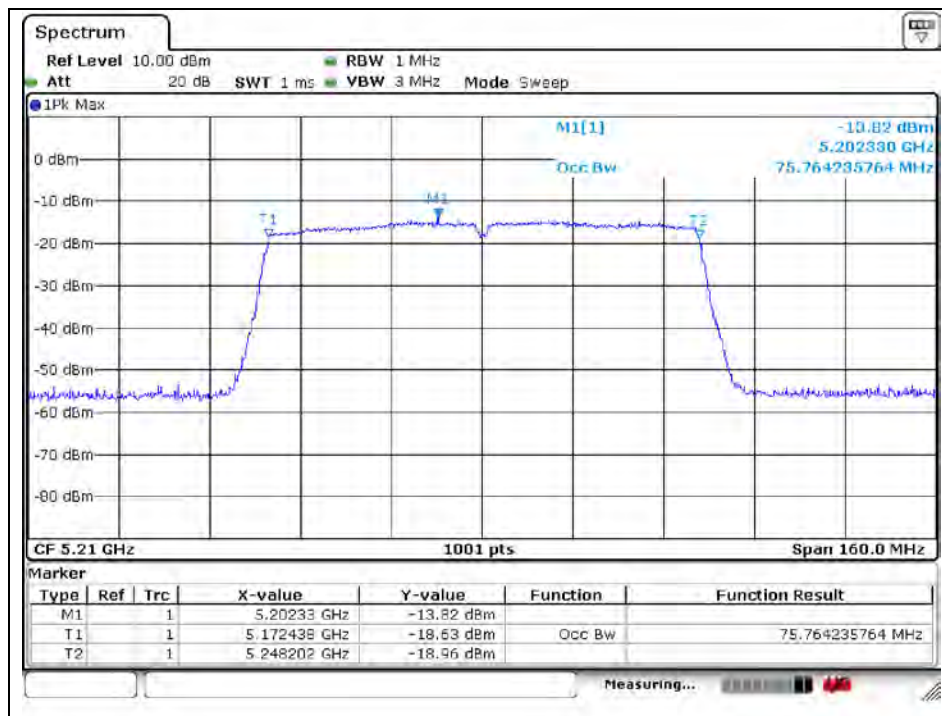
### 802.11n\_HT40 (Band 1)

High Channel (5 230 MHz)



### 802.11ac\_VHT80 (Band 1)

Middle Channel (5 210 MHz)



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A4(210 mm x 297 mm)

## 4. 6 dB bandwidth

### 4.1. Test setup



### 4.2. Limit

Within the 5.725 – 5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

### 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 section C.2 of KDB 789033\_D02 v01r02.
2. Set RBW : 100 kHz.
3. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.
9. In case of band crossing channels 138, 142 and 144, the measurement is complied with section D of KDB 644545\_D03 v01.

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A4(210 mm x 297 mm)

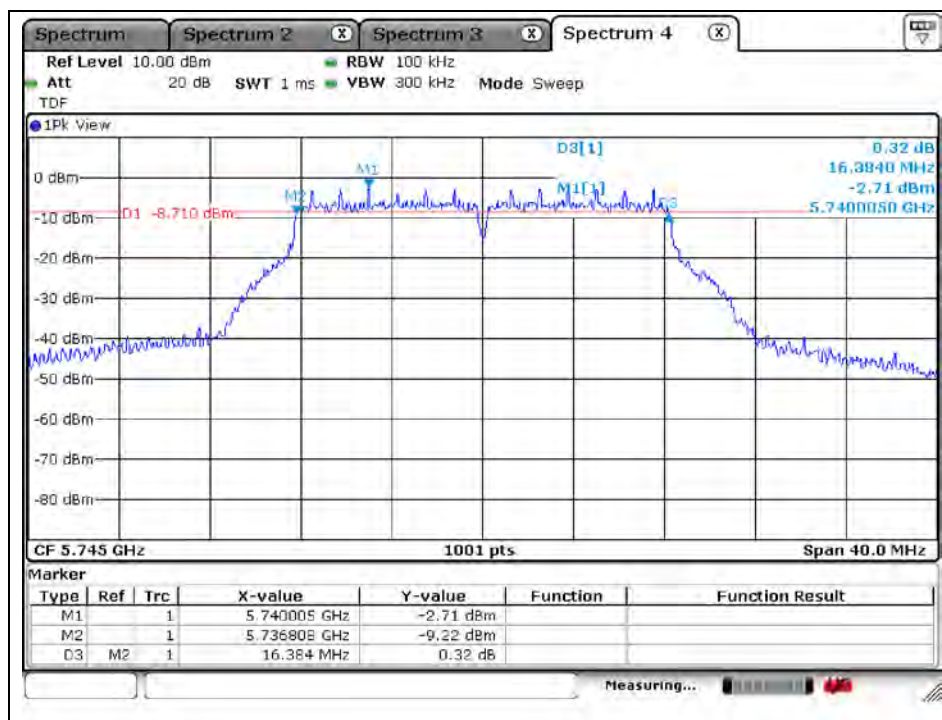
#### 4.4. Test result

Ambient temperature : (23 ± 1) °C  
Relative humidity : 47 % R.H.

Band	Mode	Frequency (MHz)	Ch.	Data Rate	6 dB Bandwidth (MHz)	Minimum Bandwidth (kHz)
U-NII 3	11a	5 745	149	6 Mbps	16.38	500
		5 785	157	6 Mbps	16.38	500
		5 825	165	6 Mbps	16.38	500
	11n_HT20	5 745	149	MCS0	17.58	500
		5 785	157	MCS0	17.58	500
		5 825	165	MCS0	17.58	500
	11n_HT40	5 755	151	MCS0	36.44	500
		5 795	159	MCS0	36.44	500
	11ac_VHT80	5 775	155	MCS0	76.24	500
U-NII 3 (Band-Crossing channels)	11a	5 720	144	6 Mbps	3.21	500
	11n_HT20	5 720	144	MCS0	3.81	500
	11n_HT40	5 710	142	MCS0	3.17	500
	11ac_VHT80	5 690	138	MCS0	2.93	500

#### 802.11a (Band 3)

Low Channel (5 745 MHz)



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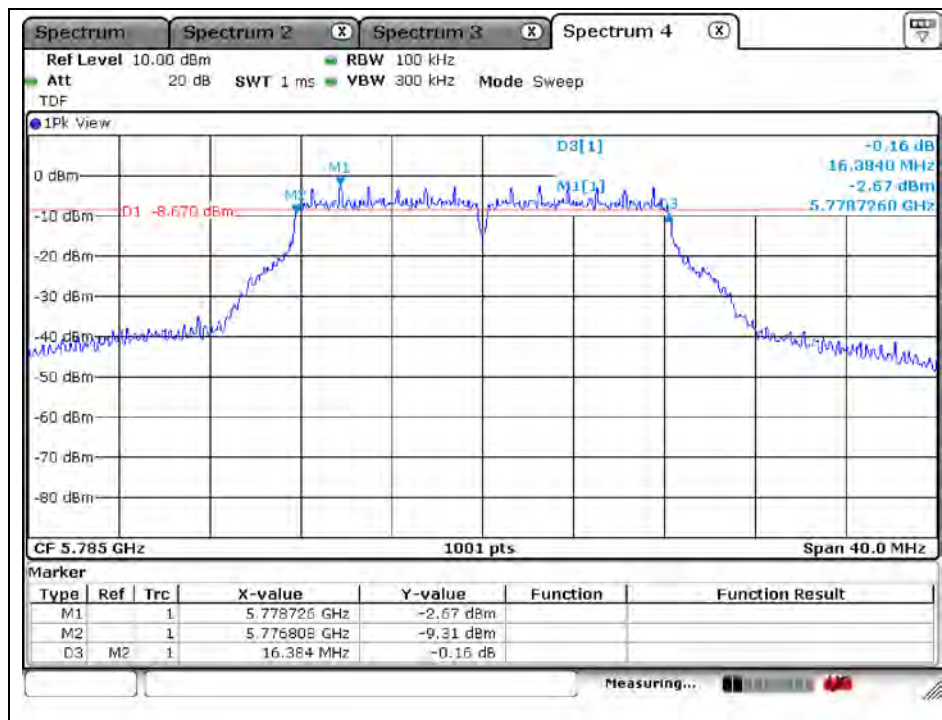
SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

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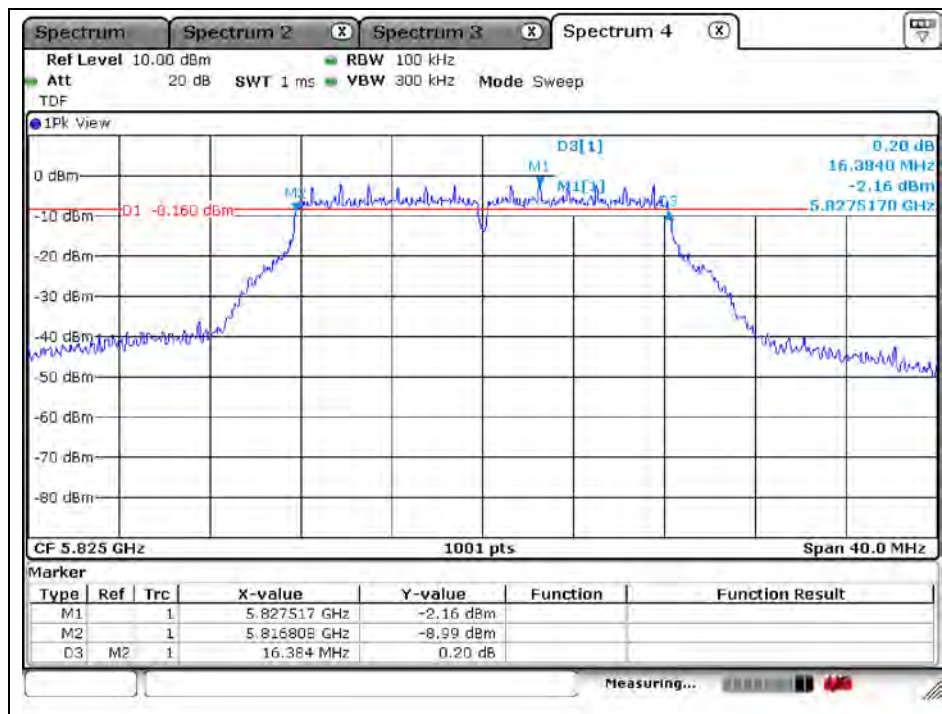
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A4(210 mm x 297 mm)

## Middle Channel (5 785 MHz)



## High Channel (5 825 MHz)

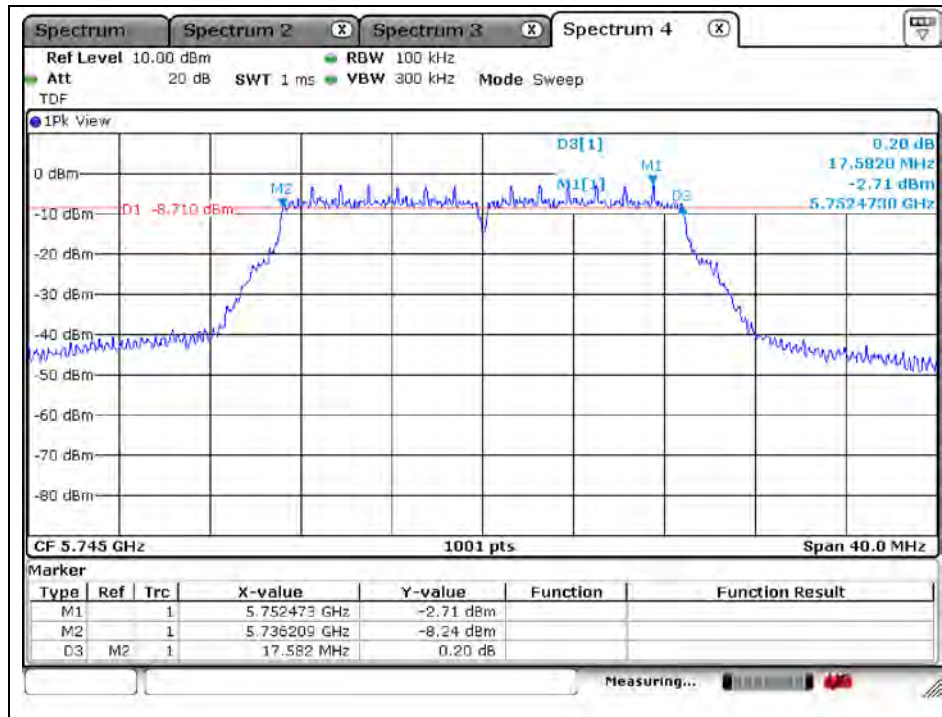


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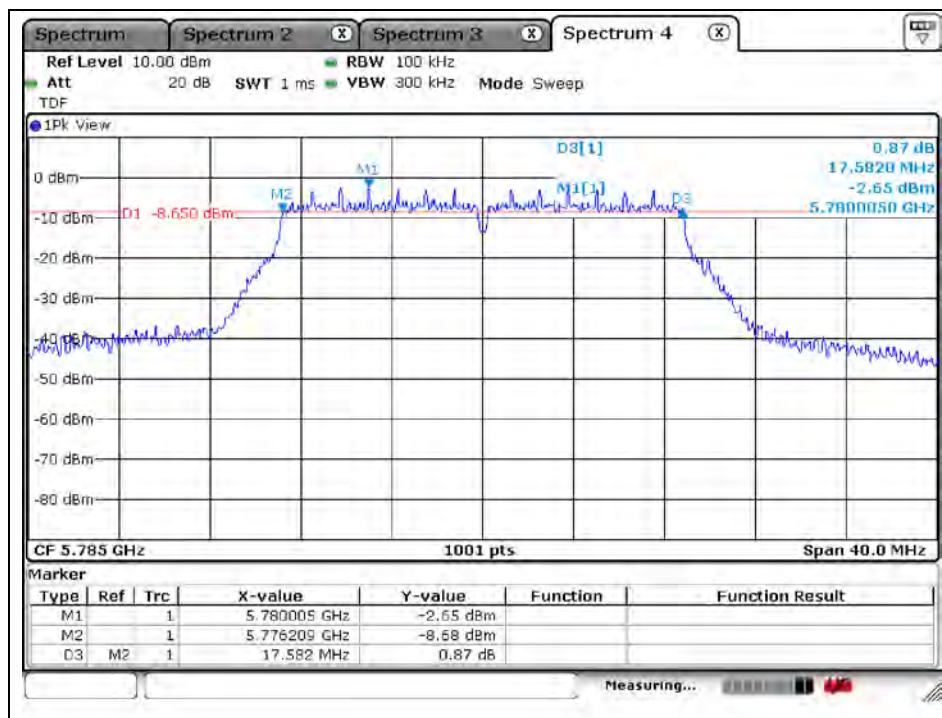


### 802.11n\_HT20 (Band 3)

Low Channel (5 745 MHz)



Middle Channel (5 785 MHz)



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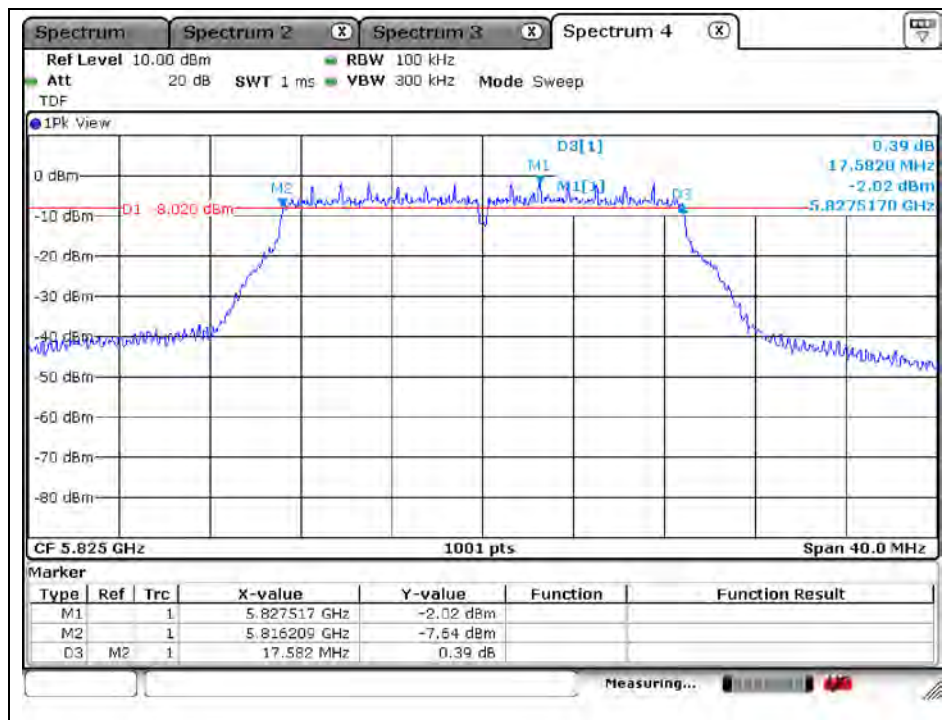
SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

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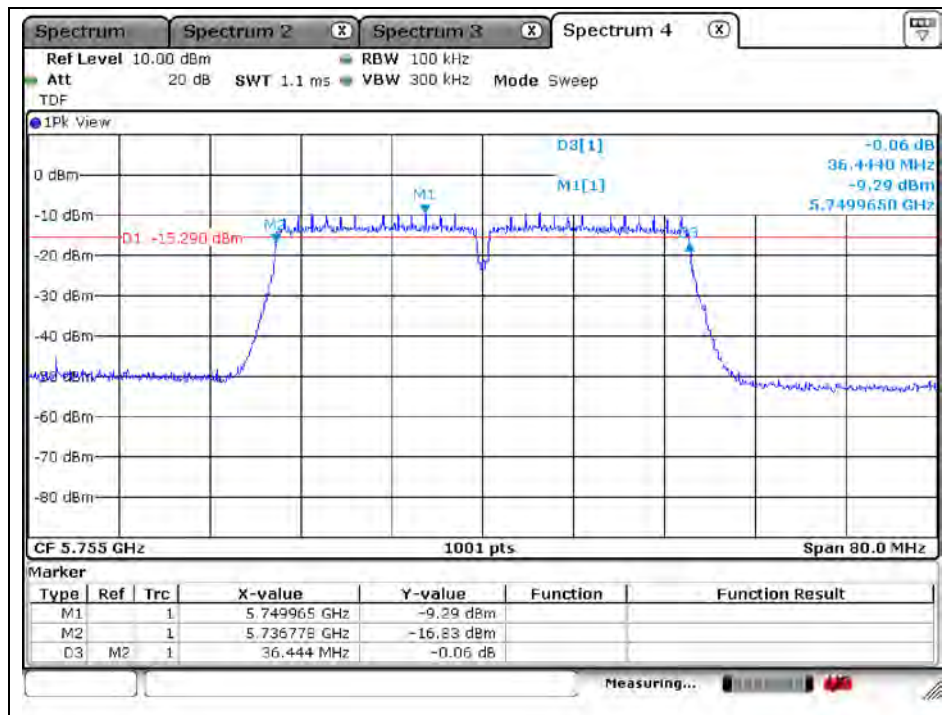
A4(210 mm x 297 mm)

## High Channel (5 825 MHz)



## 802.11n\_HT40 (Band 3)

### Low Channel (5 755 MHz)



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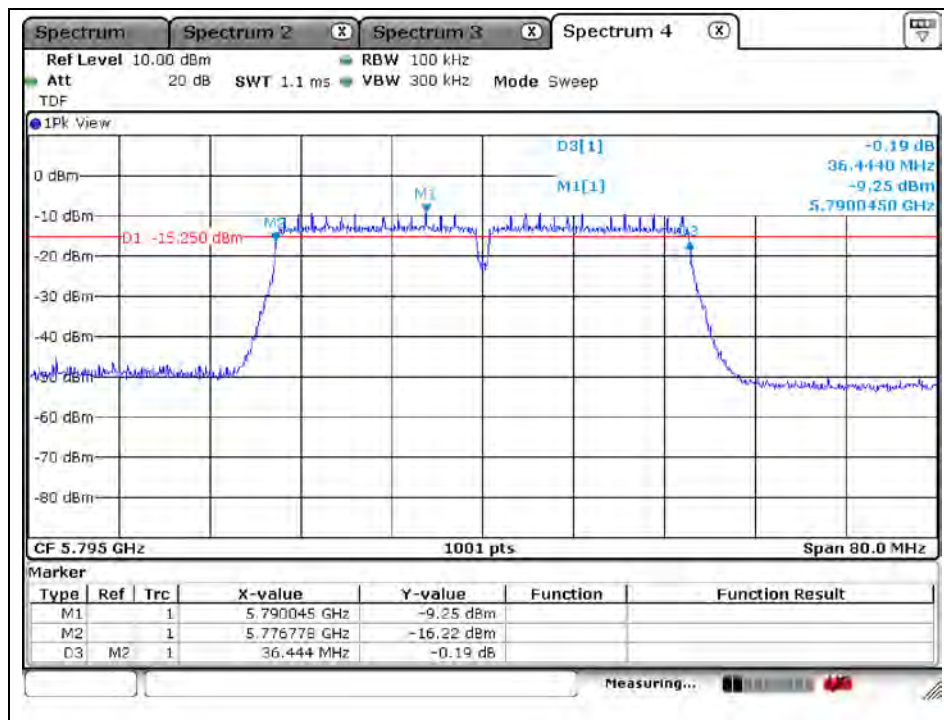
RTT5041-20(2015.10.01)(3)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

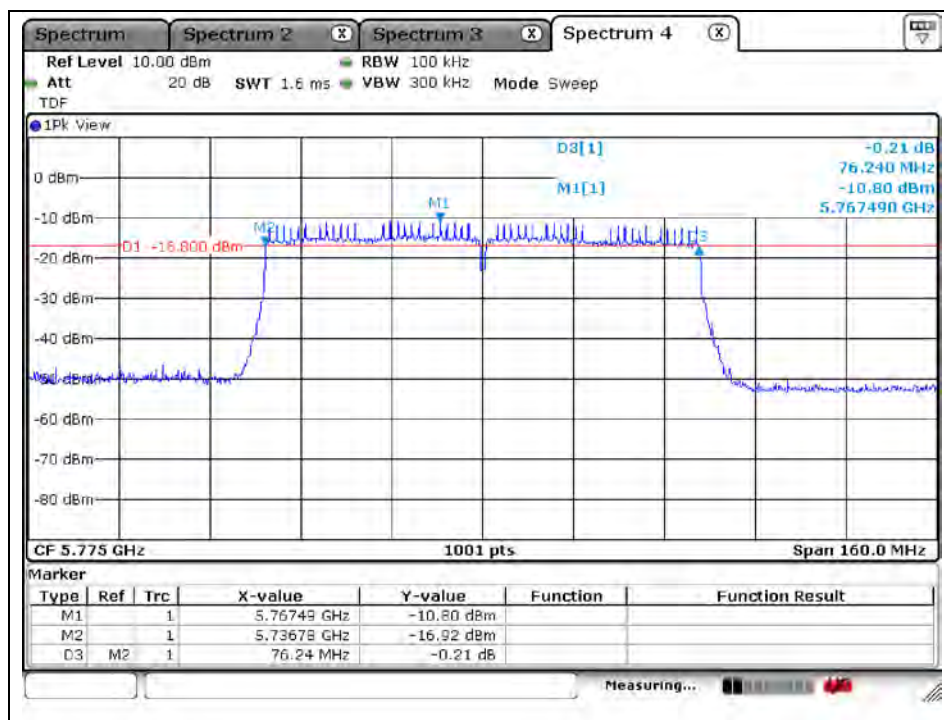


### High Channel (5 795 MHz)



### 802.11ac\_VHT80 (Band 3)

#### Middle Channel (5 775 MHz)



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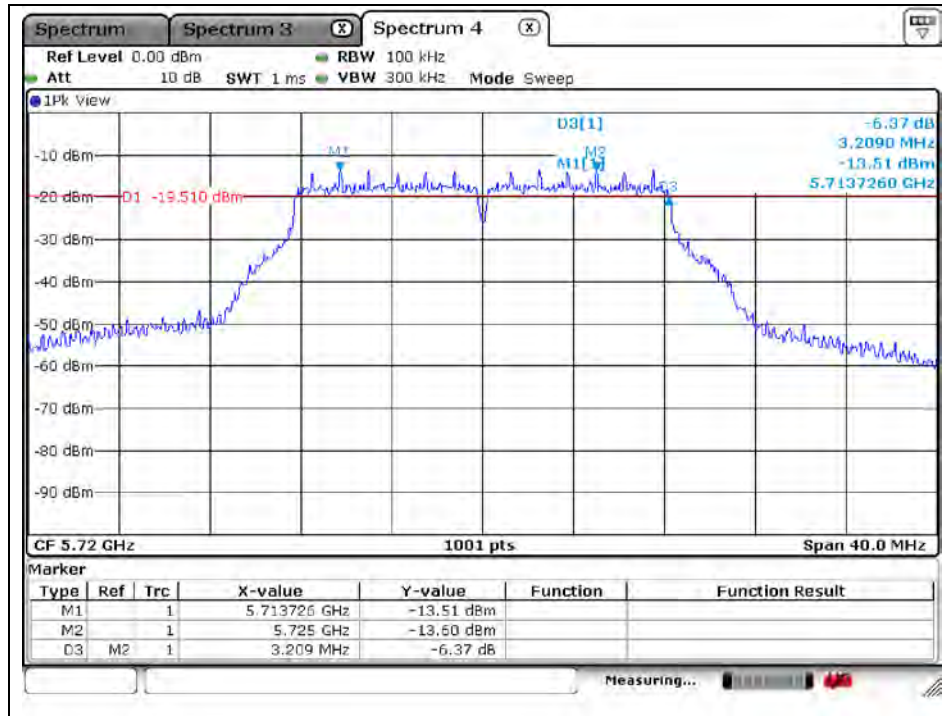
RTT5041-20(2015.10.01)(3)

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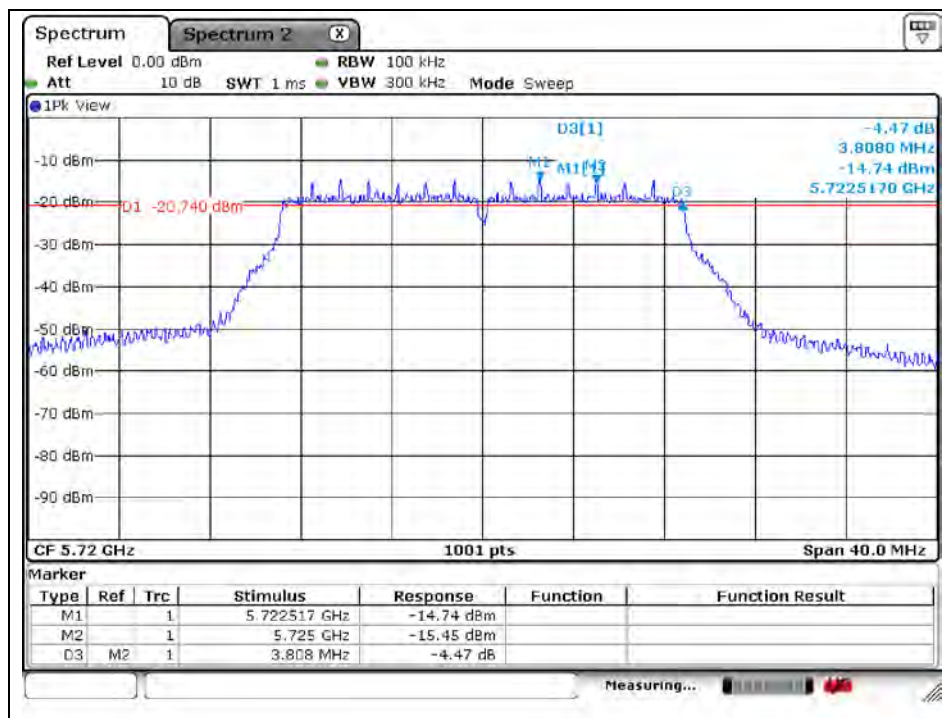
A4(210 mm x 297 mm)

## Band-crossing channels

## 802.11a (5 720 MHz)

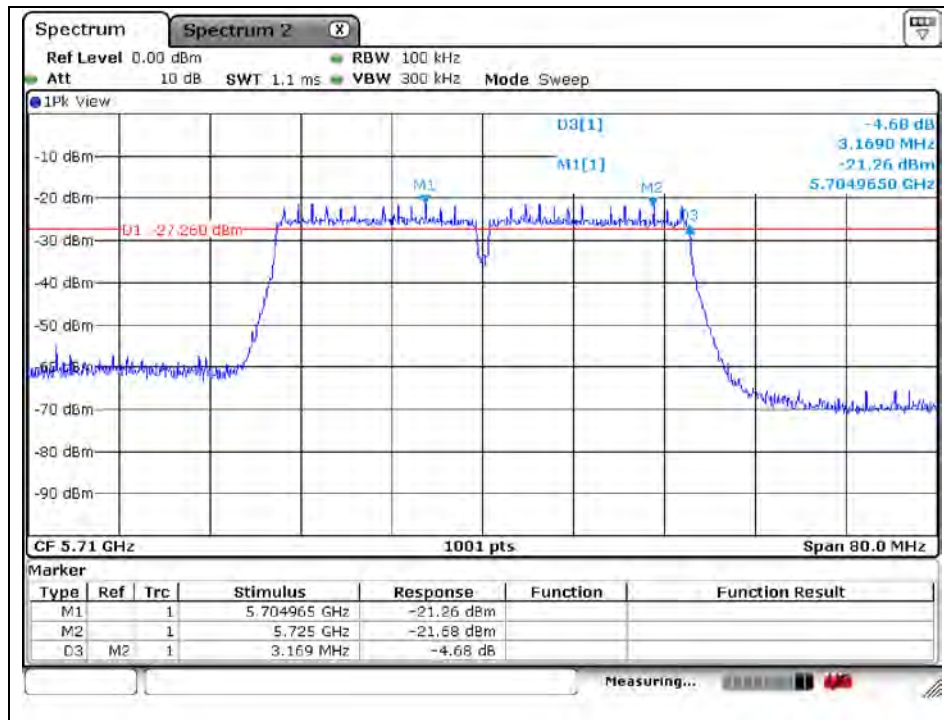


802.11n\_HT20 (5 720 MHz)

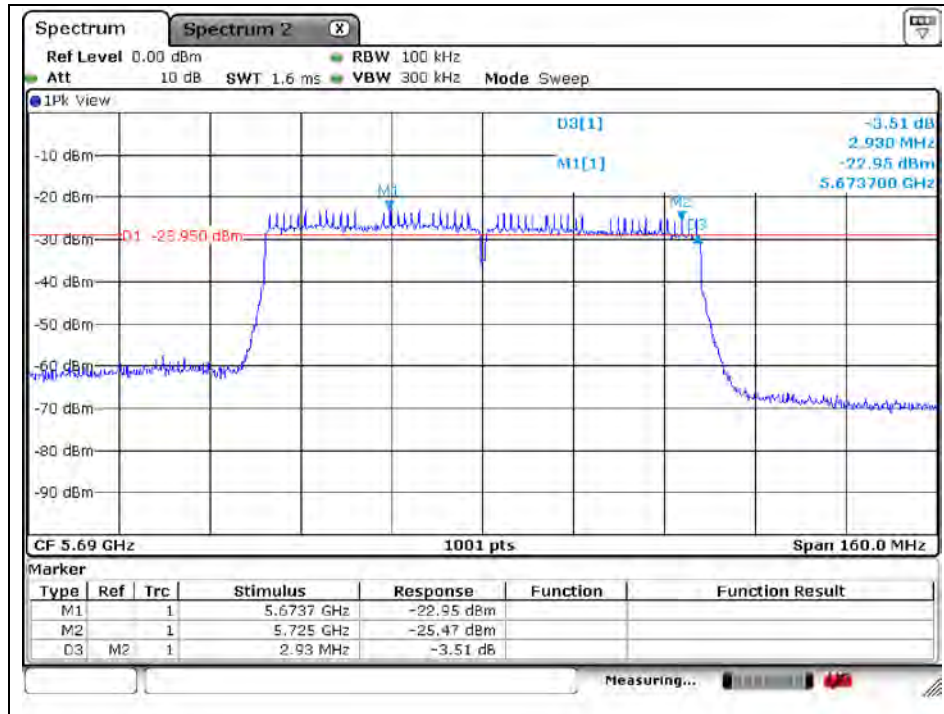


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### 802.11n\_HT40 (5 710 MHz)



### 802.11ac\_VHT80 (5 690 MHz)



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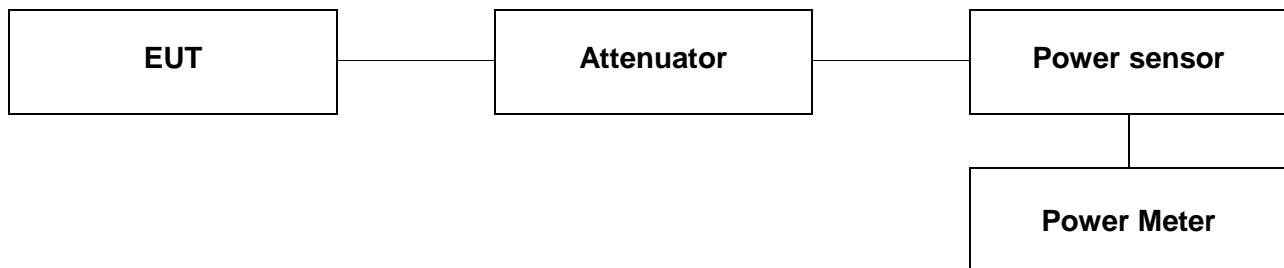
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A4(210 mm x 297 mm)

## 5. Maximum Conducted Output Power

### 5.1. Test setup



### 5.2. Limit

#### FCC 15.407 (a)(1)(iv)

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dB i. In addition, the maximum power spectral density shall not exceed 11 dB m in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dB i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB i.

#### (a)(2)

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dB m 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dB m in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dB i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB i.

#### (a)(3)

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dB m in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dB i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB i. However, fixed point-to point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dB i without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

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A4(210 mm x 297 mm)

### 5.3. Test procedure

1. This measurement settings are specified in section E.3.a of KDB 789033\_D02 v01r02.
2. Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.
  - The EUT is configured to transmit continuously or to transmit with a consistent duty cycle.
  - At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
  - The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
3. If the transmitter does not transmit continuously, measure the duty cycle,  $x$ , of the transmitter output signal as described in section II.B.
4. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
5. Adjust the measurement in dBm by adding  $10 \log (1/x)$  where  $x$  is the duty cycle (e.g.,  $10 \log (1/0.25)$  if the duty cycle is 25 percent).
6. In case of band crossing channels 138, 142 and 144, the measurement is complied with section E.2.d of KDB 789033\_D02 v01r02 and section D of KDB 644545\_D03 v01.

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A4(210 mm x 297 mm)



## 5.4. Test result

Ambient temperature : (23 ± 1) °C  
Relative humidity : 47 % R.H.

### - 11a

Band	Power	Frequency (MHz)	Conducted Power (dB m)							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
U-NII 1	Mea. average	5 180	10.76	10.50	10.47	10.23	9.67	9.34	9.00	8.79
	Result		<b>11.08</b>	10.96	11.03	11.04	10.75	10.83	10.80	10.73
	Mea. average	5 200	10.73	10.50	10.32	10.15	9.68	9.22	9.03	8.81
	Result		11.05	10.96	10.88	10.96	10.76	10.71	10.83	10.75
	Mea. average	5 240	10.17	10.00	9.81	9.66	9.09	8.65	8.35	8.23
	Result		10.49	10.46	10.37	10.47	10.17	10.14	10.15	10.17
U-NII 2A	Mea. average	5 260	9.79	9.67	9.64	9.43	9.23	8.90	8.59	8.39
	Result		10.11	10.13	10.20	10.24	10.31	10.39	10.39	10.33
	Mea. average	5 280	10.02	9.84	9.67	9.48	9.41	9.00	8.75	8.55
	Result		10.34	10.30	10.23	10.29	10.49	10.49	<b>10.55</b>	10.49
	Mea. average	5 320	9.68	9.49	9.38	9.16	9.07	8.65	8.39	8.17
	Result		10.00	9.95	9.94	9.97	10.15	10.14	10.19	10.11
U-NII 2C	Mea. average	5 500	8.92	8.87	8.61	8.50	7.68	7.30	7.19	6.90
	Result		9.24	9.33	9.17	9.31	8.76	8.79	8.99	8.84
	Mea. average	5 580	9.30	9.36	9.00	8.84	8.16	7.74	7.57	7.36
	Result		9.62	<b>9.82</b>	9.56	9.65	9.24	9.23	9.37	9.30
	Mea. average	5 720	9.37	9.15	9.13	8.94	8.24	7.89	7.61	7.44
	Result		9.69	9.61	9.69	9.75	9.32	9.38	9.41	9.38
U-NII 3	Mea. average	5 745	7.93	7.75	7.62	7.43	7.04	6.53	6.40	6.09
	Result		8.25	8.21	8.18	8.24	8.12	8.02	8.20	8.03
	Mea. average	5 785	8.05	7.91	7.82	7.60	7.13	6.79	6.40	6.22
	Result		8.37	8.37	8.38	8.41	8.21	8.28	8.20	8.16
	Mea. average	5 825	8.68	8.46	8.37	8.14	7.64	7.24	6.93	6.75
	Result		<b>9.00</b>	8.92	8.93	8.95	8.72	8.73	8.73	8.69

Band	Conducted Power Limit (dB m)					
	Frequency (MHz)	Fixed Limit (dB m)	26 dB BW (MHz)	11+10LogB (dB m)	Antenna gain (dB i)	Limit (dB m)
U-NII 1	5 180	24				
	5 200	24				
	5 240	24				
U-NII 2A	5 260	24	21.46	24.32	2.89	24
	5 280	24	21.50	24.32	2.89	24
	5 320	24	21.50	24.32	2.89	24
U-NII 2C	5 500	24	21.46	24.32	2.51	24
	5 580	24	21.50	24.32	2.51	24
	5 720	24	21.62	24.35	2.51	24
U-NII 3	5 745	30				
	5 785	30				
	5 825	30				

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Mode	Duty cycle							
	Data Rate [Mbps]							
11a	6	9	12	18	24	36	48	54
Duty Cycle (%)	93	90	88	83	78	71	66	64
Correction factor (dB)	0.32	0.46	0.56	0.81	1.08	1.49	1.80	1.94

Remark:

1. Result (dB m) = Average (dB m) + Correction factor (dB)
2. Duty cycle (%) = (Tx on time / Tx on + off time) x 100
3. Correction factor (dB) = 10 log (1/duty cycle (ms))

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# - 11n\_HT20

Band	Power	Frequency (MHz)	Conducted Power (dB m)							
			Data Rate [MCS]							
			0	1	2	3	4	5	6	7
U-NII 1	Mea. average	5 180	10.52	10.23	10.01	9.62	9.30	9.02	8.87	8.77
	Result		10.84	10.83	10.87	10.70	10.73	10.82	10.81	10.78
	Mea. average	5 200	10.61	10.35	10.07	9.75	9.33	9.00	8.85	8.67
	Result		10.93	<u>10.95</u>	10.93	10.83	10.76	10.80	10.79	10.68
	Mea. average	5 240	10.06	9.72	9.54	9.11	8.74	8.33	8.26	8.12
	Result		10.38	10.32	10.40	10.19	10.17	10.13	10.20	10.13
U-NII 2A	Mea. average	5 260	9.74	9.45	9.21	9.29	8.84	8.51	8.37	8.24
	Result		10.06	10.05	10.07	10.37	10.27	10.31	10.31	10.25
	Mea. average	5 280	9.71	9.49	9.21	9.29	8.94	8.56	8.48	8.33
	Result		10.03	10.09	10.07	10.37	10.37	10.36	<u>10.42</u>	10.34
	Mea. average	5 320	9.57	9.21	9.01	9.05	8.65	8.25	8.29	7.98
	Result		9.89	9.81	9.87	10.13	10.08	10.05	10.23	9.99
U-NII 2C	Mea. average	5 500	8.72	8.44	8.27	7.84	7.50	7.16	6.94	6.85
	Result		9.04	9.04	9.13	8.92	8.93	8.96	8.88	8.86
	Mea. average	5 580	9.38	9.07	8.86	8.32	8.00	7.64	7.52	7.19
	Result		9.70	9.67	<u>9.72</u>	9.40	9.43	9.44	9.46	9.20
	Mea. average	5 720	9.35	9.02	8.77	8.21	7.89	7.50	7.39	7.18
	Result		9.67	9.62	9.63	9.29	9.32	9.30	9.33	9.19
U-NII 3	Mea. average	5 745	7.84	7.56	7.26	7.01	6.54	6.31	6.06	6.05
	Result		8.16	8.16	8.12	8.09	7.97	8.11	8.00	8.06
	Mea. average	5 785	8.08	7.72	7.56	7.17	6.86	6.49	6.28	6.11
	Result		8.40	8.32	8.42	8.25	8.29	8.29	8.22	8.12
	Mea. average	5 825	8.61	8.32	8.08	7.78	7.39	7.02	6.85	6.65
	Result		8.93	8.92	<u>8.94</u>	8.86	8.82	8.82	8.79	8.66

Band	Conducted Power Limit (dB m)					
	Frequency (MHz)	Fixed Limit (dB m)	26 dB BW (MHz)	11+10LogB (dB m)	Antenna gain (dB i)	Limit (dB m)
U-NII 1	5 180	24				
	5 200	24				
	5 240	24				
U-NII 2A	5 260	24	21.86	24.40	2.89	24
	5 280	24	21.86	24.40	2.89	24
	5 320	24	21.90	24.40	2.89	24
U-NII 2C	5 500	24	21.82	24.39	2.51	24
	5 580	24	21.94	24.41	2.51	24
	5 720	24	21.82	24.39	2.51	24
U-NII 3	5 745	30				
	5 785	30				
	5 825	30				

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A4(210 mm x 297 mm)

Mode	Duty cycle							
	Data Rate [MCS]							
11n_HT20	0	1	2	3	4	5	6	7
Duty Cycle (%)	93	87	82	78	72	66	64	63
Correction factor (dB)	0.32	0.60	0.86	1.08	1.43	1.80	1.94	2.01

Remark:

1. Result (dB m) = Average (dB m) + Correction factor (dB)
2. Duty cycle (%) = (Tx on time / Tx on + off time) x 100
3. Correction factor (dB) = 10 log (1/duty cycle (ms))

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## - 11n\_HT40

Band	Power	Frequency (MHz)	Conducted Power (dB m)							
			Data Rate [MCS]							
			0	1	2	3	4	5	6	7
U-NII 1	Mea. average	5 190	5.95	5.39	4.98	4.85	4.28	3.98	3.86	3.57
	Result		6.55	6.47	6.47	6.65	6.57	<b>6.74</b>	6.70	6.58
	Mea. average	5 230	5.63	5.16	4.73	4.43	3.88	3.45	3.30	3.13
	Result		6.23	6.24	6.22	6.23	6.17	6.21	6.14	6.14
U-NII 2A	Mea. average	5 270	6.48	5.80	5.19	5.16	4.79	4.35	4.24	3.90
	Result		7.08	6.88	6.68	6.96	7.08	<b>7.11</b>	7.08	6.91
	Mea. average	5 310	6.20	5.59	5.39	5.06	4.55	4.07	4.03	3.77
	Result		6.80	6.67	6.88	6.86	6.84	6.83	6.87	6.78
U-NII 2C	Mea. average	5 510	4.62	4.06	3.65	3.57	3.10	2.73	2.56	2.40
	Result		5.22	5.14	5.14	5.37	5.39	5.49	5.40	5.41
	Mea. average	5 550	5.60	5.01	4.61	4.55	4.06	3.51	3.29	3.22
	Result		6.20	6.09	6.10	6.35	<b>6.35</b>	6.27	6.13	6.23
	Mea. average	5 710	4.95	4.56	4.13	3.89	3.55	3.05	2.85	2.62
	Result		5.55	5.64	5.62	5.69	5.84	5.81	5.69	5.63
U-NII 3	Mea. average	5 755	3.94	3.29	3.08	2.89	2.19	1.78	1.65	1.48
	Result		4.54	4.37	4.57	4.69	4.48	4.54	4.49	4.49
	Mea. average	5 795	4.10	3.72	3.32	2.98	2.69	1.99	1.93	1.88
	Result		4.70	4.80	4.81	4.78	<b>4.98</b>	4.75	4.77	4.89

Band	Conducted Power Limit (dB m)					
	Frequency (MHz)	Fixed Limit (dB m)	26 dB BW (MHz)	11+10LogB (dB m)	Antenna gain (dB i)	Limit (dB m)
U-NII 1	5 190	24				
	5 230	24				
U-NII 2A	5 270	24	40.39	27.06	2.89	24
	5 310	24	40.36	27.06	2.89	24
U-NII 2C	5 510	24	40.60	27.09	2.51	24
	5 550	24	40.36	27.06	2.51	24
	5 710	24	40.44	27.07	2.51	24
U-NII 3	5 755	30				
	5 795	30				

Mode	Duty cycle							
	Data Rate [MCS]							
11n_HT40	0	1	2	3	4	5	6	7
Duty Cycle (%)	87	78	71	66	59	53	52	50
Correction factor (dB)	0.60	1.08	1.49	1.80	2.29	2.76	2.84	3.01

Remark:

1. Result (dB m) = Average (dB m) + Correction factor (dB)
2. Duty cycle (%) = (Tx on time / Tx on + off time) x 100
3. Correction factor (dB) = 10 log (1/duty cycle (ms))

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# - 11ac\_VHT20

Band	Power	Frequency (MHz)	Conducted Power (dB m)								
			Data Rate [MCS]								
			0	1	2	3	4	5	6	7	8
U-NII 1	Mea. average	5 180	10.60	10.36	9.95	9.64	9.30	8.93	8.81	8.74	8.53
	Result		10.92	10.96	10.81	10.72	10.73	10.67	10.68	10.75	10.75
	Mea. average	5 200	10.87	10.62	10.36	10.05	9.60	9.24	9.11	9.06	8.83
	Result		11.19	<u>11.22</u>	11.22	11.13	11.03	10.98	10.98	11.07	11.05
	Mea. average	5 240	10.04	9.81	9.53	9.09	8.73	8.46	8.38	8.07	7.97
	Result		10.36	10.41	10.39	10.17	10.16	10.20	10.25	10.08	10.19
U-NII 2A	Mea. average	5 260	9.75	9.41	9.21	9.24	8.90	8.61	8.50	8.38	8.33
	Result		10.07	10.01	10.07	10.32	10.33	10.35	10.37	10.39	10.55
	Mea. average	5 280	9.91	9.52	9.27	9.49	9.01	8.78	8.60	8.43	8.21
	Result		10.23	10.12	10.13	<u>10.57</u>	10.44	10.52	10.47	10.44	10.43
	Mea. average	5 320	9.56	9.31	9.08	9.01	8.78	8.35	8.21	8.06	7.95
	Result		9.88	9.91	9.94	10.09	10.21	10.09	10.08	10.07	10.17
U-NII 2C	Mea. average	5 500	8.73	8.44	8.22	7.81	7.60	7.18	7.12	6.98	6.69
	Result		9.05	9.04	9.08	8.89	9.03	8.92	8.99	8.99	8.91
	Mea. average	5 580	9.12	8.87	8.65	8.26	7.89	7.46	7.34	7.36	7.03
	Result		9.44	9.47	9.51	9.34	9.32	9.20	9.21	9.37	9.25
	Mea. average	5 720	9.34	8.87	8.60	8.17	7.92	7.59	7.56	7.44	7.17
	Result		<u>9.66</u>	9.47	9.46	9.25	9.35	9.33	9.43	9.45	9.39
U-NII 3	Mea. average	5 745	7.84	7.57	7.26	7.06	6.66	6.17	6.18	6.03	5.81
	Result		8.16	8.17	8.12	8.14	8.09	7.91	8.05	8.04	8.03
	Mea. average	5 785	7.92	7.68	7.36	7.22	6.74	6.48	6.39	6.17	5.93
	Result		8.24	8.28	8.22	8.30	8.17	8.22	8.26	8.18	8.15
	Mea. average	5 825	8.57	8.19	7.91	7.67	7.30	6.99	6.84	6.75	6.51
	Result		<u>8.89</u>	8.79	8.77	8.75	8.73	8.73	8.71	8.76	8.73

Band	Conducted Power Limit (dB m)					
	Frequency (MHz)	Fixed Limit (dB m)	26 dB BW (MHz)	11+10LogB (dB m)	Antenna gain (dB i)	Limit (dB m)
U-NII 1	5 180	24				
	5 200	24				
	5 240	24				
U-NII 2A	5 260	24	21.78	24.38	2.89	24
	5 280	24	21.74	24.37	2.89	24
	5 320	24	21.58	24.34	2.89	24
U-NII 2C	5 500	24	21.74	24.37	2.51	24
	5 580	24	21.74	24.37	2.51	24
	5 720	24	21.90	24.40	2.51	24
U-NII 3	5 745	30				
	5 785	30				
	5 825	30				

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Mode	Duty cycle								
	Data Rate [MCS]								
11ac_VHT20	0	1	2	3	4	5	6	7	8
Duty Cycle (%)	93	87	82	78	72	67	65	63	60
Correction factor (dB)	0.32	0.60	0.86	1.08	1.43	1.74	1.87	2.01	2.22

Remark:

1. Result (dB m) = Average (dB m) + Correction factor (dB)
2. Duty cycle (%) = (Tx on time / Tx on + off time) x 100
3. Correction factor (dB) = 10 log (1/duty cycle (ms))

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# - 11ac\_VHT40

Band	Power	Frequency (MHz)	Conducted Power (dB m)									
			Data Rate [MCS]									
			0	1	2	3	4	5	6	7	8	9
U-NII 1	Mea. average	5 190	6.08	5.45	4.99	4.87	4.38	4.01	3.71	3.69	3.61	3.41
	Result		6.68	6.53	6.48	6.67	6.67	6.69	6.47	6.61	<b>6.80</b>	6.78
	Mea. average	5 230	5.56	5.15	4.76	4.37	3.98	3.53	3.39	3.26	3.10	2.97
	Result		6.16	6.23	6.25	6.17	6.27	6.21	6.15	6.18	6.29	6.34
U-NII 2A	Mea. average	5 270	6.27	5.86	5.49	5.28	4.81	4.42	4.26	4.02	3.78	3.67
	Result		6.87	6.94	6.98	7.08	<b>7.10</b>	7.10	7.02	6.94	6.97	7.04
	Mea. average	5 310	6.21	5.67	5.36	5.22	4.70	4.21	4.05	3.96	3.72	3.56
	Result		6.81	6.75	6.85	7.02	6.99	6.89	6.81	6.88	6.91	6.93
U-NII 2C	Mea. average	5 510	4.81	4.23	3.90	3.58	3.14	2.77	2.58	2.28	2.08	1.93
	Result		5.41	5.31	5.39	5.38	5.43	5.45	5.34	5.20	5.27	5.30
	Mea. average	5 550	5.50	5.20	4.81	4.43	3.92	3.56	3.50	3.24	3.15	2.84
	Result		6.10	6.28	6.30	6.23	6.21	6.24	6.26	6.16	<b>6.34</b>	6.21
	Mea. average	5 710	5.20	4.53	4.28	4.01	3.50	3.11	2.88	2.79	2.64	2.50
	Result		5.80	5.61	5.77	5.81	5.79	5.79	5.64	5.71	5.83	5.87
U-NII 3	Mea. average	5 755	4.09	3.50	3.01	2.70	2.33	2.02	1.77	1.58	1.44	1.20
	Result		4.69	4.58	4.50	4.50	4.62	4.70	4.53	4.50	4.63	4.57
	Mea. average	5 795	4.28	3.68	3.20	3.08	2.64	2.27	1.98	1.88	1.64	1.49
	Result		4.88	4.76	4.69	4.88	4.93	<b>4.95</b>	4.74	4.80	4.83	4.86

Band	Conducted Power Limit (dB m)					
	Frequency (MHz)	Fixed Limit (dB m)	26 dB BW (MHz)	11+10LogB (dB m)	Antenna gain (dB i)	Limit (dB m)
U-NII 1	5 190	24				
	5 230	24				
U-NII 2A	5 270	24	40.36	27.06	2.89	24
	5 310	24	40.68	27.09	2.89	24
U-NII 2C	5 510	24	40.76	27.10	2.51	24
	5 550	24	40.48	27.07	2.51	24
	5 710	24	40.60	27.09	2.51	24
U-NII 3	5 755	30				
	5 795	30				

Mode	Duty cycle									
	Data Rate [MCS]									
11ac_VHT40	0	1	2	3	4	5	6	7	8	9
Duty Cycle (%)	87	78	71	66	59	54	53	51	48	46
Correction factor (dB)	0.60	1.08	1.49	1.80	2.29	2.68	2.76	2.92	3.19	3.37

Remark:

- Result (dB m) = Average (dB m) + Correction factor (dB)
- Duty cycle (%) = (Tx on time / Tx on + off time) x 100
- Correction factor (dB) = 10 log (1/duty cycle (ms))

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## - 11ac\_VHT80

Band	Power	Frequency (MHz)	Conducted Power (dB m)									
			Data Rate [MCS]									
			0	1	2	3	4	5	6	7	8	9
U-NII 1	Mea. Average	5 210	4.77	2.46	3.53	2.50	2.10	1.75	2.45	2.32	1.18	1.65
	Result		5.91	6.13	5.90	5.26	5.29	5.32	6.12	<b>6.19</b>	5.16	5.74
U-NII 2A	Mea. Average	5 290	5.65	2.32	4.47	3.95	3.45	3.10	2.39	2.25	2.08	1.93
	Result		6.79	5.99	<b>6.84</b>	6.71	6.64	6.67	6.06	6.12	6.06	6.02
U-NII 2C	Mea. Average	5 530	4.96	2.12	3.68	3.70	3.13	2.14	2.00	1.92	1.67	1.63
	Result		6.10	5.79	6.05	6.46	6.32	5.71	5.67	5.79	5.65	5.72
	Mea. Average	5 690	4.94	2.09	3.76	3.78	3.24	2.32	2.24	2.07	1.73	1.73
	Result		6.08	5.76	6.13	<b>6.54</b>	6.43	5.89	5.91	5.94	5.71	5.82
U-NII 3	Mea. Average	5 775	3.98	1.32	2.80	2.79	2.26	1.53	1.25	1.12	0.95	1.04
	Result		5.12	4.99	5.17	<b>5.55</b>	5.45	5.10	4.92	4.99	4.93	5.13

Band	Conducted Power Limit (dB m)					
	Frequency (MHz)	Fixed Limit (dB m)	26 dB BW (MHz)	11+10LogB (dB m)	Antenna gain (dB i)	Limit (dB m)
U-NII 1	5 210	24				
U-NII 2A	5 290	24	82.64	30.17	2.89	24
U-NII 2C	5 530	24	83.28	30.21	2.51	24
	5 690	24	82.48	30.16	2.51	24
U-NII 3	5 775	30				

Mode	Duty cycle									
	Data Rate [MCS]									
11ac_VHT80	0	1	2	3	4	5	6	7	8	9
Duty Cycle (%)	77	43	58	53	48	44	43	41	40	39
Correction factor (dB)	1.14	3.67	2.37	2.76	3.19	3.57	3.67	3.87	3.98	4.09

Remark:

1. Result (dB m) = Average (dB m) + Correction factor (dB)
2. Duty cycle (%) = (Tx on time / Tx on + off time) x 100
3. Correction factor (dB) = 10 log (1/duty cycle (ms))

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### -Band-crossing channels

Band	Mode	Frequency (MHz)	Mea. Average (dB m)	Duty Correction Factor (dB)	Result (dB m)	Limit (dB m)
U-NII 2C	11a	5 720	6.93	0.32	7.25	22.96
U-NII 3			0.52	0.32	0.84	30.00
U-NII 2C	11n_HT20	5 720	6.59	0.32	6.91	22.99
U-NII 3			0.85	0.32	1.17	30.00
U-NII 2C	11n_HT40	5 710	3.19	0.60	3.79	24.00
U-NII 3			-7.47	0.60	-6.87	30.00
U-NII 2C	11ac_VHT20	5 720	6.43	0.32	6.75	22.98
U-NII 3			0.93	0.32	1.25	30.00
U-NII 2C	11ac_VHT40	5 710	3.13	0.60	3.73	24.00
U-NII 3			-7.39	0.60	-6.79	30.00
U-NII 2C	11ac_VHT80	5 690	3.41	1.14	4.55	24.00
U-NII 3			-11.75	1.14	-10.61	30.00

Band	Mode	Conducted Power Limit (dB m)					
		Frequency (MHz)	Fixed Limit (dB m)	26 dB BW (MHz)	11+10LogB (dB m)	Antenna gain (dB i)	Limit (dB m)
U-NII 2C	11a	5 720	24	15.71	22.96	2.51	22.96
U-NII 3							30
U-NII 2C	11n_HT20	5 720	24	15.83	22.99	2.51	22.99
U-NII 3							30
U-NII 2C	11n_HT40	5 710	24	35.69	26.53	2.51	24.00
U-NII 3							30
U-NII 2C	11ac_VHT20	5 720	24	15.79	22.98	2.51	22.98
U-NII 3							30
U-NII 2C	11ac_VHT40	5 710	24	35.61	26.52	2.51	24.00
U-NII 3							30
U-NII 2C	11ac_VHT80	5 690	24	76.53	29.84	2.51	24.00
U-NII 3							30

Remark:

1. Result (dB m) = Average (dB m) + Correction factor (dB)
2. Duty cycle (%) = (Tx on time / Tx on + off time) x 100
3. Correction factor (dB) = 10 log (1/duty cycle (ms))

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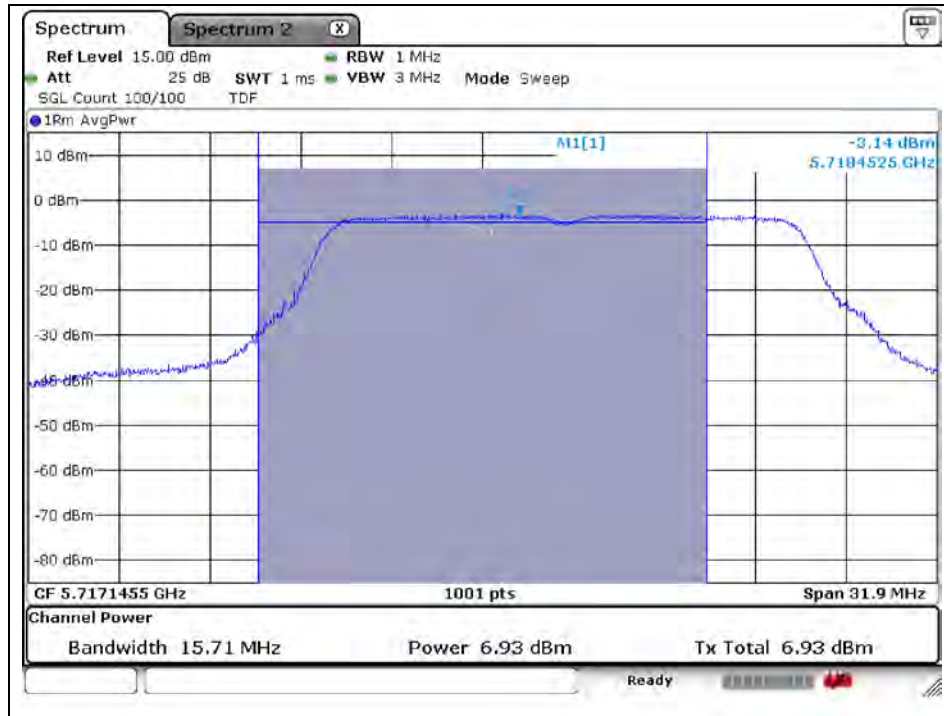
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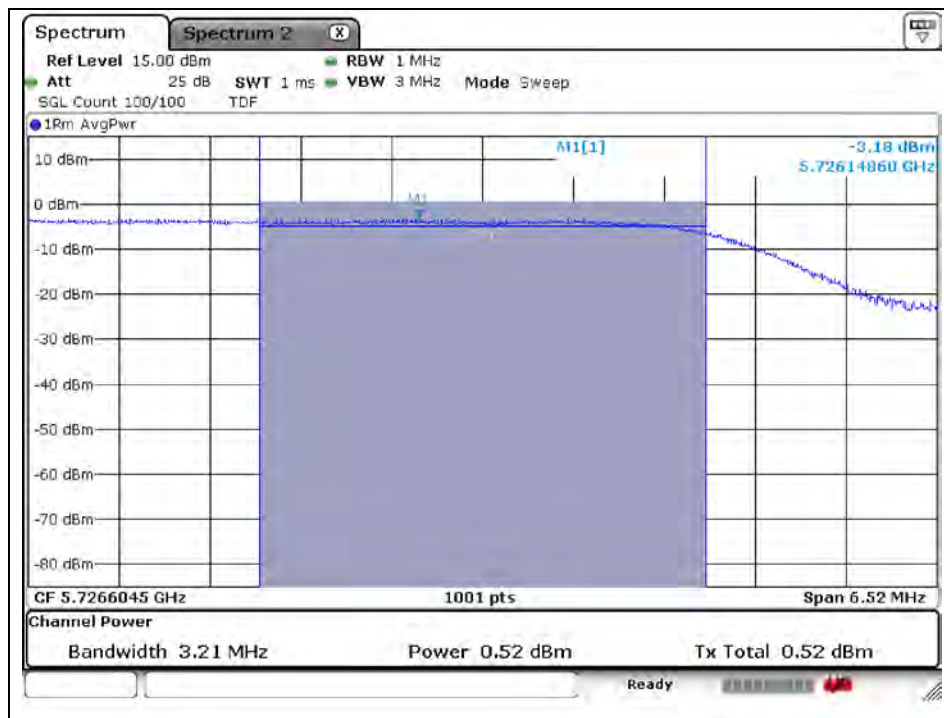
A4(210 mm x 297 mm)

## Band-crossing channels

### 802.11a (5 720 MHz)\_U-NII 2C



### 802.11a (5 720 MHz)\_U-NII 3



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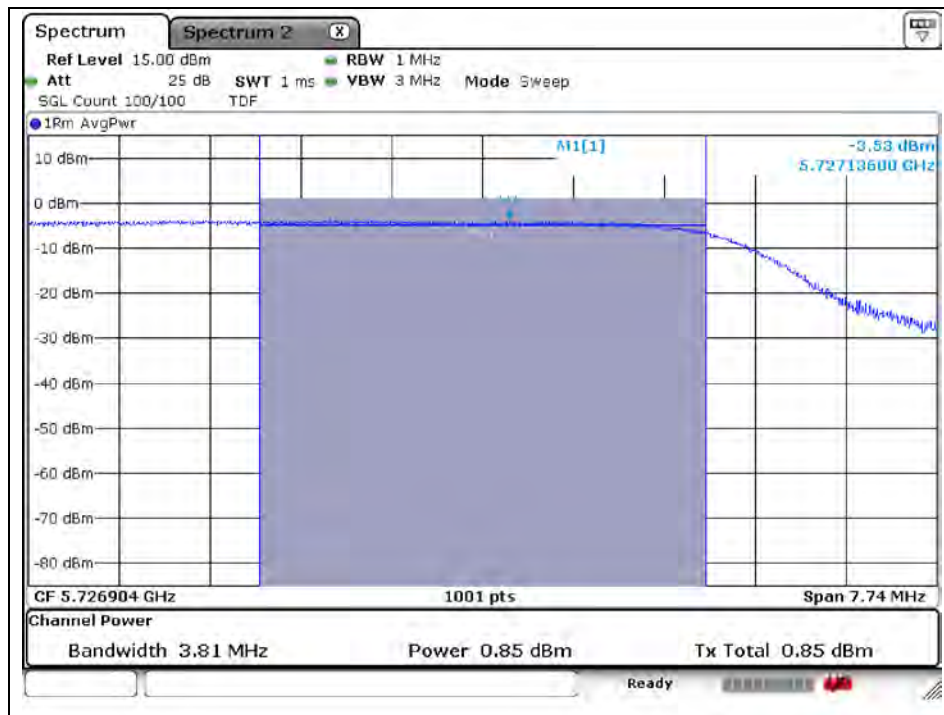
A4(210 mm x 297 mm)



### 802.11n\_HT20 (5 720 MHz)\_U-NII 2C



### 802.11n\_HT20 (5 720 MHz)\_U-NII 3



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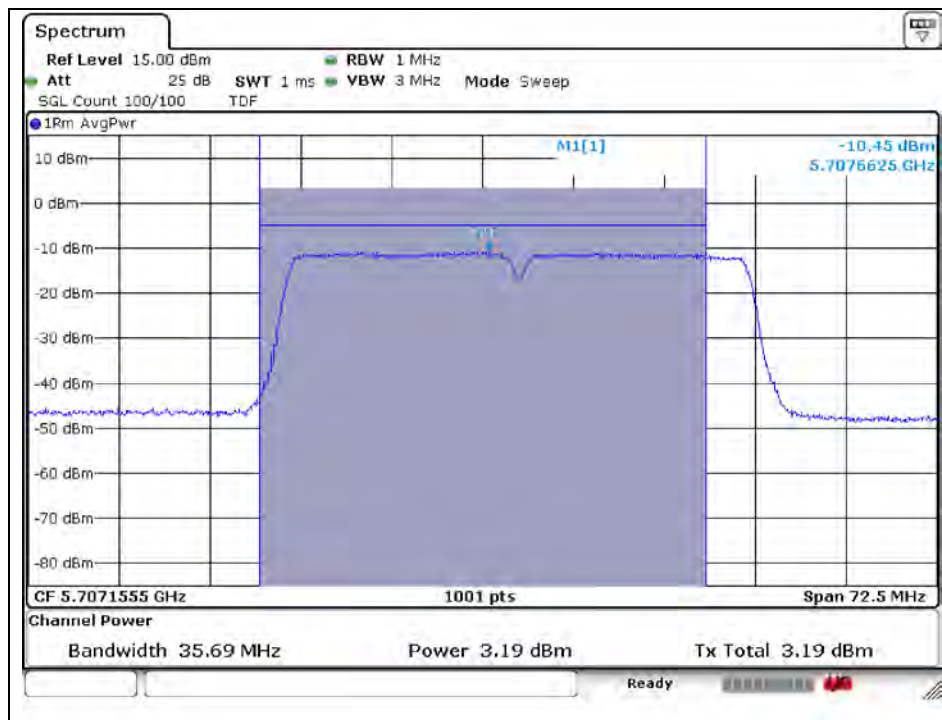
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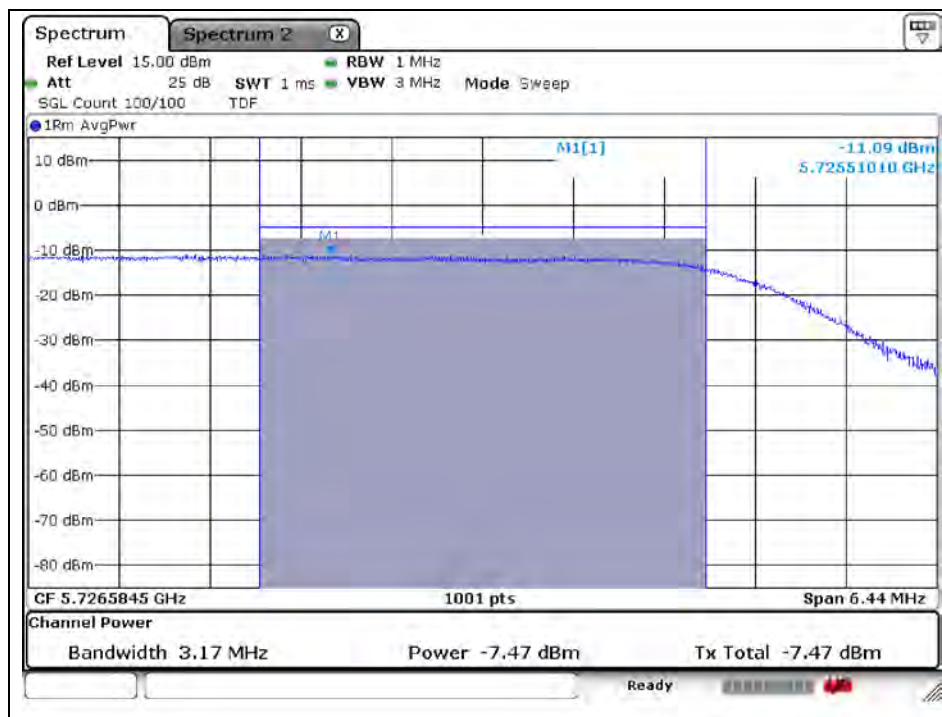
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### 802.11n\_HT40 (5 710 MHz)\_U-NII 2C



### 802.11n\_HT40 (5 710 MHz)\_U-NII 3



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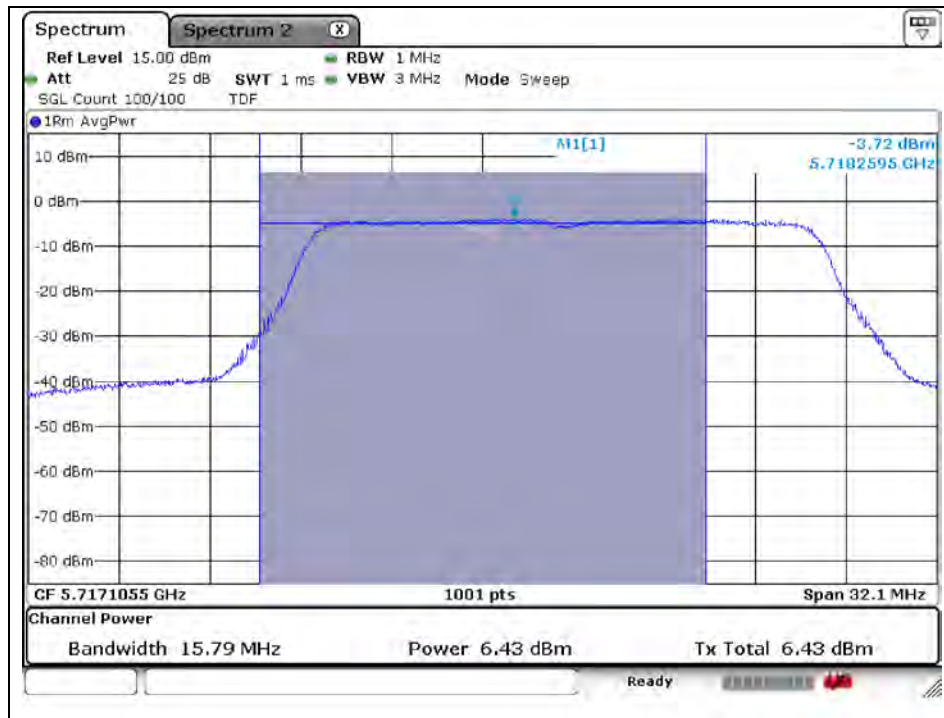
SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

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### 802.11ac\_VHT20 (5 720 MHz)\_U-NII 2C



### 802.11ac\_VHT20 (5 720 MHz)\_U-NII 3



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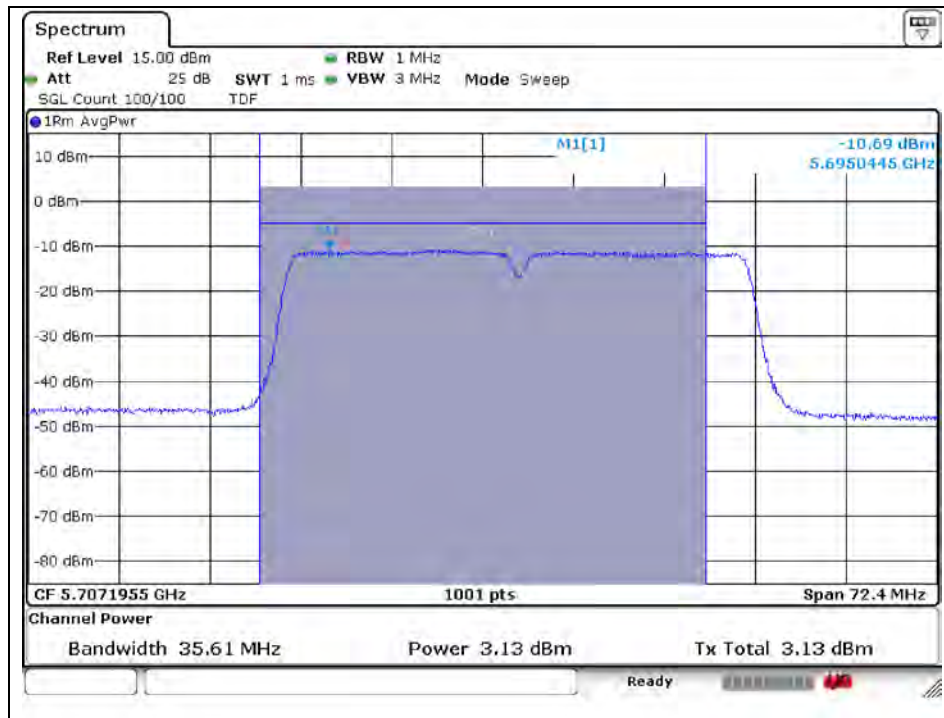
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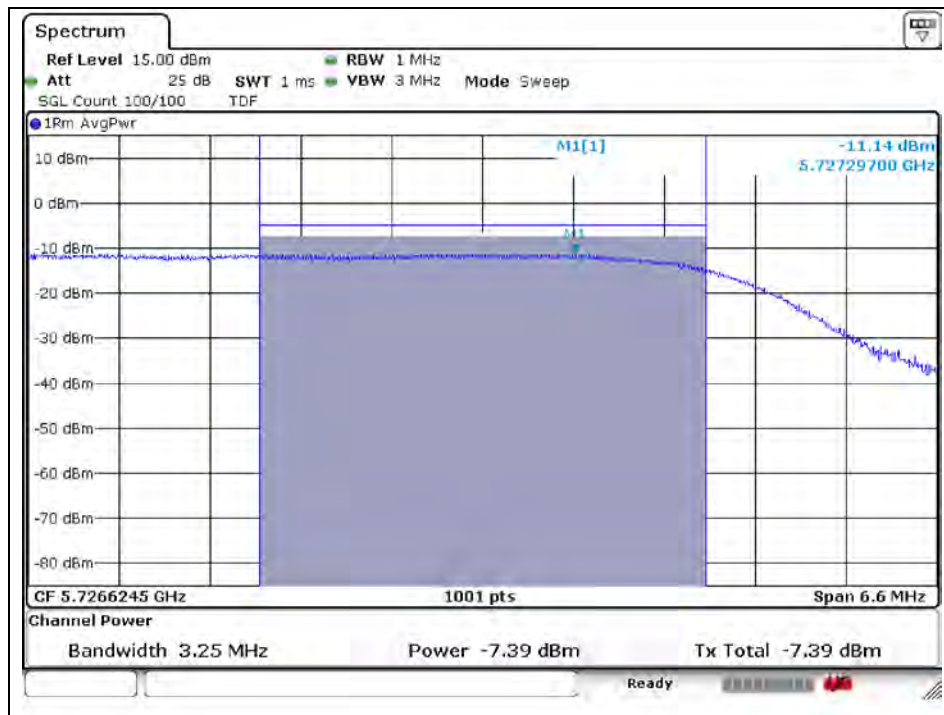
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## 802.11ac\_VHT40 (5 710 MHz)\_U-NII 2C



## 802.11ac\_VHT40 (5 710 MHz)\_U-NII 3



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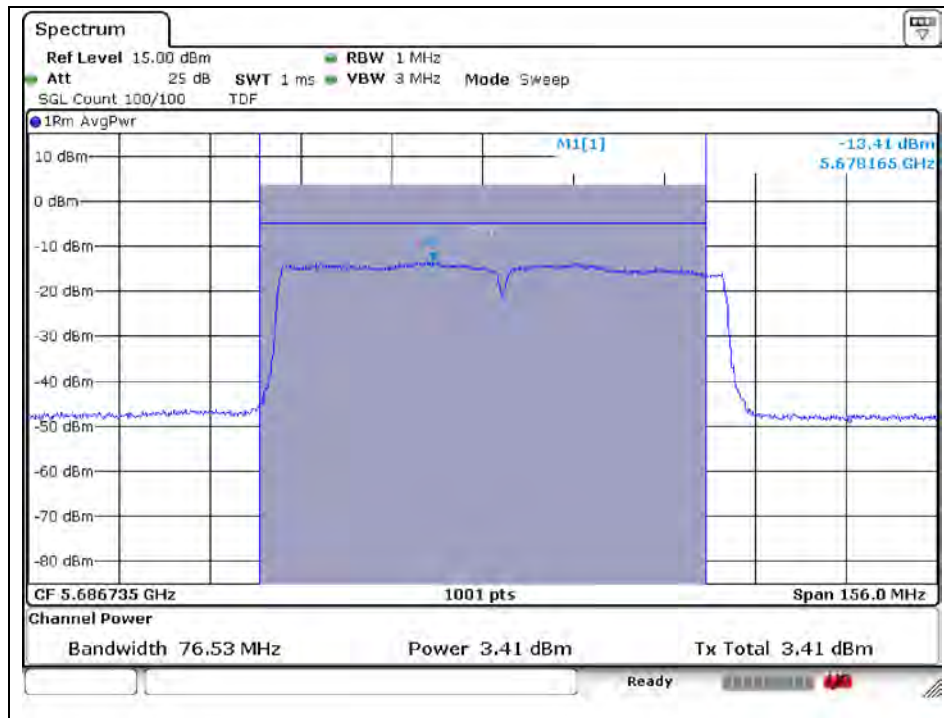
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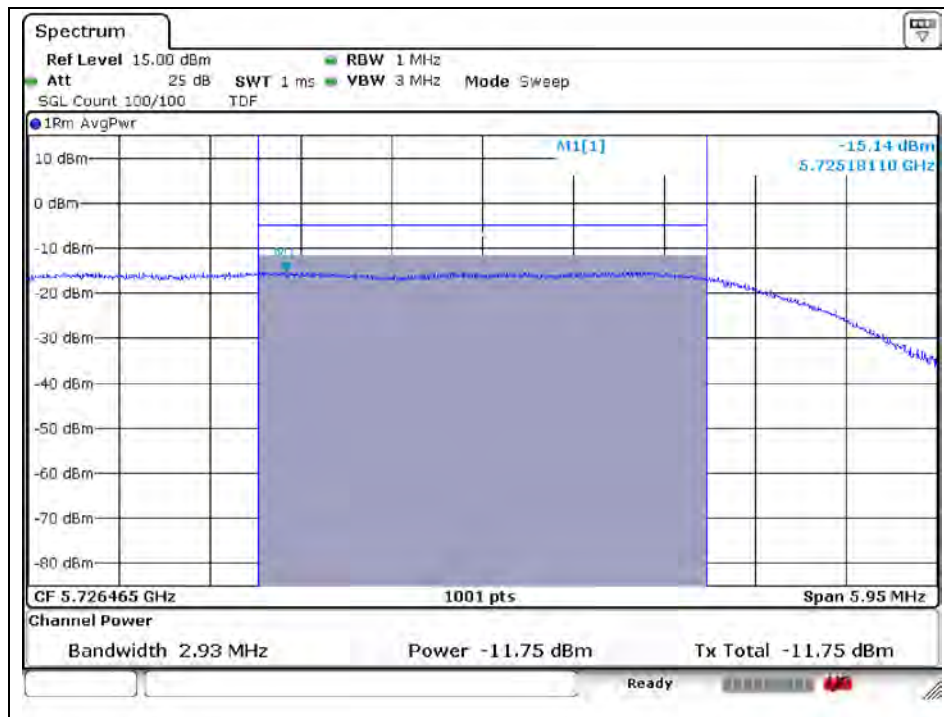
A4(210 mm x 297 mm)



### 802.11ac\_VHT80 (5 690 MHz)\_U-NII 2C



### 802.11ac\_VHT80 (5 690 MHz)\_U-NII 3



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## 6. Peak Power Spectral Density

### 6.1. Test setup



### 6.2. Limit

#### FCC 15.407 (a)(1)(iv)

For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### (a)(2)

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### (a)(3)

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

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### 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\_D02 v01r02.
  2. Create an average power spectrum for the EUT operating mode being tested by following the instructions in section II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, "Compute power...". (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)
  3. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
  4. Make the following adjustments to the peak value of the spectrum, if applicable:
    - a) **If Method SA-2 or SA-2 Alternative was used, add  $10 \log(1/x)$ , where  $x$  is the duty cycle, to the peak of the spectrum.**
    - b) If Method SA-3 Alternative was used and the linear mode was used in step II.E.2.g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.
  5. The result is the Maximum PSD over 1 MHz reference bandwidth.
  6. For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the specified measurement bandwidth (*i.e.*, 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth ( $< 1$  MHz, or  $< 500$  kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:
    - a) Set  $RBW \geq 1/T$ , where  $T$  is defined in section II.B.I.a).
    - b) Set  $VBW \geq 3$  RBW.
    - c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add  $10\log(500 \text{ kHz}/RBW)$  to the measured result, whereas RBW ( $< 500$  kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
    - d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add  $10\log(1 \text{ MHz}/RBW)$  to the measured result, whereas RBW ( $< 1$  MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
    - e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.
- Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections 5.c) and 5.d) above, since RBW = 100 kHz is available on nearly all spectrum analyzers.
7. In case of band crossing channels 138, 142 and 144, the measurement is complied with section D of KDB 644545\_D03 v01.

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## 6.4. Test result

Ambient temperature : (23 ± 1) °C

Relative humidity : 47 % R.H.

Band	Mode	Frequency (MHz)	Ch.	Data Rate	Measured PPSP (dB m)	Duty Factor (dB)	Final PPSP (dB m)	Limit (dB m/1 MHz)
U-NII 1	11a	5 180	36	6 Mbps	-0.21	0.32	0.11	11
		5 200	40	6 Mbps	0.10	0.32	0.42	11
		5 240	48	6 Mbps	-0.91	0.32	-0.59	11
	11n_HT20	5 180	36	MCS0	-0.89	0.32	-0.57	11
		5 200	40	MCS0	-0.51	0.32	-0.19	11
		5 240	48	MCS0	-1.53	0.32	-1.21	11
	11n_HT40	5 190	38	MCS0	-8.10	0.60	-7.50	11
		5 230	46	MCS0	-8.91	0.60	-8.31	11
	11ac_VHT80	5 210	42	MCS0	-12.35	1.14	-11.21	11
U-NII 2A	11a	5 260	52	6 Mbps	-1.12	0.32	-0.80	11
		5 280	56	6 Mbps	-1.00	0.32	-0.68	11
		5 320	64	6 Mbps	-1.44	0.32	-1.12	11
	11n_HT20	5 260	52	MCS0	-1.59	0.32	-1.27	11
		5 280	56	MCS0	-1.53	0.32	-1.21	11
		5 320	64	MCS0	-1.85	0.32	-1.53	11
	11n_HT40	5 270	54	MCS0	-7.71	0.60	-7.11	11
		5 310	62	MCS0	-8.08	0.60	-7.48	11
	11ac_VHT80	5 290	58	MCS0	-11.28	1.14	-10.14	11
U-NII 2C	11a	5 500	100	6 Mbps	-2.04	0.32	-1.72	11
		5 580	116	6 Mbps	-1.40	0.32	-1.08	11
		5 720	144	6 Mbps	-1.52	0.32	-1.20	11
	11n_HT20	5 500	100	MCS0	-2.51	0.32	-2.19	11
		5 580	116	MCS0	-2.16	0.32	-1.84	11
		5 720	144	MCS0	-2.15	0.32	-1.83	11
	11n_HT40	5 510	102	MCS0	-9.53	0.60	-8.93	11
		5 550	110	MCS0	-8.59	0.60	-7.99	11
		5 710	142	MCS0	-9.26	0.60	-8.66	11
	11ac_VHT80	5 530	106	MCS0	-11.95	1.14	-10.81	11
		5 690	138	MCS0	-11.78	1.14	-10.64	11

Band	Mode	Frequency (MHz)	Ch.	Data Rate	Measured PPSP (dB m)	Duty Factor (dB)	Final PPSP (dB m)	Limit (dB m/500 kHz)
U-NII 3	11a	5 745	149	6 Mbps	-5.81	0.32	-5.49	30
		5 785	157	6 Mbps	-5.71	0.32	-5.39	30
		5 825	165	6 Mbps	-5.15	0.32	-4.83	30
	11n_HT20	5 745	149	MCS0	-6.27	0.32	-5.95	30
		5 785	157	MCS0	-6.19	0.32	-5.87	30
		5 825	165	MCS0	-5.48	0.32	-5.16	30
	11n_HT40	5 755	151	MCS0	-13.08	0.60	-12.48	30
		5 795	159	MCS0	-12.96	0.60	-12.36	30
	11ac_VHT80	5 775	155	MCS0	-15.63	1.14	-14.49	30

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### - Band-crossing channels.

Band	Mode	Frequency (MHz)	Ch.	Data Rate	Measured PPSD (dB m)	Duty Factor (dB)	Final PPSD (dB m)	Limit (dBm/500 MHz)
<b>U-NII 3 (Band-crossing channel)</b>	11a	5 720	144	6 Mbps	-6.12	0.32	-5.80	30
	11n_HT20	5 720	144	MCS0	-6.60	0.32	-6.28	30
	11n_HT40	5 710	142	MCS0	-13.92	0.60	-13.32	30
	11ac_VHT80	5 690	138	MCS0	-18.77	1.14	-17.63	30

Note : Final PPSD (dB m) = Measured PPSD (dB m) + Duty Factor (dB)

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RTT5041-20(2015.10.01)(3)

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A4(210 mm x 297 mm)

## 802.11a (Band 1)

Low Channel (5 180 MHz)



Middle Channel (5 200 MHz)



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A4(210 mm x 297 mm)

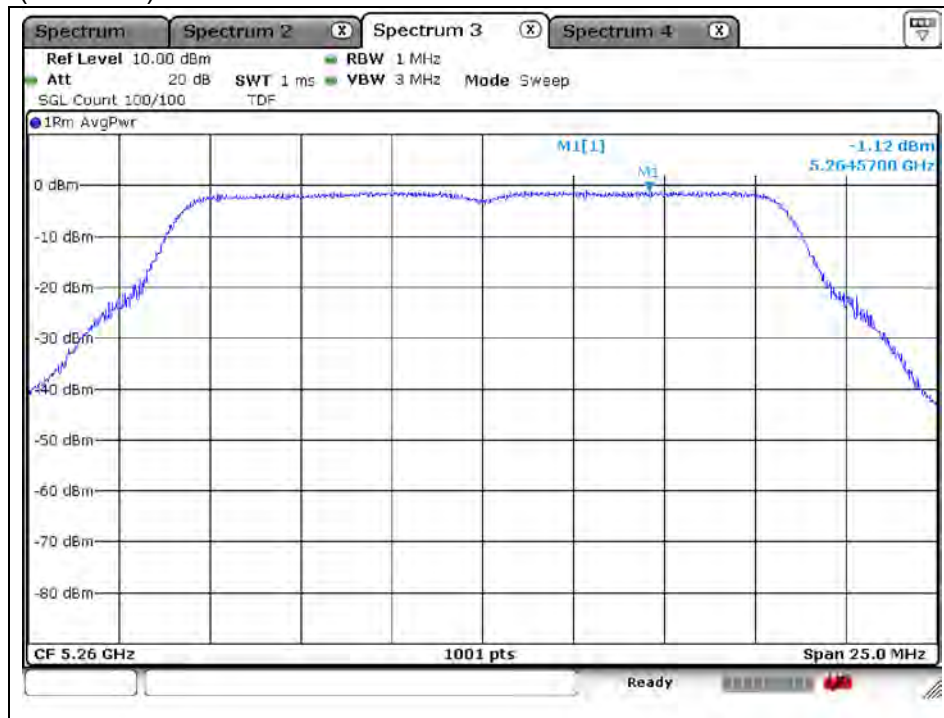


## High Channel (5 240 MHz)



## 802.11a (Band 2A)

### Low Channel (5 260 MHz)



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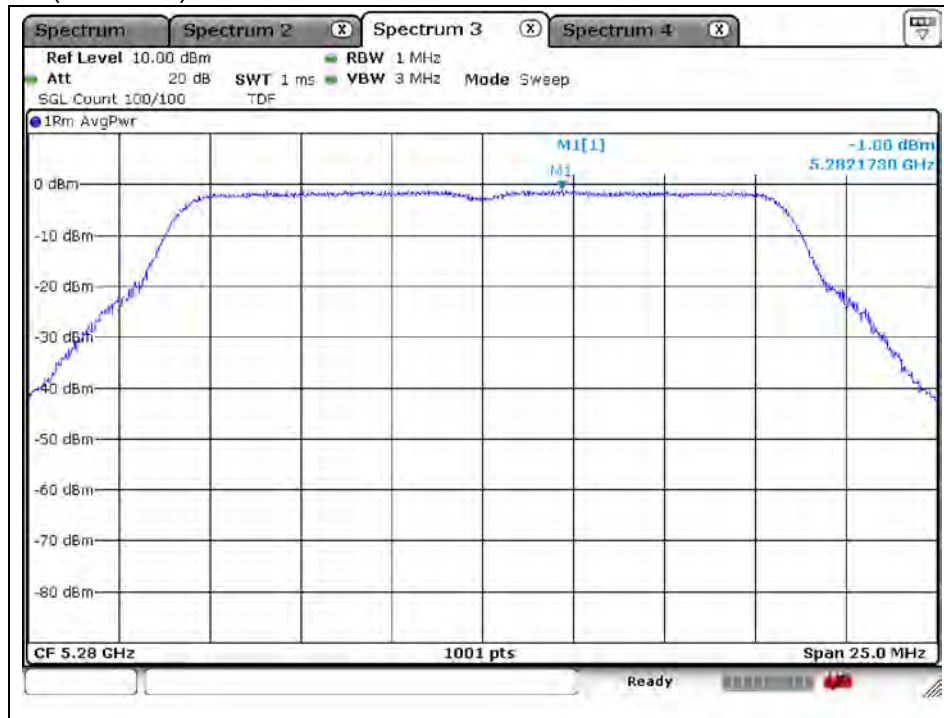
SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

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A4(210 mm x 297 mm)

## Middle Channel (5 280 MHz)



## High Channel (5 320 MHz)



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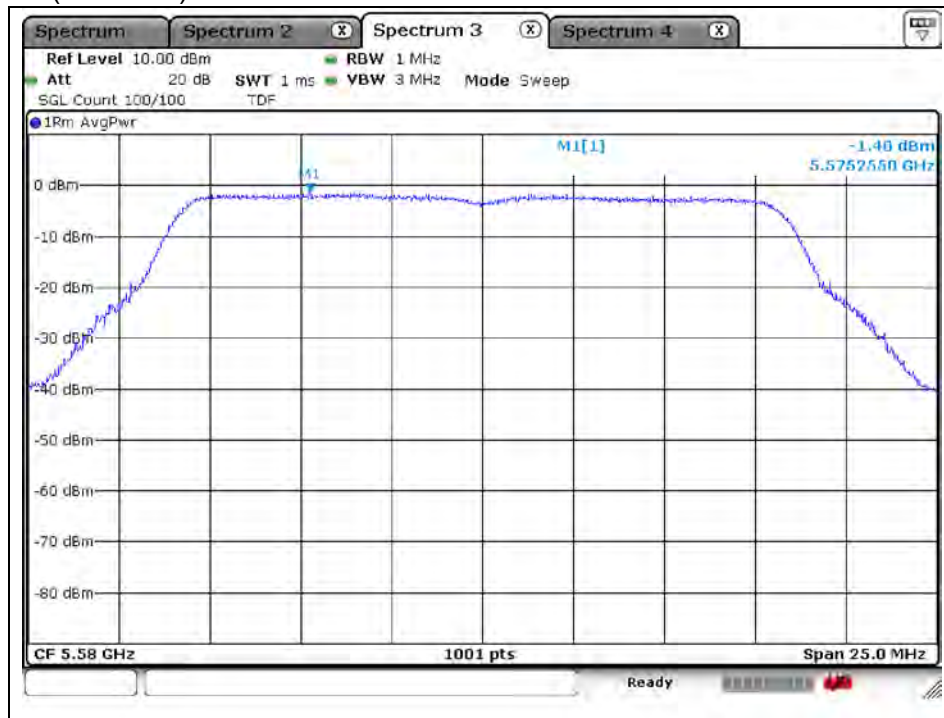
A4(210 mm x 297 mm)

## 802.11a (Band 2C)

Low Channel (5 500 MHz)



Middle Channel (5 580 MHz)



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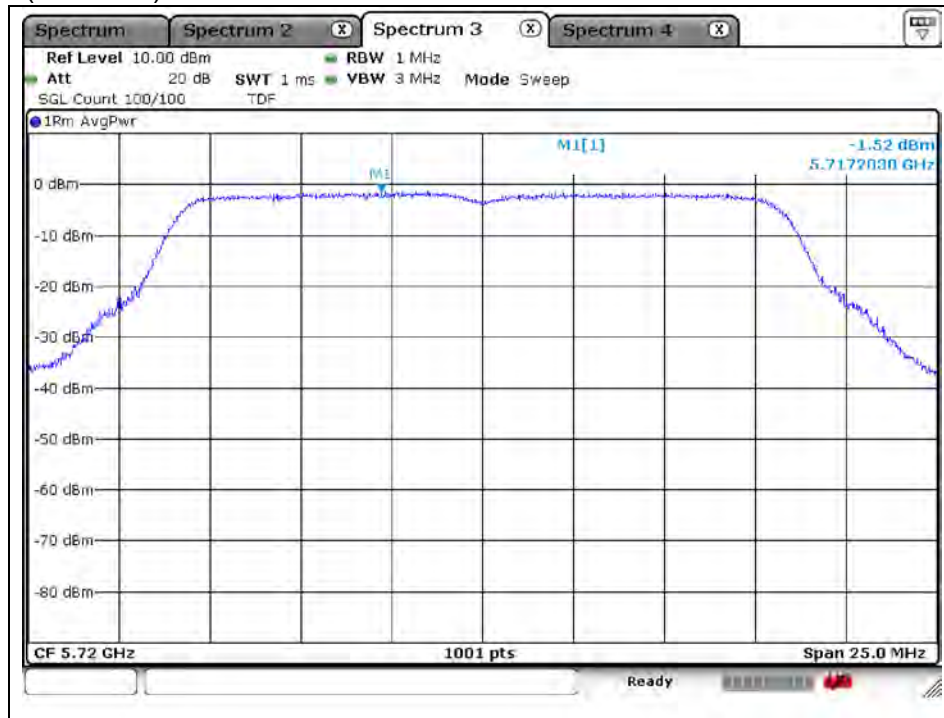
SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

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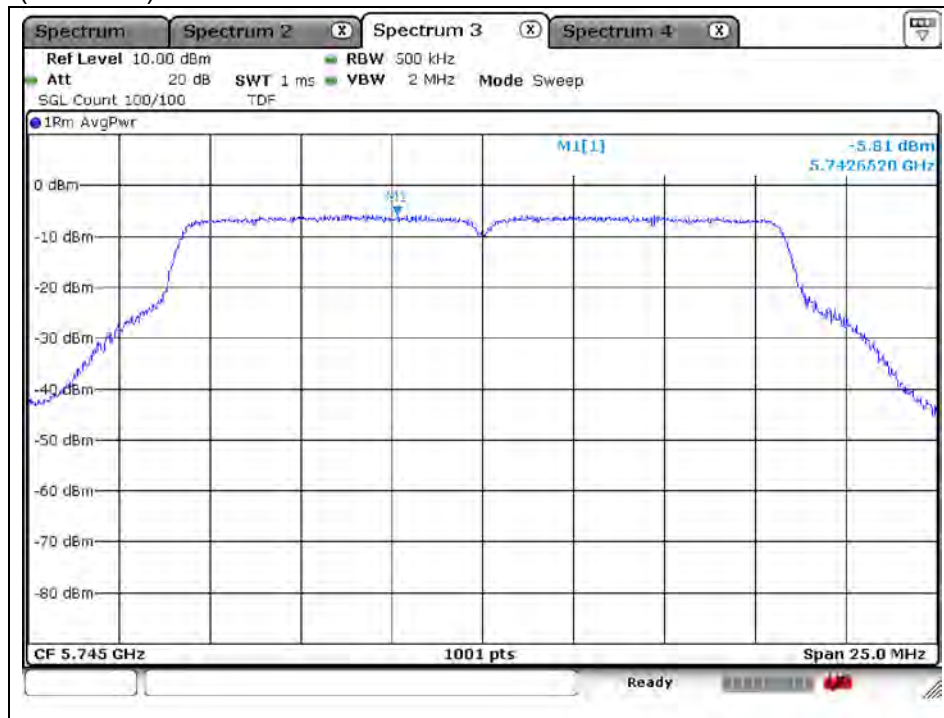
A4(210 mm x 297 mm)

## High Channel (5 720 MHz)



## 802.11a (Band 3)

### Low Channel (5 745 MHz)



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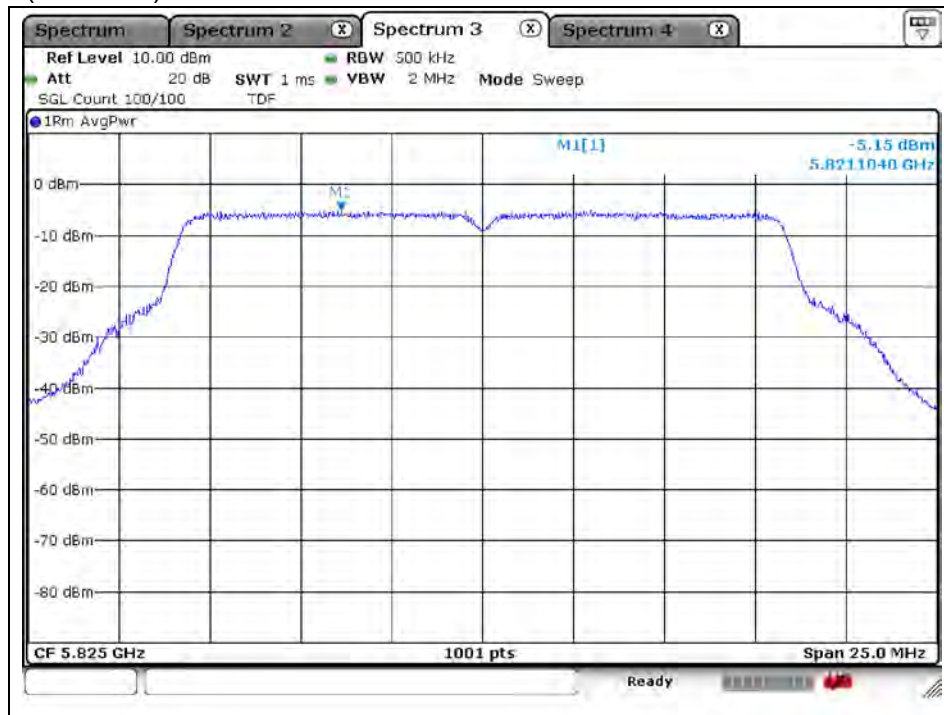
A4(210 mm x 297 mm)



## Middle Channel (5 785 MHz)



## High Channel (5 825 MHz)



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A4(210 mm x 297 mm)

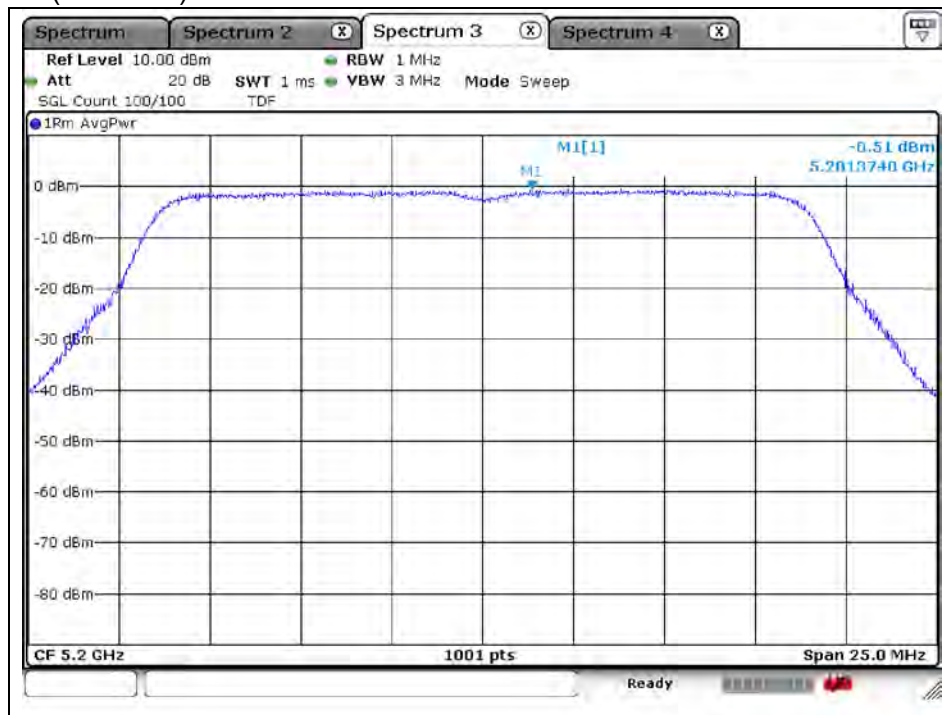


## 802.11n\_HT20 (Band 1)

Low Channel (5 180 MHz)



Middle Channel (5 200 MHz)



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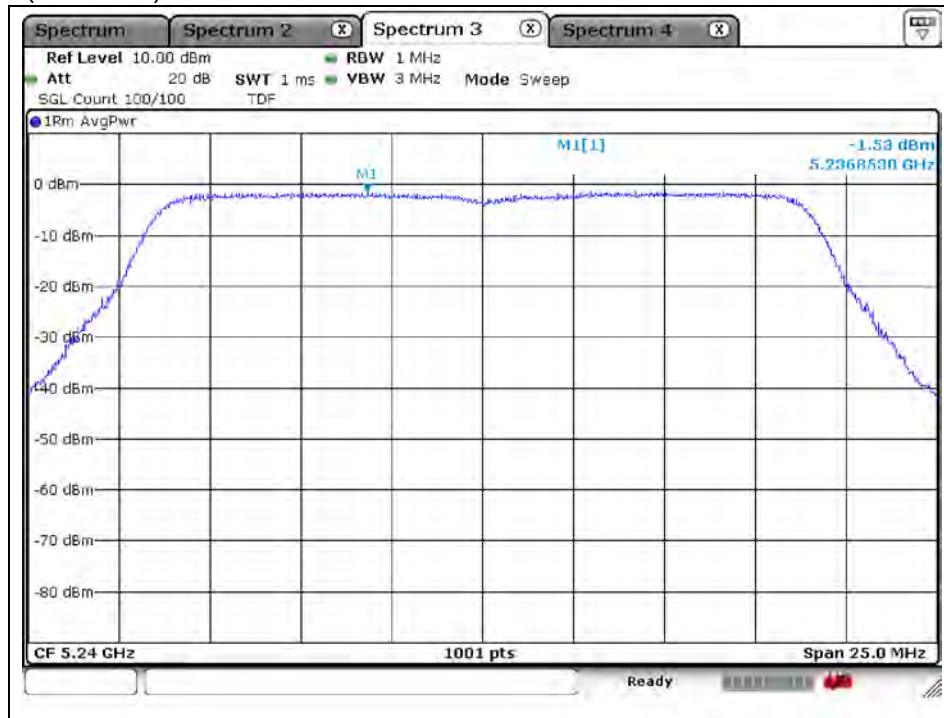
SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

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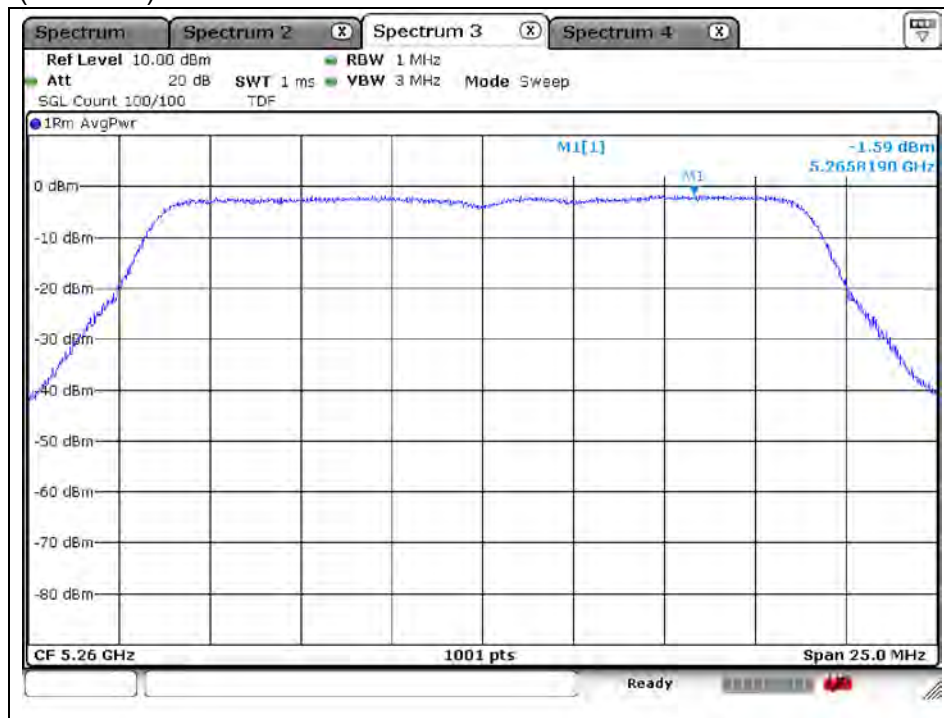
A4(210 mm x 297 mm)

## High Channel (5 240 MHz)



## 802.11n\_HT20 (Band 2A)

### Low Channel (5 260 MHz)



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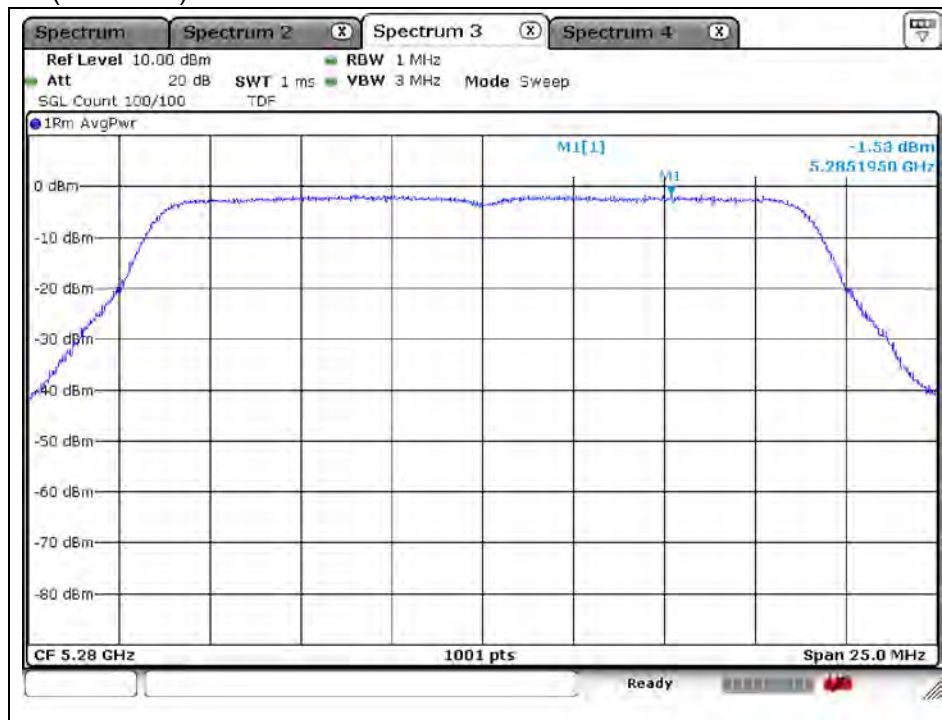
SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-20(2015.10.01)(3)

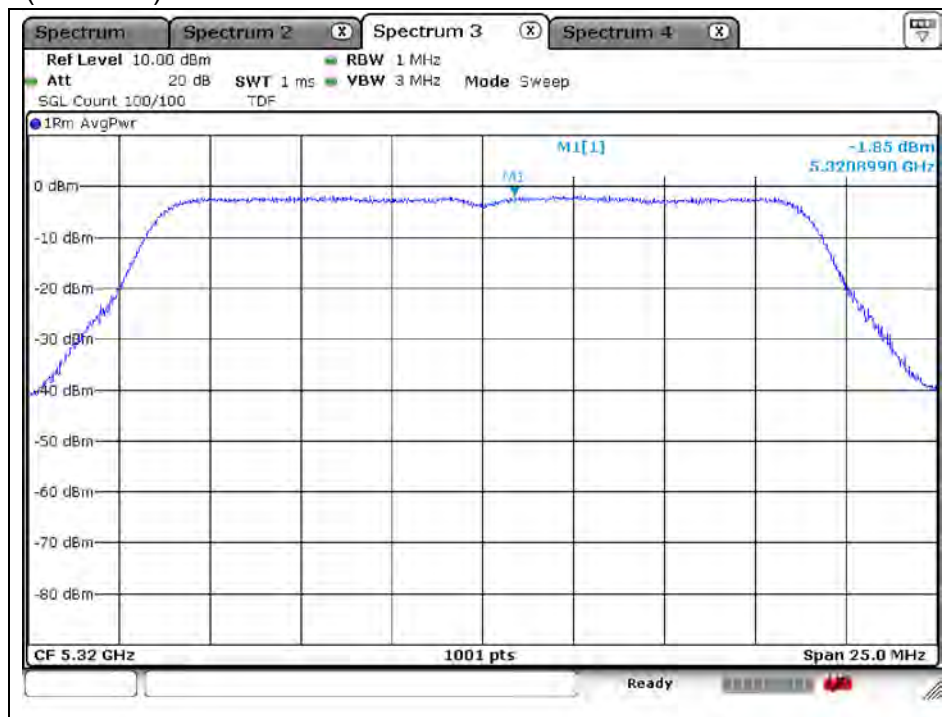
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A4(210 mm x 297 mm)

## Middle Channel (5 280 MHz)



## High Channel (5 320 MHz)



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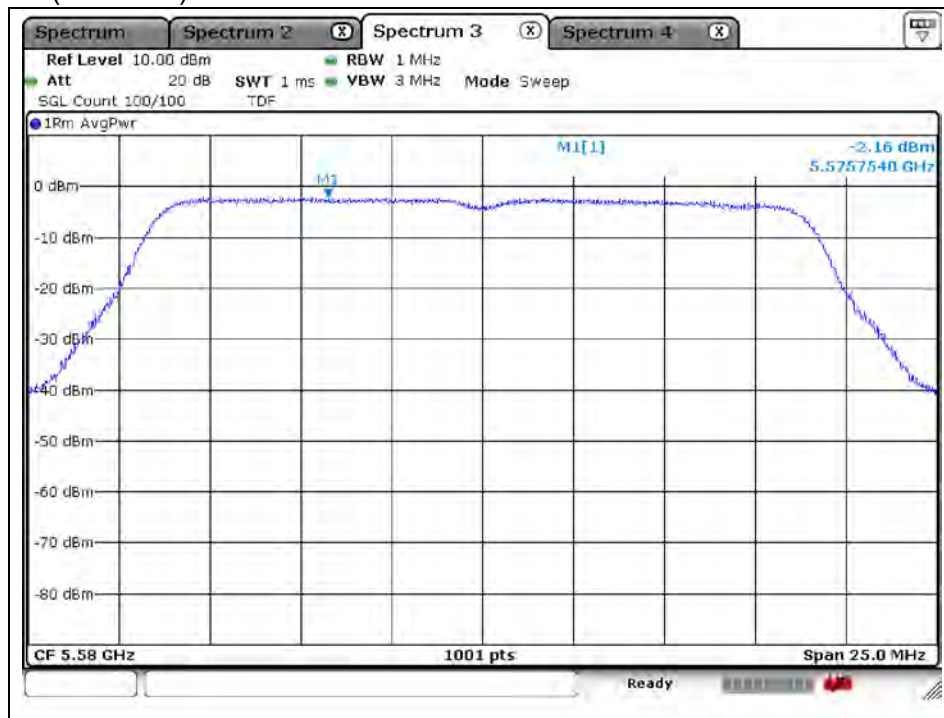
A4(210 mm x 297 mm)

### 802.11n\_HT20 (Band 2C)

Low Channel (5 500 MHz)



Middle Channel (5 580 MHz)



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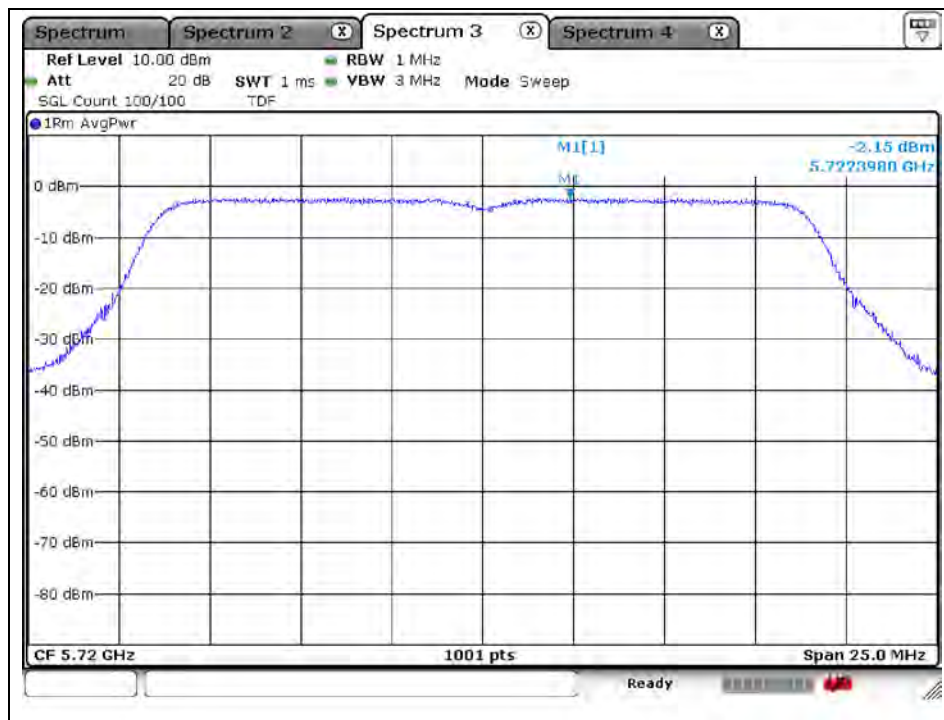
RTT5041-20(2015.10.01)(3)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

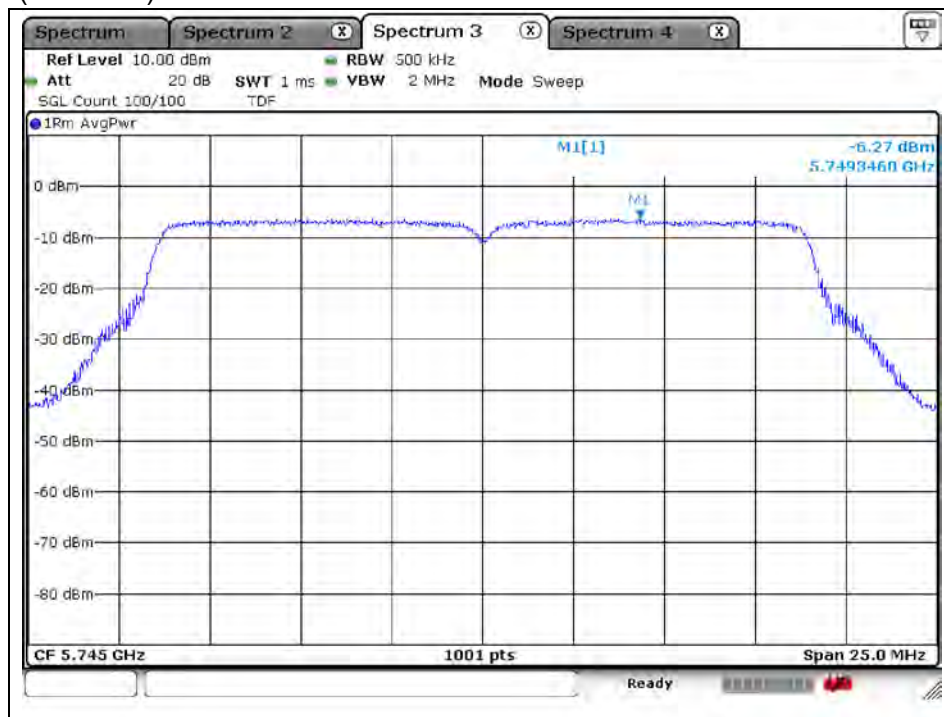


## High Channel (5 720 MHz)



## 802.11n\_HT20 (Band 3)

### Low Channel (5 745 MHz)



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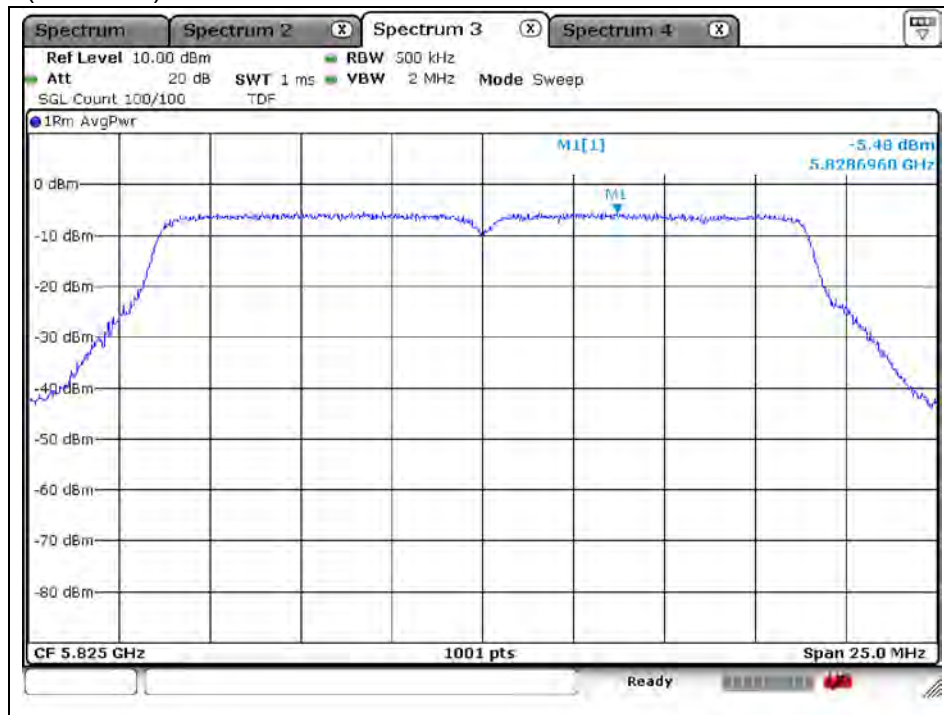
A4(210 mm x 297 mm)



## Middle Channel (5 785 MHz)



## High Channel (5 825 MHz)



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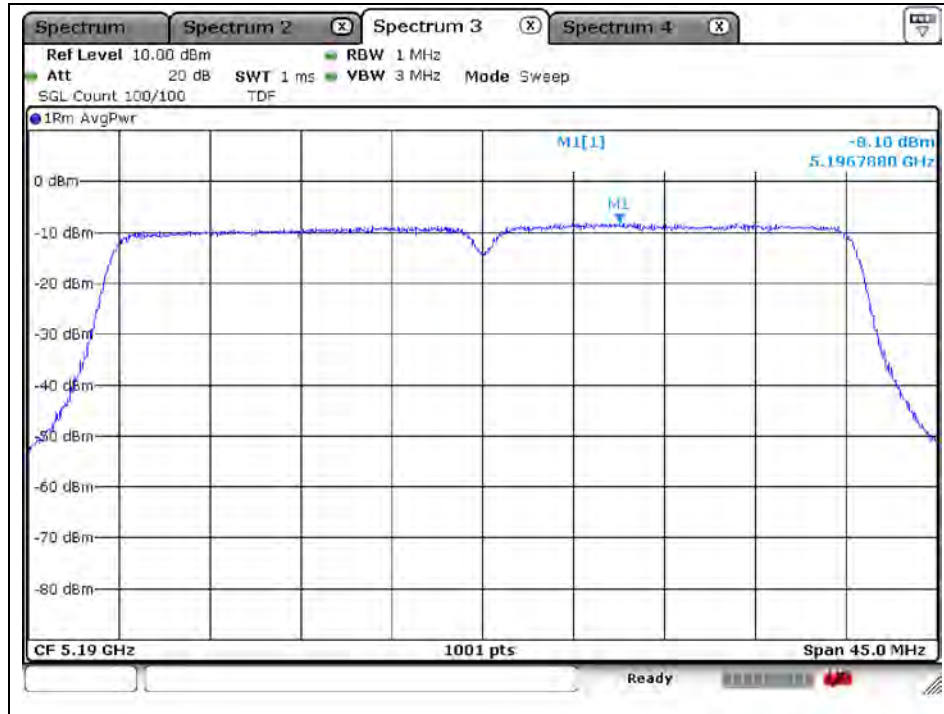
RTT5041-20(2015.10.01)(3)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

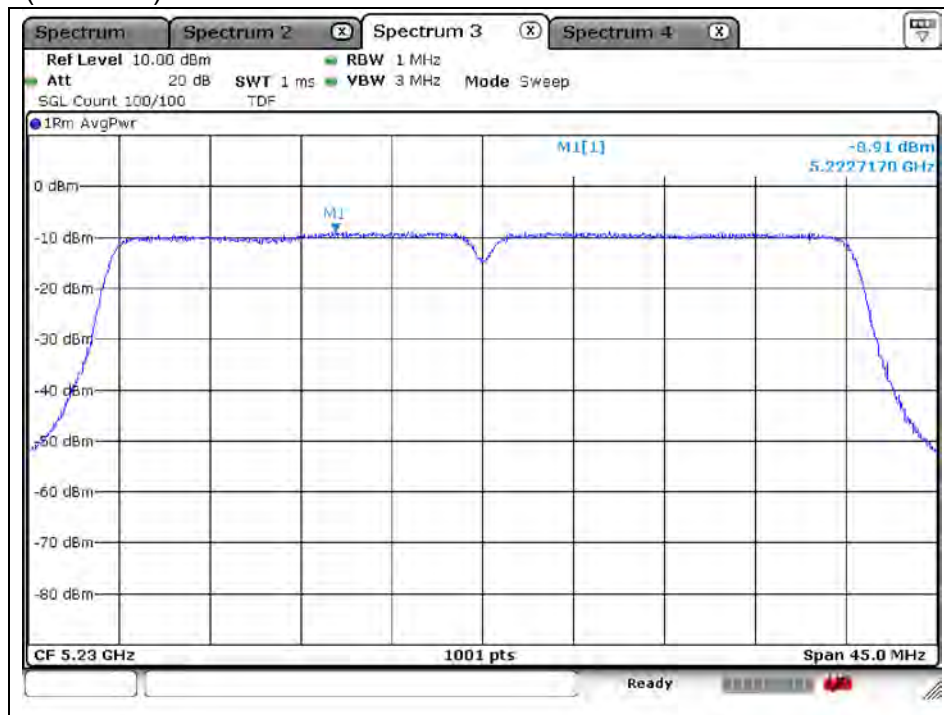
A4(210 mm x 297 mm)

## 802.11n\_HT40 (Band 1)

Low Channel (5 190 MHz)



High Channel (5 230 MHz)



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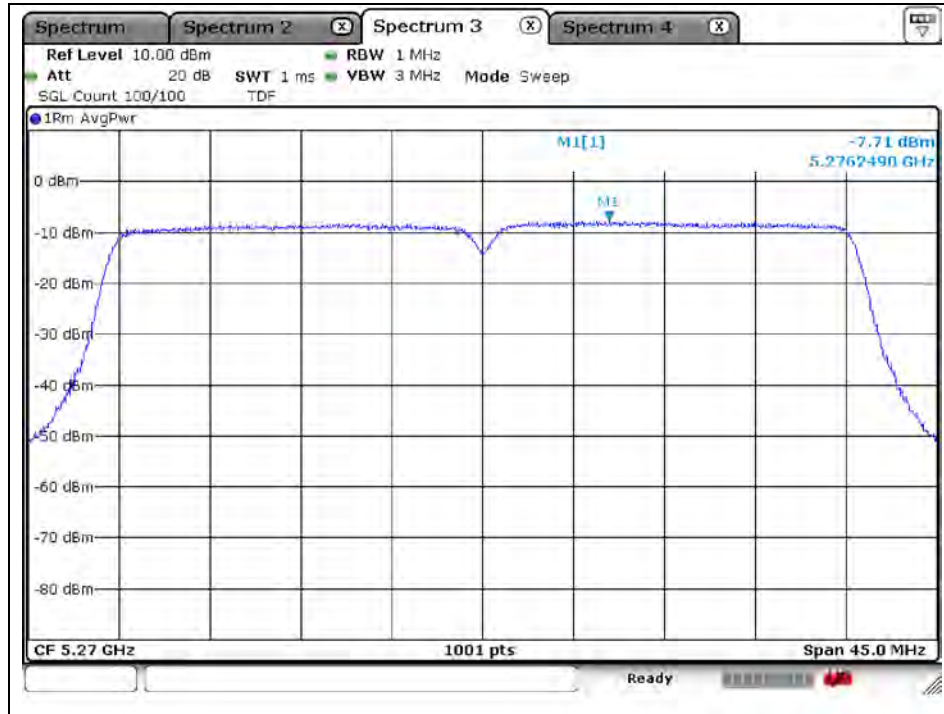
RTT5041-20(2015.10.01)(3)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

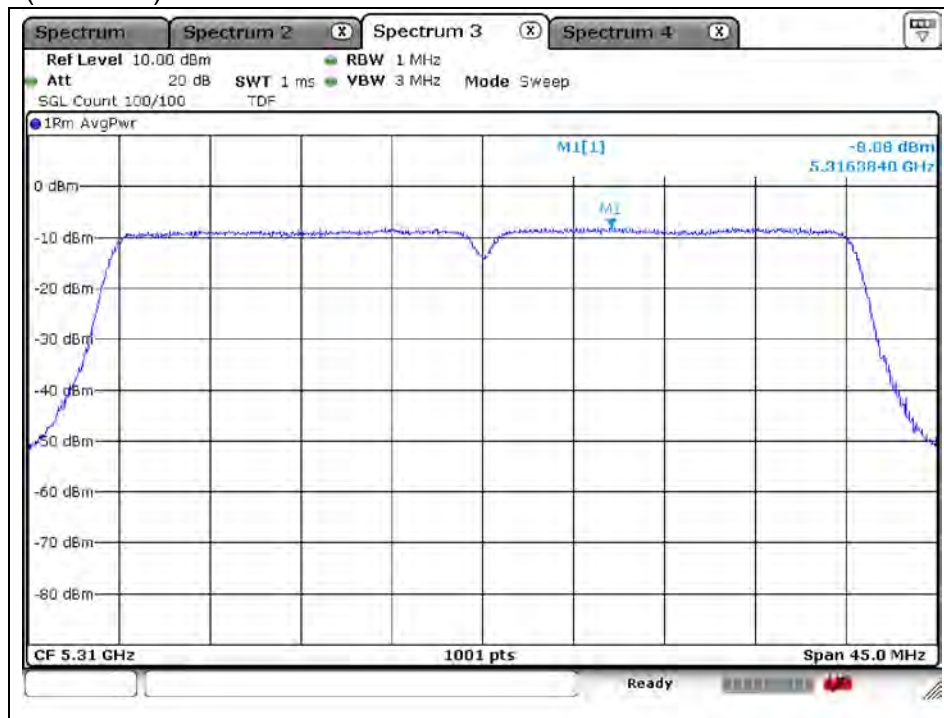
A4(210 mm x 297 mm)

## 802.11n\_HT40 (Band 2A)

Low Channel (5 270 MHz)



High Channel (5 310 MHz)



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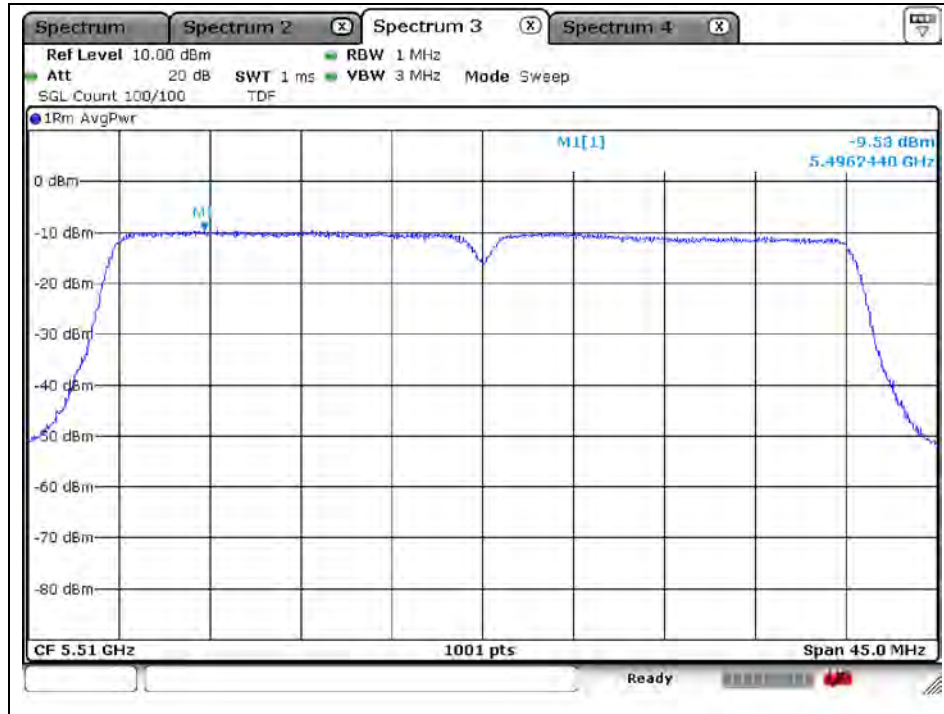
RTT5041-20(2015.10.01)(3)

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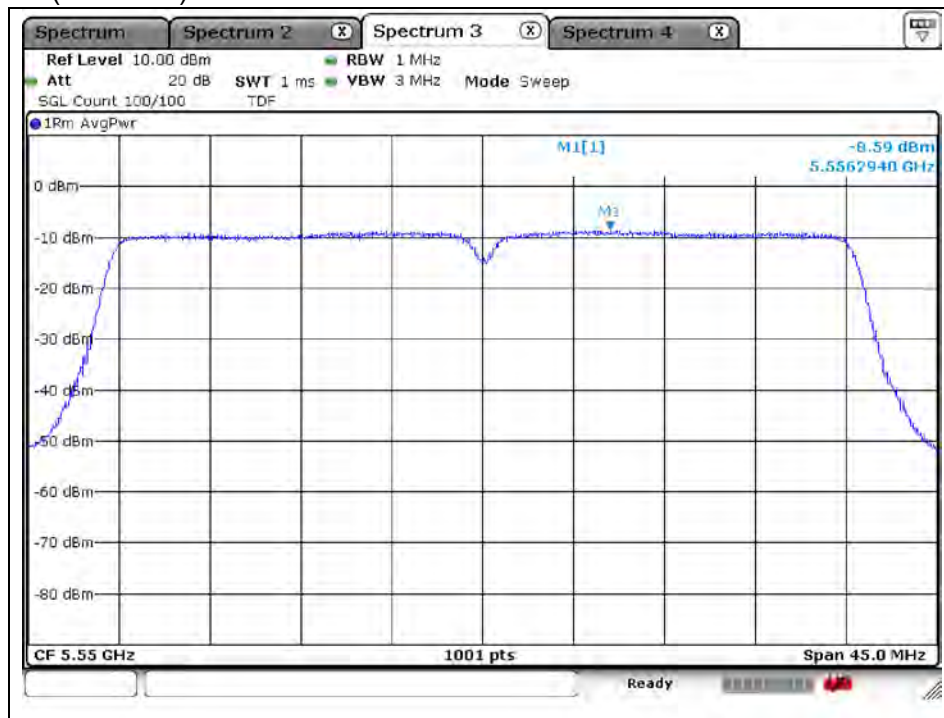
A4(210 mm x 297 mm)

## 802.11n\_HT40 (Band 2C)

Low Channel (5 510 MHz)



Middle Channel (5 550 MHz)



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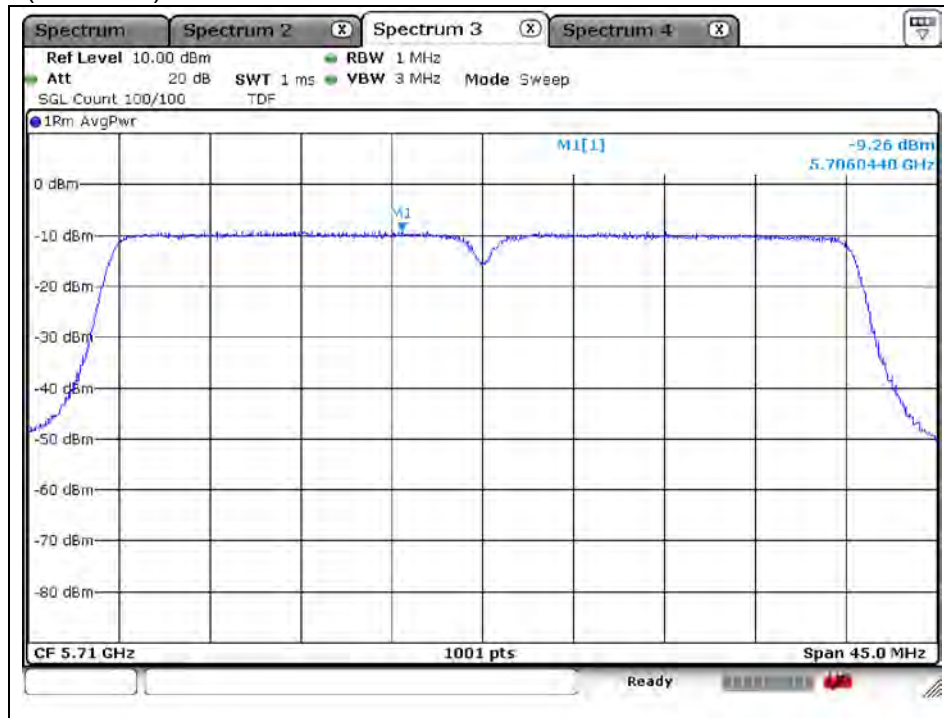
RTT5041-20(2015.10.01)(3)

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A4(210 mm x 297 mm)

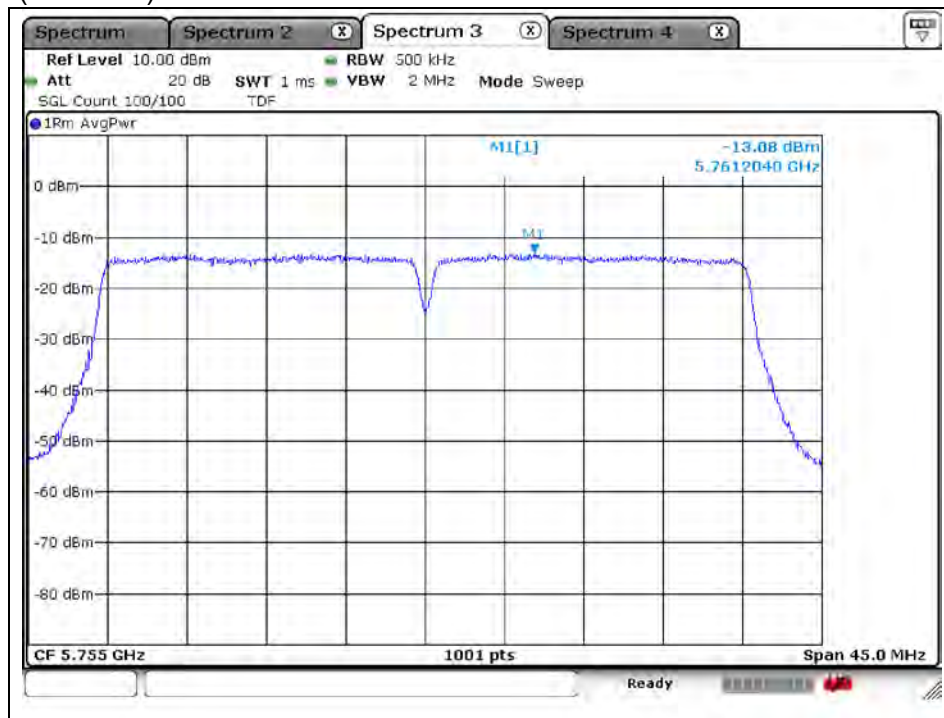


## High Channel (5 710 MHz)



## 802.11n\_HT40 (Band 3)

### Low Channel (5 755 MHz)



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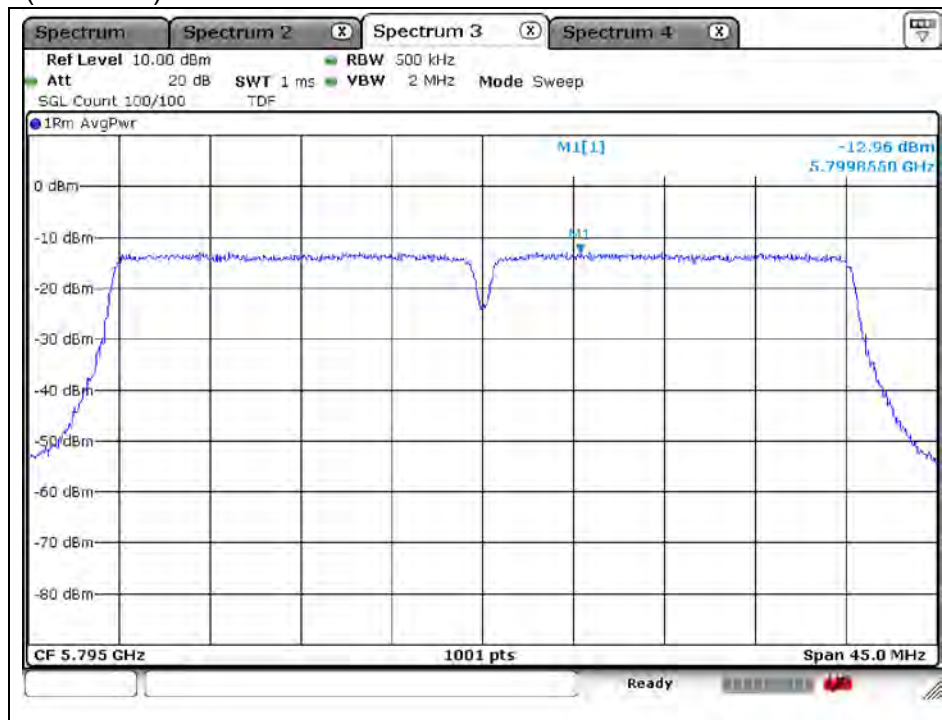
RTT5041-20(2015.10.01)(3)

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A4(210 mm x 297 mm)

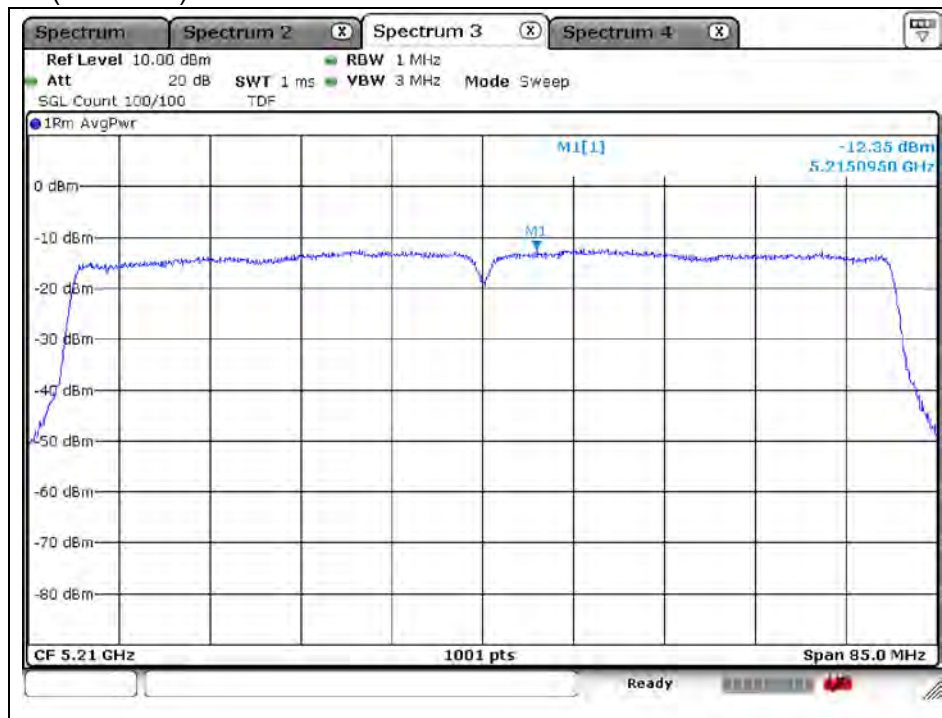


## High Channel (5 795 MHz)



## 802.11ac\_VHT80 (Band 1)

### Middle Channel (5 210 MHz)



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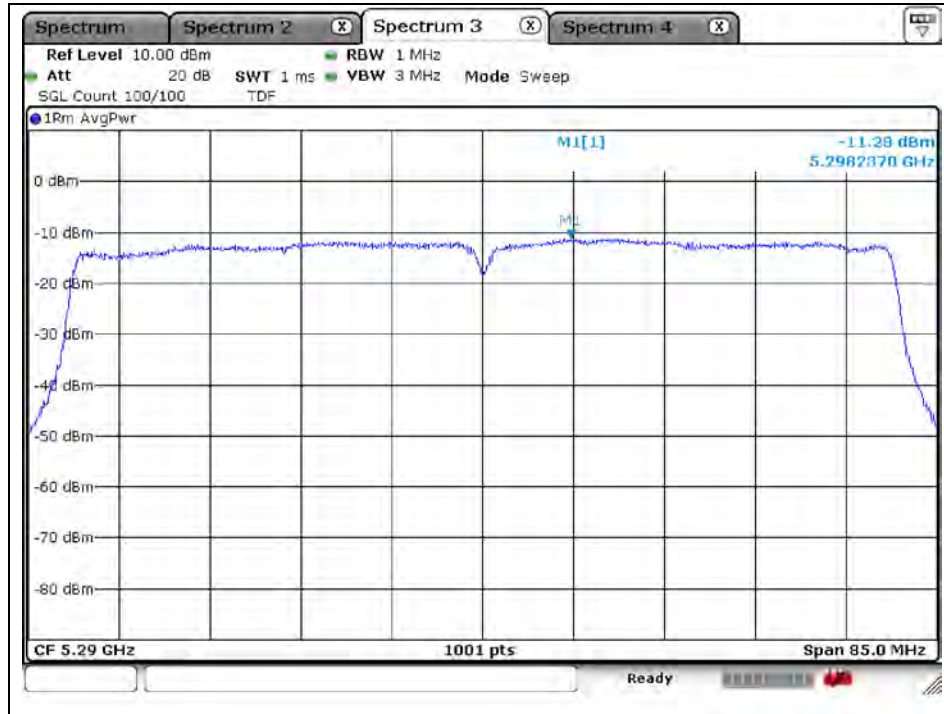
RTT5041-20(2015.10.01)(3)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

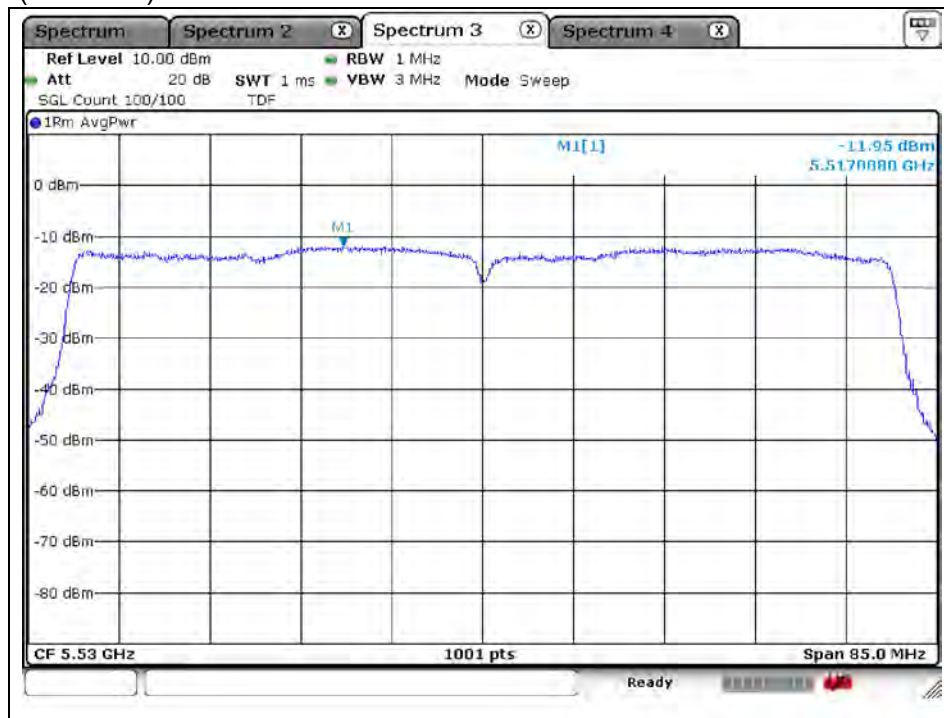
### 802.11ac\_VHT80 (Band 2A)

Middle Channel (5 290 MHz)



### 802.11ac\_VHT80 (Band 2C)

Low Channel (5 530 MHz)



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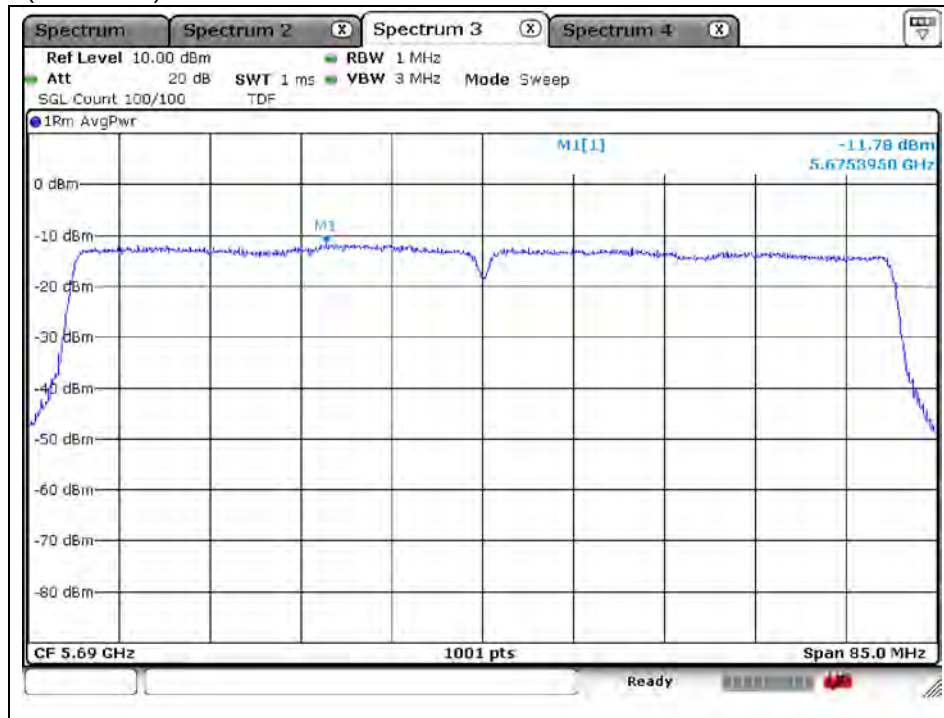
SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

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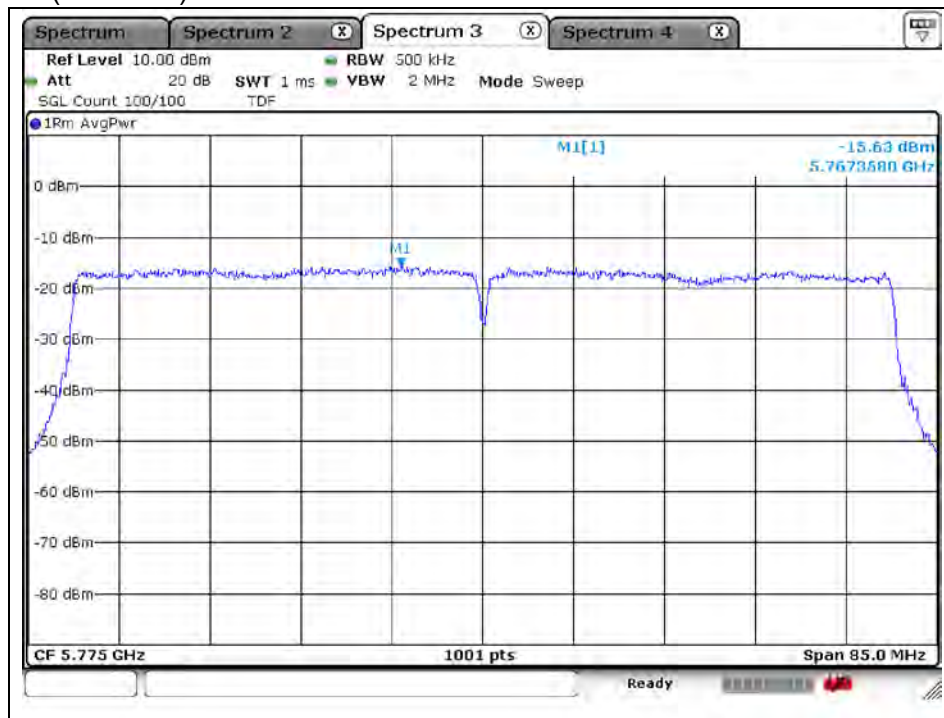
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A4(210 mm x 297 mm)

## High Channel (5 690 MHz)



## 802.11ac\_VHT80 (Band 3) Middle Channel (5 775 MHz)



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A4(210 mm x 297 mm)

## Band-crossing channels

U-NII 3 11a (5 720 MHz)



U-NII 3 11n\_HT20 (5 720 MHz)



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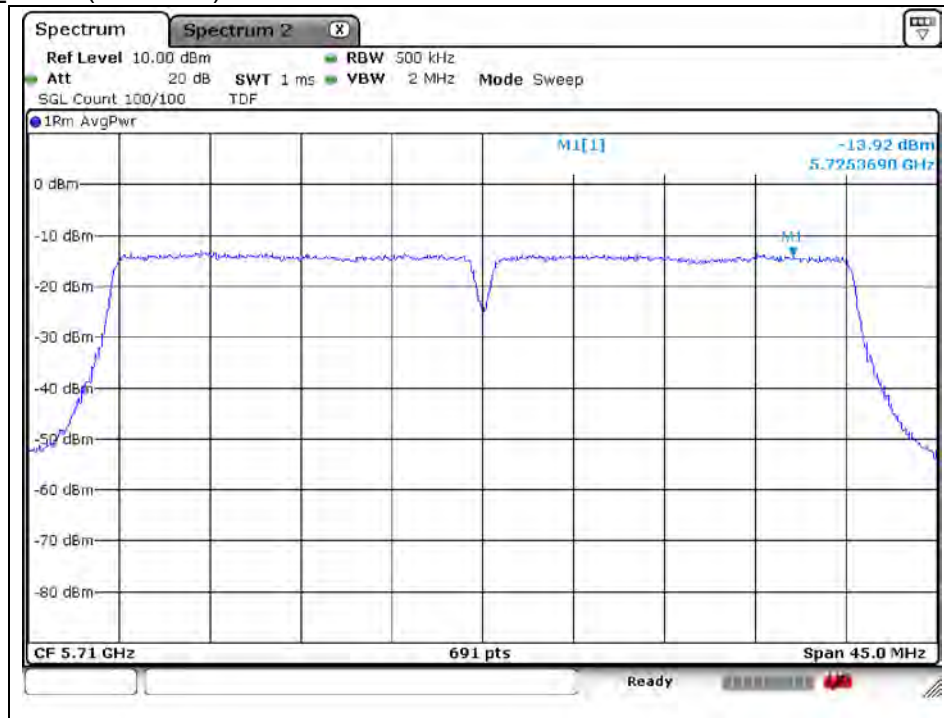
RTT5041-20(2015.10.01)(3)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

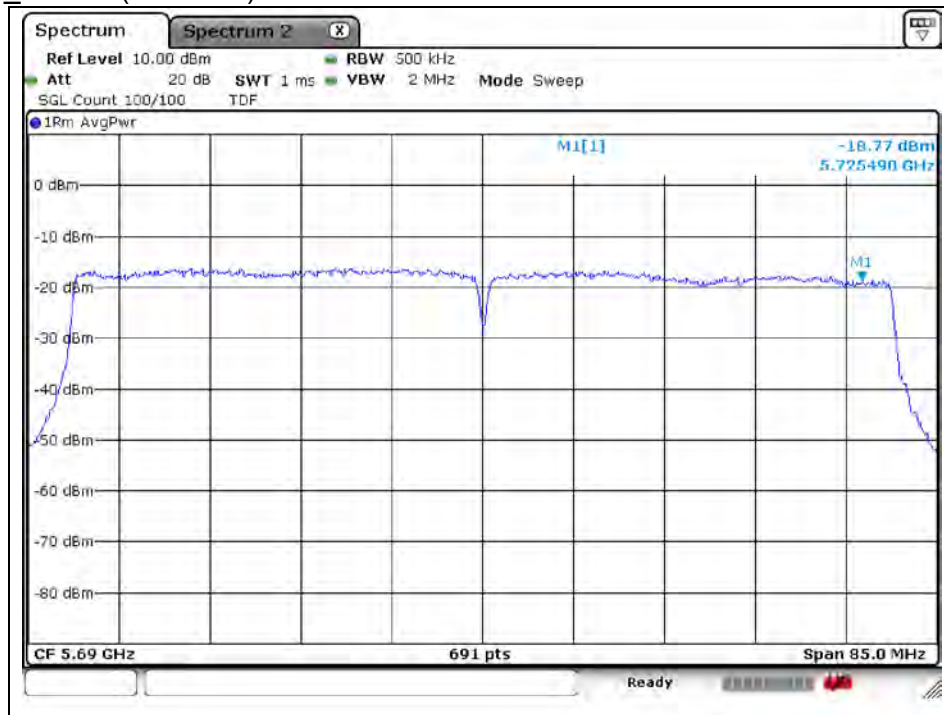
A4(210 mm x 297 mm)



## U-NII 3 11n\_HT40 (5 710 MHz)



## U-NII 3 11ac\_VHT80 (5 690 MHz)



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Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)



## 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 §15.407 (a) if transmitting antennas of directional gain greater than 6 dBi 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 Pcb type and peak max gain of antenna as below.

Band	5 180 MHz – 5 320 MHz	5 500 MHz – 5 720 MHz	5 745 MHz – 5 825 MHz
Mode	11a/n_HT20, HT40, 11ac_VHT20, VHT40, VHT80		
Gain	2.89 dBi	2.51 dBi	5.78 dBi

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A4(210 mm x 297 mm)