Bundesnetzagentur TEST R Bundesnetzagentur TEST R Bundesnetzagentur TEST R Bundesnetzagentur TEST R	Deutsche Akkreditierungsstelle
Testing laboratory	Applicant
CTC advanced GmbH Untertuerkheimer Strasse 6 – 10 66117 Saarbruecken / Germany Phone: + 49 681 5 98 - 0 Fax: + 49 681 5 98 - 9075 Internet: http://www.ctcadvanced.com e-mail: mail@ctcadvanced.com Accredited Testing Laboratory: The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS) The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-03	Ingenico Group 9 Avenue de la Gare Rovaltain 26958 Valence Cedex 9 / FRANCE Phone: -/- Contact: Nicolas Jacquemont e-mail: <u>nicolas.jacquemont@ingenico.com</u> Phone: +33 4 75 84 21 23 Manufacturer Ingenico Group 9 Avenue de la Gare Rovaltain 26958 Valence Cedex 9 / FRANCE
Test sta	ndard/s
FCC - Title 47 CFRFCC - Title 47 of the Code ofPart 15frequency devices	Federal Regulations; Chapter I; Part 15 - Radio
RSS - 210 Issue 9 Spectrum Management and T Licence-Exempt Radio Appar	elecommunications Radio Standards Specification - atus: Category I Equipment
	elecommunications Radio Standards Specification

Test Item							
Kind of test item:	Payment terminal						
Model name:	AXIUM D7 CL/4G/WIFI/BT						
FCC ID:	XKB-AXICL4GWBT						
IC:	2586D-AXICL4GWBT						
Frequency:	U-NII bands: U-NII-1; U-NII-2A & 2C; U-NII-3						
Technology tested:	WLAN						
Antenna:	Integrated antenna						
Power supply:	3.7 V DC by Li-polymer battery 115 V AC by mains adapter						
Temperature range:	0°C to +50°C						

For further applied test standards please refer to section 3 of this test report.

This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test report authorized:

Andreas Luckenbill Lab Manager Radio Communications & EMC

Test performed:

p.o.

Sebastian Janoschka Testing Manager Radio Communications & EMC



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2 General information

2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CTC advanced GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.

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2.2 Application details

Date of receipt of order:	2018-09-21
Date of receipt of test item:	2018-09-21
Start of test:	2018-10-29
End of test:	2019-02-26
Person(s) present during the test:	-/-

2.3 Test laboratories sub-contracted

None

3 Test standard/s and references

Test standard	Date	Description
FCC - Title 47 CFR Part 15	-/-	FCC - Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices
RSS - 210 Issue 9	August 2016	Spectrum Management and Telecommunications Radio Standards Specification - Licence-Exempt Radio Apparatus: Category I Equipment
RSS - Gen Issue 5	April 2018	Spectrum Management and Telecommunications Radio Standards Specification - General Requirements for Compliance of Radio Apparatus
Guidance	Version	Description
UNII: KDB 789033 D02	v02r01	Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E American National Standard for Methods of Measurement of
ANSI C63.4-2014	-/-	Radio-Noise Emissions from Low-Voltage Electrical and Electronic
ANSI C63.10-2013	-/-	Equipment in the Range of 9 kHz to 40 GHz American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

-/-Testing of Unlicensed Wireless Devices





4 **Test environment**

Temperature		T _{nom} T _{max} T _{min}	+22 °C during room temperature tests No tests under extreme temperature conditions required. No tests under extreme temperature conditions required.
Relative humidity content	:		42 %
Barometric pressure	:		1026 hpa
Power supply		V _{nom} V _{max}	3.7 V DC by Li-polymer battery No tests under extreme voltage conditions required.
	·	Vmin	No tests under extreme voltage conditions required.

5 **Test item**

5.1 **General description**

Kind of test item :	Payment terminal
Type identification :	AXIUM D7 CL/4G/WIFI/BT
HMN :	-/-
PMN :	Axium D7
HVIN :	AXIUM D7 CL/4G/WIFI/BT
FVIN :	4.19.1
S/N serial number :	Radiated unit: 182667314091119803183628 Conducted unit:182677314091119803190341
Hardware status :	296230079
Software status :	4.19.1
Firmware status :	-/-
Frequency band :	U-NII bands: U-NII-1; U-NII-2A & 2C; U-NII-3
Type of radio transmission : Use of frequency spectrum :	OFDM
Type of modulation :	(D)BPSK, (D)QPSK, 16 – QAM, 64 – QAM
Number of channels :	24 channels @ 20 MHz bandwidth 11 channels @ 40 MHz bandwidth
Antenna :	Integrated antenna
Power supply :	3.7 V DC by Li-polymer battery 115 V AC by mains adapter
Temperature range :	0°C to +50°C

5.2 Additional information

The content of the following annexes is defined in the QA. It may be that not all of the listed annexes are necessary for this report, thus some values in between may be missing.

Test setup and EUT photos are included in test report:

1-6927/18-01-22_AnnexA 1-6927/18-01-22_AnnexB 1-6927/18-01-22_AnnexD



6 Description of the test setup

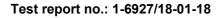
Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, RF generating and signaling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Lab/Item).

Agenda: Kind of Calibration

- k calibration / calibrated
- ne not required (k, ev, izw, zw not required)
- ev periodic self verification
- Ve long-term stability recognized
- vlkl! Attention: extended calibration interval
- NK! Attention: not calibrated

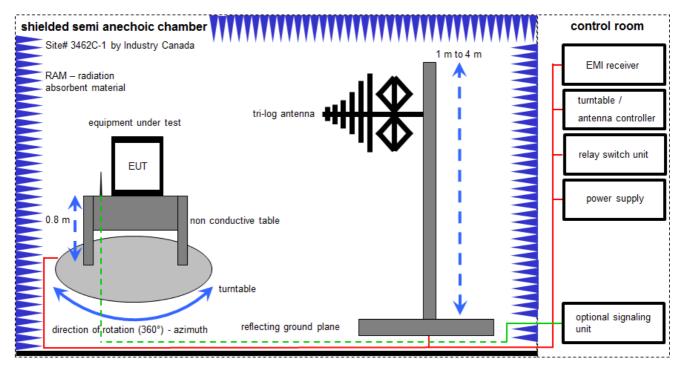
- EK limited calibration
- zw cyclical maintenance (external cyclical maintenance)
- izw internal cyclical maintenance
- g blocked for accredited testing
- *) next calibration ordered / currently in progress





6.1 Shielded semi anechoic chamber

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 30 MHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are conform to specifications ANSI C63. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analyzers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.



Measurement distance: tri-log antenna 10 meter EMC32 software version: 10.30.0

FS = UR + CL + AF

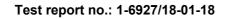
(FS-field strength; UR-voltage at the receiver; CL-loss of the cable; AF-antenna factor)

Example calculation:

FS [dBµV/m] = 12.35 [dBµV/m] + 1.90 [dB] + 16.80 [dB/m] = 31.05 [dBµV/m] (35.69 µV/m)

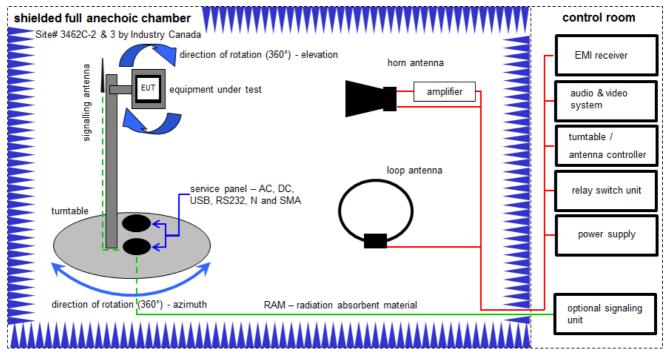
Equipment table:

No.	Lab / Item	Equipment	Туре	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	A	Switch-Unit	3488A	HP	2719A14505	300000368	ev	-/-	-/-
2	A	Meßkabine 1	HF-Absorberhalle	MWB AG 300023	-/-	300000551	ne	-/-	-/-
3	А	EMI Test Receiver	ESCI 3	R&S	100083	300003312	k	15.12.2017 12.12.2018	14.12.2018 11.12.2019
4	А	Analyzer-Reference- System (Harmonics and Flicker)	ARS 16/1	SPS	A3509 07/0 0205	300003314	vIKI!	15.01.2018	14.01.2020
5	Α	Antenna Tower	Model 2175	ETS-Lindgren	64762	300003745	izw	-/-	-/-
6	А	Positioning Controller	Model 2090	ETS-Lindgren	64672	300003746	izw	-/-	-/-
7	А	Turntable Interface- Box	Model 105637	ETS-Lindgren	44583	300003747	izw	-/-	-/-
8	А	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck Mess - Elektronik	371	300003854	vIKI!	24.11.2017	23.11.2020





6.2 Shielded fully anechoic chamber



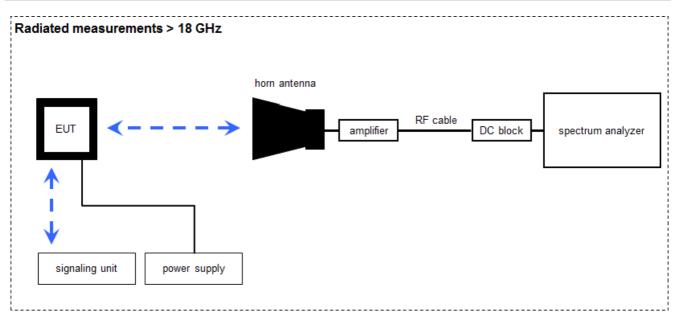
Measurement distance: horn antenna 3 meter; loop antenna 3 meter

FS = UR + CA + AF (FS-field strength; UR-voltage at the receiver; CA-loss of the signal path; AF-antenna factor)

FS $[dB\mu V/m] = 40.0 [dB\mu V/m] + (-35.8) [dB] + 32.9 [dB/m] = 37.1 [dB\mu V/m] (71.61 <math>\mu V/m$) Equipment table:

Example calculation:

	1.1.1								
No.	Lab / Item	Equipment	Туре	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	А, В	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vIKI!	07.07.2017	06.07.2019
2	С	Active Loop Antenna 9 kHz to 30 MHz	6502	EMCO	2210	300001015	viKi!	07.07.2017	06.07.2019
3	Α	Highpass Filter	WHK1.1/15G-10SS	Wainwright	37	400000148	ne	-/-	-/-
4	Α	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789	ne	-/-	-/-
5	А	Band Reject Filter	WRCG2400/2483- 2375/2505-50/10SS	Wainwright	26	300003792	ne	-/-	-/-
6	А	Broadband Amplifier 0.5-18 GHz	CBLU5184540	CERNEX	22051	300004483	ev	-/-	-/-
7	A, B, C	4U RF Switch Platform	L4491A	Agilent Technologies	MY50000032	300004510	ne	-/-	-/-
8	A, B, C	Computer	Intel Core i3 3220/3,3 GHz, Prozessor	-/-	2V2403033A54 21	300004591	ne	-/-	-/-
9	A, B, C	NEXIO EMV- Software	BAT EMC V3.16.0.49	EMCO	-/-	300004682	ne	-/-	-/-
10	A, B, C	Anechoic chamber	-/-	TDK	-/-	300003726	ne	-/-	-/-
11	A, B, C	EMI Test Receiver 9kHz-26,5GHz	ESR26	R&S	101376	300005063	k	14.12.2017 14.09.2018	13.12.2018 13.12.2019
12	А	RF Amplifier	AFS4-00100800-28- 20P-4-R	MITEQ	2008992	300005204	ne	-/-	-/-
13	А	RF-Amplifier	AMF-6F06001800- 30-10P-R	NARDA-MITEQ Inc	2011571	300005240	ev	-/-	-/-



Measurement distance: horn antenna 50 cm

FS = UR + CA + AF

(FS-field strength; UR-voltage at the receiver; CA-loss signal path & distance correction; AF-antenna factor)

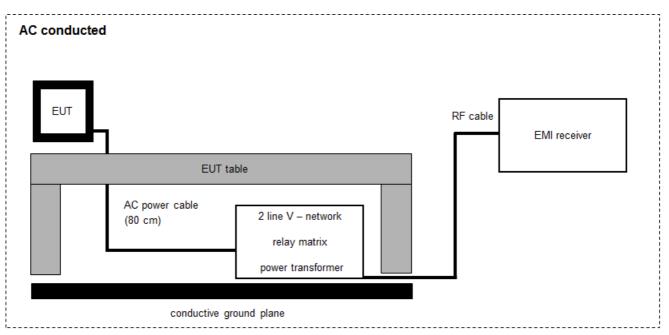
Example calculation:

 $FS [dB\mu V/m] = 40.0 [dB\mu V/m] + (-60.1) [dB] + 36.74 [dB/m] = 16.64 [dB\mu V/m] (6.79 \mu V/m)$

Equipment table:

No.	Lab / Item	Equipment	Туре	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	A	Std. Gain Horn Antenna 18.0-26.5 GHz	638	Narda	-/-	300000486	viKi!	13.12.2017	12.12.2019
2	А	Std. Gain Horn Antenna 26.5-40.0 GHz	V637	Narda	82-16	300000510	viKi!	13.12.2017	12.12.2019
3	А	Signal Analyzer 40 GHz	FSV40	R&S	101042	300004517	k	16.01.2018 17.12.2018	15.01.2019 16.12.2019
4	А	Amplifier 2-40 GHz	JS32-02004000-57- 5P	MITEQ	1777200	300004541	ev	-/-	-/-
5	А	RF-Cable	ST18/SMAm/SMAm/ 48	Huber & Suhner	Batch no. 127377	400001183	ev	-/-	-/-
6	А	DC-Blocker 0.1-40 GHz	8141A	Inmet	-/-	400001185	ev	-/-	-/-





FS = UR + CF + VC

(FS-field strength; UR-voltage at the receiver; CR-loss of the cable and filter; VC-correction factor of the ISN)

Example calculation:

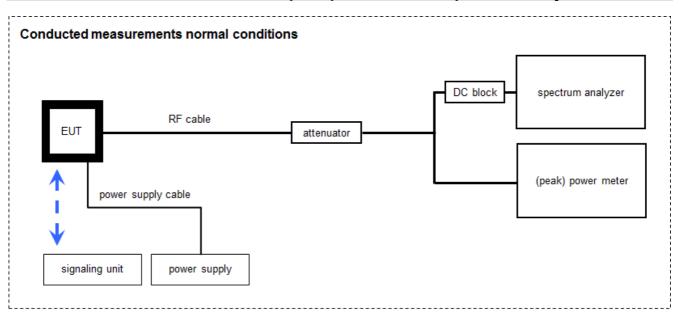
 \overline{FS} [dBµV/m] = 37.62 [dBµV/m] + 9.90 [dB] + 0.23 [dB] = 47.75 [dBµV/m] (244.06 µV/m)

Equipment table:

No.	Lab / Item	Equipment	Туре	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	А	Two-line V-Network (LISN) 9 kHz to 30 MHz	ESH3-Z5	R&S	892475/017	300002209	viKi!	13.12.2017	12.12.2019
2	Α	RF-Filter-section	85420E	HP	3427A00162	300002214	NK!	-/-	-/-
3	Α	Hochpass 150 kHz	EZ-25	R&S	100010	300003798	ev	-/-	-/-
4	А	MXE EMI Receiver 20 Hz to 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405	k	18.12.2017 12.12.2018	17.12.2018 11.12.2019

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6.5 Conducted measurements with peak power meter & spectrum analyzer



WLAN tester version: 1.1.13; LabView2015

OP = AV + CA

(OP-output power; AV-analyzer value; CA-loss signal path)

<u>Example calculation:</u> OP [dBm] = 6.0 [dBm] + 11.7 [dB] = 17.7 [dBm] (58.88 mW)

Equipment table:

No.	Lab / Item	Equipment	Туре	Manufacturer	Serial No.	INV. No.	Kind of Calibration	Last Calibration	Next Calibration
1	А	Signal Analyzer 40 GHz	FSV40	R&S	101042	300004517	k	16.01.2018 17.12.2018	15.01.2019 16.12.2019
2	А	RF-Cable	ST18/SMAm/SMAm/ 48	Huber & Suhner	Batch no. 127377	400001183	ev	-/-	-/-
3	А	DC-Blocker 0.1-40 GHz	8141A	Inmet	-/-	400001185	ev	-/-	-/-
4	А	Hygro-Thermometer	-/-, 5-45°C, 20- 100%rF	Thies Clima	-/-	400000108	ev	11.05.2018	10.05.2020
5	А	PC Tester R005	Intel Core i3 3220/3,3 GHz, Prozessor	-/-	2V2403033A45 23	300004589	ne	-/-	-/-
6	А	Teststand	Teststand Custom Sequence Editor	National Instruments GmbH	-/-	300004590	ne	-/-	-/-
7	А	RF-Cable	ST18/SMAm/SMAm/ 60	Huber & Suhner	Batch no. 606844	400001181	ev	-/-	-/-
8	А	Coax Attenuator 10 dB 2W 0-40 GHz	MCL BW-K10- 2W44+	Mini Circuits	-/-	400001186	ev	-/-	-/-
9	А	Synchron Power Meter	SPM-4	СТС	1	300005580	ev	-/-	-/-
10	А	DC-Blocker	WA7046	Weinschel Associates	-/-	400001310	ev	-/-	-/-
11	А	DC Power Supply	HMP2020	Rohde & Schwarz	102850	300005517	vlKI!	14.12.2017	13.12.2019

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7 Sequence of testing

7.1 Sequence of testing radiated spurious 9 kHz to 30 MHz

Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, it is placed on a table with 0.8 m height.
- If the EUT is a floor standing device, it is placed directly on the turn table.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 3 m (see ANSI C 63.4) see test details.
- EUT is set into operation.

Premeasurement*

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna height is 1 m.
- At each turntable position the analyzer sweeps with positive-peak detector to find the maximum of all emissions.

Final measurement

- Identified emissions during the pre-measurement are maximized by the software by rotating the turntable from 0° to 360°.
- Loop antenna is rotated about its vertical axis for maximum response at each azimuth about the EUT. (For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT)
- The final measurement is done in the position (turntable and elevation) causing the highest emissions with quasi-peak (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. A plot with the graph of the premeasurement and the limit is stored.

*)Note: The sequence will be repeated three times with different EUT orientations.



7.2 Sequence of testing radiated spurious 30 MHz to 1 GHz

Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 10 m or 3 m (see ANSI C 63.4) see test details.
- EUT is set into operation.

Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 m to 3 m.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement

- The final measurement is performed for at least six highest peaks according to the requirements of the ANSI C63.4.
- Based on antenna and turntable positions at which the peak values are measured the software maximize the peaks by changing turntable position ± 45° and antenna height between 1 and 4 m.
- The final measurement is done with quasi-peak detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement with marked maximum final results and the limit is stored.



7.3 Sequence of testing radiated spurious 1 GHz to 18 GHz

Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- If the EUT is a tabletop system, a 2-axis positioner with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed directly on the turn table.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- Measurement distance is 3 m (see ANSI C 63.4) see test details.
- EUT is set into operation.

Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height is 1.5 m.
- At each turntable position and antenna polarization the analyzer sweeps with positive peak detector to find the maximum of all emissions.

Final measurement

- The final measurement is performed for at least six highest peaks according to the requirements of the ANSI C63.4.
- Based on antenna and turntable positions at which the peak values are measured the software maximizes the peaks by rotating the turntable from 0° to 360°. This measurement is repeated for different EUT-table positions (0° to 150° in 30°-steps) and for both antenna polarizations.
- The final measurement is done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and RMS detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement with marked maximum final results and the limit is stored.



7.4 Sequence of testing radiated spurious above 18 GHz

Setup

- The equipment is set up to simulate normal operation mode as described in the user manual or defined by the manufacturer.
- Auxiliary equipment and cables are positioned to simulate normal operation conditions as described in ANSI C 63.4.
- The AC power port of the EUT (if available) is connected to a power outlet.
- The measurement distance is as appropriate (e.g. 0.5 m).
- The EUT is set into operation.

Premeasurement

• The test antenna is handheld and moved carefully over the EUT to cover the EUT's whole sphere and different polarizations of the antenna.

Final measurement

- The final measurement is performed at the position and antenna orientation causing the highest emissions with Peak and RMS detector (as described in ANSI C 63.4).
- Final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement and the limit is stored.



8 **Measurement uncertainty**

Measurement uncertainty						
Test case	Uncer	Uncertainty				
Antenna gain	± 3	dB				
Power spectral density	± 1.1	5 dB				
Spectrum bandwidth	± 100 kHz (depende	s on the used RBW)				
Occupied bandwidth	± 100 kHz (depends	s on the used RBW)				
Maximum output power		± 1.15 dB conducted ± 3 dB radiated				
Ainimum emissions bandwidth ± 100 kHz (depends on the used R						
Band edge compliance radiated	± 3	dB				
	> 3.6 GHz	± 1.15 dB				
Spurious emissions conducted	> 7 GHz	± 1.15 dB				
	> 18 GHz	± 1.89 dB				
	≥ 40 GHz	± 3.12 dB				
Spurious emissions radiated below 30 MHz	± 3 dB					
Spurious emissions radiated 30 MHz to 1 GHz	± 3 dB					
Spurious emissions radiated 1 GHz to 12.75 GHz	± 3.	7 dB				
Spurious emissions radiated above 12.75 GHz	± 4.	5 dB				
Spurious emissions conducted below 30 MHz (AC conducted)	± 2.	6 dB				

9 Summary of measurement results

\boxtimes	No deviations from the technical specifications were ascertained
	There were deviations from the technical specifications ascertained
	This test report is only a partial test report. The content and verdict of the performed test cases are listed below.

CTC I advanced

TC Identifier	Description	Verdict	Date	Remark
RF-Testing	CFR Part 15 RSS 247, Issue 2	See table	2019-03-07	-/-

Test specification clause	Test case	Temperature conditions	Power source voltages	с	NC	NA	NP	Remark
-/-	Output power verification (cond.)	Nominal	Nominal		-/	-		-/-
-/-	Antenna gain	Nominal	Nominal		-/	-		-/-
U-NII Part 15	Duty cycle	Nominal	Nominal		-/	-		-/-
§15.407(a) RSS - 247 (6.2.1.1) RSS - 247 (6.2.2.1) RSS - 247 (6.2.3.1) RSS - 247 (6.2.4.1)	Maximum output power (conducted & radiated)	Nominal	Nominal	\boxtimes				-/-
§15.407(a) RSS - 247 (6.2.1.1) RSS - 247 (6.2.2.1) RSS - 247 (6.2.3.1) RSS - 247 (6.2.4.1)	Power spectral density	Nominal	Nominal	X				-/-
RSS - 247 (6.2.4.1)	Spectrum bandwidth 6dB bandwidth	Nominal	Nominal	X				-/-
§15.407(a) RSS - 247 (6.2.1.2)	Spectrum bandwidth 26dB bandwidth	Nominal	Nominal	X				-/-
RSS Gen clause 6.6	Spectrum bandwidth 99% bandwidth	Nominal	Nominal		-/-			-/-
§15.205 RSS - 247 (6.2.1.2) RSS - 247 (6.2.2.2) RSS - 247 (6.2.3.2) RSS - 247 (6.2.4.2)	Band edge compliance radiated	Nominal	Nominal	\boxtimes				-/-
§15.407(b) RSS - 247 (6.2.1.2) RSS - 247 (6.2.2.2) RSS - 247 (6.2.3.2) RSS - 247 (6.2.4.2)	TX spurious emissions radiated	Nominal	Nominal	\boxtimes				-/-
§15.109 RSS-Gen	RX spurious emissions radiated	Nominal	Nominal	X				-/-
§15.209(a) RSS-Gen	Spurious emissions radiated < 30 MHz	Nominal	Nominal	X				-/-
§15.107(a) §15.207	Spurious emissions conducted emissions < 30 MHz	Nominal	Nominal	X				-/-
§15.407 RSS - 247 (6.3)	DFS	Nominal	Nominal		-/-		See report 1-6927/18-01-26	

Notes:

C: Compliant NC: Not compliant NA: Not applicable NP: Not per	rmed
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10 Additional comments

Reference documents:	DFS report 1-6927/18-	01-26	
Special test descriptions:	Used power settings: a & n HT20		16
		n HT40:	12

Configuration descriptions: None

Provided channels:

Channels with 20 MHz channel bandwidth:

U-NII-1 & U-NII-2A (5150 MHz to 5250 MHz & 5250 MHz to 5350 MHz) channel number & centre frequency								
channel	36	40	44	48	52	56	60	64
f _c / MHz	5180	5200	5220	5240	5260	5280	5300	5320

U-NII-2C (5470 MHz to 5725 MHz) channel number & centre frequency											
channel	100	104	108	112	116	120	124	128	132	136	140
f _c / MHz	5500	5520	5540	5560	5580	5600	5620	5640	5660	5680	5700

U-NII-3 (5725 MHz to 5850 MHz) channel number & centre frequency					
channel	149	153	157	161	165
f _c / MHz	5745	5765	5785	5805	5825

Channels with 40 MHz channel bandwidth:

U-NII-1 & U-NII-2A (5150 MHz to 5250 MHz & 5250 MHz to 5350 MHz) channel number & centre frequency						
channel	38	46	54	62		
f _c / MHz	5190	5230	5270	5310		

U-NII-2C (5470 MHz to 5725 MHz) channel number & centre frequency						
channel	102	110	118	126	134	
f _c / MHz	5510	5550	5590	5630	5670	

U-NII-3 (5725 MHz to 5850 MHz) channel number & centre frequency					
channel	151	159			
f _c / MHz	5755	5795			

Note: The channels used for the tests were marked in bold in the list.

Test report	no.: 1-692	7/18-01-18 CTC I advanced
Test mode:		No test mode available. Iperf was used to ping another device with the largest support packet size
	\boxtimes	Special software is used. EUT is transmitting pseudo random data by itself
Antennas and transmit operating modes:		 Operating mode 1 (single antenna) Equipment with 1 antenna, Equipment with 2 diversity antennas operating in switched diversity mode by which at any moment in time only 1 antenna is used, Smart antenna system with 2 or more transmit/receive chains, but operating in a mode where only 1 transmit/receive chain is used)
		 Operating mode 2 (multiple antennas, no beamforming) Equipment operating in this mode contains a smart antenna system using two or more transmit/receive chains simultaneously but without beamforming.
		 Operating mode 3 (multiple antennas, with beamforming) Equipment operating in this mode contains a smart antenna system using two or more transmit/receive chains simultaneously with beamforming. In addition to the antenna assembly gain (G), the beamforming gain (Y) may have to be taken into account when performing the measurements.



11 Measurement results

11.1 Identify worst case data rate

Measurement:

All modes of the module will be measured with an average power meter to identify the maximum transmission power on mid channel. In the case that only one or two channels are available, only these will be measured.

In further tests only the identified worst case modulation scheme or bandwidth will be measured.

Measurement parameters:

Measurement parameter				
Detector:	Peak			
Sweep time:	Auto			
Resolution bandwidth:	3 MHz			
Video bandwidth:	3 MHz			
Trace mode:	Max hold			
Used test setup:	See chapter 6.5 – A			
Measurement uncertainty:	See chapter 8			

Results:

	Modulation scheme / bandwidth							
OFDM – mode	U-NII-1 & U-NII-2A		U-N	II-2C	U-NII-3			
	Low high channel channel		Low channel			high channel		
a – mode	6 Mbit/s	6 Mbit/s	6 Mbit/s	6 Mbit/s	6 Mbit/s	6 Mbit/s		
n/ac HT20 – mode	MCS0	MCS0	MCS0	MCS0	MCS0	MCS0		
n/ac HT40 – mode	MCS0	MCS0	MCS0	MCS0	MCS0	MCS0		



11.2 Antenna gain

Description:

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module.

Measurement parameters:

Measurement parameter				
Detector:	Peak			
Sweep time:	Auto			
Resolution bandwidth:	3 MHz			
Video bandwidth:	3 MHz			
Trace mode:	Max. hold			
Test setup:	See chapter 6.2 – B (radiated) See chapter 6.5 – A (conducted)			
Measurement uncertainty:	See chapter 8			

Limits:

Antenna Gain
6 dBi / > 6 dBi output power and power density reduction required

Results:

U-NII-1	Antenna gain				
(5150 MHz to 5250 MHz)	Lowest channel	Middle channel	Highest channel		
Conducted power / dBm @ 3 MHz RBW	16.6	-/-	16.5		
Radiated power / dBm @ 3 MHz RBW	14.5	-/-	17.6		
Gain / dBi (calculated)	-2.1	-/-	1.1		
U-NII-2A		Antenna gain			
(5250 MHz to 5350 MHz)	Lowest channel	Middle channel	Highest channel		
Conducted power / dBm @ 3 MHz RBW	16.5	-/-	16.1		
Radiated power / dBm @ 3 MHz RBW	19.8	-/-	12.5		
Gain / dBi (calculated)	3.3	-/-	-3.6		
-					
U-NII-2C		Antenna gain			
U-NII-2C (5470 MHz to 5725 MHz)	Lowest channel	Antenna gain Middle channel	Highest channel		
•••••=•	Lowest channel 14.8		Highest channel 15.3		
(5470 MHz to 5725 MHz)		Middle channel			
(5470 MHz to 5725 MHz) Conducted power / dBm @ 3 MHz RBW	14.8	Middle channel 14.9	15.3		
(5470 MHz to 5725 MHz) Conducted power / dBm @ 3 MHz RBW Radiated power / dBm @ 3 MHz RBW	14.8 12.3	Middle channel 14.9 14.1	15.3 10.1		
(5470 MHz to 5725 MHz) Conducted power / dBm @ 3 MHz RBW Radiated power / dBm @ 3 MHz RBW Gain / dBi (calculated)	14.8 12.3	Middle channel 14.9 14.1 -0.8	15.3 10.1		
(5470 MHz to 5725 MHz) Conducted power / dBm @ 3 MHz RBW Radiated power / dBm @ 3 MHz RBW Gain / dBi (calculated) U-NII-3	14.8 12.3 -2.5	Middle channel 14.9 14.1 -0.8 Antenna gain	15.3 10.1 -5.2		
(5470 MHz to 5725 MHz) Conducted power / dBm @ 3 MHz RBW Radiated power / dBm @ 3 MHz RBW Gain / dBi (calculated) U-NII-3 (5725 MHz to 5850 MHz)	14.8 12.3 -2.5 Lowest channel	Middle channel 14.9 14.1 -0.8 Antenna gain Middle channel	15.3 10.1 -5.2 Highest channel		



Plots (conducted):

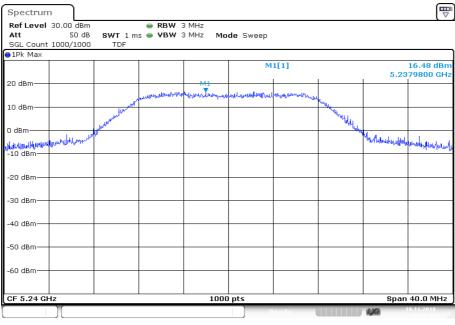
Plot 1: U-NII-1; lowest channel

Spectrum ● RBW 3 MHz SWT 1 ms ● VBW 3 MHz
 Ref Level
 30.00 dBm

 Att
 50 dB
 Mode Sweep Count 1000/1000 SGL TDF ●1Pk Ma× M1[1] 16.60 dBm 5.1859000 GHz 20 dBm mound mounder 10 dBm 0 dBm unanderal and the full of the prover hop-hilly hat a high for a high f -20 dBm -30 dBm--40 dBm -50 dBm -60 dBm· CF 5.18 GHz 1000 pts Span 40.0 MHz

Date: 19.NOV.2018 08:10:30

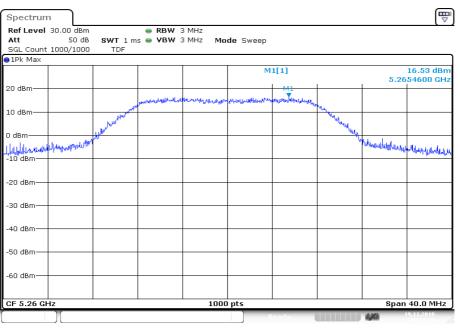
Plot 2: U-NII-1; highest channel



Date: 19.NOV.2018 08:12:35

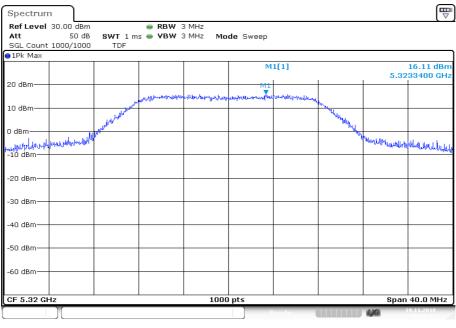


Plot 3: U-NII-2A; lowest channel



Date: 19.NOV.2018 08:14:21

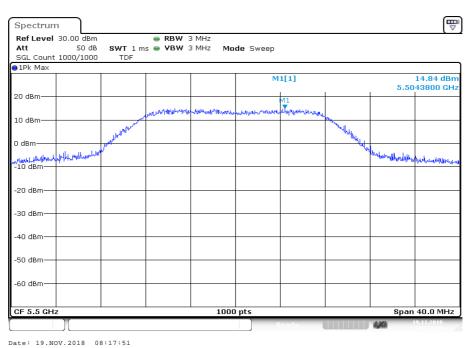
Plot 4: U-NII-2A; highest channel



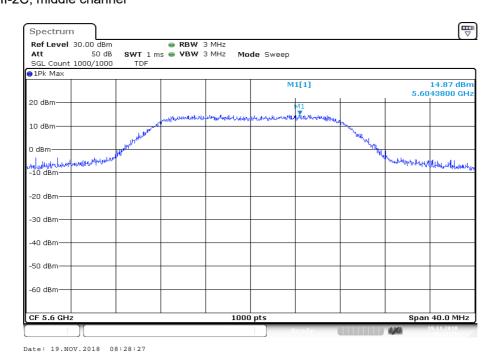
Date: 19.NOV.2018 08:16:04



Plot 5: U-NII-2C; lowest channel

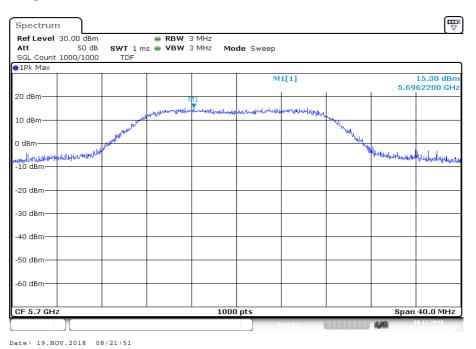


Plot 6: U-NII-2C; middle channel

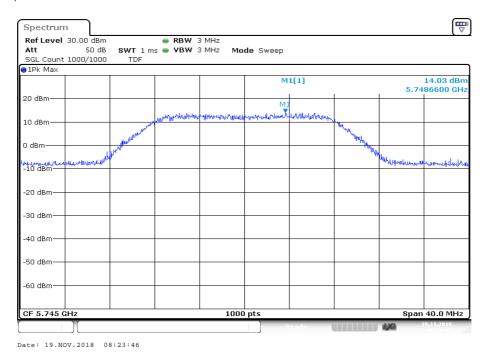




Plot 7: U-NII-2C; highest channel



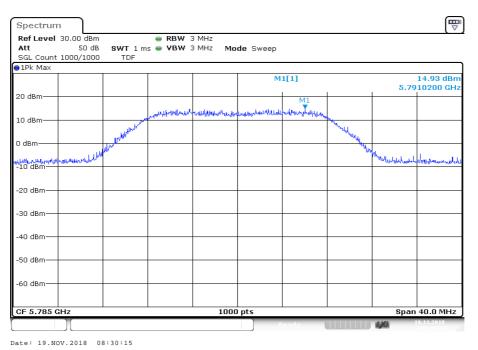
Plot 8: U-NII-3; lowest channel



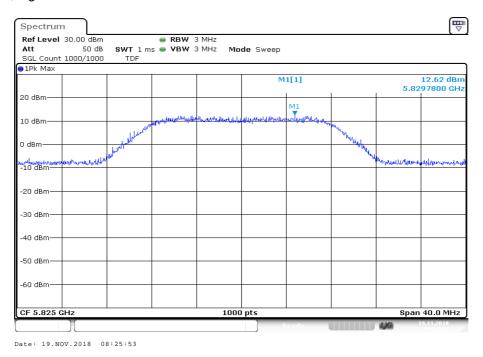
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Plot 9: U-NII-3; middle channel



Plot 10: U-NII-3; highest channel





11.3 Duty cycle

Description:

The duty cycle is necessary to compute the maximum power during an actual transmission. The shown plots and values are to show an example of the measurement procedure. The real value is measured direct during the power measurement or power density measurement. The correction value is shown in each plot of these measurements.

Measurement:

Measurement parameter				
According to: KDB789033 D02, B.				
Detector:	Peak			
Sweep time:	Auto			
Resolution bandwidth:	10 MHz			
Video bandwidth:	10 MHz			
Span:	Zero			
Trace mode:	Video trigger / view / single sweep			
Used test setup:	See chapter 6.5 – A			
Measurement uncertainty:	See chapter 8			

Results:

Duty cycle and correction factor:

	Calculation method						
OFDM – mode	T _{on} (D2 _{plot}) * 100 / T _{complete} (D3 _{plot}) = duty cycle 10 * log(duty cycle) = correction factor						
	Ton (D2plot) T _{complete} (D3plot) Duty cycle Correction factor						
a – mode	1.365 ms	1.558 ms	87.6 %	0.57 dB			
n/ac HT20 – mode	1.280 ms	1.475 ms	86.8 %	0.61 dB			
n/ac HT40 – mode	577.16 µs	775.78 µs	74.4 %	1.18 dB			



Plots:

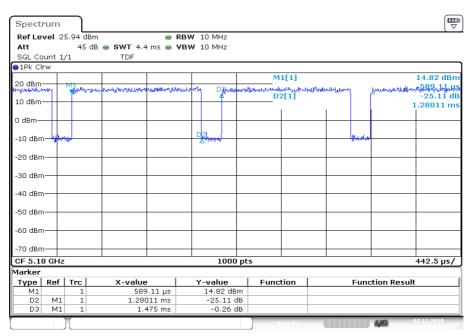
Duty cycle and correction factor (example for one channel & one antenna mode):

Plot 1: duty cycle of the transmitter; a – mode

Spect	rum												
Ref Le Att SGL Co		45	Bm dB e SWT 4.7 TDF	_	RBW 1 VBW 1								
O 1Pk Cl		-											
20 dBm 20 dBm 10 dBm		Minh	altheled personal have	and the states	r-h-m	1 D3m	dor trabby		1[1] \	uhronuohuutrortor		ſ	14.86 dBm -652,22,43 -24.24 dB 1.36543 ms
0 dBm-		_			_								
-10 dBn	7 - 1 94	wyl				22 Autolia					վրակտ		
-20 dBn	<u>ا</u> -۲												
-30 dBn	<u>ו</u> רי				+								
-40 dBn													
-50 dBn	י				+								
-60 dBn					-								
-70 dBn							<u> </u>						
CF 5.1 Marker	8 GHz					100	0 pts						468.75 μs/
Type	Ref	Trc	X-value	, I	Y	-value	1	Func	tion		June	tion Resul	+ 1
M1	Ker	1		2.22 μs		14.86 di	Bm	- anc	cion		and	cion Kesul	•
D2	M1	1		543 ms		-24.24							
D3	M1	1	1.55	781 ms		-0.13	dB						
[][R	e ad y			1,70	19.11.2018

Date: 19.NOV.2018 08:10:35

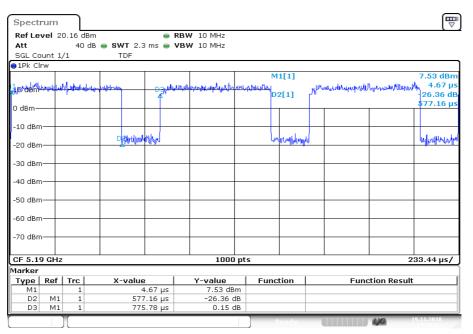
Plot 2: duty cycle of the transmitter; n/ac HT20 – mode



Date: 7.NOV.2018 13:58:46



Plot 3: duty cycle of the transmitter; n/ac HT40 – mode



Date: 19.NOV.2018 07:41:13



11.4 Maximum output power

11.4.1 Maximum output power according to FCC requirements

Description:

Measurement of the maximum output power conducted

Measurement:

Measurement parameter				
According to: KDB789033 D02, E.2.e.				
Detector:	RMS			
Sweep time:	≥10*(swp points)*(total on/off time)			
Resolution bandwidth:	1 MHz			
Video bandwidth:	3 MHz			
Span:	> EBW			
Trace mode:	Max hold			
Analyzer function	Band power / channel power Interval > 26 dB EBW			
Used test setup:	See chapter 6.5 – A			
Measurement uncertainty:	See chapter 8			

Limits:

Radiated output power	Conducted output power for mobile equipment
Conducted power + 6 dBi antenna gain	250mW 5.150-5.250 GHz The lesser one of 250mW or 11 dBm + 10 log Bandwidth 5.250-5.350 GHz 250mW or 11 dBm + 10 log Bandwidth 5.470-5.725 GHz (where Bandwidth is the 26dB Bandwidth [MHz]) 1W 5.725-5.85 GHz



<u>Results:</u>

	Maximum output power conducted [dBm]						
	U-NII-1 (5150 MHz to 5250 MHz)						
	Lowest channel	Middle channel	Highest channel				
	13.69	_/_	13.64				
	U-NII-2A (5250 MHz to 5350 MHz)						
	Lowest channel	Highest channel					
а	13.51	_/_	13.21				
	U-NII-2C (5470 MHz to 5725 MHz)						
	Lowest channel	Middle channel	Highest channel				
	11.97	12.19	12.47				
	U-NII-3 (5725 MHz to 5850 MHz)						
	Lowest channel	Middle channel	Highest channel				
	10.66	11.27	8.82				

<u>Results:</u>

	Maximum output power conducted [dBm]				
	U-NII-1 (5150 MHz to 5250 MHz)				
	Lowest channel	Middle channel	Highest channel		
	14.01	_/_	14.00		
	U-NII-2A (5250 MHz to 5350 MHz)				
n/ac HT20	Lowest channel	Middle channel	Highest channel		
	13.90	_/_	13.75		
	U-NII-2C (5470 MHz to 5725 MHz)				
	Lowest channel	Middle channel	Highest channel		
	12.32	12.16	12.29		
	U-NII-3 (5725 MHz to 5850 MHz)				
	Lowest channel	Middle channel	Highest channel		
	10.59	12.49	8.90		



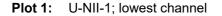
<u>Results:</u>

	Maximum output power conducted [dBm]				
	U-NII-1 (5150 MHz to 5250 MHz)				
	Lowest channel		Highest channel		
	10.53		10.41		
	U-NII-2A (5250 MHz to 5350 MHz)				
	Lowest channel		Highest channel		
n/ac HT40	0 10.30		10.13		
	U-NII-2C (5470 MHz to 5725 MHz)				
	Lowest channel	Middle channel		Highest channel	
	8.83	9.22		8.72	
	U-NII-3 (5725 MHz to 5850 MHz)				
	Lowest channel		Highest channel		
	7.36		7.87		

Test report no.: 1-6927/18-01-18



Plots: a - mode

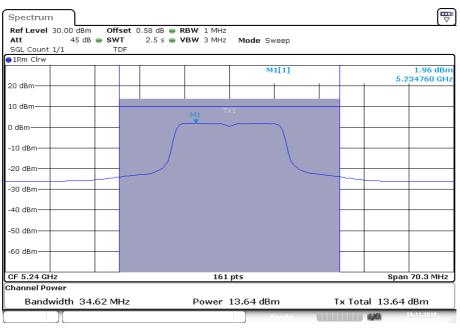


₽ Spectrum Ref Level30.00 dBmOffseAtt45 dBSWT
 Offset
 0.57 dB ●
 RBW
 1 MHz

 SWT
 2.5 s ●
 VBW
 3 MHz
 Mode Sweep . Count 1/1 SGL TDF ●1Rm Clrw 2.00 dBm 5.184100 GHz M1[1] 20 dBm 10 dBm· 0 dBm -10 dBm--20 dBm -30 dBm--40 dBm--50 dBm--60 dBm-Span 66.0 MHz CF 5.18 GHz 161 pts Channel Power Bandwidth 32.47 MHz Tx Total 13.69 dBm Power 13.69 dBm LXI

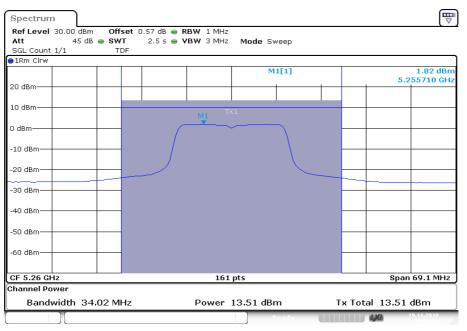
Date: 19.NOV.2018 08:10:51

Plot 2: U-NII-1; highest channel



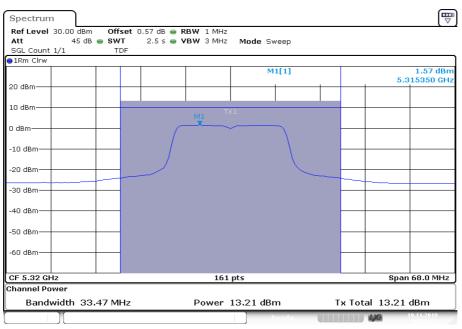
Date: 19.NOV.2018 08:12:54

Plot 3: U-NII-2A; lowest channel



Date: 19.NOV.2018 08:14:39

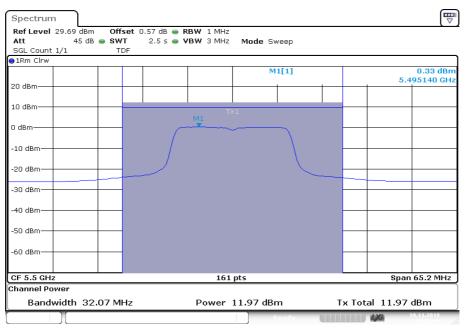
Plot 4: U-NII-2A; highest channel



Date: 19.NOV.2018 08:16:22

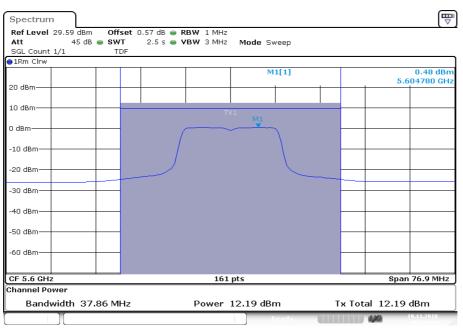


Plot 5: U-NII-2C; lowest channel



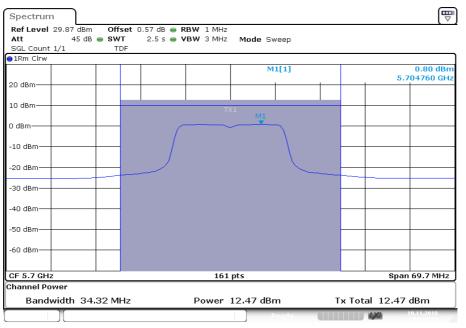
Date: 19.NOV.2018 08:18:09

Plot 6: U-NII-2C; middle channel



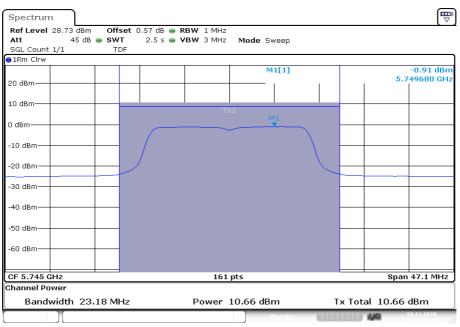
Date: 19.NOV.2018 08:28:45

Plot 7: U-NII-2C; highest channel



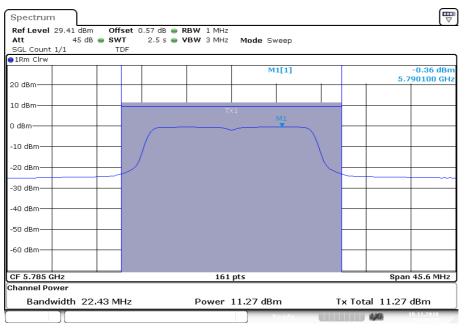
Date: 19.NOV.2018 08:22:09

Plot 8: U-NII-3; lowest channel



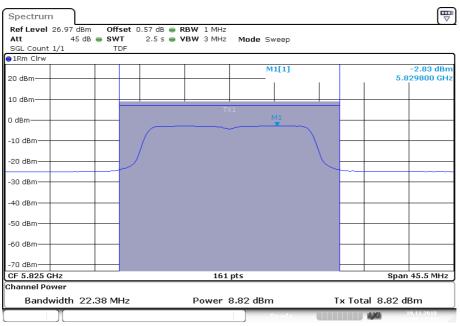
Date: 19.NOV.2018 08:24:03

Plot 9: U-NII-3; middle channel



Date: 19.NOV.2018 08:30:32

Plot 10: U-NII-3; highest channel

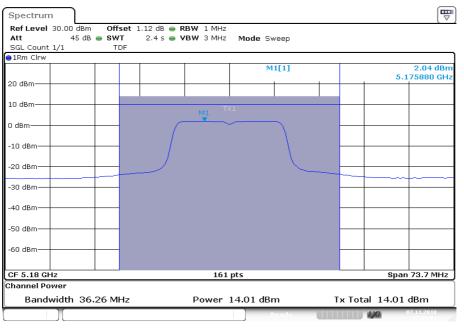


Date: 19.NOV.2018 08:26:14



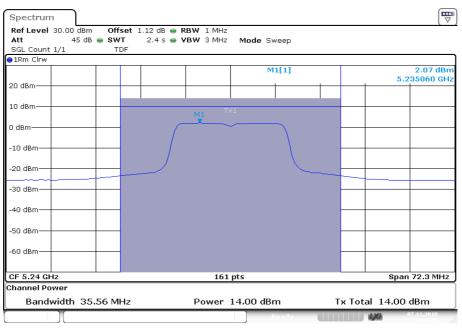
Plots: n/ac HT20 - mode

Plot 1: U-NII-1; lowest channel



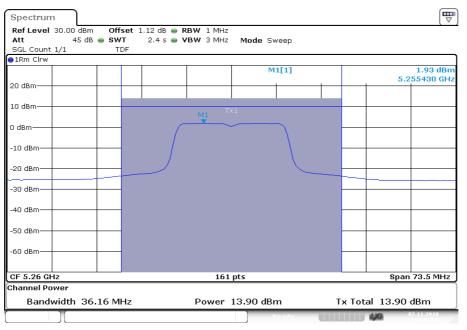
Date: 7.NOV.2018 13:59:02

Plot 2: U-NII-1; highest channel



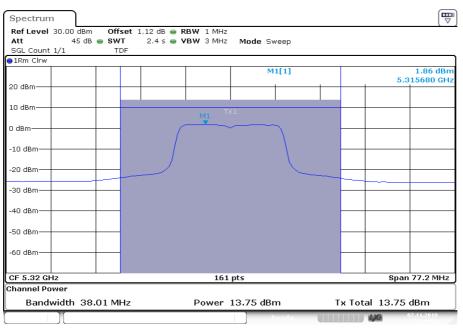
Date: 7.NOV.2018 14:01:17

Plot 3: U-NII-2A; lowest channel



Date: 7.NOV.2018 14:03:43

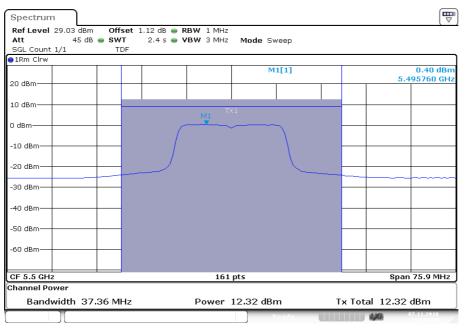
Plot 4: U-NII-2A; highest channel



Date: 7.NOV.2018 13:49:59

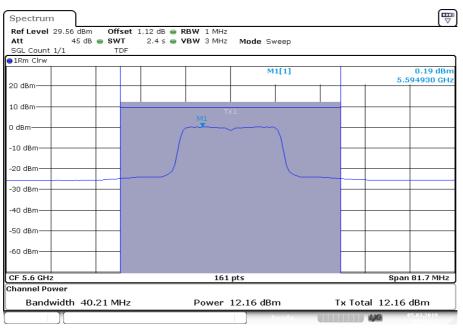


Plot 5: U-NII-2C; lowest channel



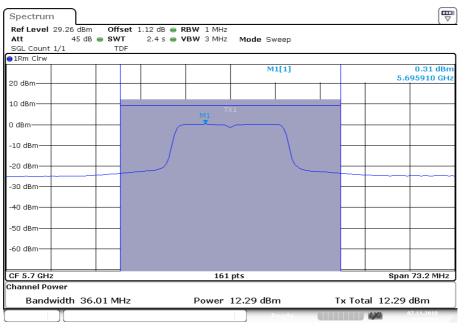
Date: 7.NOV.2018 13:55:47

Plot 6: U-NII-2C; middle channel



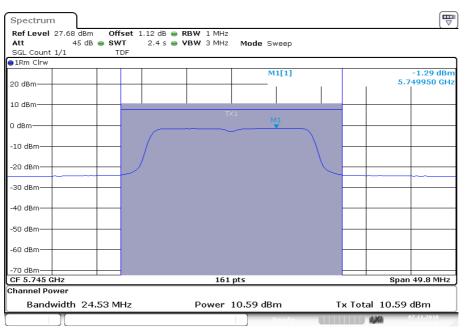
Date: 5.MAR.2019 09:18:37

Plot 7: U-NII-2C; highest channel



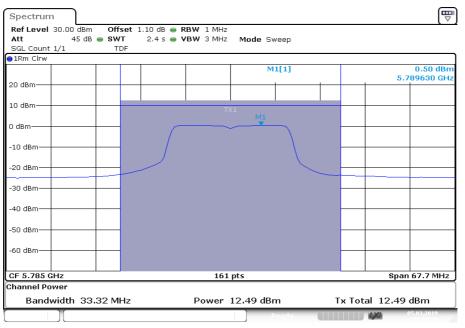
Date: 7.NOV.2018 14:10:55

Plot 8: U-NII-3; lowest channel

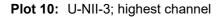


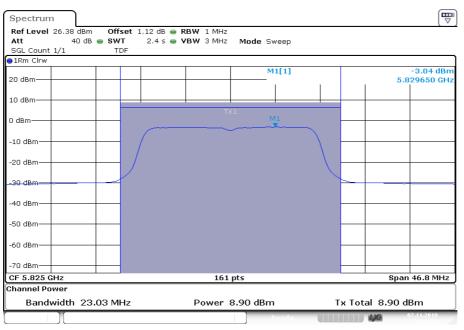
Date: 7.NOV.2018 14:13:46

Plot 9: U-NII-3; middle channel

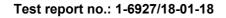


Date: 5.MAR.2019 09:22:41



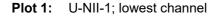


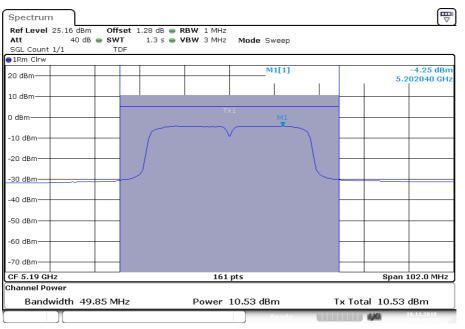
Date: 7.NOV.2018 14:15:58



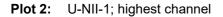


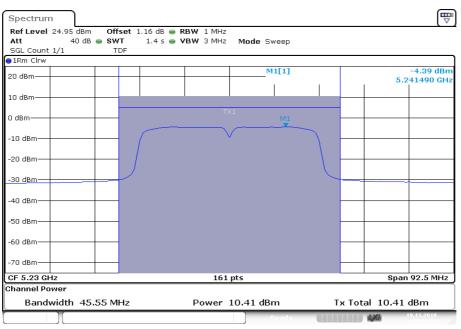
Plots: n/ac HT40 - mode





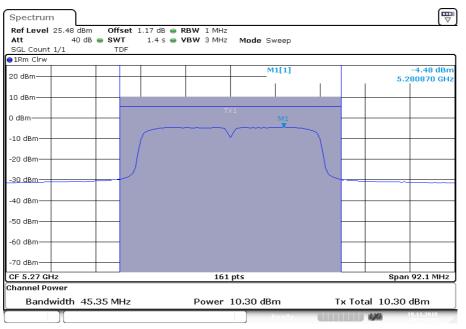
Date: 19.NOV.2018 07:41:35





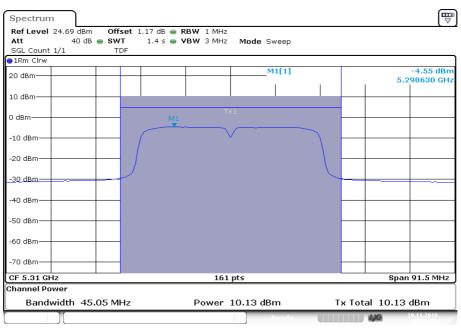
Date: 19.NOV.2018 07:47:36

Plot 3: U-NII-2A; lowest channel



Date: 19.NOV.2018 07:50:02

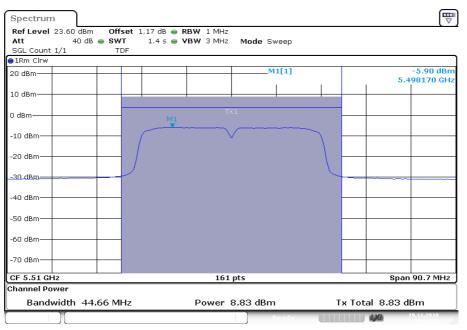
Plot 4: U-NII-2A; highest channel



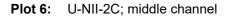
Date: 19.NOV.2018 07:52:21

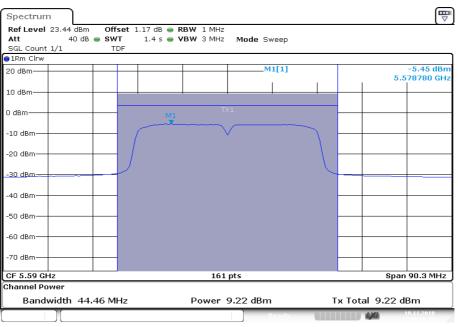


Plot 5: U-NII-2C; lowest channel



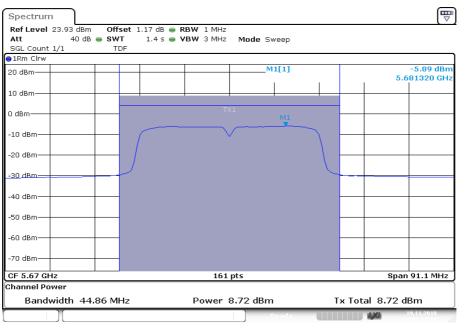
Date: 19.NOV.2018 07:54:42





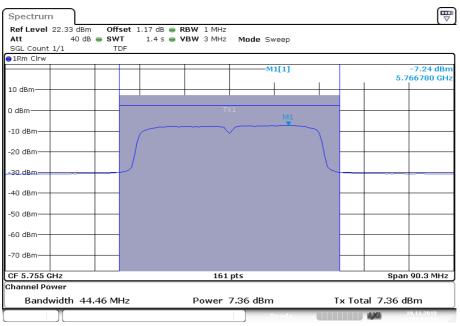
Date: 19.NOV.2018 07:56:46

Plot 7: U-NII-2C; highest channel



Date: 19.NOV.2018 07:58:49

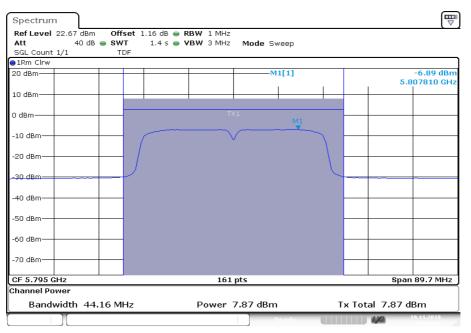
Plot 8: U-NII-3; lowest channel



Date: 19.NOV.2018 08:00:53



Plot 9: U-NII-3; highest channel



Date: 19.NOV.2018 08:03:04



11.4.2 Maximum output power according to IC requirements

Description:

Measurement of the maximum output power conduced + radiated

Measurement:

Measurement parameter			
Detector:	RMS		
Sweep time:	≥10*(swp points)*(total on/off time)		
Resolution bandwidth:	1 MHz		
Video bandwidth:	≥ 3 MHz		
Span:	> EBW		
Trace mode:	Max hold		
Analyzer function	Band power / channel power Interval > 99% OBW		
Used test setup:	See chapter 6.5 – A		
Measurement uncertainty:	See chapter 8		

Limits:

Radiated output power	Conducted output power for mobile equipment
The lesser one of	The lesser one of
200 mW or 10 dBm + 10 log Bandwidth 5.150-5.250 GHz 1 W or 17 dBm + 10 log Bandwidth 5.250-5.350 GHz 1 W or 17 dBm + 10 log Bandwidth 5.470-5.725 GHz (where Bandwidth is the 99% Bandwidth [MHz]) Conducted power + 6dBi antenna gain 5.725-5.825 GHz	250mW or 11 dBm + 10 log Bandwidth 5.250-5.350 GHz 250mW or 11 dBm + 10 log Bandwidth 5.470-5.725 GHz (where Bandwidth is the 99% Bandwidth [MHz]) 1W 5.725-5.825 GHz

Results:

	Maximum output power [dBm]			
	l	J-NII-1 (5150 MHz to 5250 MHz)	
	Lowest channel	Middle channel	Highest channel	
	Conducted			
	13.65	_/_	13.60	
	Radiated	l (calculated – see chapter anter	nna gain)	
	11.55	_/_	14.70	
	U	-NII-2A (5250 MHz to 5350 MHz	z)	
	Lowest channel	Middle channel	Highest channel	
		Conducted		
	13.47	_/_	13.17	
	Radiated	l (calculated – see chapter anter	nna gain)	
а	16.77	_/_	9.57	
	U-NII-2C (5470 MHz to 5725 MHz)			
	Lowest channel	Middle channel	Highest channel	
	Conducted			
	11.93	12.14	12.43	
	Radiated	l (calculated – see chapter anter	nna gain)	
	9.43	11.34	7.23	
	U-NII-3 (5725 MHz to 5850 MHz)			
	Lowest channel	Middle channel	Highest channel	
		Conducted		
	10.59	11.21	8.76	
		l (calculated – see chapter anter		
	7.89	6.51	6.66	





<u>Results:</u>

	Maximum output power [dBm]			
	L	J-NII-1 (5150 MHz to 5250 MHz		
	Lowest channel	Middle channel	Highest channel	
	13.97	_/_	13.95	
	Radiated	l (calculated – see chapter anter	ina gain)	
	11.87	_/_	15.05	
	U	-NII-2A (5250 MHz to 5350 MHz	z)	
	Lowest channel	Middle channel	Highest channel	
	Conducted			
	13.86	_/_	13.70	
	Radiated (calculated – see chapter antenna gain)			
n/ac HT20	17.16	-/-	10.1	
	U-NII-2C (5470 MHz to 5725 MHz)			
	Lowest channel	Middle channel	Highest channel	
	Conducted			
	12.27	12.10	12.23	
	Radiated	l (calculated – see chapter anter	ina gain)	
	9.77	11.30	7.03	
	l	J-NII-3 (5725 MHz to 5850 MHz	1	
	Lowest channel	Middle channel	Highest channel	
		Conducted		
	10.53	12.44	8.84	
		l (calculated – see chapter anter		
	7.83	7.74	6.74	

Test report no.: 1-6927/18-01-18

<u>Results:</u>

	Maximum output power [dBm]				
	L	J-NII-1 (5150 MI	Hz to 5250 MHz)	
	Lowest channel		Highest channel		
		Cond	ucted		
	10.46		10.35		
	Radiated	(calculated - se	ee chapter anter	nna gain)	
	8.36			11.45	
	U	-NII-2A (5250 M	Hz to 5350 MH	z)	
	Lowest channel			Highest channel	
		Cond	ucted		
	10.25			10.07	
	Radiated (calculated – see chapter antenna gain)				
n/ac HT40	13.55			6.47	
	U-NII-2C (5470 MHz to 5725 MHz)				
	Lowest channel	Middle		Highest channel	
		Cond			
	8.79	9.1		8.66	
		,	ee chapter anter	. <i>.</i>	
	6.29	8.3		3.46	
		J-NII-3 (5725 MI	Hz to 5850 MHz		
	Lowest channel	l Highest channel		Highest channel	
		Cond	ucted		
	7.31			7.82	
		(calculated - se	ee chapter anter		
	4.61			5.72	



Test report no.: 1-6927/18-01-18



Plots: a - mode

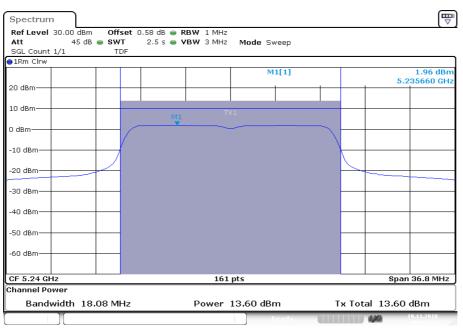
Plot 1: U-NII-1; lowest channel

₽ Spectrum Ref Level30.00 dBmOffseAtt45 dBSWT
 Offset
 0.57 dB ●
 RBW
 1 MHz

 SWT
 2.5 s ●
 VBW
 3 MHz
 Mode Sweep . Count 1/1 SGL TDF ●1Rm Clrw M1[1] 2.00 dBm 5.184760 GHz 20 dBm 10 dBm 0 dBm--10 dBm--20 dBm--30 dBm--40 dBm--50 dBm--60 dBm-Span 36.5 MHz CF 5.18 GHz 161 pts Channel Power Bandwidth 17.93 MHz Power 13.65 dBm Tx Total 13.65 dBm LXI

Date: 19.NOV.2018 08:11:39

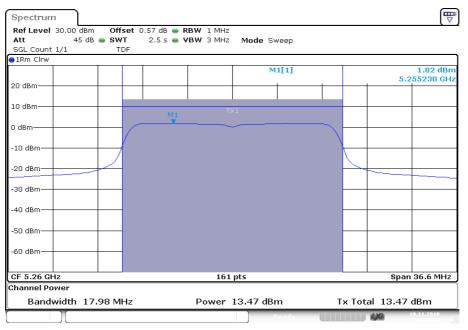
Plot 2: U-NII-1; highest channel



Date: 19.NOV.2018 08:13:29

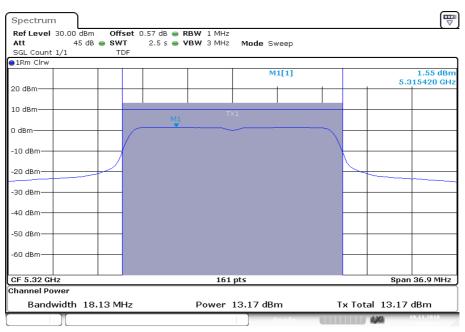


Plot 3: U-NII-2A; lowest channel



Date: 19.NOV.2018 08:15:16

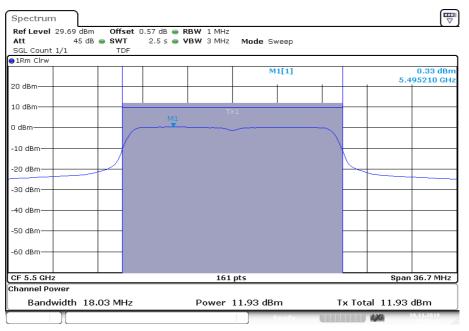
Plot 4: U-NII-2A; highest channel



Date: 19.NOV.2018 08:16:55

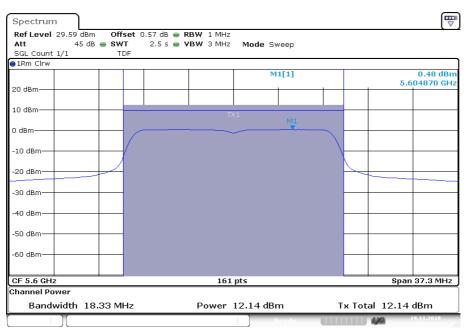


Plot 5: U-NII-2C; lowest channel



Date: 19.NOV.2018 08:18:48

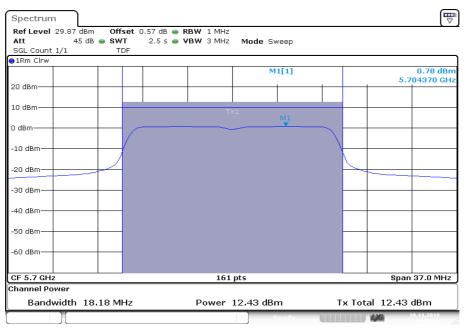
Plot 6: U-NII-2C; middle channel



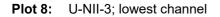
Date: 19.NOV.2018 08:29:21

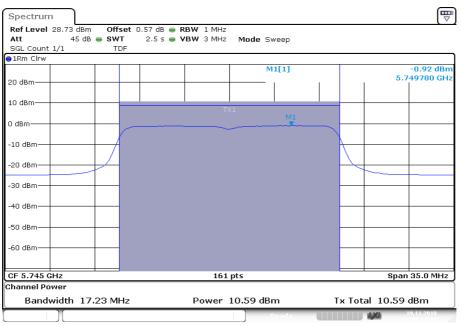


Plot 7: U-NII-2C; highest channel



Date: 19.NOV.2018 08:22:52

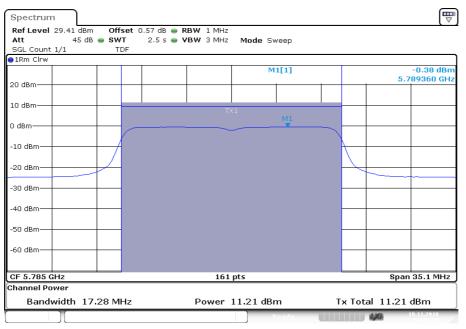




Date: 19.NOV.2018 08:24:43

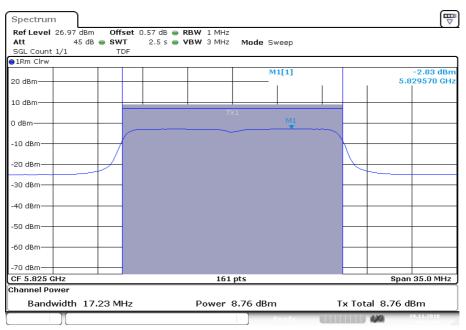


Plot 9: U-NII-3; middle channel



Date: 19.NOV.2018 08:31:14

Plot 10: U-NII-3; highest channel

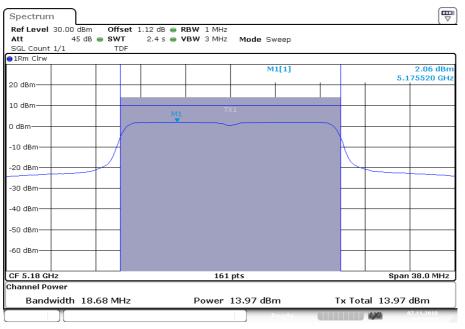


Date: 19.NOV.2018 08:26:51



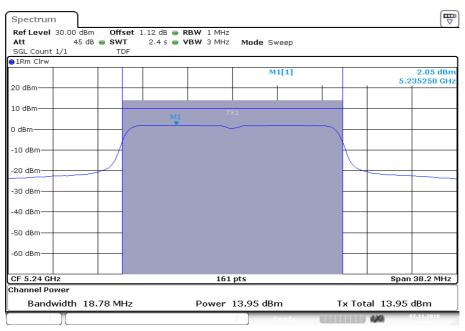
Plots: n/ac HT20 - mode

Plot 1: U-NII-1; lowest channel



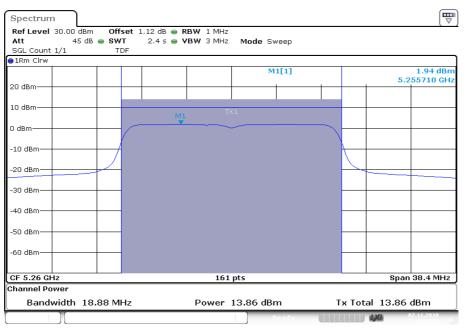
Date: 7.NOV.2018 13:59:50

Plot 2: U-NII-1; highest channel



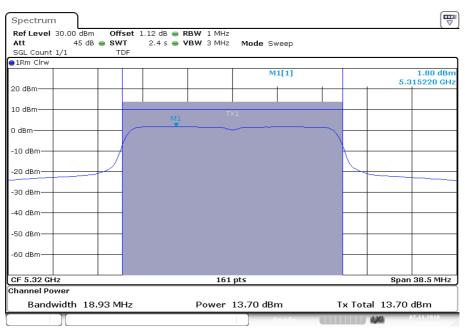
Date: 7.NOV.2018 14:01:53

Plot 3: U-NII-2A; lowest channel



Date: 7.NOV.2018 14:04:21

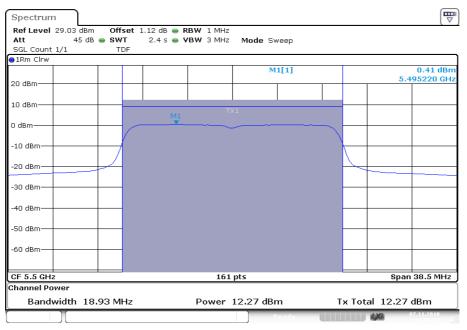
Plot 4: U-NII-2A; highest channel



Date: 7.NOV.2018 13:50:32

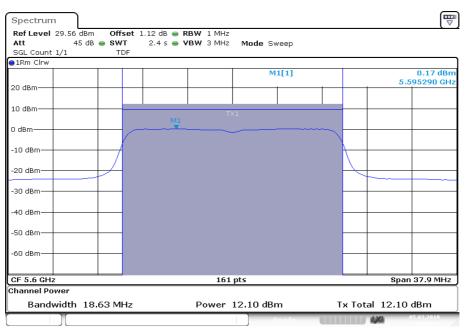


Plot 5: U-NII-2C; lowest channel



Date: 7.NOV.2018 13:56:27

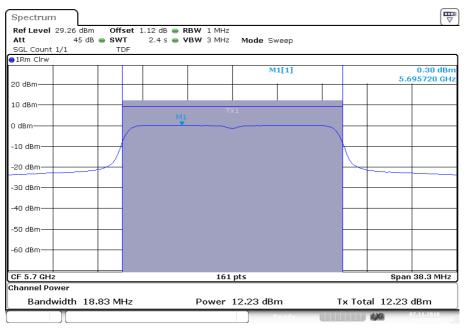
Plot 6: U-NII-2C; middle channel



Date: 5.MAR.2019 09:19:13

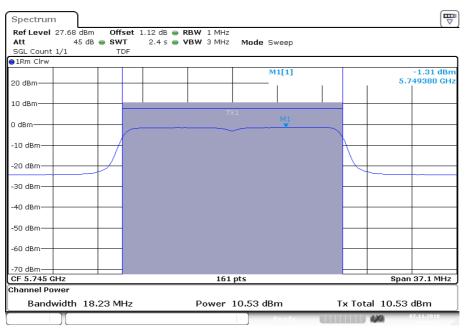


Plot 7: U-NII-2C; highest channel



Date: 7.NOV.2018 14:11:40

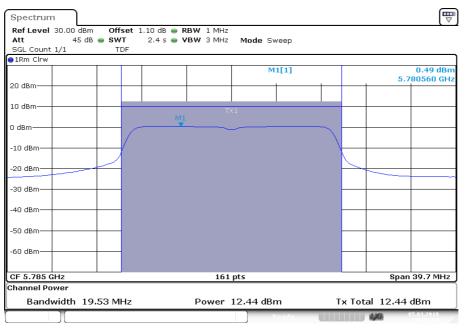
Plot 8: U-NII-3; lowest channel



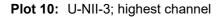
Date: 7.NOV.2018 14:14:26

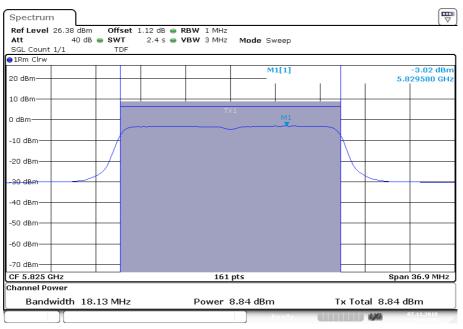


Plot 9: U-NII-3; middle channel



Date: 5.MAR.2019 09:23:20

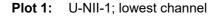


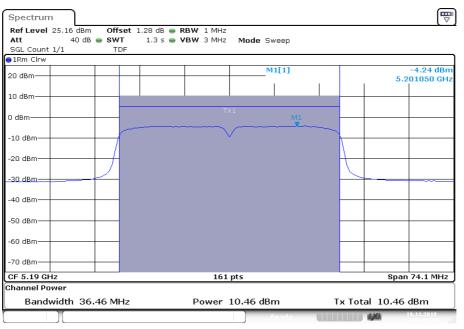


Date: 7.NOV.2018 14:16:37

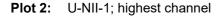


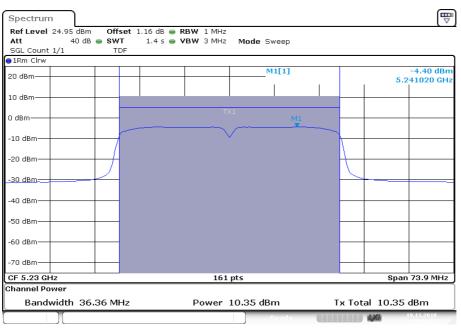
Plots: n/ac HT40 - mode





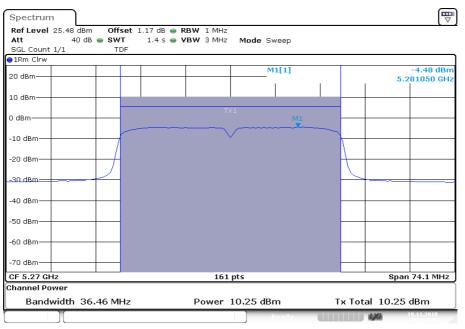
Date: 19.NOV.2018 07:42:35





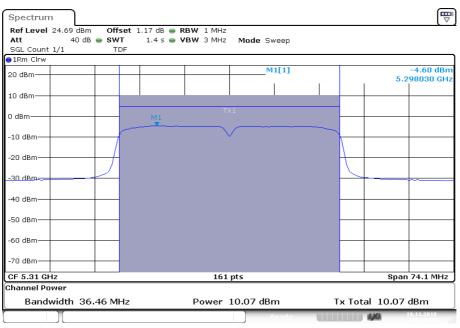
Date: 19.NOV.2018 07:48:24

Plot 3: U-NII-2A; lowest channel



Date: 19.NOV.2018 07:50:50

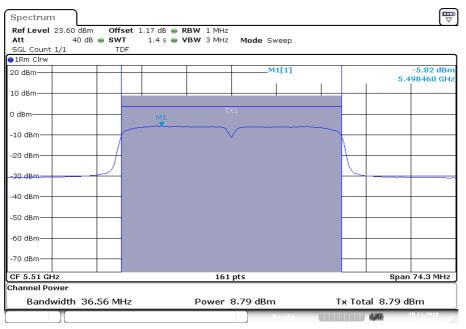
Plot 4: U-NII-2A; highest channel



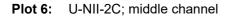
Date: 19.NOV.2018 07:53:08

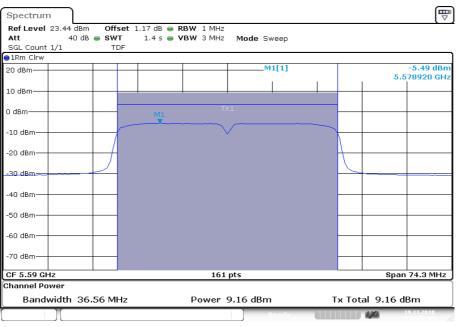


Plot 5: U-NII-2C; lowest channel



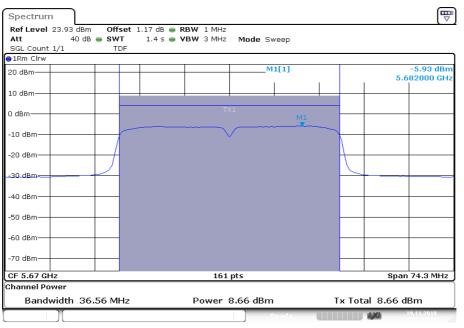
Date: 19.NOV.2018 07:55:17





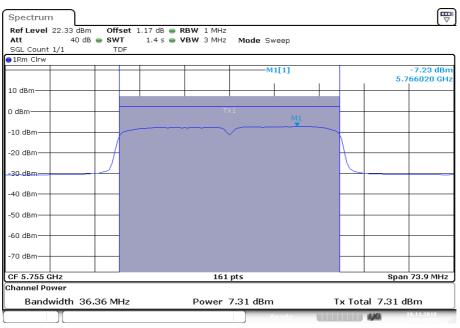
Date: 19.NOV.2018 07:57:20

Plot 7: U-NII-2C; highest channel



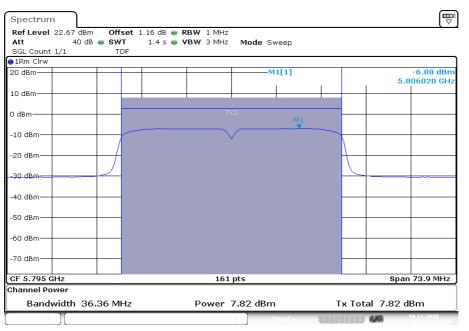
Date: 19.NOV.2018 07:59:22

Plot 8: U-NII-3; lowest channel



Date: 19.NOV.2018 08:01:26

Plot 9: U-NII-3; highest channel



Date: 19.NOV.2018 08:03:38



11.5 Power spectral density

11.5.1 Power spectral density according to FCC requirements

Description:

Measurement of the power spectral density of a digital modulated system. The measurement is repeated at the lowest, middle and highest channel.

Measurement:

Measurement parameter			
According to: KDB789033 D02, F.			
Detector:	RMS		
Sweep time:	≥10*(swp points)*(total on/off time)		
Resolution bandwidth:	1 MHz for U-NII-1/2A & 2C 500 kHz for U-NII-3		
Video bandwidth:	≥ 3xRBW		
Span:	> EBW		
Trace mode:	Max hold		
Used test setup:	See chapter 6.5 – A		
Measurement uncertainty:	See chapter 8		

Limits:

Power Spectral Density	
power spectral density conducted ≤ 11 dBm in any 1 MHz band (band 5150 – 5250 MHz)	
power spectral density conducted ≤ 11 dBm in any 1 MHz band (band 5250 – 5350 MHz) power spectral density conducted ≤ 11 dBm in any 1 MHz band (band 5470 – 5725 MHz)	
power spectral density conducted ≤ 30 dBm in any 500 kHz band (band 5725 – 5850 MHz)	



	Power spectral density (dBm/1MHz or dBm/500kHz)			
	U-NII-1 (5150 MHz to 5250 MHz)			
	Lowest channel	Middle channel	Highest channel	
	2.00	_/_	1.96	
	U-NII-2A (5250 MHz to 5350 MHz)			
	Lowest channel	Middle channel	Highest channel	
а	1.82	_/_	1.57	
	U-NII-2C (5470 MHz to 5725 MHz)			
	Lowest channel	Middle channel	Highest channel	
	0.33	0.48	0.80	
	U-NII-3 (5725 MHz to 5850 MHz)			
	Lowest channel	Middle channel	Highest channel	
	-3.90	-3.25	-5.75	

<u>Results:</u>

	Power spectral density (dBm/1MHz or dBm/500kHz)			
	U-NII-1 (5150 MHz to 5250 MHz)			
	Lowest channel	Middle channel	Highest channel	
	2.06	_/_	2.07	
	U-NII-2A (5250 MHz to 5350 MHz)			
	Lowest channel	Middle channel	Highest channel	
n/ac HT20	1.93	_/_	1.86	
	U-NII-2C (5470 MHz to 5725 MHz)			
	Lowest channel	Middle channel	Highest channel	
	0.40	0.19	0.31	
	U-NII-3 (5725 MHz to 5850 MHz)			
	Lowest channel	Middle channel	Highest channel	
	-4.26	-2.37	-6.00	



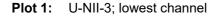
<u>Results:</u>

	Power spectral density (dBm/1MHz or dBm/500kHz)			3m/500kHz)	
	U-NII-1 (5150 MHz to 5250 MHz)				
	Lowest channel		Highest channel		
	-4.25		-4.39		
	U-NII-2A (5250 MHz to 5350 MH			z)	
	Lowest channel			Highest channel	
n/ac HT40	-4.48		-4.55		
	U-NII-2C (5470 MHz to 5725 MHz)			z)	
	Lowest channel	Middle	channel	Highest channel	
	-5.90	-5.45		-5.89	
	U-NII-3 (5725 MHz to 5850 MHz)	
	Lowest channel		Highest channel		
	-10.24			-9.87	

Test report no.: 1-6927/18-01-18



Plots: a - mode



Spectrum Ref Level 13.73 dBm Offse Att 30 dB • SWT
 Offset
 0.57 dB ●
 RBW
 500 kHz

 SWT
 2.5 s ●
 VBW
 3 MHz
 Mode Sweep SGL Count 1/1 TDF ●1Rm Clrw M1[1] -3.90 dBm 5.749840 GHz 10 dBm-0 dBm--10 dBm--20 dBm--30 dBm -40 dBm--50 dBm--60 dBm· -70 dBm--80 dBm-CF 5.745 GHz 161 pts Span 30.0 MHz

Date: 19.NOV.2018 08:25:08

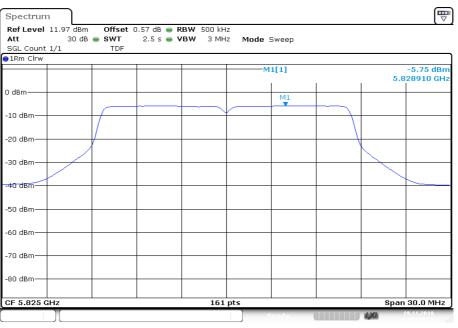
Plot 2: U-NII-3; middle channel

₽ Spectrum
 Offset
 0.57 dB ●
 RBW
 500 kHz

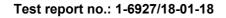
 SWT
 2.5 s ●
 VBW
 3 MHz
 Ref Level 14.41 dBm 30 dB 🖷 SWT Att SGL Count 1/1 Mode Sweep TDF ⊖1Rm Clrw M1[1] -3.25 dBm 5.789660 GHz 10 dBm· 0 dBm--10 dBm--20 dBm -30 dBm--40 dBm--50 dBm -60 dBm -70 dBm -80 dBm-CF 5.785 GHz Span 30.0 MHz 161 pts Date: 19.NOV.2018 08:31:39



Plot 3: U-NII-3; highest channel

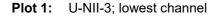


Date: 19.NOV.2018 08:27:16

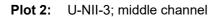




Plots: n/ac HT20 - mode



Spectrum Ref Level 12.68 dBm Offse Att 30 dB • SWT Offset 1.12 dB ● RBW 500 kHz SWT 2.4 s ● VBW 3 MHz Mode Sweep SGL Count 1/1 TDF -M1[1] -4.26 dBn 10 dBm-5.749840 GHz 0 dBm -10 dBm--20 dBm--30 dBm--40 dBm· -50 dBm--60 dBm--70 dBm -80 dBm· CF 5.745 GHz 161 pts Span 30.0 MHz Date: 7.NOV.2018 14:14:51



Spectrum
 Offset
 1.10 dB
 ■
 RBW
 500 kHz

 SWT
 2.4 s
 ■
 VBW
 3 MHz
 Ref Level 15.61 dBm 30 dB 🖷 SWT Att SGL Count 1/1 Mode Sweep TDF ⊖1Rm Clrw M1[1] -2.37 dBm 5.780160 GHz 10 dBm M1 0 dBm -10 dBm--20 dBm--30 dBm--40 dBm--50 dBm--60 dBm--70 dBm -80 dBm-CF 5.785 GHz 161 pts Span 30.0 MHz Date: 5.MAR.2019 09:23:44

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Plot 3: U-NII-3; highest channel

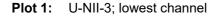
Spectrum
 Ref Level
 11.38
 Bm
 Offset
 1.12
 B
 RBW
 500
 kHz

 Att
 30
 dB
 SWT
 2.4 s
 VBW
 3 MHz
 Mode
 Sweep
 Att SGL Count 1/1 TDF M1[1] -6.00 dBm 5.829840 GHz 0 dBm-M1 -10 dBm--20 dBm--30 dBm--40 dBm -50 dBm--60 dBm--70 dBm -80 dBm-161 pts Span 30.0 MHz CF 5.825 GHz LX.

Date: 7.NOV.2018 14:17:02



Plots: n/ac HT40 – mode



Spectrum Ref Level 7.33 dBm Offse Att 25 dB • SWT
 Offset
 1.17 dB
 ■
 RBW
 500 kHz

 SWT
 2 s
 ■
 VBW
 3 MHz
 Mode Sweep SGL Count 1/1 TDF ⊖1Rm Clrw M1[1] -10.24 dBm 5.766130 GHz 0 dBm-M1 -10 dBm--20 dBm--30 dBm--40 dBm--50 dBm -60 dBm -70 dBm--80 dBm--90 dBm-240 pts Span 60.0 MHz CF 5.755 GHz Date: 19.NOV.2018 08:01:52

Plot 2: U-NII-3; highest channel

Spectrum
 Offset
 1.16 dB
 RBW
 500 kHz

 SWT
 2 s
 VBW
 3 MHz
 Ref Level 7.67 dBm 25 dB 👄 SWT Att SGL Count 1/1 Mode Sweep TDF ⊖1Rm Clrw M1[1] -9.87 dBm 5.806380 GHz 0 dBm M -10 dBm--20 dBm--30 dBm--40 dBm--50 dBm--60 dBm--70 dBm -80 dBm--90 dBm-CF 5.795 GHz 240 pts Span 60.0 MHz

Date: 19.NOV.2018 08:04:03



11.5.2 Power spectral density according to IC requirements

Description:

Measurement of the power spectral density of a digital modulated system. The measurement is repeated at the lowest, middle and highest channel.

Measurement:

Measurement parameter						
Detector:	RMS					
Sweep time:	≥10*(swp points)*(total on/off time)					
Resolution bandwidth:	1 MHz for U-NII-1/2A & 2C 500 kHz for U-NII-3					
Video bandwidth:	≥ 3xRBW					
Span:	> EBW					
Trace mode:	Max hold					
Used test setup:	See chapter 6.5 – A					
Measurement uncertainty:	See chapter 8					

Limits:

Power Spectral Density	
power spectral density e.i.r.p. ≤ 10 dBm in any 1 MHz band (band 5150 – 5250 MHz)	
power spectral density conducted \leq 11 dBm in any 1 MHz band (band 5250 – 5350 MHz) power spectral density conducted \leq 11 dBm in any 1 MHz band (band 5470 – 5725 MHz)	
power spectral density conducted ≤ 30 dBm in any 500 kHz band (band 5725 – 5850 MHz)	



	Power spe	ctral density (dBm/1MHz or dB	m/500kHz)				
	U-NII-1 (5150 MHz to 5250 MHz)						
	Lowest channel	Middle channel	Highest channel				
		Conducted					
	2.0	_/_	1.96				
	Radiated	l (calculated – see chapter anter	ina gain)				
	-0.1	_/_	1.06				
а	U-NII-2A (5250 MHz to 5350 MHz)						
a	Lowest channel	Middle channel	Highest channel				
	1.82	_/_	1.55				
	U	-NII-2C (5470 MHz to 5725 MHz	z)				
	Lowest channel	Middle channel	Highest channel				
	0.33	_/_	0.48				
	L	J-NII-3 (5725 MHz to 5850 MHz					
	Lowest channel	Middle channel	Highest channel				
	-3.87	-3.26	-5.76				

Results:

	Power spe	ctral density (dBm/1MHz or dB	Sm/500kHz)				
	U-NII-1 (5150 MHz to 5250 MHz)						
	Lowest channel	Middle channel	Highest channel				
		Conducted					
	2.06	_/_	2.05				
	Radiated	d (calculated – see chapter anter	nna gain)				
	-0.04	_/_	3.15				
n/ac HT20	U-NII-2A (5250 MHz to 5350 MHz)						
	Lowest channel	Middle channel	Highest channel				
	1.94	_/_	1.80				
	U-NII-2C (5470 MHz to 5725 MHz)						
	Lowest channel	Middle channel	Highest channel				
	0.41	0.17	0.30				
		J-NII-3 (5725 MHz to 5850 MHz)				
	Lowest channel	Middle channel	Highest channel				
	-4.26	-2.37	-6.01				

	Power spec	ctral density (d	Bm/1MHz or dE	3m/500kHz)			
	U-NII-1 (5150 MHz to 5250 MHz)						
	Lowest channel			Highest channel			
		Cond	ucted				
	-4.24			-4.40			
	Radiated	l (calculated – se	ee chapter anter	nna gain)			
	-6.34		-3.30				
n/ac HT40	U	-NII-2A (5250 N	/Hz to 5350 MHz)				
11/ac 11140	Lowest channel		Highest channel				
	-4.48		-4.60				
	U	-NII-2C (5470 N	Hz to 5725 MH	z)			
	Lowest channel	Middle	channel	Highest channel			
	-5.82	-5.	5.49 -5.93				
	L	J-NII-3 (5725 M	1Hz to 5850 MHz)				
	Lowest channel		Highest channel				
	-10.28			-9.90			

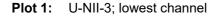


Test report no.: 1-6927/18-01-18

Test report no.: 1-6927/18-01-18



Plots: a - mode

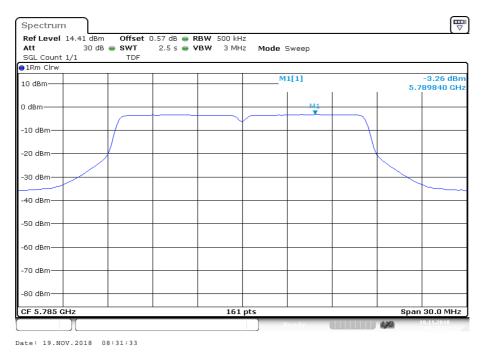


Spectrum Ref Level 13.73 dBm Offse Att 30 dB • SWT
 Offset
 0.57 dB ●
 RBW
 500 kHz

 SWT
 2.5 s ●
 VBW
 3 MHz
 Mode Sweep SGL Count 1/1 TDF ●1Rm Clrw M1[1] -3.87 dBm 5.749840 GHz 10 dBm-0 dBm--10 dBm--20 dBm--30 dBm -40 dBm--50 dBm--60 dBm· -70 dBm--80 dBm-CF 5.745 GHz 161 pts Span 30.0 MHz

Date: 19.NOV.2018 08:25:02

Plot 2: U-NII-3; middle channel



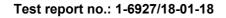
© CTC advanced GmbH



Plot 3: U-NII-3; highest channel

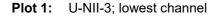


Date: 19.NOV.2018 08:27:11

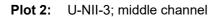




Plots: n/ac HT20 - mode



Spectrum Ref Level 12.68 dBm Offse Att 30 dB • SWT Offset 1.12 dB ● RBW 500 kHz SWT 2.4 s ● VBW 3 MHz Mode Sweep SGL Count 1/1 TDF -M1[1] -4.26 dBn 10 dBm-5.750030 GHz 0 dBm VII T -10 dBm--20 dBm--30 dBm--40 dBm· -50 dBm--60 dBm--70 dBm -80 dBm· CF 5.745 GHz 161 pts Span 30.0 MHz Date: 7.NOV.2018 14:14:46

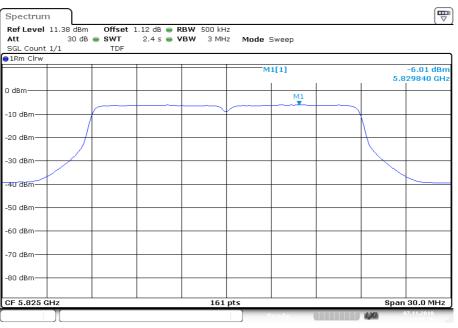


₽ Spectrum
 Offset
 1.10 dB ●
 RBW
 500 kHz

 SWT
 2.4 s ●
 VBW
 3 MHz
 Ref Level 15.61 dBm 30 dB 🖷 SWT Att SGL Count 1/1 Mode Sweep TDF ⊖1Rm Clrw M1[1] -2.37 dBm 5.790030 GHz 10 dBm 0 dBm -10 dBm--20 dBm--30 dBm--40 dBm--50 dBm--60 dBm--70 dBm -80 dBm-CF 5.785 GHz 161 pts Span 30.0 MHz Date: 5.MAR.2019 09:23:38



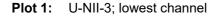
Plot 3: U-NII-3; highest channel



Date: 7.NOV.2018 14:16:56



Plots: n/ac HT40 – mode



Spectrum Ref Level 7.33 dBm Offse Att 25 dB • SWT
 Offset
 1.17 dB
 ■
 RBW
 500 kHz

 SWT
 2 s
 ■
 VBW
 3 MHz
 Mode Sweep SGL Count 1/1 TDF ⊖1Rm Clrw M1[1] -10.28 dBm 5.766380 GHz 0 dBm-M1 -10 dBm--20 dBm--30 dBm--40 dBm--50 dBm -60 dBm -70 dBm--80 dBm--90 dBm-240 pts Span 60.0 MHz CF 5.755 GHz Date: 19.NOV.2018 08:01:46

Plot 2: U-NII-3; highest channel

Spectrum
 Offset
 1.16 dB
 RBW
 500 kHz

 SWT
 2 s
 VBW
 3 MHz
 Ref Level 7.67 dBm 25 dB 👄 SWT Att SGL Count 1/1 Mode Sweep TDF ⊖1Rm Clrw M1[1] -9.90 dBm 5.806380 GHz 0 dBm M1 -10 dBm--20 dBm--30 dBm--40 dBm--50 dBm--60 dBm· -70 dBm -80 dBm--90 dBm-CF 5.795 GHz 240 pts Span 60.0 MHz

Date: 19.NOV.2018 08:03:57



11.6 Minimum emission bandwidth for the band 5.725-5.85 GHz

Description:

Measurement of the 6 dB bandwidth of the modulated signal.

Measurement:

Measurement parameter					
According to: KDB789033 D02, C.2.					
Detector:	Peak				
Sweep time:	Auto				
Resolution bandwidth:	100 kHz				
Video bandwidth:	300 kHz				
Span:	40 MHz				
Measurement procedure:	Using marker to find -6dBc frequencies				
Trace mode:	Max hold (allow trace to stabilize)				
Used test setup:	See chapter 6.5 – A				
Measurement uncertainty:	See chapter 8				

Limits:

FCC	IC
The minimum 6 dB bandwid	Ith shall be at least 500 kHz.

Test report no.: 1-6927/18-01-18



Results:

	6 dB emission bandwidth (MHz)						
	U-NII-3 (5725 MHz to 5850 MHz)						
а	Lowest channel	Middle channel	Highest channel				
	16.39	16.39	16.39				

Results:

	6 dB emission bandwidth (MHz)						
n/ac HT20	U-NII-3 (5725 MHz to 5850 MHz)						
n/ac H120	Lowest channel	Middle channel	Highest channel				
	17.65	17.65	17.65				

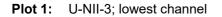
Results:

	6 dB emission bandwidth (MHz)					
n/ac HT40	U-NII-3 (5725 MHz to 5850 MHz)					
11/aC 1140	Lowest channel	Highest channel				
	35.24	35.42				

Test report no.: 1-6927/18-01-18



Plots: a - mode



Spectr	um									
Ref Lev	vel 8	.73 dBm	1	😑 RBW	/ 100 kHz					
Att		25 dB	SWT 1 ms	👄 VBW	/ 300 kHz 🛛 Mi	ode Swe	еер			
SGL Co	unt 1	431/143	31 TDF							
🕒 1Pk Ma	эх]
0 dBm—							M1[1]	мз	5.7	-7.31 dBm 367880 GHz
0 0.0			Mahand	mounter	Amerilandour	nontro	Majelyn	Munthan litt		-0.48 dBm
-10 dBm			- 1			¥		Ă,	5.7	524925 GHz
-20 dBm			- And - Contraction - Contract					\		
-30 dBm		al ward	r"						When we and	munu
-30 dBm	MAY									monun
-40 dBm										
-50 dBm	-		_							
-60 dBm	-									
-70 dBm										
/ 0 0.0										
-80 dBm										
CF 5.74	15 CH	2			100	Inte				1 30.0 MHz
Marker	.5 61				100.	. pt3			opu	
Type	Ref	Trc	X-value	. 1	Y-value	L E	unction	Eupo	tion Resul	+ 1
M1		1	5.7367		-7.31 di		anocion	, runc	Alon Kesul	<u> </u>
D2	M1	1		37 MHz	-0.19					
MЗ		1	5.75249	25 GHz	-0.48 di	3m				
M4		1	5.75318	17 GHz	-7.50 di	3m				
)[Ready		4/4	19.11.2018

Date: 19.NOV.2018 08:24:29

Plot 2: U-NII-3; middle channel

Specti	rum										
Ref Le	vel 9	.41 dBm		RBW	100 kHz						
Att		25 dB	SWT 1 ms	VBW	300 kHz Mc	de	Sweep				
SGL Co	unt 1	.431/143	1 TDF								
😑 1Pk Ma	эх										
				МЗ			M1	[1]			-6.99 dBm
0 dBm—				-			<u> </u>			5.7	767880 GHz
o aom			Minneal	funtional	nontrusting	man	Inneless	stulyum	Ammlupel 1 +		0.13 dBm
-10 dBm	∩				\	<u> </u>			4	5.7	799649 GHz
			J.						L.		
-20 dBm	∩— -		N							M	
		and the second								mour .	
~30,d8m	4774	w.								Ville,	Manner
											1.000 U.
-40 dBm)— 										
-50 dBm											
-50 UBII											
-60 dBm											
00 001	·										
-70 dBm	\rightarrow										
-80 dBm	∩— -										
CF 5.78	35 CH	17		L	1001	nts				Sna	in 30.0 MHz
Marker	50 01	12			1001	pts				эрс	
	Ref	Trc	X-value		Y-value	1	Funct	ion I	Fund	tion Resu	.1+ 1
Type M1	Rei	1	5.7767		-6,99 dB	m	Funct	IOII	Func	cion Rest	III
D2	M1			37 MHz	0.13 (
M3	1071	1	5.77996		0.13 dB						
M4		1	5.79318		-6.86 dB						
		7				_			2		10 11 2018
		Л					Re				

Date: 19.NOV.2018 08:31:00

Plot 3: U-NII-3; highest channel

Spectrum										Ē
Ref Level 6	.97 dBm	•	RBW 1	.00 kHz						
Att	25 dB	SWT 1 ms 👄	увж з	00 kHz - Mo	de S	Sweep				
SGL Count 1	431/1431	TDF								
1Pk Max										
						M	1[1] _N	43		-8.99 dBm
0 dBm		M1 A B	A						5.8	167880 GHz
-10 dBm		- "Julacultain	month	mounding	man	hund M	aldynn	Jon March 1		-2.42 dBm
·10 dBm				V V	/			, 1	5.8	299750 GHz
-20 dBm		J.						- <u>\</u>		
	and the	f							my.	
-30 dBm	Naka								man and a second	
40 dBm	and the								~~~~~	manus
40'd8m										1100000
-50 dBm										
-60 dBm										
-70 dBm —										
-80 dBm										
-90 dBm									_	
CF 5.825 GH	lz			1001	pts				Spa	n 30.0 MHz
larker										
	Trc	X-value		Y-value		Func	tion	Fund	tion Resu	t
M1 D2 M1	1	5.816788 G		-8.99 dB 0.05 c						
M3 M1	1	5.829975 G		-2.42 dB						
M4	1	5.8331817 G		-2.42 dB -8.94 dB						
		0.0001011 0		0.51.00		_				

Date: 19.NOV.2018 08:26:34



Plots: n/ac HT20 - mode

Plot 1: U-NII-3; lowest channel

Specti	um											
Ref Le	vel 7	.68 dBn	1	🔵 RBW	/ 100 kHz							
Att		25 d8	SWT 1 ms	VBW	/ 300 kHz M	de S	weep					
SGL Co	unt 1	521/15:	21 TDF				·					
😑 1Pk Ma	эх											۱
							M.	1[1] N	43		-	-8.50 dBm
0 dBm—	-			٨					X		5.736	i1587 GHz
			- Janut mush	moundling	Muhandrug	man	malles	BEIGHAM	manhanley	₩ 2		1.16 dBm
-10 dBm						1				4	5.750	00052 GHz
-20 dBm			Λ							N		
-20 ubii		للر	in .							Mr. Mar		
-30 dBm		and the second									when	www
-30 dBm	m										· ~ ~	Mallynew
-40 dBm												
-50 dBm												
-60 dBm												
-60 aBir												
-70 dBm												
-70 001												
-80 dBm												
-90 dBm												
CF 5.74	15 GH	z			100	l pts					Span (30.0 MHz
Marker												
Туре	Ref		X-value		Y-value		Funct	tion	Fi	inction R	esult	
M1		1	5.73615		-8.50 di							
D2	M1	1		22 MHz	-0.39							
M3		1	5.75000		-1.16 d							
M4	_		5.75381	U9 GHZ	-8.90 di	- inc						
		П]	R	eady		1,70	07	11.2018

Date: 7.NOV.2018 14:14:12

Plot 2: U-NII-3; middle channel

Specti	um									
Ref Le [.] Att SGL Co		30	dB SWT 1 r		W 100 kHz W 300 kHz N	lode s	Gweep			
⊖1Pk Ma	эх									
0 dBm—			MI	hulm	hendralling	purt	M1[1]	Ma	4	-6.15 dBm 761889 GHz 0.25 dBm 925222 GHz
-10 dBm			N						h. –	
-20 dBm -20 dBm -30 dBm	M	www	/0*						- Workton	mm
-40 dBm										
-50 dBm	-									
-60 dBm										
-70 dBm	-									-
-80 dBm										
CF 5.78	35 GF	17			1001	nts			Snar	n 30.0 MHz
Marker		-			1001				opu	
Type	Ref	Trc	X-valu	e	Y-value		Function	Fun	ction Resul	t
M1		1	5.77618	389 GHz	-6.15 dB					
D2	M1	1		22 MHz	-0.41					
MЗ		1	5.79252		0.25 dB					
M4		1	5.79384	412 GHz	-6.56 dB	m				
][Ready		4,70	05.03.2019

Date: 5.MAR.2019 09:23:08

Plot 3: U-NII-3; highest channel

Spectr	um									
	/el 6	.38 dBm		RBW						
Att		25 dB	SWT 1 ms 👄	VBW :	300 kHz - Mc	de Sw	/eep			
		521/1521	. TDF							
1Pk Ma	ix .				-					
) dBm—								мз	_	-10.35 dBn
, abiii			12 month alper	8. 6	A 0	β.,	heards	X A A	5. M4	8161587 GH
10 dBm			- man man Uni	nd halfanni ha	moundary	pound	nm Middellynu	ומלצייקטייאל לביייבטיעל לשיניקי	q.	-3.04 dBn 8300052 GH:
					1 1	/	1	1	-1, ³ .	.8300052 GH
20 dBm	_	A	Я — — —						- k.	
		South Start							"Un more	
30 dBm		wow							10w074	7/1
40 dBm	ym									Mu maynan
to ubiii										
50 dBm	_									
60 dBm	_									
70 dBm										
80 dBm										
80 UBIII										
90 dBm										
CF 5.82		7			1001	nts			Sn	an 30.0 MHz
larker		-			1001	pes				
	Ref	Trc	X-value	1	Y-value	r	unction	l Eu	nction Res	ult
M1		1	5.8161587	GHz	-10.35 dB			1		
D2	M1	1	17.6522		-0.14 0					
MЗ		1	5.8300052		-3.04 dB					
M4		1	5.8338109	GHz	-10.49 dB	m				

Date: 7.NOV.2018 14:16:19



Plots: n/ac HT40 - mode

Plot 1: U-NII-3; lowest channel

Spectrum	ו						
Ref Level 2.33 (dBm	👄 RBW 100 kł	Ηz				
Att 20	dB SWT 1.1 n	ns 👄 VBW 300 kł	Hz Mode Sv	veep			
SGL Count 2565/	2565 TDF						
⊜1Pk Max							
			ME	-M1[1]		-1	L4.23 dBm
					1	5.737	73778 GHz
-10 dBm	West worker where	aborander Markenber	olany products	rated for the second	olysburger the Hot		-6.51 dBm
00.10	1 m		l II		<u> </u>	5.758	37763 GHz
-20 dBm	1						
-30 dBm	1					V	
-So abin	- 1 ⁰					March .	
-40 dBm to have	ч —					Mar Carlonge	the work with a g
ahilledu data an							- mouth and any
-50 dBm							
-60 dBm							
-70 dBm							
-/0 ubiii							
-80 dBm							
-90 dBm							
CF 5.755 GHz			1001 pts			Span	60.0 MHz
Marker							
Type Ref Tro				inction	Funct	ion Result	
	1 5.73737		.23 dBm				
			0.20 dB				
	1 5.75877		.51 dBm				
M4	1 5.77262	23 GHZ -14.	.03 dBm				
				Ready		LXA 11	0.11.2018

Date: 19.NOV.2018 08:01:11

Plot 2: U-NII-3; highest channel

Spectrum										
Ref Level 2	2.67 dBm		👄 RBW	100 kHz						
Att	20 dB	SWT 1.1 n	ns 👄 VBW	/ 300 kHz 🛛 🛚 🛛	lode S	weep				
SGL Count 2	2549/254	9 TDF								
●1Pk Max										
					M	3 ⁻ M1[1]			-	14.20 dBm
			1 1 4						5.77	73778 GHz
-10 dBm		- Weiley Jugoto and	here de constantes	ayaayaayaayaya	paradam	- had palgabu	monteentrustreet	malau 1		-5.95 dBm
00.10		1						24	5.79	87763 GHz
-20 dBm		1		4				1		
-30 dBm		P								
-55 0611-	monorth							~	W.	hiterargeturan
140 PBR ter	part Aller								"Unulyand	ulu
how a strategy and the										marturell
-50 dBm										
-60 dBm										
-70 dBm										
00 40										
-80 dBm										
-90 dBm										
-so abiii										
CF 5.795 GH	lz	1		1001	pts				Span	60.0 MHz
Marker										
Type Ref	Trc	X-value		Y-value	I F	unction		Function	Result	1
M1	1	5.77737		-14.20 dBr						
D2 M1			13 MHz	1.00 d						
MЗ	1	5.79877	63 GHz	-5.95 dBr	n					
M4	1	5.8128	02 GHz	-13.20 dBr	n					
	Τ					Deady		LXI		9.11.2018
	Л							191		

Date: 19.NOV.2018 08:03:22



11.7 Spectrum bandwidth / 26 dB bandwidth

Description:

Measurement of the 26 dB bandwidth of the modulated signal.

Measurement:

Measureme	nt parameter						
According to: KD	According to: KDB789033 D02, C.1.						
Detector:	Peak						
Sweep time:	Auto						
Resolution bandwidth:	1% EBW						
Video bandwidth:	≥ RBW						
Span:	> Complete signal						
Trace mode:	Max hold						
Used test setup:	see chapter 6.5 – A						
Measurement uncertainty:	see chapter 8						

Limits:

Spectrum Bandwidth – 26 dB Bandwidth

IC: Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

FCC: Radar Detection Function of Dynamic Frequency Selection (DFS). U-NII devices operating with any part of its 26 dB emission bandwidth in the 5.25-5.35 GHz and 5.47-5.725 GHz bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems.



		26 dB band	width (MHz)							
	L	J-NII-1 (5150 MI	Hz to 5250 MHz)						
	Lowest channel	Middle	channel	Highest channel						
	32.47	-,	/_	34.6						
	Lowest frequency	/	F	lighest frequency						
	5185.245			5257.483						
	U-NII-2A (5250 MHz to 5350 MHz)									
	Lowest channel	Middle	channel	Highest channel						
а	34.02	-/	/_	33.47						
	U-NII-2C (5470 MHz to 5725 MHz)									
	Lowest channel	Middle	channel	Highest channel						
	32.07	37.	.86	34.32						
	L	J-NII-3 (5725 MI	Hz to 5850 MHz							
	Lowest channel	Middle	channel	Highest channel						
	23.18	22	.43	22.38						
	Lowest frequency	/	Highest frequency							
	5733.612			5836.139						



		26 dB band	width (MHz)						
	L	J-NII-1 (5150 MI	Hz to 5250 MHz)					
	Lowest channel	Middle	channel	Highest channel					
	36.26	-/	/_	35.56					
	Lowest frequency	/	F	lighest frequency					
	5162.118			5257.882					
	U-NII-2A (5250 MHz to 5350 MHz)								
	Lowest channel	Middle	channel	Highest channel					
n/ac HT20	36.16	-/	/_	38.01					
	U-NII-2C (5470 MHz to 5725 MHz)								
	Lowest channel	Middle	channel	Highest channel					
	37.36	40.	.21	36.01					
	L	J-NII-3 (5725 MI	Hz to 5850 MHz)					
	Lowest channel	Middle	channel	Highest channel					
	24.53	33.	.32	23.03					
	Lowest frequency	/	Highest frequency						
	5732.812			5836.538					

Test report no.: 1-6927/18-01-18

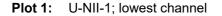
		26 dB bandwidth (MHz)								
	L		Hz to 5250 MHz)							
	Lowest channel		Highest channel							
	49.85			45.55						
	Lowest frequency	/	F	lighest frequency						
	5167.123		5252.477							
	U	-NII-2A (5250 M	IHz to 5350 MHz)							
	Lowest channel			Highest channel						
n/ac HT40	45.35			45.06						
	U	-NII-2C (5470 M	Hz to 5725 MHz)							
	Lowest channel	Middle	channel	Highest channel						
	44.66	44.	.46	44.86						
	U-NII-3 (5725 MHz to 5850 MHz)									
	Lowest channel			Highest channel						
	44.46		44.16							
	Lowest frequency	/	Highest frequency							
	5732.822		5816.978							



Test report no.: 1-6927/18-01-18



Plots: a - mode



₽ Spectrum ● RBW 300 kHz SWT 1 ms ● VBW 1 MHz Ref Level 11.62 dBm Att 30 dB Mode Sweep SGL Count 1435/1435 TDF ●1Pk Ma× M1[1] 22.75 dBr 5.1638661 GHz 5.13 dBm 0 dBm M3[1] 5.1852447 GHz -10 dBm ጌ Je. -20 dBm Marian 2 unun -30 dal orthy -40 dBm -50 dBm -60 dBm -70 dBm· -80 dBm· Span 50.0 MHz CF 5.18 GHz 1001 pts Marker Y-value -22.75 dBm -0.30 dB 5.13 dBm Type Ref Trc X-value Function Function Result 5.1638661 GHz 32.4675 MHz 5.1852447 GHz M1 D2 M3 M1 M4 5.1963336 GHz -23.05 dBm 12

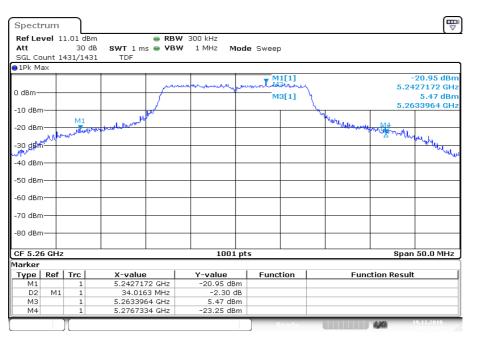
Date: 19.NOV.2018 08:10:45

Plot 2: U-NII-1; highest channel

₽ Spectrum Ref Level 11.19 dBm 🔵 RBW 300 kHz Att 30 dB SGL Count 1457/1457 SWT 1 ms 👄 VBW 1 MHz Mode Sweep TDF ⊖1Pk Ma× M1[1] 22.24 dBn Marson 5.2228669 GHz 0 dBm M3[1] 4.92 dBn 2352548 GH -10 dBm H4 Maliny M1 -20 dBm trylly. -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm -80 dBm-CF 5.24 GHz 1001 pts Span 50.0 MHz Marker Y-value Function Function Result Type Ref Trc <u>X-value</u> 5.2228669 GHz 34.6158 MHz -22.24 dBm 1.11 dB 4.92 dBm -21.13 dBm D2 M1 5.2352548 GHz 5.2574828 GHz МЗ M4

Date: 19.NOV.2018 08:12:47

Plot 3: U-NII-2A; lowest channel



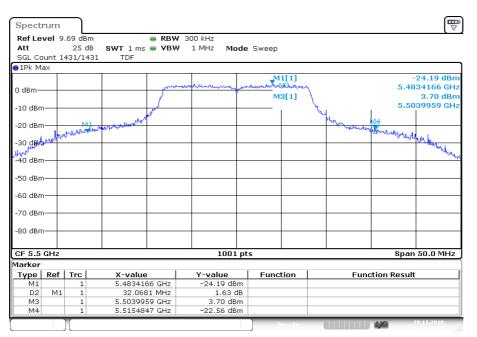
Date: 19.NOV.2018 08:14:32

Plot 4: U-NII-2A; highest channel

Spectr	um										E
Ref Lev	vel 1	0.79 dBn	n	RBW	300 kHz						``
Att		30 di	3 SWT 1 ms	VBW	1 MHz M	ode	Sweep				
SGL Co	unt 1	431/143	1 TDF								
●1Pk Ma	эх										
0 dBm—				permi	mannen	استر	M1[1]	AN/3		5.	-22.13 dBn 3035663 GH:
				كر			M3[1]	\		5.	4.99 dBn 3265434 GH:
-20 dBm		М1	Mar Allower	v				~~ ~	W. Wowlow	MA	
-30 dem	phat	Mar and the	torothe a Malenser							and Burg	3265434 GH:
www											. Walter
-40 dBm											
-50 dBm											
-60 dBm	-										
-70 dBm											
-80 dBm	_										
CF 5.32	2 GHz				1001	pts				Sp	an 50.0 MHz
Marker											
Type	Ref	Trc	X-value		Y-value		Function		Fu	nction Res	ult
M1		1	5.3035663	3 GHz	-22.13 dBr						
D2	M1	1	33.4669		-0.73 d						
M3 M4		1	5.3265434		4.99 dBr -22.86 dBr						
							Ready	1		4,00	19.11.2018

Date: 19.NOV.2018 08:16:16

Plot 5: U-NII-2C; lowest channel



Date: 19.NOV.2018 08:18:03

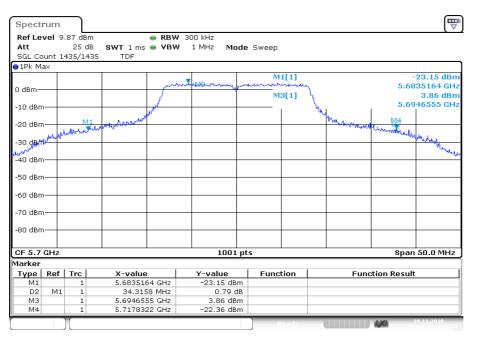
Plot 6: U-NII-2C; middle channel

Spect	rum												
Ref Le Att SGL Co		25 d	B SWT 1 ms		300 kHz 1 MHz Mc	de S	Sweep						
01Pk M													
0 dBm—				Kong	allower	prove	maleton	l[1] •~~~~ 8[1]	γ			5.58	24.76 dBm 21179 GHz 3.67 dBm
-10 dBm -20 dBm		M1	when a man and a start when	on the second					- Vr	Wy march	Heredale	5.59 പക. M	33568 GHz สู ซึ่งในปู
-30 d B M -40 dBm		Posta in .	and the second									- www.www.Wy	Kunn Um
-50 dBm	-												
-60 dBm													
-70 dBm	<u>ا</u> ر												
-80 dBm	-												
CF 5.6	GHz		1	1	1001	pts						Span	50.0 MHz
Marker													
Туре	Ref	Trc	X-value		Y-value		Funct	ion		Fi	unction	Result	
M1		1	5.58211		-24.76 dB								
D2	M1	1		l9 MHz	-2.31 c								
M3 M4		1	5.59335 5.61997		3.67 dB -27.07 dB								
							R	eady	1		- M		9.11.2018

Date: 19.NOV.2018 08:28:39



Plot 7: U-NII-2C; highest channel



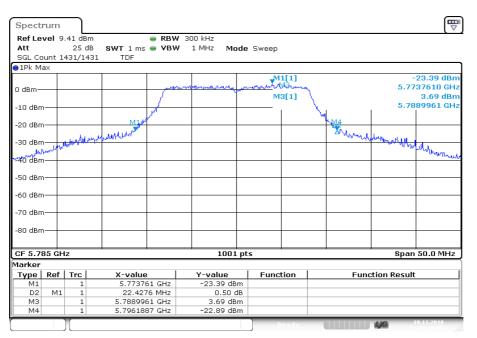
Date: 19.NOV.2018 08:22:03

Plot 8: U-NII-3; lowest channel

Spectrum									
Ref Level 8.			RBW						
Att	25 dB	SWT 1 ms (● VBW	1 MHz Mod	e Sweep				
SGL Count 14	31/1431	TDF							
●1Pk Max									
					M NA	1[1]			-24.02 dBm
0 dBm			man				λ	5.73	336115 GHz
			1		M	3[1]	1		2.53 dBm
-10 dBm			1				<u>ч</u> ,	5.74	183469 GHz
		ALL AND	r.				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
-20 dBm		The second secon							harilly manadalo
-20 dBm	LLAN	guluby rubdel					22 well the rest	Wash Marson	
-30 uBm	Mr. M. Santa I							- mproduly	horse
AND dBm									wardel
10 abiii									
-50 dBm									
00 00.00									
-60 dBm									
-70 dBm		++							
-80 dBm									
CF 5.745 GH	7	1		1001 g	nts			Snar	50.0 MHz
Marker	-			1001				opai	
	Trc	X-value	1	Y-value	Fund	tion		ction Resul	F 1
Type Ref M1	1	5.7336115	CH2	-24.02 dBm		cion	Fur	iction Resul	L
D2 M1	1	23.1767		0.36 dB					
M3 M1	1	5.7483469		2.53 dBm					
M4	1	5.7567882		-23.67 dBm					
	()				· · · · · · · · · · · · · · · · · · ·	_			10 11 2010
								1.76	

Date: 19.NOV.2018 08:23:57

Plot 9: U-NII-3; middle channel



Date: 19.NOV.2018 08:30:27

Plot 10:	U-NII-3; highest channel	
Plot 10:	U-NII-3; highest channel	

Spectru	m	٦											ſ
Ref Leve	I 6.97	dBm		● RBW	/ 300 kHz								
Att	2	25 dB	SWT 1 ms	VBW	I 1 MHz Mo	de	Sweep						
SGL Coun	t 143:	1/1431	TDF										
⊖1Pk Max													
							<u>M</u> 1	[1]				-	25.64 dBn
0 dBm	+			the second s	malmonum	men	www.W	440~~	<u>۱</u>			5.81	37610 GH
				1	ľ		Ma	[1]	1				0.46 dBn
-10 dBm—				Å					1			5.82	96453 GH
-20 dBm—				հվ					mar				
									N	×.			
-30 dBm— ന49നdBm ^{പ്രദ}			and the second second							<u>∆</u> 4			
	ach	Month	Mag words							Marth	where	Ann	Mar woody
∿40₁dB m <u>∿</u> /	Note o	-										~~~	Work work
-50 dBm—	+												
-60 dBm—	-												
-70 dBm—													
-70 ubiii—													
-80 dBm—													
-00 00111													
-90 dBm—													
CF 5.825	GHz		1		1001	pts						Span	50.0 MHz
Marker						<u> </u>							
	ef T	rc	X-value	1	Y-value	1	Funct	ion	1	Fu	nction	Result	
M1		1	5.8137		-25.64 dBi	m							-
D2	M1	1	22.37	'8 MHz	-0.09 d	в							
MЗ		1	5.82964	53 GHz	0.46 dB	n							
M4		1	5.83613	39 GHz	-25.73 dB	n							
	1							adv			1.30		19.11.2018
											100		

Date: 19.NOV.2018 08:26:08



Plots: n/ac HT20 - mode

Plot 1: U-NII-1; lowest channel

Spectrum						
Ref Level 10.94 dBm	🖷 RBV	V 300 kHz				(
Att 30 dB	SWT 1 ms 👄 VBV	V 1 MHz Mode	e Sweep			
SGL Count 1521/1521	TDF					
1Pk Max						
			M1[1]			23.07 dBm
) dBm	June	menning	en un hablen	m	5.16	21176 GHz
Gabin	1		M3[1]	4		4.60 dBm
10 dBm	1			<u> </u>	5.18	45955 GHz
10 dBm	. Art			M	MA Marine Marine	
20 dBm M1	and the highly way to be a second of the sec				Although Ma	
and all the and the second						Malutary .
30kapu						- Marthu
40 dBm						
50 dBm						
60 dBm						
70 dBm						
80 dBm						
CF 5.18 GHz		1001 pt:	5		Span	50.0 MHz
larker						
Type Ref Trc	X-value	Y-value	Function	Fun	ction Result	
M1 1	5.1621176 GHz	-23.07 dBm				
D2 M1 1 M3 1	36.2639 MHz 5.1845955 GHz	0.06 dB 4.60 dBm				
M3 1 M4 1	5.1983816 GHz	-23.01 dBm				
1917	3.1903810 GHz	20.01 UBIII				

Date: 7.NOV.2018 13:58:56

Plot 2: U-NII-1; highest channel

Spectru	m											
Ref Leve Att SGL Cour		30 de	SWT 1 m		WY 300 kHz WY 1 MHz Ny	lode	Sweep)				
●1Pk Max												
0 dBm				June	uere huddannun	m	mound	1[1] ~~~~~ 3[1]	m			-22.28 dBn 2223176 GH 5.03 dBn
-10 dBm-	_			J.					1		5.3	2353044 GH
-20 dBm—		M1	all man provident							Www.Wallala	M4	2353044 GH:
"AD UBm-	up										2. 4	man Hundle of
-40 dBm—	-											
-50 dBm—	+											
-60 dBm—	+											
-70 dBm—	+											
-80 dBm—	+											
CF 5.24	GHZ		1	I	1001	pts		I			Spa	n 50.0 MHz
Marker												
	tef	Trc	X-value	. 1	Y-value	1	Funct	tion	1	Fun	ction Resu	ılt
M1		1	5.22231		-22.28 dE	m						
D2	M1	1	35.564	15 MHz	0.41	dВ						
M3 M4		1	5.23530 5.25788		5.03 dE -21.87 dE							
							P	eady			120	07.11.2018 14:01:11

Date: 7.NOV.2018 14:01:11

Plot 3: U-NII-2A; lowest channel

Spectrum							
Ref Level 10.	.67 dBm	e Ri	3W 300 kHz				
Att	30 dB	SWT 1 ms 👄 VI	BW 1 MHz Mod	e Sweep			
SGL Count 15	21/1521	TDF					
1Pk Max							
		سمرو	www.mer	M1[1]	-~~		-21.84 dBm +13189 GHz
0 dBm				M3[1]	1		4.66 dBm
-10 dBm					1	5.26	527973 GHz
-20 dBm M	1	a have any about the			Mar hadden		while white
-20 UBIN	multer	hour a				and marcherly	- Andrew
ap dBm							www.upple
P*							1
40 dBm							
-50 dBm							
-60 dBm							
-00 ubiii							
-70 dBm							
-80 dBm							
CF 5.26 GHz			1001 pt	s		Spar	50.0 MHz
1arker							
Type Ref	Trc	X-value	Y-value	Function	Func	tion Resul	t j
M1	1	5.2413189 GHz	-21.84 dBm				
D2 M1	1	36.1636 MHz	-0.06 dB				
M3	1	5.2627973 GHz	4.66 dBm				
M4	1	5.2774825 GHz	-21.90 dBm				

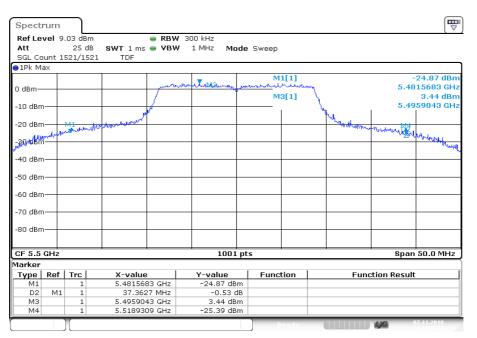
Date: 7.NOV.2018 14:03:37

Plot 4: U-NII-2A; highest channel

Spectr	um									
Ref Lev Att SGL Co	unt 1	30	dB SWT 1 m		W 300 kHz W 1 MHz Mo	de Sweep)			
⊖1Pk Ma	эх					M	1[1]			24.11 dBm
o -10				pennen	Josphen mour	mon	1010-900 1111	m		03694 GHz
0 dBm—				1		M	3[1]	- \		4.41 dBm
-10 dBm				1				<u> </u>	5.31	39558 GHz
			Art	ť				Junay		
-20 dBm	-41	-100 P. P.	where the state of					- March March	WYMANNIL HILL	
പുദ്ധിപ്പും പുദ്ധിപ്പും	hland		- Maria Maria Maria					hadron and the day	Zuk	www.
-40 dBm										
-50 dBm										
-60 dBm										
-70 dBm										
-80 dBm										
-80 aBm										
CF 5.32	2 GHz				1001	ots			Span	50.0 MHz
Marker										
Type	Ref	Trc	X-value	e	Y-value	Func	tion	Fun	ction Result	:
M1		1	5.30036	94 GHz	-24.11 dBm	1				
D2	M1	1		24 MHz	1.16 dE					
M3 M4		1	5.31395		4.41 dBm -22.94 dBm					
1414		1	3.33030	20 012	22.97 UDII	· ·	_		14-3475	17 11 2018
		Л							4,44	

Date: 7.NOV.2018 13:49:53

Plot 5: U-NII-2C; lowest channel



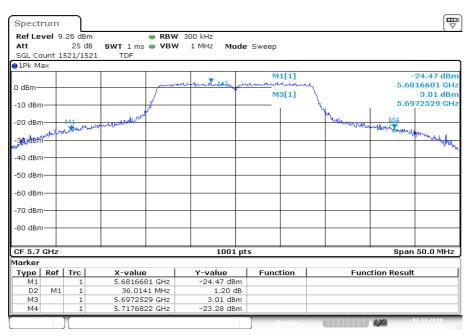
Date: 7.NOV.2018 13:55:41

Plot 6: U-NII-2C; middle channel

Spectrum						l≣ ▼
Ref Level 9 Att SGL Count 1	25 dB	SWT 1 ms 👄 VB	W 300 kHz W 1 MHz Mode	e Sweep		
⊖1Pk Max						
				M1[1]		-23.38 dBn
0 dBm		- market and the second s	when mound and	L.Mammun	my	5.5795702 GH
		/		M3[1]	- Y	2.90 dBn
-10 dBm-+					×	5.6010988 GH
		A CONTRACTOR OF			₩.	
-20 dBm 📲		A nather			Walatha de	nu h h
Mulu	water	MVurnum mit				warman and an and an
-40 dBm —						
-50 dBm						
-60 dBm						
70.10						
-70 dBm-+						
-80 dBm						
CF 5.6 GHz			1001 p	ts		Span 50.0 MHz
Marker						
Type Ref	Trc	X-value	Y-value	Function	Eu	nction Result
M1	1	5.5795702 GHz	-23.38 dBm			
D2 M1		40.2099 MHz	-1.60 dB			
M3	1	5.6010988 GHz	2.90 dBm			
M4	1	5.6197801 GHz	-24.97 dBm			
	7)		05.02.2010
	Л			Ready		05.03.2019

Date: 5.MAR.2019 09:18:32

Plot 7: U-NII-2C; highest channel



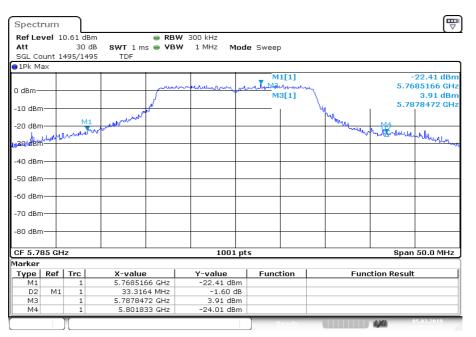
Date: 7.NOV.2018 14:10:49

Plot 8: U-NII-3; lowest channel

Spectrum						
Ref Level	7.68 dBm	🖷 RBV	V 300 kHz			
Att	25 dB	SWT 1 ms 👄 VBV	W 1 MHz Mode	e Sweep		
SGL Count	1521/152	1 TDF				
∋1Pk Max						
				M1[1]_		-25.85 dBr
0 dBm —			البر المندون والمحمد المحمد	March march and the	443	5.7328123 GH
			- I - Y	M3[1]	1	1.51 dBr
-10 dBm		1				5.7520927 GH
		all			N.	1 1
-20 dBm —		Ml Ja			Me M4	
-30 dBm -40 dBm		mandetward			- Antonio	and also with the work when the
-30 dBm	Mr. Wall	,			<u> </u>	San Strate Brillingham Banch
Merel Martin						100 Warne
-40 aBm						
-50 dBm						
-50 00111						
-60 dBm						
-70 dBm						
-80 dBm						
-90 dBm						
CF 5.745 G	Hz		1001 p	ts		Span 50.0 MHz
/larker						
Type Ref	Trc	X-value	Y-value	Function	Fun	ction Result
M1	1	5.7328123 GHz	-25.85 dBm			
D2 M		24.5253 MHz	-2.00 dB			
MЗ	1	5.7520927 GHz	1.51 dBm			
M4	1	5.7573376 GHz	-27.84 dBm			
	1			Dondu		07.11.2018

Date: 7.NOV.2018 14:13:40

Plot 9: U-NII-3; middle channel



Date: 5.MAR.2019 09:22:35

Ref Le	vel 6	.38 dBm		RBW	300 kHz							
Att		25 dB	SWT 1 ms	👄 VBW	1 MHz M	1ode	Sweep					
SGL Co	ount 1	521/152	1 TDF									
🕒 1Pk M	ах											
							M	1[1]				-27.69 d
0 dBm-				man	mound	سر به	withda	anna			5.8	135117 (
-10 dBn						Ĩ	M	3[1]				-0.41 d
-10 aBU) — [-			1					A		5.8	276972 (
-20 dBn	<u> </u>			r					<u> </u>			
			MIM						M.			
-30 dBn	η 		A share			-			A	asta L		
	المعرور	www.	Chemina Autor							- TOULDING A	the man of	whitemen
<mark>∿⊾40°</mark> dBh	<u>ו</u> -ר		had an and the for the second s									
-50 dBn												
-30 ubii	·											
-60 dBn	η					_						
-70 dBn												
00 JD-												
-80 dBn												
-90 dBn	-											
CF 5.8		17			10)1 pt	-				Sna	n 50.0 MI
Marker					10	- pc					opu	
Type	Ref	Trc	X-value	a	Y-value	1	Func	tion		Functi	on Resu	lt
M1		1	5.81351		-27.69	dBm	. unc			. anoti	0.1.1634	••
D2	M1	1		57 MHz	0.12							
MЗ		1	5.82769	72 GHz	-0.41							
M4		1	5.83653	84 GHz	-27.57	dBm						
	-						1		21111	1111	NO.	07 11 2018

Plot 10: U-NII-3; highest channel



Plots: n/ac HT40 - mode

Plot 1: U-NII-1; lowest channel

Spectrum					
Ref Level 5.16 df Att 25 5 SGL Count 2760/2	dB SWT 1 ms 👄 VBV	V 500 kHz V 3 MHz Mode	Sweep		X
1Pk Max					
0 dBm		Males an pursue was a puter	<u>and and Milling</u>	m	-25.93 dBm 5.1671229 GH
-10 dBm	<u>}</u>		M3[1]		2.42 dBm 5.1769129 GH
-20 dBm	Mileo			hat	
-30 dBm					Mar warden war
-50 dBm					
-60 dBm					
-70 dBm					
-80 dBm					
-90 dBm					
CF 5.19 GHz		1001 pt	5		Span 100.0 MHz
1arker					
Type Ref Trc	X-value	Y-value -25.93 dBm	Function	Funct	ion Result
M1 1 D2 M1 1	5.1671229 GHz 49.8499 MHz	-25.93 dBm 1.98 dB			
M3 1	5.1769129 GHz	2.42 dBm			
M4 1	5.2169728 GHz	-23.94 dBm			
			Ready		19.11.2018

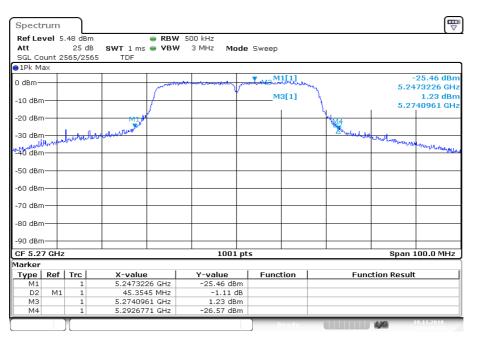
Date: 19.NOV.2018 07:41:30

Plot 2: U-NII-1; highest channel

Spectrum								ſ₩
Ref Level 4 Att SGL Count 2	20 dB	SWT 1 ms 👄 VI	3W 500 kHz 3W 3 MHz Mi	ode Si	veep			, ,
⊖1Pk Max								
0 dBm		- m	and to surprise a standar of	,	worked	m	5.2	-26.60 dBn 069233 GH
-10 dBm					M3[1]	h.		1.22 dBn 391910 GH:
-20 dBm		Mind				- W44		
-30 dBm	Marhourhal	MI with					wald when where we	and the monthly
-50 dBm								attach De
-60 dBm								
-70 dBm								
-80 dBm								
-90 dBm								
CF 5.23 GH	z		100	pts	I	I	Span	100.0 MHz
Marker								
Type Ref		X-value	Y-value		Function	Fu	nction Resu	lt
M1	1	5.2069233 GH						
D2 M1		45.5542 MH						
M3 M4	1	5.239191 GH 5.2524774 GH						
][Ready		4,40	19.11.2018 07:17:29

Date: 19.NOV.2018 07:47:30

Plot 3: U-NII-2A; lowest channel



Date: 19.NOV.2018 07:49:57

Plot 4: U-NII-2A; highest channel

Spectrum					
Ref Level 4.69 dBr	m 🖷 RBV	/ 500 kHz			L
Att 20 d	B SWT 1 ms 👄 VBV	V 3 MHz Mode	Sweep		
SGL Count 2565/25	65 TDF				
⊜1Pk Max					
0 dBm		Martin Contraction of the second	M1[1]		-25.45 dBm
o doni	fundation	V		way	5.2876221 GHz
-10 dBm			M3[1]	1	0.97 dBm
			1	N	5.3009091 GHz
-20 dBm	- MIL			NM4	
	a lange de la constante				
-30 dBm	A PARTY CONTRACTOR			- weathy left	and the second s
-30 dBm					oder the committee from a look how how
pro abin					- Car
-50 dBm					
-60 dBm					
-70 dBm					
-80 dBm					
-00 0011					
-90 dBm					
CF 5.31 GHz		1001 pt			
		1001 pt	S		Span 100.0 MHz
Marker					
Type Ref Trc	X-value	Y-value	Function	Fun	iction Result
M1 1 D2 M1 1	5.2876221 GHz 45.055 MHz	-25.45 dBm -1.56 dB			
M3 1	45.055 MH2 5.3009091 GHz	-1.56 UB 0.97 dBm			
M3 1 M4 1	5.3326771 GHz	-27.01 dBm			
		2.102 0.011)		10.11.2010
			Ready		07:52:15

Date: 19.NOV.2018 07:52:16

Plot 5: U-NII-2C; lowest channel

Spectrum					
Ref Level 3.60 dBm	● RBW	/ 500 kHz			(·
Att 20 dB	SWT 1 ms 👄 VBW	/ 3 MHz Mode	Sweep		
SGL Count 2565/256	5 TDF				
1Pk Max					
0 dBm		wellinggemeenen on	M1 M	3.	-27.49 dBm
	Market Market	-1° Ψ		~	5.4874225 GHz
-10 dBm			M3[1]	1	-0.39 dBm 5.5223875 GHz
-20 dBm				<u> </u>	
-20 UBIII	Mille			W#	
-30 dBm	www.uhours			Any hours	
-20 dBm -30 dBm สูงช่าชชิต					and my the the whether whether a
"40°aBm					Company and
-50 dBm					marine the share and a second
-50 UBIII					
-60 dBm					
-70 dBm					
-80 dBm					
-90 dBm					
CF 5.51 GHz		1001 pt	5		Span 100.0 MHz
1arker					
Type Ref Trc	X-value	Y-value	Function	Fu	nction Result
M1 1	5.4874225 GHz	-27.49 dBm			
D2 M1 1 M3 1	44.6556 MHz 5.5223875 GHz	0.98 dB -0.39 dBm			
M3 1 M4 1	5.5320781 GHz	-26.51 dBm			
	0.0020101 0/12	20.01 000			

Date: 19.NOV.2018 07:54:37

Plot 6: U-NII-2C; middle channel	
---	--

Spectrum							
Ref Level 3	.44 dBm		RBW	500 kHz			•
Att	20 dB	0111 2 1112	VBW	3 MHz Mode	Sweep		
SGL Count 2	565/256	5 TDF					
∋1Pk Max							
0 dBm			her all a	mulal margineria	man Millichan		-26.30 dBm
			part .	V V		my	5.5675223 GHz
-10 dBm			1		M3[1]	5	0.71 dBm
			1			h,	5.5988910 GHz
-20 dBm		Mi				1922	
00 d0		and a sumary				Dubu de	
-30 uBm	Norallan	HHOLM					all blog have been been a
-30 dBm							and the war and the second
							www
-50 dBm							
-60 dBm							
-70 dBm —							
-80 dBm							
-90 dBm							
CF 5.59 GHz				1001 pt	c		Span 100.0 MHz
Marker				1001 pc	-		5pail 10010 Mill2
	Trc	X-value	1	Y-value	Function	-	nction Result
Type Ref M1	1	5.567522	2 CH2	-26.30 dBm	Function	Fu	
D2 M1	1	44.455		-20.30 uBili 0.90 dB			
M3	1	5.59889		0.90 db			
M4	1	5.611978		-25.40 dBm			
	1						10 11 2018
	Л				Ready		

Date: 19.NOV.2018 07:56:41



Plot 7: U-NII-2C; highest channel

Spectr	um												
Ref Lev	el 3				👄 RBV	/ 500 kH	z						
Att		20 di			VBV	/ 3 MH	z Mode	sweep					
SGL Co		565/25	55	TDF									
1Pk Ma	×												
0 dBm—	_					multilitier	did to a	M	1[1]				-25.54 dBn
					(and the second		v			~		5.6	474225 GH:
-10 dBm					1	_		M;	3[1]	1			0.73 dBn
					W.					N	1		595103 GH:
20 dBm				M1 XJW						112			
-20 dBm -30 dBm			فعرما	June						Z _{ilu} ,	N.B.		
SO GDIII	war	MANAH	M. Martin								- Marria	merchandrog	
40 dBm			_			_							- Collevelles
													in lathallout
50 dBm													
60 dBm													
-70 dBm													
, o abiii													
-80 dBm	_		_										
-90 dBm			-										
CF 5.67	GHz						1001 pi	ts				Snan	100.0 MHz
larker	0.12						1001 p					opun	10010 1112
	Ref	Trc	>	(-value		Y-v	alue	Func	tion		Funct	ion Resu	lt
M1		1		.64742			5.54 dBm						
D2	M1	1		44.855	53 MHz		0.24 dB						
MЗ		1		.65951			0.73 dBm						
M4		1	5	.69227	78 GHz	-2	5.30 dBm						

Date: 19.NOV.2018 07:58:44

Plot 8: U-NII-3; lowest channel

Spectrum										
Ref Level	2.33 dB	m	RBW	500 kHz						
Att	20 d	B SWT 1 ms	👄 VBW	3 MHz Mo	de	Sweep				
SGL Count	2565/25	65 TDF								
●1Pk Max										
				-		J.MM1	1]			-29.32 dBm
			mounder	mound	June			ung	5.7	328220 GHz
-10 dBm			1			M3[1]	1		-1.46 dBm
00.10			1					Υ.	5.7	601946 GH
-20 dBm		MJø	r					W#		
-30 dBm		- And						- Ang		
	au Maryon	nontententerterterter						whereas	4 the receiver to and	which
-40 dBpc	July 1									un strated on the last
-50 dBm										
-50 UBIII										
-60 dBm										
00 00										
-70 dBm										
-80 dBm										
-90 dBm										
CF 5.755 0				1001	nte				 Snan	100.0 MHz
Marker	1112			1001	prs				эран	100.0 MHZ
	(×			- 1	Functio		-	ction Resu	
Type Re M1	f Trc	X-value 5.7328		<u>Y-value</u> -29.32 dB	-	Functio	n)	Fun	cuon kesu	n
D2 M			22 GH2 59 MHz	-29.32 UB 1.62 c						
M3	1 1	5.76019		-1.46 dB						
M4	1	5.7772		-27.69 dB						
	7				_					10 11 2018
									1000	

Date: 19.NOV.2018 08:00:48



Plot 9: U-NII-3; highest channel

Spect										₹
	vel 2	2.67 dBm			500 kHz					
Att		20 dB	SWT 1 ms 🖷	• VBW	3 MHz Mod	e Sweep				
		2549/254	9 TDF							
1Pk Ma	эх									
				enert	and proving proving	Miller uner Math	RAM3			-27.14 dBn
10 dBm					V			١	5.77	28220 GH
TO UBII	'		1			M3[11	1	5.00	-1.10 dBn 178874 GH:
20 dBm	∩		1						5.60	
			M1,					* ¥4		
30 dBm	∩— -		1 MARAN					-		
	1	Un superson	mumul						Mr. J. way building the be	
<u>Litara</u>		•	mand MMar						When we want and a strategy	- Hatelewertuck
50 dBm										
-60 dBm	∩— -									
70 dBm	<u>ו</u> רי									
-80 dBm										
00 000	·									
-90 dBm	∩— -									
CF 5.79	95 GH	lz			1001 p	its			Span	100.0 MHz
1arker										
Туре	Ref	Trc	X-value		Y-value	Functio	in	Fi	Inction Result	t
M1 D2	M1	1	5.772822		-27.14 dBm -0.32 dB					
M3	1911	1	5.8078874		-0.32 UB -1.10 dBm	-				
M4		1	5.8169779		-27.46 dBm					

Date: 19.NOV.2018 08:02:59



11.8 Occupied bandwidth / 99% emission bandwidth

Description:

Measurement of the 99% bandwidth of the modulated signal acc. RSS-GEN.

Measurement:

Measureme	nt parameter
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	300 kHz / 500 kHz
Video bandwidth:	1 MHz / 3 MHz
Span:	50 MHz / 100 MHz
Measurement procedure:	Measurement of the 99% bandwidth using the integration function of the analyzer
Trace mode:	Max hold (allow trace to stabilize)
Test setup:	See sub clause 6.5 – A
Measurement uncertainty:	See sub clause 8

<u>Usage:</u>

-/-	IC
OBW is necessary fo	r Emission Designator



Results:

		99% bandwidth (kHz)								
	U-NII-1 (5150 MHz to 5250 MHz)									
	Lowest channel	Middle channel	Highest channel							
	17932	_/_	18082							
	U	-NII-2A (5250 MHz to 5350 MHz	z)							
	Lowest channel	Middle channel	Highest channel							
а	17982	_/_	18132							
	U-NII-2C (5470 MHz to 5725 MHz)									
	Lowest channel	Middle channel	Highest channel							
	18032	18332	18182							
		J-NII-3 (5725 MHz to 5850 MHz)							
	Lowest channel	Middle channel	Highest channel							
	17233	17283	17233							

<u>Results:</u>

		99% bandwidth (kHz)							
	U-NII-1 (5150 MHz to 5250 MHz)								
	Lowest channel	Middle channel	Highest channel						
	18681	_/_	18781						
	U	-NII-2A (5250 MHz to 5350 MHz	z)						
	Lowest channel	Middle channel	Highest channel						
n/ac HT20	18881	_/_	18931						
	U-NII-2C (5470 MHz to 5725 MHz)								
	Lowest channel	Middle channel	Highest channel						
	18931	18631	18831						
		J-NII-3 (5725 MHz to 5850 MHz							
	Lowest channel	Middle channel	Highest channel						
	18232	19530	18132						



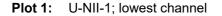
<u>Results:</u>

		99% bandy	vidth (kHz)		
	L	J-NII-1 (5150 MI	Hz to 5250 MHz)	
	Lowest channel			Highest channel	
	36464			36364	
	U	-NII-2A (5250 M	IHz to 5350 MHz	z)	
	Lowest channel		Highest channel		
n/ac HT40	36464			36464	
	U	-NII-2C (5470 M	1Hz to 5725 MHz)		
	Lowest channel	Middle	channel	Highest channel	
	36563	365	563 36563		
	L	J-NII-3 (5725 MI	Hz to 5850 MHz)		
	Lowest channel		Highest channel		
	36364			36364	

Test report no.: 1-6927/18-01-18



Plots: a - mode



₽ Spectrum ● RBW 300 kHz SWT 1 ms ● VBW 1 MHz Ref Level 11.62 dBm Att 30 dB Mode Sweep SGL Count 1435/1435 TDF ●1Pk Ma× 5.07 dBr un Judas 5.1771030 GHz 17.932067932 MHz dat a 0 dBm Occ Bw T: -10 dBm -20 dBm of the half have and adjust yen -30 d**Bm¹** -ma -40 dBm -50 dBm -60 dBm -70 dBm--80 dBm 1001 pts Span 50.0 MHz CF 5.18 GHz Marker Type | Ref | Trc Y-value Function Result X-value Function 5.177103 GHz 5.1711089 GHz M1 T1 T2 5.07 dBm -8.72 dBm 17.932067932 MHz Occ Bw 5.189041 GHz -7.46 dBm

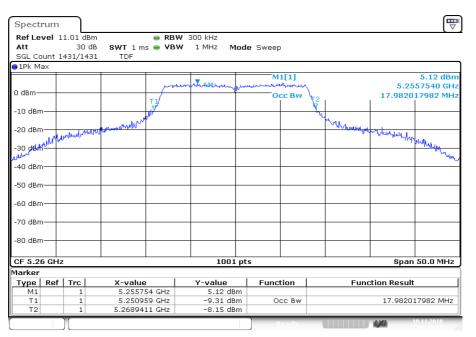
Date: 19.NOV.2018 08:11:33

Plot 2: U-NII-1; highest channel

₽ Spectrum Ref Level 11.19 dBm 🔵 RBW 300 kHz Att 30 dB SGL Count 1457/1457 SWT 1 ms 👄 VBW 🛛 1 MHz Mode Sweep TDF ⊖1Pk Ma× M1[1] 5.68 dBm 5.2420980 GHz 0 dBm Occ By 18.081918082 MH -10 dBm MM -20 dBm million . dent Wigh -30 de**h**í -40 dBm -50 dBm -60 dBm--70 dBm· -80 dBm-CF 5.24 GHz 1001 pts Span 50.0 MHz Marker **Y-value** 5.68 dBm -7.44 dBm Type Ref Trc X-value 5.242098 GHz 5.231009 GHz Function Function Result M1 T1 T2 Occ Bw 18.081918082 MHz 5.2490909 GHz -9.92 dBm

Date: 19.NOV.2018 08:13:23

Plot 3: U-NII-2A; lowest channel



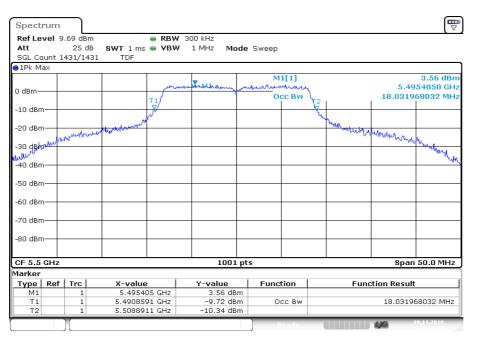
Date: 19.NOV.2018 08:15:10

Plot 4: U-NII-2A; highest channel

Spectru	ım											
Ref Lev Att SGL Cou		25	dB SWT 1 m		₩ 300 kHz ₩ 1 MHz №	lode	9 Sweep	I				
😑 1Pk Max	:											
0 dBm—				and a	monentalitien	m	man	1[1] ****** :c Bw	\			4.99 dBm 65030 GHz 68132 MHz
-10 dBm-			لر .	T 1/					V 2 V 0	4		
-20 dBm-	Mur	homporter	inford and a second and							"haywe wanter	mon town have been been to a start of the second	Wellym Marker
-30, dBm ² -40 dBm-	**											· why
-40 aBm-												
-60 dBm-												
-70 dBm-												
-80 dBm-												
CF 5.32	GHz		L	1	1001	pts	;				Span	50.0 MHz
Marker												
	Ref	Trc	X-value		Y-value		Func	tion		Func	tion Result	:
M1		1	5.3165		4.99 dB							
T1 T2		1	5.31090 5.3290		-10.31 dB -10.38 dB		0	cc Bw			18.1318	68132 MHz
							R	eady	- (4,84	19.11.2018

Date: 19.NOV.2018 08:16:49

Plot 5: U-NII-2C; lowest channel



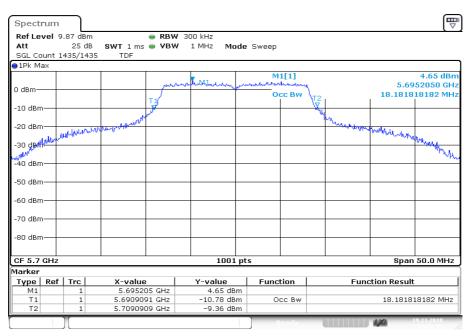
Date: 19.NOV.2018 08:18:42

Plot 6: U-NII-2C; middle channel

Spect	rum											
Ref Le	vel 🤉	9.59 dBi	n	RBW	300 kHz							
Att		25 d	B SWT 1 ms	👄 VBW	1 MHz Mo	ode	Sweep					
SGL Co	ount 1	1431/14	31 TDF									
😑 1Pk M	ах											
					-		M	1[1]				4.08 dBm
0 dBm-				presson	and helphrony	me	montenan	بسهويتكمانهم			5.59	54050 GHz
				T1/		ľ	0	cc Bw	h.		18.3316	68332 MHz
-10 dBo				V					<u>\</u> \\ ₽			
10 0.0.0	·		y-ut-to-to-ht-hr	ALCON CONTRACT					- N	la -		white white her
-20 dBn	ŋ		- Walnut and the							- VIL market		
····	lane	propher	Arrestone .							- 1001	WWWWWWWWWWW	
-30 d 8 d	Mar .	·				<u> </u>						" Wang
Mall .												med
-40 dBn	∩— -											.00
-50 dBn	י—+											
-60 dBn	י—+											
-70 dBn	י−+											
-80 dBn	ר−י					<u> </u>						
CF 5.6	GHz				1001	pts					Span	50.0 MHz
Marker						<u> </u>						
Type	Ref	Trc	X-value	• I	Y-value	1	Func	tion		Func	tion Result	· 1
M1		1		05 GHz	4.08 dB	m				- une		
T1		1	5.59080		-9.70 dE		0	cc Bw			18.3316	68332 MHz
T2		1	5.60914	09 GHz	-9.91 dE	lm 🗌						
		71				-) .	o a du	6		4.362	19.11.2018
							J					

Date: 19.NOV.2018 08:29:15

Plot 7: U-NII-2C; highest channel



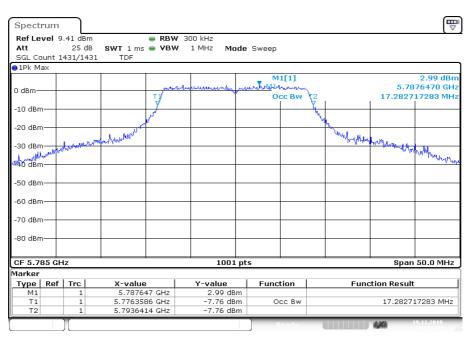
Date: 19.NOV.2018 08:22:46

Plot 8: U-NII-3; lowest channel

Spect	rum									Ē
Ref Le Att SGL Co		25 di	SWT 1 ms	● RBW ● VBW		de Swee	эр			
⊖1Pk M	ax .									
0 dBm—					and	, here here and	M1[1]			2.08 dBn 496450 GH:
-10 dBm				¥			Occ Bw	2 {	17.232	767233 MH
-20 dBm				Star -				"Un the		
-30 dBm		ەلىرىيە.	In Mr. Muhambur					Walkhow	whicher	
40 dBm	have	~ .	lin MU and						white	marchala Malan
-50 dBm										
-60 dBm							_			
-70 dBm										
-80 dBm										
CF 5.74	45 GH	z			1001	pts			Spa	n 50.0 MHz
Marker	Ref	Trc		- 1	Y-value	1 5.	nction		unction Resu	
Type M1	Ker	1	X-value 5.74964		2.08 dBr		riction	F	uniction Resu	n.
T1 T2		1	5.736408	36 GHz	-8.50 dBr -8.25 dBr	n	Occ Bw		17.232	767233 MHz
							Ready		100	19.11.2018

Date: 19.NOV.2018 08:24:36

Plot 9: U-NII-3; middle channel



Date: 19.NOV.2018 08:31:08

Plot 10: U-NII-3; highest channel

Spectr	um											
Ref Lev Att SGL Cou		25 d	B SWT 1 ms		300 kHz 1 MHz MC	ode	Sweep					, ,
⊖1Pk Ma	х											
0 dBm—	_			TI	nur Tratilition	m	munt	1[1] 	1			0.74 dBm 09040 GHz 67233 MHz
-10 dBm-	-			Ĵ.			0	CC BW	12		17.2327	67233 MHZ
-20 dBm-				us the					_	1		
-30 dBm·	_		and a damate							Mu Mundum	na la contra da la	
r-40.d8m	mberden	aparath	man Many Mar								merrownite	white word word
-50 dBm·	_											
-60 dBm·												
-70 dBm·												
-80 dBm-	_											
-90 dBm·												
CF 5.82	5 GH	z			1001	í pts	5				Spar	50.0 MHz
Marker												
	Ref	Trc	X-value 5.8209		<u>Y-value</u> 0.74 dB		Func	tion		Fund	tion Result	
M1 T1 T2		1 1 1	5.8209 5.81640 5.83364	86 GHz	-9.20 dE -10.69 dE	3m	0	cc Bw			17.2327	67233 MHz
) r	eady			4,40	19.11.2018

Date: 19.NOV.2018 08:26:45



Plots: n/ac HT20 - mode

Plot 1: U-NII-1; lowest channel

Spectr	um						
Ref Lev	el 1	0.94 dB	m 🖷 RE	300 kHz			
Att		25 c	B SWT 1 ms 👄 VB	3W 1 MHz Mod	e Sweep		
SGL Co	unt 1	521/152	1 TDF				
😑 1Pk Ma	IX.						J
0.10-			, man	man tubberrow por	M1[1]	4	5.08 dBm 5.1753550 GHz
0 dBm—			т 1/		Occ Bw	T2.	18.681318681 MHz
-10 dBm	_		J.				
-20 dBm			A PALITAN LAT			Munhy many	
ab Ut	Append	pughtheory	orenter and the life				annumphine the second for the
							a mark
-40 dBm							
-50 dBm							
-60 dBm	_						
-70 dBm	_						
-80 dBm	_						
CF 5.18	GHz			1001 pt	s		Span 50.0 MHz
Marker							
	Ref		X-value	Y-value	Function	Fund	ction Result
M1		1	5.175355 GHz	5.08 dBm			
T1 T2		1	5.1707093 GHz 5.1893906 GHz	-6.92 dBm -6.87 dBm	Occ Bw		18.681318681 MHz
][Ready		07.11.2018

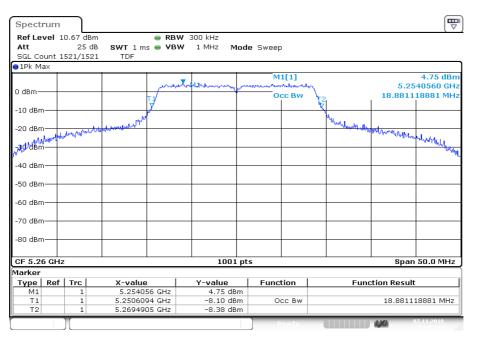
Date: 7.NOV.2018 13:59:44

Plot 2: U-NII-1; highest channel

Spect	rum						
Att		0.87 dB 25 (521/15)	dB SWT 1 ms 🖷 VB	W 300 kHz W 1 MHz Mode	e Sweep		X
⊖1Pk M	ах						
0 dBm—				muchableson	M1[1]	7	4.93 dBm 5.2358540 GHz 18.781218781 MHz
			T A			\ ²	
-10 dBm			مىر بى			A martine of	
-20 dBr	۱ <u> </u>	Munda	Holy Paul Lary			VID/Mileso	thinkney
- Balden	1 Northean		- physical left				tomber and ward for the
/* -40 dBm							1
-50 dBr	ד י						
-60 dBm	<u>ا</u> ر						
-70 dBm	<u>ا</u> ر						
-80 dBm							
-80 aBn							
CF 5.2	4 GHz			1001 pt:	s		Span 50.0 MHz
Marker							
Туре	Ref	Trc	X-value	Y-value	Function	Fun	ction Result
M1 T1		1	5.235854 GHz 5.2306094 GHz	4.93 dBm -7.06 dBm	Occ Bw		18.781218781 MHz
T2		1	5.2493906 GHz	-8.75 dBm	OCC DW		10.101210701 MHZ
)			Ready		07.11.2018

Date: 7.NOV.2018 14:01:47

Plot 3: U-NII-2A; lowest channel



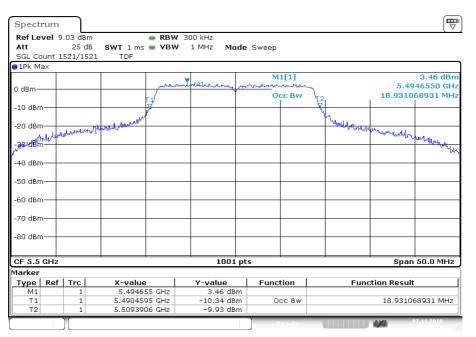
Date: 7.NOV.2018 14:04:15

Plot 4: U-NII-2A; highest channel

Spect	rum										
Ref Le Att SGL Co		25	dB SWT 1 ms	● RBW ● VBW		ode	Sweep				
⊖1Pk M	ах										
0 dBm-			Т	- f	whereare	por no	when	l[1] ^~~~^, c Bw	* 12		4.52 dBm L52550 GHz 068931 MHz
-10 dBn	י—ר		M	<u>y</u>					Why.		
-20 dBn -86 dBn	and a start	www.uht	my and a start of the						- muleupp	anthe photo which a	Her White has
-40 dBn											- C LA
-50 dBn	<u>ا</u> ر										
-60 dBn											
-70 dBn	۱										
-80 dBn	۱										
CF 5.3	2 GHz		1		1001	pts			1	Spar	1 50.0 MHz
Marker											
Туре	Ref	Trc	X-value		Y-value		Funct	ion	Fun	ction Resul	t l
M1 T1 T2		1 1 1	5.31525 5.310559 5.329490	4 GHz	4.52 dB -8.55 dB -9.82 dB	m	Oc	c Bw		18.9310	68931 MHz
							R	e a d y		4,40	07.11.2018

Date: 7.NOV.2018 13:50:26

Plot 5: U-NII-2C; lowest channel



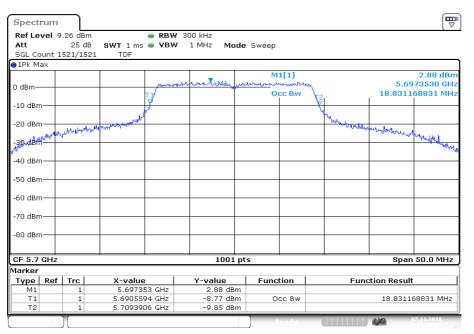
Date: 7.NOV.2018 13:56:21

Plot 6: U-NII-2C; middle channel

Spectru	m	ר										
Ref Leve	el 9.5	6 dBm		🖷 RBW	300 kHz							
Att		25 dB	SWT 1 ms	👄 VBW	1 MHz Mo	de	Sweep					
SGL Cour		1/1521	TDF									
●1Pk Max												
								1[1]				3.37 dBm
0 dBm	_			mound	an marked Million	ww	-Mananak		~			972030 GHz
				тź			0	c Bw	<u>1</u> 2		18.631	368631 MHz
-10 dBm—	-			7	-				- <u>\</u>			
				P					h.			
-20 dBm—		- Uhana	mathinte						~	WWW puper	Anthony	
and the life	4 Aurola		walt with with								Lo o Doorde Marke	www.uuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu
- auronii —												- alleo Privi
-40 dBm—												r
10 abiii												
-50 dBm—	_				_							
-60 dBm—	-											_
-70 dBm—												
-80 dBm—												
CF 5.6 GI	Ηz				1001	pts					Spa	n 50.0 MHz
Marker												
Type R	.ef 1	Frc	X-value	.	Y-value		Func	tion		Fund	tion Resu	lt
M1		1	5.59720		3.37 dB							
T1		1	5.590659		-10.02 dB		0	CC BW			18.631	368631 MHz
T2		1	5.609290	07 GHz	-8.75 dB	m						
							R	eady			1,00	05.03.2019

Date: 5.MAR.2019 09:19:08

Plot 7: U-NII-2C; highest channel



Date: 7.NOV.2018 14:11:34

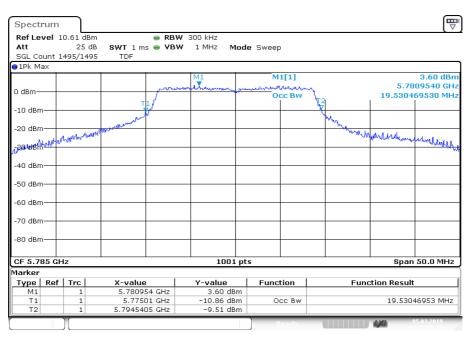
Plot 8: U-NII-3; lowest channel

Spectrum						
Ref Level 3 Att SGL Count 3	25 dB	SWT 1 ms 👄 VBV	W 300 kHz W 1 MHz Mode	e Sweep		X
⊖1Pk Max						
0 dBm		T.J.	-	M1[1] 	×¥2	2.12 dBm 5.7501950 GHz 18.231768232 MHz
-10 dBm		J J			- <u>t</u> i	
-20 dBm—		N N			Ma Maria	
-30 dBm -30 dBm -40 dBm	Allanpara	and Martin Martin			"Mutur	upplementer Munichard
-50 dBm						
-60 dBm						
-70 dBm						
-80 dBm						
-90 dBm						
CF 5.745 G	Ηz	1	1001 p	ts	1	Span 50.0 MHz
Marker						
Type Ref		X-value	Y-value	Function	Fu	nction Result
M1 T1	1	5.750195 GHz 5.7359091 GHz	2.12 dBm -6.91 dBm	Occ Bw		18.231768232 MHz
T2	1	5.7541409 GHz	-7.81 dBm	JUL BW		10.231/00232 MHZ
)[Ready		07.11.2018

Date: 7.NOV.2018 14:14:20



Plot 9: U-NII-3; middle channel



Date: 5.MAR.2019 09:23:15

Plot 10: U-NII-3; highest channel

Spect	rum										
Ref Le Att SGL Co		25 d	B SWT 1 ms		300 kHz ' 1 MHz Mc	de	Sweep				
😑 1Pk M	ax										
0 dBm—				Thursday	www.man	men	mont	1[1] Milana	hag .		0.15 dBm 291960 GHz
-10 dBn	∩			1		-	00	CC BW		18.1318	368132 MHz
-20 dBn				ŕ					<u> </u>		
-30 dBn		1							- Weller	816 - 1 - 1	
v 4048 A	man	ullhan	wellow and the							refurched average	marithmene
-50 dBn						-					
-60 dBn	n										
-70 dBn	<u>ا</u> ر										
-80 dBn	<u>ו</u> רי										
-90 dBn	י -					-					
CF 5.8	25 GH	z			1001	pts				Spar	1 50.0 MHz
Marker											
Туре	Ref	Trc	X-value		Y-value	_	Funct	tion	Fu	nction Resul	t
M1 T1 T2		1	5.8291	59 GHz	0.15 dB -8.38 dB	m	0	cc Bw		18.1318	68132 MHz
		1	5.83409	JA RHS	-8.73 dB		1			1.0.000	07 11 2018
		Л								1910	

Date: 7.NOV.2018 14:16:31



Plots: n/ac HT40 - mode

Plot 1: U-NII-1; lowest channel

Spect	rum											
Ref Le	vel 5	.16 dBm		RBW	500 kHz							
Att		20 dB	SWT 1 ms 🖷	VBW	3 MHz Mo	de	Sweep					
SGL Co	ount 2	760/276	D TDF									
😑 1Pk M	ах											1
0 dBm-					monum	والعسي	andrah	Highan				2.00 dBm
o abiii				A martin		1			W Z			965900 GHz
-10 dBm	η					<u> </u>	0	cc Bw	<u> </u>		36.4635	i36464 MHz
			1						- V			
-20 dBm	<u>ו</u> רי								<u> </u>			
		m	manus						- W	m	n .	
-30 dBm		~ IV	NA YANK			<u> </u>				- 1-	m.	
na sionale h	hrm/					-					P-47 MA	Marsher
-50 dBm												
00 0.011	·					ĺ l						
-60 dBm	- ⊢−					<u> </u>						
						Ĺ						
-70 dBm	η 					<u> </u>						
-80 dBm	+-י					<u> </u>						
-90 dBm												
CF 5.19	9 GHz				1001	. pt	5				Span	100.0 MHz
Marker												
Туре	Ref	Trc	X-value		Y-value		Func	tion		Functio	on Resul	t l
M1		1	5.19659		2.00 dB			_				
T1 T2		1	5.1718182 5.2082817		-5.51 dB -4.82 dB		0	CC BW			36.4635	36464 MHz
			5.2082817	GHZ	-4.82 QB	10						
		Л					R	e a d y		4	X	19.11.2018

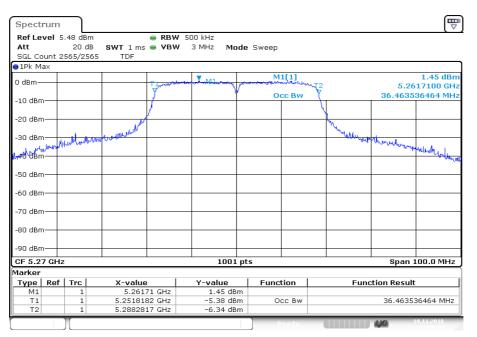
Date: 19.NOV.2018 07:42:29

Plot 2: U-NII-1; highest channel

Spectrur	n							
Ref Level Att SGL Count	20 d	B SWT 1 ms 👄	RBW 500 kHz VBW 3 MHz M	ode Sweep				
😑 1Pk Max								
0 dBm		T1	warmer Justie	Variant	1111	1 2	5.22	1.35 dBm 32100 GHz
-10 dBm—					CC BW	N.	36.3636	36364 MHz
-20 dBm—		- Maral						
-30 dBm—	worthe	probation of the second state of the				Minum	Mar Marken hu	al .
~~~~~~ ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~								Mr. Underland
-50 dBm—								
-60 dBm—								
-70 dBm—								
-80 dBm—								
-90 dBm—								
CF 5.23 G	Hz		100	1 pts			Span 1	.00.0 MHz
Marker Type Re	f Trc	X-value	Y-value	Fund	I	F	ation Descrit	
Type Re M1	1 IFC	x-value 5.22321 0			aion	Fun	ction Result	
T1 T2	1	5.2119181 0	GHz -5.09 d	Bm C	CC BW		36,36363	86364 MHz
			· · ·		Ready		4,40	9.11.2018

Date: 19.NOV.2018 07:48:18

Plot 3: U-NII-2A; lowest channel



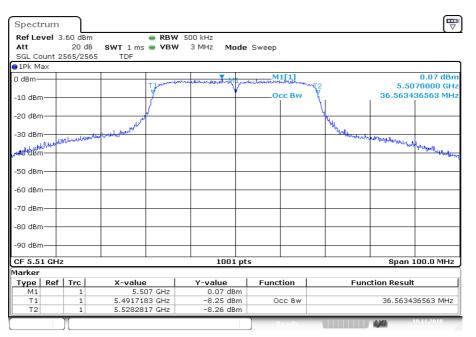
Date: 19.NOV.2018 07:50:45

Plot 4: U-NII-2A; highest channel

Spectru	ım											
Ref Lev Att SGL Cou		20 de	SWT 1 ms		500 kHz 3 MHz M	ode	Sweep					
😑 1Pk Max	(
0 dBm	_			Thomas	and the second second second		M	1[1]	₩ J 2		5.3	0.95 dBm 059000 GHz
-10 dBm-	+			/		\vdash	0	cc Bw	Ň		36,4633	536464 MHz
-20 dBm-	_		المعر	/		+			- 4 4			
-30 dBm-		din Luk	wood and and and and and and and and and an			<u> </u>			-	Waller and	Plaster J. C. J.	
-30 dBm- എ90 dBm-	apartu	properties				\vdash						My Hunter Aluctor of
-50 dBm-						-						
-60 dBm-	_					-						
-70 dBm-	_					-						
-80 dBm-	_					-						
-90 dBm-	+					+						
CF 5.31	GHz		1	1	100	i pts	5	1			Span	100.0 MHz
Marker												
	Ref	Trc	X-value		Y-value	$ \rightarrow $	Func	tion		Fun	ction Resul	t
M1 T1 T2		1 1 1	5.30 5.29181 5.32828		0.95 di -6.07 di -6.70 di	3m	0	cc Bw			36.4635	36464 MHz
12		1	5.32828	17 GHZ	-6.70 ai	5111		_	611		4.542	19.11.2018
							J				1XI	

Date: 19.NOV.2018 07:53:03

Plot 5: U-NII-2C; lowest channel



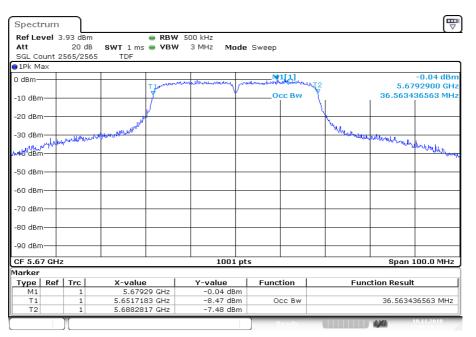
Date: 19.NOV.2018 07:55:12

Plot 6: U-NII-2C; middle channel

Spectrum											
Ref Level 3.	.44 dBm		RBW	500 kHz							
Att	20 dB	SWT 1 ms	👄 VBW	3 MHz Mo	ode	Sweep					
SGL Count 2	565/2565	TDF									
●1Pk Max											
0 dBm			h de AM	Lameretterhorn	-	mun	1 1 1				0.67 dBm
			Thursday		1 million			₩ <u>7</u> 2		5.60	07900 GHz
-10 dBm			7			0	cc Bw	¥.		36.5634	36563 MHz
			1					٦,			
-20 dBm		1	,						4.		
		1 alatter							Walk I.		
-30 dBm	سابنة لحرائا المساليرا المعادا	All on the state of the state o						-		When we will	
-20 dBm -30 dBm -30 dBm										in the second	An Martin trade and he
⊌#® °dBm											- march
-50 dBm											
-30 ubiii											
-60 dBm											
-00 0011											
-70 dBm											
-80 dBm											
-90 dBm											
CF 5.59 GHz				1001	. pts					Span :	100.0 MHz
Marker											
Type Ref	Trc	X-value		Y-value	_	Funct	tion		Func	tion Result	
M1	1		79 GHz	0.67 dB		-				06 5604	
T1 T2	1	5.57171		-7.94 dE -7.70 dE		0	CC BW			36.5634	36563 MHz
		3.00828.		-7.70 UE							
	Л									1/1	17:57:14

Date: 19.NOV.2018 07:57:15

Plot 7: U-NII-2C; highest channel



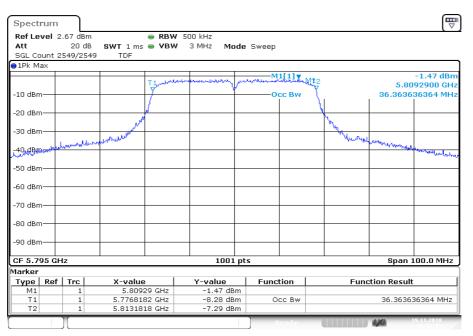
Date: 19.NOV.2018 07:59:17

Plot 8: U-NII-3; lowest channel

Spectr	um											
Ref Lev	vel 2	.33 dBm		RBW	500 kHz							
Att		20 dB	SWT 1 ms	VBW	3 MHz Mi	ode	Sweep					
SGL Co	unt 2	565/2565	5 TDF									
∋1Pk Ma	ж					-						
			-			—	M	1. Contrain				-1.39 dBm
				TIment	manuture	a meno	and the second	www.woodha	₩ 1 2		5.7	664900 GHz
-10 dBm	-			1		-	<u> </u>	cc Bw	Ľ.		36.3636	536364 MHz
				1/					- 11			
-20 dBm	-			r	-				- 4 ,			
									!`	M.		
-30 dBm			and when							Muchan		Lealer marter walnut
40 dd	1. Maple	لماري المراجع والمحادث المراجع	and the second of							- W may	la alyse would	adua.
"Windland	• · · · ·		netermond the									" Child Marshy bare
-50 dBm												
-50 abin												
-60 dBm												
-70 dBm	_											
-80 dBm			-		-	-						
-90 dBm	-											
CF 5.75	i5 GH	z			100:	1 pts					Span	100.0 MHz
Marker												
	Ref		X-value		Y-value		Func	tion		Fund	tion Resul	t
M1		1		49 GHz	-1.39 dE			D				000004
T1 T2		1	5.73691		-8.15 dE -8.92 dE		0	cc Bw			36,3636	36364 MHz
12			5.77328		-8.92 U	<u>, m</u>						
							F	te a d y			1,70	19.11.2018

Date: 19.NOV.2018 08:01:21

Plot 9: U-NII-3; highest channel



Date: 19.NOV.2018 08:03:32