

6. BAND EDGE COMPLIANCE TEST

6.1. Limits

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

6.2. Test setup

The EUT was placed on a turn table which was 0.8 m above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both horizontal and vertical polarizations.

The bandwidth of the Spectrum's VBW is set at 3MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure.

Note: If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.

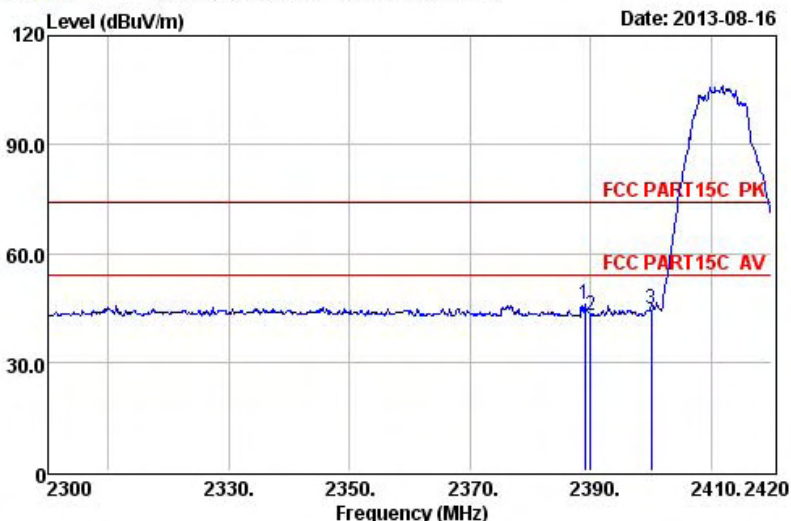
Test data as follows:



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Data: 164 File: D:\966 data\C\customer.EM6 (179)



Site : 966 Chamber
Condition: FCC PART15C PK 3m ZN30701 VERTICAL
EUT : WIRELESS TRANSMITTER
M/N : TOP-GS04-T
Power : DC 5V from PC input AC 120V/60Hz
Test By : Andy
Comment : Temp:24.8'C Humi:56% Press:101.52kPa
Test Mode: WIFI 802.11b 2412MHz

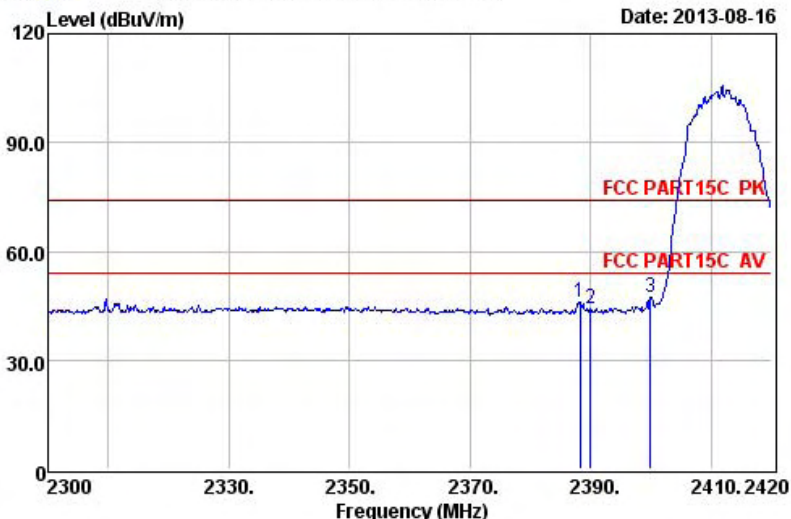
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	Freq	Factor	Level	Loss	Factor	Level	Line	Limit
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB
1	2389.04	26.32	36.08	7.34	28.72	45.82	74.00	-28.18
2	2390.00	26.32	33.27	7.34	28.72	43.01	74.00	-30.99
3	2400.00	26.32	35.03	7.34	28.72	44.77	74.00	-29.23



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Data: 165 File: D:\966 data\C\customer.EM6 (179)



Site : 966 Chamber
Condition: FCC PART15C PK 3m ZN30701 HORIZONTAL
EUT : WIRELESS TRANSMITTER
M/N : TOP-GS04-T
Power : DC 5V from PC input AC 120V/60Hz
Test By : Andy
Comment : Temp:24.8'C Humi:56% Press:101.52kPa
Test Mode: WIFI 802.11b 2412MHz

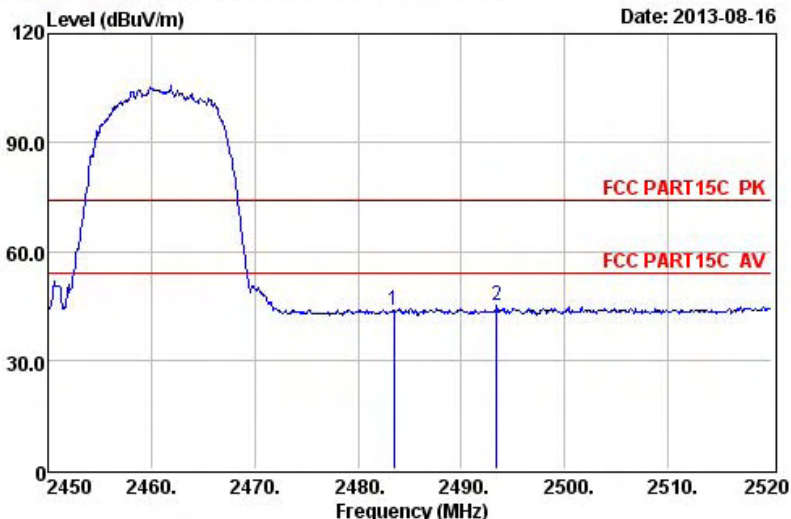
	Preamp	Read	Cable	Antenna	Limit	Over	
	Freq	Factor	Level	Loss	Factor	Line	
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dB
1	2388.20	26.32	36.19	7.34	28.72	45.93	74.00 -28.07
2	2390.00	26.32	34.20	7.34	28.72	43.94	74.00 -30.06
3	2399.96	26.32	37.54	7.34	28.72	47.28	74.00 -26.72



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Site : 966 Chamber
Condition: FCC PART15C PK 3m ZN30701 HORIZONTAL
EUT : WIRELESS TRANSMITTER
M/N : TOP-GS04-T
Power : DC 5V from PC input AC 120V/60Hz
Test By : Andy
Comment : Temp:24.8'C Humi:56% Press:101.52kPa
Test Mode: WIFI 802.11b 2462MHz

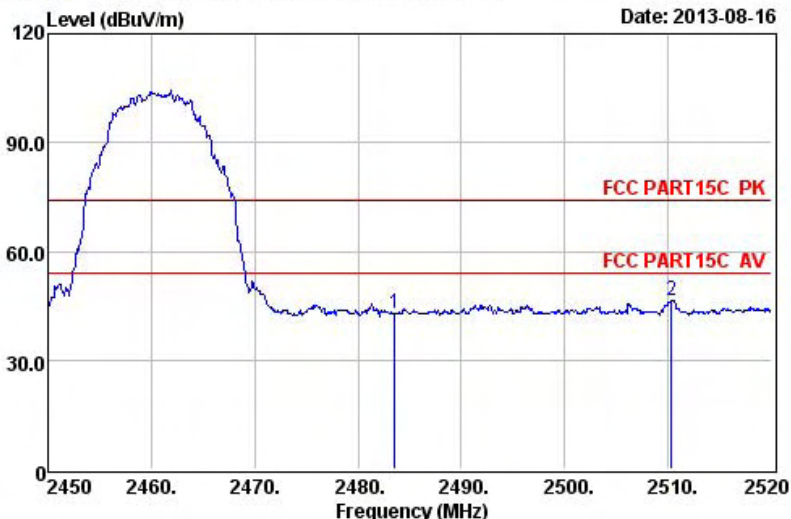
	Preamp	Read	Cable	Antenna	Limit	Over		
Freq	Factor	Level	Loss	Factor	Level	Line		
MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m		
1	2483.50	26.34	33.51	7.57	28.79	43.53	74.00	-30.47
2	2493.40	26.35	34.98	7.61	28.80	45.04	74.00	-28.96



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Data: 167 File: D:\966 data\C\customer.EM6 (179)



Site : 966 Chamber
Condition: FCC PART15C PK 3m ZN30701 VERTICAL
EUT : WIRELESS TRANSMITTER
M/N : TOP-GS04-T
Power : DC 5V from PC input AC 120V/60Hz
Test By : Andy
Comment : Temp:24.8'C Humi:56% Press:101.52kPa
Test Mode: WIFI 802.11b 2462MHz

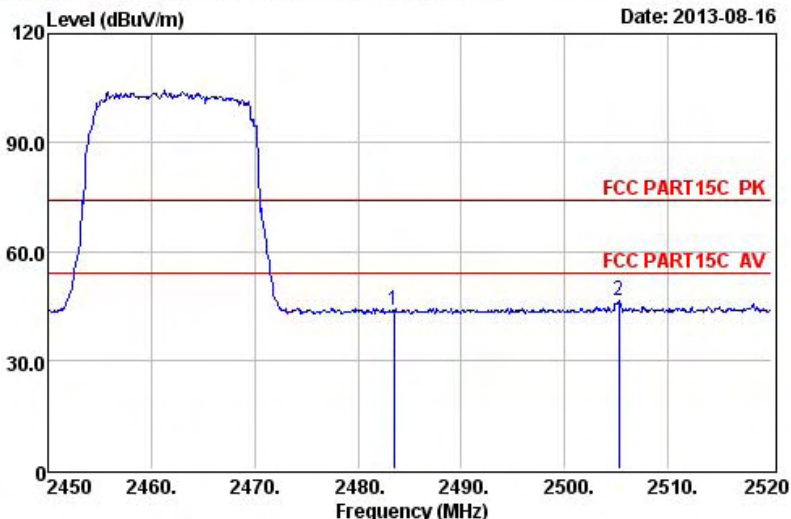
	Preamp	Read	Cable	Antenna	Limit	Over		
	Freq	Factor	Level	Loss	Factor	Level		
	MHz	dB	dBuV	dB	dB/m	dBuV/m		
1	2483.53	26.34	32.76	7.57	28.79	42.78	74.00	-31.22
2	2510.34	26.35	36.37	7.66	28.84	46.52	74.00	-27.48



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Condition: FCC PART15C PK 3m ZN30701 VERTICAL
EUT : WIRELESS TRANSMITTER
M/N : TOP-GS04-T
Power : DC 5V from PC input AC 120V/60Hz
Test By : Andy
Comment : Temp:24.8'C Humi:56% Press:101.52kPa
Test Mode: WIFI 802.11g 2462MHz

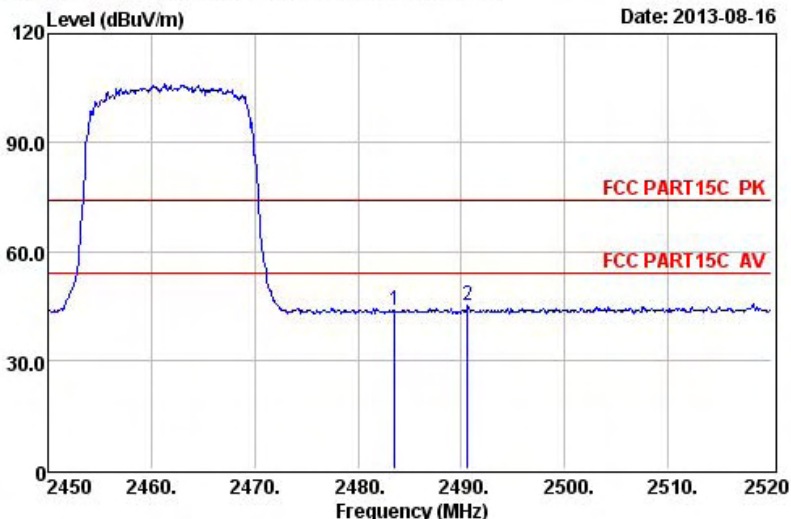
	Preamp	Read	Cable	Antenna	Limit	Over		
	Freq	Factor	Level	Loss	Factor	Line		
	MHz	dB	dBuV	dB	dB/m	dBuV/m		
1	2483.50	26.34	33.48	7.57	28.79	43.50	74.00	-30.50
2	2505.23	26.35	36.44	7.61	28.84	46.54	74.00	-27.46



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Data: 169 File: D:\966 data\C\customer.EM6 (179)



Site : 966 Chamber
Condition: FCC PART15C PK 3m ZN30701 HORIZONTAL
EUT : WIRELESS TRANSMITTER
M/N : TOP-GS04-T
Power : DC 5V from PC input AC 120V/60Hz
Test By : Andy
Comment : Temp:24.8'C Humi:56% Press:101.52kPa
Test Mode: WIFI 802.11g 2462MHz

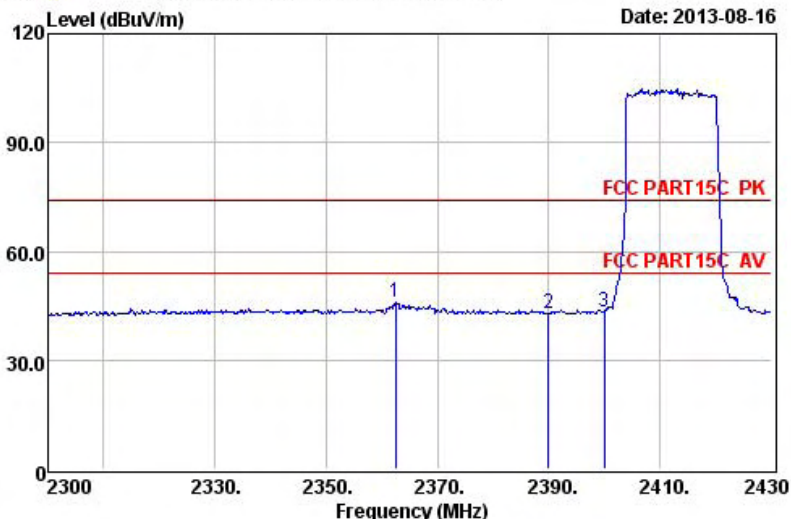
	Preamp	Read	Cable	Antenna	Limit	Over	
	Freq	Factor	Level	Loss	Factor	Line	
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dB
1	2483.53	26.34	33.51	7.57	28.79	43.53	74.00 -30.47
2	2490.60	26.35	34.90	7.57	28.80	44.92	74.00 -29.08



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Site : 966 Chamber
Condition: FCC PART15C PK 3m ZN30701 VERTICAL
EUT : WIRELESS TRANSMITTER
M/N : TOP-GS04-T
Power : DC 5V from PC input AC 120V/60Hz
Test By : Andy
Comment : Temp:24.8'C Humi:56% Press:101.52kPa
Test Mode: WIFI 802.11g 2412MHz

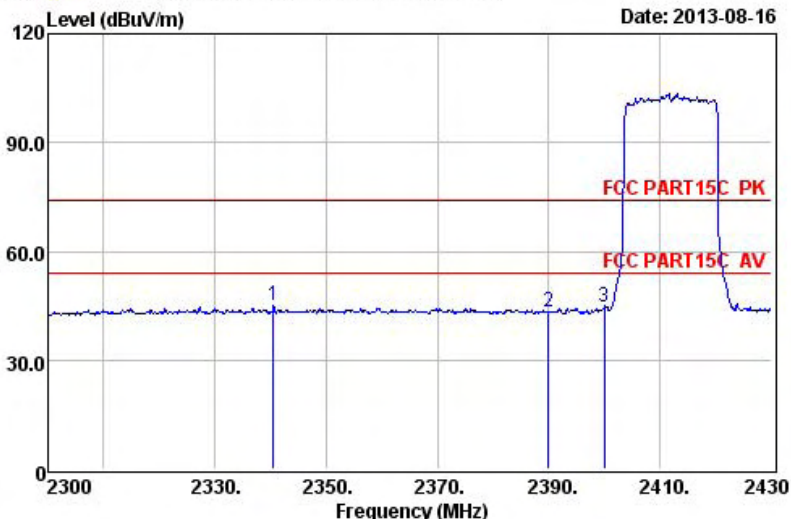
	Preamp	Read	Cable	Antenna	Limit	Over		
	Freq	Factor	Level	Loss	Factor	Level		
	MHz	dB	dBuV	dB	dB/m	dBuV/m		
1	2362.40	26.31	36.34	7.25	28.69	45.97	74.00	-28.03
2	2389.96	26.32	33.06	7.34	28.72	42.80	74.00	-31.20
3	2399.97	26.32	33.57	7.34	28.72	43.31	74.00	-30.69



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Site : 966 Chamber
Condition: FCC PART15C PK 3m ZN30701 HORIZONTAL
EUT : WIRELESS TRANSMITTER
M/N : TOP-GS04-T
Power : DC 5V from PC input AC 120V/60Hz
Test By : Andy
Comment : Temp:24.8'C Humi:56% Press:101.52kPa
Test Mode: WIFI 802.11g 2412MHz

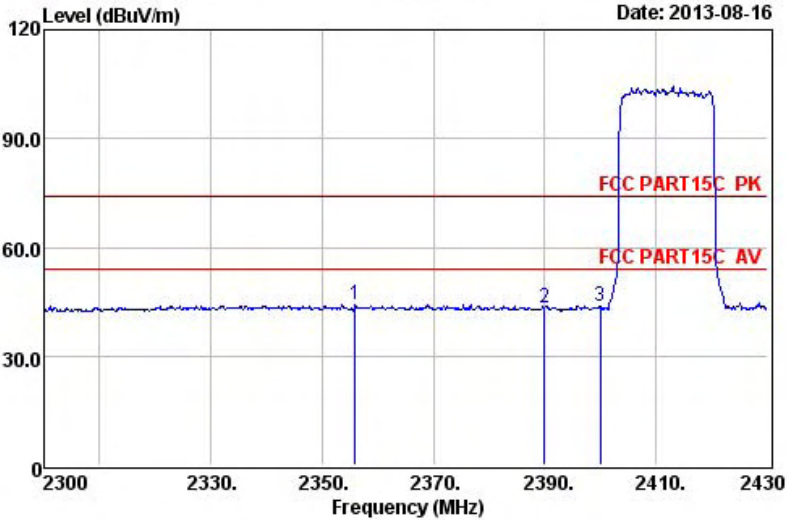
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	Freq	Factor	Level	Loss	Factor	Line	
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dB
1	2340.56	26.30	35.54	7.21	28.68	45.13	74.00 -28.87
2	2389.96	26.32	33.42	7.34	28.72	43.16	74.00 -30.84
3	2399.97	26.32	34.85	7.34	28.72	44.59	74.00 -29.41



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Site : 966 Chamber
 Condition: FCC PART15C PK 3m ZN30701 HORIZONTAL
 EUT : WIRELESS TRANSMITTER
 M/N : TOP-GS04-T
 Power : DC 5V from PC input AC 120V/60Hz
 Test By : Andy
 Comment : Temp:24.8'C Humi:56% Press:101.52kPa
 Test Mode: WIFI 802.11n(HT20) 2412MHz

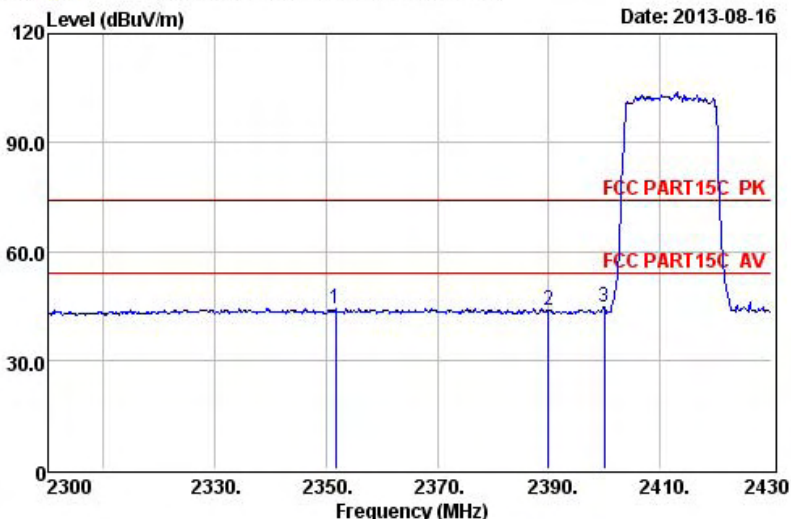
	Preamp	Read	Cable	Antenna	Limit	Over		
Freq	Factor	Level	Loss	Factor	Line	Limit		
MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m		
1	2355.90	26.31	34.41	7.25	28.69	44.04	74.00	-29.96
2	2389.96	26.32	33.62	7.34	28.72	43.36	74.00	-30.64
3	2399.97	26.32	33.87	7.34	28.72	43.61	74.00	-30.39



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Data: 173 File: D:\966 data\C\customer.EM6 (179)



Site : 966 Chamber
Condition: FCC PART15C PK 3m ZN30701 VERTICAL
EUT : WIRELESS TRANSMITTER
M/N : TOP-GS04-T
Power : DC 5V from PC input AC 120V/60Hz
Test By : Andy
Comment : Temp:24.8'C Humi:56% Press:101.52kPa
Test Mode: WIFI 802.11n(HT20) 2412MHz

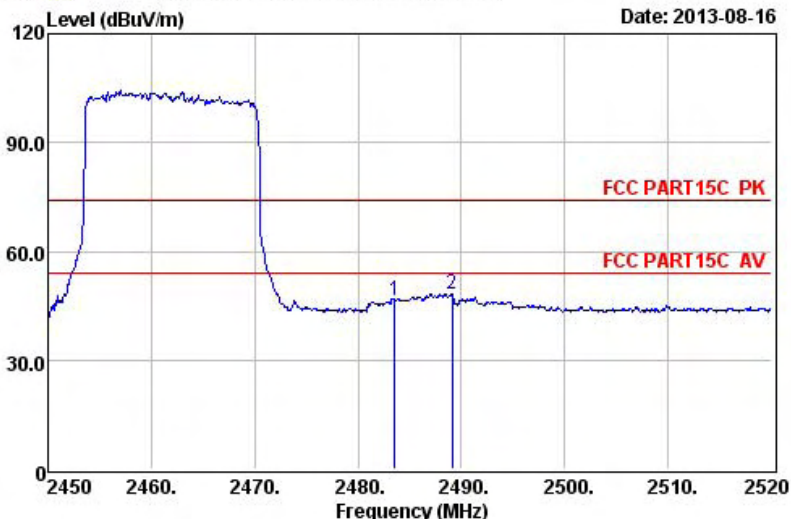
	Preamp	Read	Cable	Antenna	Limit	Over		
Freq	Factor	Level	Loss	Factor	Line	Limit		
MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m		
1	2351.74	26.31	34.57	7.25	28.69	44.20	74.00	-29.80
2	2389.96	26.32	33.79	7.34	28.72	43.53	74.00	-30.47
3	2399.97	26.32	35.00	7.34	28.72	44.74	74.00	-29.26



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Data: 174 File: D:\966 data\C\customer.EM6 (179)



Site : 966 Chamber
Condition: FCC PART15C PK 3m ZN30701 VERTICAL
EUT : WIRELESS TRANSMITTER
M/N : TOP-GS04-T
Power : DC 5V from PC input AC 120V/60Hz
Test By : Andy
Comment : Temp:24.8'C Humi:56% Press:101.52kPa
Test Mode: WIFI 802.11n(HT20) 2462MHz

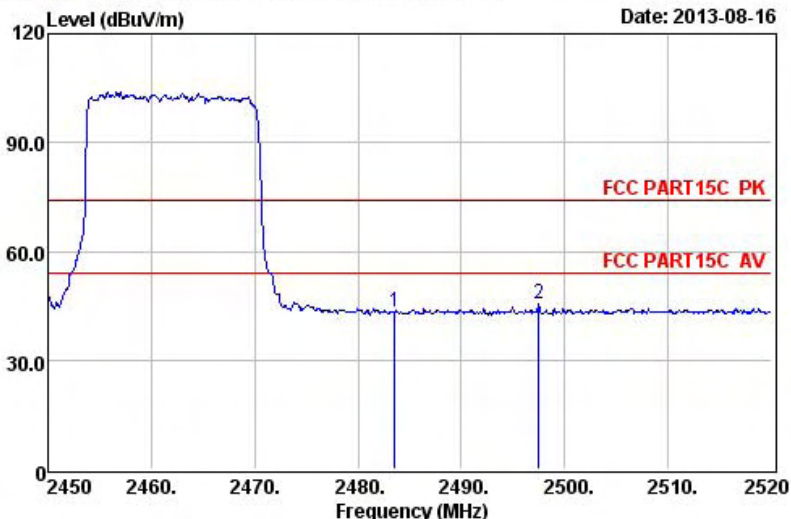
	Preamp	Read	Cable	Antenna	Limit	Over	
	Freq	Factor	Level	Loss	Factor	Line	Limit
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m
1	2483.53	26.34	36.56	7.57	28.79	46.58	74.00 -27.42
2	2489.13	26.35	38.21	7.57	28.80	48.23	74.00 -25.77



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Data: 175 File: D:\966 data\C\customer.EM6 (179)



Site : 966 Chamber
Condition: FCC PART15C PK 3m ZN30701 HORIZONTAL
EUT : WIRELESS TRANSMITTER
M/N : TOP-GS04-T
Power : DC 5V from PC input AC 120V/60Hz
Test By : Andy
Comment : Temp:24.8'C Humi:56% Press:101.52kPa
Test Mode: WIFI 802.11n(HT20) 2462MHz

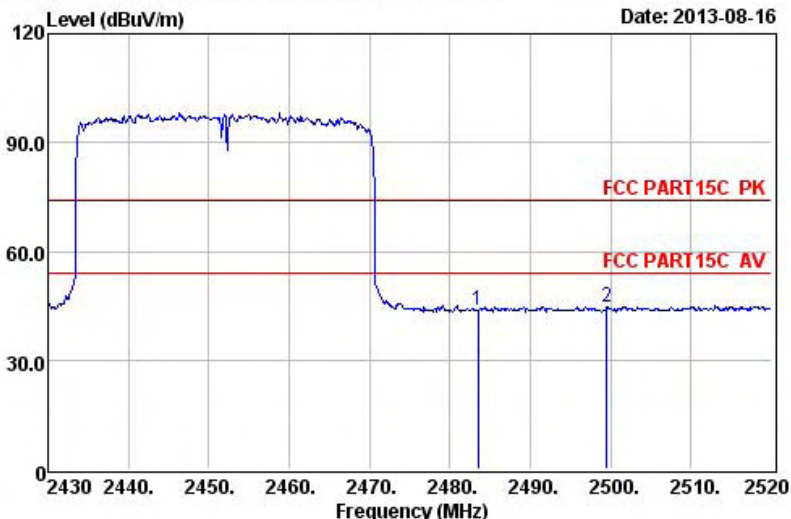
	Preamp	Read	Cable	Antenna	Limit	Over		
Freq	Factor	Level	Loss	Factor	Line	Limit		
MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m		
1	2483.53	26.34	33.32	7.57	28.79	43.34	74.00	-30.66
2	2497.46	26.35	35.45	7.61	28.80	45.51	74.00	-28.49



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Site : 966 Chamber
Condition: FCC PART15C PK 3m ZN30701 HORIZONTAL
EUT : WIRELESS TRANSMITTER
M/N : TOP-GS04-T
Power : DC 5V from PC input AC 120V/60Hz
Test By : Andy
Comment : Temp:24.8'C Humi:56% Press:101.52kPa
Test Mode: WIFI 802.11n(HT40) 2452MHz

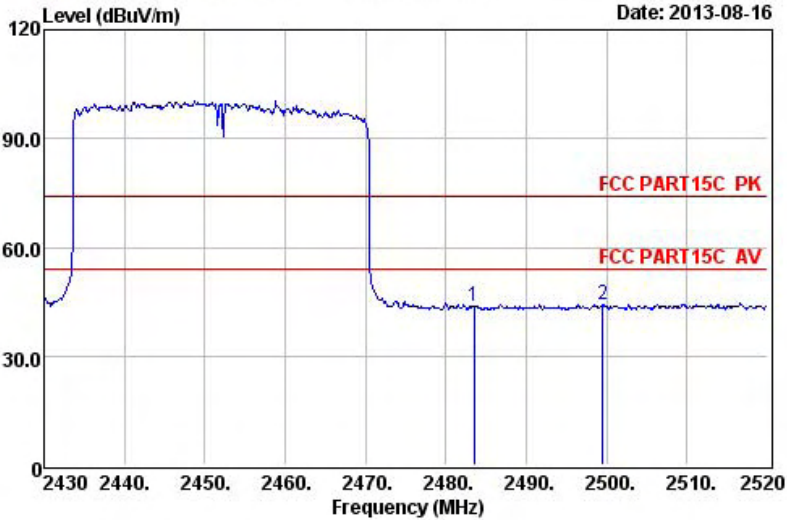
	Preamp	Read	Cable	Antenna	Limit	Over		
Freq	Factor	Level	Loss	Factor	Line	Limit		
MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m		
1	2483.46	26.34	33.62	7.57	28.79	43.64	74.00	-30.36
2	2499.48	26.35	34.75	7.61	28.80	44.81	74.00	-29.19



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Data: 177 File: D:\966 data\C\customer.EM6 (179)



Site : 966 Chamber
 Condition: FCC PART15C PK 3m ZN30701 VERTICAL
 EUT : WIRELESS TRANSMITTER
 M/N : TOP-GS04-T
 Power : DC 5V from PC input AC 120V/60Hz
 Test By : Andy
 Comment : Temp:24.8'C Humi:56% Press:101.52kPa
 Test Mode: WIFI 802.11n(HT40) 2452MHz

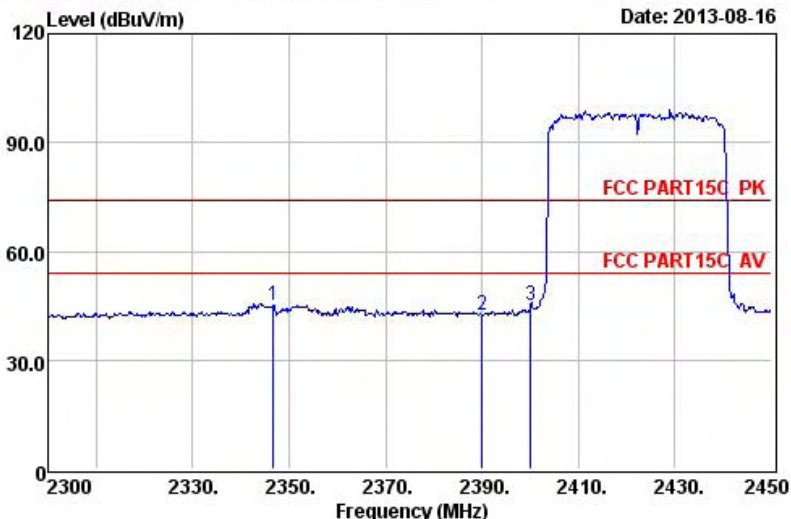
	Preamp	Read	Cable	Antenna	Limit	Over	
	Freq	Factor	Level	Loss	Factor	Line	
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dB
1	2483.46	26.34	33.71	7.57	28.79	43.73	74.00 -30.27
2	2499.48	26.35	34.16	7.61	28.80	44.22	74.00 -29.78



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Site : 966 Chamber
Condition: FCC PART15C PK 3m ZN30701 VERTICAL
EUT : WIRELESS TRANSMITTER
M/N : TOP-GS04-T
Power : DC 5V from PC input AC 120V/60Hz
Test By : Andy
Comment : Temp:24.8'C Humi:56% Press:101.52kPa
Test Mode: WIFI 802.11n(HT40) 2422MHz

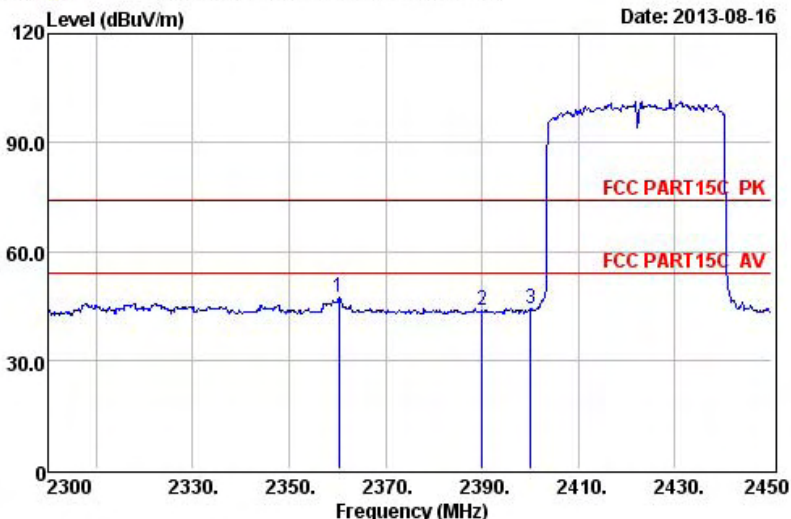
	Preamp	Read	Cable	Antenna	Limit	Over	
	Freq	Factor	Level	Loss	Factor	Line	
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dB
1	2346.80	26.30	35.65	7.21	28.68	45.24	74.00 -28.76
2	2390.00	26.32	32.51	7.34	28.72	42.25	74.00 -31.75
3	2400.05	26.32	35.26	7.34	28.72	45.00	74.00 -29.00



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Site : 966 Chamber
Condition: FCC PART15C PK 3m ZN30701 HORIZONTAL
EUT : WIRELESS TRANSMITTER
M/N : TOP-GS04-T
Power : DC 5V from PC input AC 120V/60Hz
Test By : Andy
Comment : Temp:24.8'C Humi:56% Press:101.52kPa
Test Mode: WIFI 802.11n(HT40) 2422MHz

	Preamp	Read	Cable	Antenna	Limit	Over	
	Freq	Factor	Level	Loss	Factor	Line	
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dB
1	2360.30	26.31	37.46	7.25	28.69	47.09	74.00 -26.91
2	2390.00	26.32	33.81	7.34	28.72	43.55	74.00 -30.45
3	2400.05	26.32	34.37	7.34	28.72	44.11	74.00 -29.89

7. OUTPUT POWER TEST

7.1. Limits

For systems using digital modulation in the 2400~2483.5MHz, The Peak out put Power shall not exceed 1W(30dBm)

7.2. Test setup

1. The Transmitter output (antenna port) was connected to the power meter.
2. Turn on the EUT and power meter and then record the peak power value.
3. Repeat above procedures on all channels needed to be tested.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

7.3. Test result

	Channel Frequency (MHz)	Peak output Power	Limit (dBm)	Result
802.11b	2412	16.05	30	Pass
	2437	16.13	30	Pass
	2462	16.58	30	Pass
802.11g	2412	13.43	30	Pass
	2437	13.31	30	Pass
	2462	13.36	30	Pass
802.11n(HT20)	2412	12.26	30	Pass
	2437	12.21	30	Pass
	2462	12.23	30	Pass
802.11n(HT40)	2422	12.15	30	Pass
	2437	12.17	30	Pass
	2452	12.22	30	Pass

8. POWER SPECTRAL DENSITY TEST

8.1. Limits

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

8.2. Test setup

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW =100kHz.
4. Set the VBW = 300 RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.

8.3. Test result

	Channel Frequency (MHz)	Power density (dBm/100KHz)	Limit (dBm/3KHz)	Result
802.11b	2412	0.96	8	Pass
	2437	2.43	8	Pass
	2462	1.24	8	Pass
802.11g	2412	-2.27	8	Pass
	2437	-3.28	8	Pass
	2462	-3.85	8	Pass
802.11n (HT20)	2412	-5.55	8	Pass
	2437	-5.64	8	Pass
	2462	-6.00	8	Pass
802.11n (HT40)	2422	-8.84	8	Pass
	2437	-8.73	8	Pass
	2452	-8.23	8	Pass

802.11b 2412MHz



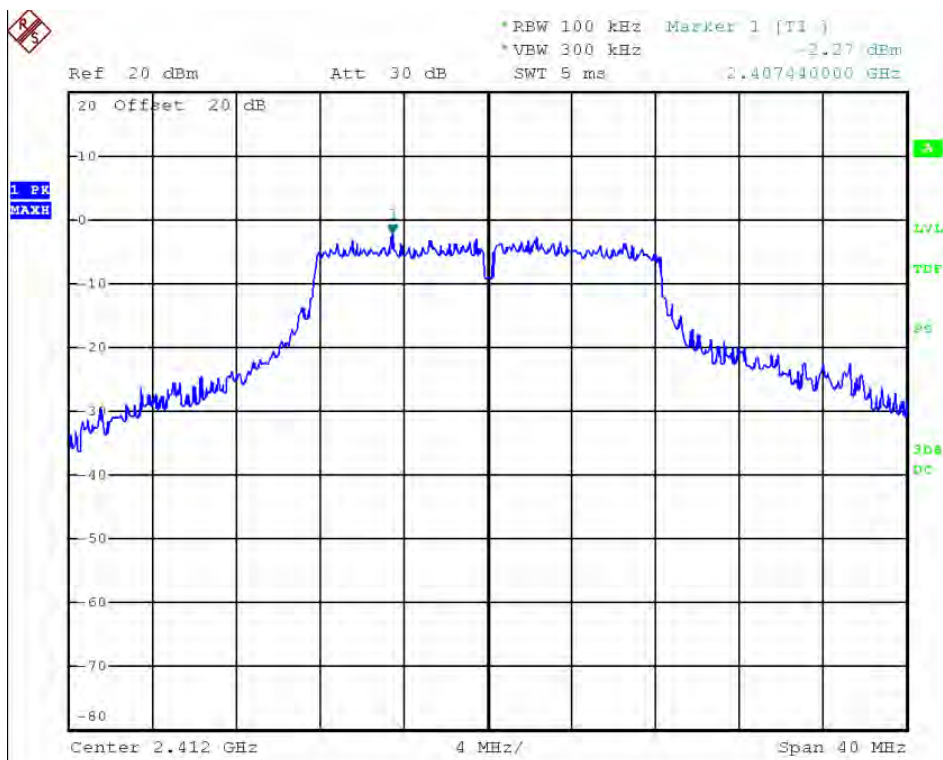
802.11b 2437MHz



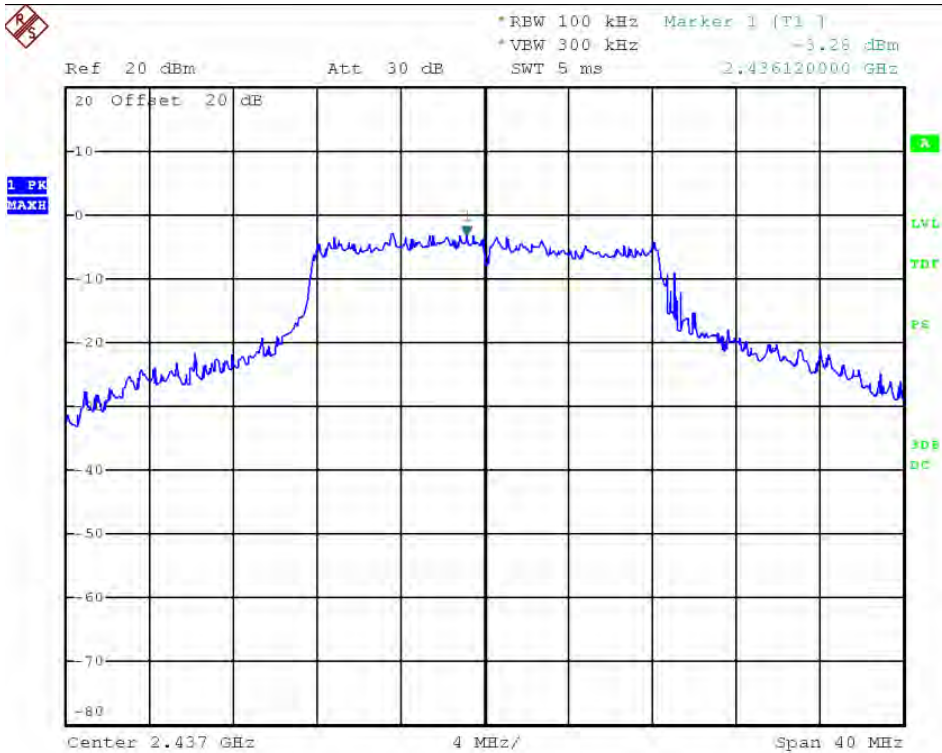
802.11b 2462MHz



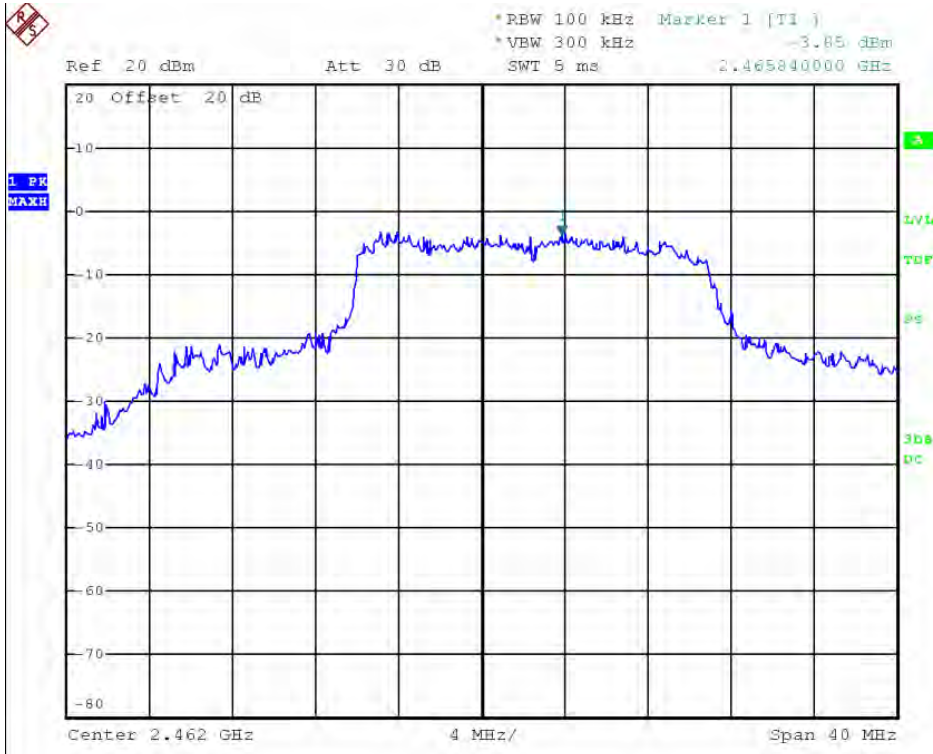
802.11g 2412MHz



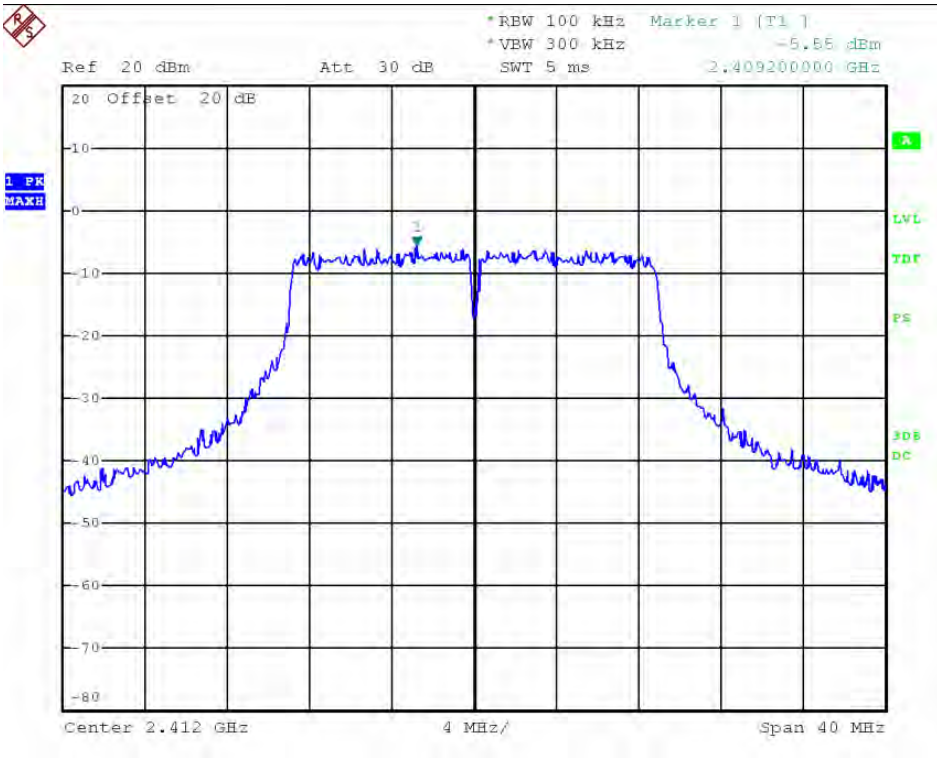
802.11g 2437MHz



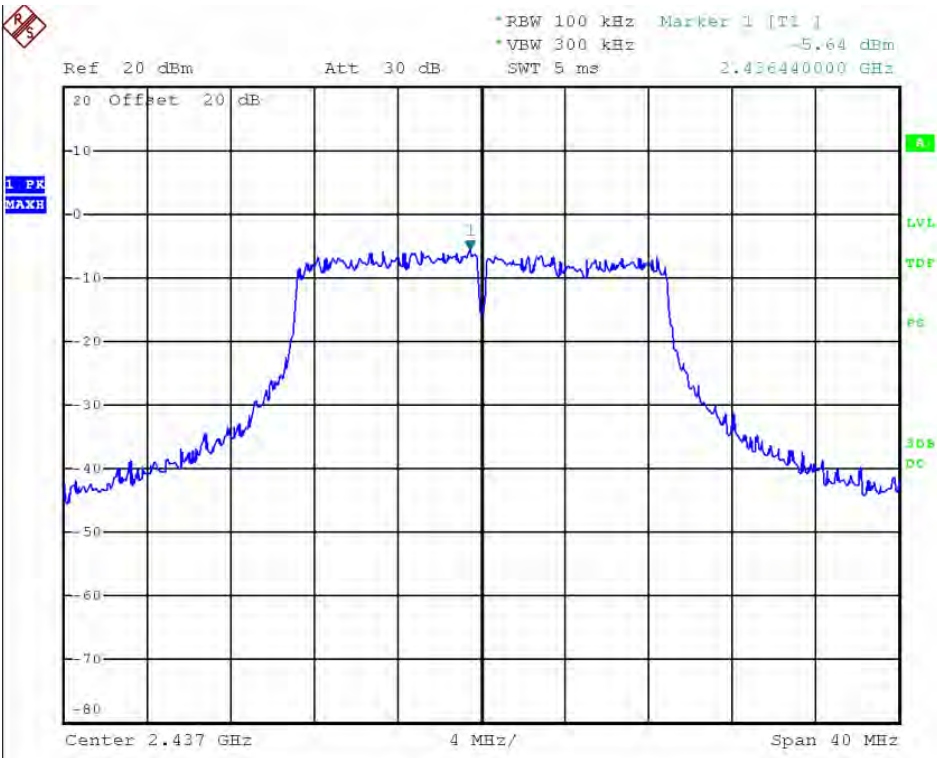
802.11g 2462MHz



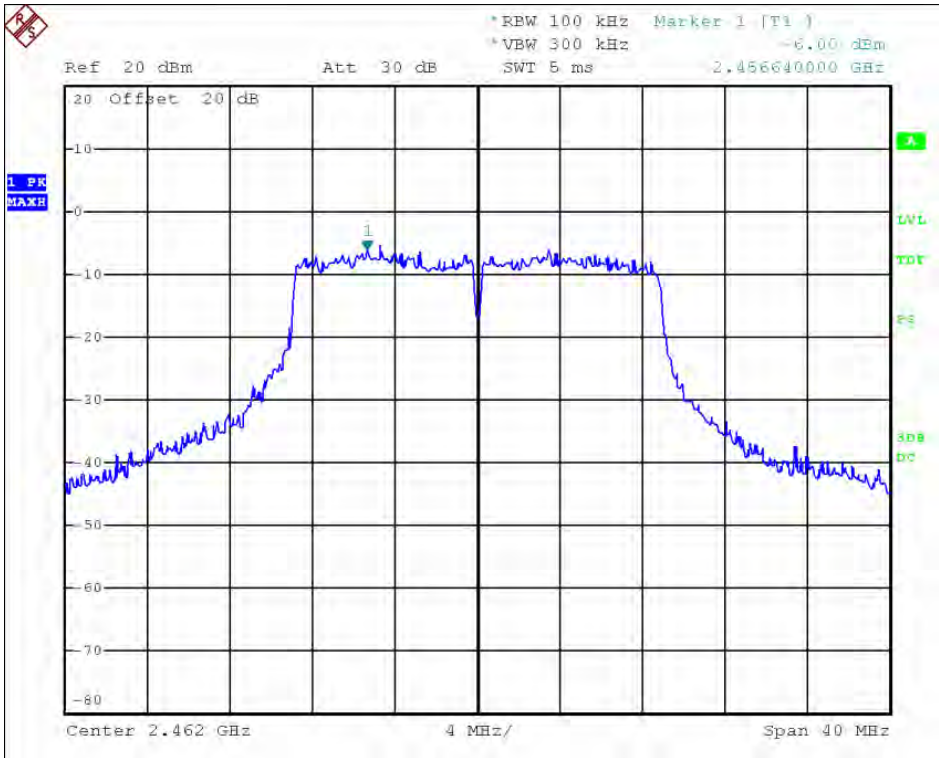
802.11n (HT20) 2412MHz



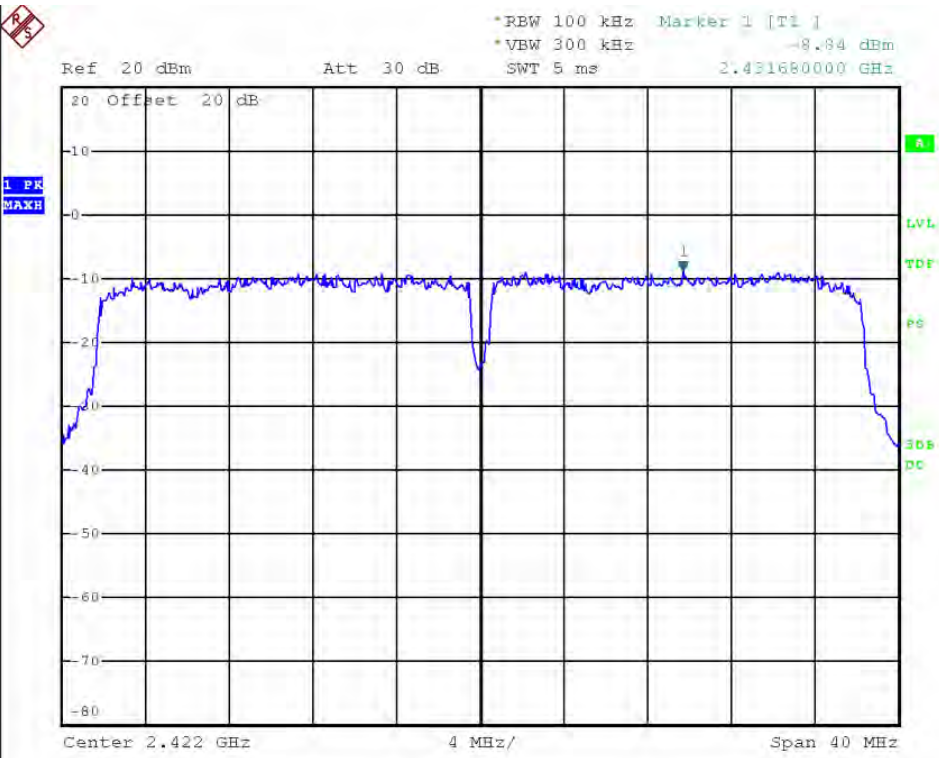
802.11n (HT20) 2437MHz



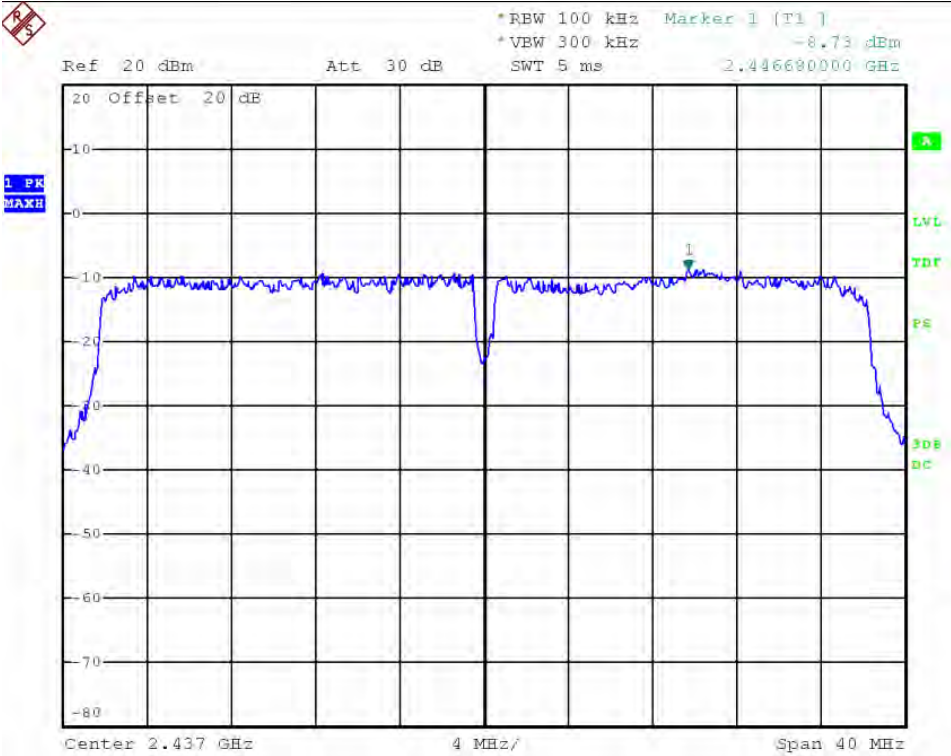
802.11n(HT20) 2462MHz



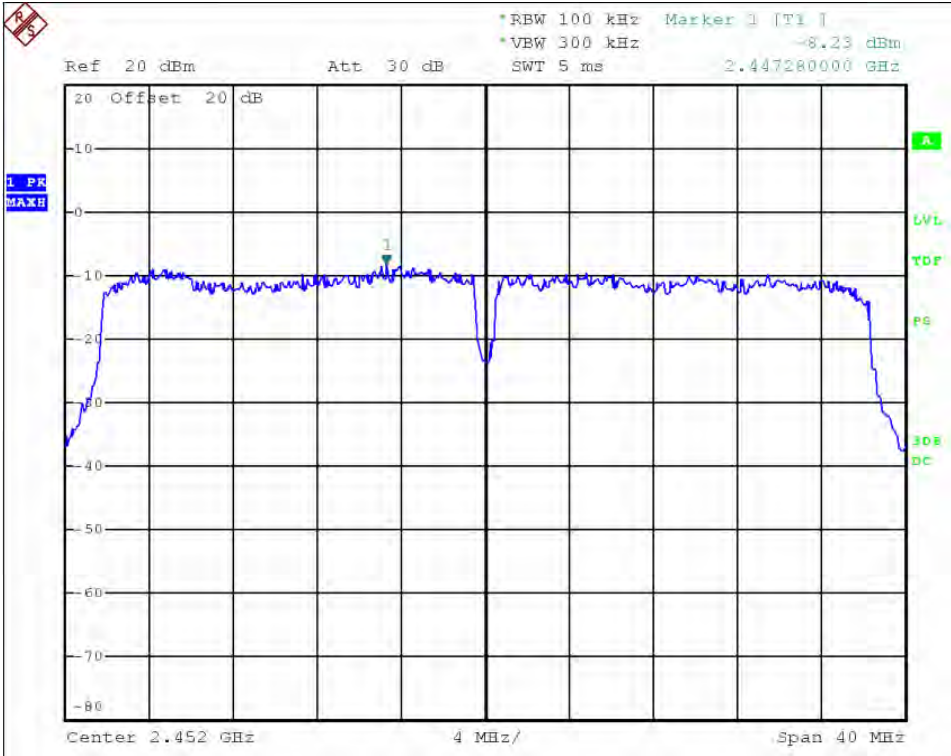
802.11 n (HT40) 2422MHz



802.11 n (HT40) 2437MHz



802.11 n (HT40)2452MHz



9. ANTENNA REQUIREMENTS

9.1. Limits

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

9.2. Result

The antennas used for this product are external antenna and used inverse SMA connect, that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 2 dBi.

10. PHOTOGRAPHS OF TEST SET-UP

Please see annex.

11. PHOTOGRAPHS OF THE EUT

Please see annex.

END.