

Produkte
Products

Prüfbericht - Nr.:		ULR-TC568819300000072F		Seite 1 von 53 Page 1 of 53	
<i>Test Report No.:</i>					
Auftraggeber: <i>Client:</i>		Life Signals, Inc. 39355 California Street Suite 305 Fremont, CA 94538 USA.			
Gegenstand der Prüfung: <i>Test item:</i>		Life Signal ECG Remote Monitoring Patch Platform			
Bezeichnung: <i>Identification:</i>		LP1250	Serien-Nr.: <i>Serial No.</i>	Engineering Sample	
Wareneingangs-Nr.: <i>Receipt No.:</i>		166180757	Eingangsdatum: <i>Date of receipt:</i>	25.09.2019	
Prüfört: <i>Testing location:</i>		Refer Page 5 of 53 for test facilities			
Prüfgrundlage: <i>Test specification:</i>		FCC Part 15 Subpart C 15.247 ANSI C63.10-2013			
Prüfergebnis: <i>Test Result:</i>		Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). The test items passed the test specification(s).			
Prüflaboratorium: <i>Testing Laboratory:</i>		TÜV Rheinland (India) Pvt. Ltd. 27/B, 2nd corss, Electronic City Phase 1 Bangalore – 560 100. India FCC Test Site Registration no.: 496599			
geprüft / tested by:			kontrolliert / reviewed by:		
26.09.2019	Rajesh M Gowda Engineer		06.12.2019	Raghavendra Katti Assistant Manager	
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>
Sonstiges / Other Aspects:		FCC ID : 2AHV9-LP1250			
Abkürzungen:		Abbreviations:			
P(ass) = entspricht Prüfgrundlage		P(ass) = passed			
F(ail) = entspricht nicht Prüfgrundlage		F(ail) = failed			
N/A = nicht anwendbar		N/A = not applicable			
N/T = nicht getestet		N/T = not tested			
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.</i>					

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 IndiaTel.: +9180 6723 3500 · Fax: +9180 6723 3542 · Web: <https://www.tuv.com>

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TEST SUMMARY

Section	Test item	Result
15.247 (b) (3)	Maximum Conducted Output Power	Pass
15.247 (a) (2)	6 dB / DTS Bandwidth	Pass
15.247 (e)	Maximum Power Spectral Density	Pass
15.247 (d)	Emissions in non – restricted band	Pass
15.247 (a)(1)	Conducted Spurious Emissions	Pass
15.247 (d) / (15.209 & 15.205)	Radiated spurious emissions and emissions in Restricted bands of operation	Pass

Discipline: Electronics Testing
Group: EMC Test Facility

Note: Measurements were made as per KDB 558074 D01 DTS Measurement Guidance v05r02.

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1 GENERAL REMARKS

1.1 Complimentary Materials

All attachments are integral part of this test report.

1: TEST SETUP PHOTOS

2: EUT EXTERNAL PHOTOS

3: EUT INTERNAL PHOTOS

4: FCC LABEL AND LABEL LOCATION

5: BLOCK DIAGRAM

6: SPECIFICATION OF EUT

7: SCHEMATIC DIAGRAM

8: BILL OF MATERIAL

9: USER MANUAL

10: MAXIMUM PERMISSIBLE EXPOSURE INFORMATION

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2 TEST SITES

2.1 Testing Facilities

1. TÜV Rheinland (India) Private Limited
108 , Beside ISBR Business School,
Electronic city Phase I
Bangalore - 560 100.
2. TÜV Rheinland (India) Pvt. Ltd.
27/B, 2nd corss, Electronic City Phase 1
Bangalore – 560 100. India

2.2 List of Test and Measurement Instruments

Table 1: Test and measurements instrument used

Equipment	Manufacturer	Model Name	Serial Number	Firmware Versions	Calibration Due Date	Periodicity	Used for Test Items
Spectrum Analyser	Agilent Technologies	E4407B	US41192772	A.14.06	28-03-2020	Yearly	Antenna - Port Measurements
EMI Receiver	Rohde & Schwarz	ESU 40	100288	4.43 SP3	11-10-2020	Yearly	Radiated Spurious Emission
Active loop antenna	Schwarzbeck	FMZB 1519 B	1519B-00111	-	16/01/2020	Yearly	
Biconical Antenna	Schwarzbeck mess-elektronik	VHBB-9124 / BBA-9106	01028	-	16-01-2020	Yearly	
Log-Periodic Antenna	Schwarzbeck mess-elektronik	VUSLP-9111B	9111B-111	-	17-01-2020	Yearly	
Broadband Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-1944	-	16-01-2020	Yearly	
Anechoic Chamber	Frankonia	-	-	-	-	-	

Table 2: Instrument application Software versions

Sl. No	Test Type	Application software	Version
1	Radiated spurious emission measurement- 3 meter Fully Anechoic Chamber	EMC 32	10.50.00

3 GENERAL PRODUCT INFORMATION

3.1 Product Function and Intended Use

The Life Signal ECG Remote Monitoring Patch Platform is a wireless Remote monitoring System intended for use by healthcare professionals for continuous collection of physiological data in home and healthcare settings. This includes heart rate and electrocardiography (ECG). Data is transmitted wirelessly from Life Signal Biosensor to Remote Secure server for analysis and storage. The Life Signal ECG Remote Monitoring Patch Platform can include the ability to notify healthcare professionals when Heart Rate falls outside the set limit.

3.2 Ratings and System Details

Table 3: Ratings and System Details as declared by the client

Operating frequency range	2400 MHz to 2483.5 MHz	
Radio Protocol	WLAN 802.11b	
Channel Spacing	5MHz	
Modulation	Complimentary Code Keying (CCK) and Direct-sequence spread spectrum (DSSS)	
Data rate	1,2,5.5 and 11Mbps	
Number of antennas	1	
Antenna type	Chip antenna	
Antenna gain	2412 MHz	2.4 dBi
	2437 MHz	3.4 dBi
	2462 MHz	3.7 dBi
Supply Voltage to Product	2.8 V DC	
Dimensions	8mm xx 115mm xx 84mm	
Environmental conditions	25 °C & RH 70%	

Disclaimer:

The information/data is supplied by the client and the same is considered to arrive at the final value. Any changes made apart from the specified specification, can directly impact on the test results.

3.3 Measurement Uncertainty:

Table 4: Measurement Uncertainty

Parameter	Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±1.5 dB
Power Spectral Density, conducted	±3 dB
Unwanted Emissions, conducted	±3 dB
All emissions, radiated	±6 dB
Temperature	±3 °C
Supply Voltages	±3 %
Time	±5 %

Note: The listed uncertainties are the worst case uncertainty for the entire range of measurements and are for the reporting purpose only and are not used in determining the PASS/FAIL of the results.

4 TEST SET-UP AND OPERATION MODE

4.1 Principle of Configuration Selection

Transmission was enabled with highest possible duty cycle on Low, Middle and High channels to obtain maximum emissions.

4.2 Test Operation and Test Software

Test Software - Patch firmware- Biosensor Patch Firmware, version - V 3.1.1
Hardware version - Life Signal Biosensor Patch Hardware, 7000000014A

4.3 Special Accessories and Auxiliary Equipment

- FTDI version - 2.3 (Test Jig).

4.4 Countermeasures to achieve EMC Compliance

- None

4.5 Test modes – data rates and modulations

- Tested for WLAN 802.11b mode and all the data rates related to “802.11b” mode are tested and reported.

4.6 List of Frequencies and Frequency bands

Frequency Band (MHz)	Channel No.	Channel Frequency (MHz)
2400 – 2483.5	1	2412
	2	2417
	3	2422
	4	2427
	5	2432
	6	2437
	7	2442
	8	2447
	9	2452
	10	2457
	11	2462

Table 5: List of WLAN 802.11b Frequencies

Protocol: WLAN 802.11b

Channel Low : 2412 MHz

Channel Mid : 2437 MHz

Channel High : 2462 MHz

Note:

1. TUV Sample Identification number:
Conducted sample - A000998315-010
Radiated sample - A000998315-003
2. As the product supports WLAN 802.11 b mode only, hence conducted and radiated mode tests were done for all the b mode supported data rates.

5 TEST METHODOLOGY

5.1 Radiated Emission Test

The radiated emission measurement was performed according to the procedures in ANSI C63.10-2013. The equipment under test (EUT) was placed at the middle of the 80 cm high turntable for below 1 GHz & 1.5 m height for above 1 GHz measurement, and the EUT is 3 meters far from the measuring antenna. The turntable was rotated 360° for obtaining the maximum emission. The height of the measuring antennas was scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained. The measurement above 1000 MHz was performed by horn antenna, The measurement below 30 MHz was performed by loop antenna, Measurement from 30 MHz to 200 MHz was performed by Baloon and Biconical Antenna, and measurement from 200 MHz to 1 GHz was performed by Log-Periodic Antenna.

The EUT was rotated around the X-, Y-, and Z-Axis and the results from worst case axis are recorded.

5.1.1 Test Setup Configuration

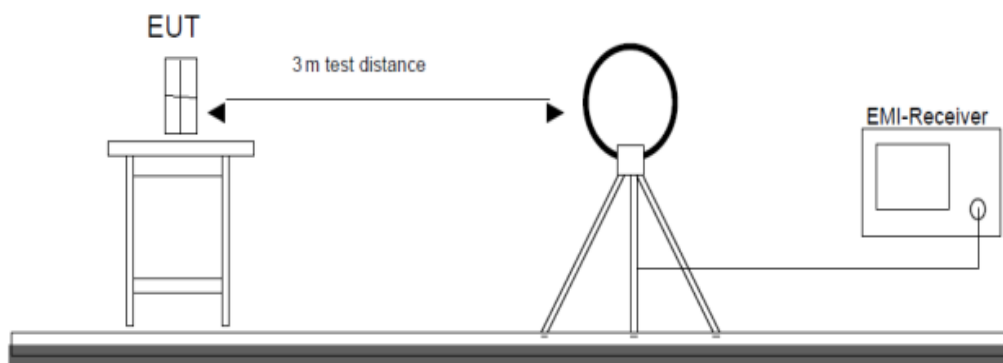


Figure 1: Frequency Range 9 kHz- 30 MHz

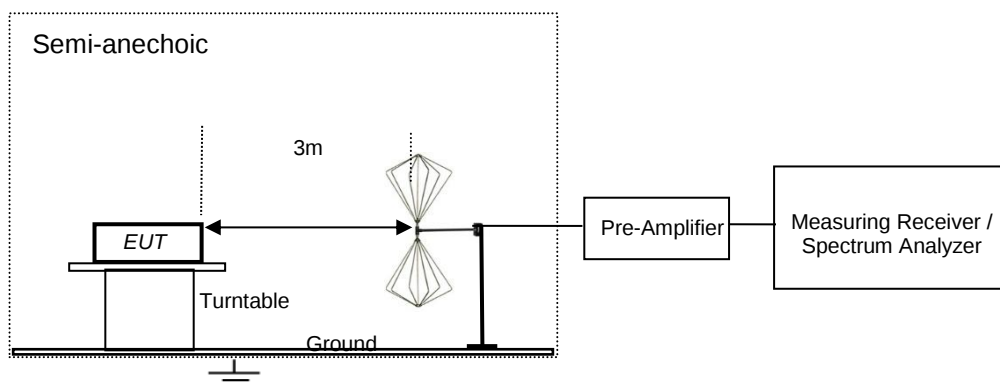


Figure 2: Frequency Range 30 MHz – 200 MHz

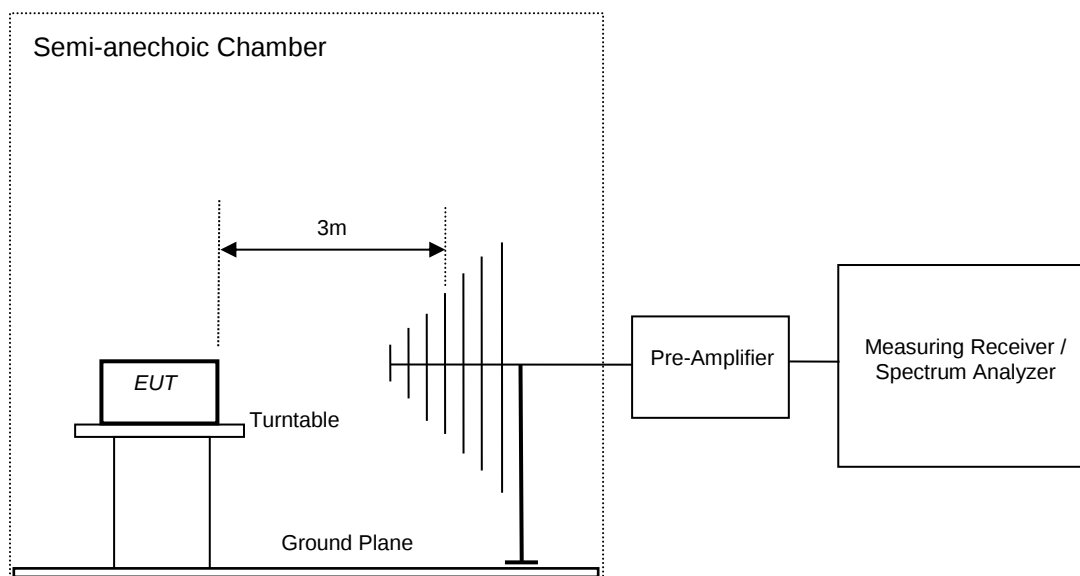


Figure 3: Frequency Range 200 MHz - 1GHz

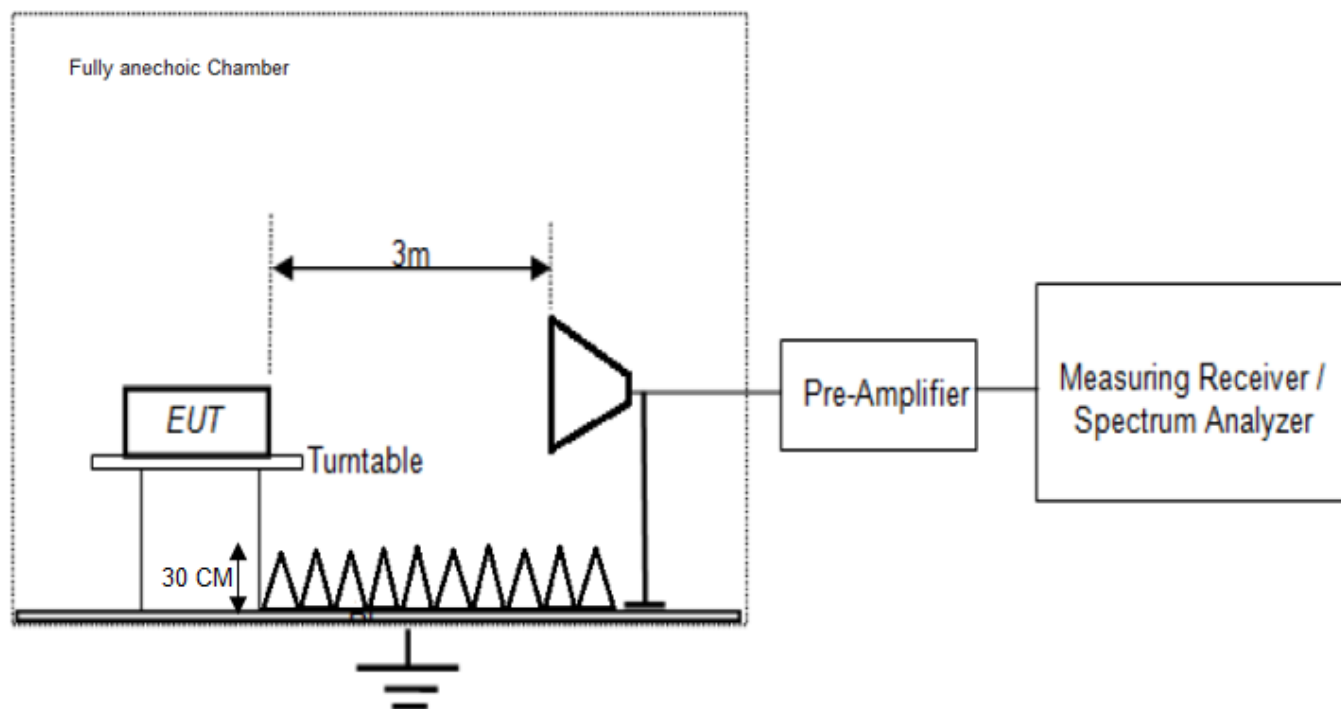


Figure 4: Frequency Range 1GHz – 26GHz

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6 Test Results

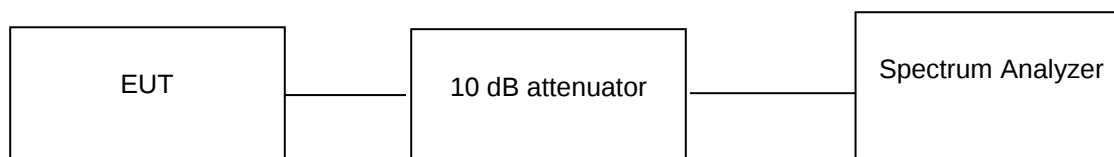
6.1 Maximum conducted output power

Result

Pass

Test Specification	FCC part 15 Subpart C 15.247 (b)(3)
Measurement Bandwidth	300 kHz
Detector	Average
Requirement	$\leq 1 \text{ W}$ (30 dBm)

Test Method:



Environmental and Test conditions:

Normal Temperature = +25 °C

Voltage (V norm) = 2.8 V DC (Battery)

RH = 63.6 %

Test results:

10 dB attenuator + 0.8 dB Cable loss = 10.8 dB offset is considered in below result

Protocol: 802.11b

Data rate (Mbps)	Frequency (MHz)	Power (dBm)	Limit (dBm)
1	2412	2.08	30
	2437	1.30	30
	2462	1.89	30
2	2412	1.38	30
	2437	0.44	30
	2462	1.09	30
5.5	2412	1.74	30
	2437	0.87	30
	2462	1.28	30
11	2412	1.55	30
	2437	0.76	30
	2462	1.28	30

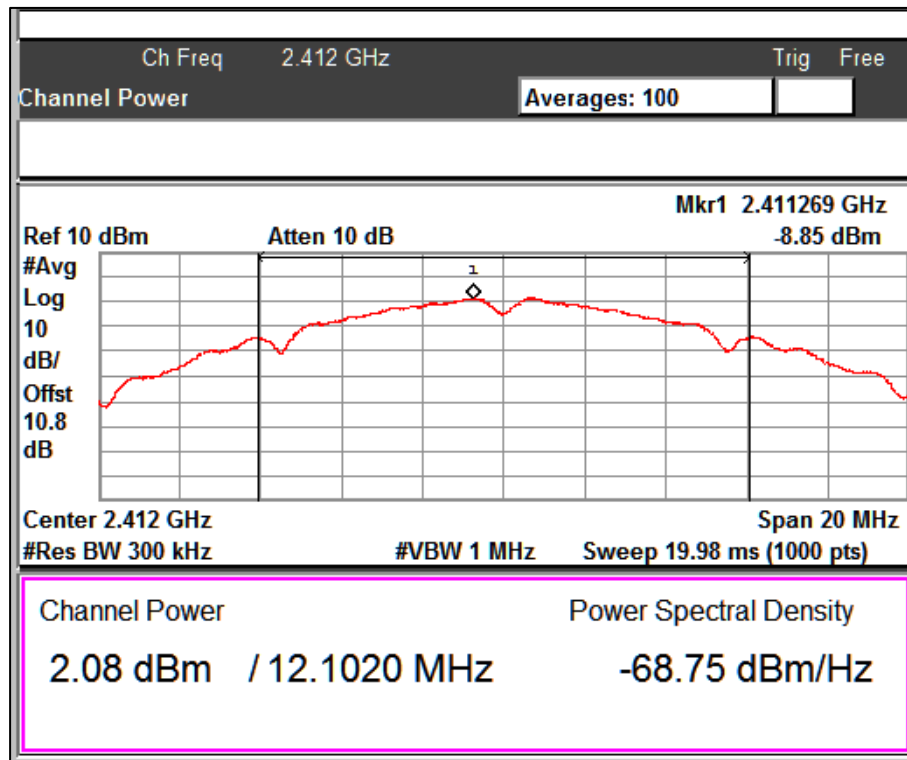
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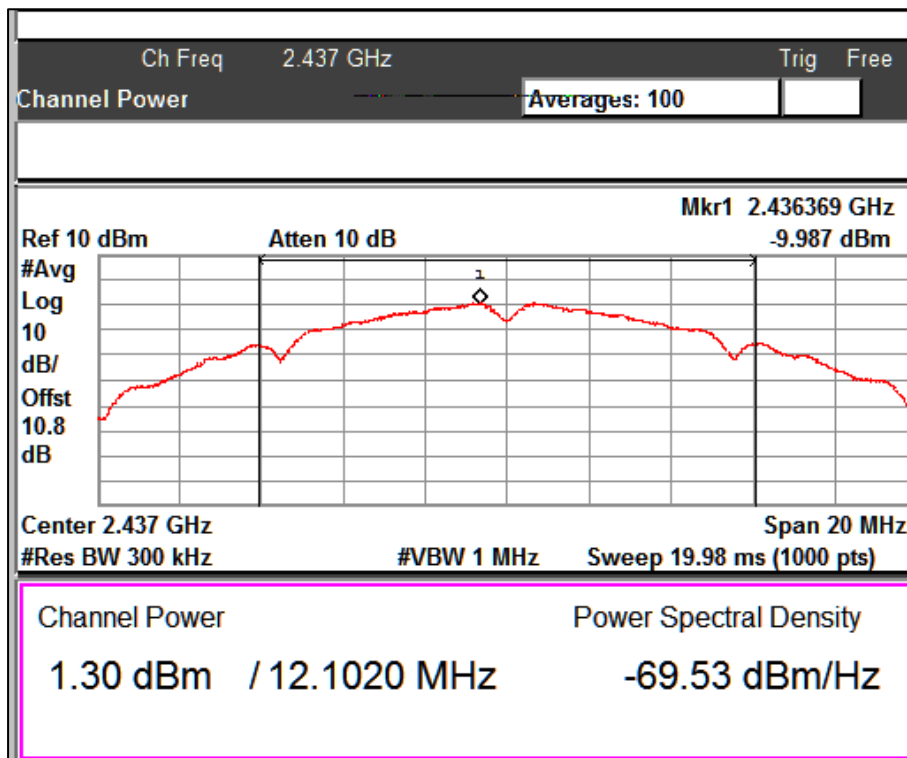
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Channel Frequency: 2412 MHz

Data rate: 1Mbps



Channel Frequency: 2437 MHz

Data rate: 1Mbps

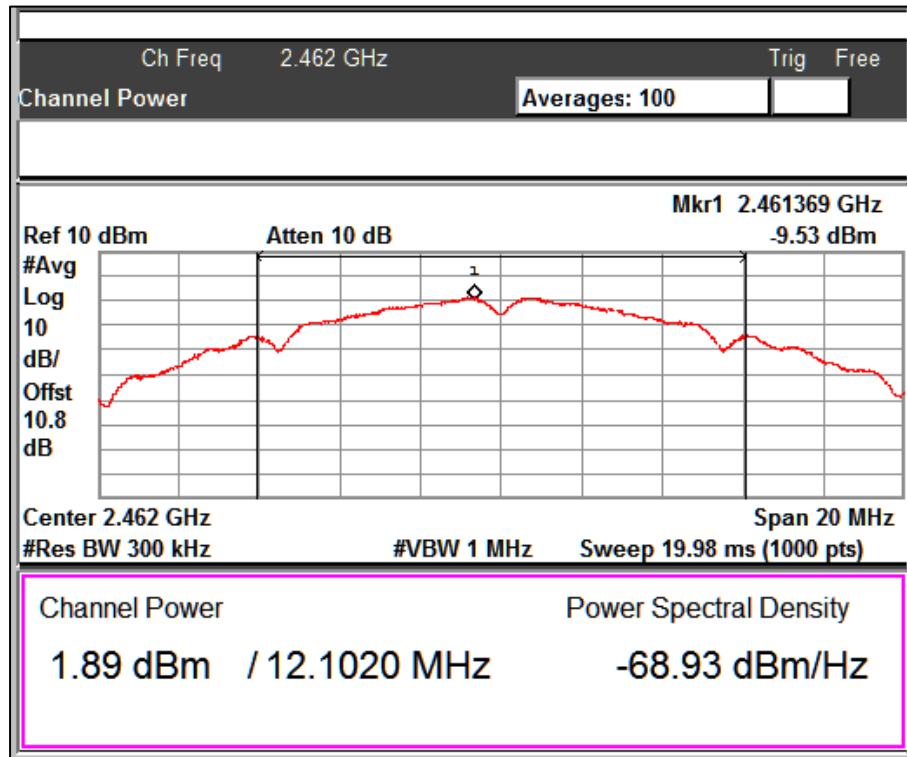
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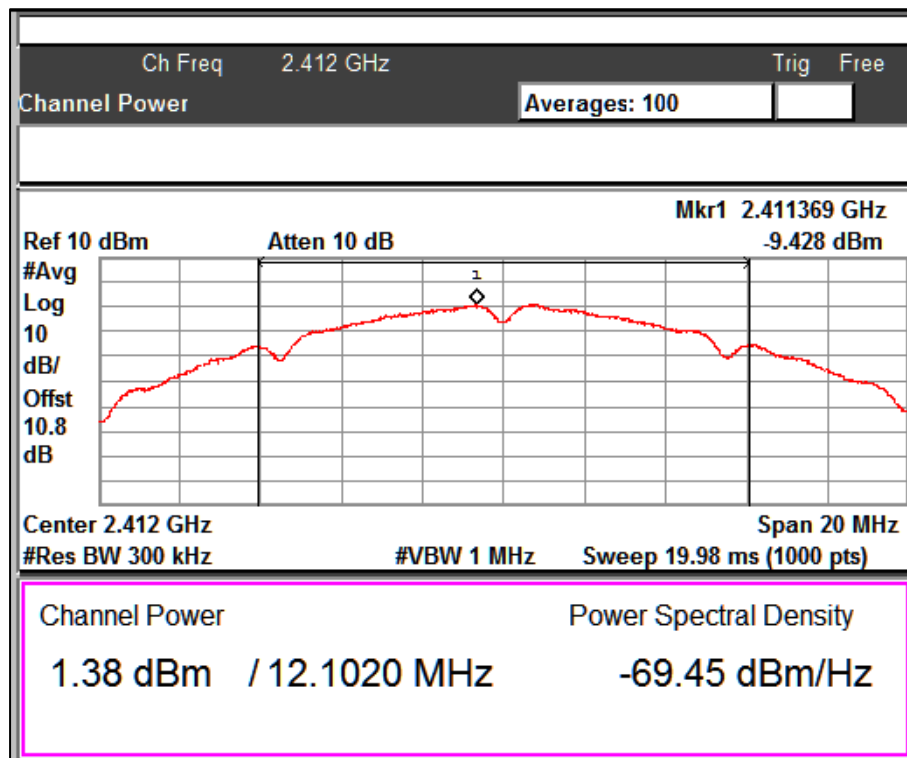
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Channel Frequency: 2462 MHz

Data rate: 1Mbps



Channel Frequency: 2412 MHz

Data rate: 2Mbps

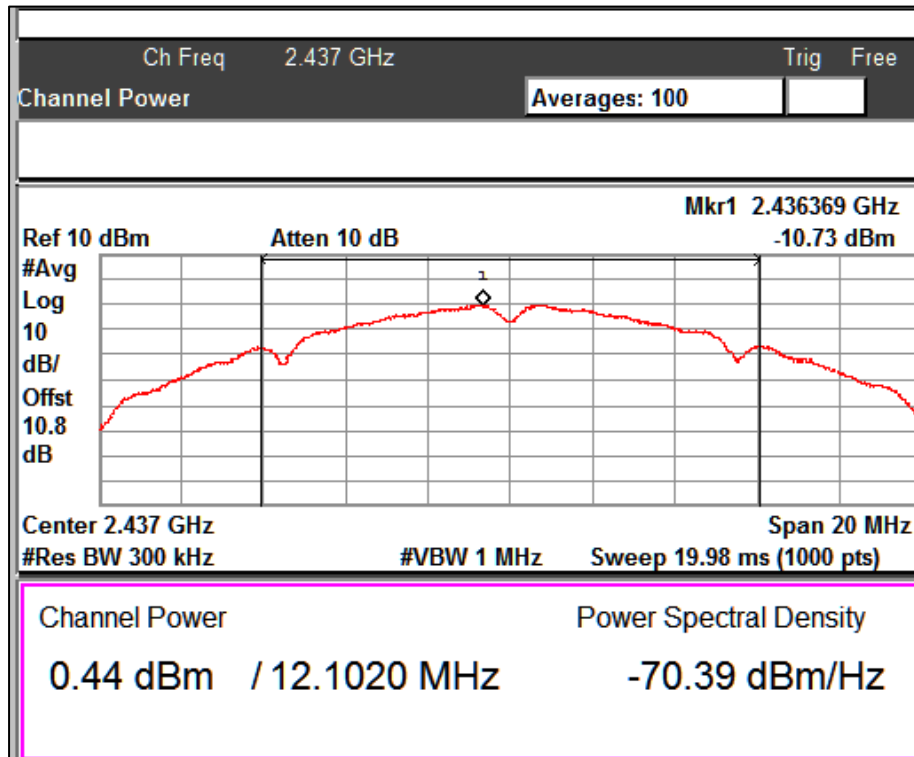
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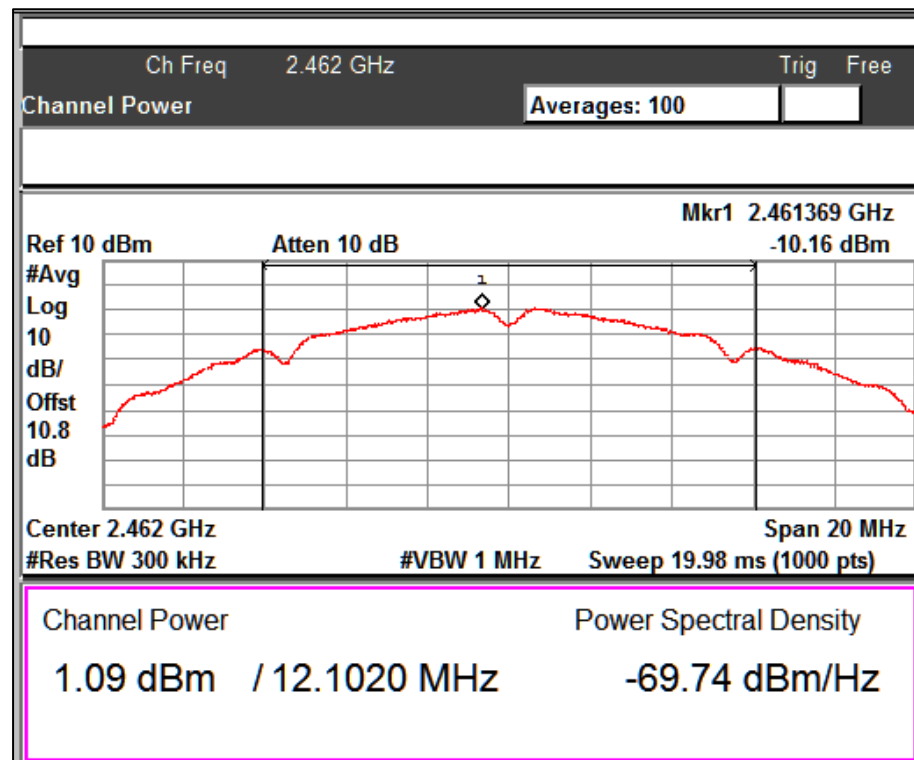
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Channel Frequency: 2437 MHz

Data rate: 2Mbps



Channel Frequency: 2462 MHz

Data rate: 2Mbps

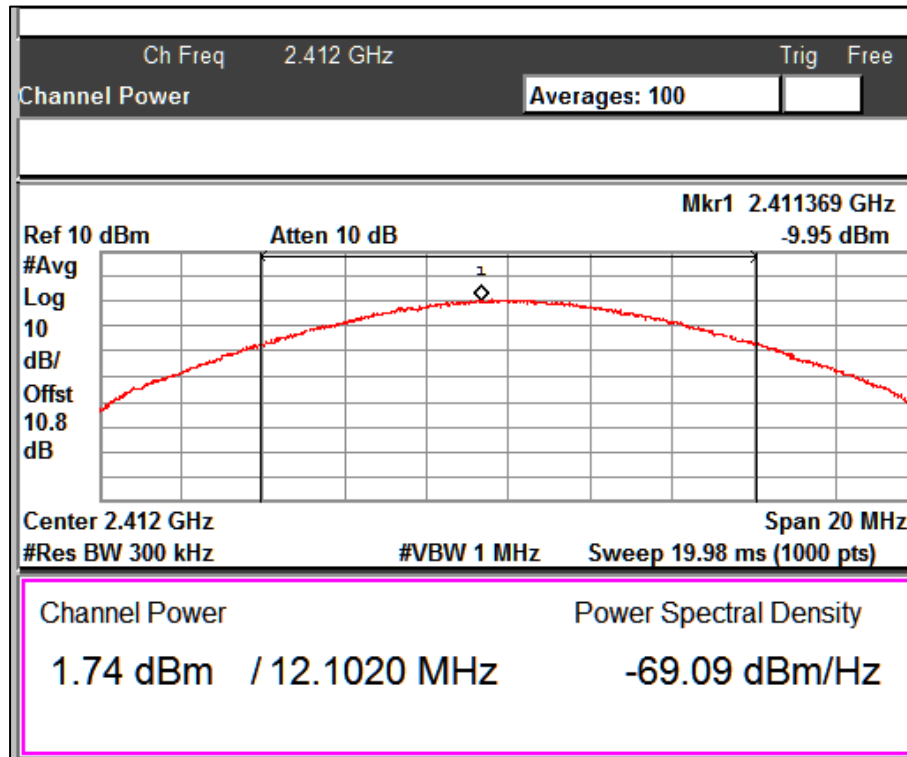
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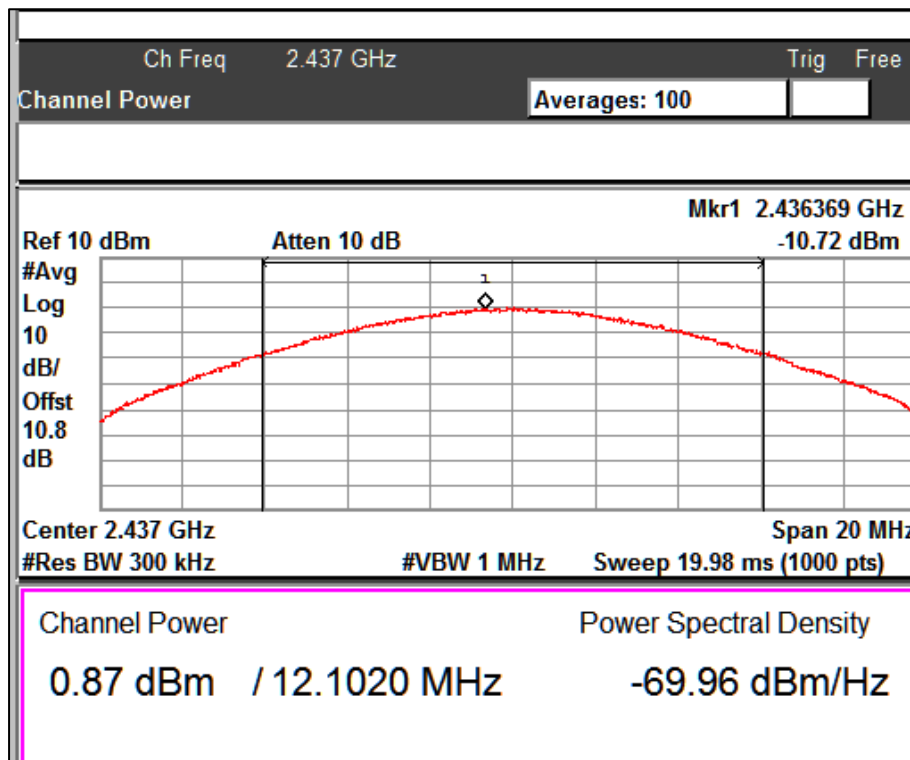
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Channel Frequency: 2412 MHz

Data rate: 5.5Mbps



Channel Frequency: 2437 MHz

Data rate: 5.5Mbps

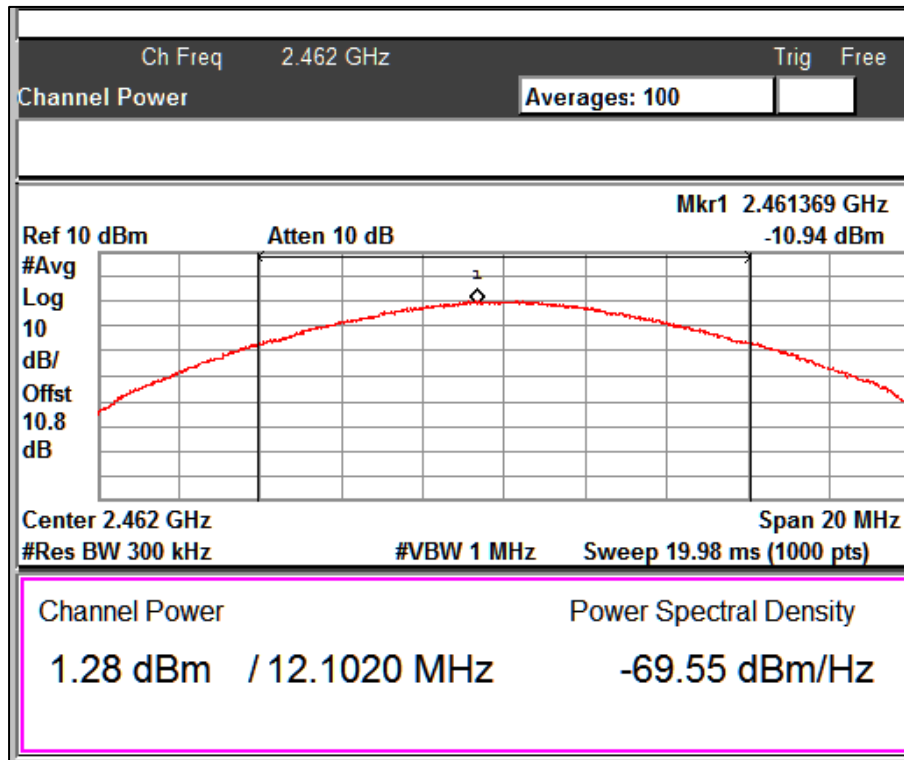
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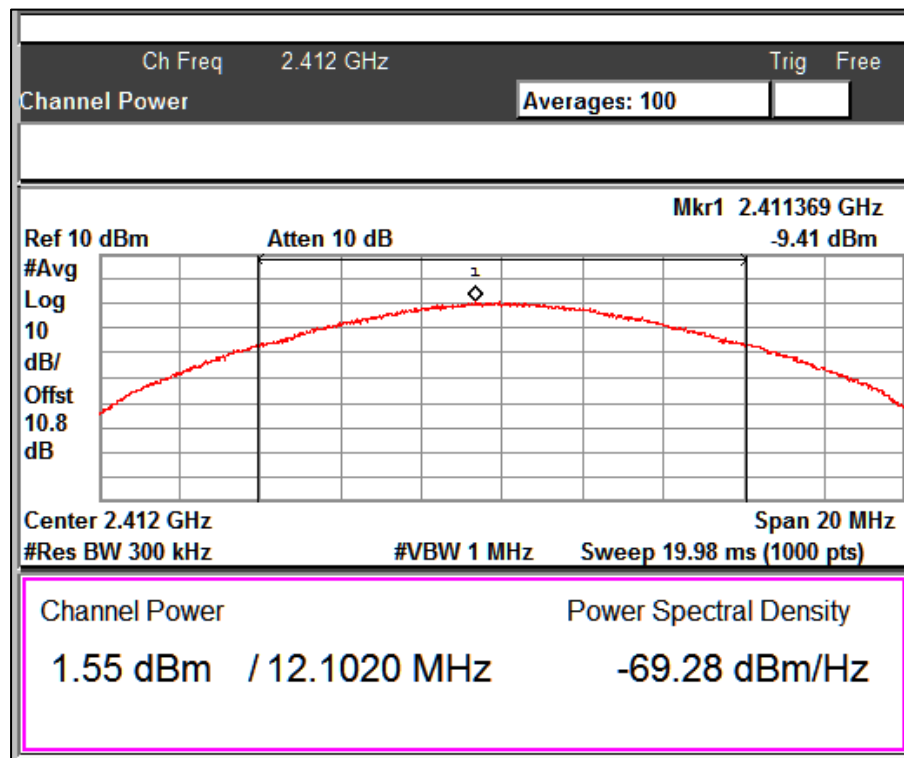
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Channel Frequency: 2462 MHz

Data rate: 5.5Mbps



Channel Frequency: 2412 MHz

Data rate: 11Mbps

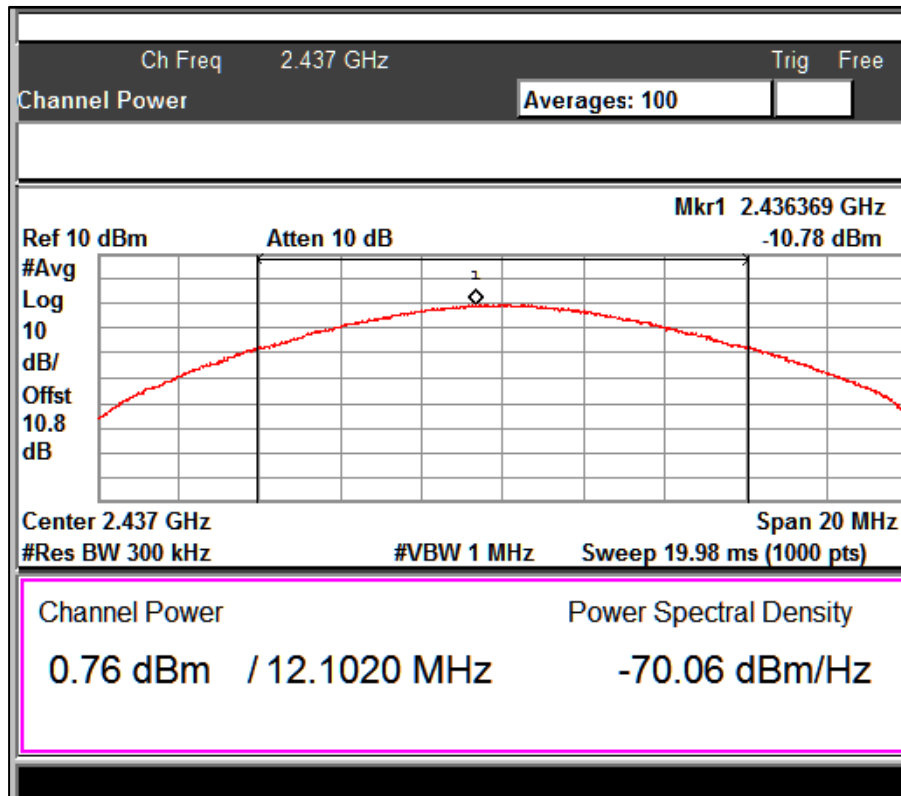
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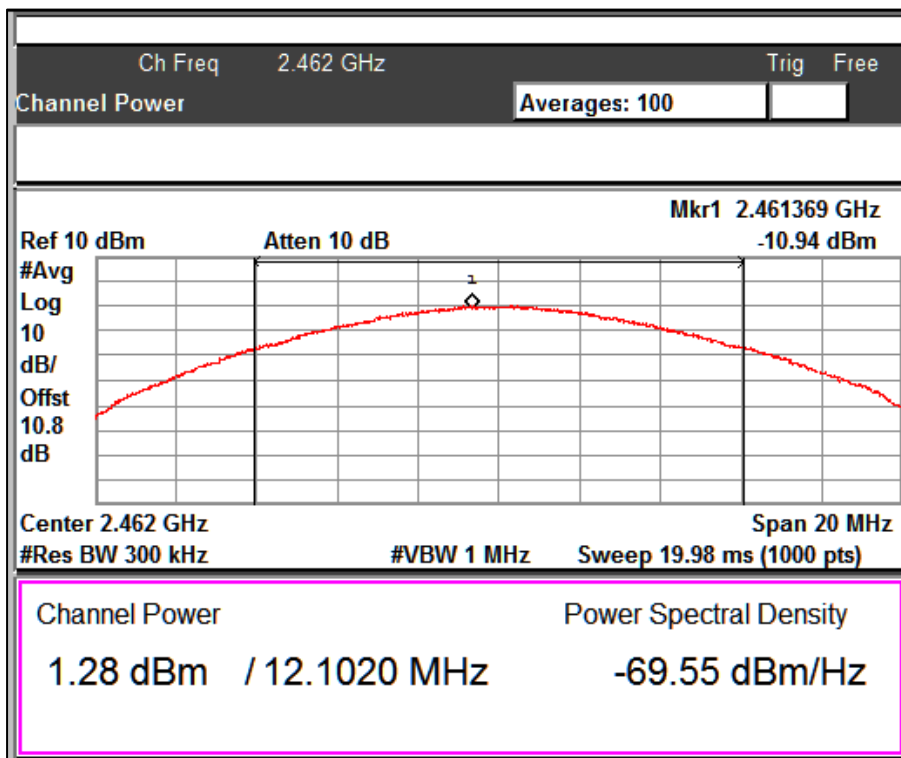
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Channel Frequency: 2437 MHz

Data rate: 11Mbps



Channel Frequency: 2462 MHz

Data rate: 11Mbps

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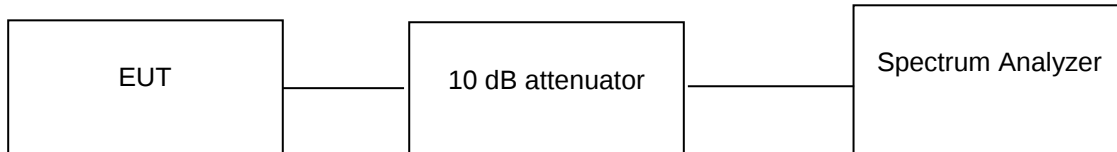
6.2 Maximum Power Spectral Density

Result

Pass

Test Specification FCC Part 15 Subpart C Section 15.247 (e)
 Detector Function Average
 Port of testing Antenna port
 Requirement For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm.

Test Method:



Environmental and Test conditions:

Normal Temperature = +25 °C

Voltage (V norm) = 2.8 V DC (Battery)

RH = 63.6 %

Test results:

10 dB attenuator + 0.8 dB Cable loss = 10.8 dB offset is considered in below result

Protocol: 802.11b

Data rate (Mbps)	Frequency (MHz)	PSD (dBm)	Limit (dBm)
1	2412	-13.55	8
	2437	-13.97	8
	2462	-14.53	8
2	2412	-13.96	8
	2437	-15.63	8
	2462	-14.95	8
5.5	2412	-14.62	8
	2437	-17.88	8
	2462	-18.47	8
11	2412	-14.17	8
	2437	-17.66	8
	2462	-18.18	8

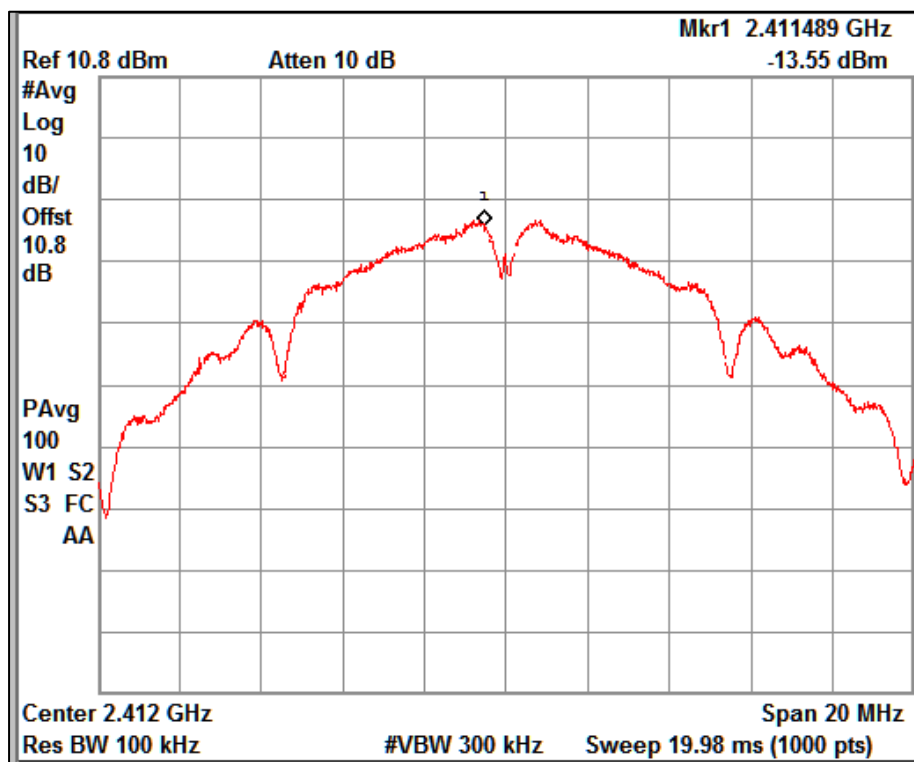
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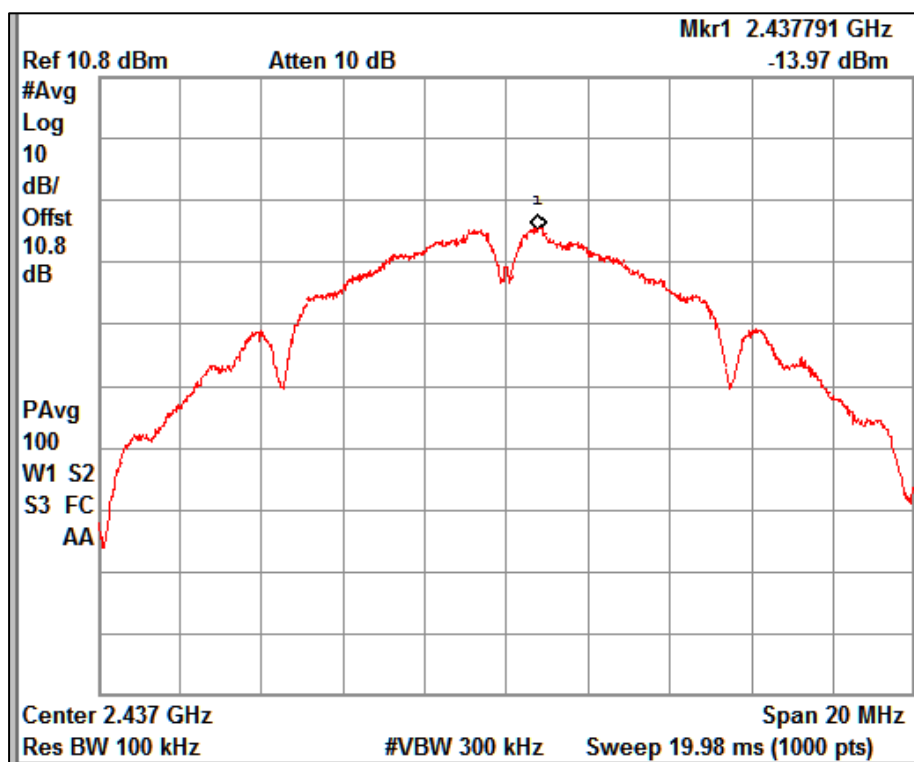
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Channel Frequency: 2412 MHz

Data rate: 1Mbps



Channel Frequency: 2437 MHz

Data rate: 1Mbps

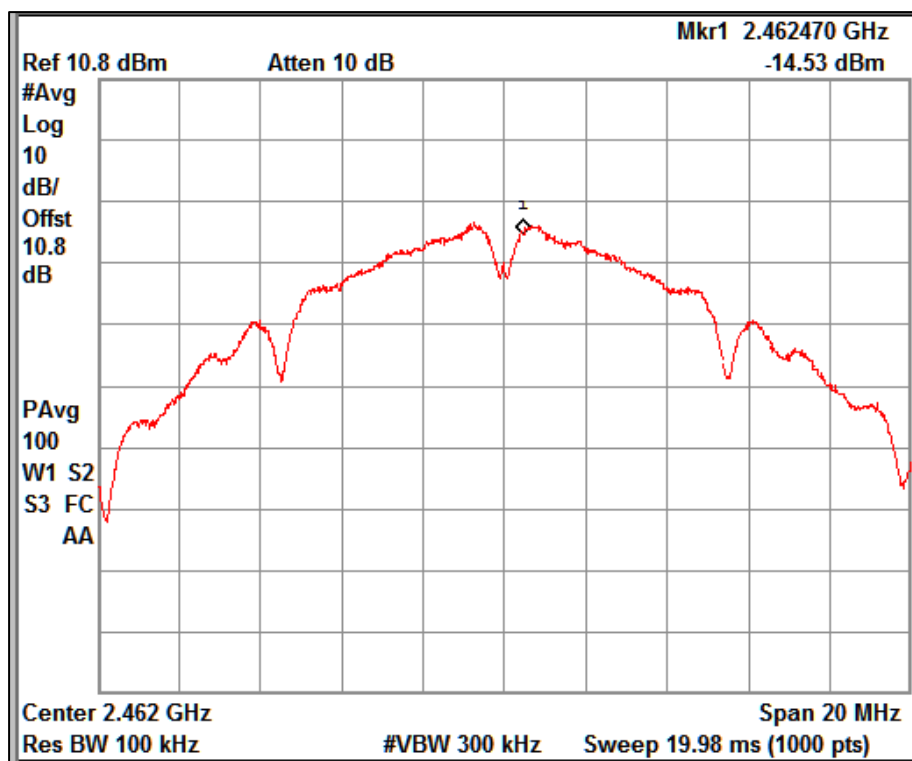
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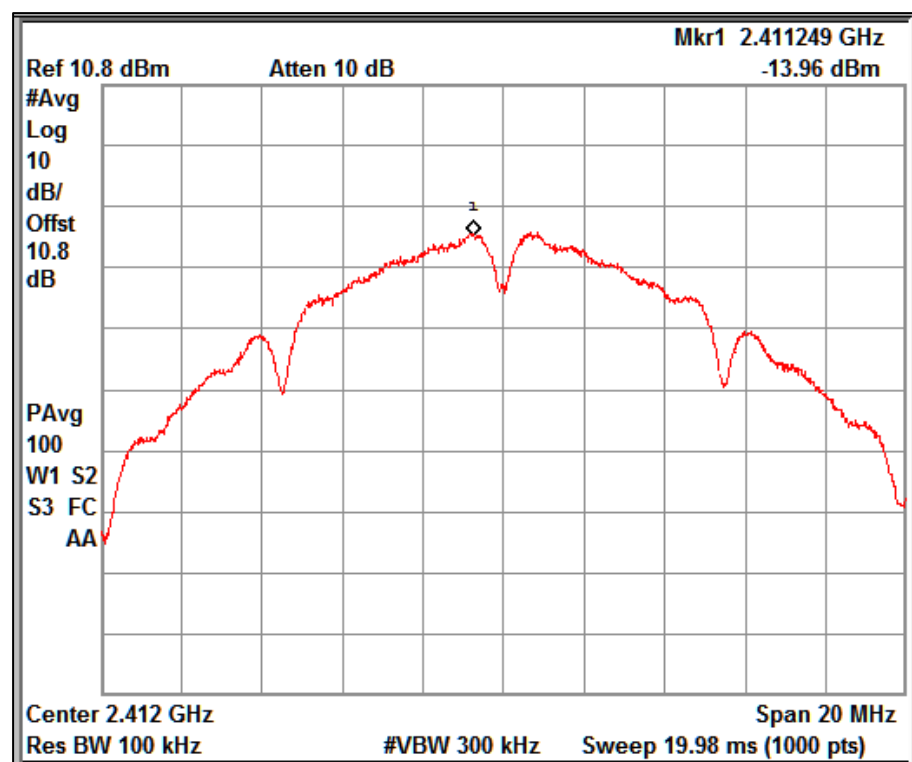
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Channel Frequency: 2462 MHz

Data rate: 1Mbps



Channel Frequency: 2412 MHz

Data rate: 2Mbps

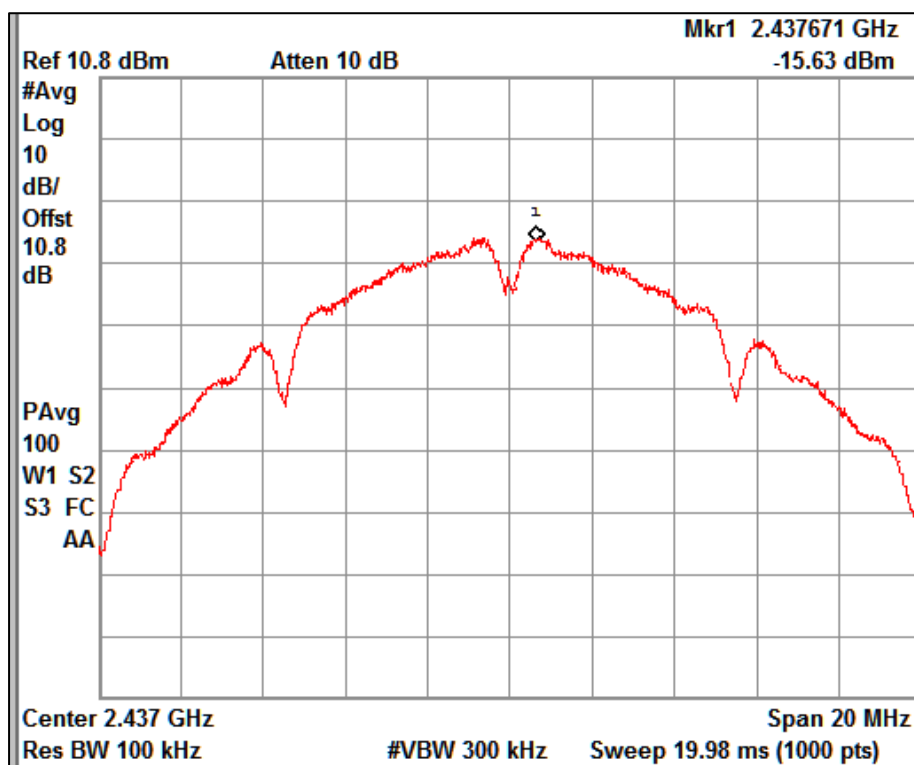
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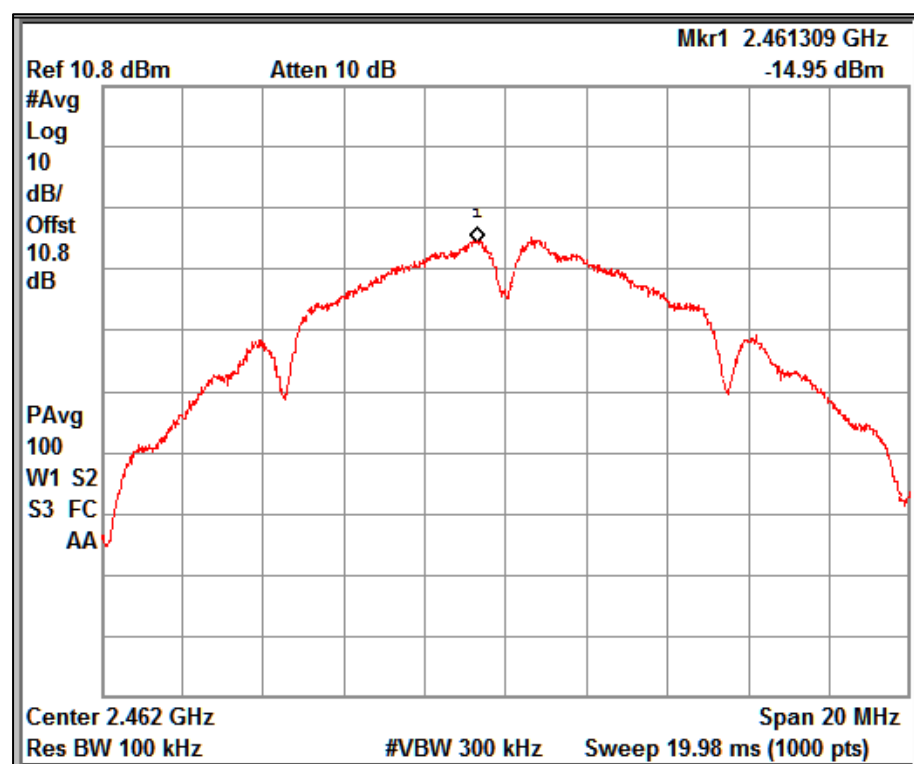
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Channel Frequency : 2437 MHz

Data rate: 2Mbps



Channel Frequency: 2462 MHz

Data rate: 2Mbps

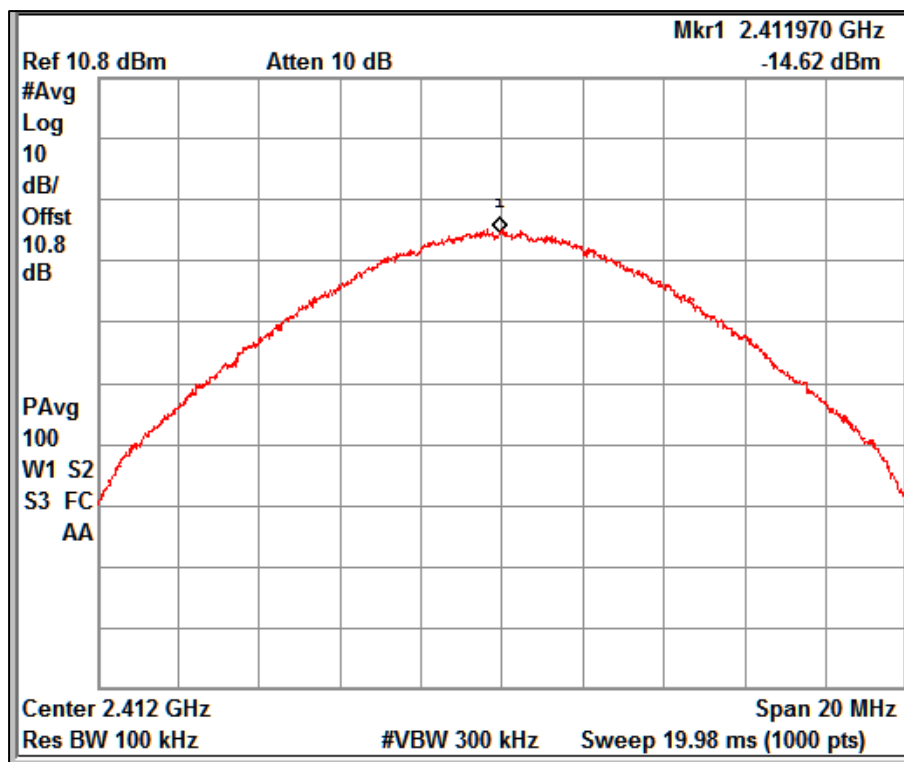
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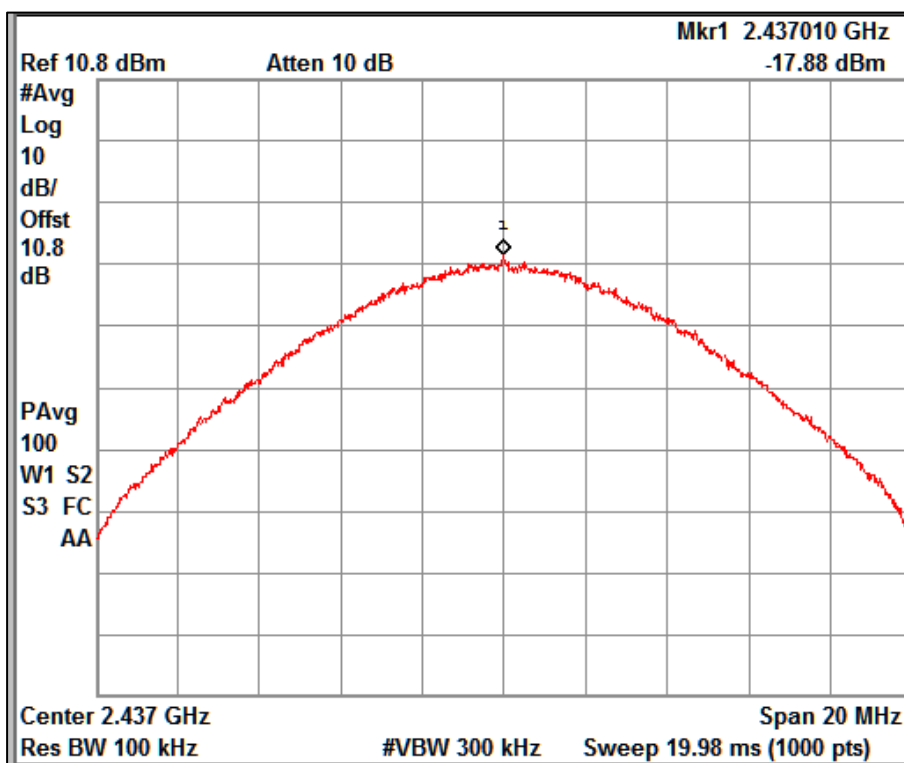
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Channel Frequency: 2412 MHz

Data rate: 5.5Mbps



Channel Frequency: 2437 MHz

Data rate: 5.5Mbps

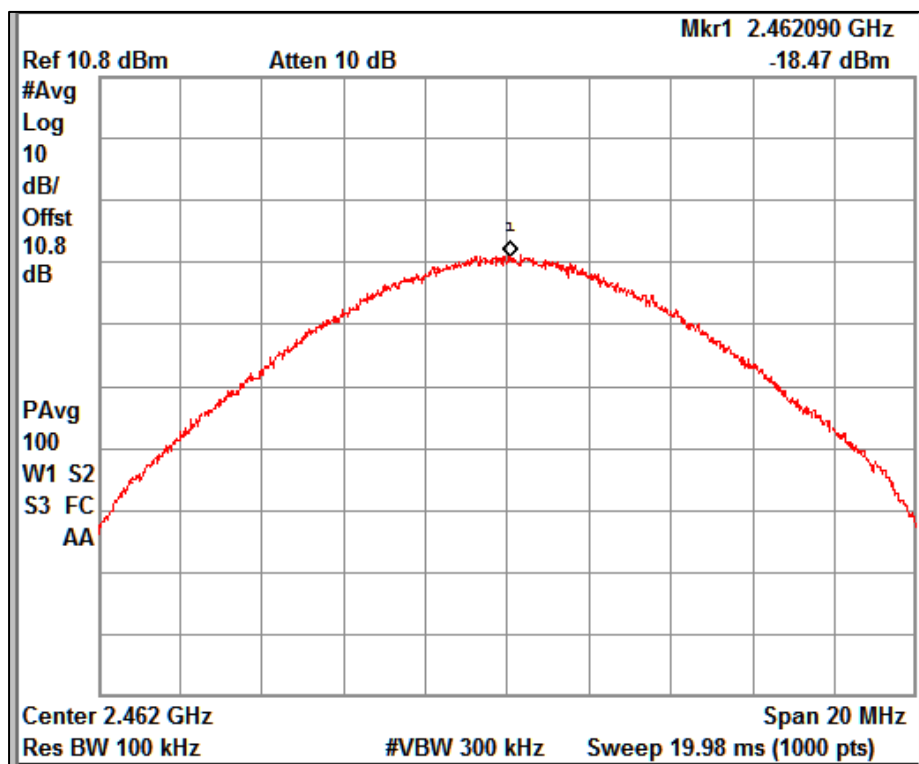
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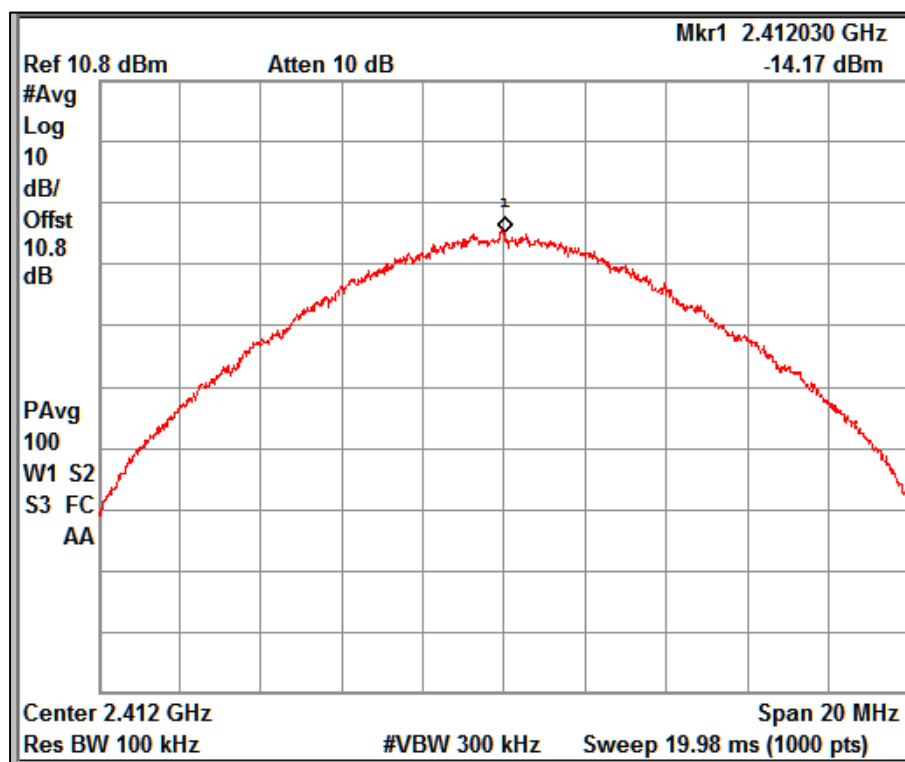
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Channel Frequency: 2462 MHz

Data rate: 5.5Mbps



Channel Frequency: 2412 MHz

Data rate: 11Mbps

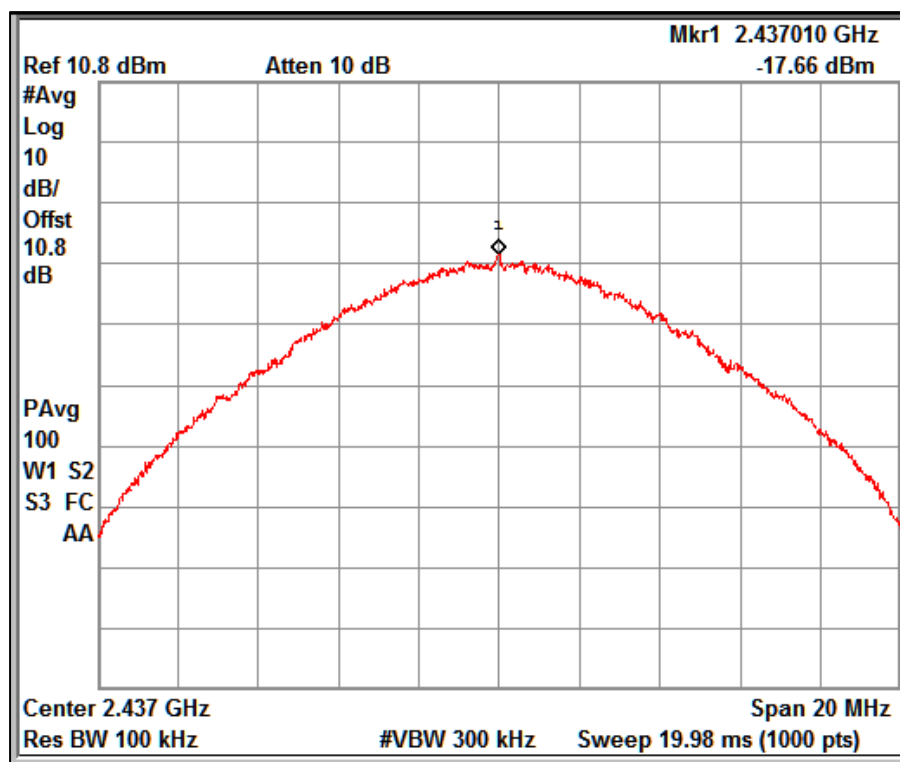
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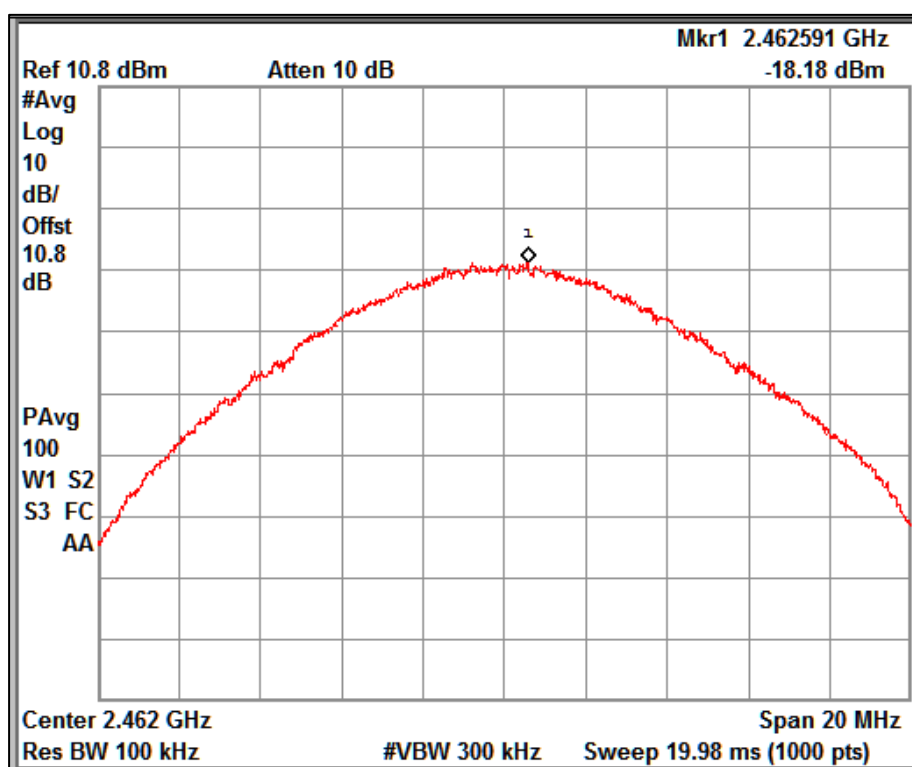
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Channel Frequency: 2437 MHz

Data rate: 11Mbps



Channel Frequency: 2462 MHz

Data rate: 11Mbps

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6.3 DTS Bandwidth

Result

Pass

Test Specification

FCC part 15 Subpart C Section 15.247 (a)(2)

Detector

Peak

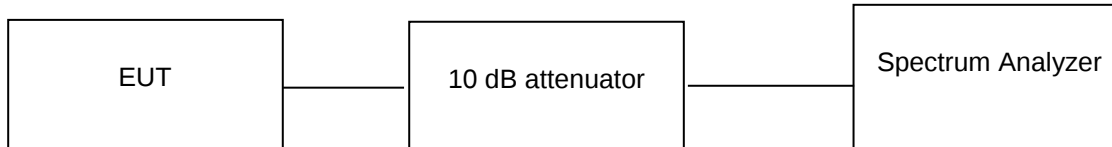
Port of testing

Antenna Port

Requirement

The minimum 6 dB bandwidth shall be at least 500 kHz.

Test Method:



Environmental and Test conditions:

Normal Temperature = +25 °C

Voltage (V norm) = 2.8 V DC (Battery)

RH = 63.6 %

Test results:

10 dB attenuator + 0.8 dB Cable loss = 10.8 dB offset is considered in below result

Protocol: 802.11b

Data rate (Mbps)	Frequency (MHz)	6dB bandwidth (MHz)	99% OBW (MHz)
1	2412	5.63	12.10
	2437	5.17	11.85
	2462	6.08	12.06
2	2412	5.77	11.92
	2437	5.98	11.77
	2462	5.67	11.93
5.5	2412	5.61	11.18
	2437	4.49	11.09
	2462	6.32	11.22
11	2412	5.72	11.38
	2437	5.64	11.37
	2462	5.56	11.21

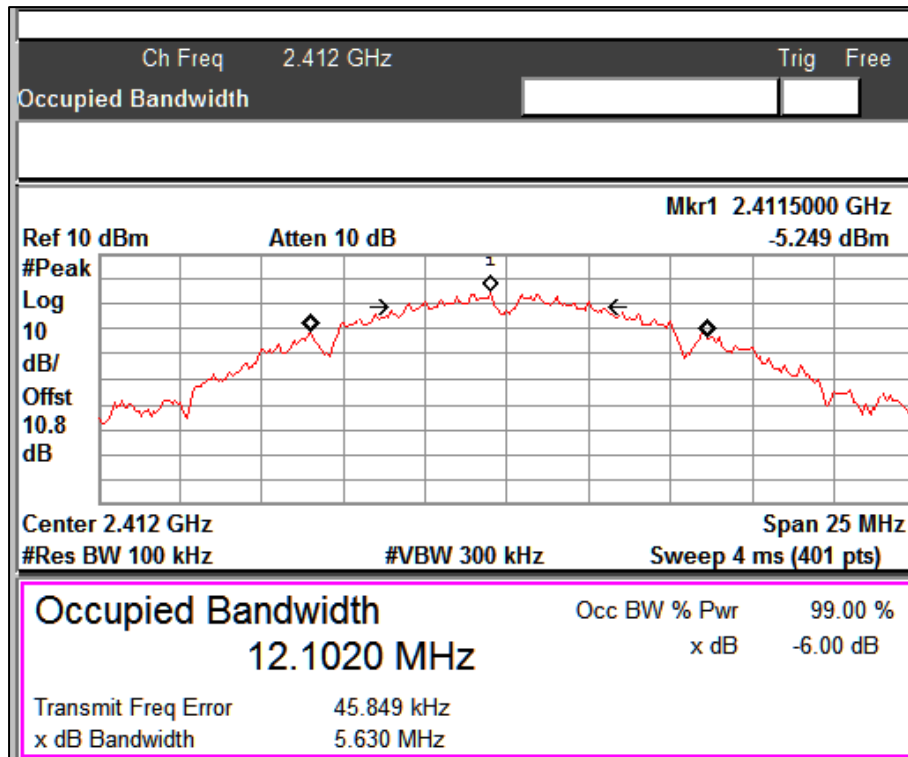
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000072F

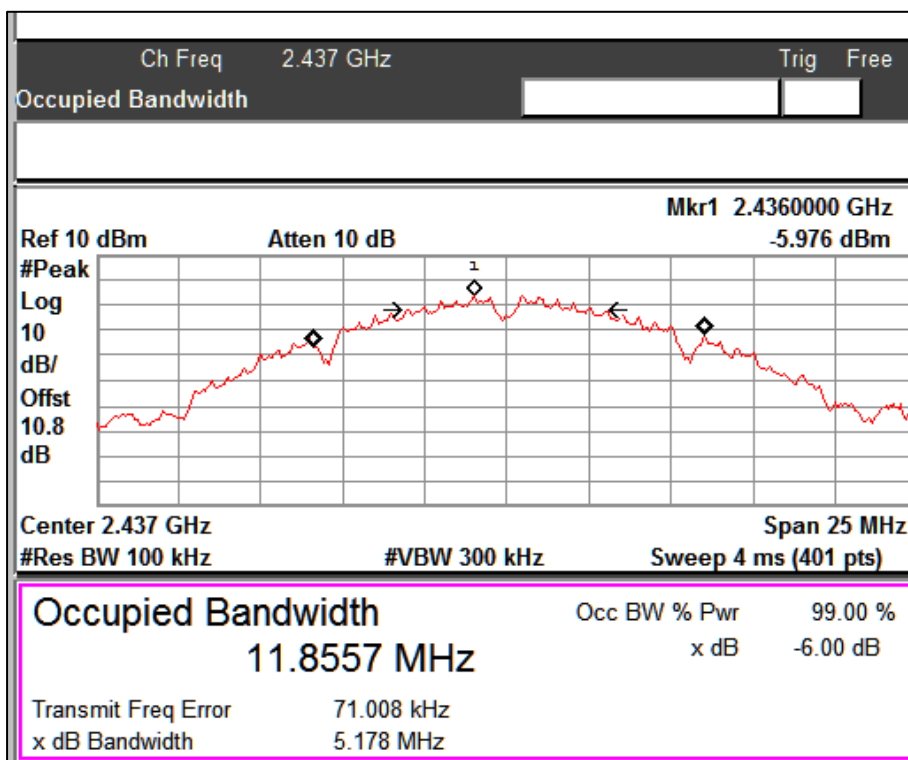
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Channel Frequency: 2412 MHz

Data Rate: 1Mbps



Channel Frequency: 2437 MHz

Data Rate: 1Mbps

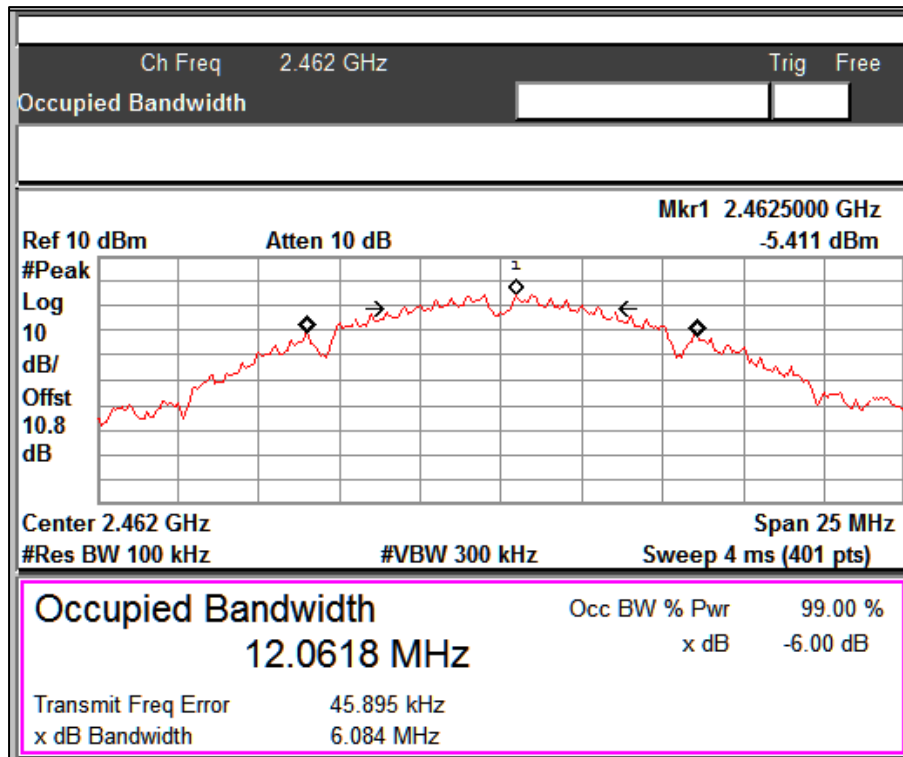
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000072F

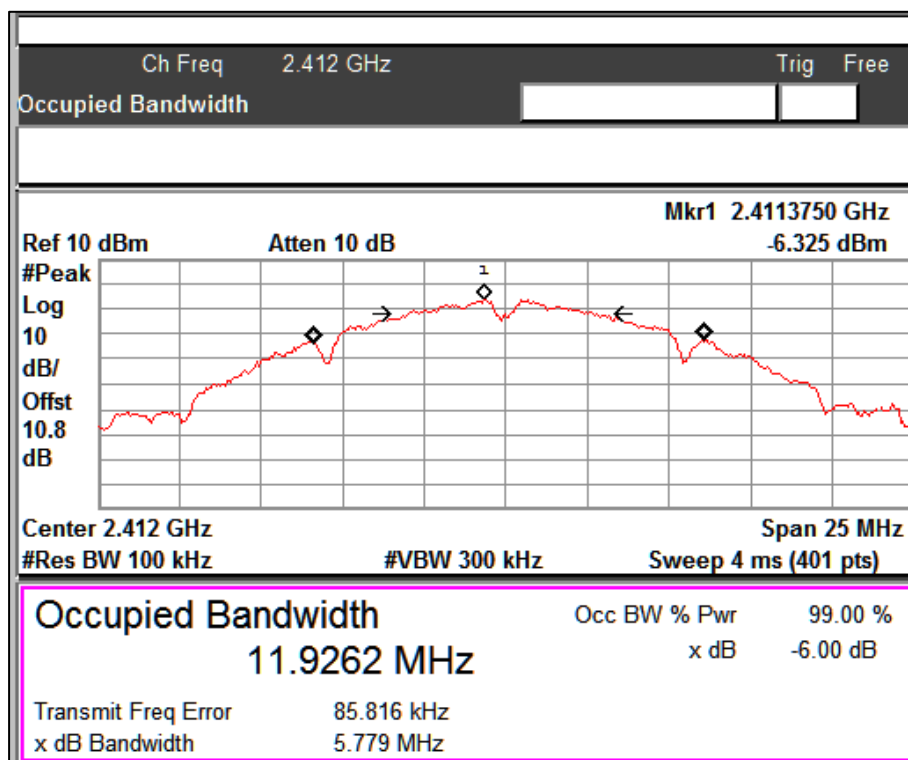
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Channel Frequency: 2462 MHz

Data Rate :1Mbps



Channel Frequency: 2412 MHz

Data Rate: 2Mbps

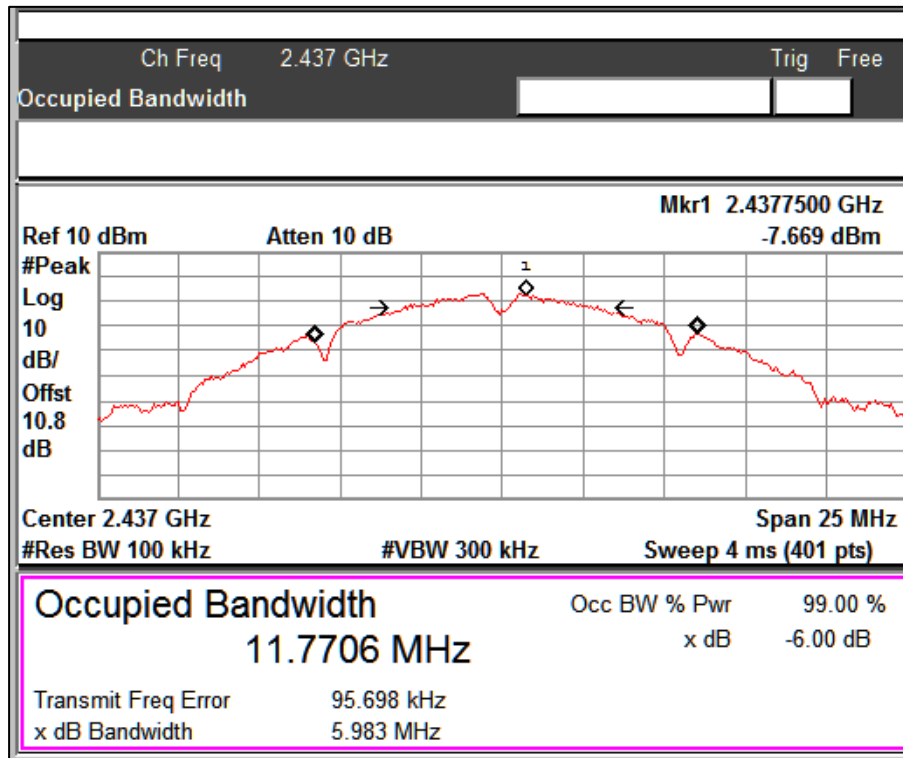
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000072F

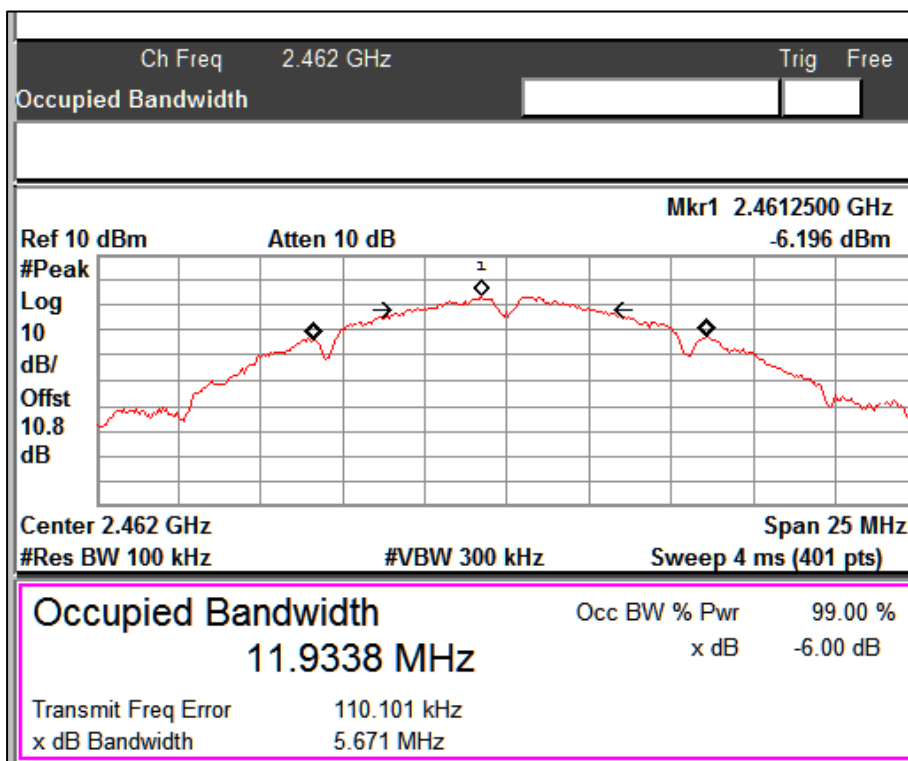
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Channel Frequency: 2437 MHz

Data Rate: 2Mbps



Channel Frequency: 2462 MHz

Data Rate: 2Mbps

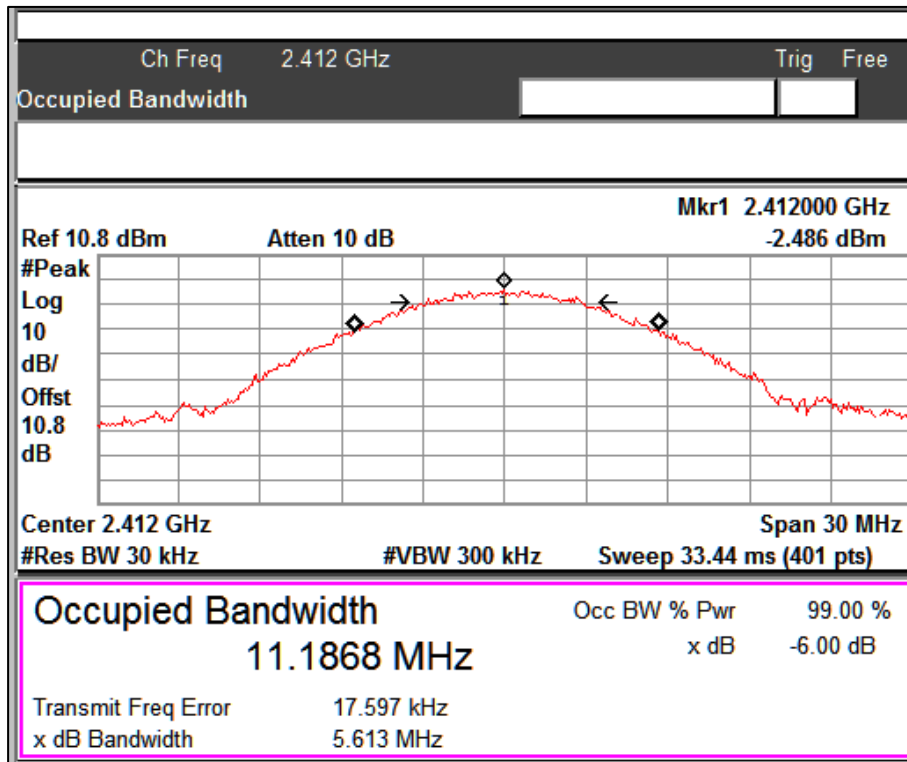
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000072F

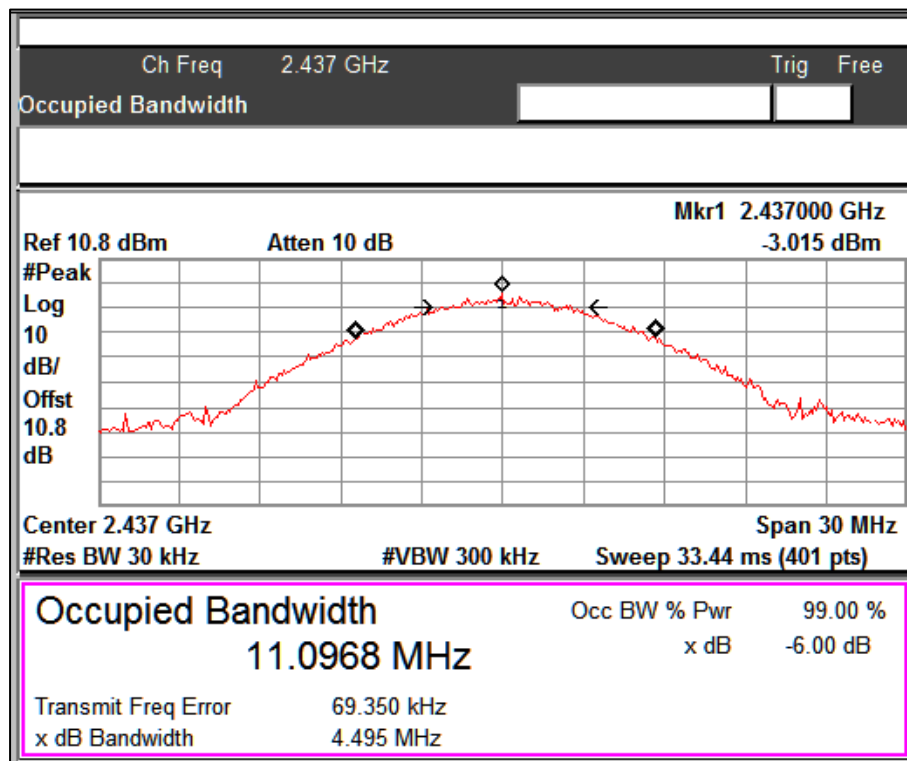
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Channel Frequency: 2412 MHz

Data Rate: 5.5Mbps



Channel Frequency: 2437 MHz

Data Rate: 5.5Mbps

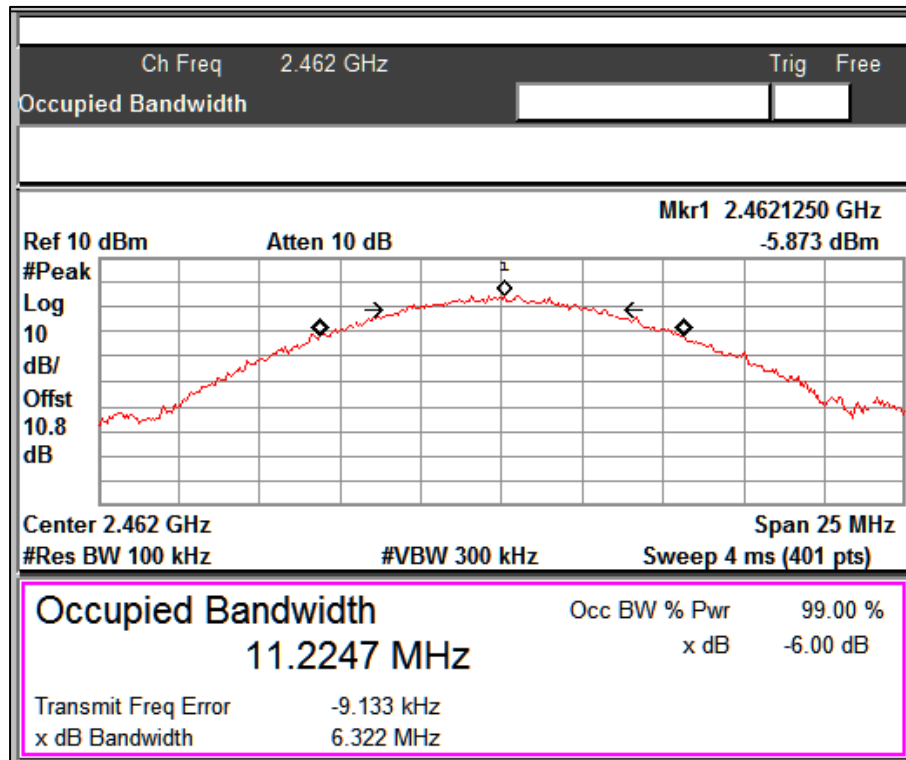
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000072F

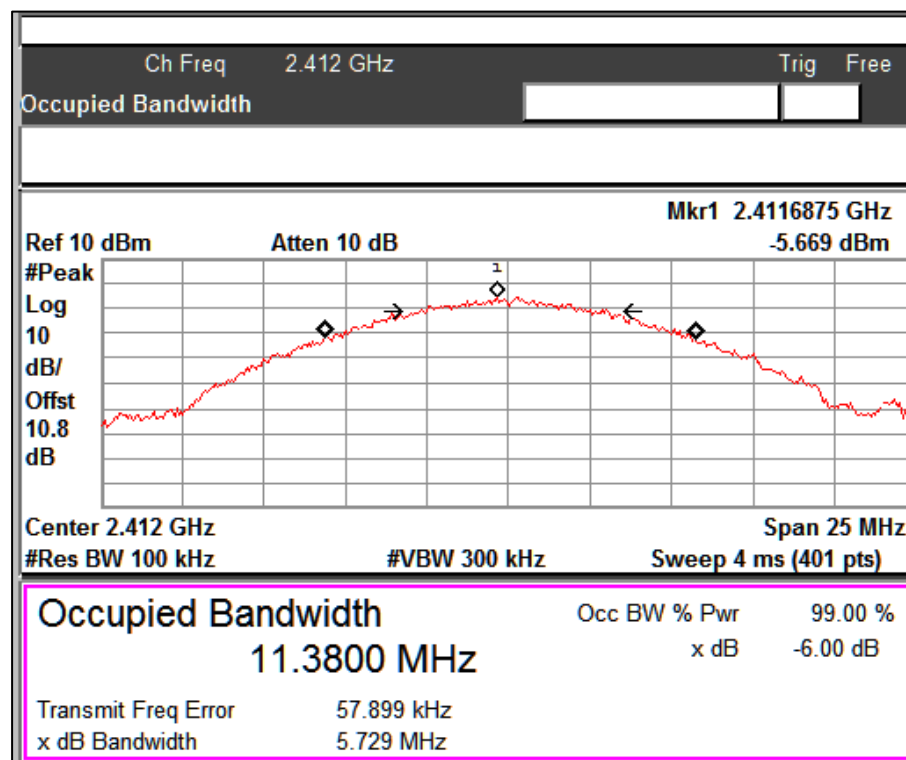
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Channel Frequency: 2462 MHz

Data Rate: 5.5Mbps



Channel Frequency: 2412 MHz

Data Rate : 11Mbps

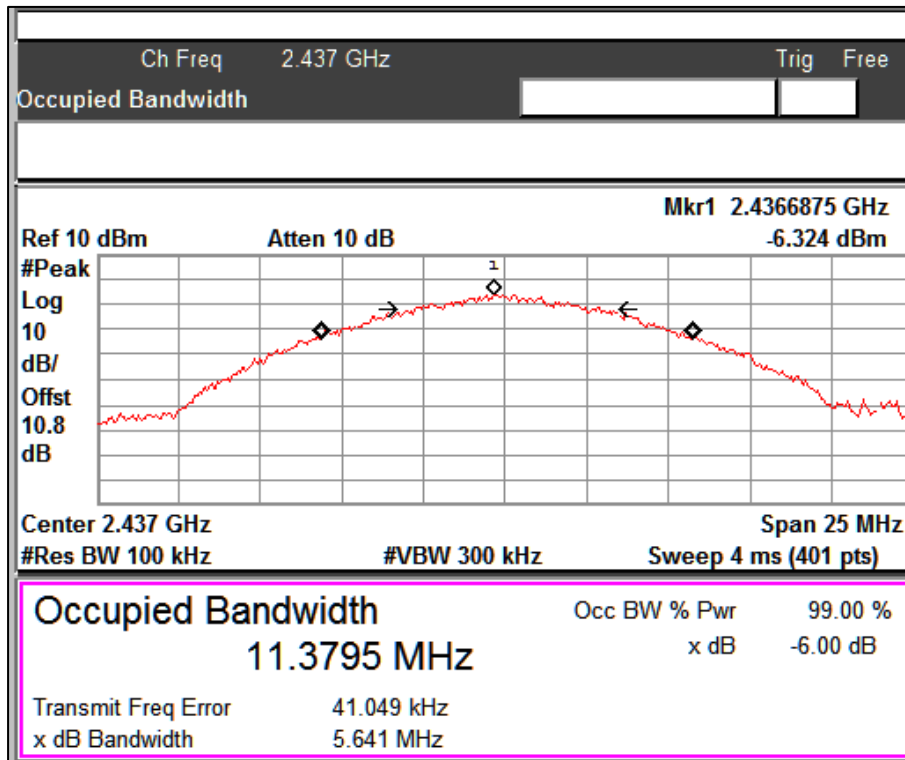
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000072F

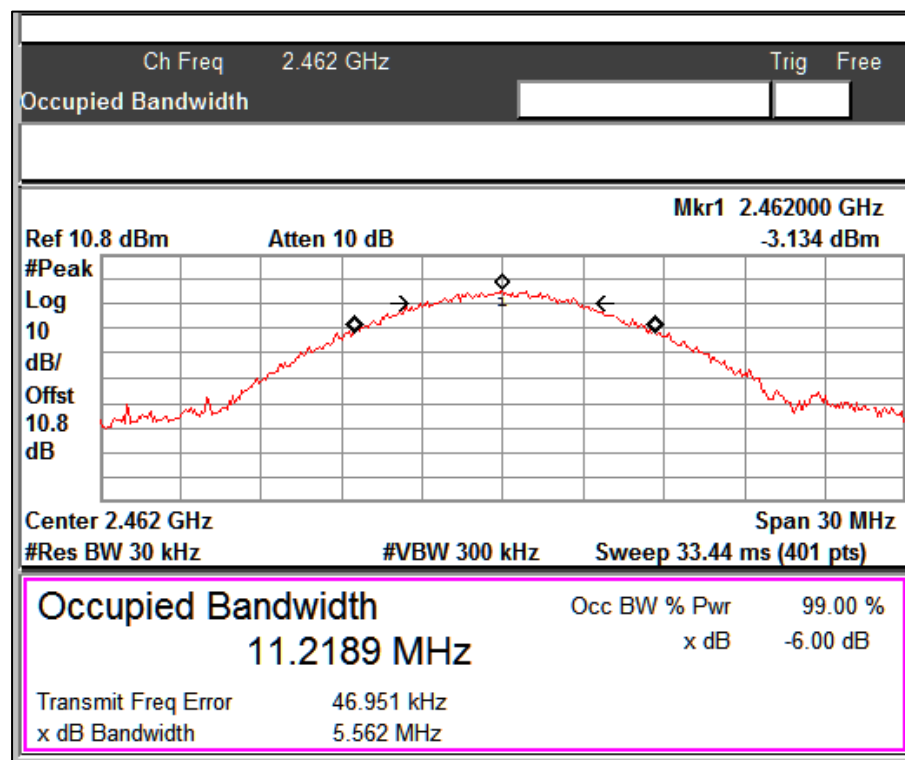
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Channel Frequency: 2437 MHz

Data Rate: 11Mbps



Channel Frequency: 2462 MHz

Data Rate: 11Mbps

Prüfbericht - Nr.:

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6.4 Emissions in non-restricted frequency bands and Conducted Spurious emissions

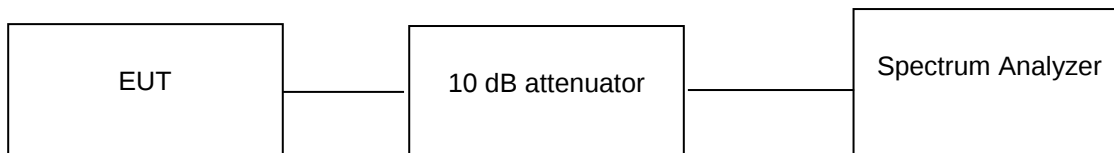
6.4.1 Emissions in non-restricted frequency bands

Result

Pass

Test Specification FCC Part 15 Subpart C Section 15.247 (d)
 Detector Function Peak
 Port of testing Antenna port
 Requirement In any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the Highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

Test Method:



Environmental and Test conditions:

Normal Temperature = +25 °C

Voltage (V norm) = 2.8 V DC (Battery)

RH = 63.6 %

Test results:

10 dB attenuator + 0.8 dB Cable loss = 10.8 dB offset is considered in below result

Protocol: 802.11b

Data rate (Mbps)	Channel Frequency (MHz)	Value at Band Edge		Reference Value B (dBm)	Band Edge Value A~B (dBm)	Limit (dBm)
		Frequency (MHz)	Value A (dBm)			
1	2412	2393	-51.33	-7.86	-43.47	-30
	2462	2483	-57.51	-4.60	-52.91	-30
2	2412	2394	-53.14	-6.17	-46.97	-30
	2462	2483	-57.36	-6.36	-51.00	-30
5.5	2412	2393	-52.87	-5.24	-47.63	-30
	2462	2483	-58.28	-5.17	-53.11	-30
11	2412	2393	-53.01	-4.73	-48.28	-30
	2462	2483	-57.80	-6.06	-51.74	-30

Prüfbericht - Nr.:

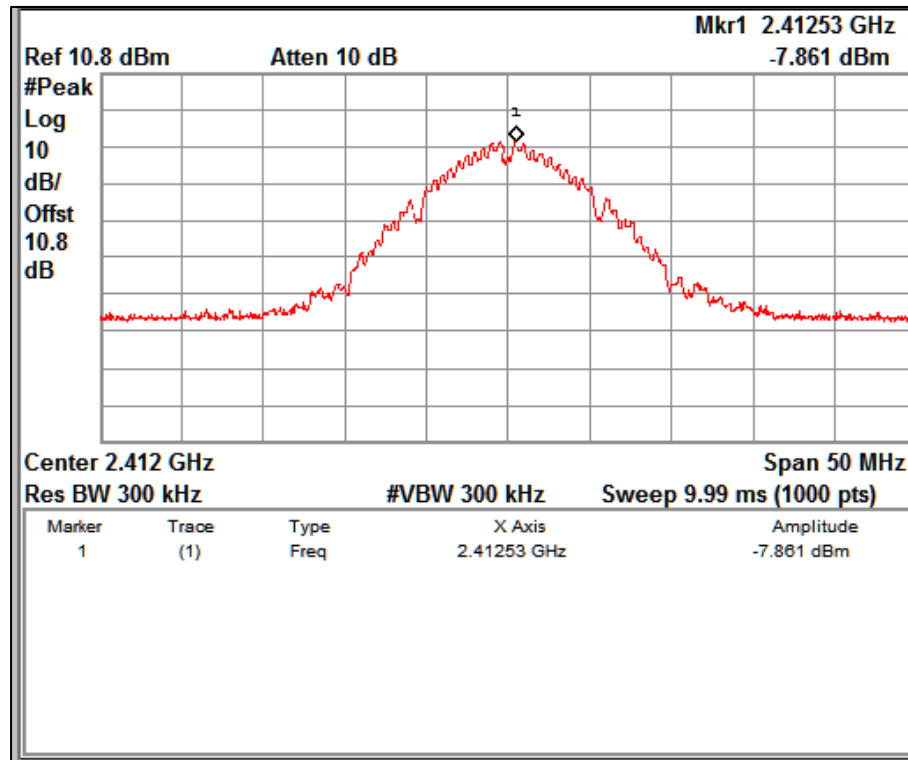
Test Report No.:

ULR-TC568819300000072F

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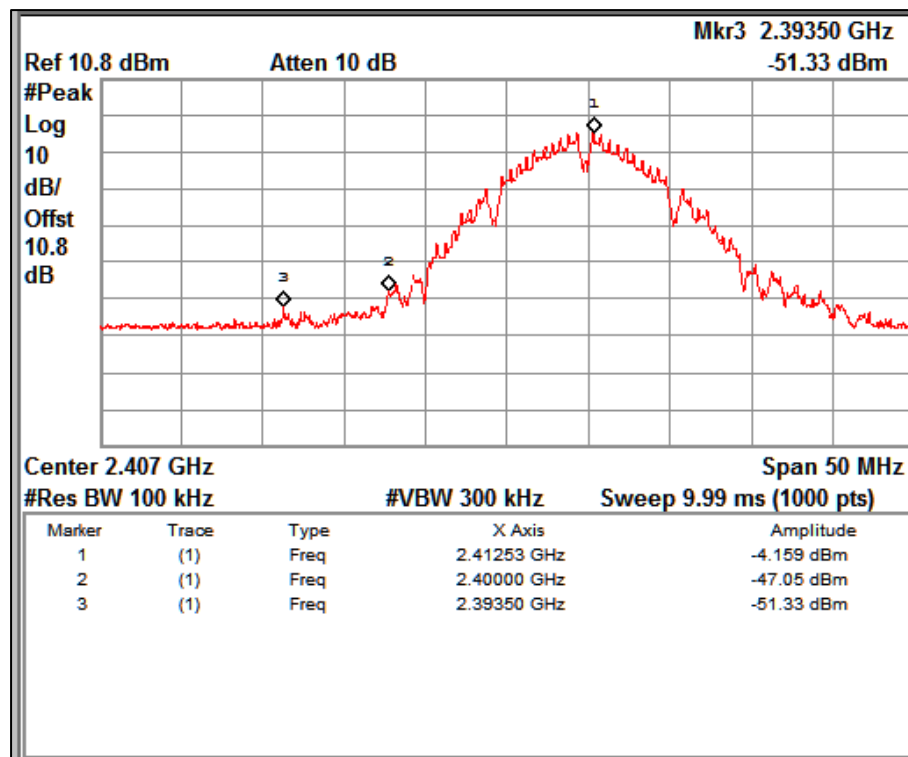
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Reference Plot



Channel Frequency: 2412 MHz

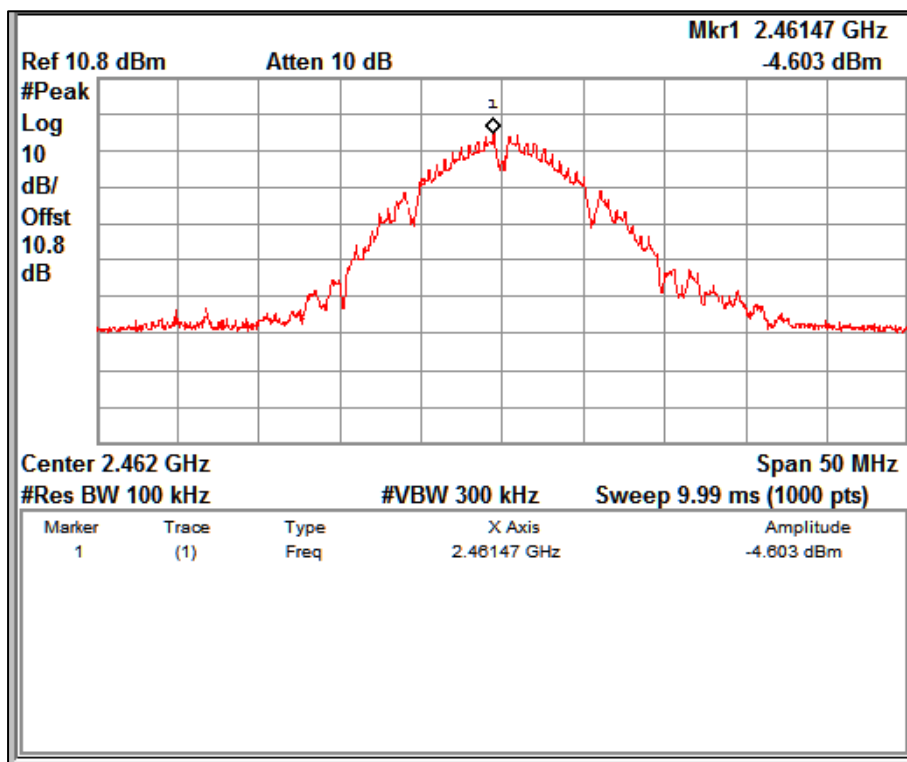
Data rate: 1Mbps



Channel Frequency: 2412 MHz

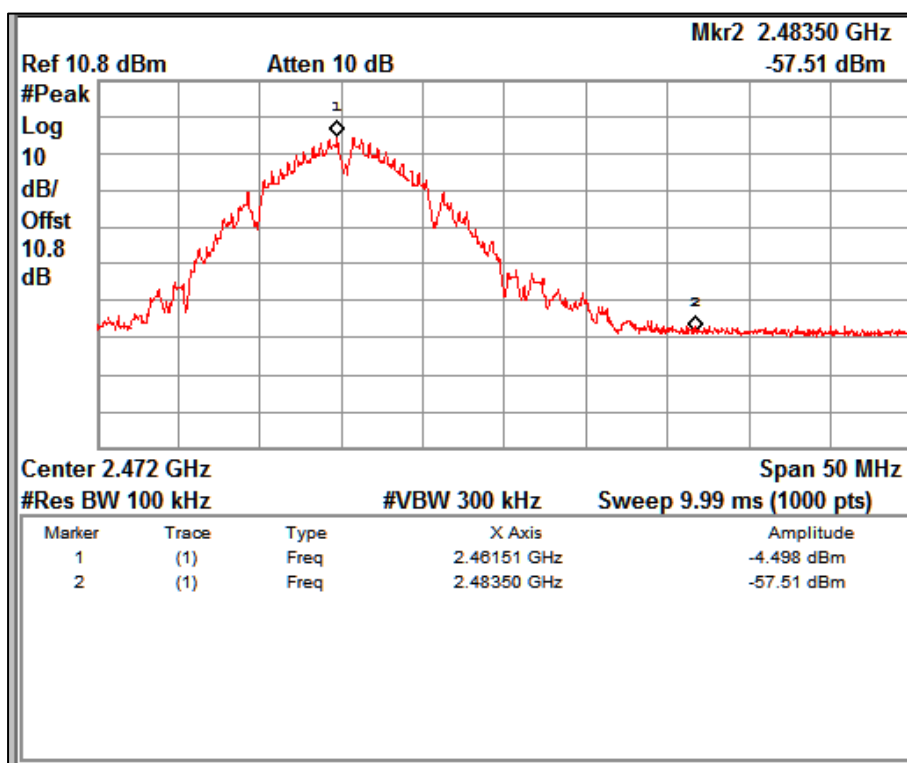
Data rate: 1Mbps

Reference Plot



Channel Frequency: 2462 MHz

Data rate: 1Mbps



Channel Frequency: 2462 MHz

Data rate: 1Mbps

Prüfbericht - Nr.:

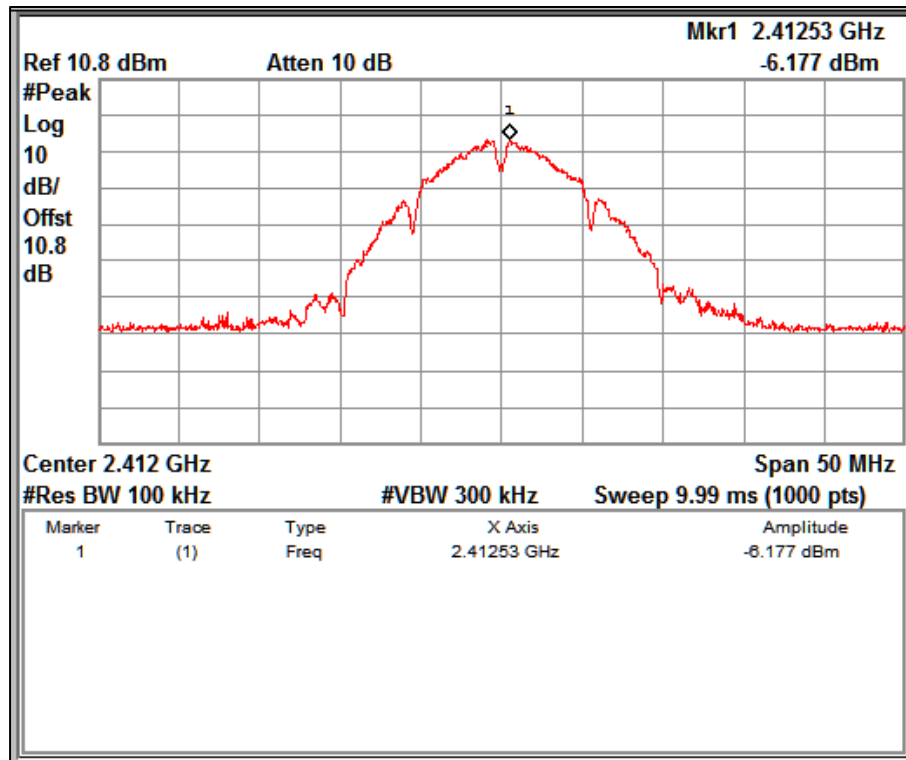
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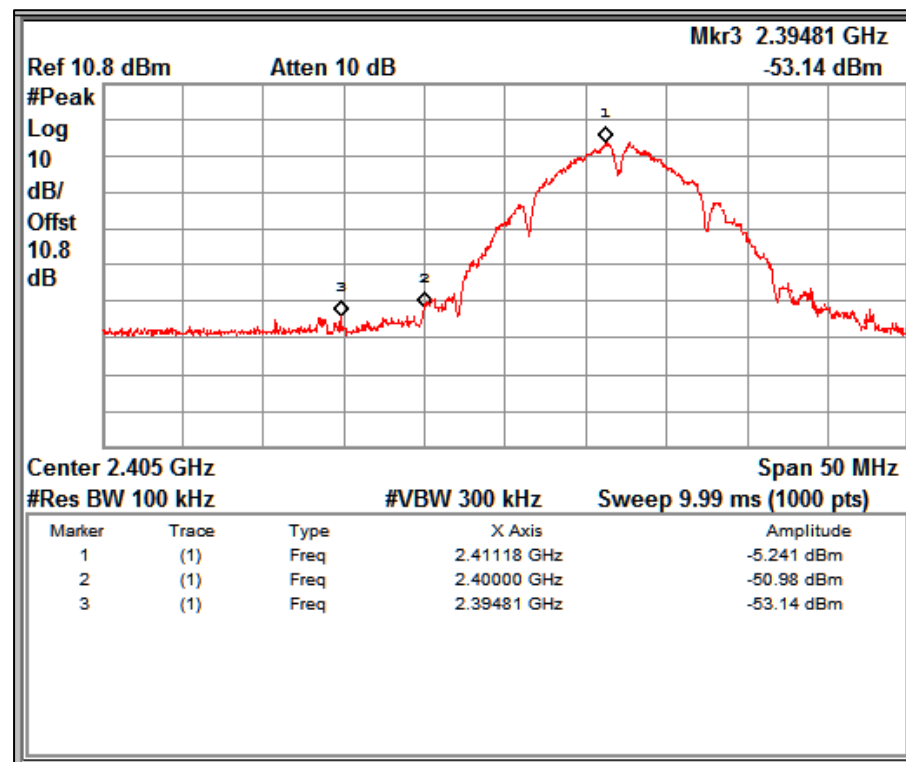
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Reference Plot



Channel Frequency: 2412 MHz

Data rate: 2Mbps



Channel Frequency: 2412 MHz

Data rate: 2Mbps

Prüfbericht - Nr.:

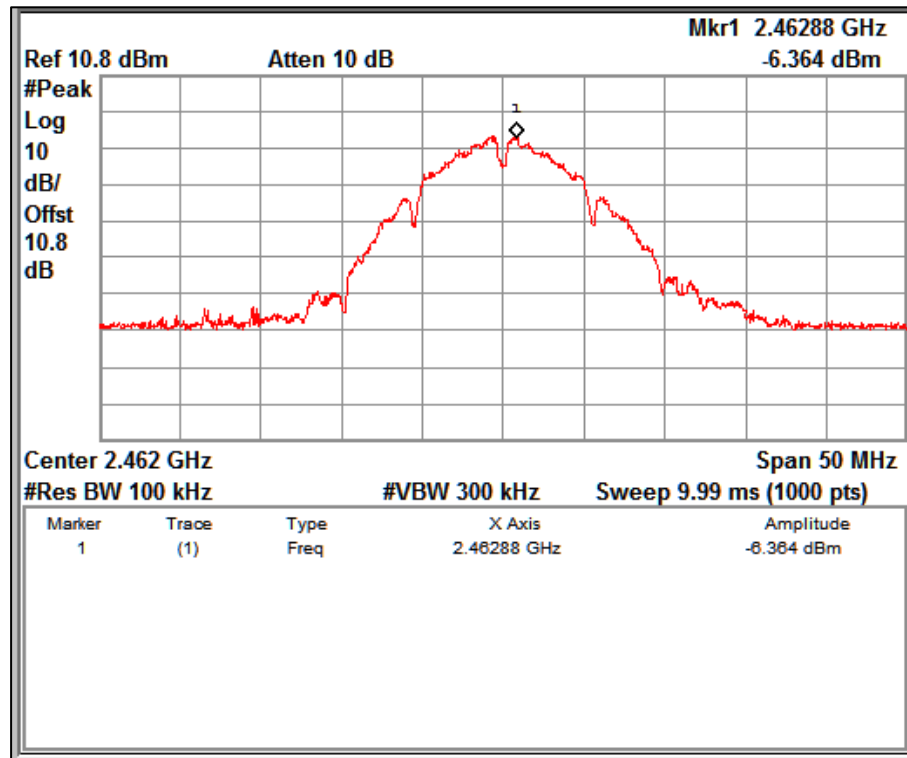
Test Report No.:

ULR-TC568819300000072F

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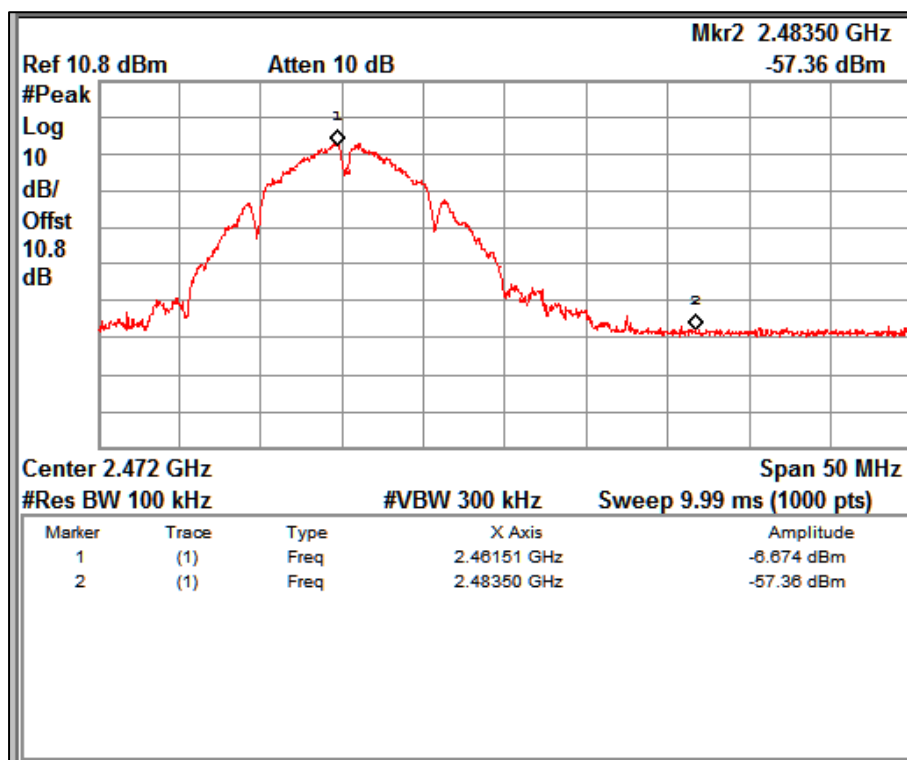
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Reference Plot



Channel Frequency: 2462 MHz

Data rate: 2Mbps



Channel Frequency: 2462 MHz

Data rate: 2Mbps

Prüfbericht - Nr.:

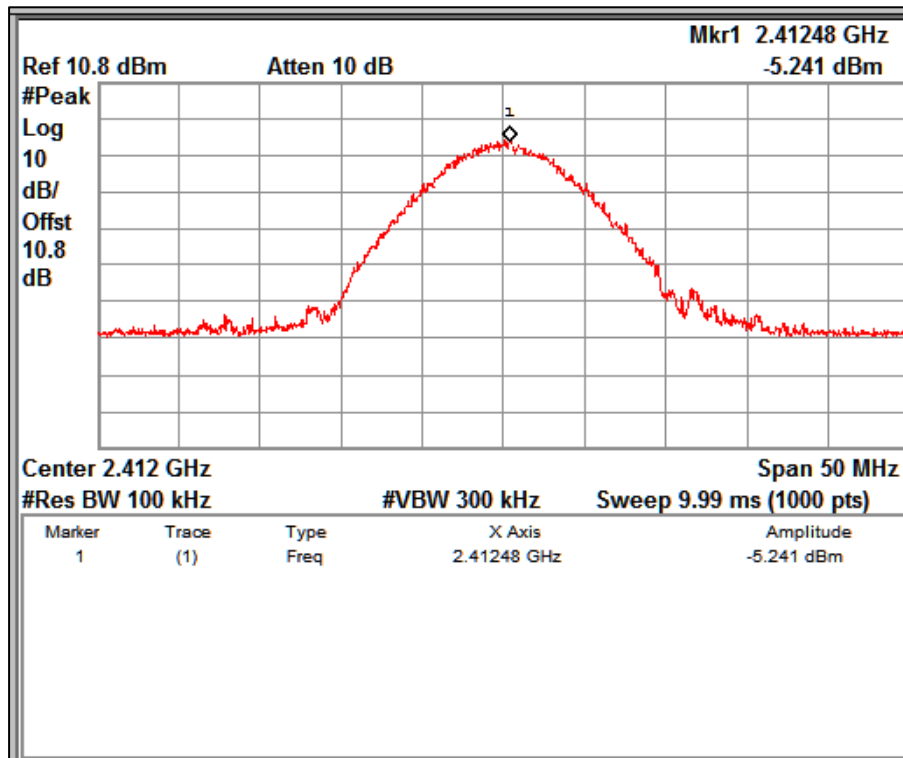
Test Report No.:

ULR-TC568819300000072F

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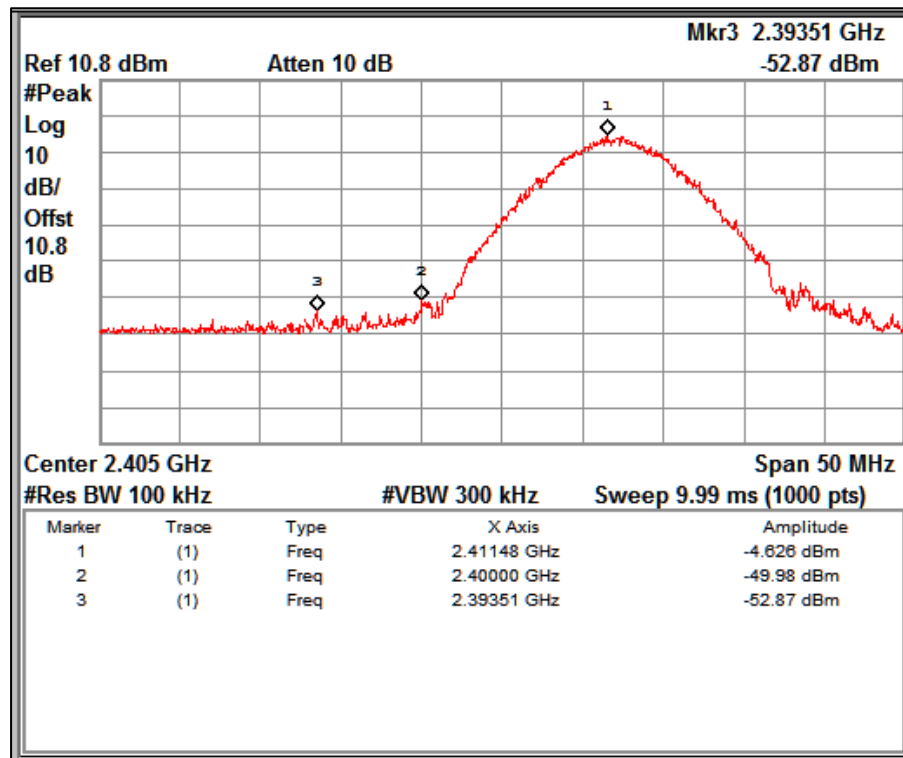
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Reference Plot



Channel Frequency: 2412 MHz

Data rate: 5.5Mbps



Channel Frequency: 2412 MHz

Data rate: 5.5Mbps

Prüfbericht - Nr.:

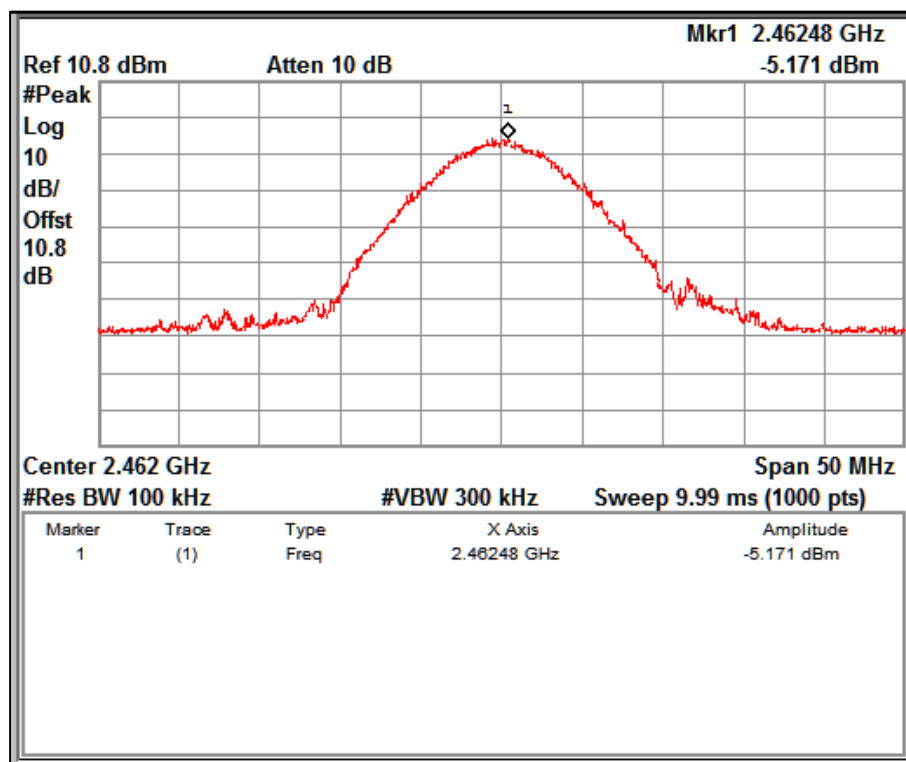
Test Report No.:

ULR-TC568819300000072F

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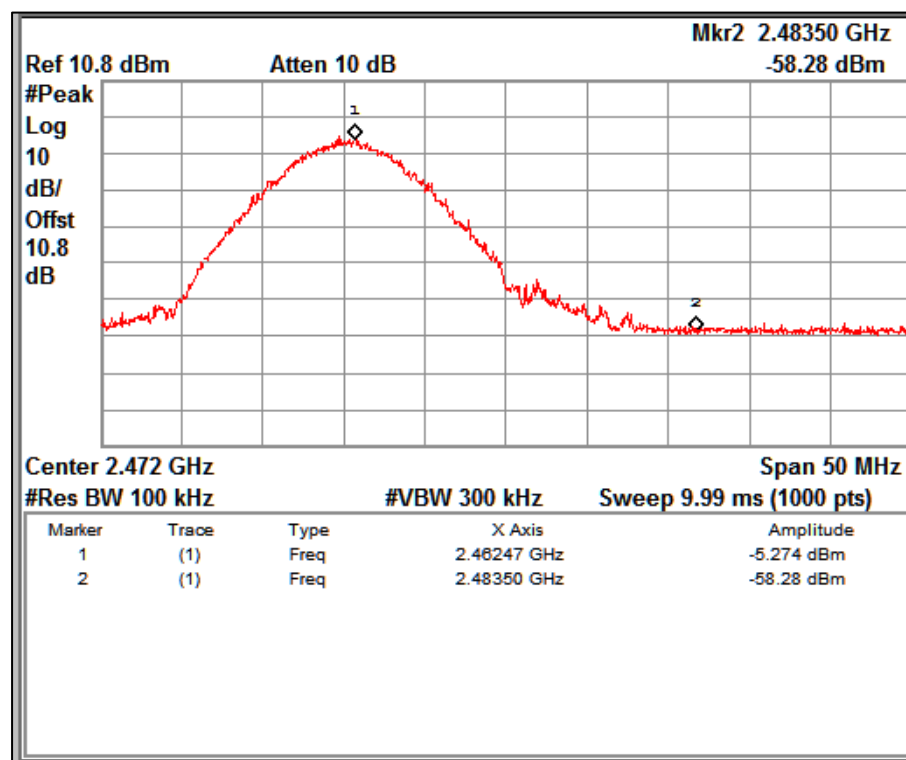
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Reference Plot



Channel Frequency: 2462 MHz

Data rate: 5.5Mbps



Channel Frequency: 2462 MHz

Data rate: 5.5Mbps

Prüfbericht - Nr.:

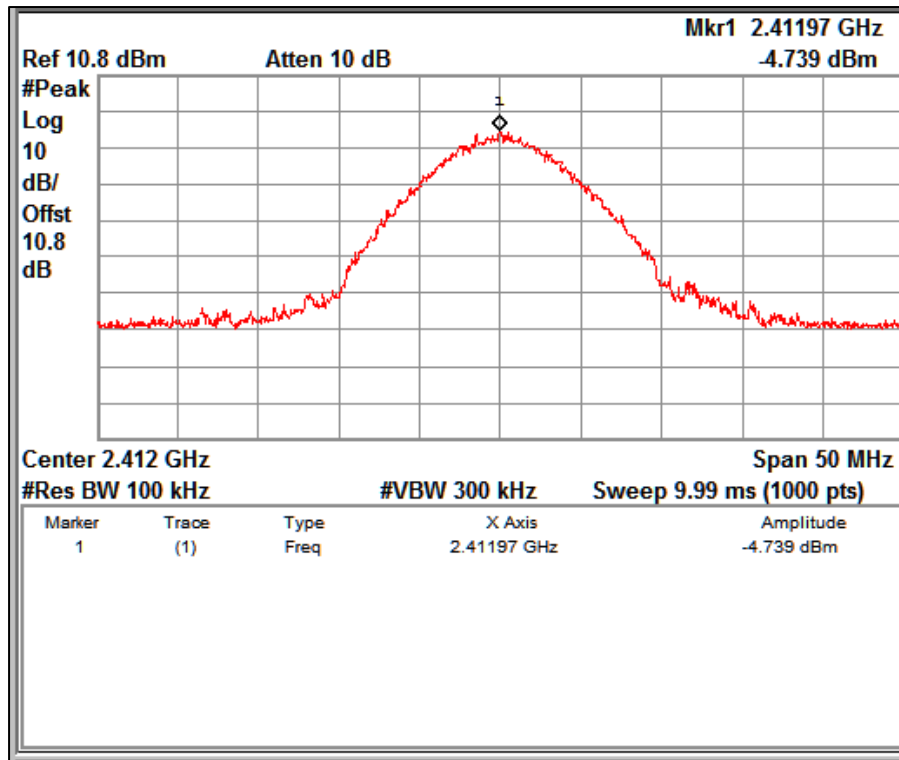
Test Report No.:

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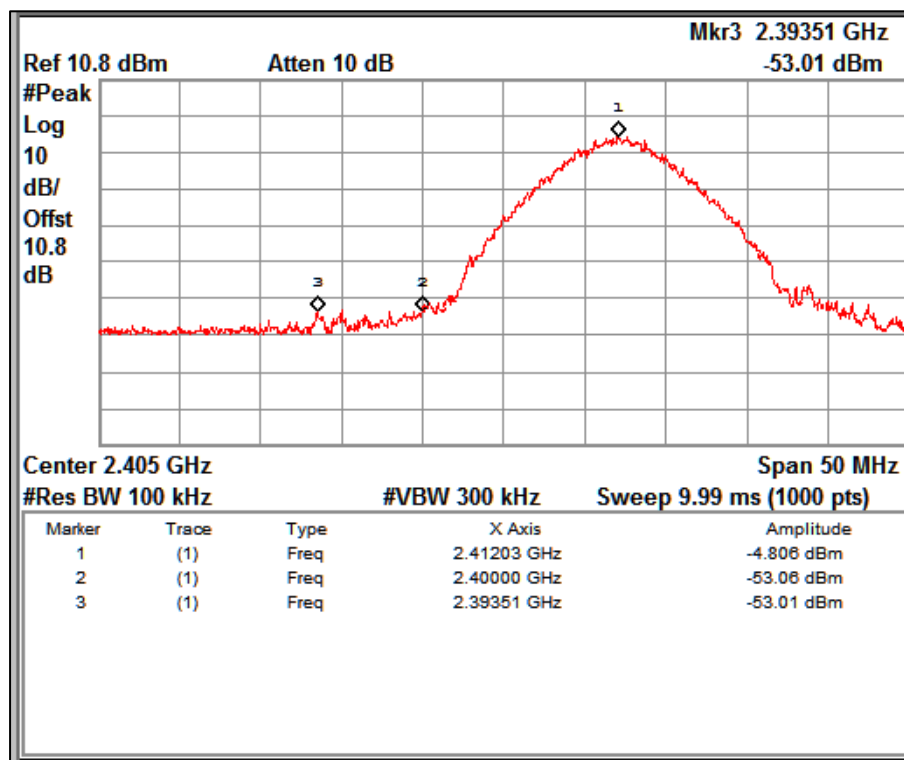
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Reference Plot



Channel Frequency: 2412 MHz

Data rate: 11Mbps



Channel Frequency: 2412 MHz

Data rate: 11Mbps

Prüfbericht - Nr.:

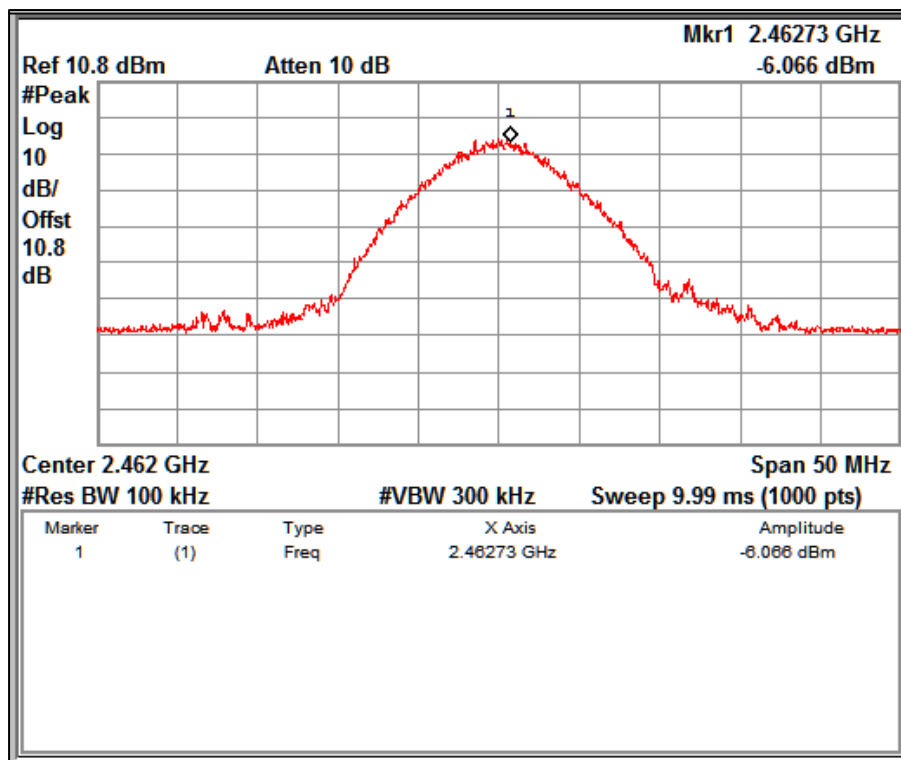
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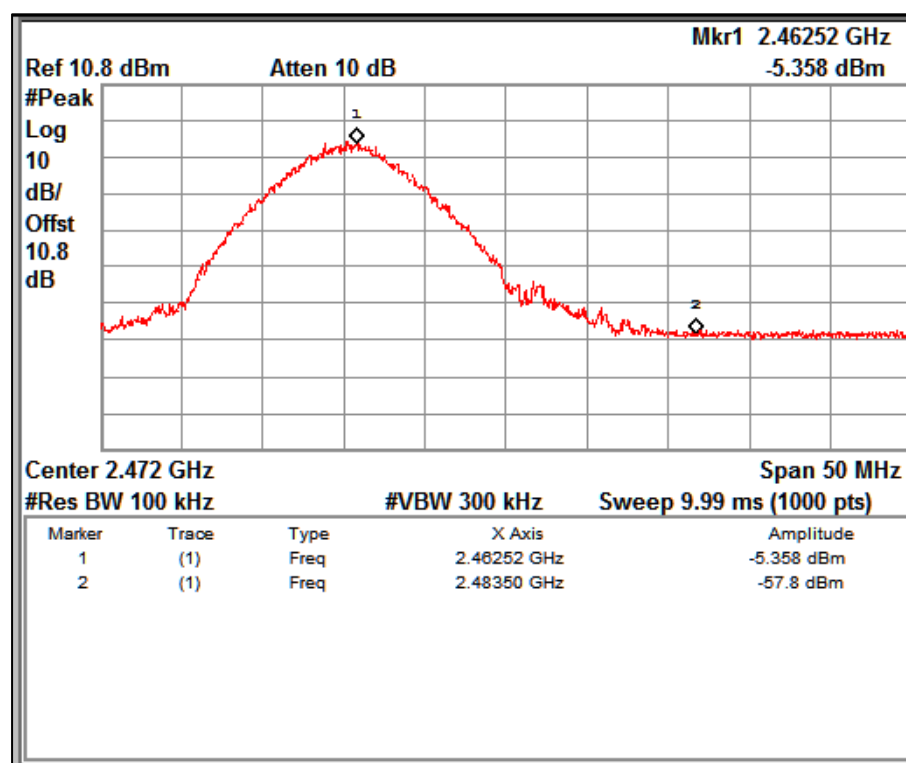
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Reference Plot



Channel Frequency: 2462 MHz

Data rate: 11Mbps



Channel Frequency: 2462 MHz

Data rate: 11Mbps

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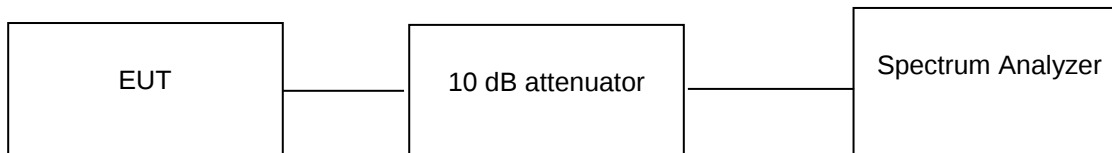
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6.4.2 Conducted Spurious Emission

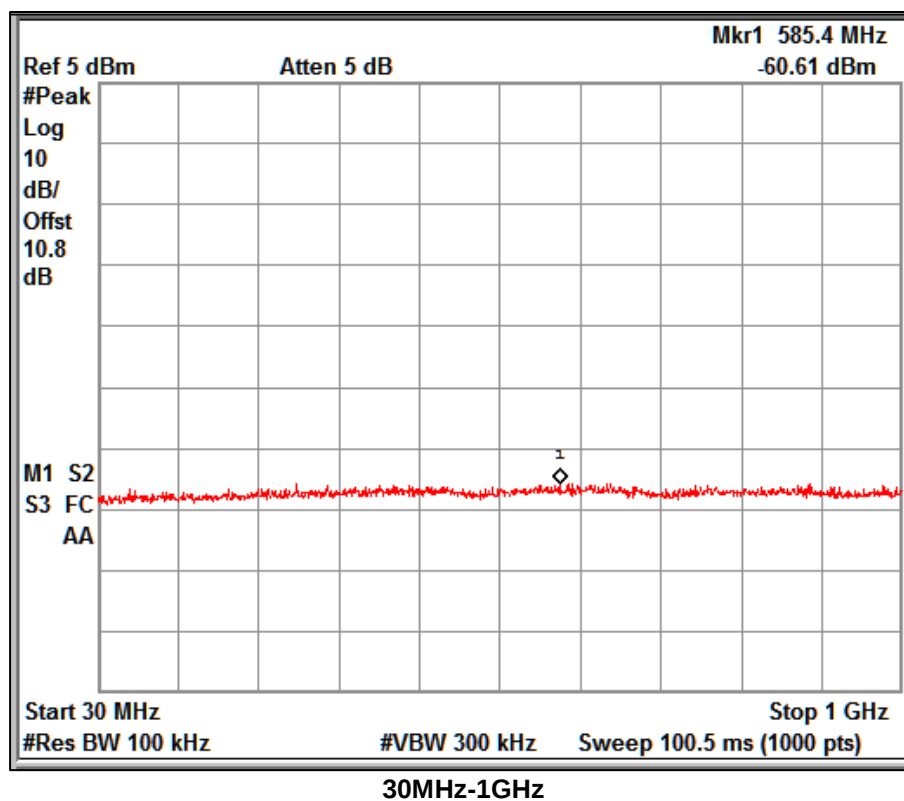
Result

Pass

Test Method:



Test results:



Prüfbericht - Nr.:

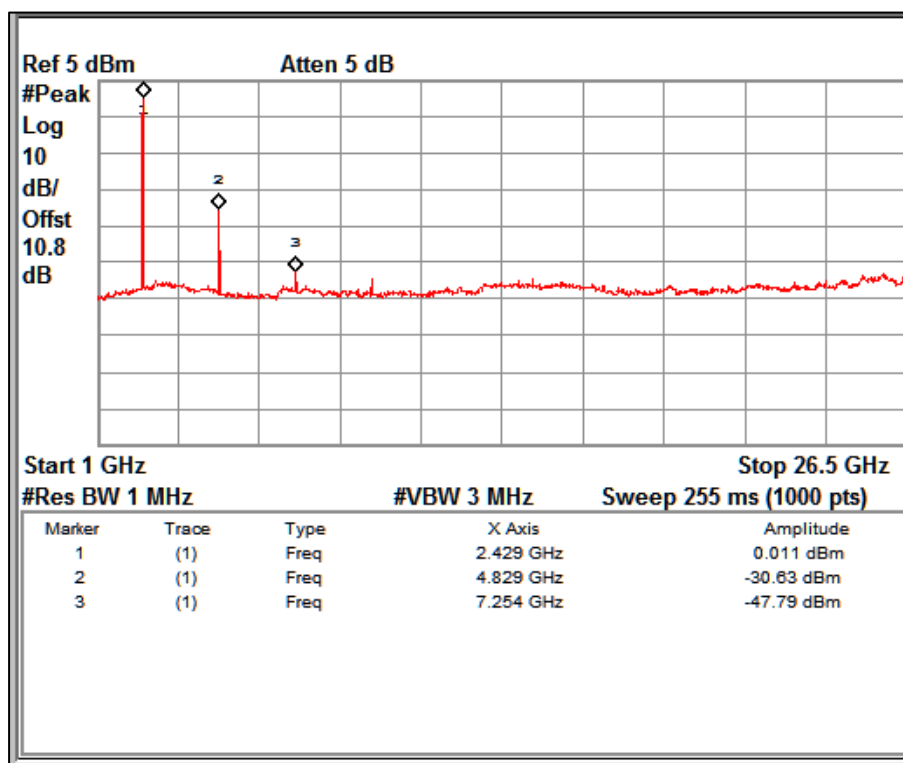
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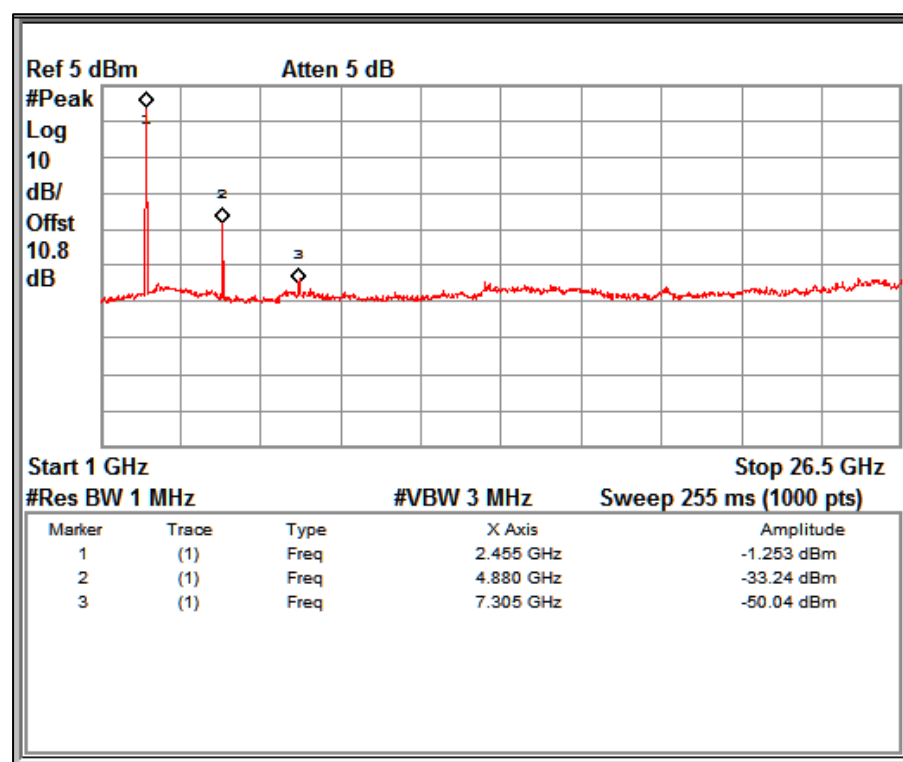
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1GHz-26.5GHz



Channel Frequency: 2412 MHz

Data rate: 1Mbps



Channel Frequency : 2437 MHz

Data rate:1Mbps

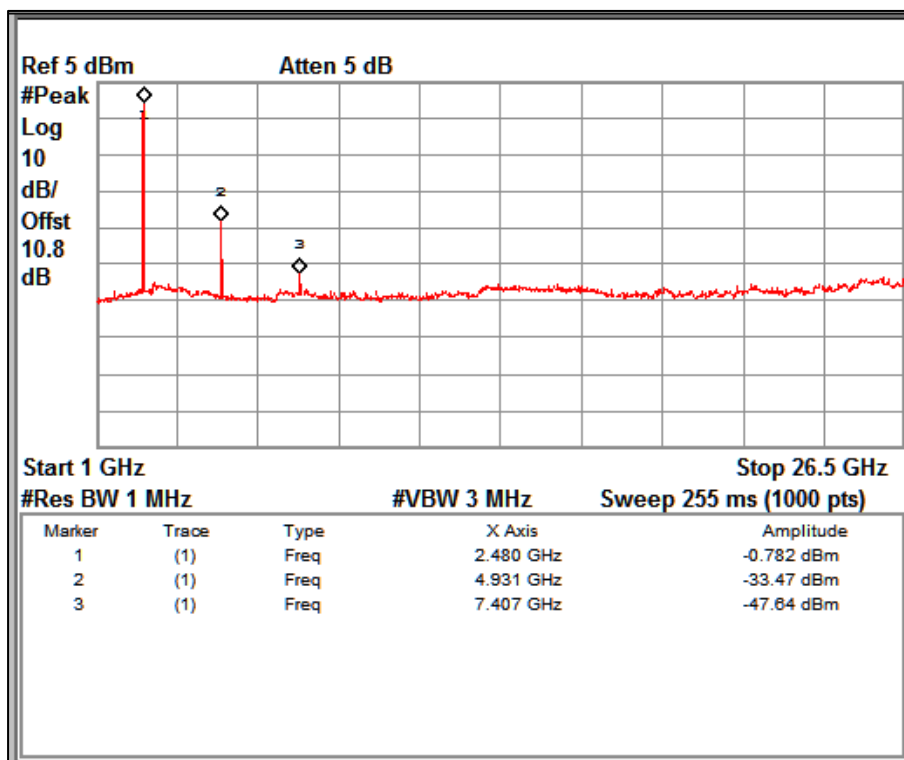
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000072F

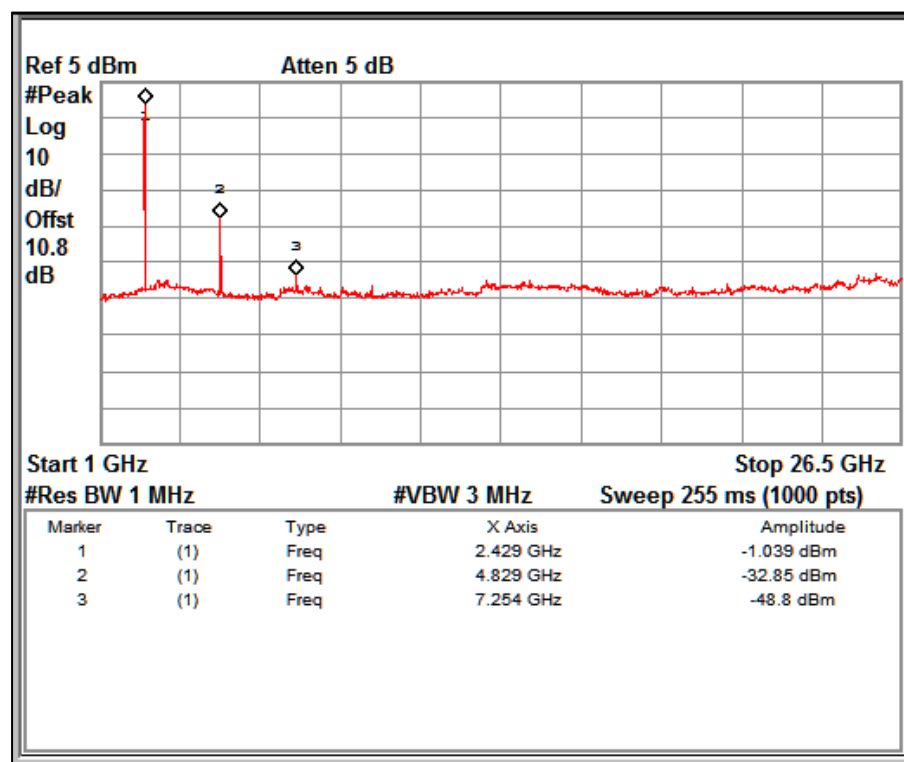
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Channel Frequency: 2462 MHz

Data rate: 1Mbps



Channel Frequency: 2412 MHz

Data rate: 2Mbps

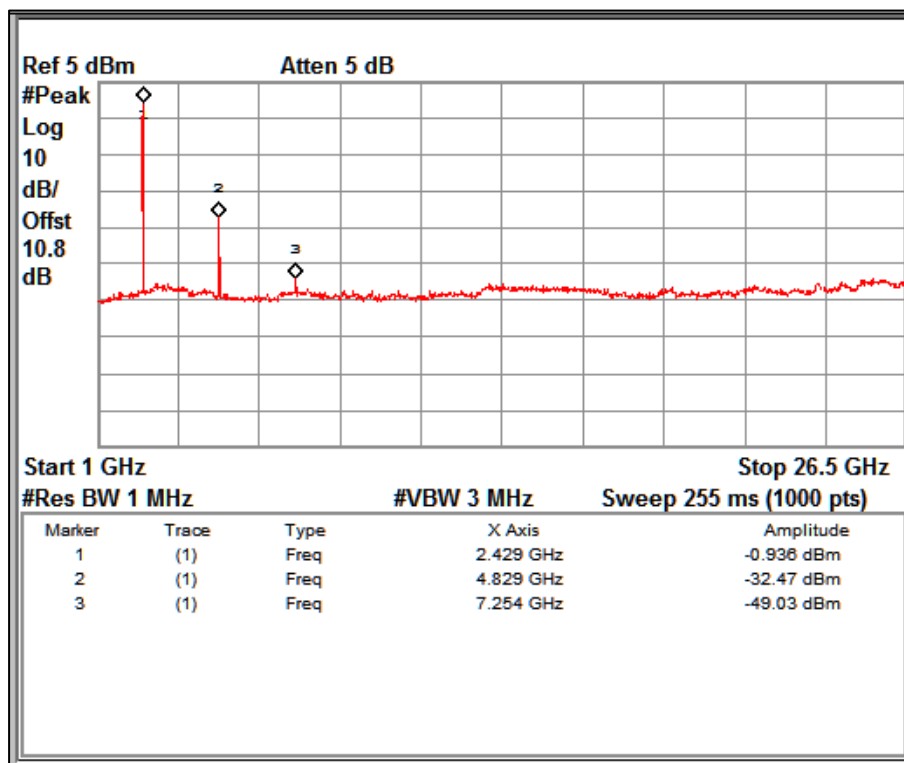
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000072F

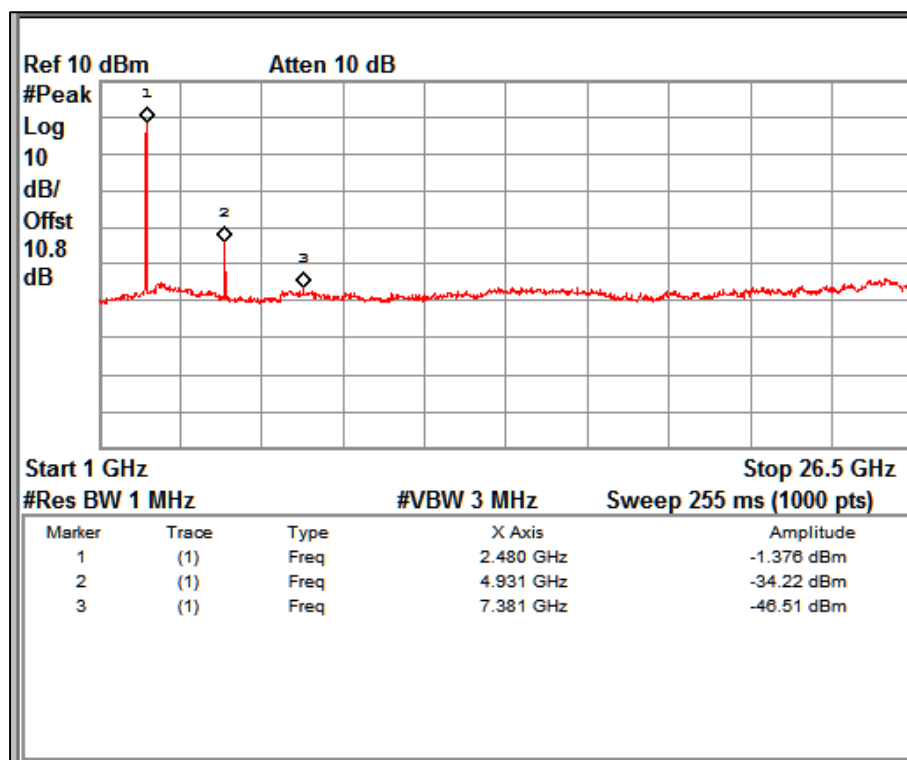
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Channel Frequency: 2437 MHz

Data rate: 2Mbps



Channel Frequency: 2462 MHz

Data rate: 2Mbps

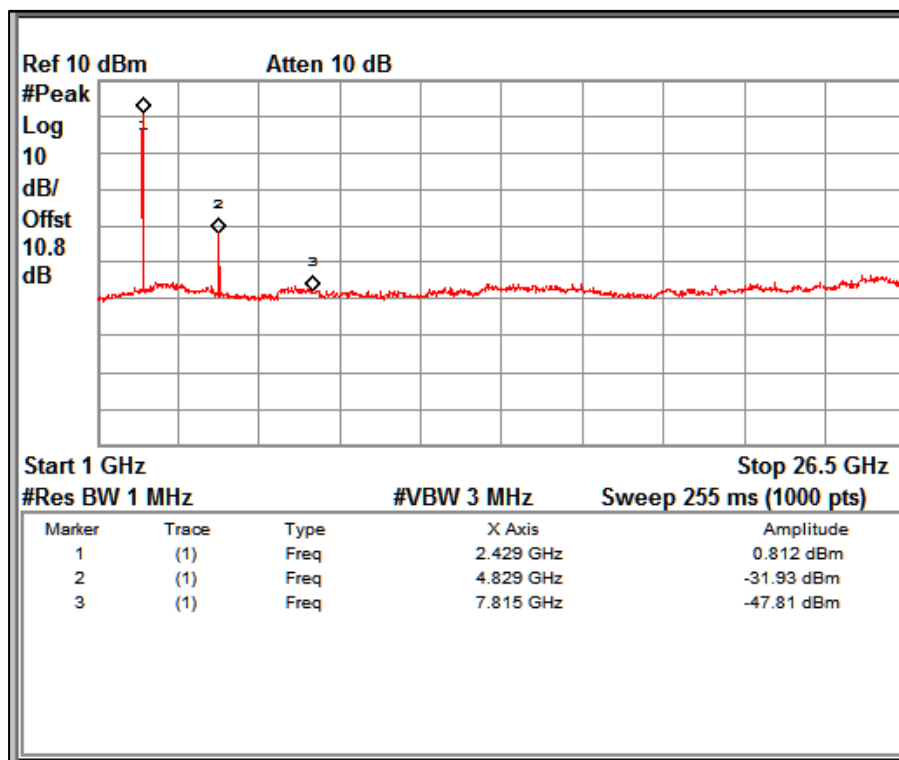
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000072F

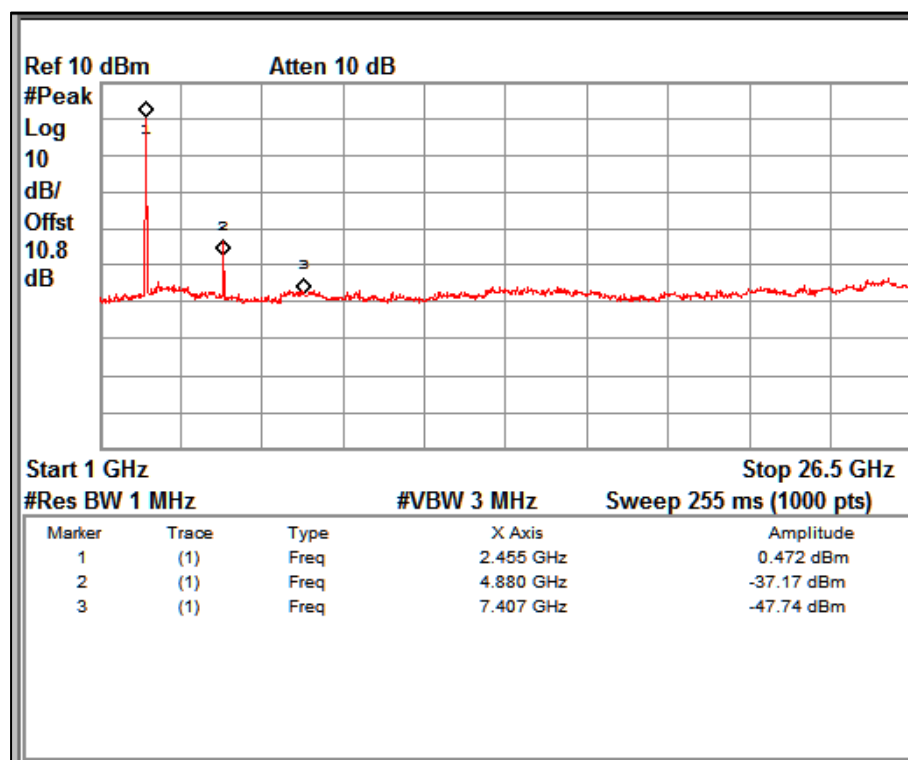
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Channel Frequency: 2412 MHz

Data rate: 5.5Mbps



Channel Frequency: 2437 MHz

Data rate: 5.5Mbps

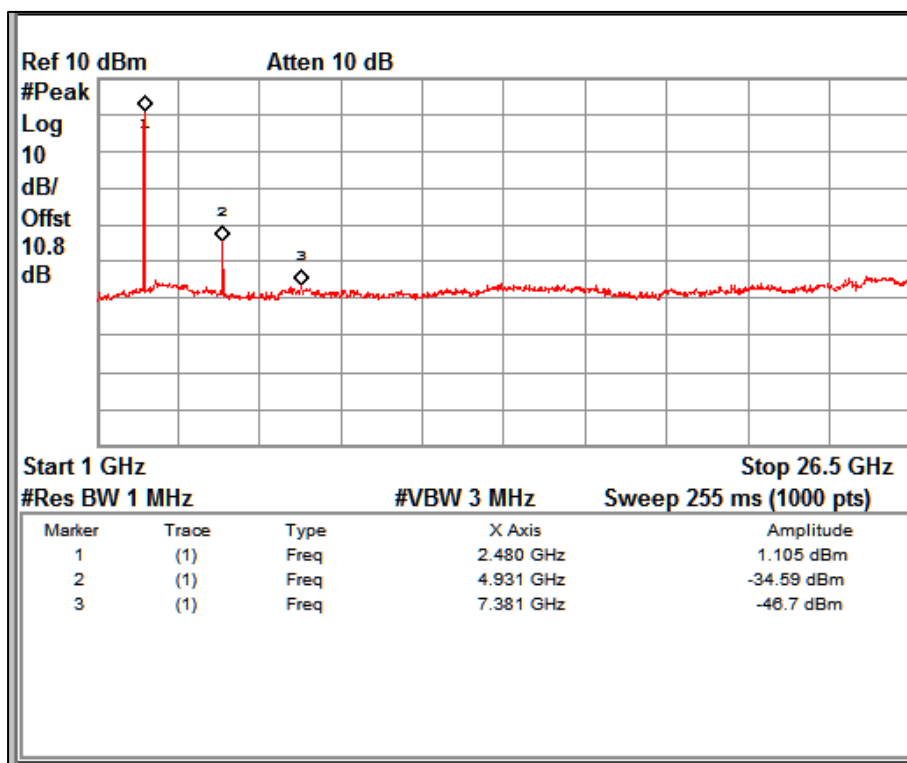
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000072F

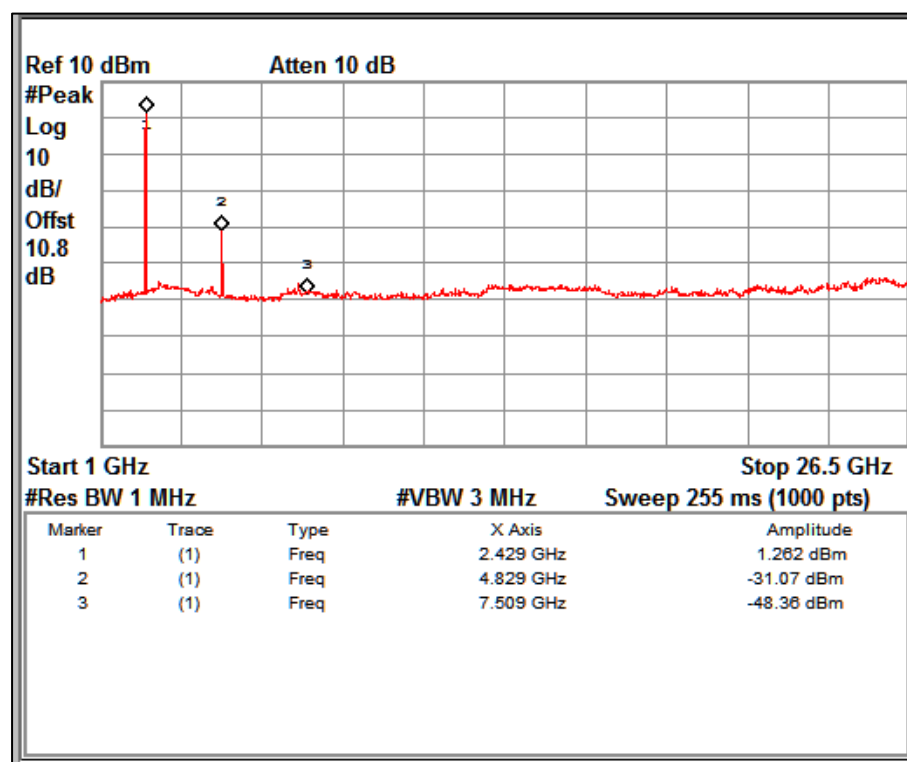
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Channel Frequency: 2462 MHz

Data rate: 5.5Mbps



Channel Frequency : 2412 MHz

Data rate:11Mbps

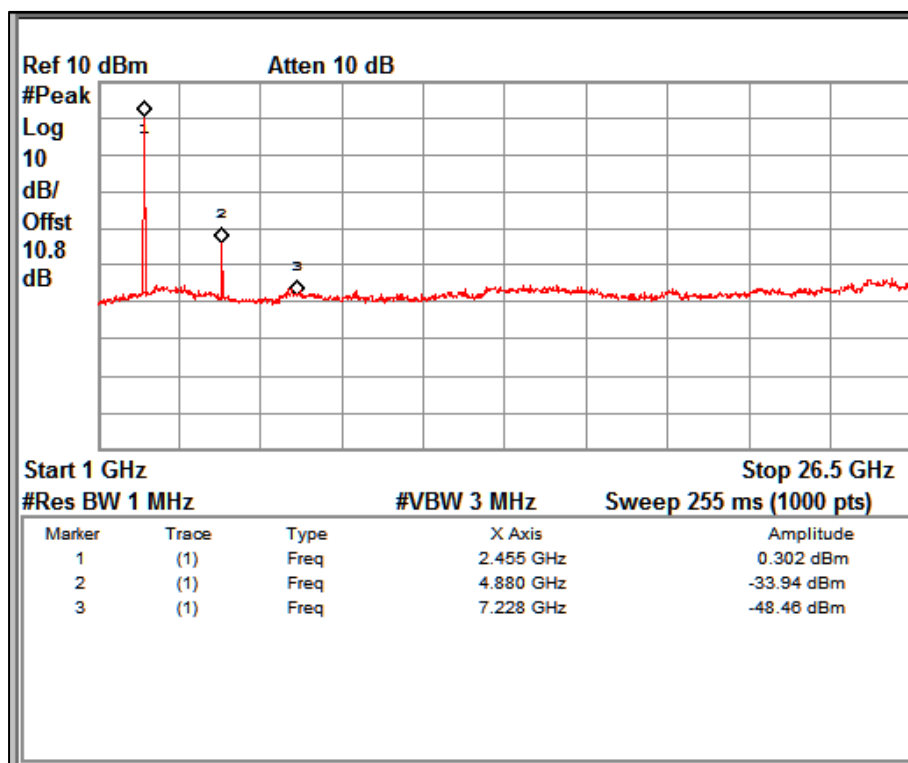
Prüfbericht - Nr.:

Test Report No.:

ULR-TC568819300000072F

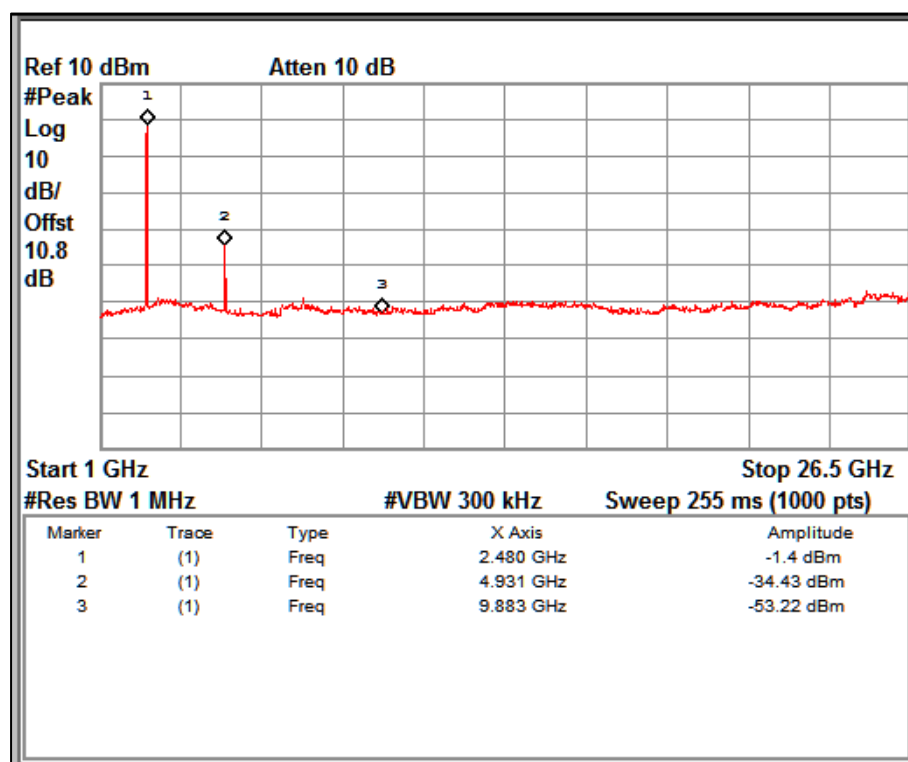
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Channel Frequency: 2437 MHz

Data rate: 11Mbps



Channel Frequency: 2462 MHz

Data rate: 11Mbps

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6.5 Radiated spurious emission and emissions in restricted bands of operation

Result

Pass

Test Specification	FCC part 15 Subpart C Section 15.247 (d) / (15.209 & 15.205)
Test Method	ANSI C 63.10 – 2013
Measurement Location	Fully Anechoic Chamber
Measuring Distance	3 m
Detector	QP for frequency beLow 1 GHz, Average for frequency above 1 GHz
Requirement	As per the limits mentioned in the beLow table

Limits for Radiated Emission of Section 15.209:

Frequency (MHz)	Field strength (μV/m)	Field strength (dBμV/m)	Distance of Measurement (m)
0.009 – 0.490	2400/F(kHz)	48.50 – 13.80	300*
0.490 – 1.705	24000/F(kHz)	33.80 – 23.00	30*
1.705 -30	30	29.54	30*
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Remark: * the limit shows in the table above of frequency range 0.009 – 0.490, 0.490 – 1.705 MHz and 1.705-30MHz is at 300 meter, 30 meter and 30 meter range respectively, which corresponds to 128-93.8, 73.80-62.95, 69.54 dBμV/m at 3m range by extrapolation calculation and the measurement of loop antenna.

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz Radiated emission limits in these three bands are based on measurements employing an average detector.

Test Conditions:

Environmental conditions:

Normal Temperature = +23.2 °C

Voltage (V norm) = 2.8 V DC (Battery)

RH = 69.2 %

Note:

Measurements were made as per section 8.6 in KDB 558074 D01 15.247 Measurement Guidance v05r02

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Test results:

No emissions found in frequency 9 kHz to 30 MHz

Test results for the frequencies in range between 30MHz-200MHz

Polarization	Frequency (MHz)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Vertical	119.90	11.92	43.50	-31.58
	157.43	12.86	43.50	-30.64
	172.51	13.83	43.50	-29.67
Horizontal	61.40	10.20	40.00	-29.80
	121.22	11.55	43.50	-31.95
	198.07	19.07	43.50	-24.43

Test results for the frequencies in range between 200MHz-1GHz

Polarization	Frequency (MHz)	Field strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Vertical	274.37	13.89	46.00	-32.11
	945.36	29.07	46.00	-16.93
	957.76	30.43	46.00	-15.57
Horizontal	370.24	17.29	46.00	-28.71
	687.78	23.43	46.00	-22.57
	836.05	26.26	46.00	-19.74

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Test results for the frequencies in range between 1GHz-26.5GHz

Protocol: 802.11b

Data rate : 1Mbps

Channel	Polarization	Frequency (MHz)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Low	Vertical	2390(Pk)	39.53	74	-34.47
		2390(Av)	26.05	54	-27.95
		2412(Pk)	88.29	*	-
		2412(Av)	84.48	*	-
		4824(Pk)	55.30	74	-18.70
		4824(Av)	51.67	54	-2.33
		7236(Pk)	48.49	74	-25.51
		7236(Av)	34.33	54	-19.67
	Horizontal	2390(Pk)	40.34	74	-33.66
		2390(Av)	27.01	54	-26.99
		2412(Pk)	90.09	*	-
		2412(Av)	86.28	*	-
		4824(Pk)	49.53	74	-24.47
		4824(Av)	45.27	54	-8.73
		7236(Pk)	48.11	74	-25.89
		7236(Av)	33.94	54	-20.06
Mid	Vertical	2437(Pk)	88.91	*	-
		2437(Av)	84.93	*	-
		4874(Pk)	51.48	74	-22.52
		4874(Av)	47.66	54	-6.34
		7311(Pk)	47.79	74	-26.21
		7311(Av)	34.69	54	-19.31
	Horizontal	2437(Pk)	89.98	*	-
		2437(Av)	86.15	*	-
		4874(Pk)	46.91	74	-27.09
		4874(Av)	41.15	54	-12.85
		7311(Pk)	48.28	74	-25.72
		7311(Av)	34.21	54	-19.79
High	Vertical	2462(Pk)	88.54	*	-
		2462(Av)	84.56	*	-
		2483.5(Pk)	37.57	74	-36.43
		2483.5(Av)	24.35	54	-29.65
		4924(Pk)	49.51	74	-24.49
		4924(Av)	44.81	54	-9.19
		7386(Pk)	48.78	74	-25.22
		7386(Av)	34.36	54	-19.64
	Horizontal	2462(Pk)	90.05	*	-
		2462(Av)	85.96	*	-
		2483.5(Pk)	38.15	74	-35.85
		2483.5(Av)	24.63	54	-29.37
		4924(Pk)	45.61	74	-28.39
		4924(Av)	38.21	54	-15.79
		7386(Pk)	47.81	74	-26.19
		7386(Av)	34.21	54	-19.79

* : Fundamental Frequency

Pk: Peak Detector; Av: Average Detector

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Data rate : 2Mbps

Channel	Polarization	Frequency (MHz)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Low	Vertical	2390(Pk)	39.48	74	-34.52
		2390(Av)	25.93	54	-28.07
		2412(Pk)	93.92	*	-
		2412(Av)	87.13	*	-
		4824(Pk)	55.11	74	-18.89
		4824(Av)	49.72	54	-4.28
		7236(Pk)	48.39	74	-25.61
		7236(Av)	34.68	54	-19.32
	Horizontal	2390(Pk)	39.10	74	-34.90
		2390(Av)	25.47	54	-28.53
		2412(Pk)	90.98	*	-
		2412(Av)	84.12	*	-
		4824(Pk)	48.95	74	-25.05
		4824(Av)	42.25	54	-11.75
		7236(Pk)	48.35	74	-25.65
		7236(Av)	33.97	54	-20.03
Mid	Vertical	2437(Pk)	91.73	*	-
		2437(Av)	84.89	*	-
		4874(Pk)	51.24	74	-22.76
		4874(Av)	44.81	54	-9.19
		7311(Pk)	47.76	74	-26.24
		7311(Av)	34.43	54	-19.57
	Horizontal	2437(Pk)	92.13	*	-
		2437(Av)	85.29	*	-
		4874(Pk)	46.53	74	-27.47
		4874(Av)	38.52	54	-15.48
High	Vertical	2462(Pk)	91.70	*	-
		2462(Av)	84.69	*	-
		2483.5(Pk)	38.54	74	-35.46
		2483.5(Av)	24.84	54	-29.16
		4924(Pk)	49.60	74	-24.40
		4924(Av)	42.52	54	-11.48
		7386(Pk)	48.70	74	-25.30
		7386(Av)	34.70	54	-19.30
	Horizontal	2462(Pk)	91.18	*	-
		2462(Av)	84.27	*	-
		2483.5(Pk)	37.68	74	-36.32
		2483.5(Av)	24.63	54	-29.37
		4924(Pk)	45.17	74	-28.83
		4924(Av)	36.61	54	-17.39
		7386(Pk)	48.34	74	-25.66
		7386(Av)	34.21	54	-19.79

* : Fundamental Frequency

Pk: Peak Detector; Av: Average Detector

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Data rate : 5.5Mbps

Channel	Polarization	Frequency (MHz)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
Low	Vertical	2390(Pk)	40.45	74	-33.55
		2390(Av)	26.02	54	-27.98
		2412(Pk)	93.69	*	-
		2412(Av)	85.43	*	-
		4824(Pk)	55.27	74	-18.73
		4824(Av)	40.94	54	-13.06
		7236(Pk)	47.79	74	-26.21
		7236(Av)	34.04	54	-19.96
	Horizontal	2390(Pk)	40.35	74	-33.65
		2390(Av)	25.75	54	-28.25
		2412(Pk)	94.43	*	-
		2412(Av)	86.25	*	-
		4824(Pk)	48.84	74	-25.16
		4824(Av)	37.15	54	-16.85
		7236(Pk)	48.05	74	-25.95
		7236(Av)	33.99	54	-20.01
Mid	Vertical	2437(Pk)	93.26	*	-
		2437(Av)	84.72	*	-
		4874(Pk)	51.50	74	-22.50
		4874(Av)	39.91	54	-14.09
		7311(Pk)	48.46	74	-25.54
		7311(Av)	34.22	54	-19.78
	Horizontal	2437(Pk)	92.47	*	-
		2437(Av)	84.16	*	-
		4874(Pk)	46.04	74	-27.96
		4874(Av)	33.87	54	-20.13
		7311(Pk)	48.32	74	-25.68
		7311(Av)	34.09	54	-19.91
High	Vertical	2462(Pk)	90.90	*	-
		2462(Av)	83.52	*	-
		2483.5(Pk)	38.74	74	-35.26
		2483.5(Av)	24.56	54	-29.44
		4924(Pk)	50.04	74	-23.96
		4924(Av)	38.18	54	-15.82
		7386(Pk)	48.55	74	-25.45
		7386(Av)	34.22	54	-19.78
	Horizontal	2462(Pk)	93.24	*	-
		2462(Av)	85.87	*	-
		2483.5(Pk)	30.09	74	-43.91
		2483.5(Av)	24.95	54	-29.05
		4924(Pk)	45.14	74	-28.86
		4924(Av)	32.40	54	-21.60
		7386(Pk)	48.37	74	-25.63
		7386(Av)	34.10	54	-19.90

*- : Fundamental Frequency

Pk: Peak Detector; Av: Average Detector

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Data rate : 11Mbps

Channel	Polarization	Frequency (MHz)	Field Strength (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Low	Vertical	2390(Pk)	41.10	74	-32.90
		2390(Av)	26.01	54	-27.99
		2412(Pk)	93.53	*	-
		2412(Av)	85.34	*	-
		4824(Pk)	55.01	74	-18.99
		4824(Av)	44.89	54	-9.11
		7236(Pk)	48.51	74	-25.49
		7236(Av)	34.09	54	-19.91
	Horizontal	2390(PK)	41.61	74	-32.39
		2390(Av)	26.18	54	-27.82
		2412(Pk)	94.51	*	-
		2412(Av)	86.46	*	-
		4824(Pk)	48.69	74	-25.31
		4824(Av)	38.02	54	-15.98
		7236(Pk)	48.20	74	-25.80
		7236(Av)	33.98	54	-20.02
Mid	Vertical	2437(Pk)	92.11	*	-
		2437(Av)	83.83	*	-
		4874(Pk)	52.04	74	-21.96
		4874(Av)	40.84	54	-13.16
		7311(Pk)	48.03	74	-25.97
		7311(Av)	34.37	54	-19.63
	Horizontal	2437(PK)	94.28	*	-
		2437(Av)	85.18	*	-
		4874(Pk)	46.72	74	-27.28
		4874(Av)	35.07	54	-18.93
		7311(pk)	48.03	74	-25.97
		7311(Av)	34.23	54	-19.77
High	Vertical	2462(Pk)	91.53	*	-
		2462(Av)	83.36	*	-
		2483.5(Pk)	39.26	74	-34.74
		2483.5(Av)	24.60	54	-29.40
		4924(Pk)	49.79	74	-24.21
		4924(Av)	38.19	54	-15.81
		7386(Pk)	48.31	74	-25.69
		7386(Av)	34.36	54	-19.64
	Horizontal	2462(PK)	93.27	*	-
		2462(Av)	85.12	*	-
		2483.5(Pk)	38.66	74	-35.34
		2483.5(Av)	24.83	54	-29.17
		4924(Pk)	44.97	74	-29.03
		4924(Av)	33.33	54	-20.67
		7386(Pk)	48.55	74	-25.45
		7386(Av)	34.14	54	-19.86

*- : Fundamental Frequency

Pk: Peak Detector; Av: Average Detector

Formula:Field strength (dBμV/m) = Measured value (dBμV) +Cable loss (dB) +antenna factor (dB)-preamplifier gain (dBi)

Note: No harmonics found between 4th Harmonics to 10th harmonics

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*****END OF TEST REPORT*****