Test Report of FCC CFR 47 Part 15 Subpart C

On Behalf of

GL Technologies (Hong Kong) Limited
Unit 210D, 2/F, Enterprise Place Hong Kong Science Park, Shatin, N.T, Hong Kong

Product Name:	**GL-MT300N-V2**
Model/Type No.:	**GL-MT300N-V2**
FCC ID:	**2AFIW-300NV2**
Prepared By:	**Shenzhen Hongcai Testing Technology Co., Ltd.** 1st-3rd Floor, Building C, Shuanghuan Xin Yi Dai Hi-Tech Industrial Park, No.8 Baoqing Road, Baolong Industrial Zone, Longgang District, Shenzhen, Guangdong, China Tel: +86-755-86337020 Fax:+86-755-86337028
Report Number:	HCT17DR084E-1
Tested Date:	April 8~14, 2017
Issued Date:	April 14, 2017
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Reviewed By: Owen.Yang
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Approved By: Tony Wu
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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	**GL Technologies (Hong Kong) Limited**
Address of Applicant:	**Unit 210D, 2/F, Enterprise Place Hong Kong Science Park, Shatin, N.T, Hong Kong**
Manufacturer:	**GL Technologies (Hong Kong) Limited**
Address of Manufacturer:	**Unit 210D, 2/F, Enterprise Place Hong Kong Science Park, Shatin, N.T, Hong Kong**

General Description of E.U.T

Items	Description
EUT Description:	GL-MT300N-V2
Model No.:	GL-MT300N-V2
Trade Mark:	GL·iNet
Frequency Band:	IEEE 802.11b： 2412MHz～2462MHz; IEEE 802.11g： 2412MHz～2462MHz; IEEE 802 11n HT20： 2412MHz～2462MHz; IEEE 802 11n HT40： 2422MHz～2452MHz;
Channel Spacing:	IEEE 802.11b : 5MHz IEEE 802.11g : 5MHz IEEE 802 11n HT20 : 5MHz IEEE 802 11n HT40 : 5MHz
Number of Channels:	IEEE 802.11b :11 Channels; IEEE 802.11g :11 Channels; IEEE 802 11n HT20 :11 Channels; IEEE 802 11n HT40 :7 Channels;
Transmit Data Rate:	maximum of 150Mbps
Type of Modulation:	IEEE 802.11b：CCK IEEE 802.11g：OFDM IEEE 802 11n HT20：OFDM IEEE 802 11n HT40：OFDM
Antenna Type:	PCB ANTENNA
Antenna Gain:	Ant 1: 3.2dBi Ant 2: 3.2dBi
Power Rating:	Input: DC 5V

Remark:* *The test data gathered are from the production sample provided by the manufacturer.*

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1.2 Test standards

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

KDB558074 D01 V03r03: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247.

RSS-GEN Issue 4: General Requirements for Compliance of Radio Apparatus.

RSS 247 Issue 1: Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices.

1.3 Test Facility

All measurement required was performed at laboratory of Shenzhen CTL Testing Technology Co., Ltd.

Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 22/EN 55022 requirements.

FCC – Registration No.: 970318

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 970318, December, 2013.

IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.

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2. SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The calibrated antennas used to sample the radiated field strength are mounted on a non-conductive, motorized antenna mast 3 or 10 meters from the leading edge of the turntable.

2.3 General Test Procedures

Conducted Emissions: The EUT is placed on the table, which is 0.8 m above ground plane According to the requirements in ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

Radiated Emissions: The EUT is a placed on as turntable, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in ANSI C63.10-2013.

2.4 Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Transmitter power conducted	+/- 0.57 dB
Transmitter power Radiated	+/- 2.20 dB
Conducted spurious emission 9KHz-40 GHz	+/- 2.20 dB
Occupied Bandwidth	+/- 0.01 dB
Power Line Conducted Emission	+/- 3.20 dB
Radiated Emission	+/- 4.32 dB

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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2.5 Measure Results Explanation Example

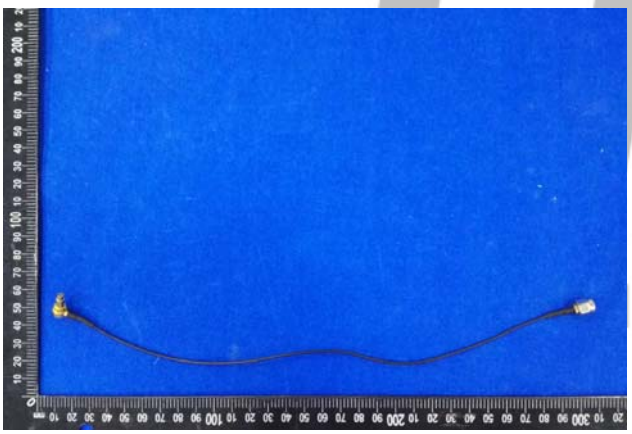
For all conducted test items:

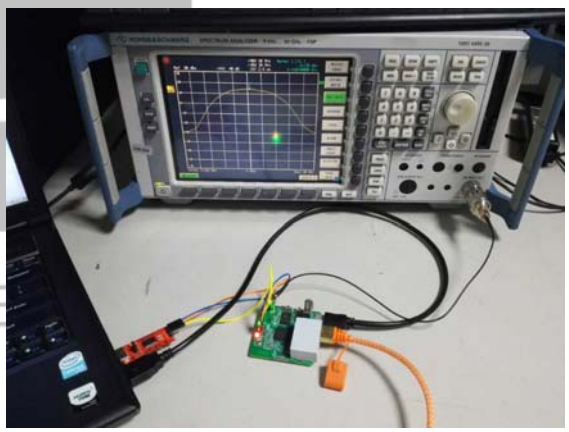
The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable less and attenuator factor.
Offset= RF cable less+ attenuator factor.

Note: Using a temporary antenna connector for the EUT when the conducted measurements are performed.

Equipment	Manufacturer	Model No.	Frequency range(GHz)	Attenuation values(dBm)
Line	Zhenjiang south electronic	RG317	1-12	0.09
			<1G	0.04
			>12G	1.01
Connector	Zhenjiang south electronic	SMA-K/N-J	1-12	0.01
			<1G	0.005
			>12G	0.03





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2.6. Block diagram of EUT configuration for test

The test software was used to control EUT work in Continuous TX mode, and select test channel, wireless mode as below table.

Mode	Data rate (Mpbs) (see Note)	Channel	Frequency (MHz)
IEEE 802.11b	1	CH1	2412
	1	CH6	2437
	1	CH11	2462
IEEE 802.11g	6	CH1	2412
	6	CH6	2437
	6	CH11	2462
IEEE 802.11N HT20	6.5	CH1	2412
	6.5	CH6	2442
	6.5	CH11	2462
IEEE 802.11N HT40	13.5	CH3	2422
	13.5	CH6	2437
	13.5	CH9	2452
Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.			

2.7 List of Measuring Equipments Used

Test equipments list of Shenzhen CTL Testing Technology Co., Ltd.

No.	Equipment	Manufacturer	Model No.	S/N	Last Calculator	Due Calculator
1	EMI Test Receiver	R&S	ESCI	100687	2016-7-25	2017-7-24
2	EMI Test Receiver	R&S	ESPI	100097	2016-10-1	2017-10-31
3	Amplifier	HP	8447D	1937A02492	2016-7-25	2017-7-24
4	TRILOG Broadband Test-Antenna	SCHWARZBECK	VULB9163	9163-324	2016-7-25	2017-7-24
5	Triple-Loop Antenna	EVERFINE	LLA-2	711002	2016-10-1	2017-10-31
6	RF POWER AMPLIFIER	FRANKONIA	FLL-75	1020A1109	2016-7-25	2017-7-24
7	6DB Attenuator	FRANKONIA	N/A	1001698	2016-7-25	2017-7-24
8	10dB attenuator	ELECTRO-METRICS	EM-7600	836	2016-7-25	2017-7-24
9	Spectrum Analyzer	R&S	FSP	100397	2016-10-1	2017-10-31
10	Broadband preamplifier	SCH WARZBECK	BBV9718	9718-182	2016-7-25	2017-7-24
11	Horn Antenna	SCHWARZBECK	BBHA 9120D	0437	2016-7-25	2017-7-24
12	Horn Antenna	SCHWARZBECK	BBHA9170	0483	2016-7-25	2017-7-24

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3. SUMMARY OF Test RESULTS

FCC/IC Rules	Description of Test	Result
FCC §15.207 IC RSS-GEN Clause 8.8	AC Power Line Conducted Emission	Pass
FCC §15.247(b) IC RSS-247 Issue1 Clause 5.4 (4)	Output Power Measurement	Pass
FCC §15.247(e) IC RSS-247 Issue1 Clause 5.2 (2)	Power Spectral Density	Pass
FCC §15.247(a) IC RSS-247 Issue1 Clause 5.2 (1) IC RSS-GEN Clause 6.6	6dB Bandwidth 99%Occupied Bandwidth	Pass
FCC §15.247 (d) IC RSS-247 Issue1 Clause 5.5	Conducted Spurious Emission	Pass
FCC §15.205 and §15.209 IC RSS-247 Issue1 Clause 5.5	Radiated Spurious Emission	Pass
FCC§15.247 (d) and §15.205 and §15.209 IC RSS-247 Issue1 Clause 5.5	Unwanted Emissions	Pass
FCC §15.203/15.247(b)/(c) IC RSS-GEN Clause 8.3	Antenna Requirement	Pass

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4. Test OF AC POWER LINE CONDUCTED EMISSION

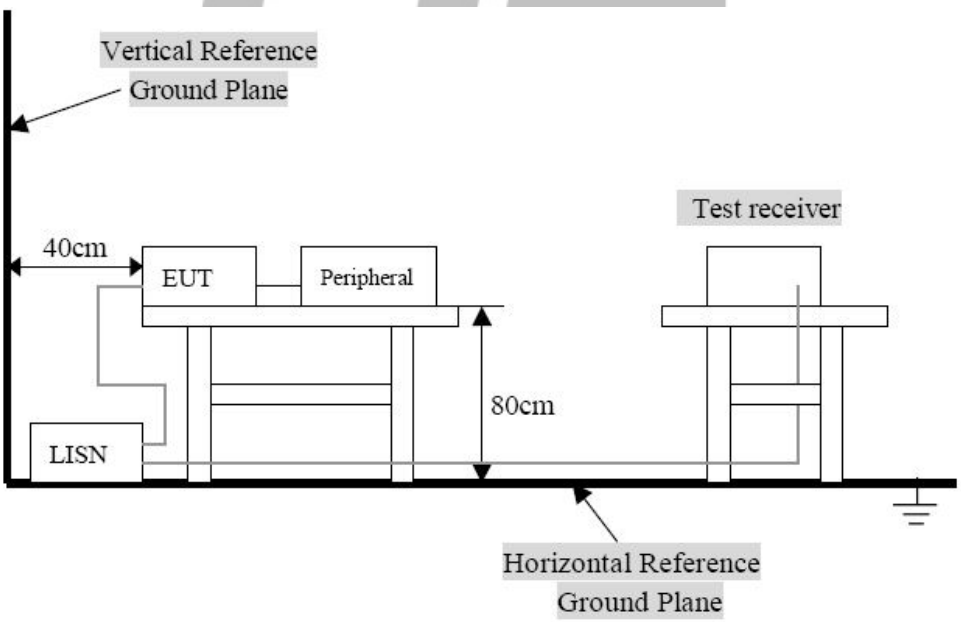
4.1 Applicable standard

Refer to FCC §15.207 and IC RSS-GEN Clause 8.8

For a Low-power Radio-frequency Device is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150～0.500	66～56	56～46
0.500～5.000	56	46
5.000～30.00	60	50

4.2 Test Setup Diagram



Remark: The EUT was connected to a 120 VAC/ 60Hz power source.

4.3 Test Result

Temperature (℃) : 23~25	EUT: GL-MT300N-V2
Humidity (%RH): 45~58	M/N: GL-MT300N-V2
Barometric Pressure (mbar): 950~1000	Operation Condition: Tx Mode

Test result: PASS

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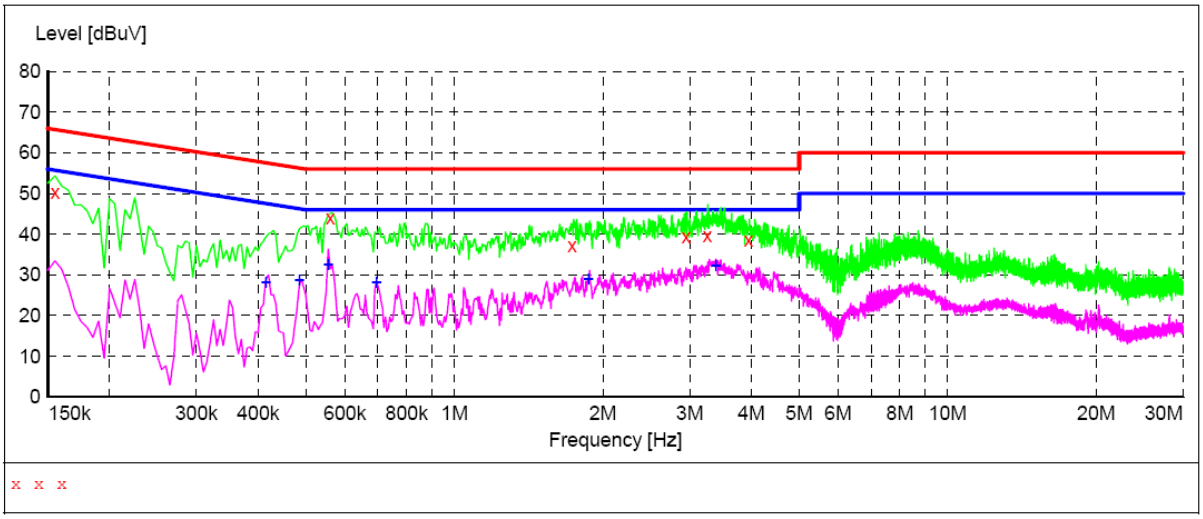
Conducted Emission Test Data

EUT:	GL-MT300N-V2
M/N:	GL-MT300N-V2
Operating Condition:	Tx Mode
Test Site:	Shielded Room
Operator:	Li
Test Specification:	DC 5V
Comment:	Live Line
Start of Test:	Tem:25℃ Hum:50%

SCAN TABLE: "Voltage(150K-30M)FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT:

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.155000	50.30	12.0	66	15.4	QP	L1	GND
0.560000	44.00	10.4	56	12.0	QP	L1	GND
1.730000	37.20	12.7	56	18.8	QP	L1	GND
2.950000	39.40	12.3	56	16.6	QP	L1	GND
3.255000	39.50	12.6	56	16.5	QP	L1	GND
3.940000	38.50	13.2	56	17.5	QP	L1	GND

MEASUREMENT RESULT:

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.415000	28.20	11.0	48	19.3	AV	L1	GND
0.485000	28.60	10.6	46	17.7	AV	L1	GND
0.555000	32.50	10.4	46	13.5	AV	L1	GND
0.695000	28.30	10.3	46	17.7	AV	L1	GND
1.870000	29.10	13.0	46	16.9	AV	L1	GND
3.390000	32.20	12.7	46	13.8	AV	L1	GND

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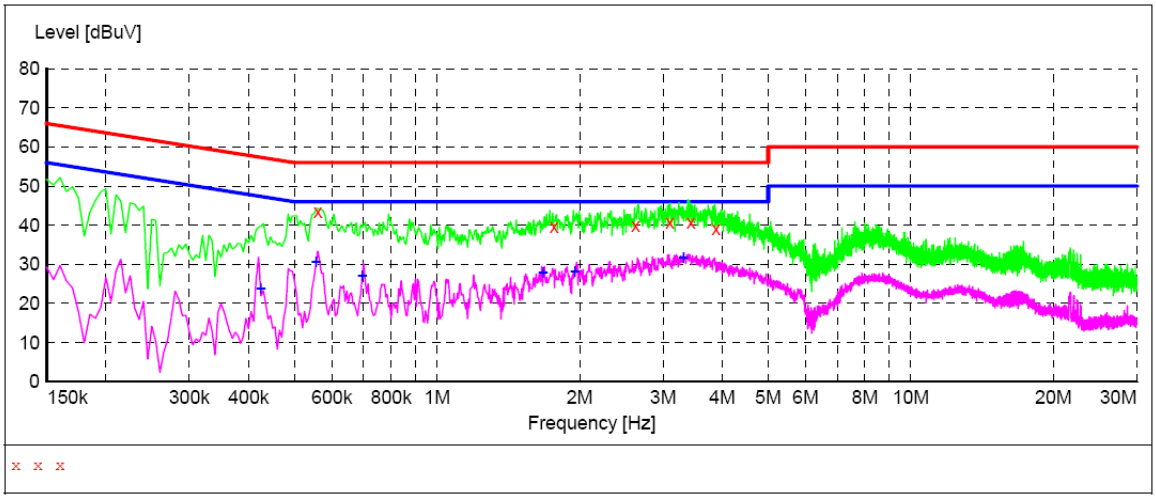
Conducted Emission Test Data

EUT:	GL-MT300N-V2
M/N:	GL-MT300N-V2
Operating Condition:	Tx Mode
Test Site:	Shielded Room
Operator:	Li
Test Specification:	DC 5V
Comment:	Neutral Line
Start of Test:	Tem:25℃ Hum:50%

SCAN TABLE: "Voltage(150K-30M)FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT:

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.560000	43.40	10.4	56	12.6	QP	N	GND
1.765000	39.50	12.8	56	16.5	QP	N	GND
2.620000	40.00	12.6	56	16.0	QP	N	GND
3.095000	40.60	12.4	56	15.4	QP	N	GND
3.430000	40.60	12.8	56	15.4	QP	N	GND
3.875000	39.00	13.2	56	17.0	QP	N	GND

MEASUREMENT RESULT:

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.425000	23.70	11.0	47	23.6	AV	N	GND
0.555000	30.70	10.4	46	15.3	AV	N	GND
0.695000	27.00	10.3	46	19.0	AV	N	GND
1.675000	27.80	12.6	46	18.2	AV	N	GND
1.955000	28.10	13.2	46	17.9	AV	N	GND
3.310000	31.60	12.6	46	14.4	AV	N	GND

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5. Output Power Measurement

5.1 Applicable standard

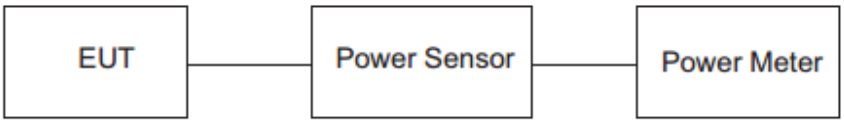
Refer to FCC §15.247 (b) and IC RSS-247 Issue1 Clause 5.4 (4).

KDB 558074 v03r03 – Section 9.1.2 PKPM1 Peak Power, Method

KDB 558074 v03r03 – Section 9.2.3.2 Method AVGPM-G

The maximum permissible conducted output power is 1Watt.

5.2 EUT Setup



5.3 Test Equipment List and Details

See section 2.5.

5.4 Test Procedure

Method PKPM1 (Peak Power Measurement)

Peak power measurement were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor, The pulse senor employs a VBW = 50MHz so this method was only used for signals whose DTS bandwidth was than or equal to 50MHz.

Method AVGPM-G (Average Power Measurement)

Average power measurement were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor, The pulse mater implemented triggering and fating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter, The trace was averaged over 100 traces to obtain the final measured average power.

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5.5 Test Result

Temperature (℃) : 22~23	EUT: GL-MT300N-V2
Humidity (%RH): 50~54	M/N: GL-MT300N-V2
Barometric Pressure (mbar): 950~1000	Operation Condition: Tx Mode

Average power：

Mode	Test CH	Ant. Port	Average power (dBm)	Total Average power (dBm)	Limit (dBm)	Result
802.11b	Low	Chain 1	14.25	16.55	30.00	Pass
		Chain 2	12.97			
	Mid	Chain 1	16.64	19.07	30.00	Pass
		Chain 2	15.38			
	High	Chain 1	16.22	18.65	30.00	Pass
		Chain 2	14.96			
802.11g	Low	Chain 1	15.23	17.66	30.00	Pass
		Chain 2	13.97			
	Mid	Chain 1	15.16	17.59	30.00	Pass
		Chain 2	13.9			
	High	Chain 1	15.02	17.45	30.00	Pass
		Chain 2	13.76			
802.11n20	Low	Chain 1	15.11	17.54	30.00	Pass
		Chain 2	13.85			
	Mid	Chain 1	15.59	18.02	30.00	Pass
		Chain 2	14.33			
	High	Chain 1	15.20	17.63	30.00	Pass
		Chain 2	13.96			
802.11n40	Low	Chain 1	16.87	19.30	30.00	Pass
		Chain 2	15.61			
	Mid	Chain 1	16.92	19.34	30.00	Pass
		Chain 2	15.66			
	High	Chain 1	16.71	19.14	30.00	Pass
		Chain 2	15.45			

Remark: The Total Average Power (dBm) = $10*\log\{10^{(\text{Chain 1 Average Power }/10)}+10^{(\text{Chain 2 Average Power }/10)}\}$.

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Peak power：

Mode	Test CH	Ant. Port	Peak power (dBm)	Total Peak power (dBm)	Limit (dBm)	Result
802.11b	Low	Chain 1	19.65	22.42	30.00	Pass
		Chain 2	19.15			
	Mid	Chain 1	20.08	22.67	30.00	Pass
		Chain 2	19.19			
	High	Chain 1	20.66	22.99	30.00	Pass
		Chain 2	19.18			
802.11g	Low	Chain 1	17.40	19.83	30.00	Pass
		Chain 2	16.16			
	Mid	Chain 1	17.24	19.51	30.00	Pass
		Chain 2	16.56			
	High	Chain 1	17.12	19.55	30.00	Pass
		Chain 2	15.88			
802.11n20	Low	Chain 1	17.18	19.61	30.00	Pass
		Chain 2	15.94			
	Mid	Chain 1	17.80	20.23	30.00	Pass
		Chain 2	16.56			
	High	Chain 1	17.26	19.69	30.00	Pass
		Chain 2	16.02			
802.11n40	Low	Chain 1	16.87	19.99	30.00	Pass
		Chain 2	17.08			
	Mid	Chain 1	18.36	20.79	30.00	Pass
		Chain 2	17.12			
	High	Chain 1	18.21	20.64	30.00	Pass
		Chain 2	16.97			

Remark: The Total Average Power (dBm) = $10*\log\{10^{(\text{Chain 1 Average Power }/10)}+10^{(\text{Chain 2 Average Power }/10)}\}$.

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6. Test of Peak Power Spectral Density

6.1 Applicable standard

Refer to FCC §15.247 (e) and IC RSS-247 Issue1 Clause 5.2 (2).

KDB 558074v03r03 – Section 10.2 Method PKPSD

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

6.2 EUT Setup

Spectrum Analyzer

6.3 Test Equipment List and Details

See section 2.5.

6.4 Test Procedure

The transmitter output was connected to the spectrum analyzer and the parameter was set as below:

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 ⩾ 3 kHz.
4. Set the VBW ⩾ 3 x 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.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

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6.5 Test Result

Temperature (℃) : 22~23	EUT: GL-MT300N-V2
Humidity (%RH): 50~54	M/N: GL-MT300N-V2
Barometric Pressure (mbar): 950~1000	Operation Condition: Tx Mode

Chain 1:

IEEE 802.11b mode

Channel	Channel Frequency (MHz)	Power Level in 3KHz RBW (dBm)	Maximum Limit (dBm)	Pass / Fail
Low	2412	-9.90	8	PASS
Middle	2437	-4.54	8	PASS
High	2462	-5.06	8	PASS

IEEE 802.11g mode

Channel	Channel Frequency (MHz)	Power Level in 3KHz RBW (dBm)	Maximum Limit (dBm)	Pass / Fail
Low	2412	-10.23	8	PASS
Middle	2437	-9.85	8	PASS
High	2462	-10.66	8	PASS

IEEE 802.11n HT20 mode

Channel	Channel Frequency (MHz)	Power Level in 3KHz RBW (dBm)	Maximum Limit (dBm)	Pass / Fail
Low	2412	-11.44	8	PASS
Middle	2437	-9.80	8	PASS
High	2462	-10.70	8	PASS

IEEE 802.11n HT40 mode

Channel	Channel Frequency (MHz)	Power Level in 3KHz RBW (dBm)	Maximum Limit (dBm)	Pass / Fail
Low	2422	-14.38	8	PASS
Middle	2437	-14.92	8	PASS
High	2452	-13.16	8	PASS

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Chain 2:

IEEE 802.11b mode

Channel	Channel Frequency (MHz)	Power Level in 3KHz RBW (dBm)	Maximum Limit (dBm)	Pass / Fail
Low	2412	-10.05	8	PASS
Middle	2437	-4.55	8	PASS
High	2462	0.39	8	PASS

IEEE 802.11g mode

Channel	Channel Frequency (MHz)	Power Level in 3KHz RBW (dBm)	Maximum Limit (dBm)	Pass / Fail
Low	2412	-10.93	8	PASS
Middle	2437	-10.10	8	PASS
High	2462	-11.06	8	PASS

IEEE 802.11n HT20 mode

Channel	Channel Frequency (MHz)	Power Level in 3KHz RBW (dBm)	Maximum Limit (dBm)	Pass / Fail
Low	2412	-9.81	8	PASS
Middle	2437	-8.51	8	PASS
High	2462	-11.05	8	PASS

IEEE 802.11n HT40 mode

Channel	Channel Frequency (MHz)	Power Level in 3KHz RBW (dBm)	Maximum Limit (dBm)	Pass / Fail
Low	2422	-15.18	8	PASS
Middle	2437	-14.25	8	PASS
High	2452	-15.06	8	PASS

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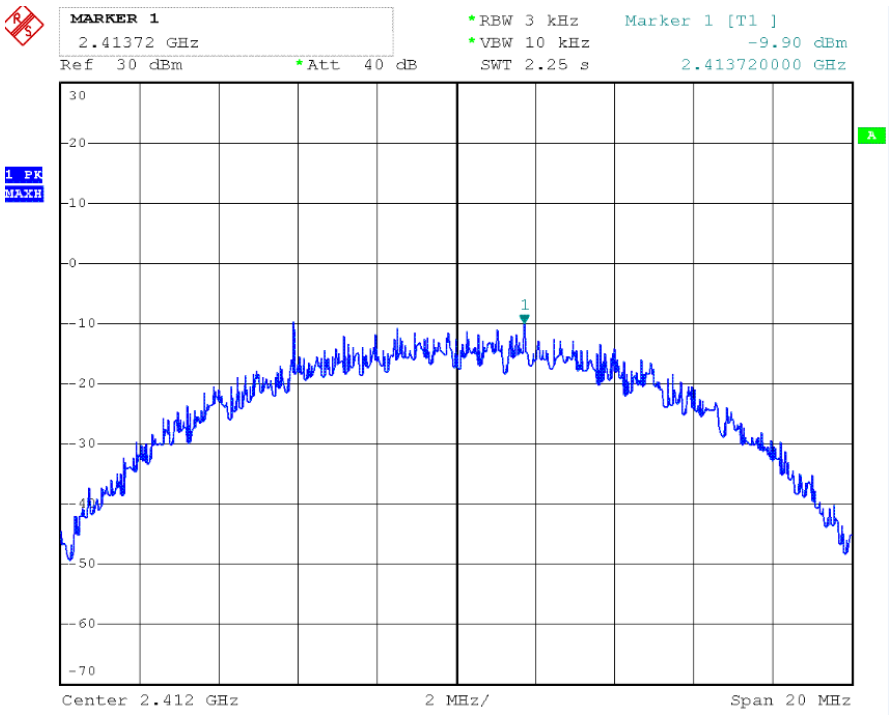
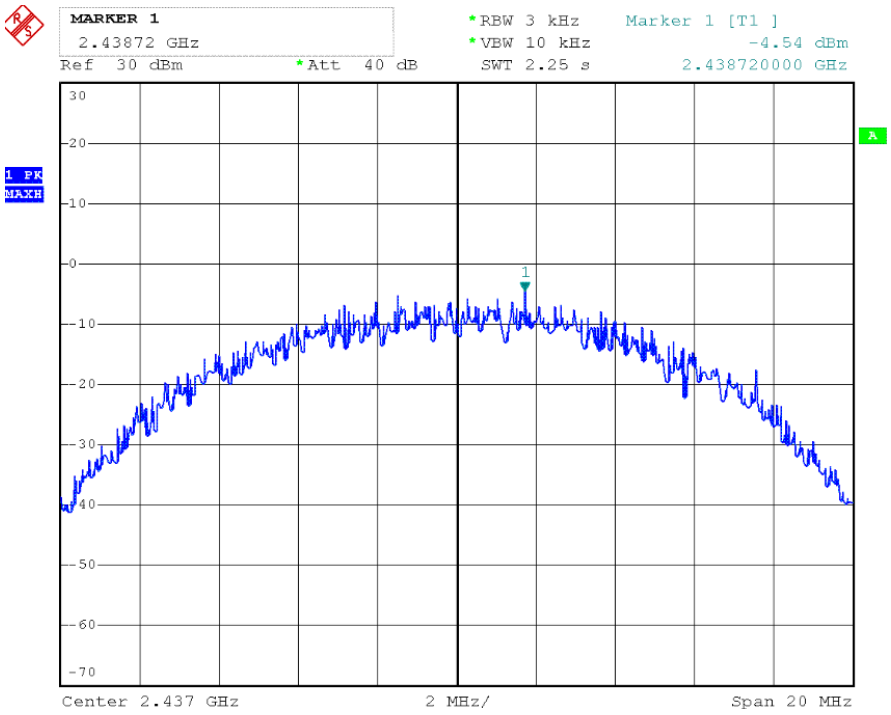
Chain 1:

POWER SPECTRAL DENSITY (IEEE 802.11b MODE CH Low)



POWER SPECTRAL DENSITY (IEEE 802.11b MODE CH Mid)



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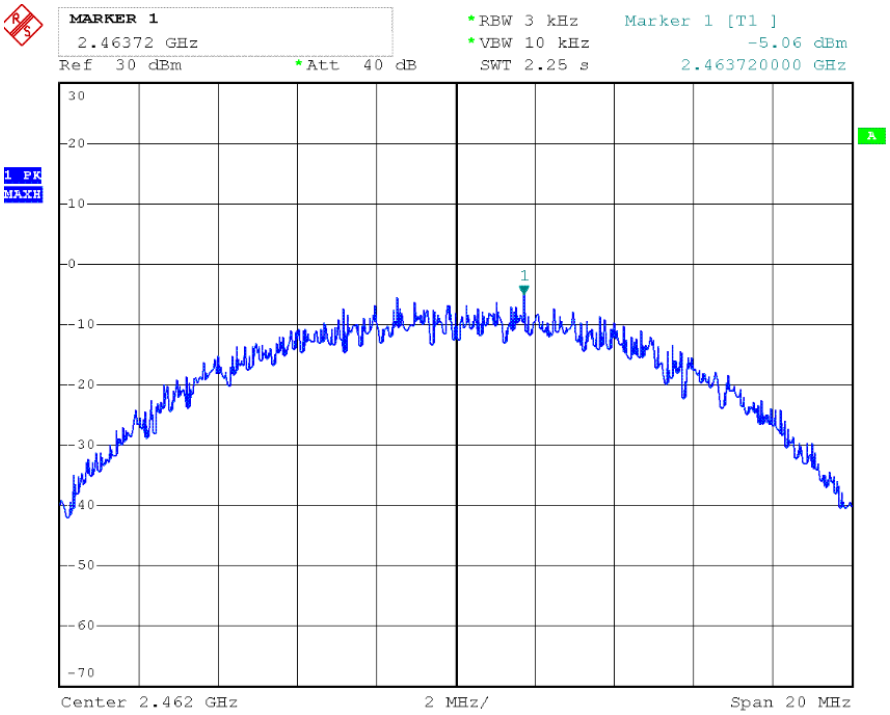
POWER SPECTRAL DENSITY (IEEE 802.11b MODE CH High)



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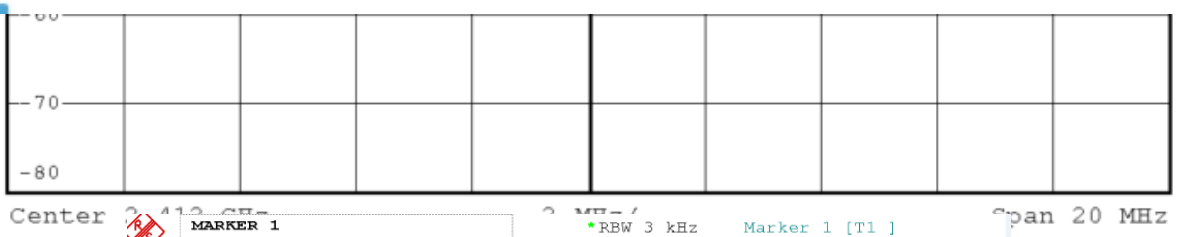
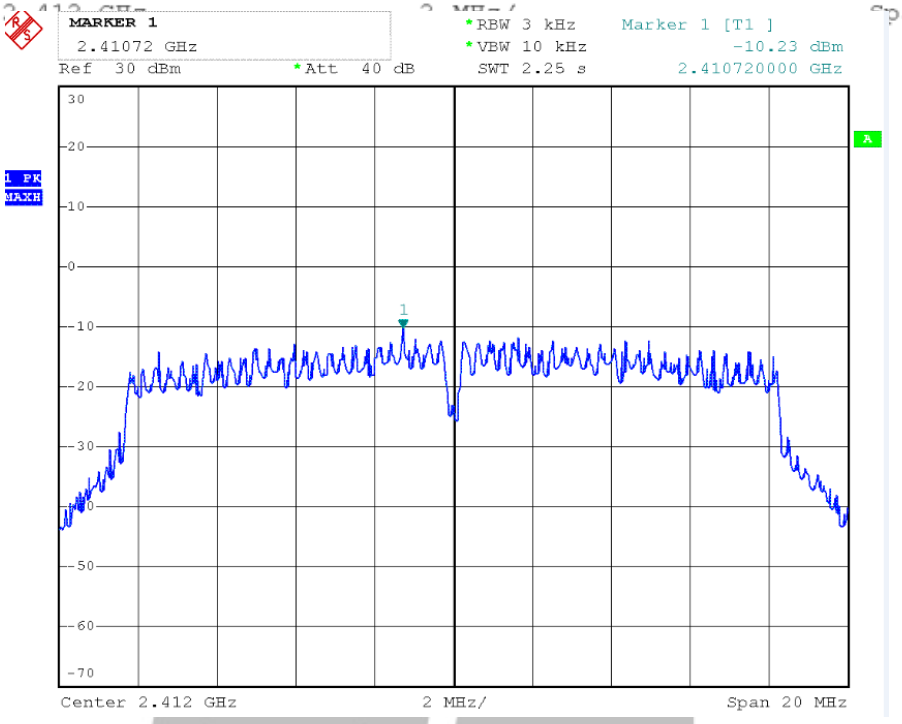
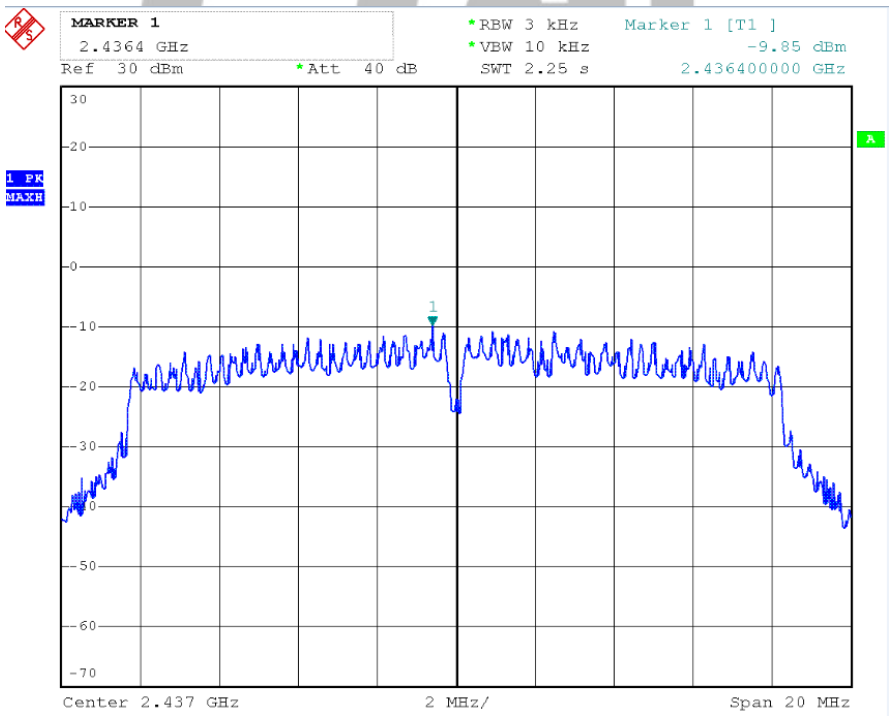




POWER SPECTRAL DENSITY (IEEE 802.11g MODE CH Mid)



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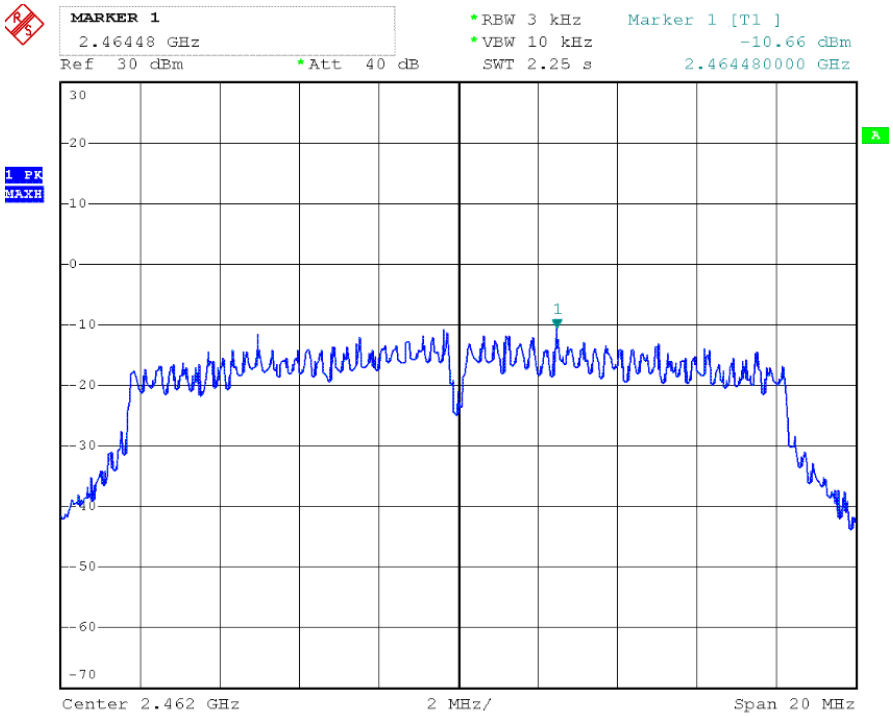
POWER SPECTRAL DENSITY (IEEE 802.11g MODE CH High)



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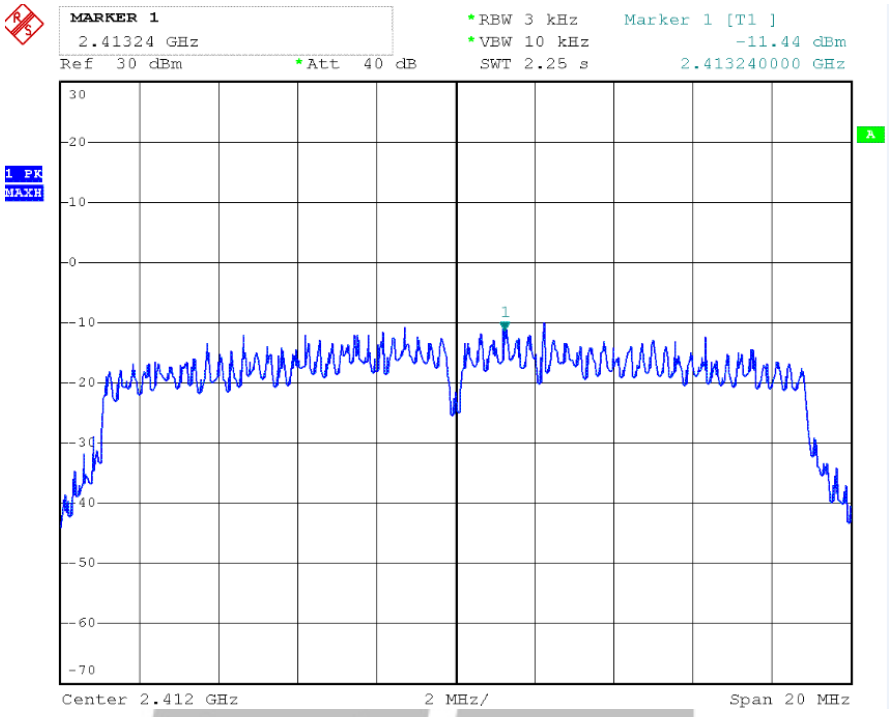
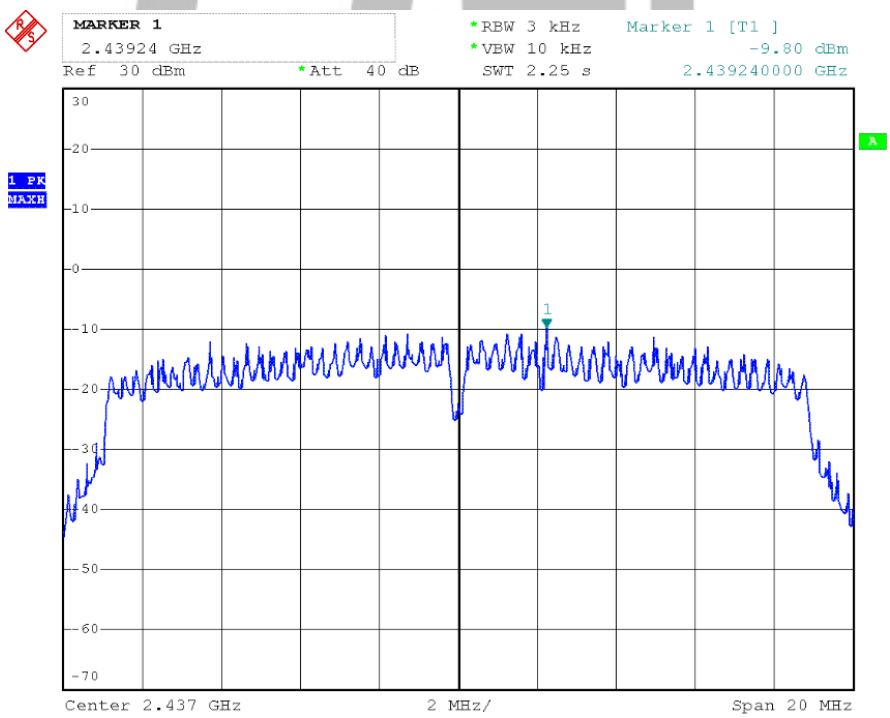
POWER SPECTRAL DENSITY (IEEE 802.11n HT20 MODE CH Low)



POWER SPECTRAL DENSITY (IEEE 802.11n HT20 MODE CH Mid)



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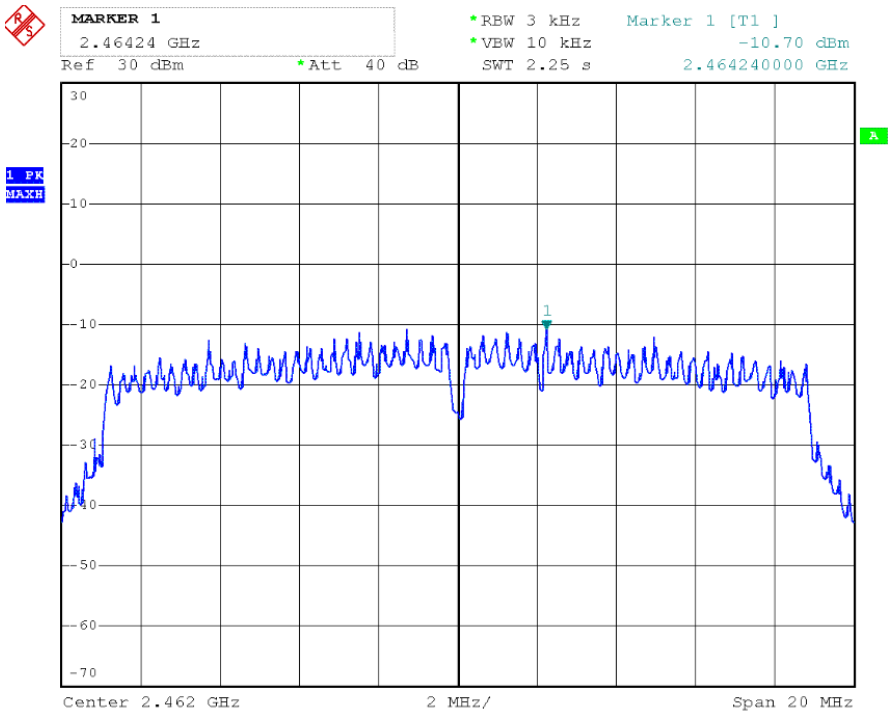
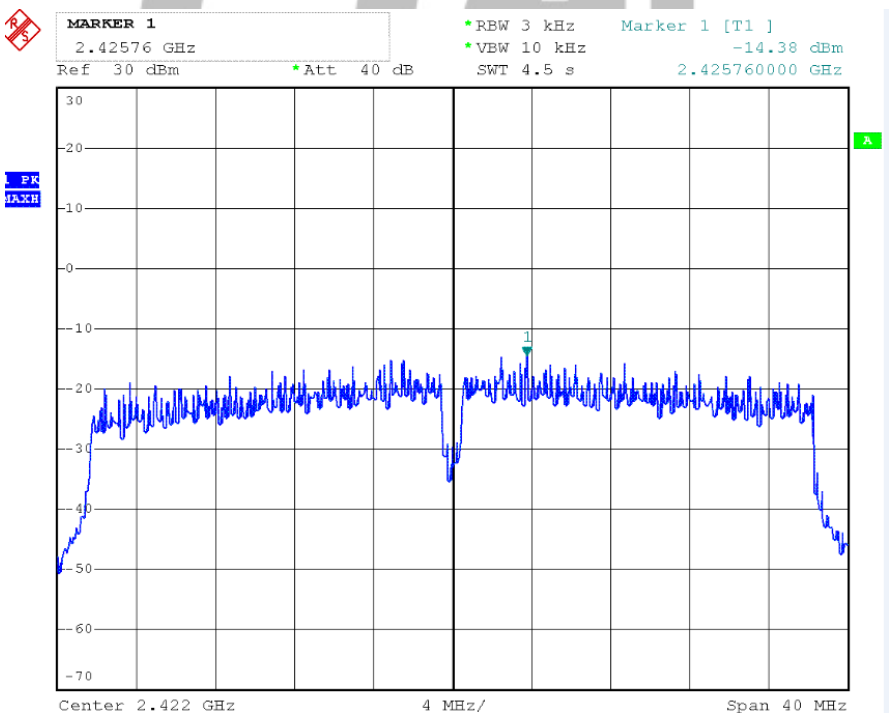
POWER SPECTRAL DENSITY (IEEE 802.11n HT20 MODE CH High)



POWER SPECTRAL DENSITY (IEEE 802.11n HT40 MODE CH Low)



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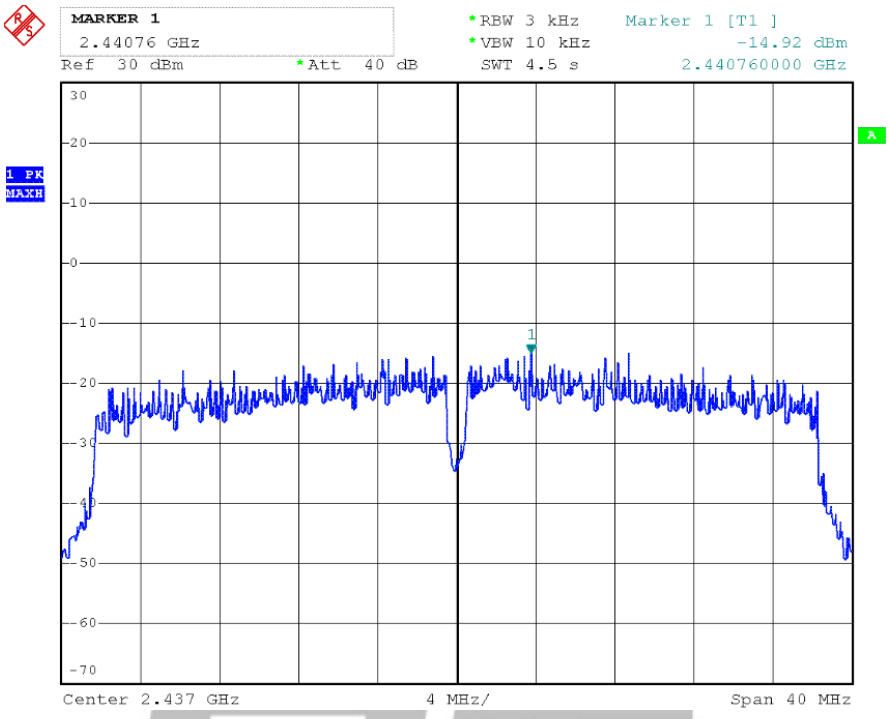
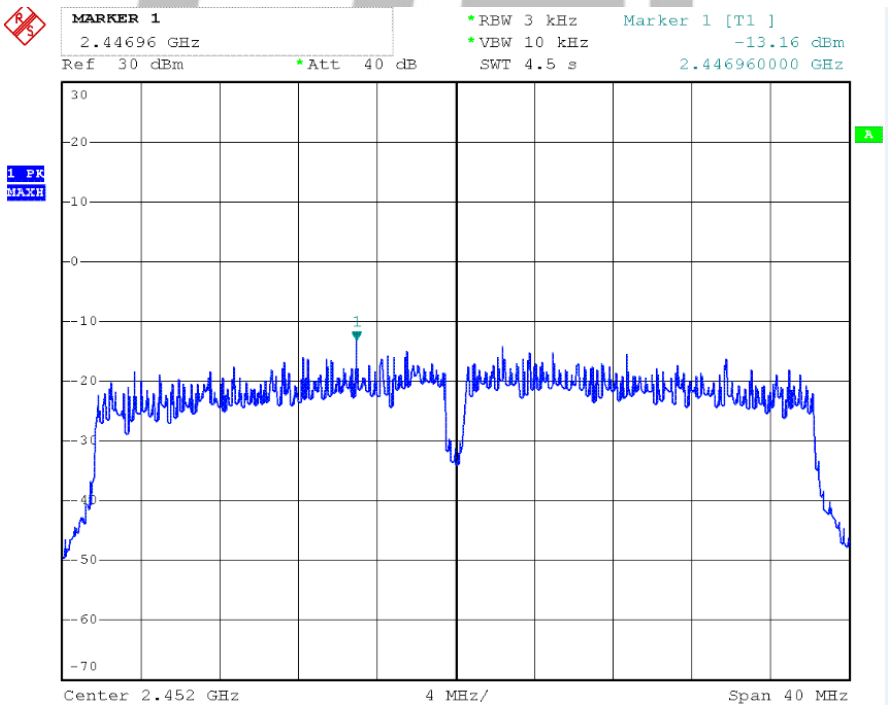
POWER SPECTRAL DENSITY (IEEE 802.11n HT40 MODE CH Mid)



POWER SPECTRAL DENSITY (IEEE 802.11n HT40 MODE CH High)



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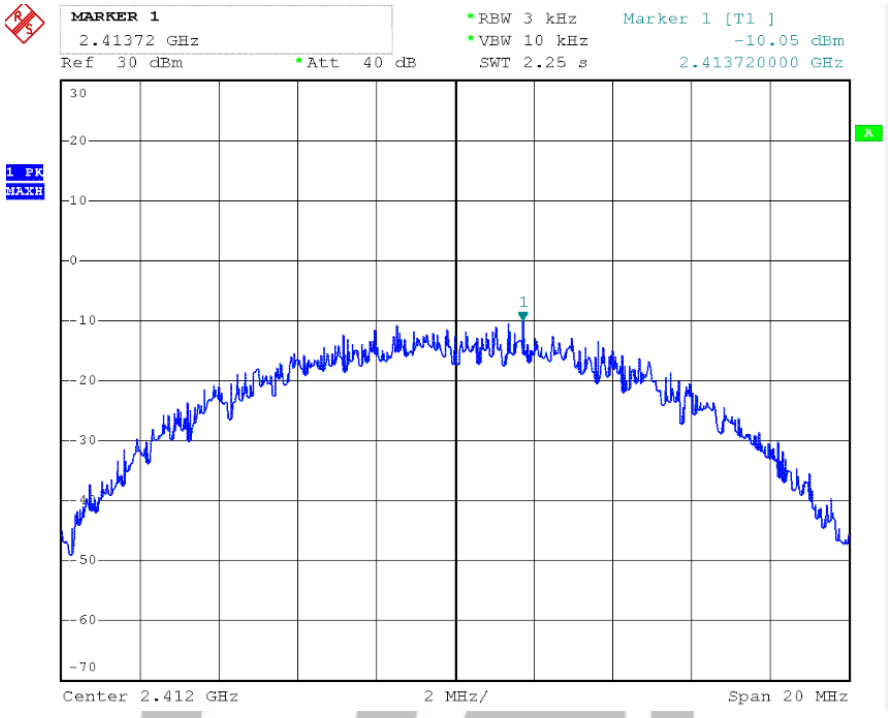
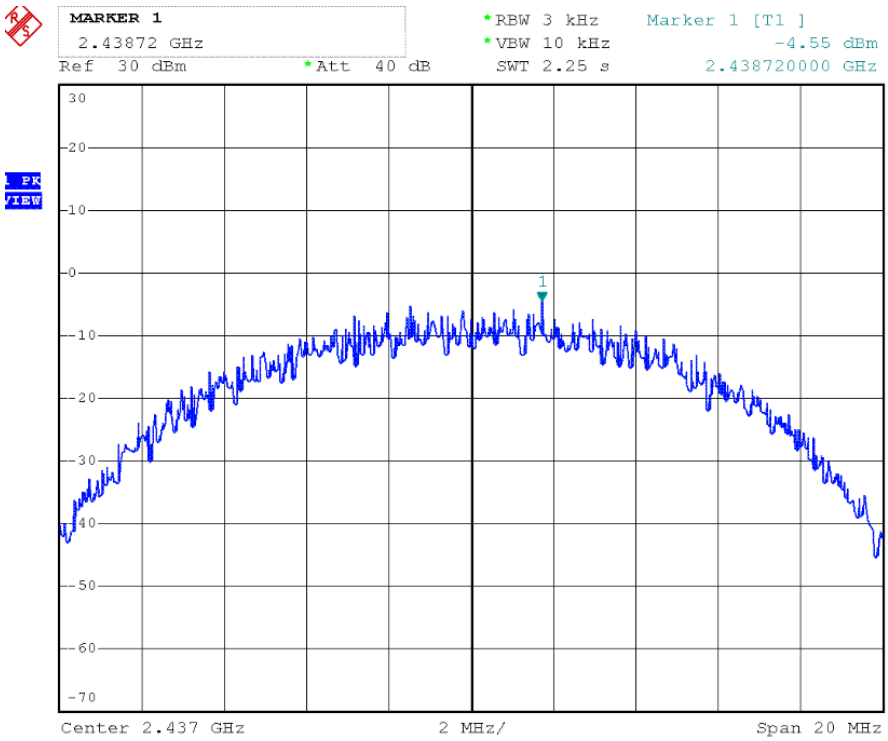
Chain 2:

POWER SPECTRAL DENSITY (IEEE 802.11b MODE CH Low)



POWER SPECTRAL DENSITY (IEEE 802.11b MODE CH Mid)



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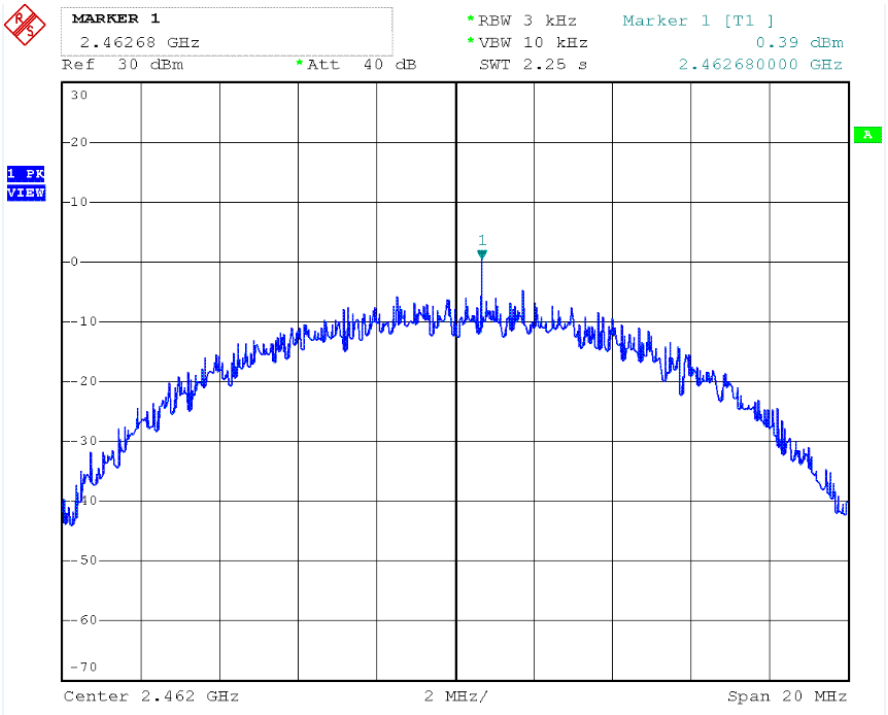
POWER SPECTRAL DENSITY (IEEE 802.11b MODE CH High)



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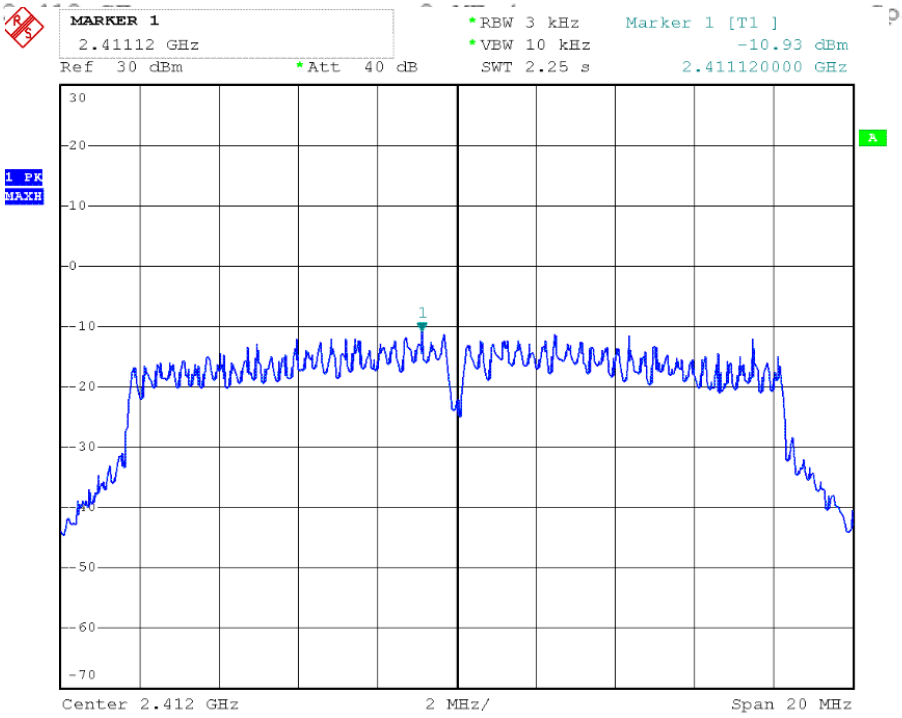
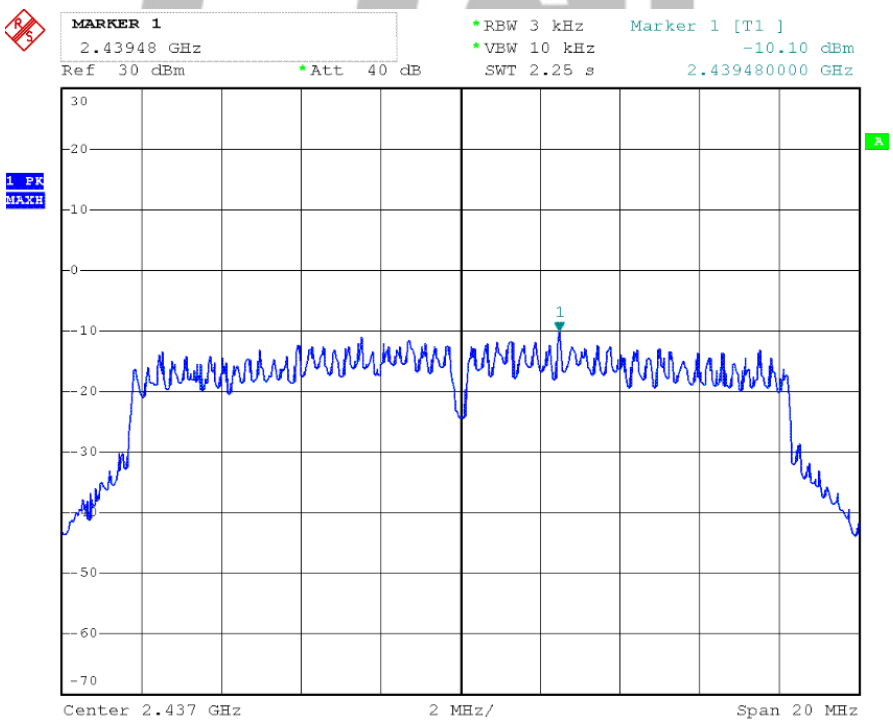


POWER SPECTRAL DENSITY (IEEE 802.11g MODE CH Mid)



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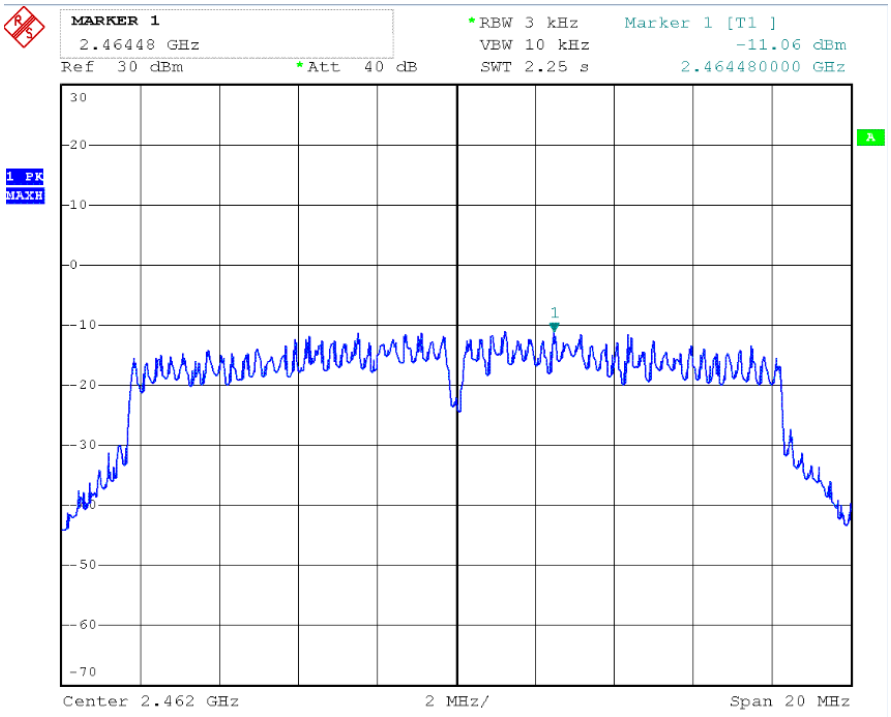
POWER SPECTRAL DENSITY (IEEE 802.11g MODE CH High)



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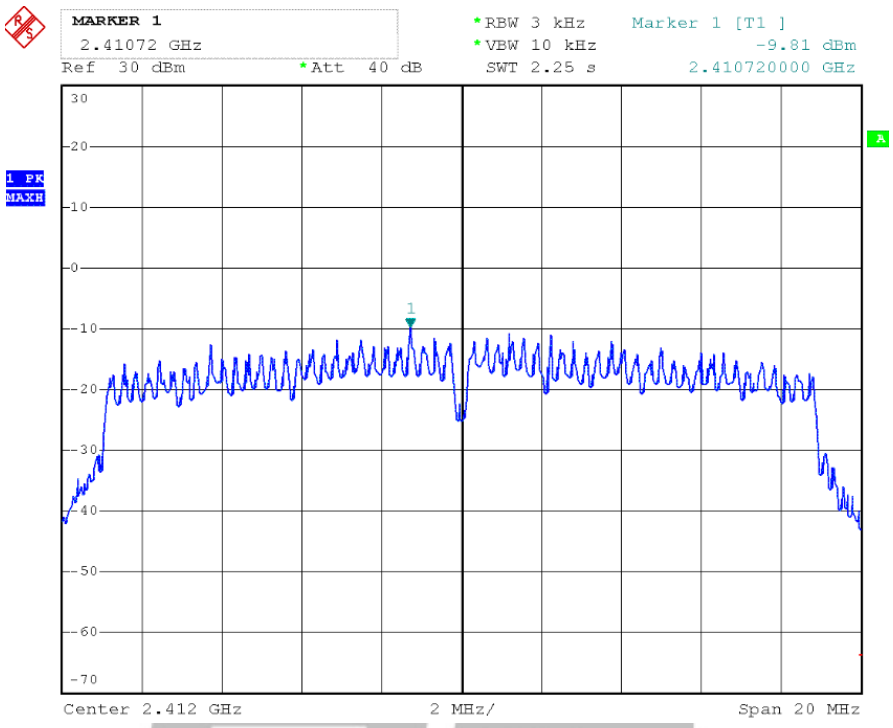
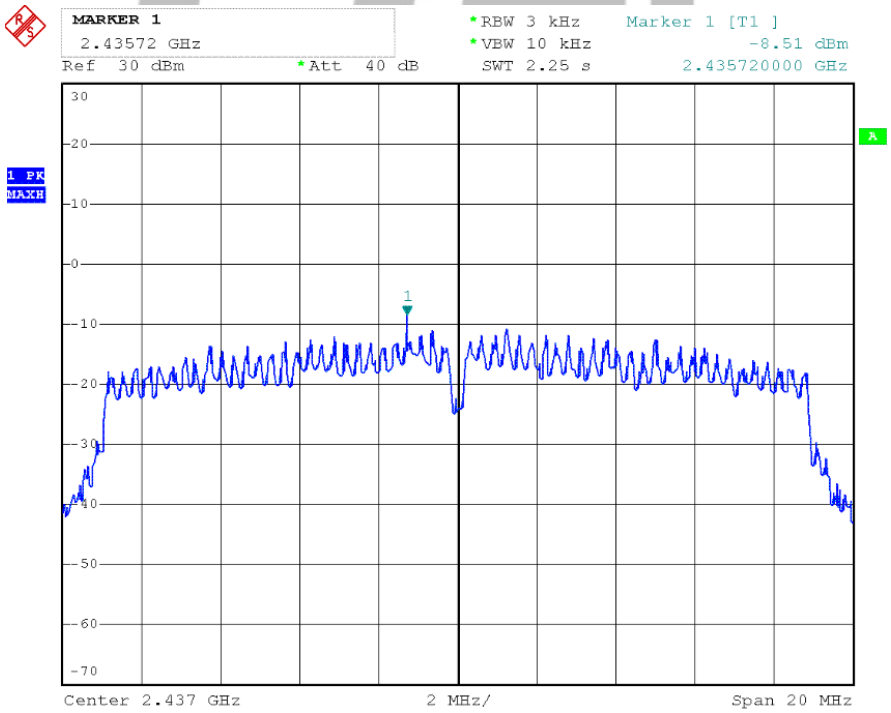
POWER SPECTRAL DENSITY (IEEE 802.11n HT20 MODE CH Low)



POWER SPECTRAL DENSITY (IEEE 802.11n HT20 MODE CH Mid)



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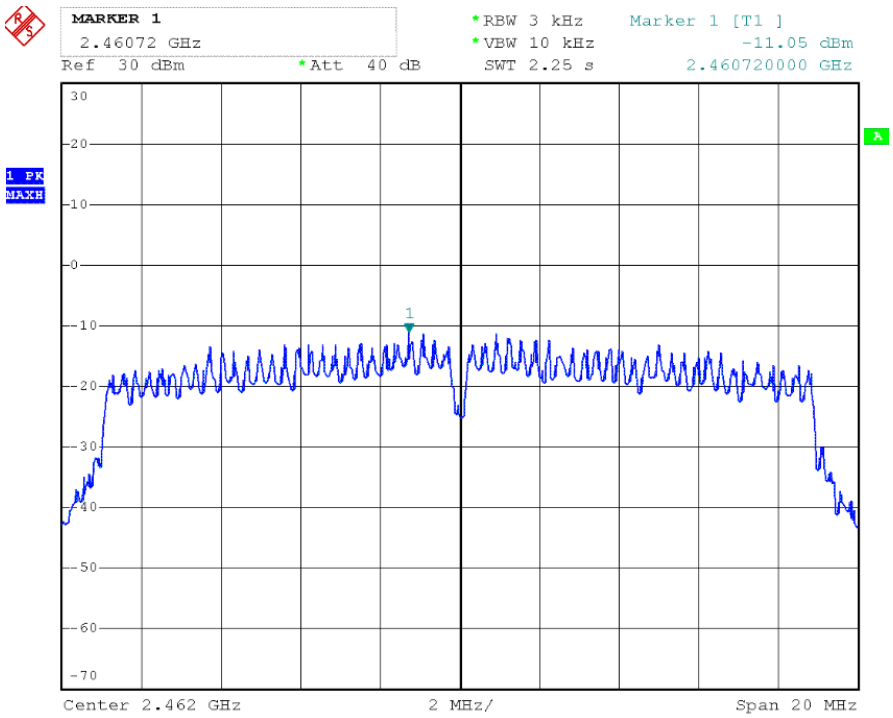
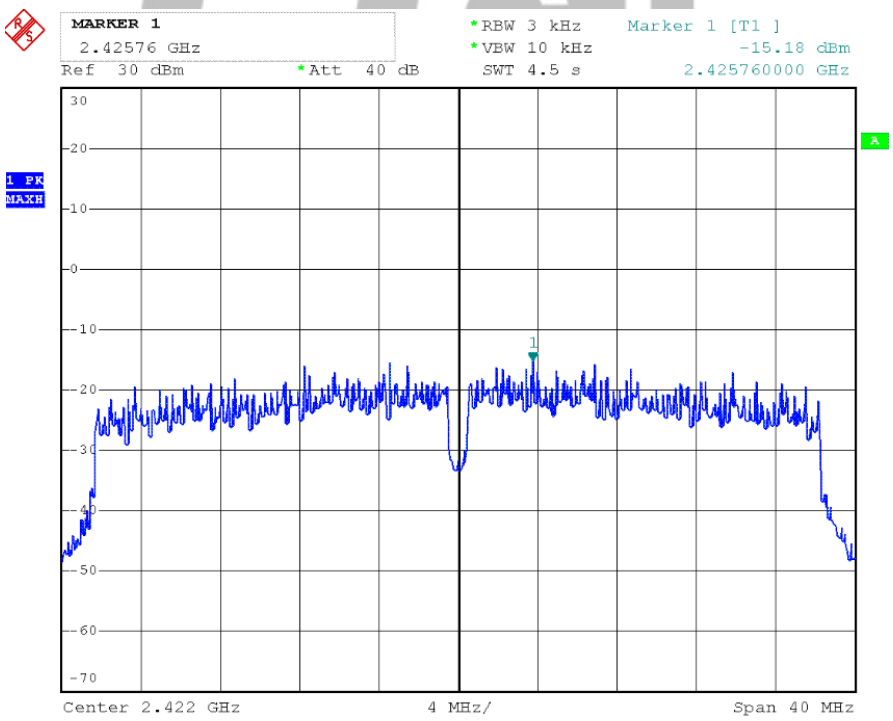
POWER SPECTRAL DENSITY (IEEE 802.11n HT20 MODE CH High)



POWER SPECTRAL DENSITY (IEEE 802.11n HT40 MODE CH Low)



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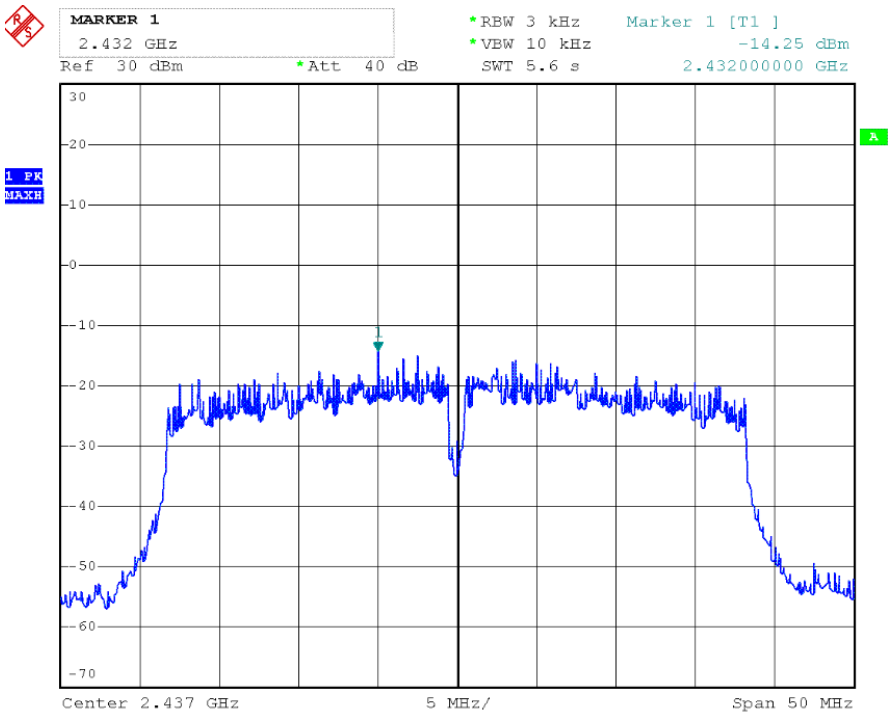
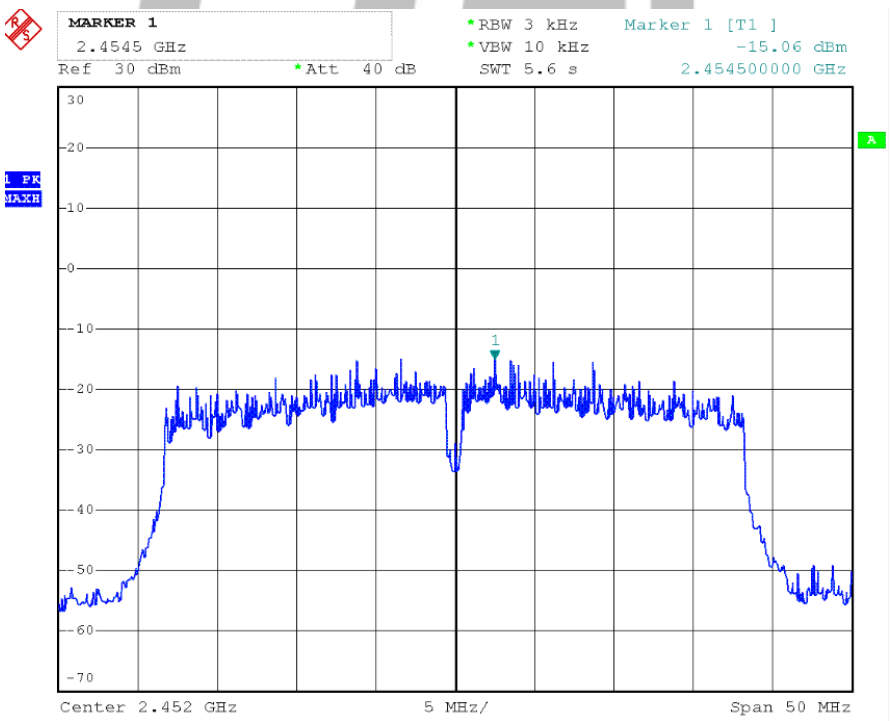
POWER SPECTRAL DENSITY (IEEE 802.11n HT40 MODE CH Mid)



POWER SPECTRAL DENSITY (IEEE 802.11n HT40 MODE CH High)



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7. Test of 6dB Bandwidth

7.1 Applicable standard

Refer to FCC §15.247 (a) (2) and IC RSS-247 Issue1 Clause 5.2 (1), IC RSS-GEN Clause 6.6

KDB558074 v03r03 – Section 8.2 Option 2

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

7.2 EUT Setup

Spectrum Analyzer

7.3 Test Equipment List and Details

See section 2.5.

7.4 Test Procedure

The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB. The transmitter output was connected to a spectrum analyzer and the parameter was set as below:

1. Set resolution bandwidth (RBW) = 100 kHz.

2. Set the video bandwidth (VBW) ⩾ 3 x RBW.

3. Detector = Peak.

4. Trace mode = max hold.

5. Sweep = auto couple.

6. Allow the trace to stabilize.

7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

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7.5 Test Result

Temperature (℃) : 22~23	EUT: GL-MT300N-V2
Humidity (%RH): 50~54	M/N: GL-MT300N-V2
Barometric Pressure (mbar): 950~1000	Operation Condition: Tx Mode

Chain 1:

IEEE 802.11b mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	9.16	500	PASS
Middle	2437	10.08	500	PASS
High	2462	8.40	500	PASS

IEEE 802.11g mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	16.28	500	PASS
Middle	2437	16.28	500	PASS
High	2462	16.32	500	PASS

IEEE 802 11n HT20 mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	16.24	500	PASS
Middle	2437	17.16	500	PASS
High	2462	17.48	500	PASS

IEEE 802 11n HT40 mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2422	35.20	500	PASS
Middle	2437	35.04	500	PASS
High	2452	35.12	500	PASS

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Chain 2:

IEEE 802.11b mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	8.28	500	PASS
Middle	2437	8.28	500	PASS
High	2462	8.36	500	PASS

IEEE 802.11g mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	16.28	500	PASS
Middle	2437	16.28	500	PASS
High	2462	15.40	500	PASS

IEEE 802 11n HT20 mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2412	16.32	500	PASS
Middle	2437	16.36	500	PASS
High	2462	16.08	500	PASS

IEEE 802 11n HT40 mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (kHz)	Pass / Fail
Low	2422	35.04	500	PASS
Middle	2437	35.70	500	PASS
High	2452	35.10	500	PASS

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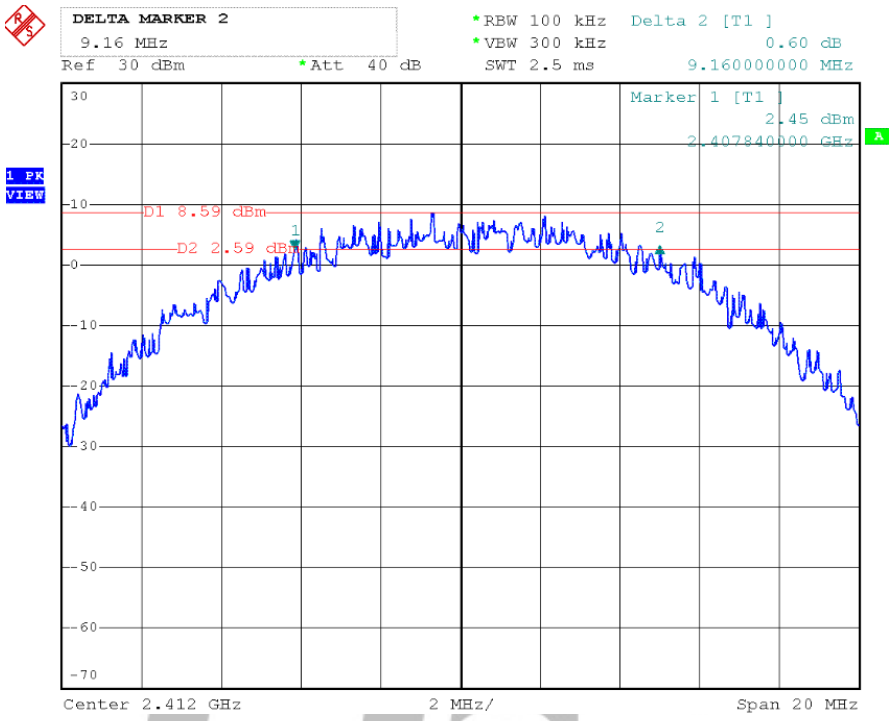
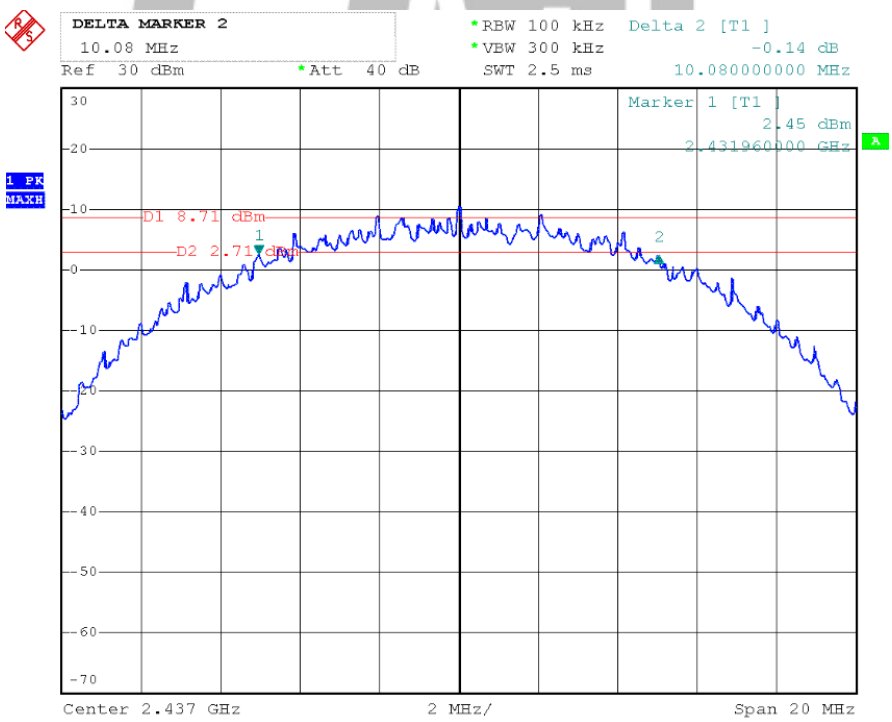
Chain 1:

6dB BANDWIDTH (IEEE 802.11b MODE CH Low)



6dB BANDWIDTH (IEEE 802.11b MODE CH Mid)



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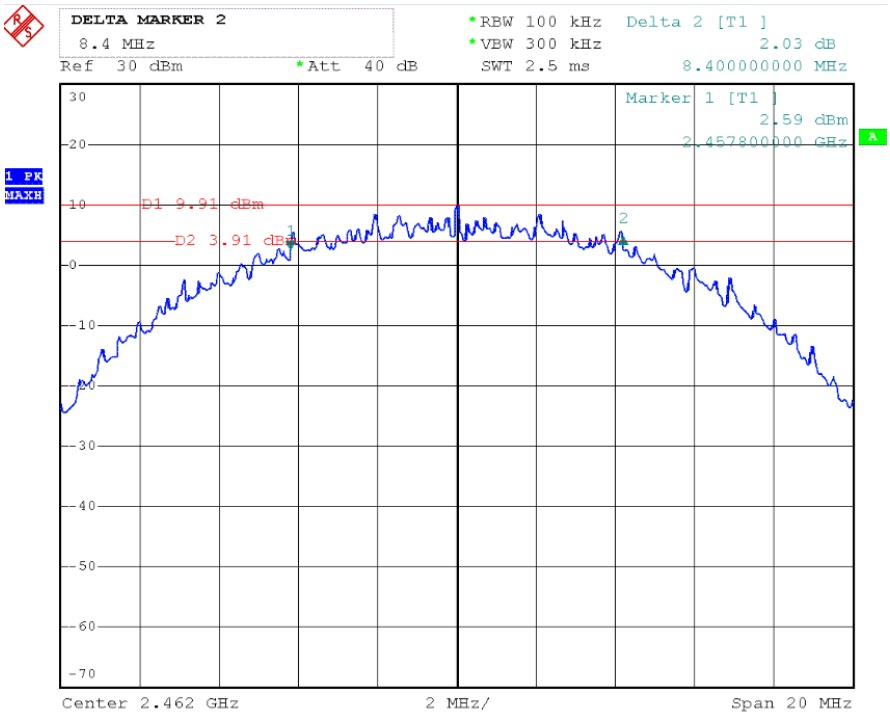
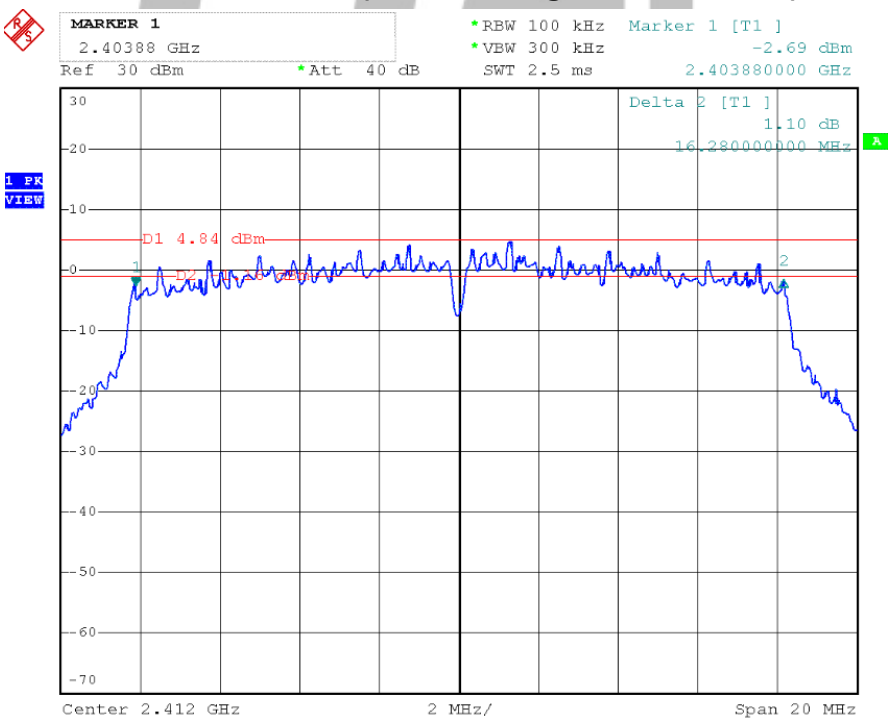
6dB BANDWIDTH (IEEE 802.11b MODE CH High)



6dB BANDWIDTH (IEEE 802.11g MODE CH Low)



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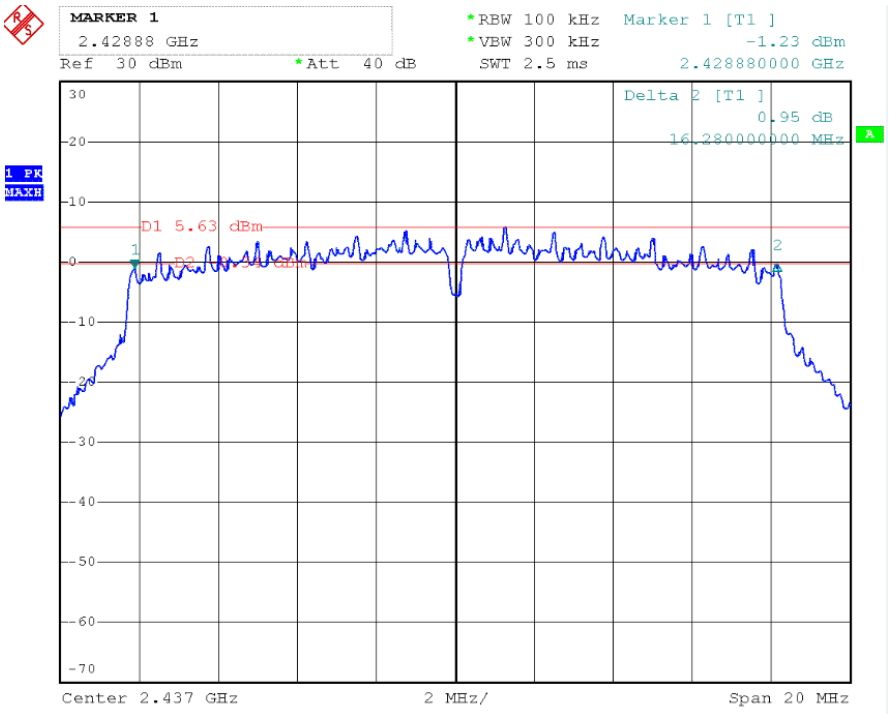
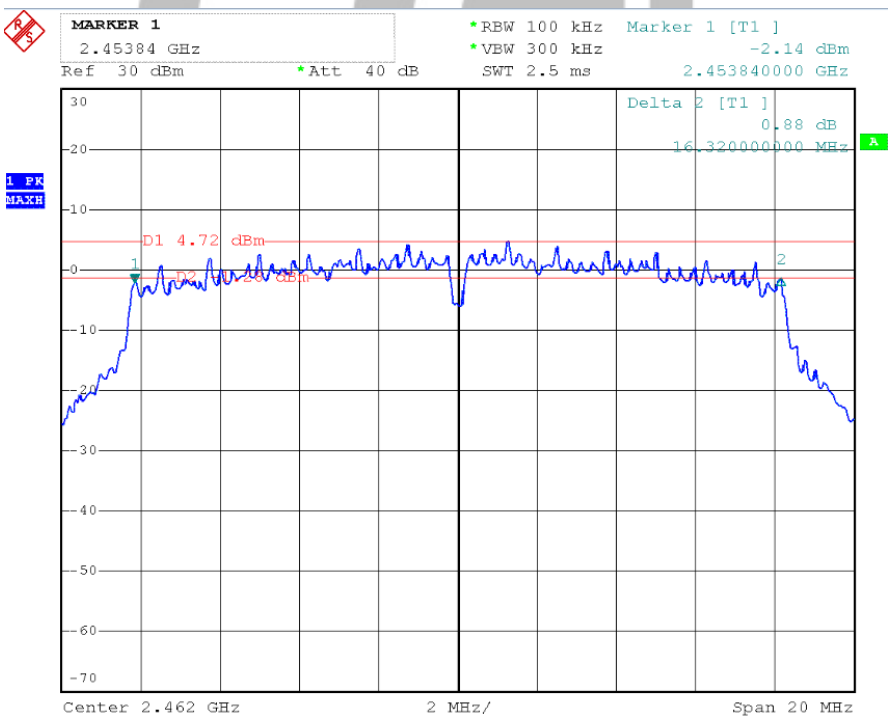
6dB BANDWIDTH (IEEE 802.11g MODE CH Mid)



6dB BANDWIDTH (IEEE 802.11g MODE CH High)



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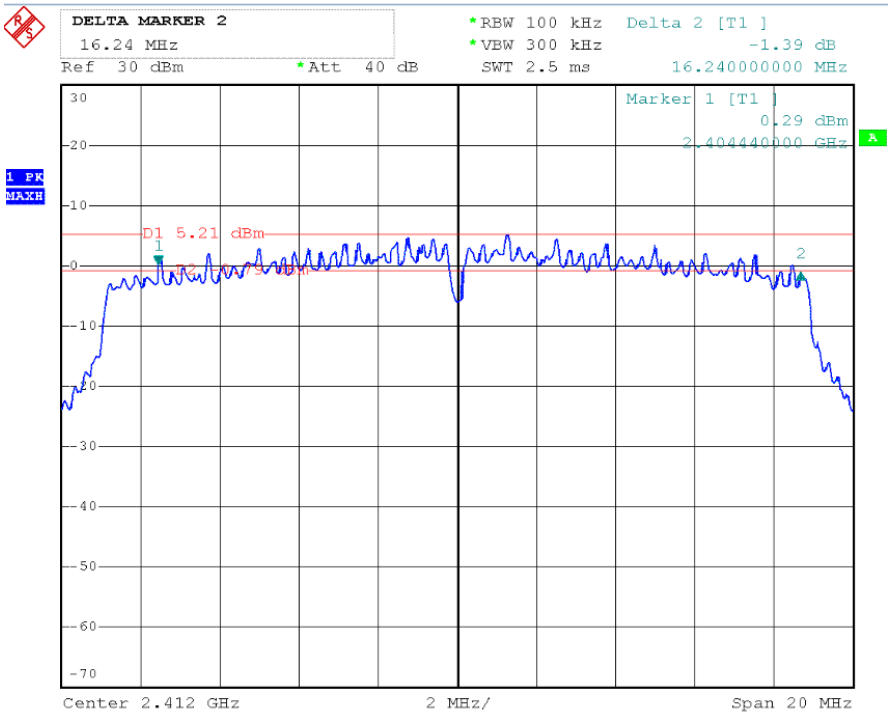
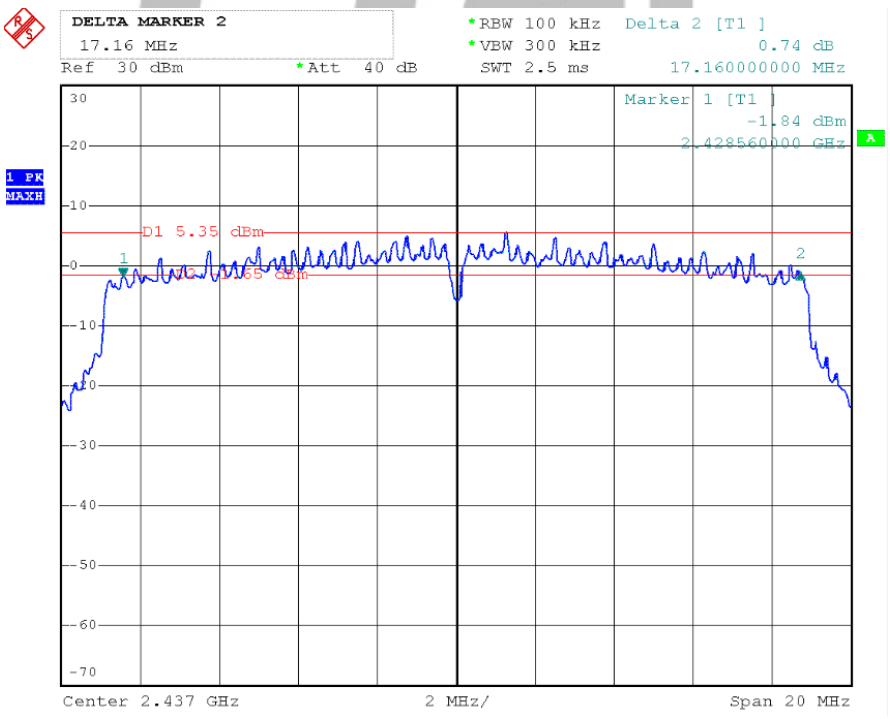
6dB BANDWIDTH (IEEE 802 11n HT20 MODE CH Low)



6dB BANDWIDTH (IEEE 802 11n HT20 MODE CH Mid)



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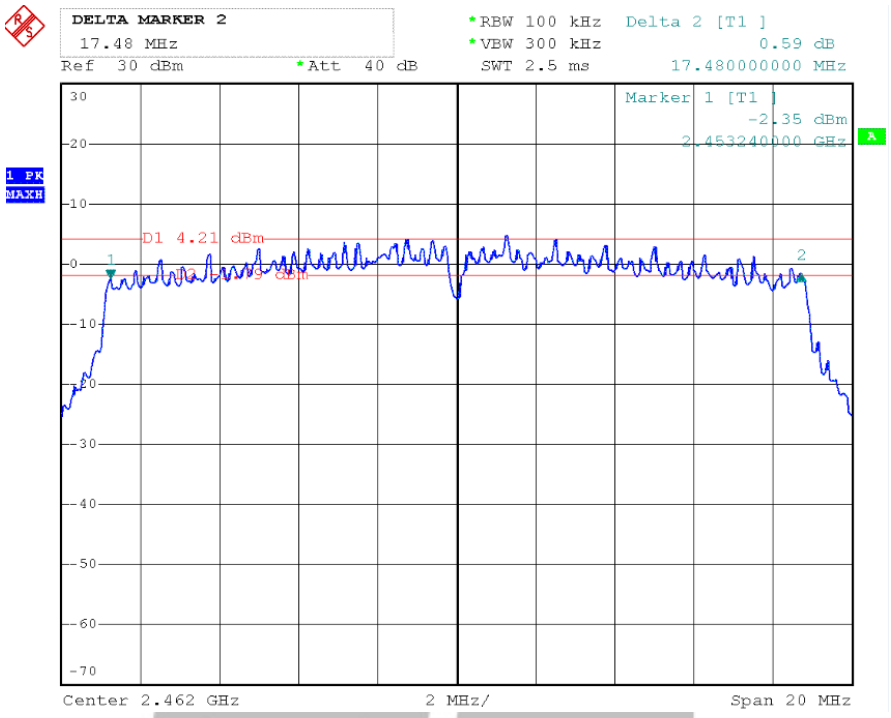
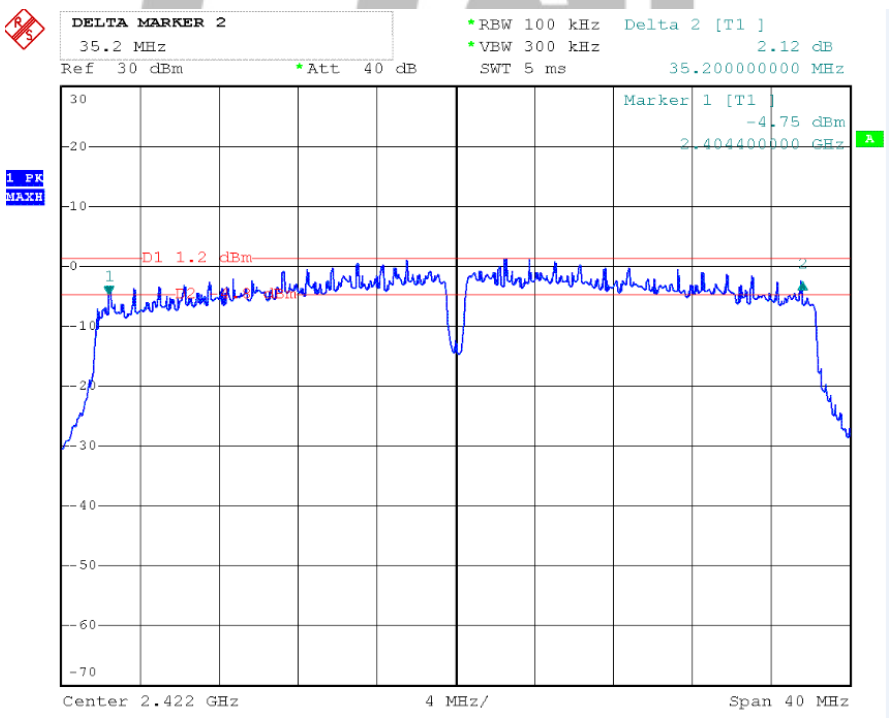
6dB BANDWIDTH (IEEE 802.11n HT20 MODE CH High)



6dB BANDWIDTH (IEEE 802 11n HT40 MODE CH Low)



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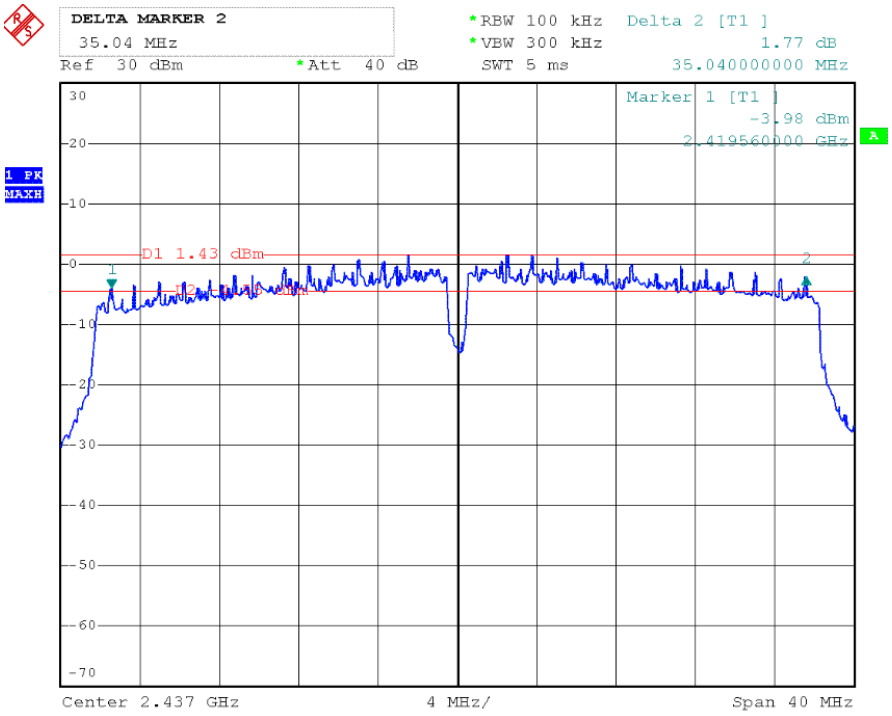
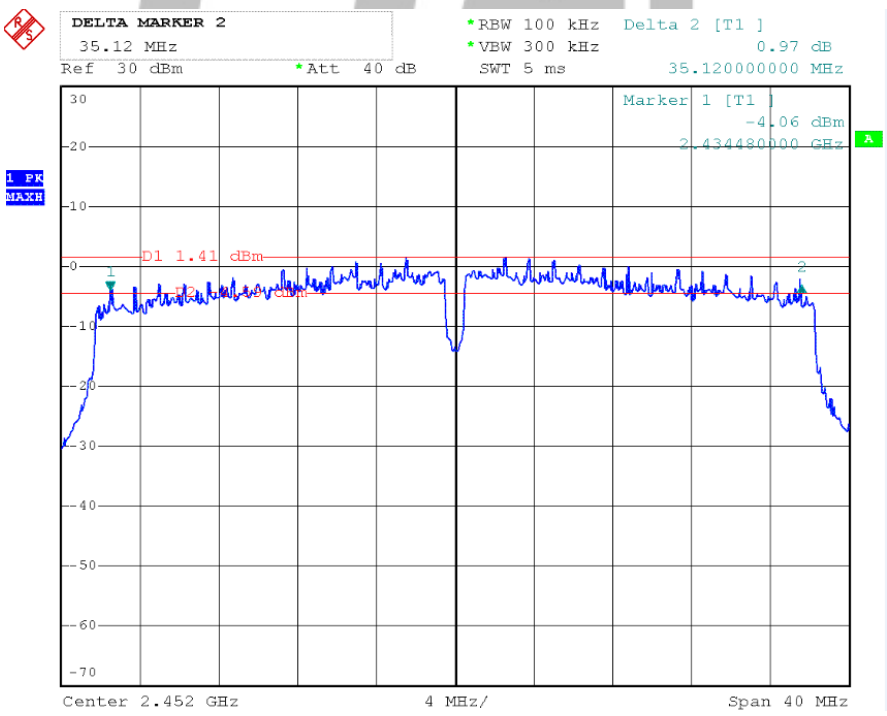
6dB BANDWIDTH (IEEE 802 11n HT40 MODE CH Mid)



6dB BANDWIDTH (IEEE 802.11 n HT40 MODE CH High)



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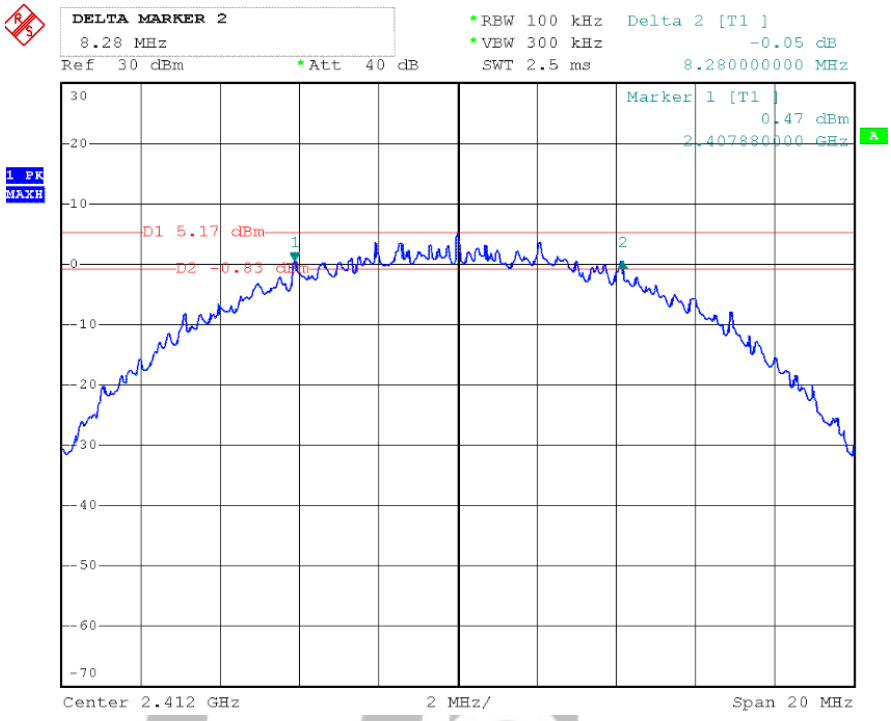
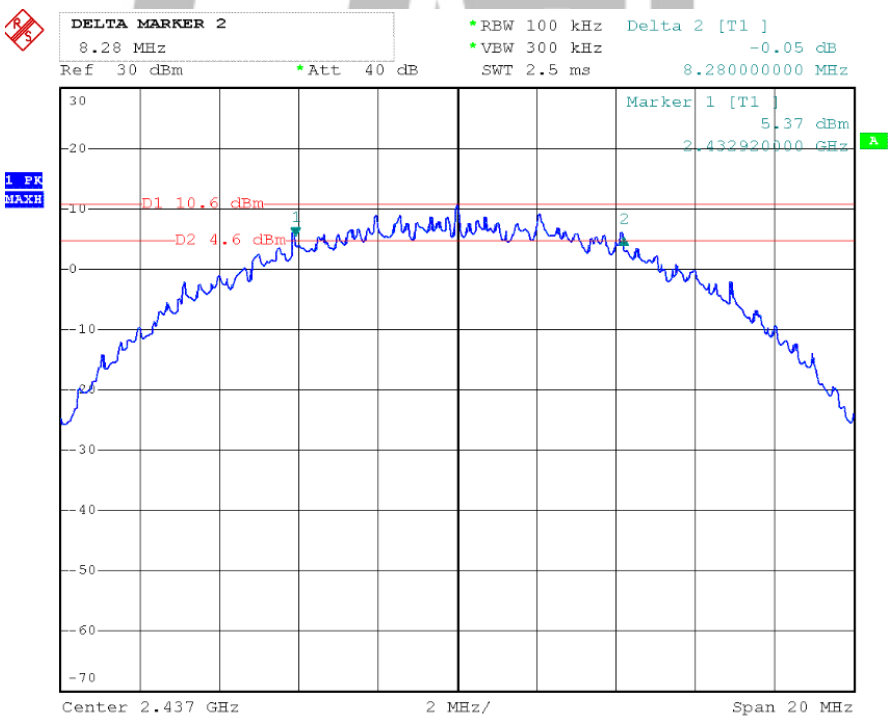
Chain 2:

6dB BANDWIDTH (IEEE 802.11b MODE CH Low)



6dB BANDWIDTH (IEEE 802.11b MODE CH Mid)



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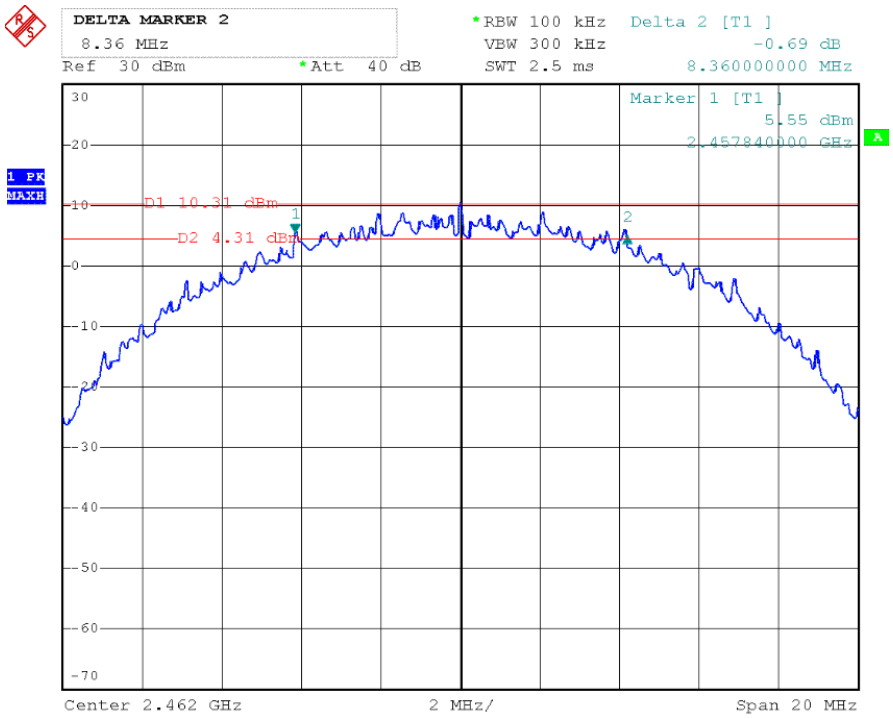
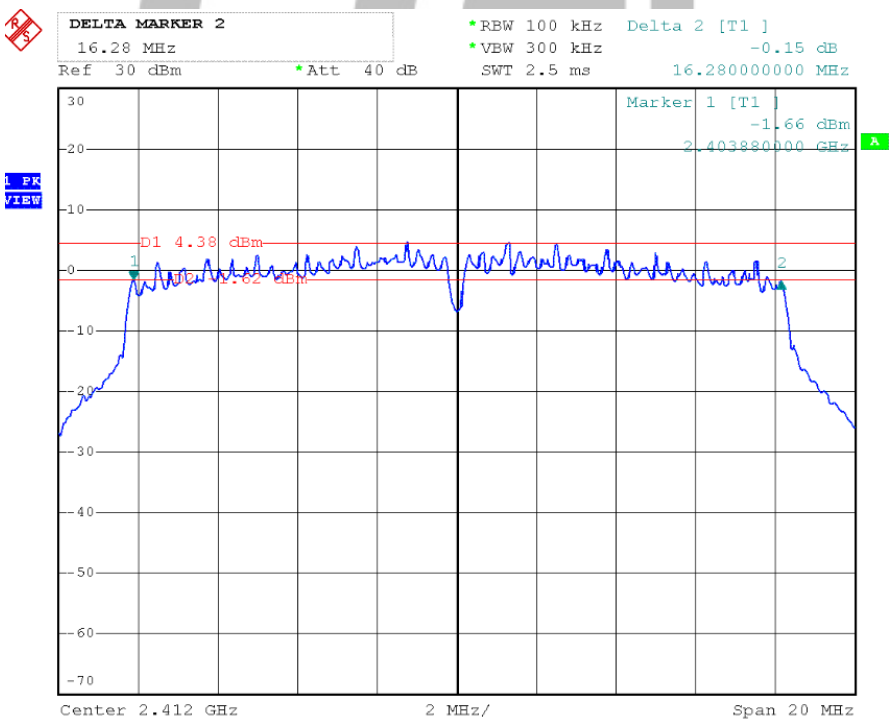
6dB BANDWIDTH (IEEE 802.11b MODE CH High)



6dB BANDWIDTH (IEEE 802.11g MODE CH Low)



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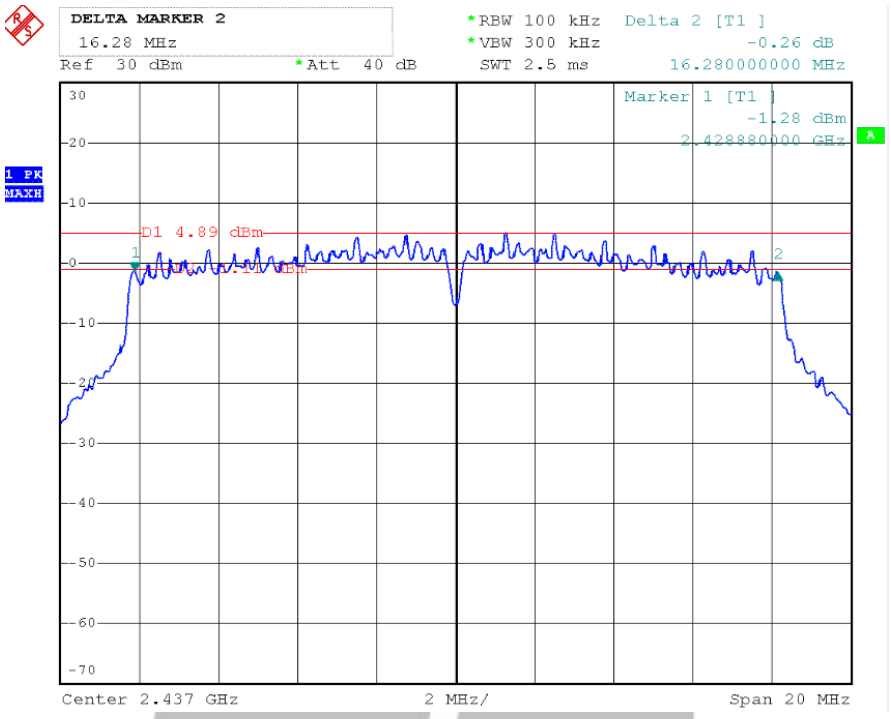
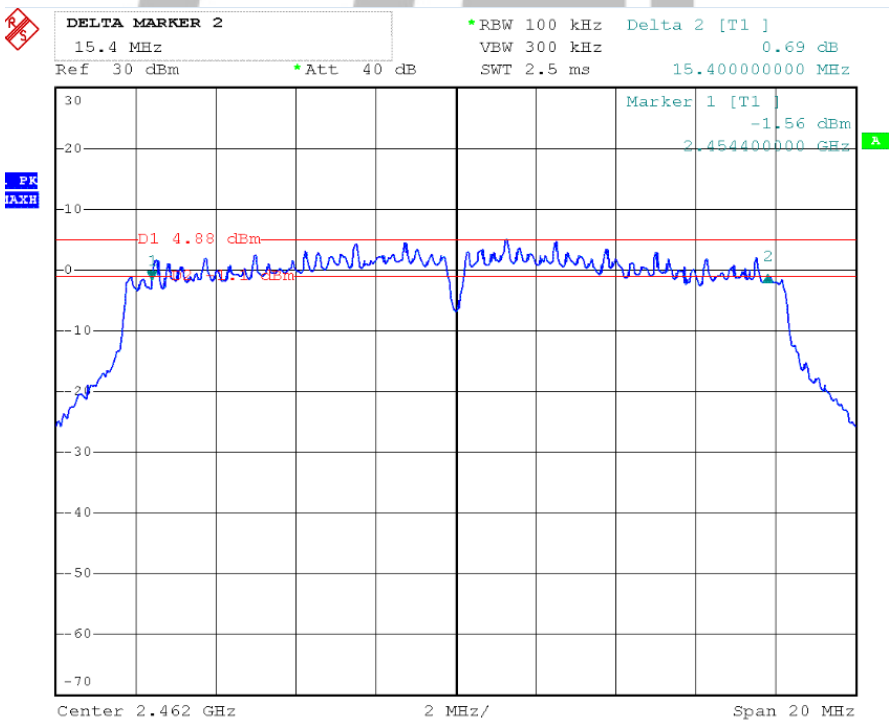
6dB BANDWIDTH (IEEE 802.11g MODE CH Mid)



6dB BANDWIDTH (IEEE 802.11g MODE CH High)



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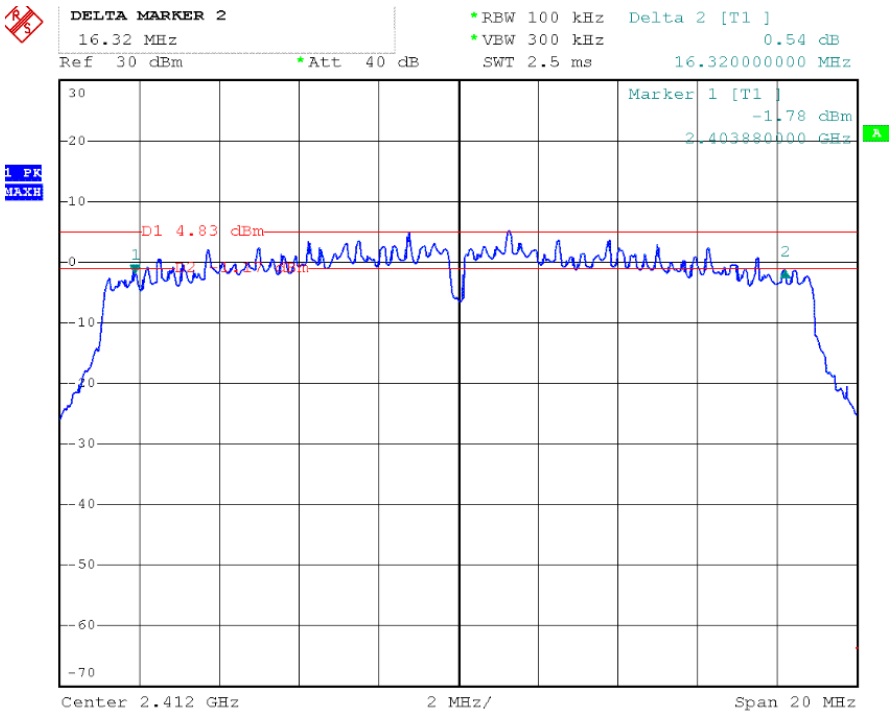
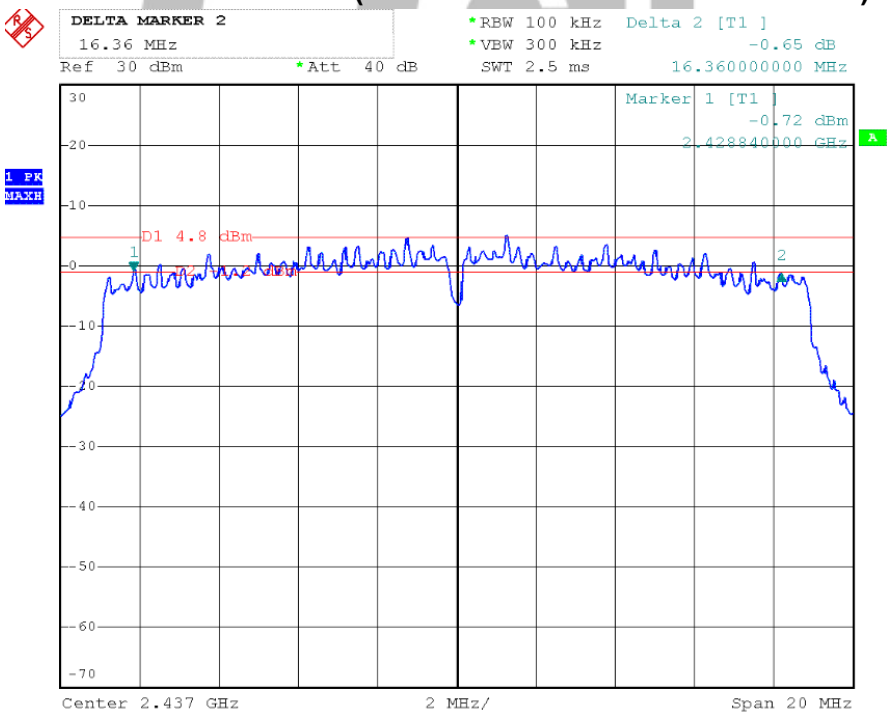
6dB BANDWIDTH (IEEE 802 11n HT20 MODE CH Low)



6dB BANDWIDTH (IEEE 802 11n HT20 MODE CH Mid)



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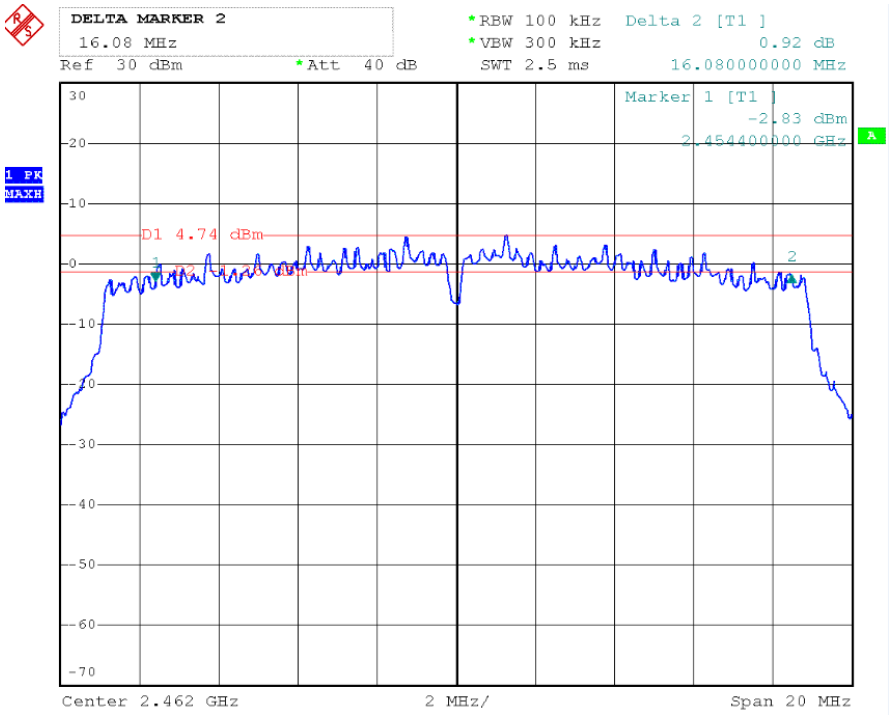
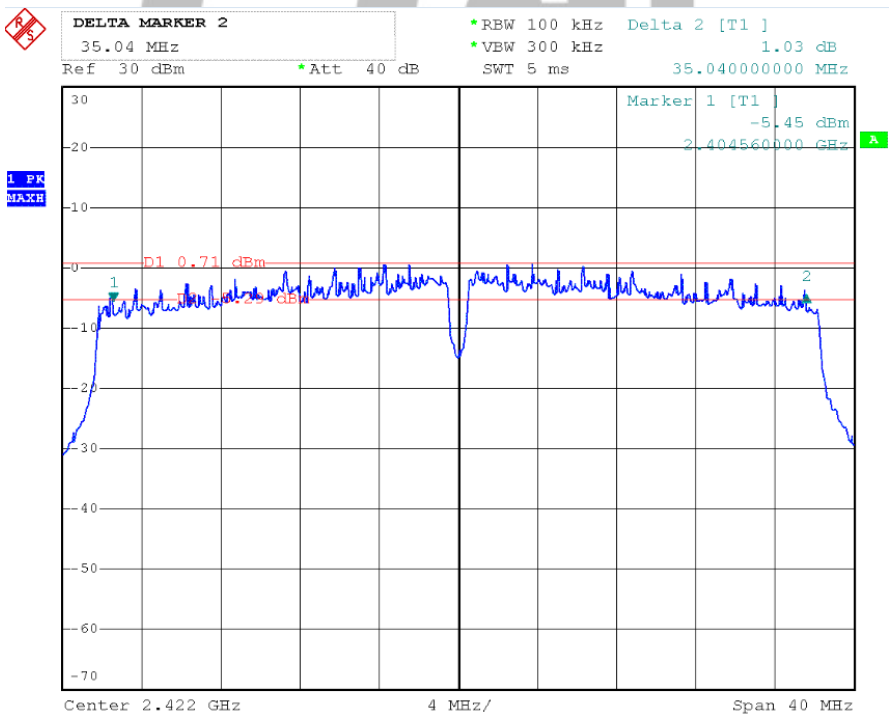
6dB BANDWIDTH (IEEE 802.11n HT20 MODE CH High)



6dB BANDWIDTH (IEEE 802 11n HT40 MODE CH Low)



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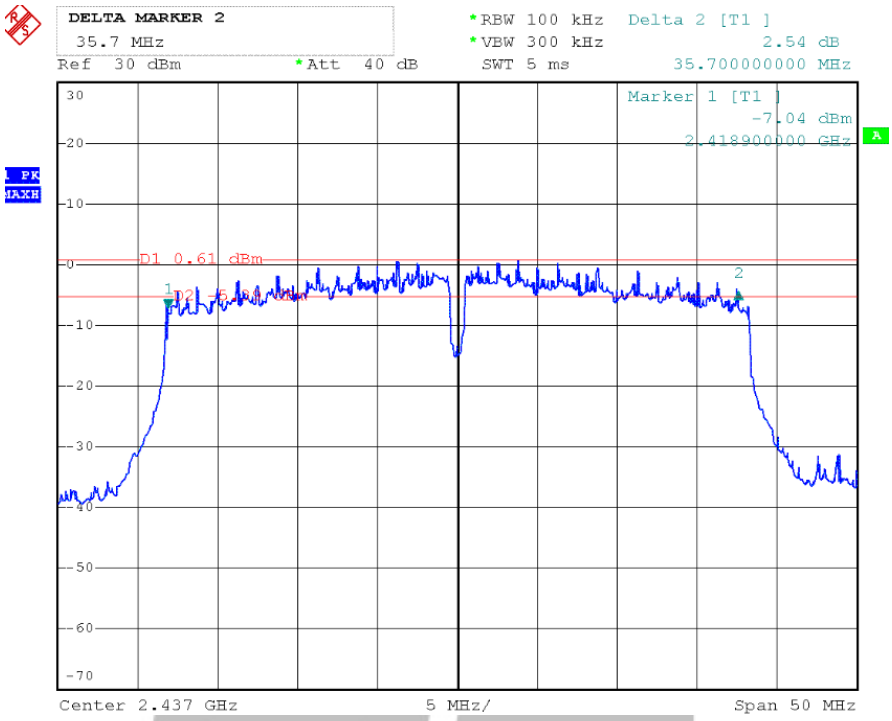
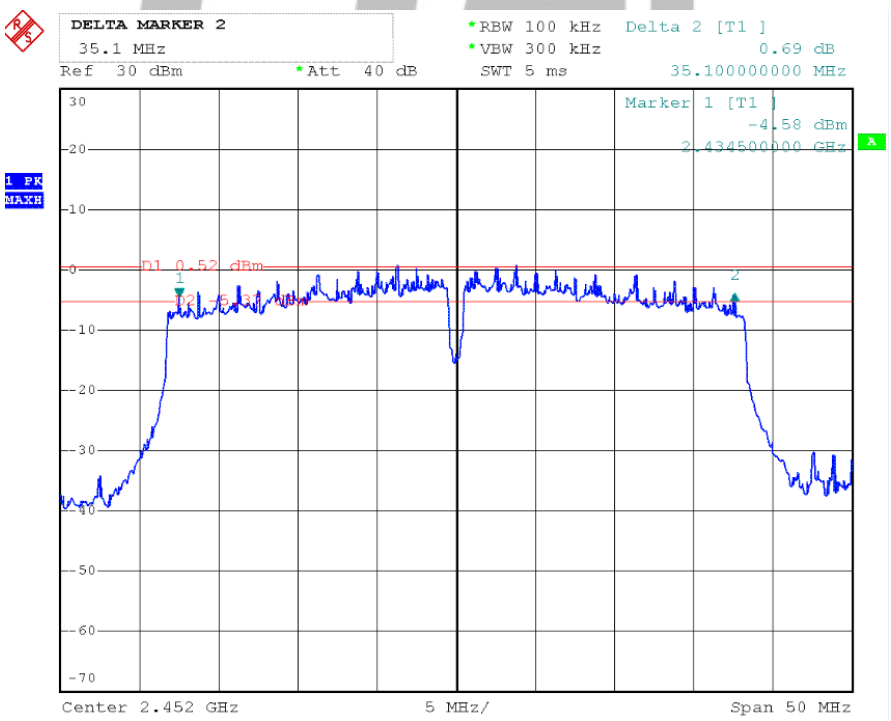
6dB BANDWIDTH (IEEE 802 11n HT40 MODE CH Mid)



6dB BANDWIDTH (IEEE 802.11 n HT40 MODE CH High)



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8. Test of Conducted Spurious Emission

8.1 Applicable standard

Refer to FCC §15.247 (d) and IC RSS-247 Issue1 Clause 5.5.

KDB 558074 v03r03 – Section 11.3

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. In addition, radiated emissions that fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209.

8.2 EUT Setup

Spectrum Analyzer

8.3 Test Equipment List and Details

See section 2.5.

8.4 Test Procedure

1. Set start frequency to DTS channel edge frequency.

2. Set stop frequency so as to encompass the spectrum to be examined.

3. Set RBW = 100 kHz.

4. Set VBW ≥ 300 kHz.

5. Detector = peak.

6. Trace Mode = max hold.

7. Sweep = auto couple.

8. Allow the trace to stabilize (this may take some time, depending on the extent of the span).

9. Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

8.5 Test Result

Temperature (℃) : 22~23	EUT: GL-MT300N-V2
Humidity (%RH): 50~54	M/N: GL-MT300N-V2
Barometric Pressure (mbar): 950~1000	Operation Condition: TX Mode

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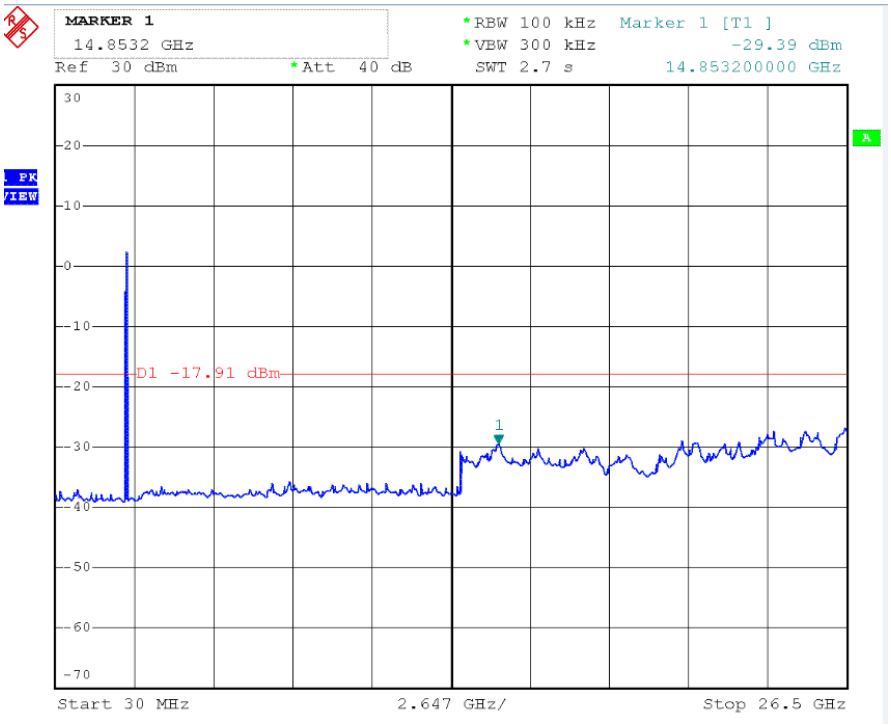
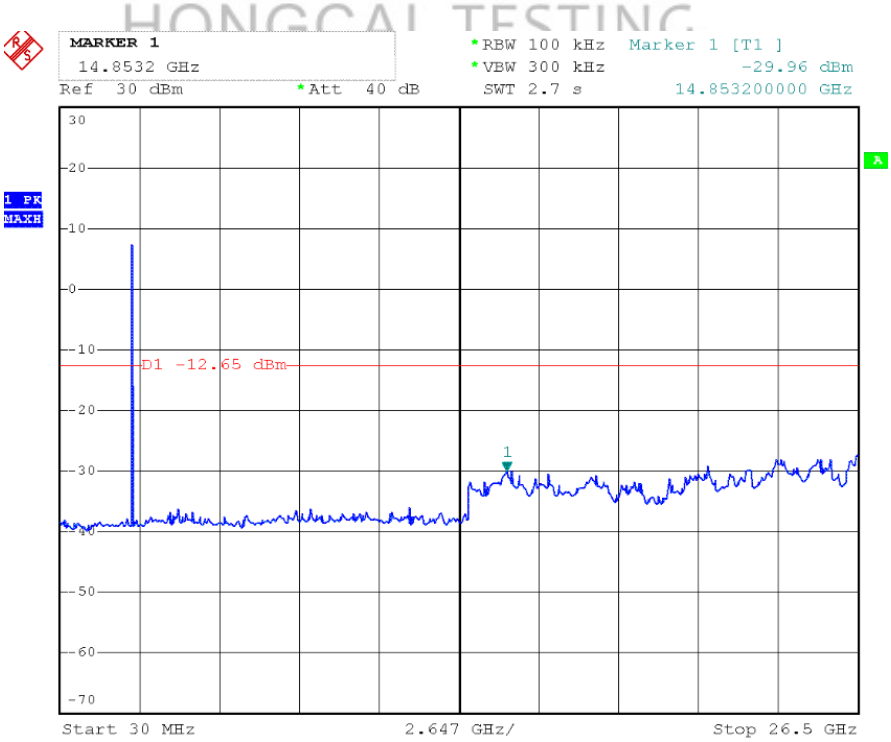
Test Result: PASS

Chain 1:

IEEE 802.11b mode
CH Low



CH Mid



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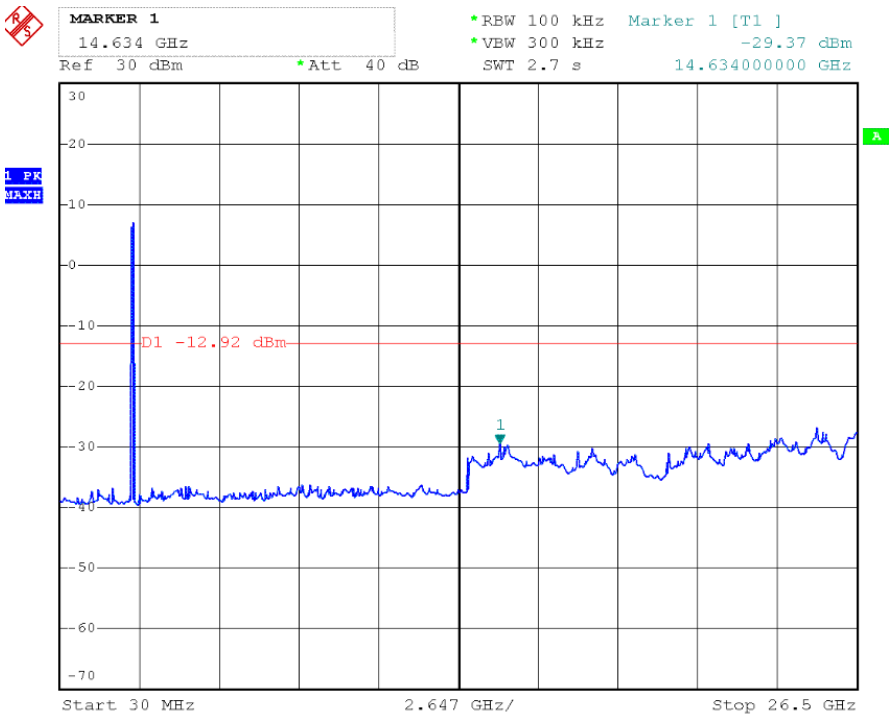
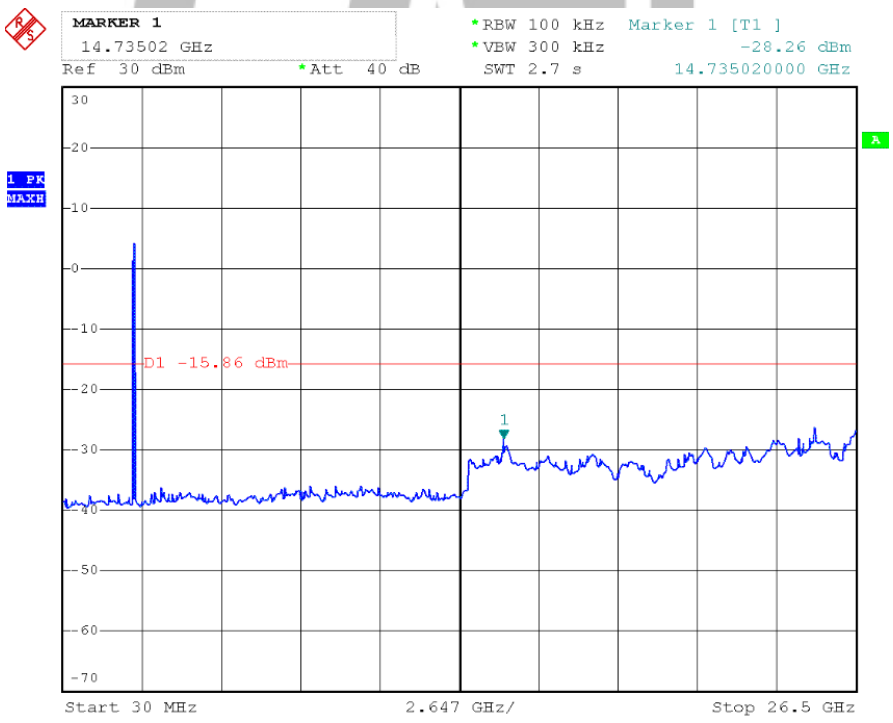
CH High



IEEE 802.11g mode

CH Low



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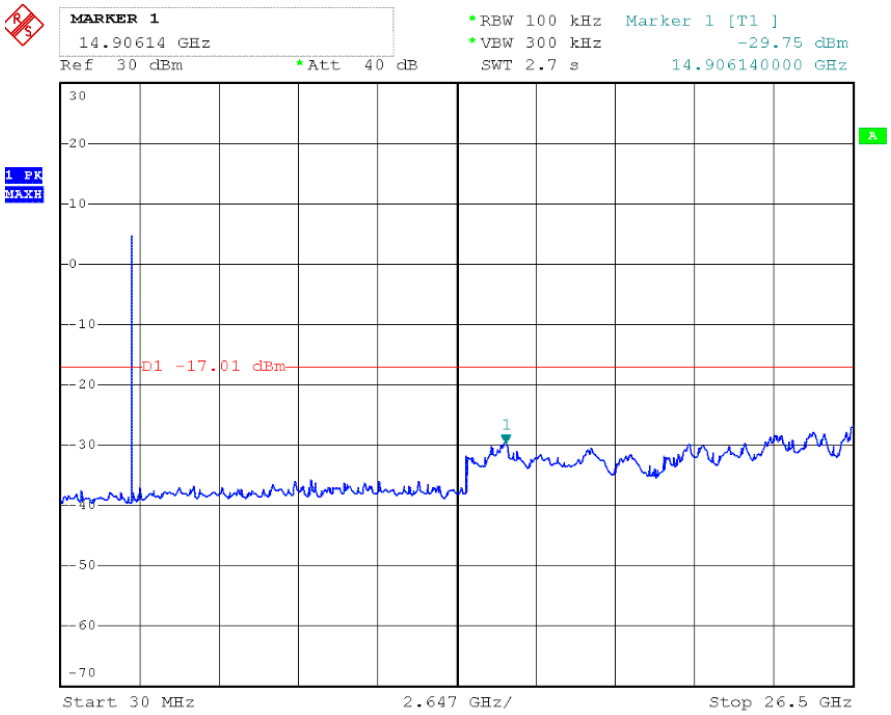
CH Mid



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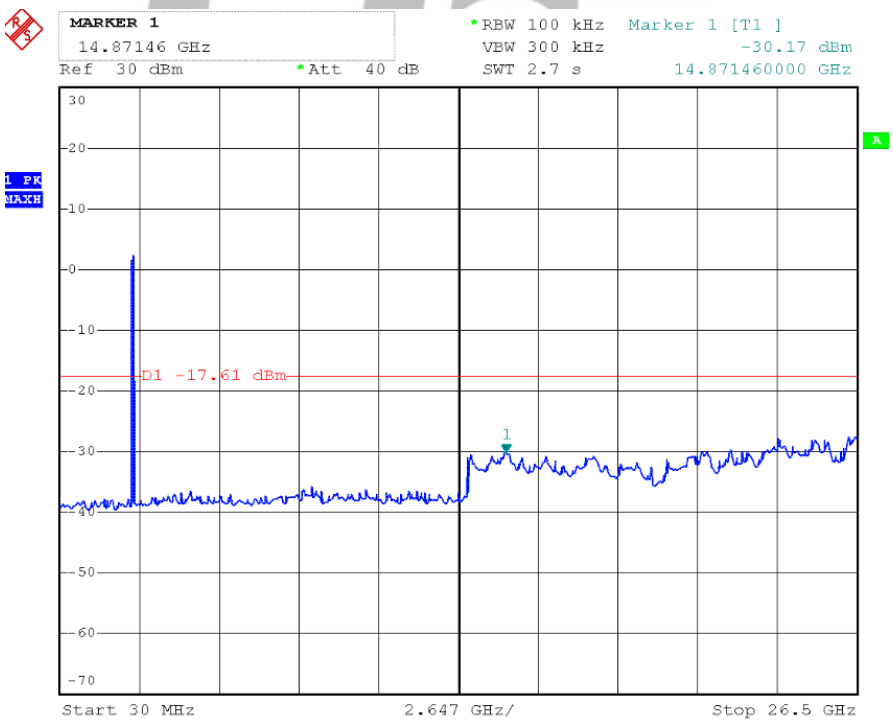

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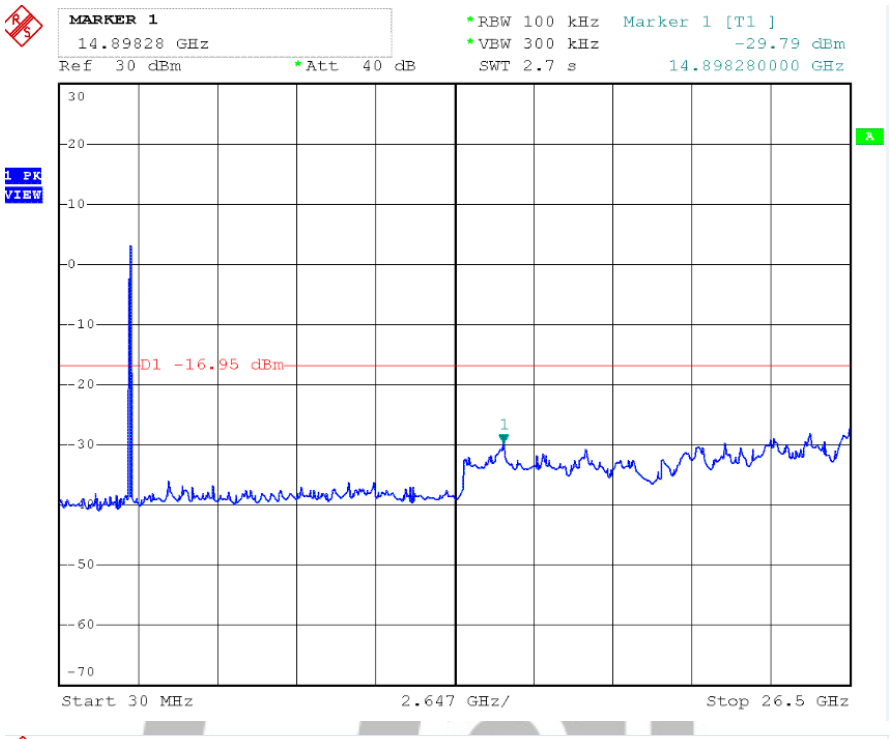
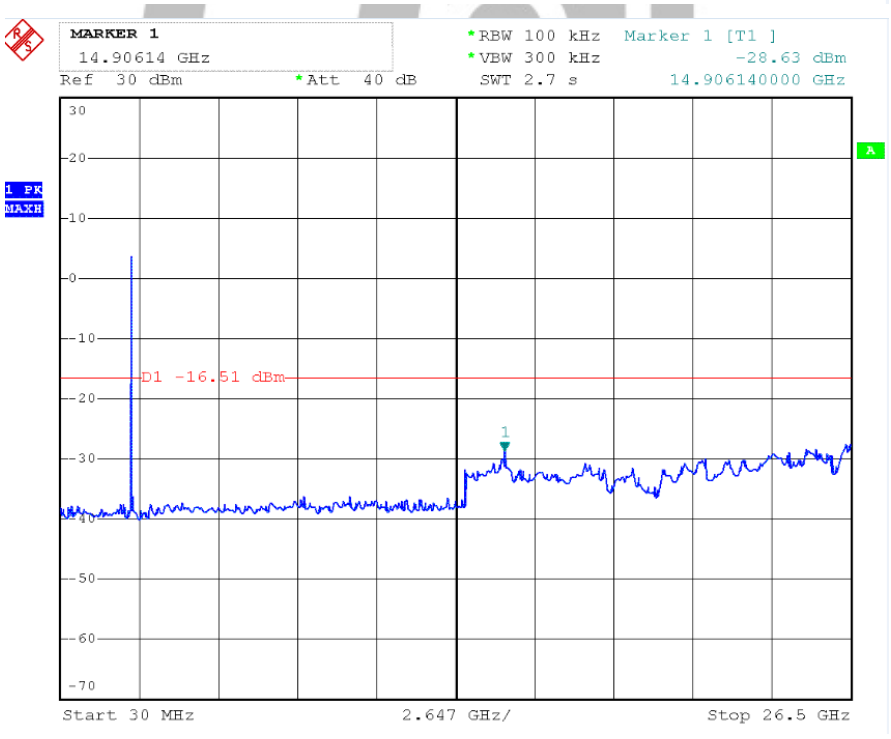
IEEE 802 11n HT20 mode

CH Low



CH Mid



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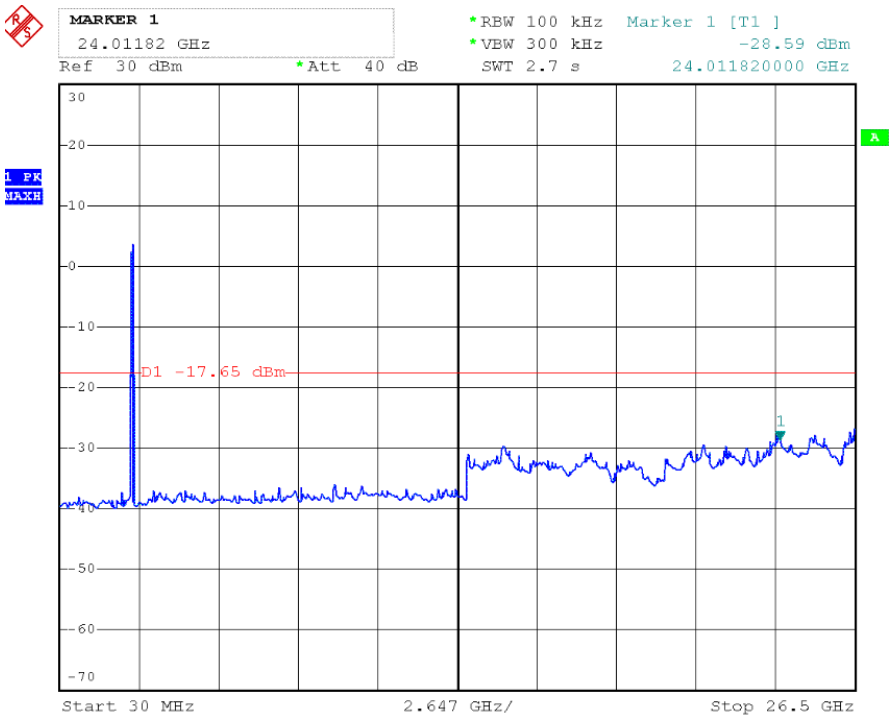
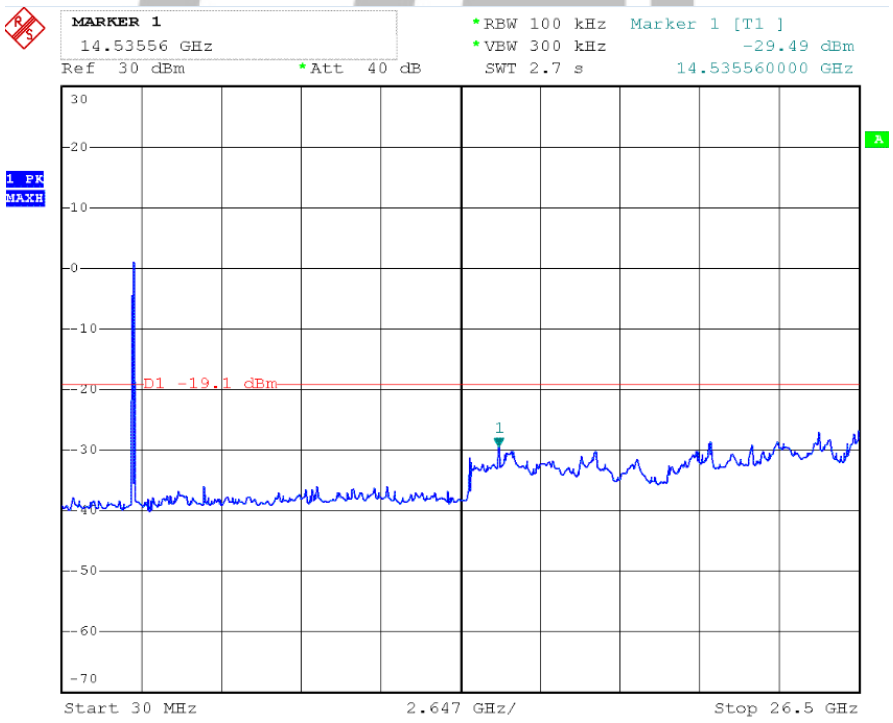
CH High



IEEE 802 11n HT40 mode

CH Low



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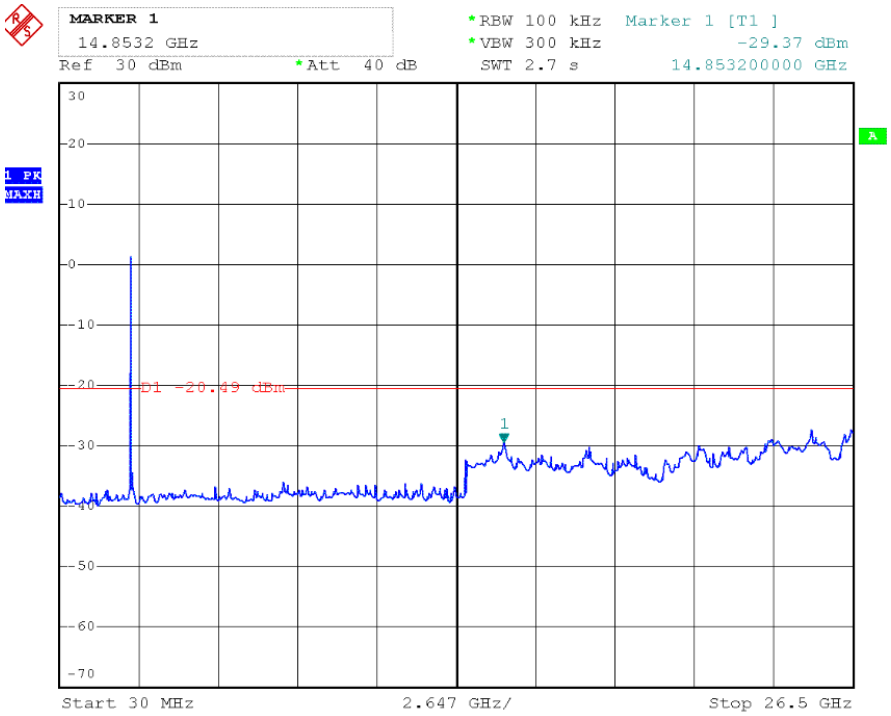
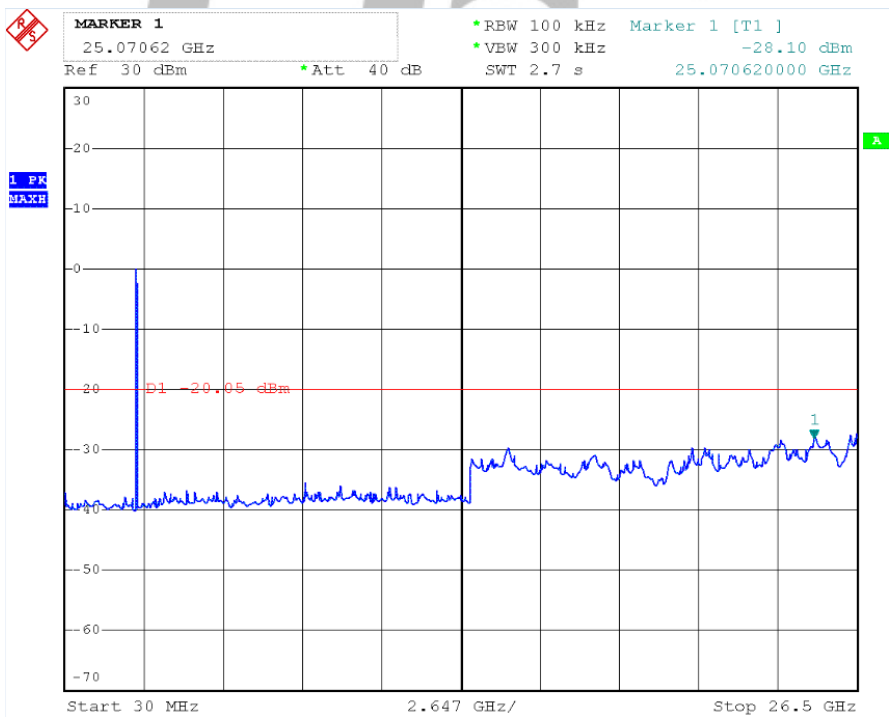
CH Mid



CH High



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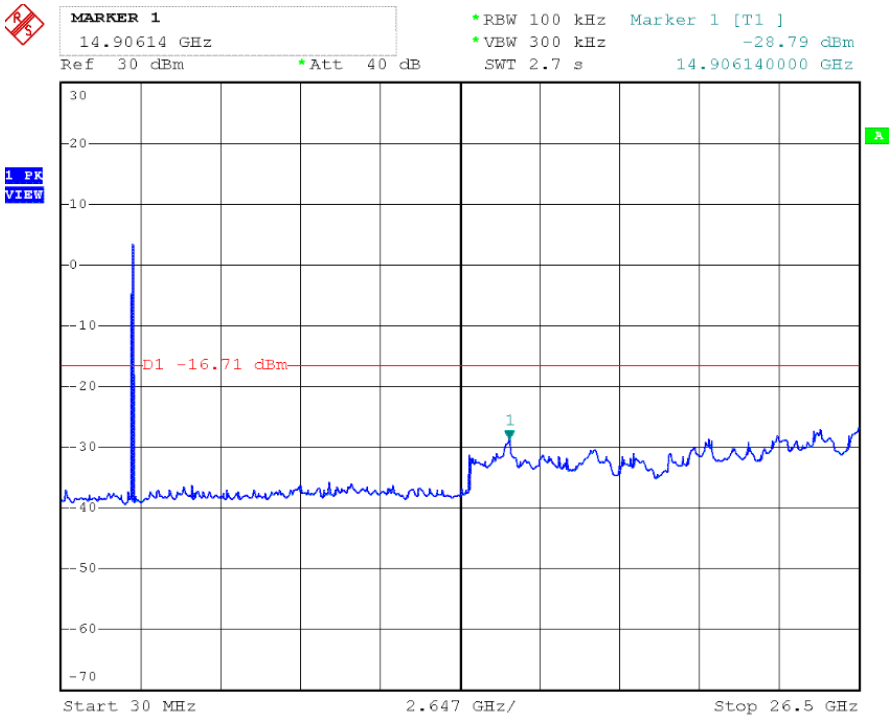
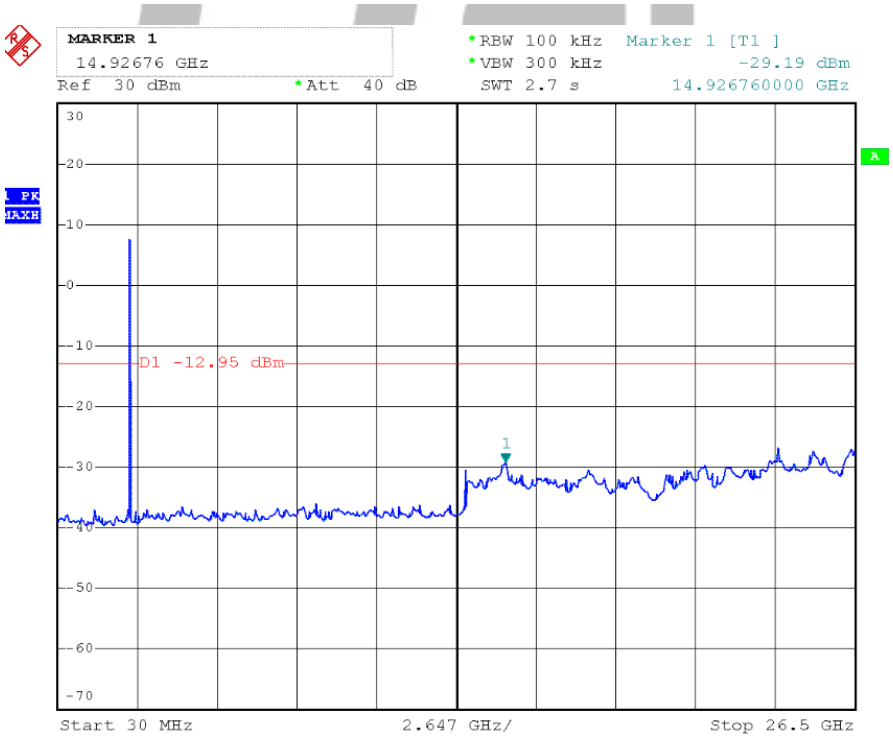
Chain 2:

IEEE 802.11b mode
CH Low



CH Mid



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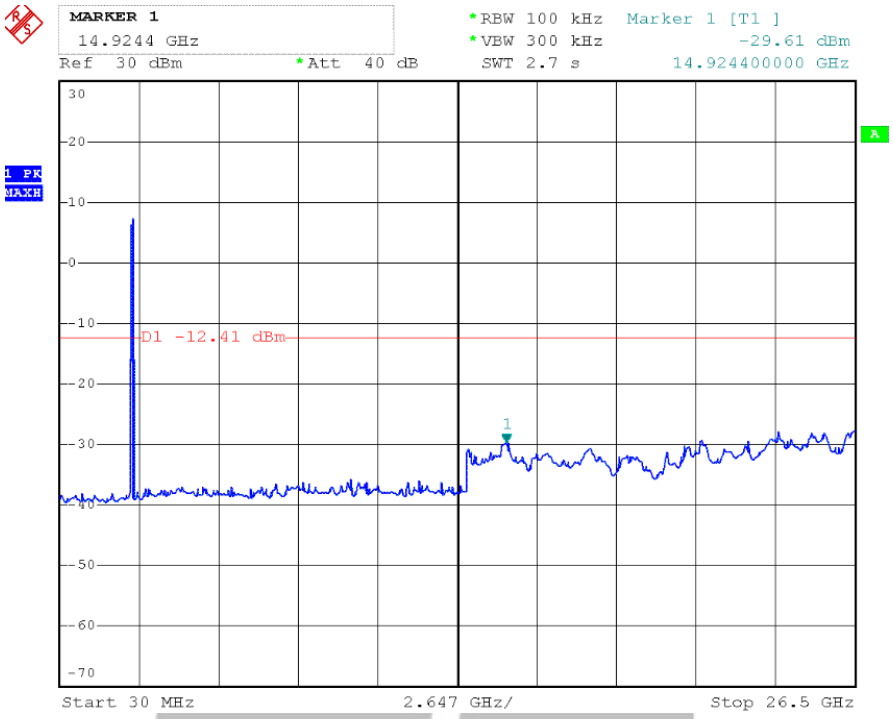
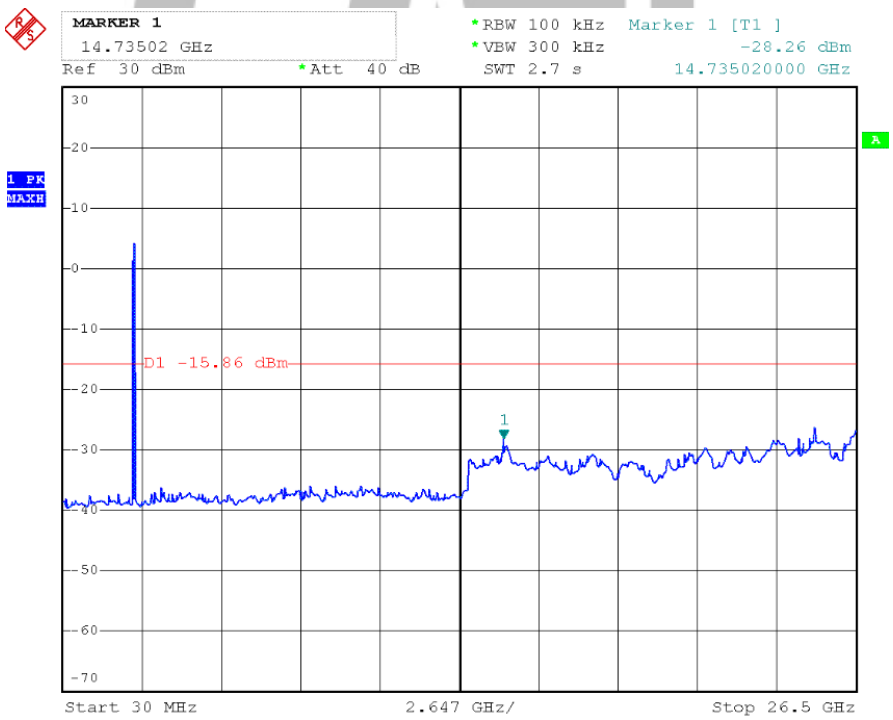
CH High



IEEE 802.11g mode

CH Low



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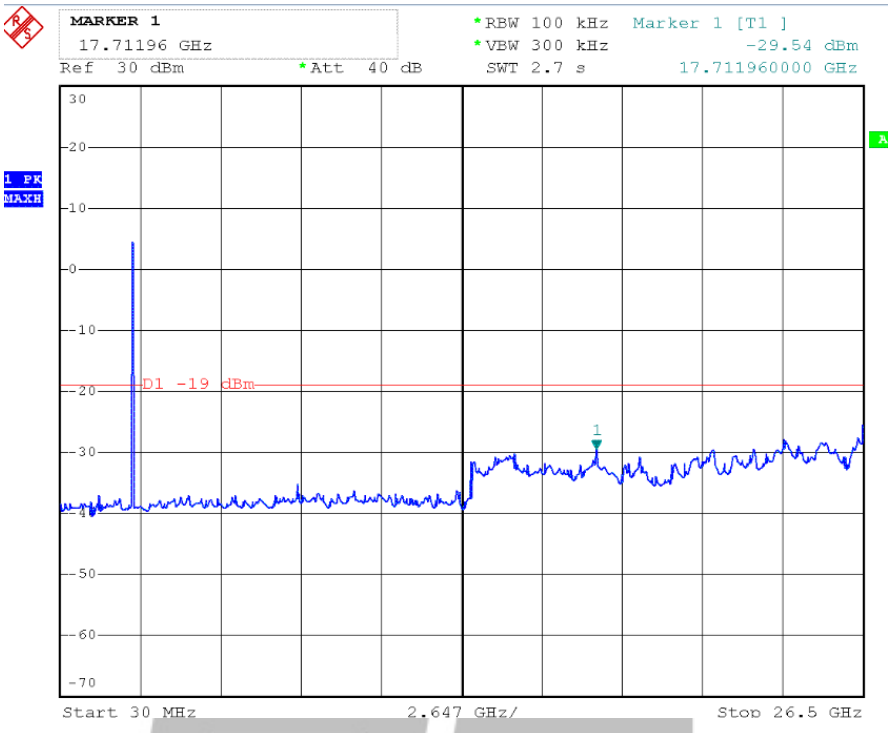
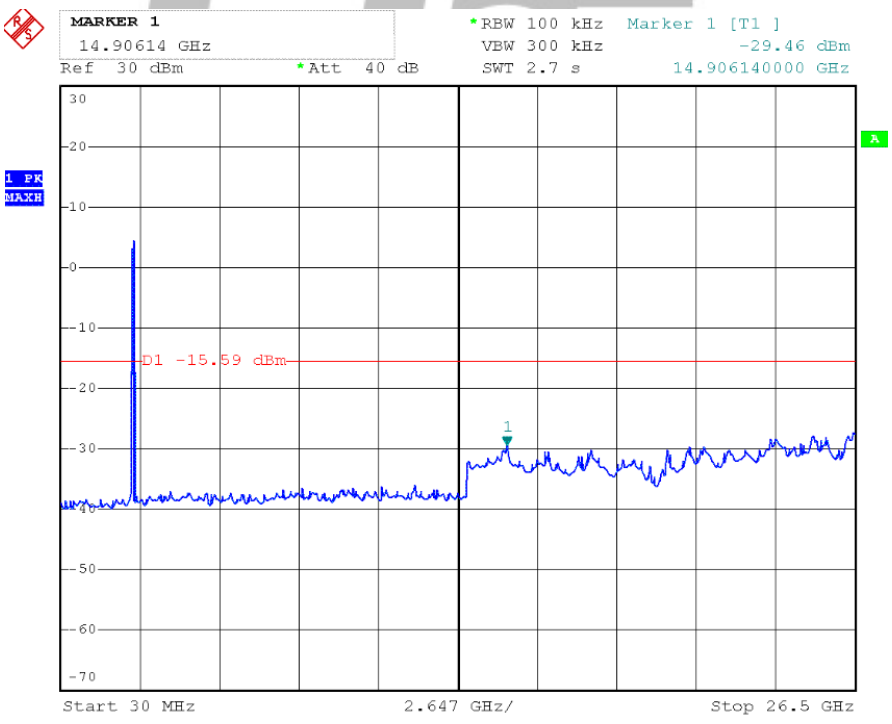
CH Mid



CH High



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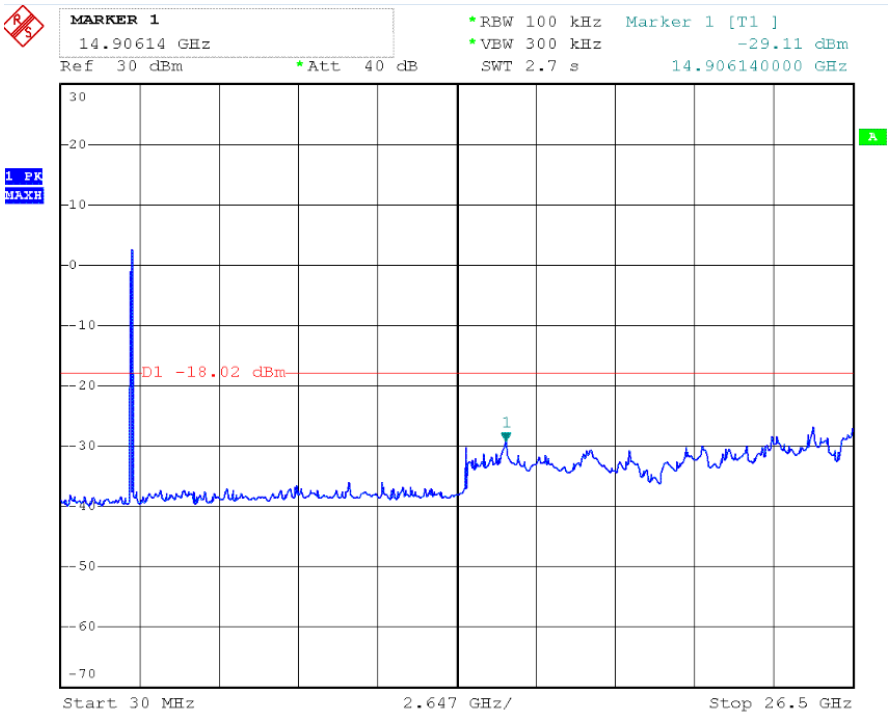
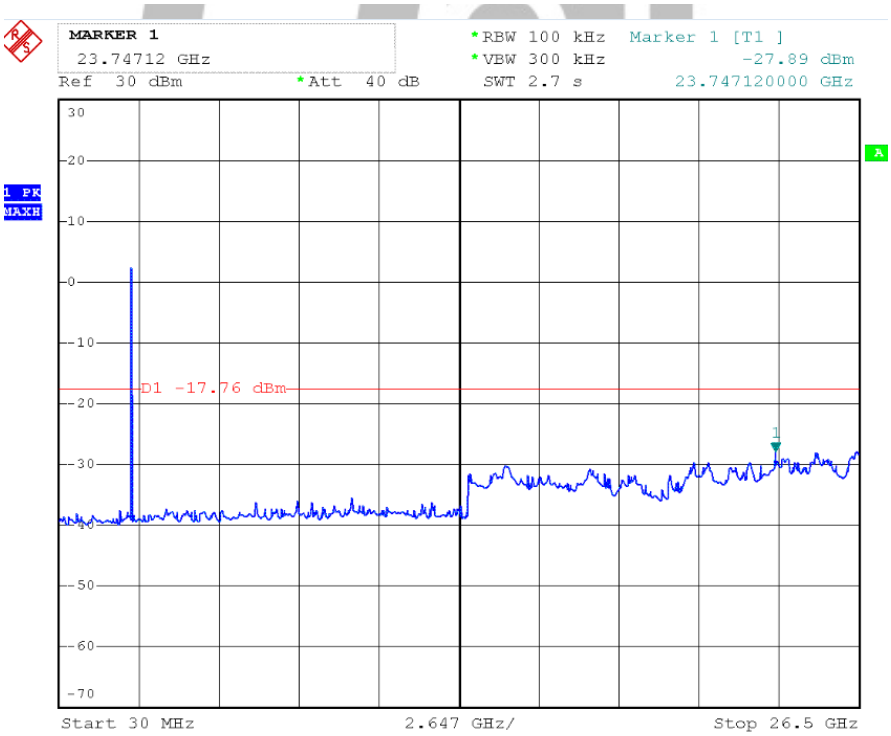
IEEE 802 11n HT20 mode

CH Low



CH Mid



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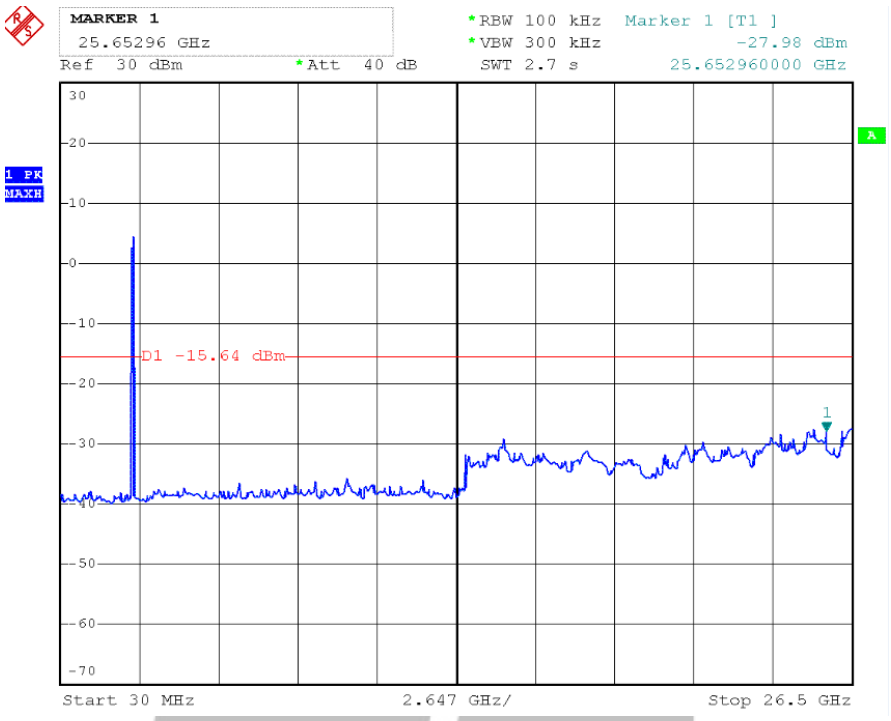
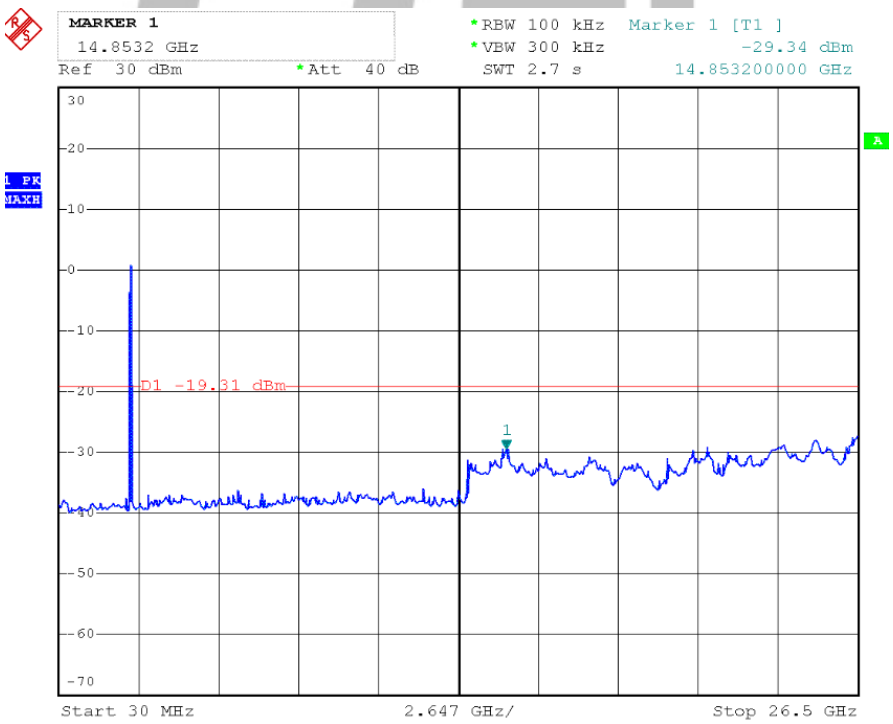
CH High



IEEE 802 11n HT40 mode

CH Low



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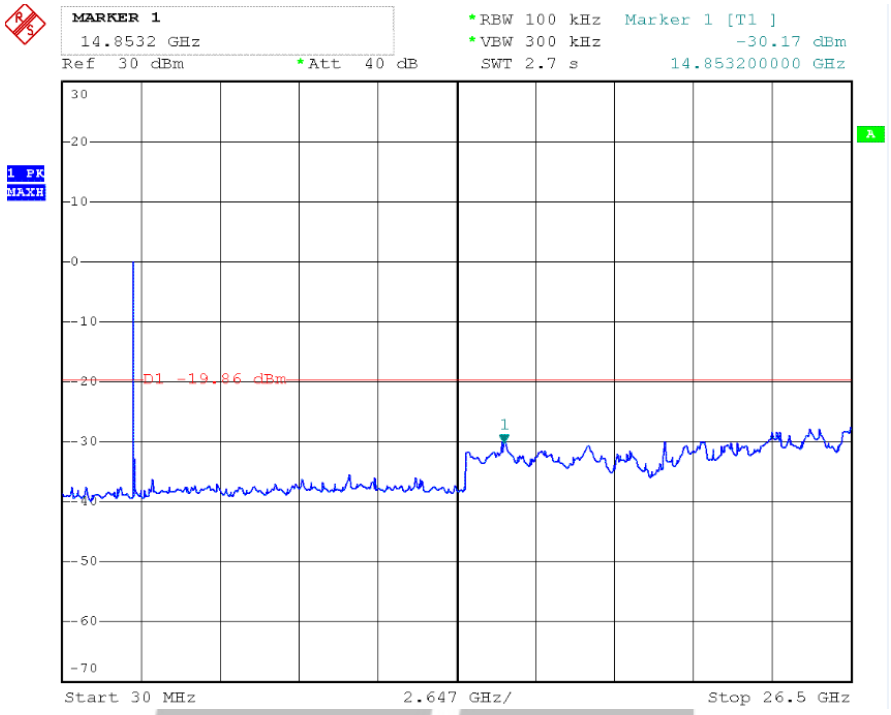
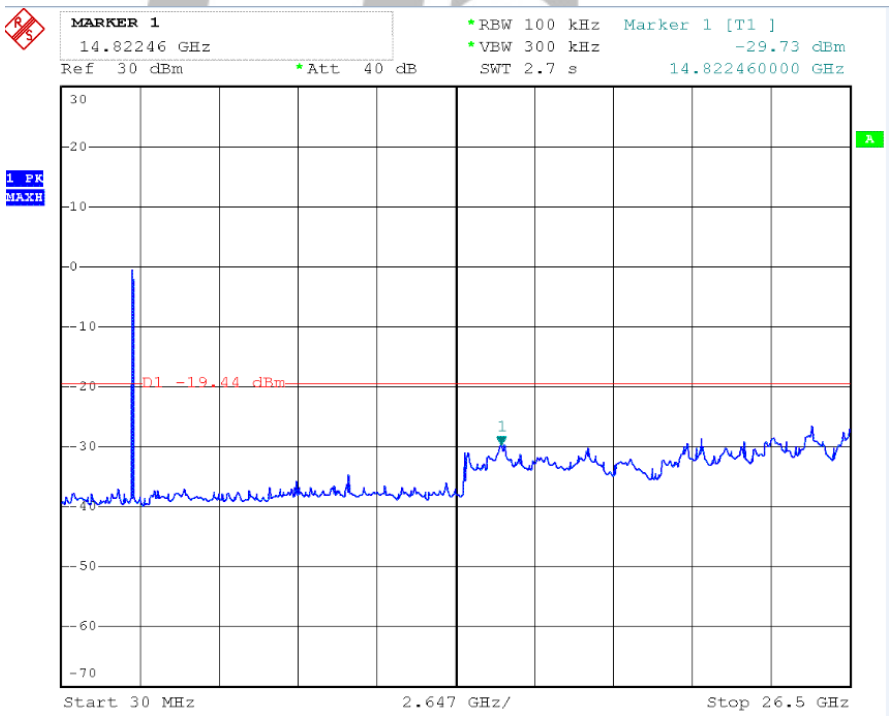
CH Mid



CH High



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9. Test of Radiated Spurious Emission

9.1 Radiated Spurious Emission

Refer to FCC §15.205 and §15.209, IC RSS-247 Clause 5.5

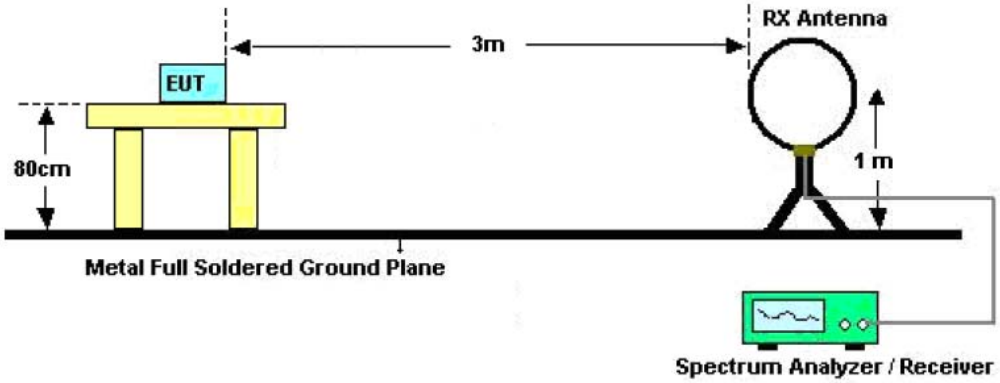
9.1.1 Limits

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

9.1.2 EUT Setup

For radiated emission below 30MHz



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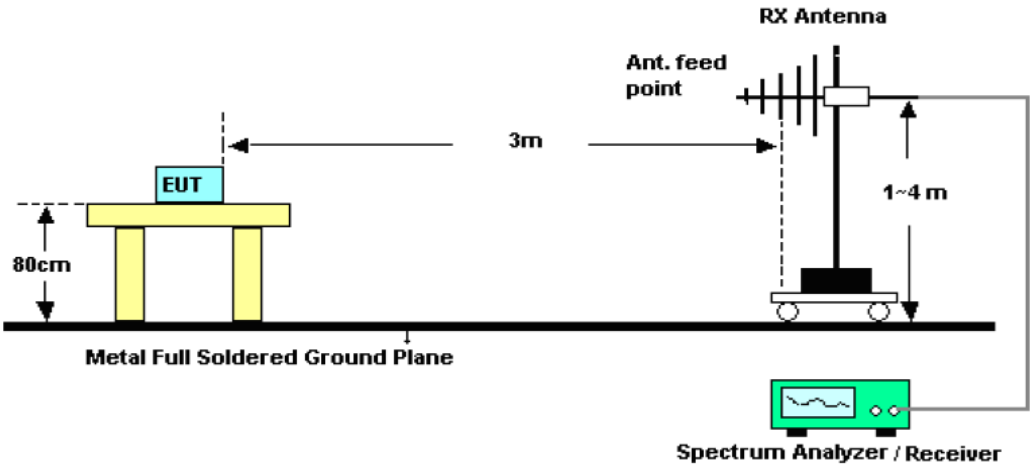
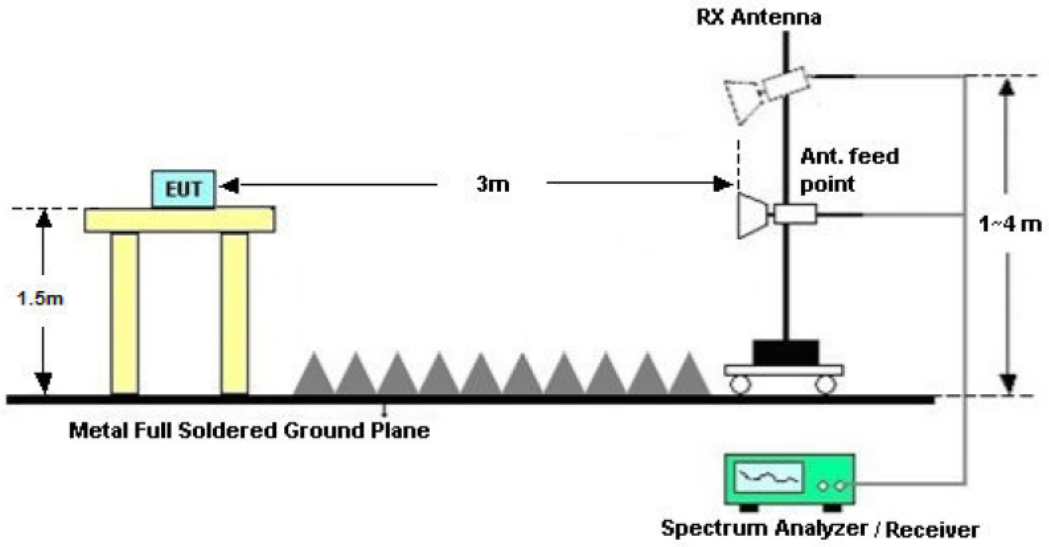
For radiated emission from 30MHz to1GHz



For radiated emission from above1GHz



9.1.3 Test Procedure

KDB 558074 v03r03 – Section 12.1, 12.2.7

Quasi-Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Set RBW = 120kHz(for emissions from 30MHz-1GHz)
3. Detector = Quasi-Peak
4. Trace Mode = max hold.
5. Sweep = auto couple.
6. Trace was allowed to stabilize

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Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Set RBW = 1MHz
3. Set VBW = 3MHz
4. Detector = Peak
5. Trace Mode = max hold.
6. Sweep = auto couple.
7. Trace was allowed to stabilize

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Set RBW = 1MHz
3. Set VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points=1001 (>= 2 x span/RBW)
6. Sweep = auto couple.
7. Trace (RMS) averaging was performed over at least 100 traces

NOTE:

1. Configure the EUT according to ANSI C63.10-2013
2. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
4. For band edge emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.

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9.1.4 Test Result

Temperature (℃) : 22~23	EUT: GL-MT300N-V2
Humidity (%RH): 50~54	M/N: GL-MT300N-V2
Barometric Pressure (mbar): 950~1000	Operation Condition: Charging, Normal operation ,TX Mode

Note:
1. Worst-case radiated emission below 30MHz is IEEE 802 11b TX (CH Low) mode;
2. Worst-case radiated emission below 1GHz is IEEE 802.11g TX (CH Low, Middle, High) mode.
3. Worst-case radiated emission above 1GHz is IEEE 802.11n HT20 TX (CH Low, Middle, High) and IEEE 802 11n HT40 TX (CH Low, Mid, High) mode.
4. Worst-case radiated emission is Antenna 1,so we chose it for the data as follow:

RADIATED EMISSION BELOW 30 MHz

IEEE 802.11 b TX (CH Low) operating Mode:

Frequency	Meter Reading	Antenna Factor	Cable Loss	Emission Levels	Limits	Margin	Detector Mode
(MHz)	(dBμV)	(dB/M)	(dB)	(dBμV/M)	(dB μ V/M)	(dB)	PK/QP
0.5	33.71	8	1.12	42.83	73.6	-30.77	QP
21.07	33.16	8.76	1.26	43.18	69.5	-26.32	QP
25.61	34.48	8.94	1.15	44.57	69.5	-24.93	QP
30.56	34.58	8.12	1.73	44.43	69.5	-25.07	QP

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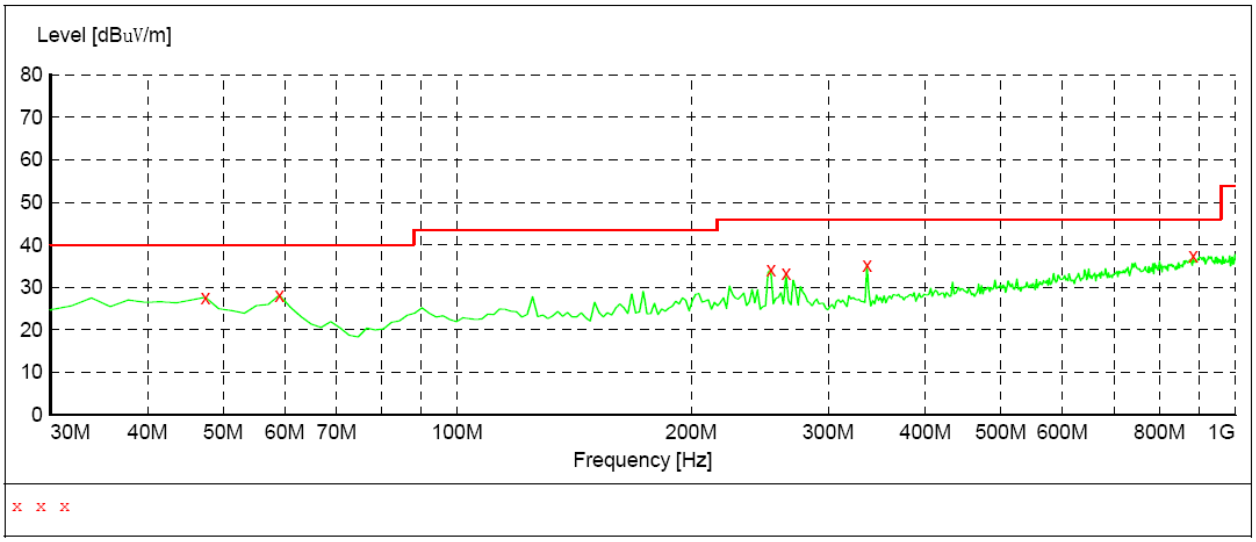
Spurious Emission Below 1GHz: IEEE 802.11g TX (CH Low)

EUT:	GL-MT300N-V2
M/N:	GL-MT300N-V2
Operating Condition:	TX Mode
Test Site:	3m CHAMBER
Operator:	Chen
Test Specification:	DC 5V
Comment:	Polarization: Horizontal

SWEEP TABLE: "test (30M-1G)"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	9163-2015



MEASUREMENT RESULT:

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	27.70	16.7	40.0	12.3	QP	100.0	0.00	HORIZONTAL
59.100000	28.20	15.7	40.0	11.8	QP	100.0	0.00	HORIZONTAL
253.100000	34.20	13.8	46.0	11.8	QP	100.0	0.00	HORIZONTAL
264.740000	33.30	14.7	46.0	12.7	QP	100.0	0.00	HORIZONTAL
336.520000	35.30	16.0	46.0	10.7	QP	100.0	0.00	HORIZONTAL
883.600000	37.50	25.4	46.0	8.5	QP	100.0	0.00	HORIZONTAL

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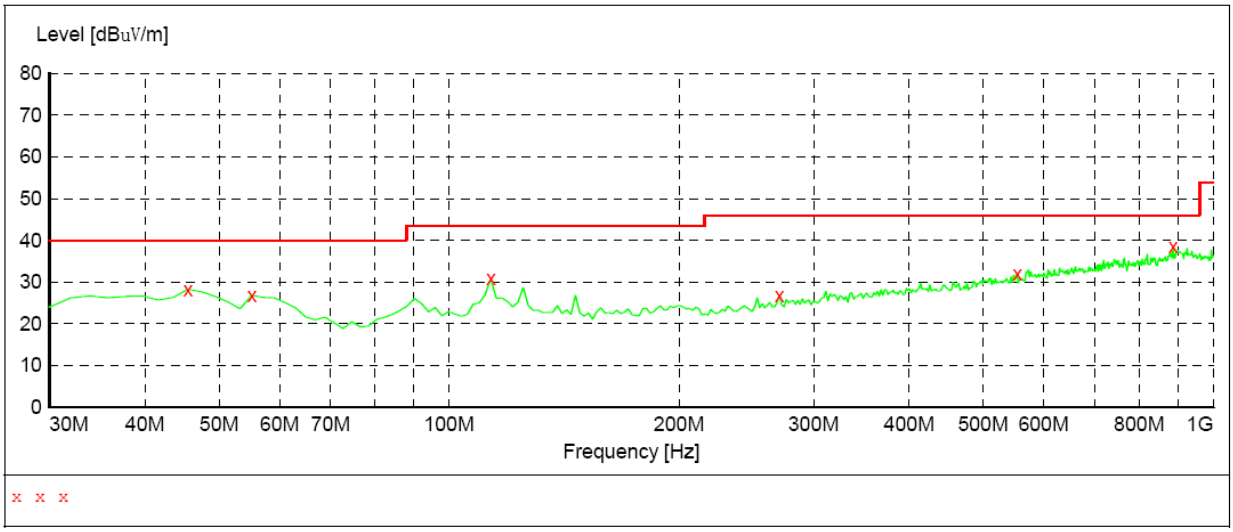
Spurious Emission Below 1GHz : IEEE 802.11g TX (CH Low)

EUT:	GL-MT300N-V2
M/N:	GL-MT300N-V2
Operating Condition:	TX Mode
Test Site:	3m CHAMBER
Operator:	Chen
Test Specification:	DC 5V
Comment:	Polarization: Vertical

SWEEP TABLE: "test (30M-1G)"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	9163-2015



MEASUREMENT RESULT:

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
45.520000	28.30	16.8	40.0	11.7	QP	100.0	0.00	VERTICAL
55.220000	26.90	15.1	40.0	13.1	QP	100.0	0.00	VERTICAL
113.420000	30.80	12.5	43.5	12.7	QP	100.0	0.00	VERTICAL
270.560000	26.80	14.9	46.0	19.2	QP	100.0	0.00	VERTICAL
553.800000	32.00	20.4	46.0	14.0	QP	100.0	0.00	VERTICAL
885.540000	38.60	25.4	46.0	7.4	QP	100.0	0.00	VERTICAL

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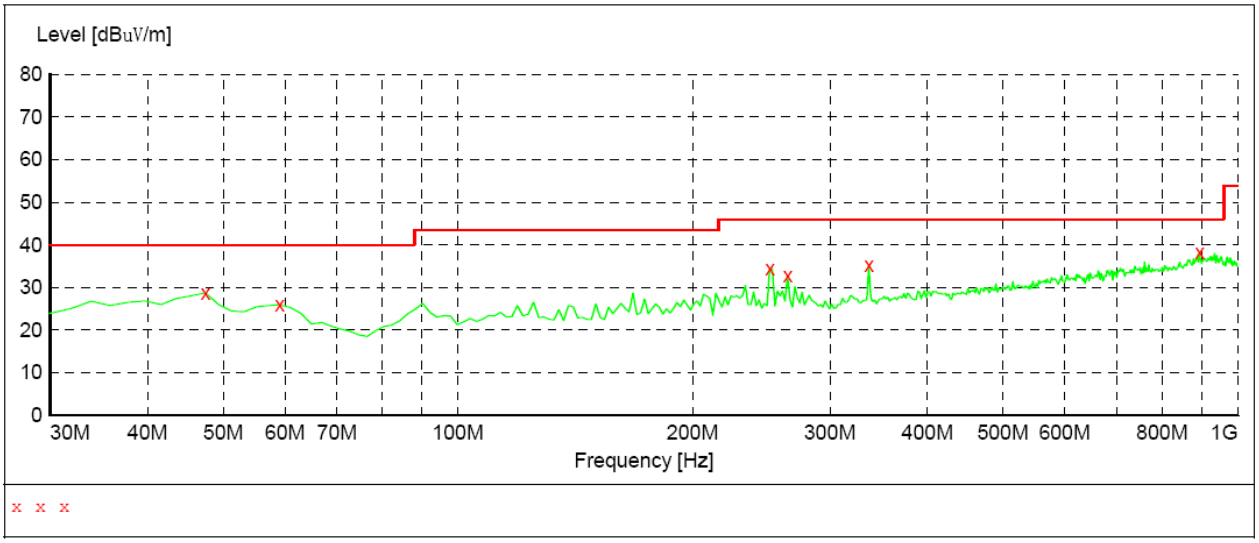
Spurious Emission Below 1GHz: IEEE 802.11g TX (CH Mid)

EUT:	GL-MT300N-V2
M/N:	GL-MT300N-V2
Operating Condition:	TX Mode
Test Site:	3m CHAMBER
Operator:	Chen
Test Specification:	DC 5V
Comment:	Polarization: Horizontal

SWEEP TABLE: "test (30M-1G)"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	9163-2015



MEASUREMENT RESULT:

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	28.80	16.7	40.0	11.2	QP	100.0	0.00	HORIZONTAL
59.100000	25.90	15.7	40.0	14.1	QP	300.0	0.00	HORIZONTAL
251.160000	34.40	13.8	46.0	11.6	QP	100.0	0.00	HORIZONTAL
264.740000	32.90	14.7	46.0	13.1	QP	100.0	0.00	HORIZONTAL
336.520000	35.30	16.0	46.0	10.7	QP	100.0	0.00	HORIZONTAL
893.300000	38.30	25.6	46.0	7.7	QP	100.0	0.00	HORIZONTAL

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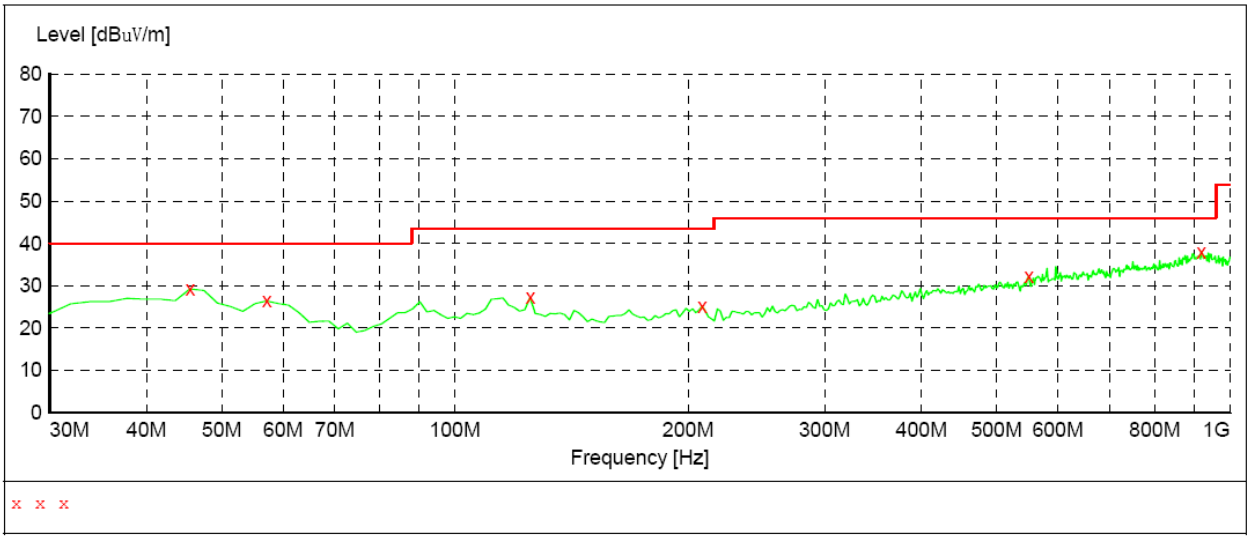
Spurious Emission Below 1GHz: IEEE 802.11g TX (CH Mid)

EUT:	GL-MT300N-V2
M/N:	GL-MT300N-V2
Operating Condition:	TX Mode
Test Site:	3m CHAMBER
Operator:	Chen
Test Specification:	DC 5V
Comment:	Polarization: Vertical

SWEEP TABLE: "test (30M-1G)"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	9163-2015



MEASUREMENT RESULT:

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
45.520000	29.20	16.8	40.0	10.8	QP	300.0	0.00	VERTICAL
57.160000	26.40	15.7	40.0	13.6	QP	100.0	0.00	VERTICAL
125.060000	27.20	13.0	43.5	16.3	QP	100.0	0.00	VERTICAL
208.480000	25.20	14.1	43.5	18.3	QP	100.0	0.00	VERTICAL
549.920000	32.20	20.5	46.0	13.8	QP	100.0	0.00	VERTICAL
918.520000	38.00	25.7	46.0	8.0	QP	100.0	0.00	VERTICAL

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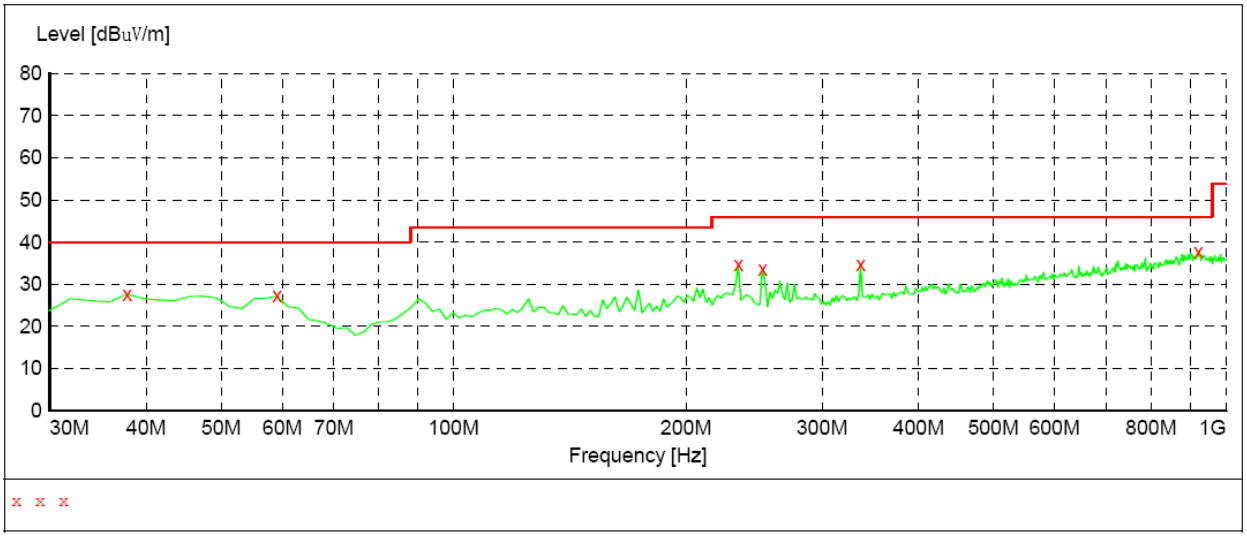
Spurious Emission Below 1GHz: IEEE 802.11g TX (CH High)

EUT:	GL-MT300N-V2
M/N:	GL-MT300N-V2
Operating Condition:	TX Mode
Test Site:	3m CHAMBER
Operator:	Chen
Test Specification:	DC 5V
Comment:	Polarization: Horizontal

SWEEP TABLE: "test (30M-1G)"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	9163-2015



MEASUREMENT RESULT:

4

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
37.760000	27.60	13.7	40.0	12.4	QP	300.0	0.00	HORIZONTAL
59.100000	27.20	15.7	40.0	12.8	QP	100.0	0.00	HORIZONTAL
233.700000	34.60	13.3	46.0	11.4	QP	300.0	0.00	HORIZONTAL
251.160000	33.60	13.8	46.0	12.4	QP	100.0	0.00	HORIZONTAL
336.520000	34.80	16.0	46.0	11.2	QP	100.0	0.00	HORIZONTAL
920.460000	37.80	25.7	46.0	8.2	QP	100.0	0.00	HORIZONTAL

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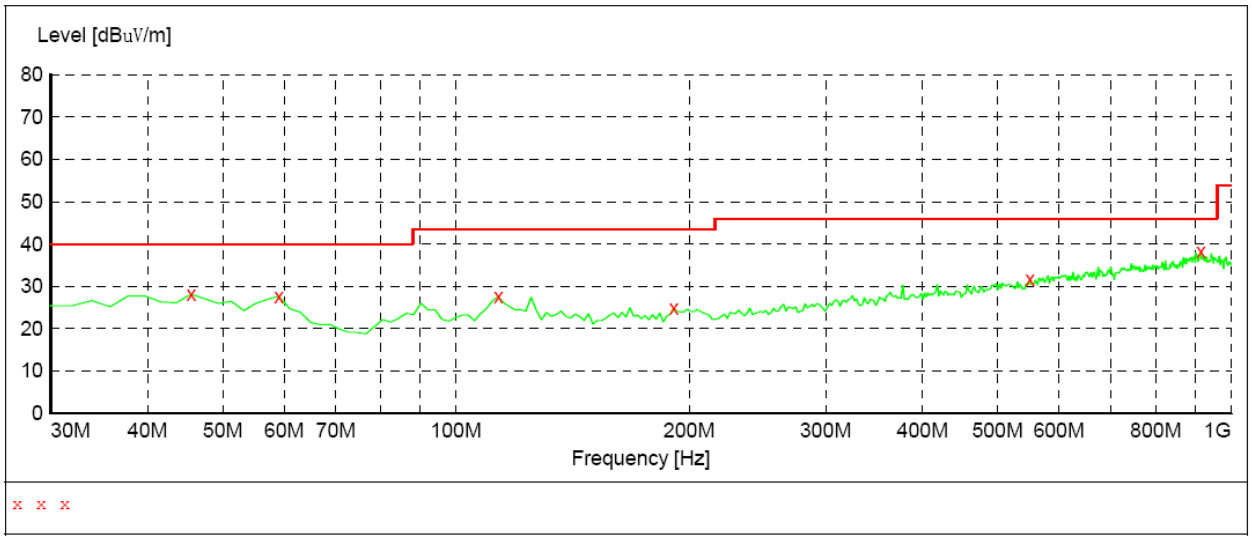
Spurious Emission Below 1GHz: IEEE 802.11g TX (CH High)

EUT:	GL-MT300N-V2
M/N:	GL-MT300N-V2
Operating Condition:	TX Mode
Test Site:	3m CHAMBER
Operator:	Chen
Test Specification:	DC 5V
Comment:	Polarization: Vertical

SWEEP TABLE: "test (30M-1G)"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	9163-2015



MEASUREMENT RESULT:

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
45.520000	28.10	16.8	40.0	11.9	QP	100.0	0.00	VERTICAL
59.100000	27.70	15.7	40.0	12.3	QP	100.0	0.00	VERTICAL
113.420000	27.60	12.5	43.5	15.9	QP	100.0	0.00	VERTICAL
191.020000	25.00	13.6	43.5	18.5	QP	100.0	0.00	VERTICAL
549.920000	31.80	20.5	46.0	14.2	QP	100.0	0.00	VERTICAL
914.640000	38.20	25.8	46.0	7.8	QP	100.0	0.00	VERTICAL

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RADIATED EMISSION ABOVE 1 GHz

IEEE 802.11n HT20 TX (CH Low)

Channel Low（2412MHz）								
Maximum Frequency (MHz)	Polarity and Level					Limit (dBμV/m)	Margin (dBμV/m)	Mark (P/Q/A)
	Polarity	Height (m)	Reading dBμV	Transd	Result dBμV/m			
1380.66	H	1	54.91	-7.96	46.95	74	-27.05	P
			42.15	-7.96	34.19	54	-19.81	A
1380.22	V	1	54.33	-7.96	46.37	74	-27.63	P
			41.76	-7.96	33.8	54	-20.2	A
2412	H	1	112.07	-6.46	105.61	----	----	P
			101.46	-6.46	95	----	----	A
2412	V	1	114.06	-6.46	107.6	----	----	P
			103.26	-6.46	96.8	----	----	A
4824	H	1	49.53	0.53	50.06	74	-23.94	P
			39.15	0.53	39.68	54	-14.32	A
4824	V	1	50.35	0.53	50.88	74	-23.12	P
			39.06	0.53	39.59	54	-14.41	A
7236	H	1	49.43	7.42	56.85	74	-17.15	P
			39.52	7.42	46.94	54	-7.06	A
7236	V	1	50.22	7.42	57.64	74	-16.36	P
			39.63	7.42	47.05	54	-6.95	A
11145.34	H	1	----	----	----	----	----	----
			----	----	----	----	----	----
16327.65	----	----	----	----	----	----	----	----
25376.32	----	----	----	----	----	----	----	----

Remark: 1.Transd=Antenna Factor + Cable Loss - Pre-amplifier
Margin = Level-Limit
Mark: P means Peak Value, Q means Quasi Peak Value, A means Average Value
2. Data of measurement within this frequency range shown " -" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=3MHz, A(Average): RBW=1MHz, VBW=3MHz.
4. The test limit distance is 3m limit

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IEEE 802.11 n HT20 TX (CH Middle)

Channel Middle（2437MHz）								
Maximum Frequency (MHz)	Polarity and Level					Limit (dBμV/m)	Margin (dBμV/m)	Mark (P/Q/A)
	Polarity	Height (m)	Reading dBμV	Transd	Result dBμV/m			
1326.33	H	1	54.42	-8.95	45.47	74	-28.53	P
			42.94	-8.54	34.4	54	-19.6	A
1326.22	V	1	55.85	-8.54	47.31	74	-26.69	P
			43.16	-8.54	34.62	54	-19.38	A
2437	H	1	111.82	-6.68	105.14	----	----	P
			102.34	-6.68	95.66	----	----	A
2437	V	1	115.32	-6.68	108.64	----	----	P
			103.85	-6.68	97.17	----	----	A
4874	H	1	51.01	0.44	51.45	74	-22.55	P
			40.32	0.44	40.76	54	-13.24	A
4874	V	1	51.14	0.44	51.58	74	-22.42	P
			40.34	0.44	40.78	54	-13.22	A
7311	H	1	50.21	7.17	57.38	74	-16.62	P
			39.85	7.17	47.02	54	-6.98	A
7311	V	1	50.32	7.17	57.49	74	-16.51	P
			40.23	7.17	47.4	54	-6.6	A
11238.52	H	1	----	----	----	----	----	----
			----	----	----	----	----	----
16327.71	----	----	----	----	----	----	----	----
25376.58	----	----	----	----	----	----	----	----

Remark: 1.Transd=Antenna Factor + Cable Loss - Pre-amplifier
Margin = Level-Limit
Mark: P means Peak Value, Q means Quasi Peak Value, A means Average Value
2. Data of measurement within this frequency range shown " -" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=3MHz, A(Average): RBW=1MHz, VBW=3MHz.
4. The test limit distance is 3m limit

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IEEE 802.11 n HT20 TX (CH High)

Channel High（2462MHz）								
Maximum Frequency (MHz)	Polarity and Level					Limit (dBμV/m)	Margin (dBμV/m)	Mark (P/Q/A)
	Polarity	Height (m)	Reading dBμV	Transd	Result dBμV/m			
1312.66	H	1	55.43	-8.21	47.22	74	-26.78	P
			43.65	-8.21	35.44	54	-18.56	A
1311.67	V	1	56.14	-8.21	47.93	74	-26.07	P
			44.23	-8.21	36.02	54	-17.98	A
2462	H	1	111.34	-6.26	105.08	----	----	P
			101.45	-6.26	95.19	----	----	A
2462	V	1	114.34	-6.26	108.08	----	----	P
			102.38	-6.26	96.12	----	----	A
4924	H	1	50.37	0.99	51.36	74	-22.64	P
			40.18	0.99	41.17	54	-12.83	A
4924	V	1	53.17	0.99	54.16	74	-19.84	P
			41.49	0.99	42.48	54	-11.52	A
7386	H	1	51.38	7.58	58.96	74	-15.04	P
			40.45	7.58	48.03	54	-5.97	A
7386	V	1	50.23	7.58	57.81	74	-16.19	P
			40.18	7.58	47.76	54	-6.24	A
11243.58	H	1	----	----	----	----	----	----
			----	----	----	----	----	----
16327.45	----	----	----	----	----	----	----	----
25376.26	----	----	----	----	----	----	----	----

Remark: 1.Transd=Antenna Factor + Cable Loss - Pre-amplifier
Margin = Level-Limit
Mark: P means Peak Value, Q means Quasi Peak Value, A means Average Value
2. Data of measurement within this frequency range shown " -" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=3MHz, A(Average): RBW=1MHz, VBW=3MHz.
4. The test limit distance is 3m limit

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IEEE 802 11n HT40 TX (CH Low)

Channel Low（2422MHz）								
Maximum Frequency (MHz)	Polarity and Level					Limit (dBμV/m)	Margin (dBμV/m)	Mark (P/Q/A)
	Polarity	Height (m)	Reading dBμV	Transd	Result dBμV/m			
1382	H	1	55.06	-8.77	46.29	74	-27.71	P
			42.15	-8.77	33.38	54	-20.62	A
1364	V	1	55.15	-8.77	46.38	74	-27.62	P
			41.53	-8.77	32.76	54	-21.24	A
2412	H	1	115.03	-7.27	107.76	----	----	P
			108.33	-7.27	101.06	----	----	A
2412	V	1	119.03	-7.27	111.76	----	----	P
			109.04	-7.27	101.77	----	----	A
4824	H	1	39.06	-0.28	38.78	54	-15.22	P
			51.5	-0.28	51.22	74	-22.78	A
4824	V	1	39.01	-0.28	38.73	54	-15.27	P
			48.94	6.61	55.55	74	-18.45	A
7236	H	1	39.42	6.61	46.03	54	-7.97	P
			48.94	6.61	55.55	74	-18.45	A
7236	V	1	39.25	6.61	45.86	54	-8.14	P
			39.06	-0.28	38.78	54	-15.22	A
11145.34	H	1	----	----	----	----	----	----
			----	----	----	----	----	----
16327.65	----	----	----	----	----	----	----	----
25376.32	----	----	----	----	----	----	----	----

Remark: 1.Transd=Antenna Factor + Cable Loss - Pre-amplifier
Margin = Level-Limit
Mark: P means Peak Value, Q means Quasi Peak Value, A means Average Value
2. Data of measurement within this frequency range shown " -" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=3MHz, A(Average): RBW=1MHz, VBW=3MHz.
4. The test limit distance is 3m limit

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IEEE 802 11n HT40TX (CH Middle)

Channel Middle（2437MHz）								
Maximum Frequency (MHz)	Polarity and Level					Limit (dBμV/m)	Margin (dBμV/m)	Mark (P/Q/A)
	Polarity	Height (m)	Reading dBμV	Transd	Result dBμV/m			
1310.26	H	1	56.68	-8.56	48.12	74	-25.88	P
			43.77	-8.56	35.21	54	-18.79	A
1310.88	V	1	56.77	-8.56	48.21	74	-25.79	P
			43.15	-8.56	34.59	54	-19.41	A
2437	H	1	116.65	-7.06	109.59	----	----	P
			109.95	-7.06	102.89	----	----	A
2437	V	1	120.65	-7.06	113.59	----	----	P
			110.66	-7.06	103.6	----	----	A
4874	H	1	51.7	-0.07	51.63	74	-22.37	P
			40.68	-0.07	40.61	54	-13.39	A
4874	V	1	53.12	-0.07	53.05	74	-20.95	P
			40.63	-0.07	40.56	54	-13.44	A
7311	H	1	50.56	6.82	57.38	74	-16.62	P
			41.04	6.82	47.86	54	-6.14	A
7311	V	1	50.56	6.82	57.38	74	-16.62	P
			40.87	6.82	47.69	54	-6.31	A
11238.52	H	1	----	----	----	----	----	----
			----	----	----	----	----	----
16327.71	----	----	----	----	----	----	----	----
25376.58	----	----	----	----	----	----	----	----

Remark: 1.Transd=Antenna Factor + Cable Loss - Pre-amplifier
Margin = Level-Limit
Mark: P means Peak Value, Q means Quasi Peak Value, A means Average Value
2. Data of measurement within this frequency range shown " -" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=3MHz, A(Average): RBW=1MHz, VBW=3MHz.
4. The test limit distance is 3m limit

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IEEE 802 11n HT40TX (CH High)

Channel High（2452MHz）								
Maximum Frequency (MHz)	Polarity and Level					Limit (dBμV/m)	Margin (dBμV/m)	Mark (P/Q/A)
	Polarity	Height (m)	Reading dBμV	Transd	Result dBμV/m			
1318.66	H	1	56.24	-8.76	47.48	74	-26.52	P
			44.14	-8.76	35.38	54	-18.62	A
1318.66	V	1	56.74	-8.76	47.98	74	-26.02	P
			44.25	-8.76	35.49	54	-18.51	A
2462	H	1	119.21	-6.81	112.4	----	----	P
			106.21	-6.81	99.4	----	----	A
2462	V	1	120.74	-6.81	113.93	----	----	P
			109.95	-6.81	103.14	----	----	A
4924	H	1	51.54	0.44	51.98	74	-22.02	P
			41.21	0.44	41.65	54	-12.35	A
4924	V	1	55.06	0.44	55.5	74	-18.5	P
			42.2	0.44	42.64	54	-11.36	A
7386	H	1	50.95	7.03	57.98	74	-16.02	P
			40.71	7.03	47.74	54	-6.26	A
7386	V	1	50.31	7.03	57.34	74	-16.66	P
			40.22	7.03	47.25	54	-6.75	A
11243.58	H	1	----	----	----	----	----	----
			----	----	----	----	----	----
16327.45	----	----	----	----	----	----	----	----
25376.26	----	----	----	----	----	----	----	----

Remark: 1.Transd=Antenna Factor + Cable Loss - Pre-amplifier
Margin = Level-Limit
Mark: P means Peak Value, Q means Quasi Peak Value, A means Average Value
2. Data of measurement within this frequency range shown " -" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=3MHz, A(Average): RBW=1MHz, VBW=3MHz.
4. The test limit distance is 3m limit

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10. Test of Band Edges Emission

10.1 Applicable standard

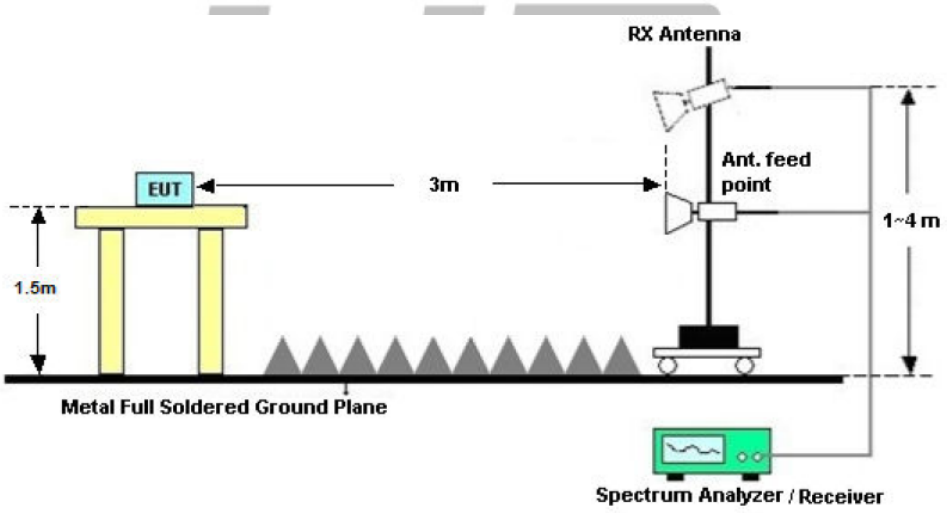
Refer to FCC §15.247 (d), IC RSS-247 Issue1 Clause 5.5

KDB558074 v03r03 – Section 11.3

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. In addition, radiated emissions that fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209.

10.2 EUT Setup

Radiated Measurement Setup



Conducted Measurement Setup

Spectrum Analyzer

10.3 Test Equipment List and Details

See section 2.5.

10.4 Test Procedure

Conducted Measurement

KDB558074 v03r03 – Section 11.3

1.Set the center frequency and span to encompass frequency range to be measured.

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2.Set the RBW = 100 kHz.
3.Set the VBW ≥ 3 x RBW.
4.Detector = peak.
5.Sweep time = auto couple.
6.Trace mode = max hold.
7.Allow trace to fully stabilize.
8.Use the peak marker function to determine the maximum amplitude level.

Radiated Measurement

KDB 558074 v03r03 – Section 12.1, 12.2.7

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Set RBW = 1MHz
3. Set VBW = 3MHz
4. Detector = Peak
5. Trace Mode = max hold.
6. Sweep = auto couple.
7. Trace was allowed to stabilize

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Set RBW = 1MHz
3. Set VBW = 3MHz
4. Detector = power average (RMS)
5. Sweep = auto couple.
6. Trace (RMS) averaging was performed over at least 100 traces

NOTE :

1. Configure the EUT according to ANSI C63.10-2013
2. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
4. For band edge emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.

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10.5 Test Result

Temperature (℃) : 22~23	EUT: GL-MT300N-V2
Humidity (%RH): 50~54	M/N: GL-MT300N-V2
Barometric Pressure (mbar): 950~1000	Operation Condition: Tx Mode

PASS

Chain 1:

Radiated Test Result

IEEE 802.11b mode

Channel	Freq.(MHz)	Level(dBuV)	Limit(dBuV)	Margin(dB)	Detector
	2400	49.36	74	-24.64	Peak
LOW	2400	37.17	54	-16.83	Average
	2483.5	48.4	74	-25.6	Peak
HIGH	2483.5	36.97	54	-17.03	Average

IEEE 802.11g mode

Channel	Freq.(MHz)	Level(dBuV)	Limit(dBuV)	Margin(dB)	Detector
	2400	48.34	74	-25.66	Peak
LOW	2400	36.19	54	-17.81	Average
	2483.5	49.2	74	-24.8	Peak
HIGH	2483.5	36.98	54	-17.02	Average

IEEE 802 11n HT20 mode

Channel	Freq.(MHz)	Level(dBuV)	Limit(dBuV)	Margin(dB)	Detector
	2400	44.93	74	-29.07	Peak
LOW	2400	33.96	54	-20.04	Average
	2483.5	46.97	74	-27.03	Peak
HIGH	2483.5	34.75	54	-19.25	Average

IEEE 802 11n HT40 mode

Channel	Freq.(MHz)	Level(dBuV)	Limit(dBuV)	Margin(dB)	Detector
	2400	44.93	74	-29.07	Peak
LOW	2400	33.96	54	-20.04	Average
	2483.5	46.97	74	-27.03	Peak
HIGH	2483.5	34.75	54	-19.25	Average

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Chain 2:

IEEE 802.11b mode

Channel	Freq.(MHz)	Level(dBuV)	Limit(dBuV)	Margin(dB)	Detector
	2400	49.36	74	-24.64	Peak
LOW	2400	37.17	54	-16.83	Average
	2483.5	48.4	74	-25.6	Peak
HIGH	2483.5	36.97	54	-17.03	Average

IEEE 802.11g mode

Channel	Freq.(MHz)	Level(dBuV)	Limit(dBuV)	Margin(dB)	Detector
	2400	48.34	74	-25.66	Peak
LOW	2400	36.19	54	-17.81	Average
	2483.5	49.2	74	-24.8	Peak
HIGH	2483.5	36.98	54	-17.02	Average

IEEE 802 11n HT20 mode

Channel	Freq.(MHz)	Level(dBuV)	Limit(dBuV)	Margin(dB)	Detector
	2400	44.93	74	-29.07	Peak
LOW	2400	33.96	54	-20.04	Average
	2483.5	46.97	74	-27.03	Peak
HIGH	2483.5	34.75	54	-19.25	Average

IEEE 802 11n HT40 mode

Channel	Freq.(MHz)	Level(dBuV)	Limit(dBuV)	Margin(dB)	Detector
	2400	44.93	74	-29.07	Peak
LOW	2400	33.96	54	-20.04	Average
	2483.5	46.97	74	-27.03	Peak
HIGH	2483.5	34.75	54	-19.25	Average

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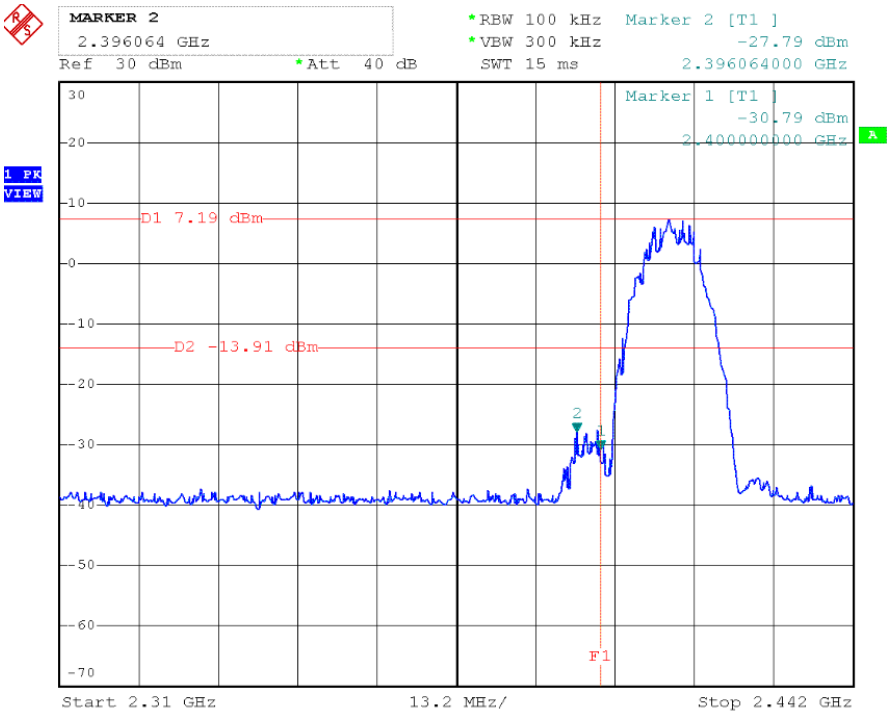
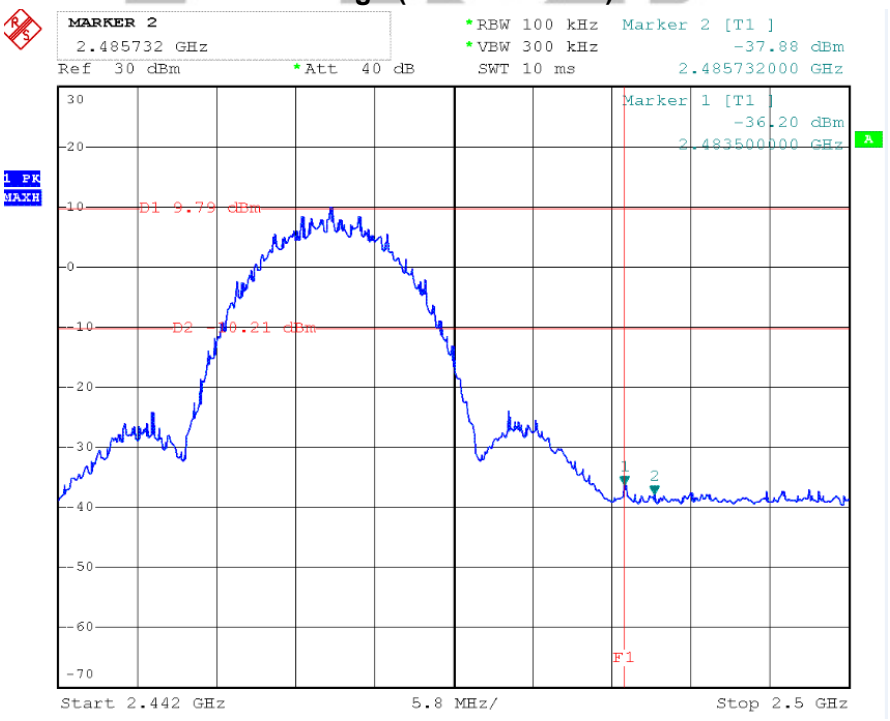
Chain 1:

Test of Conducted band edges

CH Low (802.11b MODE)



CH High (802.11b MODE)



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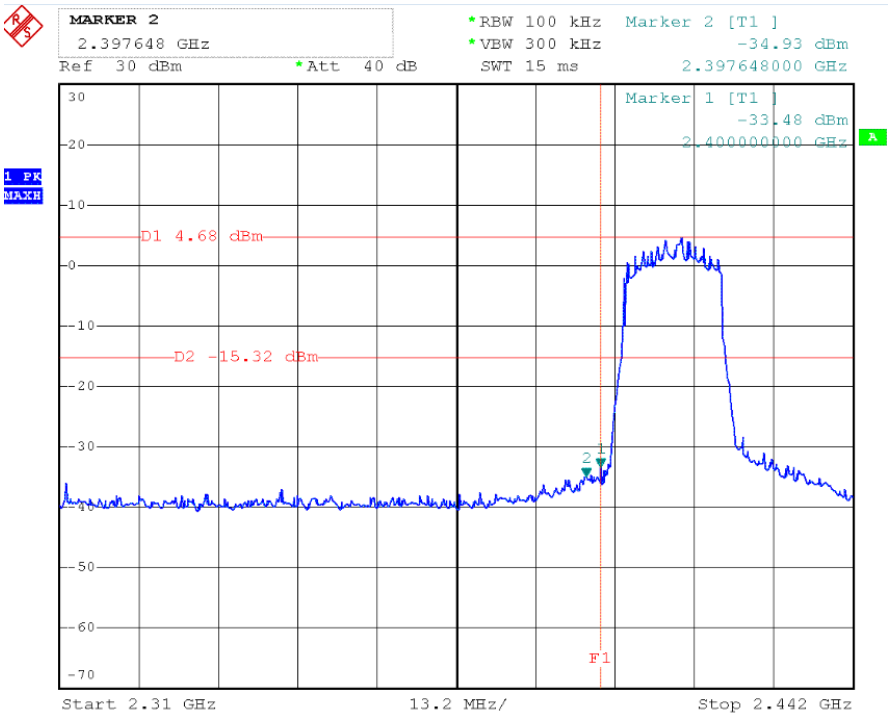
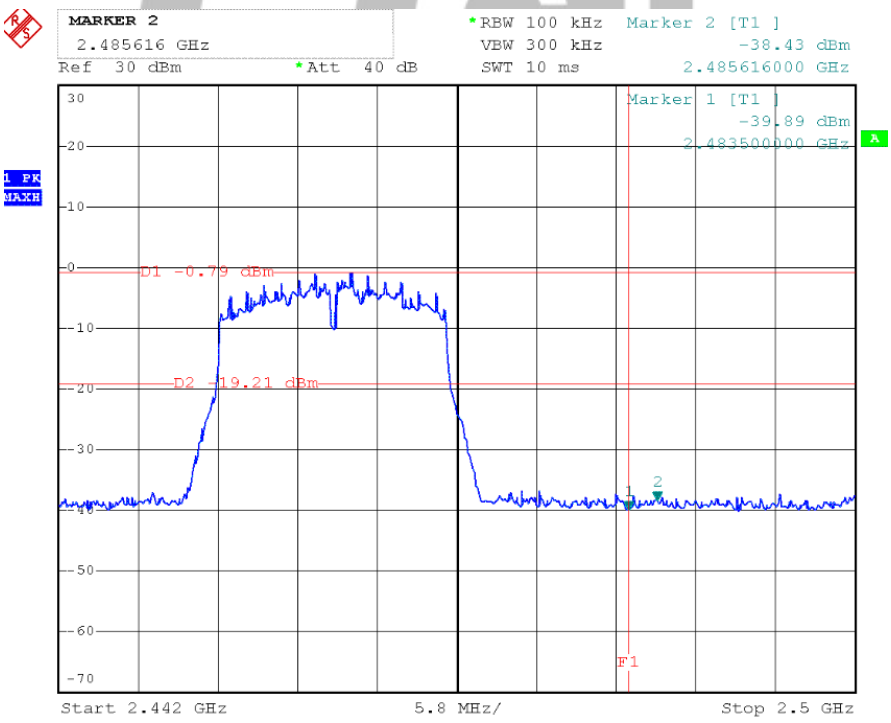
CH Low (802.11g MODE)



CH High (802.11g MODE)



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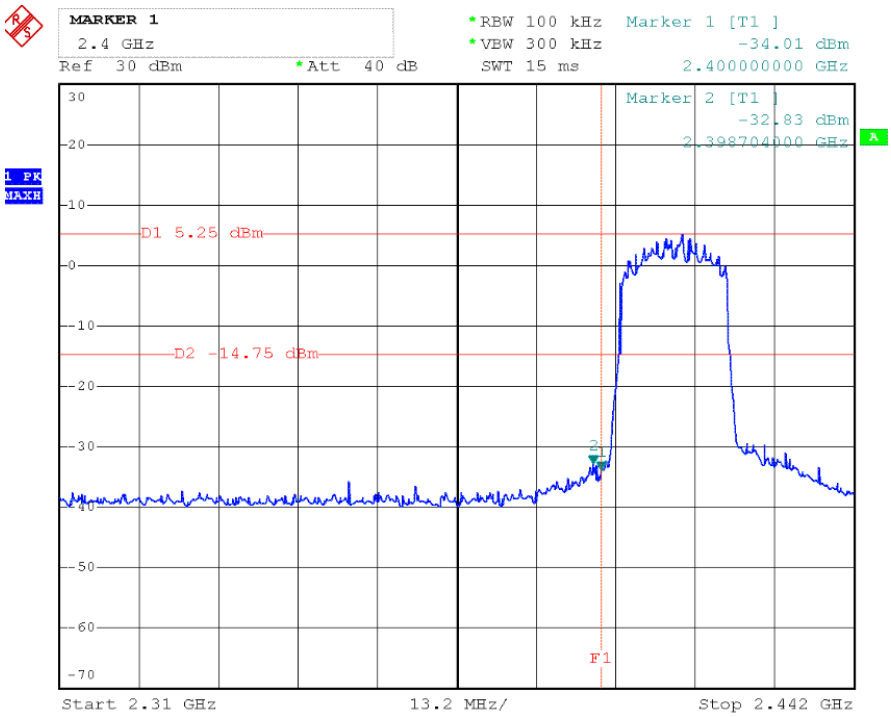
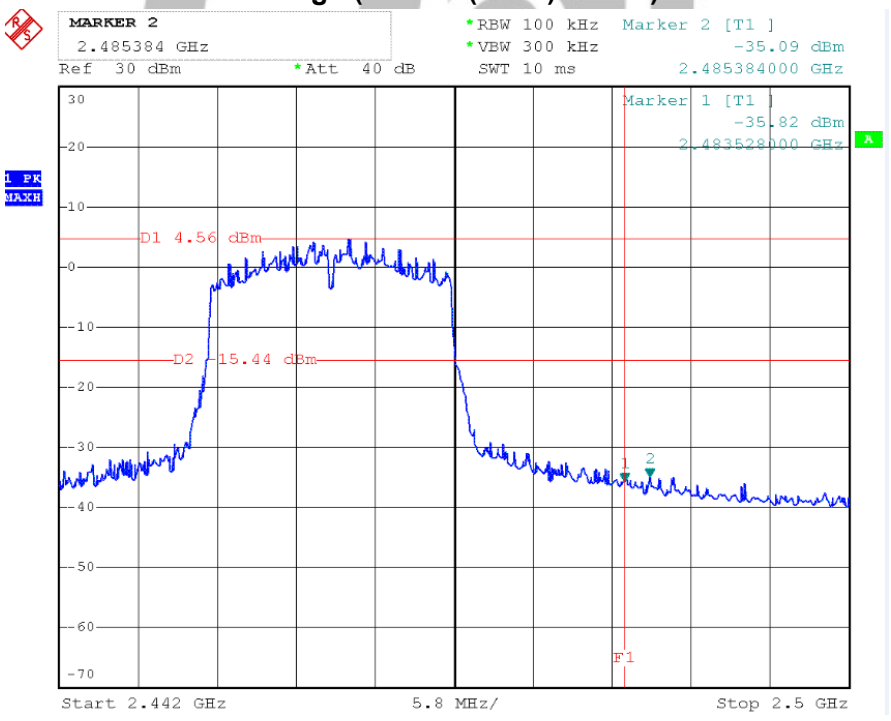
CH Low (802.11n(HT20) MODE)



CH High (802.11n(HT20) MODE)



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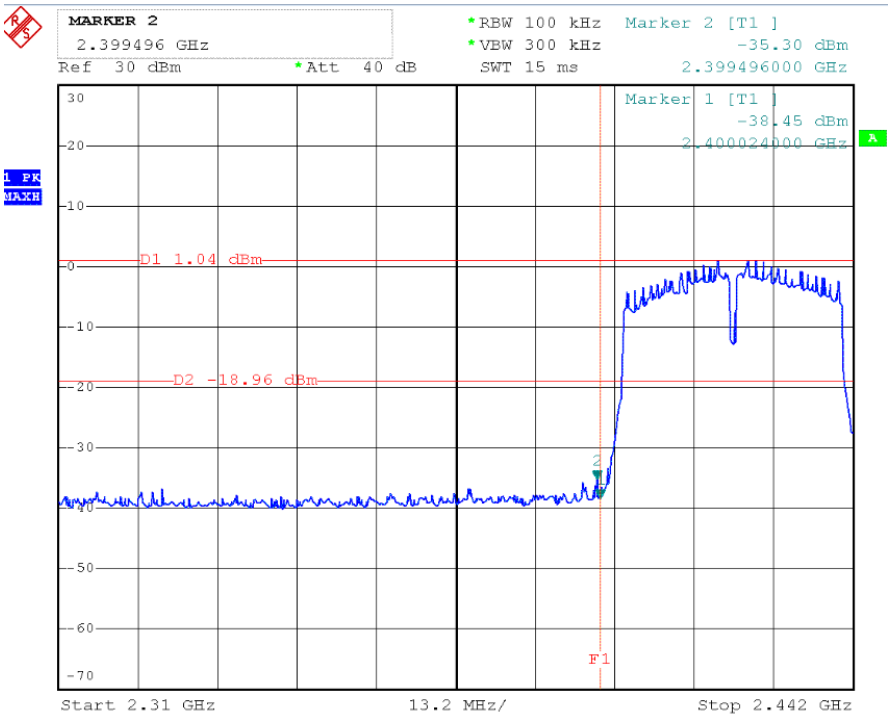
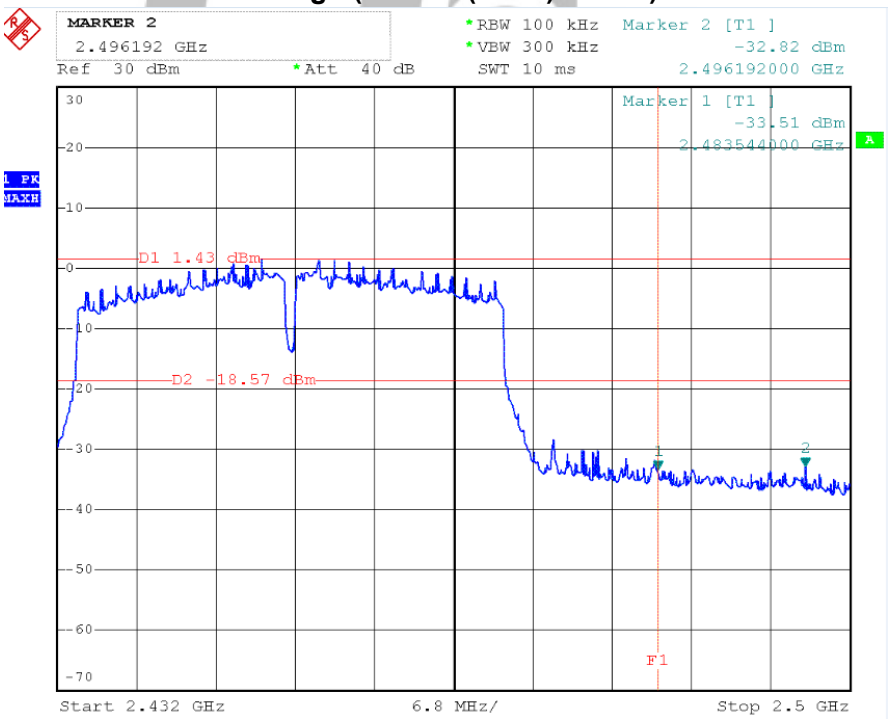
CH Low (802.11n(HT40) MODE)



CH High (802.11n(HT40) MODE)



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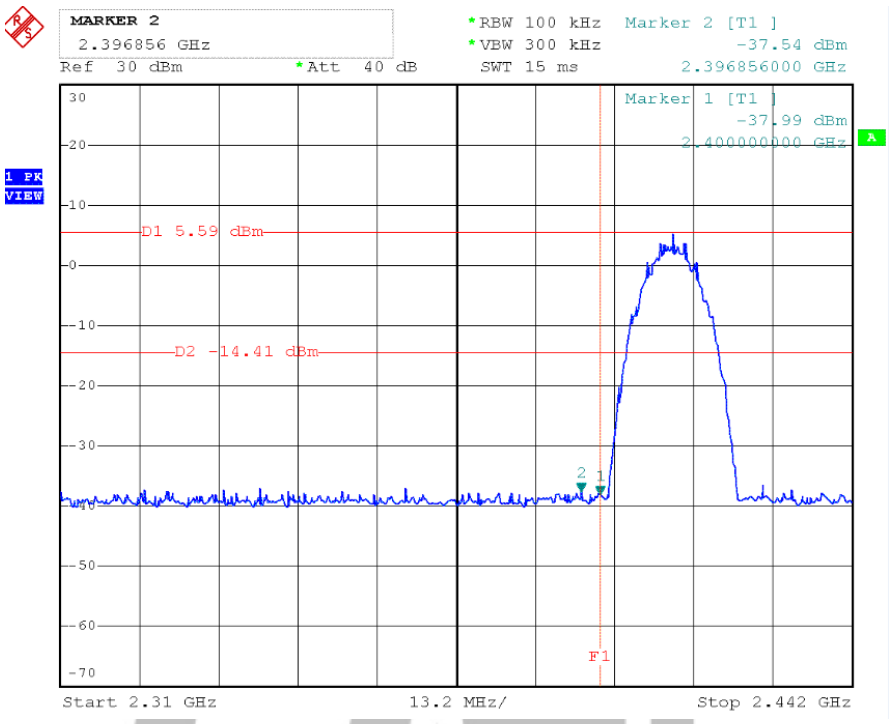
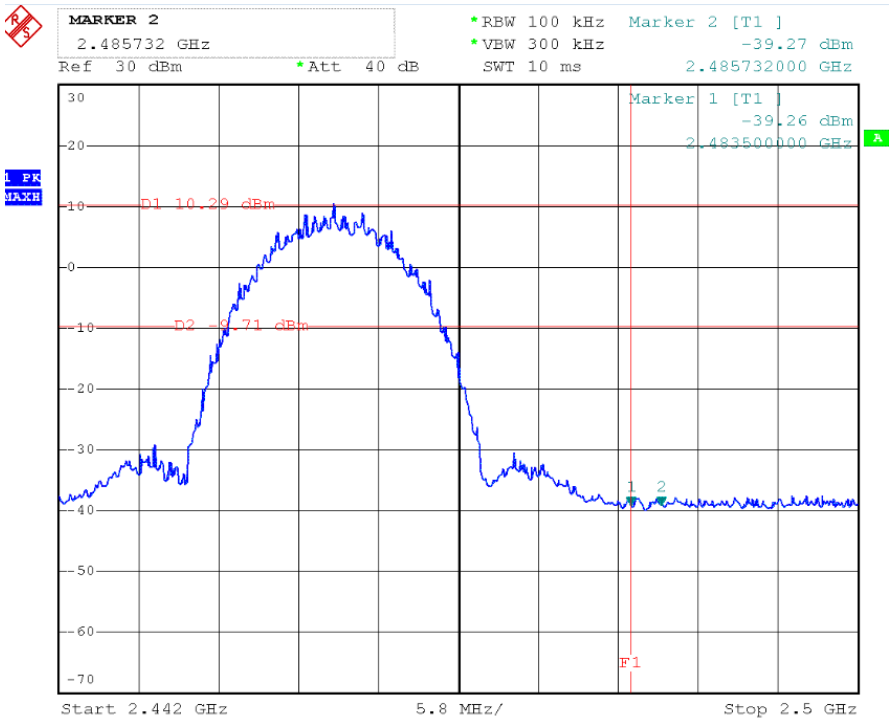
Chain 2:

Test of Conducted band edges

CH Low (802.11b MODE)



CH High (802.11b MODE)



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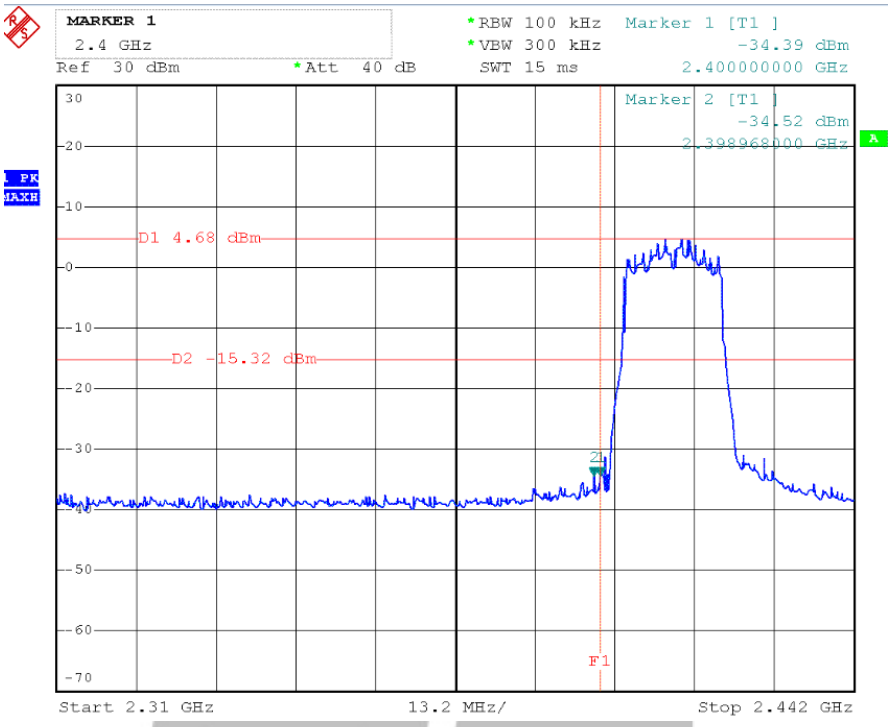
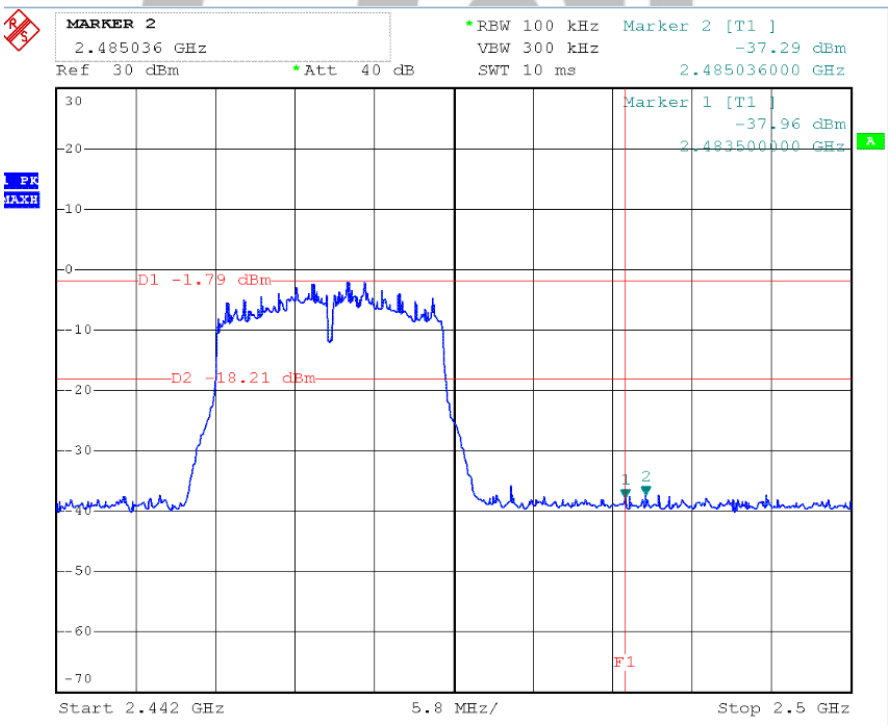
CH Low (802.11g MODE)



CH High (802.11g MODE)



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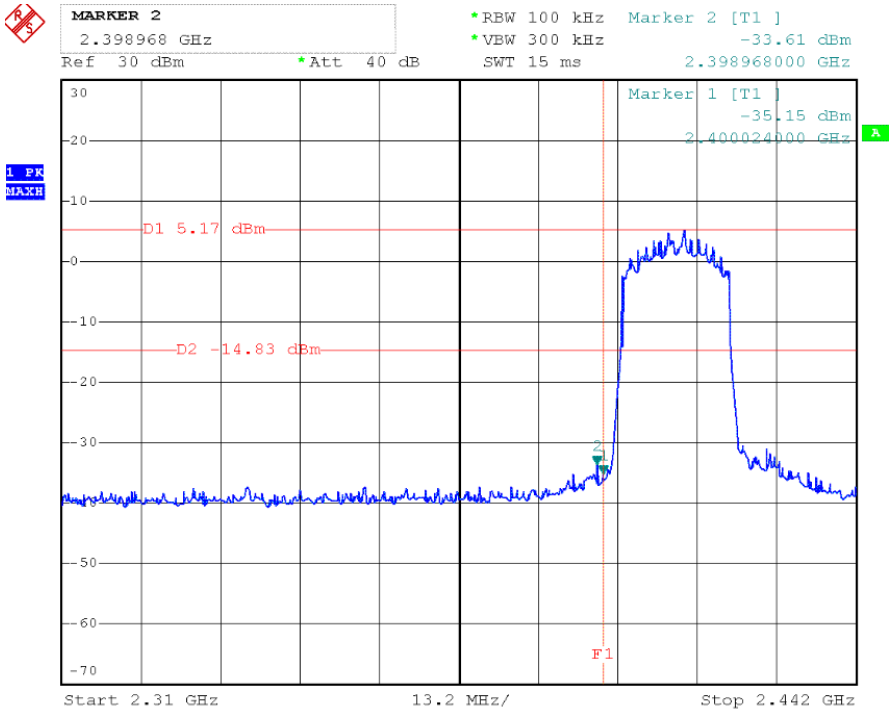
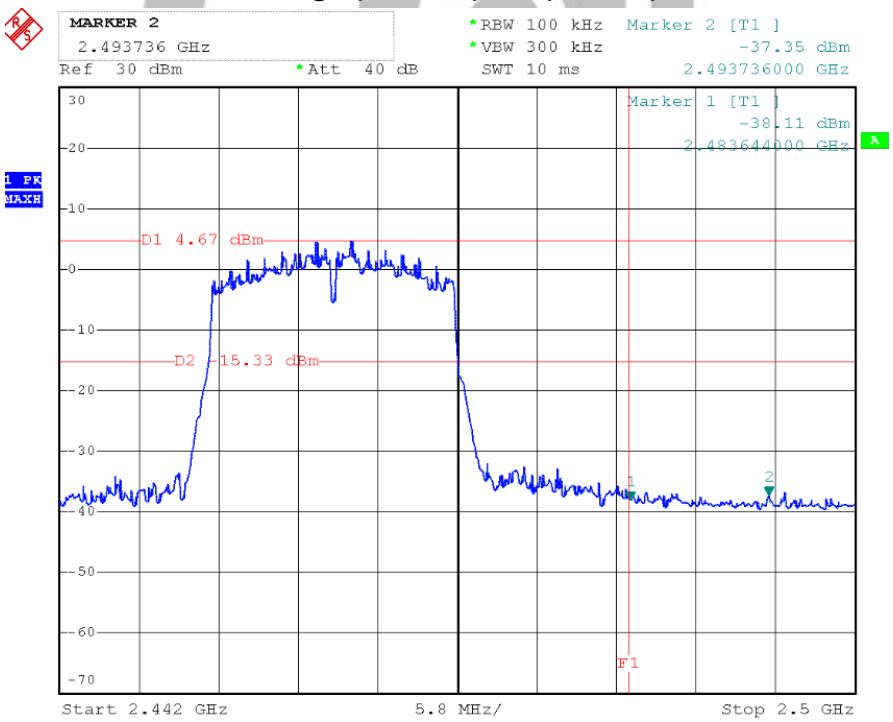
CH Low (802.11n(HT20) MODE)



CH High (802.11n(HT20) MODE)



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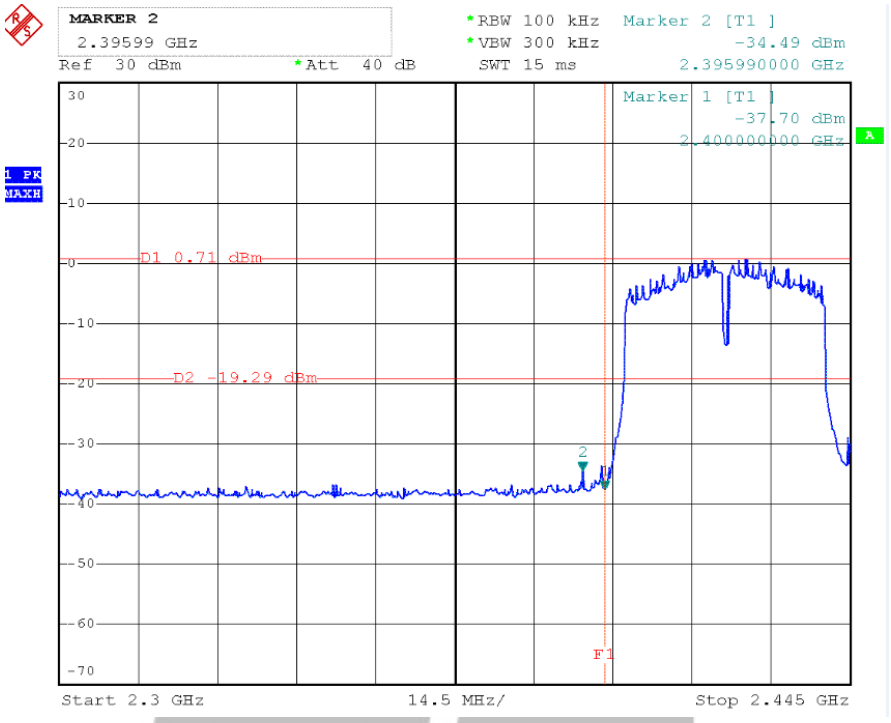
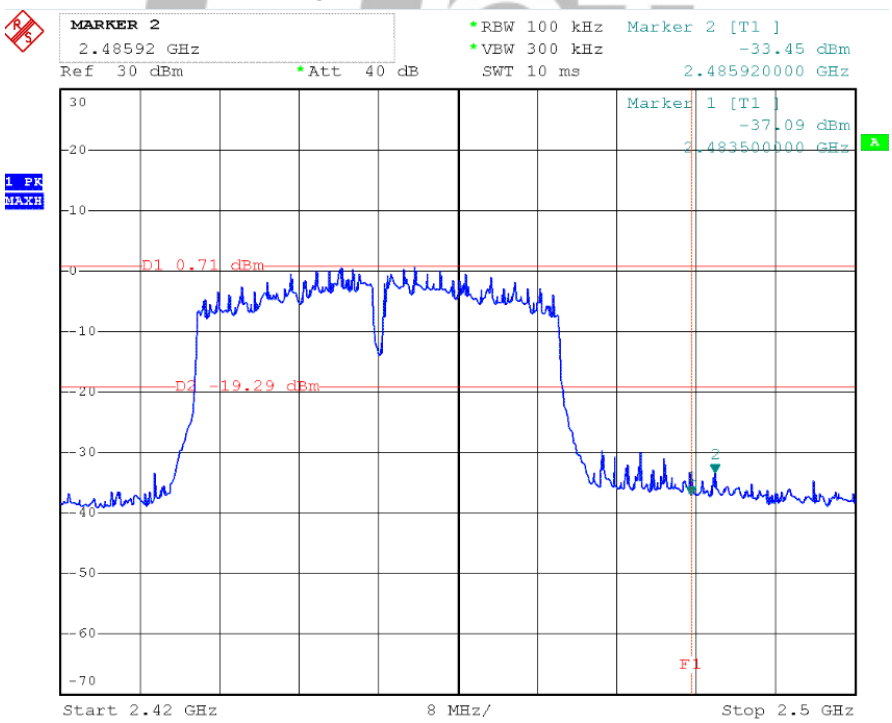
CH Low (802.11n(HT40) MODE)



CH High (802.11n(HT40) MODE)



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11. ANTENNA REQUIREMENT

11.1 standard Applicable

Section 15.203 & IC RSS-GEN Clause 8.3

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. 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 manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Section 15.247(b)/(c)

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

If the intentional radiator is used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

11.2 Antenna Connected Construction

There are no provisions for connections to an external antenna.
The antenna is designed with permanent attachment and no consideration of replacement.
The antenna used in this product is complied with standard. The maximum Gain of the antenna lower than 6.0dBi and have the definite antenna Specification.

…End of Report…

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