EN 301 893 RF Test Report

Report No.:	REBBUI-WTW-P21040655-1
Test Model:	RTL8852BE
Received Date:	Apr. 20, 2021
Test Date:	May 05 to July 05, 2021
Issued Date:	Aug. 05, 2021
Applicant:	Realtek Semiconductor Corp.
Address:	No. 2, Innovation Road II, Hsinchu Science Park, Hsinchu 300, Taiwan
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan

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Release Control Record

Issue No.	Description	Date Issued
REBBUI-WTW-P21040655-1	Original release.	Aug. 05, 2021

1 Certificate of Conformity

Product:	11ax RTL8852BE Combo module
Brand:	REALTEK
Test Model:	RTL8852BE
Sample Status:	Engineering sample
Applicant:	Realtek Semiconductor Corp.
Test Date:	May 05 to July 05, 2021
Standards:	EN 301 893 V2.1.1 (2017-05)

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Phoenix Huang , **Date:** Aug. 05, 2021

Phoenix Huang / Specialist

Approved by : , **Date:** Aug. 05, 2021

Clark Lin / Technical Manager

2 Summary of Test Results

The EUT has been tested according to the following specifications:

EN 301 893 V2.1.1		
Clause	Test Parameter	Result
4.2.1	Carrier Frequencies	Pass
4.2.2	Nominal, and Occupied, Channel Bandwidth	Pass
4.2.3	RF Output Power	Pass
4.2.3	Transmit Power Control (TPC)	Pass
4.2.3	Power Density	Pass
4.2.4.1	Transmitter unwanted emissions outside the 5 GHz RLAN bands	Pass
4.2.4.2	Transmitter unwanted emissions within the 5 GHz RLAN bands	Pass
4.2.5	Receiver Spurious Emissions	Pass
4.2.6.2	Dynamic Frequency Selection	See Note 2
4.2.7	Adaptivity	Pass
4.2.8	Receiver Blocking	Pass
4.2.9	User Access Restrictions	Pass
4.2.10	Geo-location capability	Not Applicable

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. The ”Dynamic Frequency Selection” was recorded in another test report.

2.1 Test Instruments

For Legacy mode - spurious emissions (below 1GHz) test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer Keysight	N9030A	MY54490570	June 16, 2020	June 15, 2021
Pre_Amplifier Agilent	8447D	2944A10663	Apr. 26, 2021	Apr. 25, 2022
TRILOG Antenna SCHWARZBECK	VULB9168	9168-162	Nov. 09, 2020	Nov. 08, 2021
Software	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208411	NA	NA
Power meter Anritsu	ML2495A	1529002	July 22, 2020	July 21, 2021
Power sensor Anritsu	MA2411B	1339443	July 22, 2020	July 21, 2021
Power meter Anritsu	ML2496A	1529003	Aug. 05, 2020	Aug. 04, 2021
Power sensor Anritsu	MA2411B	1339442	Aug. 05, 2020	Aug. 04, 2021
ESG Vector signal generator Agilent	E4438C	MY45094468/005 506 602 UK6 UNJ	Nov. 18, 2020	Nov. 17, 2021

NOTE:
1. The test was performed in RF Fully Chamber No. 1.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: May 25, 2021

For RU mode - spurious emissions (below 1GHz) test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer Keysight	N9030A	MY54490570	June 16, 2021	June 15, 2022
Pre_Amplifier Agilent	8447D	2944A10663	Apr. 26, 2021	Apr. 25, 2022
TRILOG Antenna SCHWARZBECK	VULB9168	9168-162	Nov. 09, 2020	Nov. 08, 2021
Software	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208411	NA	NA
Power meter Anritsu	ML2495A	1529002	July 22, 2020	July 21, 2021
Power sensor Anritsu	MA2411B	1339443	May 31, 2021	May 30, 2022
Power meter Anritsu	ML2496A	1529003	Aug. 05, 2020	Aug. 04, 2021
Power sensor Anritsu	MA2411B	1339442	Aug. 05, 2020	Aug. 04, 2021
ESG Vector signal generator Agilent	E4438C	MY45094468/005 506 602 UK6 UNJ	Nov. 18, 2020	Nov. 17, 2021

NOTE:
1. The test was performed in RF Fully Chamber No. 1.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: June 16, 2021

For spurious emissions (above 1GHz) test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer Keysight	N9030A	MY55410176	June 30, 2020	June 29, 2021
Pre_Amplifier HP	8449B	3008A01923	Oct. 08, 2020	Oct. 07, 2021
Pre_Amplifier EMCI	EMC184045	980143	Jan. 05, 2021	Jan. 04, 2022
Horn_Antenna SCHWARZBECK	BBHA 9120 D	9120D-1592	Nov. 22, 2020	Nov. 21, 2021
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 22, 2020	Nov. 21, 2021
Software	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208542	NA	NA
Power meter Anritsu	ML2495A	1529002	July 22, 2020	July 21, 2021
Power sensor Anritsu	MA2411B	1339443	July 22, 2020	July 21, 2021
Power meter Anritsu	ML2496A	1529003	Aug. 05, 2020	Aug. 04, 2021
Power sensor Anritsu	MA2411B	1339442	Aug. 05, 2020	Aug. 04, 2021
ESG Vector signal generator Agilent	E4438C	MY45094468/005 506 602 UK6 UNJ	Nov. 18, 2020	Nov. 17, 2021

NOTE:
1. The test was performed in RF Fully Chamber No. 2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: May 05 to 11, 2021

For adaptivity test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSW8	101497	Nov. 10, 2020	Nov. 09, 2021
Spectrum Analyzer Keysight	N9030A	MY55410176	June 25, 2021	June 24, 2022
Universal Wireless Test Set	MT8870A	6201671352	Mar. 07, 2021	Mar. 06, 2022
ESG Vector signal generator Agilent	E4438C	MY45094468/005 506 602 UK6 UNJ	Nov. 18, 2020	Nov. 17, 2021
Upgrade the software license on current E4438C ESG Agilent	E4438CK-403	ESG E4_010001	NA	NA
MXG X-Series RF Vector Signal Generator Agilent	N5182B	MY53052700	July 14, 2020	July 13, 2021
Direct Coupler EMCI	CS20-18-436/16	1139	Jan. 11, 2021	Jan. 10, 2022
Power Splitter/combiner Mini-Circuits	ZN4PD-642W-S+	408501327_03	Sep. 30, 2020	Sep. 29, 2021
Power Splitter/combiner Mini-Circuits	ZN4PD-642W-S+	408501327_04	Sep. 30, 2020	Sep. 29, 2021

NOTE:
1. The test was performed in Adaptivity room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: July 05, 2021

For receiver blocking test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSW8	101497	Nov. 10, 2020	Nov. 09, 2021
Spectrum Analyzer Keysight	N9030A	MY55410176	June 30, 2020	June 29, 2021
Universal Wireless Test Set	MT8870A	6201671352	Mar. 07, 2021	Mar. 06, 2022
ESG Vector signal generator Agilent	E4438C	MY45094468/005 506 602 UK6 UNJ	Nov. 18, 2020	Nov. 17, 2021
Upgrade the software license on current E4438C ESG Agilent	E4438CK-403	ESG E4_010001	NA	NA
MXG X-Series RF Vector Signal Generator Agilent	N5182B	MY53052700	July 14, 2020	July 13, 2021
Direct Coupler EMCI	CS20-18-436/16	1139	Jan. 11, 2021	Jan. 10, 2022
Power Splitter/combiner Mini-Circuits	ZN4PD-642W-S+	408501327_03	Sep. 30, 2020	Sep. 29, 2021
Power Splitter/combiner Mini-Circuits	ZN4PD-642W-S+	408501327_04	Sep. 30, 2020	Sep. 29, 2021

NOTE:
1. The test was performed in Adaptivity room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: May 14, 2021

For other test items:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	101516	Mar. 08, 2021	Mar. 07, 2022
Spectrum Analyzer Keysight	N9030A	MY54490570	June 16, 2020	June 15, 2021
AC Power Source Extech Electronics	6905S	1991551	NA	NA
Temperature & Humidity Chamber TERCHY	MHU-225AU	911033	Nov. 24, 2020	Nov. 23, 2021
DC Power Supply GOOD WILL INSTRUMENT CO., LTD.	GPC - 3030D	7700087	NA	NA
ESG Vector signal generator Agilent	E4438C	MY45094468/005 506 602 UK6 UNJ	Nov. 18, 2020	Nov. 17, 2021
Power meter Anritsu	ML2495A	0824006	Apr. 28, 2021	Apr. 27, 2022
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA
MXG X-Series RF Vector Signal Generator Agilent	N5182B	MY53052700	July 14, 2020	July 13, 2021
MIMO Powermeasurement Test set (4X4) Agilent	U2021XA	U2021XA_01	Sep. 16, 2020	Sep. 15, 2021
MIMO Powermeasurement Test set (4X4) Agilent	U2021XA	U2021XA_02	Nov. 13, 2020	Nov. 12, 2021
Switch Box Agilent	PS-X10-100	PS-X10-100_01	Sep. 17, 2020	Sep. 16, 2021

NOTE: 1. The test was performed in Oven room 1.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: June 03 to 04, 2021

2.2 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Parameter	Uncertainty
RF frequency	±0.14 ppm
RF power conducted	±1.2 dB
RF power radiated	±4.9 dB
Spurious emissions, conducted	±2.5 dB
Spurious emissions, radiated	±4.9 dB
Humidity	±0.6 %
Temperature	±0.4 °C
Time	±5 %

2.3 Maximum Measurement Uncertainty

For the test methods, according to ETSI EN 301 893 standard, the measurement uncertainty figures shall be calculated and shall correspond to an expansion factor (coverage factor) k = 1,96 or k = 2 (which provide confidence levels of respectively 95 % and 95,45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)). Principles for the calculation of measurement uncertainty are contained in ETSI TR 100 028-1 [i.6] and ETSI TR 100 028-2 [i.7], in particular in annex D of the ETSI TR 100 028-2 [i.7].

Maximum measurement uncertainty

Parameter	Uncertainty
RF frequency	±10 ppm
RF power conducted	±1,5 dB
RF power radiated	±6 dB
Spurious emissions, conducted	±3 dB
Spurious emissions, radiated	±6 dB
Humidity	±5 %
Temperature	±2 °C
Time	±10 %

2.4 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	11ax RTL8852BE Combo module
Brand	REALTEK
Test Model	RTL8852BE
Status of EUT	Engineering sample
Nominal Voltage	3.3 Vdc from host equipment
Normal Testing Voltage	Vnom= 3.3 Vdc
Temperature Operating Range	-20℃ ~ 70℃
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT (20/40) mode in 2.4GHz 1024QAM for OFDMA in 11ax HE mode
Modulation Technology	DSSS, OFDM, OFDMA
Transfer Rate	802.11b: up to 11 Mbps 802.11a/g: up to 54 Mbps 802.11n: up to 300 Mbps 802.11ac: up to 866.7 Mbps 802.11ax: up to 1201.0 Mbps
Operating Frequency	**2.4GHz:** 2.412 ~ 2.472 GHz **5GHz:** 5.18 ~ 5.24 GHz, 5.26 ~ 5.32 GHz, 5.50 ~ 5.70 GHz, 5.745 ~ 5.825 GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20), VHT20, 802.11ax (HE20): 13 802.11n (HT40), VHT40, 802.11ax (HE40): 9 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 24 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 11 802.11ac (VHT80), 802.11ax (HE80): 5
EIRP Power	**For 2TX** **CDD Mode:** 2.4 GHz : 19.90 dBm 5.18 ~ 5.24 GHz : 22.77 dBm 5.26 ~ 5.32 GHz : 22.77 dBm 5.50 ~ 5.70 GHz : 22.87 dBm 5.745 ~ 5.825 GHz : 13.91 dBm **Beamforming Mode:** 2.4 GHz : 19.86 dBm 5.18 ~ 5.24 GHz : 22.75 dBm 5.26 ~ 5.32 GHz : 22.74 dBm 5.50 ~ 5.70 GHz : 22.86 dBm 5.745 ~ 5.825 GHz : 13.79 dBm **For 1TX** 2.4 GHz : 19.90 dBm 5.18 ~ 5.24 GHz : 22.87 dBm 5.26 ~ 5.32 GHz : 22.88 dBm 5.50 ~ 5.70 GHz : 22.92 dBm 5.745 ~ 5.825 GHz : 13.90 dBm

Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Beamforming Factor	3 dB by manufacturer's declaration
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. The EUT has below HW SKU configuration, as below table:

SKU No.	Interface	Description
1	PCIe + USB	Single antenna port
2	PCIe + USB	Dual antenna port
3	PCIe + UART	Dual antenna port

Note:
1. For spurious emissions (below 1GHz): From the above HW SKUs, the worse case was found in **SKU No.: 3**. Therefore only the test data of the SKU was recorded in this report.
2. For spurious emissions (above 1GHz): From the above HW SKUs, the worse case was found in **SKU No.: 2**. Therefore only the test data of the SKU was recorded in this report.

3. Simultaneously transmission condition.

Condition	Technology	
1	WLAN 5GHz	Bluetooth
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.		

4. The EUT incorporates a MIMO function.

2.4GHZ Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11b	2TX/1TX Diversity	2RX
802.11g	2TX/1TX Diversity	2RX
802.11n (HT20)	2TX/1TX Diversity	2RX
802.11n (HT40)	2TX/1TX Diversity	2RX
VHT20	2TX/1TX Diversity	2RX
VHT40	2TX/1TX Diversity	2RX
802.11ax (HE20)	2TX/1TX Diversity	2RX
802.11ax (HE40)	2TX/1TX Diversity	2RX
802.11ax (RU26/52/106/242/484)	2TX/1TX Diversity	2RX
5GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11a	2TX/1TX Diversity	2RX
802.11n (HT20)	2TX/1TX Diversity	2RX
802.11n (HT40)	2TX/1TX Diversity	2RX
802.11ac (VHT20)	2TX/1TX Diversity	2RX
802.11ac (VHT40)	2TX/1TX Diversity	2RX
802.11ac (VHT80)	2TX/1TX Diversity	2RX
802.11ax (HE20)	2TX/1TX Diversity	2RX
802.11ax (HE40)	2TX/1TX Diversity	2RX
802.11ax (HE80)	2TX/1TX Diversity	2RX
802.11ax (RU26/52/106/242/484/996)	2TX/1TX Diversity	2RX

Note:
1. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
2. The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.
3. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz), 802.11ac mode for 20MHz (40MHz, 80MHz) and 802.11ax mode for 20MHz (40MH, 80MHz), therefore the manufacturer will control the power for 802.11n/ac mode is the same as the 802.11ax or more lower than it and investigated worst case to representative mode in test report.

5. The antennas provided to the EUT, please refer to the following table:

Ant. Set	RF Chain No.	Brand	Model	Ant. Net Gain (dBi)	Frequency Range (GHz)	Ant. Type	Connector Type	Cable Length (mm)
1	Chain 0	ARISTOTLE	RFA-27-JP326-MHF4300	3.5	2.4~2.4835	PIFA	i-pex(MHF)	300
				5	5.15~5.85			
				5	5.875~7.125			
	Chain 1	ARISTOTLE	RFA-27-JP326-MHF4300	3.5	2.4~2.4835	PIFA	i-pex(MHF)	300
				5	5.15~5.85			
				5	5.875~7.125			
2	Chain 0	ARISTOTLE	RFA-27-C38H1-MHF4300	3	2.4~2.4835	Dipole	i-pex(MHF)	300
				5	5.15~5.85			
				5	5.875~7.125			
	Chain 1	ARISTOTLE	RFA-27-C38H1-MHF4300	3	2.4~2.4835	Dipole	i-pex(MHF)	300
				5	5.15~5.85			
				5	5.875~7.125			

Note:
1. From the above transmission chains, the worse case was found in transmission on Chain 0 for 1TX mode. Therefore only the test data of the mode was recorded in this report.
2. Max. gain was selected for the final test, except for Spurious Emissions & Adaptivity test.

6. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.
7. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

3.2 Description of Test Modes

For 5180 ~ 5320MHz

8 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	52	5260 MHz
40	5200 MHz	56	5280 MHz
44	5220 MHz	60	5300 MHz
48	5240 MHz	64	5320 MHz

4 channels are provided for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	54	5270 MHz
46	5230 MHz	62	5310 MHz

2 channels are provided for 802.11ac (VHT80), 802.11ax (HE80):

Channel	Frequency	Channel	Frequency
42	5210 MHz	58	5290 MHz

For 5500 ~ 5700MHz

11 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20):

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz		

5 channels are provided for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40):

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz		

2 channels are provided for 802.11ac (VHT80), 802.11ax (HE80):

Channel	Frequency	Channel	Frequency
106	5530 MHz	122	5610 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT configure mode	Applicable to										Description
	CF	OB	ROP	TPC	PD	AD	SE<1G	SE≥1G	SSM	RB	
1	√	√	√	√	√	√	√	√	√	√	2TX
2	-	√	√	√	√	-	√	√	√	-	1TX

Where CF: Carrier frequencies
OB: Occupied channel bandwidth measurement
ROP: RF output power
TPC: Transmit Power Control
PD: Power Density
AD: Adaptivity (Channel Access Mechanism)
SE<1G: Spurious Emissions below 1GHz
SE≥1G: Spurious Emissions above 1GHz
SSM: Signal under Spectrum Power Mask
RB: Receiver Blocking

Note:
1. The EUT's PIFA antenna had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
2. For 20MHz bandwidth, 40MHz bandwidth and 80MHz bandwidth of RU mode, the worst case was found in **20MHz bandwidth**. Therefore only the test data of the mode was recorded in this report

Carrier Frequencies and Channelization (Frequency Stability):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT configure mode	Mode	Available Channel	Tested Channel	Modulation Technology
1, 2	802.11a	36 to 64	36	OFDM
		100 to 140	100	OFDM

Occupied Channel Bandwidth Measurement:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, RU configurations and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT configure mode	CDD Mode						
	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter	RU Configuration
1	802.11a	36 to 64	64	OFDM	BPSK	6Mb/s	-
		100 to 140	100	OFDM	BPSK	6Mb/s	-
	802.11ax (HE20)	36 to 64	36	OFDMA	BPSK	MCS0	-
		100 to 140	140	OFDMA	BPSK	MCS0	-
	802.11ax (HE40)	38 to 62	38	OFDMA	BPSK	MCS0	-
		102 to 134	102	OFDMA	BPSK	MCS0	-
	802.11ax (HE80)	42 to 58	42	OFDMA	BPSK	MCS0	-
		106 to 122	106	OFDMA	BPSK	MCS0	-
	802.11ax (RU26)	36 to 64	36, 64	OFDMA	BPSK	MCS0	26/0, 26/8
		100 to 140	100, 140	OFDMA	BPSK	MCS0	26/0, 26/8
	802.11ax (RU52)	38 to 62	36, 64	OFDMA	BPSK	MCS0	52/37, 52/40
		102 to 134	100, 140	OFDMA	BPSK	MCS0	52/37, 52/40
	802.11ax (RU106)	42 to 58	36, 64	OFDMA	BPSK	MCS0	106/53, 106/54
		106 to 122	100, 140	OFDMA	BPSK	MCS0	106/53, 106/54

EUT configure mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter	RU Configuration
2	802.11a	36 to 64	64	OFDM	BPSK	6Mb/s	-
		100 to 140	100	OFDM	BPSK	6Mb/s	-
	802.11ax (HE20)	36 to 64	36	OFDMA	BPSK	MCS0	-
		100 to 140	100	OFDMA	BPSK	MCS0	-
	802.11ax (HE40)	38 to 62	38	OFDMA	BPSK	MCS0	-
		102 to 134	102	OFDMA	BPSK	MCS0	-
	802.11ax (HE80)	42 to 58	42	OFDMA	BPSK	MCS0	-
		106 to 122	106	OFDMA	BPSK	MCS0	-
	802.11ax (RU26)	36 to 64	36, 64	OFDMA	BPSK	MCS0	26/0, 26/8
		100 to 140	100, 140	OFDMA	BPSK	MCS0	26/0, 26/8
	802.11ax (RU52)	38 to 62	36, 64	OFDMA	BPSK	MCS0	52/37, 52/40
		102 to 134	100, 140	OFDMA	BPSK	MCS0	52/37, 52/40
	802.11ax (RU106)	42 to 58	36, 64	OFDMA	BPSK	MCS0	106/53, 106/54
		106 to 122	100, 140	OFDMA	BPSK	MCS0	106/53, 106/54

RF Output Power:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, RU configurations and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT configure mode	CDD Mode						
	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter	RU Configuration
1	802.11a	36 to 64	36, 64	OFDM	BPSK	6Mb/s	-
		100 to 140	100, 140	OFDM	BPSK	6Mb/s	-
	802.11ac (VHT20)	36 to 64	36, 64	OFDM	BPSK	MCS0	-
		100 to 140	100, 140	OFDM	BPSK	MCS0	-
	802.11ac (VHT40)	38 to 62	38, 62	OFDM	BPSK	MCS0	-
		102 to 134	102, 134	OFDM	BPSK	MCS0	-
	802.11ac (VHT80)	42 to 58	42, 58	OFDM	BPSK	MCS0	-
		106 to 122	106, 122	OFDM	BPSK	MCS0	-
	802.11ax (HE20)	36 to 64	36, 64	OFDMA	BPSK	MCS0	-
		100 to 140	100, 140	OFDMA	BPSK	MCS0	-
	802.11ax (HE40)	38 to 62	38, 62	OFDMA	BPSK	MCS0	-
		102 to 134	102, 134	OFDMA	BPSK	MCS0	-
	802.11ax (HE80)	42 to 58	42, 58	OFDMA	BPSK	MCS0	-
		106 to 122	106, 122	OFDMA	BPSK	MCS0	-
	802.11ax (RU26)	36 to 64	36, 64	OFDMA	BPSK	MCS0	26/0, 26/8
		100 to 140	100, 140	OFDMA	BPSK	MCS0	26/0, 26/8
	802.11ax (RU52)	38 to 62	36, 64	OFDMA	BPSK	MCS0	52/37, 52/40
		102 to 134	100, 140	OFDMA	BPSK	MCS0	52/37, 52/40
	802.11ax (RU106)	42 to 58	36, 64	OFDMA	BPSK	MCS0	106/53, 106/54
		106 to 122	100, 140	OFDMA	BPSK	MCS0	106/53, 106/54

EUT configure mode	Beamforming Mode						
	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter	RU Configuration
1	802.11ac (VHT20)	36 to 64	36, 64	OFDM	BPSK	MCS0	-
		100 to 140	100, 140	OFDM	BPSK	MCS0	-
	802.11ac (VHT40)	38 to 62	38, 62	OFDM	BPSK	MCS0	-
		102 to 134	102, 134	OFDM	BPSK	MCS0	-
	802.11ac (VHT80)	42 to 58	42, 58	OFDM	BPSK	MCS0	-
		106 to 122	106, 122	OFDM	BPSK	MCS0	-
	802.11ax (HE20)	36 to 64	36, 64	OFDMA	BPSK	MCS0	-
		100 to 140	100, 140	OFDMA	BPSK	MCS0	-
	802.11ax (HE40)	38 to 62	38, 62	OFDMA	BPSK	MCS0	-
		102 to 134	102, 134	OFDMA	BPSK	MCS0	-
	802.11ax (HE80)	42 to 58	42, 58	OFDMA	BPSK	MCS0	-
		106 to 122	106, 122	OFDMA	BPSK	MCS0	-
	802.11ax (RU26)	36 to 64	36, 64	OFDMA	BPSK	MCS0	26/0, 26/8
		100 to 140	100, 140	OFDMA	BPSK	MCS0	26/0, 26/8
	802.11ax (RU52)	38 to 62	36, 64	OFDMA	BPSK	MCS0	52/37, 52/40
		102 to 134	100, 140	OFDMA	BPSK	MCS0	52/37, 52/40
	802.11ax (RU106)	42 to 58	36, 64	OFDMA	BPSK	MCS0	106/53, 106/54
		106 to 122	100, 140	OFDMA	BPSK	MCS0	106/53, 106/54
EUT configure mode	**Mode**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**	**RU Configuration**
2	802.11a	36 to 64	36, 64	OFDM	BPSK	6Mb/s	-
		100 to 140	100, 140	OFDM	BPSK	6Mb/s	-
	802.11ac (VHT20)	36 to 64	36, 64	OFDM	BPSK	MCS0	-
		100 to 140	100, 140	OFDM	BPSK	MCS0	-
	802.11ac (VHT40)	38 to 62	38, 62	OFDM	BPSK	MCS0	-
		102 to 134	102, 134	OFDM	BPSK	MCS0	-
	802.11ac (VHT80)	42 to 58	42, 58	OFDM	BPSK	MCS0	-
		106 to 122	106, 122	OFDM	BPSK	MCS0	-
	802.11ax (HE20)	36 to 64	36, 64	OFDMA	BPSK	MCS0	-
		100 to 140	100, 140	OFDMA	BPSK	MCS0	-
	802.11ax (HE40)	38 to 62	38, 62	OFDMA	BPSK	MCS0	-
		102 to 134	102, 134	OFDMA	BPSK	MCS0	-
	802.11ax (HE80)	42 to 58	42, 58	OFDMA	BPSK	MCS0	-
		106 to 122	106, 122	OFDMA	BPSK	MCS0	-
	802.11ax (RU26)	36 to 64	36, 64	OFDMA	BPSK	MCS0	26/0, 26/8
		100 to 140	100, 140	OFDMA	BPSK	MCS0	26/0, 26/8
	802.11ax (RU52)	38 to 62	36, 64	OFDMA	BPSK	MCS0	52/37, 52/40
		102 to 134	100, 140	OFDMA	BPSK	MCS0	52/37, 52/40
	802.11ax (RU106)	42 to 58	36, 64	OFDMA	BPSK	MCS0	106/53, 106/54
		106 to 122	100, 140	OFDMA	BPSK	MCS0	106/53, 106/54

Transmit Power Control (TPC):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, RU configurations and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT configure mode	CDD Mode						
	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter	RU Configuration
1	802.11a	52 to 64	64	OFDM	BPSK	6Mb/s	-
		100 to 140	100, 140	OFDM	BPSK	6Mb/s	-
	802.11ac (VHT20)	52 to 64	64	OFDM	BPSK	MCS0	-
		100 to 140	100, 140	OFDM	BPSK	MCS0	-
	802.11ac (VHT40)	54 to 62	62	OFDM	BPSK	MCS0	-
		102 to 134	102, 134	OFDM	BPSK	MCS0	-
	802.11ac (VHT80)	58	58	OFDM	BPSK	MCS0	-
		106 to 122	106, 122	OFDM	BPSK	MCS0	-
	802.11ax (HE20)	52 to 64	64	OFDMA	BPSK	MCS0	-
		100 to 140	100, 140	OFDMA	BPSK	MCS0	-
	802.11ax (HE40)	54 to 62	62	OFDMA	BPSK	MCS0	-
		102 to 134	102, 134	OFDMA	BPSK	MCS0	-
	802.11ax (HE80)	58	58	OFDMA	BPSK	MCS0	-
		106 to 122	106, 122	OFDMA	BPSK	MCS0	-
	802.11ax (RU26)	52 to 64	64	OFDMA	BPSK	MCS0	26/8
		100 to 140	100, 140	OFDMA	BPSK	MCS0	26/0, 26/8
	802.11ax (RU52)	52 to 64	64	OFDMA	BPSK	MCS0	52/40
		102 to 134	100, 140	OFDMA	BPSK	MCS0	52/37, 52/40
	802.11ax (RU106)	52 to 64	64	OFDMA	BPSK	MCS0	106/54
		106 to 122	100, 140	OFDMA	BPSK	MCS0	106/53, 106/54
	Beamforming Mode						
	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter	RU Configuration
	802.11ac (VHT20)	52 to 64	64	OFDM	BPSK	MCS0	-
		100 to 140	100, 140	OFDM	BPSK	MCS0	-
	802.11ac (VHT40)	54 to 62	62	OFDM	BPSK	MCS0	-
		102 to 134	102, 134	OFDM	BPSK	MCS0	-
	802.11ac (VHT80)	58	58	OFDM	BPSK	MCS0	-
		106 to 122	106, 122	OFDM	BPSK	MCS0	-
	802.11ax (HE20)	52 to 64	64	OFDMA	BPSK	MCS0	-
		100 to 140	100, 140	OFDMA	BPSK	MCS0	-
	802.11ax (HE40)	54 to 62	62	OFDMA	BPSK	MCS0	-
		102 to 134	102, 134	OFDMA	BPSK	MCS0	-
	802.11ax (HE80)	58	58	OFDMA	BPSK	MCS0	-
		106 to 122	106, 122	OFDMA	BPSK	MCS0	-
	802.11ax (RU26)	52 to 64	64	OFDMA	BPSK	MCS0	26/8
		100 to 140	100, 140	OFDMA	BPSK	MCS0	26/0, 26/8
	802.11ax (RU52)	52 to 64	64	OFDMA	BPSK	MCS0	52/40
		102 to 134	100, 140	OFDMA	BPSK	MCS0	52/37, 52/40
	802.11ax (RU106)	52 to 64	64	OFDMA	BPSK	MCS0	106/54
		106 to 122	100, 140	OFDMA	BPSK	MCS0	106/53, 106/54

EUT configure mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter	RU Configuration
2	802.11a	52 to 64	64	OFDM	BPSK	6Mb/s	-
		100 to 140	100, 140	OFDM	BPSK	6Mb/s	-
	802.11ac (VHT20)	52 to 64	64	OFDM	BPSK	MCS0	-
		100 to 140	100, 140	OFDM	BPSK	MCS0	-
	802.11ac (VHT40)	54 to 62	62	OFDM	BPSK	MCS0	-
		102 to 134	102, 134	OFDM	BPSK	MCS0	-
	802.11ac (VHT80)	58	58	OFDM	BPSK	MCS0	-
		106 to 122	106, 122	OFDM	BPSK	MCS0	-
	802.11ax (HE20)	52 to 64	64	OFDMA	BPSK	MCS0	-
		100 to 140	100, 140	OFDMA	BPSK	MCS0	-
	802.11ax (HE40)	54 to 62	62	OFDMA	BPSK	MCS0	-
		102 to 134	102, 134	OFDMA	BPSK	MCS0	-
	802.11ax (HE80)	58	58	OFDMA	BPSK	MCS0	-
		106 to 122	106, 122	OFDMA	BPSK	MCS0	-
	802.11ax (RU26)	52 to 64	64	OFDMA	BPSK	MCS0	26/0, 26/8
		100 to 140	100, 140	OFDMA	BPSK	MCS0	26/0, 26/8
	802.11ax (RU52)	52 to 64	64	OFDMA	BPSK	MCS0	52/37, 52/40
		102 to 134	100, 140	OFDMA	BPSK	MCS0	52/37, 52/40
	802.11ax (RU106)	52 to 64	64	OFDMA	BPSK	MCS0	106/53, 106/54
		106 to 122	100, 140	OFDMA	BPSK	MCS0	106/53, 106/54

Power Density:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, RU configurations and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT configure mode	CDD Mode						
	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter	RU Configuration
1	802.11a	36 to 64	36, 64	OFDM	BPSK	6Mb/s	-
		100 to 140	100, 140	OFDM	BPSK	6Mb/s	-
	802.11ac (VHT20)	36 to 64	36, 64	OFDM	BPSK	MCS0	-
		100 to 140	100, 140	OFDM	BPSK	MCS0	-
	802.11ac (VHT40)	38 to 62	38, 62	OFDM	BPSK	MCS0	-
		102 to 134	102, 134	OFDM	BPSK	MCS0	-
	802.11ac (VHT80)	42 to 58	42, 58	OFDM	BPSK	MCS0	-
		106 to 122	106, 122	OFDM	BPSK	MCS0	-
	802.11ax (HE20)	36 to 64	36, 64	OFDMA	BPSK	MCS0	-
		100 to 140	100, 140	OFDMA	BPSK	MCS0	-
	802.11ax (HE40)	38 to 62	38, 62	OFDMA	BPSK	MCS0	-
		102 to 134	102, 134	OFDMA	BPSK	MCS0	-
	802.11ax (HE80)	42 to 58	42, 58	OFDMA	BPSK	MCS0	-
		106 to 122	106, 122	OFDMA	BPSK	MCS0	-
	802.11ax (RU26)	36 to 64	36, 64	OFDMA	BPSK	MCS0	26/0, 26/8
		100 to 140	100, 140	OFDMA	BPSK	MCS0	26/0, 26/8
	802.11ax (RU52)	38 to 62	36, 64	OFDMA	BPSK	MCS0	52/37, 52/40
		102 to 134	100, 140	OFDMA	BPSK	MCS0	52/37, 52/40
	802.11ax (RU106)	42 to 58	36, 64	OFDMA	BPSK	MCS0	106/53, 106/54
		106 to 122	100, 140	OFDMA	BPSK	MCS0	106/53, 106/54

EUT configure mode	Beamforming Mode						
	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter	RU Configuration
1	802.11ac (VHT20)	36 to 64	36, 64	OFDM	BPSK	MCS0	-
		100 to 140	100, 140	OFDM	BPSK	MCS0	-
	802.11ac (VHT40)	38 to 62	38, 62	OFDM	BPSK	MCS0	-
		102 to 134	102, 134	OFDM	BPSK	MCS0	-
	802.11ac (VHT80)	42 to 58	42, 58	OFDM	BPSK	MCS0	-
		106 to 122	106, 122	OFDM	BPSK	MCS0	-
	802.11ax (HE20)	36 to 64	36, 64	OFDMA	BPSK	MCS0	-
		100 to 140	100, 140	OFDMA	BPSK	MCS0	-
	802.11ax (HE40)	38 to 62	38, 62	OFDMA	BPSK	MCS0	-
		102 to 134	102, 134	OFDMA	BPSK	MCS0	-
	802.11ax (HE80)	42 to 58	42, 58	OFDMA	BPSK	MCS0	-
		106 to 122	106, 122	OFDMA	BPSK	MCS0	-
	802.11ax (RU26)	36 to 64	36, 64	OFDMA	BPSK	MCS0	26/0, 26/8
		100 to 140	100, 140	OFDMA	BPSK	MCS0	26/0, 26/8
	802.11ax (RU52)	38 to 62	36, 64	OFDMA	BPSK	MCS0	52/37, 52/40
		102 to 134	100, 140	OFDMA	BPSK	MCS0	52/37, 52/40
	802.11ax (RU106)	42 to 58	36, 64	OFDMA	BPSK	MCS0	106/53, 106/54
		106 to 122	100, 140	OFDMA	BPSK	MCS0	106/53, 106/54
EUT configure mode	**Mode**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**	**RU Configuration**
2	802.11a	36 to 64	36, 64	OFDM	BPSK	6Mb/s	-
		100 to 140	100, 140	OFDM	BPSK	6Mb/s	-
	802.11ac (VHT20)	36 to 64	36, 64	OFDM	BPSK	MCS0	-
		100 to 140	100, 140	OFDM	BPSK	MCS0	-
	802.11ac (VHT40)	38 to 62	38, 62	OFDM	BPSK	MCS0	-
		102 to 134	102, 134	OFDM	BPSK	MCS0	-
	802.11ac (VHT80)	42 to 58	42, 58	OFDM	BPSK	MCS0	-
		106 to 122	106, 122	OFDM	BPSK	MCS0	-
	802.11ax (HE20)	36 to 64	36, 64	OFDMA	BPSK	MCS0	-
		100 to 140	100, 140	OFDMA	BPSK	MCS0	-
	802.11ax (HE40)	38 to 62	38, 62	OFDMA	BPSK	MCS0	-
		102 to 134	102, 134	OFDMA	BPSK	MCS0	-
	802.11ax (HE80)	42 to 58	42, 58	OFDMA	BPSK	MCS0	-
		106 to 122	106, 122	OFDMA	BPSK	MCS0	-
	802.11ax (RU26)	36 to 64	36, 64	OFDMA	BPSK	MCS0	26/0, 26/8
		100 to 140	100, 140	OFDMA	BPSK	MCS0	26/0, 26/8
	802.11ax (RU52)	38 to 62	36, 64	OFDMA	BPSK	MCS0	52/37, 52/40
		102 to 134	100, 140	OFDMA	BPSK	MCS0	52/37, 52/40
	802.11ax (RU106)	42 to 58	36, 64	OFDMA	BPSK	MCS0	106/53, 106/54
		106 to 122	100, 140	OFDMA	BPSK	MCS0	106/53, 106/54

Adaptivity Test:

☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology
802.11ax (HE20)	36 to 64, 100 to 140	100	OFDMA
802.11ax (HE40)	38 to 62, 102 to 134	102	OFDMA

Spurious Emissions Test (Below 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, RU configurations and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT configure mode	CDD Mode						
	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter	RU Configuration
1	802.11ax (HE40)	38 to 62, 102 to 134	102	OFDMA	BPSK	MCS0	-
	802.11ax (RU26)	36 to 64, 100 to 140	100	OFDMA	BPSK	MCS0	26/0
	Receiver	36 to 64 100 to 140	36	-	-	-	-
EUT configure mode	**Mode**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**	**RU Configuration**
2	802.11ax (HE40)	38 to 62, 102 to 134	38	OFDMA	BPSK	MCS0	-
	802.11ax (RU26)	36 to 64, 100 to 140	100	OFDMA	BPSK	MCS0	26/0

Spurious Emissions Test (Above 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, RU configurations and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT configure mode	CDD Mode						
	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter	RU Configuration
1	802.11ax (HE40)	38 to 62, 102 to 134	38, 102	OFDMA	BPSK	MCS0	-
	802.11ax (RU26)	36 to 64, 100 to 140	36, 100	OFDMA	BPSK	MCS0	26/0, 26/0
	Receiver	36 to 64 100 to 140	36, 100	-	-	-	-
EUT configure mode	**Mode**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**	**RU Configuration**
2	802.11ax (HE40)	38 to 62, 102 to 134	38, 102	OFDMA	BPSK	MCS0	-
	802.11ax (RU26)	36 to 64, 100 to 140	64, 100	OFDMA	BPSK	MCS0	26/0, 26/0

Transmitter Unwanted Emissions within the 5GHz RLAN Bands (Signal under Spectrum Mask):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, RU configurations and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT configure mode	CDD Mode						
	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter	RU Configuration
1	802.11a	36 to 64	36, 64	OFDM	BPSK	6Mb/s	-
		100 to 140	100, 140	OFDM	BPSK	6Mb/s	-
	802.11ax (HE20)	36 to 64	36, 64	OFDMA	BPSK	MCS0	-
		100 to 140	100, 140	OFDMA	BPSK	MCS0	-
	802.11ax (HE40)	38 to 62	38, 62	OFDMA	BPSK	MCS0	-
		102 to 134	102, 134	OFDMA	BPSK	MCS0	-
	802.11ax (HE80)	42 to 58	42, 58	OFDMA	BPSK	MCS0	-
		106 to 122	106, 122	OFDMA	BPSK	MCS0	-
	802.11ax (RU26)	36 to 64	36, 64	OFDMA	BPSK	MCS0	26/0, 26/8
		100 to 140	100, 140	OFDMA	BPSK	MCS0	26/0, 26/8
	802.11ax (RU52)	38 to 62	36, 64	OFDMA	BPSK	MCS0	52/37, 52/40
		102 to 134	100, 140	OFDMA	BPSK	MCS0	52/37, 52/40
	802.11ax (RU106)	42 to 58	36, 64	OFDMA	BPSK	MCS0	106/53, 106/54
		106 to 122	100, 140	OFDMA	BPSK	MCS0	106/53, 106/54
EUT configure mode	**Mode**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**	**RU Configuration**
2	802.11a	36 to 64	36, 64	OFDM	BPSK	6Mb/s	-
		100 to 140	100, 140	OFDM	BPSK	6Mb/s	-
	802.11ax (HE20)	36 to 64	36, 64	OFDMA	BPSK	MCS0	-
		100 to 140	100, 140	OFDMA	BPSK	MCS0	-
	802.11ax (HE40)	38 to 62	38, 62	OFDMA	BPSK	MCS0	-
		102 to 134	102, 134	OFDMA	BPSK	MCS0	-
	802.11ax (HE80)	42 to 58	42, 58	OFDMA	BPSK	MCS0	-
		106 to 122	106, 122	OFDMA	BPSK	MCS0	-
	802.11ax (RU26)	36 to 64	36, 64	OFDMA	BPSK	MCS0	26/0, 26/8
		100 to 140	100, 140	OFDMA	BPSK	MCS0	26/0, 26/8
	802.11ax (RU52)	38 to 62	36, 64	OFDMA	BPSK	MCS0	52/37, 52/40
		102 to 134	100, 140	OFDMA	BPSK	MCS0	52/37, 52/40
	802.11ax (RU106)	42 to 58	36, 64	OFDMA	BPSK	MCS0	106/53, 106/54
		106 to 122	100, 140	OFDMA	BPSK	MCS0	106/53, 106/54

Receiver Blocking Test:

☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11a	36 to 64	36	OFDM	BPSK	6Mb/s
	100 to 140	100	OFDM	BPSK	6Mb/s

Test Condition:

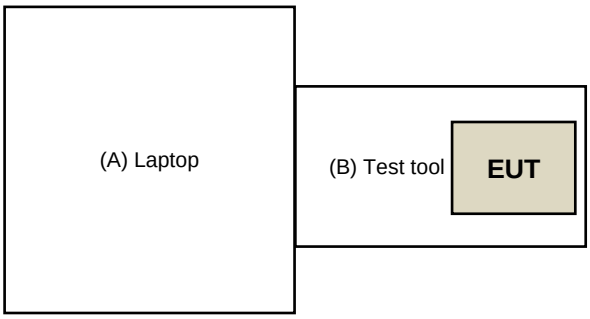
Applicable to	Environmental conditions	INPUT POWER	Tested by
CF	25deg. C, 60%RH	230Vac, 50Hz	Angus Peng
OB	25deg. C, 60%RH	230Vac, 50Hz	Angus Peng
ROP	25deg. C, 60%RH	230Vac, 50Hz	Angus Peng
TPC	25deg. C, 60%RH	230Vac, 50Hz	Angus Peng
PD	25deg. C, 60%RH	230Vac, 50Hz	Angus Peng
AD	25deg. C, 60%RH	230Vac, 50Hz	Tobey Chen
SE<1G	22deg. C, 72%RH, 25deg. C, 65%RH	230Vac, 50Hz	Ethan Hsu, Vic Huang
SE≥1G	25deg. C, 65%RH, 24deg. C, 74%RH	230Vac, 50Hz	Vic Huang, Ethan Hsu
SSM	25deg. C, 60%RH	230Vac, 50Hz	Angus Peng
RB	25deg. C, 60%RH	230Vac, 50Hz	Tobey Chen

3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6420	B92T3R1	DoC	Provided by Lab
B.	Test tool	Realtek	NA	NA	NA	Supplied by client

3.3.1 Configuration of System under Test



3.4 General Description of Applied Standards

The EUT is a RF Product. According to the specification of the EUT declared by the manufacturer, it must comply with the requirements of the following standard:

EN 301 893 V2.1.1 (2017-05)

All test items have been performed and recorded as per the above standard.

4 Test Procedure and Results

4.1 Carrier Frequencies

4.1.1 Limits of Carrier Frequencies

The actual centre frequency for any given channel shall be maintained within the range fc ± 20 ppm.

4.1.2 Test Procedures

Refer to EN 301 893 V2.1.1 clause 5.4.2.

4.1.3 Deviation from Test Standard

No deviation

4.1.4 Test Setup

The measurement was performed at normal and extreme environmental conditions. The measurement channels were performed in accordance with EN 301 893 clause 5.3.2. The equipment was configured to operate under its worst case situation with respect to output power. The EUT shall be connected to spectrum analyzer. (In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator.).

4.1.5 Test Results (Mode 1)

802.11a

Test Condition			Carrier Centre Frequencies f_c (MHz)			
			(CH36) 5180 MHz		(CH100) 5500 MHz	
			Reading	ppm	Reading	ppm
T_{nom}(℃)	25	V_{nom} (V)	5180.0106	2.0463	5500.0064	1.1636
T_{min}(℃)	-20	V_{nom} (V)	5180.0017	0.3282	5499.9973	-0.4909
T_{max}(℃)	70	V_{nom} (V)	5179.9891	-2.1042	5499.9827	-3.1455

4.1.6 Test Results (Mode 2)

802.11a

Test Condition			Carrier Centre Frequencies f_c (MHz)			
			(CH36) 5180 MHz		(CH100) 5500 MHz	
			Reading	ppm	Reading	ppm
T_{nom}(℃)	25	V_{nom} (V)	5180.0106	2.0463	5500.0111	2.0182
T_{min}(℃)	-20	V_{nom} (V)	5180.0017	0.3282	5500.0073	1.3273
T_{max}(℃)	70	V_{nom} (V)	5179.9891	-2.1042	5499.9915	-1.5455

4.2 Nominal and Occupied Channel Bandwidth Measurement

4.2.1 Limit of Nominal and Occupied Channel Bandwidth Measurement

The Nominal Channel Bandwidth for a single Operating Channel shall be 20 MHz.
Alternatively, equipment may implement a lower Nominal Channel Bandwidth with a minimum of 5 MHz, providing they still comply with the Nominal Centre Frequencies defined in clause 4.2.1.

The Occupied Channel Bandwidth shall be between 80 % and 100 % of the Nominal Channel Bandwidth. In case of smart antenna systems (devices with multiple transmit chains) each of the transmit chains shall meet this requirement. The Occupied Channel Bandwidth might change with time/payload. During a Channel Occupancy Time (COT), equipment may operate temporarily with an Occupied Channel Bandwidth of less than 80 % of its Nominal Channel Bandwidth with a minimum of 2 MHz.

4.2.2 Test Procedure

Refer to EN 301 893 V2.1.1 clause 5.4.3

Measurement Method	
☒ Conducted measurement	☐ Radiated measurement

4.2.3 Deviation from Test Standard

No deviation.

4.2.4 Test Setup

The measurement was performed at normal environmental conditions only. The measurement channels were performed in accordance with EN 301 893 clause 5.3.2. The equipment was configured to operate under its worst case situation with respect to output power. (In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator.) Controlling software (RTL8852B MP Toolkit V1.0.16) has been activated to set the EUT on specific status.
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4.2.5 Test Results (Mode 1)

CDD Mode

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	Minimum limit (MHz)	Maximum limit (MHz)	Pass / Fail
64	5320	16.32	16	20	Pass
100	5500	16.32	16	20	Pass

802.11ax (HE20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	Minimum limit (MHz)	Maximum limit (MHz)	Pass / Fail
36	5180	18.88	16	20	Pass
140	5700	18.88	16	20	Pass

802.11ax (HE40)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	Minimum limit (MHz)	Maximum limit (MHz)	Pass / Fail
38	5190	37.68	32	40	Pass
102	5510	37.68	32	40	Pass

802.11ax (HE80)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	Minimum limit (MHz)	Maximum limit (MHz)	Pass / Fail
42	5210	76.96	64	80	Pass
106	5530	77.28	64	80	Pass

802.11ax (RU26)

Channel	Channel Frequency (MHz)	RU Configuration	Occupied Bandwidth (MHz)	Minimum limit (MHz)	Maximum limit (MHz)	Pass / Fail
36	5180	26/0	15.76	2	20	Pass
64	5320	26/8	15.8	2	20	Pass
100	5500	26/0	15.8	2	20	Pass
140	5700	26/8	15.8	2	20	Pass

802.11ax (RU52)

Channel	Channel Frequency (MHz)	RU Configuration	Occupied Bandwidth (MHz)	Minimum limit (MHz)	Maximum limit (MHz)	Pass / Fail
36	5180	52/37	15.44	2	20	Pass
64	5320	52/40	15.72	2	20	Pass
100	5500	52/37	15.16	2	20	Pass
140	5700	52/40	15.68	2	20	Pass

802.11ax (RU106)

Channel	Channel Frequency (MHz)	RU Configuration	Occupied Bandwidth (MHz)	Minimum limit (MHz)	Maximum limit (MHz)	Pass / Fail
36	5180	106/53	15.48	2	20	Pass
64	5320	106/54	15.48	2	20	Pass
100	5500	106/53	15.36	2	20	Pass
140	5700	106/54	15.48	2	20	Pass

4.2.6 Test Results (Mode 2)

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	Minimum limit (MHz)	Maximum limit (MHz)	Pass / Fail
64	5320	16.36	16	20	Pass
100	5500	16.36	16	20	Pass

802.11ax (HE20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	Minimum limit (MHz)	Maximum limit (MHz)	Pass / Fail
36	5180	18.84	16	20	Pass
100	5500	18.88	16	20	Pass

802.11ax (HE40)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	Minimum limit (MHz)	Maximum limit (MHz)	Pass / Fail
38	5190	37.68	32	40	Pass
102	5510	37.68	32	40	Pass

802.11ax (HE80)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	Minimum limit (MHz)	Maximum limit (MHz)	Pass / Fail
42	5210	77.28	64	80	Pass
106	5530	77.28	64	80	Pass

802.11ax (RU26)

Channel	Channel Frequency (MHz)	RU Configuration	Occupied Bandwidth (MHz)	Minimum limit (MHz)	Maximum limit (MHz)	Pass / Fail
36	5180	26/0	15.84	2	20	Pass
64	5320	26/8	15.76	2	20	Pass
100	5500	26/0	15.84	2	20	Pass
140	5700	26/8	15.8	2	20	Pass

802.11ax (RU52)

Channel	Channel Frequency (MHz)	RU Configuration	Occupied Bandwidth (MHz)	Minimum limit (MHz)	Maximum limit (MHz)	Pass / Fail
36	5180	52/37	15.68	2	20	Pass
64	5320	52/40	15.44	2	20	Pass
100	5500	52/37	15.68	2	20	Pass
140	5700	52/40	15.64	2	20	Pass

802.11ax (RU106)

Channel	Channel Frequency (MHz)	RU Configuration	Occupied Bandwidth (MHz)	Minimum limit (MHz)	Maximum limit (MHz)	Pass / Fail
36	5180	106/53	15.4	2	20	Pass
64	5320	106/54	15.44	2	20	Pass
100	5500	106/53	15.68	2	20	Pass
140	5700	106/54	15.44	2	20	Pass

4.3 RF Output Power and Transmit Power Control (TPC)

4.3.1 Limits of RF output power

Frequency Range (MHz)	Mean e.i.r.p. Limit (dBm)	
	☒ With TPC	☐ Without TPC
5150 to 5350	23	20 / 23 (see note 1)
5470 to 5725	30 (see note 2)	27 (see note 2)
Note 1: The applicable limit is 20 dBm, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 23 dBm. Note 2: Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5 250 MHz to 5 350 MHz.		

4.3.2 Limits of RF Output Power at Lowest Power Level

Frequency Range (MHz)	Average EIRP (dBm)
5250 to 5350	17
5470 to 5725	24(see note)
Note: Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5 250 MHz to 5 350 MHz.	

4.3.3 Test Procedure

Refer to EN 301 893 V2.1.1 clause 5.4.4

Measurement	
☒ Conducted measurement	☐ Radiated measurement
☒ Option 1: For equipment with continuous transmission capability or for equipment operating (or with the capability to operate) with a constant duty cycle (e.g. Frame Based equipment).	
☐ Option 2: For equipment without continuous transmission capability and operating (or with the capability to operate) in only one sub-band.	
☐ Option 3: For equipment without continuous transmission capability and having simultaneous transmissions in both sub-bands.	

4.3.4 Deviation from Test Standard

No deviation.

4.3.5 Test Setup

The measurements were performed at both normal environmental conditions and at the extremes of the operating temperature range. The measurement channels were performed in accordance with EN 301 893 clause 5.3.2. The equipment was configured to operate under its worst case situation with respect to output power. (In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator.) The RF power as defined in EN 301 893 clause 4.2.3 shall be measured and recorded. Controlling software (RTL8852B MP Toolkit V1.0.16) has been activated to set the EUT on specific status.

4.3.6 Test Results for RF Output Power at the Highest Power Level (Mode 1)

CDD Mode

802.11a

Test Condition			EIRP (dBm)			
			(CH36) 5180 MHz	(CH64) 5320 MHz	(CH100) 5500 MHz	(CH140) 5700 MHz
T_{nom}(℃)	25	V_{nom} (V)	21.11	21.25	21.31	21.15
T_{min}(℃)	-20	V_{nom} (V)	21.44	21.37	21.66	21.40
T_{max}(℃)	70	V_{nom} (V)	20.99	21.02	21.23	21.13

802.11ac (VHT20)

Test Condition			EIRP (dBm)			
			(CH36) 5180 MHz	(CH64) 5320 MHz	(CH100) 5500 MHz	(CH140) 5700 MHz
T_{nom}(℃)	25	V_{nom} (V)	21.54	21.53	21.56	21.58
T_{min}(℃)	-20	V_{nom} (V)	21.75	21.70	21.72	21.87
T_{max}(℃)	70	V_{nom} (V)	21.30	21.39	21.33	21.41

802.11ac (VHT40)

Test Condition			EIRP (dBm)			
			(CH38) 5190 MHz	(CH62) 5310 MHz	(CH102) 5510 MHz	(CH134) 5670 MHz
T_{nom}(℃)	25	V_{nom} (V)	22.48	22.50	22.50	22.51
T_{min}(℃)	-20	V_{nom} (V)	22.62	22.63	22.63	22.65
T_{max}(℃)	70	V_{nom} (V)	22.38	22.21	22.14	22.43

802.11ac (VHT80)

Test Condition			EIRP (dBm)			
			(CH42) 5210 MHz	(CH58) 5290 MHz	(CH106) 5530 MHz	(CH122) 5610 MHz
T_{nom}(℃)	25	V_{nom} (V)	22.45	22.43	22.55	22.31
T_{min}(℃)	-20	V_{nom} (V)	22.64	22.68	22.66	22.64
T_{max}(℃)	70	V_{nom} (V)	22.27	22.29	22.26	22.24

802.11ax (HE20)

Test Condition			EIRP (dBm)			
			(CH38) 5190 MHz	(CH62) 5310 MHz	(CH102) 5510 MHz	(CH134) 5670 MHz
T_{nom}(℃)	25	V_{nom} (V)	21.56	21.56	21.57	21.62
T_{min}(℃)	-20	V_{nom} (V)	21.77	21.73	21.73	21.91
T_{max}(℃)	70	V_{nom} (V)	21.32	21.42	21.34	21.45

802.11ax (HE40)

Test Condition			EIRP (dBm)			
			(CH38) 5190 MHz	(CH62) 5310 MHz	(CH102) 5510 MHz	(CH134) 5670 MHz
T_{nom}(℃)	25	V_{nom} (V)	22.63	22.62	22.72	22.69
T_{min}(℃)	-20	V_{nom} (V)	22.77	22.75	22.85	22.83
T_{max}(℃)	70	V_{nom} (V)	22.53	22.33	22.36	22.61

802.11ax (HE80)

Test Condition			EIRP (dBm)			
			(CH42) 5210 MHz	(CH58) 5290 MHz	(CH106) 5530 MHz	(CH122) 5610 MHz
T_{nom}(℃)	25	V_{nom} (V)	22.58	22.52	22.70	22.54
T_{min}(℃)	-20	V_{nom} (V)	22.77	22.77	22.81	22.87
T_{max}(℃)	70	V_{nom} (V)	22.40	22.38	22.41	22.47

802.11ax (RU26)

Test Condition			EIRP (dBm)			
			(CH36) 5180 MHz	(CH64) 5320 MHz	(CH100) 5500 MHz	(CH140) 5700 MHz
RU Configuration			26/0	26/8	26/0	26/8
T_{nom}(℃)	25	V_{nom} (V)	12.39	12.31	12.32	12.35
T_{min}(℃)	-20	V_{nom} (V)	12.58	12.56	12.53	12.68
T_{max}(℃)	70	V_{nom} (V)	12.21	12.17	12.13	12.28

802.11ax (RU52)

Test Condition			EIRP (dBm)			
			(CH36) 5180 MHz	(CH64) 5320 MHz	(CH100) 5500 MHz	(CH140) 5700 MHz
RU Configuration			52/37	52/40	52/37	52/40
T_{nom}(℃)	25	V_{nom} (V)	14.80	14.89	14.84	14.86
T_{min}(℃)	-20	V_{nom} (V)	14.94	15.16	15.07	15.00
T_{max}(℃)	70	V_{nom} (V)	14.70	14.70	14.58	14.78

802.11ax (RU106)

Test Condition			EIRP (dBm)			
			(CH36) 5180 MHz	(CH64) 5320 MHz	(CH100) 5500 MHz	(CH140) 5700 MHz
RU Configuration			106/53	106/54	106/53	106/54
T_{nom}(℃)	25	V_{nom} (V)	18.04	18.01	18.10	18.06
T_{min}(℃)	-20	V_{nom} (V)	18.37	18.13	18.45	18.31
T_{max}(℃)	70	V_{nom} (V)	17.92	17.78	18.02	18.04

Beamforming Mode

802.11ac (VHT20)

Test Condition			EIRP (dBm)			
			(CH36) 5180 MHz	(CH64) 5320 MHz	(CH100) 5500 MHz	(CH140) 5700 MHz
T_{nom}(℃)	25	V_{nom} (V)	21.51	21.52	21.51	21.55
T_{min}(℃)	-20	V_{nom} (V)	21.72	21.69	21.67	21.84
T_{max}(℃)	70	V_{nom} (V)	21.27	21.38	21.28	21.38

802.11ac (VHT40)

Test Condition			EIRP (dBm)			
			(CH38) 5190 MHz	(CH62) 5310 MHz	(CH102) 5510 MHz	(CH134) 5670 MHz
T_{nom}(℃)	25	V_{nom} (V)	22.46	22.48	22.49	22.48
T_{min}(℃)	-20	V_{nom} (V)	22.60	22.61	22.62	22.62
T_{max}(℃)	70	V_{nom} (V)	22.36	22.19	22.13	22.40

802.11ac (VHT80)

Test Condition			EIRP (dBm)			
			(CH42) 5210 MHz	(CH58) 5290 MHz	(CH106) 5530 MHz	(CH122) 5610 MHz
T_{nom}(℃)	25	V_{nom} (V)	22.44	22.40	22.54	22.30
T_{min}(℃)	-20	V_{nom} (V)	22.63	22.65	22.65	22.63
T_{max}(℃)	70	V_{nom} (V)	22.26	22.26	22.25	22.23

802.11ax (HE20)

Test Condition			EIRP (dBm)			
			(CH38) 5190 MHz	(CH62) 5310 MHz	(CH102) 5510 MHz	(CH134) 5670 MHz
T_{nom}(℃)	25	V_{nom} (V)	21.54	21.53	21.55	21.58
T_{min}(℃)	-20	V_{nom} (V)	21.75	21.70	21.71	21.87
T_{max}(℃)	70	V_{nom} (V)	21.30	21.39	21.32	21.41

802.11ax (HE40)

Test Condition			EIRP (dBm)			
			(CH38) 5190 MHz	(CH62) 5310 MHz	(CH102) 5510 MHz	(CH134) 5670 MHz
T_{nom}(℃)	25	V_{nom} (V)	22.61	22.61	22.64	22.66
T_{min}(℃)	-20	V_{nom} (V)	22.75	22.74	22.77	22.80
T_{max}(℃)	70	V_{nom} (V)	22.51	22.32	22.28	22.58

802.11ax (HE80)

Test Condition			EIRP (dBm)			
			(CH42) 5210 MHz	(CH58) 5290 MHz	(CH106) 5530 MHz	(CH122) 5610 MHz
T_{nom}(℃)	25	V_{nom} (V)	22.55	22.48	22.69	22.53
T_{min}(℃)	-20	V_{nom} (V)	22.74	22.73	22.80	22.86
T_{max}(℃)	70	V_{nom} (V)	22.37	22.34	22.40	22.46

4.3.7 Test Results for RF Output Power at the Highest Power Level (Mode 2)

802.11a

Test Condition			EIRP (dBm)			
			(CH36) 5180 MHz	(CH64) 5320 MHz	(CH100) 5500 MHz	(CH140) 5700 MHz
T_{nom}(℃)	25	V_{nom} (V)	21.17	21.19	21.12	21.08
T_{min}(℃)	-20	V_{nom} (V)	21.50	21.31	21.47	21.33
T_{max}(℃)	70	V_{nom} (V)	21.05	20.96	21.04	21.06

802.11ac (VHT20)

Test Condition			EIRP (dBm)			
			(CH36) 5180 MHz	(CH64) 5320 MHz	(CH100) 5500 MHz	(CH140) 5700 MHz
T_{nom}(℃)	25	V_{nom} (V)	21.56	21.54	21.54	21.55
T_{min}(℃)	-20	V_{nom} (V)	21.77	21.71	21.70	21.84
T_{max}(℃)	70	V_{nom} (V)	21.32	21.40	21.31	21.38

802.11ac (VHT40)

Test Condition			EIRP (dBm)			
			(CH38) 5190 MHz	(CH62) 5310 MHz	(CH102) 5510 MHz	(CH134) 5670 MHz
T_{nom}(℃)	25	V_{nom} (V)	22.54	22.51	22.52	22.48
T_{min}(℃)	-20	V_{nom} (V)	22.68	22.64	22.63	22.62
T_{max}(℃)	70	V_{nom} (V)	22.44	22.23	22.23	22.40

802.11ac (VHT80)

Test Condition			EIRP (dBm)			
			(CH42) 5210 MHz	(CH58) 5290 MHz	(CH106) 5530 MHz	(CH122) 5610 MHz
T_{nom}(℃)	25	V_{nom} (V)	22.41	22.45	22.52	22.35
T_{min}(℃)	-20	V_{nom} (V)	22.60	22.70	22.63	22.68
T_{max}(℃)	70	V_{nom} (V)	22.23	22.31	22.23	22.28

802.11ax (HE20)

Test Condition			EIRP (dBm)			
			(CH38) 5190 MHz	(CH62) 5310 MHz	(CH102) 5510 MHz	(CH134) 5670 MHz
T_{nom}(℃)	25	V_{nom} (V)	21.65	21.62	21.58	21.56
T_{min}(℃)	-20	V_{nom} (V)	21.86	21.79	21.74	21.85
T_{max}(℃)	70	V_{nom} (V)	21.41	21.48	21.35	21.39

802.11ax (HE40)

Test Condition			EIRP (dBm)			
			(CH38) 5190 MHz	(CH62) 5310 MHz	(CH102) 5510 MHz	(CH134) 5670 MHz
T_{nom}(℃)	25	V_{nom} (V)	22.73	22.66	22.68	22.60
T_{min}(℃)	-20	V_{nom} (V)	22.87	22.83	22.81	22.74
T_{max}(℃)	70	V_{nom} (V)	22.63	22.37	22.32	22.52

802.11ax (HE80)

Test Condition			EIRP (dBm)			
			(CH42) 5210 MHz	(CH58) 5290 MHz	(CH106) 5530 MHz	(CH122) 5610 MHz
T_{nom}(℃)	25	V_{nom} (V)	22.65	22.63	22.64	22.59
T_{min}(℃)	-20	V_{nom} (V)	22.84	22.88	22.75	22.92
T_{max}(℃)	70	V_{nom} (V)	22.47	22.49	22.35	22.52

802.11ax (RU26)

Test Condition			EIRP (dBm)			
			(CH36) 5180 MHz	(CH64) 5320 MHz	(CH100) 5500 MHz	(CH140) 5700 MHz
RU Configuration			26/0	26/8	26/0	26/8
T_{nom}(℃)	25	V_{nom} (V)	12.40	12.46	12.35	12.25
T_{min}(℃)	-20	V_{nom} (V)	12.59	12.71	12.56	12.58
T_{max}(℃)	70	V_{nom} (V)	12.22	12.32	12.16	12.18

802.11ax (RU52)

Test Condition			EIRP (dBm)			
			(CH36) 5180 MHz	(CH64) 5320 MHz	(CH100) 5500 MHz	(CH140) 5700 MHz
RU Configuration			52/37	52/40	52/37	52/40
T_{nom}(℃)	25	V_{nom} (V)	14.84	14.86	14.80	14.81
T_{min}(℃)	-20	V_{nom} (V)	14.98	15.13	15.03	14.95
T_{max}(℃)	70	V_{nom} (V)	14.74	14.67	14.54	14.73

802.11ax (RU106)

Test Condition			EIRP (dBm)			
			(CH36) 5180 MHz	(CH64) 5320 MHz	(CH100) 5500 MHz	(CH140) 5700 MHz
RU Configuration			106/53	106/54	106/53	106/54
T_{nom}(℃)	25	V_{nom} (V)	18.00	18.09	18.12	18.02
T_{min}(℃)	-20	V_{nom} (V)	18.33	18.21	18.47	18.27
T_{max}(℃)	70	V_{nom} (V)	17.88	17.86	18.04	18.00

4.3.8 Test Results for RF Output Power at the Lowest Power Level (Mode 1)

CDD Mode

802.11a

Test Condition			EIRP (dBm)		
			(CH64) 5320 MHz	(CH100) 5500 MHz	(CH140) 5700 MHz
T_{nom}(℃)	25	V_{nom} (V)	16.25	16.31	16.15
T_{min}(℃)	-20	V_{nom} (V)	16.37	16.66	16.40
T_{max}(℃)	70	V_{nom} (V)	16.02	16.23	16.13

802.11ac (VHT20)

Test Condition			EIRP (dBm)		
			(CH64) 5320 MHz	(CH100) 5500 MHz	(CH140) 5700 MHz
T_{nom}(℃)	25	V_{nom} (V)	16.53	16.56	16.58
T_{min}(℃)	-20	V_{nom} (V)	16.70	16.72	16.87
T_{max}(℃)	70	V_{nom} (V)	16.39	16.33	16.41

802.11ac (VHT40)

Test Condition			EIRP (dBm)		
			(CH62) 5310 MHz	(CH102) 5510 MHz	(CH134) 5670 MHz
T_{nom}(℃)	25	V_{nom} (V)	16.50	16.50	16.51
T_{min}(℃)	-20	V_{nom} (V)	16.63	16.63	16.65
T_{max}(℃)	70	V_{nom} (V)	16.21	16.14	16.43

802.11ac (VHT80)

Test Condition			EIRP (dBm)		
			(CH58) 5290 MHz	(CH106) 5530 MHz	(CH122) 5610 MHz
T_{nom}(℃)	25	V_{nom} (V)	16.43	16.55	16.31
T_{min}(℃)	-20	V_{nom} (V)	16.68	16.66	16.64
T_{max}(℃)	70	V_{nom} (V)	16.29	16.26	16.24

802.11ax (HE20)

Test Condition			EIRP (dBm)		
			(CH64) 5320 MHz	(CH100) 5500 MHz	(CH140) 5700 MHz
T_{nom}(℃)	25	V_{nom} (V)	16.56	16.57	16.62
T_{min}(℃)	-20	V_{nom} (V)	16.73	16.73	16.91
T_{max}(℃)	70	V_{nom} (V)	16.42	16.34	16.45

802.11ax (HE40)

Test Condition			EIRP (dBm)		
			(CH62) 5310 MHz	(CH102) 5510 MHz	(CH134) 5670 MHz
T_{nom}(℃)	25	V_{nom} (V)	16.62	16.72	16.69
T_{min}(℃)	-20	V_{nom} (V)	16.75	16.85	16.83
T_{max}(℃)	70	V_{nom} (V)	16.33	16.36	16.61

802.11ax (HE80)

Test Condition			EIRP (dBm)		
			(CH58) 5290 MHz	(CH106) 5530 MHz	(CH122) 5610 MHz
T_{nom}(℃)	25	V_{nom} (V)	16.52	16.70	16.54
T_{min}(℃)	-20	V_{nom} (V)	16.77	16.81	16.87
T_{max}(℃)	70	V_{nom} (V)	16.38	16.41	16.47

Beamforming Mode

802.11ac (VHT20)

Test Condition			EIRP (dBm)		
			(CH64) 5320 MHz	(CH100) 5500 MHz	(CH140) 5700 MHz
T_{nom}(℃)	25	V_{nom} (V)	16.52	16.51	16.55
T_{min}(℃)	-20	V_{nom} (V)	16.69	16.67	16.84
T_{max}(℃)	70	V_{nom} (V)	16.38	16.28	16.38

802.11ac (VHT40)

Test Condition			EIRP (dBm)		
			(CH62) 5310 MHz	(CH102) 5510 MHz	(CH134) 5670 MHz
T_{nom}(℃)	25	V_{nom} (V)	13.48	13.49	13.48
T_{min}(℃)	-20	V_{nom} (V)	13.61	13.62	13.62
T_{max}(℃)	70	V_{nom} (V)	13.19	13.13	13.40

802.11ac (VHT80)

Test Condition			EIRP (dBm)		
			(CH58) 5290 MHz	(CH106) 5530 MHz	(CH122) 5610 MHz
T_{nom}(℃)	25	V_{nom} (V)	13.40	13.54	13.30
T_{min}(℃)	-20	V_{nom} (V)	13.65	13.65	13.63
T_{max}(℃)	70	V_{nom} (V)	13.26	13.25	13.23

802.11ax (HE20)

Test Condition			EIRP (dBm)		
			(CH64) 5320 MHz	(CH100) 5500 MHz	(CH140) 5700 MHz
T_{nom}(℃)	25	V_{nom} (V)	16.53	16.55	16.58
T_{min}(℃)	-20	V_{nom} (V)	16.70	16.71	16.87
T_{max}(℃)	70	V_{nom} (V)	16.39	16.32	16.41

802.11ax (HE40)

Test Condition			EIRP (dBm)		
			(CH62) 5310 MHz	(CH102) 5510 MHz	(CH134) 5670 MHz
T_{nom}(℃)	25	V_{nom} (V)	16.61	16.64	16.66
T_{min}(℃)	-20	V_{nom} (V)	16.74	16.77	16.80
T_{max}(℃)	70	V_{nom} (V)	16.32	16.28	16.58

802.11ax (HE80)

Test Condition			EIRP (dBm)		
			(CH58) 5290 MHz	(CH106) 5530 MHz	(CH122) 5610 MHz
T_{nom}(℃)	25	V_{nom} (V)	16.48	16.69	16.53
T_{min}(℃)	-20	V_{nom} (V)	16.73	16.80	16.86
T_{max}(℃)	70	V_{nom} (V)	16.34	16.40	16.46

4.3.9 Test Results for RF Output Power at the Lowest Power Level (Mode 2)

802.11a

Test Condition			EIRP (dBm)		
			(CH64) 5320 MHz	(CH100) 5500 MHz	(CH140) 5700 MHz
T_{nom}(℃)	25	V_{nom} (V)	16.19	16.12	16.08
T_{min}(℃)	-20	V_{nom} (V)	16.31	16.47	16.33
T_{max}(℃)	70	V_{nom} (V)	15.96	16.04	16.06

802.11ac (VHT20)

Test Condition			EIRP (dBm)		
			(CH64) 5320 MHz	(CH100) 5500 MHz	(CH140) 5700 MHz
T_{nom}(℃)	25	V_{nom} (V)	16.54	16.54	16.55
T_{min}(℃)	-20	V_{nom} (V)	16.71	16.70	16.84
T_{max}(℃)	70	V_{nom} (V)	16.40	16.31	16.38

802.11ac (VHT40)

Test Condition			EIRP (dBm)		
			(CH62) 5310 MHz	(CH102) 5510 MHz	(CH134) 5670 MHz
T_{nom}(℃)	25	V_{nom} (V)	16.51	16.52	16.48
T_{min}(℃)	-20	V_{nom} (V)	16.64	16.63	16.62
T_{max}(℃)	70	V_{nom} (V)	16.23	16.23	16.40

802.11ac (VHT80)

Test Condition			EIRP (dBm)		
			(CH58) 5290 MHz	(CH106) 5530 MHz	(CH122) 5610 MHz
T_{nom}(℃)	25	V_{nom} (V)	16.45	16.52	16.35
T_{min}(℃)	-20	V_{nom} (V)	16.70	16.63	16.68
T_{max}(℃)	70	V_{nom} (V)	16.31	16.23	16.28

802.11ax (HE20)

Test Condition			EIRP (dBm)		
			(CH64) 5320 MHz	(CH100) 5500 MHz	(CH140) 5700 MHz
T_{nom}(℃)	25	V_{nom} (V)	16.62	16.58	16.56
T_{min}(℃)	-20	V_{nom} (V)	16.79	16.74	16.85
T_{max}(℃)	70	V_{nom} (V)	16.48	16.35	16.39

802.11ax (HE40)

Test Condition			EIRP (dBm)		
			(CH62) 5310 MHz	(CH102) 5510 MHz	(CH134) 5670 MHz
T_{nom}(℃)	25	V_{nom} (V)	16.66	16.68	16.60
T_{min}(℃)	-20	V_{nom} (V)	16.83	16.81	16.74
T_{max}(℃)	70	V_{nom} (V)	16.37	16.32	16.52

802.11ax (HE80)

Test Condition			EIRP (dBm)		
			(CH58) 5290 MHz	(CH106) 5530 MHz	(CH122) 5610 MHz
T_{nom}(℃)	25	V_{nom} (V)	16.63	16.64	16.59
T_{min}(℃)	-20	V_{nom} (V)	16.88	16.75	16.92
T_{max}(℃)	70	V_{nom} (V)	16.49	16.35	16.52

4.4 Power Density

4.4.1 Limit of Power Density

Frequency Band (MHz)	Mean e.i.r.p. Density Limit (dBm/MHz)	
	☒ With TPC	☐ Without TPC
5150 to 5350	10	7 / 10 (see note 1)
5470 to 5725	17 (see note 2)	14 (see note 2)
Note 1: The applicable limit is 7 dBm/MHz, except for transmissions whose nominal bandwidth falls completely within the band 5 150 MHz to 5 250 MHz, in which case the applicable limit is 10 dBm/MHz. Note 2: Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5 250 MHz to 5 350 MHz.		

4.4.2 Test Procedure

Refer to EN 301 893 V2.1.1 clause 5.4.4

Measurement	
☒ Conducted measurement	☐ Radiated measurement
☒ Option 1: For equipment with continuous transmission capability or for equipment operating (or with the capability to operate) with a constant duty cycle (e.g. Frame Based equipment)	
☐ Option 2: For equipment without continuous transmission capability and without the capability to transmit with a constant duty cycle	

4.4.3 Deviation from Test Standard

No deviation.

4.4.4 Test Setup

The measurement was performed at normal environmental conditions only. The measurement channels were performed in accordance with EN 301 893 clause 5.3.2. The equipment was configured to operate under its worst case situation with respect to output power. (In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator.). Controlling software (RTL8852B MP Toolkit V1.0.16) has been activated to set the EUT on specific status.

4.4.5 Test Results (Mode 1)

CDD Mode

802.11a

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
36	5180	9.80	10	Pass
64	5320	9.88	10	Pass
100	5500	9.94	10	Pass
140	5700	9.85	10	Pass

802.11ac (VHT20)

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
36	5180	9.84	10	Pass
64	5320	9.86	10	Pass
100	5500	9.90	10	Pass
140	5700	9.80	10	Pass

802.11ac (VHT40)

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
38	5190	8.37	10	Pass
62	5310	8.10	10	Pass
102	5510	8.25	10	Pass
134	5670	8.38	10	Pass

802.11ac (VHT80)

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
42	5210	6.02	10	Pass
58	5290	6.54	10	Pass
106	5530	5.94	10	Pass
122	5610	6.79	10	Pass

802.11ax (HE20)

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
36	5180	9.86	10	Pass
64	5320	9.90	10	Pass
100	5500	9.93	10	Pass
140	5700	9.83	10	Pass

802.11ax (HE40)

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
38	5190	8.40	10	Pass
62	5310	8.28	10	Pass
102	5510	8.58	10	Pass
134	5670	8.40	10	Pass

802.11ax (HE80)

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
42	5210	6.03	10	Pass
58	5290	7.04	10	Pass
106	5530	6.48	10	Pass
122	5610	6.90	10	Pass

802.11ax (RU26)

Channel Number	Channel Frequency (MHz)	RU Configuration	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
36	5180	26/0	9.91	10	Pass
64	5320	26/8	9.82	10	Pass
100	5500	26/0	9.83	10	Pass
140	5700	26/8	9.90	10	Pass

802.11ax (RU52)

Channel Number	Channel Frequency (MHz)	RU Configuration	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
36	5180	52/37	9.70	10	Pass
64	5320	52/40	9.86	10	Pass
100	5500	52/37	9.76	10	Pass
140	5700	52/40	9.79	10	Pass

802.11ax (RU106)

Channel Number	Channel Frequency (MHz)	RU Configuration	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
36	5180	106/53	9.80	10	Pass
64	5320	106/54	9.91	10	Pass
100	5500	106/53	9.87	10	Pass
140	5700	106/54	9.81	10	Pass

Beamforming Mode

802.11ac (VHT20)

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
36	5180	9.83	10	Pass
64	5320	9.84	10	Pass
100	5500	9.86	10	Pass
140	5700	9.78	10	Pass

802.11ac (VHT40)

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
38	5190	8.35	10	Pass
62	5310	8.08	10	Pass
102	5510	8.23	10	Pass
134	5670	8.36	10	Pass

802.11ac (VHT80)

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
42	5210	5.94	10	Pass
58	5290	6.52	10	Pass
106	5530	5.92	10	Pass
122	5610	6.77	10	Pass

802.11ax (HE20)

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
36	5180	9.84	10	Pass
64	5320	9.89	10	Pass
100	5500	9.91	10	Pass
140	5700	9.82	10	Pass

802.11ax (HE40)

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
38	5190	8.38	10	Pass
62	5310	8.26	10	Pass
102	5510	8.55	10	Pass
134	5670	8.38	10	Pass

802.11ax (HE80)

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
42	5210	6.01	10	Pass
58	5290	7.02	10	Pass
106	5530	6.46	10	Pass
122	5610	6.87	10	Pass

4.4.6 Test Results (Mode 2)

802.11a

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
36	5180	9.89	10	Pass
64	5320	9.86	10	Pass
100	5500	9.92	10	Pass
140	5700	9.88	10	Pass

802.11ac (VHT20)

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
36	5180	9.86	10	Pass
64	5320	9.86	10	Pass
100	5500	9.88	10	Pass
140	5700	9.92	10	Pass

802.11ac (VHT40)

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
38	5190	8.27	10	Pass
62	5310	8.03	10	Pass
102	5510	7.69	10	Pass
134	5670	7.98	10	Pass

802.11ac (VHT80)

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
42	5210	5.91	10	Pass
58	5290	5.89	10	Pass
106	5530	5.41	10	Pass
122	5610	5.68	10	Pass

802.11ax (HE20)

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
36	5180	9.94	10	Pass
64	5320	9.88	10	Pass
100	5500	9.90	10	Pass
140	5700	9.96	10	Pass

802.11ax (HE40)

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
38	5190	8.29	10	Pass
62	5310	8.04	10	Pass
102	5510	7.71	10	Pass
134	5670	8.00	10	Pass

802.11ax (HE80)

Channel Number	Channel Frequency (MHz)	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
42	5210	6.10	10	Pass
58	5290	6.08	10	Pass
106	5530	5.42	10	Pass
122	5610	5.76	10	Pass

802.11ax (RU26)

Channel Number	Channel Frequency (MHz)	RU Configuration	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
36	5180	26/0	9.80	10	Pass
64	5320	26/8	9.82	10	Pass
100	5500	26/0	9.90	10	Pass
140	5700	26/8	9.86	10	Pass

802.11ax (RU52)

Channel Number	Channel Frequency (MHz)	RU Configuration	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
36	5180	52/37	9.84	10	Pass
64	5320	52/40	9.80	10	Pass
100	5500	52/37	9.80	10	Pass
140	5700	52/40	9.82	10	Pass

802.11ax (RU106)

Channel Number	Channel Frequency (MHz)	RU Configuration	Power Density (dBm/1MHz) (EIRP)	Limit (dBm/1MHz) (EIRP)	Pass / Fail
36	5180	106/53	9.86	10	Pass
64	5320	106/54	9.96	10	Pass
100	5500	106/53	9.82	10	Pass
140	5700	106/54	9.80	10	Pass

4.5 Transmitter Unwanted Emissions outside the 5 GHz RLAN Bands

4.5.1 Limits of Transmitter Unwanted Emission outside the 5 GHz RLAN Bands

Frequency Range (MHz)	Maximum power, ERP (dBm)	Bandwidth (kHz)
30 to 47	-36	100
47 to 74	-54	100
74 to 87.5	-36	100
87.5 to 118	-54	100
118 to 174	-36	100
174 to 230	-54	100
230 to 470	-36	100
470 to 862	-54	100
862 to 1000	-36	100
Frequency Range (GHz)	Maximum power, EIRP (dBm)	Bandwidth (MHz)
1 to 26	-30	1

4.5.2 Test Procedure

Refer to EN 301 893 V2.1.1 clause 5.4.5

Measurement	
☐ Conducted measurement	☒ Radiated measurement
For Conducted measurement: The level of unwanted emissions shall be measured as their power in a specified load (conducted spurious emissions) and their effective radiated power when radiated by the cabinet or structure of the equipment with the antenna connector(s) terminated by a specified load (cabinet radiation).	
Conducted measurement (For equipment with multiple transmit chains): ☐ Option 1: The results for each of the transmit chains for the corresponding 1 MHz segments shall be added and compared with the limits. ☐ Option 2: The results for each of the transmit chains shall be individually compared with the limits after these limits have been reduced by $10 \times \log_{10}(T_{CH})$ (number of active transmit chains).	

4.5.3 Deviation from Test Standard

No deviation

4.5.4 Test Setup

1. For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration).
2. The measurement was performed at normal environmental conditions only. Controlling software (RTL8852B MP Toolkit V1.0.16) has been activated to set the EUT on specific status.
3. The equipment was configured to operate under its worst case situation with respect to output power.
4. The measurement channels were performed in accordance with EN 301 893 clause 5.3.2.

4.5.5 Test Results (Mode 1)

PIFA Antenna

Below 1GHz worst-Case Data:

802.11ax (HE40)

Spurious Emission Frequency Range	30MHz ~ 1GHz	Operating Channel	102

Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
117.80	V	-69.35	-54.00	-15.35
212.96	H	-66.84	-54.00	-12.84
479.98	H	-66.54	-54.00	-12.54
479.98	V	-70.22	-54.00	-16.22
500.03	H	-65.46	-54.00	-11.46
511.62	V	-69.28	-54.00	-15.28
539.82	H	-66.10	-54.00	-12.10
546.49	V	-67.80	-54.00	-13.80
552.16	H	-67.96	-54.00	-13.96
571.26	V	-69.09	-54.00	-15.09
600.01	H	-67.49	-54.00	-13.49
600.01	V	-63.58	-54.00	-9.58
666.47	H	-65.45	-54.00	-11.45
666.52	V	-64.99	-54.00	-10.99
697.51	V	-67.68	-54.00	-13.68
724.47	H	-70.44	-54.00	-16.44
758.89	V	-69.57	-54.00	-15.57
796.60	H	-69.24	-54.00	-15.24
822.86	H	-70.18	-54.00	-16.18
840.32	V	-69.34	-54.00	-15.34

802.11ax (RU26)

Spurious Emission Frequency Range	30MHz ~ 1GHz	Operating Channel	100
		RU Configuration	26/0

Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
68.65	V	-62.88	-54.00	-8.88
106.61	V	-65.96	-54.00	-11.96
108.50	H	-66.74	-54.00	-12.74
199.19	H	-66.33	-54.00	-12.33
480.00	H	-65.70	-54.00	-11.70
480.00	V	-69.89	-54.00	-15.89
526.91	H	-65.50	-54.00	-11.50
544.42	V	-69.97	-54.00	-15.97
562.93	H	-67.85	-54.00	-13.85
666.45	H	-63.67	-54.00	-9.67
666.45	V	-67.32	-54.00	-13.32
697.10	V	-69.77	-54.00	-15.77
699.78	H	-59.08	-54.00	-5.08
734.21	V	-70.56	-54.00	-16.56
764.45	V	-69.93	-54.00	-15.93
801.31	V	-70.92	-54.00	-16.92
803.15	H	-69.33	-54.00	-15.33
828.72	V	-68.09	-54.00	-14.09
831.31	H	-68.56	-54.00	-14.56
857.23	H	-69.03	-54.00	-15.03

Above 1GHz worst-Case Data:

802.11ax (HE40)

Spurious Emission Frequency Range	1GHz ~ 26GHz	Operating Channel	38, 102

Spurious Emission Level					
Channel	Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
38	10380.00	H	-52.71	-30.00	-22.71
	10380.00	V	-51.60	-30.00	-21.60
	15574.00	V	-43.35	-30.00	-13.35
	15582.00	H	-42.21	-30.00	-12.21
	20760.00	H	-55.98	-30.00	-25.98
	20760.00	V	-54.95	-30.00	-24.95
102	11020.00	H	-48.19	-30.00	-18.19
	11020.00	V	-49.67	-30.00	-19.67
	16532.00	V	-44.99	-30.00	-14.99
	16536.00	H	-41.95	-30.00	-11.95
	22040.00	H	-54.20	-30.00	-24.20
	22040.00	V	-54.34	-30.00	-24.34

802.11ax (RU26)

Spurious Emission Frequency Range	1GHz ~ 26GHz	Operating Channel	36, 100
		RU Configuration	26/0, 26/0

Spurious Emission Level					
Channel	Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
36	10360.43	V	-47.02	-30.00	-17.02
	10366.70	H	-44.60	-30.00	-14.60
	15543.50	H	-40.73	-30.00	-10.73
	15551.00	V	-37.03	-30.00	-7.03
	20720.00	H	-55.97	-30.00	-25.97
	20720.00	V	-53.80	-30.00	-23.80
100	10982.89	H	-44.12	-30.00	-14.12
	10982.89	V	-45.67	-30.00	-15.67
	16474.21	H	-33.86	-30.00	-3.86
	16475.74	V	-33.60	-30.00	-3.60
	22000.00	H	-55.24	-30.00	-25.24
	22000.00	V	-54.20	-30.00	-24.20

Dipole Antenna

Below 1GHz worst-Case Data:

802.11ax (HE40)

Spurious Emission Frequency Range	30MHz ~ 1GHz	Operating Channel	102

Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
70.09	V	-68.26	-54.00	-14.26
117.80	V	-66.15	-54.00	-12.15
195.45	H	-68.47	-54.00	-14.47
479.98	H	-65.30	-54.00	-11.30
505.70	H	-64.33	-54.00	-10.33
510.08	V	-68.40	-54.00	-14.40
527.98	H	-65.89	-54.00	-11.89
529.18	V	-67.68	-54.00	-13.68
552.76	H	-64.76	-54.00	-10.76
555.54	V	-67.64	-54.00	-13.64
600.01	H	-67.50	-54.00	-13.50
600.01	V	-63.51	-54.00	-9.51
663.88	V	-64.82	-54.00	-10.82
666.47	H	-65.54	-54.00	-11.54
697.01	H	-60.72	-54.00	-6.72
697.06	V	-65.09	-54.00	-11.09
758.89	V	-67.90	-54.00	-13.90
804.66	H	-68.06	-54.00	-14.06
816.45	V	-67.71	-54.00	-13.71
836.39	H	-66.52	-54.00	-12.52

802.11ax (RU26)

Spurious Emission Frequency Range	30MHz ~ 1GHz	Operating Channel	100
		RU Configuration	26/0

Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
95.76	H	-65.98	-54.00	-11.98
99.94	V	-66.02	-54.00	-12.02
205.26	H	-69.04	-54.00	-15.04
480.00	H	-65.25	-54.00	-11.25
480.00	V	-69.91	-54.00	-15.91
506.07	H	-66.02	-54.00	-12.02
538.80	V	-70.18	-54.00	-16.18
549.40	H	-68.28	-54.00	-14.28
581.88	V	-69.87	-54.00	-15.87
663.82	H	-63.32	-54.00	-9.32
666.45	V	-67.12	-54.00	-13.12
699.23	V	-68.52	-54.00	-14.52
755.40	H	-69.02	-54.00	-15.02
766.04	V	-69.20	-54.00	-15.20
793.11	V	-65.98	-54.00	-11.98
794.95	H	-69.08	-54.00	-15.08
808.43	V	-67.62	-54.00	-13.62
813.15	H	-69.69	-54.00	-15.69
850.46	H	-69.84	-54.00	-15.84
856.28	V	-69.37	-54.00	-15.37

Above 1GHz worst-Case Data:

802.11ax (HE40)

Spurious Emission Frequency Range	1GHz ~ 26GHz	Operating Channel	38, 102

Spurious Emission Level					
Channel	Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
38	10380.00	H	-51.76	-30.00	-21.76
	10380.00	V	-53.06	-30.00	-23.06
	15570.00	H	-53.84	-30.00	-23.84
	15570.00	V	-51.98	-30.00	-21.98
	20760.00	H	-55.33	-30.00	-25.33
	20760.00	V	-55.49	-30.00	-25.49
102	11020.00	H	-50.73	-30.00	-20.73
	11020.00	V	-49.52	-30.00	-19.52
	16530.00	H	-53.96	-30.00	-23.96
	16530.00	V	-51.60	-30.00	-21.60
	22040.00	H	-56.11	-30.00	-26.11
	22040.00	V	-55.86	-30.00	-25.86

802.11ax (RU26)

Spurious Emission Frequency Range	1GHz ~ 26GHz	Operating Channel	36, 100
		RU Configuration	26/0, 26/0

Spurious Emission Level					
Channel	Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
36	10342.47	H	-47.30	-30.00	-17.30
	10342.47	V	-49.76	-30.00	-19.76
	15514.21	V	-42.71	-30.00	-12.71
	15514.60	H	-47.10	-30.00	-17.10
	20720.00	H	-56.23	-30.00	-26.23
	20720.00	V	-55.59	-30.00	-25.59
100	10982.89	H	-42.67	-30.00	-12.67
	10982.89	V	-43.32	-30.00	-13.32
	16473.19	H	-40.96	-30.00	-10.96
	16475.74	V	-37.23	-30.00	-7.23
	22000.00	H	-55.94	-30.00	-25.94
	22000.00	V	-52.52	-30.00	-22.52

4.5.6 Test Results (Mode 2)

PIFA Antenna

Below 1GHz worst-Case Data:

802.11ax (HE40)

Spurious Emission Frequency Range	30MHz ~ 1GHz	Operating Channel	38

Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
30.00	V	-50.24	-36.00	-14.24
99.79	H	-59.45	-54.00	-5.45
117.85	V	-66.98	-54.00	-12.98
209.52	H	-66.93	-54.00	-12.93
479.98	H	-64.74	-54.00	-10.74
499.88	H	-64.00	-54.00	-10.00
504.01	V	-68.90	-54.00	-14.90
531.37	H	-66.73	-54.00	-12.73
540.52	V	-66.91	-54.00	-12.91
562.46	V	-67.18	-54.00	-13.18
571.56	H	-66.70	-54.00	-12.70
600.01	H	-68.31	-54.00	-14.31
600.01	V	-63.48	-54.00	-9.48
666.37	H	-65.47	-54.00	-11.47
666.47	V	-64.96	-54.00	-10.96
699.10	H	-65.56	-54.00	-11.56
758.89	V	-68.27	-54.00	-14.27
799.98	H	-69.45	-54.00	-15.45
805.65	V	-69.45	-54.00	-15.45
822.91	V	-69.20	-54.00	-15.20

802.11ax (RU26)

Spurious Emission Frequency Range	30MHz ~ 1GHz	Operating Channel	100
		RU Configuration	26/0

Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
68.50	H	-60.90	-54.00	-6.90
99.64	V	-66.52	-54.00	-12.52
109.44	H	-67.93	-54.00	-13.93
480.00	H	-65.88	-54.00	-11.88
480.00	V	-68.98	-54.00	-14.98
498.36	H	-66.42	-54.00	-12.42
513.78	V	-71.68	-54.00	-17.68
529.50	H	-65.75	-54.00	-11.75
549.80	H	-68.45	-54.00	-14.45
553.63	V	-71.80	-54.00	-17.80
578.65	V	-70.64	-54.00	-16.64
639.99	H	-71.18	-54.00	-17.18
663.82	H	-64.28	-54.00	-10.28
666.50	V	-66.71	-54.00	-12.71
697.05	V	-64.68	-54.00	-10.68
758.78	V	-70.47	-54.00	-16.47
797.53	H	-68.21	-54.00	-14.21
801.66	V	-69.32	-54.00	-15.32
834.54	V	-70.21	-54.00	-16.21
844.89	H	-67.93	-54.00	-13.93

Above 1GHz worst-Case Data:

802.11ax (HE40)

Spurious Emission Frequency Range	1GHz ~ 26GHz	Operating Channel	38, 102

Spurious Emission Level					
Channel	Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
38	10380.00	H	-51.73	-30.00	-21.73
	10380.00	V	-52.87	-30.00	-22.87
	15560.00	V	-44.57	-30.00	-14.57
	15572.00	H	-40.42	-30.00	-10.42
	20760.00	H	-56.59	-30.00	-26.59
	20760.00	V	-55.92	-30.00	-25.92
102	11020.00	H	-50.77	-30.00	-20.77
	11020.00	V	-52.49	-30.00	-22.49
	16531.00	H	-40.62	-30.00	-10.62
	16535.00	V	-44.61	-30.00	-14.61
	22040.00	H	-55.79	-30.00	-25.79
	22040.00	V	-55.17	-30.00	-25.17

802.11ax (RU26)

Spurious Emission Frequency Range	1GHz ~ 26GHz	Operating Channel	64, 100
		RU Configuration	26/0, 26/0

Spurious Emission Level					
Channel	Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
64	10644.00	H	-51.56	-30.00	-21.56
	10644.31	V	-47.50	-30.00	-17.50
	15967.87	V	-38.60	-30.00	-8.60
	15968.00	H	-35.88	-30.00	-5.88
	21280.00	H	-54.60	-30.00	-24.60
	21280.00	V	-53.80	-30.00	-23.80
100	10984.09	V	-49.06	-30.00	-19.06
	11052.00	H	-48.41	-30.00	-18.41
	16474.47	H	-35.93	-30.00	-5.93
	16475.23	V	-37.35	-30.00	-7.35
	22000.00	H	-55.97	-30.00	-25.97
	22000.00	V	-53.04	-30.00	-23.04

Dipole Antenna

Below 1GHz worst-Case Data:

802.11ax (HE40)

Spurious Emission Frequency Range	30MHz ~ 1GHz	Operating Channel	38

Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
117.85	V	-67.08	-54.00	-13.08
207.44	H	-66.52	-54.00	-12.52
479.98	H	-66.97	-54.00	-12.97
497.89	H	-66.58	-54.00	-12.58
500.03	V	-70.21	-54.00	-16.21
532.41	V	-66.65	-54.00	-12.65
534.60	H	-65.15	-54.00	-11.15
557.23	H	-67.35	-54.00	-13.35
557.58	V	-67.46	-54.00	-13.46
600.01	H	-68.52	-54.00	-14.52
600.01	V	-63.81	-54.00	-9.81
663.88	H	-63.76	-54.00	-9.76
663.88	V	-66.88	-54.00	-12.88
699.90	V	-68.98	-54.00	-14.98
758.89	V	-68.73	-54.00	-14.73
787.50	V	-70.54	-54.00	-16.54
804.16	H	-69.43	-54.00	-15.43
810.73	H	-70.69	-54.00	-16.69
830.62	V	-68.89	-54.00	-14.89
844.85	H	-70.77	-54.00	-16.77

802.11ax (RU26)

Spurious Emission Frequency Range	30MHz ~ 1GHz	Operating Channel	100
		RU Configuration	26/0

Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
99.94	H	-67.23	-54.00	-13.23
107.40	V	-63.98	-54.00	-9.98
207.74	H	-68.86	-54.00	-14.86
480.00	H	-65.55	-54.00	-11.55
480.00	V	-69.79	-54.00	-15.79
501.89	H	-67.46	-54.00	-13.46
544.97	H	-66.81	-54.00	-12.81
549.85	V	-70.61	-54.00	-16.61
561.99	H	-69.04	-54.00	-15.04
588.45	V	-72.47	-54.00	-18.47
625.01	V	-73.62	-54.00	-19.62
663.87	H	-63.50	-54.00	-9.50
666.45	V	-67.43	-54.00	-13.43
697.29	H	-59.74	-54.00	-5.74
759.97	V	-69.34	-54.00	-15.34
767.79	H	-68.86	-54.00	-14.86
801.56	V	-70.55	-54.00	-16.55
821.81	V	-70.68	-54.00	-16.68
841.06	V	-68.57	-54.00	-14.57
849.97	H	-69.55	-54.00	-15.55

Above 1GHz worst-Case Data:

802.11ax (HE40)

Spurious Emission Frequency Range	1GHz ~ 26GHz	Operating Channel	38, 102

Spurious Emission Level					
Channel	Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
38	10380.00	H	-52.55	-30.00	-22.55
	10380.00	V	-54.47	-30.00	-24.47
	15570.00	H	-55.03	-30.00	-25.03
	15570.00	V	-52.76	-30.00	-22.76
	20760.00	H	-53.36	-30.00	-23.36
	20760.00	V	-55.18	-30.00	-25.18
102	11020.00	H	-51.84	-30.00	-21.84
	11020.00	V	-53.23	-30.00	-23.23
	16530.00	H	-54.83	-30.00	-24.83
	16530.00	V	-49.16	-30.00	-19.16
	22040.00	H	-54.95	-30.00	-24.95
	22040.00	V	-53.44	-30.00	-23.44

802.11ax (RU26)

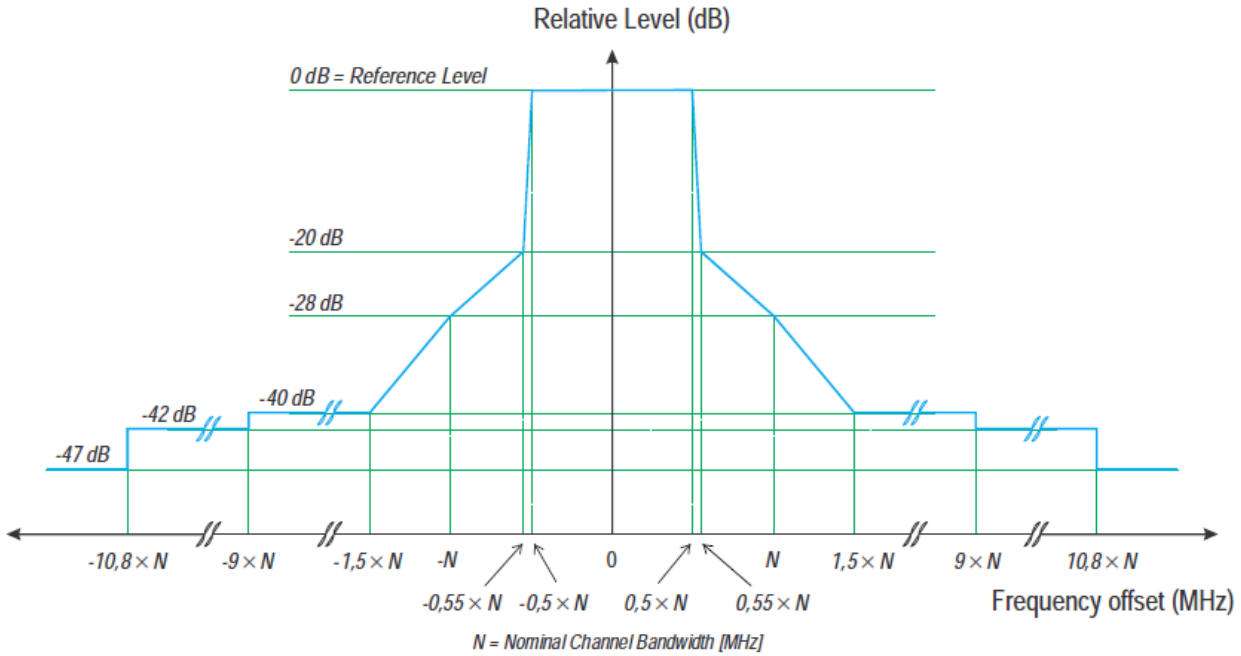
Spurious Emission Frequency Range	1GHz ~ 26GHz	Operating Channel	64, 100
		RU Configuration	26/0, 26/0

Spurious Emission Level					
Channel	Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
64	10640.26	H	-50.66	-30.00	-20.66
	10640.26	V	-45.73	-30.00	-15.73
	15960.47	H	-43.35	-30.00	-13.35
	15960.83	V	-41.72	-30.00	-11.72
	21280.00	H	-54.99	-30.00	-24.99
	21280.00	V	-54.44	-30.00	-24.44
100	10983.49	V	-48.33	-30.00	-18.33
	10988.68	H	-48.12	-30.00	-18.12
	16473.57	H	-42.64	-30.00	-12.64
	16475.23	V	-36.82	-30.00	-6.82
	22000.00	H	-53.46	-30.00	-23.46
	22000.00	V	-51.75	-30.00	-21.75

4.6 Transmitter Unwanted Emissions within the 5 GHz RLAN Bands

4.6.1 Limits of Transmitter Unwanted Emissions within the 5 GHz RLAN Bands

The average level of the transmitted spectrum shall not exceed the limits given in the following figure:



The mean Power Density (measured with a 1 MHz measurement bandwidth) of transmitter unwanted emissions within the 5 GHz RLAN bands shall not exceed the limit of the mask provided above figure or an absolute level of –30 dBm /MHz, whichever is greater.

4.6.2 Test Procedure

Refer to EN 301 893 V2.1.1 clause 5.4.6

Measurement Method	
☒ Conducted measurement	☐ Radiated measurement
☐ Option 1: For equipment with continuous transmission capability	
☒ Option 2: For equipment without continuous transmission capability	

4.6.3 Deviation from Test Standard

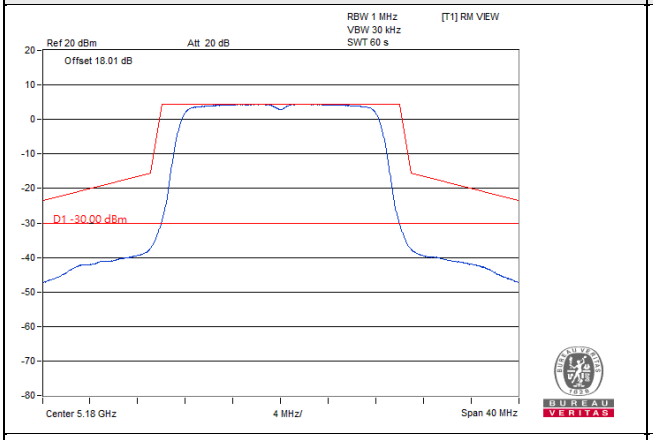
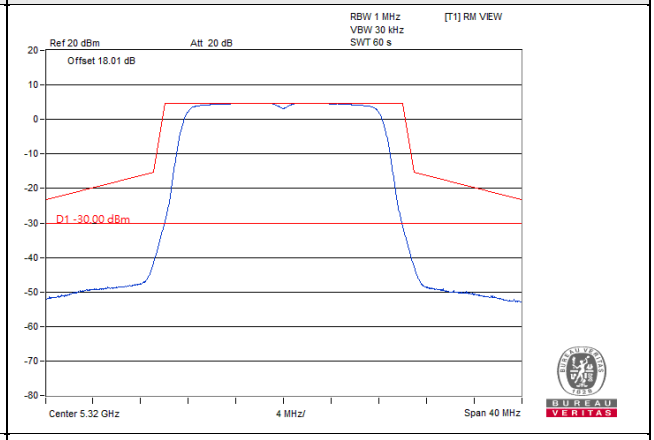
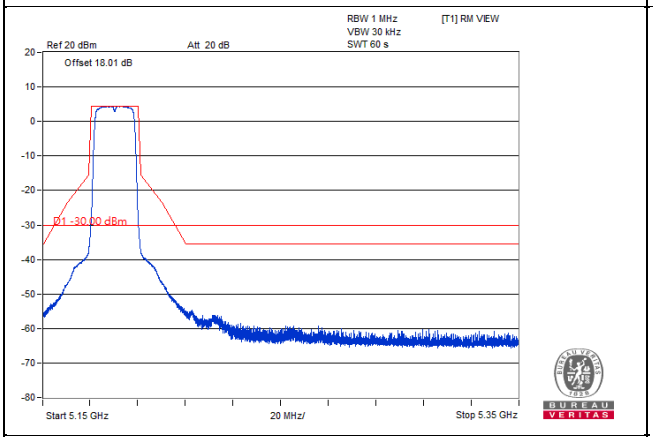
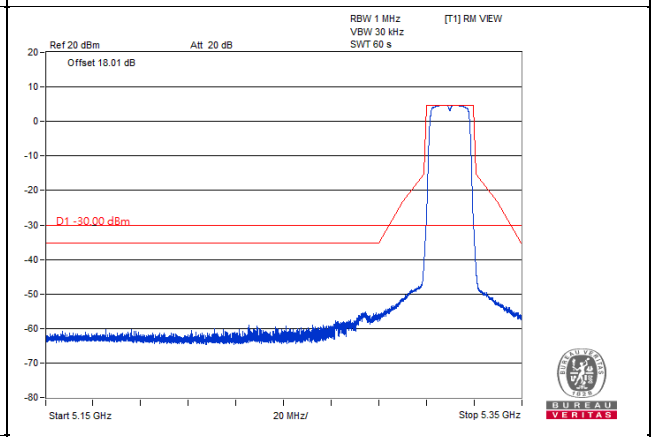
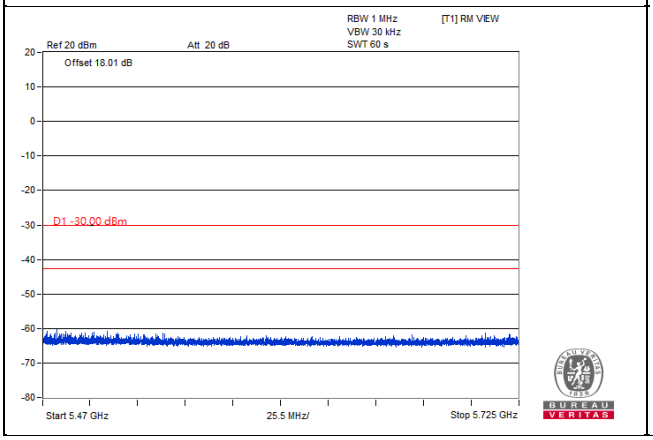
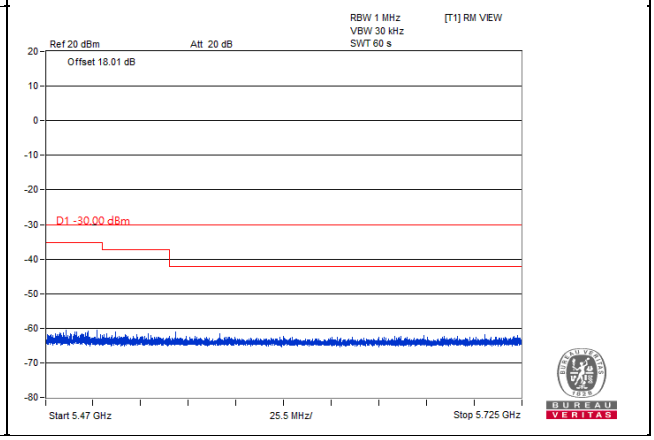
No deviation.

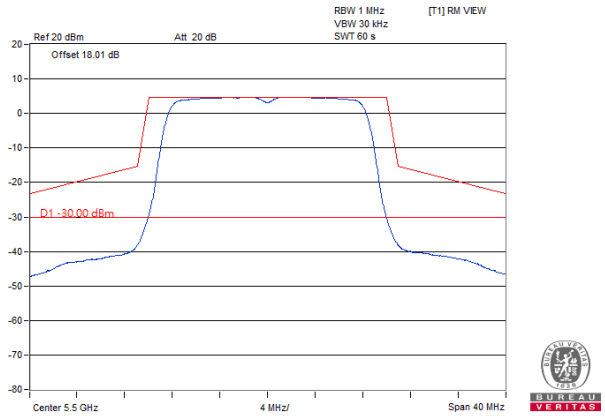
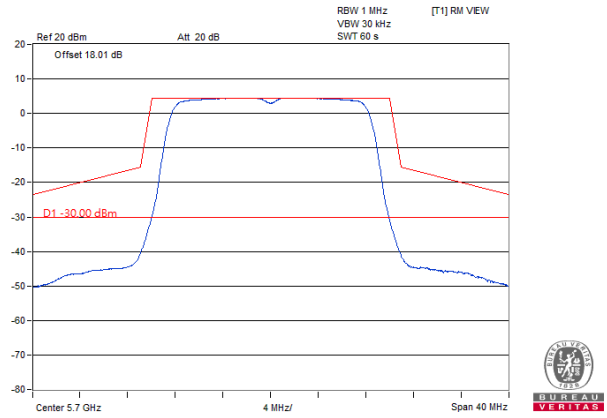
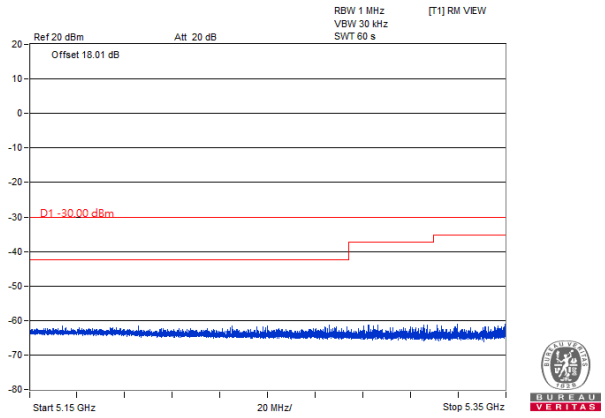
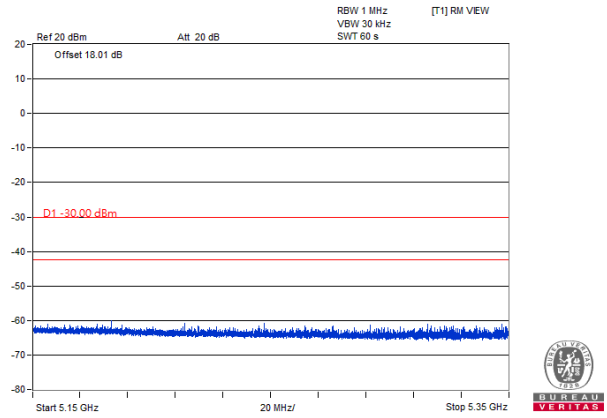
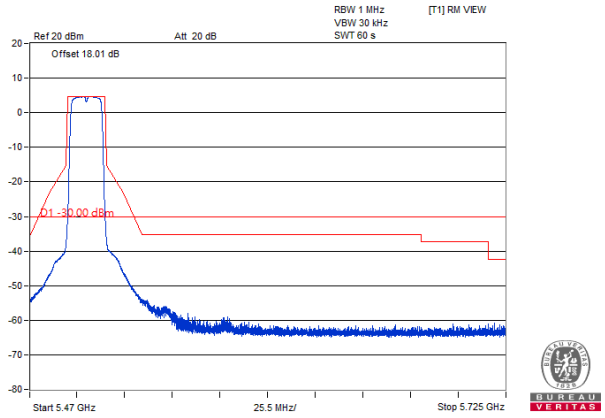
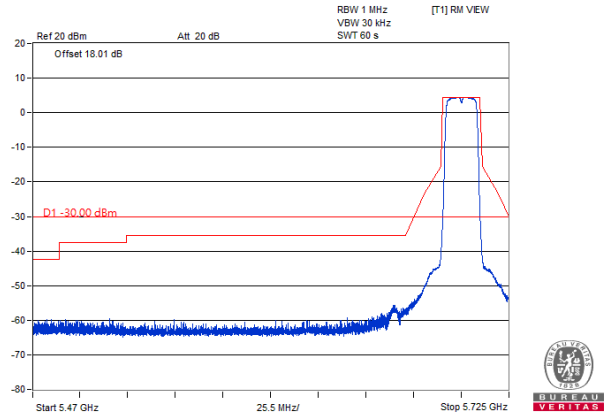
4.6.4 Test Setup

The measurement was performed at normal environmental conditions only. The measurement channels were performed in accordance with EN 301 893 clause 5.3.2. The equipment was configured to operate under its worst case situation with respect to output power. (In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator.). Controlling software (RTL8852B MP Toolkit V1.0.16) has been activated to set the EUT on specific status.

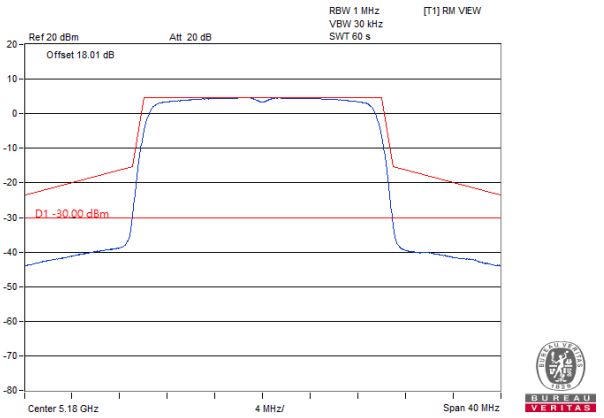
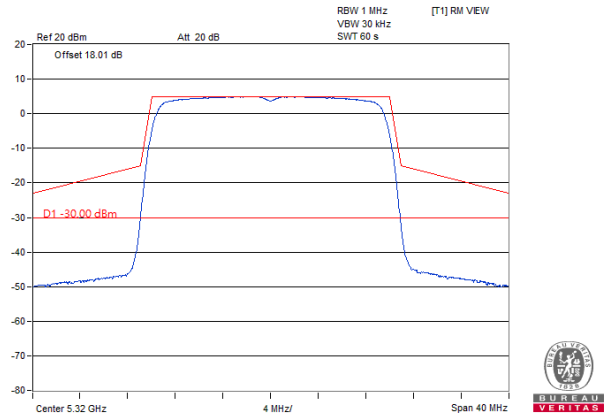
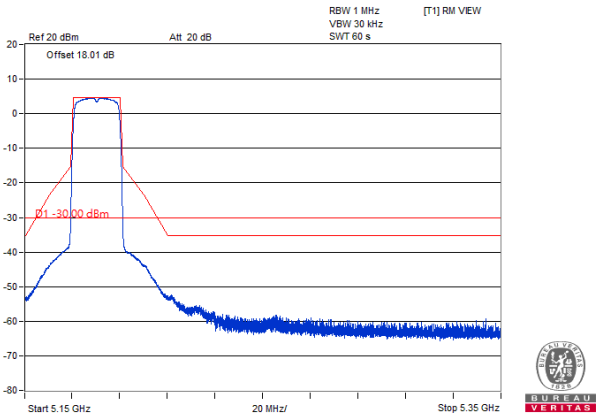
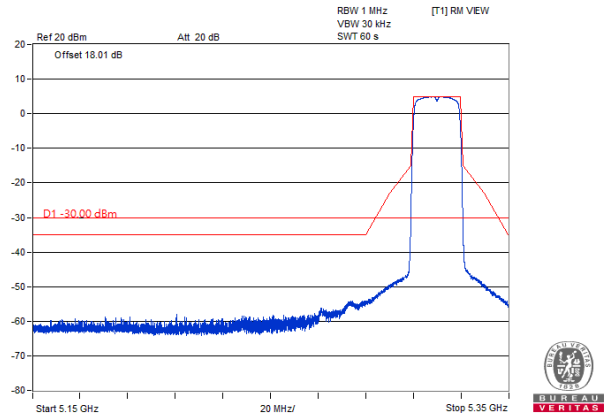
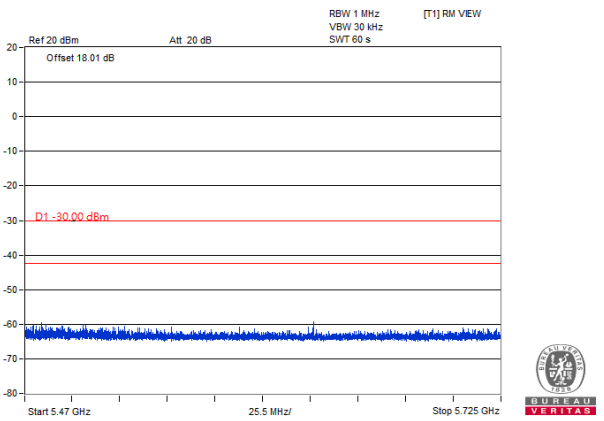
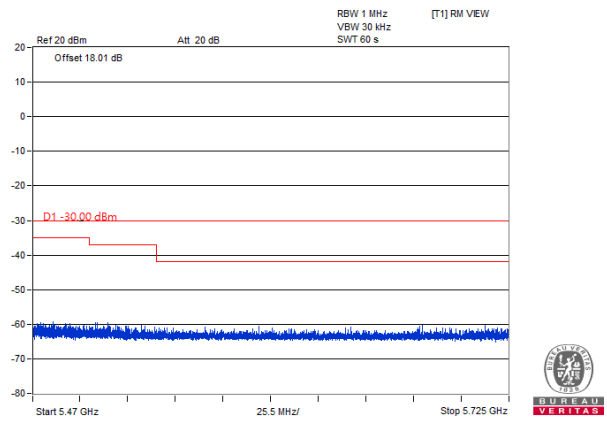
4.6.5 Test Results (Mode 1)

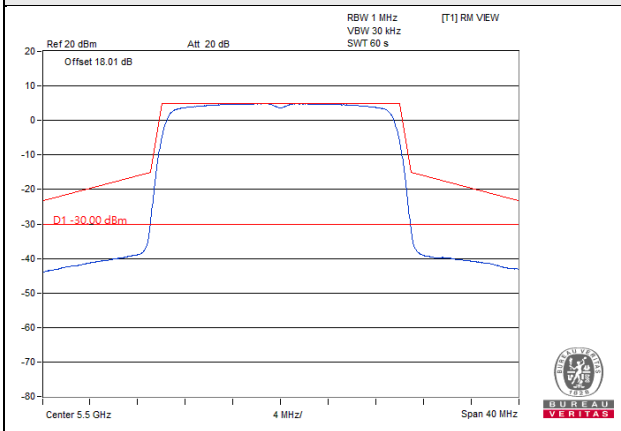
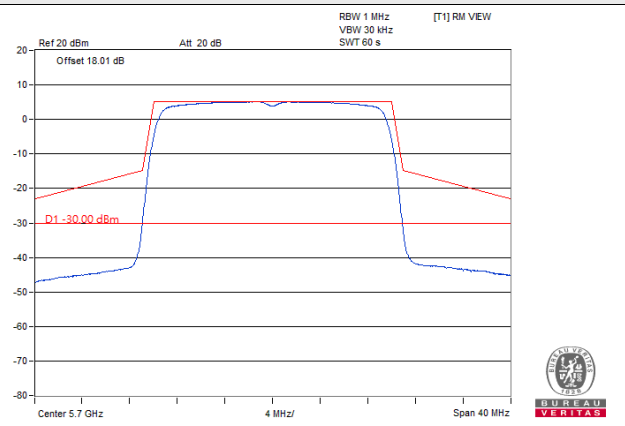
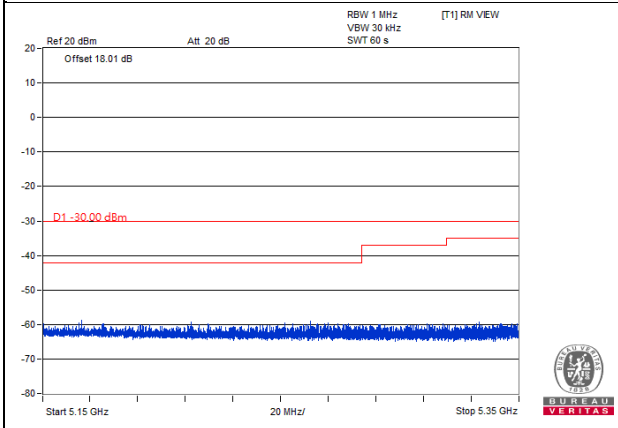
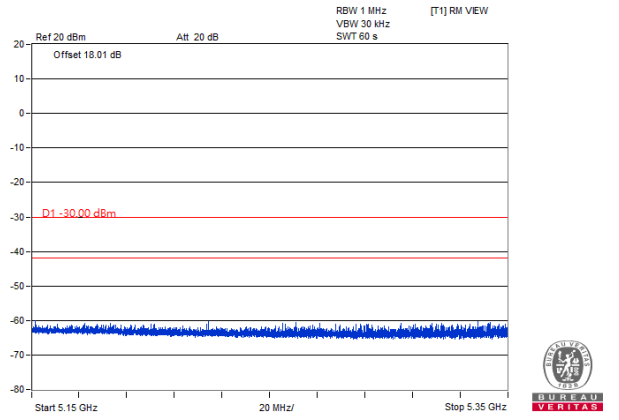
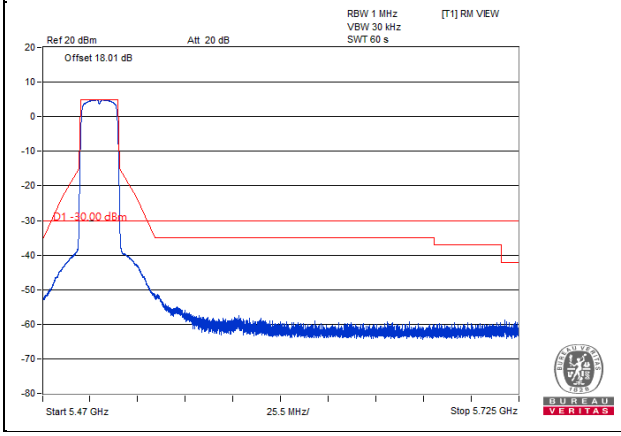
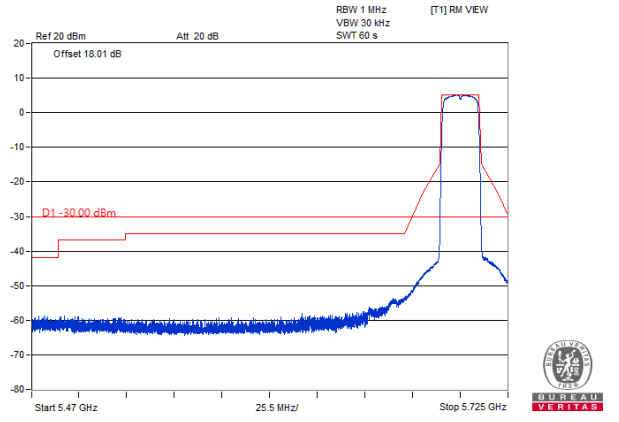
802.11a

CH36 5180MHz	CH64 5320MHz
	
	
	

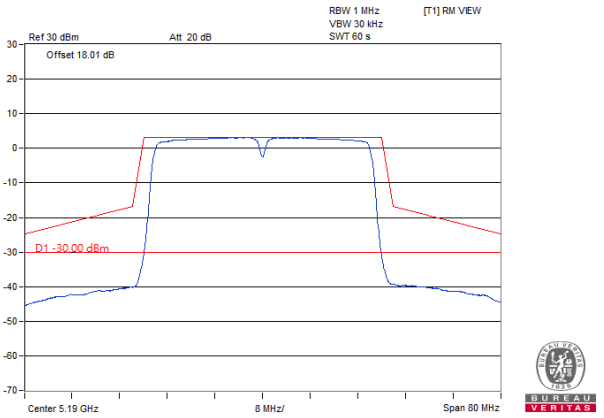
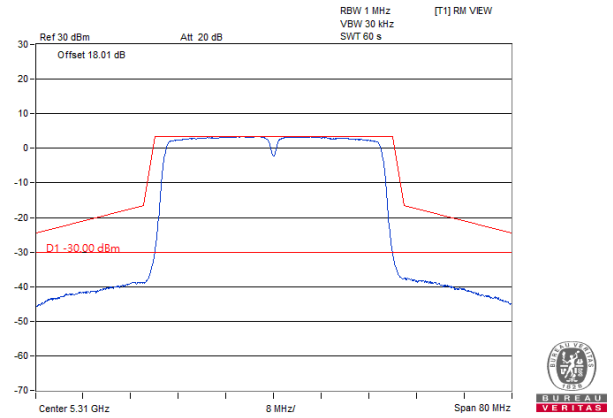
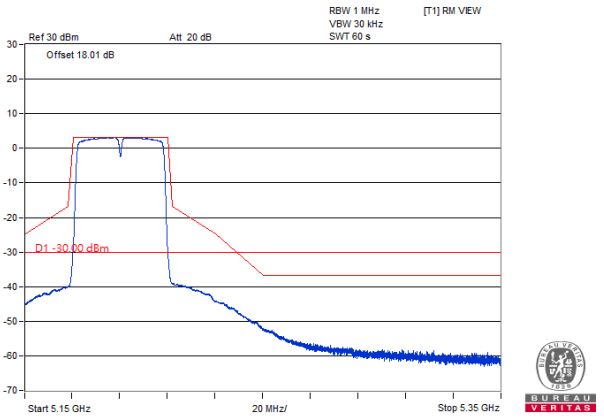
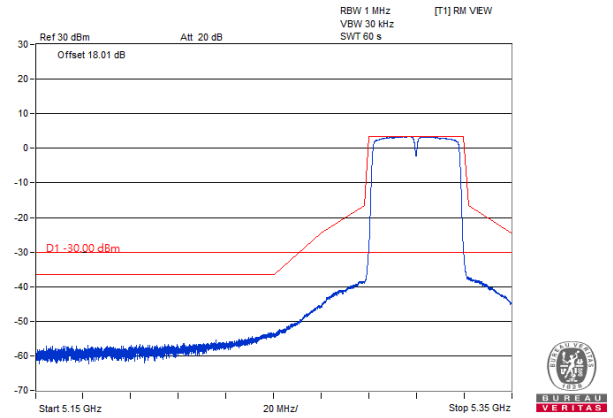
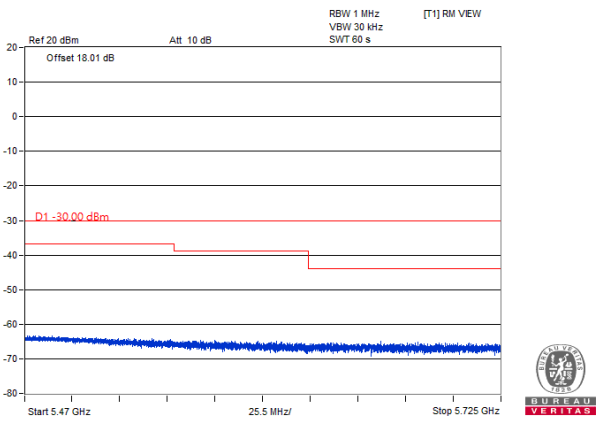
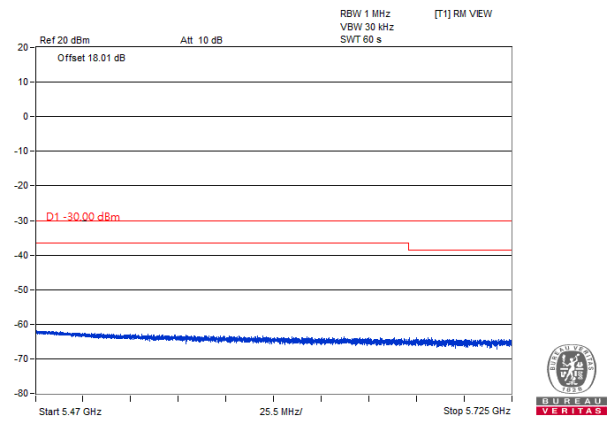
CH100 5500MHz	CH140 5700MHz
	
	
	

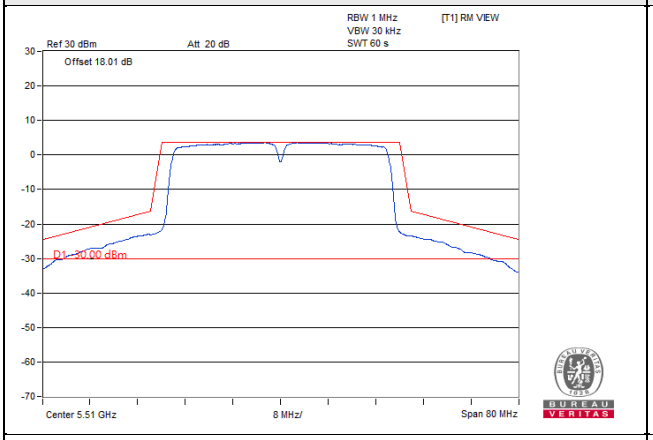
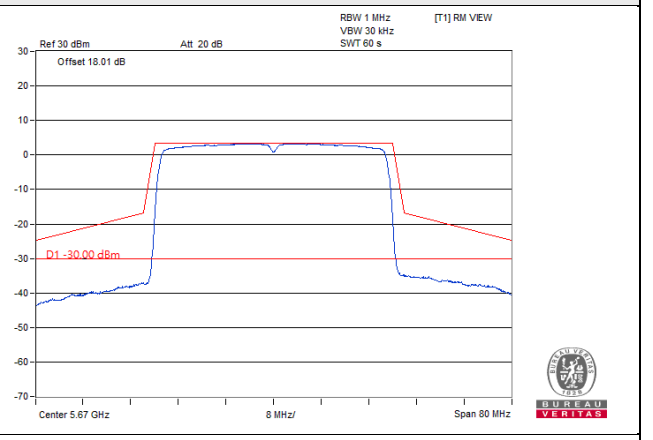
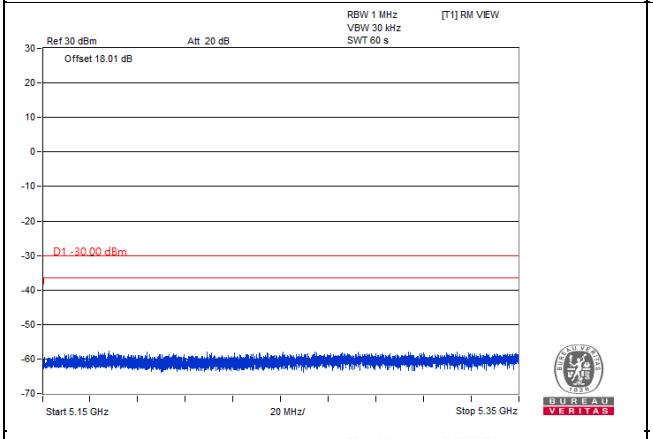
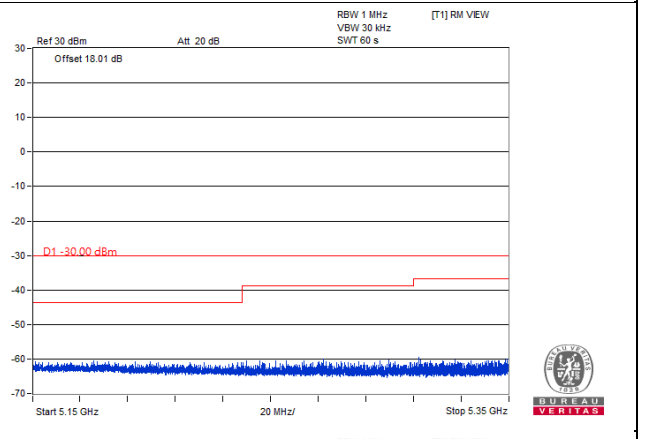
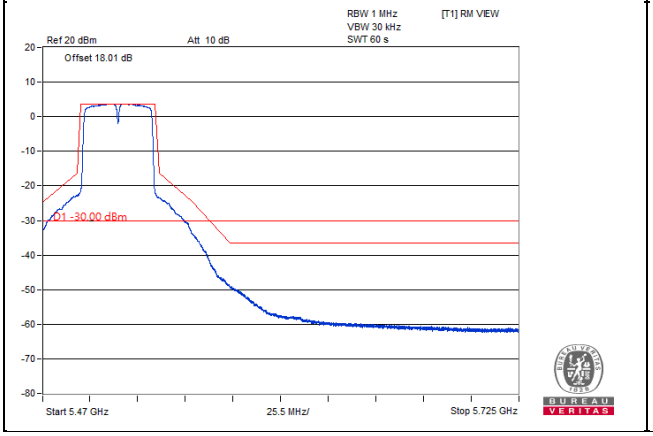
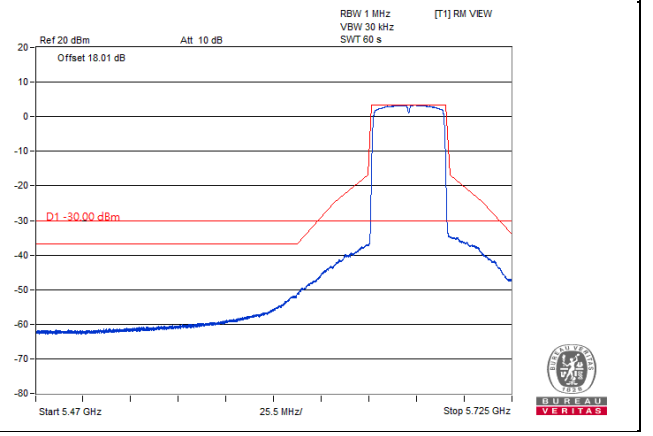
802.11ax (HE20)

CH36 5180MHz	CH64 5320MHz
	
	
	

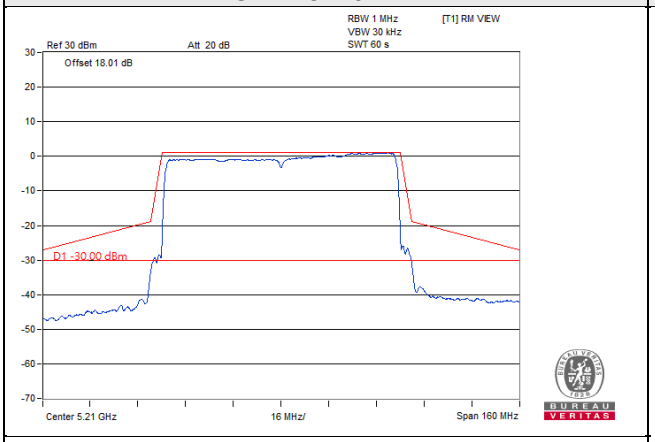
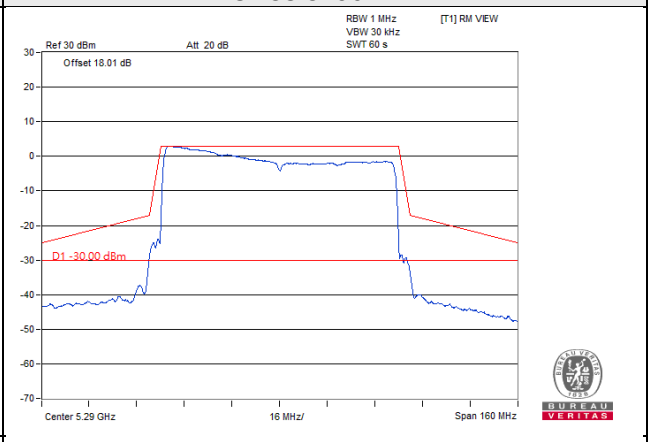
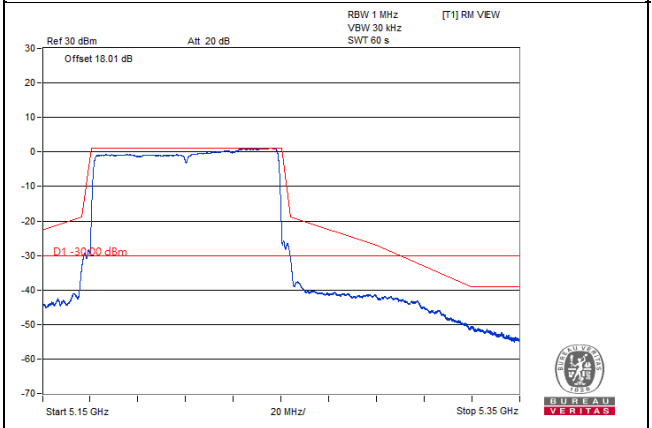
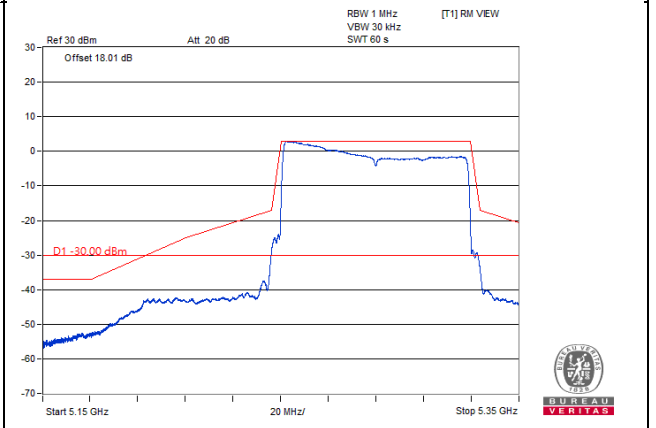
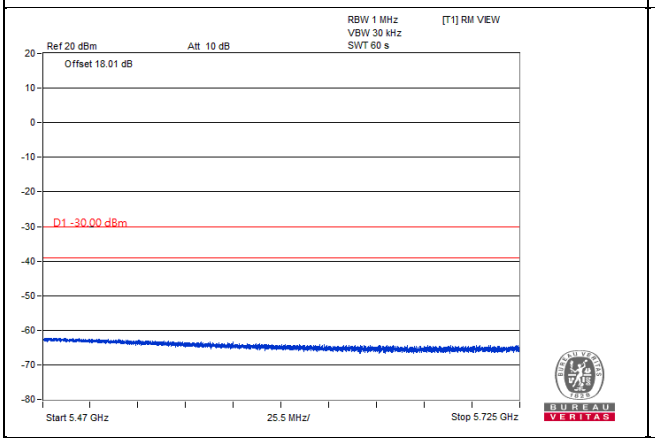
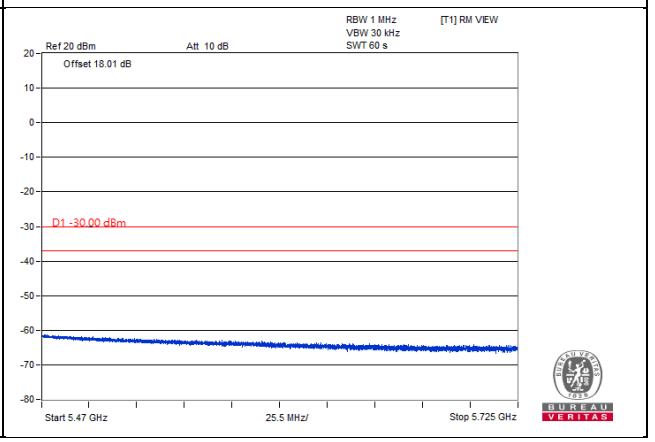
CH100 5500MHz	CH140 5700MHz
	
	
	

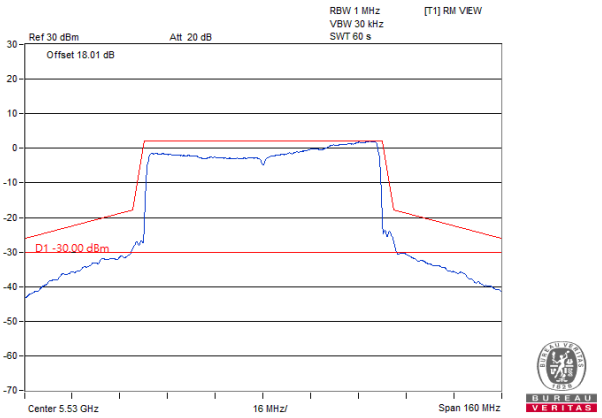
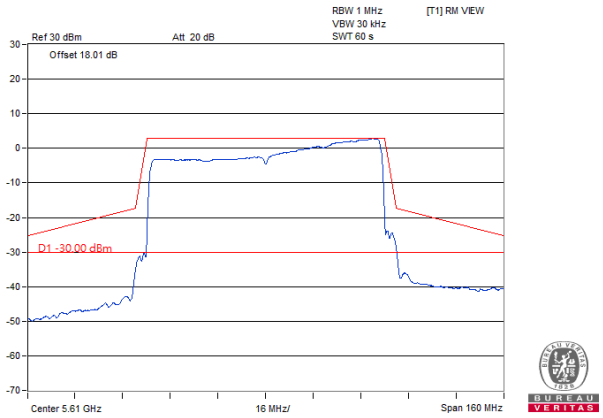
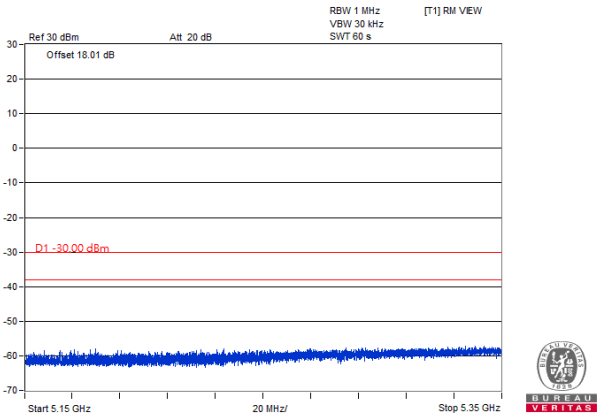
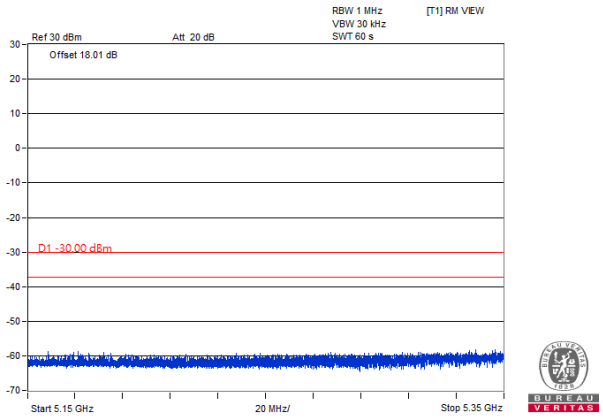
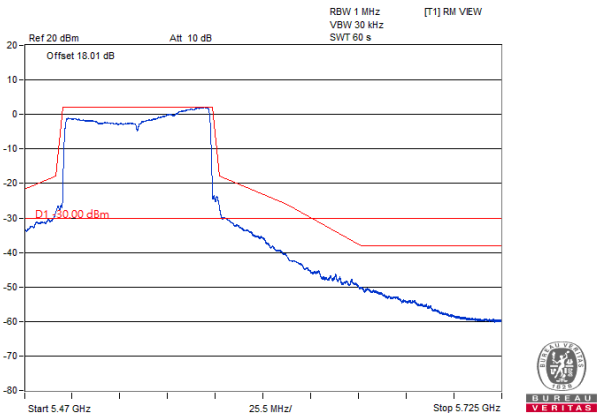
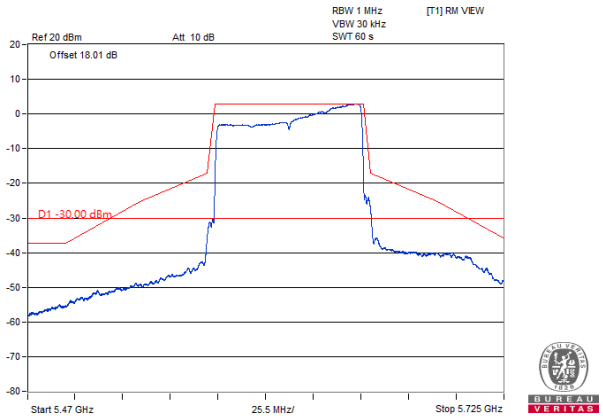
802.11ax (HE40)

CH38 5190MHz	CH62 5310MHz
	
	
	

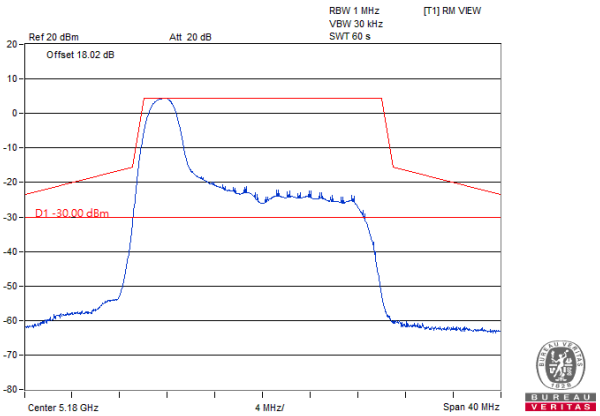
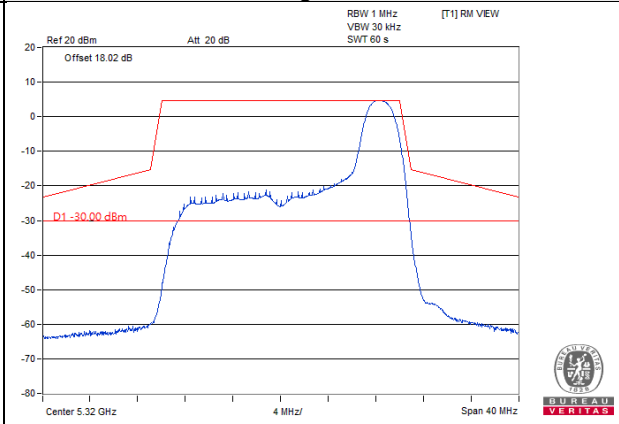
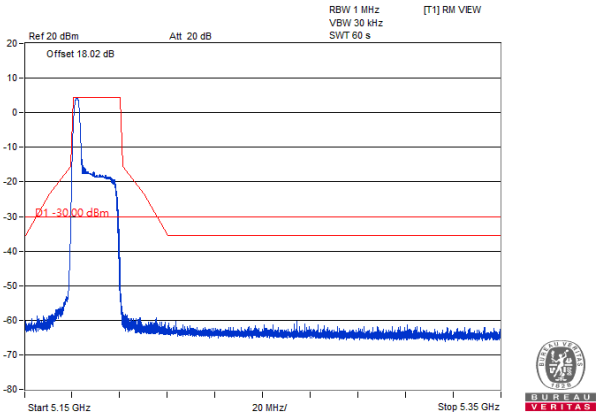
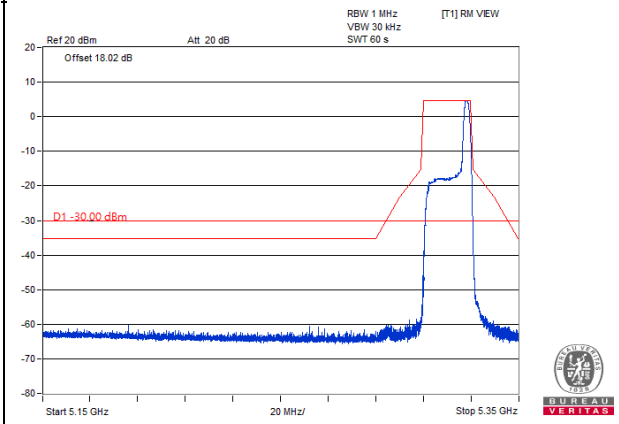
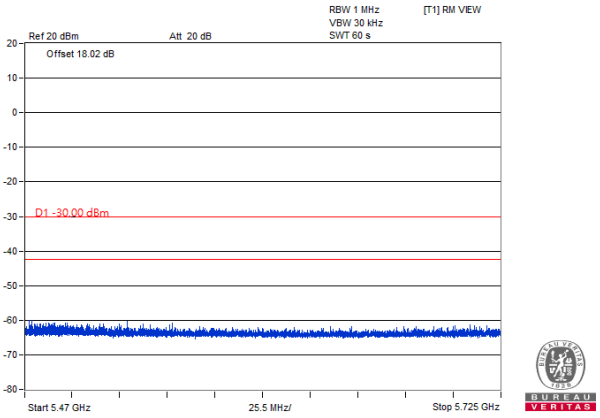
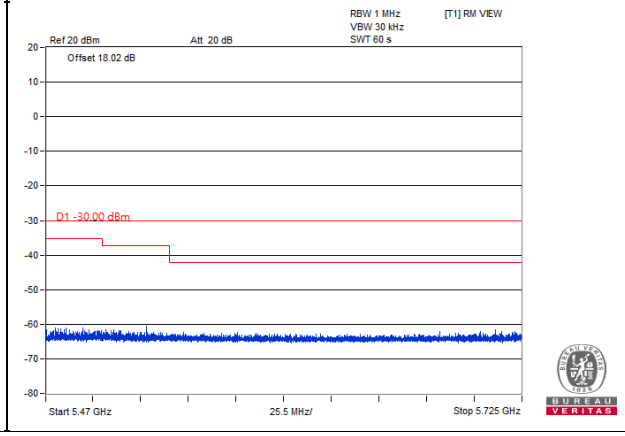
CH102 5510MHz	CH134 5670MHz
	
	
	

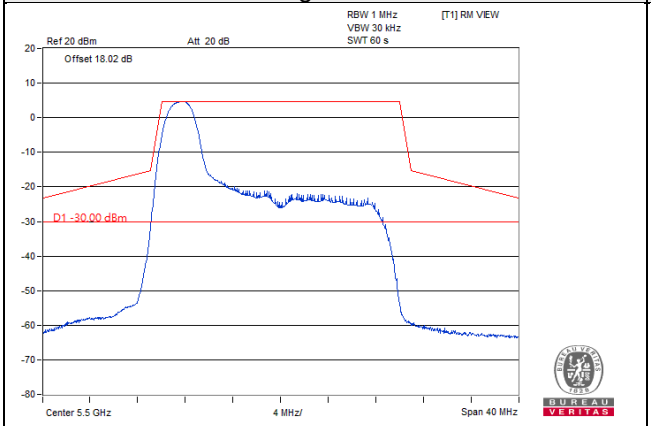
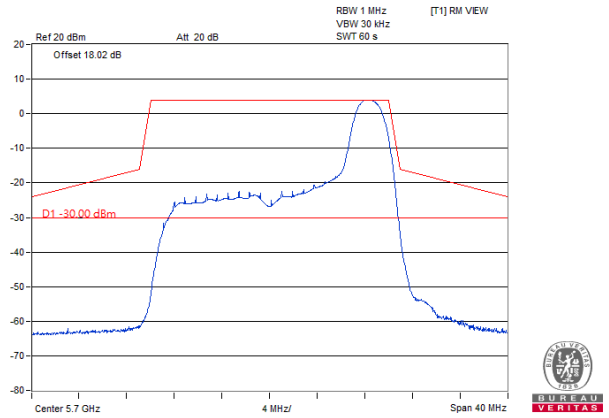
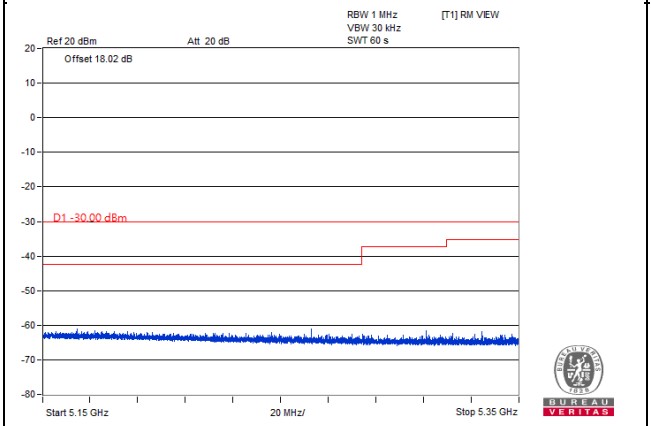
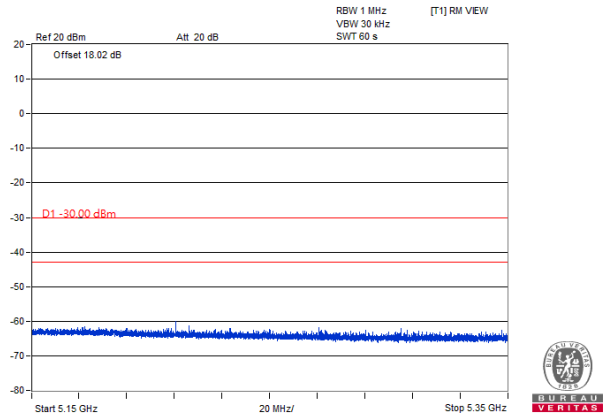
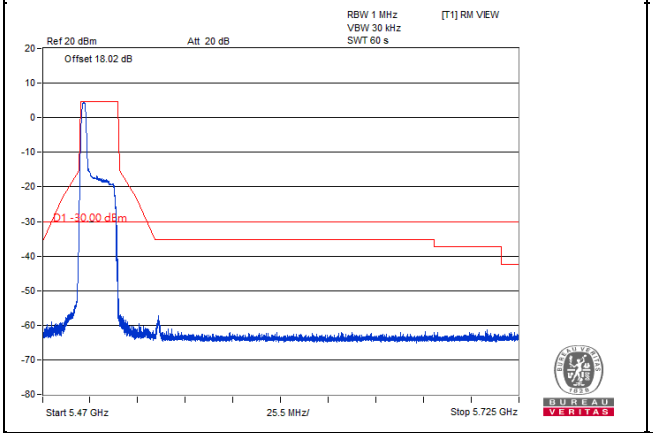
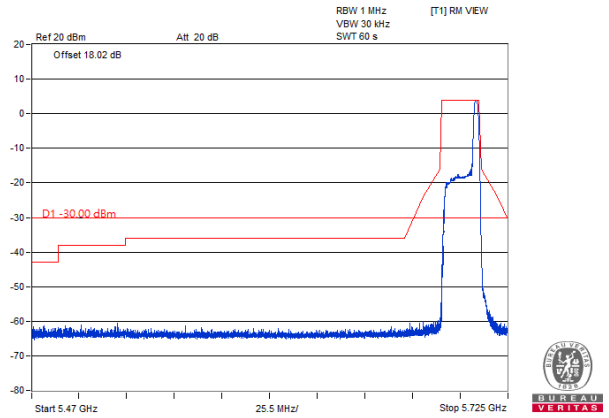
802.11ax (HE80)

CH42 5210MHz	CH58 5290MHz
	
	
	

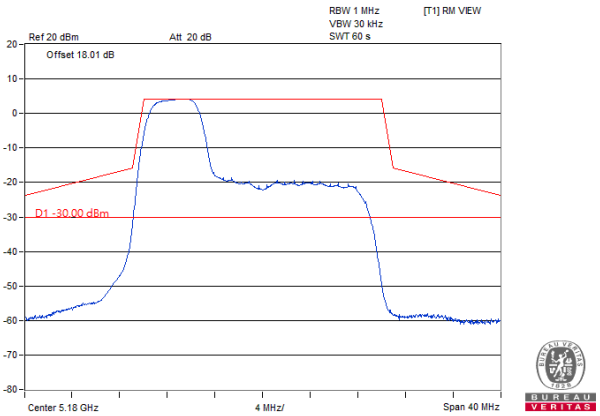
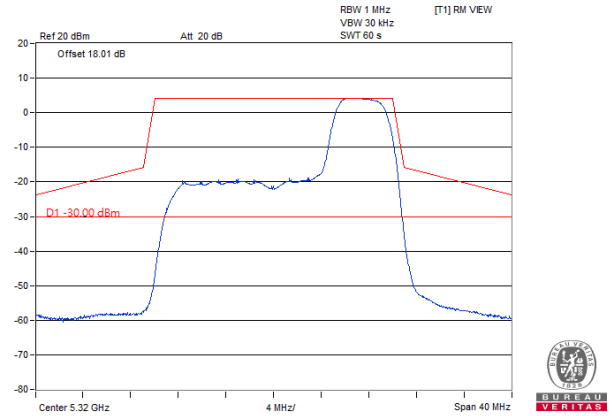
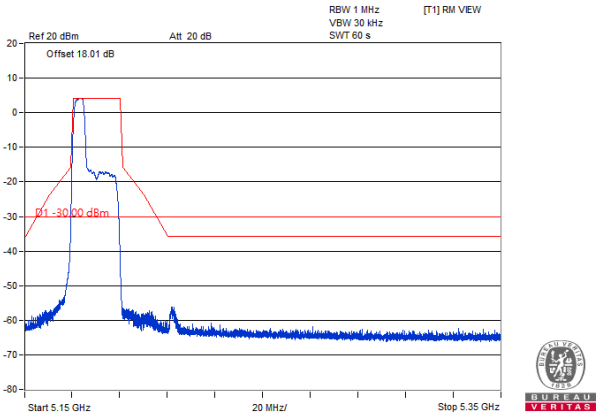
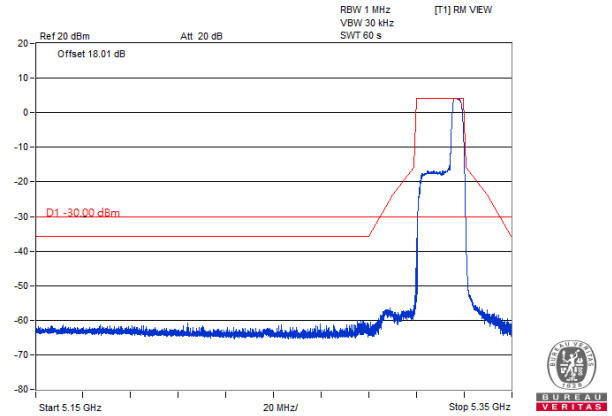
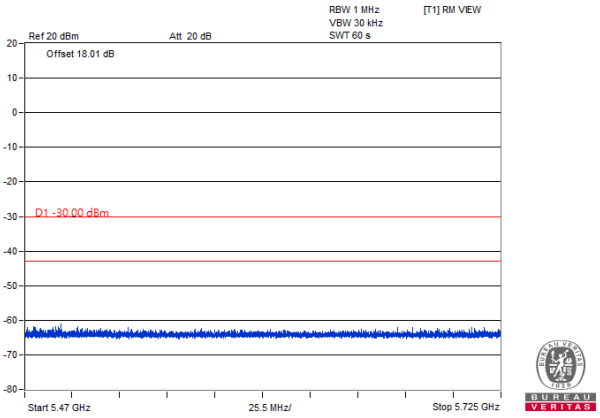
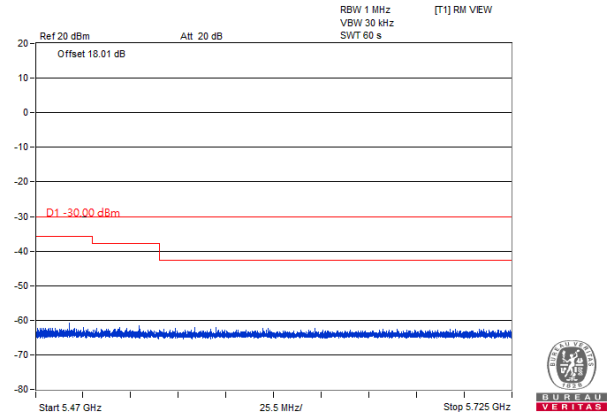
CH106 5530MHz	CH122 5610MHz
	
	
	

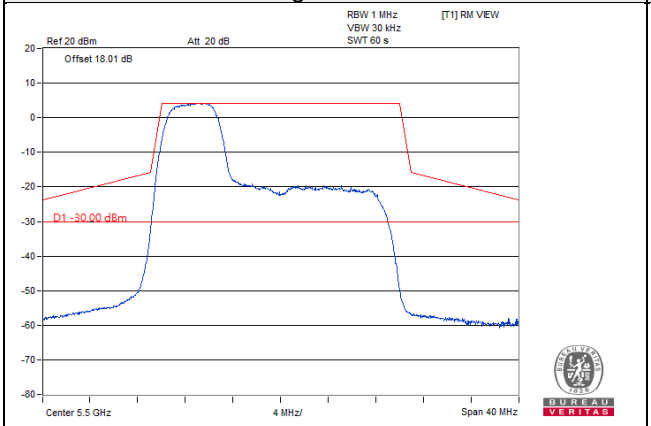
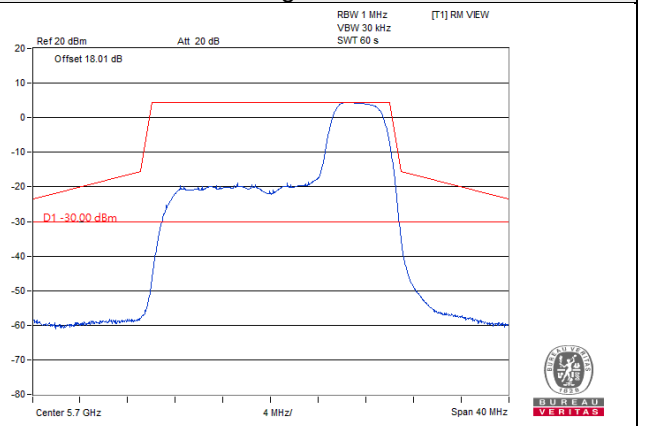
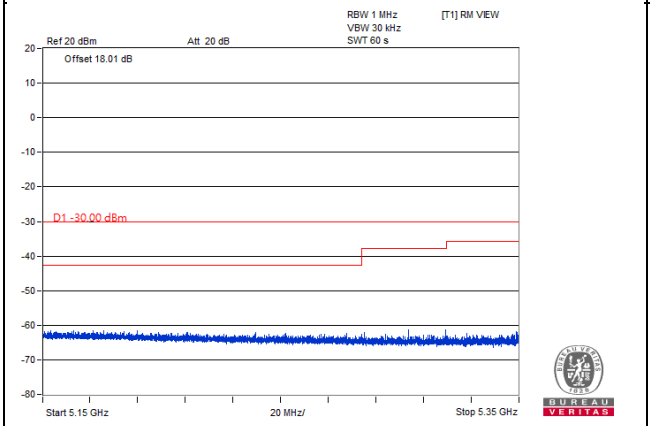
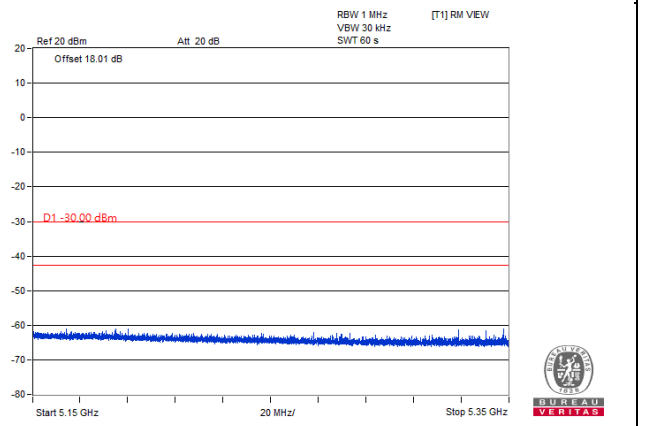
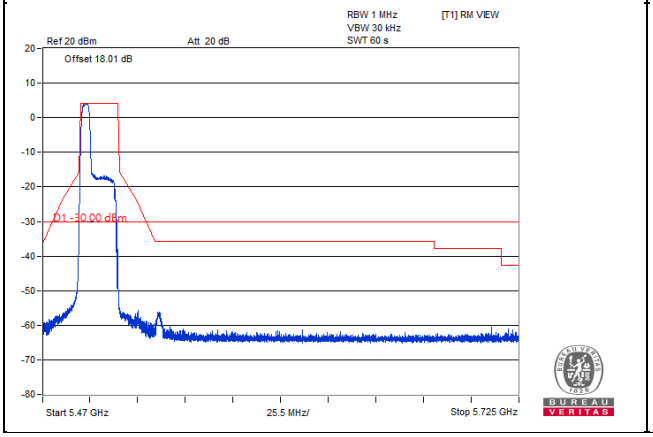
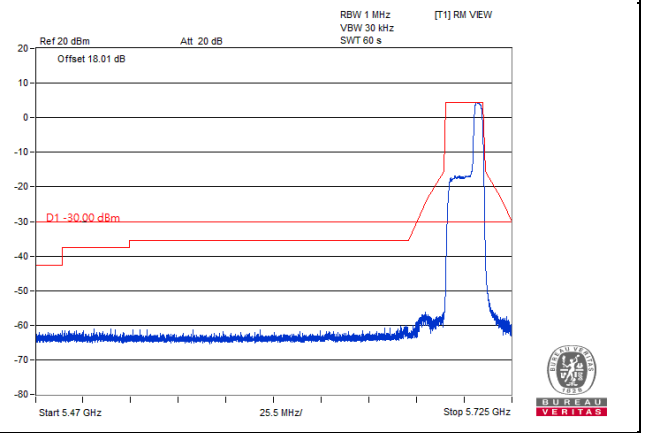
802.11ax (RU26)

CH36 5180MHz	CH64 5320MHz
RU Configuration: 26/0	RU Configuration: 26/8
	
	
	

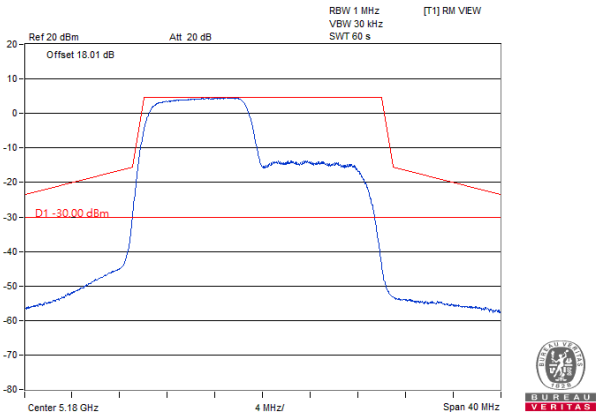
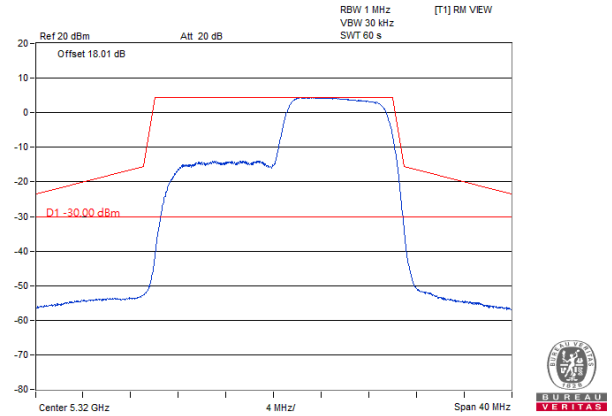
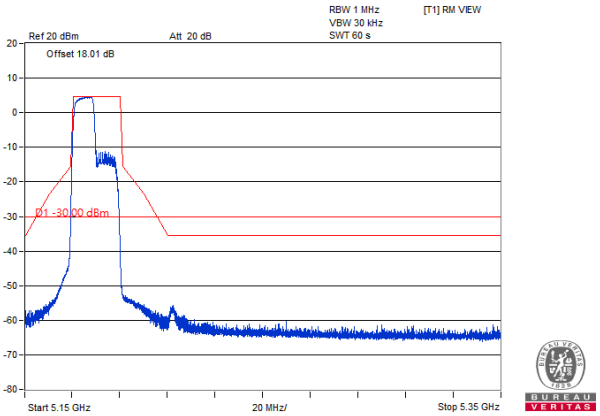
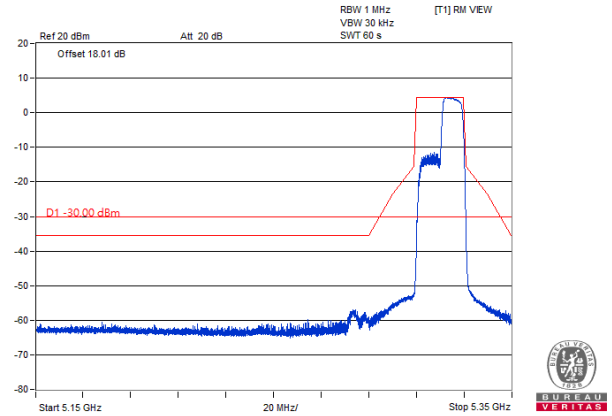
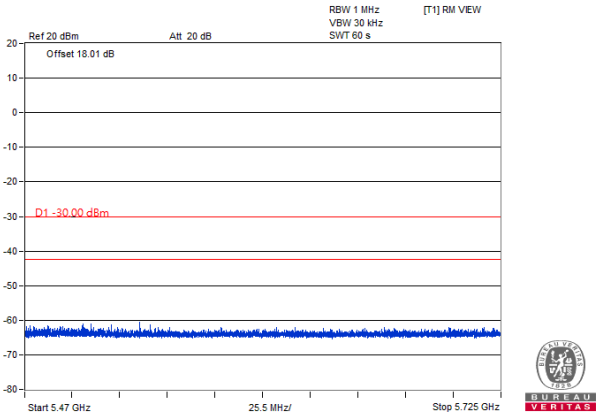
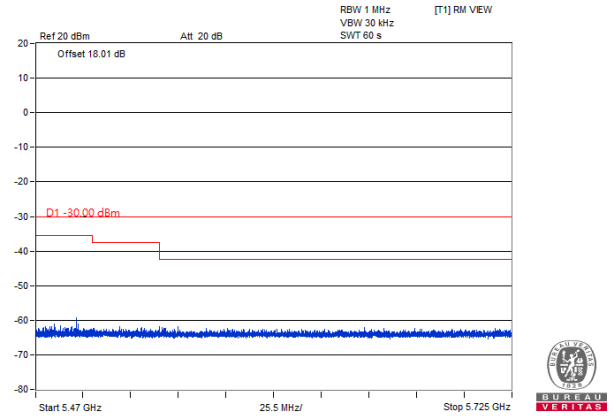
CH100 5500MHz	CH140 5700MHz
RU Configuration: 26/0	RU Configuration: 26/8
	
	
	

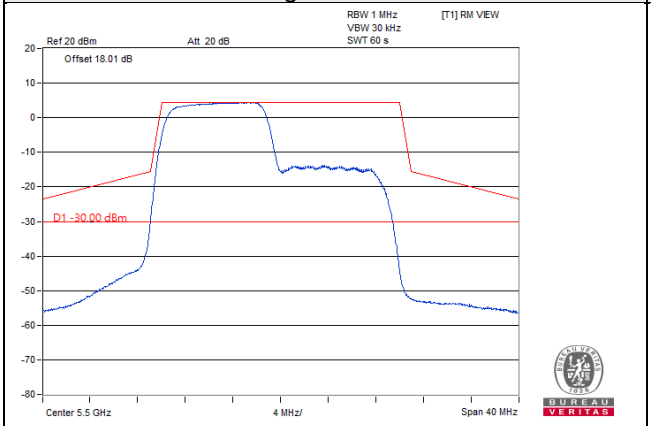
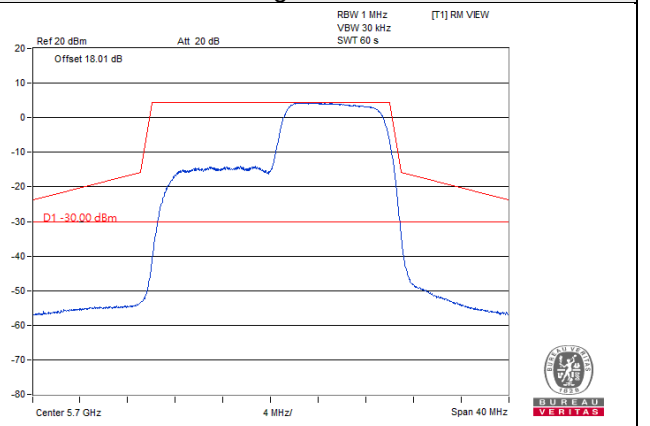
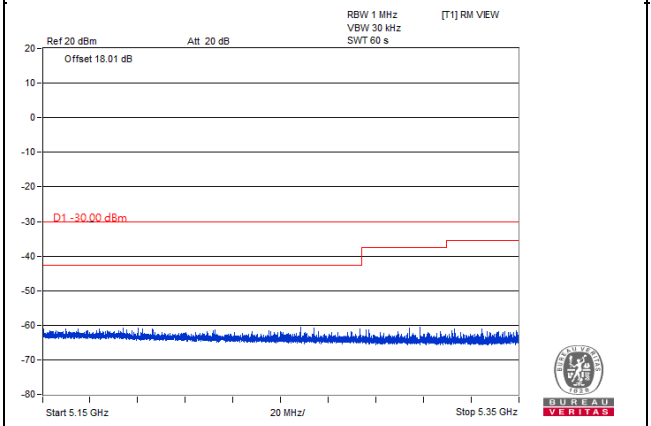
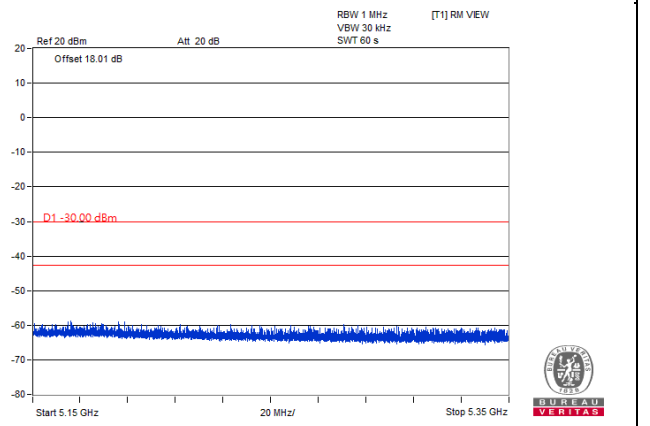
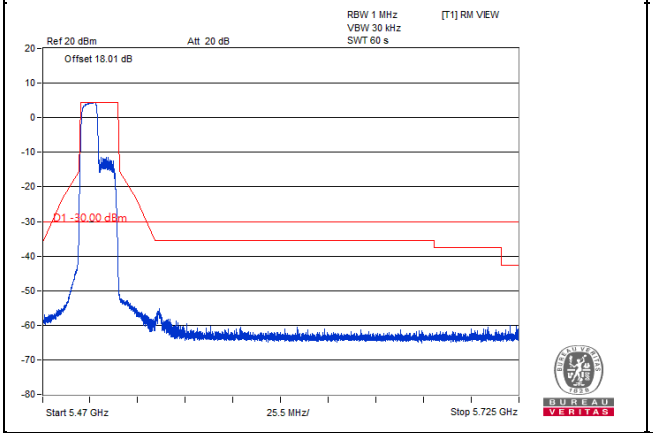
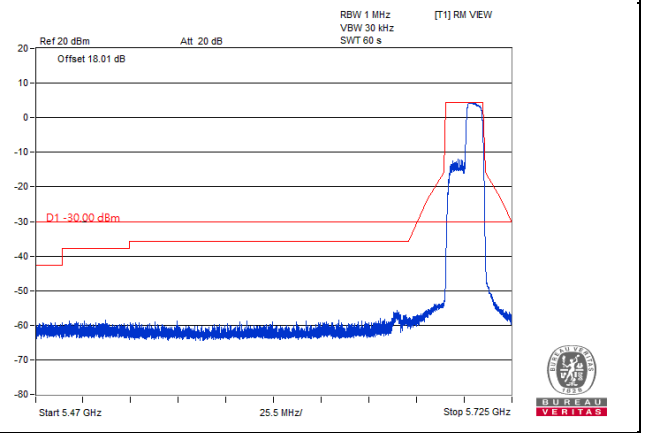
802.11ax (RU52)

CH36 5180MHz	CH64 5320MHz
RU Configuration: 52/37	RU Configuration: 52/40
	
	
	

CH100 5500MHz	CH140 5700MHz
RU Configuration: 52/37	RU Configuration: 52/40
	
	
	

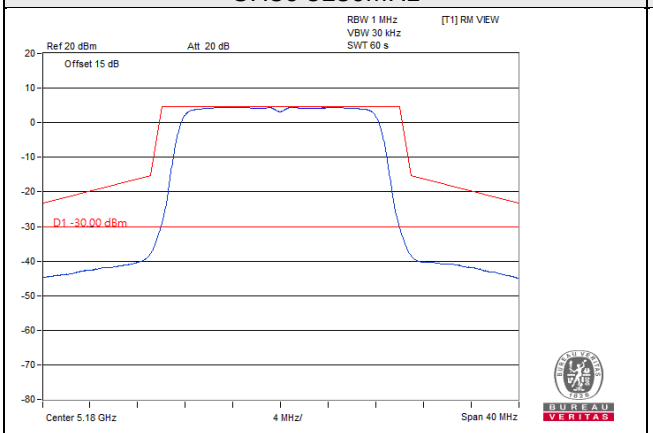
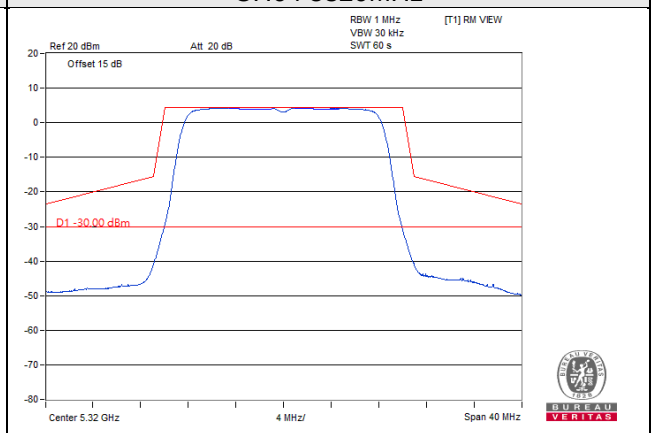
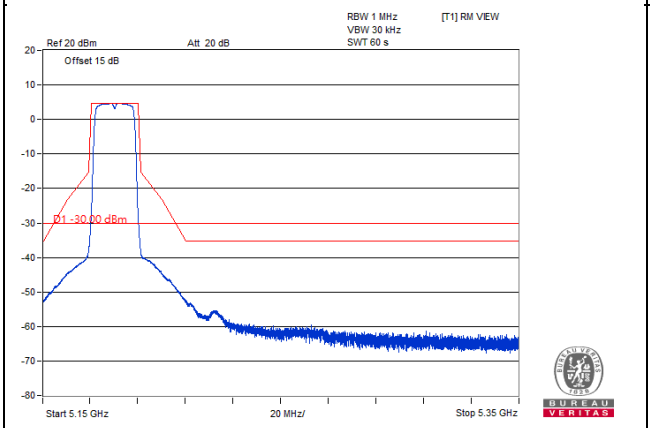
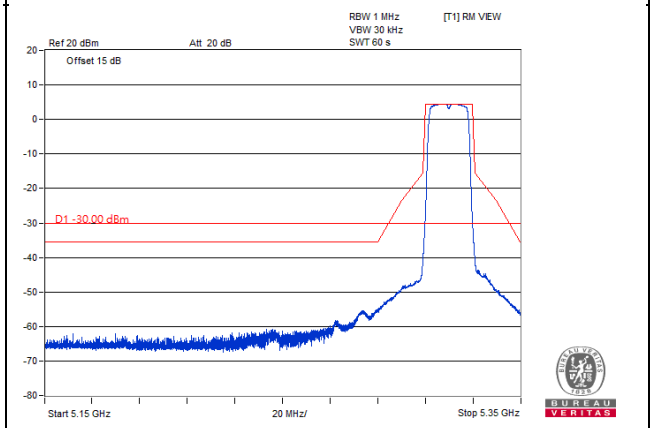
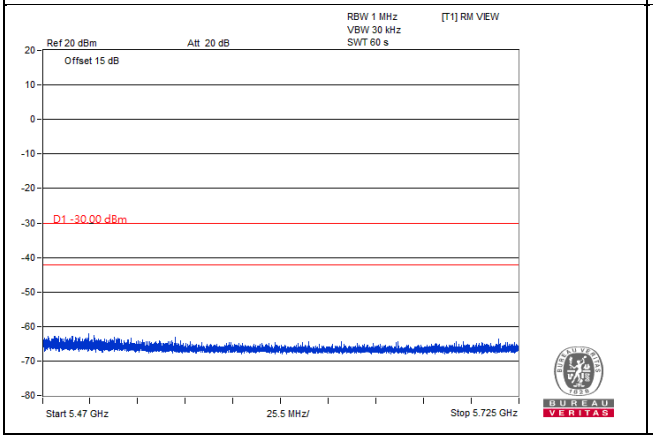
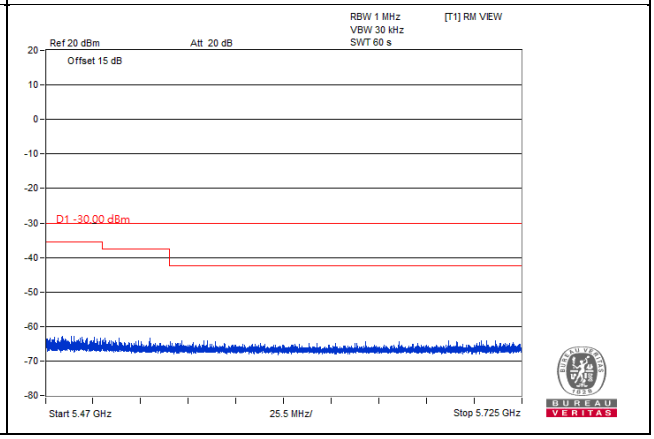
802.11ax (RU106)

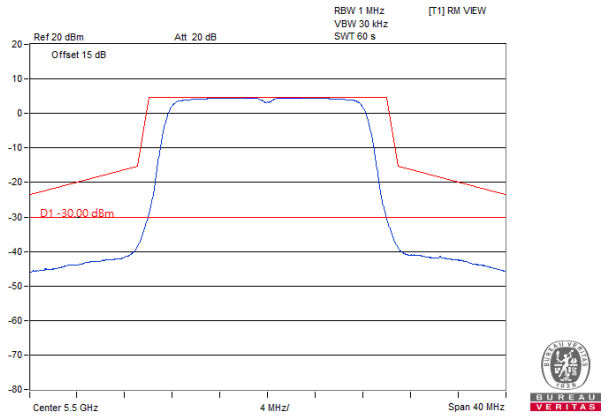
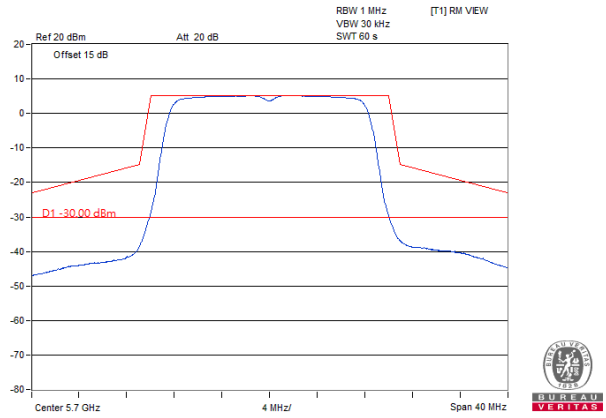
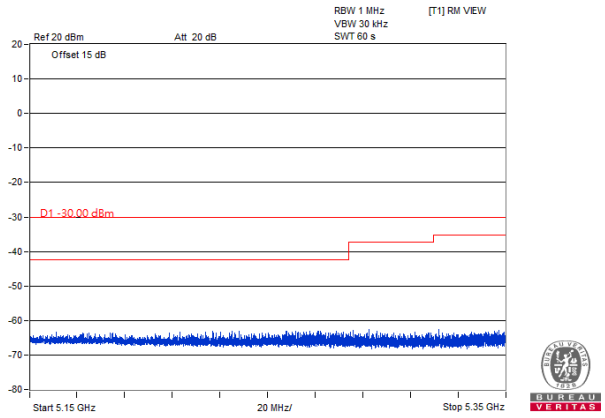
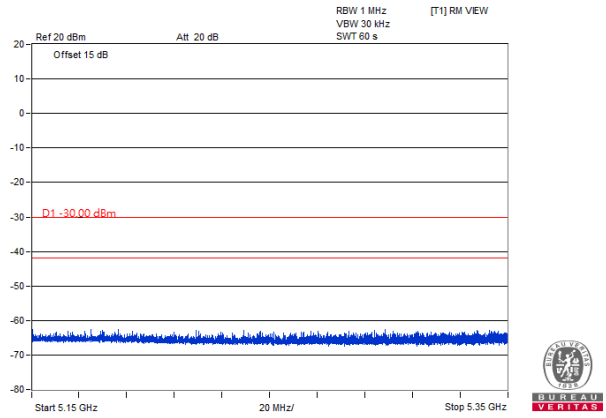
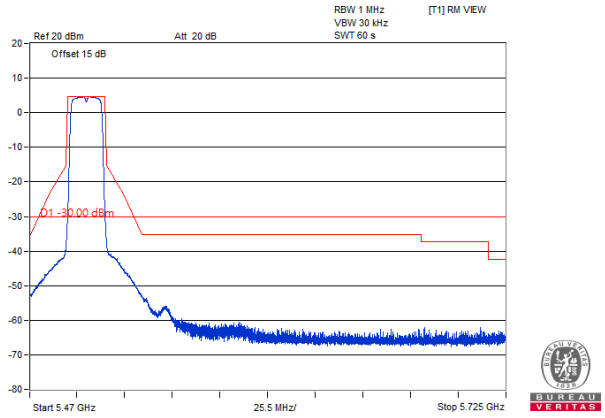
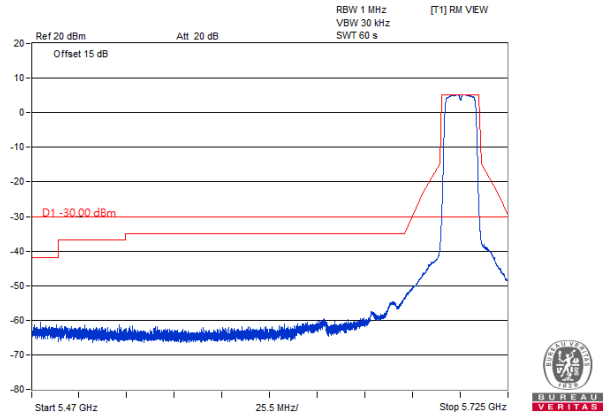
CH36 5180MHz	CH64 5320MHz
RU Configuration: 106/53	RU Configuration: 106/54
	
	
	

CH100 5500MHz	CH140 5700MHz
RU Configuration: 106/53	RU Configuration: 106/54
	
	
	

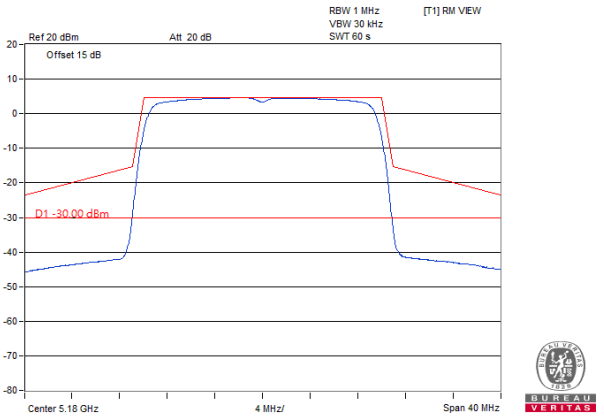
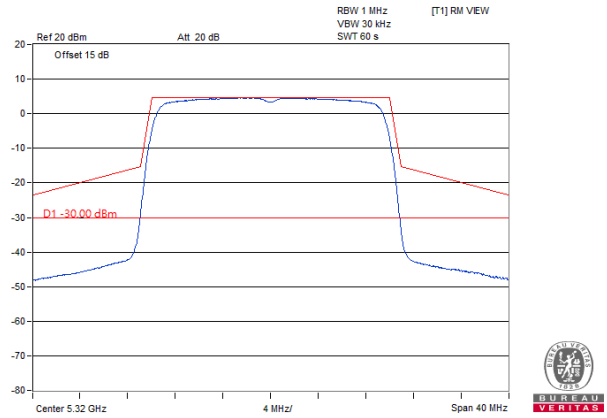
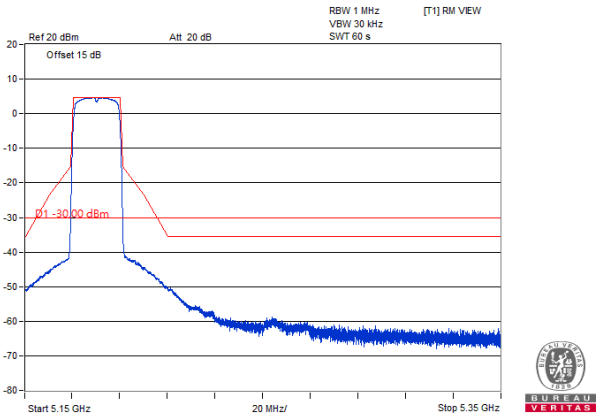
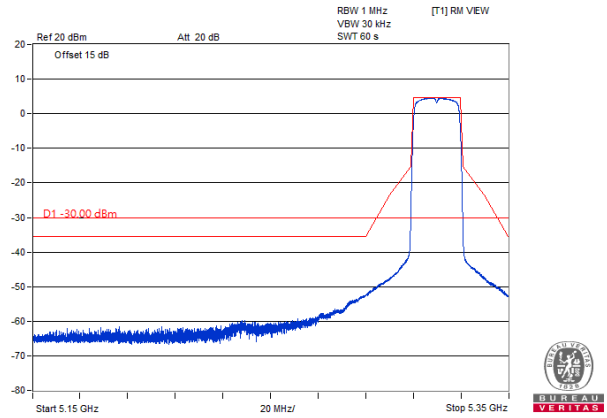
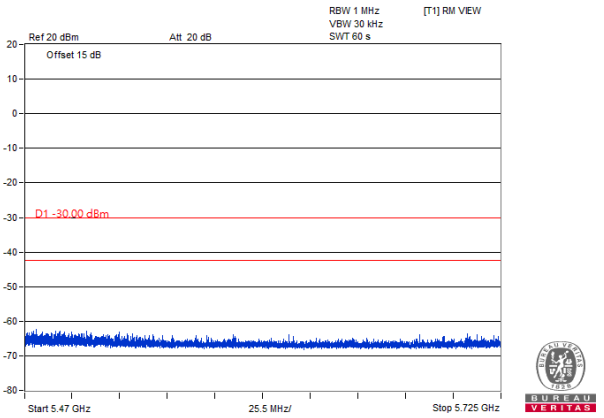
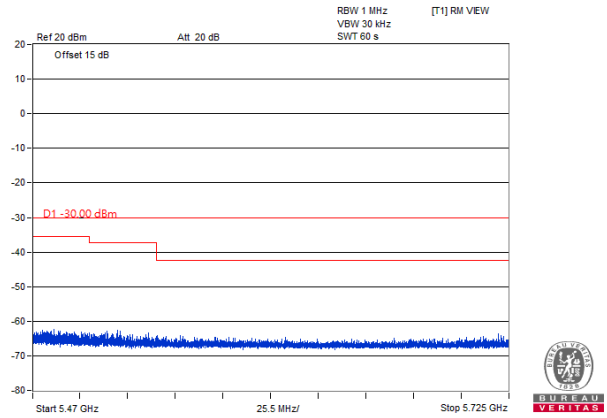
4.6.6 Test Results (Mode 2)

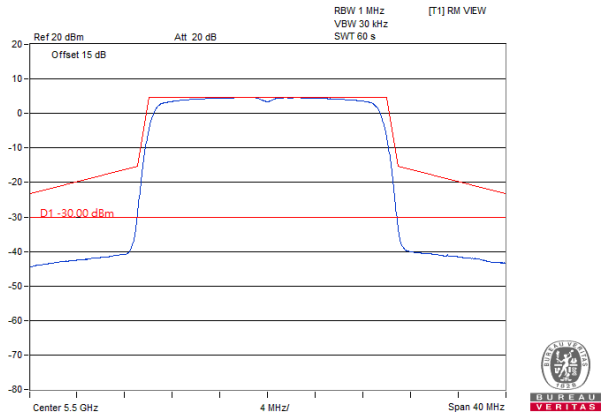
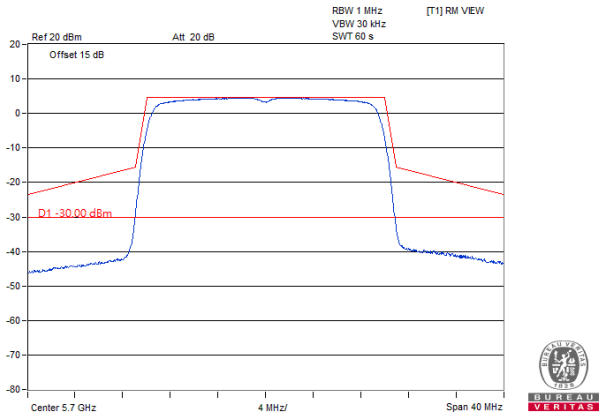
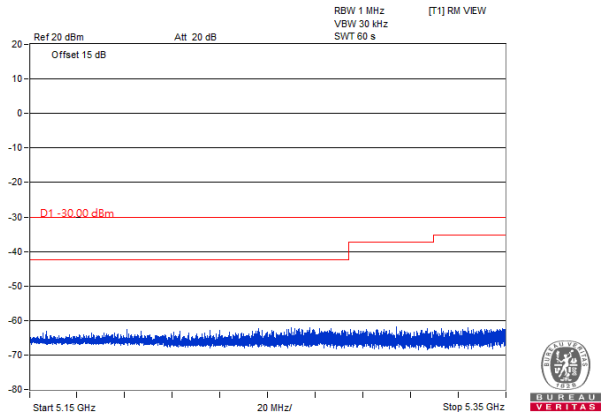
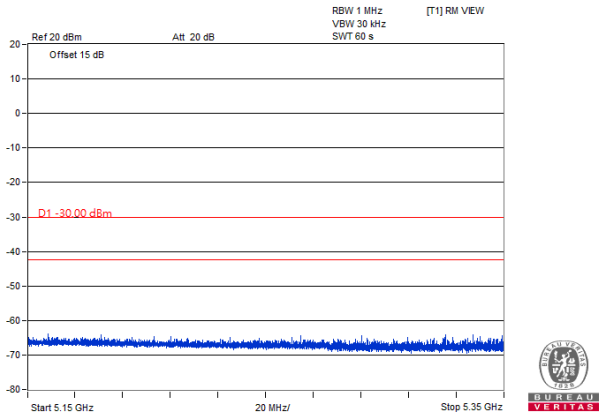
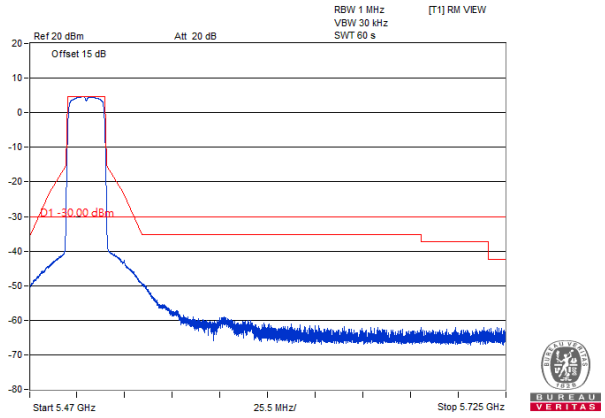
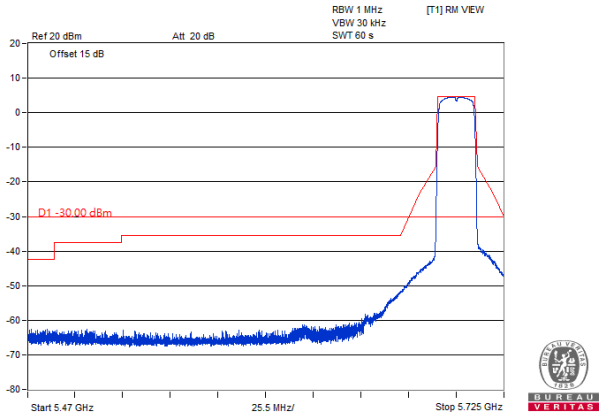
802.11a

CH36 5180MHz	CH64 5320MHz
	
	
	

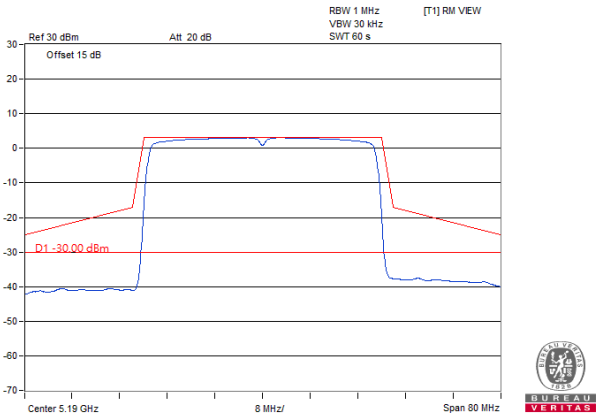
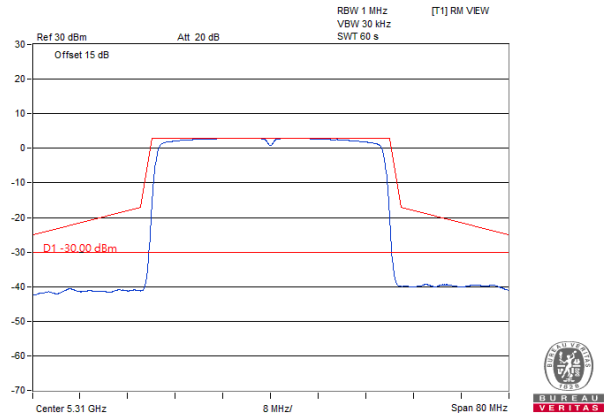
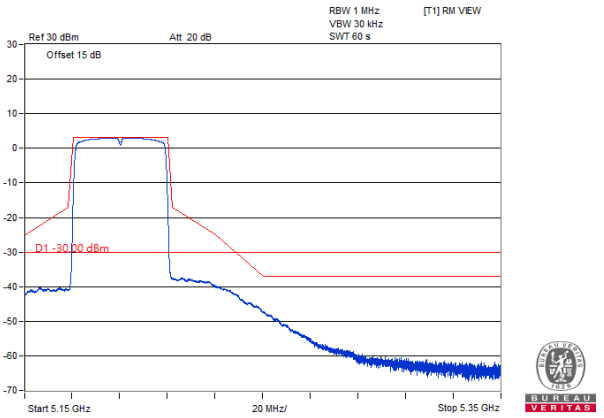
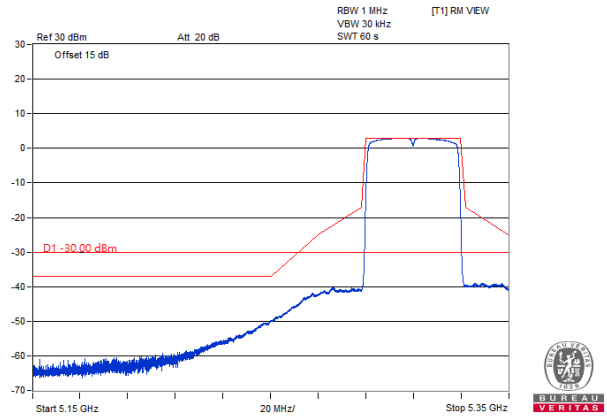
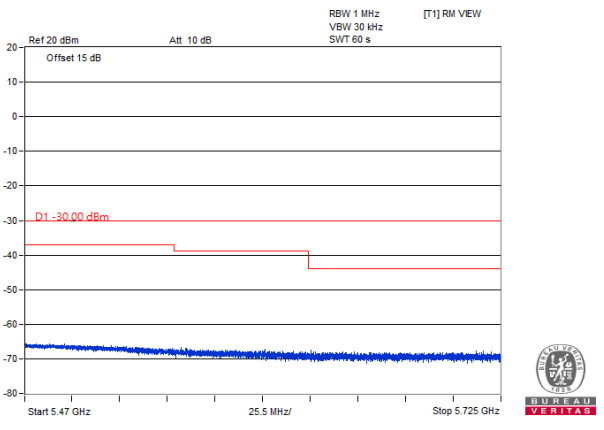
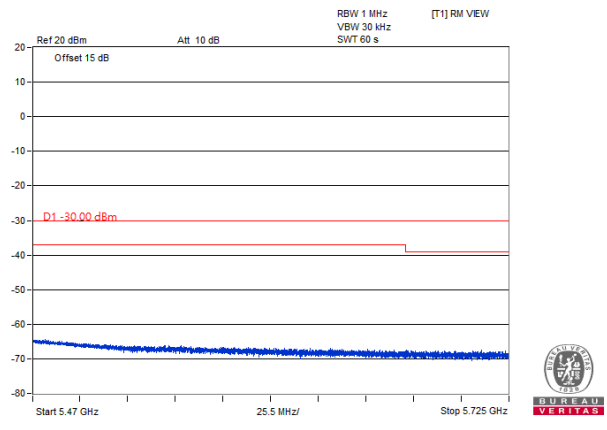
CH100 5500MHz	CH140 5700MHz
	
	
	

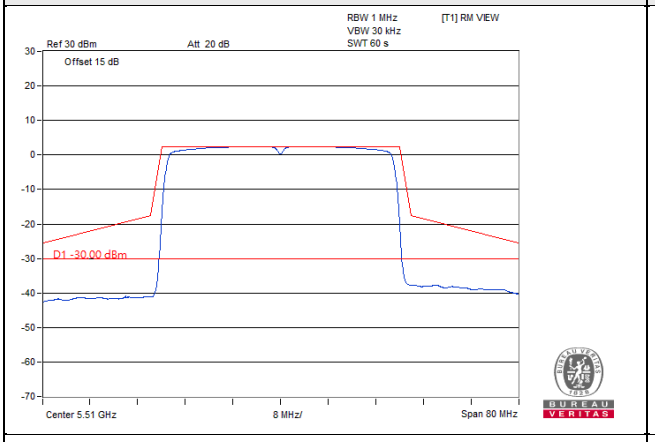
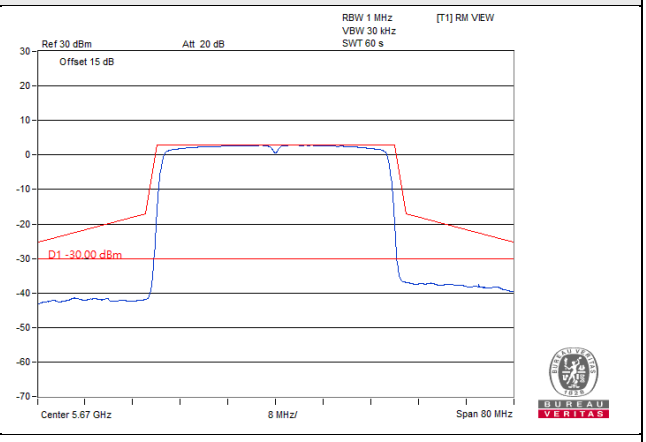
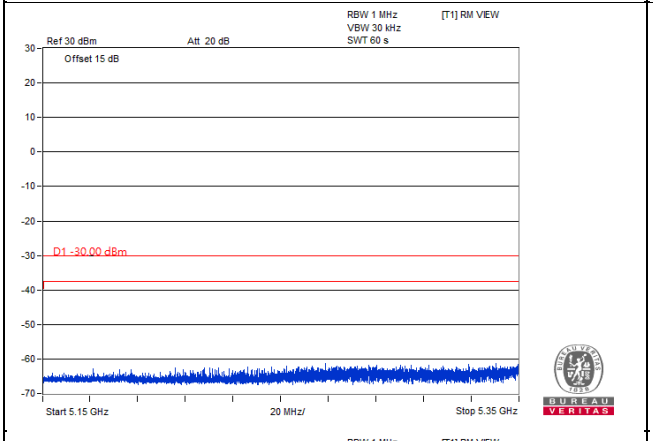
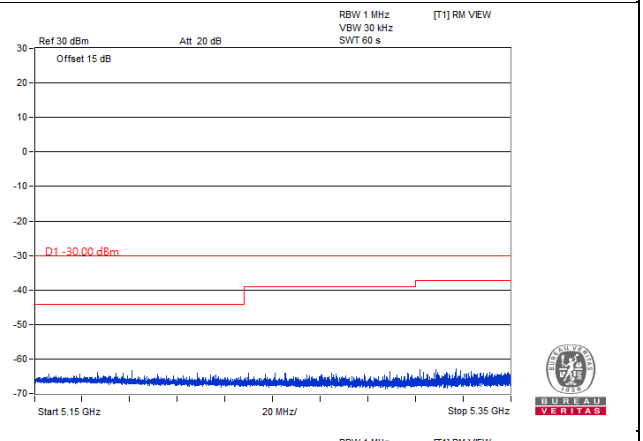
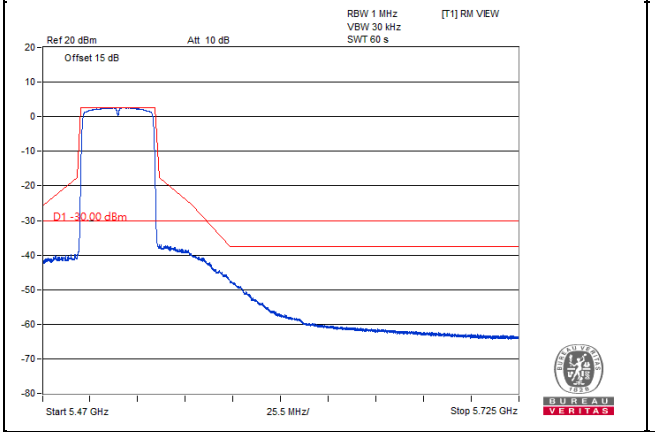
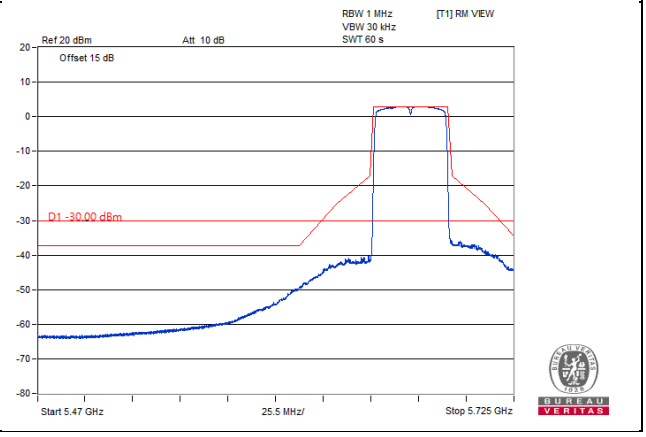
802.11ax (HE20)

CH36 5180MHz	CH64 5320MHz
	
	
	

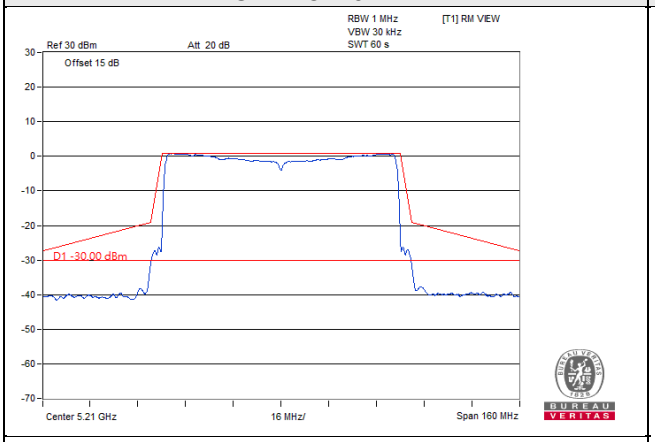
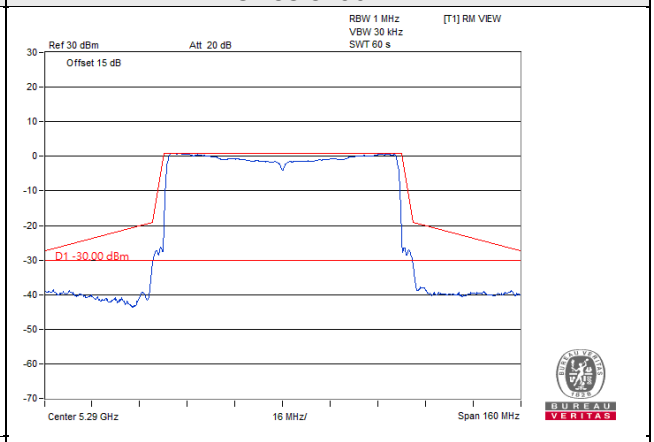
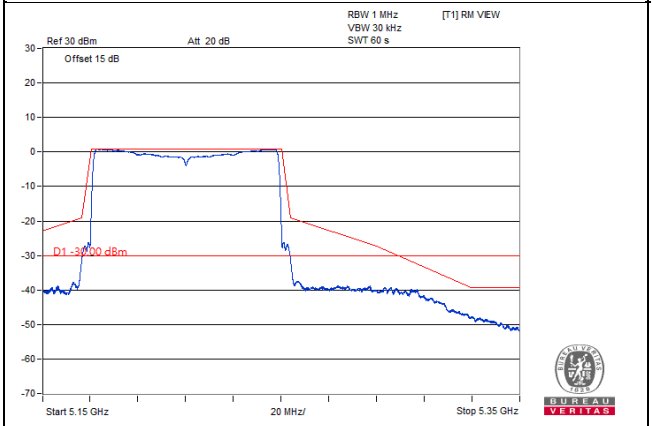
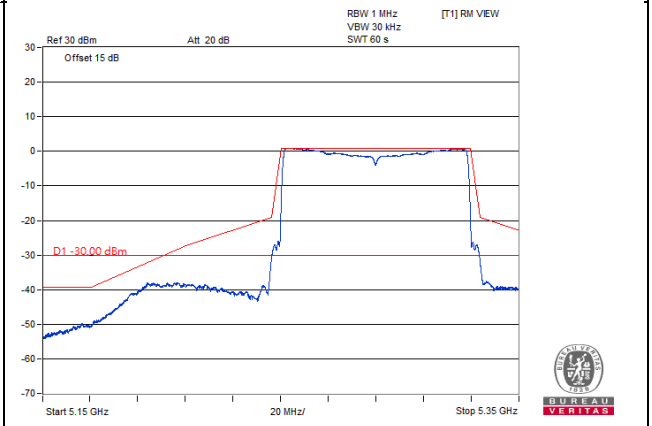
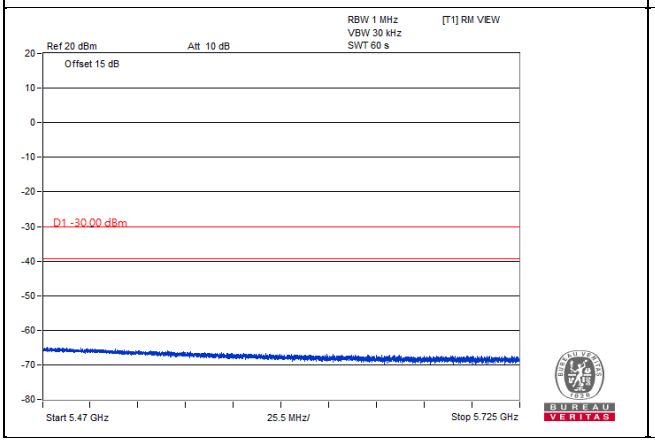
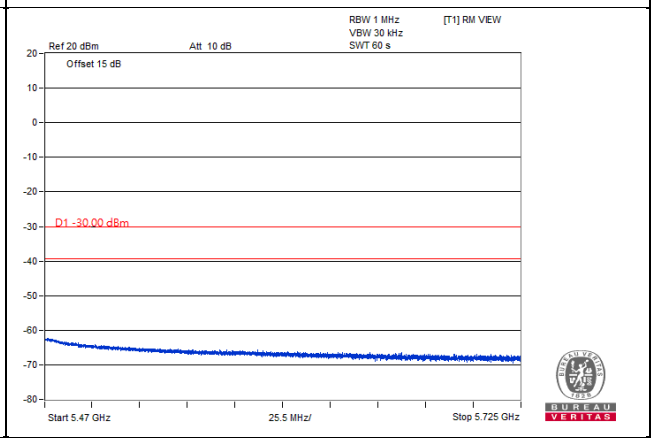
CH100 5500MHz	CH140 5700MHz
	
	
	

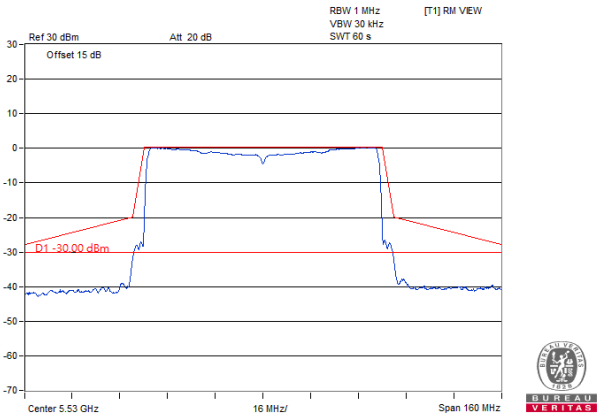
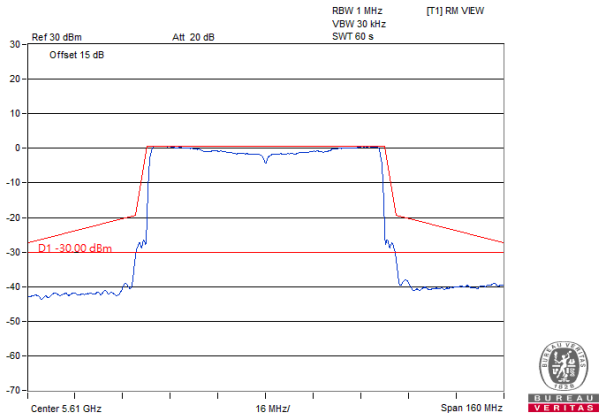
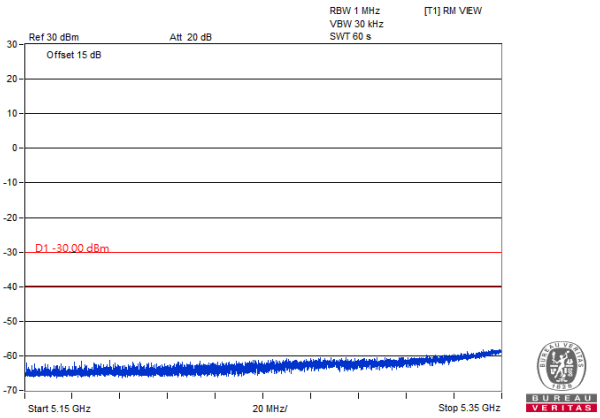
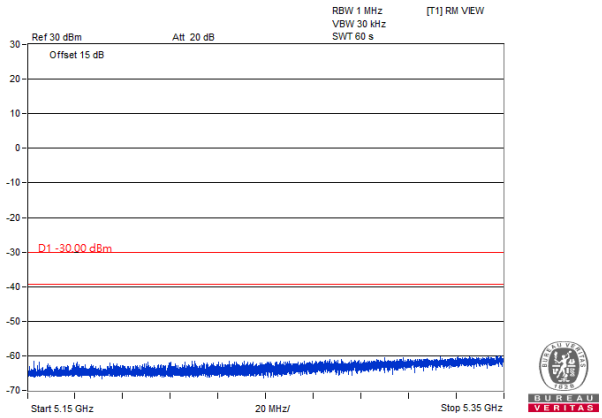
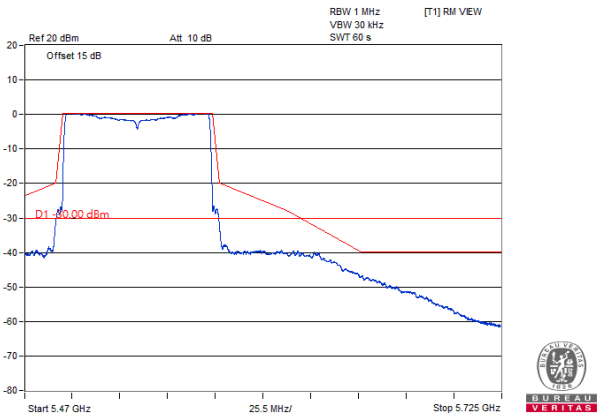
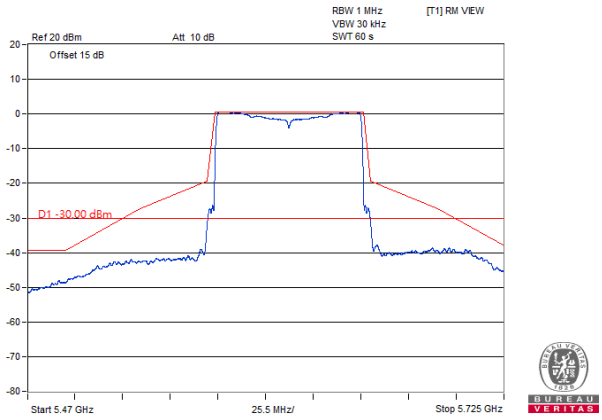
802.11ax (HE40)

CH38 5190MHz	CH62 5310MHz
	
	
	

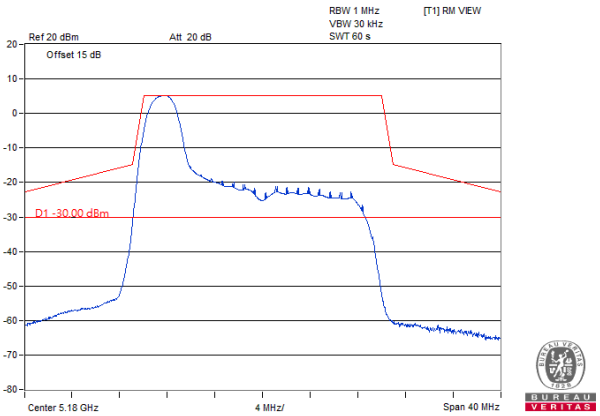
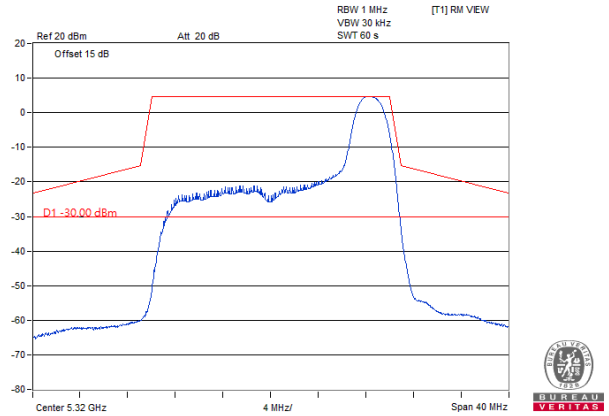
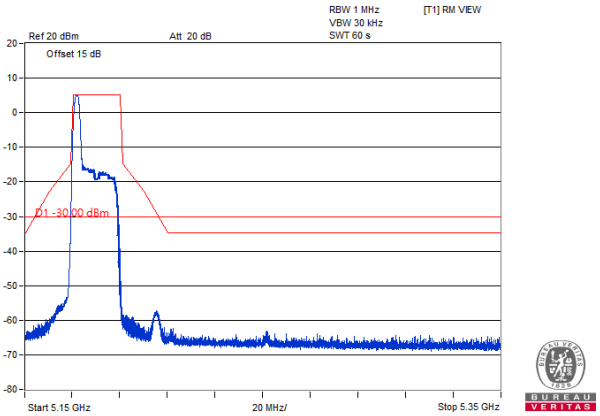
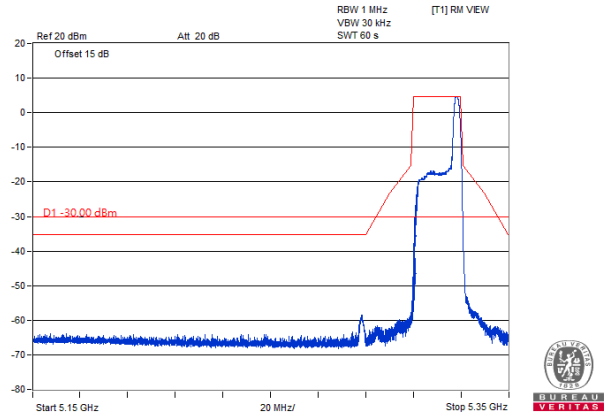
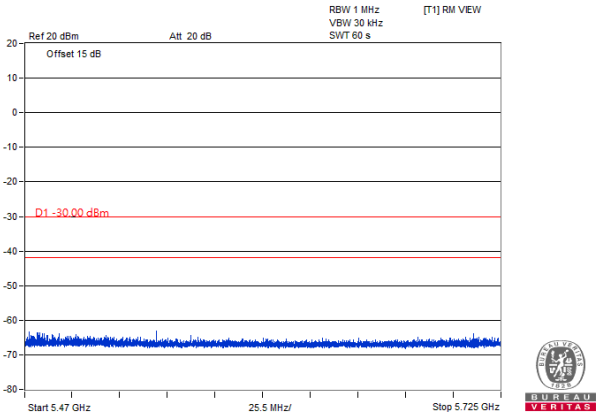
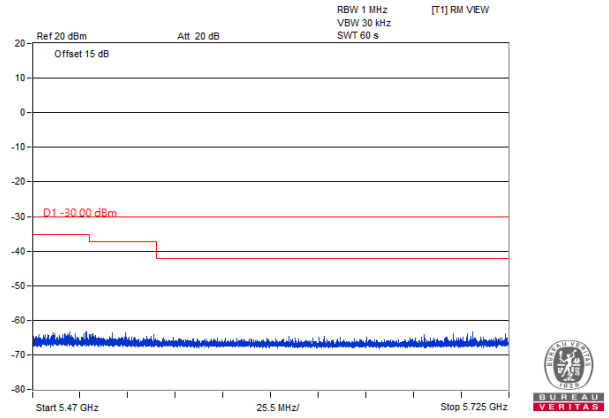
CH102 5510MHz	CH134 5670MHz
	
	
	

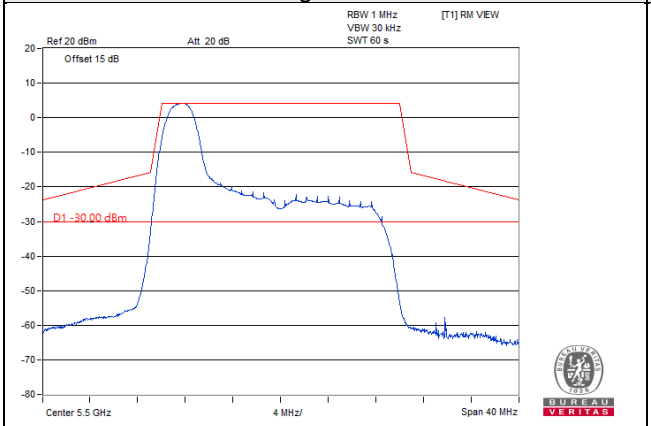
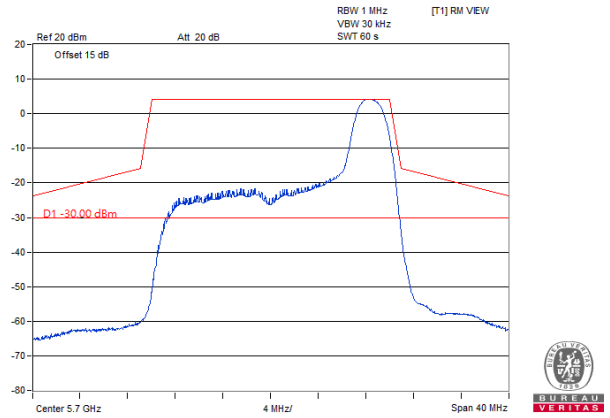
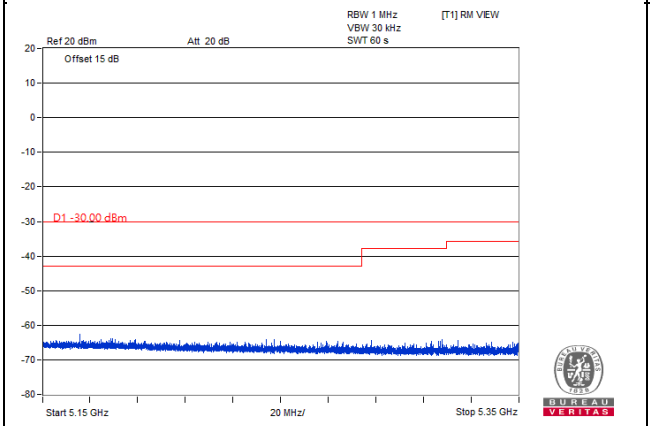
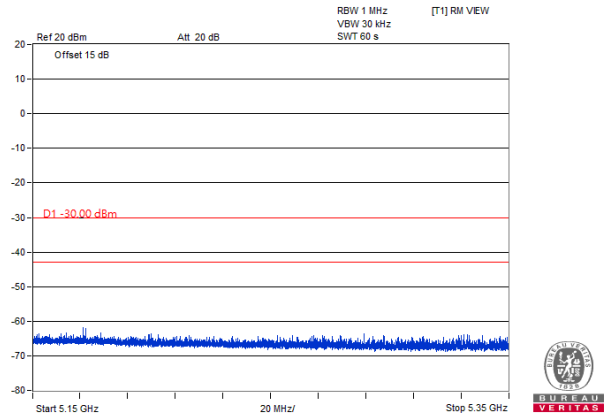
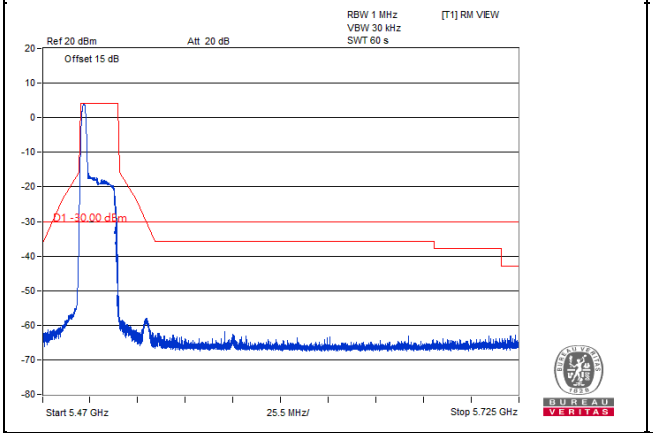
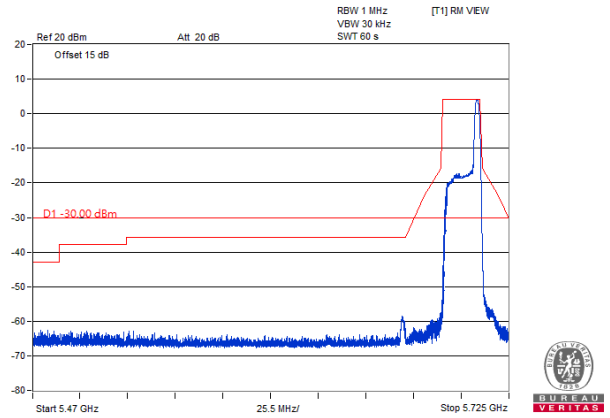
802.11ax (HE80)

CH42 5210MHz	CH58 5290MHz
	
	
	

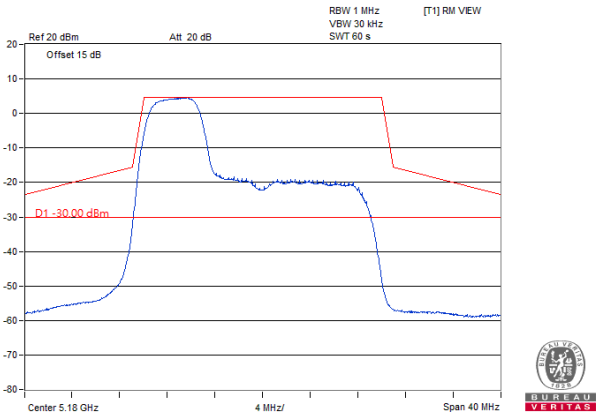
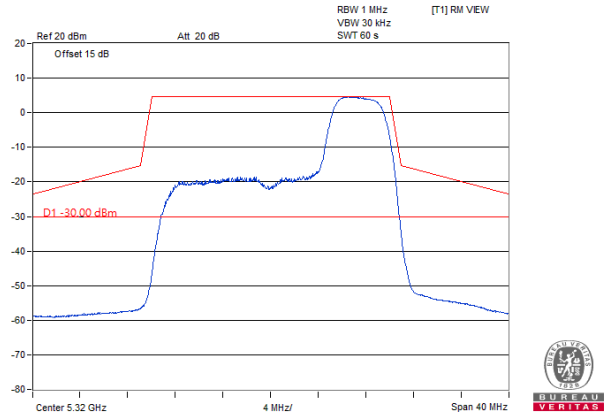
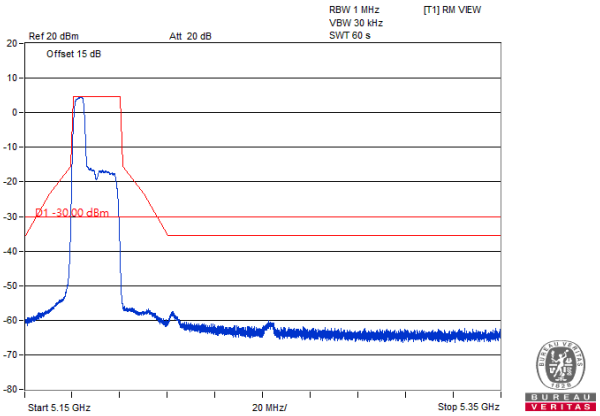
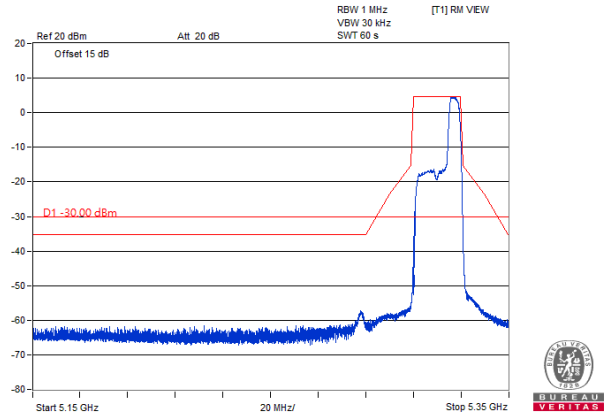
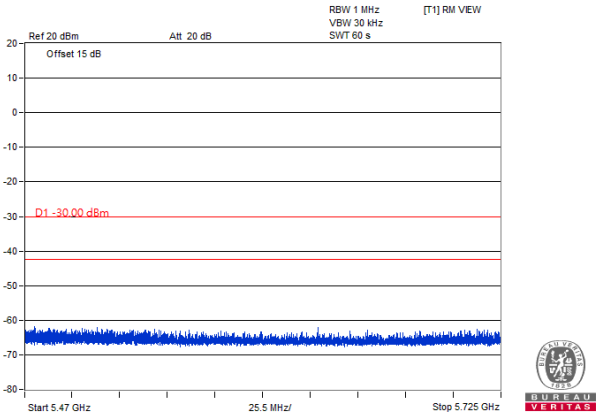
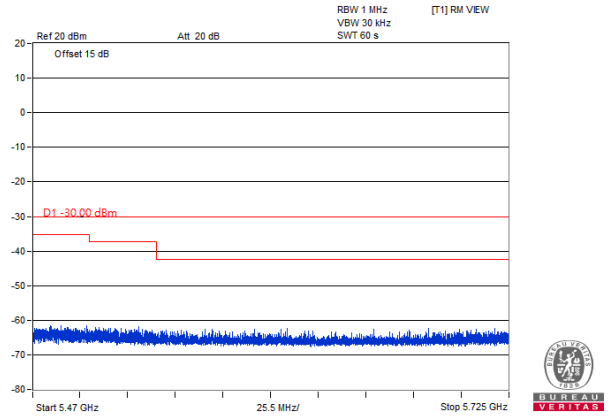
CH106 5530MHz	CH122 5610MHz
	
	
	

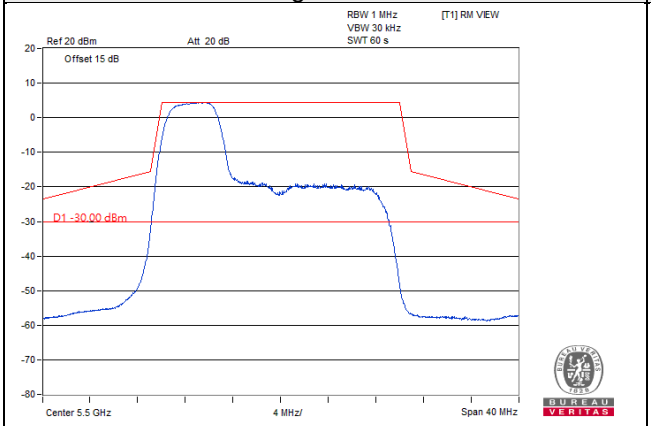
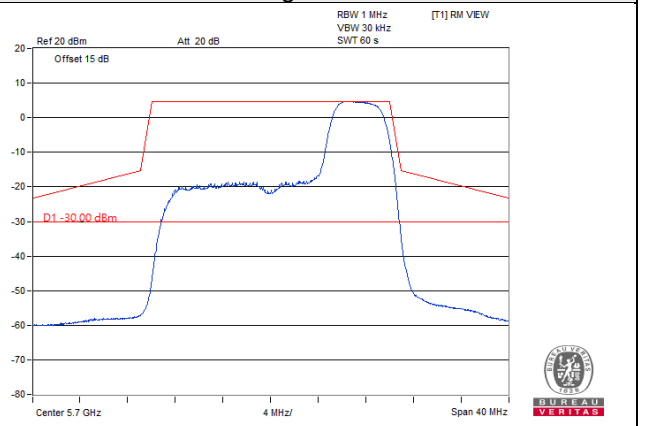
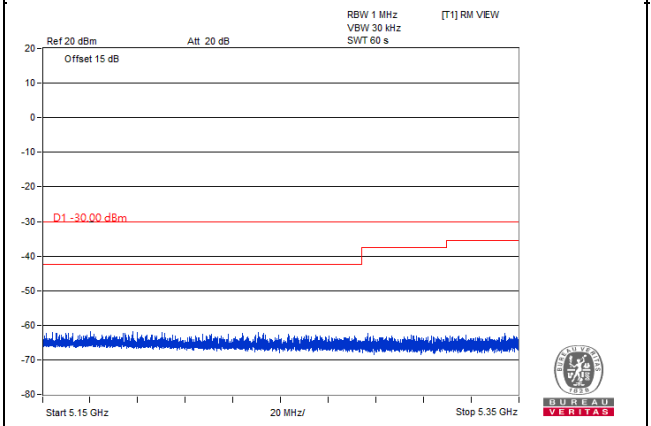
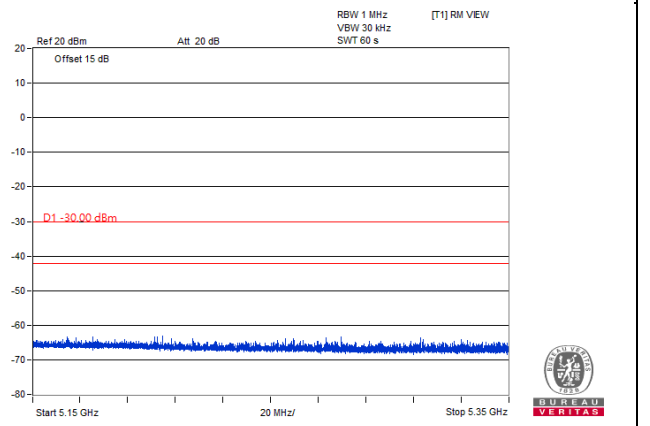
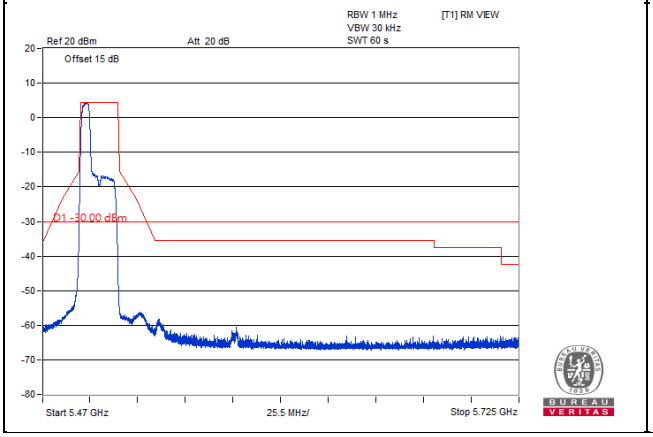
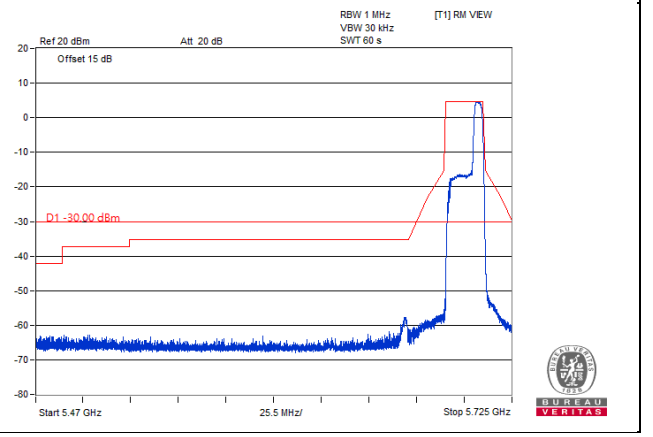
802.11ax (RU26)

CH36 5180MHz	CH64 5320MHz
RU Configuration: 26/0	RU Configuration: 26/8
	
	
	

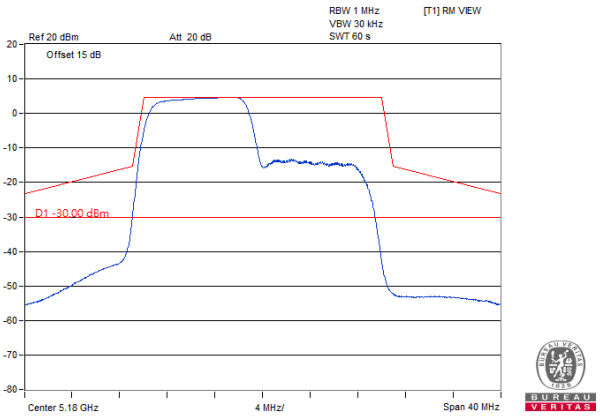
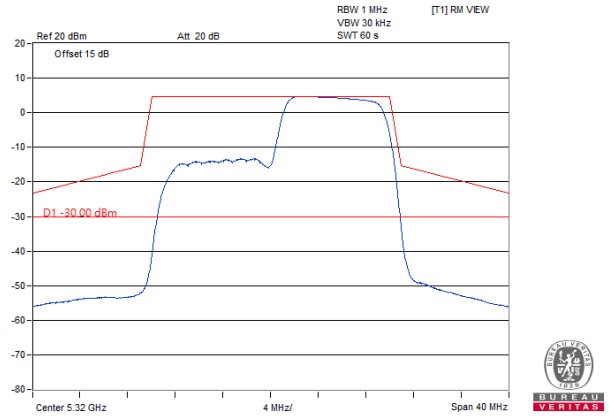
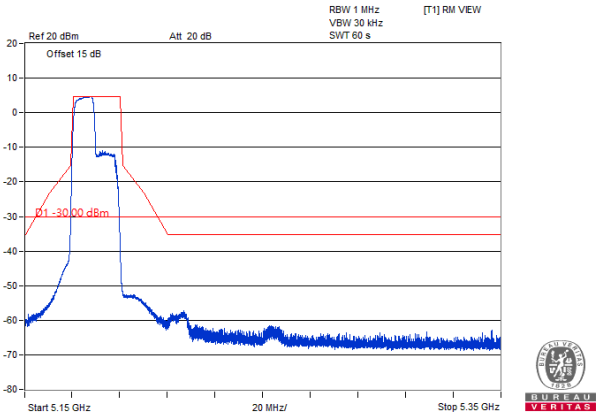
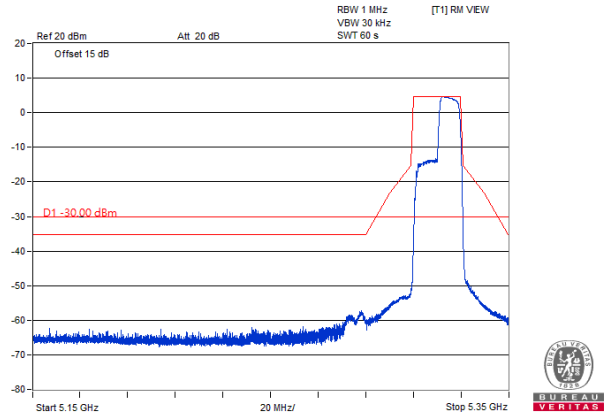
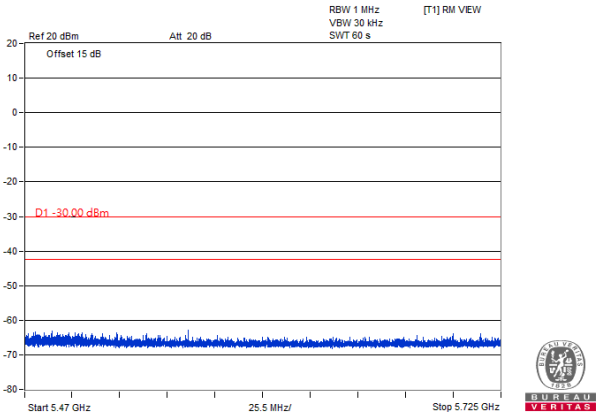
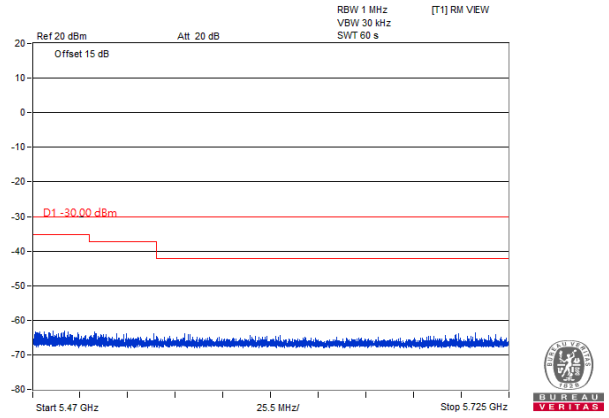
CH100 5500MHz	CH140 5700MHz
RU Configuration: 26/0	RU Configuration: 26/8
	
	
	

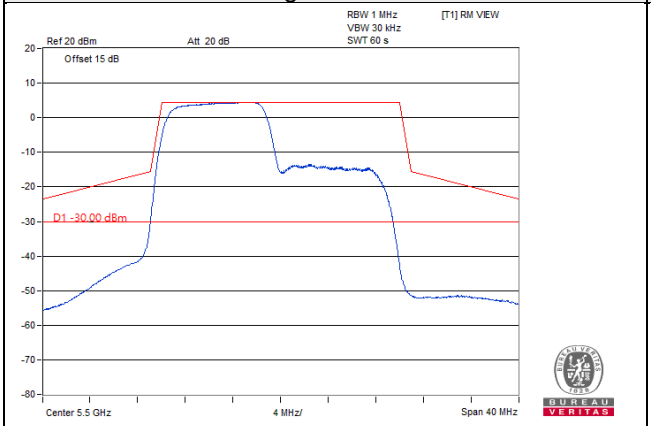
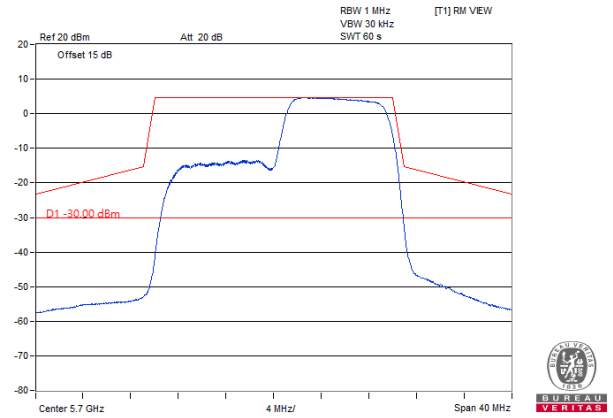
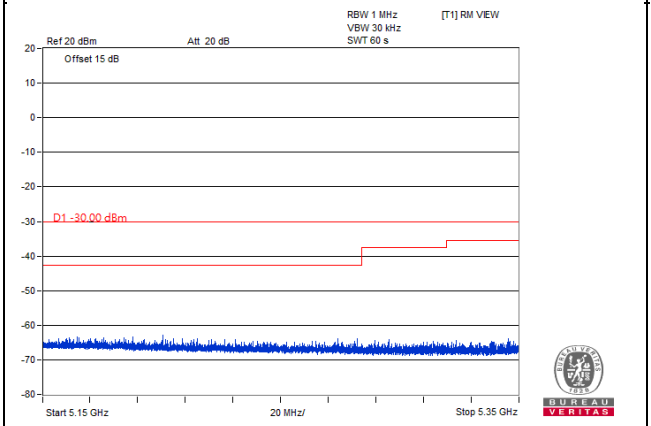
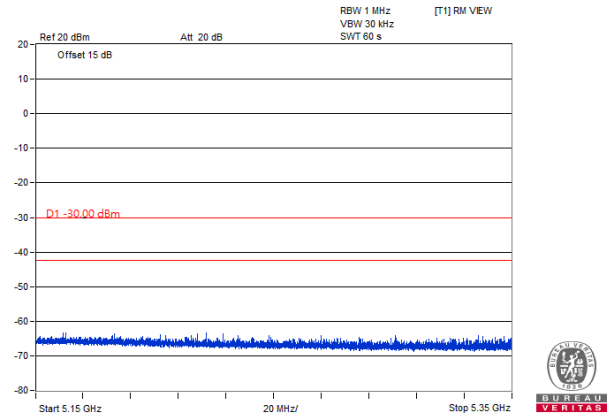
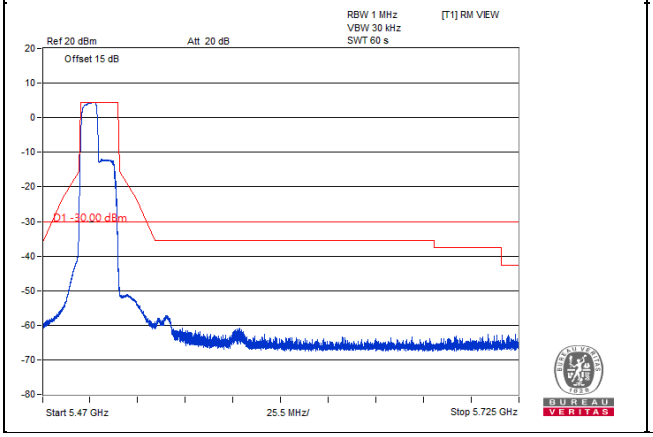
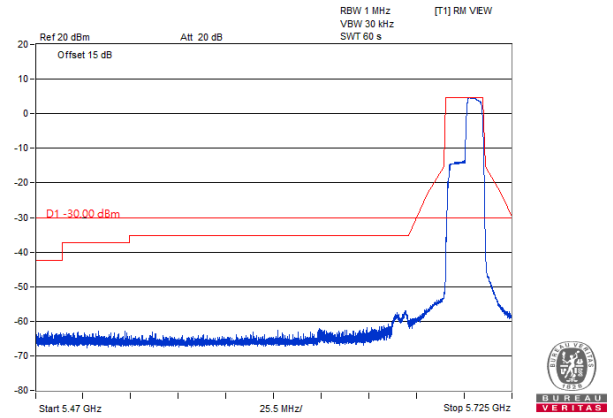
802.11ax (RU52)

CH36 5180MHz	CH64 5320MHz
RU Configuration: 52/37	RU Configuration: 52/40
	
	
	

CH100 5500MHz	CH140 5700MHz
RU Configuration: 52/37	RU Configuration: 52/40
	
	
	

802.11ax (RU106)

CH36 5180MHz	CH64 5320MHz
RU Configuration: 106/53	RU Configuration: 106/54
	
	
	

CH100 5500MHz	CH140 5700MHz
RU Configuration: 106/53	RU Configuration: 106/54
	
	
	

4.7 Receiver Spurious Emissions

4.7.1 Limit of Receiver Spurious Emissions

Frequency Range	Maximum Power Limit ERP (≤ 1 GHz) EIRP (>1 GHz)	Measurement Bandwidth
30 MHz ~ 1 GHz	-57dBm	100 kHz
1 GHz ~ 26 GHz	-47dBm	1 MHz

4.7.2 Test Procedure

Refer to EN 301 893 V2.1.1 clause 5.4.7

Measurement Method	
☐ Conducted measurement	☒ Radiated measurement
For Conducted measurement: The level of unwanted emissions shall be measured as their power in a specified load (conducted spurious emissions) and their effective radiated power when radiated by the cabinet or structure of the equipment with the antenna connector(s) terminated by a specified load (cabinet radiation).	
Conducted measurement (For equipment with multiple transmit chains): ☐ Option 1: The results for each of the transmit chains for the corresponding 1MHz segments shall be added and compared with the limits. ☐ Option 2: The results for each of the transmit chains shall be individually compared with the limits after these limits have been reduced by 10 x log (N) (number of active transmit chains)	

4.7.3 Deviation from Test Standard

No deviation.

4.7.4 Test Setup

1. For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration).
2. Testing was performed when the equipment was in a receive-only mode.
3. The measurement was performed at normal environmental conditions only. Controlling software (RTL8852B MP Toolkit V1.0.16) has been activated to set the EUT on specific status.
4. The measurement channels were performed in accordance with EN 301 893 clause 5.3.2.

4.7.5 Test Results

PIFA Antenna

Below 1GHz worst-Case Data:

Spurious Emission Frequency Range	30MHz ~ 1GHz	Operating Channel	36

Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
35.97	V	-62.43	-57.00	-5.43
53.08	H	-61.73	-57.00	-4.73
92.28	V	-65.12	-57.00	-8.12
92.83	H	-63.04	-57.00	-6.04
117.85	V	-61.79	-57.00	-4.79
130.74	H	-60.14	-57.00	-3.14
144.02	V	-65.64	-57.00	-8.64
159.34	H	-67.47	-57.00	-10.47
163.12	V	-65.78	-57.00	-8.78
298.69	H	-61.06	-57.00	-4.06
299.87	V	-63.24	-57.00	-6.24
538.01	H	-63.86	-57.00	-6.86
663.82	V	-62.09	-57.00	-5.09
663.87	H	-62.84	-57.00	-5.84
698.59	V	-67.46	-57.00	-10.46
748.19	V	-67.42	-57.00	-10.42
752.36	H	-66.11	-57.00	-9.11
773.70	H	-66.44	-57.00	-9.44
818.43	V	-64.91	-57.00	-7.91
949.06	H	-67.09	-57.00	-10.09

Above 1GHz worst-Case Data:

Spurious Emission Frequency Range	1GHz ~ 26GHz	Operating Channel	36, 100

Spurious Emission Level					
Channel	Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
36	6906.00	H	-55.61	-47.00	-8.61
	6906.00	V	-53.62	-47.00	-6.62
100	7333.00	H	-57.31	-47.00	-10.31
	7333.00	V	-54.61	-47.00	-7.61

Dipole Antenna

Below 1GHz worst-Case Data:

Spurious Emission Frequency Range	30MHz ~ 1GHz	Operating Channel	36

Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
37.11	V	-62.65	-57.00	-5.65
53.08	H	-60.98	-57.00	-3.98
88.55	H	-60.35	-57.00	-3.35
99.79	V	-60.63	-57.00	-3.63
128.35	H	-60.33	-57.00	-3.33
144.02	V	-65.31	-57.00	-8.31
165.16	V	-66.94	-57.00	-9.94
232.62	V	-67.67	-57.00	-10.67
298.74	H	-60.88	-57.00	-3.88
298.91	V	-63.57	-57.00	-6.57
538.31	H	-61.12	-57.00	-4.12
554.42	H	-64.02	-57.00	-7.02
663.87	H	-62.71	-57.00	-5.71
666.45	V	-62.56	-57.00	-5.56
698.29	H	-62.94	-57.00	-5.94
699.78	V	-62.58	-57.00	-5.58
764.15	V	-67.27	-57.00	-10.27
767.19	H	-64.90	-57.00	-7.90
835.54	V	-67.72	-57.00	-10.72
874.54	H	-64.54	-57.00	-7.54

Above 1GHz worst-Case Data:

Spurious Emission Frequency Range	1GHz ~ 26GHz	Operating Channel	36, 100

Spurious Emission Level					
Channel	Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
36	6906.00	H	-55.89	-47.00	-8.89
	6906.00	V	-54.62	-47.00	-7.62
100	7333.00	H	-58.33	-47.00	-11.33
	7333.00	V	-53.83	-47.00	-6.83

4.8 Adaptivity

4.8.1 Product information for Adaptivity (Channel Access Mechanism)

Adaptivity (Channel Access Mechanism)	
☐Frame Based Equipment	☐ The Frame Based Equipment operates as an Initiating Device
	☐ The Frame Based Equipment operates as an Responding Device
	☐ The Frame Based Equipment can operate as an Initiating Device and as a Responding Device
☒Load Based Equipment	☐ The Load Based Equipment operates as a Supervising Device
	☒ The Load Based Equipment operates as a Supervised Device
	☐ The Load Based Equipment can operate as a Supervising and as a Supervised Device

Priority Classes implemented by the Load Based Equipment	
☐Operating as a Supervising Device	☐ Priority Class 4 (Highest priority)
	☐ Priority Class 3
	☐ Priority Class 2 ☐ Note 1 ☐ Note 2
	☐ Priority Class 1 (Lowest priority) ☐ Note 1
☒Operating as a Supervised Device	☐ Priority Class 4 (Highest priority)
	☐ Priority Class 3
	☒ Priority Class 2 ☐ Note 1
	☐ Priority Class 1 (Lowest priority) ☐ Note 1

Energy Detection Threshold Level (TL)	
☐Frame Based Equipment	For $P_H \leq 13$ dBm : TL = -75 dBm/MHz For 13 dBm < P_H < 23 dBm : TL = -85 dBm/MHz + (23 dBm - P_H) For $P_H \geq 23$ dBm : TL = -85 dBm/MHz (assumes a 0 dBi receive antenna and P_H to be specified in dBm e.i.r.p)
☒Load Based Equipment	☒ Option 1: TL = -75 dBm/MHz (assumes a 0 dBi receive antenna)
	☐ Option 2: For $P_H \leq 13$ dBm : TL = -75 dBm/MHz For 13 dBm < P_H < 23 dBm : TL = -85 dBm/MHz + (23 dBm - P_H) For $P_H \geq 23$ dBm : TL = -85 dBm/MHz (assumes a 0 dBi receive antenna and P_H to be specified in dBm e.i.r.p)

4.8.2 Requirements and Limits of Adaptive

Channel Access Mechanism		
Requirement	**Frame Based Equipment**	**Load Based Equipment**
Minimum Clear Channel Assessment (CCA) Time	9 µs	9 µs
Maximum Channel Occupancy (COT) Time	95 % of the Fixed Frame Period (Note 1)	2 ~ 10 ms(See Table 1 & 2)
Minimum Idle Period	5% COT, with a min of 100 µs	25µs
Extended CCA check	NA	NA
Short Control Signalling Transmissions	Maximum duty cycle of 5 % within an observation period of 50 ms	
Note 1: The Fixed Frame Periods supported by the equipment shall be declared by the manufacturer and shall be within the range of 1 ms to 10 ms.		

Table 1: Priority Class dependent Channel Access parameters for Supervising Devices

Class #	**p_0**	**CW_{min}**	**CW_{max}**	**maximum Channel Occupancy Time (COT)**
4	1	3	7	2 ms
3	1	7	15	4 ms
2	3	15	63	6 ms (see note 1 and note 2)
1	7	15	1 023	6 ms (see note 1)
NOTE 1: The maximum *Channel Occupancy Time* (COT) of 6 ms may be increased to 8 ms by inserting one or more pauses. The minimum duration of a pause shall be 100 µs. The maximum duration (Channel Occupancy) before including any such pause shall be 6 ms. Pause duration is not included in the channel occupancy time. NOTE 2: The maximum Channel Occupancy Time (COT) of 6 ms may be increased to 10 ms by extending CW to CW × 2 + 1 when selecting the random number q for any backoff(s) that precede the Channel Occupancy that may exceed 6 ms or which follow the Channel Occupancy that exceeded 6 ms. The choice between preceding or following a Channel Occupancy shall remain unchanged during the operation time of the device. NOTE 3: The values for p_0, CW_{min}, CW_{max} are minimum values. Greater values are allowed.				

Table 2: Priority Class dependent Channel Access parameters for Supervised Devices

Class #	**p_0**	**CW_{min}**	**CW_{max}**	**Maximum Channel Occupancy Time (COT)**
4	2	3	7	2 ms
3	2	7	15	4 ms
2	3	15	1 023	6 ms (see note 1)
1	7	15	1 023	6 ms (see note 1)
NOTE 1: The maximum *Channel Occupancy Time* (COT) of 6 ms may be increased to 8 ms by inserting one or more pauses. The minimum duration of a pause shall be 100 µs. The maximum duration (Channel Occupancy) before including any such pause shall be 6 ms. Pause duration is not included in the channel occupancy time. NOTE 2: The values for p_0, CW_{min}, CW_{max} are minimum values. Greater values are allowed.				

Table 3: Classification of Idle Periods dependent Priority Class for Supervising Devices

Class #	Idle Periods Classification
4	$B_n = \begin{cases} [0, 23[\ \mu s, & n = 0 \\ [23 + 9 \times (n-1), 23 + 9 \times n[\ \mu s, & 1 \le n \le 3 \\ [50, \infty[\ \mu s, & n = 4 \end{cases}$
3	$B_n = \begin{cases} [0, 23[\ \mu s, & n = 0 \\ [23 + 9 \times (n-1), 23 + 9 \times n[\ \mu s, & 1 \le n \le 7 \\ [86, \infty[\ \mu s, & n = 8 \end{cases}$
2	$B_n = \begin{cases} [0, 41[\ \mu s, & n = 0 \\ [41 + 9 \times (n-1), 41 + 9 \times n[\ \mu s, & 1 \le n \le 31 \\ [320, \infty[\ \mu s, & n = 32 \end{cases}$ (use of note 2 in table 1) $B_n = \begin{cases} [0, 41[\ \mu s, & n = 0 \\ [41 + 9 \times (n-1), 41 + 9 \times n[\ \mu s, & 1 \le n \le 15 \\ [176, \infty[\ \mu s, & n = 16 \end{cases}$ (not use of note 2 in table 1)
1	$B_n = \begin{cases} [0, 77[\ \mu s, & n = 0 \\ [77 + 9 \times (n-1), 77 + 9 \times n[\ \mu s, & 1 \le n \le 15 \\ [212, \infty[\ \mu s, & n = 16 \end{cases}$

Table 4: Classification of Idle Periods dependent Priority Class for Supervised Devices

Class #	Idle Periods Classification
4	$B_n = \begin{cases} [0, 32[\ \mu s, & n = 0 \\ [32 + 9 \times (n-1), 32 + 9 \times n[\ \mu s, & 1 \le n \le 3 \\ [59, \infty[\ \mu s, & n = 4 \end{cases}$
3	$B_n = \begin{cases} [0, 32[\ \mu s, & n = 0 \\ [32 + 9 \times (n-1), 32 + 9 \times n[\ \mu s, & 1 \le n \le 7 \\ [95, \infty[\ \mu s, & n = 8 \end{cases}$
2	$B_n = \begin{cases} [0, 41[\ \mu s, & n = 0 \\ [41 + 9 \times (n-1), 41 + 9 \times n[\ \mu s, & 1 \le n \le 15 \\ [176, \infty[\ \mu s, & n = 16 \end{cases}$
1	$B_n = \begin{cases} [0, 77[\ \mu s, & n = 0 \\ [77 + 9 \times (n-1), 77 + 9 \times n[\ \mu s, & 1 \le n \le 15 \\ [212, \infty[\ \mu s, & n = 16 \end{cases}$

Table 5: Idle Periods probability dependent Priority Class

Class #	Idle Periods probability
4	$p(n) \leq \begin{cases} 0{,}05, & n = 0 \\ 0{,}05 + n \times 0{,}25, & 1 \leq n \leq 3 \\ 1, & n > 3 \end{cases}$
3	$p(n) \leq \begin{cases} 0{,}05, & n = 0 \\ 0{,}18, & n = 1 \\ 0{,}18 + (n-1) \times 0{,}125, & 2 \leq n \leq 6 \\ 1, & n > 6 \end{cases}$
2	$p(n) \leq \begin{cases} 0{,}05, & n = 0 \\ 0{,}12, & n = 1 \\ 0{,}12 + (n-1) \times 0{,}03125, & 2 \leq n \leq 29 \\ 1, & n > 29 \end{cases}$ (use of note 2 in table 1) $p(n) \leq \begin{cases} 0{,}05, & n = 0 \\ 0{,}12, & n = 1 \\ 0{,}12 + (n-1) \times 0{,}0625, & 2 \leq n \leq 15 \\ 1, & n > 15 \end{cases}$ (not use of note 2 in table 1) $p(n) \leq \begin{cases} 0{,}05, & n = 0 \\ 0{,}09 + (n-1) \times 0{,}03125, & 1 \leq n \leq 7 \\ 0{,}59 + (n-1) \times 0{,}03125, & 8 \leq n \leq 14 \\ 1, & n > 14 \end{cases}$ (use of note 1 in table 1 & table 2)
1	$p(n) \leq \begin{cases} 0{,}05, & n = 0 \\ 0{,}12, & n = 1 \\ 0{,}12 + (n-1) \times 0{,}0625, & 2 \leq n \leq 15 \\ 1, & n > 15 \end{cases}$

1. E define the total number of Idle Periods observed. Then E is the sum of events in all bins:
$$E = \sum_{n=0}^{k} H(B_n)$$

2. p(n) define the probability that idle periods of duration less than the upper limit specified for bin B_n occurred, p(n) = p (Idle Period < upper limit of bin B_n)
$$p(n) = \frac{\sum_{i=0}^{n} H(B_i)}{E}$$

4.8.3 Test Procedure

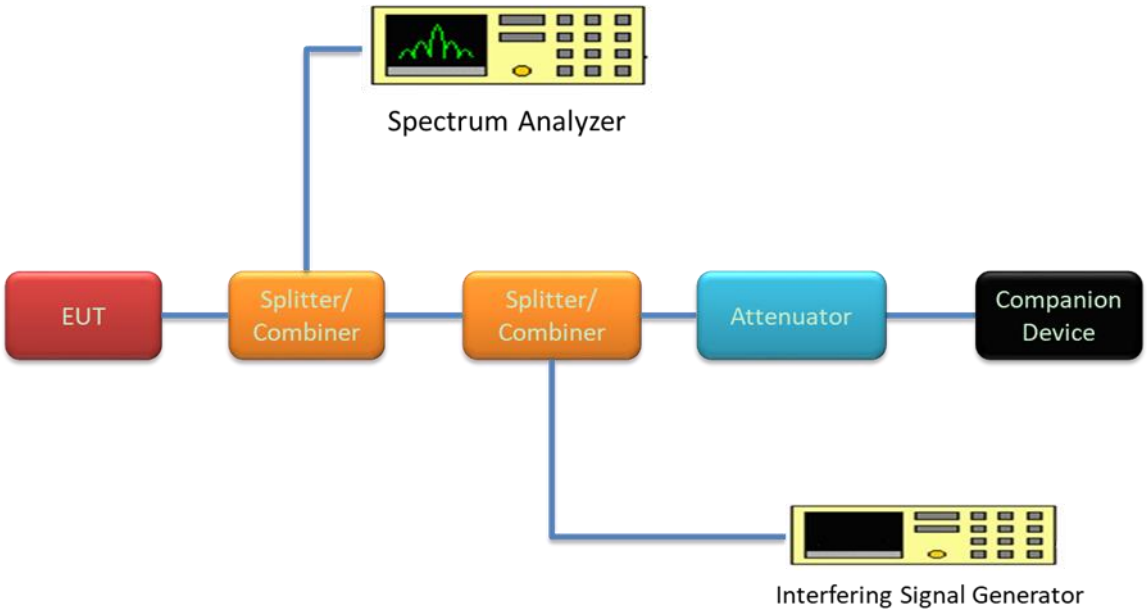
Refer to EN 301 893 V2.1.1 clause 5.4.9

Measurement Method	
☒ Conducted measurement	☐ Radiated measurement

4.8.4 Deviation from Test Standard

No deviation.

4.8.5 Test Setup Configuration



Companion Device information

Product	Brand	Model No.	Software/Firmware Version
AX3000 4-Stream WiFi Router	NETGEAR	RAX40v2	V1.0.2.24_2.0.32

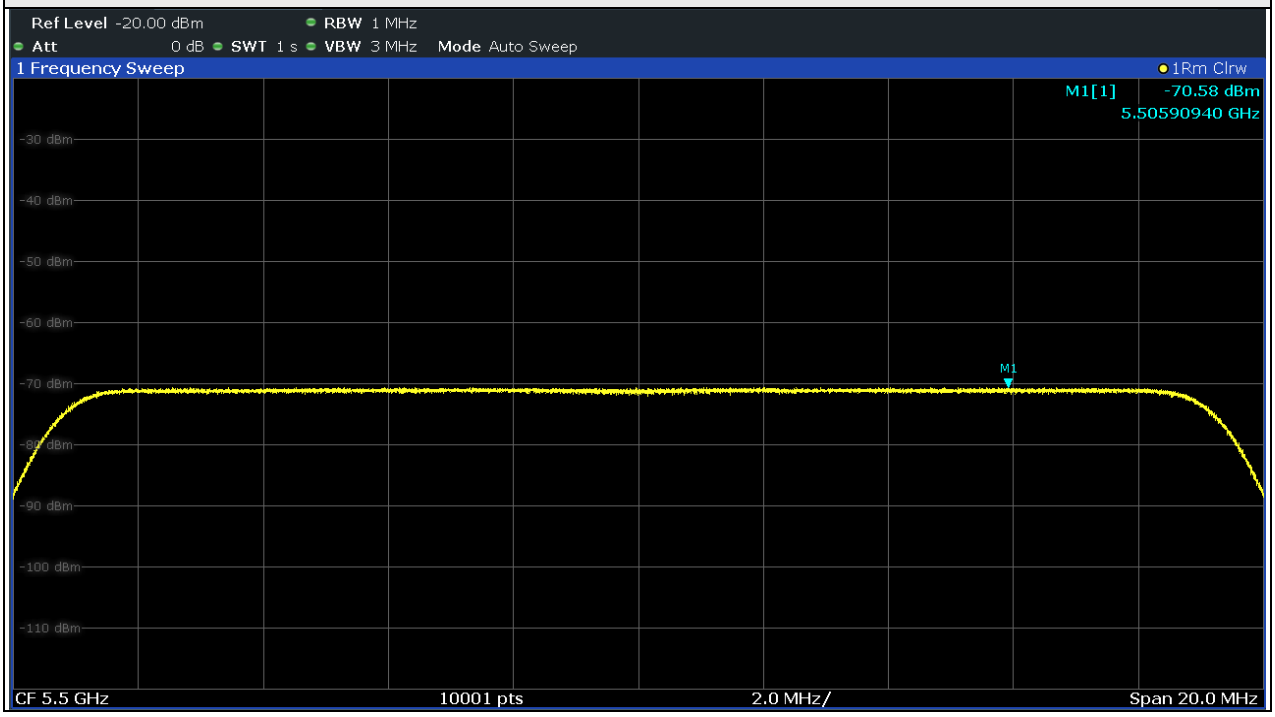
4.8.6 List of Measurement

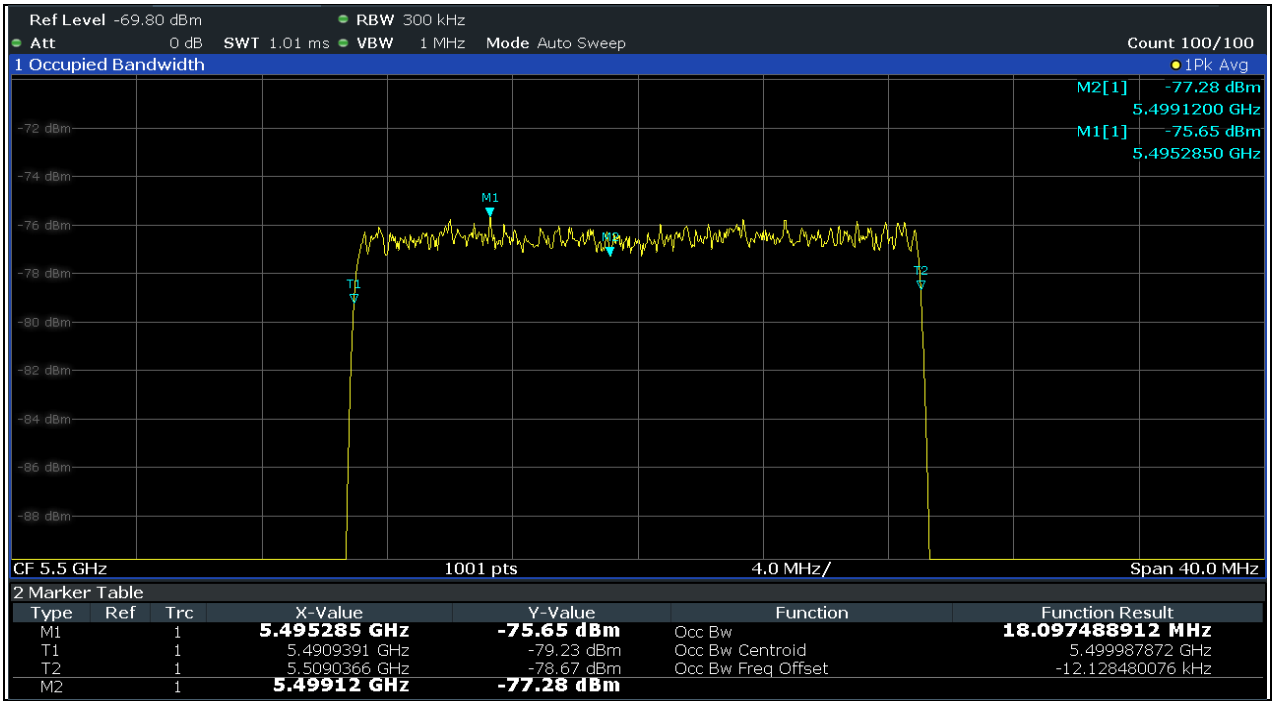
Clause	Test Parameter	Remarks	Pass/Fail
4.2.7.3.1	Adaptive (Frame Based Equipment)	Not Applicable	NA
4.2.7.3.2	Adaptive (Load Based Equipment)	Applicable	Pass
4.2.7.3.3	Short Control Signalling Transmissions	Applicable	Pass

4.8.7 Interference Signals used for Adaptivity tests

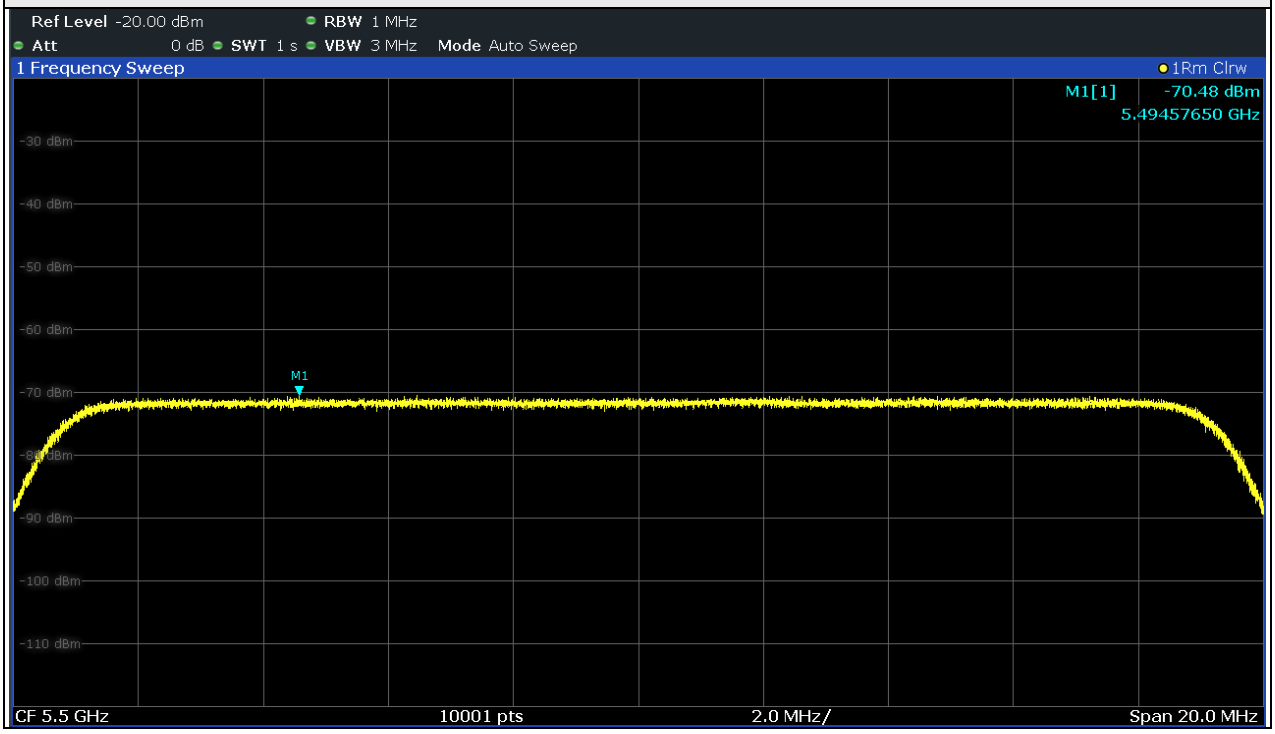
Energy Detection Threshold Level (TL)	
Option 1: TL = -75 dBm/MHz (assumes a 0 dBi receive antenna)	
UUT antenna Gain(G) : 5 dBi	
The ED Threshold level (TL) = -75 dBm/MHz + G (5dBi) = -70 dBm/MHz	☒ at the antenna connector ☐ in front of the antenna

Additive White Gaussian Noise (AWGN) test signal

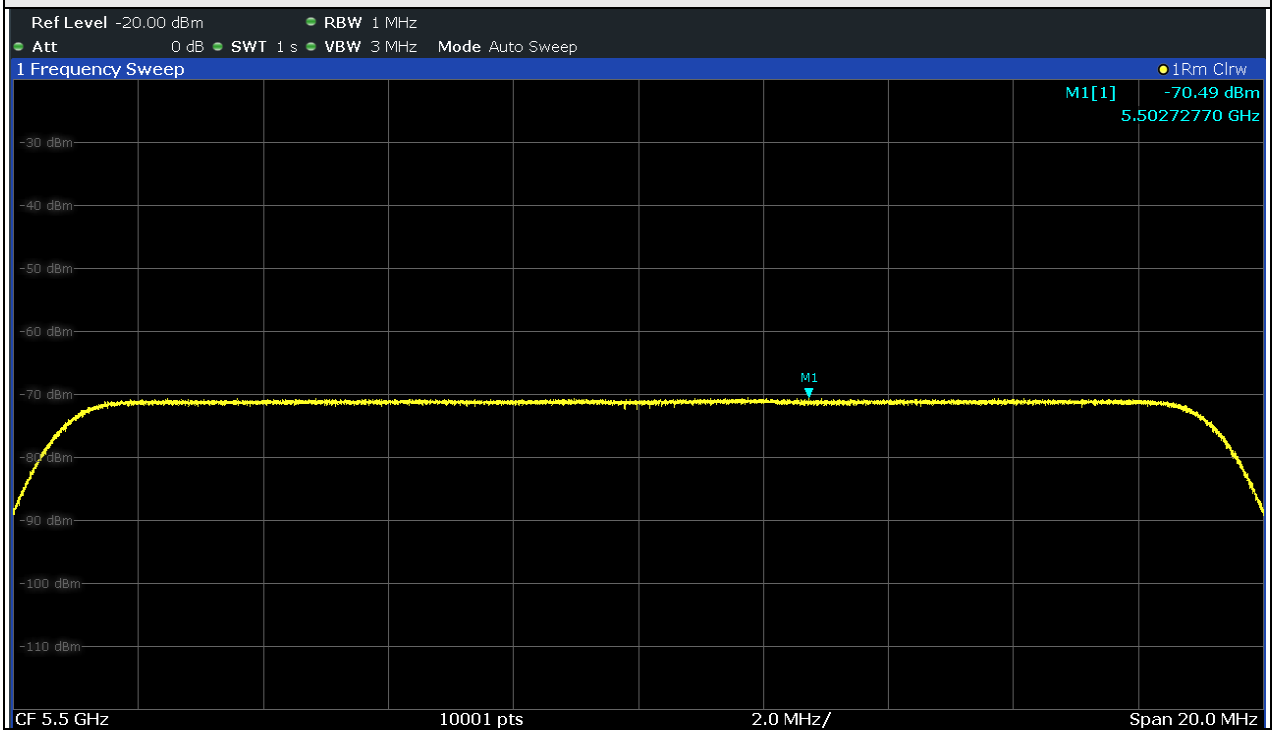




OFDM test signal



LTE test signal



4.8.8 Test Result

4.8.8.1 Adaptive Test Result

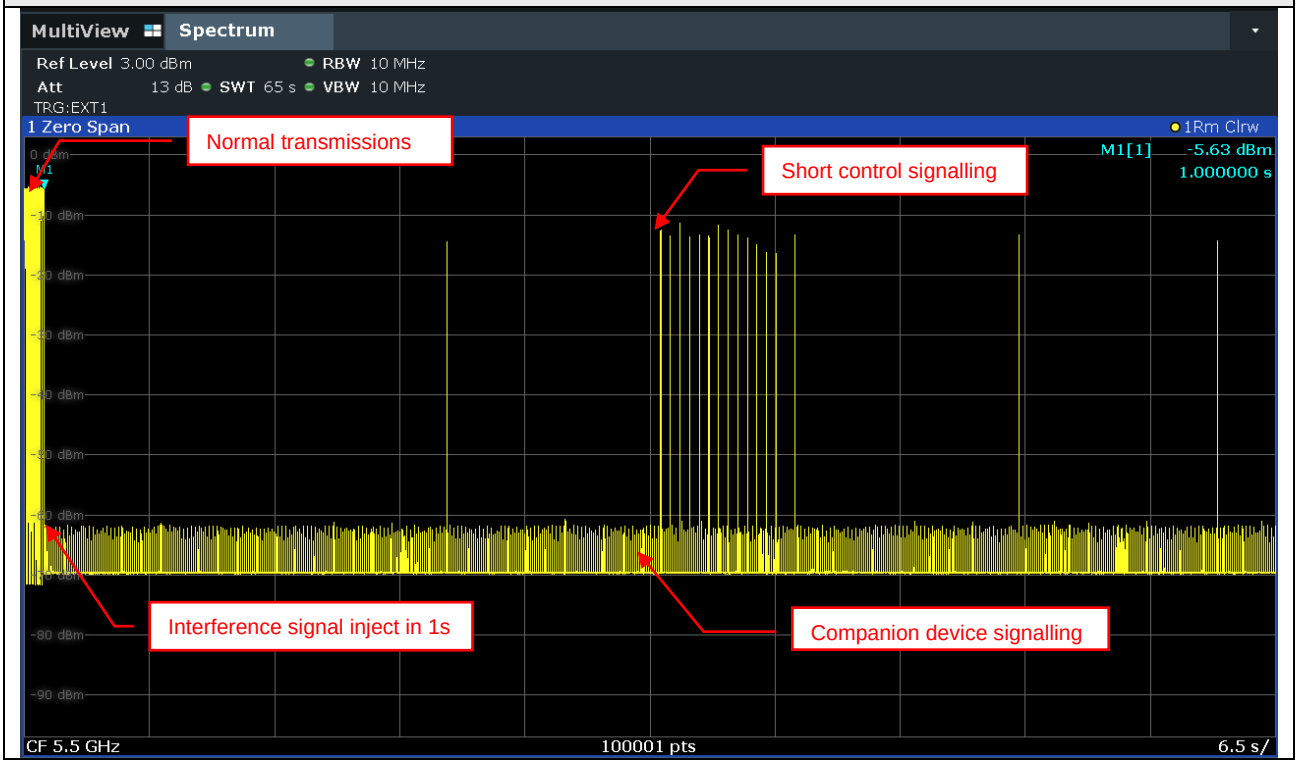
Channel Operation of EUT Device type

☐Frame Based Equipment	☐ Single Channel Operation
	☐ Multi-Channel Operation
☒Load Based Equipment	☒ Single Channel Operation
	☐ Option 1 for Multi-Channel Operation
	☒ Option 2 for Multi-Channel Operation

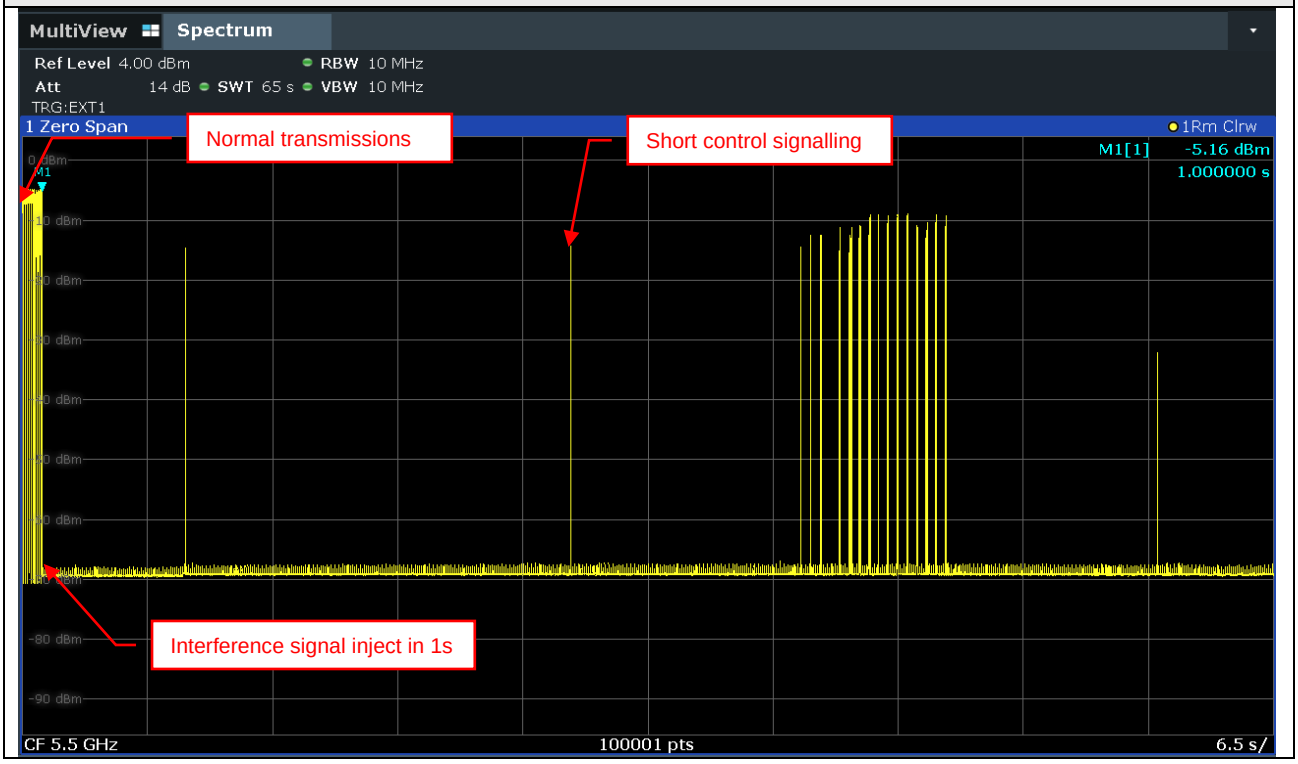
Operating Frequency Bands and Mode of EUT

Operational Mode	Operating Frequency (MHz)	Test Result
802.11ax (HE20)	5500	Pass

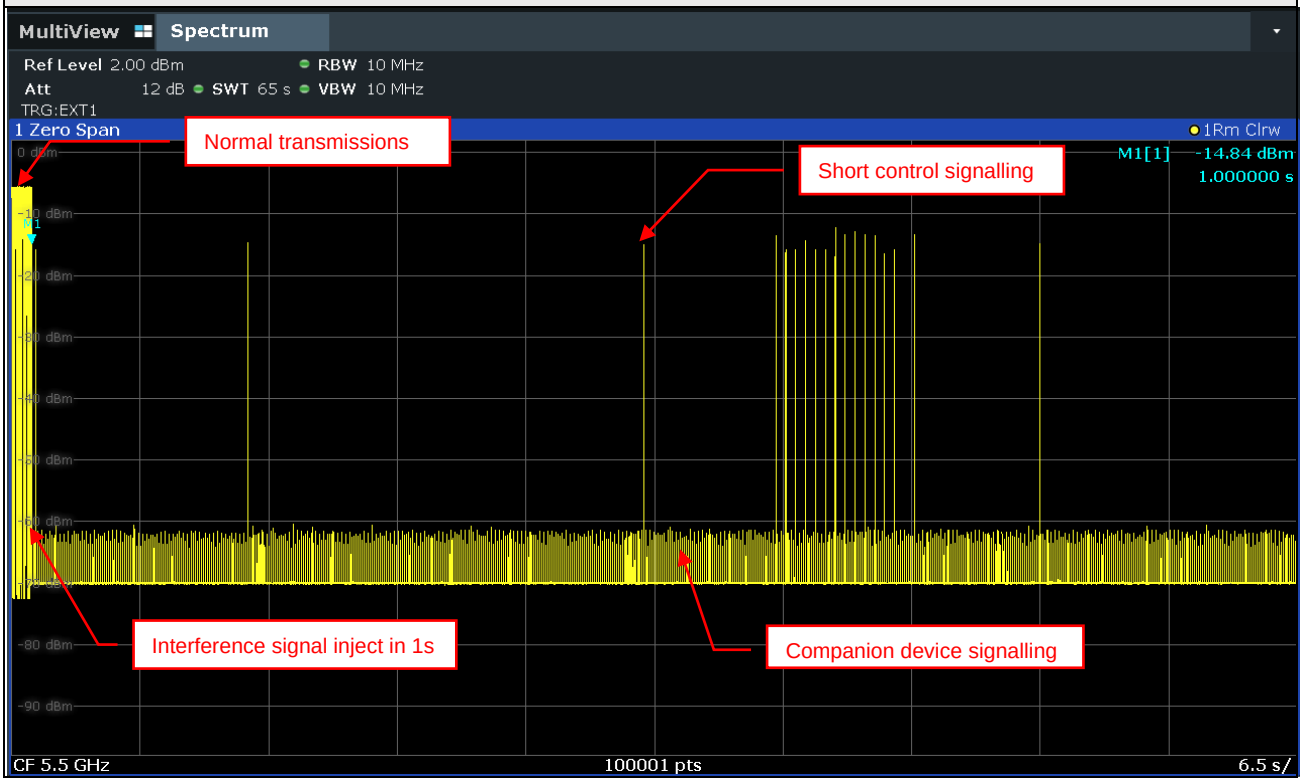
Additive White Gaussian Noise (AWGN) signal test result



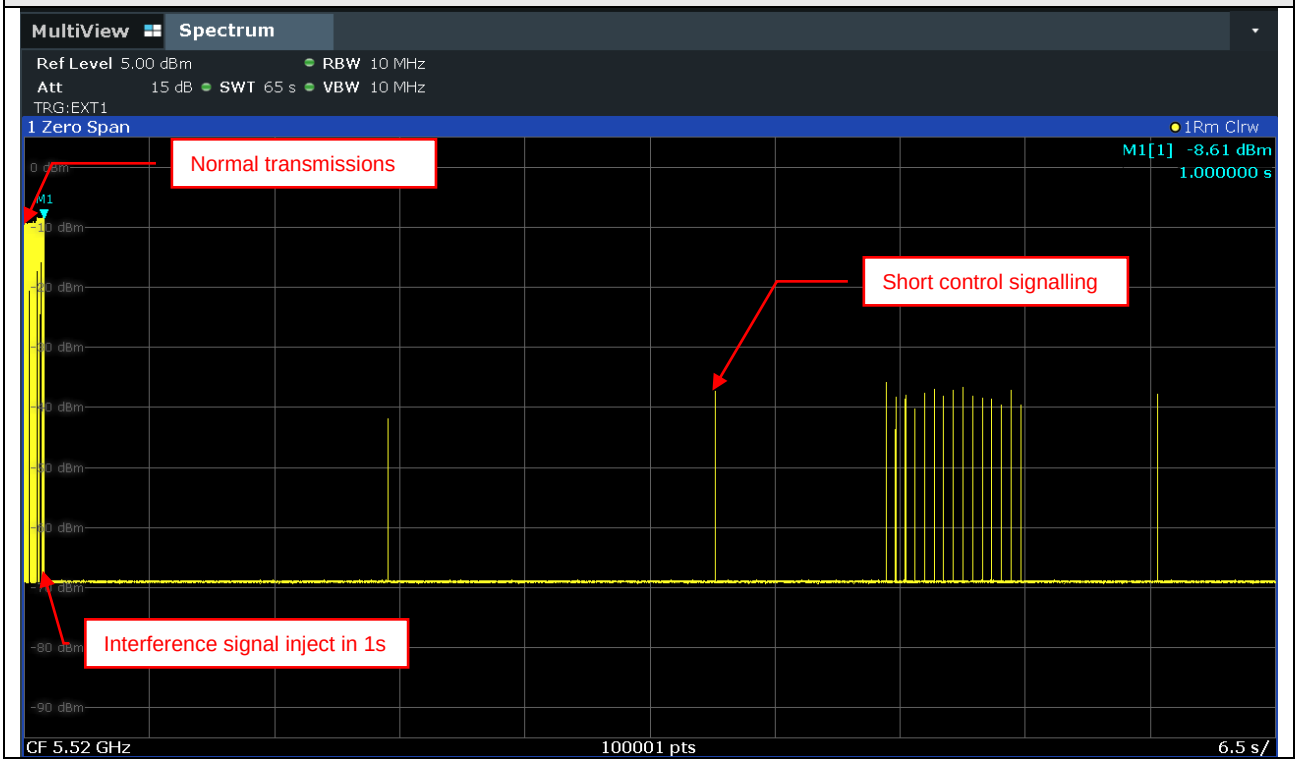
OFDM signal test result



LTE test signal



Operational Mode	Operating Frequency (MHz)	Test Result
802.11ax (HE40)	5510	Pass

Additive White Gaussian Noise (AWGN) signal test result


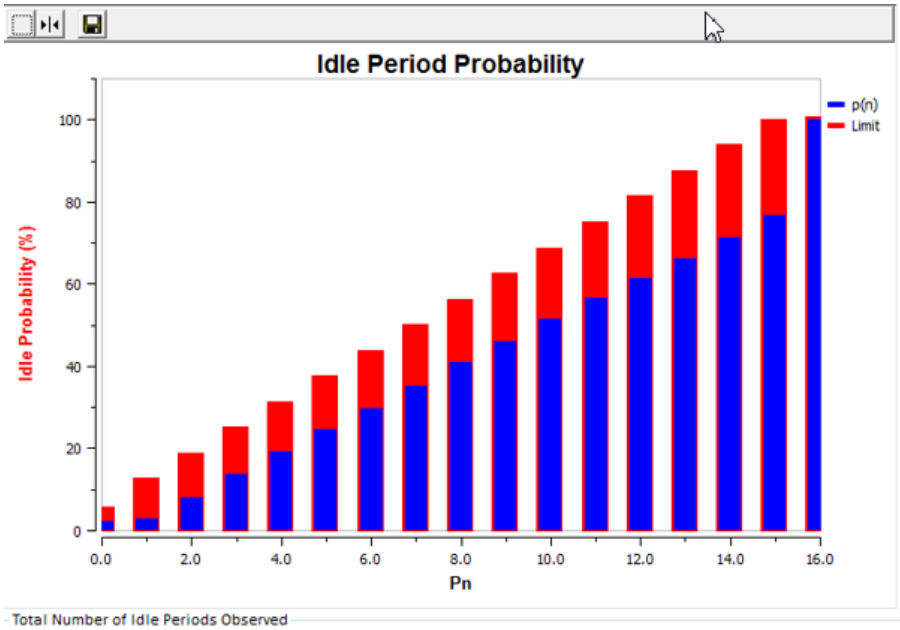
4.8.8.2 Test Results of Channel Access Mechanism

Channel Access Mechanism of EUT Type

☐Frame Based Equipment	
☒Load Based Equipment	☒ Option A : verify channel access mechanism
	☐ Option B : declaration by manufacturer

Operating Frequency Bands and Mode of EUT

Operational Mode	Operating Frequency (MHz)	Maximum Channel Occupancy Time (ms)	Minimum Idle Period (μs)	Test Result
802.11ax (HE40)	5510	5.594	27.344	Pass



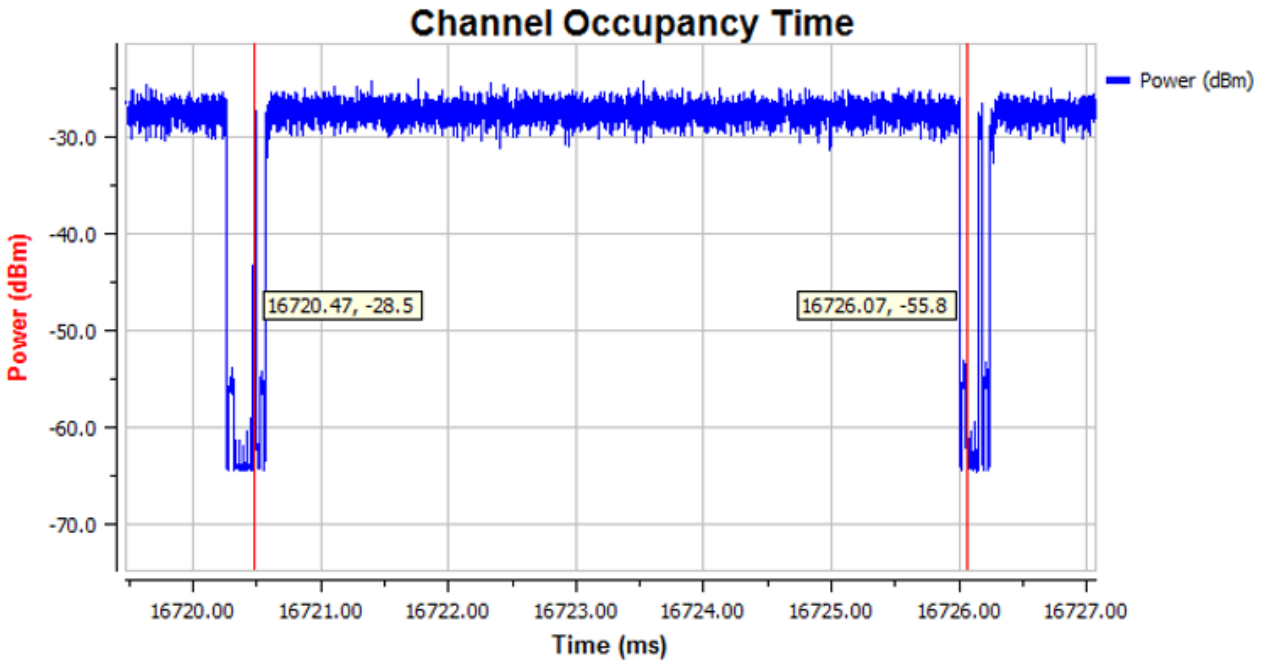
Maximum Probability of Each Idle Period

P(n)	Result (%)	Limit (%)	Status
0	2.26	5	Pass
1	2.81	12	Pass
2	8.06	18.25	Pass
3	13.87	24.5	Pass
4	19.16	30.75	Pass
5	24.68	37	Pass
6	29.7	43.25	Pass
7	35.15	49.5	Pass
8	40.81	55.75	Pass
9	46.03	62	Pass
10	51.46	68.25	Pass
11	56.56	74.5	Pass
12	61.52	80.75	Pass
13	66.24	87	Pass
14	71.28	93.25	Pass
15	76.68	99.5	Pass
16	100	100	Pass

Total Number of Idle Periods Observed

Total Idle Period Number : 10013

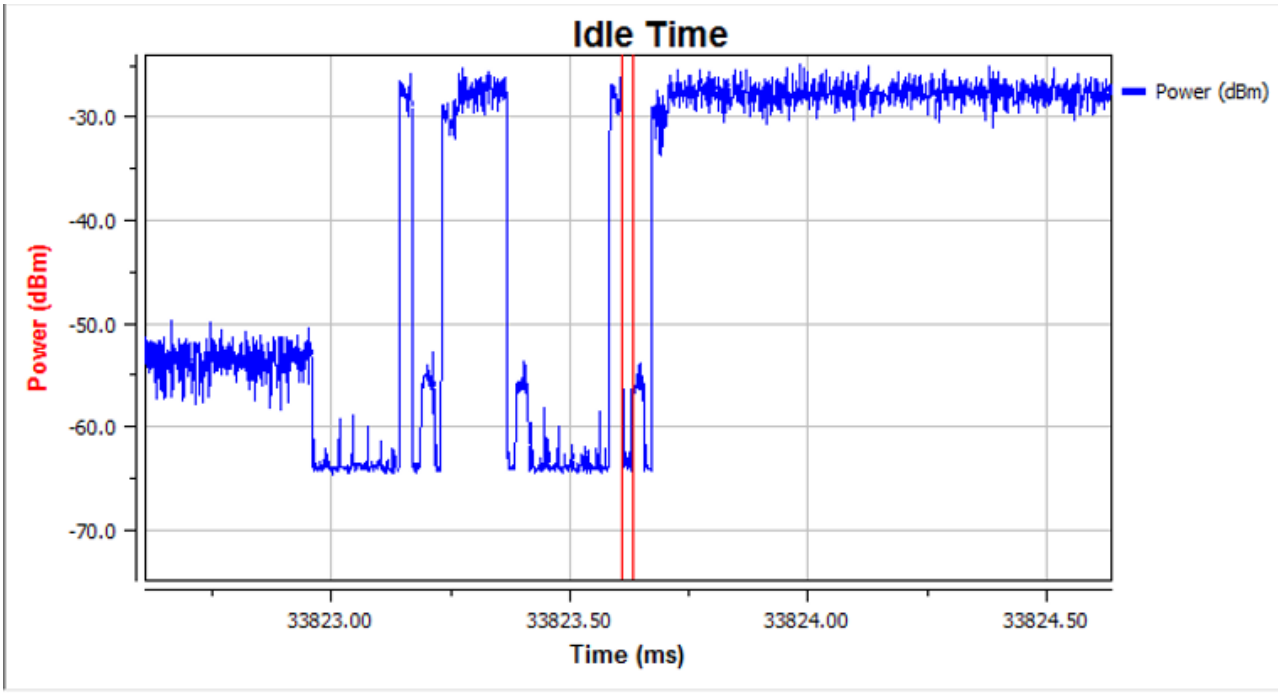
Maximum Channel Occupancy Time



Channel Occupency Information

Maximum COT (ms) : 5.594

Minimum Idle Period



Channel Occupency Information

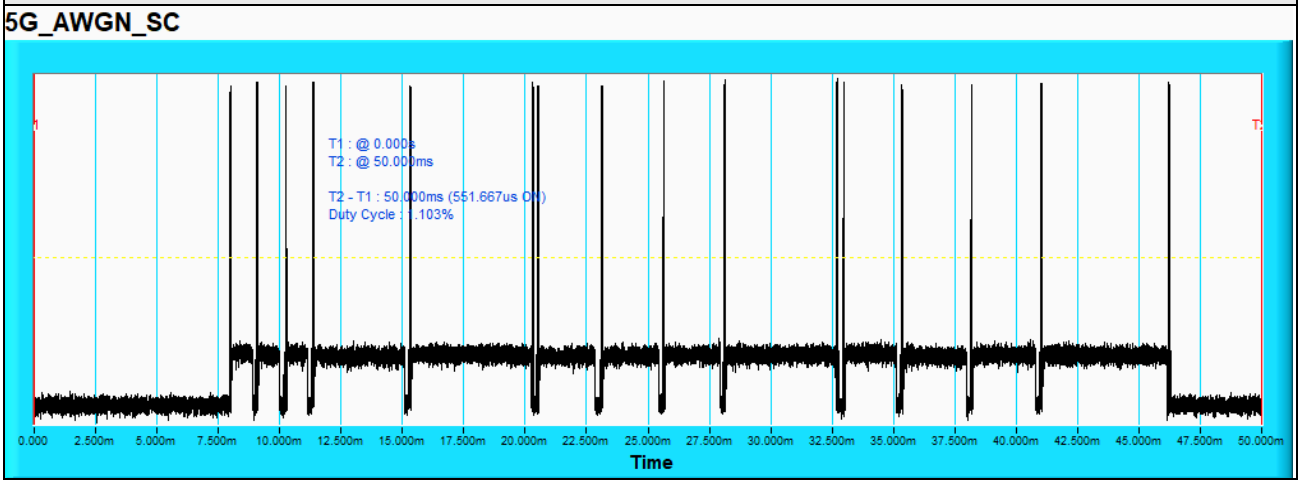
Minimum Idle Time (us) : 27.344

4.8.8.3 Short Control Signalling Transmissions Result

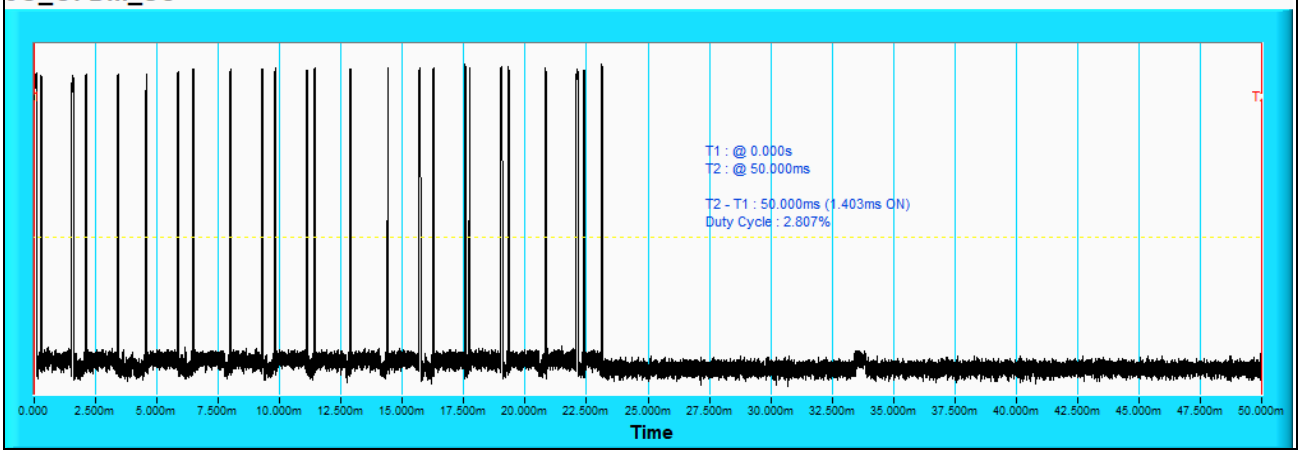
802.11ax (HE20) mode CH100 5500MHz

Short Control Signalling Transmission Result			
Interference signal	Total duration of SCST(ms)	Limit (ms)	Pass/Fail
AWGN signal	0.55	2.5	Pass
OFDM signal	1.4	2.5	Pass
LTE signal	0.6	2.5	Pass

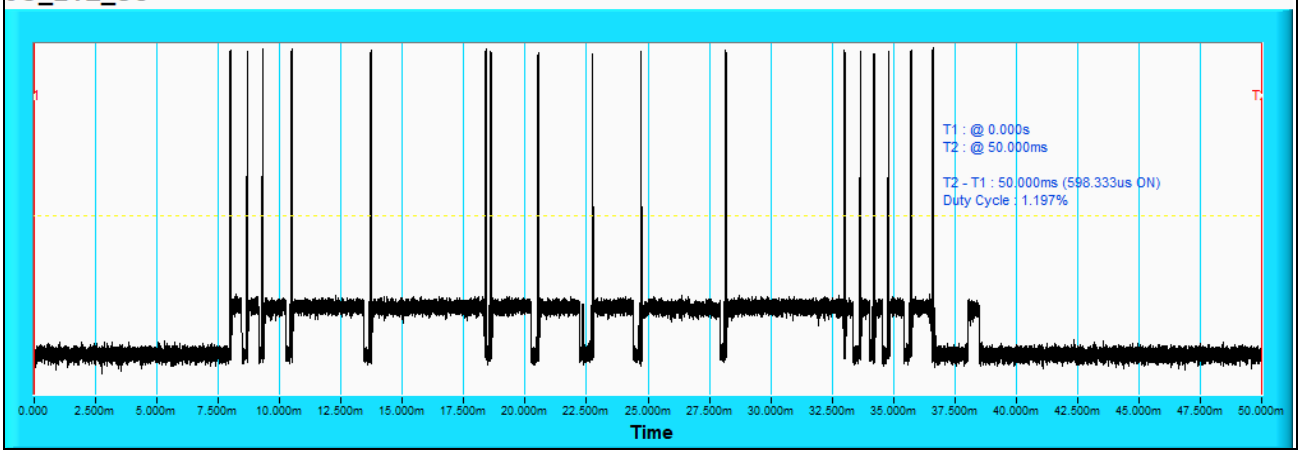
AWGN signal test result



OFDM signal test result



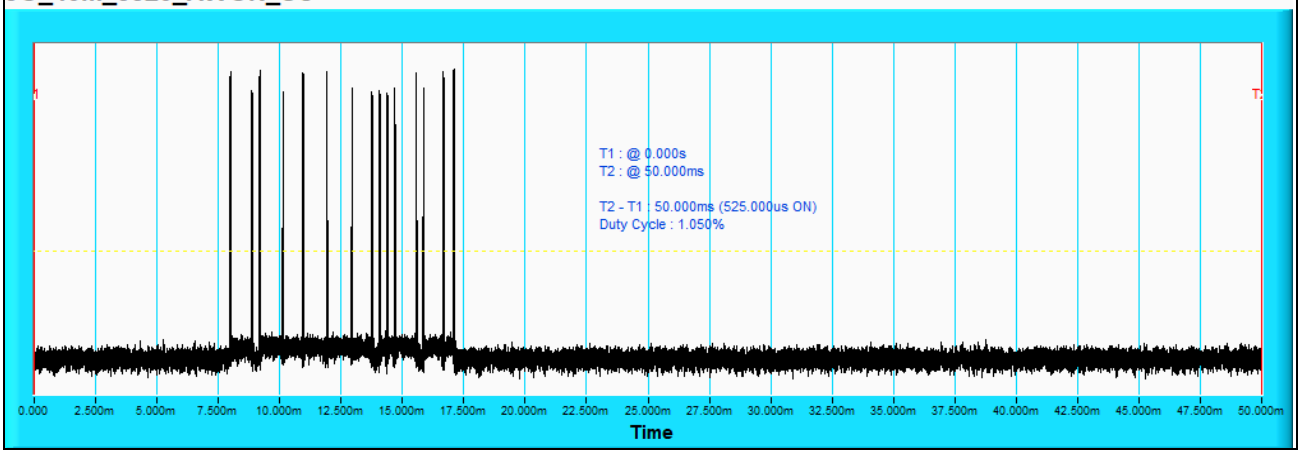
LTE signal test result
5G_LTE_SC



802.11ax (HE40) mode CH102 5510MHz

Short Control Signalling Transmission Result			
Interference of signal	Total duration of SCST(ms)	Limit (ms)	Pass/Fail
AWGN signal	0.53	2.5	PASS

AWGN signal test result
5G_40M_5520_AWGN_SC



4.9 Receiver Blocking

4.9.1 Limit of Receiver Blocking

Receiver Blocking Criterion	
Minimum performance criterion	☒PER ≦10%
	☐Alternative performance criteria (See note)
Note: The manufacturer was declared performance criteria is x% for the intended use of the equipment.	

Receiver Blocking Parameters				
Wanted signal mean power from companion device (dBm)	**Blocking Signal Frequency (MHz)**	**Blocking Signal Power (dBm) (See note 2)**		**Type of blocking signal**
		Master or Slave with radar detection (see note 3)	**Slave without radar detection (see note 3)**	
P_{min} + 6 dB	5100	-53	-59	Continuous Wave
P_{min} + 6 dB	4900 5000 5975	-47	-53	Continuous Wave

Note 1: P_{min} is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria as defined in clause 4.2.8.3 in the absence of any blocking signal.
Note 2: The levels specified are levels in front of the UUT antenna. In case of conducted measurements, the same levels should be used at the antenna connector irrespective of antenna gain.
Note 3: Slave devices with a maximum e.i.r.p. of less than 23 dBm do not have to implement radar detection unless these devices are used in fixed outdoor point to point or fixed outdoor point to multipoint applications

4.9.2 Test Procedure

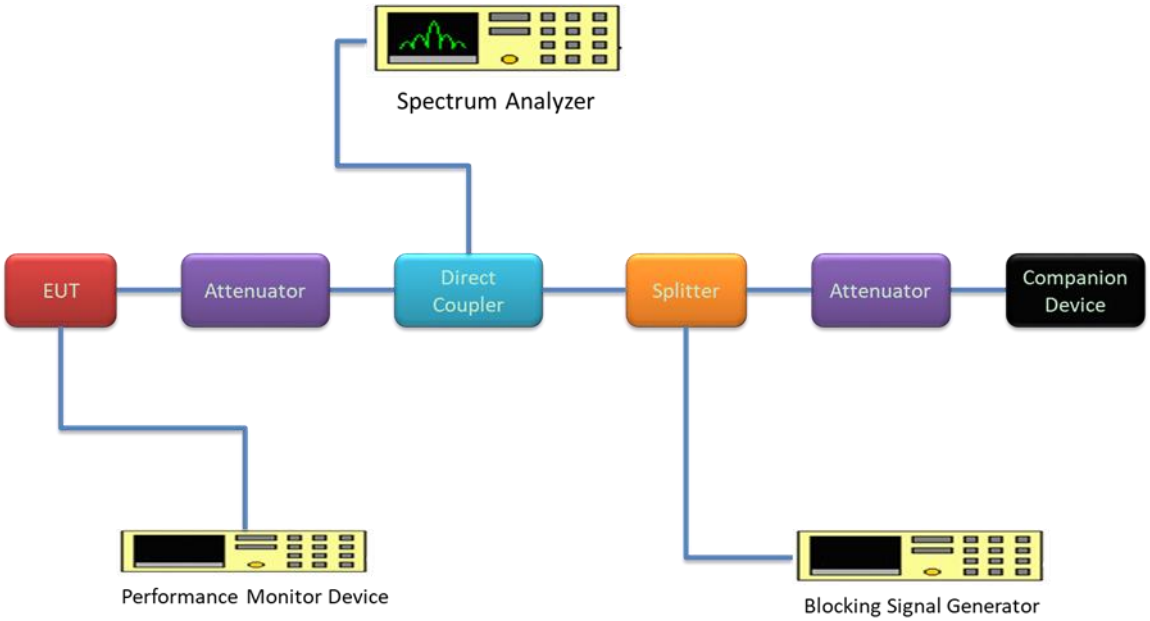
Refer to EN 301 893 V2.1.1 clause 5.4.10

Measurement Method	
☒ Conducted measurement	☐ Radiated measurement

4.9.3 Deviation from Test Standard

No deviation.

4.9.4 Test Setup Configuration



4.9.5 Test Results

Receiver Blocking Measure Of The Capability				Blocking Signal Power			
11a	CH 36:	Pmin (dBm):	-92	■ at the antenna connector			
	CH 100:	Pmin (dBm):	-92	□ in front of the antenna			
Operation Mode	**Channel Number**	**Wanted Signal Mean Power From Companion Device (dBm)**	**Blocking Signal Frequency (MHz)**	**The Actual Blocking Signal Power (dBm) (Note 1)**	**The Highest Level At Which The Performance Criteria Are Met (dBm) (Note 1)**	**PER (%)**	**Test Result**
11a	36	-86	5100	-59	-35	2.2	Pass
			4900	-53	-20	1.8	Pass
			5000	-53	-22	1.6	Pass
			5975	-53	-23	2.7	Pass
	100	-86	5100	-59	-18	5.5	Pass
			4900	-53	-18	4.8	Pass
			5000	-53	-18	2.3	Pass
			5975	-53	-23	5.6	Pass
Note: In case of conducted measurements, the same levels should be used at the antenna connector irrespective of antenna gain.							

4.10 User Access Restrictions

4.10.1 Definition

User Access Restrictions are constraints implemented in the RLAN device to restrict access of the user to any hardware and/or software settings of the equipment, including software replacement(s), which may impact (directly or indirectly) the compliance of the equipment with the requirements in the present document.

NOTE: The user should be understood as the end user, the operator or any person not responsible for the compliance of the equipment against the requirements in the present document.

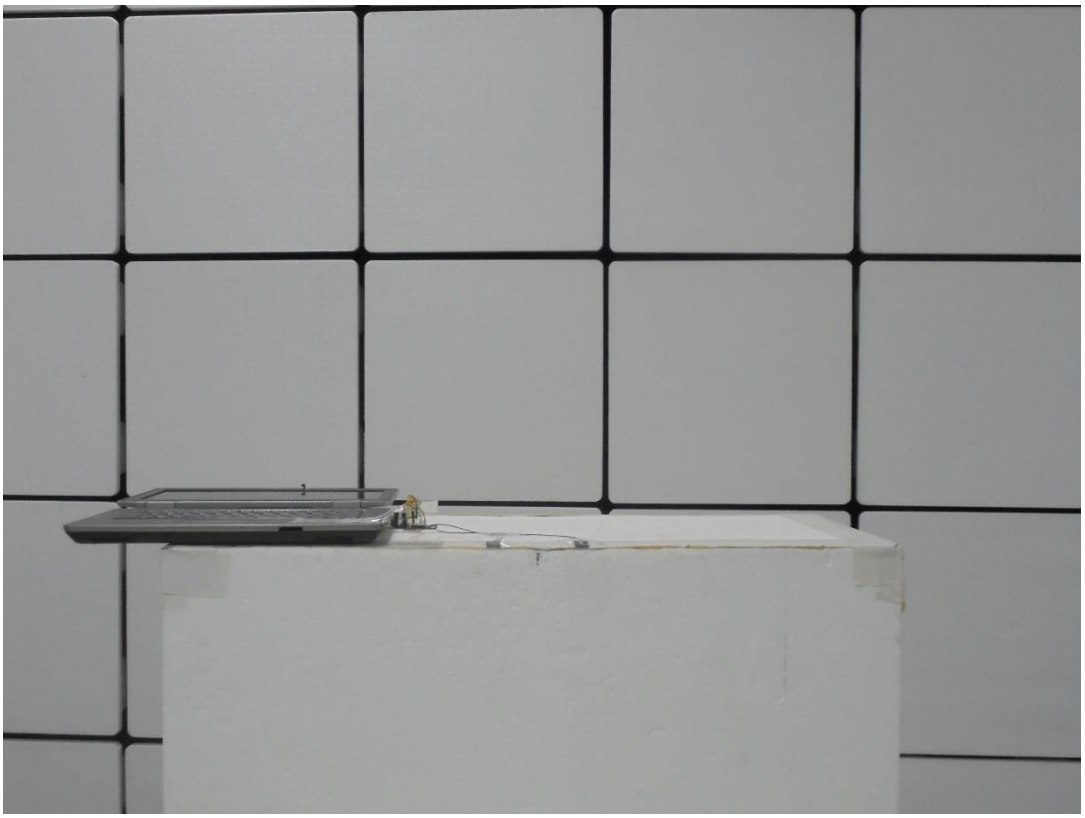
4.10.2 Requirement

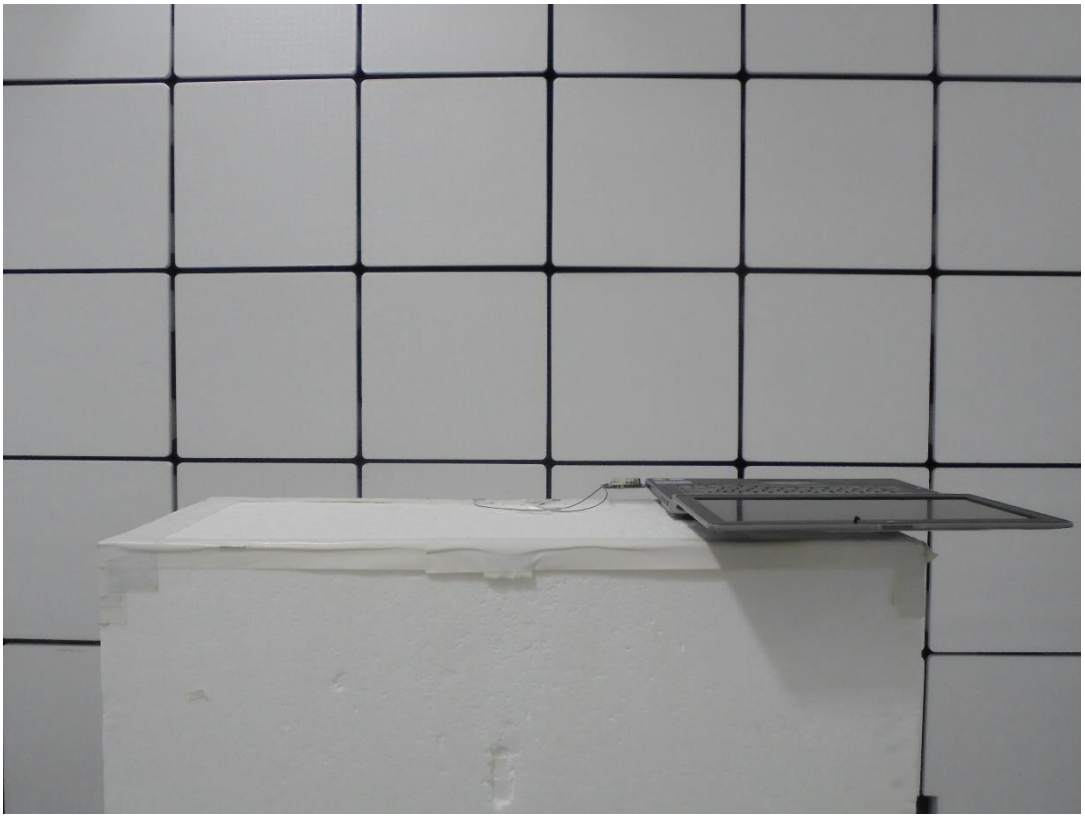
The equipment shall be so constructed that settings (hardware and/or software) related to DFS shall not be accessible to the user if changing those settings result in the equipment no longer being compliant with the DFS requirements in clause 4.2.6.
The above requirement includes the prevention of indirect access to any setting that impacts DFS.

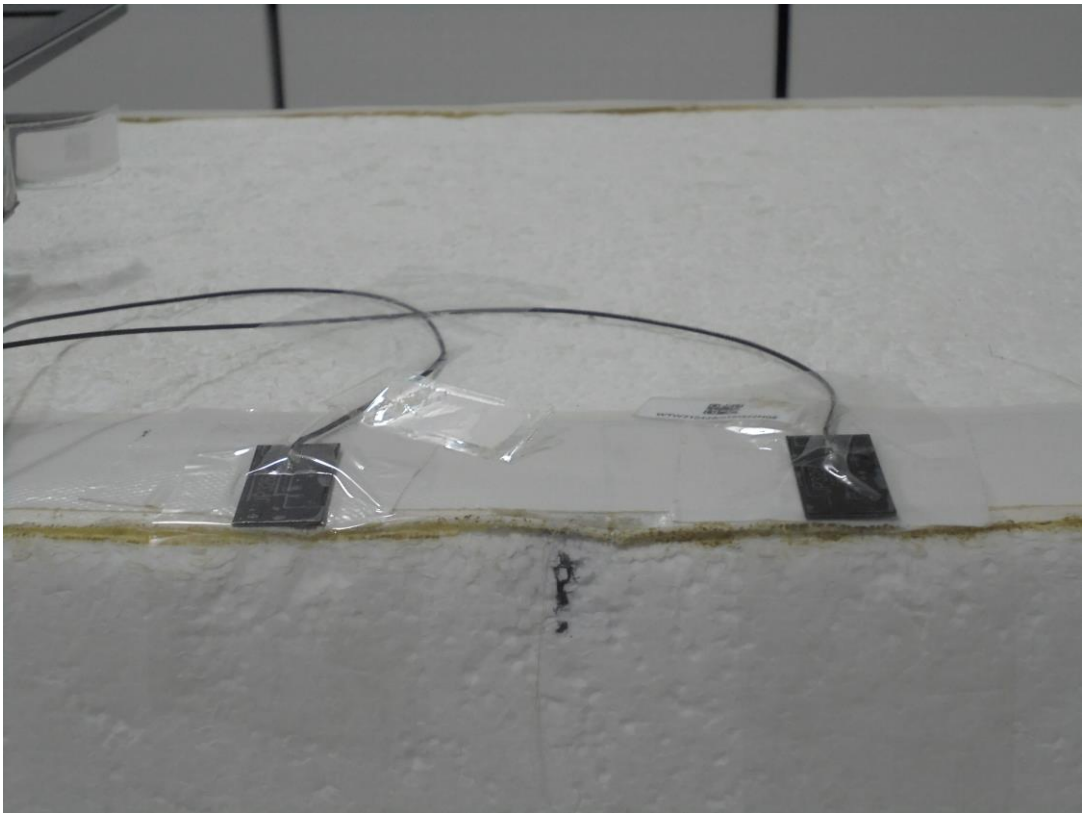
Manufacturer provides declaration form to meet this requirement.

5 Photographs of the Test Configuration

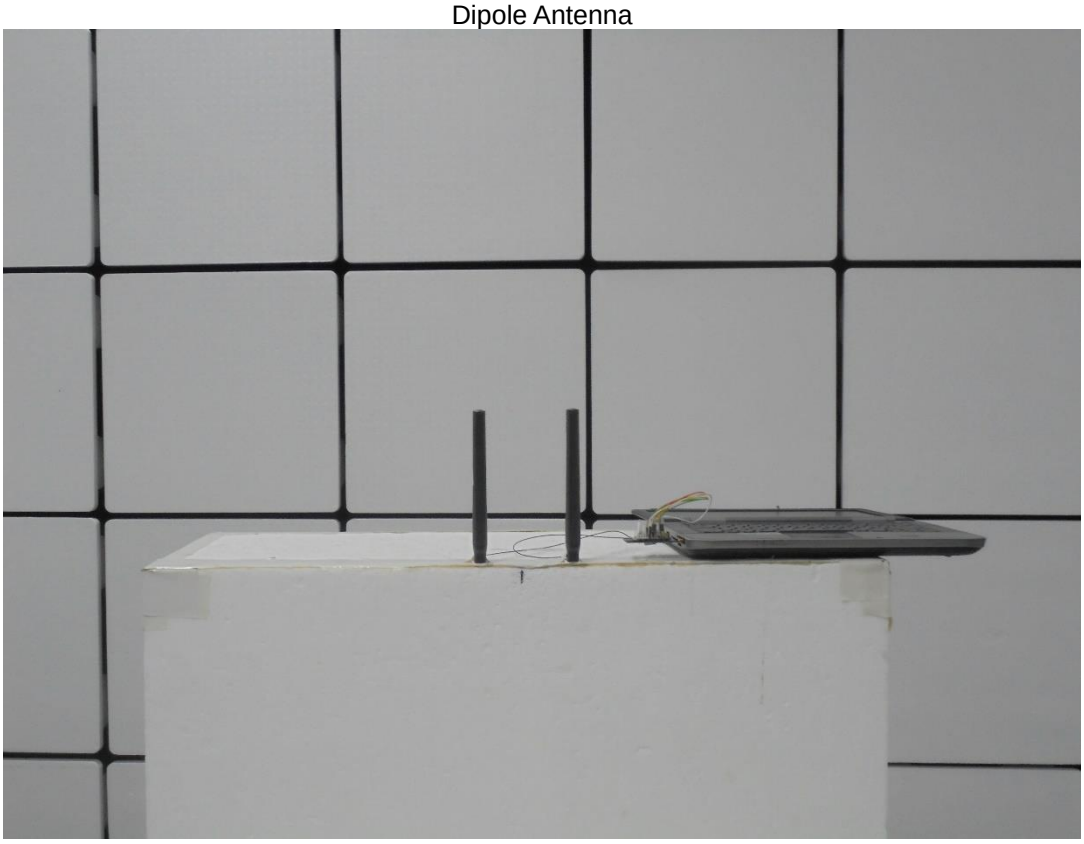
TX / RX Spurious Emission Test
PIFA Antenna







Dipole Antenna



Appendix - Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Lin Kou EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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