

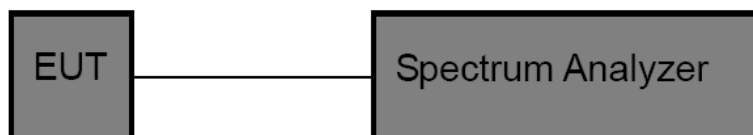


3.4. Band edge and Spurious Emissions (Conducted)

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.

Test Configuration



Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. Use the following spectrum analyzer settings:
RBW = 100 kHz, VBW $\geq$ RBW, scan up through 10th harmonic.
Sweep = auto, Detector function = peak, Trace = max hold
4. Measure and record the results in the test report.

Test Mode

Please refer to the clause 2.4.

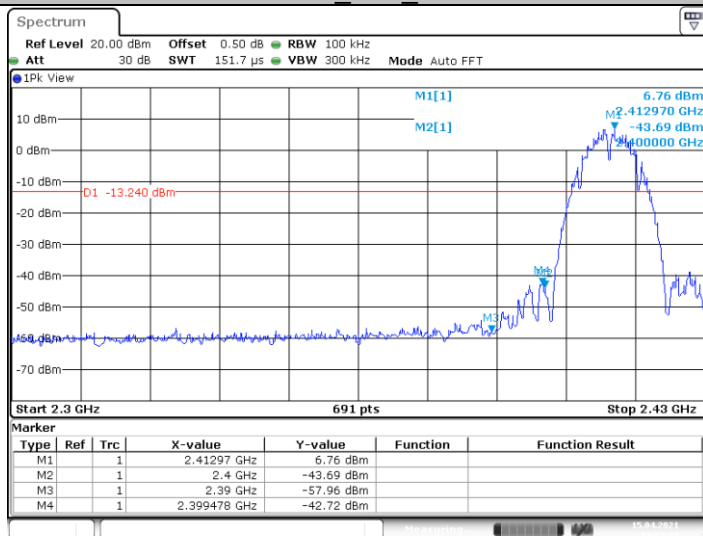
Test Results

(1) Band edge Conducted Test

Test Mode	Frequency[MHz]	Ref Level[dBm]	Result[dBm]	Limit[dBm]	Verdict
802.11b	2412	6.76	-42.72	≤ -13.24	PASS
	2462	6.57	-54.93	≤ -13.43	PASS
802.11g	2412	2.80	-32.52	≤ -17.20	PASS
	2462	-0.07	-43.28	≤ -20.07	PASS
802.11n(HT20)	2412	1.75	-36.56	≤ -18.25	PASS
	2462	-0.45	-45.45	≤ -20.45	PASS
802.11n(HT40)	2422	-1.61	-41.58	≤ -21.61	PASS
	2452	-1.78	-36.14	≤ -21.78	PASS

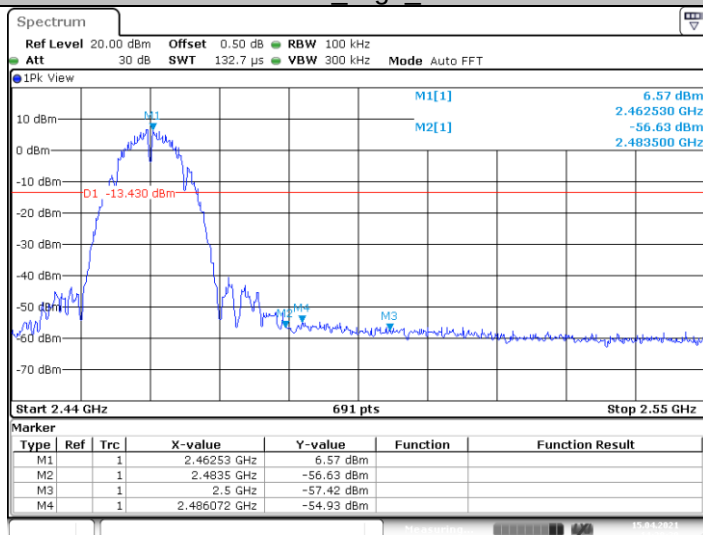


802.11b Low 2412



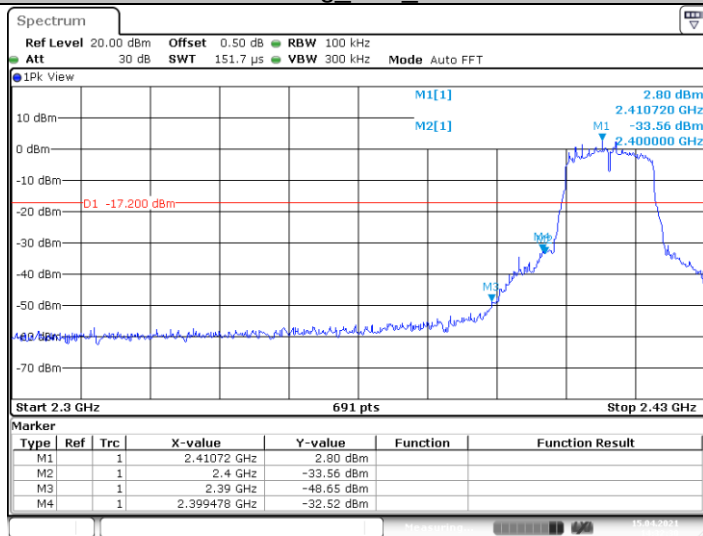
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802.11b High 2462



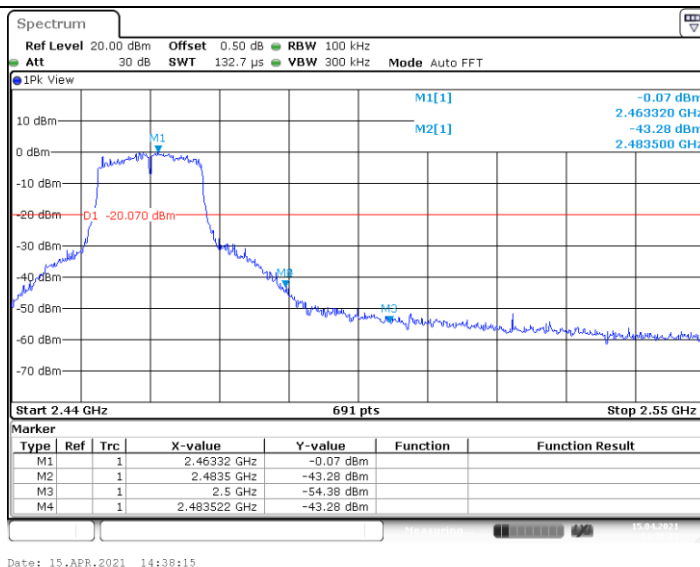
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802.11g Low 2412

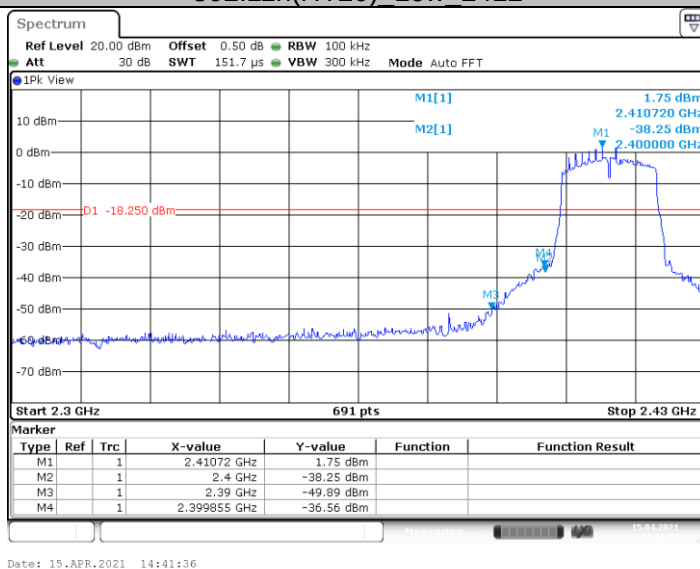


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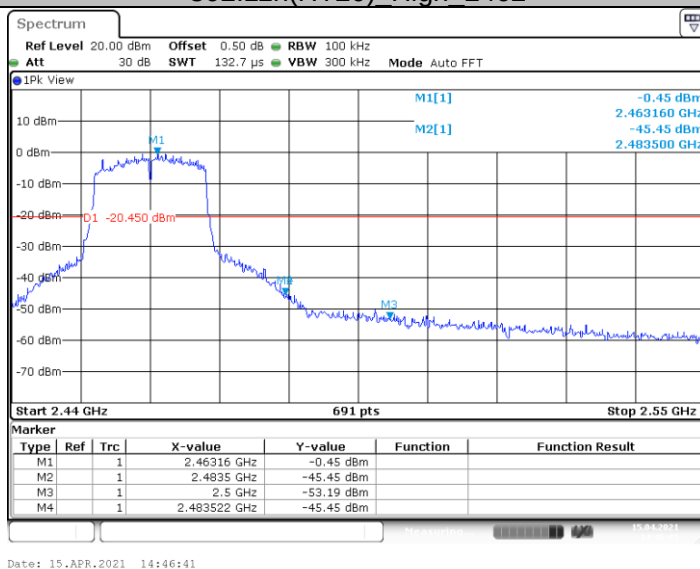
802.11g High 2462



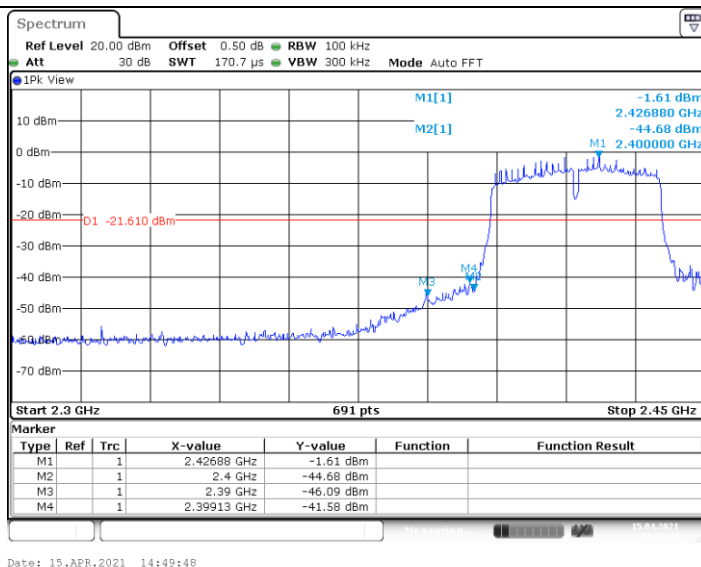
802.11n(HT20) Low 2412



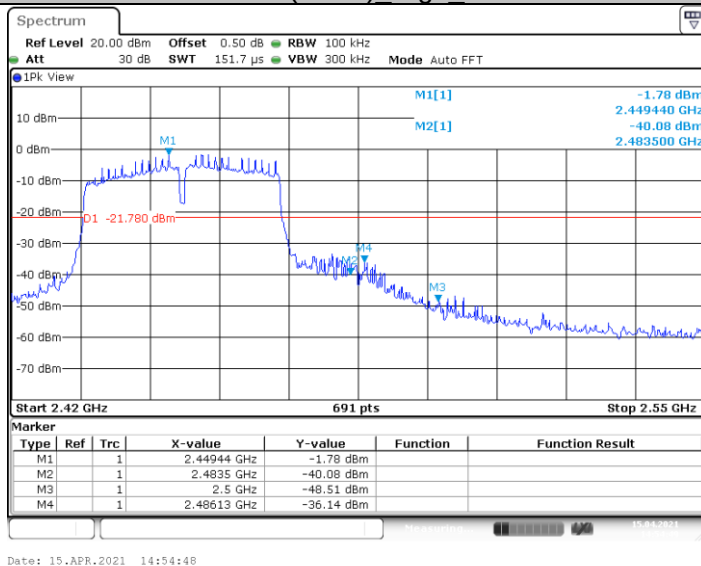
802.11n(HT20) High 2462



802.11n(HT40) Low 2422



802.11n(HT40) High 2452



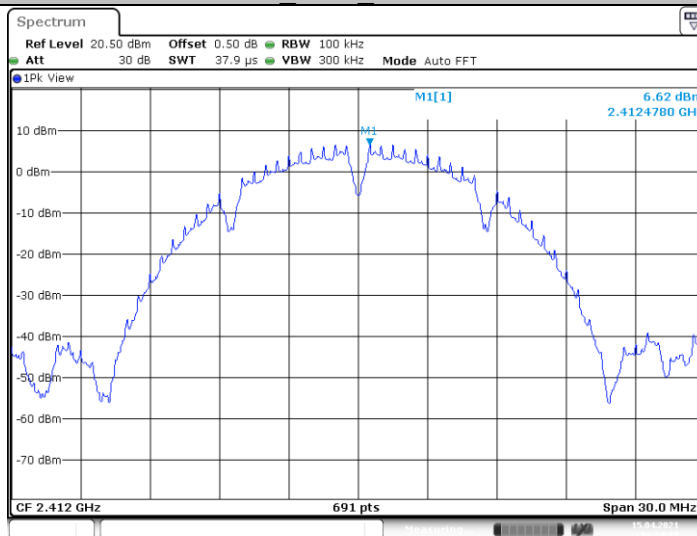


(2) Conducted Spurious Emissions Test

Test Mode	Frequency[MHz]	Freq Range [Mhz]	Ref Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
802.11b	2412	Reference	6.62	6.62	---	PASS
		30~1000	30~1000	-70.71	<=-13.38	PASS
		1000~26500	1000~26500	-42.3	<=-13.38	PASS
	2437	Reference	6.84	6.84	---	PASS
		30~1000	30~1000	-71.43	<=-13.16	PASS
		1000~26500	1000~26500	-43.7	<=-13.16	PASS
	2462	Reference	6.54	6.54	---	PASS
		30~1000	30~1000	-69.49	<=-13.46	PASS
		1000~26500	1000~26500	-45.98	<=-13.46	PASS
802.11g	2412	Reference	2.81	2.81	---	PASS
		30~1000	30~1000	-71.24	<=-17.19	PASS
		1000~26500	1000~26500	-35.16	<=-17.19	PASS
	2437	Reference	2.84	2.84	---	PASS
		30~1000	30~1000	-70.9	<=-17.16	PASS
		1000~26500	1000~26500	-47.06	<=-17.16	PASS
	2462	Reference	2.45	2.45	---	PASS
		30~1000	30~1000	-70.91	<=-17.55	PASS
		1000~26500	1000~26500	-46.73	<=-17.55	PASS
802.11n(HT20)	2412	Reference	1.90	1.90	---	PASS
		30~1000	30~1000	-71.03	<=-18.10	PASS
		1000~26500	1000~26500	-36.72	<=-18.10	PASS
	2437	Reference	1.78	1.78	---	PASS
		30~1000	30~1000	-71.55	<=-18.22	PASS
		1000~26500	1000~26500	-46.99	<=-18.22	PASS
	2462	Reference	1.03	1.03	---	PASS
		30~1000	30~1000	-70.49	<=-18.97	PASS
		1000~26500	1000~26500	-46.7	<=-18.97	PASS
802.11n(HT40)	2422	Reference	-1.39	-1.39	---	PASS
		30~1000	30~1000	-71.65	<=-21.39	PASS
		1000~26500	1000~26500	-41.28	<=-21.39	PASS
	2437	Reference	-2.71	-2.71	---	PASS
		30~1000	30~1000	-71.01	<=-22.71	PASS
		1000~26500	1000~26500	-46.11	<=-22.71	PASS
	2452	Reference	-1.95	-1.95	---	PASS
		30~1000	30~1000	-71.08	<=-21.95	PASS
		1000~26500	1000~26500	-35.81	<=-21.95	PASS

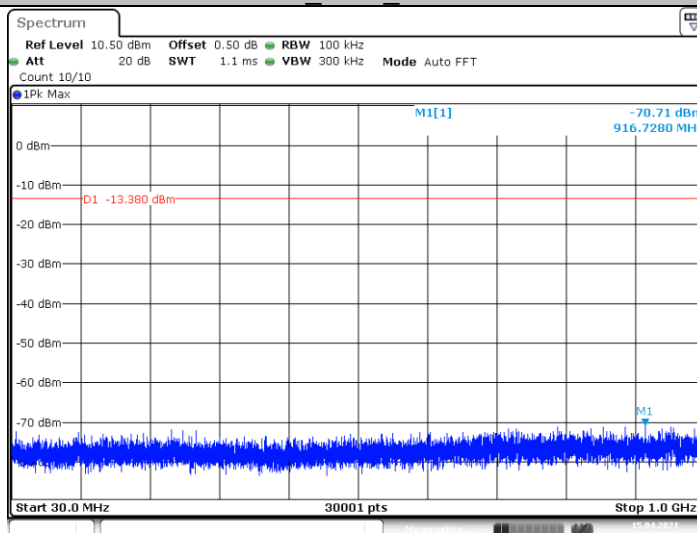


802.11b 2412 0~Reference



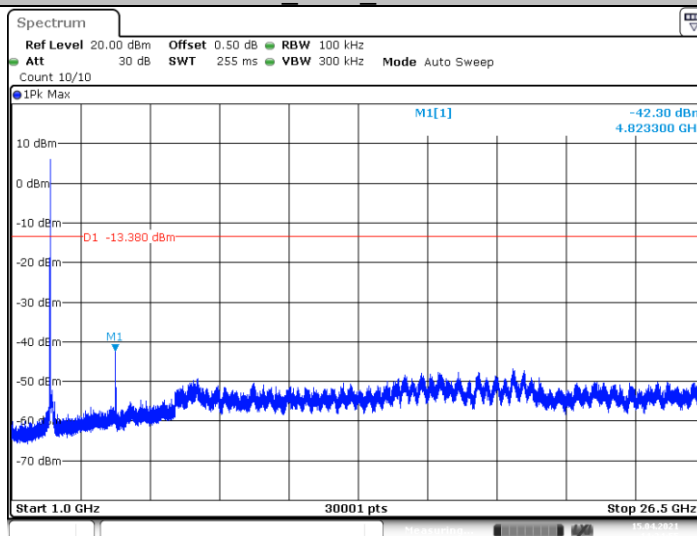
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802.11b 2412 30~1000



Date: 15.APR.2021 14:24:27

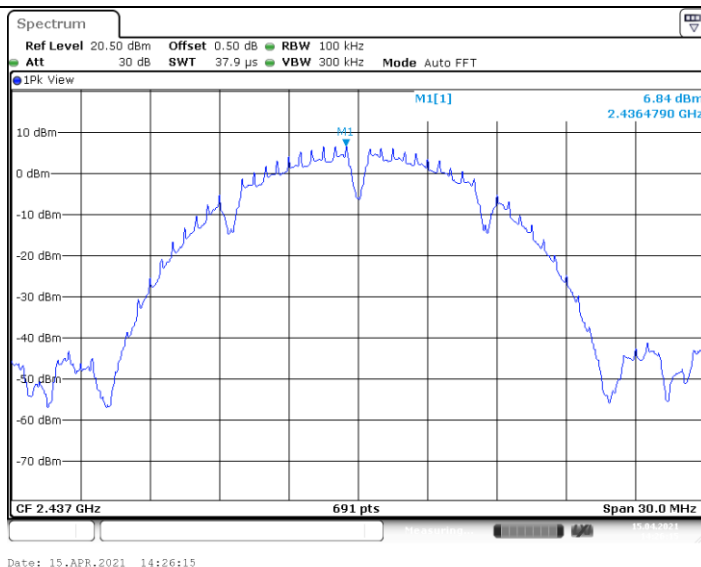
802.11b 2412 1000~26500



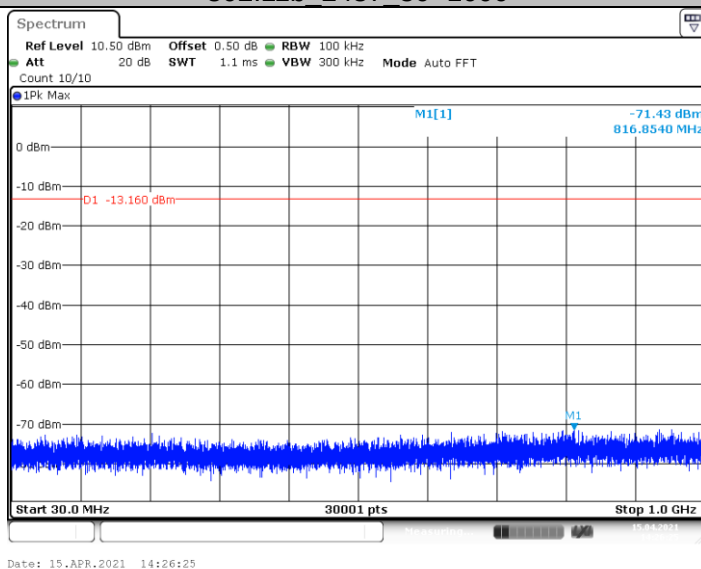
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802.11b 2437 0~Reference

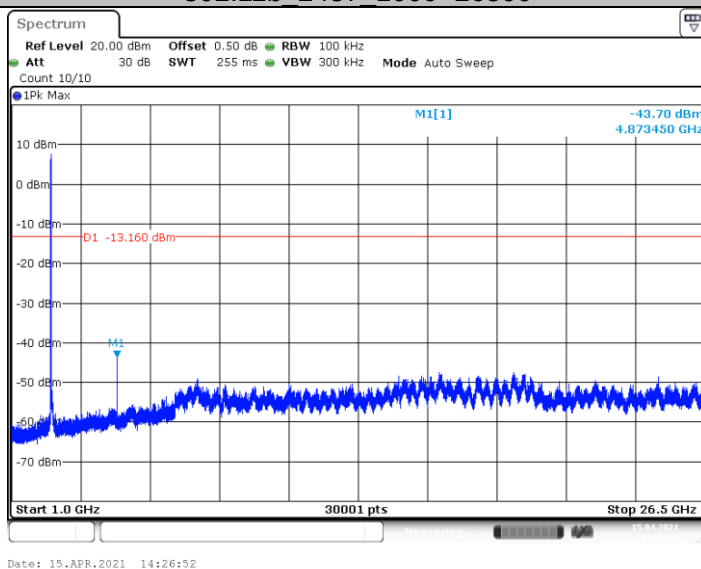




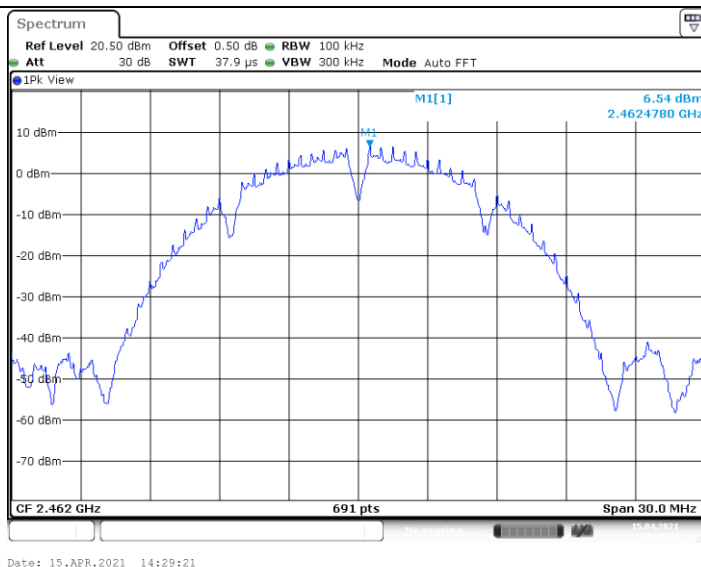
802.11b 2437 30~1000



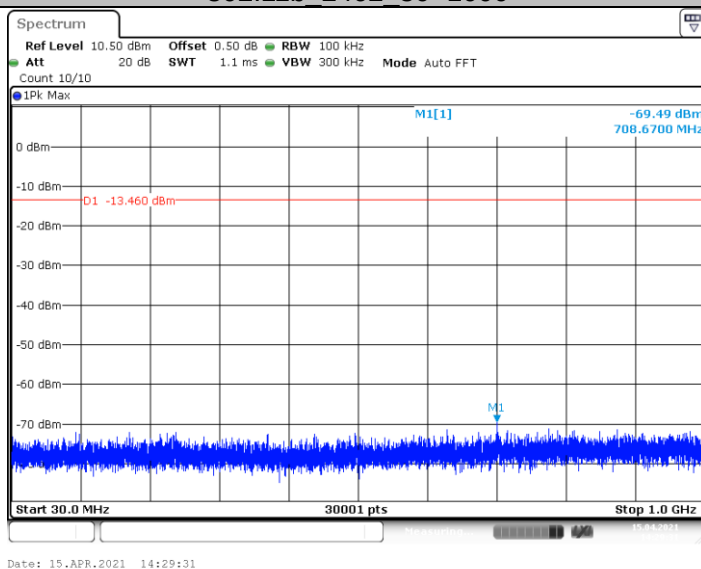
802.11b 2437 1000~26500



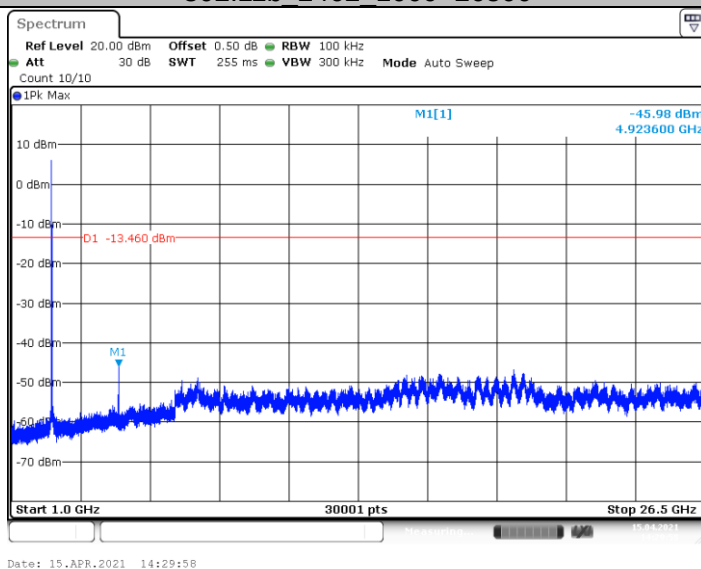
802.11b 2462 0~Reference



802.11b 2462 30~1000

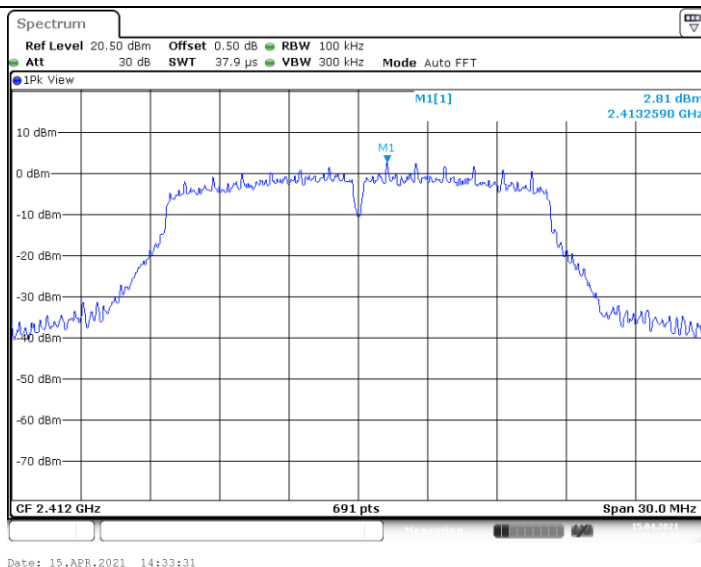


802.11b 2462 1000~26500

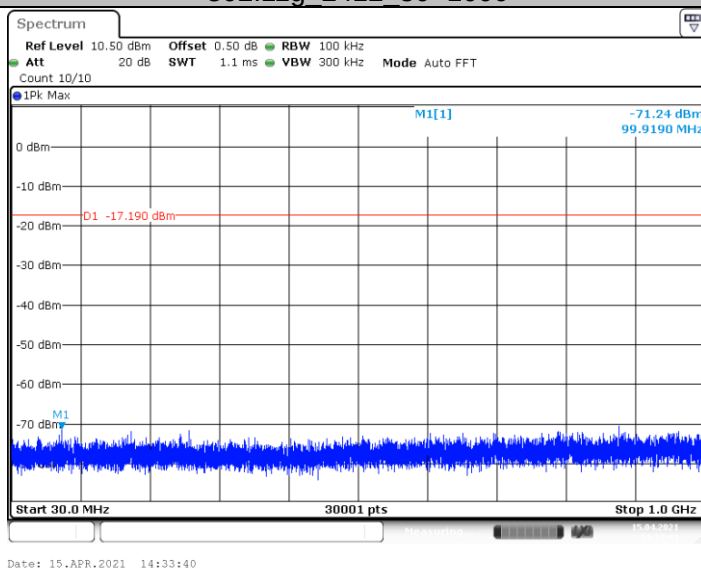


802.11g 2412 0~Reference

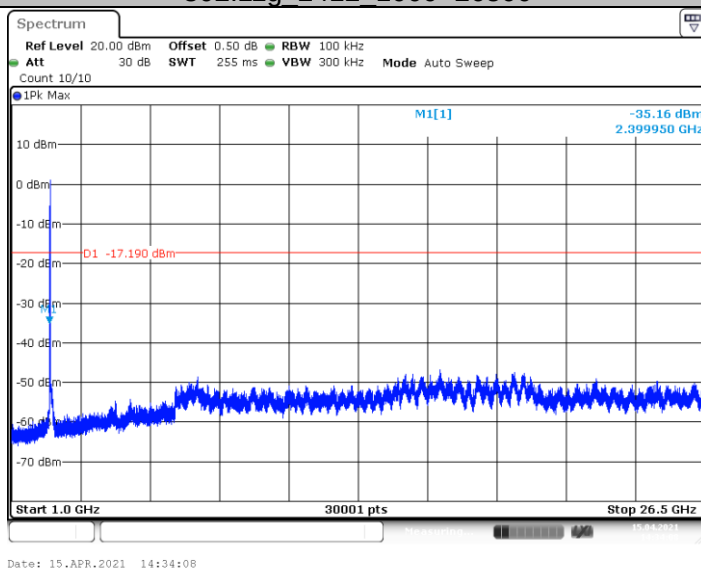




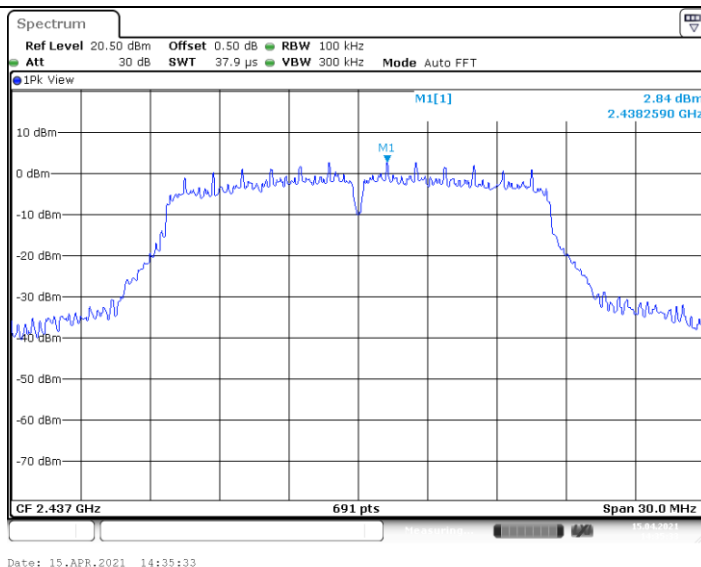
802.11g 2412 30~1000



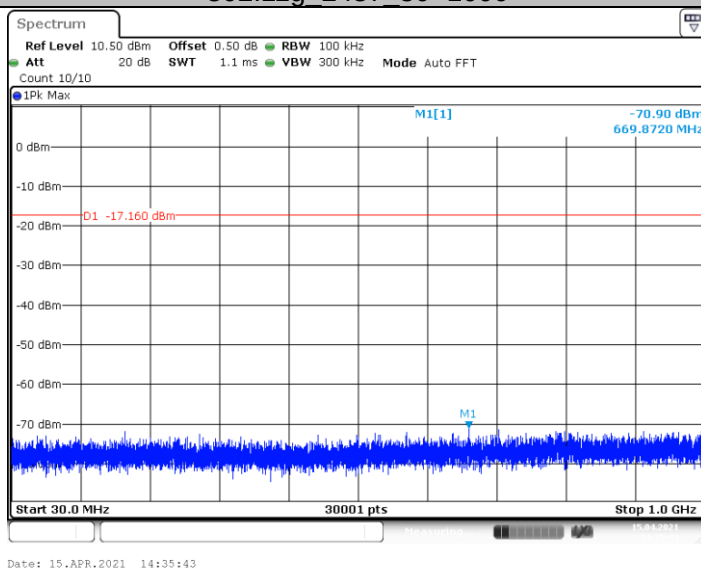
802.11g 2412 1000~26500



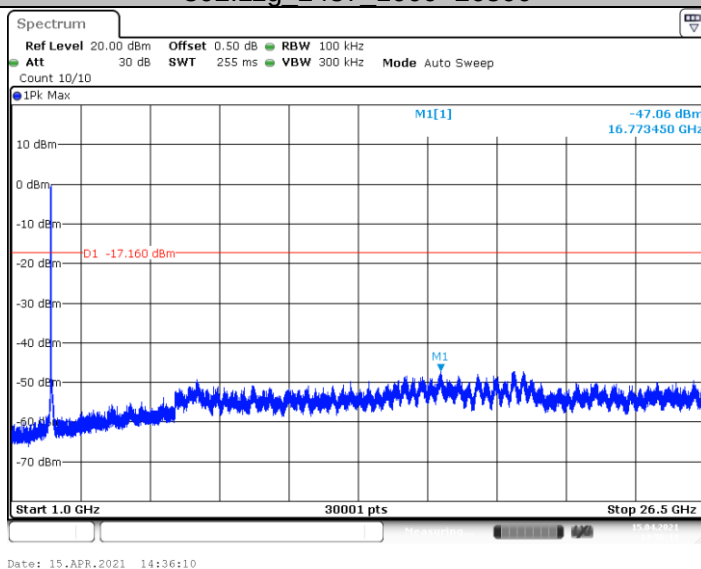
802.11g 2437 0~Reference



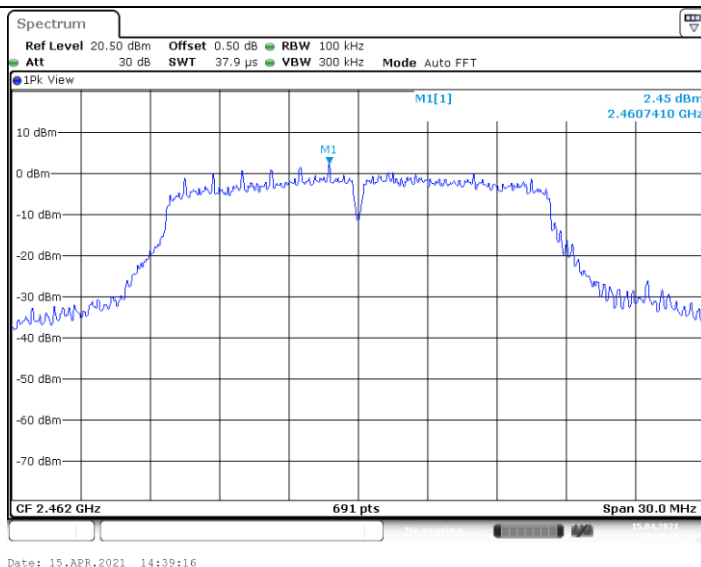
802.11g 2437 30~1000



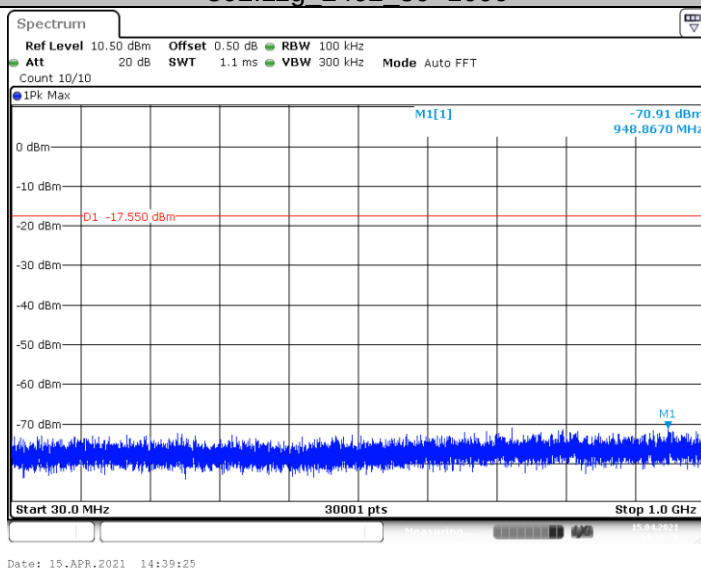
802.11g 2437 1000~26500



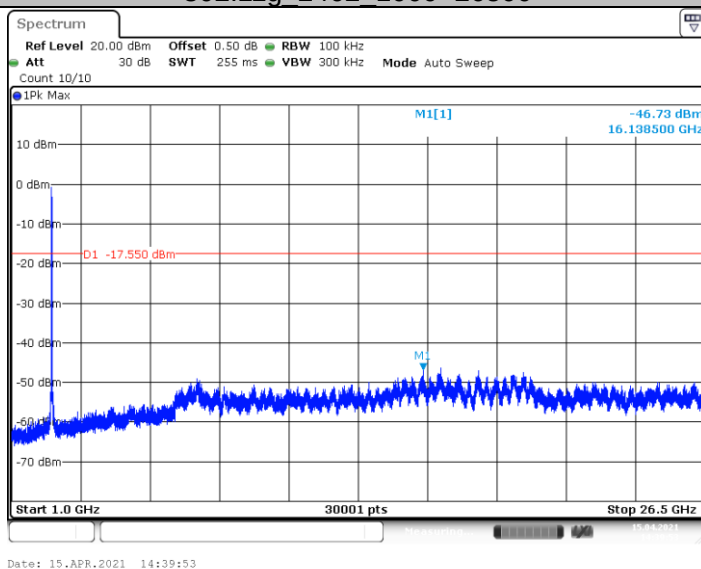
802.11g 2462 0~Reference



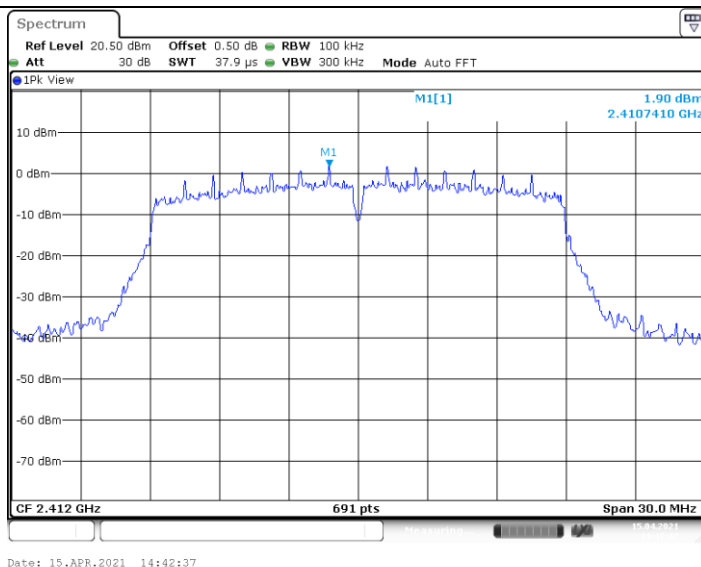
802.11g 2462 30~1000



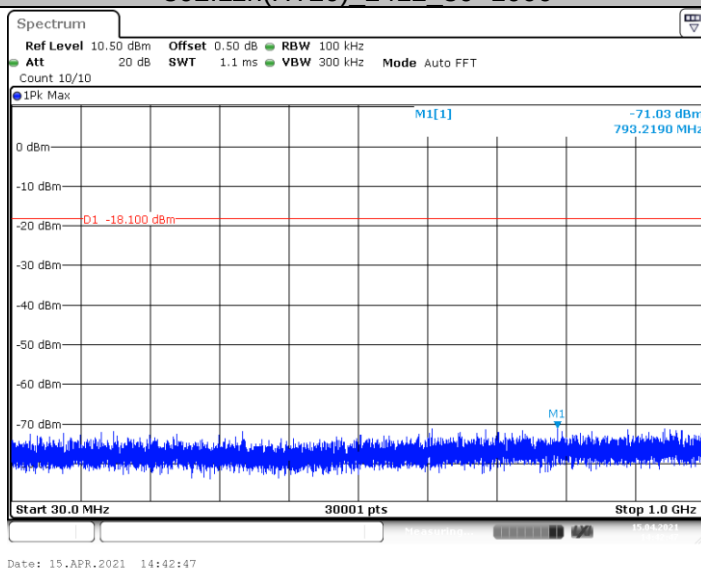
802.11g 2462 1000~26500



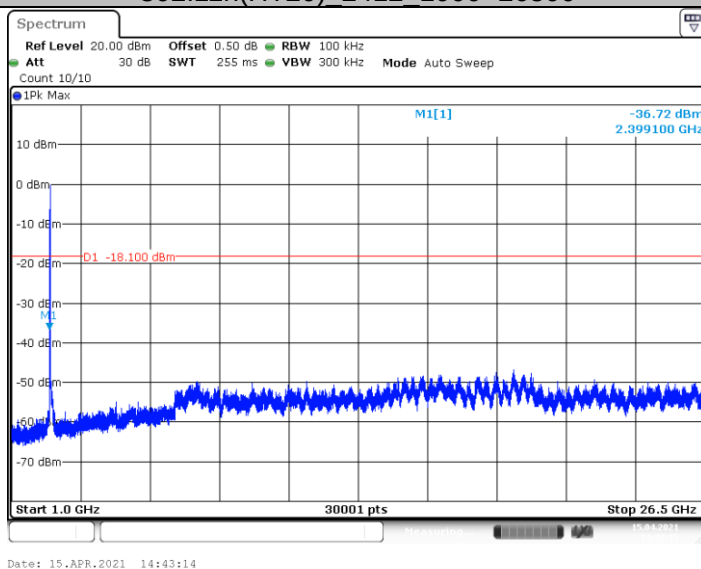
802.11n(HT20) 2412 0~Reference



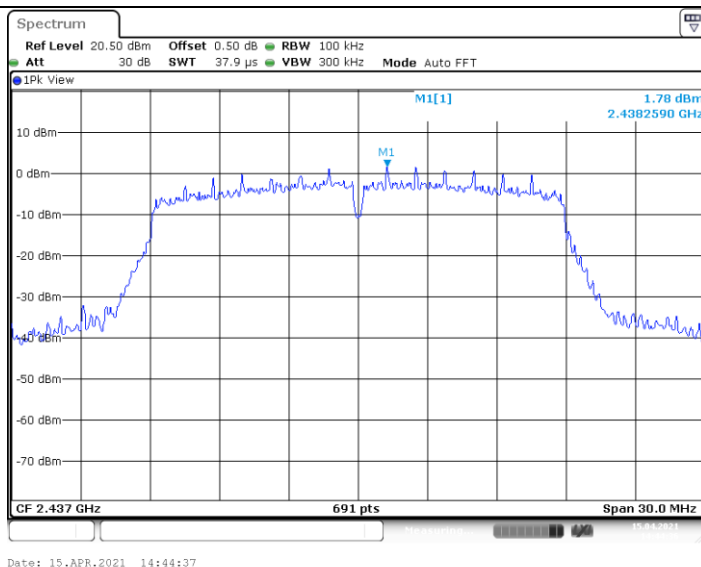
802.11n(HT20) 2412 30~1000



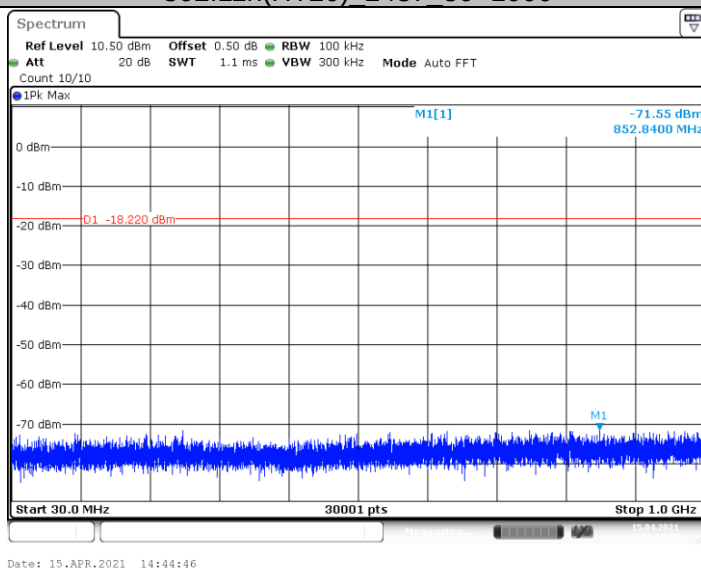
802.11n(HT20) 2412 1000~26500



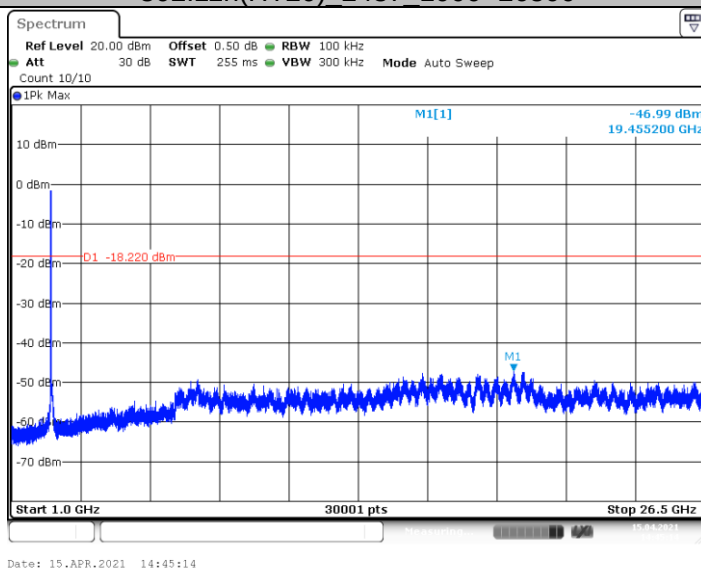
802.11n(HT20) 2437 0~Reference



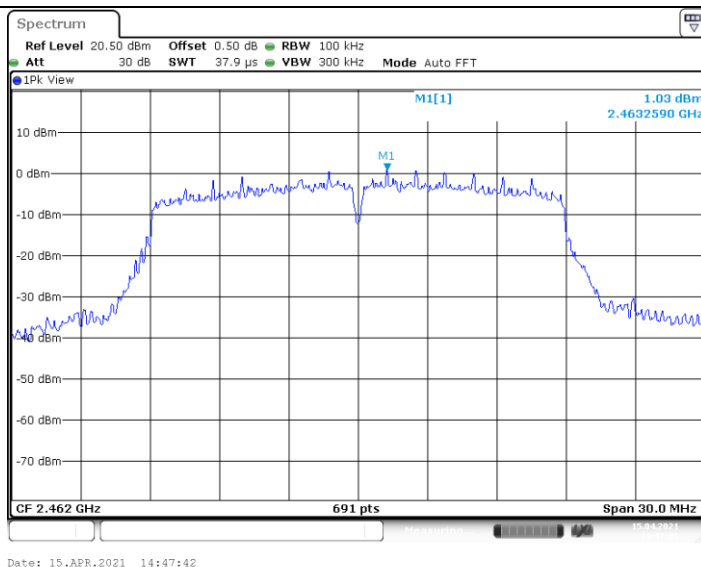
802.11n(HT20) 2437 30~1000



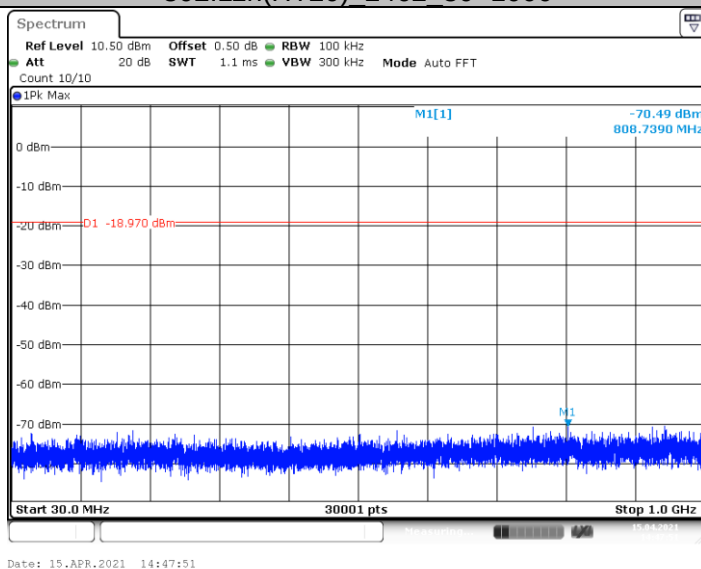
802.11n(HT20) 2437 1000~26500



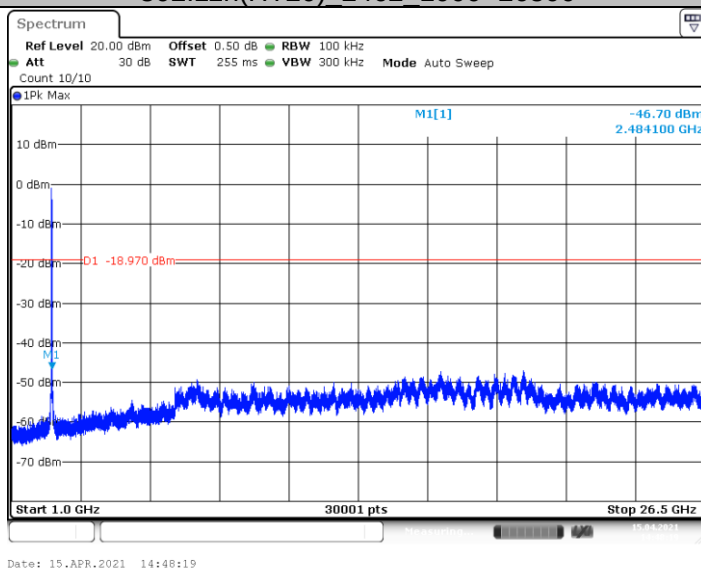
802.11n(HT20) 2462 0~Reference



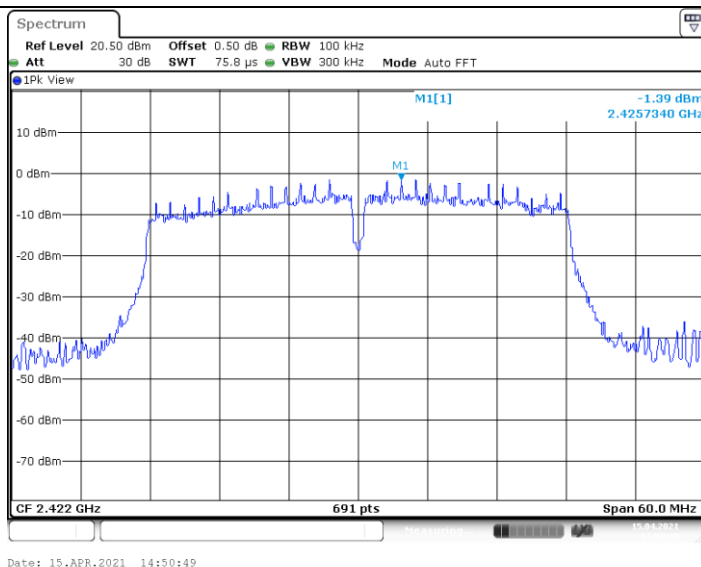
802.11n(HT20) 2462 30~1000



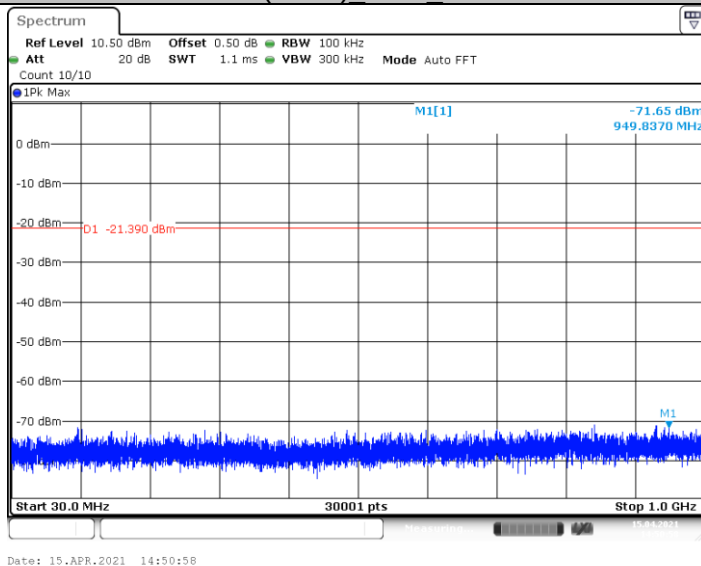
802.11n(HT20) 2462 1000~26500



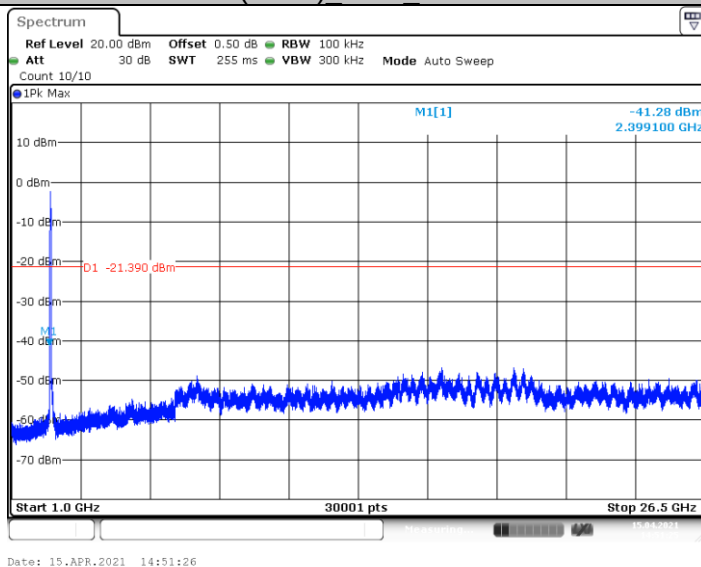
802.11n(HT40) 2422 0~Reference



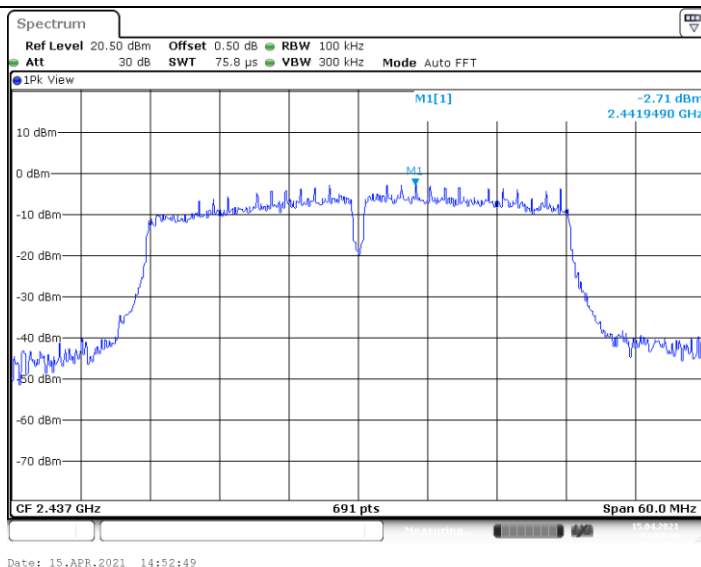
802.11n(HT40) 2422 30~1000



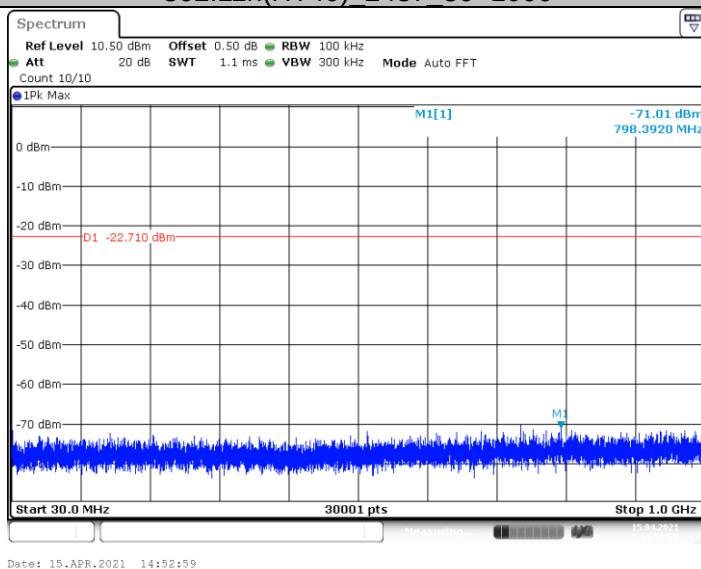
802.11n(HT40) 2422 1000~26500



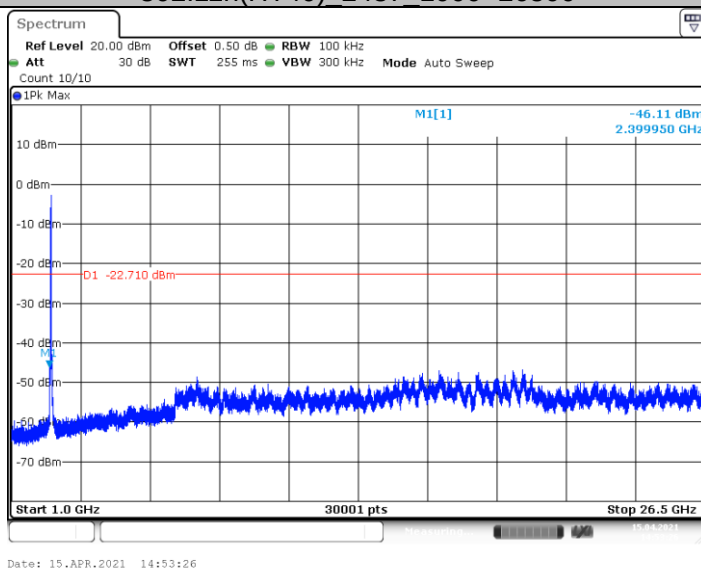
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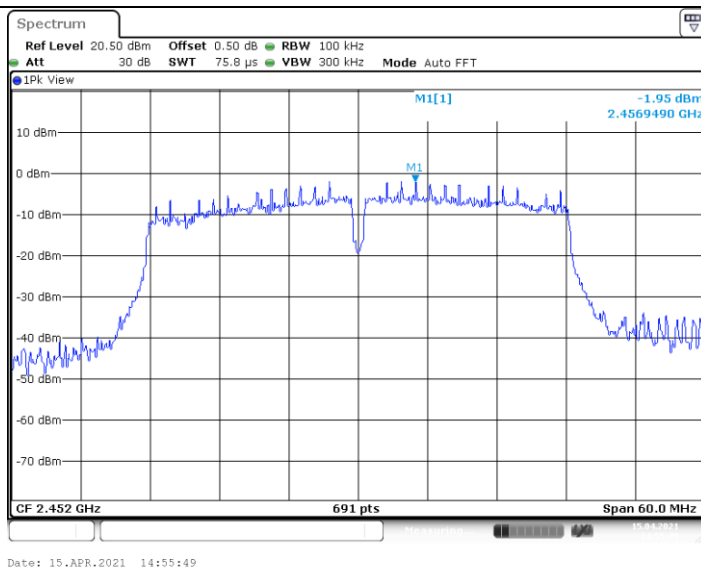
802.11n(HT40) 2437 30~1000



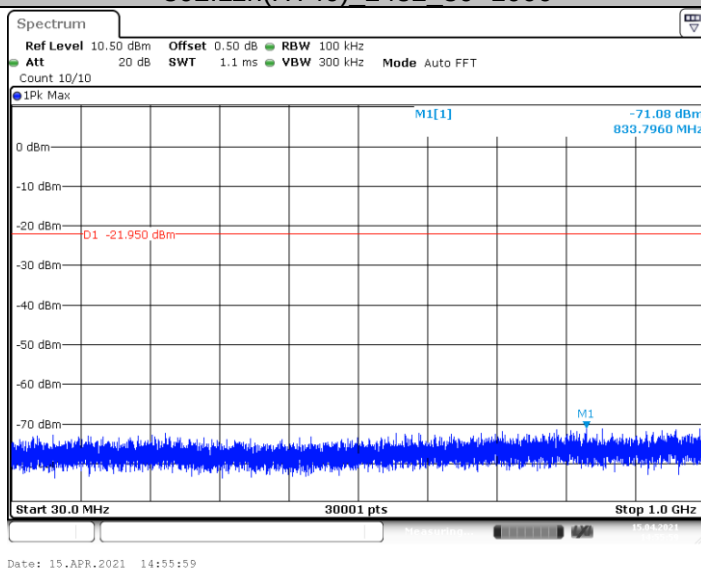
802.11n(HT40) 2437 1000~26500



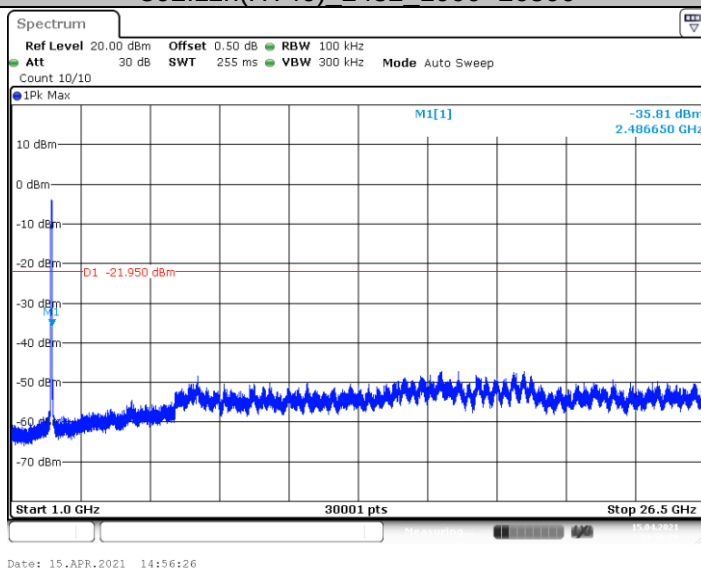
802.11n(HT40) 2452 0~Reference



802.11n(HT40) 2452 30~1000



802.11n(HT40) 2452 1000~26500





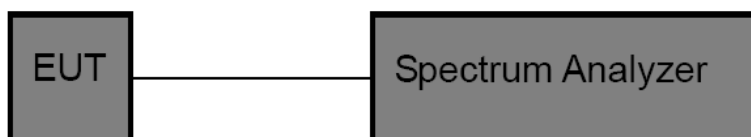
3.5. DTS Bandwidth

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2)/ RSS-247 5.2 a:

Test Item	Limit	Frequency Range(MHz)
DTS Bandwidth	≥ 500 KHz (6dB bandwidth)	2400~2483.5

Test Configuration



Test Procedure

5. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
6. DTS Spectrum Setting:
 - (1) Set RBW = 100 kHz.
 - (2) Set the video bandwidth (VBW) ≥ 3 RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.OCB Spectrum Setting:
 - (1) Set RBW = 1% ~ 5% occupied bandwidth.
 - (2) Set the video bandwidth (VBW) ≥ 3 RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.

NOTE: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

Test Mode

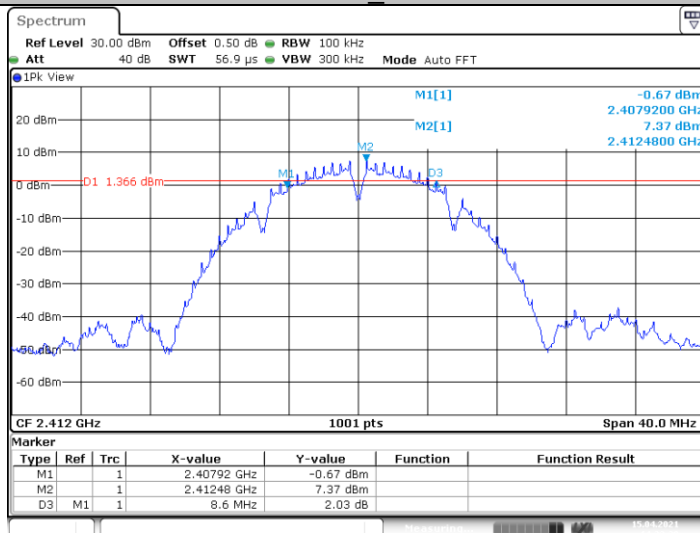
Please refer to the clause 2.4.

**Test Results**

Test Mode	Frequency[MHz]	DTS BW [MHz]	Limit[MHz]	Verdict
802.11b	2412	8.600	≥ 0.5	PASS
	2437	8.600	≥ 0.5	PASS
	2462	8.160	≥ 0.5	PASS
802.11g	2412	15.200	≥ 0.5	PASS
	2437	16.000	≥ 0.5	PASS
	2462	15.400	≥ 0.5	PASS
802.11n(HT20)	2412	15.400	≥ 0.5	PASS
	2437	16.040	≥ 0.5	PASS
	2462	15.200	≥ 0.5	PASS
802.11n(HT40)	2422	35.280	≥ 0.5	PASS
	2437	35.280	≥ 0.5	PASS
	2452	35.280	≥ 0.5	PASS

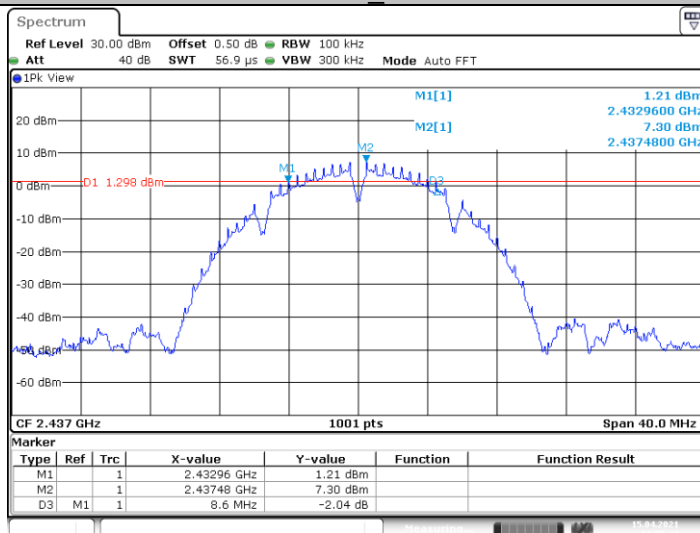


802.11b 2412



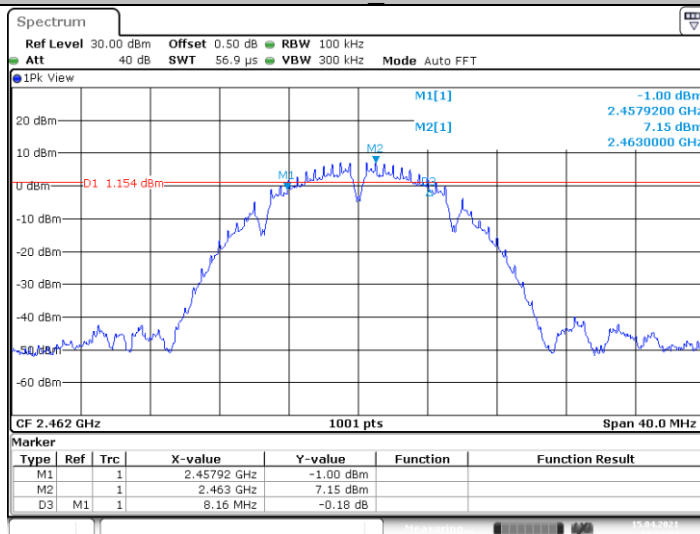
Date: 15.APR.2021 14:22:39

802.11b 2437



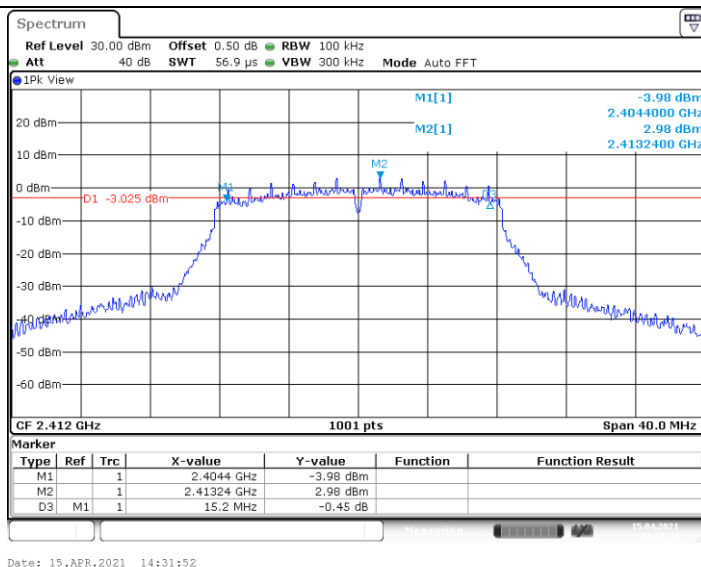
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802.11b 2462

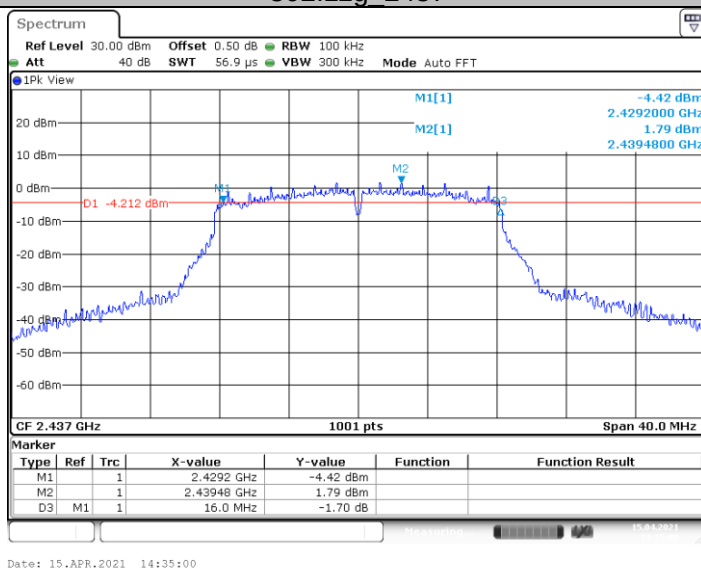


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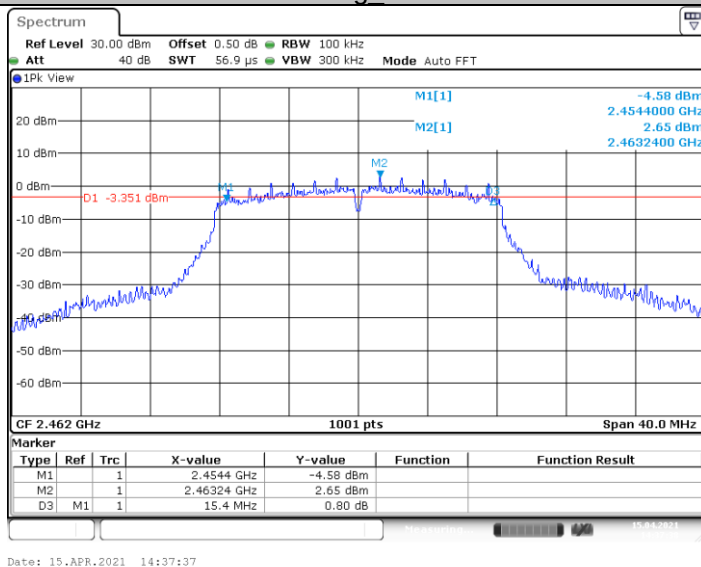
802.11g 2412



802.11g 2437

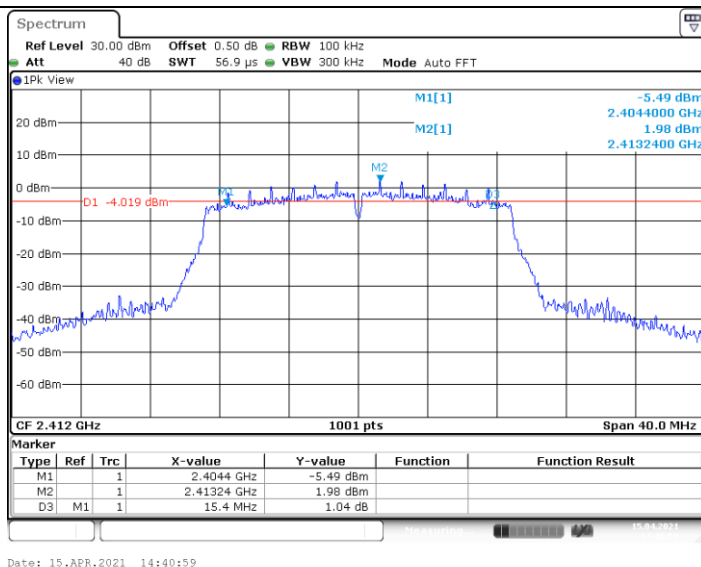


802.11g 2462

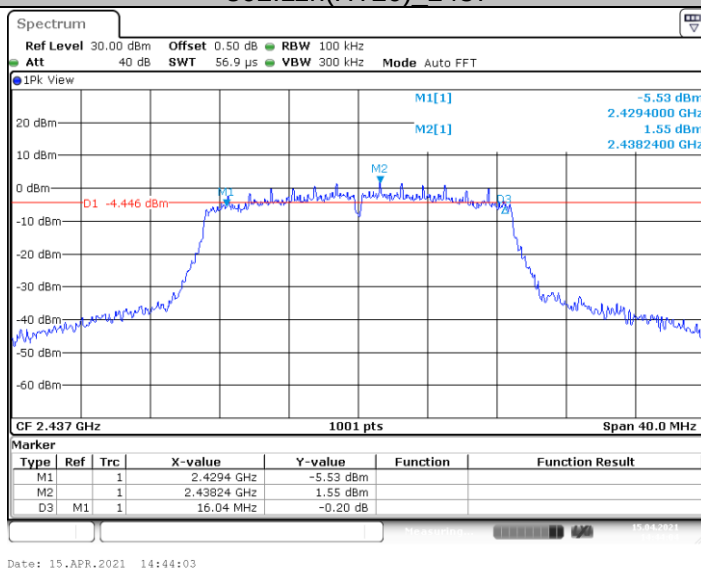


802.11n(HT20) 2412

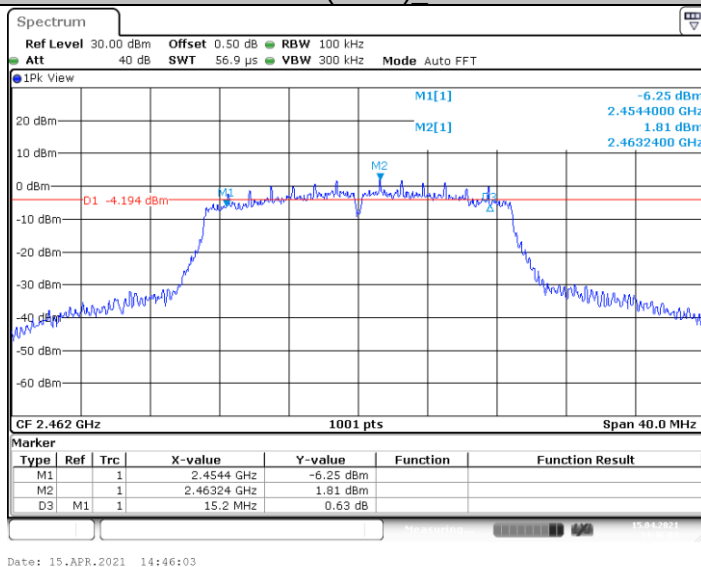




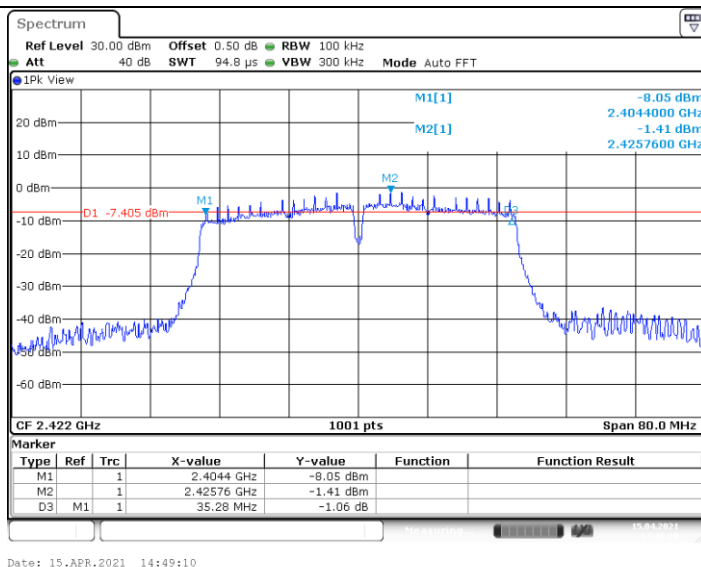
802.11n(HT20) 2437



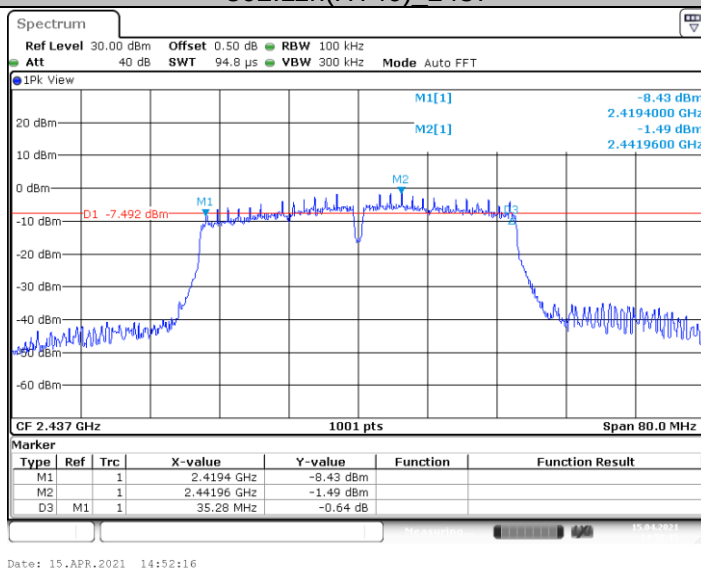
802.11n(HT20) 2462



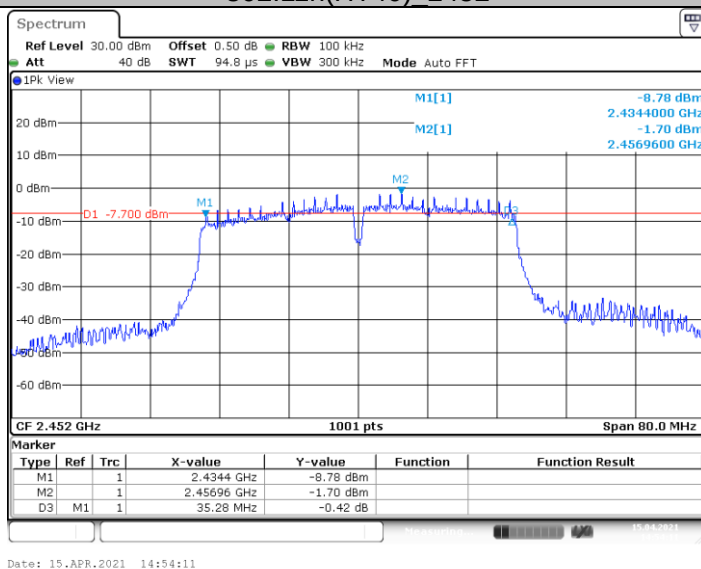
802.11n(HT40) 2422



802.11n(HT40) 2437



802.11n(HT40) 2452





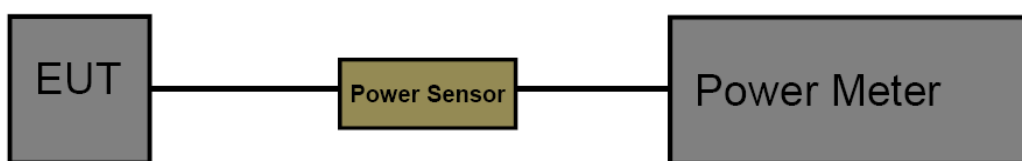
3.6. Peak Output Power

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3)/ RSS-247 5.4:

Section	Test Item	Limit	Frequency Range(MHz)
CFR 47 FCC 15.247(b)(3)	Maximum conducted output power	1 Watt or 30dBm	2400~2483.5
ISED RSS-247 5.4 d	EIRP	4 Watt or 36dBm	2400~2483.5

Test Configuration



Test Procedure

1. The maximum conducted output power may be measured using a broadband Peak RF power meter.
2. Peak power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor.
3. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.
4. Record the measurement data.

Test Mode

Please refer to the clause 2.4.

Test Result



Test Mode	Frequency[MHz]	Result[dBm]	Limit[dBm]	Verdict
802.11b	2412	18.19	<=30	PASS
	2437	17.98	<=30	PASS
	2462	17.80	<=30	PASS
802.11g	2412	20.43	<=30	PASS
	2437	20.37	<=30	PASS
	2462	20.28	<=30	PASS
802.11n(HT20)	2412	19.21	<=30	PASS
	2437	19.15	<=30	PASS
	2462	19.00	<=30	PASS
802.11n(HT40)	2422	18.78	<=30	PASS
	2437	18.59	<=30	PASS
	2452	18.58	<=30	PASS

Note: Test results increased RF cable loss by 1dB.



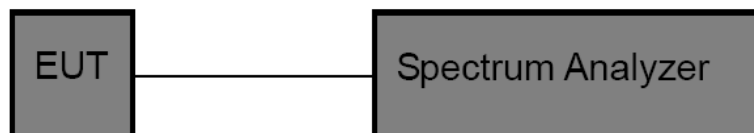
3.7. Power Spectral Density

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e)/ RSS-247 5.2 b:

Test Item	Limit	Frequency Range(MHz)
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.
3. Spectrum Setting:
Set analyzer center frequency to DTS channel center frequency.
Set the span to 1.5 times the DTS bandwidth.
Set the RBW to: 3 kHz
Set the VBW to: 10 kHz
Detector: PK
Sweep time: Auto
Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

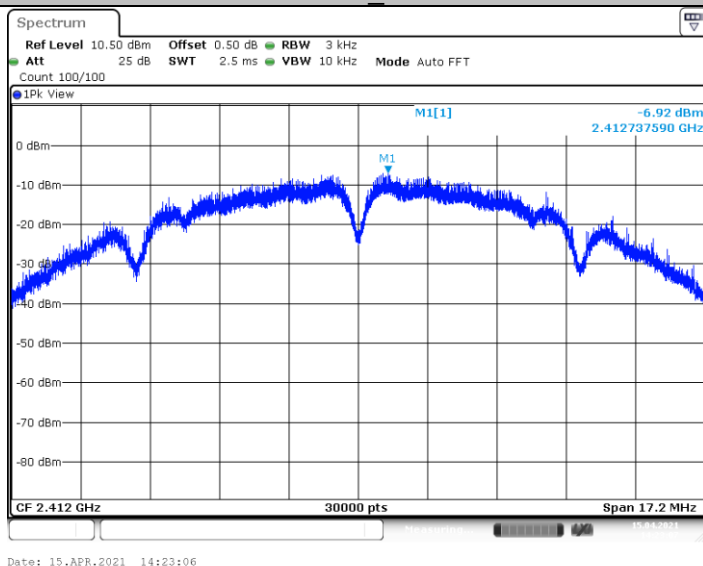
Please refer to the clause 2.4.

**Test Result**

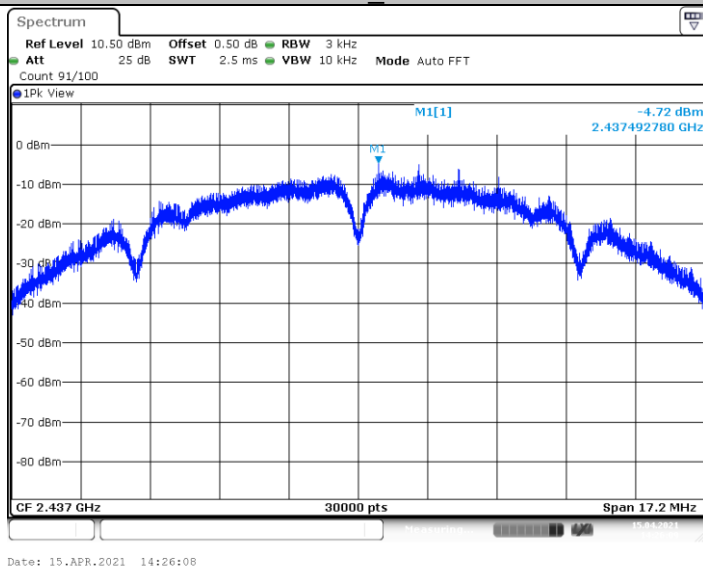
Test Mode	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
802.11b	2412	-6.92	<=8	PASS
	2437	-4.72	<=8	PASS
	2462	-7.38	<=8	PASS
802.11g	2412	-10.27	<=8	PASS
	2437	-11.02	<=8	PASS
	2462	-11.36	<=8	PASS
802.11n(HT20)	2412	-12.92	<=8	PASS
	2437	-11.05	<=8	PASS
	2462	-12.11	<=8	PASS
802.11n(HT40)	2422	-16.15	<=8	PASS
	2437	-16.37	<=8	PASS
	2452	-16.16	<=8	PASS



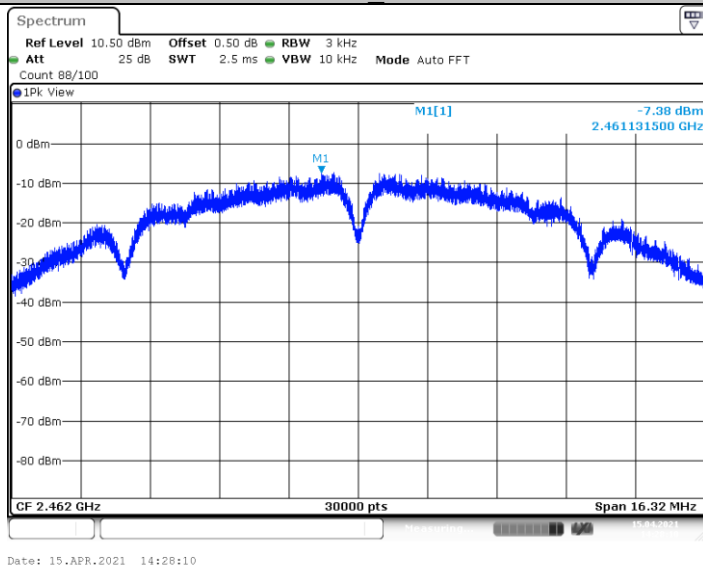
802.11b 2412



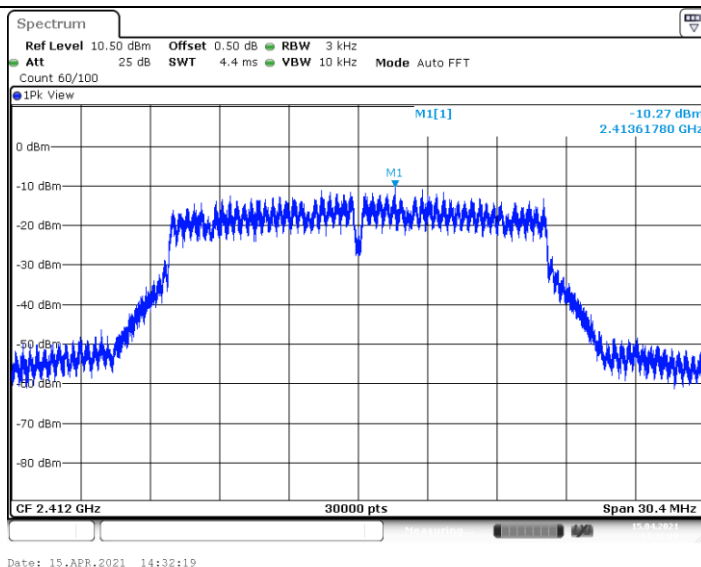
802.11b 2437



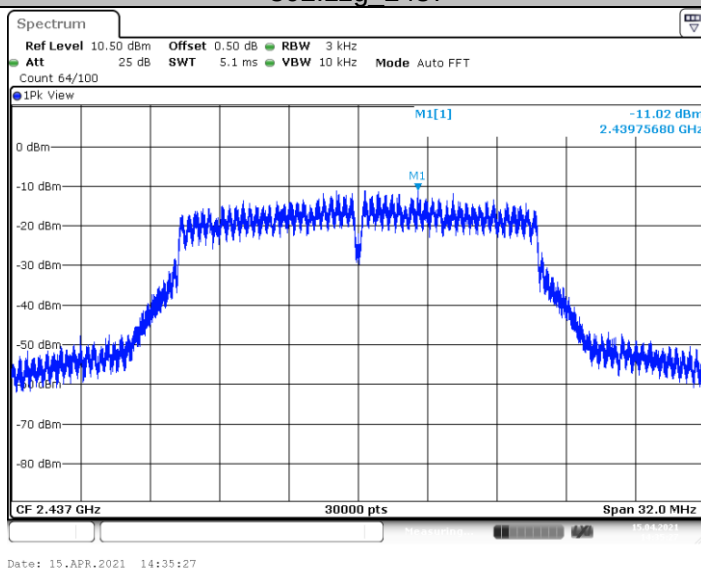
802.11b 2462



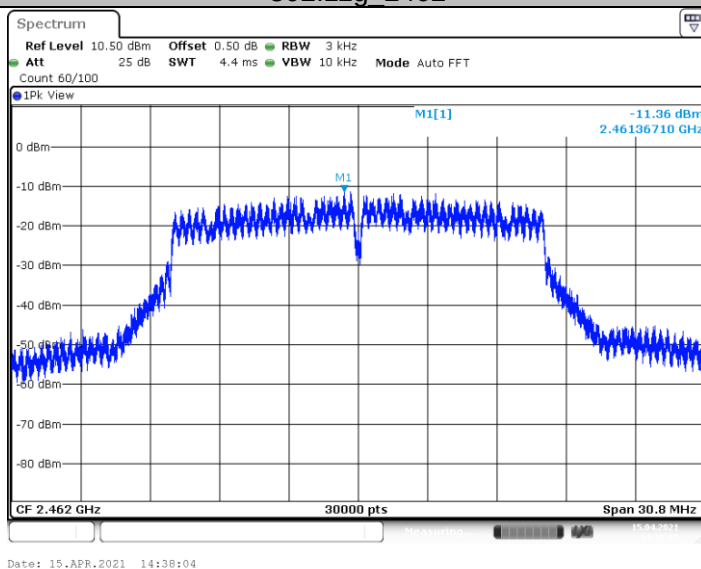
802.11g 2412



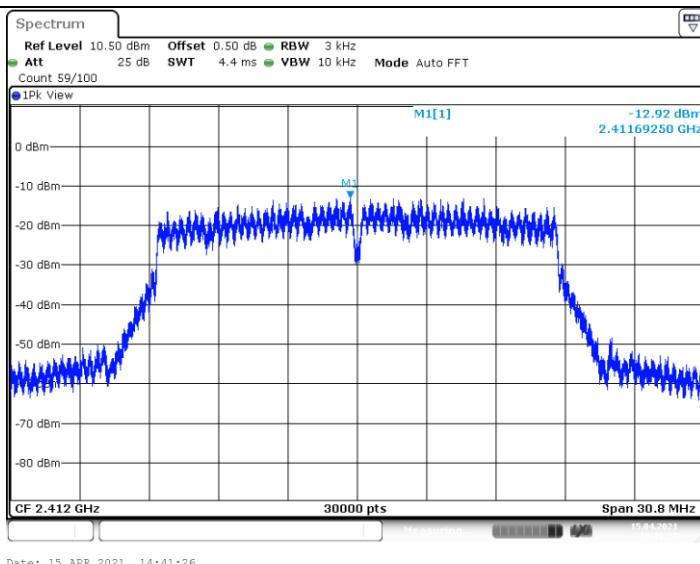
802.11g 2437



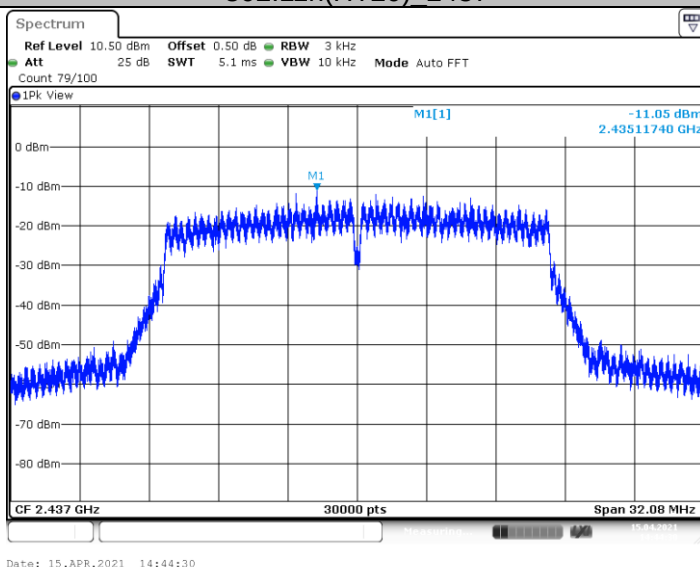
802.11g 2462



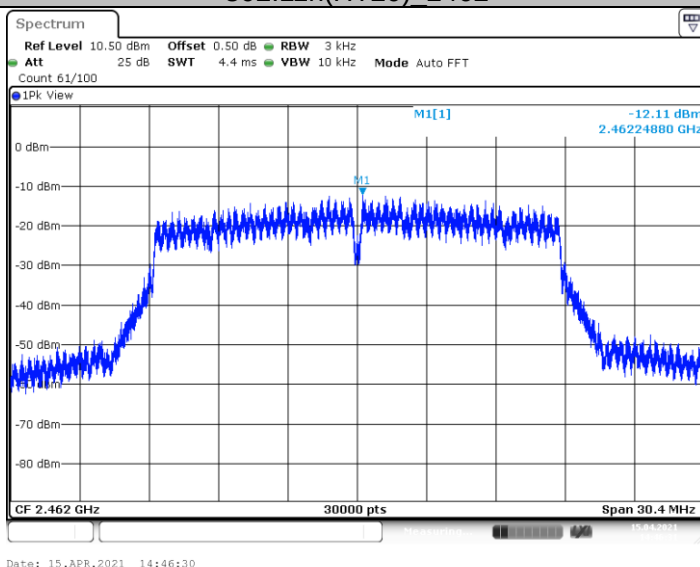
802.11n(HT20) 2412



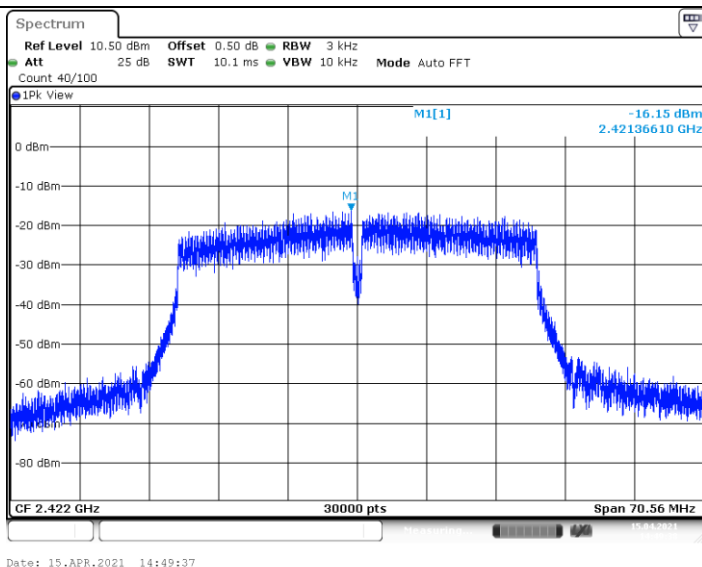
802.11n(HT20) 2437



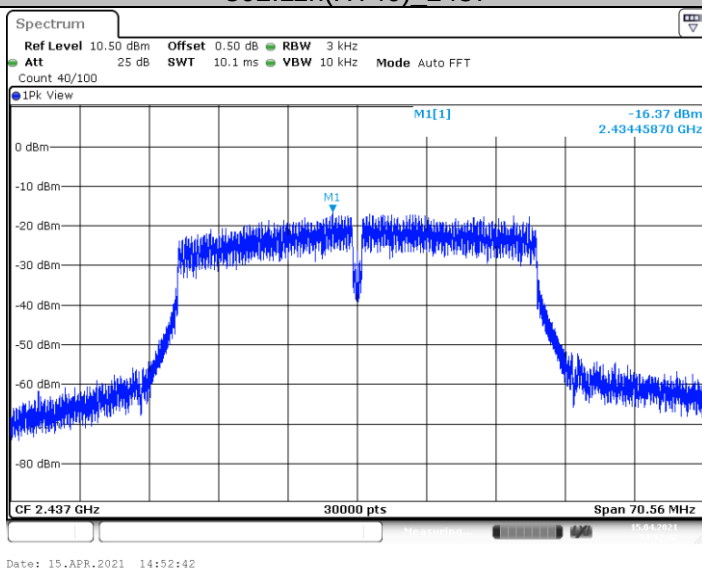
802.11n(HT20) 2462



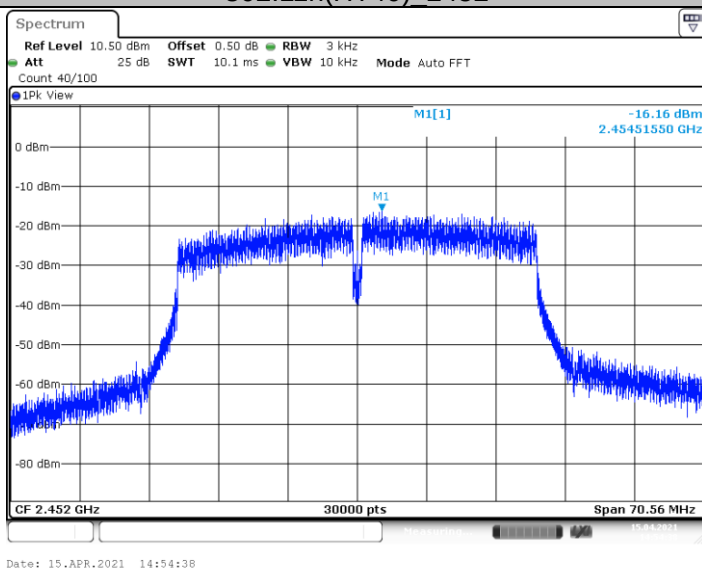
802.11n(HT40) 2422



802.11n(HT40) 2437



802.11n(HT40) 2452



CTC Laboratories, Inc.

Room 101 Building B, No. 7, Lanqing 1st Road, Luhu Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China
Tel.: (86)755-27521059 Fax: (86)755-27521011 Http://www.sz-ctc.org.cn



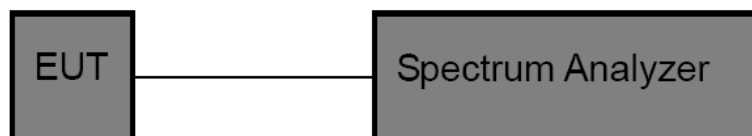
For anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China : yz.cnca.cn

3.8. Duty Cycle

Limit

None, for report purposes only.

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.
3. Spectrum Setting:
Set analyzer center frequency to DTS channel center frequency.
Set the span to 0Hz
Set the RBW to 10MHz
Set the VBW to 10MHz
Detector: peak
Sweep time: auto
Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

Please refer to the clause 2.4.

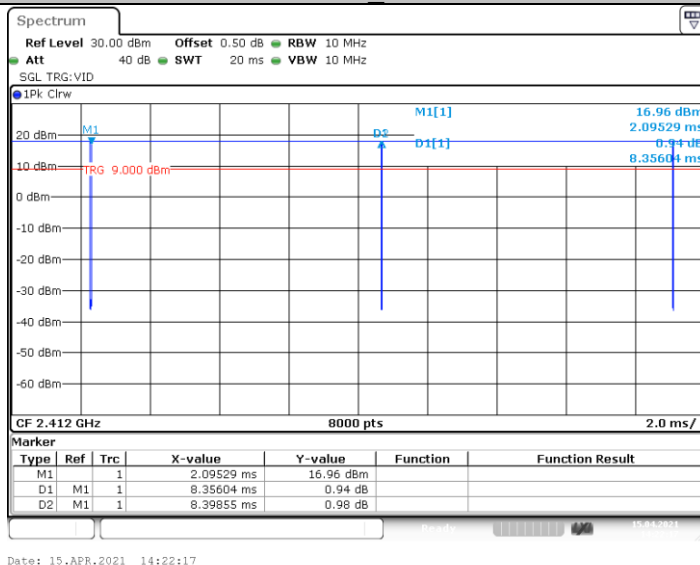
Test Result



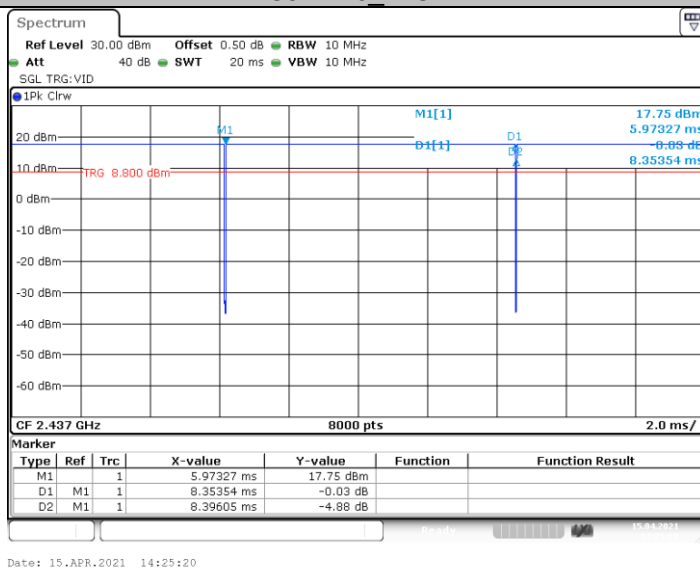
Test Mode	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T Minimum VBW (kHz)	Final setting For VBW (kHz)
802.11b	2412	8.36	8.40	99.49	0.12	1
	2437	8.35	8.40	99.49	0.12	1
	2462	8.35	8.40	99.49	0.12	1
802.11g	2412	1.38	1.43	96.67	0.70	1
	2437	1.38	1.43	96.76	0.70	1
	2462	1.38	1.43	96.68	0.70	1
802.11n(HT20)	2412	1.29	1.34	96.54	0.75	1
	2437	1.29	1.34	96.54	0.75	1
	2462	1.29	1.34	96.45	0.75	1
802.11n(HT40)	2422	0.64	0.69	93.27	1.45	2
	2437	0.64	0.69	93.27	1.45	2
	2452	0.64	0.69	93.27	1.45	2



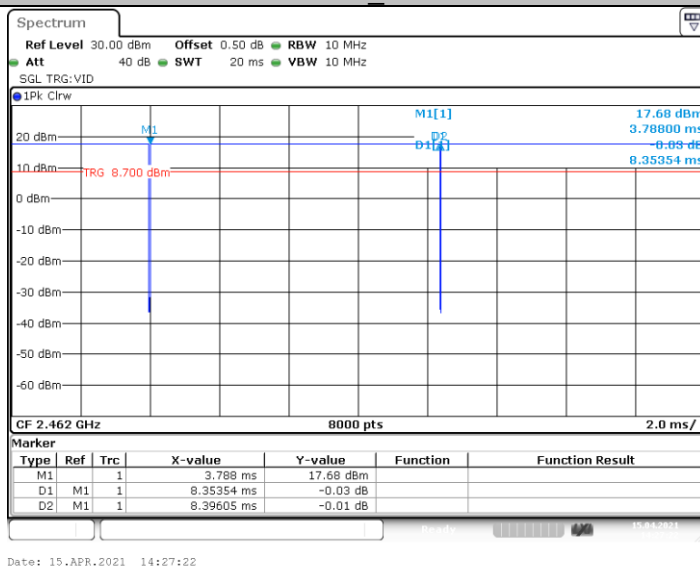
802.11b 2412



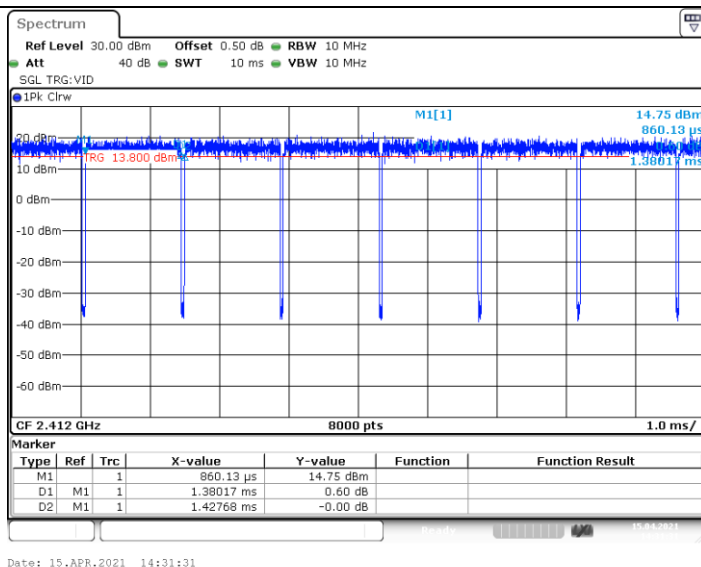
802.11b 2437



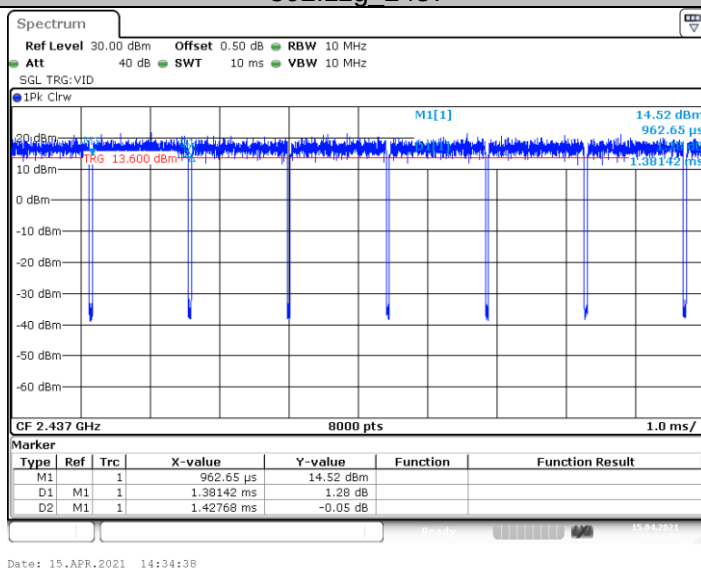
802.11b 2462



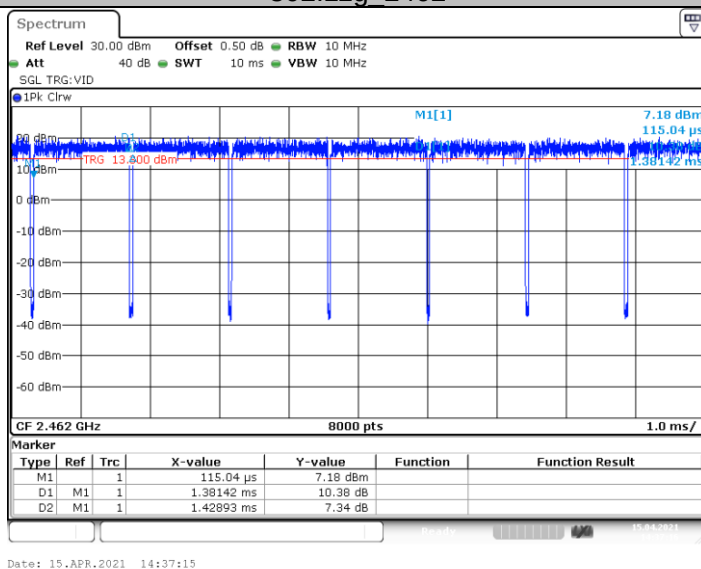
802.11g 2412



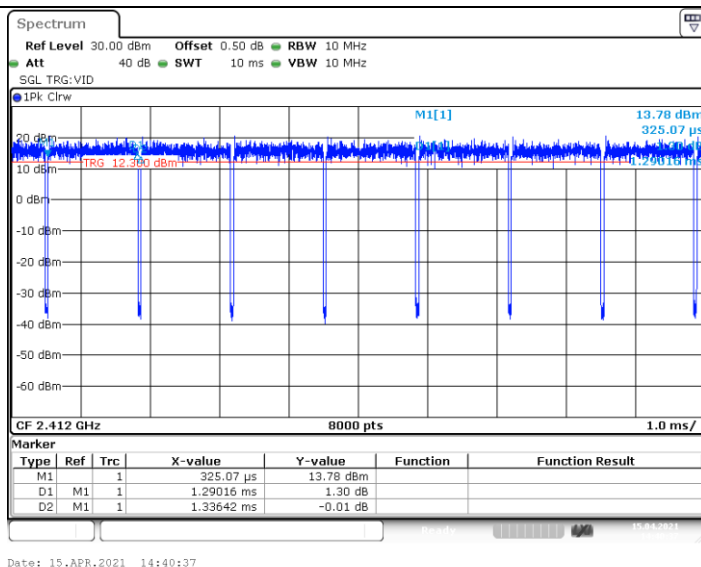
802.11g 2437



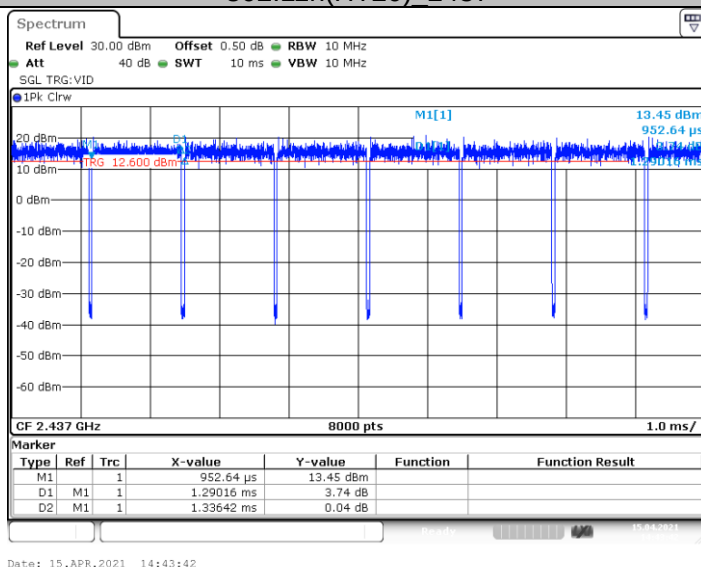
802.11g 2462



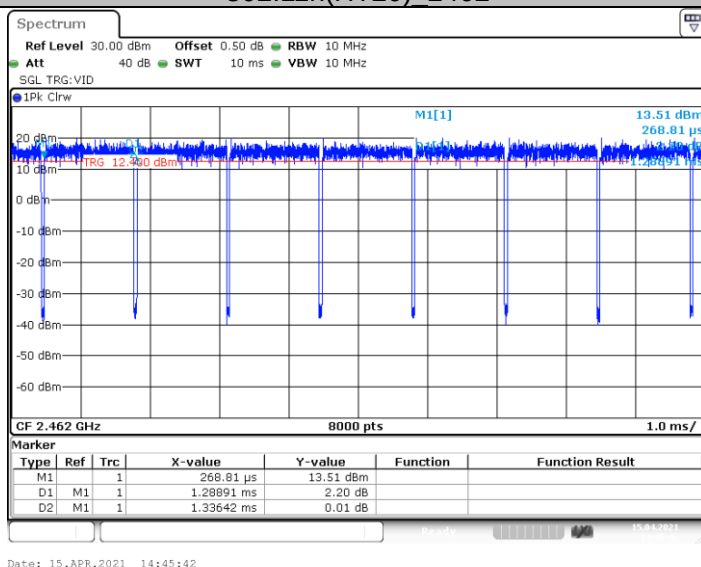
802.11n(HT20) 2412



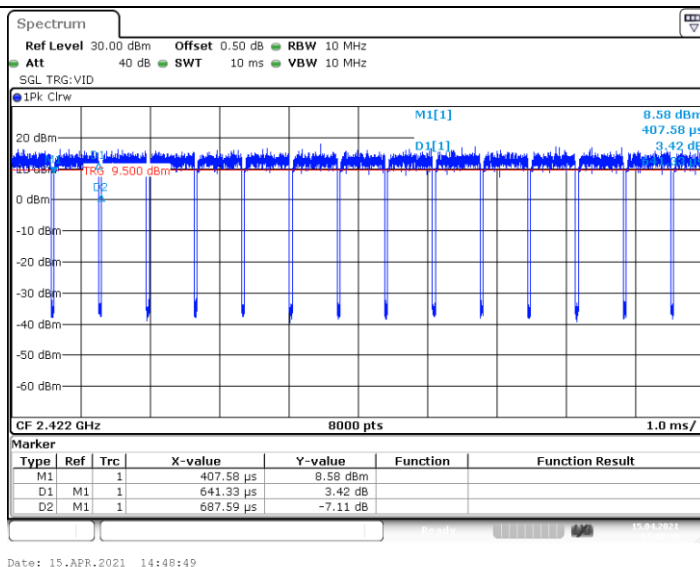
802.11n(HT20) 2437



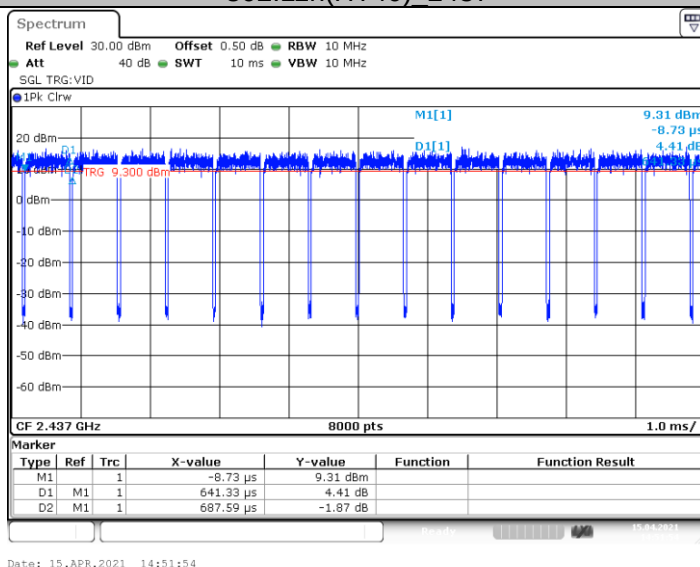
802.11n(HT20) 2462



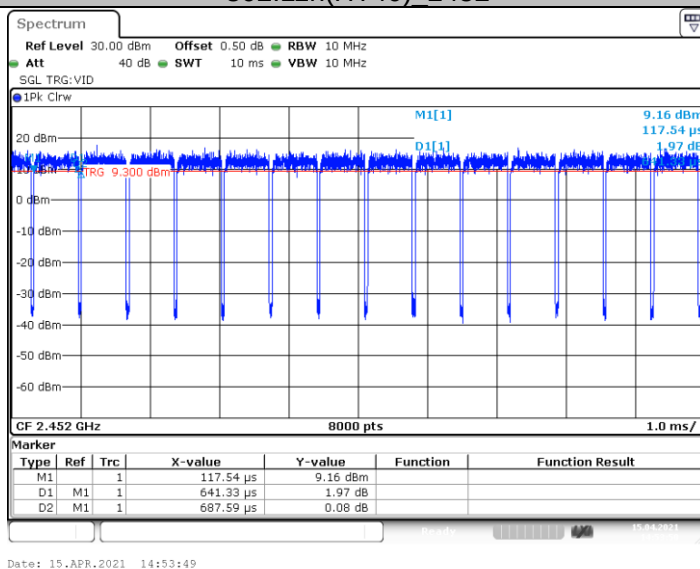
802.11n(HT40) 2422



802.11n(HT40) 2437



802.11n(HT40) 2452





3.9. Antenna requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C 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. The use of a permanently attached antenna or of antenna that uses a unique coupling to the intentional radiator, 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.

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

Test Result

The directional gain of the antenna less than 6dBi, please refer to the EUT internal photographs antenna photo.

*****THE END*****