TEST REPORT

CERTIFICATE OF CONFORMITY

Standard:	**EN 301 893 V2.1.1 (2017-05)**
Report No.:	REBBUI-WTW-P22100653-7
Product:	11ax RTL8851BE Combo module
Brand:	REALTEK
Model No.:	RTL8851BE
Received Date:	2022/10/25
Test Date:	2022/12/12 ~ 2023/3/20
Issued Date:	2023/5/3
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

Approved by: _____ , **Date:** **2023/5/3**

May Chen / Manager

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Prepared by : Vito Lung / Specialist

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Release Control Record

Issue No.	Description	Date Issued
REBBUI-WTW-P22100653-7	Original release.	2023/5/3

1 Certificate

Product:	11ax RTL8851BE Combo module
Brand:	REALTEK
Test Model:	RTL8851BE
Sample Status:	Engineering sample
Applicant:	Realtek Semiconductor Corp.
Test Date:	2022/12/12 ~ 2023/3/20
Standard:	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 RF characteristics under the conditions specified in this report.

2 Summary of Test Results

EN 301 893 V2.1.1		
Clause	Test Item	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 up to 1 GHz	Pass
4.2.4.1	Transmitter unwanted emissions outside the 5 GHz RLAN bands above 1 GHz	Pass
4.2.4.2	Transmitter unwanted emissions within the 5 GHz RLAN bands	Pass
4.2.5	Receiver Spurious Emissions up to 1 GHz	Pass
4.2.5	Receiver Spurious Emissions above 1 GHz	Pass
4.2.6.2	Dynamic Frequency Selection	Refer to Note 1
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

Notes:

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

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in ETSI TR 100 028-1:

Parameter	Uncertainty (±)	Maximum allowable uncertainty (±)
RF frequency	0.0106 ppm	10 ppm
RF power conducted	1.371 dB	1.5 dB
RF power radiated	4.9 dB	6 dB
Spurious emissions, conducted	2.5 dB	3 dB
Spurious emissions, radiated	4.9 dB	6 dB
Humidity	0.3%	5%
Temperature	0.12 °C	2 °C
Time	2.53%	10%

The other instruments specified are routine verified to remain within the calibrated levels, no measurement uncertainty is required to be calculated.

2.2 Supplementary Information

There is not any deviation from the test standards for the test method, and no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	11ax RTL8851BE Combo module
Brand	REALTEK
Test Model	RTL8851BE
Status of EUT	Engineering sample
Power Supply Rating	3.3Vdc from host equipment
Temperature Operating Range	-20 °C ~ 70 °C
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode 1024QAM for OFDMA in 11ax HE mode
Modulation Technology	OFDM, OFDMA
Transfer Rate	802.11a: up to 54 Mbps 802.11n: up to 150 Mbps 802.11ac: up to 433.3 Mbps 802.11ax: up to 600.4 Mbps
Operating Frequency	5.18 GHz ~ 5.24 GHz 5.26 GHz ~ 5.32 GHz 5.5 GHz ~ 5.7 GHz
Number of Channel	802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 19 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 9 802.11ac (VHT80), 802.11ax (HE80): 4
Resource Unit (RU)	Single RU: 26-tone, 52-tone, 106-tone, 242-tone, 484-tone, 996-tone
Output Power (e.i.r.p.)	5.18 GHz ~ 5.24 GHz : 22.77dBm 5.26 GHz ~ 5.32 GHz: 22.80 dBm 5.5 GHz ~ 5.7 GHz: 22.95 dBm
EUT Category	Slave without radar detection,with TPC function
Adaptive Operational Mode	Load Based Equipment

Note:

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

SKU No.	Product name	HW Configuration
1	11ax RTL8851BE Combo module	PCIe + USB interface + Dual antenna port
2		PCIe + USB interface + Single antenna port
Note: For spurious emissions: 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.		

2. There are Bluetooth and WLAN (2.4 GHz & 5 GHz) technology used for the EUT.
3. Simultaneously transmission condition.

Condition	Technology	
1	WLAN (5 GHz)	Bluetooth
2	WLAN (2.4 GHz)	Bluetooth
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.		

4. The EUT support OFDMA and Partial RU mode, therefore partial RU combination were investigated and the worst case scenario was identified. (The worst case data were presented in section 3.2.1)
5. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Antenna Description of EUT

1. The antenna information is listed as below.

Antenna NO.	RF Chain NO.	Brand	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type	Cable Length (mm)
1	Chain 1	REALTEK	RTK-ANT-0022	3.4	2.4~2.4835GHz	PIFA	IPEX4	300
				5	5.15~5.85GHz			
	Chain 2	REALTEK	RTK-ANT-0022	3.4	2.4~2.4835GHz	PIFA	IPEX4	300
				5	5.15~5.85GHz			
2	Chain 1	Aristotle	RFA-27-C38H1-MHF4300	3	2.4~2.4835GHz	Dipole	IPEX4	300
				5	5.15~5.85GHz			
	Chain 2	Aristotle	RFA-27-C38H1-MHF4300	3	2.4~2.4835GHz	Dipole	IPEX4	300
				5	5.15~5.85GHz			
3	Chain 1	LYNwave	ALX22F-120AA0-00	3.2	2.4~2.4835GHz	Monopole	IPEX4	200
				4	5.15~5.85GHz			
	Chain 2	LYNwave	ALX22F-120AA0-00	3.2	2.4~2.4835GHz	Monopole	IPEX4	200
				4	5.15~5.85GHz			

Note:
1. Max. gain was selected for the final test, except for Spurious Emissions & Adaptivity test.

*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.

2. The EUT incorporates a SISO function:

5 GHz Band		
Modulation Mode	**TX & RX Configuration**	
802.11a	1TX Diversity	1RX
802.11n (HT20)	1TX Diversity	1RX
802.11n (HT40)	1TX Diversity	1RX
802.11ac (VHT20)	1TX Diversity	1RX
802.11ac (VHT40)	1TX Diversity	1RX
802.11ac (VHT80)	1TX Diversity	1RX
802.11ax (HE20)	1TX Diversity	1RX
802.11ax (HE40)	1TX Diversity	1RX
802.11ax (HE80)	1TX Diversity	1RX
802.11ax (RU26/52/106/242/484/996)	1TX Diversity	1RX

Note:
1. The modulation and bandwidth are similar for 802.11n mode for 20 MHz (40 MHz), 802.11ac mode for 20 MHz (40 MHz, 80 MHz) and 802.11ax mode for 20 MHz (40 MHz, 80 MHz), 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.

3.3 Channel List

FOR 5180 ~ 5320 MHz

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 ~ 5700 MHz

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

3.4 Test Mode Applicability and Tested Channel Detail

Pre-Scan:	1. PIFA/Monopole ANT can be used in the following ways: X / Y / Z axis. Pre-scan in these ways and find the worst case as a representative test condition. 2. For Partial RU modes of 20MHz,40MHz and 80MHz bandwidth needs to be pre-worst. 3. EUT has two types of patterns. dual port sampling(1Tx Diversity)/single port sampling(Fixed Chain0). Pre-scan in these ways to find the worst case as a representative test condition. 4. 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).
Worst Case:	1. PIFA/Monopole ANT the worst case was found when positioned on (X / Y / Z axis): Transmitter Unwanted Emissions in the Spurious Domain up to 1GHz Z-axis worst ; Transmitter Unwanted Emissions in the Spurious Domain above 1GHz Z-axis worst. 2. The worst case occurs in 20MHz bandwidth(partial RU 26/52/106). 3. dual port sampling/single port sampling types Worst Condition: single port sampling

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

Test Item	EUT Configure Mode	Mode	Tested Channel	Modulation	Data Rate Parameter	RU Configuration	Special requirements
Carrier Frequencies	-	802.11a	36 , 100	un-modulation	-	-	-
Nominal, and Occupied, Channel Bandwidth	-	802.11a	36 ,100	BPSK	6Mb/s	-	
		802.11ax (HE20)	36, 100	BPSK	MCS0	-	-
		802.11ax (HE40)	36, 100	BPSK	MCS0	-	
		802.11ax (HE80)	38, 102	BPSK	MCS0	-	
		20 MHz Preamble 802.11ax (RU26)	42, 106	BPSK	MCS0	26/0, 26/0	
		20 MHz Preamble 802.11ax (RU52)	36, 100	BPSK	MCS0	52/37, 52/37	
		20 MHz Preamble 802.11ax (RU106)	64, 140	BPSK	MCS0	106/54, 106/54	

Test Item	EUT Configure Mode	Mode	Tested Channel	Modulation	Data Rate Parameter	RU Configuration	Special requirements
Output Power / Power Density	-	802.11a	36, 64, 100, 140	BPSK	6Mb/s	-	-
		802.11ac (VHT20)	36, 64, 100, 140	BPSK	MCS0	-	
		802.11ac (VHT40)	38, 62, 102, 134	BPSK	MCS0	-	
		802.11ac (VHT80)	42, 58, 106, 122	BPSK	MCS0	-	
		802.11ax (HE20)	36, 64, 100, 140	BPSK	MCS0	-	
		802.11ax (HE40)	38, 62, 102, 134	BPSK	MCS0	-	
		802.11ax (HE80)	42, 58, 106, 122	BPSK	MCS0	-	
		20 MHz Preamble 802.11ax (RU26)	36, 64, 100, 140	BPSK	MCS0	26/0, 26/8, 26/0, 26/8	
		20 MHz Preamble 802.11ax (RU52)	36, 64, 100, 140	BPSK	MCS0	52/37, 52/40, 52/37, 52/40	
		20 MHz Preamble 802.11ax (RU106)	36, 64, 100, 140	BPSK	MCS0	106/53, 106/54, 106/53, 106/54	
Transmit Power Control (TPC)	-	802.11a	64, 100, 140	BPSK	6Mb/s	-	-
		802.11ac (VHT20)	64, 100, 140	BPSK	MCS0	-	
		802.11ac (VHT40)	62, 102, 134	BPSK	MCS0	-	
		802.11ac (VHT80)	58, 106, 122	BPSK	MCS0	-	
		802.11ax (HE20)	64, 100, 140	BPSK	MCS0	-	
		802.11ax (HE40)	62, 102, 134	BPSK	MCS0	-	
		802.11ax (HE80)	58, 106, 122	BPSK	MCS0	-	

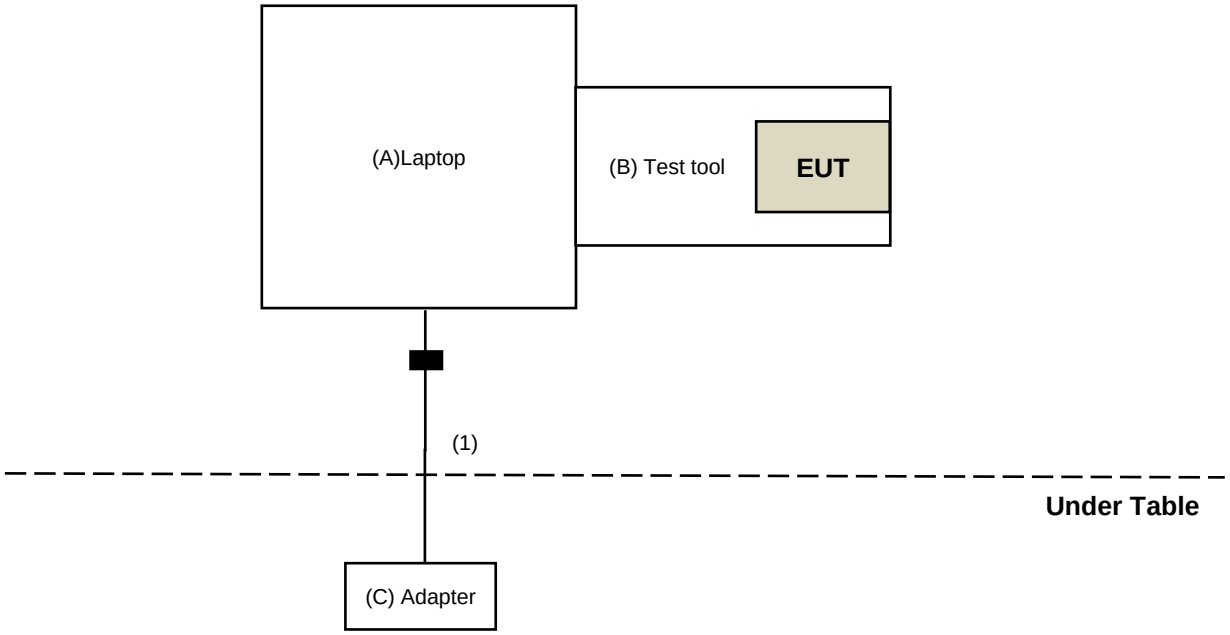
Test Item	EUT Configure Mode	Mode	Tested Channel	Modulation	Data Rate Parameter	RU Configuration	Special requirements
Transmitter unwanted emissions outside the 5 GHz RLAN bands up to 1 GHz	A	802.11ax (HE40)	102	BPSK	MCS0	-	-
	B						
	C						
	A	20 MHz Preamble 802.11ax (RU106)	100	BPSK	MCS0	106/53	
	B						
	C						
Transmitter unwanted emissions outside the 5 GHz RLAN bands above 1 GHz	A	802.11ax (HE40)	38, 102	BPSK	MCS0	-	
	B		38, 102				
	C		38, 102				
	A	20 MHz Preamble 802.11ax (RU106)	64 , 100	BPSK	MCS0	106/54,106/53	
	B		64 , 100				
	C		64 , 100				
Transmitter unwanted emissions within the 5 GHz RLAN bands	-	802.11a	36, 64, 100, 140	BPSK	6Mb/s	-	-
		802.11ax (HE20)	36, 64, 100, 140	BPSK	MCS0	-	
		802.11ax (HE40)	38, 62, 102, 134	BPSK	MCS0	-	
		802.11ax (HE80)	42, 58, 106, 122	BPSK	MCS0	-	
		20 MHz Preamble 802.11ax (RU26)	36, 64, 100, 140	BPSK	MCS0	26/0, 26/8, 26/0, 26/8	
		20 MHz Preamble 802.11ax (RU52)	36, 64, 100, 140	BPSK	MCS0	52/37, 52/40, 52/37, 52/40	
		20 MHz Preamble 802.11ax (RU106)	36, 64, 100, 140	BPSK	MCS0	106/53, 106/53, 106/53, 106/54	
Receiver Spurious Emissions up to 1 GHz	A	Receiver	100	-	-	-	-
	B	Receiver					
	C	Receiver					
Receiver Spurious Emissions above 1 GHz	A	Receiver	36 ,100	-	-	-	
	B	Receiver					
	C	Receiver					

Test Item	EUT Configure Mode	Mode	Tested Channel	Modulation	Data Rate Parameter	RU Configuration	Special requirements
Adaptivity	-	802.11ax (HE20)	100	-	MCS0	-	
		802.11ax (HE40)	102	-	MCS0	-	Add Test Worst Pmin
Receiver Blocking	-	802.11a	36, 100	-	6Mb/s	-	-
EUT Configure Mode:	A	with Dipole Antenna					
	B	with PIFA Antenna					
	C	with Monopole Antenna					

3.5 Test Program Used and Operation Descriptions

Controlling software (RTL8851B_PCIE_MP_Package_ALPHA_v2.0.23_homologation(98236)) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

3.6 Connection Diagram of EUT and Peripheral Devices



3.7 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Laptop	Dell	Latitude 7430	8C19NN3	N/A	Provided by Lab
B	Test tool	Realtek	N/A	N/A	N/A	Supplied by applicant
C	Adapter	DELL	LA90PM111	N/A	N/A	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	DC Cable	1	1.8	NO	1	Provided by Lab

4 Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.1 Carrier Frequencies

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
MXG X-Series RF Vector Signal Generator Keysight	N5182B	MY53052700	2022/7/18	2023/7/17
PSG analog signal generator (from 250 kHz to 50 GHz) Keysight	E8257D	MY53401987	2022/6/21	2023/6/20
PXA Signal Analyzer(3 Hz to 50 GHz) Keysight	N9030A	MY54490570	2022/6/20	2023/6/19
Software	ADT_RF Test Software V6.6.5.4	N/A	N/A	N/A
Temperature & Humidity Chamber TERCHY	MHU-225AU	911033	2022/11/18	2023/11/17

Notes:

1. The test was performed in Oven room 1.
2. Tested Date: 2022/12/12 ~ 2023/1/9

4.2 Nominal, and Occupied, Channel Bandwidth

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
MXG X-Series RF Vector Signal Generator Keysight	N5182B	MY53052700	2022/7/18	2023/7/17
PSG analog signal generator (from 250 kHz to 50 GHz) Keysight	E8257D	MY53401987	2022/6/21	2023/6/20
PXA Signal Analyzer(3 Hz to 50 GHz) Keysight	N9030A	MY54490570	2022/6/20	2023/6/19
Software	ADT_RF Test Software V6.6.5.4	N/A	N/A	N/A

Notes:

1. The test was performed in Oven room 1.
2. Tested Date: 2022/12/12 ~ 2023/1/9

4.3 RF Output Power

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
MXG X-Series RF Vector Signal Generator Keysight	N5182B	MY53052700	2022/7/18	2023/7/17
Power Meter Anritsu	ML2495A	1529002	2022/6/22	2023/6/21
PSG analog signal generator (from 250 kHz to 50 GHz) Keysight	E8257D	MY53401987	2022/6/21	2023/6/20
PXA Signal Analyzer(3 Hz to 50 GHz) Keysight	N9030A	MY54490570	2022/6/20	2023/6/19
Software	ADT_RF Test Software V6.6.5.4	N/A	N/A	N/A
Temperature & Humidity Chamber TERCHY	MHU-225AU	911033	2022/11/18	2023/11/17

Notes:

1. The test was performed in Oven room 1.
2. Tested Date: 2022/12/12 ~ 2023/1/9

4.4 Transmit Power Control (TPC)

Refer to section 4.2 to get information of the instruments.

4.5 Power Density

Refer to section 4.2 to get information of the instruments.

4.6 Transmitter unwanted emissions outside the 5 GHz RLAN bands up to 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208411	N/A	N/A
Power Meter Anritsu	ML2495A	0824006	2022/5/9	2023/5/8
		1529002	2022/6/22	2023/6/21
Preamplifier Agilent	8447D	2944A10663	2022/4/25	2023/4/24
PSG analog signal generator (from 250 kHz to 50 GHz) Keysight	E8257D	MY53401987	2022/6/21	2023/6/20
Pulse Power Sensor Anritsu	MA2411B	1339443	2022/5/29	2023/5/28
		1726432	2022/5/29	2023/5/28
PXA Signal Analyzer(3 Hz to 50 GHz) Keysight	N9030A	MY54490570	2022/6/20	2023/6/19
Software	ADT_Radiated_V7.6.15.9.5	N/A	N/A	N/A
Trilog Broadband Antenna Schwarzbeck	VULB 9168	9168-162	2022/10/20	2023/10/19

Notes:

1. The test was performed in RF Fully Chamber No. 1.
2. Tested Date: 2022/12/30

4.7 Transmitter unwanted emissions outside the 5 GHz RLAN bands above 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208542	N/A	N/A
Horn Antenna Schwarzbeck	BBHA 9120 D	9120D-1479	2022/11/13	2023/11/12
	BBHA 9170	9170-683	2022/11/13	2023/11/12
Power Meter Anritsu	ML2495A	1529002	2022/6/22	2023/6/21
	ML2496A	1529003	2022/8/8	2023/8/7
Pre-Amplifier Agilent 8449B (1 to 26.5GHz) Agilent	8449B	3008A01922	2022/8/15	2023/8/14
Pre_Amplifier EMCI	EMC184045	980143	2022/1/4 2022/12/28	2023/1/3 2023/12/27
PSG analog signal generator (from 250 kHz to 50 GHz) Keysight	E8257D	MY53401987	2022/6/21	2023/6/20
Pulse Power Sensor Anritsu	MA2411B	1339443	2022/5/29	2023/5/28
		1726432	2022/5/29	2023/5/28
Software	ADT_Radiated_V7.6.15.9.5	N/A	N/A	N/A
Spectrum Analyzer Keysight	N9030A	MY54490520	2022/8/5	2023/8/4

Notes:

1. The test was performed in RF Fully Chamber No. 2.
2. Tested Date: 2022/12/16 ~ 2023/2/16

4.8 Transmitter unwanted emissions within the 5 GHz RLAN bands

Refer to section 4.2 to get information of the instruments.

4.9 Receiver Spurious Emissions up to 1 GHz

Refer to section 4.6 to get information of the instruments.

4.10 Receiver Spurious Emissions above 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208542	N/A	N/A
Horn Antenna Schwarzbeck	BBHA 9120 D	9120D-1479	2022/11/13	2023/11/12
	BBHA 9170	9170-683	2022/11/13	2023/11/12
Power Meter Anritsu	ML2495A	1529002	2022/6/22	2023/6/21
	ML2496A	1529003	2022/8/8	2023/8/7
Pre-Amplifier Agilent 8449B (1 to 26.5GHz) Agilent	8449B	3008A01922	2022/8/15	2023/8/14
Pre_Amplifier EMCI	EMC184045	980143	2022/1/4	2023/1/3
PSG analog signal generator (from 250 kHz to 50 GHz) Keysight	E8257D	MY53401987	2022/6/21	2023/6/20
Pulse Power Sensor Anritsu	MA2411B	1339443	2022/5/29	2023/5/28
		1726432	2022/5/29	2023/5/28
Software	ADT_Radiated_V7.6.15.9.5	N/A	N/A	N/A
Spectrum Analyzer Keysight	N9030A	MY54490520	2022/8/5	2023/8/4

Notes:

1. The test was performed in RF Fully Chamber No. 2.
2. Tested Date: 2022/12/15 ~ 2022/12/19

4.11 Adaptivity

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Combiner / Splitter (Model:ZN2PD-9G) Mini-Circuits	ZN2PD-9G	ZN2PD-9G	2022/6/9	2023/6/8
MXG Vector signal generator KEYSIGHT	N5182B	MY53052282	2023/1/6	2024/1/5
N9030B - PXA Signal Analyzer KEYSIGHT	N9030B	MY57140488	2023/3/6	2024/3/5
PXA KEYSIGHT	N9030B	MY57140953	2022/7/1	2023/6/30
Signal Analyzer R&S	FSV7	104056	2022/5/20	2023/5/19
Spectrum Analyzer R&S	FSV40	100979	2022/3/25	2023/3/24

Notes:

1. The test was performed in Adaptivity room.
2. Tested Date: 2023/3/20

4.12 Receiver Blocking

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Combiner / Splitter (Model:ZN2PD-9G) Mini-Circuits	ZN2PD-9G	ZN2PD-9G	2022/6/9	2023/6/8
MXG Vector signal generator KEYSIGHT	N5182B	MY53052282	2023/1/6	2024/1/5
N9030B - PXA Signal Analyzer KEYSIGHT	N9030B	MY57140488	2022/2/24	2023/2/23
PXA KEYSIGHT	N9030B	MY57140953	2022/7/1	2023/6/30
Signal Analyzer R&S	FSV7	104056	2022/5/20	2023/5/19
Spectrum Analyzer R&S	FSV40	100979	2022/3/25	2023/3/24

Notes:

1. The test was performed in Adaptivity room.
2. Tested Date: 2023/2/23

5 Limits of Test Items

5.1 Carrier Frequencies

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

5.2 Nominal, and Occupied, Channel Bandwidth

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.

5.3 RF Output Power

Highest Power Level

Frequency Range (MHz)	Mean e.i.r.p. Limit (dBm)
	With TPC
5150 to 5350	23
5470 to 5725	30 (see note)
Note : Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5250 MHz to 5350 MHz.	

5.4 Transmit Power Control (TPC)

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 5250 MHz to 5350 MHz.	

5.5 Power Density

Frequency Band (MHz)	Mean e.i.r.p. Density Limit (dBm/MHz)
	With TPC
5150 to 5350	10
5470 to 5725	17 (see note)
Note : Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5250 MHz to 5350 MHz.	

5.6 Transmitter unwanted emissions outside the 5 GHz RLAN bands up to 1 GHz

Frequency Range	Maximum Power Limit	Bandwidth
30 MHz to 47 MHz	-36 dBm	100 kHz
47 MHz to 74 MHz	-54 dBm	100 kHz
74 MHz to 87.5 MHz	-36 dBm	100 kHz
87.5 MHz to 118 MHz	-54 dBm	100 kHz
118 MHz to 174 MHz	-36 dBm	100 kHz
174 MHz to 230 MHz	-54 dBm	100 kHz
230 MHz to 470 MHz	-36 dBm	100 kHz
470 MHz to 862 MHz	-54 dBm	100 kHz
862 MHz to 1 GHz	-36 dBm	100 kHz

Note: These limits are e.r.p. for emissions up to 1 GHz.

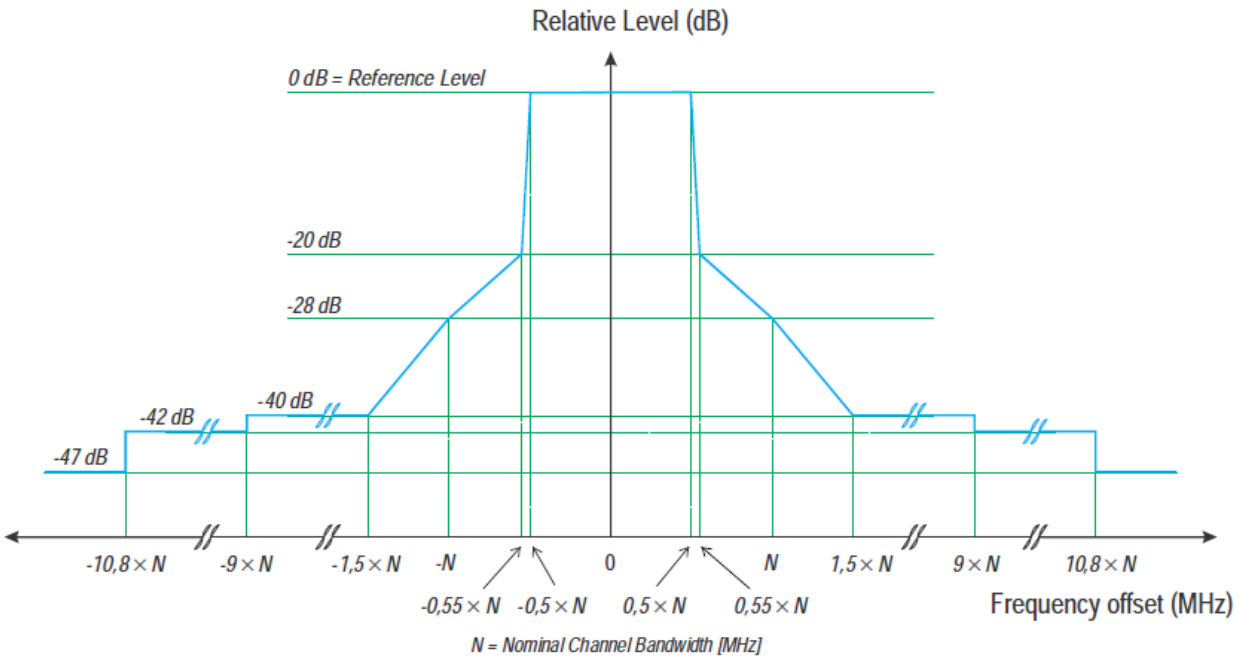
5.7 Transmitter unwanted emissions outside the 5 GHz RLAN bands above 1 GHz

Frequency Range	Maximum Power Limit	Bandwidth
1 GHz to 5.15 GHz	-30 dBm	1 MHz
5.35 GHz to 5.47 GHz	-30 dBm	1 MHz
5.725GHz to 26 GHz	-30 dBm	1 MHz

Note: These limits are e.i.r.p. for emissions above 1 GHz.

5.8 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.

5.9 Receiver Spurious Emissions up to 1 GHz

Frequency Range	Maximum Power Limit	Bandwidth
30 MHz to 1 GHz	-57 dBm	100 kHz

Note: These limits are e.r.p. for emissions up to 1 GHz.

5.10 Receiver Spurious Emissions above 1 GHz

Frequency Range	Maximum Power Limit	Bandwidth
1 GHz to 26 GHz	-47 dBm	1 MHz

Note: These limits are e.i.r.p. for emissions above 1 GHz.

5.11 Adaptivity

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)
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	1023	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	1023	6 ms (see note 1)
1	7	15	1023	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)
$$p(n) = \frac{\sum_{i=0}^{n} H(B_i)}{E}$$

5.12 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				

6 Test Arrangements

6.1 Carrier Frequencies

Test procedure refer to chapter 5.4.2 of EN 301 893 V2.1.1.

Measurement Method	Conducted measurement
Option 1: Equipment operating without modulation.	

6.2 Nominal, and Occupied, Channel Bandwidth

Test procedure refer to chapter 5.4.3 of EN 301 893 V2.1.1.

Measurement Method	Conducted measurement

6.3 RF Output Power

Test procedure refer to chapter 5.4.4 of EN 301 893 V2.1.1.

Measurement Method	Conducted 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).	

6.4 Transmit Power Control (TPC)

Test procedure refer to chapter 5.4.4 of EN 301 893 V2.1.1.

Measurement Method	Conducted measurement

6.5 Power Density

Test procedure refer to chapter 5.4.4 of EN 301 893 V2.1.1.

Measurement Method	Conducted 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)	

6.6 Transmitter unwanted emissions outside the 5 GHz RLAN bands up to 1 GHz

Test procedure refer to chapter 5.4.5 of EN 301 893 V2.1.1.

Measurement Method	Radiated measurement

6.7 Transmitter unwanted emissions outside the 5 GHz RLAN bands above 1 GHz

Test procedure refer to chapter 5.4.5 of EN 301 893 V2.1.1.

Measurement Method	Radiated measurement

6.8 Transmitter unwanted emissions within the 5 GHz RLAN bands

Test procedure refer to chapter 5.4.6 of EN 301 893 V2.1.1.

Measurement Method	Conducted measurement
Option 2: For equipment without continuous transmission capability.	

6.9 Receiver Spurious Emissions up to 1 GHz

Test procedure refer to chapter 5.4.7 of EN 301 893 V2.1.1.

Measurement Method	Radiated measurement

6.10 Receiver Spurious Emissions above 1 GHz

Test procedure refer to chapter 5.4.7 of EN 301 893 V2.1.1.

Measurement Method	Radiated measurement

6.11 Adaptivity

Test procedure refer to chapter 5.4.9 of EN 301 893 V2.1.1.

Measurement Method	Conducted measurement

6.12 Receiver Blocking

Test procedure refer to chapter 5.4.10 of EN 301 893 V2.1.1.

Measurement Method	Radiated measurement

7 Test Results of Test Item

7.1 Carrier Frequencies

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Dolly Chung

802.11a

Channel	Frequency (MHz)	Carrier Centre Frequencies f_c (MHz)					
		Extreme test conditions					
		25 ℃		-20 ℃		70 ℃	
36	5180	5180.0031	0.60	5179.9952	-0.93	5180.0103	1.99
100	5500	5500.0054	0.98	5499.9952	-0.87	5499.9967	-0.6

7.2 Nominal, and Occupied, Channel Bandwidth

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Dolly Chung

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	Minimum limit (MHz)	Maximum limit (MHz)	Test Result
36	5180	16.4	16	20	Pass
100	5500	16.4	16	20	Pass

802.11ax (HE20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	Minimum limit (MHz)	Maximum limit (MHz)	Test Result
36	5180	18.88	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)	Test Result
38	5190	37.76	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)	Test Result
42	5210	76.8	64	80	Pass
106	5530	76.8	64	80	Pass

802.11ax (HE20) RU26

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	Minimum limit (MHz)	Maximum limit (MHz)	Test Result
36	5180	15.8	2	20	Pass
100	5500	15.84	2	20	Pass

802.11ax (HE20) RU52

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	Minimum limit (MHz)	Maximum limit (MHz)	Test Result
64	5180	15.68	2	20	Pass
140	5700	15.68	2	20	Pass

802.11ax (HE20) RU106

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	Minimum limit (MHz)	Maximum limit (MHz)	Test Result
36	5180	15.6	2	20	Pass
140	5700	15.52	2	20	Pass

7.3 RF Output Power

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Dolly Chung

802.11a

Channel	Frequency (MHz)	EIRP (dBm)			Limit (dBm)	Test Result
		Test Conditions				
		25 ℃	-20 ℃	70 ℃		
36	5180	21.24	21.36	21.13	23	Pass
64	5320	21.22	21.37	21.07	23	Pass
100	5500	21.23	21.34	21.10	23	Pass
140	5700	21.31	21.47	21.21	23	Pass

802.11ac (VHT20)

Channel	Frequency (MHz)	EIRP (dBm)			Limit (dBm)	Test Result
		Test Conditions				
		25 ℃	-20 ℃	70 ℃		
36	5180	21.72	21.84	21.62	23	Pass
64	5320	21.84	21.93	21.71	23	Pass
100	5500	21.72	21.90	21.61	23	Pass
140	5700	21.74	21.90	21.60	23	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	EIRP (dBm)			Limit (dBm)	Test Result
		Test Conditions				
		25 ℃	-20 ℃	70 ℃		
38	5190	22.59	22.77	22.44	23	Pass
62	5310	22.60	22.80	22.44	23	Pass
102	5510	22.68	22.90	22.53	23	Pass
134	5670	22.75	22.91	22.55	23	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	EIRP (dBm)			Limit (dBm)	Test Result
		Test Conditions				
		25 ℃	-20 ℃	70 ℃		
42	5210	22.61	22.76	22.45	23	Pass
58	5290	22.52	22.65	22.38	23	Pass
106	5530	22.63	22.79	22.48	23	Pass
122	5610	22.58	22.70	22.38	23	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	EIRP (dBm)			Limit (dBm)	Test Result
		Test Conditions				
		25 ℃	-20 ℃	70 ℃		
36	5180	21.76	21.88	21.66	23	Pass
64	5320	21.89	21.98	21.76	23	Pass
100	5500	21.74	21.92	21.63	23	Pass
140	5700	21.76	21.92	21.62	23	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	EIRP (dBm)			Limit (dBm)	Test Result
		Test Conditions				
		25 ℃	-20 ℃	70 ℃		
38	5190	22.65	22.75	22.53	23	Pass
62	5310	22.61	22.75	22.50	23	Pass
102	5510	22.80	22.95	22.67	23	Pass
134	5670	22.78	22.90	22.60	23	Pass

802.11ax (HE80)

Channel	Frequency (MHz)	EIRP (dBm)			Limit (dBm)	Test Result
		Test Conditions				
		25 ℃	-20 ℃	70 ℃		
42	5210	22.64	22.77	22.50	23	Pass
58	5290	22.55	22.70	22.42	23	Pass
106	5530	22.65	22.77	22.49	23	Pass
122	5610	22.61	22.71	22.50	23	Pass

802.11ax (HE20) RU26

Channel	Frequency (MHz)	EIRP (dBm)			Limit (dBm)	Test Result
		Test Conditions				
		25 ℃	-20 ℃	70 ℃		
36	5180	12.66	12.78	12.56	23	Pass
64	5320	12.67	12.76	12.54	23	Pass
100	5500	12.55	12.73	12.44	23	Pass
140	5700	12.65	12.81	12.51	23	Pass

802.11ax (HE20) RU52

Channel	Frequency (MHz)	EIRP (dBm)			Limit (dBm)	Test Result
		Test Conditions				
		25 ℃	-20 ℃	70 ℃		
36	5180	15.40	15.52	15.30	23	Pass
64	5320	15.49	15.58	15.36	23	Pass
100	5500	15.29	15.47	15.18	23	Pass
140	5700	15.40	15.56	15.26	23	Pass

802.11ax (HE20) RU106

Channel	Frequency (MHz)	EIRP (dBm)			Limit (dBm)	Test Result
		Test Conditions				
		25 ℃	-20 ℃	70 ℃		
36	5180	18.06	18.18	17.96	23	Pass
64	5320	18.15	18.24	18.02	23	Pass
100	5500	18.42	18.60	18.31	23	Pass
140	5700	18.12	18.28	17.98	23	Pass

7.4 Transmit Power Control (TPC)

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Dolly Chung

802.11a

Channel	Frequency (MHz)	EIRP at the Lowest Power Level (dBm)			Limit (dBm)	Test Result
		Test Conditions				
		25 ℃	-20 ℃	70 ℃		
64	5320	16.22	16.37	16.07	17	Pass
100	5500	16.23	16.34	16.10	17	Pass
140	5700	16.31	16.47	16.21	17	Pass

802.11ac (VHT20)

Channel	Frequency (MHz)	EIRP at the Lowest Power Level (dBm)			Limit (dBm)	Test Result
		Test Conditions				
		25 ℃	-20 ℃	70 ℃		
64	5320	16.84	16.93	16.71	17	Pass
100	5500	16.72	16.90	16.61	17	Pass
140	5700	16.74	16.90	16.60	17	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	EIRP at the Lowest Power Level (dBm)			Limit (dBm)	Test Result
		Test Conditions				
		25 ℃	-20 ℃	70 ℃		
62	5310	16.60	16.80	16.44	17	Pass
102	5510	16.68	16.90	16.53	17	Pass
134	5670	16.75	16.91	16.55	17	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	EIRP at the Lowest Power Level (dBm)			Limit (dBm)	Test Result
		Test Conditions				
		25 ℃	-20 ℃	70 ℃		
58	5290	16.52	16.65	16.38	17	Pass
106	5530	16.63	16.79	16.48	17	Pass
122	5610	16.58	16.70	16.38	17	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	EIRP at the Lowest Power Level (dBm)			Limit (dBm)	Test Result
		Test Conditions				
		25 ℃	-20 ℃	70 ℃		
64	5320	16.89	16.98	16.76	17	Pass
100	5500	16.74	16.92	16.63	17	Pass
140	5700	16.76	16.92	16.62	17	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	EIRP at the Lowest Power Level (dBm)			Limit (dBm)	Test Result
		Test Conditions				
		25 ℃	-20 ℃	70 ℃		
62	5310	16.61	16.75	16.50	17	Pass
102	5510	16.80	16.95	16.67	17	Pass
134	5670	16.78	16.90	16.60	17	Pass

802.11ax (HE80)

Channel	Frequency (MHz)	EIRP at the Lowest Power Level (dBm)			Limit (dBm)	Test Result
		Test Conditions				
		25 ℃	-20 ℃	70 ℃		
58	5290	16.55	16.70	16.42	17	Pass
106	5530	16.65	16.77	16.49	17	Pass
122	5610	16.61	16.71	16.50	17	Pass

7.5 Power Density

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Dolly Chung

802.11a

Channel	Frequency (MHz)	EIRP PSD (dBm/MHz)	PSD Limit (dBm)	Test Result
36	5180	9.81	10	Pass
64	5320	9.7	10	Pass
100	5500	9.71	10	Pass
140	5700	9.75	10	Pass

802.11ac (VHT20)

Channel	Frequency (MHz)	EIRP PSD (dBm/MHz)	PSD Limit (dBm)	Test Result
36	5180	9.66	10	Pass
64	5320	9.8	10	Pass
100	5500	9.68	10	Pass
140	5700	9.66	10	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	EIRP PSD (dBm/MHz)	PSD Limit (dBm)	Test Result
38	5190	7.49	10	Pass
62	5310	7.48	10	Pass
102	5510	7.67	10	Pass
134	5670	7.66	10	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	EIRP PSD (dBm/MHz)	PSD Limit (dBm)	Test Result
42	5210	4.62	10	Pass
58	5290	4.34	10	Pass
106	5530	4.79	10	Pass
122	5610	4.89	10	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	EIRP PSD (dBm/MHz)	PSD Limit (dBm)	Test Result
36	5180	9.7	10	Pass
64	5320	9.82	10	Pass
100	5500	9.71	10	Pass
140	5700	9.69	10	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	EIRP PSD (dBm/MHz)	PSD Limit (dBm)	Test Result
38	5190	7.57	10	Pass
62	5310	7.55	10	Pass
102	5510	7.72	10	Pass
134	5670	7.67	10	Pass

802.11ax (HE80)

Channel	Frequency (MHz)	EIRP PSD (dBm/MHz)	PSD Limit (dBm)	Test Result
42	5210	4.64	10	Pass
58	5290	4.38	10	Pass
106	5530	4.81	10	Pass
122	5610	4.94	10	Pass

802.11ax (HE20) RU26

Channel	Frequency (MHz)	EIRP PSD (dBm/MHz)	PSD Limit (dBm)	Test Result
36	5180	9.7	10	Pass
64	5320	9.73	10	Pass
100	5500	9.62	10	Pass
140	5700	9.56	10	Pass

802.11ax (HE20) RU52

Channel	Frequency (MHz)	EIRP PSD (dBm/MHz)	PSD Limit (dBm)	Test Result
36	5180	9.86	10	Pass
64	5320	9.87	10	Pass
100	5500	9.71	10	Pass
140	5700	9.58	10	Pass

802.11ax (HE20) RU106

Channel	Frequency (MHz)	EIRP PSD (dBm/MHz)	PSD Limit (dBm)	Test Result
36	5180	9.87	10	Pass
64	5320	9.79	10	Pass
100	5500	9.97	10	Pass
140	5700	9.62	10	Pass

7.6 Transmitter unwanted emissions outside the 5 GHz RLAN bands up to 1 GHz

Mode A

802.11ax (HE40)

Spurious Emission Frequency Range	30 MHz ~ 1 GHz	**Operating Channel**	102
Input Power (System)	230 Vac, 50 Hz	**Environmental Conditions**	23°C, 67% RH
Tested By	Jeff Hsieh		

Spurious Emission Level				
Frequency (MHz)	**Antenna Polarization**	**Level (dBm)**	**Limit (dBm)**	**Margin (dB)**
54.08	V	-57.85	-36.00	-21.85
115.06	H	-70.77	-54.00	-16.77
206.09	H	-70.75	-54.00	-16.75
222.26	V	-64.04	-54.00	-10.04
222.91	H	-66.08	-54.00	-12.08
224.85	H	-66.42	-54.00	-12.42
499.48	V	-71.87	-54.00	-17.87
499.88	H	-74.00	-54.00	-20.00
534.15	V	-75.54	-54.00	-21.54
543.55	H	-71.55	-54.00	-17.55
543.55	V	-73.77	-54.00	-19.77
566.68	H	-73.27	-54.00	-19.27
566.73	V	-74.07	-54.00	-20.07
589.76	V	-73.40	-54.00	-19.40
589.81	H	-75.45	-54.00	-21.45
612.90	V	-73.68	-54.00	-19.68
636.03	H	-74.26	-54.00	-20.26
636.03	V	-73.98	-54.00	-19.98
659.16	V	-74.22	-54.00	-20.22
675.62	H	-74.17	-54.00	-20.17

802.11ax (HE) 106-tone RU

Spurious Emission Frequency Range	30 MHz ~ 1 GHz	**Operating Channel**	100
Input Power (System)	230 Vac, 50 Hz	**Environmental Conditions**	23°C, 67% RH
Tested By	Jeff Hsieh		

Spurious Emission Level				
Frequency (MHz)	**Antenna Polarization**	**Level (dBm)**	**Limit (dBm)**	**Margin (dB)**
99.74	V	-72.68	-54.00	-18.68
103.07	H	-73.72	-54.00	-19.72
196.09	V	-68.71	-54.00	-14.71
204.10	H	-68.30	-54.00	-14.30
223.30	H	-66.35	-54.00	-12.35
223.55	V	-65.00	-54.00	-11.00
499.78	H	-74.10	-54.00	-20.10
499.83	V	-70.87	-54.00	-16.87
543.50	H	-72.77	-54.00	-18.77
543.60	V	-73.51	-54.00	-19.51
566.63	H	-72.37	-54.00	-18.37
566.73	V	-73.60	-54.00	-19.60
589.76	H	-74.69	-54.00	-20.69
610.96	V	-72.44	-54.00	-18.44
612.95	V	-72.88	-54.00	-18.88
633.29	H	-75.27	-54.00	-21.27
636.03	H	-74.19	-54.00	-20.19
640.11	V	-74.09	-54.00	-20.09
659.11	H	-73.70	-54.00	-19.70
673.38	V	-74.06	-54.00	-20.06

Mode B

802.11ax (HE40)

Spurious Emission Frequency Range	30 MHz ~ 1 GHz	**Operating Channel**	102
Input Power (System)	230 Vac, 50 Hz	**Environmental Conditions**	24°C, 69% RH
Tested By	Ethan Hsu		

Spurious Emission Level				
Frequency (MHz)	**Antenna Polarization**	**Level (dBm)**	**Limit (dBm)**	**Margin (dB)**
99.94	V	-78.52	-54.00	-24.52
105.86	H	-80.56	-54.00	-26.56
198.33	V	-74.04	-54.00	-20.04
206.39	H	-71.82	-54.00	-17.82
499.83	H	-77.17	-54.00	-23.17
511.22	V	-77.25	-54.00	-23.25
520.82	V	-77.73	-54.00	-23.73
528.28	H	-78.15	-54.00	-24.15
544.10	H	-77.39	-54.00	-23.39
553.70	V	-76.01	-54.00	-22.01
569.47	H	-76.48	-54.00	-22.48
572.45	V	-77.25	-54.00	-23.25
589.62	V	-75.43	-54.00	-21.43
603.94	H	-76.86	-54.00	-22.86
610.11	V	-75.88	-54.00	-21.88
641.30	H	-76.30	-54.00	-22.30
642.69	V	-76.10	-54.00	-22.10
669.16	H	-75.17	-54.00	-21.17
669.75	V	-75.28	-54.00	-21.28
692.49	H	-74.37	-54.00	-20.37

802.11ax (HE) 106-tone RU

Spurious Emission Frequency Range	30 MHz ~ 1 GHz	**Operating Channel**	100
Input Power (System)	230 Vac, 50 Hz	**Environmental Conditions**	24°C, 69% RH
Tested By	Ethan Hsu		

Spurious Emission Level				
Frequency (MHz)	**Antenna Polarization**	**Level (dBm)**	**Limit (dBm)**	**Margin (dB)**
99.94	V	-78.52	-54.00	-24.52
194.30	V	-73.07	-54.00	-19.07
208.38	H	-73.23	-54.00	-19.23
487.64	H	-78.02	-54.00	-24.02
500.38	V	-76.83	-54.00	-22.83
510.97	H	-76.50	-54.00	-22.50
520.22	V	-76.42	-54.00	-22.42
539.62	H	-75.77	-54.00	-21.77
543.40	V	-76.38	-54.00	-22.38
553.95	H	-75.97	-54.00	-21.97
566.39	V	-75.25	-54.00	-21.25
581.01	H	-77.29	-54.00	-23.29
584.94	V	-74.82	-54.00	-20.82
608.42	H	-76.94	-54.00	-22.94
619.61	V	-74.94	-54.00	-20.94
635.18	V	-75.96	-54.00	-21.96
635.88	H	-75.43	-54.00	-21.43
655.03	H	-75.94	-54.00	-21.94
660.70	V	-74.39	-54.00	-20.39
670.85	H	-74.82	-54.00	-20.82

Mode C

802.11ax (HE40)

Spurious Emission Frequency Range	30 MHz ~ 1 GHz	**Operating Channel**	102
Input Power (System)	230 Vac, 50 Hz	**Environmental Conditions**	24°C, 69% RH
Tested By	Ethan Hsu		

Spurious Emission Level				
Frequency (MHz)	**Antenna Polarization**	**Level (dBm)**	**Limit (dBm)**	**Margin (dB)**
99.83	V	-78.63	-54.00	-24.63
105.65	H	-80.67	-54.00	-26.67
198.22	V	-74.15	-54.00	-20.15
206.28	H	-71.93	-54.00	-17.93
499.72	H	-77.28	-54.00	-23.28
511.11	V	-77.36	-54.00	-23.36
520.71	V	-77.84	-54.00	-23.84
528.17	H	-78.26	-54.00	-24.26
543.99	H	-77.50	-54.00	-23.50
553.59	V	-76.12	-54.00	-22.12
569.36	H	-76.59	-54.00	-22.59
572.34	V	-77.36	-54.00	-23.36
589.51	V	-75.54	-54.00	-21.54
603.83	H	-76.97	-54.00	-22.97
610.00	V	-75.99	-54.00	-21.99
641.19	H	-76.41	-54.00	-22.41
642.58	V	-76.21	-54.00	-22.21
669.05	H	-75.28	-54.00	-21.28
669.64	V	-75.39	-54.00	-21.39
692.38	H	-74.48	-54.00	-20.48

802.11ax (HE) 106-tone RU

Spurious Emission Frequency Range	30 MHz ~ 1 GHz	**Operating Channel**	100
Input Power (System)	230 Vac, 50 Hz	**Environmental Conditions**	24°C, 69% RH
Tested By	Ethan Hsu		

Spurious Emission Level				
Frequency (MHz)	**Antenna Polarization**	**Level (dBm)**	**Limit (dBm)**	**Margin (dB)**
99.72	V	-78.74	-54.00	-24.74
194.18	V	-72.98	-54.00	-18.98
208.17	H	-73.35	-54.00	-19.35
500.27	V	-76.72	-54.00	-22.72
510.85	H	-76.62	-54.00	-22.62
520.10	V	-76.23	-54.00	-22.23
525.69	H	-78.15	-54.00	-24.15
539.50	H	-75.98	-54.00	-21.98
543.21	V	-76.19	-54.00	-22.19
553.73	H	-76.18	-54.00	-22.18
566.20	V	-75.44	-54.00	-21.44
580.79	H	-77.41	-54.00	-23.41
584.75	V	-74.74	-54.00	-20.74
608.30	H	-77.06	-54.00	-23.06
619.42	V	-74.75	-54.00	-20.75
635.09	V	-75.87	-54.00	-21.87
635.76	H	-75.34	-54.00	-21.34
655.14	H	-76.03	-54.00	-22.03
660.81	V	-74.30	-54.00	-20.30
670.66	H	-75.01	-54.00	-21.01

7.7 Transmitter unwanted emissions outside the 5 GHz RLAN bands above 1 GHz

Mode A

802.11ax (HE40)

Spurious Emission Frequency Range	1 GHz ~ 26 GHz	**Operating Channel**	38, 102
Input Power (System)	230 Vac, 50 Hz	**Environmental Conditions**	22°C, 62% RH
Tested By	Ethan Hsu		

Spurious Emission Level					
Channel	**Frequency (MHz)**	**Antenna Polarization**	**Level (dBm)**	**Limit (dBm)**	**Margin (dB)**
38	10374.85	V	-33.08	-30.00	-3.08
	10376.04	H	-41.63	-30.00	-11.63
	15570.00	H	-51.22	-30.00	-21.22
	15570.00	V	-52.38	-30.00	-22.38
	20760.00	H	-48.41	-30.00	-18.41
	20760.00	V	-48.42	-30.00	-18.42
102	11016.47	H	-45.16	-30.00	-15.16
	11018.47	V	-40.57	-30.00	-10.57
	16530.00	H	-50.23	-30.00	-20.23
	16530.00	V	-50.67	-30.00	-20.67
	22040.00	H	-53.11	-30.00	-23.11
	22040.00	V	-52.51	-30.00	-22.51

802.11ax (HE) 106-tone RU

Spurious Emission Frequency Range	1 GHz ~ 26 GHz	**Operating Channel**	64, 100
Input Power (System)	230 Vac, 50 Hz	**Environmental Conditions**	25°C, 68% RH
Tested By	Ethan Hsu		

Spurious Emission Level					
Channel	**Frequency (MHz)**	**Antenna Polarization**	**Level (dBm)**	**Limit (dBm)**	**Margin (dB)**
64	10622.47	H	-37.94	-30.00	-7.94
	10623.16	V	-33.25	-30.00	-3.25
	15934.03	H	-49.98	-30.00	-19.98
	15934.03	V	-45.82	-30.00	-15.82
	21248.11	H	-42.46	-30.00	-12.46
	21248.11	V	-39.31	-30.00	-9.31
100	10983.07	V	-42.02	-30.00	-12.02
	10983.66	H	-40.88	-30.00	-10.88
	16476.25	H	-41.03	-30.00	-11.03
	16476.25	V	-37.99	-30.00	-7.99
	21967.33	H	-49.25	-30.00	-19.25
	21967.33	V	-41.62	-30.00	-11.62

Mode B

802.11ax (HE40)

Spurious Emission Frequency Range	1 GHz ~ 26 GHz	Operating Channel	38, 102
Input Power (System)	230 Vac, 50 Hz	Environmental Conditions	22°C, 62% RH
Tested By	Spencer Liao		

Spurious Emission Level					
Channel	Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
38	10380.00	H	-39.44	-30.00	-9.44
	10380.00	V	-34.50	-30.00	-4.50
	15570.00	H	-46.92	-30.00	-16.92
	15570.00	V	-48.73	-30.00	-18.73
	20760.00	H	-43.20	-30.00	-13.20
	20760.00	V	-47.76	-30.00	-17.76
102	11020.00	H	-40.40	-30.00	-10.40
	11020.00	V	-40.77	-30.00	-10.77
	16530.00	H	-46.85	-30.00	-16.85
	16530.00	V	-44.81	-30.00	-14.81
	22040.00	H	-49.96	-30.00	-19.96
	22040.00	V	-49.73	-30.00	-19.73

802.11ax (HE) 106-tone RU

Spurious Emission Frequency Range	1 GHz ~ 26 GHz	Operating Channel	64, 100
Input Power (System)	230 Vac, 50 Hz	Environmental Conditions	26°C, 69% RH
Tested By	Spencer Liao		

Spurious Emission Level					
Channel	Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
64	10623.06	H	-34.96	-30.00	-4.96
	10623.06	V	-34.04	-30.00	-4.04
	15935.71	V	-43.88	-30.00	-13.88
	15935.82	H	-46.07	-30.00	-16.07
	21244.49	V	-37.93	-30.00	-7.93
	21245.62	H	-38.22	-30.00	-8.22
100	10982.89	H	-44.78	-30.00	-14.78
	10982.89	V	-38.32	-30.00	-8.32
	16473.43	H	-38.17	-30.00	-8.17
	16474.87	V	-33.16	-30.00	-3.16
	21966.42	V	-44.26	-30.00	-14.26
	21967.78	H	-45.30	-30.00	-15.30

Mode C

802.11ax (HE40)

Spurious Emission Frequency Range	1 GHz ~ 26 GHz	Operating Channel	38, 102
Input Power (System)	230 Vac, 50 Hz	Environmental Conditions	24°C, 70% RH
Tested By	Ethan Hsu		

Spurious Emission Level					
Channel	Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
38	10376.43	H	-39.40	-30.00	-9.40
	10376.43	V	-37.53	-30.00	-7.53
	15570.00	H	-50.28	-30.00	-20.28
	15570.00	V	-49.33	-30.00	-19.33
	20760.00	H	-40.68	-30.00	-10.68
	20760.00	V	-47.97	-30.00	-17.97
102	11020.00	H	-46.76	-30.00	-16.76
	11020.00	V	-44.26	-30.00	-14.26
	16530.00	H	-50.34	-30.00	-20.34
	16530.00	V	-49.19	-30.00	-19.19
	22040.00	H	-52.56	-30.00	-22.56
	22040.00	V	-52.55	-30.00	-22.55

802.11ax (HE) 106-tone RU

Spurious Emission Frequency Range	1 GHz ~ 26 GHz	Operating Channel	64, 100
Input Power (System)	230 Vac, 50 Hz	Environmental Conditions	22°C, 62% RH
Tested By	Spencer Liao		

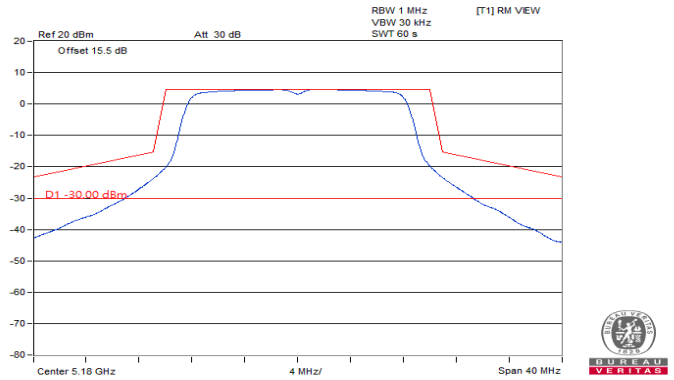
Spurious Emission Level					
Channel	Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
64	10623.02	H	-41.64	-30.00	-11.64
	10623.32	V	-37.84	-30.00	-7.84
	15935.48	V	-43.72	-30.00	-13.72
	15935.76	H	-46.12	-30.00	-16.12
	21244.35	H	-38.31	-30.00	-8.31
	21245.53	V	-37.85	-30.00	-7.85
100	10983.34	H	-49.16	-30.00	-19.16
	10983.62	V	-37.12	-30.00	-7.12
	16473.22	H	-38.09	-30.00	-8.09
	16475.90	V	-33.08	-30.00	-3.08
	21965.58	V	-44.74	-30.00	-14.74
	21965.66	H	-46.22	-30.00	-16.22

7.8 Transmitter unwanted emissions within the 5 GHz RLAN bands

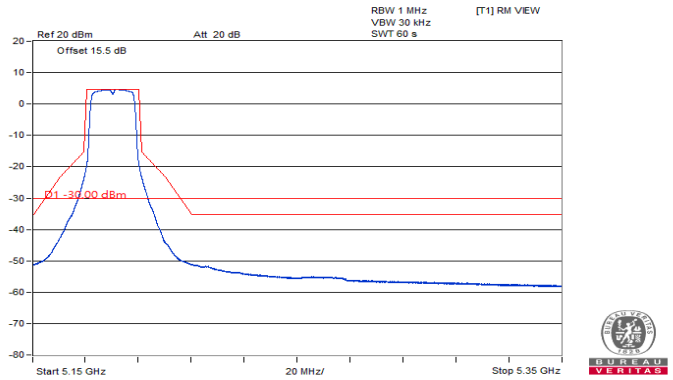
Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Dolly Chung

802.11a

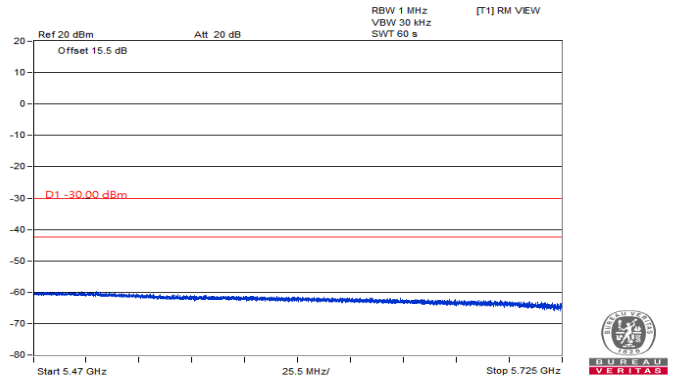
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands



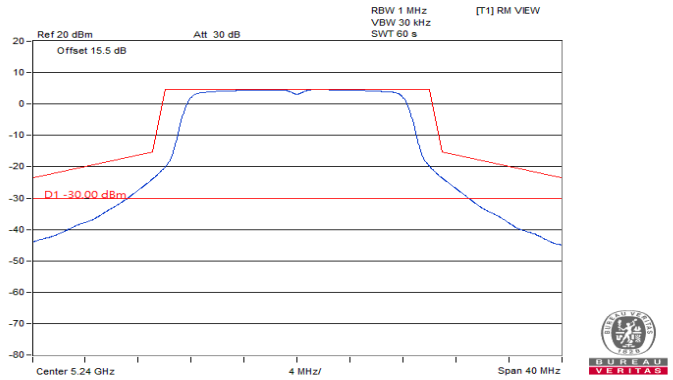
802.11a : CH 36



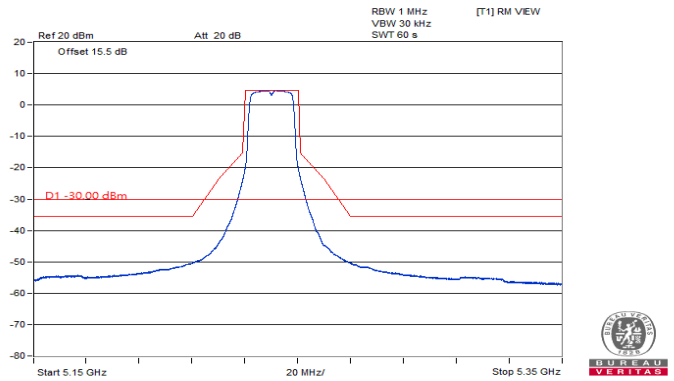
802.11a : CH 36



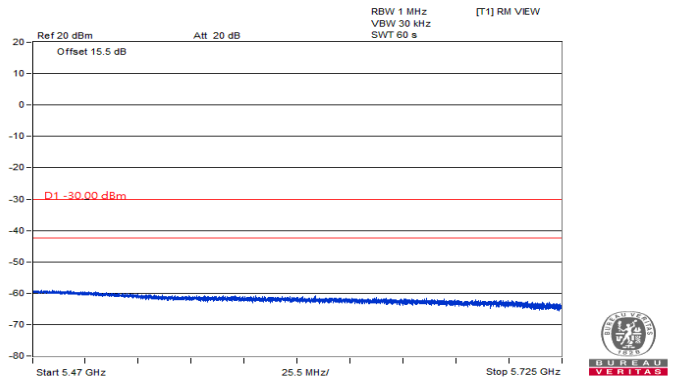
802.11a : CH 36



802.11a : CH 48

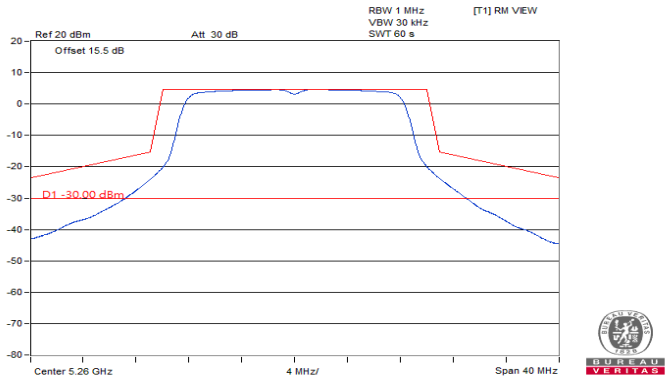


802.11a : CH 48

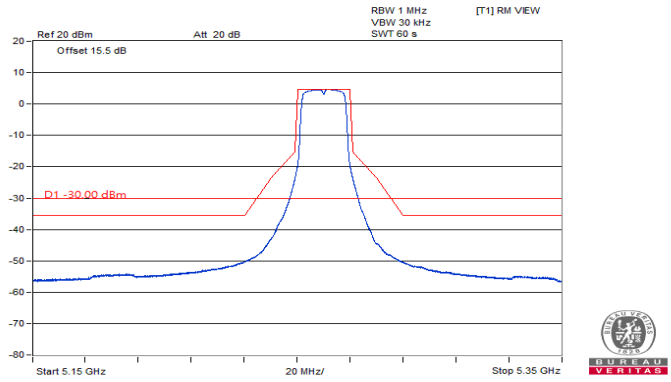


802.11a : CH 48

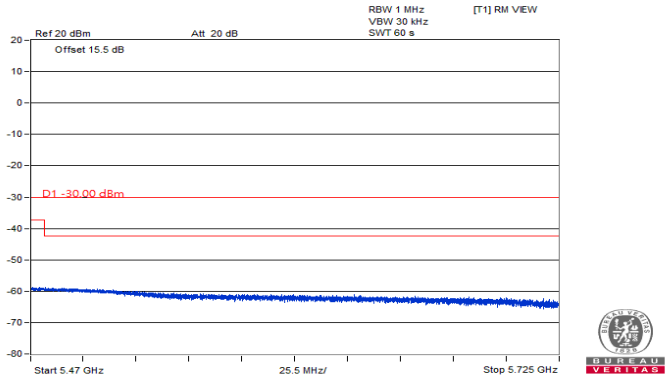
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands



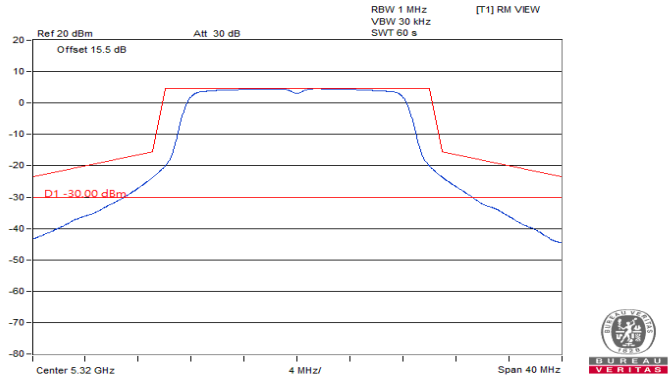
802.11a : CH 52



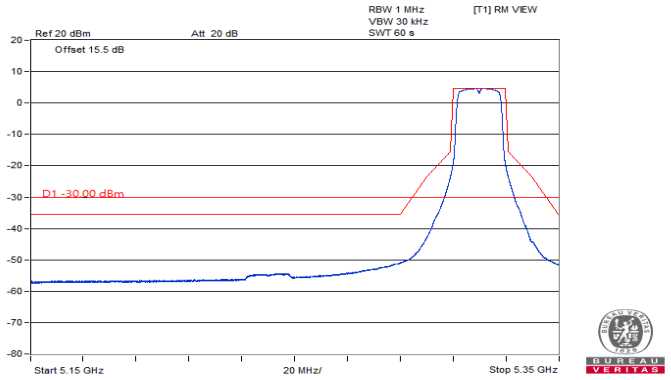
802.11a : CH 52



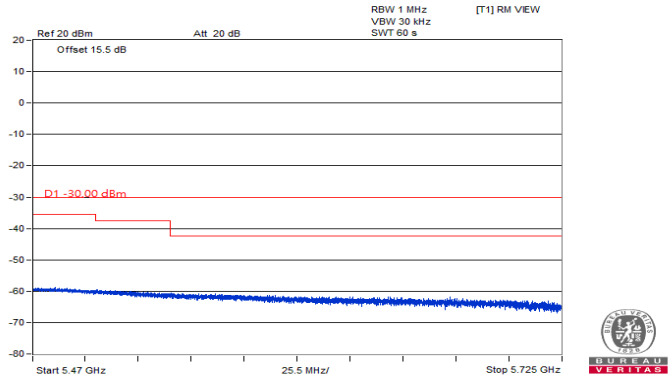
802.11a : CH 52



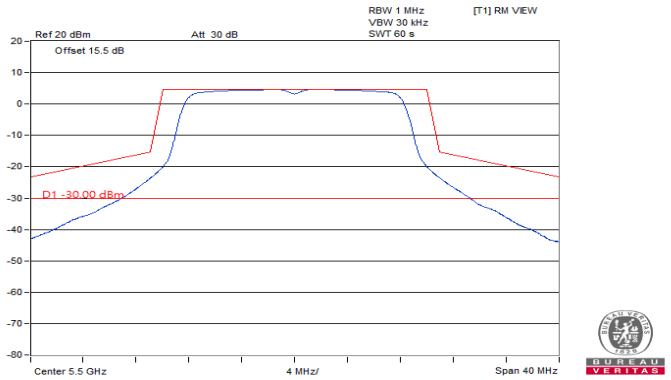
802.11a : CH 64



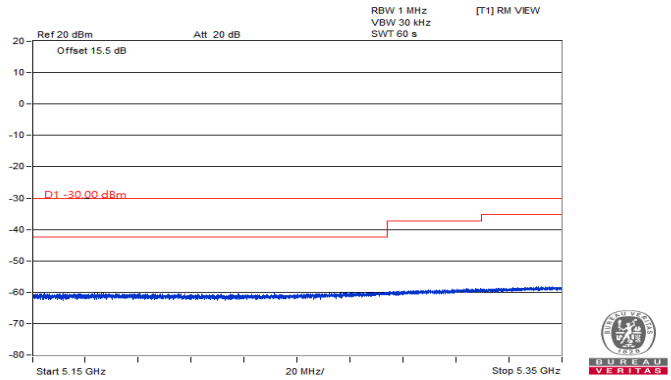
802.11a : CH 64



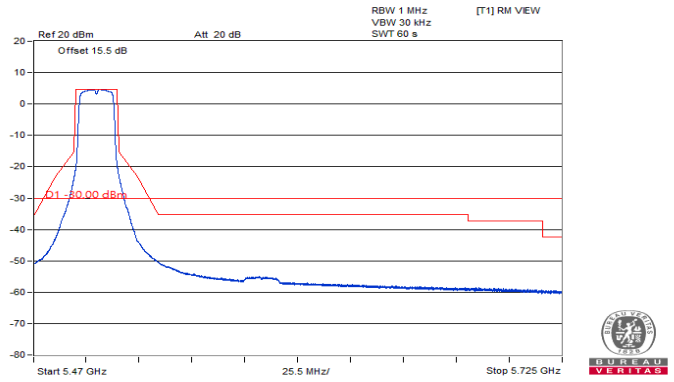
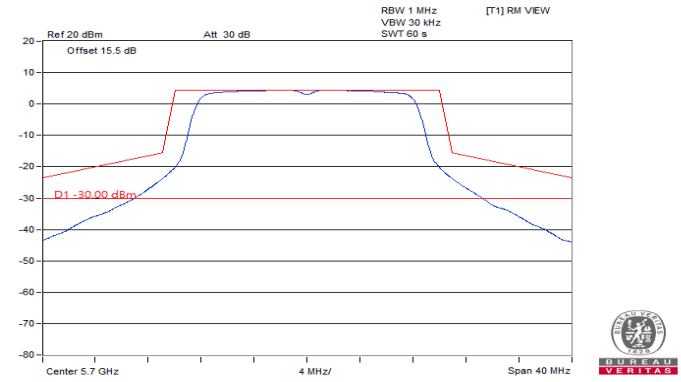
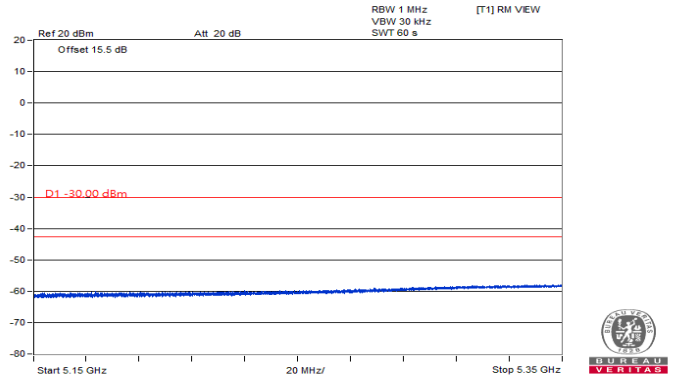
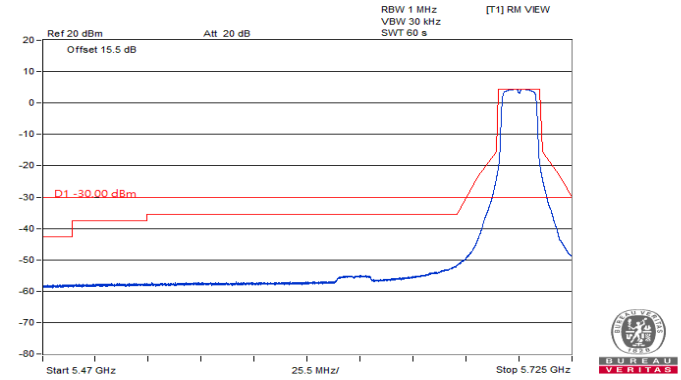
802.11a : CH 64



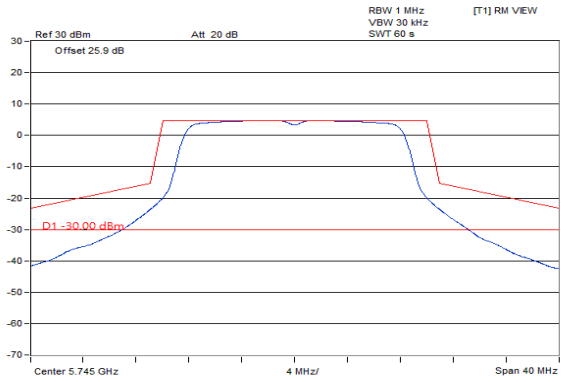
802.11a : CH 100



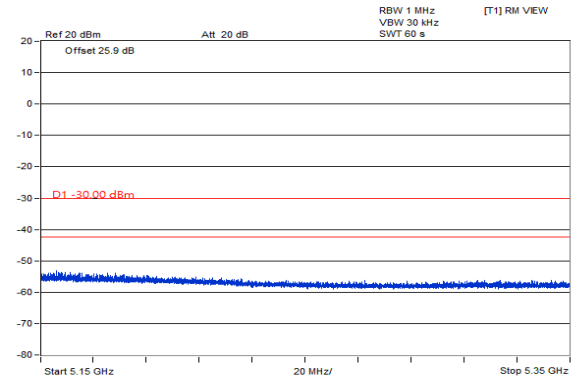
802.11a : CH 100

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
802.11a : CH 100	802.11a : CH 140
	
802.11a : CH 140	802.11a : CH 140

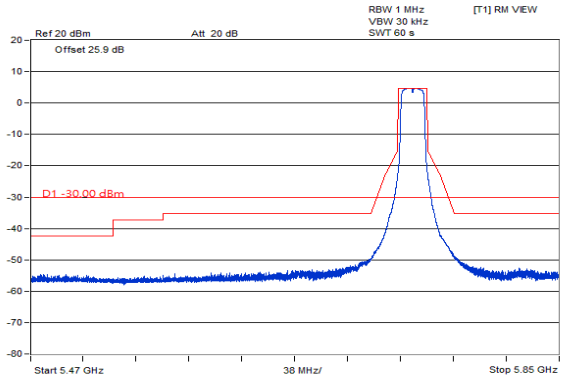
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands



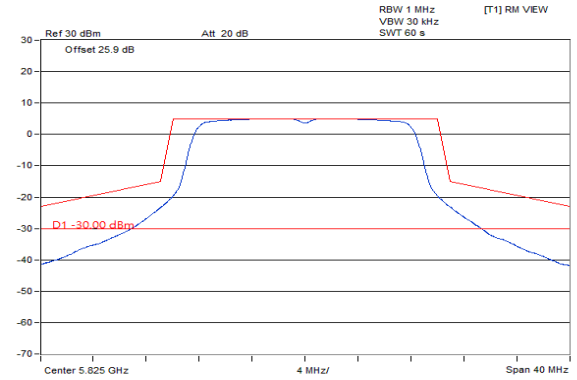
802.11a : CH 149



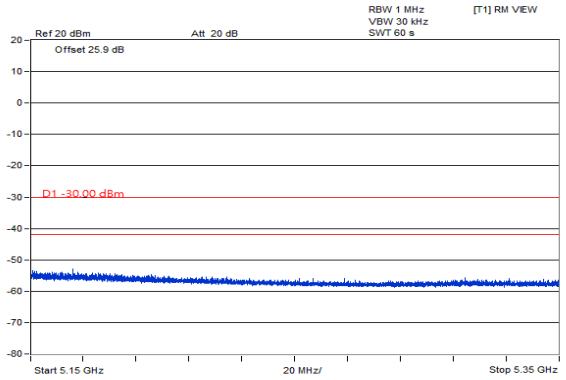
802.11a : CH 149



802.11a : CH 149



802.11a : CH 165



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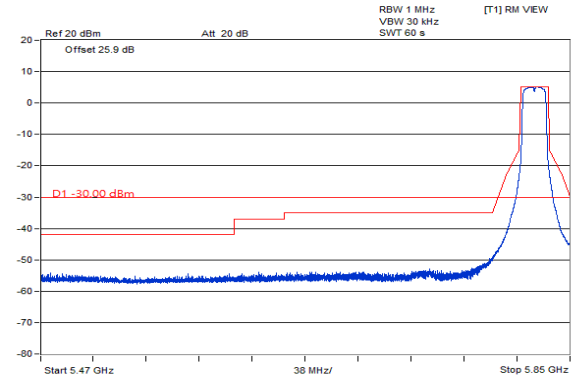
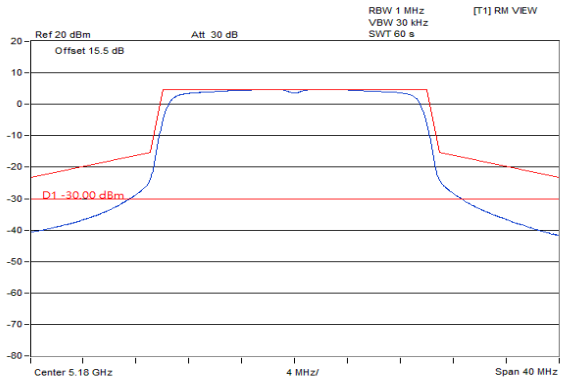
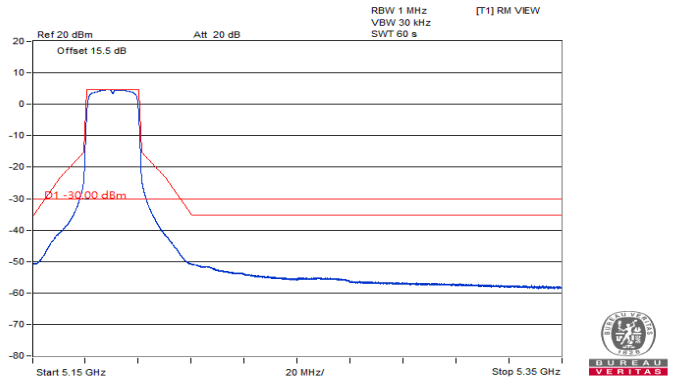
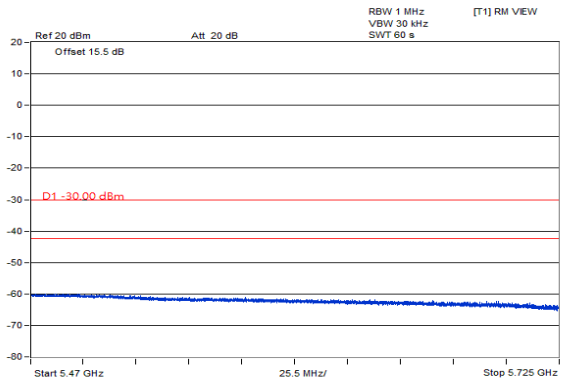
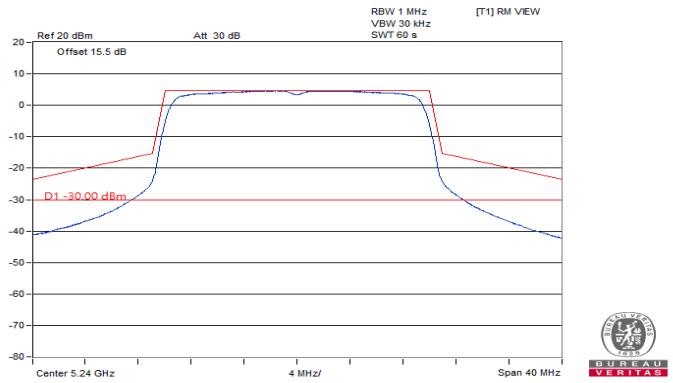
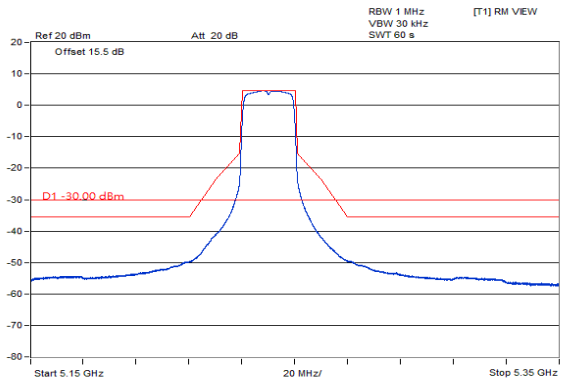
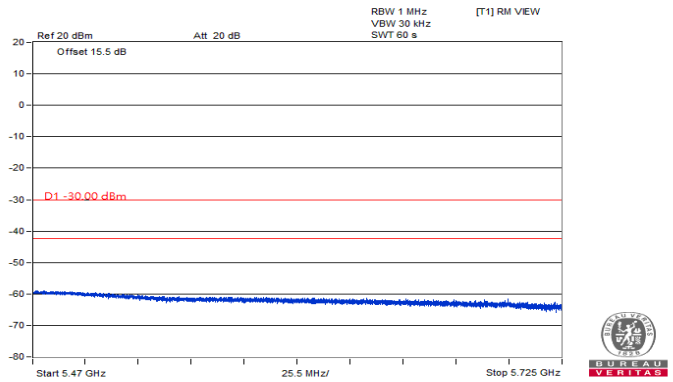
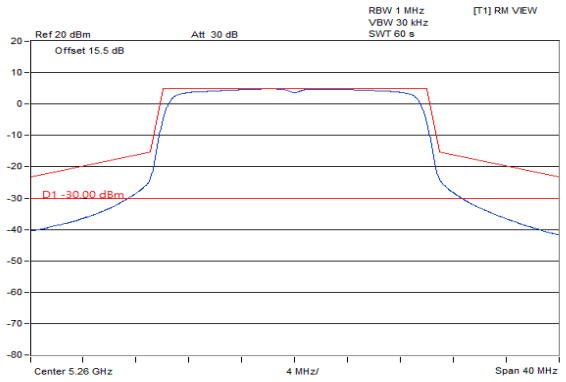


802.11a : CH 165

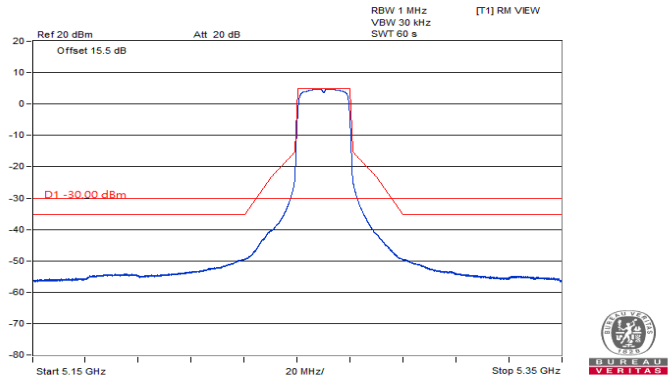
802.11ax (HE20)

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
802.11ax (HE20) : CH 36	802.11ax (HE20) : CH 36
	
802.11ax (HE20) : CH 36	802.11ax (HE20) : CH 48
	
802.11ax (HE20): CH 48	802.11ax (HE20) : CH 48

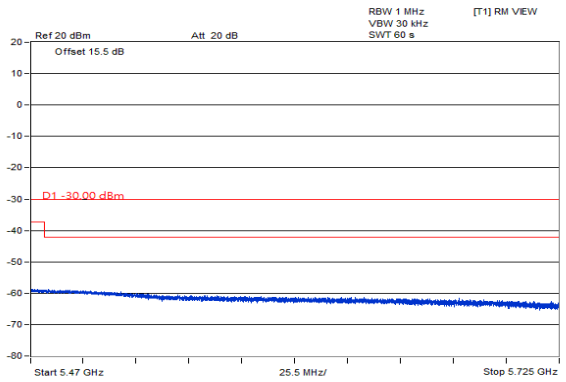
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands



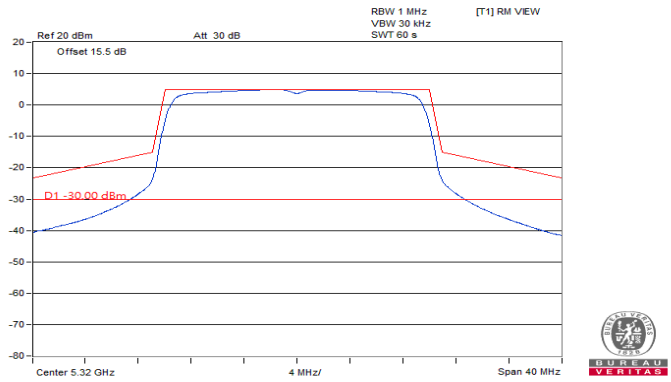
802.11ax (HE20) : CH 52



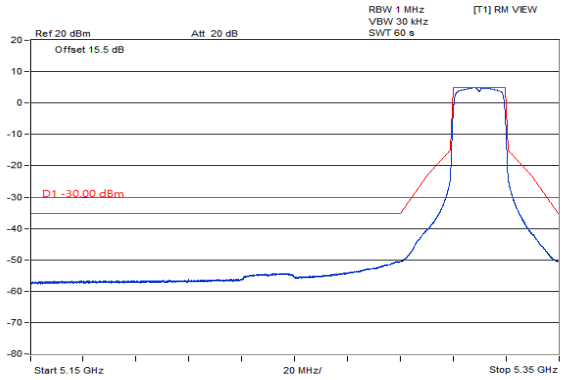
802.11ax (HE20) : CH 52



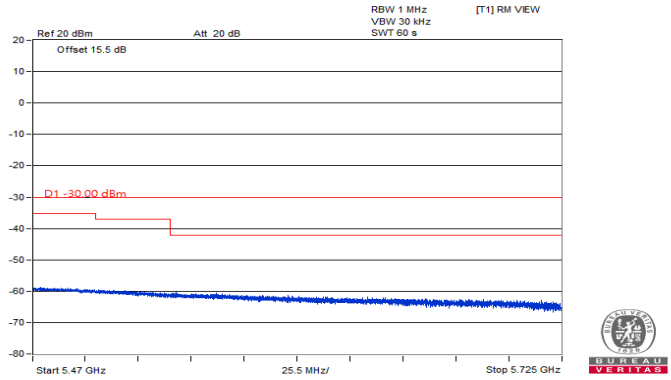
802.11ax (HE20) : CH 52



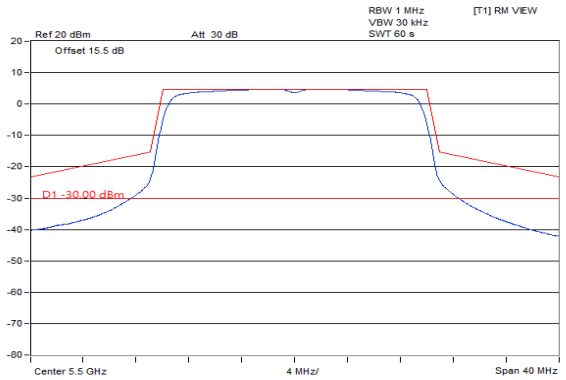
802.11ax (HE20) : CH 64



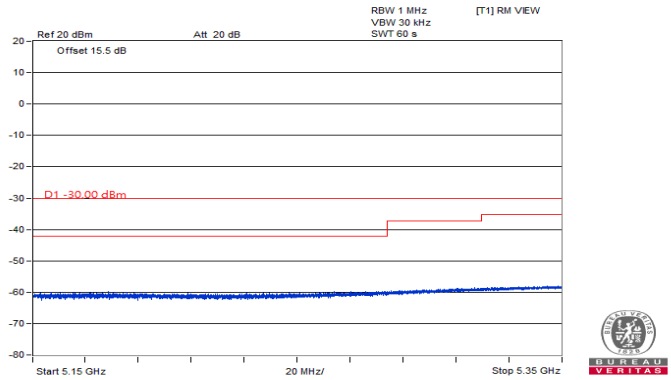
802.11ax (HE20) : CH 64



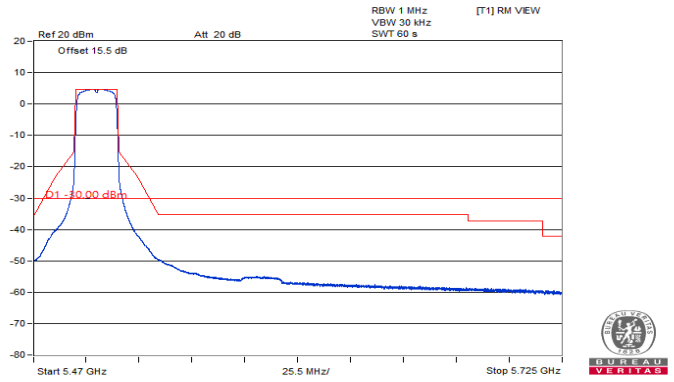
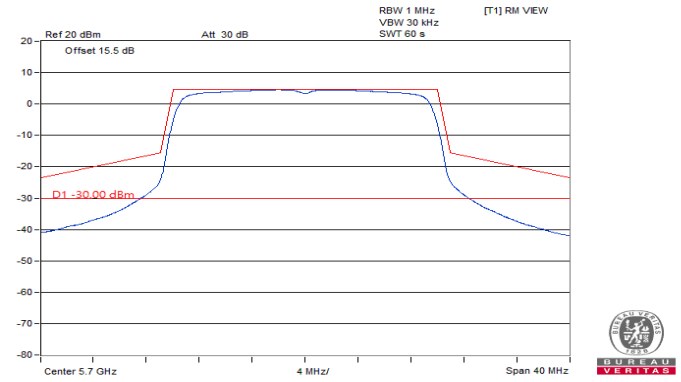
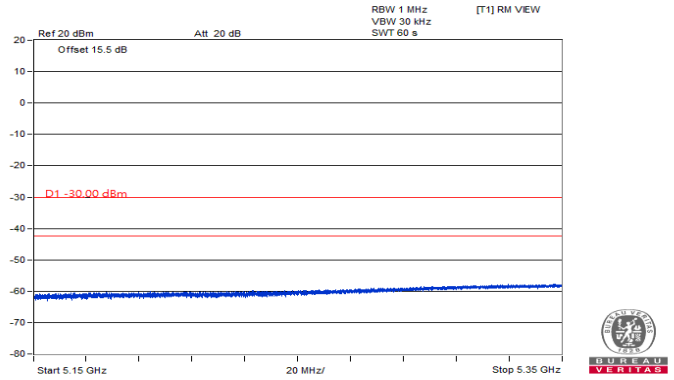
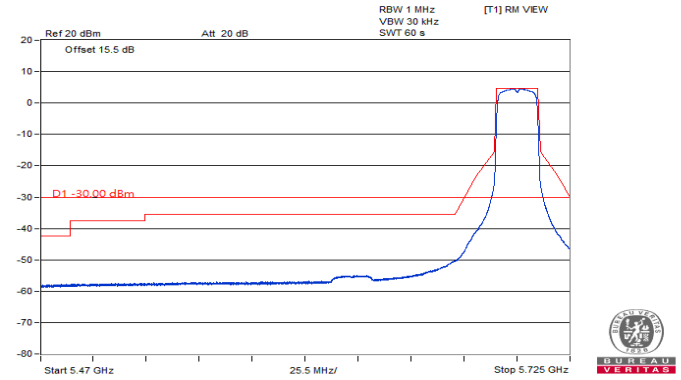
802.11ax (HE20) : CH 64



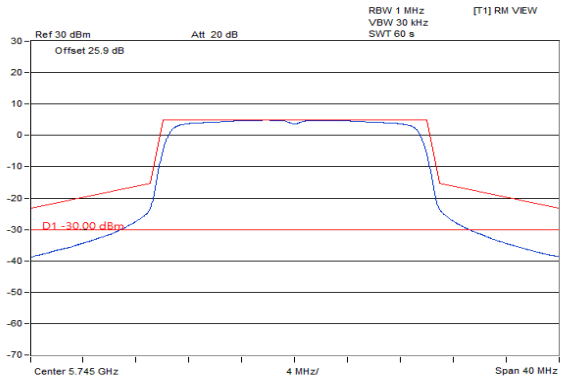
802.11ax (HE20) : CH 100



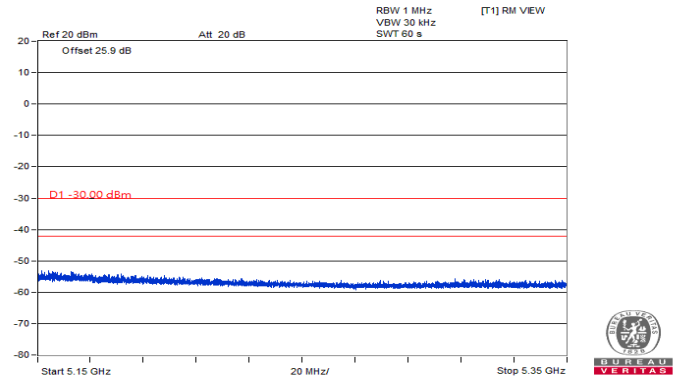
802.11ax (HE20) : CH 100

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
 802.11ax (HE20) : CH 100	 802.11ax (HE20) : CH 140
 802.11ax (HE20) : CH 140	 802.11ax (HE20) : CH 140

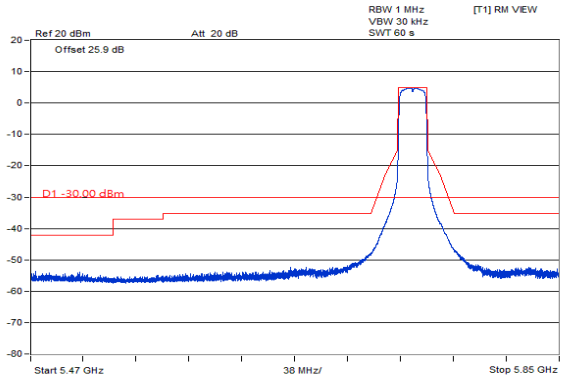
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands



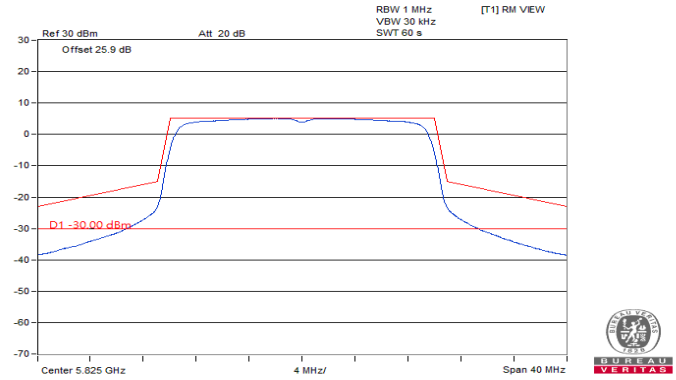
802.11ax (HE20) : CH 149



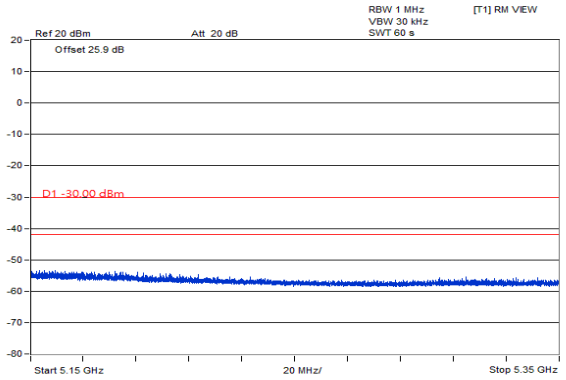
802.11ax (HE20) : CH 149



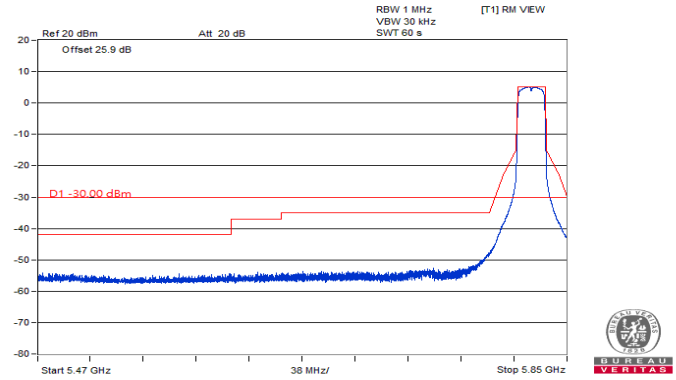
802.11ax (HE20) : CH 149



802.11ax (HE20) : CH 165

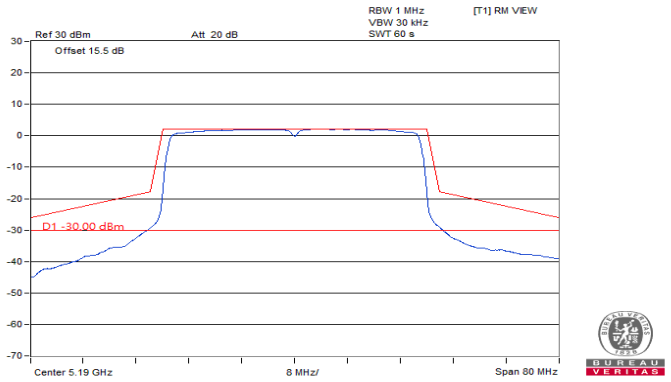
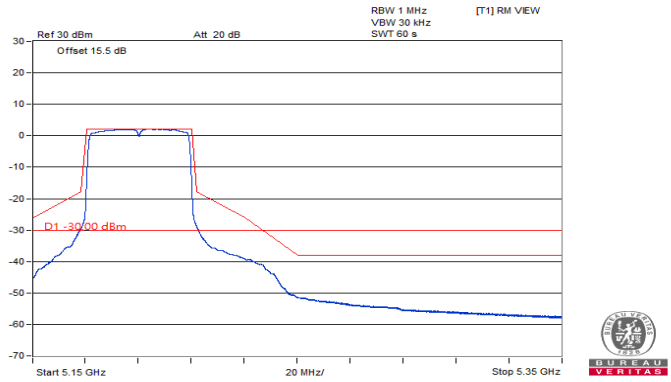
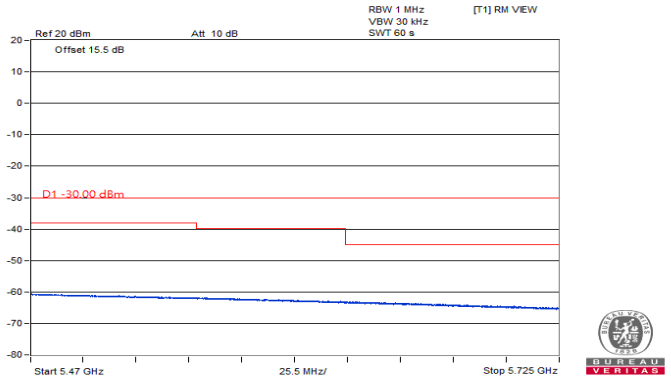
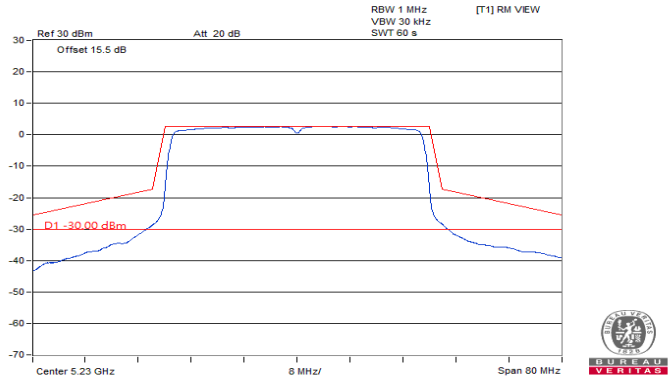
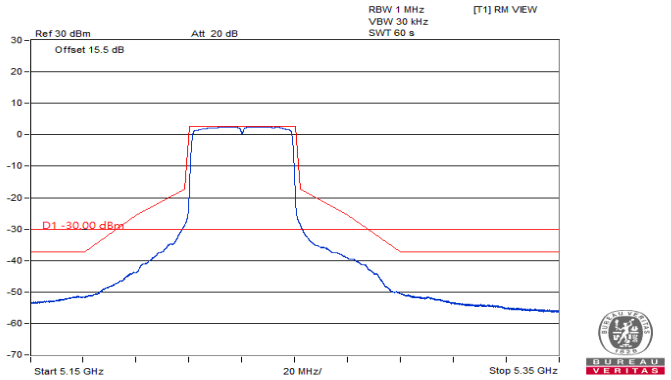
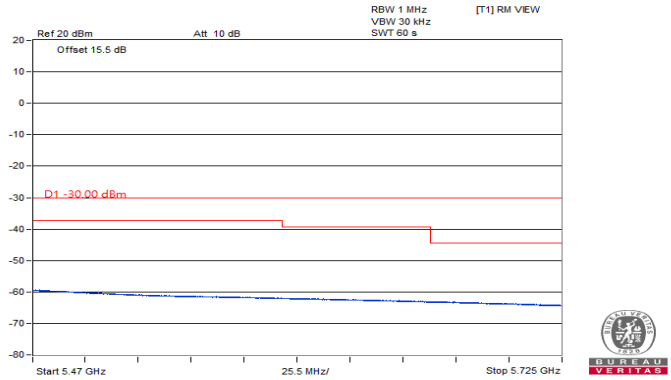


802.11ax (HE20) : CH 165

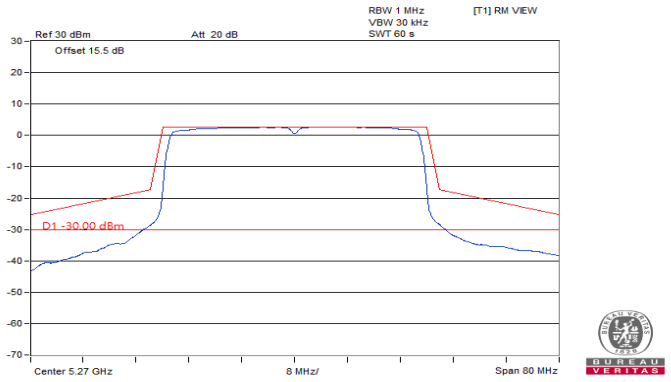


802.11ax (HE20) : CH 165

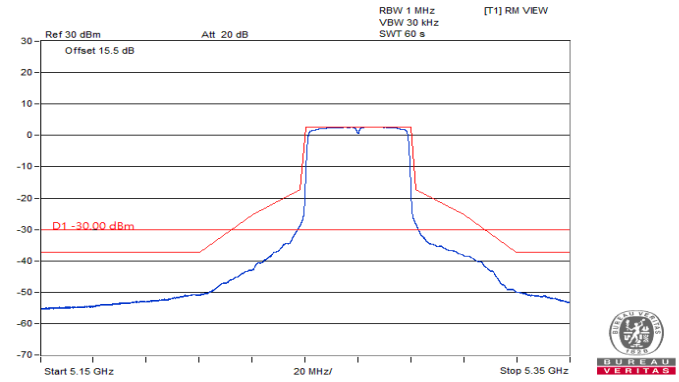
802.11ax (HE40)

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
802.11ax (HE40) : CH 38	802.11ax (HE40) : CH 38
	
802.11ax (HE40) : CH 46	802.11ax (HE40) : CH 46
	
802.11ax (HE40) : CH 46	802.11ax (HE40) : CH 46

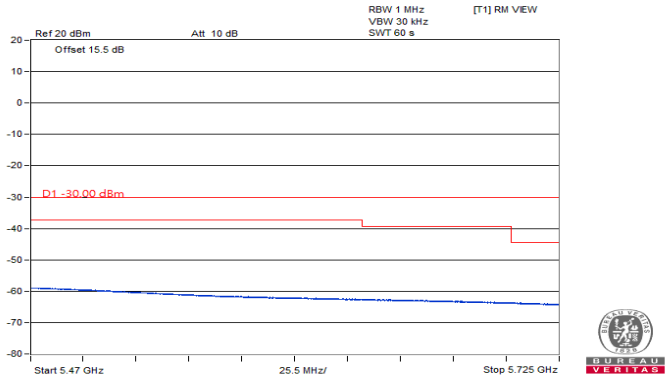
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands



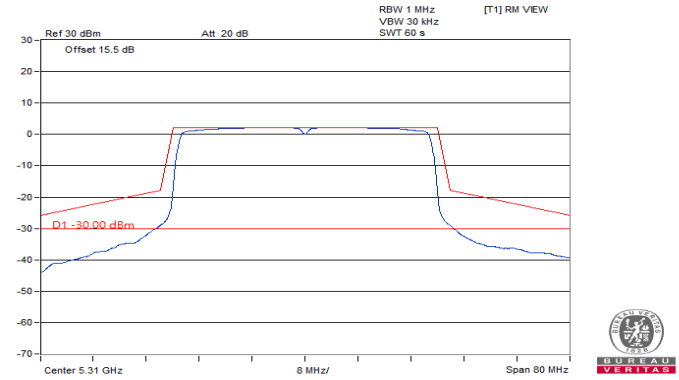
802.11ax (HE40) : CH 54



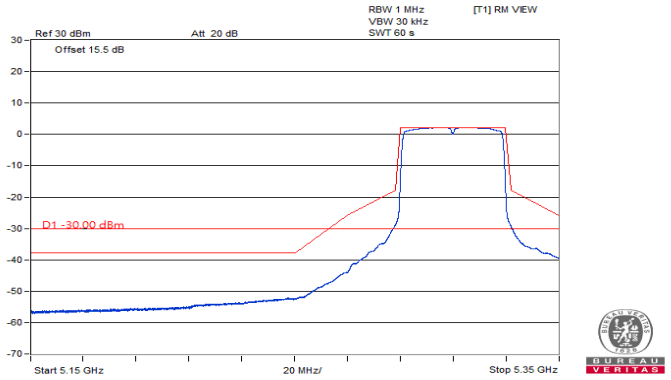
802.11ax (HE40) : CH 54



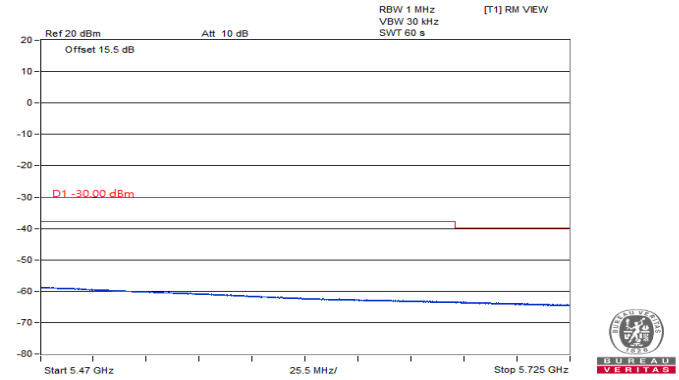
802.11ax (HE40) : CH 54



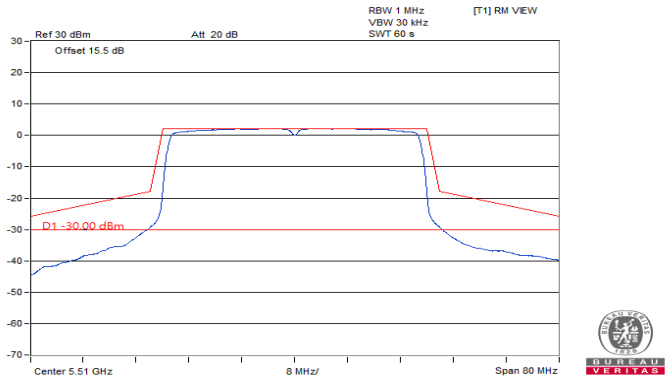
802.11ax (HE40) : CH 62



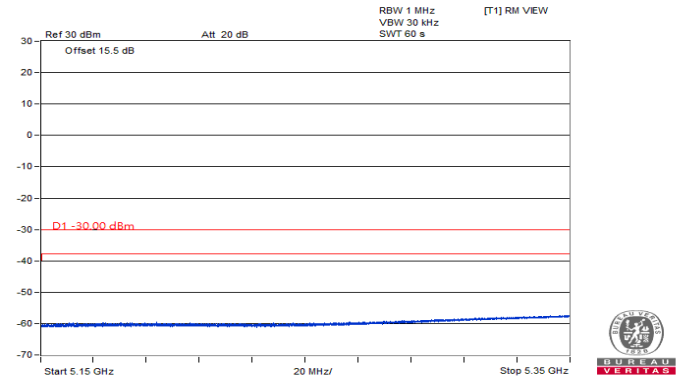
802.11ax (HE40) : CH 62



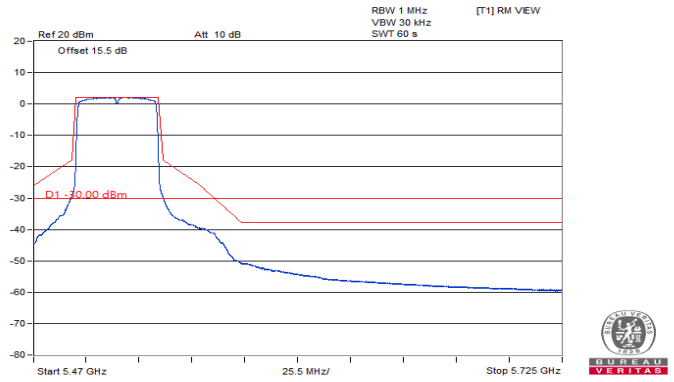
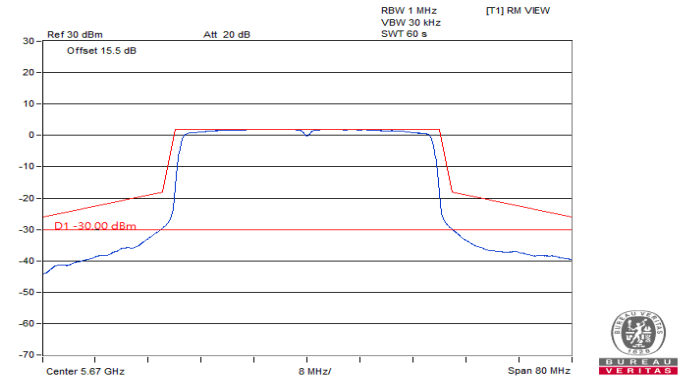
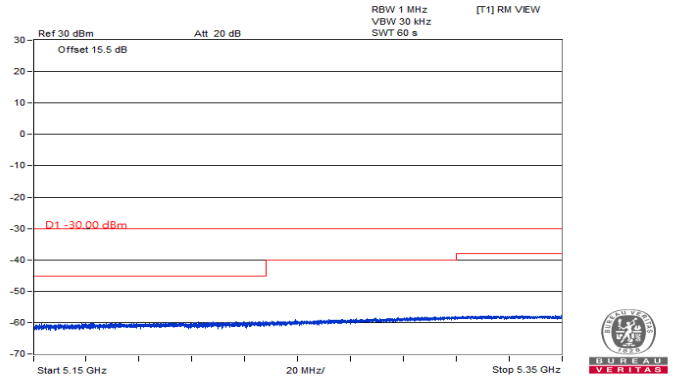
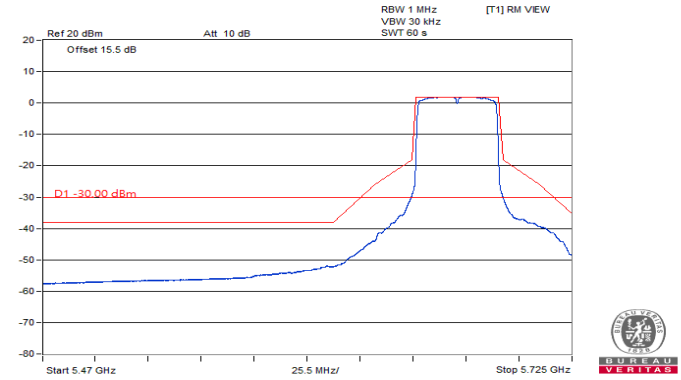
802.11ax (HE40) : CH 62



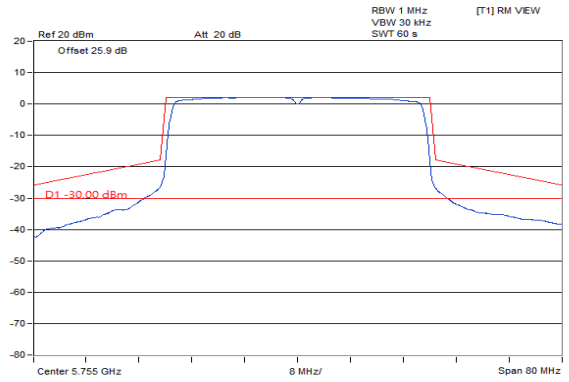
802.11ax (HE40) : CH 102



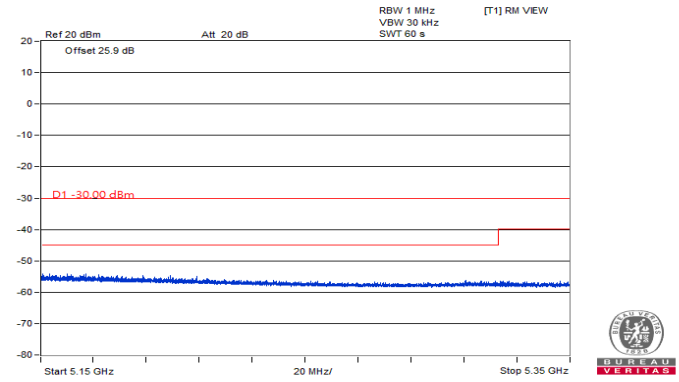
802.11ax (HE40) : CH 102

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
802.11ax (HE40) : CH 102	802.11ax (HE40) : CH 134
	
802.11ax (HE40) : CH 134	802.11ax (HE40) : CH 134

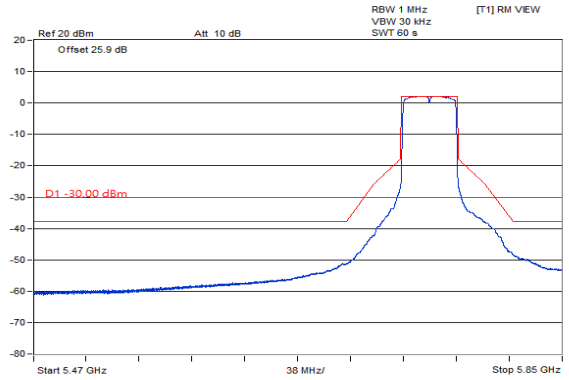
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands



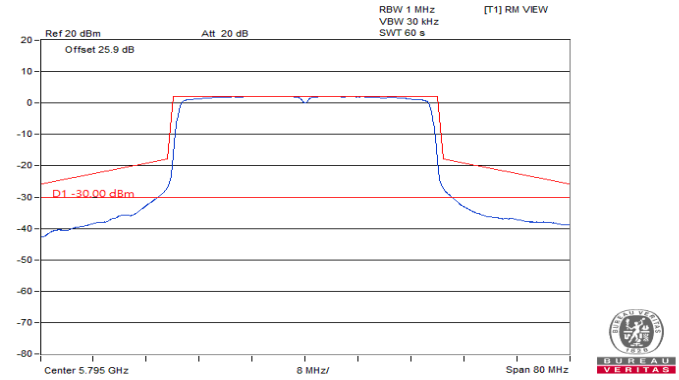
802.11ax (HE40) : CH 151



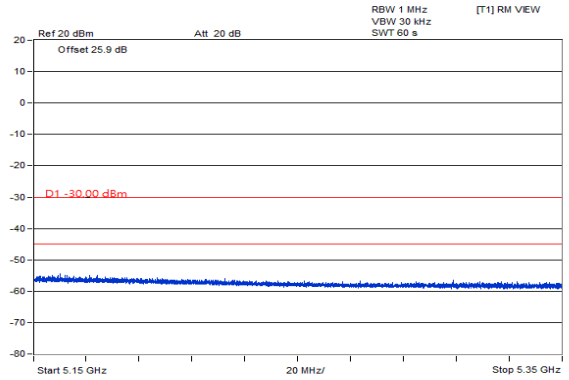
802.11ax (HE40) : CH 151



802.11ax (HE40) : CH 151



802.11ax (HE40) : CH 159



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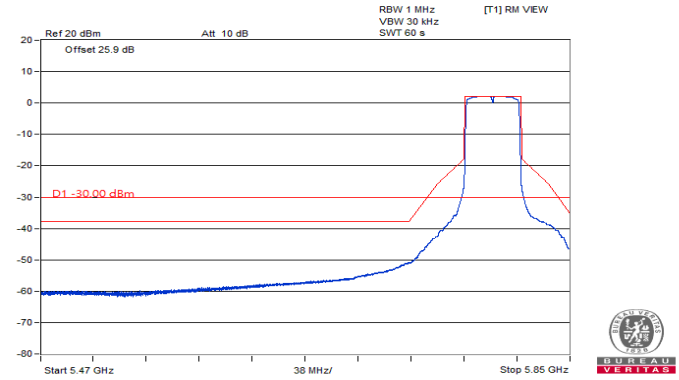
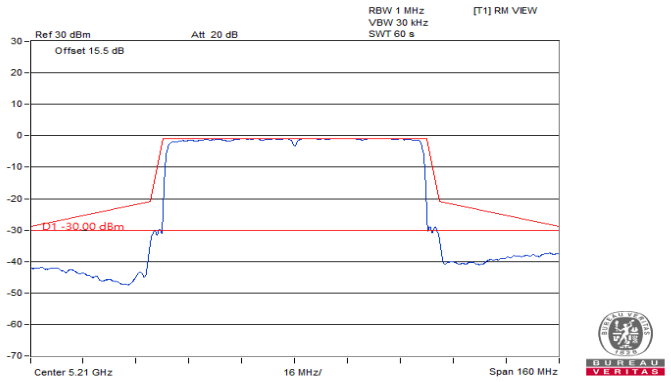
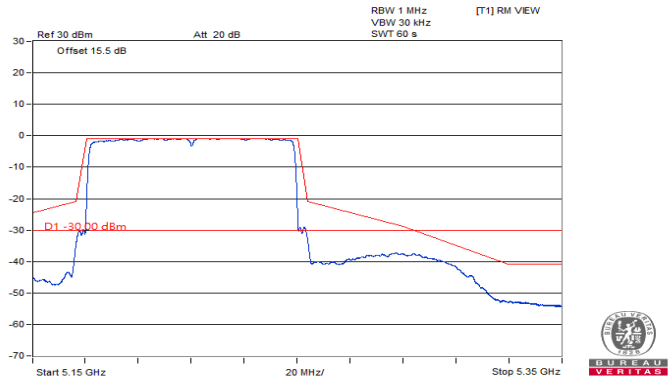
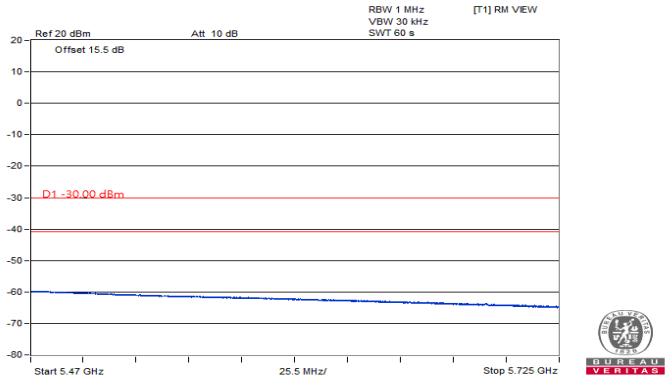
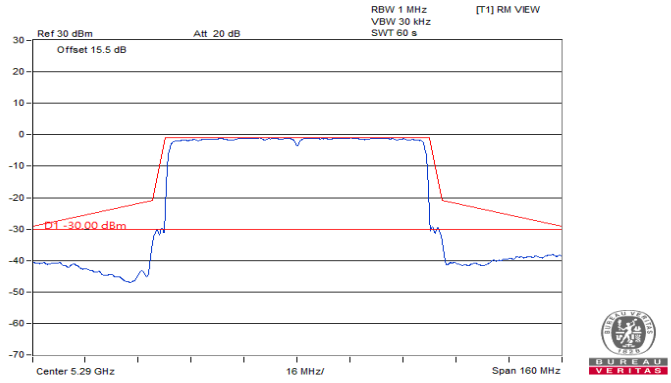
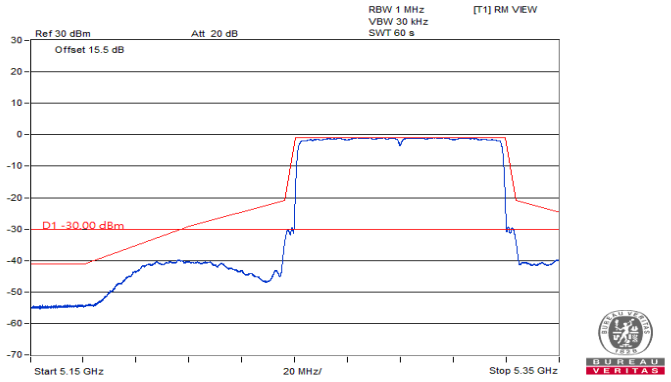
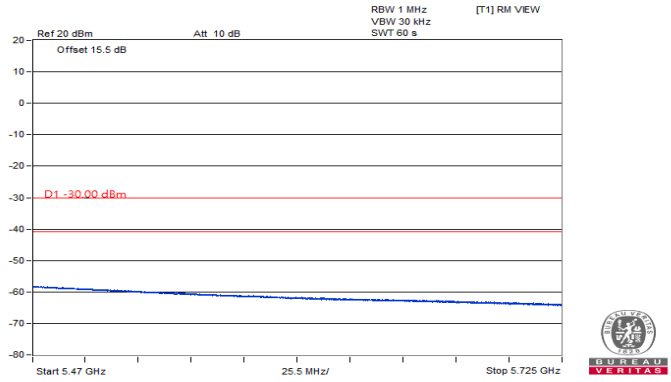


802.11ax (HE40) : CH 159

802.11ax (HE80)

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
802.11ax (HE80) : CH 42	802.11ax (HE80) : CH 42
	
802.11ax (HE80) : CH 42	802.11ax (HE80) : CH 58
	
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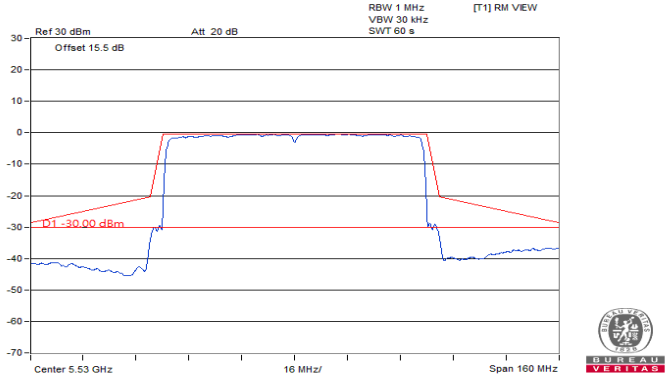
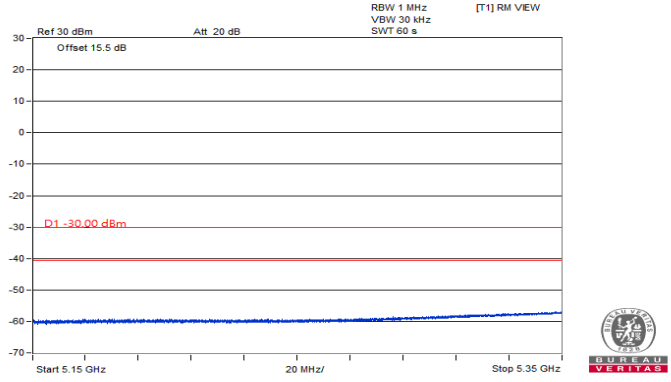
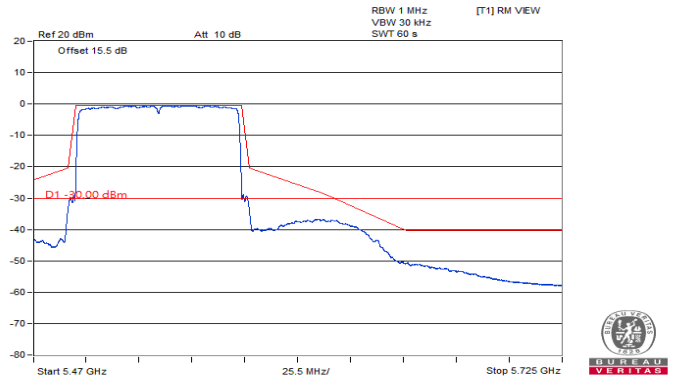
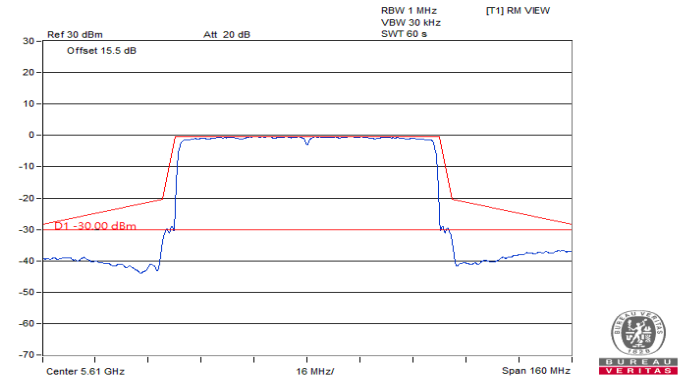
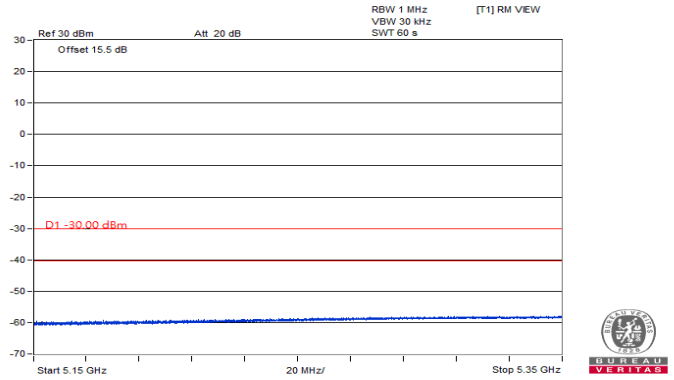
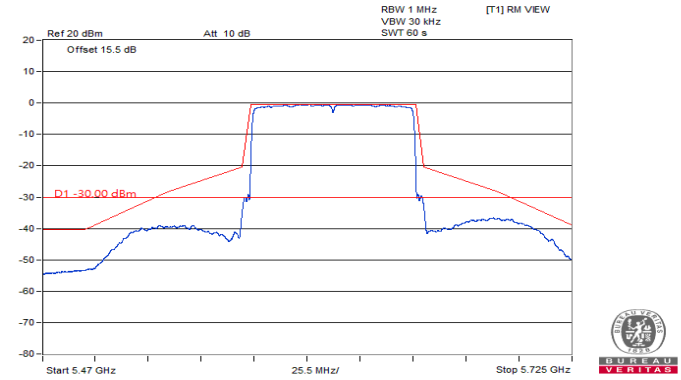
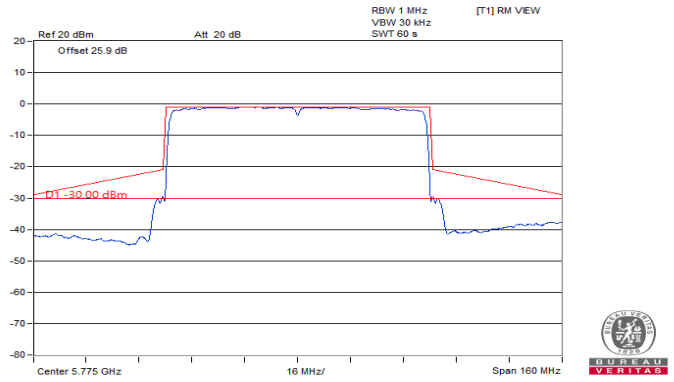
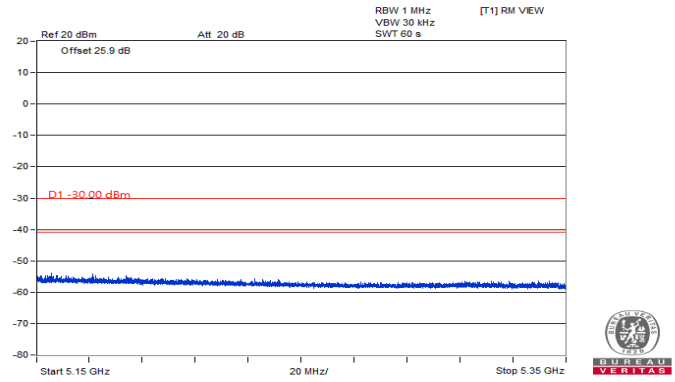
	
802.11ax (HE80) : CH 106	802.11ax (HE80) : CH 106

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
 802.11ax (HE80) : CH 106	 802.11ax (HE80) : CH 122
 802.11ax (HE80) : CH 122	 802.11ax (HE80) : CH 122

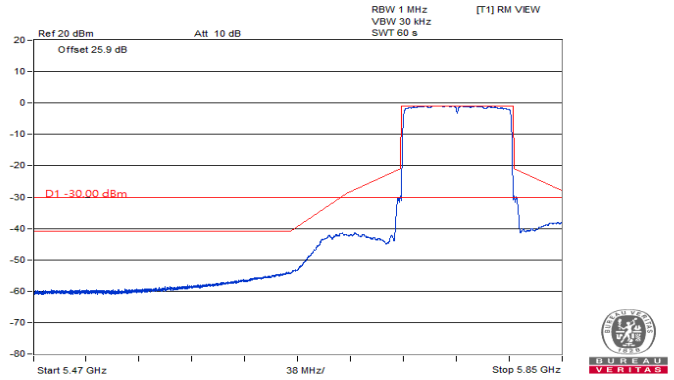
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands



802.11ax (HE80) : CH 155

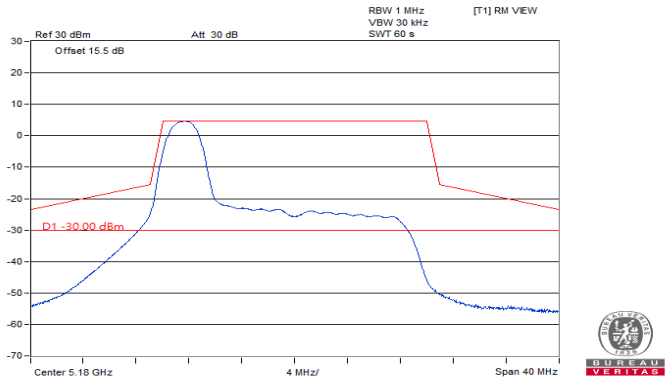
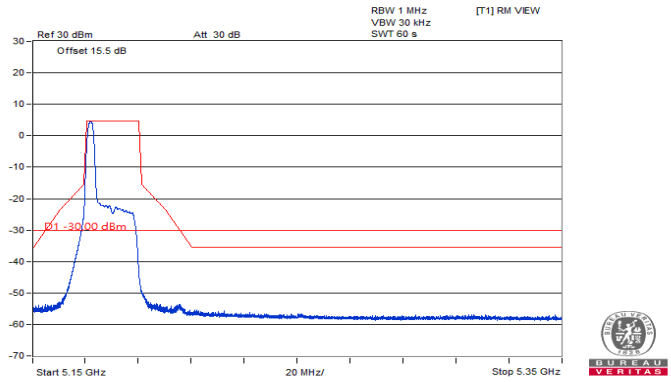
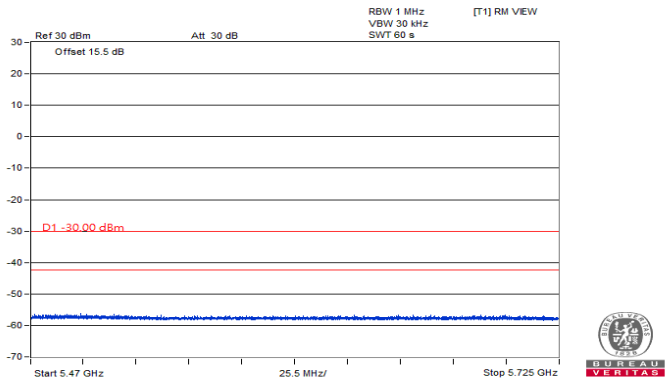
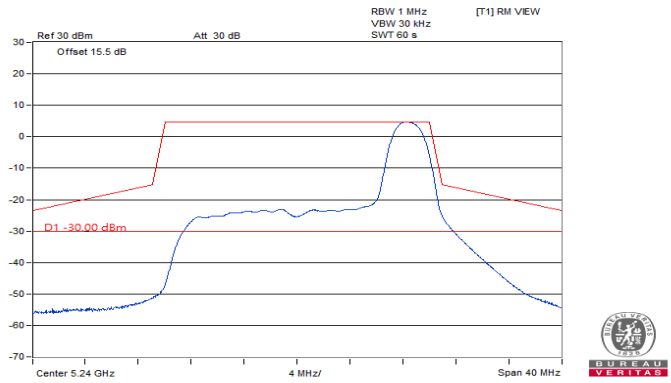
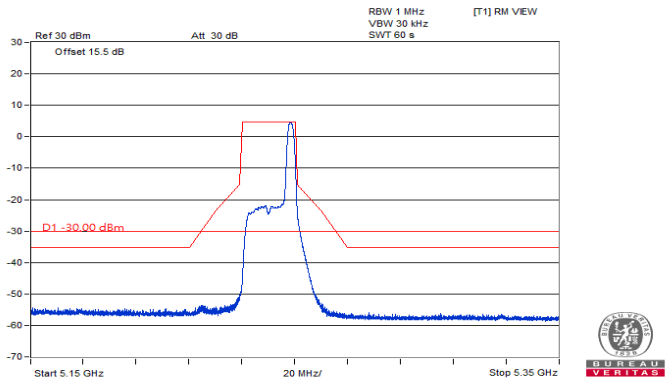
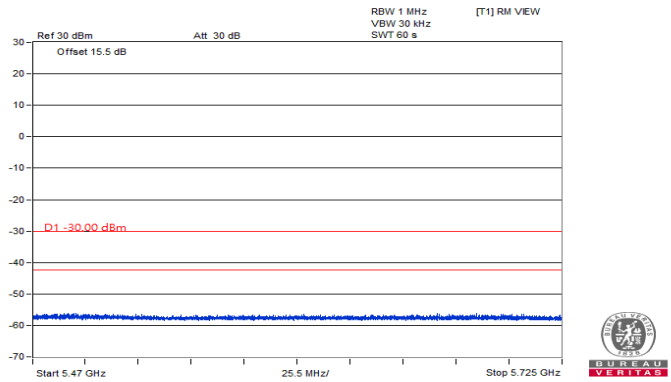


802.11ax (HE80) : CH 155

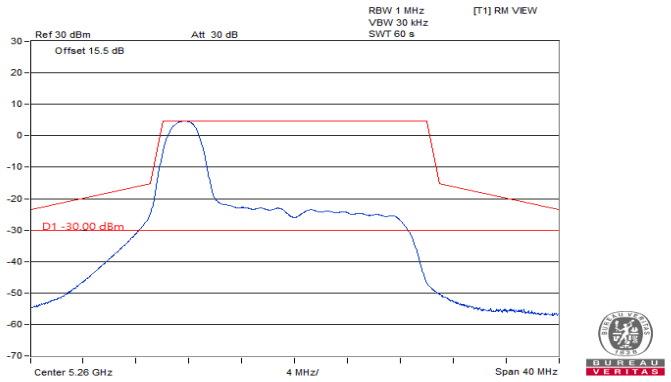
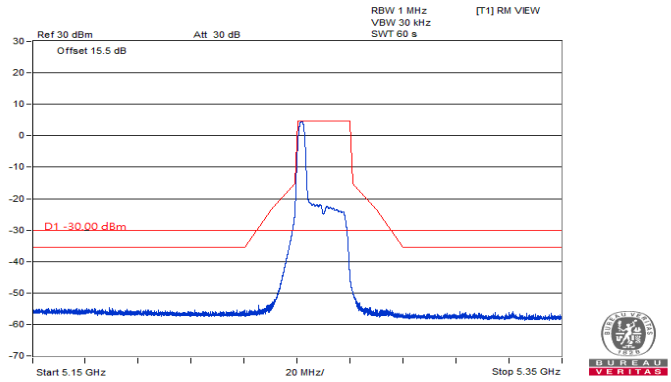
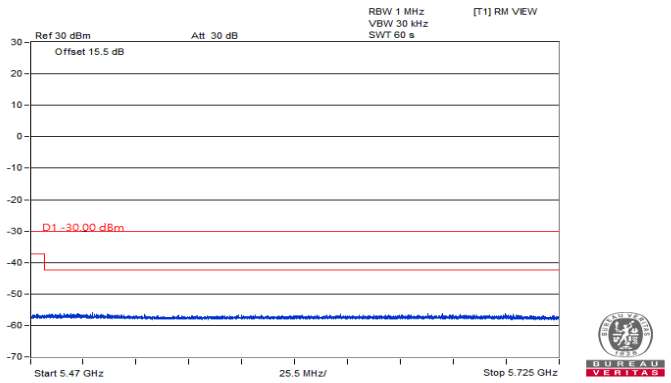
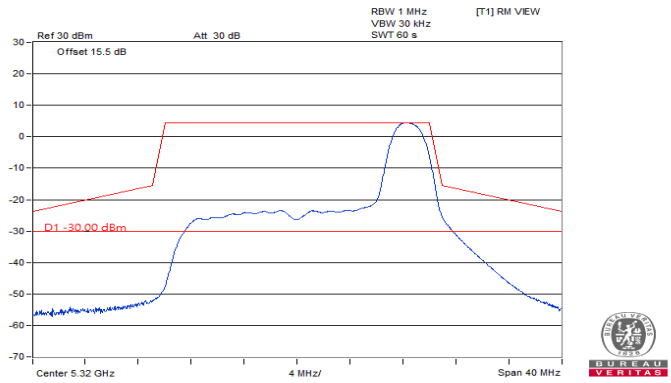
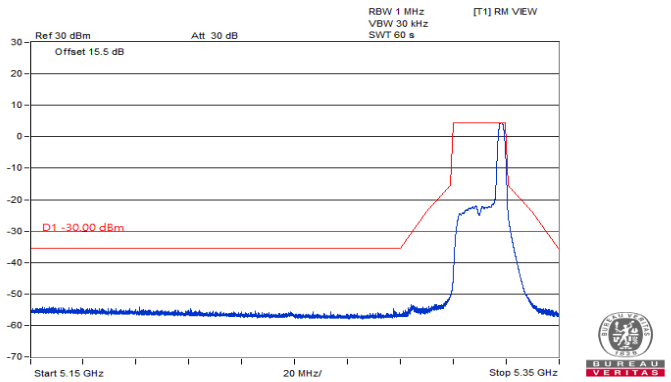
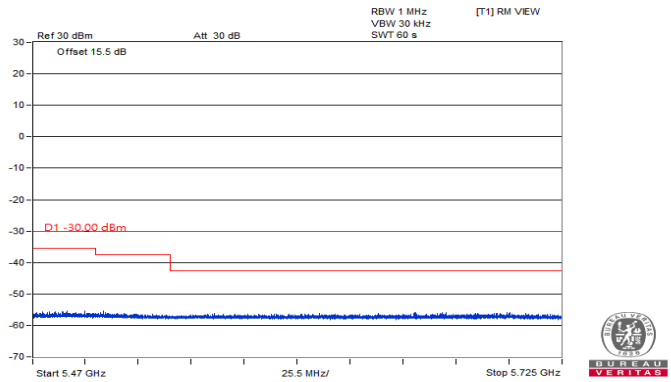
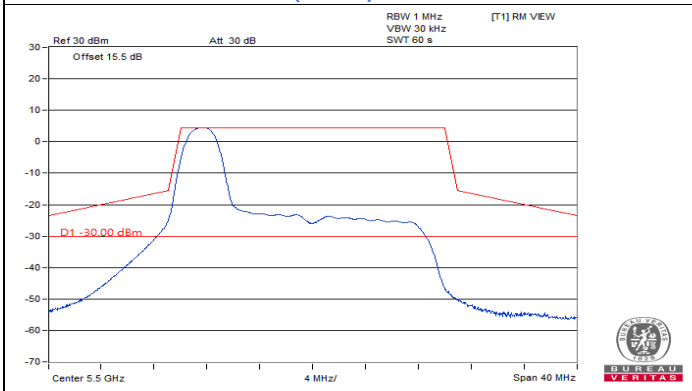
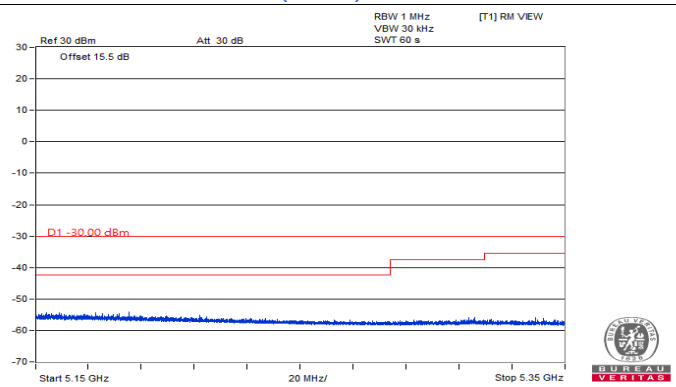


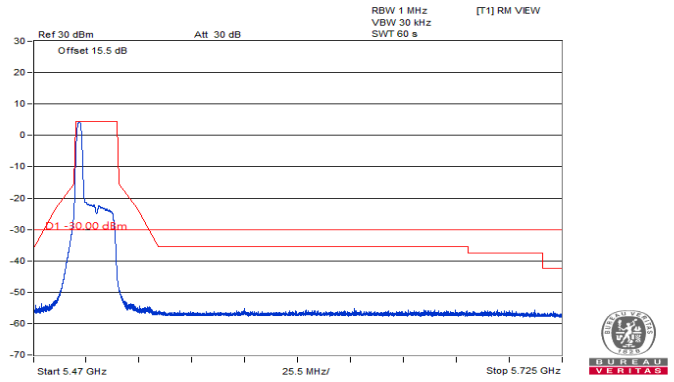
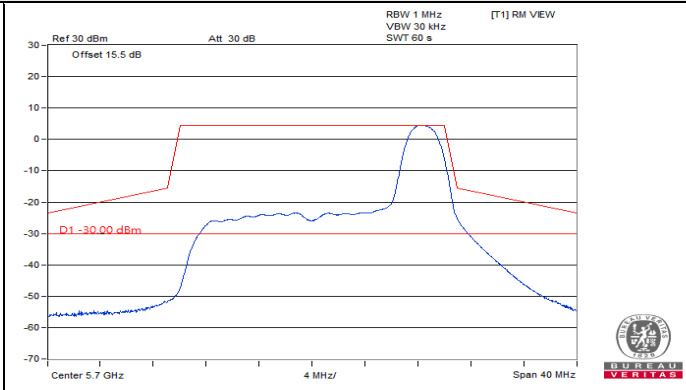
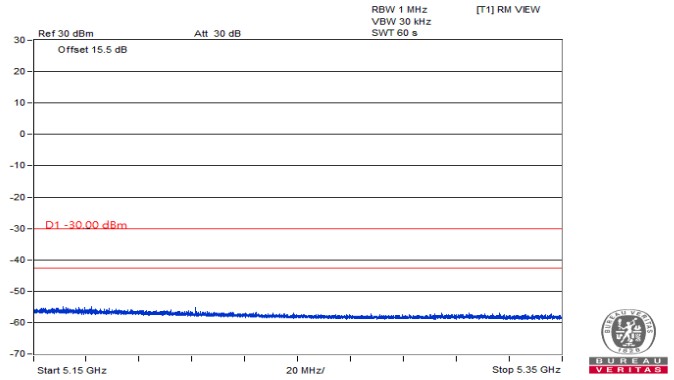
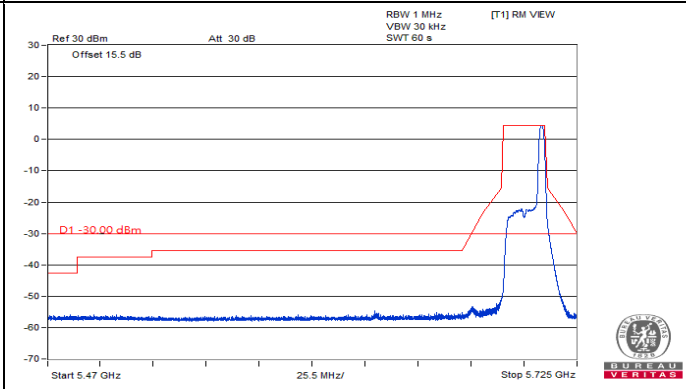
802.11ax (HE80) : CH 155

802.11ax (HE20) RU26

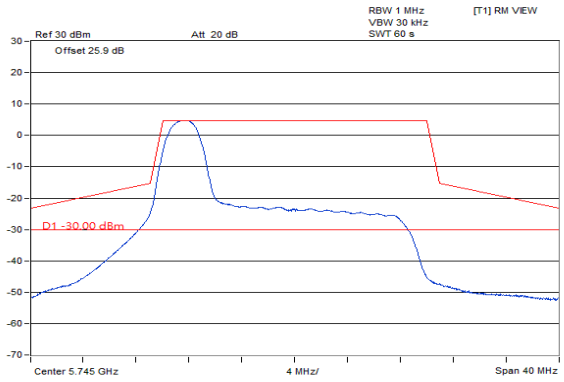
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
802.11ax (HE20) RU26 : CH 36	802.11ax (HE20) RU26 : CH 36
	
802.11ax (HE20) RU26 : CH 36	802.11ax (HE20) RU26 : CH 48
	
802.11ax (HE20) RU26 : CH 48	802.11ax (HE20) RU26 : CH 48

802.11ax (HE20) RU26

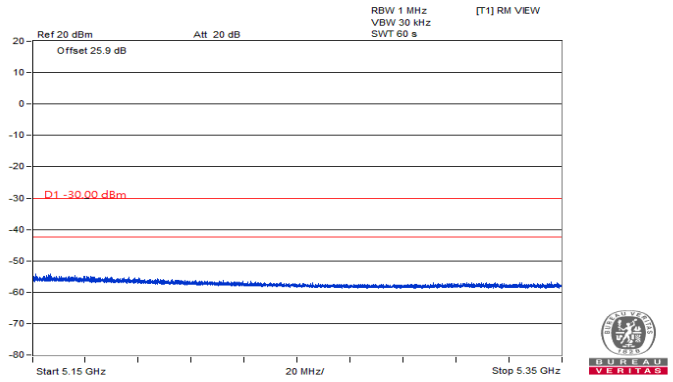
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
 802.11ax (HE20) RU26 : CH 52	 802.11ax (HE20) RU26 : CH 52
 802.11ax (HE20) RU26 : CH 52	 802.11ax (HE20) RU26 : CH 64
 802.11ax (HE20) RU26 : CH 64	 802.11ax (HE20) RU26 : CH 64
 802.11ax (HE20) RU26 : CH 100	 802.11ax (HE20) RU26 : CH 100

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
802.11ax (HE20) RU26 : CH 100	802.11ax (HE20) RU26 : CH 140
	
802.11ax (HE20) RU26 : CH 140	802.11ax (HE20) RU26 : CH 140

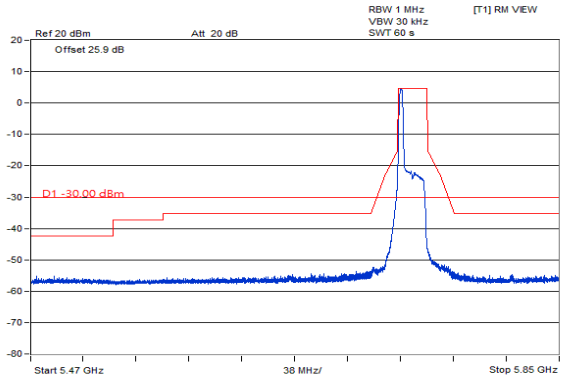
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands



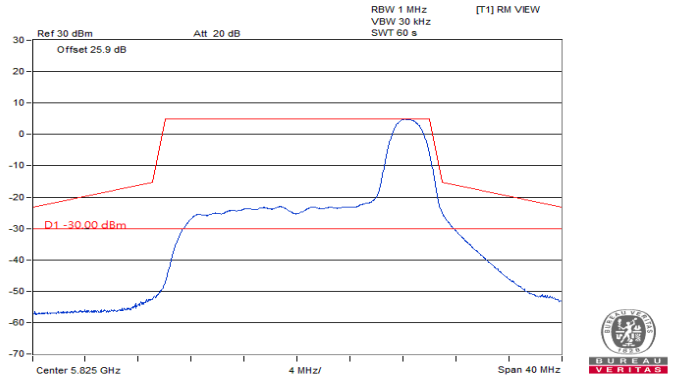
802.11ax (HE20) RU26 : CH 149



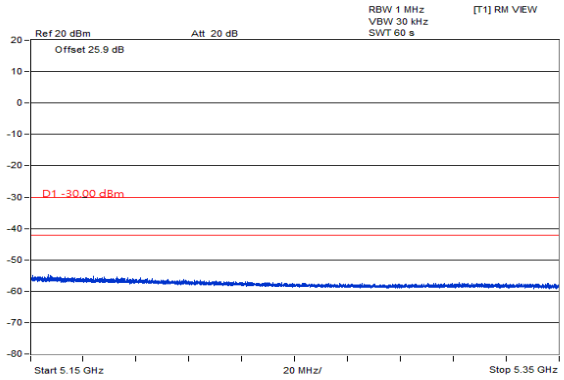
802.11ax (HE20) RU26 : CH 149



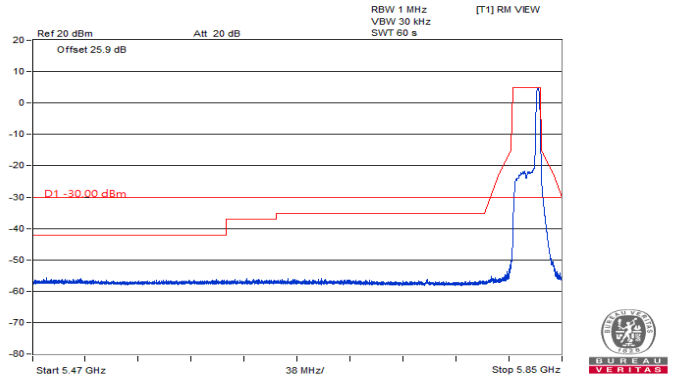
802.11ax (HE20) RU26 : CH 149



802.11ax (HE20) RU26 : CH 165

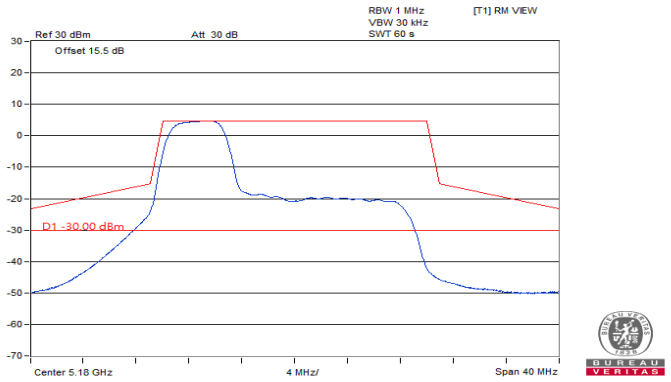
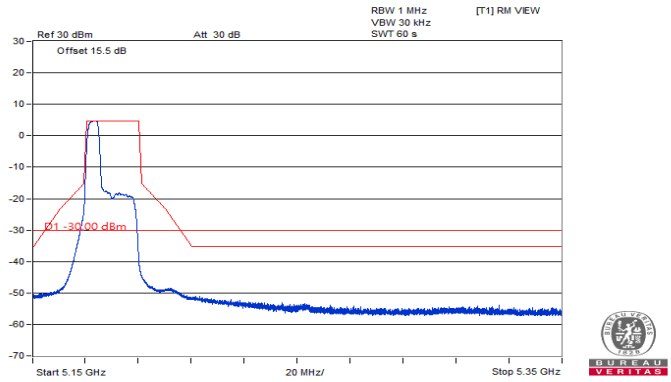
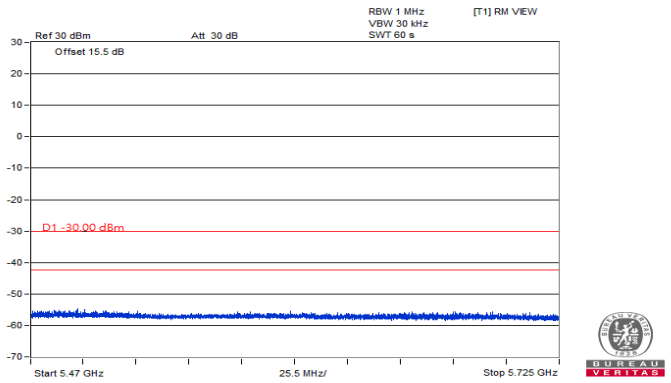
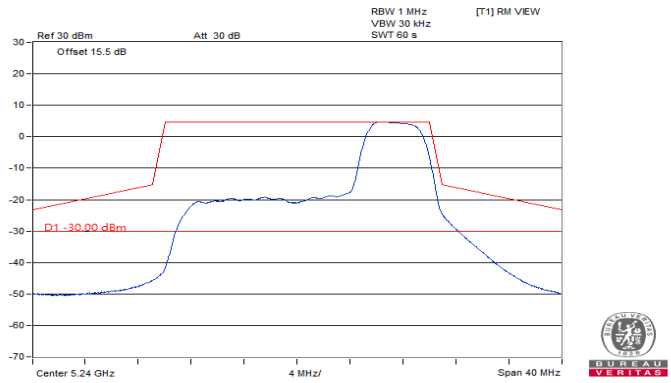
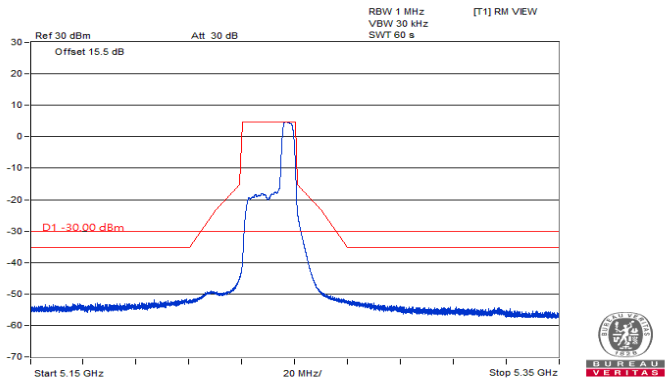
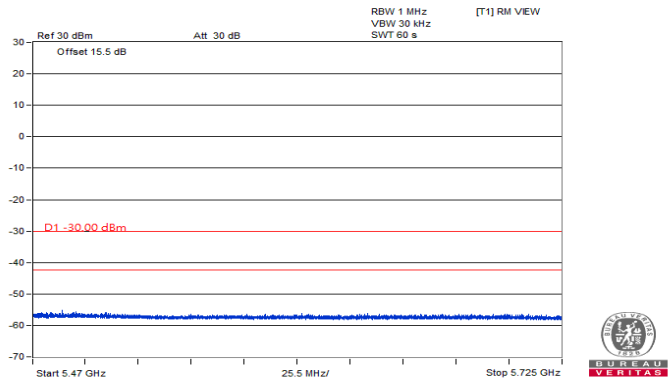


802.11ax (HE20) RU26 : CH 165

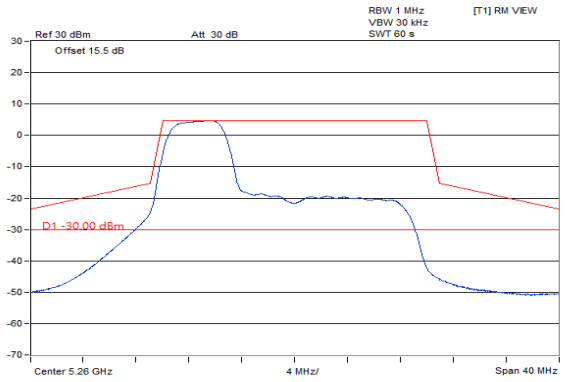


802.11ax (HE20) RU26 : CH 165

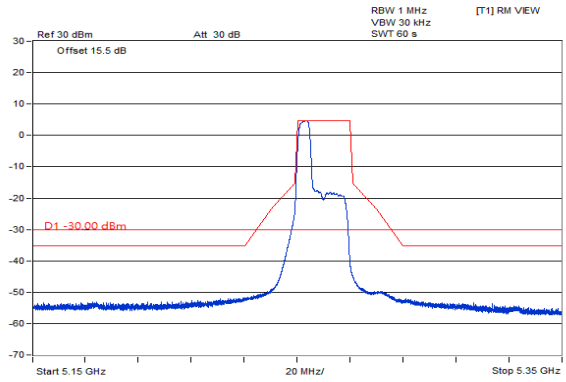
802.11ax (HE20) RU52

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
802.11ax (HE20) RU52 : CH 36	802.11ax (HE20) RU52 : CH 36
	
802.11ax (HE20) RU52 : CH 36	802.11ax (HE20) RU52 : CH 48
	
802.11ax (HE20) RU52 : CH 48	802.11ax (HE20) RU52 : CH 48

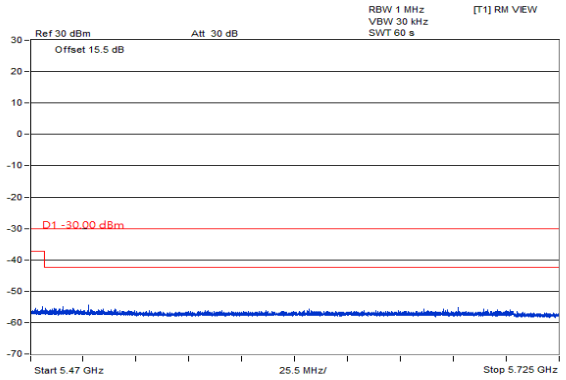
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands



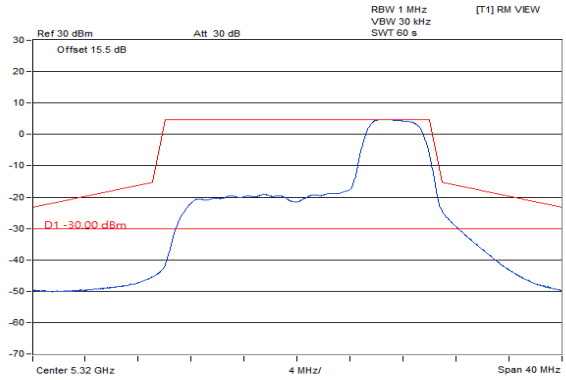
802.11ax (HE20) RU52 : CH 52



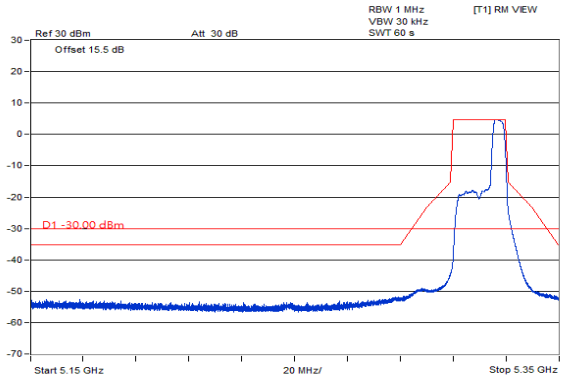
802.11ax (HE20) RU52 : CH 52



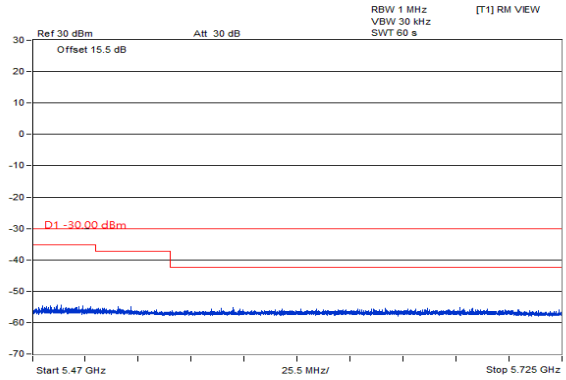
802.11ax (HE20) RU52 : CH 52



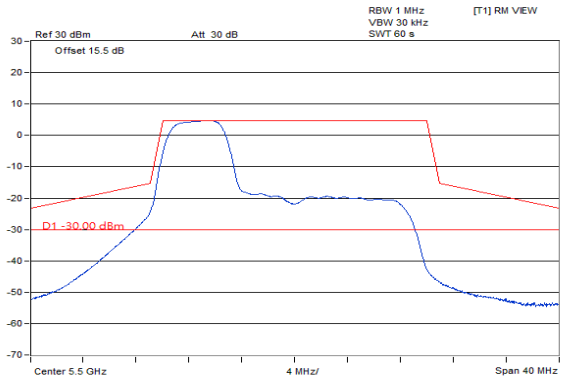
802.11ax (HE20) RU52 : CH 64



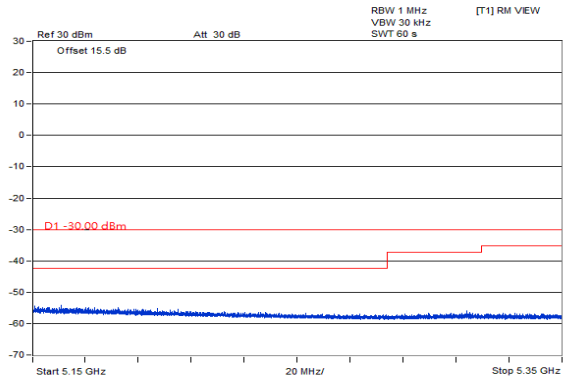
802.11ax (HE20) RU52 : CH 64



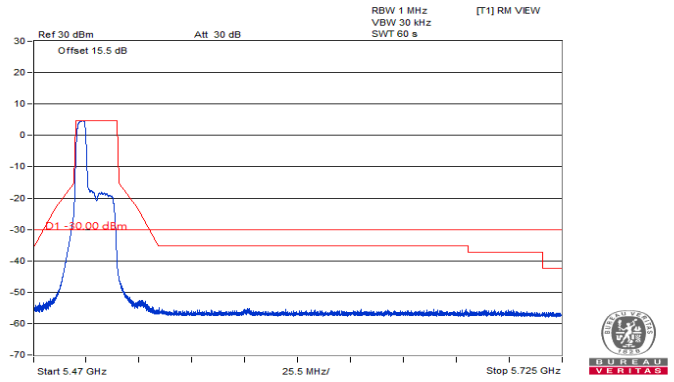
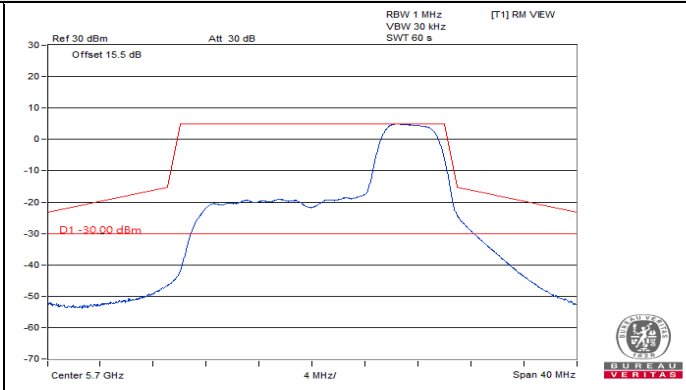
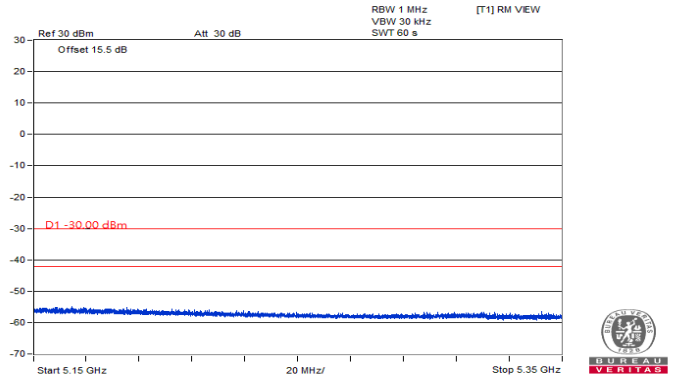
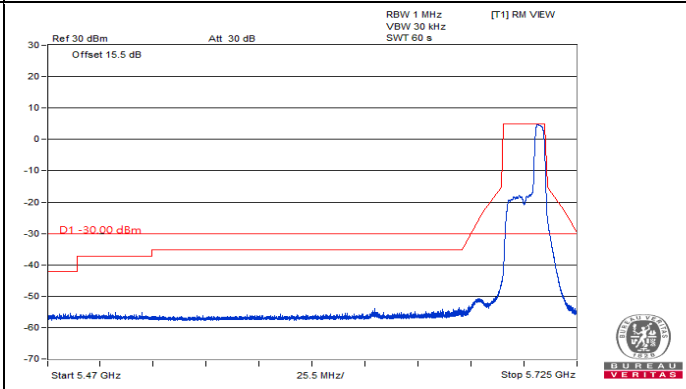
802.11ax (HE20) RU52 : CH 64



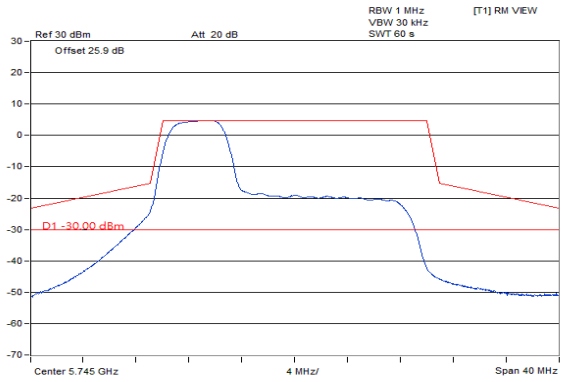
802.11ax (HE20) RU52 : CH 100



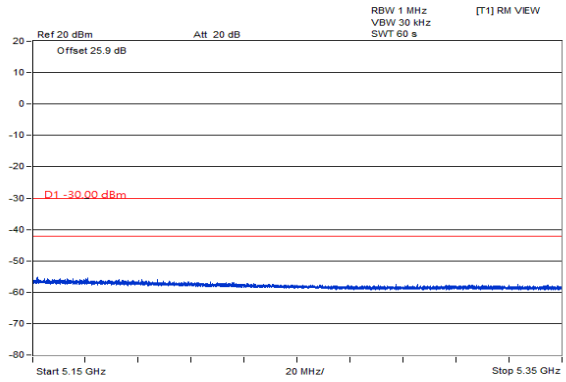
802.11ax (HE20) RU52 : CH 100

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
802.11ax (HE20) RU52 : CH 100	802.11ax (HE20) RU52 : CH 140
	
802.11ax (HE20) RU52 : CH 140	802.11ax (HE20) RU52 : CH 140

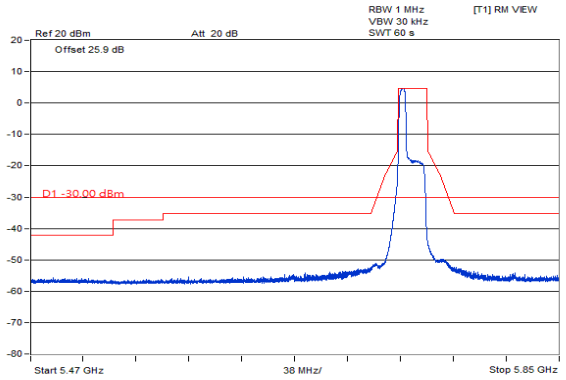
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands



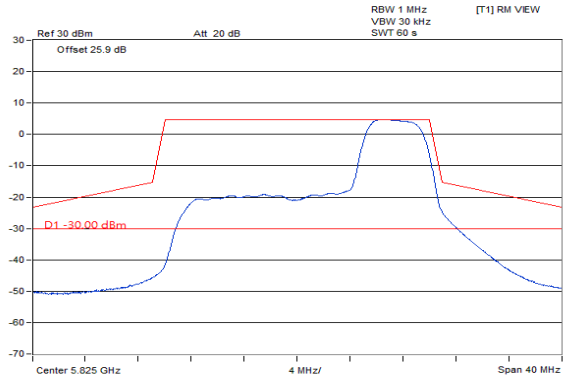
802.11ax (HE20) RU52 : CH 149



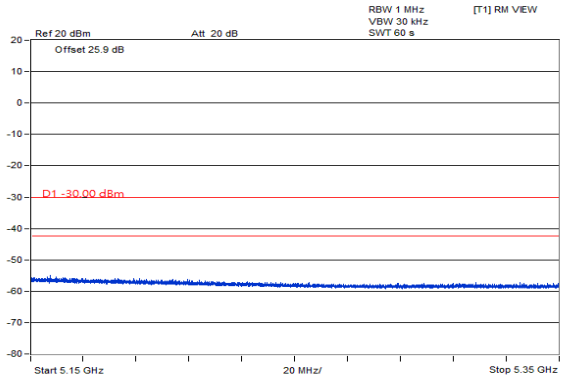
802.11ax (HE20) RU52 : CH 149



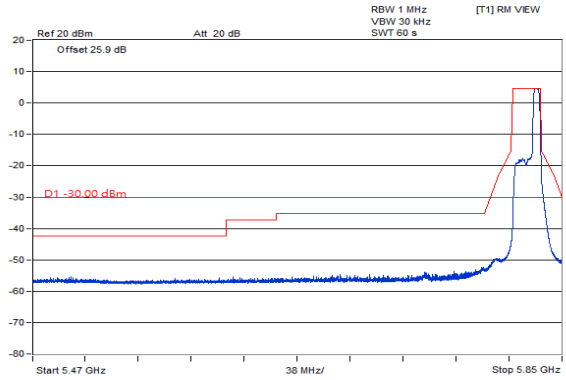
802.11ax (HE20) RU52 : CH 149



802.11ax (HE20) RU52 : CH 165

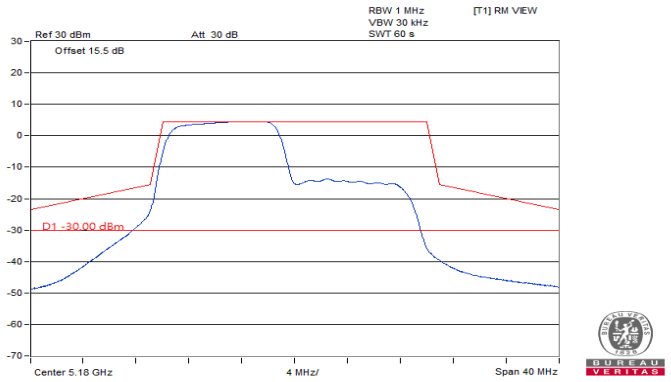
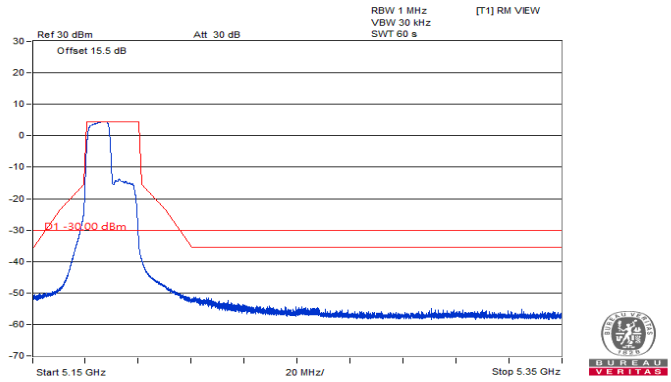
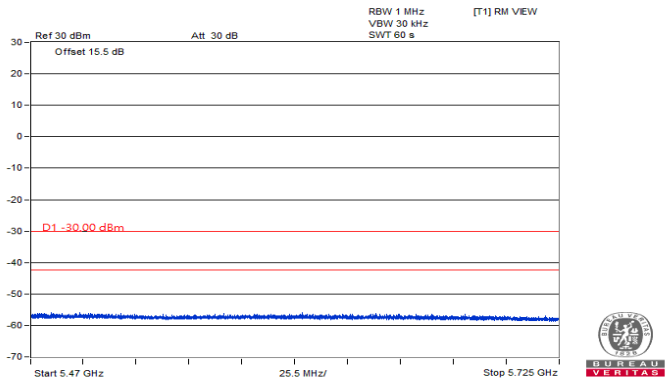
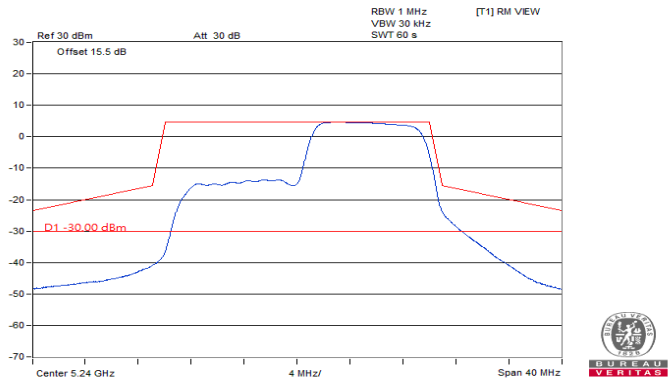
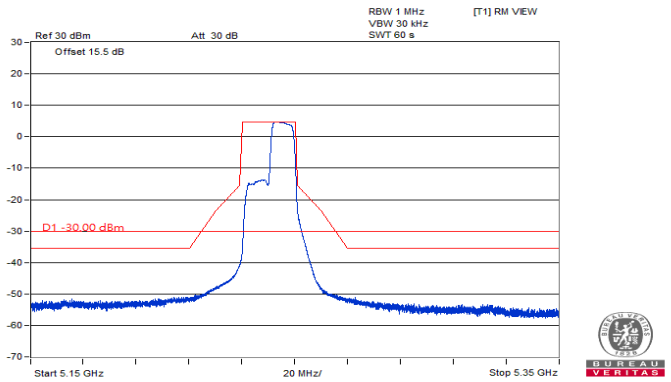
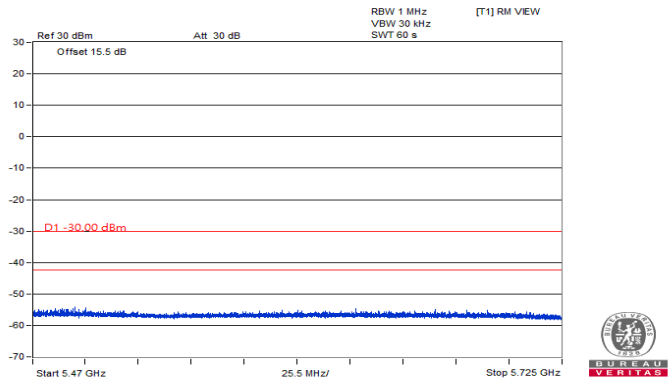


802.11ax (HE20) RU52 : CH 165

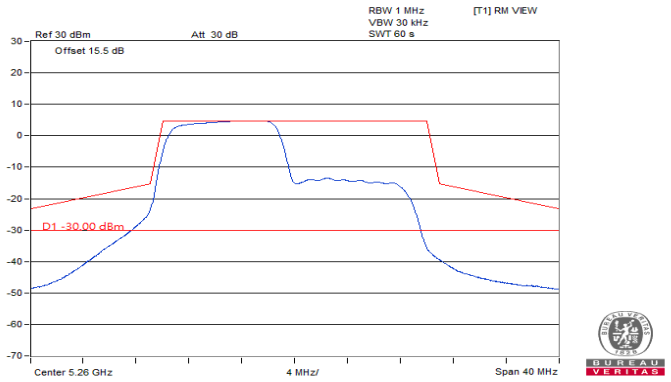
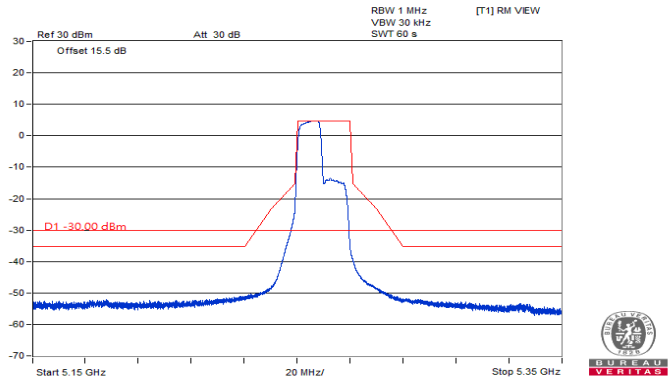
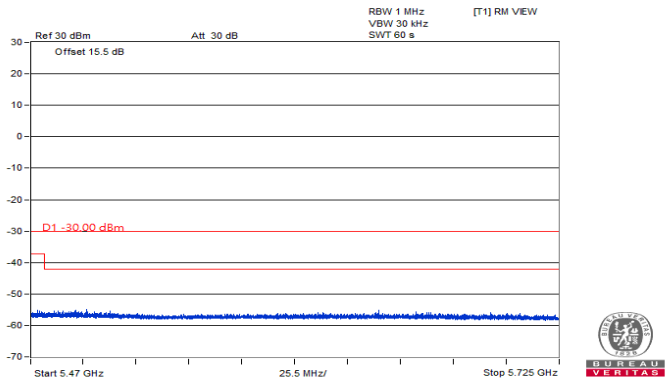
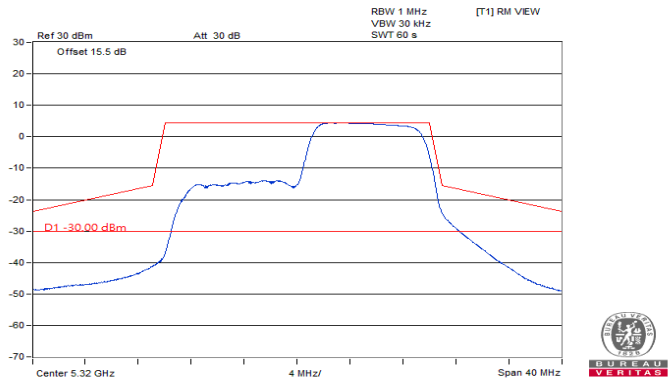
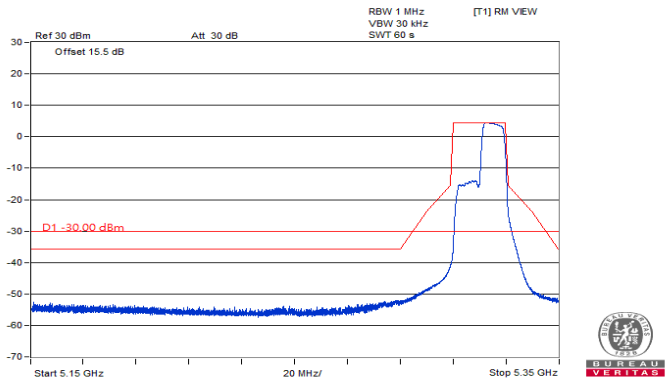
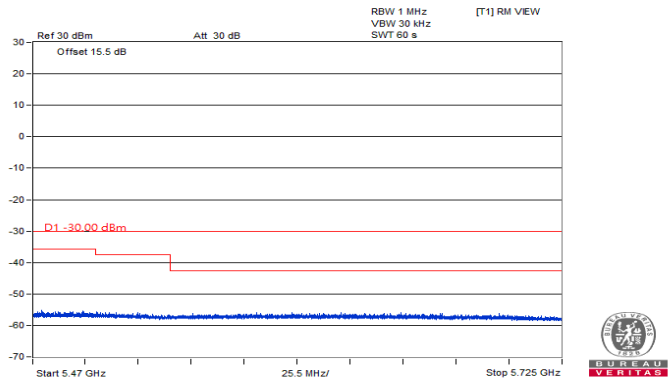
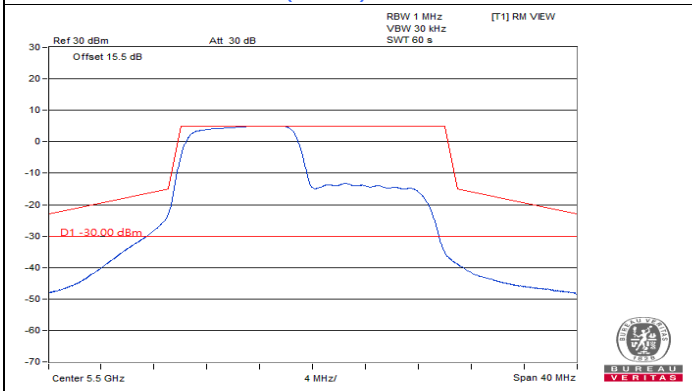
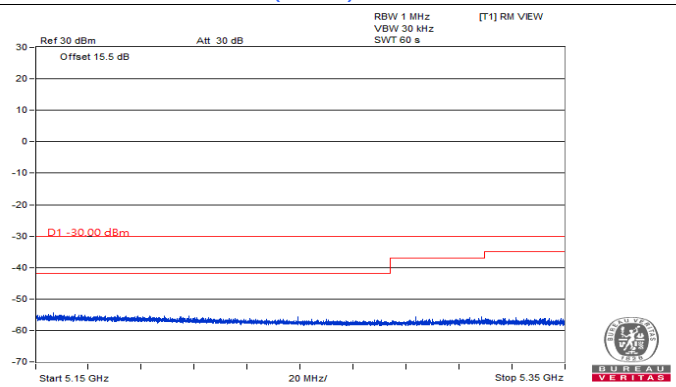


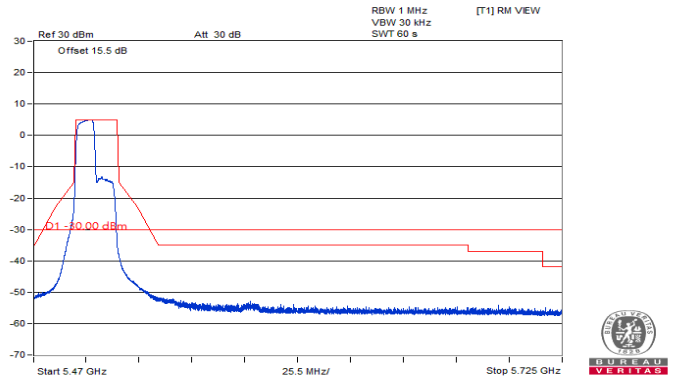
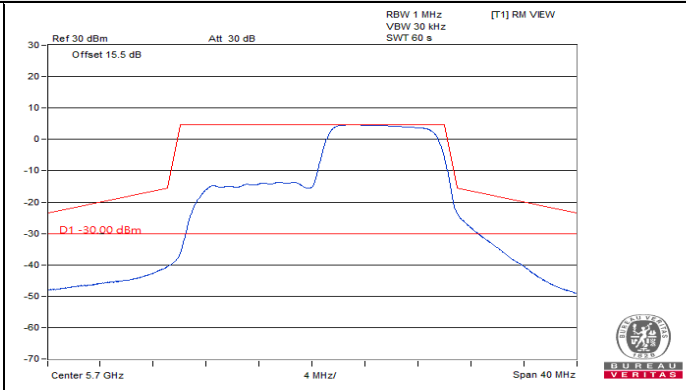
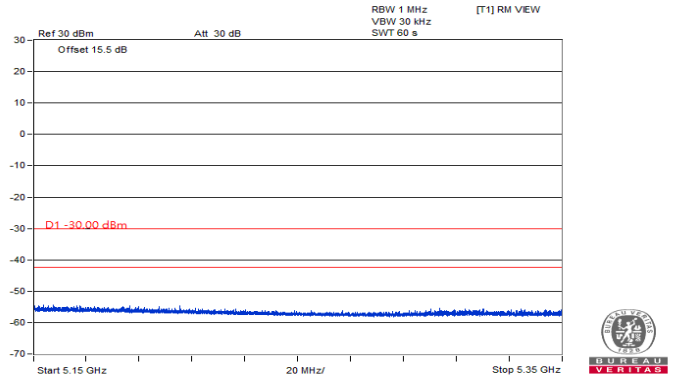
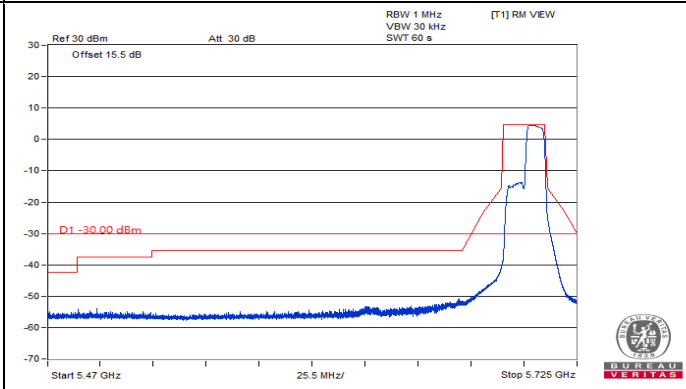
802.11ax (HE20) RU52 : CH 165

802.11ax (HE20) RU106

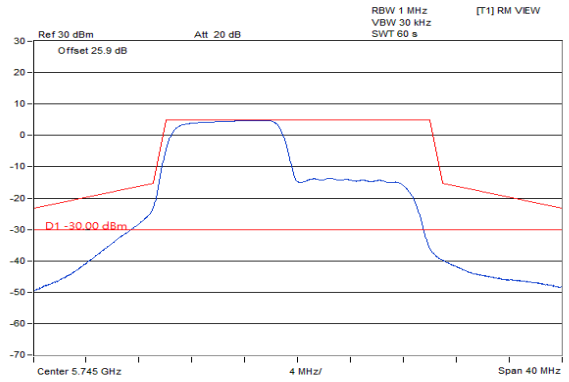
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
802.11ax (HE20) RU106 : CH 36	802.11ax (HE20) RU106 : CH 36
	
802.11ax (HE20) RU106 : CH 36	802.11ax (HE20) RU106 : CH 48
	
802.11ax (HE20) RU106 : CH 48	802.11ax (HE20) RU106 : CH 48

802.11ax (HE20) RU106

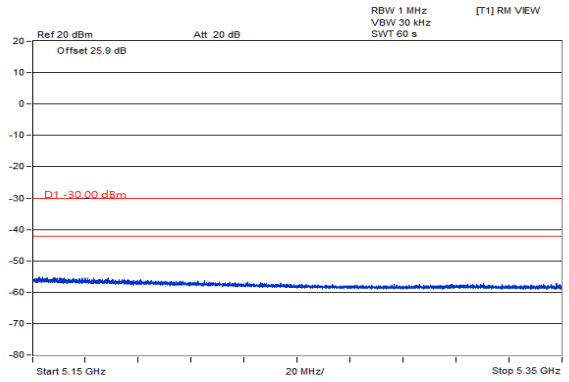
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
 802.11ax (HE20) RU106 : CH 52	 802.11ax (HE20) RU106 : CH 52
 802.11ax (HE20) RU106 : CH 52	 802.11ax (HE20) RU106 : CH 64
 802.11ax (HE20) RU106 : CH 64	 802.11ax (HE20) RU106 : CH 64
 802.11ax (HE20) RU106 : CH 100	 802.11ax (HE20) RU106 : CH 100

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
802.11ax (HE20) RU106 : CH 100	802.11ax (HE20) RU106 : CH 140
	
802.11ax (HE20) RU106 : CH 140	802.11ax (HE20) RU106 : CH 140

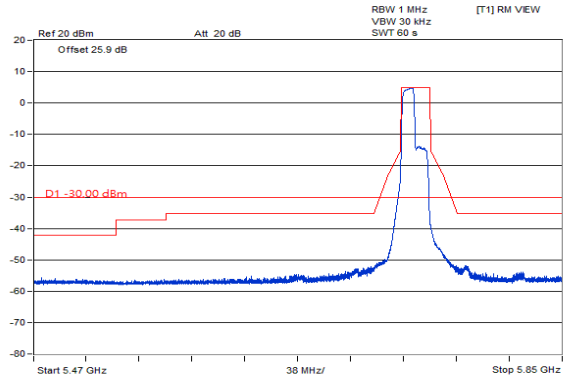
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands



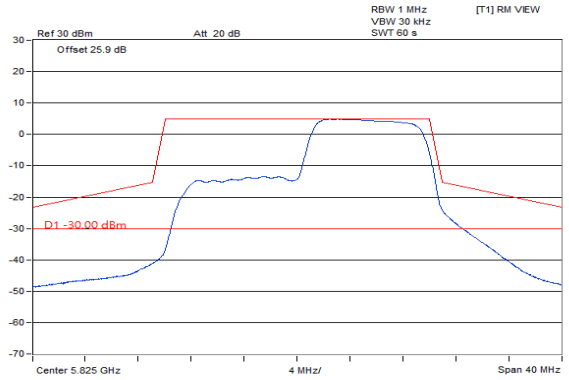
802.11ax (HE20) RU106 : CH 149



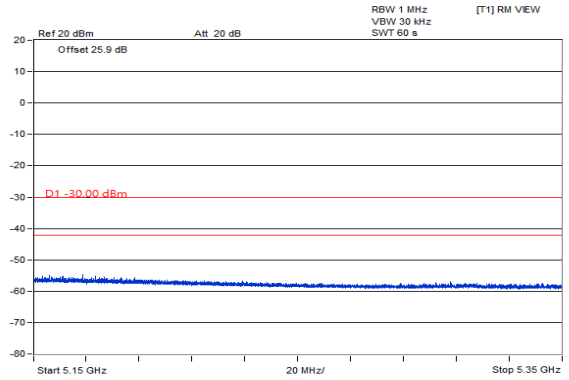
802.11ax (HE20) RU106 : CH 149



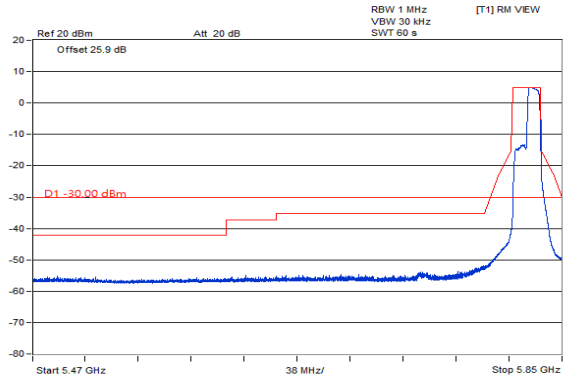
802.11ax (HE20) RU106 : CH 149



802.11ax (HE20) RU106 : CH 165



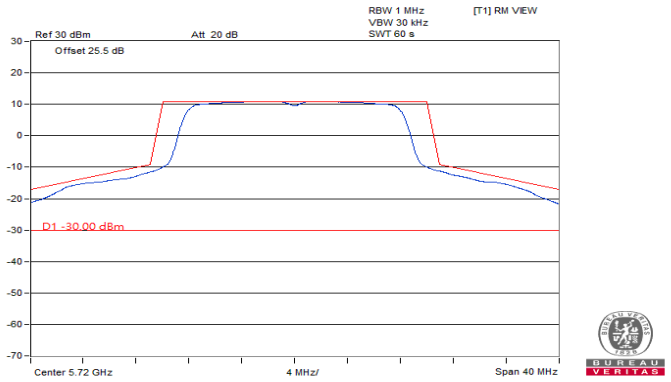
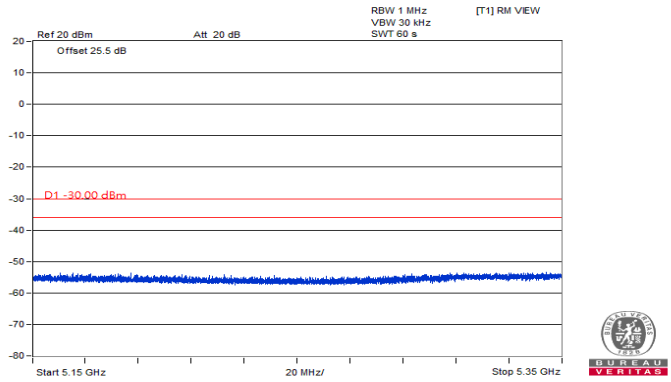
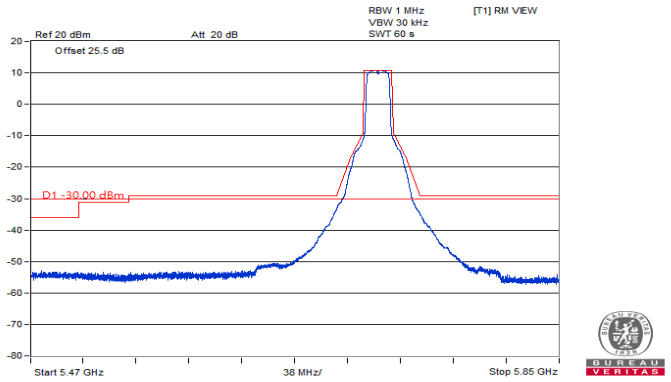
802.11ax (HE20) RU106 : CH 165



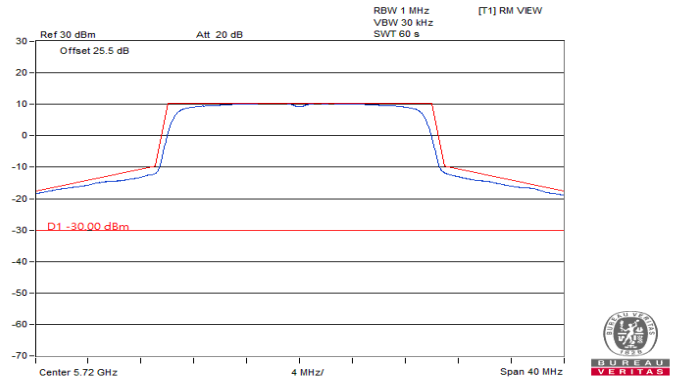
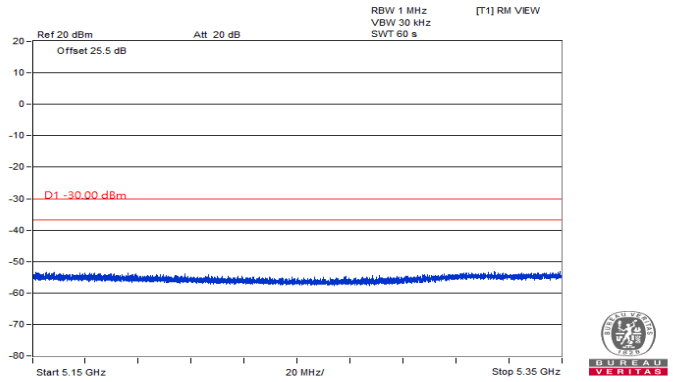
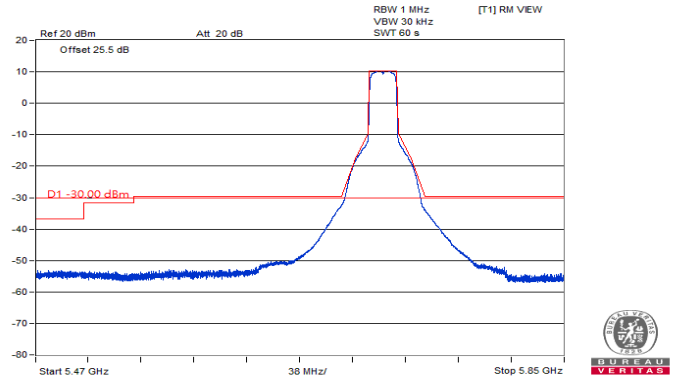
802.11ax (HE20) RU106 : CH 165

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Dolly Chung

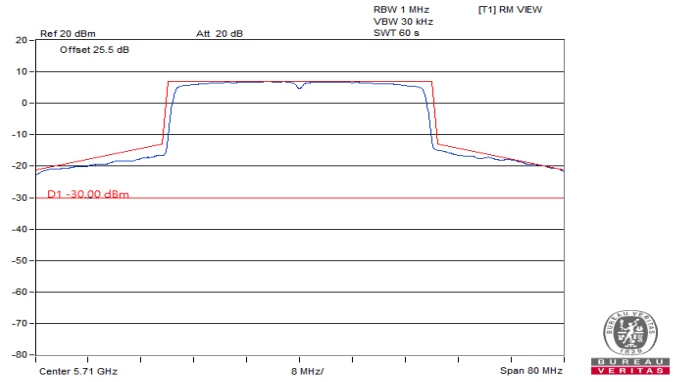
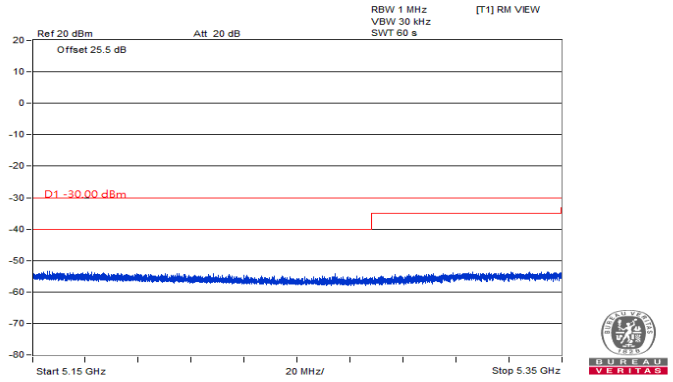
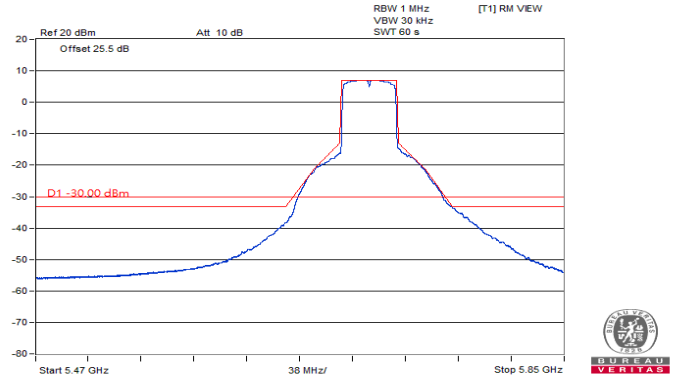
802.11a

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
 802.11a : CH 144	 802.11a : CH 144
 802.11a : CH 144	

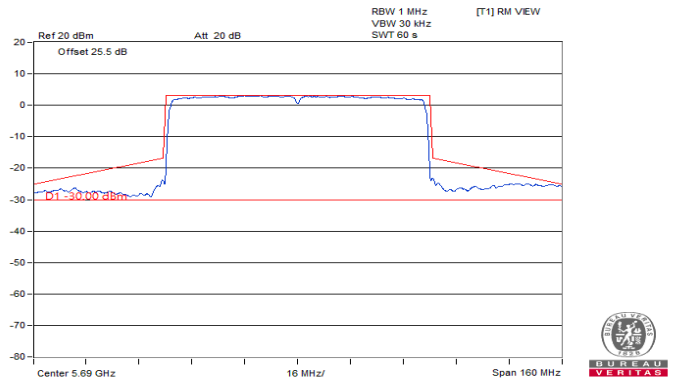
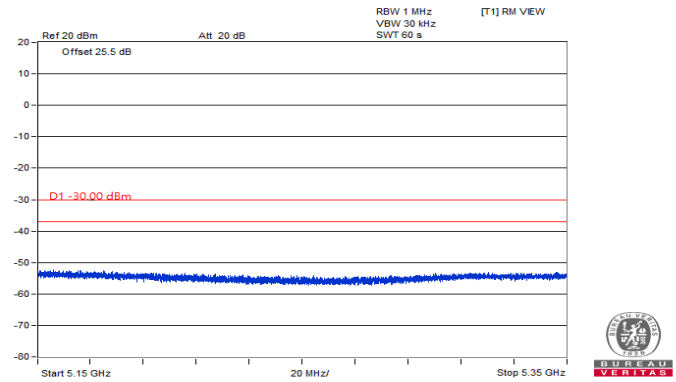
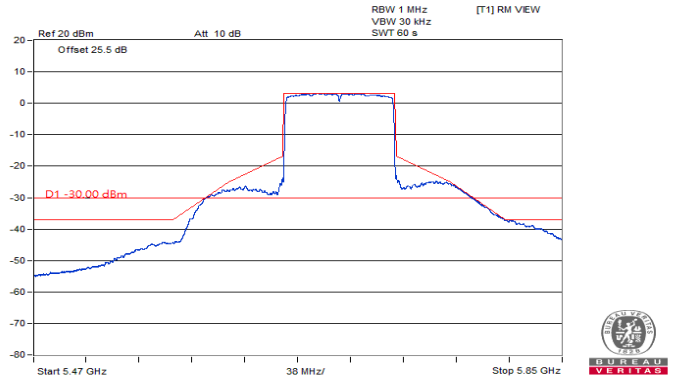
802.11ax (HE20)

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
 802.11ax (HE20) : CH 144	 802.11ax (HE20) : CH 144
 802.11ax (HE20) : CH 144	

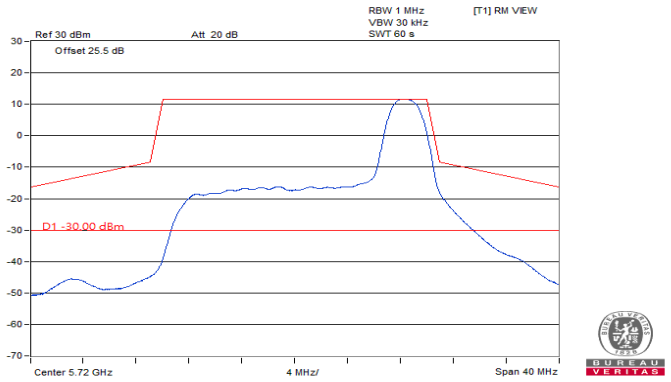
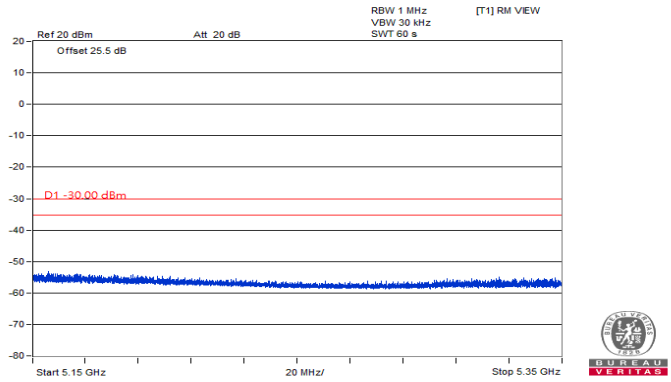
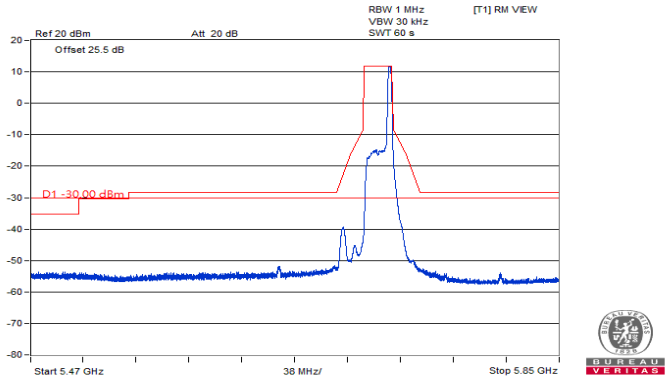
802.11ax (HE40)

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
 802.11ax (HE40) : CH 142	 802.11ax (HE40) : CH 142
 802.11ax (HE40) : CH 142	

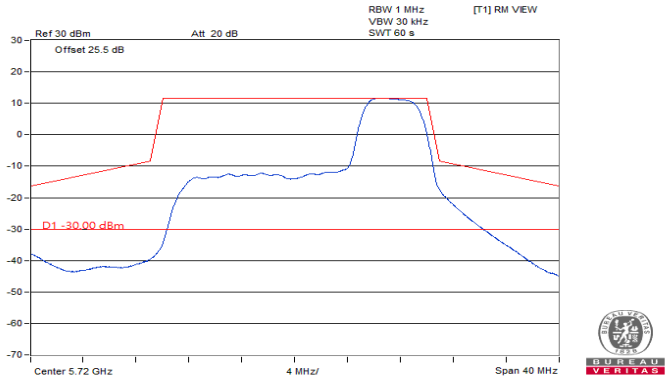
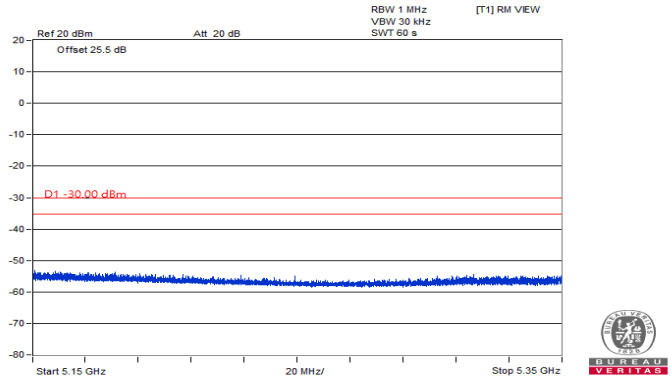
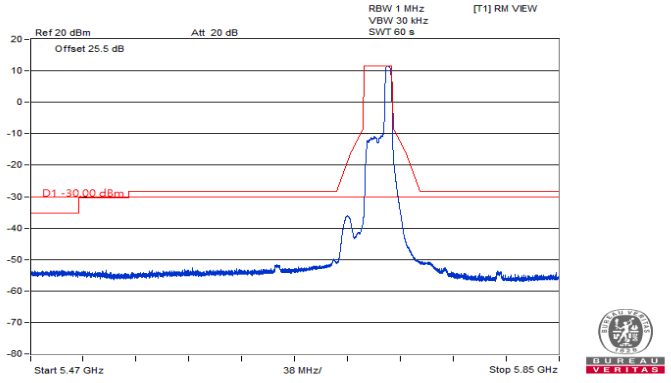
802.11ax (HE80)

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
802.11ax (HE80) : CH 138	802.11ax (HE80) : CH 138
	
802.11ax (HE80) : CH 138	

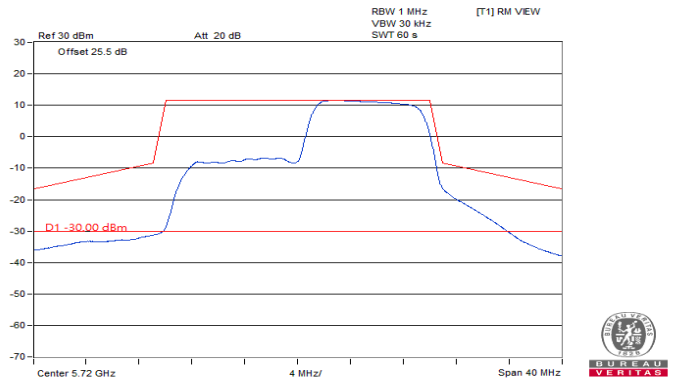
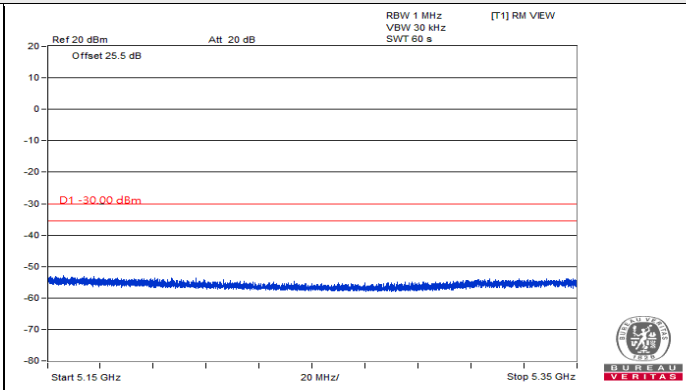
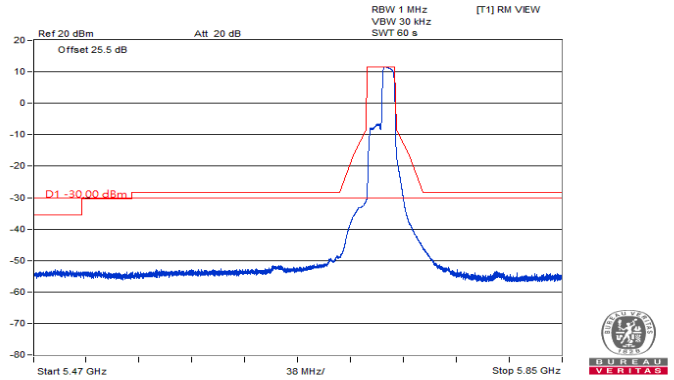
802.11ax (HE20) RU26

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
 802.11ax (HE20) RU26 : CH 144	 802.11ax (HE20) RU26 : CH 144
 802.11ax (HE20) RU26 : CH 144	

802.11ax (HE20) RU52

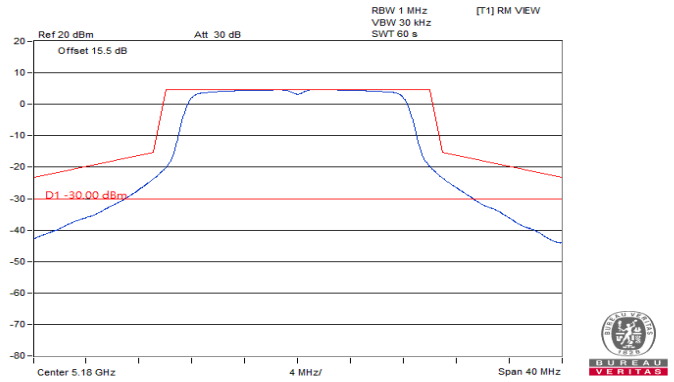
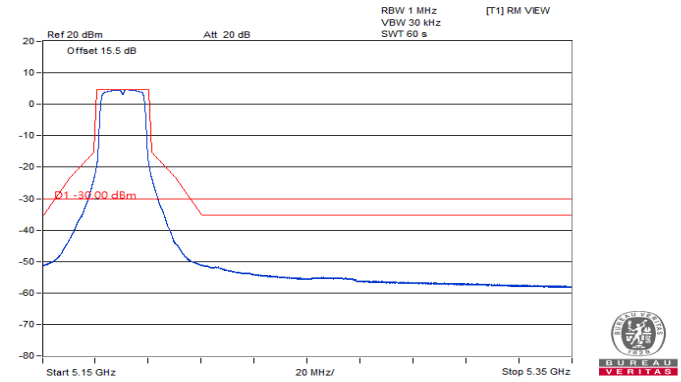
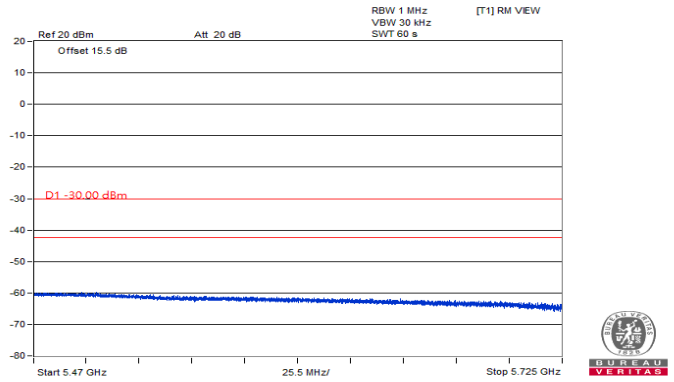
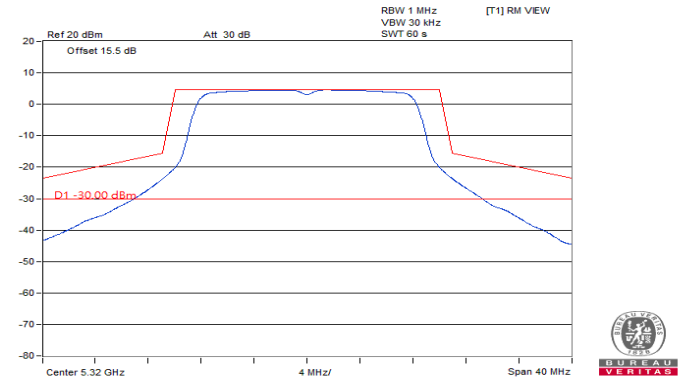
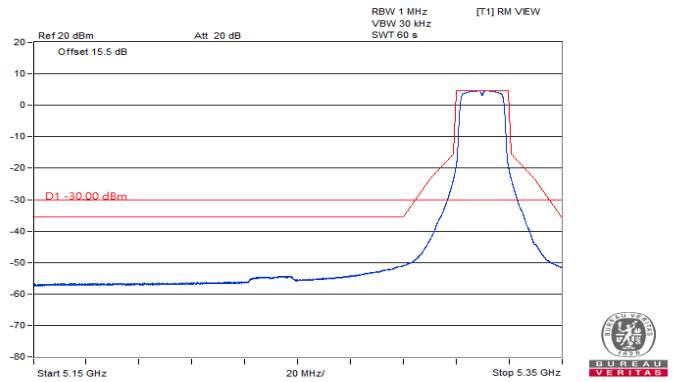
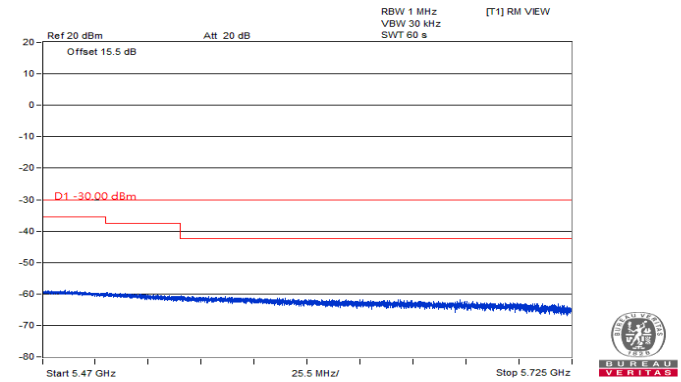
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
 802.11ax (HE20) RU52 : CH 144	 802.11ax (HE20) RU52 : CH 144
 802.11ax (HE20) RU52 : CH 144	

802.11ax (HE20) RU106

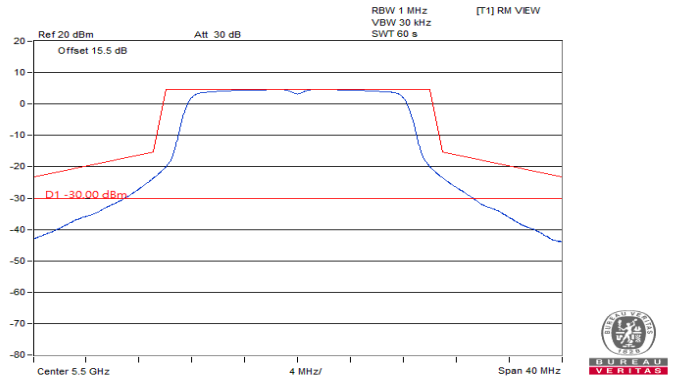
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
 802.11ax (HE20) RU106 : CH 144	 802.11ax (HE20) RU106 : CH 144
 802.11ax (HE20) RU106 : CH 144	

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Dolly Chung

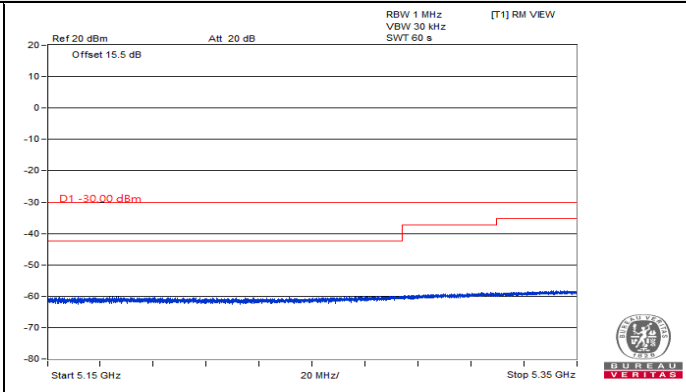
802.11a

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
802.11a : CH 36	802.11a : CH 36
	
802.11a : CH 36	802.11a : CH 64
	
802.11a : CH 64	802.11a : CH 64

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands



802.11a : CH 100



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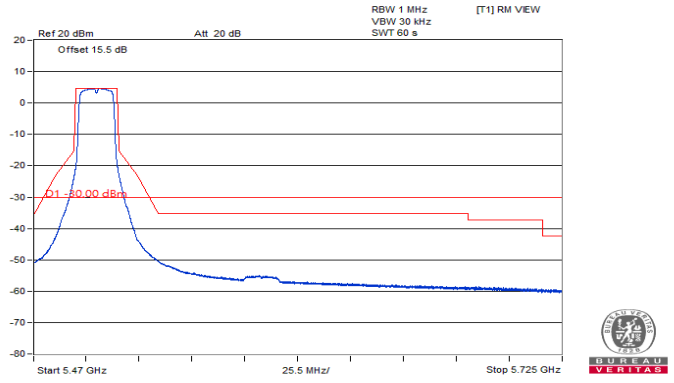
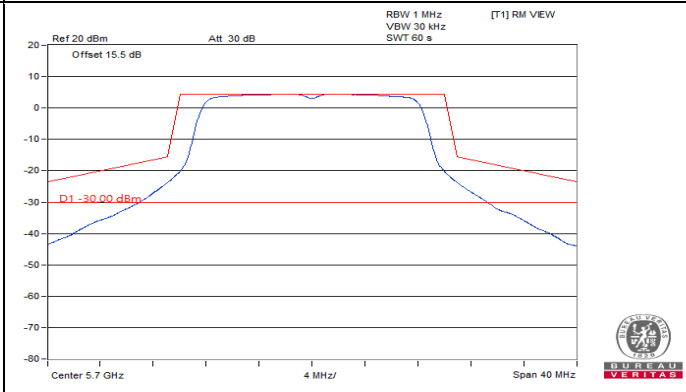
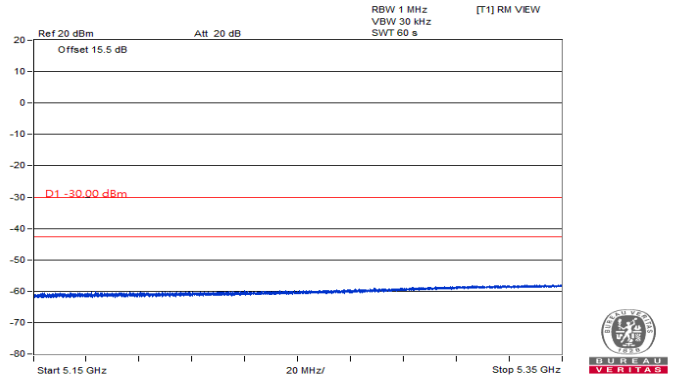


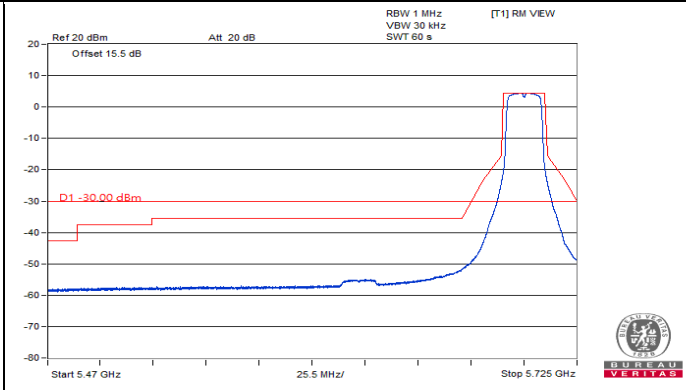
802.11a : CH 100



802.11a : CH 140

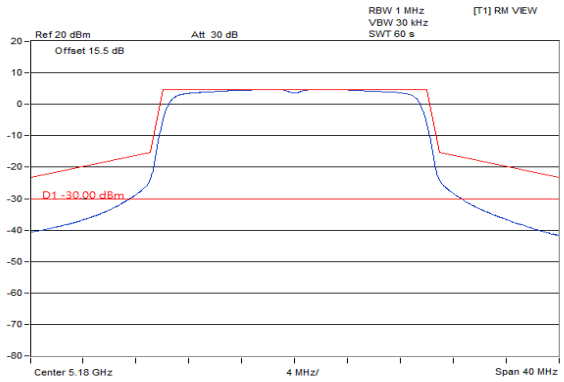
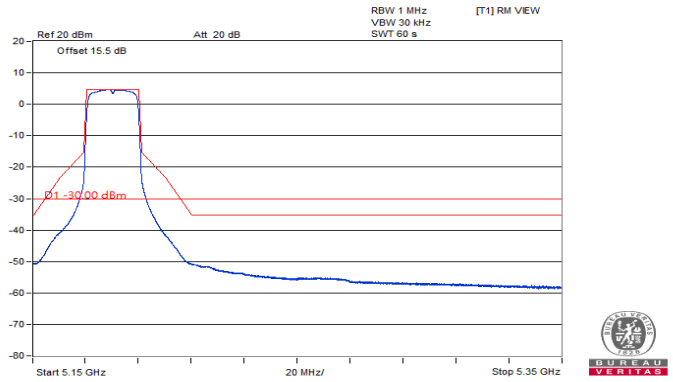
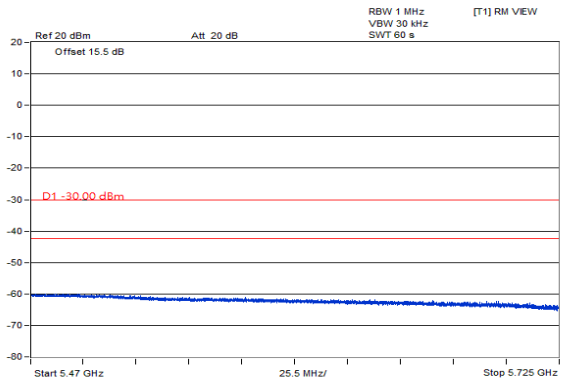
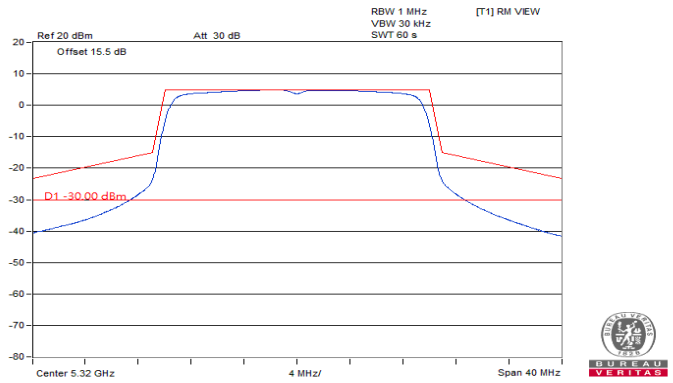
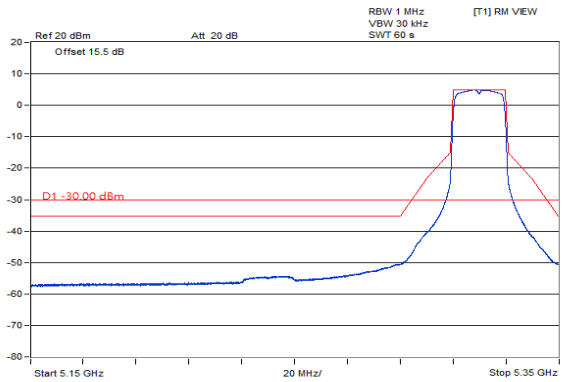
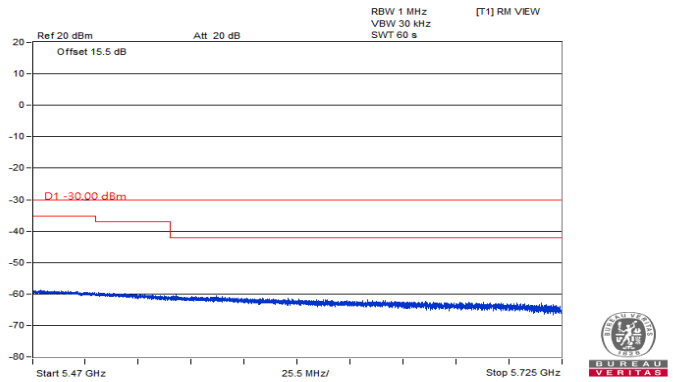


802.11a : CH 140

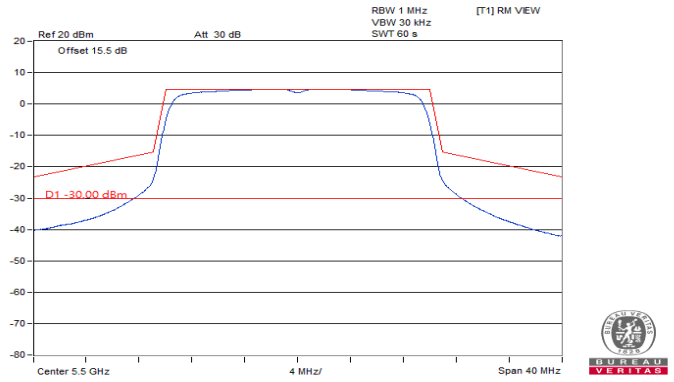


802.11a : CH 140

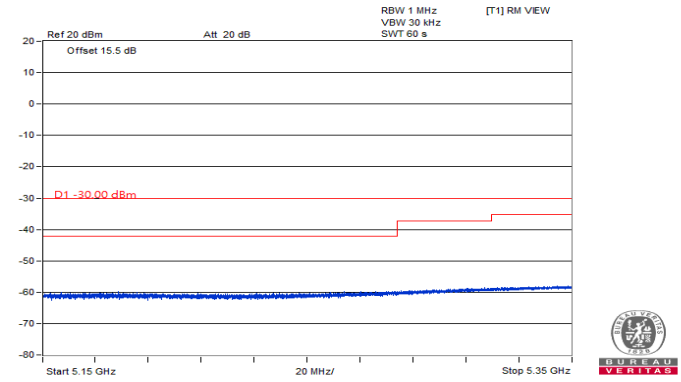
802.11ax (HE20)

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
802.11ax (HE20) : CH 36	802.11ax (HE20) : CH 36
	
802.11ax (HE20) : CH 36	802.11ax (HE20) : CH 64
	
802.11ax (HE20) : CH 64	802.11ax (HE20) : CH 64

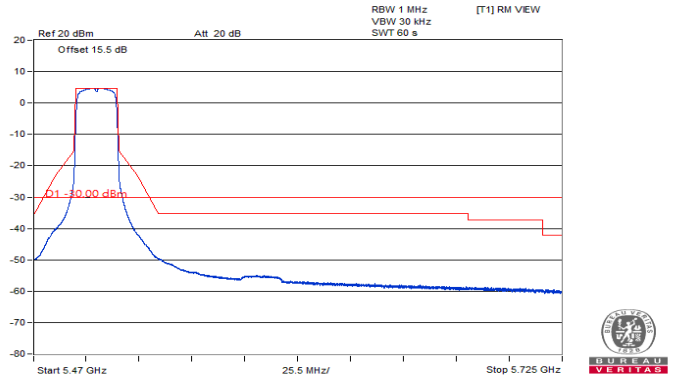
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands



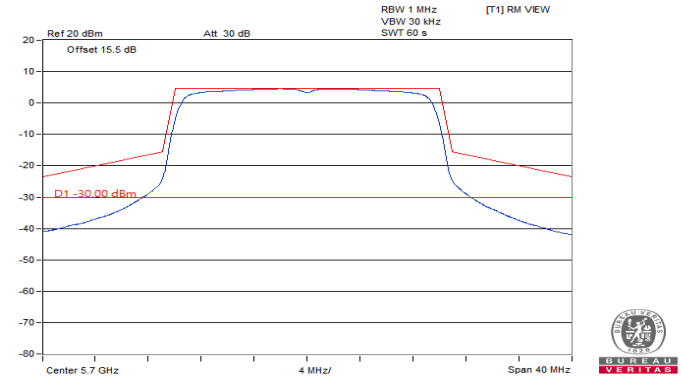
802.11ax (HE20) : CH 100



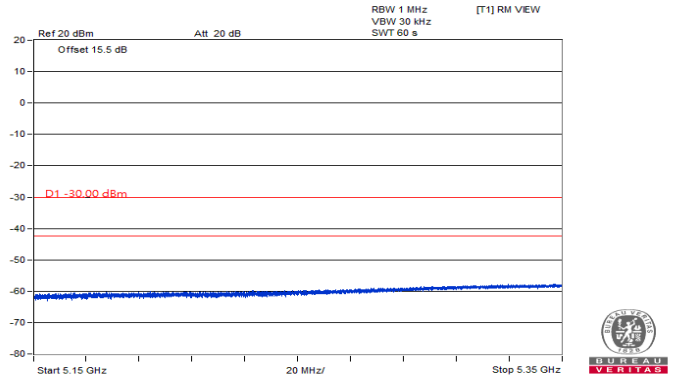
802.11ax (HE20) : CH 100



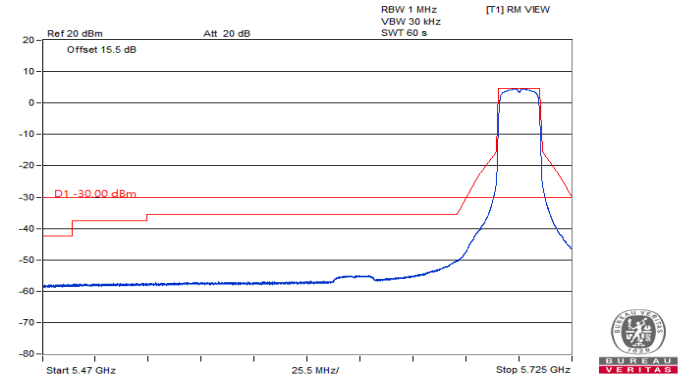
802.11ax (HE20) : CH 100



802.11ax (HE20) : CH 140

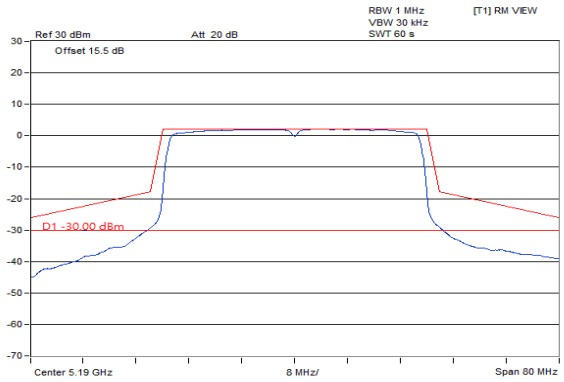
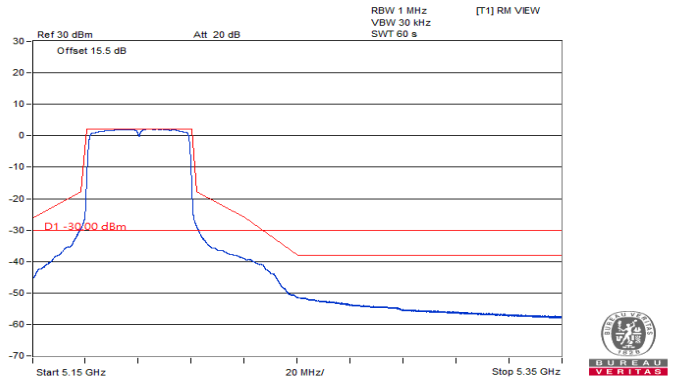
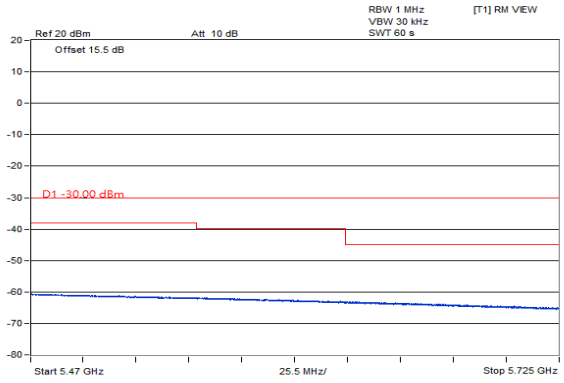
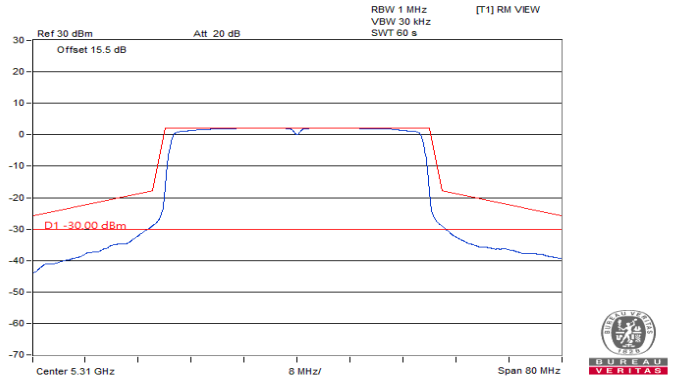
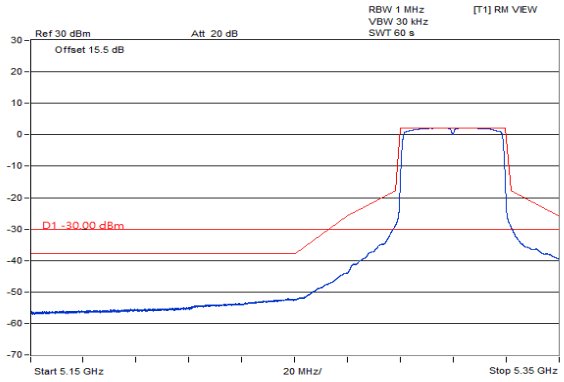
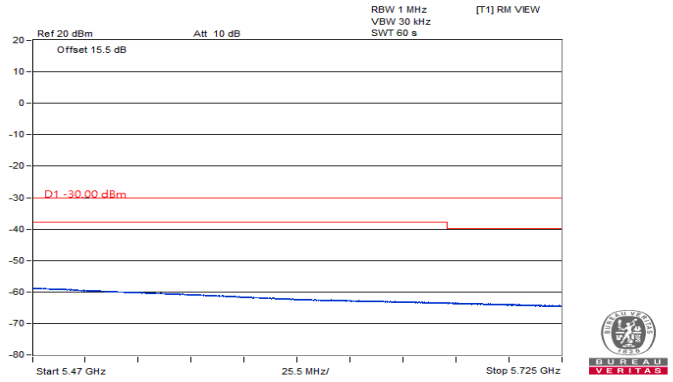


802.11ax (HE20) : CH 140

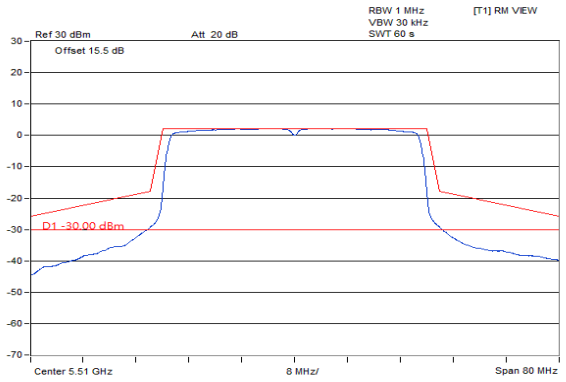


802.11ax (HE20) : CH 140

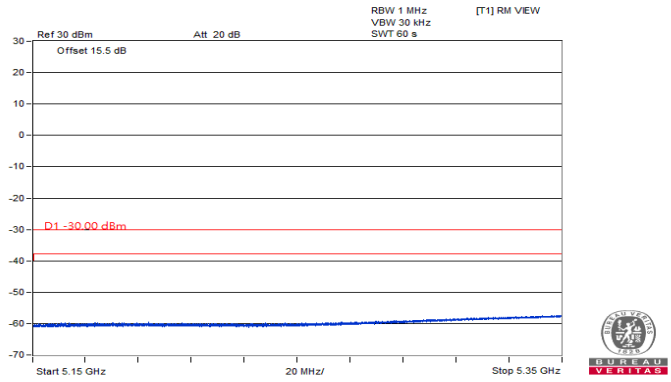
802.11ax (HE40)

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
802.11ax (HE40) : CH 38	802.11ax (HE40) : CH 38
	
802.11ax (HE40) : CH 38	802.11ax (HE40) : CH 62
	
802.11ax (HE40) : CH 62	802.11ax (HE40) : CH 62

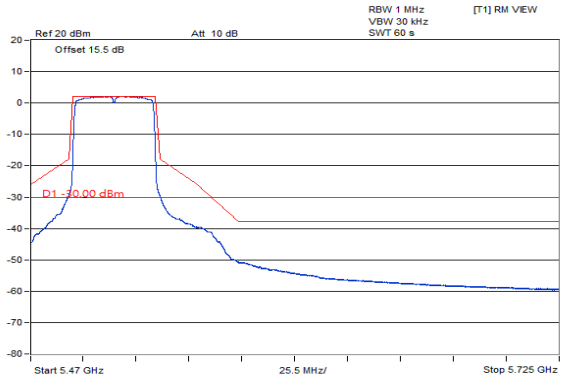
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands



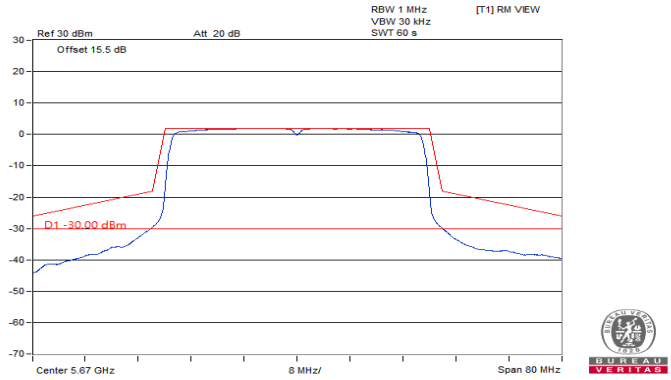
802.11ax (HE40) : CH 102



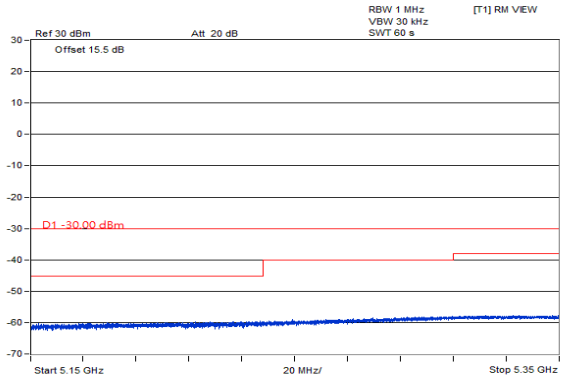
802.11ax (HE40) : CH 102



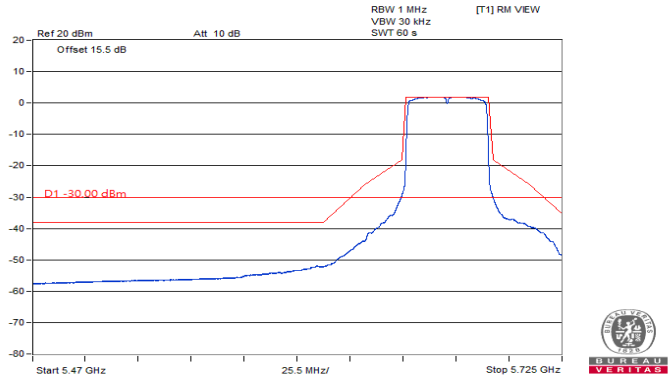
802.11ax (HE40) : CH 102



802.11ax (HE40) : CH 134

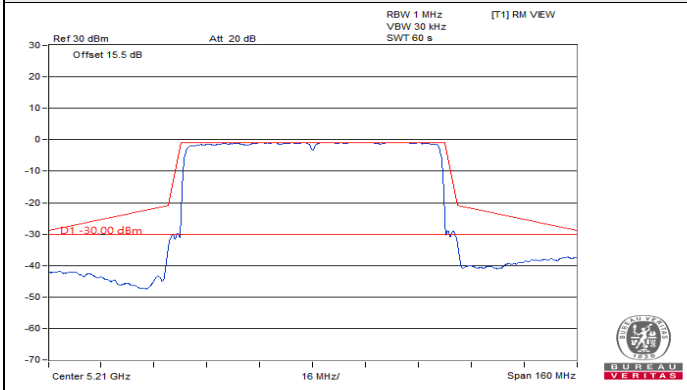
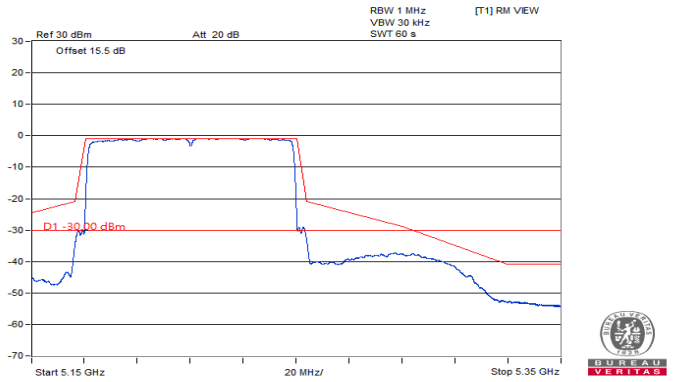
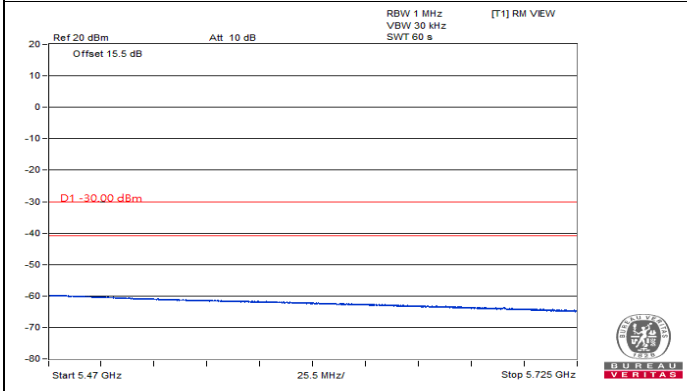
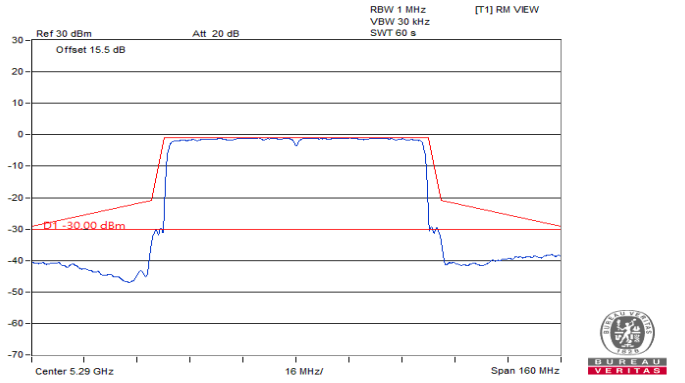
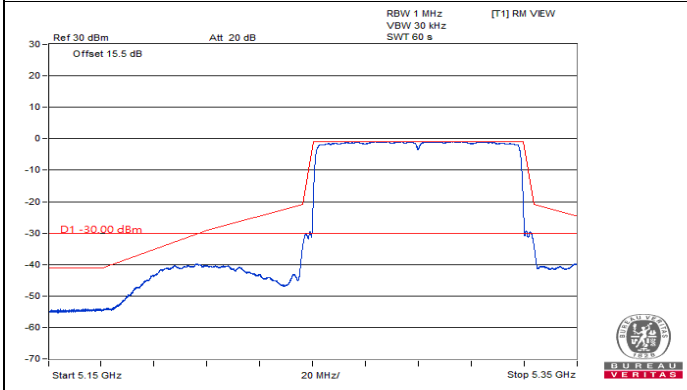
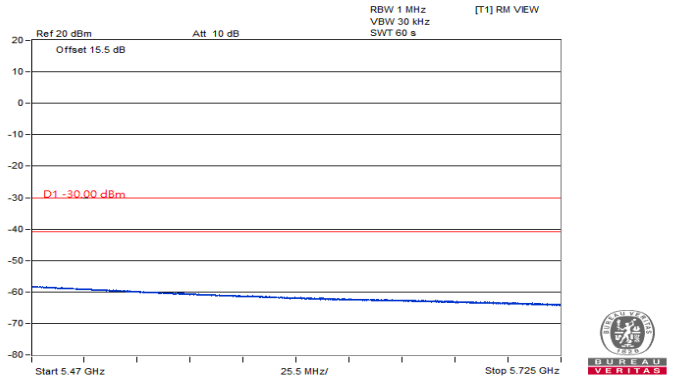
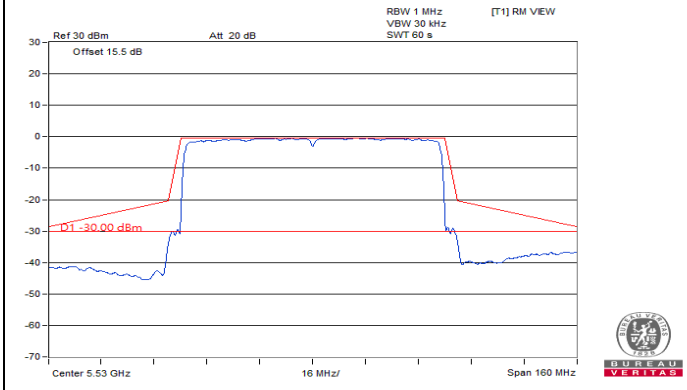
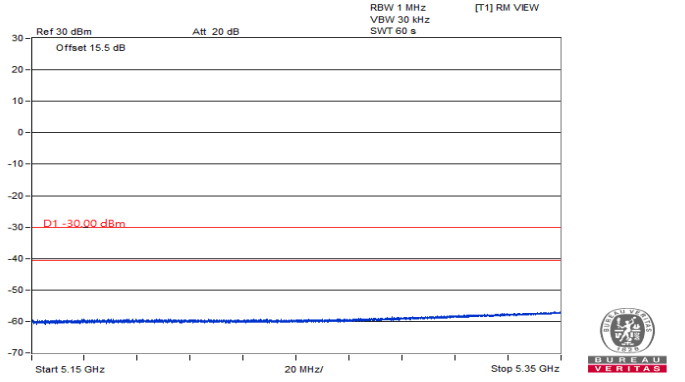


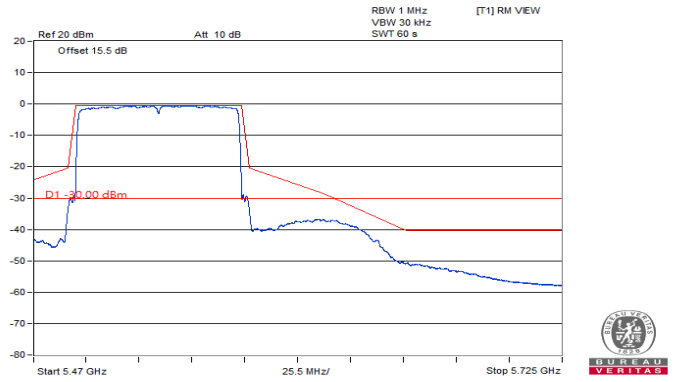
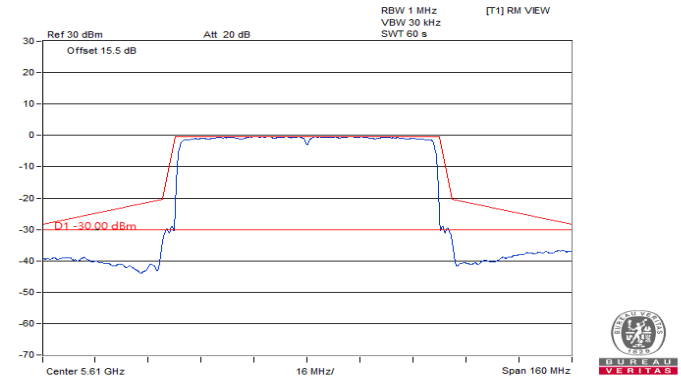
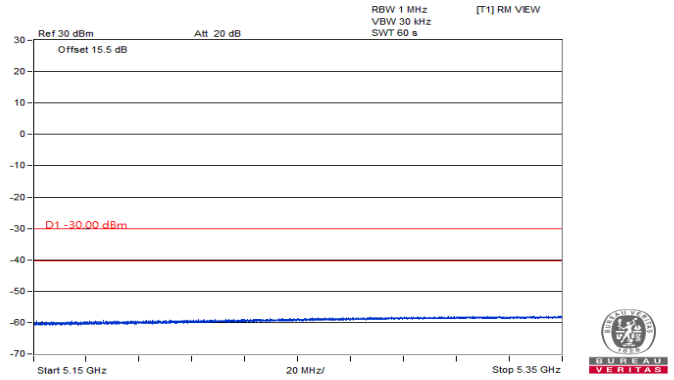
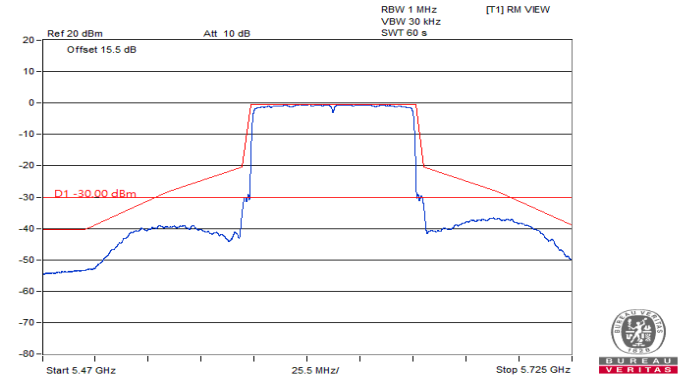
802.11ax (HE40) : CH 134



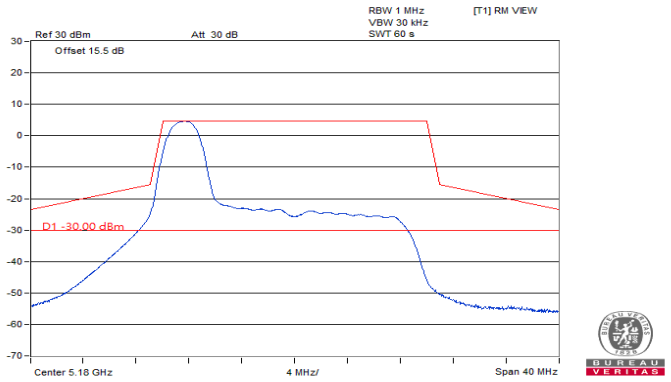
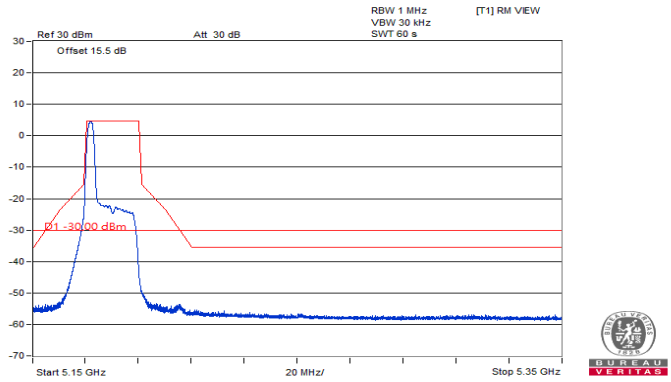
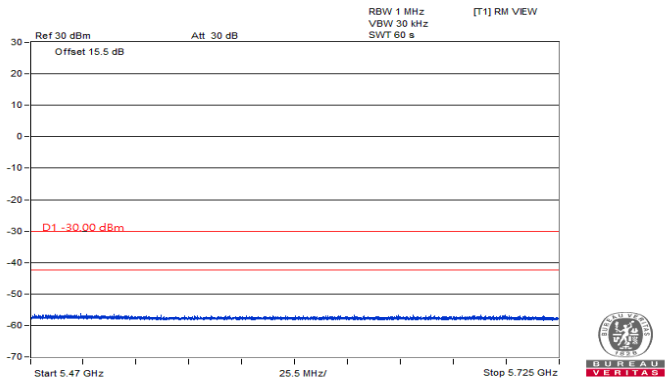
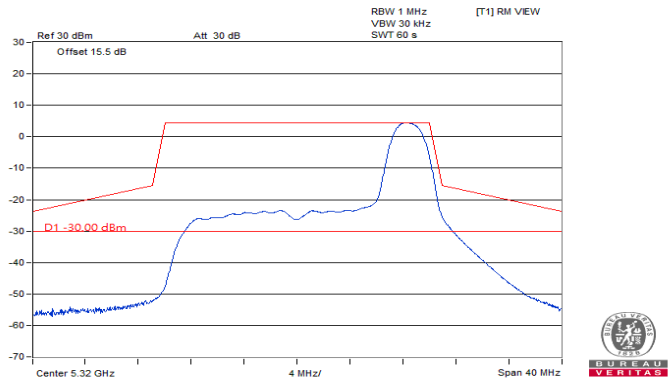
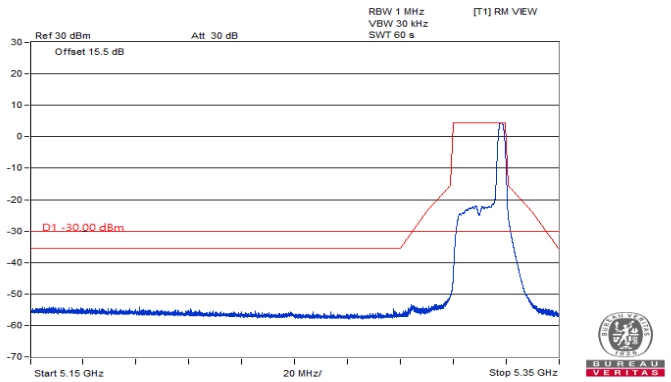
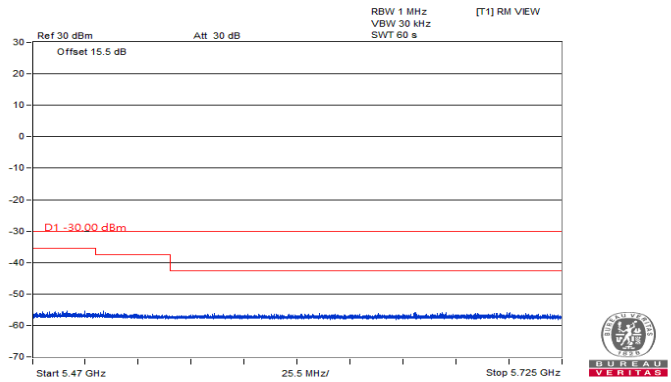
802.11ax (HE40) : CH 134

802.11ax (HE80)

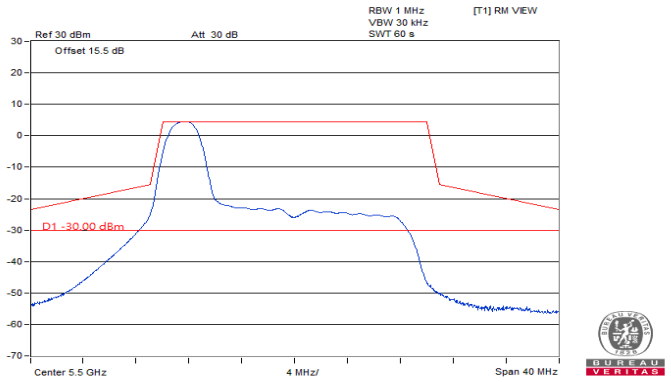
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
802.11ax (HE80) : CH 42	802.11ax (HE80) : CH 42
	
802.11ax (HE80) : CH 42	802.11ax (HE80) : CH 58
	
802.11ax (HE80) : CH 58	802.11ax (HE80) : CH 58
	
802.11ax (HE80) : CH 106	802.11ax (HE80) : CH 106

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
 802.11ax (HE80) : CH 106	 802.11ax (HE80) : CH 122
 802.11ax (HE80) : CH 122	 802.11ax (HE80) : CH 122

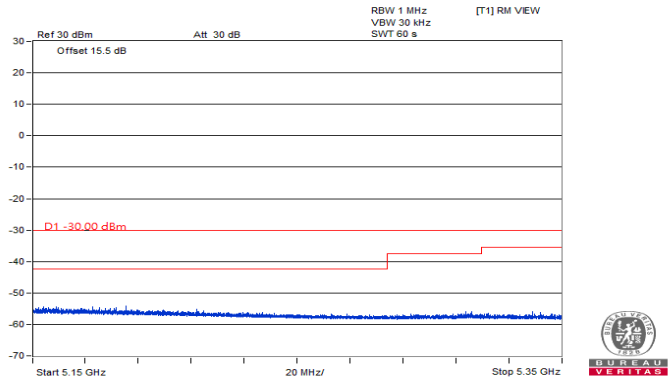
802.11ax (HE20) RU26

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
802.11ax (HE20) RU26 : CH 36	802.11ax (HE20) RU26 : CH 36
	
802.11ax (HE20) RU26 : CH 36	802.11ax (HE20) RU26 : CH 64
	
802.11ax (HE20) RU26 : CH 64	802.11ax (HE20) RU26 : CH 64

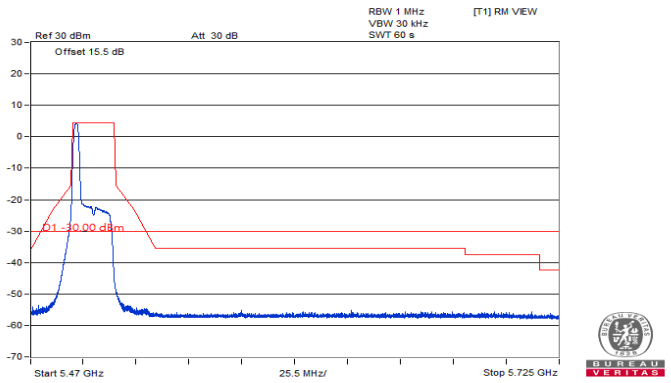
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands



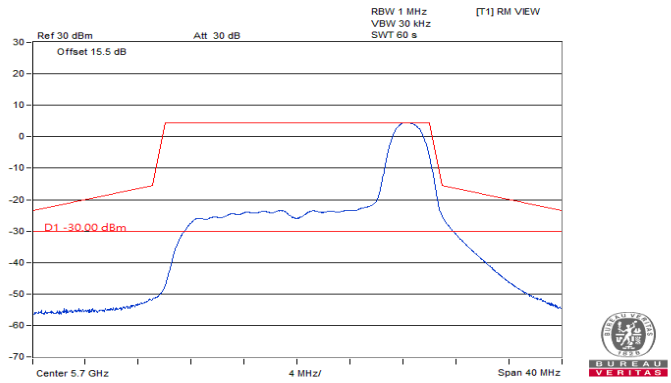
802.11ax (HE20) RU26 : CH 100



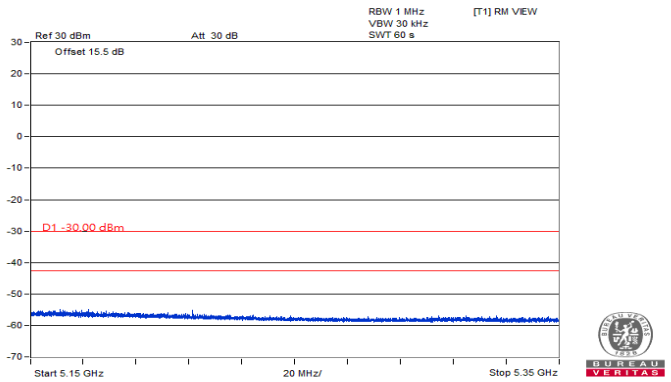
802.11ax (HE20) RU26 : CH 100



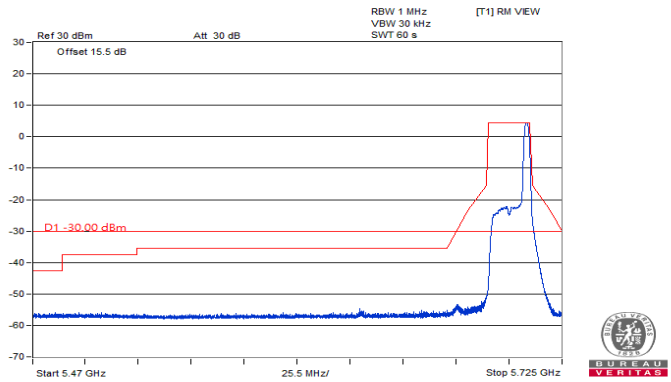
802.11ax (HE20) RU26 : CH 100



802.11ax (HE20) RU26 : CH 140

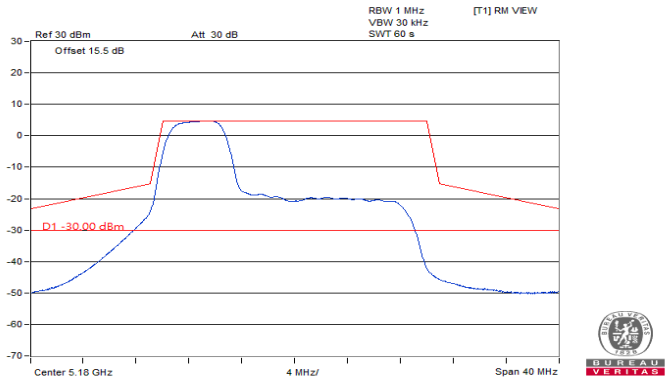
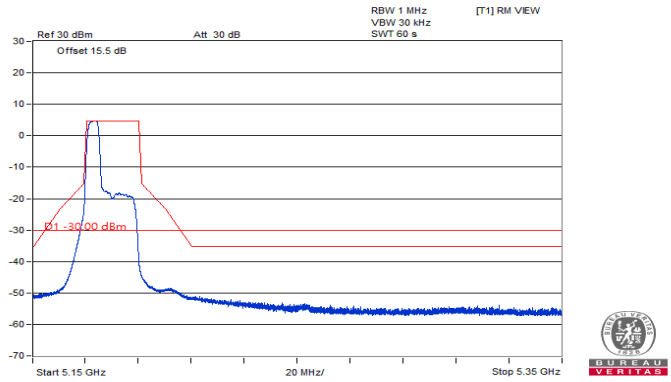
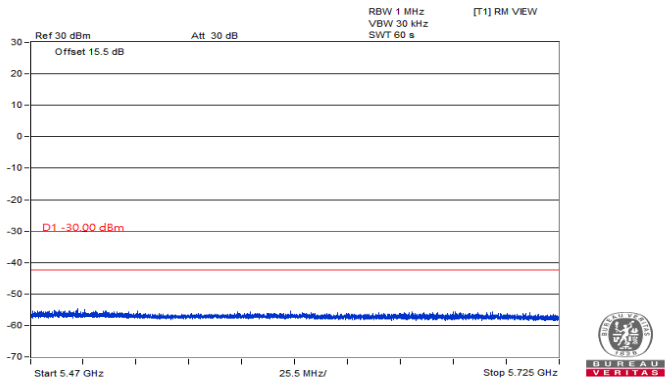
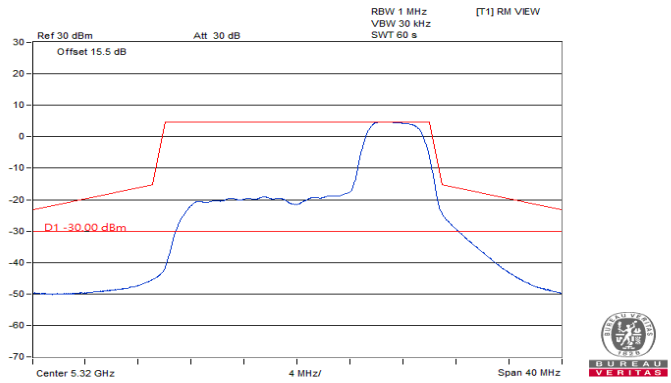
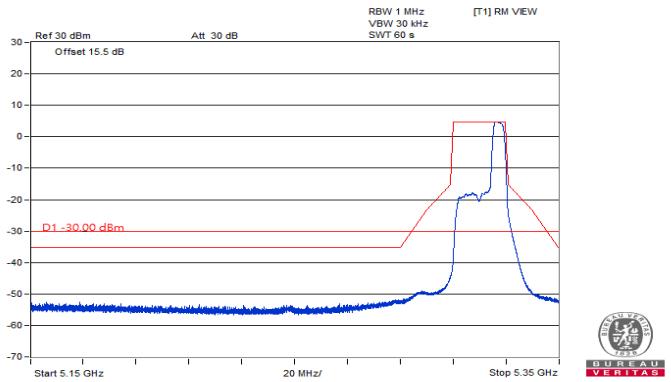
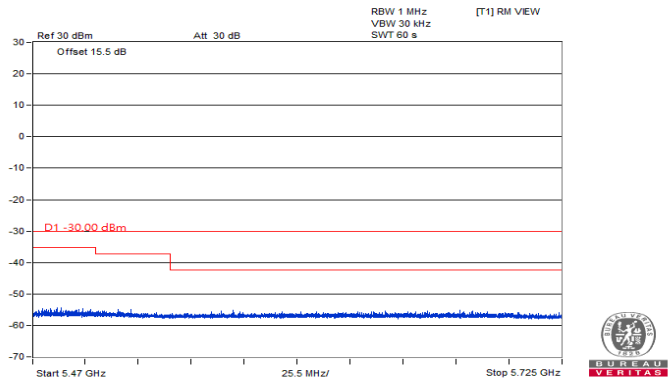


802.11ax (HE20) RU26 : CH 140

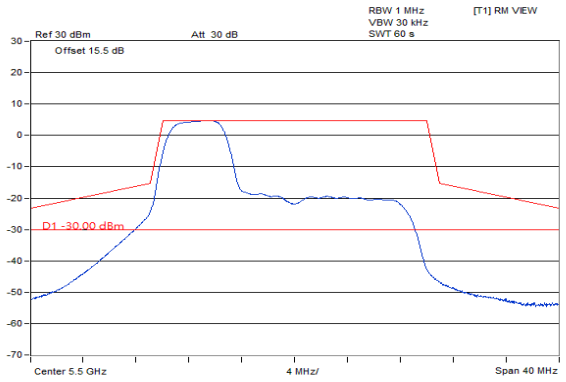


802.11ax (HE20) RU26 : CH 140

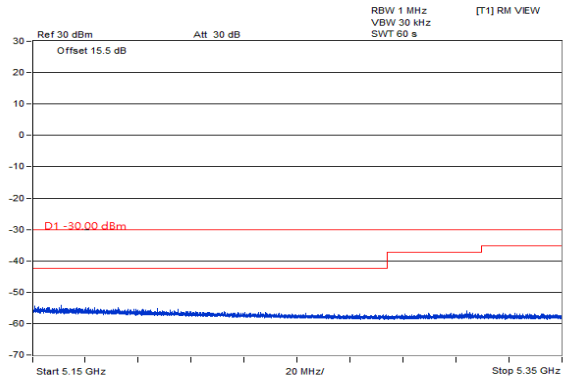
802.11ax (HE20) RU52

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
802.11ax (HE20) RU52 : CH 36	802.11ax (HE20) RU52 : CH 36
	
802.11ax (HE20) RU52 : CH 36	802.11ax (HE20) RU52 : CH 64
	
802.11ax (HE20) RU52 : CH 64	802.11ax (HE20) RU52 : CH 64

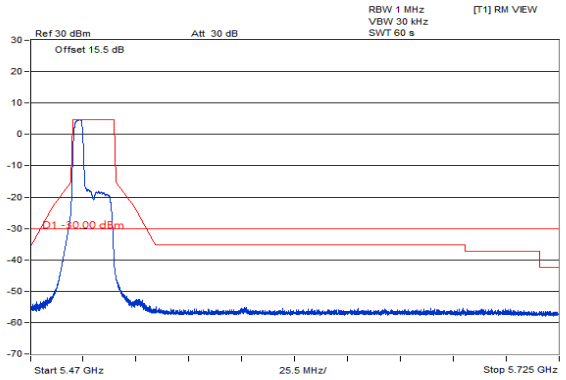
Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands



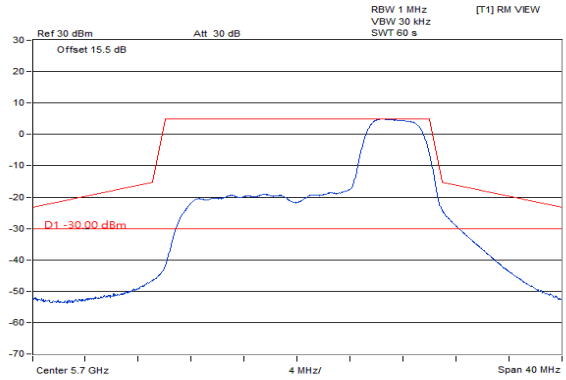
802.11ax (HE20) RU52 : CH 100



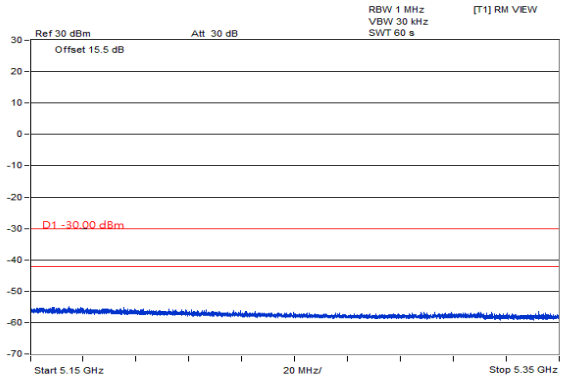
802.11ax (HE20) RU52 : CH 100



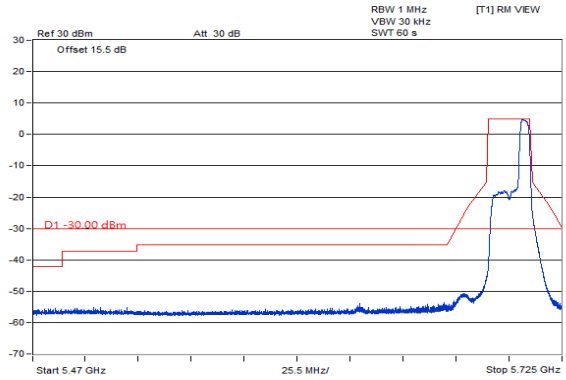
802.11ax (HE20) RU52 : CH 100



802.11ax (HE20) RU52 : CH 140

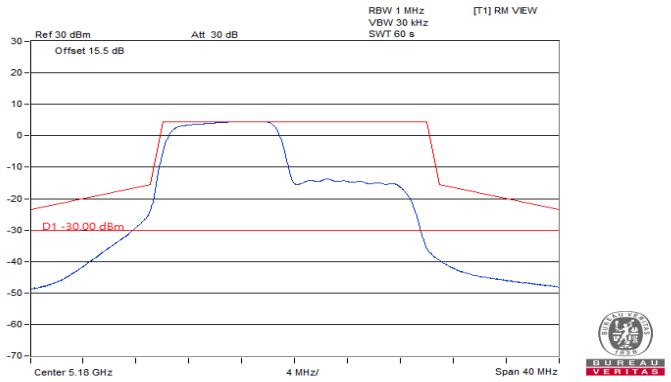
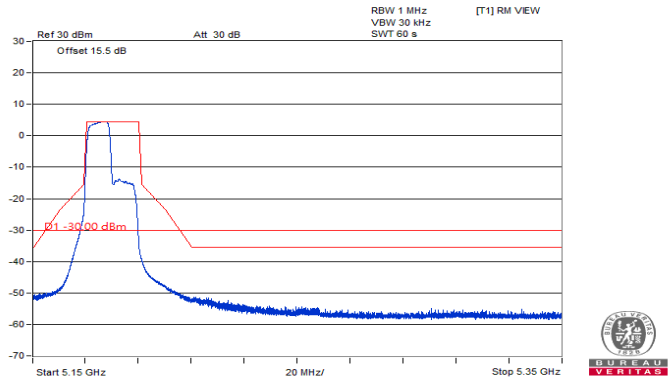
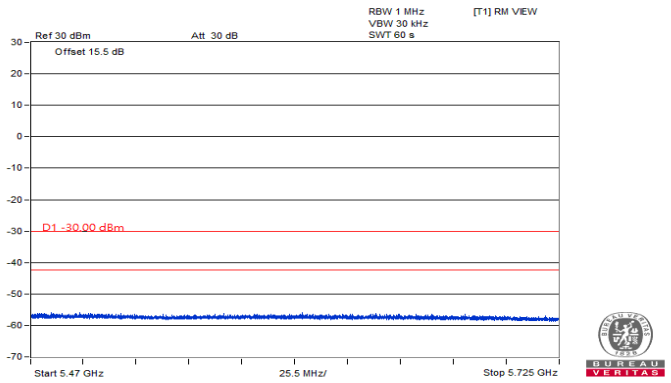
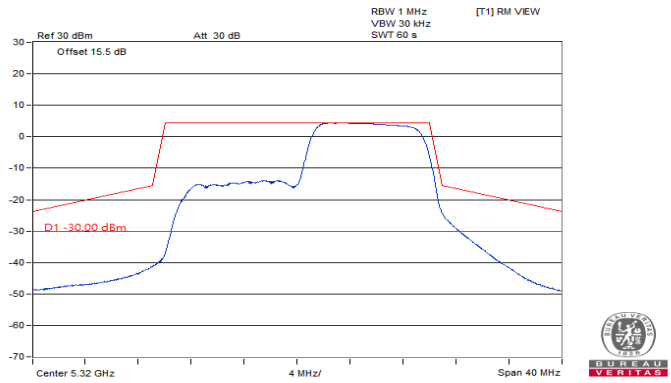
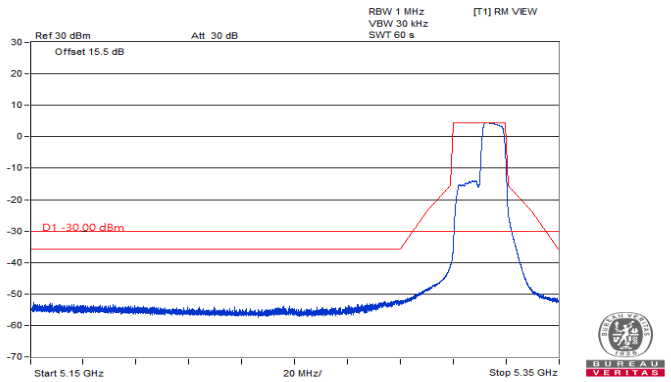
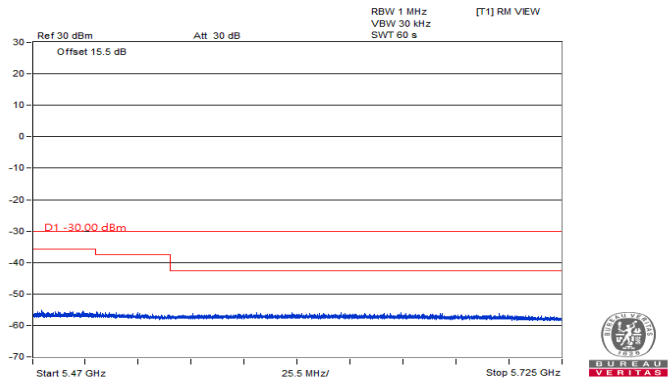


802.11ax (HE20) RU52 : CH 140

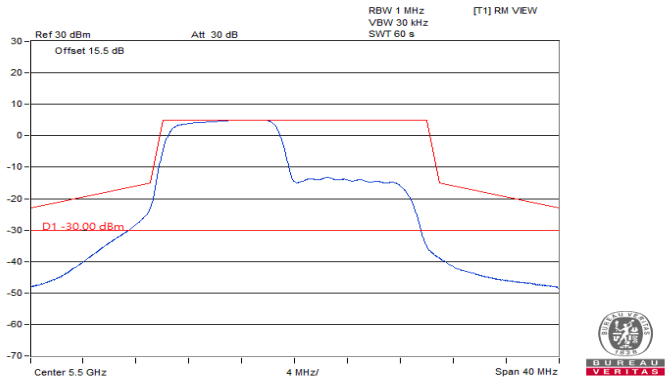
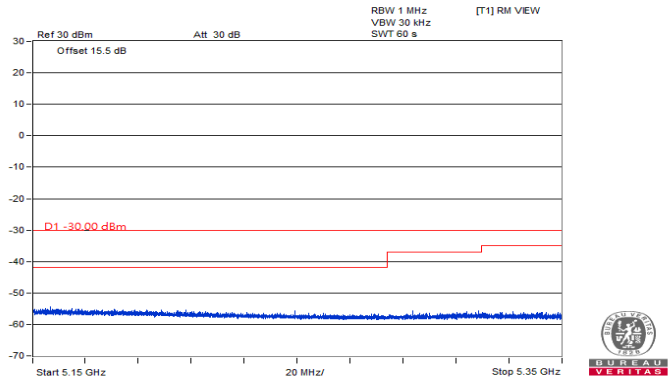


802.11ax (HE20) RU52 : CH 140

802.11ax (HE20) RU106

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
802.11ax (HE20) RU106 : CH 36	802.11ax (HE20) RU106 : CH 36
	
802.11ax (HE20) RU106 : CH 36	802.11ax (HE20) RU106 : CH 64
	
802.11ax (HE20) RU106 : CH 64	802.11ax (HE20) RU106 : CH 64

802.11ax (HE20) RU106

Spectrum plots of the unwanted emissions within the 5 GHz RLAN bands	
	
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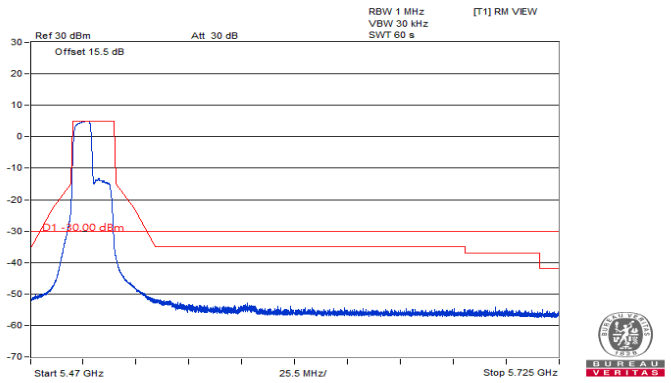
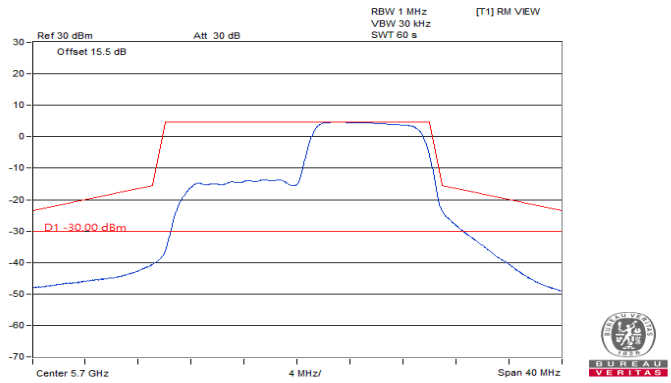
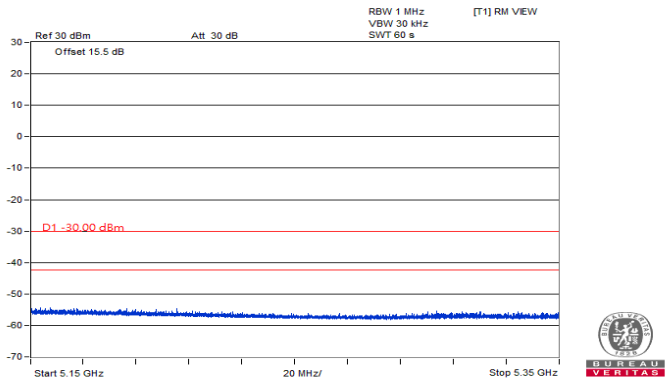
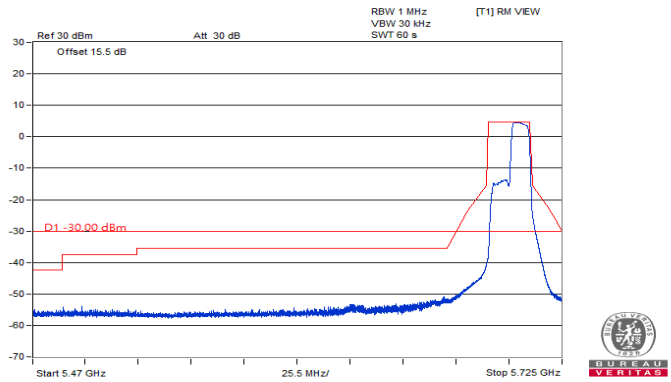
	
802.11ax (HE20) RU106 : CH 100	802.11ax (HE20) RU106 : CH 140
	
802.11ax (HE20) RU106 : CH 140	802.11ax (HE20) RU106 : CH 140

7.9 Receiver Spurious Emissions up to 1 GHz

Mode A

Spurious Emission Frequency Range	30 MHz ~ 1 GHz	**Operating Channel**	100
Input Power (System)	230 Vac, 50 Hz	**Environmental Conditions**	23°C, 67% RH
Tested By	Jeff Hsieh		

Spurious Emission Level				
Frequency (MHz)	**Antenna Polarization**	**Level (dBm)**	**Limit (dBm)**	**Margin (dB)**
49.40	H	-61.23	-57.00	-4.23
49.40	V	-63.78	-57.00	-6.78
63.48	H	-69.77	-57.00	-12.77
99.79	H	-68.02	-57.00	-11.02
148.59	H	-64.19	-57.00	-7.19
150.33	V	-67.76	-57.00	-10.76
166.00	V	-63.71	-57.00	-6.71
166.60	H	-60.19	-57.00	-3.19
222.56	H	-66.42	-57.00	-9.42
222.76	V	-66.02	-57.00	-9.02
225.04	V	-66.60	-57.00	-9.60
233.20	H	-66.05	-57.00	-9.05
265.93	H	-70.78	-57.00	-13.78
266.18	V	-69.91	-57.00	-12.91
299.86	V	-62.98	-57.00	-5.98
407.45	H	-77.97	-57.00	-20.97
543.55	V	-72.66	-57.00	-15.66
589.71	H	-75.04	-57.00	-18.04
805.95	V	-69.28	-57.00	-12.28
819.33	V	-67.92	-57.00	-10.92

Mode B

Spurious Emission Frequency Range	30 MHz ~ 1 GHz	Operating Channel	100
Input Power (System)	230 Vac, 50 Hz	Environmental Conditions	24°C, 69% RH
Tested By	Ethan Hsu		

Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
49.40	H	-66.16	-57.00	-9.16
63.53	H	-72.75	-57.00	-15.75
166.00	V	-72.55	-57.00	-15.55
166.60	H	-63.22	-57.00	-6.22
204.30	V	-72.63	-57.00	-15.63
204.35	H	-72.61	-57.00	-15.61
232.36	H	-66.22	-57.00	-9.22
299.16	V	-67.64	-57.00	-10.64
426.75	V	-77.09	-57.00	-20.09
427.20	H	-75.53	-57.00	-18.53
464.76	H	-73.66	-57.00	-16.66
828.04	V	-72.59	-57.00	-15.59
855.25	V	-72.64	-57.00	-15.64
869.12	H	-72.73	-57.00	-15.73
886.19	V	-71.27	-57.00	-14.27
932.25	V	-71.71	-57.00	-14.71
961.40	V	-71.00	-57.00	-14.00
965.58	H	-72.06	-57.00	-15.06
974.48	V	-69.94	-57.00	-12.94
976.27	H	-70.68	-57.00	-13.68

Mode C

Spurious Emission Frequency Range	30 MHz ~ 1 GHz	Operating Channel	100
Input Power (System)	230 Vac, 50 Hz	Environmental Conditions	24°C, 69% RH
Tested By	Ethan Hsu		

Spurious Emission Level				
Frequency (MHz)	Antenna Polarization	Level (dBm)	Limit (dBm)	Margin (dB)
49.29	H	-66.27	-57.00	-9.27
63.42	H	-72.86	-57.00	-15.86
165.79	V	-72.77	-57.00	-15.77
166.49	H	-63.33	-57.00	-6.33
204.08	V	-72.85	-57.00	-15.85
204.14	H	-72.72	-57.00	-15.72
232.27	H	-66.33	-57.00	-9.33
298.94	V	-67.86	-57.00	-10.86
426.53	V	-77.31	-57.00	-20.31
427.01	H	-75.44	-57.00	-18.44
464.87	H	-73.77	-57.00	-16.77
827.82	V	-72.71	-57.00	-15.71
855.04	V	-72.86	-57.00	-15.86
869.03	H	-72.84	-57.00	-15.84
885.97	V	-71.49	-57.00	-14.49
932.13	V	-71.93	-57.00	-14.93
961.18	V	-71.21	-57.00	-14.21
965.49	H	-72.15	-57.00	-15.15
974.26	V	-70.17	-57.00	-13.17
976.15	H	-70.87	-57.00	-13.87

7.10 Receiver Spurious Emissions above 1 GHz

Mode A

Spurious Emission Frequency Range	1 GHz ~ 26 GHz	**Operating Channel**	36, 100
Input Power (System)	230 Vac, 50 Hz	**Environmental Conditions**	22°C, 62% RH
Tested By	Spencer Liao		

Spurious Emission Level					
Channel	**Frequency (MHz)**	**Antenna Polarization**	**Level (dBm)**	**Limit (dBm)**	**Margin (dB)**
36	6906.67	H	-54.28	-47.00	-7.28
	6906.67	V	-53.03	-47.00	-6.03
100	7333.33	H	-52.97	-47.00	-5.97
	7333.33	V	-51.73	-47.00	-4.73

Mode B

Spurious Emission Frequency Range	1 GHz ~ 26 GHz	**Operating Channel**	36, 100
Input Power (System)	230 Vac, 50 Hz	**Environmental Conditions**	22°C, 62% RH
Tested By	Spencer Liao		

Spurious Emission Level					
Channel	**Frequency (MHz)**	**Antenna Polarization**	**Level (dBm)**	**Limit (dBm)**	**Margin (dB)**
36	6906.67	H	-54.96	-47.00	-7.96
	6906.67	V	-54.28	-47.00	-7.28
100	7333.33	H	-53.00	-47.00	-6.00
	7333.33	V	-52.30	-47.00	-5.30

Mode C

Spurious Emission Frequency Range	1 GHz ~ 26 GHz	**Operating Channel**	36, 100
Input Power (System)	230 Vac, 50 Hz	**Environmental Conditions**	24°C, 70% RH
Tested By	Ethan Hsu		

Spurious Emission Level					
Channel	**Frequency (MHz)**	**Antenna Polarization**	**Level (dBm)**	**Limit (dBm)**	**Margin (dB)**
36	6906.00	H	-56.06	-47.00	-9.06
	6906.00	V	-56.51	-47.00	-9.51
100	7333.00	H	-56.81	-47.00	-9.81
	7333.00	V	-56.34	-47.00	-9.34

7.11 Adaptivity

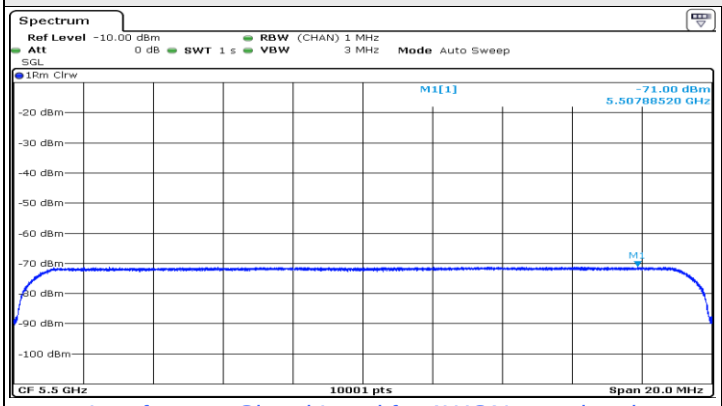
Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Stan Shih

EUT Information		
Product	**Model No.**	**Software/Firmware Version**
RTL8851BE	RTL8851BE	6001.19.102.0

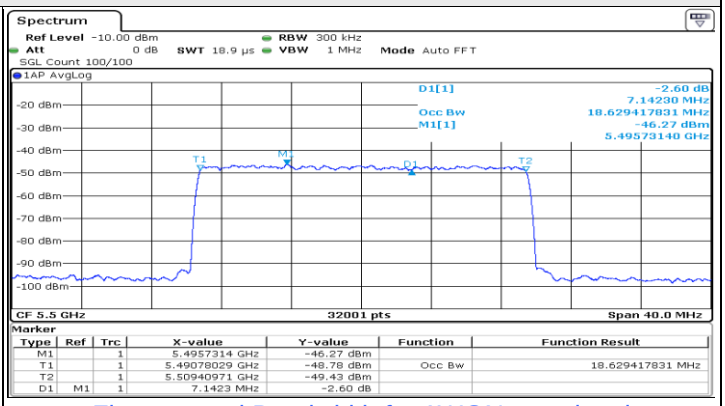
Companion Device Information			
Product	**Brand**	**Model No.**	**Software/Firmware Version**
Wireless Router	ASUS	RT-AX88U	3.0.0.4.382_5329

Energy Detection Threshold Level (TL)
Option 1: TL = -75 dBm/MHz (assumes a 0 dBi receive antenna)
EUT antenna Gain(G) : 4 dBi
The ED Threshold level (TL) = -75 dBm/MHz + G (4 dBi) = -71 dBm/MHz The interference signal level to the EUT is lower than -71 dBm/MHz at the antenna connector.

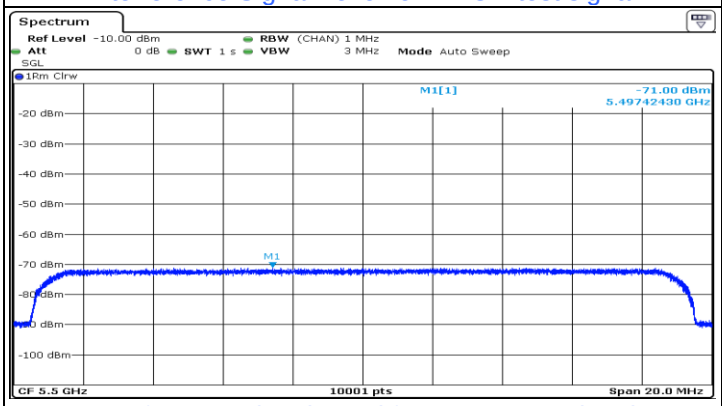
Plots of Interference Signal



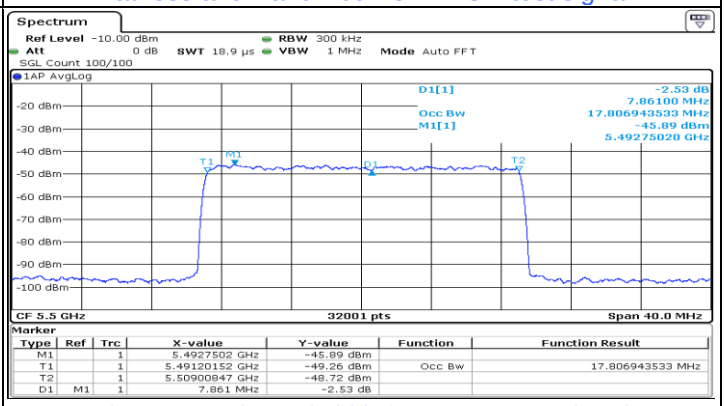
Interference Signal Level for AWGN test signal



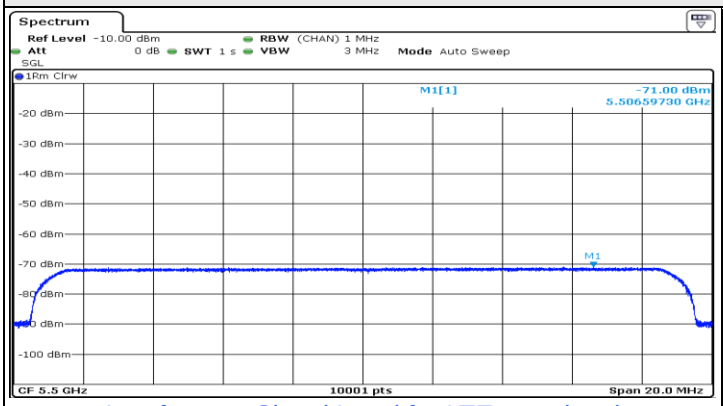
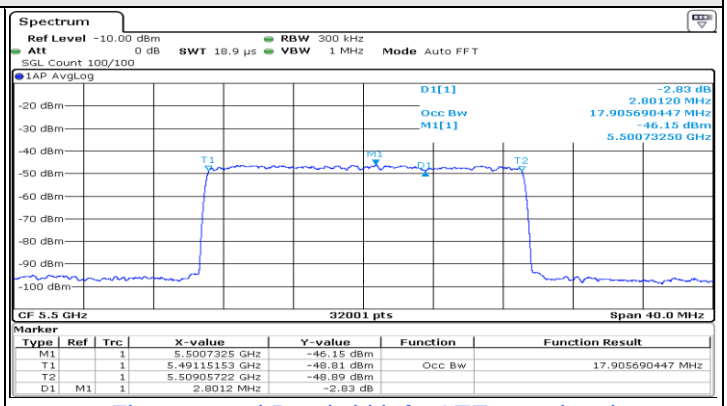
Flatness and Bandwidth for AWGN test signal



Interference Signal Level for OFDM test signal

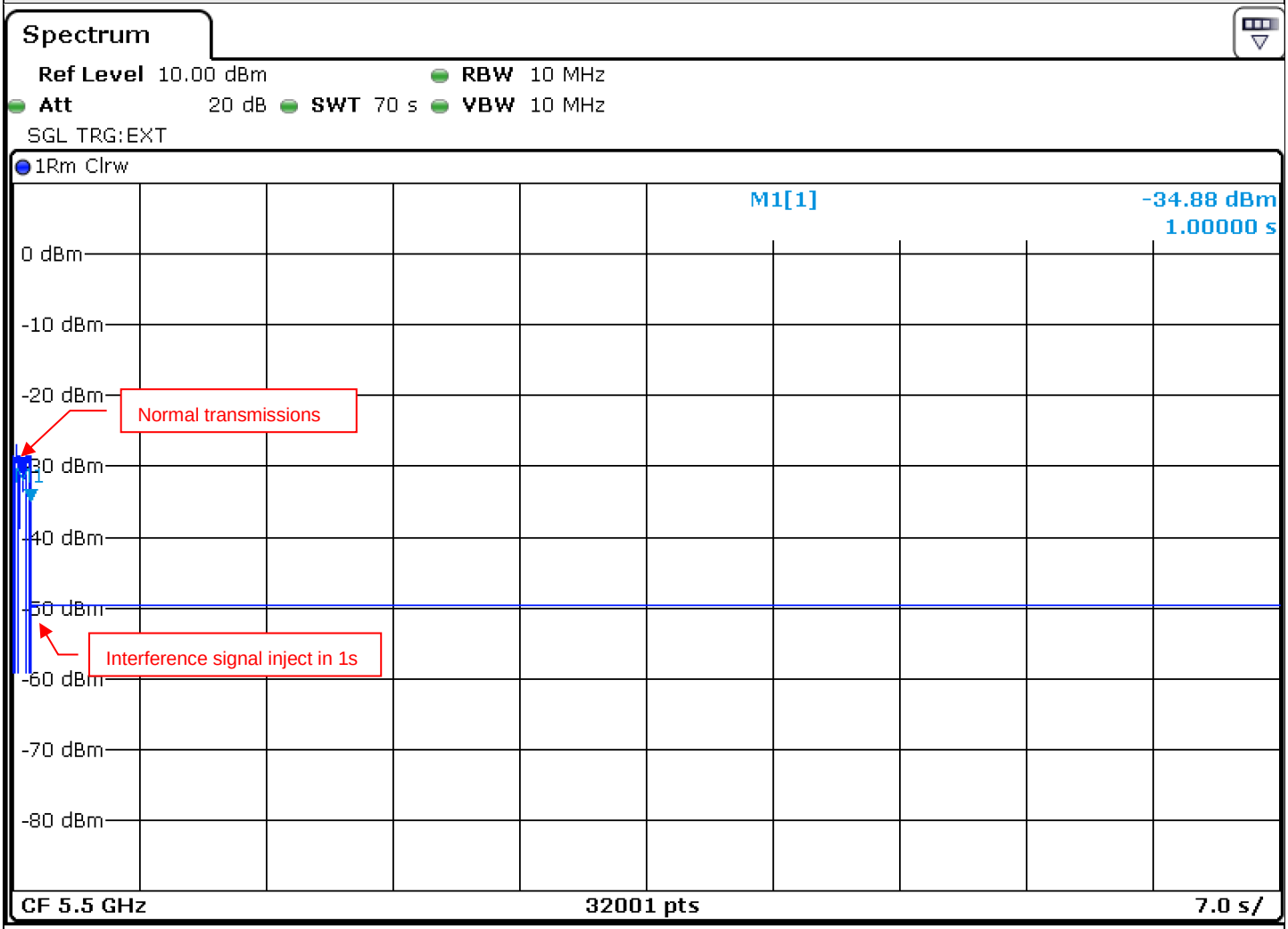


Flatness and Bandwidth for OFDM test signal

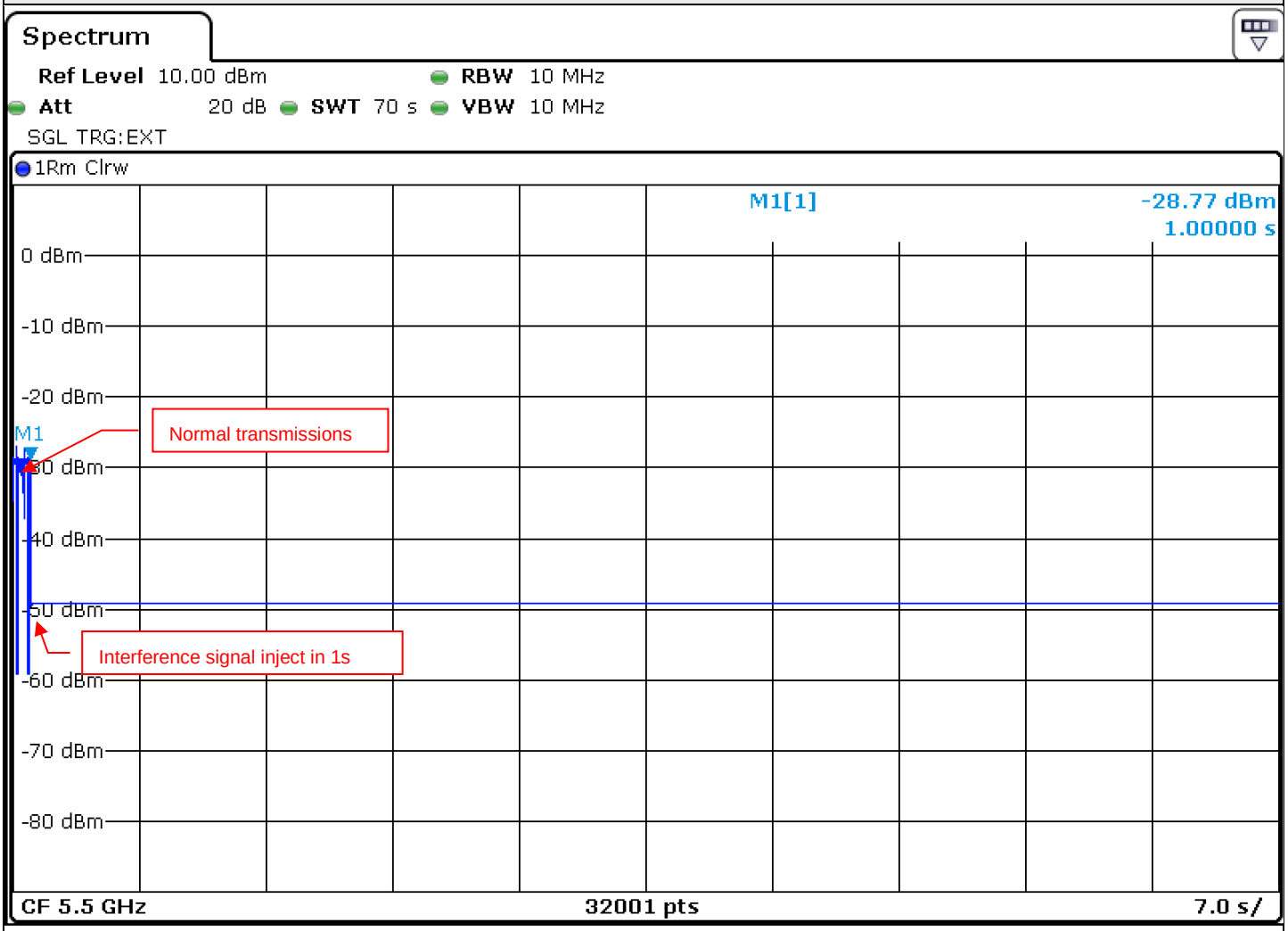
Plots of Interference Signal	
	
Interference Signal Level for LTE test signal	Flatness and Bandwidth for LTE test signal

For Adaptivity

Load Based Equipment				
Channel Operation of EUT Device type	**Operation Mode**	**Operating Frequency (MHz)**	**Interference Signal (MHz)**	**Test Result**
Single Channel Operation	802.11ax (HE20)	5500	5500	Pass
Option 2 for Multi-Channel Opreation	802.11ax (HE40)	5510	5520	Pass

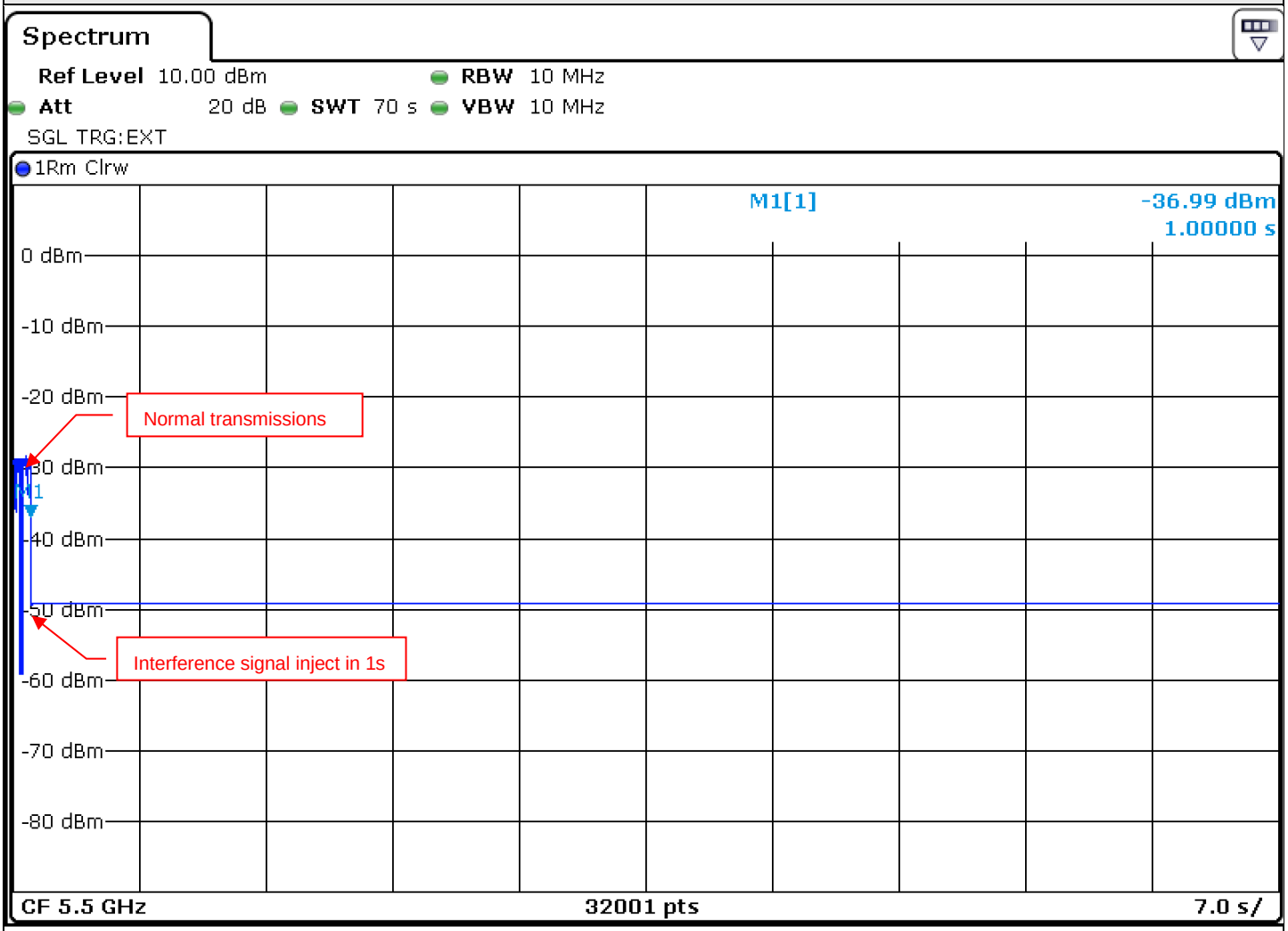
Plots of Adaptivity

Additive White Gaussian Noise (AWGN) signal test result 11ax20 5G 5500 MHz

Plots of Adaptivity



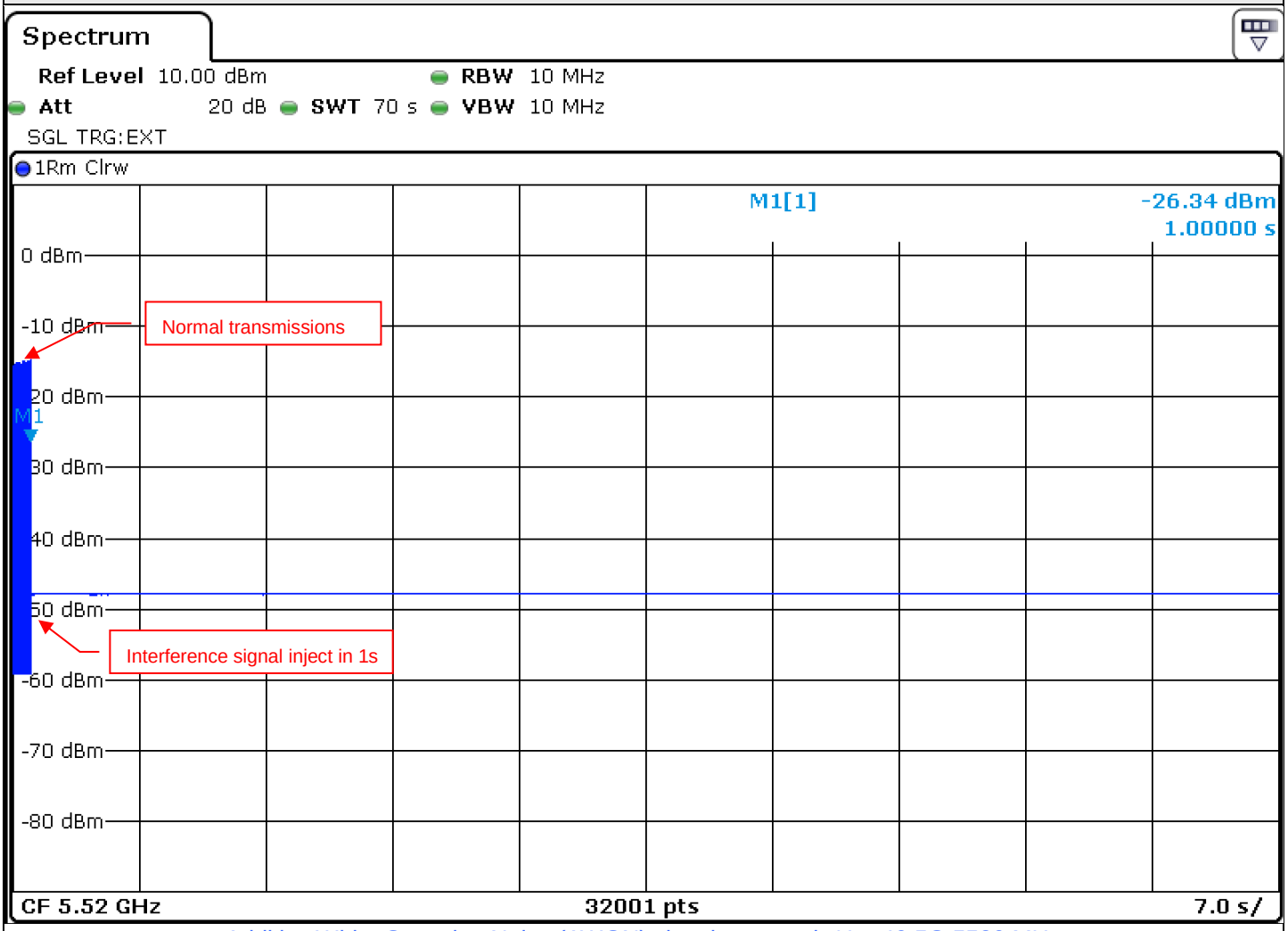
OFDM signal test result 11ax20 5G 5500 MHz

Plots of Adaptivity



LTE signal test result 11ax20 5G 5500 MHz

Plots of Adaptivity

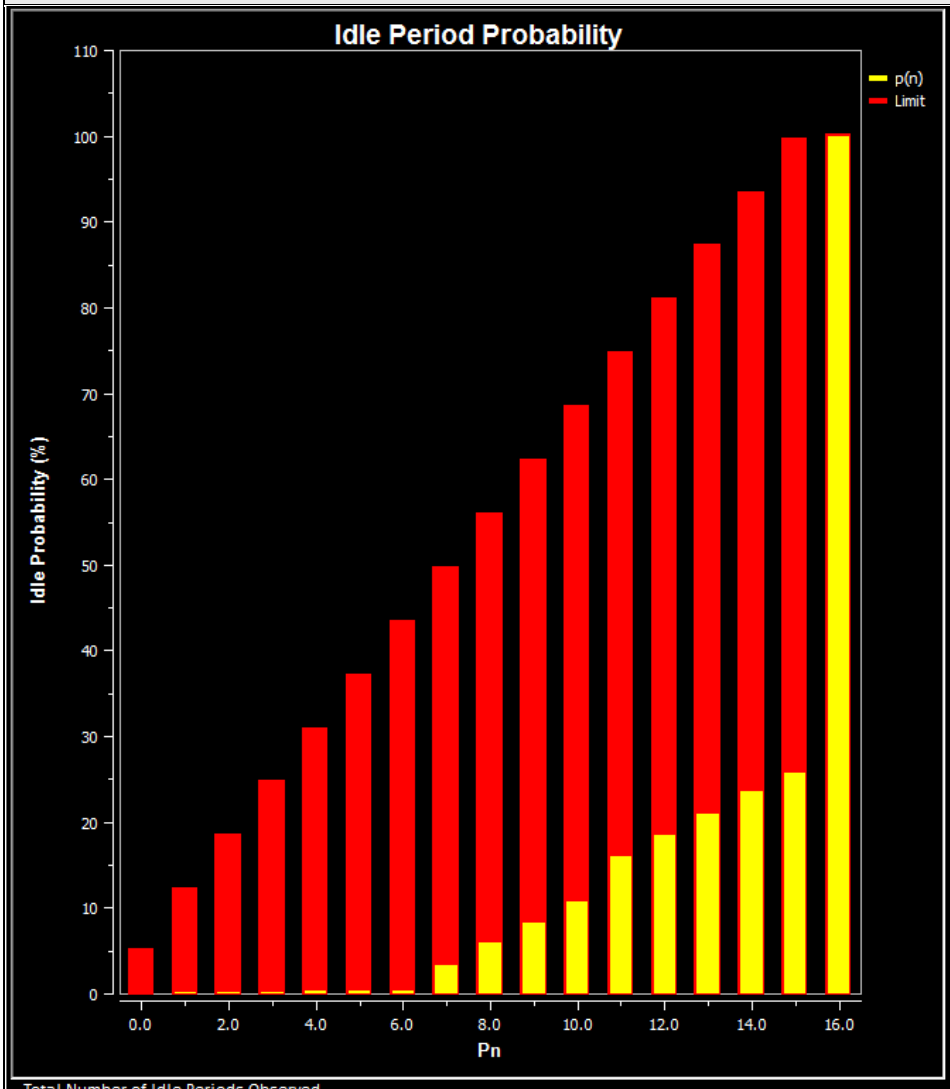


Additive White Gaussian Noise (AWGN) signal test result 11ax40 5G 5520 MHz

For Channel Access Mechanism

Load Based Equipment Option A : verify medium access mechanism					
Equipment operates		The Load Based Equipment operates as a Supervised Device			
Priority Classes implemented		Priority Class 2			
Operation Mode	**Operating Frequency (MHz)**	**Maximum Channel Occupancy Time (ms)**	**Minimum Idle Period (μs)**	**Limit of Maximum Channel Occupancy Time (ms)**	**Test Result**
802.11ax (HE40)	5510	2.683	27.1	6	Pass

Plots of Channel Access Mechanism



Maximum Probability of Each Idle Period

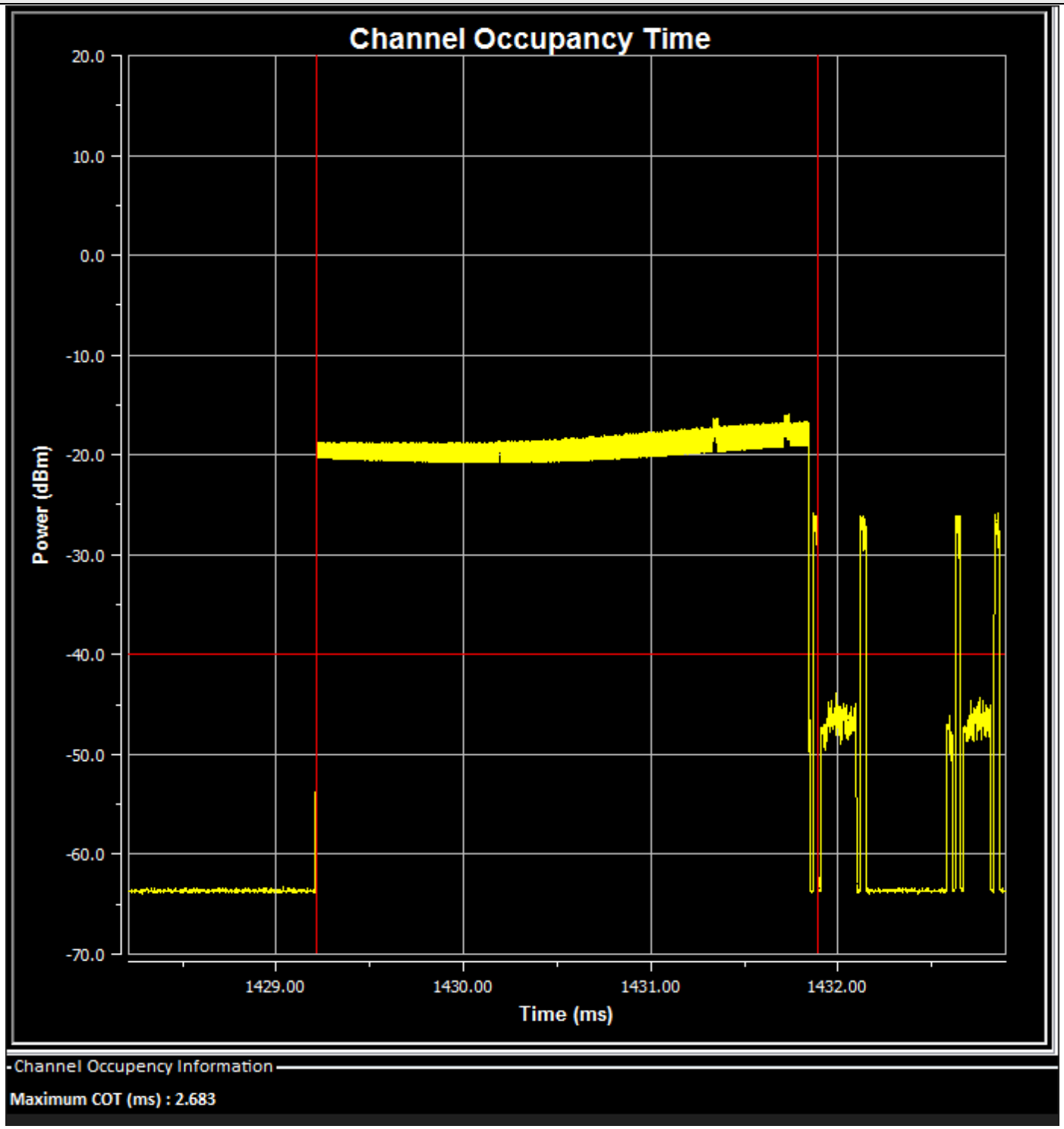
P(n)	Result (%)	Limit (%)	Status
0	0.08	5	Pass
1	0.13	12	Pass
2	0.17	18.25	Pass
3	0.21	24.5	Pass
4	0.25	30.75	Pass
5	0.26	37	Pass
6	0.34	43.25	Pass
7	3.26	49.5	Pass
8	5.91	55.75	Pass
9	8.21	62	Pass
10	10.66	68.25	Pass
11	15.97	74.5	Pass
12	18.51	80.75	Pass
13	20.93	87	Pass
14	23.57	93.25	Pass
15	25.77	99.5	Pass
16	100	100	Pass

Total Number of Idle Periods Observed

Total Idle Period Number : 10002

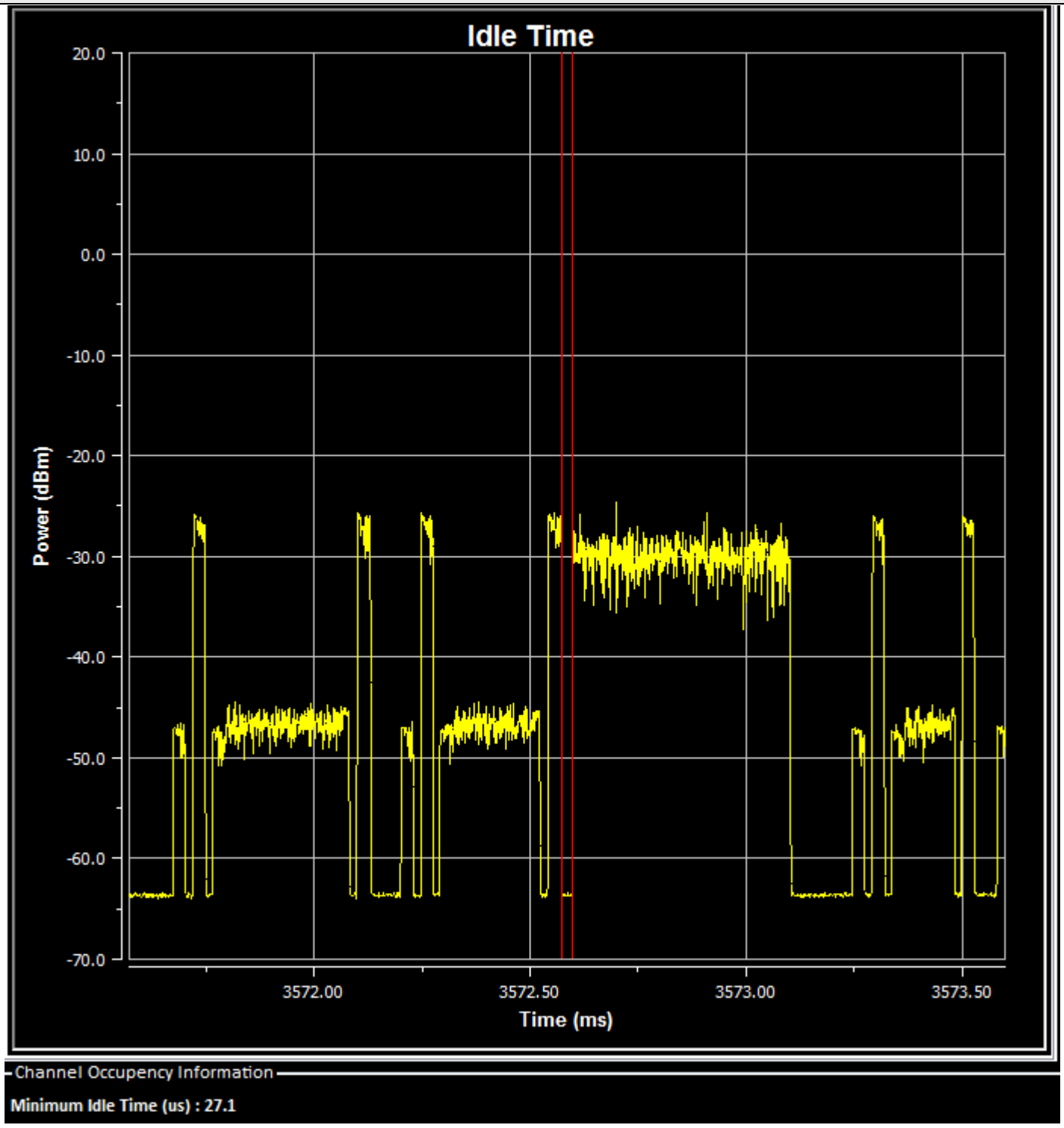
Idle Periods dependent Priority

Plots of Channel Access Mechanism



Maximum Channel Occupancy Time

Plots of Channel Access Mechanism



Minimum Idle Period

For Short Control Signalling Transmission

Operation Mode	Operating Frequency (MHz)	Interference signal	SCST Total On Time (ms)	SCST Limit (ms)	Test Result
802.11ax (HE20)	5500	AWGN signal	0	2.5	Pass
		OFDM signal	0	2.5	Pass
		LTE signal	0	2.5	Pass
802.11ax (HE40)	5510	AWGN signal non-Primary	0	2.5	Pass

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Stan Shih

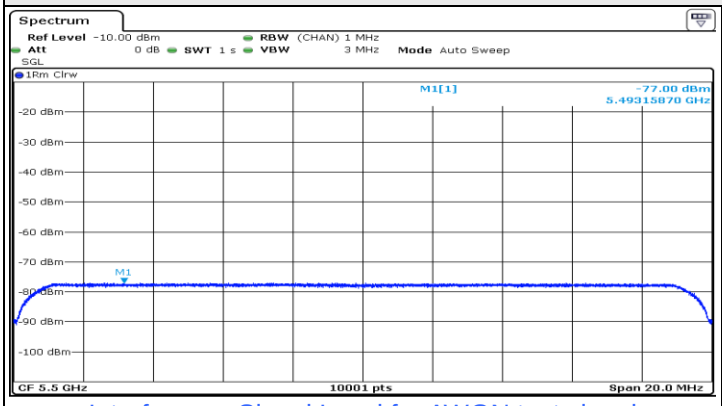
Add Test low antenna gain
Test Results for reference by client's requirement.

EUT Information		
Product	**Model No.**	**Software/Firmware Version**
RTL8851BE	RTL8851BE	6001.19.102.0

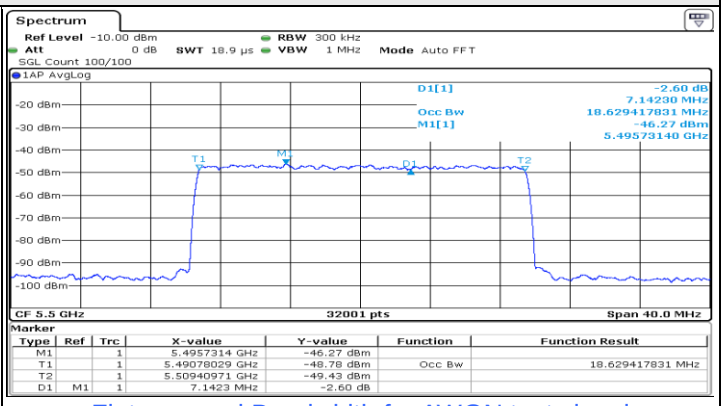
Companion Device Information			
Product	**Brand**	**Model No.**	**Software/Firmware Version**
Wireless Router	ASUS	RT-AX88U	3.0.0.4.382_5329

Energy Detection Threshold Level (TL)
Option 1: TL = -75 dBm/MHz (assumes a 0 dBi receive antenna)
EUT antenna Gain(G) : -2 dBi
The ED Threshold level (TL) = -75 dBm/MHz + G (-2 dBi) = -77 dBm/MHz The interference signal level to the EUT is lower than -77 dBm/MHz at the antenna connector.

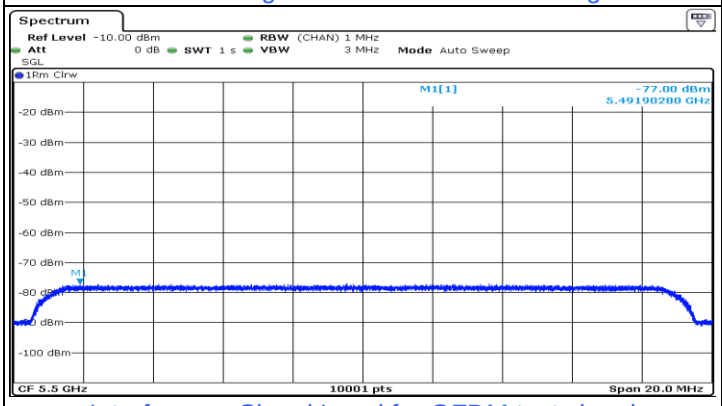
Plots of Interference Signal



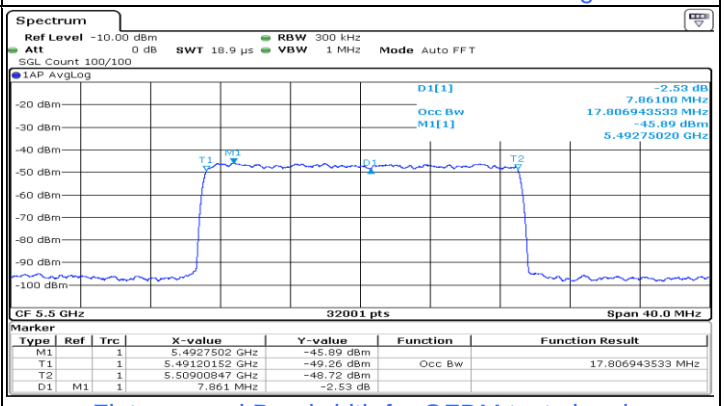
Interference Signal Level for AWGN test signal



Flatness and Bandwidth for AWGN test signal

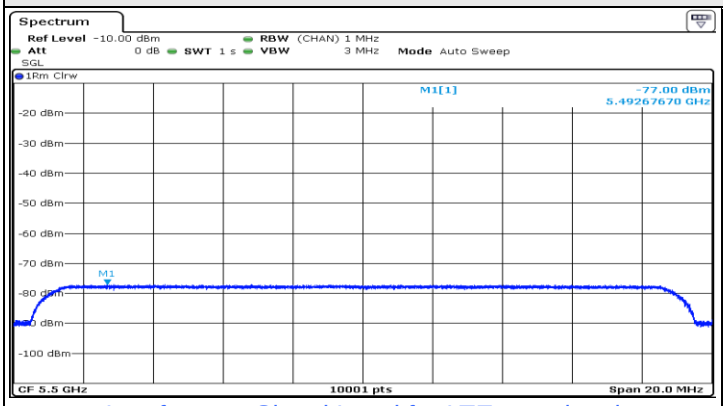


Interference Signal Level for OFDM test signal

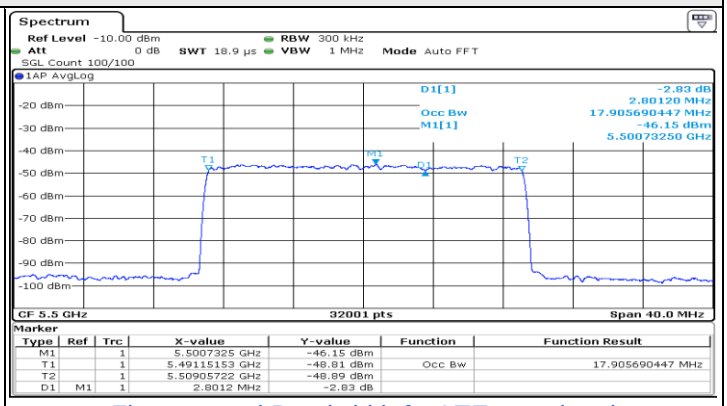


Flatness and Bandwidth for OFDM test signal

Plots of Interference Signal



Interference Signal Level for LTE test signal

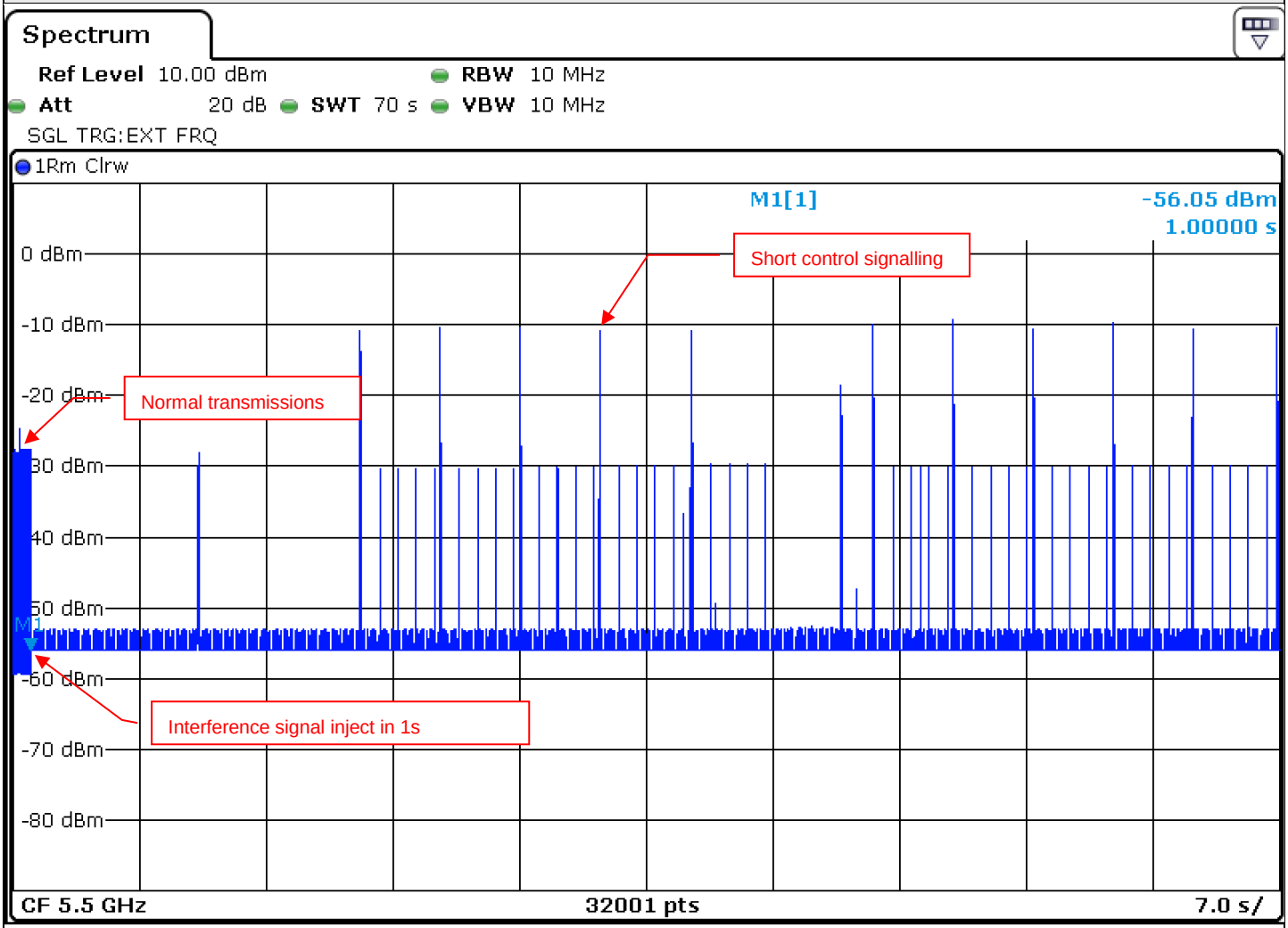


Flatness and Bandwidth for LTE test signal

For Adaptivity

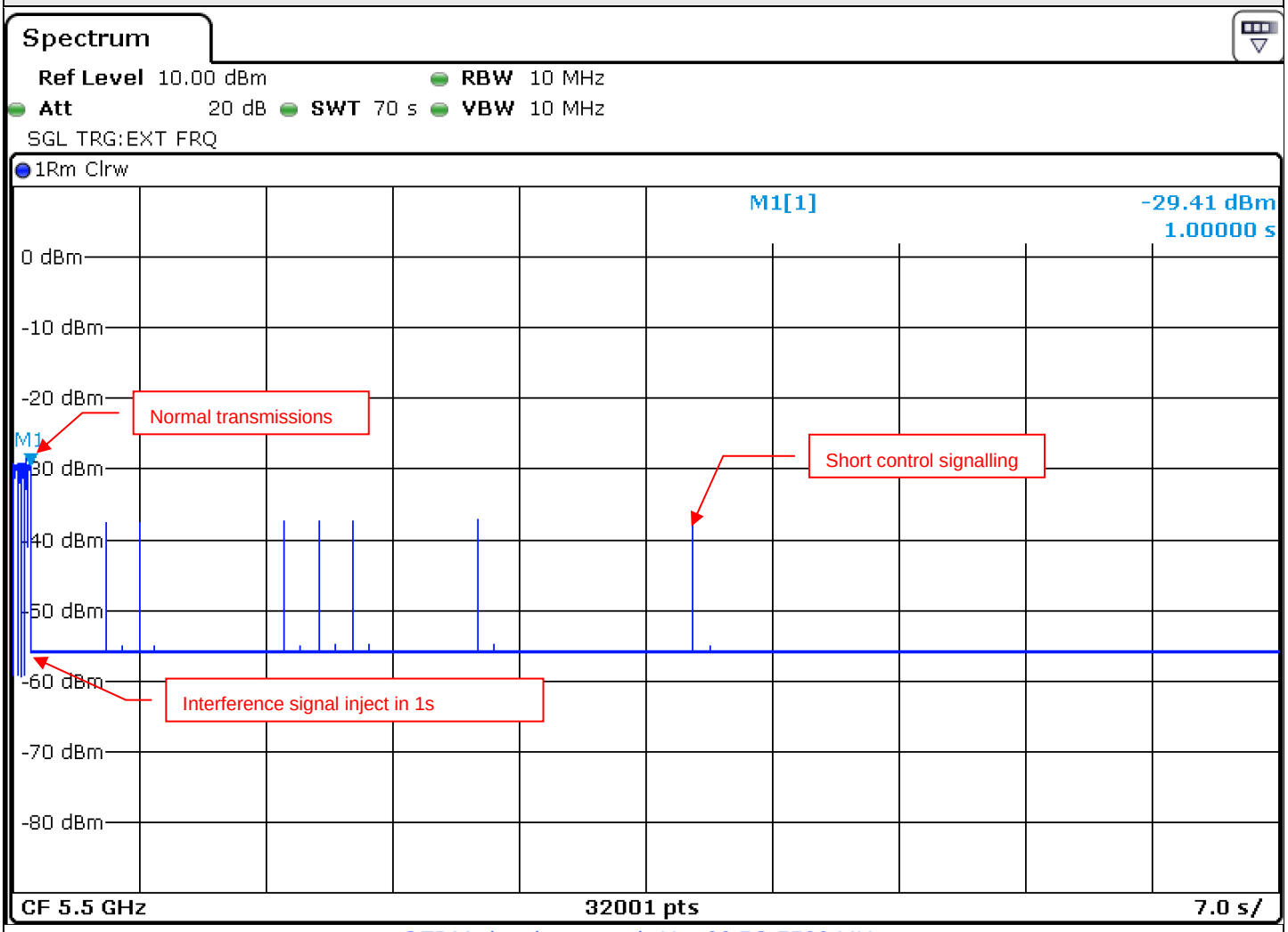
Load Based Equipment				
Channel Operation of EUT Device type	**Operation Mode**	**Operating Frequency (MHz)**	**Interference Signal (MHz)**	**Test Result**
Single Channel Operation	802.11ax (HE20)	5500	5500	Pass
Option 2 for Multi-Channel Opreation	802.11ax (HE40)	5510	5520	Pass

Plots of Adaptivity



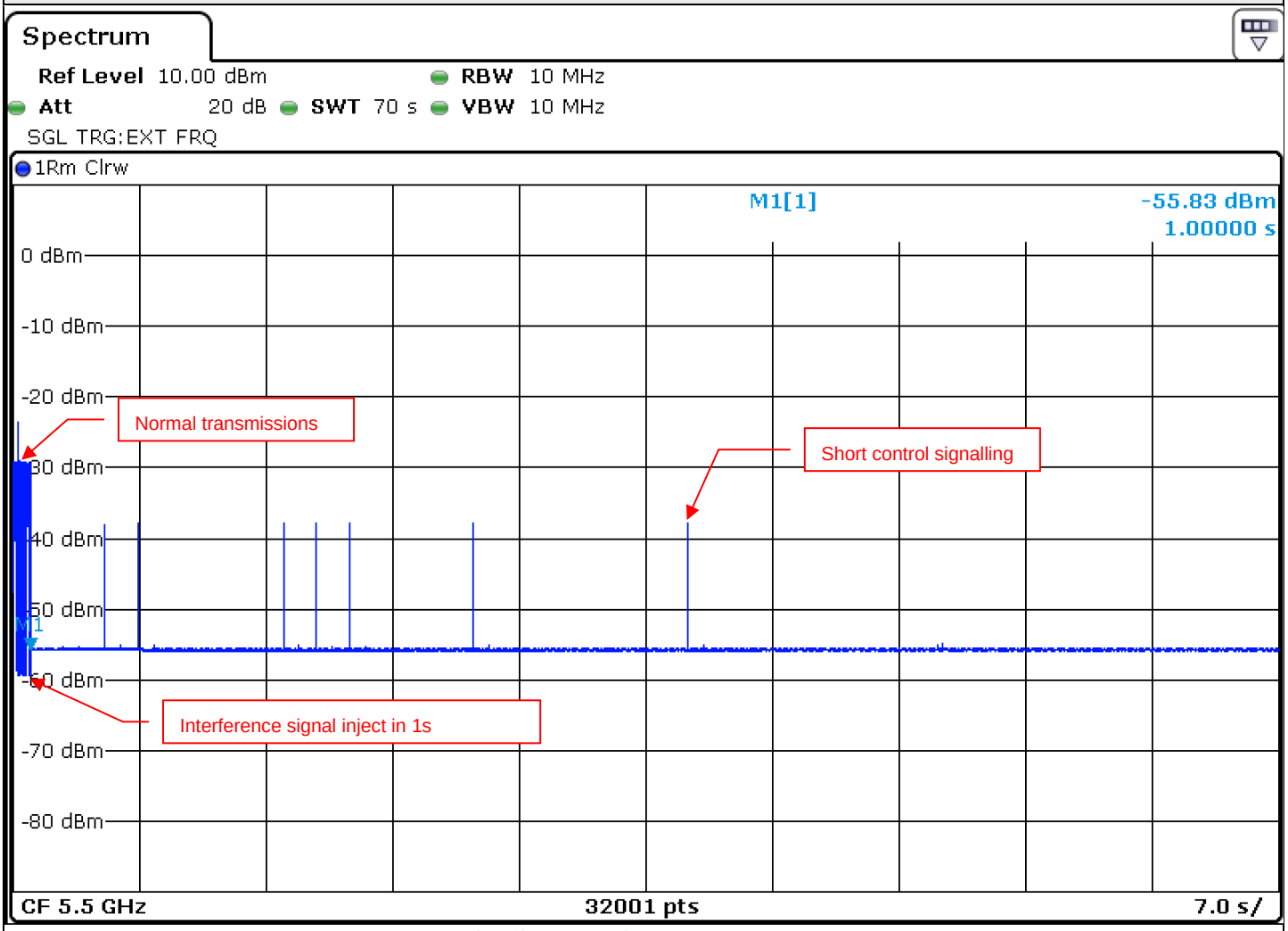
Additive White Gaussian Noise (AWGN) signal test result 11ax20 5G 5500 MHz

Plots of Adaptivity



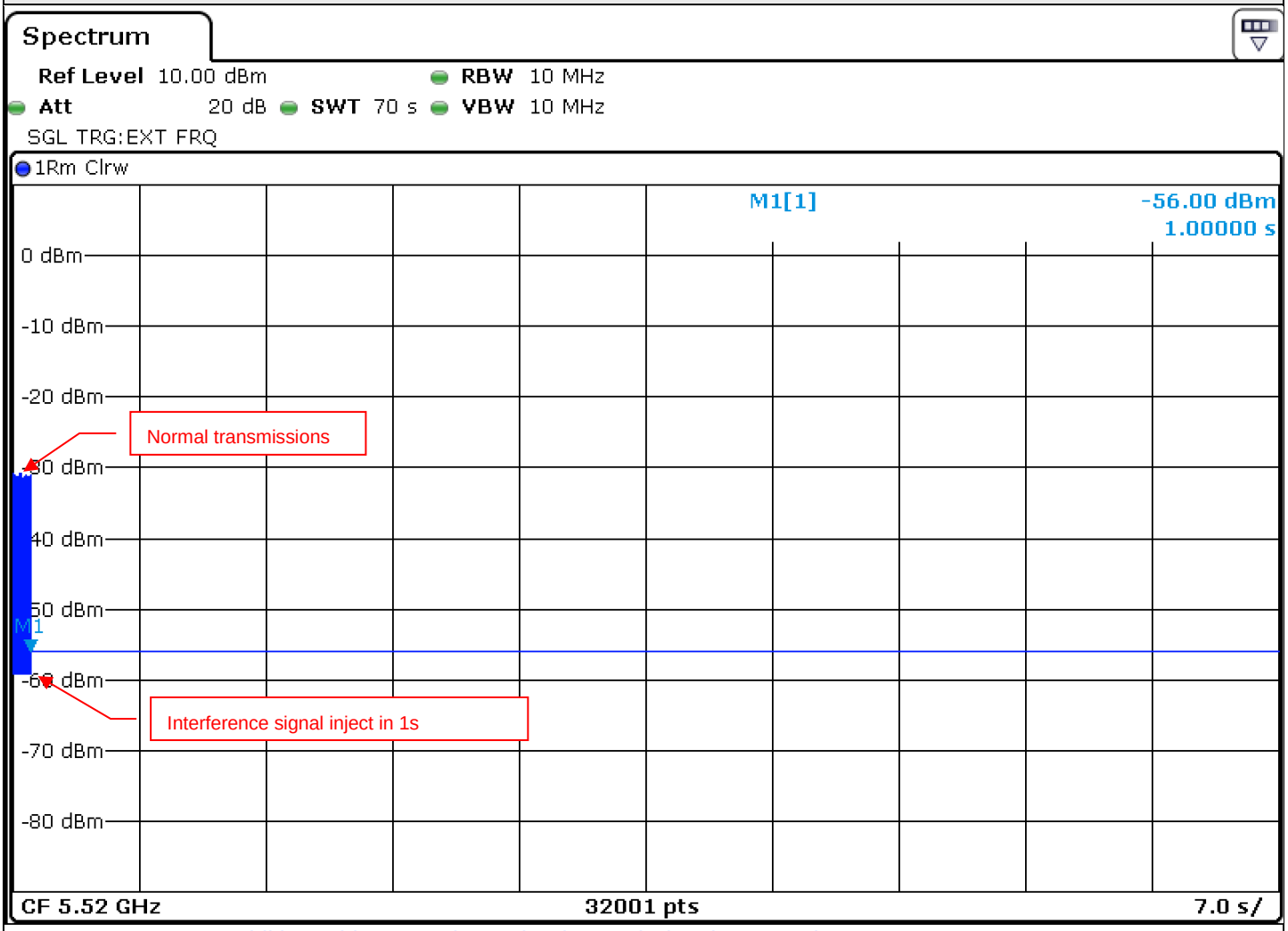
OFDM signal test result 11ax20 5G 5500 MHz

Plots of Adaptivity



LTE signal test result 11ax20 5G 5500 MHz

Plots of Adaptivity

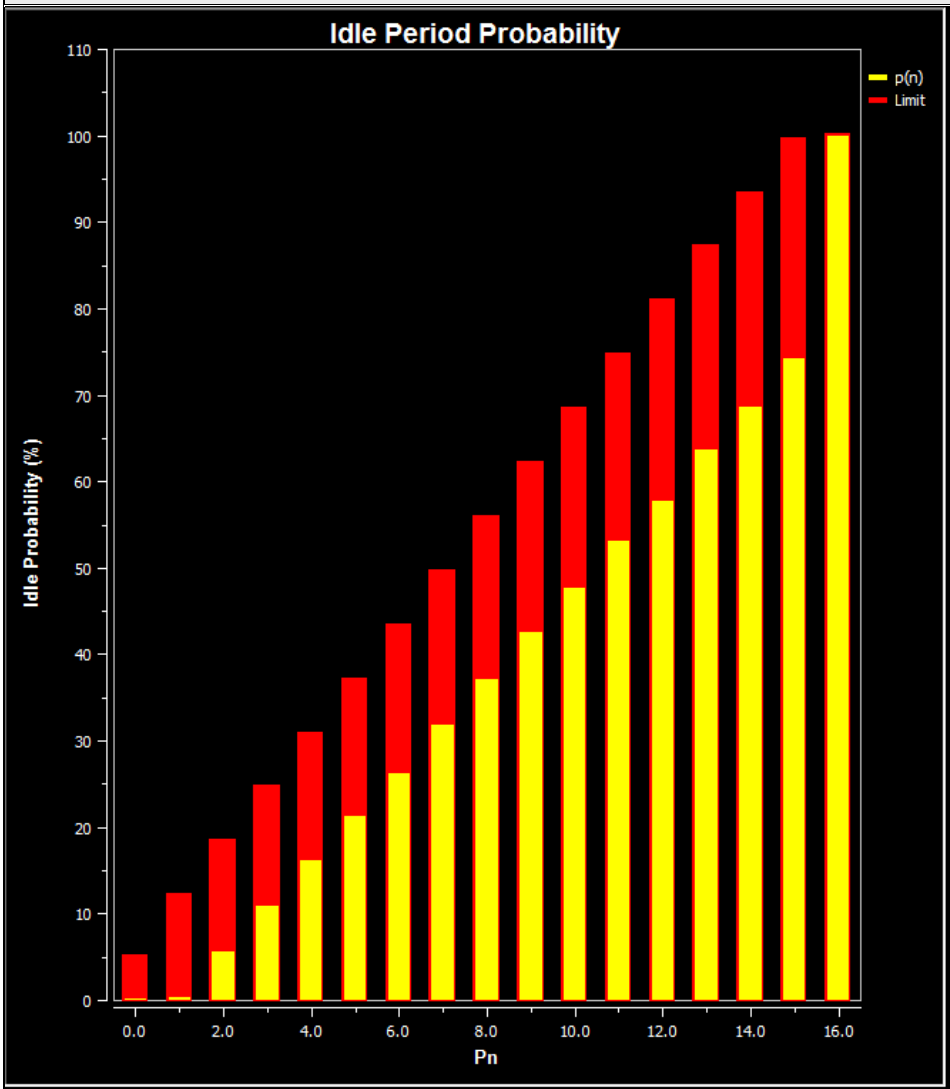


Additive White Gaussian Noise (AWGN) signal test result 11ax40 5G 5520 MHz

For Channel Access Mechanism

Load Based Equipment Option A : verify medium access mechanism					
Equipment operates		The Load Based Equipment operates as a Supervised Device			
Priority Classes implemented		Priority Class 2			
Operation Mode	**Operating Frequency (MHz)**	**Maximum Channel Occupancy Time (ms)**	**Minimum Idle Period (μs)**	**Limit of Maximum Channel Occupancy Time (ms)**	**Test Result**
802.11ax (HE40)	5510	2.115	27.1	6	Pass

Plots of Channel Access Mechanism



Maximum Probability of Each Idle Period

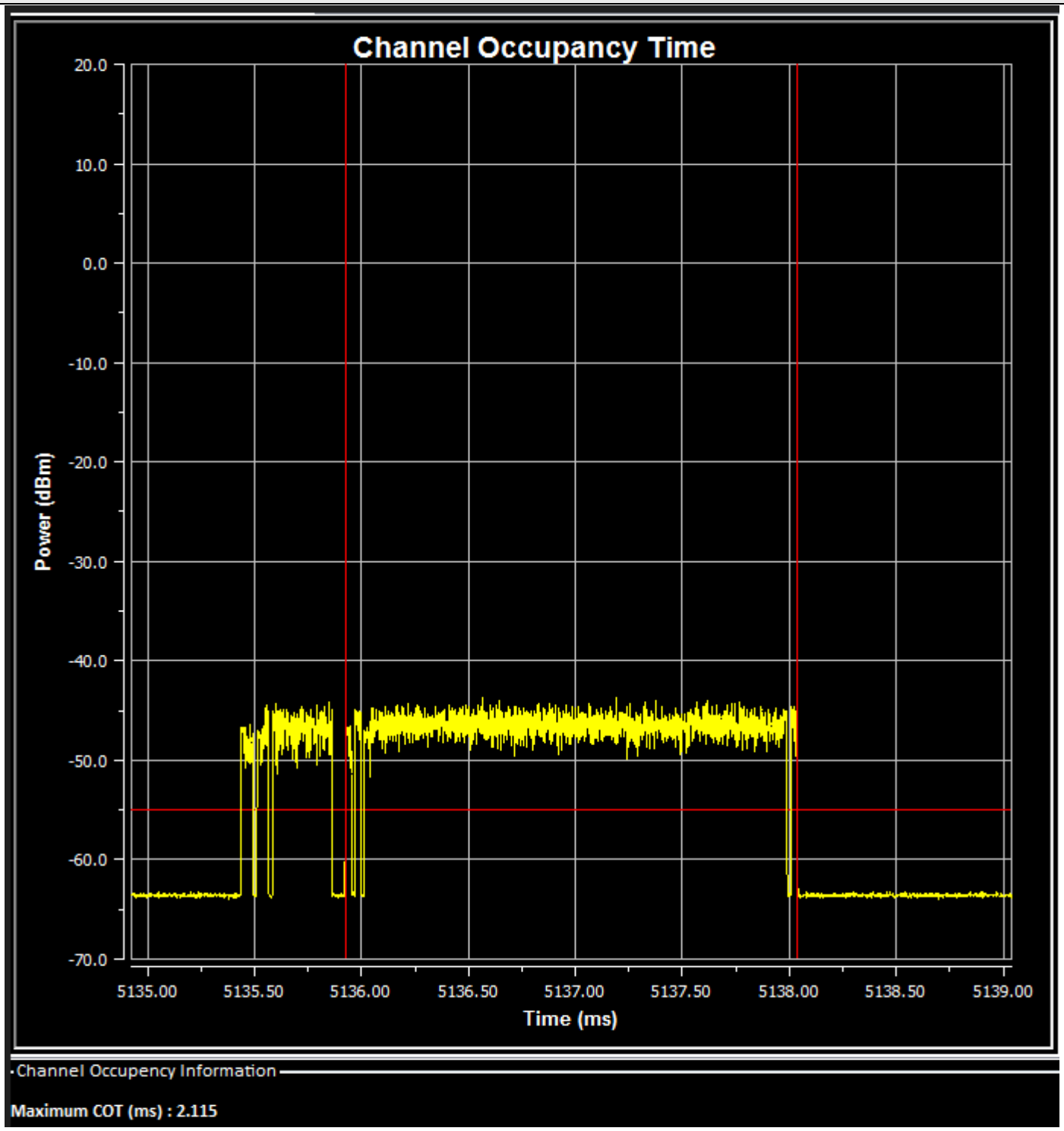
P(n)	Result (%)	Limit (%)	Status
0	0.12	5	Pass
1	0.25	12	Pass
2	5.66	18.25	Pass
3	10.91	24.5	Pass
4	16.14	30.75	Pass
5	21.24	37	Pass
6	26.29	43.25	Pass
7	31.84	49.5	Pass
8	37.14	55.75	Pass
9	42.54	62	Pass
10	47.61	68.25	Pass
11	53.08	74.5	Pass
12	57.71	80.75	Pass
13	63.59	87	Pass
14	68.68	93.25	Pass
15	74.19	99.5	Pass
16	100	100	Pass

Total Number of Idle Periods Observed

Total Idle Period Number : 10019

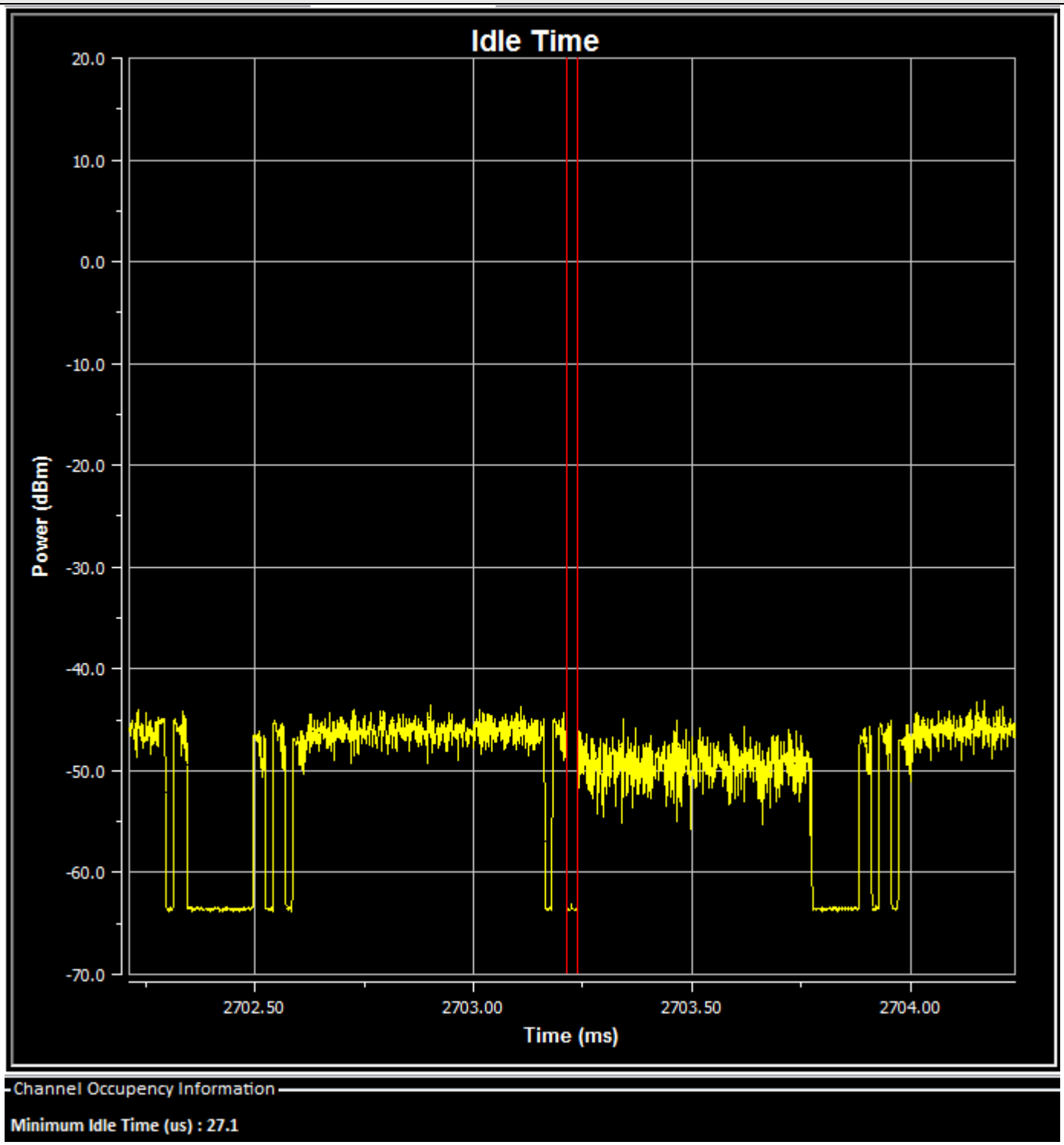
Idle Periods dependent Priority

Plots of Channel Access Mechanism



Maximum Channel Occupancy Time

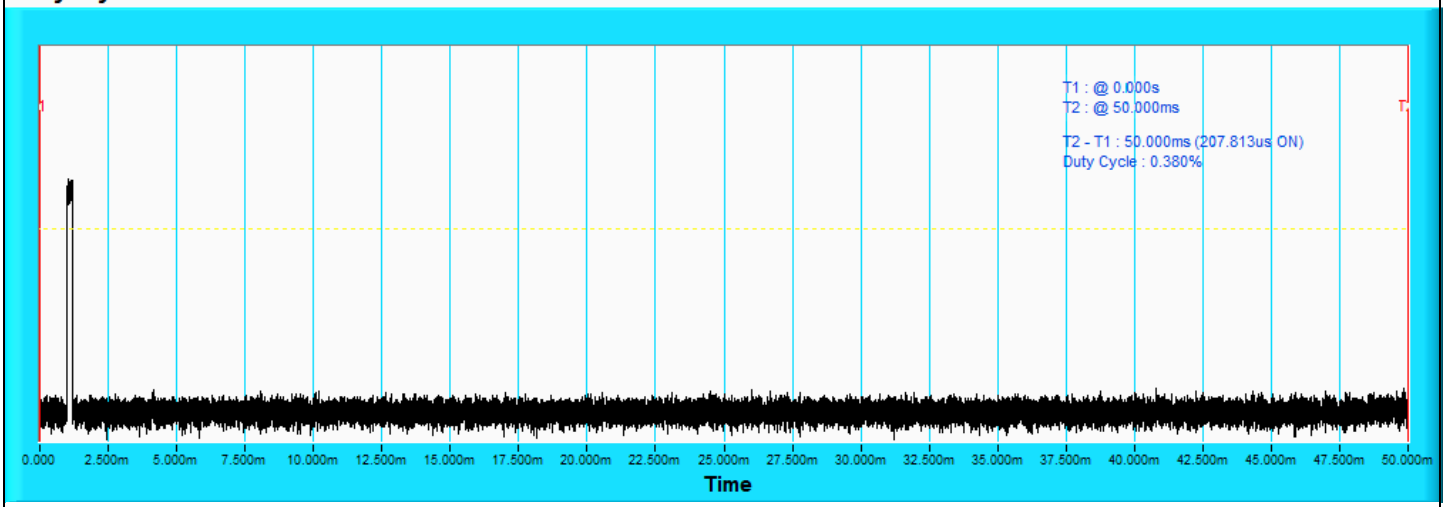
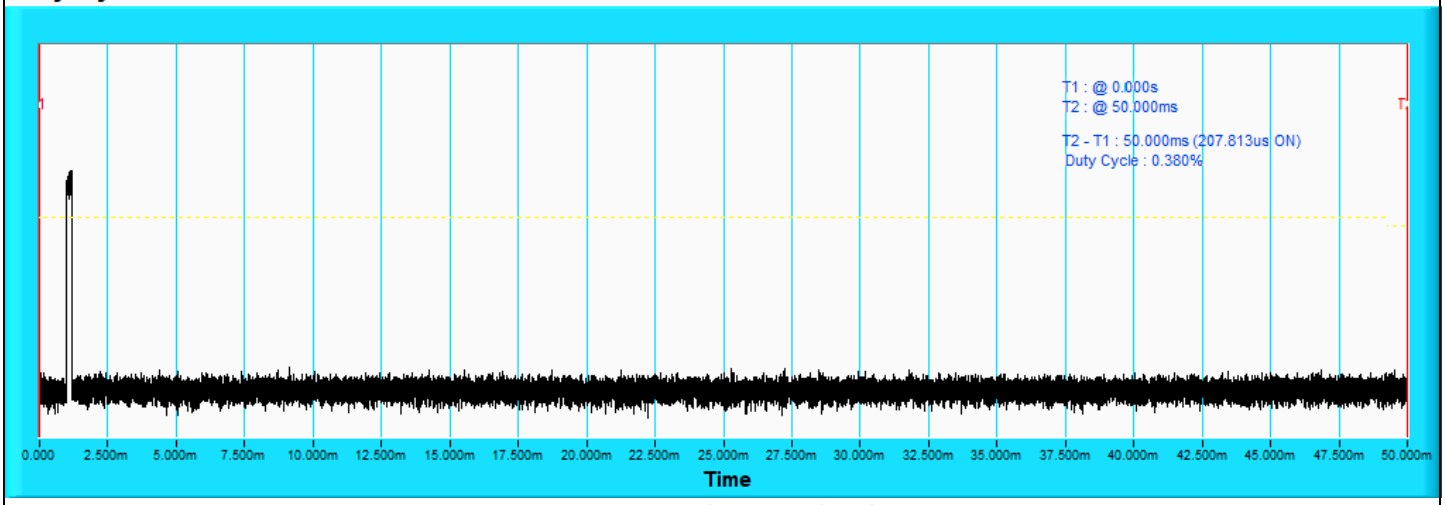
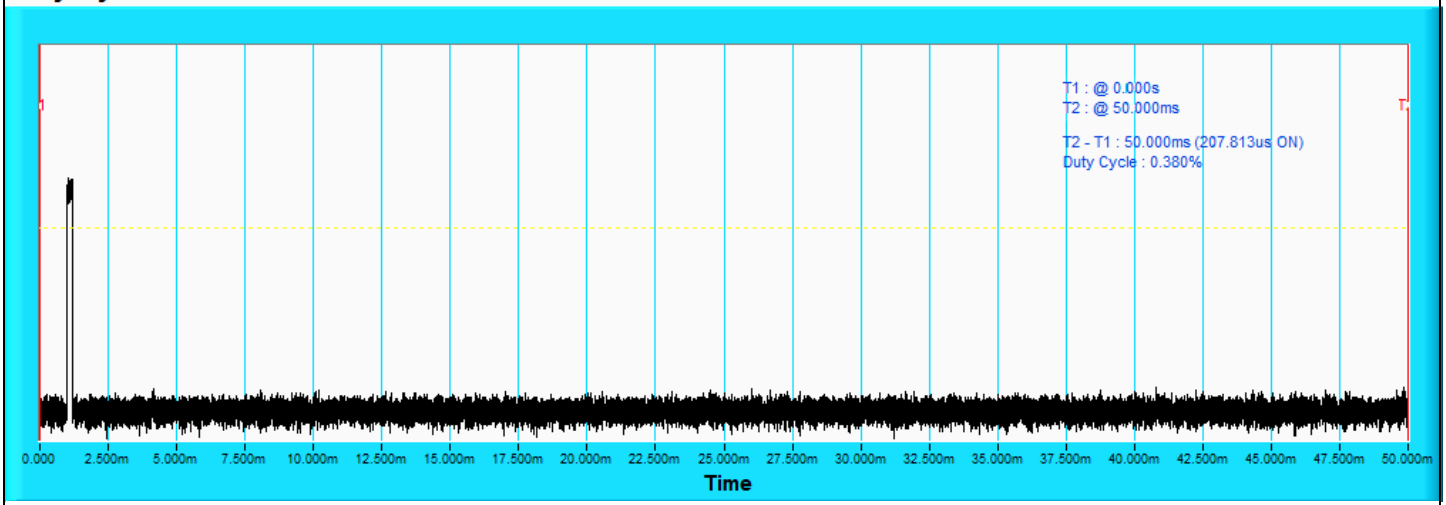
Plots of Channel Access Mechanism



Minimum Idle Period

For Short Control Signalling Transmission

Operation Mode	Operating Frequency (MHz)	Interference signal	SCST Total On Time (ms)	SCST Limit (ms)	Test Result
802.11ax (HE20)	5500	AWGN signal	0.21	2.5	Pass
		OFDM signal	0.21	2.5	Pass
		LTE signal	0.21	2.5	Pass
802.11ax (HE40)	5510	AWGN signal non-Primary	0	2.5	Pass

Plots of Short Control Signalling Transmission
Duty Cycle

11ax20 5G / AWGN signal
Duty Cycle

11ax20 5G / OFDM signal
Duty Cycle

11ax20 5G / LTE signal

7.12 Receiver Blocking

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Thomas Liao

Receiver Blocking Criterion	
Minimum Performance Criterion:	PER or FER ≦10%

Receiver Blocking Measure Of The Capability

Operation Mode	Operating Frequency (MHz)	Wanted Signal Mean Power From Companion Device (dBm)	Blocking Signal Frequency (MHz)	The Actual Blocking Signal Power (dBm)	The Highest Level At Which The Performance Criteria Are Met (dBm)	PER(%)	Test Result
11a	5180	-83	5100	-59	-29	3.5	Pass
			4900	-53	-25	2.8	Pass
			5000	-53	-12	3.2	Pass
			5975	-53	-5	2.6	Pass
	5500	-86	5100	-59	-25	2.4	Pass
			4900	-53	-26	3.3	Pass
			5000	-53	-25	3.4	Pass
			5975	-53	-26	2.7	Pass

Note: The minimum level of the wanted signal at 5180 MHz is -89 dBm , and at 5500 MHz is -91 dBm

8 User Access Restrictions

8.1 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.

8.2 Requirement

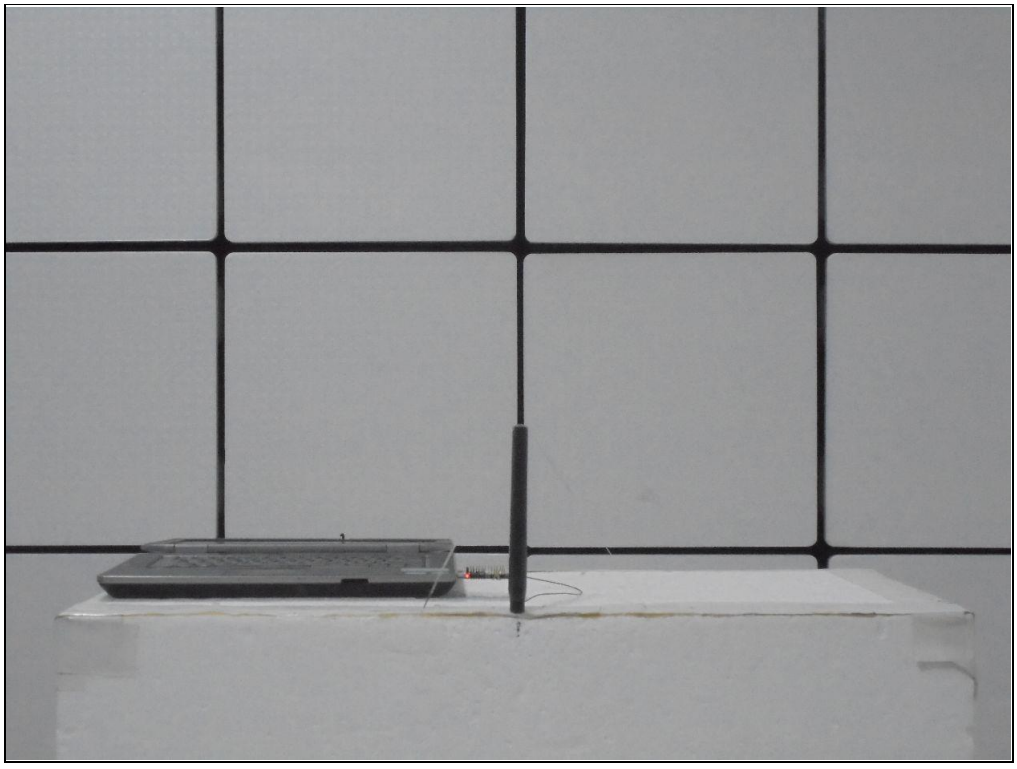
The equipment shall be so constructed that settings (hardware and/or software) related to DFS shall not be accessible to the user if changing those settings result in the equipment no longer being compliant with the DFS requirements in clause 4.2.6.
The above requirement includes the prevention of indirect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

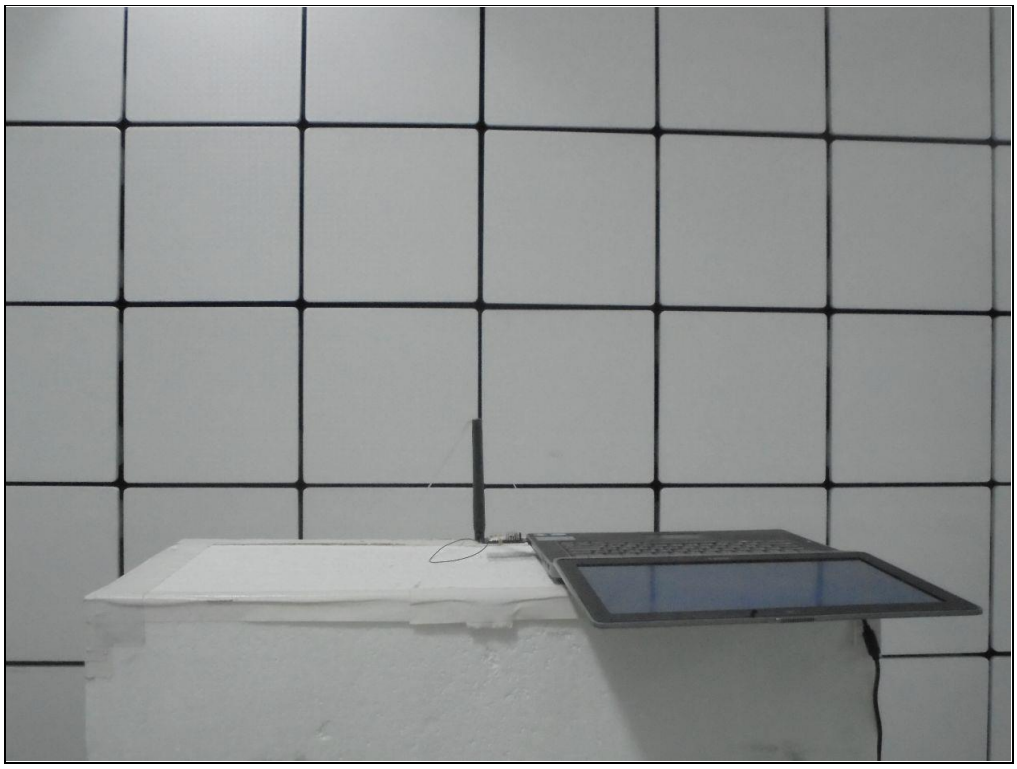
Manufacturer provides declaration form to meet this requirement.

9 Pictures of Test Arrangements

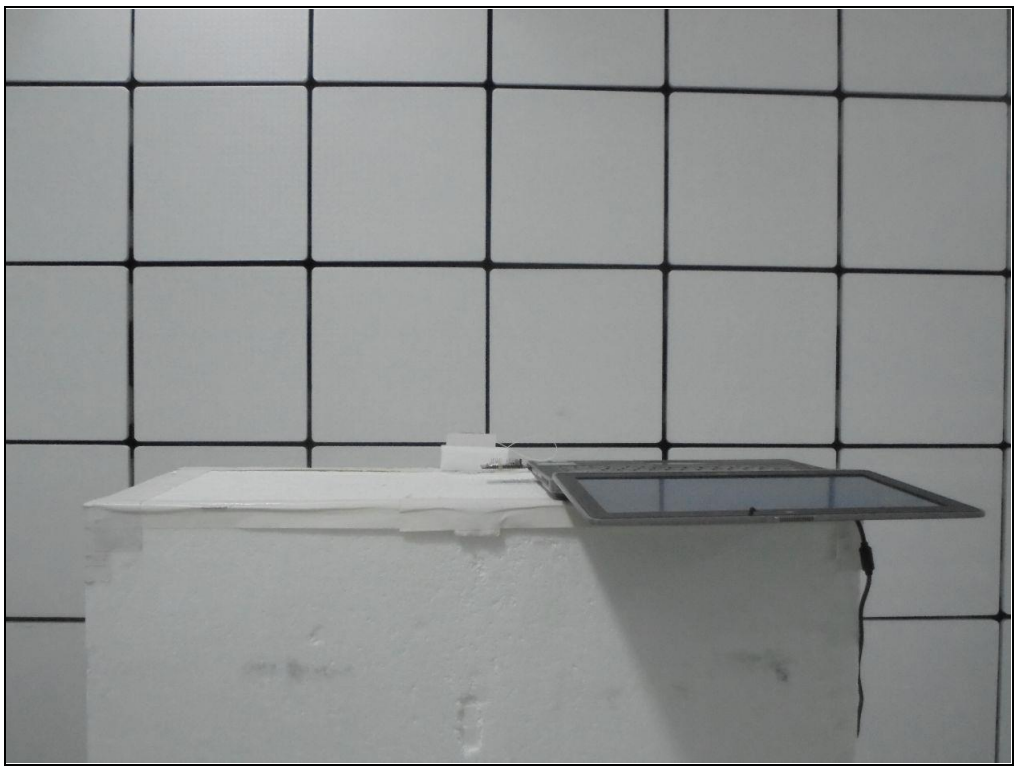
Emissions (up to 1 GHz / above 1 GHz)

Mode A

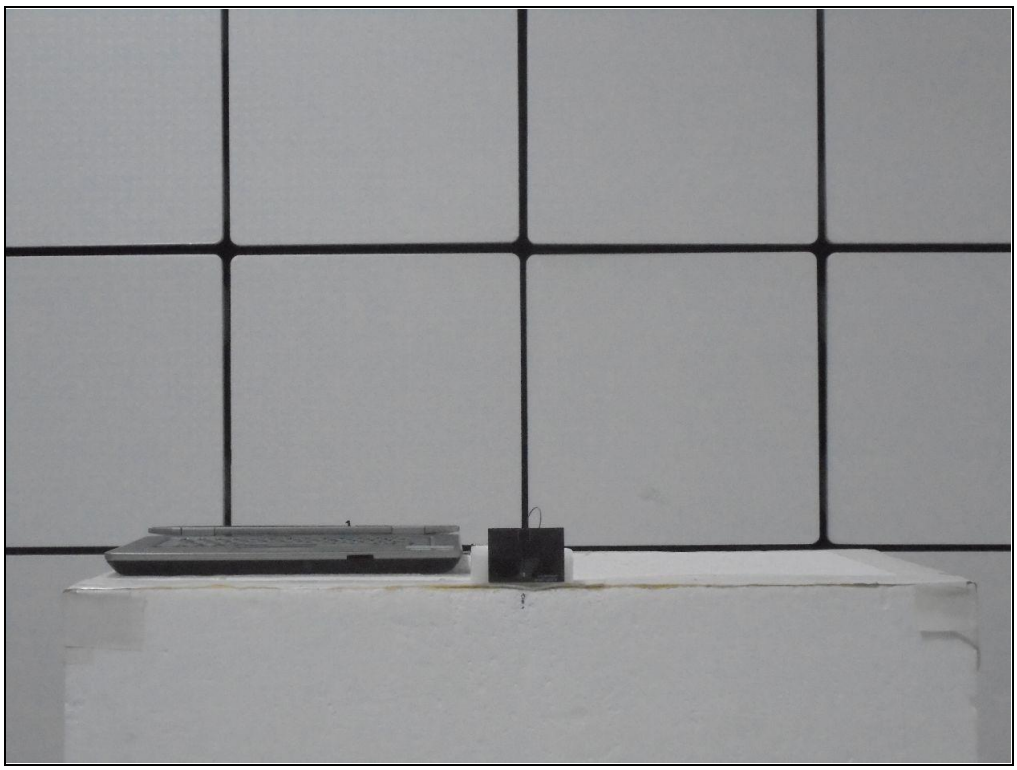




Mode B



Mode C



10 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 FCC recognized accredited test firms and accredited 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@bureauveritas.com
Web Site: http://ee.bureauveritas.com.tw

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

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