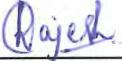


Produkte
Products

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<i>Test Report No.:</i>				
Auftraggeber: <i>Client:</i>		Redpine Signals Inc. 2107N.First Street, Suite 680 San Jose, CA 95131-2019 U.S.A		
Gegenstand der Prüfung: <i>Test item:</i>		802.11 a/b/g/n Wi-Fi Module		
Bezeichnung: <i>Identification:</i>		RS9113DB	Serien-Nr.: <i>Serial No.</i>	Engineering Sample
Wareneingangs-Nr.: <i>Receipt No.:</i>		166153525	Eingangsdatum: <i>Date of receipt:</i>	05.07.2019
Prüfort: <i>Testing location:</i>		Refer Page 5 of 77 for test facilities		
Prüfgrundlage: <i>Test specification:</i>		FCC Part 15 Subpart E 15.407 ANSI C63.10-2013 & RSS 247 Issue 2 and RSS Gen Issue 5		
Prüfergebnis: <i>Test Result:</i>		Der Prüfgegenstand entspricht oben genannter Prüfgrundlage(n). <i>The test items passed the test specification(s).</i>		
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 ISED Test Site Number.: 346E-1		
geprüft / tested by:		kontrolliert / reviewed by:		
08.07.2019	Rajesh M Gowda Engineer		09.08.2019	Raghavendra G 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>
Sonstiges / Other Aspects: FCC ID : XF6-RS9113DB ; Class 2 Permissive Change IC: 8407A-RS9113DB ; Class 2 Permissive Change				
Abkürzungen:		P(ass) = entspricht Prüfgrundlage F(fail) = entspricht nicht Prüfgrundlage N/A = nicht anwendbar N/T = nicht getestet	Abbreviations:	P(ass) = passed F(fail) = failed N/A = not applicable 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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TEST SUMMARY

Test item	Section	ISED	Result
Average Conducted Output Power	15.247 (b) (3)	RSS 247 Issue 2 Section 6.2	Pass
Radiated spurious emissions and emissions in Restricted bands of operation	15.247 (d) / (15.209 & 15.205)	RSS-Gen Issue 5 Section 6.2	Pass
Conducted emission on A.C power lines	15.207	RSS-Gen Issue 5 section 8.8	Pass

Note: The module is originally certified for FCC with FCC ID:XF6-RS9113DB, and IC: 8407A-RS9113DB with respect to the changes made originally certified module class 2 permissive change has been applied. Changes made to the originally certified module are listed in the below table.

Application Purpose	Antenna	Wi-Fi (5 GHz)
Class II Permissive Change	mFlexPIFA	Tested for 802.11 a/n for 20MHz bandwidth only.

The original module tested for 802.11 a/b/g/n 20MHz & 40MHz bandwidth along with BT/BLE and ZigBee, with the above-specified FCC ID and IC. In the current module is restricted to use of only in 802.11 a/b/g/n for 20MHz bandwidth only for above specified antenna and results related to same are reported in this test report. Remaining protocols like ZigBee, BT and BLE are disabled and are not enabled for the end user, and is as declared by manufacturer.

To address the test results for the above changes, the original test report numbers for FCC: 19660146 001, 19660146 002, 19660146 003, 19660146 004 is been updated to ULR-TC56881930000051F 001.

To address the test results for the above changes, the original test report numbers for IC: 19660149 001, 19660149 002, 19660149 003 is been updated to ULR-TC56881930000051F 001

Discipline: Electronics Testing

Group: EMC Test Facility

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1 GENERAL REMARKS

1.1 Complimentary Materials

All attachments are integral part of this test report.

- 1: Test Setup Photo
- 2: EUT External Photo
- 3: EUT Internal Photo
- 4: Maximum Permissible Exposure Information
- 5: USER MANUAL

2 TEST SITES

2.1 Testing Facilities

- 1) TUV Rheinland (India) Private Limited
108 , Beside ISBR Business School,
Electronic city Phase I
Bangalore - 560 100.
- 2) TUV Rheinland (India) Private Limited
27/B, 2nd Cross,
Electronic City Phase 1, Bangalore- 560100

2.2 List of Test and Measurement Instruments

Table 1: Test and measurements instrument used

Equipment	Manufacturer	Model Name	Serial Number	Calibration Due Date	Periodicity	Used for Test Items
Signal Analyzer	Rohde & Schwarz	FSV7	101644	29/12/2019	Yearly	Antenna - Port Measurements
USB Peak power sensor	AIMIL Ltd	55006	10231	22-12-2019	Yearly	
EMI Test Receiver	Rohde & Schwarz	ESU 40	100288	11/10/2019	Yearly	
EMI Test Receiver	Rohde & Schwarz	ESW 44	101773	19/09/2019	Yearly	Radiated Spurious Emission
Active loop antenna	Frankonia	LAX-10	LAX-10-800	15-01-2020	Yearly	
Biconical Antenna	Schwarzbeck mess-elektronik	VHBB-9124 / BBA-9106	9124-656	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	
Semi Anechoic Chamber	Frankonia	-	-	-	-	
EMI Receiver	Rohde & Schwarz	ESR7	101133	16-01-2020	Yearly	
LISN	Rohde & Schwarz	ENV 216	100022	18-10-2019	Yearly	AC Power line conducted emission
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100811	09-08-2019	Yearly	

3 GENERAL PRODUCT INFORMATION

3.1 Product Function and Intended Use

The RS9113 module integrates a multi-threaded MAC processor with integrated analog peripherals and support for digital peripherals, baseband digital signal processor, analog front-end, crystal oscillator, calibration OTP memory, Dual band RF transceiver, Dual-band high-power amplifiers, baluns, diplexers, diversity switch and Quad-SPI Flash thus providing a fully-integrated solution for embedded wireless applications. The RS9113 based chips and modules leverage and improve upon Redpine's proven low power innovations from Lite-FTM products (RS9110) and provide WLAN 802.11n convergence solution for integration into mobile and M2M communication devices. It can connect to a host processor through SDIO, USB, SPI or UART interfaces.

3.2 Ratings and System Details as declared by Manufacturer

Table 2: Ratings and System Details

Operating frequency range	UNII-1:5150 MHz to 5250 MHz UNII-3:5725 MHz to 5850 MHz UNII-2A:5250 MHz to 5350 MHz UNII-2C:5470 MHz to 5725 MHz
Radio Protocol	Wi-Fi_5GHz
Channel Spacing	5 MHz
Modulation	802.11a: OFDM withBPSK,QPSK,16-QAM,64-QAM 802.11n: BPSK,QPSK,16-QAM,64QAM
Number of antennas	1
Antenna type	mFlexPIFA
Antenna gain	5.8 dBi
Supply Voltage to Product	3 to 3.6V DC from the host device
Dimensions	14 x 15 x 2.1 mm
Environmental conditions	-40 to 85 deg c

3.1 Measurement Uncertainty:

Table 3: Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	±1.5 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, Mid and High channels to obtain maximum emissions.

4.2 Test Operation and Test Software

Test Software – PER test software was used to enable the transmission with 100% duty cycle changing channels and data rates on the EUT for the test in the report.

Software version-1.7.2

Hardware version - 6.0

4.3 Special Accessories and Auxiliary Equipment

- Test Laptop was used to configure the device in transmission mode.

4.4 Countermeasures to achieve EMC Compliance

- None

4.5 Test modes – data rates and modulations

For Radiated spurious emissions only the worst case results and are reported in this report.

Note: Below KDB are referred for the procedure

1. 789033 D02 General U-NII Test Procedures New Rules v02r01

4.6 List of Frequencies and Frequency bands

Frequency Band (MHz)	Channel No.	Channel Frequency (MHz)
UNII 1 (5150 – 5250)	36	5180
	40	5200
	44	5220
	48	5240
UNII 2A (5250-5350)	52	5260
	56	5280
	60	5300
	64	5320
UNII 2C (5470-5725)	100	5500
	104	5520
	108	5540
	112	5560
	116	5580
	120	5600
	124	5620
	128	5640
	132	5660
	136	5680
UNII 2C (5725-5850)	140	5700
	144	5720
	149	5745
	153	5765
	157	5785
	161	5805
	165	5825

Table 4: List of Wi-Fi center Frequencies

Note: TUV Sample Identification number : A000952265-001(Radiated & Conducted)

5 RADIATED 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

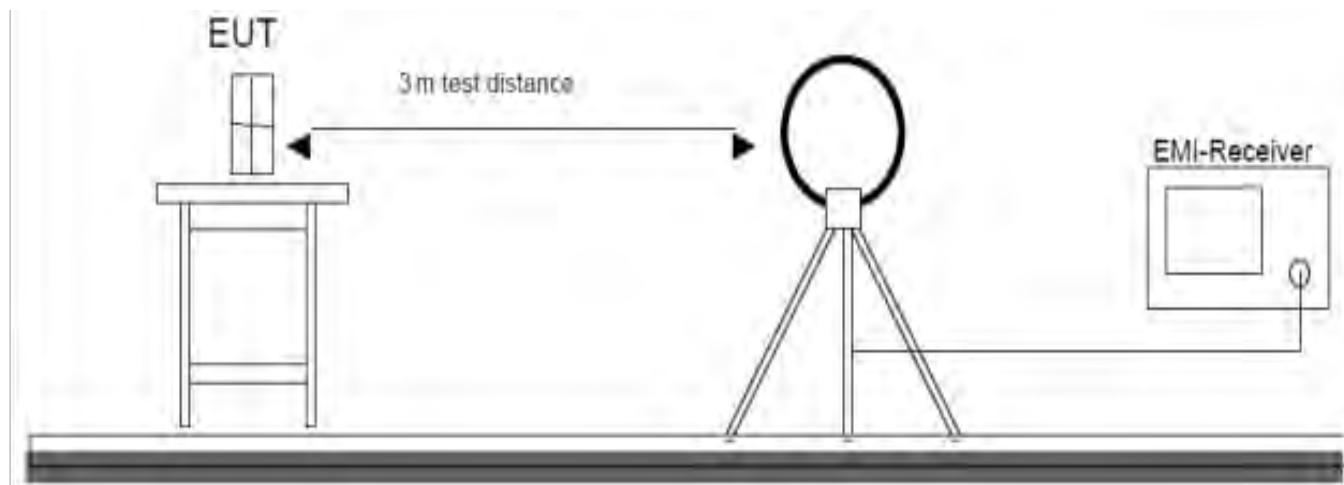


Figure 1: Frequency Range 9 kHz- 30 MHz

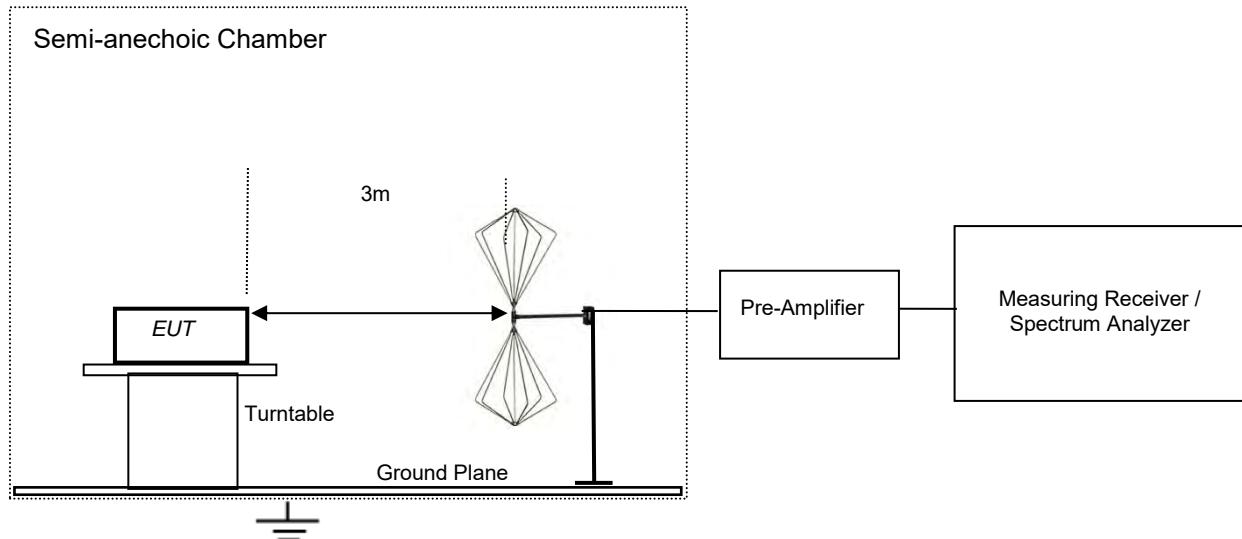


Figure 2: Frequency Range 30 MHz – 200 MHz

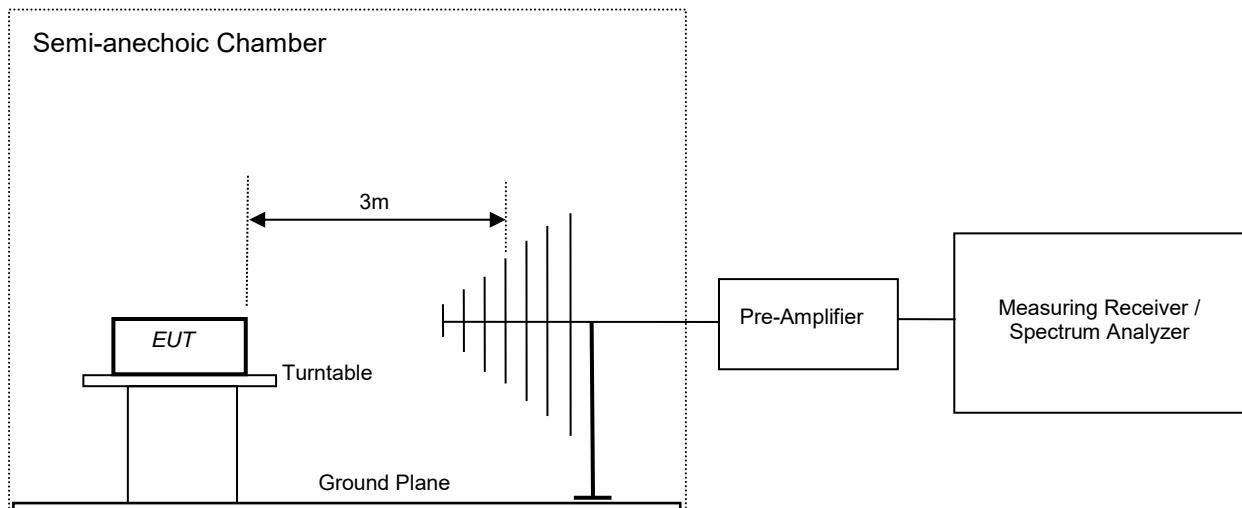


Figure 3: Frequency Range 200 MHz - 1GHz

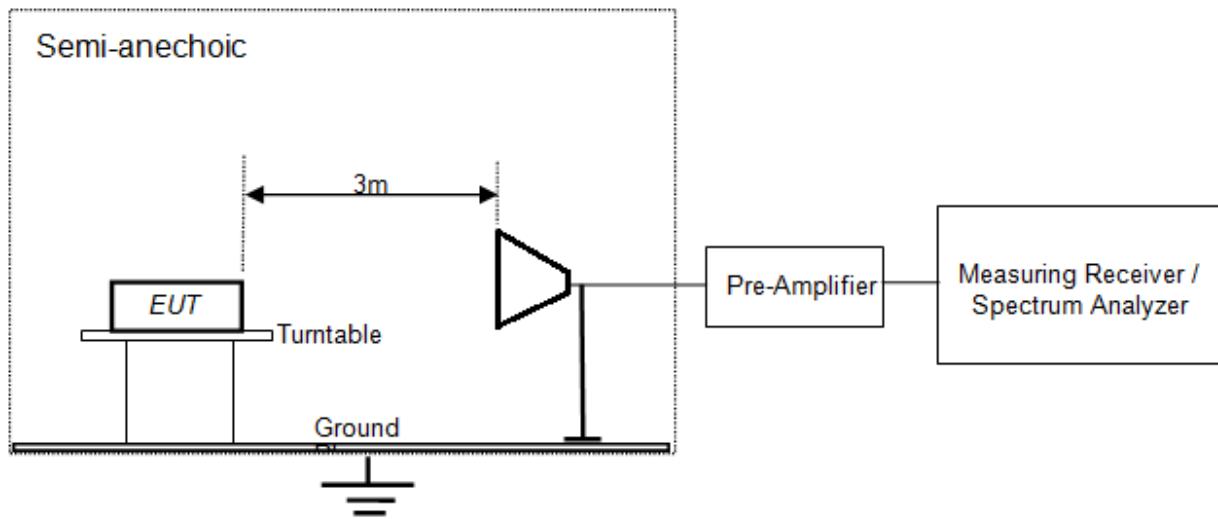


Figure 4: Frequency Range above 1 GHz

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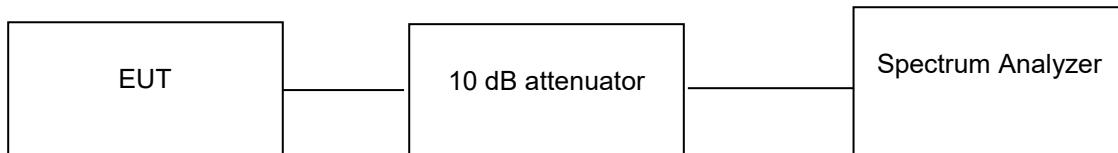
6 Test Results-Wi-Fi

6.1 Average conducted output power

Result

Test Specification	FCC part 15 Subpart C 15.407	Pass
Measurement	1 MHz	
Bandwidth		
Detector	Peak	
Requirement	≤ 1 W (30 dBm)	

Test Method:



Environmental and Test conditions:

Normal Temperature = 25+ °C

Voltage (V norm) = 12 V DC

RH = 63.2 %

Test results:

10 dB attenuator + 1 Cable loss = 11 dB offset is considered in below result

Non-DFS Band

Protocol: 802.11a

Data rate (Mbps)	Channel No	Frequency (MHz)	Power (dBm)	Limit (dBm)
6	36	5180	5.75	24
	40	5200	5.73	24
	48	5240	5.72	24
	149	5745	6.22	24
	157	5785	6.41	24
	165	5825	7.36	24
24	36	5180	5.27	24
	40	5200	5.41	24
	48	5240	5.51	24
	149	5745	6.10	24
	157	5785	6.36	24
	165	5825	7.25	24
54	36	5180	3.62	24
	40	5200	3.63	24
	48	5240	3.78	24
	149	5745	4.13	24
	157	5785	4.34	24
	165	5825	5.46	24

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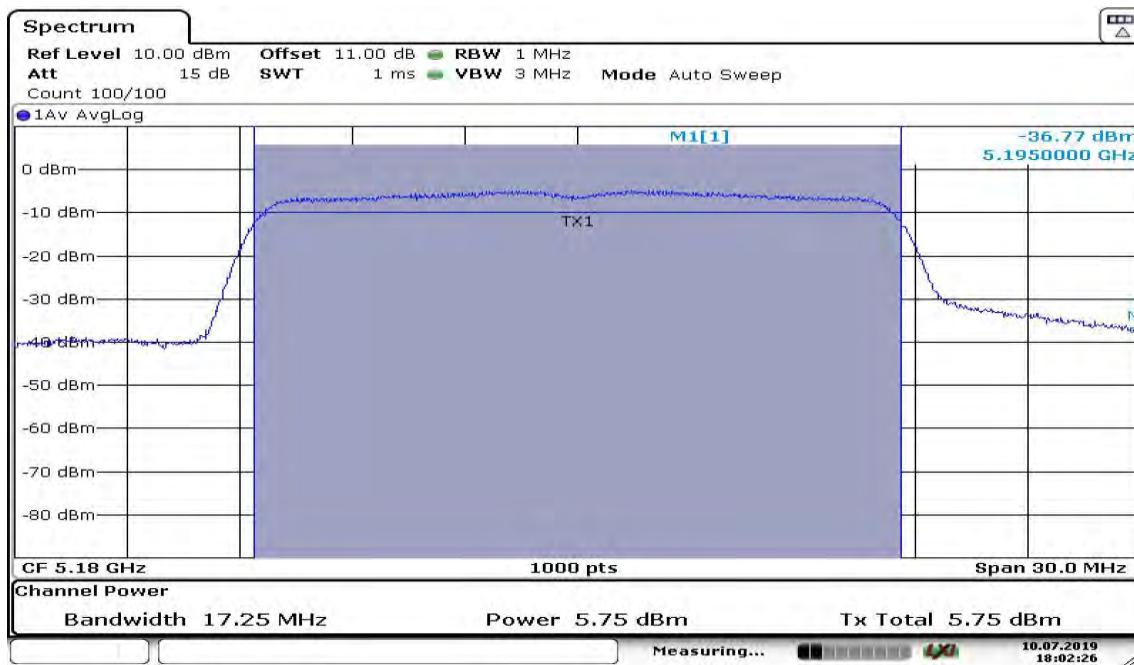
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Protocol: 802.11n

Data rate (Mbps)	Channel No	Frequency (MHz)	Power (dBm)	Limit (dBm)
MCS0	36	5180	4.94	24
	40	5200	4.94	24
	48	5240	4.96	24
	149	5745	5.41	24
	157	5785	5.66	24
	165	5825	6.66	24
MCS4	36	5180	4.77	24
	40	5200	4.89	24
	48	5240	4.87	24
	149	5745	5.49	24
	157	5785	5.71	24
	165	5825	6.64	24
MCS7	36	5180	2.36	24
	40	5200	2.57	24
	48	5240	2.77	24
	149	5745	2.86	24
	157	5785	3.14	24
	165	5825	4.27	24

Protocol: 802.11a



Date: 10.JUL.2019 18:02:27

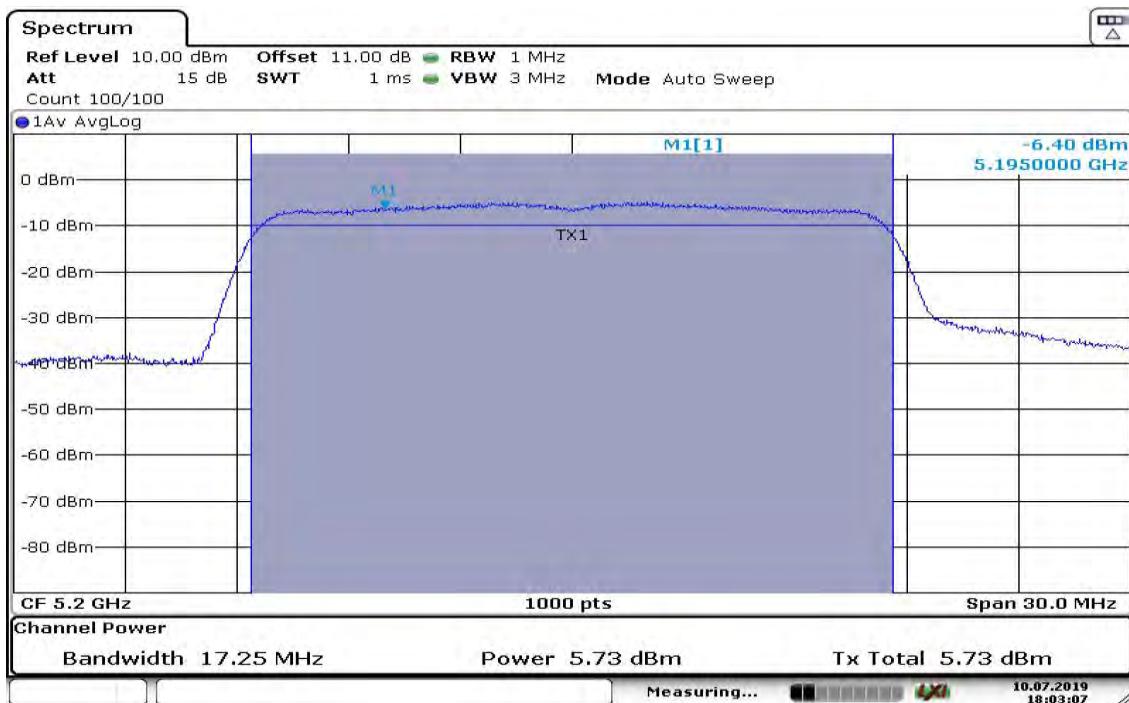
Data Rate: 6 Mbps

Channel Frequency-5180MHz

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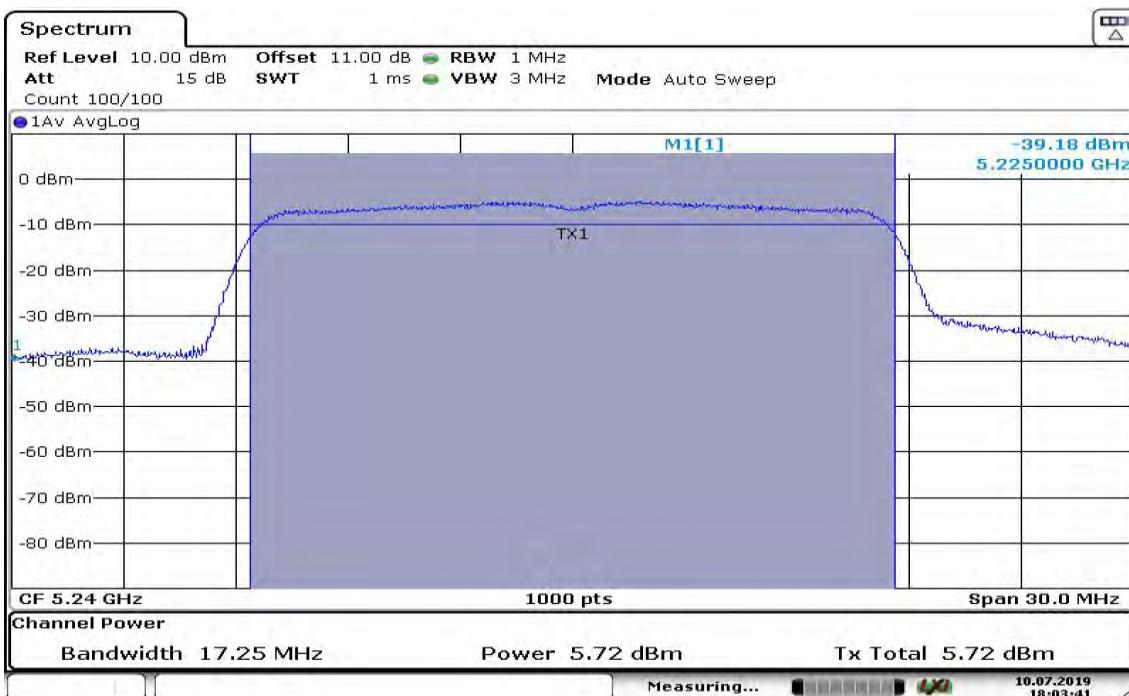
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Date: 10.JUL.2019 18:03:08

Data Rate: 6 Mbps

Channel Frequency-5200MHz



Date: 10.JUL.2019 18:03:42

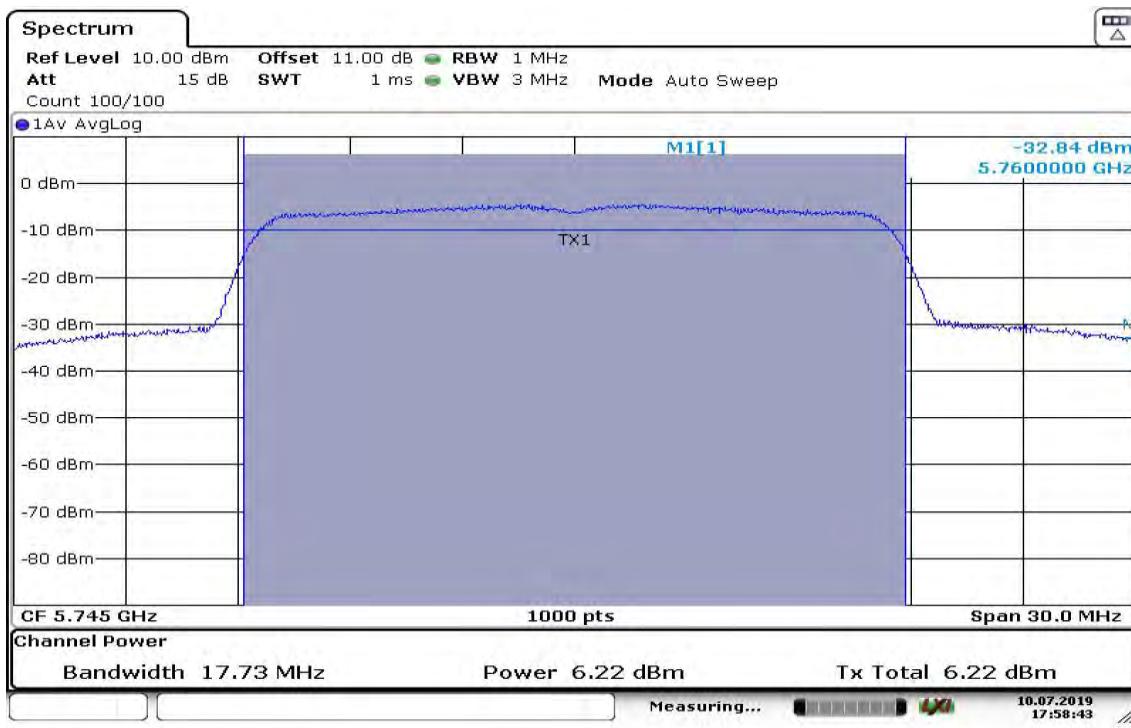
Data Rate: 6 Mbps

Channel Frequency-5240MHz

Prüfbericht - Nr.:
Test Report No.:

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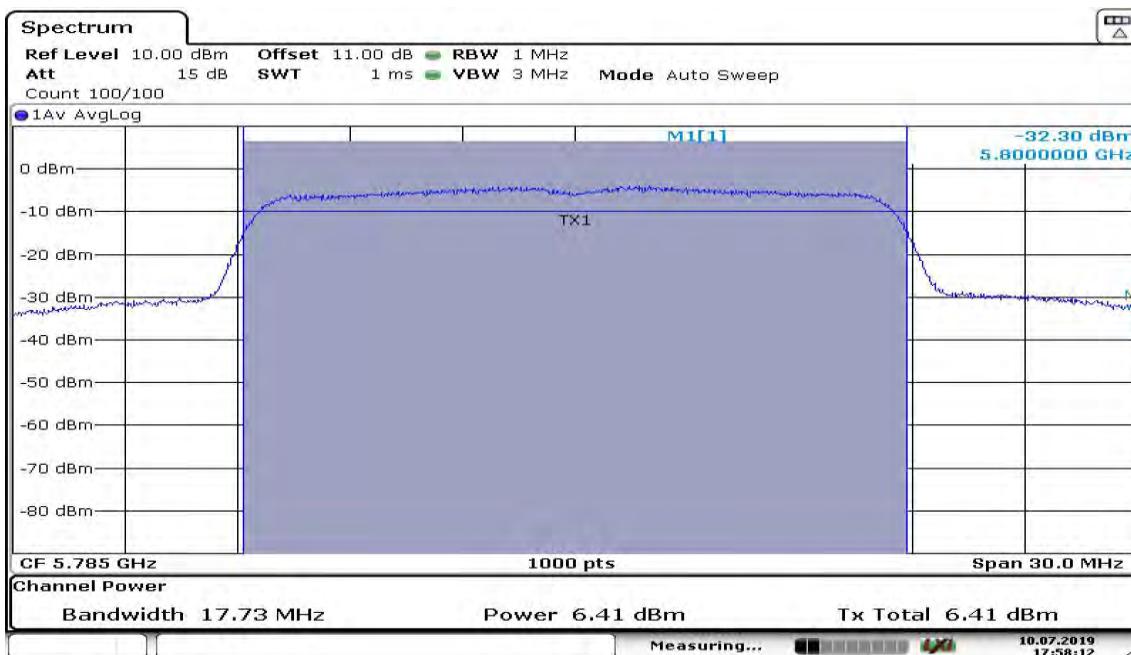
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Date: 10.JUL.2019 17:58:43

Data Rate: 6 Mbps

Channel Frequency-5745MHz



Date: 10.JUL.2019 17:58:12

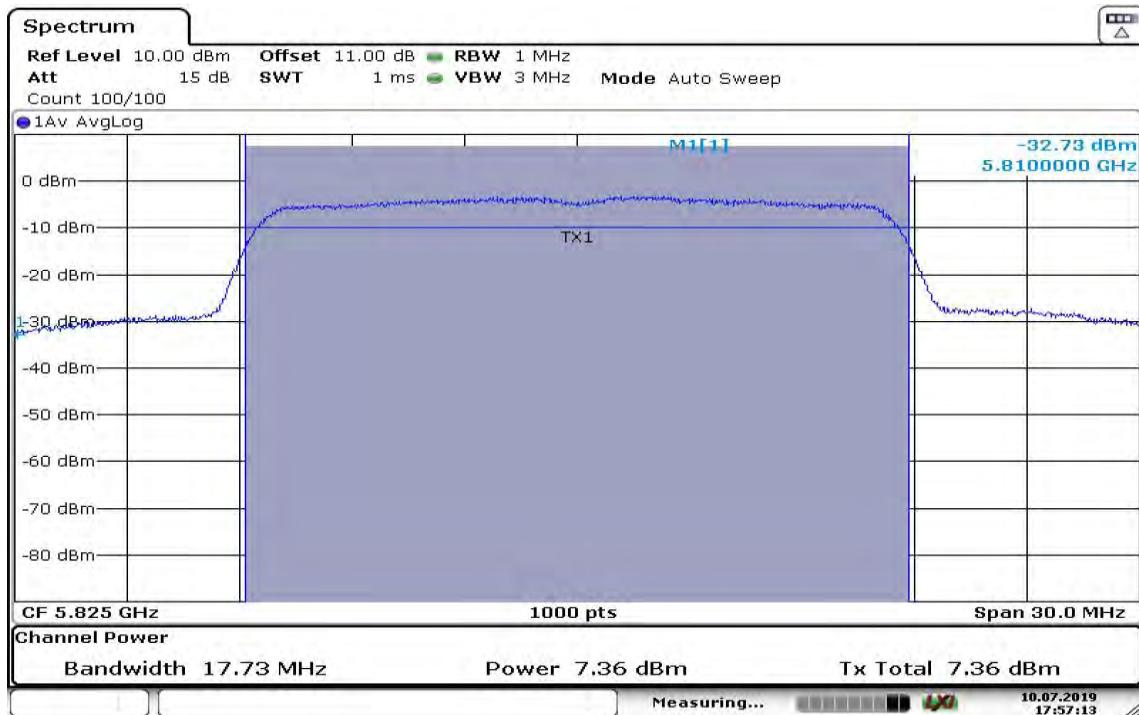
Data Rate: 6 Mbps

Channel Frequency-5785MHz

Prüfbericht - Nr.:
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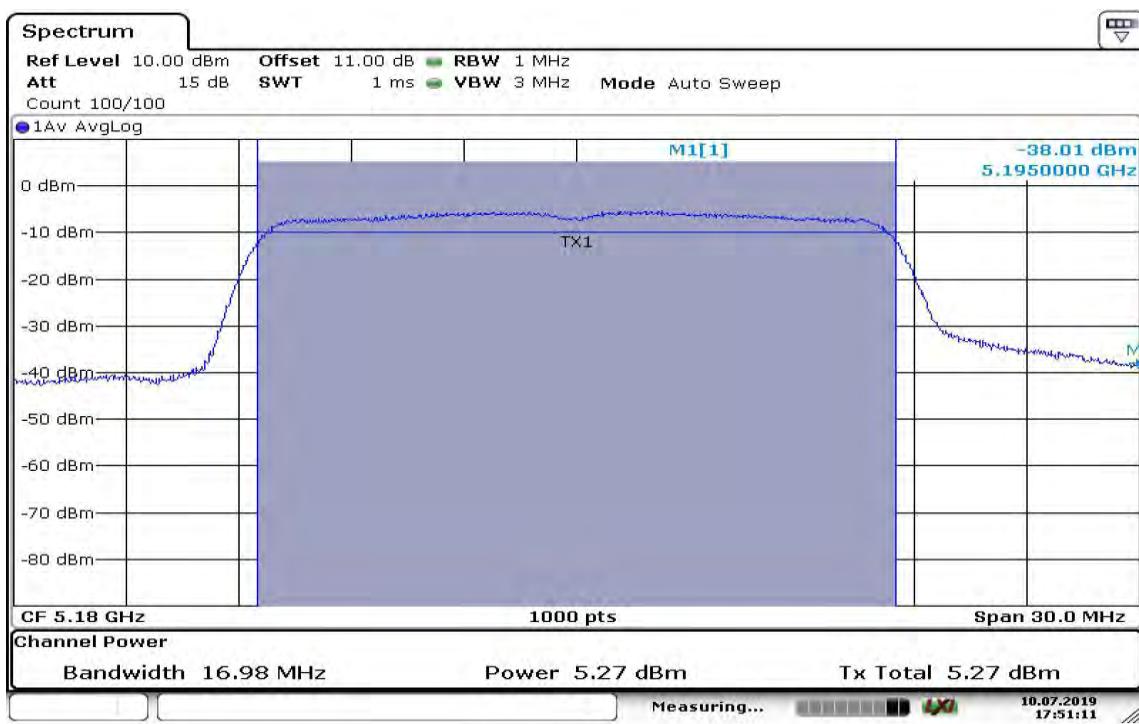
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Date: 10.JUL.2019 17:57:13

Data Rate: 6 Mbps

Channel Frequency-5825MHz



Date: 10.JUL.2019 17:51:11

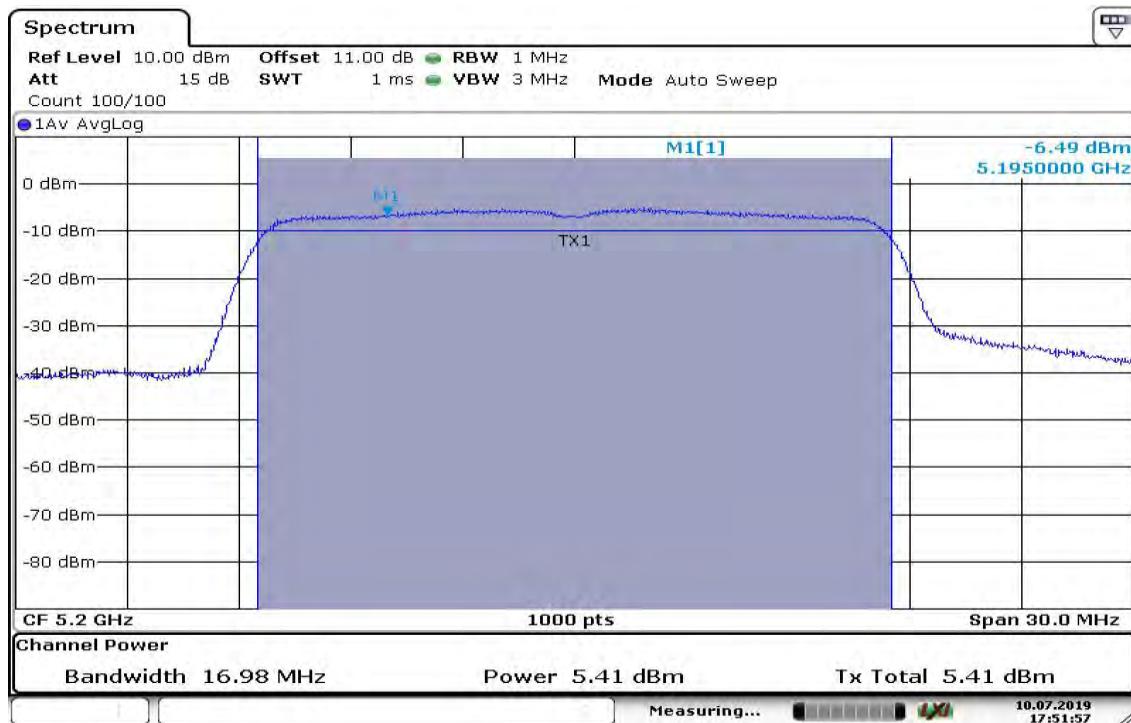
Data Rate: 24 Mbps

Channel Frequency-5180MHz

Prüfbericht - Nr.:
Test Report No.:

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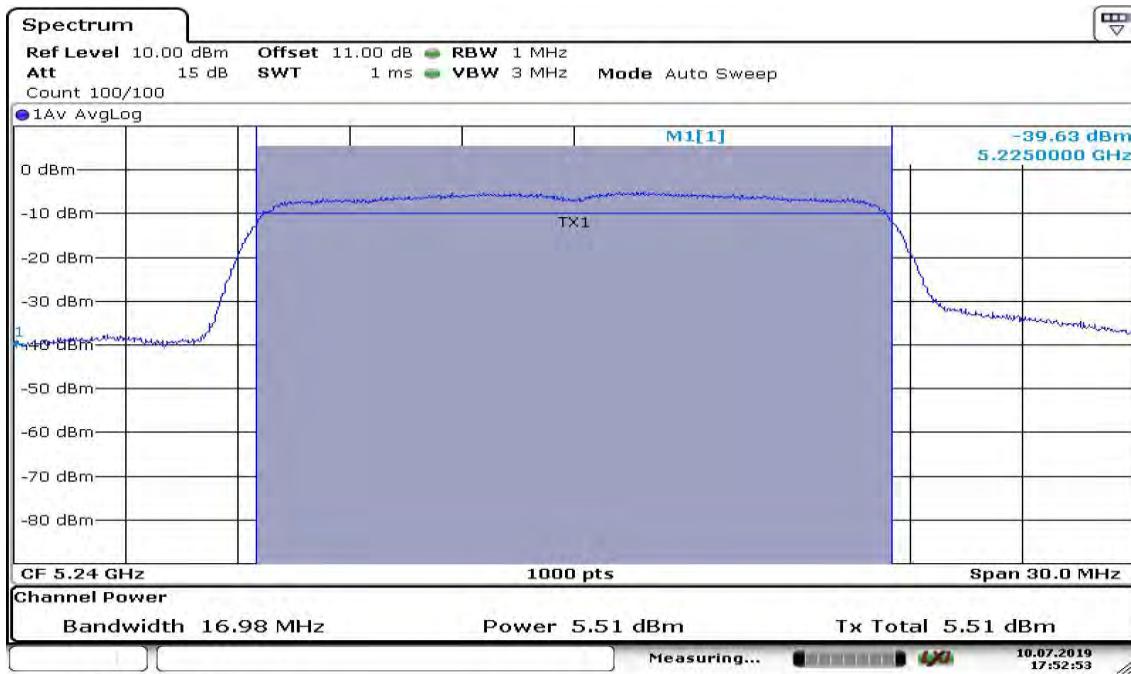
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Date: 10.JUL.2019 17:51:57

Data Rate: 24 Mbps

Channel Frequency-5200MHz



Date: 10.JUL.2019 17:52:54

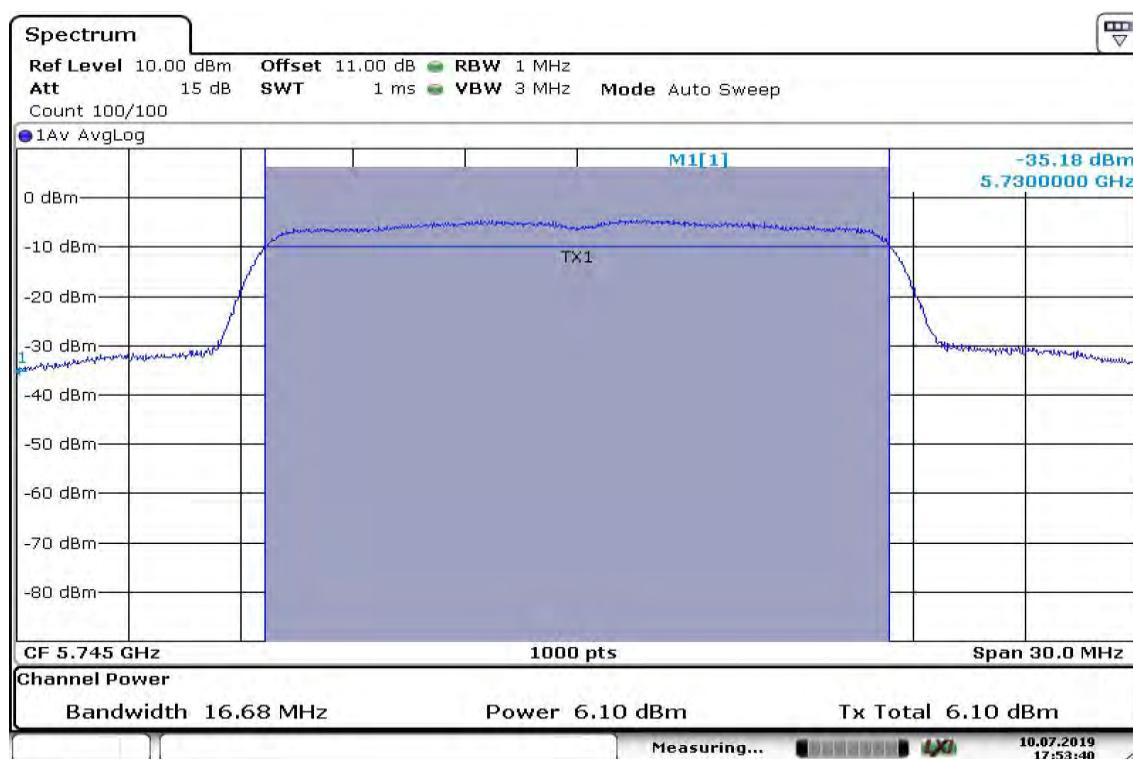
Data Rate: 24 Mbps

Channel Frequency-5240MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

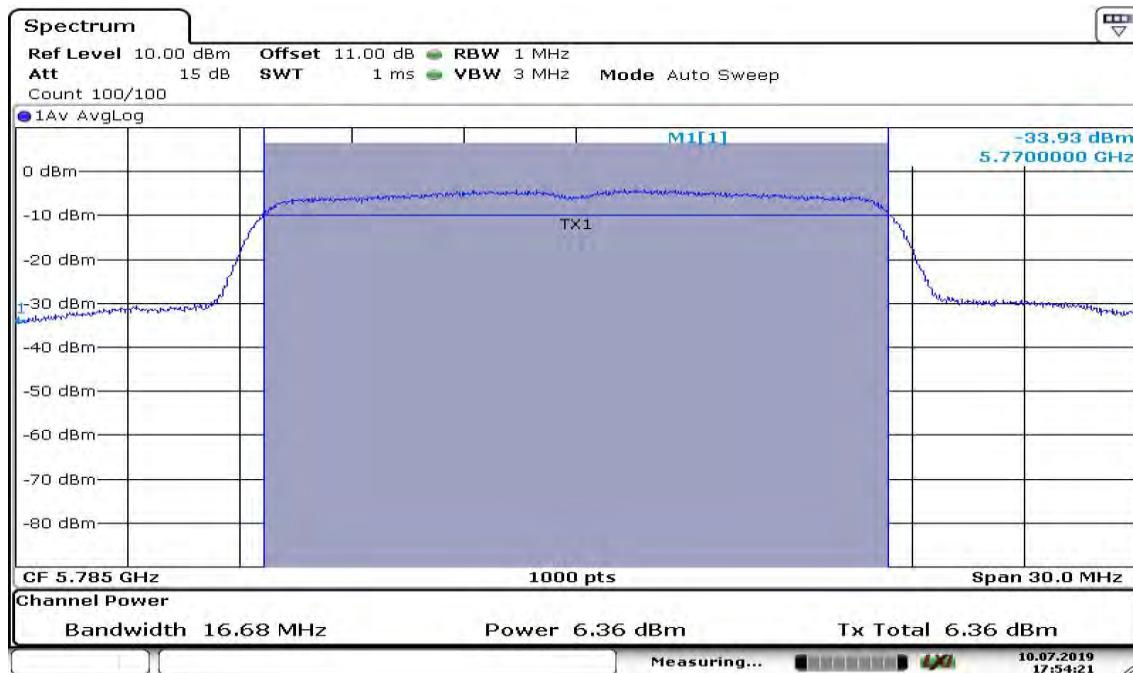
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Date: 10.JUL.2019 17:53:40

Data Rate: 24 Mbps

Channel Frequency-5745MHz



Date: 10.JUL.2019 17:54:21

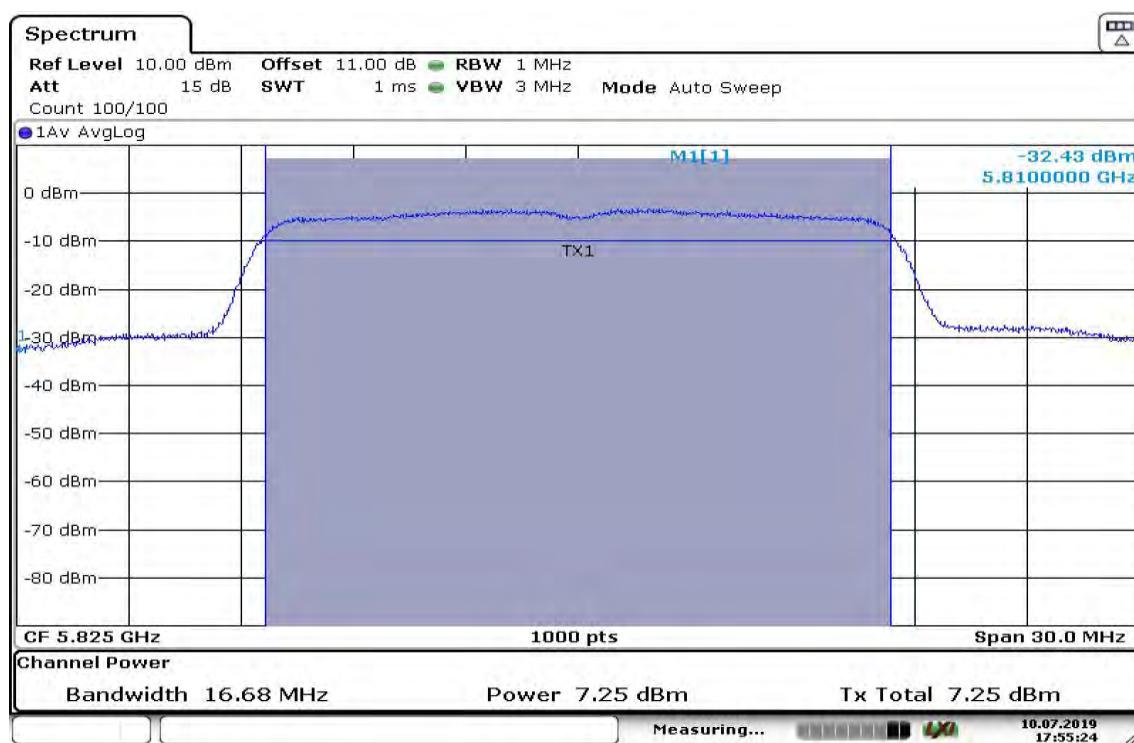
Data Rate: 24 Mbps

Channel Frequency-5785MHz

Prüfbericht - Nr.:
Test Report No.:

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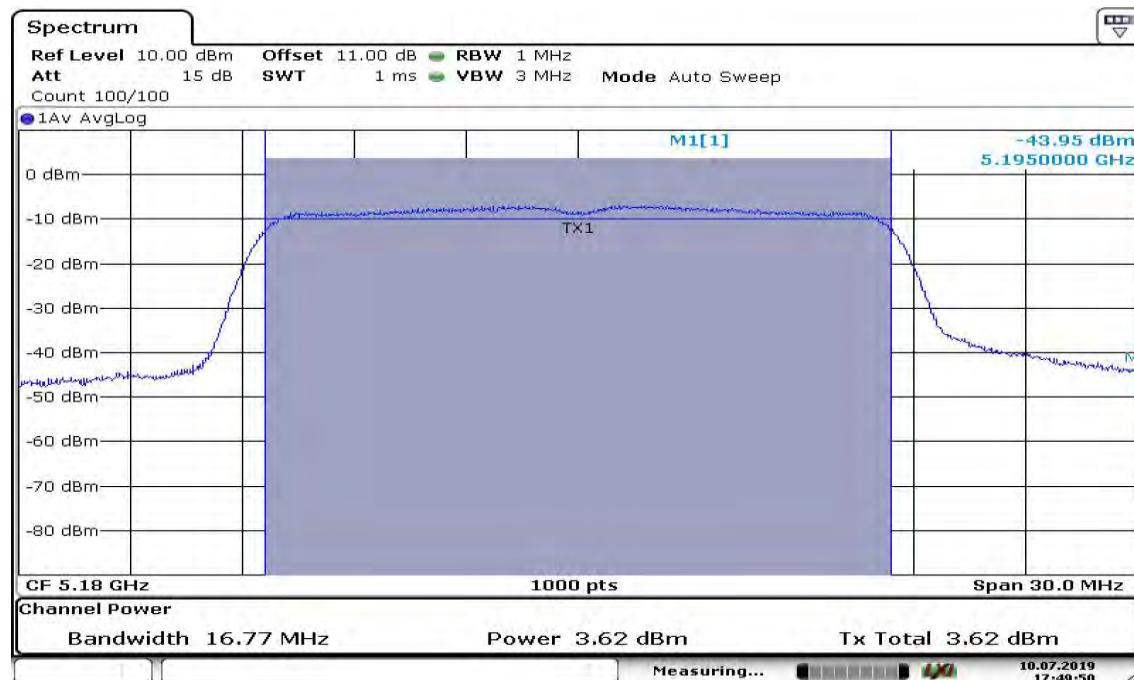
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Date: 10.JUL.2019 17:55:24

Data Rate: 24 Mbps

Channel Frequency-5825MHz



Date: 10.JUL.2019 17:49:50

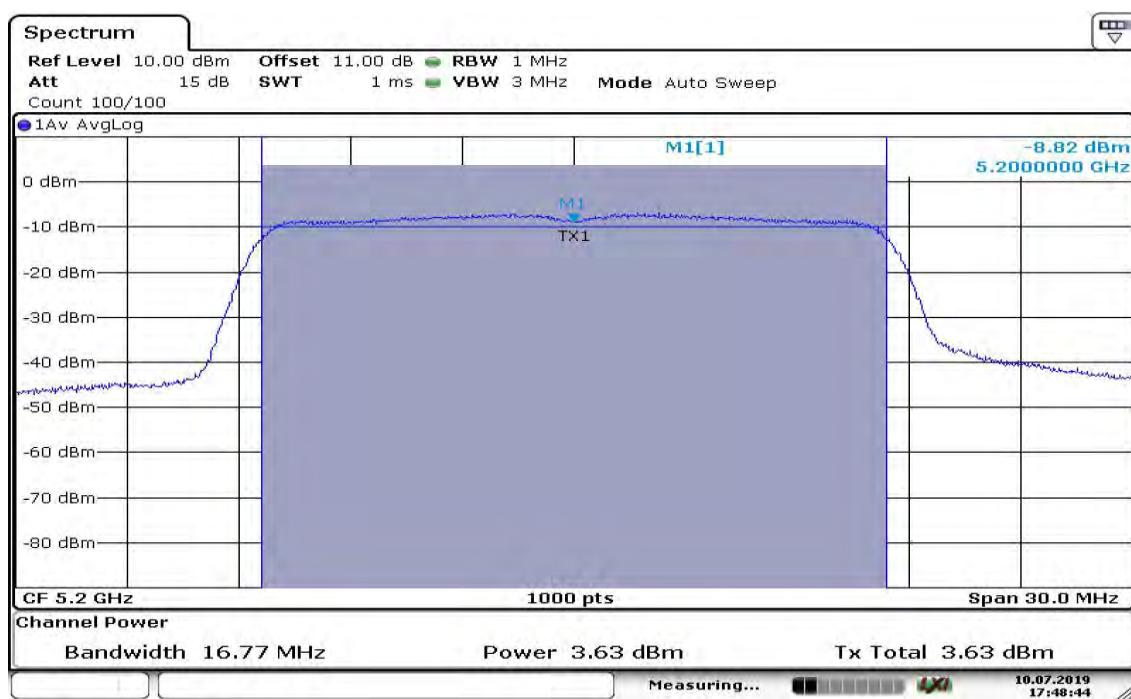
Data Rate: 54 Mbps

Channel Frequency-5180MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

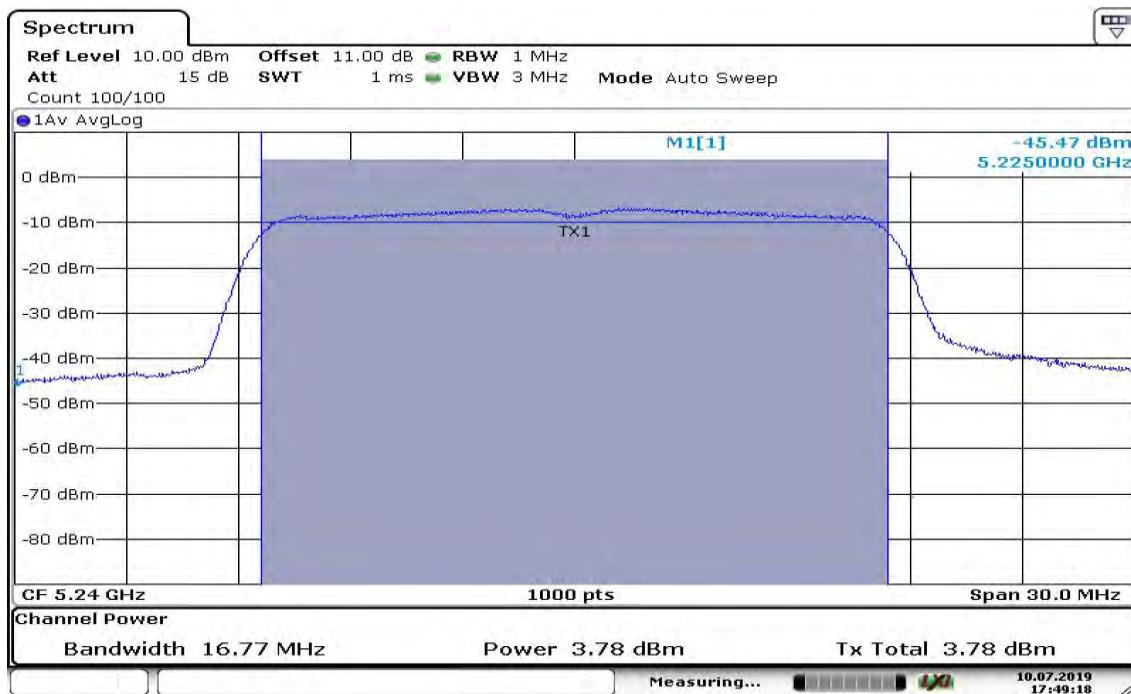
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Date: 10.JUL.2019 17:48:45

Data Rate: 54 Mbps

Channel Frequency-5200MHz



Date: 10.JUL.2019 17:49:18

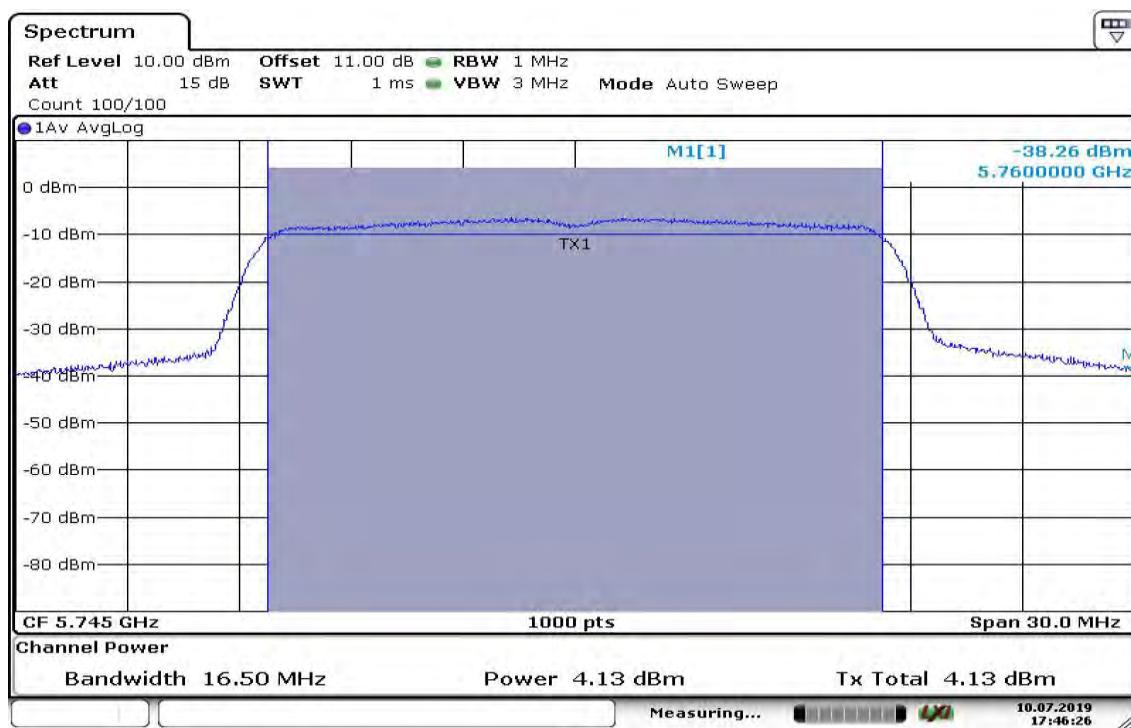
Data Rate: 54 Mbps

Channel Frequency-5240MHz

Prüfbericht - Nr.:
Test Report No.:

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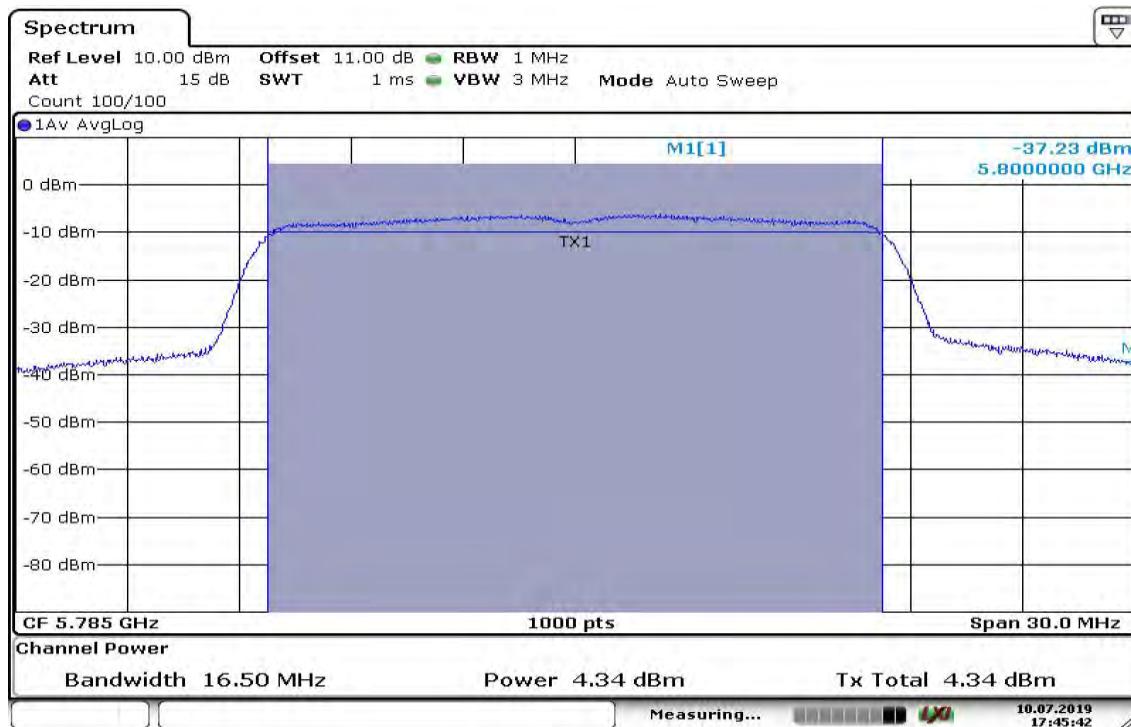
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Date: 10.JUL.2019 17:46:27

Data Rate: 54 Mbps

Channel Frequency-5745MHz



Date: 10.JUL.2019 17:45:42

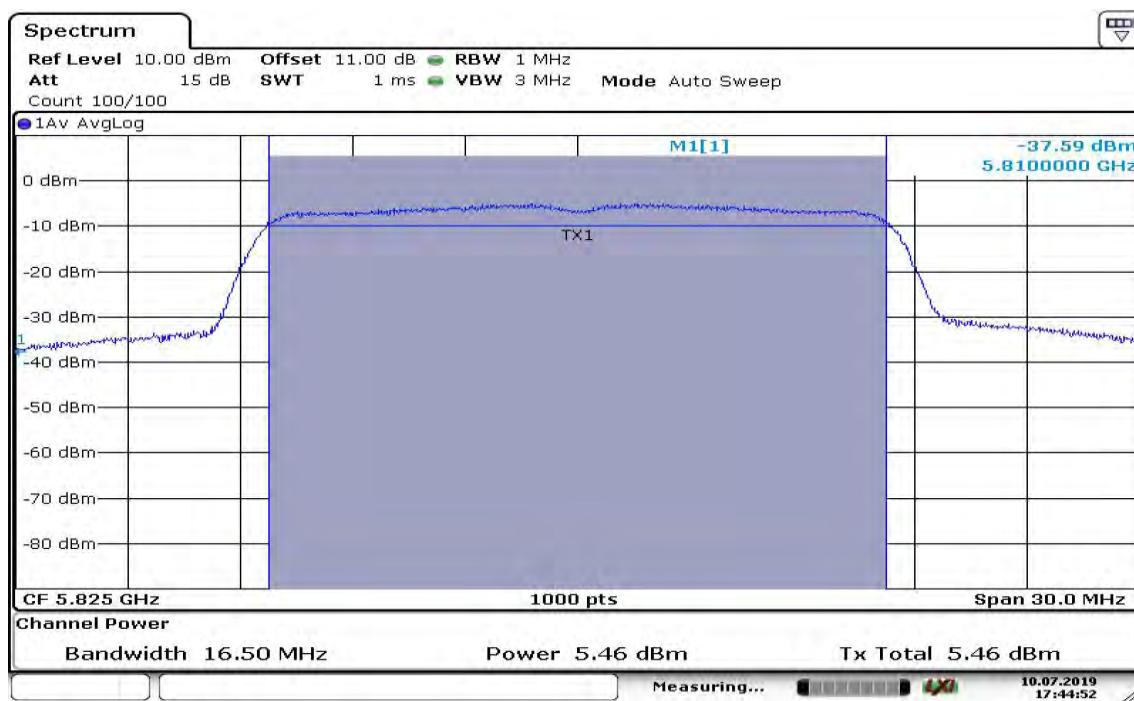
Data Rate: 54 Mbps

Channel Frequency-5785MHz

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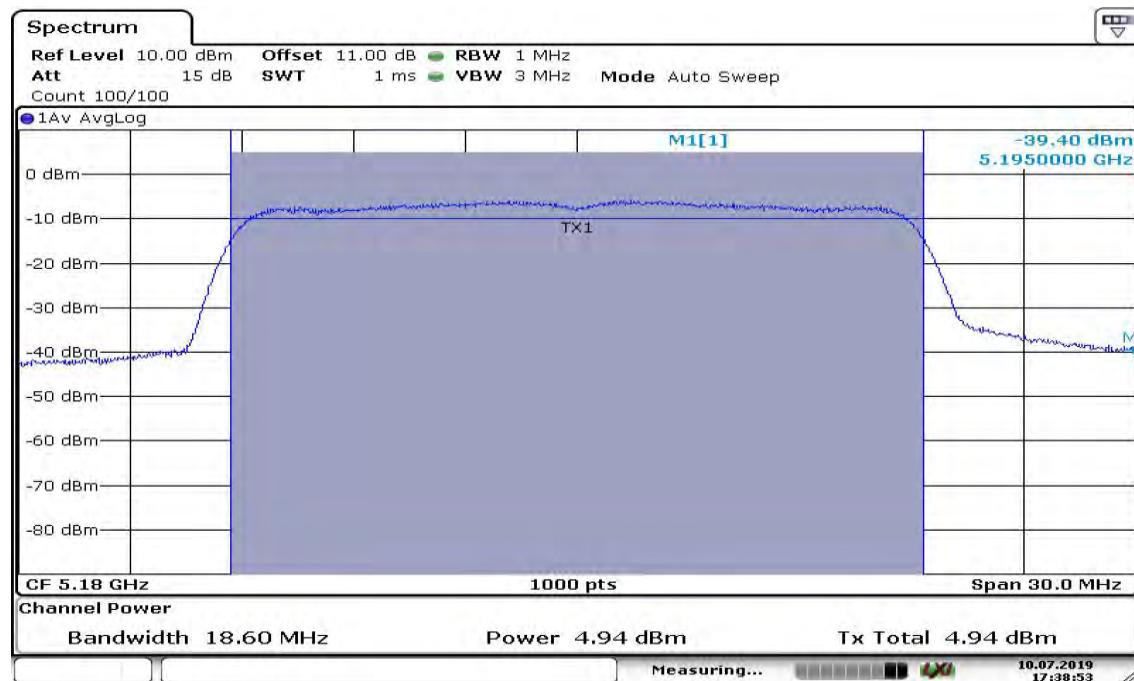
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Date: 10.JUL.2019 17:44:52

Data Rate: 54 Mbps

Channel Frequency-5825MHz



Date: 10.JUL.2019 17:38:53

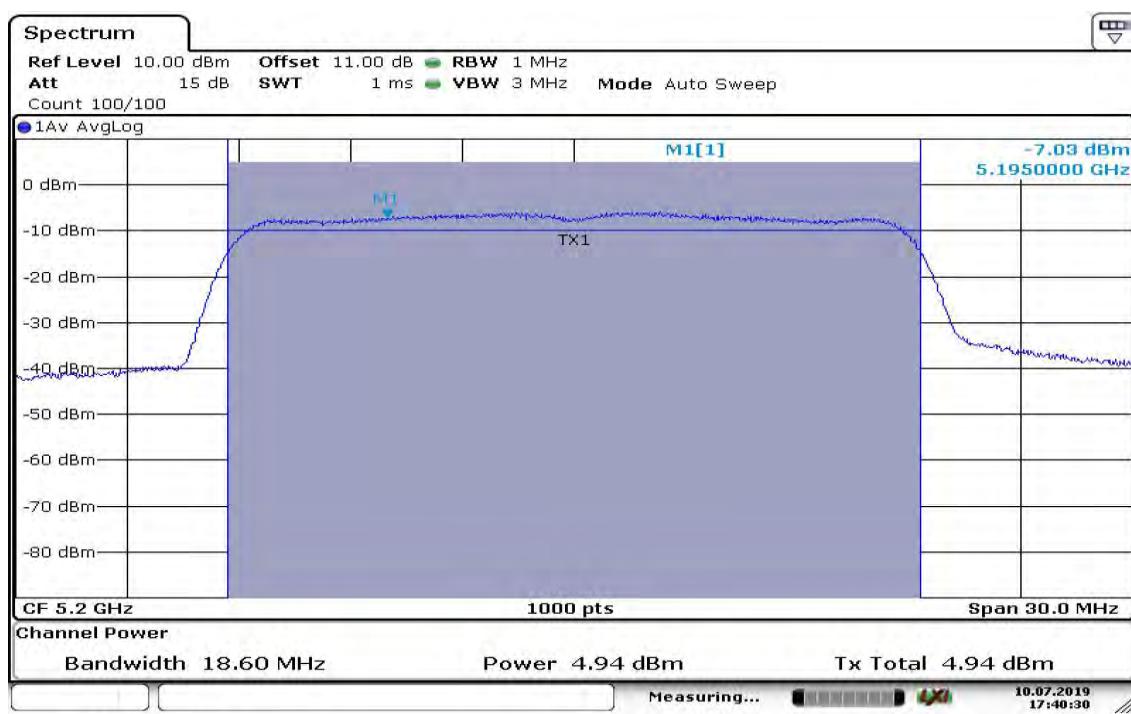
Data Rate: MCS0

Channel Frequency-5180MHz

Prüfbericht - Nr.:
Test Report No.:

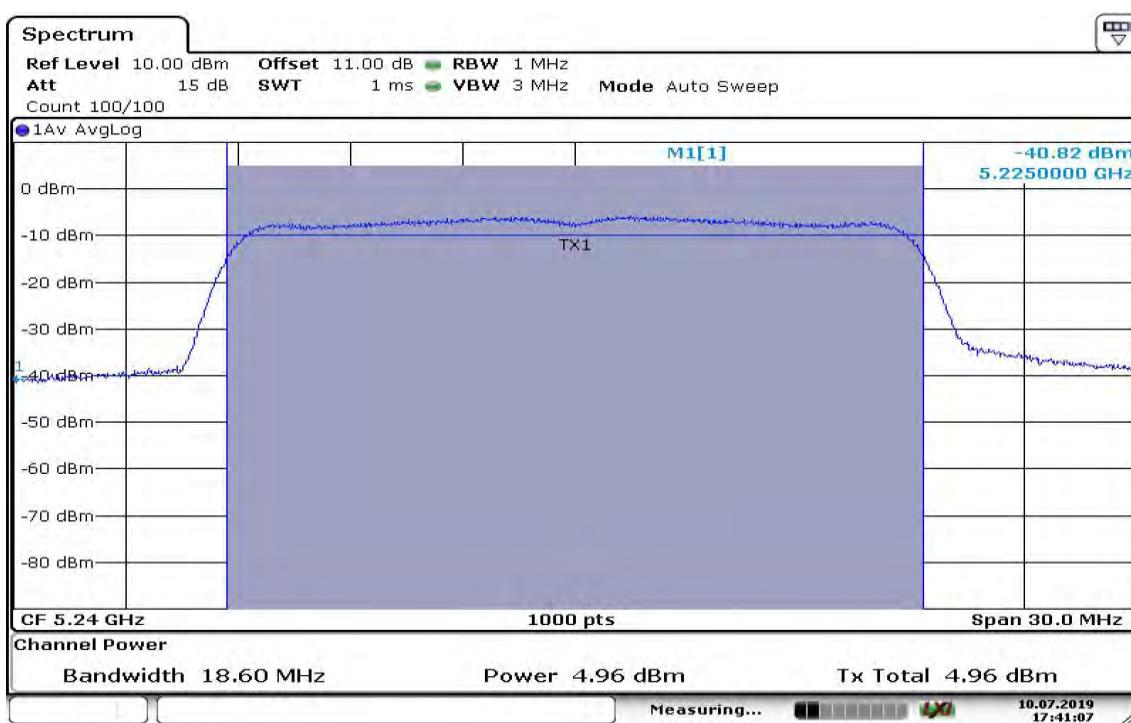
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Data Rate: MCS0

Channel Frequency-5200MHz



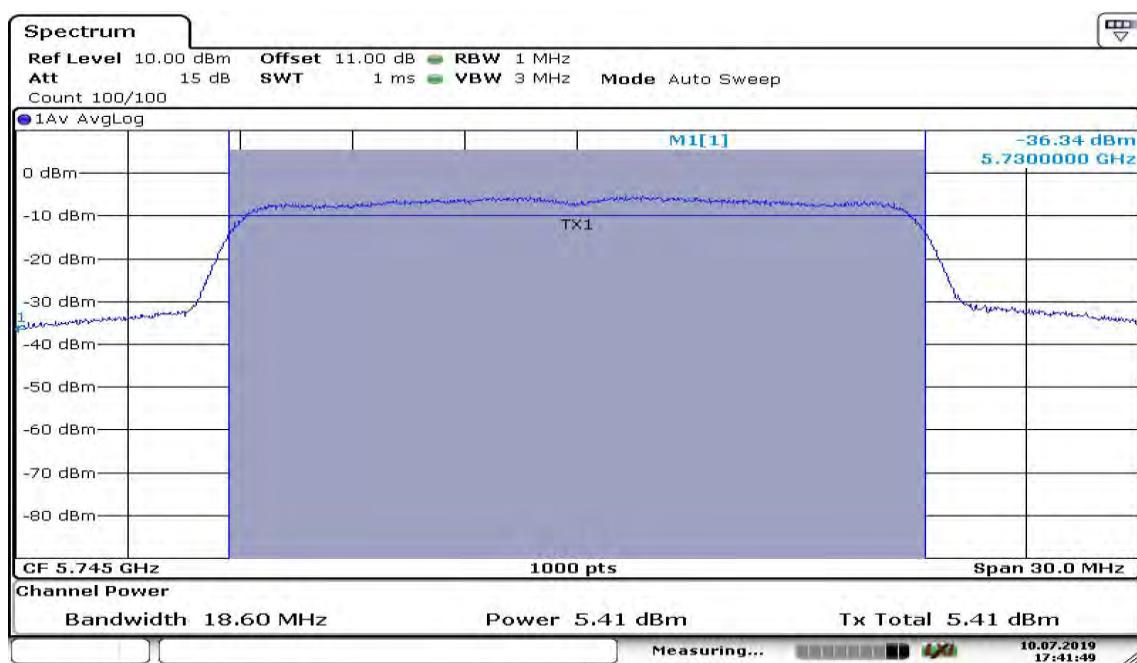
Data Rate: MCS0

Channel Frequency-5240MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

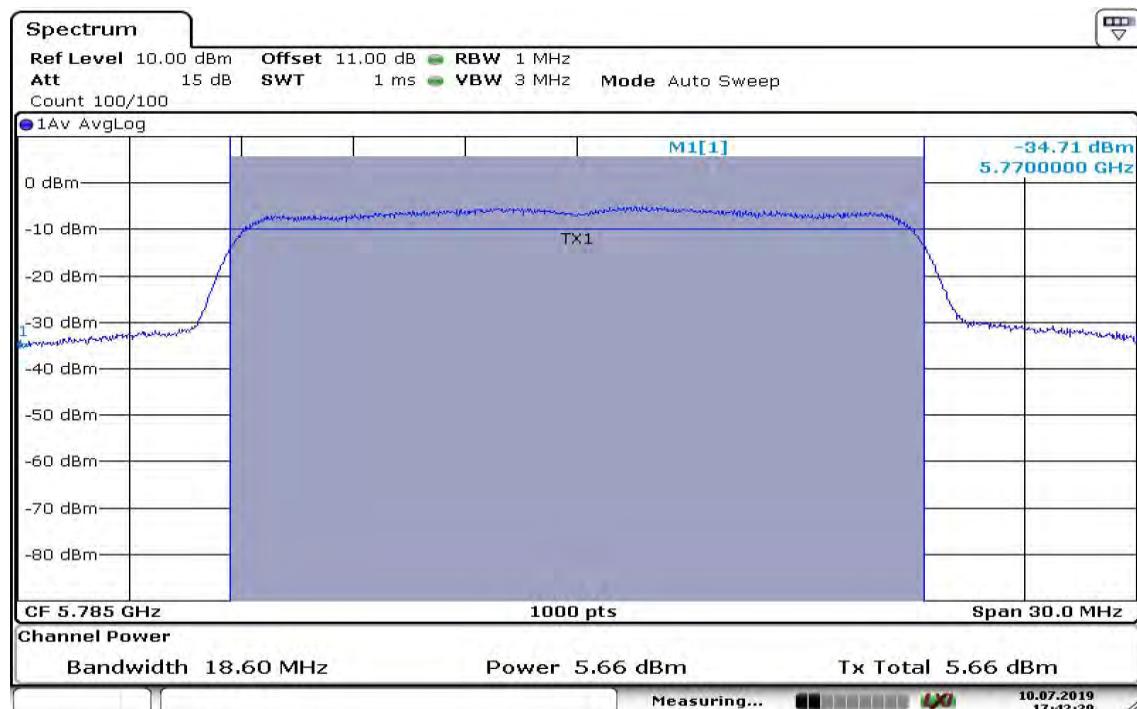
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Date: 10.JUL.2019 17:41:50

Data Rate: MCS0

Channel Frequency-5745MHz



Date: 10.JUL.2019 17:42:29

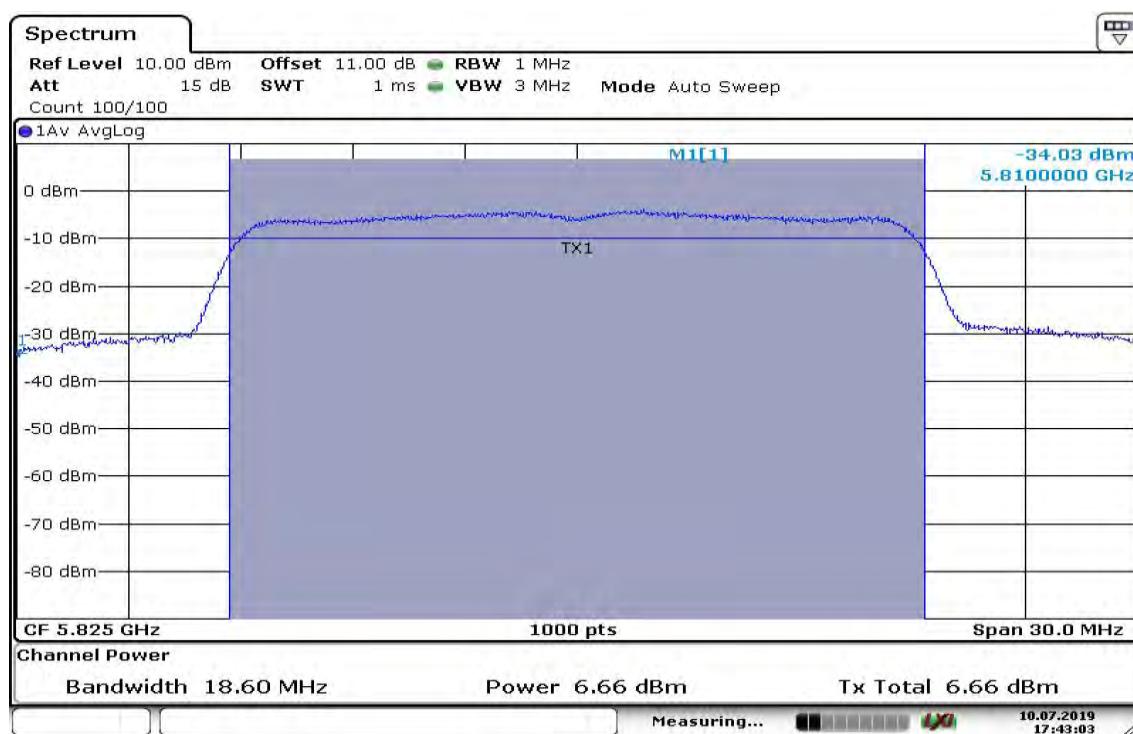
Data Rate: MCS0

Channel Frequency-5785MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

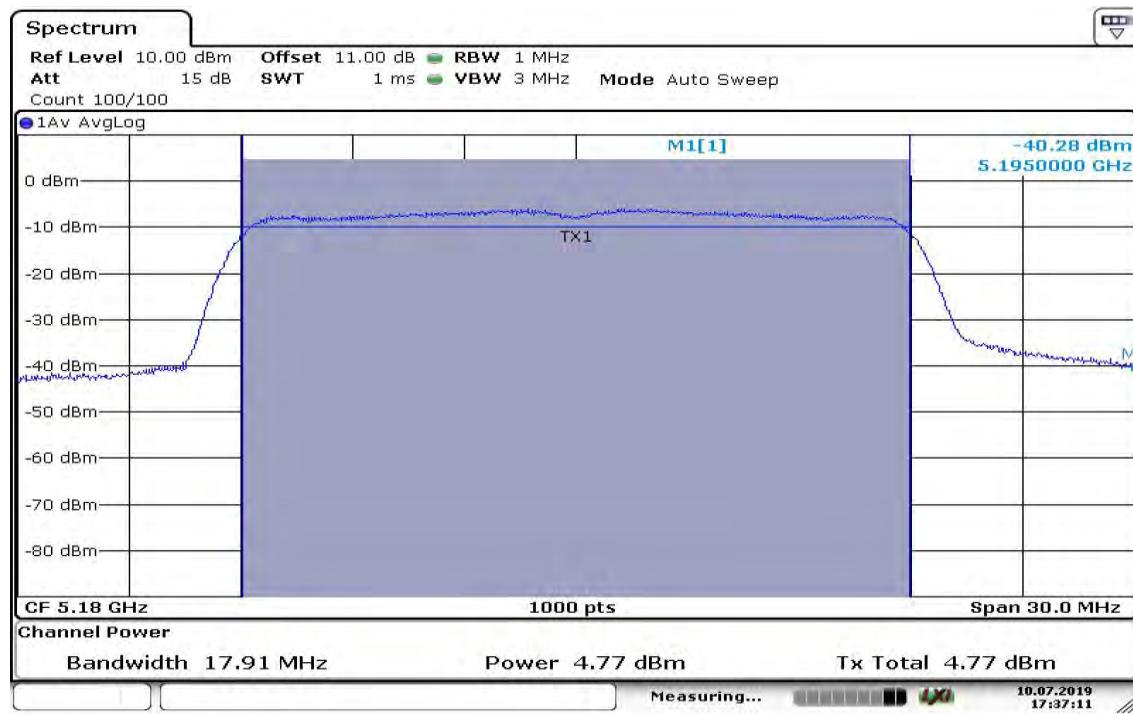
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Date: 10.JUL.2019 17:43:04

Data Rate: MCS0

Channel Frequency-5825MHz



Date: 10.JUL.2019 17:37:12

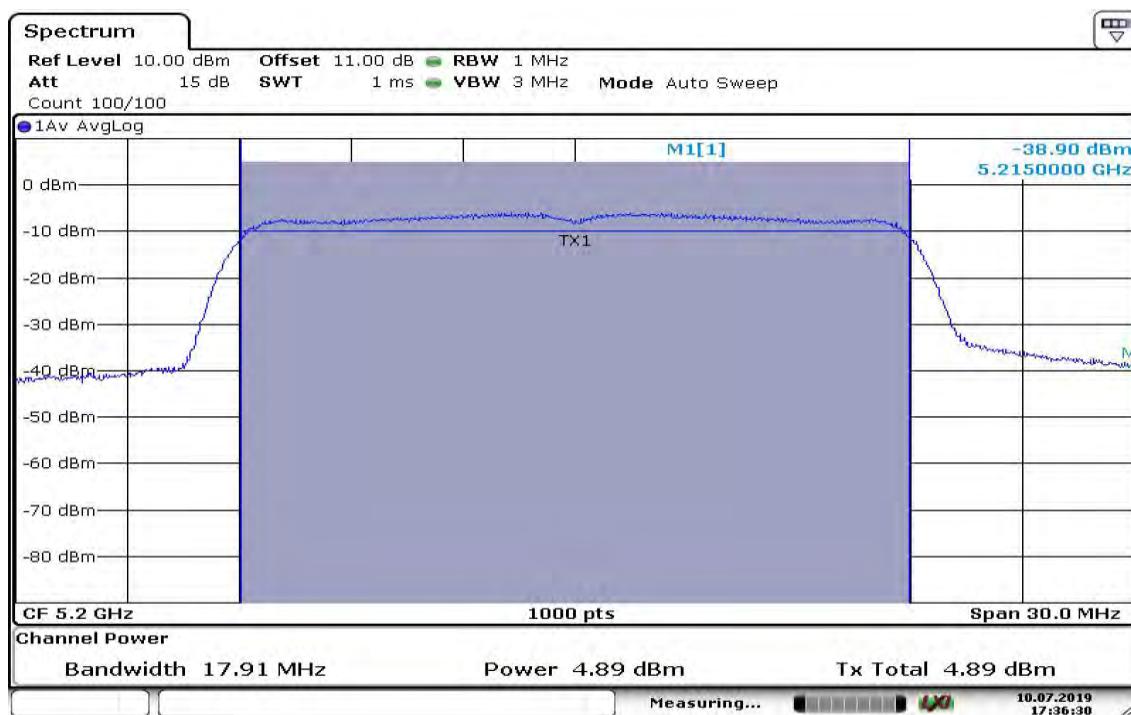
Data Rate: MCS4

Channel Frequency-5180MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

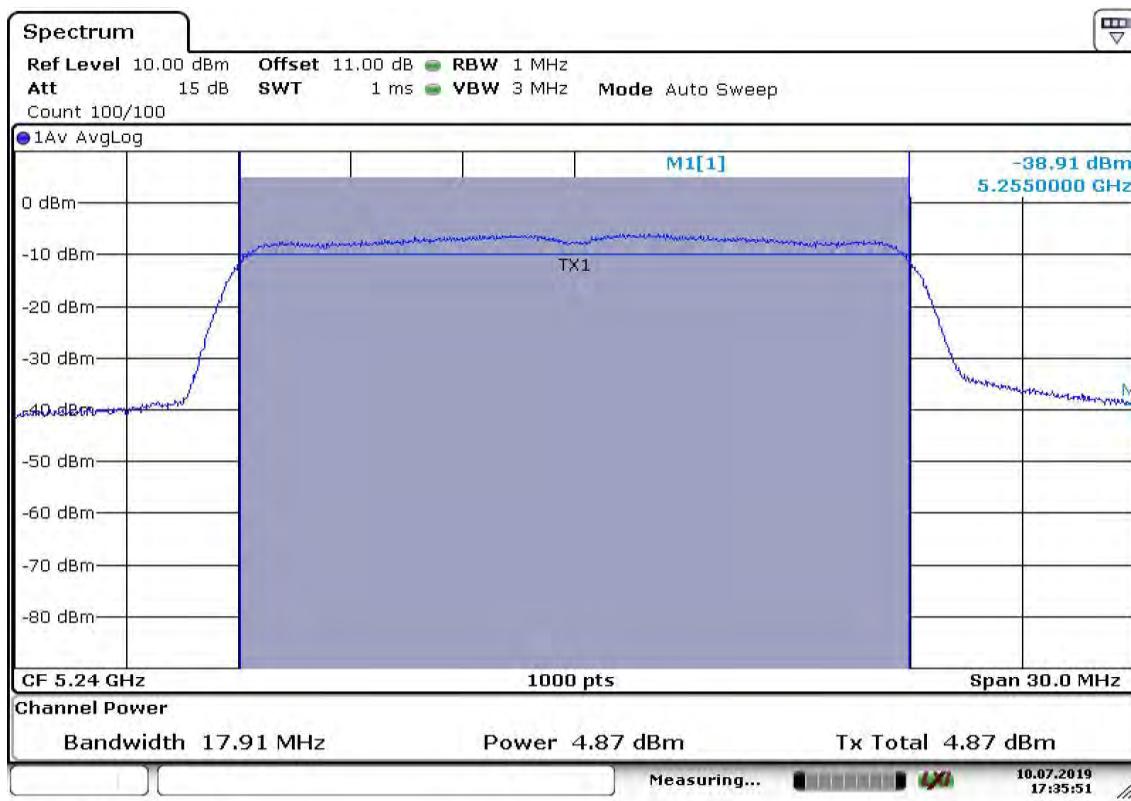
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Date: 10.JUL.2019 17:36:30

Data Rate: MCS4

Channel Frequency-5200MHz



Date: 10.JUL.2019 17:35:51

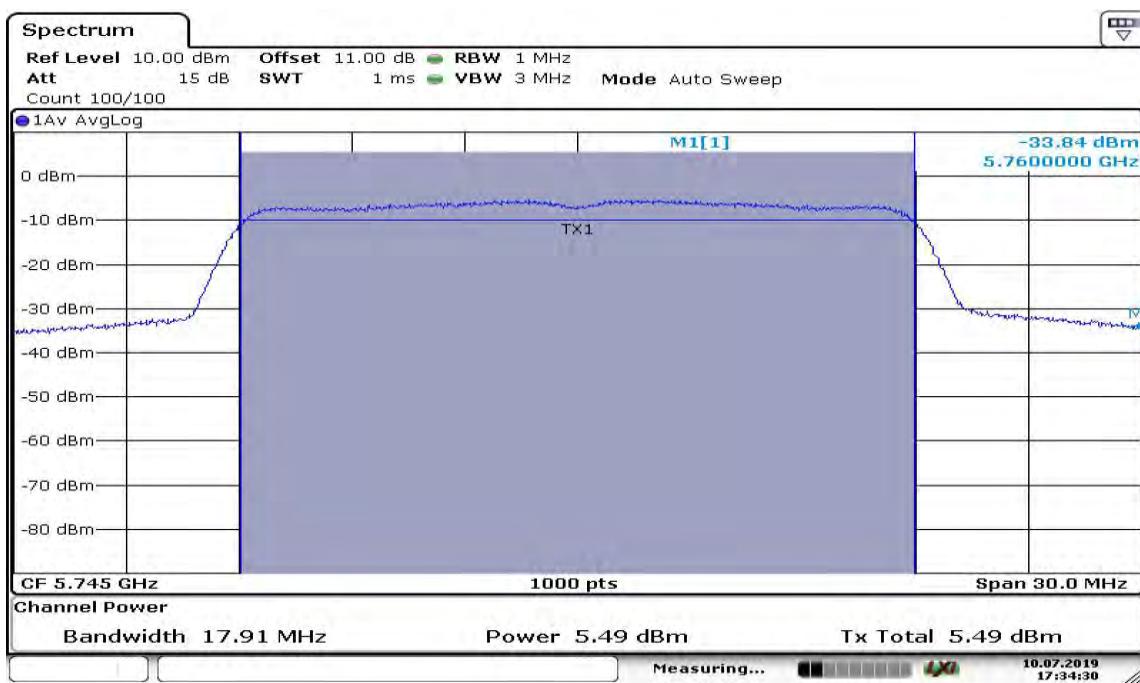
Data Rate: MCS4

Channel Frequency-5240MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

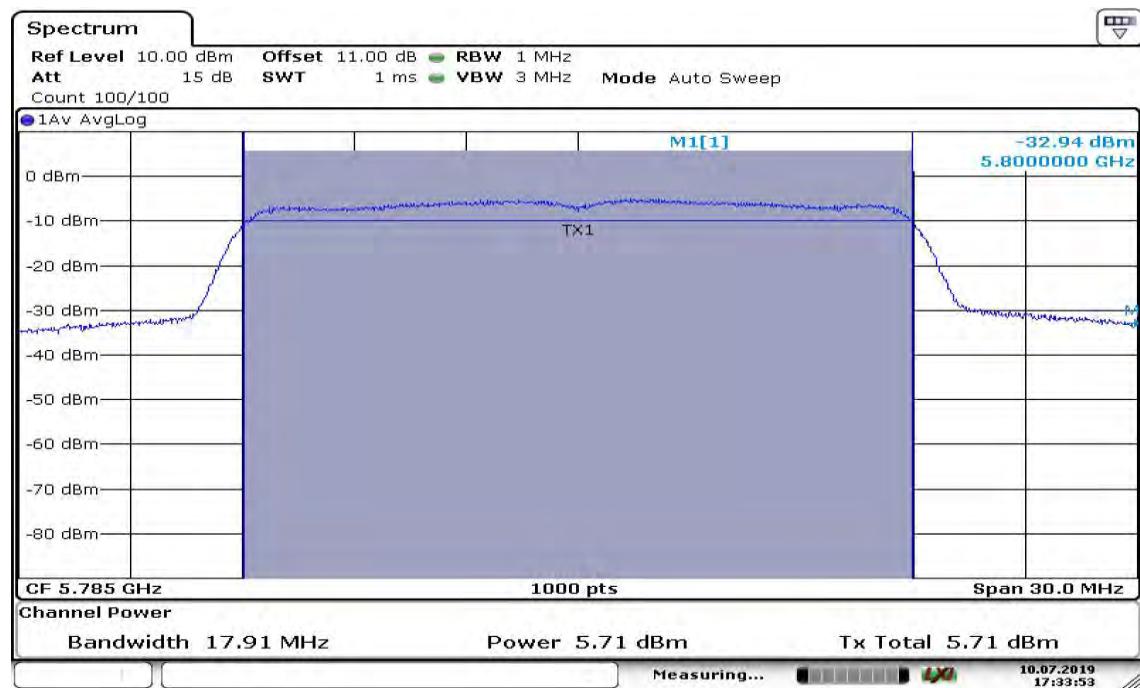
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Date: 10.JUL.2019 17:34:30

Data Rate: MCS4

Channel Frequency-5745MHz



Date: 10.JUL.2019 17:33:53

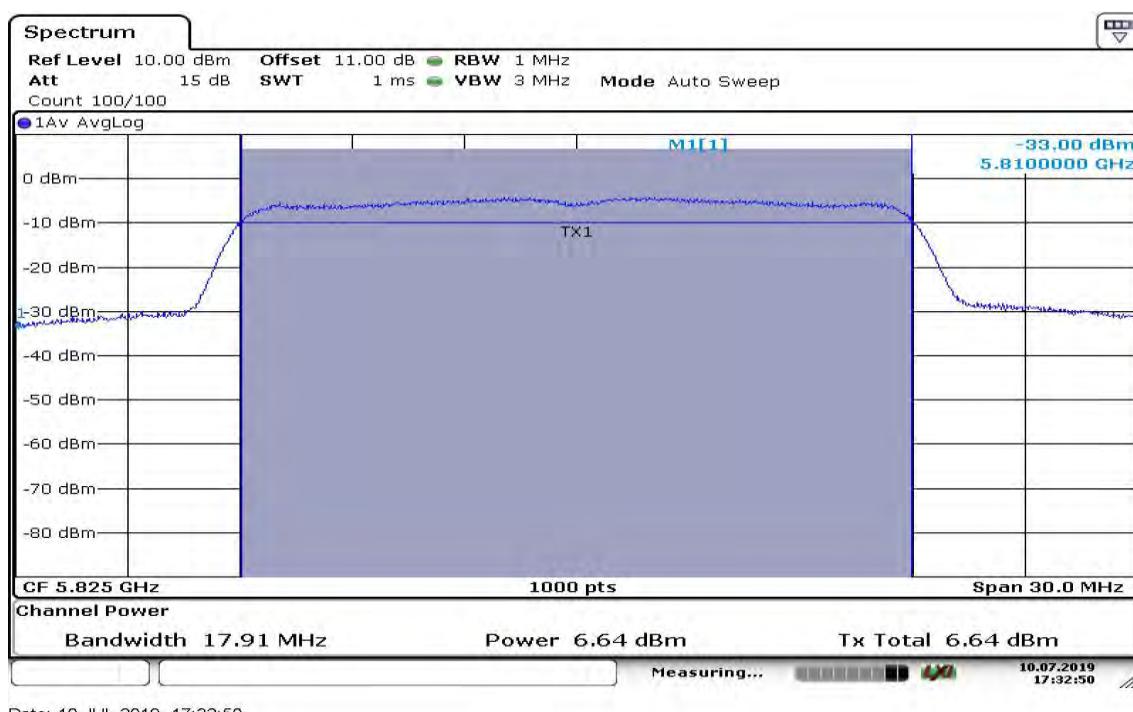
Data Rate: MCS4

Channel Frequency-5785MHz

Prüfbericht - Nr.:
Test Report No.:

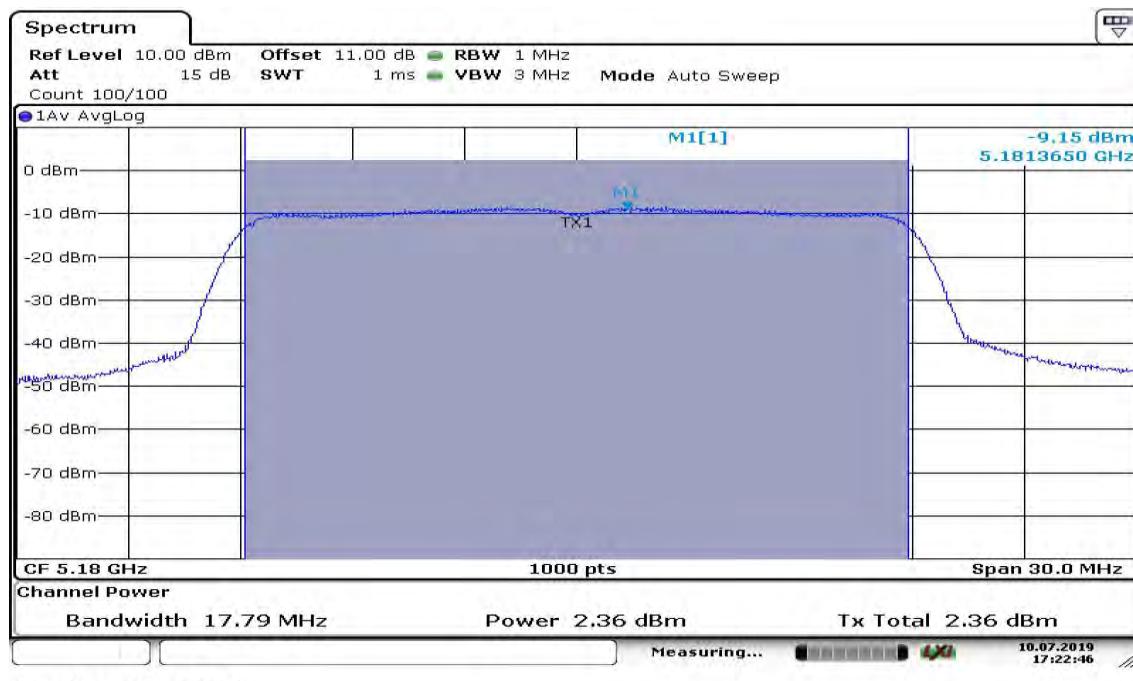
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Data Rate: MCS4

Channel Frequency-5825MHz



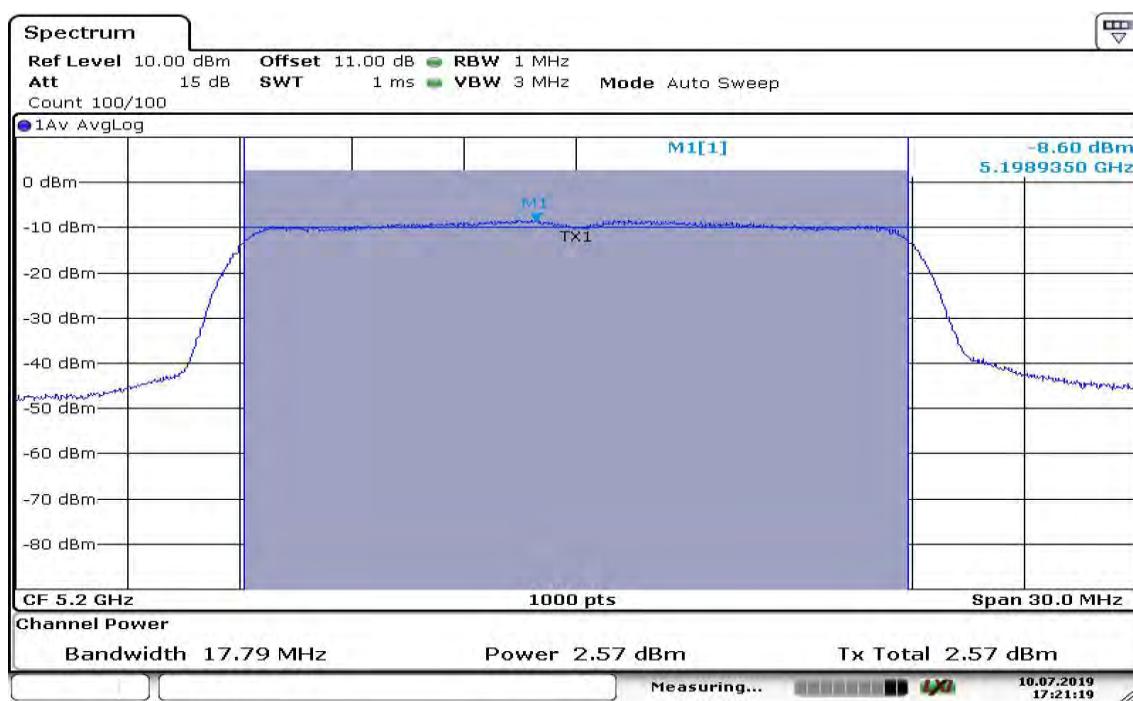
Data Rate: MCS7

Channel Frequency-5180MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

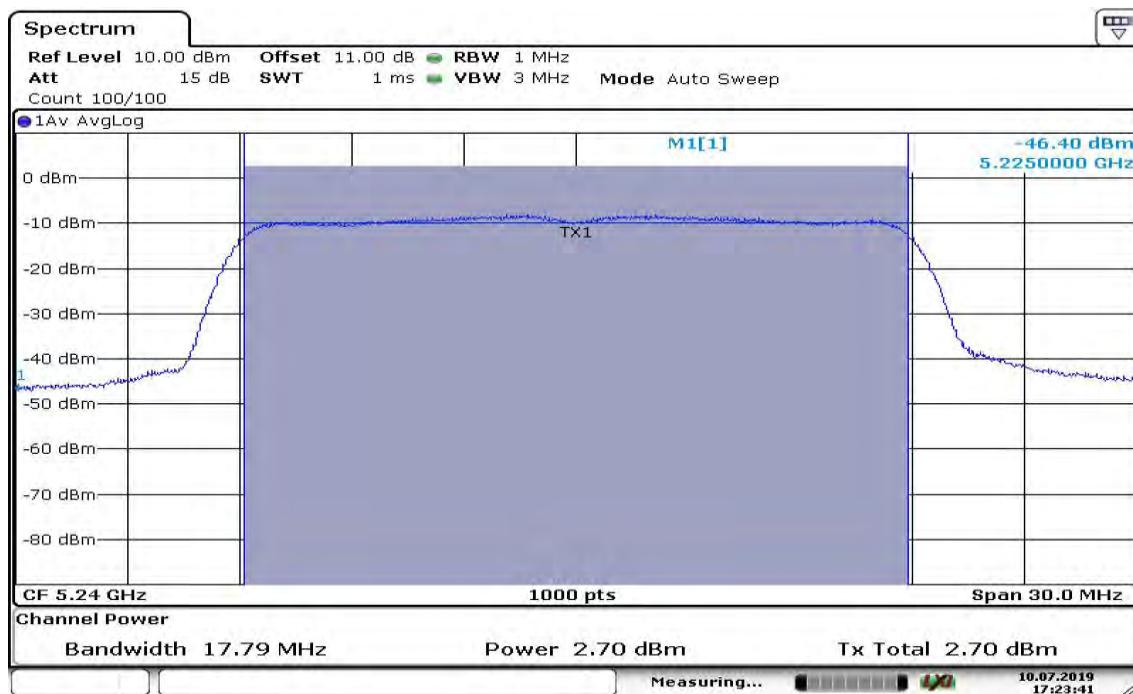
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Date: 10.JUL.2019 17:21:20

Data Rate: MCS7

Channel Frequency-5200MHz



Date: 10.JUL.2019 17:23:41

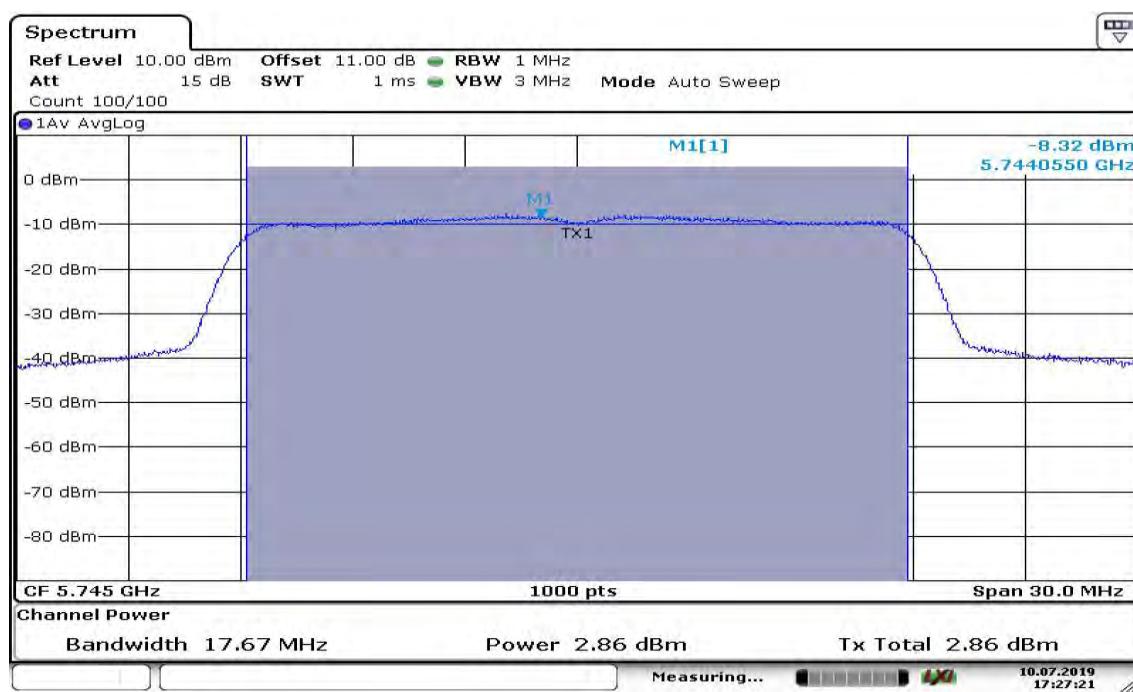
Data Rate: MCS7

Channel Frequency-5240MHz

Prüfbericht - Nr.:
Test Report No.:

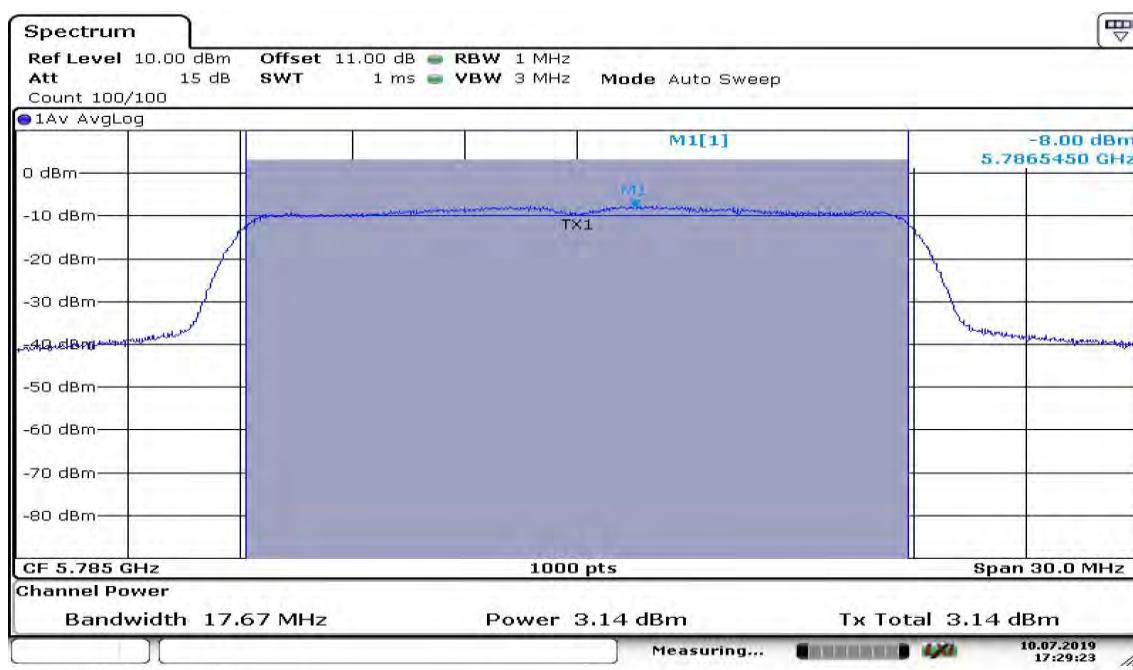
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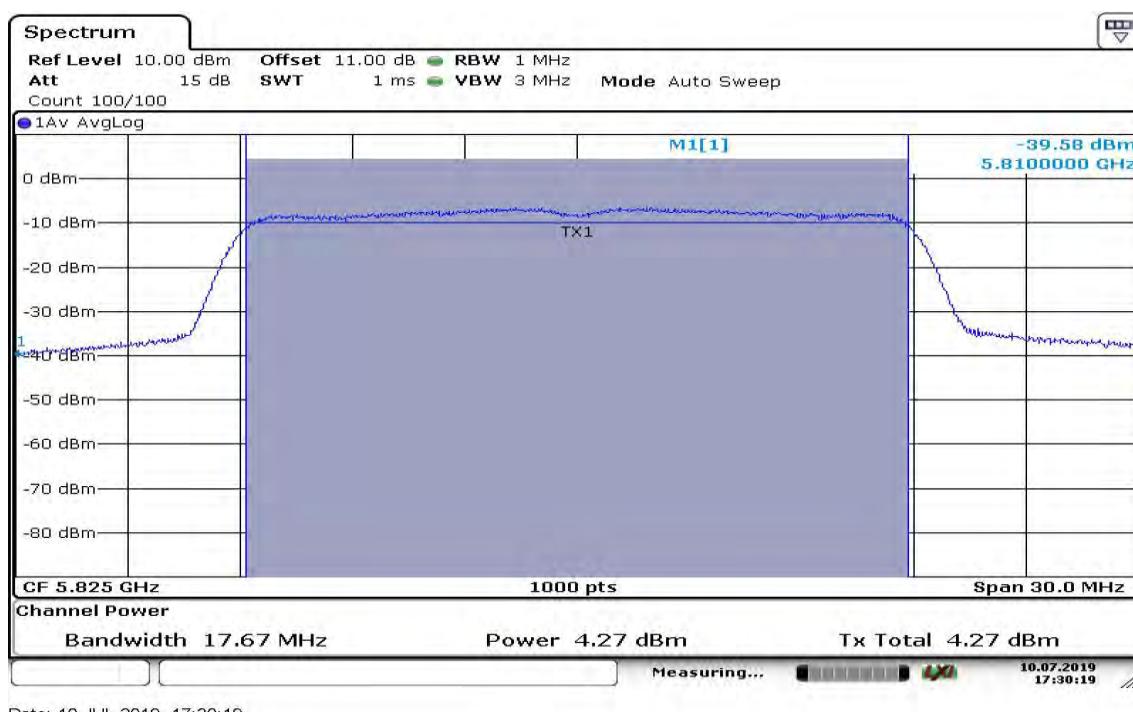
Data Rate: MCS7

Channel Frequency-5745MHz



Data Rate: MCS7

Channel Frequency-5785MHz



Data Rate: MCS7

Channel Frequency-5825MHz

DFS Band

Protocol: 802.11a

Data rate (Mbps)	Channel No	Frequency (MHz)	Power (dBm)	Limit (dBm)
6	52	5260	4.94	24
	64	5320	4.38	24
	100	5500	6.66	24
	120	5600	7.11	24
	140	5700	8.22	24
24	52	5260	5.23	24
	64	5320	4.4	24
	100	5500	6.72	24
	120	5600	7.3	24
	140	5700	8.22	24
54	52	5260	5.22	24
	64	5320	4.37	24
	100	5500	4.58	24
	120	5600	4.94	24
	140	5700	6.11	24

Prüfbericht - Nr.:
Test Report No.:

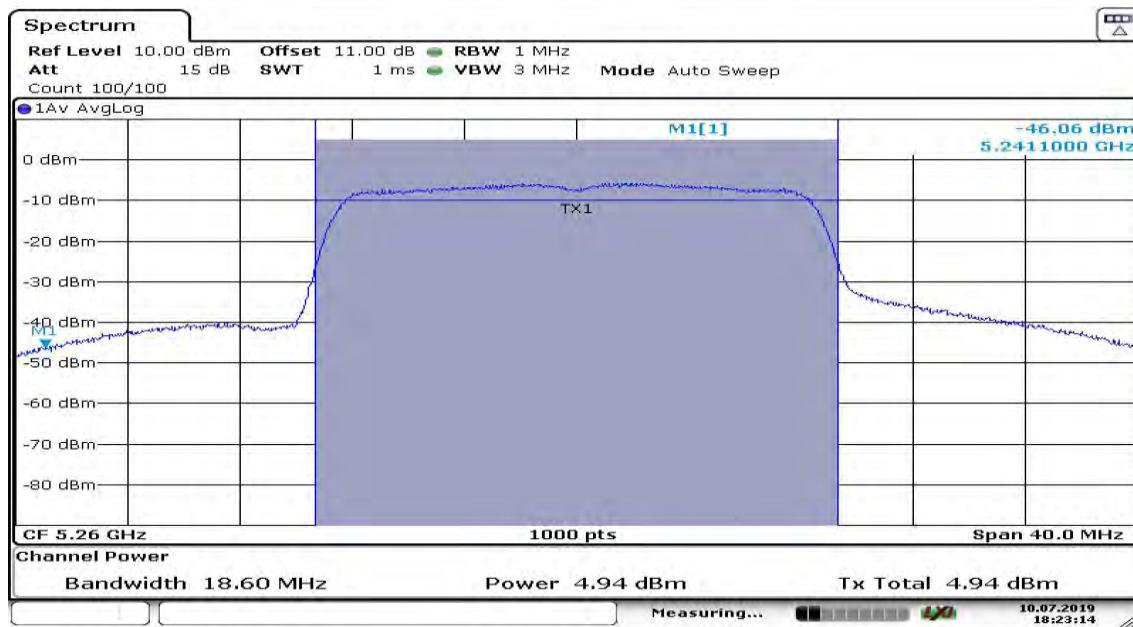
ULR-TC56881930000051F 001

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Protocol: 802.11n

Data rate (Mbps)	Channel No	Frequency (MHz)	Power (dBm)	Limit (dBm)
MCS0	52	5260	4.46	24
	64	5320	3.76	24
	100	5500	4.67	24
	120	5600	5.89	24
	140	5700	6.97	24
MCS4	52	5260	4.45	24
	64	5320	3.70	24
	100	5500	5.52	24
	120	5600	6.02	24
	140	5700	7.05	24
MCS7	52	5260	4.34	24
	64	5320	3.72	24
	100	5500	3.67	24
	120	5600	4.21	24
	140	5700	5.28	24

Protocol: 802.11a



Date: 10.JUL.2019 18:23:14

Data Rate: 6 Mbps

Channel Frequency-5260MHz

Prüfbericht - Nr.:
Test Report No.:

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Date: 10.JUL.2019 18:24:36

Data Rate: 6 Mbps

Channel Frequency-5320MHz



Date: 10.JUL.2019 18:25:13

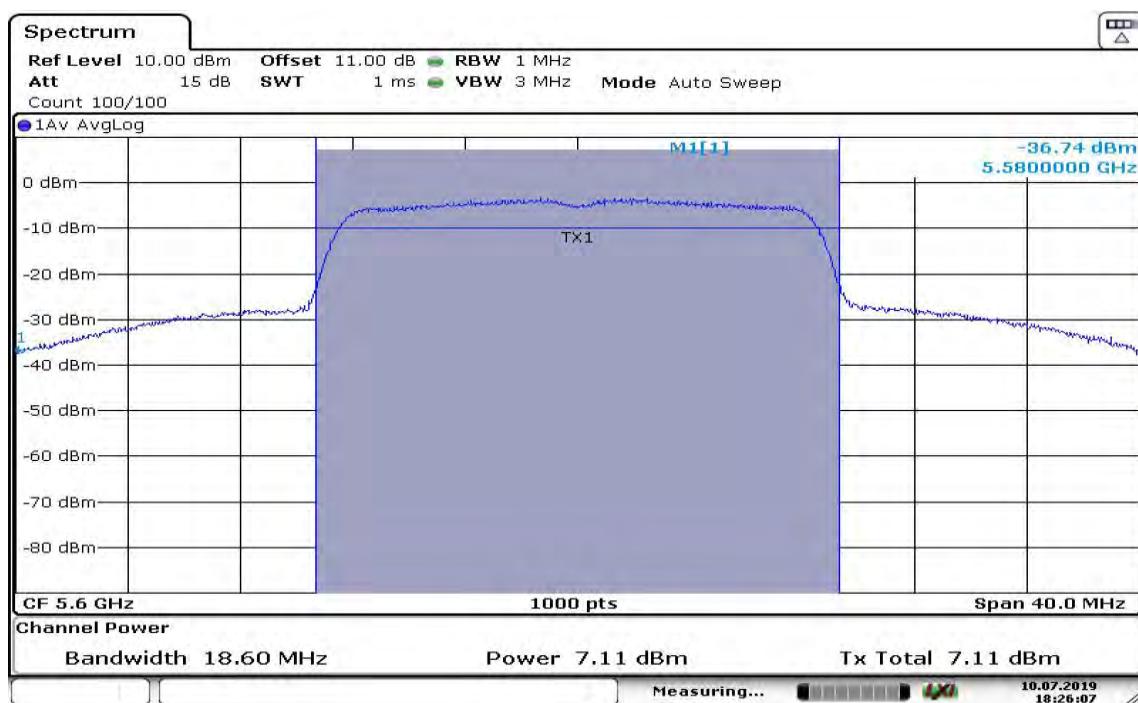
Data Rate: 6 Mbps

Channel Frequency-5500MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

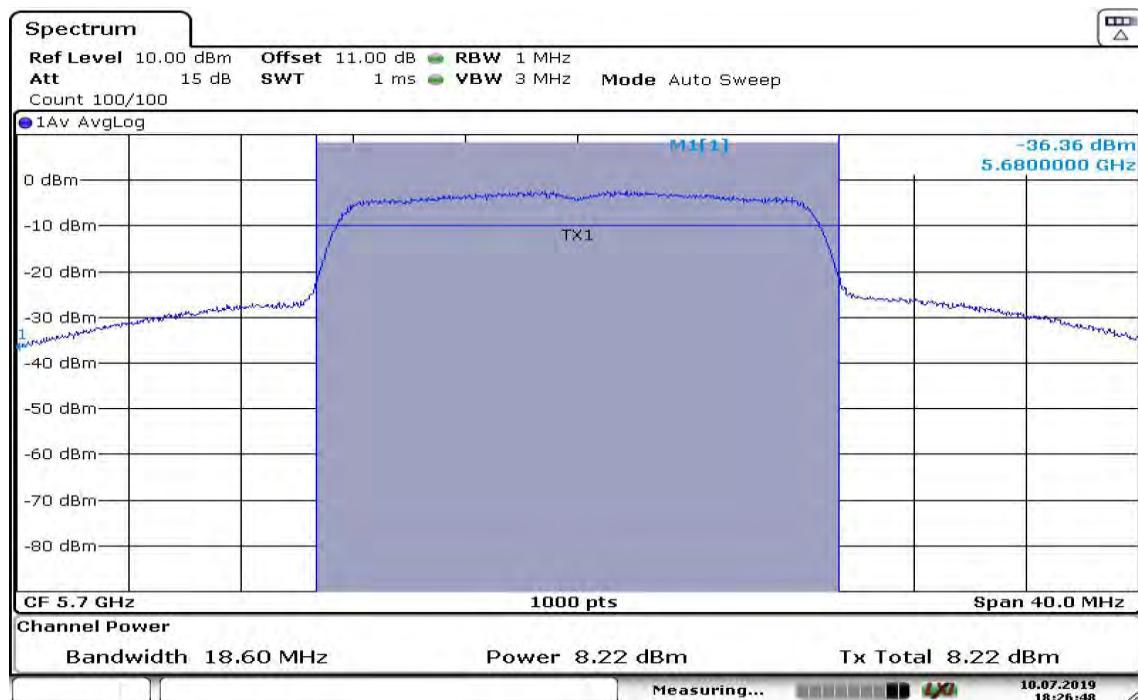
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Date: 10.JUL.2019 18:26:08

Data Rate: 6 Mbps

Channel Frequency-5600MHz



Date: 10.JUL.2019 18:26:48

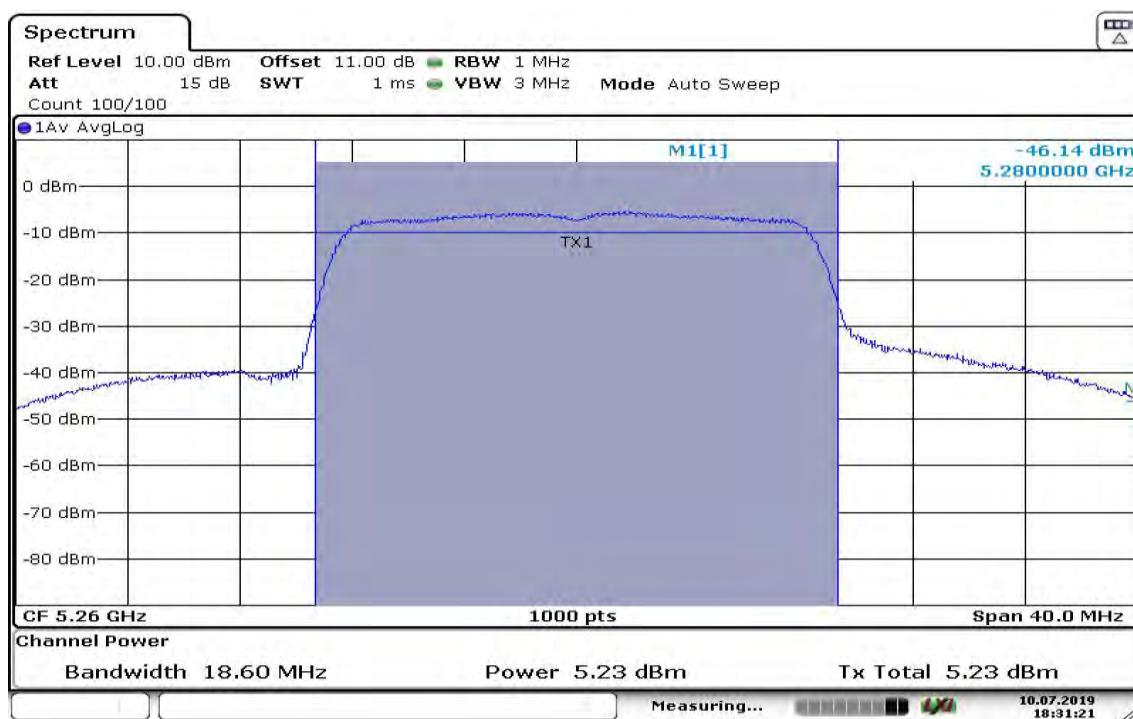
Data Rate: 6 Mbps

Channel Frequency-5700MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

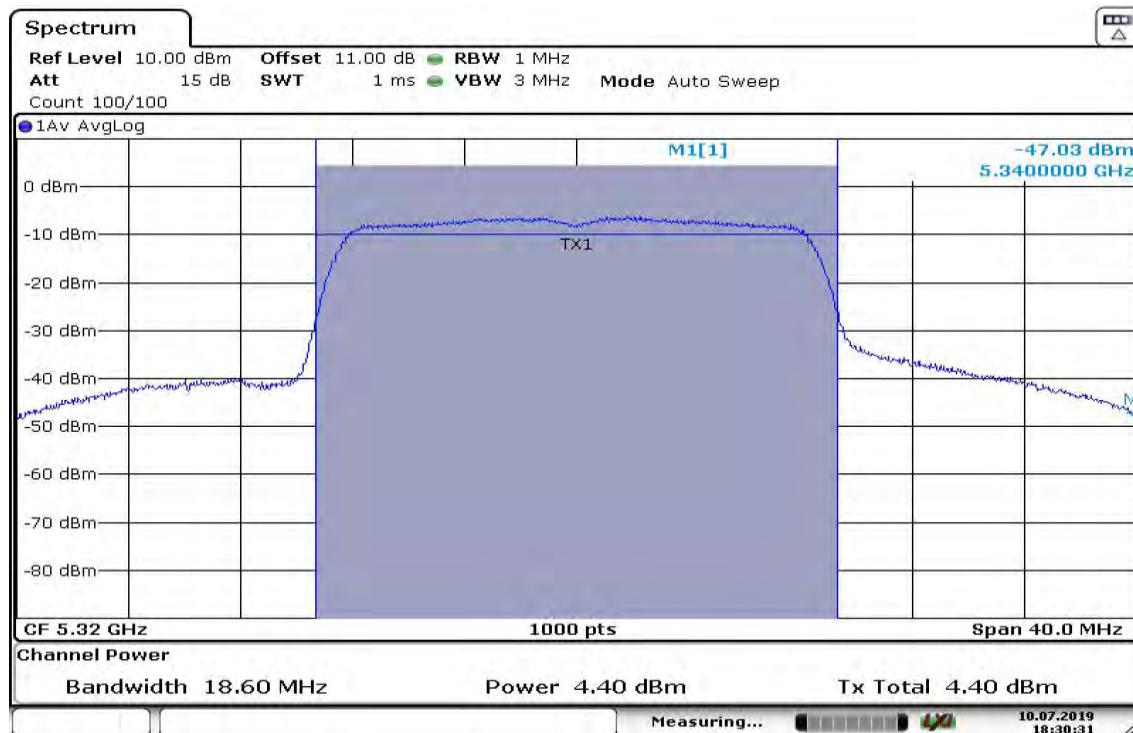
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Date: 10.JUL.2019 18:31:21

Data Rate: 24 Mbps

Channel Frequency-5260MHz



Date: 10.JUL.2019 18:30:31

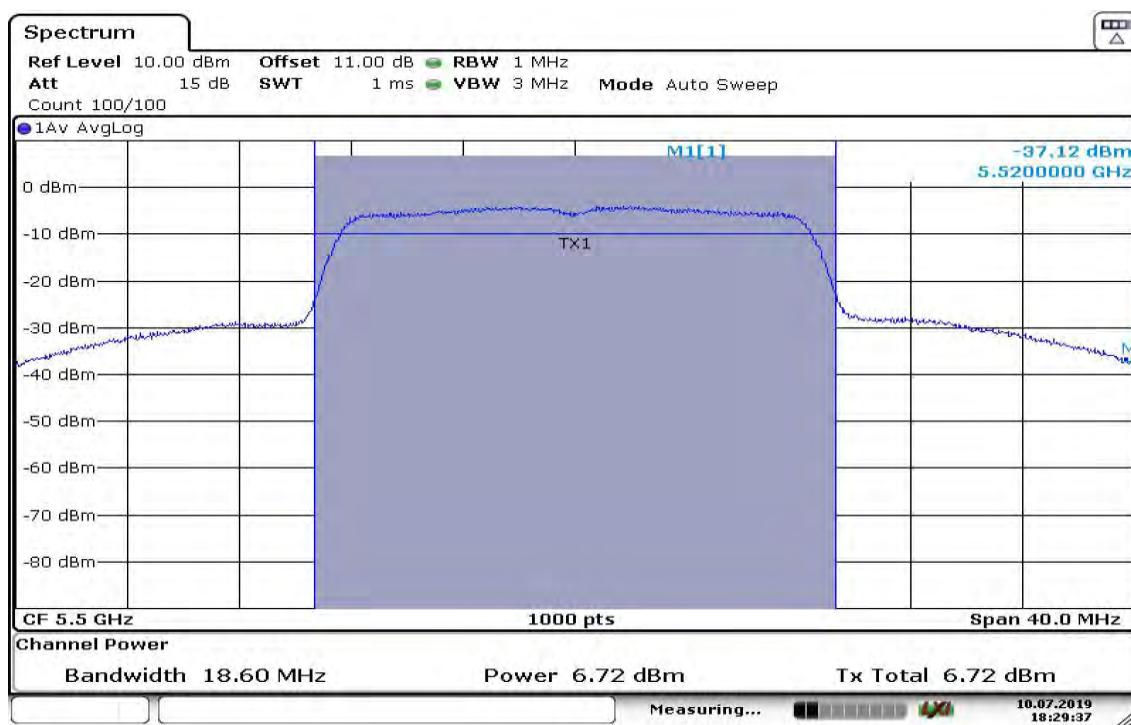
Data Rate: 24 Mbps

Channel Frequency-5320MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

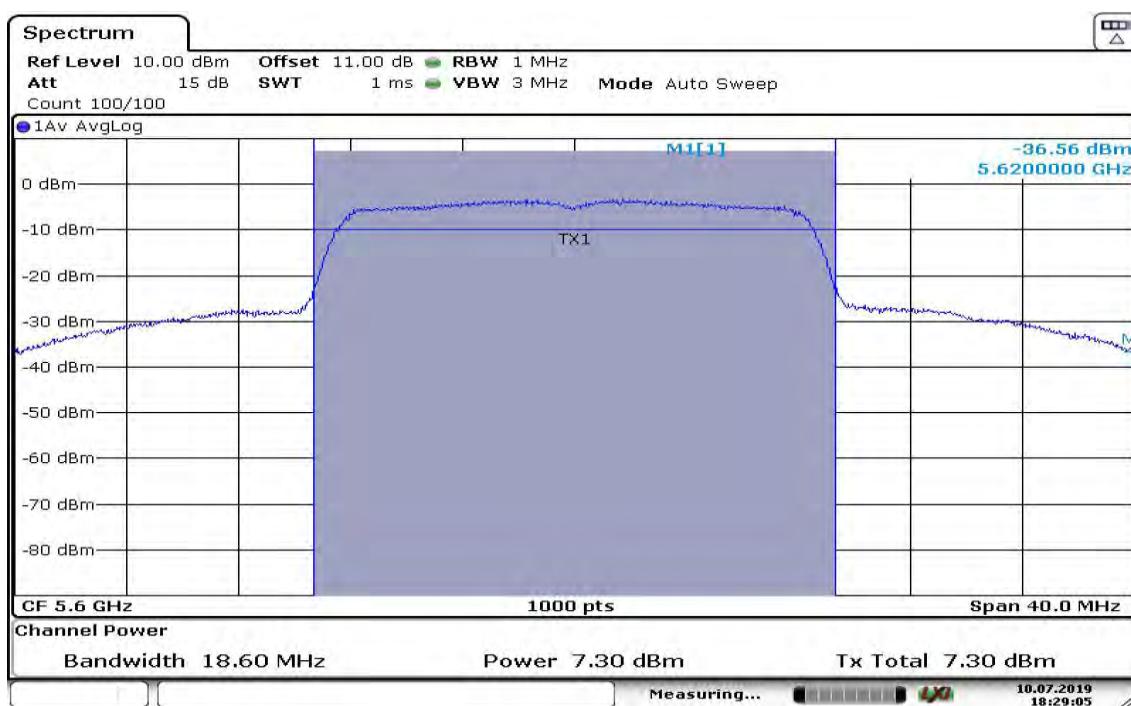
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Date: 10.JUL.2019 18:29:37

Data Rate: 24 Mbps

Channel Frequency-5500MHz



Date: 10.JUL.2019 18:29:06

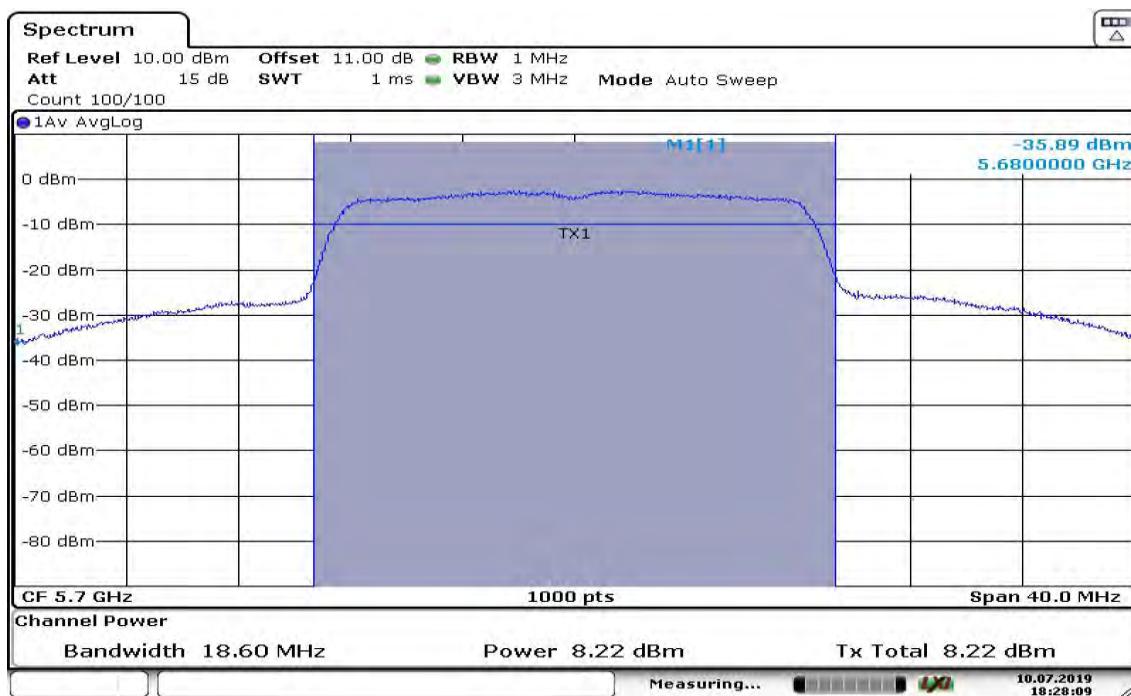
Data Rate: 24 Mbps

Channel Frequency-5600MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

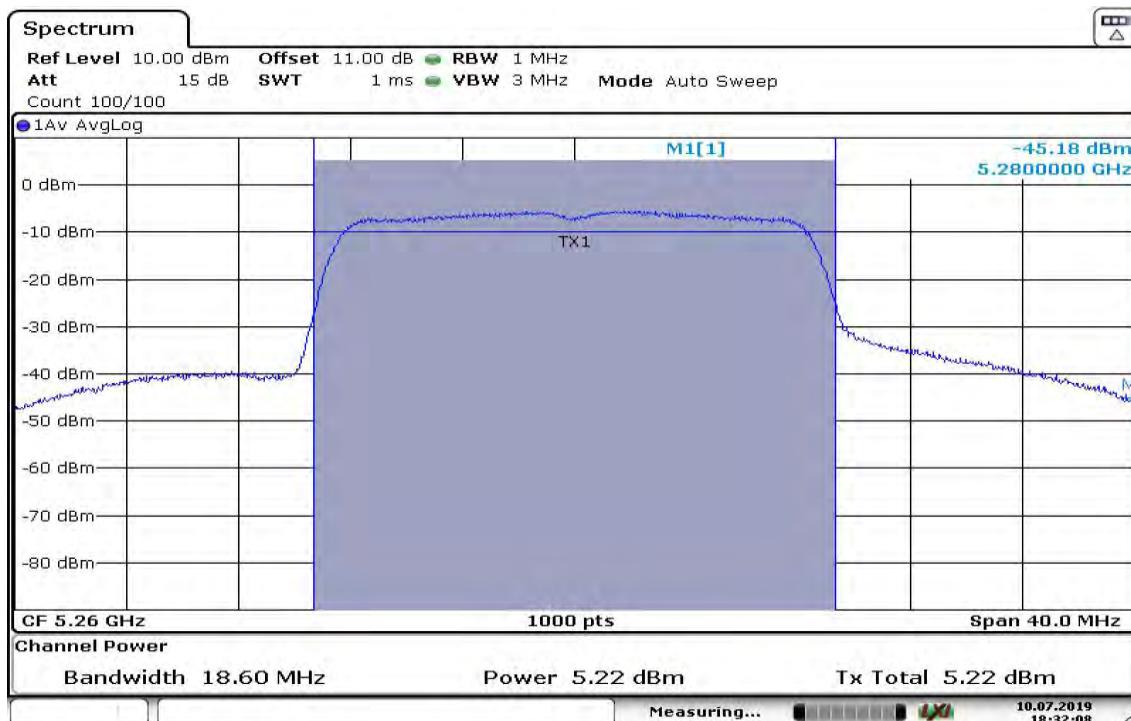
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Date: 10.JUL.2019 18:28:09

Data Rate: 24 Mbps

Channel Frequency-5700MHz



Date: 10.JUL.2019 18:32:09

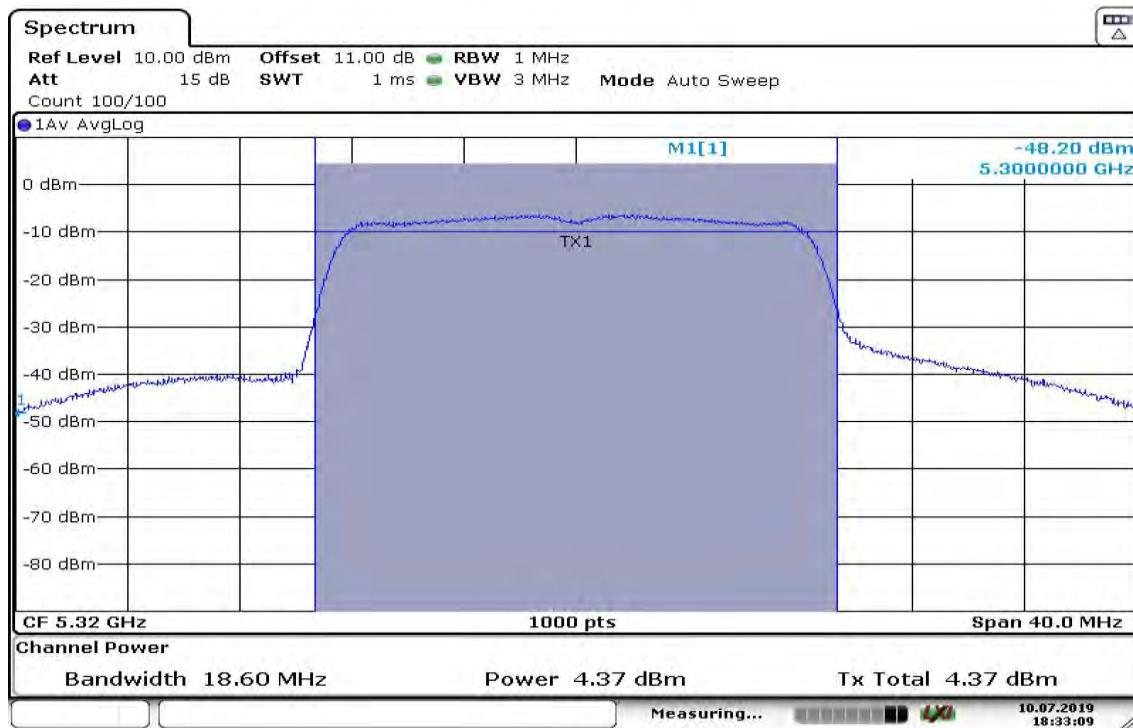
Data Rate: 54 Mbps

Channel Frequency-5260MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

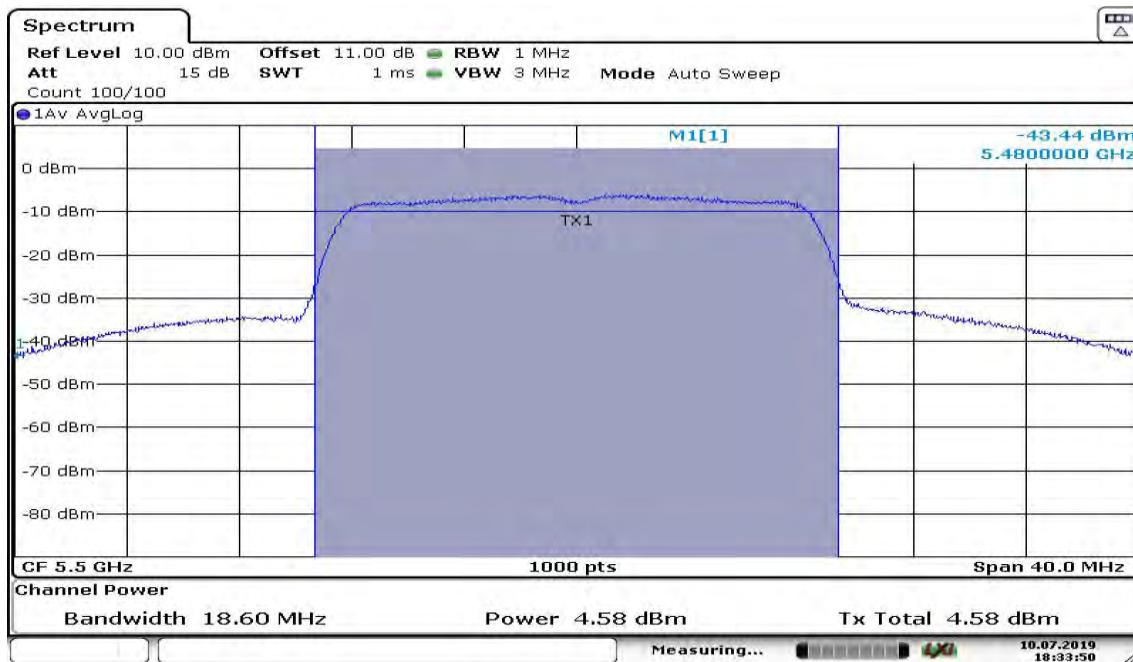
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Date: 10.JUL.2019 18:33:09

Data Rate: 54 Mbps

Channel Frequency-5320MHz



Date: 10.JUL.2019 18:33:51

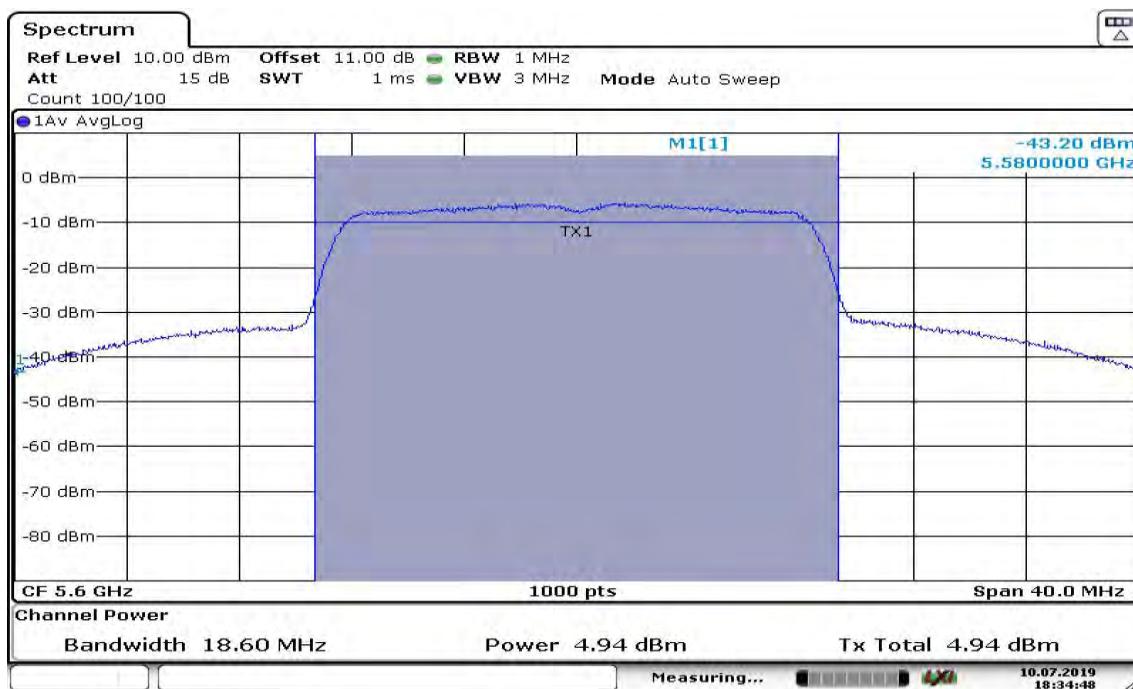
Data Rate: 54 Mbps

Channel Frequency-5500MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

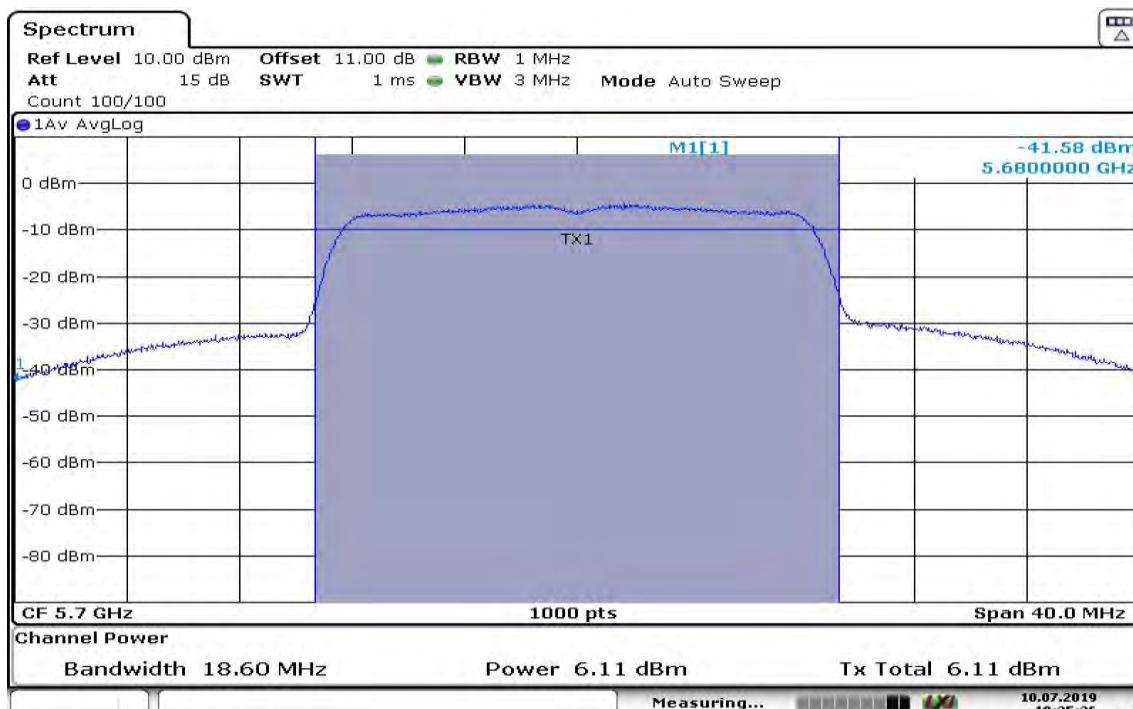
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Date: 10.JUL.2019 18:34:49

Data Rate: 54 Mbps

Channel Frequency-5600MHz



Date: 10.JUL.2019 18:35:26

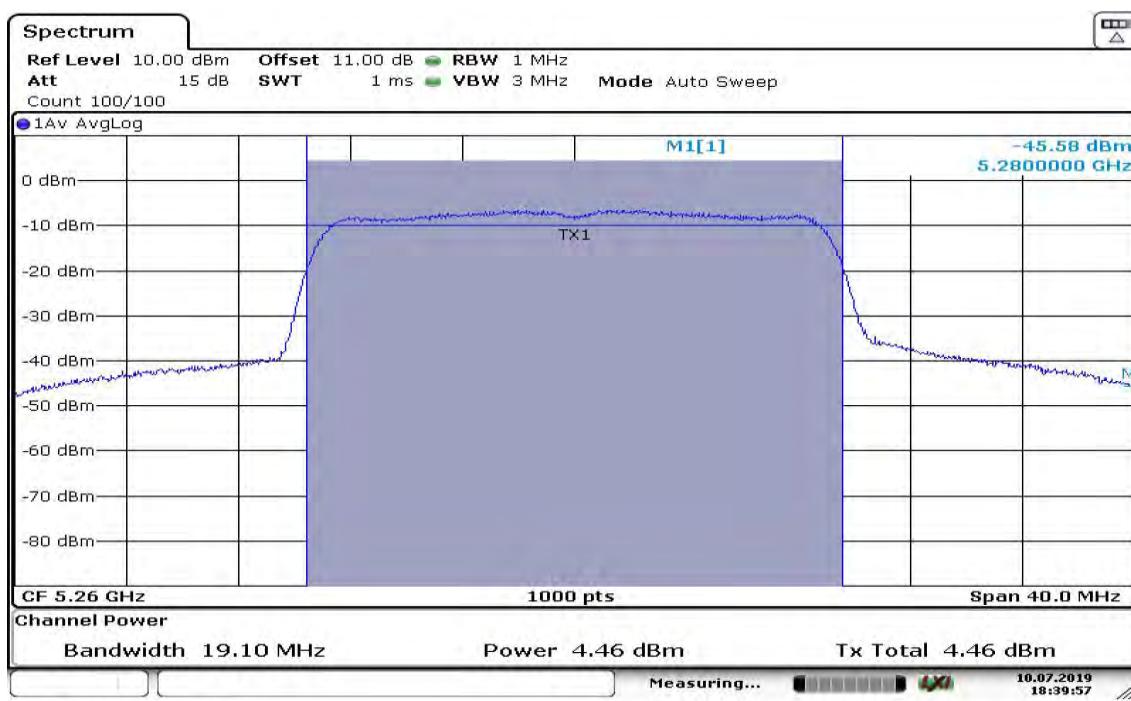
Data Rate: 54 Mbps

Channel Frequency-5700MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

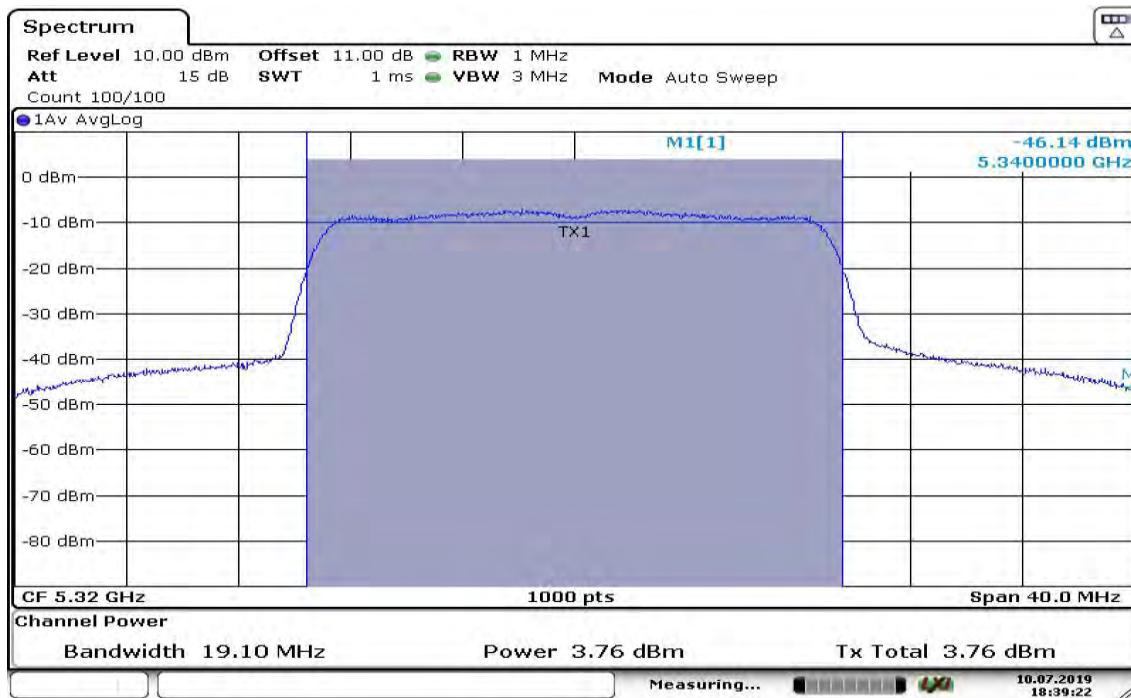
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Date: 10.JUL.2019 18:39:58

Data Rate: MCS0

Channel Frequency-5260MHz



Date: 10.JUL.2019 18:39:22

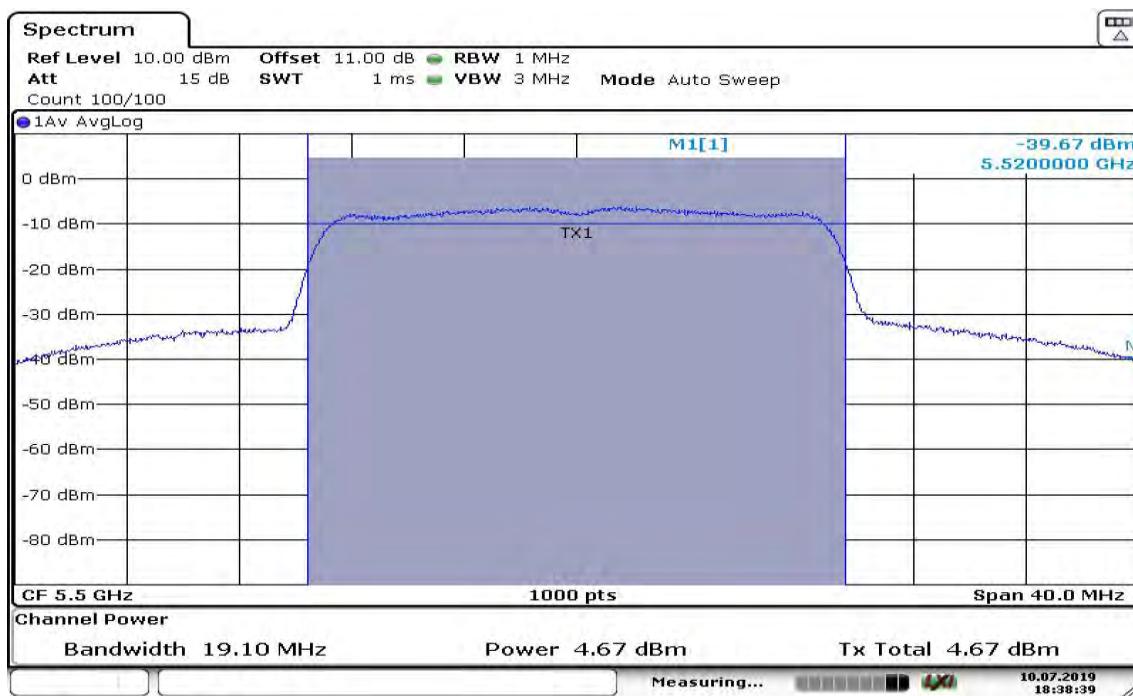
Data Rate: MCS0

Channel Frequency-5320MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

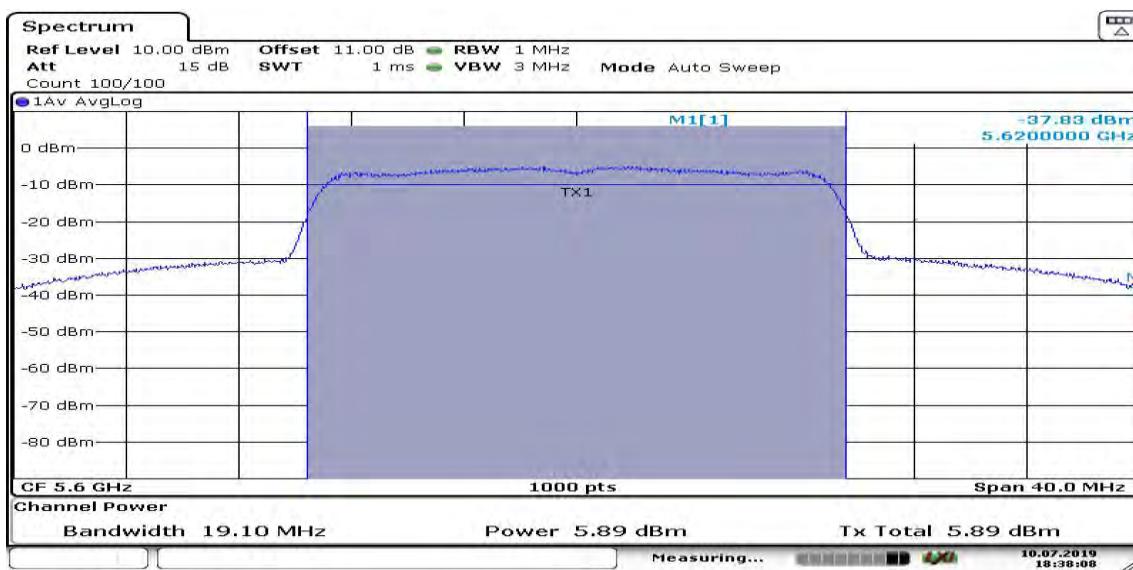
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Date: 10.JUL.2019 18:38:39

Data Rate: MCS0

Channel Frequency-5500MHz



Date: 10.JUL.2019 18:38:09

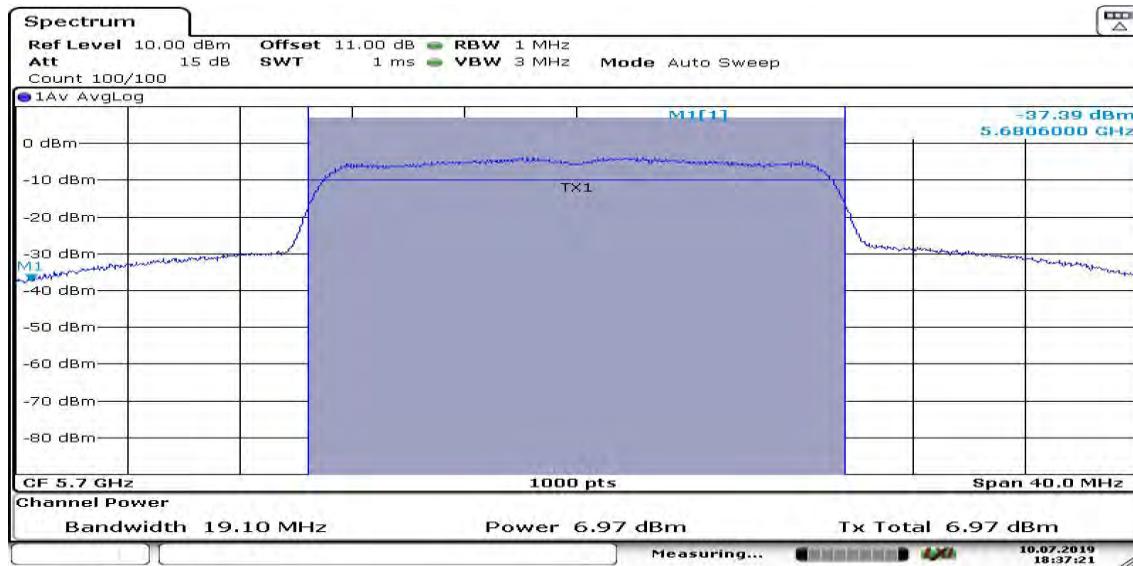
Data Rate: MCS0

Channel Frequency-5600MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

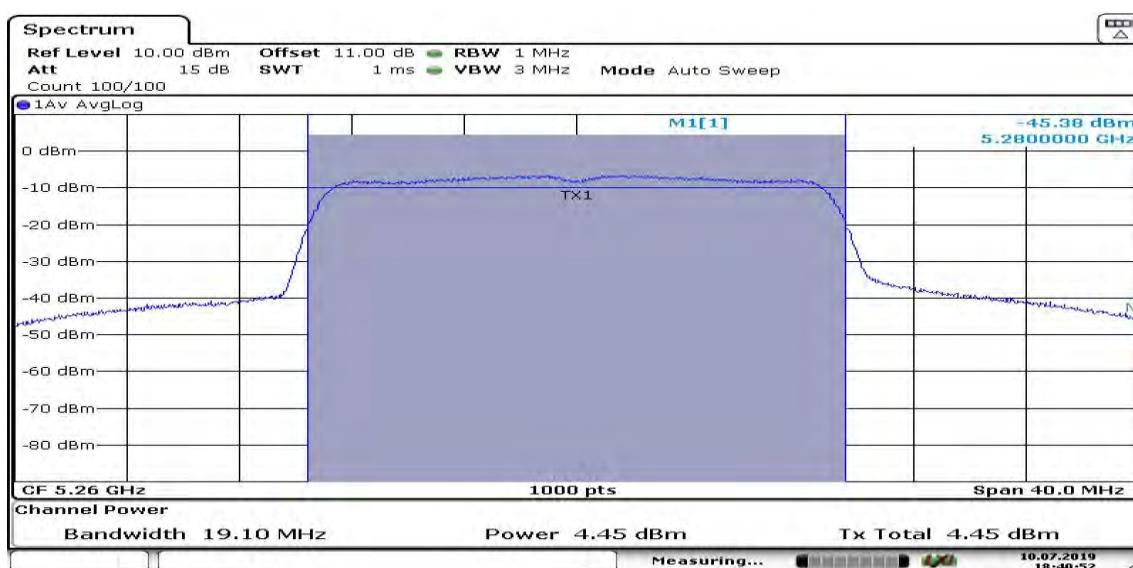
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Date: 10.JUL.2019 18:37:22

Data Rate: MCS0

Channel Frequency-5700MHz



Date: 10.JUL.2019 18:40:52

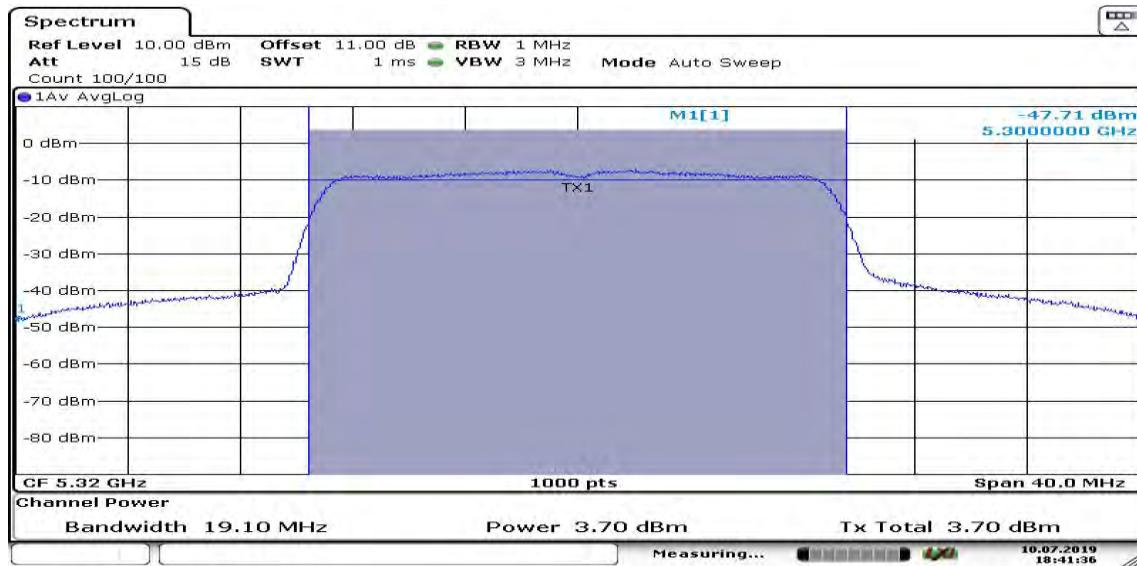
Data Rate: MCS4

Channel Frequency-5260MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

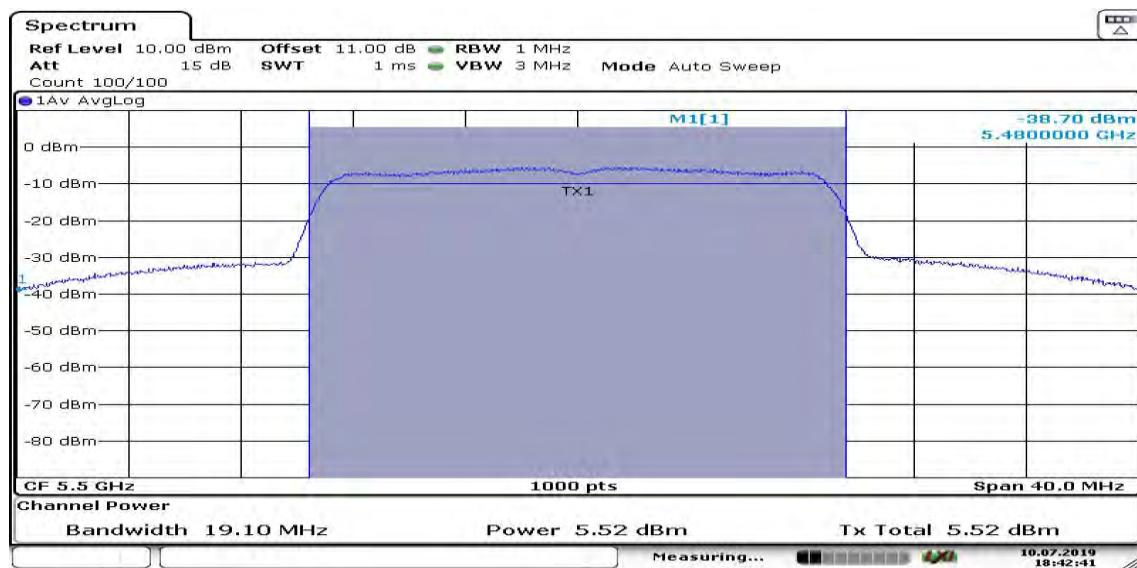
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Date: 10.JUL.2019 18:41:36

Data Rate: MCS4

Channel Frequency-5320MHz



Date: 10.JUL.2019 18:42:41

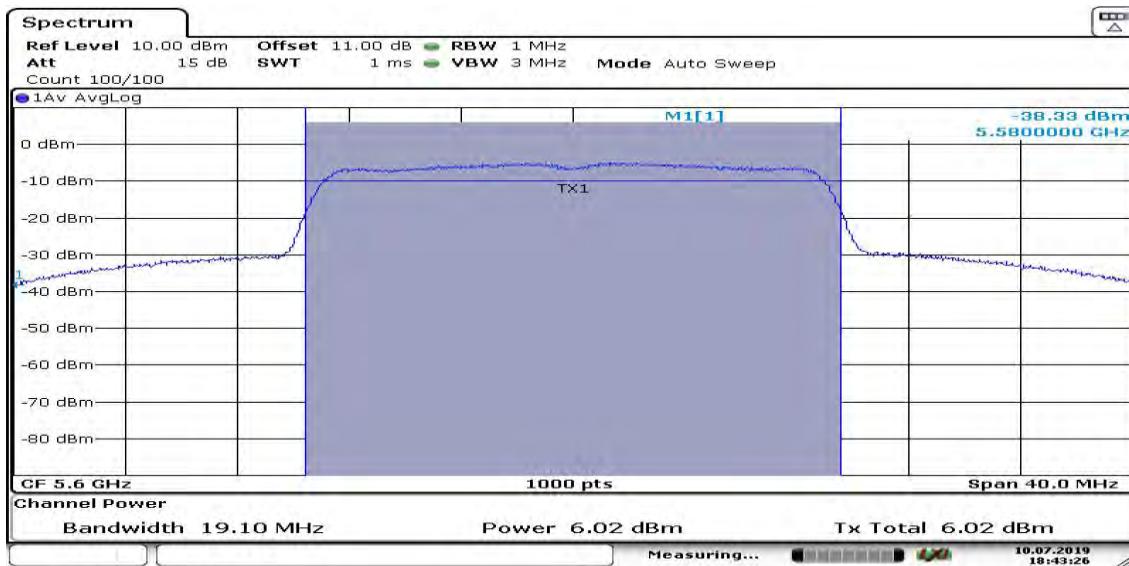
Data Rate: MCS4

Channel Frequency-5500MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

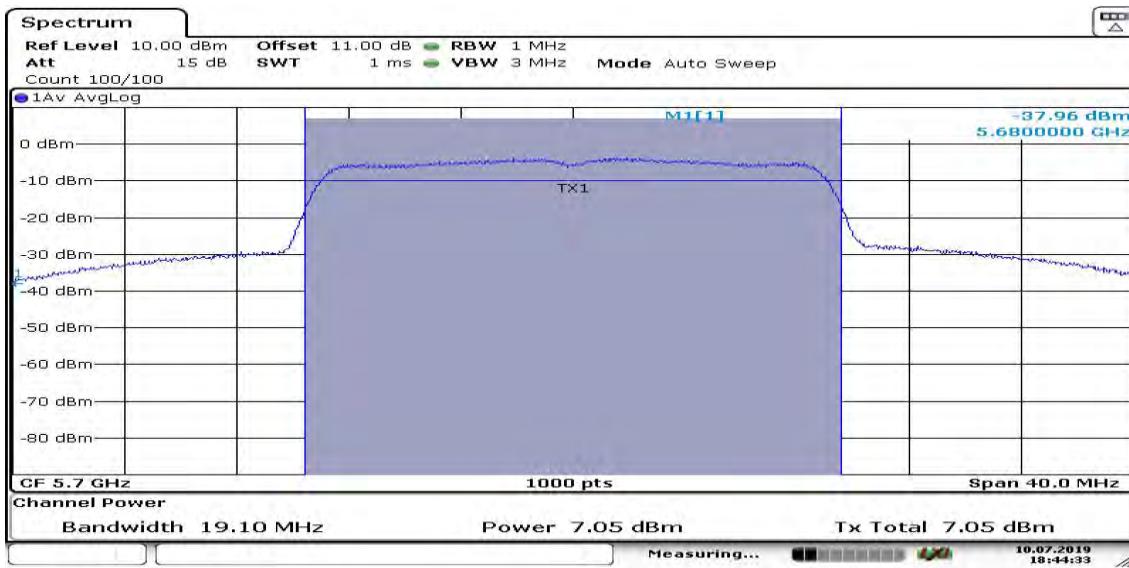
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Date: 10.JUL.2019 18:43:26

Data Rate: MCS4

Channel Frequency-5600MHz



Date: 10.JUL.2019 18:44:33

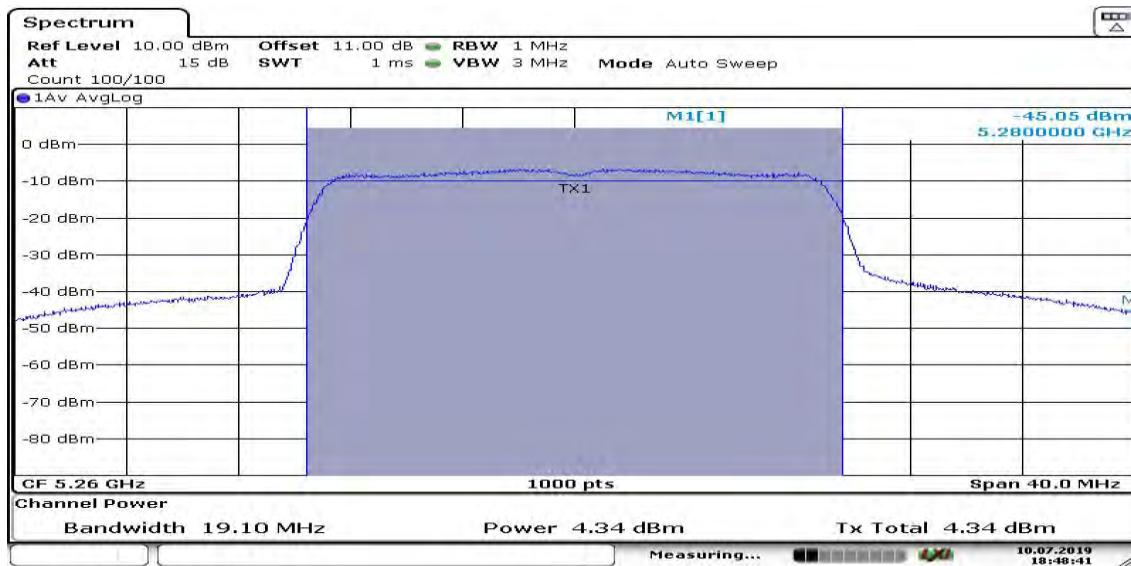
Data Rate: MCS4

Channel Frequency-5700MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

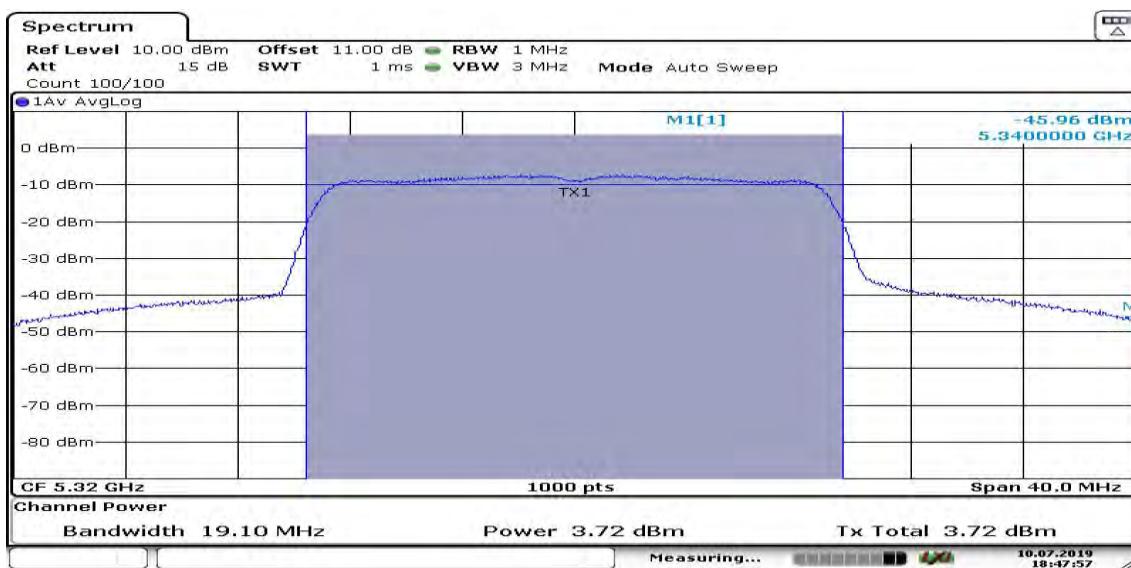
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Date: 10.JUL.2019 18:48:41

Data Rate: MCS7

Channel Frequency-5260MHz



Date: 10.JUL.2019 18:47:58

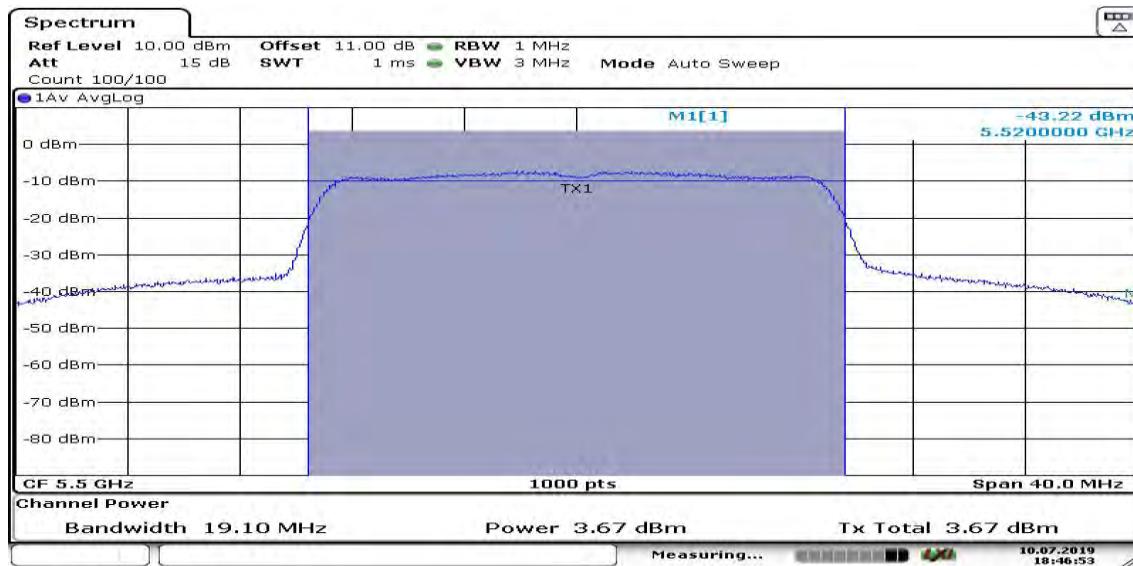
Data Rate: MCS7

Channel Frequency-5320MHz

Prüfbericht - Nr.:
Test Report No.:

ULR-TC56881930000051F 001

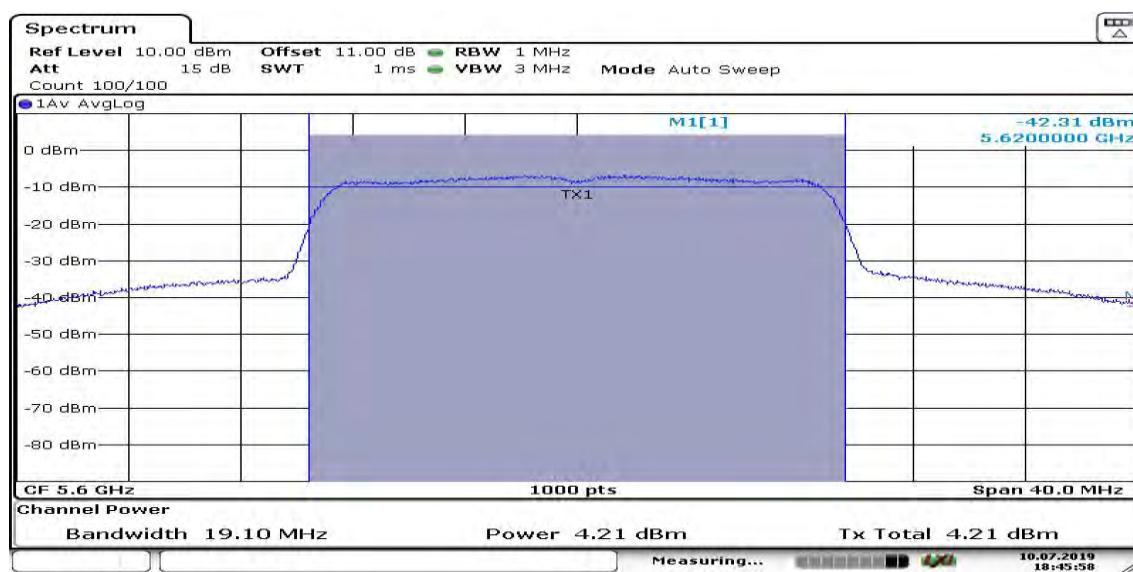
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Date: 10.JUL.2019 18:46:54

Data Rate: MCS7

Channel Frequency-5500MHz



Date: 10.JUL.2019 18:45:59

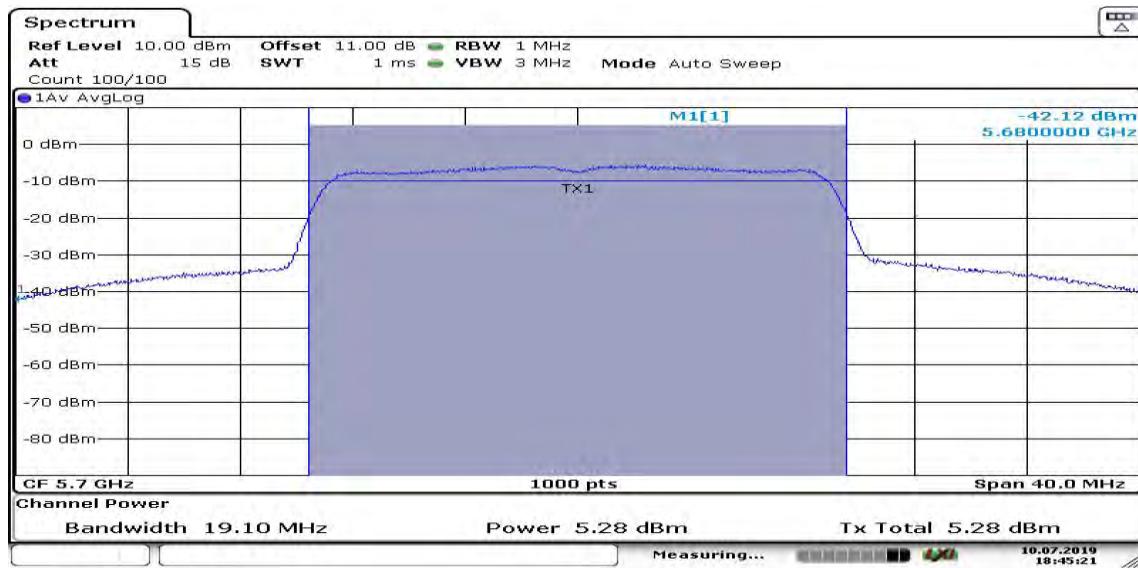
Data Rate: MCS7

Channel Frequency-5600MHz

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Date: 10.JUL.2019 18:45:21

Data Rate: MCS7

Channel Frequency-5700MHz

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6.2 Radiated spurious emissions and emissions in restricted bands of operation

Result

Pass

Test Specification	FCC part 15 Subpart E Section 15.209
Test Method	ANSI C 63.10 – 2013
Measurement Location	Semi Anechoic Chamber & 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 (μ V/m)	Field strength (dB μ V/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 dB μ V/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.

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Test results:

No emissions found in frequency 9 kHz to 30 MHz

Test results for frequencies in the range 30 MHz – 1 GHz

Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Vertical	34.19	12.38	40	-27.62
	34.91	9.27	40	-30.73
	39.36	6.93	40	-33.07
	79.86	24.96	40	-15.04
	83.95	26.23	40	-13.77
	155.44	28.1	43.5	-15.40
	231.33	24.68	43.5	-18.82
Horizontal	125.34	30.45	43.5	-13.05
	131.39	30.56	43.5	-12.94
	135.42	27.46	43.5	-16.04
	139.43	26.21	43.5	-17.29
	336.37	24.47	46	-21.53
	360.00	25.05	46	-20.95
	385.52	18.05	46	-27.95

Note: Emission level = Received value + Antenna factor + Cable loss – Pre-Amplifier Gain

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Non-DFS Band

For frequency range: 1 GHz-26.5 GHz

Protocol: 802.11a

Data rate: 6 Mbps

Frequency Band	Channel No. or Frequency	Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5150-5250 (UNII-1)	36(5180)	Vertical	5150(PK)	48.95	74	-25.05
			5150(Av)	30.98	54	-23.02
			5180(PK)	94.48	*	*
			5180(Av)	84.64	*	*
			10360(Pk)	No Harmonics found		
			10360(Av)	No Harmonics found		
	40(5200)	Horizontal	5150(PK)	53.91	74	-20.09
			5150(Av)	33.78	54	-20.22
			5180(PK)	99.883	*	*
			5180(Av)	90.564	*	*
			10360(Pk)	No Harmonics found		
			10360(Av)	No Harmonics found		
		Vertical	5150(PK)	42.8	74	-31.2
		5150(Av)	30.35	54	-23.65	
		5200(PK)	94.42	*	*	
		5200(Av)	85.34	*	*	
		10400(Pk)	No Harmonics found			
		10400(Av)	No Harmonics found			

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5150-5250 (UNII-1)	40(5200)	Horizontal	5150(PK)	45.94	74	-28.06
			5150(Av)	34.17	54	-19.83
			5200(PK)	101.66	*	*
			5200(Av)	91.87	*	*
			10400(Pk)			
			10400(Av)			
	48(5240)	Vertical	No Harmonics found			
			5240(PK)	95.47		
			5240(Av)	85.66		
			5350(PK)	42.59	74	-31.41
			5350(Av)	29.71	54	-24.29
			10480(Pk)			
5725-5850 (UNII-3)	149(5745)	Horizontal	10480(Av)			
			5240(PK)	101.7	*	*
			5240(Av)	92.32	*	*
			5350(PK)	43.93	74	-30.07
			5350(Av)	31.71	54	-22.29
			10480(Pk)			
	157(5785)	Vertical	10480(Av)			
			5745(PK)	93.04	*	*
			5745(Av)	83.84	*	*
			11490(Pk)			
			11490(Av)			
			5745(PK)	95.71	*	*
165(5825)	157(5785)	Horizontal	5745(Av)	86.36	*	*
			11490(Pk)	55.93	68.23	-12.3
			11490(Av)	41.93	54	-12.07
			5785(PK)	94.13	*	*
			5785(Av)	85.04	*	*
			11570(Pk)	56.32	68.23	-11.91
	165(5825)	Vertical	11570(Av)	41.81	54	-12.19
			5785(PK)	97.05	*	*
			5785(Av)	87.43	*	*
			11570(Pk)	56.32	68.23	-11.91
			11570(Av)	41.81	54	-12.19
			5825(PK)	96.86	*	*

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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Data rate: 24 Mbps

Frequency Band	Channel No. or Frequency	Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5150-5250 (UNII-1)	36(5180)	Vertical	5150(PK)	48.31	74	-25.69
			5150(Av)	31.98	54	-22.02
			5180(PK)	96.35	*	*
			5180(Av)	85.63	*	*
		Horizontal	10360(Pk)	No Harmonics found		
			10360(Av)	No Harmonics found		
	40(5200)		5150(PK)	54.98	74	-19.02
	Vertical	5150(Av)	37.19	54	-16.81	
		5180(PK)	102.62	*	*	
		5180(Av)	92.68	*	*	
	Horizontal	10360(Pk)	NHF			
		10360(Av)	NHF			
		5150(PK)	43.35	74	-30.65	
5150-5250 (UNII-1)	48(5240)	Vertical	5150(Av)	30.39	54	-23.61
			5200(PK)	95.84	*	*
			5200(Av)	85.51	*	*
		Horizontal	10400(Pk)	No Harmonics found		
			10400(Av)	No Harmonics found		
			5150(PK)	46.747	74	-27.253
		Vertical	5150(Av)	34.42	54	-19.58
			5200(PK)	103.475	*	*
			5200(Av)	92.92	*	*
		Horizontal	10400(Pk)	No Harmonics found		
			10400(Av)	No Harmonics found		
			5240(PK)	95.32	*	*
5150-5250 (UNII-1)		Vertical	5240(Av)	84.99	*	*
			5350(PK)	42.99	74	-31.01
			5350(Av)	29.75	54	-24.25
		Horizontal	10480(Pk)	No Harmonics found		
			10480(Av)	No Harmonics found		
			5240(PK)	103.261	74	29.261

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5725-5850 (UNII-3)	149(5745)	Vertical	5745(PK)	93.79	*	*
			5745(Av)	83.6	*	*
			11490(Pk)	55.75	68.23	-12.48
			11490(Av)	41.69	54	-12.31
		Horizontal	5745(PK)	96.95	*	*
			5745(Av)	86.74	*	*
			11490(Pk)	55.713	68.23	-12.517
			11490(Av)	41.77	54	-12.23
	157(5785)	Vertical	5785(PK)	95.19	*	*
			5785(Av)	85.01	*	*
			11570(Pk)	56.225	68.23	-12.005
			11570(Av)	41.832	54	-12.168
		Horizontal	5785(PK)	97.68	*	*
			5785(Av)	87.75	*	*
			11570(Pk)	55.4	68.23	-12.83
			11570(Av)	41.713	54	-12.287
	165(5825)	Vertical	5825(PK)	93.73	*	*
			5825(Av)	87.07	*	*
			11650(Pk)	55.648	68.23	-12.582
			11650(Av)	41.847	54	-12.153
		Horizontal	5825(PK)	98.92	*	*
			5825(Av)	88.6	*	*
			11650(Pk)	56.605	68.23	-11.625
			11650(Av)	41.654	54	-12.346

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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Data rate: 54 Mbps

Frequency Band	Channel No. or Frequency	Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5150-5250 (UNII-1)	36(5180)	Vertical	5150(PK)	45.383	74	-28.617
			5150(Av)	30.643	54	-23.357
			5180(PK)	93.974	*	*
			5180(Av)	83.952	*	*
		Horizontal	10360(Pk)	No Harmonics found		
			10360(Av)	No Harmonics found		
	40(5200)		5150(PK)	50.499	74	-23.501
	Vertical	5150(Av)	33.177	54	-20.823	
		5180(PK)	100.461	*	*	
		5180(Av)	89.918	*	*	
	Horizontal	10360(Pk)	No Harmonics found			
		10360(Av)	No Harmonics found			
	48(5240)	Vertical	5150(PK)	42.825	74	-31.175
			5150(Av)	30.071	54	-23.929
			5200(PK)	92.916	*	*
			5200(Av)	82.753	*	*
			10400(Pk)	No Harmonics found		
			10400(Av)	No Harmonics found		
		Horizontal	5150(PK)	44	74	-30
			5150(Av)	31.73	54	-22.27
			5200(PK)	98.93	*	*
			5200(Av)	89.04	*	*
			10400(Pk)	No Harmonics found		
			10400(Av)	No Harmonics found		

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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5725-5850 (UNII-3)	149(5745)	Vertical	5745(PK)	92.37	*	*
			5745(Av)	81.49	*	*
			11490(Pk)	56.57	68.23	-11.66
			11490(Av)	41.79	54	-12.21
		Horizontal	5745(PK)	95.6	*	*
			5745(Av)	85.03	*	*
			11490(Pk)	55.75	68.23	-12.48
			11490(Av)	41.77	54	-12.23
	157(5785)	Vertical	5785(PK)	93.93	*	*
			5785(Av)	82.92	*	*
			11570(Pk)	55.71	68.23	-12.52
			11570(Av)	41.77	54	-12.23
		Horizontal	5785(PK)	96.09	*	*
			5785(Av)	85.86	*	*
			11570(Pk)	55.98	68.23	-12.25
			11570(Av)	41.73	54	-12.27
	165(5825)	Vertical	5825(PK)	96.323	*	*
			5825(Av)	85.321	*	*
			11650(Pk)	56.01	68.23	-12.22
			11650(Av)	41.67	54	-12.33
		Horizontal	5825(PK)	97.84	*	*
			5825(Av)	86.77	*	*
			11650(Pk)	56.41	68.23	-11.82
			11650(Av)	41.63	54	-12.37

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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Data rate: MCS0

Frequency Band	Channel No. or Frequency	Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
36(5180)	Vertical	5150(PK)	51.63	74	-22.37	
		5150(Av)	31.47	54	-22.53	
		5180(PK)	93.971	*	*	
		5180(Av)	84.03	*	*	
		10360(Pk)		No Harmonics found		
		10360(Av)		No Harmonics found		
	Horizontal	5150(PK)	58.22	74	-15.78	
		5150(Av)	35.92	54	-18.08	
		5180(PK)	100.543	*	*	
		5180(Av)	90.79	*	*	
		10360(Pk)		No Harmonics found		
		10360(Av)		No Harmonics found		
5150-5250 (UNII-1)	Vertical	5150(PK)	42.77	74	-31.23	
		5150(Av)	30.03	54	-23.97	
		5200(PK)	94.03	*	*	
		5200(Av)	84.14	*	*	
		10400(Pk)		No Harmonics found		
		10400(Av)		No Harmonics found		
	Horizontal	5150(PK)	43.9	74	-30.1	
		5150(Av)	31.96	54	-22.04	
		5200(PK)	100.46	*	*	
		5200(Av)	90.52	*	*	
		10400(Pk)		No Harmonics found		
		10400(Av)		No Harmonics found		
48(5240)	Vertical	5240(PK)	94.32	*	*	
		5240(Av)	84.5	*	*	
		5350(PK)	42.65	74	-31.35	
		5350(Av)	29.59	54	-24.41	
		10480(Pk)		No Harmonics found		
		10480(Av)		No Harmonics found		
	Horizontal	5240(PK)	101.528	*	*	
		5240(Av)	91.79	*	*	
		5350(PK)	43.61	74	-30.39	
		5350(Av)	31.38	54	-22.62	
		10480(Pk)		No Harmonics found		
		10480(Av)		No Harmonics found		

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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Frequency Band	Channel No. or Frequency	Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5725-5850 (UNII-3)	149(5745)	Vertical	5745(PK)	92.35	*	*
			5745(Av)	82.65	*	*
			11490(Pk)	55.83	68.23	-12.4
			11490(Av)	41.89	54	-12.11
	157(5785)	Horizontal	5745(PK)	95.81	*	*
			5745(Av)	86.11	*	*
			11490(Pk)	55.7	68.23	-12.53
			11490(Av)	41.87	54	-12.13
	165(5825)	Vertical	5785(PK)	93.83	*	*
			5785(Av)	83.8	*	*
			11570(Pk)	55.37	68.23	-12.86
			11570(Av)	41.75	54	-12.25
	165(5825)	Horizontal	5785(PK)	96.55	*	*
			5785(Av)	86.95	*	*
			11570(Pk)	56.09	68.23	-12.14
			11570(Av)	41.71	54	-12.29

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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Protocol: 802.11n

Data rate: MCS4

Frequency Band	Channel No. or Frequency	Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5150-5250 (UNII-1)	36(5180)	Vertical	5150(PK)	47.62	74	-26.38
			5150(Av)	31.45	54	-22.55
			5180(PK)	94.8	*	*
			5180(Av)	84.26	*	*
			10360(Pk)	No Harmonics found		
			10360(Av)	No Harmonics found		
	40(5200)	Horizontal	5150(PK)	54.22	74	-19.78
			5150(Av)	34.12	54	-19.88
			5180(PK)	100.04	*	*
			5180(Av)	89.5	*	*
			10360(Pk)	No Harmonics found		
			10360(Av)	No Harmonics found		
	48(5240)	Vertical	5150(PK)	42.22	74	-31.78
			5150(Av)	30.07	54	-23.93
			5200(PK)	93.1	*	*
			5200(Av)	82.58	*	*
			10400(Pk)	No Harmonics found		
			10400(Av)	No Harmonics found		
		Horizontal	5150(PK)	43.74	74	-30.26
			5150(Av)	31.93	54	-22.07
			5200(PK)	100.77	*	*
			5200(Av)	90.21	*	*
			10400(Pk)	No Harmonics found		
			10400(Av)	No Harmonics found		

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5725-5850 (UNII-3)	149(5745)	Vertical	5745(PK)	92.77	*	*
			5745(Av)	82.34	*	*
			11490(Pk)	55.08	68.23	-13.15
			11490(Av)	41.78	54	-12.22
		Horizontal	5745(PK)	95.58	*	*
			5745(Av)	85.14	*	*
			11490(Pk)	56.44	68.23	-11.79
			11490(Av)	41.79	54	-12.21
5725-5850 (UNII-3)	157(5785)	Vertical	5785(PK)	94.24	*	*
			5785(Av)	83.85	*	*
			11570(Pk)	55.6	68.23	-12.63
			11570(Av)	41.79	54	-12.21
		Horizontal	5785(PK)	97.01	*	*
			5785(Av)	86.56	*	*
			11570(Pk)	55.56	68.23	-12.67
			11570(Av)	41.77	54	-12.23
	165(5825)	Vertical	5825(PK)	96.56	*	*
			5825(Av)	86.14	*	*
			11650(Pk)	55.91	68.23	-12.32
			11650(Av)	41.73	54	-12.27
		Horizontal	5825(PK)	97.9	*	*
			5825(Av)	87.37	*	*

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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Frequency Band	Channel No. or Frequency	Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5150-5250 (UNII-1)	36(5180)	Vertical	5150(PK)	46.79	74	-27.21
			5150(Av)	30.49	54	-23.51
			5180(PK)	91.52	*	*
			5180(Av)	80.53	*	*
			10360(Pk)	No Harmonics found		
			10360(Av)	No Harmonics found		
	40(5200)	Horizontal	5150(PK)	52.92	74	-21.08
			5150(Av)	32.57	54	-21.43
			5180(PK)	98.6	*	*
			5180(Av)	87.67	*	*
			10360(Pk)	No Harmonics found		
			10360(Av)	No Harmonics found		
	48(5240)	Vertical	5150(PK)	42.42	74	-31.58
			5150(Av)	29.98	54	-24.02
			5200(PK)	91.53	*	*
			5200(Av)	80.56	*	*
			10400(Pk)	No Harmonics found		
			10400(Av)	No Harmonics found		
		Horizontal	5150(PK)	44.12	74	-29.88
			5150(Av)	31.54	54	-22.46
			5200(PK)	99.13	*	*
			5200(Av)	88.1	*	*
			10400(Pk)	No Harmonics found		
			10400(Av)	No Harmonics found		

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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5725-5850 (UNII-3)	149(5745)	Vertical	5745(PK)	90.65	*	*
			5745(Av)	79.88	*	*
			11490(Pk)	57.25	68.23	-10.98
			11490(Av)	41.89	54	-12.11
		Horizontal	5745(PK)	93.17	*	*
			5745(Av)	82.15	*	*
			11490(Pk)	55.52	68.23	-12.71
			11490(Av)		54	-54
	157(5785)	Vertical	5785(PK)	91.81	*	*
			5785(Av)	81.08	*	*
			11570(Pk)	55.68	68.23	-12.55
			11570(Av)	41.79	54	-12.21
		Horizontal	5785(PK)	94.21	*	*
			5785(Av)	83.41	*	*
			11570(Pk)	56.19	68.23	-12.04
			11570(Av)	41.83	54	-12.17
	165(5825)	Vertical	5825(PK)	94.49	*	*
			5825(Av)	83.72	*	*
			11650(Pk)	56.2	68.23	-12.03
			11650(Av)	41.84	54	-12.16
		Horizontal	5825(PK)	96.04	*	*
			5825(Av)	85.11	*	*
			11650(Pk)	56.22	68.23	-12.01
			11650(Av)	41.73	54	-12.27

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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DFS Band

Protocol: 802.11a

Data rate: 6 Mbps

Frequency Band	Channel No. or Frequency	Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5250-5350 (UNII-2A)	52(5260)	Vertical	5350(PK)	42.34	74	-31.66
			5350(Av)	29.74	54	-24.26
			5260(PK)	93.55	*	*
			5260(Av)	84.36	*	*
			10520(Pk)	No Harmonics found		
			10520(Av)	No Harmonics found		
	64(5320)	Horizontal	5350(PK)	42.97	74	-31.03
			5350(Av)	31.43	54	-22.57
			5260(PK)	100.93	*	*
			5260(Av)	91.23	*	*
			10520(Pk)	No Harmonics found		
			10520(Av)	No Harmonics found		
		Vertical	5350(PK)	48.59	74	-25.41
			5350(Av)	30.47	54	-23.53
			5320(PK)	92.08	*	*
			5320(Av)	82.17	*	*
			10640(Pk)	No Harmonics found		
			10640(Av)	No Harmonics found		
		Horizontal	5350(PK)	57.2	74	-16.8
			5350(Av)	34.33	54	-19.67
			5320(PK)	100.21	*	*
			5320(Av)	90.46	*	*
			10640(Pk)	No Harmonics found		
			10640(Av)	No Harmonics found		

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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Frequency Band	Channel No. or Frequency	Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5470-5725 (UNII-2C)	100(5500)	Vertical	5460(PK)	52.1	74	-21.9
			5460(Av)	30.86	54	-23.14
			5470(PK)	57.33	74	-16.67
			5470(Av)	35.83	54	-18.17
			5500(PK)	90.78	*	*
			5500(Av)	81.71	*	*
			11000(Pk)	55.66	68.23	-12.57
			11000(Av)	41.59	54	-12.41
	120(5600)	Horizontal	5460(PK)	60.99	74	-13.01
			5460(Av)	35.24	54	-18.76
			5470(PK)	67.06	74	-6.94
			5470(Av)	43.3	54	-10.7
			5500(PK)	98.79	*	*
			5500(Av)	89.2	*	*
			11000(Pk)	56.37	68.23	-11.86
			11000(Av)	41.53	54	-12.47
	140(5700)	Vertical	5600(Pk)	90.38	*	*
			5600(Av)	81.64	*	*
			11200(PK)	55.41	68.23	-12.82
			11200(Av)	40.66	54	-13.34
		Horizontal	5600(Pk)	96.92	*	*
			5600(Av)	87.75	*	*
			11200(PK)	54.81	68.23	-13.42
			11200(Av)	40.77	54	-13.23
		Vertical	5700(Pk)	93.3	*	*
			5700(Av)	84.004	*	*
			11400(PK)	55.99	68.23	-12.24
			11400(Av)	41.753	54	-12.247
		Horizontal	5700(Pk)	97.34	*	*
			5700(Av)	87.86	*	*
			11400(PK)	56.88	68.23	-11.35
			11400(Av)	41.75	54	-12.25

*=> Fundamental frequency

Pk-> Peak

Av-> Average

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Data rate: 24 Mbps

Frequency Band	Channel No. or Frequency	Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5250-5350 (UNII-2A)	52(5260)	Vertical	5350(PK)	41.9	74	-32.1
			5350(Av)	29.56	54	-24.44
			5260(PK)	93.52	*	*
			5260(Av)	83.15	*	*
			10520(Pk)	No Harmonics found		
			10520(Av)	No Harmonics found		
	64(5320)	Horizontal	5350(PK)	42.44	74	-31.56
			5350(Av)	30.08	54	-23.92
			5260(PK)	97.97	*	*
			5260(Av)	87.28	*	*
			10520(Pk)	No Harmonics found		
			10520(Av)	No Harmonics found		
			5350(PK)	46.12	74	-27.88
			5350(Av)	30.54	54	-23.46
			5320(PK)	93.06	*	*
			5320(Av)	82.49	*	*
			10640(Pk)	No Harmonics found		
			10640(Av)	No Harmonics found		
			5350(PK)	49.88	74	-24.12
			5350(Av)	32.23	54	-21.77
			5320(PK)	97.59	*	*
			5320(Av)	86.96	*	*
			10640(Pk)	No Harmonics found		
			10640(Av)	No Harmonics found		

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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Frequency Band	Channel No. or Frequency	Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5470-5725 (UNII-2C)	100(5500)	Vertical	5460(PK)	48.07	74	-25.93
			5460(Av)	31.22	54	-22.78
			5470(PK)	55.71	74	-18.29
			5470(Av)	36.69	54	-17.31
			5500(PK)	93.04	*	*
			5500(Av)	82.47	*	*
			11000(Pk)	55	68.23	-13.23
			11000(Av)	41.28	54	-12.72
	120(5600)	Horizontal	5460(PK)	51.26	74	-22.74
			5460(Av)	32.46	54	-21.54
			5470(PK)	58.77	74	-15.23
			5470(Av)	39.09	54	-14.91
			5500(PK)	95.29	*	*
			5500(Av)	85.14	*	*
			11000(Pk)	55.5	68.23	-12.73
			11000(Av)	41.19	54	-12.81
140(5700)	120(5600)	Vertical	5600(Pk)	93.09	*	*
			5600(Av)	82.84	*	*
			11200(PK)	54.57	68.23	-13.66
			11200(Av)	40.85	54	-13.15
	140(5700)	Horizontal	5600(Pk)	94.83	*	*
			5600(Av)	84.59	*	*
			11200(PK)	54.13	68.23	-14.1
			11200(Av)	40.29	54	-13.71
	140(5700)	Vertical	5700(Pk)	95.82	*	*
			5700(Av)	85.67	*	*
			11400(PK)	55.24	68.23	-12.99
			11400(Av)	41.23	54	-12.77
		Horizontal	5700(Pk)	95.36	*	*
			5700(Av)	85.32	*	*
			11400(PK)	55.31	68.23	-12.92
			11400(Av)	41.04	54	-12.96

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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*Test Report No.:***ULR-TC56881930000051F 001****Seite 66 von 8**
*Page 66 of 8***Data rate: 54 Mbps**

Frequency Band	Channel No. or Frequency	Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5250-5350 (UNII-2A)	52(5260)	Vertical	5350(PK)	42.5	74	-31.5
			5350(Av)	29.9	54	-24.1
			5260(PK)	93.28	*	*
			5260(Av)	82.92	*	*
			10520(Pk)	No Harmonics found		
			10520(Av)	No Harmonics found		
		Horizontal	5350(PK)	43.09	74	-30.91
			5350(Av)	31.19	54	-22.81
			5260(PK)	100.16	*	*
			5260(Av)	89.23	*	*
			10520(Pk)	No Harmonics found		
			10520(Av)	No Harmonics found		
	64(5320)	Vertical	5350(PK)	47.43	74	-26.57
			5350(Av)	30.64	54	-23.36
			5320(PK)	93.18	*	*
			5320(Av)	82.44	*	*
			10640(Pk)	No Harmonics found		
			10640(Av)	No Harmonics found		
		Horizontal	5350(PK)	53.31	74	-20.69
			5350(Av)	33.22	54	-20.78
			5320(PK)	99.69	*	*
			5320(Av)	88.75	*	*
			10640(Pk)	No Harmonics found		
			10640(Av)	No Harmonics found		

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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Test Report No.:**ULR-TC56881930000051F 001****Seite 67 von 8**
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Frequency Band	Channel No. or Frequency	Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5470-5725 (UNII-2C)	100(5500)	Vertical	5460(PK)	43.17	74	-30.83
			5460(Av)	30.25	54	-23.75
			5470(PK)	52.31	74	-21.69
			5470(Av)	32.16	54	-21.84
			5500(PK)	89.99	*	*
			5500(Av)	79.68	*	*
			11000(Pk)	54.71	68.23	-13.52
			11000(Av)	41.08	54	-12.92
	120(5600)	Horizontal	5460(PK)	48.77	74	-25.23
			5460(Av)	31.45	54	-22.55
			5470(PK)	56.26	74	-17.74
			5470(Av)	35.12	54	-18.88
			5500(PK)	96.12	*	*
			5500(Av)	85.29	*	*
			11000(Pk)	55.44	68.23	-12.79
			11000(Av)	41.04	54	-12.96
	140(5700)	Vertical	5600(Pk)	91.33	*	*
			5600(Av)	80.53	*	*
			11200(PK)	54.57	68.23	-13.66
			11200(Av)	40.43	54	-13.57
		Horizontal	5600(Pk)	95.03	*	*
			5600(Av)	84.68	*	*
			11200(PK)	54.01	68.23	-14.22
			11200(Av)	40.25	54	-13.75
		Vertical	5700(Pk)	94.24	*	*
			5700(Av)	83.68	*	*
			11400(PK)	55.02	68.23	-13.21
			11400(Av)	41.26	54	-12.74
		Horizontal	5700(Pk)	95.38	*	*
			5700(Av)	84.72	*	*
			11400(PK)	55.06	68.23	-13.17
			11400(Av)	41.04	54	-12.96

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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Page 68 of 8**Protocol: 802.11n****Data rate: MCS0**

Frequency Band	Channel No. or Frequency	Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	
5250-5350 (UNII-2A)	52(5260)	Vertical	5350(PK)	42.4	74	-31.6	
			5350(Av)	29.99	54	-24.01	
			5260(PK)	93.49	*	*	
			5260(Av)	83.71	*	*	
		Horizontal	10520(Pk)	No Harmonics found			
			10520(Av)	No Harmonics found			
	64(5320)	Vertical	5350(PK)	43.29	74	-30.71	
			5350(Av)	31.01	54	-22.99	
			5260(PK)	98.75	*	*	
			5260(Av)	88.85	*	*	
		Horizontal	10520(Pk)	No Harmonics found			
			10520(Av)	No Harmonics found			

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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Frequency Band	Channel No. or Frequency	Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5470-5725 (UNII-2C)	100(5500)	Vertical	5460(PK)	47.57	74	-26.43
			5460(Av)	30.77	54	-23.23
			5470(PK)	57.36	74	-16.64
			5470(Av)	35.48	54	-18.52
			5500(PK)	90.12	*	*
			5500(Av)	80.25	*	*
			11000(Pk)	55.03	68.23	-13.2
			11000(Av)	41.29	54	-12.71
			5460(PK)	54	74	-20
	120(5600)	Horizontal	5460(Av)	32.95	54	-21.05
			5470(PK)	63.3	74	-10.7
			5470(Av)	40.3	54	-13.7
			5500(PK)	96.11	*	*
			5500(Av)	86.36	*	*
			11000(Pk)	54.89	68.23	-13.34
			11000(Av)	41.28	54	-12.72
			5600(Pk)	92.02	*	*
			5600(Av)	82.06	*	*
140(5700)	Vertical	Vertical	11200(PK)	54.66	68.23	-13.57
			11200(Av)	40.26	54	-13.74
			5600(Pk)	94.88	*	*
			5600(Av)	85.25	*	*
	Horizontal	Horizontal	11200(PK)	55.07	68.23	-13.16
			11200(Av)	40.27	54	-13.73
			5700(Pk)	93.91	*	*
			5700(Av)	84.27	*	*
	Vertical	Vertical	11400(PK)	55.18	68.23	-13.05
			11400(Av)	41.34	54	-12.66
			5700(Pk)	94.75	*	*
			5700(Av)	85.1	*	*
	Horizontal	Horizontal	11400(PK)	55.43	68.23	-12.8
			11400(Av)	41.22	54	-12.78

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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Data rate: MCS4

Frequency Band	Channel No. or Frequency	Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	
5250-5350 (UNII-2A)	52(5260)	Vertical	5350(PK)	42.46	74	-31.54	
			5350(Av)	29.86	54	-24.14	
			5260(PK)	92.76	*	*	
			5260(Av)	82.29	*	*	
			10520(Pk)	No Harmonics found			
			10520(Av)	No Harmonics found			
	64(5320)	Horizontal	5350(PK)	43.31	74	-30.69	
			5350(Av)	31.11	54	-22.89	
			5260(PK)	99.68	*	*	
			5260(Av)	89.14	*	*	
			10520(Pk)	No Harmonics found			
			10520(Av)	No Harmonics found			
		Vertical	5350(PK)	45.33	74	-28.67	
			5350(Av)	30.18	54	-23.82	
			5320(PK)	91.74	*	*	
			5320(Av)	81.3	*	*	
			10640(Pk)	No Harmonics found			
			10640(Av)	No Harmonics found			
		Horizontal	5350(PK)	48.66	74	-25.34	
			5350(Av)	32.41	54	-21.59	
			5320(PK)	98.2	*	*	
			5320(Av)	87.7	*	*	
			10640(Pk)	No Harmonics found			
			10640(Av)	No Harmonics found			

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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Frequency Band	Channel No. or Frequency	Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5470-5725 (UNII-2C)	100(5500)	Vertical	5460(PK)	47.83	74	-26.17
			5460(Av)	31.38	54	-22.62
			5470(PK)	56.51	74	-17.49
			5470(Av)	36.97	54	-17.03
			5500(PK)	92.97	*	*
			5500(Av)	82.55	*	*
			11000(Pk)	55.57	68.23	-12.66
			11000(Av)	40.98	54	-13.02
	120(5600)	Horizontal	5460(PK)	54.19	74	-19.81
			5460(Av)	33.91	54	-20.09
			5470(PK)	60.64	74	-13.36
			5470(Av)	41.06	54	-12.94
			5500(PK)	96.98	*	*
			5500(Av)	86.52	*	*
			11000(Pk)	54.91	68.23	-13.32
			11000(Av)	40.89	54	-13.11
140(5700)	Vertical	Vertical	5600(Pk)	91.92	*	*
			5600(Av)	81.55	*	*
			11200(PK)	55.05	68.23	-13.18
			11200(Av)	40.41	54	-13.59
	Horizontal	Horizontal	5600(Pk)	95.30	*	*
			5600(Av)	84.83	*	*
			11200(PK)	55.09	68.23	-13.14
			11200(Av)	40.23	54	-13.77
	Vertical	Vertical	5700(Pk)	94.19	*	*
			5700(Av)	83.85	*	*
			11400(PK)	55.27	68.23	-12.96
			11400(Av)	40.6	54	-13.40
	Horizontal	Horizontal	5700(Pk)	96.02	*	*
			5700(Av)	85.64	*	*
			11400(PK)	55.09	68.23	-13.14
			11400(Av)	40.39	54	-13.61

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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*Page 72 of 8***Data rate: MCS7**

Frequency Band	Channel No. or Frequency	Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5250-5350 (UNII-2A)	52(5260)	Vertical	5350(PK)	43.35	74	-30.65
			5350(Av)	29.84	54	-24.16
			5260(PK)	93.87	*	*
			5260(Av)	82.63	*	*
			10520(Pk)	No Harmonics found		
			10520(Av)	No Harmonics found		
	64(5320)	Horizontal	5350(PK)	43.01	74	-30.99
			5350(Av)	30.94	54	-23.06
			5260(PK)	99.92	*	*
			5260(Av)	88.93	*	*
			10520(Pk)	No Harmonics found		
			10520(Av)	No Harmonics found		
		Vertical	5350(PK)	51.04	74	-22.96
			5350(Av)	30.90	54	-23.1
			5320(PK)	94.23	*	*
			5320(Av)	83.40	*	*
			10640(Pk)	No Harmonics found		
			10640(Av)	No Harmonics found		
		Horizontal	5350(PK)	56.27	74	-17.73
			5350(Av)	33.05	54	-20.95
			5320(PK)	99.842	*	*
			5320(Av)	88.88	*	*
			10640(Pk)	No Harmonics found		
			10640(Av)	No Harmonics found		

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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Frequency Band	Channel No. or Frequency	Polarization	Frequency (MHz)	Emission level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5470-5725 (UNII-2C)	100(5500)	Vertical	5460(PK)	45.15	74	-28.85
			5460(Av)	30.25	54	-23.75
			5470(PK)	53.82	74	-20.18
			5470(Av)	32.67	54	-21.33
			5500(PK)	89.70	*	*
		Horizontal	5500(Av)	78.77	*	*
			11000(Pk)	55.03	68.23	-13.20
			11000(Av)	41.04	54	-12.96
			5460(PK)	49.59	74	-24.41
			5460(Av)	31.25	54	-22.75
	120(5600)	Vertical	5470(PK)	57.76	74	-16.24
			5470(Av)	35.35	54	-18.65
			5500(PK)	95.46	*	*
			5500(Av)	84.52	*	*
			11000(Pk)	55.19	68.23	-13.04
		Horizontal	11000(Av)	41.00	54	-13.00
			5600(Pk)	90.73	*	*
			5600(Av)	79.94	*	*
			11200(PK)	53.88	68.23	-14.35
			11200(Av)	40.41	54	-13.59
	140(5700)	Vertical	5600(Pk)	94.72	*	*
			5600(Av)	83.56	*	*
			11200(PK)	53.93	68.23	-14.3
			11200(Av)	40.29	54	-13.71
			5700(Pk)	92.87	*	*
		Horizontal	5700(Av)	82.09	*	*
			11400(PK)	55.17	68.23	-13.06
			11400(Av)	40.52	54	-13.48
			5700(Pk)	94.39	*	*
			5700(Av)	83.61	*	*
		Horizontal	11400(PK)	54.85	68.23	-13.38
			11400(Av)	40.45	54	-13.55

*-> Fundamental frequency

Pk-> Peak

Av-> Average

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7 Conducted Emission Test on A.C. Power Line

Result

Pass

Test Specification : FCC Part 15 Section 15.207
Test Method : ANSI C63.10-2013
Testing Location : Screened room
Measurement Bandwidth : 9kHz
Frequency Range : 150kHz – 30MHz
Supply Voltage : 110VAC,60Hz

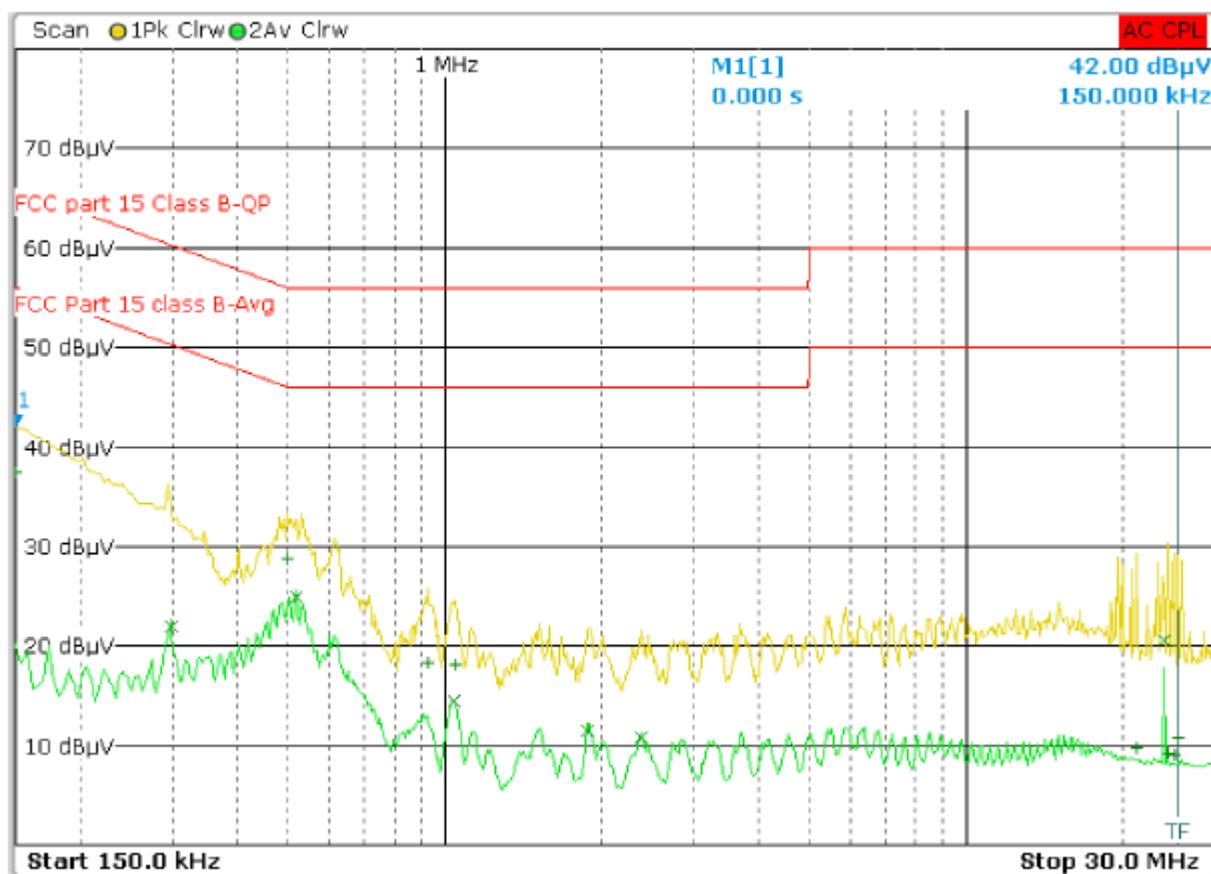
Limit of section 15.207

Frequency of emission (MHz)	QP Limit (dB μ V)	AV Limit (dB μ V/m)
0.15 – 0.5	66 – 56*	56 – 46*
0.5 – 5	56	46
5 – 30	60	50

* Decreases with the logarithm of the frequency

Test Result: LINE Graphs and Tables

110v AC , 60Hz



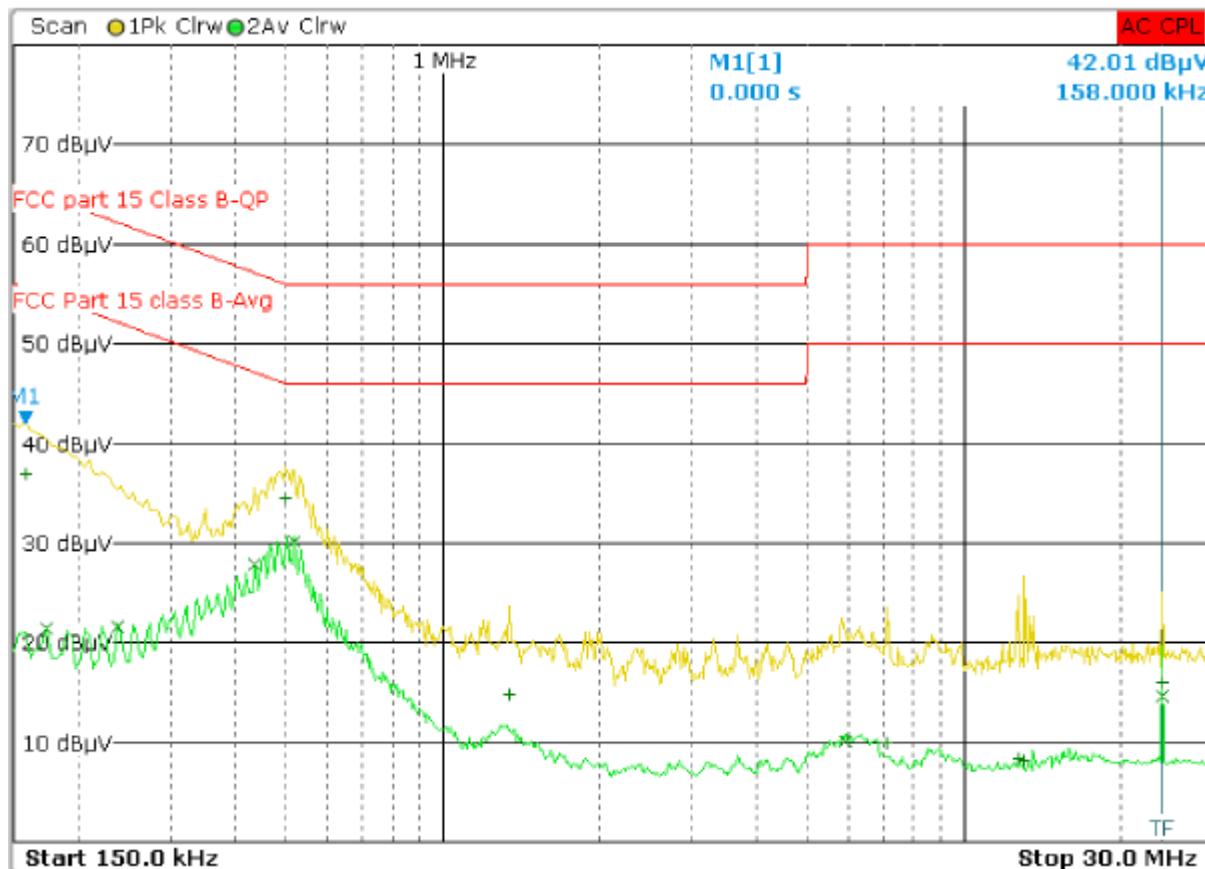
Line Graph

Trace	Frequency	Level (dB μ V)	Phase	Detector	Delta Limit/dB
2	518.000000000 kHz	24.85		Average	-21.15
1	498.000000000 kHz	28.82		Quasi Peak	-27.21
2	298.000000000 kHz	22.00		Average	-28.30
1	150.000000000 kHz	37.45		Quasi Peak	-28.55
2	24.026000000 MHz	20.52		Average	-29.48
2	1.038000000 MHz	14.42		Average	-31.58
2	1.882000000 MHz	11.55		Average	-34.45
2	2.382000000 MHz	10.79		Average	-35.21
1	926.000000000 kHz	18.25		Quasi Peak	-37.75
1	1.050000000 MHz	18.14		Quasi Peak	-37.86
1	25.602000000 MHz	10.75		Quasi Peak	-49.25
1	21.186000000 MHz	9.68		Quasi Peak	-50.32
1	24.346000000 MHz	9.20		Quasi Peak	-50.80
1	25.194000000 MHz	9.11		Quasi Peak	-50.89

Line Table

Test Result: Neutral Graphs and Tables

110v AC , 60Hz



Neutral Graph

Trace	Frequency	Level (dB μ V)	Phase	Detector	Delta Limit/dB
2	518.000000000 kHz	30.20		Average	-15.80
2	434.000000000 kHz	27.80		Average	-19.38
1	498.000000000 kHz	34.51		Quasi Peak	-21.52
1	158.000000000 kHz	36.99		Quasi Peak	-28.58
2	238.000000000 kHz	21.59		Average	-30.58
2	174.000000000 kHz	21.50		Average	-33.27
2	24.026000000 MHz	14.60		Average	-35.40
2	5.906000000 MHz	10.07		Average	-39.93
1	1.338000000 MHz	14.86		Quasi Peak	-41.14
1	24.026000000 MHz	16.05		Quasi Peak	-43.95
1	7.122000000 MHz	10.01		Quasi Peak	-49.99
1	12.734000000 MHz	8.30		Quasi Peak	-51.70
1	13.066000000 MHz	8.12		Quasi Peak	-51.88

Neutral Table

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Power Level settings used during the test

Non-DFS

Band	Channel Frequency	Channel number	Data rate/ respected power levels					
			6Mbps	24Mbps	54Mbps	MCS0	MCS4	MCS7
UNII-1	5180	36	11	11	9	10	10	8
	5200	40	11	11	9	10	10	8
	5240	48	11	11	9	10	10	8
UNII-3	5745	149	10	10	8	9	9	7
	5785	157	10	10	8	9	9	7
	5825	165	10	10	8	9	9	7

DFS

Band	Channel Frequency	Channel number	Data rate/ respected power levels					
			6Mbps	24Mbps	54Mbps	MCS0	MCS4	MCS7
UNII 2A	5260	52	9	9	9	8	8	8
	5320	64	9	9	9	8	8	8
UNII 2C	5500	100	9	9	7	8	8	6
	5600	120	9	9	7	8	8	6
	5700	140	9	9	7	8	8	6

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