



Test Report Serial Number:	45461690 R6.0
Test Report Date:	15 February 2022
Project Number:	1557

## EMC Test Report - Appendix F

Applicant:



**Garmin International Inc.**  
**1200 East 151 St**  
**Olathe, KS, 66062**  
**USA**

FCC ID:

**IPH-04247**

Product Model Number / HVIN

**A04247**

IC Registration Number

**1792A-04247**

Product Marketing Name / PMN

**A04247**

In Accordance With:

### **CFR Title 47, Part 15 Subpart C (§15.247), Part 15 Subpart B**

Digital Transmission System (DTS)

### **RSS-Gen, RSS-247 Issue 2**

Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

Approved By:

**Ben Hewson, President**

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Canada



Test Lab Certificate: 2470.01



Industry  
Canada

IC Registration 3874A-1



FCC Registration: CA3874

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### Revision History

<b>Samples Tested By:</b>		Art Voss, P.Eng.	<b>Date(s) of Evaluation:</b>		1 Oct - 1 Dec, 2021
<b>Report Prepared By:</b>		Art Voss, P.Eng.	<b>Report Reviewed By:</b>		Ben Hewson
<b>Report Revision</b>	<b>Description of Revision</b>	<b>Revised Section</b>	<b>Revised By</b>	<b>Revision Date</b>	
0.1	Draft Release	n/a	Art Voss	4 December, 2022	
1.0	Initial Release	n/a	Art Voss	25 January, 2022	
2.0	Revised Plot Headings	16.0	Art Voss	2 February, 2022	
3.0	Revised Scope	3.0	Art Voss	3 February, 2022	
4.0	Added DSS Equipment Class	Cover	Art Voss	9 February, 2022	
5.0	Revised BLE Info	7-14	Art Voss	14 February, 2022	
6.0	Revised Appendices	D-H	Art Voss	15 February, 2022	
	Revised Filing from DSS to DTS	n/a			

**Conducted Power Measurement Results: 802.11**

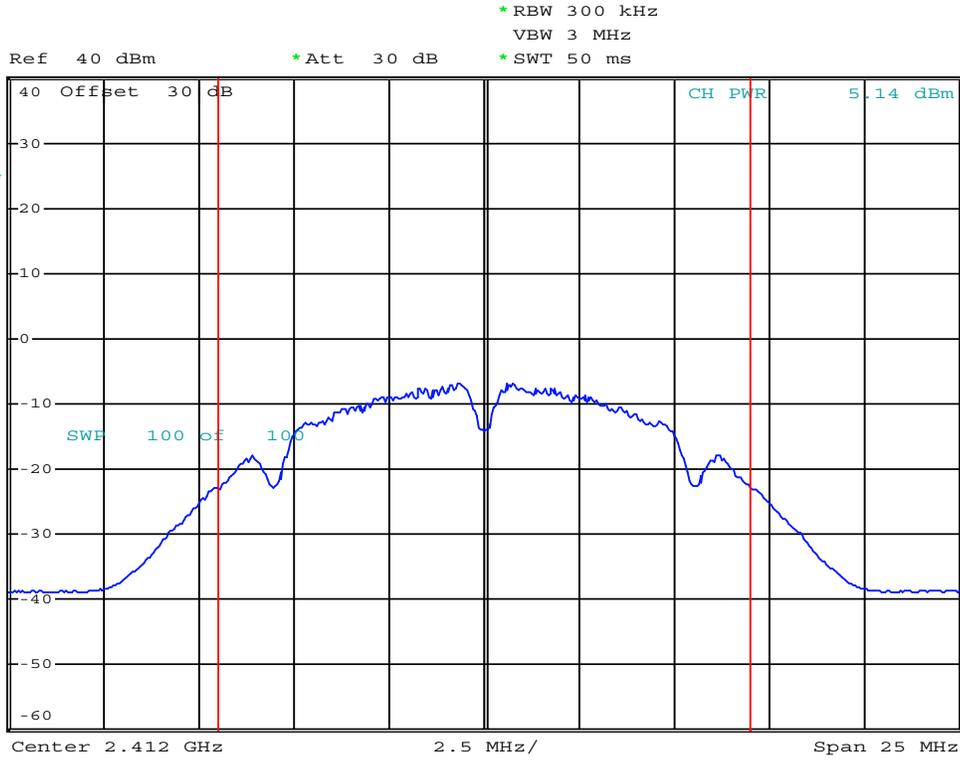
Mode	Channel Number	Frequency (MHz)	Modulation	Bit Rate (Mbps)	Transmit Duty Cycle [DC] (%)	Duty Cycle Correction [CF] <sup>(1)</sup> (dB)	Measured Power [P <sub>Meas</sub> ] (dBm)	Corrected Power [P <sub>Corr</sub> ] <sup>(2)</sup> (dBm)	Conducted Limit [P <sub>Lim</sub> ] (dBm)	Conducted Margin <sup>(3)</sup> (dB)
802.11b	1	2412	CCK	1	95.9	0.18	5.14	5.32	30	24.7
	2	2417		1	95.9	0.18	5.21	5.39	30	24.6
	3	2422		1	95.9	0.18	5.23	5.41	30	24.6
	6	2437		1	95.9	0.18	5.42	5.60	30	24.4
	10	2457		1	95.9	0.18	5.49	5.67	30	24.3
	11	2462		1	95.9	0.18	5.51	5.69	30	24.3
	11	2462	DSSS	5.5	83.4	0.79	3.20	3.99	30	26.0
11	2462	11		83.4	0.79	4.37	5.16	30	24.8	
802.11g	11	2462	OFDM	6	96.3	0.16	6.19	6.35	30	23.6
	11	2462		9	94.6	0.24	6.04	6.28	30	23.7
	11	2462		12	88.2	0.55	5.54	6.09	30	23.9
	11	2462		24	88.2	0.55	4.82	5.37	30	24.6
	11	2462		54	88.2	0.55	3.66	4.21	30	25.8
802.11n	11	2462	MCS0	6.5	87.6	0.57	5.30	5.87	30	24.1
	11	2462	MCS4	36	87.6	0.57	3.08	3.65	30	26.3
	11	2462	MCS7	65	87.6	0.57	2.50	3.07	30	26.9
<b>Result:</b>									<b>Complies</b>	

(1) Correction Factor [CF] = 10Log(1/[DC])

(2) Corrected Power [P<sub>Corr</sub>] = P<sub>Meas</sub> + CF

(3) Conducted Margin = P<sub>Limit</sub> - P<sub>Corr</sub>

## Conducted Power: WiFi



Date: 16.NOV.2021 09:06:53

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.11b	1	2412	CCK	1	5.14

## Conducted Power: WiFi

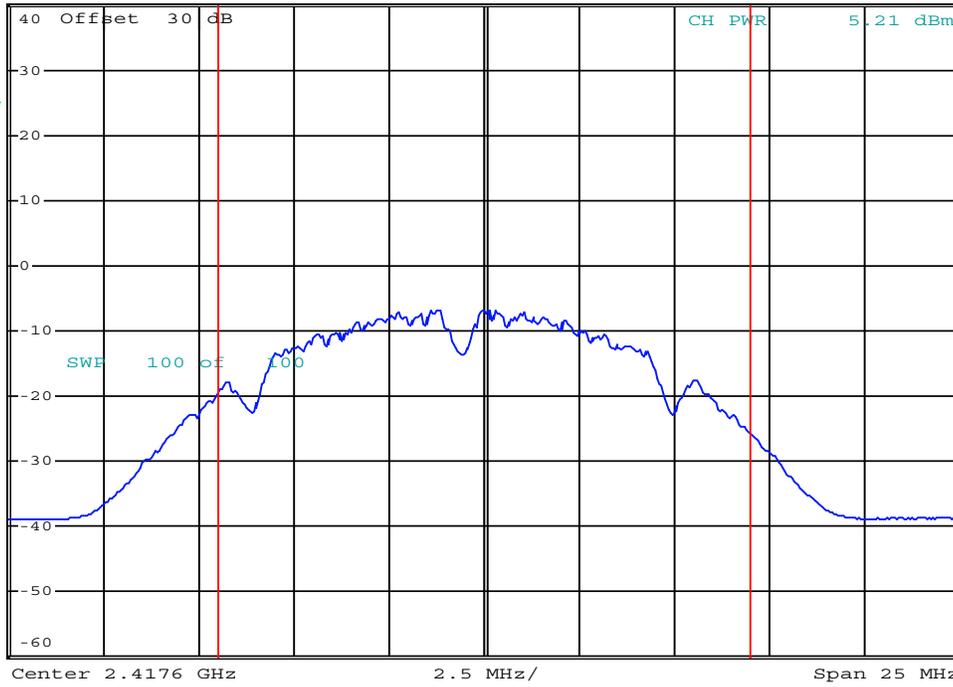


\*RBW 300 kHz  
 VBW 3 MHz  
 \*SWT 50 ms

Ref 40 dBm

\*Att 30 dB

1 RM  
 VIEW



Date: 16.NOV.2021 09:54:37

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.11b	2	2417	CCK	1	5.21

## Conducted Power: WiFi

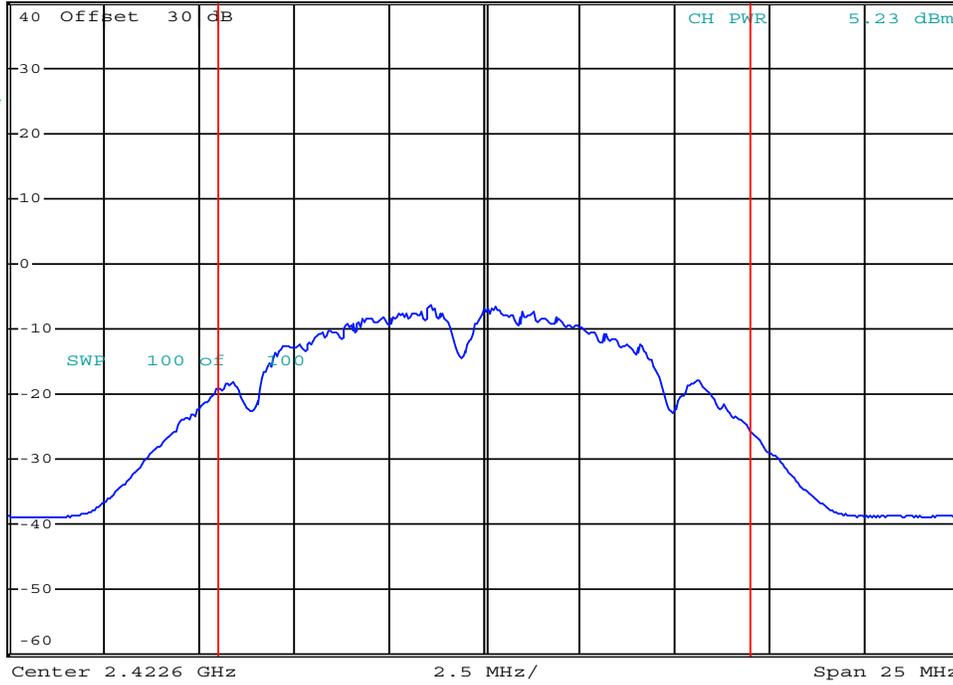


\*RBW 300 kHz  
 VBW 3 MHz  
 \*SWT 50 ms

Ref 40 dBm

\*Att 30 dB

1 RM  
 VIEW



Date: 16.NOV.2021 09:56:10

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.11b	3	2422	CCK	1	5.23

## Conducted Power: WiFi

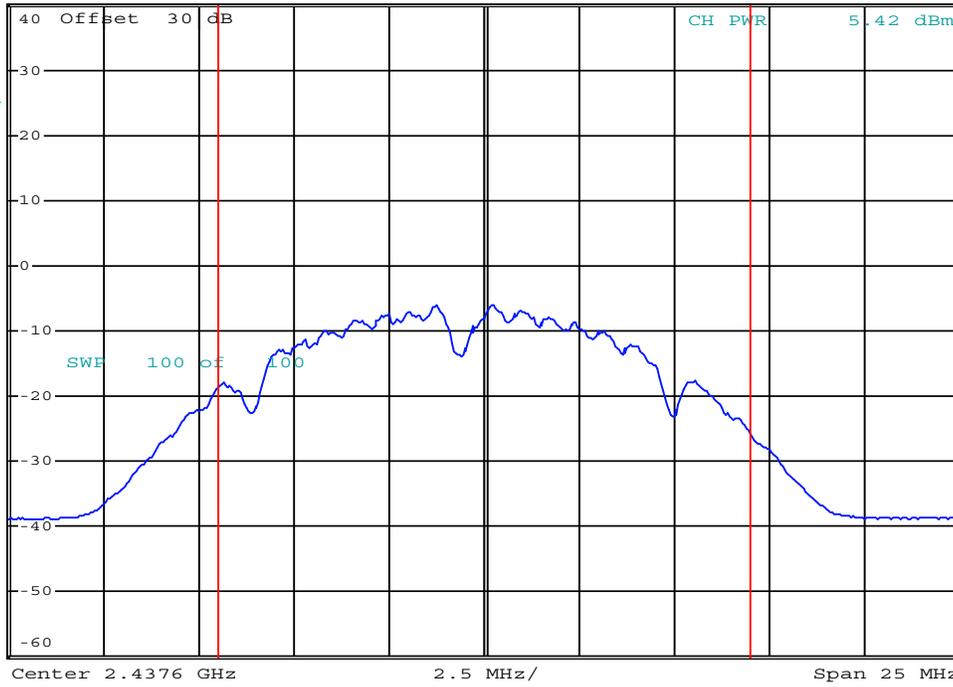


\*RBW 300 kHz  
 VBW 3 MHz  
 \*SWT 50 ms

Ref 40 dBm

\*Att 30 dB

1 RM  
 VIEW



Date: 16.NOV.2021 09:58:08

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.11b	6	2437	CCK	1	5.42

## Conducted Power: WiFi

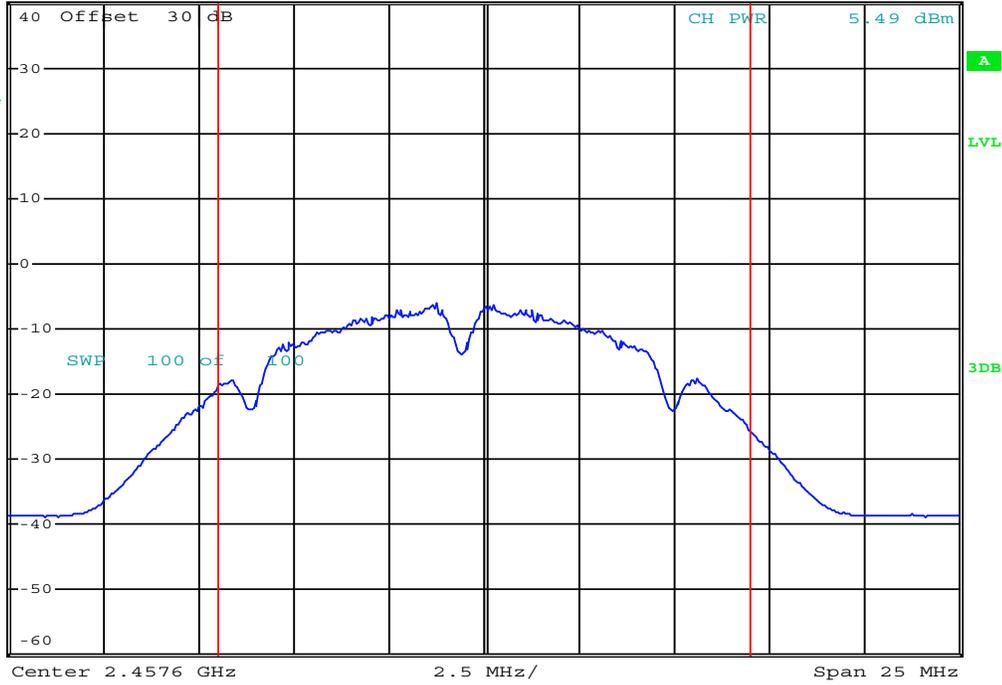


\*RBW 300 kHz  
 VBW 3 MHz  
 \*SWT 50 ms

Ref 40 dBm

\*Att 30 dB

1 RM  
 VIEW



Date: 16.NOV.2021 10:01:15

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.11b	10	2457	CCK	1	5.49

**Conducted Power: WiFi**

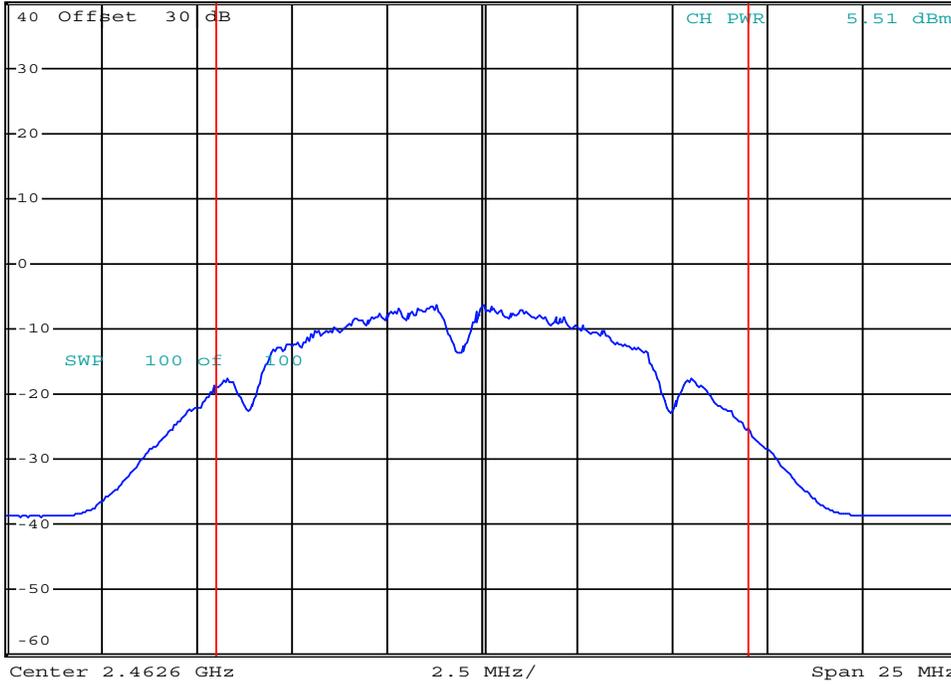


\*RBW 300 kHz  
 VBW 3 MHz  
 \*SWT 50 ms

Ref 40 dBm

\*Att 30 dB

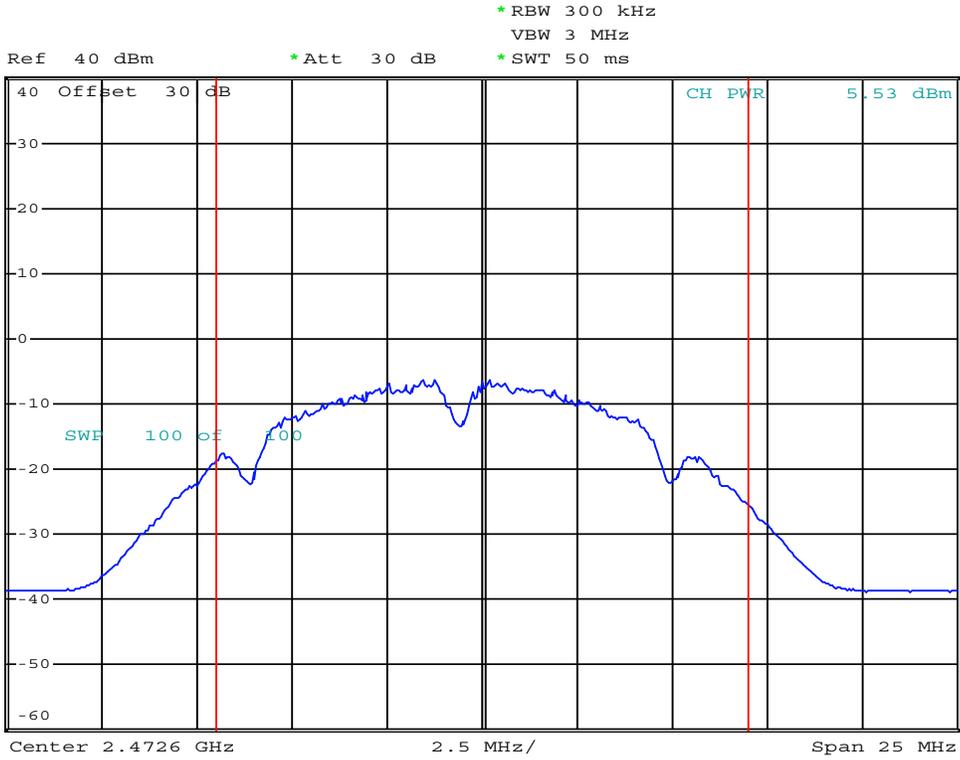
1 RM  
 VIEW



Date: 16.NOV.2021 10:02:23

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.11b	11	2462	CCK	1	5.51

## Conducted Power: WiFi



Date: 16.NOV.2021 10:07:13

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.11b	13	2472	CCK	1	5.53

## Conducted Power: WiFi

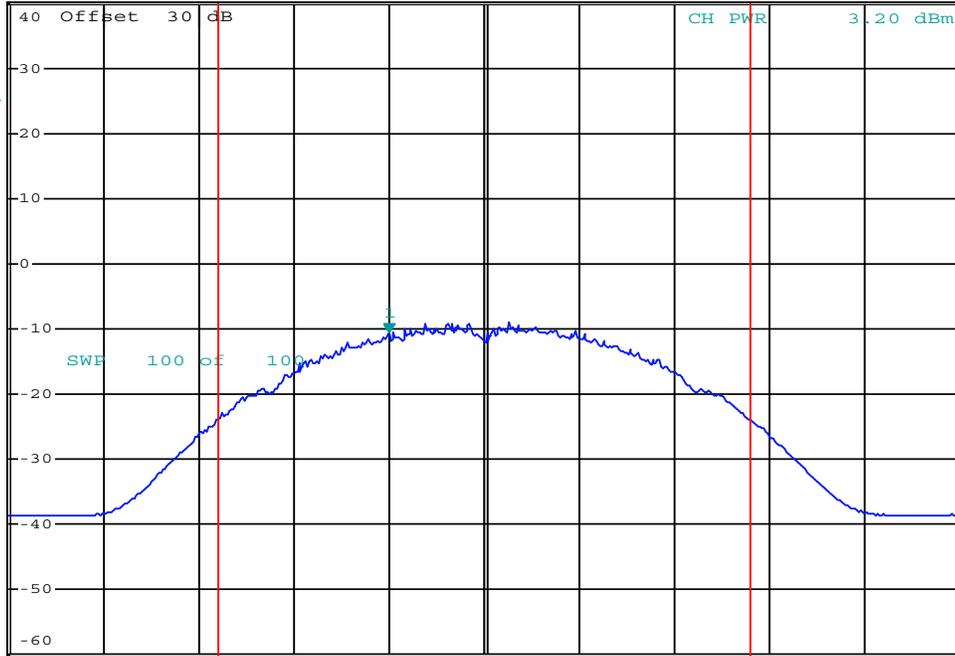


\*RBW 300 kHz    Marker 1 [T1 ]  
 VBW 3 MHz                    -10.56 dBm  
 \*SWT 50 ms                    2.459500000 GHz

Ref 40 dBm

\*Att 30 dB

1 RM \*  
 VIEW



Date: 16.NOV.2021 10:16:29

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.11b	11	2462	DSSS	5.5	3.20

## Conducted Power: WiFi

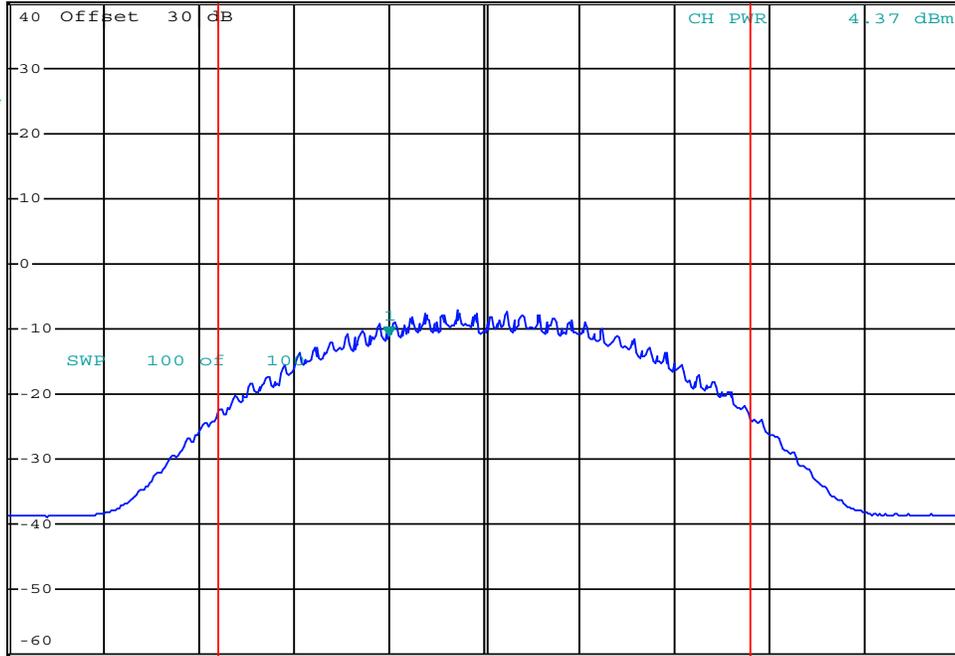


\*RBW 300 kHz    Marker 1 [T1 ]  
 VBW 3 MHz        -10.92 dBm  
 \*SWT 50 ms        2.459500000 GHz

Ref 40 dBm

\*Att 30 dB

1 RM \*  
 VIEW



Date: 16.NOV.2021 10:19:19

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.11b	11	2462	DSSS	11	4.37

## Conducted Power: WiFi

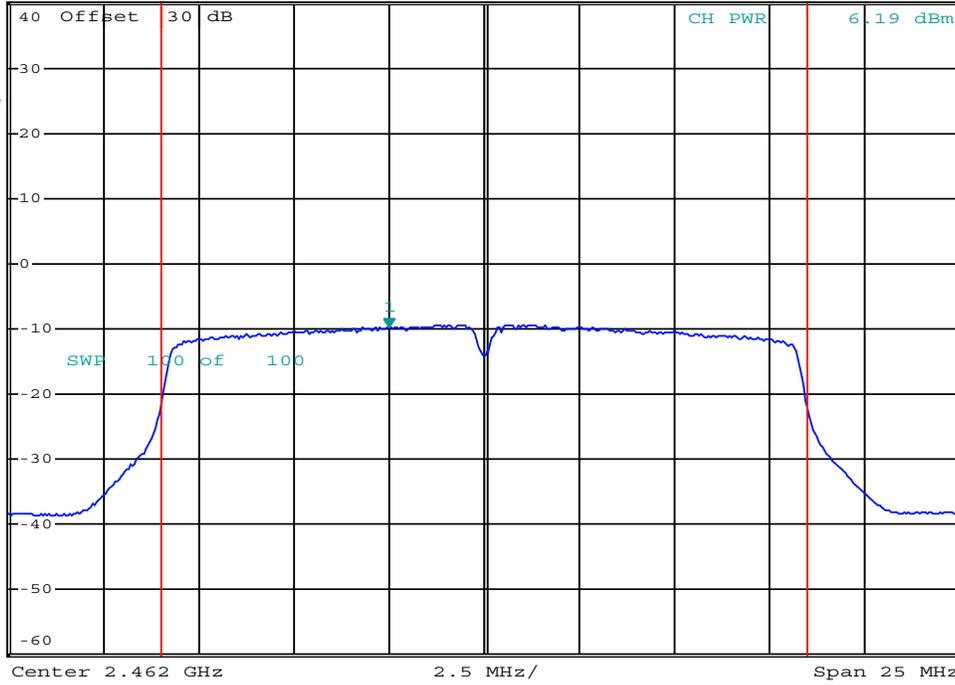


\*RBW 300 kHz Marker 1 [T1 ]  
 VBW 3 MHz -9.69 dBm  
 \*SWT 50 ms 2.459500000 GHz

Ref 40 dBm

\*Att 30 dB

1 RM\*  
 VIEW



Date: 16.NOV.2021 10:37:45

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.11g	11	2462	OFDM	6	6.19

## Conducted Power: WiFi

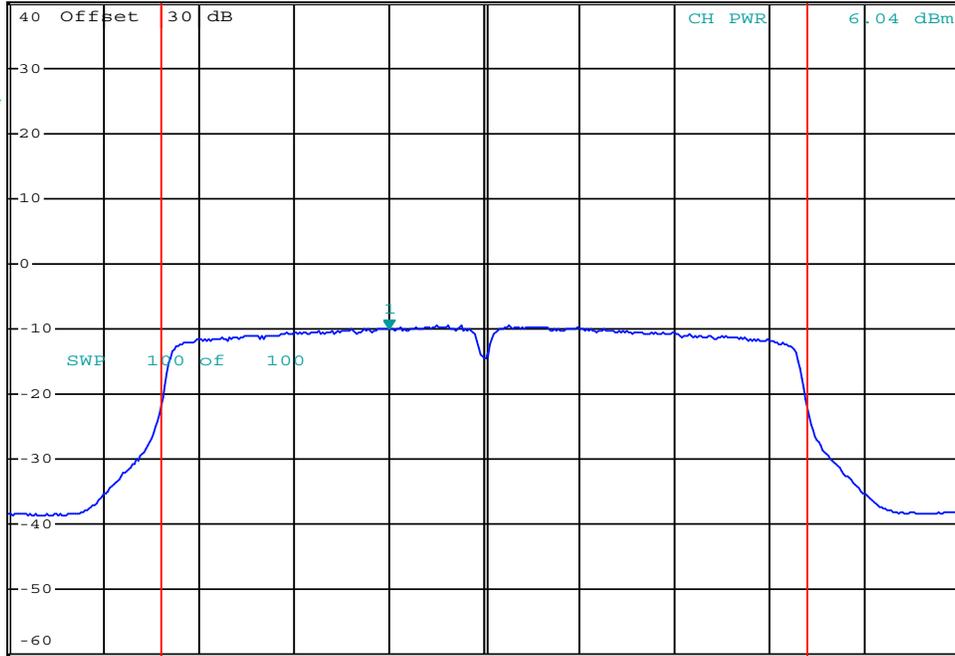


\*RBW 300 kHz    Marker 1 [T1 ]  
 VBW 3 MHz        -10.01 dBm  
 \*SWT 50 ms        2.459500000 GHz

Ref 40 dBm

\*Att 30 dB

1 RM\*  
VIEW



Date: 16.NOV.2021 10:40:26

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.11g	11	2462	OFDM	9	6.04

## Conducted Power: WiFi

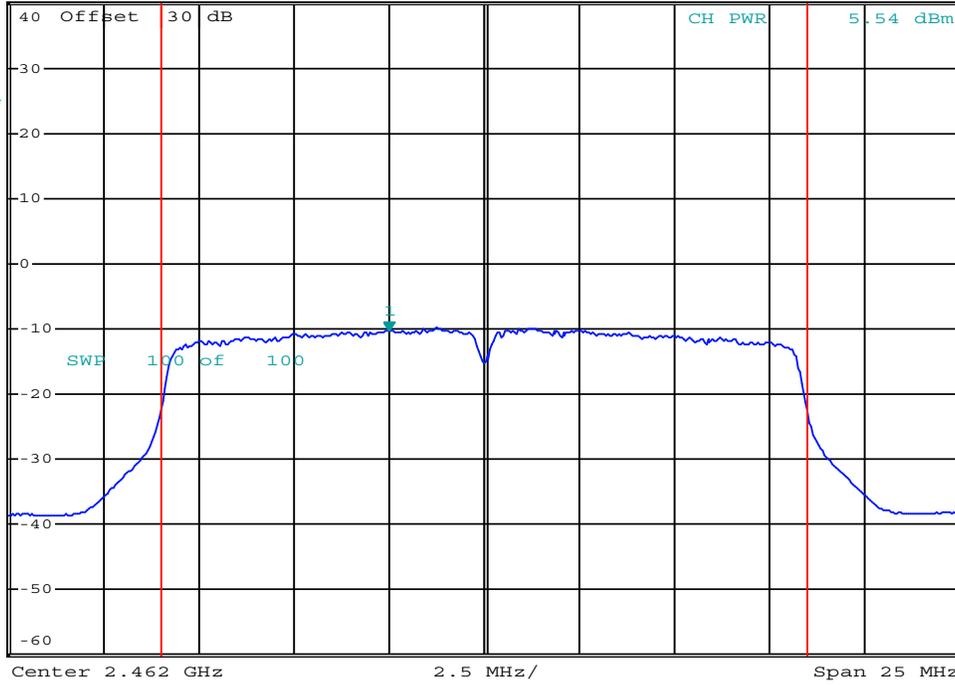


\*RBW 300 kHz    Marker 1 [T1 ]  
 VBW 3 MHz        -10.28 dBm  
 \*SWT 50 ms        2.459500000 GHz

Ref 40 dBm

\*Att 30 dB

1 RM \*  
 VIEW



Date: 16.NOV.2021 10:41:41

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.11g	11	2462	OFDM	12	5.54

## Conducted Power: WiFi

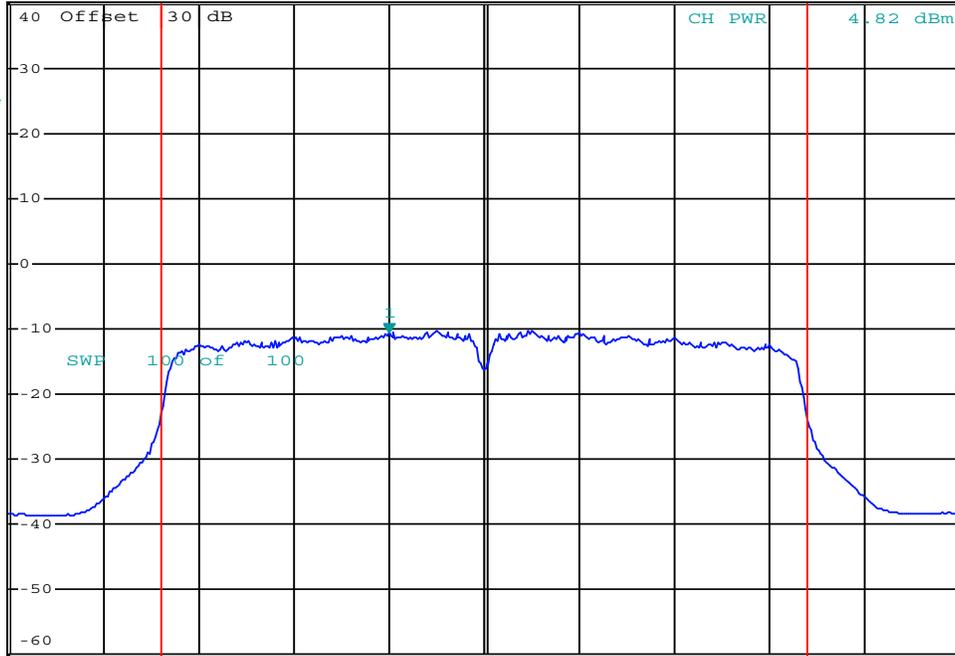


\*RBW 300 kHz    Marker 1 [T1 ]  
 VBW 3 MHz        -10.65 dBm  
 \*SWT 50 ms        2.459500000 GHz

Ref 40 dBm

\*Att 30 dB

1 RM\*  
 VIEW



Date: 16.NOV.2021 10:44:20

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.11g	11	2462	OFDM	24	4.82

## Conducted Power: WiFi

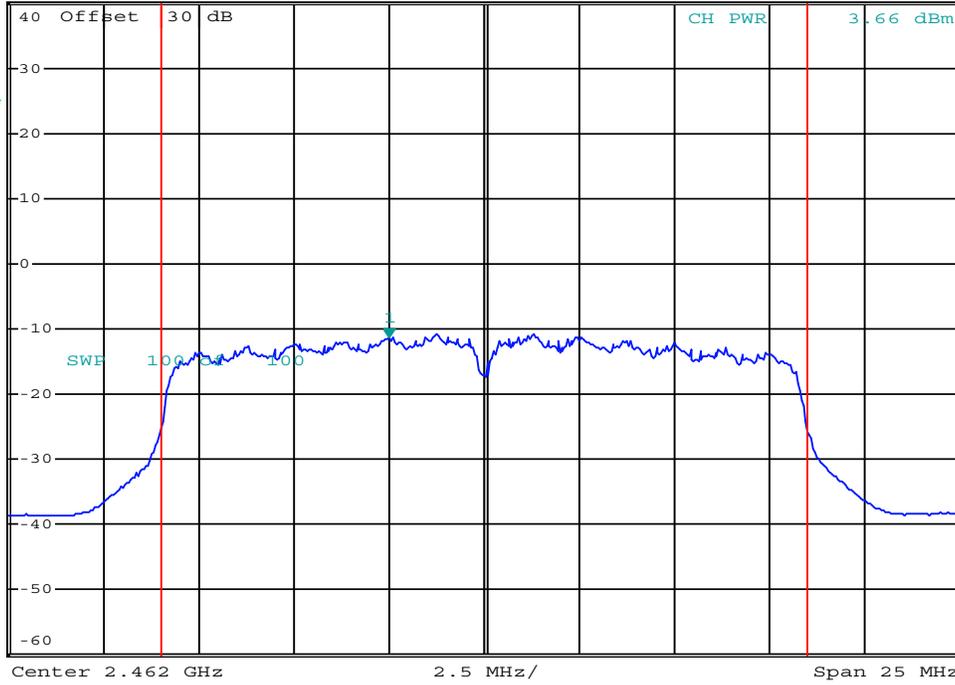


\*RBW 300 kHz Marker 1 [T1 ]  
 VBW 3 MHz -11.33 dBm  
 \*SWT 50 ms 2.459500000 GHz

Ref 40 dBm

\*Att 30 dB

1 RM \*  
 VIEW



Date: 16.NOV.2021 10:45:18

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.11g	11	2462	OFDM	54	3.66

## Conducted Power: WiFi



\*RBW 300 kHz    Marker 1 [T1 ]  
 VBW 3 MHz                    -38.45 dBm  
 \*Att 30 dB                    2.459500000 GHz

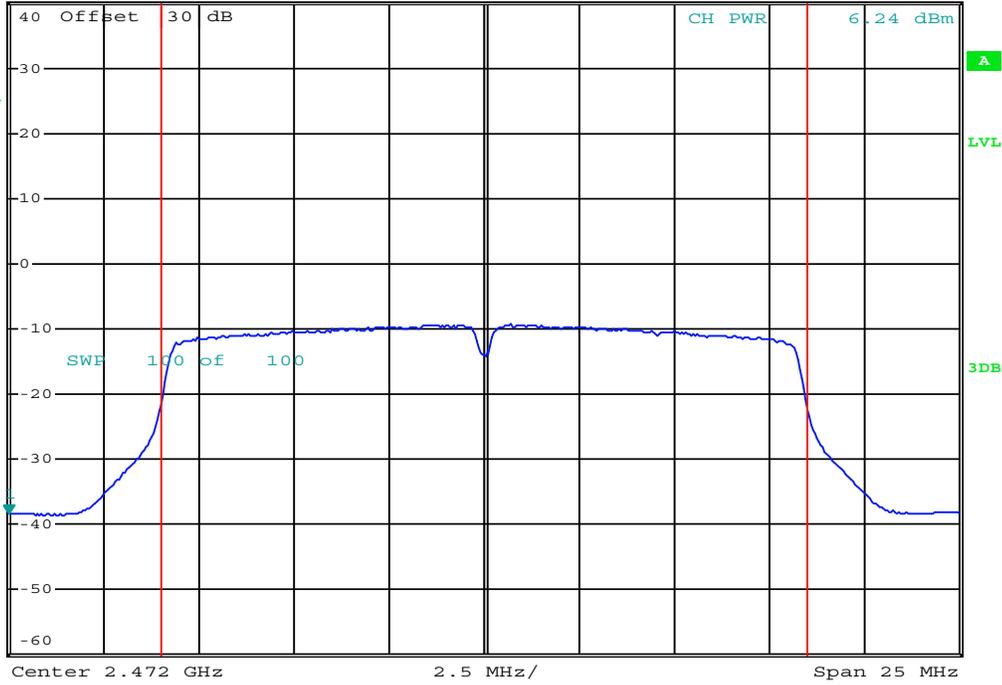
Ref 40 dBm

\*Att 30 dB

\*SWT 50 ms

2.459500000 GHz

1 RM\*  
 VIEW



Date: 16.NOV.2021 10:39:10

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.11g	13	2472	OFDM	6	6.24

## Conducted Power: WiFi

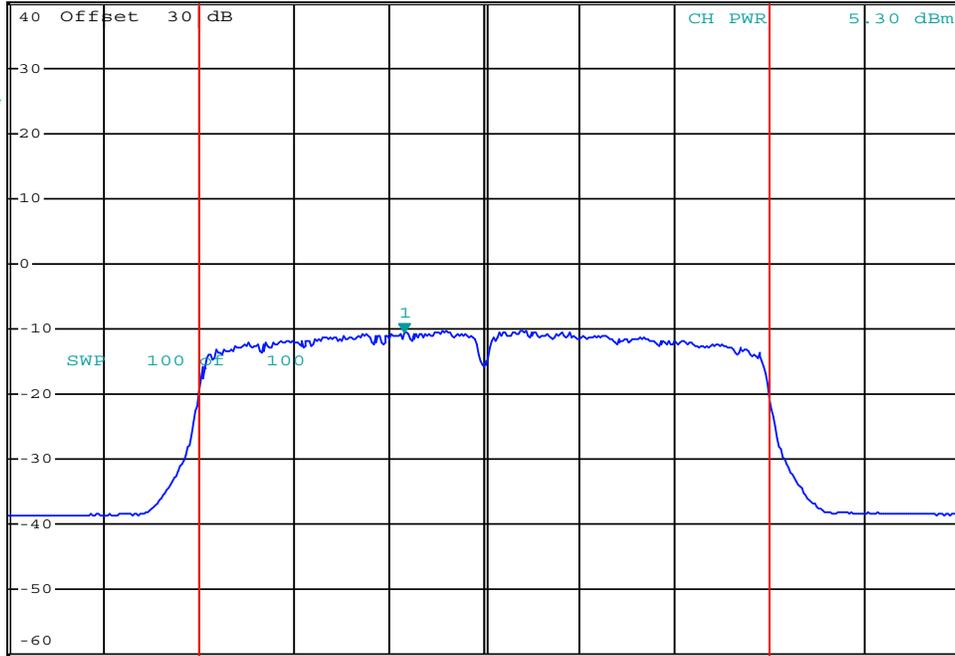


\*RBW 300 kHz    Marker 1 [T1 ]  
 VBW 3 MHz        -10.55 dBm  
 \*SWT 50 ms        2.459500000 GHz

Ref 40 dBm

\*Att 30 dB

1 RM\*  
 VIEW



Date: 16.NOV.2021 11:06:01

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.11n	11	2462	MCS0	6.5	5.30

## Conducted Power: WiFi

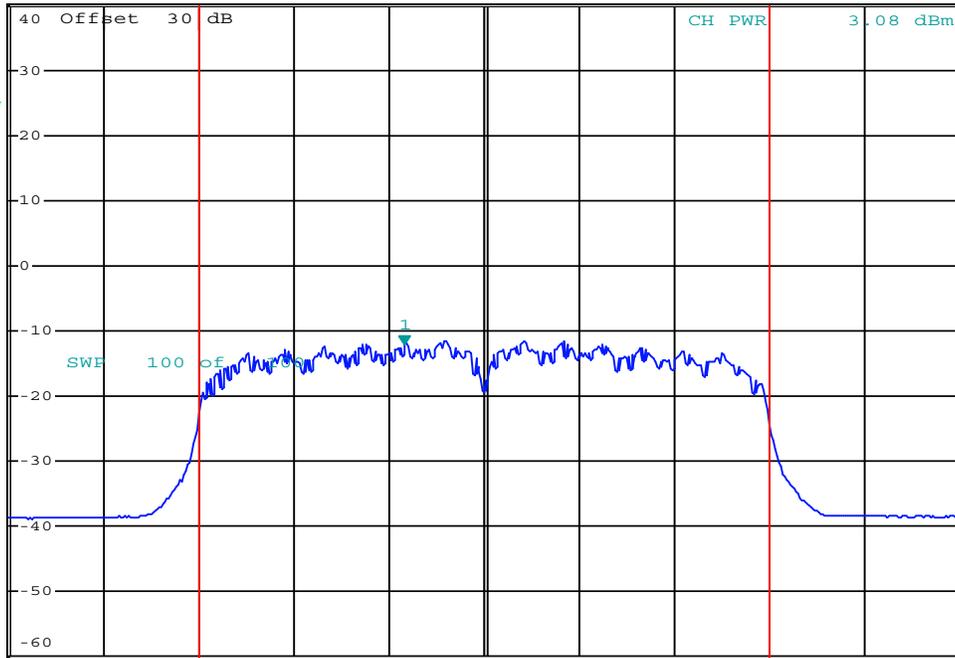


\*RBW 300 kHz Marker 1 [T1 ]  
 VBW 3 MHz -12.18 dBm  
 \*SWT 50 ms 2.459500000 GHz

Ref 40 dBm

\*Att 30 dB

1 RM \*  
 VIEW



Center 2.462 GHz

3 MHz/

Span 30 MHz

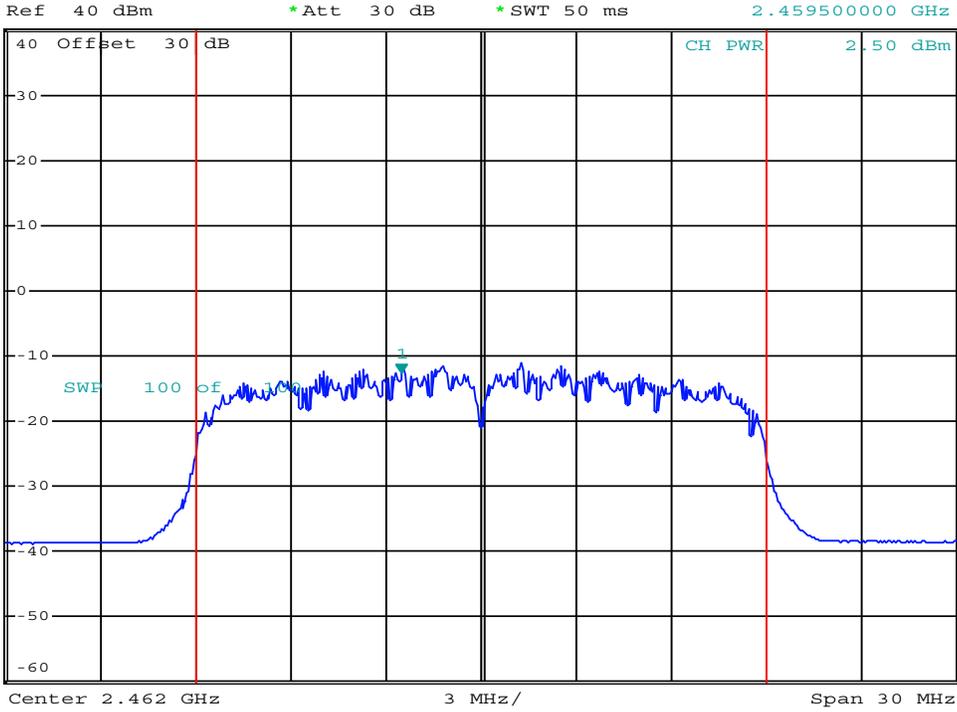
Date: 16.NOV.2021 11:12:13

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.11n	11	2462	MCS4	36	3.08

**Conducted Power: WiFi**



\*RBW 300 kHz    Marker 1 [T1 ]  
 VBW 3 MHz                    -12.51 dBm  
 \*SWT 50 ms                    2.459500000 GHz



Date: 16.NOV.2021 11:13:53

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.11n	11	2462	MCS7	65	2.50

## Conducted Power: WiFi

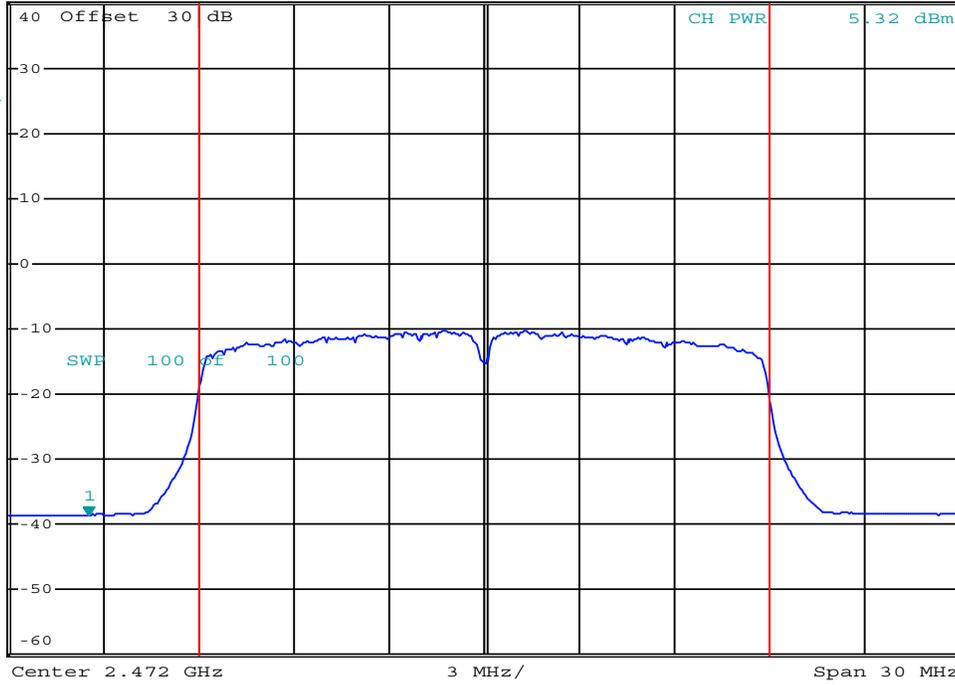


\*RBW 300 kHz    Marker 1 [T1 ]  
 VBW 3 MHz                    -38.51 dBm  
 \*SWT 50 ms                    2.459500000 GHz

Ref 40 dBm

\*Att 30 dB

1 RM\*  
 VIEW



Date: 16.NOV.2021 11:11:03

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.11n	13	2462	MCS0	6.5	5.32





**Conducted Power Measurement Results: 802.15 (BLE)**

Mode	Channel Number	Frequency (MHz)	Modulation	Bit Rate (Mbps)	Transmit Duty Cycle [DC] (%)	Duty Cycle Correction [CF] <sup>(1)</sup> (dB)	Measured Power [P <sub>Meas</sub> ] (dBm)	Corrected Power [P <sub>Corr</sub> ] <sup>(2)</sup> (dBm)	Conducted Limit [P <sub>Lim</sub> ] (dBm)	Conducted Margin <sup>(3)</sup> (dB)
BLE	2	2402	GMSK	-	60.8	2.16	-1.46	0.70	30	29.3
	18	2442			60.8	2.16	-0.98	1.18	30	28.8
	39	2480			60.8	2.16	-0.93	1.23	30	28.8
	39	2442			60.8	2.16	-0.60	1.56	30	28.4
	39	2480			60.8	2.16	-0.74	1.42	30	28.6
<b>Result:</b>									<b>Complies</b>	

(1) Correction Factor [CF] = 10Log(1/[DC])

(2) Corrected Power [P<sub>Corr</sub>] = P<sub>Meas</sub> + CF

(3) Conducted Margin = P<sub>Limit</sub> - P<sub>Corr</sub>

**Conducted Power: 802.15**

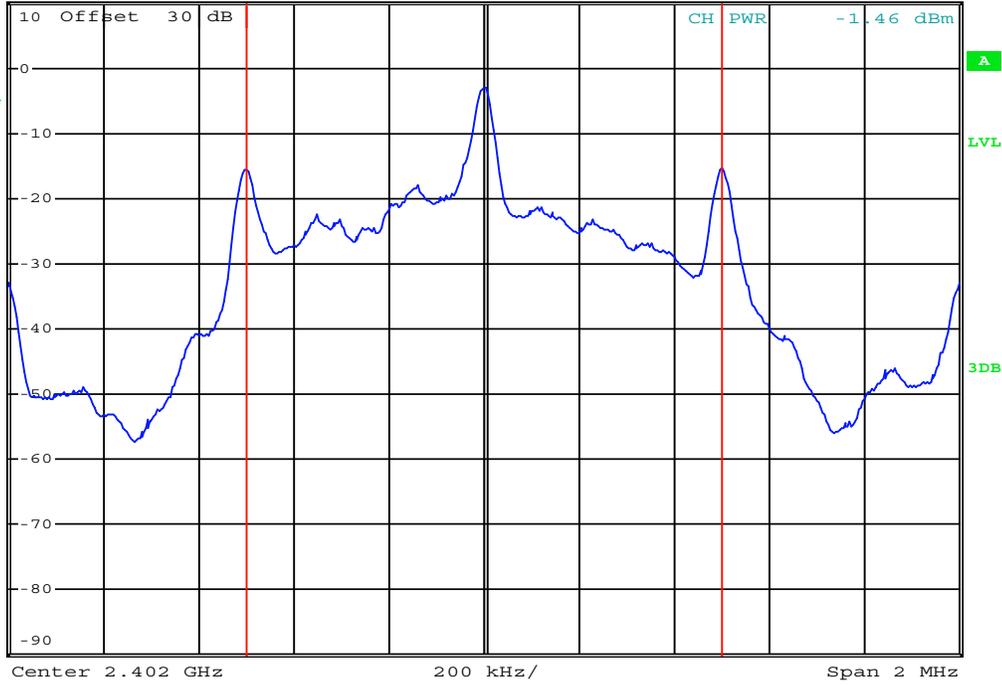


\*RBW 30 kHz  
 \*VBW 300 kHz  
 \*SWT 1 s

Ref 10 dBm

\*Att 10 dB

1 RM  
 VIEW



Date: 16.NOV.2021 13:40:26

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.15	2	2480	GMSK	-	-1.46

# Conducted Power: 802.15

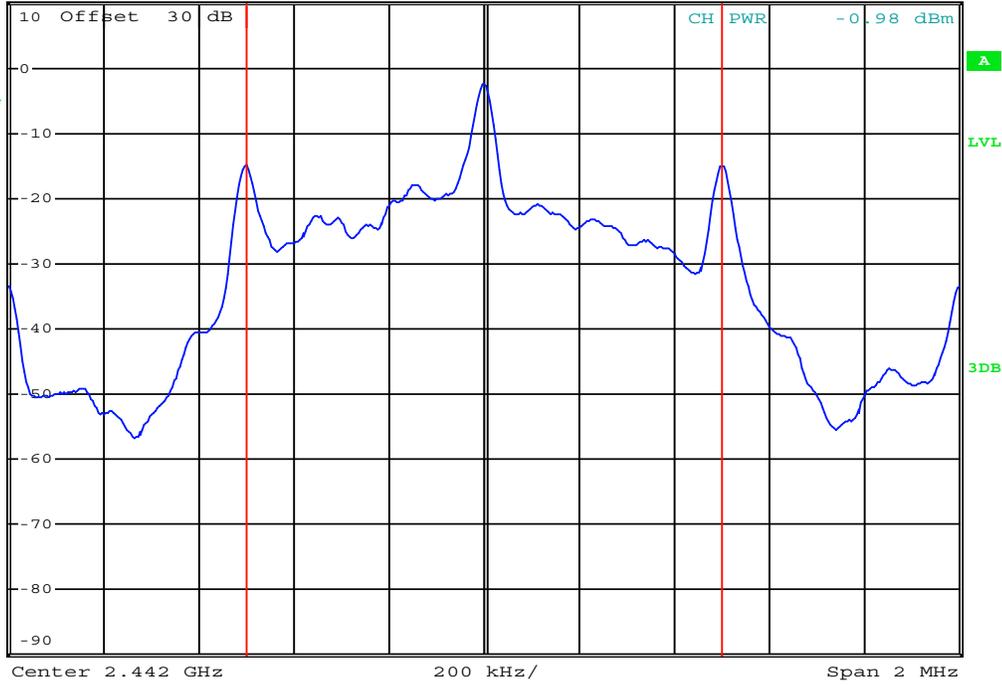


\*RBW 30 kHz  
 \*VBW 300 kHz  
 \*SWT 1 s

Ref 10 dBm

\*Att 10 dB

1 RM  
 VIEW



Date: 16.NOV.2021 13:39:01

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.15	18	2442	GMSK	-	-0.98

**Conducted Power: 802.15**



\*RBW 30 kHz    Marker 1 [T1 ]  
 VBW 300 kHz    -32.93 dBm  
 \*Att 10 dB    \*SWT 1 s    2.479000000 GHz

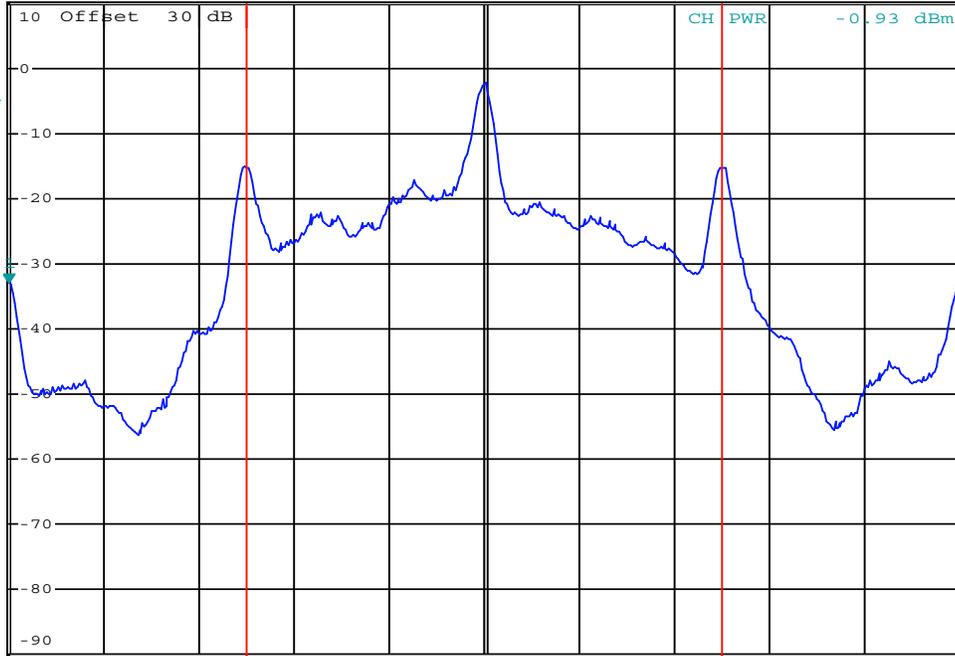
Ref 10 dBm

\*Att 10 dB

\*SWT 1 s

2.479000000 GHz

1 RM\*  
VIEW



Date: 16.NOV.2021 13:41:26

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.15	39	2480	GMSK	-	-0.93

**Conducted Power: 802.15 @ -30°C**



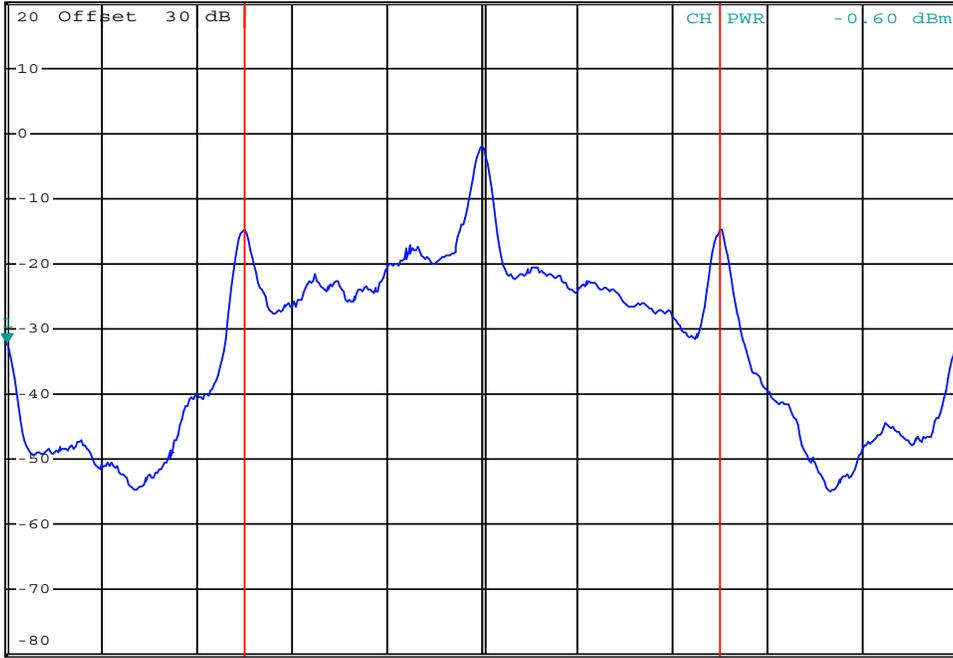
\*RBW 30 kHz    Marker 1 [T1 ]  
 VBW 300 kHz    -32.19 dBm  
 \*Att 10 dB    \*SWT 1 s    2.479000000 GHz

Ref 20 dBm

\*Att 10 dB

CH PWR -0.60 dBm

1 RM \*  
 VIEW



Date: 20.NOV.2021 11:51:20

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.15	39	2480	GMSK	-	-0.60

**Conducted Power: 802.15 @ +40°C**



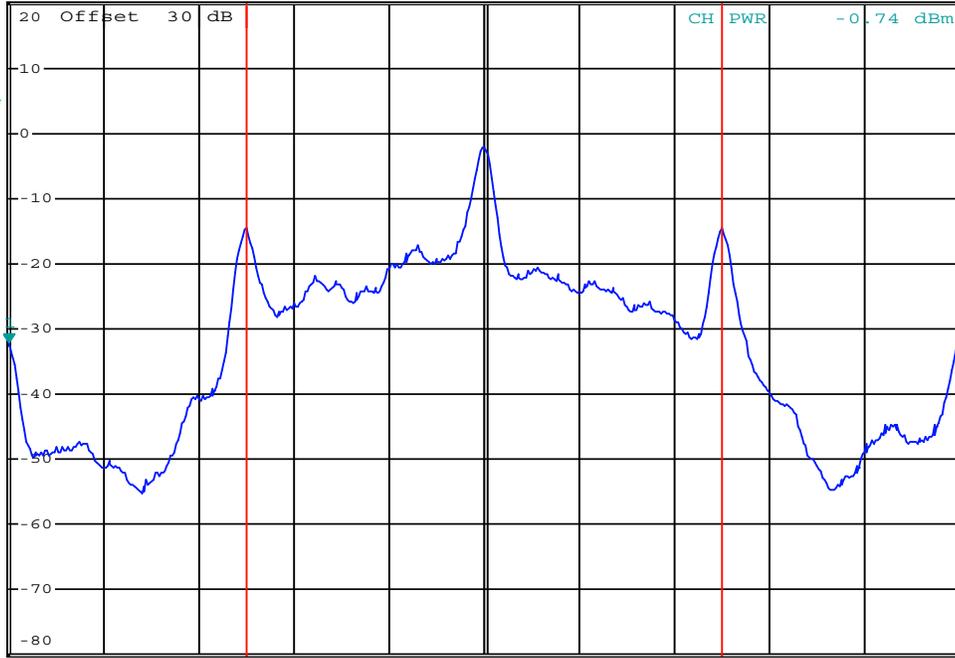
\*RBW 30 kHz    Marker 1 [T1 ]  
 VBW 300 kHz    -32.10 dBm  
 \*Att 10 dB    \*SWT 1 s    2.479000000 GHz

Ref 20 dBm

\*Att 10 dB

CH PWR -0.74 dBm

1 RM \*  
 VIEW



Date: 20.NOV.2021 12:41:50

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Conducted Power (dBm)
802.15	39	2480	GMSK	-	-0.74

**Power Spectral Density Measurement Results: WiFi**

Mode	Channel Number	Frequency (MHz)	Modulation	Bit Rate (Mbps)	Measured PSD [PSD <sub>Meas</sub> ] (dBm)	Transmit Duty Cycle [DC] (%)	Duty Cycle Correction [CF] <sup>(1)</sup> (dB)	Corrected PSD [PSD <sub>Corr</sub> ] <sup>(2)</sup> (dBm)	PSD Limit [PSD <sub>Lim</sub> ] (dBm)	Margin <sup>(3)</sup> (dB)
802.11b	11	2462	CCK	1.0	-8.090	95.9	0.18	-7.91	10	17.9
802.11g	11	2462	OFDM	6.0	-10.860	92.4	0.34	-10.52	10	20.5
802.11n	11	2462	MCS0	6.5	-10.860	87.6	0.57	-10.29	10	20.3
<b>Result: Complies</b>										

(1) Duty Cycle Correction Factor [CF] =  $10\log(1/[DC])$

(2) Corrected PSD [PSDCorr] = [PSDMeas] + [CF]

(3) Margin = [PSD<sub>Limit</sub>] - [PSDCorr]

# Power Spectral Density: WiFi



\*RBW 100 kHz    Marker 1 [T1 ]  
 VBW 1 MHz                    -8.09 dBm  
 \*Att 30 dB                    2.461000000 GHz

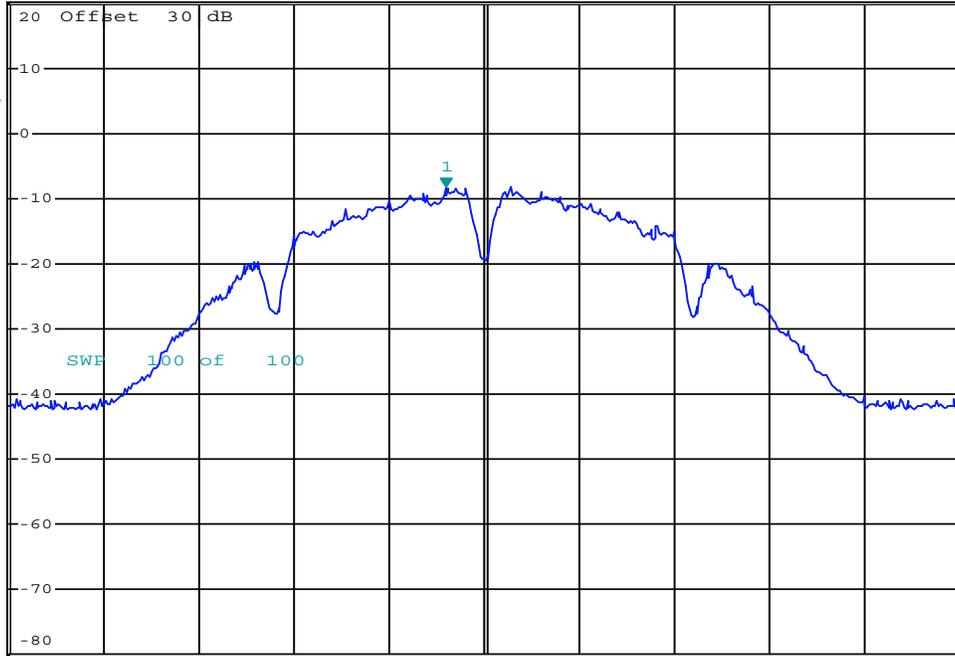
Ref 20 dBm

\*Att 30 dB

\*SWT 50 ms

2.461000000 GHz

1 RM\*  
VIEW



Center 2.462 GHz

2.5 MHz/

Span 25 MHz

Date: 21.NOV.2021 13:12:48

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Measured PSD (dBm)
802.11b	11	2462	CCK	1	-8.09

# Power Spectral Density: WiFi



\*RBW 100 kHz    Marker 1 [T1 ]  
 VBW 1 MHz                    -10.86 dBm  
 \*Att 30 dB                    2.462650000 GHz

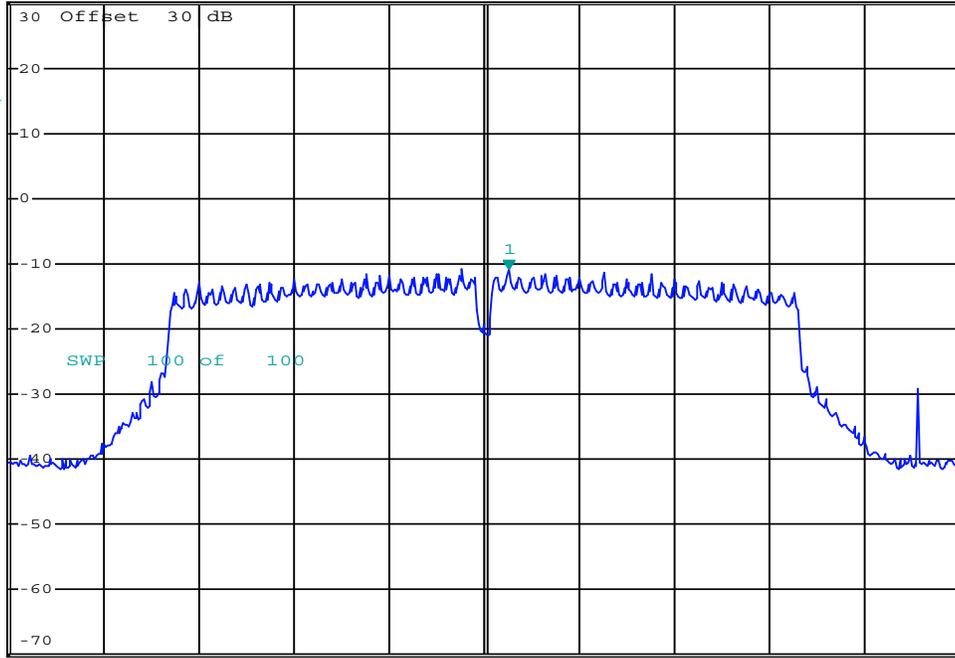
Ref 30 dBm

\*Att 30 dB

\*SWT 50 ms

2.462650000 GHz

1 RM\*  
VIEW



Date: 21.NOV.2021 13:38:41

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Measured PSD (dBm)
802.11g	11	2462	OFDM	6	-10.86

# Power Spectral Density: WiFi



\*RBW 100 kHz    Marker 1 [T1 ]  
 VBW 1 MHz        -11.00 dBm  
 \*Att 30 dB        2.460750000 GHz

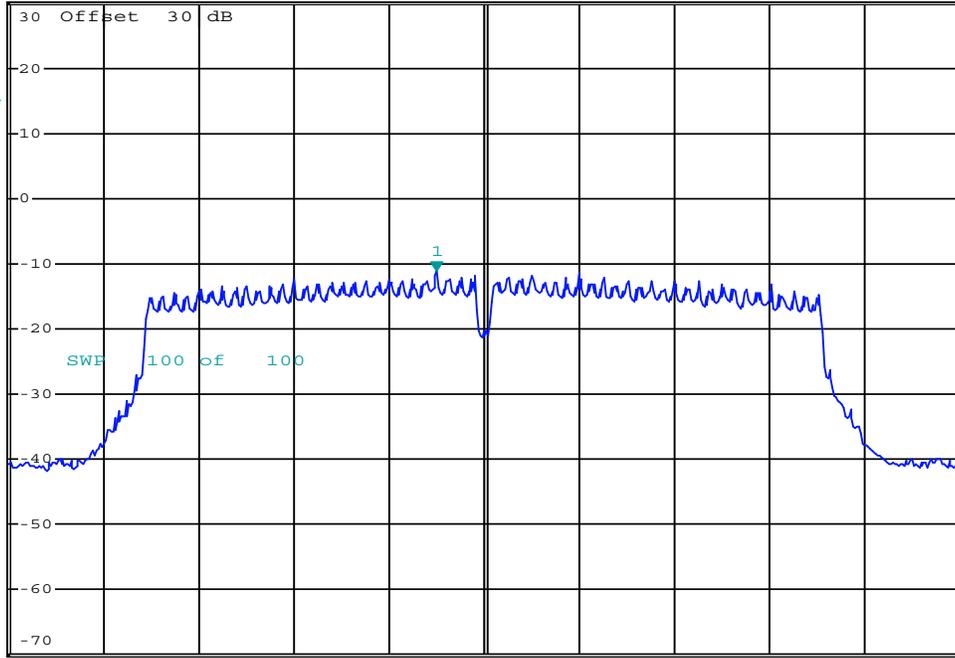
Ref 30 dBm

\*Att 30 dB

\*SWT 50 ms

2.460750000 GHz

1 RM \*  
 VIEW



Date: 21.NOV.2021 13:40:11

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Measured PSD (dBm)
802.11n	11	2462	MCS0	6.5	-10.86

**Power Spectral Density Measurement Results: BLE**

Mode	Channel Number	Frequency (MHz)	Modulation	Bit Rate (Mbps)	Measured PSD [PSD <sub>Meas</sub> ] (dBm)	Transmit Duty Cycle [DC] (%)	Duty Cycle Correction [CF] <sup>(1)</sup> (dB)	Corrected PSD [PSD <sub>Corr</sub> ] <sup>(2)</sup> (dBm)	PSD Limit [PSD <sub>Lim</sub> ] (dBm)	Margin <sup>(3)</sup> (dB)
BLE	2	2402	GMSK	-	-13.910	60.8	2.16	-11.75	8	19.7
BLE	18	2442	GMSK	-	-14.190	60.8	2.16	-12.03	8	20.0
BLE	39	2480	GMSK	-	-11.920	60.8	2.16	-9.76	8	17.8
<b>Result: Complies</b>										

(1) Duty Cycle Correction Factor [CF] =  $10\log(1/[DC])$

(2) Corrected PSD [PSDCorr] = [PSDMeas] + [CF]

(3) Margin = [PSD<sub>Limit</sub>] - [PSDCorr]

# Power Spectral Density: BLE

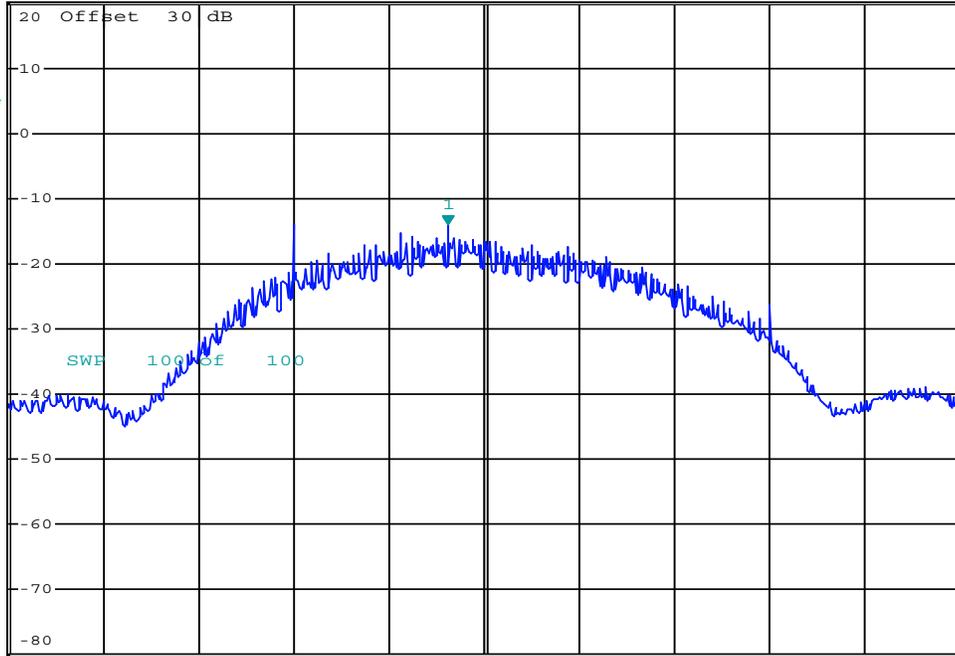


\*RBW 100 kHz    Marker 1 [T1 ]  
 VBW 1 MHz        -13.91 dBm  
 \*Att 0 dB         2.401924000 GHz  
 \*SWT 50 ms

Ref 20 dBm

\*Att 0 dB

1 RM \*  
 VIEW



Date: 17.NOV.2021 15:37:24

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Measured PSD (dBm)
BLE	2	2402	GMSK	-	-13.91

# Power Spectral Density: BLE

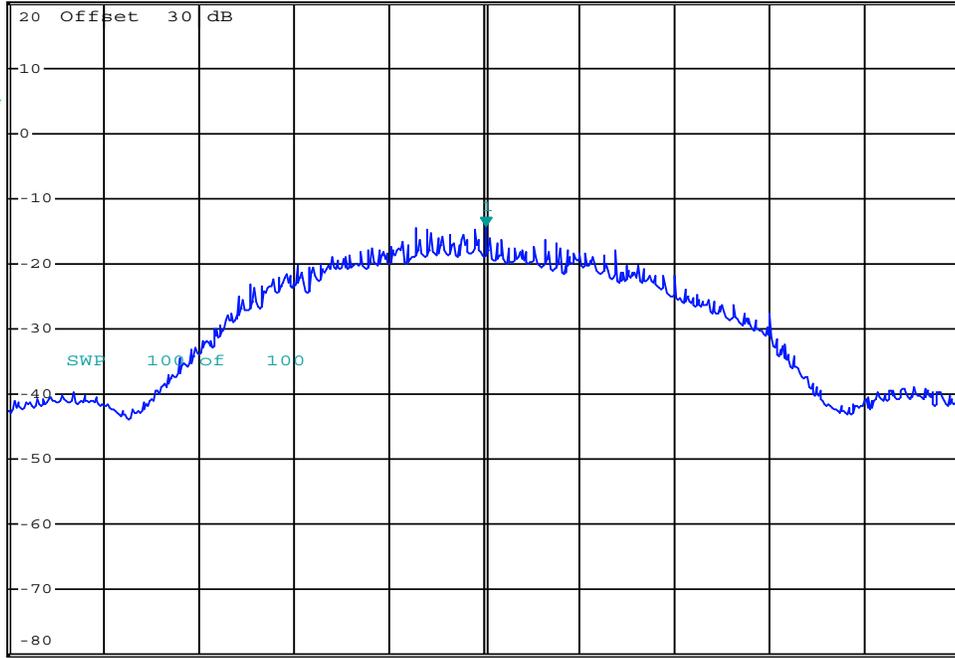


\*RBW 100 kHz    Marker 1 [T1 ]  
 VBW 1 MHz        -14.19 dBm  
 \*Att 0 dB         2.442004000 GHz  
 \*SWT 50 ms

Ref 20 dBm

\*Att 0 dB

1 RM\*  
 VIEW



Date: 17.NOV.2021 15:38:34

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Measured PSD (dBm)
BLE	18	2442	GMSK	-	-14.19

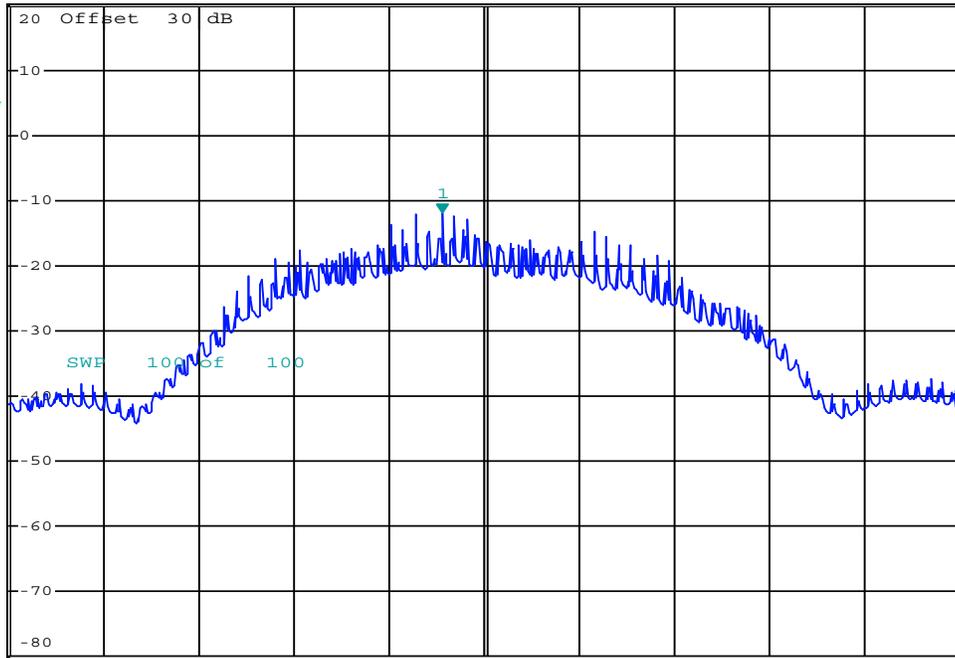
# Power Spectral Density: BLE



\*RBW 100 kHz    Marker 1 [T1 ]  
 VBW 1 MHz        -11.92 dBm  
 \*SWT 50 ms        2.479912000 GHz

Ref 20 dBm        \*Att 0 dB

1 RM \*  
 VIEW



Date: 17.NOV.2021 15:39:44

Mode	Channel Number	Channel Frequency (MHz)	Modulation	Data Rate (mbps)	Measured PSD (dBm)
BLE	39	2480	GMSK	-	-11.92