

TEST REPORT

KCTL Inc.

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Report No.:
KR20-SRF0030-D
Page (1) of (1046)

KCTL

1. Client

- Name : KAON Media Co.,Ltd.
- Address : Kaonmedia Building, 884-3, Seongnam-daero, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea
- Date of Receipt : 2019-11-11

2. Use of Report : Certification

3. Name of Product and Model : AP Router / AR2146

4. Manufacturer and Country of Origin : KAON Media Co.,Ltd. / Korea

5. FCC ID : WQT-AP5000

6. Date of Test : 2019-12-04 to 2020-02-26

7. Test Standards : FCC Part 15 Subpart E, 15.407

8. Test Results : Refer to the test result in the test report

Affirmation	Tested by Name : Euijung Kim (Signature)	Technical Manager Name : Bobae Lee (Signature)
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2020-02-27

KCTL Inc.

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Page (2) of (1046)

**Report revision history**

Date	Revision	Page No
2020-02-03	Initial report	-
2020-02-10	Updated	19~22, 137~140, 255~258
2020-02-19	Updated	360,361,365, 369,373
2020-02-26	Updated	10,11,12,19,21, 22,40,41, 79~133,137, 139,140,142, 143,198~252, 1046
2020-02-27	Updated	141

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Note. The report No. KR20-SRF0030-C is superseded by the report No. KR20-SRF0030-D.

CONTENTS

1. General information	4
2. Device information	4
2.1. Accessory information	5
2.2. Information about derivative model.....	5
2.3. Frequency/channel operations.....	6
2.4. Duty Cycle Correction Factor.....	7
2.5. Power level setup in software	10
3. Antenna requirement	12
3.1 Antenna information.....	12
3.2 Directional Gain Calculations.....	12
4. Summary of tests.....	13
5. Measurement uncertainty	14
6. Measurement results explanation example	15
7. Test results	16
7.1. Maximum conducted output power.....	16
7.2. Maximum Power Spectral Density	135
7.3. 26 dB Bandwidth.....	254
7.4. 6 dB Bandwidth.....	359
7.5. Frequency Stability	377
7.6. Spurious Emission, Band Edge and Restricted bands.....	382
7.7. AC Conducted emission	1044
8. Measurement equipment	1046

1. General information

Client : KAON Media Co.,Ltd.
Address : Kaonmedia Building, 884-3, Seongnam-daero, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea
Manufacturer : KAON Media Co.,Ltd.
Address : Kaonmedia Building, 884-3, Seongnam-daero, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea
Laboratory : KCTL Inc.
Address : 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea
Accreditations : FCC Site Designation No: KR0040, FCC Site Registration No: 687132
VCCI Registration No. : R-20080, G-20078, C-20059, T-20056
Industry Canada Registration No. : 8035A
KOLAS No.: KT231

2. Device information

Equipment under test : AP Router
Model : AR2146
Derivative model : EVO5000AP
Frequency range : 2 412 MHz ~ 2 462 MHz (802.11b/g/n_HT20)
2 422 MHz ~ 2 452 MHz (802.11n_HT40)
UNII-1: 5 180 MHz ~ 5 240 MHz (11a/n_HT20/ac_VHT20)
UNII-1: 5 190 MHz ~ 5 230 MHz (11n_HT40/ac_VHT40)
UNII-1: 5 210 MHz (11ac_VHT80)
UNII-2A: 5 260 MHz ~ 5 320 MHz (11a/n_HT20/ac_VHT20)
UNII-2A: 5 270 MHz ~ 5 310 MHz (11n_HT40/ac_VHT40)
UNII-2A: 5 290 MHz (11ac_VHT80)
UNII-2C: 5 500 MHz ~ 5 720 MHz (11a/n_HT20/ac_VHT20)
UNII-2C: 5 510 MHz ~ 5 710 MHz (11n_HT40/ac_VHT40)
UNII-2C: 5 530 MHz ~ 5 690 MHz (11ac_VHT80)
UNII-3: 5 745 MHz ~ 5 825 MHz (11a/n_HT20/ac_VHT20)
UNII-3: 5 755 MHz ~ 5 795 MHz (11n_HT40/ac_VHT40)
UNII-3: 5 775 MHz (11ac_VHT80)
Modulation technique : DSSS (802.11b)
OFDM (802.11a/g/n_HT20/ HT40/ac_VHT20/ VHT40/ VHT80)
Number of channels : 11 ch (802.11b/g/n_HT20)_2.4 GHz Band
9 ch (802.11n_HT40)_2.4 GHz Band
UNII-1: 4 ch (20 MHz), 2 ch (40 MHz), 1 ch (80 MHz)
UNII-2A: 4 ch (20 MHz), 2 ch (40 MHz), 1 ch (80 MHz)
UNII-2C: 12 ch (20 MHz), 6 ch (40 MHz), 3 ch (80 MHz)
UNII-3: 5 ch (20 MHz), 2 ch (40 MHz), 1 ch (80 MHz)
Power source : DC 12 V
Antenna specification : PCB Antenna
2.4G 1.88 dBi
UNII-1 1.98 dBi
UNII-2A 1.97 dBi

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Page (5) of (1046)



UNII-2C 1.94 dBi

UNII-3 1.86 dBi

Software version : 1.0.22

Hardware version : 1.0

Operation temperature : 22 °C

2.1. Accessory information

Equipment	Manufacturer	Model	Serial No.	FCC ID
AC Adapter	Chenzhou Frcem Electronics Co.,Ltd	F24L9-120200SPAU	N/A	N/A

2.2. Information about derivative model

The difference between basic model and derivative models is:

The basic and derivative model are electrically identical.

The derivative models is only for the simplified derivation based on buyer's model name.



2.3. Frequency/channel operations

This device contains the following capabilities:

2.4 GHz WIFI: WLAN 802.11b/g/n(HT20,HT40)

5 GHz WIFI: WLAN 802.11a/g/n(HT20,HT40)/ac(VHT20,VHT40,VHT80)

UNII-1

Ch.	Frequency (MHz)
36	5 180
44	5 220
48	5 240

UNII-2A

Ch.	Frequency (MHz)
52	5 260
60	5 300
64	5 320

UNII-2C

Ch.	Frequency (MHz)
100	5 500
120	5 600
140	5 700
144	5 720

UNII-3

Ch.	Frequency (MHz)
149	5 745
157	5 785
165	5 825

Table 2.3.1. 802.11a/n/ac_HT20/VHT20 mode

UNII-1

Ch.	Frequency (MHz)
38	5 190
46	5 230

UNII-2A

Ch.	Frequency (MHz)
54	5 270
62	5 310

UNII-2C

Ch.	Frequency (MHz)
102	5 510
118	5 590
134	5 670
142	5 710

UNII-3

Ch.	Frequency (MHz)
151	5 755
159	5 795

Table 2.3.2. 802.11n/ac_HT40/VHT40 mode

UNII-1

Ch.	Frequency (MHz)
42	5 210

UNII-2A

Ch.	Frequency (MHz)
58	5 290

UNII-2C

Ch.	Frequency (MHz)
106	5 530
122	5 610
138	5 690

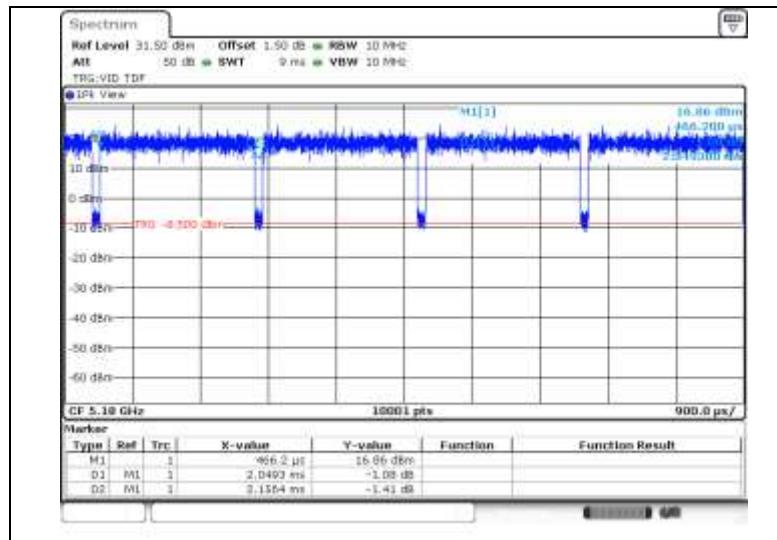
UNII-3

Ch.	Frequency (MHz)
155	5 775

Table 2.3.3 802.11ac_VHT80 mode

2.4. Duty Cycle Correction Factor

- 802.11a

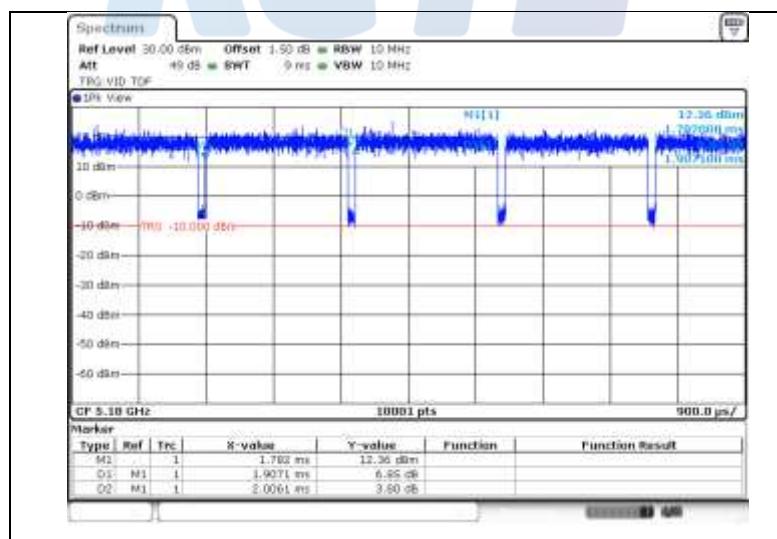


Note₁): period: 2.156 4 ms, On time: 2.049 3 ms

Note₂): DCCF = $10 \log(1 / x) = 10 \log(1/0.950) = 0.22$ dB, $x = 2.049\ 3 / 2.156\ 4 = 0.950$ (95.0%)

Note₃): 802.11a is a non-continuous transmission (duty cycle < 98%)

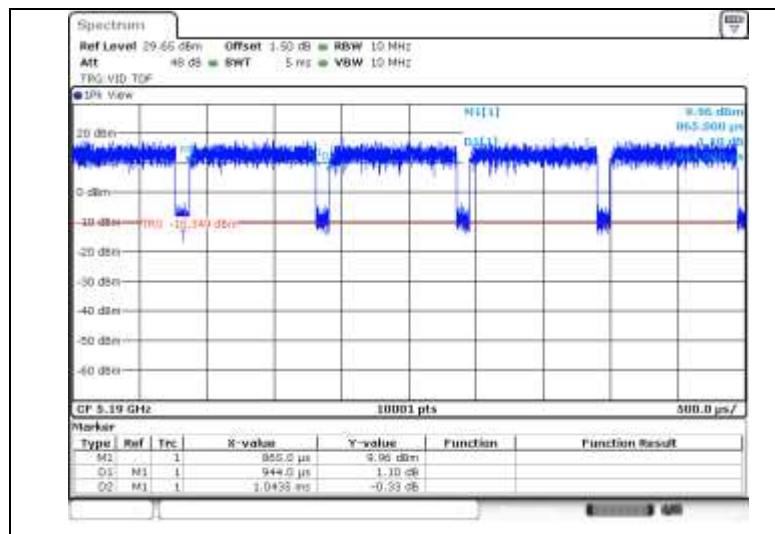
- 802.11n HT20



Note₁): period: 2.006 1 ms, On time: 1.907 1 ms

Note₂): DCCF = $10 \log(1 / x) = 10 \log(1/0.951) = 0.22$ dB, $x = 1.907\ 1 / 2.006\ 1 = 0.951$ (95.1%)

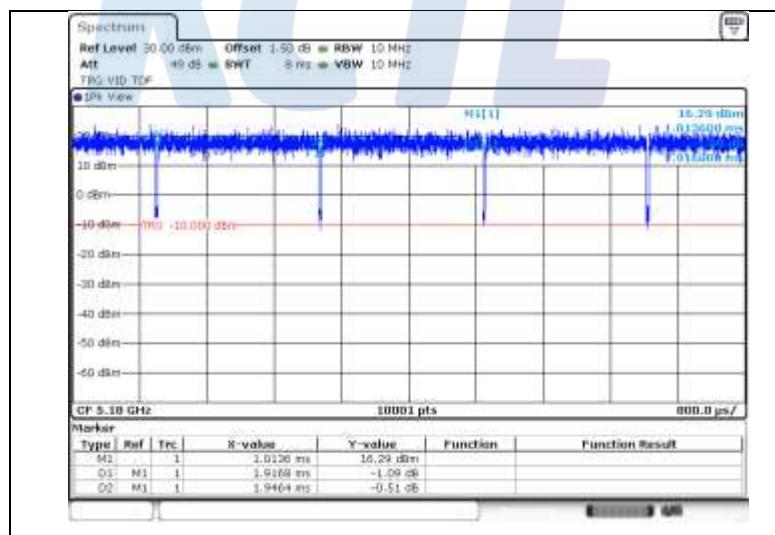
Note₃): 802.11a HT20 is a non-continuous transmission (duty cycle < 98%)

- 802.11n HT40

Note₁): period: 1.043 5 ms, On time: 0.944 ms

Note₂): DCCF = $10 \log(1/x) = 10 \log(1/0.905) = 0.44$ dB, $x = 0.944/1.043\ 5 = 0.905$ (90.5%)

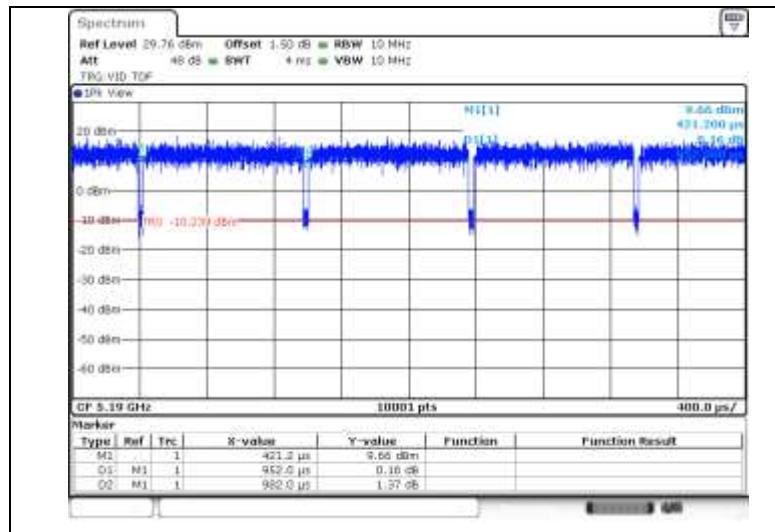
Note₃): 802.11a HT40 is a non-continuous transmission (duty cycle < 98%)

- 802.11ac VHT20

Note₁): period: 1.946 4 ms, On time: 1.916 8 ms

Note₂): DCCF = $10 \log(1/x) = 10 \log(1/0.985) = 0.07$ dB, $x = 1.916\ 8/1.946\ 4 = 0.985$ (98.5%)

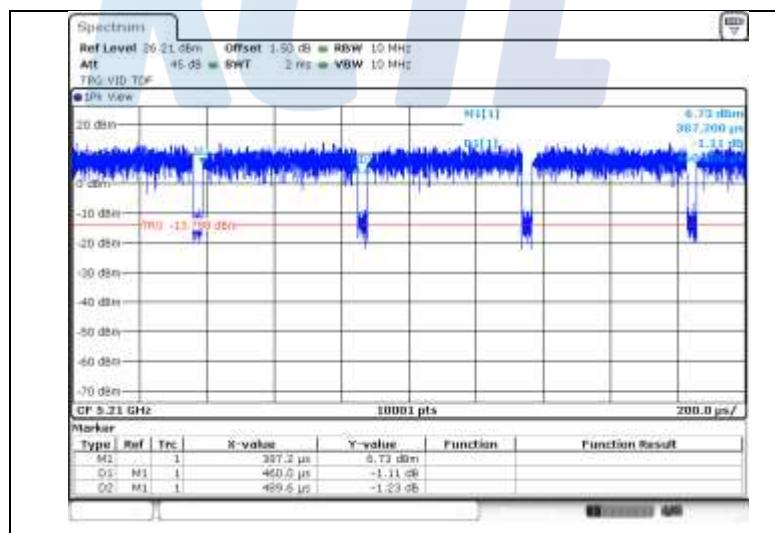
Note₃): 802.11ac VHT20 is a continuous transmission (duty cycle ≥ 98%)

- 802.11ac VHT40

Note₁): period: 0.982 ms, On time: 0.952 ms

Note₂): DCCF = $10 \log(1/x) = 10 \log(1/0.969) = 0.13$ dB, $x = 0.952/0.982 = 0.969$ (96.9 %)

Note₃): 802.11ac VHT40 is a non-continuous transmission (duty cycle < 98 %)

- 802.11ac VHT80

Note₁): period: 0.489 6 ms, On time: 0.460 ms

Note₂): DCCF = $10 \log(1/x) = 10 \log(1/0.940) = 0.27$ dB, $x = 0.460/0.489 6 = 0.940$ (94.0 %)

Note₃): 802.11ac VHT80 is a non-continuous transmission (duty cycle < 98 %)

2.5. Power level setup in software

Power level setup in software						
Test Mode	Channel	Software Setup				
		ANT 0	ANT 1	ANT 2	ANT 3	4TX MIMO
a	5 180 MHz	72	82	81	81	71
	5 220 MHz	72	90	90	90	73
	5 240 MHz	72	90	90	90	75
	5 260 MHz	75	90	90	90	66
	5 300 MHz	65	86	90	88	66
	5 320 MHz	69	80	84	82	66
	5 500 MHz	70	72	72	68	68
	5 600 MHz	76	90	86	90	66
	5 700 MHz	85	86	81	88	66
	5 720 MHz	86	86	86	86	66
	5 745 MHz	84	90	90	90	84
	5 785 MHz	86	90	90	90	88
	5 825 MHz	89	90	90	90	90
n20	5 180 MHz	72	80	82	80	71
	5 220 MHz	72	90	90	90	73
	5 240 MHz	72	90	90	90	73
	5 260 MHz	73	90	90	90	66
	5 300 MHz	70	90	90	89	66
	5 320 MHz	69	80	82	83	66
	5 500 MHz	70	71	71	69	68
	5 600 MHz	74	90	90	90	66
	5 700 MHz	85	85	78	87	66
	5 720 MHz	85	86	86	86	66
	5 745 MHz	84	90	90	90	86
	5 785 MHz	87	90	90	90	88
	5 825 MHz	89	90	90	90	89
n40	5 190 MHz	68	58	63	63	53
	5 230 MHz	86	86	86	86	88
	5 270 MHz	82	86	86	86	76
	5 310 MHz	70	63	62	62	58
	5 510 MHz	68	68	67	67	63
	5 590 MHz	81	82	82	82	80
	5 670 MHz	82	82	82	82	79
	5 710 MHz	82	82	82	82	79
	5 755 MHz	86	86	86	86	86
	5 795 MHz	86	86	86	86	86

ac20	5 180 MHz	71	79	83	80	71
	5 220 MHz	72	90	90	90	73
	5 240 MHz	72	90	90	90	73
	5 260 MHz	76	90	90	90	66
	5 300 MHz	69	90	90	90	66
	5 320 MHz	69	80	82	83	66
	5 500 MHz	70	71	71	69	66
	5 600 MHz	79	90	90	90	66
	5 700 MHz	83	83	79	86	66
	5 720 MHz	85	86	86	86	66
	5 745 MHz	85	90	90	90	87
	5 785 MHz	87	90	90	90	88
	5 825 MHz	89	90	90	90	89
ac40	5 190 MHz	68	59	63	63	53
	5 230 MHz	86	86	86	86	86
	5 270 MHz	81	86	86	86	76
	5 310 MHz	70	62	62	62	58
	5 510 MHz	71	68	68	68	63
	5 590 MHz	82	82	82	82	80
	5 670 MHz	82	82	82	82	79
	5 710 MHz	82	82	82	82	79
	5 755 MHz	86	86	86	86	86
	5 795 MHz	86	86	86	86	86
ac80	5 210 MHz	64	58	62	60	48
	5 290 MHz	62	57	58	58	53
	5 530 MHz	63	57	61	58	53
	5 610 MHz	82	82	82	82	82
	5 690 MHz	82	82	82	82	82
	5 775 MHz	82	82	82	82	82

3. Antenna requirement

According to §15.203, §15.407

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- The transmitter has permanently attached Dipole Antenna.
- The E.U.T Complies with the requirement of §15.203, §15.407

3.1 Antenna information

Mode	SISO				CDD	MIMO
	ANT 0	ANT 1	ANT 2	ANT 3	ANT 0 + 1 + 2 + 3	ANT 0 + 1 + 2 + 3
802.11a	√	√	√	√	√	X
802.11n HT20	√	√	√	√	√	√
802.11n HT40	√	√	√	√	√	√
802.11ac VHT20	√	√	√	√	√	√
802.11ac VHT40	√	√	√	√	√	√
802.11ac VHT80	√	√	√	√	√	√

√ = Support, X = Not support

Note.

1. This device employs SISO and CDD, MIMO technology output power as ANT 0 and ANT 1 and ANT 2 and ANT 3.

3.2 Directional Gain Calculations

According to clause F), 2), d), (ii) of KDB 662911 D01 Multiple Transmitter Output, Directional gain may be calculated by using the formulas as below.

3.2.1. Directional Antenna Gain with equal gain

Band	ANT 0 Gain (dBi)	ANT 1 Gain (dBi)	ANT 2 Gain (dBi)	ANT 3 Gain (dBi)	PSD Directional Gain (dBi)	Power Directional Gain (dBi)
UNII 1	1.98	1.98	1.98	1.98	8.00	1.98
UNII 2A	1.97	1.97	1.97	1.97	7.99	1.97
UNII 2C	1.94	1.94	1.94	1.94	7.96	1.94
UNII 3	1.86	1.86	1.86	1.86	7.88	1.86

Note.

1. If all transmit signals are completely correlated, then

$$\text{Directional gain} = G_{\text{ANT}} + \text{Array Gain}.$$

- For PSD measurements on all devices Array gain = $10 \log (N_{\text{ANT}} / N_{\text{ss}})$ dB
- For Power measurements on IEEE 802.11 devices Array gain = 0 dB For $N_{\text{ANT}} \leq 4$.

4. Summary of tests

FCC Part section(s)	Parameter	Test results
15.407(a)	Maximum conducted output power	Pass
15.407(a)	Maximum power spectral density	Pass
15.407(a)	26 dB bandwidth	Pass
15.407(e)	6 dB bandwidth	Pass
15.407(g)	Frequency stability	Pass
15.407(d), 15.205(a), 15.209(a)	Spurious emission	Pass
	Band-edge, restricted band	Pass
15.207(a)	Conducted emissions	Pass

Notes:

1. All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
2. According to exploratory test no any obvious emission were detected from 9 kHz to 30 MHz. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30 m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.
3. The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z. It was determined that X orientation was worst-case orientation. Therefore, all final radiated testing was performed with the EUT in X orientation.
4. The test procedure(s) in this report were performed in accordance as following.
 - ANSI C63.10-2013
 - KDB 662911 D01 v02r01
 - KDB 789033 D02 v02r01
5. The EUT supports SISO and MIMO modes.
6. The worst-case data rates were:
 - 802.11a mode : 6Mbps
 - 802.11n/ac_HT20 mode : MCS0 / MCS0NSS1
 - 802.11n/ac_HT40 mode : MCS0 / MCS0NSS1
 - 802.11ac_VHT80 mode : MCS0 / MCS0NSS1

5. Measurement uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of $k=2$ to indicated a 95% level of confidence. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded uncertainty (\pm)	
Conducted RF power	1.76 dB	
Conducted spurious emissions	4.03 dB	
Radiated spurious emissions	9 kHz ~ 30 MHz:	2.28 dB
	30 MHz ~ 300 MHz	4.98 dB
	300 MHz ~ 1 000 MHz	5.14 dB
	1 GHz ~ 6 GHz	6.70 dB
	Above 6 GHz	6.60 dB
Conducted emissions	9 kHz ~ 150 kHz	3.66 dB
	150 kHz ~ 30 MHz	3.26 dB

6. Measurement results explanation example

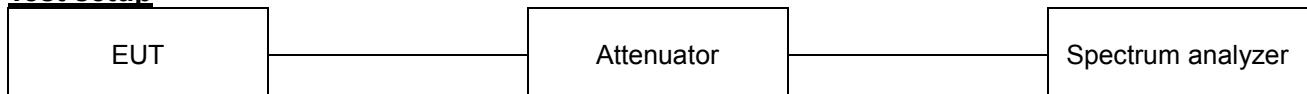
The offset level is set in the spectrum analyzer to compensate the RF cable loss factor between EUT conducted output port and spectrum analyzer.

With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Frequency (MHz)	Factor(dB)	Frequency (MHz)	Factor(dB)
30	9.99	17 000	12.71
100	10.05	18 000	12.94
200	10.15	19 000	13.43
300	10.23	20 000	13.09
400	10.30	21 000	13.18
500	10.35	22 000	13.72
600	10.39	23 000	13.54
700	10.44	24 000	13.47
800	10.49	25 000	13.64
900	10.54	26 000	13.80
1 000	10.55	26 500	13.63
2 000	10.86	27 000	13.84
3 000	11.07	28 000	13.69
4 000	11.24	29 000	14.08
5 000	11.48	30 000	14.12
6 000	11.66	31 000	14.38
7 000	11.78	32 000	14.94
8 000	12.05	33 000	15.01
9 000	12.06	34 000	15.47
10 000	12.15	35 000	15.53
11 000	12.27	36 000	15.62
12 000	12.24	37 000	16.10
13 000	12.43	38 000	16.24
14 000	12.68	39 000	16.25
15 000	12.81	40 000	16.48
16 000	12.70	-	-

Note.

Offset(dB) = RF cable loss(dB) + Attenuator(dB)

7. Test results**7.1. Maximum conducted output power****Test setup****Limit**

According to §15.407(a)

Band	EUT category	Limit
UNII-1	Outdoor access point	1 W (30 dBm)
	Indoor access point	
	Fixed point-to-point access point	
UNII-2A	Client device	250 mW (23.98 dBm)
UNII-2C	✓	250 mW or 11 dBm + 10logB*
UNII-3	✓	1 W (30 dBm)

Note.:

*FCC Limit B is the 26 dB emission bandwidth.

Test procedureANSI C63.10-2013-Section 12.3.3.2 and 14.2
KDB 789033 D02 v02r01 - Section E.2.d) or e)
KDB 662911 D01 v02r01 – Section E).1)

Test settings**Used test method is Section E.2.d)****◆ KDB 789033 D02 v02r01****Section E.2.d)****Method SA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction):**

- (i) Measure the duty cycle, x, of the transmitter output signal as described in II.B..
- (ii) Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- (iii) Set RBW = 1 MHz
- (iv) Set RBW \geq 3 MHz
- (v) Number of points in sweep $\geq 2 \times$ span/RBW. (This ensures that bin-to-bin spacing is \leq RBW/2, so that narrowband signals are not lost between frequency bins.)
- (vi) Sweep time = auto.
- (vii) Detector = power averaging (rms), if available. Otherwise use sample detector mode.
- (viii) Do not use sweep triggering. Allow the sweep to “free run.”
- (ix) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.
- (x) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- (xi) Add $10 \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add $10 \log(1/0,25) = 6$ dB if the duty cycle is 25%.

Section E.2.e)**Method SA-2 Alternative (power averaging(rms) detection with slow sweep with each spectrum bin averaging across on and off times of the EUT transmissions, followed by duty cycle correction):**

- (i) Measure the duty cycle, x, of the transmitter output signal as described in II.B..
- (ii) Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- (iii) Set RBW = 1 MHz
- (iv) Set RBW \geq 3 MHz
- (v) Number of points in sweep $\geq 2 \times$ span/RBW. (This ensures that bin-to-bin spacing is \leq RBW/2, so that narrowband signals are not lost between frequency bins.)
- (vi) Manually set sweep time $\geq 10 \times$ (number of points in sweep) \times (total on/off period of the transmitted signal).
- (vii) Set detector = power averaging (rms)
- (viii) Perform a single sweep.
- (ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement

function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

- (x) Add $10 \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add $10 \log(1/0.25) = 6$ dB if the duty cycle is 25%.

Section E.3.a)

Method PM (Measurement using an RF average power meter):

- (xi) 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 constant 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
- (xii) If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in II
- (xiii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
- (xiv) 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%).

Section E.3.b)

Method PM-G (Measurement using a gated RF average power meter):

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

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Report No.:

KR20-SRF0030-D

Page (19) of (1046)

**Test results****SISO**

Test mode	Band	Frequency (MHz)	Measured output power									
			Reading ANT 0 (dBm)	Reading ANT 1 (dBm)	Reading ANT 2 (dBm)	Reading ANT 3 (dBm)	DCCF (dB)	Result ANT 0 (dBm) ⁽¹⁾	Result ANT 1 (dBm) ⁽¹⁾	Result ANT 2 (dBm) ⁽¹⁾	Result ANT 3 (dBm) ⁽¹⁾	Limit (dBm)
11a	UNII 1	5 180	15.16	17.46	16.74	17.13	0.22	15.38	17.68	16.96	17.35	30.00
		5 220	15.09	19.33	19.07	19.45		15.31	19.55	19.29	19.67	
		5 240	15.20	19.64	19.38	19.68		15.42	19.86	19.60	19.90	
	UNII 2A	5 260	16.03	19.87	18.18	19.52		16.25	20.09	18.40	19.74	23.98
		5 300	13.39	19.61	18.02	19.05		13.61	19.83	18.24	19.27	
		5 320	14.70	17.12	18.44	17.39		14.92	17.34	18.66	17.61	
	UNII 2C	5 500	15.06	14.98	15.60	12.75		15.28	15.20	15.82	12.97	23.98
		5 600	16.26	19.47	19.68	18.68		16.48	19.69	19.90	18.90	
		5 700	19.10	18.85	17.96	18.55		19.32	19.07	18.18	18.77	
	Straddle	5 720	18.75	18.06	18.55	17.63		18.97	18.28	18.77	17.85	22.93
	UNII 3	5 745	19.00	20.26	20.53	19.85		19.22	20.48	20.75	20.07	30.00
		5 785	19.38	20.06	20.26	19.49		19.60	20.28	20.48	19.71	
		5 825	19.87	20.06	20.26	19.36		20.09	20.28	20.48	19.58	
11n HT20	UNII 1	5 180	15.18	16.99	16.82	16.77	0.22	15.40	17.21	17.04	16.99	30.00
		5 220	15.19	19.39	18.88	19.32		15.41	19.61	19.10	19.54	
		5 240	15.23	19.63	19.25	19.70		15.45	19.85	19.47	19.92	
	UNII 2A	5 260	15.79	19.89	18.04	19.49		16.01	20.11	18.26	19.71	23.98
		5 300	14.71	19.95	18.20	19.28		14.93	20.17	18.42	19.50	
		5 320	14.66	17.23	18.01	17.66		14.88	17.45	18.23	17.88	
	UNII 2C	5 500	15.06	14.54	15.21	12.81		15.28	14.76	15.43	13.03	23.98
		5 600	15.46	19.40	19.82	18.73		15.68	19.62	20.04	18.95	
		5 700	18.92	18.50	17.13	18.27		19.14	18.72	17.35	18.49	
	Straddle	5 720	18.30	17.94	18.22	17.41		18.52	18.16	18.44	17.63	22.96
	UNII 3	5 745	19.15	20.15	20.54	19.98		19.37	20.37	20.76	20.20	30.00
		5 785	19.71	20.00	20.44	19.55		19.93	20.22	20.66	19.77	
		5 825	19.88	20.10	20.21	19.39		20.10	20.32	20.43	19.61	
11n HT40	UNII 1	5 190	13.68	11.14	12.86	12.35	0.44	14.12	11.58	13.30	12.79	30.00
		5 230	18.47	18.13	18.34	18.42		18.91	18.57	18.78	18.86	
		5 270	17.80	18.70	17.15	18.16		18.24	19.14	17.59	18.60	23.98
	UNII 2A	5 310	14.66	12.71	13.55	11.96		15.10	13.15	13.99	12.40	
		5 510	14.00	13.47	13.93	12.06		14.44	13.91	14.37	12.50	23.98
		5 590	16.90	16.88	17.57	16.14		17.34	17.32	18.01	16.58	
	UNII 2C	5 670	17.57	17.44	17.97	16.96		18.01	17.88	18.41	17.40	23.98
		5 710	17.54	17.03	17.73	16.77		17.98	17.47	18.17	17.21	
		5 755	19.35	19.28	19.32	18.50		19.79	19.72	19.76	18.94	30.00
	UNII 3	5 795	19.22	18.90	19.04	18.10		19.66	19.34	19.48	18.54	

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Report No.:

KR20-SRF0030-D

Page (20) of (1046)



11ac VHT20	UNII 1	5 180	15.07	16.86	17.27	17.19	-	15.07	16.86	17.27	17.19	30.00
		5 220	15.39	19.45	19.16	19.47		15.39	19.45	19.16	19.47	
		5 240	15.64	19.84	19.65	19.91		15.64	19.84	19.65	19.91	
	UNII 2A	5 260	16.49	20.06	18.24	19.64		16.49	20.06	18.24	19.64	23.98
		5 300	14.68	20.14	18.67	19.56		14.68	20.14	18.67	19.56	
		5 320	14.67	17.49	18.25	17.84		14.67	17.49	18.25	17.84	
		5 500	15.07	14.69	15.35	13.12		15.07	14.69	15.35	13.12	
		5 600	17.05	19.75	19.89	18.99		17.05	19.75	19.89	18.99	
		5 700	18.44	18.20	17.46	18.43		18.44	18.20	17.46	18.43	
	Straddle	5 720	18.13	18.21	18.55	17.60		18.13	18.21	18.55	17.60	22.98
	UNII 3	5 745	19.30	20.26	20.71	19.94		19.30	20.26	20.71	19.94	30.00
		5 785	19.80	20.14	20.54	19.61		19.80	20.14	20.54	19.61	
		5 825	19.93	20.26	20.27	19.63		19.93	20.26	20.27	19.63	
		5 190	13.90	11.62	13.21	12.50	0.13	14.03	11.75	13.34	12.63	30.00
	UNII 1	5 230	18.78	18.52	18.64	18.61		18.91	18.65	18.77	18.74	
		5 270	17.71	18.85	17.56	18.46		17.84	18.98	17.69	18.59	30.00
	UNII 2A	5 310	14.75	12.55	13.80	12.20		14.88	12.68	13.93	12.33	
		5 510	15.03	13.60	14.46	12.54		15.16	13.73	14.59	12.67	23.98
	UNII 2C	5 590	17.29	17.07	17.90	16.50		17.42	17.20	18.03	16.63	
		5 670	17.85	17.54	18.22	17.36		17.98	17.67	18.35	17.49	
	Straddle	5 710	17.43	17.13	17.65	16.86		17.56	17.26	17.78	16.99	
	UNII 3	5 755	19.53	19.36	19.56	18.23		19.66	19.49	19.69	18.36	30.00
		5 795	19.36	19.13	19.16	17.95		19.49	19.26	19.29	18.08	
11ac VHT40	UNII 1	5 210	13.11	11.81	12.13	12.39	0.27	13.38	12.08	12.40	12.66	30.00
		5 290	12.79	11.36	11.58	11.45		13.06	11.63	11.85	11.72	23.98
	UNII 2A	5 530	12.96	10.85	12.00	10.69		13.23	11.12	12.27	10.96	23.98
		5 610	17.75	17.58	17.63	16.97		18.02	17.85	17.90	17.24	
	Straddle	5 690	18.07	17.39	17.66	17.11		18.34	17.66	17.93	17.38	
	UNII 3	5 775	18.64	18.22	18.19	17.39		18.91	18.49	18.46	17.66	30.00

Note.

1. Result(dBm) = Reading (dBm) + Duty Factor (dB)

4TX MIMO

Test mode	Band	Frequency (MHz)	Measured output power					
			Reading ANT 0 (dBm)	Reading ANT 1 (dBm)	Reading ANT 2 (dBm)	Reading ANT 3 (dBm)	DCCF (dB)	Result 4TX MIMO (dBm) ⁽¹⁾
11a	UNII 1	5 180	15.01	14.47	14.11	14.39	0.22	20.75
		5 220	15.08	14.58	14.25	15.02		20.99
		5 240	15.38	15.41	15.05	15.73		21.64
	UNII 2A	5 260	13.30	13.65	13.13	12.87		19.49
		5 300	13.45	13.35	13.49	13.22		19.62
		5 320	13.55	13.10	13.44	12.97		19.51
	UNII 2C	5 500	13.33	13.06	13.71	12.17		19.34
		5 600	13.13	13.21	13.31	12.76		19.35
		5 700	13.75	12.98	13.41	12.83		19.50
	Straddle	5 720	12.65	12.54	12.67	11.68		18.65
	UNII 3	5 745	18.52	18.22	18.34	17.81		24.47
		5 785	19.39	18.78	19.10	18.38		25.17
		5 825	19.27	19.24	19.53	18.86		25.47
11n HT20	UNII 1	5 180	14.33	14.50	13.90	14.19	0.22	20.48
		5 220	14.76	14.81	14.12	14.73		20.85
		5 240	14.85	14.85	14.56	14.96		21.05
	UNII 2A	5 260	13.82	13.69	13.63	13.46		19.89
		5 300	13.68	13.53	13.65	13.30		19.78
		5 320	13.59	13.50	13.37	12.95		19.60
	UNII 2C	5 500	13.36	12.75	13.45	12.08		19.18
		5 600	13.34	13.43	13.82	13.31		19.72
		5 700	13.54	12.96	13.49	12.87		19.47
	Straddle	5 720	12.41	12.35	12.66	11.28		18.45
	UNII 3	5 745	18.37	18.60	18.84	18.03		24.71
		5 785	19.06	18.81	19.17	18.23		25.07
		5 825	18.93	18.97	19.19	18.46		25.14
11n HT40	UNII 1	5 190	8.70	9.53	9.67	9.57	0.44	15.84
		5 230	17.87	17.74	17.21	18.03		24.18
	UNII 2A	5 270	16.40	16.05	16.28	16.92		22.88
		5 310	10.61	10.28	11.47	10.97		17.31
	UNII 2C	5 510	12.08	11.28	12.28	10.82		18.11
		5 590	16.42	15.61	16.41	15.81		22.53
		5 670	16.59	16.18	16.70	16.18		22.87
	Straddle	5 710	16.17	15.62	16.26	15.78		22.42
	UNII 3	5 755	18.47	18.56	18.69	18.36		24.98
		5 795	18.26	18.48	18.32	18.01		24.73

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Report No.:

KR20-SRF0030-D

Page (22) of (1046)



11ac VHT20	UNII 1	5 180	14.57	14.48	14.14	14.38	-	20.42	30.00
		5 220	14.93	15.03	14.46	14.87		20.85	
		5 240	15.04	14.90	14.99	14.89		20.98	
	UNII 2A	5 260	13.81	13.81	14.20	14.00		19.98	23.98
		5 300	13.84	13.61	14.12	13.56		19.81	
		5 320	13.90	13.58	13.95	13.40		19.73	
	UNII 2C	5 500	13.71	12.83	13.89	12.46		19.28	23.98
		5 600	13.82	13.39	13.74	13.04		19.53	
		5 700	13.60	13.52	13.76	12.95		19.49	
	Straddle	5 720	12.44	12.32	12.44	11.42		18.20	22.97
	UNII 3	5 745	19.21	19.17	19.15	18.54		25.05	30.00
		5 785	19.31	19.21	19.31	18.43		25.10	
		5 825	19.84	19.45	19.48	18.71		25.41	
11ac VHT40	UNII 1	5 190	8.93	9.53	10.05	9.54	0.13	15.69	30.00
		5 230	18.02	17.80	17.73	18.46		24.17	
	UNII 2A	5 270	16.78	16.08	16.76	17.05		22.83	30.00
		5 310	10.67	10.68	11.67	11.34		17.27	
	UNII 2C	5 510	11.92	11.52	12.39	11.39		17.98	23.98
		5 590	16.33	16.03	16.57	15.91		22.37	
		5 670	17.11	16.32	16.58	16.52		22.79	
	Straddle	5 710	16.29	15.93	16.13	16.25		22.63	
	UNII 3	5 755	19.05	18.89	18.92	18.72		25.05	30.00
		5 795	18.79	18.47	18.57	18.30		24.69	
11ac VHT80	UNII 1	5 210	7.97	8.62	8.12	10.23	0.27	15.12	30.00
	UNII 2A	5 290	10.29	9.93	10.05	10.70		16.54	23.98
	UNII 2C	5 530	10.43	9.24	9.78	9.62		16.08	23.98
		5 610	17.37	17.01	17.25	16.85		23.42	
	Straddle	5 690	17.69	17.25	17.38	16.71		23.56	
	UNII 3	5 775	18.12	18.05	17.83	17.70		24.22	30.00

Note.

1. Result(dBm) = $10\log(10(\text{ANT 0/10}) + 10(\text{ANT 1/10}) + 10(\text{ANT 2/10}) + 10(\text{ANT 3/10})) + \text{Duty Factor (dB)}$

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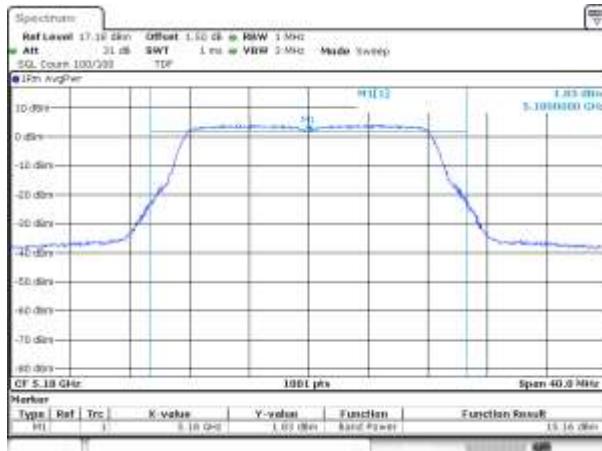
Report No.:
KR20-SRF0030-D

Page (23) of (1046)

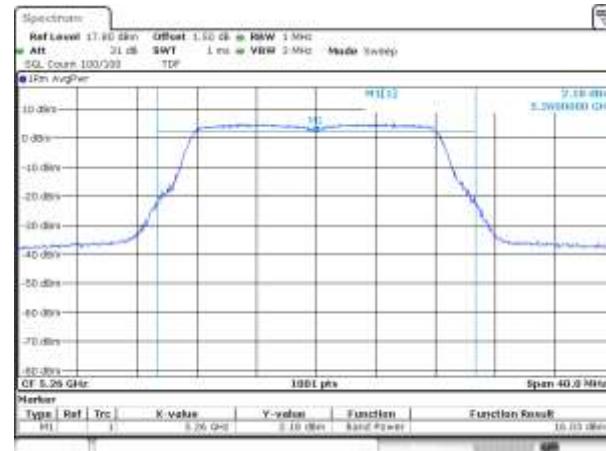
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SISO ANT 0

UNII-1 / 802.11a / 5 180 MHz



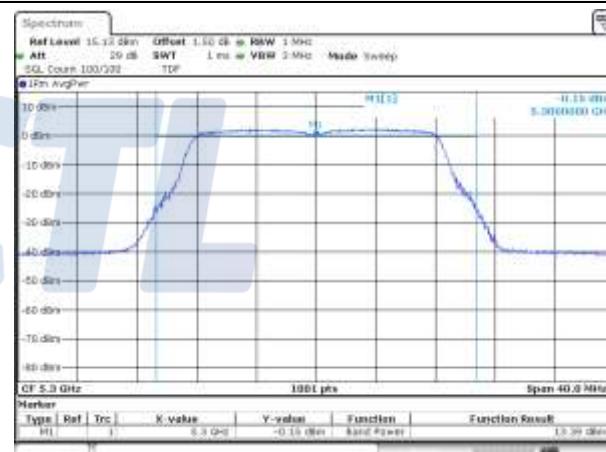
UNII-2A / 802.11a / 5 260 MHz



UNII-1 / 802.11a / 5 220 MHz



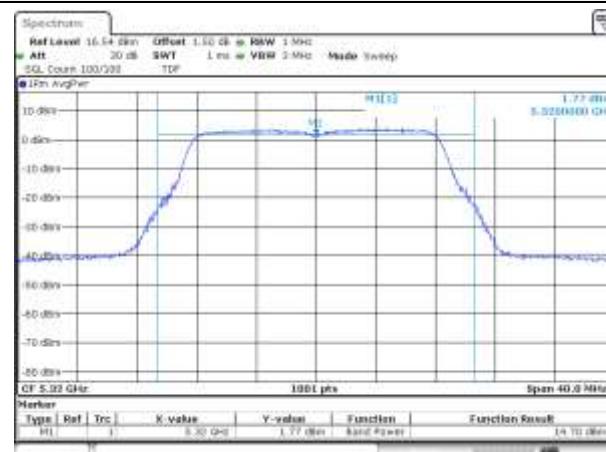
UNII-2A / 802.11a / 5 300 MHz



UNII-1 / 802.11a / 5 240 MHz



UNII-2A / 802.11a / 5 320 MHz



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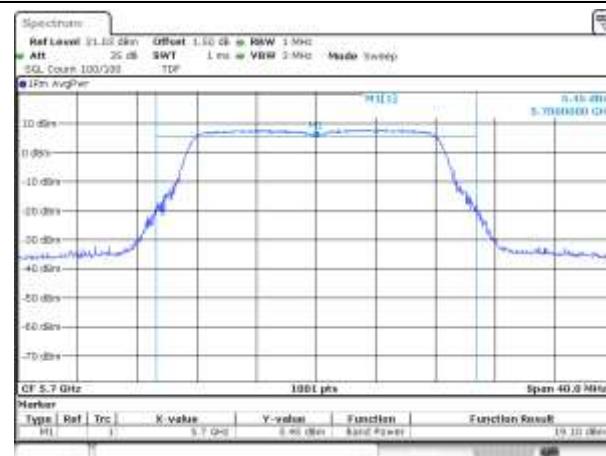
Page (24) of (1046)

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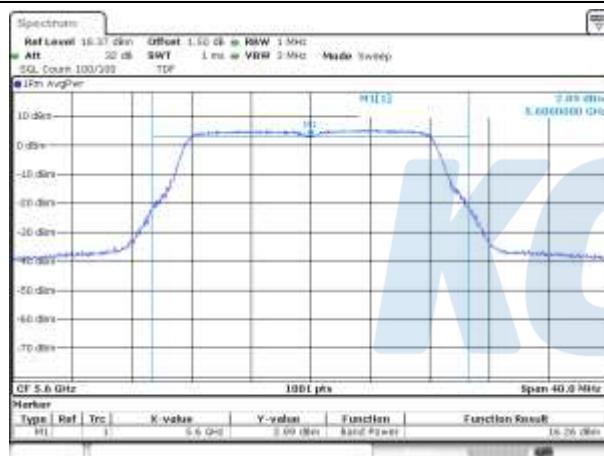
UNII-2C / 802.11a / 5 500 MHz



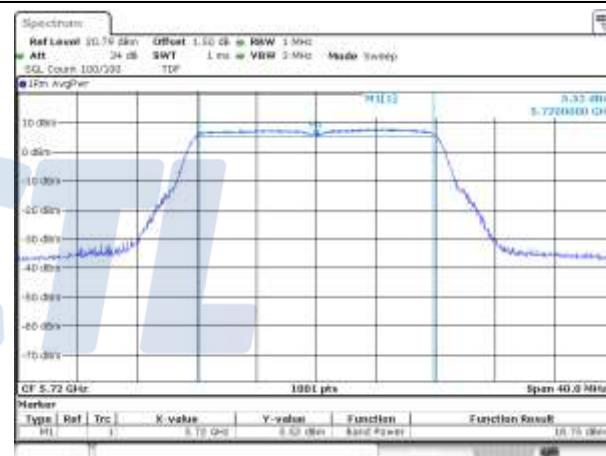
UNII-2C / 802.11a / 5 700 MHz



UNII-2C / 802.11a / 5 600 MHz



UNII-2C / 802.11a / 5 720 MHz



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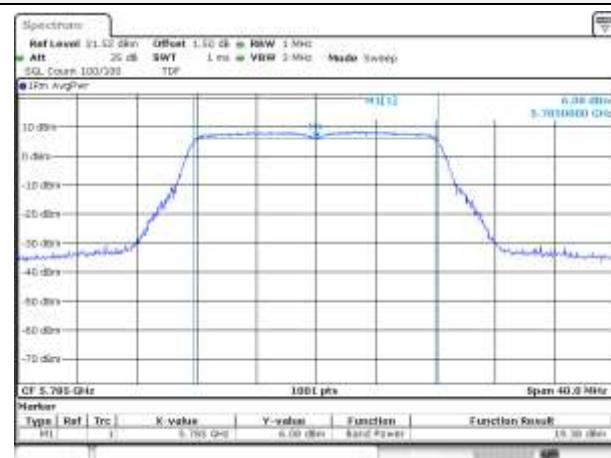
Page (25) of (1046)

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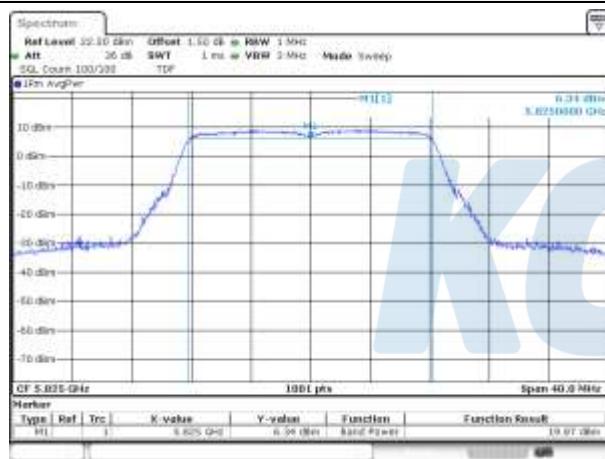
UNII-3 / 802.11a / 5 745 MHz



UNII-3 / 802.11a / 5 785 MHz



UNII-3 / 802.11a / 5 825 MHz



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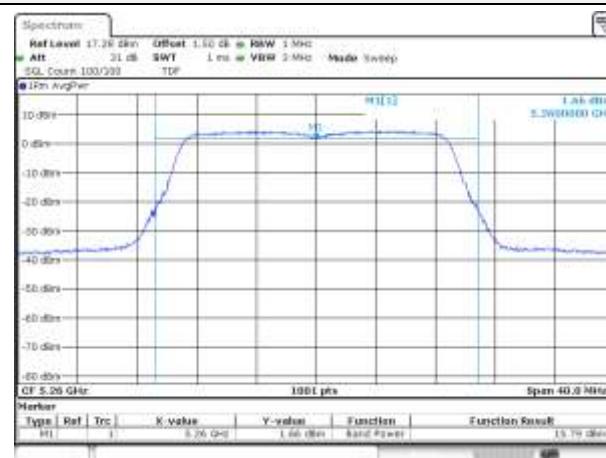
Page (26) of (1046)

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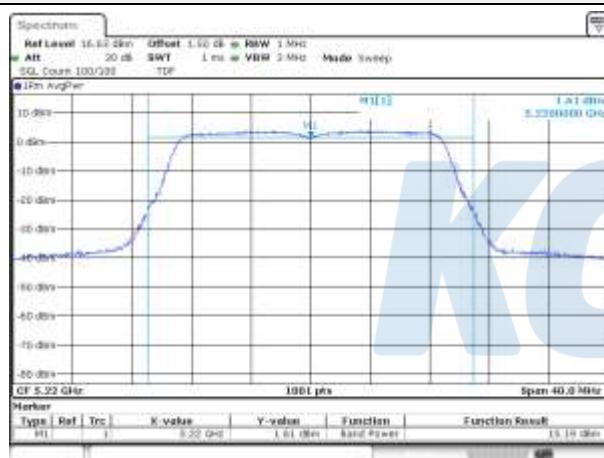
UNII-1 / 802.11n HT20 / 5 180 MHz



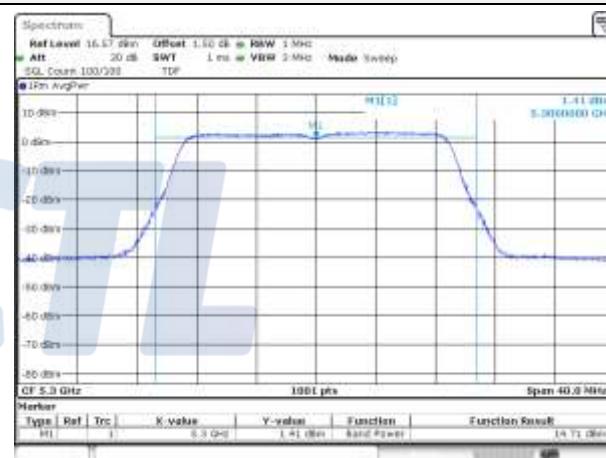
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UNII-1 / 802.11n HT20 / 5 220 MHz



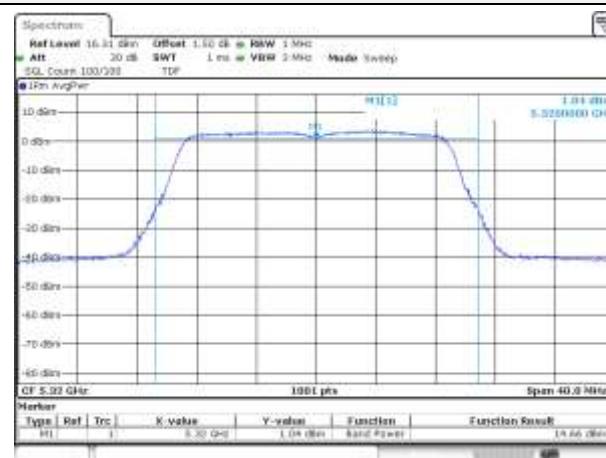
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UNII-1 / 802.11n HT20 / 5 240 MHz



UNII-2A / 802.11n HT20 / 5 320 MHz



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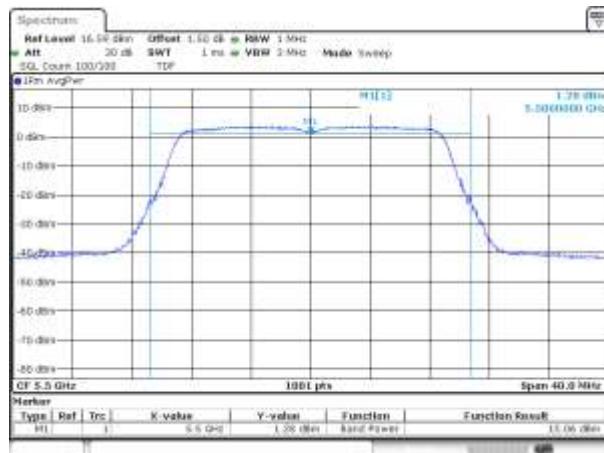
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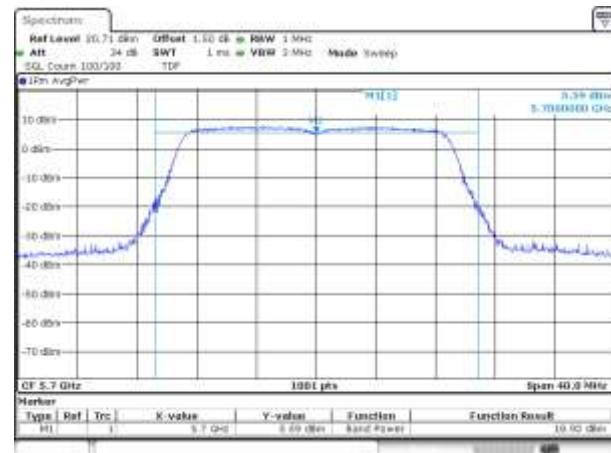
Page (27) of (1046)

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UNII-2C / 802.11n HT20 / 5 500 MHz



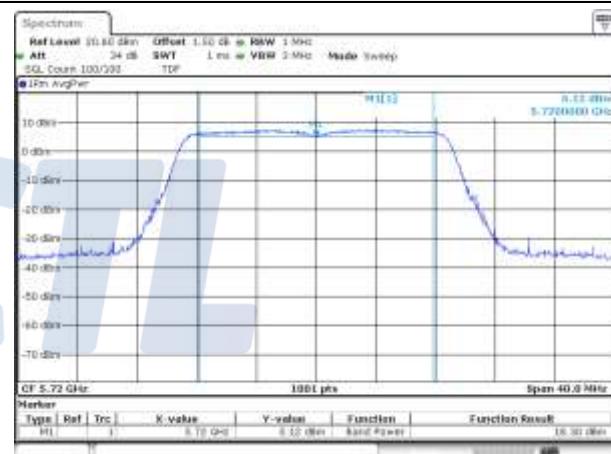
UNII-2C / 802.11n HT20 / 5 700 MHz

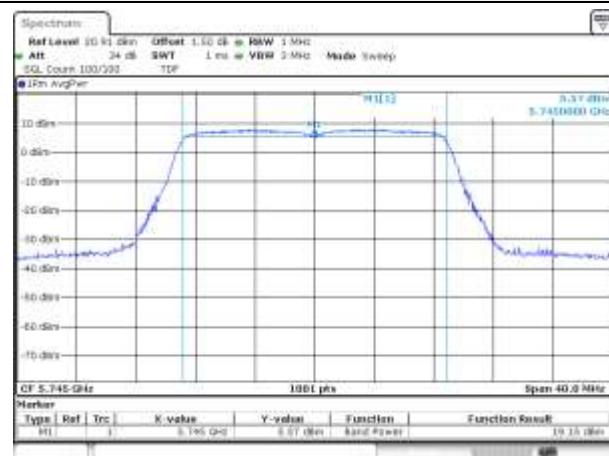
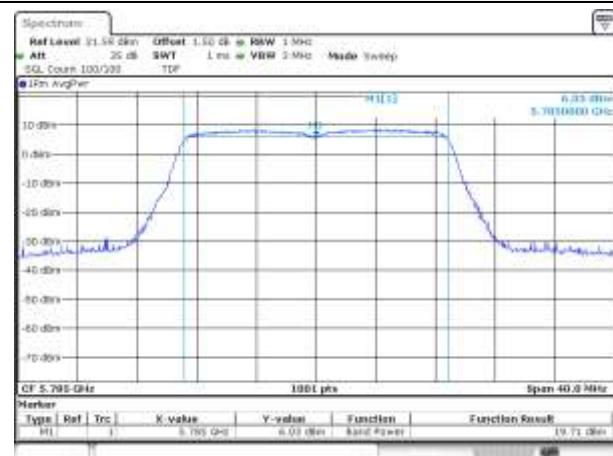
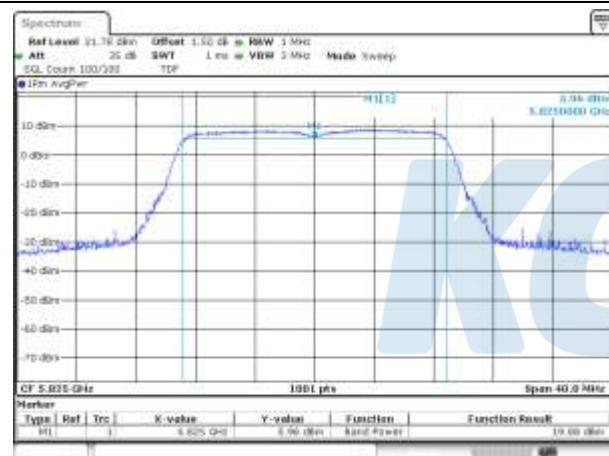


UNII-2C / 802.11n HT20 / 5 600 MHz



UNII-2C / 802.11n HT20 / 5 720 MHz



UNII-3 / 802.11n HT20 / 5 745 MHz**UNII-3 / 802.11n HT20 / 5 785 MHz****UNII-3 / 802.11n HT20 / 5 825 MHz**

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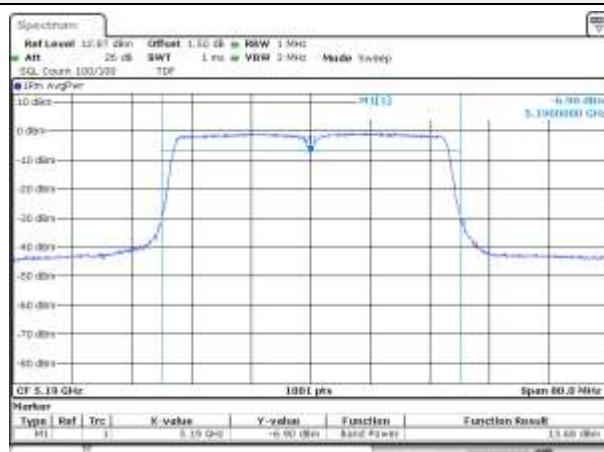
65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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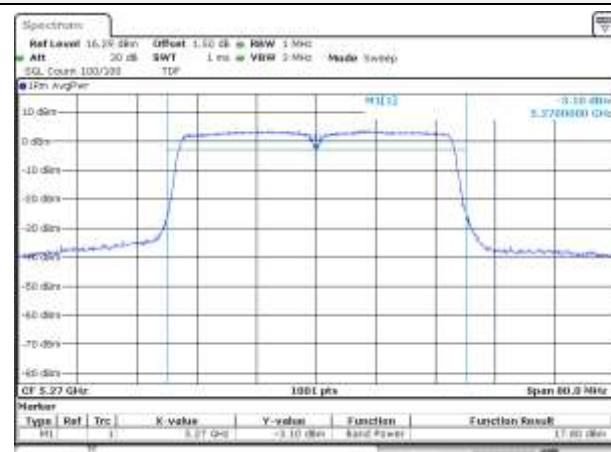
Page (29) of (1046)

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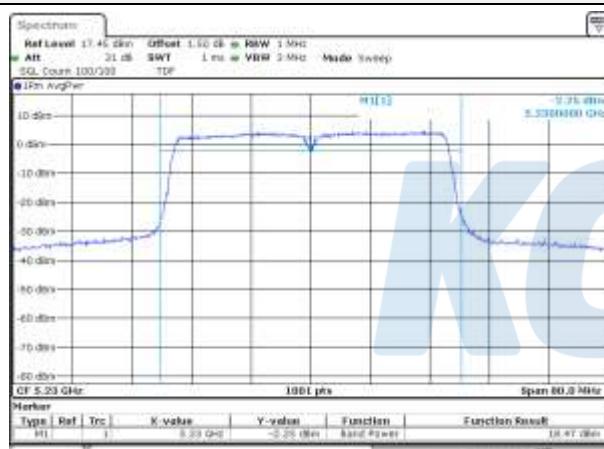
UNII-1 / 802.11n HT40 / 5 190 MHz



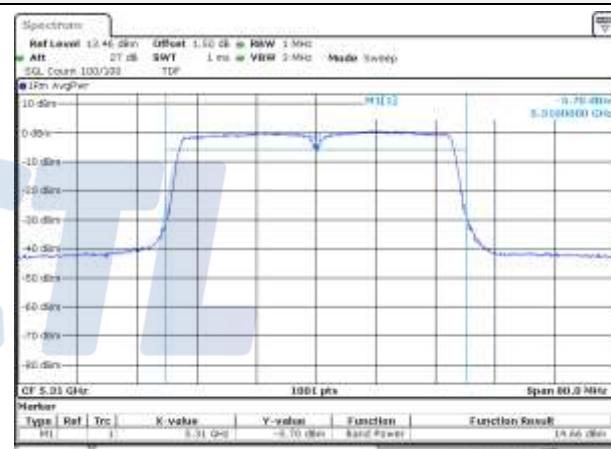
UNII-2A / 802.11n HT40 / 5 270 MHz



UNII-1 / 802.11n HT40 / 5 230 MHz



UNII-2A / 802.11n HT40 / 5 310 MHz



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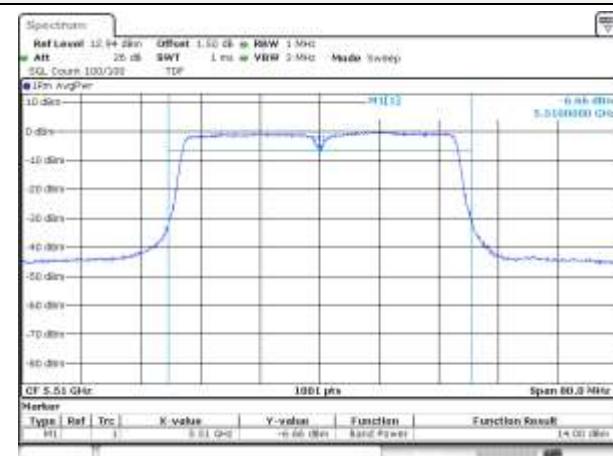
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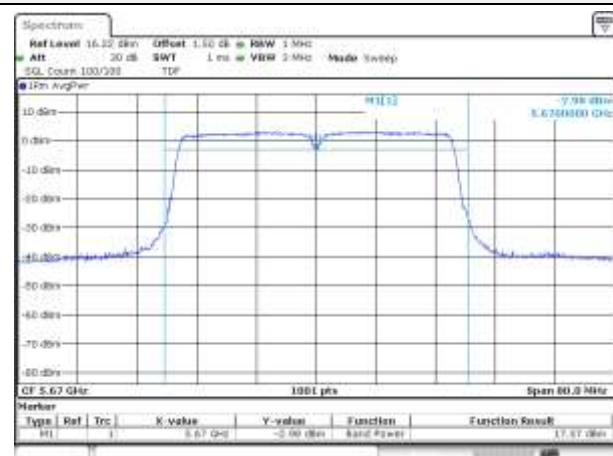
Page (30) of (1046)

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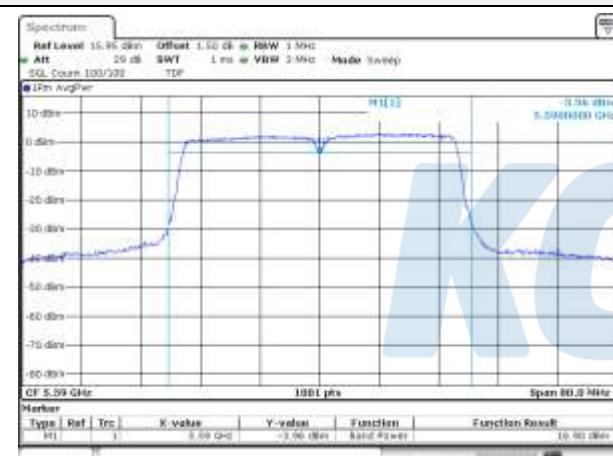
UNII-2C / 802.11n HT40 / 5 510 MHz



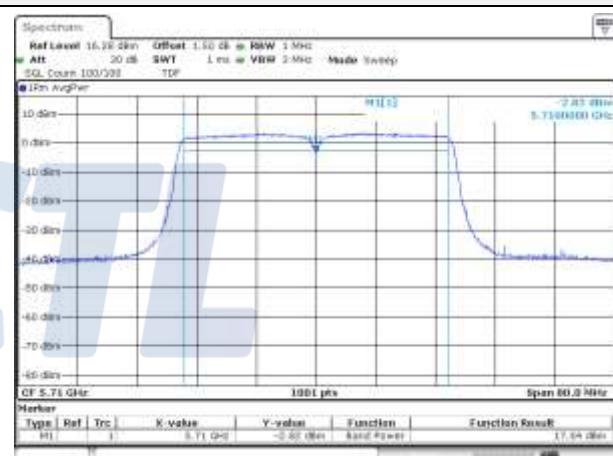
UNII-2C / 802.11n HT40 / 5 570 MHz



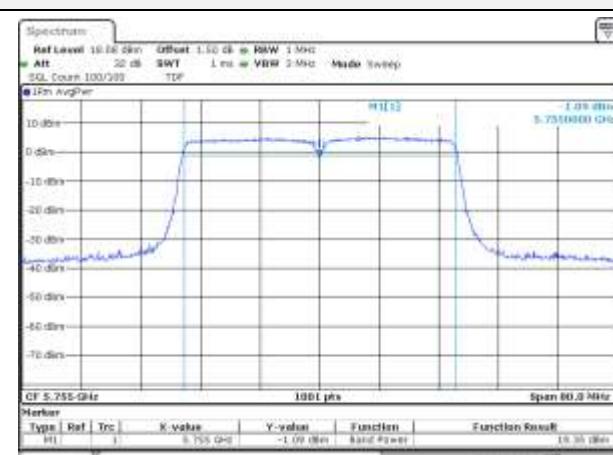
UNII-2C / 802.11n HT40 / 5 590 MHz



UNII-2C / 802.11n HT40 / 5 710 MHz



UNII-3 / 802.11n HT40 / 5 755 MHz



UNII-3 / 802.11n HT40 / 5 795 MHz



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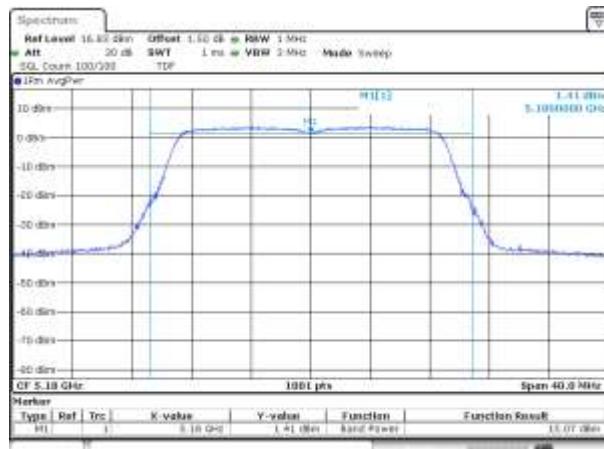
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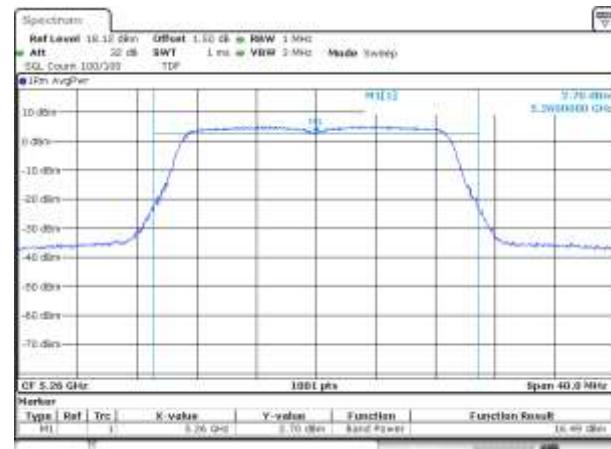
Page (31) of (1046)

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UNII-1 / 802.11ac VHT20 / 5 180 MHz



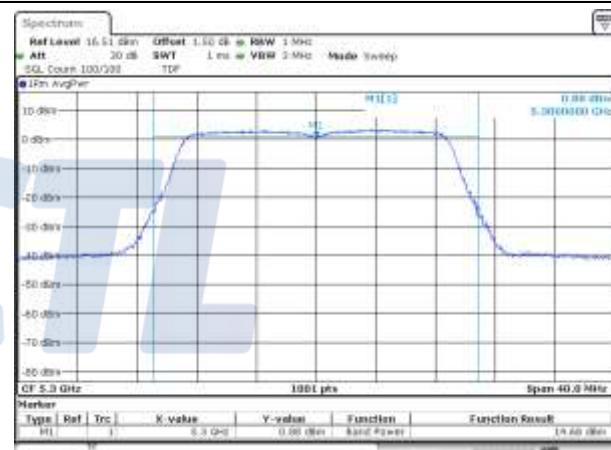
UNII-2A / 802.11ac VHT20 / 5 260 MHz



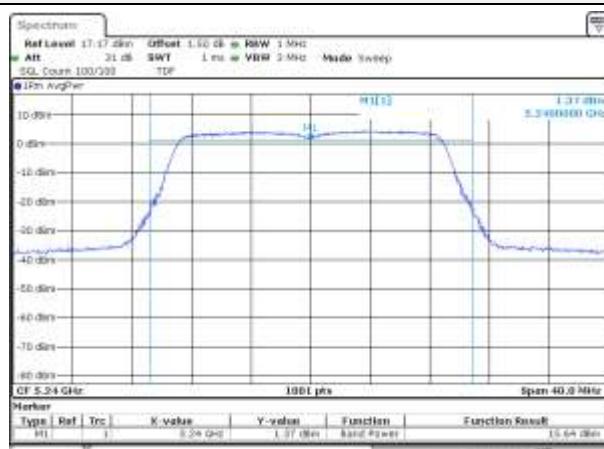
UNII-1 / 802.11ac VHT20 / 5 220 MHz



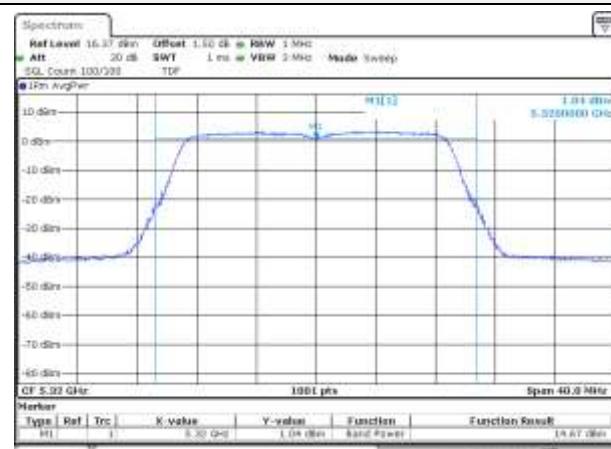
UNII-2A / 802.11ac VHT20 / 5 300 MHz



UNII-1 / 802.11ac VHT20 / 5 240 MHz



UNII-2A / 802.11ac VHT20 / 5 320 MHz



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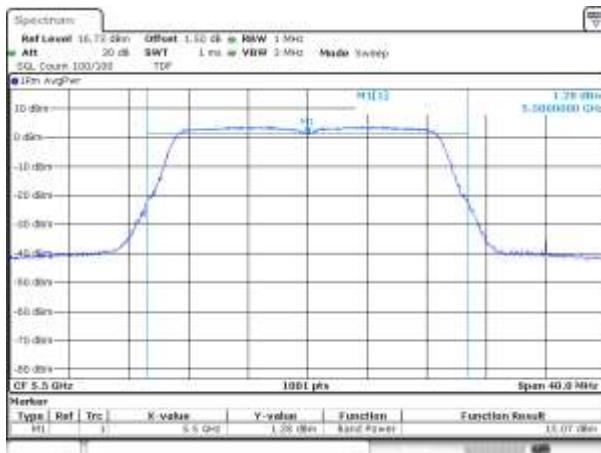
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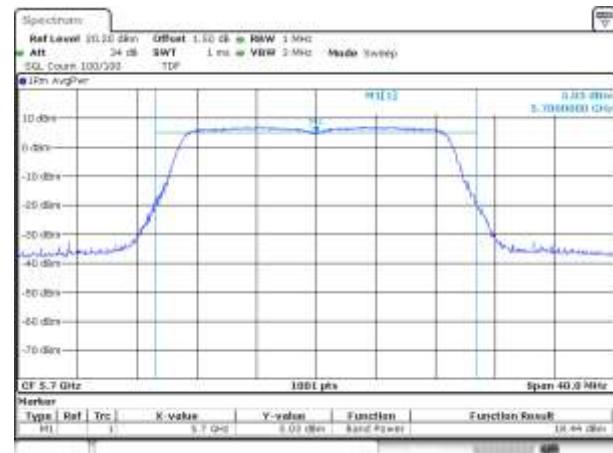
Page (32) of (1046)

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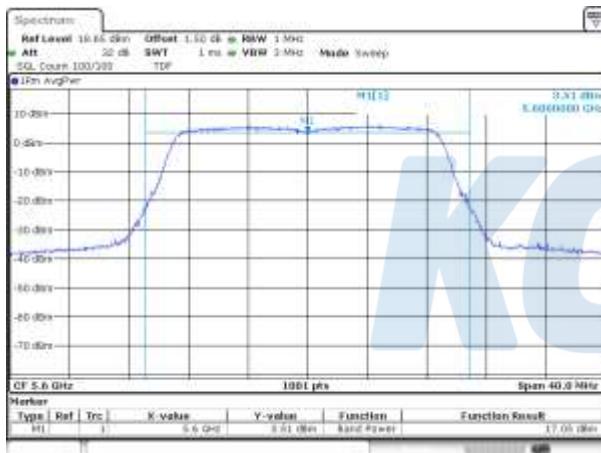
UNII-2C / 802.11ac VHT20 / 5 500 MHz



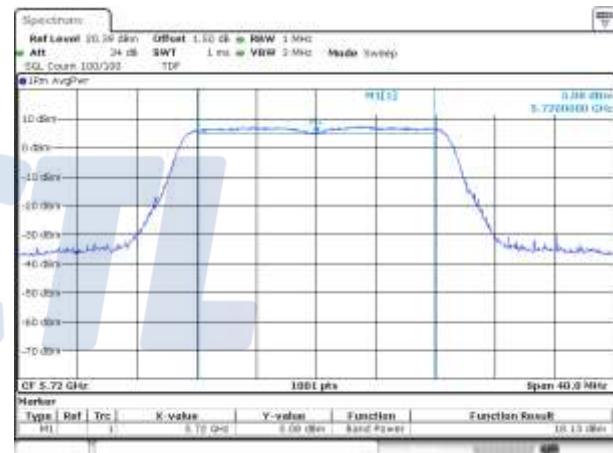
UNII-2C / 802.11ac VHT20 / 5 700 MHz

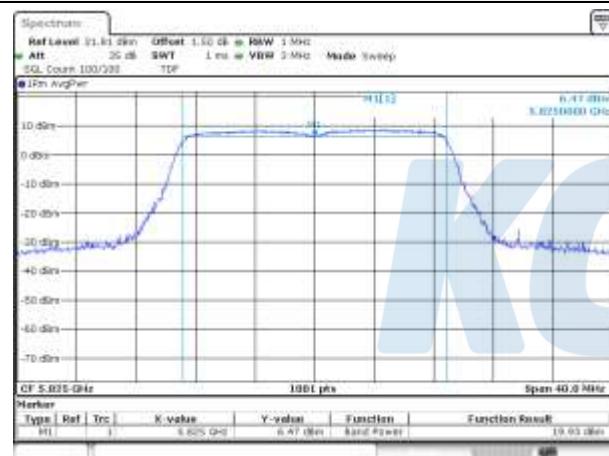


UNII-2C / 802.11ac VHT20 / 5 600 MHz



UNII-2C / 802.11ac VHT20 / 5 720 MHz



UNII-3 / 802.11ac VHT20 / 5 745 MHz**UNII-3 / 802.11ac VHT20 / 5 785 MHz****UNII-3 / 802.11ac VHT20 / 5 825 MHz**

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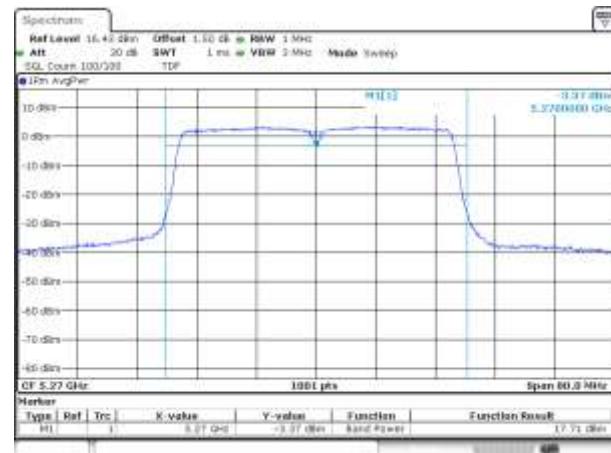
Page (34) of (1046)

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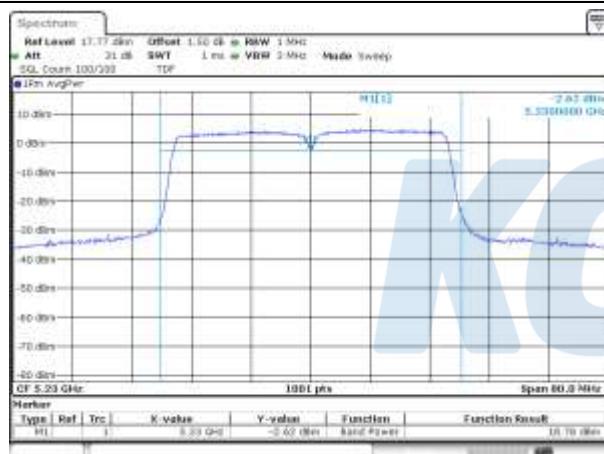
UNII-1 / 802.11ac VHT40 / 5 190 MHz



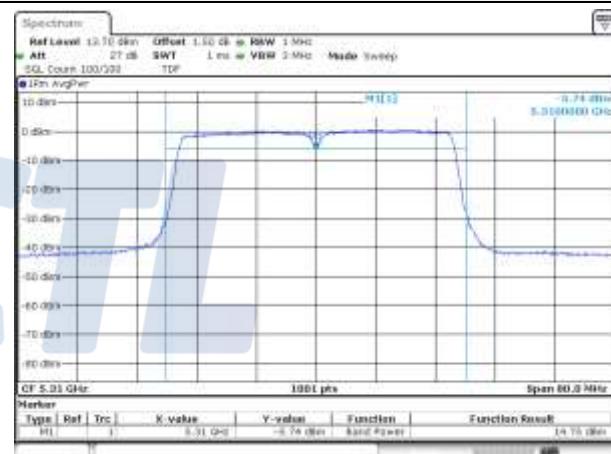
UNII-2A / 802.11ac VHT40 / 5 270 MHz



UNII-1 / 802.11ac VHT40 / 5 230 MHz



UNII-2A / 802.11ac VHT40 / 5 310 MHz



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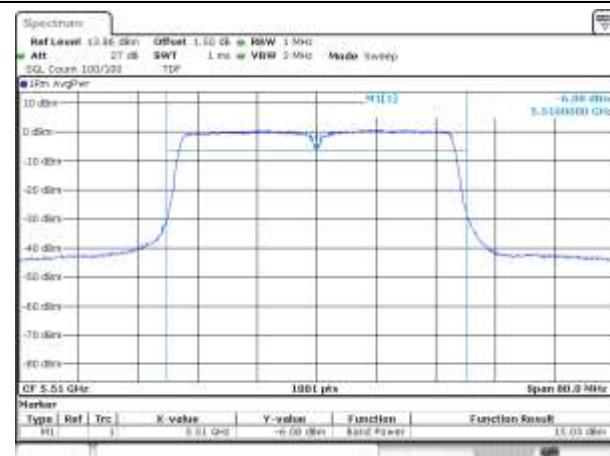
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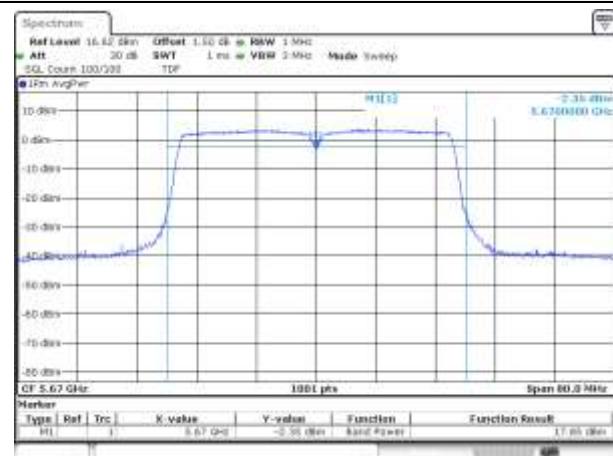
Page (35) of (1046)

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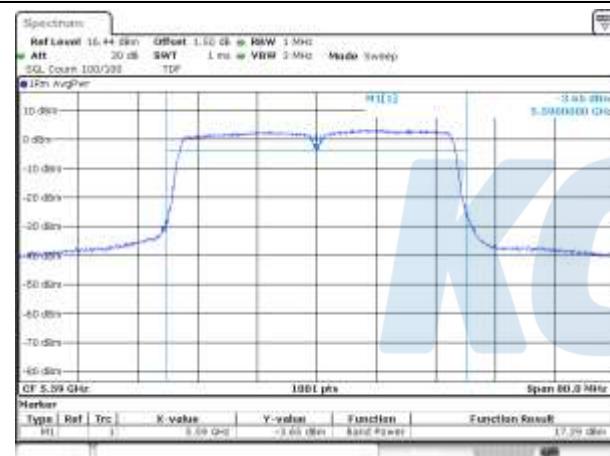
UNII-2C / 802.11ac VHT40 / 5 510 MHz



UNII-2C / 802.11ac VHT40 / 5 670 MHz



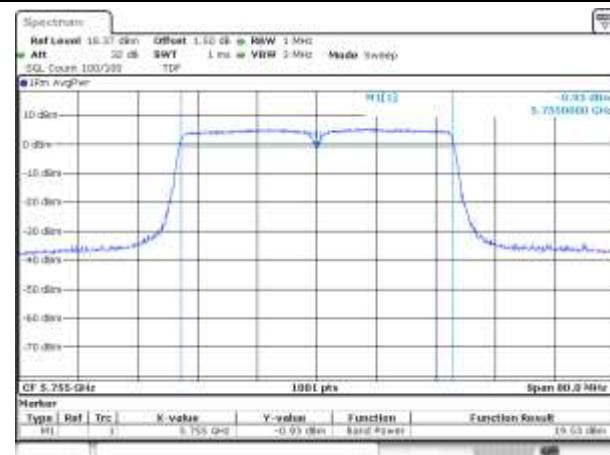
UNII-2C / 802.11ac VHT40 / 5 590 MHz



UNII-2C / 802.11ac VHT40 / 5 710 MHz



UNII-3 / 802.11ac VHT40 / 5 755 MHz



UNII-3 / 802.11ac VHT40 / 5 795 MHz



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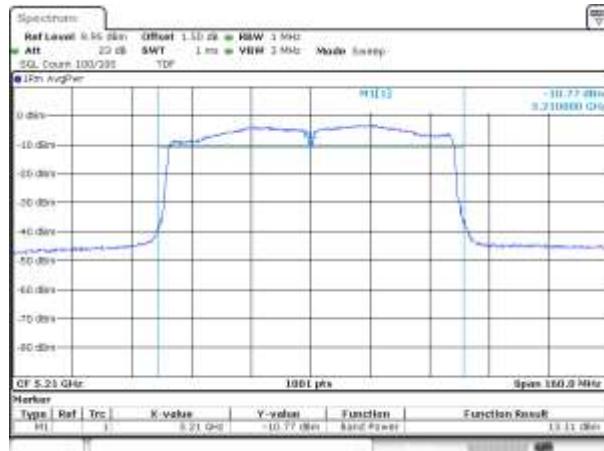
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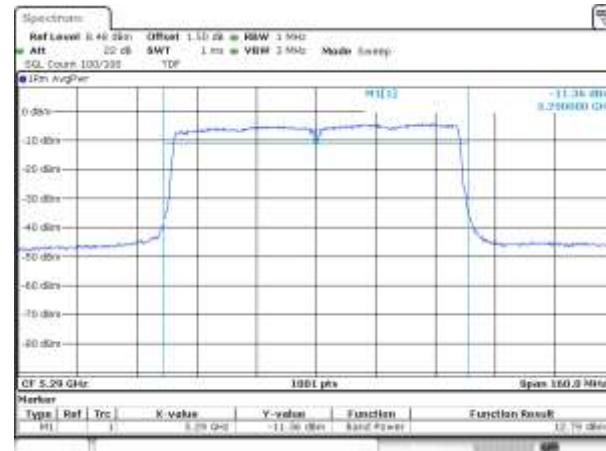
Page (36) of (1046)

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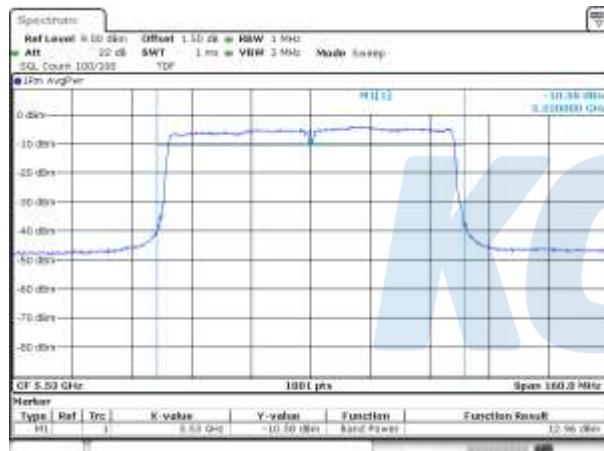
UNII-1 / 802.11ac VHT80 / 5 210 MHz



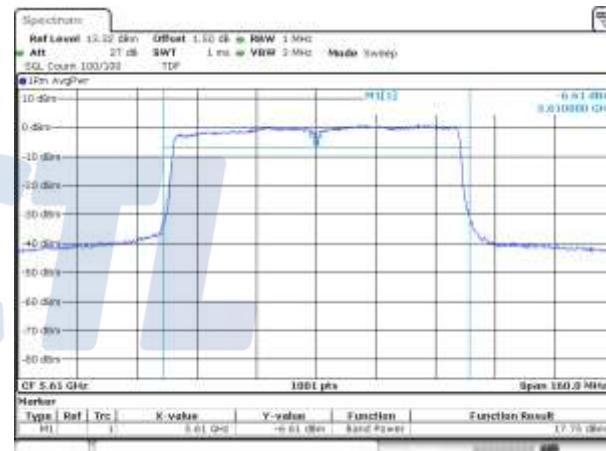
UNII-2A / 802.11ac VHT80 / 5 290 MHz



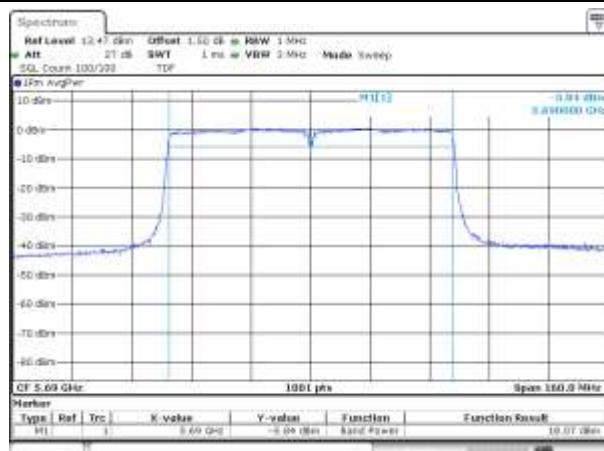
UNII-2C / 802.11ac VHT80 / 5 530 MHz



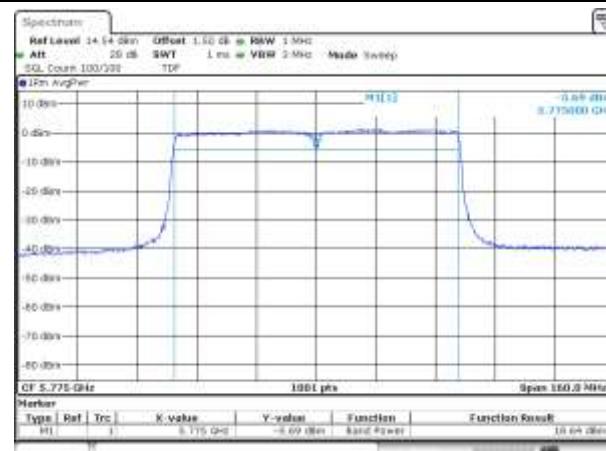
UNII-2C / 802.11ac VHT80 / 5 610 MHz



UNII-2C / 802.11ac VHT80 / 5 690 MHz



UNII-3 / 802.11ac VHT80 / 5 775 MHz



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Page (37) of (1046)

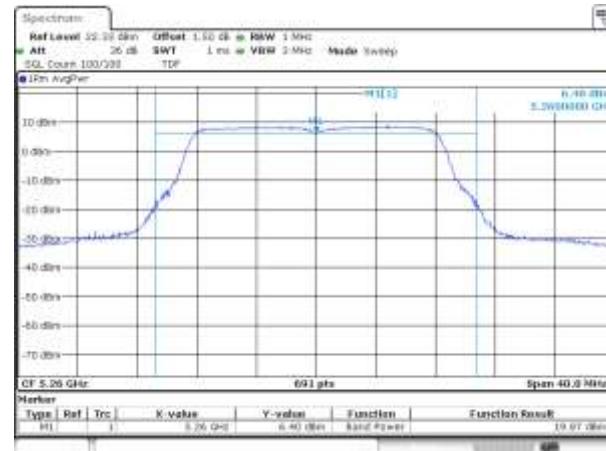
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UNII-1 / 802.11a / 5 180 MHz



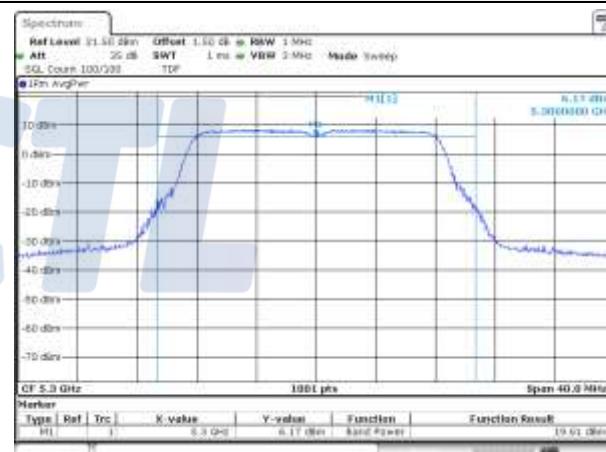
UNII-2A / 802.11a / 5 260 MHz



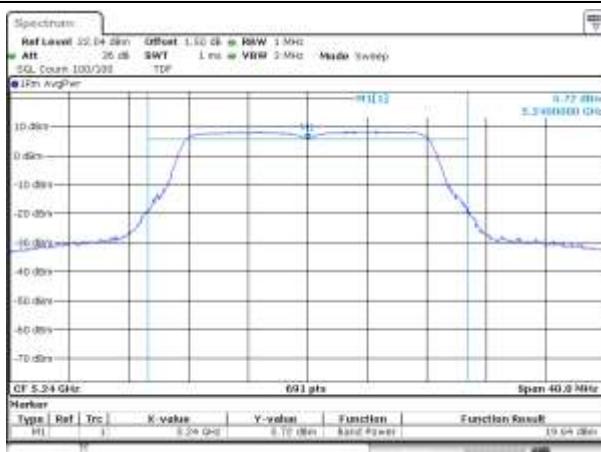
UNII-1 / 802.11a / 5 220 MHz



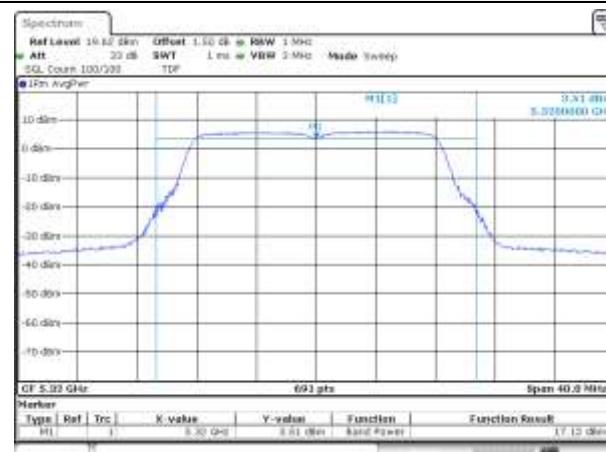
UNII-2A / 802.11a / 5 300 MHz



UNII-1 / 802.11a / 5 240 MHz



UNII-2A / 802.11a / 5 320 MHz



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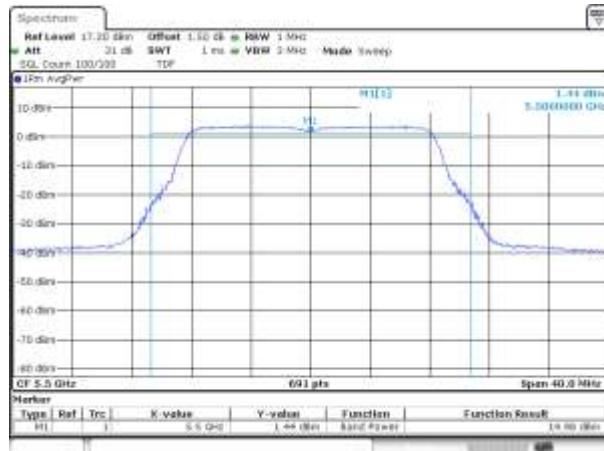
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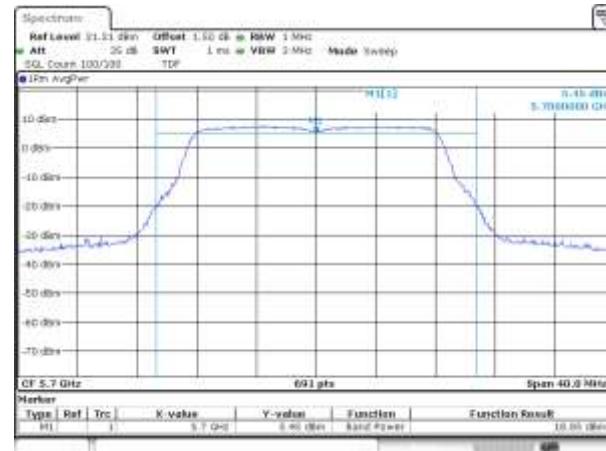
Page (38) of (1046)

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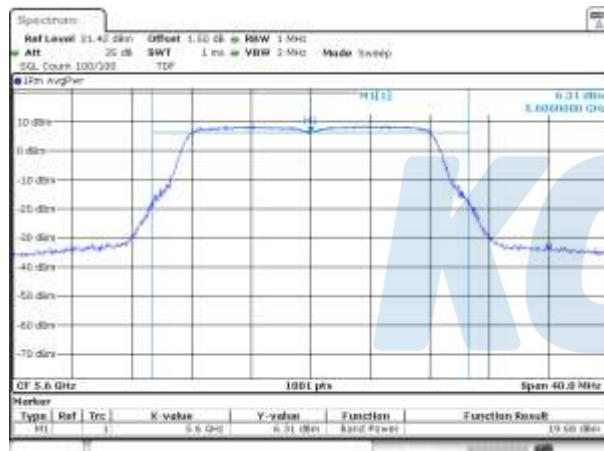
UNII-2C / 802.11a / 5 500 MHz



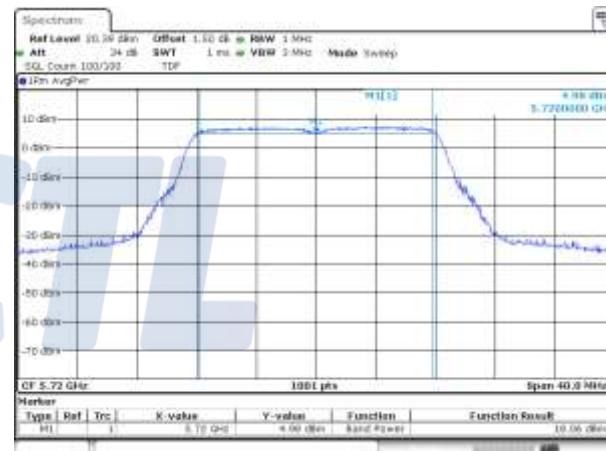
UNII-2C / 802.11a / 5 700 MHz



UNII-2C / 802.11a / 5 600 MHz



UNII-2C / 802.11a / 5 720 MHz



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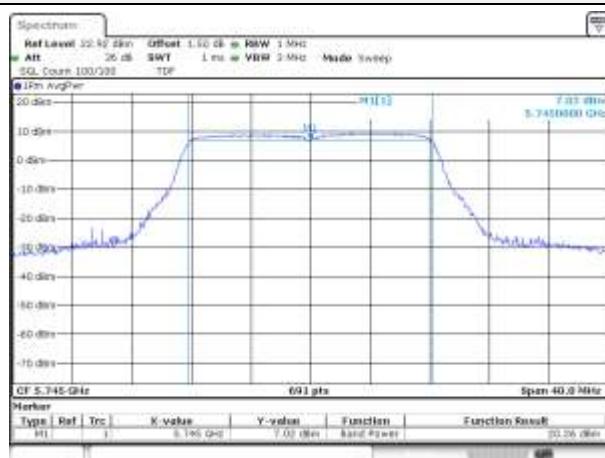
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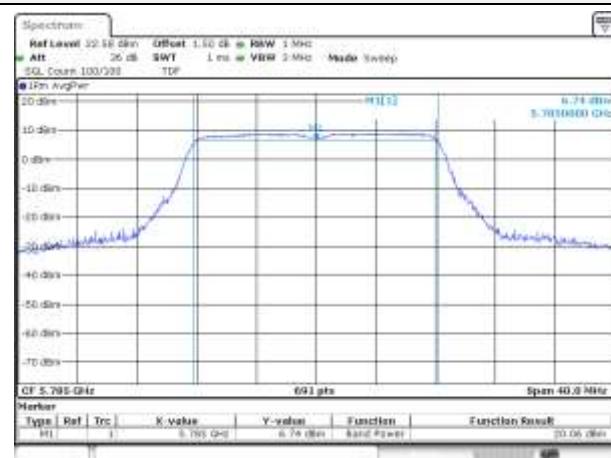
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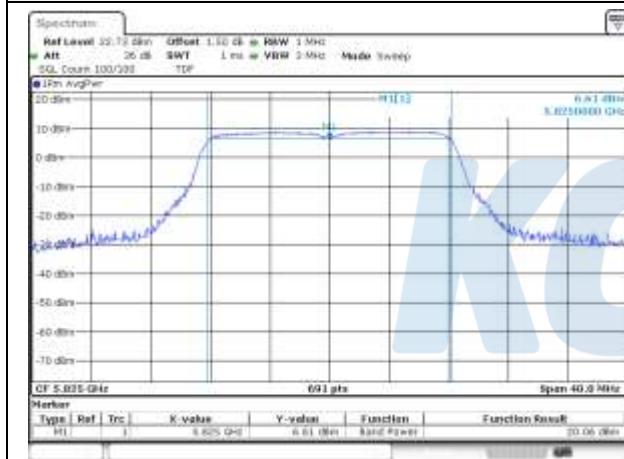
UNII-3 / 802.11a / 5 745 MHz



UNII-3 / 802.11a / 5 785 MHz



UNII-3 / 802.11a / 5 825 MHz



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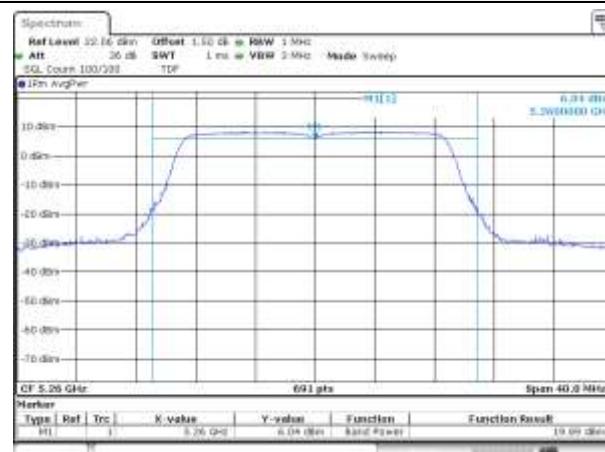
Page (40) of (1046)

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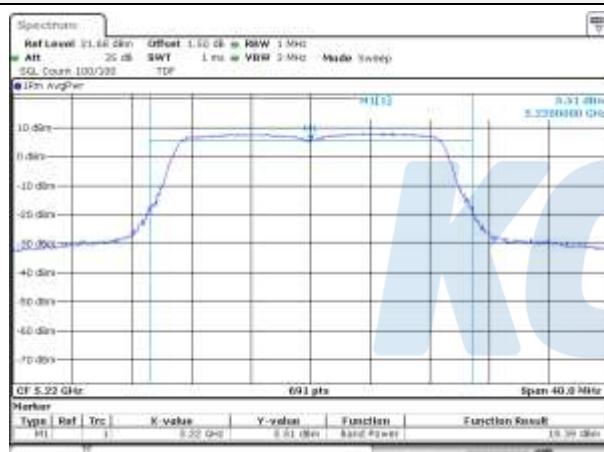
UNII-1 / 802.11n HT20 / 5 180 MHz



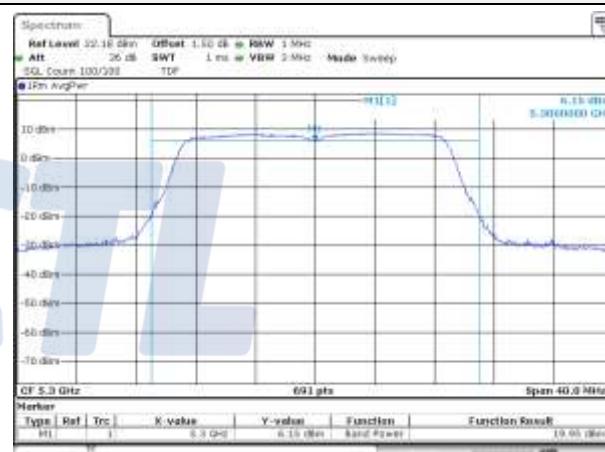
UNII-2A / 802.11n HT20 / 5 260 MHz



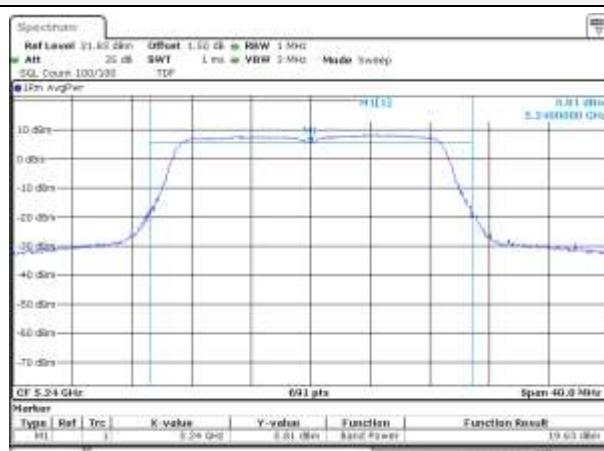
UNII-1 / 802.11n HT20 / 5 220 MHz



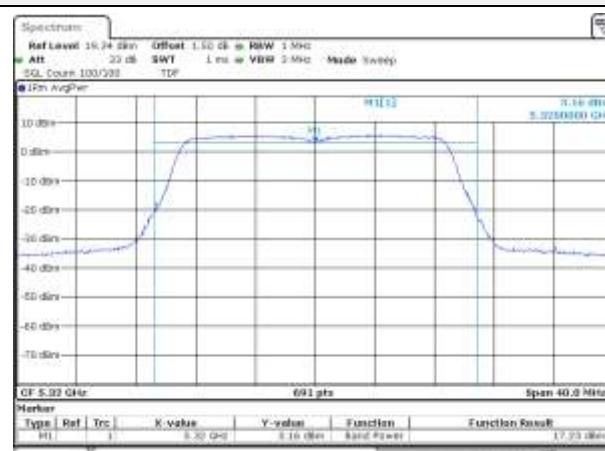
UNII-2A / 802.11n HT20 / 5 300 MHz



UNII-1 / 802.11n HT20 / 5 240 MHz



UNII-2A / 802.11n HT20 / 5 320 MHz



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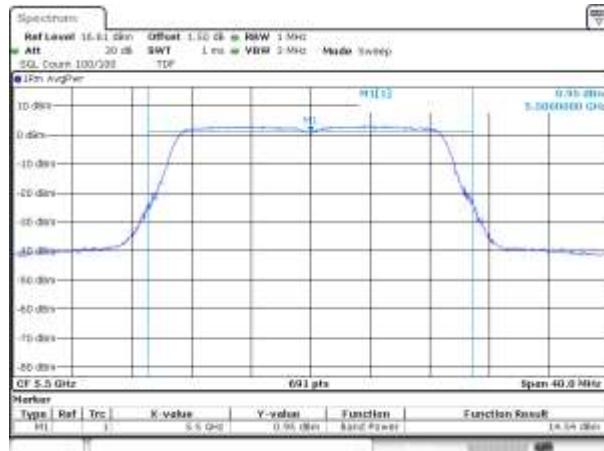
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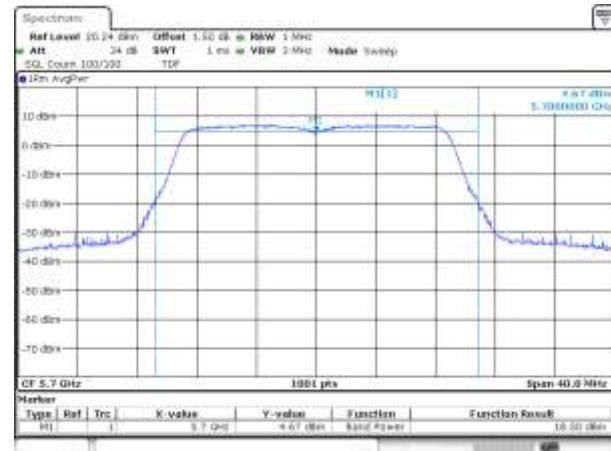
Page (41) of (1046)

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UNII-2C / 802.11n HT20 / 5 500 MHz



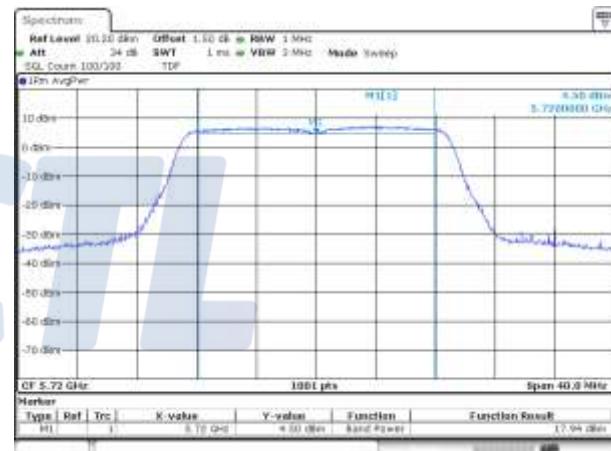
UNII-2C / 802.11n HT20 / 5 700 MHz



UNII-2C / 802.11n HT20 / 5 600 MHz



UNII-2C / 802.11n HT20 / 5 720 MHz



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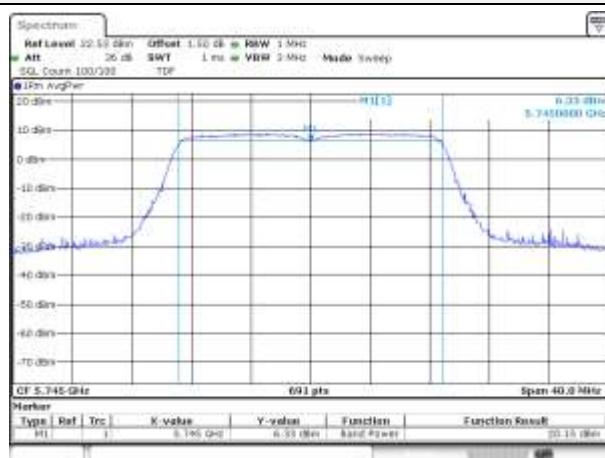
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Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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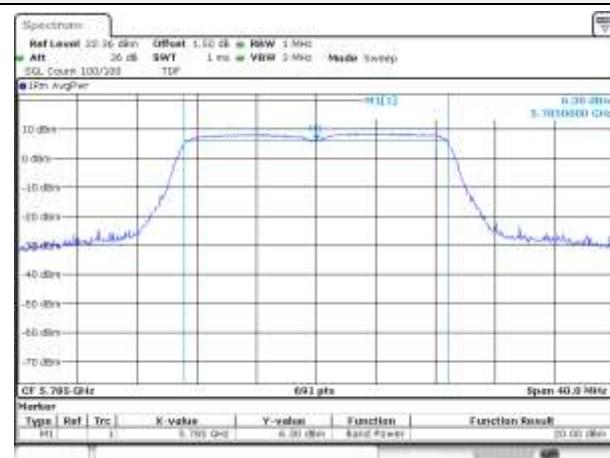
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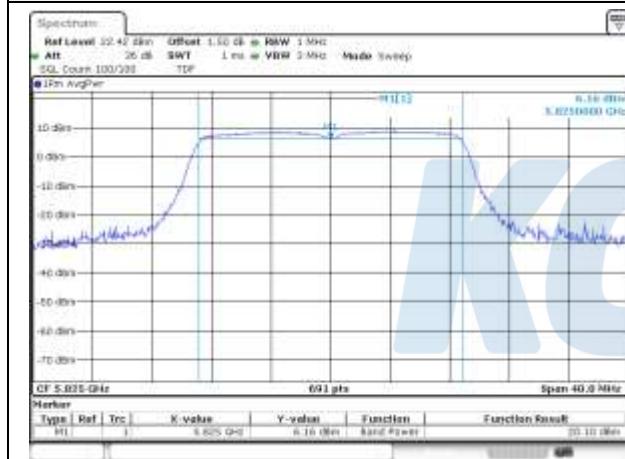
UNII-3 / 802.11n HT20 / 5 745 MHz



UNII-3 / 802.11n HT20 / 5 785 MHz



UNII-3 / 802.11n HT20 / 5 825 MHz



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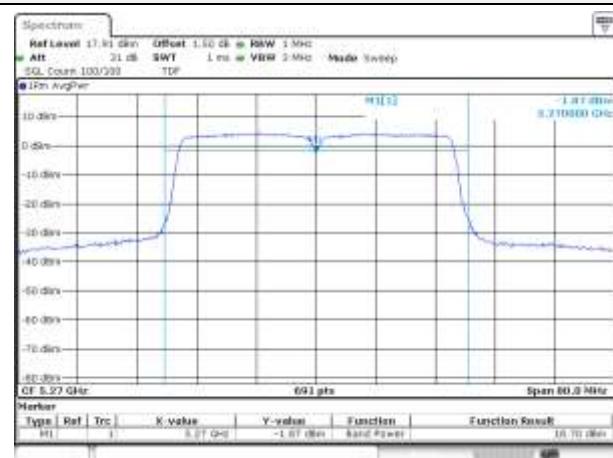
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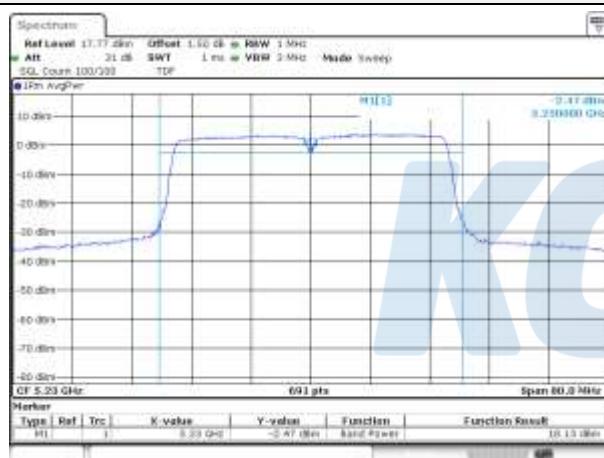
UNII-1 / 802.11n HT40 / 5 190 MHz



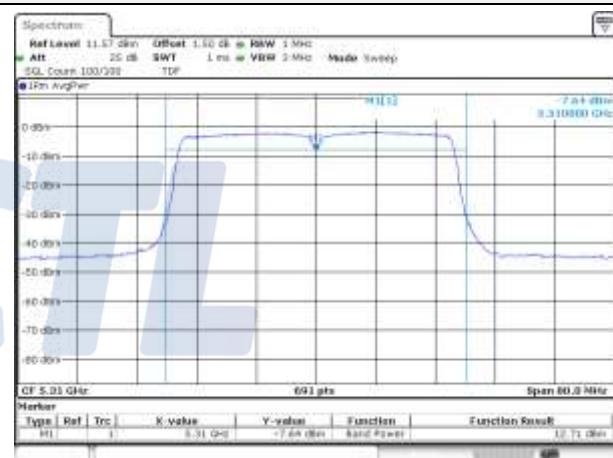
UNII-2A / 802.11n HT40 / 5 270 MHz



UNII-1 / 802.11n HT40 / 5 230 MHz



UNII-2A / 802.11n HT40 / 5 310 MHz



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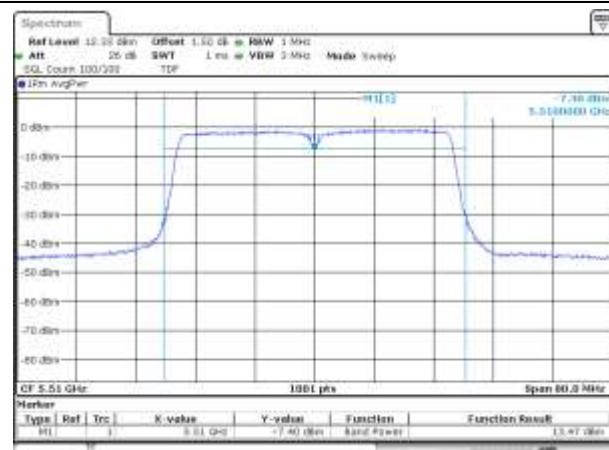
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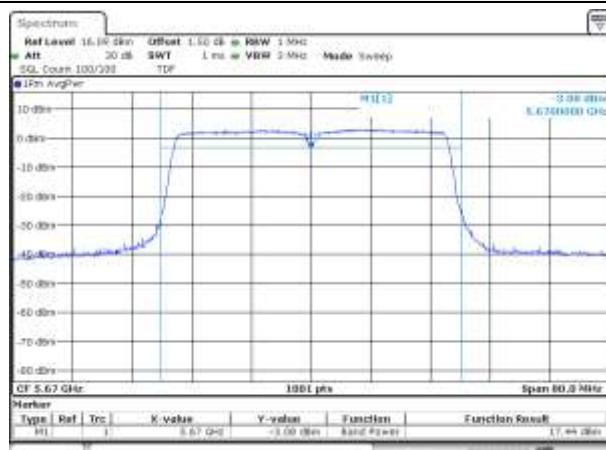
Page (44) of (1046)

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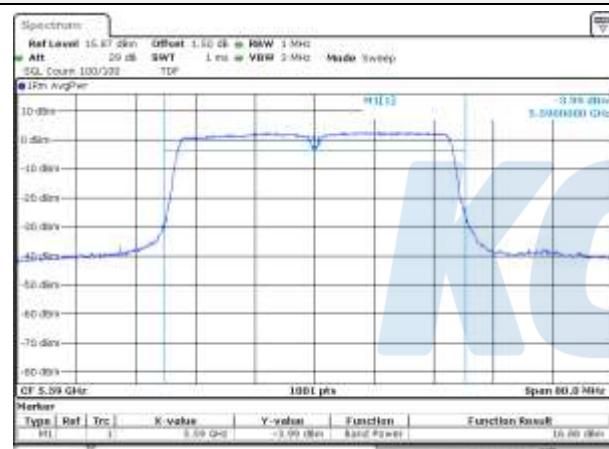
UNII-2C / 802.11n HT40 / 5 510 MHz



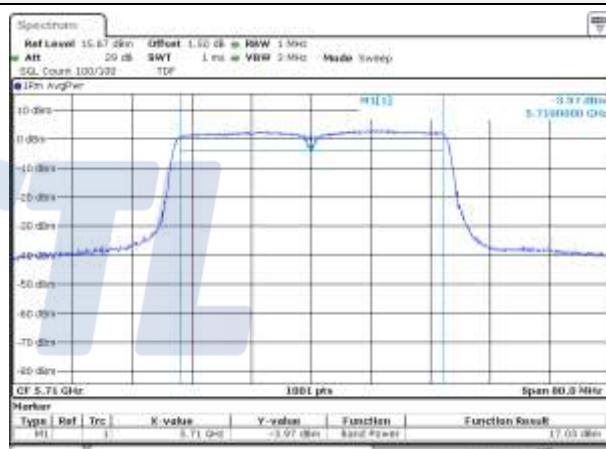
UNII-2C / 802.11n HT40 / 5 670 MHz



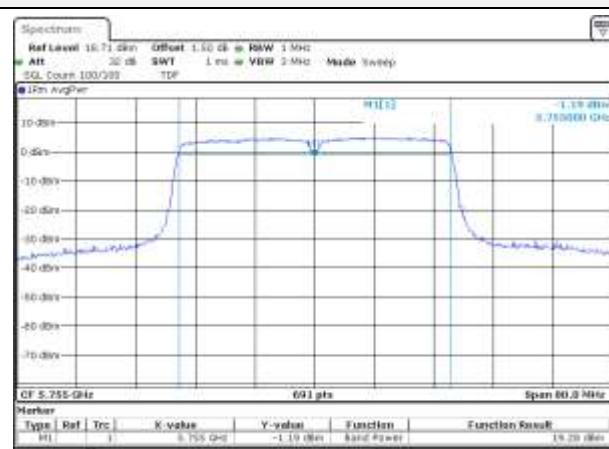
UNII-2C / 802.11n HT40 / 5 590 MHz



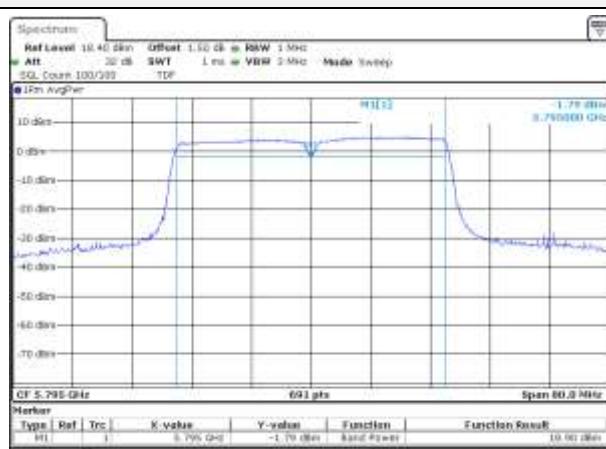
UNII-2C / 802.11n HT40 / 5 710 MHz



UNII-3 / 802.11n HT40 / 5 755 MHz



UNII-3 / 802.11n HT40 / 5 795 MHz



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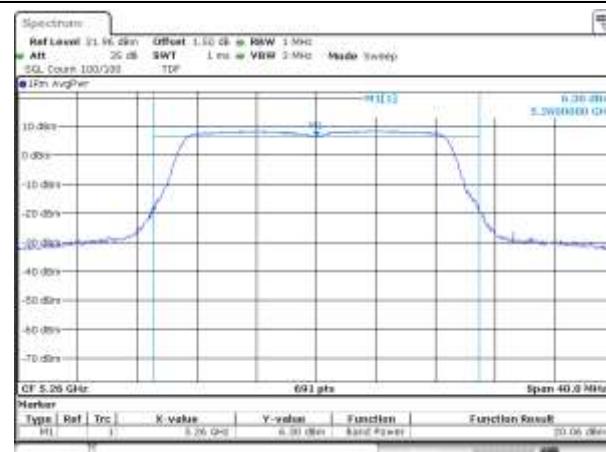
Page (45) of (1046)

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UNII-1 / 802.11ac VHT20 / 5 180 MHz



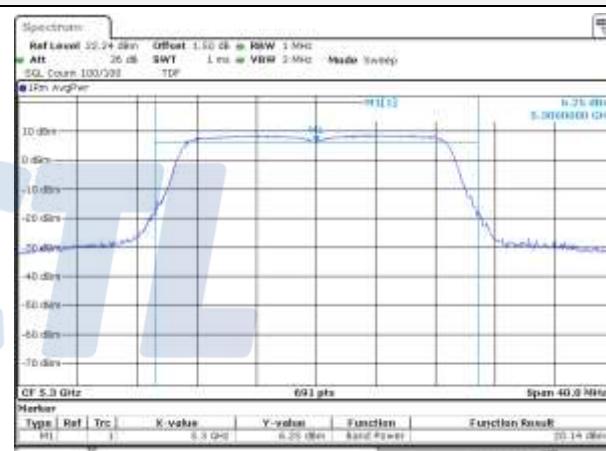
UNII-2A / 802.11ac VHT20 / 5 260 MHz



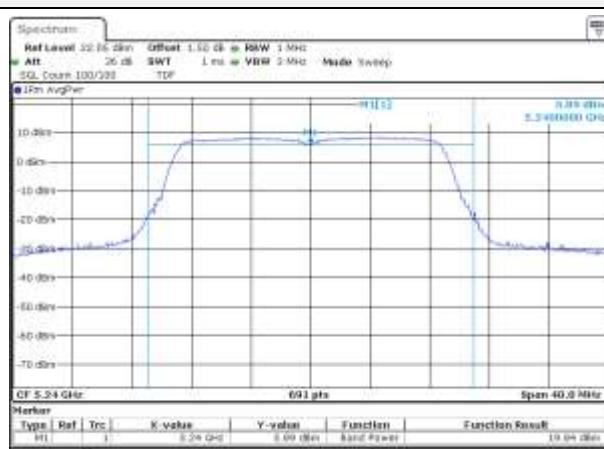
UNII-1 / 802.11ac VHT20 / 5 220 MHz



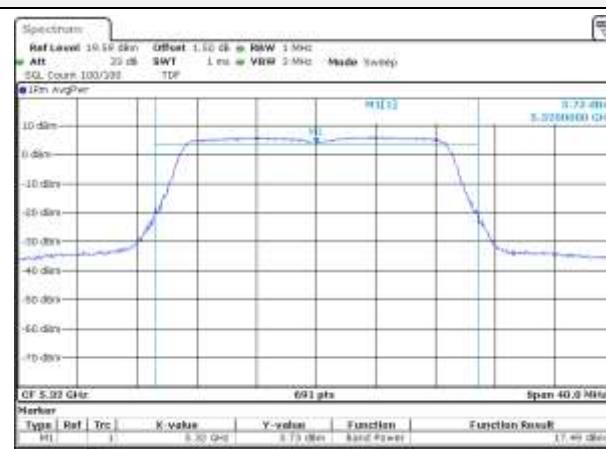
UNII-2A / 802.11ac VHT20 / 5 300 MHz



UNII-1 / 802.11ac VHT20 / 5 240 MHz



UNII-2A / 802.11ac VHT20 / 5 320 MHz



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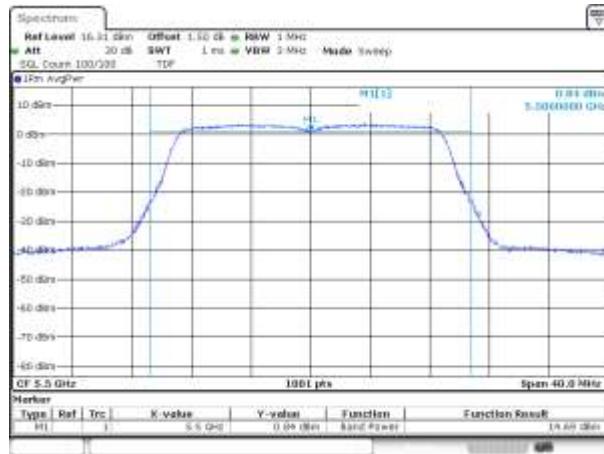
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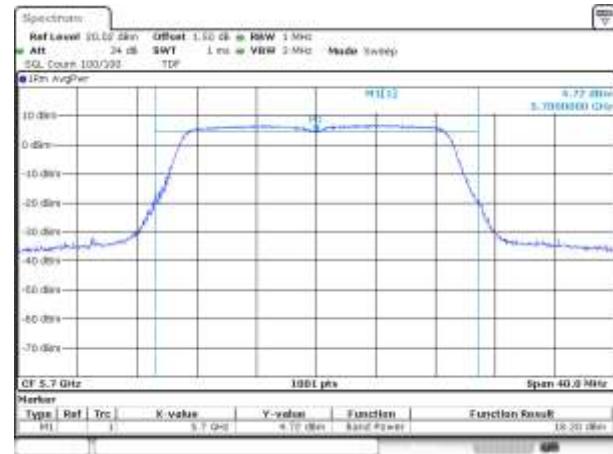
Page (46) of (1046)

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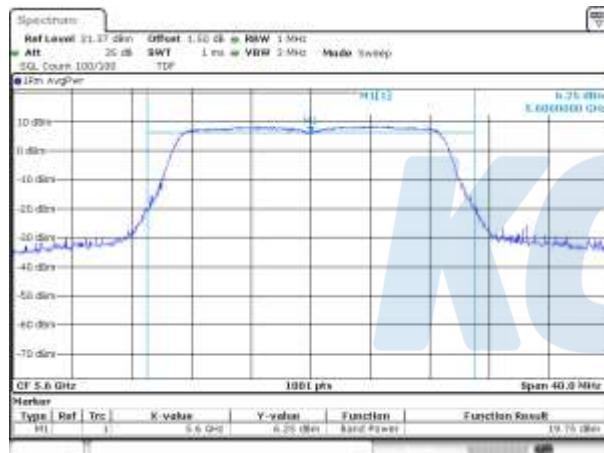
UNII-2C / 802.11ac VHT20 / 5 500 MHz



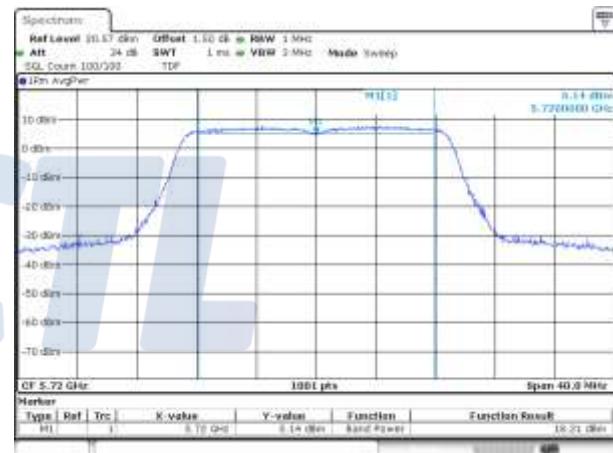
UNII-2C / 802.11ac VHT20 / 5 700 MHz



UNII-2C / 802.11ac VHT20 / 5 600 MHz



UNII-2C / 802.11ac VHT20 / 5 720 MHz



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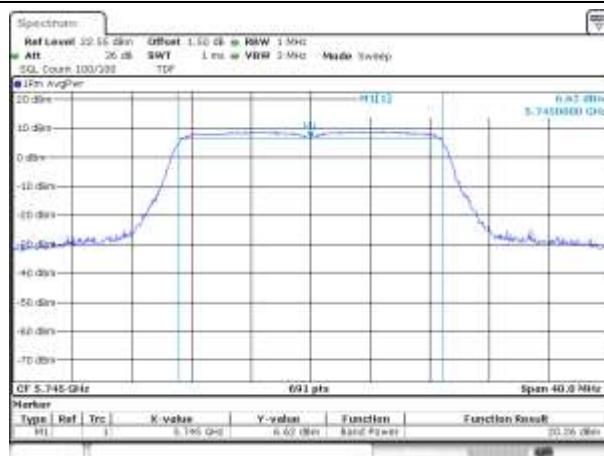
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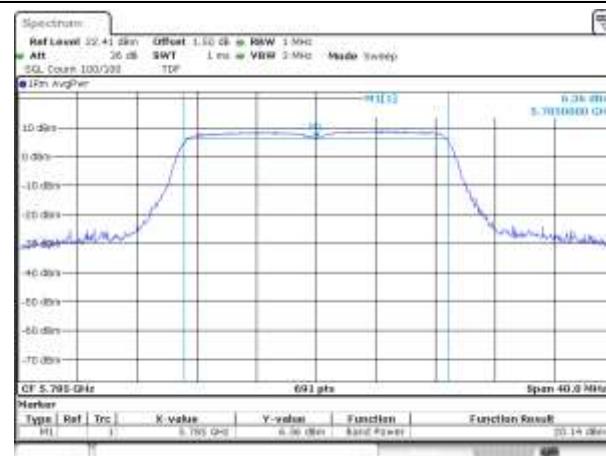
Page (47) of (1046)

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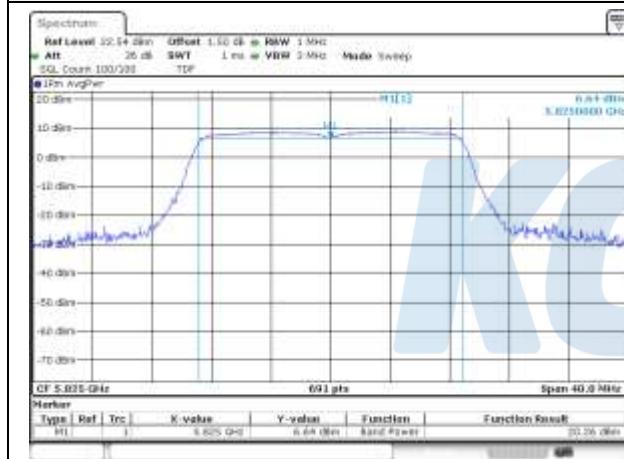
UNII-3 / 802.11ac VHT20 / 5 745 MHz



UNII-3 / 802.11ac VHT20 / 5 785 MHz



UNII-3 / 802.11ac VHT20 / 5 825 MHz



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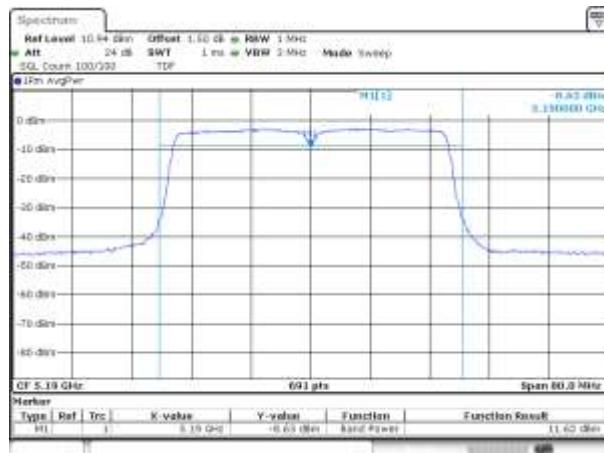
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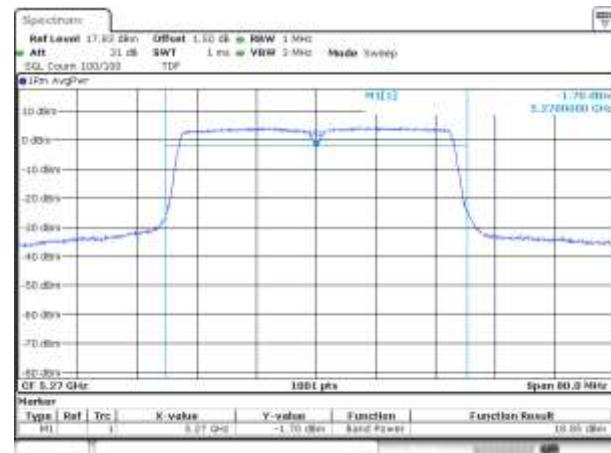
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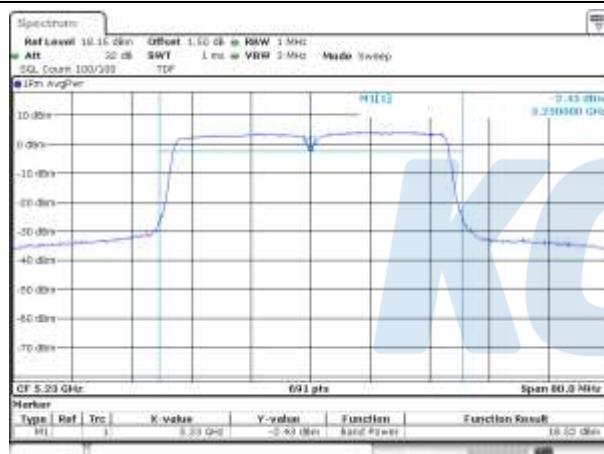
UNII-1 / 802.11ac VHT40 / 5 190 MHz



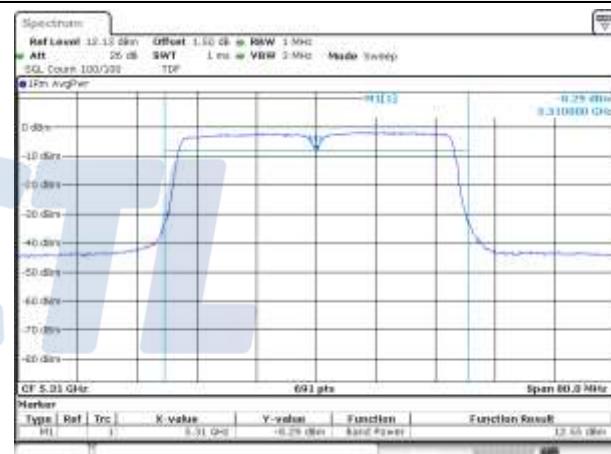
UNII-2A / 802.11ac VHT40 / 5 270 MHz



UNII-1 / 802.11ac VHT40 / 5 230 MHz



UNII-2A / 802.11ac VHT40 / 5 310 MHz



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Report No.:
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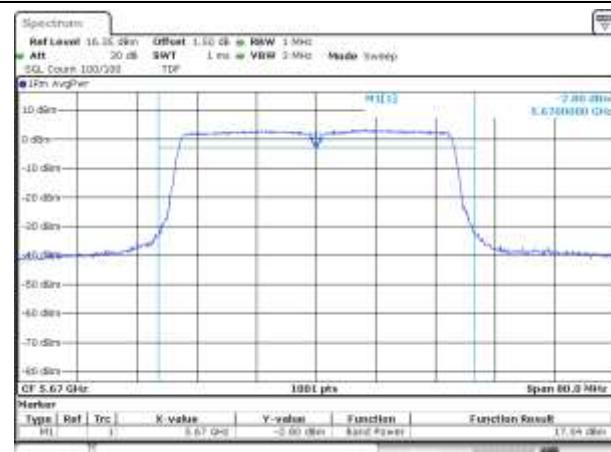
Page (49) of (1046)

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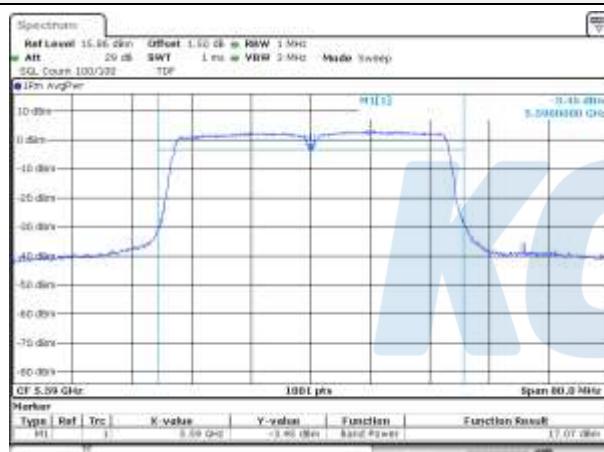
UNII-2C / 802.11ac VHT40 / 5 510 MHz



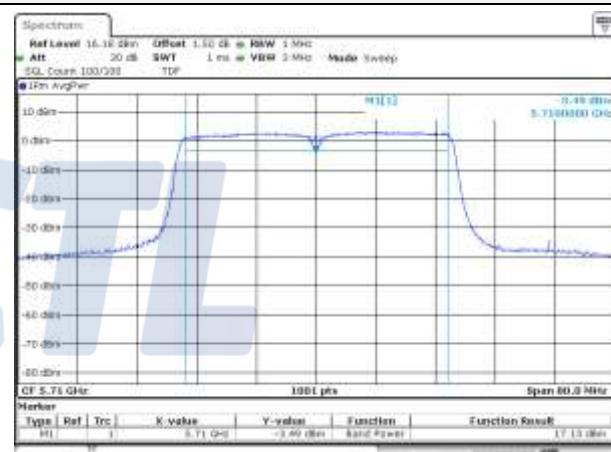
UNII-2C / 802.11ac VHT40 / 5 670 MHz



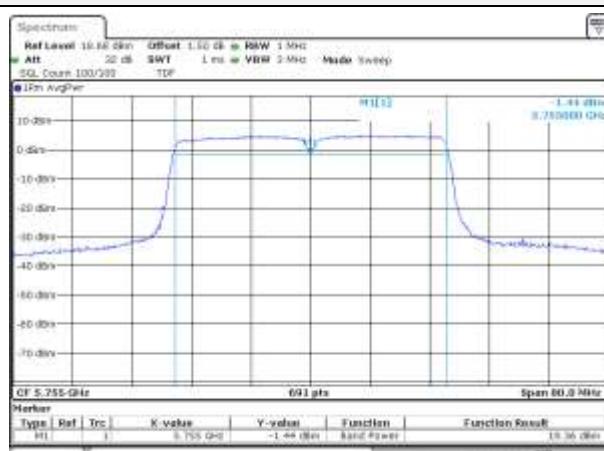
UNII-2C / 802.11ac VHT40 / 5 590 MHz



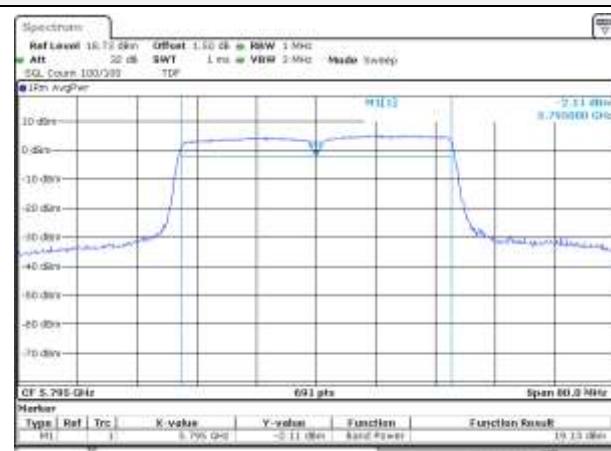
UNII-2C / 802.11ac VHT40 / 5 710 MHz



UNII-3 / 802.11ac VHT40 / 5 755 MHz



UNII-3 / 802.11ac VHT40 / 5 795 MHz



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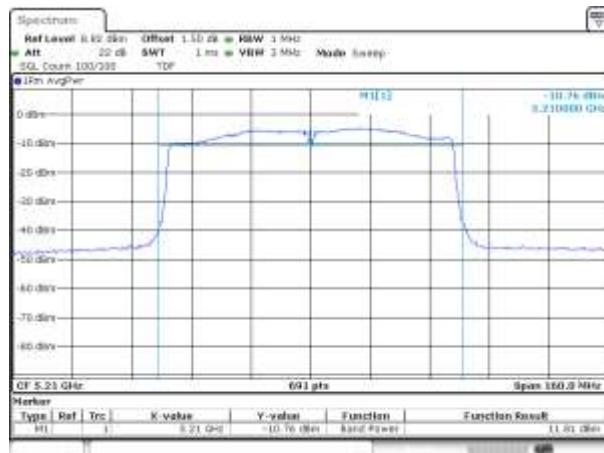
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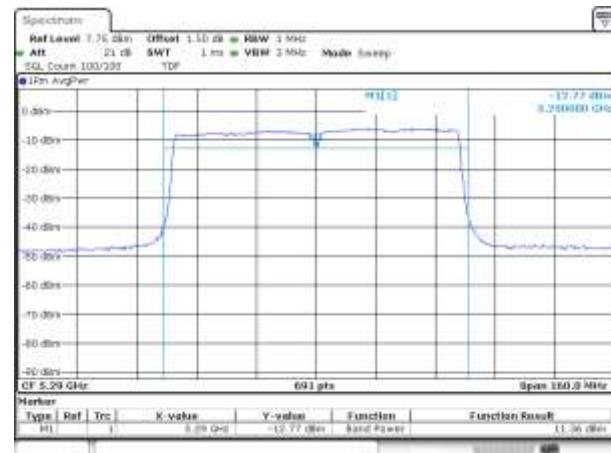
Page (50) of (1046)

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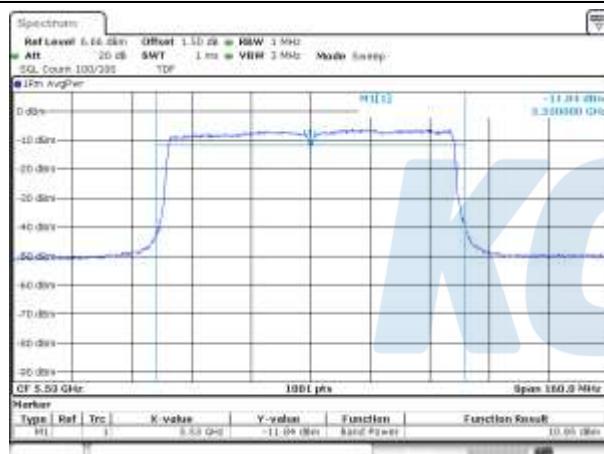
UNII-1 / 802.11ac VHT80 / 5 210 MHz



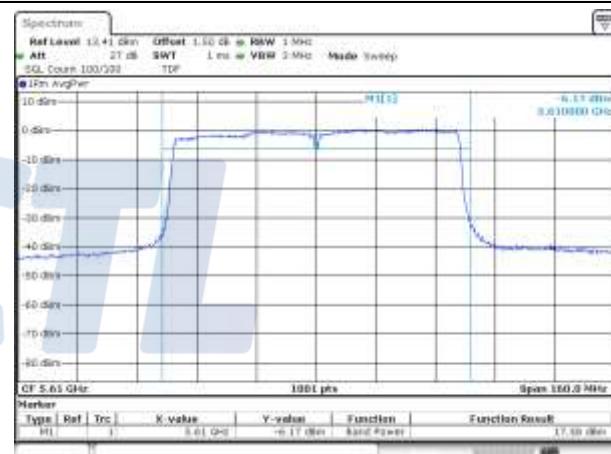
UNII-2A / 802.11ac VHT80 / 5 290 MHz



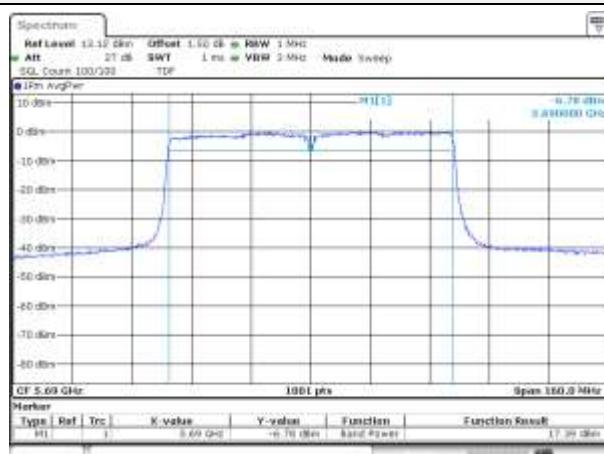
UNII-2C / 802.11ac VHT80 / 5 530 MHz



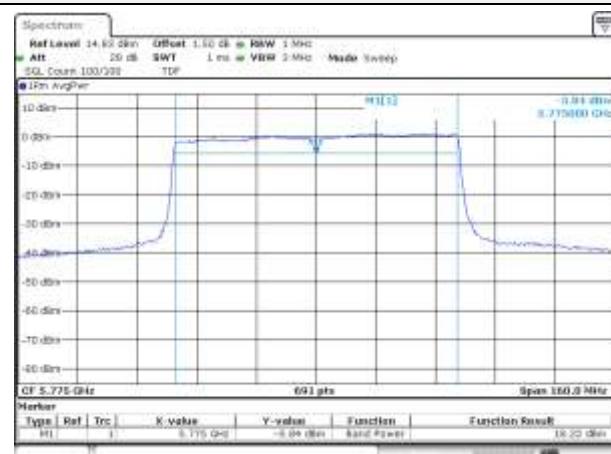
UNII-2C / 802.11ac VHT80 / 5 610 MHz



UNII-2C / 802.11ac VHT80 / 5 690 MHz



UNII-3 / 802.11ac VHT80 / 5 775 MHz



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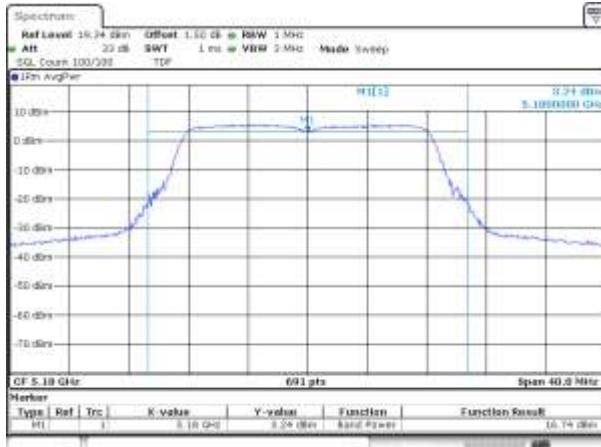
Report No.:
KR20-SRF0030-D

Page (51) of (1046)

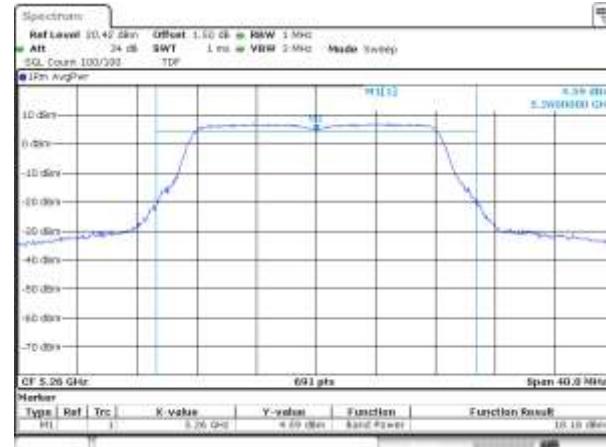
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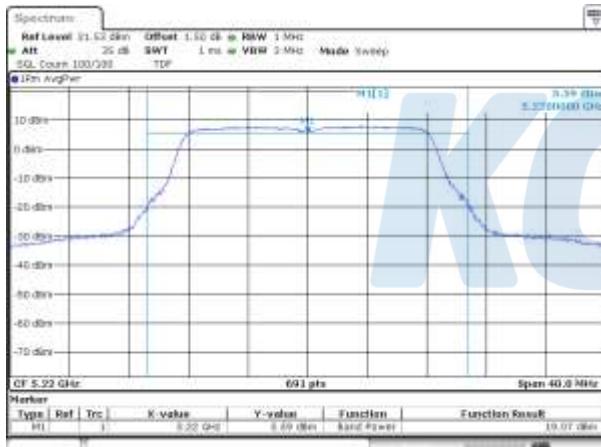
UNII-1 / 802.11a / 5 180 MHz



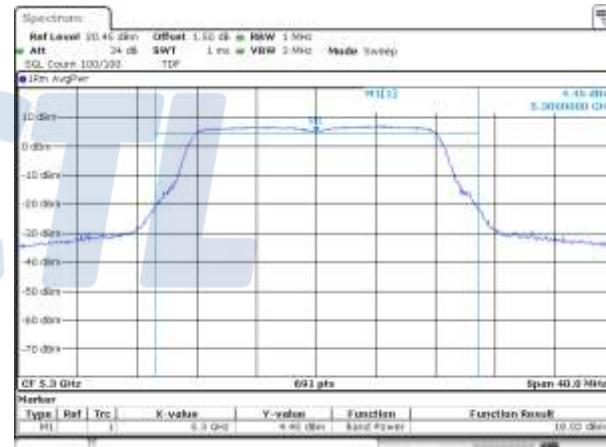
UNII-2A / 802.11a / 5 260 MHz



UNII-1 / 802.11a / 5 220 MHz



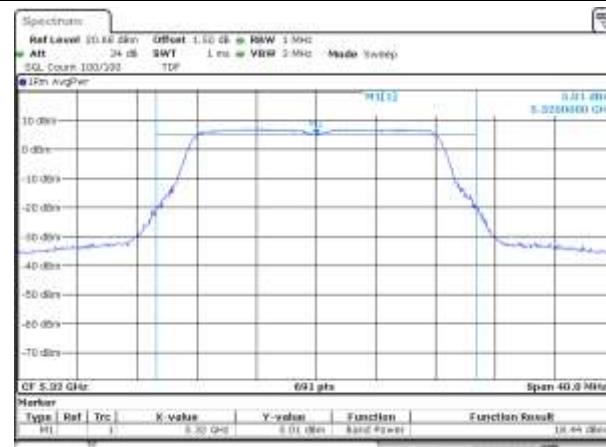
UNII-2A / 802.11a / 5 300 MHz



UNII-1 / 802.11a / 5 240 MHz



UNII-2A / 802.11a / 5 320 MHz



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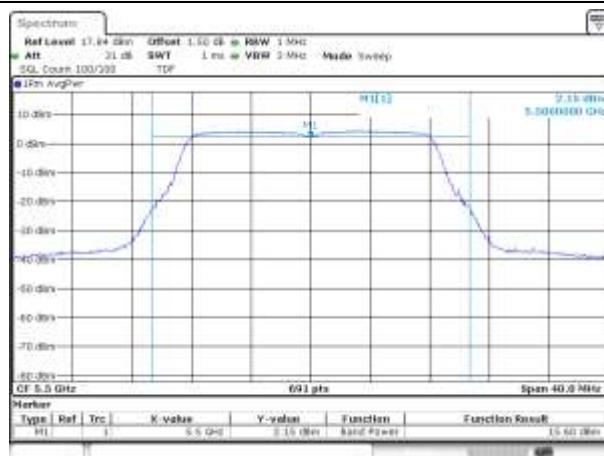
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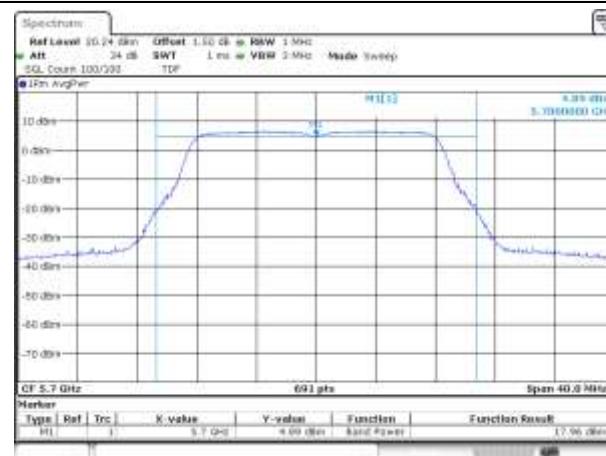
Page (52) of (1046)

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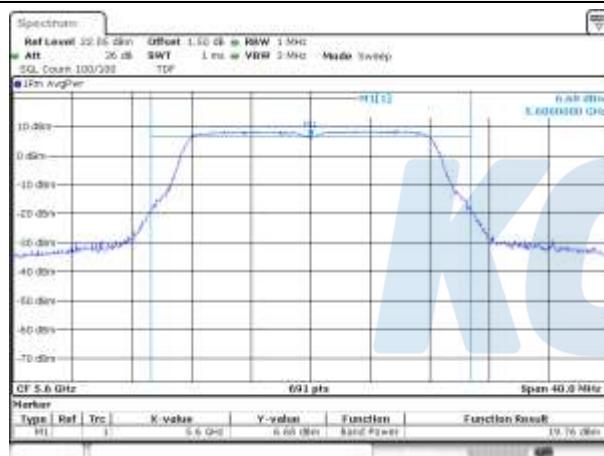
UNII-2C / 802.11a / 5 500 MHz



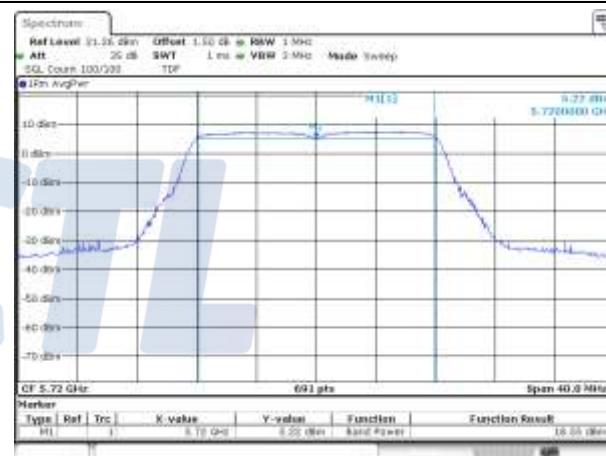
UNII-2C / 802.11a / 5 700 MHz



UNII-2C / 802.11a / 5 600 MHz



UNII-2C / 802.11a / 5 720 MHz



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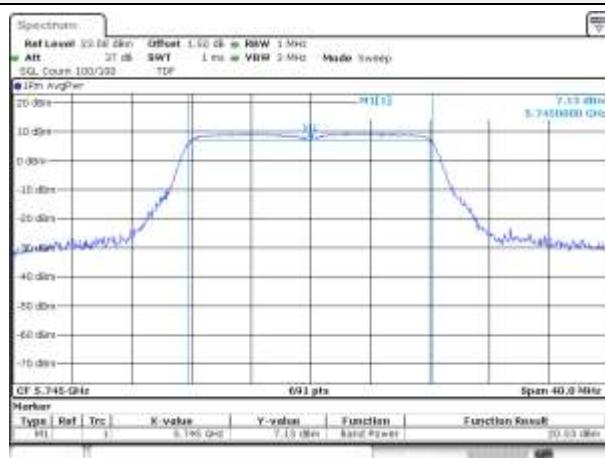
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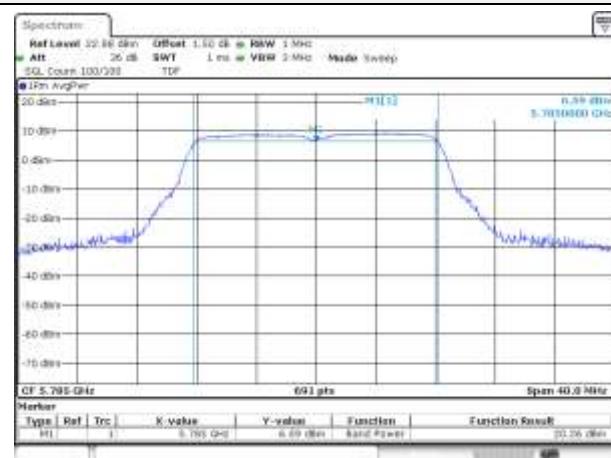
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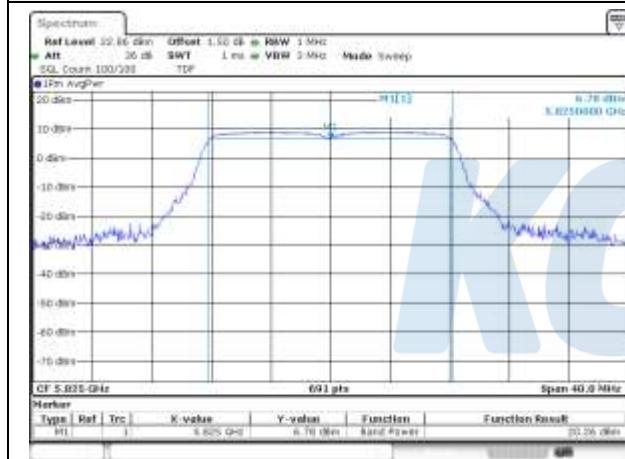
UNII-3 / 802.11a / 5 745 MHz



UNII-3 / 802.11a / 5 785 MHz



UNII-3 / 802.11a / 5 825 MHz



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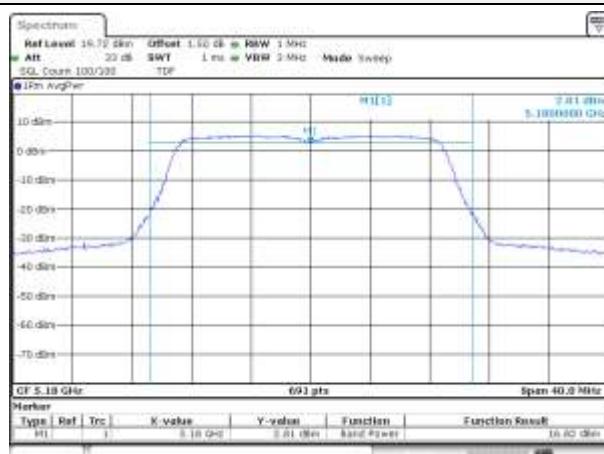
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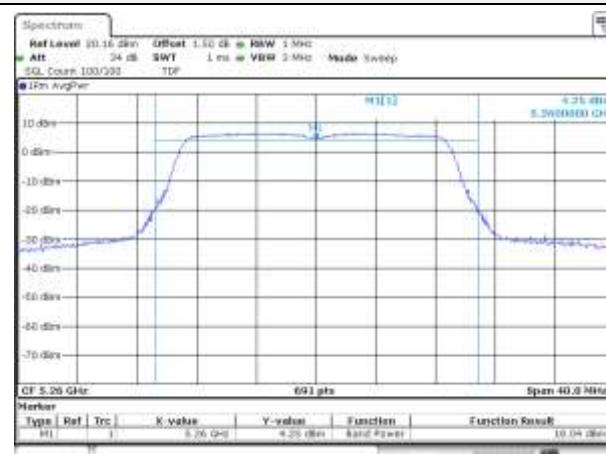
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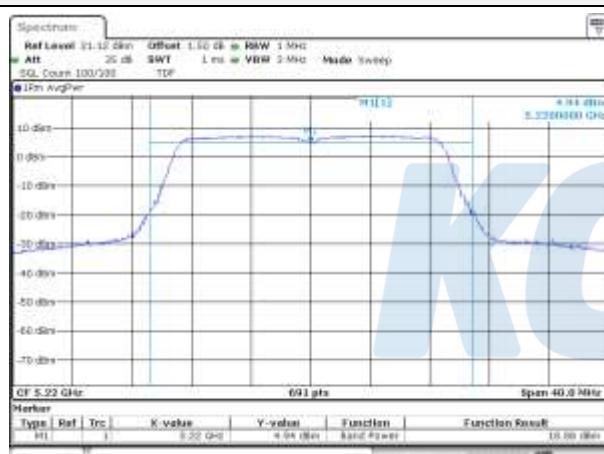
UNII-1 / 802.11n HT20 / 5 180 MHz



UNII-2A / 802.11n HT20 / 5 260 MHz



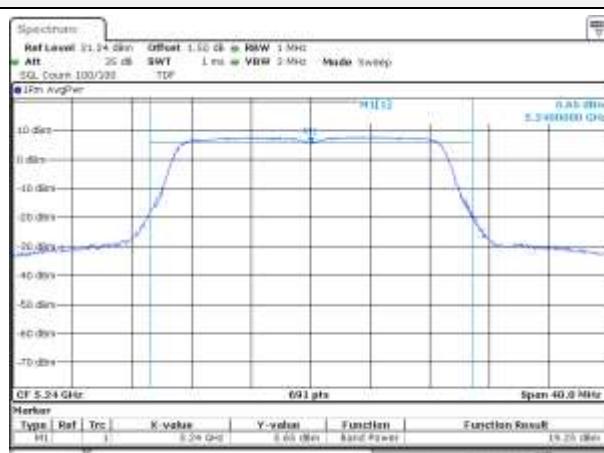
UNII-1 / 802.11n HT20 / 5 220 MHz



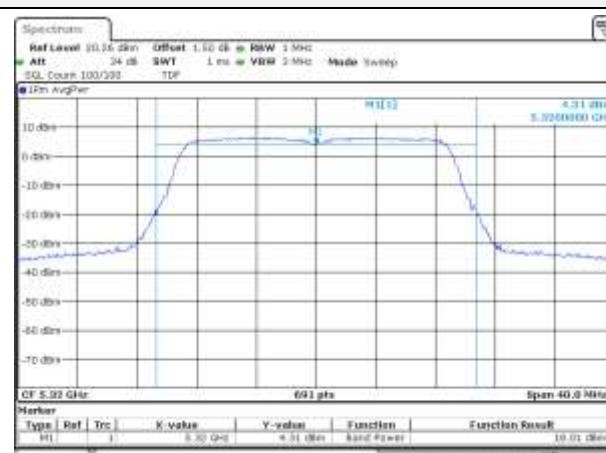
UNII-2A / 802.11n HT20 / 5 300 MHz



UNII-1 / 802.11n HT20 / 5 240 MHz



UNII-2A / 802.11n HT20 / 5 320 MHz



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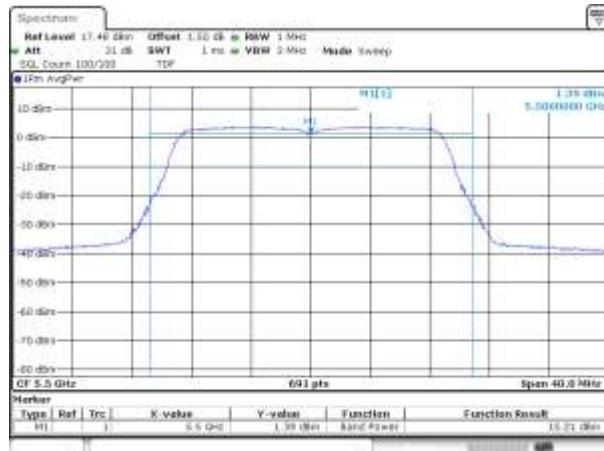
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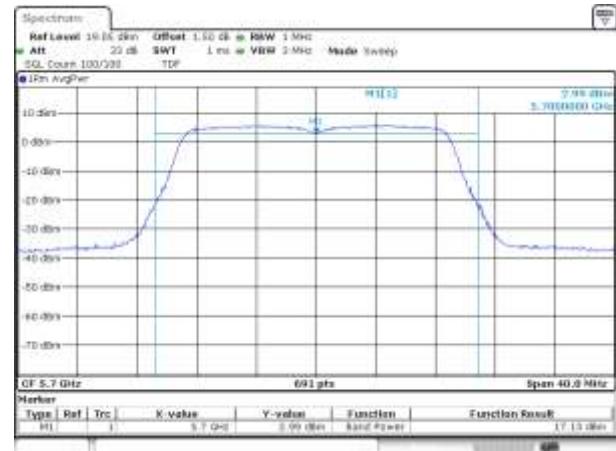
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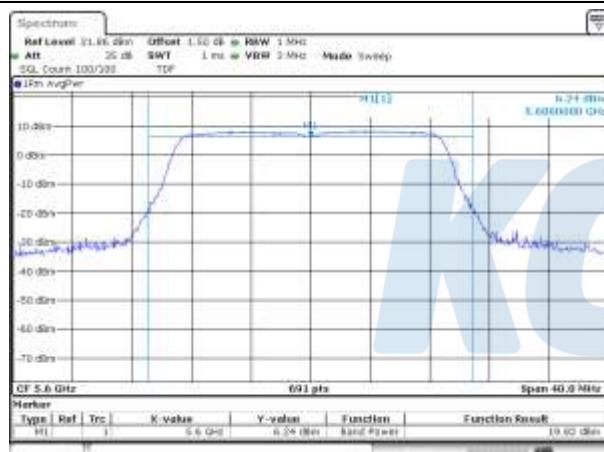
UNII-2C / 802.11n HT20 / 5 500 MHz



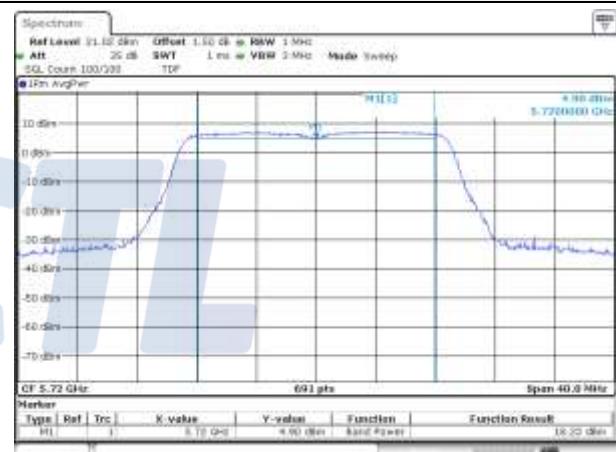
UNII-2C / 802.11n HT20 / 5 700 MHz



UNII-2C / 802.11n HT20 / 5 600 MHz



UNII-2C / 802.11n HT20 / 5 720 MHz



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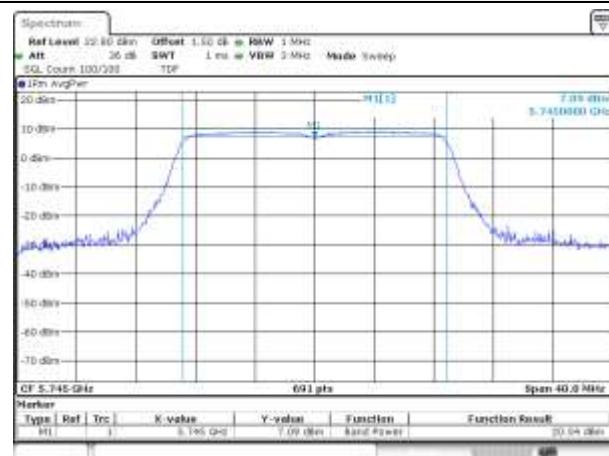
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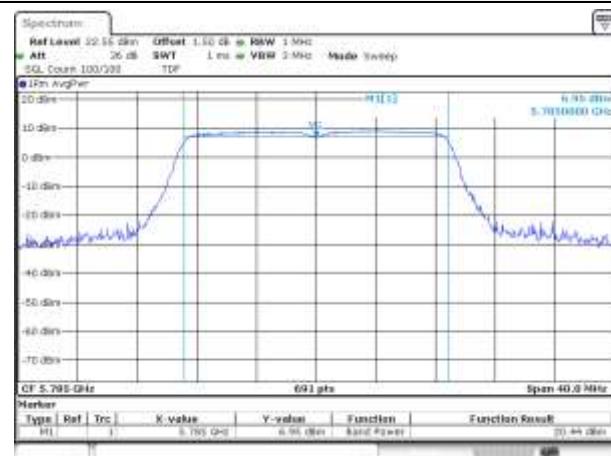
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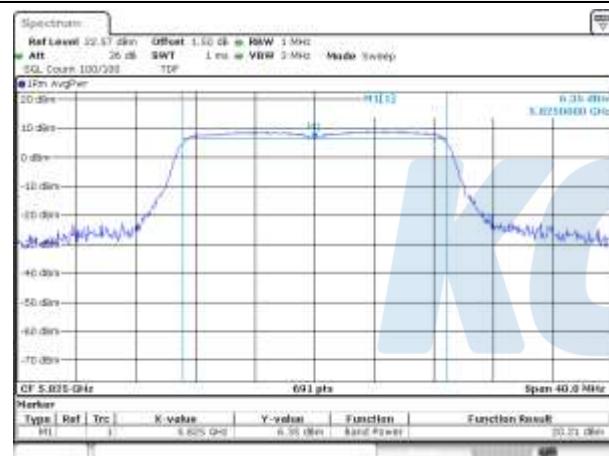
UNII-3 / 802.11n HT20 / 5 745 MHz



UNII-3 / 802.11n HT20 / 5 785 MHz



UNII-3 / 802.11n HT20 / 5 825 MHz



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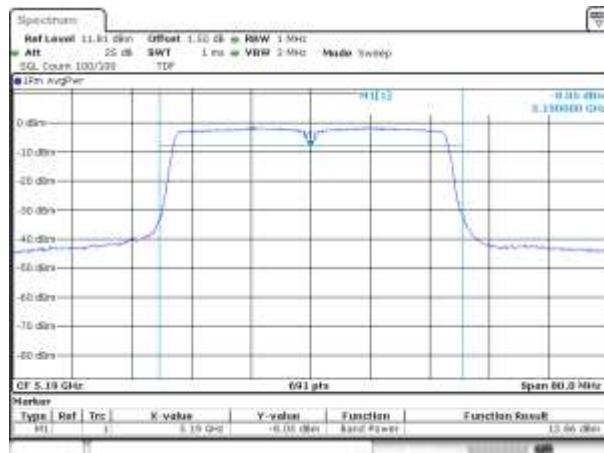
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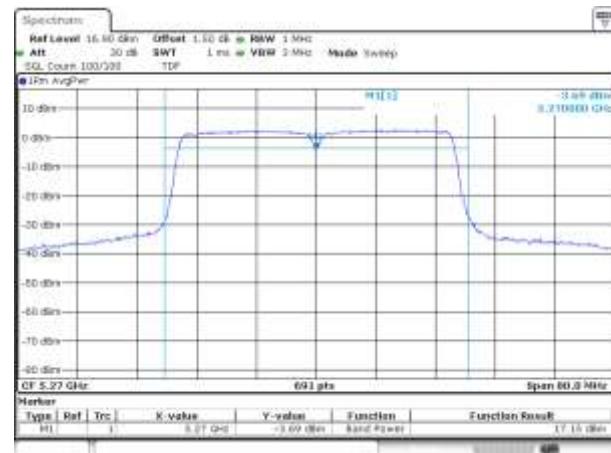
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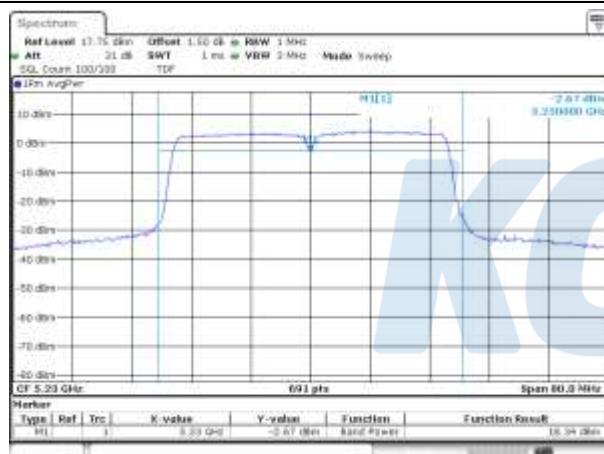
UNII-1 / 802.11n HT40 / 5 190 MHz



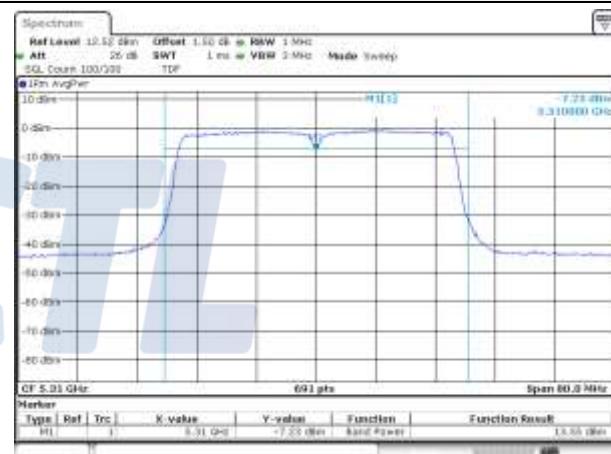
UNII-2A / 802.11n HT40 / 5 270 MHz



UNII-1 / 802.11n HT40 / 5 230 MHz



UNII-2A / 802.11n HT40 / 5 310 MHz



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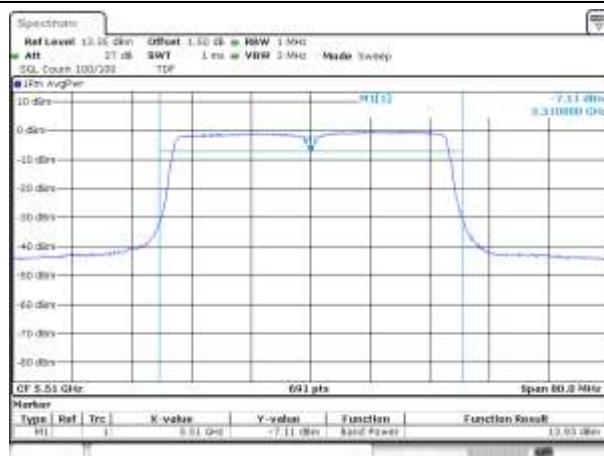
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Page (58) of (1046)

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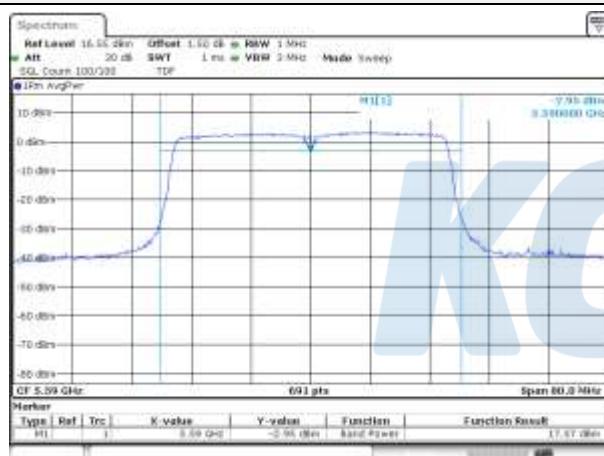
UNII-2C / 802.11n HT40 / 5 510 MHz



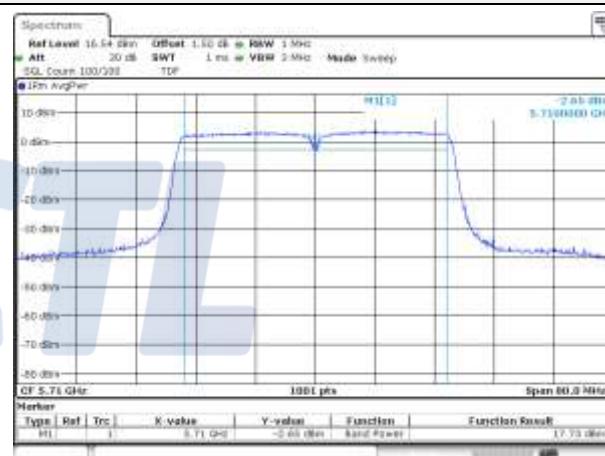
UNII-2C / 802.11n HT40 / 5 670 MHz



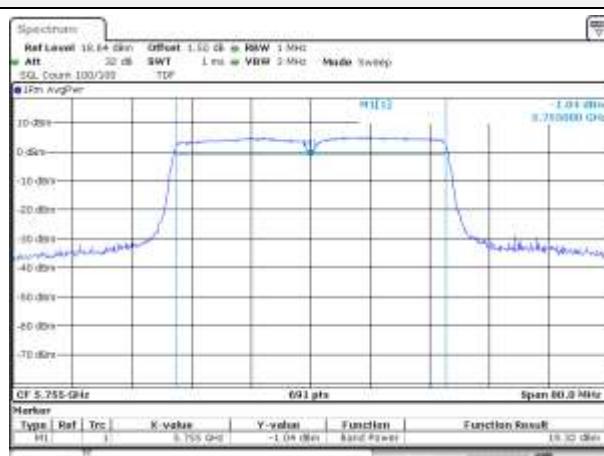
UNII-2C / 802.11n HT40 / 5 590 MHz



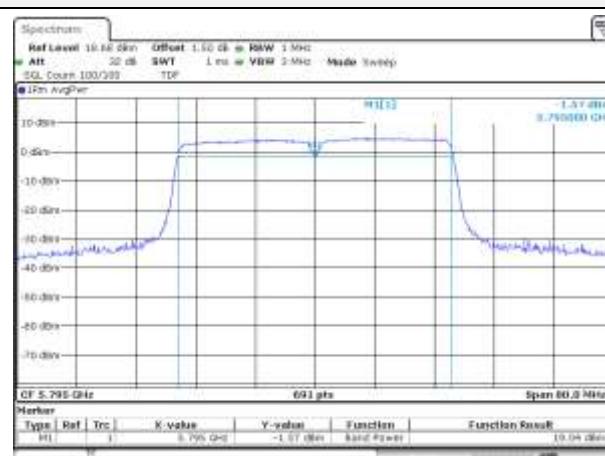
UNII-2C / 802.11n HT40 / 5 710 MHz



UNII-3 / 802.11n HT40 / 5 755 MHz



UNII-3 / 802.11n HT40 / 5 795 MHz



KCTL Inc.

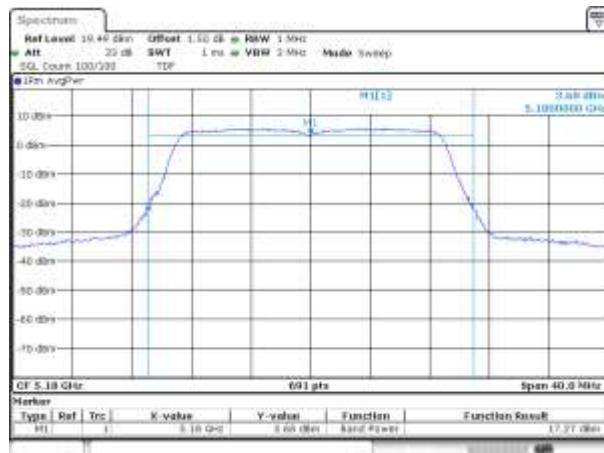
65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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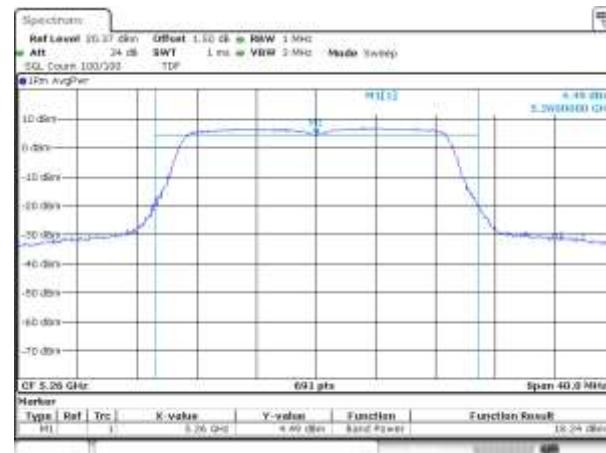
Page (59) of (1046)

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UNII-1 / 802.11ac VHT20 / 5 180 MHz



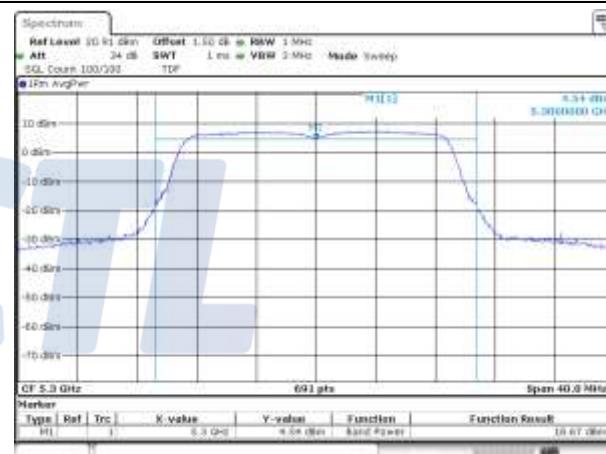
UNII-2A / 802.11ac VHT20 / 5 260 MHz



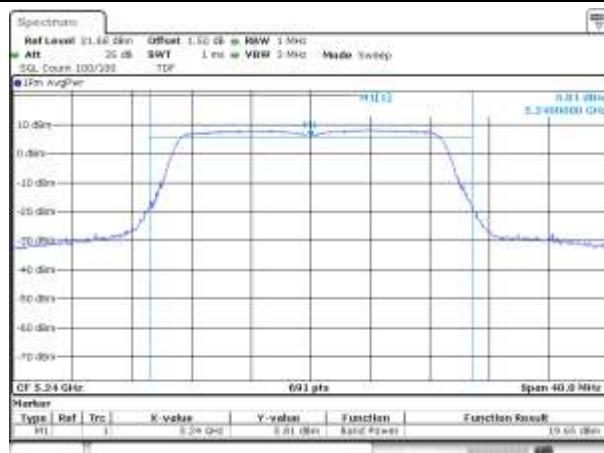
UNII-1 / 802.11ac VHT20 / 5 220 MHz



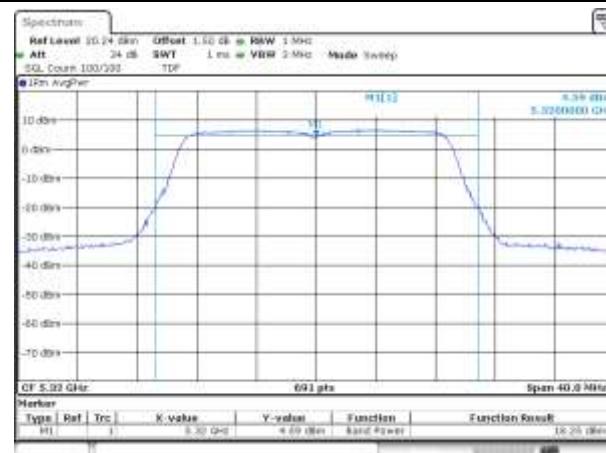
UNII-2A / 802.11ac VHT20 / 5 300 MHz



UNII-1 / 802.11ac VHT20 / 5 240 MHz



UNII-2A / 802.11ac VHT20 / 5 320 MHz



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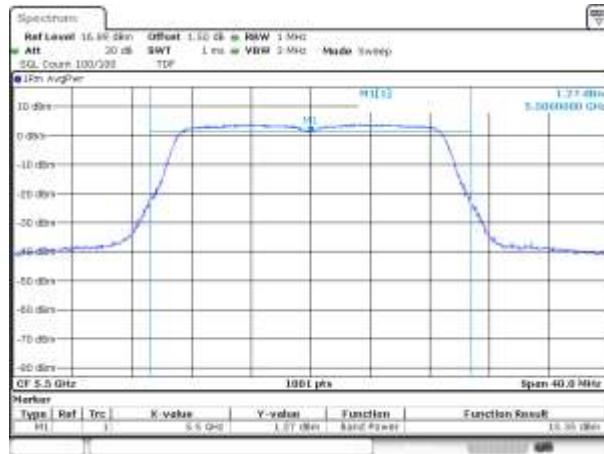
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TEL: 82-31-285-0894 FAX: 82-505-299-8311
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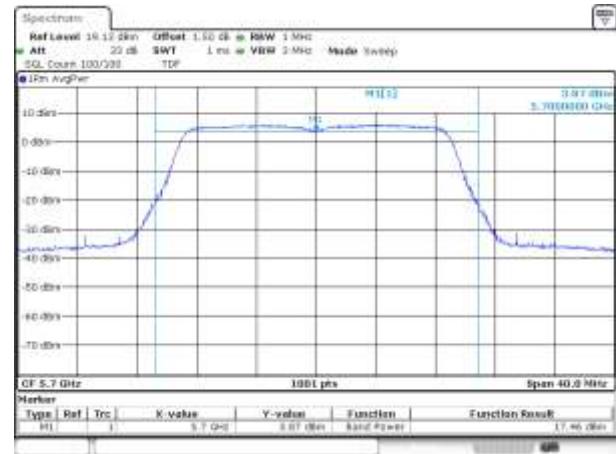
Page (60) of (1046)

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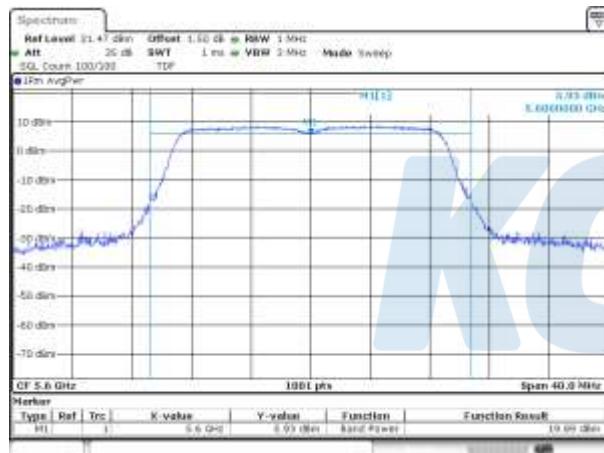
UNII-2C / 802.11ac VHT20 / 5 500 MHz



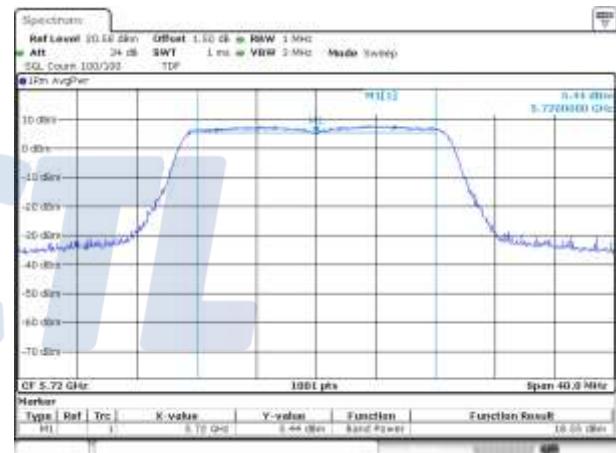
UNII-2C / 802.11ac VHT20 / 5 700 MHz



UNII-2C / 802.11ac VHT20 / 5 600 MHz



UNII-2C / 802.11ac VHT20 / 5 720 MHz



KCTL Inc.

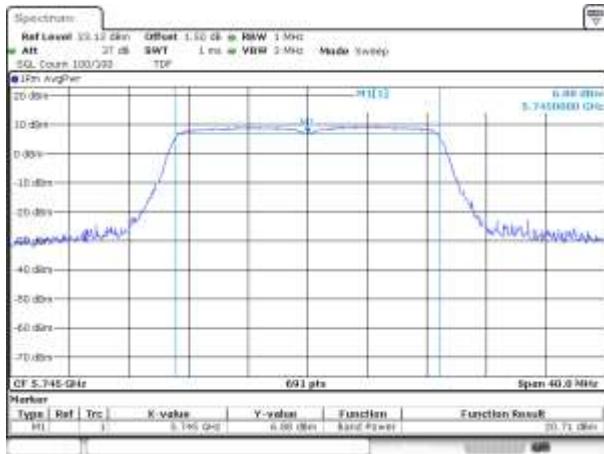
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TEL: 82-31-285-0894 FAX: 82-505-299-8311
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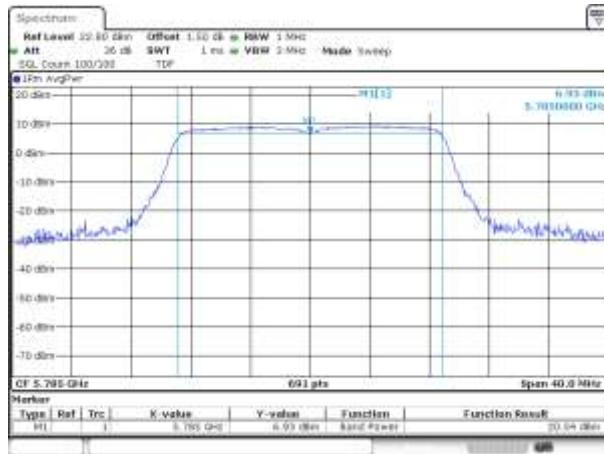
Page (61) of (1046)

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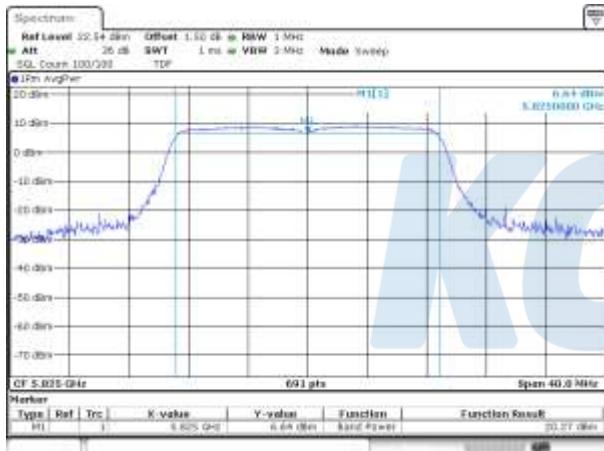
UNII-3 / 802.11ac VHT20 / 5 745 MHz



UNII-3 / 802.11ac VHT20 / 5 785 MHz



UNII-3 / 802.11ac VHT20 / 5 825 MHz



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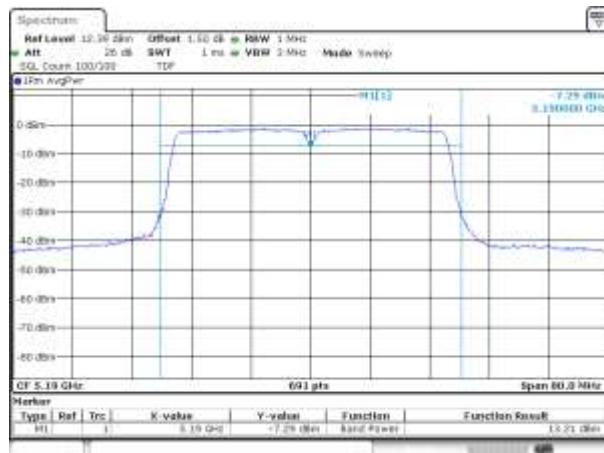
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Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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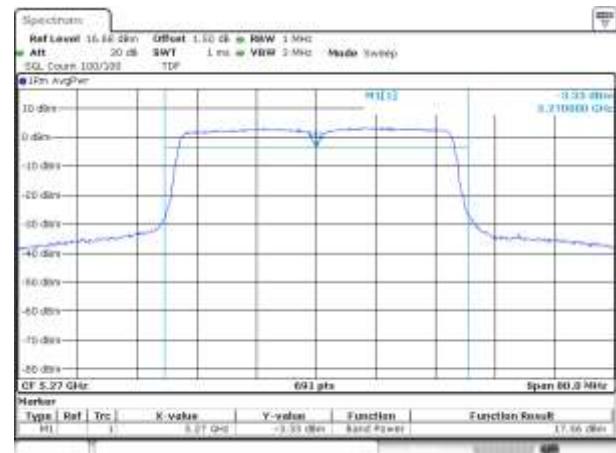
Page (62) of (1046)

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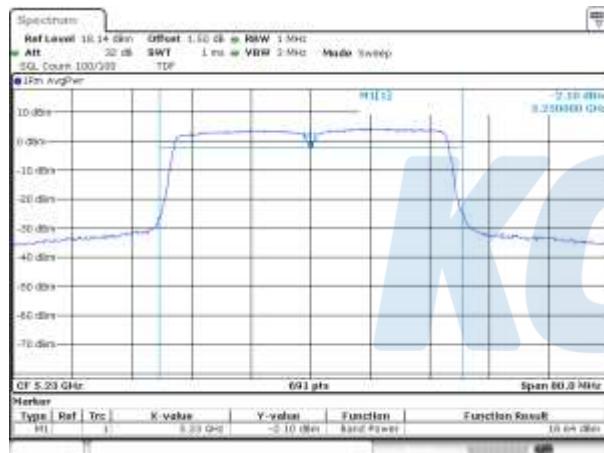
UNII-1 / 802.11ac VHT40 / 5 190 MHz



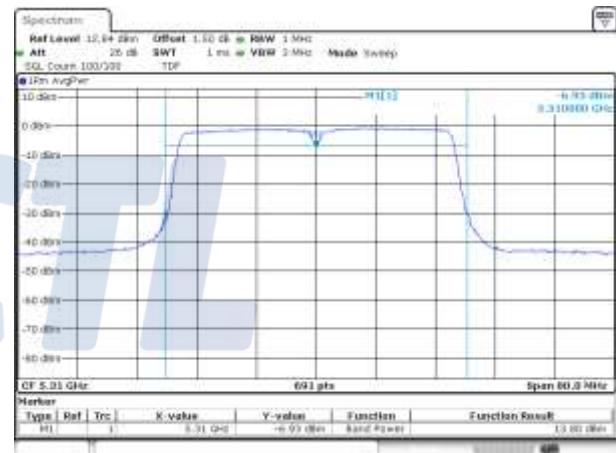
UNII-2A / 802.11ac VHT40 / 5 270 MHz



UNII-1 / 802.11ac VHT40 / 5 230 MHz



UNII-2A / 802.11ac VHT40 / 5 310 MHz



KCTL Inc.

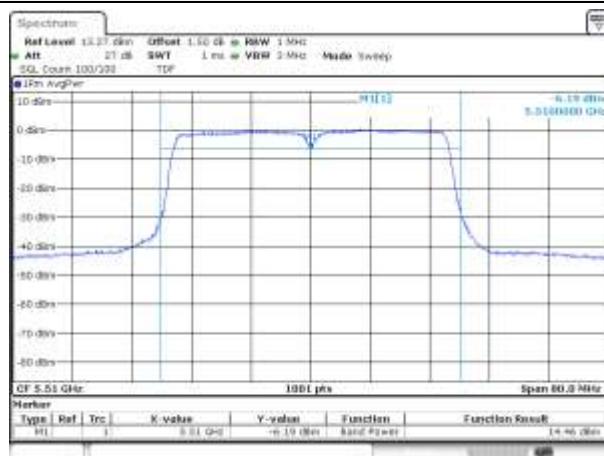
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TEL: 82-31-285-0894 FAX: 82-505-299-8311
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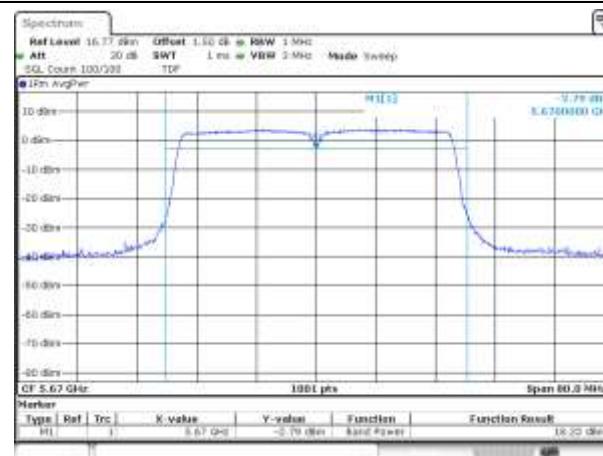
Page (63) of (1046)

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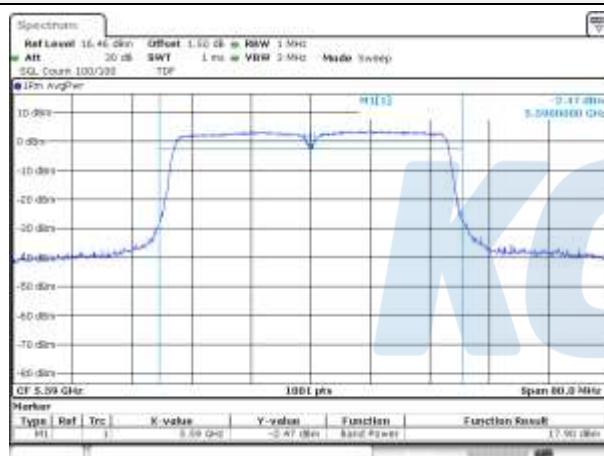
UNII-2C / 802.11ac VHT40 / 5 510 MHz



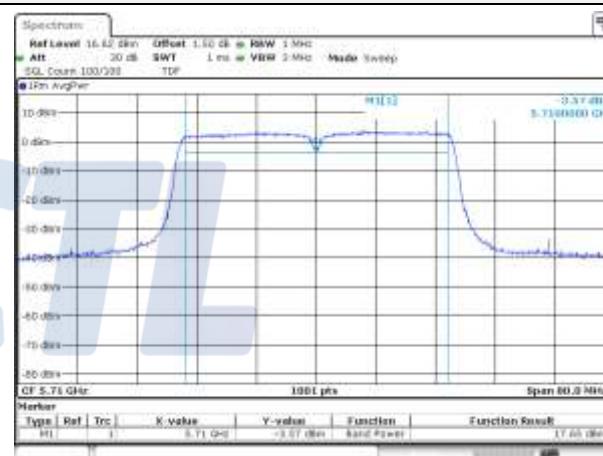
UNII-2C / 802.11ac VHT40 / 5 670 MHz



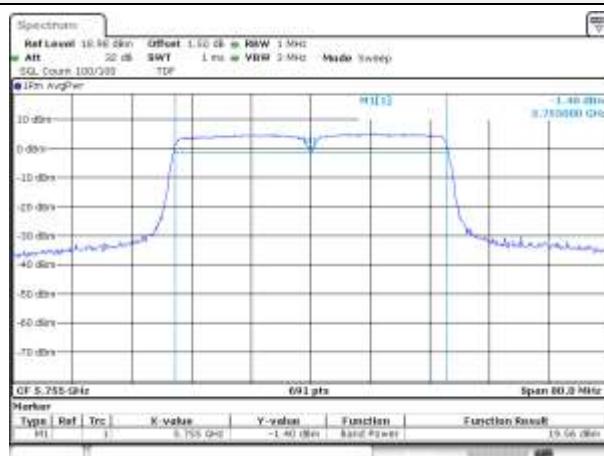
UNII-2C / 802.11ac VHT40 / 5 590 MHz



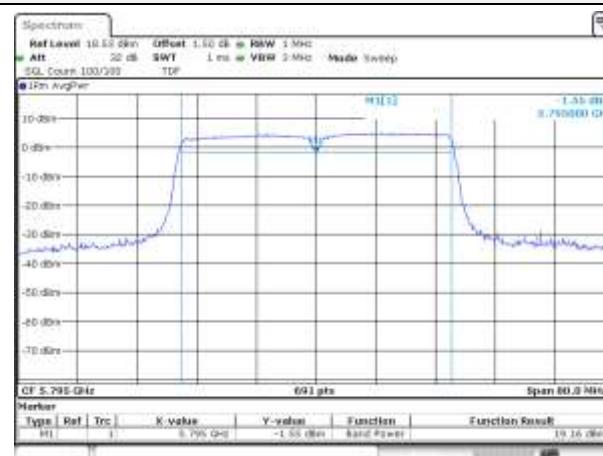
UNII-2C / 802.11ac VHT40 / 5 710 MHz



UNII-3 / 802.11ac VHT40 / 5 755 MHz



UNII-3 / 802.11ac VHT40 / 5 795 MHz



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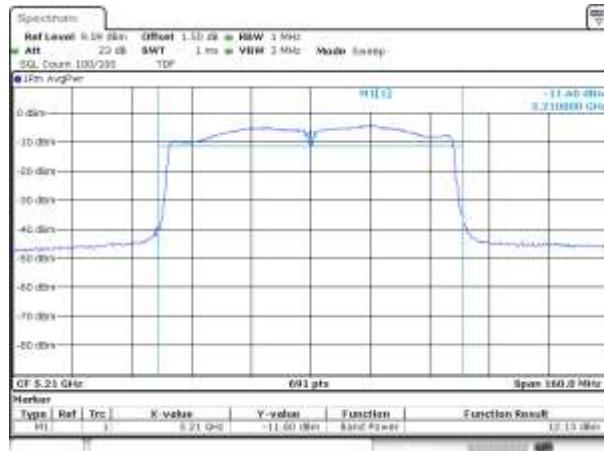
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TEL: 82-31-285-0894 FAX: 82-505-299-8311
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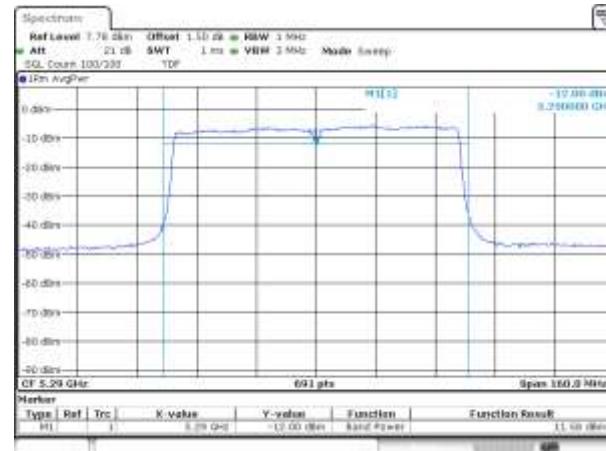
Page (64) of (1046)

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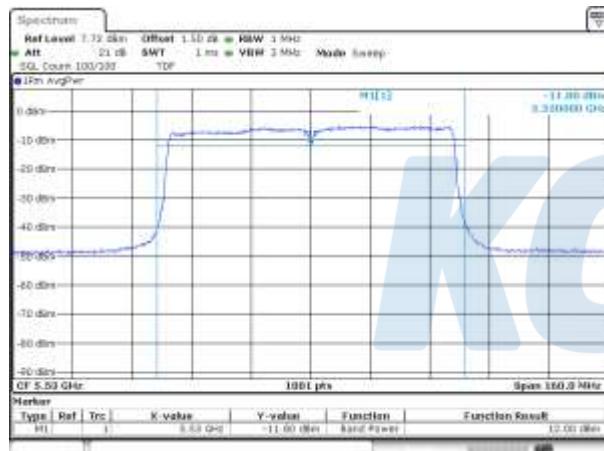
UNII-1 / 802.11ac VHT80 / 5 210 MHz



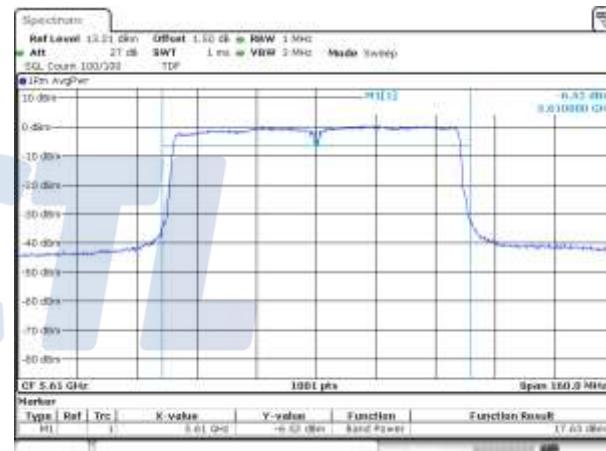
UNII-2A / 802.11ac VHT80 / 5 290 MHz



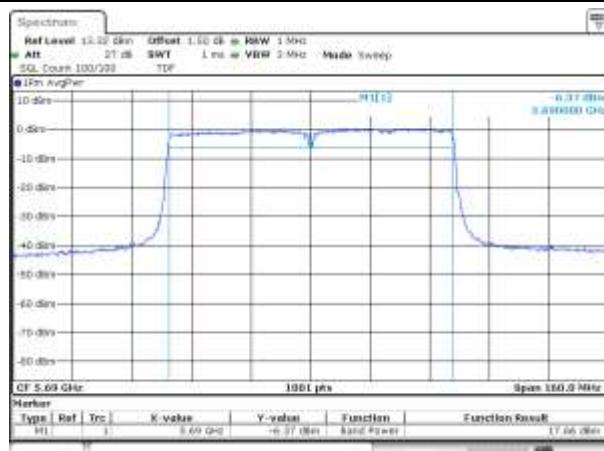
UNII-2C / 802.11ac VHT80 / 5 530 MHz



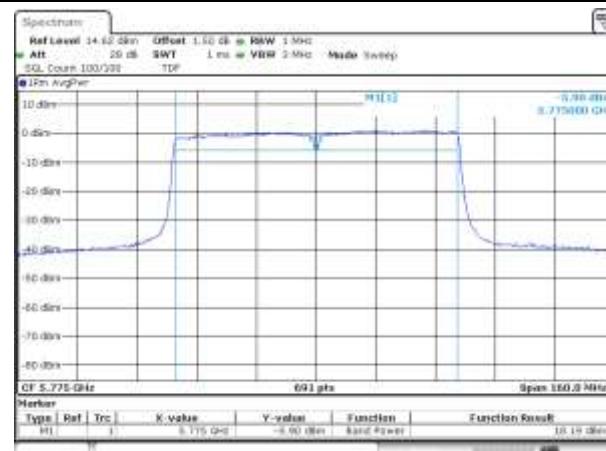
UNII-2C / 802.11ac VHT80 / 5 610 MHz



UNII-2C / 802.11ac VHT80 / 5 690 MHz



UNII-3 / 802.11ac VHT80 / 5 775 MHz



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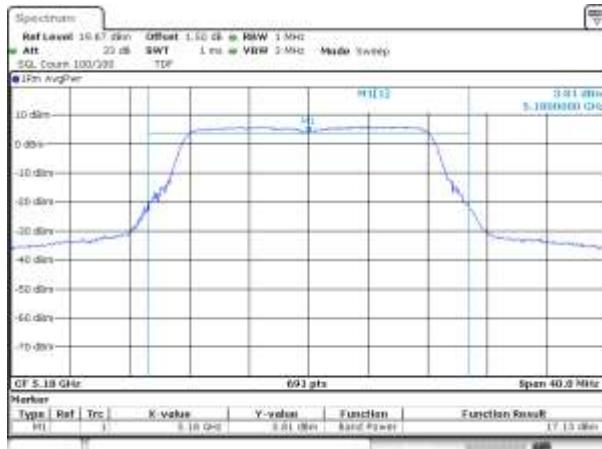
Report No.:
KR20-SRF0030-D

Page (65) of (1046)

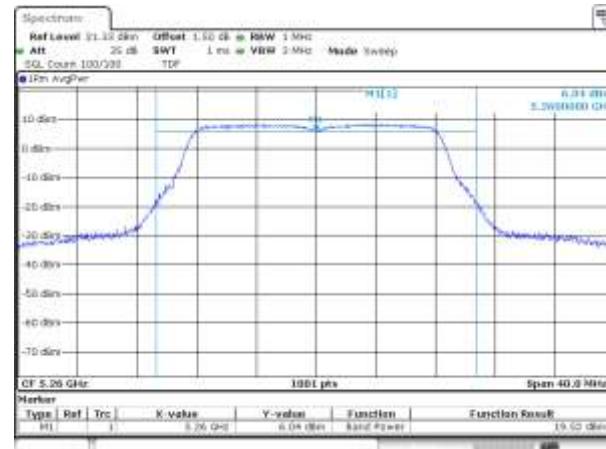
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UNII-1 / 802.11a / 5 180 MHz



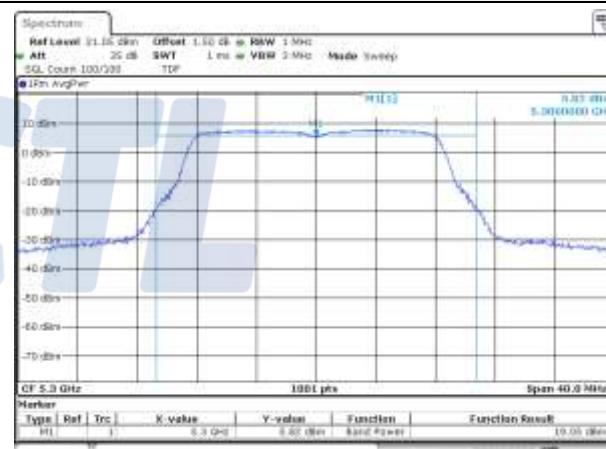
UNII-2A / 802.11a / 5 260 MHz



UNII-1 / 802.11a / 5 220 MHz



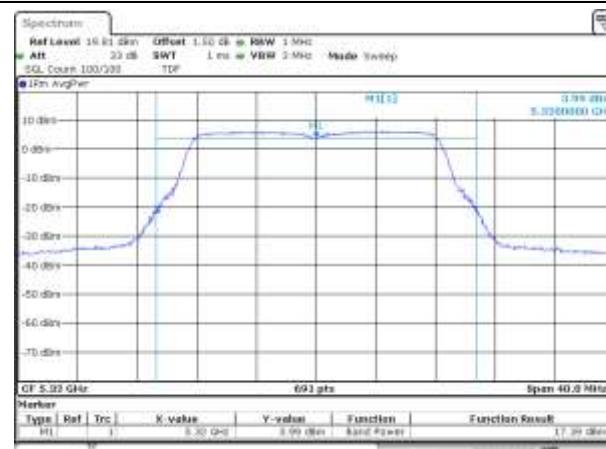
UNII-2A / 802.11a / 5 300 MHz



UNII-1 / 802.11a / 5 240 MHz



UNII-2A / 802.11a / 5 320 MHz



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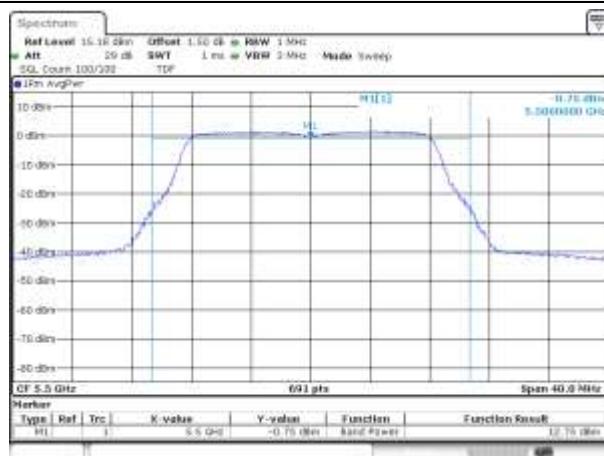
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TEL: 82-31-285-0894 FAX: 82-505-299-8311
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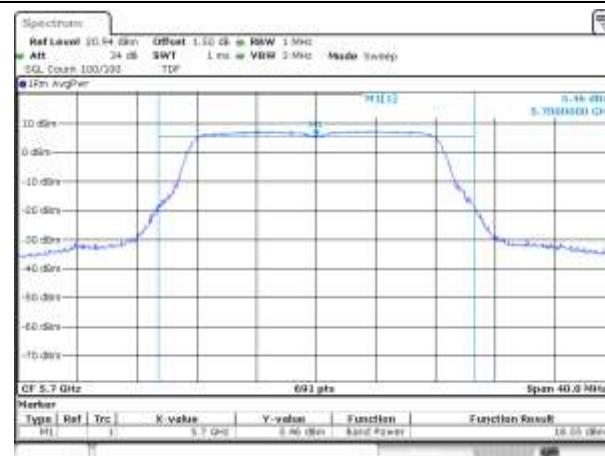
Page (66) of (1046)

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UNII-2C / 802.11a / 5 500 MHz



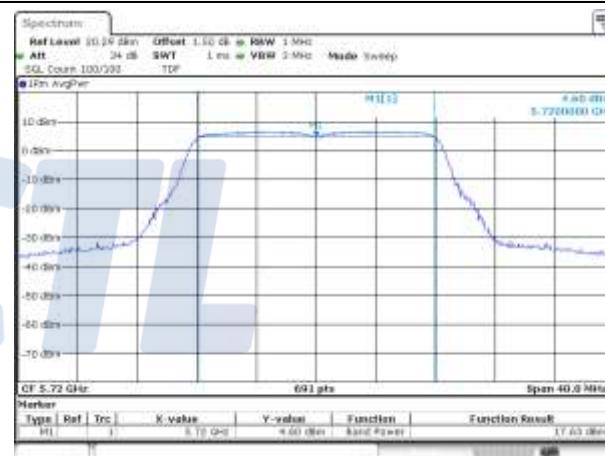
UNII-2C / 802.11a / 5 700 MHz



UNII-2C / 802.11a / 5 600 MHz



UNII-2C / 802.11a / 5 720 MHz



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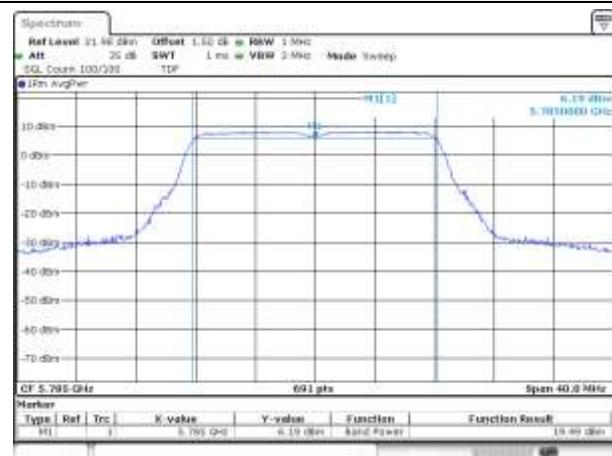
Page (67) of (1046)

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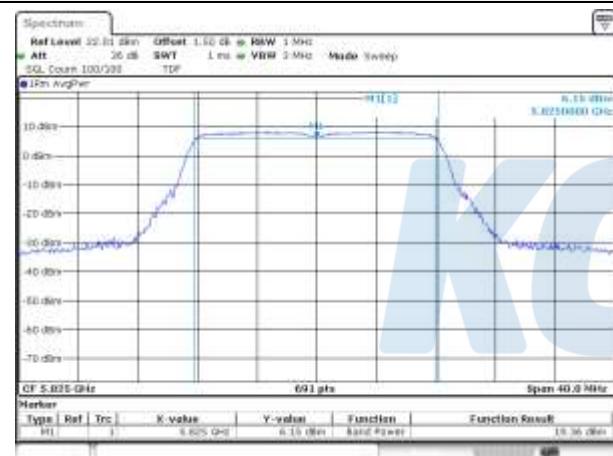
UNII-3 / 802.11a / 5 745 MHz



UNII-3 / 802.11a / 5 785 MHz



UNII-3 / 802.11a / 5 825 MHz



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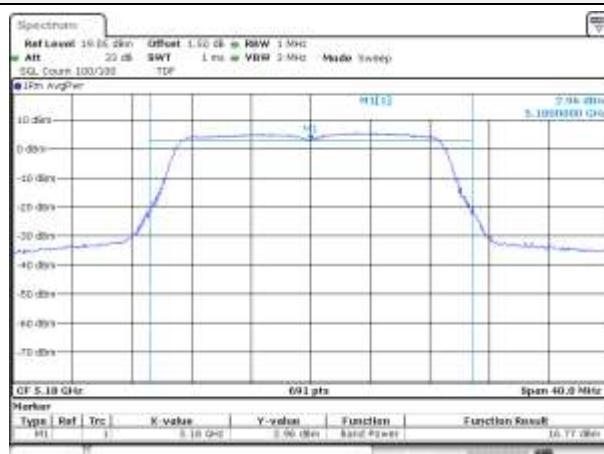
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TEL: 82-31-285-0894 FAX: 82-505-299-8311
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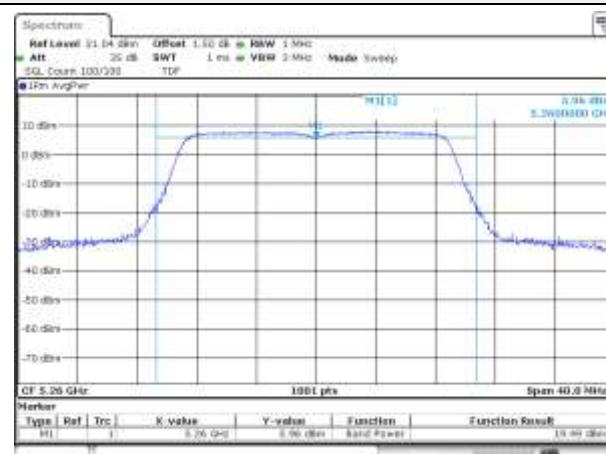
Page (68) of (1046)

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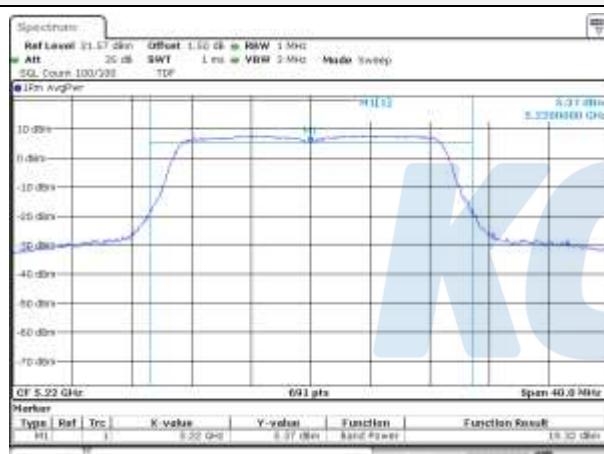
UNII-1 / 802.11n HT20 / 5 180 MHz



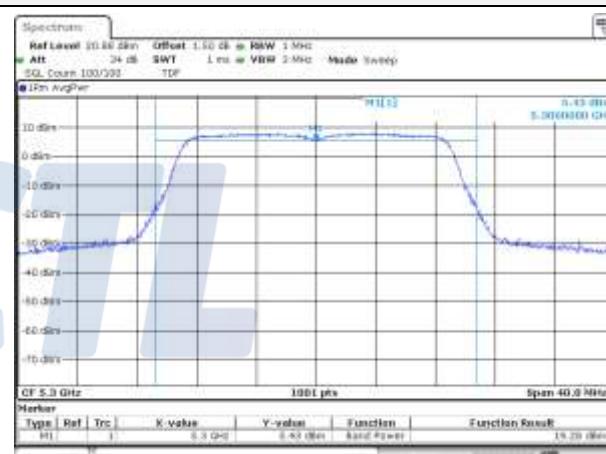
UNII-2A / 802.11n HT20 / 5 260 MHz



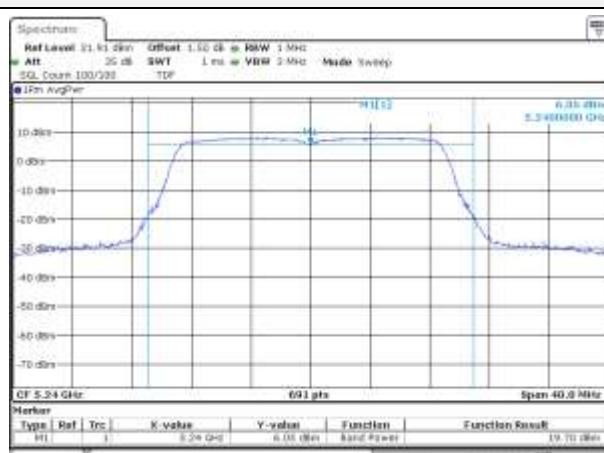
UNII-1 / 802.11n HT20 / 5 220 MHz



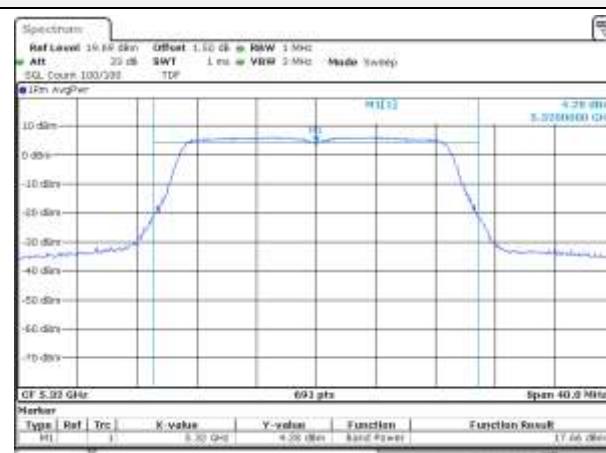
UNII-2A / 802.11n HT20 / 5 300 MHz



UNII-1 / 802.11n HT20 / 5 240 MHz



UNII-2A / 802.11n HT20 / 5 320 MHz



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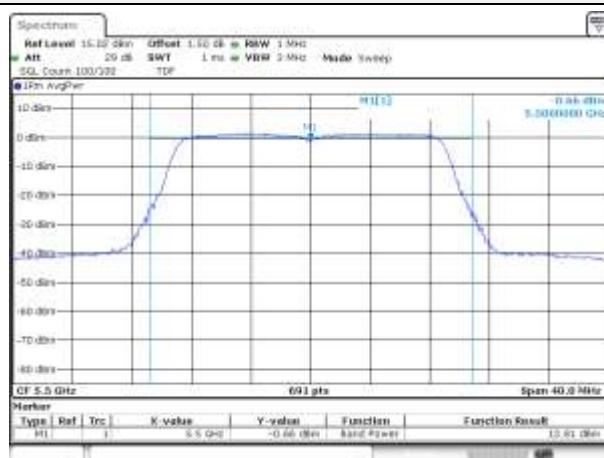
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Page (69) of (1046)

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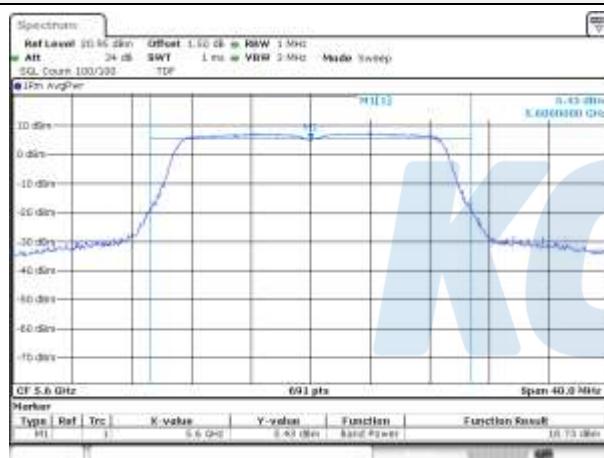
UNII-2C / 802.11n HT20 / 5 500 MHz



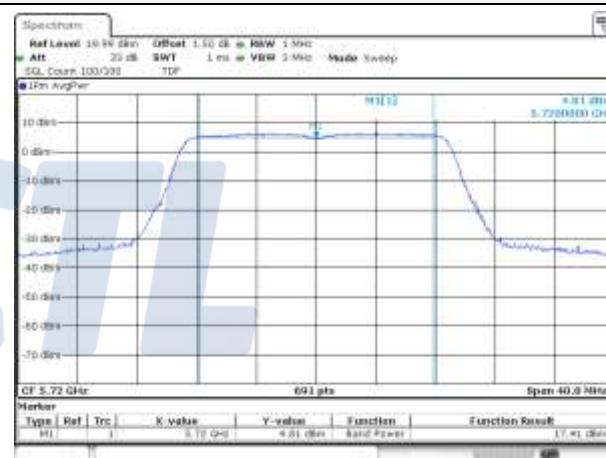
UNII-2C / 802.11n HT20 / 5 700 MHz

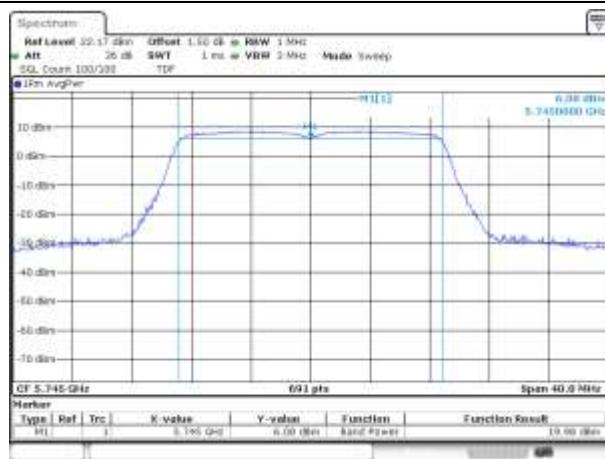
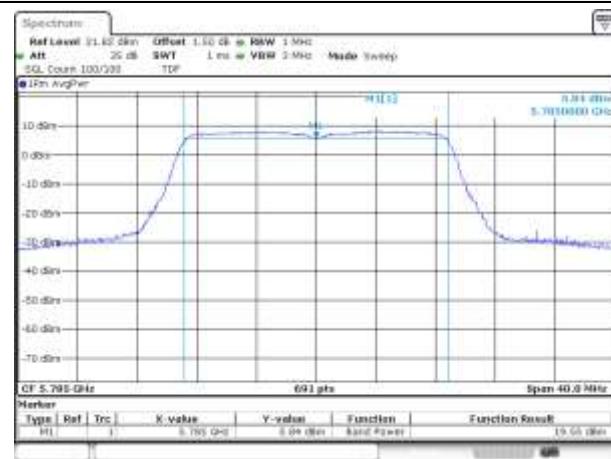
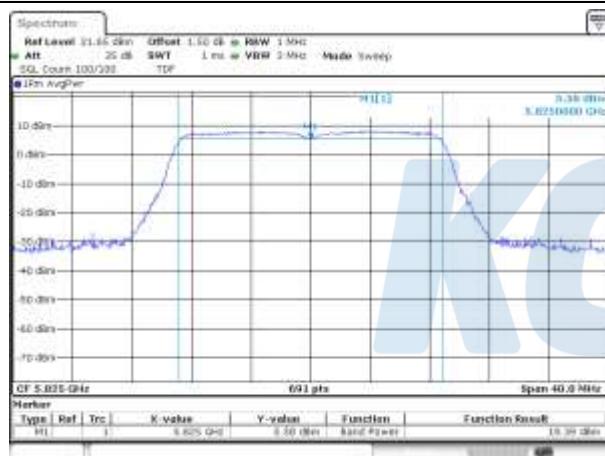


UNII-2C / 802.11n HT20 / 5 600 MHz



UNII-2C / 802.11n HT20 / 5 720 MHz



UNII-3 / 802.11n HT20 / 5 745 MHz**UNII-3 / 802.11n HT20 / 5 785 MHz****UNII-3 / 802.11n HT20 / 5 825 MHz**

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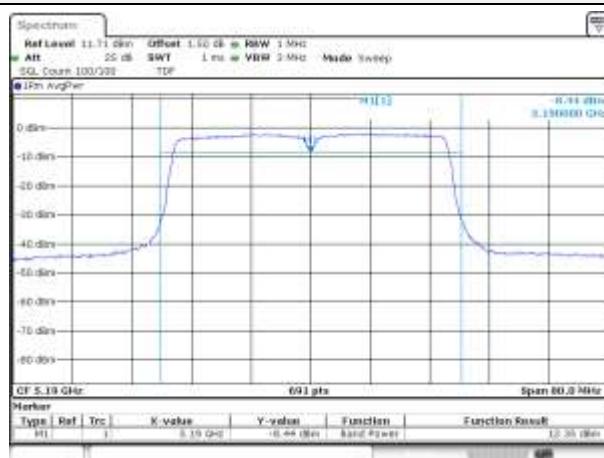
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TEL: 82-31-285-0894 FAX: 82-505-299-8311
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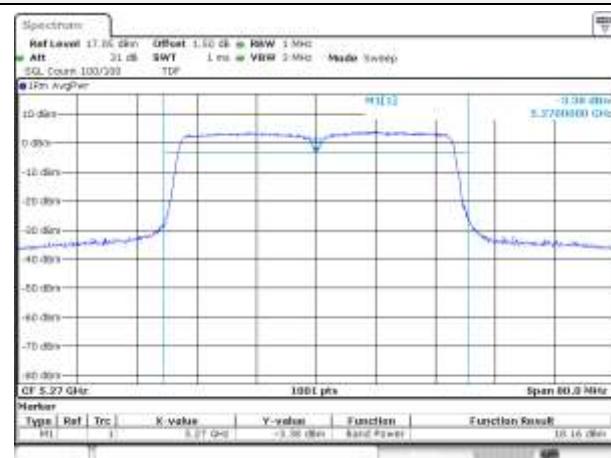
Page (71) of (1046)

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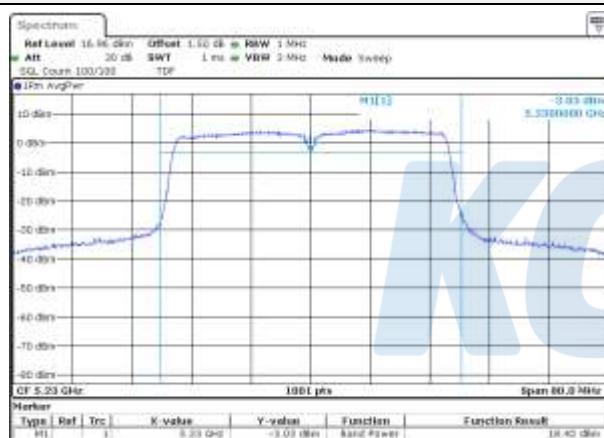
UNII-1 / 802.11n HT40 / 5 190 MHz



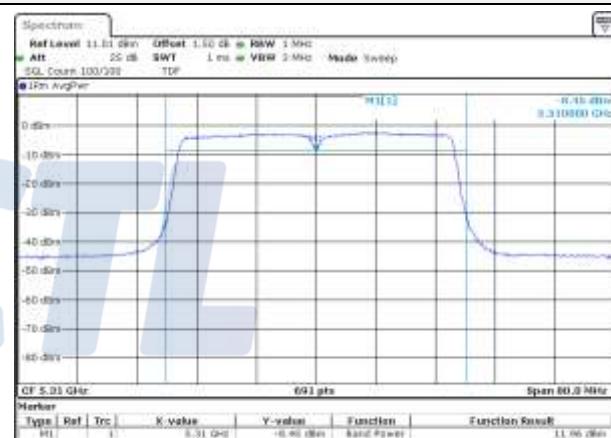
UNII-2A / 802.11n HT40 / 5 270 MHz



UNII-1 / 802.11n HT40 / 5 230 MHz



UNII-2A / 802.11n HT40 / 5 310 MHz



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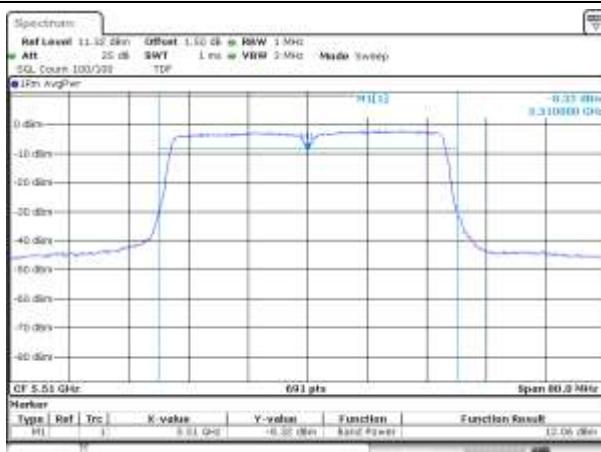
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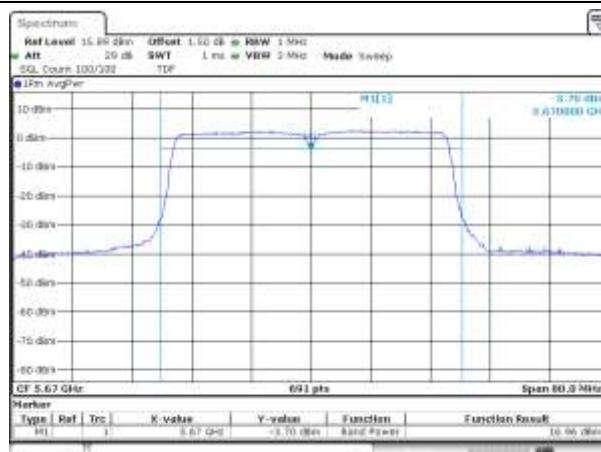
Page (72) of (1046)

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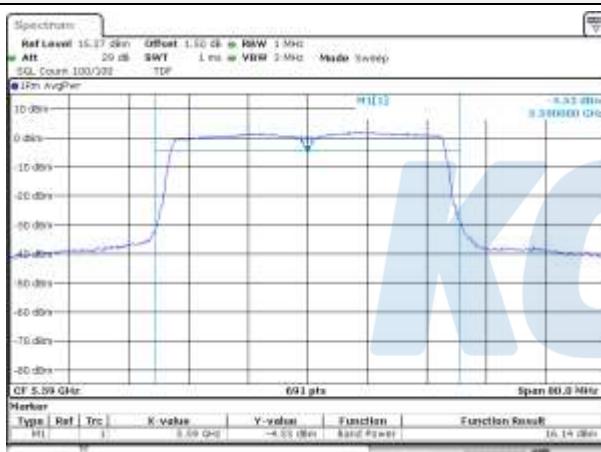
UNII-2C / 802.11n HT40 / 5 510 MHz



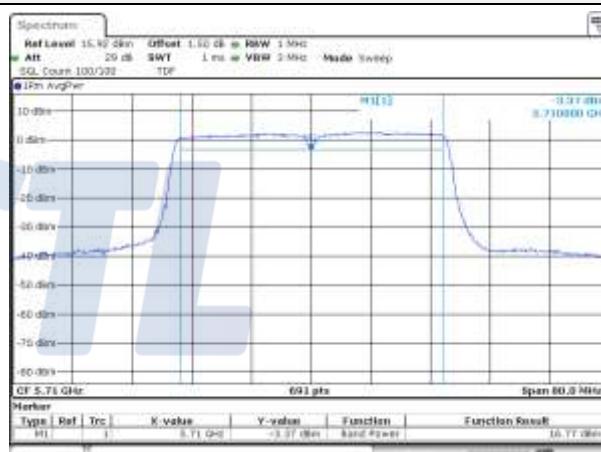
UNII-2C / 802.11n HT40 / 5 670 MHz



UNII-2C / 802.11n HT40 / 5 590 MHz



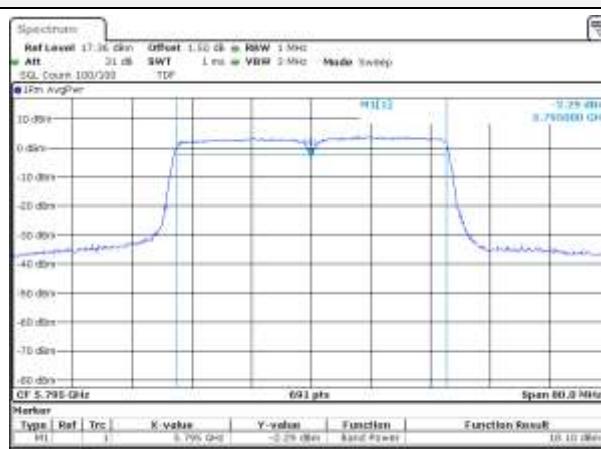
UNII-2C / 802.11n HT40 / 5 710 MHz



UNII-3 / 802.11n HT40 / 5 755 MHz



UNII-3 / 802.11n HT40 / 5 795 MHz



KCTL Inc.

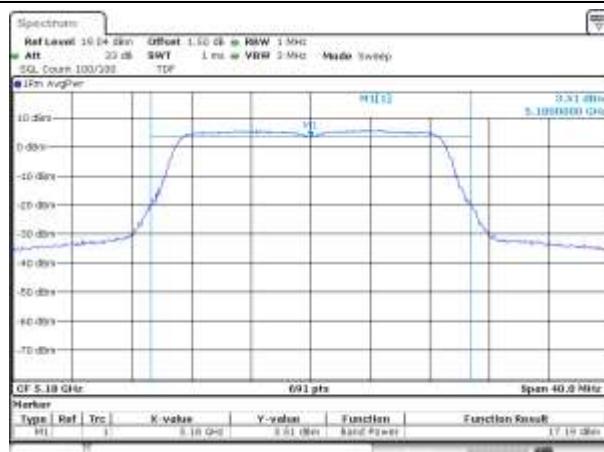
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TEL: 82-31-285-0894 FAX: 82-505-299-8311
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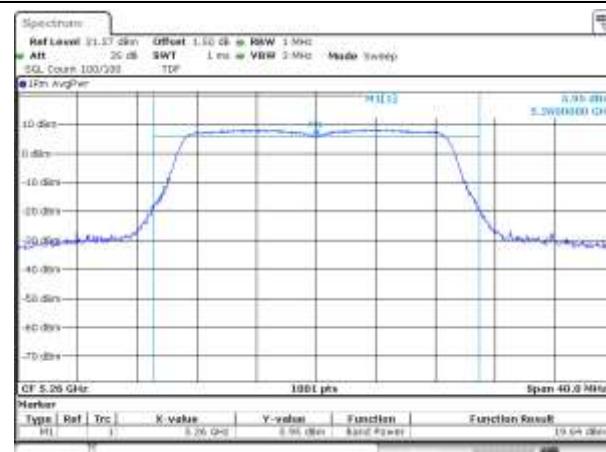
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UNII-1 / 802.11ac VHT20 / 5 180 MHz



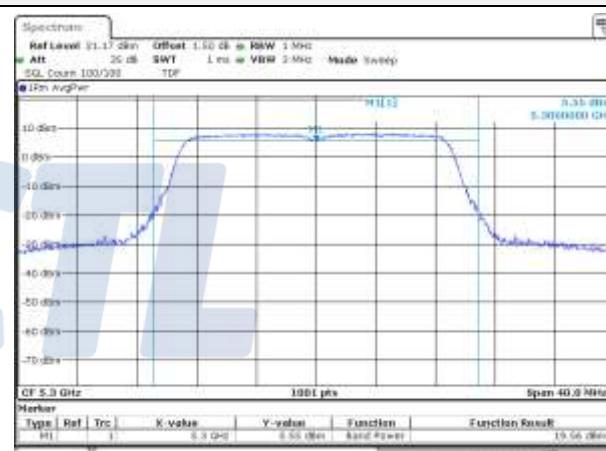
UNII-2A / 802.11ac VHT20 / 5 260 MHz



UNII-1 / 802.11ac VHT20 / 5 220 MHz



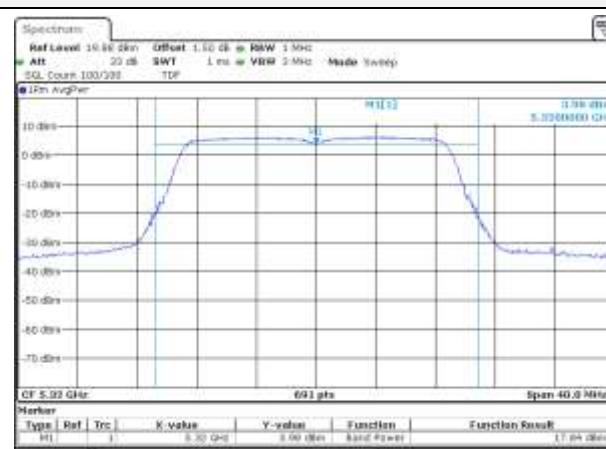
UNII-2A / 802.11ac VHT20 / 5 300 MHz



UNII-1 / 802.11ac VHT20 / 5 240 MHz



UNII-2A / 802.11ac VHT20 / 5 320 MHz



KCTL Inc.

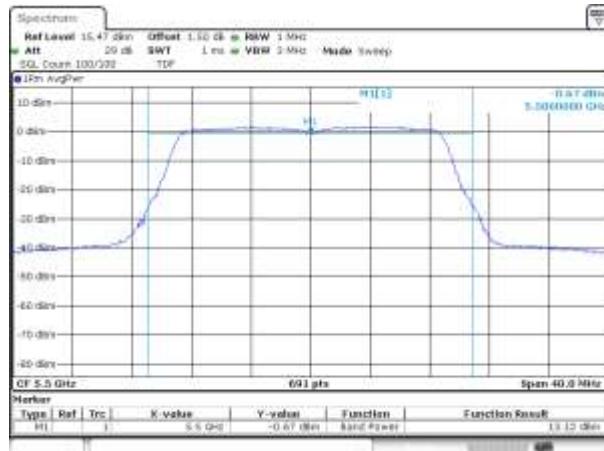
65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR20-SRF0030-D

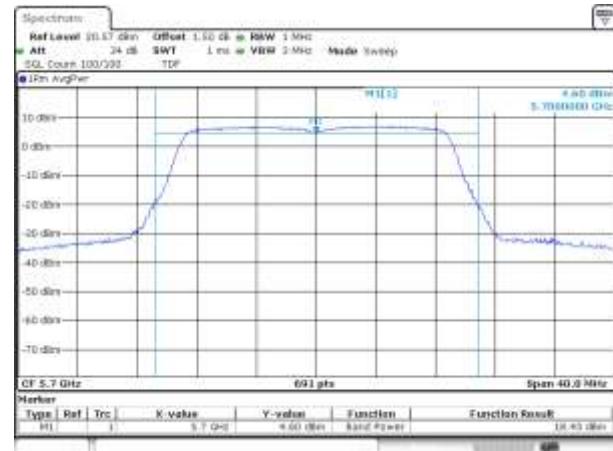
Page (74) of (1046)

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UNII-2C / 802.11ac VHT20 / 5 500 MHz



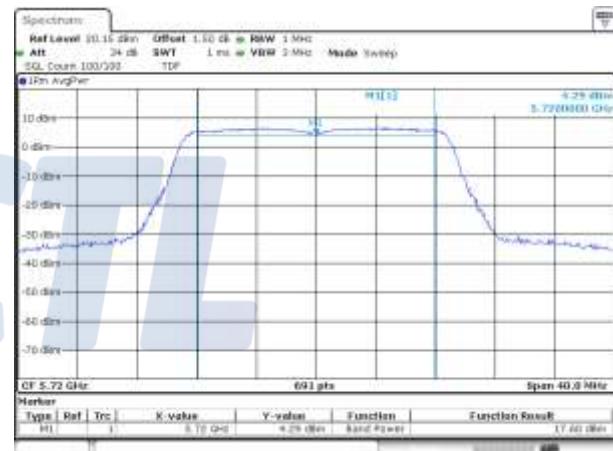
UNII-2C / 802.11ac VHT20 / 5 700 MHz

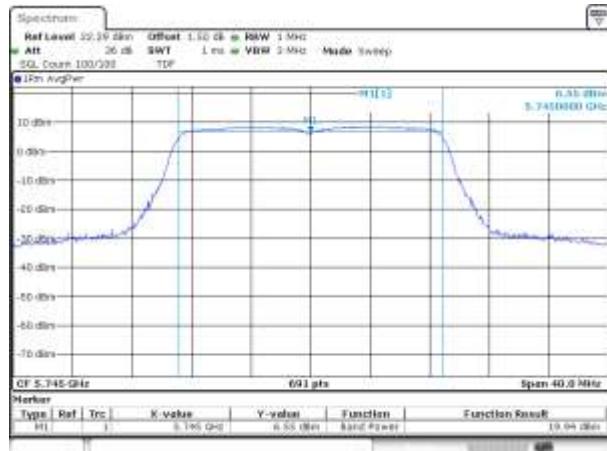
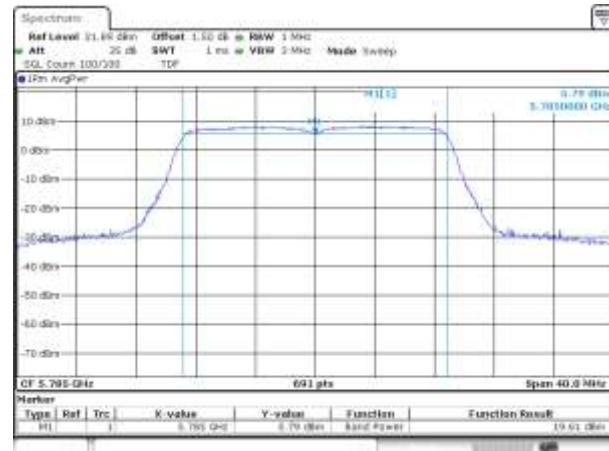
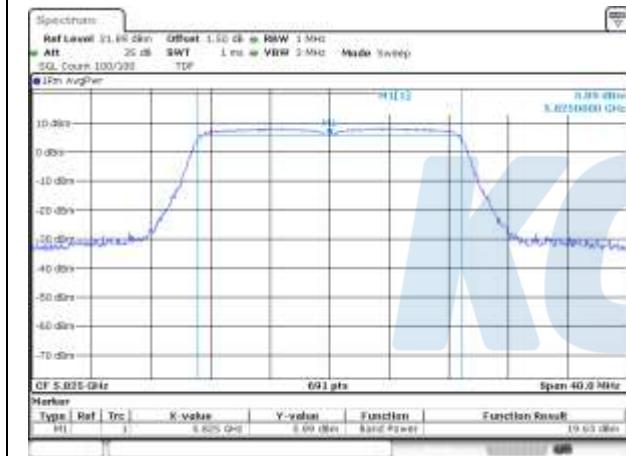


UNII-2C / 802.11ac VHT20 / 5 600 MHz



UNII-2C / 802.11ac VHT20 / 5 720 MHz



UNII-3 / 802.11ac VHT20 / 5 745 MHz**UNII-3 / 802.11ac VHT20 / 5 785 MHz****UNII-3 / 802.11ac VHT20 / 5 825 MHz**

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KCTL Inc.

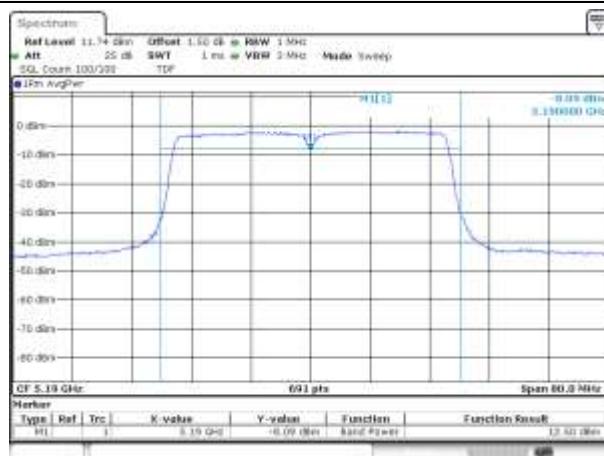
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Page (76) of (1046)

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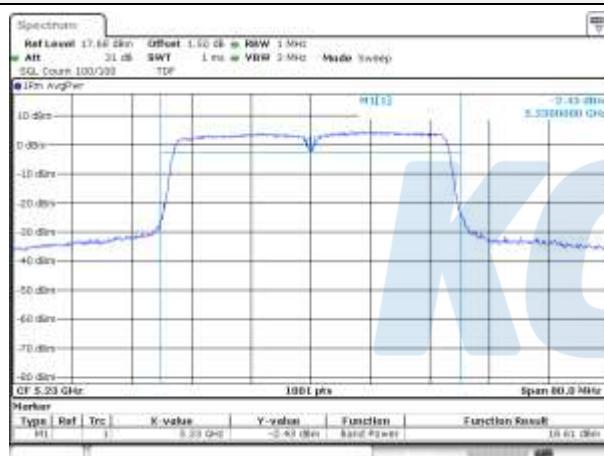
UNII-1 / 802.11ac VHT40 / 5 190 MHz



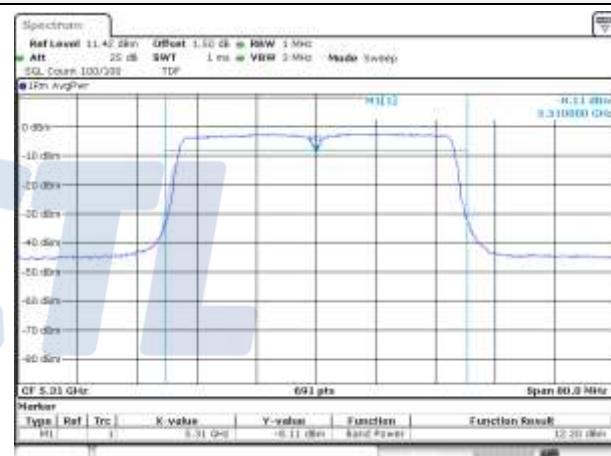
UNII-2A / 802.11ac VHT40 / 5 270 MHz



UNII-1 / 802.11ac VHT40 / 5 230 MHz



UNII-2A / 802.11ac VHT40 / 5 310 MHz



KCTL Inc.

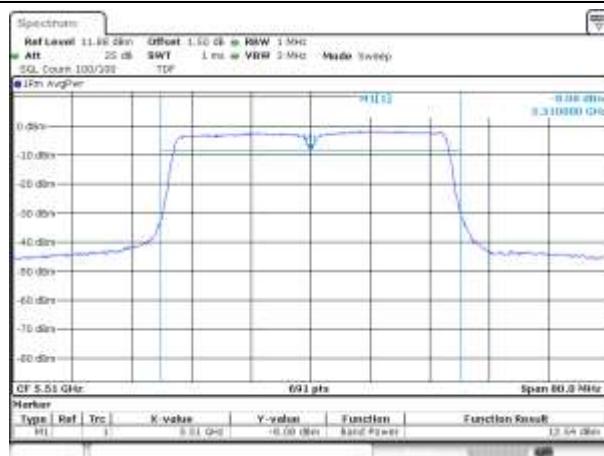
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Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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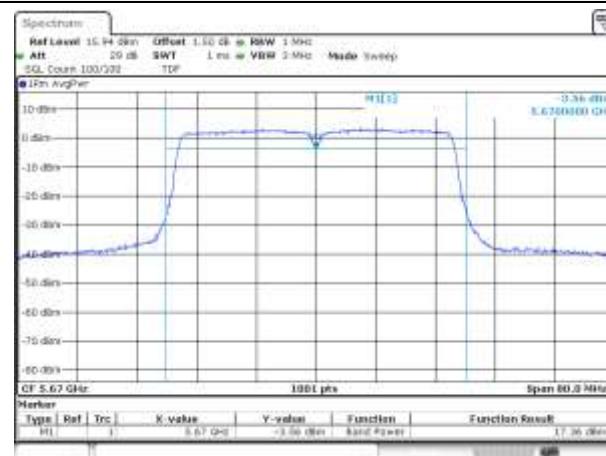
Page (77) of (1046)

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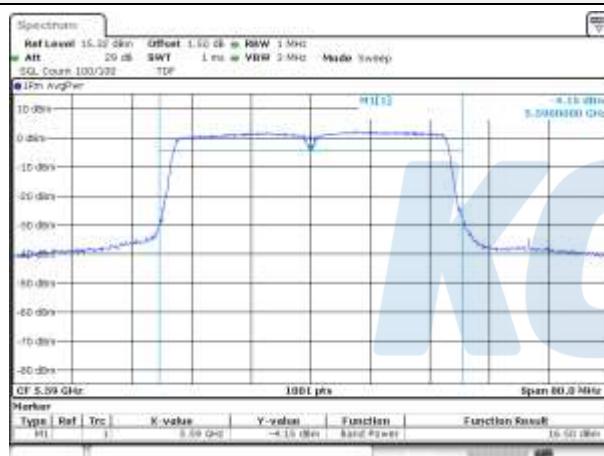
UNII-2C / 802.11ac VHT40 / 5 510 MHz



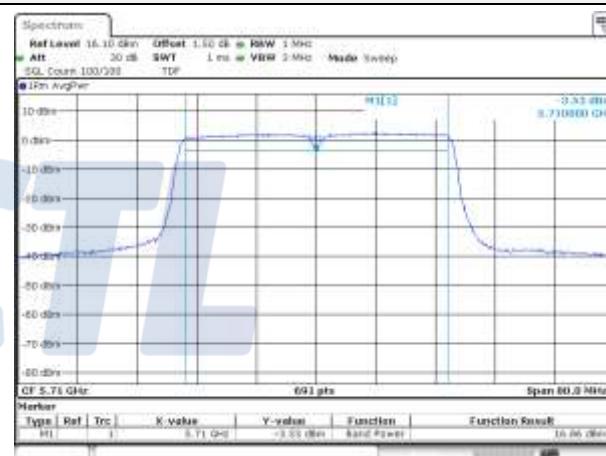
UNII-2C / 802.11ac VHT40 / 5 670 MHz



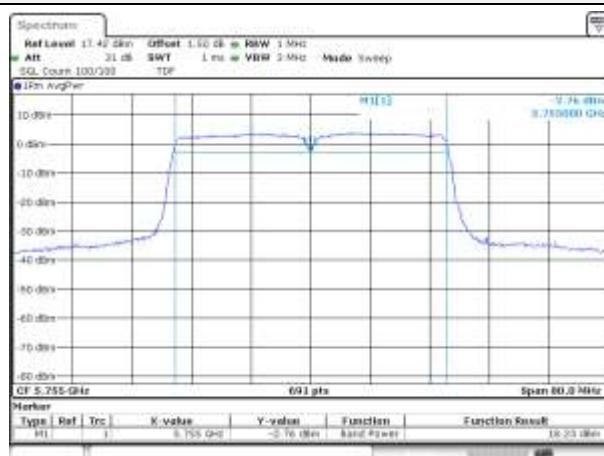
UNII-2C / 802.11ac VHT40 / 5 590 MHz



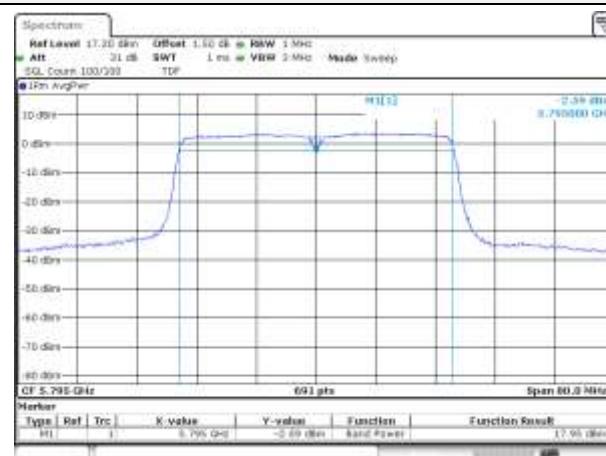
UNII-2C / 802.11ac VHT40 / 5 710 MHz



UNII-3 / 802.11ac VHT40 / 5 755 MHz



UNII-3 / 802.11ac VHT40 / 5 795 MHz



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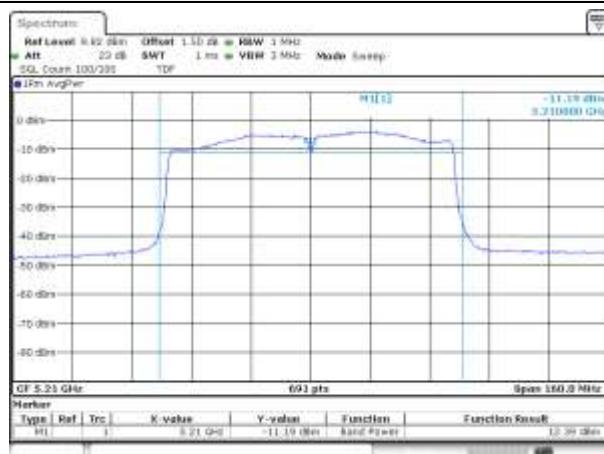
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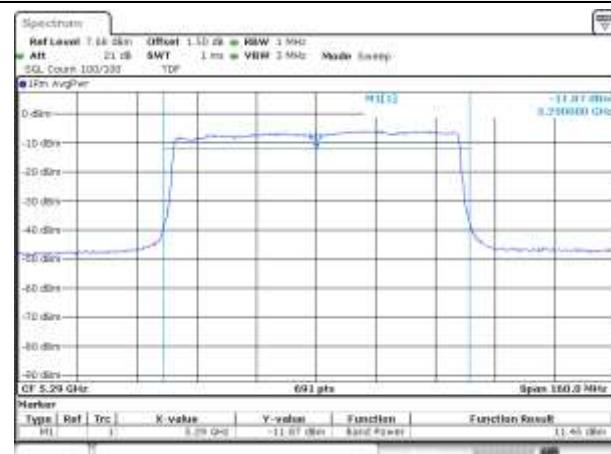
Page (78) of (1046)

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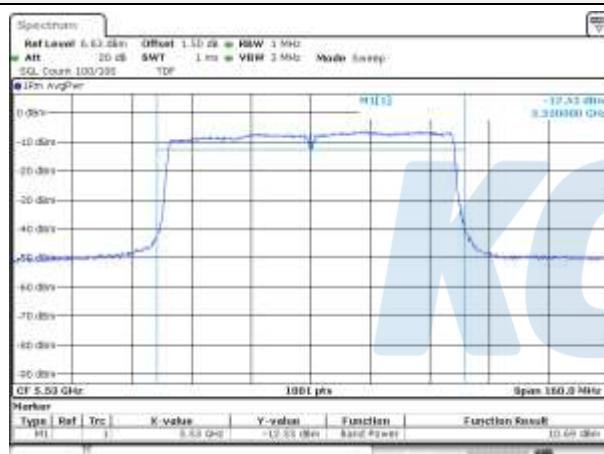
UNII-1 / 802.11ac VHT80 / 5 210 MHz



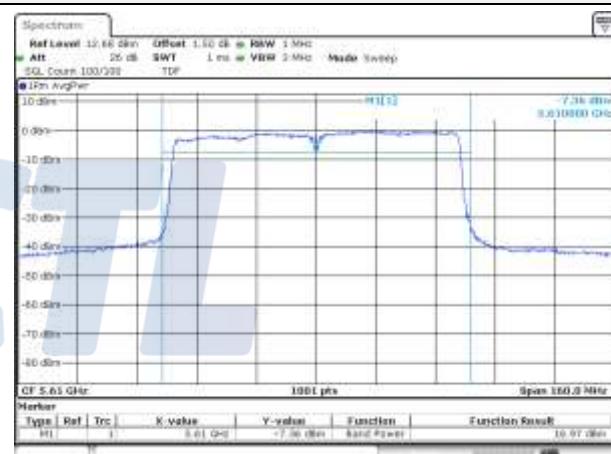
UNII-2A / 802.11ac VHT80 / 5 290 MHz



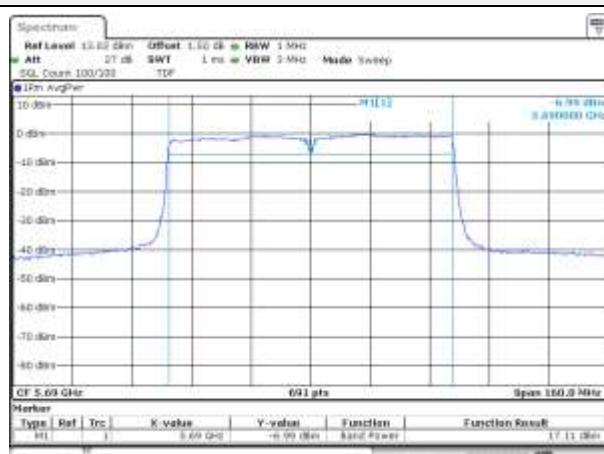
UNII-2C / 802.11ac VHT80 / 5 530 MHz



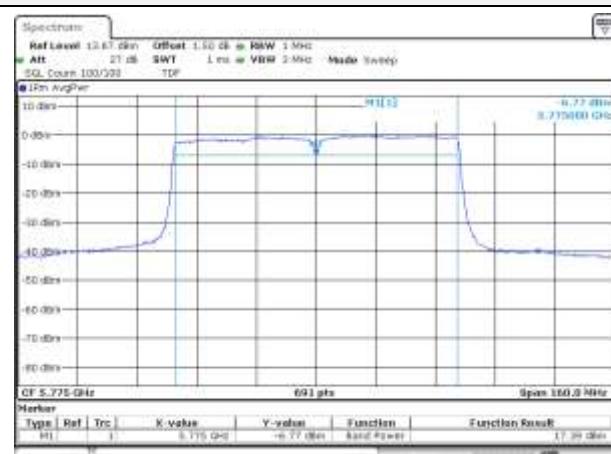
UNII-2C / 802.11ac VHT80 / 5 610 MHz

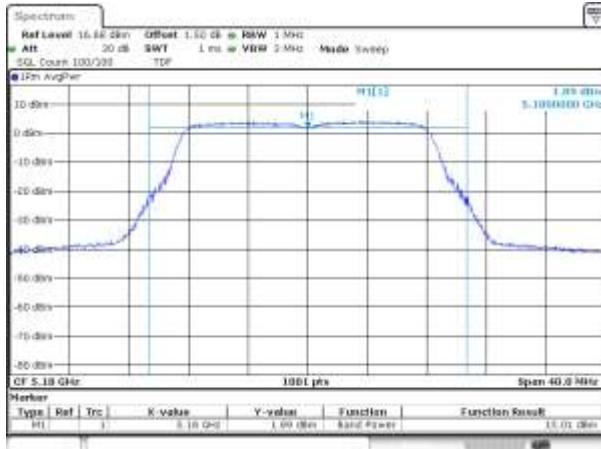
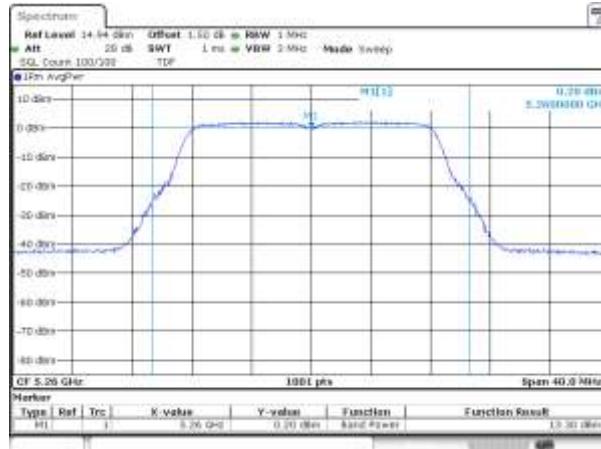
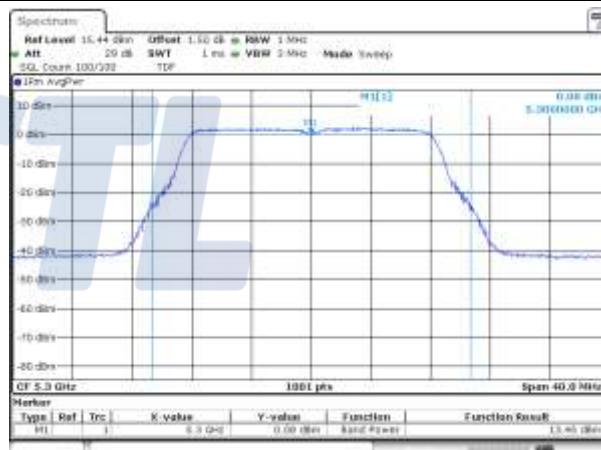
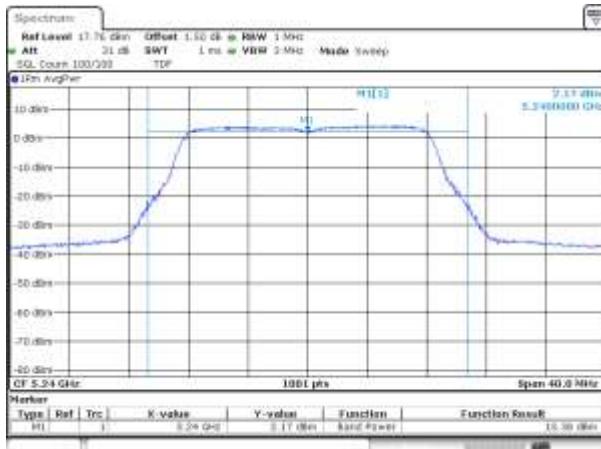
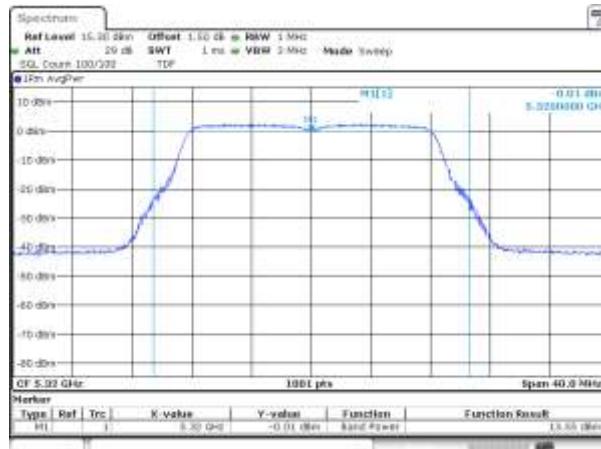


UNII-2C / 802.11ac VHT80 / 5 690 MHz



UNII-3 / 802.11ac VHT80 / 5 775 MHz



4TX MIMO ANT 0**UNII-1 / 802.11a / 5 180 MHz****UNII-2A / 802.11a / 5 260 MHz****UNII-1 / 802.11a / 5 220 MHz****UNII-2A / 802.11a / 5 300 MHz****UNII-1 / 802.11a / 5 240 MHz****UNII-2A / 802.11a / 5 320 MHz**

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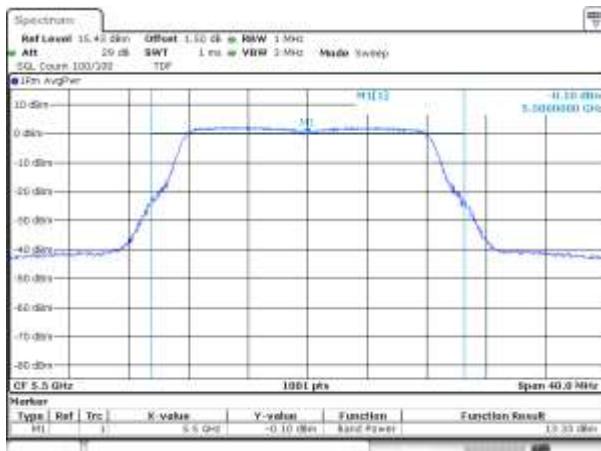
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Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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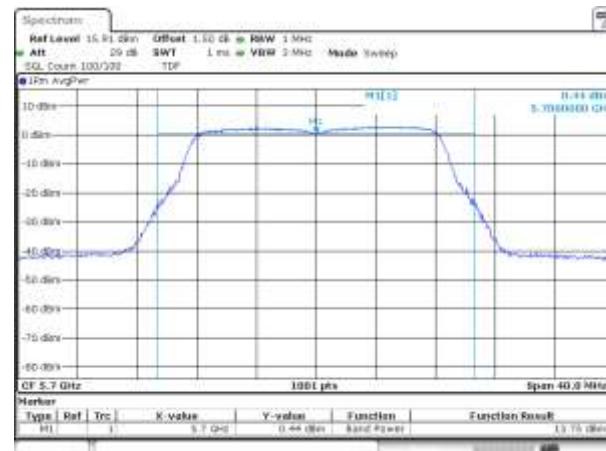
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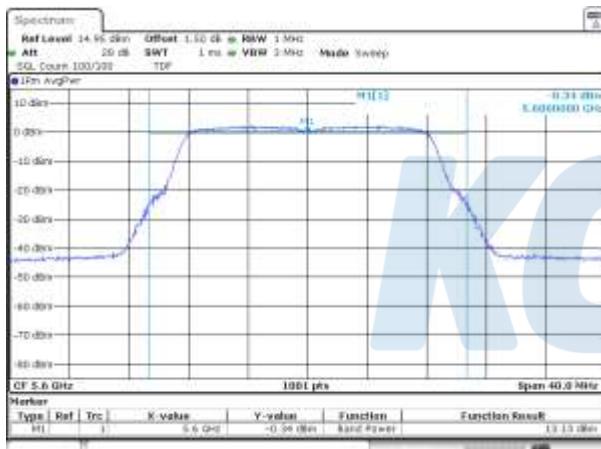
UNII-2C / 802.11a / 5 500 MHz



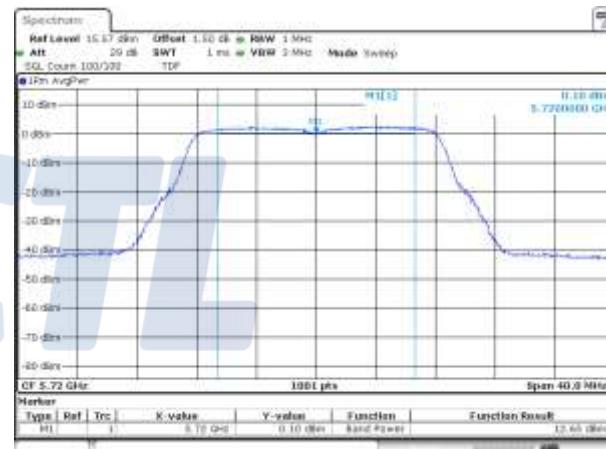
UNII-2C / 802.11a / 5 700 MHz



UNII-2C / 802.11a / 5 600 MHz



UNII-2C / 802.11a / 5 720 MHz



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Page (81) of (1046)

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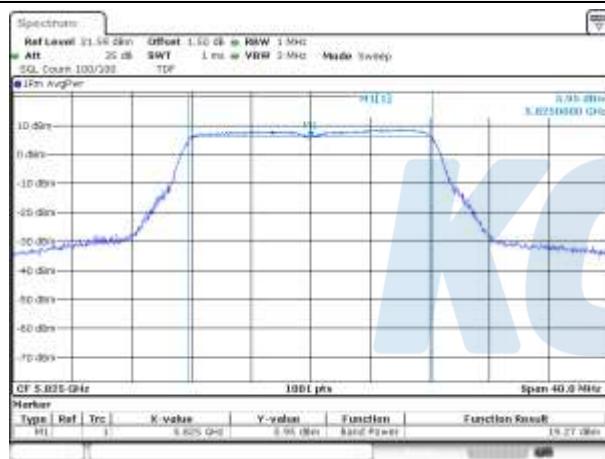
UNII-3 / 802.11a / 5 745 MHz



UNII-3 / 802.11a / 5 785 MHz



UNII-3 / 802.11a / 5 825 MHz



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KCTL Inc.

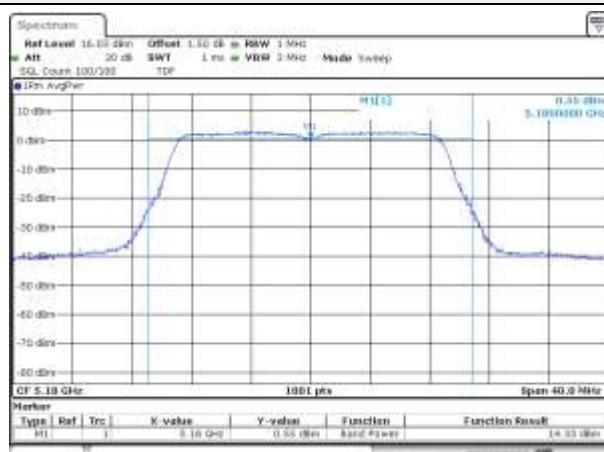
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TEL: 82-31-285-0894 FAX: 82-505-299-8311
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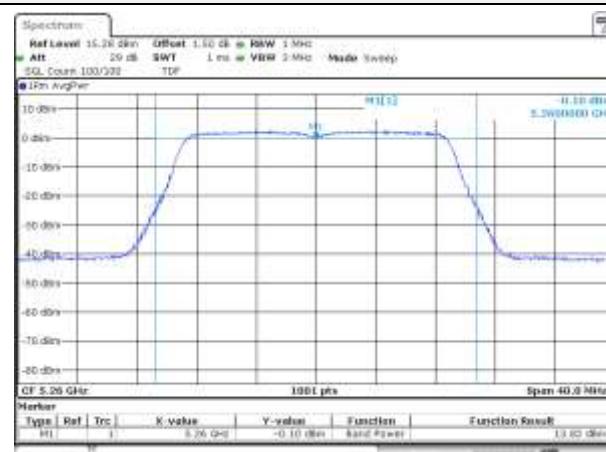
Page (82) of (1046)

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UNII-1 / 802.11n HT20 / 5 180 MHz



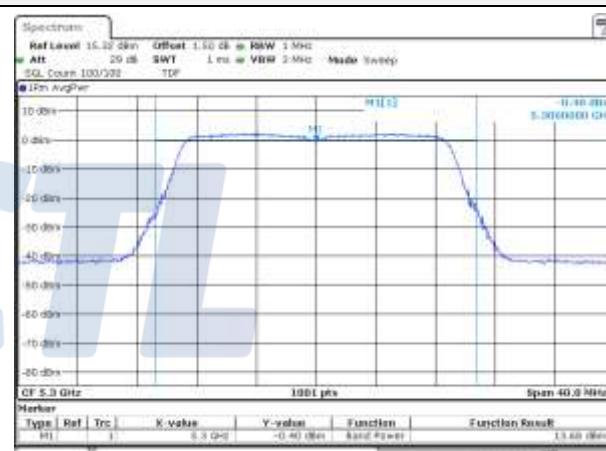
UNII-2A / 802.11n HT20 / 5 260 MHz



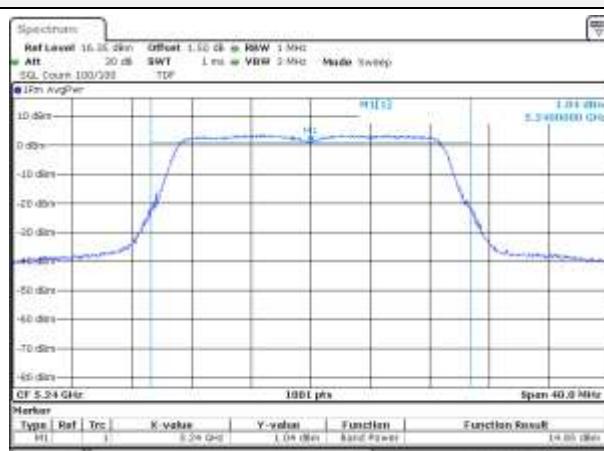
UNII-1 / 802.11n HT20 / 5 220 MHz



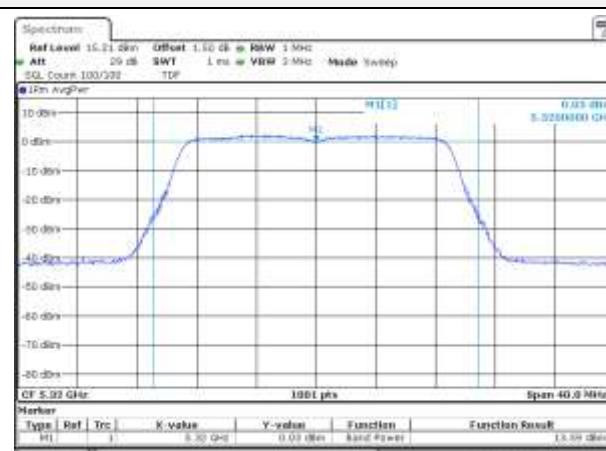
UNII-2A / 802.11n HT20 / 5 300 MHz



UNII-1 / 802.11n HT20 / 5 240 MHz



UNII-2A / 802.11n HT20 / 5 320 MHz



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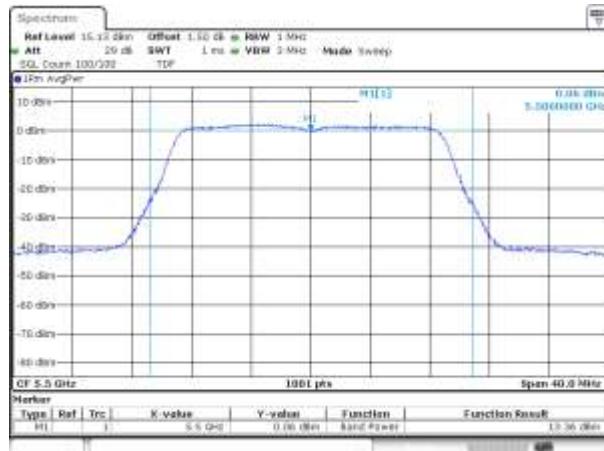
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Suwon-si, Gyeonggi-do, 16677, Korea
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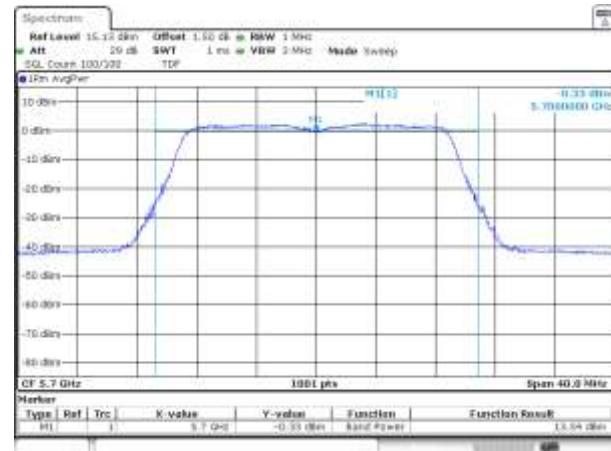
Page (83) of (1046)

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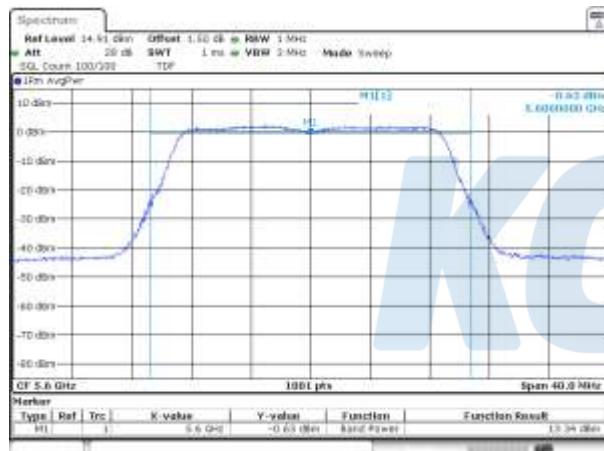
UNII-2C / 802.11n HT20 / 5 500 MHz



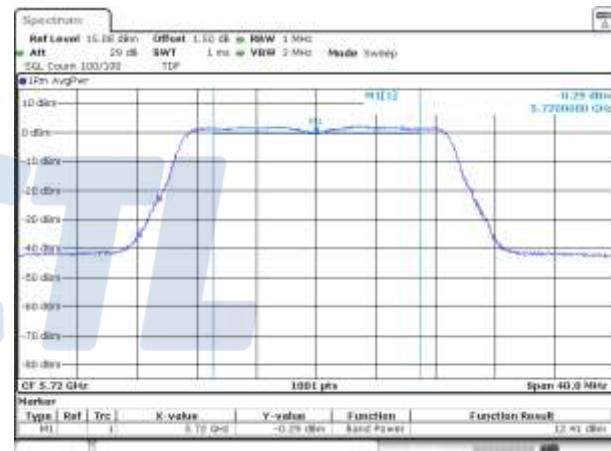
UNII-2C / 802.11n HT20 / 5 700 MHz



UNII-2C / 802.11n HT20 / 5 600 MHz



UNII-2C / 802.11n HT20 / 5 720 MHz



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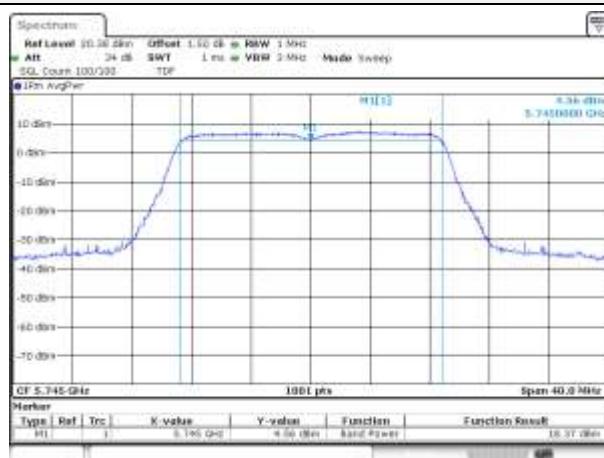
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Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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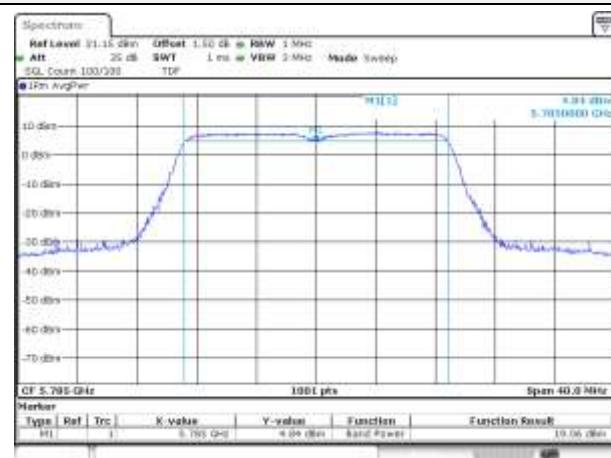
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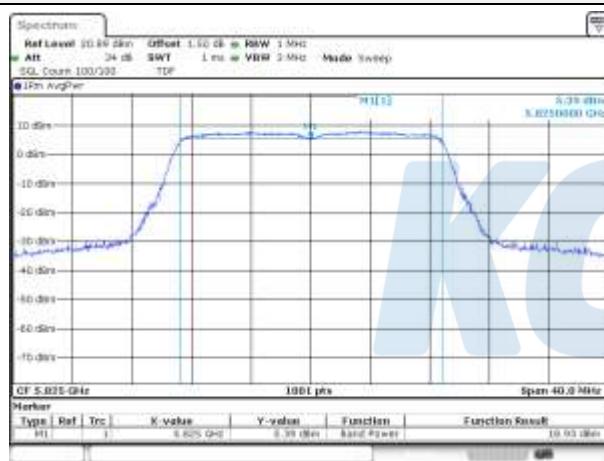
UNII-3 / 802.11n HT20 / 5 745 MHz



UNII-3 / 802.11n HT20 / 5 785 MHz



UNII-3 / 802.11n HT20 / 5 825 MHz



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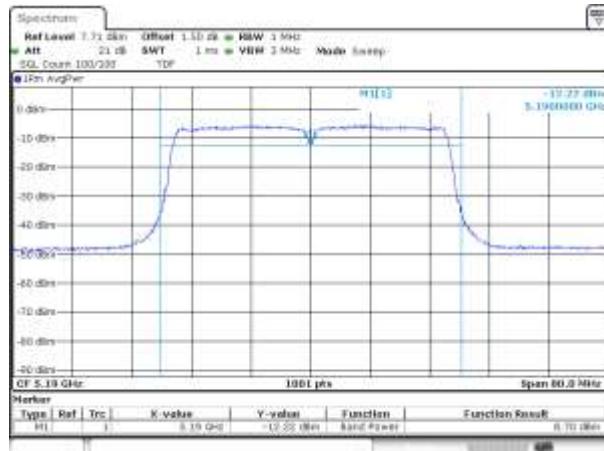
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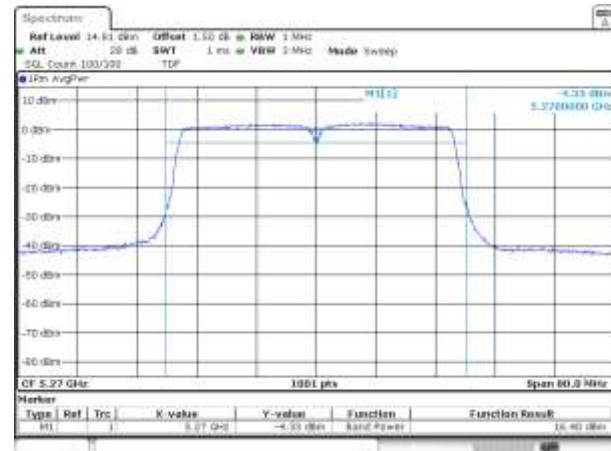
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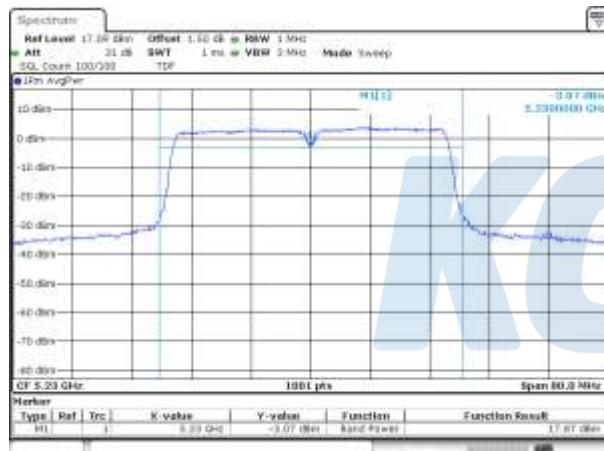
UNII-1 / 802.11n HT40 / 5 190 MHz



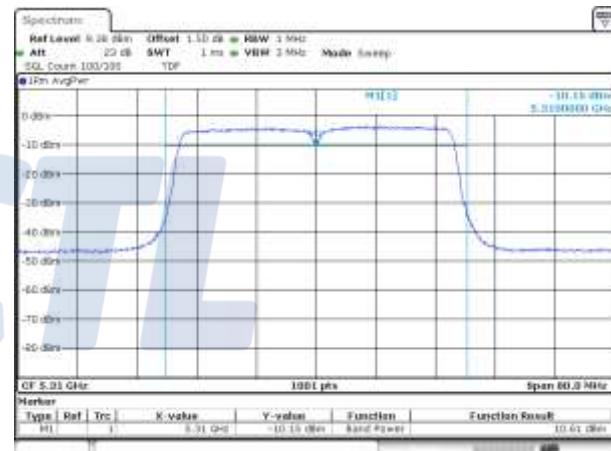
UNII-2A / 802.11n HT40 / 5 270 MHz



UNII-1 / 802.11n HT40 / 5 230 MHz



UNII-2A / 802.11n HT40 / 5 310 MHz



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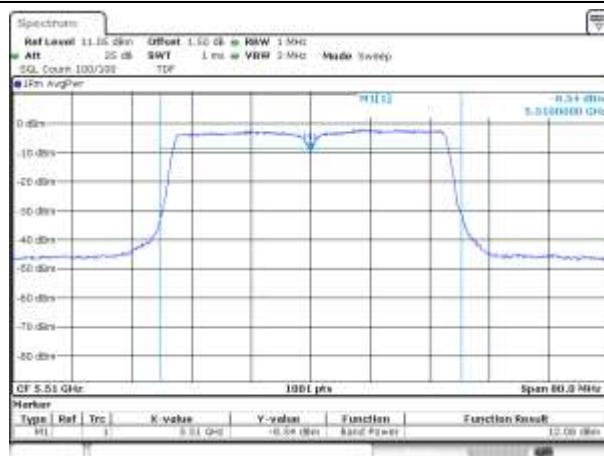
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TEL: 82-31-285-0894 FAX: 82-505-299-8311
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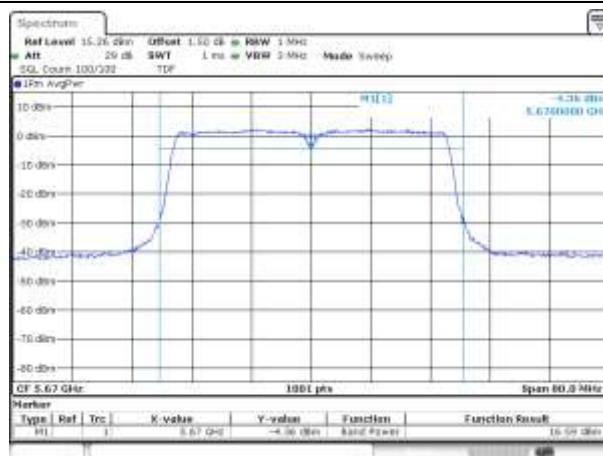
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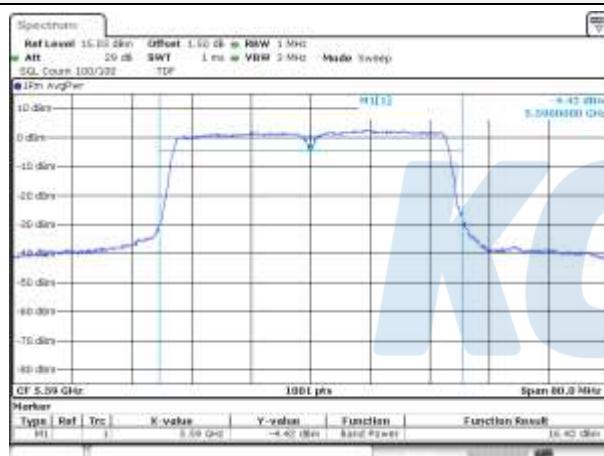
UNII-2C / 802.11n HT40 / 5 510 MHz



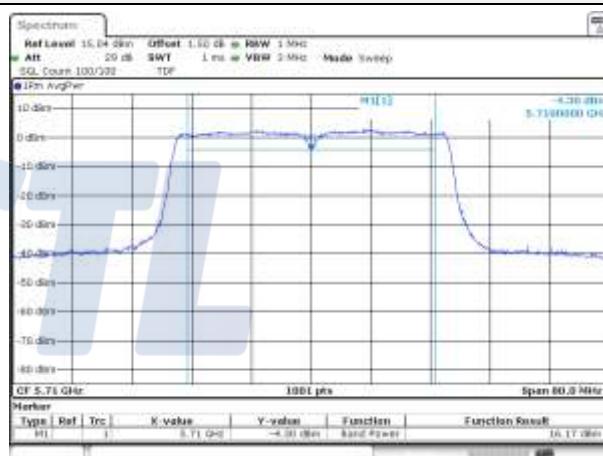
UNII-2C / 802.11n HT40 / 5 670 MHz



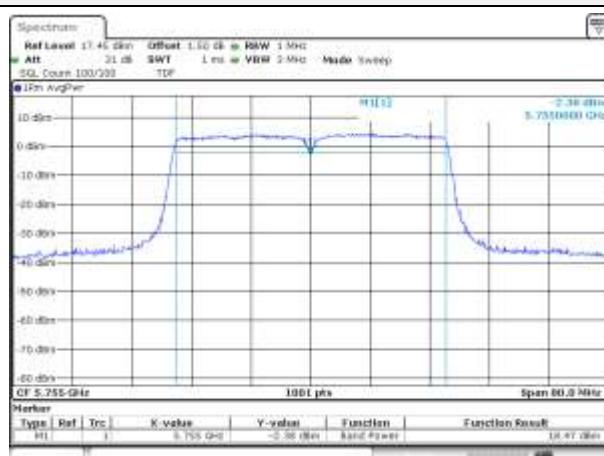
UNII-2C / 802.11n HT40 / 5 590 MHz



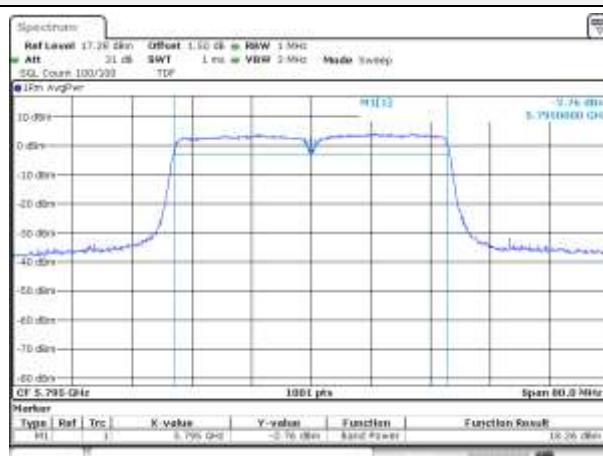
UNII-2C / 802.11n HT40 / 5 710 MHz



UNII-3 / 802.11n HT40 / 5 755 MHz



UNII-3 / 802.11n HT40 / 5 795 MHz



KCTL Inc.

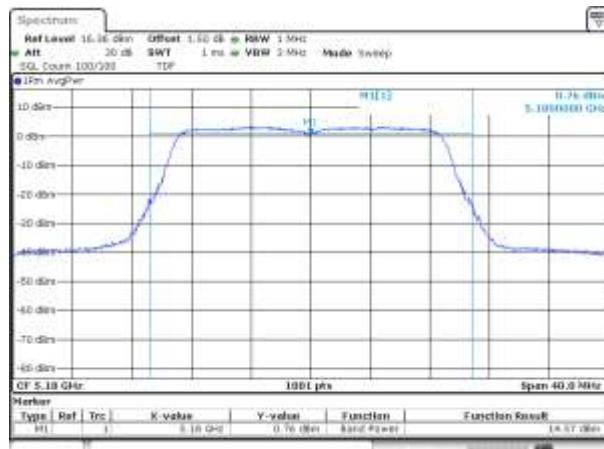
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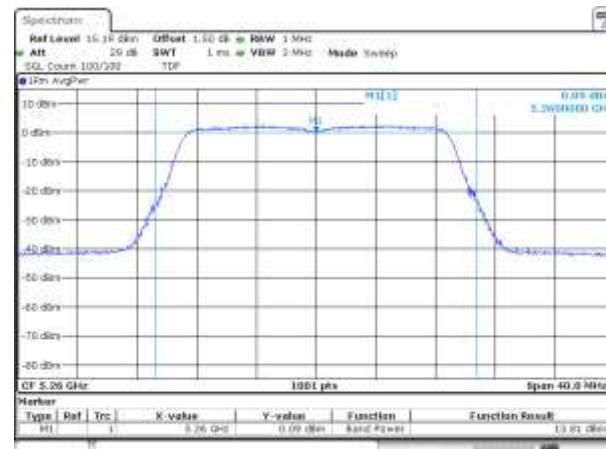
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UNII-1 / 802.11ac VHT20 / 5 180 MHz



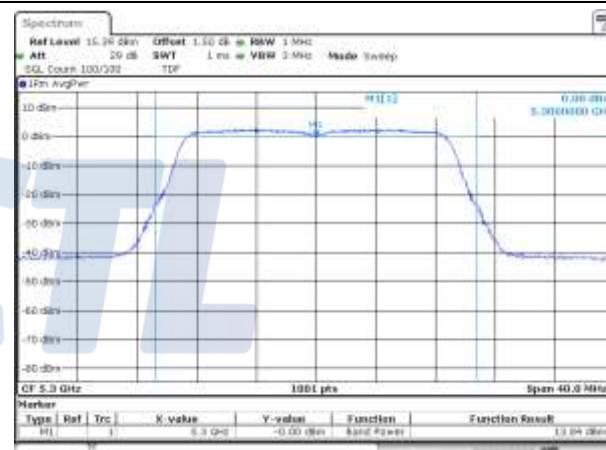
UNII-2A / 802.11ac VHT20 / 5 260 MHz



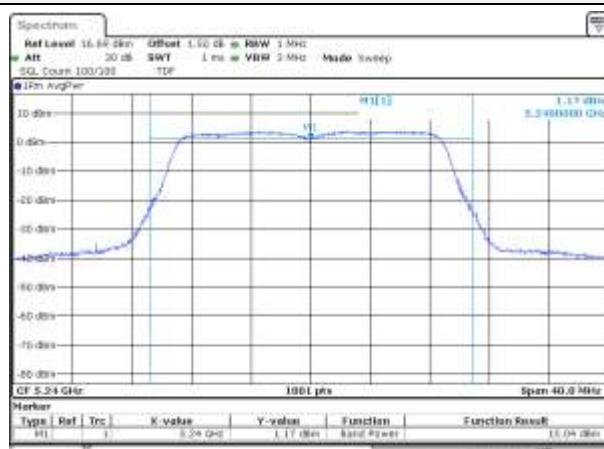
UNII-1 / 802.11ac VHT20 / 5 220 MHz



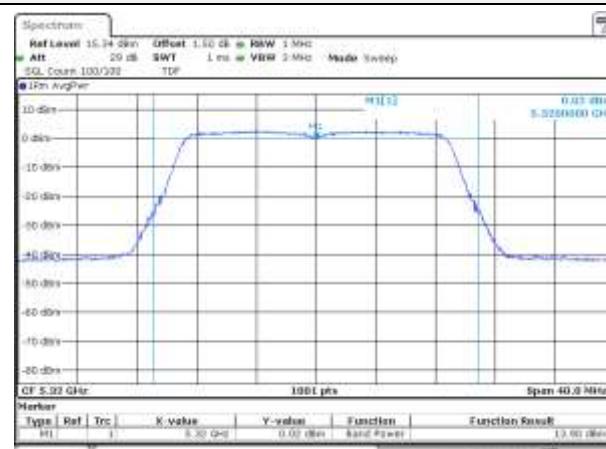
UNII-2A / 802.11ac VHT20 / 5 300 MHz



UNII-1 / 802.11ac VHT20 / 5 240 MHz



UNII-2A / 802.11ac VHT20 / 5 320 MHz



KCTL Inc.

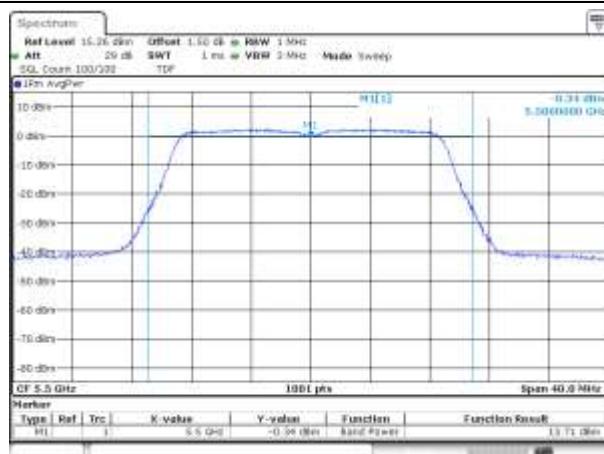
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Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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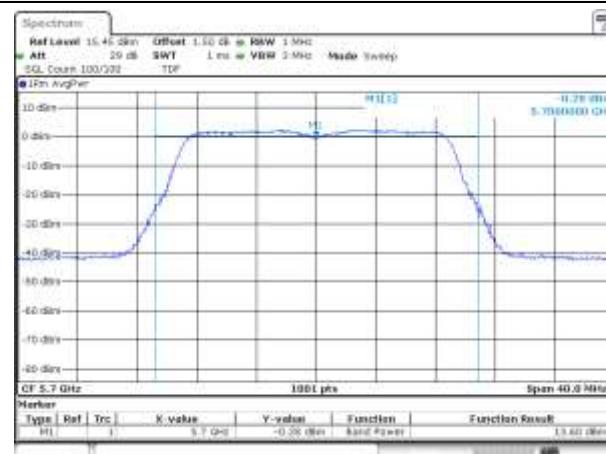
Page (88) of (1046)

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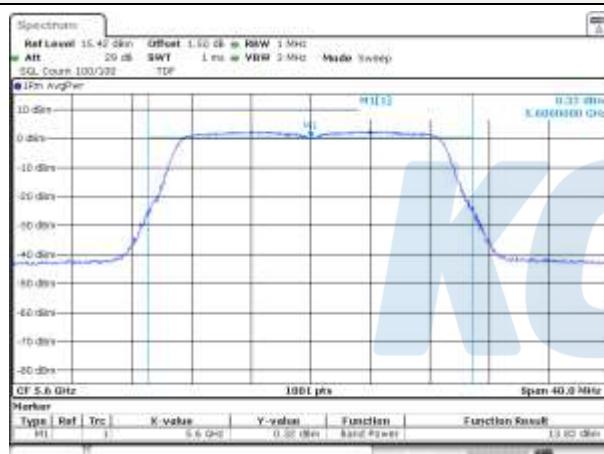
UNII-2C / 802.11ac VHT20 / 5 500 MHz



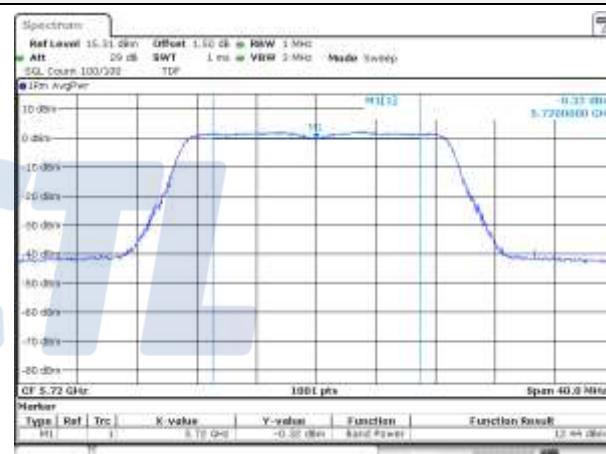
UNII-2C / 802.11ac VHT20 / 5 700 MHz



UNII-2C / 802.11ac VHT20 / 5 600 MHz



UNII-2C / 802.11ac VHT20 / 5 720 MHz



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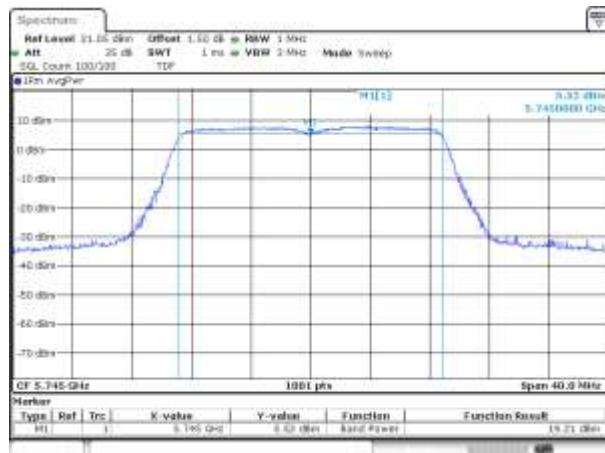
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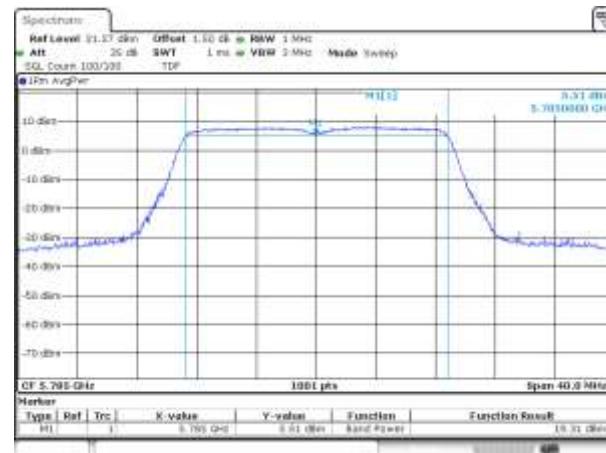
Page (89) of (1046)

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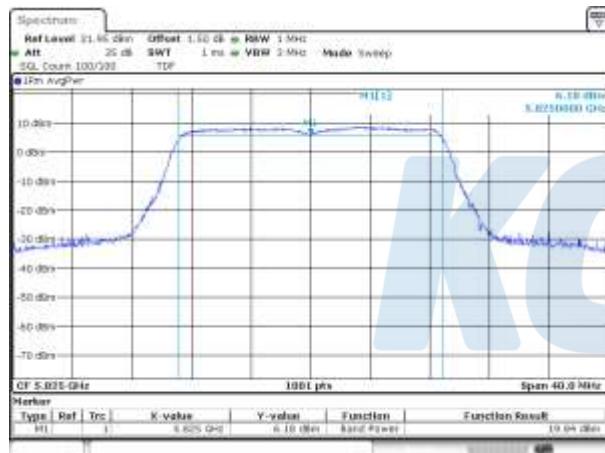
UNII-3 / 802.11ac VHT20 / 5 745 MHz



UNII-3 / 802.11ac VHT20 / 5 785 MHz



UNII-3 / 802.11ac VHT20 / 5 825 MHz



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Report No.:
KR20-SRF0030-D

Page (90) of (1046)

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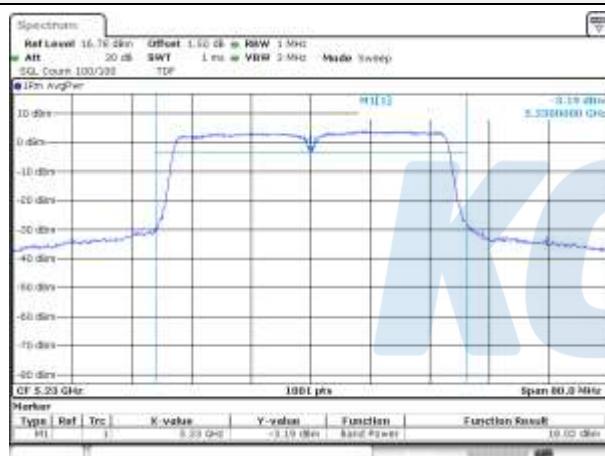
UNII-1 / 802.11ac VHT40 / 5 190 MHz



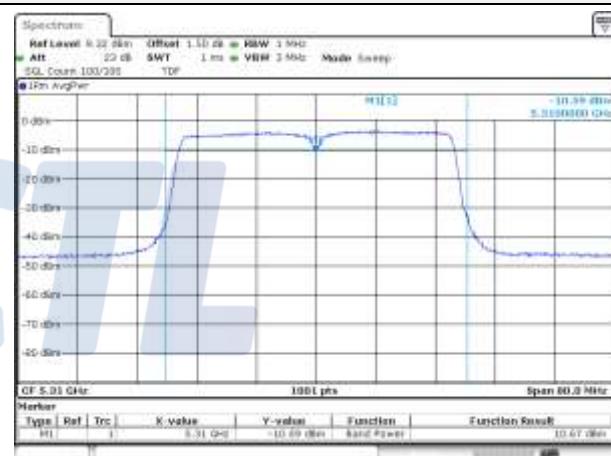
UNII-2A / 802.11ac VHT40 / 5 270 MHz



UNII-1 / 802.11ac VHT40 / 5 230 MHz



UNII-2A / 802.11ac VHT40 / 5 310 MHz



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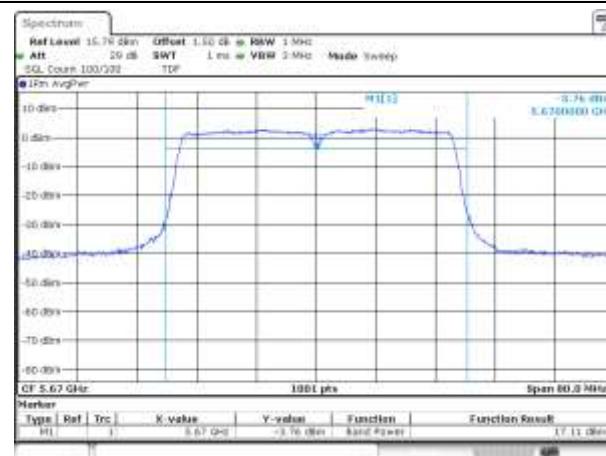
Page (91) of (1046)

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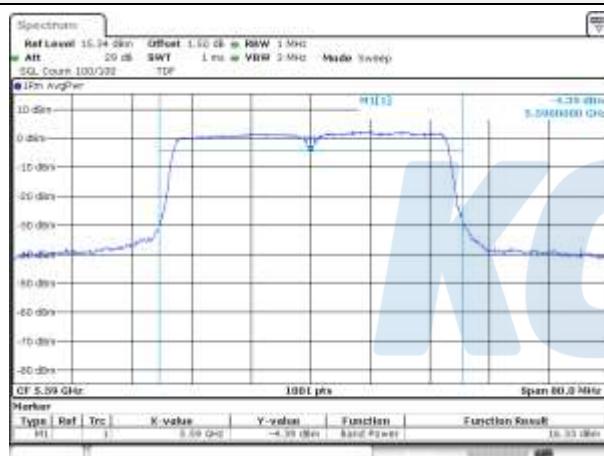
UNII-2C / 802.11ac VHT40 / 5 510 MHz



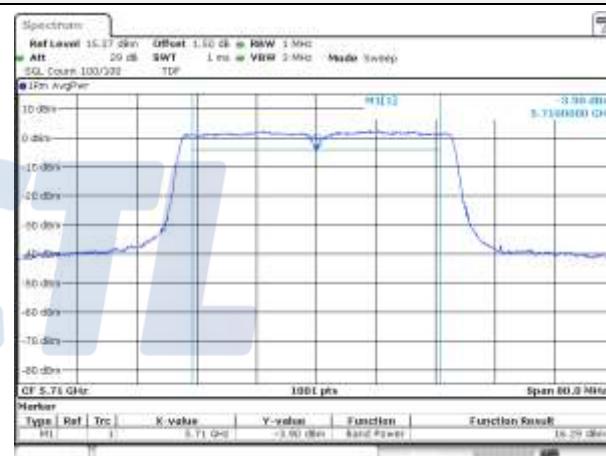
UNII-2C / 802.11ac VHT40 / 5 670 MHz



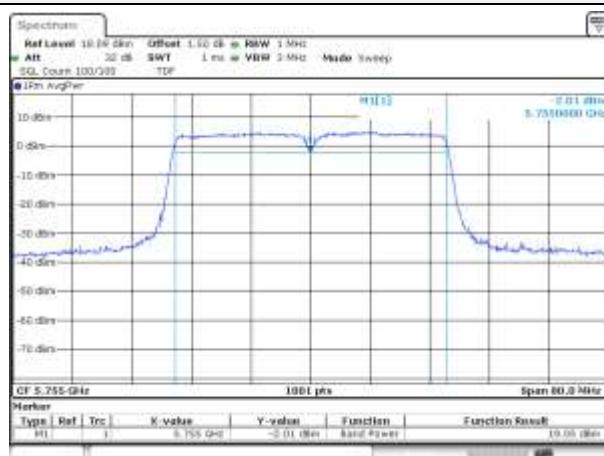
UNII-2C / 802.11ac VHT40 / 5 590 MHz



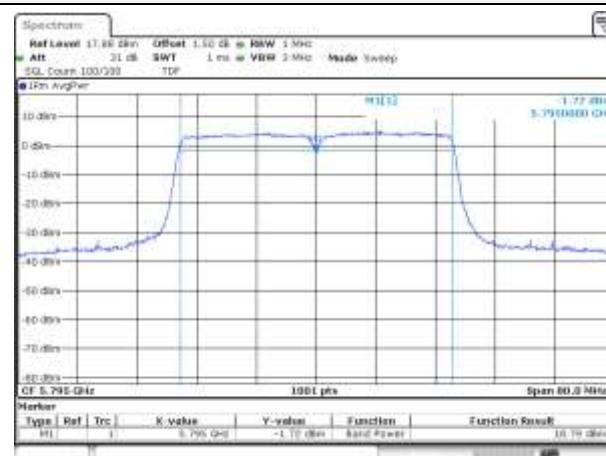
UNII-2C / 802.11ac VHT40 / 5 710 MHz



UNII-3 / 802.11ac VHT40 / 5 755 MHz



UNII-3 / 802.11ac VHT40 / 5 795 MHz



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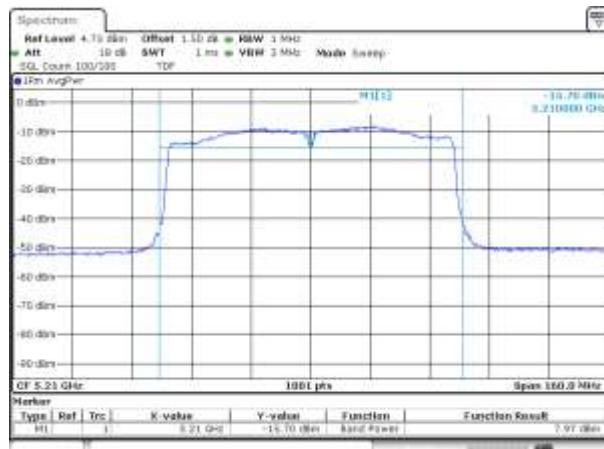
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Page (92) of (1046)

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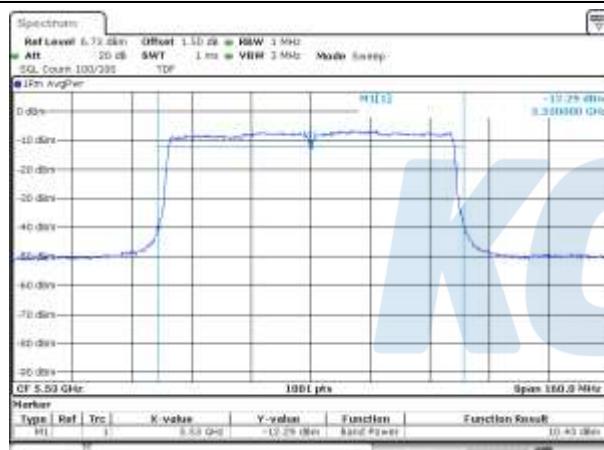
UNII-1 / 802.11ac VHT80 / 5 210 MHz



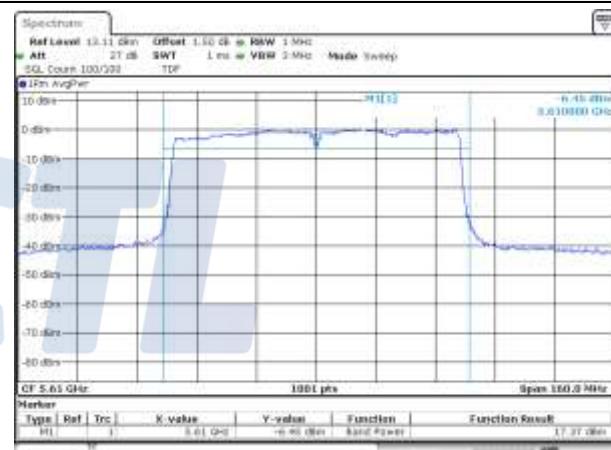
UNII-2A / 802.11ac VHT80 / 5 290 MHz



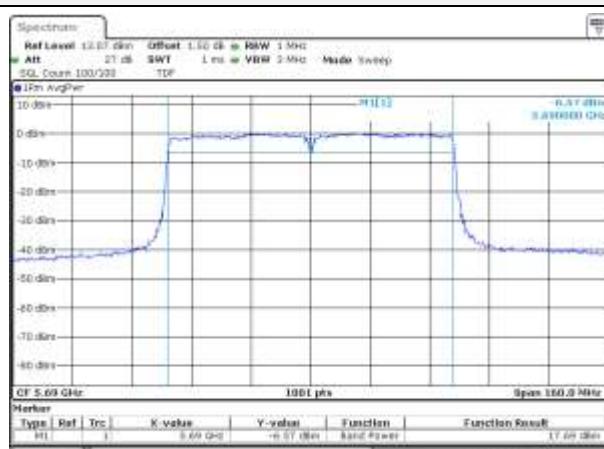
UNII-2C / 802.11ac VHT80 / 5 530 MHz



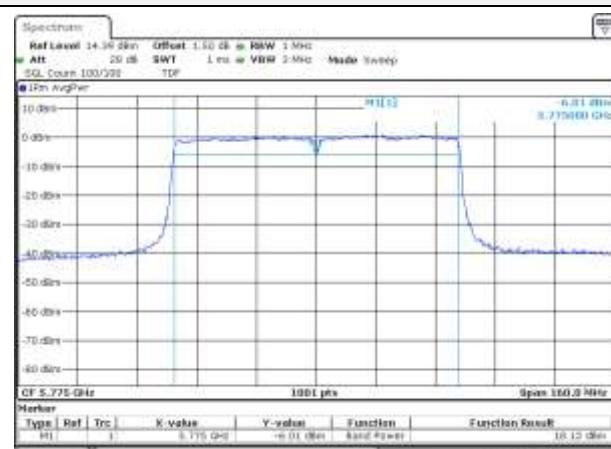
UNII-2C / 802.11ac VHT80 / 5 610 MHz



UNII-2C / 802.11ac VHT80 / 5 690 MHz

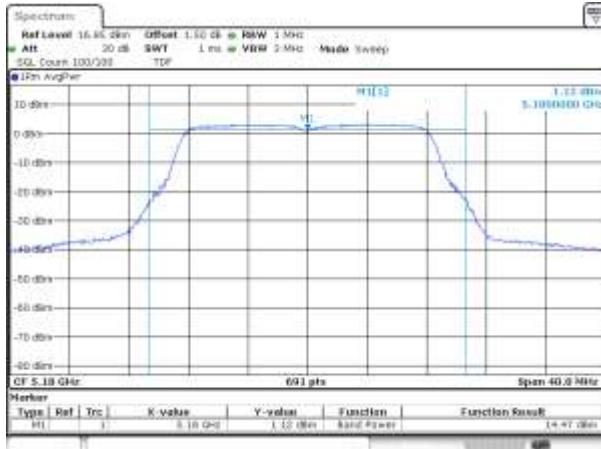


UNII-3 / 802.11ac VHT80 / 5 775 MHz

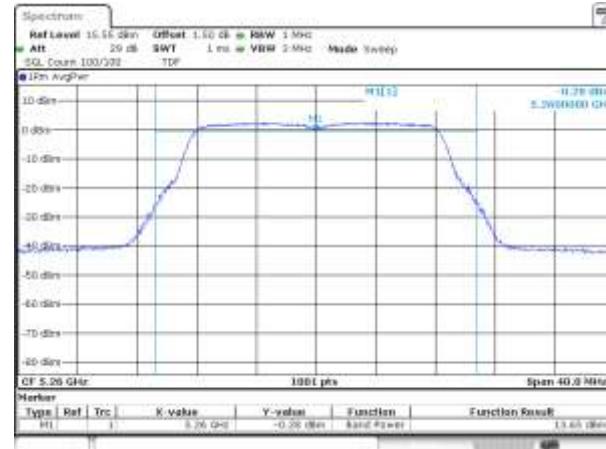


4TX MIMO ANT 1

UNII-1 / 802.11a / 5 180 MHz



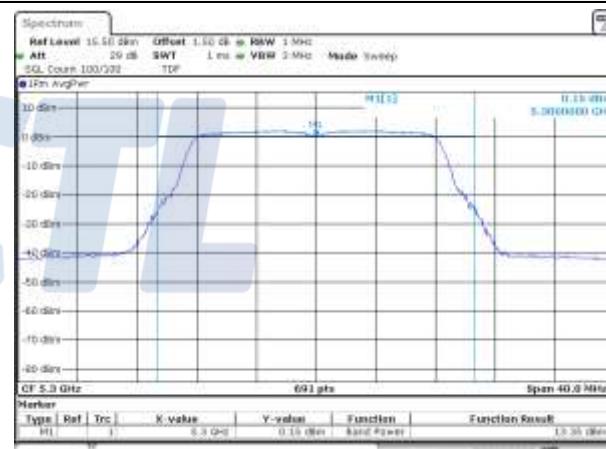
UNII-2A / 802.11a / 5 260 MHz



UNII-1 / 802.11a / 5 220 MHz



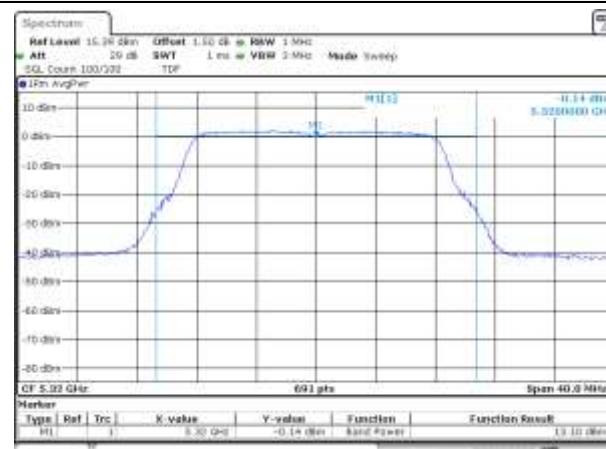
UNII-2A / 802.11a / 5 300 MHz



UNII-1 / 802.11a / 5 240 MHz



UNII-2A / 802.11a / 5 320 MHz



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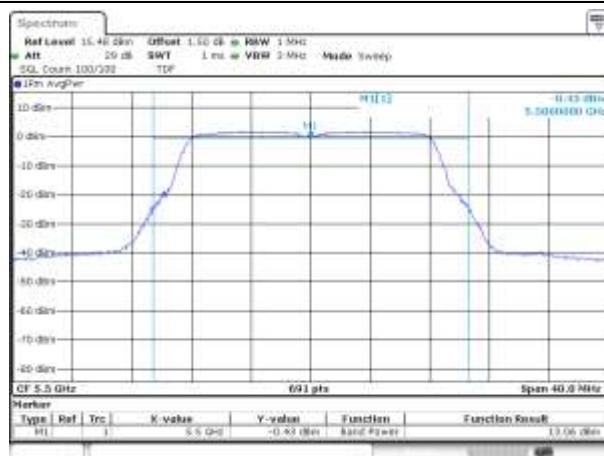
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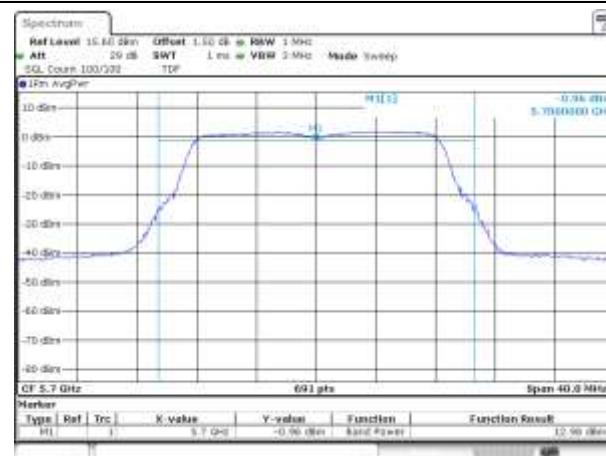
Page (94) of (1046)

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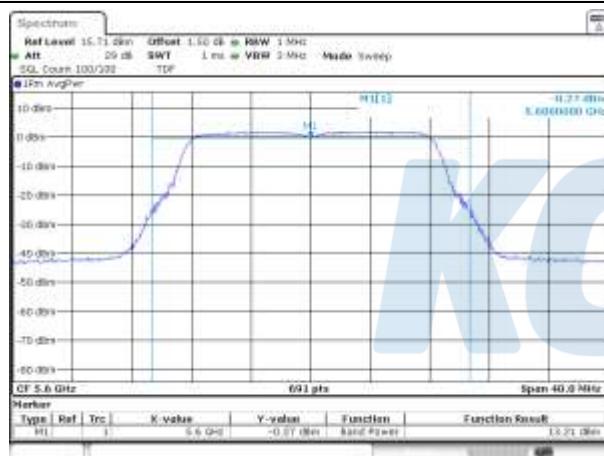
UNII-2C / 802.11a / 5 500 MHz



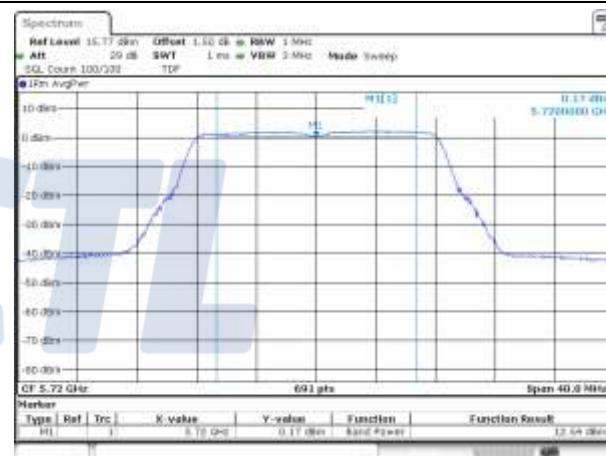
UNII-2C / 802.11a / 5 700 MHz



UNII-2C / 802.11a / 5 600 MHz



UNII-2C / 802.11a / 5 720 MHz



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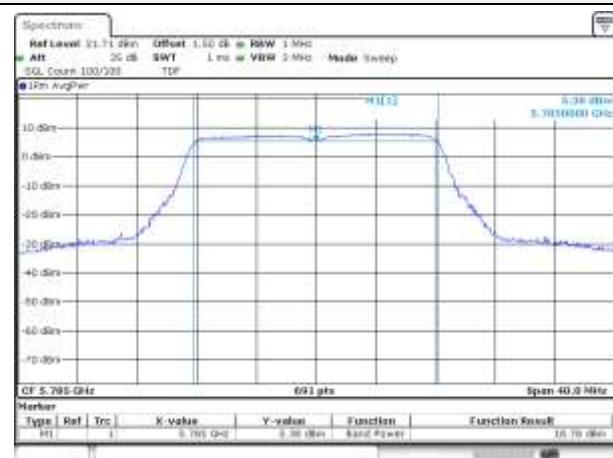
Page (95) of (1046)

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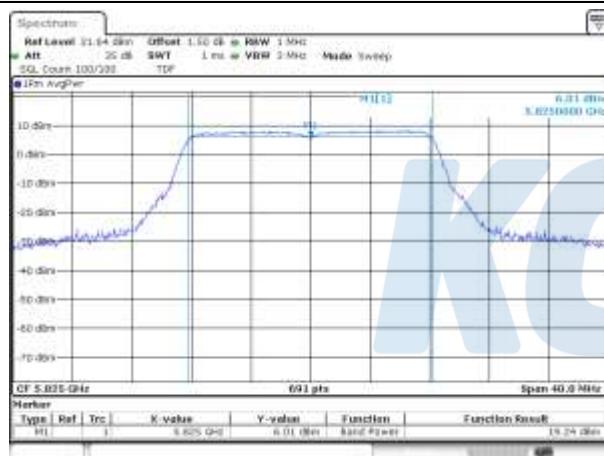
UNII-3 / 802.11a / 5 745 MHz



UNII-3 / 802.11a / 5 785 MHz



UNII-3 / 802.11a / 5 825 MHz



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