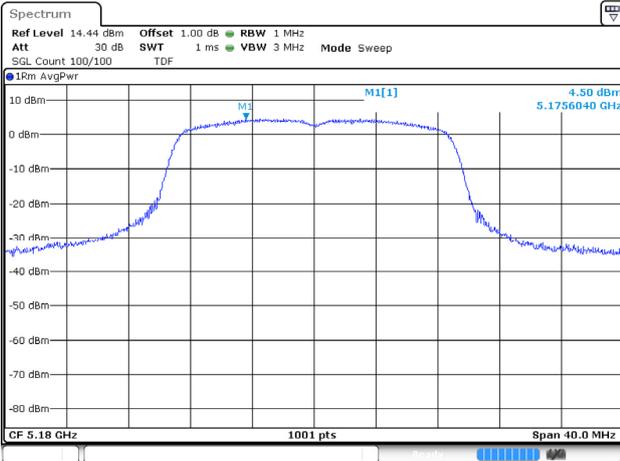# KCTL Inc.

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UNII-1 / 802.11ac VHT20 / Low ch.

UNII-2A / 802. 11ac VHT20 / Low ch.

UNII-1 / 802. 11ac VHT20 / Mid ch.

UNII-2A / 802. 11ac VHT20 / Mid ch.

UNII-1 / 802. 11ac VHT20 / High ch.

UNII-2A / 802. 11ac VHT20 / High ch.

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UNII-2C / 802. 11ac VHT20 / Low ch.

UNII-2C / 802. 11ac VHT20 / Mid ch.

UNII-2C / 802. 11ac VHT20 / High ch.

UNII-2C 802. 11ac VHT20 / Straddle ch.

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UNII-3 / 802. 11ac VHT20 / Low ch.

UNII-3 / 802. 11ac VHT20 / Mid ch.

UNII-3 802. 11ac VHT20 / High ch.

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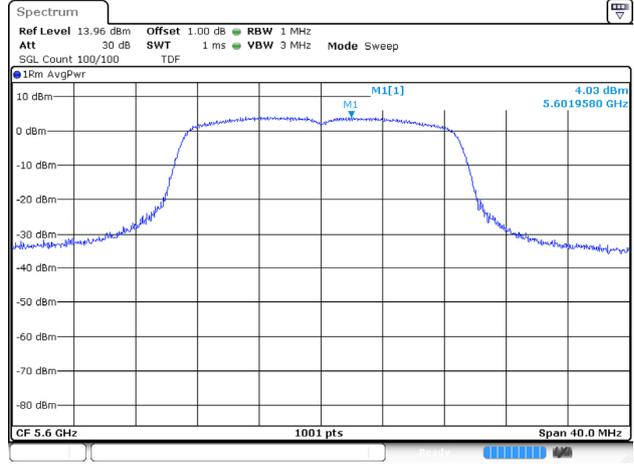www.kctl.co.kr

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UNII-1 / 802.11ac VHT40 / Low ch.	UNII-2A / 802.11ac VHT40 / Low ch.

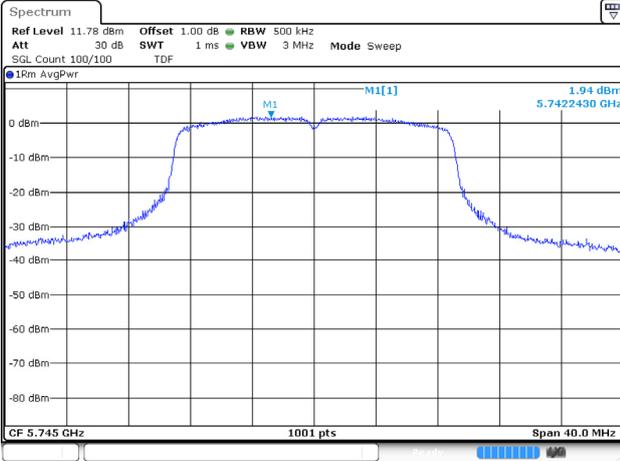| UNII-1 / 802.11ac VHT40 / High ch.	UNII-2A / 802.11ac VHT40 / High ch.

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UNII-2C / 802.11ac VHT40 / Low ch.

UNII-3 / 802.11ac VHT40 / Straddle ch.

UNII-2C / 802.11ac VHT40 / Mid ch.

UNII-3 / 802.11ac VHT40 / Low ch.

UNII-2C / 802.11ac VHT40 / High ch.

UNII-3 / 802.11ac VHT40 / High ch.

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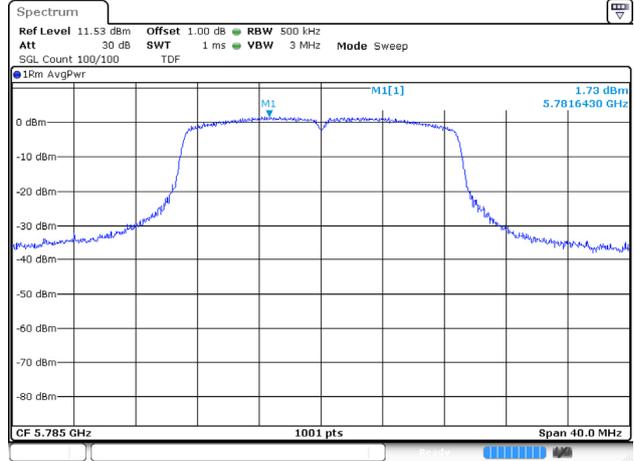www.kctl.co.kr

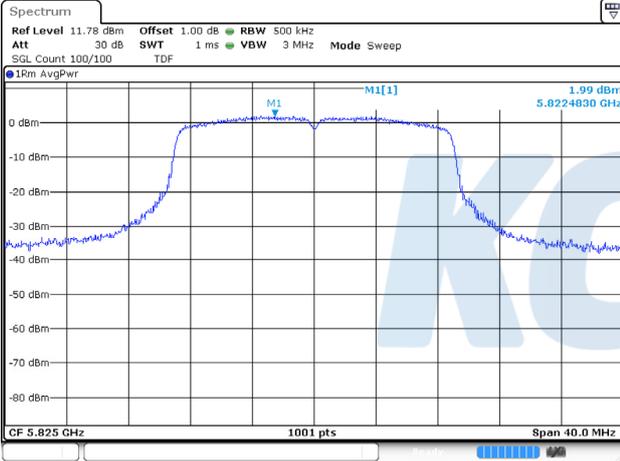Report No.:
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UNII-1 / 802.11ac VHT80 / Low ch.
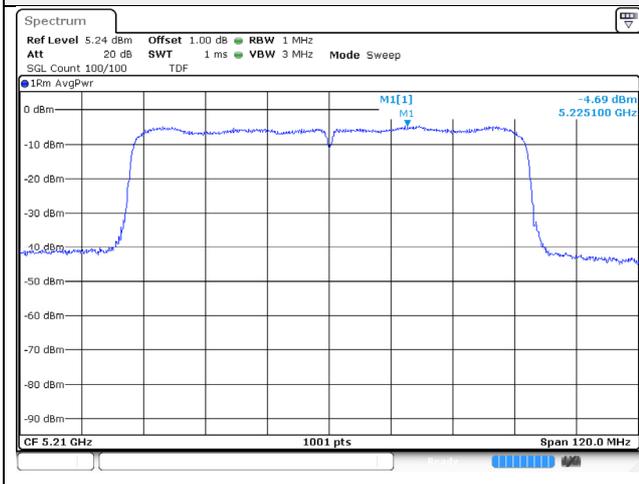
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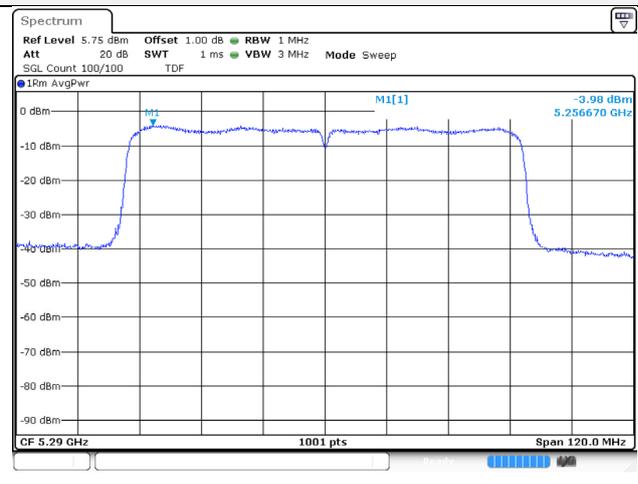
UNII-2C / 802.11ac VHT80 / Low ch.
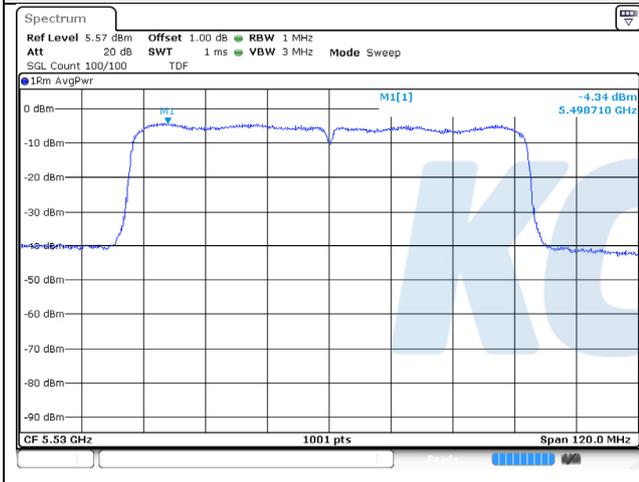
UNII-2C / 802.11ac VHT80 / High ch.

UNII-2C / 802.11ac VHT80 / Straddle ch.

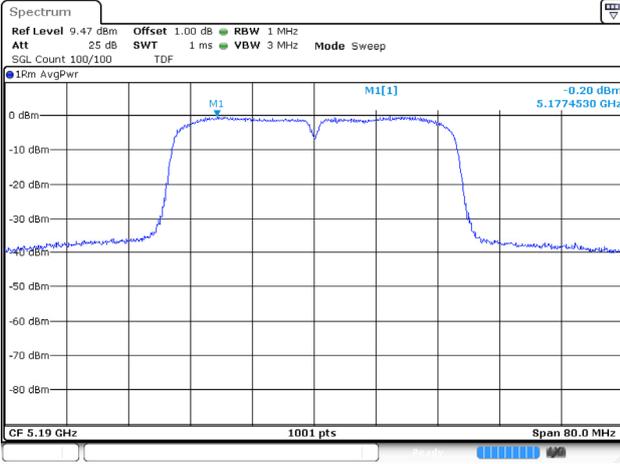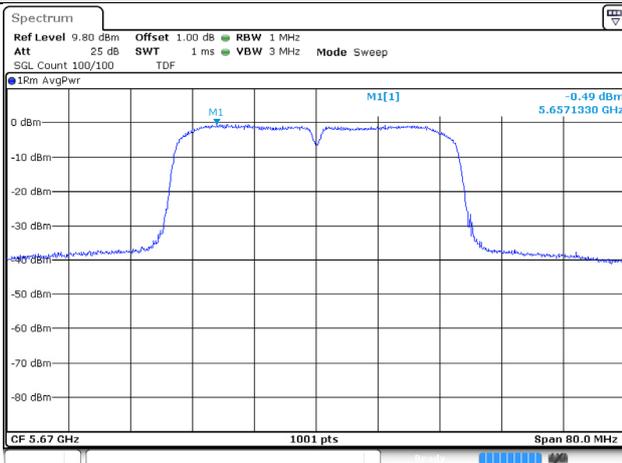## UNII-3 / 802.11ac VHT80 / Low ch.

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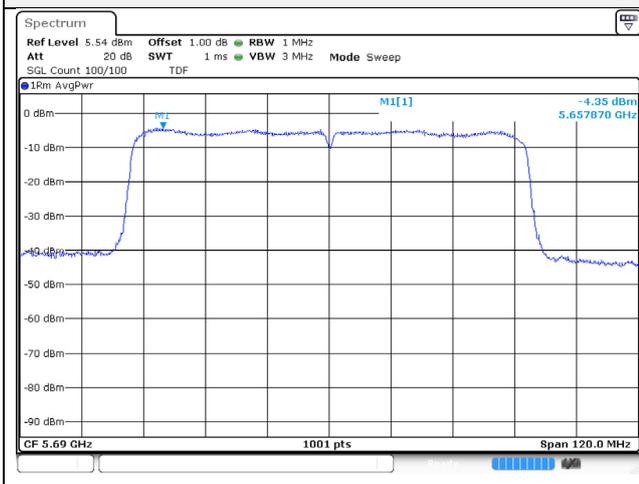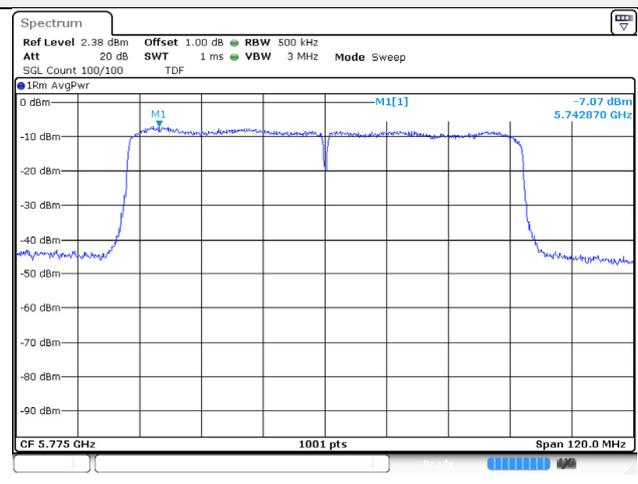
7.3.   26 ㏈ Bandwidth & 99% Bandwidth

Test setup

EUT		Attenuator		Spectrum analyzer
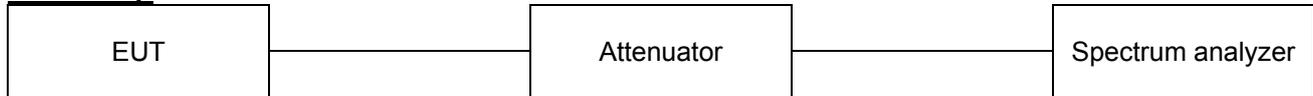
Limit
N/A

Test procedure
ANSI C63.10-2013 Section 12.4
KDB 789033 D02 v02r01 - Section C.1 (26㏈bandwidth)
KDB 789033 D02 v02r01 - Section D (99% bandwidth)

Test settings

1. 26 ㏈ Bandwidth
   a. Set RBW = approximately 1% of the emission bandwidth.
   b. Set the VBW > RBW.
   c. Detector = Peak.
   d. Trace mode = max hold.
   e. Measure the maximum width of the emission that is 26 ㏈ down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

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

Notes:
1. [1]) means Band-crossing channels.

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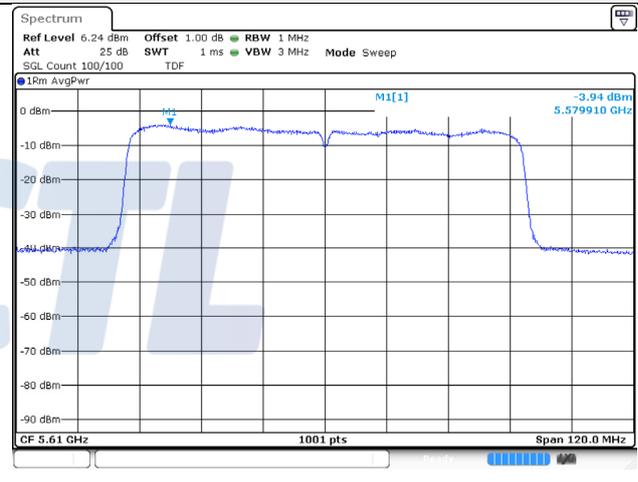Report No.:
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Test results
26 ㏈ bandwidth

Test mode	Band	Frequency(㎒)	Measured Bandwidth (㎒)
802.11a	UNII-1	5 180	20.73
		5 200	20.73
		5 240	23.18
	UNII-2A	5 260	21.23
		5 280	20.88
		5 320	20.78
	UNII-2C	5 500	21.08
		5 600	21.43
		5 700	22.48
		5 720[1]	16.11
802.11n HT20	UNII-1	5 180	21.93
		5 200	22.53
		5 240	22.38
	UNII-2A	5 260	22.33
		5 280	22.18
		5 320	22.53
	UNII-2C	5 500	21.93
		5 600	21.93
		5 700	21.78
		5 720[1]	16.31
802.11n HT40	UNII-1	5 190	52.05
		5 230	41.06
	UNII-2A	5 270	63.44
		5 310	52.05
	UNII-2C	5 510	52.05
		5 590	63.04
		5 670	63.24
		5 710[1]	35.69

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Test mode	Band	Frequency(㎒)	Measured Bandwidth (㎒)
802.11ac VHT20	UNII-1	5 180	21.43
		5 200	22.48
		5 240	22.58
	UNII-2A	5 260	22.43
		5 280	21.43
		5 320	22.38
	UNII-2C	5 500	21.43
		5 600	21.48
		5 700	21.58
		5 720 1)	16.31
802.11ac VHT40	UNII-1	5 190	41.16
		5 230	41.26
	UNII-2A	5 270	41.16
		5 310	41.06
	UNII-2C	5 510	41.16
		5 590	41.26
		5 670	41.06
		5 710 1)	35.39
802.11ac VHT80	UNII-1	5 210	81.28
	UNII-2A	5 290	81.28
	UNII-2C	5 530	81.04
		5 610	81.04
		5 690 1)	75.79

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99% bandwidth

Test mode	Band	Frequency(㎒)	Measured Bandwidth (㎒)
802.11a	UNII-1	5 240	16.48
	UNII-2A	5 260	16.53
802.11n HT20	UNII-1	5 240	17.68
	UNII-2A	5 260	17.68
802.11n HT40	UNII-1	5 230	37.26
	UNII-2A	5 270	37.16
802.11ac VHT20	UNII-1	5 240	17.63
	UNII-2A	5 260	17.63
802.11ac VHT40	UNII-1	5 230	36.26
	UNII-2A	5 270	36.36
802.11ac VHT80	UNII-1	5 210	75.40
	UNII-2A	5 290	75.52

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26 ㏈ bandwidth

UNII-1 / 802.11a / Low ch.

Spectrum

Ref Level 13.52 dBm   Offset 1.00 dB   RBW 200 kHz
Att   25 dB   SWT   1 ms   VBW 500 kHz   Mode Sweep
TDF
1Pk View

M1[1]   3.57 dBm   5.1777520 GHz
        -22.81 dBm   5.1694605 GHz

CF 5.18 GHz   1001 pts   Span 50.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.177752 GHz	3.57 dBm		
M2		1	5.1694605 GHz	-22.81 dBm		
D3	M2	1	20.7293 MHz	-0.59 dB		

UNII-2A / 802.11a / Low ch.

Spectrum

Ref Level 15.15 dBm   Offset 1.00 dB   RBW 200 kHz
Att   25 dB   SWT   1 ms   VBW 500 kHz   Mode Sweep
TDF
1Pk View

M1[1]   5.36 dBm   5.2575020 GHz
        -20.92 dBm   5.2493606 GHz

CF 5.26 GHz   1001 pts   Span 50.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.257502 GHz	5.36 dBm		
M2		1	5.2493606 GHz	-20.92 dBm		
D3	M2	1	21.2288 MHz	-0.61 dB		

UNII-1 / 802.11a / Mid ch.

Spectrum

Ref Level 14.39 dBm   Offset 1.00 dB   RBW 200 kHz
Att   25 dB   SWT   1 ms   VBW 500 kHz   Mode Sweep
TDF
1Pk View

M1[1]   5.04 dBm   5.2037960 GHz
        -21.11 dBm   5.1898601 GHz

CF 5.2 GHz   1001 pts   Span 50.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.203796 GHz	5.04 dBm		
M2		1	5.1898601 GHz	-21.11 dBm		
D3	M2	1	20.7293 MHz	0.15 dB		

UNII-2A / 802.11a / Mid ch.

Spectrum

Ref Level 14.19 dBm   Offset 1.00 dB   RBW 200 kHz
Att   25 dB   SWT   1 ms   VBW 500 kHz   Mode Sweep
TDF
1Pk View

M1[1]   4.44 dBm   5.2824980 GHz
        -22.43 dBm   5.2694605 GHz

CF 5.28 GHz   1001 pts   Span 50.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.282498 GHz	4.44 dBm		
M2		1	5.2694605 GHz	-22.43 dBm		
D3	M2	1	20.8791 MHz	0.39 dB		

UNII-1 / 802.11a / High ch.

Spectrum

Ref Level 15.53 dBm   Offset 1.00 dB   RBW 200 kHz
Att   25 dB   SWT   1 ms   VBW 500 kHz   Mode Sweep
TDF
1Pk View

M1[1]   5.49 dBm   5.2378020 GHz
        -20.74 dBm   5.2293606 GHz

CF 5.24 GHz   1001 pts   Span 50.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.237802 GHz	5.49 dBm		
M2		1	5.2293606 GHz	-20.74 dBm		
D3	M2	1	23.1768 MHz	-6.70 dB		

UNII-2A / 802.11a / High ch.

Spectrum

Ref Level 14.93 dBm   Offset 1.00 dB   RBW 200 kHz
Att   25 dB   SWT   1 ms   VBW 500 kHz   Mode Sweep
TDF
1Pk View

M1[1]   4.94 dBm   5.3188010 GHz
        -21.28 dBm   5.3098601 GHz

CF 5.32 GHz   1001 pts   Span 50.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.318801 GHz	4.94 dBm		
M2		1	5.3098601 GHz	-21.28 dBm		
D3	M2	1	20.7792 MHz	-0.78 dB		

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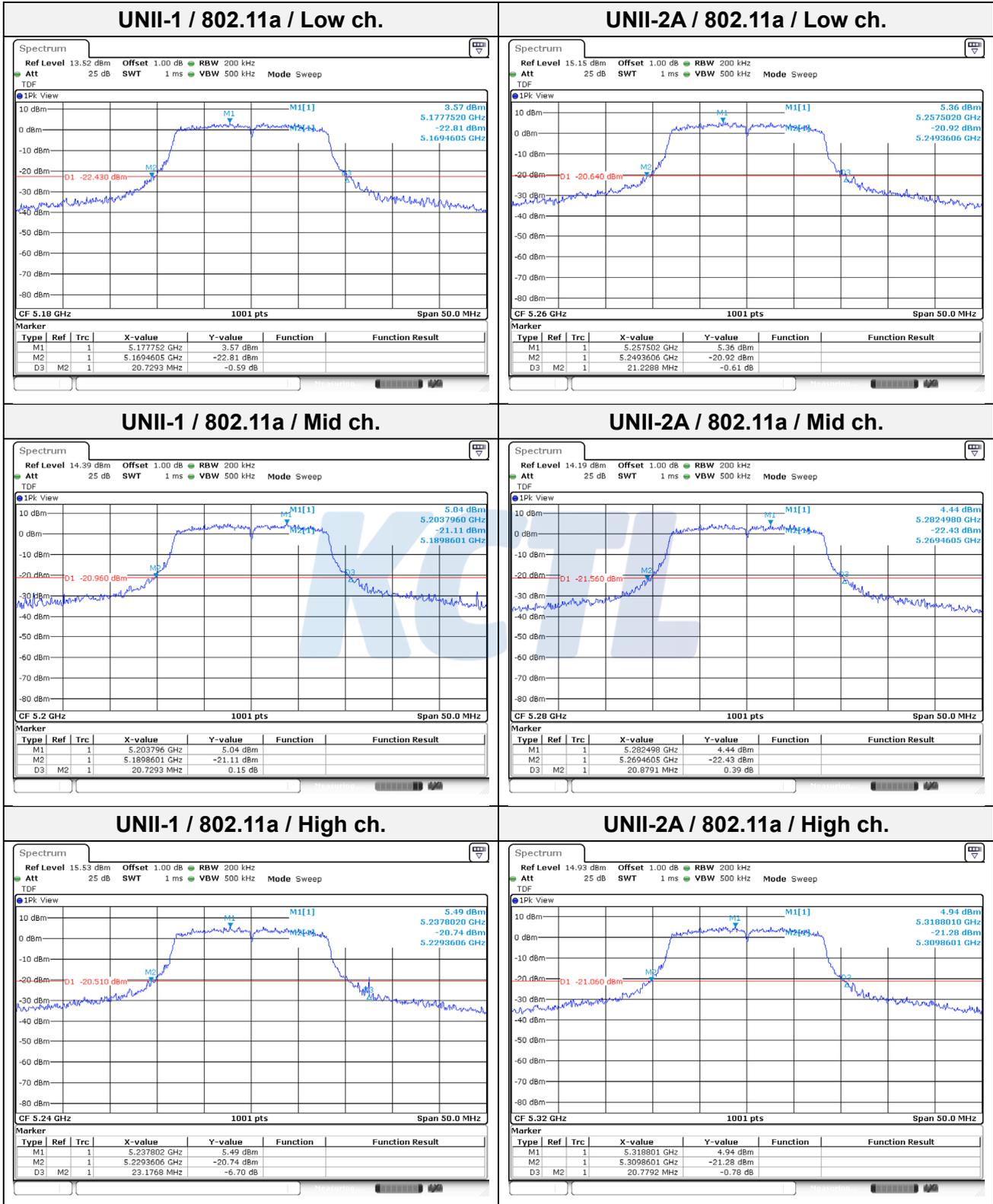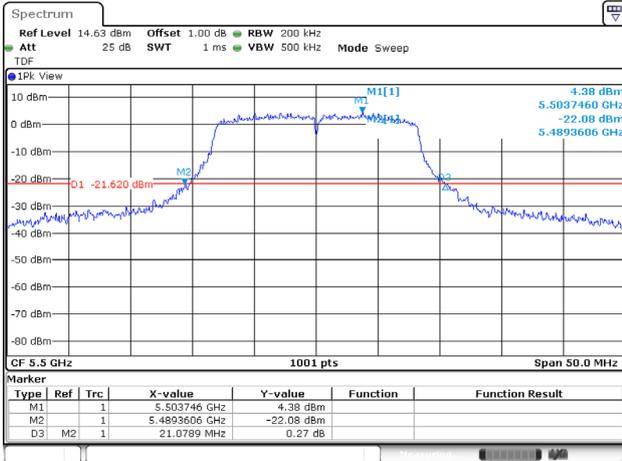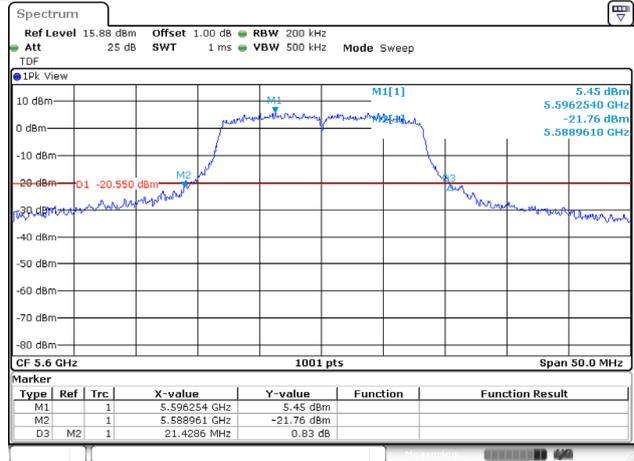www.kctl.co.kr

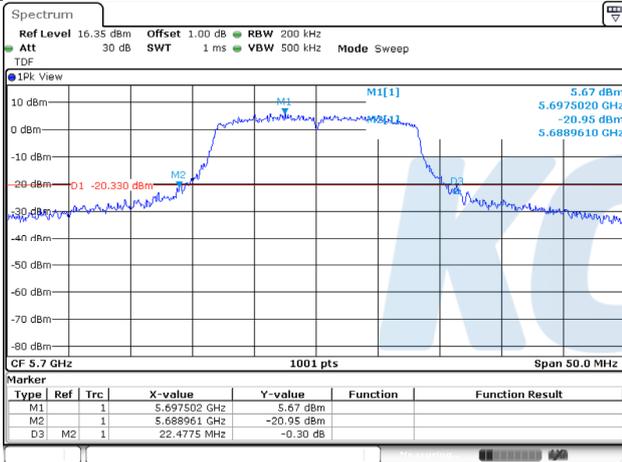Report No.:
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UNII-2C / 802.11a / Low ch.

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.503746 GHz	4.38 dBm		
M2		1	5.4893606 GHz	-22.08 dBm		
D3	M2	1	21.0789 MHz	0.27 dB		

UNII-2C / 802.11a / Mid ch.

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.596254 GHz	5.45 dBm		
M2		1	5.588961 GHz	-21.76 dBm		
D3	M2	1	21.4286 MHz	0.83 dB		

UNII-2C / 802.11a / High ch.

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.697502 GHz	5.67 dBm		
M2		1	5.688961 GHz	-20.95 dBm		
D3	M2	1	22.4775 MHz	-0.30 dB		

UNII-2C / 802.11a / Straddle ch.

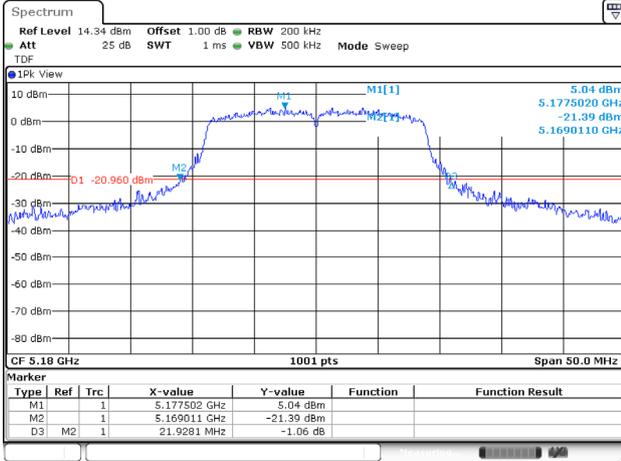| Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.717752 GHz	6.09 dBm		
M2		1	5.725 GHz	5.11 dBm		
D3	M2	1	-16.107 MHz	-26.05 dB		
D4	M2	1	5.389 MHz	-25.08 dB		

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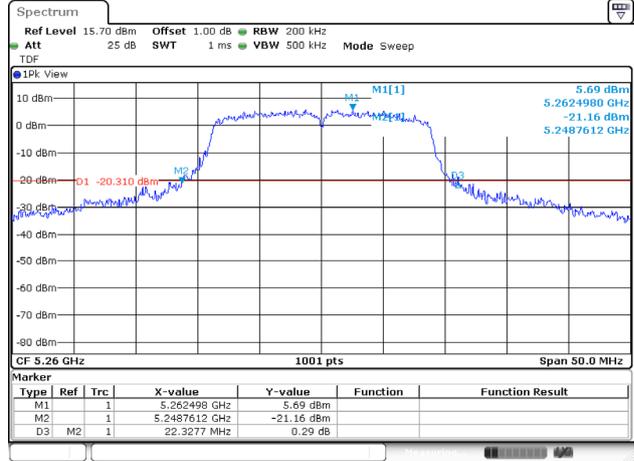www.kctl.co.kr

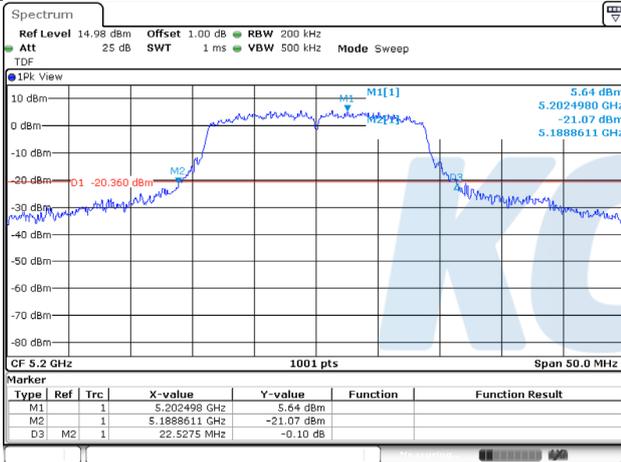Report No.:
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UNII-1 / 802.11n HT20 / Low ch.

Spectrum
Ref Level 14.34 dBm   Offset 1.00 dB   RBW 200 kHz
Att   25 dB   SWT   1 ms   VBW 500 kHz   Mode Sweep
TDF
1Pk View

M1[1]   5.04 dBm   5.1775020 GHz
-21.39 dBm   5.1690110 GHz
D1 -20.960 dBm

CF 5.18 GHz   1001 pts   Span 50.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.177502 GHz	5.04 dBm		
M2		1	5.169011 GHz	-21.39 dBm		
D3	M2	1	21.9281 MHz	-1.06 dB		

UNII-2A / 802.11n HT20 / Low ch.

Spectrum
Ref Level 15.70 dBm   Offset 1.00 dB   RBW 200 kHz
Att   25 dB   SWT   1 ms   VBW 500 kHz   Mode Sweep
TDF
1Pk View

M1[1]   5.69 dBm   5.2624980 GHz
-21.16 dBm   5.2487612 GHz
D1 -20.310 dBm

CF 5.26 GHz   1001 pts   Span 50.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.262498 GHz	5.69 dBm		
M2		1	5.2487612 GHz	-21.16 dBm		
D3	M2	1	22.3277 MHz	0.29 dB		

UNII-1 / 802.11n HT20 / Mid ch.

Spectrum
Ref Level 14.98 dBm   Offset 1.00 dB   RBW 200 kHz
Att   25 dB   SWT   1 ms   VBW 500 kHz   Mode Sweep
TDF
1Pk View

M1[1]   5.64 dBm   5.2024980 GHz
-21.07 dBm   5.1888611 GHz
D1 -20.360 dBm

CF 5.2 GHz   1001 pts   Span 50.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.202498 GHz	5.64 dBm		
M2		1	5.1888611 GHz	-21.07 dBm		
D3	M2	1	22.5275 MHz	-0.10 dB		

UNII-2A / 802.11n HT20 / Mid ch.

Spectrum
Ref Level 14.10 dBm   Offset 1.00 dB   RBW 200 kHz
Att   25 dB   SWT   1 ms   VBW 500 kHz   Mode Sweep
TDF
1Pk View

M1[1]   4.64 dBm   5.2808490 GHz
-22.57 dBm   5.2690110 GHz
D1 -21.360 dBm

CF 5.28 GHz   1001 pts   Span 50.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.280849 GHz	4.64 dBm		
M2		1	5.269011 GHz	-22.57 dBm		
D3	M2	1	22.1778 MHz	0.72 dB		

UNII-1 / 802.11n HT20 / High ch.

Spectrum
Ref Level 15.37 dBm   Offset 1.00 dB   RBW 200 kHz
Att   25 dB   SWT   1 ms   VBW 500 kHz   Mode Sweep
TDF
1Pk View

M1[1]   6.05 dBm   5.2387510 GHz
-20.64 dBm   5.2287612 GHz
D1 -19.950 dBm

CF 5.24 GHz   1001 pts   Span 50.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.238751 GHz	6.05 dBm		
M2		1	5.2287612 GHz	-20.64 dBm		
D3	M2	1	22.3776 MHz	-0.64 dB		

UNII-2A / 802.11n HT20 / High ch.

Spectrum
Ref Level 15.27 dBm   Offset 1.00 dB   RBW 200 kHz
Att   25 dB   SWT   1 ms   VBW 500 kHz   Mode Sweep
TDF
1Pk View

M1[1]   5.28 dBm   5.3237960 GHz
-21.64 dBm   5.3088611 GHz
D1 -20.720 dBm

CF 5.32 GHz   1001 pts   Span 50.0 MHz

Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.323796 GHz	5.28 dBm		
M2		1	5.3088611 GHz	-21.64 dBm		
D3	M2	1	22.5275 MHz	0.31 dB		

KCTL Inc.

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www.kctl.co.kr

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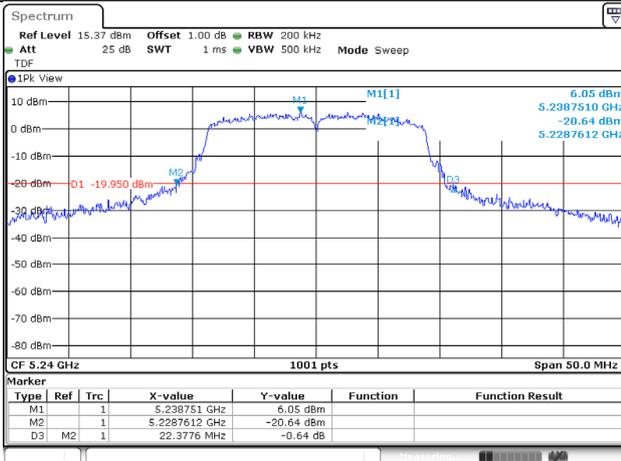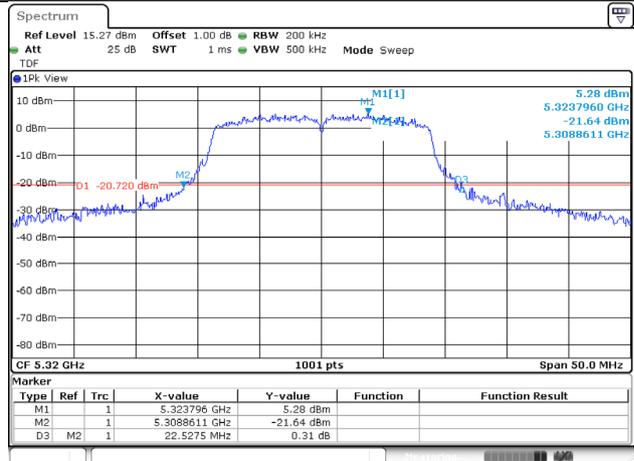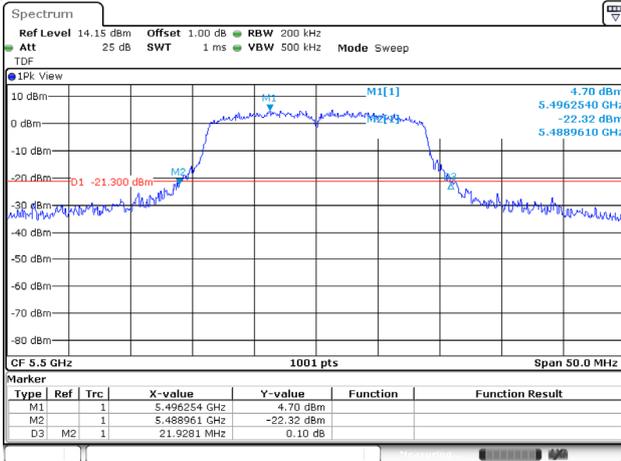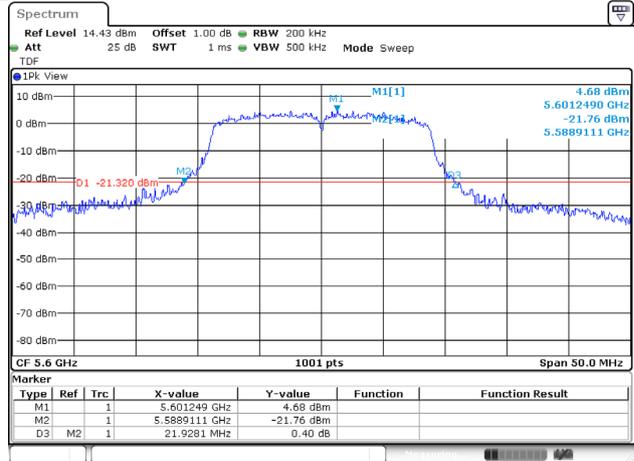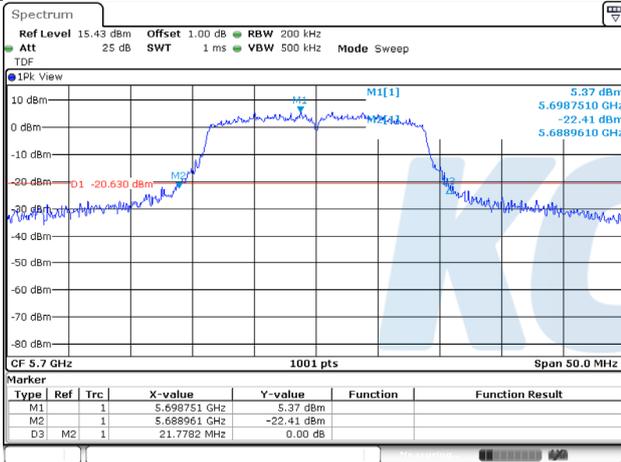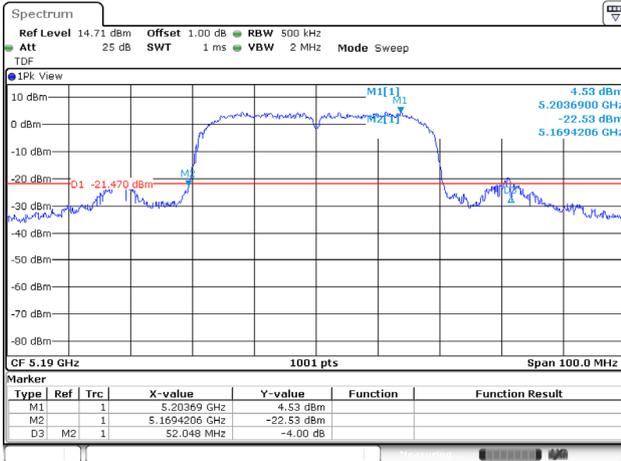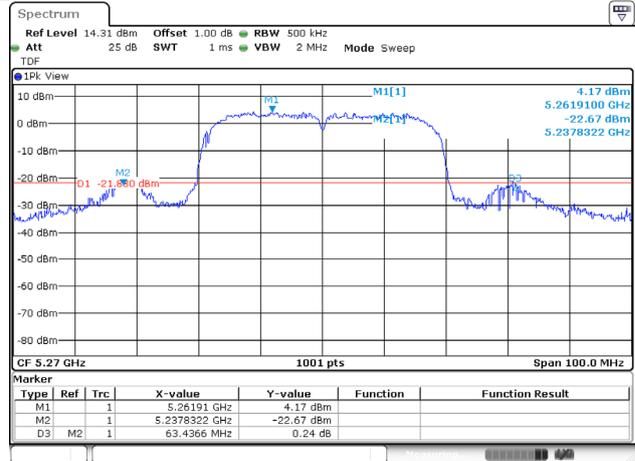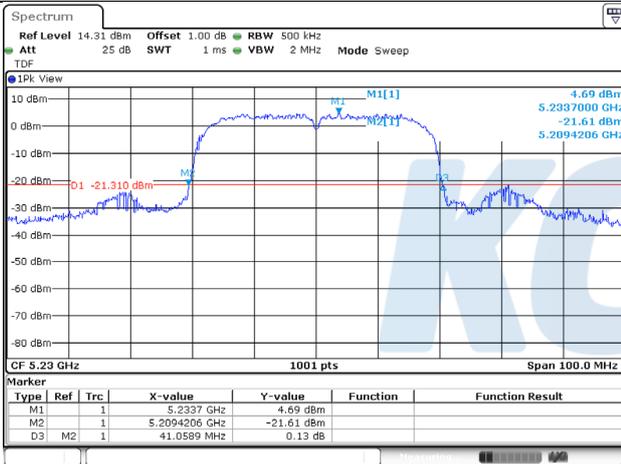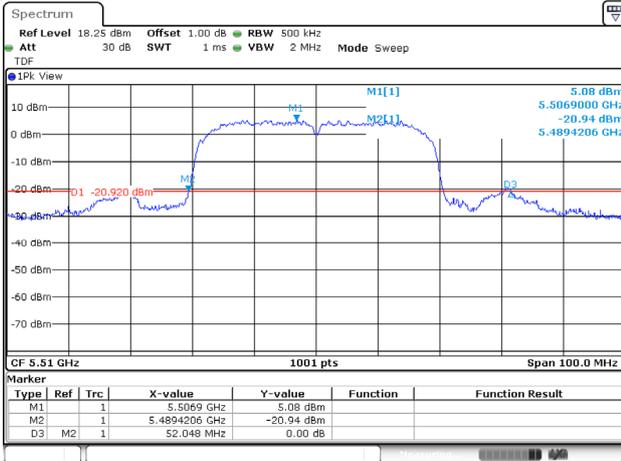

UNII-2C / 802.11n HT20 / Mid ch.

UNII-2C / 802.11n HT20 / High ch.

UNII-2C / 802.11n HT20 / Straddle ch.

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UNII-2A / 802.11n HT40 / Low ch.

UNII-1 / 802.11n HT40 / High ch.

UNII-2A / 802.11n HT40 / High ch.

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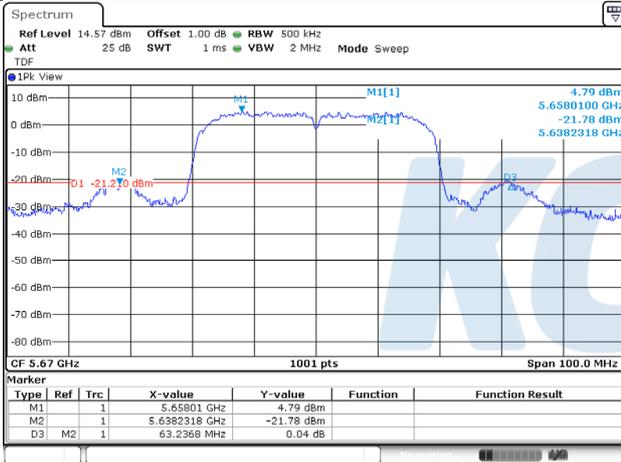Report No.:
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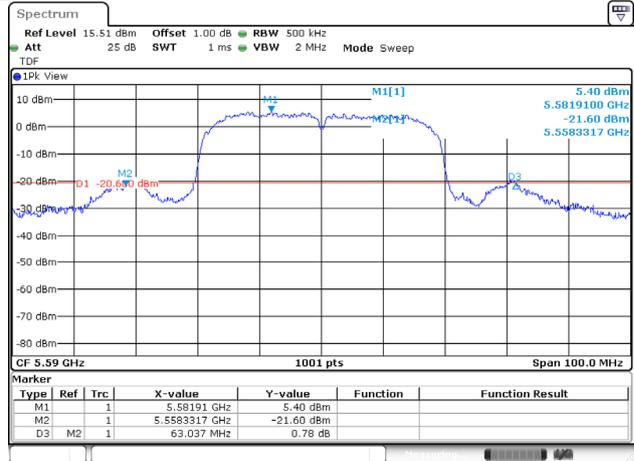
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